

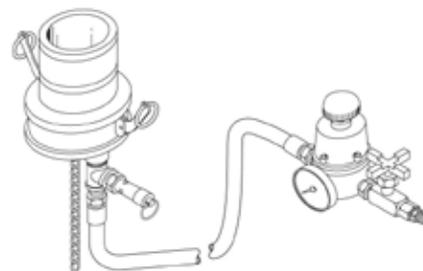
Engine Tools

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Air Induction

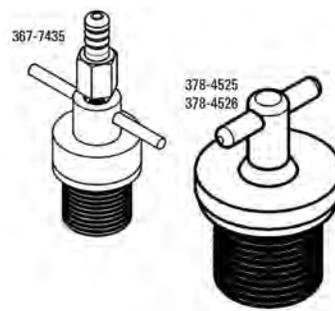
FT1984 Pressurizing Group

Reference



Engine Tools

**367-7435, 378-4525, 378-4526
Aftercooler Testing Plugs**



| Part Number | Description |
|-------------|--------------------------|
| 378-4525 | Aftercooler Testing Plug |
| 378-4526 | Aftercooler Testing Plug |
| 367-7435 | Aftercooler Testing Plug |

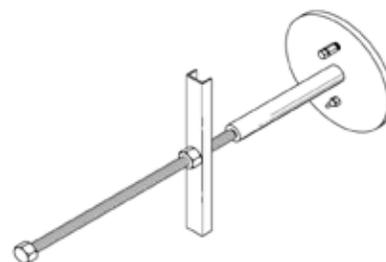
321-6022 Pressurizer Assembly

Essential Tool

Model: 793F, 795F, and 797F Off-Highway Truck

Warranty: Six Months

- Used to seal air induction system to test for air leaks temporarily — replaces primary and secondary air filters
- Used with shop air supply and dealer supplied 0 to 70 kPa (0 to 10 psi) pressure gauge
- Requires one pressurizer tool for each air cleaner (797F Off-Highway Truck requires five tools)
- Each tool features a quick-disconnect air fitting and a preset pressure relief valve
- 9H-5548 O-ring Seal is serviced separately



| Part Number | Description |
|-------------|----------------------|
| 321-6022 | Pressurizer Assembly |

152-2067 Differential Pressure Gauge

Model: Multiple Engine Models

Warranty: Six Months



- Used to monitor aftercooler pressure drop in applications with crankcase fumes recirculation
- Minimize risk of engine reliability problems
- Helps eliminate premature plugging of aftercooler cores
- Increase service life of air cleaner
- Eliminates need for using two gauges
- Installs easily across air side of aftercooler core
- Measures differential pressure continuously, regardless of fluctuation in system pressure
- For maximum accuracy, calibrate gauge in position used
- Magnahelic gauge with high pressure option

| | |
|-------------------|---------------------------------|
| Accuracy | ±2% of full scale |
| Weight | .51 kg (18 oz) |
| Range | 0 - 101 cm (0 - 40 in) of water |
| Minor divisions | 1.0 |
| Temperature range | (-6° to 60° C) 20° to 140° F |
| Maximum pressure | 551 kPa (80 psi) |

| Part Number | Description |
|-------------|-----------------------------|
| 152-2067 | Differential Pressure Gauge |

Turbocharging Reconditioning Tools

Model: Multiple Engine Models

Warranty: Six Months

The tools needed to service a particular turbocharger can be determined from the following charts.

Reference

SMHS6854, Special Instruction

| Part No. | Description | 3LK | 4, 4A, 4C | 4B, 4D | V4HD, V4MD | 4MD, 4ME | 4HD | F, E |
|---------------------|--------------------|-----|-----------|--------|------------|----------|-----|------|
| FT0165 ¹ | Fixture (Modified) | X | X | X | X | X | X | X |
| FT0165 | Fixture | | X | X | X | X | X | X |
| FT0168 | Adapter | | | X | | | | X |
| FT0170 | Support Screw | | X | X | X | X | X | |
| FT0174 | Driver Tool | | X | X | X | X | X | |
| FT0175 | Expander Sleeve | | X | X | X | X | X | |
| FT0623 | Removal Tool | | | | | X | X | |
| FT0626 | Spacer Block | X | X | X | X | X | | |
| FT0745 | Pliers, Modified | | X | X | X | X | X | X |
| FT0808 | Adapter | X | X | | X | | | |

¹ FT0165 (Modified) replaces FT0165 Turbo Fixture

| Part Number | Description | 3LK | 4 4A 4C | 4B 4D | V4HD V4MD | 4MD 4ME | 4HD | F E |
|-------------|--------------------------------|-----|---------|-------|-----------|---------|-----|-----|
| 9S-6343 | Cartridge Fixture ¹ | -- | -- | -- | -- | X | X | X |
| 9S-6363 | Fixture Group ² | -- | -- | -- | -- | X | X | X |

(Continued)

Turbocharging Reconditioning Tools (Continued)

Model: Multiple Engine Models

Warranty: Six Months

¹9S-6343 replaced FT0622

²9S-6363 replaced FT0621

Manufacturer: AiResearch

| Part No. | Description | T6 | T12 | T114 | T18 | T24 | T3019 | T04 | TV81 | TW81 |
|---------------------|--------------------|----|-----|------|-----|-----|-------|-----|------|------|
| FT0165 ¹ | Fixture (Modified) | X | X | X | X | X | X | X | X | X |
| FT0165 | Fixture | X | X | X | X | X | X | | | |
| FT0168 | Adapter | X | X | | | | | | | |
| FT0170 | Support Screw | | X | X | X | X | X | | | |
| FT0174 | Driver Tool | X | X | X | X | X | X | | X | X |
| FT0745 | Pliers, Modified | X | X | X | X | | | | X | X |
| FT0808 | Adapter | | | | | | | X | | |
| FT1354 | Adapter | | | | | | | | X | X |
| 9S-6363 | Fixture Group | | X | | | | | | X | X |
| 9S-6343 | Cartridge Fixture | | X | | | | | | X | X |

¹ FT0165 (Modified) replaces FT0165 Turbo Fixture

FT3191 Driver Socket

Model: 770/772, D8 and 374/390

Warranty: None

| Specifications | |
|----------------|--------------------|
| Length | 84.14 mm (3.31 in) |



9S-6343 Fixture Assembly and Turbine Holders

- Used to disassemble turbocharger rotating assemblies by positioning turbine wheel in 9S-6343 Fixture Assembly for removal of shaft nut
- Contains sockets required to hold Schwitzer turbine wheels
- Set of 4 turbine holders available to hold AiResearch turbine wheels
- Frame of fixture retains holder in place

| Item | Description |
|------|--------------------------------|
| 2 | Turbine Holders (not serviced) |

| Item | Part Number | Description |
|------|-------------|-------------------------------|
| 1 | 9S-6343 | Fixture Assembly ¹ |

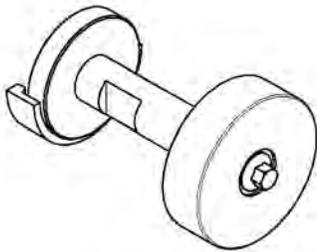


¹9S-6343 replaces FT0622

370-4653 C7.1 Turbocharger Alignment Tool

Model Usage: Perkins C7.1 Engines

Warranty: 6 Months



- Used to counterbalance the turbocharger for easier installation and alignment
- Used in assembly and removal of Turbocharger
- Material: Steel

| Part Number | Description | Size | Weight |
|-------------|----------------------------------|---|--------------------|
| 370-4653 | C7.1 Turbocharger Alignment Tool | Counter balance: 80 mm dia. x 175 mm long | 3.13 kg (6.9 lbs.) |

9S-6363 Turbocharger Fixture Group

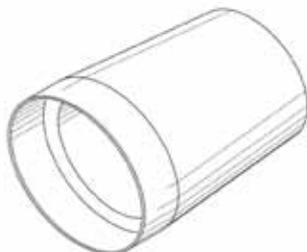


- Used for disassembly and assembly of current and non-current turbochargers
- Mounting plate tilts 90° so turbochargers can be positioned vertically or horizontally
- In either position, mounting plate can be rotated to 8 fixed positions in 360°

| Part Number | Description |
|-------------|---|
| 9S-6363 | Turbocharger Fixture Group ¹ |

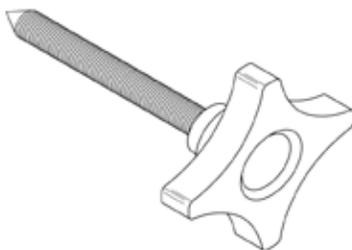
¹9S-6363 replaces FT0621

FT0175 Ring Expander Sleeve



- Used to service turbocharger (see chart)

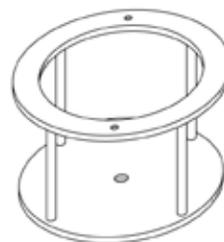
FT0170 Support Screw



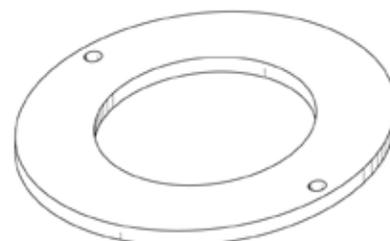
- Used to service turbocharger (see chart)

FT0165 Modified Fixture

- Existing FT0165 Fixture can be modified according to boxed dimensions so that only one adapter is needed for disassembly and assembly of all turbochargers
- Material: SAE 1020 steel

**FT0168 Fixture Adapter**

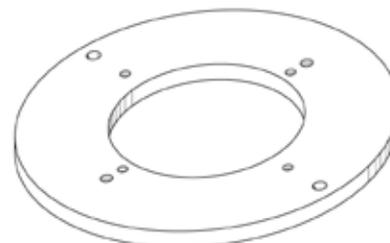
- Used to service turbocharger (see chart)
- Material: SAE 1020 steel

**FT0174 Driver Tool**

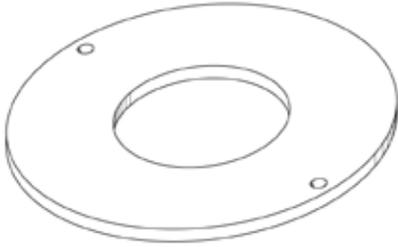
- Used to service turbocharger (see chart)
- Material: SAE 4140 steel

**FT0808 Fixture Adapter**

- Used to service turbocharger (see chart)
- Material: SAE 1018 steel

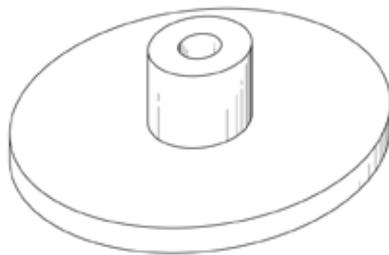


FT1354 Turbocharger Fixture Adapter



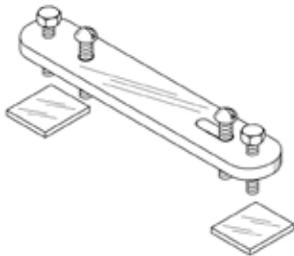
- Used with FT0165 Fixture for disassembly of AiResearch TV81 and TW81 Turbochargers
- Material: SAE 1020 steel

FT0626 Spacer Block



- Used to service turbocharger (see chart)
- Material: SAE 1020 steel

FT0623 Insert Removal Tool



- Used to service turbocharger (see chart)
- Material: mild steel (bar) brass or aluminum (bearing plate)

1U-5429 Snap Ring Pliers

Model: Multiple Engine Models

Warranty: Six Months



- Used to remove snap rings from deep bores in turbocharger housings and other components
- Plier tips slightly off center to improve visibility
- Pins made from 1.04 mm (0.041 in) diameter piano wire

| Part Number | Description |
|-------------|------------------|
| 1U-5429 | Snap Ring Pliers |

304-9575 Bellows Tool Assembly

Essential Tool

C175-16 Generator Set Engine

Warranty: Six Months

- Used to remove and install turbocharger exhaust bellows
- Fits over bellows to maintain proper shape and help prevent deforming of inlet and outlet
- Covers and protects bellows during disassembly and assembly
- Two-piece design with hinge and latch allow quick installation and removal
- 306-7948 Inner Ring Segments (four per tool) and 2N-2658 Socket Head Screw (16 per tool) are serviced separately
- Service/Repair Part: 306-7648 Ring



Reference

REN7466, Service Manual, C175-16 Generator Set Engine, Disassembly and Assembly

| Part Number | Description |
|-------------|-----------------------|
| 304-9575 | Bellows Tool Assembly |

304-9576 Feeler Gauge Assembly

Essential Tool

Model: C175-16 Generator Set Engine

Warranty: Six Months

- Used to ensure corrugations in exhaust manifold bellows are properly aligned
- Bellows corrugations must be checked when exhaust manifold is installed on engine and turbocharger
- Properly shaped and aligned corrugations will extend bellows service life
- Heavy-duty, spring-steel feeler gauge with steel handle is shaped to reach all sides of bellows
- Tool is black oxide coated to prevent corrosion



Reference

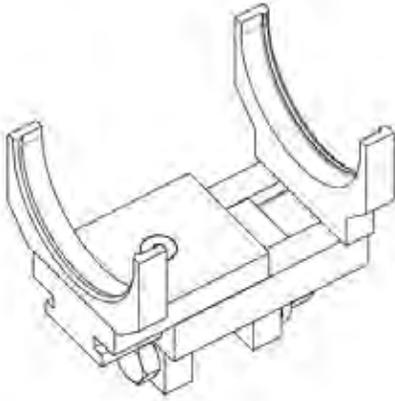
REN7466, C175-16 Generator Set Engine, Disassembly and Assembly

| Part Number | Description |
|-------------|-----------------------|
| 304-9576 | Feeler Gauge Assembly |

361-5661 Exhaust Bellows Remove and Install Tool

Model Usage: C9.3, C13, C15, C18, C27, and C32 Tier4 interim and Tier4 final machines

Warranty: Six Months



- Used to safely compress exhaust bellows for removal and installation
- Facilitates removal of bellows without removing components on either side
- Not to be used directly on bellows convolutions
- Used with 19 mm box end or ratcheting box end wrench for quick assembly

| Specifications | |
|----------------|---------------------------------------|
| Dimensions | 83 x 83 x 112 mm (3.3 x 3.3 x 4.4 in) |
| Weight | 1.41 kg (3.1 lb) |

| Part Number | Description |
|-------------|---|
| 361-5661 | Exhaust Bellows Remove and Install Tool |

380-5368 Alignment Tool

Model Usage: 797 Off-Highway Trucks

Warranty: Six Months



- Used to align bellows on the 797 Off-Highway Truck
- Used to aid in rework procedure

Reference

REHS6084, Procedure to Retrofit Exhaust Group on 797F Off-Highway Truck

| Specifications | |
|----------------|---------------------------------|
| Dimensions | 545 x 327 mm (21.46 x 12.87 in) |
| Weight | 14 kg (30.9 lb) |

| Part Number | Description |
|-------------|----------------|
| 380-5368 | Alignment Tool |

215-2592 Wastegate Tool Kit

Model: C-15 Engine

Warranty: Six Months



- Used to test and adjust wastegate setting

| Item | Description |
|------|--|
| 3 | Hose, 6.35 mm (0.25 in) inside diameter (not included) |

(Continued)

215-2592 Wastegate Tool Kit (Continued)

Model: C-15 Engine
Warranty: Six Months

| Item | Part Number | Description |
|-----------------------------|-------------|---|
| -- | 215-2592 | Wastegate Tool Kit |
| Service/Repair Parts | | |
| 1 | 213-4269 | Adapter |
| 2 | 8C-3996 | Setscrew-socket (3 required per collet set) |
| 4 | 214-0788 | Regulator |

| Item | Part Number | Description |
|---|-------------|----------------|
| Service/Repair Parts (Continued) | | |
| 5 | 215-2648 | Toggle Valve |
| 6 | 215-2649 | Connector |
| 7 | 7B-0192 | Cross Fitting |
| 8 | 214-0787 | Pressure Gauge |

261-0940 Bendix Air Compressor Test Kit

Essential Tool

Model: All Cat® Truck Engines with Bendix Air Compressor
Warranty: None - Considered a Consumable

| Part Number | Description |
|-------------|--------------------------------|
| 261-0940 | Bendix Air Compressor Test Kit |

- Allows technician to accurately troubleshoot online air system on engine with Bendix Air Compressor



Fabricated Tools for Installing Turbine Shaft Seal Rings in Turbochargers

Model: Multiple Engine Models
Warranty: None

- Special tools designed to assist serviceman when installing shaft seal rings in turbochargers
- Eliminate possibility of ring damage resulting from overexpansion

| Part Number | Description | Turbocharger Model |
|-------------|-------------|-----------------------|
| FT1785 | Installer | T12, 61, 81 |
| FT1786 | Installer | T51 |
| FT1787 | Installer | T18 |
| FT1788 | Installer | T91 |
| FT1789 | Installer | 4LE, LF, MF |
| FT1790 | Installer | 4 MD, HD, HF, ME, 5MF |



180-5286 Turbine Shaft TPS57 Turbocharger Socket

Essential Tool

Model: G3606 and G3612 Engines

Warranty: Six Months



- Used to remove and install turbocharger shaft bearings
- Used with FT2685 Mounting Plate
- Socket threads onto shaft and pulls or pushes bearing
- Heat-treated for added durability
- Thread: M24 x 2
- Square drive: 1/2 inch

| Part Number | Description |
|-------------|---|
| 180-5286 | Turbine Shaft TPS57 Turbocharger Socket |

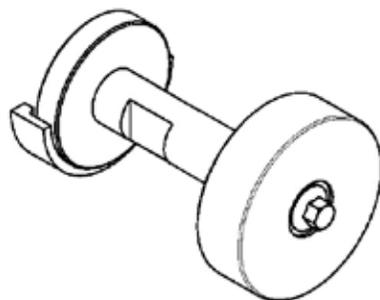
Reference

REHS0556, Special Instruction, Disassembly and Assembly of the Water Cooled TPS57 Turbocharger

370-4653 Turbocharger Counterbalance Tool

Model Usage: C7.1

Warranty: Six Months



- Aids in re-assembly of C7.1 turbocharger
- Ensures the turbochargers are correctly positioned.

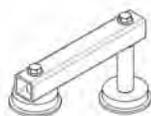
| Specifications | |
|----------------|---------------------------------------|
| Dimensions | 175 x 80 x 80 mm (6.9 x 3.1 x 3.1 in) |
| Weight | 3.14 kg (6.9 lb) |

| Part Number | Index Description |
|-------------|----------------------------------|
| 370-4653 | Turbocharger Counterbalance Tool |

375-2606 Twin Turbocharger Alignment Tool

Model Usage: C4.4

Warranty: Six Months



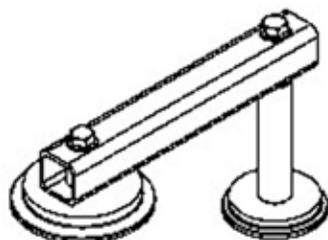
- Used to correctly align turbochargers for the bellows assembly

| Part Number | Description | Dimensions | Weight |
|-------------|----------------------------------|---|------------------|
| 375-2606 | Twin Turbocharger Alignment Tool | 275 x 158 x 80 mm (10.8 x 6.2 x 3.1 in) | 2.75 kg (6.1 lb) |

365-8434 Twin Turbocharger Alignment Tool

Model Usage: C7.1

Warranty: Six Months



- Used to correctly align turbochargers for bellows assembly

| Specifications | |
|----------------|---|
| Dimensions | 300 x 177 x 90 mm (11.8 x 7.0 x 3.5 in) |
| Weight | 3.27 kg (7.2 lb) |

| Part Number | Description |
|-------------|----------------------------------|
| 365-8434 | Twin Turbocharger Alignment Tool |

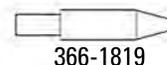
Exhaust Manifold Alignment Pins

Model Usage: C7.1, C6.6, C4.4

Warranty: Six Months

- Used to align exhaust manifold and gaskets to cylinder head

| Part Number | Dimensions | Weight |
|-----------------------|------------------------------|--------------------|
| Specifications | | |
| 366-1819 | 63 x 11.8 mm (2.48 x .46 in) | .039 kg (0.086 lb) |
| 366-1820 | 63 x 13.8 mm (2.48 x .54 in) | .051 kg (0.112 lb) |



366-1819



366-1820

FT2299 Turbine Holder

Model: Multiple Engine Models

Warranty: None

- Used for disassembly and assembly of turbocharger on 621E and 627E Scrapers
- Convenient tool for holding turbine wheel during removal and installation of impeller nut

References

621E, Service Manual

627E, Service Manual

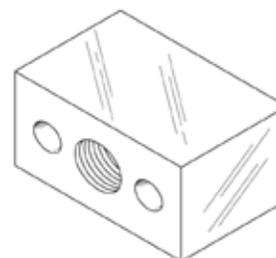


FT2229 Puller Plate

Model: 3406B

Warranty: None

- Required to remove impeller from water pump shaft on 3406B Engines (8S-2264 Puller Group, used to pull water pump impellers on 3406 Engines, cannot be used for this task on 3406B)
- Designed to fit narrower bolt hole spacing on 3406B impellers

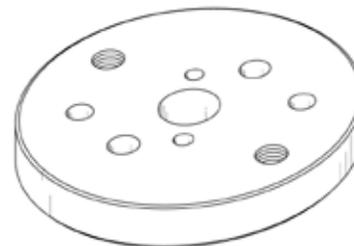


FT2800 Puller Plate

Model: 3524B Engine in 797 Off-Highway Truck

Warranty: None

- Used to remove impeller from 199-5590 Water Pump
- Used with 1P-0820 Hydraulic Puller Group
- Material: SAE 1020 steel

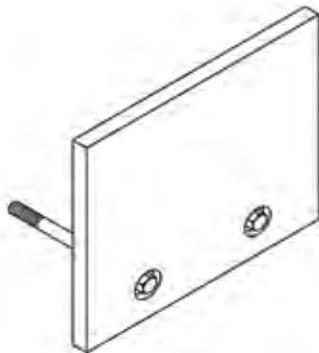


FT2685 Turbocharger Cartridge (TPS57)

Mounting Plate Assembly

Model: G3606 and G3612 Engines

Warranty: None



- Used to hold ABB TPS57 turbocharger cartridge for disassembly and assembly
- Used with 180-5286 Socket for maintenance of turbine bearing
- Permits one-man operation while applying sockets to each end of turbine shaft

319-2189 Diesel Particulate Filter Ash Cleaning Tool

Model: Cat® Engines

Warranty: Six Months



- Cleaning process (patent pending) that utilizes pulsed air
- Fully automated computer-controlled process
- Pre-clean DPF check to verify that DPF can be cleaned
- Cleans all Cat® DPF sizes
- Self-cleaning feature to extend the cartridge filter life
- Full containment of ash for safe and easy disposal

Reference

NEHS1034, 319-2189 DPF Cleaner Tool Operating Manual

Cleaning Process

1. Perform an Ash Service Regeneration
2. Remove the DPF from the vehicle and place it in the cleaning tool
3. Start the cleaning tool using the Cat® cleaning cycle
4. Re-install filter on the vehicle
5. Cat® ET needs to be used to program the Engine ECM that an Ash Cleaning has been performed

Cleaning Methods

This tool and process is the preferred and most economical method for cleaning of DPF's.

More Information

A brief video walk around and the Tech Tips video segment are available at <https://truck.cat.com/cda/layout?m=121186&x=7>

Compatibility

The base Cat® DPF Cleaning Tool could be used with the proper adapters for (Cummins, Mack, Volvo, Hino and others) to clean their DPF's. This flexibility will allow customers and TEPS dealers to purchase just one base tool. OEM specific adapters and software must be purchased through the engine manufacturer.

| Specifications | |
|------------------------|---|
| Dimensions (L x W x H) | 1900 x 1010 x 2100 mm (75 x 40 x 83 in) |
| Weight | 500kg (1100 lb) |
| Power | 110 VAC / 60Hz |
| Air | 875 kPa (125 psi) recommended |
| | 700 kPa (105 psi) minimum |

(Continued)

319-2189 Diesel Particulate Filter Ash Cleaning Tool (Continued)

Model: Cat® Engines
 Warranty: Six Months

| Part Number | Description |
|---|---------------------------|
| 319-2189 | DPF Cleaner Group |
| 319-2190 | DPF Cleaner Adapter Group |
| 319-2189 DPF Cleaner Group Contains: Base Tool, DPF Cleaner Software, Base Tool DPF Cleaner (no adapters) and the following:¹ | |
| 319-2190 | DPF Cleaner Adapter Group |
| 319-2190 DPF Cleaner Adapter Group Contains the following:¹ | |
| 319-1834 | Cone, 27.94 cm (11 in) |
| 319-1835 | Cone, 33.02 cm (13 in) |
| 319-1836 | Cone, 38.10 cm (15 in) |
| 319-1838 | Adapter (Lower), Large |
| 319-1839 | Adapter (Lower), Small |

| Part Number | Description |
|--|---|
| Optional Accessories include NETG5056 DPF Cleaner Software and the following: | |
| 373-2992 | CT660 DPF Adapter Ring |
| 373-9826 | Tier 4 DPF Adapter Ring (pin and slot design) |
| 319-2192 | Mass Transit Bus Adapter ² |
| Consumables | |
| 319-2193 | HEPA Filter |
| 319-2194 | Cartridge Filters (contains 2 filters) |
| 319-1833 | Filter Bucket |
| 320-2679 | Air Dryer Desiccant |
| 320-2680 | Coalescing Filter |

¹ NETG5056 will be required if 319-2189 DPF Cleaner Group is not purchased.

² Use with the 319-1835 Cone

Differential Pressure Regulator Testing and Reconditioning Apparatus

Model: Multiple Engine Models
 Warranty: Six Months

- Required to test and calibrate differential pressure regulators
- Basic test apparatus required for fuel operated pressure ratio controls and exhaust bypass valves
- Additional parts required for pneumatic pressure ratio control

References

FE035027, Special Instructions
 FE034610, Special Instructions

| Non-Part Number Items (in photo) | |
|----------------------------------|-------------------|
| Item | Description |
| 1 | Basic Apparatus |
| 6 | Calibration Plate |
| 7 | Rod |



| Item | Part Number | Description |
|------|-------------|--|
| 2 | 4L-9555 | Cover |
| 3 | 3B-7722 | Bushing-Pipe-Reducing 3/8 in-18 NPTF to 1/4 in-18 NPTF |
| 4 | 3B-7276 | Nipple |
| 5 | 5L-3252 | Cover |

(Continued)

Differential Pressure Regulator Testing and Reconditioning Apparatus (Continued)

Model: Multiple Engine Models

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|----------------------|
| 8 | 9M-0428 | Gauge (or Manometer) |
| 9 | 3B-7263 | Nipple - Pipe |
| 10 | 3B-7719 | Coupling |

Engine Tools

6V-7060 Gauge Group

Model: Multiple Engine Models

Warranty: Six Months



- Used to measure seal ring grooves on turbocharger components
- Precision ground to maximum permissible width for seal ring grooves on turbine shaft and when assemblies, flinger sleeves and thrust collars
- Gauge held perpendicular to groove when measurements made; if gauge will enter groove, part must be reconditioned or scrapped; if gauge will not enter, part is reusable

| Part Number | Description | Size |
|-------------|---|----------------------|
| 6V-7012 | Foam Insert | -- |
| 6V-7016 | Gauge | 3.302 mm (0.1300 in) |
| 6V-7017 | Gauge | 2.591 mm (0.1020 in) |
| 6V-7018 | Gauge | 1.765 mm (0.0695 in) |
| 6V-7019 | Gauge | 1.740 mm (0.0685 in) |
| 6V-7021 | Gauge | 1.689 mm (0.0665 in) |
| 6V-7022 | Gauge | 1.676 mm (0.0600 in) |
| 6V-7023 | Gauge | 1.659 mm (0.0653 in) |
| 6V-7060 | Gauge Group | -- |
| 6V-6045 | Case - Plastic, NEEG2061 Accessories Case Decal | -- |

FT1781 Cartridge Checking Fixture

Model: Multiple Engine Models

Warranty: None



- Used to check reconditioned cartridge assemblies in turbocharger for correct end play movement
- Increases service life by early detection of end play movement not within correct tolerances (end clearance problems can result in turbocharger failure, which could result in engine failure)

FT1782 Turbocharger Test Stand

Model: Multiple Engine Models

Warranty: None

- Used to test all current turbochargers that are used on Caterpillar® engines
- Used to test seal ring leakage, end housing clearance and shaft rotation
- Can also give break-in before installation — uses air and oil pressure to provide conditions that are similar to normal operation
- Has oil heater to raise temperature of oil to normal engine oil temperature



2P-2333 High Temperature Sealer

Warranty: Six Months

Model: Multiple Engine Models

- Used on all exhaust manifold joints, either flat or cylindrical
- Retains sealing characteristics at temperatures up to 980° C (2000° F)

| Part Number | Description |
|-------------|-------------------------|
| 2P-2333 | High Temperature Sealer |



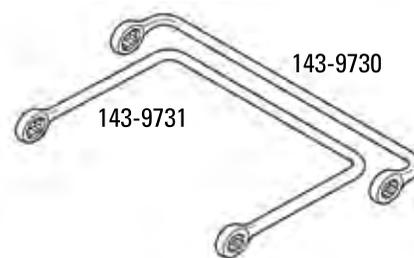
143-9730 Wrench (30 mm throat)

143-9731 Wrench (122 mm throat)

Model: 3176, 3176B, C-10, C-12, 3114, 3116, 3126 Engines

Warranty: Six Months

- Used to properly tighten hard-to-reach 15 mm (0.59 in) nuts
- Used with 1/2 inch square drive torque wrench
- Helps prevent turbocharger gasket failures
- 2 wrenches fit almost all turbocharger installations



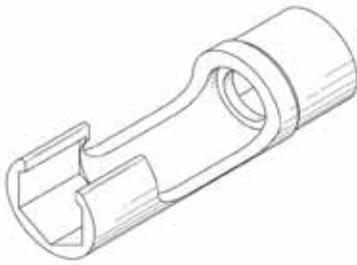
| Part Number | Description | Size | Drive | Distance Between Wrench Faces |
|-------------|---|-----------------|---------------|-------------------------------|
| 143-9730 | Turbocharger Wrench, 30 mm (1.18 in) reach throat | 15 mm, 12 point | 12 in, square | 266.7 mm (10.50 in) |
| 143-9731 | Turbocharger Wrench, 122 mm (4.8 in) reach throat | 15 mm, 12 point | 12 in, square | 200 mm (7.87 in) |

329-5928 Slotted Socket

Essential Tool

Model: C-7 and C-9 Turbochargers

Warranty: Six Months



- Used to remove and install speed sensor on turbocharger
- Used with 3/8 inch square drive wrench
- Cut out deep-well design provides clearance for speed sensor
- 5-point hex (13 mm) design helps prevent sensor damage

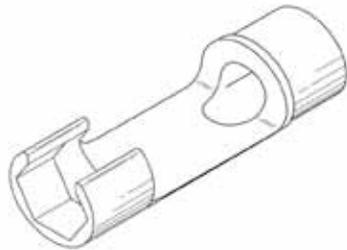
| Part Number | Description |
|-------------|----------------|
| 329-5928 | Slotted Socket |

349-3548 Slotted Socket

Essential Tool

Model: All Tier 4 Engines

Warranty: Six Months



- Used to remove and install flame detect sensor on Cat® Tier 4 Engines with Caterpillar® Regeneration System (CRS) heads
- Used with 3/8 inch square drive wrench
- Cut out, deep-well design provides clearance for sensor connector
- Five point hex (16 mm) design helps prevent sensor damage
- Socket is 78 mm (3.0 in) long with a durable chrome plated finish

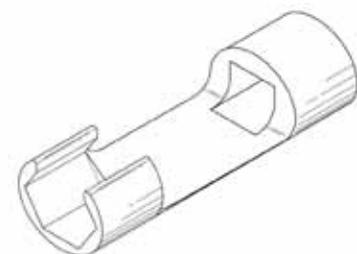
| Part Number | Description |
|-------------|----------------|
| 349-3548 | Slotted Socket |

342-9516 Slotted Socket

Essential Tool

Model: 330E Excavators

Warranty: Six Months



- Used to remove and install 320-0576 Engine Temperature Sensor
- Used with 3/8 inch square drive wrench
- 17 mm deep-well socket with cut out provides clearance for sensor body
- Five-point hex grips sensor base helping prevent damage to sensor
- Chrome plated for corrosion resistance
- Length: 78 mm (3.07 in)

| Part Number | Description |
|-------------|----------------|
| 342-9516 | Slotted Socket |

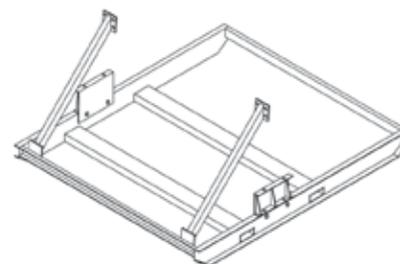
Cooling System

FT2554 Holding Fixture

Model: 793C Trucks

Warranty: None

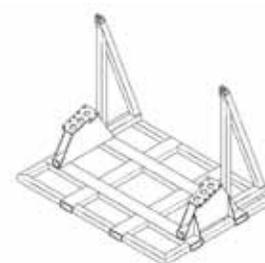
- Used to provide safe method for holding radiator and cowling group during removal and installation of modular front end
- Prevents bottom of radiator tank from being crushed
- Allows use of fork lift, with a 2722 kg (6000 lb) capacity, to move radiator and cowling group once removed from truck
- Overall length x width: 3048 x 3101 mm (120 x 122 in)

**348-4227 Holding Fixture Assembly**

Model: 793D Mechanical Drive Off-Highway Truck

Warranty: Six Months

- Replaces canceled FT3044 Holding Fixture Assembly
- Used to provide secure method for holding and storing radiator and cowling group during removal and installation of modular front end
- Prevents bottom of radiator tank from being crushed when removed from truck
- Allows use of fork lift with a 2722 kg (6000 lb) capacity, to move or store radiator and cowling group once removed from truck
- Overall size (L x W x H): 305 x 229 x 236 cm (120 x 90 x 93 in)

**Reference**

REN8334, 793 Off-Highway Truck Disassembly and Assembly Engine Supplement, Modular Front End Remove and Install

| Part Number | Description |
|-------------|--------------------------|
| 348-4227 | Holding Fixture Assembly |

315-0009 Tool Group**Essential Tool**

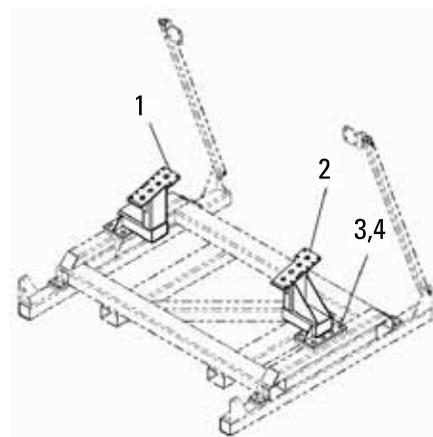
Model: 793D and 793F MD Off-Highway Truck

Warranty: Six Months

Reference

REN8334, 793D Off-Highway Truck Engine Supplement, Disassembly and Assembly, Modular Front End Remove and Install

- Used to hold radiator, with shrouding and ladder, in vertical position
- Used with 175-7532 Radiator Support Assembly
- Consists of 315-0227 Left-Hand Fixture Assembly, 316-0649 Right-Hand Fixture Assembly, and mounting hardware, all serviced separately
- Prevents damage to bottom of radiator when removed from truck
- Requires a minimum 2722 kg (6000 lb) forklift to move fixture and radiator combination
- Fixture assemblies have 3E-3879 Eyebolt (M16 x 2) to allow easy lifting and positioning (part of assembly)
- Uses 4K-7239 Dowels to locate fixture assemblies on radiator support assembly (part of assembly)



| Item | Part Number | Description | Quantity |
|------|-------------|-----------------------------|----------|
| -- | 315-0009 | Tool Group | -- |
| 1 | 315-0227 | Left-Hand Fixture Assembly | 1 |
| 2 | 316-0649 | Right-Hand Fixture Assembly | 1 |

(Continued)

Cooling System

315-0009 Tool Group (Continued)

Essential Tool

Model: 793D and 793F MD Off-Highway Truck

Warranty: Six Months

| Item | Part Number | Description | Quantity |
|------|-------------|-----------------------------------|----------|
| 3 | 8T-0666 | Bolt, M24 x 76.2 mm (3.0 in) long | -- |
| 4 | 6V-8237 | Hard Washer | -- |

Engine Tools

178-3704 Lift Bracket Assembly

Essential Tool

Model: Multiple Machine Models

Warranty: Six Months



- Used to remove AMOCs radiator cores on 950 through 994 Wheel Loaders, all Wheel Tractors, and any vehicle using AMOC Radiator Cores
- Allows one-person removal and installation of radiator cores
- To install: place bale in "down position" and attach bracket over top of radiator core with center hole over core protrusion to restrict side movement
- To lift: push bracket down to properly position spring-loaded wings and raise bale to "up position"; tighten set screws to positive lock
- To remove: place radiator core on ground (remove weight) and place bale in down position

| Part Number | Description | Lift Capacity |
|-------------|-----------------------|------------------|
| 178-3704 | Lift Bracket Assembly | 45.4 kg (100 lb) |

208-1350 Radiator Fin Comb

Model: Multiple Engine Models

Warranty: Six Months



- Multi-head tool which handles 8, 9, 10, 12, 14, and 15 fins/inch
- Breaks down easily for tool box storage

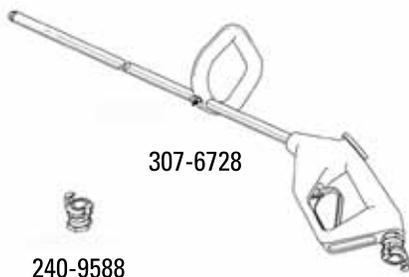
| Part Number | Description |
|-------------|-------------------|
| 208-1350 | Radiator Fin Comb |

307-6728 Air Wand

240-9588 Twist-lock Coupler

Model: D8T and D9T Track Type Tractors

Warranty: Manufacturer's



307-6728

240-9588

- Used to clean radiator cores and cooling components
- Supplied with 3/4 inch twist lock coupler (240-9588 Twist Lock Coupler, sold separately, mates with air wand coupler)
- Aluminum extension tube is 179 cm (70.5 in) long for cleaning hard to reach areas
- Adjustable handle on extension tube adds stability during cleaning operations
- Twenty-two 3 mm (0.12 in) holes at end of extension tube provide more efficient cleaning
- Air wand provides up to 4 kp (9.0 lbf) thrust at 690 kPa (100 psi) and 5700 lpm (200 scfm) air flow

(Continued)

307-6728 Air Wand (Continued)

240-9588 Twist-lock Coupler

Model: D8T and D9T Track Type Tractors

Warranty: Manufacturer's

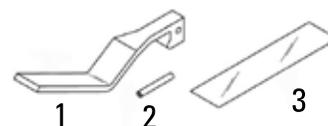
- Lightweight design for easy use
- Compliant with OSHA standards
- Rebuild kits are available (see charts)

| Part Number | Description |
|-------------|--|
| 307-6728 | Air Wand (with twist-lock coupler) |
| 240-9588 | Twist-lock Coupler (for air supply hose) |

317-6934 Trigger Kit

| Part Number | Description |
|-------------|-------------|
| 317-6934 | Trigger Kit |

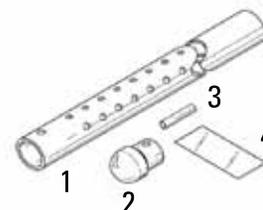
| Item | Description |
|------|---------------------|
| 1 | Replacement Trigger |
| 2 | Pin |
| 3 | Warning Film |



317-6935 Extension Kit

| Part Number | Description |
|-------------|----------------------------|
| 317-6935 | Extension Kit ¹ |

| Item | Description |
|------|---|
| 1 | Replacement Extension Tube, 1791 mm (70.5 in) |
| 2 | Extension Cap |
| 3 | Pin |
| 4 | Warning Film |

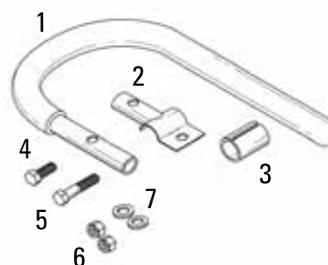


¹Used with 317-6937 Compression Fitting

317-6936 Handle Kit

| Part Number | Description |
|-------------|-------------|
| 317-6936 | Handle Kit |

| Item | Description |
|------|--------------------|
| 1 | Replacement Handle |
| 2 | Handle Clamp (2) |
| 3 | Bushing |
| 4 | Bolt |
| 5 | Bolt |
| 6 | Nut (2) |
| 7 | Washer (2) |



317-6937 Compression Fitting

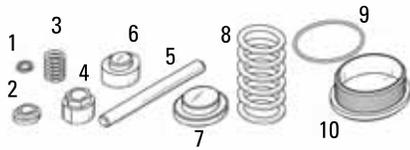
| Item | Description |
|------|---------------------|
| 1 | Compression Fitting |
| 2 | Compression Ring |
| 3 | Compression Nut |

| Part Number | Description |
|-------------|----------------------------------|
| 317-6937 | Compression Fitting ¹ |



¹Used with 317-6935 Extension Kit

317-6938 Valve Rebuild Kit



| Item | Description |
|------|--------------|
| 1 | O-ring |
| 2 | Top Packing |
| 3 | Spring |
| 4 | Packing Nut |
| 5 | Valve Stem |
| 6 | Poppet Skirt |
| 7 | Poppet Seal |
| 8 | Spring |
| 9 | O-ring |
| 10 | Valve Cap |

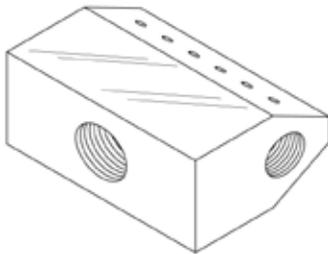
| Part Number | Description |
|-------------|-------------------|
| 317-6938 | Valve Rebuild Kit |

Engine Tools

FT2978 Nozzle

Model: Most Models

Warranty: None



- Used to clean hard to reach places between radiator core and other cooling components
- Used with 156-0931 Air Gun

FT1377 Installer

Model: Multiple Engine Models

Warranty: None



- Used when installing side channels on radiator cores on D10 Tractors
- Compresses resilient strips so that bolts and holes can be aligned

2S-9528 Blade Reversing Tool

Model: Multiple Engine Models

Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 2S-9528 | Blade Reversing Tool |

- Used to change fan blade pitch on machines equipped with reversible fan blades



Tooling for Variable Speed Fan Clutch on Trucks

Model: Multiple Engine Models

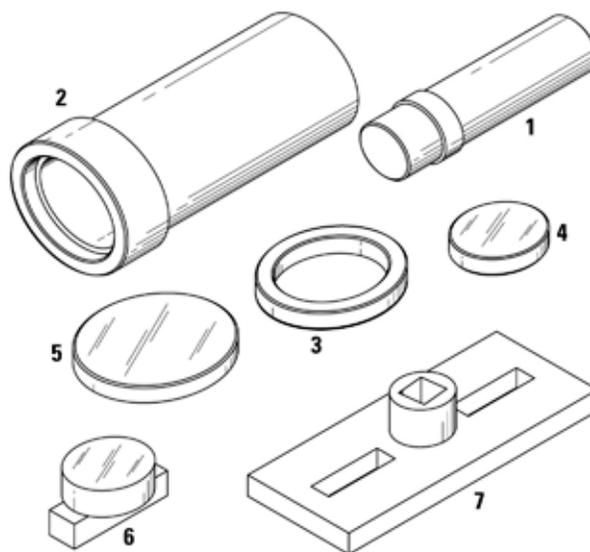
Warranty: None

- Provides tooling needed to disassemble and assemble variable speed fan clutch on 768C, 769C, 771C, 772B, 773B, 775B, 784B, 785B, 789B, and 793B Trucks
- FT2461 and FT2467 used to disassemble and assemble 6I-4427 and 123-6968 Fan Clutches
- FT2464 and FT2465 Plates used to disassemble and assemble 100-8105 and 129-9494 Fan Clutches which are both replaced by 133-5969 Fan Clutch

Reference

SEN8603-01, Variable Speed Fan Clutch

| Item | Part No. | Description | Material |
|------|----------|----------------|----------------|
| 1 | FT2461 | Pressing Bar | SAE 4140 steel |
| 2 | FT2462 | Pressing Tube | SAE 4140 steel |
| 3 | FT2463 | Ring | SAE 4140 steel |
| 4 | FT2464 | Plate | SAE 4140 steel |
| 5 | FT2465 | Plate | SAE 4140 steel |
| 6 | FT2466 | Mounting Plate | SAE 4140 steel |
| 7 | FT2467 | Rotating Plate | |



Disassembly and Assembly Tooling for 200 Rockford Fan Clutch

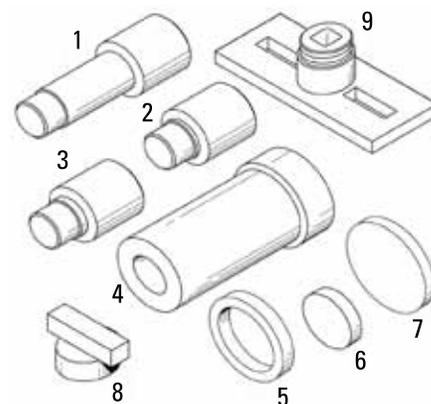
Model: Multiple Engine Models

Warranty: None

- Used to disassemble and assemble 183-5116 (200 Series Rockford) Variable Speed Fan Clutch on D9R (s/n ABK and ACL) and D10R (s/n 3KR and AKT) Track-Type Tractors
- Heat treat FT2814 through FT2820 to RC 38 to 42

Reference

SEN8603-01, Variable Speed Fan Clutch



(Continued)

Disassembly and Assembly Tooling for 200 Rockford Fan Clutch (Continued)

Model: Multiple Engine Models

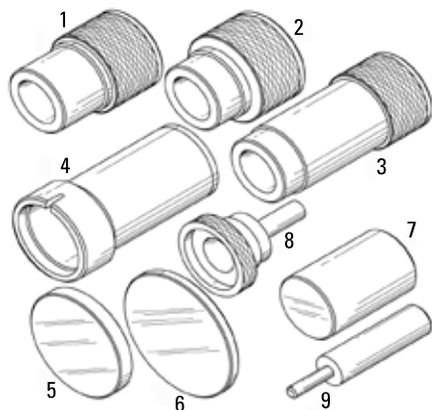
Warranty: None

| Item | Part Number | Description | Material |
|------|-------------|--|----------------|
| 1 | FT2814 | Bearing Remover | SAE 4140 steel |
| 2 | FT2815 | Bearing Installer | SAE 4140 steel |
| 3 | FT2816 | Bearing Installer | SAE 4140 steel |
| 4 | FT2817 | Bearing Remover | SAE 4140 steel |
| 5 | FT2818 | Installation Ring Plate | SAE 4140 steel |
| 6 | FT2819 | Fan Hub and Shaft Assembly Removal Plate | SAE 4140 steel |
| 7 | FT2820 | Bearing and Seal Removal and Installation Plate | SAE 4140 steel |
| 8 | FT2821 | Clutch Body Hold Fixture Assembly | SAE 1020 steel |
| 9 | FT2822 | Fan Mounting Hub Removal and Installation Fixture Assembly | SAE 1020 steel |

Tooling for Variable Speed Fan Clutch on Off-Highway Trucks

Model: Multiple Engine Models

Warranty: None



- Used to disassemble and assemble variable speed fan clutch on 784C, 785C, 785CHAA, 789C, and 793C Off-Highway Trucks
- Ensures proper positioning and installation of clutch parts
- Material (all parts): SAE 4140 steel

Reference

REN2634, Service Manual, Variable Speed Fan Clutch

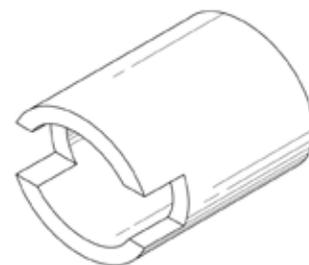
| Item | Part Number | Description |
|------|-------------|-------------------------|
| 1 | FT2749 | Bearing Installer |
| 2 | FT2750 | Bearing Installer |
| 3 | FT2751 | Bearing Remover |
| 4 | FT2752 | Seal Installer Assembly |
| 5 | FT2753 | Bearing Installer |
| 6 | FT2754 | Bearing Installer |
| 7 | FT2755 | End Cap Remover |
| 8 | FT2756 | Sensor Installer |
| 9 | FT2757 | Sensor Installer |

FT0203 Spring Compressor

Model: Multiple Engine Models

Warranty: None

- Water temperature regulators can be disassembled by fabricating a short length of pipe as illustrated

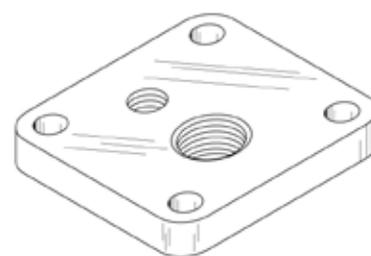


FT0161 Thermometer Adapter

Model: D8H Engine

Warranty: None

- Used to mount the Thermometer to D8H Engine



243-6532 Spanner Wrench Assembly

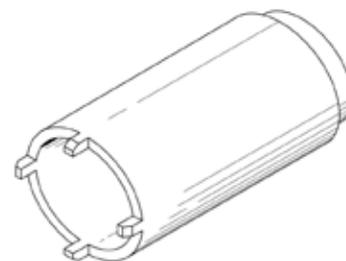
Model: C-9 Engines in Timber King Feller Buncher

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 243-6532 | Spanner Wrench Assembly |

- Used to disassemble and assemble Flexxaire engine fans
- Used with 1/2 inch square drive ratchet

| | |
|------------------|-------------------|
| Square drive | 1/2 in |
| Number of teeth | 4, equally spaced |
| Tooth width | 6.1 mm (0.24 in) |
| Inside diameter | 64.0 mm (2.5 in) |
| Outside diameter | 76.2 mm (3 in) |



9S-8140 Pressurizing Pump

Model: Multiple Engine Models

Warranty: Six Months



- Used to pressurize cooling systems to detect leaks
- Can also test dash gauges, relief valves, and pressure caps
- All items in figure are included

Reference

SMHS8303, Special Instruction

| Item | Part Number | Description |
|---------------------|-------------|------------------------------------|
| -- | 9S-8140 | Pressurizing Pump |
| Consists of: | | |
| 1 | 6V-7775 | Gauge 0 - 205 kPa (0 - 30 psi) |
| 2 | 2P-2331 | Release Valve ¹ |
| 3 | 3R-3810 | Hose |
| 4 | 2P-2329 | Adapter Bushing |
| 5 | 9S-8139 | Packing (Internal) |
| 6 | 6V-0117 | Bushing |
| Not shown | | |
| -- | 4M-5317 | Pipe Reducing Bushing ² |
| -- | 186-5234 | Hose Assembly |
| -- | 6V-9068 | Valve Kit |

¹Not included in earlier pump groups; to permit testing of automotive-type cooling systems, ordered and installed on earlier pumps

²Part of Cylinder Pressure Group (Gas Engines)

259-6237 Cooling System Tester

Essential Tool

Model: 416, 420, 428, 430, 434, 442 Series E Backhoe Loaders, Small Track-Type Tractors, Small Track-Type Loaders, Mini-Excavators, Compact Wheel Loaders

Warranty: Manufacturer's Lifetime



- Used to pressure test cooling systems that use screw-on type radiator caps
- Used on many light commercial vehicles, passenger vehicles, marine applications, and motorcycles with internal radiator neck diameters of 45.0 mm (1.77 in) or less
- Cooling system tester group includes: pump, set of extensions to fit different sizes of radiator necks, gauge, supply and drain hoses, instruction book, and carrying case

Repair Information

SPX Service Repair

755 Eisenhower Drive

Owatonna, MN 55060

Attn: Repair Department

Phone: 800-344-4013

Visit the SPX Repair Track web link to complete and submit the form for proper authorization: <https://repairtrack.spx.com>

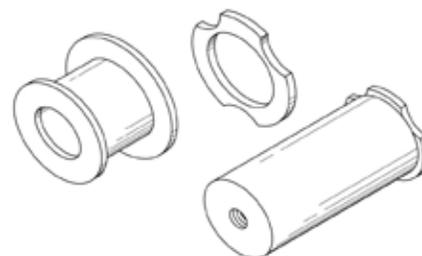
| Part Number | Description |
|-------------|-----------------------|
| 259-6237 | Cooling System Tester |

FT0200 Seal Case Removal Tool

Model: Multiple Engine Models

Warranty: None

- Used to remove brass case on any water pump equipped with carbon thrust washer and bellows-type seal on D9H, 776, 777, 777B
- Material: SAE 1020 steel

**5P-9722 Seal Driver**

Model: 3208 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 5P-9722 | Seal Driver |

- Used to install the 9N-3141 Water Pump Seal Assembly (9N-3075 Water Pump and 9N-3898 Water Pump)
- Required to compress seal spring pre-determined distance

References

SENR3910, 3176 Service Manual

SEHS9120, Special Instruction, Operation

**9U-6944 Pump Seal Installer**

Model: 3046 Diesel Engine

Warranty: Six Months

| Part Number | Description |
|-------------|---------------------|
| 9U-6944 | Pump Seal Installer |

- Used to install water pump seal

Reference

SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engines

**6V-6159 Seal Guide**

Model: 3204 Engines

Warranty: Six Months

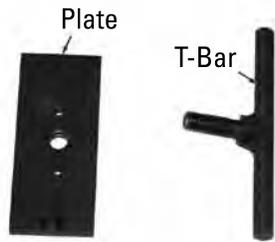
| Part Number | Description |
|-------------|-------------|
| 6V-6159 | Seal Guide |

- Used for assembly of 1W-6446 Water Pump and 2W-1223 Water Pump
- Prevents shaft seal from rolling when shaft is installed in water pump housing



FT1783 Fixture

Model: Multiple Engine Models
Warranty: None



- Facilitates drilling of vent holes in water pump impellers
- Consists of locating plate and threaded T-bar (can be fabricated according to FT1783 drawings)

Impeller Installers

Model: 3204, 3208
Warranty: Six Months



- Used with an arbor press to position impeller to specified clearance from water pump body
- Designed to bottom on water pump body when impeller is in correct position on shaft
- 8T-3142 Impeller Installer for all 3204 Family Engine water pumps
- 8T-0457 Impeller Installer for all 3208 Family Engine water pumps

| Part Number | Description |
|-------------|---|
| 8T-3142 | Impeller Installer - 3204 Family Engine water pumps |
| 8T-0457 | Impeller Installer - 3208 Family Engine water pumps |

Fabricated Tools for Reconditioning and Testing 3400 Series Engine Water Pumps

Model: 3400
Warranty: None



| Item | Part Number | Description | Use |
|------|-------------|-------------|--|
| 1 | FT1760 | Driver | Used with hammer to drive shaft from pump assembly |
| 2 | FT1762 | Test Driver | Used with V1-A Vacuum Tester to test water seal after assembly |

Fabricated Tools for Reconditioning and Testing 3208 Engine Water Pumps

Group 1

Model: 3208

Warranty: None

| Group 1 | | | |
|---------|-------------|--------------|--|
| Item | Part Number | Description | Use |
| 1 | FT1700 | Fixture | Used to hold water pump shaft during pump assembly |
| 2 | FT1706 | Installer | Used with arbor press to install bearings into housing |
| 3 | FT1705 | Installer | Used with arbor press to install seal into housing |
| 4 | FT1704 | Installer | Used with arbor press to install impeller on shaft |
| 5 | FT1752 | Test Fixture | Used with V1-A Vacuum Tester to test water seal after assembly |



Fabricated Tools

Group 2

| Group 2 | | | |
|---------|-------------|-------------|---|
| Item | Part Number | Description | Use |
| 6 | FT1708 | Fixture | Used with FT1707 Ram Adapter and hydraulic press to remove impeller and seal from shaft |
| 7 | FT1707 | Ram Adapter | Used with FT1708 Fixture and hydraulic press to remove impeller and seal from shaft |
| 8 | FT1702 | Driver | Used with hammer to drive rear bearing from pump housing |
| 9 | FT1703 | Driver | Used with hammer to drive front bearing from pump housing |
| 10 | FT1701 | Fixture | Used to hold pump housing during disassembly |

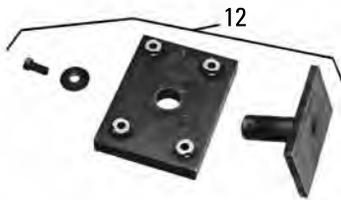


FT1733 Fixture



| Item | Part Number | Description | Use |
|------|-------------|-------------|---|
| 11 | FT1733 | Fixture | Used with Zero automated glass bead machine to clean pump housings, pulleys and impellers |

FT1732 Salvage Fixture



| Item | Part Number | Description | Use |
|------|-------------|-----------------|--|
| 12 | FT1732 | Salvage Fixture | Used with 6.74 mm (17/64 in) drill and drill press to drill holes in pump housing flanges that have been rebuilt with weld |

Water Pump Seal Installation Tools

Model: Multiple Engine Models

Warranty: Six Months



- Water pump seal installation tool has been removed from 4W-3864 Water Pump Seal Groups
- 7N-7843 and 7N-8268 Water Pump Seal Installation Tools used to install seal groups in respective water pumps (see chart)

Reference

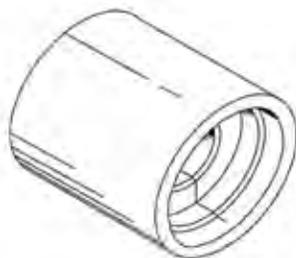
SEHS8449, Special Instruction

| Part Number | Description | Engine |
|-------------|-----------------------|-----------------------|
| 4W-3864 | Water Pump Seal Group | 3300 Series and 3406B |
| 7N-7843 | Installation Tool | 3400 Series |
| 7N-8268 | Installation Tool | 6 1/4 Bore Vee |

172-5711 Seal Installer

Model: 3306 Engines

Warranty: Six Months



- Used to install 154-9291 and 169-1750 Water Pump Seals
- Makes installation quick and easy

| Part Number | Description | Outside Diameter | Inside Diameter | Counter Bore Diameter | Material |
|-------------|----------------|----------------------|------------------------|------------------------|----------|
| 172-5711 | Seal Installer | 47.4 mm (1.87 in) | 19.54 mm (0.769 in) | 36.50 mm (1.437 in) | Steel |

248-3310 Spanner Wrench

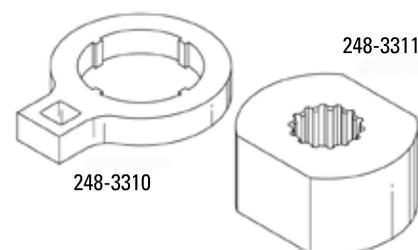
248-3311 Holding Fixture

Model: G3520B and G3520C Engines in Large Mining Trucks

Warranty: Six Months

| Part Number | Description |
|-------------|-----------------|
| 248-3310 | Spanner Wrench |
| 248-3311 | Holding Fixture |

- Used to disassemble and assemble jacket water (JW) pumps and separate circuit aftercooler (SCAC) water pumps
- Used with a bench vise and 1/2 inch square drive ratchet
- Special repair tools allow pump repair instead of pump replacement
- Holding fixture is placed in a bench vise to hold pump spline
- Spanner wrench fits innermost locknut inside pump housing



193-8094 Spline Wrench (14 Teeth)

193-8100 Impeller Nut Spanner

Model: All 3500 Marine Engines with discontinued 148-8000 Seawater Pump

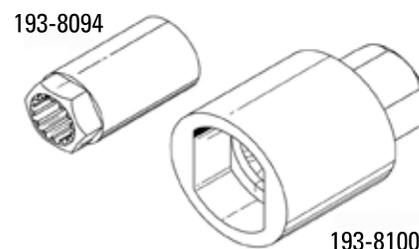
Warranty: Six Months

| Part Number | Description |
|-------------|--------------------------|
| 193-8094 | Spline Wrench (14 Teeth) |
| 193-8100 | Impeller Nut Spanner |

- Used to disassemble and assemble pump during rebuild
- 193-8094 used to hold spline
- 193-8100 used to remove locknut

Reference

SENR6564, Service Manual, 3500B Engines Disassembly and Assembly

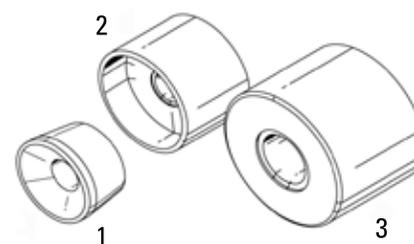


Water Pump Seal Installers

Model: 3400 Engines

Warranty: Six Months

- Used to install water pump seals
- Both 139-0088 and 138-9299 tools work on 3406C Engines with serial numbers 8PN10279-UP and 3406E Engines with serial numbers 5EK85240-UP



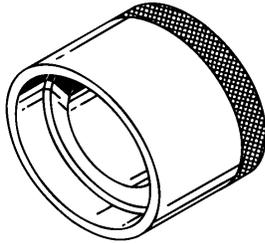
| Item | Part Number | Description | Outside Diameter | Inside Diameter | Counter Bore Diameter | Material | Installs |
|------|-------------|----------------------|---------------------|---------------------|-----------------------|---------------------|---|
| 1 | 138-9299 | Oil Seal Tool | 35.42 mm (1.394 in) | 19.25 mm (0.757 in) | -- | Aluminum or Plastic | Pump shaft through 136-1152 Oil Seal in pump housing ¹ |
| 2 | 139-0088 | Seal Installer | 43.9 mm (1.73 in) | 19.31 mm (0.760 in) | 37.6 mm (1.48 in) | Steel | 128-0317 Coolant Seal and support ring in housing |
| 3 | 147-6521 | Seal/Shaft Installer | -- | -- | -- | -- | Shaft/oil seal assembly into early pump housing |

¹136-1152 is discontinued

135-7629 Water Pump Seal Installer

Model: 3406 Engines

Warranty: Six Months



- Used to correctly and quickly install the 118-9163 Seal Group in water pumps
- Replaces discontinued 2W-9102 Installation Tool (Water Pump Seal) and 125-9622 Seal Installer (Water Pump)
- Seal fits into counterbore of seal installer
- Seal installer slips over pump shaft (seal is installed using hand force)
- Overall length: 22.4 mm (0.88 in)
- Diameter: 31.75 mm (1.25 in)

| Part No. | Description |
|----------|---------------------------|
| 135-7629 | Water Pump Seal Installer |

Reference

SEHS8449, Special Instruction, Installation of Water Pump Seal Group

323-3526 Seal Installer

Essential Tool

Model: C9 Marine Engine, C9 Petroleum Engine

Warranty: Six Months



- Used to install 200-3052 Seal Group in water pump
- Seal fits into counterbore of seal installer and then uses pump shaft as a guide
- Correctly installs seal without damage
- Durable, steel construction

| Part No. | Description |
|----------|----------------|
| 323-3526 | Seal Installer |

Reference

REN8633, C9 Petroleum Disassembly and Assembly

325-5756 Seal Installer

Essential Tool

Model: C15 and C18 Engines for Cat® Built Machines and On-Highway use

Warranty: Six Months



- Used to install 276-4756 Seal Group in water pump
- Seal fits into counterbore of seal installer and then uses pump shaft as guide
- Correctly installs seals without damage
- Durable, steel construction
- Black oxide coating for corrosion resistance

| Part No. | Description |
|----------|----------------|
| 325-5756 | Seal Installer |

Reference

REN9706, C15 On-Highway Engines

183-4028 Seal Installer

Essential Tool

Model: 3176, C-10, C-12, and 3196 Engines

Warranty: Six Months

| Part No. | Description |
|----------|----------------|
| 183-4028 | Seal Installer |

- Used to install 147-5088 Pump Seal into 153-8053 Pump
- Provides quick, easy installation



417-6000 Seal Installer Tool, 417-6001 Seal Installer Tool

Model Usage: 3406E, C15, C18, G3516C Auxiliary Water Pump

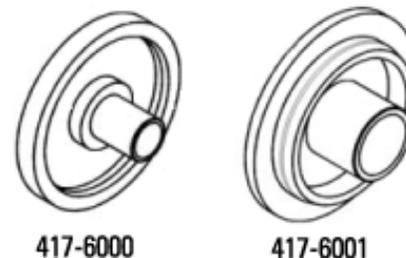
Warranty: Six Months

- Used to correctly install new style seals into 391-2227 Sea Pump
- Guides seal and set seals to correct depth
- Black Oxide coated for durability
- Used in conjunction with hand press

Reference

REN2389, C18 Marine and Auxiliary Marine Generator Set Engines

| Specifications | | |
|----------------|---------------------|------------------------------|
| Part Number | Description | Dimensions |
| 417-6000 | Seal Installer Tool | 140 x 55.8 mm (5.5 x 2.2 in) |
| 417-6001 | Seal Installer Tool | 90 x 31.7 mm (3.5 x 1.3 in) |



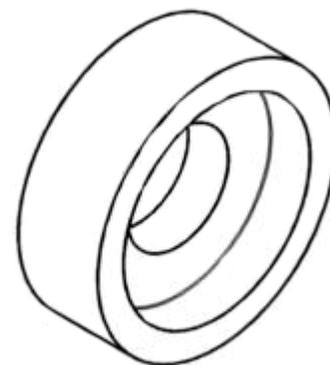
FT3201 Seal Installer

Model Usage: C15, C18, 3400 Engines

Warranty: None

- Used to install 336-2212 Pump Seal
- Correctly installs seal without damage
- Provides quick, easy installation
- Make from Mild steel

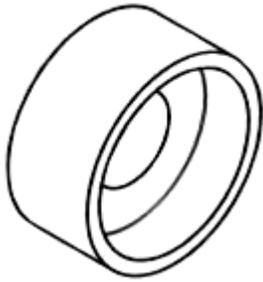
| | |
|--------|----------------|
| FT3201 | Seal Installer |
|--------|----------------|



FT3202 Seal Installer

Model Usage: C15, C18, 3400 Engines

Warranty: None



- Used to install 349-2654 Pump Seal
- Correctly installs seal without damage
- Provides quick, easy installation
- Made from Mild steel

| | |
|--------|----------------|
| FT3202 | Seal Installer |
|--------|----------------|

FT3171 Seal Installer

Essential Tool

Model: Cat® Marine Engines

Warranty: None



- Used to install 336-2212 Pump Seal in 352-8589 Pump
- Correctly installs seal without damage
- Provides quick, easy installation
- Made from SAE 1020M steel

1U-9582 Seal Guide

Model: 3304 and 3306 Series Engines

Warranty: Six Months



- Used in repair of water pumps on 3304 and 3306 Series Engines
- Prevents damage to 8C-5210 Seal while installing impeller shaft
- Seal installed into housing first, and shaft installed through seal

| Part Number | Description |
|-------------|-------------|
| 1U-9582 | Seal Guide |

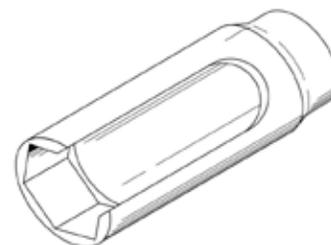
9U-5103 Slotted Socket

Model: 3406E, C-15, and C-16 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|----------------|
| 9U-5103 | Slotted Socket |

- Used to remove and install coolant temperature sensor
- Deep well design easily reaches sensor
- Slotted side for sensor wire clearance
- Square drive: 1/2 inch
- Socket type: 6 point, 1 1/16 in



9U-6627 Seal Installer, 9U-6626 Locknut Spanner Wrench

2P-2317 Locknut Spanner Wrench

Model: 3400 Marine Engines

Warranty: Six Months

- Used to disassemble and assemble 6I-1928 and 105-0268 Raw Water Pumps — used on 5N-6054 Seal Group
- Spanner sockets reduce removal time of shaft locknuts — easier removal and less chance of damage
- Dual purpose 9U-6627 Seal Driver installs seal — ring is used with driver to remove old seal

| Item | Part Number | Description |
|-------|-------------|---|
| 1 & 2 | 9U-6627 | Seal Installer (Includes item 2 Seal Remover) |
| 3 | 9U-6626 | Locknut Spanner Wrench |
| 4 | 2P-2317 | Locknut Spanner Wrench |



164-2192 Pressure Probe

Model: Multiple Engine Models

Warranty: Six Months

- Replaces discontinued 5P-2718 Pressure Probe
- Used with pressure gauge to check pressure of fluid-filled compartments
- Fits 3.175 mm (1/8 in) pipe plug threads
- Can be used alone or with 5P-2720 Probe Adapter Group, 5P-2725 Probe Adapter Group, or 5P-3591 Probe Adapter Group
- Can be used in applications up to 2750 kPa (400 psi)

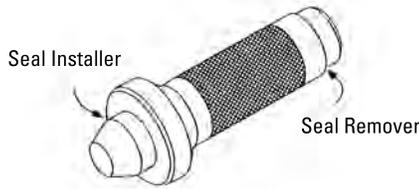
| Part Number | Description |
|-------------|----------------|
| 164-2192 | Pressure Probe |



9U-6956 Water Pump Seal Installer

Model: 3408 and 3412 Marine Engines

Warranty: Six Months



- Used to remove and install ceramic seals on most pumps that use a 5N-6055 Seal Group
- Used with 1U-8306 Socket-Spanner for rebuilding 6I-1898 and 4C-3613 Water Pumps
- One-piece design eliminates need for second tool
- Large end of driver installs seals — greatly reduces chances of damage
- Handle end of driver removes old ceramic seal
- Overall length: 180.0 mm (7.1 in)
- Large diameter: 70.0 mm (2.75 in)

| Part Number | Description |
|-------------|---------------------------|
| 9U-6956 | Water Pump Seal Installer |

385-4578 Seal Installer

Model Usage: C32 Marine

Warranty: Six Months



- Used to replace seals on the auxiliary pump
- Prevents seal damage during installation

| 385-4578 Specifications | |
|-------------------------|-------------------------------|
| Dimensions | 37.0 x 30.1 mm (1.5 x 1.2 in) |
| Weight | 0.05 kg (0.1 lb) |

420-5855 Water Pump Seal Installer

Model Usage: D8R, 3406E, D8N, D9N, D11R, 994F, D11T CD

Warranty: Six Months



- Used to properly install water pump seal 311-8411 into assembly 311-8410

| Specifications | |
|----------------|-----------------------------|
| Dimensions | 47 x 45 mm (1.85 x 1.77 in) |
| Weight | .463 kg (1.02 lb) |

| Part Number | Description |
|-------------|---------------------------|
| 420-5855 | Water Pump Seal Installer |

221-8647 Seal Installer

- Used to install thermostat seal in housing
- Top portion of installer fits into housing and acts as a guide
- Lower portion slides through guide portion to install seals accurately and efficiently
- Lower portion bolts to handle using a 2D-4534 Bolt (3/8-16)
- Knurled handle makes installer easier to hold



| Part Number | Description |
|-------------|----------------|
| 221-8647 | Seal Installer |

Temporary Strainers

Model: 3400, 3500, 3600 Family Engines

Warranty: Six Months

- Convenient to install in coolant lines on 3600, 3500 and some 3400 Family Engines
- Filter particles larger than 1.58 mm (1/16 in) diameter
- Used during initial startups and after overhauls
- Meant to be removed from cooling system before engine returned to service



| Part Number | Description | Material | Perforations | Pipe Size |
|-------------|--------------------|-----------------|----------------------------|-----------------|
| 4C-9045 | Temporary Strainer | Stainless Steel | 1.58 mm (1/16 in) diameter | 101.6 mm (4 in) |
| 4C-9046 | Temporary Strainer | Stainless Steel | 1.58 mm (1/16 in) diameter | 127 mm (5 in) |
| 4C-9047 | Temporary Strainer | Stainless Steel | 1.58 mm (1/16 in) diameter | 152.4 mm (6 in) |

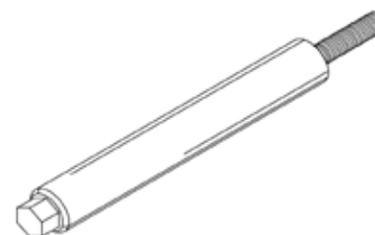
125-5597 Mounting Bar

Model: 3406E Marine Engine

Warranty: Six Months

- Used to hold heat exchanger plates in alignment during disassembly and assembly
- Makes repair work faster and easier

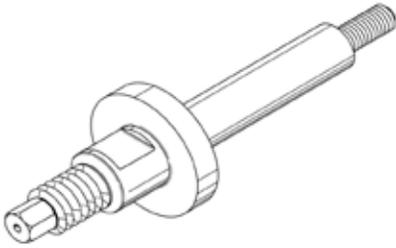
| Part No. | Description | Hex End | Outside Diameter | Threaded End |
|----------|--------------|-------------------|---------------------|--------------|
| 125-5597 | Mounting Bar | 19.05 mm (3/4 in) | 29.75 mm (1.171 in) | 1/2 - 13 |



237-9608 Mounting Bar

Model: C-18

Warranty: Six Months



- Used to preload aftercooler plates for assembly
- Makes repair work easier and faster
- 2 bars are typically used per aftercooler

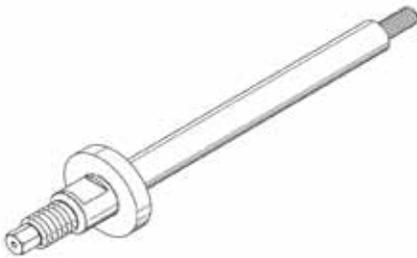
| Part Number | Description |
|-------------|--------------|
| 237-9608 | Mounting Bar |

334-0114 Mounting Bar

Essential Tool

Model: C27, C30, C32, and 3412E Marine Engines

Warranty: Six Months



- Used to align and preload aftercooler plates during assembly
- Bars align aftercooler plates and threaded adjuster compresses plates to proper preload
- Makes repair work easier and faster
- Two bars are typically used per aftercooler
- Durable steel construction

Reference

SENR5031, Service Manual, 3412E, C30, and C32 Marine Engines, Disassembly and Assembly Manual

| Part Number | Description |
|-------------|--------------|
| 334-0114 | Mounting Bar |

169-4309 Mounting Bar

Model: 3412 HEUI Marine Engines

Warranty: Six Months



- Used to align heat exchanger plates during disassembly and assembly
- Makes heat exchanger repair work easier and faster
- Two guides are typically used per heat exchanger

Reference

SENR5031, Disassembly and Assembly Manual

| | |
|------------------|---------------------|
| Hex end | 19.05 mm (3/4 in) |
| Outside diameter | 29.75 mm (1.171 in) |
| Threaded end | 5/8-11 |

| Part Number | Description |
|-------------|--------------|
| 169-4309 | Mounting Bar |

FT3045 Angle Bracket

Model: 3516 Generator Set

Warranty: None

- Used to remove and install radiator
- Clamps both segments of radiator core together to make it easier to handle
- Material: SAE 1020M Steel

Reference

REN5060, 3500B Engine Disassembly and Assembly Manual



359-4915 Fan Drive Installer, 359-4916 Fan Drive Installer

Essential Tool

Model: D6R, D6T Track-Type Tractors, 937D Track-Type Loader

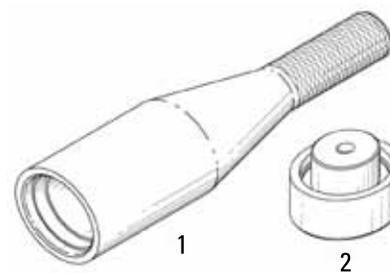
Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---------------------|
| 1 | 359-4915 | Fan Drive Installer |
| 2 | 359-4916 | Fan Drive Installer |

- Used to install wear sleeves on 336-7696 and 350-5637 Fan Drives
- Provides a way to install wear sleeves without damage to seals or fan drive
- Made from hardened steel and black oxide coated for long service life

Reference

REN8175, D6R Series III and D6T Track-Type Tractors, Engine Supplement, Disassembly and Assembly



Assembly Tooling for MESABI Radiator

Model: 793, 797 Off-Highway Truck

Warranty: Six Months

- Used to assemble MESABI Radiator
- Various tools and lubricating oil provide means to correctly assemble radiator components, including seals
- Special hand tools designed to help prevent damage to the radiator during assembly

References

KENR8578, 793F Off-Highway Truck, Engine Supplement, Disassembly and Assembly

KENR8384, 797F Off-Highway Truck, Engine Supplement, Disassembly and Assembly

| Part Number | Description |
|-------------|-------------|
| FT3163 | As Fixture |
| FT3164 | As Fixture |
| FT3165 | Bracket |

| Part Number | Description |
|-------------|-------------------|
| 342-2334 | Support Tool |
| 342-2335 | Cleaning Brush |
| 342-2346 | Lubrication Brush |
| 342-2348 | Lubrication Brush |
| 342-2349 | Lubricating Oil |
| 4Q-5144 | Install Tool |

(Continued)

Assembly Tooling for MESABI Radiator (Continued)

Model: 793, 797 Off-Highway Truck

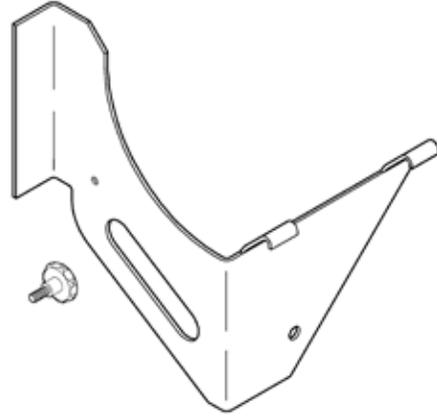
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 4Q-5222 | Breaker Tool |

373-4792 Turbo Alignment Bracket

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Required to properly install and align the turbo assembly

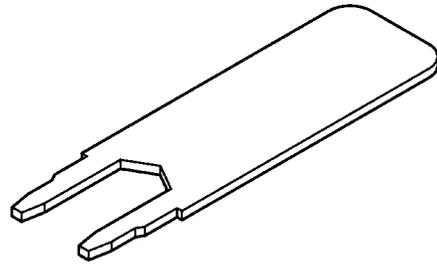
| Specifications | |
|----------------|--|
| Dimensions | 355.6 x 279.4 x 304.8 mm (14.0 x 11.0 x 12.0 in) |
| Weight | 2.3 kg (5.0 lb) |

| Part Number | Description |
|-------------|-------------------------|
| 373-7492 | Turbo Alignment Bracket |

373-4724 Air Compressor Coolant Line Release Tool

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to manually install injector into cylinder head
- Releases the locking mechanism to allow the removal of the coolant line on the air compressor

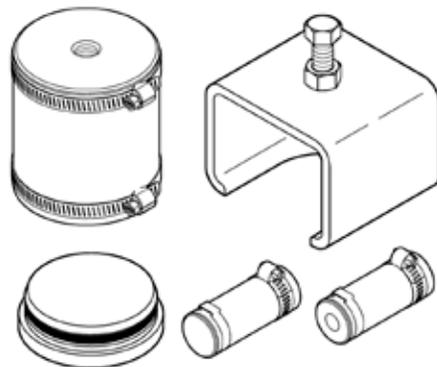
| Specifications | |
|----------------|--------------------|
| Dimensions | 3 x 1 x 0.25 in |
| Weight | 0.23 kg (0.50 lbs) |

| Part Number | Description |
|-------------|--|
| 373-4724 | Air Compressor Coolant Line Release Tool |

373-4793 Charge Air Cooler Test Group

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to perform diagnostics on the charge air cooler (intercooler).

| Specifications | |
|----------------|---|
| Dimensions | 177.8 x 134.6 x 134.6 mm (7.0 x 5.3 x 5.3 in) |
| Weight | 2.56 kg (5.65 lb) |

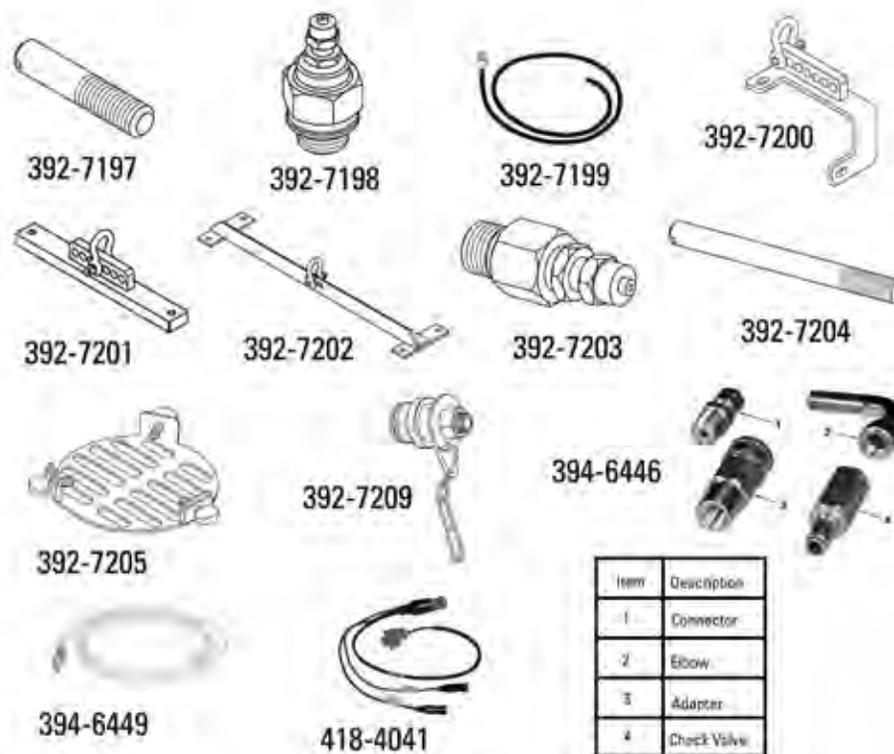
| Part No. | Description |
|----------|------------------------------|
| 373-4793 | Charge Air Cooler Test Group |

CT660 15L Engine Tools

Model Usage: CT660

Warranty: Six Months

- Service tools for servicing various systems of the CT660, 15L engine.



| Part Number | Description | Weight | Qty. |
|-------------|--|-------------------|------|
| 392-7197 | High Pressure Pump Alignment Pins | .054 kg (.12 lb) | 2 |
| 392-7198 | Oil Pressure Test Adapter | .118 kg (.26 lb) | 1 |
| 392-7199 | Fuel Line Return Test hose & Adapter | 1.54 kg (3.39 lb) | 1 |
| 392-7200 | Turbo Lifting Bracket | 1.03 kg (2.26 lb) | 1 |
| 392-7201 | Cylinder Head Lifting Bracket | 2.25 kg (4.95 lb) | 2 |
| 392-7202 | EGR Lifting Bracket | 2.73 kg (6.03 lb) | 1 |
| 392-7203 | Crankcase Pressure Adapter | .040 kg (.089 lb) | 1 |
| 392-7204 | Intake Housing Alignment Pins | .064 kg (.14 lb) | 2 |
| 392-7205 | Air Intake Guard | .168 kg (.37 lb) | 1 |
| 392-7209 | Oil Cooler Pressure Test Kit | .868 kg (1.91 lb) | 2 |
| 394-6446 | Fuel Pressure Test Kit | .136 kg (.30 lb) | 1 |
| 394-6499 | High Pressure Return Line Tester (19 mm) | 1.50 kg (3.30 lb) | 1 |
| 418-4041 | AFTFSV Temperature Breakout Harness | .227 kg (.50 lb) | 1 |

373-4794 Thermostat Housing Extension Tube Seal Installer

Model Usage: CT660 Truck
Warranty: Manufacturer's



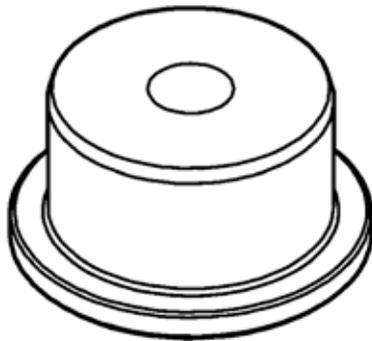
- Used to properly install the extension tube seal into the thermostat housing

| Specifications | |
|----------------|---|
| Dimensions | 137.2 x 177.8 x 134.6 mm (5.4 x 7.0 x 5.3 in) |
| Weight | 0.29 kg (0.65 lb) |

| Part No. | Description |
|----------|--|
| 373-4794 | Thermostat Housing Extension Tube Seal Installer |

373-4825 Charge Air Cooler Pipe to High Speed Turbo Extension Tube Seal Installer

Model Usage: CT660 Truck
Warranty: Manufacturer's



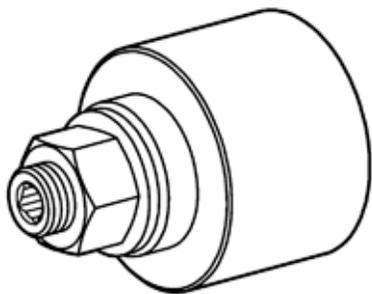
- Used to properly install the extension tube seal into the air charge cooler (inter-cooler) pipe

| Specifications | |
|----------------|---|
| Dimensions | 137.2 x 180.3 x 134.6 mm (5.4 x 7.1 x 5.3 in) |
| Weight | 0.54 kg (1.2 lb) |

| Part Number | Description |
|-------------|--|
| 373-4825 | Charge Air Cooler Pipe to High Speed Turbo Extension Tube Seal Installer |

373-4831 Fan Hub Seal Installer

Model Usage: CT660 Truck
Warranty: Manufacturer's



- Used to properly install the fan hub housing seal

| Specifications | |
|----------------|---|
| Dimensions | 127.0 x 127.0 x 177.8 mm (5 x 5 x 7 in) |
| Weight | 2.1 kg (4.6 lb) |

| Part Number | Description |
|-------------|------------------------|
| 373-4831 | Fan Hub Seal Installer |

379-9007 Fan Clutch Wrench

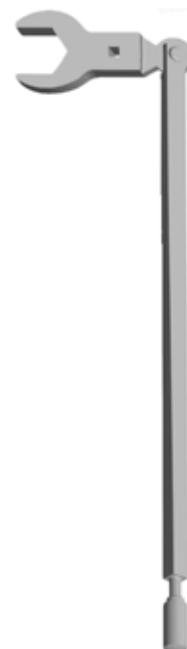
Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to easily remove fan hub nut on CT660 engines
- Force can be applied using air hammer or by hand using included attachment and standard hammer or mallet
- Fan clutch wrench can be used with 1/2" drive torque wrench to reinstall nut

| Specifications | |
|----------------|--|
| Dimensions | 101.6 x 101.6 x 863.6 mm (4.0 x 4.0 x 34.0 in) |
| Weight | 3.6 kg (7.9 lb) |

| Part Number | Description |
|-------------|----------------------------|
| 379-9007 | 379-9007 Fan Clutch Wrench |



Engine Tools

372-5254 Coolant Management Tool

Model Usage: CT660 Truck

Warranty: Manufacturer's

- Equipped with two unique adapters that use standard shop air to create regulated pressure and a powerful vacuum
- Regulated pressure quickly empties entire system
- Single closure valve allows for pressure test
- Vacuum eliminates possibility of air pockets forming in the EGR cooler

| Specifications | |
|----------------|---|
| Dimensions | 439.4 x 528.3 x 1252.2 mm (17.3 x 20.8 x 49.3 in) |
| Weight | 33.1 kg (73 lb) |

| Part Number | Description |
|-------------|-------------------------|
| 372-5254 | Coolant Management Tool |

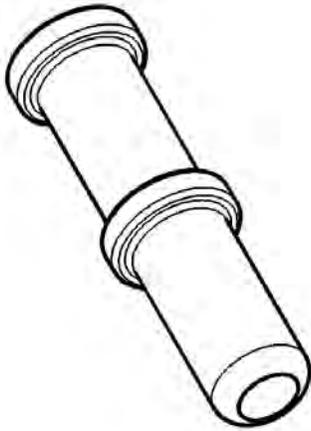


385-1861 Coolant Line Plug

Model Usage: All C7 thru C18, Industrial and Captive Engines

Warranty: Manufacturer's

- Used to plug the coolant line to the DEF injector during DPF removal
- Two coolant line plugs are required per engine for this procedure
- Effects all Tier 4 final engines, C7 – C18



| Part Number | Description |
|-------------|-------------------|
| 385-1861 | Coolant Line Plug |

Crankshaft, Main Bearings and Flywheel

Crankshaft Gear Installation Tools

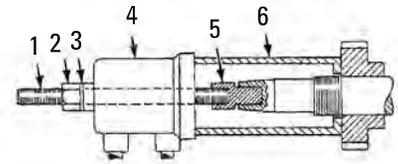
Model: Cat® Engines

Warranty: Six Months

- Used to install crankshaft gears on most engines with tool setup illustrated

| Item | Part Number | Description |
|------|-------------|-------------|
| 6 | FT1410 | Sleeve |

| Item | Part Number | Description | Thread Size |
|---|-------------|----------------|---|
| 1 | 5H-1275 | Stud | -- |
| 2 | 1B-4206 | Nut | -- |
| 3 | 4D-3704 | Washer | -- |
| 4 | 6V-3160 | Cylinder Group | -- |
| Thread sizes of adapters (5) are as follows: | | | |
| 5 | 5F-7339 | Adapter | 3/4 in NF - Male x 5/8 in NF - Female |
| 5 | 5F-7342 | Adapter | 1 in NF - Male x 5/8 in NF - Female |
| 5 | 5H-1274 | Adapter | 1 1/4 in NF - Male x 5/8 in NF - Female |
| 5 | 5H-1276 | Adapter | 7/8 in NF - Male x 5/8 in NF - Female |



Engine Tools

FT2632 Installer

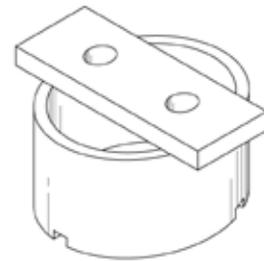
Model: C10/C12 ADEM3 Engines

Warranty: None

- Used to easily press crankshaft mounted timing ring into position
- Fabricated from 6V-2108 Sleeve Tool by cutting slots into one face
- Bar is used with existing bolts to push sleeve onto crankshaft
- Sleeve material: SAE 1025 tubing
- Bar material: SAE 1018 steel

Reference

REN2236, Special Instruction



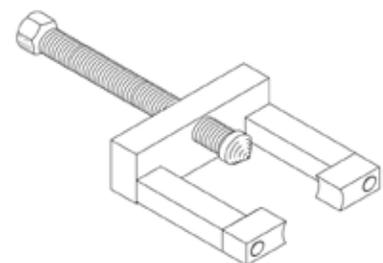
137-7293 Crank Gear Puller

Model: 3116 and 3126 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------|
| 137-7293 | Crank Gear Puller |

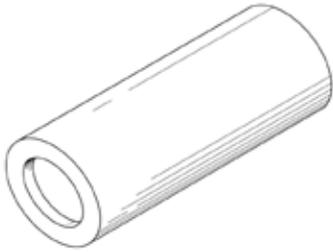
- Used to remove 2W-8147 Gear from crankshaft
- Saves time by allowing crankshaft gear to be removed without removing crankshaft from engine or engine from frame
- Especially useful on 3126 Engines in motor home applications
- Weight: 3 kg (7 lb)
- All items in figure are included



FT1410 Sleeve

Model: Cat® Engines

Warranty: None

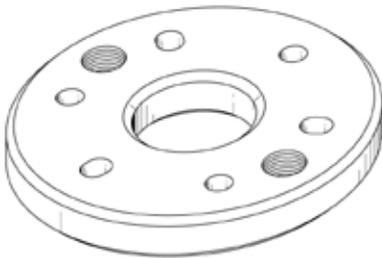


- Replacement for 5H-1273 Sleeve
- Material: SAE 1020 steel

FT1033 Puller Adapter

Model: D8K

Warranty: None

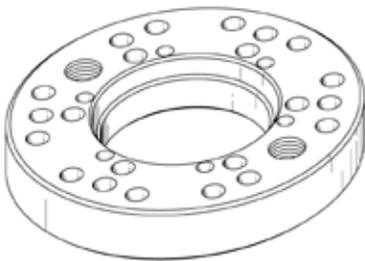


- Used to facilitate removal of crankshaft pulley and damper on later 13.72 cm (5.4 in) bore, 6-cylinder vehicle engines and D8K Tractor
- Material: SAE 4140 steel

FT0915 Adapter

Model: 4.75 inch and 5.4 inch Bore Engines

Warranty: None



- Used to facilitate removal of crankshaft pulley and hub on 12.07 cm (4.75 in) and some 13.72 cm (5.4 in) bore engines
- Material: SAE 4140 steel

5P-3546 Puller Plate

Model: D10, D11N, 245B, 992C

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 5P-3546 | Puller Plate |

- Used to remove 9S-3013 Crankshaft Gear on D343 and 1693 Engines
- Used with 6V-3160 Hydraulic Puller, 9M-6592 Guide, three 6F-4991 Bolts, and three 7F-1926 Bolts



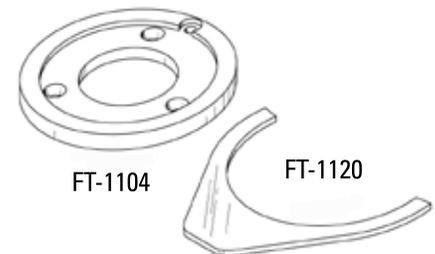
FT1104 Drill Fixture

FT1120 Chip Deflector

Model: 1674

Warranty: None

- Used to remove crankshaft gear on 1674 Engine without removing crankshaft from engine
- FT1104 Drill Fixture assembled to crankshaft flange so that drill bushing is aligned with key which positions crankshaft gear; gear removed by drilling partially through gear with solid carbide or carbide-tipped drill; after fixture removed, chisel can be used to break gear from crankshaft
- FT1120 Chip Deflector bent to fit under end of crankshaft before drilling is started



FT1342 Guide Bolts

Model: 3408, 3408B, 834B, 988B

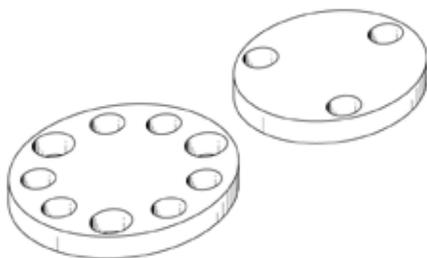
Warranty: None

- Used to hold crankshaft gear in position when removing and installing flywheel on engines prior to 48W-1713 in 988B Wheel Loaders — if tools are not used, gear can fall off crankshaft and cause damage
- On engines beginning with 48W-1713, fabricated tools not required because cast bosses in flywheel housing prevent gear from falling
- 2 required
- Material: SAE 1020 steel



FT1576 Puller Plate

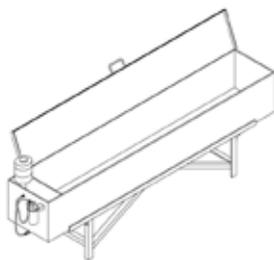
Model: D10
Warranty: None



- Used with 9M-6592 Guide and three 1K-9418 Bolts to remove crankshaft gear on D346, D348 and D349 Engines
- Can be fabricated from dimensions given in Detail "A", or by modifying 5P-3546 Puller Plate with dimensions given in Detail "B"

FT1587 Cold Solvent Tank

Model: Cat® Engines
Warranty: None



- Cold solvent cleaning of crankshafts needed during reconditioning of engines and after crankshafts have been ground
- Sized specifically to clean crankshafts; takes less floor space than commercially available cold solvent tanks that are large enough to clean crankshafts used in most Cat® Engines
- Equipped with pump and filter to remove debris from solvent during use; filter reduces solvent replacement cost; with installation of "tee" fitting at pump outlet, a hose can be added to flush passages in crankshaft
- Pair of 5P-8637 Crankshaft Supports can be used in tank to make it easier to turn crankshaft during cleaning
- Capacity: 400 L (105.6 U.S. gal) when filled with solvent to depth of 254 mm (10 in)

5P-8637 Crankshaft Support Group

Model: Cat® Engines
Warranty: Six Months



- V-block-type supports used to inspect crankshafts for bend (2 support groups required)
- Replaceable plastic bearing pads will not damage crankshaft

Reference

SEBF8054, Guideline for Reusable Parts

| Part Number | Description | Quantity |
|--|----------------------------|----------|
| 5P-8637 | Crankshaft Support Group | -- |
| Crankshaft Support Group Consists of: | | |
| 0S-0509 | Bolt (3/8 - 16) | 2 |
| 2H-6120 | Screw (used with 268-1699) | 3 |
| 5P-8636 | Pad | 2 |
| 7F-7836 | Screw | 4 |

5P-8718 BrakeSaver Rotor Support

Model: 3406, 3406B, 3408, 3408B

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------------|
| 5P-8718 | BrakeSaver Rotor Support |

- Used to prevent damage to seals during BrakeSaver removal and installation on 3400 Series Engines
- Attached to engine with four OS-1594 Bolts
- Replaces 9N-0046 design changes



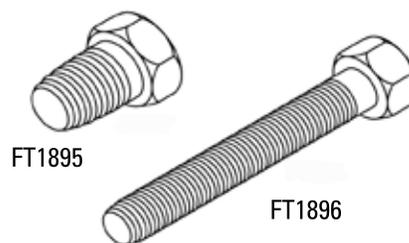
FT1895 Plug

FT1896 Bolt

Model: Cat® Engines with BrakeSavers

Warranty: None

- Make replacement of diaphragm in brakesaver control valve easier
- Hold spool valve in place while replacing diaphragm
- Reduce loss of oil



8F-4423 Flywheel Lifter

Model: Cat® Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------|
| 8F-4423 | Lifter - Flywheel |

- Used for flywheel removal and installation
- Two lifters can be used for removal and installation of some crankshafts
- Maximum lifting capacity: 454 kg (1000 lb)



393-2572 Flywheel Stopper Plate

Model Usage: C3.8

Warranty: Manufacturer's



- Used to loosen and tighten the flywheel screw

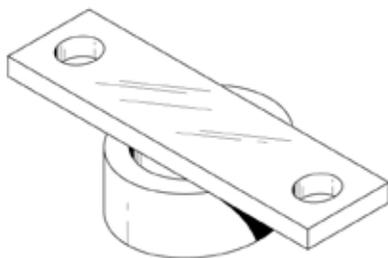
| Specifications | |
|----------------|--------------------------------|
| Dimensions | 140 x 78.7 mm (5.51 x 3.10 in) |
| Weight | .662 kg (1.45 lb) |

| Part Number | Description |
|-------------|------------------------|
| 393-2572 | Flywheel Stopper Plate |

FT1341 Bracket Assembly

Model: 3408, 3408B, 834B, 988B

Warranty: None

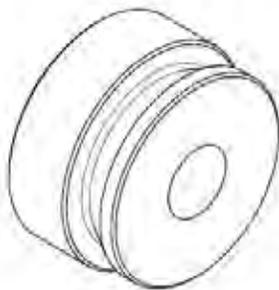


- Adaptable to 988B Engine
- Used to prevent crankshaft gear from dropping off crankshaft during removal of flywheel and damaging seals

364-7209 C4.4 Timing Case Cover Alignment Tool

Model Usage: C4.4

Warranty: Six Months



- Used to correctly align pressed timing case cover for C4.4 engine

| Specifications | |
|----------------|------------------------------------|
| Dimensions | Outer Diameter: 79.35 mm (3.12 in) |
| | Depth: 44.45 mm (1.75 in) |
| Weight | 3.62 kg (8.0 lb) |
| Material(s) | Steel |

| Part Number | Description |
|-------------|---------------------------------------|
| 364-7209 | C4.4 Timing Case Cover Alignment Tool |

364-7210 Timing Case Cover Alignment Tool

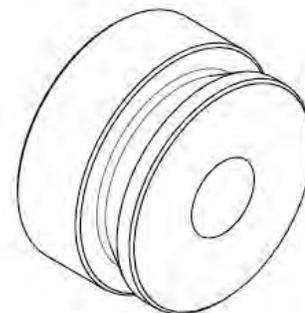
Model Usage: C7.1, C6.6

Warranty: Six Months

- Used to correctly align pressed timing case cover

| Specifications | |
|----------------|------------------------------------|
| Dimensions | Outer Diameter: 79.35 mm (3.12 in) |
| | Depth: 44.45 mm (1.75 in) |
| Weight | 1.12 kg (2.49 lb) |
| Material(s) | Steel |

| Part Number | Description |
|-------------|----------------------------------|
| 364-7210 | Timing Case Cover Alignment Tool |



9U-7994 Flywheel Guide Pin

Model: 3046 Diesel Engine

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------|
| 9U-7994 | Flywheel Guide Pin |

- Used to remove and install flywheel (2 required)
- Supports weight and aligns flywheel during engine assembly
- Simple to use (threaded guide pin has screwdriver slot for easy installation)
- Thread: M12 x 1.25
- Overall length: 190 mm (7.5 in)

Reference

SEN6458, Special Instruction, Disassembly and Assembly of 3046 Engines



5P-3022 Wear Sleeve and Seal Installer

Model: Cat® Engines

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------------------|
| 5P-3022 | Wear Sleeve and Seal Installer |

- Used to install both front and rear seals and wear sleeves on 15.88 cm (6.25 in) bore V-engines
- Also included with 3N-8008 Crankshaft Seal Conversion Group, Front, and 3N-8000 Crankshaft Seal Conversion Group, Rear, for replacing former piston ring-type seal, thrower, and baffle



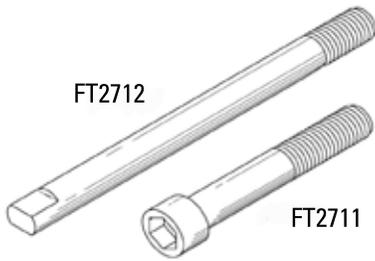
Crankshaft, Main Bearings and Flywheel

FT2711 Special Bolt

FT2712 Guide Stud

Model: 3196 Rear Power Take-Off Engines and 365B Hydraulic Excavator

Warranty: None

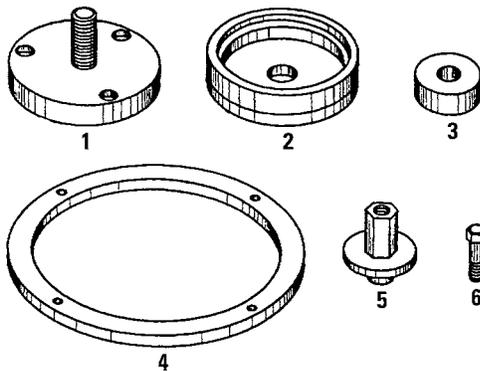


- Used to align and support rear crankshaft gear while oil seal is being installed
- Eliminates oil seal damage during installation
- Guide studs align crankshaft gear (3 required)
- Special bolts lock crankshaft gear into position (2 required)
- Special bolt made from: 095-0705 Socket Head Hex Bolt
- Material for FT2712: SAE 4140 steel

Crankshaft Seal and Wear Sleeve Installation Tools (Silicone and Hydrodynamic)

Model: 1100, 3100, 3200, 3300, 3400

Warranty: Six Months



- Typical tools for installing silicone and hydrodynamic-type oil seals and wear sleeves

Reference

- SMHS7100-02, Special Instruction
- SMHS8508, Special Instruction
- SMHS8301, Special Instruction
- SMHS6959-01, Special Instruction

| CURRENT ENGINES | | | | |
|---|----------------|-------------|--------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 1100 and 3100 Engines - Silicon Seals - SMHS7100 | | | | |
| 1 | Rear | 5P-0290 | Locator | -- |
| 2 | Front | 9S-6030 | Installer | -- |
| 2 | Rear | 5P-7293 | Installer | -- |
| 3, 4 | Front | 6V-7777 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 1P-5515 | Bolt | 2 |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7338 | Distorter Ring / Adapter | -- |
| 3034 | | | | |
| 2 | Front | 159-9074 | Front Seal Installer | -- |
| 2 | Rear | 159-9071 | Rear Seal Installer | -- |
| 3, 4 | Front and Rear | 159-9076 | Rear Drive Handle | -- |

| CURRENT ENGINES | | | | |
|----------------------|-------------|-------------|----------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 3054 and 3056 | | | | |
| 1 | Front | 9U-6208 | Locator ¹ | -- |
| 2 | Front | 9U-6207 | Plate | -- |
| 2 | Front | 9U-6211 | Installer | -- |
| 2 | Rear | 9U-6203 | Installer | -- |
| 3, 4 | Front | 9U-6209 | Sleeve | -- |
| 3, 4 | Front | 9U-6206 | Stud | -- |
| 3, 4 | Rear | 9U-6204 | Seal Guide | -- |
| 3, 4 | Rear | 9U-6202 | Plate | -- |
| 6 | Front | 089-7989 | Bolt | 3 |
| -- | Front Group | 9U-6210 | Installer Group | -- |
| 3064 and 3066 | | | | |
| 1 | Rear | 9U-6171 | Locator | -- |
| 2 | Front | 9U-6179 | Washer | -- |
| 2 | Rear | 9U-6169 | Installer | -- |
| 2 | Rear | 6V-3303 | Bolt | -- |
| 3, 4 | Front | 9U-6178 | Installer Stud | -- |

(Continued)

Crankshaft Seal and Wear Sleeve Installation Tools (Silicone and Hydrodynamic) (Continued)

Model: 1100, 3100, 3200, 3300, 3400

Warranty: Six Months

| CURRENT ENGINES | | | | |
|--|----------------|-------------|----------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 3064 and 3066 (Continued) | | | | |
| 3, 4 | Rear | 5P-8247 | Hard Washer | -- |
| 6 | Rear | 9U-6172 | Bolt | 2 |
| -- | Front Group | 9U-6180 | Front Seal Installer Group | -- |
| -- | Rear Group | 9U-6170 | Rear Seal Installer Group | -- |
| 3046 | | | | |
| 1 | Rear | 4C-6375 | Locator | -- |
| 2 | Front | 4C-6378 | Seal Installer Sleeve | -- |
| 2 | Rear | 6V-3303 | Bolt | -- |
| 2 | Rear | 127-1591 | Rear Oil Seal Installer | -- |
| 3, 4 | Front | 4C-6376 | Installer Stud | -- |
| 3, 4 | Front | 4C-6377 | Installer Washer | -- |
| 3, 4 | Rear | 5P-8247 | Hard Washer | -- |
| 6 | Rear | 9U-6172 | Bolt | 2 |
| 3200 and 3204 Engines - Silcon Seals - SMHS7100 | | | | |
| 1 | Rear | 5P-0290 | Locator | -- |
| 2 | Front | 9S-6030 | Installer | -- |
| 2 | Rear | 8T-3098 | Installer | -- |
| 2 | Rear | 5P-7293 | Installer | -- |
| 3, 4 | Front | 6V-7777 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 1P-5515 | Bolt | 2 |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7338 | Distorter Ring / Adapter | -- |
| 3208 Engines - Silcon Seals - SMHS7100 | | | | |
| 1 | Rear | 5P-0290 | Locator | -- |
| 2 | Front | 5P-4194 | Installer | -- |
| 2 | Rear | 5P-7293 | Installer | -- |
| 3, 4 | Front | 5P-4230 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 1P-5515 | Bolt | 2 |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7338 | Distorter Ring / Adapter | -- |

| CURRENT ENGINES | | | | |
|--|----------------|-------------|----------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 3208 Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Rear | 5P-0290 | Locator | -- |
| 2 | Front | 4C-4234 | Installer ² | -- |
| 2 | Rear | 5P-7293 | Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 1P-5515 | Bolt | 2 |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7338 | Distorter Ring / Adapter | -- |
| 3300 Engines - Silcon Seals - SMHS7100 | | | | |
| 1 | Rear | 9S-8871 | Locator | 3 |
| 2 | Front | 4C-8982 | Installer | -- |
| 2 | Rear | 5P-7298 | Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 9S-8890 | Bolts | 3 |
| 6 | Rear | 7F-8022 | Bolt | 1 |
| -- | Front | 5P-7315 | Distorter Ring | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7313 | Distorter Ring | -- |
| 3300 Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Rear | 9S-8871 | Locator | 3 |
| 2 | Front | 4C-8982 | Installer | -- |
| 2 | Rear | 6V-7876 | Installer | -- |
| 2 | Rear | 1U-8585 | Installer | -- |
| 2 | Rear | 6V-7877 | Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 2P-1956 | Bolt | -- |
| 6 | Rear | 7F-8022 | Bolt | 1 |
| -- | Front | 5P-7315 | Distorter Ring | -- |
| -- | Front | 9Y-9895 | Seal Group | 1 |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7313 | Distorter Ring | -- |
| 3114 and 3116 Engines - Hydrodynamic Seals - SMHS8508, SEHS8868 | | | | |
| 2 | Front | 1U-7430 | Front Crank Seal Installer | -- |
| 2 | Rear | 1U-7594 | Rear Installer | -- |
| 3, 4 | Rear | 1U-7597 | Sleeve Ring | -- |

(Continued)

Crankshaft, Main Bearings and Flywheel

Crankshaft Seal and Wear Sleeve Installation Tools (Silicone and Hydrodynamic) (Continued)

Model: 1100, 3100, 3200, 3300, 3400

Warranty: Six Months

Engine Tools

| CURRENT ENGINES | | | | |
|--|----------------|-------------|----------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 3114 and 3116 Engines - Hydrodynamic Seals - SMHS8508, SEHS8868 (Continued) | | | | |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 1U-7596 | Modified by Cat® Bolt | -- |
| -- | -- | 171-7212 | Wear Sleeve | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 4C-4869 | Distorter Ring | -- |
| -- | -- | 5P-6208 | Wear Sleeve Installer | -- |
| 3114, 3116 and 3126 HEUI Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Rear | 132-8772 | Locator | 2 |
| 2 | Front | 1U-7430 | Front Crank Seal Installer | -- |
| 2 | Rear | 1U-7594 | Rear Installer | -- |
| 3, 4 | Rear | 1U-7597 | Sleeve Ring | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 1U-7596 | Modified by Cat® Bolt | -- |
| -- | -- | 171-7212 | Wear Sleeve | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 4C-4869 | Distorter Ring | -- |
| -- | -- | 5P-6208 | Wear Sleeve Installer | -- |
| 3176, 3196, C-10 and C-12³ | | | | |
| -- | Front | 145-5247 | Wear Sleeve Installer | -- |
| -- | Front | 9Y-0821 | Wear Sleeve | -- |
| -- | Rear | 9Y-0810 | Wear Sleeve | -- |
| -- | Rear | 147-2675 | Wear Sleeve Installer | -- |
| 3400 Engines - Silcon Seals - SMHS7100 | | | | |
| 1 | Front and Rear | 5P-1733 | Locator | -- |
| 1 | Rear | 5P-7301 | Locator | -- |
| 2 | Front | 6V-2086 | Installer | -- |
| 2 | Rear | 6V-2087 | Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front and Rear | 5P-1737 | Bolt | 3 |

| CURRENT ENGINES | | | | |
|---|----------------|-------------|----------------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 3400 Engines - Silcon Seals - SMHS7100 (Continued) | | | | |
| 6 | Rear | 5P-7310 | Bolt | 2 |
| 6 | Rear | 5P-7309 | Bolt | 2 |
| -- | Front and Rear | 5P-7314 | Distorter Ring | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| 3400 Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Front and Rear | 5P-1733 | Locator | -- |
| 1 | Rear | 5P-3594 | Locator | -- |
| 1 | Rear | 5P-7301 | Locator | -- |
| 2 | Front | 6V-6142 | Installer | -- |
| 2 | Rear | 8T-2855 | Installer | -- |
| 2 | Rear | 8T-2683 | Installer | -- |
| 2 | Rear | 6V-6143 | Installer | -- |
| 3, 4 | Rear | 8T-2856 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front and Rear | 5P-1737 | Bolt | 3 |
| 6 | Rear | 5P-7309 | Bolt | 2 |
| 6 | Rear | 1T-0720 | Bolt | 2 |
| 6 | Rear | 5P-7310 | Bolt | 2 |
| -- | Front and Rear | 5P-7314 | Distorter Ring | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 5P-7409 | Sleeve Distorter | -- |
| 3500 Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Front and Rear | 6V-4003 | Locator | -- |
| 1 | Rear | 192-6339 | Crankshaft Seal Locator Assembly | -- |
| 2 | Front and Rear | 8T-3099 | Installer | -- |
| 2 | Front and Rear | 6V-4977 | Installer | -- |
| 2 | Rear | 187-1841 | Seal And Wear Sleeve Installer | -- |
| 3, 4 | Front and Rear | 6V-4001 | Other Part | -- |
| 3, 4 | Front and Rear | 6V-4002 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |

(Continued)

Crankshaft Seal and Wear Sleeve Installation Tools (Silicone and Hydrodynamic) (Continued)

Model: 1100, 3100, 3200, 3300, 3400

Warranty: Six Months

| CURRENT ENGINES | | | | |
|--|----------------|-------------|-------------------|------|
| Item | Location | Part Number | Description | Qty. |
| 3500 Engines - Hydrodynamic Seals - SMHS8508 (Continued) | | | | |
| 5 | Rear | 2J-3505 | Full Nut | 4 |
| 6 | Front and Rear | 2N-5006 | Bolt | 2 |
| -- | Front and Rear | 1U-7325 | Distorter Adapter | -- |
| -- | Front and Rear | 6V-3143 | Distorter Adapter | -- |
| -- | Rear | 5P-7409 | Sleeve Distorter | -- |
| C27/C32 Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Front and Rear | 5P-1733 | Locator | -- |
| 1 | Rear | 249-2937 | Locator | -- |
| 2 | Front | 6V-6142 | Installer | -- |
| 2 | Rear | 6V-6143 | Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Front and Rear | 5P-7314 | Distorter Ring | -- |
| C175 Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Front and Rear | 250-4586 | Locator | -- |
| 2 | Front and Rear | 250-4587 | Installer | -- |
| 3, 4 | Front and Rear | 323-4712 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front and Rear | 322-2078 | Bolt | -- |
| -- | Front and Rear | 1U-7325 | Distorter Adapter | -- |
| -- | Rear | 5P-7409 | Sleeve Distorter | -- |
| D343 (5.4 in) 6 Cylinder Engines - Silicon Seals - SMHS7100 | | | | |
| 1 | Front | 9S-8876 | Locator | -- |
| 1 | Rear | 9S-8870 | Locator | -- |
| 2 | Front | 5P-7295 | Installer | -- |
| 2 | Rear | 5P-7294 | Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front | 9S-8889 | Bolt | 2 |
| 6 | Rear | 2P-2346 | Bolt | 3 |
| -- | Front | 5P-7316 | Distorter Ring | -- |

| CURRENT ENGINES | | | | |
|--|----------------|-------------|--------------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| D343 (5.4 in) 6 Cylinder Engines - Silicon Seals - SMHS7100 (Continued) | | | | |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| D348 (5.4 in) 60 degree Vee Engines - Silicon Seals - SMHS7100 | | | | |
| 1 | Front | 5P-7302 | Locator | -- |
| 1 | Rear | 9S-8874 | Locator | -- |
| 2 | Front | 5P-7297 | Installer ⁴ | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front | 9S-8889 | Bolt | 2 |
| 6 | Front and Rear | 9S-8893 | Bolt | 3 |
| -- | Front | 5P-7316 | Distorter Ring | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| (5.4 in) 60 degree Vee Engines - Hydrodynamic Seals - SMHS8508 | | | | |
| 1 | Front | 5P-7302 | Locator | -- |
| 1 | Rear | 9S-8874 | Locator | -- |
| 2 | Front | 4C-5822 | Installer | -- |
| 2 | Rear | 9U-5114 | Seal and Wear Sleeve Installer | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front | 9S-8889 | Bolt | 2 |
| 6 | Front and Rear | 9S-8893 | Bolt | 3 |
| -- | Front | 5P-7316 | Distorter Ring | -- |
| -- | Front | 7C-7473 | Seal | -- |
| -- | Front and Rear | 5P-7312 | Distorter | -- |
| -- | Rear | 7C-7474 | Seal | -- |
| D379, D398, D399, G379, G398 and G399 Engines - Hydrodynamic Seals - SMHS8301 | | | | |
| 1 | -- | 6V-7829 | Locator | -- |
| 2 | -- | 6V-7831 | Installer | -- |
| 3, 4 | -- | 6V-7833 | Other Part | -- |
| 3, 4 | -- | 6V-7799 | Other Part | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | -- | 4B-5271 | Bolt | 6 |
| 6 | -- | 3B-1915 | Bolt | 6 |
| 6 | -- | 6V-9442 | Bolt | 2 |

(Continued)

Crankshaft, Main Bearings and Flywheel

Crankshaft Seal and Wear Sleeve Installation Tools (Silicone and Hydrodynamic) (Continued)

Model: 1100, 3100, 3200, 3300, 3400

Warranty: Six Months

Engine Tools

| CURRENT ENGINES | | | | |
|--|----------|-------------|-------------|------|
| Item | Location | Part Number | Description | Qty. |
| D379, D398, D399, G379, G398 and G399 Engines - Hydrodynamic Seals - SMHS8301 (Continued) | | | | |
| 6 | -- | 6V-7834 | Bolt | 2 |

¹ Includes 089-7989 Bolt

² Use stud instead of damper bolt

³ 3196 Rear Gear Train Parts: FT2712 (Qty 3) and FT2711 Bolts (Qty 2)

⁴ FT2323, made from 5P-7297

Crankshaft Seal and Wear Sleeve Installation Tools (Silicone and Hydrodynamic): Non-Current Engines

| NON-CURRENT ENGINES | | | | |
|--|----------------|-------------|-------------------|------|
| Item | Location | Part Number | Description | Qty. |
| D342 and 5.75 in Bore Engines - Silicon Seals - SMHS6959-01 | | | | |
| 2 | Front | 5P-6543 | Installer | -- |
| 4 | Front | 5P-3036 | Ring | -- |
| 4 | Front | 5P-6545 | Ring | -- |
| 6 | Front | 5S-8096 | Bolt | -- |
| -- | Front | 5P-3037 | Plate | -- |
| D334, 1674 and 4.75 in Bore Engines - Silicon Seals - SMHS6959-01¹ | | | | |
| 1 | Front | 9S-8876 | Locator | -- |
| 4 | Front | 9S-8537 | Ring ² | -- |
| 4 | Front | 9S-8545 | Ring ³ | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Front | 9S-8889 | Bolt | 2 |

| NON-CURRENT ENGINES | | | | |
|--|----------------|-------------|-------------------------|------|
| Item | Location | Part Number | Description | Qty. |
| D334, 1674 and 4.75 in Bore Engines - Silicon Seals - SMHS6959-01⁴ | | | | |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| -- | Rear | 9S-8864 | Plate | -- |
| 6 | Rear | 8S-4950 | Cap (9/16 in - 18 thd) | 2 |
| D336, 1676 and 4.5 in Bore Engines - Silicon Seals - SMHS6959-01 | | | | |
| 1 | Front | 9S-8876 | Locator | -- |
| 5 | Front and Rear | 9S-8858 | Nut Assembly | -- |
| 6 | Rear | 9S-8892 | Bolt | -- |
| 6 | Front | 9S-8889 | Bolt | 2 |
| -- | Rear | 9S-8864 | Plate | -- |

¹ 1674 Bore Engine: 92B322-Up, 93B292-Up, 94B675-Up or prior engines reworked with discontinued 9S-0124 or 1N-5466 Crankshaft Assemblies

² Not used on D334 Marine Engines

³ Not used on D334 Industrial or 1674 Engines

⁴ 1674 Bore Engine: 92B1-92B331, 93B1-93B291, 94B1-94B674 with discontinued 4S-5349 and discontinued 7L-5188 Crankshaft Assemblies

417-3193 Crankshaft Turning Tool

Model Usage: C175-16 & 20

Warranty: Six Months



- Used at either crankshaft end to rotate crankshaft when checking crankshaft end clearance during initial fit up
- Reduces time by eliminating need to install bolts in crankshaft flange to rotate crankshaft
- Allows manual rotation of crankshaft as needed for D&A processes
- Material: Steel

| Specifications | |
|----------------|----------------------------------|
| Length | 787.4 x 40.6 mm (31.0 x 1.6 in.) |
| Weight | 1.1 Kg (2.5 lb.) |

| Part Number | Description |
|-------------|-------------------------|
| 417-3193 | Crankshaft Turning Tool |

193-0233 PTO Oil Seal Installer

Model: 3408 and 3412 Engines

Warranty: Six Months

- Tool must be used to install the 160-8181 PTO Shaft Seal (Seal is included in the 178-2973 Seal Kit)
- Used with nut and washer of PTO yoke to push seal into position
- Decreases installation time (uses positive stop to accurately set depth of seal)
- Made from hardened steel for added durability



| Part Number | Description |
|-------------|------------------------|
| 193-0233 | PTO Oil Seal Installer |

422-7508 PTO Seal Installer Tool Assembly

Model Usage: 3500 Machine Engines

Warranty: Six Months

- Used to quickly and easily install rear PTO oil seal
- Necessary to correctly install seal without damage
- Decreases installation time
- Made from steel with black oxide coating

| Specifications | | |
|----------------|---------------------------------|-------------------|
| Part Number | Dimensions | Weight |
| 422-7508 | 152.5 x 101.6 mm (6.0 x 4.0 in) | 4.25 kg (9.37 lb) |



FT3142 Seal Installer

Model: 793D and 797B Off-Highway Trucks

Warranty: None

- Used to install 119-6354 PTO Shaft Seal, which is part of 119-6355 Seal Kit
- Used with nut and washer of PTO yoke to push seal into position
- Necessary to correctly install seal without damage
- Decreases installation time (uses positive stop to accurately set depth of seal)
- Made from high-density plastic (ATSM D4000)

References

REN9717, 3500B High Displacement Engines for Caterpillar Built Machines

SEN1126, 3500B Engines for Caterpillar Built Machines

KENR8117, 3512C Engines for Caterpillar Built Machines

SEN1486, 3512B and 3516B Engine Supplement for 784C, 785C and 785C HAA Off-Highway Truck/Tractors



Wear Sleeve Installers

Model: 3176, 3176B, C-10, and C-12 Engines

Warranty: Six Months

- Used to quickly and easily install crankshaft wear sleeves

| Part Number | Description | Use |
|-------------|-----------------------|--------------------------|
| 145-5247 | Wear Sleeve Installer | Front Crankshaft Sleeves |
| 147-2675 | Wear Sleeve Installer | Rear Sleeves |

393-2571 Crankshaft Sleeve Installation Tool

Model Usage: C3.8

Warranty: Manufacturer's



- Used to easily install rear crank seal and wear sleeve

| Specifications | |
|----------------|---------------------------------|
| Dimensions | 130 x 115.1 mm (5.12 x 4.53 in) |
| Weight | 2.02 kg (4.45 lbs) |

| Part Number | Description |
|-------------|-------------------------------------|
| 393-2571 | Crankshaft Sleeve Installation Tool |

9U-6170 Installer Group

Model: 3064 and 3066 Engines

Warranty: Six Months



- Used to install rear seal and wear sleeve onto crankshaft (assures seal lip will bear uniformly around the crankshaft)
- Prevents seal damage during installation — longer seal life
- Group includes all items in figure

Reference

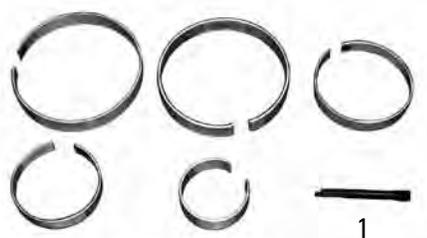
SEN5553, Service Manual

| Item | Part Number | Description | Size |
|------|-------------|---------------------------|-------------------------|
| 1 | 9U-6169 | Installer | -- |
| 2 | 9U-6171 | Locator | -- |
| 3 | 9U-6172 | Bolt | M12 x 1.25 x 20 mm long |
| 4 | 5P-8247 | Hard Washer | 15.875 mm (0.625 in) |
| 5 | 6V-3303 | Bolt | M16 x 2 x 60 mm long |
| -- | 9U-6170 | Rear Seal Installer Group | -- |

5P-7318 Wear Sleeve Distorter Group

Model: D10, D9N, D8K, 631E, 637E

Warranty: Six Months



- Used to remove all 1.58 mm (0.062 in) thick crankshaft front and rear wear sleeves
- Prevents damage to crankshaft
- Removal in-chassis takes just a few minutes
- Group includes all items in figure

| Item | Part Number | Description | Size | Where Used |
|-----------------|-------------|-----------------------------|------|-----------------------------|
| -- | 5P-7318 | Wear Sleeve Distorter Group | -- | -- |
| 1 | 5P-7312 | Distorter | -- | -- |
| Distorter Rings | | | | |
| -- | 5P-7313 | Distorter Ring | -- | 3300 Series, Rear |
| -- | 5P-7314 | Distorter Ring | -- | 3400 Series, Front and Rear |
| -- | 5P-7315 | Distorter Ring | -- | 3300 Series, Front |

(Continued)

5P-7318 Wear Sleeve Distorter Group (Continued)

Model: D10, D9N, D8K, 631E, 637E

Warranty: Six Months

| Item | Part Number | Description | Size | Where Used |
|------------------------------------|-------------|--------------------------|--------------------|-------------------------------|
| Distorter Rings (Continued) | | | | |
| -- | 5P-7316 | Distorter Ring | 14.61 cm (5.75 in) | D-Series Engines |
| -- | 5P-7317 | Distorer Ring | 13.72 cm (5.4 in) | D-Series Engines |
| -- | 5P-7338 | Distorter Ring / Adapter | -- | 1100, 3100, 3200 Series, Rear |

4C-4869 Distorter Ring

Model: 3114, 3116, 910E

Warranty: Six Months

- Used with 5P-7312 Distorter to remove rear crankshaft wear sleeve from 1.1 liter engine
- Wear sleeve removal can be difficult without use of distorter and distorter ring to expand sleeve away from crankshaft; after wear sleeve is expanded on journal, it can easily be removed without damaging sealing surfaces

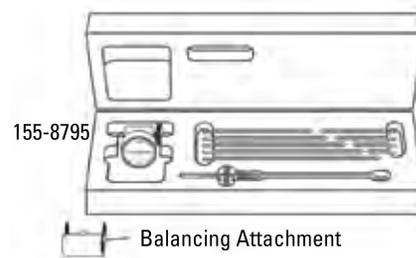
| Part Number | Description |
|-------------|----------------|
| 4C-4869 | Distorter Ring |

155-8795 Crankshaft Distortion Gauge

Model: All Engines, 3500 and Up

Warranty: Six Months

- Used to check crankshaft bearing alignment or shaft deflection without engine disassembly
- Also used as a strain gauge on frame of running engine
- Will stay in any position for hands free operation
- Comes with ten rods (varying sizes)
- Sharp rod points hold gauge on surfaces with an angle up to 45 degrees
- Balancing attachment maintains face of indicator in any desired position
- Attractive protective case
- Group includes all items in figure



| | |
|-------------------------------|---------------------------|
| Dial indicator graduations | 0.02 mm |
| Dial reading | 0-50-0 |
| Range per revolution | 1 mm (0.03 in) |
| Travel length | 4.0 mm (0.16 in) |
| Range | 61 - 458 mm (2.4 - 18 in) |
| Balancing attachment quantity | 2 |

| Part Number | Description |
|-------------|-----------------------------|
| 155-8795 | Crankshaft Distortion Gauge |

5P-7409 Distorter

Model: Cat® Engines

Warranty: Six Months

| Part Number | Description |
|-------------|------------------|
| 5P-7409 | Sleeve Distorter |

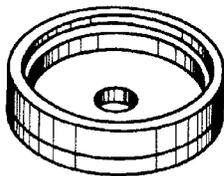
- Used to remove 1.58 mm (0.062 in) thick crankshaft wear sleeves on engines equipped with BrakeSavers
- Appropriate distorter ring must be selected from 5P-7318 Distorter Group



1U-8585 Installer

Model: 3300 Family Engines

Warranty: Six Months



- Required to install new double lip 7C-4297 Seal Group in rear of block for crankshaft

| Part Number | Description |
|-------------|-------------|
| 1U-8585 | Installer |

1U-7325 Distorter Adapter

Model: 3508, 3512, 3516, 789, 793, 994

Warranty: Six Months

- Used with 5P-7409 Distorter to remove front and rear crankshaft wear sleeves from 3500 Series Engines with 1W-6974 Seal Group and 1W-6977 Seal Group
- Positions 5P-7409 Distorter properly against flywheel and timing gear housing for wear sleeve removal, a difficult task without the use of a distorter and adapter to expand sleeve away from crankshaft; once expanded on journal, wear sleeve can be easily removed

| Part Number | Description |
|-------------|-------------------|
| 1U-7325 | Distorter Adapter |

6V-3143 Distorter Adapter

Model: 3500 Engines

Warranty: Six Months



- Used with 5P-7409 Wear Sleeve Distorter to remove crankshaft wear sleeves

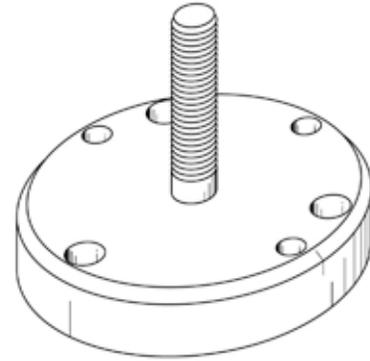
| Part Number | Description |
|-------------|-------------------|
| 6V-3143 | Distorter Adapter |

FT0125 Pilot

Model: D311H, D320, D330, D333, G333 and 1673 Engines

Warranty: None

- Used with FT0126 Sleeve to install crankshaft oil seal
- Material: SAE 4140 steel



FT2794 Crankshaft Seal Installer

Model: 3508 Engines in D10R Track-Type Tractors

Warranty: None

- Used to install front crankshaft seal
- Used with two 3E-3883 Eyebolts
- Allows in-chassis installation
- Greatly reduces labor time

Reference

Service Manual, D10R Disassembly and Assembly



FT0126 Sleeve

Model: Cat® Engines

Warranty: None

- Used with FT0125 Pilot for oil seal installation



4C-5501 Alignment Tool

Model: 416, 426, 428, 3054

Warranty: Six Months



- Used when installing front cover on 3054 engine in 416 Backhoe Loader
- Fits around crankshaft into seal recess in cover and centers cover and seal on crankshaft
- Helps prevent seal damage during cover installation and ensures seal lip will bear uniformly around crankshaft to provide long seal life

| Part Number | Description |
|-------------|----------------|
| 4C-5501 | Alignment Tool |

9U-6200 Alignment Group

Model: 3056 Engines

Warranty: Six Months



- Used to install front cover (correctly aligns it for easier installation)
- Designed to fit around crankshaft and into seal recess — centers cover on crankshaft
- Prevents seal damage during installation and helps assure uniform contact of seal lip — two advantages that extend seal life

| Part Number | Description |
|-------------|-----------------|
| 9U-6201 | Alignment Group |

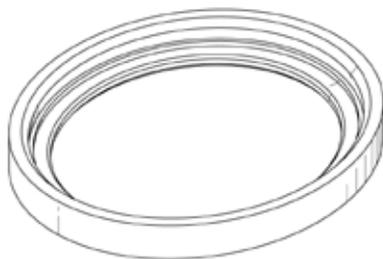
Reference

SEN5555, Service Manual

FT2806 Seal Installer Ring

Model: 3054, 3056 Engines

Warranty: None



- Used to install rear crankshaft oil seal
- Material: SAE1018 steel

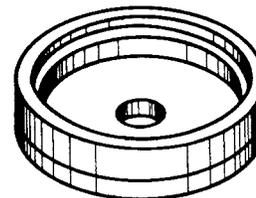
9U-5114 Seal and Wear Sleeve Installer

Model: D346, D348, D349

Warranty: Six Months

- Required to locate 7C-7474 Seal and Wear Sleeve, Rear, on D346, D348 and D349 Engines, 5.4 bore, 60° Vee

| Part Number | Description |
|-------------|--------------------------------|
| 9U-5114 | Seal and Wear Sleeve Installer |



Crankshaft Oil Seal Installers

Essential Tool

Model: 3034 Engines

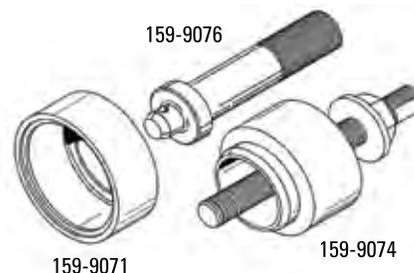
Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 159-9074 | Front Seal Installer |
| 159-9071 | Rear Seal Installer |
| 159-9076 | Rear Drive Handle |

- Used to install front and rear crankshaft oil seals
- 159-9074 for front and 159-9071 for rear crank seal
- 159-9076 Handle used with 159-9071

Reference

SEN5013, Engine Disassembly and Assembly Module



393-2570 Gear Case Oil Seal Installation Tool

Model Usage: C3.8

Warranty: Manufacturer's

- Used to easily install gear case oil seal

| Specifications | |
|----------------|----------------------------------|
| Dimensions | 86.4 x 148.8 mm (3.40 x 5.86 in) |
| Weight | 1.06 kg (2.33 lbs) |

| Part Number | Description |
|-------------|--------------------------------------|
| 393-2570 | Gear Case Oil Seal Installation Tool |



1U-7430 Front Seal Installer

1U-7598 Rear Seal Installer Group

Model: 3114, 3116

Warranty: Six Months



- Required for disassembly, assembly and adjusting of 1.1 liter engine, fuel system, and governor
- 1U-7430 Front Seal Installer used to install crankshaft front seal
- 1U-7598 Rear Seal Installer Group used to install crankshaft rear seal and its mating wear sleeve

References

SENR3582, Specification Module
 SENR3583, System Operation Testing and Adjusting
 SENR3611, Disassembly and Assembly Manual
 SEHS8868, Special Instruction, operation

| Part Number | Description |
|---------------------------|----------------------------|
| 1U-7430 | Front Crank Seal Installer |
| 1U-7598 | Rear Seal Installer Group |
| Group Consists of: | |
| 1U-7594 | Rear Installer |
| 1U-7596 | Modified by Cat® Bolt |
| 1U-7597 | Sleeve Ring |
| 9S-8858 | Nut Assembly |

9U-6180 Front Seal Installer Group

Model: 3064 and 3066 Engines

Warranty: Six Months



- Used to install crankshaft front seal without removing front cover
- Makes installation easier and prevents damage to seals
- Assures uniform contact around crankshaft (ultimately provides longer seal life)

Reference

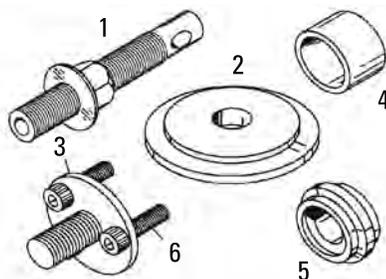
SENR5553, Service Manual, 3066 Diesel Engines

| Item | Part No. | Description |
|---------------------------|----------|----------------------------|
| -- | 9U-6180 | Front Seal Installer Group |
| Group Consists of: | | |
| 1 | 9U-6179 | Washer |
| 2 | 9U-6178 | Installer Stud |
| 3 | 9U-6181 | Sleeve |

9U-6210 Installer Group

Model: 3054 and 3056 Engines

Warranty: Six Months



- Used to install crankshaft front oil seal to proper depth of 9.3 mm (0.37 in)
- Prevents seal damage

Reference

SENR5547, Service Manual, Service Module in SENR5555

| Item | Part Number | Description | Quantity |
|---------------------------|-------------|----------------------|----------|
| -- | 9U-6210 | Installer Group | -- |
| Group Consists of: | | | |
| 1 | 9U-6206 | Stud | -- |
| 2 | 9U-6207 | Plate | -- |
| 3 | 9U-6208 | Locator ¹ | -- |
| 4 | 9U-6209 | Sleeve | -- |
| 5 | 9U-6211 | Installer | -- |
| 6 | 089-7989 | Bolt | 3 |

¹ Includes 089-7989 Bolt

9U-6205 Rear Seal Installer Group

Model: 3054 and 3056 Engines

Warranty: Six Months

| Item | Part No. | Description |
|---------------------------|----------|---------------------------|
| -- | 9U-6205 | Rear Seal Installer Group |
| Group Consists of: | | |
| 1 | 9U-6202 | Plate |
| 2 | 9U-6203 | Installer |
| 3 | 9U-6204 | Seal Guide |

- Used to install rear seal onto crankshafts (assures seal lip will conform uniformly around crankshaft)
- Prevents seal damage during installation — longer seal life

Reference

SEN5555, Service Manual



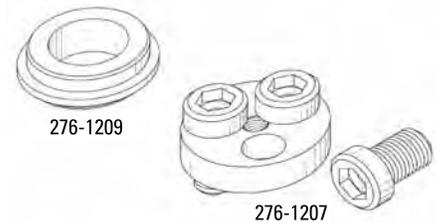
Cat® C6.6 Engine / Perkins Vista D Engine Tools

Essential Tool

Model: C6.6 Engines

Warranty: None

| Part Number | Description | Use |
|-------------|--------------------------|------------------------------------|
| 276-1207 | Front Crankshaft Locator | Install front shaft seal in engine |
| 276-1209 | Installer | Install front shaft seal in engine |



383-1654 Main Bearing Installation Tool

Model Usage: Cat® 3054, C4.4, C6.6

Warranty: Six Months

- Used to install main bearings during rework process

| Specifications | |
|----------------|---|
| Dimensions | 104.3 x 44.7 x 12.0 mm (4.11 x 1.76 x .47 in) |
| Weight | .01 kg (.02 lb) |
| Material | Plastic |

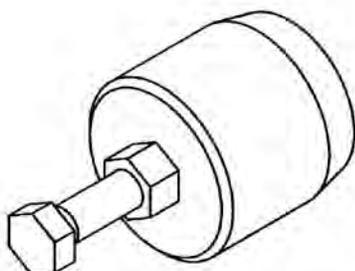
| Part Number | Description |
|-------------|--------------------------------|
| 383-1654 | Main Bearing Installation Tool |



278-2636 Seal Removal Tool

Essential Tool

Model: C6.6 Engines
Warranty: Six Months



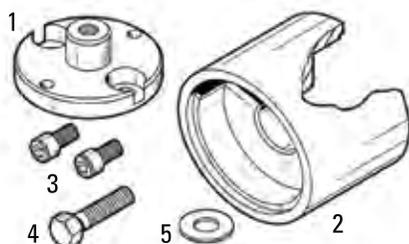
- Used to remove front main oil seal
- Used with 1U-7600 Puller Group

| Part Number | Description |
|-------------|-------------------|
| 278-2636 | Seal Removal Tool |

4C-6375 Locator

127-1591 Rear Oil Seal Installer

Model: 3046 Diesel Engine
Warranty: Six Months



4C-6375

- Used to install crankshaft rear seal (assures seal lip will bear uniformly around crankshaft)
- Prevents seal damage during installation

127-1591

- Reversible
- Used to install 103-2835 Rear Crankshaft Oil Seal Assembly and 117-5015 Oil Seal Assembly (when installer bottoms against crankshaft, seal assembly, including wearsleeve, is installed in correct location)
- Used with 4C-6375 Locator, 9U-6172 Socket Head Screw (2), 8T-0375 Bolt, and 5P-8247 Washer
- Installer equally distributes installation pressure on edge of seal (prevents damage to edge of seal assembly during assembly, resulting in longer seal life)
- Knurled outside diameter provides better grip for mechanic during oil seal installation
- To use: bolt locator onto crankshaft, put seal assembly in installer, push seal onto crankshaft until installer bottoms out

Reference

SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engine

| Item | Part Number | Description | Size | Small Seal Diameter | Large Seal Diameter |
|---------------------------------------|-------------|-------------------------|-----------------------------|---------------------|---------------------|
| 1 | 4C-6375 | Locator | -- | -- | -- |
| 2 | 127-1591 | Rear Oil Seal Installer | -- | 96 mm (3.78 in) | 98.06 mm (3.861 in) |
| 3 | 9U-6172 | Bolt | M12 x 1.25 x 20 mm long (2) | -- | -- |
| 4 | 6V-3303 | Bolt | M16 x 2 x 60 mm long | -- | -- |
| 5 | 4B-5275 | Washer | 15.875 mm (0.625 in) | -- | -- |
| Used With 127-1591: | | | | | |
| 1 | 4C-6375 | Locator | -- | -- | -- |
| 3 | 9U-6172 | Bolt | M12 x 1.25 x 20 mm long (2) | -- | -- |
| Used With 127-1591 (not shown) | | | | | |
| -- | 8T-0375 | Bolt | -- | -- | -- |
| -- | 5P-8247 | Hard Washer | -- | -- | -- |

Seal Installer Tools

Model: 3046 Engine

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|-----------------------|
| 1 | 4C-6378 | Seal Installer Sleeve |
| 2 | 4C-6376 | Installer Stud |
| 3 | 4C-6377 | Installer Washer |

- Used to install crankshafts front seal without removing front cover
- Makes installation easier, faster, and prevents damage to seal
- Ensures uniform seal contact around crankshaft — ultimately provides longer seal life



Reference

SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engine

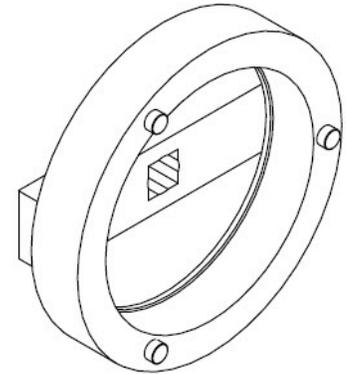
367-3534 Seal Installer

Model Usage: C7.1, C6.6, C4.4

Warranty: Six Months

- Used to correctly remove and assemble front crankshaft oil seal

| Part Number | Description |
|-------------|----------------|
| 367-3534 | Seal Installer |

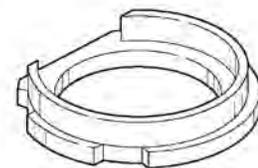


363-3031 Seal Installer Assembly

Model Usage: C6.4 and 3066 Engines

Warranty: Six Months

- Used to install 324-4223 Seal on front of crankshaft without removing front cover
- Used in place of current 9U-6180 Front Seal Installer Group when installing newly designed seals (using the 9U-6180 will cause seal damage)
- Makes installation easier and prevents damage to seals
- Ensures uniform contact around crankshaft (ultimately provides longer seal life)
- Designed with clearance to fit around protruding parts
- Material: steel



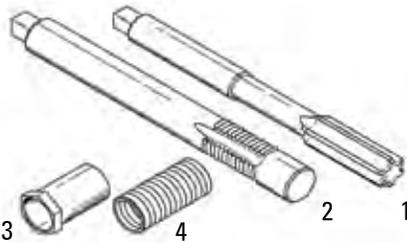
| Part Number | Description | Size | Weight |
|-------------|-------------------------|---|-----------------|
| 363-3031 | Seal Installer Assembly | 125 mm (4.9 in) overall diameter x 24.5 mm (.95 in) thick | 0.6 kg (1.3 lb) |

Thread Repair Kits

Essential Tool

Model: 3406, G3406, 3408, G3408, 3508, G3508, 3512, G3512, 3516, and G3516 Engines

Warranty: Six Months



- Used to repair main bearing cap bolt holes
- Repairs bolt hole threads to like-new condition
- Groups are serviced at individual tool level only

References

SEBF8387, Main Bearing Bolt Hole Repair in 3400 Engines

SEBF8437, Main Bearing Bolt Hole Repair in 3500 Engines

| Item | Part Number | Description | Engine Model | 1st Ream | 2nd Ream | 3rd Ream | 1st Tap | 2nd Tap | Insert Sleeve | Insert |
|--|-------------|---|--------------------------------|----------|----------|----------|----------|----------|---------------|----------|
| 1 | 178-2349 | Reamer | -- | -- | -- | -- | -- | -- | -- | -- |
| 1 | 178-2350 | Reamer | -- | -- | -- | -- | -- | -- | -- | -- |
| 1 | 178-2351 | Reamer | -- | -- | -- | -- | -- | -- | -- | -- |
| 1 | 178-2462 | Reamer | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | 178-2353 | Tap (1-14 UNS) | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | 178-2356 | Tap (1-14 UNS) | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | 178-2463 | Tap (7/8-16) | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | 178-2465 | Tap (7/8-16) | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | 178-2467 | Insert, Sleeve | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | 178-2468 | Insert, Sleeve | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | 178-2501 | Threaded Insert (All 3400 Models) | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | 178-2502 | Threaded Insert (All Early 3500 Models) | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | 178-2503 | Threaded Insert (All Late 3500 Models) | -- | -- | -- | -- | -- | -- | -- | -- |
| Main Bearing Bolt Hole Repair Tools for 3400 and 3500 Engines | | | | | | | | | | |
| -- | 203-6594 | Thread Repair Kit ¹ | All 3400 | 178-2349 | 178-2350 | 178-2351 | 178-2353 | 178-2356 | 178-2467 | 178-2501 |
| -- | 203-6597 | Thread Repair Kit ¹ | Early 3500 3/4 in bolt hole | 178-2462 | N/A | N/A | 178-2463 | 178-2465 | 178-2468 | 178-2502 |
| -- | 203-6598 | Thread Repair Kit ¹ | Late 3500 7/8 in bolt hole | 178-2351 | N/A | N/A | 178-2353 | 178-2356 | 178-2467 | 178-2503 |

¹ Not serviced

Bearing Cap Tools

Model: 1100, 3100, 3208, D342, D379, D398, D399, 3512, D397, G397, D375, G375, D364, 3500

Warranty: Six Months

- 8S-5131 Adapter used to torque front main bearing cap when oil pump is in place on 1100 and 3100 Series and 3208 Engines
- 1D-5343 Wrench used to remove hollow head screws from main bearing caps on D342 Engines
- 8M-9379 Wrench used to remove main bearing caps without removing pan on D379, D398 and D399 Engines; to apply actual torque indicated by the torque wrench dial reading, insert torque wrench at right angle to 8M-9379 Wrench Assembly
- Discontinued 7F-1709 Wrench used to remove main bearing caps without removing pan on D397, G397, D3867, D375, G375 and D364 Engines
- 9U-5023 Main Bearing Wrench used to remove and install crankshaft main bearings on 3500 Family Engines; fits both 12.7 mm (1/2 in) diameter bolt and 19.05 mm (3/4 in) diameter main bearing bolts; can be used through crankshaft access opening in sides of block without removing oil pan when connected to short extension and 3/4 inch drive torque wrench; no longer fits bolts on 17.15 cm (6 3/4 in) bore engines (use 8M-9379 Wrench instead)



| Item | Part Number | Description | Socket Size (left end) | Socket Size (right end) | Drive Size |
|------|-------------|---------------------|------------------------|-------------------------|------------|
| 1 | 8S-5131 | Adapter | -- | -- | -- |
| 2 | 1D-5343 | Wrench | -- | -- | -- |
| 3 | 9U-5023 | Main Bearing Wrench | 1 5/16 in | 1 1/8 in | 3/4 in |
| 4 | 7F-1709 | Wrench ¹ | -- | -- | -- |
| 5 | 8M-9379 | Wrench | -- | -- | -- |

¹ Discontinued

284-5266 Spanner Wrench Assembly

Essential Tool

Model: C175 Engine

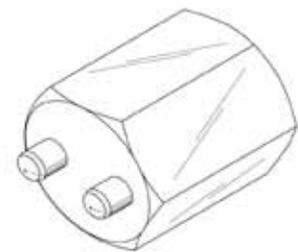
Warranty: Six Months

- Used to remove and install main bearing cap studs
- Used with 1 1/4 inch socket or 1/2 inch square drive wrench

Reference

REN7466, C175 Engine Disassembly and Assembly Manual

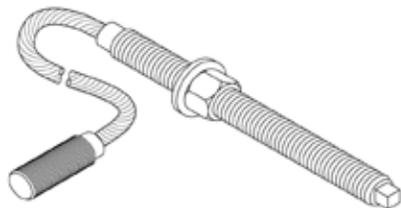
| Part Number | Description | Pin-to-Pin Center Distance |
|------------------|-------------------------|----------------------------|
| 284-5266 | Spanner Wrench Assembly | 16 mm (0.63 in) |
| Includes: | | |
| 9X-8979 | Dowel Pin | -- |



3500 Engine Main Bearing Cap Removal/Installation Tool

Model: All 3500 Engines

Warranty: Six Months



- Used in pairs to remove and install main bearing cap (makes operation much easier)
- Allows one mechanic to remove or install a bearing cap weighing approximately 16 kg (35 lb)
- Flexible wire rope makes it easier to insert tool through engine side covers

Application Procedure

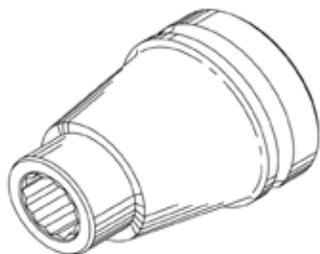
1. Loosen all 4 bolts for the main bearing cap.
2. Remove the 2 outer bolts for main bearing cap and replace with tooling.
3. Hand tighten smaller threaded end until tooling bottoms out in cylinder block.
4. Adjust nuts and washers on tooling until washers contact main bearing cap.
5. Remove the 2 remaining inner bolts for main bearing cap.
6. Loosen nuts evenly in order to lower cap. Lower cap to the end of the bolt to gain access to main bearing.
7. Reverse to process for installation.

| Part Number | Use |
|-------------|--|
| 230-5843 | Early 3500 Engines with 3/4 in thd. bearing caps |
| 236-6688 | Later 3500 Engines with 7/8 in thd. bearing caps |

9U-6942 Socket

Model: 3500 Engines

Warranty: Six Months



- Used to remove and install crankshaft counterweight bolts and piston connecting rod bolts
- Used with an impact wrench
- 3/4 inch drive is necessary to obtain the correct bolt torque (1/2 inch drive sockets will not work in this application)
- Socket is specifically designed to provide adequate clearance

| Part Number | Description | Drive Size | Size | Small Diameter |
|-------------|-------------|------------|------------------------------|----------------|
| 9U-6942 | Socket | 3/4 in | 15.875 mm (5/8 in), 12 point | 25 mm (1.0 in) |

FT1794 Crankshaft Main Bearing Removal Tool Group

Model: 3500

Warranty: None



- Used to inspect main bearings of crankshaft on 3500 Series Engines on seagoing vessels for passenger transport; inspection must be done at specific intervals
- Difficult task — because of weight of bearing caps, their tight fit and limited access — is made easier

Reference

SMHS8331, Special Instruction

Bearing Removal and Installation Tools

Model: Cat® Engines
 Warranty: Six Months

- Used to remove main bearing upper halves quickly and easily in Cat® Engines
- Shank of tool is adjustable to fit angle of crankshaft oil passage



| Bearing Thickness | Part Number |
|---|-------------|
| Models: D353, D379, D398, D399 / Bore Size: 159 mm (6.25 in) | |
| 4.55 - 14.76 mm (0.179 - 0.581 in) | 2P-5517 |
| Models: D339, D342, D364, D375, D386, D379 / Bore Size: 146 mm (5.75 in) | |
| 4.55 - 14.76 mm (0.179 - 0.581 in) | 2P-5517 |
| Models: 4 Cylinder, 90 degree V-8, D343, D346, D348, D349, 1693 / Bore Size: 137 mm (5.40 in) | |
| 4.55 - 14.76 mm (0.179 - 0.581 in) | 2P-5517 |
| Models: D326, D337 / Bore Size: 130 mm (5.125 in) | |
| 4.55 - 14.76 mm (0.179 - 0.581 in) | 2P-5517 |
| Models: D315, D318, D336, 1673 (early), 1676 / Bore Size: 114 mm (4.50 in) | |
| 4.55 - 14.76 mm (0.179 - 0.581 in) | 2P-5517 |
| Model: D311 (early) / Bore Size: 102 mm (4.00) | |
| 4.55 - 14.76 mm (0.179 - 0.581 in) | 2P-5517 |
| Model: 3406 / Bore Size: 137 mm (5.40 in) | |
| 2.60 - 3.96 mm (0.1025 - 0.156 in) | 2P-5518 |
| Models: D330C, 3304, D333C, 3306, D334, 1674 / Bore Size: 121 mm (4.75 in) | |
| 2.60 - 3.96 mm (0.1025 - 0.156 in) | 2P-5518 |
| Models: D330, D333, D320, 1100 and 3100 Series, 3208, 1670, 1673 (Later) / Bore Size: 114 mm (4.00 in) | |
| 2.60 - 3.96 mm (0.1025 - 0.156 in) | 2P-5518 |
| Models: D311 (Later), D320 / Bore Size: 102 mm (4.00 in) | |
| 2.60 - 3.96 mm (0.1025 - 0.156 in) | 2P-5518 |

FT1857 Handle

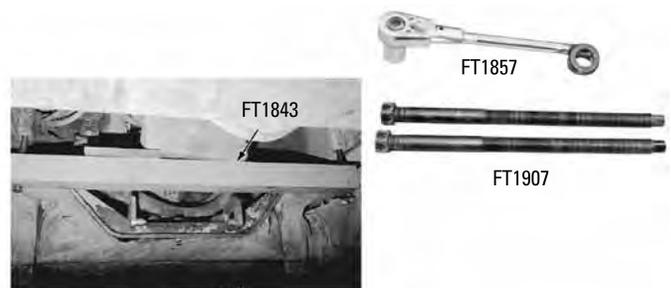
FT1907 Bolt, FT1843 Support

Model: D10
 Warranty: None

- Fabricated tools for replacing engine bearing without removing engine from chassis
- Save time when replacing main and connecting rod bearings on D10 Tractor by permitting oil pan to be removed without removing engine from chassis (formerly necessary to remove engine to provide clearance for removal of oil pan)

Reference

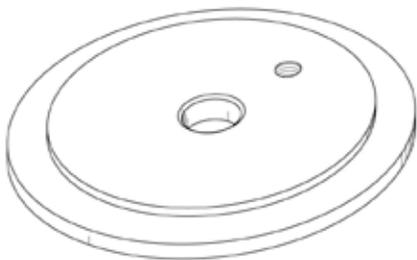
SEHS8432, Special Instruction



FT1206 Pusher Plate

Model: 16G Motor Graders and 623B Elevating Scrapers

Warranty: None

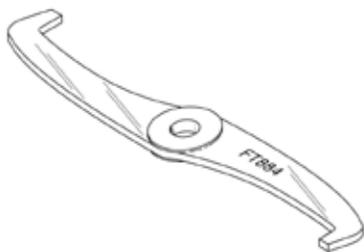


- Used for engine in-chassis seal and wear sleeve installation

FT0884 Dimensions to Modify 1P-2321 Puller Assembly

Model: Cat® Engines

Warranty: None



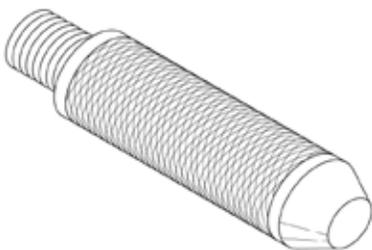
- Used to remove oil thrower on engines with ring-type crankshaft rear seal

| Part Number | Description |
|-------------|---------------------|
| 1P-2321 | Jaw Puller Assembly |

FT0108 Driver Handle

Model: D10, D10N, D8K, D9H, D9L, 651E, 657E

Warranty: None



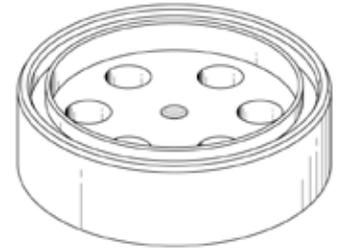
- Used with FT0101, FT0102, FT0106, FT0807, and FT0885 Driver Bodies

FT0101 Driver Body

Model: D8K, D9H, D353

Warranty: None

- Used to install rear oil thrower on crankshaft of D353 Engine
- Used with FT0108 Driver Handle
- Material: SAE 4140 steel

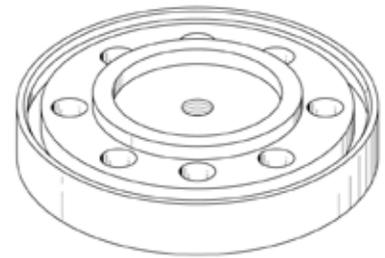


FT0102 Driver Body

Model: D353

Warranty: None

- Used to install front oil thrower on crankshaft of D353 Engine
- Used with FT0108 Driver Handle
- Material: SAE 4140 steel

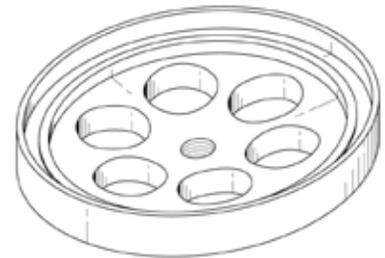


FT0106 Driver Body

Model: D343, 1693, 5.4 inch Bore, 619C, 630B, 631B, 632, 657, 666

Warranty: None

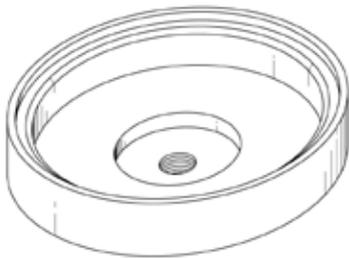
- Used to install oil thrower on crankshaft of D343, 1693 and 4- and 6-cylinder 13.72 cm (5.4 in) bore engines used in 619C, 630B, 631B, 632 Tractors and 657 and 666 Scrapers
- Used with FT0108 Driver Handle
- Material: SAE 4140 steel



FT0807 Driver Body

Model: D9H

Warranty: None

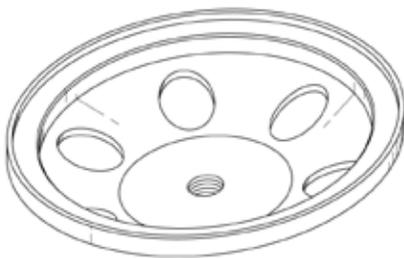


- Used to install front oil thrower on crankshaft of D353 Engine
- Used with FT0108 Driver Handle
- Material: SAE 1020 steel

FT0107 Driver Body

Model: 641, 650, 651, 657, 660, and 666 Tractors, 5.4 inch Bore

Warranty: None

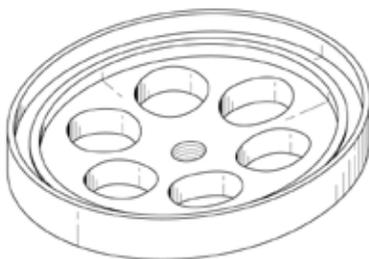


- Used to install oil thrower on crankshaft of 13.72 cm (5.4 in) bore V8 engines

FT0885 Driver Body

Model: D10, 824C, 834B, 980C, 980F

Warranty: None



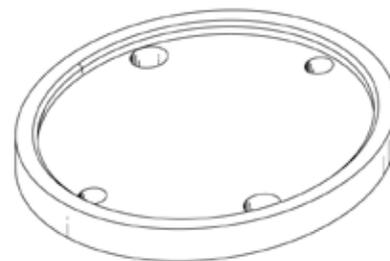
- Used to install oil thrower for crankshaft rear seal on 13.72 cm (5.4 in) bore 60° V8 and V12 Engines
- Used with FT0108 Driver Handle
- Material: SAE 4140 steel

FT0105 Push Plate

Model: D379B, D398B, D399

Warranty: None

- Used to install oil thrower on crankshaft of D397, D375 and G375 Engines



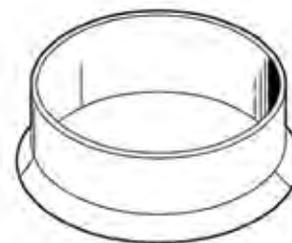
171-7212 Repair Sleeve

Model: 3114, 3116, 3126, 3126B Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 171-7212 | Wear Sleeve |

- Used to quickly and easily repair front crankshaft hub damaged by crankshaft seal
- Used with current 5P-6208 Installation Tool
- Used in place of 5P-6188 Repair Sleeve
- Provides wider surface to ensure seal is running completely on sleeve
- Sleeve width: 29.0 mm (1.14 in)



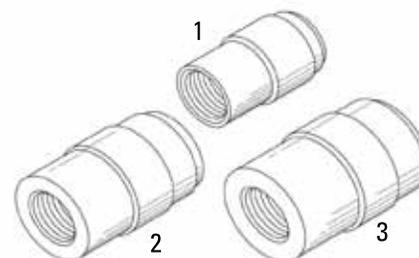
Drivers

Model: Cat® Engines

Warranty: None

- Used with FT0129, FT0131, and FT0133 Sleeves and FT0144 Handle to install crankshaft plugs and retaining rings for engines listed in chart

| Item | Part Number | Model |
|------|-------------|---|
| 1 | FT0128 | 619C and 824 Tractor Engines & D326, D337, D343, D336 Engines in all Applications |
| 2 | FT0130 | 641, 650, 651, 657, 660, 666 Tractor Engines |
| 3 | FT0132 | D353, D379 & D398 Engines in all Applications |



FT0143 Driver

Model: D375 and D397 Engines

Warranty: None

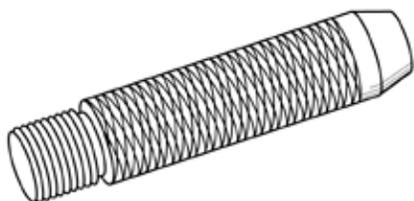


- Used to install crankshaft plugs
- Used with FT0144 Handle
- Material: SAE 4140 steel

FT0144 Handle

Model: D7G Engine

Warranty: None

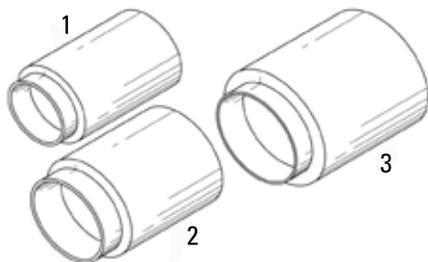


- Used with FT0128, FT0130, FT0132, and FT0143 Drivers for D7G

Sleeves

Model: Cat® Engines

Warranty: None



- Used with FT0128, FT0130, FT0132 Drivers and FT0144 Handle to compress and install crankshaft plugs and retaining rings for engines listed in chart
- Material: SAE 4140 steel

| Item | Part Number | Model |
|------|-------------|---|
| 1 | FT0129 | 619C and 824 Tractor Engines & D326, D337, D343, D336 Engines in all Applications |
| 2 | FT0131 | 641, 650, 651, 657, 660, 666 Tractor Engines |
| 3 | Ft0133 | D353, D379 & D398 Engines in all Applications |

332-9511 Bearing Puller Assembly

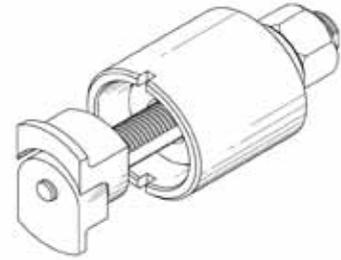
Essential Tool

Model: 793F Off-Highway Truck

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 332-9511 | Bearing Puller Assembly |

- Used to remove 146-7411 Bearing Sleeve from 146-7404 Cage Assembly in flywheel housing
- Used with 1 5/8 inch socket (dealer supplied)
- Spring-loaded puller tips retract to fit through bearing sleeve then expand to engage bearing sleeve
- Puller tips are hardened to increase strength and durability
- Acme threads on puller rod make removal faster
- Thrust bearing under nut allows easier removal of bearing sleeve
- Not for use with impact tools



373-5840 3500 Liner Insert Air Leak Check Tool

Model: 3500 Engines

Warranty: Six Months

- Used to pressurize the joint and check for air leaks to insure liner insert is fully seated.
- Insert air leak check tool into newly inserted cylinder blocks
- Apply soapy water liberally around the joint on the top of deck
- Attach shop air supply line and set regulator to 137 kPa (20 psi).
- Tool kit includes safety regulator

Note: Do not use without regulator set to 137 kPa (20 psi)

| Specifications | |
|----------------|---|
| Description | Dimensions |
| Kit | 267 x 343 x 83 mm (10.5 x 13.5 x 3.26 in) |
| Tool | 205 x 86.68 mm (8.07 x 3.41 in) |

| Part Number | Description |
|-------------|---------------------------------------|
| 373-5840 | 3500 Liner Insert Air Leak Check Tool |

Cylinder Block and Liners

Engine Tools

FT1855 Block Pressure Test Group

Model: 1100, 3100, 3208

Warranty: None



- Used to check porosity of cylinder block in rebuilt engines (Engine blocks often become pitted on outer wall of cylinder due to improper cooling system maintenance. If pitting becomes severe and cylinders are bored oversize when the engine is rebuilt, there is a possibility that the cylinder wall can have porosity not noticed by visual inspection alone.)

Application Procedure

- As part of the test process, put the block on the floor with the flywheel housing end on supporting blocks. Be sure all core and drain plugs are in place.
- Plug the oil cooler outlet
- Install the plate on each cylinder bank
- Fill the cylinder banks with water through the front water passages
- Install the small plates, attach the air pressure regulator, and introduce 100 to 310 kPa (15 to 30 psi) air pressure into the block (if porosity is present, water will either seep or leak into the bores)

9U-6274 Compression Test Kit

Model: 3046, 3054, 3056, 3064, and 3066 Engines

Warranty: Six Months



- Used to obtain compression pressure for comparison with other cylinders
- Gauge holds reading until released by bleed-off valve
- Flexible hose provides easy viewing angle of pressure gauge
- Air connectors also used to put shop air into combustion chamber while replacing valve springs
- Dual scales on gauge — psi and kPa
- Pressure range: 0 to 7000 kPa (0 to 1000 psi)

| Item | Description |
|-----------|----------------|
| Not Shown | NEEG2538 Decal |

| Item | Part No. | Description |
|-----------------------------|----------|--------------------------|
| -- | 9U-6274 | Compression Test Kit |
| Service/Repair Parts | | |
| 1.0 | 9U-6279 | Carrying Case |
| 2.0 | 9U-6277 | Pressure Gauge |
| 3.0 | 9U-6389 | Tee Fitting |
| 4.0 | 9U-6387 | Bleed Valve ¹ |
| 5.0 | 9U-6275 | Quick Coupler |
| 6.0 | 9U-6280 | Air Connector |
| 7.0 | 9U-6384 | Hose Assembly |
| 8.0 | 9U-6145 | Air Connector |
| 9.0 | 9U-6390 | Bushing |
| 10.0 | 9U-6276 | Quick Coupler |
| 11.0 | 9U-6391 | Quick Coupler |
| 12.0 | 5C-0249 | Plug Cap |
| 13.0 | 9U-6394 | Plug Cap |
| 14.0 | 9U-6393 | Check Valve |
| 15.0 | 7D-2746 | Elbow |
| 16.0 | 9U-6392 | Quick Coupler |

(Continued)

9U-6274 Compression Test Kit (Continued)

Model: 3046, 3054, 3056, 3064, and 3066 Engines

Warranty: Six Months

| Item | Part No. | Description |
|------------------|----------|-------------|
| Not Shown | | |
| -- | 9U-6385 | Foam Block |

¹ Part of Cylinder Pressure Group (Gas Engines)

193-5859 Cylinder Pressure Tool Kit (Gas Engines)

Essential Tool

Model: G3300, G3400, G3500, and G3600 Engines

Warranty: Six Months

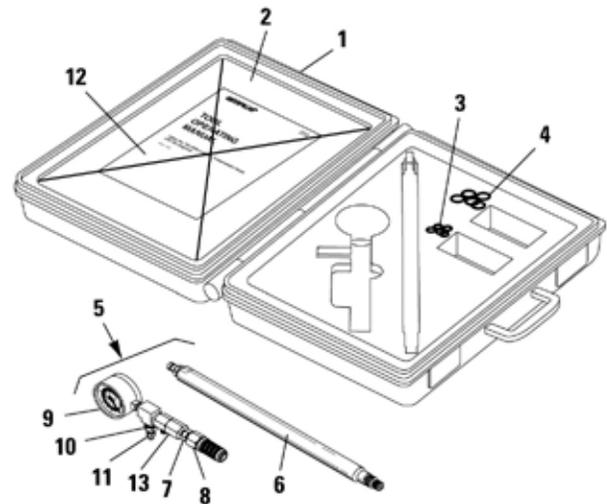
- Used to check cylinder compression
- Low compression reading can be indication of valve guttering, broken valves, broken or worn piston rings, or worn cylinder liners
- Quick way to check for potential engine wear
- Can obtain compression pressure to compare with other cylinders and pressure ratio chart
- 8T-0855 Gauge holds pressure reading until bleed-off valve is released
- Includes easy to use instructions
- Pressure range: 0 to 4000 kPa (0 to 680 psi)

Reference

NEHS0798, Tool Operating Manual, Using the 193-5859 Cylinder Pressure Tool Kit (All Gas Engines)

| Item | Description |
|-----------|---------------------------------------|
| 5 | Cylinder Pressure Group (Gas Engines) |
| 12 | NEHS0798 Tool Operating Manual |
| 13 | Check Valve ¹ |
| Not Shown | NEEG2911 Decal |

¹ Part of Cylinder Pressure Group (Gas Engines)



| Item | Part Number | Description |
|------|-------------|---|
| 1 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) |
| 2 | 6V-6126 | Holder Block (Foam) |
| 3 | 8L-2786 | O-ring (Brown) |
| 4 | 8M-5127 | O-ring (Yellow) |
| 6 | 192-7130 | Adapter Group ¹ |

| Item | Part Number | Description |
|------|-------------|--|
| 7 | 5P-8998 | Nipple - Pipe |
| 8 | 6V-4144 | Coupler Assembly (For 42000 kPa) |
| 9 | 8T-0855 | Gauge - Pressure |
| 10 | 4M-5317 | Pipe Reducing Bushing ¹ |
| 11 | 9U-6387 | Bleed Valve ¹ |
| -- | 193-5859 | Cylinder Pressure Tool Kit (Gas Engines) |

¹ Part of Cylinder Pressure Group (Gas Engines)

1P-3565 Chamfering Group

Model: 1100, 3100

Warranty: Six Months

1P-3564



- Used to break sharp corner at bottom of cylinder bore after honing cylinder bores on 1100 and 3100 Series Engines

| Part Number | Description |
|-------------|-------------------|
| 1P-3565 | Chamfering Group |
| 1P-3564 | Abrasive Cone (6) |

365-1197 Bore Brush

Model Usage: 3500 Engines

Warranty: Six Months



- Used to aid in chamfering the cylinder block liner bores on 3500 engines
- Shaft mounted 241.3 mm (9.5 in) O.D. brush
- Used with a suitable drill or honing machine
- Removes combustion residue and cleans liner bore

| Part Number | Description |
|-------------|-------------|
| 365-1197 | Bore Bush |

8S-2269 Ridge Reamer

Model: 1100, 3100, 3204

Warranty: Six Months



- Used to remove carbon buildup in cylinder bores
- Service Part: 8S-7202 Cutter Bit (qty. 1)

| Part Number | Description |
|-------------|--------------|
| 8S-2269 | Ridge Reamer |

Plate Pullers

Model: 3126 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 129-9196 | Puller Plate (lower) |
| 129-9197 | Puller Plate (upper) |

- Used to install 107-7604 Cylinder Sleeve in cylinder blocks with damaged cylinder walls
- Used with 1P-0820 Hydraulic Puller Group, 6V-2183 Forcing Screw, 1P-2329 Insert, 1D-5119 Nut, 5H-1504 Washer, and hydraulic pump and hose



Reference

SEBF8268, Installing a 107-7604 Cylinder Sleeve in 3126 Engines

Plate Pullers

Model: 3114 and 3116
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 9U-6008 | Plate Puller |
| 9U-6007 | Plate Puller |

- Used to install 7C-6208 Cylinder Sleeve into the block
- Used with 1P-0820 Hydraulic Puller, 6V-2183 Forcing Screw, 1P-2329 Insert, 1D-5119 Nut, 5H-1504 Washer, and hydraulic pump and hose



Reference

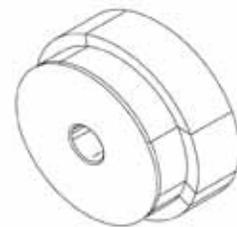
SEHS9047, Special Instruction, Installation of 7C-6208 Cylinder Sleeve

9U-6142 Puller Plate

Model: 3064 and 3066 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 9U-6142 | Puller Plate |

- Used to install cylinder sleeves (both mechanically and hydraulically)
- Used with 1P-0820 Hydraulic Puller Group, 1D-5119 Jam Nut, 5H-1504 Washer, 6V-2183 Forcing Screw, discontinued 1P-2392 Puller Plate, and a hydraulic pump



Reference

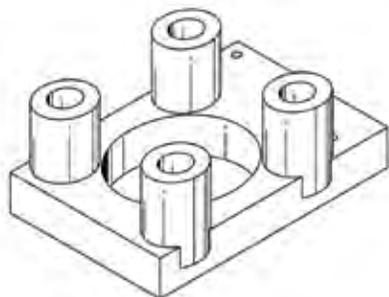
SENR5553, Disassembly and Assembly Manual, 3066 Diesel Engine

4C-4377 Stress Plate Group

142-2285 Cylinder Head Stress Plate

Model: See below

Warranty: Six Months



- Used to hone cylinder bores (necessary tool to properly recondition cylinder bores)
- Allows each cylinder to be honed individually
- Must be installed on cylinder block to simulate assembled cylinder block during stress honing and to measure finished bore dimensions
- Service Part: 200-5214 Spacer

| Part Number | Description | Model |
|-------------|----------------------------|------------|
| 4C-4377 | Stress Plate Group | 3114, 3116 |
| 142-2285 | Cylinder Head Stress Plate | 3126B |

References

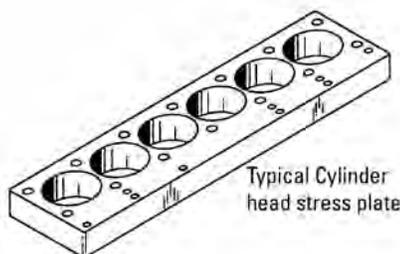
Service Manual for 3114 and 3116 Engines

SEHS9047, Special Instruction, 3114 and 3116 Engines

Cylinder Head Stress Plates

Model: 3114, 3116, and 3126 Engines

Warranty: Six Months



- Used to properly recondition and measure cylinder bores
- Used with 8T-0362 Bolt and 8T-3282 Washer (14 of each required)
- Plate must be installed on cylinder block to simulate cylinder head being assembled onto block
- When plate is installed, cylinder bore is distorted as though cylinder head were installed (plate provides adequate clearance for cylinder hone and measuring tools)
- If plate is not installed during honing, bore will not be round when cylinder head is assembled onto block (this will reduce the life of the overhaul and could affect engine performance)
- Plate is hardened for added strength and durability

| | |
|-----------------------|---|
| Overall size | 789 x 215 x 50 mm (31.1 x 8.5 x 2.0 in) |
| Bore size (3126) | 112 mm (4.4 in) |
| Bore size (3114/3116) | 107 mm (4.2 in) |
| Bolt specifications | M20 x 2.5, 110 mm long |

| Part Number | Model |
|-------------|------------|
| 125-2064 | 3126 |
| 126-8132 | 3114, 3116 |

Tools for Reconditioning Cylinder Block Counterbores

Model: Multiple Engine Models

Warranty: Six Months

Engine blocks which develop cracks in the cylinder liner counterbore area can be repaired. The repair consists of machining a new counterbore and installing a liner seat insert. The insert is then machined to standard counterbore depth with the 5P-4175 Counterboring Tool.

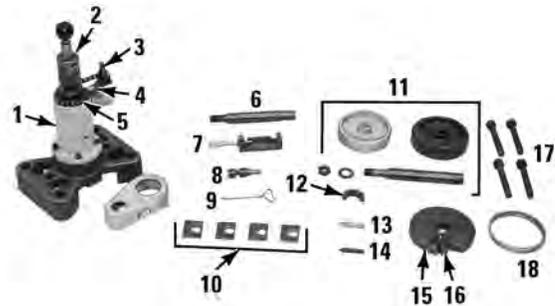
The 5P-4175 Counterboring Tool along with the basic tools required for all engines are described below. Refer to the chart for additional tools and the inserts which must be selected for individual engines.

References

SMHS7600, Special Instruction

SMHS7585, Special Instruction, Use of 5P-4175 Counterboring Tool

Other Special Instructions listed in chart



| Item | Description |
|------|---|
| 3 | Also includes: Drive Assembly (Part of 5P-1629) |
| 7 | No longer available - use 9U-7986 Base and Micrometer Group |
| 11 | Installer Assembly (includes parts listed below) |
| 12 | Depth Master Gauge |
| 13 | Cutter Assembly |
| 14 | Cutter Setting Gauge |
| 15 | Holder Group (includes parts listed below) |
| 17 | Mounting Bolts |
| 18 | Liner Seat Insert |

| Item | Part Number | Description |
|---|-------------|----------------------------------|
| Basic Tools Required for All Engines | | |
| 1 | 5P-4175 | Counterboring Tool Group |
| 2 | 8H-3127 | Bolt - Hex Socket Head |
| 3 | 5P-1629 | Drive Group (Part of 5P-4175) |
| 3 | 5P-1627 | Sprocket Drive (Part of 5P-1629) |
| 3 | 4B-9806 | Screw |
| 4 | 5P-1631 | Chain Assembly (Part of 5P-4175) |
| 5 | 6V-2120 | Sprocket (Part of 5P-4175) |
| 6 | 5P-1657 | Shaft |
| 8 | 5P-1630 | Drive Adapter ¹ |

| Item | Part Number | Description |
|---|-------------|-------------------|
| Basic Tools Required for All Engines (Continued) | | |
| 9 | 5P-1656 | Tool Remover Hook |
| 10 | 5P-1769 | Washer (4) |
| Additional Tools Required for Individual Engines (Refer to Chart for Part Numbers) | | |
| 11 | 5F-9871 | Nut |
| 11 | 4M-6013 | Washer |
| 15 | 6V-4985 | Holder Plate |
| 15 | 6V-4984 | Screw |
| 16 | 5P-1626 | Setscrew |

¹ Part of 1P-4000 Line Boring Tool Group

Cylinder Block and Liners

Application Chart for Counterboring Tools

Engine Tools

| | (18) | (11) | (12) | (13) | (14) | (15) | (17) | | |
|--|-----------------------|---|----------------------|-----------------|----------------------|--------------|---------------------|----------------------|---------------------------------------|
| Engine Model | Liner Seat Insert | Installer | Master Depth Gauge | Cutter Assembly | Cutter Setting Gauge | Holder Group | Mounting Bolts | Water Ferrule | Special Instructions |
| 5.4 / 90 V-8 | 5P-0937 | 5P-1653 | 5P-1646 | 5P-1658 | 5P-1642 | -- | 1D-4614 | -- | GMGO2442-01 |
| D330 D333 1670 1673 | 5P-1621 | 5P-1650 | 5P-1648 | 5P-1659 | 5P-2409 | 5P-1638 | 8S-4740 | -- | GMGO2442-01 |
| D330C D333C 1673C 3304 3306 | 5P-1622 | 5P-1651 | 5P-1648 | 5P-1659 | 5P-2409 | 5P-1637 | 1A-5405 (2) | -- | GMGO2442-01 |
| D339 D342 | 5P-6595 ¹ | 6V-0164, 6V-4987, 6V-4983, 4M-6013, 5F-9871 | 6V-0156, 6V- 0157 | 5P-1619 | 5P-6593, 5P- 6594 | 5P-1633 | 1D-4614 | 5N-8869 ² | SMHS7049-01, SMHS7982 ² |
| D339 D342 D364 D375 D386 D397 | 5P-1625 | -- | 5P-1647 | 5P-1619 | 5P-1643 | 5P-1633 | 1D-4614, 9S-1354 | -- | -- |
| D343 1693 | 5P-1624 | 5P-1653 | 5P-1646 | 5P-1658 | 5P-1641 | -- | 1D-4614 | -- | GMGO2442-01 |
| D353 D379 | 1W-6265 ¹³ | 6V-0165 | 6V-0156 | 5P-8606 | -- | 5P-1632 | 1D-4614 | 5N-8868 | SMHS7221-01 |
| D353 D379 D398 D399 | 5P-0936 | 5P-1655 | 5P-1646 | 5P-1619 | 5P-1644 | 5P-1632 | 1D-4614 | -- | GMGO2442-01 |
| D398 D399 | 1W-6267 ¹⁴ | 6V-4986, 4M-6013, 5F-9871 | -- | -- | -- | -- | -- | -- | -- |
| D398 D399 | 1W-6266 ¹⁵ | 6V-4983 | 6V-0157 | -- | -- | -- | -- | 5N-8869 | SMHS7982 |
| Spacer Plate Engines, Liner Seat Inserts 8N-6938, 8N-6150 (0.06 in); 8N-6939, 8N-6742 (0.12 in) | | | | | | | | | |
| 3400 Series | 2W-3815 | -- | 6V-0118 (0.06 in) | 6V-6191 | 6V-6189 | -- | 7B-5163 | -- | SMHS8222 |
| 3400 Series | 5N-0093 | -- | 8T-0843 (0.10 in) | -- | -- | -- | -- | -- | -- |
| 3500 Series | 7W-5949 | -- | 6V-0191 | 6V-2025 | 8T-5113 | 8T-2682 | 1D-3419 | -- | SMHS7600 |
| D334 1674 3304 3306 ⁶ | 5P-4174 | 5P-1651 | 5P-4176 | 5P-1659 | 5P-2409 | 5P-1637 | 1D-4588 | -- | GMGO2442-01 |
| D342 | 8N-6150 | -- | 6V-0118 (0.06 in) | 6V-2025 | -- | 5P-1633 | 9S-1351 | -- | SMHS7585 |
| D342 | 8N-6742 | -- | 6V-0191 (0.12 in) | -- | -- | -- | -- | -- | SMHS7585 |
| D343 1693 D346 D348 D349 ⁴ | 5P-4173 | 5P-1653 | 5P-4176 | 5P-1658 | 5P-1641 | -- | 1D-4614 | -- | GMGO2442-01 |
| -- | 8N-6939 | -- | 6V-0191 (0.12 in) | -- | -- | -- | -- | -- | SMHS7600 |
| -- | 8N-6938 | -- | 6V-0118 (0.06 in) | 6V-2025 | -- | 5P-1632 | 1D-4614 | -- | -- |

¹ Use in case of excessive counterbore cracking

² D342 only

³ D379-D398 and D399

⁴ Except discontinued 5S-9500 Block

⁵ D353 Cylinders 1 and 4

⁶ Except discontinued 5S-6200 Block

9U-7988 Riser Plate Group

Model: 3300 Engines with Spacer Plate
Warranty: Six Months

| Part Number | Description |
|-------------|-------------------|
| 9U-7988 | Riser Plate Group |

- Used during salvage operation of liner seats which are cracked or damaged
- Used with 9U-7990 Counterbore Tool Group, 9U-7989 Cutter Plate or 9U-7961 Cutter Plate, and 9U-7992 Cutter Bit
- Eliminates need to remove adjacent cylinder liners during rework procedure



Reference

NEHS0612, Tool Operating Manual

9U-7990 Counterbore Tool Group

Model: 3176, 3300 (with spacer plate), and 3406 (with spacer plate) Engines
Warranty: Six Months

- Used to machine engine block liner seats which are cracked or damaged
- Used with heavy duty electric drill (5/8 or 3/4 inch, 300 to 600 RPM, 8 amps or more), 9U-7988 Riser Plate Group (3300 Engine), 9U-7993 Depth Gauge Assembly
- A variety of insert thicknesses are available depending on depth of cut
- Cutter plate is tapered — helps center counterbore tooling in cylinder bore
- Each counterbore operation requires a specific cutter bit and cutter plate (see chart for specific tooling and insert part number)n>- 3176 and 3300 Engines use 9U-7989 Cutter Plate and 9U-7992 Cutter Bitn>- 3406 Engines use 9U-7991 Cutter Plate and 6V-6191 Cutter Bit
- Will not fit 3408 or 3412 Engines



Reference

NEHS0612, Tool Operating Manual

| Item | Part Number | Description | Model |
|-------------------------|-------------|------------------------|-----------------------|
| -- | 9U-7990 | Counterbore Tool Group | -- |
| Typical Examples | | | |
| 1 | 9U-7989 | Cutter Plate | 3176 and 3300 Engines |
| 1 | 9U-7991 | Cutter Plate | 3406 Engines |
| 2 | 9U-7992 | Cutter Bit | 3176 and 3300 Engines |
| 2 | 6V-6191 | Cutter Bit | 3406 Engines |

Cylinder Block and Liners

Counterbore Tool Group (Continued)

Model: 3176, 3300 (with spacer plate), and 3406 (with spacer plate) Engines

Warranty: Six Months

Engine Tools



| Not Shown | |
|------------|------------------------------|
| Item | Description |
| Metal Case | Basic Counterbore Tool Group |
| Case | Base and Micrometer Group |

| Item ¹ | Part Number | Description |
|-------------------|-------------|--|
| 1 | 9U-7985 | Basic Counterbore Tool Group (not serviced) ² |
| 2 | 9U-7986 | Base and Micrometer Group ² |
| 3 | 9U-7987 | Master Gauge ² |
| 4 | 5P-1656 | Tool Remover Hook |
| 5 | 9U-7984 | Depth Set Collar |
| 6 | 1U-7576 | Allen Wrench, 5/32 in |
| 6 | 1U-7575 | Allen Wrench, 1/8 in |
| 6 | 1U-7577 | Allen Wrench, 3/16 in |

| Item ¹ | Part Number | Description |
|-------------------|-------------|---|
| 7 | 8T-0207 | Bolt M16 x 2 x 100 mm long (3 required) |
| 8 | 5P-8247 | Hard Washer |
| 9 | 0S-1569 | Bolt, 5/8-11 x 4 in long (3 required) |
| 10 | 5P-1630 | Drive Adapter ³ |
| 11 | 9U-7983 | Offset Washer (3 required) |
| 12 | 5P-8248 | Hard Washer |
| 13 | 0L-1328 | Bolt, 3/4-16 x 4 in long (3 required) |

¹Item 1: 9U-7985 Basic Counterbore Tool Group (metal case included, but not shown (part of 1U-6220 Counterbore Group) Not Serviced

²Part of 1U-6220 Counterbore

³Part of 1P-4000 Line Boring Tool Group

Machining Dimensions for Cylinder Block Liner Seats

| Liner Inserts | Bore Diameter | Depth of Cut |
|--------------------|----------------------|----------------------|
| 3176 Engine | | |
| 105-4203 | 145.85 mm (5.742 in) | 0.772 mm (0.0304 in) |
| 105-4204 | 145.85 mm (5.742 in) | 0.822 mm (0.0324 in) |
| 105-4202 | 145.85 mm (5.742 in) | 0.872 mm (0.0343 in) |
| 104-7903 | 145.85 mm (5.742 in) | 1.555 mm (0.0612 in) |
| 104-7895 | 145.85 mm (5.742 in) | 1.605 mm (0.0632 in) |
| 104-7904 | 145.85 mm (5.742 in) | 1.655 mm (0.0652 in) |
| 104-7905 | 145.85 mm (5.742 in) | 2.660 mm (0.1047 in) |
| 104-7896 | 145.85 mm (5.742 in) | 2.710 mm (0.1067 in) |
| 104-7906 | 145.85 mm (5.742 in) | 2.760 mm (0.1087 in) |
| 3300 engine | | |
| 104-5511 | 144.05 mm (5.671 in) | 0.772 mm (0.0304 in) |
| 104-5512 | 144.05 mm (5.671 in) | 0.822 mm (0.0324 in) |
| 104-5513 | 144.05 mm (5.671 in) | 0.872 mm (0.0343 in) |
| 104-5515 | 144.05 mm (5.671 in) | 1.555 mm (0.0612 in) |
| 104-5518 | 144.05 mm (5.671 in) | 1.605 mm (0.0632 in) |

| Liner Inserts | Bore Diameter | Depth of Cut |
|--------------------------------|----------------------|----------------------|
| 3300 engine (Continued) | | |
| 104-5522 | 144.05 mm (5.671 in) | 1.655 mm (0.0652 in) |
| 104-5526 | 144.05 mm (5.671 in) | 2.660 mm (0.1047 in) |
| 104-5527 | 144.05 mm (5.671 in) | 2.710 mm (0.1067 in) |
| 104-5528 | 144.05 mm (5.671 in) | 2.760 mm (0.1087 in) |
| 104-5529 | 144.05 mm (5.671 in) | 5.160 mm (0.2031 in) |
| 104-5530 | 144.05 mm (5.671 in) | 5.210 mm (0.2051 in) |
| 104-5531 | 144.05 mm (5.671 in) | 5.260 mm (0.2071 in) |
| 5P-4174 | 147.32 mm (5.800 in) | 5.210 mm (0.2051 in) |
| 3406 Engine | | |
| 6I-4361 | 166.05 mm (6.537 in) | 0.772 mm (0.0304 in) |
| 9Y-3368 | 166.05 mm (6.537 in) | 0.822 mm (0.0324 in) |
| 6I-4362 | 166.05 mm (6.537 in) | 0.872 mm (0.0343 in) |
| 6I-4363 | 166.05 mm (6.537 in) | 1.555 mm (0.0612 in) |
| 2W-3815 | 166.05 mm (6.537 in) | 1.605 mm (0.0632 in) |
| 6I-4364 | 166.05 mm (6.537 in) | 1.655 mm (0.0652 in) |

(Continued)

Machining Dimensions for Cylinder Block Liner Seats (Continued)

| Liner Inserts | Bore Diameter | Depth of Cut |
|--------------------------------|----------------------|----------------------|
| 3406 Engine (Continued) | | |
| 6I-4365 | 166.05 mm (6.537 in) | 2.660 mm (0.1047 in) |
| 5N-0093 | 166.05 mm (6.537 in) | 2.710 mm (0.1067 in) |
| 6I-4366 | 166.05 mm (6.537 in) | 2.760 mm (0.1087 in) |
| 101-0524 | 166.05 mm (6.537 in) | 5.160 mm (0.2031 in) |

| Liner Inserts | Bore Diameter | Depth of Cut |
|--------------------------------|----------------------|----------------------|
| 3406 Engine (Continued) | | |
| 101-0523 | 166.05 mm (6.537 in) | 5.210 mm (0.2051 in) |
| 101-0525 | 166.05 mm (6.537 in) | 5.260 mm (0.2071 in) |
| 5P-4173 | 169.29 mm (6.665 in) | 5.080 mm (0.2000 in) |
| 108-1068 | 169.33 mm (6.667 in) | 3.302 mm (0.1300 in) |

159-9404 Counterbore Tool Group

Model: C-10 and C-12 Engines

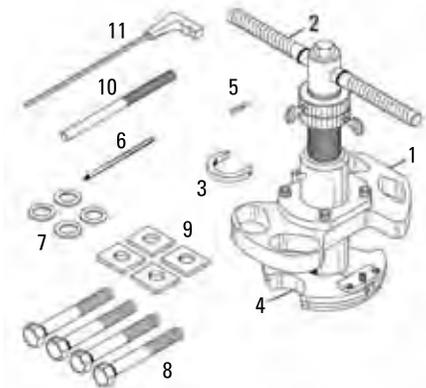
Warranty: Six Months

- Used to machine cylinder bore liner seat ledge with special backcut seat design
- Used with 170-6555 Stylus Extension (100 mm [3.94 in]) to measure counterbore depth (not included in group, but requires 9U-7993 Depth Gauge and 8T-0455 Liner Projection Indicator Group)
- Hand operated, easy to use
- 4 shim thicknesses are available to raise liner back to its original height (can be stacked to achieve necessary projection)

References

NEHS0733, Tool Operating Manual, 159-9404 Counterbore Tool Group For C-10 and C-12 Engines

SENR6593, Testing and Adjusting C-10/C-12 Truck Engines

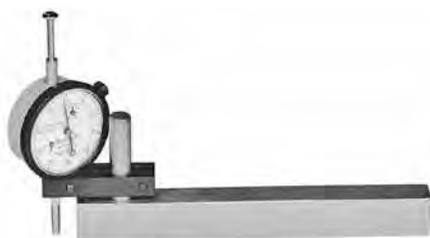


| Item | Part Number | Description | Size | Quantity |
|------------------|-------------|------------------------------|--------------------|----------|
| 1 | 159-9393 | Basic Machine - Not Serviced | -- | -- |
| 2 | 159-9397 | T Handle | -- | -- |
| 3 | 159-9401 | Spacer Block | -- | -- |
| 4 | 159-9402 | Cutter Plate | -- | -- |
| 5 | 159-9403 | Cutter Bit | -- | -- |
| 6 | 170-6555 | Stylus Extension | 100 mm (3.94 in) | -- |
| 7 | 5P-8247 | Hard Washer | -- | 4 |
| 8 | 8T-0358 | Bolt, M16 | -- | 4 |
| 9 | 159-9395 | Square Washer | -- | 4 |
| 10 | 159-9400 | Cutter Plate Wrench | -- | -- |
| 11 | 159-9398 | Hex Key | -- | -- |
| -- | 159-9404 | Counterbore Tool Group | -- | -- |
| Not shown | | | | |
| -- | 159-9396 | Carrying Case | -- | -- |
| -- | 168-7363 | Shim | 0.22 mm (0.009 in) | -- |
| -- | 168-7364 | Shim | 0.25 mm (0.010 in) | -- |
| -- | 168-7365 | Shim | 0.28 mm (0.011 in) | -- |
| -- | 168-7366 | Shim | 0.50 mm (0.020 in) | -- |

9U-7993 Depth Gauge Assembly

Model: 3300, 3400, and 3176 Engines

Warranty: Six Months



- Used to measure actual depth of liner seat counterbore — used during rework procedure of 3176, 3300, and 3400 Engine cylinder blocks
- Used with 9U-7990 Counterbore Tool Group
- Counterbore tool does not have to be removed to measure depth of counterbore — saves time and ensures greater accuracy over conventional means of measuring

Reference

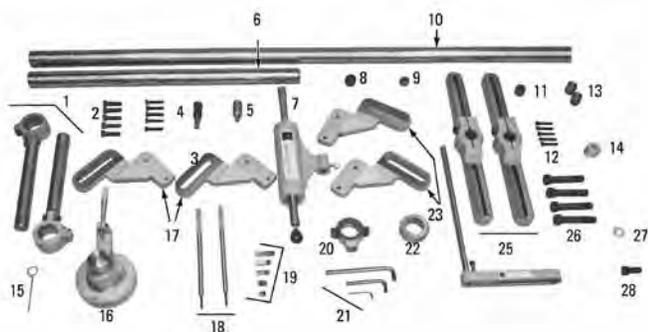
NEHS0612, Tool Operating Manual

| Part Number | Description |
|-------------|----------------------|
| 9U-7993 | Depth Gauge Assembly |

1P-4000 Line Boring Tool Group

Model: Multiple Engine Models

Warranty: Six Months



- Used with the appropriate centering rings to precision bore semi-finished service main bearing caps
- Hydraulically operated feed mechanism and power drive with a 12.7 mm (1/2 in) drill

References

SEBF4500, Engine and Component Reconditioning Guide

SMHS7606, Special Instruction

| Engine Bore Size | Centering Ring (2 Required) Standard | Centering Ring (2 Required) Oversize |
|---|--------------------------------------|--------------------------------------|
| 4.50 in (1100, 3100, 3200) | 1P-2344 | 6V-0138 |
| 5.40 in — 3400 Series | 5P-2381 | 6V-0142 |
| 6.25 in V-Engines | 1P-2351 | 6V-0145 |
| 6.70 in 3500 Engine | 6V-7836 | 4C-8564 |
| Not Shown: Box Assembly and Instructions Form SMH7606 | | |

| Item | Part Number | Description | Qty. |
|------|-------------|----------------------------|------|
| 2 | 0S-1571 | Bolt (English) | 5 |
| 3 | 0S-1587 | Bolt | 5 |
| 4 | 3K-4897 | Pin | -- |
| 4 | 5P-1630 | Drive Adapter ¹ | -- |
| 5 | 1P-2364 | Adapter - Line Bore | -- |
| 7 | 5P-2981 | Feed Assembly ¹ | -- |
| 8 | 5M-5693 | Washer | 5 |
| 9 | 2S-6160 | Washer | 5 |
| 11 | 4D-0670 | Washer | 5 |
| 12 | 1B-9575 | Bolt | 5 |
| 13 | 1B-4331 | Nut | 4 |
| 14 | 4B-4283 | Washer | 8 |
| 15 | 9S-8521 | Rod | -- |
| 17 | 1P-2383 | Bridge Extension (L.H.) | 2 |
| 18 | 1P-2359 | Wrench, 5/32 in | -- |

| Item | Part Number | Description | Qty. |
|-----------------|-------------|------------------------------|------|
| 18 | 1P-2360 | Wrench, 3/16 in | -- |
| 19 | 1P-2354 | Tool Bit, 5/8 in | 2 |
| 19 | 1P-2355 | Tool Bit, 7/8 in | 2 |
| 19 | 1P-2356 | Tool Bit, 1 1/4 in | 2 |
| 19 | 1P-2357 | Tool Bit, 1 1/2 in | 2 |
| 19 | 1P-2358 | Tool Bit, 2 in | 2 |
| 20 | 1P-2362 | Holder Assembly, Larger | -- |
| 21 ² | 1D-5343 | Wrench | -- |
| 21 | 4B-9820 | Wrench | -- |
| 22 | 1P-2366 | Holder Assembly ¹ | -- |
| 22 | 1P-2372 | Screw | -- |
| 22 | 2H-0191 | Bolt | 2 |
| 26 | 1D-4615 | Bolt | 4 |
| 27 | 4B-4281 | Washer | -- |
| 28 | 0S-1589 | Bolt | -- |

(Continued)

1P-4000 Line Boring Tool Group (Continued)

Model: Multiple Engine Models

Warranty: Six Months

| Item | Part Number | Description | Qty. |
|--|-------------|--------------------------------|------|
| -- | 1P-4000 | Line Boring Tool Group | -- |
| Item 1, Upright Bearing Assembly (2 each) Consists of: ³ | | | |
| 1 | 1L-0509 | Socket Head Cap Screw (3/8-16) | 4 |
| 1 | 7M-5130 | Pin | -- |
| Item 6, Bar Assembly, 31 in Long includes: | | | |
| 6 | 1K-6976 | Setscrew | 2 |
| Item 10, Bar Assembly, 66 in Long includes: | | | |
| 6 | 1K-6976 | Setscrew | 2 |

| Item | Part Number | Description | Qty. |
|--|-------------|------------------------|------|
| Item 16, Micrometer Bracket Assembly includes: ⁴ | | | |
| -- | 3L-2540 | Screw | -- |
| -- | 8H-3127 | Bolt - Hex Socket Head | -- |
| Item 24, Torsion Bar Assembly includes: Bar, Bracket and: | | | |
| -- | 5S-7003 | Screw | -- |
| Item 25, Bridge Assembly includes: | | | |
| -- | 2L-0041 | Bolt | -- |

¹ Part of 1P-4000 Line Boring Tool Group

² Includes: 1D-5343, 1/8/in and 5/16 in Hex Wrench, also a 3/8 in Hex Wrench

³ Also includes: Oiler

⁴ Also includes: Holder and Micrometer

FT1482 Stop Collar Assembly

Model: Multiple Engine Models

Warranty: None

- Used with 1P-4000 Line Boring Tool Group
- Stop collar clamped on shaft of feed mechanism to stop advance of boring bar
- Primarily used for reboring bushing bores which have flat shoulder at bottom

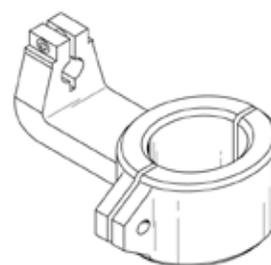


FT1481 Micrometer Holder

Model: Multiple Engine Models

Warranty: None

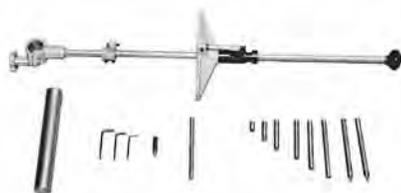
- Saves time in measuring bores when using 1P-4000 Line Boring Tool Group; bore sizes can be measured without removing tool holder from boring bar or disassembling boring bar tool setup to use dial bore gauge
- Used with discontinued 1P-2371 Micrometer; placed directly on boring bar to measure protrusion of carbide tipped tool
- Made from the discontinued 6V-2122 Holder available as service part of discontinued 1P-2370 Micrometer Bracket Assembly



6V-7840 Deck Checking Tool Assembly

Model: 518

Warranty: Six Months



- Provides very accurate measurements, which are compared to block specifications, to determine how much of top surface of cylinder block has been machined (when an engine is reconditioned, it is important to know if top deck has been previously machined)

Reference

SEHS8187, Special Instruction

| Part Number | Description | Size |
|------------------------|-----------------------------|-------------|
| 6V-7840 | Deck Checking Tool Assembly | -- |
| Service / Repair Parts | | |
| 4B-9820 | Wrench | 1/8 in |
| 6B-7225 | Wrench, 3/16 in Hex | 3/16 in Hex |

362-4253 Depth Micrometer Kit

Model: 3400, C15, C-15, C-16, C18, C27, and C32 Engines

Warranty: Six Months

- Used to measure deck height on specific engines
- Used with 362-4250 Tool Kit (Deck Height Measuring Tool)
- 600 mm (24 in) depth micrometer is ideal for measuring large parts
- Includes 400 mm (16 in) moveable bridge attachment
- Precision instrument with resolution of 0.01 mm (.0005 in) provides accurate deck height measurements
- MODE and SET buttons control a range of functions including On/Off, Preset/Hold, Absolute/Relative, and Inch/Metric displays
- One CR2032 lithium battery supplies power for a year or more of normal use
- Kit includes wooden case with provisions for storing depth gauge and moveable bridge attachment
- Includes supplier operating manual

References

NEHS1102 Tool Operating Manual

SEBF9213, Measuring the Distance to the Top Deck of C15, C-15, C-16, C18, 3400, C27, and C32 Engines, Reuse and Salvage Guidelines

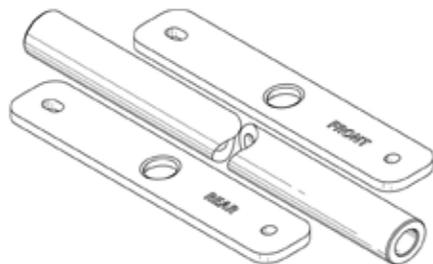
| Part Number | Description |
|-------------|-------------|
| 362-4253 | Depth Gauge |

362-4250 Tool Kit (Deck Height Measuring Tool)

Essential Tool

Model: C15, C-15, C16, C-16, C18, C-18, 3400, C27 and C32

Warranty: Six Months



- Used to measure deck height on both V-style and inline engines
- Used with 362-4253 Gauge Kit (order separately)
- End plates are marked for easy identification
- Tool is set up the same way each time to reduce variation, which can cause inaccurate measurements
- For durability, end plates are black oxide coated, and tube is chrome plated

References

NEHS1102, Tool Operating Manual

SEBF9213, Measuring the distance to the top deck of C15, C-15, C-16, C18, 3400, C27, and C32 Engines

| | |
|------------|-----------------------|
| End plates | 3.17 kg (7.0 lb) each |
| Tube | 7.03 kg (15.6 lb) |

(Continued)

362-4250 Tool Kit (Deck Height Measuring Tool) (Continued)

Essential Tool

Model: C15, C-15, C16, C-16, C18, C-18, 3400, C27 and C32

Warranty: Six Months

| Part Number | Description |
|--|---------------------------------------|
| 362-4250 | Tool Kit (Deck Height Measuring Tool) |
| Service/Repair Parts | |
| 362-4251 | Thru-Bar |
| 362-4252 | End Plates |
| Additional Required Tooling (Sold Separately) | |
| 362-4253 | Depth Gauge |

299-5231 Leg Assembly

Essential Tool

Model: 3600 Gas and Diesel Engines

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 299-5231 | Leg Assembly |

- Used to remove cylinder liners (replaces former design)
- Can be used at working pressures up to 34,500 kPa (5,000 psi) which is an increase from 17,250 kPa (2500 psi) of former design
- One-piece design is easier to use (eliminates separate bolt and foot components of former design)
- Serves as a replacement for 6V-7077 Puller Leg and 6V-7076 Foot which are both part of the 3600 Cylinder Liner Removal Tooling



5P-8665 Cylinder Liner Puller

Model: Multiple Engine Models

Warranty: Six Months

- Utilizes an impact wrench for fast removal of cylinder liners
- Pulls all liners, most in seconds
- Easy to install and remove
- 6V-4133 Wedge Bracket available separately to be used with 5P-8665 Puller; always use 6V-4133 when removing liners from 3500 Family Engines; it may be used to remove liners in horizontal position from 146.05 mm (5.75 in) bore and 158.75 mm (6.25 in) bore engines; wedge keeps puller feet rigidly positioned under edge of liner
- 1/2 inch impact wrench adequate for job
- Applicable to all Cat® cylinder liners and any other liner up to:
Diameter: 178 mm (7.0 in)
Length: 457 mm (18.0 in)



| Item | Part Number | Description | Qty. |
|------|-------------|--------------|------|
| 1 | 5P-8672 | Arm Assembly | 2 |
| 2 | 5P-8666 | Pin | 2 |
| 3 | 5P-8667 | Bushing | -- |

| Item | Part Number | Description | Qty. |
|------|-------------|---------------------|------|
| 4 | 131-6119 | Plate Assembly, Top | -- |
| 5 | 5P-8669 | Bearing Assembly | -- |
| 6 | 5P-8668 | Turning Tool | -- |

(Continued)

Cylinder Block and Liners

5P-8665 Cylinder Liner Puller (Continued)

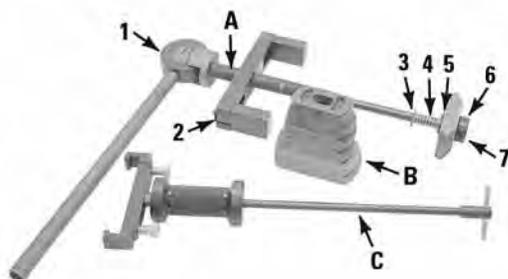
Model: Multiple Engine Models

Warranty: Six Months

| Item | Part Number | Description | Qty. |
|------|-------------|---------------------------------------|------|
| 7 | 5P-8671 | Foot | 2 |
| 8 | 6V-4133 | Wedge Bracket (see information above) | -- |
| 9 | 2D-4534 | Screw | 2 |

| Item | Part Number | Description | Qty. |
|------|-------------|--------------------------|------|
| 10 | 8T-5103 | Arm Assembly | 2 |
| 11 | 131-6118 | Lifting Bar | -- |
| 12 | 8T-5104 | Spring (Part of Item 4) | 2 |
| 13 | 8T-5105 | Plunger (Part of Item 4) | 2 |
| -- | 5P-8665 | Cylinder Liner Puller | -- |

5P-3570 Cylinder Liner Puller Group Discontinued — Service Parts Available



- Discontinued and replaced by 5P-8665 Cylinder Liner Puller

Reference

GEG00631, Special Instructions

| Item | Description |
|------|--|
| C | Cylinder Liner Remover — 137.2 mm (5.4 in) Bore Engines Only |

| Item | Part Number ¹ | Description | Size |
|--|--------------------------|-------------------|------|
| Includes the following Service/Repair Parts | | | |
| 1 | 5P-3571 | Cam and Rod Group | -- |
| 2 | 1J-8499 | Washer (2) | -- |
| 2 | 0S-1621 | Bolt | -- |
| 3 | 4B-4283 | Washer | -- |
| 4 | 5M-6186 | Spring | -- |
| 5 | 8F-6462 | Washer | -- |
| 6 | 1P-2388 | Nut | -- |

| Item | Part Number ¹ | Description | Size |
|--|--------------------------|---|-------------------------|
| Includes the following Service/Repair Parts (Continued) | | | |
| 7 | 4B-9806 | Screw | -- |
| A | 5P-3570 | Cylinder Liner Puller Group, Discontinued | -- |
| B | 1P-2398 | Puller Plate | 158.8 mm (6.25 in) Bore |
| B | 1P-2394 | Puller Plate | 120.7 mm (4.75 in) Bore |
| B | 1P-2396 | Puller Plate | 137.2 mm (5.4 in) Bore |

¹All part numbers in the table have a Six Month warranty

7F-1857 Liner Puller

Discontinued — Service Parts Available

- Discontinued and replaced by 5P-8665 Cylinder Puller liner

| Service / Repair Parts | |
|------------------------|-------------|
| Item | Description |
| 3 | Handle |
| 11 | Swivel |



| Item | Part Number | Description | Quantity |
|-----------------------------|-------------|--|----------|
| Service/Repair Parts | | | |
| 1 | 1B-4333 | Nut | -- |
| 2 | 001-5599 | Bearing | -- |
| 3 | 7F-1860 | Handle | -- |
| 4 | 5F-7347 | Head | -- |
| 5 | 5F-7353 | Thrust Washer | -- |
| 6 | 1A-1460 | Bolt (1/2 - 13) (fork mounting hardware) | 3 |
| 7 | 4B-4280 | Washer | 3 |
| 8 | 5F-7350 | Block | 3 |
| 9 | 1B-4330 | Nut | -- |
| 10 | 0S-1579 | Bolt | -- |
| 11 | 5F-7349 | Swivel | -- |
| 12 | 1B-4331 | Nut | -- |

Adapter Plates for Discontinued 7F-1857 Puller

Model: Multiple Engine Models

Warranty: Six Months

| Cylinder Liner Removal — Adapter Plate Selection | |
|--|----------------------------------|
| Size | Adapter Plate Part No. (Current) |
| Adapter Plate Part Number (Former) | |
| 114.3 mm (4.50 in) | 5P-7362 |
| Adapter Plate Part Numbers (Current) | |
| 120.7 mm (4.75 in) | 1P-2394 |
| 137.2 mm (5.40 in) | 1P-2398 |
| 158.8 mm (6.25 in) | 1P-2396 |

- The hydraulic puller and the different size adapter plates are not included in discontinued 7F-1857 Cylinder Liner Puller Assembly (adapter plates ordered separately as required)

8T-0455 Liner Projection Tool Group

Model: Multiple Engine Models

Warranty: Six Months



- Provides easy, accurate way to determine cylinder liner projection and counter-bore depth

Reference

SMHS7727, Special Instruction

| Item | Part Number | Description |
|------|-------------|---|
| 1 | 6V-6045 | Case - Plastic, NEEG2061 Accessories Case Decal |
| 1 | 8T-0453 | Block |
| 2 | 2P-5486 | Gauge Block |
| 3 | 1P-2402 | Gauge Body |
| 4 | 1P-5507 | Gauge |
| 5 | 1P-2403 | Dial Indicator |
| 5 | 1P-5512 | Contact Point |
| 6 | 1P-5513 | Contact Point |
| 7 | 5S-2671 | Screw ¹ |
| -- | 8T-0455 | Liner Projection Tool Group |

¹Part of 6D-6680 Tool Group

2P-8260 Cylinder Liner Installer Group

Model: Multiple Engine Models

Warranty: Six Months



- Used to install cylinder liners
- Attaches to head bolt or stud, whichever is used, and applies firm, steady pressure, making damage to liner seals less likely

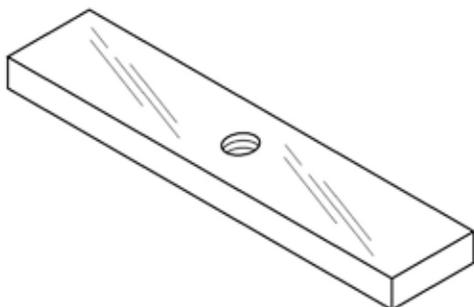
| Item | Description |
|------|-------------|
| 3 | Rod |
| 4 | Plate |

| Item | Part Number | Description |
|------|-------------|--------------------------------|
| 1 | 3H-8538 | Pin |
| 2 | 3B-4615 | Cotter Pin |
| -- | 2P-8260 | Cylinder Liner Installer Group |

FT1543 Plate

Model: 3500

Warranty: None



- Used with 2P-8260 Liner Installer Group to install cylinder liners on all 3500 Family Engines
- Used in place of discontinued 2P-8257 Plate which is not long enough to fit across cylinder liner for 3500 Family Engines
- Can also be used on engines with smaller bore diameters
- Material: SAE 1020 steel

Cylinder Pack Pullers

Model: See Chart

Warranty: Six Months

- Used to pull liner, piston and connecting rod, as an assembly, from engines
- Very useful when used for in-frame overhauls because it eliminates need for ridge reaming and dirt generated by reaming
- Each puller should be used with appropriate bridge (see chart) and 1U-6319 Socket which has an extended body to cover length of threaded rod and can be used with impact wrench

References

SEHS8554, Special Instruction

REN7466, C175 Disassembly and Assembly Manual

SENR1007, Disassembly and Assembly Manual



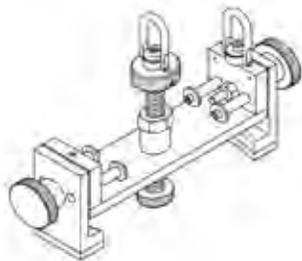
| Cylinder Pack Pullers | | | | | | | | |
|---|-----------------------|------------------|-----------------|-----------------------------------|-----------------|------------------|------------------|------------------|
| Engine (Bore mm) | | | | | | | | |
| | 3300 (120.7 mm) | 3176 (125 mm) | C12 (130 mm) | 3400 (137 mm / 129.5 mm) | C32 (145 mm) | 6.25 (160 mm) | 3500 (170 mm) | C175 (175 mm) |
| Puller | 8T-0812 | 1U-9593 | 129-6675 | 6V-9448 ¹ 2 | 373-1438 | 8T-0811 | 8T-2686 | 290-8087 |
| Bridge | -- | 1U-9897 | 1U-9897 | 1U-6317 | 1U-6317 | 5F-7347 | FT1970 | 288-9171 |
| Socket | 1U-6319 | 1U-6319 | 1U-6319 | 1U-6319 | 1U-6319 | 1U-6319 | 1U-6319 | -- |
| Repair Parts | | | | | | | | |
| Full Nut | 2J-3506 | 2J-3506 | 2J-3506 | 2J-3506 | 2J-3506 | 2J-3506 | 2J-3506 | 2J-3506 |
| Hard Washer | 5H-1504 | 5H-1504 | 5H-1504 | 5H-1504 | 5H-1504 | 5H-1504 | 5H-1504 | 5H-1504 |
| Plate | 4C-8738 | 1U-9596 | 129-6677 | 4C-8743 | 373-1440 | 4C-8747 | 4C-8751 | 4C-8751 |
| Threaded Stud | 1U-9597 | 1U-9597 | 1U-9597 | 1U-9597 | 1U-9597 | 1U-9597 | 1U-9597 | 288-9159 |
| Rubber Cup | 4C-8736 | 1U-9594 | 129-6676 | 4C-8741 | 373-1439 | 4C-8745 | 4C-8749 | 417-3451 |
| Segment Group | 4C-8739 | 1U-9598 | 129-6678 | 4C-8744 | 373-1441 | -- | 4C-8752 | 4C-8752 |
| Base Cone | 1U-9825 | 1U-9825 | 9U-6630 | 1U-9825 | 9U-6630 | 1U-9825 | 1U-9825 | 288-9161 |
| Base Plate | -- | -- | -- | 4C-8742 | -- | 4C-8746 | 4C-8750 | 288-9162 |
| ¹ 6V-9448 also used for 139.7 mm (5.5 in) engine bore size | | | | | | | | |
| ² Early 6V-9448 Cylinder Pack Pullers have fine thread studs. The only service parts for these pullers are: 1B-4207 Full Nut, 5H-1504 Hard Washer, Threaded Stud made from 6V-4832 | | | | | | | | |

322-3564 Puller Group

Essential Tool

Model: C175 Engines

Warranty: Six Months



European Union compliant, CE marked

- Used to remove and install cylinder liner, piston, and connecting rod as an assembly
- Very useful when used for in-frame overhauls because ridge reaming is not required (eliminates the dirt and grit generated by reaming)
- Puller group should be used with 328-5926 Spacer Plate (provides clearance between cylinder liner lip and head to allow installation of puller group)
- End blocks lock onto cylinder liner lip to secure piston pack to puller group
- Center lift pin assembly threads into piston to prevent it from dropping out of cylinder liner
- Dual lifting eyes allow straight or angled lifting of piston pack for easier removal and installation on engine block

References

REN7466, C175 Disassembly and Assembly Manual

NEHS1074, Tool Operating Manual, 322-3564 Cylinder Pack Puller

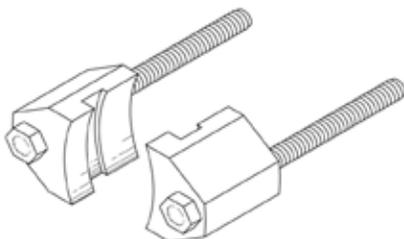
| Serviceable Parts | |
|-------------------|---------------|
| Part Number | Description |
| 395-0090 | Set Knobs (2) |

| Part Number | Description | Working Load Limit |
|-------------|--------------|--------------------|
| 322-3564 | Puller Group | 57 kg (125 lb) |

328-5926 Spacer

Model: C175 Engines

Warranty: Six Months



- Used to position and hold cylinder liner 35 mm (1.4 in) above surface of cylinder block during C175 Piston Pack service
- Used with 290-8087 Puller Group, 288-9171 Bridge, and 322-3564 Puller Group
- Supports cylinder liner in a raised position while other tooling is removed and installed
- Cylinder liner clamps are made from high molecular weight plastic to protect sealing surface of cylinder liner
- Steel bolts thread into existing holes in cylinder block to secure tooling

| Part Number | Description |
|-------------|-------------|
| 328-5926 | Spacer |

References

REN7466, C175-16 Generator Set Engine

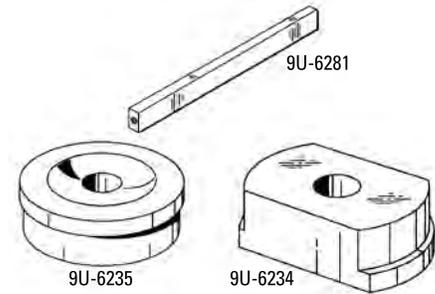
KENR6052, C175-16 and C175-20 Engines for Caterpillar Built Machines

Cylinder Liner Puller Plates and Leg

Model: 3054 and 3056 Engines

Warranty: Six Months

- Used to remove and install cylinder liners
- 9U-6234 Puller Plate used to remove liners, 9U-6235 to install liners
- Legs used between puller plates and additional tooling (three required)
- Liners manually or hydraulically removed (see additional tooling list)



| | |
|----------------------------|-----------------------|
| 9U-6281 Leg | |
| Overall length | 330 mm (13.0 in) |
| Internal thread (one end) | 1/2-13 |
| Included but Not Serviced: | |
| 9S-7346 | Cylinder Assembly (2) |

| Part Number | Description | Use | Size | Quantity |
|---|--|----------------|------------------|----------|
| 9U-6281 | Leg | -- | -- | -- |
| 9S-7346 | Cylinder Assembly | -- | -- | 2 |
| 9U-6234 | Puller Plate | Remove liners | -- | -- |
| 9U-6235 | Puller Plate | Install liners | -- | -- |
| Additional tooling for hydraulic operation | | | | |
| 1D-5119 | Jam Nut | -- | -- | 1 |
| 1P-2329 | Threaded Insert | -- | -- | 1 |
| 1A-1460 | Bolt (1/2 - 13) (fork mounting hardware) | -- | 1/2 - 13 x 2 inL | 3 |
| 1U-9895 | Cross block | -- | -- | -- |
| 5F-7347 | Head | -- | -- | -- |
| 5H-1504 | Washer | -- | -- | -- |
| 5P-8245 | Hard Washer | -- | -- | 3 |
| 6V-2183 | Forcing Screw ¹ | -- | -- | 1 |
| Additional tooling for manual operation | | | | |
| 2J-3507 | Nut | -- | 1 - 8 ThreadL | -- |
| 8H-0684 | Wrench | -- | -- | -- |

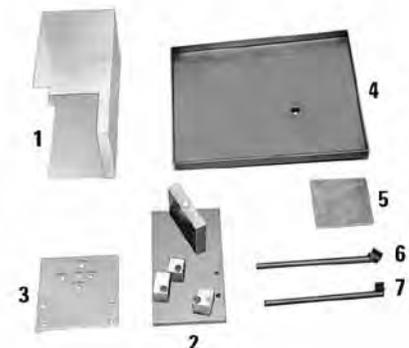
¹These parts are used for both hydraulic and manual operation.

5P-8709 Piston Cooling Jet Alignment Tool Group

Model: Older Cat® Engines including D353, D377, D398, D899, G379, and G399 only

Warranty: Six Months

- Used to check the direction of cooling jet spray — used for 5S-1765, 4N-8986, 2N-4541, 4N-9881, and 5L-4262 Piston Cooling Jets only
- Used with fuel injection equipment test stands (FITB, FIETS, and AVM)
- Group has been updated to eliminate non-current bench tooling
- Tooling is required for off-engine testing of piston cooling jets for the engines listed above only
- Parts are serviced separately to reduce dealer cost (no need to purchase tools already in inventory)



Reference

SMHS7267, Use of 5P-8709 Tool Group

| Item | Description | Quantity | Where Used |
|-------------------|---------------|----------|--|
| Required Hardware | Hose Assembly | 1 | Oil supply #6 (37 degree) x 965.2 mm (38.00 in) long |

(Continued)

5P-8709 Piston Cooling Jet Alignment Tool Group (Continued)

Model: Older Cat® Engines including D353, D377, D398, D899, G379, and G399 only

Warranty: Six Months

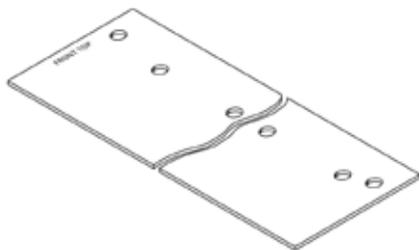
Engine Tools

| Item | Part Number | Description | Quantity | Where Used |
|---|-------------|---|----------|---|
| 1 | 5P-8596 | Screen | 1 | with all benches (FITB, FIETS, and AVM) |
| 6 | 5P-8612 | Cooling Jet Adjustment Wrench | 1 | -- |
| 7 | 5P-8613 | Cooling Jet Adjustment Wrench | 1 | -- |
| -- | 5P-8709 | Piston Cooling Jet Alignment Tool Group | -- | -- |
| 2 | 5P-8597 | Spray Shield | 1 | With FITB, FIETS, and AVM |
| 3 | 5P-8598 | Target | 1 | With FITB, FIETS, and AVM |
| 4 | 5P-8599 | Fixture Assembly | 1 | With FITB, FIETS, and AVM |
| 5 | 5P-8600 | Oil Return Pan | 1 | With FITB bench only (Kent Moore) |
| Required Hardware (not included in group). The following list of hardware is required, but not included as part of the 5P-8709 Piston Cooling Jet Alignment Tool Group. This tooling can be purchased as needed. | | | | |
| -- | 6V-9132 | Fixture Assembly | 1 | target/fixture assembly to bench rails |
| -- | 6V-9134 | Screw Assembly | 1 | fixture assembly to bench rails (short) |
| -- | 6V-9138 | Clamp Assembly | 1 | fixture assembly to rail system |
| -- | 0L-1138 | Bolt | 4 | Target to 6V-9132 |
| -- | 0S-1588 | Bolt | 2 | 5P-8599 to 6V-9132 |
| -- | 032-1267 | Connector | 1 | Oil supply #6 (37 degree) to 1/4-18 NPTF (external) |
| -- | 032-1268 | Elbow, 90 degree | 1 | Oil supply #6 (37 degree) to 1/4-18 NPTF (external) |
| Service/Repair Parts for 5P-8599 Fixture Assembly | | | | |
| -- | 3B-7614 | Bolt | 2 | -- |
| -- | 1L-8793 | Bolt | 1 | -- |
| -- | 4D-3120 | Bolt | 1 | -- |
| -- | 7S-6701 | Bolt | 1 | -- |
| -- | 8H-9208 | Dowel | 8 | -- |

FT2736 Alignment Gauge

Model: 3034 Turbocharged Engines

Warranty: None



- Used to align piston cooling jets
- Helps align all four jets in a single operation
- Can also be used to align earlier versions of piston cooling jets
- Material: Perspex

Application Procedure

1. Put alignment gauge on cylinder block ring dowels
2. Carefully insert steel rods into each jet
For current piston cooling jets use 1.30 mm (0.051 in) diameter rods
For previous piston cooling jets use 1.20 mm (0.047 in) diameter rods
If small diameter rods are not available, use the large diameter rod and machine it to a 1.20 mm (0.047 in) diameter, 8.0 mm (0.13 in) long
Rods inserted into jets must protrude through holes in gauge and extend just above top deck of block
When rods do not protrude through holes in gauge, carefully bend each affected jet until all rods protrude through gauge
3. Remove gauge and rods

Reference

SEN5012-02, Service Manual, System Operations Test and Adjustment

319-6486 Alignment Tool

Essential Tool

Model: C4.4 and C6.6 Industrial Engine

Warranty: Six Months

| Part Number | Description |
|-------------|----------------|
| 319-6486 | Alignment Tool |

- Used to align front housing on engine block
- Used with three 8T-4185 Bolts (M10 x 50 mm long, dealer supplied) to attach tool to engine block
- Tool fits opening in front housing to accurately position housing during assembly
- Overall size: 77 x 25 mm (3.0 x 1.0 in)



Reference

REN9722, Disassembly and Assembly, C6.6 Industrial Engine

1U-9593 Cylinder Pack Puller, 1U-9897 Bridge Group and 1U-6319 Socket

Model: 3176

Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 1U-9897 | Bridge Group |
| 1U-6319 | Socket |
| 1U-9593 | Cylinder Pack Puller |

- 1U-9593 Cylinder Pack Puller used with 1U-9897 Bridge Group to remove cylinder packs or liner only
- 1U-6319 Socket used with 1U-9593 Cylinder Pack Puller; allows use of impact wrench
- 1U-9897 Bridge Group includes 4C-3503 Foot



References

SENR3910, 3176 Service Manual
SEHS9120, Special Instruction, operation

6V-7772 Driver

Model: 3200

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 6V-7772 | Driver |

- Used to install piston cooling orifices



Drivers

Model: 3200

Warranty: Six Months

- Used for installing piston cooling orifices and plugs



| Item | Part Number | Description | Model | Use |
|------|-------------|-------------|---------------|--|
| 2 | 6D-3039 | Pin | -- | -- |
| 3 | 6V-7771 | Driver | 3208 | Install piston cooling jet plugs |
| 1 | 6V-7772 | Driver | 3204 and 3208 | Spring pin in end of driver helps hold orifice on tool until it is driven into place |

198-9113 Seal Installer

Essential Tool

Model: 3034 Engine

Warranty: Six Months



- Used to install rubber seal in front and rear main bearing cap
- Reduces risk of damage to seal's metal core

Reference

3034 Engine Service Manual

| Part Number | Description | Overall Length | Diameter of Large End | Diameter of Small End |
|-------------|----------------|-----------------|-----------------------|-----------------------|
| 198-9113 | Seal Installer | 165 mm (6.5 in) | 50.8 mm (2 in) | 25.4 mm (1 in) |

5P-8595 Honing Tool Group

Model: 6.25 inch Bore, 6-Cylinder Diesel Engines

Warranty: Six Months

- Used to recondition cylinder liners on 158.75 mm (6.25 in) bore, 6-cylinder diesel engines (D398, D379, D399, D353)
- When later pistons with Keystone rings are installed in earlier engines, honing operation necessary to remove liner wear ridge and produce smooth surface
- FT1371 Holding Fixture holds cylinder liners when honing; provides cradle for 3/4 inch (375 RPM) drill

Reference

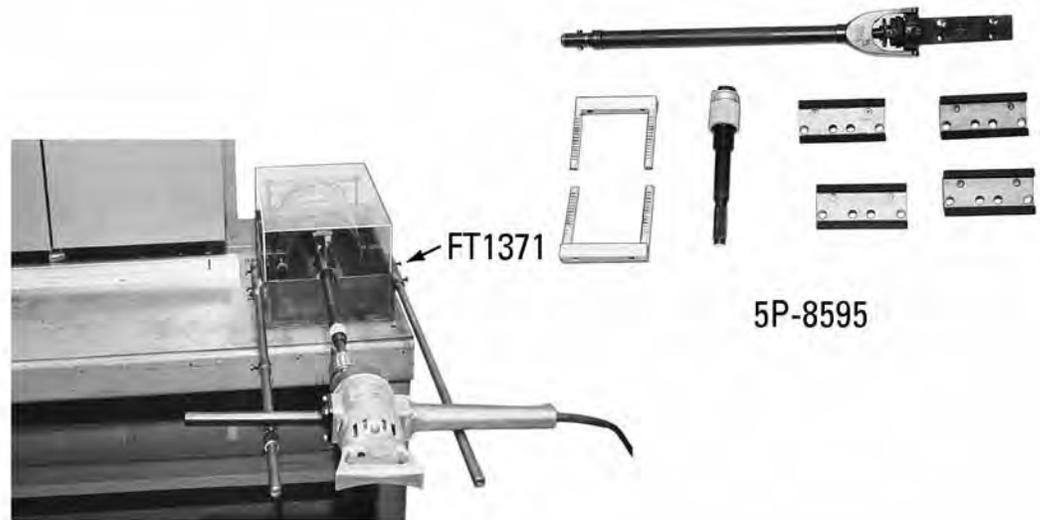
SMHS7220, Special Instruction

(Continued)

5P-8595 Honing Tool Group (Continued)

Model: 6.25 inch Bore, 6-Cylinder Diesel Engines

Warranty: Six Months



Engine Tools

| Part Number | Description |
|-----------------------------|--|
| 5P-8595 | Honing Tool Group |
| Service/Repair Parts | |
| 5P-8592 | Stone, 114.03 - 182.88 mm (4.5 - 7.2 in) Diameter (70 Grit) |
| 5P-8593 | Stone, 114.03 - 182.88 mm (4.5 - 7.2 in) Diameter (600 Grit) |
| 5P-8591 | Holder, Stone |
| 6V-7853 | Stone, 101.6 - 142.24 mm (4.0 - 5.6 in) Diameter (70 Grit) |

FT1283 Cylinder Liner Holding Fixture

Model: Multiple Engine Models

Warranty: None

- Holds cylinder liners firmly in position while using Flex-Hone (Flex-Hone powered by 1/2 inch electric drill suspended with cable and pulley arrangement; other end of cable is counterweighted to make honing easier)
- Additional FT1283 Fixture can be set up for cleaning liners after honing



FT1711 Light Table

Model: Multiple Engine Models

Warranty: None



- Used for inspecting all Cat® cylinder liners
- Fluorescent light source mounted under plexiglass plate
- As many as 6 liners can be placed on fixture at same time
- Adjustable to allow different viewing angles of internal surfaces of liners

FT1561 Cylinder Liner Storage Cabinet

Model: Multiple Engine Models

Warranty: None



- Used to keep cylinder liners clean after reconditioning
- Size (H x W x D): 2134 x 2159 x 1219 mm (84 x 85 x 48 in)

References

Engine and Component Reconditioning Guide

SEBF4569, Cylinder Liner Storage Bulletin R-11

FT1528 Liner Honing Machine

FT1524 Tub Assembly

Model: Multiple Engine Models

Warranty: None



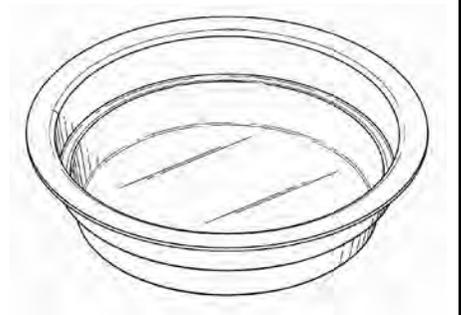
- Automatically hones and cleans cylinder liners in 10 minutes compared to 1/2 hour for manual operation
- Will recondition 4 cylinder liners at same time and put correct crosshatch pattern on liner bores
- Two FT1524 Tub Assemblies and six cylinder liner plates needed to use FT1528 Liner Honing Machine; cylinder liner plates hold liners with 101.6, 114.3, 120.7, 137.2, 146.1, and 158.8 mm (4.0, 4.5, 4.75, 5.4, 5.75 and 6.25 in) bores; correct cylinder liner plate is put into one of the tubs and liners are installed through holes of plate for honing operation; other tub used for cleaning

356-9752 Protective Plug

Model: 3500 Engines
 Warranty: Six Months

| Part Number | Description |
|-------------|-----------------|
| 356-9752 | Protective Plug |

- Used to cover open cylinder bores during service
- Easily and quickly installed and removed
- Covers can be used on 3500 cylinder liners or bare cylinder block bores
- Made of durable plastic
- Stops debris from getting into cylinder block during machining operations.



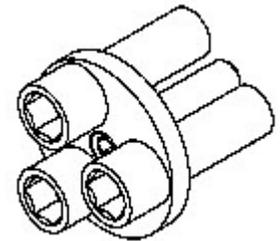
366-5984 Installer Assembly

Model Usage: C7.1, C6.6
 Warranty: Six Months

- Used to correctly install crankshaft front oil seal

| Specifications | |
|----------------|------------------------------|
| Dimensions | 54X50X50 mm (2.1X2.0X2.0 in) |
| Weight | 0.3 kg (0.7 lb) |

| Part Number | Description |
|-------------|--------------------|
| 366-5984 | Installer Assembly |



Cylinder Head, Valves and Cam Followers

Thread Insert Installation Tools

Model: All Engines Models

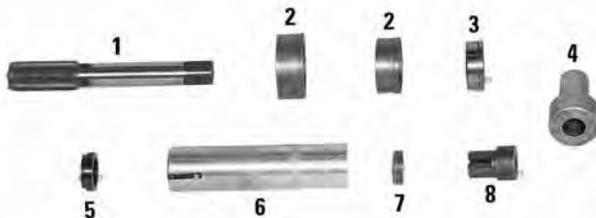
Warranty: Six Months

- Installation of thread inserts provides relatively easy, inexpensive method of reconditioning cylinder heads in which pre-combustion chamber threads have been damaged

Reference

SMHS7697, Special Instruction

| Engine Bore Size | Drill Size | Thread Size | (1) Tap | (3) Tap Guide | (5) Pre - Assembly | (6) Sleeve Insert | (7) Nib | (8) |
|------------------------------------|------------|-------------|------------|------------------|-----------------------|----------------------|------------|---------|
| 95.25 mm (3.75 in) | 1 in | | | 8F-5574 | | 9F-7143 | | |
| 101.60 mm (4.0 in) | 1 in | | | | | 9F-7143 | | |
| 107.95 mm (4.25 in) | 1 1/8 in | | 8F-5577 | 8F-5575 | | 9F-7143 | 8F-5574 | |
| 114.30 mm (4.5 in) | 1 1/8 in | | 8F-5577 | | | 9F-7143 | 8F-5574 | |
| 101.60 mm (4.0 in) | 51/64 in | 3/4 in - 12 | | | | 9F-7143 | | |
| 114.30 mm (4.50 in) | 51/74 in | 3/4 in - 12 | | | | 9F-7143 | | |
| 114.30 mm (4.50 in) | 28/32 in | 7/8 in - 12 | 9M-6595 | | 9M-6594 | 9F-7143 | 9M-6593 | 9M-6596 |
| 114.30 mm (4.50 in) V-8 | 28/32 in | | 9M-6595 | | | | 8S-6400 | |
| 120.65 mm (4.75 in) 4-Valve | 28/32 in | 7/8 in - 12 | 9M-6595 | | | | 8S-6400 | |
| 120.65 mm (4.75 in) 2-Valve | 28/32 in | 7/8 in - 12 | 9M-6595 | | | | 8S-6400 | |
| 130.75 mm (5.12 in) | 1 1/8 in | | 8F-5577 | | | 9F-7143 | 5H-8146 | |
| 130.75 mm (5.12 in) Series F | 1 in | | | | | 9F-7143 | | |



Thread Insert Installation Tools (Continued)

| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|--|------------|---------------|---------|---------|-----------|--------------|----------------|---------------|---------|---------|
| Engine Bore Size | Drill Size | Thread Size | Tap | Pilot | Tap Guide | Drill Winder | Pre - Assembly | Sleeve Insert | Nib | |
| 137.31 mm (5.4 in) | 29/32 in | 7/8 in - 12 | 9M-6595 | | 9M-6591 | 9M-6592 | 9M-6594 | 9F-7143 | 9M-6593 | 9M-6596 |
| D343, 1693 90° V-8 | | | | | | | | | | |
| 137.31 mm (5.4 in) | 29/32 in | 7/8 in - 12 | 9M-6595 | | | 5P-2418 | 9M-6594 | 9F-7143 | 8S-6400 | 9M-6596 |
| 3400 Series, 137.31 mm (5.4 in) | 29/32 in | 7/8 in - 12 | 9M-6595 | | | | 9M-6594 | 9F-7143 | 9M-6593 | 9M-6596 |
| 60° V-8, V-12, V-16, 146.05 mm (5.75 in) | 1 1/4 in | 1 1/4 in - 12 | | | | | | 9F-7143 | 8F-5575 | |
| 146.05 mm (5.75 in) | 1 1/8 in | 1 1/8 in - 12 | 8F-5577 | 1P-3571 | | | | 9F-7143 | 5H-8146 | |
| 158.75 mm (6.25 in) | 1 in | 1 in - 12 | | | | | | 9F-7143 | 8S-6402 | |

Special Length Heli-Coil Inserts

| Thread Size x Length | Description | Part Number |
|------------------------------|-------------------|-------------|
| 3/4-16 x 1.500 ¹ | Insert | 6V-9074 |
| 5/8-11 x 1.250 ¹ | Insert | 6V-9076 |
| M8-1.25 x 16 mm ² | Insert | 9U-5177 |
| M16-2 x 32 mm ² | Insert | 9U-5604 |
| M8-1.25 x 16 mm | Tap | 4C-8475 |
| 5/8-11 x 1.250 | Tap | 4C-9686 |
| 3/4-16 x 1.500 | Tap | 4C-9702 |
| M16-2 x 32 mm | Tap | 4C-9732 |
| 3/4-16 x 1.500 | Installation Tool | 6V-9082 |
| 5/8-11 x 1.250 | Installation Tool | 6V-9083 |
| M8-1.25 x 16 mm | Installation Tool | 8T-2790 |
| M16-2 x 32 mm | Installation Tool | 8T-2799 |

¹Warranty: Manufacturer, One Year

²Warranty: Manufacturer, 30-Day

Valve Guide Drivers and Bushings

Model: All Cat® Diesel Engines, except 1100, 3100, 3208

Warranty: Six Months

- Piloted drivers used to remove and install valve guides
- Most valve guides have flange that prevents driving them past correct depth; guides without flange require a bushing to ensure proper depth



(Continued)

Valve Guide Drivers and Bushings (Continued)

Model: All Cat® Diesel Engines, except 1100, 3100, 3208

Warranty: Six Months

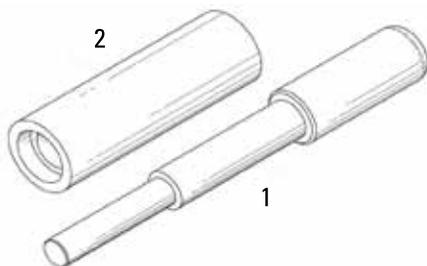
| Valve Guide Drivers and Bushings | | | |
|----------------------------------|---|-----------------|----------------------|
| Bore Size | Engine and Engine Application | Driver Part No. | Bushing Part No. |
| 130 mm (5.125 in) | D326, D337 | 4H-0446 | |
| 146 mm (5.75 in) | D342 | 4H-0446 | |
| 146 mm (5.75 in) | D339, D364, D375, D386, D397 | 4H-0446 | |
| 159 mm (6.25 in) | D353, D379, D398, D399 | 4H-0446 | 5P-1726 |
| 137 mm (5.4 in) | 4-Cylinder, D343, G343, 1693, V-8 90° | 7M-3975 | 5P-1728 |
| 137 mm (5.4 in) | 3406, 3408, 3412 | | 5P-2396 |
| 137 mm (5.4 in) | D346, D348, D349 with 9.53 mm (0.375 in) Grooved Guides | 7M-3975 | 5P-1729 |
| 114 mm (4.5 in) | 1676 | 7S-5919 | |
| 121 mm (4.75 in) | D334, 1674 | 7S-5919 | |
| 121 mm (4.75 in) | D330C, 3304, D333C, 3306 | | 7S-8858 ¹ |
| 170 mm (6.69 in) | G3500, 3500 | 7M-3975 | 5P-1729 |
| 175 mm (6.88 in) | C175 | 283-0052 | 284-1503 |

¹ Includes 9U-7349 Felt Top Marker

Valve Guide Driver and Bushing Essential Tool

Model: 3500 Engines

Warranty: Six Months



- 334-0409 Driver used to remove and install valve guides with flanges
- 334-0410 Bushing used with 334-0409 Driver to install valve guides without flanges to proper depth
- Used on 201-4257, 239-0690, and 239-0691 Cylinder Heads
- Tools have black oxide coating to prevent corrosion
- Heat-treated for added durability

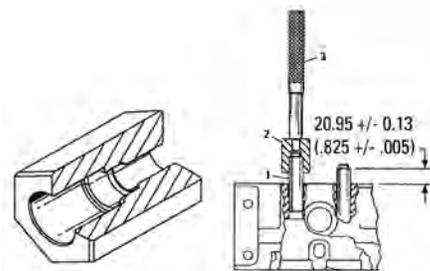
| Item | Part No. | Description |
|------|----------|---------------------|
| 1 | 334-0409 | Valve Guide Driver |
| 2 | 334-0410 | Valve Guide Bushing |

124-9057 Guide Collar (Swirl)

Model: 3406C Engines with Swirl Inlet Valve Seats/Inserts

Warranty: Six Months

- Used to quickly and accurately install discontinued 121-4317 Valve Guide to proper installation height
- Used with 9U-6895 Valve Guide Driver
- Install valve guide into guide collar, install 9U-6895 Valve Guide Driver into guide collar, and drive it into place (when guide collar contacts surface of cylinder head, valve guide is at proper height)
- Guide collar is heat-treated and plated for durability
- Size: 31.8 mm (1.25 in) hex
- Length: 44.5 mm (1.75 in)



| Item | Part Number | Description |
|------|-------------|-------------------|
| 1 | 121-4317 | Valve Guide |
| 2 | 124-9057 | Guide Collar |
| 3 | 9U-6895 | Valve Seat Driver |

Valve Guide Installation Tooling

Essential Tool

Model: 3406C Engines with Swirl Inlet Valve Seats/Inserts

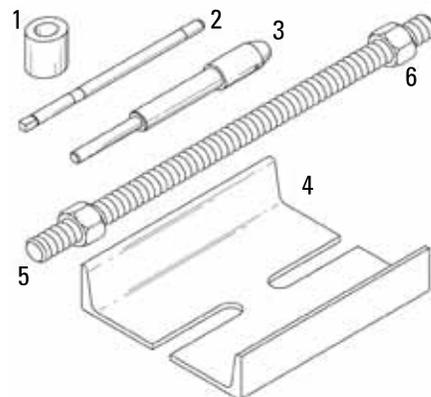
Warranty: Six Months on 328-6001 and 328-6003 Only

- Used to install 184-5494 and 184-5495 Valve Guides — quickly and accurately
- 328-6001 Driver is hardened (RKW C40-50) for long service life
- FT3123 is made from a modified 7M-3975 Driver Assembly
- FT3124 is made from SAE 1020M steel
- FT3125 is made up of 3/4-10 threaded rod (SAE 1020M) and two 6V-8182 Nuts

Reference

SEBF9137, Guideline for Reusable Parts and Salvage Operations, Installation and Removal of Valve Guides and Valve Seat Inserts for G3500 Series of Engines

| Item | Part Number | Description |
|------|-------------|-----------------------|
| 3 | FT3123 | Valve Guide Driver |
| 4 | FT3124 | Valve Guide C-Channel |
| 5 | FT3125 | Threaded Rod |

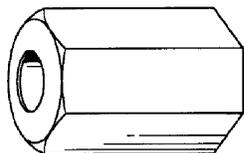


| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | 328-6001 | Valve Guide Bushing |
| 2 | 328-6003 | Valve Guide Reamer |
| 6 | 6V-8182 | Full Nut, 3/4 in - 10 thd |

9U-6954 Guide Collar

Model: 3300 Engines

Warranty: Six Months



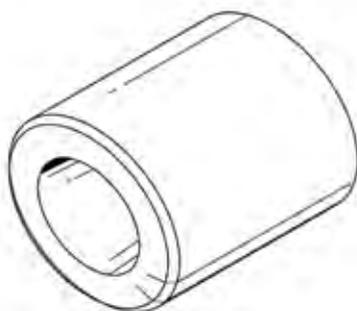
- Used to install stepped valve guides to correct height
- Prevents damage to valve guide during installation
- Saves time by automatically controlling guide height
- Height of valve guide above head: 22.23 ± 0.25 mm (0.875 ± 0.010 in)

| Part Number | Description |
|-------------|--------------|
| 9U-6954 | Guide Collar |

149-4008 Valve Guide Collar

Model: 3126B Engines

Warranty: Six Months



- Used to install exhaust valve guides to correct depth in cylinder heads
- Used with 9U-6895 Driver
- Installs valves guides to a consistent depth each time (removes guess work and time consuming measurements)
- Heat-treated for durability
- Overall length: 39.8 mm (1.57 in)
- Outside diameter: 28.5 mm (1.12 in)

| Part Number | Description |
|-------------|--------------------|
| 149-4008 | Valve Guide Collar |

9U-6220 Stop Collar

Model: 3054 and 3056 Engines (all SN's)

Warranty: Six Months



- Used to install valve guides to proper height of 15.10 mm (0.594 in)
- Used with 1U-9169 Guide Driver (7ZK, 6FK, 7AK, 1 ML)
- Used with 157-3722 Guide Driver (5YS, 7MS, 2PW, 3GW)
- Zinc coated to prevent corrosion

| Part Number | Description |
|-------------|-------------|
| 9U-6220 | Stop Collar |

342-6109 Stop Collar

Model: C9 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 342-6109 | Stop Collar |

- Used to install 259-5829 Valve Guide to proper height
- Used with 4C-6366 Guide Driver
- Prevents damage to valve guide during installation
- Black oxide coating for corrosion resistance



157-3722 Valve Guide Driver

Model: 3054, 3056 Engines (serial no. 5YS, 7MS, 2PW, and 3GW)
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 157-3722 | Guide Driver |

- Used to remove and install valve guides
- Used with 9U-6220 Stop Collar
- Heat-treated for added durability

| | |
|------------------|---------------------|
| Small diameter | 8.40 mm (0.331 in) |
| Larger diameter | 12.75 mm (0.502 in) |
| Overall diameter | 19.05 mm (0.750 in) |
| Overall length | 233.5 mm (9.19 in) |



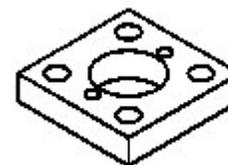
364-3081 Alignment Guide

Model Usage: G3500 Engines
Warranty: Six Months

- Provides valve guide alignment during installation procedure
- Provides for the proper installation depth of the valve guides

Reference:
SEBF9137

| Specifications | |
|----------------|---|
| Dimensions | 120 x 120 x 26 mm (4.72 x 4.72 x 1.02 in) |
| Weight | 2.07 kg (4.56 lbs) |
| Material | Steel |

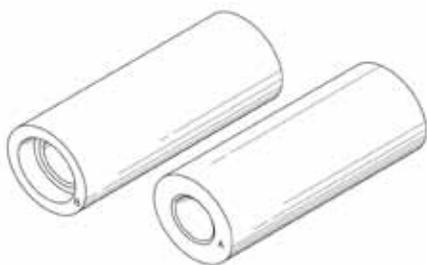


| Part Number | Description |
|-------------|-----------------|
| 364-3081 | Alignment Guide |

275-2423 Valve Guide Installer

Model: G3408 and G3412 Engines

Warranty: Six Months



- Used to install both intake and exhaust valve guides to two different heights (depends on which end of tool is placed against valve guide)
- Used with 9U-7349 Valve Guide Driver
- Inserting driver into end A will install 213-7537 Exhaust Valve Guide to required 32.3 mm (1.27 in) height
- Inserting 9U-7349 Valve Guide Driver into end B will install 213-7536 Intake Valve Guide to required 26.0 mm (1.02 in) height
- Used with a hydraulic press rather than hammer to prevent damage to top of valve guide

| Part Number | Description |
|-------------|-----------------------|
| 275-2423 | Valve Guide Installer |

Reference

SENR6432, Service Manual, Disassembly and Assembly, G3408 & G3412 Engines

FT1565 Valve Guide Removal and Installation Tool

Model: All Cat® Engines with replaceable valve guides

Warranty: None



- Used with Winona Van Norman PH-7000 Heavy Duty Production Headmaster System and bed extension
- Valve guides hydraulically removed and installed on all Cat® engines that have cylinder heads with replaceable valve guides
- Generally installed on left rear corner of main table
- C-frame assembly of tool has 3 pivot points that give it many positions for use; single-action hydraulic cylinder fastened to this frame and controlled by foot-operated air driven hydraulic pump

Reference

SEBF4570, Engine and Component Reconditioning Guide Bulletin R-12, "The FT1565 Valve Guide Removal and Installation Tool"

6V-7770 Valve Guide Tool Kit

6V-7755 Spring Seat Guide

Model: 1100, 3100, 3200

Warranty: Six Months



- Used for installing valve guide sleeves in cylinder heads
- Used with 6V-3095 Boring Fixture and 6V-3108 Boring Fixture Kit
- Valve guides in cylinder heads of 1100, 3100 and 3200 Family Engines not replaceable; when valve guide wears beyond 9.55 mm (0.3760 in) diameter "Use Again" dimension, guide must be reconditioned or complete cylinder head replaced
- 6V-7770 Tool Kit and 6V-7755 Adapter provide tools necessary to bore worn valve guides for installation of 4W-3778 and 4W-3779 Valve Guide Sleeves; tool kit includes driver to install valve guide sleeves and two reamers to size inside diameter of valve guide sleeves to correct dimension

Reference

SMHS82770-01, Special Instruction

(Continued)

6V-7770 Valve Guide Tool Kit (Continued)

6V-7755 Spring Seat Guide

Model: 1100, 3100, 3200

Warranty: Six Months

| Item | Part Number | Description | Size |
|--|-------------|-------------------|---------------------|
| 1 | 6V-7770 | Valve Guide Kit | -- |
| 2 | 6V-7755 | Spring Seat Guide | -- |
| Service/Repair Parts for 6V-7770 Kit, Includes: Line Up Bushing and Drill Bushing | | | |
| -- | 5P-5173 | Reamer | 9.47 mm (0.373 in) |
| -- | 5P-5174 | Reamer | 9.499 mm (0.374 in) |
| -- | 5P-5176 | Brush | -- |
| -- | 6V-7155 | Core Drill | -- |
| -- | 6V-7156 | Reamer | 12.7 mm (0.500 in) |
| -- | 6V-7157 | Driver | -- |
| -- | 6V-7158 | Pin | -- |
| Not Shown | | | |
| -- | 9U-5987 | Oil | 0.236 L (1/2 pint) |

1U-6685 Guide and Insert Tool Group

Model: 3114, 3116

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------|
| 1U-7792 | Guide Collar |
| 1U-7793 | Guide Driver |
| 1U-7794 | Shaft Assembly |
| 1U-7795 | Holding Block |
| 1U-7796 | Exhaust Extractor |
| 1U-7797 | Inlet Extractor |
| 1U-7798 | Slide Hammer |
| 1U-8211 | Lid Filler Block |
| 6V-7145 | Case |

- Required for disassembly, assembly, and adjusting of 1.1 liter engine, fuel system, and governor
- Used for valve guide and valve seat removal and installation

References

SENR3582, Specification Module
SENR3583, System Operation Testing and Adjusting
SENR3611, Disassembly and Assembly Manual

| |
|-------------------|
| Included: |
| Valve Seat Driver |



149-6115 Valve Seat Installer

Model: 3126B Engines

Warranty: Six Months

- Used to install intake and exhaust valve seats
- Used with hydraulic press (valve seats should not be installed using this tool and a hammer)
- Heat-treated for added durability
- To install valve seats, place a 7N-1819 Valve Guide or a piece of suitable tubing over the pin and press into place using hydraulic press (if tubing is used, both ends must be machined squarely)

Reference

Engine Service Manual



(Continued)

Cylinder Head, Valves and Cam Followers

149-6115 Valve Seat Installer (Continued)

Model: 3126B Engines

Warranty: Six Months

| | |
|----------------------|-------------------------|
| Length of tubing | 103 mm (4.0 in) minimum |
| Small end of driver | intake seats |
| Larger end of driver | exhaust seats |

| Part Number | Description |
|-------------|----------------------|
| 149-6115 | Valve Seat Installer |

Engine Tools

1U-9654 Tool Group

Discontinued — Service Parts Available



Reference

SEN3910, 3176 Service Manual

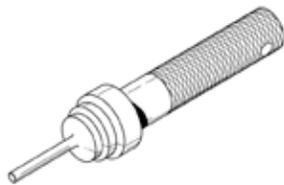
All part numbers in the table have a six month warranty

| Part Number | Description |
|-------------|------------------|
| 1U-9168 | Guide Collar |
| 1U-9169 | Driver |
| 1U-9170 | Driver |
| 1U-9706 | Plate |
| 6V-7145 | Case |
| 1U-8211 | Lid Filler Block |
| 1U-7795 | Holding Block |
| 9U-6460 | Guide Collar |
| 1U-9654 | Tool Group |

132-4379 Valve Seat Driver (HEUI)

Model: 3114, 3116, and 3126 (HEUI) Engines

Warranty: Six Months



- Used to install 126-0453 Insert (inlet) and 1W-2713 Insert (exhaust) — helps eliminate damage to insert which can occur when a driver is not used
- Long pilot serves as a guide during installation
- Tool ensures that all seats are installed uniformly and to proper depth
- Hardened for added durability — knurled handle provides better grip

| | |
|---------------------|-------------------|
| Overall tool length | 212.0 mm (8.3 in) |
| Pilot length | 81.0 mm (3.2 in) |
| Pilot diameter | 7.9 mm (0.311 in) |

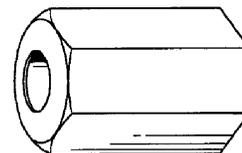
| Part Number | Description |
|-------------|-------------------|
| 132-4379 | Valve Seat Driver |

9U-6460 Guide Collar

Model: 3176 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 9U-6460 | Guide Collar |

- Used to install stepped valve guide without damage to guide
- Used with 1U-9169 Driver for valve guide removal with discontinued 1U-9654 Tool Group
- Installation height of guide is automatically set (drive guide collar down until it bottoms against top surface of cylinder head)
- Made from high strength steel and heat treated — provides a quality, long-lasting tool
- Bright nickel coating and hex shape provide easy identification



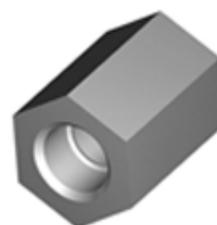
421-9848 Guide Collar

Model Usage: C9 Engines
Warranty: Six Months

- Used to quickly and correctly install intake valve guides on C9 engines with 252-8439 head to correct depth and protrusion
- Used to install stepped valve guide without damage
- Installation guide height is automatically set
- Material: High strength heat treated steel provides a high quality, long-lasting tool

| Specifications | |
|----------------|-------------------------------|
| Dimensions | 40 x 28.6 mm (1.57 x 1.12 in) |
| Weight | .17 kg (.37 lb) |

| Part Number | Description |
|-------------|--------------|
| 421-9848 | Guide Collar |



9U-6137 Installation Guide Collar

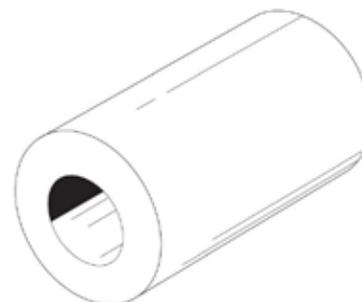
Model: 3064 and 3066 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|---------------------------|
| 9U-6137 | Installation Guide Collar |

- Used to install valve guides to 17.00 mm (0.669 in) above the top of the cylinder head (quickly and easily installs to correct height)
- Used with 1U-7793 Guide Driver
- Zinc coated to prevent corrosion

Reference

SENR5553, Service Manual, 3066 Diesel Engines

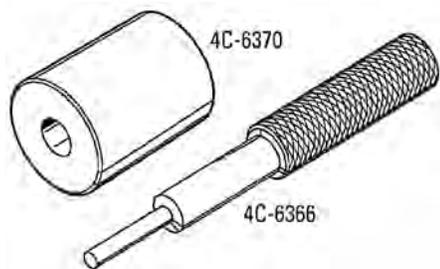


4C-6366 Valve Guide Driver

4C-6370 Guide Collar

Model: 3046 Diesel Engine

Warranty: Six Months



- Used to remove and install valve guide
- Ensures proper height of valve guide
- Knurled handle for better handling
- Guide collar stop height: 14.00 ± 0.10 mm (0.552 ± 0.004 in)

| Part Number | Description |
|-------------|--------------------|
| 4C-6366 | Valve Guide Driver |
| 4C-6370 | Guide Collar |

Reference

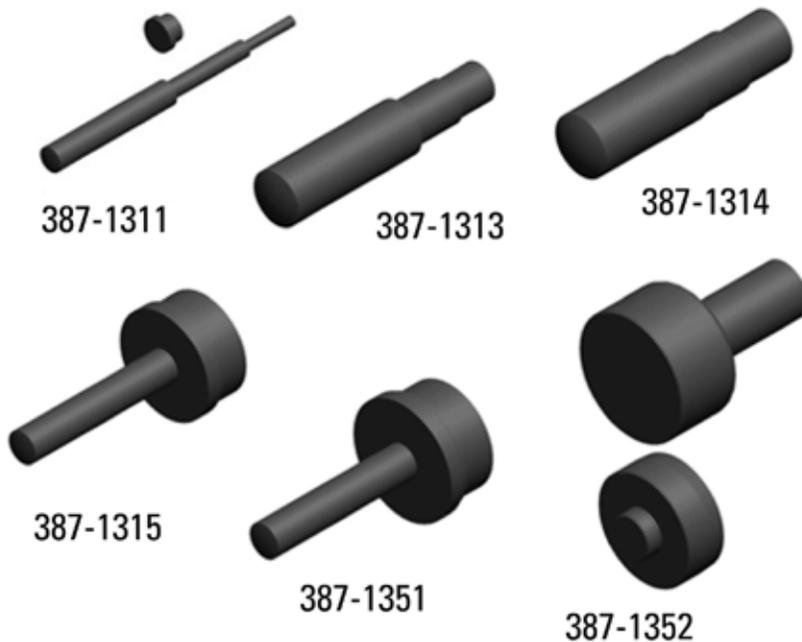
SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engine

C1.8/C2.4 Tooling

Model Usage: 305E, 304E, 303.5E

Warranty: Manufacturer's

- 387-1311 - used to install and remove valve guide
- 387-1313 - used to remove piston wrist pin
- 387-1314 - used to remove idler gear bushings
- 387-1315 - used to remove crankshaft bearing
- 387-1351 - used to install crankshaft bearing
- 387-1352 - used to install rear crankshaft wear sleeve and guide



| Specifications | | |
|----------------|---------------------------------|--|
| Part Number | Description | Dimensions |
| 387-1311 | Valve Guide Driver | 225 x 19.05 x 19.05 mm (8.86 x .75 x .75 in) |
| 387-1313 | Wrist Pin Removal Tool | 162 x 34.9 x 34.9 mm (6.38 x 1.37 x 1.37 in) |
| 387-1314 | Idler Gear Bushing Removal Tool | 175 x 45 x 45 mm (6.89 x 1.77 x 1.77 in) |

(Continued)

C1.8/C2.4 Tooling (Continued)

Model Usage: 305E, 304E, 303.5E

Warranty: Manufacturer's

| Specifications | | |
|----------------|--|--|
| Part Number | Description | Dimensions |
| 387-1315 | Crankshaft Bearing Removal Tool | 135 x 64.7 x 64.7 mm (5.31 x 2.55 x 2.55 in) |
| 387-1351 | Crankshaft Bearing Installation Tool | 130.5 x 88 mm (5.14 x 3.46 in) |
| 387-1352 | Crankshaft Wear Sleeve Installation Tool | 139.9 x 90 mm (5.51 x 3.54 in) |

C9.3 Valve Guide and Valve Seat Installer Tools

Model Usage: C9.3

Warranty: Six Months

- Used to install valve guides and seats for C9.3 engines
- Long pilot, valve seat installer, serves as a guide during installation
- Assures seats and guides are installed to proper depths



| Specifications | | | |
|----------------|-----------------------|------------------------------|-------------------|
| Part Number | Description | Dimensions | Weight |
| 362-5404 | Valve Guide Installer | 47 x 25 mm (1.85 x .98 in) | .141 kg (.31 lb) |
| 364-4009 | Valve Seat Installer | 207 x 42 mm (8.15 x 1.65 in) | .682 kg (1.50 lb) |

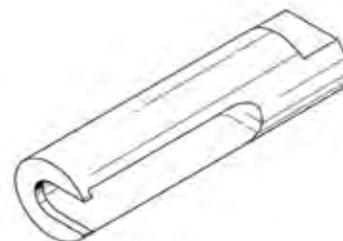
4C-8134 Valve Guide Seal Remover

Model: 3046 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------------|
| 4C-8134 | Valve Guide Seal Remover |

- Used to remove valve guide seal
- Used with 1U-7600 Slide Hammer
- Tapped hole for slide hammer: 1/2 - 20
- Wrench flat: 19 mm (3/4 in)



Valve Guide Ream and Hone Tools

Model: Multiple Engine Models

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 5P-7289 | Mandrel |
| 5P-7290 | Sleeve |
| 5P-7291 | Stone |
| 5P-7292 | Adapter |

- Used with head and driver from 1P-7451 Valve Guide Honing Group to ream and hone 12.7 mm (0.5 in) valve guides on D379, D398, D399, G379, G398, G399

Reference
GMG00866



1P-7451 Valve Guide Honing Group

Model: Multiple Engine Models

Warranty: Six Months



- Provides precise method for sizing grooved valve guides on D346, D348, D349
- 5P-3536 Valve Guide Gauge Group recommended for measuring all current engine valve guides; however, 1P-7452 Valve Guide Measuring Group for 0.375 mm (0.0014 in) diameter guides still available

Reference

SMHS7526, Special Instruction

| Item | Part Number | Description |
|------|-------------|-----------------------------|
| 1 | 1P-7455 | Mandrel |
| 2 | 1P-7454 | Stone (7) |
| 3 | 1P-7457 | Truing Sleeve |
| 4 | 1P-7458 | Driver |
| 5 | 1P-7459 | Reamer, 9.42 mm (0.371 in) |
| 6 | 1P-7452 | Valve Guide Measuring Group |
| 7 | 5P-8615 | Honing Oil, 18.9 L (5 gal) |
| -- | 1P-7451 | Valve Guide Honing Group |

5P-5170 Valve Guide Knurling Group

Model: 1100, 3100 and 3208

Warranty: Six Months



- Used to recondition cylinder heads and valve guides that are 9.4 to 10 mm (0.371 to 0.375 in) in diameter
- Among models that can be serviced are 1100, 3100 and 3208 Engines; other arbor and reamer sizes adaptable to all current and most non-current Cat® engines are available separately; arbor and reamer sizes not listed can be obtained from K-Line Industries, Inc., 315 Garden Avenue, Holland, Michigan 49423

Reference

SMHS6747, Special Instruction

| Part Number | Description | Size |
|---------------------|----------------------------|---------------------|
| 5P-5170 | Valve Guide Knurling Group | -- |
| Consists of: | | |
| 5P-5171 | Reamer | 9.423 mm (0.371 in) |
| 5P-5172 | Reamer | 9.423 mm (0.371 in) |
| 5P-5173 | Reamer | 9.47 mm (0.373 in) |

| Part Number | Description | Size |
|---------------------------------|----------------|---------------------|
| Consists of: (Continued) | | |
| 5P-5174 | Reamer | 9.499 mm (0.374 in) |
| 5P-5175 | Knurling Arbor | 9.423 mm (0.371 in) |
| 5P-5176 | Brush | -- |
| 5P-5177 | Speed Reducer | -- |
| 9U-5987 | Oil | 0.236 L (1/2 pint) |

(Continued)

5P-5170 Valve Guide Knurling Group (Continued)

Model: 1100, 3100 and 3208

Warranty: Six Months

| Part Number | Description | Size |
|--|----------------|----------------------|
| Other Arbors and Reamers -- Not Included in 5P-5170 (Sold Separately) | | |
| 5P-5188 | Knurling Arbor | 7.924 mm (0.312 in) |
| 5P-5189 | Knurling Arbor | 10.312 mm (0.406 in) |
| 5P-5190 | Knurling Arbor | 12.7 mm (0.500 in) |
| 5P-5179 | Reamer | 7.874 mm (0.310 in) |
| 5P-5180 | Reamer | 7.899 mm (0.311 in) |

| Part Number | Description | Size |
|--|-------------|----------------------|
| Other Arbors and Reamers -- Not Included in 5P-5170 (Sold Separately) (Continued) | | |
| 5P-5182 | Reamer | 10.185 mm (0.401 in) |
| 5P-5184 | Reamer | 12.573 mm (0.495 in) |
| 5P-5185 | Reamer | 12.598 mm (0.496 in) |
| 5P-5186 | Reamer | 12.623 mm (0.497 in) |
| 6V-7156 | Reamer | 12.7 mm (0.500 in) |

5P-3536 Valve Guide Gauge Group

Model: Multiple Engine Models

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 5P-3536 | Valve Guide Gauge Group |

- Provides method for quickly and accurately measuring all current valve guides for size, taper, and out-of-roundness on D379, D398, D399, G379, G398 and G399
- Contains 3 probes, 3 master ring gauges, and a dial bore gauge
- Probes sized to cover all current valve guides: 7.92 mm (0.312 in), 9.52 mm (0.375 in), and 12.7 mm (0.500 in)
- Each probe long enough to reach completely through longest guide
- Gauge graduated in 0.005 mm (0.0002 in) increments with useable range of 0.38 mm (0.015 in) for each probe

Reference

GMGO2562, Special Instruction

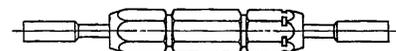


Valve Guide Gauges

Model: Cat® Engines

Warranty: Six Months

- Used for quick, accurate checking of valve guide wear limits on Cat® Engines
- Gauges are double-ended to permit checking maximum and minimum valve guide bore dimensions



(Continued)

Valve Guide Gauges (Continued)

Model: Cat® Engines

Warranty: Six Months

Engine Tools

| Valve Guide Gauge Application | | |
|--------------------------------------|---|---|
| Part Number | Engines In Which Gauge (Red End) is Used to Check Worn Valve Guides | Engines In Which Gauge (Green End) is Used to Check New or Knurled Value Guides |
| Valve Guide Gauge Application | | |
| 6V-7058 | 9.55 mm (0.376 in), 1673, 1693, 1100, Series, 3100 Series, 3204 3208, 3304, 3306, D330C, D333C, D342, D343, D346, D348, D349, D353, D379, D398, D399, 137.2 (5.4 in) Bore 90 degree V-8 | 9.5 mm (0.374 in), 1100 Series, 3100 Series, 3204 and 3208 |
| 6V-7068 | 9.54 mm (0.3755 in), 3406, 3408, 3412, 3508, 3512, 3516, 9.65 mm (0.38 in) intake and exhaust valve | 9.460mm (0.3725 in), 3304, 3306, 3406, 3408, 3412 |
| 261-3687 | 12.672 mm (0.498 in), 3508, 3512, 3516, 12.7 mm (0.5 in) exhaust valves only | 12.594 mm (0.4958 in) |
| 6V-7895 | 12.775 mm (0.503 in), D353, D379, D398, D399 | -- |
| 4C-9734 | 8.08 mm (0.318 in), 3114, 3116 | 8.035 mm (0.316 in) |

5S-1330 Pneumatic Valve Spring Compressor

Model: All Engines except 3600

Warranty: Six Months



- Timesaver when removing and installing valve keepers
- Discontinued 5S-1326 Special Adapter used in place of regular jaws for servicing D343 and 1693 Engines

| Item | Part Number | Description | Size |
|------|-------------|-----------------------------------|---|
| -- | 5S-1330 | Pneumatic Valve Spring Compressor | -- |
| 1 | 5S-1325 | Frame | -- |
| 3 | 5S-1326 | Cylinder Special Adapter | -- |
| 2 | 5S-1323 | Cylinder | -- |
| 4 | 5S-1327 | Jaw | [25.4 mm (1 in) - 44.45 mm (1 1/4 in) Cap] |
| 5 | 5S-1328 | Jaw | [28.57 mm (1 1/8 in) - 50.8 mm (2 in) Cap] |
| 6 | 5S-1329 | Jaw | [38.1 mm (1 1/2 in) - 63.5 mm (2 1/2 in) Cap] |

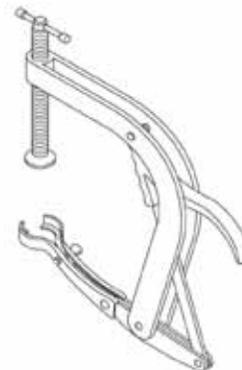
1P-3527 Valve Spring Compressor

Model: 1.1, 1.2, 3126B, 3200, 3300, 3400

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 1P-3527 | Valve Spring Compressor |

- Quick and easy way to remove valve springs
- Hand operated
- An alternative to the 5S-1330 Pneumatic Spring Compressor when compressed air is not available
- Cylinder head must be off the engine



6V-4062 Injector Spring Compressor

Model: 3500 Marine

Warranty: Six Months

| Part Number | Description |
|-------------|----------------------------|
| 6V-4062 | Injector Spring Compressor |

- Used to check fuel injection — will move freely under its own weight
- Rack movement needs to be checked in several positions

Reference

SENR4693, 3516 Marine Disassembly and Assembly



7F-4292 Valve Spring Compressor Group

Model: 1100, 3100, 3208

Warranty: Six Months

- Used to remove and install valve springs manually
- Engines with recessed valve spring chambers require 7M-3976 Adapter; 1100 and 3100 Series and 3208 Engines require 8S-2277 Adapter Assembly

| Part Number | Description |
|-------------|--|
| 7F-4292 | Valve Spring Compressor Group |
| 7F-4291 | Compressor Assembly |
| 8S-2277 | Adapter Assembly (1100, 3100 Series, 3208) (Not part of 7F-4292) |
| 7M-3976 | Adapter (D343, 1693) (Not part of 7F-4292) |



9U-6144 Adapter Assembly

Model: 3064 and 3066 Engines

Warranty: Six Months



- Used for manual removal of valve springs (adapts 7F-4292 Compressor Group to 3064 and 3066 Engines)
- Can also be used with 9U-6145 Air Connector to remove valve springs without removing head

Reference

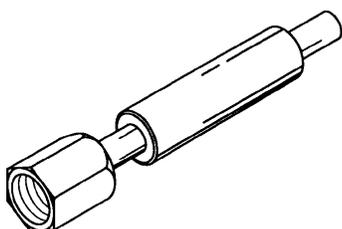
SEN5553, Service Manual, 3066 Diesel Engines

| Part Number | Description |
|-------------|------------------|
| 9U-6144 | Adapter Assembly |

9U-6145 Air Connector

Model: 3064 and 3066 Engines

Warranty: Six Months



- Used to replace valve springs and guide seals without removing the head (allows on-engine replacement)
- Air connector fits into cylinder head injector port to put shop air into combustion chamber (prevents valve from dropping into cylinder bore)
- Used with 7F-4292 Valve Spring Compressor and 9U-6144 Compressor Adapter
- Part of 9U-6274 Compression Test Kit (connector can be ordered separately if the test kit is not needed)

Reference

SEN5553, Service Manual, 3306 Diesel Engines

| Part Number | Description |
|-------------|---------------|
| 9U-6145 | Air Connector |

| | |
|--------------------|---------------------|
| Overall length | 153 mm (6.0 in) |
| Small end diameter | 7.15 mm (0.281 in) |
| Body diameter | 16.75 mm (0.659 in) |
| Air connection | 1/4-18 NPTF |
| Hex head | 19.0 mm (0.75 in) |

268-1971 Compression Adapter

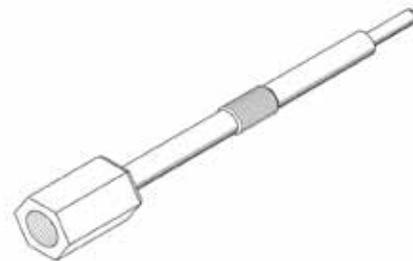
Essential Tool

Model: C6.6 Engines

Warranty: None

| Part Number | Description |
|-------------|---------------------|
| 268-1971 | Compression Adapter |

- Used to adapt compression tester



1U-9347 Valve Spring Compressor Group

Model: 3400

Warranty: Six Months

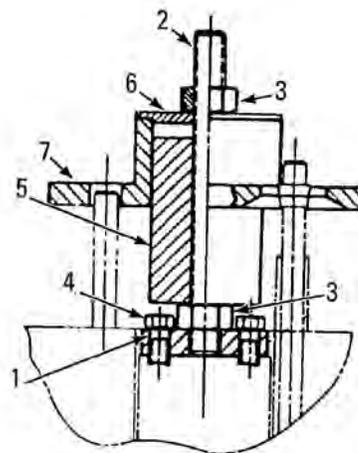
- Used to remove and install valve springs on 3400 Family Engines equipped with earlier-style fuel nozzle adapter or new-style adapter
- Compresses all valve springs on one cylinder at same time; safely retains them while the valve locks are removed
- Can be used with cylinder head on or off engine
- Saves time, especially for on-engine applications
- Applications: replacing valve stem seals and springs, removing springs to service the unit injector sleeve

Reference

SEHS9032, Special Instruction

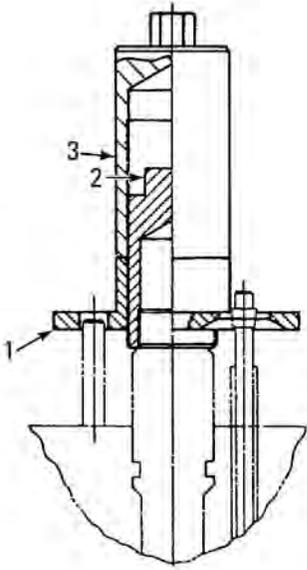
Earlier Style Nozzle Adapters

| Item | Description |
|------|----------------|
| 1 | Adapter Plate |
| 2 | Stud |
| 5 | Collar |
| 6 | Spacer |
| 7 | Plate Assembly |



| Item | Part Number | Description | Quantity |
|------|-------------|-------------------------------|----------|
| 3 | 1D-4719 | Nut | 2 |
| 4 | 0S-1618 | Bolt | 2 |
| -- | 1U-9347 | Valve Spring Compressor Group | -- |

Later Style Nozzle Adapters



| Item | Description |
|------|------------------|
| 1 | Plate Assembly |
| 2 | Adapter Assembly |
| 3 | Adapter Assembly |

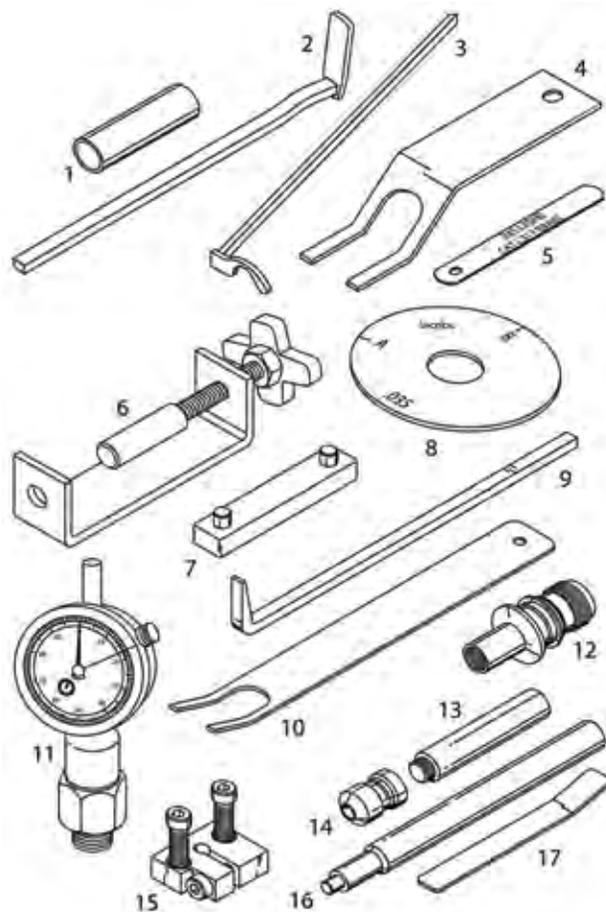
Service Tools for Jacobs Vehicle Systems (Jake Brake®)

Essential Tool

Model: C-10, C-12, 3176/B, 3306B/C, 3406B/C/E Truck Engines

Warranty: Six Months

- Used to quickly and accurately install or service Jake Brake Units on Cat® On-Highway Truck Engines and articulated trucks
- All tools are genuine OEM parts
- Tools can be ordered individually
- 149-6112 Trigger Upgrade Kit allows rotation of dial indicator in early trigger sets kits
- 143-6452 Fuel Line Protective Kit includes caps to seal fuel lines from contamination during a retrofit (for 3406B and C Engines only)
- 149-6111 Oil Pressure Test Kit includes a solenoid valve o-ring pack (pack not available separately). Individual O-rings are available by ordering 2U-1493 Seal Ring, Lower, 2U-1492 Seal Ring, Middle, and 143-6642 Seal Ring, Upper.



| Item | Part Number | Description |
|------|-------------|--|
| 1 | 149-6108 | Installation Support Tool ¹ |
| 2 | 134-2836 | Feeler Gauge, 1.70 mm (0.067 in) ¹ |
| 2 | 149-0054 | Adjusting Gauge, 0.457 mm (0.018 in) ¹ |
| 2 | 149-6105 | Adjusting Gauge, 2.03 mm (0.08 in) ¹ |
| 2 | 149-0050 | Adjusting Gauge, 2.29 mm (0.09 in) ¹ |
| 3 | 149-0059 | S/P Adjusting Gauge, 3.43 mm (0.135 in) ¹ |
| 4 | 149-0053 | Feeler Gauge, 1.52 mm (0.06 in) ¹ |
| 4 | 149-0052 | Feeler Gauge, 1.78 mm (0.07 in) ¹ |
| 5 | 149-0055 | Feeler Gauge, 0.508 mm (0.02 in) ¹ |

| Item | Part Number | Description |
|------|-------------|--|
| 5 | 149-6114 | Feeler Gauge, 0.635 mm (0.025 in) ¹ |
| 5 | 149-0056 | Feeler Gauge, 1.14 mm (0.045 in) ¹ |
| 5 | 150-7227 | Feeler Gauge, 1.02 mm (0.04 in) ¹ |
| 5 | 149-0058 | Feeler Gauge, 1.27 mm (0.05 in) ¹ |
| 6 | 134-2837 | Slave Piston Tool |
| 7 | 149-6113 | Bridge Set Gauge Package ¹ |
| 8 | 149-0114 | Slave Lash Gauge, 0.889 mm (0.035 in) ¹ |
| 9 | 149-6110 | M/P Holding Wedge ² |
| 10 | 149-0051 | Feeler Gauge, 2.03 mm (0.08 in) ¹ |
| 11 | 149-6109 | Trigger Adjusting Group with Dial Indicator |

(Continued)

Cylinder Head, Valves and Cam Followers

Service Tools for Jacobs Vehicle Systems (Jake Brake®) (Continued)

Essential Tool

Model: C-10, C-12, 3176/B, 3306B/C, 3406B/C/E Truck Engines

Warranty: Six Months

Engine Tools

| Item | Part Number | Description |
|------|-------------|--|
| 12 | 150-3618 | Pressure Test Solenoid Valve ³ |
| 13 | 150-3617 | Pressure Test Adapter ³ |
| 14 | 150-3616 | C/V Pressure Test Body ³ |
| 15 | 149-6104 | Dowel Extractor ¹ |
| 16 | 150-3619 | C/V Cover Removal Tool ³ |
| 17 | 149-0028 | Feeler Gauge, 0.686 mm (0.027 in) ¹ |
| 17 | 149-0049 | Feeler Gauge, 0.762 mm (0.03 in) ¹ |
| 17 | 155-5238 | Feeler Gauge, 0.838 mm (0.033 in) ¹ |

| Item | Part Number | Description |
|------------------|-------------|---|
| 17 | 155-5239 | Feeler Gauge, 0.94 mm (0.037 in) ¹ |
| Not shown | | |
| -- | 149-6106 | Cat® Tool Kit |
| -- | 149-6107 | Tool Box ¹ |
| -- | 149-6111 | Oil Pressure Test Kit |
| -- | 149-6112 | Trigger Adjusting Group Upgrade Kit |
| -- | 143-6452 | Fuel Line Protective Kit ¹ |
| -- | 150-7145 | Pressure Gauge 0 - 700 kPa (0 - 101.5 psi) ³ |

¹ Part of 149-6106 Tool Kit-Cat®

² Part of 149-6109 Trigger Adjusting Group

³ Part of 149-6111 Oil Pressure Test Kit

376-7704 Intake Gauge

376-7716 Exhaust Gauge

Model Usage: CT11, CT13, CT15 Engines

Warranty: Manufacturer's



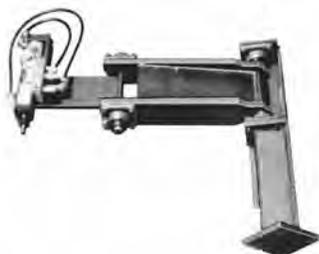
- Used to properly service Jake brakes used on CT11, CT13 and CT15
- Tools angled at 90° angle for ease of access

| Specifications | | |
|----------------|---------------------|--------------------------------|
| Part No. | Description | Dimensions |
| 376-7704 | .5 mm Intake Gauge | 175 x 43.7 mm (6.9 x 1.7 in) |
| 376-7716 | .8 mm Exhaust Gauge | 175.3 x 43.7 mm (6.9 x 1.7 in) |

FT1566 Valve Spring Compressor

Model: All Cat® Engines

Warranty: None



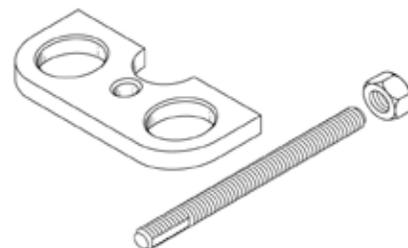
- Used to pneumatically compress valve springs to remove and install valves
- FT drawing has instructions for building 2 units: one for attachment to cylinder head disassembly bench and the other, which has a longer column, to be attached to Winona Van Norman head bench
- Spring compressor arm has 2 pivot joints permitting operator to compress several valve springs before moving cylinder head
- At end of arm is 50 mm (2 in) air cylinder with a 152 mm (6 in) stroke, 1245 N (280 lb) of force with shop air at 620 kPa (90 psi)
- 3-position, lever-activated valve controls movement of cylinder rod

FT1886 Valve Spring Compressor Group

Model: 3204 and 3208

Warranty: None

- Makes valve spring replacement faster and easier in applications where clearances are limited



228-3610 Feeler Gauge (C15)

235-0032 Lash Gauge (C13)

Model: C13 and C15 Engines

Warranty: Six Months

- Used to set variable valve actuators

| Part Number | Description |
|-------------|--------------|
| 228-3610 | Feeler Gauge |
| 235-0032 | Lash Gauge |

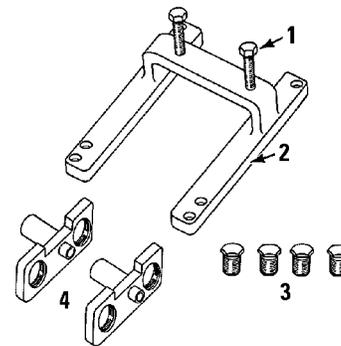
241-0124 Spring Compressor Group

Model: 3500 Engines

Warranty: Six Months

- Functions as valve spring compressor for on-engine removal of valve springs
- Compresses all four springs simultaneously
- Functions as valve depressor when plugs are installed in bridges; depressing valves allows borescope inspection of valve faces and seats
- Easy installation — requires removal of rocker shaft and rocker arms only
- Operable by one person
- Mounting bolts included

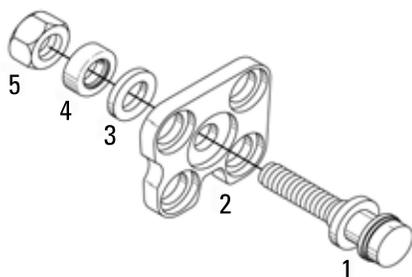
| Item | Part Number | Description | Size | Quantity |
|------|-------------|--------------------------|-------------------|----------|
| 1 | 0S-1587 | Bolt | 1/2-13 x 1 3/4 in | 2 |
| 2 | 241-0121 | Mounting Bracket | -- | 1 |
| 3 | 4T-5657 | Plug | -- | 4 |
| 4 | 241-0122 | Spring Compressor Bridge | -- | 2 |



Valve Spring Compressor Group for C13 Engine

Model: C13 Engine

Warranty: Six Months



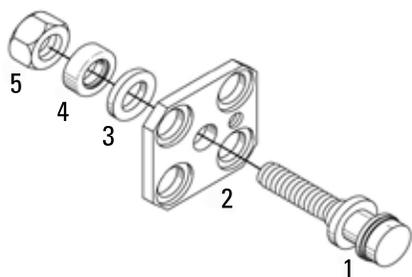
- Used to remove and install valve springs of C13 Engine
- Compresses all valve springs on one cylinder at same time; holds them in place while valve locks are removed
- Can be used with cylinder head on or off-engine
- Saves time, especially for on-engine applications

| Item | Part Number | Description |
|---|-------------|------------------|
| 235-0518 Valve Spring Compressor Group | | |
| 1 | 9U-7548 | Compressor Base |
| 2 | 267-5716 | Compressor Plate |
| 3 | 2S-0115 | Washer |
| 4 | 1U-8826 | Thrust Bearing |
| 5 | 2J-3506 | Nut |

Valve Spring Compressor Group for 3176 Engine

Model: 3176 Engine

Warranty: Six Months



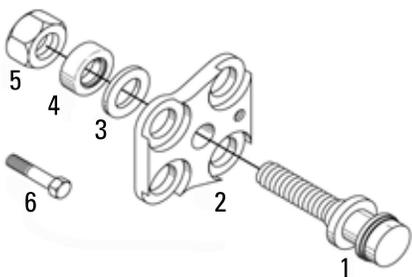
- Used to remove and install valve springs of 3176 Engine
- Compresses all valve springs on one cylinder at same time; holds them in place while valve locks are removed
- Can be used with cylinder head on or off-engine
- Saves time, especially for on-engine applications

| Item | Part Number | Description |
|--|-------------|------------------|
| 4C-6726 Valve Spring Compressor Group | | |
| 1 | 9U-7548 | Compressor Base |
| 2 | 4C-6727 | Compressor Plate |
| 3 | 2S-0115 | Washer |
| 4 | 1U-8826 | Thrust Bearing |
| 5 | 2J-3506 | Nut |

Valve Spring Compressor Group for 3406E Engine

Model: 3406E Engine

Warranty: Six Months



- Used to remove and install valve springs of 3406E Engine
- Compresses all valve springs on one cylinder at same time; holds them in place while valve locks are removed
- Can be used with cylinder head on or off-engine
- Saves time, especially for on-engine applications

References

SENR5580, Service Manual

SENR6421, Service Manual Module, Disassembly and Assembly 3406E Engines

| Item | Part Number | Description |
|--|-------------|------------------|
| 9U-7241 Valve Spring Compressor Group | | |
| 1 | 1U-7639 | Compressor Base |
| 2 | 9U-7242 | Compressor Plate |
| 3 | 5P-8248 | Hard Washer |
| 4 | 1U-8826 | Thrust Bearing |
| 5 | 2J-3506 | Nut |
| 6 | 0L-1143 | Bolt |

9U-6195 Valve Spring Compressor Group

Model: 3054 and 3056 Engines

Warranty: Six Months

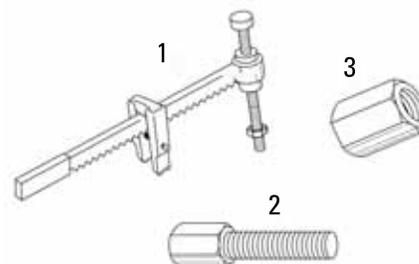
- Used to manually remove and install valve springs without removing cylinder head
- Used with 9U-6280 Air Connector to hold valves in position

Reference

SENR5547, Service Module in SENR5555 Service Manual

| Item | Description |
|------|-------------|
| 3 | Nut |

| Item | Part Number | Description |
|------|-------------|-------------------------------|
| 1 | 9U-6193 | Compressor Assembly |
| 2 | 9U-6194 | Stud |
| 3 | 9U-6196 | Nut |
| -- | 9U-6195 | Valve Spring Compressor Group |



Engine Tools

333-0758 C175 Engine Valve Spring Compressor

Essential Tool

Model: C175 Engine

Warranty: Six Months

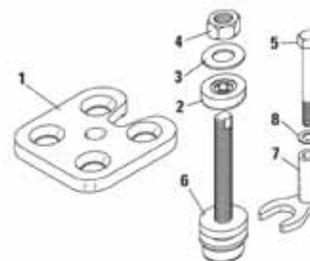
- Used to compress four valve springs to remove valve spring retainer locks
- Allows servicing of valve springs, valve seals, and valves
- Can be used with cylinder head on or off-engine
- Saves time, especially for on-engine applications
- Comes complete with heavy-duty, foam lined carry case (not shown)
- Tool revised to fit Tier I and Tier II cylinder heads

References

NEHS0954, Tool Operating Manual, 333-0758 Tool Group (Valve Spring and Injector Sleeve) for C175 Engines

| Item | Description | Quantity |
|------|--|----------|
| 1 | Base Plate ¹ | 1 |
| 5 | Driver (used with Injector Sleeve Puller Installer) ¹ | 1 |
| 6 | Spring Compressor Rod Assembly ¹ | 1 |
| 7 | Yoke Retainer Assembly ¹ | 1 |

¹ Not serviced



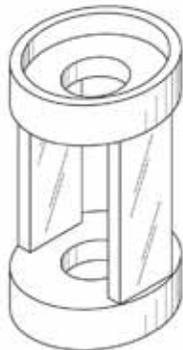
| Item | Part Number | Description | Quantity |
|-----------------------------|-------------|--------------------------------------|----------|
| -- | 333-0758 | Tool Group (Valve Spring Compressor) | -- |
| Service/Repair Parts | | | |
| 2 | 8S-8287 | Thrust Bearing Assembly | 1 |
| 3 | 4M-6953 | Hardened Washer | 1 |
| 4 | 108-2079 | Nut | 1 |
| 8 | 5P-8245 | Hard Washer | 1 |

276-1221 Valve Spring Assembly

Essential Tool

Model: C6.6 Engines

Warranty: Six Months



- Used to remove valve spring without removing cylinder head
- Used with 9U-6195 Valve Spring Compressor Group

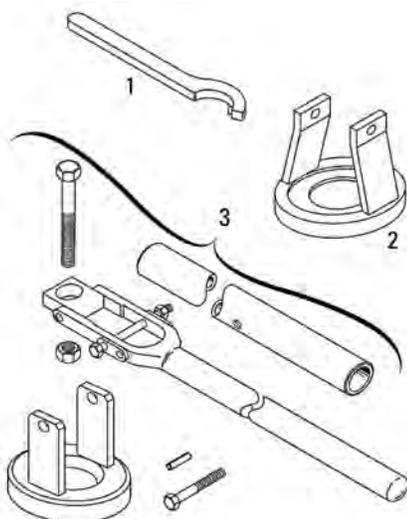
| Part No. | Description |
|----------|-----------------------|
| 276-1221 | Valve Spring Assembly |

8T-2660 Compressor Group

Essential Tool

Model: All 3600 Diesel Engines

Warranty: Six Months



- Used to remove and install valve springs, plus prevents damage to the valve rotator
- Spring removal from HFO engines require 8T-2660 along with 167-3972 Spanner Wrench and 167-3974 Mounting Cap Assembly

| Item | Description |
|------|------------------|
| 3 | Extension Handle |
| 3 | Lever Group |

| Item | Part Number | Description | Size |
|------|-------------|---|--------------------------------------|
| 1 | 167-3972 | Spanner Wrench (HFO Only) (not included) | -- |
| 2 | 167-3974 | Mounting Cap Assembly (HFO Only) (not included) | -- |
| 3 | 2A-4781 | Bolt | 1/4-20 x 69.9 mm (2.75 in) long |
| 3 | 8F-6350 | Bolt | 3/8-16 x 203 mm (8.0 in) long |
| 3 | 8T-2660 | Compressor Group | -- |
| 3 | 9S-8752 | Nut - Full (3/8 - 16) | 3/8-16 |
| 3 | 8T-2661 | Spring Compressor Adapter | -- |
| 3 | 6H-3956 | Spring Pin | 4.76 x 25.4 mm (0.187 x 1.0 in) long |

8S-2263 Valve Spring Tester

Model: All Engines
Warranty: Six Months

| Part Number | Description |
|-------------|---------------------|
| 8S-2263 | Valve Spring Tester |

- Provides fast, accurate testing for old valve springs which should be tested before installing in reconditioned head
- Scale graduated in newtons and has maximum capacity of 1555 N (350 lb)
- Similar to 4C-9496 Spring Tester with maximum test force of 1200 lb for testing larger springs



5S-1322 Valve Keeper Inserter

Model: All Cat® Engines
Warranty: Six Months

| Part Number | Description |
|-------------|-----------------------|
| 5S-1322 | Valve Keeper Inserter |

- Used with the 7F-4292 Compressor to install valve keepers

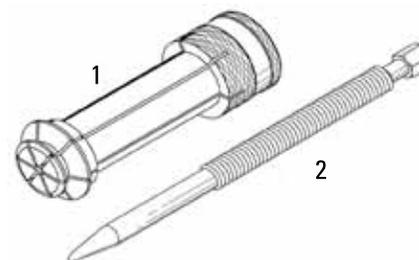


Valve Seat Extractor Tooling Essential Tool

Model: 3500 Engines
Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|----------------------|
| 1 | 317-3841 | Valve Seat Extractor |
| 2 | 317-3843 | Shaft Assembly |

- Used to remove valve seat inserts on 3500 Engines
- Used with 166-7441 Valve Seat Extractor Tool Group
- Both parts are hardened for strength and long service life
- Tools are black oxide coated for corrosion resistance



Reference

SMHS7935, Special Instruction

166-7441 Valve Seat Extractor Tool Group

Model: All Cat® Engines except 3600

Warranty: Six Months



- Replaces discontinued 6V-4805 Valve Seat Extractor Tool Group and discontinued 9S-3080 Valve Seat Insert Puller Group
- Used to remove valve seat inserts on all Cat® engines
- Uses only 4 extractors and employs different method of insert removal, which causes less damage to the extractors
- Provides grinder to groove inside of insert to make insert removal easier with extractor
- 165-5647 has notched 47.63 mm (1.875 in) diameter for easy removal of G3500 swirl-type inserts

Reference

SMHS7935, Special Instruction

| Item | Description |
|------|----------------|
| 10 | Plate Assembly |

| Item | Part Number | Description | Size |
|------|-------------|---------------------------------|--|
| 1 | 6V-4801 | Stone | -- |
| -- | 166-7741 | Valve Seat Extractor Tool Group | -- |
| 2 | 6V-4802 | Wheel | -- |
| 3 | 165-5647 | Extractor | 22.23 mm (0.875 in), 34.93 mm (1.375 in), 47.63 mm (1.875 in) plus swirl inserts |
| 4 | 6V-4194 | Extractor | 25.4 mm (1.0 in), 38.1 mm (1.5 in), 50.8 mm (2.0 in) |
| 5 | 6V-4195 | Extractor | 28.58 mm (1.125 in), 41.28 mm (1.625 in) 53.98 mm (2.125 in) |

| Item | Part Number | Description | Size |
|------|-------------|--|---|
| 6 | 6V-4196 | Extractor | 31.75 mm (1.25 in), 44.45 mm (1.75 in) 57.15 mm (2.25 in) |
| 7 | 222-3074 | Medium Mini Die Grinder, requires 4C-3689 Collar | -- |
| 8 | 6V-4199 | Lifting Bracket | -- |
| 9 | 6V-4197 | Base Group | -- |
| 11 | 6V-4803 | Thrust Bearing (Part of 6V-4804) | -- |
| 12 | 6V-4804 | Handle Assembly | -- |
| 13 | 6V-4192 | Shaft Assembly | -- |

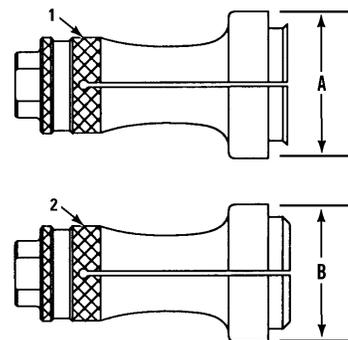
Valve Seat Extractors

Model: 3054 and 3056 Engines

Warranty: Six Months

- Used with 9S-3095 Handle Assembly to remove valve seat insert

| Item | Part No. | Description | Dimension (A, B) | Extractor Length | Use |
|------|----------|---------------------|-------------------|------------------|---------------------------|
| 1 | 9U-6396 | Extractor (Inlet) | 49.5 mm (1.95 in) | 102 mm (4 in) | Remove inlet valve seat |
| 2 | 9U-6397 | Extractor (Exhaust) | 44.7 mm (1.76 in) | 102 mm (4 in) | Remove exhaust valve seat |



4C-6371 Valve Seat Driver, Inlet

4C-6372 Valve Seat Driver, Exhaust

Model: 3046 Diesel Engine

Warranty: Six Months

| Part Number | Description |
|-------------|----------------------------|
| 4C-6371 | Valve Seat Driver, Inlet |
| 4C-6372 | Valve Seat Driver, Exhaust |

- Used to install valve seats
- Serves as a guide to properly align seat during installation — saves time and reduces chance of damage
- Knurled handle for better handling

Reference

SEN6458, Special Instruction, Disassembly and Assembly of 3046 Engine



Valve Seat Drivers

Essential Tool

Model: Cat® 3400 Gas Engine

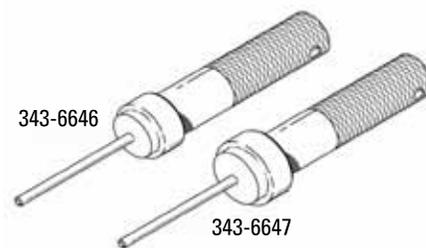
Warranty: Six Months

- Used to install valve seats
- Used with suitable mallet
- Serves as a guide to properly align valve seat during installation — reduces assembly time and helps prevent possible damage
- Knurled handle for better grip and handling
- Hardened (RKW C40-45) for durability and long service life

Reference

SEN6568, G3408C and G3412C Engines, Disassembly and Assembly

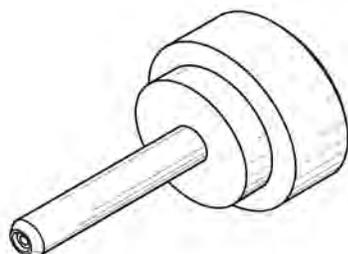
| Part Number | Description | Use |
|-------------|----------------------------|--------------------------------------|
| 343-6646 | Valve Seat Driver, Exhaust | Installs 212-0938 Exhaust Valve Seat |
| 343-6647 | Valve Seat Driver, Inlet | Installs 214-3286 Inlet Valve Seat |



366-5728 G3500 Engine Valve Guide Installer

Model Usage: G3500 Engines with water cooled inserts

Warranty: Six Months



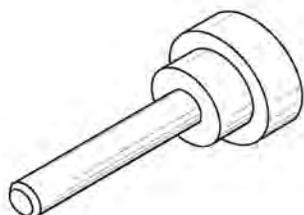
- Used to install intake and exhaust valve guides on G3500 engines with water cooled inserts, used during rework process
- This is a shorter version of the 9U-6184 that enables more control over the installation process
- Made from steel and hardened for durability

| Part Number | Description | Size | Weight |
|-------------|-----------------------|---|-----------------|
| 366-5728 | Valve Guide Installer | Overall dimensions: 42.4 mm (1.67 in) diameter X 76 mm (2.99 in) long | 0.27 kg (.6 lb) |

362-9108 G3500 Engine Valve Seat Installer

Model Usage: G3500 Engines with water cooled inserts

Warranty: Six Months



- Used in rework process for installing valve seats in G3500 engines with water cooled inserts
- Helps guide valve seat during installation (makes correct installation easier and faster)
- Made from steel and hardened for durability

| Part Number | Description | Size | Weight |
|-------------|-------------------|--|------------------------|
| 362-9108 | Valve Seat Driver | Overall dimensions: 59.5 mm (2.34 in) diameter x 140 mm (5.51 in) long | Weight: 0.84 (1.85 lb) |

9S-3080 Valve Seat Insert Puller Group Discontinued — Service Parts Available



Reference

GMG02114, Special Instruction

| Item | Part Number ¹ | Description |
|------|--------------------------|--------------------------------|
| -- | 9S-3080 | Valve Seat Insert Puller Group |
| 1 | 9S-3081 | Extractor |
| 1 | 9S-3082 | Extractor |
| 1 | 9S-3084 | Extractor |
| 1 | 9S-3085 | Extractor |
| 1 | 9S-3086 | Extractor |
| 1 | 9S-3087 | Extractor |
| 1 | 9S-3089 | Extractor |
| 2 | 9S-3095 | Handle Assembly |
| 3 | 9S-3097 | Shaft (part of 9S-3095) |

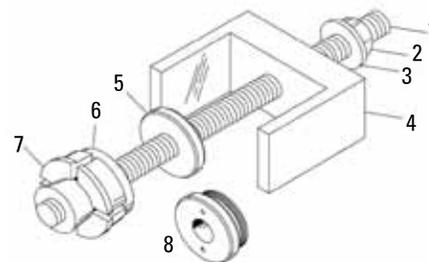
¹All part numbers in the table have a six month warranty

130-1449 Valve Seat Puller Group

Model: All 3600 and G3600 Engines

Warranty: Six Months

- Replaces discontinued 9U-5099 Valve Seat Puller Group (9U-5099 includes 9U-5096 Bridge Assembly)
- Used to remove intake and exhaust valve seat inserts
- Used with 6V-3160 Hydraulic Cylinder for faster, safer removal
- A 9U-5098 Threaded Insert, part of 130-1449, can be used to adapt discontinued 6V-7047 Hydraulic Cylinder (130-1449 includes 9U-5096 Bridge Assembly)
- Overall length: 337 mm (13.3 in)
- Overall width: 140 mm (5.5 in)



Reference

SENR3594, Disassembly and Assembly, 3612 and 3616 Engines

| Item | Part Number | Description |
|------------------|-------------|-------------------------|
| 1 | 128-6759 | Stud and Cone Assembly |
| 2 | 1A-1935 | Nut |
| 3 | 3K-5234 | Washer (3) |
| 4 | 9U-5096 | Bridge Assembly |
| 5 | 128-6761 | Nut |
| 6 | 9U-5097 | Shoulder Screw |
| 7 | 157-2882 | Expander |
| 8 | 9U-5098 | Insert |
| -- | 130-1449 | Valve Seat Puller Group |
| Not Shown | | |
| 6 | 9U-5095 | Plate |

Valve Seat and Valve Guide Tooling

Model: 3034 Engines

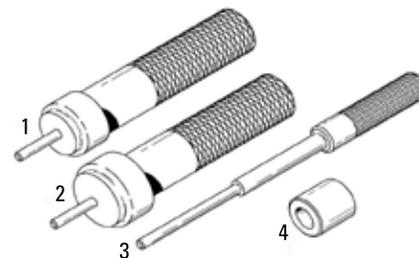
Warranty: Six Months

- Used to remove and install valve guides and valve seats

Reference

SENR5013, 3034 Engine Disassembly and Assembly Manual

| Valve Seat and Valve Guide Removal and Installation Tooling | | | |
|---|-------------|---------------------------|--------------------------------------|
| Item | Part Number | Description | Use |
| 1 | FT2714 | Intake Valve Seat Driver | Install 45 degree intake valve seat |
| 2 | FT2715 | Exhaust Valve Seat Driver | Install 45 degree exhaust valve seat |
| 3 | FT2716 | Valve Guide Driver | Remove and install valve guide |
| 4 | FT2717 | Valve Guide Stop Collar | Install valve guide to correct depth |



C4.2 and C6.4 Valve Guide Install and Removal Tools

Model Usage: C4.2, C6.4
Warranty: Six Months



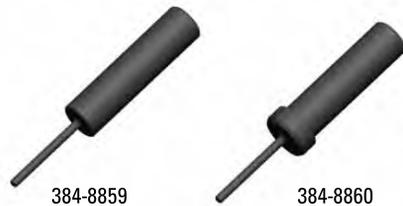
- Used to install remove and install valve guides during rework process
- Made of hardened steel and black oxide coated for durability and corrosion resistance

Reference
KENR8105

| Part Number | Description | Dimensions | Weight |
|-----------------------|-----------------------|---------------------------------|-----------------|
| Specifications | | | |
| 384-8861 | Valve Guide Remover | 20.0 x 230.0 mm (.78 x 9.05 in) | .33 kg (.73 lb) |
| 384-8862 | Valve Guide Installer | 20.0 x 120.0 mm (.78 x 4.72 in) | .28 kg (.62 lb) |

C6.4 Valve Seat Install Tools

Model Usage: C6.4
Warranty: Six Months



- Used to install intake and exhaust valve seats during rework process
- Made of hardened steel and black oxide coated for durability and corrosion resistance

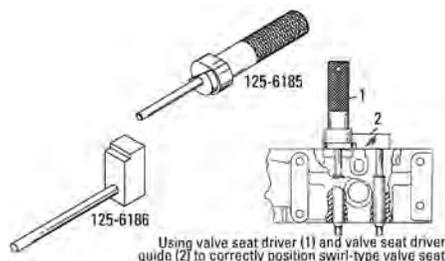
Reference
KENR8106

| Specifications | | | |
|-----------------------|------------------------|-------------------------------------|------------------|
| Part Number | Description | Dimensions | Weight |
| 384-8859 | Intake Seat Installer | 30.0 x 185.0 mm (1.18 x 7.28 in) | .65 kg (1.43 lb) |
| 384-8860 | Exhaust Seat Installer | 37.9 x 185.5 mm (1.50 x 7.30 in) | .71 kg (1.56 lb) |

125-6185 Swirl Valve Seat Driver

125-6186 Swirl Valve Seat Driver Guide

Model: 3406C Engines With Swirl Valve Seat/Insert
Warranty: Six Months



- Used to install 115-2358 Inlet Swirl Valve Seat/Insert
- Using both tools quickly and correctly positions valve seat
- Valve seat locates on shoulder of valve seat driver (will only locate in one position)
- Valve seat driver guide correctly positions the radial location of valve seat driver (positions the seat in the correct radial location in cylinder head)
- Valve seat driver locates in valve guide bore — valve seat driver guide locates in valve guide bore of adjacent valve port
- Seat driver and guide are hardened and plated for durability
- Overall length of seal driver: 252 mm (9.9 in)
- Overall size of valve seat driver guide: 61 x 155 mm (2.4 x 6.1 in)

| Part Number | Description |
|-------------|-------------------------------|
| 125-6185 | Swirl Valve Seat Driver |
| 125-6186 | Swirl Valve Seat Driver Guide |

9U-6176 Valve Seat Driver

9U-6177 Exhaust Driver Plate

Model: 3064 and 3066 Engines

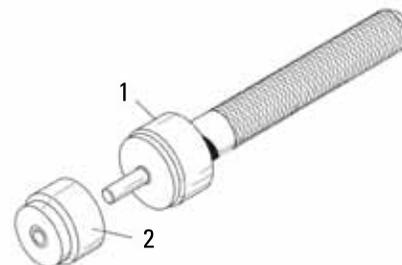
Warranty: Six Months

- Used to install both intake and exhaust valve seats
- Correctly aligns insert during installation
- Knurled handle for better handling

Reference

SEN5553, Service Manual, 3066 Diesel Engines

| Item | Part Number | Description | Length | Major Outside Diameter |
|------|-------------|----------------------|-----------------|------------------------|
| 1 | 9U-6176 | Valve Seat Driver | 207 mm (8.1 in) | 45.6 mm (1.79 in) |
| 2 | 9U-6177 | Driver Plate Exhaust | -- | 38.1 mm (1.50 in) |



Valve Seat Drivers

Model: 3054 and 3056 Engines (SN's 7ZK, 6FK, 7AK, 1ML)

Warranty: Six Months

- Used to install 30° and 45° intake and exhaust valve seats
- Helps guide seat during installation (makes correct installation easier and faster)
- 9U-6183 used for 45° intake seats, 9U-6184 for 45° exhaust seats, 9U-6185 for 30° intake seats
- Knurled handle for better grip (zinc coated for corrosion resistance)
- Overall length: 203.0 mm (8.0 in)
- Outside major diameter: 42.4 to 51.2 mm (1.7 to 2.0 in)

References

SEN5547, Service Manual

SEN5555, Service Manual

| Part Number | Description |
|-------------|-------------------|
| 9U-6183 | Valve Seat Driver |
| 9U-6184 | Valve Seat Driver |
| 9U-6185 | Valve Seat Driver |



Valve Seat Drivers

Model: 3054 and 3056 Engines with 5YS, 7MS, 2PW, and 3GW Serial Numbers

Warranty: Six Months

- Used to install valve seats in new engines with unfinished valve seats and guides
- Installs both 30 and 45 degree seats
- Knurled handle provides better grip

| Part Number | Description | Overall Length | Major Outside Diameter |
|-------------|-----------------------------|----------------|------------------------|
| 157-3717 | Valve Seat Driver (Intake) | 227 mm (9 in) | 44.9 mm (1.77 in) |
| 157-3716 | Valve Seat Driver (Exhaust) | 227 mm (9 in) | 42.8 mm (1.69 in) |



Valve Seat Drivers

Model: 3406E Engines

Warranty: Six Months



- Used to install valve seat inserts
- Serves as guide for proper alignment of insert during installation
- Knurled handle for better grip (zinc coated for corrosion resistance)

Reference

SENR6421, Special Instruction

| Part Number | Description | Overall Length | Major Outside Diameter |
|-------------|-----------------------------|----------------|------------------------|
| 9U-6897 | Valve Seat Driver (Inlet) | 254 mm (10 in) | 47.4 mm (1.87 in) |
| 9U-6898 | Valve Seat Driver (Exhaust) | 254 mm (10 in) | 42.5 mm (1.67 in) |

8T-0859 Valve Seat Depth Gauge

Model: 1100, 3100, 3200

Warranty: Six Months



- Used to quickly determine valve seat depth on cylinder heads
- During cylinder head reconditioning, valve seat faces usually grind moving face of valve seat deeper into cylinder head; as material is removed from seat face, valve stem length on spring side of cylinder head increases, reducing distance valve spring is compressed and at same time reducing spring load; with use of straight edge across top of valve guide, gauges used to determine if valve seat depth is within limits

| Part Number | Detail |
|-------------|-------------------------------|
| 8T-0859 | Gauge, 25,000 kPa (36000 psi) |

Reference

SMHS8319, Special Instruction

393-0369 Valve Guide Stop Collar

Model Usage: C4.4

Warranty: Six Months



- Used to install the valve guides to the correct height 12.7 mm (.50 in) above the spring seat on the cylinder head
- Protects valve guides during installation

| Specifications | |
|----------------|------------------------------|
| Dimensions | 25.5 x 30 mm (1.0 x 1.18 in) |
| Material | Steel |

FT1767 Valve Seat Insert Shrinker

Model: Most Cat® Engines

Warranty: None

- Used with carbon dioxide (CO2) to decrease (shrink) outside diameter of valve seat inserts for easy installation
- Takes about 10 seconds to shrink an insert
- Can also be used to shrink valve guides, bearings, and other small parts



WARNING

Because of the pressures and temperatures involved, always wear safety glasses and insulated gloves when working with liquid and/or solid carbon dioxide (CO2).

6V-0087 Valve Stem Gauge

Model: Most Cat® Engines

Warranty: Six Months

- Used to measure valve stem wear more quickly than a micrometer
- Application includes all valves on current Cat® engines and most non-current engines (micrometer still needed to measure valves on D336, D334, 1674 and some other non-current engines)
- Has 4 accurately machined slots used for the four most common valve stem diameters
- Hardened to resist wear but will not damage valve stems
- If correct gauge slot slides over valve stem, valve is worn excessively and should not be reused



Reference

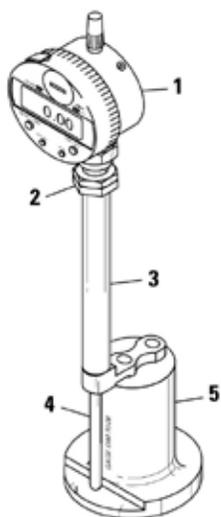
SEBF8034, Guideline for Reusable Parts, Valves and Valve Spring Specifications (provides minimum use-again stem diameters for all valves used in Cat engines)

| Item | Part Number | Description |
|------|-------------|---|
| 1 | 5P-4227 | Tag Holder, Form SEES5544 Instruction Card |
| 2 | 6V-3198 | Gauge |
| 2 | 6V-3199 | Gauge |
| -- | 6V-0087 | Valve Stem Gauge |

155-1536 Valve Recession Tool Kit

Model: 3500 and G3500 Engines

Warranty: Six Months



- Used to determine actual valve and valve seat wear
- Digital Indicator displays inches and millimeters

Reference

NEHS0708, Tool Operating Manual

NEEG2811, Decal

| Item | Part No. | Description |
|------------------|----------|------------------------|
| 1 | 258-6575 | Dial Indicator |
| 2 | 5P-4814 | Collet As - Clamp |
| 3 | 155-1579 | Base Assembly |
| 4 | 155-1683 | Rod Assembly |
| 5 | 155-1643 | Projection Gauge Block |
| Not shown | | |
| -- | 6V-3073 | Case - Plastic |
| -- | 258-6601 | Foam Block |

213-9285 Valve Recession Tool Kit

Model: G3400 Engine

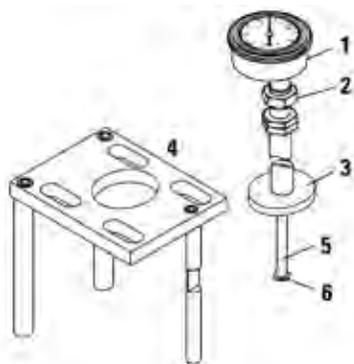
Warranty: Six Months

- Used to determine the actual valve and valve seat wear
- Valve recession can be checked without removing rocker arms — reducing engine downtime
- Large center hole in support assembly provides clearance for spark plug tube on engines with Magneto and CDIS ignition systems
- Slots in support assembly allow access to valve rotator on either side of rocker arm
- Small magnets in legs of base assembly hold it in place while taking measurements

Reference

NEHS0851, Tool Operating Manual, Operating Instructions for 213-9285 Valve Recession Tool Group for G3400 Engines

| |
|--------------------------------|
| Included with 213-9285 |
| Description |
| NEEG2946 Decal |
| NEHS0851 Tool Operating Manual |



(Continued)

213-9285 Valve Recession Tool Kit (Continued)

Model: G3400 Engine
Warranty: Six Months

| Item | Part Number | Description |
|--|-------------|---|
| -- | 213-9285 | Valve Recession Tool Kit |
| Included with 213-9285 | | |
| -- | 4C-3975 | Case |
| -- | 213-9386 | Foam Block |
| -- | 213-9198 | Valve Recession Tool Group (Not Serviced) |
| Included with 213-9198 (not serviced) | | |
| 1 | 158-5080 | Dial Indicator |
| 2 | 5P-4814 | Collet As - Clamp |
| 3 | 213-9193 | Base Assembly |
| 4 | 230-5826 | Support Assembly |
| 5 | 213-9192 | Rod Assembly |
| 6 | 9S-8903 | Point |

334-7085 Valve Recession Kit

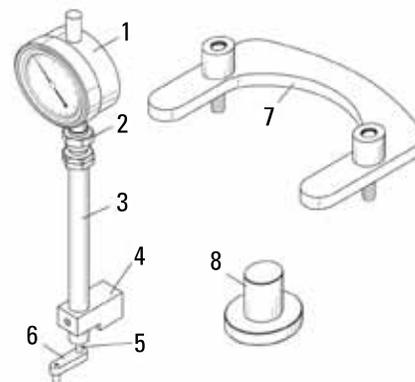
Essential Tool

Model: All G3500C and G3500E Engines
Warranty: Six Months

- Used to determine actual valve and seat wear on G3520C and G3520E Engines
- Can be used without removing rocker arms for reduced disassembly (less engine downtime)
- Indicator is set to zero using gauge block
- Horseshoe shaped plate bolts directly to cylinder head to provide a solid platform for 146-3270 Base Assembly (magnetic)
- For quick installation and removal, socket head cap screws are retained in horseshoe shaped plate with snap rings
- Can also be used with a 369-2607 Digital Indicator

Reference

SEBU6711, Operation and Maintenance Manual, G3500 Engines, Valve Stem Projection - Measure/Record



| Item | Description |
|------|----------------|
| 3 | Body Assembly |
| 5 | Rod Assembly |
| 7 | Plate Assembly |
| 8 | Gauge Block |

| Item | Part Number | Description |
|------------------|-------------|--------------------------|
| 1 ^{1,2} | 6V-3075 | Indicator - Dial |
| 2 ¹ | 5P-4814 | Collet As - Clamp |
| 3 | 146-3270 | Base Assembly |
| 4 | 9S-8883 | Contact Point |
| -- | 334-7085 | Valve Recession Tool Kit |

¹Part of 148-2997 Valve Recession Tool Kit

²Not included

FT1741 Vacuum Tester

Model: 3612, 3616

Warranty: None



- Used to check for leaks between valve face and seat on cylinder heads after valves and seats have been ground and valve springs assembled
- Consists of vacuum pump with connecting parts and set of 8 fabricated adapters to fit over all sizes of valves used in the Cat® Engine line

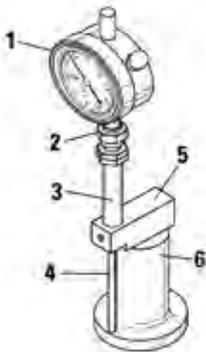
| Item | Description | Quantity |
|------|---------------------|----------|
| 2 | Fabricated Adapters | 8 |

| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 208-1356 | Vacuum Pump |

148-2997 Valve Recession Tool Kit

Model: 3600 and G3600 Engines

Warranty: Six Months



- Used to determine actual valve and valve seat wear
- Can be used without removing rocker arms (reduces engine downtime)
- Can be used with 369-2607 Digital Indicator

Reference

NEHS0710, Tool Operating Manual

| Item | Description |
|------|--------------------------------|
| 3 | Body (not serviced separately) |

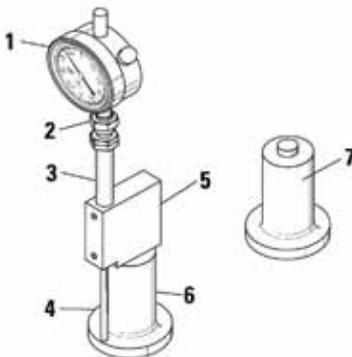
| Item | Part Number | Description |
|------|-------------|--------------------------|
| 1 | 6V-3075 | Indicator - Dial |
| 2 | 5P-4814 | Collet As - Clamp |
| 4 | 146-3271 | Extension Rod |
| 5 | 146-3270 | Base Assembly |
| 6 | 146-2738 | Projection Gauge Block |
| -- | 148-2997 | Valve Recession Tool Kit |

Valve Recession Tooling

Essential Tool

Model: C175 Engines

Warranty: Six Months



- Used to determine actual valve and valve seat wear
- Used with following parts from 148-2997 Valve Recession Kit:
 - Dial Indicator (1)
 - Clamp Collet (2)
 - Body (3)
 - Extension Rod (4)
- Can also be used with 369-2607 Digital Indicator (not part of group)
- Allows measurements without removing rocker arms (reduces engine downtime)
- 326-7689 Projection Gauge Block (6) used for intake valves
- 326-7693 Projection Gauge Block (7) used for exhaust valves
- Projection gauge blocks are laser etched with part number, intake or exhaust, and dimension for easy identification

(Continued)

Valve Recession Tooling (Continued)

Essential Tool

Model: C175 Engines
Warranty: Six Months

- 326-7698 Base Assembly (5) features 2 set screw locations
-Lower set screw is used with 3600 and G3600 Engines
-Upper set screw is used with C175 Engines
- 3 mm Allen wrench (dealer supplied) tightens appropriate set screw into locator hole in body (3)

Reference

NEHS0710 Tool Operating Manual

| Item | Description |
|------|--|
| 3 | Body (Part of 148-2997 Valve Recession Tool Kit) |

| Item | Part Number | Description |
|------------------|-------------|-------------------|
| 1 ^{1 2} | 6V-3075 | Indicator - Dial |
| 2 ¹ | 5P-4814 | Collet As - Clamp |
| 4 ¹ | 146-3271 | Extension Rod |

| Item | Part Number | Description |
|------|-------------|----------------------------------|
| 5 | 326-7698 | Base Assembly |
| 6 | 326-7689 | Projection Gauge Block (Intake) |
| 7 | 326-7693 | Projection Gauge Block (Exhaust) |

¹Part of 148-2997 Valve Recession Tool Kit

²Not included

Dowel Drivers

Model: See below
Warranty: Six Months

| Part Number | Model |
|-------------|-------|
| 5P-2406 | 3400 |
| 6V-4009 | 3500 |

- Used to install valve train bridge dowels to correct height
- 5P-0944 Dowel Puller Group and 5P-0942 Extractor used for dowel removal



Typical Dowel Driver

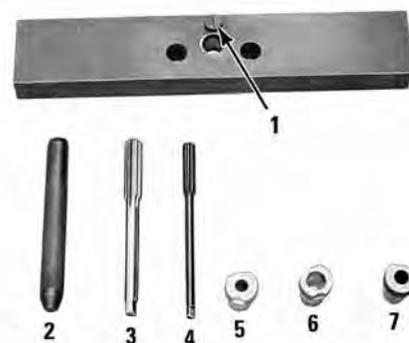
5P-7333 Bridge Dowel Repair Tool Group

Model: 3400
Warranty: Six Months

- Used to repair cylinder heads with loose bridge dowels
- Repair done by drilling and reaming larger dowel hole and installing 5P-7324 Plug; plug then drilled and reamed for installation of new bridge dowel

Reference

SMHS7072, Special Instruction



(Continued)

Cylinder Head, Valves and Cam Followers

5P-7333 Bridge Dowel Repair Tool Group (Continued)

Model: 3400

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 5P-7330 | Screw |
| 2 | 5P-7325 | Driver |
| 3 | 5P-7331 | Reamer |
| 4 | 5P-7332 | Reamer |

| Item | Part Number | Description |
|------|-------------|--------------------------------|
| 5 | 5P-7326 | Drill Bushing |
| 6 | 5P-7328 | Drill Bushing |
| 7 | 5P-7327 | Drill Bushing |
| -- | 5P-7333 | Bridge Dowel Repair Tool Group |

Engine Tools

3P-2243 Installer Group

Model: 6.25 inch Bore V-Engines

Warranty: Six Months



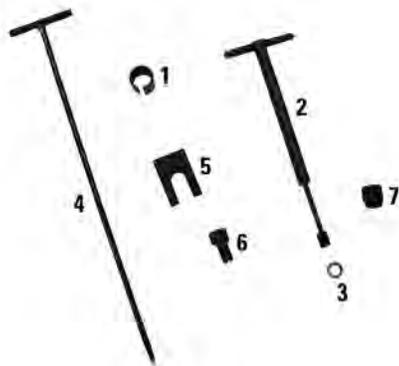
- Used to locate and install seals between valve lifter guide brackets on later 158.75 mm (6.25 in) bore V-engines (D379B, D398B, D399)

| Item | Part Number | Description |
|------|-------------|-------------------------------------|
| 1 | 1P-0529 | Handle |
| -- | 0L-1404 | Stud (attaches handle to installer) |
| -- | 3P-2243 | Installer Group |

5P-7433 Cam Follower Tool Group

Model: 3400

Warranty: Six Months



- Used for removal and installation of valve lifters

| Item | Part Number | Description |
|------|-------------|-------------------------|
| 1 | 417-1323 | Compressor |
| 2 | 5P-2408 | Handle Assembly |
| 3 | 5P-2685 | Nut |
| 4 | 5P-6599 | Handle Assembly |
| 5 | 5P-2395 | Holder Assembly |
| 6 | 5P-6601 | Collet |
| 7 | 5P-2400 | Compressor |
| -- | 5P-7433 | Cam Follower Tool Group |

417-1323 Installation Sleeve

Model Usage: 3400C Engines

Warranty: Six Months



- Used to remove and install lifter assembly in cylinder block
- Used to make an alignment of the new lifter guide spring
- Replaces discontinued 5P-2405, which is a part of 5P-7433 Cam Follower Group
- Serviceable part: order sleeve to update group 5P-7433
- Material: Steel

| Specifications | |
|----------------|------------------------------|
| Dimensions | 38 x 36.5 mm (1.5 x 1.43 in) |
| Weight | 0.065 kg (0.14 lb) |

| Part Number | Description |
|-------------|---------------------|
| 417-1323 | Installation Sleeve |

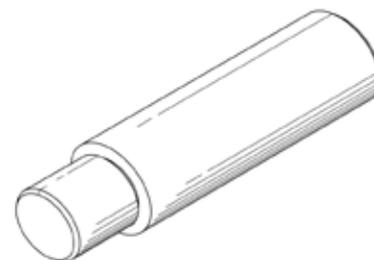
Rocker Arm Bearing Installation Tools

Model: See below

Warranty: None

- Drivers used for proper installation of rocker arm bearings
- Material: SAE4140 steel

| Part Number | Model |
|-------------|--|
| FT0190 | D339, D342, D353, G353, D397, G397, D375, G375 |
| FT0191 | D326, D337 |
| FT0192 | D311H, D320, D330, D333, G333, 1670, 1673 |
| FT0193 | D398, G398, D379, G379 |



Valve Lash Setting Tools

Essential Tool

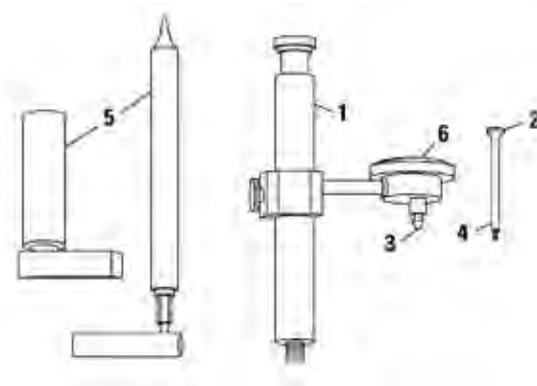
Model: 3500A and 3500B Diesel, 3500 Magneto and EIS Gas Engines

Warranty: Six Months

- Used to accurately set engine valve lash with factory setting methods
- Installation of tools is quick and easy with adjustment of indicator position required on initial set-up only
- Removal of fuel lines not necessary to measure valve lash
- Adding 147-2058 Extension to indicator allows valve lash to be measured on Magneto Gas engine without removing spark plug extension
- Socket and torque wrench used to torque rocker arm nuts are preset at factory to 70 N·m (52 ft·lb) — weight of torque wrench alone sets value of valve lash
- Valve bridge adjustment can be made without removing the rocker arm. Use the 147-5536 Contact Point, 147-2058 Extension, and 148-7211 Socket to make the adjustment.
- A slide rule type torque computer, Form SEHS7150, is available to determine torque wrench dial reading for different extensions
- This tool will not fit on some early 3500 Engines with old fuel manifolds.
- Dial indicator is not included in group — choice of 147-2056 (inch) or 147-5537 (mm) is available

Reference

REHS0128, Special Instruction



(Continued)

Cylinder Head, Valves and Cam Followers

Valve Lash Setting Tools (Continued)

Essential Tool

Model: 3500A and 3500B Diesel, 3500 Magneto and EIS Gas Engines

Warranty: Six Months

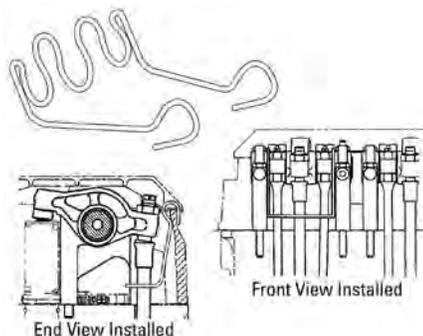
Engine Tools

| Item | Part Number | Description |
|---|-------------|--------------------------------------|
| 147-5482 Valve Lash Adjustment Group | | |
| 1 | 145-5191 | Support Assembly |
| 2 | 147-5536 | Contact Point |
| 3 | 147-2057 | Contact Point |
| 4 | 147-2058 | Extension |
| 5 | 148-7211 | Bridge Nut Socket |
| -- | 6V-3073 | Case - Plastic |
| Not Shown | 147-5535 | Foam Block |
| Required tooling not included in 147-5482 - must be ordered separately: | | |
| 6 | 147-2056 | Dial Indicator (inch), preferred, or |
| 6 | 147-5537 | Dial Indicator (metric) |
| Recommended tooling not included in 147-5482 - must be ordered separately: | | |
| Not Shown | 147-2060 | Socket Wrench |
| Not Shown | 147-2059 | Torque Wrench |

146-2597 Push Rod Holder

Model: 3114, 3116, and 3126 Engines with MUI Fuel Systems

Warranty: Six Months



- Used to hold all three push rods in place while rocker arm assembly is installed to cylinder head
- Hook design ensures tool must be removed before valve cover can be installed
- Provides faster and easier method of installing rocker arm assemblies
- Individual holder tool design will work on either 4- or 6-cylinder engines

| Part Number | Description |
|-------------|-----------------|
| 146-2597 | Push Rod Holder |

194-2062 Tool Group

Model: 3408 and 3412 HEUI Engines or G3500 Engines

Warranty: Six Months

3408 and 3412 HEUI Engines (194-2062 Tool Group)

- Used to make valve adjustment procedure much easier
- Used with standard screwdriver to set valve lash
- Wrench has extra deep socket to reach adjustment locknut
- Specially designed feeler gauge has both 0.381 mm (0.015 in) and 0.762 mm (0.030 in) settings required for valve lash procedure

G3500 Engines (194-2061 Wrench)

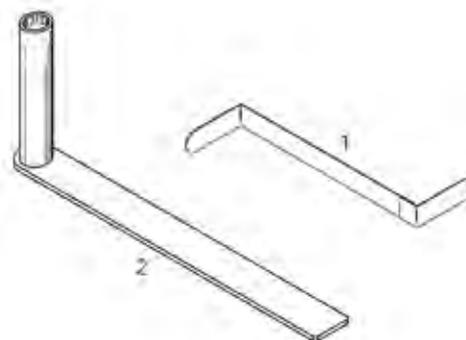
- Used to adjust boost pressure of 146-0758 Exhaust Bypass Valve
- Used with a standard 6.35 mm (1/4 in) Nut Driver
- To access adjustment screw, remove 9S-4205 Plug
- Wrench can also be used to adjust valve bridges
- Socket end: 9/16 inch

(Continued)

194-2062 Tool Group (Continued)

Model: 3408 and 3412 HEUI Engines or G3500 Engines

Warranty: Six Months



| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 194-2060 | Gauge |
| 2 | 194-2061 | Wrench |
| -- | 194-2062 | Tool Group |

Valve Lash Setting Tool

Model: 3500 Engines

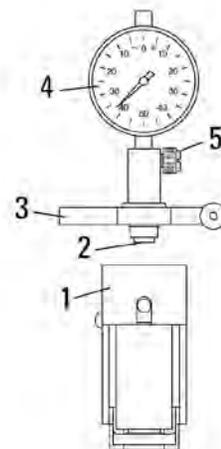
Warranty: Six Months

- Replaces discontinued 4C-8241 Valve Lash Setting Gauge
- Used to provide valve lash settings on 3500 A Series diesel engines
- Dial indicator eliminates guesswork by measuring exact valve gap (greatly reduces time needed to accurately adjust valves)
- Base assembly has an inner and outer sleeve: inner sleeve puts tension on rocker arm; outer sleeve puts pressure, in opposite direction, on valve bridge assembly; dial indicator measures gap to determine exact valve setting

Reference

SEHS9261, Special Instruction

| | |
|--------------------|---|
| Indicator diameter | 57 mm (2.25 in) |
| Graduations | 0.025 mm (0.001 in) |
| Dial reading | 0-50-0 |
| Range | 6.35 mm (0.250 in) total; 2.54 mm (0.100 in) per revolution |



| Item | Part Number | Description |
|--|-------------|--------------------------|
| Assembled Valve Lash Setting Tool | | |
| 1 | 125-2742 | Base Assembly (for 3500) |
| 2 | 6V-2057 | Contact Point |
| 3 | 125-2743 | Collar Group |
| 4 | 4C-8246 | Indicator |
| 5 | 9U-6272 | Nylon Screw |
| Not shown | 6V-2030 | Extension ^{1 2} |

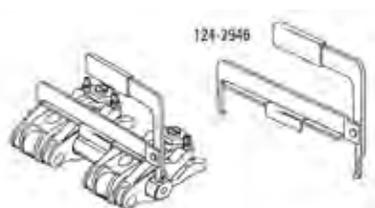
¹Used for FIETS and AVM with heavy duty coupling

²Part of 6V-6042 Indicator Contact Point Group

Lifting Bracket Assemblies

Model: 3406E Engines and C11/13 Engines

Warranty: Six Months



Lifting bracket firmly clamps rocker arm assembly together

- Used to lift rocker arm assembly during removal and installation (keeps the assembly aligned)
- Fingers of lifting bracket fit through bolt holes in rocker arm shaft and firmly clamp assembly together
- Using the lifting bracket greatly decreases assembly time because valve and unit injector rocker arms are held in correct relation to one another (using lifting bracket allows the mechanic to have a free hand during assembly)

| Part Number | Description | Model |
|-------------|--------------------------|-------------------|
| 124-2946 | Lifting Bracket Assembly | 3406E Rocker Arm |
| 293-2989 | Lifting Bracket Assembly | C11/13 Rocker Arm |
| 387-8004 | Lifting Bracket Assembly | C27 Rocker Arm |

8S-6691 Cylinder Head Stand Group

Model: 3100 and 3208

Warranty: Six Months



- Provide simple head support and clearance between head and work bench when service work required on cylinder heads
- 2 stands included in group

| Part Number | Description |
|-------------|---------------------------|
| 8S-6691 | Cylinder Head Stand Group |

9U-6238 Guide Bolt

Model: 3054 and 3056 Engines

Warranty: Six Months



- Used to align cylinder head with block during installation (2 bolts required)
- Screw driver slot used to easily install and remove the guide bolt
- Zinc coated to prevent corrosion

| Part Number | Description |
|-------------|-------------|
| 9U-6238 | Guide Bolt |

| | |
|----------------|-------------------|
| Overall length | 127.0 mm (5.0 in) |
| Diameter | 12.7 mm (0.5 in) |
| Thread | 1/2 - 20 2A |

185-5321 Cylinder Head Lifting Hook Assembly

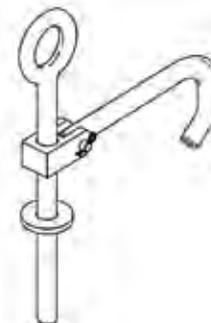
Model: 3114, 3116, 3126, 3300, and 3400 (except 3126B and 3406E) Engines

Warranty: Six Months

- Used to quickly and safely lift cylinder head core
- Designed for bare cylinder head "Core" handling only and not as an engine assembly tool
- Reduces potential injuries from manually handling cylinder head castings
- Easily attaches to core without bolts
- Straight leg inserts into middle bolt hole of cylinder head and hooked leg fits into breather opening on 3114, 3116, 3126 MUI/HEUI Engines or into exhaust port on 3300, 3406, 3408, and 3412 Engines

| | |
|--------------------------|-----------------|
| Maximum lifting capacity | 340 kg (750 lb) |
|--------------------------|-----------------|

| Part Number | Description |
|-------------|-------------------------------------|
| 185-5321 | Cylinder Head Lifting Hook Assembly |



199-1418 Hook Assembly

Model: 3406E, C-15, and C-16 Engines

Warranty: Six Months

- Used to quickly and easily lift cylinder head cores (camshaft must be removed prior to using tool)
- Used with an overhead lifting device
- Attaches easily without bolts or lifting eyes
- Grabs cylinder head core below camshaft bearing saddle
- Designed for bare head "core" lifting only

NOTICE

To prevent camshaft and other cylinder head component damage, DO NOT use this hook assembly as an engine assembly tool.

| | |
|--------------------------|-----------------|
| Maximum lifting capacity | 159 kg (350 lb) |
|--------------------------|-----------------|

| Part Number | Description |
|-------------|---------------|
| 199-1418 | Hook Assembly |



5P-3021 Lifting Bracket

Model: 3406

Warranty: Six Months

| Part Number | Description |
|-------------|-----------------|
| 5P-3021 | Lifting Bracket |

- Used for cylinder head removal and installation for 3406 Truck Engines with little or no access to rear lifting eye on cylinder head



5P-8700 Lifting Bracket

Model: 3408, 3412 Marine Engines

Warranty: Six Months



- Used to remove and install cylinder head and exhaust manifold assemblies on 3408 and 3412 Marine Engines in narrow engine compartments
- Designed to be used in pairs for lifting cylinder head assemblies vertically at approximately same angle as they are positioned on block; brackets attached to heads between end cylinders; two 0S-1618 Bolts, 5/16 inch-18 thread, 25.4 mm (1.0 in) long required for each bracket

| Part Number | Description |
|-------------|-----------------|
| 5P-8700 | Lifting Bracket |

165-4638 Guide Manifold

Model: 3400 Engines

Warranty: Six Months



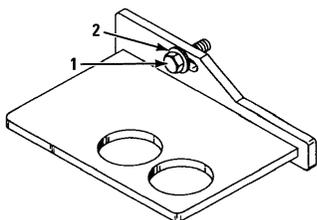
- Used to install exhaust manifolds
- Threads onto manifold stud for positive retention

| Part Number | Description |
|-------------|----------------|
| 165-4638 | Guide Manifold |

1U-8264 Head Lifting Bracket

Model: 3176, C10, and C12 Engines

Warranty: Six Months



European Union compliant, CE marked

- Used to remove and install cylinder head
- Used with two 6V-3668 Bolts and 5P-8245 Hard Washers
- Use one of two lifting holes, depending on which head is being removed
- Slotted mounting holes allows mechanic to easily balance cylinder head before lifting

| | |
|--------------------|-----------------|
| Working load limit | 114 kg (250 lb) |
|--------------------|-----------------|

| Item | Part Number | Description |
|------|-------------|----------------------|
| 1 | 6V-3668 | Bolt |
| 2 | 5P-8245 | Hard Washer |
| -- | 1U-8264 | Head Lifting Bracket |

209-1368 Head Lifting Bracket

Model: C-9 Engine

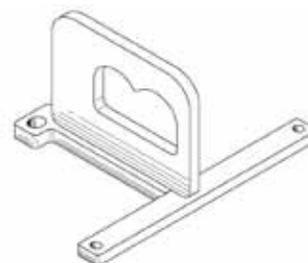
Warranty: Six Months

European Union compliant, CE marked

- Used to lift cylinder head with or without exhaust manifold and turbocharger
- Two lifting positions allow head to remain level during lifting procedure
- Bolts to cylinder head using two 6V-2317 Bolts, one 6V-3668 Bolt, two 5M-2894 Washers, and one 5P-8245 Washer (not part of lifting bracket)

| | |
|--------------------|-----------------|
| Working load limit | 159 kg (350 lb) |
|--------------------|-----------------|

| Part Number | Description |
|-------------|----------------------|
| 209-1368 | Head Lifting Bracket |



367-3535 Timing Case Cover Alignment Tool

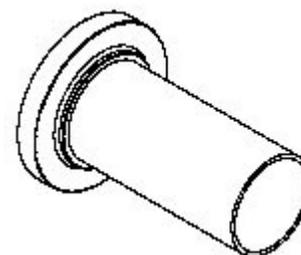
Model Usage: C7.1

Warranty: Six Months

- Used to correctly align pressed steel timing case cover to the timing case

| Specifications | |
|----------------|---|
| Dimensions | 5.8 x 3.75 x 3.75 in (147 x 95.25 x 95.25 mm) |
| Material | Steel |

| Part Number | Description |
|-------------|----------------------------------|
| 367-3535 | Timing Case Cover Alignment Tool |



371-1079 Head Lifting Bracket

Model Usage: C175

Warranty: Six Months

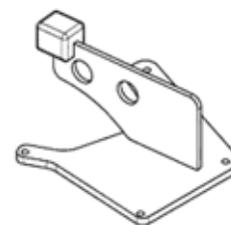
- Allows operator to quickly and easily lift engine cylinder head
- Multiple lifting points enables cylinder head to be at lifted level or at the angle of the block deck
- Threaded block allows convenient use of handle (126-6920)
- Requires five M8 - 1.25 x 25 mm (6V-3940) and two M14 - 2.0 x 35 mm (6V-8550) bolts (purchased separately) for fastening bracket to cylinder head
- CE Compliant

Reference

NEHS1128, Tool Operating Manual

| Specifications | |
|--------------------|-------------------|
| Part Number | Description |
| Weight | 3.7 kg (8.61 lbs) |
| Working Load Limit | 136 kg (300 lbs) |

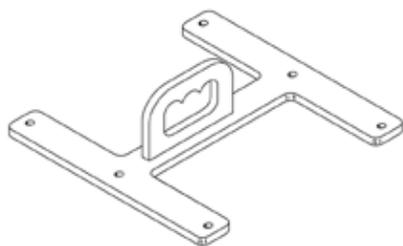
| Part No. | Description | Dimensions |
|----------|----------------------|--|
| 371-1079 | Head Lifting Bracket | 286 x 253 x 128.1 mm (113 x 10 x 5 in) |



185-3145 Lifting Bracket Assembly

Model: 3406E, 3456, C-15, and C-16 Engines

Warranty: Six Months



- Used to quickly and easily lift cylinder heads
- Attaches with six 1B-7182 Bolts and 9M-1974 Hard Washers or equivalent (not included)
- Designed for a bare cylinder head, with or without camshaft
- Includes multiple hook points for proper balancing

| Part Number | Description |
|-------------|--------------------------|
| 185-3145 | Lifting Bracket Assembly |

370-8083 Cylinder Head Lifting Bracket

Model: 3406E, 3456, C-15, C-16 Engines

Warranty: Six Months

European Union compliant, CE marked

- Used to quickly and easily lift cylinder heads with exhaust manifold and turbo charger attached.
- Includes multiple lift points to help keep cylinder head level during installation.
- Uses three 5/16" - 18 x 1 1/4" (1B-7182) and two 1/2" - 13 x 3 1/4" (0V-0375) bolts to fasten bracket to cylinder head. (Bolts are purchased separately.)

Reference

NEHS1114, Tool Operating Manual

| Specifications | |
|--------------------|--|
| Dimensions | 363 x 252 x 160 mm (14.3 x 9.9 x 6.3 in) |
| Weight | 4.5 kg (10 lbs) |
| Working Load Limit | 430.91 kg (950 lbs) |

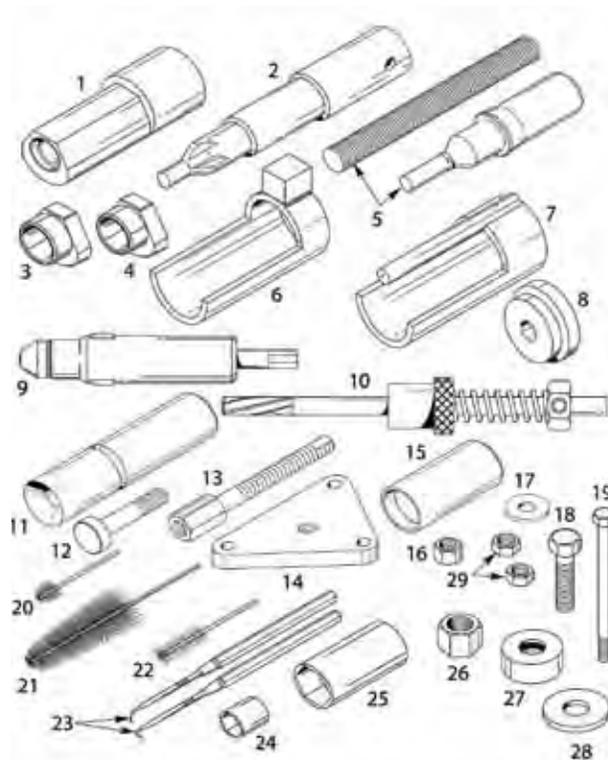
| Part Number | Description |
|-------------|-------------------------------|
| 370-8083 | Cylinder Head Lifting Bracket |

Sleeve Replacement Tools

Model: 3114, 3116 and 3126 Engines

Warranty: Six Months

- 143-2099 Sleeve Replacement Tool Group replaces the former 127-3458 Sleeve Replacement Tool Group
- The former 127-3458 Sleeve Replacement Tool Group can be UPDATED to the new configuration simply by purchasing the 143-2098 Sleeve Removal Tool Group; previous tooling not listed below is no longer needed for the new procedures
- These new improved tools are simpler and make the job faster and easier — offering the following benefits over the former 127-3458 Tool Group:
 - No tapping of old sleeves — means less debris, no stripped threads and no problem with loose sleeves turning
 - Works in low-overhead applications, such as cylinders #5 and #6 in GM truck chassis, Cat® machine installations, and others
 - Should be no need to remove the cylinder head from the engine for sleeve replacement
- Used on engines equipped with Mechanical Unit Injectors (MUI) or Hydraulic Actuated Electronically Controlled Unit Injectors (HEUI)
- Engines produced since early 1994 have had injector sleeves roller expanded at the factory; the original 4C-4462 Tool Group will not pull these sleeves (either the 127-3458 or the 143-2099 Tool Group is required)
- All special tooling necessary to efficiently remove, install, and ream copper injector sleeves is included in a single custom case in the 143-2099 Group (some additional shop supplies are also required, as specified in the Tool Operating Manual NEHS0675)



| | |
|----------------------|--|
| Item | Description |
| 18 | Bolt |
| Included (Not shown) | |
| NEEG2748 | Decal |
| NEHS0675 | Tool Operating Manual, "Using the 143-2099 Sleeve Replacement Tool Group on 3114, 3116 and 3126 Engines" |

| 143-2099 Sleeve Replacement Tool Group | | | |
|--|-------------|--------------------------------------|------|
| Item | Part Number | Description | Size |
| 1 | 125-7060 | Driver | -- |
| 3 | 4C-8714 | Guide Bushing (large) | -- |
| 4 | 4C-8715 | Guide Bushing (small) | -- |
| 6 | 125-7059 | Reaction Sleeve (HEUI) | -- |
| 7 | 9U-5671 | Receiver Sleeve Adapter ¹ | -- |

| 143-2099 Sleeve Replacement Tool Group | | | |
|--|-------------|-----------------------------|------|
| Item | Part Number | Description | Size |
| 8 | 4C-5572 | Plate (for reaction sleeve) | -- |
| 9 | 121-2920 | Roller Expander | -- |
| 10 ² | 9U-6101 | Reamer Group | -- |
| 11 | 142-8278 | Swage Tool | -- |
| 12 | 142-8279 | Sleeve Puller | -- |
| 13 | 142-8280 | Sleeve Stud | -- |
| 14 | 142-8281 | Plate | -- |

(Continued)

Cylinder Head, Valves and Cam Followers

Sleeve Replacement Tools (Continued)

Model: 3114, 3116 and 3126 Engines

Warranty: Six Months

Engine Tools

| 143-2099 Sleeve Replacement Tool Group | | | |
|--|-------------|---------------------------------|---------------------------------------|
| Item | Part Number | Description | Size |
| 15 | 143-8612 | Driver | -- |
| 17 | 7D-1649 | Hard Washer | -- |
| 19 | 6V-3821 | Hex Bolt | M8 x 1.25, 110 mm (4.3 in) long |
| 20 | 4C-5553 | Sleeve Cleaning Brush (tapered) | -- |
| 21 | 126-3297 | Large Bore Brush | -- |
| 22 | 4C-5570 | Small Bore Brush | -- |
| 23 | 9U-6859 | Pick Set | -- |
| 24 | 214-6625 | Socket | 11 mm, 3/8 in square drive, six point |
| 25 | 213-3530 | Socket | 1 1/8 in |
| 26 | 2J-3506 | Nut | 3/4 - 10 thd |
| 27 | 1U-8826 | Thrust Bearing | -- |

| 143-2099 Sleeve Replacement Tool Group | | | |
|---|-------------|----------------|-------------------------|
| Item | Part Number | Description | Size |
| 28 | 2S-0115 | Washer | -- |
| 29 | 1B-4430 | Jam Nut | 1/2 - 20 |
| Item 2 - Reamer Assembly³ | | | |
| 2 | 4C-8713 | Reamer Shank | -- |
| 2 | 4C-5502 | Set Screw | -- |
| Item 5 - Swage Assembly | | | |
| 5 | 4C-5573 | Swage (sleeve) | -- |
| 5 | 4C-5548 | Stud | 3/4 - 10 thd x 5 1/2 in |
| Not shown | | | |
| 1 | 6V-7145 | Case | -- |
| -- | 125-0684 | Foam Insert | -- |

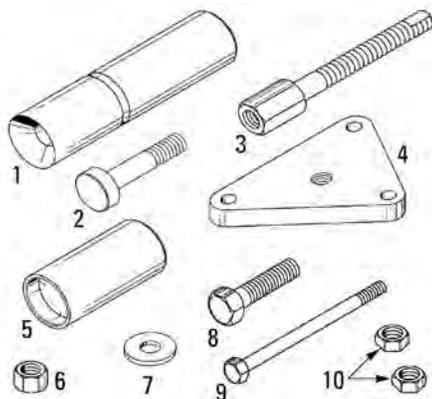
¹9U-5671 Sleeve 36.0 mm (1.42 in) 98.0 mm (3.86 in) Open end

²Includes: 9U-6102 Reamer, 9U-6103 Collar, 9U-6104 Compression Spring, and 9U-6105 Guide Bushing

³Includes: Reamer Head

143-2098 Sleeve Removal Tool Group

Warranty: Six Months



| Included (Not shown) | |
|----------------------|--|
| Item | Description |
| NEEG2748 | Decal |
| NEHS0675 | Tool Operating Manual, "Using the 143-2099 Sleeve Replacement Tool Group on 3114, 3116 and 3126 Engines" |

| 143-2098 Sleeve Removal Tool Group | | | |
|------------------------------------|-------------|--------------------------------------|--|
| Item | Part Number | Description | Size |
| 1 | 142-8278 | Swage Tool | -- |
| 2 | 142-8279 | Sleeve Puller | -- |
| 3 | 142-8280 | Sleeve Stud | -- |
| 4 | 142-8281 | Plate | -- |
| 5 | 143-8612 | Driver | -- |
| 6 ¹ | 3L-2415 | Full Nut and Hex Bolt (forcing bolt) | Nut 1/2 - 13, Bolt 1/2 - 20, 63.5 mm (2.5 in) long |
| 7 | 7D-1649 | Hard Washer | -- |
| 9 | 6V-3821 | Hex Bolt | M8 x 1.25, 110 mm (4.3 in) long |
| 10 | 1B-4430 | Jam Nut | 1/2 - 20 |
| -- | 143-2098 | Sleeve Removal Tool Group | -- |

¹Item 8 is Bolt

139-0692 Sleeve Jaw

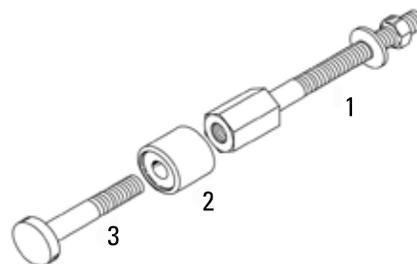
Model: 3114, 3116, 3126 Engines

Warranty: Six Months

- Used with 143-2099 Sleeve Replacement Tool Group to aid in sleeve pulling operation
- Sharp chamfer rolls top of injector sleeve over sleeve stud, reducing chance of stud pulling out

| Item | Description |
|------|--------------|
| 1 | Pulling Stud |
| 3 | Sleeve Stud |

| Item | Part Number | Description |
|------|-------------|-------------|
| 2 | 139-0692 | Sleeve Jaw |



131-8362 Reamer Head

Essential Tool

Model: 3114, 3116, and 3126 Engines

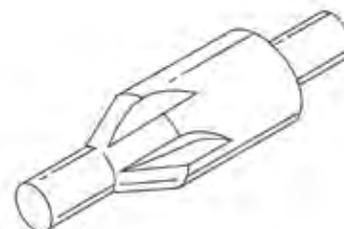
Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 131-8362 | Reamer Head |

- For reaming tapered injector seat in copper alloy injector sleeves
- Used with 143-2099 Sleeve Replacement Tool Group
- Made from solid carbide for superior life and performance

Reference

NEHS0675, Tool Operating Manual



385-8470 Valve Guide Reamer

Model Usage: 308E, 906H, 907H, 908H, and any C3.3B engine

Warranty: Six Months

- Used to properly install valve guides
- Used to ream valve guide for the C3.3B engine

| 385-8470 Specifications | |
|-------------------------|-------------------------------|
| Dimensions | 178 x 7.1 mm (7.01 x .280 in) |



417-4368 Reamer

Model Usage: Various Caterpillar Engines

Warranty: Manufacturer's

- Used if the sleeve of the unit injector has been removed from the engine to remove carbon on 3126B, C7, C9 and C9.3 engines
- Can also be used to ream valve guides to correct dimension within tolerance
- 9/32 inch (7.14mm)

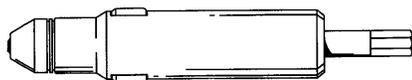
| Specifications | | |
|----------------|-------------|-------------------------------|
| Part Number | Description | Dimensions |
| 417-4368 | Reamer | 178 x 7.1 mm (7.01 x .280 in) |



121-2920 Roller Expander

Model: 1.1/1.2 L Engines

Warranty: Six Months



- Included with 143-2099 Sleeve Replacement Tool Group
- Helps ensure positive seal of sleeve to injector bore
- Easy to use — use torque wrench to turn in sleeve, up to 11 N·m (8 ft·lb)
- To update 4C-4462 Injector Sleeve Removal and Installation Tool Group

Reference

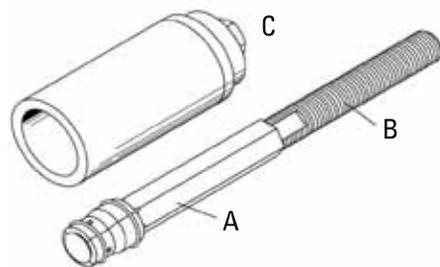
NEHS0675, Tool Operating Manual, “Using the 143-2099 Sleeve Replacement Tool Group on 3114, 3116 and 3126 Engines”

| Part Number | Description |
|----------------------|-----------------|
| 121-2920 | Roller Expander |
| Service/Repair Parts | |
| 4C-6732 | Race |
| 4C-6733 | Bearing |
| 4C-6737 | Retaining Ring |
| 4C-6738 | Retaining Ring |

151-4832 Sleeve Remover Assembly

Model: 3126B HEUI Engines

Warranty: Six Months



- Used to easily remove injector sleeves
- Designed for non-grooved injector sleeves
- Includes 177-7804 Segment Collet

Application Procedure

1. Insert tool fully into injector sleeve bore. Expand tool by turning part A and part B in opposite directions. Sharp set screw points should bite into walls of sleeve.
2. Install pulling bridge, thrust bearing, washer, and nut (item C, part of tool group). Tighten nut on puller stud to remove sleeve.

Reference

REN1369, Special Instruction, Unit Injector Sleeves

NOTE:

Set screw points should protrude approximately 2.0 mm (0.08 in) from surface of pulling tool collet.

| Thread | 3/4 - 10 |
|--------------------------------------|--------------------|
| Overall assembled length with puller | 254 mm (10 in) |
| Points | 141-4635 Set Screw |
| Item | Description |
| A | Expanding segment |
| B | Threaded rod |
| C | Puller components |

| Part Number | Description |
|-------------|-------------------------|
| 151-4832 | Sleeve Remover Assembly |

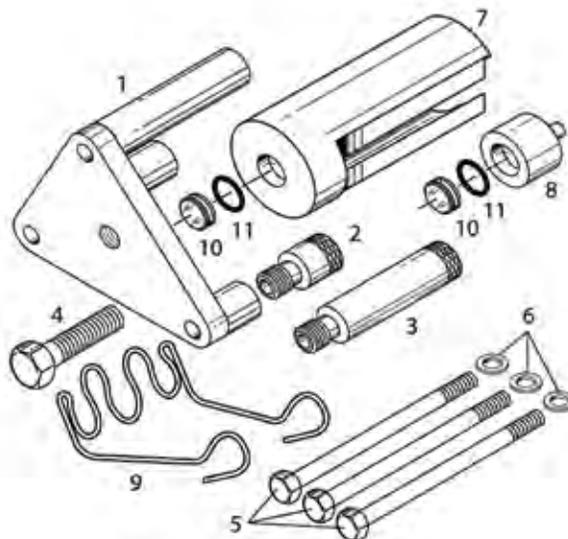
173-1530 Injector Seating Tool Group

Essential Tool

Model: 3114, 3116, 3126 MUI and 3116, 3126 2-Valve HEUI Engines

Warranty: Six Months

- Used to seat entire injector seating land into sleeve (eliminates combustion gas leakage)
- Used with 9U-5019 Torque Wrench
- Trues up out of round injector sleeves that cause combustion gas leakage
- Eliminates need to ream newly installed sleeves
- Eliminates injector clamp bolt load relaxation
- Provides consistent seating force from cylinder to cylinder using a simple forcing screw operation
- Works with existing sleeve removal and installation tooling
- Can be used in place of 142-8279 Plate used for sleeve removal for more control of location
- Forcing bridge mounts same as 142-8279 Plate
- Interchangeable legs work on bare head or with intake manifold in place



Reference

NEHS0738, Using the 173-1530 Injector Seating Tool Group on 3114, 3116, 3126 MUI and 3116 and 3126 2-Valve HEUI Engines

| Included (Not shown) | |
|----------------------|-------------|
| Item | Description |
| NEEG2838 | Decal, Case |

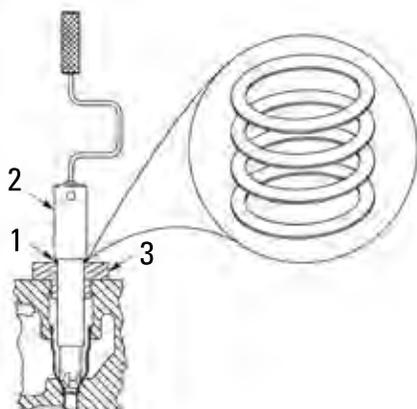
| Item | Part Number | Description |
|------|-------------|--------------------------------------|
| 1 | 173-1529 | Forcing Bridge |
| 2 | 173-1534 | Short Spacer Leg |
| 3 | 173-1535 | Long Spacer Leg |
| 4 | 3L-2415 | Full Nut and Hex Bolt (forcing bolt) |
| 5 | 7X-0457 | Hex Head Bolt (for forcing bridge) |
| 6 | 9M-1974 | Washer |
| 7 | 173-1531 | Injector Forcing Cover (MUI) |

| Item | Part Number | Description |
|-----------|-------------|-------------------------------|
| 8 | 173-1532 | Injector Forcing Cover (HEUI) |
| 9 | 146-2597 | Push Rod Holder |
| 10 | 175-7801 | Wear Button |
| 11 | 1P-8116 | O-ring |
| -- | 173-1530 | Injector Seating Tool Group |
| Not shown | | |
| 3 | 6V-3073 | Case - Plastic |
| -- | 173-1528 | Foam Insert |

170-9227 Reamer Shims

Model: 3116 and 3126 MUI, 3126 HEUI Engines

Warranty: Six Months



- Used to control depth of injector sleeve reaming operation; helps eliminate reamer chatter
- Allows only 0.25 mm (0.01 in) of material to be removed at a time — can prevent sleeve from being reamed too deep
- Provides a positive stop at end of reaming operation
- Thickness: 0.25 mm (0.01 in)
- Number of shims per packet: 4

Application Procedure

1. Start with 4 shims installed between 4C-8713 Reamer Shank (2) and 4C-8714 Bushing (3).
2. Ream sleeve until reamer shank contacts shim.
3. Remove one 0.25 mm (0.01 in) shim at a time and repeat until proper seat depth is obtained.

Reference

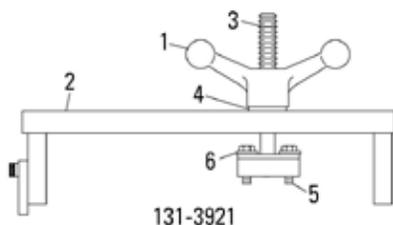
NEHS0675, Tool Operating Manual

| Item | Part Number | Description |
|------|-------------|-----------------------|
| 1 | 170-9227 | Reamer Shims |
| 2 | 4C-8713 | Reamer Shank |
| 3 | 4C-8714 | Guide Bushing (large) |

131-3921 Puller Group (HEUI)

Model: 3408 and 3412 HEUI Engines

Warranty: Six Months



- Used to easily remove carbon-fouled injectors from cylinder head
- Puller has large, balled end, handle for easier removal
- Puller bridge assembly sits on cylinder head top surface and uses a pivoting leg extension to keep bridge from sliding off of cylinder head

| 131-3921 Injector Puller Group | |
|--------------------------------|--------------------|
| Stud assembly overall length | 118.5 mm (4.67 in) |
| Stud thread | 3/8 - 16 |
| Bolt size | 1/4 - 20 |
| Distance between bolt holes | 29 mm (1.1 in) |
| Bridge overall length | 270 mm (10.7 in) |

| Item | Part Number | Description |
|------|-------------|------------------------|
| 1 | 131-8196 | Handle |
| 2 | 131-8197 | Puller Bridge Assembly |
| 3 | 131-8198 | Puller Stud Assembly |
| 4 | 093-0386 | Puller Stud Assembly |
| 5 | 0S-1616 | Bolt |
| 6 | 4B-4276 | Flat Washer |
| -- | 131-3921 | Puller Group (HEUI) |

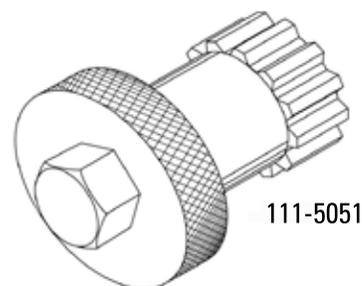
111-5051 Injector Wrench (3408 and 3412 HEUI)

Model: 3408 and 3412 HEUI Engines

Warranty: Six Months

- Used to remove and install stainless steel injector sleeves
- Used with 3/4 inch socket
- Spline on tool engages internal spline in sleeve

| Part Number | Description | Hex Size | Knurled Washer Diameter | Spline |
|-------------|-----------------|----------|-------------------------|------------|
| 111-5051 | Injector Wrench | 3/4 in | 50.8 mm (2 in) | 48 - tooth |



164-5924 Injector Bore Gauge, 164-5927 Tube Brush

Essential Tool

Model: 3408 and 3412 HEUI Engines

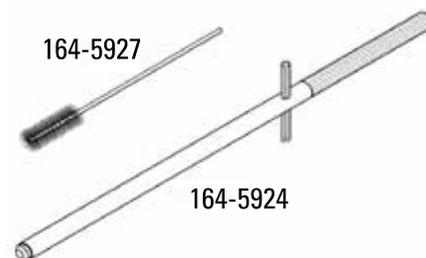
Warranty: Six Months

| Part Number | Description |
|-------------|---------------------|
| 164-5924 | Injector Bore Gauge |
| 164-5927 | Tube Brush |

- Used to clean and check clearance of injector sleeve tip area
- Proper cleaning of injector tip bore is mandatory when changing HEUI engine injectors
- Tools are included in 163-1575 HEUI Injector Rework Kit

Reference

REHS0116, Special Instruction



4C-8714 Guide Bushing (Large), 4C-8715 Guide Bushing (Small)

9U-5671 Reaction Sleeve

Model: 3114 and 3116 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------------------------|
| 4C-8714 | Guide Bushing (large) |
| 4C-8715 | Guide Bushing (small) |
| 9U-5671 | Receiver Sleeve Adapter ¹ |

- Used to replace and ream injector sleeves without removing valve springs — saves time
- 9U-5671 is designed to clear the valve springs and provide adequate support for pulling the injector sleeve
- 4C-8714 and 4C-8715 Guide Bushings allow reaming and sleeve installation without valve spring removal

Reference

SEHS9120, Special Instruction

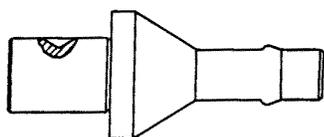


¹9U-5671 Sleeve 36.0 mm (1.42 in) 98.0 mm (3.86 in) Open end

4C-6591 Bottom Swage

Model: 3176

Warranty: Six Months



- Replaces discontinued 4C-6714 Bottom Swage
- Used to install injector sleeves in 3176 Engine cylinder heads
- Addition of pilot extension and lead-in chamfer ensure proper swaging of bottom of injector sleeve

| Part Number | Description |
|-------------|--------------|
| 4C-6591 | Bottom Swage |

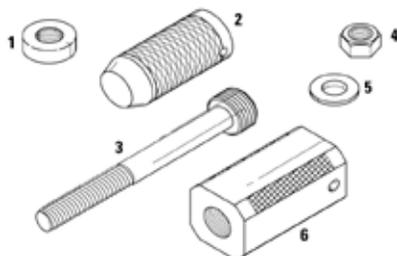
Reference

SEHS9246, Special Instruction

9U-6891 Injector Tool Group

Model: C-10, C-12, and 3406E Engines

Warranty: Six Months



- 128-7889 Puller Bridge replaces discontinued 9U-7260 Puller Bridge (new puller bridge can be used on all three engines)
- Injector tool group is used to remove and install injector sleeves

References

SENR6421, 3406E Service Manual, Disassembly and Assembly

SENR1002, C-10 Disassembly and Assembly

SENR1007, C-12 Disassembly and Assembly

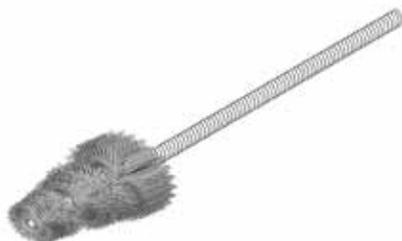
| Item | Part Number | Description |
|------|-------------|---------------------|
| 1 | 9U-6877 | Thrust Bearing |
| 2 | 9U-7258 | Driver Cap |
| 3 | 221-9778 | Puller Stud |
| 4 | 4K-0367 | Nut - Full |
| 5 | 5P-8247 | Hard Washer |
| 6 | 128-7889 | Puller Bridge |
| -- | 9U-6891 | Injector Tool Group |

312-3204 Injector Brush

Essential Tool

Model: C175 Engine

Warranty: Six Months



- Used to clean injector bores before inserting injectors
- Tapered design for easy insertion and efficient cleaning action
- Overall length: 350 mm (13.8 in)
- Diameter: 32 mm (1.26 in)
- Wire filament diameter: 0.25 mm (0.010 in)

| Part Number | Description |
|-------------|----------------|
| 312-3204 | Injector Brush |

9U-6860 Tool Group

Model: 3176, 3176B

Warranty: Six Months

- Replaces discontinued 4C-4054 Tool Group
- Used to install, clean, and ream injector sleeves in cylinder head

References

SEHS8884, Unit Injector Test Specifications

SENR5109, 3176 Service Manual

SEHS9246 Special Instruction, operation



| Part Number | Description |
|-------------|------------------------------|
| 9U-6860 | Tool Group |
| 1B-2886 | Bolt |
| 8H-8556 | Socket, 1 in |
| 213-3530 | Socket |
| 1U-8826 | Thrust Bearing |
| 2J-3506 | Nut |
| 2S-0115 | Washer |
| 3S-2713 | Full Hardened Nut |
| 4C-5502 | Set Screw |
| 4C-5538 | Reamer Head |
| 4C-5552 | Large Bore Brush |
| 4C-6591 | Bottom Swage |
| 4C-6730 | Roller Expander ¹ |
| 4C-8720 | Guide Bushing |

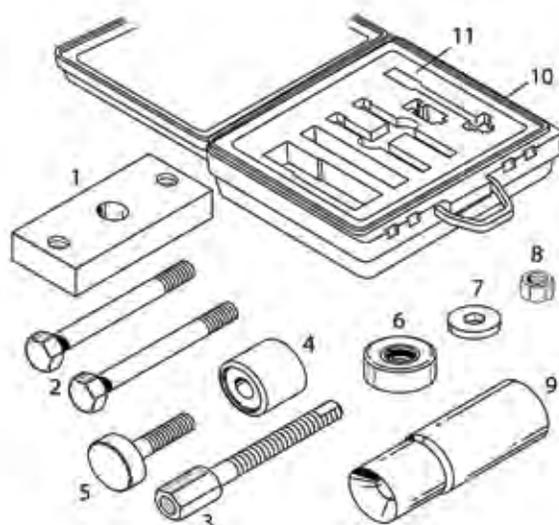
| Part Number | Description |
|-------------|---------------------|
| 4C-8721 | Guide Bushing |
| 4C-9495 | Tee Handle |
| 7X-0613 | Hard Washer |
| 9U-6631 | Foam Insert Set |
| 9U-6851 | Lower Pilot |
| 9U-6853 | Tap |
| 9U-6854 | Puller Screw |
| 9U-6855 | Reamer Shank |
| 9U-6856 | Flare Tool |
| 9U-6857 | Driver |
| 9U-6858 | Bridge Plate |
| 9U-6859 | Pick Set |
| 9U-6861 | Puller Stud |
| 9U-6862 | Small Tapered Brush |
| 9U-6863 | Small Bore Brush |

¹ Includes 4C-6732 Race, 4C-6733 Bearing, 4C-6734 Roll, 4C-6735 Cage, and 4C-6738 Retaining Ring

169-3374 Injector Sleeves Tool Group

Model: 3176 and 3176B Engines

Warranty: Six Months



- Used to quickly and easily remove brass injector sleeves
- Eliminates sleeve tapping (threading) operation — no brass chips to fall into engine
- Similar to current 3100 Engine brass sleeve removal procedure

Reference

NEHS0734, Tool Operating Manual, 169-3374 Brass Injector Sleeve Removal Group for 3176 and 3176B Engines

| Item | Part Number | Description |
|------|-------------|----------------|
| 1 | 9U-6858 | Bridge Plate |
| 2 | 1B-2886 | Bolt |
| 3 | 142-8280 | Sleeve Stud |
| 4 | 151-4833 | Sleeve Jaw |
| 5 | 156-2870 | Puller Stud |
| 6 | 1U-8826 | Thrust Bearing |

| Item | Part Number | Description |
|------|-------------|--|
| 7 | 7D-1649 | Hard Washer |
| 8 | 1F-7958 | Full Nut (1/2 - 13) (fork mounting hardware) |
| 9 | 156-2869 | Crimping Swage |
| 10 | 6V-3073 | Case - Plastic |
| 11 | 173-5508 | Foam Insert |
| -- | 169-3374 | Injector Sleeves Tool Group |

C9.3 Engine Head Assembly Tools

Model Usage: C9.3

Warranty: Six Months



364-2687



364-0745



371-1603

- Multifunction tool used to correctly remove and install C9.3 injector sleeves
- Removal requires 3/8 - 16 slide hammer shaft (i.e. 6V-2166)
- Long shank tap supplied for machining grooves in sleeve for easy removal
- Supplied o-ring prevents debris from entering combustion chamber during removal
- 364-0745 and 371-1603 required to remove and install valve spring retainers

| Specifications | | | |
|----------------|-------------------------|---------------------------------------|------------------|
| Part Number | Description | Dimensions | Weight |
| 364-0745 | Hold Down Plate | 35 x 67.9 x 4 mm (1.4 x 2.7 x .16 in) | .026 kg (.57 lb) |
| 364-2687 | Sleeve Puller | 32 x 109 mm (1.3 x 4.3 in) | .45 kg (.99 lb) |
| 371-1603 | Valve Spring Compressor | 28 x 75 x 32 mm (1.1 x 3.0 x 1.3 in) | .204 kg (.45 lb) |
| Not Shown | | | |
| 370-8733 | Tap - Shank (M6 x 1) | 120 - 140 mm long (4.7 - 5.5 in) | .54 kg (1.2 lb) |

372-7975 C7 Injector Sleeve Removal/Installation Tool

Model: C7 Engines
Warranty: Six Months

- Used to remove and install the injector sleeve on C7 Engines
- Uses a 1/4" - 28 x 6" long tap, purchased separately (example McMaster - Carr 2589A26)
- Uses 2, 1/4" - 28 bolts to engage threads in sleeve after threads have been cut to remove sleeve
- Install top portion of tool to use as an installer to tap new sleeve in place
- Black oxide coating and hardened steel allow for durability and resistance to rust

Note:

Tool shown in install configuration (remove end piece to use as removal tool)

| Specifications | |
|----------------|------------------------------|
| Dimensions | 35 x 185 mm (1.38 x 7.28 in) |
| Weight | 1.2 kg (2.65 lbs) |

| Part Number | Description |
|-------------|--|
| 372-7975 | C7 Injector Sleeve Removal/Installation Tool |

333-0759 Injector Sleeve Tool

Essential Tool

Model: C175 Engines
Warranty: Six Months

- Used to remove and install externally threaded injector sleeves on C175 Engines
- Used with 1/2 inch drive wrench to install (screw in) and remove (screw out) threaded style injector sleeve
- Four hardened teeth (RKW C45-55) engage notches on interior of injector sleeve
- Longer length easily reaches down into cylinder head
- Durable, welded-steel construction with black oxide coating for corrosion resistance



References

KENR6052, C175-16 and C175-20 Engines For Caterpillar Built Machines, Disassembly and Assembly
REN7466, C175-16 Generator Set Engine, Disassembly and Assembly

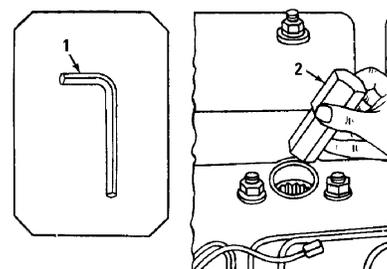
| Part Number | Description |
|-------------|----------------------|
| 333-0759 | Injector Sleeve Tool |

Screw-In Precombustion Chamber Tools

Model: Most Cat® Engines
Warranty: Six Months

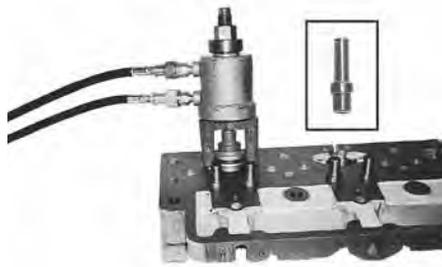
| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 1D-5343 | Wrench |
| 2 | 1F-0479 | Tool |

- 1D-5343 Wrench required to remove set screw and 1F-0479 Tool to loosen precombustion chamber on earlier screw-in type precombustion chambers
- 1F-0479 Tool also used to install these earlier precombustion chambers



Drive-In Precombustion Chamber Tools

Model: Most Cat® Engines
Warranty: Six Months



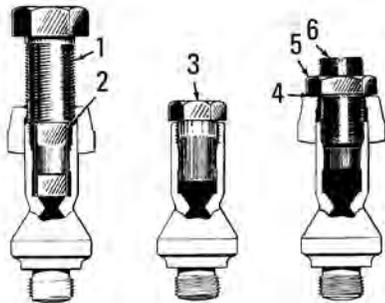
- Hydraulic puller combined with tools shown provides simple and efficient method of removing drive-in type precombustion chamber
- Same tools can be used without hydraulic puller
- Driver used to install drive-in type precombustion chambers in cylinder heads; lower end of this tool serves as pilot so hammer blows can be directed squarely on upper end of chamber

| Part Number | Description |
|-------------|----------------|
| 6V-3160 | Cylinder Group |

| | |
|-----------|--------|
| Includes: | Saddle |
|-----------|--------|

5F-9217 Precombustion Chamber Tool Group

Model: Most Cat® Engines
Warranty: Six Months

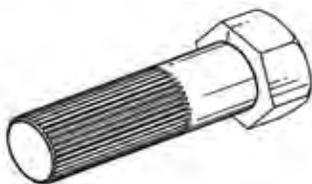


- Engines with 1-piece precombustion chambers require only 5F-8353 Wrench for removal and installation

| Item | Part Number | Description | Use |
|------|-------------|----------------------------------|--|
| 1 | 1A-2208 | Bolt | Remove precombustion chamber retainer |
| 2 | 5F-9072 | Spacer | Remove precombustion chamber retainer |
| 3 | 5F-8353 | Wrench | Remove and install precombustion chamber |
| 4 | 4B-4285 | Washer | Replace precombustion chamber retainer |
| 5 | 0L-1017 | Nut | Replace precombustion chamber retainer |
| 6 | 6F-5515 | Screw | Replace precombustion chamber retainer |
| -- | 5F-9217 | Precombustion Chamber Tool Group | -- |

8S-0225 Precombustion Chamber Wrench

Model: 1674, D334, 3400
Warranty: Six Months



- Used to remove and install precombustion chambers on 1674, D334, and 3400 Series Engines

| Part Number | Description |
|-------------|------------------------------|
| 8S-0225 | Precombustion Chamber Wrench |

5P-0125 Precombustion Chamber Wrench

Model: 3204, D3, 910, 931

Warranty: Six Months

Model: 3204, D3, 910, 931

- Used to remove and install precombustion chambers on 3204 Engine in D3 Tractors, 910 Wheel Loaders, and 931 Track Loaders

| Part Number | Description |
|-------------|------------------------------|
| 5P-0125 | Precombustion Chamber Wrench |



5P-0961 Fuel Valve Adapter Wrench

Model: 3400

Warranty: Six Months

| Part Number | Description |
|-------------|---------------------------|
| 5P-0961 | Fuel Valve Adapter Wrench |

- Used for removal and installation of direct injection fuel valve adapters on 3400 Series Engines



5S-0276 Glow Plug Wrench

Model: Multiple Engine Models

Warranty: Six Months

- Used to remove and install glow plugs with 9.525 mm (3/8 in) hex on D4E, D6D, D6H, 637D, 977L

| Part Number | Description |
|-------------|------------------|
| 5S-0276 | Glow Plug Wrench |



Glow Plug Tools

Model: Most Cat® Engines

Warranty: Six Months

- Wrenches and guide screws needed for installation and removal of glow plugs with 7.93 mm (5/16 in) hex on earlier engines

| Item | Part Number | Description |
|------|-------------|-------------|
| 1.0 | 1H-5656 | Wrench |
| 2.0 | 8S-2243 | Wrench |
| 3.0 | 9S-2573 | Socket |
| 5.0 | 9F-4571 | Guide Screw |
| 6.0 | 5H-7446 | Guide Screw |



390-1134 Plug Adapter

Model Usage: C3.3B engines

Warranty: Manufacturer's



- Used to check engine compression from a glow plug port
- Used to verify that compression is at correct level

| Specifications | |
|----------------|--------------------------------|
| Dimensions | 193.6 x 19.1 mm (7.6 x .75 in) |

| Part Number | Description |
|-------------|--------------|
| 390-1134 | Plug Adapter |

161-3440 Socket

Essential Tool

Model: C-10 and C-12 Engines

Warranty: Six Months



- Used to tighten cylinder head bolts under water manifold without removing it
- Works on both single and dual thermostat housings
- Required according to PS4435 Product Support Program
- Do NOT use with impact driver
- Heat-treated for added durability and long life

| | |
|-------------------|-----------------|
| Square drive | 3/4 in |
| Double hex socket | M16 bolts |
| Overall length | 190 mm (7.5 in) |

| Part Number | Description |
|-------------|-------------|
| 161-3440 | Socket |

FT1322 Lever Assembly

Model: 3400

Warranty: None



- Permits removal and installation of glow plugs and precombustion chambers without removing valve cover base and rocker arm shaft

FT0869 Cylinder Head (or Hydraulic Cylinder) Storage Rack

Model: All Cat® Engines

Warranty: None

- Provides excellent facility for storing cylinder heads
- With modifications, can also be used for hydraulic cylinder storage



9U-7511 Spark Plug Seat Cleaner

Model: 3500 and 3600 Spark Ignited Engines

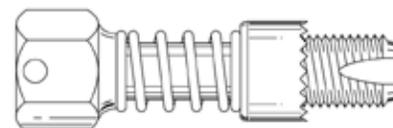
Warranty: Six Months

- Used to clean gasket seat of rust resulting from a leaking gasket
- Used to clean threads in cylinder head

Reference

NEEG2585, Decal (instructions for inside lid of case)

| | |
|-----------------------|---------------------|
| External hex | 22.225 mm (7/8 in) |
| Internal square drive | 3/8 in |
| Thread | M18 x 1.5 mm |
| Overall length | 75 mm (3.0 in) |



| Part Number | Description |
|---|---|
| 9U-7511 | Spark Plug Seat Cleaner |
| To build service kit, order:¹ | |
| 9Y-6792 | Gasket (standard), 25 each |
| 105-7124 | Gasket (oversize), 25 each |
| 9U-7512 | Foam |
| 6V-6045 | Case - Plastic, NEEG2061 Accessories Case Decal |

¹Als order: NEEG2585 Decal (inside lid) and NEEG2586 Decal (outside case)

154-9521 Spark Plug Seat Cleaner

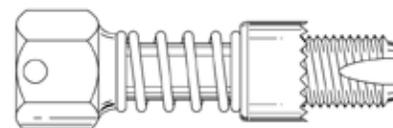
Model: G3400 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 154-9521 | Spark Plug Seat Cleaner |

- Used to simultaneously clean rust and debris from gasket seat and cylinder head threads
- Used with 3/4 inch, 6 point socket (do not use 12 point socket)
- Spring-loaded design only removes dirt and debris, not metal

| | |
|----------------|-----------------|
| Thread size | M14 x 1.25 |
| External hex | 19 mm (0.75 in) |
| Overall length | 75 mm (3.0 in) |



FT0868 Cylinder Head Component Parts Rack

Model: All Cat® Engines

Warranty: None



- Provides storage for fourteen 305 x 610 mm (12 x 24 in) wire baskets
- During cylinder head rebuild, storage space is required for small items like valves, springs, etc.

5P-1762 Support Bracket

Model: 3304 and 3306

Warranty: Six Months



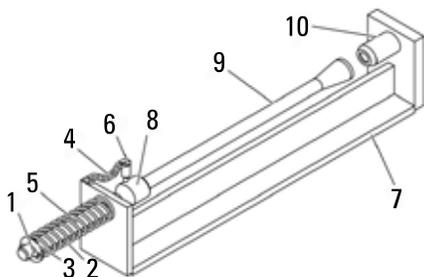
- Used to support fan drive bracket when cylinder head is removed from chassis

| Part Number | Description |
|-------------|-----------------|
| 5P-1762 | Support Bracket |

FT0117 Seal Ferrule Assembly Tool

Model: All Cat® Engines

Warranty: None



- Used to speed up assembly of cylinder head ferrules and seals

| Item | Description |
|------|------------------|
| 1 | Pin |
| 2 | Spring |
| 3 | Flat Washer |
| 4 | Chain |
| 5 | Upper Rod |
| 6 | Connecting Pin |
| 7 | Bracket |
| 8 | Connecting Joint |
| 9 | Lower Rod |
| 10 | Base |
| | A. Rubber Seals |
| | B. Ferrule |

FT0806 Cylinder Head Repair Bench

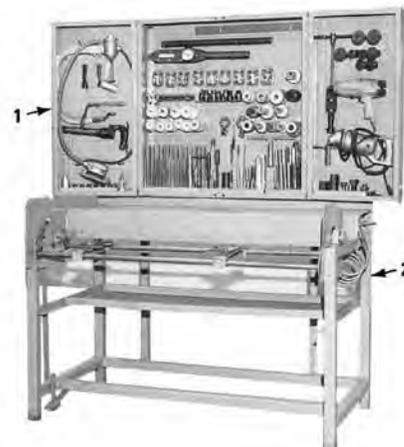
Model: All Cat® Engines

Warranty: None

- Provides cradle which will mount all Cat® cylinder heads
- Cradle is well balanced and supported by ball bearings
- Foot-operated release mechanism enables serviceman to turn cylinder heads with ease

| Item | Part Number | Description |
|---|-------------|--------------|
| 2 | FT0806 | Repair Bench |
| Clamps used to service 3208 and 3406 cylinder heads | | |
| | FT1660 | Clamp |
| | FT1661 | Clamp |
| | FT1662 | Clamp |

| Item | Part Number | Description |
|------|-------------|--|
| 1 | 9S-9087 | Tool Cabinet (for illustration purposes) |



5P-8703 Insert

Model: D353 Engine

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 5P-8703 | Insert |

- Required to modify former D353 cylinder heads for spacer plate blocks
- Quantity: 12

Reference

SMHS7339, Special Instruction



6V-9050 Stud Removal Tool Group

Model: 3200, 3300, 3400, C9, C15, C-16, C18, C27, C32

Warranty: Six Months

- Designed to remove broken exhaust manifold studs and bolts
- Consists of drill fixture, 2 alignment bushings, 2 drill bushings, and 2 drills
- Removal of broken stud begins by using disc grinder to grind broken stud so 164-3755 Drill Fixture can be secured to cylinder head; 1/8 inch drill and drill bushing first used to drill completely through broken stud; then stud is drilled out using 5/16 inch drill and drill bushing
- Since bolts are used to retain exhaust manifolds on 3200 Family Engines, HeliCoil is acceptable for repair of these heads; however, studs with taperlock threads are used to retain exhaust manifolds on 3300 and 3400 Family Engines and HeliCoil cannot be satisfactorily used to repair cylinder heads on these engines.

Reference

SMHS8297, Special Instruction



| Item | Part Number | Description |
|------|-------------|------------------|
| 1 | 6V-3073 | Case - Plastic |
| 2 | 6V-4094 | Foam - Convolved |
| 3 | 6V-9051 | Block |

| Item | Part Number | Description |
|------|-------------|-------------|
| 4 | 5P-7330 | Screw |
| 4 | 164-3755 | Fixture |

(Continued)

Cylinder Head, Valves and Cam Followers

6V-9050 Stud Removal Tool Group (Continued)

Model: 3200, 3300, 3400, C9, C15, C-16, C18, C27, C32

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|--|
| 5 | 164-3756 | Alignment Bushing, 9.53 mm (0.375 in) diameter (2 piece) |
| 6 | 0S-1588 | Bolt |
| 7 | 164-3757 | Drill Bushing, 7.94 mm (0.312 in) diameter |

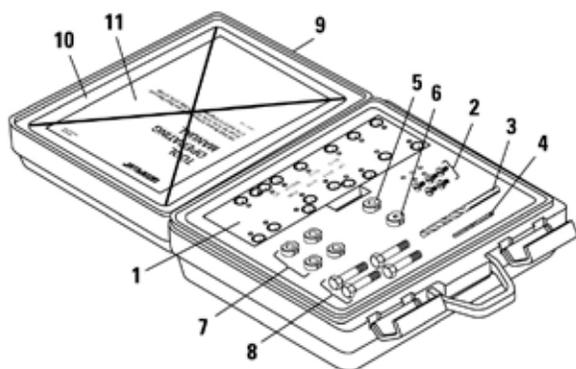
| Item | Part Number | Description |
|------|-------------|--|
| 7 | 164-3758 | Drill Bushing, 3.18 mm (0.125 in) diameter |
| 8 | 5P-6732 | Screw |
| 9 | 6V-9048 | Drill, 7.94 mm (5/16 in) outside diameter |
| 9 | 6V-9049 | Drill, 3.18 mm (1/8 in) outside diameter |
| -- | 6V-9050 | Stud Removal Tool Group |

Engine Tools

188-3922 Exhaust Stud and Bolt Removal Tool Group

Model: 3114, 3116, 3126, 3126B, 3176, 3176B, 3196, C7, C-10, and C-12 Engines

Warranty: Six Months



- Used to remove broken metric exhaust bolts and studs from engines
- Designed for drilling out studs/bolts to minimum thread diameter — remaining pieces of thread can be removed and threads cleaned up with a tap
- Can be used with engine still installed in machine/vehicle
- Includes a drilling plate, alignment bushings, drill bushings, and drill bits

Reference

NEHS0787, Tool Operating Manual

| Item | Description |
|-----------|--------------------------------|
| 11 | NEHS0787 Tool Operating Manual |
| Not Shown | NEEG2895 Decal |

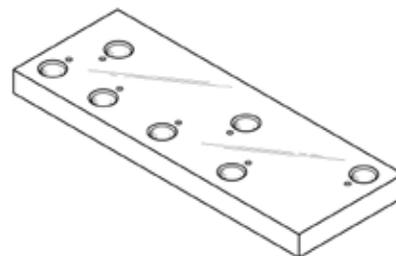
| Item | Part Number | Description | Qty. |
|------|-------------|--|------|
| 1 | 188-3914 | Drilling Plate | -- |
| 2 | 188-3915 | Bushing Lock Screw | 5 |
| 3 | 1U-8163 | Drill, 8.5 mm (0.334 in) | -- |
| 4 | 1U-8133 | Drill, 2.5 mm (0.098 in) | -- |
| 5 | 188-3923 | Bushing, 8.5 mm (0.334 in) inside diameter | -- |
| 6 | 188-3918 | Bushing, 2.5 mm (0.098 in) inside diameter | -- |

| Item | Part Number | Description | Qty. |
|------|-------------|---|------|
| 7 | 188-3916 | Bushing, 10 mm (0.393 in) inside diameter | 4 |
| 8 | 8T-4186 | Bolt, M10 x 1.5, 40 mm (1.57 in) long | 4 |
| 9 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- |
| 10 | 188-3921 | Foam Insert | -- |
| -- | 188-3922 | Exhaust Stud and Bolt Removal Tool Group | -- |

357-4646 Drilling Plate

Model: 3054 Engines
 Warranty: Six Months

- Used to remove broken exhaust manifold studs and bolts from engine
- Used with 188-3922 Exhaust Stud and Bolt Removal Group
- Used in place of 188-3914 Drilling Plate
- Designed to attach to exhaust manifold and exactly locate drill bits when drilling out broken studs/bolts
- Can be used with engine still installed in machine/vehicle
- Black-oxide coated for corrosion resistance



Reference

NEHS0787, Tool Operating Manual

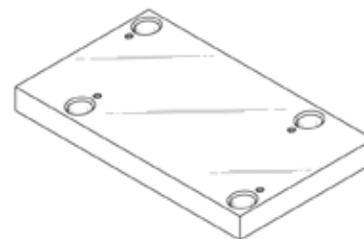
| Part Number | Description |
|-------------|----------------|
| 367-4646 | Drilling Plate |

350-8688 Drilling Guide Plate

Model: C11 Engine, C13 Engine
 Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 350-8688 | Drilling Guide Plate |

- Used to remove broken exhaust manifold studs and bolts from engines
- Used with 188-3922 Exhaust Stud and Bolt Removal Group
- Used in place of 188-3914 Drilling Plate
- Designed to attach to exhaust manifold and exactly locate drill bits when drilling out broken studs/bolts on C11 and C13 engines
- Can be used with engine still installed in machine/vehicle
- Reversible design to fit both sides of engine
- Black oxide coated for corrosion resistance



Reference

NEHS0787, Tool Operating Manual,
 188-3922 Broken Bolt and Stud Removal Group

FT1766 Pilot Adapters

Model: All Cat® Engines
Warranty: None



- Can be installed in cylinder head and used as guide when surface is ground
- Can be made in 3 different sizes which will fit all Cat® cylinder heads equipped with precombustion chambers or nozzle adapters
- Can be used with valve seat grinding tools which use 9.53 mm (0.375 in) diameter pilot

Reference
SMHS8276, Special Instruction

6V-7028 Spring Seat Enlarger

Model: All Cat® Engines
Warranty: Six Months



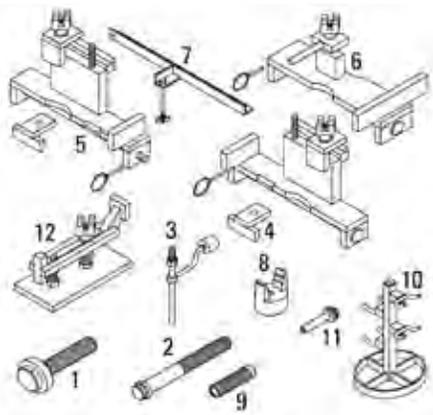
- Used to machine larger spring seat diameter on 9N-1107 Cylinder Heads; larger spring seat necessary to install large diameter valve springs and spacers
- Must be used with 12.7 mm (1/2 in) electric drill (500 to 700 RPM)

| Part Number | Description |
|-------------|----------------------|
| 6V-7028 | Spring Seat Enlarger |

Reference
SEHS8131, Special Instruction

Fabricated Tools for Batch Processing Cylinder Heads

Model: 3204, 3208
Warranty: None



- Used to decrease reconditioning time of cylinder heads
- Especially helpful when large quantities of cylinder heads are reconditioned (batch processing)

| Item | Part Number | Description |
|------|-------------|-------------------------------|
| 1 | FT1654 | Plug Driver |
| 2 | FT1655 | Plug Driver |
| 3 | FT1656 | Cylinder Head Thickness Gauge |
| 4 | FT1660 | Head Bench Clamp |
| 5 | FT1661 | Head Bench Clamp |
| 6 | FT1662 | Head Bench Clamp |
| 7 | FT1712 | Valve Retainer |
| 8 | FT1721 | Valve Seat Cutter Set Gauge |
| 9 | FT1722 | Valve Lock Remover |
| 10 | FT1739 | Cylinder Head Wash Rack |
| 11 | FT1753 | Valve Stem Protector |
| 12 | FT1779 | Holding Fixture |

375-2773 Installation Tool

Model Usage: C13 & C15 Engines

Warranty: Six Months

- Used to install valve seal using hand pressure
- Prevents damage to valve seal during installation

| Specifications | |
|----------------|--------------------------------|
| Dimensions | 150 x 26.8 mm (5.90 x 1.05 in) |
| Weight | .54 kg (1.20 lbs) |
| Material | Steel |

| Part Number | Description |
|-------------|-------------------|
| 375-2773 | Installation Tool |



4C-6373 Valve Seal Installer

Model: 3046 Diesel Engine

Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 4C-6373 | Valve Seal Installer |

- Used to install valve seal — easily installed using hand force
- Prevents damage to valve seal during installation — saves time and reduces cost
- Knurled for ease of handling



Reference

SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engine

Cylinder Condition Analysis Tools

Model: All Models

Warranty: Six Months

- Used to analyze cylinder condition on any Cat® engine
- Pressurized air is introduced into cylinder; amount of pressure drop is indicator of piston ring and valve condition

Reference

GMG00694, Special Instruction

| Item | Description |
|------|-------------------------------------|
| 4 | Norgren Regulator Model #11-002-049 |



(Continued)

Cylinder Head, Valves and Cam Followers

Cylinder Condition Analysis Tools (Continued)

Model: All Models

Warranty: Six Months

Engine Tools

| Item | Part Number | Description |
|------|-------------|--|
| 1 | 6K-5875 | Hose Assembly |
| 2 | 1P-5564 | Adapter (D.I. Engines) |
| 3 | 1P-5565 | Adapter (Gas Engines) |
| 5 | 3B-7767 | Nipple (Modify nipple by filling with braze and drilling a 1.02 mm (0.04 in) orifice hole through braze) |
| 6 | 3B-7762 | Tee Fitting |
| 7 | 6V-4142 | Nipple, Unvalved (for 42000 kPa) |

| Item | Part Number | Description |
|------------------|-------------|---|
| 8 | 9S-7341 | Fitting [6.35 mm (1/4 in) tube, 3.175 mm (1/8 in) pipe] |
| 9 | 8S-2268 | Tube Assembly |
| 10 | 6V-4143 | Coupler Assembly |
| 10 | 7S-8897 | Seal |
| 11 | 8T-0846 | Pressure Gauge |
| 12 | 1P-5569 | Tip |
| 13 | 1P-5567 | Tip |
| Not Shown | | |
| -- | 5K-5068 | Nipple - Pipe Hexagon |

9U-7995 Head Guide Pin

Model: 3046 Diesel Engine

Warranty: Six Months



- Used to align cylinder head during engine assembly — two required
- Simple to use (threaded guide pin has screwdriver slot for easy installation)
- Thread: M12 x 1.75
- Overall length: 115.0 mm (4.5 in)

Reference

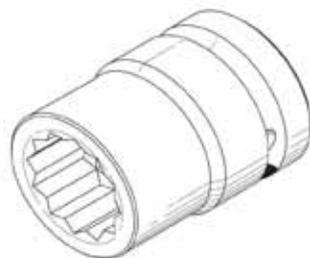
SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engine

| Part Number | Description |
|-------------|----------------|
| 9U-7995 | Head Guide Pin |

312-2840 Socket (Head and Flywheel Bolt)

Model: C175

Warranty: Six Months



- Used to remove and install cylinder head and flywheel bolts
- Used with 3/4 inch drive standard and torque wrenches
- Do not use with impact wrench
- Heavy-duty, twelve-point socket properly fits M16 Bolts (24 mm across flats)

References

KENR6052, Service Manual, C175-16 and C175-20 Engine, Disassembly and Assembly
REN7466, Service Manual, C175-16 Generator Engine Sets, Disassembly and Assembly

| Part Number | Description |
|-------------|---------------------------------|
| 312-2840 | Socket (Head and Flywheel Bolt) |

359-4208 G3500 Valve Seat Removal Tool

Model Usage: G3500

Warranty: Six Months

- Safely removes valve seats from Gas 3500 engines
- Eliminates insert breakage
- Reduces repair time
- Reduces rework due to broken inserts



| Specifications | |
|-------------------------------|--|
| Hydraulic Source Requirements | 68.9 kPa (10,000 psi) |
| Dimensions | 355.6 x 228.6 x 190.5 mm (14 x 9 x 7.5 in) |
| Weight | 8.85 kg (19.5 lbs) |

| Part Number | Description |
|---------------|-------------------------------|
| 359-4208 | G3500 Valve Seat Removal Tool |
| Service Parts | |
| 371-0351 | Cylinder-Puller |
| 359-4286 | Collet As. |
| 359-4287 | Drawbar |
| 359-4288 | Washer |
| 361-0074 | Slide-lower |

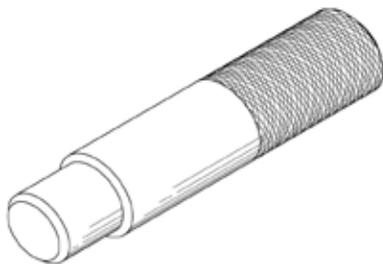
Electrical and Ignition Tools

Engine Tools

FT1031 Bearing Driver

Model: Prestolite Starters

Warranty: None



- Used to properly install Oilite bearings in Prestolite starting motors
- Act as insertion and sizing tool during installation of bearings
- Driver does not destroy bearings self-lubricating qualities

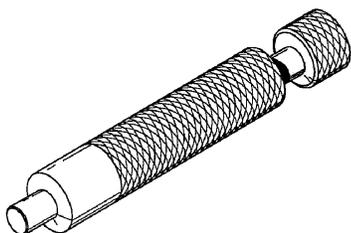
Reference

FM035064, Special Instruction

9U-7226 Installer Group

Model: 3406E Engine

Warranty: Six Months



- Used to install valve stem seals — easily installed using hand force
- Prevents installation damage to valve stem seals
- Seals can be installed with cylinder head on or off the engine
- Knurled handles for better grip and zinc-coated to prevent corrosion
- Diameter: 22.2 mm (0.87 in)
- Overall length: 140.0 mm (5.5 in)

Reference

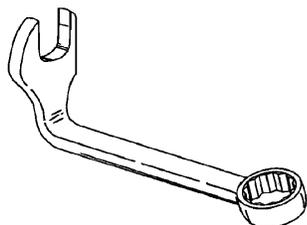
SENR5580, Service Manual

| Part Number | Description | Diameter | Overall Length |
|-------------|----------------------------|-------------------|-----------------|
| 9U-7226 | Valve Seal Installer Group | 22.2 mm (0.87 in) | 140 mm (5.5 in) |

FT2396 Magneto Wrench

Model: 3406 Spark Ignited Engines

Warranty: None



- Used to disassemble and assemble magneto drive (holds bolt head through mounting hole while tightening magneto drive group)
- Fabricate tool from 4C-9602 Combination Wrench, 23.81 mm (15/16 in), or similar 23.81 mm (15/16 in) combination wrench

1P-2977 Alternator Pulley Tool Group

Model: Delco-Remy Alternators

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|------------------------------|
| -- | 1P-2977 | Alternator Pulley Tool Group |
| 1 | 1P-7363 | Seal (2) |

- Used to remove pulley retaining nut on shaft of Delco-Remy 20-SI and 25-SI Series Alternators



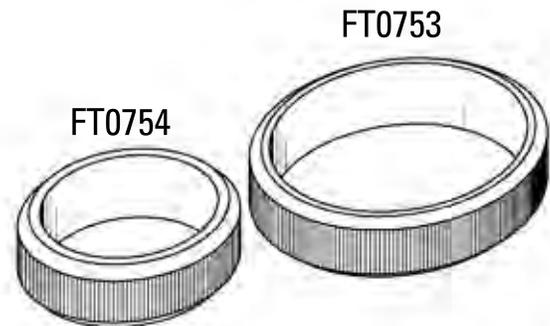
FT0753 Bearing Insert

FT0754 Bearing Insert

Model: Delco-Remy Alternators

Warranty: None

- If alternator bearings fail, 1S-2584 and 1S-2585 End Frames can be salvaged by fabricating FT0753 and FT0754 inserts to replace damaged sleeves

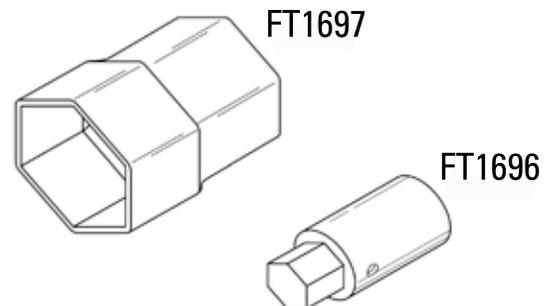


FT1696 Wrench, FT1697 Socket

Model: Multiple Engine Models

Warranty: None

- Two alternator pulley nut tools can be fabricated to tighten the nut for the alternator pulley on 613 and 615 Tractor Scrapers



398-6915 Mounting Ring Socket Wrench

Model Usage: Various
Warranty: Manufacturer's



- Used to tighten retaining nut on Emergency Stop Push Button assembly 109-6507 with 124-3176 Guard
- Double ended wrench can be used for 18 mm (.71 in) and 30 mm (1.2 in) pilot light mounting rings

| Specifications | | |
|----------------|-----------------------------|--------------------------------|
| Part Number | Description | Dimensions |
| 398-6915 | Mounting Ring Socket Wrench | 101.6 x 35.3 mm (4.0 x 1.4 in) |

1P-5559 Spark Plug Adapter Wrench

2P-5481 Spark Plug Wrench

Model: 5.4 inch Bore Natural Gas Engines
Warranty: Six Months



- Used to remove spark plugs and adapters on 137.2 mm (5.4 in) Bore Natural Gas Engines (G342, G353, G379, G398)
- Especially useful because plugs and adapters are deeply recessed in top of engine
- 1P-5559 Wrench:
Large end: 31.75 mm (1.25 in)
Small end: 19.05 mm (0.75 in)

| Part Number | Description |
|-------------|---------------------------|
| 2P-5481 | Spark Plug Wrench |
| 1P-5559 | Spark Plug Adapter Wrench |

176-7129 Terminal Removal and Installation Tool Assembly

Model: All G3500 Non-CSA Electronic Ignition Engines
Warranty: Six Months



- Used to remove and install 169-4290 Terminal without removing 169-4295 Extension
- Saves time and money
- Threads easily into terminal
- Design permits quick replacement if shaft [127 mm (5 in) long] breaks during service
- For removal: 1) insert shaft through spring and thread three revolutions into terminal; 2) pull terminal out
- For installation: 1) screw terminal onto shaft; 2) insert through extension; 3) snap onto transformer head; 4) loosen shaft from terminal

| Part Number | Description |
|-------------|---|
| 176-7129 | Terminal Removal and Installation Tool Assembly |

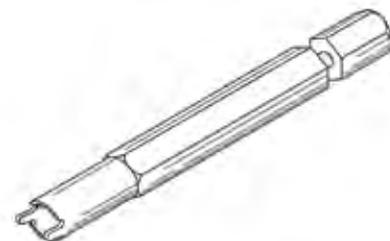
132-8263 Terminal Spanner Wrench

Model: All G3500 and G3600 EIS Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 132-8263 | Terminal Spanner Wrench |

- Used to install and remove 127-8893 Terminal Assembly
- Required to allow proper torquing of terminal assembly (2.70 ± 0.25 N·m, 24.0 ± 2.2 in-lb)
- Accurate torque is essential to avoid damage to terminal components; necked-down diameter minimizes chance of over-torque

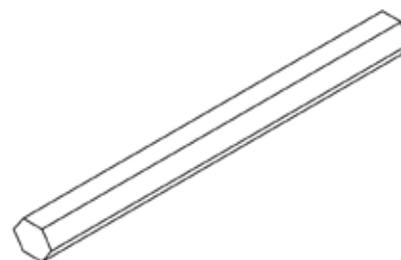


FT1780 Removal and Installation Tool

Model: 3400 Series Spark Ignited Engines

Warranty: None

- Needed to remove and install 213-7539 Spark Plug Adapter Assemblies
- Fabricated from 28.6 mm (1.125 in) hexagonal steel rod with sufficient length to reach adapters
- Minimum yield strength of steel: 689,500 kPa (100,000 psi)



235-9751 Spark Plug Driver Adapter Assembly

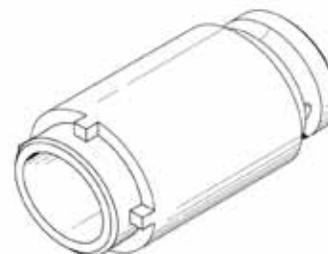
Essential Tool

Model: G3500C Engines

Warranty: Six Months

| Part Number | Description |
|-------------|------------------------------------|
| 235-9751 | Spark Plug Driver Adapter Assembly |

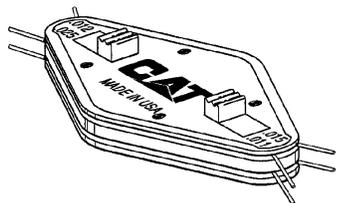
- Used to remove and install 225-0902 Adapter (spark plug)
- Used with 19.05 mm (3/4 in) ratchet
- Built-in pilot for easy engagement



9U-7516 Spark Plug Gauge

Model: 3300, 3400, 3500, and 3600 Spark Ignited Engines

Warranty: Six Months



- Used to check spark plug gap on spark ignited engines
- Compact size — easy to carry from job to job
- Gap wires are retractable — prevents damage when not in use
- Gauge has 2 of each size wires (4 sizes in all)

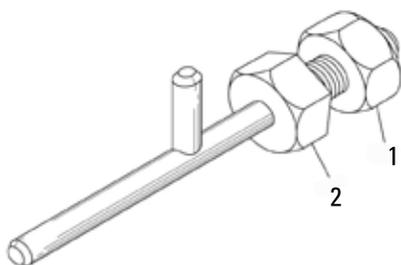
| Engine Application | Spark Plug Gap |
|-----------------------|---------------------|
| 3600 | 0.279 mm (0.011 in) |
| 3600 Ionization probe | 0.635 mm (0.025 in) |
| 3500 | 0.279 mm (0.011 in) |
| 3400 | 0.381 mm (0.015 in) |
| 3400 J-gap | 0.304 mm (0.012 in) |
| 3300 | 0.635 mm (0.025 in) |

| Part Number | Description |
|-------------|------------------|
| 9U-7516 | Spark Plug Gauge |

FT2449 Indicator Bracket

Model: 3516 Locomotive Engine

Warranty: None



- Used to check engine to generator alignment
- Threads into hole on main traction generator drive shaft
- Allows 2 alignment readings to be taken at the same time — 1 indicator reads outer coupling diameter and 1 reads coupling face

| Item | Part Number | Description |
|------|-------------|----------------|
| 1 | 4K-0367 | Nut - Full |
| 2 | 7X-0344 | Bolt, 5/8 - 11 |

192-7039 Driver Assembly

Model: DV096 Generator Set

Warranty: Six Months



- Used to install shaft seal for auxiliary water pump
- Used with hammer and suitable driver with 6.4 mm (0.25 in) pilot
- Drive installer onto shaft until OD of tool contacts housing
- Saves time during pump overhaul by installing seal at exact location every time (eliminates guess work)

Reference

Generator Service Manual

| Part Number | Description |
|-------------|-----------------|
| 192-7039 | Driver Assembly |

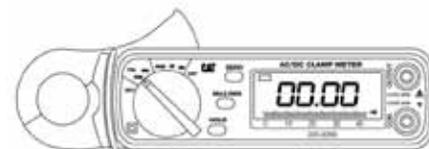
225-8266 Clamp On Ammeter

Model: All

Warranty: Manufacturer's One Year

European Union compliant, CE marked

- Used to measure AC or DC current
- Compact size and low cost make this unit indispensable
- Clamp-on probe replaces standard test leads (allows current measurements without breaking circuit)
- Measures current in cables up to 23 mm (0.9 in) diameter
- User selectable 400 ampere and 1200 ampere scales for both AC and DC
- Powered by two 1U-9533 AA Alkaline Batteries
- Designed with a built-in display, push button zero control for DC operation, "display hold" to freeze display, "max/min recording" to display highest and lowest readings, auto power-off (unit turns off automatically after 30 minutes), and low battery indicator
- Shipped with batteries, carrying case, and users guide



Repair Information

Extech Instruments

9 Townsend West

Nashua, NH 03061

Ph: (781) 890-7440, ext: 220

Fax: (781) 890-7864

Email: repair@extech.com

| | |
|--------------|---------------------------------------|
| Weight | 190 g (6.7 oz) |
| Overall size | 183 x 61 x 36 mm (7.2 x 2.5 x 1.4 in) |
| Resolution | 1 A |

| Part Number | Description |
|----------------------|--|
| 225-8266 | Clamp On Ammeter (400, 1200 A ranges) |
| Service/Repair Parts | |
| 1U-9533 | AA Alkaline Battery , non-rechargeable, package qty 96 (5 required to power Indicator III) |
| 6V-6014 | Cable |

Carrying Case and Accessories for Discontinued 8T-0900 Clamp-on Ammeter

Warranty: Six Months

| Item | Description |
|------|-------------------------------------|
| 3 | Form SEHS8026 "Electrical Test Kit" |

| Item | Part Number | Description |
|------|-------------|---|
| 1 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) |
| 2 | 6V-6040 | Foam Insert |
| 4 | 6V-6014 | Cable |
| 5 | 6V-7070 | Digital Multimeter |



175-7546 Oil Filter Cutter Group

Model: All Models

Warranty: Six Months



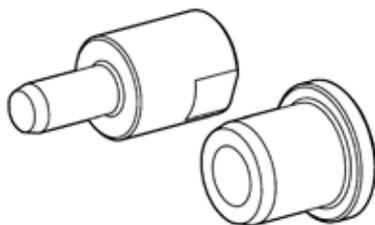
- Used to cut open spin-on filters to inspect filter media for contaminants, a common practice when diagnosing potential machine problems and internal contaminants.
- Aluminum frame construction
- Designed to cut all types of filters, including aircraft-style filters, without repositioning cutting wheels
- Heavy-duty double roller and cutting wheel design eliminates binding of filters
- All wear parts are heat-treated steel for added durability
- Cutting wheels are ground with a double-taper edge for easier cutting

| Item | Part Number | Description | Required |
|-----------|-------------|-------------------------|----------|
| -- | 175-7546 | Oil Filter Cutter Group | -- |
| 1 | 177-0364 | Roller | 2 |
| 2 | 177-0365 | Cutting Wheel | 2 |
| 3 | 177-0367 | Pin | 4 |
| Not shown | 177-0366 | Spacer | 2 |

373-4824 Oil Filter Housing Extension Tube Seal Installer

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to properly install the extension tube seals in the oil filter housing

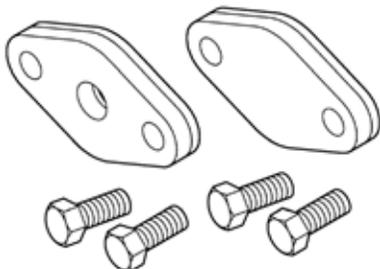
| Specifications | |
|----------------|---|
| Dimensions | 177.8 x 139.7 x 127.0 mm (7.0 x 5.5 x 5.0 in) |
| Weight | 0.43 kg (0.94 lb) |

| Part Number | Description |
|-------------|--|
| 373-4824 | Oil Filter Housing Extension Tube Seal Installer |

373-4830 Oil Cooler Test Plates

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to pressure test the oil cooler

| Specifications | |
|----------------|--------------|
| Dimensions | 5 x 4 x 2 in |
| Weight | 0.5 lbs |

| Part Number | Description |
|-------------|------------------------|
| 373-4830 | Oil Cooler Test Plates |

371-4330 Oil Filter Drainer Group

Model Usage: Any Engine Application

Warranty: Six Months

- Used to cleanly drain an oil filter before removal from engine
- Designed to puncture a hole in side of the inverted oil filters to allow easy oil drainage
- Do not remove oil filter from engine until oil has been completely drained into oil storage container
- Equipped with 101.6 – 165.1 mm (4 - 6 ½ in) attached clamp

| Specifications | |
|----------------|--|
| Dimensions | 64 x 35 x 31.75 mm (2.52 x 1.38 x 1.25 in) |
| Weight | 69.0 kg (1.51 lb) |

| Part Number | Description |
|-------------|--------------------------|
| 371-4330 | Oil Filter Drainer Group |



4C-5084 Spin-on Oil Filter Cutter

Discontinued — Service Parts Available

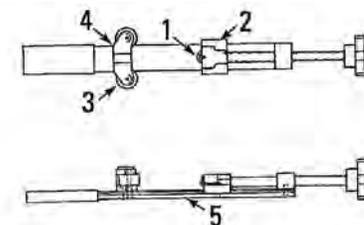
Warranty: Six Months

Reference

SEHS9160, Special Instruction

| Item | Description |
|------|----------------------------|
| 5 | NEEG2002 Decal (not shown) |

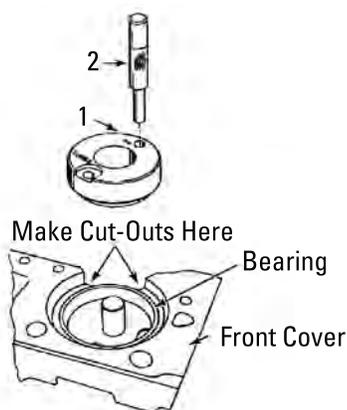
| Item | Part Number | Description |
|------|-------------|---------------------------|
| -- | 4C-5084 | Spin-on Oil Filter Cutter |
| 1 | 5P-4811 | Cutting Wheel |
| 1 | 133-5633 | Spacer Insert |
| 1 | 9U-5354 | Shoulder Screw |
| 2 | 9U-5356 | Saddle |
| 3 | 9U-5353 | Roller |
| 4 | 9U-5355 | Roller Bracket |



4C-6780 Bushing Removal Tool Group

Model: 3208 Engines

Warranty: Six Months



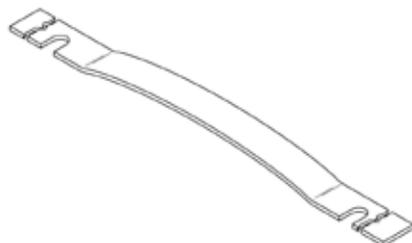
- Removes oil pump bushing fast without damaging timing gear cover
- Works on both naturally aspirated and turbo-charged engines
- Marked for each engine for easy use

| Item | Part Number | Description |
|-----------------------------|-------------|----------------------------|
| -- | 4C-6780 | Bushing Removal Tool Group |
| Service/Repair Parts | | |
| 1 | 4C-6781 | Bushing Removal Guide |
| 2 | 4C-6782 | Bushing Removal Punch |

FT0977 Oil Pump and Pan Removal and Installation Tool

Model: 992 Engine

Warranty: None



- Used to remove oil pump and pan as a unit on 992
- Material: SAE 1020 steel

9S-9273 Coupler

9S-9274 Plug

Model: D8H, 583H, D9G, DD9G, 594

Warranty: Six Months



- Coupler is quick disconnect adapter for equipment that services high speed oil change attachment groups; high speed oil change groups provide convenient method for both fill and evacuation of engine crankcase oil, and a compatible quick disconnect coupler is essential for service equipment that supplies and evacuates oil
- Minimal chance for airborne contaminants to enter engine during oil changes with high speed oil change arrangement
- Three different nipples are used in various attachment groups; 9S-9273 Coupler accommodates all three; steel cable lanyard provided for disconnecting coupler from nipple
- 9S-9274 Plug Assembly used to protect coupler from dirt and other contaminants when not in use
- Easier for customer to meet local regulations concerning oil spillage; leakproof seal created when coupler connected to nipple; also, no leakage occurs when coupler engages nipple or when connection is broken

(Continued)

9S-9273 Coupler (Continued)

9S-9274 Plug

Model: D8H, 583H, D9G, DD9G, 594

Warranty: Six Months

- Has 41.3 mm (1.62 in) hex for installing 3/4 inch-14 NPTF threaded end into service hose fitting

| | |
|----------|-------------------|
| Length | 70.6 mm (2.78 in) |
| Diameter | 50.8 mm (2.00 in) |

| Item | Part Number | Description |
|-----------|-------------|--|
| 1 | 9S-9273 | Coupler |
| Not shown | 9S-9274 | Plug Assembly |
| 2 | 1P-7919 | Nipple, Bulkhead 37 degree Male, 1 1/16 - 12 thd |
| Not shown | 8T-5373 | Nipple, Face Seal Male, 1 3/16 - 12 thd |
| Not shown | 9S-9271 | Nipple, 3/4 - 14 NPTF thd Male |
| Not shown | 9S-9272 | Cap Assembly (for the 3 nipples) |

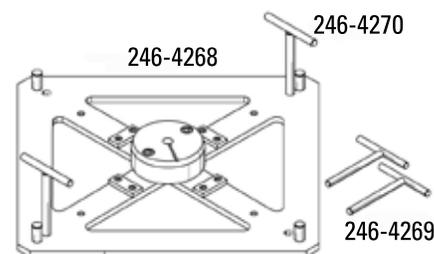
246-4268 Coupler Rework Fixture Group

Model: 3524B Engine

Warranty: Six Months

| Part Number | Description |
|-------------|------------------------------|
| 246-4268 | Coupler Rework Fixture Group |

- Used to disassemble and assemble 3524B Engine coupling group
- Used with two 246-4269 Positioning Pin Assembly and two 246-4270 Positioning Pin Assembly (part of group)
- Allows replacement of individual parts rather than entire group
- Mounts easily on 1P-2420 Transmission Repair Stand using four FT0996 Positioning Legs



Reference

REN2276-02, 3524B Engine Service Manual, Disassembly and Assembly

201-2592 Bit

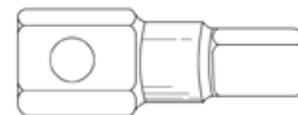
Model: MY2000, C-15, and C-16 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 201-2592 | Bit |

- Special 5/16 inch bit used to remove the square socket oil gallery pipe plugs
- Used with standard 7/16 inch socket and ratchet

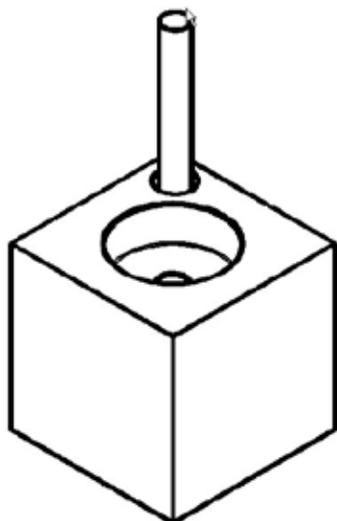
| | |
|----------------|-----------------|
| Male hex | 7/16 in |
| Male square | 5/16 in |
| Overall length | 32 mm (1.25 in) |



301-0285 Alignment Tool

Model Usage: C1.5 and C2.2 Engine

Warranty: Six Months



- Properly orients the oil pump to the engine block
- Provide protection of the oil pump during the installation process

Reference:

KENR9149, KENR6948, KENR6229

| Part Number | Description |
|-------------|----------------|
| 301-0285 | Alignment Tool |

385-8485 Dowel Driver

Model Usage: C175

Warranty: Six Months



- Used to insert new oil dowel (371-6466) into C175 Block
- Does not distort dowel during installation

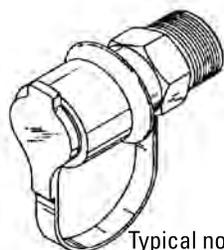
| 385-8485 Specifications | |
|-------------------------|------------------------------|
| Dimensions | 153 x 20 mm (6.02 x 0.79 in) |

126-7538 Transmission Oil Nozzle Assembly

126-7539 Crankcase Oil Nozzle Assembly

Model: Multiple Engine Models

Warranty: Six Months



Typical nozzle assembly

- Used to attach hose of high speed oil change equipment onto component being serviced on D8R Track-Type Tractor (provides leakproof connection when installed)
- Nozzles help customers to more effectively meet local regulations concerning oil spillage
- Using high speed oil change equipment provides fast and convenient way to fill and drain oil from components

| Part Number | Description | Length | Diameter | Thread Size | Hex Size | Installed To | Used with |
|-------------|-----------------|----------------------|----------------------|---------------|----------------------|---------------------------------|----------------------------|
| 126-7538 | Nozzle Assembly | 78.7 mm (3.10 in) | 48.5 mm (1.91 in) | 3/4 -14 NPTF | 33.3 mm (1.31 in) | transmission case oil drain | 110-8319 Receiver Assembly |
| 126-7539 | Nozzle Assembly | 83.8 mm (3.30 in) | 54.6 mm (2.15 in) | 3/4 - 14 NPTF | 38.1 mm (1.50 in) | engine crank- case oil drain | 110-8827 Receiver Assembly |

Engine Test Tools

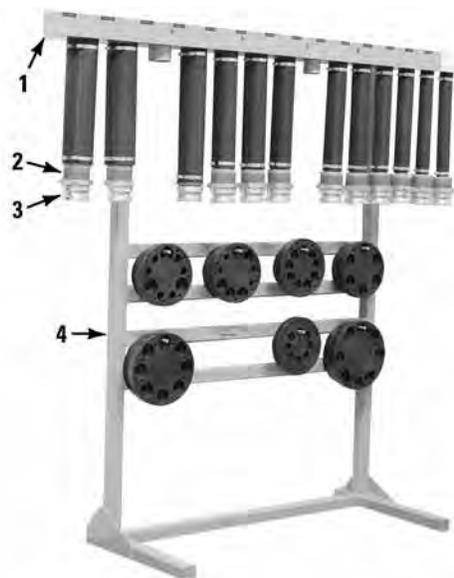
FT0949 Dynamometer Adapter Storage Rack
FT0940 Water Line Adapter, FT0941 Hose Hanger

Model: All Vehicle Engine Models

Warranty: None

- 2 sets of FT0940 Adapters needed to adapt standard size quick disconnect couplings into water lines between cooling tower and any Cat® engine; one end of adapter connects to male half of quick disconnect coupling; other end sized to fit engine water hose
- FT0941 Hose Hanger used to store complete set of quick disconnect-type water lines for dynamometer testing Cat® engines; can be mounted on FT0949 Storage Rack

| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | FT0941 | Hose Hanger |
| 2 | FT0940 | Adapter |
| 3 | | Quick Disconnect Coupling |
| 4 | FT0949 | Storage Rack |

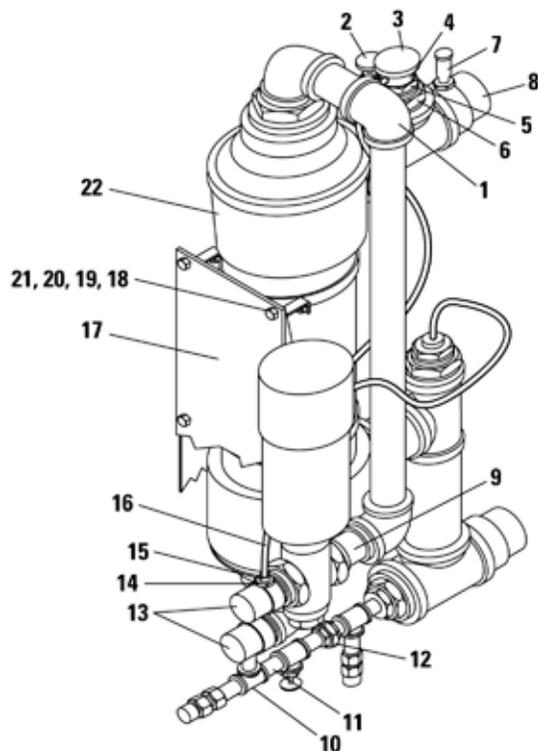


Engine Tools

FT0790 Cooling Tower Group

Model: All Vehicle Engine Models

Warranty: None



- Efficient, economical means for engine cooling for dynamometer installations
- Many parts available from Parts Department; some must be purchased locally; Bill of Material which includes some fabricated items given below; for complete details of construction, request drawings FT0790, FT0789, FT0788, and FT0955

| Item | Part Number | Description |
|------|-------------|-------------------------|
| 8 | FT-0955 | Adapter |
| 13 | FT-0788 | Adapter |
| 17 | FT-0789 | Stand |
| 22 | 7L489 | Heat Exchanger Assembly |

| Item | Part Number | Description |
|------|-------------|-------------------------|
| 1 | 7B-7138 | Street Elbow 90° |
| 2 | 7B-9684 | Globe Valve |
| 3 | 2S-3080 | Cap Assembly |
| 4 | 3S-5546 | Neck |
| 5 | 2F-5277 | Reducing Bushing |
| 6 | 5L-6669 | Reducing Bushing |
| 7 | 7F-6785 | Thermometer |
| 9 | 3B-7296 | Close Nipple (2 in NPT) |
| 10 | 5B-8979 | Tee |

| Item | Part Number | Description |
|------|-------------|------------------|
| 11 | 3B-7866 | Nipple |
| 12 | 7B-9685 | Pipe Union |
| 14 | 8B-1931 | Reducing Bushing |
| 15 | 4S-8386 | Copper Tubing |
| 16 | 4S-8759 | Vinyl Tube |
| 18 | 0S-1621 | Bolt |
| 19 | 3B-4508 | Lock Washer |
| 20 | 1D-4719 | Nut |
| 21 | 4B-4280 | Washer |

Flywheel Adapters for Dynamometer Testing

Model: Most Vehicle Engine Models

Warranty: Six Months

- Adapters can be fabricated to mount entire line of Cat® engines to either Clayton or Taylor Dynamometers

Tractors

| Model | Serial number | Adapter |
|-------|--|-----------|
| D3 | 6N, 79U, 83U | FT0730-4 |
| D4 | 6U, 7U | FT0720-01 |
| D4C | 39A, 40A, 54A, 55A | FT0719-2 |
| D4D | 67A, 78A, 88A, 91A, 22C, 97F, 44H, 18J, 20J, 49J, 58J, 59J, 60J, 61J, 65J, 66J, 82J, 83J, 84J, 69K, 7R | |
| D4E | 27X, 28X, 29X, 70X, 71X | FT0719-2 |
| D5 | 98A, 81H, 82H, 83H, 84H, 21J, 62J, 63J, 67J, 68J, 93J, 95J, 96J, 97J, 98J, 6R, 12R | |
| D5B | 23X, 24X, 25X, 26X, 43X, 44X, 45X | FT0719-2 |
| D6 | 8U, 9U | FT0720-01 |
| D6B | 37A, 44A, 56A, 57A, 37H, 38H | FT0719-2 |
| D6C | 41A, 71A, 73A, 74A, 76A, 82A, 83A, 96A, 90B, 46J, 47J, 56J, 69J, 99J, 10K, 26K, 17K, 69U | FT0719-2 |
| D6D | 3X, 4X, 5X, 6X | FT0719-2 |

Tractors (Continued)

| Model | Serial Number | Adapter |
|-------|-------------------------|----------|
| D7 | 17A | FT0725 |
| D7E | 47A, 48A, 75A | FT0725 |
| D7F | 91E, 92E, 61G, 93N, 94 | FT0719-2 |
| D7G | 64V, 91V, 92V, 72W | FT0719-2 |
| D8 | 113A, 14A, 15A | FT0724-2 |
| D8H | 22A, 35A, 36A, 46A, 68A | FT0724-2 |
| D8K | 76V, 77V | FT0724-2 |
| D9 | 18A, 19A, 49A, 50A | FT0722-1 |
| D9 | 34A | FT0724-2 |
| D9G | 66A, 90J, 91J, 29N, 30N | FT0724-2 |
| D9H | 90V | FT0724-2 |
| D10 | 84W | FT1776-1 |

Pipelayers

| Model | Serial Number | Adapter |
|--------|---------------|----------|
| 561B | 62A | FT0719-2 |
| 561C | 85H, 92J | FT0719-2 |
| 561D | 54X | FT0719-2 |
| 571A | 64A | FT0725 |
| 571F | 95N | FT0719-2 |
| 571G | 16W | FT0719-2 |
| 572E | 21A, 65A | FT0725 |
| 572F | 96N | FT0719-2 |
| 572G | 40U | FT0719-2 |
| 583C-E | 16A | FT0724-2 |
| 583H | 38A, 61A | FT0724-2 |
| 583K | 78V | FT0724-2 |
| 594 | 62H | FT0724-2 |
| 594H | 96V | FT0274-2 |

Track-Type Loaders

| Model | Serial Number | Adapter |
|--------|-----------------------------------|-----------|
| 931 | 10N, 78U, 81U | FT0730-4 |
| 933C-E | 11A | FT0728 |
| 933F-G | 25A, 42A | FT0717-1 |
| 941 | 70H, 75H | FT0719-2 |
| 941B | 80H | FT0719-2 |
| 943 | 3Y, 31Y, 4Z | FT1617 |
| 951 | 89A, 63K | FT0719-2 |
| 951B-C | 15F, 32F, 19H, 69H, 79H, 72J, 86J | FT0719-2 |
| 953 | 76Y, 5Z | FT1617 |
| 955C-E | 12A | FT0720-01 |
| 955F | 51A | FT0719-2 |
| 955H | 60A, 72A, 77A, 93A | FT0719-2 |
| 955K | 48H, 61H, 31J, 64J, 85J | FT0719-2 |
| 955L | 71J, 13X | FT0719-2 |
| 977 | 20A | FT0720-01 |
| 977H | 53A | FT0719-2 |
| 977K | 46H, 76H, 48J, 70J, 11K | FT0719-2 |
| 977L | 48J, 70J, 14X | FT0719-2 |
| 983 | 38K | FT0775-2 |

Excavators

| Model | Serial number | Adapter |
|-------|---------------|----------|
| 215 | 96L | FT0719-2 |
| 215 | 57X | FT1617 |
| 225 | 51U, 61X | FT1730-4 |
| 225 | 20S, 76U | FT0719-2 |
| 235 | 32K, 62X, 81X | FT0719-2 |
| 245 | 95V | FT1177-3 |

Motor Graders

| Model | Serial Number | Adapter |
|---|--|-----------|
| 12 | 80C, 70D, 71D | FT0720-01 |
| 12E | 99E, 12F, 21F, 29H, 17K | FT0719-2 |
| 12F | 73G, 59H, 89H, 13K, 33K | FT0719-2 |
| 12G | 61M | FT0719-2 |
| 14B | 64C, 78E | FT0720-01 |
| 14C | 35F | FT0719-2 |
| 14D | 96F | FT0719-2 |
| 14E | 72G, 99G, 12K | FT0719-2 |
| 14G | 96U | FT0719-2 |
| 16 | 49G ¹ | FT0718-1 |
| 16G | 93U | FT1177-3 |
| 112 | 81C, 3U | FT0720-01 |
| 112E | 68E, 91G | FT0719-2 |
| 112F | 46D, 82F, 80J, 89J | FT0719-2 |
| 120 | 89G, 60H, 14K, 35K, 10R, 22R, 90R, 13U | FT0719-2 |
| 120G | 87V | FT0719-2 |
| 130G | 74V | FT0719-2 |
| 140 | 11R, 24R, 14U | FT0719-2 |
| 140G | 72V | FT0719-2 |
| 212 | 79C, 95C | FT0728-1 |
| ¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement Gear Group | | |

Tractor-Scrapers

Engine Tools

| Model | Serial Number | Adapter |
|-------|---|----------------------|
| DW15 | 45C, 59C, 70C, 75D, 76D | FT0725 |
| DW20 | 21C, 57C, 67C, 87E, 88E | FT0725 |
| DW21 | 58C, 69C, 85E, 86E | FT0725 |
| 613 | 71M | FT0730-4 |
| 613B | 38W | FT0730-4 |
| 619B | 89E, 90E | FT0725 |
| 619C | 61F ¹ , 62F | FT0718-1 |
| 621 | 23H | FT0723-1 |
| 621B | 45P, 35V | FT1177-3 |
| 623 | 52U | FT0723-1 |
| 623B | 46P | FT1177-3 |
| 627 | 50K, 54K, 68M, 69M | FT0719-2 |
| 627B | 14S | FT0719-2 |
| 630A | 52F ¹ | FT0718-1 |
| 630B | 14G1-438 ¹ , 14G442 ¹ , 14G-1443 ¹ | FT0718-1 or FT0775-2 |
| 630B | 14G439, 14G440, 14G441, 14G444 Up | FT0718-1 or FT0775-2 |
| 631A | 51F ¹ | FT0718-1 or FT0775-2 |
| 631B | 13G1-3062 ¹ | FT0718-1 or FT0775-2 |
| 631B | 13G-3063 | FT0775-2 |
| 631C | 67M | FT0775-2 |
| 631D | 24W | FT1177-3 |
| 632 | 14G | FT0718-1 |
| 63 | 44J | FT0775-2 |

¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement Gear Group

Tractor-Scrapers (Continued)

| Model | Serial Number | Adapter |
|-------|-----------------------|----------|
| 633C | 66M | FT1177-3 |
| 633D | 25W | FT1177-3 |
| 637 | 64M, 91N, 92N | FT0719-2 |
| 637 | 65M | FT0775-2 |
| 637D | 26W, 27W | FT1177-3 |
| 641 | 64F1-317 | FT0729-1 |
| 641 | 64F318, 41M | FT0727-1 |
| 641B | 65K | FT0776-1 |
| 650 | 63F | FT0729-1 |
| 650 | 63F, 77F | FT0727-1 |
| 650B | 58K | FT0776-1 |
| 651 | 33G1-154 | FT0729-1 |
| 651 | 33G155, 44M | FT1776-1 |
| 651B | 67K | FT1776-1 |
| 657 | 31G1-174 | FT0729-1 |
| 657 | 31G175, 46M | FT0727-1 |
| 657 | 19G1-357 ¹ | FT0718-1 |
| 657 | 19G358 | FT0775-2 |
| 657B | 53K, 47M | FT0775-2 |
| 657B | 68K | FT0776-1 |
| 660 | 77F1, 123, 90F1, 168 | FT0729-1 |
| 660 | 77F124, 90F169 | FT0727-1 |
| 660B | 18G, 58K | FT0776-1 |
| 666 | 32G | FT0729-1 |
| 666 | 77F, 64H | FT0727-1 |
| 666B | 20G1-119 ¹ | FT0718-1 |
| 666B | 20G120 | FT0775-2 |
| 666B | 66K | FT0776-1 |

¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement Gear Group

Off-Highway Trucks

| Model | Serial Number | Adapter |
|-------|--|----------|
| 759 | 99F1-8431 ¹ , 99F850 ¹ | FT0718-1 |
| 769 | 99F844 | FT0775-2 |
| 768 | 79S | FT0775-2 |
| 772 | 11S, 80S | FT0776-1 |
| 773 | 63G | FT0776-1 |
| 776 | 14H | FT0776-1 |
| 777 | 84A | FT0776-1 |

¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement.

Skidders

| Model | Serial Number | Adapter |
|-------|-----------------------|----------|
| 518 | 50S, 55U, 94U, 95U | FT0719-2 |
| 528 | 51S, 78W | FT0719-2 |
| 814 | 90P, 14R | FT0719-2 |
| 815 | 91P, 15R | FT0719-2 |
| 816 | 57U | FT0719-2 |
| 824 | 29C ¹ | FT0718-1 |
| 824B | 36H1-313 ¹ | FT0718-1 |
| 824B | 36H314 | FT0775-2 |
| 826B | 58U | FT0775-2 |
| 834 | 43E1-313 ¹ | FT0718-1 |
| 834 | 43E314 | FT0775-2 |
| 835 | 44N | FT0775-2 |

¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement Gear Group

Wheel Loaders

| Model | Serial Number | Adapter |
|-------|---|----------|
| 910 | 80U | FT0730-4 |
| 920 | 62K, 41J, 75J | FT0719-2 |
| 922 | 63A | FT0716 |
| 922 | 59A | FT0717-1 |
| 922B | 94A, 74J, 88J | FT0719-2 |
| 930 | 41K, 79J | FT0719-2 |
| 944 | 58A | FT0716 |
| 944 | 43A, 70A, 77J, 87J | FT0719-2 |
| 950 | 90A, 99A, 58H, 15J, 43J, 73J, 81J, 31K, 49U | FT0719-2 |
| 966 | 33A | FT0719-2 |
| 966B | 75A, 57H | FT0719-2 |
| 966C | 78G, 76J, 30K | FT0719-2 |
| 980 | 42H | FT0723-1 |
| 980B | 89P | FT0719-2 |
| 988 | 87A1-13081 | FT0718-1 |
| 9888 | 7A-1309 | FT0775-2 |
| 988B | 50W | FT1177-3 |
| 992 | 25K | FT0776-1 |
| 992C | 42X | FT1177-3 |

Engines

| Model | Serial Number | Adpater |
|-------|---|-----------|
| D311H | 51B | FT0717-1 |
| 311 | 7S, 9S, 4V | FT0728-1 |
| D312 | 1N | FT0720-01 |
| D315 | 9S, 4V, 5V | FT0720-01 |
| D315G | 48B, 52B | FT0720-01 |
| D318 | 3V, 5V, 6V | FT0720-01 |
| D318G | 45B, 53B | FT0720-01 |
| D320A | 63B | FT0717-1 |
| D326 | 25B, 26B, 27B | FT0725 |
| D326F | 39B, 40B | FT0725 |
| D330A | 56B, 57B, 85B, 86B | FT0719-2 |
| D330B | 81B, 82B, 98B, 99B | FT0719-2 |
| D330C | 2B, 4B, 5B, 78P, 48V | FT0719-2 |
| 3304 | | FT0719-2 |
| D333A | 58B, 59B, 87B | FT0719-2 |
| D333B | 79B, 80B, 84B | FT0719-2 |
| D333C | 23C, 66D, 67D, 68D, 28M, 62M, 3N, 70R, 76R273, 62U, 49V | FT0719-2 |
| 3306 | | FT0719-2 |
| D334 | 92B, 93B | FT0723-1 |
| D336 | 55B, 60B | FT0723-1 |
| D337 | 22B, 23B, 24B | FT0725 |
| D337F | 37B, 38B | FT0725 |
| D339 | 34B | FT0725 |
| D342C | 31B, 32B, 49B, 50B, 71B, 35J | FT0724-2 |

Engines (Continued)

Engine Tools

| Model | Serial Number | Adapter |
|---------|-------------------------|----------|
| D343 | 62B1-5738 ¹ | FT0718-1 |
| D343A | 33B1-2489 ¹ | FT0718-1 |
| D343 | 62B-5739, 97N | FT0775-2 |
| D343A | 33B-2490, 63M | FT0775-2 |
| D346 | 39J, 40J, 98N | FT0776-1 |
| D348 | 36J, 38J, 57K, 92R | FT0776-1 |
| D349 | 61P, 62P, 32R, 93R | FT0776-1 |
| D353 | 46B1-869, 47B1-469 | FT0722-1 |
| D353 | 468870, 478470 | FT0724-2 |
| D353D | 64B | FT0724-2 |
| D353DE | 77B | FT0724-2 |
| D364 | 19B, 20B, 21B | FT0726-1 |
| D375 | 16B, 17B, 18B | FT0726-1 |
| D375D | 43B, 44B | FT0726-1 |
| D379A-B | 68B, 69B, 72B, 76B | FT0721-2 |
| D386 | 13B, 14B, 15B | FT0726-1 |
| D397 | 10B, 11B, 12B | FT0726-1 |
| D397D | 41B, 42B | FT0726-1 |
| D398 | 66B, 67B, 73B, 75B, 34J | FT0721-2 |
| D399 | 35B, 91B, 49C | FT1176-3 |
| 1140 | 36B | FT0730-4 |

¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement Gear Group

Engines (Continued)

| Model | Serial Number | Adapter |
|-------|-----------------------|----------|
| 1145 | 97B | FT0730-4 |
| 1150 | 96B | FT0730-4 |
| 1160 | 95B | FT0730-4 |
| 3145 | 96M, 65P | FT0730-4 |
| 3150 | 97M, 66P | FT0730-4 |
| 3160 | 98M, 67P, 68P | FT0730-4 |
| 3204 | 45V | FT0730-4 |
| 3208 | 90N, 40S, 75V, 79V | FT0730-4 |
| 1670 | 61B | FT0719-2 |
| 1673 | 74B | FT0719-2 |
| 1673B | 70B, 78B | FT0719-2 |
| 1673C | 69D, 76R | FT0719-2 |
| 1674 | 94B | FT0719-2 |
| 1676 | 54B | FT0719-2 |
| 1693 | 65B1-493 ¹ | FT0718-1 |
| 1693 | 65B494, 27U | FT0775-2 |
| 3406 | 90U, 91U, 92U, 70V | FT1177-3 |
| 3408 | 67U, 99U, 28V | FT1177-3 |
| 3412 | 60M, 38S | FT1177-3 |
| 3512 | 49Y, 50Y, 51Y, 24Z | FT1615 |

¹ Use FT0775 Adapter on engines equipped with discontinued 4S-9643 or 9S-7536 (not serviced) Crankshaft Replacement Gear Group

Dynamometer Testing Facilities

Miscellaneous drawings available from Division Service Manager:

Engine Base Assembly for Dynamometer Room, Miscellaneous Drawing 2002

- Provides details for constructing a very versatile base on which any engine and stand can be secured for dyno testing
- Accomplished by movable tee hooks in permanent floor slots

Single Base Dynamometer Room, Miscellaneous Drawing 2014

Double Base Dynamometer Room, Miscellaneous Drawing 2001

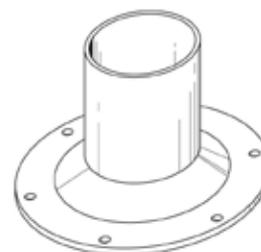
- Provide construction details for single and tandem engine dyno test arrangements
- Facilities include a roof-mounted exhaust stack which can be pulled up to ceiling level by means of a winch and cable
- Plans include soundproof doors and acoustical walls and ceiling

FT1003 Water Line Adapter

Model: All Vehicle Engine Models

Warranty: None

- Used to connect dynamometer cooling line to engine water pump when dyno testing 5.4 inch Bore 60° V-8 Vehicle Engines
- Remove bypass line adapter and regulator housing and bolt adapter directly to water pump
- Material: SAE 1020 steel



FT1438 Dynamometer Testing Aftercooler

Model: 3176, 3208, 3304B, 3306B, 3406B

Warranty: None



- Air-to-water aftercooler used for dyno testing air-to-air aftercooled engines in 621, 623, 627, 631, 637, 641, 650, 651, 657, 660 and 666 Tractor-Scrapers; 772 and 773 Trucks; and 980 Wheel Loaders
- Designed to maintain 65.56° C (150° F) maximum inlet manifold temperature for engines up to 1000 Hp
- Former FT1198 Test Aftercooler, which was limited to 450 Hp, was discontinued

4C-3502 Engine Repair Indicator Kit

Model: All Earthmoving Machines

Warranty: Six Months



- Designed for dealer Product Support Salesmen
- Consolidates many non-technical engine evaluation service tools into convenient, easy-to-carry-and-use kit; includes simple service tools, which measure crankcase pressure, check coolant conditioner and allow for filter inspection
- Allows more accurate check of general engine condition than possible with casual walk-around inspection
- With Engine Overhaul Estimator (ordered separately), allows qualified personnel to predict possible repair options and to recommend improved customer maintenance practices

Consists of 3 parts:

- Non-technical engine evaluation service tools (see consist below) and order form for Engine Overhaul Estimator
- Engine evaluation worksheet which includes guidelines for walk-around inspection of machines engine and cooling system
- Literature discussing proper engine maintenance practices

Reference

SEHS9037, Special Instruction

| |
|--|
| Kit also Includes: |
| Screwdriver (flat blade) |
| Water Bottle |
| SEHS9037 Use of the 4C-3502 Engine Repair Indicator Kit |
| PEEP7234 Oil Change Labels (English) |
| PEEP8211 Engine Evaluation Worksheet |
| SEBD0717 Diesel Fuel and Your Engine |
| SEBD0518 Know Your Cooling System |
| PEDP6101 Repair Before Failure Testimonial |
| PEDP7101 Managing Preventive Maintenance Before Failure |
| SEBU5596 Identification Number Location Guide |
| SEBU6250 Caterpillar's Machine Lubricant Recommendations |
| PEHP9013 Air Filter Indicator Facts Sheet |
| PEDP7105 Scheduling Oil Sampling |
| SEBD0640 Oil and Your Engine |

| Part Number | Description |
|-------------|--|
| 8T-2844 | Temperature Recorder Group |
| 4C-9301 | Coolant Test Kit |
| 185-3630 | Filter Strap Wrench Assm. ¹ |

| Part Number | Description |
|-------------|--|
| 239-6825 | Ratchet (1/2 in Drive) |
| 9S-1732 | Extension -- 127 mm (5.0 in) Long (1/2 in Drive) |

(Continued)

4C-3502 Engine Repair Indicator Kit (Continued)

Model: All Earthmoving Machines

Warranty: Six Months

| Part Number | Description |
|-------------|--|
| 4C-4732 | Filter Minder and Filter Service Indicator |
| 4C-4733 | Crankcase Pressure Gauge |
| 4C-4730 | Carrying Case |
| 1U-7262 | Magnet |
| 8H-8580 | Scraper |

| Part Number | Description |
|-------------|-----------------------------|
| 1S-0178 | Fitting |
| 5H-8936 | Adapter |
| 4C-4731 | Block Foam Lower |
| 4C-4729 | Block Foam Upper |
| 4C-3502 | Engine Repair Indicator Kit |

¹Warranty: Six Months

1U-8835 Scale

Model: All Engine Models

Warranty: Six Months

- Optional inch scale used with 8T-0452 Gauge Assembly (slack tube manometer) to check gas pressures such as intake manifold or exhaust back pressure
- Easier to read when inch readings are referenced than standard centimeter scale

| Part Number | Description |
|-------------|-------------|
| 1U-8835 | Scale |

196-3165 Tool Kit, C-9 Engine

Model: C-9 Engine

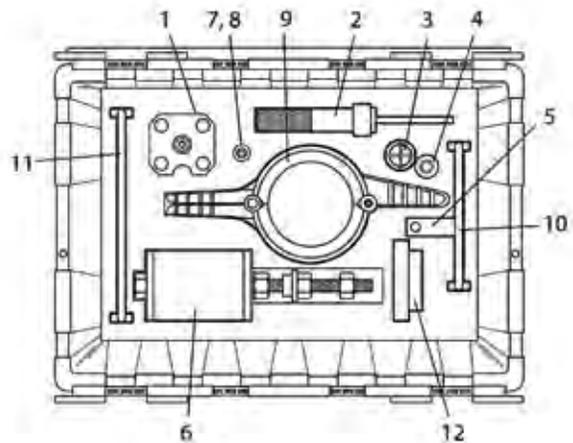
Warranty: Six Months

- 196-3165 Tool Kit used to overhaul C-9 Engines (contains all tools unique to this engine)
- 173-5533 Bracket securely attaches C-9 engine to repair stand — bolts to engine using breather assembly mounting holes
- Used with 173-5533 Repair Stand Bracket and 1U-5750 Engine Repair Stand
- Available as a kit or individual parts can be ordered separately

Reference

Service Manual, for C-9 Engines

| Media Number | Description |
|----------------------|-------------|
| NEEG2925 (Not Shown) | Decal |



| Item | Part Number | Description |
|------|-------------|--------------------------------------|
| 1 | 176-5487 | Valve Spring Compressor ¹ |
| 2 | 173-5523 | Valve Seat Installer |
| 3 | 173-5525 | Valve Seat Puller |
| 4 | 173-5524 | Driver Valve Guide |
| 5 | 191-6077 | Bracket |
| 6 | 173-5527 | Cylinder Pack Puller Group |
| 7 | 136-4632 | Timing Pin |
| 8 | 139-7064 | Timing Pin Adapter |

| Item | Part Number | Description |
|------|-------------|---|
| 9 | 173-5528 | Piston Ring Compressor |
| 10 | 143-9731 | Turbocharger Wrench, 122 mm (4.8 in) reach throat |
| 11 | 143-9730 | Turbocharger Wrench, 30 mm (1.18 in) reach throat |
| 12 | 1U-7430 | Front Crank Seal Installer |
| 13 | 196-5469 | Foam Insert |
| 14 | 196-5472 | Storage Case |
| -- | 196-3165 | Tool Kit, C-9 Engine |

(Continued)

196-3165 Tool Kit, C-9 Engine (Continued)

Model: C-9 Engine

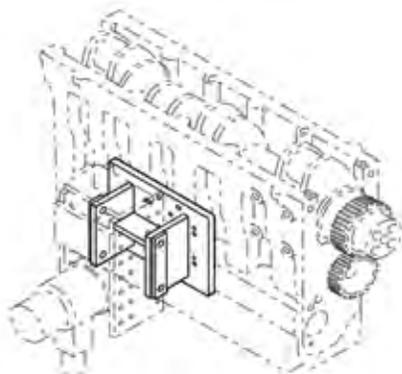
Warranty: Six Months

¹ Includes 176-5484 Plate Assembly, 176-5486 Plug Assembly, and 187-1852 Holding Clamp

173-5533 Repair Stand Bracket

Warranty: Six Months

| Part Number | Description |
|---|----------------------|
| Engine Repair Stand with Adapter Bracket | |
| 173-5533 | Engine Stand Bracket |
| 1U-5750 | Engine Repair Stand |



9U-7530 Tool Kit, 3406E Engine

Model: 3406E, C-15, C-16

Warranty: Six Months

- Contains tools to remove and install camshaft and cam bearing, compress valve springs, install valve seals, valve seats, and valve guides, remove and install pendulum damper, adjust injector pre-stroke, remove and install injector sleeve, test and adjust adjustable idler gear, clean injector bores
- Also services cable connectors, and provides necessary electronic cables to test, adjust, and troubleshoot 3406E Engines
- Packaged in 2 plastic containers with foam inserts for ease of handling and storage (Plastic cases and foam inserts are not serviced under Cat® part number; if these items are needed, contact the Dealer Service Tools Division)
- Chart, packaged in each kit, identifies tool requirements by job and lists reference publication form numbers
- Total weight: 48 kg (105 lb)

Reference

SENR5580, Service Manual

NOTE:

Refer to part number in Tool Guide for individual features/benefits and picture of each tool listed.

| Includes | Description |
|----------|-------------------------------|
| NEEG2581 | 3406E Tooling Reference Chart |

| Part Number | Description |
|-----------------------------|------------------------------------|
| 9U-7530 | Tool Kit, 3406E Engine |
| Service/Repair Parts | |
| 9U-7256 | Guide Assembly |
| 9U-7240 | Camshaft Lifting Hook (2 required) |
| 9U-7257 | Cradle Assembly |
| 9U-7225 | Camshaft Pilot (2 required) |
| 9U-7243 | Alignment Sleeve |
| 9U-7210 | Puller Plate |
| 9U-7213 | Backup Plate |
| 9U-7214 | Spacer Plate |
| 9U-7222 | Cam Bearing Pilot |
| 9U-7223 | Alignment Bushing |
| 9U-7241 | Valve Spring Compressor Group |

| Part Number | Description |
|---|--------------------------------|
| Service/Repair Parts (Continued) | |
| 9U-7226 | Valve Seal Installer Group |
| 9U-6898 | Valve Seat Driver (Exhaust) |
| 9U-6897 | Valve Seat Driver (Inlet) |
| 9U-6895 | Valve Seat Driver |
| 9U-6894 | Guide Collar |
| 9U-6896 | Guide Bolt |
| 9U-7227 | Injector Height Gauge Assembly |
| 9U-6891 | Injector Tool Group |
| 9U-7255 | Adjustable Idler Assembly |
| 9U-7324 | Indicator Bracket |
| 9U-6862 | Small Tapered Brush |
| 9U-6863 | Small Bore Brush |

(Continued)

9U-7530 Tool Kit, 3406E Engine (Continued)

Model: 3406E, C-15, C-16

Warranty: Six Months

| Part Number | Description |
|---|------------------------|
| Service/Repair Parts (Continued) | |
| 9U-7244 | End Brush |
| 9U-7237 | Drill Extension |
| 4C-5552 | Large Bore Brush |
| 7X-1715 | Adapter Cable Assembly |

| Part Number | Description |
|---|---|
| Service/Repair Parts (Continued) | |
| 7X-1403 | Adapter Cable Assembly |
| 7X-1686 | Adapter Cable Assembly |
| 7X-1695 | Timing Probe Cable |
| 175-3700 | Connector Service Kit (less crimp tool) |

356-8752 G3600 Operator Tool Group

Model Usage: G3606 (3XF), G3608 (4WF), G3612 (1YG), G3616 (4CG)

Warranty: Six Months

- Aids in providing daily service to an engine
- May be used with 169-8373 Bottle Group
- Includes pad of data sheets to record all service information
- Helps to lubricate pivot joints of waste gate, fuel mixing valve, and choke linkage
- Used to remove spark plugs and chase threads
- Helps to clean and gap spark plugs
- Aids in gathering oil samples

| Media Number | Description |
|--------------|----------------|
| NEHS0680 | Data Sheet Pad |

| Part Number | Description |
|---|--------------------------------------|
| 356-8752 | Operator Tool Group |
| 356-8752 G3600 Operator Tool Group | |
| 1U-9824 | Tool Group |
| 245-5829 | Coolant Test Kit |
| 4C-4601 | Spark Plug Socket |
| 6V-9124 | Screwdriver |
| 7X-3387 | S-O-S Sampling Valve |
| 8C-3445 | Dust Cap (Engine) |
| 8F-9866 | Cat® Pro "L" Grease Gun ¹ |
| 9U-7511 | Spark Plug Seat Cleaner |
| 9U-7516 | Spark Plug Gauge |

¹Warranty: Six Months

360-9664 Diesel Particulate Filter (DPF) Crack Detection Kit

Model Usage: C13: S/N LEE1-UP, C15: S/N SDP1-UP, B5R1-UP

Warranty: Six Months



- For On-Highway Truck Engines equipped with DPFs (2007 and newer), not for Tier 4 machines
- Used to determine whether a DPF is defective
- Utilized while DPF is still on the engine to take an exhaust sample
- Uses filter paper elements to determine amount of soot leaking through DPF

Reference

REHS5017, Special Instructions

| 360-9664 DPF Crack Detection Kit | |
|----------------------------------|---|
| Part Number | Description |
| 360-9664 | Diesel Particulate Filter (DPF) Crack Detection Kit |
| 360-9664 DPF Crack Detection Kit | |
| 001-6449 | Connector - Flared |
| 360-9665 | Box - Filter |
| 360-9666 | Orifice - Short |
| 360-9667 | Orifice Assembly - Long |
| 360-9668 | Cap |
| 360-9669 | Foam Assembly |
| 360-9670 | Card Comparator |
| 3L-7055 | Connector - Pipe |

399-7930 Crack Detection Group Cap

Model Usage: C7, C9

Warranty: Six Months



- Used with 360-9664 Crack Detection Group to measure leakage of soot through DPF Systems
- Provides proper fitting flanges to restrict exhaust flow during crack detection test
- Fits 4 inch exhaust systems

| Serviceable Parts | |
|-------------------|---------------------------|
| Part Number | Description |
| 399-7930 | Crack Detection Group Cap |
| Serviceable Parts | |
| 399-7932 | Cap |
| 399-7933 | Orifice |
| 399-7934 | Plate |

370-2284 Dummy Injector Tool

Model Usage: 3500 Engines

Warranty: Six Months



- Installs in place of fuel injector and has 1/4" - 18 NPTF tapped port to allow for leak checking of cylinder head

| Specifications | |
|---------------------------|---|
| Port Size | 1/4" - 18" NPTF |
| Material | Steel |
| Seal Installer Dimensions | 62mm (2.44in) dia x 147mm (5.79in) long |
| Weight | 1.56kg (3.4 lbs) |

(Continued)

370-2284 Dummy Injector Tool (Continued)

Model Usage: 3500 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|---------------------|
| 370-2284 | Dummy Injector Tool |

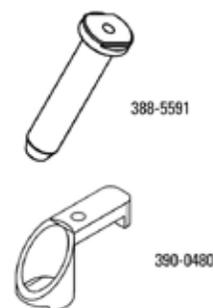
388-5591 Dummy Injector Tool

390-0480 Dummy Injector Hold Down Clamp

Model Usage: All C175 Engines
Warranty: Six Months

- Used to support troubleshooting of compression leaks on C175 engines
- Installs in place of fuel injector and has 1/4" – 18 NPTF tapped port to allow for leak checking of cylinder head
- Material: Steel

| Part Number | Dimensions | Weight |
|-------------|--|-------------------|
| 388-5591 | 49.7 x 162 mm (1.96 x 6.38 in) | .992 kg (2.19 lb) |
| 390-0480 | 118.9 x 62.4 x 49.7 mm (4.68 x 2.46 x 1.96 in) | .42 kg (.93 lb) |



195-0875 Marine Tool Kit (Not Serviced)

Model: 3116, 3126, 3126B, 3176, 3196 Marine Engines with Metric Fasteners
Warranty: Six Months

- Used for basic engine repairs and maintenance (provides a ride-along tool kit with specific engine tools)
- 195-0875 Tool Kit is not serviced as a group (allows for option of adding or deleting tools to fit the customers needs)
- 202-8643 Tool Box is a plastic, water-tight container (will not rust or scratch like metal boxes)
- Inch sockets and wrenches may be substituted or added to the kit
- Tool box capacity: 9 kg (20 lb)
- Tool box decal: NEEG2916



| |
|--------------------------------------|
| Included in Kit: |
| Wrench Group, Metric |
| Orange Hand Cleaner, 225 mL (7.5 oz) |

| Part Number | Description |
|------------------------------|---|
| 195-0875 | Marine Tool Kit (Not Serviced) |
| Recommended Tool List | |
| 1S-0257 | Ball Peen Hammer, 0.34 kg (12 oz) |
| 1U-9579 | WypAll Paper Wipers (bundle) |
| 285-1145 | Combination Padlock |
| 5F-4764 | Rolling Head Pry Bar, 40.64 cm (16 in) ¹ |
| 6V-6193 | Diagonal Cutting Pliers, 44.45 cm (17 1/2 in) |
| 8H-8575 | Extension Assembly |

| Part Number | Description |
|--|--|
| Recommended Tool List (Continued) | |
| 8H-8576 | Adapter |
| 239-6824 | Reversible Ratchet, 3/8 in Drive |
| 9U-7290 | Screwdriver Set |
| 141-1655 | Inspection Light |
| 146-2728 | Flex Pickup Tool |
| 185-3630 | Filter Strap Wrench Assm. ¹ |

(Continued)

195-0875 Marine Tool Kit (Not Serviced) (Continued)

Model: 3116, 3126, 3126B, 3176, 3196 Marine Engines with Metric Fasteners

Warranty: Six Months

| Part Number | Description |
|--|---|
| Recommended Tool List (Continued) | |
| 194-3574 | 3/8 Drive, 12 Point Metric Socket Set, 12-piece |
| 202-8643 | Tool Box (plastic) |

¹Warranty: Six Months

372-5257 EGR Leak Detection Kit

Model Usage: CT660 Truck, CT11, CT13, CT15

Warranty: Manufacturer's



- Used to perform leak test on each chamber of the EGR cooler
- Uses compressed air pressure to detect leaks
- Test can be performed in less than 5 minutes
- Kit includes 10 components including a regulator assembly for more accurate test results

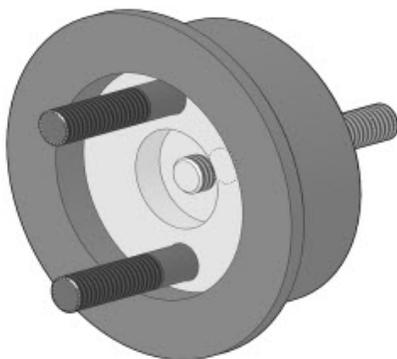
| Specifications | |
|----------------|---|
| Dimensions | 495.3 x 393.7 x 165.1 mm (19.5 x 15.5 x 6.5 in) |
| Weight | 7.3 kg (16.0 lb) |

| Part Number | Description |
|-------------|------------------------|
| 372-5257 | EGR Leak Detection Kit |

373-4725 Seal Installer

Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's



- Used to install the crankshaft front oil seal on the 11L and 13L engines

| Specifications | |
|----------------|---------------------------------|
| Dimensions | 203.2 x 203.2 mm (8.0 x 8.0 in) |
| Weight | 5.0 kg (11.0 lb) |

| Part Number | Description |
|-------------|--------------------------|
| 373-4725 | Front Oil Seal Installer |

373-4726 Seal Installer

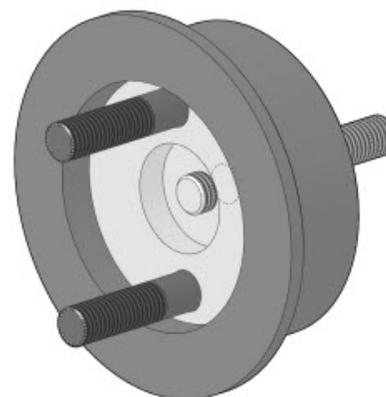
Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's

- Used to install the crankshaft rear oil seal on the 11L and 13L engines

| Specifications | |
|----------------|---------------------------------|
| Dimensions | 182.9 x 177.8 mm (7.2 x 7.0 in) |
| Weight | 4.5 kg (9.9 lb) |

| Part Number | Description |
|-------------|-------------------------|
| 373-4726 | Rear Oil Seal Installer |



373-4732 Air Intake Guard

Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to help prevent foreign material from entering the air intake port

| Specifications | |
|----------------|---|
| Dimensions | 177.8 mm dia. x 50.8 mm h (7 in. dia. x 2 in h) |
| Weight | .344 kg (.76 lb) |
| Material | Plastic |

| Part Number | Description |
|-------------|------------------|
| 373-4732 | Air Intake Guard |



373-4733 Pilot Bearing Seal Installation Tool

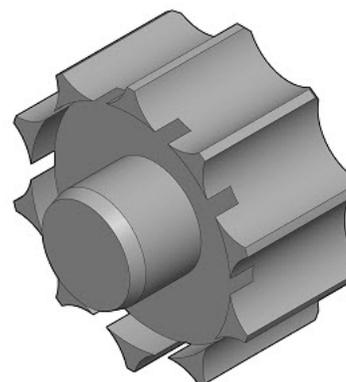
Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to press the pilot bearing seal into the flywheel housing on 11L and 13L engines

| Specifications | |
|----------------|---|
| Dimensions | 172.7 x 132.1 x 121.9 mm (6.8 x 5.2 x 4.8 in) |
| Weight | 0.63 kg (1.4 lb) |

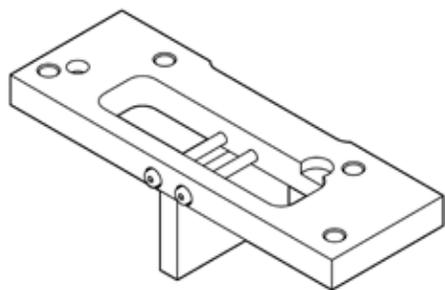
| Part Number | Description |
|-------------|--------------------------------------|
| 373-4733 | Pilot Bearing Seal Installation Tool |



373-4796 High Pressure Pump Drive Holding Plate

Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's



- Holding fixture used for high pressure pump
- Mounts in a vise for installation of pump drive gear

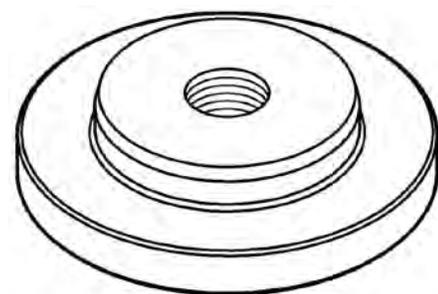
| Specifications | |
|----------------|--|
| Dimensions | 261.6 x 170.2 x 175.3 mm (10.3 x 6.7 x 6.9 in) |
| Weight | 2.53 kg (5.57 lb) |

| Part No. | Description |
|----------|--|
| 373-4796 | High Pressure Pump Drive Holding Plate |

373-4797 High Pressure Pump Drive Seal Installer

Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's



- Used to install high pressure pump drive seal

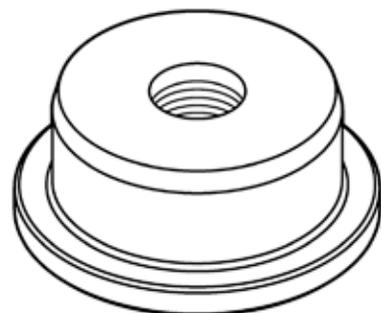
| Specifications | |
|----------------|--|
| Dimensions | 119.4 x 111.8 x 61.0 mm (4.7 x 4.4 x 2.4 in) |
| Weight | 0.61 kg (1.35 lb) |

| Part No. | Description |
|----------|---|
| 373-4797 | High Pressure Pump Drive Seal Installer |

373-4798 EGR Coolant Housing Upper Elbow Extension Tube Seal Installer (large)

Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's



- Used to install the large extension tube seal into the upper EGR coolant housing

| Specifications | |
|----------------|--|
| Dimensions | 119.4 x 111.8 x 61.0 mm (4.7 x 4.4 x 2.4 in) |
| Weight | 0.45 kg (1.0 lb) |

| Part Number | Description |
|-------------|---|
| 373-4798 | EGR Coolant Housing Upper Elbow Extension Tube Seal Installer (large) |

373-4799 EGR Coolant Housing Upper Elbow Extension Tube Seal Installer (small)

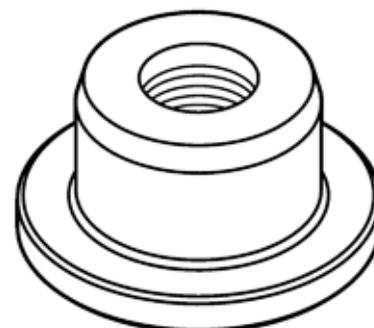
Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's

- Used to install the small extension tube seal into the upper EGR coolant housing

| Specifications | |
|----------------|--------------------------------------|
| Dimensions | 25.4 x 25.4 x 25.4 mm (1 x 1 x 1 in) |
| Weight | 0.45 kg (1.0 lb) |

| Part Number | Description |
|-------------|---|
| 373-4799 | EGR Coolant Housing Upper Elbow Extension Tube Seal Installer (small) |



374-6394 Sleeve Protrusion Hold Down Clamps

Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's

- Used to secure cylinder liner in place to accurately measure line protrusion during service
- Clamps are secured in place with four 10.9 grade bolts

| Specifications | |
|----------------|---|
| Dimensions | 101.6 x 88.9 x 33.0 mm (4.0 x 3.5 x 1.3 in) |
| Weight | 1.16 kg (2.85 lb) |

| Part Number | Description |
|-------------|------------------------------------|
| 374-6394 | Sleeve Protrusion Hold Down Clamps |



374-6417 Fey Ring Installation Tool

Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to align and install fey rings on the exhaust manifold
- Cone positioned on manifold housing as guide to properly seat rings
- Plastic installer used to expand rings over cone to properly seat the fey rings

| Specifications | |
|----------------|---|
| Dimensions | 127.0 x 121.9 x 7.4 mm (5.0 x 4.8 x 2.9 in) |
| Weight | 0.9 kg (1.3 lb) |

| Part Number | Description |
|-------------|----------------------------|
| 374-6417 | Fey Ring Installation Tool |



376-7698 Crankcase Pressure Test Adapter

Model Usage: CT660 Truck, CT11, CT13

Warranty: Manufacturer's



- Used to measure combustion gas flow out of the engine breather
- Can be used with the digital manometer from the 368-8645 Blow-by Group or the 8T-0452 Water Manometer

| Specifications | |
|----------------|--------------------|
| Dimensions | 2.7 x 8.3 x 1.7 in |
| Weight | 1.2 lbs |

| Part Number | Description |
|-------------|---------------------------------|
| 376-7698 | Crankcase Pressure Test Adapter |

384-2804 G3500 Valve Seat and Guide Runout Tool

Model Usage: G3512C, G3512E, G3516C, G3516E, G3520, G3520C and G3520E

Warranty: Manufacturer's



- Used to measure valve guide to valve seat runout
- Checks accuracy of total valve seat runout

Reference

SEBF9137-05, Reuse and Salvage Guidelines

NEHS1140 Tool Operating Manual

| Part Number | Description |
|-------------------------------------|--|
| 384-2804 | G3500 Valve Seat and Guide Runout Tool |
| 384-2804 Gauge Group Service/Repair | |
| 384-2802 | Pilot |

399-2786 Compression Test Adapter

Model Usage: All C3.8 Engines

Six Months



- Used to easily check cylinder compression on the C3.8 engine
- Used with the 9U-6274 Compression Test Group

| Part Number | Description | Dimensions |
|-------------|--------------------------|--------------------------------|
| 399-2786 | Compression Test Adapter | 170.2 x 38.1 mm (6.7 x 1.5 in) |

Fuel System Test Tools

FT2642 Nozzle Block to Filter Block Tubing

FT2643 Filter Block to Metering Unit Tubing

Model: AVM 12C Fuel Injection Test Bench

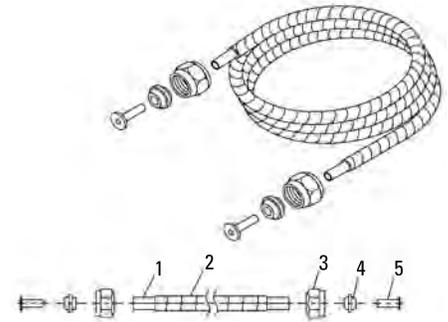
Warranty: None

- Provides more durable outer tubing wrap for early test benches
- Used with discontinued 132-9753 AVM 20-12C Fuel Injection Test Bench, discontinued 139-1437 AVM 20-12C Fuel Injection Test Bench, Bench S/N 0001/0023
- Tubing must be cut to identical lengths for metering accuracy
- Both FT2642 and FT2643 can be made from either 9U-7707 [310 cm (122 in)] long or 9U-7702 [3353 cm (110 ft)] long

| Part Number | Tubing Length | Spirowrap Length (Installed) | Spirowrap Free Length |
|-------------|------------------|------------------------------|-----------------------|
| FT2642 | 305 mm (12.0 in) | 280 mm (11.0 in) | 440 mm (17.3 in) |
| FT2643 | 270 mm (10.6 in) | 245 mm (9.6 in) | 360 mm (14.2 in) |

| Item | Description | | |
|------|--------------------------------------|--|--|
| 1 | Flexible Tubing (1 1/4 in TFE-White) | | |
| 3 | Nut (use existing) | | |

| Item | Part Number | Description |
|------|-------------|----------------------------|
| 2 | 5P-6039 | Spirowrap, 6 mm (0.24 in) |
| 4 | 9U-7704 | Ferrule, 6.35 mm (0.25 in) |
| 5 | 7K-8332 | Insert |



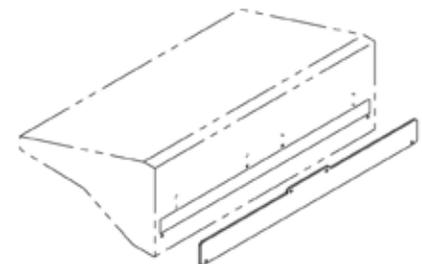
Engine Tools

FT2620 Access Cover, AVM

Model: Hartridge AVM 20-12C Fuel Injection Test Bench (Serial Number 1 thru 18)

Warranty: None

- Drawing provides dimensions to cut access hole and fabricate cover for tip shield access



158-2262 AVM 2-PC Fuel Injection Equipment Test Stand

Model: Cat® Engines

Warranty: Manufacturer's One Year



European Union compliant, CE marked

Test benches are capable of operating in the 380-480 Volt range but actual voltage will be checked and or changed during the on-site commissioning by the authorized Hartridge agent.

- Used to test fuel injection system components for pump and line fuel systems on Cat® engines

Machine Basics

- Advanced Video Metering (AVM)
- Designed to Caterpillar® specifications to test most injection pumps in the Cat® product line (includes all Cat-built pumps, Stanadyne DB2 and DB4 pumps used on 3054 and 3056 pre-emission certified engines, and Zexel and Nippondenso pumps used on 3046, 3064, and 3066)
- Stanadyne, Lucas, and Bosch emission certified pumps may not be serviced by Cat® dealers
- Complies with European CE marking directive and conforms with ECM standards
- Basic machine and metering unit complies with ISO4008, EEC, and UL/CSA standards (pump mounting system, cooled nozzle block, and master nozzles are unique to Cat®)
- "DCdrive" and standard PC architecture allow modem or network connections
- Uses industry standard PC allowing future expansion
- Uses a direct drive, high-torque, 15 kW (20 Hp) DC motor for low RPM performance
- An on-board air supply with electronic readout is available for setting FARC controls
- Electronic dynamic phasing
- Auto Step test plan editor and execution
- Pressure phasing to 80 bars
- Other features are 2 variable DC supplies, cooled metering unit, back leakage temperature measurement at pump outlet, analog speed trim for fine control of governors, digital pressure displays, drive "nudge" control
- This unit has many common parts currently used with standard Hartridge benches, resulting in product support from Delphi Diesel Systems Worldwide

Machine Displays

- Control panel pivots to permit operation from either side of test stand
- Display modes include; speed, pump output, phasing angle, pressure and test stand self diagnostic information
- With exception of oil pressure control valves and emergency stop buttons, a built-in computer and keyboard control test stand with user friendly Windows®
- Pump output and test stand operating data are displayed on a 38 cm (15 in) color monitor

Nozzle Block

- Cooled nozzle block dissipates heat, at its source, from high-energy Cat® fuel pumps
- Articulated support arm pivots beneath front of table, allowing master nozzle mount to be repositioned without disturbing pump mounting brackets
- Underslung multi-position master nozzle mount has vertical adjustment

Injection Pump Mounting Information

- Standard Cat® pump mounting rail uses existing mounting accessories and hardware (not included)

Testing

- "Intelligent Firing Order Learning" allows pump to be connected to test injectors in most convenient way
- Drive system automatically compensates for load variations (provides a constant, pre-selectable test speed within a range of 30 to 4000 RPM)
- All connections and associated valves are grouped together on the bulkhead, leaving a large unobstructed, self-draining work area at front of table for tools and fittings
- Powerful Hewlett-Packard computer controlled platform is flexible, and upgradeable to meet future requirements and provides accurate metering and information management/documentation capabilities provide compliance with current emissions and ISO standards

(Continued)

158-2262 AVM 2-PC Fuel Injection Equipment Test Stand (Continued)

Model: Cat® Engines

Warranty: Manufacturer's One Year

- High-speed, 12-cylinder advanced metering system reduces test time

Operation

- Control console pivots to permit operation from either side of test stand
- Keyboard height and angle are set to minimize strain
- Floppy and CD-ROM can be accessed from front of machine
- Computer and keyboard allow operator to enter data (speed) and observe results (pump output) on display
- All functions are menu controlled
- On-screen "analog" pressure gauges, a first in the test bench market, allows viewing trends and relative measurements while displaying numerical value for accurate setting
- Dynamic phasing display shows all pump phasing angles ($\pm 0.1^\circ$) simultaneously for rapid adjustment
- Self-diagnostic function will indicate motor over/temperature, air supply failure, dirty filter, stalled motor, and low tank levels
- Built-in PC allows test data to be stored on standard database software or print to color printer (not included). Operating data such as test plans can be entered, stored, removed and executed

Service

- Built-in, self-diagnostic routines are used to detect internal machine problems, with faults and test results displayed on LCD screen
- All electronic circuits use solid state technology and feature simple plug-in replacement boards
- All test oil supply and lube system components are located on left-hand side of bench
- All electrical and electronic services are on right side of bench

Worldwide Compatibility

- Machines have multiple language capability (current language choices are Dutch, English, French, German, Greek, Italian, Portuguese, Spanish, and Turkish)
- The machines include the Manual on CD-ROM in the following languages: Dutch, English, French, German, Greek, Italian, Portuguese, Spanish, and Turkish
- Bench is CSA-approved
- Bench meets applicable CE directives when on-site commissioning is completed

Repair Information

If test stand needs more than general maintenance or adjusting, contact original equipment manufacturer at the following locations.

Hartridge Limited

The Hartridge Building

Network 421

Radclive Road

Buckingham

MK18 4FD

U.K.

Switchboard: 44 (0) 1280 825 600

Fax: 44 (0) 1280 825 601

Service 24-Hour: 44 (0) 1280 825 650

Service Fax: 44 (0) 1280 825 675

Service E-mail address: support@hartridge.com

Web site: www.hartridge.com

Reference

NEHS0724, Tool Operating Manual (included with bench — may be ordered separately)

Ordering Information

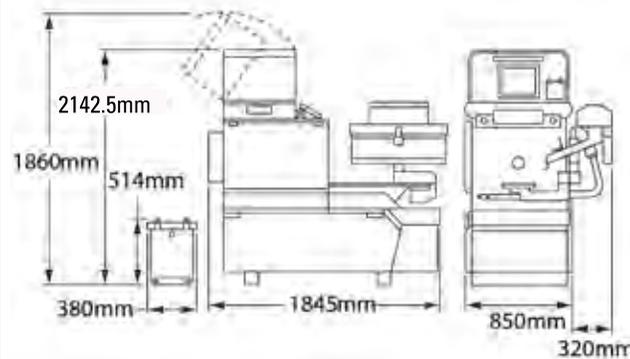
- Test benches are capable of operating in the 380-480 Volt range, but actual voltage will be checked and or changed during the on-site commissioning by the authorized Hartridge agent. On-site startup is provided by the manufacturer. For 220 to 240 volt applications, a transformer is required.

(Continued)

Worldwide Compatibility (Continued)

| Part Number | Description |
|-------------|--|
| 158-2262 | AVM 2-PC Fuel Injection Equipment Test Stand, 380 to 480 volt, 50/60 Hz, 3-phase |

Installation Requirements



These items are necessary for installation and must be ordered separately.

- 6V-6067 Calibration Fluid (208.5 L [55 gal]) or 6V-6068 Calibration Fluid (19 L [5 gal])
- 10W Engine lube oil preferred; 10W30 is acceptable
- 380 to 480 volt, 50/60 Hz, 3-phase (45 amp maximum)
- 3 lpm (0.6 gpm) at 20° C (68° F) maximum temperature at 1.5 bar pressure

On-Site Startup and Commissioning

A one-time on-site commissioning and basic bench training is included in the price of the bench. This service is provided by Hartridge.

- Fuel injection pump mounting and drive hardware must be ordered separately (contact your Dealer Service Tools Division representative for ordering assistance)

Specifications

| | |
|--------------------------|---|
| Case size | 191 x 114 x 209 cm (75 x 45 x 81 in) |
| Gross weight | 1170 kg (2580 lb) |
| Net weight | 970 kg (2140 lb) |
| DC motor | 14.9 kW (20 Hp) high torque |
| Flywheel | 1.8 kgm ² (43 ft-lb ²) |
| Motor RPM | 30 - 4000 RPM load compensating |
| Electrical supply | For 20 Hp: 380 - 480 V, 3-phase (80 A max.) |
| Current amp requirements | 63 A, but 100 A service is recommended |
| Transformer requirements | 208 - 240 V (45 kva) units require a 50 - 60 Hz |
| Compressed air supply | 6 bar (90 psi) |
| Water supply | 3.0 lpm (0.06 gpm) |

**Computer
Drive System**

| | |
|--------------------------|---|
| Computer: | |
| PC | Routeco |
| Processor | Pentium P633 |
| Hard disk drive | 10 GB |
| RAM | 64 MB |
| Operating system | NT Workstation |
| Floppy disk drive | 3.5 in 1.44 MB |
| CD-ROM drive | |
| Mouse | (PS/2 connection) |
| Serial ports | 2 |
| Parallel port | 1 |
| Expansion | Standard ISA or PCI card interface |
| Industrial grade monitor | 38 cm (15 in) diagonal color 800 x 600 SVGA |
| Keyboard | 102 key with protection membrane cover |
| Drive System: | |
| Motor | DC Thyristor controlled, 15 kW (20 Hp) |
| Speed range | 30 - 4000 RPM |
| Speed/torque (RPM/N-m) | 0/165, 590/165, 1500/95, 2500/51 |

**Continuous Operation Torque Ratings
Speed Control**

| | |
|----------------------------------|--|
| Speed Control: | |
| Closed loop speed control system | Zero steady state droop |
| Digital speed selection | From computer application |
| Analogue trim adjustment | ±10% |
| Acceleration rate | 400 RPM per second |
| “Nudge” function | Orientates drive to aid pump mounting |
| Flywheel inertia | 1.8 kgm ² (43 ft-lb ²) |
| Flywheel brake | Air-operated friction brake for emergency stop |

**Continuous Operation Torque Ratings
Calibration System**

| | |
|--------------------------------|--|
| Calibration System: | |
| Video display metering | 12 line |
| Color display screen | 38 cm (15 in) |
| Capacity | 5 - 500 mm ³ , stroke with 3 measuring modes, calibrate, over-check, and average |
| Selectable units | (mm ³ /st, cc/50, cc/100, cc/125, cc/250, cc/300, cc/500) and adjustable scale via upper/lower limits entry |
| Back leakage flowmeter display | 50 - 1500 cc/min or 3 - 90 L/hr |
| Units | cc/min, l/hr, and cc/1000st |

Instrumentation

Engine Tools

| Instrumentation | | | | | | |
|-------------------------|--|------------|-----------|----------------------------|--|--|
| | On-screen display | Resolution | Stability | Range | Display | Units |
| Tachometer | Numerical | 1 RPM | ±1 RPM | | | |
| Fuel Supply | | | | 1 - 4 bars | On-screen as numerical value and analogue representation | bar, Mpa, psi, mmHg, mbar, hPa, kPa |
| Auxiliary A | | | | 0 - 4 bars | On-screen as numerical value and analogue representation | bar, Mpa, psi, mmHg, mbar, hPa, kPa |
| Auxiliary B | | | | 0 - 16 bars | On-screen as numerical value and analogue representation | bar, Mpa, psi, mmHg, mbar, hPa, kPa |
| Boost Pressure | | | | 0 - 4 bars | On-screen as numerical value and analogue representation | bar, Mpa, psi, mmHg, mbar, hPa, kPa |
| Pressure Phasing | 80 bar displayed as numerical value | | | | | bar, Mpa, psi, mmHg, mbar, hPa, kPa |
| Lube Oil | 7 bar displayed as numerical value | | | | | bar, Mpa, psi, mmHg, mbar, hPa, kPa |
| Advance (optional) | | 0.1 mm | | ±10 mm | | mm, DPA°, DPC°, Stanadyne°, Bosch° |
| Fuel Supply Temperature | | | | 0° to 80° C | Numerical value on-screen | ° C (° F) |
| Back Leakage | Both temperature and flow numerical values | | | 0° to 80° C (0° to 175° F) | | Flow units: cc/min, l/hr, and cc/1000str |

Phasing

| Phasing | | |
|-------------------------|---|------------|
| Pressure phasing | Standard, dynamic phasing optional, and angle of rotation shown | |
| Resolution display | 0.1° | |
| | Range | Resolution |
| Static Phasing | 0° to 360° | 0.1° |
| 12-line Dynamic Phasing | 0° to 360° | 0.1° |

Hydraulic System

| | |
|--|-------------------------------------|
| Test Oil Supply and Controls | |
| Electric motor | Direct pump drive |
| Pressure rating | 550 L/hr and 0 - 4 bar (0 - 60 psi) |
| Pressure phase supply | 0 - 80 bar |
| Tank | 45 L (10 gal) capacity |
| Temperature Control | |
| Temperature controlling | ±2° C |
| Lube Oil Supply | |
| Pressure | 250 L/hr and 0 - 4 bar |
| Tank | 14 L (3 gal) capacity |
| Separate hours counters for: | |
| Fuel pump | |
| Fuel filter with "change filter" message every 500 hours | |
| Drive | |
| Machine | |

Auxiliaries

| | |
|--------------------------|--|
| Two DC supply outlets | 0 - 25 V at 3 A, which can be parallel connected to give 6 A |
| Multi-pin 110V connector | For external single cylinder calibrator and point of injection transducers |
| Clock display | Real time |
| Socket | For advance kit transducer |

6V-7900, 208/240 V; 1U-8212, 440/480 V; 1U-8213, 380/420 V Test Stands (All Discontinued)

Repair Information

If test stand needs more than general maintenance or adjusting, contact original equipment manufacturer at the following locations.

Hartridge Limited
 The Hartridge Building
 Network 421
 Radclive Road
 Buckingham
 MK18 4FD
 U.K.

Switchboard: 44 (0) 1280 825 600
 Fax: 44 (0) 1280 825 601
 Service 24-Hour: 44 (0) 1280 825 650
 Service Fax: 44 (0) 1280 825 675
 Service E-mail address: support@hartridge.com
 Web site: www.hartridge.com

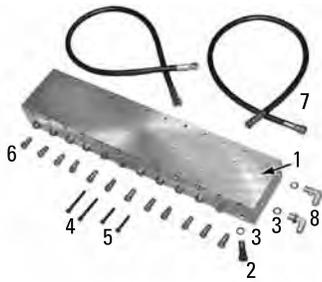


| Part Number | Description |
|-------------|-----------------------|
| 6V-7900 | Test Stand, 208/240 V |
| 4C-8212 | Test Stand, 440/480 V |
| 1U-8213 | Test Stand, 380/420 V |

FIETS Nozzle Block and Lines

Model: Fuel Injection Equipment Test Stand

Warranty: Six Months



Nozzle block and replacement lines are applicable to all Fuel Injection Equipment Test Stands (discontinued 6V-7900, discontinued 6V-7901, discontinued 6V-7902, discontinued 6V-7903, discontinued 6V-9440, discontinued 1U-8212, discontinued 1U-8213)

Cooled Nozzle Block

- Nozzle holding block uses test oil from phasing pressure circuit to carry nozzle-generated heat back to sump where it is removed by heat exchanger
- Improves work environment by eliminating hot test oil vapors at graduates
- Reduces heat-related deterioration of test stands non-metallic lines
- Contains replaceable nozzle tip shields to prevent erosion of nozzle block
- Required when using latest test specifications (in TMI)
- Required when testing pumps from higher horsepower 3400 Servies Engines

FIETS Lines Group

- Contains the following groups:

9U-7694 Nozzle Group Lines

9U-7697 Discharge Conduit Group

9U-7697 Discharge Conduit Group — bypasses constricting joints in swing arm

9U-7694 Nozzle Lines Group — provides nozzle bleed return to test oil sump

- Increases test stand accuracy by minimizing leaks
- Former nylon tubing replaced with teflon tubing for better abrasion resistance of tubes inside swing arm and longer life
- Flexible tubing is fuel, heat, and ozone resistant (used for pulse dampers and lines to graduates)
- Internal routing of teflon lines redirected through front bearing support arm — reduces kinking and makes line replacement faster and easier
- Corrects possible contamination of test oil from table drain tray on certain vintage benches

References

NEHS0594-01, Using the TMI System to Retrieve Off Engine Injection Pump Test Specifications for the FIETS

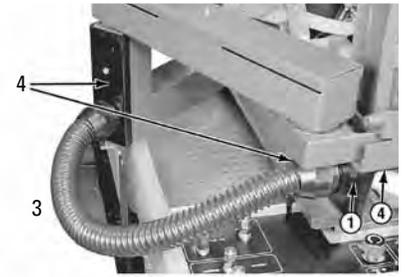
NEHS0593, Tool Operating Manual, Installing the Replacement Lines on the FIETS

| Cooled Nozzle Block Parts | | | |
|---------------------------|-------------|---------------------------------|----------|
| Item | Part Number | Description | Quantity |
| 1 | 128-5093 | Block Nozzle | 1 |
| 2 | 128-5094 | Tip Shield Fitting | 12 |
| 3 | 3J-1907 | O-ring Seal for 5P-9617 Adapter | 14 |
| 4 | 6L-5551 | Bolt | 2 |
| 5 | 2H-3764 | Bolt | 2 |
| 6 | 5P-4400 | Air Block Connector | 12 |
| 7 | 7G-7105 | Hose Assembly | 2 |
| 8 | 030-7947 | Elbow Fitting | 2 |

9U-7697 Discharge Conduit Group

Warranty: Six Months

| Item | Part Number | Description |
|---|-------------|-------------------------|
| -- | 9U-7697 | Discharge Conduit Group |
| Discharge Conduit Group Consists of: | | |
| 1 | 9U-7457 | Conduit Bracket |
| 2 | 9U-7458 | Conduit Fitting |
| 3 | 9U-7459 | Flexible Conduit |
| 4 | 9U-7701 | Arm Lining Tube |
| Not shown | 8D-7712 | Head Screw |

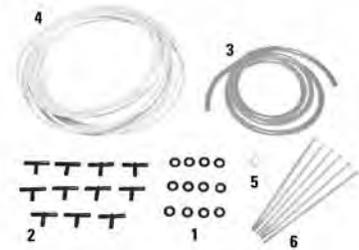


Engine Tools

9U-7694 Nozzle Lines Group

Warranty: Six Months

| Item | Part Number | Description |
|--|-------------|--------------------|
| -- | 9U-7694 | Nozzle Lines Group |
| Nozzle Lines Group Consists of: | | |
| 1 | 5R-7136 | Sealing Washer |
| 2 | 9U-7698 | Tee Fitting |
| 3 | 9U-7699 | Flexible Tubing |
| 4 | 9U-7707 | Flexible Tubing |
| 5 | 9U-7706 | Hose Clamp |
| 6 | 068-9941 | Wire Tie |
| Not shown | 1S-9593 | Cable Strap |



Calibration Fluid

Warranty: None

| Part Number | EAME Part Number | Qty. | Size |
|-------------|------------------|------|----------------|
| 6V-6068 | 185-4665 | 1 | 18.9 L (5 gal) |
| 6V-6067 | N/A | 1 | 208 L (55 gal) |

- Fuel injection test benches
- Pop Testers



Fuel Injection Tube Assemblies

Model: Cat® Fuel Injection Test Bench (FITB) and Fuel Injection Equipment Test Stand (FIETS)
Warranty: Six Months

- Bend-to-fit lines that reduce need for special fuel injection lines
- Data available in TMI uses 9U-6705 Master Nozzles and 9U-5298 and 9U-5299 lines (see SEHS0594)

Referenes

NEHS0594, Tool Operating Manual, Using TMI to Find Pump Specifications
LEBQ0724, Technical Marketing Information (TMI)



(Continued)

Fuel Injection Tube Assemblies (Continued)

Model: Cat® Fuel Injection Test Bench (FITB) and Fuel Injection Equipment Test Stand (FIETS)

Warranty: Six Months

| Part Number | Overall Length | Use |
|-------------|----------------|---|
| 9U-5298 | 76 cm (30 in) | Used for testing all in-line pumps and 3208 |
| 9U-5299 | 127 cm (50 in) | Used for testing all 3400 Vee pumps |

9U-6705 Master Nozzle Group

Model: Cat® Fuel Injection Test Bench (FITB) and Fuel Injection Equipment Test Stand (FIETS), AVM

Warranty: Six Months



- Replaces discontinued 1U-5500 Master Valve Assembly, 9U-5024 Master Valve Assembly, and 6V-9470 Master Valve Assembly
- Used to test fuel pump delivery rates on FITB and FIETS
- Has improved accuracy of $\pm 1\%$ with four-orifice tip (greatly improved over former valve assemblies with $\pm 5\%$ accuracy)
- Required when using new pump performance test specifications available in TMI
- Use with 9U-5298 and 9U-5299 Tube Assemblies (high pressure fuel lines)

| Part Number | Description |
|----------------------|----------------|
| 9U-6705 | Nozzle Master |
| Service/Repair Parts | |
| 9U-5037 | Bleed Fitting |
| 7W-4486 | Sealing Washer |

References

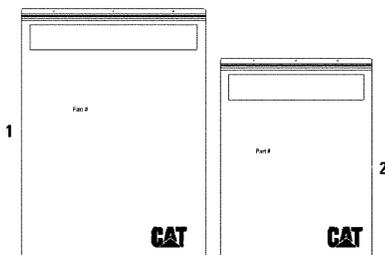
NEHS0594, Tool Operating Manual, Using

TMI to Find Off-Engine Test Specs

LEBQ0724, Technical Marketing Information (TMI)

Storage Bags

Warranty: None



- Keep fuel lines sealed and protected from dust and dirt
- Ziplock closure prevents oil and other greases from leakage
- Printed with 2-color Cat® logo, black part number, and a white area that can be written on to identify the parts inside the bag
- Transparent so the parts can be visibly identified
- May be used for a variety of purposes
- 3 sealed hang holes on top of bag spaced to fit standard one inch pegboard hooks

| Item | Part Number | Outside Dimensions | Ziplock Closure | Clear Vinyl Back and Front |
|------|-------------|-----------------------------|------------------------------|----------------------------|
| 1 | 152-0789 | 55.9 x 76.2 mm (22 x 30 in) | Top of bag (55.9 mm [22 in]) | 10.0 mm |
| 2 | 152-0788 | 45.7 x 60.0 mm (18 x 24 in) | Top of bag (45.7 mm [18 in]) | 10.0 mm |

NEHS0594 Using TMI for Finding Injection Pump Off Engine Test Specifications

Model: Fuel Injection Equipment Test Stand
 Warranty: None

- Contains complete instructions to obtain test specifications through TMI on Caterpillar® Network
- New data format gives larger selection of data for each pump (does not require resetting pump)
- Data can be obtained using injection pump and governor group part number, or engine arrangement number
- Most current data is always available on line

Reference

LEBQ0724, TMI Technical Marketing Information

Calibration Fluid

Model: Cat® Fuel Injection Test Bench and Cat® Fuel Injection Equipment Test Stand
 Warranty: Six Months

- SAE J967 (ISO 4113) Calibration Fluid recommended by Cat® for use in fuel injection test benches, 5P-4150 Nozzle Tester Group and discontinued 6V-4022 Injector Tester

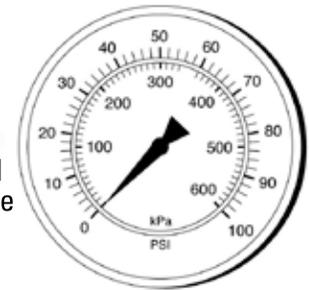
| Part Number | Size |
|-------------|-------------------|
| 6V-6067 | 208 L (55 US gal) |
| 6V-6068 | 18.9 L (5 US gal) |

Pressure Gauges

Model: All Models with Pump and Line Fuel Systems
 Warranty: Six Months

- Used to replace original gauges on the discontinued 6V-7900, discontinued 1U-8212, and discontinued 1U-8213 Fuel Injection Test Benches, and discontinued 132-9753 and discontinued 139-1437 (AVM)
- Replaces without modifying test stand
- Displays both kPa and psi
- Diameter: 102 mm (4.0 in)
- 1/4 inch NPT lower back connection
- Liquid-filled, chrome-plated cast brass case
- Clamp and profile ring included for panel mounting

Typical Pressure Gauge



| Part Number | Replaces Hartridge Gauge |
|-------------|-----------------------------------|
| 4C-4617 | 0 to 7000 kPa (0 to 1000 psi) |
| 9U-6099 | -100 to 4000 kPa (-14 to 580 psi) |
| 9U-6100 | 0 to 700 kPa (0 to 101 psi) |
| 8T-7637 | 0 to 1400 kPa (0 to 203 psi) |

9U-7840 Calibration Fluid and Diesel Fuel Test Kit

Model: FIETS, FITB, AVM, All Cat® Engines

Warranty: Six Months

Engine Tools



- Used to measure viscosity and specific gravity of SAE J967D (ISO4113) calibration fluid
- Used with fuel injection equipment test stand (FIETS) and fuel injection test bench (FITB) — helps to maintain accuracy of test equipment
- Performs test to make sure calibration fluid in test equipment is within specifications
- Saves money — fluid is not changed prematurely
- Beakers made from durable Nalgene — will not shatter
- Viscosity cup is individually calibrated for each test group — cup and calibration chart marked with individual serial number (matched set)
- Used to correct measured horsepower for density of fuel when testing engines on dynamometers

References

NEHS0607, Tool Operating Manual

NEHS0631, Tool Operating Manual, General Maintenance for FIETS

NEHS0640, Tool Operation Manual, Installing Fuel Suction Port on the FIETS

| | |
|---|---|
| Case (W x L x D) | 33 x 40.5 x 15.3 cm (13.0 x 16.0 x 6.0 in) |
| Weight | 2 kg (5.0 lb) |
| Viscosity cup | individually serialized (includes calibration sheets) |
| Beaker material | Nalgene |
| Also Included (not shown): NEEG2600 Decal | |

| Item | Part Number | Description |
|-----------------------------|-------------|---|
| -- | 9U-7840 | Calibration Fluid and Diesel Fuel Test Kit |
| Service/Repair Parts | | |
| 1 | 9U-7839 | Stopwatch |
| 2 | 1P-7438 | Beaker |
| 3 | 5P-2712 | Thermo-Hydrometer, Assembly API Gravity Scale |

| Item | Part Number | Description |
|---|-------------|----------------------------------|
| Service/Repair Parts (Continued) | | |
| 4 | 1P-7408 | Thermo-Hydrometer, Gravity Scale |
| 5 | 9U-7842 | Beaker |
| 6 | 4C-3975 | Plastic Storage Case |
| 7 | 9U-7841 | Viscosity Cup |
| Not shown | 9U-7917 | Button Battery (one required) |

136-8330 Basic Mounting/Setup Group (Not Serviced)

Model: All Fuel Injection Equipment Test Stands (FITB, FIETS, and AVM)

Warranty: Six Months

- Replaces discontinued 1U-7426 Pump Adapter Group
- Used to adapt injection pump mounting and drive groups to test stand
- Used with fuel injection equipment test stands (FITB, FIETS, and AVM)
- Group has been updated to eliminate non-current tooling and add new required tooling
- Tooling is required for off-engine testing of injection pumps and governors
- Parts are serviced separately to reduce dealer cost (no need to purchase tools already in inventory)

References

NEHS0594, TMI Specification

NEHS0607, 9U-7840 Calibration Fluid Test Kit

NEHS0624, 4C-8192 Heavy Duty Coupling Group (Hartridge Bench UpGrade)

NEHS0625, Tool Operating Manual, 3408/12, PEEC NSFS

NEHS0631, FIETS General Maintenance and Trouble Shooting

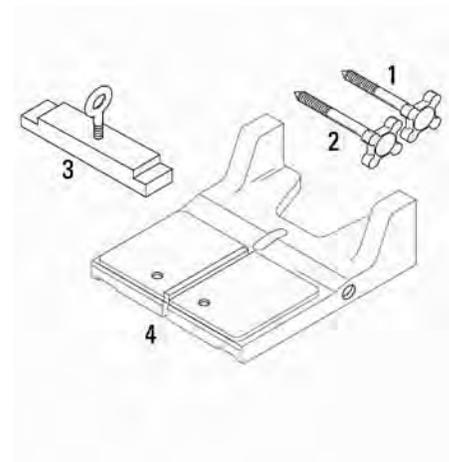
NEHS0639, Tool Operating Manual, 3406B and 3406C, PEEC NSFS

NEHS0640, Tool Operating Manual, Calibration Fluid Suction Port

SEHS8024, 6V-6070 Governor Adjustment Tool Group

SEHS9318, 3161 Woodward Test and Adjustment

SMHS7013, 5P-4203 SMFS Tool Group

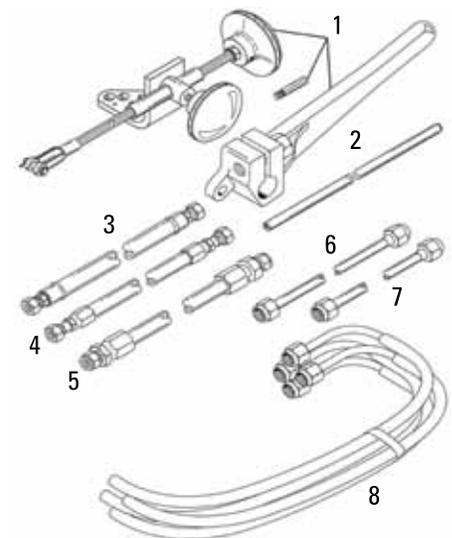


| Item | Part Number | Description | Quantity |
|--------------------------|-------------|---|----------|
| -- | 136-8330 | Basic Mounting/Setup Group (not serviced) | -- |
| Mounting Hardware | | | |
| 1 | 6V-6103 | Screw Assembly | 2 |
| 2 | 6V-9134 | Screw Assembly | 2 |
| 3 | 6V-9138 | Clamp Assembly | 2 |
| 4 | 6V-9132 | Fixture Assembly | 1 |

Lines and Testing Hardware

Warranty: Six Months

| Item | Part Number | Description | Quantity |
|-----------------------------------|-------------|-------------------------------|----------|
| Lines and Testing Hardware | | | |
| 1 | 1P-3520 | Control Group | 1 |
| 2 | 126-1827 | Rod | 1 |
| 3 | 7G-7105 | Hose Assembly | 3 |
| 4 | 3V-2744 | Hose Assembly | 1 |
| 5 | 031-2125 | Hose Assembly - Hyd | 1 |
| 6 | 9U-5299 | Tube As - Fuel Injection Test | 12 |
| 7 | 9U-5298 | Tube As - Fuel Injection Test | 8 |
| 8 | 5P-6515 | Lines Group | 2 |

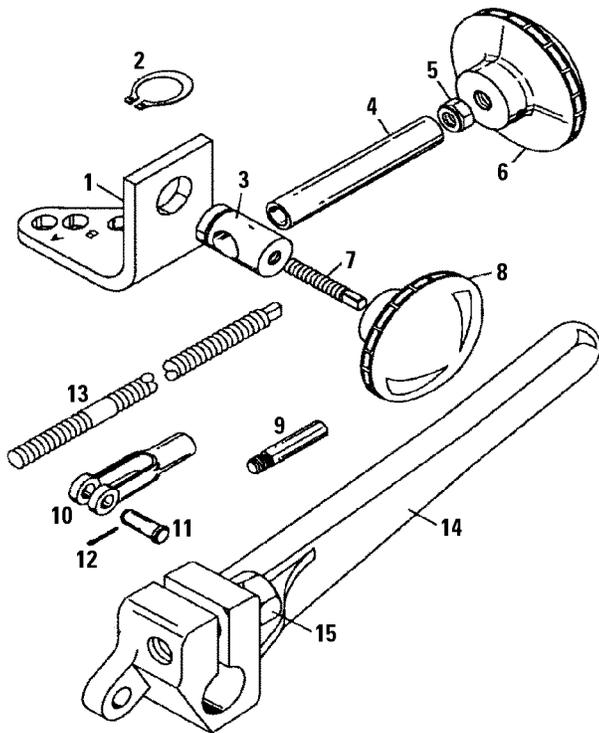


Fuel System Test Tools

Additional Service/Repair Parts

Warranty: Six Months

Engine Tools



Service/Repair Parts (without Part Numbers) for discontinued 1P-3520 Control Group

| Item | Description | Qty. |
|--------------------------------|---------------|--|
| 3 | Lug | 1 |
| 9 | Pin | 1 |
| 13 | Stud | 1 |
| Additional Service Part | | |
| | Hose Assembly | #6 (37 degree) [9/16 - 18 thd x 965 mm (38.0 in) long] |

| Item | Part No. | Description | Qty. | Where Used |
|--|----------|-------------|------|------------|
| Service/Repair Parts for discontinued 1P-3520 Control Group | | | | |
| 1 | 1P-3493 | Bracket | 1.0 | -- |
| 2 | 2J-6356 | Ring | 1.0 | -- |
| 3 | 1P-3487 | Lug | 1.0 | -- |
| 4 | 1P-2335 | Sleeve | 1.0 | -- |
| 5 | 1A-8285 | Nut (3) | 1.0 | -- |
| 6 ¹ | 1P-2333 | Knob | 2.0 | -- |
| 7 | 1P-3492 | Stud | 1.0 | -- |
| 9 | 1P-3486 | Pin | 1.0 | -- |
| 10 | 1P-3494 | Yoke | 1.0 | -- |
| 11 | 1P-3491 | Pin | 1.0 | -- |
| 12 | 3B-4609 | Pin | 1.0 | -- |
| 13 | 1P-3488 | Stud | 1.0 | -- |
| 14 | 6D-4396 | Lever | 1.0 | -- |
| 15 | 1A-2029 | Bolt | 2.0 | -- |

| Item | Part No. | Description | Qty. | Where Used |
|--|----------|-----------------------------------|------|---|
| Additional Hardware (Dependent on Pump Model) | | | | |
| -- | 6V-7793 | Coupling Group | 1.0 | drive adapt Hartridge 20.00 mm (0.787 in) jaw |
| -- | 1U-5223 | Fitting | 6.0 | bleed return for 1P-1795 (discontinued) |
| -- | 3P-1539 | Tube Assembly | 8.0 | 1.60 mm (0.063 in) ID x 533.4 mm (21.0 in) long |
| -- | 4L-5937 | Injection Pump Fuel Line Assembly | 6.0 | 1.60 mm (0.063 in) ID x 431.8 mm (17.0 in) long |
| Additional Parts | | | | |
| 6 | 6V-9138 | Clamp Assembly | -- | fixture assembly to rail system |
| 9 | 6V-9134 | Screw Assembly | -- | fixture assembly to bench rails (short) |
| 10 | 6V-9132 | Fixture Assembly | -- | target/fixture assembly to bench rails |

(Continued)

Additional Service/Repair Parts (Continued)

Warranty: Six Months

| Item | Part No. | Description | Qty. | Where Used |
|-------------------------------------|----------|-----------------------------------|------|--|
| Additional Parts (Continued) | | | | |
| 10 | 6V-6103 | Screw Assembly | -- | fixture assembly to bench rails (long) |
| -- | 3P-1539 | Tube Assembly | 8.0 | 1.60 mm (0.063 in) ID x 533.4 mm (21.0 in) long |
| -- | 3V-2744 | Hose Assembly | -- | #4 (37 degree) [7/16 - 20 thd x 610 mm (24.0 in) long] |
| -- | 4L-5937 | Injection Pump Fuel Line Assembly | 6.0 | 1.60 mm (0.063 in) ID x 431.8 mm (17.0 in) long |
| -- | 6V-7793 | Coupling Group | 1.0 | drive adapt Hartridge 20.00 mm (0.787 in) jaw |
| -- | 8N-5132 | Clamp | -- | for master nozzle |

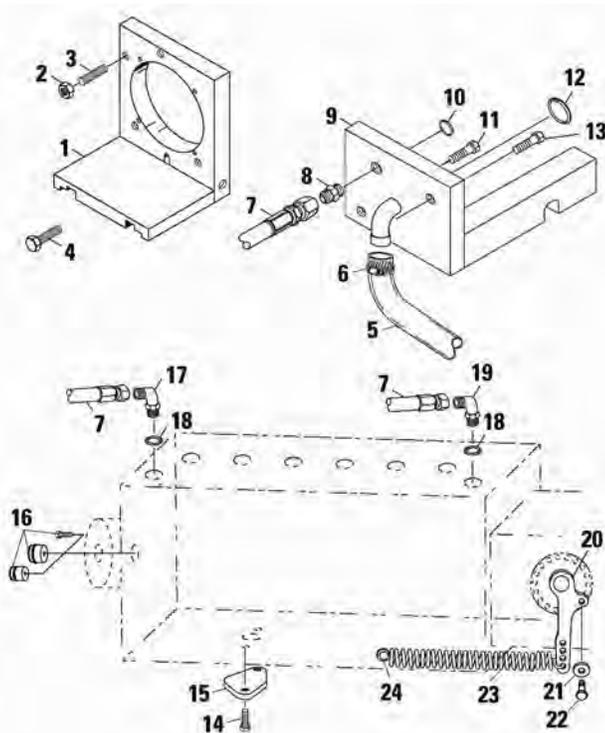
| Item | Part No. | Description | Qty. | Where Used |
|-------------------------------------|----------|-------------------------------|------|---|
| Additional Parts (Continued) | | | | |
| -- | 9U-5298 | Tube As - Fuel Injection Test | -- | 1.83 mm (0.072 in) ID x 762.0 mm (30.0 in) long |
| -- | 9U-5299 | Tube As - Fuel Injection Test | -- | 1.83 mm (0.072 in) ID x 1270.0 mm (50.0 in) long |
| -- | 1U-5223 | Fitting | 6.0 | bleed return for 1P-1795 (discontinued) |
| -- | 1T-0416 | Bolt | -- | for master nozzle |
| -- | 9U-6705 | Nozzle Master | -- | for master nozzle |
| -- | 031-2125 | Hose Assembly - Hyd | -- | #4 (37 degree) [7/16 - 20 thd x 1016 mm (40 in) long] |
| -- | 126-1827 | Rod | -- | drive coupling rotation (Cat® heavy duty) |

¹ 1P-2333 Knob, is Item 6 and 8

135-2916 Mounting Drive Group (Not Serviced)

Model: 3406B, 3406C, and 3406 PEEC Engines

Warranty: Six Months



- Replaces discontinued 6V-4990 Adapter Group
- Used to mount and test fuel injection pumps
- Used with fuel injection equipment test stands (FITB, FIETS, and AVM)
- Tooling is required for off-engine testing of injection pumps
- Parts are serviced separately to reduce dealer cost (no need to purchase tools already in inventory)

References

NEHS0594, TMI Specification

NEHS0624, Tool Operating Manual

NEHS0639, Tool Operating Manual

| Item | Part Number | Description | Qty. |
|------|-------------|---------------------------------|------|
| 1 | 6V-6101 | Plate Assembly ¹ | 1 |
| 2 | 6V-8801 | Nut | 5 |
| 3 | 1J-8668 | Stud | 5 |
| 4 | 0L-1143 | Bolt | 3 |
| 5 | 9U-7709 | Drain Tube | 1 |
| 6 | 5D-1026 | Hose Clamp | 1 |
| 7 | 7G-7105 | Hose Assembly | 3 |
| 8 | 5P-6661 | Fitting | 1 |
| 9 | 6V-6102 | Support Assembly | 1 |
| 10 | 1S-0004 | O-ring Seal | 1 |
| 11 | 0S-1591 | Bolt | 1 |
| 12 | 3J-1907 | O-ring Seal for 5P-9617 Adapter | 2 |
| 12 | 8S-5953 | O-ring Seal | 1 |
| 13 | 3B-1915 | Bolt | 1 |

| Item | Part Number | Description | Qty. |
|-----------------|-------------|-------------------------------------|------|
| 14 ² | 2A-0762 | Bolt | 2 |
| 15 | 9U-5297 | Cover | 2 |
| 16 | 8T-2849 | Plug | 1 |
| 16 | 4W-4616 | Quad Ring Seal | 1 |
| 16 | 4W-0435 | Quad Ring Seal | 1 |
| 16 | 8T-2848 | Plug | 1 |
| 16 | 7H-2069 | Bolt | 1 |
| 17 | 030-7947 | Elbow Fitting | 1 |
| 19 | 1W-3151 | Orifice Fitting | 1 |
| 20 | 6N-3646 | Lever | 1 |
| 21 | 5P-0537 | Hard Washer | 1 |
| 23 | 9M-3858 | Spring | 1 |
| 24 | 6V-8918 | Bolt | 1 |
| -- | 135-2916 | Mounting Drive Group (not serviced) | -- |

¹ Some later 6V-6101 Plate Assemblies do not include shield.

² 2A-0762 Bolt, is item 14 (Qty. 2) and item 22 (Qty. 1)

Additional Required Hardware for 135-2916 Mounting Drive Group

Warranty: Six Months

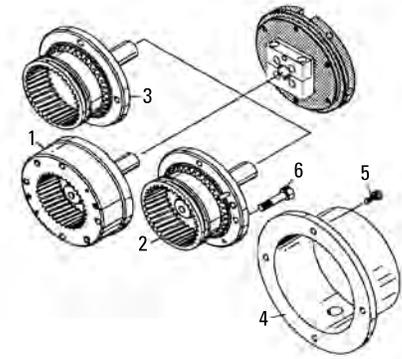
The following list of hardware is required, but not included as part of the 135-2916 Mounting Drive Group (not serviced). This tooling can be purchased as needed.

Drive Adapters for 4C-8723 Jaw Assembly

| Item | Part No. | Description | Where Used | Qty. |
|------|----------|---|--|------|
| 1 | 6V-6097 | Camshaft Drive Adapter Assembly | camshaft drive (10 degree helix with 50 teeth) | -- |
| 2 | 1U-8700 | Camshaft Drive Adapter Assembly | camshaft drive (15 degree helix with 50 teeth) | -- |
| 3 | 4C-8249 | Camshaft Drive Adapter Assembly | camshaft drive (15.615 degree helix with 52 teeth) | -- |
| 4 | 6V-6099 | Camshaft Drive Shield Assembly ¹ | -- | 1 |
| 5 | 4L-7124 | Bolt - Hex Socket Head ² | -- | 4 |
| 6 | 0L-1143 | Bolt | bolt, drive adapter to injection pump cam | 3 |

¹ Some later 6V-6101 Plate Assemblies do not include shield.

² Part of 1P-0520 Driver Group



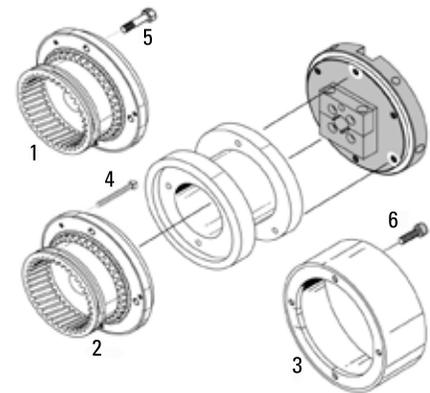
Engine Tools

Drive Adapters for Discontinued 4C-8192 Heavy-Duty Coupling

Warranty: Six Months

| Item | Description |
|------|-------------|
| 4 | Pusher Bolt |

| Item | Part Number | Description | Quantity |
|------|-------------|---------------------------------|----------|
| 1 | 4C-8193 | Camshaft Drive Adapter Assembly | -- |
| 2 | 4C-8194 | Camshaft Drive Adapter Assembly | -- |
| 3 | 126-1826 | Camshaft Drive Shield Assembly | -- |
| 5 | 0L-1143 | Bolt | 3 |
| 6 | 8H-0707 | Bolt | 4 |



Adapter Part Numbers and Usage

| Usage | 4C-8723 Jaw Assembly | 4C-8192 Heavy-Duty Coupling Group ¹ |
|---|----------------------|--|
| 3406B PEEC Engine - 8TC, 3406B Truck Engine - 4MG3600-UP, 15 degree Helix with 50 teeth | 1U-8700 | 4C-8193 ^{2,3} |
| 3406B PEEC Engine - 3ZJ, 3406B Truck Engine - 4MG3600-UP, 15.615 degree Helix with 52 teeth | 4C-8249 | 4C-8194 ^{2,3} |
| 3406 Truck Engine - 7FB and 4MG3600-DOWN, 10 degree Helix with 50 teeth | 6V-6097 | 6V-6097 ⁴ |

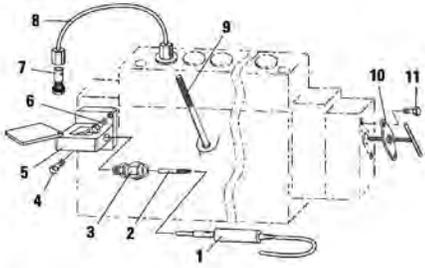
¹ Discontinued

² Requires 126-1826 Oil Shield Assembly on 6V-6101 Plate Assembly.

³ Requires 4C-8189 Drive Tube.

⁴ Attach the 4C-8723 Jaw Assembly onto the discontinued 4C-8192 Heavy-Duty Coupling Group.

Test Hardware (PEEC and Non-PEEC Engines)

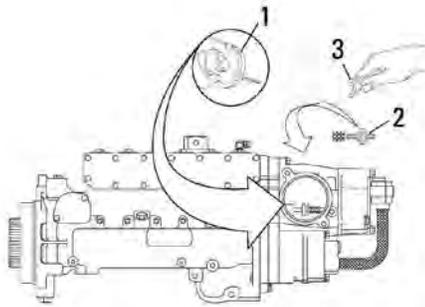


| Item | Part Number | Description | Quantity |
|------|-------------|--|----------|
| 1 | 8T-1002 | Position Probe (X4) | 1 |
| 2 | 5P-4160 | Point - Indicator Contact, 19.05 mm (0.75 in) long | 1 |
| 3 | 5P-4814 | Collet As - Clamp | 1 |
| 4 | 7B-2742 | Bolt | 1 |
| 5 | 8T-9198 | Rack Indicator Bracket Assembly | 1 |
| 6 | 0S-1615 | Bolt ¹ | 1 |
| 7 | 9U-6705 | Nozzle Master | 6 |
| 8 | 9U-5298 | Tube As - Fuel Injection Test | 6 |
| 9 | 6V-4186 | Pin - Fuel Pump Timing | 1 |
| 10 | 9U-5296 | Rack Positioning Assembly ² | -- |
| 11 | 4F-7957 | Bolt | -- |

¹ Parts serviced separately.

² Non-PEEC, 3406B and 3406C Rack Adjustment

Rack Positioning Hardware (3406 PEEC Engines)



| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | 9U-5292 | Rack Pre-load Assembly |
| 2 | 9U-5295 | Rack Positioning Assembly |
| 3 | 9U-5120 | Spanner Wrench |

Zexel and Nippondenso Fuel Pump and Governor Disassemble and Assemble Tools

Model: 3046, 3064 and 3066 Engines

Warranty: Six Months



- Used to disassemble and assemble fuel injection pump and governor
- Makes overhaul of pump and governor simpler and faster
- Using this specialized tooling reduces the risk of part and component damage

References

SENR6572, Supplement for Fuel Injection Pumps for 3064 and 3066 Engines

SENR6573, Supplement for Fuel Injection Pumps for 3046 Engines

| Part Number | Description | Use |
|-------------|--------------|--|
| 4C-6608 | Holding Tray | keep parts organized (reduces chance of lost or damaged parts) |

Fixture Group / Mounting Plate

| Item | Part Number | Description | Use |
|------|-------------|----------------------------|--|
| 1 | 4C-5602 | Fixture Group ¹ | hold pump in any position for ease of repair (can greatly increase mechanic's efficiency during overhaul) |
| 2 | 4C-5603 | Mounting Plate | bolts to fuel injection pump and attaches to 4C-5602 Fixture Group; allows attachment of Nippondenso, Zexel, and Stanadyne pump, all to the same plate |



¹ Includes support assembly, 4C-5712 Base Assembly, 4C-5715 Bushing, and lock pin assembly

Assemble Tools for Zexel and Nippondenso Fuel Pump

| Item | Part Number | Description | Use |
|------|-------------|-----------------------------|---|
| 1 | 4C-5567 | Torque Adjusting Socket | remove and adjust torque control spring |
| 2 | 126-2370 | Wrench (3046 only) | remove and adjust torque control spring |
| 2 | 4C-5085 | Wrench (3064 and 3066 only) | remove and adjust torque control spring |
| 3 | 5P-1720 | Seal Pick | remove shims under plunger springs |
| 4 | 4C-6605 | Tweezers | remove and install delivery valve (care must be taken not to damage this part) |
| 5 | 4C-5574 | Seal Protector | Protects seal face during front cover installation (seals can be damaged by camshaft keyway slot, if not protected) |
| 6 | 4C-4025 | Bearing Installer | install bearing on camshaft (reduces bearing damage and part replacement cost) |
| 7 | 4C-4098 | Seal Installer | install seals in front pump cover |



Disassemble Tools for Zexel and Nippondenso Fuel Pump

| Item | Part Number | Description | Use |
|------|-------------|--------------------|---|
| 1 | 4C-5601 | Plunger Compressor | compresses plunger spring and roller so plunger holders can be installed and removed |
| 2 | 4C-6381 | Lower Plier | designed to reach through pump case and remove/install plungers |
| 3 | 4C-6597 | Plunger Holder | hold plungers off camshaft so it can be removed or installed |
| 4 | 4C-5580 | Pulling Adapter | removes 4C-4024 Camshaft Holder from camshaft |
| 5 | 4C-4024 | Camshaft Holder | hold camshaft while removing and installing retaining nut that holds flyweights to camshaft |
| 6 | 4C-6380 | Plunger Holder | makes removal and installation of roller much easier |



(Continued)

Disassemble Tools for Zexel and Nippondenso Fuel Pump (Continued)

| Item | Part Number | Description | Use |
|------|-------------|-------------|---|
| 7 | 4C-4956 | Nut Socket | removes and installs flyweight retaining nut (specially designed) |

195-0768 Thread Adapter



This adapter is used to adapt the 4C-5601 Plunger Compressor to Zexel pumps with M28 threaded plugs.

To remove existing M26 thread adapter:

1. Remove block with spring fingers (heat may be required to loosen thread lock compound).
2. Remove washer and current M26 thread adapter (silver).
3. Install new M28 thread adapter (black oxide).
4. Install washer and block with spring fingers (use 4C-4030 Thread Lock to secure block with spring fingers).

| Item | Part Number | Description |
|------|-------------|--------------------|
| 1 | 4C-5601 | Plunger Compressor |
| 2 | 195-0768 | Thread Adapter |

Zexel and Nippondenso Fuel Pump and Governor Test and Adjust Tools

Model: 3046, 3064 and 3066 Engines

Warranty: Six Months



- Used to test and adjust fuel pump and governor after an overhaul
- Used with discontinued 8T-1001 Electronic Position Indicator, 8T-1002 Indicator Probe, 6V-3075 Indicator, and 5P-4163 Indicator Tip

References

NEHS0622, Tool Operating Manual, Testing and Adjusting Fuel Injection Pump and Governor on 3064 and 3066 Engines
 SENR6573, Supplement, Nippondenso Fuel System

| Item | Part Number | Description | Use |
|-----------------------|-------------|---------------------|---|
| Mounting Tools | | | |
| 1 | 8S-2264 | Puller Group | helps remove drive adapter from pump |
| 2 | 9U-7493 | Drive Adapter | attaches pump to test stand drive spindle |
| 3 | 0T-0722 | Bolt | attaches pump to test stand base plate |
| 4 | 4S-9191 | Flat Washer | attaches pump to test stand base plate |
| 5 | 9U-7494 | Pump Mounting Plate | attaches pump to test stand base plate |

| Item | Part Number | Description | Use |
|-----------------------------------|-------------|----------------|--|
| Mounting Tools (Continued) | | | |
| 6 | 6V-9138 | Clamp Assembly | pump mounting base (part of Fuel Injection Test Stand) |
| 7 | 0T-0924 | Bolt | attaches pump to test stand base plate |
| 8 | 3B-4506 | Lock Washer | attaches pump to test stand base plate |
| 9 | 6V-9134 | Screw Assembly | pump mounting base (part of Fuel Injection Test Stand) |

(Continued)

Zexel and Nippondenso Fuel Pump and Governor Test and Adjust Tools (Continued)

Model: 3046, 3064 and 3066 Engines

Warranty: Six Months

| Item | Part Number | Description | Use |
|-----------------------------------|-------------|------------------|--|
| Mounting Tools (Continued) | | | |
| 10 | 6V-9132 | Fixture Assembly | pump mounting base (part of Fuel Injection Test Stand) |
| 11 | 118-1713 | Washer | attaches pump to test stand drive spindle |
| 12 | 118-1711 | Nut | attaches pump to test stand drive spindle |
| 13 ¹ | 2A-4639 | Bolt | attaches pump to test stand drive spindle |

¹Item 13 includes: item 8, 3B-4506 Lock Washers (2)

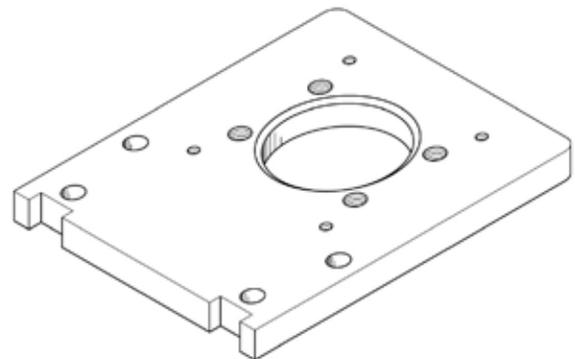
²See FT2559 for plate modification.

FT2560 Plate Modification for Guard

| Part Number | Description |
|-------------|------------------------------|
| FT2560 | Plate Modification for Guard |

| Item | Part Number | Description | Use |
|-----------------------------------|-------------|-----------------------------|---|
| Mounting Tools (Continued) | | | |
| 14 | 9U-7501 | Drive Adapter | attaches pump to test stand drive spindle |
| Not shown | | | |
| -- | 2H-0191 | Bolt | -- |
| -- | 146-7767 | Guard Assembly ² | -- |

Engine Tools



Adjustment Tools

| Item | Part Number | Description | Use |
|-------------------------|-------------|---|--|
| Adjustment Tools | | | |
| 1 | 8T-1001 | Electronic Position Indicator | obtain measurement specifications |
| 2 | 8T-1002 | Position Probe (X4) | obtain rack measurement specifications |
| 3 | 6V-3075 | Indicator - Dial | obtain measurement specifications |
| 4 | 5P-4163 | Point - Indicator Contact, 120.65 mm (4.75 in) long | obtain measurement specifications |
| 5 | 4C-2982 | Indicator Collet | as an assembly to measure plunger lift |
| 6 | 4C-5713 | Nozzle Overflow Assembly | allows mechanic to see when fuel stops flowing and then check timing angle |

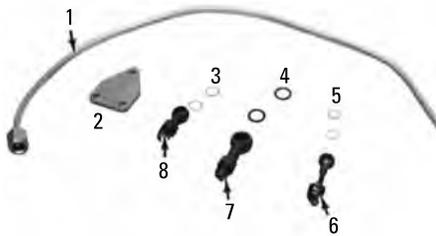


(Continued)

Adjustment Tools (Continued)

| Item | Part Number | Description | Use |
|-------------------------------------|-------------|-----------------------------|---|
| Adjustment Tools (Continued) | | | |
| 7 | 4C-5085 | Wrench (3064 and 3066 only) | adjusts the setting of torque idling screw |
| 8 | 4C-5567 | Torque Adjusting Socket | adjusts the setting of torque idling screw |
| 9 | 4C-6509 | Plunger Spring Retainer | replace adjustment shims (holds plunger spring off top of roller) |
| 10 | 5P-1720 | Seal Pick | replace adjustment shims (holds plunger spring off top of roller) |
| 11 | 4C-6605 | Tweezers | helps to remove and install delivery valve |
| 12 | 9Y-6051 | Locknut | as an assembly to measure plunger lift |
| 13 | 4C-5604 | Copper Washer (2) | as an assembly to measure plunger lift |
| 14 | 4C-4658 | J-tube Fitting | as an assembly to measure plunger lift |
| 15 | 4C-4766 | Plunger Adapter | as an assembly to measure plunger lift |

Calibration Fluid and Lube Line Tooling



| Item | Part Number | Description | Use |
|------|-------------|--------------------------------------|---|
| 1 | 127-4365 | Fuel Injector Test Tube Assembly (6) | connect injection pump to master nozzle |
| 2 | 4C-4909 | Transfer Pump Cover | covers transfer pump opening during testing |
| 3 | 4C-5708 | Copper Washer (2) | returns test oil from pump back to test stand |
| 4 | 4C-5707 | Copper Washer (2) | supplies test oil to fuel pump |
| 5 | 4C-5706 | Copper Washer (2) | supplies lube oil to pump |
| 6 | 4C-6609 | Lube Oil Supply Fitting | supplies lube oil to pump |
| 7 | 4C-5711 | Calibration Fluid Supply Fitting | supplies test oil to fuel pump |
| 8 | 4C-5710 | Calibration Fluid Return Fitting | returns test oil from pump back to test stand |

Indicator Tools



| Item | Description | Use |
|------|-------------------------------|--|
| 1 | Electronic Position Indicator | obtain rack measurement specifications |

(Continued)

Indicator Tools (Continued)

| Item ¹ | Part Number | Description | Use |
|------------------------|-------------|--|---|
| Indicator Tools | | | |
| 2 | 8T-1002 | Position Probe (X4) | obtain rack measurement specifications |
| 3 | 5P-4160 | Point - Indicator Contact, 19.05 mm (0.75 in) long | obtain rack measurement specifications |
| 4 | 3P-1567 | Indicator | obtain rack measurement specifications |
| 5 | 4C-5569 | Measurement Adapter ² | attaches indicator to pump for rack measurement |
| 6 | 4C-2982 | Indicator Collet | as an assembly to measure plunger lift |
| 7 | 146-7774 | Nylon Screw ³ | attaches indicator to pump for rack measurement |

¹Item 1: Electronic Position Indicator, Use: obtain rack measurement specifications

²Used for FIETS with original coupling

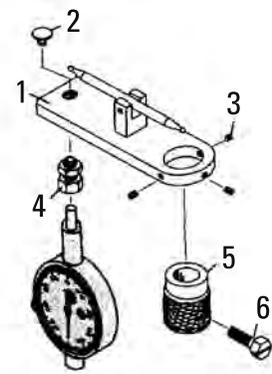
³Used for FIETS and AVM with heavy duty coupling

146-7780 Rack Position Bracket Group (not serviced)

| Item | Part Number | Description | Qty. |
|------------------|-------------|--|------|
| 1 | 146-7777 | Arm Assembly ¹ | -- |
| 2 | 6V-2057 | Contact Point | 1 |
| 3 | 5B-9324 | Set Screw ¹ | 3 |
| 4 | 3P-1565 | Collet Clamp | -- |
| 5 | 146-7771 | Rack Measurement Adapter ¹ | -- |
| 6 | 146-7774 | Nylon Screw ¹ | 1 |
| -- | 146-7780 | Rack Position Bracket Group (not serviced) | -- |
| Not Shown | | | |
| -- | 6V-2030 | Extension ^{1,2} | 1 |

¹Used for FIETS and AVM with heavy duty coupling

²Part of 6V-6042 Indicator Contact Point Group



4C-8145 Throttle Control Indicator Group

Sets rack and throttle control angle

Engine Tools



| Item | Includes |
|------|--|
| 1 | Base Assembly and Upper Plate |
| 2 | Indicator Assembly and Adjusting Block |
| 3 | Column Assembly and Upright Bar |
| 4 | Throttle Control Linkage, Sleeve and Pin |
| 5 | Adjusting Block and Guide |
| 7 | Dial Assembly |

| Item | Part Number | Description |
|------|-------------|--------------------|
| 1 | 9X-8873 | Bolt |
| 1 | 4C-8135 | Lower Plate |
| 2 | 4C-8143 | Pointer |
| 2 | 6V-0672 | Knob (thumb screw) |
| 3 | 6V-8183 | Nut |
| 3 | 8R-0739 | Washer |
| 3 | 8T-8889 | Bolt |
| 3 | 4K-4726 | Rod End |
| 4 | 6V-6961 | Knob |

| Item | Part Number | Description |
|------|-------------|----------------------------------|
| 4 | 4C-8138 | Nut |
| 4 | 4C-8146 | Rod End Yoke |
| 5 | 3W-6756 | Knob |
| 5 | 6V-8189 | Nut |
| 7 | 7S-1114 | Spring Washer ¹ |
| 7 | 4M-5281 | Bolt |
| 7 | 4C-8144 | Degree Wheel |
| -- | 4C-8145 | Throttle Control Indicator Group |

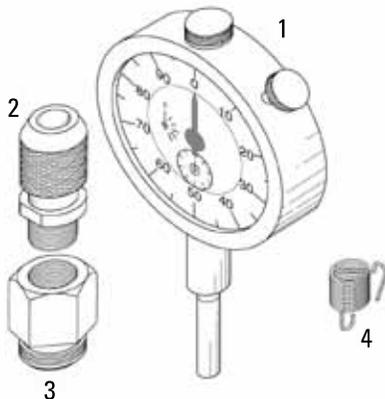
¹ Not serviced

Engine Governor Adjustment Tools

Essential Tool

Model: C0.5, C0.7, C1.1, C1.5, C1.6 and C2.2 Engines

Warranty: Six Months



- Used to adjust governor on specific model Industrial engines
- Used with 8C-4982 Allen Head Screw (M4 x 20 x 0.70 mm) and 9U-7400 Multitach Tool Group

Reference

KENR6228-00, Testing and Adjusting C0.5, C0.7, C1.1, C1.5, C1.6 and C2.2 Industrial Engines

| Item | Part Number | Description | Use |
|------|-------------|-----------------------|--|
| 1 | 330-7396 | Dial Indicator | graduated in 0.01 mm increments and has a 20 mm (.8 in) long extension tip |
| 2 | 330-7397 | Dial Indicator Holder | fits over indicator shaft and collet locks it in position |
| 3 | 330-7398 | Engine Block Adapter | installs in cylinder block and allows dial indicator holder to thread into adapter |
| 4 | 330-7399 | Spring | replaces start spring during testing and adjusting procedures |

Injection Pump Off-Engine Disassembly, Assembly, and Bench Test

Model: Early 3054 and 3056 Pre-Emission Engines

Warranty: Six Months

- Used to disassemble and assemble Stanadyne DB2 and DB4 fuel injection pump and governor used on pre-emission 3054 and 3056 engines
- Makes adjustments to fuel pump and governor simpler and faster
- Specialized tooling reduces the risk of parts and/or component damage
- Not for use on 3054-3056 Engines with Stanadyne, Lucas, or Bosch emission pumps

References

SENR6574, Stanadyne Fuel System (Supplement)

ENG95-1 IRM, for 3054 and 3056 Engine Fuel Systems



| Part Number | Description | Use |
|-------------|--------------|--|
| 4C-6608 | Holding Tray | keep parts organized (reduces chance of lost or damaged parts) |

Disassembly and Assembly Tools for Injection Pump Off-Engine

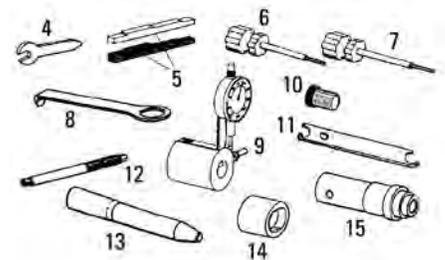
| Item | Part Number | Description | Used |
|------|-------------|----------------------------|---|
| 1 | 4C-5602 | Fixture Group ¹ | disassembly and assembly |
| 2 | 4C-5603 | Plate | hold pump during disassembly and assembly |



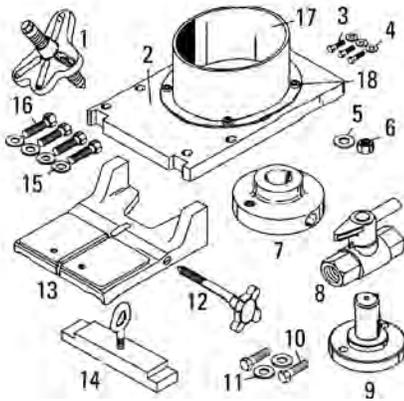
¹ Includes support assembly, 4C-5712 Base Assembly, 4C-5715 Bushing, and lock pin assembly

Disassembly and Assembly Tools for Injection Pump Off-Engine

| Item | Part Number | Description | Use |
|---------------------------------------|-------------|-------------|---|
| Disassembly and Assembly Tools | | | |
| 10 | 4C-6621 | Bushing | advance cam screw |
| 11 | 4C-8053 | Remover | -- |
| 12 | 4C-8128 | Extractor | with screwdriver |
| 13 | 4C-6829 | Installer | install pump shaft |
| 14 | 4C-6989 | Socket | remove pump end cap |
| 15 | 4C-6841 | Mandrel | remove pump bearing |
| 4 | 4C-6839 | Wrench | adjust governor linkage |
| 5 | 4C-8124 | Linkage Kit | set clearance between rear of throttle shaft and vertical tab on linkage hook |
| 6 | 4C-6842 | Screwdriver | set timing trimmer screw |
| 7 | 4C-6827 | Screwdriver | with 4C-8128 to remove delivery valve and stop screw |
| 8 | 4C-8129 | Wrench | remove spring side advance piston hole plug hole plug |
| 9 | 4C-6845 | Fixture | with shop air to measure roller-to-roller dimension |



Bench Mounting Tools and Testing Tools



| Item | Description | Use |
|------|---------------------|---|
| 2 | Pump Mounting Plate | mount pump on 6V-9132 Base Plate Rail Adapter |

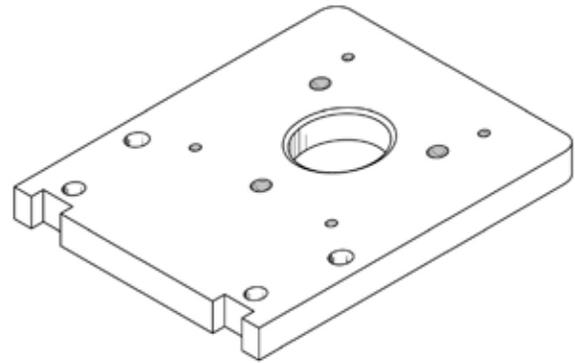
| Item | Part Number | Description | Use | Quantity |
|---|-------------|-----------------------------|---|----------|
| Bench Mounting Tools and Testing Tools | | | | |
| 1 | 8S-2264 | Puller Group | remove 9U-7493 Drive Adapter from pump | -- |
| 2 | 1U-5366 | Pump Mounting Plate | mount pump on 6V-9132 Base Plate Rail Adapter | -- |
| 3 | 0T-0772 | Bolt | connect fuel injection pump to mounting plate | 3 |
| 4 | 4S-9191 | Flat Washer | connect fuel injection pump to mounting plate | 3 |
| 5 | 118-1713 | Washer | connect 9U-7493 to pump | -- |
| 6 | 118-1711 | Nut | connect 9U-7493 to pump | -- |
| 7 | 9U-7493 | Drive Adapter | connect 9U-7501 Drive Adapter to bench drive | -- |
| 8 | 8T-6864 | Valve Shut-off | -- | -- |
| 9 | 9U-7501 | Drive Adapter | -- | -- |
| 10 | 2A-4639 | Bolt | bolt 9U-7501 to 9U-7493 | 2 |
| 11 ¹ | 5M-2894 | Washer | bolt 9U-7501 to 9U-7493 | 2 |
| 12 | 6V-9134 | Screw Assembly | secure base plate to rails | -- |
| 13 | 6V-9132 | Fixture Assembly | -- | -- |
| 14 | 6V-9138 | Clamp Assembly | secure base plate to rails | -- |
| 16 | 0T-0924 | Bolt | -- | 4 |
| 17 | 146-7767 | Guard Assembly ² | -- | -- |
| 18 | 2H-0191 | Bolt | -- | 4 |

¹Item 11: 2M-2894 Flat Washer (Qty. 2) is also Item 15: 2M-2894 Flat Washer (Qty. 4)

²See FT2559 for plate modification.

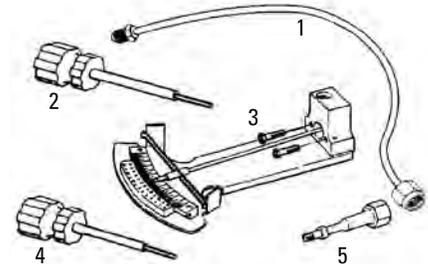
FT2559 Plate

| Part Number | Description |
|-------------|-------------|
| FT2559 | Plate |



Calibration Fluid and Lube Line Tooling

| Item | Part Number | Description | Y |
|------|-------------|----------------------------------|---|
| 1 | 127-4365 | Fuel Injector Test Tube Assembly | connect injection pump to master nozzle |
| 2 | 4C-6827 | Screwdriver | -- |
| 3 | 4C-8126 | Indicator Assembly | measure advance |
| 4 | 4C-6842 | Screwdriver | -- |
| 5 | 4C-8054 | Tap Fitting | check transfer pump pressure |

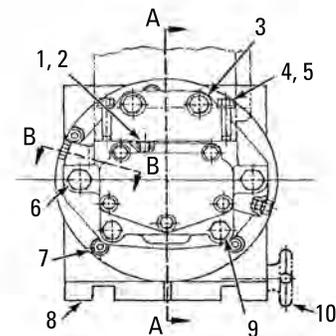


4C-6907 Governor Drive Group

4C-8740 Air Supply and Test Group

Model: 3500 and 3600 Family Engines with Woodward 3161 Governors
 Warranty: Six Months

- Used for off-engine bench testing and adjusting Woodward 3161 Governors on Fuel Injection Pump Test Stand
- Used with either Fuel Injection Equipment Test Stand (discontinued 6V-7900, discontinued 1U-8212 or discontinued 1U-8213 made by Hartridge) or non-current fuel injection test bench (made by Kent-Moore) and 4C-6100 Torque Control Tool Group
- Eliminates need for specialized governor test bench
- 4C-6907 Governor Drive Group used to mount and drive 3161 Governor with fuel injection equipment test stand; parts from 1W-2135 Drive Group (used on 3500 Series Engines) were modified and used in drive gear box; modified parts are called out and identified; parts of gear box that were not modified are shown in 3500 Series Engine parts books
- 4C-8740 Air Supply and Test Group contains pressure gauges and regulators to perform pneumatic tests and adjustments



References

- NEHS0545, 3161 Governor Test
- SEHS9318, Test and Adjust of 3161 Governors On Fuel Injection Test Stand
- SEHS9351, Schedules for On Fuel Injection Test Stand

(Continued)

4C-6907 Governor Drive Group (Continued)

4C-8740 Air Supply and Test Group

Model: 3500 and 3600 Family Engines with Woodward 3161 Governors

Warranty: Six Months

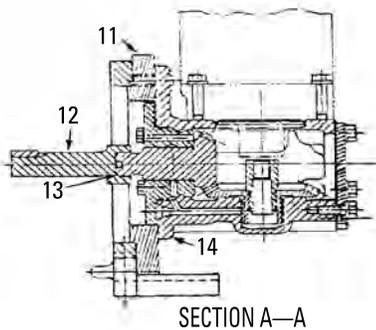
Engine Tools

| Item | Part Number | Description | Quantity |
|--|-------------|---|----------|
| -- | 4C-6907 | Governor Drive Group | -- |
| 4C-6907 Governor Drive Group - Serviced | | | |
| 1.0 | 9F-2247 | Pipe Plug | 4 |
| 2.0 | 3P-0647 | Seal | 4 |
| 3.0 | 0S-1621 | Bolt | 2 |
| 4.0 | 0L-2070 | Bolt | 4 |
| 5.0 | 5M-2894 | Washer | 4 |
| 6.0 | 1D-4588 | Bolt | 2 |
| 7.0 | 1L-0509 | Socket Head Cap Screw (3/8-16) | 4 |
| 8.0 | 6V-6101 | Plate Assembly ¹ | -- |
| 9.0 | 1A-7669 | Bolt | 2 |
| 10.0 | 6V-6103 | Screw Assembly | -- |
| Required but not included | | | |
| -- | 4L-7124 | Bolt - Hex Socket Head ² | 4 |
| -- | 6V-6099 | Camshaft Drive Shield Assembly ¹ | 1 |

¹Some later 6V-6101 Plate Assemblies do not include shield.

²Part of 1P-0520 Driver Group

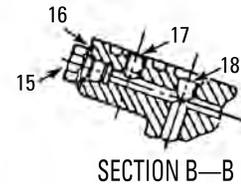
Section A-A



| Item | Part Number | Description |
|------|-------------|----------------------|
| 11 | 4C-6906 | Adapter |
| 12 | 4C-6905 | Drive Shaft Assembly |
| 13 | 4C-6904 | Pinion |
| 14 | 4C-6903 | Housing Assembly |

Section B-B

| Item | Part Number | Description | Qty. |
|-----------|-------------|-------------|------|
| 15 | 9S-4182 | Plug | 2 |
| 16 | 6V-5048 | Seal | 2 |
| 17 and 18 | 9F-2247 | Pipe Plug | 2 |



4C-8740 Air Supply and Test Group

| Item | Description |
|------|--|
| 6 | 9.53 mm (3/8 in) Tubing, 0.46 m (1.5 ft) |
| 7 | Air Bulb (W.A. Baum Co. Inc. Catalog No. 1890) |



| Item | Part Number | Description | Size | Qty. |
|-------------------------------|-------------|---------------------------|------------------------------|------|
| 1 | 8T-0841 | Plastic Case | -- | -- |
| 2 | 8T-0839 | Diff Pressure Gauge | -- | -- |
| 3 | 9U-6100 | Gauge | -- | -- |
| 4 | 4C-3974 | Union Fitting | -- | 4 |
| 5 | 1U-5469 | Pressure Gauge | -- | -- |
| -- | 4C-8740 | Air Supply and Test Group | -- | -- |
| Not Shown ¹ | | | | |
| -- | 8T-0821 | Tubing | 16 m (52.5 ft) | -- |
| -- | 4C-3973 | Fitting | 3.18 x 3.18 mm (1/8 x 1/8in) | 4 |
| -- | 3J-7354 | O-ring Seal | -- | 2 |
| -- | 5D-9231 | Fitting | -- | 2 |

¹ Also not shown: Male Connector, 6.35 x 3.18 mm (1/4x 1/8in) (Qty. 2) and Bulkhead Union, 3.18 mm (1/8in) (Qty. 2)

4C-6100 Tool Group, 3161 Governor Torque Control

Model: Multiple Engine Models

Warranty: Six Months



- Used to perform variety of in-vehicle engine governor and fuel system settings for D11 Track-Type Tractor and the 777, 785 and 789 Off-Highway Trucks
- Easily installed on governor without removing surrounding components such as alternator or water hoses
- With correct combination of lever arms and weights, a specific torque is applied to 3161 Woodward Governor speeder and terminal shafts; allows for setup of governor, setting fuel injection timing, derating of governor for high altitude applications, and evaluation of governor schedule

| Item ¹ | Part Number | Description | Weight |
|-------------------|-------------|--|----------------|
| 1 | 4C-3975 | Plastic Storage Case | -- |
| 1 | 4C-6102 | Torque Arm Weight | 2.27 kg (5 lb) |
| 2 | 4C-6099 | Torque Arm | -- |
| 3 | 4C-6103 | Torque Arm Weight | 4.08 kg (9 lb) |
| 4 | 4C-6101 | Torque Arm | -- |
| 5 | 4C-6098 | Torque Arm | -- |
| 6 | 4C-6105 | Insert | -- |
| -- | 4C-6100 | Tool Group, 3161 Governor Torque Control | -- |

¹ Not shown: NEEG2435 Decal

Vehicle Application with Tooling Combinations for 4C-6100 Tool Group, 3161 Governor Torque Control

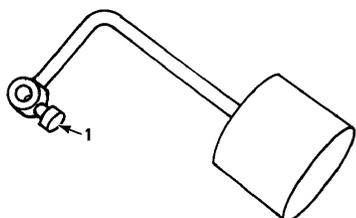
| Vehicle Application with Tooling Combinations | | |
|---|-------------|-------------------|
| Tool Usage | Part Number | Description |
| D11 Track-Type Tractor | | |
| Terminal shaft tools ¹ | 4C-6102 | Torque Arm Weight |
| Speeder shaft tools ¹ | 4C-6103 | Torque Arm Weight |
| 777, 785 and 789 Off-Highway Trucks | | |
| Terminal shaft tools ¹ | 4C-6102 | Torque Arm Weight |
| Speeder shaft tools ¹ | 4C-6103 | Torque Arm Weight |

¹ Includes: Torque Arm

1U-9361 Governor Torque Arm

Model: 3500 Marine and Industrial Generator Sets

Warranty: Six Months



- Used to test and adjust 3161 governor
- Applies consistent torque to governor and fuel system linkage for more accurate fuel system adjustments
- Can be installed on terminal shaft of 3161 governor
- Arm applies 10.3 N·m (7.60 ft-lb) of torque to governor linkage when torque arm is installed with center line of cylinder-shaped weight in horizontal position

Reference

SEHS9240-01, Special Instruction

| Item | Part Number | Description |
|------|-------------|---------------------|
| 1 | 3F-7147 | Bolt |
| -- | 1U-9361 | Governor Torque Arm |

1U-6661 Tester

Discontinued — Service/Repair Parts Available

References

SEHS8867, Using the 1U-6661 Pop Tester

SEHS8858, Using the 6V-4022 Injector Tester to Test 1.1 L Fuel Injectors

SEHS8922, Installation of 1U-6667 Conversion Group

SEHS8884, Unit Injector Test Specifications for 1.1 L Engines, 1.7 L Engines and 3500 Family Engines

NEEG2565, Decals for Pop Tester

Service Magazine, June 6, 1994, pages 8-9

| 1U-6661 Tester Service/Repair Parts | |
|-------------------------------------|----------------------|
| Part Number | Description |
| 4C-3407 | Spring Ret |
| 4C-3408 | Cover |
| 4C-3411 | Panel |
| 4C-3413 | Back Cover |
| 4C-3414 | Screw |
| 4C-3415 | Screw |
| 4C-3417 | Knob |
| 4C-3420 | Torsion Bar Assembly |
| 4C-3422 | Vinyl Grip |
| 4C-3423 | Needle Valve |
| 4C-3424 | Valve Meeting Group |
| 4C-3425 | Back Panel |
| 4C-3426 | Stopper |
| 4C-3430 | Pivot Link |
| 4C-3431 | Pump Lever |
| 4C-3432 | Clevis Pin |
| 4C-3433 | Shaft Top |
| 4C-3434 | Lower Pivot |
| 4C-3435 | Spring |
| 4C-3437 | Shaft |
| 4C-3438 | Clevis Pin |
| 4C-3439 | Spring |

| 1U-6661 Tester Service/Repair Parts | |
|-------------------------------------|---------------|
| Part Number | Description |
| 4C-3440 | Connector |
| 4C-3441 | Spacer Ring |
| 4C-3442 | Nylon Bearing |
| 4C-3443 | Bushing |
| 4C-3444 | Nylon Bearing |
| 4C-3445 | Swivel Stop |
| 4C-3446 | Filter Stem |
| 4C-3447 | Brass Insert |
| 4C-3448 | Connector |
| 4C-3449 | Pipe Tee |
| 4C-3450 | Pipe Elbow |
| 4C-3451 | Check Valve |
| 4C-3452 | Pipe Elbow |
| 4C-3453 | Connector |
| 4C-3454 | Priming Valve |
| 4C-3455 | Connector |
| 4C-3456 | Valve Check |
| 4C-3457 | Pipe Nipple |
| 4C-3458 | Pipe Connect |
| 4C-3459 | Line Return |
| 4C-3460 | Pipe Elbow |
| 4C-3461 | Pipe Elbow |

| 1U-6661 Tester Service/Repair Parts | |
|-------------------------------------|----------------|
| Part Number | Description |
| 4C-3462 | Hose Assembly |
| 4C-3463 | Swivel |
| 4C-3464 | Pipe Elbow |
| 4C-3465 | Line |
| 4C-3466 | Pipe Connector |
| 4C-3467 | Line Gauge |
| 4C-3468 | Insert |
| 4C-3469 | Washer |
| 4C-3470 | Squeeze Bulb |
| 4C-3471 | Lines Group |
| 4C-3474 | Cap |
| 4C-3475 | Bushing |
| 4C-3476 | Primary Pump |
| 4C-3477 | Ring |
| 4C-3478 | O-ring |
| 4C-3479 | Piston |
| 4C-3482 | Sleeve |
| 4C-3483 | Pad |
| 4C-3485 | O-ring Seal |
| 4C-3487 | Cylinder |
| 4C-3658 | Col Spring |
| 4C-9674 | Screw |
| 1U-6661 | Tester |

6V-4172 Injector Sleeve

Model: D11N, 3508, 3512, 3516, 777B, 785, 789, 3500

Warranty: Six Months

| Part Number | Description |
|-------------|-----------------|
| 6V-4172 | Injector Sleeve |

- Used to cover fuel ports when cleaning injectors on D11N, 777B, 785, 789, and 3500 Series Engines



5P-4150 Nozzle Tester Group

Model: 1100, 3100, 3208, 3400

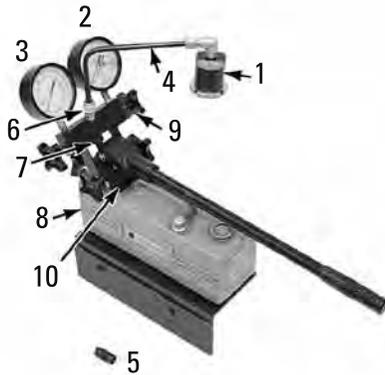
Warranty: Six Months

- Used to test all fuel nozzles, including pencil-type nozzles on 1100 and 3100 Series and 3208 Engines, direct injection capsule-type fuel nozzles on 3400 Series Engines, and capsule-type nozzles used on all other engines

Reference

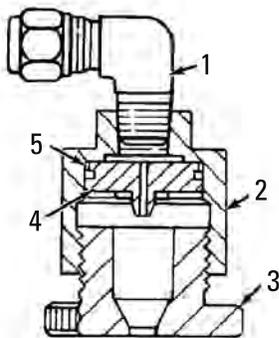
SEHS7292, Special Instruction

Engine Tools



| Item | Part Number | Description | Notes |
|---|-------------|---------------------|---|
| 1 | 5P-8744 | Adapter Assembly | If desired, quick disconnect fittings may be installed for faster changing of nozzle adapters; refer to Engine News of October 3, 1979, for installation instructions |
| 3 | 8T-0856 | Gauge | 6000 kPa (870 psi) SEHS7605 Caution Label |
| 4 | 5P-4721 | Tube | End fittings not included; included with 5P-4719 and 5P-4720 |
| 5 | 5P-4244 | Adapter | -- |
| 6 | 5P-4719 | Fitting | Includes connecting fitting for 5P-4721 |
| 7 | 5P-4243 | Fitting | -- |
| 8 | 8T-5313 | Filter | -- |
| 9 | 4J-7533 | Seal | one on each hand valve, qty. 5 |
| 10 | 6V-0183 | Gasket | between reservoir and pump |
| 11 | 8T-0859 | Gauge - Pressure | 25000 kPa (3600 psi) |
| -- | 5P-4150 | Nozzle Tester Group | -- |
| Available separately (not shown) | | | |
| -- | 1U-9578 | Repair Kit | -- |

Service/Repair Parts for 5P-8744 Adapter Assembly (Sold Separately)



| Item | Description |
|------|-------------|
| 2 | Adapter |
| 3 | Retainer |

| Service/Repair Parts for 5P-8744 Adapter Assembly (Sold Separately) | | |
|---|-------------|----------------------|
| Item | Part Number | Description |
| 1 | 5P-4720 | Fitting ¹ |
| 2 | 5P-8741 | Adapter |
| 3 | 5P-8740 | Retainer |
| 4 | 5P-8742 | Piston Assembly |
| 5 | 2S-4663 | Seal |

¹Includes connecting fitting for 5P-4721

1U-9578 Repair Kit

Model: Cat® Engines
Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 1U-9578 | Repair Kit |

- Used to disassemble and assemble 5P-4150 Nozzle Tester Group
- Contains gaskets, seals, O-rings, steel balls and filter, along with printed parts breakdown if parts not included in the kit are needed
- Allows worn or broken 5P-4150 Nozzle Tester Group to be repaired and put back into operation when used along with other service parts listed in Tool Guide

5P-7448 Adapter

Model: Flat Seat Fuel Injection Valves
Warranty: Six Months

| Part Number | Description |
|-------------|----------------------|
| 5P-7448 | Adapter ¹ |

- Used to test and adjust flat seat fuel injection valves on 5P-4150 Tester and also discontinued 1P-1795 Master Valve from fuel injection test bench



¹ Not included with tube assemblies, must be ordered separately

8S-2270 Fuel Collector

1U-8857 Extension Tube and FT1384 Extension

Model: All Fuel Systems
Warranty: 1U-8857: Six Months

1U-8857 Extension Tube

- Used with 8S-2270 Fuel Collector to collect spray from 5P-4150 Nozzle Tester or 8S-2242 Nozzle Tester
- Increases height of 8S-2270 Fuel Collector to prevent splashing of test fluid; made of plastic and can be cut shorter to meet varying heights required by different mounting arrangements of Nozzle Tester Group
- Originally offered as FT1384 drawing, dealer now has option of purchasing or fabricating because the necessary plastic is difficult to purchase in some areas

| Part Number | Description |
|-------------|-------------|
| FT1384 | Extension |

| Part Number | Description |
|-------------|----------------|
| 1U-8857 | Extension Tube |
| 8S-2270 | Fuel Collector |



Tube Assemblies

Model: D6D, 528, 3300, 3046, 3054, 3056, 3064, 3066

Warranty: Six Months



- Used with 5P-4150 Nozzle Tester and 5P-7448 Adapter to test fuel nozzles in 3300 Series DI Engines
- 6V-2170 and 5P-7448 are used on 3054, 3056, 3064 and 3066 Engines (14 mm x 1.5 thd)
- 5P-4718 Adapter is used for, 3034 and 3046 Engines (12 mm x 1.5 thd)

| Item | Part Number | Description | Used to Test |
|-----------|-------------|---|----------------------------------|
| 1 | 6V-2170 | Tube Assembly | 8N-7001 Fuel Nozzle ¹ |
| 2 | 6V-2171 | Tube Assembly | 7N-0449 Fuel Nozzle |
| 3 | 3J-1906 | Nut (Part of 6V-2170 and 6V-2171) | -- |
| 4 | 3J-1905 | Sleeve (Part of 6V-2170 and 6V-2171) | -- |
| 5 | 5P-7448 | Adapter ² | -- |
| Not shown | 5P-4718 | Adapter (not included with tube assemblies; must be ordered separately) | -- |

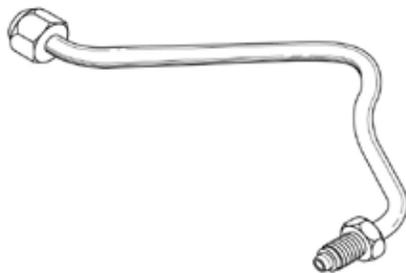
¹ Discontinued

² Not included with tube assemblies, must be ordered separately

FT1743 Line Assembly

Model: Fuel Systems

Warranty: None



- Used to test 8N-7006, 8N-7007, 4W-7012 and 4W-7013 Fuel Nozzles
- Designed to be used with 5P-4150 Nozzle Tester Group
- Attached to 5P-4721 Tube by using 5P-4244 Adapter (parts of Nozzle Tester Group)

Reference

SEHS7292, Special Instruction

1U-7326 Governor Calibration Bench

Model: 3114, 3116, and 3126 MUI Engines

Warranty: Six Months



- Used to disassemble, assemble, test, and calibrate governor groups
- All tools in 1U-7326, 1U-9087 (not serviced), and 1U-9088 (discontinued) are serviced separately (groups can be assembled ordering only tools not currently in a dealers inventory)
- Tools are required to service various governor groups, including Type V (1994 truck versions) and type VI (dual horsepower) governors

1U-7326 Governor Calibration Bench

- Used to adjust governor on 1.1 Liter Engines
- Used with 9U-7401 Multitach II, 9U-5104 LED Photo Pickup, and 4C-3024 Charger (not included) to read speed

References

SENR6454, Service Manual, Governor

SEHS8868, Special Instruction, Using the 1U-7326 Governor Calibration Bench

(Continued)

1U-7326 Governor Calibration Bench (Continued)

Model: 3114, 3116, and 3126 MUI Engines

Warranty: Six Months

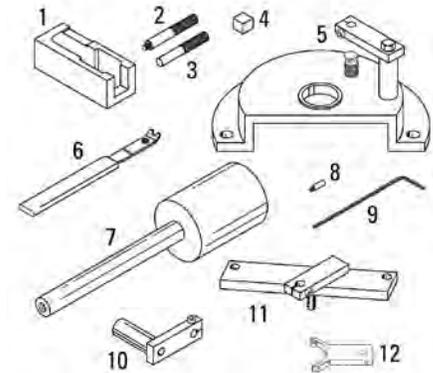
| Part Number | Description |
|-----------------------------|---------------------------------------|
| 1U-7326 | Governor Calibration Bench |
| Service/Repair Parts | |
| 4C-4167 | Motor Pump Unit, 230 VAC |
| 4C-4168 | Motor Pump Unit, 115 VAC ¹ |
| 4C-4169 | Pump Inlet Strainer/Filter |
| 8F-0212 | O-ring for Collector Cup |
| 9U-6629 | Oil Gearbox |

¹ 230 VAC single-phase power is not always available to operate 1U-7326 Governor Calibration Bench; 4C-4168 is the only special part needed to convert 1U-7326 to 115 VAC operation so it can be plugged into any 20 A, 115 V outlet.

1U-9088 Governor Disassembly and Assembly Tool Group

Discontinued

- Used to disassemble and assemble governor groups (many tools in this group were part of discontinued 1U-7315 Governor Repair Group)
- Used with 1U-7326 Governor Calibration Bench
- 1U-7606 Servo Disassembly and Assembly Block — properly positions governor assembly to disassemble and assemble output clevis from servo piston, and press backup spring pin in or out (can also be used on older style servos to safely hold assembly while driving spring pin in or out)
- 1U-7635 Servo Disassembly Driver — used to push servo valve shoulder to avoid damaging valve when removing output clevis from servo piston (use with 1U-7606)
- 1U-7636 Servo Assembly Driver — used to press output clevis into servo piston (use with 1U-7606)
- 6V-9072 Piston Seal Guide — guides new fuel ratio control piston and seal into housing



| | |
|-----------|-------|
| Not Shown | |
| NEEG2650 | Decal |

| Service/Repair Parts | | |
|----------------------|-------------|--|
| Item | Part Number | Description |
| 1 | 1U-7606 | Servo Block |
| 2 | 1U-7635 | Clevis Driver |
| 3 | 1U-7636 | Servo Driver |
| 4 | 1U-7313 | Gauge Block |
| 5 | 1U-7309 | Shim Adjustment Tool (Governor Riser) |
| 6 | 4C-4354 | Applicator |
| 7 | 1U-7314 | Shim Weight |
| 8 | 9S-0229 | Contact Point |
| 9 | 1U-7311 | Torque Wrench (1.5 mm hex-torque cam adjust) |
| 10 | 1U-7308 | Shim Adjustment Tool (governor spring) |
| 11 | 1U-7310 | Torque Adjustment Tool |
| 12 | 9U-5120 | Spanner Wrench |
| -- | 1U-9088 | Governor Disassembly and Assembly Tool Group |

(Continued)

1U-9088 Governor Disassembly and Assembly Tool Group (Continued)

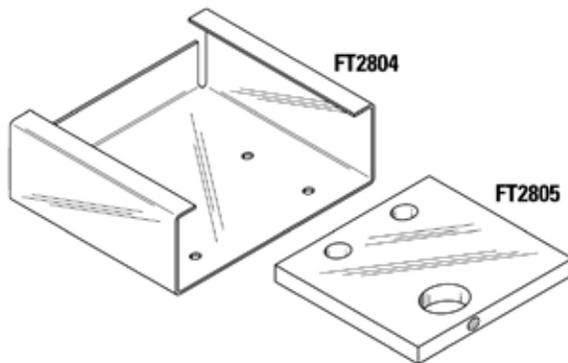
Discontinued

Engine Tools

| Service/Repair Parts | | |
|------------------------|-------------|-------------------------|
| Item | Part Number | Description |
| Not shown ¹ | | |
| 1 | 6V-7145 | Case |
| -- | 1U-7307 | Governor Repair Fixture |
| -- | 1U-7637 | Foam Insert Set |
| -- | 6V-6106 | Dial Indicator |
| -- | 8S-3675 | Point - Indicator |
| -- | 1U-7312 | Calibration Plate |

¹Also not shown: NEEG2650 Decal

FT2804 Bracket and FT2805 Plate



- Used to hold 9U-7401 Multitach II onto 1U-7326 Governor Bench
- Used with 1U-7326 Governor Bench
- Allows Multitach II to read governor speed
- Both FT tools are made from SAE 1018 steel

1U-9087 Governor Adjust Tool Group (Not Serviced)



- Used to calibrate governors (some tools in this group were part of discontinued 1U-7315 Governor Repair Group or 9U-6880 Throttle Lever Tool Group)
- Used with 1U-7326 Governor Calibration Bench
- 1U-7299 Adjusting Wrench — adjusts governor output (load stop) position and fuel ratio control setting on Type V and later model governors (used with 1U-7300)
- 1U-7431 Adjusting Tool — adjusts low power load stop setting on Type VI governors (used with 1U-7300)
- 1U-7316 Calibration Pin Group — used to calibrate Type V and later model governors and is designed to avoid interference with fuel ration control (cannot be used for on-engine fuel setting adjustment)

| | |
|-----------|-------|
| Not Shown | |
| NEEG2649 | Decal |

| Item | Part Number | Description |
|------|-------------|--------------------------------------|
| 1 | 4C-9594 | Wrench, 1/2 in (low idle adjustment) |
| 2 | 1U-5548 | Wrench, 8 mm (high idle adjustment) |
| 3 | 5P-4205 | Wrench ¹ |

| Item | Part Number | Description |
|----------------|-------------|---|
| 4 ² | 1U-6673 | Wrench - Fuel Ratio Control Adjusting and Synchronizing |
| 5 | 1U-6672 | Rack Adjusting Wrench |

(Continued)

1U-9087 Governor Adjust Tool Group (Not Serviced) (Continued)

| Item | Part Number | Description |
|---|-------------|--|
| 6 | 1U-7299 | Adjustment (FRC) Wrench ("Type V" 1994 and later Trucks) |
| 7 | 1U-7300 | Wrench (3 mm Hex) |
| 8 | 1U-8815 | Point - Indicator Contact |
| 9 | 1U-7316 | Calibration Pin Group |
| 10 | 1U-7431 | Adjusting Tool (dual horse-power screw) |
| -- | 1U-9087 | Governor Adjust Tool Group |
| 9U-6880 Throttle Lever Tool Group Serviced | | |
| 11 | 9U-6877 | Thrust Bearing |
| 12 | 9U-6876 | Puller Stud |
| 13 | 9U-6874 | Puller Bracket |
| 14 | 9U-6875 | Shoulder Screw |

| Item | Part Number | Description |
|---|-------------|---|
| 9U-6880 Throttle Lever Tool Group Serviced (Continued) | | |
| 15 | 9U-6883 | Pusher Block Assembly |
| 16 | 9U-6881 | Adjustable Arm Assembly |
| 18 | 9M-1974 | Washer |
| 19 | 6V-0299 | Full Nut |
| 20 ³ | 369-2607 | Digital Indicator |
| Not Shown | | |
| 1 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) |
| 3 | 9U-5120 | Spanner Wrench |
| -- | 9U-6885 | Top Cover Assembly |
| -- | 5P-8245 | Hard Washer |
| -- | 6V-6106 | Dial Indicator |

¹Warranty: Six Months

²159-1783 Fuel Ratio Control Adjusting Wrench is 51 mm (2 in) shorter than 1U-6673; required for 3116-3126 Engines in Challenger 35, 45, and 55

³369-2607 Digital Dial Indicator (not part of group, but shown)

159-1783 Fuel Ratio Control Adjusting and Synchronizing Wrench

Essential tool

Model: 3114, 3116, 3126 MUI Engines Used in Challenger 35, 45, and 55 Tractors

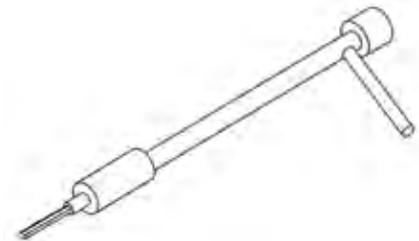
Warranty: Six Months

| Part Number | Description |
|-------------|---|
| 159-1783 | Fuel Ratio Control Adjusting and Synchronizing Wrench |

- Used to adjust fuel ratio control (similar to 1U-6673)
- Shorter length provides necessary clearance for Challengers
- May be used in place of 1U-6673 for most applications
- Overall length: 145.9 mm (5.74 in)
- Hex wrench size: 2 mm

References

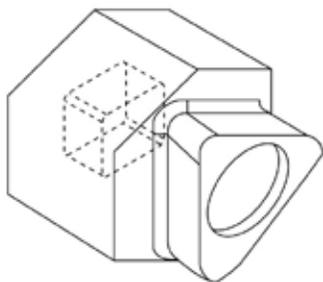
SENR6454, Service Manual, Governor
SEHS8868, Special Instructions, Using the 1U-7326 Governor Calibration Bench



148-3605 Wrench

Model: 3116 Engines

Warranty: One Year



Model: 3116 Engines

- Replaces discontinued 131-5009 Wrench
- Used to remove and install tamper resistant plugs on 3116 governors installed after 01/01/96
- Used with standard socket and ratchet or flat wrench
- Short hex design works well in confined spaces
- 3/8 square drive (required for dual Hp governors)
- Tamper resistant plugs protect load stop and fuel air ratio control settings on some Type IV governors and fuel air ratio control setting only on some Type V governors
- Hex head diameter: 22.23 mm (7/8 in)

| Part Number | Description |
|-------------|-------------|
| 148-3605 | Wrench |

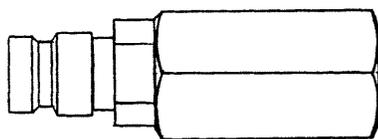
Reference

SENR6454, Service Manual Module, 3114/3116 and 3116 Engine Governors (MUI)

4C-9309 Adapter

Model: 3114, 3116

Warranty: Six Months



- Used to test 2.3 gain governor (available in 1991) for 1.1 L Engines on 1U-7326 Governor Calibration Bench (adapters for earlier pumps included with 1U-7326)
- Used on governor transfer pump outlet fitting
- Use 3K-0360 or 8M-5260 O-ring Seal with adapter

| Part Number | Description |
|-------------|-------------------|
| 4C-9309 | Spanner Pin Group |

Reference

SEHS8868, Special Instruction

Fuel System Tools

Essential Tool

Model: C4.4 and C6.6 Engines

Warranty: Six Months except 298-5564 which is Manufacturer's Lifetime



300-4988 Fuel Leak Kit

- Used to measure fuel leak rates on C4.4 and C6.6 engines
- Aids in diagnosing faulty fuel injectors on hard-to-start engines

298-5564 T40 Torx Socket

- Used to install injector hold down bolt on C4.4 and C6.6 engines
- Eliminates risk of damaging injector or inlet rocker arm
- 3/8 inch square drive with T40 Torx bit
- Overall length: 114.3 mm (4.5 in)

(Continued)

Fuel System Tools (Continued)

Essential Tool

Model: C4.4 and C6.6 Engines

Warranty: Six Months except 298-5564 which is Manufacturer's Lifetime

References

SEBD9416, Service Manual (298-5564)

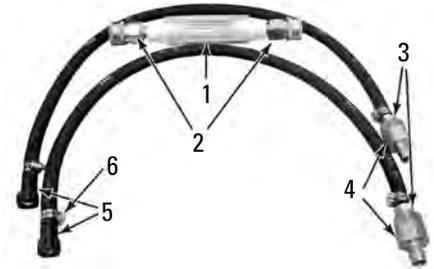
TIBU4874, Bulletin (300-4988)

| Part Number | Description |
|-------------|-----------------|
| 300-4988 | Fuel Leak Kit |
| 298-5564 | T40 Torx Socket |

301-1501 Air-in-Fuel Test Kit

- Used to check for air in fuel in C4.4 and C6.6 engines

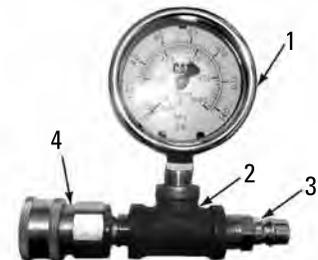
| Item | Part Number | Description |
|-----------------------------|-------------|----------------------|
| -- | 301-1501 | Air-In Fuel Test Kit |
| Service/Repair Parts | | |
| 1 | 2P-8278 | Fuel Flow Tube |
| 2 | 3P-2233 | Coupler Assembly |
| 3 | 102-5758 | Hose End |
| 4 | 3P-2234 | Nipple |
| 5 | 215-9513 | Connector |
| 6 | 124-6275 | Hose Clamp |



304-3107 Pressure Adapter

- Used to check transfer pump pressure on C4.4 and C6.6 engines

| Item | Part Number | Description |
|-----------------------------|-------------|-------------------|
| -- | 304-3107 | Pressure Adapter |
| Service/Repair Parts | | |
| 1 | 8T-0854 | Gauge |
| 2 | 6V-1739 | Pipe Reducing Tee |
| 3 | 3P-2236 | Nipple |
| 4 | 3P-2233 | Coupler Assembly |



334-3221 Nozzle

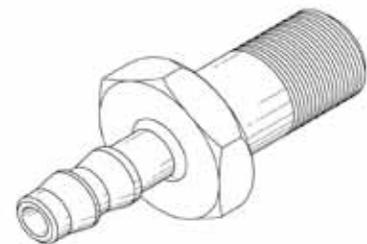
Essential Tool

Model: C6.4 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 334-3221 | Nozzle |

- Used to connect fuel leak kit to 297-7658 Manifold Block (for measuring test fuel system leaks)
- Used with 300-4988 Fuel Leak Kit
- M14 x 1.5 threaded end installs into manifold block
- Barbed end fits 8.25 mm (5/16 in) ID hose from fuel leak kit



FT1979 Forcing Screw Assembly

Model: 3204 Engine

Warranty: None



- Used to remove fuel injection pump housing and governor from 3204 Engine in D3C, D4C, IT12, 931C, 935C
- Mounts in timing gear cover in place of cover plug and forces fuel injection pump camshaft out of its drive gear
- Consists of 6V-2467 Bolt and bored and tapped 4B-8586 Plug

Reference

SENR4038, Disassembly and Assembly Service Manual Supplement for IT12 Integrated Toolcarrier 3204 Vehicular Engine (fuel injection pump housing and governor removal procedures)

323-3949 and 362-9754 Fuel Delivery Test Kits

Model Usage: C6.6, C4.4 Engines

Warranty: Six Months



- Used to check volumetric flow rates for high-pressure rail fuel systems
- Provides a method to flush fuel outlet ports on high-pressure rail fuel systems
- Steel fitting, orifice, and tube assembly connects to each outlet individually
- Includes five high-pressure cap assemblies to block fuel outlets not being tested
- Drilled orifice meters fuel flow at a precise rate
- Volumetric fuel flow (volume over a specific time) from each outlet, can be compared to determine if fuel pump output is acceptable

Reference

KENR6938 High Leakoff of the Electronic Unit Injector on C6.6 and C4.4 Engines

| Part Number | Description |
|-------------|----------------------------|
| 356-2470 | Graduated Cylinder |
| 362-9749 | Discharge Orifice Assembly |
| 362-9751 | Rail Plug Assembly |
| 362-9752 | Nut |
| 362-9753 | Pin Gauge |

370-4657 Rocker Arm Assembly Aid

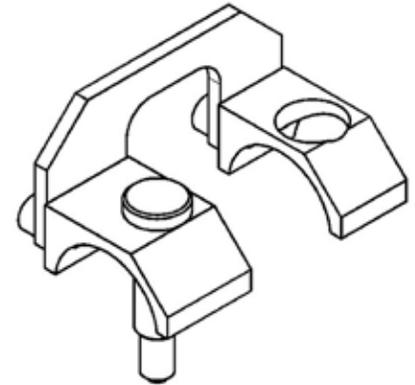
Model Usage: C7.1, C6.6, C4.4

Warranty: Six Months

- Used to hold rocker arms in place for assembly and disassembly
- One required for each cylinder

| Specifications | |
|----------------|--------------------------------------|
| Dimensions | 59 x 52 x 37 mm (2.3 x 2.0 x 1.5 in) |
| Weight | 0.08 kg (0.18 lb) |

| Part Number | Description |
|-------------|-------------------------|
| 370-4657 | Rocker Arm Assembly Aid |



367-8608 Engine Timing Pin

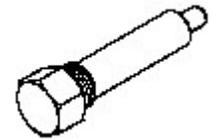
Model Usage: C7.1, C6.6, C4.4

Warranty: Six Months

- Determines when crankshaft is positioned at top dead center
- Locks crankshaft in TDC position

| Specifications | |
|----------------|--------------------------------------|
| Dimensions | 87 x 22 x 22 mm (3.4 x .87 x .87 in) |
| Weight | .14 kg (.31 lb) |

| Part Number | Description |
|-------------|-------------------|
| 367-8608 | Engine Timing Pin |



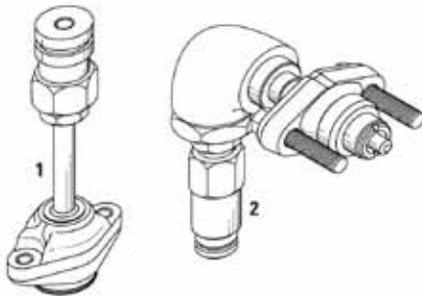
Fuel System Repair and Adjust

Connector Assemblies

Essential Tool

Model: C175-16 Engine - S/N WYB1-UP

Warranty: Six Months



- Used to back flush common rail fuel system on C175 Engines
- Used with 295-5490 Filter Cart, 170-8500 Particle Analyzer, and various cap/plugs (part of 276-7018 Cap and Plug Kit)
- Provides a method of flushing fuel systems on C175 engines with out removing fuel system components

Reference

SEBF9107, Reuse and Salvage Guideline, Procedure for Back Flushing the Common Rail Fuel System of C175 Engines

SEBF9109, Reuse and Salvage Guideline, Handling Procedures for the Components of the Common Rail Fuel System for C175 Engines

PEBJ0002, Caterpillar Dealer Contamination Control Guidelines

PEBJ9180, Contamination Control Guideline, Diesel Fuel Cleanliness By Particle Analyzer

REN7466, Disassembly and Assembly, C175-16 Generator Set Engine

REN9338, Systems Operation, Testing and Adjusting, C175-16 Generator Set Engine

REN9339, Troubleshooting, C175-16 Generator Set Engine

NEHS0799, 170-8500 Analyzer Group Tool Operating Manual

| | |
|-----------|------------------------|
| Includes: | |
| FT1979 | Forcing Screw Assembly |

| Item | Part Number | Description | Use |
|------|-------------|----------------------|--|
| 1 | 330-7185 | Connector Assembly | installed in place of high pressure fuel line on number two cylinder |
| 2 | 334-4442 | Connector Assembly | installed in place of high pressure fuel line at pump outlet |
| -- | 301-1501 | Air-In Fuel Test Kit | -- |
| -- | 304-3107 | Pressure Adapter | -- |

Timing Fixture Plates

Model: Cat® Engines

Warranty: Six Months



- Used to time accessory drive shaft to engine with fuel pump housing and governor removed

| Part Number | Engine |
|-------------|---|
| 8S-5417 | 4.75 in Bore, 4- and 6- Cylinder 2-valve engines (scroll pumps) |
| 8S-4625 | 951B Traxcavator with 4.5 in Bore engine and hydraulic governor |
| 5P-0143 | 3204 Engine |
| 5P-4240 | D8K Engine (14 degree 17 in timing) |

8T-5246 Engine Timing Indicator Group

Model: Multiple Engine Models

Warranty: Six Months

- Used to determine piston true top dead center (TDC) and fuel injection pump timing of most Cat® engines
- Replaces discontinued 3S-2954 Indicator Group
- Components for timing each engine in accordance with procedure described in Special Instruction SMHS7083 listed in application chart below
- 6V-2056 Rod and 6V-2057 Contact Point available separately for 3300 Series DI Engines

| Model | Adapter | Rod | Contact Point | Dial Indicator and Collet |
|---|---------|---------|---------------|---------------------------|
| D336,1676 | 8T-5340 | 3S-3264 | 9S-8883 | 6V-3075,5P-4814 |
| 1100 and 3100 Series 3208, 3204 and 3406 DI ¹ | 8T-3206 | 8S-2296 | 9S-8883 | 6V-3075,5P-4814 |
| 3204 PC ² | 8T-5339 | 3S-3264 | 9S-8883 | 6V-3075,5P-4814 |
| 3300 Series DI ¹ | 8T-3206 | 6V-2056 | 6V-2057 | 6V-3075,5P-4814 |
| 3400 Series DI | 8T-5340 | 3S-3264 | 5P-7261 | 6V-3075,5P-4814 |
| 3400 Series PC ² | 8T-5340 | 3S-3264 | 5P-2393 | 6V-3075,5P-4814 |
| D353, D379, D398, D399 | 8T-5338 | 3S-3264 | 5P-6531 | 6V-3075,5P-4814 |
| Engines Not Listed Above ² | 8T-5338 | 3S-3264 | 5P-7261 | 6V-3075,5P-4814 |
| 3406A | 8T-3205 | 3S-3264 | | 6V-3075,5P-4814 |
| 3406B, 3408B, 3412B | 8T-3206 | 5S-8090 | 6V-2057 | 6V-3075,5P-4814 |

¹ DI — Direct Injection

² PC — Precombustion Chamber



| Item ¹ | Part Number | Description | Size |
|-------------------|-------------|--|--------------------------------|
| 1 | 3S-3269 | Contact Point | 25.40 mm (1 in) |
| 1 | 5P-6531 | Point | 57.20 mm (2.25 in) |
| 1 | 5P-7276 | Container | -- |
| 1 | 8S-3675 | Point - Indicator | 3.10 mm (0.12 in) |
| 1 | 6V-2057 | Contact Point | 3.17 mm (0.12 in) ² |
| 1 | 3S-3268 | Point - Indicator Contact | 6.35 mm (0.25 in) |
| 1 | 9S-8883 | Contact Point | 12.70 mm (0.50 in) |
| 1 | 5P-7261 | Contact Point | 31.80 mm (1.25 in) |
| 1 | 5P-2393 | Contact Point | 38.10 mm (1.50 in) |
| 1 | 5P-4809 | Point Indicator | 50.80 mm (2 in) |
| 1 | 3S-3270 | Point - Indicator Contact, 44.45 mm (1.75 in) long | 44.50 mm (1.75 in) |
| 2 | 6V-3075 | Indicator - Dial | -- |
| 3 | 5P-4814 | Collet As - Clamp | -- |

(Continued)

8T-5246 Engine Timing Indicator Group (Continued)

Model: Multiple Engine Models

Warranty: Six Months

Engine Tools

| Item ¹ | Part Number | Description | Size |
|-------------------|-------------|---|---------------------|
| 4 | 6V-6105 | Block | -- |
| 5 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- |
| 6 | 8T-5247 | Block (not serviced) | -- |
| 7 | 8T-5339 | Adapter | -- |
| 8 | 8T-5340 | Adapter | -- |
| 9 | 8T-5338 | Adapter | -- |
| 10 | 3S-3264 | Rod | 180.90 mm (7.12 in) |
| 11 | 8S-2296 | Rod | 133.40 mm (5.25 in) |
| 12 | 8T-3206 | Adapter | -- |
| 13 | 9S-0239 | Adapter Assembly | -- |
| 14 | 5S-8090 | Rod Assembly | -- |
| 15 | 6V-2056 | Rod Assembly | -- |
| 16 | 1T-0416 | Bolt | -- |
| 17 | 8N-5132 | Clamp | -- |
| 18 | 8T-3205 | Adapter | -- |
| -- | 8T-5246 | Engine Timing Indicator Group | -- |

¹Item 6: 8T-5247 Block (Not serviced)

²9.52 mm (0.375 in) diameter flat face

6V-6175 Torque Adapter

4C-9874 Torque Adapter

Model: D25C, 3304B, 3306B

Warranty: Six Months



- 4C-9874 replaces discontinued 6V-6176 Torque Adapter
- Bolted to fuel pump drive gear on 3300 Series Engines so that specific torque can be applied to gear by tightening center bolt to specified torque value
- 6V-6175 Adapter used on standard engines; 4C-9874 Adapter used on engines with automatic timing advance
- Both adapters have 1/2 inch square drive

| Part Number | Description |
|-------------|----------------|
| 4C-9874 | Torque Adapter |
| 6V-6175 | Torque Adapter |

2P-8256 Timing Decal

Model: 1100, 3100

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 2P-8256 | Timing Decal |

- Attach to crankshaft pulley or damper pulley on 1100 and 3100 Series Engines as alternate method for flow checking static timing without removing rocker arm shaft and injection nozzle



5P-0950 Timing Plate

Model: 1100, 3100, 3208

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 5P-0950 | Timing Plate |

- Used to time fuel injection pump and governor with front cover removed



4C-9287 Timing Advance Holding Tool

Model: 3406B

Warranty: Six Months

- Used when pin timing 1988 and newer 3406B Engines, serial numbers 4MG3600 and up, that have large cone-type retainer on fuel timing advance
- Mounted on timing advance
- Required to hold timing advance at bottom of its travel (retarded position) while pin timing engine; if not used, position can slip and proper timing is not achieved

Reference

SEBR0544-02, Truck Engine Manual

| Part Number | Description |
|-------------|-----------------------------|
| 4C-9287 | Timing Advance Holding Tool |



127-1069 Timing Pin

Model: 3054 and 3056 Engines

Warranty: Six Months



- Used to set engine piston at 100° before top dead center (BTDC) when timing Lucas fuel pump (at this location, the piston can be more accurately set to a specific position)
- Whistle on top of timing pin confirms that piston is on compression stroke
- Installs into nozzle bore and is held in place with nozzle clamp
- Material: SAE 1020 steel

Reference

SEN6525, Supplement, Lucas Fuel System

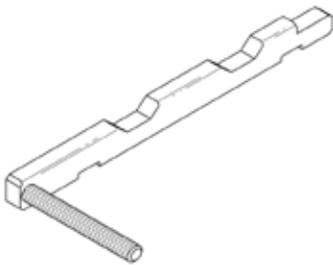
| Part Number | Description |
|-------------|-------------|
| 127-1069 | Timing Pin |

329-6925 Timer Tool Assembly

Essential Tool

Model: 3054B Engine

Warranty: Six Months



- Used to remove and install balancer (maintains timing)
- Also used during disassembly and assembly of balancer
- Black oxide coated for corrosion resistance

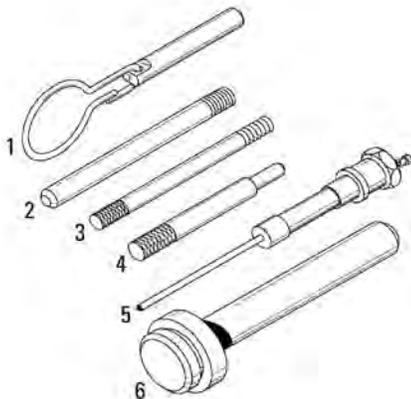
| Part Number | Description |
|-------------|---------------------|
| 329-6925 | Timer Tool Assembly |

Timing Setting Tools

Essential Tool

Model: 3054E and 3056E Engines

Warranty: Six Months



- Used to set timing of engine

| Item | Part Number | Description | Engine Used On |
|------|-------------|----------------------|----------------|
| 1 | 230-6283 | Locking Pin | 3054E |
| 2 | 231-8848 | Balancer Fitting Pin | 3054E |
| 3 | 231-8849 | Locking Pin | 3054E |
| 4 | 230-6284 | Locating Pin | 3054E |
| 5 | 226-2270 | Timing Piston | 3056E |
| 6 | 226-2268 | Plug Installer | 3056E |

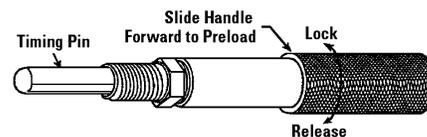
136-4632 Timing Pin

220-2793 Timing Pin

Model: 1.1L, 1.2L, 3300, 3176 and 3400 Engines

Warranty: Six Months

- Used to determine when crankshaft is positioned at top dead center
- Spring loaded pin presses against flywheel; as engine is rotated pin will drop into hole as number one cylinder reaches TDC
- Adapters furnished to fit models listed with sufficient clearance behind timing hole
- Easier to use than a bolt — allows one man operation
- Hardened pin to resist bending
- No adapter needed for 3300 and 3400



| Part Number | Description | Size | Use |
|-------------|--------------------|--------------|-----------------------|
| 136-4632 | Timing Pin | -- | -- |
| 220-2793 | Timing Pin | -- | -- |
| 139-7064 | Timing Pin Adapter | 1/2in - 20 | 3176 C10/12 Engines |
| 139-7063 | Timing Pin Adapter | 7/16in - 201 | 1.1 and 1.2 L Engines |

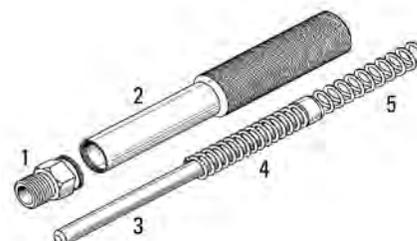
208-9387 Timing Pin, 208-9388 Adapter

Essential Tool

Model: 3176C Engine, D7R Track-Type Tractor and C-9 Engine, D6R Track-Type Tractor

Warranty: Six Months

- Pin and adapter allows use of 136-4632 Timing Pin with D6R and D7R flywheel housings
- Used with 208-0888 Crankshaft Turning Tool
- Easily determines when crankshaft is positioned at top dead center
- Spring loaded pin presses against flywheel. As engine is rotated pin drops into hole when number one cylinder reaches TDC
- Easy to use — allows 1-man operation
- Hardened pin resists bending



| Item | Description |
|------|-----------------------------|
| 4 | Spring (part of timing pin) |
| 5 | Spring (part of timing pin) |

| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 208-9388 | Adapter |
| 2 | 136-4632 | Timing Pin |
| 3 | 208-9387 | Pin |

268-1966 Timing Adapter Pin

Essential Tool

Model: C6.6 Engines

Warranty: None



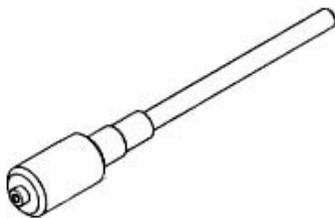
- Allows use of a timing pin

| Part Number | Description |
|-------------|--------------------|
| 268-1966 | Timing Adapter Pin |

364-9107 Fuel Pump Locking Pin

Model Usage: C7.1, C6.6, C4.4

Warranty: Six Months



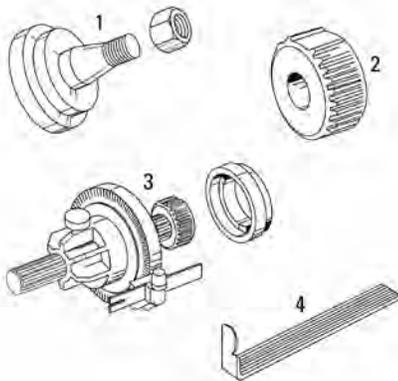
- Used to lock the fuel injection pump in the correct timing position
- Engages into rear of pump drive gear

| Part Number | Description |
|-------------|-----------------------|
| 364-9107 | Fuel Pump Locking Pin |

9U-6188 Timing Fixture Group

Model: 3054 and 3056 Engines

Warranty: Six Months



- Four separate tools used in combination to check accuracy of timing mark location on fuel injection pump or engine
- Needed to determine location of timing mark on engine if front cover is replaced

Reference

SEN5547, Service Module in SEN5555 Service Manual

| Item | Part Number | Description |
|------|-------------|----------------------|
| -- | 9U-6188 | Timing Fixture Group |
| 1 | 9U-6189 | Drive Adapter |
| 2 | 9U-6190 | Gear Adapter |
| 3 | 9U-6192 | Timing Fixture |
| 4 | 9U-6191 | Pointer |

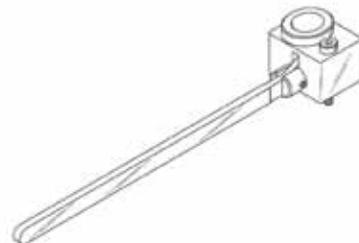
338-1054 Pump Timing Tool Group

Essential Tool

Model: C6.6 Engines
Warranty: Six Months

| Part Number | Description |
|-------------|------------------------|
| 338-1054 | Pump Timing Tool Group |

- Used to set timing of common rail fuel pump
- Required for installation to ensure proper operation of fuel pump

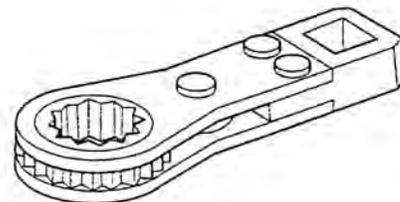


157-3719 Fuel Spanner

Model: 3054 and 3056 Engines with Bosch Fuel Pumps
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 157-3719 | Fuel Spanner |

- Used to remove and install Bosch fuel injection pumps
- Built-in ratchet mechanism reduces removal/installation time
- Square drive: 3/8 inch
- Socket size: 13 mm, 12-point

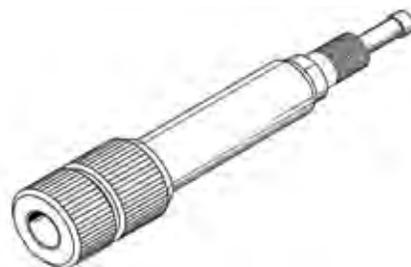


192-3331 Timing Gauge

Model: 3056 Engines with Bosch Pumps
Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 192-3331 | Timing Gauge |

- Replaces discontinued 136-3113 Timing Gauge
- Used to hold dial indicator while checking injection pump timing on engines with Bosch EPVE fuel pump

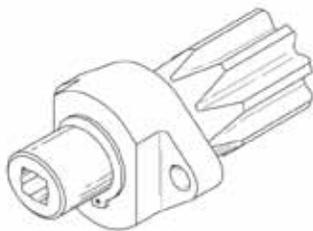


299-9126 Crankshaft Turning Group

Essential Tool

Model: C4.2, C6.4, 3054, and 3096 Engines

Warranty: Six Months



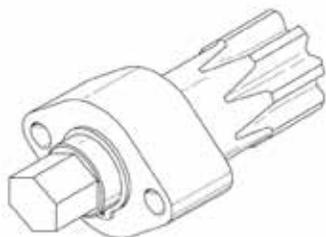
- Used to rotate engine crankshaft
- Used with 1/2 inch drive
- Designed with internal bearings for smooth rotation
- Bolts to access hole in flywheel housing

| Part Number | Description |
|-------------|--------------------------|
| 299-9126 | Crankshaft Turning Group |

285-5989 Engine Turning Group

Model: 3516, 3520, and 3524 Large Mining Truck Engines

Warranty: Six Months



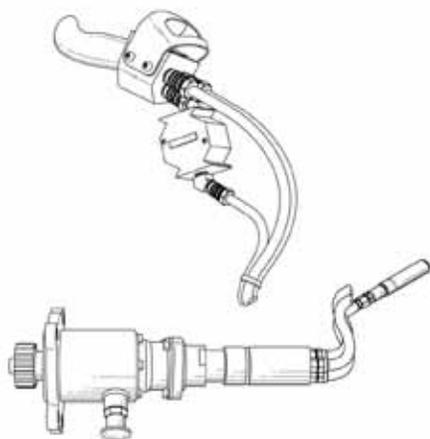
- Used to rotate engine crankshaft
- Used with 1 inch socket
- Heavy-duty design uses two needle bearings for smoother rotation
- Bolts to access hole in flywheel housing

| Part Number | Description |
|-------------|----------------------|
| 285-5989 | Engine Turning Group |

329-3831 Barring Group

Model: 3500, 3600, and C175 Engines

Warranty: Six Months



- Used to rotate engine during valve setting and timing procedures
- Used with shop air supply and dealer supplied connectors
- Makes engine rotation much easier and enables one-person operation
- Rugged design provides maximum durability and dependability
- 620 kPa (90 psi) air pressure produces more than 203 N·m (150 ft-lb) of torque
- Reversible-vane, air motor provides precise control in both clockwise and counterclockwise directions
- Incorporates pull pin locking device that engages/disengages barring motor
- Air supply and lock-out valves prohibit unintentional tool operation
- Dual pendant levers control direction (CW/CCW) and speed (pressing lever farther down increases rotation speed)
- Opposing male/female disconnects between air motor and control pendant for easy assembly and to ensure consistent directional control (rotation)
- Control pendant group and air motor group disconnects can be coupled together to provide air line contamination control when tooling is not assembled
- Depending on engine, use access cover or remove starter to install barring tool
- Air motor mounting flange can be positioned through 360 degrees of rotation for different applications
- 328-2307 Muffler offered as serviceable part
- 334-3258 Service Kit available for air motor rebuild

(Continued)

329-3831 Barring Group (Continued)

Model: 3500, 3600, and C175 Engines

Warranty: Six Months

| Part Number | Description |
|-----------------------------|---------------|
| 329-3831 | Barring Group |
| Service/Repair Parts | |
| 328-2307 | Muffler |
| 334-3258 | Service Kit |

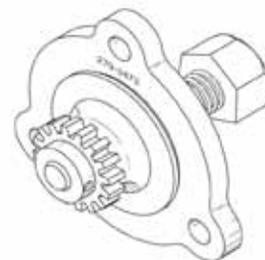
279-3473 Barring Device

Model: C175 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|----------------|
| 279-3473 | Barring Device |

- Used to manually rotate crankshaft on C175 Engine
- Used with M34 Socket
- Bolts to starter access hole in flywheel housing

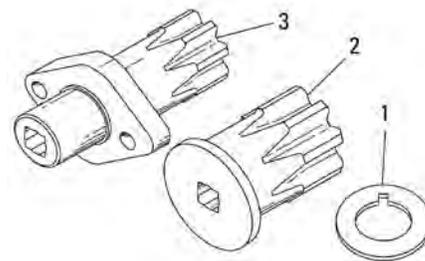


Tools for Rotating Crankshaft

Model: C15, C16, 3400, 3508, 3512 Engines and 5.4 inch Bore Engine

Warranty: Six Months

| Item | Part Number | Description | Use |
|------|-------------|----------------------------|--|
| 1 | 9S-9114 | Spacer | Position 1P-7410 Timing Plate on discontinued 8S-2346 Shaft Assembly when setting lifters off engine |
| 2 | 9S-9082 | Turning Tool, 1/2 in drive | Rotate crankshaft |
| 3 | 238-9586 | Turning Tool, 1/2 in drive | Contains internal needle bearings; bolts to flywheel housing for easier rotation of crankshaft |



Tools for Rotating Crankshaft

Model: 3114, 3116 and 3126 Engines

Warranty: Six Months

- Used to rotate crankshaft (makes setting valves and engine timing procedures easier)
- Used with 5P-7305 Engine Turning Gear and 1/2 inch square drive ratchet
- Fastens to starter mounting hole using starter mounting bolts
- Rotate gear shaft housing assembly until 5P-7305 Engine Turning Gear engages flywheel gear before tightening starter mounting bolts

(Continued)

Tools for Rotating Crankshaft (Continued)

Model: 3114, 3116 and 3126 Engines

Warranty: Six Months

Engine Tools

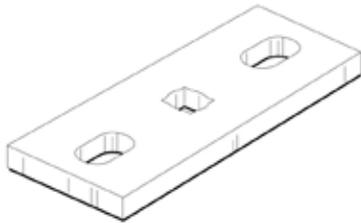


| Part Number | Description | Size |
|--|------------------------|--------------------|
| Measure dimension X on starter housing to determine which part to use | | |
| 9U-6943 | Shaft Housing Assembly | 146 mm (5.75 in) |
| 9U-7336 | Shaft Housing Assembly | 127 mm (5.00 in) |
| 5P-7305 | Engine Turning Gear | 6/8 and 8/10 pitch |

9U-6198 Crankshaft Turning Tool

Model: 3054 and 3056 Engines

Warranty: Six Months



- Used to rotate crankshafts (connects directly to front of crankshafts)
- Has 1/2 inch drive in center to connect ratchet or breaker bar
- Dimensions: 50 x 140 mm (2.0 x 5.5 in)

Reference

SENR5555, Service Manual

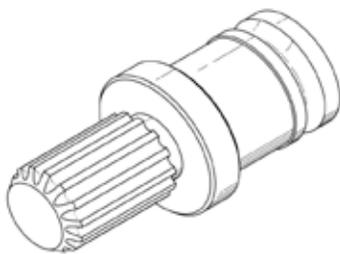
| Part Number | Description |
|-------------|-------------------------|
| 9U-6198 | Crankshaft Turning Tool |

208-0888 Engine Turning Tool

Essential Tool

Model: 3176C and C-9 Engines

Warranty: Six Months



- Used to turn crankshaft in engines with rear PTO flywheel housing (engages forward spline of upper PTO gear)
- Used in applications where no flywheel turning tool access is provided
- Heat-treated for added durability
- To install: remove cover plate or hydraulic pump as needed

| Part Number | Description |
|-------------|---------------------|
| 208-0888 | Engine Turning Tool |

| | |
|--------------|----------|
| Square drive | 3/4 in |
| Spline | 14-tooth |

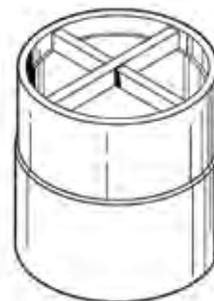
178-8615 Socket

Model: 3114, 3116, 3126 MUI, HEUI, and 3126B Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 178-8615 | Socket |

- Used to turn engine crankshaft by hand
- Socket crossbars engage all four bolt heads in front pulley hub
- Prevents over-tightening or loosening of a single bolt when it used to turn crankshaft clockwise or counterclockwise
- Square drive: 3/4 inch
- Overall length: 90 mm (3.5 in)



350-7549 Socket Assembly (C9.3 Engine)

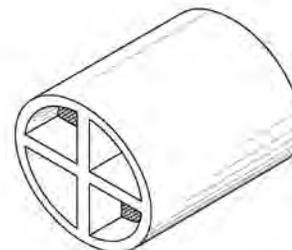
Essential Tool

Model Usage: All C9.3 Engines

Warranty: Six Months

- Used to rotate crankshaft by hand
- Used with 3/4 inch square drive ratchet
- Socket cross-bars engage four front pulley hub bolts eliminating need for removal to attach turning tool

| Part Number | Description | Size |
|-------------|-------------------------------|--|
| 350-7549 | Socket Assembly (C9.3 Engine) | Overall diameter: 79 mm (3.11 in) x 87 mm (3.43 in) long |



5P-7306 Gear Shaft Housing Assembly

5P-7305 Engine Turning Gear

Model: Cat® Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-----------------------------|
| 5P-7305 | Engine Turning Gear |
| 5P-7306 | Gear Shaft Housing Assembly |

- Makes engine rotation much easier for valve setting and timing procedures, especially on engines with no compression release
- Any engine that will accept standard short and long nose electric starters can be rotated
- Pinion gear has 6/8 pitch gear on one end and 8/10 pitch on other
- Both ends of pinion have 1/2 inch square drive hole to accommodate standard ratchet



5F-2807 Cap

2F-2990 Plug

Model: D5B, D6D, D9N, IT28, 943, 953, 963, 973

Warranty: Six Months



- Used to protect fuel pumps (cap) and lines (plug) when removing them from engine

| Part Number | Description |
|-------------|-------------|
| 2F-2990 | Plug |
| 5F-2807 | Cap |

6V-4089 Reamer Assembly

Model: 1100, 3100, 3200 and 330 Series Direct Injection Engines

Warranty: Six Months



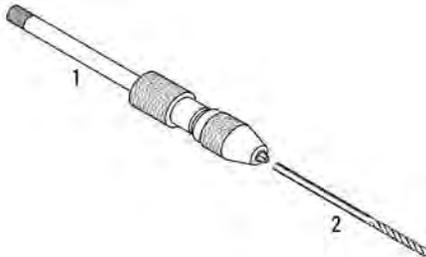
- Removes carbon deposits from bores of pencil-type fuel nozzles

| Part Number | Description |
|-------------|-----------------|
| 6V-4089 | Reamer Assembly |

5B-1401 Fuel Injection Valve Orifice Cleaning Tool Group

Model: Cat® Engines

Warranty: Six Months



- Used to remove carbon from orifice in nozzle end of flat seat-type fuel injection valves
- Chuck has hollow handle to store drills
- Do not use these tools to clean capsule-type valves

| Item | Part Number | Description | Size |
|------|-------------|--|----------------------|
| 1 | 5B-1254 | Chuck | -- |
| 2 | 7F-1522 | Drill, 0.711 mm (0.028 in) | -- |
| 2 | 6H-8639 | Drill, 0.813 mm (0.032 in) | -- |
| -- | 5B-1401 | Fuel Injection Valve Orifice Cleaning Tool Group | -- |
| 2 | 5B-2177 | Drill | 0.5 mm (0.0197 in) |
| 2 | 5B-2178 | Drill | 0.610 mm (0.024 in) |
| 2 | 7B-5724 | Drill | 0.445 mm (0.0175 in) |

8S-2245 Cleaning Tool Group

Model: 1100, 3100, 3208

Warranty: Six Months

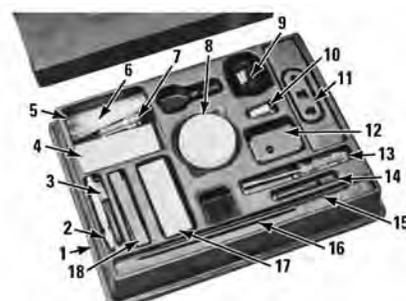
- Used to properly service pencil-type injection nozzles used in 1100 and 3100 Series and 3208 Engines

Reference

SEHS7292

| Item | Description |
|------|-------------|
| 4 | Pad |

| Item | Part Number | Description | Size |
|------|-------------|-----------------------|--------------------|
| 1 | 8S-2262 | Case Assembly | -- |
| 2 | 8S-2256 | Vise Assembly | -- |
| 3 | 5P-0958 | Retractor Assembly | -- |
| 5 | 8S-2246 | Wire Assembly | 0.20 mm (0.008 in) |
| 6 | 8S-2247 | Wire Assembly | 0.28 mm (0.011 in) |
| 7 | 5P-4813 | Socket | -- |
| 8 | 8S-2259 | Lapping Compound | -- |
| 9 | 8S-2257 | Loupe | -- |
| 10 | 6V-4979 | Carbon Stop Seal Tool | -- |
| 11 | 2P-5487 | Adapter | -- |
| 12 | 8S-2250 | Holding Tool | -- |
| 13 | 6V-9124 | Screwdriver | -- |
| 14 | 8S-2254 | Retractor Assembly | -- |
| 15 | 8S-2255 | Scraper | -- |
| 16 | 8S-2251 | Drill | -- |
| 17 | 8S-2258 | Brass Wire Brush | -- |
| 18 | 8S-2260 | Honing Stone | -- |
| -- | 8S-2245 | Cleaning Tool Group | -- |



Engine Tools

5P-6229 Extractor

Model: 3400 Series Direct Injection Engine

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 5P-6229 | Extractor |

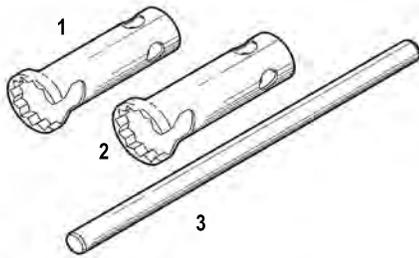
- Used to remove fuel nozzle adapter body on 3400 Series Direct Injection Engines and most other engines with precombustion chambers



Fuel Injection Valve Nut Removal Tools

Model: Cat® Engines

Warranty: Six Months



- Used for fuel injection valve nut removal on early engines

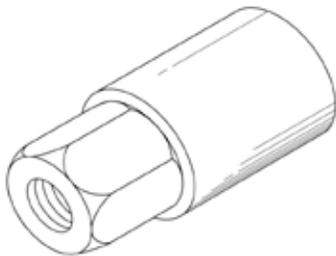
| Item | Description | Size |
|------|-------------|-------------|
| 2 | Wrench | 17/8 in hex |

| Item | Part Number | Description | Size |
|------|-------------|-------------|--------------|
| 3 | 4B-9918 | Handle | -- |
| 1 | 9B-2029 | Wrench | 1 3/4 in hex |

FT1533 Nozzle Adapter

Model: Cat® Engines

Warranty: None



- Recommended for use with 1P-0074 Slide Hammer for nozzles that are difficult to remove

6V-4061 Nozzle Puller Group

Model: D5B, D6D, 225B, 225B-3208, 3208, 518

Warranty: Six Months



- 6V-4061 Nozzle Puller Group used to remove direct injection fuel nozzles from 1100, 3100, 3200 and 3300 Series DI Engines

| Item | Part Number | Description |
|----------------|-------------|---------------------|
| 1 | 1B-4206 | Nut |
| 2 | 2S-5658 | Washer |
| 3 ¹ | 6V-4153 | Plate |
| 4 ¹ | 6V-4152 | Screw |
| 5 | 6V-4150 | Leg |
| 6 | 6V-4149 | Jaw |
| 7 | 6V-4151 | Leg |
| -- | 6V-4061 | Nozzle Puller Group |

¹ Also part of 6V-4061 Puller Group

6V-4054 Nozzle Puller Group

Model: D5B, D6D, 225B, 225B-3208, 3208, 518

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---------------------|
| 1 | 0S-1618 | Bolt |
| -- | 6V-4054 | Nozzle Puller Group |

- 6V-4054 Puller Group used with 6V-4061 Group to remove 7N-0449 Nozzles in 3300 Series DI Engines (all parts of 6V-4061 Puller Group, except 6V-4153 Plate, needed)



FT1663 Fuel Nozzle Holder

Model: Cat® Engines

Warranty: None

- Holds and identifies up to 8 fuel injection nozzles
- Fabricated from 9L-7276 Cover



6V-6980 Nozzle Puller Group

Model: 3300

Warranty: Six Months

- Replaces discontinued 6V-3129 Puller
- Used for removing 8N-7003 and 8N-7005 Nozzles used in 3300 Series Engines; can also be used for removal of discontinued 8N-7001 and 8N-7002 Nozzles
- Required because carbon build-up around nozzle stems prevent nozzles from being removed by hand

NOTE:

The 6V-6980 Puller Group should only be used when less than 150 pound-inches torque is required to pull the nozzle. The nozzle stem will bend or break if more than 150 pound-inches torque is applied with the 6V-6980 Puller. For nozzles that are extremely difficult to remove, the FT1533 Adapter and 1P-0074 Slide Hammer are still recommended. When using these tools, it is often necessary to remove various engine components.



| Item ¹ | Part Number | Description |
|-------------------|-------------|---------------------|
| -- | 6V-6980 | Nozzle Puller Group |
| 1 | 6V-6197 | Screw |
| 2 | 6V-6198 | Clip |
| 3 | 6V-6199 | Button |
| 4 ² | 6V-6130 | Puller |

¹ Item 4: 6V-6130 Puller (not serviced)

² Not serviced

6V-6976 Puller Group

Model: 3204

Warranty: Six Months



- Used to remove discontinued 1W-3996 Direct Injection Fuel Nozzles on 3204 Engines; nozzles tend to stick in their bores due to carbon deposits, etc.

NOTE:

As indicated in the parts list, several parts of the 6V-6976 Puller Group are also used in the existing 6V-4061 Nozzle Puller Group. If the dealer already has the 6V-4061 Group, only the last 4 parts (items 5, 6, 7 and 8) are needed to assemble the 6V-6976 Group.

| Item | Part Number | Description |
|----------------|-------------|---------------------|
| 1 | 1B-4206 | Nut |
| 2 ¹ | 2S-5657 | Washer |
| 3 ¹ | 6V-4153 | Plate |
| 4 ¹ | 6V-4152 | Screw |
| 5 | 6V-6979 | Leg |
| 6 | 6V-6978 | Head |
| 7 | 6V-6977 | Leg |
| 8 | 1D-4716 | Nut |
| -- | 6V-6976 | Nozzle Puller Group |

¹ Also part of 6V-4061 Puller Group

6V-7020 Nozzle Puller Group

Model: Cat® Engines

Warranty: Six Months



- Combines all components of 5 nozzle puller groups listed below without duplicating commonly-used components
- Also included are various maintenance items, such as 6V-4979 Carbon Stop Seal Too, 25 extra carbon stop seals and 6V-4089 Reamer for carbon removal; socket, extension and handle included for removal of 5/16 inch-12 point hold down screws used on some nozzle clamps

Reference

SEHS8094, Special Instruction

| Nozzle Puller Group | Engine Used On | Nozzle Part Number |
|---------------------|----------------------------|---|
| 6V-6981 | 3406 | 8N-7006 |
| 6V-6980 | 3300 Series | 8N-7005, 8N-7003 |
| 6V-6976 | 3204 | -- |
| 6V-4061 | 1100, 3100 and 3200 Series | 9N-2366, 9N-3299, 1W-5829, 9L-6969, 9N-3299 |
| 6V-4054 | 3300 Series | 7N-0449 |

| Part Number | Description | Quantity |
|-----------------------------|---|----------|
| 6V-7020 | Nozzle Puller Group | -- |
| Service/Repair Parts | | |
| 5P-4199 | Handle | 1 |
| 5P-7276 | Container | 1 |
| 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | 1 |
| 6V-4054 | Nozzle Puller Group | 1 |
| 6V-4089 | Reamer Assembly | 1 |
| 6V-4149 | Jaw | 1 |
| 6V-4150 | Leg | 1 |

| Part Number | Description | Quantity |
|---|-----------------------|----------|
| Service/Repair Parts (Continued) | | |
| 6V-4151 | Leg | 1 |
| 6V-4979 | Carbon Stop Seal Tool | 1 |
| 6V-6976 | Nozzle Puller Group | 1 |
| 6V-6980 | Nozzle Puller Group | 1 |
| 6V-6982 | Sleeve Assembly | 1 |
| 6V-6983 | Adapter | 1 |
| 6V-7031 | Block | 1 |
| 9L-9098 | Carbon Stop Seal | 25 |
| 9S-1715 | Socket | 1 |
| 9S-1721 | Extension | 1 |

6V-6981 Nozzle Puller Group

Model: 3406

Warranty: Six Months

| Item | Part Number | Description |
|----------------|-------------|------------------------|
| 1 | 1B-4206 | Nut |
| 2 | 2S-5658 | Washer |
| 3 | 6V-4152 | Screw |
| 4 ¹ | 6V-6982 | Sleeve As- sembly |
| 5 ¹ | 6V-6983 | Adapter |
| -- | 6V-6981 | Nozzle Puller Group |

- Used for removal of 8N-7006 Direct Injection Fuel Nozzles from 3406 Engines
- Uses several parts from earlier 6V-4061 Nozzle Puller Group



¹ These parts are needed to make the 6V-6981 Nozzle Puller Group from the earlier 6V-4061 Nozzle Puller Group.

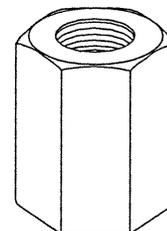
9U-6278 Injector Puller Connector

Model: 3054, 3056, 3064, and 3066 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------------------|
| 9U-6278 | Injector Puller Con- nector |

- Used to remove stuck injector nozzles due to carbon deposit build-up in bore
- Used with 1U-7600 Puller Group
- 1/2 - 20 thread (female) on one end and M12 x 1.5 thread (female) on other end



Tools for 3406B Engine Fuel Nozzle and Fuel Nozzle Adapter

Model: 3406B

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|----------------------|
| 1 | 1B-4206 | Nut |
| 2 | 8T-3199 | Screw |
| 3 | 6V-6983 | Adapter |
| 4 | 8T-3198 | Sleeve As- sembly |

- Smaller tools required to remove and install cylinder heads on 3406B Engines, which were redesigned with smaller diameter fuel injection nozzle adapters



4C-8175 Nozzle Puller Assembly

Model: 3306 Engine

Warranty: Six Months



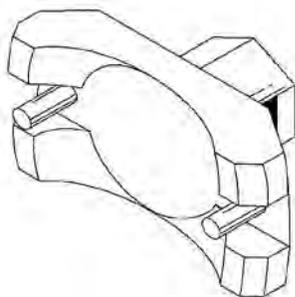
- Used to remove 104-9450 Direct Injection Fuel Nozzle Assembly
- Required for nozzle removal (carbon build-up around nozzle stems prevents removal by hand)
- Using specialized puller makes nozzle removal faster, easier, and helps prevent damage
- As of June 1, 1994 the 104-9450 Fuel Injection Nozzle is used only in the European market

| Part Number | Description |
|-------------|------------------------|
| 4C-8175 | Nozzle Puller Assembly |

134-2570 Nozzle Retainer Spanner Wrench

Model: 3406B, 3406C, 3408, 3408B, and 3412 Engines with P and L Fuel Systems

Warranty: Six Months



- Replaces discontinued 8T-3139 Spanner Wrench and 9U-5840 Spanner Wrench
- Used to remove and install 7W-2315 Fuel Injection Nozzle Retainer
- Provides additional clearance for 3406B and 3406C Engines equipped with Jacobs Engine Brake
- Made from SAE 4140 steel and heat-treated for long tool life

| | |
|-----------------------|---------------------|
| Hex size | 14.28 mm (9/16 in) |
| Overall height | 20.5 mm (0.81 in) |
| Overall diameter | 41.0 mm (1.61 in) |
| Distance between pins | 28.5 mm (1.12 in) |

| Part Number | Description |
|-------------|--------------------------------|
| 134-2570 | Nozzle Retainer Spanner Wrench |

1U-9725 Wrench

Model: See below

Warranty: Six Months



- Used on following engines to remove and replace nozzle adapters
- Larger and stronger to eliminate breakage when removing tight adapters
- Works on both 7W-1645 (old style) and 7W-5435 (new style) Nozzle Adapters
- Has 1/2 inch square drive for normal usage, and 28.57 mm (1 1/8 in) hex so larger drive socket can be used when removing tight adapters

| Engine | Serial No. |
|--------|----------------------------|
| 3406B | All |
| 3408 | S/N 78Z-1277-up |
| | S/N 67U-11092-up (DI only) |
| 3412 | S/N 81Z-4579-up |
| | S/N 38S-13223-up |
| | S/N 60M-2477-up |

| Part Number | Description |
|-------------|-------------|
| 1U-9725 | Wrench |

9U-7227 Injector Height Setting Gauge

187-0482 Spacer Sleeve

Model: 3406E Engines

Warranty: Six Months

9U-7227 Injector Height Setting Gauge

- Used to adjust injector Prestroke
- Leaves both hands free to make adjustments

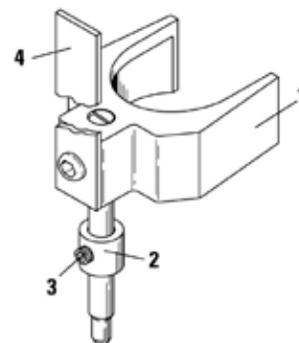
187-0482 Spacer Sleeve

- Used to help prevent improper injector height settings
- Used with 9U-7227 Injector Height Gauge with a straight indicator pin (spacer sleeve can be ordered separately)
- Sleeve rests against injector spring to keep gauge square on spring retainer
- Earlier gauges with a support flare machined onto the indicator pin do not need this spacer
- All new gauges include a spacer sleeve

References

SENR5580, Service Manual

SENR6421, Service Manual Module, Disassembly and Assembly 3406E Engines



| Item | Part Number | Description |
|------|-------------|--------------------------------|
| 1 | 9U-7227 | Injector Height Gauge Assembly |
| 2 | 187-0482 | Spacer Sleeve |
| 3 | 4L-5966 | Setscrew |
| 4 | 1U-9084 | Flag |

1U-8780 Nozzle Puller Group

Model: 3200, 3300

Warranty: Six Months

- Works to pull all 7000 Series Fuel Nozzles on 3200 and 3300 Series Engines; short enough to use on rear cylinders on 3208 Engines in highway trucks
- Strong enough to pull stuck nozzles on 3300 Series Engines
- Replaces two nozzle pullers: 6V-6980 Nozzle Puller Group for 3300 Series Engines and 6V-6976 Nozzle Puller Group for 3204 Engines
- Has two adapters, one with full clamp for 3300 Series Engines and one with half clamp for 3200 Series Engines



| Part Number | Description |
|-------------|---------------------|
| 1U-8780 | Nozzle Puller Group |

6V-7025 Guide

Model: 3406

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 6V-7025 | Guide |

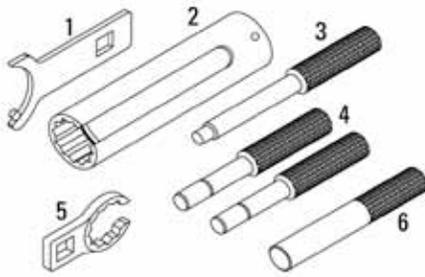
- Replaces discontinued 5P-4755 Guide
- Used to properly install 5P-2060 Seal onto 4N-3761 Direct Injection Capsule Valve Adapter on 3406 Engines



9U-5127 Tool Group, 3408 PEEC, and 3412 PEEC

Model: 3408 and 3412 PEEC Engine

Warranty: Six Months



- Replaces discontinued 4C-9579 Tool Group
- Used to test and adjust fuel pump timing on 3408 and 3412 PEEC Engines
- Increased accuracy
- On-engine field adjustments expand capability of field service mechanics
- Increases service revenue opportunities
- Durable, high quality design — convenient case protects tool investment
- 90 mm (3.54 in) long timing pin
- Two 89 mm (3.50 in) long rack zero pins
- Modified 19.05 mm (3/4 in) crowsfoot with 3/8 inch drive
- Slotted 1 5/16 inch socket with 1/2 inch drive
- Solenoid spanner wrench with 3/8 inch square drive
- 6V-2112 Pin for Haliburton Engines

| Item | Part Number | Description |
|------------------|-------------|--------------------------------------|
| 1 | 9U-5120 | Spanner Wrench |
| 2 | 136-3124 | Socket-Sensor (rack) |
| 3 | 6V-2112 | Pin |
| 3 and 6 | 6V-4186 | Pin - Fuel Pump Timing |
| 4 | 4C-9581 | Pin |
| 5 | 4C-9582 | Crowfoot Wrench, 19.05 mm (3/4 in) |
| -- | 9U-5127 | Tool Group, 3408 PEEC, and 3412 PEEC |
| Not Shown | | |
| 4 | 6V-3073 | Case - Plastic |
| -- | 9U-5128 | Foam |

9U-5219 Tool Group 3406 PEEC Engines

Model: 3406B PEEC Engine

Warranty: Six Months



- Replaces discontinued 1U-5540 Tool Group (to update former 1U-5540, order 9U-5103 Slotted Socket, 9U-5225 Foam Block, and NEEG2516 Decal
- Used to set clearance dimension between engine speed sensor and 4W-2485 Slotted Retainer (pulse wheel)
- Establish zero rack position, necessary before discontinued 8T-8697 ECAP can be used to calibrate rack position sensor without breaking governor seals
- Remove and install 6T-9675 Solenoid (fuel shutoff)
- Set timing position sensor, necessary before 8T-5282 DDT and/or discontinued 8T-8697 ECAP can be used to calibrate timing position sensor
- Remove and install water temperature sensor

Reference

SEHS8746, Special Instruction

| Item (not shown) | Description |
|------------------|-------------|
| NEEG2516 | Decal |

(Continued)

9U-5219 Tool Group 3406 PEEC Engines (Continued)

Model: 3406B PEEC Engine

Warranty: Six Months

| Item | Part Number | Description | Size |
|------|-------------|---------------------------------|--------------------------------|
| 1 | 8T-9198 | Rack Indicator Bracket Assembly | -- |
| 2 | 5P-4814 | Collet As - Clamp | -- |
| 3 | 9U-5120 | Spanner Wrench | -- |
| 4 | 6V-4186 | Pin - Fuel Pump Timing | 90 mm (3.54 in) |
| 5 | 1U-5426 | Zero Rack Compressor Assembly | -- |
| 5 | 6D-3982 | Nut | -- |
| 5 | 7F-2359 | Spring | -- |
| 5 | 9S-8903 | Point | 2.4 mm (0.094 in) ¹ |
| 6 | 9U-5103 | Slotted Socket | -- |

| Item | Part Number | Description | Size |
|------------------|-------------|---|----------------------|
| 7 | 5P-0326 | Crowfoot Wrench | 19.05 mm (3/4 in) |
| 8 | 1U-5536 | Crowfoot Wrench | 33.33 mm (1 5/16 in) |
| 9 | 1U-5425 | Timing Gauge Assembly | -- |
| -- | 9U-5219 | Tool Group 3406 PEEC Engines | -- |
| Not shown | | | |
| 1 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- |
| -- | 9U-5225 | Foam Block | -- |

¹ 12.7 mm (0.5 in) diameter flat face with a bevel to 9.7 mm (0.38 in) diameter

9U-5292 Rack Preload Assembly (3400 PEEC)

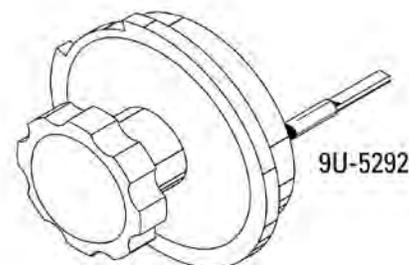
Model: 3406, 3408, and 3412 Series NSFS (PEEC) Engines with Fuel Injection Pump and Governor Group

Warranty: Six Months

- Used to set the PEEC injection pump rack position without an electronic control system

9U-5292 Rack Preload Assembly

- Used to hold pressure against (preload) rack in plus direction
- Fits in place of pumps electronic control unit (BTM)
- Fluted knob provides easy adjustment
- Outside diameter: 82.6 mm (3.25 in)
- Knob: 1V-5044



| Part Number | Description |
|-------------|------------------------|
| 9U-5292 | Rack Pre-load Assembly |

9U-5295 Rack Position Group (3400 PEEC)

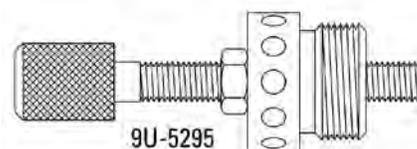
9U-5295 Rack Positioning Group

- Used to limit travel of rack and make precision rack adjustments
- Fits in place of the rack shut-off solenoid
- Knurled surfaces provide better grip while adjusting rack position
- Parts are serviced individually

References

NEHS0625, Tool Operating Manual

NEHS0639, Tool Operating Manual

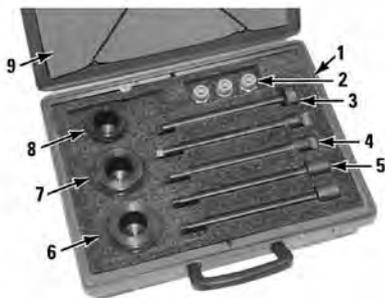


| Part Number | Description | Size |
|--|---------------------------|-------------|
| 9U-5295 | Rack Positioning Assembly | -- |
| Rack Positioning Group Consists of: | | |
| 9U-5294 | Threaded Bushing | -- |
| 9U-5293 | Rack Adjusting Screw | 1 3/16 - 12 |
| 3S-2713 | Full Hardened Nut | -- |

8T-5160 Gas Regulator Setting Tool Group

Model: All gas engines with Fisher Gas Regulators (Use FT2613 for gas engines with the discontinued 7E-3407 Sprague Gas Regulator)

Warranty: Six Months



- Used to adjust gas line pressure regulator on entire current and non-current lines of spark ignition engines
- Can service engines equipped with both smaller regulator used on 3304 and 3306 and 2 of the larger regulators used on larger engines
- Allows adjustment of gas regulator spring with no leakage at air side of regulator; air leakage during adjustment causes incorrect settings

| Item | Part Number | Description | Quantity |
|------|-------------|---|----------|
| 1 | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- |
| 2 | 8T-5149 | Fitting | 3 |
| 3 | 8T-5164 | Tool | -- |
| 4 | 8T-5163 | Tool | 2 |
| 5 | 8T-5165 | Tool | 2 |
| 6 | 8T-5159 | Foam Block | -- |
| 7 | 8T-5162 | Adapter | 2 |
| 7 | 6L-7141 | Gasket | 2 |
| 8 | 3H-8012 | Gasket | -- |
| 8 | 8T-5161 | Adapter | -- |
| 9 | 6V-6105 | Block | -- |
| -- | 8T-5160 | Gas Regulator Setting Tool Group | -- |

Assembled Setting Tool

Model: All gas engines with Fisher Gas Regulators (Use FT2613 for gas engines with the discontinued 7E-3407 Sprague Gas Regulator)

Warranty: Six Months



Assembled Setting Tool

Application Procedure

1. Select appropriate tool, adapter and gasket for regulator being set and assemble using 8T-5149 Fitting
2. To install, remove gas regulator cap and thread adapter into regulator in place of cap; push tool shaft down until it engages adjustment screw or nut and tighten fitting just enough to seal off any air leaks around shaft

(Continued)

Assembled Setting Tool (Continued)

Model: All gas engines with Fisher Gas Regulators (Use FT2613 for gas engines with the discontinued 7E-3407 Sprague Gas Regulator)
 Warranty: Six Months

| | | |
|---|--------|------------------|
| 3304, 3306 Positive Pressure Regulator | 1 each | Adapter |
| | | Tool |
| | | 8T-5149 Fitting |
| | | Gasket |
| 3304, 3306 Vacuum Regulator | 1 each | Adapter |
| | | Tool |
| | | 8T-5149 Fitting |
| | | Gasket |
| 3400, 3500 Positive Pressure Regulator | 1 each | Adapter |
| | | Tool |
| | | 8T-5149 Fitting |
| | | Gasket |
| 3400, 3500 Vacuum Regulator | 1 each | Adapter |
| | | Tool |
| | | 8T-5149 Fitting |
| | | Gasket |
| 379, 398, 399 Positive Pressure Regulator | 2 each | Adapters |
| | | Tools |
| | | 8T-5149 Fittings |
| | | Gaskets |
| 379, 398, 399 Vacuum Regulator | 2 each | Adapters |
| | | Tools |
| | | 8T-5149 Fittings |
| | | Gaskets |

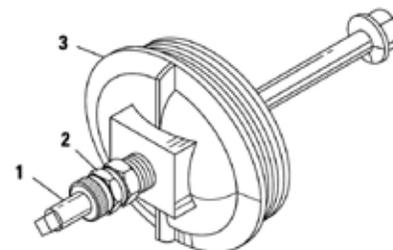
FT2613 Gas Regulator Cap Assembly

Model: All Models with discontinued 7E-3407 Gas Regulators
 Warranty: None

- Used to adjust gas line pressure on discontinued 7E-3407 Gas Regulators
- Adjust regulator while engine is running
- Eliminates costly engine downtime
- Allows adjustment of regulator with no leakage

Application Procedure

1. To install, push 155-3062 through FT2613 and 8T-5149. Position hex/washer end into regulator and tighten cap. Make sure 123-5974 O-ring is in place.
2. Tighten fitting around adjusting tool to prevent leakage, but loose enough to adjust regulator.
3. Adjust regulator and remove tools when finished.



| Item | Part Number | Description |
|------|-------------|--------------|
| 3 | FT2613 | Cap Assembly |

(Continued)

Fuel System Repair and Adjust

FT2613 Gas Regulator Cap Assembly (Continued)

Model: All Models with discontinued 7E-3407 Gas Regulators

Warranty: None

| Item | Part Number | Description |
|-------------------------------------|-------------|--------------------------|
| Gas Regulator Adjusting Tool | | |
| 1 | 155-3062 | Regulator Adjusting Tool |
| 2 | 8T-5149 | Fitting |
| 3 | 123-5974 | O-ring |

Engine Tools

Fuel Injection Pump Extractors

Model: 1100, 3100, 3200

Warranty: Six Months



- Use the extractor and wrenches to remove and install fuel injection pumps and retaining bushings

Buttress Taps

- Bottoming
- For cleaning threads on 3300 NSFS and 3400 NSFS fuel system pumps

| Size | Threads Per Inch | Part Number | Pitch Diameter |
|----------|------------------|-------------|---|
| 1.375 in | 12 | 1U-6725 | 33.746 ± 0.090 mm (1.329 ± 0.004 in) |
| 1.750 in | 12 | 1U-6726 | 43.276 ± 0.090 mm (1.704 ± 0.004 in) |

| Item | Part Number | Description | Use |
|------|-------------|----------------------|---|
| 1 | 8S-2244 | Extractor | -- |
| 2 | 8S-2243 | Wrench | With 8S-2244 Extractor to remove and install fuel injection pumps on 1100 and 3100 Series Engines and engines with Sleeve Metering Fuel Systems |
| 3 | 8T-5287 | Wrench | With 8S-2244 Extractor to remove and install fuel injection pumps on engines with compact fuel systems; replaces discontinued 8S-4613 Wrench |
| 4 | 5P-1668 | Wrench, 3/8 in drive | Remove and install fuel pump retaining bushings where space does not permit use of 8S-2243 Wrench on 1100, 3100 and 3200 Series Engines |

6V-7050 Compressor Group

Model: 3406

Warranty: Six Months



- Used for servicing fuel pump plunger and barrel assemblies on 3406 Engines with New Scroll Fuel System
- Needed to compress heavier pump lifter springs on these engines when plunger and barrel assemblies are removed and installed

Reference

SMHS8278, Special Instruction

| Item | Part Number | Description |
|------|-------------|----------------|
| 1 | 2N-3476 | Screw (4) |
| 2 | 6V-7015 | Clamp Assembly |
| 3 | 5M-7418 | Nut |

(Continued)

6V-7050 Compressor Group (Continued)

Model: 3406

Warranty: Six Months

| Item | Part Number | Description |
|-------------------------------|-------------|------------------|
| 4 | 4B-1228 | Screw |
| 5 | 4B-2046 | Nut |
| -- | 6V-7050 | Compressor Group |
| Not shown ¹ | | |
| -- | 148-5677 | Block |
| -- | 148-5675 | Case |

¹Also not shown: Block

6V-4180 Off-Engine Lifter Setting Tool Group

Model: All Engines with Forged Body or Compact Fuel Systems

Warranty: Six Months

- Replaces 5P-6600 Tool Group
- Includes lifter setting tools for all current engines, including 3400 Series Engines
- Also included are shaft assemblies which clamp positively to camshafts, eliminating movement between camshaft and degree wheel
- Tools required for individual engines are listed in the application chart below
- Additional tools needed, but not included, with 6V-4180 Group are also illustrated

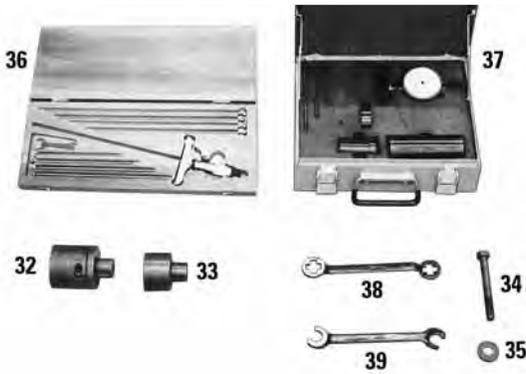


| 6V-4180 Off-Engine Lifter Setting Tool Group | | |
|---|-------------|--------------------------------------|
| Item | Part Number | Description |
| 1 | 6V-4181 | Tool Holder Block |
| 1 | 9S-8105 | Liner |
| 1 | 9S-6332 | Box Assembly |
| -- | 6V-4180 | Off-Engine Lifter Setting Tool Group |

Fuel System Repair and Adjust

Additional Tools Needed But Not Included in 6V-4180 Group

Engine Tools



| Additional Tools Needed But Not Included in 6V-4180 Group | | |
|---|-------------|-----------------|
| Item | Part Number | Description |
| 32 | 5P-6570 | Shaft |
| 33 | 8S-2272 | Shaft Assembly |
| 34 | 1B-3680 | Bolt |
| 35 | 3F-1417 | Washer |
| 36 | 6V-2012 | Gauge Group |
| 37 | 6V-7926 | Indicator Group |
| 38 | 9M-4567 | Wrench |
| 39 | 9M-4568 | Wrench |

Application Charts for 6V-4180 Tool Group

| Item | Components of 6V-4180 Tool Group (Fig. 1) | | D311, D312, D315, D318, D339, D342, D364, D375, D386, D397, D468, D3400, D4400, D4600, D6100, D6600, D7700, D8800, D11000, D13000, D17000 | D326, D337, D343, 619C, 824A, 1693 | D346, D348, D349 | D349 | D379, D398, D399 | 641, 650, 651, 657, 660, 666 |
|--------------------------------|---|-----------------|---|------------------------------------|------------------|------|------------------|------------------------------|
| | Part Number | Description | | | | | | |
| Forged Body Fuel System | | | | | | | | |
| 2 | 5P-6574 | Shaft | -- | -- | 1 | -- | -- | -- |
| 3 | 5P-6564 | Shaft | -- | -- | -- | -- | 1 | -- |
| 5 | 5P-6568 | Shaft | -- | -- | -- | 1 | -- | -- |
| 9 | 2S-6160 | Washer | 1 | 1 | 1 | -- | 1 | 1 |
| 11 | 0S-1594 | Bolt | 1 | -- | 1 | 1 | 1 | -- |
| 12 | 0S-0509 | Bolt (3/8 - 16) | 1 | 1 | 1 | -- | 1 | -- |
| 13 | 0S-1617 | Bolt | -- | 1 | -- | -- | -- | -- |
| 18 | 1P-7415 | Pointer | 1 | -- | 1 | -- | -- | -- |
| 19 | 5P-6572 | Shaft | -- | 1 | -- | -- | -- | -- |
| 31 | 1P-7410 | Degree Wheel | 1 | 1 | 1 | 1 | 1 | 1 |
| 38 ¹ | 9M-4567 | Wrench | 1 | -- | -- | 1 | 1 | -- |
| 39 | 9M-4568 | Wrench | 1 | 1 | -- | 1 | 1 | 1 |

(Continued)

Application Charts for 6V-4180 Tool Group (Continued)

| Components of 6V-4180 Tool Group (Fig. 1) | | | | | | | | |
|---|-------------|-----------------|---|------------------------------------|------------------|------|------------------|------------------------------|
| Item | Part Number | Description | D311, D312, D315, D318, D339, D342, D364, D375, D386, D397, D468, D3400, D4400, D4600, D6100, D6600, D7700, D8800, D11000, D13000, D17000 | D326, D337, D343, 619C, 824A, 1693 | D346, D348, D349 | D349 | D379, D398, D399 | 641, 650, 651, 657, 660, 666 |
| Additional Tools Needed But Not Included in 6V-4180 Tool Group | | | | | | | | |
| 32 | 5P-6570 | Shaft | -- | 1 | -- | -- | -- | -- |
| 36 ¹ | 6V-2012 | Gauge Group | 1 | 1 | 1 | 1 | 1 | 1 |
| 37 | 6V-7926 | Indicator Group | 1 | 1 | 1 | 1 | 1 | 1 |
| 38 ¹ | 9M-4567 | Wrench | 1 | -- | -- | 1 | 1 | -- |

¹Optional

Compact Fuel System

| Item | Components of 6V-4180 Tool Group (Fig.1) | D311H, D320, D330D, D333, 1670, 1673, D8, 583, 3204, 3304, 3306 | D334, D343, 1674, 6193 | D336, 1676 | 1140, 1145, 1150, 1160, 3145, 3150, 3160 | 3406 | 3408, 3412 |
|------|--|---|------------------------|------------|--|------|------------|
| 14 | Pointer | | | | 1 | | |

| Components of 6V-4180 Tool Group (Fig.1) | | | | | | | | |
|--|-------------|-------------|---|------------------------|------------|--|-------|------------|
| Item | Part Number | Description | D311H, D320, D330D, D333, 1670, 1673, D8, 583, 3204, 3304, 3306 | D334, D343, 1674, 6193 | D336, 1676 | 1140, 1145, 1150, 1160, 3145, 3150, 3160 | 3406, | 3408, 3412 |
| Compact Fuel System | | | | | | | | |
| 7 | 5P-4158 | Gauge | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 1F-1375 | Bolt | -- | -- | 2 | -- | -- | -- |
| 9 | 2S-6160 | Washer | 1 | 1 | 1 | -- | 1 | 1 |
| 10 | 2S-0932 | Washer | -- | -- | -- | 1 | -- | -- |
| 11 | 0S-1594 | Bolt | -- | -- | 1 | 1 | 1 | -- |
| 12 | 0S-0509 | Bolt | 1 | 1 | 1 | -- | 1 | -- |
| 13 | 0S-1517 | Bolt | -- | 1 | -- | -- | -- | 1 |
| 15 | 6V-6019 | Pin | -- | -- | -- | -- | -- | 1 |
| 16 | 1J-6298 | Bolt | -- | -- | -- | 1 | -- | -- |
| 17 | 2M-5218 | Shaft | 1 | -- | -- | -- | -- | -- |
| 18 | 1P-7415 | Pointer | -- | -- | 1 | -- | -- | -- |
| 19 | 5P-6572 | Shaft | -- | 1 | -- | -- | -- | -- |
| 22 | 7S-5803 | Shaft | -- | -- | 1 | -- | -- | -- |
| 23 ¹ | 6V-3035 | Shaft | 1 | -- | -- | -- | -- | -- |
| 24 ² | 5P-1768 | Pointer | -- | -- | -- | -- | 1 | 1 |
| 25 | 9S-4446 | Shaft | -- | -- | -- | 1 | -- | -- |

(Continued)

Compact Fuel System (Continued)

Engine Tools

| Components of 6V-4180 Tool Group (Fig.1) | | | | | | | | |
|---|-------------|-------------|---|------------------------|------------|--|-------|------------|
| Item | Part Number | Description | D311H, D320, D330D, D333, 1670, 1673, D8, 583, 3204, 3304, 3306 | D334, D343, 1674, 6193 | D336, 1676 | 1140, 1145, 1150, 1160, 3145, 3150, 3160 | 3406, | 3408, 3412 |
| Compact Fuel System (Continued) | | | | | | | | |
| 26 | 5P-3601 | Adapter | -- | -- | -- | -- | -- | 1 |
| 27 | 1P-7420 | Pointer | 1 | 1 | -- | -- | -- | -- |
| 28 | 5P-1761 | Shaft | -- | -- | -- | -- | 1 | -- |
| 29 ³ | 6V-3066 | Shaft | 1 | -- | -- | -- | -- | -- |
| 30 ⁴ | 5P-0129 | Sleeve | 1 | -- | -- | -- | -- | -- |
| 31 ² | 1P-7410 | Plate | 1 | 1 | 1 | 1 | 1 | 1 |
| Additional Tools Needed But Not Included in 6V-4180 Tool Group | | | | | | | | |
| 33 ⁵ | 8S-2272 | Shaft | -- | -- | -- | 1 | -- | -- |
| 34 ⁵ | 1B-3680 | Bolt | -- | -- | -- | 1 | -- | -- |
| 35 ⁵ | 3F-1417 | Washer | -- | -- | -- | 1 | -- | -- |
| 36 ⁶ | 6V-2012 | Gauge Group | -- | 1 | 1 | 1 | 1 | 1 |
| 37 | 6V-7926 | Indicator | -- | 1 | 1 | 1 | 1 | 1 |
| -- | 6V-2112 | Pin | -- | -- | -- | 1 | 1 | -- |
| -- | 2A-0762 | Bolt | -- | -- | -- | -- | -- | 1 |

¹ 3204 (10X S/N)

² Early pointer groups have a discontinued 5P-6219 Dowel, 15.8 mm (0.622 in) diameter installed for 3408 and 3412 engines. Also the 7.14 mm (0.281 in) diameter hole must be increased to 8.5 mm (0.328 in) diameter for use on later 3408 and 3412 fuel pump housings.

³ 3304 (9Z) and 3306 (10Z)

⁴ 3204 (45V S/N)

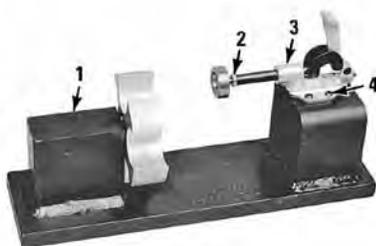
⁵ Max-Min governor only

⁶ Optional

6V-7870 Fixture Group

Model: Cat® Engines

Warranty: Six Months



- Designed with adjustable clamp and 5-position turret
- 1 position used for 3406B Engines with New Scroll Fuel Systems and remaining 4 positions for other engines with fuel pumps having reverse flow check valves
- 6V-7871 Repair Kit, consisting of turret and detent, also available

| Item | Part No. | Description |
|------|----------|----------------|
| 1 | 4B-6060 | Setscrew (2) |
| 2 | 4B-2046 | Nut |
| 3 | 6V-7015 | Clamp Assembly |
| 4 | 2N-3476 | Screw (4) |
| -- | 6V-7870 | Fixture Group |

Reference

SMHS8378, Special Instruction

Tools for Accessory Drive Gear

Model: 3204 Vehicular Engines

Warranty: None

- 4 fabricated tools needed to loosen accessory drive gear from shaft without removing radiator on 3204 Vehicular Engines
- FT1537 Socket and FT1539 Puller used on 45V Vehicular Engines
- FT1537 Socket, FT1538 Puller and FT1540 Puller used on 10X Vehicular Engines
- 8H-8561 Adapter and 5P-8676 Extension also required



| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | FT1539 | Puller |
| 2 | FT1540 | Puller |
| 4 | FT1538 | Puller |
| 6 | FT1823 | Socket |

| Item | Part Number | Description |
|------|-------------|-------------|
| 3 | 8H-8561 | Adapter |
| 5 | 5P-8676 | Extension |

9S-8520 Puller Group

Discontinued — Service Parts Available

Service Parts Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---------------|
| 1 | 9S-8527 | Bolt |
| 2 | 5P-3031 | Thrust Washer |
| 3 | 9S-8528 | Bolt Assembly |
| -- | 9S-8520 | Puller Group |

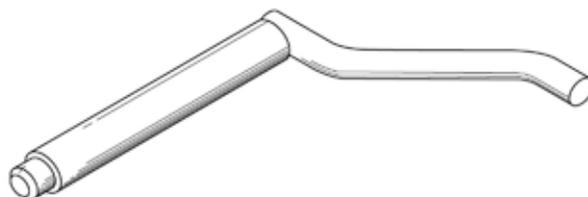


FT0887 Timing Pin

Model: 1100, 3100

Warranty: None

- Used to set timing dimensions on 1100 and 3100 Series Engines
- Can be used without removing fuel lines and air inlet pipe



Sockets for Special Applications

Model: 3208, 1100, D379, D398, D399

Warranty: Six Months



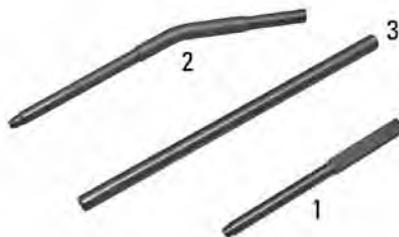
| Item | Part Number | Description | Size | Use |
|------|----------------------|------------------|-----------------------|--|
| 1 | 9S-5031 ¹ | Deep Well Socket | 5/8 in, 3/8 in drive | Required for tachometer drive adapter shaft removal on 1100 and 3100 Series Engines equipped with hydraulic governors; also used for removal and tightening cap on 9L-6969 Nozzle for 3208 Engines |
| 2 | 8S-2357 | Deep Well Socket | 9/16 in, 3/8 in drive | Required to loosen bolt which retains automatic timing advance unit to fuel injection pump camshaft on 1100 Series Engines equipped with max-min governor |
| 3 | 9S-6054 | Socket Assembly | 3/4 in drive | Turning injection pump camshaft when setting lifters on D379, D398 and D399 Engines |

¹ Comes with insert for removing spark plugs

Timing Pins

Model: 1100, 3100, 3406, 3408, 3412, 3306, 3304 D.I.

Warranty: Six Months



| Item | Part Number | Description | Model |
|------------------|-------------|------------------------|---------------------------------------|
| 1 | 6V-2112 | Pin | 1100 and 3100 Series and 3406 Engines |
| 2 | 6V-6019 | Pin | 3408 and 3412 Engines |
| 3 | 6V-4186 | Pin - Fuel Pump Timing | 3306 and 3304 D.I. Engines |
| Not Shown | | | |
| -- | 3P-1544 | Pin | 328 SMFS |
| -- | 4C-9581 | Pin | 3408/12 PEEC |

Timing Pins

Model: 3054 and 3056 Engines

Warranty: Six Months

- Used to install injection pumps on 3000 Series engines

| Part Number | Description | Use |
|-------------|-------------|---|
| 150-3992 | Timing Pin | Required to install Bosch injection pumps |
| 150-3993 | Timing Pin | Required to install Lucas and Stanadyne injection pumps |

Decal for 1P-7410 Degree Wheel

Model: 3406B

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 1P-7410 | Degree Wheel |

- Used to time 3406 Direct Injection Truck Engines (1978 Truck Model Year) with static fuel injection timing
- Decal, SEHS7306, must be applied to early 1P-7410 Degree Wheels for accurate timing
- Decal provides timing marks in increments less than one degree



9U-5692 Spring Compressor

Model: 3406, 3408 and 3412 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------|
| 9U-5692 | Spring Compressor |

- Works on all three engines — 3406, 3408 and 3412
- Used to compress heavier lifter springs in pump when fuel pump plunger and barrel assemblies are removed and installed
- Clamps on side of pump housing and eliminates need to attach to adjoining pump



References

SENR5148, Service Manual

SENR4658, Service Manual

318-6237 Rethreading Die

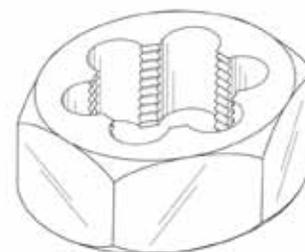
Essential Tool

Model: 613C II, DV-613C II Scraper

Warranty: Six Months

| Part Number | Description |
|-------------|-----------------|
| 318-6237 | Rethreading Die |

- Used to cut additional threads on 214-5491 Filler Neck
- Used with large wrench (dealer supplied)
- Additional threads allow gasket in fuel cap to seal against filler neck and prevent fuel/vapor leaks
- Current threads align die onto filler neck during use



| | |
|--------------------|-----------------|
| Thread size (inch) | 4-12 |
| Hex size | 178 mm (7.0 in) |
| Material | steel |

5P-6217 Fixture

5P-6218 Bearing Driver

Model: 3408, 3412

Warranty: Six Months



- Used to install tanged fuel rack bearings on 3408 and 3412 Engines

| Part Number | Description |
|-------------|----------------|
| 5P-6217 | Fixture |
| 5P-6218 | Bearing Driver |

FT1251 Pump Housing Stand

Model: Cat® Engines

Warranty: None

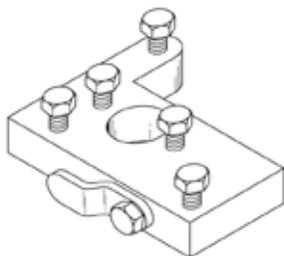


- Fuel system components conveniently serviced on this stand
- Has rails that fit holding fixture from Fuel Injection Test Bench; by using appropriate FITB adapter plate and holding fixture, injection pump housings can be mounted on stand for disassembly and assembly, then easily moved to Test Bench for final adjustment and testing

FT0960 Adapter Assembly

Model: 4.75 inch Bore Engines

Warranty: None



- Used to hold fuel rack in centered position when installing fuel pumps on all 12.07 cm (4.75 in) bore engines with compact fuel systems except D334 and 1674 Engines
- Material: mild steel

6V-4824 Driver

6V-4825 Plate

Model: 3406B

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 6V-4824 | Driver |
| 6V-4825 | Plate |

- Used to install D-shaped rack bearing in fuel injection pump housing on 3406B Engines
- 6V-4825 Plate, bolted to pump housing, pilots bearing as it is driven into position with 6V-4824 Driver
- Assure bearing installation to correct depth and angle

Reference

3406B Service Manual



7S-7113 Rack Setting Gauge

Model: D333, D330, D320, D311H

Warranty: Six Months

| Part Number | Description |
|-------------|--------------------|
| 7S-7113 | Rack Setting Gauge |

- Replaces 8M-0530 Gauge
- Measures rack travel in both fuel on and fuel off directions



6V-7941 Overfueling Spring Compressor

Model: Cat® Engines

Warranty: Six Months

| Part Number | Description |
|-------------|---------------------|
| 6V-7941 | Compressor Assembly |

- Used to make fuel rack and fuel ratio control settings on engines with New Scroll Fuel Systems
- Replaces discontinued 6V-2128 Overfueling Spring Compressor
- Plunger travel in former 6V-2128 Compressor was limited by mechanical stops and would not permit checking full range of rack settings on above engines; 6V-7941 Compressor does not have internal stops, and thus will accommodate full range of rack settings



6V-7942 Hook

Model: Cat® Engines

Warranty: Six Months



- Used to pull rack against rack centering pin on engines with negative rack settings
- Necessary because on some of these engines, overfueling spring may not move rack against centering pin

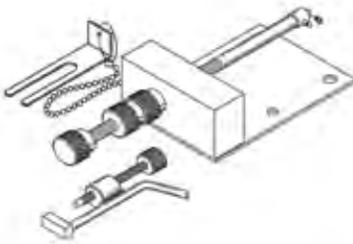
| Part Number | Description |
|-------------|-------------|
| 6V-7942 | Hook |

158-8665 Rack Set Tool

Essential Tool

Model: 3034 Engines

Warranty: Six Months



- Used to adjust maximum fuel setting if timing case or fuel pump linkage are removed or repaired

| Part Number | Description |
|-------------|---------------|
| 158-8665 | Rack Set Tool |

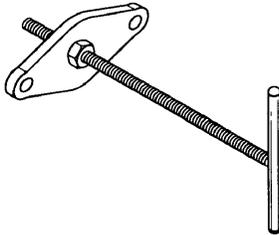
Reference

SEN5013, Disassembly and Assembly of 3034 Engine

9U-5296 Rack Positioning Assembly

Model: 3204, 3300, and 3406 Series NSFS (Non-PEEC) Engines

Warranty: Six Months



- Used to set injection pump rack while pump is being tested on test bench
- Used with FITB, FIETS, and AVM test benches

Reference

NEHS0639, Tool Operating Manual

| | |
|------------------------|--------------------|
| Overall length | 171.4 mm (6.75 in) |
| Thread size | 1/4 - 28 |
| Bolt hole diameter | 7.5 mm (0.30 in) |
| Distance between holes | 63.6 mm (2.50 in) |
| Service part | 6V-8187 Nut |

| Part Number | Description |
|-------------|--|
| 9U-5296 | Rack Positioning Assembly ¹ |

¹ Non-PEEC, 3406B and 3406C Rack Adjustment

6V-9128 Rack Position Tool Group

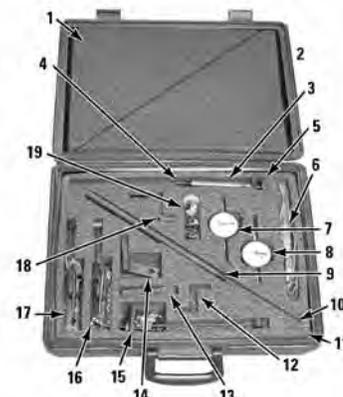
Model: Cat® Engines
 Warranty: Six Months

- Provides convenient and accurate way to set or check rack position on Cat® Engines
- Used to measure fuel rack position during normal operation of engine, or measure fuel rack position and make any necessary adjustments while engine is shut down
- Rack setting can be made or checked without removing injection pump
- Replaces discontinued 9S-0240 Rack Position Tool Group; both groups are identical, except new group contains metric dial indicators and low cost plastic case

Reference

SEHS8436, Special Instruction

| Item | Description |
|------|-------------|
| 12 | Spring |



| Item | Part Number | Description | Size |
|----------------|-------------|------------------------------|---------------------------------|
| 1 | 6V-9127 | Liner | -- |
| 2 | 6V-7145 | Case | -- |
| 3 | 9S-0239 | Adapter Assembly | -- |
| 3 ¹ | 0S-1616 | Bolt | 25.4 mm (1/4 in - 20 x 1.00 in) |
| 4 ² | 5S-8086 | Contact Point | 6.35 mm OD (0.25 in OD) |
| 4 | 5S-8090 | Rod Assembly | -- |
| 5 | 9S-8521 | Rod | -- |
| 6 | 8T-0500 | Light - Continuity Testing | -- |
| 7 | 6V-3075 | Indicator - Dial | -- |
| 8 | 6V-6106 | Dial Indicator | -- |
| 9 | 5S-8157 | Extension | -- |
| 10 | 5S-8088 | Rod Assembly | -- |
| 11 | 177-9037 | Block | -- |
| 13 | 9S-7344 | Clamp Assembly | -- |
| 14 | 9S-7343 | Bracket Assembly | -- |
| 14 | 2A-0762 | Bolt | 16.0 mm (1/4in - 20 x 7/8 in) |
| 15 | 9S-0227 | Bracket Group | -- |
| 16 | 9S-0238 | Bracket Group (not serviced) | -- |
| 17 | 9S-7350 | Bracket Group (not serviced) | -- |
| 18 | 2H-0191 | Bolt | 16.0 mm (10 - 24 x 0.625 in) |
| 18 | 9S-0225 | Bracket Assembly | -- |
| 19 | 9S-8903 | Point | 9.50 mm (0.4 in) |
| 19 | 8S-3675 | Point - Indicator | 3 mm (0.12 in) |
| 19 | 3P-1565 | Collet Clamp | -- |
| 19 | 5P-4814 | Collet As - Clamp | -- |
| 19 | 9S-8518 | Plug | -- |
| 19 | 3S-3268 | Point - Indicator Contact | 6.35 mm (0.25 in) |
| 19 | 9S-0229 | Contact Point | 9.5 mm (0.4 in) |
| 19 | 9S-8883 | Contact Point | 12.7 mm (0.5 in) |
| 19 | 3S-3269 | Contact Point | 25.4 mm (1.0 in) |
| 19 | 5P-7276 | Container | -- |
| 19 | 9S-8519 | Plug | -- |

(Continued)

Fuel System Repair and Adjust

6V-9128 Rack Position Tool Group (Continued)

Model: Cat® Engines

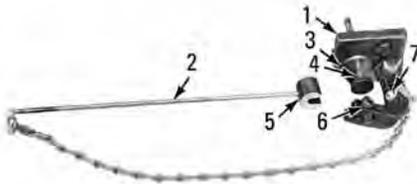
Warranty: Six Months

| Item | Part Number | Description | Size |
|------------------|-------------|--------------------------|------|
| -- | 6V-9128 | Rack Position Tool Group | -- |
| Not Shown | | | |
| -- | 4C-3474 | Cap | -- |

¹Also Item 13

²Also Item 10 and 19

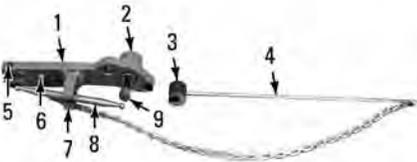
9S-0227 Bracket Group



| Item | Description |
|------|------------------|
| 1 | Bracket Assembly |
| 3 | Plug |
| 4 | Rod |

| Item | Part No. | Description |
|-----------------------------|----------|---------------|
| -- | 9S-0227 | Bracket Group |
| Service/Repair Parts | | |
| 2 | 8S-9456 | Rod Assembly |
| 5 | 9S-0234 | Spacer |
| 6 | 2A-0762 | Bolt |
| 7 | 5S-7348 | Screw |

Service / Repair Parts for Rack Position Tool Group



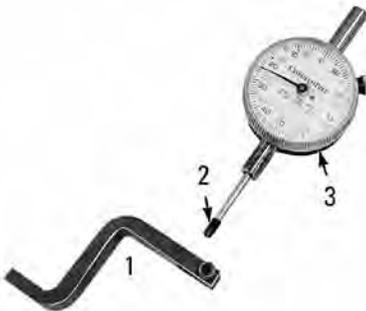
| Item | Description |
|------|------------------|
| 1 | Bracket Assembly |
| 2 | Plug |
| 8 | Hole Attachment |

| Item | Part No. | Description |
|-----------------------------|----------|--------------|
| Service/Repair Parts | | |
| 3 | 9S-0234 | Spacer |
| 4 | 8S-9456 | Rod Assembly |
| 5 | 2A-0762 | Bolt |
| 6 | 5S-7348 | Screw |
| 7 | 3F-9190 | Dowel |
| 9 | 9S-0231 | Ring |
| 9 | 9S-0213 | Rod |

9S-0228 Rack Position Tool Group

Discontinued — Service Parts Available

All part numbers in the table: Six Month Warranty



Reference

SEHS6995, rack setting procedure

| Item | Part Number | Description |
|------|-------------|--------------------------|
| 1 | 9S-0225 | Bracket Assembly |
| 1 | 2H-0191 | Bolt |
| 2 | 9S-8883 | Contact Point |
| 3 | 8S-2283 | Indicator |
| -- | 9S-0228 | Rack Position Tool Group |

6V-6070 Tool Group

Model: Cat® Engines
Warranty: Six Months

- Used to check and adjust rack and fuel ratio control linkage on all engines with New Scroll Fuel Systems (NSFS) — new procedure now used to check and adjust rack on these engines
- Replaces discontinued 6V-4095 Group and discontinued 6V-4096 Group; all tools in discontinued groups, except 6V-2128 Compressor (which was discontinued), are still available for parts service

Reference

SEHS8024, Special Instruction

| |
|------------------------------|
| Included in Group |
| Arm |
| Arm (Part of 6V-2014) (2) |
| Form SEHS8024 |
| Form NEEG2119 (Label) |
| Form SEES5641 (Layout Chart) |



| Part Number | Description | Qty. |
|------------------------------------|-------------------------------|------|
| 6V-6070 | Tool Group | -- |
| 6V-6070 Tool Group Contains | | |
| 021-7956 | Bolt | -- |
| 0S-1614 | Bolt | 2 |
| 0S-1615 | Bolt ¹ | 2 |
| 2A-0762 | Bolt | -- |
| 2P-8264 | Socket | -- |
| 2P-8265 | Socket | -- |
| 5B-5689 | Gasket | -- |
| 5P-4814 | Collet As - Clamp | 2 |
| 6V-2014 | Bracket Assembly ² | -- |
| 6V-2017 | Tool | -- |
| 6V-2030 | Extension ^{3,4} | -- |
| 6V-2105 | Tool As. - Rack ADJ | -- |

| Part Number | Description | Qty. |
|--|---|------|
| 6V-6070 Tool Group Contains (Continued) | | |
| 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- |
| 6V-3075 | Indicator - Dial | -- |
| 6V-4186 | Pin - Fuel Pump Timing | -- |
| 6V-6104 | Block | -- |
| 6V-6105 | Block | -- |
| 6V-6106 | Dial Indicator | -- |
| 6V-6151 | Adapter (Overfueling Spring Compressor) | -- |
| 6V-7941 | Compressor Assembly | -- |
| 6V-7942 | Hook | -- |
| 8H-3128 | Bolt - Hex Socket Head | 3 |
| 8H-9178 | Bolt | 2 |
| 8T-9198 | Rack Indicator Bracket Assembly | -- |
| 9S-0229 | Contact Point | -- |
| 9S-8903 | Point | -- |

¹Parts serviced separately.

²NOTE for 6V-2014, Bracket Assembly: An FT2532 Shield is available for the 6V-2014 Bracket Assembly. Refer to the separate article for specifications to make the oil shield.

³Used for FIETS and AVM with heavy duty coupling

⁴Part of 6V-6042 Indicator Contact Point Group

FT2532 Oil Shield

Model: 3304 and 3306 Engines equipped with New Scroll Fuel Systems

Warranty: None



- Used to create a shield to prevent oil leaking from indicator bracket when checking fuel-to-air ratio with engine running
- Used with 6V-2014 Bracket Assembly, which is part of 6V-6070 Tool Group
- Oil shield fits over lever shaft mounting ears of indicator bracket
- Can be easily made from aluminum or steel
- Attaches to indicator bracket with 3S-6252 RTV Adhesive/Sealant
- After oil shield is installed, check for free movement of indicator lever

6V-4069 Body Group

Model: 3208

Warranty: Six Months



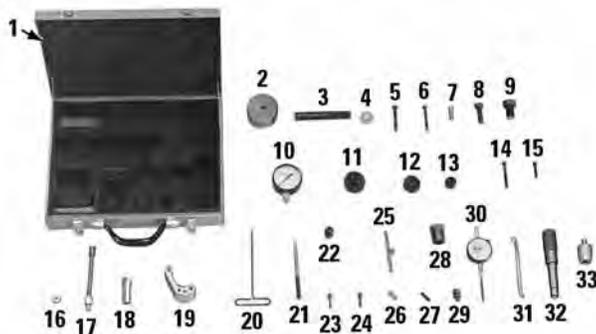
- Used to remove fuel pump drive gear from taper on drive shaft before removing sleeve metering fuel system on 3208 Engines
- Replaces 5P-2371 Puller Plate (provides more pulling force than 5P-2371)
- Needed because of lack of space in vehicle

| Item | Part Number | Description |
|------|-------------|-------------|
| -- | 6V-4069 | Body Group |
| 1 | 5L-4041 | Bolt (2) |
| 2 | 2H-0191 | Bolt |
| 3 | 6V-4088 | Washer |

5P-4203 Sleeve Metering Field Service Tool Group

Model: Cat® Engines

Warranty: Six Months



- Used for disassembly, assembly, testing and adjusting Sleeve Metering Fuel System; used for fuel setting
- Metric tools; values for testing and adjusting given in metric pressures

As a result of changes and improvements in test and adjust procedures, the discontinued 3P-1550 Sleeve Metering Field Service Tool Group was converted to the 5P-4203 S.M.F.S. Tool Group. Dealers should check the list to determine what tools are required to convert their discontinued 3P-1550 Group to the 5P-4203 Group. Some parts of the discontinued 3P-1550 Group are no longer needed, but a number of items should be retained in case of the need for dynamic checking of sleeve shaft movement.

Reference

SMHS7013, Special Instruction

| Item | Description |
|---|--------------------------|
| 9 | FT1632 Bolt ¹ |
| ¹ FT1632 Bolt is made from 2H-3740 Bolt. Refer to following article. | |

(Continued)

5P-4203 Sleeve Metering Field Service Tool Group (Continued)

Model: Cat® Engines
 Warranty: Six Months

| Item | Part Number | Description | Size | Qty. |
|------------------|----------------------|---|-------------------------------|------|
| 1 | 3P-1549 | Block | -- | -- |
| 1 | 2P-8306 | Box Assembly | -- | -- |
| 2 | 5P-0301 | Driver | -- | -- |
| 3 | 1P-0529 | Handle | -- | -- |
| 4 | 4B-4280 | Washer | -- | 2 |
| 5 | 1D-4538 | Bolt | -- | -- |
| 6 | 1D-4533 | Bolt | -- | -- |
| 7 | 3K-4910 | Screw | -- | -- |
| 8 | 0S-1603 | Bolt | -- | -- |
| 10 | 8B-8817 | Plug (Not shown) | -- | -- |
| 10 | 8T-0853 | Gauge, 0 - 400 kPa(0 - 60 psi) | -- | -- |
| 11 | 5P-0319 | Driver | -- | -- |
| 12 | 5P-0318 | Driver | -- | -- |
| 13 | 1P-0463 | Plate | 1.000 in Diameter | -- |
| 14 | 6L-5551 | Bolt | 2 1/4 in long | -- |
| 15 | 4L-7124 | Bolt - Hex Socket Head ¹ | 1 1/4 in long | -- |
| 16 | 4B-4276 | Flat Washer | -- | 4 |
| 17 | 6J-3958 | Coupling | -- | -- |
| 17 | 3B-7734 | Adapter STR | 76.2 long (1/8 in NPT x 3 in) | -- |
| 17 | 3J-7354 | Seal - O-ring - STOR for 8C-3446 (not pictured) | -- | 2 |
| 17 ² | 5D-9231 | Connector | -- | 2 |
| 18 | 3P-2210 ³ | Socket | -- | -- |
| 19 ⁴⁵ | 5P-6602 | Adapter | -- | -- |
| 20 ⁴ | 5P-4205 | Wrench ⁶ | -- | -- |

| Item | Part Number | Description | Size | Qty. |
|--|-------------|--|------------------------|------|
| 21 | 3P-1544 | Pin | -- | -- |
| 22 | 4H-0553 | Fitting | -- | -- |
| 23 | 5P-0299 | Pin | 19.2831 mm (0.7592 in) | -- |
| 24 | 5P-0298 | Pin | 17.8587 mm (0.7028 in) | -- |
| 25 ⁴ | 5P-4209 | Gauge | -- | -- |
| 26 | 3J-6956 | Spring | -- | -- |
| 27 | 8S-7271 | Setscrew | -- | -- |
| 28 | 8S-2243 | Wrench | -- | -- |
| 29 | 3P-1565 | Collet Clamp | -- | -- |
| 31 | 5P-0302 | Bar (Injector Removal) | -- | -- |
| 32 | 6V-0029 | Roll Pin Depth Gauge Tool ² | -- | -- |
| 33 ² | 6V-3071 | Seal Guide | -- | -- |
| -- | 5P-4203 | Sleeve Metering Field Service Tool Group | -- | -- |
| 3P-1567 Indicator, Includes: | | | | |
| 30 | 3P-1567 | Indicator | -- | -- |
| 30 ⁴ | 5P-6531 | Point | 57.2 mm (2.25 in) | -- |
| 30 ⁴ | 5P-4228 | Spring | -- | -- |
| The following parts which, were in the discontinued 3P-1550 Tool Group, should be retained in case of the possible need for dynamic checking of sleeve shaft movement⁷ | | | | |
| -- | 3K-6896 | Gasket | -- | -- |
| -- | 0S-1616 | Bolt | -- | -- |
| -- | 7B-2742 | Bolt | -- | -- |

Engine Tools

¹Part of 1P-0520 Driver Group

²Not included in early 5P-4203 Groups

³Special socket

⁴Tools which must be procured to convert the discontinued 3P-1550 Tool Group to the 5P-4203 Tool Group. The 3P-1567 Indicators from discontinued 3P-1550 Tool Groups must have the 5P-4228 Spring and 5P-6531 Contact Point installed. Some 3P-1567 Indicators had 5P-4809 Points, 50.8 (2.0 in) long.

⁵NOTE: The discontinued 5P-4226 Adapter was replaced by the 5P-6602 Adapter, which is required for 3208 Engines with EGR systems.

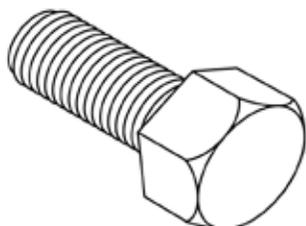
⁶Warranty: Six Months

⁷Also retain: Basket

FT1632 Bolt

Model: D5B, D6D, D7G, 225B, 225B-3208, 3208, 518, 613C

Warranty: None



- Fabricated by modifying 2H-3740 Bolt in 5P-4203 Field Service Tool Group
- Used to remove 4N-2954 Sleeve modification prevents damage to threads

3P-2200 Sleeve Metering Calibration Tool Group

Model: Cat® Engines

Warranty: Six Months



- Used for calibrating (similar to lifter setting) sleeve metering fuel pumps in shop
- Several tools from 5P-4203 Tool Group also needed for this operation
- Metric tools; values for testing and adjusting are given in metric terms, with exception of torque values and pressures

Reference

SMHS6988, Special Instruction

| Item | Part Number | Description | Size |
|-----------------|-------------|--------------|------|
| 1 | 7W-8120 | Bushing | -- |
| 10 ¹ | 5P-6557 | Spring | -- |
| 2 | 1P-7379 | Microgauge | -- |
| 3 | 3P-1568 | Indicator | -- |
| 4 | 6V-3186 | Collet | -- |
| 4 | 6V-3185 | Base | -- |
| 5 | 5P-6510 | Box Assembly | -- |

| Item | Part Number | Description | Size |
|------|-------------|--|----------------------|
| 6 | 1S-9836 | Wrench | -- |
| 7 | 3P-1546 | Pin | 15.9410 mm (0.62 in) |
| 8 | 3P-1545 | Pin | 17.3734 mm (0.68 in) |
| 9 | 3P-1540 | Pump Assembly | -- |
| -- | 3P-2200 | Sleeve Metering Calibration Tool Group | -- |

¹Part of pump assembly

Additional Calibration Tools



Engine Tools

| Item | Part Number | Description |
|---|-------------|---------------------|
| Additional Tools from 5P-4203 Tool Group Required for Pump Calibration | | |
| 1 | 8S-2243 | Wrench |
| 2 | 5P-6602 | Adapter |
| 3 | 5P-4205 | Wrench ¹ |
| 4 | 5P-4206 | Wrench |
| 5 | 1D-4533 | Bolt |
| 6 | 1D-4538 | Bolt |
| 7 | 5P-4209 | Gauge |
| 8 | 8S-7271 | Setscrew |
| 9 | 2P-8264 | Socket |
| 10 | 6V-0190 | Clamp (2) |

¹Warranty: Six Months

5P-3516 Reaming Tool Group

Model: 225B, 225B-3208, 3208, 613C

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|--------------------|
| -- | 5P-3516 | Reaming Tool Group |
| 1 | 5P-3515 | Reamer |
| 2 | 5P-3057 | Fixture Assembly |

- Used to ream 5P-4810 Camshaft Bearing when front bearing requires replacement in sleeve metering fuel system pump housings



6V-4164 Driver

6V-4163 Bit

Model: Cat® Engines

Warranty: Six Months

- Capable of applying torque required to remove and install mounting bolts for later 8N-2663 Flyweight Carrier in sleeve metering fuel systems

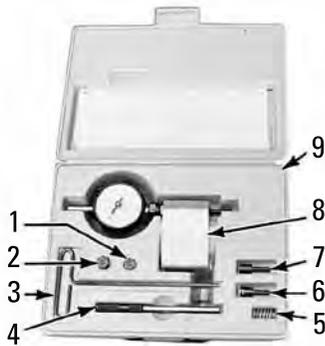
| Item | Part Number | Description | Size |
|------|-------------|-------------|---------------------------------|
| 1 | 6V-4164 | Driver | 1/4 in Hex, 3/8 in Square Drive |
| 2 | 6V-4163 | Bit | 1/4 in and 1/8 in Hex |



5P-6577 Fuel Setting Tool Group

Model: Cat® Engines

Warranty: Six Months



- Contains only those tools needed for checking and adjusting fuel setting on engines with Sleeve Metering Fuel Systems
- All tools in this group also contained in 5P-4203 Field Service Tool Group

| Item | Part Number | Description |
|----------------|-------------|-------------------------|
| 1 | 1D-4533 | Bolt |
| 2 | 1D-4538 | Bolt |
| 3 | 5P-4205 | Wrench ¹ |
| 4 | 3P-1544 | Pin |
| 5 | 3J-6956 | Spring |
| 6 | 5P-0299 | Pin |
| 7 | 5P-0298 | Pin |
| 8 | 5P-6602 | Adapter |
| 8 | 3P-1565 | Collet Clamp |
| 8 | 3P-1567 | Indicator |
| 8 | 8S-7271 | Setscrew |
| 8 ² | 5P-6531 | Point |
| 9 | 5P-7319 | Box |
| -- | 5P-6577 | Fuel Setting Tool Group |

¹Warranty: Six Months

²Part of 3P-1567

Calibration Tools

Model: 3208 Engines with Heavy Sleeve Metering Fuel System

Warranty: Six Months

- Used to set, test, and adjust heavy sleeve metering fuel pumps — these tools are not available as a group and should be ordered to supplement existing tool groups
- Used with 3P-2200 Sleeve Metering Calibration Tool Group, 5P-4203 Sleeve Metering Field Service Tool Group, and 5P-6577 Fuel Setting Tool Group
- The 3P-1565 Collet, 8S-7271 Setscrew, and 3J-6956 Spring are required for this operation and are part of 5P-4203 Sleeve Metering Field Service Tool Group or 5P-6577 Fuel Setting Tool Group
- A 6V-6082 Bit, 5/64 Hex, part of 6V-4980 Torque Screwdriver Tool Group, is required for 8S-7271 Setscrew to adjust the injection pumps
- 146-5068 Hex Key required for on engine adjustment for aftercooled engines
- All tools can be stored in a 6V-3073 Case; 6V-4094 foam (convoluted) is used in the lid; two foam blocks are required in the case bottom, 6V-4873 topped with 2P-8289 (convoluted); all foam is cut to fit the case

References

REHS0063, Special Instructions, Sleeve Setting

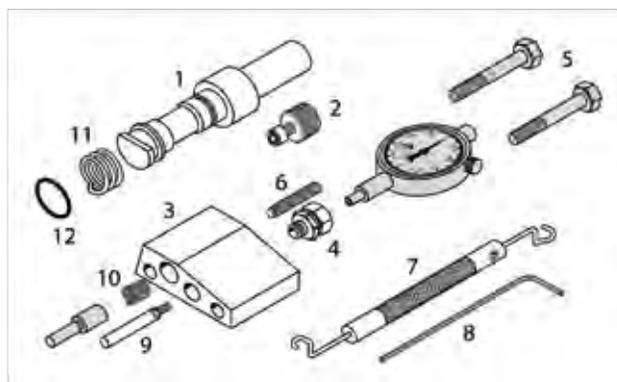
SENR3688, Service Manual

| Item | Description |
|------|--------------------------------|
| 5 | Original Load Stop Cover Bolts |

(Continued)

Calibration Tools (Continued)

Model: 3208 Engines with Heavy Sleeve Metering Fuel System
 Warranty: Six Months



Engine Tools

| Item | Part Number | Description | Used with | Used to |
|---|-------------|---------------------------------------|---|---|
| 1 | 141-6727 | Calibration Pump Assembly, 3208 HSMFS | 3P-2200 Calibration Tool Group for sleeve lever setting | Set sleeve lever position on control shaft during injection pump assembly |
| 2 | 141-6737 | Adjustable Micro-Gauge | 3P-2200 Calibration Tool Group for sleeve lever setting | Preset sleeve lever position before final calibration (use a wicking sealant to lock screw in place the first time this gauge is used) |
| 3 | 145-1853 | Calibration Fixture | 3P-2200 Calibration Tool Group for sleeve lever setting 5P-4203 or 5P-6577 for fuel setting adjustments | Hold calibrating and zero pins for rack setting and positioning control shafts for sleeve setting (required for all 3208 HSMFS and 3208 SMFS injection pumps) |
| 4 | 3P-1565 | Collet Clamp | -- | -- |
| 6 | 8S-7271 | Setscrew | -- | -- |
| 7 | 131-3459 | Sleeve Holder | -- | Position sleeve during pump disassembly and assembly - simplifies assembly and protects sleeve from damage |
| 8 | 146-5068 | Hex Key-Ball End | -- | -- |
| 9 | 5P-4809 | Point Indicator | -- | -- |
| 10 | 3J-6956 | Spring | -- | -- |
| Service parts for 141-6727 Calibration Pump Assembly | | | | |
| 11 | 5P-6557 | Spring | -- | -- |
| 12 | 8T-0116 | O-ring | -- | -- |
| Recommended but not shown | | | | |
| -- | 6V-3073 | Case - Plastic | -- | -- |
| -- | 2P-8289 | Holder Block | -- | -- |
| -- | 6V-4873 | Foam - Block | -- | -- |
| -- | 6V-4094 | Foam - Convuluted | -- | -- |

FT1525 Alignment Pin, FT1526 Fixture

FT1698 Driver

Model: 3208

Warranty: None



- Used to salvage governor housings on 3208 Engines with Sleeve Metering Fuel Systems
- Provide accurate method for maintaining proper location when reworking throttle shaft bushing bores; FT1525 Pin and FT1526 Fixture formerly used to rework only outer bore; with addition of FT1698 Driver and a longer drill and reamer, both bores can be reworked

Reference

SMHS7760-01, Special Instruction

6V-4141 Sleeve Metering Calibration Tool Group

Model: 3208

Warranty: Six Months



- Makes adjustment of sleeve levers easier on Sleeve Metering Fuel Systems
- When used with 6V-4980 Torque Screwdriver Tool Group, adjustment to sleeve levers on 3208 Engine takes about 5 minutes instead of 15 to 30 minutes
- Formerly, tolerances on sleeve lever had to be exact to 0.002 mm (0.00008 in); it was necessary to use 3P-2220 Calibration Tool Group to make an adjustment this exact; tolerances were changed to 0.05 mm (0.002 in) with a maximum of 0.05 mm (0.002 in) between each lever, and 6V-4141 Tool Group can make this adjustment accurately and faster

Reference

SMHS7835, Special Instructions

| Item | Part Number | Description | Size |
|------|-------------|--|----------------------|
| 1 | 6V-4137 | Fixture Group | -- |
| 2 | 3P-1545 | Pin | 17.3734 mm (0.68 in) |
| 3 | 8T-0888 | Washer | -- |
| 4 | 3P-1546 | Pin | 15.9410 mm (0.62 in) |
| -- | 6V-4141 | Sleeve Metering Calibration Tool Group | -- |

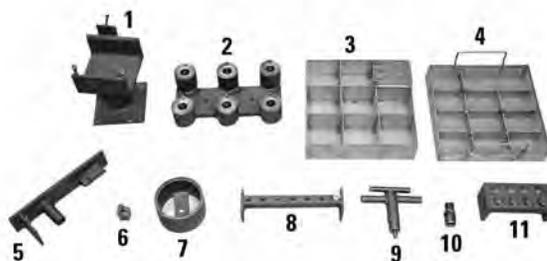
Fabricated Tools for Reconditioning 3208 Engine Fuel Systems

Model: 3208

Warranty: None

- Used to recondition 3208 Engine fuel systems

| Item | Part Number | Description |
|------|-------------|-------------------|
| 1 | FT1693 | Holding Fixture |
| 2 | FT1690 | Holding Fixture |
| 3 | FT1691 | Parts Basket |
| 4 | FT1692 | Parts Basket |
| 5 | FT1709 | Holding Fixture |
| 6 | FT1730 | Gauge (Weight) |
| 7 | FT1689 | Holding Fixture |
| 8 | FT1776 | Holding Fixture |
| 9 | FT1686 | Remover Installer |
| 10 | FT1687 | Socket |
| 11 | FT1777 | Holding Fixture |



6V-4830 Fixture Group

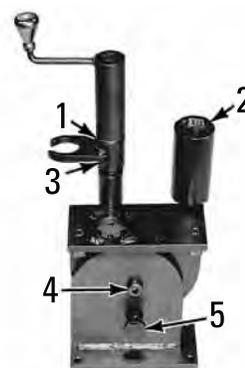
Model: Cat® Engines

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---------------|
| 1 | 5L-1100 | Bearing |
| 2 | 6V-4092 | Socket |
| 3 | 2N-7229 | Spring |
| 5 | 6V-4875 | Stop |
| -- | 6V-4830 | Fixture Group |

- Used for disassembly and assembly of unit injectors, and to check assembled injectors for free rack movement

| Item | Description |
|------|-------------|
| 4 | Screw |



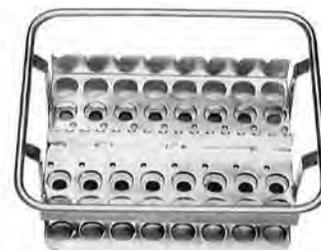
6V-6188 Cleaning Tray

Model: Cat® Engines

Warranty: Six Months

| Part Number | Description |
|-------------|---------------|
| 6V-6188 | Cleaning Tray |

- Holds specific parts of unit injectors in groups while they are cleaned in ultrasonic cleaner tank
- Plungers, bushings, tips and needles arranged in sequence so that parts which fit together and must be kept together can be cleaned but not mixed
- Tray fits in tank of either ultrasonic cleaner group



6V-4822 Tip Driver

Model: Cat® Engines

Warranty: Six Months



- Used to separate tip assembly from nut during disassembly of injector
- Can be used as alignment tool during assembly

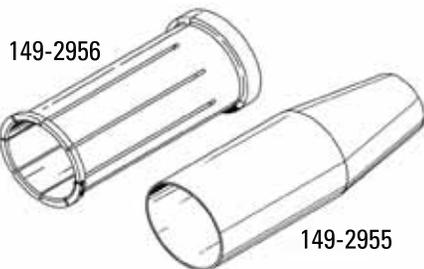
| Part Number | Description |
|-------------|-------------|
| 6V-4822 | Tip Driver |

149-2955 Seal Protector

149-2956 Backup Ring Installer

Model: 3126B Engines

Warranty: Six Months



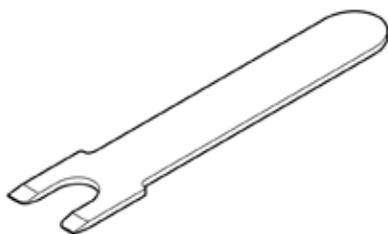
- Used to quickly install stiff O-ring and both backup rings in top groove of HI300 injector
- Prevents steel backup ring from deforming or damaging injector case during ring installation

| Part Number | Description | Overall Length | Outside Diameter (large end) | Inside Diameter (of large end) | Inside Diameter of taper | Inside Diameter |
|--------------|-----------------------|------------------|------------------------------|--------------------------------|--------------------------|--------------------|
| 149-2955 | Seal Protector | 121 mm (4.76 in) | 40 mm (1.57 in) | 37.6 mm (1.48 in) | 25.2 mm (0.99 in) | -- |
| 149-2956 | Backup Ring Installer | 105 mm (4.13 in) | -- | -- | -- | 40.75 mm (1.60 in) |
| Service Part | | | | | | |
| 5F-9657 | O-ring seal | -- | -- | -- | -- | -- |

192-5092 Removal Tool

Model: 3126B Engines

Warranty: Six Months



- Used to easily separate hose from fitting
- Used on #10 fitting on 192-2963 Oil Supply Hose on HEUI high-pressure pump
- Separates fitting from hose collar (insert beveled edge between hose collar and fitting)
- For #6 fitting use 180-0186 Hose Tool

| Part Number | Description |
|-------------|--------------|
| 192-5092 | Removal Tool |

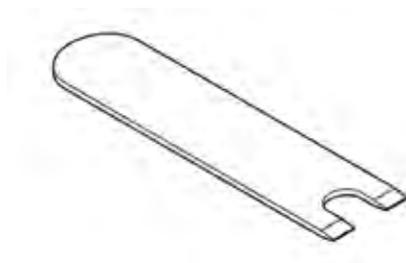
180-0186 Removal Tool

Model: 3126B HEUI Engine

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 180-0186 | Removal Tool |

- Used to quickly and easily separate 175-3236 High-Pressure Hose from fitting
- Insert beveled edge between fitting collar and hose collar; hose should release from fitting



250-6092 Removal Tool

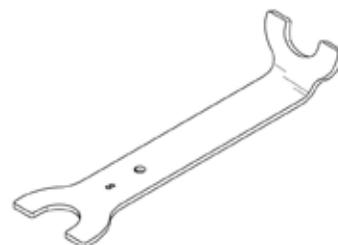
Essential Tool

Model: C15 and 3456 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|--------------|
| 250-6092 | Removal Tool |

- Used to quickly and easily separate a hose from a #8 fitting
- Used on C15 Engine turbocharger supply line and 3456 Engine crank-gear
- Insert edge of tool between fitting and hose collar to release hose from fitting
- Helps prevent hose damage — angled end of tool allows hose to be pushed off of fitting
- Other hose release tools also available: #6 180-0186 and #10 192-5092



Injector Installation and Removal Tooling

Essential Tool

Model: 3126B, C7, C9 Engines

Warranty: Six Months

- Used to push injector into bore (attaches to rocker shaft bolt)
- Used with 1/2 inch drive ratchet to apply force to raise or lower injector
- Lever action provides fast and easy installation
- Eliminates injector damage which can occur when using other installation methods
- Order parts separately

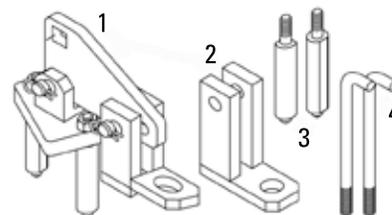
References

SENR9664, C9 Marine Engine

REN9218, C7 Engine for Cat Built Machines

REN9579, C9 Engine For Cat Built Machines

REN7458, C7 On Highway Engine



(Continued)

Injector Installation and Removal Tooling (Continued)

Essential Tool

Model: 3126B, C7, C9 Engines

Warranty: Six Months

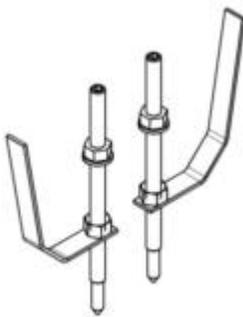
Engine Tools

| Item | Part Number | Description | Used with | Used To | Used On |
|--|-------------|----------------------------|--|-------------------|------------------------|
| Injector Installation and Removal Tooling | | | | | |
| 1 | 152-1057 | Injector Installation Tool | -- | Install injectors | 3126B |
| 2 | 191-6077 | Bracket | 152-1057 Injector Installation Tool (replaces standard bracket assembly) | Install injectors | C9 |
| 3 | 272-1149 | Leg (2 pieces) | 152-1057 Injector Installation Tool (replaces standard legs) | Install injectors | C7, C9 (after 06/2004) |
| 4 | 274-9198 | Rod (2 required) | 152-1057 Injector Installation Tool | Remove injectors | C7, C9 (after 06/2004) |

367-3070 Injector Installation and Removal Tooling

Model Usage: C7, C9 Engines

Warranty: Six Months



- Used to safely remove and install injector
- Threaded tabs captured between injector clamp and head, allowing threaded rod to be turned with 4 mm hex wrench to jack out injector clamp
- Threaded rods can be installed into head thread end down and injectors can be pulled into head with M8 nuts
- M8 nuts supplied
- Lubricant suggested on threaded rods to reduce friction

| Specifications | |
|----------------|-------------|
| Part Name | Description |
| Threaded Rods | M8 x 1.25 |
| Hex Wrench | 4 mm |

| Part Number | Description |
|-------------|---|
| 367-3070 | Injector Installation and Removal Tooling |

6V-4808 Tip Tester Adapter Group

Discontinued — Service Parts Available



| Item | Description |
|------|-------------|
| 1 | Nut |
| 2 | Body |

| Item | Part Number | Description |
|------|-------------|--------------------------|
| 3 | 6V-1250 | Seal |
| 4 | 6F-0722 | Seal |
| -- | 6V-4808 | Tip Tester Adapter Group |

9U-5132 Timing Tool Group

Model: 3500 EUI and MUI Engines

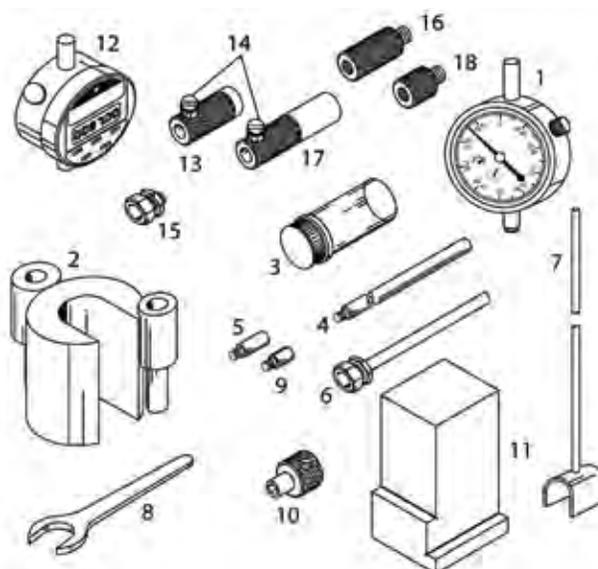
Warranty: Six Months

- Replaces discontinued 6V-7880 Tool Group (to upgrade 6V-7880 to 9U-5132, order 6V-3072 Plastic Case, 9U-5138 Set Gauge, 9U-5233 Timing Fixture, 9U-5136 Foam Insert, 129-8602 Solenoid Nut Driver, and Decal NEEG2515)
- Used to test and adjust fuel systems, including fuel timing, rack synchronization, and fuel setting
- Tool group can be used for both MUI (Mechanical Unit Injector) and EUI (Electronic Unit Injector) engines
- 136-4587 Collet Extension and 136-4588 Collet Extension can also be used with this tool group (use 136-4587 for 9U-6273 and 136-4588 for 122-0449)

Reference

NEHS0666, Tool Operating Manual

| | Set Gauge Step | Rod Sleeve Extension | Extension Rod Assembly |
|---------------------|---------------------|----------------------|------------------------------------|
| For EUI engines use | 64.34 mm (2.533 in) | 122-0449 | 122-0451 [124.0 mm (4.78 in) long] |
| For MUI engines use | 87.00 mm (3.425 in) | 9U-6273 | 9U-5220 [181.0 mm (7.12 in) long] |



| Item | Part Number | Description | Size |
|-----------------|-------------|----------------------------|------------------|
| 1 | 6V-3075 | Indicator - Dial | -- |
| 2 ¹ | 9U-5137 | Timing Fixture | -- |
| 3 | 5P-7276 | Container | -- |
| 4 | 5P-7263 | Indicator Contact Point | 76.2 mm (3.0 in) |
| 5 | 9S-8883 | Contact Point | 12.7 mm (0.5 in) |
| 6 | 4C-8753 | Extended Collet | -- |
| 7 | 8T-2684 | Rack Synchronization Gauge | 12.7 mm (0.5 in) |
| 8 | 6V-7918 | Wrench | 5/8 in |
| 9 | 8S-3675 | Point - Indicator | 3 mm (0.12 in) |
| 10 | 129-8602 | Solenoid Nut Driver | -- |
| 11 | 9U-5138 | Set Gauge | -- |
| 13 ² | 9U-6273 | Rod Sleeve Extension | -- |
| 14 ² | 9U-6272 | Nylon Screw | -- |
| 17 ² | 122-0449 | Rod Sleeve Extension | -- |
| -- | 9U-5132 | Timing Tool Group | -- |

(Continued)

Fuel System Repair and Adjust

9U-5132 Timing Tool Group (Continued)

Model: 3500 EUI and MUI Engines

Warranty: Six Months

Engine Tools

| Item | Part Number | Description | Size |
|-------------------------|-------------|---|---|
| Optional Tooling | | | |
| 12 | 369-2607 | Digital Indicator | -- |
| 15 | 5P-4814 | Collet As - Clamp | -- |
| 16 | 136-4588 | Collet Extension | -- |
| 18 | 136-4587 | Collet Extension | -- |
| Not shown | | | |
| -- | 5P-4160 | Point - Indicator Contact, 19.05 mm (0.75 in) long | 19.0 mm (0.75 in) (for digital indicator) |
| -- | 9S-9082 | Turning Tool, 1/2 in drive | 1/2 in drive |
| -- | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- |
| -- | 9U-5220 | Extension Rod Assembly | -- |
| -- | 9U-5136 | Foam Insert | -- |
| -- | 122-0451 | Extension Rod Assembly | -- |

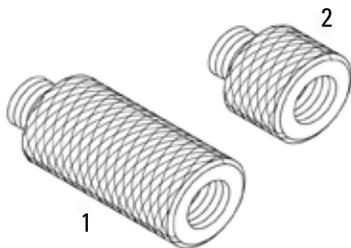
¹ Part of 9U -5233 Magnetic Fixture Group

² Additional tooling required, but not part of 9U-5132

Collet Extensions

Model: 3500 and 3500B Engines

Warranty: Six Months



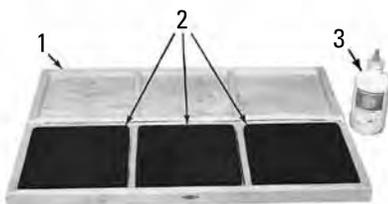
- Used to hold a dial indicator in 9U-5233 Fixture Group with 5P-4814 Collet Clamp and two (2) 6V-7918 Collet Wrenches
- Released to provide an alternative to the nylon screw-type indicator mount
- Use 136-4587 Extension-Collet with 5P-4814 Collet-Clamp, instead of 9U-6273 Rod Sleeve Extension, to check and adjust fuel timing on 3500 MUI Engines
- Use 136-4588 Extension-Collet with 5P-4814 Collet-Clamp, instead of 122-0449 Rod Sleeve Extension, to check and adjust fuel timing on 3500B EUI Engines

| Part Number | Overall Length | Diameter | Extension Length | External Thread | Internal Thread |
|-------------|------------------|----------------|-------------------|-----------------|-----------------|
| 136-4587 | 56.5 mm (2.2 in) | 19 mm (0.7 in) | 47 mm (1.85 in) | 7/16 - 20 | 3/8 - 16 |
| 136-4588 | 23 mm (0.9 in) | 19 mm (0.7 in) | 13.5 mm (0.53 in) | 7/16 - 20 | 3/8 - 16 |

6V-6999 Lapping Plates

Model: Cat® Engines

Warranty: Six Months



- 3 lapping plates assembled in discontinued 6V-7011 Lapping Plate Case make a complete lapping set
- Lapping set permits distribution of lapping work between the 3 plates
- Makes it possible to lap plates against each other to make them flat after a period of use
- All parts need to be ordered separately

(Continued)

6V-6999 Lapping Plates (Continued)

Model: Cat® Engines
Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|--------------------|
| 1 | 6V-7011 | Lapping Plate Case |
| 2 | 6V-6999 | Lapping Plate |
| 3 | 6V-7151 | Lapping Compound |

6V-7151 Lapping Compound

Model: Cat® Engines
Warranty: Six Months

- Recommended to lap flat surfaces of parts used inside unit injectors
- Soluble (can be mixed with) in either solvent or water, and can be washed off with water
- Easier to use and to remove than 8S-2259 Compound, part of 8S-2245 Tool Group for pencil-type fuel nozzles, which will give an acceptable surface finish and can be used if desired
- In dispenser-type container (squeeze bottle)
- Contents: 0.454 kg (16.0 oz)

| Part Number | Description |
|-------------|------------------|
| 6V-7151 | Lapping Compound |

1U-9395 Plate

1U-8701 Socket

Model: Cat® Engines
Warranty: Six Months

- Used with 6V-4830 Fixture Group and 6V-4822 Tip Driver to remove and install nozzle on type 2 3500 Engine unit injector (type 2 unit injectors are described in January 1987 Engine News as those with two-piece follower)
- Make it possible to replace nozzle assemblies that plug or fail; with 1U-9395 Plate installed on 6V-4830 Fixture Group, injector can be held properly to remove and install nozzle assembly
- Early nose cones on type 2 injectors have serrations on cone that are damaged during removal; 7C-9795 Replacement Cone available with a hex to tighten it; 1U-8701 Socket required to tighten cone when replacing nozzle



1U-9395



1U-8701

Reference

SEHS8993, Special Instruction

| Part Number | Description |
|-------------|-------------|
| 1U-9395 | Plate |
| 1U-8701 | Socket |

223-2454 Fuel System and Governor Tool Group, 3114-3116

Model: 3114, 3116, and 3126 Engines
Warranty: One Year

- Replaces discontinued 1U-6680 Tool Group
- Used to simplify the required testing and adjusting operations
- Allows more precise fuel system adjustments in significantly less time, at less cost, than using previous tooling
- Improvements to tool group are described below

References

NEHS0610, Tool Operating Manual

SEBR0551, Service Manual, 3116 Diesel Truck Engine

SENR3583, Service Manual, Systems Operation, Testing and Adjusting, Basic Engine Components — 3114 and 3116 Engines Timing

(Continued)

Fuel System Repair and Adjust

223-2454 Fuel System and Governor Tool Group, 3114-3116 (Continued)

Model: 3114, 3116, and 3126 Engines

Warranty: One Year

123-4940 Magnetic Base Indicator Group

- Attaches directly to tappet on top of each unit injector
- Saves time — moves from cylinder to cylinder quickly and easily
- Use with 9U-7274 Contact Point

369-2607 Digital Indicator

- Has a programmable preset feature
- Allows direct reading of published timing dimensions
- Used with the 9U-7269 Timing Gauge Block

Synchronization

9U-7270 Synchronization Gauge Block

- Used to set #1 injector to 3.5 mm (0.14 in) rack (gives more accurate and consistent results)
- Used on 127-8207 Injector

220-0123 Synchronization Gauge Block

- Used to set #1 injector to 3.0 mm (0.12 in) rack (gives more accurate and consistent results)
- Used on 127-8213 Injector

128-9640 Injector Synchronization Fixture Group

- Used to hold linkage in synchronizing position for all cylinders
- Allows both hands to be free when making adjustments
- Provides more consistent results by applying a constant spring load to the linkage

9U-7264 Linkage Lever

- Used to actuate linkage when zeroing rack position at each injector
- Includes 1U-6235 Knob

Fuel Setting

128-8827 Governor Pin Assembly

- Used to properly position injector control linkage relative to governor housing face when making static rack power setting
- Required for 1994 and later governors where calibration pin connection is not accessible from rear of governor (also works for earlier version governors)

136-4149 Governor Connection Sleeve Pliers

- Used to move linkage cover tube between governor and head to gain access to governor/rack linkage connection
- Pliers have more gripping force than former 6V-0006 Pliers (easier to move stubborn cover tubes)
- Pliers have self-locking feature of Vice-Grip type pliers
- Coated with vinyl material to prevent damage to sleeve (refer to Modifications section for reworking older pliers)

NOTE:

The discontinued 1U-6681 Holding Tool (not included) is still needed for some model governors.

The following list of tools is broken down into essential tools, recommended tools and improved tools. Many tools used in the discontinued 1U-6680 Tool Group are used again in 223-2454 Tool Group. See footnotes for status of tool.

If desired, the discontinued 1U-6680 Tool Group can be updated to a 223-2454 Tool Group by ordering those items with footnotes 1 and 2. Unless otherwise specified, quantity required is one of each item.

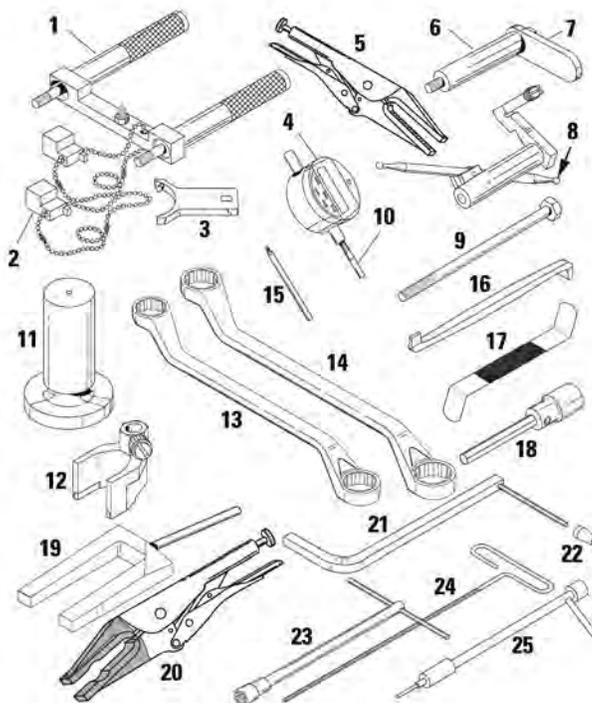
| Item | Description |
|----------------------|-------------|
| NEEG2688 (not shown) | Decal |

(Continued)

223-2454 Fuel System and Governor Tool Group, 3114-3116 (Continued)

Model: 3114, 3116, and 3126 Engines

Warranty: One Year



Engine Tools

| Item | Part Number | Description | Size |
|---|-------------|--|------------------------|
| 1 ¹ | 128-9640 | Injector Synchronization Fixture Group | -- |
| -- | 223-2454 | Fuel System and Governor Tool Group, 3114-3116 | -- |
| 128-8706 Spring Plunger (serviceable part) | | | |
| 2 | 220-0123 | Sync Gauge Block | 3.0 mm (0.12 in) |
| 2 ¹ | 9U-7270 | Sync Gauge Block | 3.5 mm (0.14 in) |
| 3 | 9U-5120 | Spanner Wrench | -- |
| 4 ¹ | 369-2607 | Digital Indicator | -- |
| 5 ¹ | 128-8823 | Locking Long Nose Pliers ² | 238 mm (9.375 in) long |
| 6 | 1U-6675 | Injector Spring Compressor | -- |
| 7 | 8T-4177 | Bolt (spring compressor) | -- |
| 8 | 9U-7282 | Indicator Fixture Group | -- |
| 9U-6272 Nylon Screw (serviceable part) | | | |
| 9 | 8C-4984 | Bolt, (indicator stand) | -- |
| 10 ¹ | 9U-7263 | Contact Point | 18.5 mm (0.73 in) long |
| Fuel Timing Tooling | | | |
| 11 ¹ | 9U-7269 | Timing Gauge Block | -- |
| 12 ¹³ | 123-4940 | Magnetic Base Group | -- |
| 13 ¹ | 128-8824 | Deep Offset Wrench | (16 and 18 mm) |
| 14 ¹ | 128-8825 | Deep Offset Wrench (17 and 19 mm) | -- |
| 15 | 9U-7274 | Contact Point | 85 mm (3.35 in) long |

(Continued)

Fuel System Repair and Adjust

223-2454 Fuel System and Governor Tool Group, 3114-3116 (Continued)

Model: 3114, 3116, and 3126 Engines

Warranty: One Year

Engine Tools

| Item | Part Number | Description | Size |
|-----------------------------------|-------------|--|------|
| Miscellaneous Engine Tools | | | |
| 16 ⁴ | 5P-0302 | Bar (Injector Removal) | -- |
| 17 ¹⁴ | 123-4941 | Valve Setting Gauge | -- |
| 18 ¹⁴ | 194-3542 | Hex Socket Bit Driver | 5 mm |
| Fuel Setting Tooling | | | |
| 19 | 130-2711 | Fuel Setting Holding Tool | -- |
| 20 | 136-4149 | Governor Connection Pliers | -- |
| 21 ¹ | 128-8827 | Fuel Setting Pin Assembly | -- |
| 22 ¹⁴ | 1U-7523 | Pilot - Pin Insertion | -- |
| 23 ¹ | 1U-7299 | Adjustment (FRC) Wrench ("Type V" 1994 and later Trucks) | -- |
| 24 ¹ | 1U-7300 | Wrench (3 mm Hex) | 3 mm |
| 25 ⁵ | 1U-6673 | Wrench - Fuel Ratio Control Adjusting and Synchronizing | -- |
| Not shown | | | |
| 1 | 6V-7145 | Case | -- |
| -- | 128-8828 | Foam Insert Group | -- |

¹ Recommended or improved tools.

² Early 128-8823 were 150 mm (6.0 in)

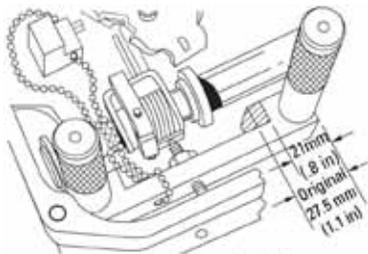
³ Some of the former 9U-7305 Groups used the new 123-4940 Magnetic Base; check your specific tool group.

⁴ Refer to the appropriate engine Service Manual for additional information on use of these tools.

⁵ 159-1783 Fuel Ratio Control Adjusting Wrench is 51 mm (2 in) shorter than 1U-6673. Required for 3116-3126 Engines in Challenger 35, 45 and 55.

Modifications

180-7956 Clamp Assembly Kit

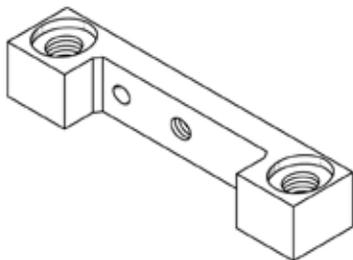


Remove shaded area, as shown

Installing 180-7956 Clamp Assembly Kit may interfere with 128-9640 Injector Synchronization Fixture Group during synchronization procedures. Modify the injector synchronization plate by machining an additional 6.5 mm (0.25 in) from plate (Refer to FT2727).

| Part Number | Description |
|-------------|--------------------|
| 180-7956 | Clamp Assembly Kit |

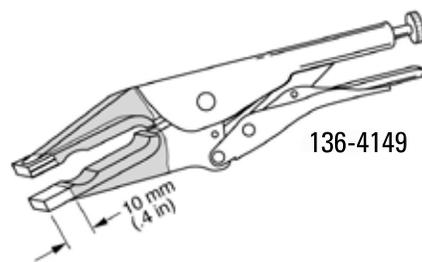
FT2727 Injector Synchronization Plate



| Part Number | Description |
|-------------|--------------------------------|
| FT2727 | Injector Synchronization Plate |

136-4149 Governor Connection Pliers

The 136-4149 Governor Connection Pliers can be used for inspection procedures as outlined in Special Instruction REHS0601, if modified. Remove 10 mm (0.4 in) of rubberized coating from tips of pliers to expose metal teeth. This modification will not affect the original function of pliers, and it will allow pliers to fit onto rivet head.



| Part Number | Description |
|-------------|----------------------------|
| 136-4149 | Governor Connection Pliers |

1U-6680 Governor and Fuel Injection Adjusting Tool Group

Discontinued — Service Parts Available

Warranty: All part numbers in the table have a Six Month warranty



| Part Number | Description |
|-------------|------------------------------|
| 1U-8702 | Injector Timing Block |
| 1U-6678 | Fixture Group |
| 8T-0267 | Socket Head Bolt |
| 4C-4716 | Injector Timing Fixture |
| 6V-6106 | Dial Indicator |
| 1U-8815 | Point - Indicator Contact |
| 3S-3268 | Point - Indicator Contact |
| 1U-6679 | Indicator Group ¹ |
| 1U-9563 | Offset Wrench |
| 1U-8790 | Nut Driver, 6 mm |
| 6V-7918 | Wrench |
| 1U-7563 | Hex Wrench, 4 mm |
| 1U-7564 | Hex Wrench, 5 mm |
| 6V-0006 | Electrical Connector Pliers |

| Part Number | Description |
|------------------|---|
| 9U-5120 | Spanner Wrench |
| 1U-6675 | Injector Spring Compressor |
| 1U-6672 | Rack Adjusting Wrench |
| 1U-6673 | Wrench - Fuel Ratio Control Adjusting and Synchronizing |
| 1U-7523 | Pilot - Pin Insertion |
| 1U-7305 | Insertion Tool |
| 1U-6680 | Governor and Fuel Injection Adjusting Tool Group |
| Not shown | |
| 4C-5851 | Foam Insert |
| 5P-0302 | Bar (Injector Removal) |
| 5P-4814 | Collet As - Clamp |
| 6V-7145 | Case |

¹Includes: 8T-7352 Bolt

1U-9563 Offset Wrench

Model: 3114, 3116

Warranty: Six Months

- Replaces discontinued 1U-8771 Offset Wrench
- Special wrench required for adjusting valve lash and injection timing on 3114 and 3116 Engine
- 4 necessary socket sizes — 16, 17, 18, and 19 mm
- Offset for clearing intake manifold

(Continued)

1U-9563 Offset Wrench (Continued)

Model: 3114, 3116

Warranty: Six Months

- Has all metric socket sizes required to adjust valve lash on any 1.1 liter engine; discontinued 1U-8771 Offset Wrench had 2 sizes, 17 mm and 19 mm; world standards for metric fasteners changed and affected 1.1 liter engine; for example, early engines have 17 mm and 19 mm locknuts; later engines have 16 mm and 18 mm locknuts; interim period of engines may have combination of sizes of locknuts; no special serial number break exists for different size locknuts

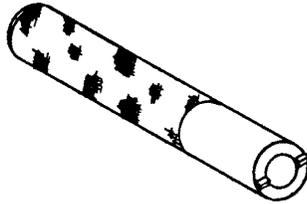
| Part Number | Description |
|-------------|---------------|
| 1U-9563 | Offset Wrench |

Engine Tools

9U-5129 Seal Remover

Model: 3176

Warranty: Six Months



- Used to remove copper combustion gas seal from unit injector tip on 3176 Engines
- Designed for quick removal without damaging injector; stretches copper seal so it can be removed by hand (pliers or chisels would likely damage injector)
- Has short chisel points that indent copper seal when tool is struck with small hammer; chisel points are shorter than seal thickness to prevent damage to injector

| Part Number | Description |
|-------------|--------------|
| 9U-5129 | Seal Remover |

5P-2413 Air Regulator Assembly

Model: 16G

Warranty: Six Months



- Enables use of shop air pressure to activate air-fuel ratio controls for checking or setting fuel rack or rack limiter
- Applicable to both mechanical and hydraulically operated controls

References

SMHS7083, Special Instruction

SEHS7465, Special Instruction

| Item | Part Number | Description |
|------|-------------|------------------------|
| 1 | 3B-7262 | Nipple |
| 2 | 4H-0553 | Fitting |
| -- | 5P-2413 | Air Regulator Assembly |

195-0761 Pressure/Vacuum Pump Group

Model: 3000 Series Engines With Stanadyne Fuel Injection Pumps

Warranty: Manufacturer's 5 year (see details)

- Used to check and adjust aneroid capsule
- Includes other accessories for general diagnostic, testing, and adjusting procedures requiring vacuum or pressure
- Compound pressure gauge
- Hand-operated, no external power required
- Includes compact carrying case

Warranty Information

The pump is warranted to be free of all defects in material and workmanship for FIVE FULL YEARS from the date of original purchase. This warranty does not apply to any defects caused by negligence of the user, use of the product in any manner other than in accordance with the instructions provided with the product, or damage caused by accidents. It also does not apply to gauges, which are warranted for a period of 90 days from date of purchase.

Repair Information

Prism Enterprises, Inc.

6952 Fairgrounds Parkway

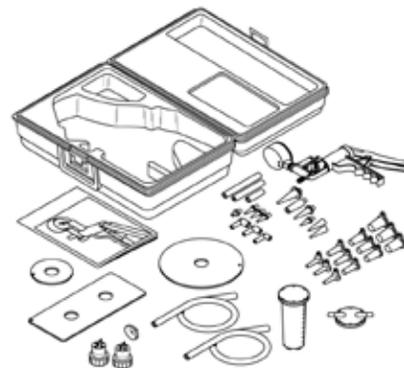
San Antonio, TX 78238

Phone: (800) MITYVAC (648-9822)

(210) 520-8051

Fax: (210) 520-8039

Web site: www.mityvac.com



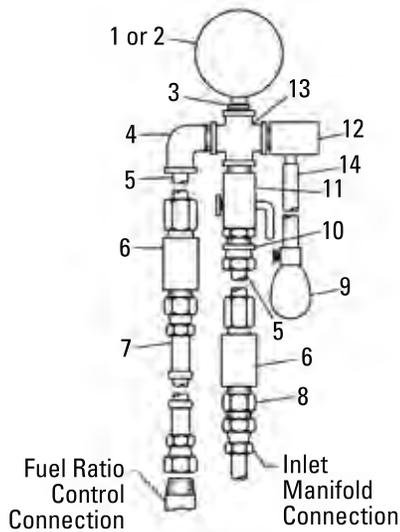
| | |
|---|--|
| Maximum vacuum at sea level | -85 kPa (23 - 25 in Hg) |
| Single stroke volume | 16.4 cu cm (1.0 cu in) |
| Maximum pressure unassisted | 100 kPa (15 psi) |
| Maximum pressure assisted | 175 kPa (25 psi) |
| Compound pressure gauge range | 100 kPa (-30 mm Hg) - 200 kPa (30 psi) |
| Vacuum gauge accuracy -85 kPa (15 - 30 in Hg) | 3% of full range |

| Part Number | Description |
|-------------|----------------------------|
| 195-0761 | Pressure/Vacuum Pump Group |

FT1906 Air Test Kit

Model: 16G

Warranty: None



- Used to check leakdown rate of fuel-air ratio controller with engine at low idle
- Used to read dynamic fuel-air ratio control setting
- Used to adjust fuel-air ratio control setting

Reference

SEN5594, 3306B Engine

| Item | Description |
|------|--|
| 9 | Air Pressure Bulb, BAUMA NOMETER No. 1890 or equivalent |
| 14 | Tubing, 1.2 mm (0.4 in) latex, 6.35 mm (0.25 in) inside diameter |

| Item | Part Number | Description |
|------|-------------|------------------------------|
| 1 | 9S-8138 | Gauge or 2.6 V-7775 Gauge |
| 3 | 3B-6768 | Adapter - STR (NPTF) |
| 4 | 5P-4459 | Elbow |
| 5 | 5P-6011 | Air Line |
| 6 | 5P-4405 | Connector |
| 7 | 6N-3169 | Hose Assembly (not serviced) |
| 8 | 8L-6557 | Adapter |
| 10 | 5P-4476 | Connector |
| 11 | 6K-5741 | Drain Cock |
| 12 | 6V-6757 | Elbow |
| 13 | 7B-0192 | Cross Fitting |

6V-9052 Piston Seal Guide

6V-9072 Piston Seal Guide

Model: D40D, D400D, 3406, 3406B

Warranty: Six Months



6V-9072



6V-9052

- Used to help install piston assembly in fuel ratio control body

| Part Number | Description |
|-------------|-------------------|
| 6V-9052 | Piston Seal Guide |
| 6V-9072 | Piston Seal Guide |

FT1820 Assembly Fixture

Model: Cat® Engines

Warranty: None

FT1820 (Change No. 1)

- Redesigned (simplified) combination of former FT1820 (Change No. 0) and FT1821 Fixtures
- Inexpensive device used to hold fuel ratio controls; fuel ratio controls are awkward to hold during disassembly and assembly



159-0271 Solenoid Spanner Wrench

Essential Tool

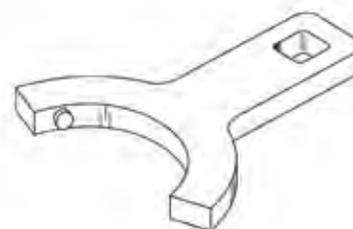
Model: 3208 Engine with Air/Fuel Ratio Control Override Solenoids

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 159-0271 | Solenoid Spanner Wrench |

- Used to install solenoid
- Used with 3/8 inch drive torque wrench
- For installation only — DO NOT USE TO REMOVE SOLENOID

| | |
|-------------------------------|---------------------------|
| Square drive | 3/8 in |
| Solenoid torque specification | 20 ± 5 N·m (15 ± 4 ft-lb) |
| Torque wrench setting | 16 ± 4 N·m (12 ± 3 ft-lb) |

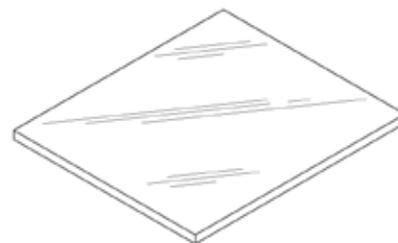


FT1585 Plate

Model: 3300, 973, 973LGP

Warranty: None

- Used for replacing worn governor spring guides in 8N-2500 Governor Housing on 3300 Direct Injection Engines with scroll fuel systems
- Used to control spring guide depth in governor housing; spring guide installed so its end is 1.40 ± 0.25 mm (0.055 ± 0.010 in) below surface of housing
- Material: 17-gauge mild steel



8T-3226 Ring Expander

Model: 3300, 3406

Warranty: Six Months

8T-3226 Ring Expander used as Seal Guide shown protecting seal



- Used for ring expanding and seal protection on all 3300 New Scroll Fuel Systems and on all 3406 New Scroll Fuel Systems
- Primary function: expander tool used with 6V-2163 Spring Compressor to install 7N-8821 Retaining Ring on weight carrier shaft; upon compression of spring assembly, 8T-3226 Ring Expander is inserted over end of weight carrier shaft; 7N-8821 Ring is then slid down over ring expander to its proper place on shaft
- Separate but important function: tool used to protect 4N-0820 Tachometer Drive Seal when assembling rear governor housing by placing ring expander over weight carrier shaft prior to assembling governor housing; rear governor housing that includes tachometer drive seal is then installed by placing it over ring expander; pre-assembled seal is protected from damage due to its position on housing; rounded top of ring expander guides seal into its proper position on carrier shaft

| Part Number | Description |
|-------------|---------------|
| 8T-3226 | Ring Expander |

8T-5223 Reamer

Model: 3406B

Warranty: Six Months

- Used to bore 8N-9679 Governor Housing on 3406B Engine to install 8N-3945 Bushing and to salvage terminal shaft (throttle) bearing bores
- Released as supplement to existing FT drawing for dealers who do not have facilities to make FT tool

| Part Number | Description |
|-------------|------------------------|
| 8T-5223 | Reamer, Same as FT1949 |

| Part Number | Description |
|-------------|--------------------------------|
| FT1951 | Bushing-Drill (Part of FT1950) |

8T-3222 Governor Adjusting Tool Group

Model: 3406B

Warranty: Six Months



- Socket handle assembly along with the 5P-4205 Wrench used to adjust high idle on 3406B Engine while in the vehicle
- Remove high idle adjusting screw cover, install 8T-3222 Governor Adjusting Tool Group over locknut, loosen locknut, adjust high idle screw using 5P-4205 Wrench and retighten locknut; remove tool group and replace cover on governor

| Item | Part Number | Description |
|------|-------------|-------------------------------|
| -- | 8T-3222 | Governor Adjusting Tool Group |
| 1 | 5P-4205 | Wrench ¹ |

¹Warranty: Six Months

4C-4354 Applicator

Model: 3114, 3116

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 4C-4354 | Applicator |

- Required to install Waldes Truarc ring (9X-2315 Retaining Ring, Series 5139-18) on servo on the 3114 and 3116 Governor
- Truarc ring requires a special applicator for installation; 4C-4354 Applicator grasps ring in a recess on underside of tool and holds it tightly under spring tension with an arm which extends over center section; tool angled so ring can be flattened to enter groove; when prongs have cleared shaft and ring is locked in groove, applicator can be withdrawn easily



FT1069 Driver

Model: 621

Warranty: None

- Used to remove seal and cage assemblies from fuel transfer pump on 621 Engine



Fuel Transfer Pump Assembly Tools

Model: 3406, 3408, 3412

Warranty: Six Months

- Used for assembly of fuel transfer pump on 3406, 3408 and 3412 Engines

| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 5P-2391 | Seal Driver |
| 2 | 5P-2392 | Seal Driver |



6V-6169 Check Valve Installer

Model: 3204, 3304B, 3306B, 3406B Series Engines with New Scroll Fuel Systems (NSFS)

Warranty: Six Months



- Used to install check valves in fuel transfer pumps

| Part Number | Description |
|-------------|-----------------------|
| 6V-6169 | Check Valve Installer |

1P-2385 Protractor Assembly

Model: D10, D6H, D7G, D8H, 224, 977L

Warranty: Six Months



- Precision tool for measuring all governor linkage angles
- Used on any linkage assemblies that are adjusted by "angle" method

Reference

SMHS7188, Special Instruction illustrates Woodward Governor linkages including correct linkage dimensions and angles

| Part Number | Description |
|-------------|---------------------|
| 1P-2385 | Protractor Assembly |

2P-8278 Fuel Flow Tube

Model: Cat® Engines

Warranty: One Year



- Install this tube in engine fuel inlet line to determine amount of air entrained in fuel

| Part Number | Description |
|-------------|----------------|
| 2P-8278 | Fuel Flow Tube |

377-5782 High Pressure In-Line Flow Sight

Model Usage: C13, C15, 3204, 3300, 3406B, 3406C

Warranty: Six Months

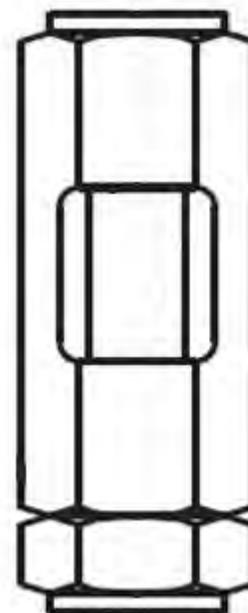
- Used to view fuel passing through fuel line during priming on engines
- Also used to inspect fluid clarity for other applications
- Used in applications where a higher pressure capacity is required

Reference:

SEBF8327, RENR9343

| Specifications | |
|-----------------------------|---|
| Dimensions | 27 x 108 mm (1.06 x 4.25 in) |
| Weight | .06 kg (.13lbs) |
| Materials | Brass, Buna N Seals, Borosilicate Sight |
| Port Size | 3/8"-18 NPT |
| Maximum Working Pressure | 2930kPa (425 psi) |
| Maximum Working Temperature | 65.6° C (150° F) |

| Part Number | Description |
|-------------|----------------------------------|
| 377-5782 | High Pressure In-Line Flow Sight |



9U-6872 In-line Flow Sight

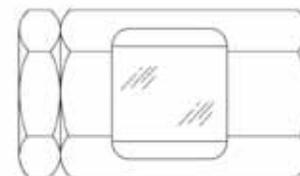
Model: 777C, 785B, 789B, 793B, D11N, and 994

Warranty: Six Months

- Used to view fuel passing through fuel line during priming on 3500 EUI Engines
- Also used to inspect fluid clarity for other applications

| | |
|-----------------------------|----------------------------------|
| Length | 75 mm (3.0 in) |
| Width across flats | 35.05 mm (1.380 in) |
| Port size | 1/2 - 14 NPTF |
| Construction | brass with Buna N seals |
| Maximum working temperature | 93° C (200° F) |
| Maximum working pressure | 345 kPa @ 21° C (50 psi @ 70° F) |

| Part Number | Description |
|-------------|--------------------|
| 9U-6872 | In-line Flow Sight |



185-3630 Filter Strap Wrench

Model: Cat® Engines

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|--|
| 1 | 6H-7378 | Retaining Ring |
| 2 | 1P-0551 | Spring Pin |
| 3 | 2P-8253 | Strap |
| -- | 185-3630 | Filter Strap Wrench Assm. ¹ |

- Provides quick, efficient service when removing or installing all spin-on type fuel and oil filters
- Capable of applying higher torques required on larger filters without denting filter can



(Continued)

185-3630 Filter Strap Wrench (Continued)

Model: Cat® Engines

Warranty: Six Months

¹Warranty: Six Months

Special Sockets for Fast Fill Fuel System Adapters

Model: Cat® Engines

Warranty: Six Months

Engine Tools



Fast-fill fuel system adapters require special sockets for their removal and installation

- 3P-2230 Socket used for Wiggins Adapter
- To remove and install Buckeye Adapter, order HG-190 Socket from Apex Machine and Tool Co, 7659 S. Western Avenue, Chicago, IL 60620

| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 3P-2230 | Socket |

| Item | Part Number | Description |
|------|-------------|-------------|
| 2 | HG-190 | Socket |

369-2607 Digital Dial Indicator

Model Usage: 3116, 994

Warranty: Six Months

- Replaces 1U-8869 Digital Dial Indicator
- Intended primarily for engine fuel system and governor adjustments but can be used in virtually any location or application that requires an indicator
- Can be used for any rack setting that is not greater than 12 mm (0.47 in); only a few engines, such as some 5.4 bore V engines, have rack settings that are greater than 12 mm (0.47 in)
- Especially useful for timing adjustments on engines with unit injectors
- Has 9.52 mm (3/8 in) stem and can be used with standard 9.52 mm (3/8 in) collets and brackets
- Can directly replace both inch and metric mechanical indicators if measuring task does not require more travel than 369-2607 is capable of; replaces 6V-3075, 6V-6106, 9M-9268, discontinued 8S-2283, and 9S-0215 indicators in most applications
- Digital (LED) display which reads in either millimeters or inches —readings displayed to nearest 0.01 mm (0.0005 in)
- Total travel of 12.7 mm (0.50 in) and can be zeroed at any plunger position which allows 369-2608 to read either positive or negative in either direction of plunger travel
- Can be pre-set to read a specific number at a particular plunger position
- Pre-set feature especially useful for measuring or setting timing dimension on engines with unit injectors (1.1 liter, 3500, 3600); pre-set feature allows indicator to be set (off engine) to set gauge dimension; when indicator and timing fixture placed on injector, actual timing dimension is displayed
- Entire head, with display, can be rotated 270° for ease of readability
- Power is supplied by two SR 44 batteries contained in indicator
- Additional features, such as use with remote printer and computers, described in instructions packaged with indicator
- 369-2607 Indicator is similar in several ways to discontinued 8T-1000 Digital Position Indicator but should not be considered interchangeable; discontinued 8T-1000 Indicator has full 25 mm (1 in) travel, remove readout and dampened transducer which allows it to be used for running rack reading; 369-2607 is less tolerant of vibration than discontinued 8T-1000 and is intended primarily as a versatile replacement for mechanical indicators
- Service Part: 3S-3268 Point

(Continued)

369-2607 Digital Dial Indicator (Continued)

Model Usage: 3116, 994

Warranty: Six Months



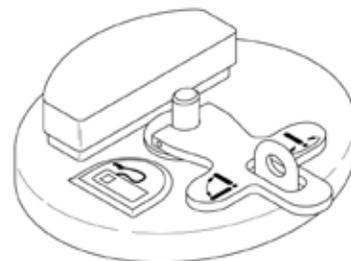
| Part Number | Description |
|-------------|-------------------|
| 369-2607 | Digital Indicator |

FT2650 Vacuum Fuel Cap

Model: 525, 527, and 545 Skidders

Warranty: None

- Used to minimize fuel loss when fuel system must be disassembled
- Special vacuum cap assembly can be installed in place of fuel filler cap
- Applying air pressure to 5P-0306 Vacuum Transducer produces a continuous vacuum in tank
- With 3 to 5 kg/cm² (50 psi) air pressure applied, transducer uses 4.65 C.F.M. of compressed air and pulls 8.75 C.F.M. of vacuum flow at 0 kg/cm² (0 psi)
- Maximum of 406 mm (16 in) Hg is pulled at 5.6 kg/cm² (80 psi) or 254 mm (10 in) Hg at 3 to 5 kg/cm² (50 psi)



171-1085 Bolt Remover Kit, 171-1088 Torque Screw Locknut Wrench, 171-1089 Idle Adjustment Locknut Wrench

Essential Tool

Model: 3054 and 3056 Engines with Stanadyne Pumps

Warranty: Six Months

171-1085 Bolt Remover Kit

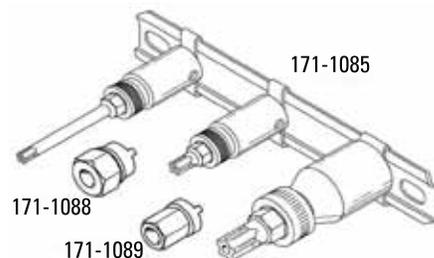
- Replaces discontinued 154-7151 Bolt Remover Kit
- Used to remove and install tamper resistant bolts on Stanadyne fuel injection pump and aneroid shield
- Used with 1/4 and 3/8 inch square drive ratchets
- Used on 5YS, 7MS, 2PW, 3GW serial number engines
- Includes longer 15IPR Torx bit for adjusting torque and idle screw

171-1088 Torque Screw Locknut Wrench

- Used to loosen and tighten the torque screw locknut
- Used with 1/2 inch open end wrench and 1 1/2 inch long 15IPR Torx bit

171-1089 Idle Adjustment Locknut Wrench

- Used to loosen and tighten the idle adjustment locknut
- Used with open end wrench and screw driver



(Continued)

171-1085 Bolt Remover Kit, 171-1088 Torque Screw Locknut Wrench, 171-1089 Idle Adjustment Locknut Wrench (Continued)

Essential Tool

Model: 3054 and 3056 Engines with Stanadyne Pumps
Warranty: Six Months

NOTE:

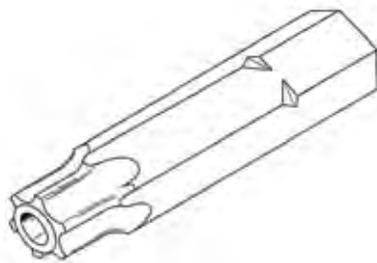
Use of these tamper resistant fastener tools is subject to Environmental Protection Agency (EPA) regulations. Read warning sheet included with each kit before using these tools.

| Part Number | Description |
|-------------|--------------------------------|
| 171-1085 | Bolt Remover Kit |
| 171-1088 | Torque Screw Locknut Wrench |
| 171-1089 | Idle Adjustment Locknut Wrench |

173-9774 Bolt Remover

Essential Tool

Model: 3054 Engine, serial number 5HK Used in 914G and 1T14G
Warranty: Six Months



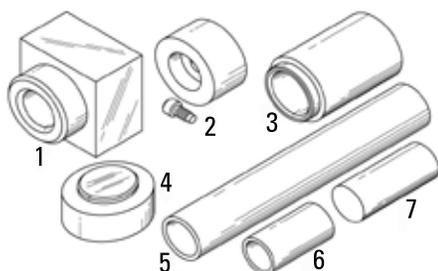
- Used to remove and install tamper resistant fasteners used on fuel injection pump access cover
- Hex shank bit fits standard 3/8 inch hex socket
- Use of this tool is subject to EPA regulations (sale of this tool is intended for internal Cat® Dealer use by qualified mechanics)
- Fastener torque: 22 N·m (16 ft-lb)

| Part Number | Description |
|-------------|--------------|
| 173-9774 | Bolt Remover |

Overhaul Tools for Discontinued 144-0835 High-Pressure Pump

Essential Tool

Model: 3408E and 3412E HEUI Engines (7PR, 4CR)
Warranty: None



- Used to overhaul discontinued 144-0835 High Pressure Oil Pumps

Reference

REHS0192, Special Instruction

| Item | Part Number | Description |
|------|-------------|---------------------------------|
| 1 | FT2606 | Yoke Fixture |
| 2 | FT2607 | Bearing Press Tool (2 required) |
| 3 | FT2608 | Rear Bearing Installation Tool |
| 4 | FT2609 | Valve Block Positioning Tool |
| 5 | FT2610 | Front Bearing Remover |
| 6 | FT2611 | Front Bearing Support (HEUI) |
| 7 | FT2612 | Rear Bearing Remover |

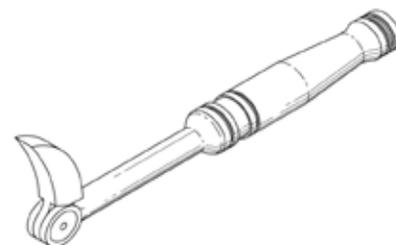
342-9517 Pry Bar

Essential Tool

Model: C9 Engines

Warranty: Six Months

- Used to aid in removal of fuel injectors
- Provides leverage to remove injectors without damage
- Indexable tip allows adjustment to best fit each injector
- Tip can be locked at 17 incremental angles of 15 degrees
- Allen wrench (dealer supplied) used to lock claw into desired position
- Black oxide coated to resist corrosion



| | |
|-----------------------|--------------------|
| Handle length | 304.8 mm (12.0 in) |
| Approximate diameter | 12.7 mm (.500 in) |
| Approximate tip width | 15.87 mm (.625 in) |

| Part Number | Description |
|-------------|-------------|
| 342-9517 | Pry Bar |

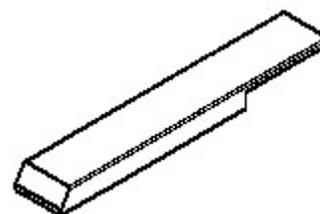
369-4007 Bearing Driver

Model Usage: All C175 Engines

Warranty: Six Months

| Item | Part No. | Description |
|------|----------|----------------|
| 1 | 369-4007 | Bearing Driver |

- Used to remove and install main bearings in C175 Engine
- Replaces cancelled 284-8228 Main Bearing Driver
- Made from high-strength Teflon (1E1581) to prevent damage to bearing and bearing seat



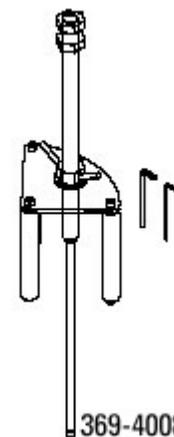
369-4008 Piston Tool Kit

Model Usage: All C175 Engines

Warranty: Six Months

| Item | Part No. | Description |
|------|----------|-----------------|
| 1 | 369-4008 | Piston Tool Kit |

- Used to raise the piston for inspection, removal, or installation of C175 connecting rod bearings



372-5215 High Pressure Rail Block off Plugs

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to test high pressure fuel system for leaks
- 6 pieces per set

| Specifications | |
|----------------|--|
| Weight | 0.14 lb per piece (0.90 lb complete set) |
| Size | 1.15 x .875 in per piece |
| Material | Steel |

| Part Number | Description |
|-------------|------------------------------------|
| 372-5215 | High Pressure Rail Block off Plugs |

372-5239 Fuel Pressure Gauge

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to measure fuel pressure, take a fuel sample and check for aerated fuel.

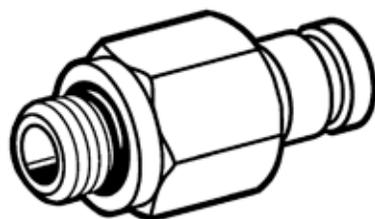
| Specifications | |
|----------------|--|
| Dimensions | 228.6 x 162.6 x 50.8 mm (9.0 x 6.4 x 2.0 in) |
| Weight | .48 kg (1.05 lb) |

| Part Number | Description |
|-------------|---------------------|
| 372-5239 | Fuel Pressure Gauge |

372-5240 Fuel Test Fitting

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to connect fuel/oil pressure test coupler to fuel fitting to measure fuel pressure of fuel inlet restriction
 - When measuring fuel inlet restriction, fitting installed at diagnostic port (inlet side) of filter housing
 - When measuring fuel pressure, fitting can be installed in fuel rail instead of Schrader valve

| Specifications | |
|----------------|--|
| Dimensions | 50.8 x 12.7 x 12.7 mm (2.0 x 0.5 x 0.5 in) |
| Weight | .05 kg (.1 lb) |

| Part Number | Description |
|-------------|-------------------|
| 372-5240 | Fuel Test Fitting |

373-5258 Fuel Filter Wrench

Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to loosen the top collar on Fuel Pro 382 models when replacing fuel filter, cap seal and vent cap seal.
- Tool should not be used to tighten the collar after replacement
- Rust free metal with cushion grip handle

| Specifications | |
|----------------|-------------------|
| Dimensions | 391 mm long |
| Weight | 0.25 kg (0.55 lb) |

| Part Number | Description |
|-------------|--------------------|
| 373-5258 | Fuel Filter Wrench |



373-4717 Injector Remover

Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to remove injectors from cylinder head

| Specifications | |
|----------------|---|
| Dimensions | 218.4 x 132.1 x 116.8 mm (8.6 x 5.2 x 4.6 in) |
| Weight | 2.9 kg (6.5 lb) |

| Part Number | Description |
|-------------|------------------|
| 373-4717 | Injector Remover |



373-4719 Fuel Line Disconnect

373-4721 Fuel Line Disconnect

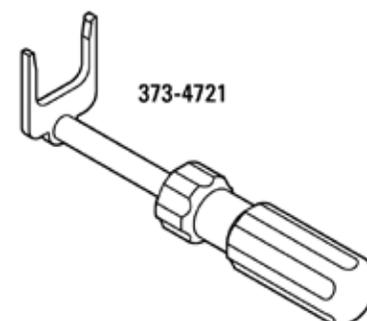
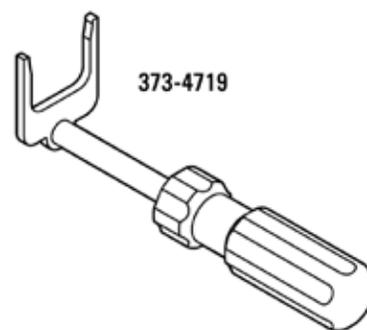
Model Usage: CT660 Truck

Warranty: Manufacturer's

- Used to release the locking mechanism to allow fuel line removal

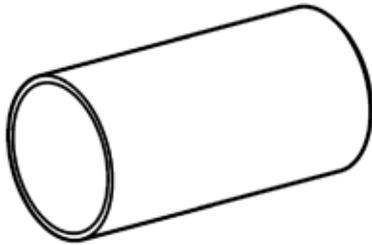
| Specifications | | |
|----------------|---|---|
| | 373-4719 | 373-4721 |
| Dimensions | 127 x 38.1 x 38.1 mm (5.0 x 1.5 x 1.5 in) | 127 x 38.1 x 38.1 mm (5.0 x 1.5 x 1.5 in) |
| Weight | 0.06 kg (0.13 lb) | 0.06 kg (0.13 lb) |

| Part Number | Description |
|-------------|----------------------|
| 373-4719 | Fuel Line Disconnect |
| 373-4721 | Fuel Line Disconnect |



373-4723 Injector Installer

Model Usage: CT660 Truck
Warranty: Manufacturer's



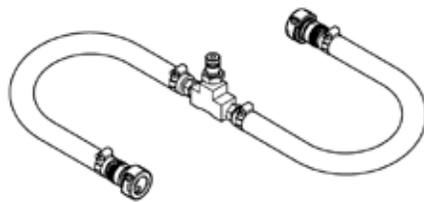
- Used to manually install injector into cylinder head

| Specifications | |
|----------------|-------------------------------|
| Dimensions | 50.8 x 25.4 mm (2.0 x 1.0 in) |
| Weight | 0.01 kg (0.4 oz) |

| Part Number | Description |
|-------------|--------------------|
| 373-4723 | Injector Installer |

373-4727 Fuel Line Restriction and Aeration Tool

Model Usage: CT660 Truck
Warranty: Manufacturer's



- Used to assist in diagnosis of fuel loss or degradation

| Specifications | |
|----------------|--------------------------------|
| Dimensions | 340.4 x 127 mm (13.4 x 5.0 in) |
| Weight | 0.64 kg (1.4 lb) |

| Part Number | Description |
|-------------|---|
| 373-4727 | Fuel Line Restriction and Aeration Tool |

373-4728 High Pressure Fuel Rail Return Tester

Model Usage: CT660 Truck
Warranty: Manufacturer's



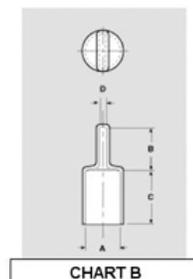
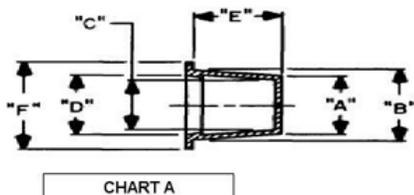
- Used to properly test the high pressure return line
- 17 mm (.70 in)

| Specifications | |
|----------------|---|
| Dimensions | 203.2 x 152.4 x 25.4 mm (8 x 6 x 1 in.) |
| Weight | 0.077 kg (0.2 lb.) |

| Part Number | Description |
|-------------|---------------------------------------|
| 373-4728 | High Pressure Fuel Rail Return Tester |

373-4730 Air & Fuel System Caps

Model Usage: CT660 Truck
Warranty: Manufacturer's



- Used to prevent dirt and debris from entering system during service

(Continued)

373-4730 Air & Fuel System Caps (Continued)

Model Usage: CT660 Truck

Warranty: Manufacturer's

| Part Number | Description |
|-------------|------------------------|
| 373-4730 | Air & Fuel System Caps |

Fuel System Caps

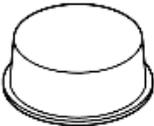
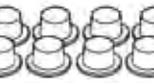
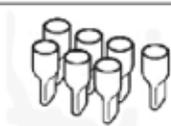
| | TYPE | Dim A | Dim B | Dim C | Dim D | Dim E | Dim F | CHART |
|---|------------------|-------|-------|-------|-------|-------|-------|-------|
|  | Tapered cap/plug | 4.990 | 5.200 | 4.920 | 5.100 | 1.000 | 5.630 | A |
|  | Tapered cap/plug | 4.090 | 4.320 | 4.010 | 4.240 | 1.250 | 4/620 | A |
|  | Tapered cap/plug | 0.690 | 0.788 | 0.628 | 0.726 | 0.560 | 0.940 | A |
|  | Tapered cap/plug | 0.815 | 0.930 | 0.753 | 0.868 | 0.625 | 1.090 | A |
|  | Tapered cap/plug | 0.964 | 1.090 | 0.901 | 1.025 | 0.750 | 1.250 | A |
|  | Tapered cap/plug | 0.390 | 0.456 | 0.327 | 0.394 | 0.380 | 0.590 | A |
|  | Tapered cap/plug | 1.094 | 1.215 | 1.031 | 1.152 | 0.750 | 1.410 | A |
|  | Tapered cap/plug | 2.760 | 2.990 | 2.685 | 2.947 | 1.000 | 3.130 | A |

Chart B

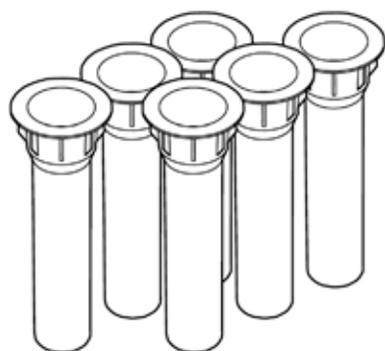
Air System Caps

| | TYPE | Dim A | Dim B | Dim C | Dim D | Dim E | Dim F | CHART |
|---|-------------------|-------|-------|-------|-------|-------|-------|-------|
|  | Cap with Pull-Tab | 0.475 | 0.625 | 1.000 | 0.125 | 1.625 | | B |
|  | Cap with Pull-Tab | 0.427 | 0.625 | 1.000 | 0.125 | 1.625 | | B |

373-4731 Fuel Injector Cups

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used to protect and prevent dirt and debris from damaging injectors while out of engine

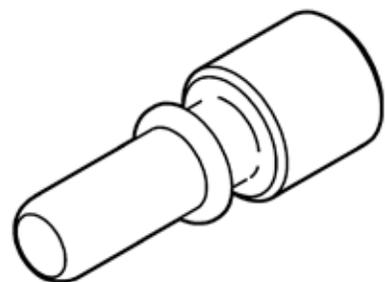
| Specifications | |
|----------------|--|
| Dimensions | 304.8 x 203.2 x 76.2 mm (12 x 8 x 3 in.) |
| Weight | 0.23 kg (0.5 lb.) |

| Part Number | Description |
|-------------|--------------------|
| 373-4731 | Fuel Injector Cups |

373-4734 Fuel Block Off Tool

Model Usage: CT660 Truck

Warranty: Manufacturer's



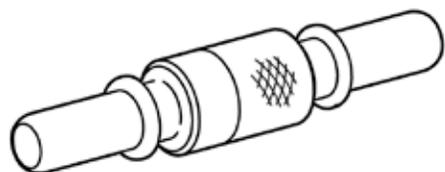
| Specifications | |
|----------------|--|
| Dimensions | 50.8 x 12.7 x 12.7 mm (2 x .5 x .5 in) |
| Weight | 0.1 kg (0.2 lb) |

| Part Number | Description |
|-------------|---------------------|
| 373-4734 | Fuel Block Off Tool |

373-4735 Fuel Line Coupler

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Used for in-line testing and diagnostics during tool usage

| Specifications | |
|----------------|--|
| Dimensions | 45.7 x 106. x 20.3 mm (1.8 x 4.2 x 0.8 in) |
| Weight | 0.1 kg (0.2 lbs) |

| Part Number | Description |
|-------------|-------------------|
| 373-4735 | Fuel Line Coupler |

380-8305 Timing Case Cover Alignment Tool

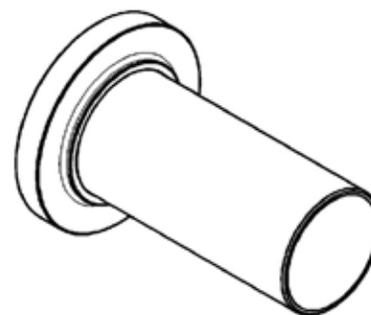
Model Usage: C4.4

Warranty: Six Months

- Used to correctly align pressed steel timing case cover to the timing case

| Specifications | |
|----------------|---------------------------------------|
| Dimensions | 150 x 95 x 95 mm (5.9 x 3.7 x 3.7 in) |
| Material | Steel |
| Weight | 0.77 kg (1.7 lb) |

| Part Number | Description |
|-------------|----------------------------------|
| 380-8305 | Timing Case Cover Alignment Tool |



Pistons, Rings and Connecting Rods

5P-3519 Piston Ring Groove Gauge

Model: Cat® Engines

Warranty: Six Months



- Used to check top and intermediate ring grooves (rectangular) to determine piston reusability
- Includes 5 plug-type gauges that cover all widths of top and intermediate grooves (gauges numbered 1 through 5)
- Attached tag identifies gauges and their use

Reference

SEBF8049, Guideline for Reusable Parts

| Items Included | Description |
|----------------|------------------|
| Form SEHS7758 | Instruction Card |

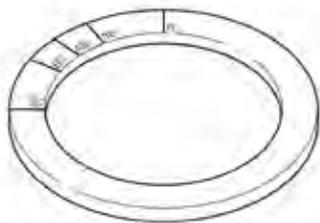
| Item | Part Number | Description |
|--|-------------|--|
| 1 | 5P-4227 | Tag Holder, Form SEES5544 Instruction Card |
| 2 | 6V-3191 | Gauge (#2) |
| 2 | 6V-3194 | Gauge (#5) |
| 2 | 6V-3190 | Gauge (#1) |
| 2 | 6V-3192 | Gauge (#3) |
| 2 | 6V-3193 | Gauge (#4) |
| -- | 5P-3519 | Piston Ring Groove Gauge |
| Also available for 3500 Engines | | |
| -- | 4C-4519 | Gauge Assembly (not part of 5P-3519) |

342-6241 Piston Gauge (3600 Diesel)

Essential Tool

Model: 3600 Engine

Warranty: Six Months



- Used on 197-6700 and 314-2700 Pistons
- Used to determine piston crown to skirt torque
- Used to indicate piston wear and reuse capability
- Used to measure angle on bolt that holds piston crown to piston skirt
- Made from aluminum with red anodizing — etched markings appear gray for better visibility
- Marked at 0, 30, 45, 60, and 90 degrees

| Part Number | Description |
|-------------|----------------------------|
| 342-6241 | Piston Gauge (3600 Diesel) |

1U-6431 Gauge Group

Model: 3406B

Warranty: Six Months

- Used for checking ring groove wear on 7C-0473, 7C-3496 and 7W-3668 Pistons found in some 3406B Truck Engines beginning with 1985 production
- Replaces discontinued 8T-3150 Gauge Group; consists of 6 gauges from 8T-3150 plus 1U-6432 Gauge and revised SEES5678-02 Instruction Card; 1U-6432 and SEES5678-02 Instruction Card can be used to upgrade existing 8T-3150 Gauge Group



| Item | Part Number | Description |
|------|-------------|----------------|
| 1 | 8T-3144 | Gauge Assembly |
| 2 | 8T-3145 | Gauge Assembly |
| 3 | 8T-3146 | Gauge Assembly |
| 4 | 8T-3147 | Gauge Assembly |
| 5 | 8T-3148 | Gauge Assembly |

| Item | Part Number | Description |
|------|-------------|--|
| 6 | 8T-3149 | Gauge Assembly |
| 7 | 1U-6432 | Gauge Assembly |
| 8 | 5P-4227 | Tag Holder, Form SEES5544 Instruction Card |
| 9 | 6V-3196 | Gauge Assembly |
| -- | 1U-6431 | Gauge Group |

Reference

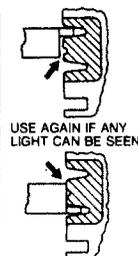
Service Magazine, June 1, 1987, page 15

Truck Engine News, May 1987, Page 8, "Use Correct Pistons and Rings for 3406B Truck Engines"

Description

SEES5678-02 Instruction Card

| BORE SIZE | TYPICAL ENGINES | GAUGES TO USE | |
|-----------|---|---------------|---------------------|
| | | TOP GROOVE | INTERMEDIATE GROOVE |
| 4.75" | 3300, 1674 | B | B |
| 5.4" | D343, 1603 | D | D |
| 5.4" | D346, D348, D349 | B | A |
| 5.4" | 3406, 3408, 3412 (With 3/8" top ring) | A | A |
| 5.4" | 3406, 3408, 3412 (With larger top ring) | E | A |
| 5.4" | 3408B Truck (1985-UP) | G | A |
| 5.75" | D342 | C | C |
| 6.25" | D353 | C | C |
| 170 mm | 3508, 3512, 3516 | F | F |



CHECK GROOVES AT TWO POSITIONS ON MAJOR DIAMETER, 90° FROM EACH PIN BORE. BODY OF GAUGE MUST ALWAYS BE OVER CAST BAND (SEE DRAWINGS).

9U-5931 Piston Ring Groove Gauge

Model: 3114 and 3116 Engines

Warranty: Six Months



- Used to measure piston ring groove
- Checks top and intermediate ring grooves to determine piston reusability
- Used on one-piece aluminum pistons: 7C-5668, 9Y-7452, 9Y-5536, 7E-1298, 7E-3428, 7E-3578
- Dimensions: 12.7 x 9.52 x 47.62 mm (0.5 x 0.37 x 1.87 in)

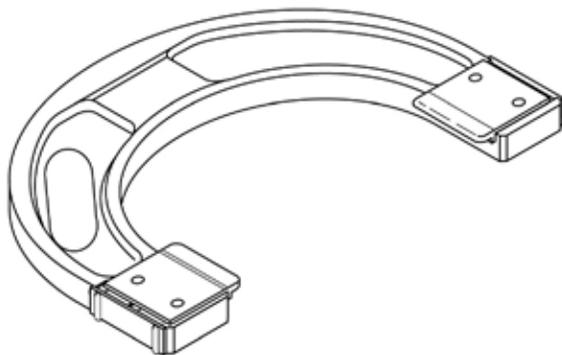
| Part Number | Description |
|-------------|--------------------------|
| 9U-5931 | Piston Ring Groove Gauge |

Piston Ring Groove Gauge Groups

Essential Tool

Model: See below

Warranty: Six Months



- Used to quickly and accurately check top ring groove pistons for wear (checks top ring groove only)
- Uses a simple Go/No-Go design (if piston passes through gauge it cannot be reused)
- Improves reliability of inspection and reduces inspection time
- Gauge repair and recalibration done only by manufacturer (damaged blades can be replaced and adjustable design allows gauge to be easily recalibrated)

References

NEHS0775 Tool Operating Manual

NEHS0834 Tool Operating Manual

NEHS0909 Tool Operating Manual

SEBF8059 Inspection Procedures and Specifications for Pistons

Note: SEBF8059 also specifies the correct gauge for a given piston part number

| Piston Ring Groove Gauges (Horseshoe Type) | | |
|--|--------------------------|----------------------------|
| Part Number | Engine Model | Manufacturer Recalibration |
| 4C-8164 | 3114 and 3116 | No |
| 186-0190 | 3126 | Yes |
| 4C-8165 | 3176 | No |
| 4C-8168 | 3300 | No |
| 4C-8169 | 3400 | No |
| 325-8422 | 3406 | Yes |
| 325-8418 | 3406 to 3412 | Yes |
| 132-4389 | 3406E | No |
| 9U-7360 | 3500 with Keystone Rings | No |

| Piston Ring Groove Gauges (Horseshoe Type) | | |
|--|------------------------------------|----------------------------|
| Part Number | Engine Model | Manufacturer Recalibration |
| 246-1176 | 3500A and B with Monotherm Pistons | Yes |
| 204-8041 | 3500HD and 3524B | Yes |
| 208-7632 | C12, C13, and 3196 | Yes |
| 208-7636 | C16 | Yes |
| 325-8425 | C18 and 3412D | Yes |
| 325-8419 | C18 to C30 | Yes |
| 325-8423 | C32 | Yes |
| 325-8420 | C7 | Yes |
| 325-8417 | C9 | Yes |
| 325-8421 | C9 | Yes |
| 418-9826 | C9 | Yes |

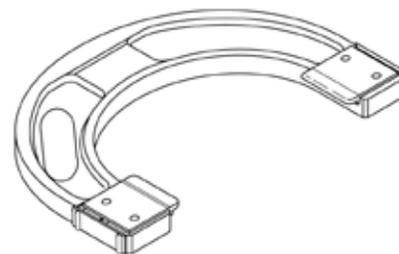
Piston Ring Groove Gauges

Model: 3500B Engines: Serial Numbers 7TR, 2GR, and 7RN

Warranty: Six Months

| Part No. | Description | Used On |
|----------|-------------------|---------------------------|
| 329-2630 | Ring Groove Gauge | top piston ring groove |
| 329-2631 | Ring Groove Gauge | second piston ring groove |

- Used to quickly and accurately check 278-0247 Monotherm Piston Ring Grooves for wear
- Uses a simple Go/No-Go design (if piston passes through gauge it cannot be reused)
- Improves reliability of inspection and reduces inspection time
- Gauge repair and recalibration done only by manufacturer (damaged blades can be replaced and adjustable design allows gauge to be easily recalibrated)



References

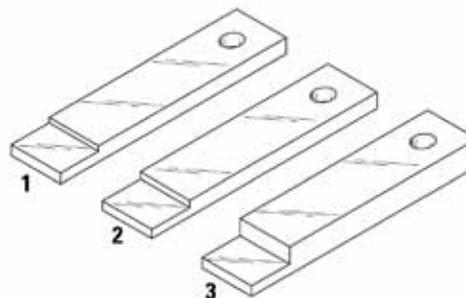
NEHS0909, Tool Operating Manual
SEBF8059, Procedure to Clean and Inspect One-Piece Pistons

Piston Ring Groove Gauges

Model: C140 and C175 Engines

Warranty: Six Months

- Used to check piston ring groove wear to determine usability of C175 Engine piston
- Simple to use Go/No-Go design. If the scribe line is visible, then the piston ring groove is good. If the line is not visible, then the piston is nonreusable.
- Three separate gauges check all three piston ring grooves
- Gauges clearly marked with TOP RING, SECOND RING, and OIL RING for easy identification
- Made from heat treated steel for wear resistance
- Size (length x width): 75 x 19 mm (3.0 x 0.75 in)
- Hole in each gauge [0.125 mm (0.250 in)] allows gauges to be grouped together on a tether

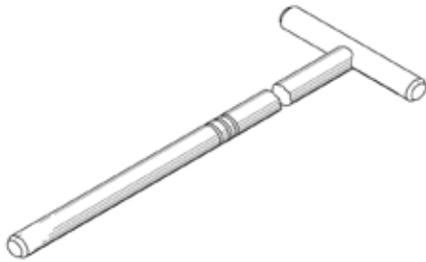


| Item | Part Number | Description |
|------|-------------|---------------------------------|
| 1 | 327-8644 | Ring Groove Gauge (top ring) |
| 2 | 327-8645 | Ring Groove Gauge (second ring) |
| 3 | 327-8646 | Ring Groove Gauge (oil ring) |

FT1022 Gauge

Model: 1100, 3100

Warranty: None



- Used to determine if correct pistons and crankshaft have been installed in 1100 and 3100 Series Engines
- Material: SAE 1020 steel

1U-7616 Compressor Group

Model: 3500

Warranty: Six Months



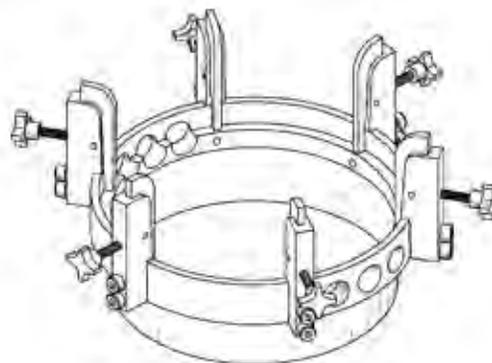
- Band-type piston ring compressor used for servicing 3500 Series Engines
- Similar to former band-type 6V-4021 Ring Compressor Group — improvements allow 1U-7616 to provide better seating of band assembly on cylinder liner to minimize possibility of ring breakage
- Has lock to secure compressed piston rings in place on piston
- Two handles for easier handling of piston, rings and rod assembly

| Item | Part Number | Description |
|------|-------------|------------------|
| 1 | 1U-7615 | Band Assembly |
| 2 | 6V-4027 | Handle Assembly |
| -- | 1U-7616 | Compressor Group |

329-8877 Piston Ring Compressor Tool Group

Model: 3600 Engines
 Warranty: Six Months

- Used to compress piston rings for piston installation on 3600 Engines (fits into top of cylinder liner and guide piston into cylinder)
- Used with overhead lifting device to lower piston/connecting rod assembly into cylinder
- Guide arms hold rings in ring grooves to prevent liner damage during piston insertion
- Guides are hardened (RKW C58-62) and black oxide coated for long wear and resistance to corrosion
- Tool weight: 11.3 kg (25 lbs)



Application Procedure

1. Fully open all six adjustable guide arms.
2. Place tool over piston opening in cylinder block.
3. Lower piston until piston rings aligned with guide arms.
4. Lubricate piston rings and grooves.
5. Turn adjustment knobs to press rings into piston grooves.
6. Lower piston assembly into cylinder block.

| Part Number | Description |
|-----------------------------|-----------------------------------|
| 329-8877 | Piston Ring Compressor Tool Group |
| Service/Repair Parts | |
| 329-8876 | Adjustable Guides |
| 8T-9515 | Socket Head Bolts |
| 5M-2894 | Washer |

255-8897 Ring Compressor Group

Essential Tool

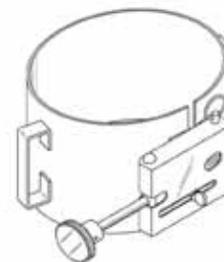
Model: C175 Engine
 Warranty: Six Months

- Used to compress piston rings

Reference

REN7466, C175 Engine Disassembly and Assembly Manual

| Part Number | Description |
|-------------|------------------------------|
| 313-4079 | Band Assembly (not serviced) |



| Part Number | Description |
|-----------------------------|------------------------------|
| 255-8897 | Ring Compressor Group |
| Service/Repair Parts | |
| 313-4079 | Band Assembly (not serviced) |
| 6V-4027 | Handle Assembly |
| 142-8546 | Set Screw |

Piston Ring Expanders

Model: Cat® Engines
Warranty: Six Months



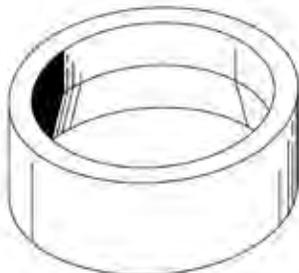
- Used to easily and safely remove and install piston rings
- When removing or installing piston rings without suitable tool, rings apt to be broken or overstressed so they no longer fit cylinder wall properly

| Engine Bore | Expander |
|---------------------------------|----------|
| 114.3 mm (4.50 in) | 5F-9059 |
| 120.7 mm (4.75 in) | 7S-9470 |
| 130.2 mm (5.13 in) ¹ | 4C-3601 |
| 137.2 mm (5.40 in) | 7M-3978 |
| 139.7 mm (5.50 in) | 149-7179 |
| 146.1 mm (5.75 in) | 7B-7974 |
| 158.8 mm (6.25 in) | 5H-9621 |
| 170 mm (6.69 in) | 271-0498 |
| 175 mm (6.89 in) | 271-0504 |
| 280 mm (11.02 in) | 271-0505 |
| 300 mm (11.81 in) | 4C-8995 |

¹ Also available in Engine Bore: 133.4 mm (5.25 in)

Piston Ring Compressors

Model: Cat® Engines
Warranty: Six Months



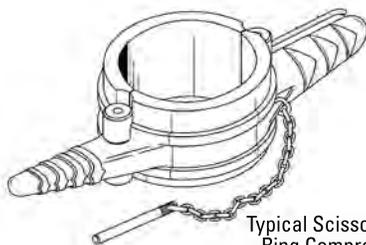
Typical One-Piece Ring Compressor

- Simple, but practical, one-piece piston ring compressors save time and prevent damage to rings when installing pistons in older engines
- Taper on inside is ground to a smooth surface so rings slide through easily
- 2B-8184 and 6H-4140 Compressors no longer available but may be fabricated by requesting drawings for FT1400 and FT1401 Compressors
- Scissors-type piston ring compressors used on more current Cat® engines; much easier and faster to use; ring breakage and injury to fingers practically eliminated

| Engine Bore | Compressor |
|---------------------|-----------------------|
| 146.10 mm (5.75 in) | 2B-8184 {1} or FT1400 |
| 158.80 mm (6.25 in) | 6H-4140 {1} or FT1401 |
| {1} Discontinued | |

| Engine Bore | Compressor |
|------------------|------------|
| 108 mm (4.25 in) | 1U-6684 |

Scissors Type Ring Compressor



Typical Scissor-Type Ring Compressor

| Engine Bore | Compressor |
|--------------------------------------|------------|
| Scissors Type Ring Compressor | |
| 105 mm (4.13 in) | 187-1462 |
| 114.30 mm (4.50 in) | 5P-3524 |
| 120.70 mm (4.75 in) | 5P-3525 |
| 125 mm (4.92 in) | 161-4163 |
| 130.10 mm (5.12 in) | 161-4164 |
| 137.20 mm (5.40 in) | 5P-3526 |
| 139.70 mm (5.50 in) | 149-7180 |
| 145 mm (5.71 in) | 200-3914 |

(Continued)

Scissors Type Ring Compressor (Continued)

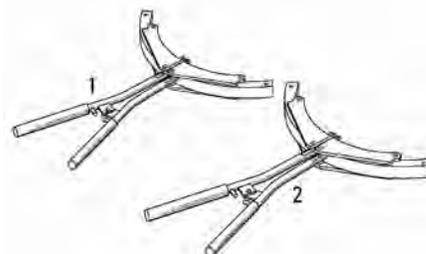
| Engine Bore | Compressor |
|---|------------|
| Scissors Type Ring Compressor (Continued) | |
| 146.10 mm (5.75 in) | 5P-3527 |
| 158.80 mm (6.25 in) | 5P-3528 |
| Scissors Type Ring Compressor (3126 and 3126B Engines) | |
| 110 mm (4.33 in) | 173-5529 |
| Scissors Type Ring Compressor (C9.3 Engines) | |
| 114.85 mm (4.52 in) | 363-4046 |

Piston Ring Expansion Pliers

Model: 3600 Engines
 Warranty: Six Months

- Used to remove and install piston rings
- Will not damage or deform piston rings or piston
- Designed to the correct piston ring diameter
- Handle design provides leverage to expand piston ring

| Item | Part Number | Description | Sized For |
|------|-------------|----------------|------------------------|
| 1 | 318-3117 | Ring Expanders | 280 mm (11.0 in) rings |
| 2 | 318-4874 | Ring Expanders | 300 mm (11.8 in) rings |



1U-6683 Expander

4C-3601 Ring Expander, 1U-6684 Compressor

Model: 3114, 3116, 3176
 Warranty: Six Months

- 1U-6683 Expander used to expand piston rings to install them on piston on 3114 and 3116 Engines
- 4C-3601 Ring Expander used to remove and install piston rings on 3176 Engine
- 1U-6684 Compressor used to compress piston rings to install piston into cylinder on 3114, 3116 and 3176
- 1U-6684 Compressor capacity: 76.2 mm (3 in) to 127.0 mm (5 in)

References

SENR3582, Specification Module
 SENR3583, System Operation Testing and Adjusting
 SENR3611, Disassembly and Assembly Manual
 SEHS8868, Special Instruction, operation

| Part Number | Description |
|-------------|---------------|
| 1U-6683 | Expander |
| 1U-6684 | Compressor |
| 4C-3601 | Ring Expander |

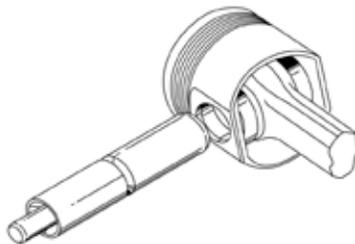


FT2984 Piston Pin Installer

FT2985 Piston Pin Installer

Model: 3500A and B; 3500B HD Engines

Warranty: None



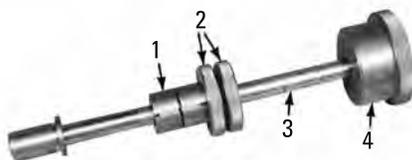
- Used to properly align piston crown, piston skirt, and connecting rod bores prior to installing the piston pin
- Eliminates damage to piston components during installation
- FT2984 is used on 3500B High Displacement Engines and FT2985 is used on 3500A and B Standard Stroke Engines
- To use, place piston pin on installer; align crown, skirt, and connecting rod bores; coat all mating surfaces with clean engine oil; push large end of tool through bores until piston pin is in place; remove installer
- Made from Polyurethane (95 Durometer)

9U-5945 Rod Locating Group

9U-5948 Expanding Segment Group (1.1)

Model: 3114 and 3116 Engines

Warranty: Six Months



- Aligns 3114 and 3116 connecting rods in discontinued 5P-3550 Connecting Rod Boring Machine prior to boring rod eye bushings
- 5P-3550 Connecting Rod Boring Machine is discontinued and not available from Cat®

9U-5948 Expanding Segment Group (1.1):

- Consists of three 50.8 mm (2 in) long segments of split collet and an O-ring (segments sold only as a group)
- Sold separately — not part of 9U-5945 Rod Locating Group

| Item | Part Number | Description |
|---|-------------|---|
| 1 | 9U-5948 | Expanding Segment Group (consists of 3 segments and one 7T-0507 O-ring) |
| -- | 9U-5945 | Rod Locating Group |
| 9U-5945 Rod Locating Group includes: | | |
| 2 | 9U-5944 | Expander Nut (2) (not serviced) |
| 3 | 9U-5943 | Bushing Locating Rod |
| 4 | 9U-5946 | Bushing (not serviced) |
| Not shown | 9U-5947 | Expander Cone (not serviced) |

9U-5917 Pin Mandrel, Bushing Out

9U-5918 Pin Mandrel, Bushing In

Model: 3114 and 3116 Engines

Warranty: Six Months

- Used to check connecting rods
- Provides accurate method for measuring bore misalignment and rod distortion
- Rod can be checked before and after rebuild with rod eye bushing in or out
- Length: 140 mm (5.5 in)
- Composition: steel



| Part Number | Description |
|-------------|--------------------------|
| 9U-5917 | Pin Mandrel, Bushing Out |
| 9U-5918 | Pin Mandrel, Bushing In |

Tools for Connecting Rod Pin Bearing Removal and Installation

Model: Cat® Engines

Warranty: Six Months

- Used to remove and install both tapered and standard connecting rod pin bearings
- Basic 5P-8639 Press Group required for all engines in addition to other tools for each family of engines; refer to table for hydraulic service tools for use with 5P-8639 Press Group
- 5P-8655 Tool Group required for current engines with standard rods

Refer to table below to select appropriate hydraulic pump and for comparison of hydraulic pump press time.

| Hydraulic Service Tools for use with 5P-8639 Press Group | |
|--|------|
| Description | Qty. |
| Hydraulic Pump (Electric or Hand) | 1 |

| Hydraulic Service Tools for use with 5P-8639 Press Group | | | | | |
|--|--|--------------------|------------------------------------|--------------------|------|
| Part Number | Description | Press Time Seconds | Loading and Unloading Time Seconds | Total Time Seconds | Qty. |
| 2P-5500 | (230V) Electric Hydraulic Pump | 10 - 15 | 45 | 55 - 60 | -- |
| 2P-5550 | (115V) Electric Hydraulic Pump | 10 - 15 | 45 | 55 - 60 | -- |
| 3S-6224 | Pump Group - Hydraulic (115V) | 3 - 5 | 45 | 48 - 50 | -- |
| 8S-8033 | Pump Grp - Hydraulic (230V) | 3 - 5 | 45 | 48 - 50 | -- |
| Hydraulic Service Tools for use with 5P-8639 Press Group | | | | | |
| 1P-2375 | Coupler Assembly Quick Connective (Male) | -- | -- | -- | 1 |
| 1P-2376 | Coupler Assembly Quick Connective (Female) (2) | -- | -- | -- | 1 |
| 8F-0024 | Hose Assembly | -- | -- | -- | 1 |

Service Parts for 5P-8639 Connecting Rod Bearing Press Group (Basic)

| Item | Part Number | Description |
|----------------|-------------|--|
| 1 | 5P-8640 | Clamp Bar |
| 2 | 5P-8642 | Clamp Pin |
| 3 ¹ | 5P-9725 | Cylinder Group |
| 4 ² | 1P-2375 | Coupler Assembly Quick Connective (Male) |
| 4 ² | 1P-7437 | Protective Cap |
| -- | 5P-8639 | Connecting Rod Bearing Press Group |



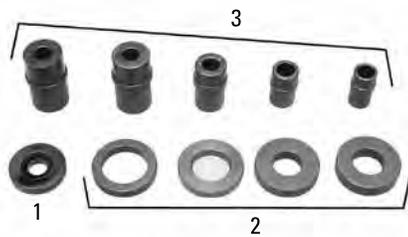
¹5P-9724 Repair Kit is available

²Part of 5P-9725

Pistons, Rings and Connecting Rods

Service Parts for 5P-8655 Connecting Rod Tool Group (Standard)

Engine Tools



| Item | Part Number | Description |
|----------------|-------------|--|
| 1 | 5P-8663 | Adapter |
| 2 | 5P-8661 | Spacer |
| 2 | 5P-8662 | Spacer |
| 2 ¹ | 5P-8654 | Spacer |
| 2 ² | 5P-8647 | Spacer |
| 3 | 5P-8656 | Adapter, D320 or 3204, 3208, D330 and 3300 |
| 3 | 5P-8657 | Adapter, D330 and D330 |
| 3 | 5P-8658 | Adapter, 1693, 3400 |
| 3 | 5P-8659 | Adapter, D342, D353 |
| 3 | 5P-8660 | Adapter, D353, D398 |
| -- | 5P-8655 | Connecting Rod Tool Group |

¹ Also in discontinued 5P-8652

² Also in 5P-8644

Tools for Removing and Installing Tapered Connecting Rod Bearings

Model: Cat® Engines

Warranty: Six Months

- Following is a complete list of tools required for bearing removal and installation. Use the application chart to select the tools for each engine connecting rod assembly.

| Engine Model | Rod Assembly | Push Adapter | Spacer | R and L Adapter | Bar Clamp | Rod Part Number Position |
|--------------|--------------|--------------|---------|-----------------|-----------|--------------------------|
| D346 | 4N-9001 | 5P-8645 | 5P-8647 | 5P-8646 | -- | UP |
| D348 | 4N-9002 | 5P-8645 | 5P-8647 | 5P-8646 | -- | DOWN |
| D349 | 4N-4261 | 5P-8645 | 5P-8647 | 5P-8646 | -- | UP |
| | -- | 5P-8645 | 5P-8647 | 5P-8646 | -- | UP |
| | -- | 5P-8645 | 5P-8647 | 5P-8646 | -- | UP |
| 3204 | -- | 5P-8645 | 6V-4819 | 5P-8653 | -- | DOWN |
| 3208 | -- | 5P-8645 | 6V-4819 | 5P-8653 | -- | UP |
| 3300 | 8N-1721 | 5P-8645 | 6V-3029 | 6V-2049 | -- | |
| 3400 | 7N-3229-6 | 5P-8649 | 5P-8651 | 5P-8650 | 5P-8640 | UP |
| | 7N-3231-6 | 5P-8649 | 5P-8651 | 5P-8650 | 5P-8640 | UP |
| | 8N-1726-9 | 5P-8645 | 6V-3197 | 5P-8646 | 5P-8640 | |
| | 8N-2486-9 | 5P-8645 | 6V-3197 | 5P-8646 | 5P-8640 | UP |
| 3500 | -- | 5P-8649 | 6V-3043 | 6V-3042 | 5P-8640 | DOWN |
| 6° | -- | 5P-8649 | 6V-3043 | 6V-3042 | 5P-8640 | DOWN |
| 3500 | -- | 4C-8725 | 4C-8726 | 4C-8727 | 5P-8640 | DOWN |
| 10° | -- | | | | | DOWN |
| 1.1 L | -- | 4C-9749 | 4C-9751 | 4C-9750 | -- | |
| 12.5° | | | | | | |

(Continued)

Tools for Removing and Installing Tapered Connecting Rod Bearings (Continued)

Model: Cat® Engines
Warranty: Six Months



| Item | Part Number | Description |
|------|-------------|-------------|
| 1 | 5P-8653 | Adapter |
| 2 | 6V-2049 | Adapter |
| 3 | 6V-4819 | Spacer |
| 4 | 5P-8650 | Adapter |
| 5 | 5P-8645 | Adapter |
| 6 | 5P-8646 | Adapter |
| 7 | 5P-8649 | Adapter |
| 8 | 6V-3042 | Adapter |
| 8 | 8T-5261 | Adapter |
| 9 | 6V-3043 | Spacer |
| 10 | 6V-3197 | Spacer |
| 11 | 5P-8647 | Spacer |
| 12 | 5P-8651 | Spacer |
| 13 | 6V-3029 | Spacer |

1U-6242 Pin Bushing Adapter
1U-6244 Spacer, 1U-6243 Push Adapter

Model: 3176 Engine
Warranty: Six Months

- Used to remove and install piston pin bearing on 9Y-1170 and 4P-2232 Connecting Rod Assemblies
- Used with 5P-8639 Press Group
- The base plate of the 5P-8639 Press Group must be modified in order to remove and install the piston pin bearing; drill and tap a 5/8-11 hole, 225.00 mm (8.858 in), from the center of the largest bore; refer to diagram

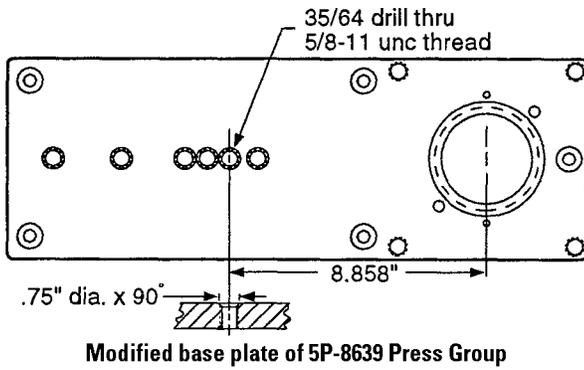


| Part Number | Description |
|-------------|---------------------|
| 1U-6242 | Pin Bushing Adapter |
| 1U-6243 | Push Adapter |
| 1U-6244 | Spacer |

Pistons, Rings and Connecting Rods

Base Plate

Engine Tools



1U-9032 Pin Bushing Adapter

1U-9033 Spacer, 1U-9034 Push Adapter

Model: 3406E Engine

Warranty: Six Months



- Used to remove and install connecting rod pin bearing (9Y-6054 Connecting Rod Assembly)
- Used with 5P-8639 Press Group
- Specifically designed for connecting rods with 12° taper

| Part Number | Description |
|-------------|---------------------|
| 1U-9032 | Pin Bushing Adapter |
| 1U-9033 | Spacer |
| 1U-9034 | Push Adapter |

FT1888 Slide Hammer Adapter

Model: 3208

Warranty: None



- Used with 1P-0074 Slide Hammer to install bolts
- Used to replace bolt without removing piston/rod assembly when connecting rod bolt is damaged

Reconditioning Connecting Rod Tools

Model: Cat® Engines
 Warranty: Six Months

- Used to produce smoother surface finish (10 MU or less required) in piston pin bearing when new piston pin bearing is installed in connecting rod and 4W-7402 Piston is used
- Smoother surface finish required only for new piston pin bearings
- 8T-2841 (discontinued) and 8T-2842 Pin Mandrel used with discontinued 5P-2050 Rod Checking Fixture to check bend, twist, and center distance



References

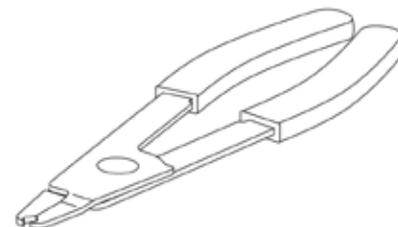
SMHS7366, Special Instruction
 SEBF8075, Guideline for Reusable Parts

| Item | Part Number | Description |
|-----------|-------------|-----------------------------------|
| 1 | 8T-3103 | Buffing Tool Group (not serviced) |
| 2 | 8T-3104 | Polishing Compound (not serviced) |
| 3 | 8T-2840 | Bushing Compound |
| 4 | 8T-3171 | Tool Bit (not serviced) |
| 5 | 8T-3170 | Set Screw |
| Not shown | 8T-2841 | Pin-Mandrel (Bushing Out) |
| Not shown | 8T-2842 | Pin-Mandrel (Bushing In) |

139-9039 Snap Ring Pliers

Model: 3400 Engines
 Warranty: Six Months

- Used to remove specially designed piston pin retaining rings without holes such as 7E-5665 and 7E-1177
- Holds ring in tight clearance against piston pin
- Overall length: 213 mm (8.4 in)



| Part Number | Description |
|-------------|------------------|
| 139-9039 | Snap Ring Pliers |

4C-8725 Pin Bushing Adapter

4C-8726 Spacer, 4C-8727 Push Adapter

Model: 3500 Family Engines with discontinued 7C-8608 (10°) Connecting Rod Assemblies
 Warranty: Six Months

- Allow 5P-8639 Press Group to be used to remove and install piston pin bearings in 3500 Family Engines with discontinued 7C-8608 Connecting Rod Assemblies (10° taper on piston pin end)
- Fits rods with 10° taper



| Part Number | Description |
|-------------|---------------------|
| 4C-8725 | Pin Bushing Adapter |
| 4C-8726 | Spacer |
| 4C-8727 | Push Adapter |

4C-9749 Push Adapter

4C-9750 Bushing Adapter, 4C-9751 Spacer

Model: All 1.1 Liter Engines

Warranty: Six Months



- Used to remove and install connecting rod bearings
- Provides economical means to rebuild connecting rods

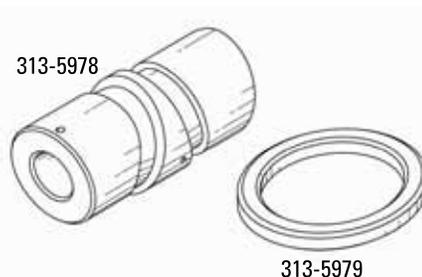
| Part Number | Description |
|-------------|-----------------|
| 4C-9749 | Push Adapter |
| 4C-9750 | Bushing Adapter |
| 4C-9751 | Spacer |

313-5978 Pin Bushing Adapter, 313-5979 Spacer

Essential Tool

Model: C27 and C32 Engines

Warranty: Six Months



- Used together to remove and install connecting rod bearings
- Used with a suitable press
- Provides an efficient way to rebuild connecting rods, without damaging components
- Durable, black-oxide coating

| Part Number | Description |
|-------------|---------------------|
| 313-5979 | Spacer |
| 313-5978 | Pin Bushing Adapter |

FT1571 Piston Storage Cabinet and Connecting Rod Assembly

Model: Cat® Engines

Warranty: None



- After reconditioning, piston and connecting rod assemblies must be covered with oil and placed in a clean storage area; cabinet keeps these components clean and provides good access
- Cabinet doors made of Plexiglass front and back permitting piston and rod assemblies to be put into cabinet on one side and removed from other side
- Doors are fastened to rollers and slide past each other
- Clear Plexiglass keeps dirt out but permits service personnel to see how many assemblies are available
- Rear of cabinet can be made from sheet metal if it is not necessary to enter cabinet from both sides
- Size (H x W x D): 2134 x 2159 x 1219 mm (84 x 85 x 48 in)

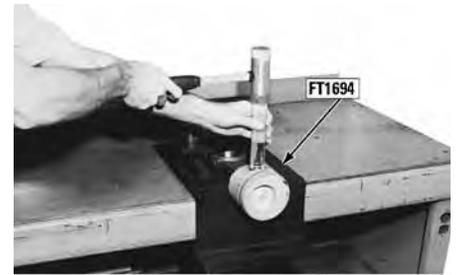
Fabricated Tools for Use in Reconditioning Piston and Connecting Rod Assemblies

Model: Cat® Engines

Warranty: None

- Used when reconditioning large numbers (batch processing) of pistons and/or connecting rod assemblies
- Make it possible to work on several pistons and/or connecting rod assemblies at same time decreasing amount of time needed for reconditioning

| Part Number | Description |
|-------------|------------------------------------|
| FT1694 | Piston and Rod Disassembly Fixture |



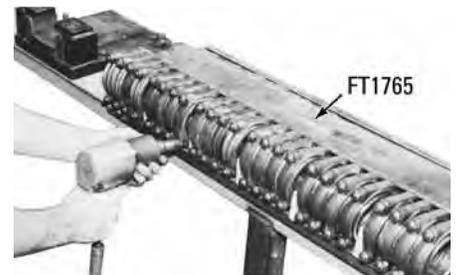
FT1716 Bolt Installation Tool

| Part Number | Description |
|-------------|------------------------|
| FT1716 | Bolt Installation Tool |



FT1765 Fixture, Holding, Connecting Rod

| Part Number | Description |
|-------------|--------------------------------|
| FT1765 | Connecting Rod Holding Fixture |



Ring Heater

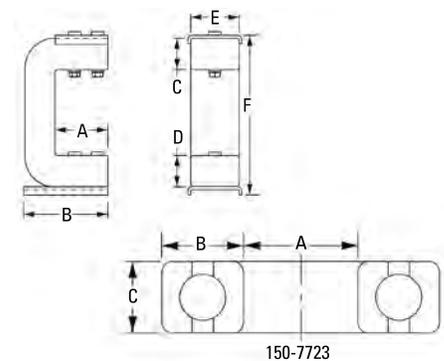
Model: All Models

Warranty: Six Months

| Part Number | Description |
|-------------|-------------|
| 150-7723 | Ring Heater |

- 150-7723 Ring Heater replaces discontinued 1U-5454 Heater Ring

| 150-7723 Ring Heater | |
|----------------------|--------|
| Item | Size |
| A | 60 mm |
| B | 95 mm |
| C | 35 mm |
| D | 35 mm |
| E | 55 mm |
| F | 180 mm |



360-3040 and 364-1170 Induction Heaters

Essential Tool

Model: All models

Warranty: Manufacturer's

Engine Tools



European Union compliant, CE marked

- Replaces canceled 6V-6996 and 6V-7118 Bearing Heaters
- Used to heat metal bearings, gears, rings, and bushings where a press fit is required
- Part heated by low voltage and high current induction to ensure equal temperature over the entire part (inner and outer ring)
- Suitable for use with sealed bearings, shielded bearings, pre-greased bearings, and bearings with polyamide cages
- Pivoting yoke design reduces unnecessary handling, reduces risk of contamination
- Suitable for continuous use — without any additional cooling system
- Includes a temperature detector (sensor) for monitoring part temperature during normal heating only
- If higher temperatures are required, use 164-3310 Infrared Thermometer
- Includes five different size induction yokes for maximum versatility
- Intelligent, programmable electronic unit:
 - includes IR remote control
 - set time and temperature to heat parts uniformly
 - program count down before heater start
 - probe and microprocessor constantly monitor heating process
 - power can be set manually from 0 to 100%

Repair Information

TM Induction Heating US Sales

Office: 720-266-4403

Mobile: 720-838-5980

Fax: 303-646-4880

E-mail: rick@tminduction-us.com

Website: www.tminduction-us.com

| Part Number | Description |
|-------------|------------------|
| 360-3040 | Induction Heater |
| 364-1170 | Induction Heater |

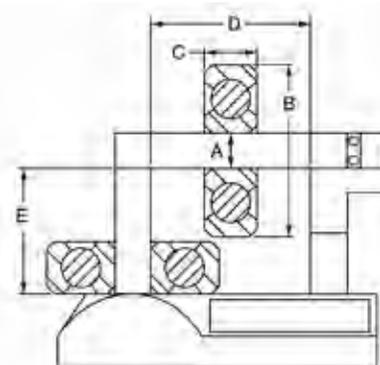
360-3040 and 364-1170 Induction Heaters (Continued)

| | |
|------------------------------|--|
| Voltage | |
| 360-3040 | 110 V |
| 364-1170 | 220V |
| Frequency | 50 or 60 Hz |
| Power | 3.6 kVA |
| Residual magnetism | less than 2 A/cm |
| Temperature mode | maximum 240° C (464° F) |
| Temperature control accuracy | ±2° C (3.6° F) |
| Timer accuracy | .01 seconds |
| Weight | 36 kg (68.3 lb) |
| Dimensions | 420 x 260 x 360 mm (16.8 x 10.2 x 14.7 in) |
| U-core width (D) | 180 mm (11.0 in) |
| U-core height (E) | 160 mm (6.3 in) |

360-3040 and 364-1170 Induction Heaters - Yoke Dimensions

| Induction Yoke Size | Part-Minimum Bore (A) | Part-Maximum Outside Diameter (B) | Part-Maximum Outside Diameter (B) With Optional Extension Yoke ¹ | Part-Maximum Width (C) | Part-Maximum Weight |
|--|-----------------------|-----------------------------------|---|------------------------|----------------------|
| 10 x 10 x 280 mm (0.39 x 0.39 x 11.02 in) | 15 mm (0.59 in) | 330 mm (12.99 in) | 570 mm (22.44 in) | 180 mm (11.02 in) | 5 kg (11 lb) |
| 14 x 14 x 280 mm (0.55 x 0.55 x 11.02 in) | 20 mm (0.78 in) | 345 mm (13.58 in) | 585 mm (23.03 in) | 180 mm (11.02 in) | 15 kg (33 lb) |
| 25 x 25 x 280 mm (0.98 x 0.98 x 11.02 in) | 35 mm (1.37 in) | 355 mm (13.97 in) | 595 mm (23.42 in) | 180 mm (11.02 in) | 25 kg (55 lb) |
| 40 x 40 x 280 mm (1.58 x 1.58 x 11.02 in) | 60 mm (2.36 in) | 360 mm (14.17 in) | 600 mm (23.62 in) | 180 mm (11.02 in) | 40 kg (88 lb) |
| 50 x 50 x 280 mm (1.96 x 1.96 x 11.02 in) | 70 mm (2.75 in) | 410 mm (16.14 in) | 600 mm (23.62 in) | 180 mm (11.02 in) | 35-70 kg (77-154 lb) |

¹Optional Extension Yoke 50 x 50 x 120 mm (1.96 x 1.96 x 4.72 in)

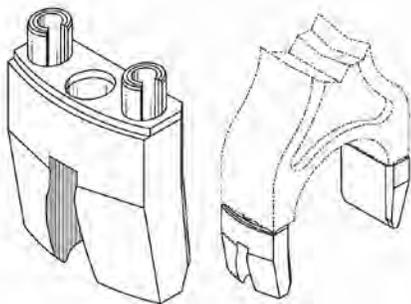


274-5875 Connecting Rod Guide Assembly

Essential Tool

Model: C175 Engine

Warranty: Six Months



- Used in pairs to position C175 Engine connecting rods during removal and installation
- Covers connecting rod end to prevent crankshaft and bearing journal damage
- Helps guide connecting rod over crankshaft rod journal during disassembly and assembly
- Guides are made from lightweight plastic
- Spring pins locate guide on connecting rod
- Guide is attached to connecting rod using 276-0100 Bolt installed through center opening
- Two guides used on each connecting rod — order in pairs

Reference

REN7466, C175-16 Generator Set Engine, Disassembly and Assembly, Pistons, Liners, and Connecting Rods, Remove and Install

| Part Number | Description |
|-------------|-------------------------------|
| 274-5875 | Connecting Rod Guide Assembly |

339-6503 Bolt

Essential Tool

Model: C175 Cat® Engines

Warranty: Six Months

- Replaces canceled 276-0010 Bolt
- Used to attach 274-5875 Connecting Rod Guide Assembly to connecting rod to protect engine components during engine disassembly and assembly
- M10 socket head bolt has M13 x 1.5 threads and is 82 mm (3.2 in) long
- Two required for use with connecting rod guide assembly

References

KENR6052, C175-16 and C175-20 Engines for Caterpillar Built Machines, Disassembly and Assembly

REN7466, C175-16 Generator Set Engine, Disassembly and Assembly

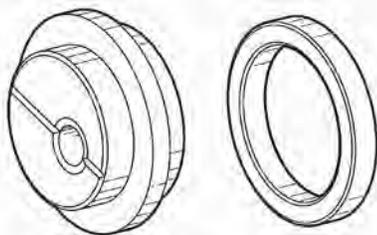
| Part Number | Description |
|-------------|-------------|
| 339-6503 | Bolt |

370-9186 Spacer, 322-6227 Center Plug

Essential Tool

Model Usage: C15 Engine

Warranty: Six Months



- Used to remove and install connecting rod wrist pin bearing
- Used with base plate of 5P-8639 Press Group
- Material: steel

Reference

SEBF8242, Engine Service Manual, Procedure for Removing and Installing Connecting Rod Bearing

| Part Number | Description | Overall Size | Weight |
|-------------|-------------|---|--------------------|
| 322-6227 | Center Plug | 100 mm (3.9 in) dia x 15.6 mm (.61 in) thick | 0.381 kg (0.83 lb) |
| 370-9186 | Spacer | 124 mm (4.9 in) dia x 50.0 mm (1.96 in) thick | 3.1 kg (6.8 lb) |

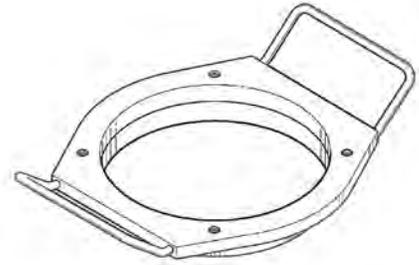
364-2837 Installer Assembly (Ring Compressor)

Essential Tool

Model Usage: G3512E and G3520E Engines

Warranty: Six Months

- Used to install piston and connecting rod assembly into engines with 350-0074 Cuffed Liners
- Fits inside of liner allowing rings to pass through cuffed section
- One-piece design
- Heat-treating and electrolysis nickel plating make tool very durable
- Teflon coating reduces friction of rings passing through tool during assembly

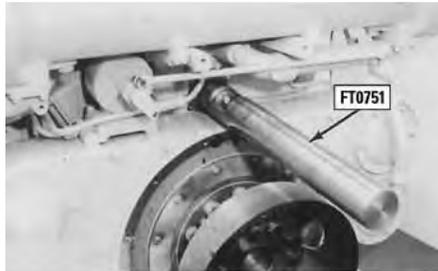


| Part Number | Description | Overall Size | Weight |
|-------------|--------------------------------------|--|-----------------|
| 364-2837 | Installer Assembly (Ring Compressor) | 30.4 x 21.1 x 3.18 cm (12 x 8.3 x 1.25 in) | 1.5 kg (3.3 lb) |

Camshaft and Timing Gear Tools

FT0751 Camshaft Alignment Sleeve

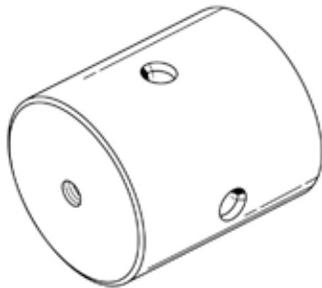
Models: D379, G379, D398, G398, D399, G399
Warranty: None



- Used when installing camshaft
- Fits over tapered end of camshaft and guides it into position, minimizing possibility of bearing damage

131-1525 Camshaft Alignment Pilot Assembly

Model: C-10 and C-12 Engines
Warranty: Six Months



- Used to remove and install camshafts (threads directly onto end of camshaft)
- Made from aluminum to prevent damage to cam bearings
- 2 cross-drilled holes provide means of removing pilot assemblies after camshaft is installed
- 2 required — thread 4 into the other to make installation between engine and firewall easier

References

SENR1002, Service Manual Module
SENR1007, Service Manual Module

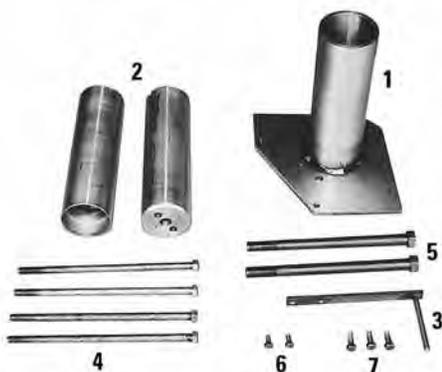
| | |
|------------------|---------------------|
| Length | 98 mm (3.9 in) |
| Outside diameter | 74.74 mm (2.943 in) |
| Stud | M10 x 1.5 thd |

| Part Number | Description |
|-------------|-----------------------------------|
| 131-1525 | Camshaft Alignment Pilot Assembly |

Camshaft Installation Tools

Model: 3500

Warranty: Six Months



- Direct replacement for discontinued 6V-4019 Pilot Group; new tooling can be used on all earlier engines
- When installing camshaft into camshaft bearings in cylinder block, it is necessary to provide pilot/guide for camshaft to prevent damage to bearings; because of changes in camshafts of 3500 engines, there are new installation tools that pilot camshaft from both ends until camshaft is in place
- Designed so camshaft can be installed from either end of engine

(Continued)

Camshaft Installation Tools (Continued)

Model: 3500

Warranty: Six Months

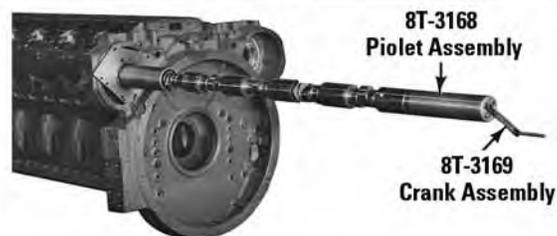
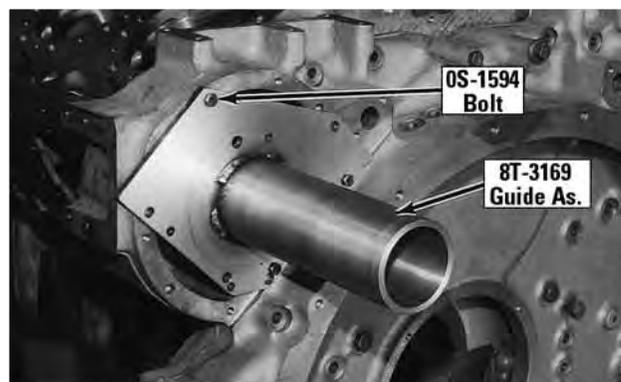
| Item | Part No. | Description | Size | Qty. |
|------|----------|----------------|------|------|
| 1 | 8T-3167 | Guide Assembly | -- | 1 |
| 2 | 8T-3168 | Pilot Assembly | -- | 2 |
| 3 | 8T-3169 | Crank Assembly | -- | 1 |

| Item | Part No. | Description | Size | Qty. |
|------|----------|-------------|-------------------------|------|
| 4 | 8S-3887 | Bolt | 1/2 in - 13 x 11 inL | 4 |
| 5 | 4J-7945 | Bolt | 3/4 in - 10 x 1 1/2 inL | 2 |
| 6 | 0S-1617 | Bolt | 5/16 in - 18 x 3/4 inL | 2 |
| 7 | 0S-1594 | Bolt | 3/8 in - 16 x 1 inL | 3 |

Application Procedure

1. Use three 0S-1594 Bolts, finger tight, to install 8T-3167 Guide Assembly on flywheel housing or front cover as shown
2. Install 8T-3168 Pilot Assemblies and 8T-3169 Handle Assembly on camshaft as shown. 2-piece camshafts should be separated for installation.
3. Put engine oil on all bearings and camshaft journals. Install pilot and camshaft through guide assembly until pilot is located in first bearing. Tighten bolts on guide assembly while turning camshaft.
4. On 3508 Engines, complete the installation of the camshaft while rotating camshaft. Remove tooling and complete engine assembly.

On 3512 and 3516 Engines, one end of separated camshaft is rotated and installed as far as camshaft joint. Attach other end of camshaft and complete installation while rotating camshaft. Remove tooling and complete assembly of engine.



Camshaft Removal and Installation Tools

Model: C175 Engine

Warranty: Six Months



- Used to remove and install camshaft from front or rear of engine
- Pilot assembly used with 8T-3169 Turning Handle
- Guide can be mounted to cylinder block or to front or rear engine rollover adapter plates
- Pilot assembly simultaneously engages two cam bearings to ensure proper alignment
- Camshaft pilot and turning handle provide smooth access into cam bearings

| Part Number | Description |
|-------------|-------------------------|
| 255-2820 | Camshaft Pilot Assembly |
| 8T-3169 | Crank Assembly |
| 282-9962 | Camshaft Guide Assembly |

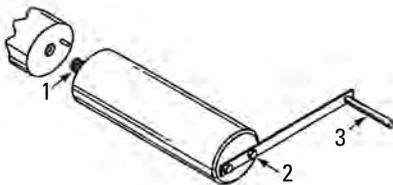
Reference

REN7466, C175-16 Engine Disassembly and Assembly Manual

125-0200 Camshaft Pilot

Model: 3500B Engine with Large Diameter Camshaft

Warranty: Six Months



- Used to remove and install 106-4584 Camshaft — simply threads onto end of camshafts and functions as a guide during installation or removal
- Used with 8T-3169 Crank Assembly to help rotate camshaft during engine assembly and disassembly (use two 0S-1617 Bolts to attach crank assembly to camshaft)
- Length of pilot is designed to be supported by 2 camshaft journals at the same time (prevents camshaft from dropping as it is installed through each bearing journal)
- Groove in end of pilot provides clearance for dowel pin in camshaft (eliminates removal of dowel)
- Made from aluminum to prevent scratching or other damage to journal surfaces
- Diameter: 91.9 mm (3.62 in)
- Length: 305.0 mm (12.0 in)

| Item | Part Number | Description | Quantity |
|------|-------------|-----------------------------------|----------|
| 1 | 2P-1303 | Taperlock Stud (part of 125-0200) | -- |
| 2 | 0S-1617 | Bolt | 2 |
| 3 | 8T-3169 | Crank Assembly | -- |
| -- | 125-0200 | Camshaft Pilot | -- |

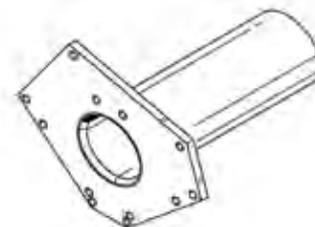
125-0201 Camshaft Guide Assembly

Model: 3500B Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------|
| 125-0201 | Camshaft Guide Assembly |

- Used to install camshaft from either end of engine
- Reduces installation time and helps prevent camshaft bearing damage
- Used with front or rear housing in place (does not bolt to bare block face)
- Overall length: 303.0 mm (11.9 in)
- Tube inside diameter: 91.98 mm (3.621 in)

**Camshaft Removal and Installation Tools**

Model: 3406E Engines

Warranty: Six Months

- Used to remove and install camshaft in chassis
- Prevents damage to camshaft and bearings
- Provides way to lift camshaft without pinching fingers

References

SENR5580, Service Manual, 3406E Engines

SENR6421, Disassembly and Assembly Manual

| Camshaft Removal and Installation Tools Specifications | |
|--|--|
| 9U-7256 Guide Assembly (Item 1) | |
| Tube (outside diameter x length) | 102 x 195 mm (4.0 x 7.7 in) |
| Plate (W x L x T) | 205 x 296 x 9.5 mm (8.0 x 11.6 x 0.38 in) |
| Plate offset from end of tube | 65 mm (2.5 in) |
| 274-7932 Guide Assembly - Front (Item 1) | |
| Tube (outside diameter x length) | 102 x 228 mm (4.0 x 8.9 in) |
| Plate (W x L x T) | 203.2 x 203.2 x 9.5 mm (8.0 x 8.0 x 0.38 in) |
| Plate offset from end of tube | 80 mm (3.15 in) |
| 274-7933 Guide Assembly - Rear (Item 1) | |
| Tube (outside diameter x length) | 102 x 203 mm (4.0 x 8.0 in) |
| Plate (W x L x T) | 249 x 279 x 9.5 mm (9.8 x 11.0 x 0.38 in) |
| Plate offset from end of tube | 65 mm (2.5 in) |
| 9U-7243 Alignment Sleeve (Item 2) | |
| Material | Steel tube |
| Tube (diameter x length) | 85 x 430 mm (3.3 x 17.0 in) |
| 9U-7225 Camshaft Pilot (Item 3) | |
| Material | Aluminum |
| Rod (diameter x length) | 84 x 85 mm (3.3 x 3.3 in) |
| Threaded stud (serviced by 3D-0490 Stud) | 1/2 in-13 x 1.0 in |
| 9U-7240 Camshaft Lifting Hook (Item 4) | |
| Handle (diameter x length) | 25 x 120 mm (1.0 x 4.8 in) |
| Hook (diameter x length) | 6.4 x 180 mm (0.25 x 7.0 in) |
| 9U-7257 Cradle Assembly (Item 5) | |
| Rod (diameter x length) | 40 x 140 mm (1.5 x 5.4 in) |
| Plate (W x L x T) | 91 x 130 x 7.9 mm (3.5 x 5.0 x 0.31 in) |

(Continued)

Camshaft and Timing Gear Tools

Camshaft Removal and Installation Tools (Continued)

Model: 3406E Engines

Warranty: Six Months

Engine Tools

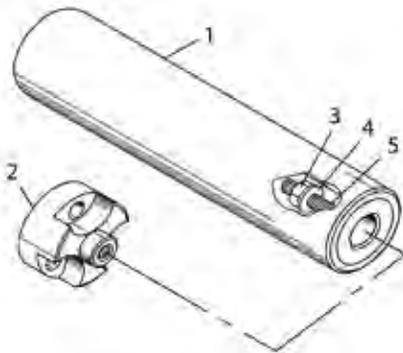


| Item | Part Number | Description |
|------|-------------|------------------------|
| 1 | 9U-7256 | Guide Assembly |
| 1 | 274-7932 | Guide Assembly - Front |
| 1 | 274-7933 | Guide Assembly - Rear |
| 2 | 9U-7243 | Alignment Sleeve |
| 3 | 9U-7225 | Camshaft Pilot |
| 4 | 9U-7240 | Camshaft Lifting Hook |
| 5 | 9U-7257 | Cradle Assembly |

177-8003 Cam Tool Group

Model: 3406E, 3456, C-15, C-16, C27/C32

Warranty: Six Months



- Used to remove camshaft through front or rear of cylinder head
- Used with three 6L-4697 Bolts to connect adapter to camshaft (not included)
- Used on many machines, cab over trucks, or when cylinder head is off for repair
- Saves time by allowing cam removal without removing other components
- Pilot sleeve simultaneously engages 2 cam bearings to guide cam without damaging bearings — loosely assemble components to prevent tool alignment problems
- To remove camshaft through front of cylinder head, screw only pilot sleeve into opposite end of camshaft
- To remove cam through rear of head: 1) remove cam gear; 2) bolt adapter onto camshaft; 3) screw pilot sleeve onto adapter
- Minimum pilot sleeve clearance between head and other components: 368.0 mm (14.5 in)

(Continued)

177-8003 Cam Tool Group (Continued)

Model: 3406E, 3456, C-15, C-16, C27/C32

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|--|
| 1 | 177-8001 | Pilot Sleeve |
| 2 | 249-2936 | Adapter (C27/C32 front install) |
| 2 | 177-8002 | Adapter (3406, C-15, C-16, C27/C32 rear install) |

| Item | Part Number | Description |
|------|-------------|--|
| 3 | 1F-7958 | Full Nut (1/2 - 13) (fork mounting hardware) |
| 4 | 5P-8245 | Hard Washer |
| 5 | 3D-0472 | Taperlock Stud |
| -- | 177-8003 | Cam Tool Group |

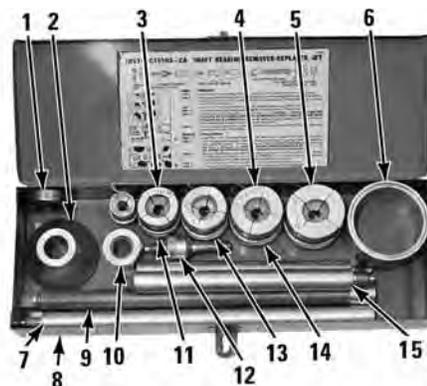
8S-2241 Camshaft Bearing Installation and Removal Group

Model: Cat® Engines

Warranty: Six Months

- Used to remove and install camshaft bearings in most Cat® Engines
- Each collet designed to handle bearing diameter range listed in chart; replacement O-ring seals used to retain collets also listed

| Item | Description | |
|--------------------------------|-------------------------------------|--------------------------|
| 13 | Backup Nut | |
| Collet Assembly Specifications | | |
| Collet | Inner Diameter Size Range | Replacement O-Ring Seals |
| 8S-8285 | 60.33 - 69.85 mm (2.375 - 2.750 in) | 4J-0524 |



| Item | Part Number | Description |
|------|-------------|-------------------------|
| 1.0 | 8S-8287 | Thrust Bearing Assembly |
| 2.0 | 8S-8288 | Cone |
| 3.0 | 8S-8282 | Collet Assembly |
| 4.0 | 8S-8284 | Collet Assembly |
| 5.0 | 8S-8285 | Collet Assembly |
| 6.0 | 8S-8289 | Tube |
| 7.0 | 8S-8293 | Long Extension |
| 8.0 | 8S-8281 | Tool Box |

| Item | Part Number | Description |
|------|-------------|---|
| 9.0 | 8S-8291 | Threaded Shaft |
| 10.0 | 8S-8290 | Nut |
| 11.0 | 8S-8884 | Backup Nut |
| 12.0 | 8S-8286 | Screw Expander |
| 14.0 | 8S-8882 | Backup Nut |
| 15.0 | 8S-8292 | Short Extension |
| -- | 8S-2241 | Camshaft Bearing Installation and Removal Group |

5P-1666 Puller Plate

5P-1667 Spacer Tube

Model: D379B, D398B, D399, 657E

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|-----------------|
| 1 | 5P-1666 | Puller Plate |
| 2 | 5P-1667 | Spacer Tube |
| 3 | 8S-8292 | Short Extension |
| 4 | 8S-8293 | Long Extension |

- Used with 8S-2241 Group for camshaft bearing removal and installation on 6.25 inch bore V Engines (two 8S-8292 Short Extensions and one 8S-8293 Long Extension required from 8S-2241 Group)



Camshaft and Timing Gear Tools

Engine Tools

1P-5545 Adapter Group

Model: 1100, 3100, 3208
Warranty: Six Months



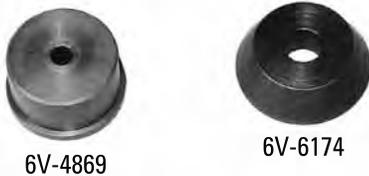
- Used with 8S-2241 Tool Group to install camshaft bearings on 1100 and 3100 Series and 3208 Engines

| Part Number | Description |
|-------------|-----------------|
| 1P-5545 | Adapter Group |
| 0S-0509 | Bolt (3/8 - 16) |

6V-4869 Adapter

6V-6174 Plug

Model: 3400
Warranty: Six Months

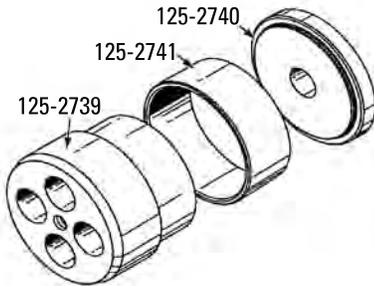


- Used with 8S-2241 Tool Group to remove and install camshaft bearings in 3400 Series Engines
- 6V-4869 Adapter used for collet assembly
- 6V-6174 Plug used for cone

| Part Number | Description |
|-------------|-------------|
| 6V-4869 | Adapter |
| 6V-6174 | Plug |

Camshaft Bearing Remove/Install Tools

Model: 3500B Engines
Warranty: Six Months

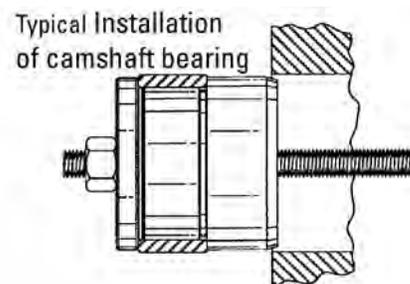


- Used to remove and install 2 sizes of camshaft bearings — makes overhaul much simpler and reduces chance of bearing damage during installation
- Used with 6V-4077 Camshaft Bearing Tool Group and 8S-2241 Camshaft Bearing Installation and Removal Group
- Designed to trap camshaft bearing between camshaft bearing pilot and backup plate — can be pushed (removed) or pulled (installed) using 6V-4077 and 8S-2241 Tool Groups
- Install thin-walled bearings by placing 125-2741 Camshaft Bearing Sleeve over the camshaft bearing pilot
- Parts are plated and hardened for durability and long life

| Part Number | Description |
|-------------|--------------------|
| 125-2739 | Cam Bearing Pilot |
| 125-2740 | Backup Plate |
| 125-2741 | Cam Bearing Sleeve |

Installation of Camshaft Bearing

| | |
|----------------------------|-------------------|
| Larger diameter of pilot | 97.9 mm (3.85 in) |
| Small diameter of pilot | 85.9 mm (3.38 in) |
| Outside diameter of sleeve | 92.1 mm (3.63 in) |

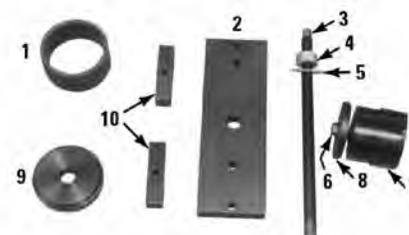


6V-4077 Camshaft Bearing Tool Group

Model: D11N, 3512, 3516, 777B, 785, 789, 994

Warranty: Six Months

- Used with components of 8S-2241 Tool Group for manual removal and installation of camshaft bearings in 3500 Series Engines
- Otherwise 316-1493 Hydraulic Puller can be used



| Item | Part Number | Description |
|------------------|-------------|-----------------------------|
| -- | 6V-4077 | Camshaft Bearing Tool Group |
| 1 | 6V-4011 | Spacer |
| 2 | 6V-4015 | Pulling Bar |
| 3 | 6V-4013 | Screw |
| 4 | 2J-3506 | Nut |
| 5 | 5P-8248 | Washer |
| 6 | 0S-1621 | Bolt |
| 7 | 6V-3177 | Pilot Group |
| 8 | 6V-4012 | Plate |
| 9 | 6V-4010 | Pulling Plate |
| 10 ¹ | 6V-4005 | Spacer |
| Not Shown | | |
| -- | 6V-2054 | Shield Driver |

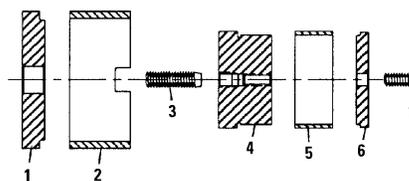
¹ Qty. 2

Camshaft Bearing Remove/Install Tools

Model: C-10 and C-12 Engines

Warranty: Six Months

- Used to remove and install camshaft bearings
- Used with 8S-2241 Camshaft Installation and Removal Group, 0S-1629 Bolt, and 8M-8778 Taperlock Stud
- Tools can be used to remove or install camshaft bearings (for installation, assemble parts as shown in illustration)
- Large diameter of bearing pilot guides bearing into bearing bore on engine for easier installation
- Reaction sleeve is designed with clearance for bolts on engine front housing



References

SEN1002, Special Instruction C-10 Disassembly and Assembly

SEN1007, Special Instruction C-12 Disassembly and Assembly

(Continued)

Camshaft and Timing Gear Tools

Camshaft Bearing Remove/Install Tools (Continued)

Model: C-10 and C-12 Engines

Warranty: Six Months

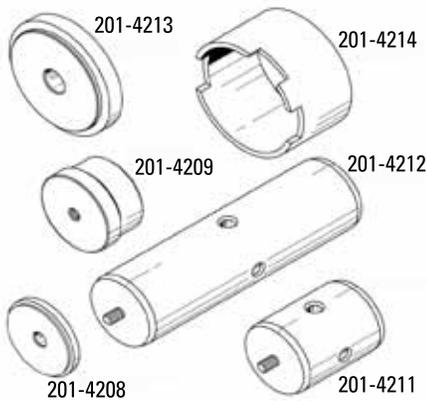
| | |
|-----------------------------------|-----------------------|
| 129-6673 Bearing Pilot | |
| Overall outside diameter | 80.92 mm (3.186 in) |
| Outside diameter of bearing pilot | 74.850 mm (2.9469 in) |
| | |
| Item | Description |
| 5 | Camshaft Bearing |

| Item | Part Number | Description |
|---------------------------------|-------------|---|
| Camshaft Bearing Tooling | | |
| 1 | 129-6672 | Puller Plate |
| 2 | 129-6671 | Reaction Sleeve |
| 3 | 8M-8778 | Taperlock Stud |
| 4 | 129-6673 | Bearing Pilot |
| 6 | 129-6674 | Backup Plate |
| 7 | 0S-1629 | Bolt |
| Not Shown | | |
| -- | 8S-2241 | Camshaft Bearing Installation and Removal Group |

Camshaft Plates, Pilots, and Sleeves

Model: C-11 and C-13 Engines

Warranty: Six Months



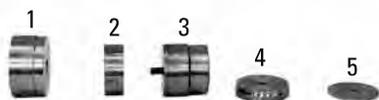
- Used to remove and install camshaft bearings
- Used with 8S-2241 Camshaft Installation and Removal Group
- Large diameter of bearing pilot guides bearing into bearing bore on engine block for easier installation
- Receiving sleeve designed with clearance for front housing engine bolts

| Part Number | Description |
|-----------------------------|------------------|
| Service/Repair Parts | |
| 201-4208 | Backup Plate |
| 201-4209 | Bearing Pilot |
| 201-4211 | Pilot Assembly |
| 201-4212 | Pilot Assembly |
| 201-4213 | Puller Plate |
| 201-4214 | Receiving Sleeve |

Camshaft Bearing Removal and Installation Tools

Model: 3406E Engines

Warranty: Six Months



- Used to remove and install camshaft bearing with head removed
- Used with 8M-8778 Stud, 6V-4013 Threaded Screw, 8S-8292 Short Extension, (2 required), 8S-8293 Long Extension, (2 required), 2J-3506 Nut, 5P-8248 Washer, 316-1493 Hydraulic Puller Assembly and hydraulic pump
- Hydraulic force easily removes bearings and prevents damage during installation

References

SENR5580, Service Manual, 3406E Engine

SENR6421, Disassembly and Assembly Manual

(Continued)

Camshaft Bearing Removal and Installation Tools (Continued)

Model: 3406E Engines

Warranty: Six Months

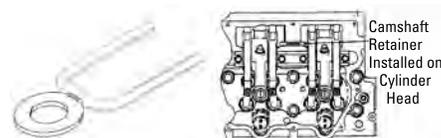
| Item | Part Number | Description | Overall Dimensions (Diameter x Thickness) |
|------|-------------|-------------------|---|
| 1 | 9U-7210 | Puller Plate | 95.0 x 19.0 mm (3.75 x 0.75 in) |
| 2 | 9U-7223 | Alignment Bushing | 85.0 x 32.0 mm (3.30 x 1.25 in) |
| 3 | 9U-7222 | Cam Bearing Pilot | 90.0 x 70.0 mm (3.50 x 2.75 in) |
| 4 | 9U-7213 | Backup Plate | 108.0 x 57.0 mm (4.25 x 2.25 in) |
| 5 | 9U-7214 | Spacer Plate | 90.0 x 4.0 mm (3.50 x 0.16 in) |

132-3904 Camshaft Retainer

Model: 3406E Engines

Warranty: Six Months

- Used to hold camshaft in cylinder head during removal and installation
- Install retainer across camshaft bearing between 2 camshaft lobes
- Failure to use retainer can result in damaged camshafts (retainer is extremely cost-effective when compared to price of new camshaft)



| Part Number | Description |
|-------------|-------------------|
| 132-3904 | Camshaft Retainer |

1U-7638 Magnetic Lifter Holder

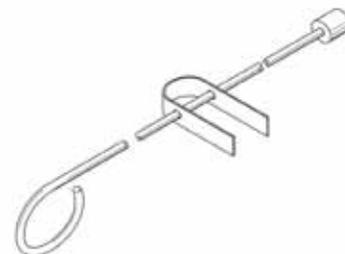
Essential Tool

Model: C7, C9, C11, and C13 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|------------------------|
| 1U-7638 | Magnetic Lifter Holder |

- Used to hold lifters in up position when removing and installing camshaft
- Eliminates interference between lifters and camshaft for faster removal and installation
- 1 tool required for each lifter bore on engine
- Easily adjustable



References

REN9707, C7/C9 Disassembly and Assembly Manual

REN9705, C11/C13 Disassembly and Assembly Manual

Gear Installation Tools

Model: 933, 951, 955, 977

Warranty: Six Months



- Necessary only when installing accessory drive shaft with engine installed in 933 Traxcavators and in 951, 955, and 977 Traxcavators with 114.3 mm (4.5 in) bore engines equipped with mechanical governors

| Item | Part Number | Description |
|------|-------------|-------------|
| 2 | 4M-3251 | Adapter |
| 1 | 1B-4210 | Nut |

| Item | Description |
|------|-------------|
| 3 | Spacer |

173-2021 Puller Group

Model: 3300 Engine

Warranty: Six Months



- Used to quickly and easily remove or install idler gear stub shaft with a common slide hammer
- Used with 1U-7600 Slide Hammer or similar tool with 1/2 - 20 threads
- Helps eliminate damage to bore of cylinder block and stub shaft
- Used by slipping cup over the stub shaft; insert puller pin through side of cup and oil feed hole in the stub shaft
- Inside bore diameter: 35 mm (1.38 in)
- Service Part: 173-2023 Pin

| Part Number | Description |
|-------------|--------------|
| 173-2021 | Puller Group |

393-2573 Idle Gear Removal and Installation Tool

Model Usage: C3.8

Warranty: Manufacturer's



- Used to easily remove and install idler gear

| Specifications | |
|----------------|-----------------------------------|
| Dimensions | 198.1 x 47.81 mm (7.72 x 1.88 in) |
| Weight | .957 kg (2.1 lbs) |

| Part Number | Description |
|-------------|---|
| 393-2573 | Idle Gear Removal and Installation Tool |

8F-3672 Gear Removal Plate

Model: Cat® Engines
 Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | 8F-3672 | Plate |
| 2 | 6V-3160 | Cylinder Group |
| 3 | 8B-7548 | Puller Assembly - Bearing |

- Removal of camshaft or accessory drive gear with hydraulic puller (2) is simple operation combining use of plate (1) and push-puller (3)



167-3834 Puller Group

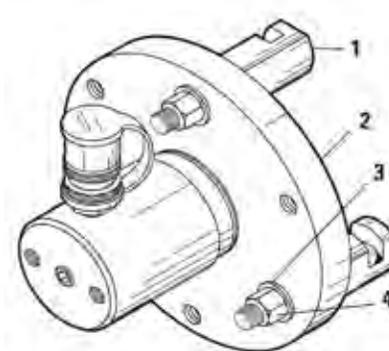
Model: 3176, 3176B, 3196, C-10, and C-12
 Warranty: Six Months

- Used to remove press fit camshaft gear without pulling camshaft or disturbing overhead components
- Used with dealer supplied 10,000 psi 1U-5230 Single Acting Hand Pump, 3S-6224 Electric Hydraulic Pump, or equivalent
- Used with induction gear heater to install cam gear (not included)
- Saves time on front cover repairs
- For engines built through May 1998
- Only works on cam gears with lightening holes; will not fit solid hub gears

Reference

NEHS0760, Tool Operating Manual

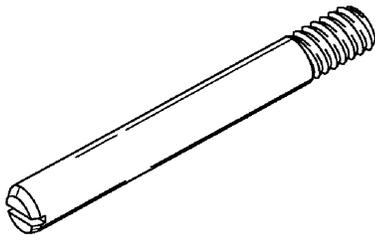
| | |
|---------------|----------------|
| Hydraulic ram | single action |
| Ram stroke | 51 mm (2.0 in) |
| Ram capacity | 25 ton |



| Item | Part Number | Description |
|-------------------------------------|-------------|----------------|
| 1 | 167-1999 | Puller Leg |
| 2 | 167-1998 | Puller Plate |
| 3 | 5P-8247 | Hard Washer |
| 4 | 6B-6683 | Nut |
| -- | 167-3834 | Puller Group |
| Required parts, not included | | |
| 1 | 5P-8245 | Hard Washer |
| 3 | 5P-2566 | Hex Head Bolt |
| -- | 138-7575 | Bracket - Link |

9U-6896 Guide Bolt

Model: 3406E Engines
Warranty: Six Months



- Used to easily align camshaft gear during installation by supporting weight of camshaft gear
- Used with 1P-7405 Eyebolt
- Length: 127 mm (5.0 in)
- Thread: 5/8 in - 11

| Part Number | Description |
|-------------|-------------|
| 9U-6896 | Guide Bolt |

References

SENR5580 Service Manual
SENR6421 Service Manual Module, Disassembly and Assembly 3406E Engines

8S-2264 Puller Group

8S-8375 Sleeve

Model: D330C, D333C, 3304 and 3306 Engines
Warranty: Six Months



Used for various pulling operations such as:

- Removing accessory drive gears on D330C, D333C, 3304 and 3306 Engines
- Removing crankshaft front pulley on 1100 and 3100 Series Engines
- Water pump disassembly and assembly on D342, D353 and 3406 Engines
- Used with an 8S-8375 Sleeve to remove the accessory drive gear on 12.07 cm (4.75 in) bore 2-valve engines
- Also used in other general purpose applications
- Available separately: 6V-7837 Screw, length 71.37 mm (2.81 in), 3/4 inch-16 thread

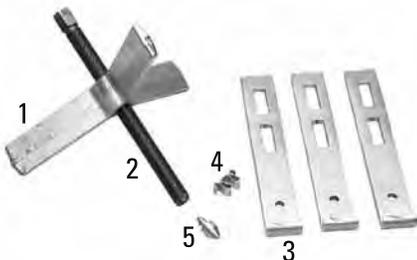
| Item | Part Number | Description |
|-----------------------------|-------------|--------------|
| -- | 8S-2264 | Puller Group |
| 8S-2264 Puller Group | | |
| 1.0 ¹ | 8S-8375 | Sleeve |
| 2.0 | 8S-5133 | Plug |
| 3.0 | 8S-6470 | Screw |
| 4.0 | 8S-5132 | Puller Plate |

| Item | Description |
|------|--------------|
| 4 | Puller Plate |

¹ Not part of 8S-2264 Group

4C-5613 Puller Group

Model: 3406
Warranty: Six Months



- Used to remove air compressor drive gear

(Continued)

4C-5613 Puller Group (Continued)

Model: 3406

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---------------|
| -- | 4C-5613 | Puller Group |
| 1 | 4C-5628 | Crossarm Body |
| 2 | 4C-5626 | Forcing Screw |
| 3 | 4C-5625 | Puller Jaw |
| 4 | 4C-5624 | Spring Clip |
| 5 | 4C-5627 | Tip |

- Has wide puller jaws that distribute load across more surface area on gear and prevent damage to splined teeth; conventional puller jaws will not properly grab under gear hub due to clearance problems, so they are used to grab in spline tooth area where they may damage gear teeth
- Can be used for general purpose pulling operations
- 3-leg, 10-ton puller with wide, flat puller jaws

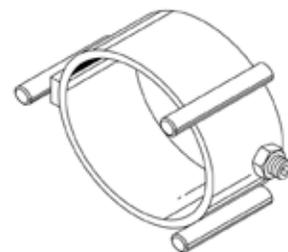
132-5451 Air Compressor Gear Holder

Model: 3406E, C-10, and C-12 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|----------------------------|
| 132-5451 | Air Compressor Gear Holder |

- Used to keep air compressor shaft from turning while removing or tightening drive gear retaining nut
- Holder makes removing and installing nut much simpler and faster — also reduces possibility of damage during overhaul procedure
- Use shop vise to hold air compressor assembly
- Service Part: 6B-6683 Nut



| | |
|----------------------------|-------------------------------|
| Inside diameter | 127 mm (5.0 in) |
| Height including pins | 88.9 mm (3.50 in) |
| Pin diameter | 12.7 mm (0.50 in) |
| Retaining nut final torque | 462 ± 54 N·m (340 ± 40 ft·lb) |

4C-9991 Idler Shaft Retrofit Tool Group

Model: 3500

Warranty: Six Months

- Used to retrofit idler gear shaft on 3500 Vee engines
- Easily and accurately aligns drill and tap for drilling and tapping bolt holes from 1/2 - 13 to 5/8 - 11 thread
- Eliminates replacing cylinder block
- Used with 1P-3048 Wrench Assembly and 1U-9218 Drill, 12.7 mm (1/2 in)

Reference

SEBF8166, Guideline for Reusable Parts

| Item | Part Number | Description | Size |
|------|-------------|---------------------------------------|-------------------------|
| -- | 4C-9991 | Idler Shaft Retrofit Tool Group | -- |
| 1 | 9U-5033 | Core Drill | 17/32 in, 4-fluted |
| 2 | 9U-5034 | Bottoming Tap | -5/8 in - 11 thd |
| -- | 1A-5822 | Bolt (not part of 4C-9991 Tool Group) | 1/2 in to 13 x 2 3/4 in |



(Continued)

4C-9991 Idler Shaft Retrofit Tool Group (Continued)

Model: 3500

Warranty: Six Months

| Item | Part Number | Description | Size |
|------------------|-------------|----------------------------|-----------------------------------|
| 4 | 9X-8883 | Bolt | 5/8 in to 11 x 2 3/4 in |
| 5 | 6V-4857 | Lockscrew (2) | -- |
| 6 | 4C-9993 | Guide Plate | -- |
| 7 | 4C-9994 | Drill Bushing | 12.7 mm (0.50 in) |
| 8 | 4C-9995 | Drill Bushing | 0.531 in |
| 9 | 4C-9996 | Drill Bushing | 0.625 in |
| 10 | 4C-9997 | Drill Bushing | 0.635 in (pilot for 0.625 in tap) |
| Not Shown | | | |
| -- | 4C-9992 | Idler Shaft Retrofit Pilot | -- |

9U-7255 Adjustable Idler Assembly

Model: 3406E Engines

Warranty: Six Months



- Used to set backlash between camshaft gear and adjustable idler gear
- Used with 9U-7324 Indicator Bracket, 7H-1942 Dial Indicator, 3S-3268 Contact Point, and 7H-1940 Universal Attachment (assures correct setting of backlash after tightening mounting bolts to adjustable idler gear)
- Holds adjustable idler gear in correct position while tightening mounting bolts
- Distance between centers: 204.03 mm (8.033 in)

| Part Number | Description |
|-------------|---------------------------|
| 9U-7255 | Adjustable Idler Assembly |

References

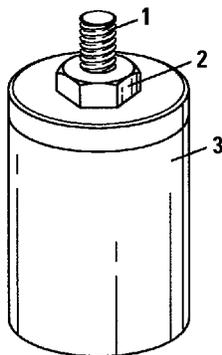
SENR5580, Service Manual

SENR6421, Service Manual Module, Disassembly and Assembly 3406E Engine

9U-6148 Idler Shaft Removal Group

Model: 3064 and 3066 Engines

Warranty: Six Months



- Used to remove idler gear shaft

Reference

SENR5553, Service Manual, 3066 Diesel Engines

| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | 9U-6147 | Removal Stud |
| 2 | 8T-4244 | Nut (M12 x 1.75) |
| 3 | 9U-6146 | Sleeve Assembly |
| -- | 9U-6148 | Idler Shaft Removal Group |

(Continued)

9U-6148 Idler Shaft Removal Group (Continued)

Model: 3064 and 3066 Engines

Warranty: Six Months

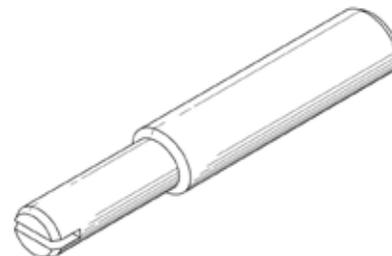
| Item | Part Number | Description |
|------------------|-------------|------------------|
| Not Shown | | |
| -- | 6V-8231 | Nut (M10 x 1.25) |

FT2781 Alignment Tool

Model: G3600 Engines

Warranty: None

- Used to accurately align ADEM III timing wheel with magnetic pickup
- Procedure for use: Insert tool through magnetic pickup hole and lock onto indicated timing wheel tooth; tighten slotted wheel to correct torque
- Material: SAE 1018 steel



9U-7324 Indicator Bracket

Model: 3406E Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------|
| 9U-7324 | Indicator Bracket |

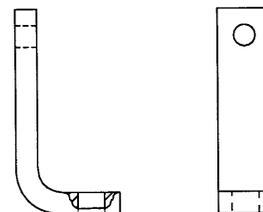
- L-shaped bracket used to fasten dial indicator to front housing (allows backlash between camshaft gear and idler gear to be measured)
- Used with 7H-1942 Dial Indicator, 3S-3268 Contact Point, and 7H-1940 Universal Attachment

References

SENR5580, Service Manual

SENR6421, Service Manual Module, Disassembly and Assembly 3406E Engine

| | |
|-----------------------------|--------------------|
| Height | 66 mm (2.6 in) |
| Threaded hole in long leg | 1/4 in - 20 |
| Clearance hole in short leg | 8.20 mm (0.312 in) |



398-9615 Air Gap Measuring Gauge

Model Usage: C3.8

Warranty: Manufacturer's



European Union Compliant, CE marked

- Used to measure the crankshaft position sensor
- Provides a quick and efficient method for checking crankshaft position sensor
- Use with 9S-0215 Dial indicator

| Specifications | |
|----------------|--------------------------------|
| Part Number | Dimensions |
| 398-9615 | 104 x 65.6 mm (4.09 x 2.58 in) |

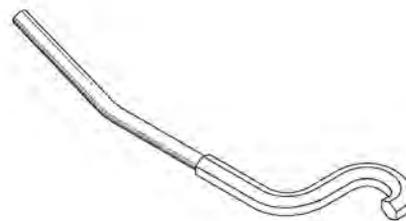
Starting Systems

FT0201 Clutch Adjustment Tool

Model: Cat® Engines

Warranty: None

- Used to adjust clutch on 53.98 mm (2 1/8 in) bore, 53.98 mm (2 1/8 in) stroke starting engines

**277-7088 Spanner Wrench****Essential Tool**

Model: G3516B and G3520B Engines

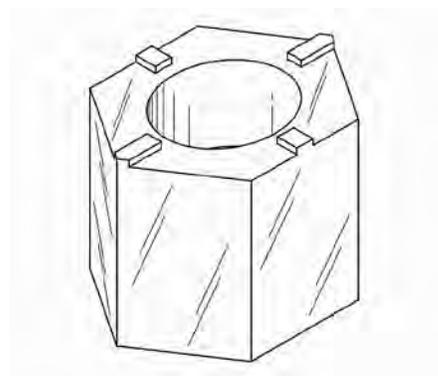
Warranty: Six Months

- Used to disassemble and assemble air starter gear box

Reference

REN2269, G3516B and G3520B Disassembly and Assembly Manual

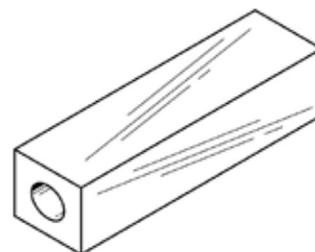
| Part Number | Description |
|-------------|----------------|
| 277-7088 | Spanner Wrench |

**FT0625 Starting Motor Adjusting Tool**

Model: Prestolite Starting Motors

Warranty: None

- Used with 8H-8568 Socket, 8H-8505 Wrench, and hollow head wrench to check solenoid shifting adjustment on engines equipped with Prestolite starting motors
- Material: mild steel



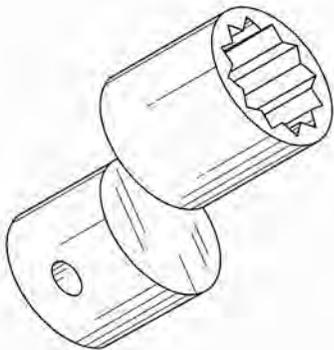
FT3089 Offset Socket

Essential Tool

Model: 3500 Engines

Warranty: None

Engine Tools



- Used to remove top bolt of starting motor on 3500 Engines (5/8 inch socket with offset provides access)
- Used with 1/2 inch square drive wrench
- Made from 8S-1595 Bolt Socket
- Not for use with impact wrenches

Engine Lifting and Positioning

6V-0097 Engine Rebuild Stand

Model: All engine models from 3204 through D348 and 3412

Warranty: Six Months

- Designed to provide most efficient means for engine reconditioning
- Design permits dynamometer testing of engine on stand
- Normally used with 9S-9081 Sling Assembly and 9S-9060 Dual Hook Hoist to rotate engine during disassembly and assembly
- Superior to former 9S-8500 Stand because of its rigid, 1-piece construction and polyurethane rather than steel wheels
- Portable with use of discontinued 1P-0090 Dolly and channel construction allows handling with lift truck with 2 sides

Reference

SMHS7861, Special Instruction

NOTE:

To mount D348 or 3412 Engine on earlier 6V-0097 Stands, it is necessary to modify front supports to provide clearance for oil coolers.

Also, to mount 3208 Engines, right rear support must be modified to provide clearance for starting motor. If these modifications are required, request the following drawings from Division Service Manager:

FT1513 — Modification for D348 or 3412 Engines

FT1530 — Modification for 3208 Engines



Engine Tools

| | |
|--------|-----------------|
| Length | 1854 mm (73 in) |
| Width | 1016 mm (40 in) |
| Height | 610 mm (24 in) |
| Weight | 272 kg (600 lb) |

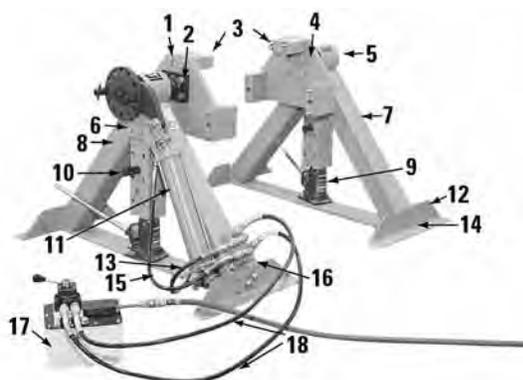
| Part Number | Description | Quantity |
|-----------------------------|----------------------|----------|
| 6V-0097 | Engine Rebuild Stand | -- |
| Service/Repair Parts | | |
| 6V-2026 | Wheel | 2 |
| 3B-4629 | Cotter Pin | 4 |
| 0S-1587 | Bolt | 4 |

| Part Number | Description | Quantity |
|---|-------------|----------|
| Service/Repair Parts (Continued) | | |
| 5P-8245 | Hard Washer | 12 |
| 1A-1135 | Bolt | 2 |
| 5P-8247 | Hard Washer | 2 |
| 1H-1200 | Pin | 2 |
| 4B-4283 | Washer | 2 |

4C-9832 Large Engine Roll-Over Stand

Model: 3508, 3512 and 3516 Engines

Warranty: Six Months



- Used for disassembly and assembly of 3508, 3512 and 3516 Engines
- Self-contained hydraulic system
- Air-driven hydraulic pump and hoses included
- Protective valve arrangement for positive rotational control
- Portable — heaviest component 86.18 kg (190 lb)
- Does not need permanent mounting
- Does not need electrical power
- Enhances safety of large engine repair
- Minimizes engine handling time — improves work efficiency
- Adaptable for on-site marine engine repair
- Stand-to-engine mounting bolts and brackets for 3500 Engines included
- Engine can be positioned vertically in any of 4 positions by one person without the need of overhead lifting equipment
- Complete 360° rotation of engine
- Each full cylinder stroke provides 90° of engine rotation
- Pivot lock pin provides positive anti-rotational locking every 30°
- Bolt-on feet allow engine stand members to stand alone during installation or storage
- Low enough to be installed on engine resting on its oil pan on floor
- Additional brackets for other engines and off-highway front struts planned for the future
- Two 12-ton jacks included

Reference

NEHS0566, Tool Operating Manual

| | |
|-----------------------------|---------------------|
| Capacity | 9072 kg (20,000 lb) |
| Item | Description |
| Not Shown, Sold Separately) | NEEG2004, Decal |

| Item | Part Number | Description |
|------|-------------|--|
| 9.0 | 1U-9754 | Hydraulic Jack, 12 ton |
| -- | 4C-9832 | Large Engine Roll-Over Stand |
| 14.0 | 5P-2228 | Bolt, 1/2 in - 13 thd x 25.4 mm (1.0 in) |
| 4.0 | 6V-8182 | Full Nut, 3/4 in - 10 thd |
| 1.0 | 7X-0341 | Bolt, 1/2 in - 13 thd x 177.8 mm (7 in) |
| 2.0 | 8C-6857 | Bolt, 3/4 in - 10 x 69.8 mm (2 3/4 in) |
| 6.0 | 8T-9313 | Bolt, 3/4 in - 10 thd x 177.8 mm (7 in) |
| 7.0 | 9U-5753 | Outboard Frame (not serviced) |
| 8.0 | 9U-5754 | Cylinder End Frame (not serviced) |
| 5.0 | 9U-5755 | Outboard Tube Weldment |

| Item | Part Number | Description |
|------|-------------|-------------------------------------|
| 11.0 | 9U-5760 | Hydraulic Cylinder |
| 3.0 | 9U-5770 | Mounting Bracket, 3500 |
| 12.0 | 9U-5772 | Foot (not serviced) |
| 16.0 | 9U-5773 | Counterbalance Valve |
| 17.0 | 9U-5774 | Air/Hydraulic Pump |
| 10.0 | 9U-5775 | Pin Assembly |
| 18.0 | 9U-5778 | Hydraulic Hose, 1828.8 mm (72.0 in) |
| 13.0 | 9U-5779 | Hydraulic Hose, 609.8 mm (24.0 in) |
| 15.0 | 9U-5780 | Hydraulic Hose, 990.6 mm (39.0 in) |

(Continued)

4C-9832 Large Engine Roll-Over Stand (Continued)

Model: 3508, 3512 and 3516 Engines

Warranty: Six Months

| Item | Part Number | Description |
|---|-------------|---|
| Additional Service/Repair Parts (Not Shown, Sold Separately)¹ | | |
| -- | 1J-8136 | Roll Pin, 3/8 in x 50.8 mm (2.0 in) |
| -- | 1P-2375 | Coupler Assembly Quick Connective (Male) |
| -- | 1P-2376 | Coupler Assembly Quick Connective (Female) (2) |
| -- | 2K-3549 | Roll Pin, 3/8 in x 101.6 mm (4.0 in) |
| -- | 3D-8913 | Elbow Pipe, 90 degree - 30 degree NPSM-EXT |
| -- | 5S-2201 | Hex Socket Head Bolt, 5/8 in - 11 thd x 31.75 mm (1 1/4 in) |

| Item | Part Number | Description |
|---|-------------|---|
| Additional Service/Repair Parts (Not Shown, Sold Separately) (Continued)¹ | | |
| -- | 6K-8328 | Bearing Cup |
| -- | 7X-0265 | Bolt, 1/4 in - 20 thd x 69.8 mm (2.75 in) |
| -- | 8T-0238 | Bearing Cone |
| -- | 9U-5758 | Cylinder End Shaft Weldment |
| -- | 9U-5759 | Outboard Shaft Weldment |
| -- | 9U-5761 | Cylinder Mount Pin |
| -- | 9U-5762 | Spacer |
| -- | 9U-5763 | Spacer |
| -- | 9U-5764 | Special Washer |
| -- | 9U-5767 | Bearing Shield |
| -- | 9U-5781 | Cotterless HitchPin |
| -- | 9U-7828 | Index Plate |

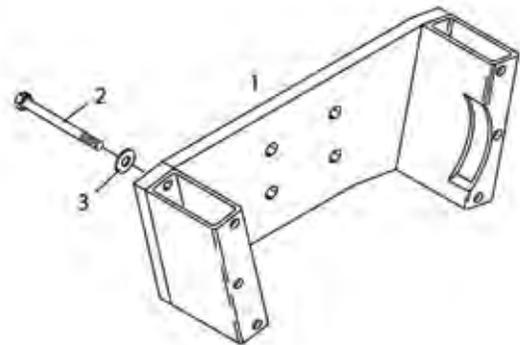
¹Also: 457012 Spring Pin

171-4660 Engine Stand Adapter Assembly

Model: 3408 and 3412

Warranty: Six Months

- Used to mount engines to roll-over stand (does not require removal of front gear train)
- Used with 4C-9832 Large Engine Roll-Over Stand
- Front and rear plates are interchangeable
- Camshaft work must be done with front bracket removed
- Flywheel housing and front gear housing must be removed
- Works best as a short block tool



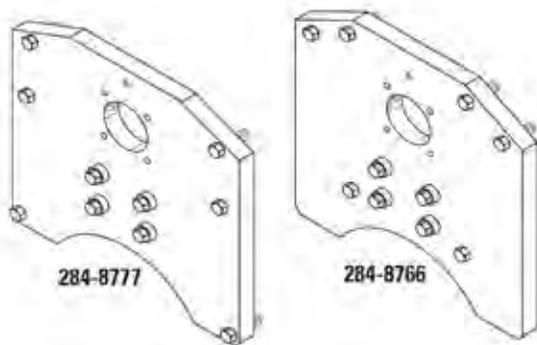
| Item | Part Number | Description |
|------|-------------|-------------------------------|
| 1 | 171-4660 | Engine Stand Adapter Assembly |
| 2 | 4F-0411 | Bolt |
| 3 | 5M-2894 | Washer |

C175 Engine Rollover Plates

Essential Tool

Model: C175 Engine

Warranty: Six Months



- Used with 4C-9832 Engine Rollover Stand to rotate engine for maintenance work
- Front and rear plates are marked and cannot be interchanged
- Center hole in each plate permits attachment of cam guide for cam removal and installation

Reference

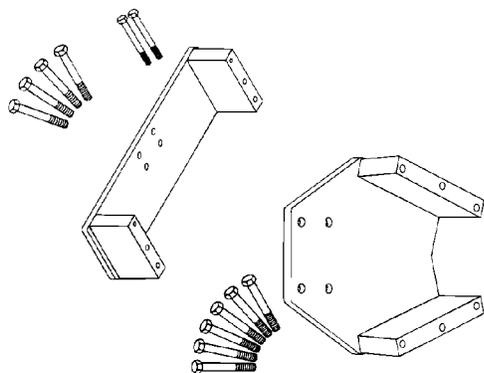
REN7466, C175-16 Engine Disassembly and Assembly Manual

| Part Number | Description |
|-------------|-------------|
| 284-8766 | Front Plant |
| 284-8777 | Rear Plate |

1U-6238 Mount Bracket Group

Model: D379, D398, D399, G379, G398, G399 Engines (6.25 Inch Bore)

Warranty: Six Months



- Used to attach engines to 4C-9832 Large Engine Roll-Over Stand during disassembly and assembly
- Makes engine overhaul simpler and faster while providing a more convenient workspace for mechanic
- Two 1A-7669 Bolts and ten 1D-5499 Bolts included (attaches mounting brackets to engine block)
- Bolts meet or exceed SAE Grade 8

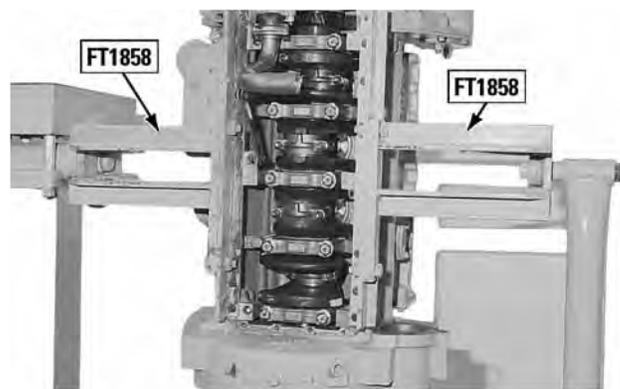
| Part Number | Description | Size | Qty. |
|-------------|---------------------|-----------------------------------|------|
| 1U-6238 | Mount Bracket Group | -- | -- |
| 1A-7669 | Bolt | 1/2 - 13 thd x 178 mm (7.0 in) | 2 |
| 1D-4599 | Bolt | 5/8 - 11 thd x 178 mm (7.0 in) | 10 |

FT1858 Engine Stand Adapter

Model: 3204

Warranty: None

- Used with 1U-7502 Engine Stand for rebuilding 3204 Engines
- Holds engine at convenient working height during disassembly or assembly



Engine Tools

1U-9352 Engine Stand, 1000 lb

Model: Engines within 1000 lb

Warranty: Six Months

- Use for lift truck, car, and light truck engine service
- 4 adjustable attachment arms make engine mounting fast and easy
- Engine can be rotated full 360° with turn of handle
- Locking pin secures work in any of 8 positions
- Both rear wheels lock tightly to anchor stand; 2 swivel casters in front provide great mobility
- Disassemble by removing only 1 bolt for easy transport

| | |
|----------|------------------|
| Capacity | 454 kg (1000 lb) |
| Weight | 45.4 kg (100 lb) |

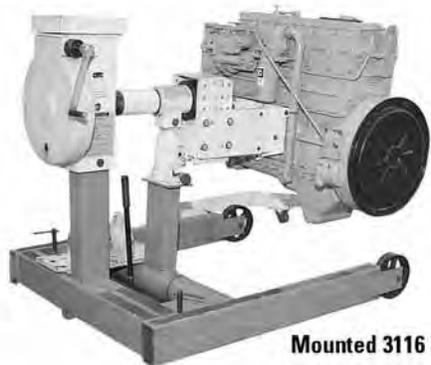


| Part Number | Description |
|-------------|-----------------------|
| 1U-9352 | Engine Stand, 1000 lb |

1U-5750 Diesel Engine Repair Stand, 2722 kg (6000 lb)

Model: Engines within 6000 lb

Warranty: Six Months



Mounted 3116 Engine

- 1U-5750 includes universal engine adapter assembly which permits use of engine mounting adapters
- Integral, 10.89 MT (12 ton) jack raises work to provide swing radius needed to turn work
- Turning even a 2.72 MT (3 ton) diesel 360° is easy — a 96 to 1 ratio worm and gear set does the job easily
- Crank handle can be locked in any position
- 2 front wheels and 2 rear casters permit easy mobility; floor locks anchor 1U-5750 in place
- Required floor space (W x L): 1219.2 x 1409.7 mm (48.0 x 55.5 in)
- Weight: 317 kg (698 lb)

Reference

Tool Guide, Lifting, Blocking and Clamping Section

| Part Number | Description |
|-------------|---------------------|
| 1U-5750 | Engine Repair Stand |

Engine Adapter Plates for 1U-5750



- Order only adapters needed for engines being worked on; universal adapter assembly required for mounting all but John Deere adapters to stand
- Warranty: Manufacturer's

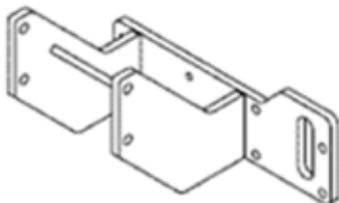
NOTE:

Products are shipped F.O.B. Searcy, Arkansas. Each Engine mounting plate includes all the necessary hardware and an engine application chart.

374-6393 Engine Mounting Adapter

Model Usage: CT660 Truck

Warranty: Manufacturer's



- Adapter for 1U-5750 Diesel Engine Repair Stand

| Specifications | |
|----------------|-------------------------|
| Dimensions | 26.85 x 18.25 x 11.5 in |
| Weight | 70 lbs |

| Part Number | Description |
|-------------|-------------------------|
| 374-6393 | Engine Mounting Adapter |

Adapter Plates Sold Separately

| Sold Separately | | | |
|-----------------|-------------|---------------|---|
| Item | Part Number | Description | Model Use |
| 1 ¹ | 1U-5749 | Adapter Plate | For Cat® engines; Nos. 1673, 1674, 1693, 3304, 3306 and 3406 in-line 6-cylinder; Nos. 1100 and 3208 V-8; No. 3408 V-8. Wt., 30.8 kg (68.0 lb) |
| Not Shown | | | |
| -- | 9U-5161 | Adapter Plate | For Cat® Engines: 1.1 and 1.7, C11 |



¹ Must be used with universal adapter plate assembly

FT2942 Transmission Support Assembly

Model: 924G and 928G Medium Wheel Loader

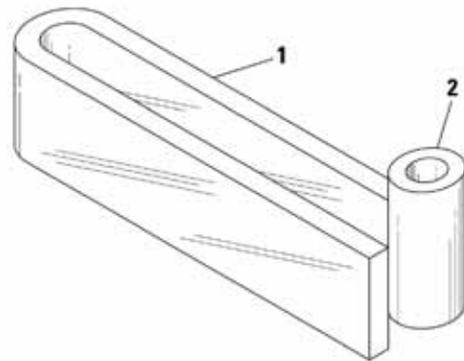
Warranty: None

- Used to mount transmission to an engine repair stand
- Used with 1U-5750 Engine Repair Stand

Reference

Service Manual, 924G and 928G Power Train Disassembly and Assembly

| | |
|---------------------|-----------------|
| Material for item 1 | SAE 1020M steel |
| Material for item 2 | ASTM A513 steel |



350-4401 Transmission Adapter

Model: CX28, CX31, CX35 Transmissions

Warranty: none

- Used to mount transmissions to engine repair stand
- Used with 1U-5750 Engine Repair Stand
- Supports transmission during disassembly and assembly

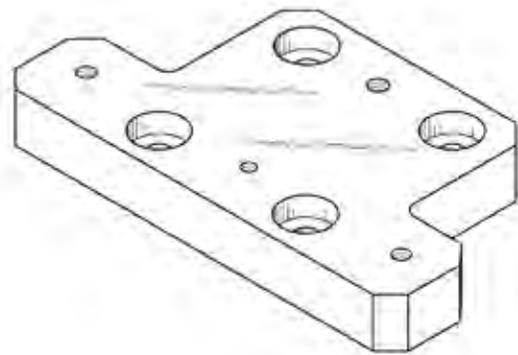
References

KENR8152, CX31-P600 Petroleum Transmission Well Servicing, Disassembly and Assembly

KENR8128, CX35-P800 Petroleum Transmission and Petroleum Power Train Packages, Disassembly and Assembly

KENR5098, CX28 On-Highway Transmission, Disassembly and Assembly

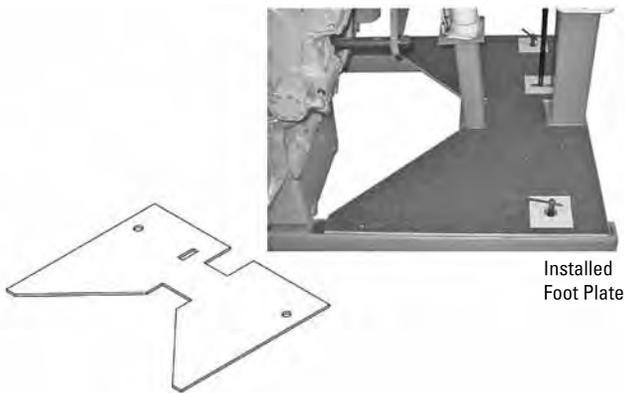
| Part Number | Description |
|-------------|----------------------|
| 350-4401 | Transmission Adapter |



206-0030 Foot Plate

Model: 1U-5750 Rollover Stand

Warranty: Six Months



- Used to provide a place for operator to stand and/or a place for tools or parts
- Used with 1U-5750 Engine Repair Stand
- Enhances usability of rollover stand
- Specially shaped to fill in space between hydraulic jack and end post
- Coated with anti-skid material and painted with high visibility yellow paint
- Steel construction 9.5 mm (0.38 in) thick

Installation Instructions

1. Installs without disassembling rollover stand.
2. Parking brake pins must be unscrewed and reinstalled when positioning plate.

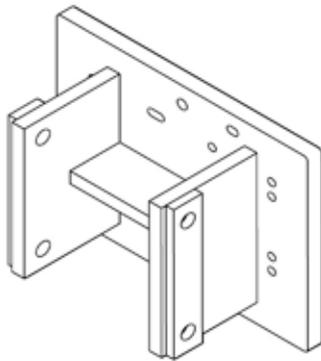
| Part Number | Description |
|-------------|-------------|
| 206-0030 | Plate |

173-5533 Repair Bracket Assembly

Essential Tool

Model: C-9 Engine

Warranty: Six Months



- Used to mount C-9 Engine on 1U-5750 Diesel Engine Repair Stand
- Using this bracket allows engine to be rotated 360 degrees
- Attaches in place of crankcase breather cover (breather cover must first be removed)

| Part Number | Description |
|-------------|----------------------|
| 173-5533 | Engine Stand Bracket |

180-2877 Adapter Group

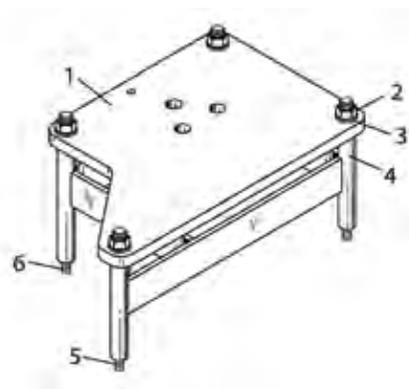
Model: MY2000 C-15 and C-16 Engines and 3406E Engines

Warranty: Six Months

- Used to mount MY2000 C-15 and C-16 “Weight-Reduced” engines onto 1U-5750 Engine Repair Stand
- Allows 360 degree rotation of engine
- Attachment location minimizes number of components that must be removed
- Also fits 3406E Engines at the same attachment location

Application Procedure

1. Remove filter assembly from inlet manifold side of engine.
2. Install discontinued 180-2874 Special Studs into two 3/4 inch threaded holes below head gasket joint.
3. Install discontinued 180-2873 Special Studs into two 3/4 inch threaded holes midway down cylinder block.
4. Screw studs in as far as possible (some may bottom-out before stud shoulder contacts cylinder block).
5. Install 180-2875 Spacer Assembly (not serviced), 180-2876 Plate (not serviced), and 5P-8248 Hard Washers.
6. Securely tighten 2J-3506 Full Nuts.
7. Attach 180-2876 Plate (not serviced) to head of 1U-5750 Engine Repair Stand.



| Item | Part Number | Description |
|------|-------------|----------------------|
| 1 | 180-2876 | Plate (Not serviced) |
| 2 | 2J-3506 | Nut |
| 3 | 5P-8248 | Hard Washer |

| Item | Part Number | Description |
|------|-------------|--------------------------------|
| 4 | 180-2875 | Spacer Assembly (Not serviced) |
| 5 | 205-9315 | Special Stud (long) |
| 6 | 205-9314 | Special Stud (short) |
| -- | 180-2877 | Adapter Group |

FT0864 Jib Crane

Model: 773

Warranty: None

- Mounted underneath canopy of 773 Truck to lift tie-arch or engine components and deposit them on service truck
- Used with 9S-8535 Trolley and 8S-9906 Ratchet
- Can be used in other applications where a crane is not available

| | |
|----------|-----------------|
| Capacity | 227 kg (500 lb) |
|----------|-----------------|



FT1032 Mounting Group

Model: 621

Warranty: None



- Required when mounting 621 Tractor engines on former 9S-8500 Engine Stand
- Short bars installed on both sides of pan at rear of engine and long bar mounted across front

9U-7847 Bolt

Model: 3046 Diesel Engine

Warranty: Six Months



- Used to fasten 3046 Engine to engine stand for disassembly and assembly (4 bolts required)
- Used with 1U-9352 Engine Stand
- Provides a source for this special hard-to-find bolt (most common fine-threaded bolts are not long enough)
- Size: M10 x 1.25 x 90 mm (3.5 in)
- Metric bolt class (grade): 10.9

Reference

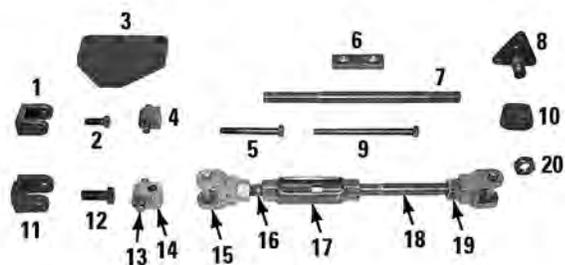
SENR6458, Special Instruction, Disassembly and Assembly of 3046 Engines

| Part Number | Description |
|-------------|-------------|
| 9U-7847 | Bolt |

8F-2550 Engine Tilting Group

Model: D364, D375, D379, G379, D386, D397, D398, G398, D399, G399

Warranty: Six Months



- Used to remove and install crankshafts; refer to charts (many parts are part of 8F-2250 Engine Tilting Group)

| Item | Description | Qty. |
|------|-------------|------|
| 6 | Spacer | |
| 7 | Upper Stud | 4 |
| 17 | Turn Buckle | 4 |

(Continued)

8F-2550 Engine Tilting Group (Continued)

Model: D364, D375, D379, G379, D386, D397, D398, G398, D399, G399

Warranty: Six Months

| Item | Part Number | Description | Qty. |
|------|----------------------|-------------------------|------|
| 1 | 8F-4228 | Hinge Yoke | 4 |
| 2 | 0L-1178 ¹ | Bolt | 4 |
| 3 | 8F-4235 | Plate | 2 |
| 4 | 8F-4233 | Hinge Block | 4 |
| 5 | 1D-4616 | Hex Head Cap Screw Bolt | 4 |
| 8 | 8F-4224 | Pivot Bracket Assembly | 4 |
| 9 | 8F-4225 | Bolt | 4 |
| 10 | 8F-4234 | Upper Hinge Block | 4 |
| 11 | 8F-4227 | Hinge Yoke | 4 |
| 12 | 5B-9385 | Bolt | 12 |
| 13 | 5F-9892 ¹ | Coupling Pin (70 ton) | 16 |

| Item | Part Number | Description | Qty. |
|------------------|----------------------|----------------------|------|
| 14 | 8F-4239 | Hinge Block | 4 |
| 15 | 8F-4226 | Yoke | 8 |
| 16 | 8F-4231 | Lower Stud | 4 |
| 18 | 8F-4230 | Upper Stud | 4 |
| 19 | 1B-4334 ¹ | Nut | 8 |
| 20 | 6F-7058 | Pivot Bracket Nut | 4 |
| -- | 8F-2550 | Engine Tilting Group | -- |
| Not shown | | | |
| -- | 3B-4618 | Cotter Pin | 32 |
| -- | 1B-4209 | Nut - Full | 2 |
| -- | 0S-0107 | Washer | 12 |

¹ Discontinued, part of the 8F-2550 Engine Tilting Group

8F-2550 Engine Tilting Group Parts

| Part Number | No. Req'd D399, G399 | No. Req'd D398, G398 | No. Req'd D379, G379 | Description | Length mm (in) | Thread Ends |
|-------------|----------------------|----------------------|----------------------|--|----------------|-------------|
| FT0733-2 | 3 | 2 | 2 | Stud | 203,2 (8.00) | RH |
| FT0111 | 3 | 2 | 2 | Stud | 254,0 (10.00) | RH |
| FT0111-A | 3 | 2 | 2 | Stud | 520,7 (20.5) | RH |
| FT0733-10 | 3 | 2 | 2 | Stud | 596,9 (23.5) | RH |
| FT0733-1 | 3 | 2 | 2 | Stud | 152,4 (6.00) | RH, LH |
| FT0733-5 | 3 | 2 | 2 | Stud | 292,1 (11.5) | RH, LH |
| FT0733-7 | 3 | 2 | 2 | Stud | 469,9 (18.5) | RH, LH |
| FT0733-9 | 3 | 2 | 2 | Stud | 546,1 (21.5) | RH, LH |
| | 12 | 8 | 8 | Block | | |
| | 6 | 4 | 4 | Stud, 368, 3 mm (1 1/4in - 14 1/2in) L | | |
| | 6 | 4 | 4 | Stud, 228, 6 mm (1 1/4in - 9 in) L | | |
| | 12 | 8 | 8 | Yoke | | |
| | 6 | 4 | 4 | Hinge Yoke | | |
| | 6 | 4 | 4 | Hinge Block | | |
| | 2 | 2 | 2 | Eyebolt 5/8 in | | |

Engine Lifting and Positioning

8F-2550 Engine Tilting Group Parts (Continued)

Engine Tools

| Part Number | No. Req'd D399, G399 | No. Req'd D398, G398 | No. Req'd D379, G379 | Description |
|----------------------|----------------------|----------------------|----------------------|--|
| 5B-1181 ¹ | 6 | 4 | 4 | Turnbuckle |
| FT0731 | 1 | | | Support Beam, LH |
| FT0735 | 1 | | | Support Beam, RH |
| FT0734 | 6 | 4 | 4 | Support Beam |
| FT0736 | 6 | 4 | 4 | Support Bracket |
| FT0732 | 2 | 2 | 2 | Lifting Channel |
| FT0113A | | 1 | 1 | Support Beam |
| FT0113 | | 1 | 1 | Support Beam |
| | | 2 | 2 | Guide Pin, 254 mm (7/8 - NF) long |
| | 2 | | | Guide Pin 254 mm (1 in - NF, 10 in) long |
| | 2 | 2 | 2 | Small Hoist |

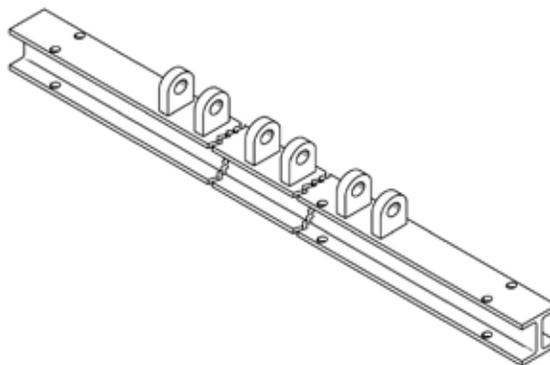
¹ Discontinued, part of the 8F-2550 Engine Tilting Group

| Part Number | No. Req'd: D399, G399 | No. Req'd: D398, G398 | No. Req'd: D379, G379 | Description | Size |
|----------------------|-----------------------|-----------------------|-----------------------|------------------------------------|---------------------------------------|
| 0S-1587 | 18 | 12 | 12 | Bolt | 12.7 - 44.45 mm (1/2 - 1 3/4 in) long |
| 1B-4334 ¹ | 12 | 8 | 8 | Nut | 1 1/4 in |
| 5F-9892 ¹ | 30 | 20 | 20 | Coupling Pin (70 ton) | -- |
| 3B-4618 | 60 | 40 | 40 | Cotter Pin | -- |
| 1D-4609 | 12 | 8 | 8 | Bolt | 19.05 - 76.2 mm (3/4 - 3 in) long |
| 1A-5964 | 12 | 8 | 8 | Bolt | 9.53 - 114.3 mm (3/8 - 4.5 in) long |
| 1D-4717 | 12 | 8 | 8 | Nut | 9.53 mm (3/8 in) |
| 6V-6546 | 6 | 4 | 4 | Bolt, 1/2-13 x 356 mm (14 in) long | 12.7 - 342.9 mm (1/2 - 13.5 in) long |
| 8F-4225 | 6 | 4 | 4 | Bolt | 19.05 - 254 mm (3/4 - 10 in) long |
| 0L-1178 ¹ | 6 | 4 | 4 | Bolt | 19.05 - 50.4 mm (3/4 - 2 in) long |
| 4B-4281 | 2 | 2 | 2 | Washer | -- |
| 1D-4720 | 2 | 2 | 2 | Nut | 5/8 in |
| 8F-4423 | 2 | 2 | 2 | Lifter - Flywheel | -- |

¹ Discontinued, part of the 8F-2550 Engine Tilting Group

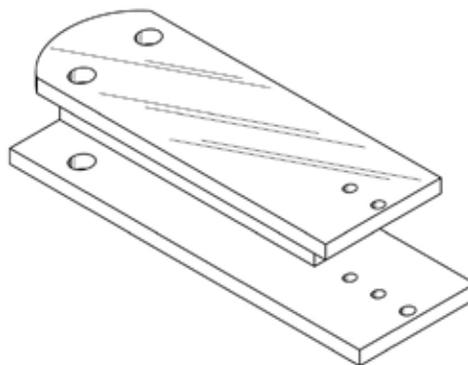
Fabricated Tools used with the 8F-2550 Engine Tilting Group

| Part Number | Description |
|-------------|------------------|
| FT0113 | Support Beam, LH |
| FT0113A | Support Beam, RH |
| FT0731 | Support Beam, LH |
| FT0735 | Support Beam, RH |



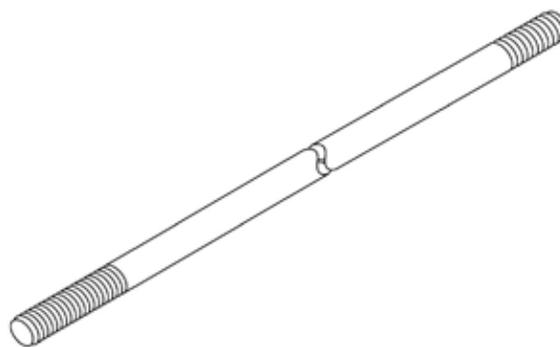
Support Beam

| Part Number | Description |
|-------------|--------------|
| FT0734 | Support Beam |



Studs

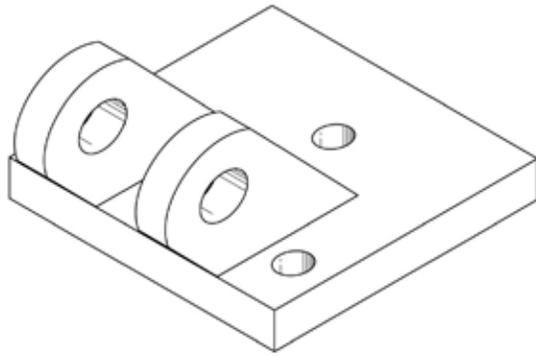
| Part Number | Description |
|-------------|-------------|
| FT0111 | Stud |
| FT0111A | Stud |
| FT0733 | Stud |



Engine Lifting and Positioning

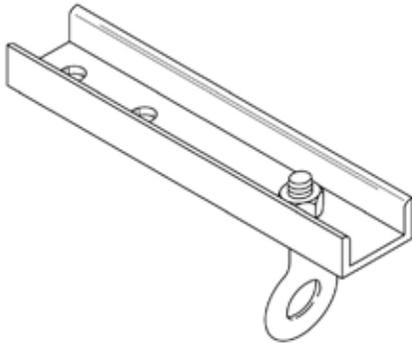
Support Bracket

| Part Number | Description |
|-------------|-----------------|
| FT0736 | Support Bracket |



Lifting Channel

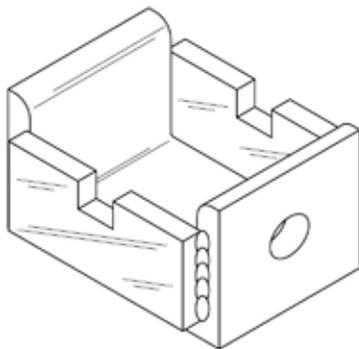
| Part Number | Description |
|-------------|-----------------|
| FT0732 | Lifting Channel |



FT2972 Engine Adapter

Model: 303C CR Mini Excavator

Warranty: None



- Used to remove and install engine
- Used with 6V-2082 Hook Group
- Adapter prevents front and rear engine lifting chains from slipping while lifting with an overhead lifting device

Reference

REN5585, 303C CR Excavator Disassembly and Assembly

| | |
|--------------------------|-----------------------------------|
| Maximum lifting capacity | 136 kg (300 lb) |
| Item 1 material | MC3 x 7.1 channel ASTM A-36 steel |
| Item 2 material | ASTM A-36 steel |

FT0962 Ladder

Model: 773

Warranty: None

- Makes 773 engine components accessible for in-chassis removal and installation
- Telescoping hooks adjustable to fit truck frame



Engine Tools

FT2792 Engine Lift Bracket

Model: 3512 Engine

Warranty: None

- Used to lift the engine out of the D10R track-type tractor using 2 normal lift points at front of engine and this bolt-on bracket at rear of engine
- Bracket mounts to top, rear side of engine (use bolts supplied with engine)
- Only 1 bracket required



Motor Grader Rear Engine Support Groups

Model: All G-Series Motor Grader Engines

Warranty: Six Months

- Used to service all G-Series Motor Grader engines
- Allow removal of motor grader transmission without removing engine
- Saves about 4 hours of labor
- Motor grader model serial number listed in chart coincides with release of load sensing hydraulic systems, threaded gland hydraulic cylinders, and corporate electrical systems
- Contain 2 support assemblies which bolt to both sides of flywheel housing to support engine; forcing bolt and locknut properly position support assembly, which is attached to rear of engine, against top surface of motor grader frame

(Continued)

Engine Lifting and Positioning

Motor Grader Rear Engine Support Groups (Continued)

Model: All G-Series Motor Grader Engines

Warranty: Six Months

Engine Tools

| Model | Serial Number | Tool Group |
|-------|----------------|------------|
| 12G | 61M-12027 & Up | A |
| | 3WC1067 & Up | A |
| 14G | 96U-7046 & Up | D |
| | 3L193 & Up | D |
| 16G | 93U-2679 & Up | E |
| 120G | 87V-8360 & Up | C |
| | 11W-1251 & Up | C |
| | 61W591 & Up | C |
| 130B | 2AB62 & Up | C |
| | 74V-2321 & Up | B |
| | 12W-1082 & Up | B |
| 140G | 59K82 & Up | B |
| | 72V-10334 & Up | A |
| | 13W741 & Up | A |
| 160G | 50H-1261 & Up | A |
| | 4JD141 & Up | A |

| Part Number | Description | Qty. |
|---|-------------------------|------|
| Engine Support Group A¹ | | |
| 4N-7862 | Support Assembly, Right | 1 |
| 1D-5118 | Jam Nut | 2 |
| 8H-6508 | Forcing Bolt | 2 |
| 0S-1595 | Bolt | 8 |
| 4B-4280 | Washer | 8 |
| Engine Support Group B² | | |
| 1D-5118 | Jam Nut | 2 |
| 8H-6508 | Forcing Bolt | 2 |
| 7B-3235 | Bolt (English) | 4 |
| Engine Support Group C³ | | |
| 1D-5118 | Jam Nut | 2 |
| 8H-6508 | Forcing Bolt | 2 |
| 0S-1595 | Bolt | 8 |

| Part Number | Description | Qty. |
|---|------------------|------|
| Engine Support Group D (Use 3 washers between support assembly and flywheel housing at each 7K-4370 bolt) | | |
| 2P-8913 | Support Assembly | 2 |
| 1D-5118 | Jam Nut | 2 |
| 8H-6508 | Forcing Bolt | 2 |
| 7K-4370 | Bolt | 4 |
| 4B-5275 | Washer | 12 |
| Engine Support Group E (Use shims as required between support assembly and flywheel housing at both support locations) | | |
| 4N-7358 | Support Assembly | 2 |
| 1D-5119 | Jam Nut | 2 |
| 4B-6208 | Forcing Bolt | 8 |
| 8S-9092 | Bolt | 4 |
| 4N-6063 | Shim | 12 |

¹Includes: Support Assembly, Left, Qty. 1

²Includes: Support Assembly, Qty. 2

³Included: Support Assembly, Qty. 2

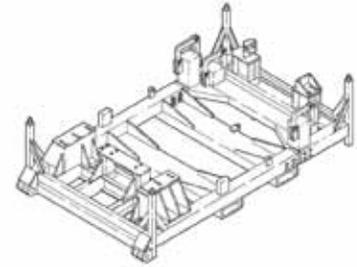
326-5851 Adjustable Engine Stand

Essential Tool

Model: C175 Engine

Warranty: Six Months

- Used to support C175-16, C175-20, and 797 Off-Highway Truck retro-fit engines for storage, shipping, and reconditioning
- Used with 323-1146 Lifting Group — attaches to engine stand mounting brackets (for lifting and moving stand with engine installed)
- Has built-in lift truck pockets for moving empty stand only (not to be used to move stand while engine is installed)
- Steel wheels on one end of stand allows engines to be loaded/unloaded from shipping containers
- Stand segments unbolt and expand to fit larger C175-20 engine
- Stackable design allows empty stands to be stored in less space



| | |
|-----------------|---------------------|
| Length (closed) | 3831mm (150.8 in) |
| Width | 2299 mm (90.5 in) |
| Height | 1073 mm (42.2 in) |
| Weight | 2196 kg (4842.0 lb) |

| Part Number | Description |
|-------------|-------------------------|
| 326-5851 | Adjustable Engine Stand |

368-0005 Lifting Bracket

Essential Tool

Model Usage: Skid Steer Loaders

Warranty: Six Months

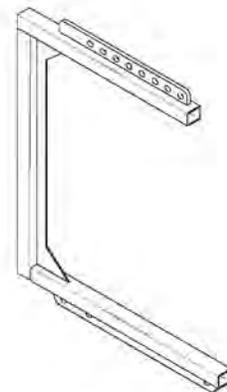
European Union compliant, CE marked

- Used to remove and install 3034, 3024C, and 3044C Engines
- Used with an overhead lifting device
- Top rail of bracket has multiple lifting points for center-of-gravity adjustments
- Bottom rail has three lifting points for various engines

Reference

NEHS1113, Tool Operating Manual

| Part Number | Description | Working Load Limit | Overall Size | Weight |
|-------------|-----------------|--------------------|--------------------------|---------------|
| 368-0005 | Lifting Bracket | 340 kg (750 lb) | 79 x 112 cm (31 x 44 in) | 24 kg (53 lb) |



795F AC Engine Rail System

Model Usage: 795F AC

Warranty: Six Months

European Union compliant, CE marked

- Used to support the C175 engine during removal and installation in the 795F AC Off-Highway Truck
- Includes rear and front rail tool groups and various support brackets that are used with both groups
- Rear rail tool group can be used independently without using the front rail tool group
- Due to overhead obstruction, rails allow engine to be rolled forward and backward for removal and installation

Reference

NEHS1096, Tool Operating Manual

KENR8726, 795F AC Off-Highway Engine Supplement

(Continued)

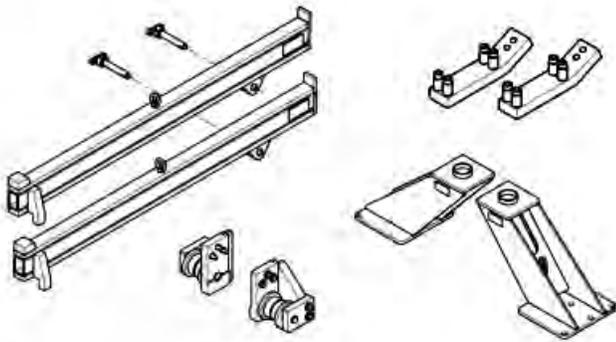
Engine Lifting and Positioning

795F AC Engine Rail System (Continued)

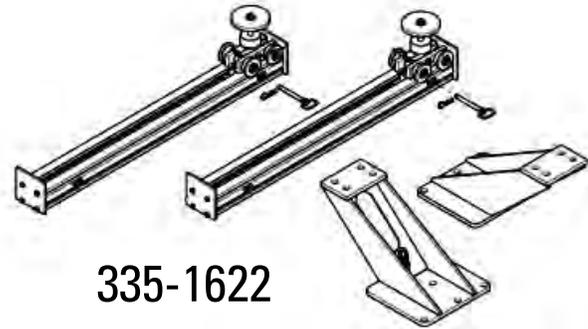
Model Usage: 795F AC

Warranty: Six Months

Engine Tools



335-1617



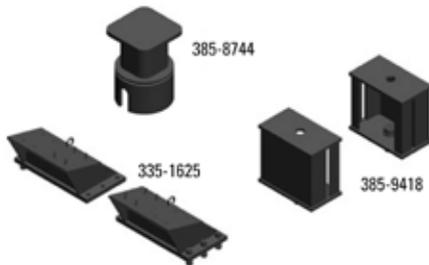
335-1622

| Part Number | Description | Weight |
|-------------|------------------|-----------------|
| 335-1617 | Rear Rail Group | 42 kg (92 lb) |
| 335-1622 | Front Rail Group | 158 kg (349 lb) |

394-0867 793F AC Engine R&I Rail Tool Group

Model Usage: 793F AC

Warranty: Six Months



- Used to support the C175 engine during removal and installation
- Allows removal and installation of engine without removing electrical cabinet off the machine
- Used with Front Rails that are part of the 335-1622 Front Rail Group

Reference

NEHS1096, Tool Operating Manual

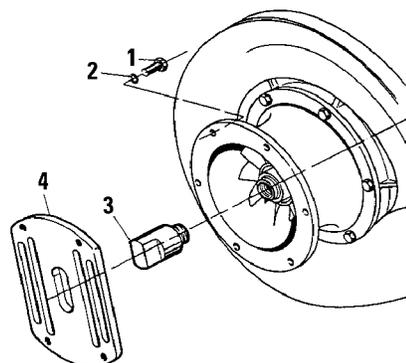
| Part Number | Description | Weight |
|----------------|------------------------------------|------------------|
| 394-0867 | 793F AC Engine R&I Rail Tool Group | -- |
| Specifications | | |
| 335-1625 | Mounting Bracket Group | 98 kg (216.1 lb) |
| 385-8744 | Lift Cap Assembly | 10 kg (22.0 lb) |
| 385-9418 | 793F AC Front Rail Tool Group | 41 kg (90.4 lb) |

3600 Engine Tools

8T-9209 Turbocharger Blocking Tool

Model: 3600 Engines
 Warranty: Six Months

- Prevents rotation of turbocharger impeller (allows emergency engine operation at reduced power)
- When rotation of turbocharger is prevented, air flow through turbo is maintained and lubricating oil flow must be stopped; (for procedure to stop lubricating oil, refer to Special Instruction SEHS8704) The output power of the engine must then be limited so exhaust gas temperature at cylinders does not exceed 480° C (900° F)
- To stop rotation, disconnect air inlet; install key (3) into impeller bushing; secure with plate (4)



| Item | Description |
|------|-------------|
| 3 | Key |
| 4 | Plate |

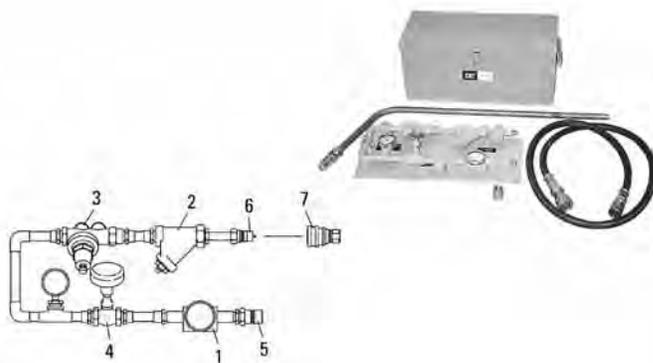
| Item | Part No. | Description | Size | Qty. |
|----------------|----------|-------------|---------------------|------|
| 1 ¹ | 0S-1595 | Bolt | 1/2 - 13 x 11/4 inL | 4 |
| 2 ¹ | 0S-1593 | Lock Washer | -- | 4 |

¹ Items are not part of 8T-9209

137-7024 Turbocharger Wash Group

Model: 3600 Engines
 Warranty: Six Months

- Used to remove deposits which form on the diffuser and turbine blades when an engine is operated on heavy fuels
- Washer provides cleaner turbines resulting in increased performance of turbocharger
- Use only with fresh, clean water (additives, solvents, salt, and dirt in water tend to form deposits on diffuser and turbine blades)



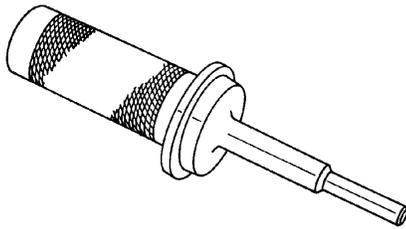
| Item | Part Number | Description |
|------|-------------|------------------|
| 1 | 130-3298 | Flow Meter |
| 2 | 130-3299 | Screen |
| 3 | 130-3300 | Regulating Valve |
| 4 | 130-3301 | Needle Valve |

| Item | Part Number | Description |
|------|-------------|--------------------------|
| 5 | 130-3295 | Quick Disconnect Nipple |
| 6 | 130-3296 | Quick Disconnect Nipple |
| 7 | 130-3297 | Quick Disconnect Coupler |
| 8 | 129-4891 | Hose Assembly |
| -- | 137-7024 | Turbocharger Wash Group |

4C-8769 Valve Seat Driver

Model: 3600 Engines

Warranty: Six Months



- Used to install water-cooled valve seat inserts
- Serves as guide and driver, helping to prevent insert damage during installation and ensuring insert is uniformly installed in cylinder head
- Overall length: 355.0 mm (14.0 in)
- Diameter of knurl handle: 65.0 mm (2.5 in)

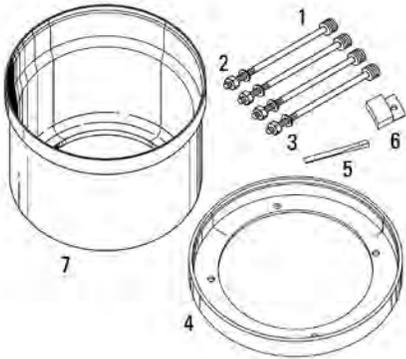
| Part Number | Description |
|-------------|-------------------|
| 4C-8769 | Valve Seat Driver |

200-5958 Wear Sleeve Installer, 1U-6241 Seal Installer

121-7705 Stud Assembly, 121-7700 Distorter Block

Model: 3600 Engines

Warranty: Six Months



- Used to remove and install crankshaft wear sleeve — essential to correctly remove and install sleeve without damage to sleeve or crankshaft
- 1U-6241 installs seal after wear sleeve is installed

Removal

- Use the 121-7700 Distorter Block with 5P-7409 Distorter
- Distorter block bolts directly to engine housing using one of the cover mounting holes and bolt
- Tools work together to make an indentation in the sleeve (helps to loosen sleeve from crankshaft)
- Distorter tool is rotated between distorter block and wear sleeve to create an indentation in the metal (similar to using a hammer and chisel to make the indentation)
- Making four indentations around the crankshaft wear sleeve should allow sleeve to easily slide off crankshaft

Installation

1. Install wear sleeve in installer.
2. Thread four studs into crankshaft.
3. Install sleeve and installer onto studs.
4. Install washers and nuts.
5. Tighten nuts to pull wear sleeve onto crankshaft.
6. When inside face of installer bottoms against end of crankshaft, sleeve is installed to correct depth.
7. Install seal.

Reference

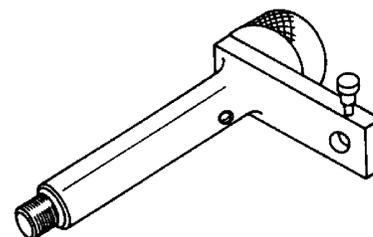
SENR3594, Service Manual Module, Disassembly and Assembly

| Item | Part Number | Description | Size |
|------|-------------|--|---|
| 1 | 121-7705 | Stud Assembly | Threads on large end: 11/8 - 12, Threads on small end: 1/2 - 13 |
| 2 | 1F-7958 | Full Nut (1/2 - 13) (fork mounting hardware) | 1/2-13 |
| 3 | 5P-8245 | Hard Washer | -- |
| 4 | 200-5958 | Wear Sleeve Installer | -- |
| 5 | 5P-7409 | Sleeve Distorter | -- |
| 6 | 121-7700 | Distorter Block | -- |
| 7 | 1U-6241 | Seal Installer | -- |

4C-6593 Valve Lash Tool

Model: 3600 Engines
Warranty: Six Months

- Used to easily check and adjust valve lash clearance of intake and exhaust valve
- Part of 4C-6594 Timing and Fuel Setting Tool Group
- Used with 6V-3075 Dial Indicator and 8S-3675 Contact Point (parts of 4C-6594 Tool Group); both can be secured in valve lash tool by tightening nylon thumb screw
- 11.11 cm (4 3/8 in) fabricated steel bracket with:
1/4 - 24 plastic thumb screw to hold a dial indicator in place
3/8 - 16 bolt with 38.1 mm (1 1/2 in) diameter knurled knob for ease of installing to valve rocker cover base



| Part Number | Description |
|-------------|---------------------------|
| 4C-6593 | Adjusting As - Valve Lash |

4C-6585 Cylinder Pressure Measuring Indicator Group, 3000 psi

Model: 3600 Engines
Warranty: Manufacturer's Six Months

- Troubleshooting tool used to check cylinder pressure on 3600 Family Diesel Engines
- Easily provides relative average peak cylinder pressure on running engine
- Not recommended for use on other than diesel engines because static pressure indication would require too much tapping to bring pointer to correct reading
- Used with 7E-1699 Manual Valve Group designed so any movement of valve stem due to engine vibration tightens valve stem against its seat; prevents valve from accidentally opening during engine operation
- K-107 cylinder pressure indicator manufactured by Kiene Diesel Accessories, Inc.
- Equipped with 3 1/2 inch Zytel nylon Bezel and case, threaded Bezel, Bourdon tube gauge, dual range 0 through 3000 psi and 0 through 210 kg/cm², metal case and service tool
- Kiene AX-13A standard indicator connection (M) by 1 1/16-10 Whitworth (F), wing nut and plug, 45° bend, 15.2 cm (6 in) long

**Repair and Service**

Kiene Diesel Accessories, Inc.
325 So. Fairbanks Street
Addison, IL 60101

Phone: 708-543-5950

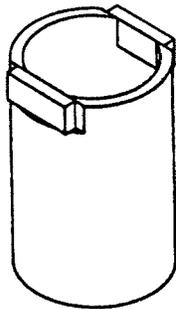
Fax: 708-543-5953

| Part Number | Description |
|-------------|---|
| 4C-6585 | Cylinder Pressure Measuring Indicator Group |

4C-6987 Socket

Model: All 3600 Engines except 3618

Warranty: Six Months



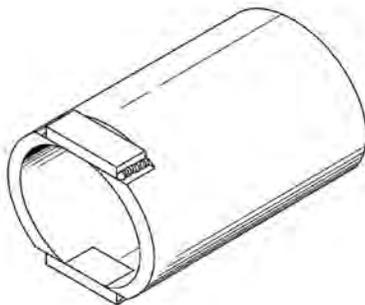
- Used for removal and installation of cylinder head nuts
- Saves time by installing nuts prior to use of tensioners and removing nuts after releasing torque
- Used with hydraulic stud tensioners of 4C-5858 Tool Group
- Maximum torque: 340 N·m (250 ft·lb)

| Part Number | Description |
|-------------|-------------|
| 4C-6987 | Socket |

184-3131 Cylinder Head Stud Socket Assembly

Model: 3618 Engines

Warranty: Six Months



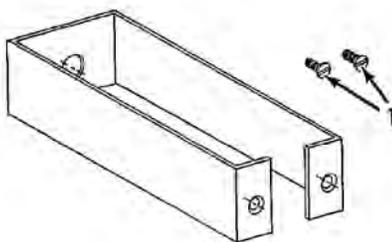
- Used to quickly remove and install cylinder head nuts after tensioning is released
- Also known as a nut spinner

| Part Number | Description |
|-------------|------------------------------------|
| 184-3131 | Cylinder Head Stud Socket Assembly |

4C-9839 Safety Retainer Group

Model: 3600 Engines

Warranty: Six Months



- Used for disassembly and assembly of cylinder head assembly
- Steel strap safety retainer for pulling rod in case pulling rod accidentally breaks
- Fits around 316-1493 Hydraulic Puller Assembly (fastened to bottom with 2 screws)
- If the pulling rod accidentally breaks and the retainer becomes deformed, the retainer should be replaced.
- Dimensions (thickness x width x length): 3.175 x 44.45 x 290 mm (1/8 x 1 3/4 x 11.4 in) long (length allows full stroke of 316-1493 Puller Assembly)

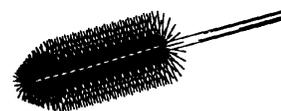
| Item | Part Number | Description |
|------|-------------|-----------------------|
| 1 | 2M-5139 | Screw (2) |
| -- | 4C-9839 | Safety Retainer Group |

130-6993 Injector Seat Cleaning Brush

Model: 3600 Engines
Warranty: Six Months

- Used to clean injector bore seats (also part of 9U-5106 Diesel Tool Group)
- Used with 1/4 inch drive drill
- Made of stainless steel — provides best cleaning results without causing damage to injector bore seat (other brushes may not have the stiffness to clean or be too stiff and cause damage)

| | |
|----------------|--------------------|
| Overall length | 31.8 cm (12.5 in) |
| Brush diameter | 47.6 mm (1.88 in) |
| Wire diameter | 0.25 mm (0.010 in) |



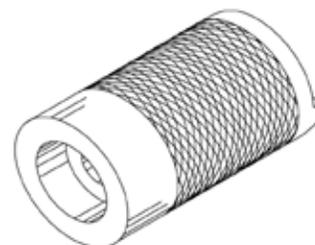
| Part Number | Description |
|-------------|---------------------|
| 130-6993 | Injector Bore Brush |

130-2534 Bridge Dowel Gauge

Model: 3600 Engines
Warranty: Six Months

- Used to check straightness and projection of 4W-5441 Bridge Guide Dowel
- Bridge dowels that are not straight will not go through gauge and must be replaced (fast and easy method of determining reusability)
- Also used to check projection of dowel above cylinder head
- Gauge quickly and accurately measures 105 ± 2 mm (4.1 ± 0.08 in) height requirement for bridge guide dowels
- Inside diameter: 19.09 mm (0.752 in)

| Part Number | Description |
|-------------|--------------------|
| 130-2534 | Bridge Dowel Gauge |

**Valve Guide Gauges**

Model: 3600 Engines
Warranty: Six Months

- Used to check wear and correct installation of valve guide
- 9U-6401 Gauge quickly gives use again or do not use again status of valve guides
- 9U-6399 Gauge used to check newly installed valve guides (passing gauge through valve guide determines straightness (deformation) of inside diameter and shows if an area is below minimum diameter)

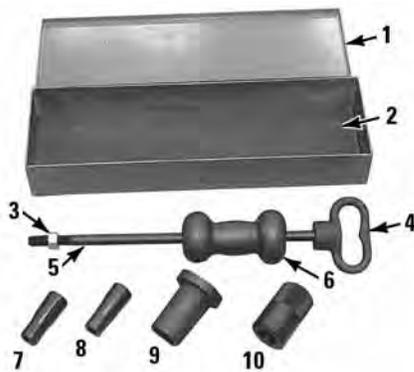


| Part Number | Description | Diameter x Length (Go) | Diameter x Length (No-Go) |
|-------------|-------------------|--------------------------------------|---------------------------------------|
| 9U-6401 | Valve Guide Gauge | 16.106 x 50.8 mm (0.634 x 2.0 in) | 16.209 x 50.8 mm (0.6381 x 2.0 in) |
| 9U-6399 | Valve Guide Gauge | 16.003 x 175 mm (0.630 x 6.9 in) | 16.059 x 50.8 mm (0.6322 x 2.0 in) |

1U-9570 Dowel Puller Group

Model: 3600 Engines

Warranty: Six Months



- Used for pulling 15.875 mm (5/8 in) and 19.05 mm (3/4 in) dowels
- Makes the job quick and easy

| | |
|---------------------|---------------------|
| Stand height | 88.9 mm (3.5 in) |
| Shaft length | 452.6 mm (17.81 in) |
| Slide hammer weight | 2.72 kg (6 lb) |

| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | 1U-9568 | Metal Box (not serviced) |
| 10 | 1U-9577 | Forcing Collar |
| 2 | 1U-9569 | Foam Block (not serviced) |
| 3 | 8T-9413 | Nut (not serviced) |
| 4 | 1U-9571 | Handle |
| 5 | 1U-9574 | Shaft |

| Item | Part Number | Description |
|------|-------------|-------------------------------|
| 6 | 1U-9575 | Slide Hammer |
| 7 | 1U-9573 | Extractor, 19.05 mm (3/4 in) |
| 8 | 1U-9572 | Extractor, 15.875 mm (5/8 in) |
| 9 | 1U-9576 | Dowel Retriever Stand |
| -- | 1U-9570 | Dowel Puller Group |

229-3639 Overhaul Protection Kit

Model: 3600 Engines

Warranty: Six Months

- Each kit contains enough plastic protective covers and plugs for one cylinder
- Easily installed and quickly removed
- Protect fuel lines and openings in cylinder head from dust and dirt and serve as moisture seal while engine is overhauled
- 4 plastic web sleeves in each kit reduce impact damage to threads of cylinder head studs

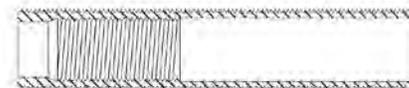
| Part Number | Description | Quantity |
|-----------------------------|---|----------|
| 229-3639 | Overhaul Protection Kit | -- |
| Service/Repair Parts | | |
| 6P-6605 | Plug, intake hole in block | 1 |
| 7H-2902 | Protective Plug, water jacket in block | 4 |
| 4C-9517 | Protective Plug, injector hole in head | 1 |
| 4C-9518 | Protective Plug, 3/16 - 16 thd, fuel lines | 4 |
| 4C-9519 | Protective Cap, 3/16 - 16 thd, fuel line connectors on head and block | 4 |
| 4C-9521 | Protective Cap, 9/16 - 18 thd, oil line connectors in head and block | 2 |
| 4C-9524 | Protective Web Sleeve, threads on cylinder head studs | 4 |
| 229-3608 | Protective Plug, Cylinder Liner and Bore | 2 |
| 229-3611 | Rod Journal Cover | 1 |

128-5113 Thread Repair Insert

Model: 3600 Engines

Warranty: Six Months

- Replaces discontinued 4C-6409 Thread Repair Insert
- Used to repair stud holes with damaged threads (only one of four holes per head can be repaired using this insert)
- Install by drilling damaged hole to 23.41 mm (1 59/64 in) and threading hole using a 2-12 tap
- Threaded repair insert is locked into place with 9S-3265 Retaining Compound

**Reference**

SEBF8151, Guideline for Reusable Parts

| | |
|----------------|--------------------|
| Outside thread | 2-12 |
| Inside thread | 1 5/8 - 12 |
| Overall length | 270.0 mm (10.6 in) |
| Drill | 4C-6415 Drill |
| Tap with pilot | 4C-6417 Tap |
| Extension tap | 4C-6416 Tap |

| Part Number | Description |
|-------------|----------------------|
| 128-5113 | Thread Repair Insert |

Ring Groove Gauges

Model: 3600 Engines

Warranty: Six Months

- Used to check piston ring groove wear to determine reusability of piston
- Simple to use. If the scribe line is visible, then the piston ring groove is good. If the line is not visible, then the piston is nonreusable.
- Three separate gauges (checks all four piston ring grooves)
- Gauges clearly marked with "top and second ring", "third ring", and "oil ring" for easy identification
- Made from heat treated steel for better wear resistance
- Size (L x W): 75 x 19 mm (3.0 x 0.8 in)



| Part Number | Description |
|-------------|---|
| 1U-9029 | Ring Groove Gauge (oil ring) |
| 1U-9030 | Ring Groove Gauge (third ring) |
| 4C-3654 | Ring Groove Gauge (top and second ring) |

| Part Number | Description |
|------------------|--|
| Not shown | |
| 197-3710 | Ring Groove Gauge (top and second ring), 3618 only |

133-1531 Threaded Insert

Model: 3600 Engines with Turbochargers

Warranty: Six Months



- Used to repair stripped or damaged threads in turbocharger housings
- Used with 4C-9730 Tap and 8T-2793 Installation Tool
- Will withstand 540° C (1000° F) temperatures
- Thread specification: M10 x 1.5

| Part Number | Description |
|-------------|-----------------|
| 133-1531 | Threaded Insert |

9U-5107 Spark Ignited Tool Group

Model: 3600 Series Spark Ignited Engines

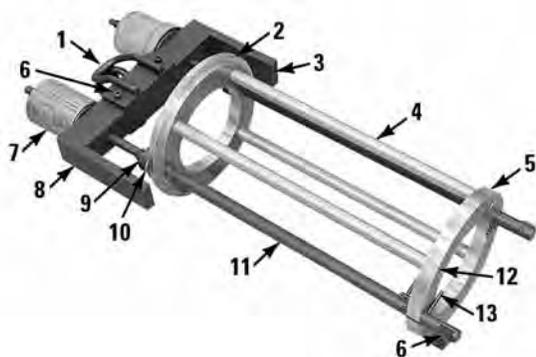
Warranty: Six Months

| Part Number | Description |
|---|--|
| 9U-5107 | Spark Ignited Tool Group |
| The 9U-5107 Group consists of the following tools (each is discussed separately) | |
| 369-2607 | Digital Indicator |
| 4C-4601 | Spark Plug Socket |
| 4C-6593 | Adjusting As - Valve Lash |
| 4C-8568 | Liner Puller Group |
| 4C-8995 | Ring Expander Group |
| 4C-9043 | Compressor Group |
| 5P-4160 | Point - Indicator Contact, 19.05 mm (0.75 in) long |
| 9U-5156 | Cleaning Tool Group |

4C-8568 Liner Puller Group (part of 9U-5107 Group)

Model: 3600 Spark Ignited Engines

Warranty: Six Months



- Used to remove and install cylinder liner using hydraulic pressure (hoist attaches to puller to easily handle tool and cylinder liner)
- Hydraulic pump connects to two hydraulic puller assemblies for a combined pulling force of 11 tons at 34,474 kPa (5000 psi)
- Used with 3S-6224 Hydraulic Pump (115 Volt) or 8S-8033 Hydraulic Pump (230 Volt); other required tooling is 8T-3035 Lines Group and 8T-0820 Pressure Gauge

References

SENR4255, Service Manual
SENR5500, Service Manual

| Item | Part Number | Description | Qty. |
|------|-------------|-----------------|------|
| 1 | 8T-2835 | Lifting Bracket | -- |
| 2 | 4C-8565 | Top Ring | -- |
| 3 | 6V-7078 | Support Bridge | 2 |

| Item | Part Number | Description | Qty. |
|------|-------------|------------------------|------|
| 4 | 6V-7069 | Rod Spacer | 4 |
| 5 | 4C-8566 | Bottom Ring | -- |
| 6 | 2J-5245 | Bolt - Hex Socket Head | 4 |

(Continued)

4C-8568 Liner Puller Group (part of 9U-5107 Group) (Continued)

Model: 3600 Spark Ignited Engines

Warranty: Six Months

| Item | Part Number | Description | Qty. | Item | Part Number | Description | Qty. |
|------|-------------|------------------------|------|------------------|-------------|--------------------|------|
| 7 | 316-1493 | Hydraulic Puller Group | 2 | 13 | 4H-6996 | Spring Pin | 8 |
| 8 | 6V-7079 | Bridge | -- | -- | 4C-8568 | Liner Puller Group | -- |
| 9 | 8T-2836 | Nut | 2 | Not shown | | | |
| 10 | 4B-5278 | Washer | 2 | -- | 4B-5276 | Bolt Washer | 2 |
| 11 | 299-5231 | Leg Assembly | 2 | -- | 2K-6073 | Bolt | 4 |
| 12 | 4D-3120 | Bolt | 8 | -- | 1B-4331 | Nut | 2 |

4C-8995 Ring Expander Group (part of 9U-5107 Group)

Model: 3600 Spark Ignited Engines

Warranty: Six Months

| Part Number | Description |
|-------------|---------------------|
| 4C-8995 | Ring Expander Group |

- Used to remove and install piston rings without damage to rings or piston
- Designed to fit 30 cm (11.8 in) piston rings

**4C-9043 Piston Ring Compressor Group (part of 9U-5107 Group)**

Model: 3600 Spark Ignited Engines

Warranty: Six Months

- Used to install piston and connecting rod assemblies
- Band-type ring compressor for 30 cm (11.8 in) piston
- Over-center adjustable lock
- Proper seating of band assembly on cylinder liner to minimize possibility of ring breakage
- 4 tabs for support while securing to piston
- 2 handles for easier positioning of piston and rings

References

SENR4255, Service Manual

SENR5535, Service Manual



| Item | Part Number | Description |
|------|-------------|------------------|
| -- | 4C-9043 | Compressor Group |
| 1 | 6V-4027 | Handle Assembly |

9U-5156 Cleaning Tool Group (part of 9U-5107 Group)

Model: 3600 Spark Ignited Engines

Warranty: Six Months

- Used to clean prechamber seats on cylinder heads
- Used with 3/8 inch drive speed handle (easily removes rust with 10 to 20 turns of handle)
- Pilot helps to keep tool aligned



| | |
|------------------|------------------------|
| Extension length | 23 cm (9.0 in) |
| Major OD | 78 mm (3.0 in) |
| Drive end | 3/8 in square (female) |
| Extension end | 1/4 - 20 thd |

(Continued)

9U-5156 Cleaning Tool Group (part of 9U-5107 Group) (Continued)

Model: 3600 Spark Ignited Engines

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|--------------------------------|
| 1 | 150-5431 | Pad Cut Down Disc ¹ |
| 2 | 150-5483 | EXL Unitized Roloc Disc |
| 3 | 1U-9023 | Pilot Assembly |
| -- | 9U-5156 | Cleaning Tool Group |

¹Warranty: Manufacturer's, 120-Day

9U-5105 Basic Tool Group

Model: 3600 Engines

Warranty: Six Months

| Part Number | Description | Qty |
|---|--|-----|
| 9U-5105 | Basic Tool Group | -- |
| The 9U-5105 Group consists of the following tools (each is discussed separately) | | |
| 1F-7958 | Full Nut (1/2 - 13) (fork mounting hardware) | -- |
| 1P-7405 | Eyebolt | -- |
| 1P-7407 | Eyebolt (1/2 - 13) | -- |
| 1P-7409 | Eyebolt | -- |
| 1U-8692 | Piston Pin Guide | -- |
| 1U-9392 | Damper Guide Pin | 2 |
| 1U-9393 | Damper Guide Pin | 2 |
| 1U-9824 | Tool Group | -- |
| 4C-6173 | Fuel Drain Tray Assembly | -- |
| 4C-6357 | Guide Group | -- |
| 235-0632 | Cylinder Installation Tool Group | -- |
| 4C-9426 | Damper Guide Pin | -- |
| 4C-9451 | Idler Rear Wrench | -- |
| 4C-9452 | Idler Rear Wrench | -- |
| 4C-9818 | Hex Shank | -- |
| 4C-9819 | Universal Joint | -- |
| 5D-1972 | Bolt (2) | -- |
| 5P-7409 | Sleeve Distorter | -- |
| 5P-8245 | Hard Washer | -- |
| 8T-0890 | Puller Group | -- |
| 8T-0914 | Flywheel Guide Pin | 2 |
| 8T-0960 | Handling Tool Group | -- |

| Part Number | Description | Qty |
|---|--------------------------------|-----|
| The 9U-5105 Group consists of the following tools (each is discussed separately) (Continued) | | |
| 8T-0970 | Camshaft Bearing Tool Group | -- |
| 8T-3022 | Rod Guide Group | -- |
| 8T-3029 | Camshaft Segment Support Group | -- |
| 8T-3034 | Water Pump Seal Driver | -- |
| 9U-5932 | Extension Camshaft Torque | -- |
| 9U-5981 | Snap Ring Retainer | -- |
| 9U-6244 | Support | -- |
| 9U-6248 | Guide Bolt | 3 |
| 9U-6251 | Suspension Yoke Assembly | -- |
| 9U-6461 | Phoenix Screwdriver | -- |
| 121-7700 | Distorter Block | -- |
| 121-7705 | Stud Assembly | -- |
| 126-6918 | Head Lifting Bracket | -- |
| 126-6919 | Head Lifting Bracket | -- |
| 126-6920 | Handle Rod | -- |
| 134-0932 | Main Bearing Driver | -- |
| 136-1452 | Internal Pliers Assembly | -- |
| 138-7573 | Bracket Assembly - Link | 2 |
| 138-7574 | Link Bracket | 2 |
| 138-7575 | Bracket - Link | 2 |
| 145-5190 | Piston Support Group | -- |
| 191-1135 | Cylinder Space Assembly | 2 |
| 200-5958 | Wear Sleeve Installer | -- |

9U-5105 Basic Tool Group for Miscellaneous Tools

8T-3034 Water Pump Seal Driver (Part of 9U-5105 Group)

Model: 3600 Engines

Warranty: Six Months

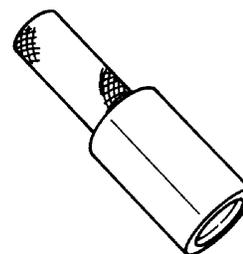
- Used to seat ceramic ring and rubber seat into water pump housing (knurled handle for better grip)
- Also installs carbon seal onto pump shaft (pressed onto shaft until light contact with ceramic seal face is made)
- Length: 210.0 mm (8.3 in)
- Seal diameter: 63.0 mm (2.5 in)

References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual



| Part Number | Description |
|-------------|------------------------|
| 8T-3034 | Water Pump Seal Driver |

1U-9824 Oil Drain Tool Group (Part of 9U-5105 Group)

Model: 3600 Engines

Warranty: Six Months

- Used to drain oil from filter housing (keeps engine clean, captures all used oil, reduces cleanup cost)
- 9U-9822 and 9U-9821 Trays catch oil; 5N-5566 Hose routes it to a container (trays attach to filter housing with four 9S-8752 Nuts)
- 1U-9823 Scoop provides convenient way to carry used filters to a disposal area (filter is also too hot to handle without scoop)
- Allows filter replacement while engine is running
- Drain trays and scoop made from heavy-gauge sheet metal
- Scoop diameter: 203 mm (8.0 in)

References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

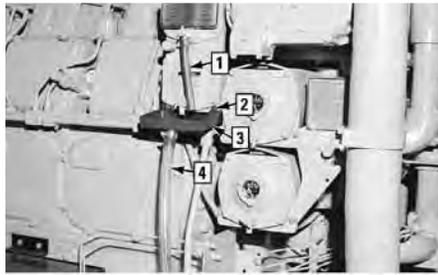


| Item | Part Number | Description | Qty. |
|----------------|-------------|----------------------------|------|
| 1 | 1U-9823 | Filter Scoop Assembly | -- |
| 2 ¹ | 9S-8752 | Nut - Full (3/8 - 16) | 2 |
| 3 | 1U-9822 | Tray Assembly, Upper | -- |
| 4 | 1U-9821 | Tray Assembly, Lower | -- |
| 5 ¹ | 5N-5566 | Hose (not part of 4C-6173) | -- |
| -- | 1U-9824 | Tool Group | -- |

¹ Not part of 1U-9824

4C-6173 Fuel Drain Tray Assembly (Part of 9U-5105 Group)

Model: 3600 Engines
Warranty: Six Months



- Used to drain fuel from filter housing (keeps engine clean, captures all fuel, reduces cleanup costs)
- 7V-0198 Hose and 4C-6173 Tray catches fuel; 5N-5566 Hose routes it to a container (tray attaches to filter housing with two 4F-4879 Bolts)
- 1U-9823 Scoop, from 1U-9824 Oil Drain Tool Group, provides convenient way to carry used filters to a disposal area
- Allows filter replacement while engine is running
- Drain tray made from heavy-gauge sheet metal with 25 mm (1.0 in) spout

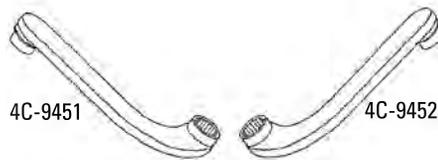
References

SENR3594, Service Manual Module of SENR3590 Service Manual
SENR3600, Service Manual Module of SENR3595 Service Manual
SENR4259, Service Manual Module of SENR4255 Service Manual

| Item | Part Number | Description |
|------|-------------|---------------------------------|
| 1 | 7V-0198 | Hose (not part of 4C-6173) |
| 2 | 4F-4879 | Bolt, (2) (not part of 4C-6173) |
| 3 | 4C-6173 | Fuel Drain Tray Assembly |
| 4 | 5N-5566 | Hose (not part of 4C-6173) |

4C-9451 and 4C-9452 Idler Gear Wrench (Part of 9U-5105 Group)

Model: 3600 Engines



- Used to remove and install bolts on rear idler gear of 3612 and 3616 Engines (accesses hard to reach bolts)
- Has 3/4 inch square-drive to connect torque wrench
- Torque extensions of 101.6 and 254 mm (4 and 10 in) are etched on each wrench so correct torque can be calculated (refer to SEHS7150 Special Instruction for correct torque wrench setting)
- 2 opposite L-shaped wrenches
12-point socket: 1 1/8 inch
Square drive end: 3/4 inch

Reference

SENR3594, Service Manual Module of SENR3590 Service Manual

| Part Number | Description |
|-------------|-------------------|
| 4C-9451 | Idler Rear Wrench |
| 4C-9452 | Idler Rear Wrench |

Engine Tools

9U-6461 Phoenix Screwdriver (Part of 9U-5105 Group)

Model: 3600 Engines
Warranty: Manufacturer's



- Used to tighten Phoenix connectors to correct torque (prevents over-torque and thus damage to terminals)
- Length: 180.0 mm (7.0 in)

| Part Number | Description |
|-------------|---------------------|
| 9U-6461 | Phoenix Screwdriver |

8T-0890 Puller Group (Part of 9U-5105 Group)

Model: 3600 Engines

- Used to remove rotor cover from centrifugal oil filter (allows replacement of 7C-8390 Rotor Liner)

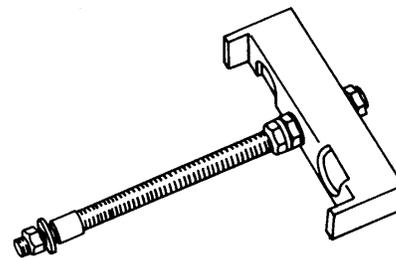
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

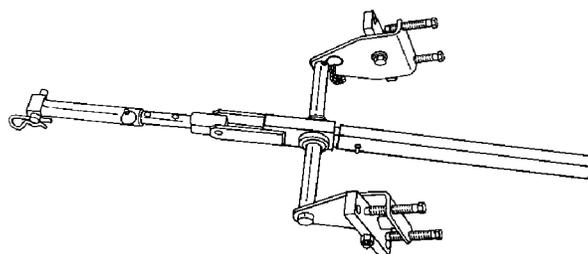
| | |
|----------------------|---------------------------------------|
| Bolt size and length | 1/2 - 13 x 10.5 in |
| Nuts (3) | 1/2 - 13 thd |
| Bridge | 35 x 40 x 169 mm (1.4 x 1.6 x 6.7 in) |

| Part Number | Description |
|-------------|--------------|
| 8T-0890 | Puller Group |

**Cylinder Head****8T-0960 Handling Tool Group (Part of 9U-5105 Group)**

Model: 3600 Engines

- Used to raise and lower crankshaft main bearing cap and 207-5034 Stud Tension Tool Group
- 4C-8357 Tray Support Rail is installed in oil pan baffle holes and supports discontinued 8T-0872 Stud Tensioner Tray (tray used as work table to support main bearing caps or stud tensioner tooling before they are lifted into place)
- 8T-0947 Tee Handle is used as handhold to aid in alignment of 207-5034
- Discontinued 8T-0956 Bracket Group is installed into crankcase access cover openings on each side of engine (adjustment screws allow precise leveling of 207-5034); discontinued 8T-0956 includes discontinued 8T-0806 Block, discontinued 8T-0954 Screw, and 8T-7238 Handle
- Two 8T-0916 Pins connect this handling group to main bearing caps (use 4K-0367 Nuts on pins)
- Most parts in the group are assembled with pins and spring clips (clips prevent tooling from falling into oil pan)

**Assembled Handling Tool Group****References**

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| Item | Description |
|------|---------------------|
| 15 | No Longer Available |



(Continued)

References (Continued)

SEN3594, Service Manual Module of SEN3590 Service Manual
 SEN3600, Service Manual Module of SEN3595 Service Manual
 SEN4259, Service Manual Module of SEN4255 Service Manual

| Item | Part Number | Description |
|------|-------------|---------------------------|
| 1 | 8T-0916 | Pin |
| 2 | 8T-0959 | Hitch Pin |
| 3 | 8T-0955 | Tensioner Lift Tube Group |
| 4 | 8T-0948 | Lift Lever Group |
| 5 | 8T-0872 | Stud Tensioner Tray |
| 6 | 8T-0961 | Rail Retainer Bushing |
| 7 | 4C-8357 | Tray Support Rail |

| Item | Part Number | Description |
|-----------------|-------------|---------------------|
| 8 | 4K-0367 | Nut - Full |
| 9 | 8T-0947 | Tee Handle |
| 10 | 1B-4430 | Jam Nut |
| 11 | 8T-0946 | Tension Lift Stud |
| 12 | 8T-0963 | Shaft |
| 13 | 5P-0370 | Lock Pin |
| 14 ¹ | 8T-0956 | Bracket Group |
| -- | 8T-0960 | Handling Tool Group |

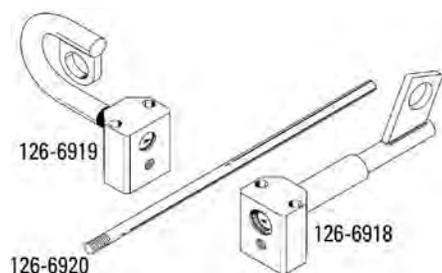
¹ Includes 8T-0806 Block, 8T-0954 Screw, and 9U-7238 Handle

126-6918 Head Lifting Bracket (3600 Vee), 126-6919 Head Lifting Bracket (3600 In-line)

126-6920 Handle Rod (Part of 9U-5105 Group)

Model: 3600 Engines

Warranty: Six Months



- Replaces discontinued 8T-2860 Head Lifting Bracket (3600)
- Used to remove and install heads on 3600 Engines — 126-6918 used for Vee engines and 126-6920 used for in-line engines
- Lifting bracket for Vee engines is designed with 25° angle (keeps bottom of head parallel to 25° block angle)
- Attach lifting bracket bolt to head with two 5D-1972 Bolts (3/4 in - 10 11 3/4 in) (part of 9U-5105 Group)
- Handle rod screws into either bracket and helps mechanic position head during assembly
- Not shown: 5D-1972 Bolt (3/4 in -10, 11 3/4 in)

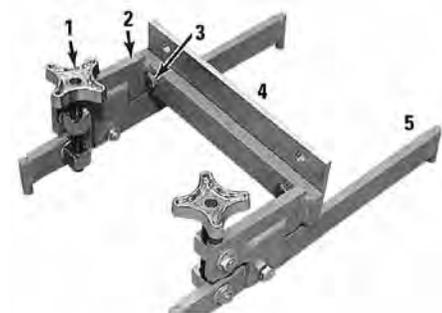
| |
|---|
| Working load limit for either lifting bracket |
| 227 kg (500 lb) |

| Part Number | Description |
|-------------|----------------------|
| 126-6918 | Head Lifting Bracket |
| 126-6919 | Head Lifting Bracket |
| 126-6920 | Handle Rod |

Crankshaft and Camshaft

8T-3029 Camshaft Segment Support Group (Part of 9U-5105 Group)

Model: 3600 Engines



- Used to support camshaft segments during removal and installation (weight of camshaft segments 28 kg [62 lb])
- Swivel assembly is adjustable for easier alignment of segment during installation
- Discontinued 8T-3050 Bracket bolts directly into the bottom 2 bolt holes of camshaft cover on 3606 and 3608 Engines
- 1U-6311 Cam Support Adapter allows the discontinued 8T-3050 to be mounted in bottom 2 holes of camshaft covers on 3612, 3616 and 3618 Engines (use two 3/8-16 bolts to attach 1U-6311 to discontinued 8T-3050)

References

SEN3594, Service Manual Manual Module of SEN3590 Service Manual
 SEN3600, Service Manual Module of SEN3595 Service Manual
 SEN4259, Service Manual Module of SEN4255 Service Manual

(Continued)

Crankshaft and Camshaft (Continued)**8T-3029 Camshaft Segment Support Group (Part of 9U-5105 Group)**

Model: 3600 Engines

| Item | Description |
|------|--|
| 3 | 3/8 in - 16 Bolt (not part of 8T-3029) |

| Item | Part Number | Description |
|------|-------------|--------------------------------|
| 1 | 8T-3049 | Swivel Assembly |
| 2 | 8T-3050 | Bracket |
| 4 | 1U-6311 | Camshaft Support Adapter |
| 5 | 8T-3048 | Lifting Bar |
| -- | 8T-3029 | Camshaft Segment Support Group |

9U-5932 Camshaft Torque Extension (Part of 9U-5105 and 9U-5106 Groups)

Model: 3600 Engines

- Used to remove and install bolts retaining thick-flange camshaft segments
- Designed with minimum clearance to fit onto the bolts (conventional sockets cannot reach the bolts)
- Using the extension requires a calculation to determine the correct torque; the extension uses a 100 mm (4 in) lever arm (use Form SEHS7150 to calculate the proper torque wrench setting)

| | |
|---------------------|-----------------|
| Square drive | 1/2 in |
| Socket (12 point) | 15/16 in |
| Length of extension | 100 mm (4.0 in) |



| Part Number | Description |
|-------------|---------------------------|
| 9U-5932 | Extension Camshaft Torque |

8T-0970 Camshaft Bearing Tool Group, 3600 Engines (Part of 9U-5105 Group)**156-7155 Camshaft Bearing Tool Group, 3618 Engines (Not Part of 9U-5105 Group)**

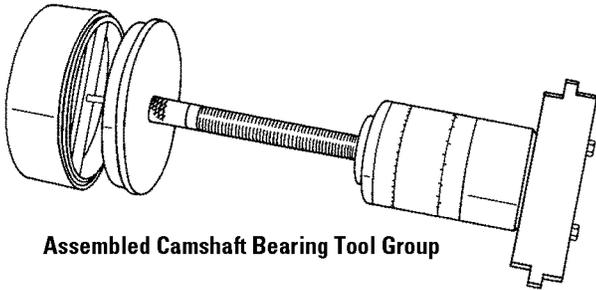
Model: 3600 Engines

- Used to remove and install camshaft bearings (not possible by any other means)
- Discontinued 8T-0968 Bridge will pilot in bearing bore on one side and when reversed, pilot in cylinder block bearing bore on other side
- Used with 3S-6224 Hydraulic Pump (115 V) or 8S-8033 Hydraulic Pump (230 V); other required tooling is 8T-3035 Lines Group and 8T-0820 Pressure Gauge

| Part Number | Description |
|-------------|-----------------------------|
| 8T-0970 | Camshaft Bearing Tool Group |
| 156-7155 | Camshaft Bearing Tool Group |

References

SENR3594, Service Manual Module of SENR3590 Service Manual
 SENR3600, Service Manual Module of SENR3595 Service Manual
 SENR4259, Service Manual Module of SENR4255 Service Manual



Assembled Camshaft Bearing Tool Group

| | |
|----------------------------|-------------------------|
| Cylinder | |
| Capacity | 180 kN (20 ton) |
| Stroke | 76 mm (3.0 in) |
| Maximum operating pressure | 69,000 kPa (10,000 psi) |

Camshaft Bearing Tools



| Item | Part Number | Description |
|--|-------------|---------------------|
| 8T-0970 Camshaft Bearing Tool Group, 3600 Engines | | |
| 1 ¹ | 316-1496 | Cylinder |
| 2 | 8T-0969 | Rod |
| 2 ¹ | 184-5397 | Threaded Rod |
| 3 | 8T-0968 | Bridge |
| 4 | 8T-0972 | Pilot |
| 5 | 8T-0971 | Plate |
| 6 | 0L-1143 | Bolt |
| 7 ¹ | 0S-1619 | Bolt |
| 8 ¹ | 8T-0973 | Insert for Cylinder |

| Item | Part Number | Description |
|---|-------------|------------------------------|
| 156-7155 Camshaft Bearing Tool Group, 3618 Engines | | |
| 1 ¹ | 316-1496 | Cylinder |
| 2 ¹ | 184-5397 | Threaded Rod |
| 3 | 156-7157 | Bridge |
| 4 | 156-7154 | Pilot |
| 5 | 156-7156 | Plate |
| 6 | 0L-1143 | Bolt |
| 7 ¹ | 0S-1619 | Bolt |
| 8 ¹ | 8T-0973 | Insert for Cylinder |
| 9 | 317-7104 | Insert for 316-1496 Cylinder |
| Not Shown | | |
| 9 | 317-7104 | Insert for 316-1496 Cylinder |

¹ Common to both groups

134-0932 Main Bearing Driver (Part of 9U-5105 Group)

Model: 3600 Engines

- Used to remove and install crankshaft main bearings (older 6l-4528 Main Bearing and new 111-3378 Main Bearing) without removing crankshaft
- Bearings are easily removed by inserting tool into crankshaft journal lubrication hole and rotating crankshaft clockwise to roll bearing out
- Will also roll in new bearings by rotating crankshaft in a counterclockwise direction
- Threaded hole in pin allows easy removal from oil passage if tool shears (tool is designed to shear to prevent damage to crankshaft)

References

SENR3594, Module of SENR3590

SENR3600, Module of SENR3595

SENR4259, Module of SENR4245

SENR5535, Module of SENR5500

| | |
|-----------------------------------|---------------------|
| Blade width | 90 mm (3.54 in) |
| Blade thickness | 6.35 mm (0.250 in) |
| Pin diameter | 19.48 mm (0.767 in) |
| Threaded puller hole in pin 8 -32 | |

| Item | Part Number | Description |
|------|-------------|---------------------|
| 1 | 134-0932 | Main Bearing Driver |
| 2 | 8F-3469 | Seal |

Piston and Connecting Rod Assembly**145-5190 Piston Support Group, (Part of 9U-5105)**

Model: All 3600 Engines

- Used to safely support piston and connecting rod assembly on all 3600 Engines when replacing connecting rod bearing
- Mounted in place of oil cooling jet with two 0S-1619 Bolts (after engine rotated until piston at top dead center position)
- Lightweight aluminum for ease of installation
- Knurled for firm grip
- Not shown: 0S-1619 Bolts, 3/8-16 x 3 inch (2)

References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

| | |
|------------------|-----------------|
| Support capacity | 102 kg (225 lb) |
|------------------|-----------------|

| Part Number | Description |
|-------------|----------------------|
| 145-5190 | Piston Support Group |

8T-3022 Rod Guide Group (Part of 9U-5105 Group)

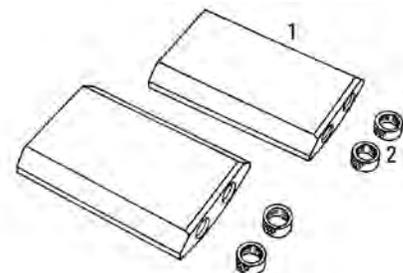
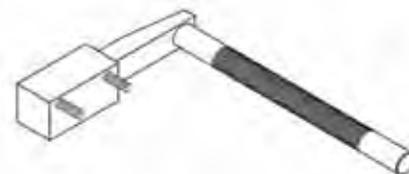
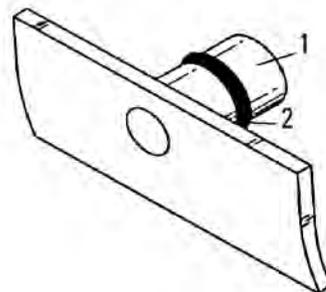
Model: 3606 and 3608 Engines

- Used to protect crankshaft bearing journal from damage
- Guides help align connecting rod onto crankshaft during installation (held to connecting rod studs with 8T-2859 Nut)
- Both parts constructed from aluminum to help prevent scratching of finished machined surfaces
- Guide dimensions: 163 x 109 x 32 mm (6.4 x 4.3 x 1.2 in)
- Knurled nut: 3/4 - 16 thread

References

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual



(Continued)

8T-3022 Rod Guide Group (Part of 9U-5105 Group) (Continued)

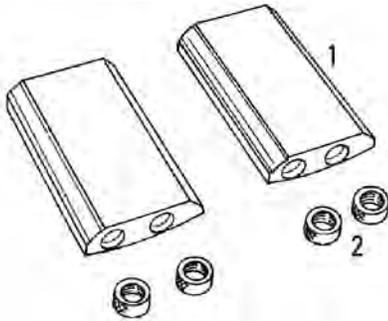
Model: 3606 and 3608 Engines

| Item | Description |
|------|---------------------------------|
| 1 | Guide (not serviced separately) |

| Item | Part Number | Description |
|-------------------------------------|-------------|-----------------|
| -- | 8T-3022 | Rod Guide Group |
| Rod Guide Group Consists of: | | |
| 2 | 8T-2859 | Nut |

4C-6357 Guide Group (Part of 9U-5105 Group)

Model: 3612 and 3616 Engines



- Used to protect crankshaft bearing journal from damage
- Guides help align connecting rod onto crankshaft during installation (held to connecting rod studs with 8T-2859 Nut)
- Both parts constructed from aluminum to help prevent scratching of finished machined surfaces
- Guide dimensions: 163 x 96.5 x 30.5 mm (6.4 x 3.8 x 1.2 in)
- Knurled nut: 3/4 - 16 thread

Reference

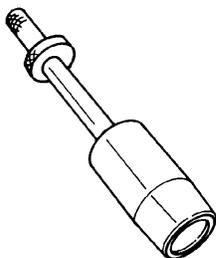
SEN3594, Service Manual Module of SENR3590 Service Manual

| Item | Description |
|------|---------------------------------|
| 1 | Guide (not serviced separately) |

| Item | Part Number | Description |
|---------------------------------|-------------|-------------|
| -- | 4C-6357 | Guide Group |
| Guide Group Consists of: | | |
| 2 | 8T-2859 | Nut |

1U-8692 Guide, Piston Pin (Part of 9U-5105 Group)

Model: 3600 Engines



- Used to easily install piston pin into piston and rod assembly (pin is put onto guide which helps align piston and rod bores)
- Constructed of lightweight aluminum

References

SEN3594, Service Manual Module of SENR3590 Service Manual

SEN3600, Service Manual Module of SENR3595 Service Manual

SEN4259, Service Manual Module of SENR4255 Service Manual

| Part Number | Description | Diameter | Length | Weight |
|-------------|------------------|------------------|-------------------|--------------|
| 1U-8692 | Piston Pin Guide | 22.8 cm (9.0 in) | 64.2 cm (25.3 in) | 7 kg (14 lb) |

136-1452 Internal Pliers Assembly (Part of 9U-5105 Group)

Model: 3600 Engines

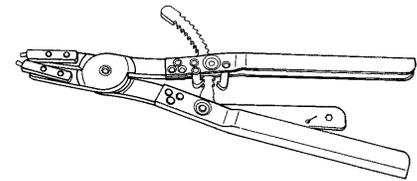
- Used to remove and install piston pin retainer or snap ring (pliers have locking handles for easier installation)
- Use with 9U-5981 Snap Ring Retainer to provide added protection if snap ring slips off pliers
- Replaceable tip makes pliers more economical
- Service Part: 1U-6728 Tip Set

References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual



| Part Number | Description | Length |
|-------------|--------------------------|---------------|
| 136-1452 | Internal Pliers Assembly | 40 cm (16 in) |

9U-5981 Snap Ring Retainer (Part of 9U-5105 Group)

Model: 3600 Engines

- Used to contain piston pin retainer (snap ring)
- Used with 136-1452 Internal Pliers Assembly during disassembly and assembly of piston and connecting rod

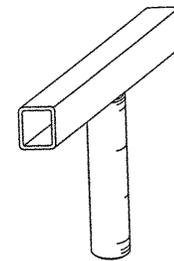
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| | |
|---------------|---------------------------------|
| Handle | 31.8 mm (1.25 in) square tubing |
| Body diameter | 42.9 mm (1.68 in) |
| Body length | 20 x 20 cm (7.8 x 7.8 in) |



| Part Number | Description |
|-------------|--------------------|
| 9U-5981 | Snap Ring Retainer |

Block**235-0632 Cylinder Installation Tool Group (Part of 9U-5105 Group)**

Model: 3600 Engines

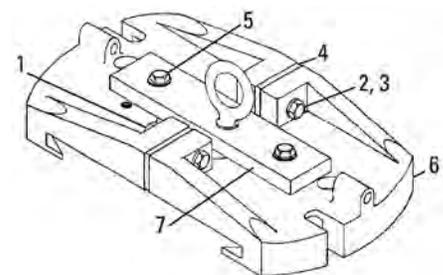
- Replaces discontinued 4C-9041 Cylinder Installation Tool Group
- Used to remove and install cylinder assembly, cylinder liner, and piston and connecting rod assembly (provides convenient method of attaching a hoist)
- Piston and connecting rod assembly can be removed separately using 235-0612 Bracket, 9S-1366 Bolt, and 5P-1076 Washer

References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual



| Item | Part Number | Description | Quantity |
|--|-------------|--|----------|
| -- | 235-0632 | Cylinder Installation Tool Group | -- |
| Cylinder Installation Tool Group Consists of: | | | |
| 1 | 1F-7958 | Full Nut (1/2 - 13) (fork mounting hardware) | 2 |
| 2 | 9S-1366 | Bolt (1/2-13) | 2 |
| 3 | 5P-1076 | Hard Washer, 13.5 mm ID x 30 mm OD | 6 |
| 4 | 1U-7619 | Spacer | 2 |

(Continued)

235-0632 Cylinder Installation Tool Group (Part of 9U-5105 Group) (Continued)

Model: 3600 Engines

| Item | Part Number | Description | Quantity |
|--|-------------|------------------|----------|
| Cylinder Installation Tool Group Consists of: (Continued) | | | |
| 5 | 0V-0375 | Bolt | 2 |
| 6 | 4C-9040 | Bracket | 2 |
| 7 | 235-0612 | Bracket Assembly | 1 |

4C-9818 Shank-Hex (Part of 9U-5105 Group)

4C-9819 Universal Joint (Part of 9U-5105 Group)

Model: 3600 Engines

- Used to easily rotate crankshaft
- Used with 213-3110 Socket, or similar part, and 12.7 mm (1/2 in) drill (reversible variable speed drill works best, but is not necessary)



| 4C-9818 Hex Shank | |
|-------------------------|--------------------------------------|
| Shank size | 7/16 hex |
| Shank length | 32 mm (1.3 in) |
| Drive end | 1/2 in square drive with lock button |
| Overall length | 70 mm (2.8 in) |
| 4C-9819 Universal Joint | |
| Outside diameter | 30 mm (1.9 in) |
| Overall length | 63 mm (2.5 in) |
| Male drive end | 1/2 in square drive with lock button |
| Female drive end | 1/2 in square drive |

| Item | Part Number | Description |
|------|-------------|------------------|
| 1 | 213-3110 | Socket, 1 1/8 in |
| 2 | 4C-9819 | Universal Joint |
| 3 | 4C-9818 | Hex Shank |

191-1135 Cylinder Liner Spacer Assembly (Part of 9U-5105 Group)

Model: 3600 Engines



- Used to install cylinder liner into block (using two will easily and evenly seat the liners)
- Steel tube designed to fit over head studs
- Used with 2 head-stud nuts, 4C-6987 Socket (184-3131 Socket for 3618 Engines) and 239-6826 Ratchet (1/2 inch Drive)
- Length: 31.432 cm (12.375 in)
- 2 required

| Part Number | Description |
|-------------|-------------------------|
| 191-1135 | Cylinder Space Assembly |

Vibration Damper and Flywheel**4C-9426 Damper Guide Pin (Part of 9U-5105 Group)**

Model: 3600 Engines

- Used to align and support vibration damper during assembly and disassembly of 3606, 3608, and 3612 Engines (2 required)
- 1/2 inch square drive socket for easy installation and removal

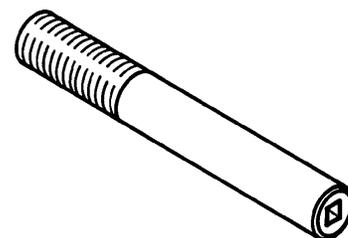
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| Part No. | Description | Diameter | Length | Thread | Weight |
|----------|------------------|--------------|------------------|------------|-----------------|
| 4C-9426 | Damper Guide Pin | 25 mm (1 in) | 15.2 cm (6.0 in) | 1 - 14 thd | 0.6 kg (1.3 lb) |

**1U-9393 Damper Guide Pin (Part of 9U-5105 Group)**

Model: 3600 Engines

- Used to align and support single vibration dampers (2 required)
- 1/2 inch square drive socket for easy installation and removal

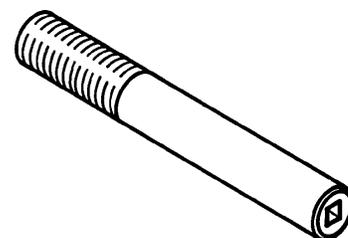
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| Part No. | Description | Diameter | Length | Thread | Weight |
|----------|------------------|--------------|------------------|-----------|-----------------|
| 1U-9393 | Damper Guide Pin | 25 mm (1 in) | 15.2 cm (6.0 in) | 1 - 8 thd | 0.6 kg (1.3 lb) |

**1U-9392 Damper Guide Pin (Part of 9U-5105 Group)**

Model: 3600 Engines

- Used to align and support outer vibration damper of dual vibration dampers (2 required)
- 1/2 inch square drive socket for easy installation and removal

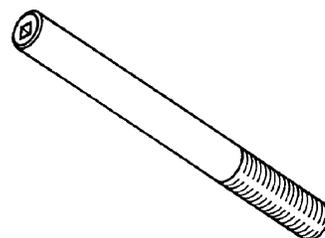
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| Part No. | Description | Diameter | Length | Thread | Weight |
|----------|------------------|-------------------|-------------------|---------------|-----------------|
| 1U-9392 | Damper Guide Pin | 28.4 mm (1.12 in) | 25.4 cm (10.0 in) | 1 1/8 - 8 thd | 1.3 kg (2.9 lb) |

**8T-0914 Flywheel Guide Pin (Part of 9U-5105 Group)**

Model: 3600 Engines

- Used to align and support flywheel and rear gear support assembly during installation and removal (2 required)
- 1/2 inch external square drive for easy installation and removal

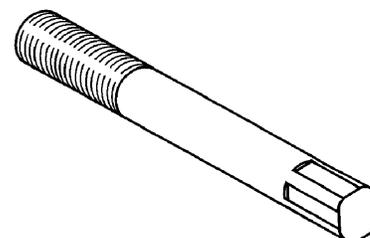
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| Part No. | Description | Diameter | Length | Thread | Weight |
|----------|--------------------|-------------------|---------------|----------------|-------------|
| 8T-0914 | Flywheel Guide Pin | 28.4 mm (1.12 in) | 61 cm (24 in) | 1 1/8 - 12 thd | 3 kg (6 lb) |



9U-5106 Diesel Tool Group

Model: 3600 Diesel Engines

Warranty: Six Months

| Part Number | Description |
|-----------------------------|-------------------------------|
| 9U-5106 | Diesel Tool Group |
| 9U-5106 Consists of: | |
| 130-6993 | Injector Bore Brush |
| 1U-8795 | Governor Torque Arm |
| 4C-5719 | Piston Ring Compression Group |
| 4C-6594 | Timing Tool Group |

| Part Number | Description |
|---|---------------------------------------|
| 9U-5106 Consists of: (Continued) | |
| 5P-0328 | Crowfoot Wrench, 7/8 in (Fuel Line) |
| 5P-0329 | Crowfoot Wrench, 15/16 in (Fuel Line) |
| 6V-7073 | Liner Puller Group |
| 8T-3268 | Bolt (2) |
| 9U-5932 | Extension Camshaft Torque |

6V-7073 Liner Puller Group (Part of 9U-5106 Group)

Model: 3600 Diesel Engines



- Used to remove and install cylinder liner using hydraulic pressure (hoist attaches to puller to easily handle tool and cylinder liner)
- Hydraulic pump connects to two hydraulic puller assemblies for a combined pulling force of 11 tons at 5000 psi
- Used with 3S-6224 Hydraulic Pump (115 Volt) or 8S-8033 Hydraulic Pump (230 Volt); other required tooling is 8T-3035 Lines Group and 8T-0820 Pressure Gauge

References

SEN3594, Service Manual Module of SENR3590 Service Manual

SEN3600, Service Manual Module of SENR3595 Service Manual

| Item | Part Number | Description |
|--|-------------|------------------------|
| -- | 6V-7073 | Liner Puller Group |
| 6V-7073 Liner Puller Group Consists of: | | |
| 3.0 | 6V-7074 | Top Ring |
| 4.0 | 8T-2835 | Bracket |
| 6.0 | 6V-7079 | Bridge |
| 7.0 | 8T-2836 | Nut |
| 10.0 | 6V-7075 | Bottom Ring |
| 11.0 | 299-5231 | Leg Assembly |
| 2.0 | 2J-5245 | Bolt - Hex Socket Head |
| 1.0 | 316-1493 | Hydraulic Puller Group |

| Item | Part Number | Description |
|--|-------------|----------------|
| 6V-7073 Liner Puller Group Consists of: (Continued) | | |
| 8.0 | 4B-5278 | Washer |
| 12.0 | 4D-3120 | Bolt |
| 13.0 | 4H-6996 | Spring Pin |
| 5.0 | 6V-7069 | Rod Spacer |
| 9.0 | 6V-7078 | Support Bridge |
| Not shown | | |
| -- | 1B-4331 | Nut |
| -- | 4B-5276 | Bolt Washer |
| -- | 2K-6073 | Bolt |

8T-3268 Bolt (Part of 9U-5106 Group)

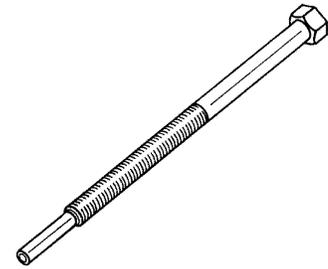
Model: 3600 Engines

- Used to remove unit injector by evenly tightening two bolts at the same time

References

SENR3594, Service Manual Module of SENR3590 Service Manual
 SENR3600, Service Manual Module of SENR3595 Service Manual

| Part No. | Description | Overall Length | Pilot Diameter | Pilot Length | Thread |
|----------|-------------|------------------|----------------|----------------|------------|
| 8T-3268 | Bolt | 13.9 cm (5.5 in) | 6 mm (0.24 in) | 27 mm (1.1 in) | 15/16 - 18 |



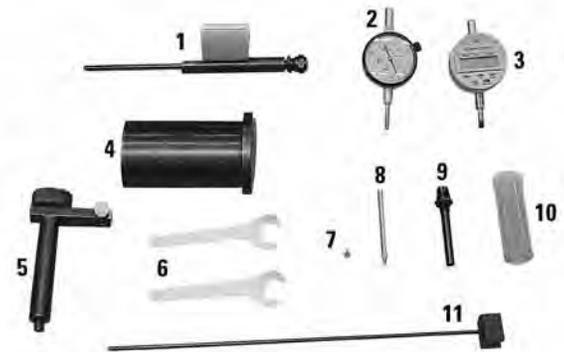
4C-6594 Timing and Fuel Setting Tool Group (Part of 9U-5106 Group)

Model: 3600 Diesel Engines

- Replaces discontinued 6V-6170 Timing and Fuel Setting Tool Group
- Used to accurately test and adjust injector synchronization and fuel timing dimension
- 4C-6593 Valve Lash Tool is used to check and adjust valve lash clearance of intake and exhaust valves using a dial indicator (used with 6V-3075 Dial Indicator and 8S-3675 Contact Point)
- 6V-3075 Dial Indicator has black numbers and markings for positive travel and red markings for negative travel (369-2607 is an optional digital indicator)

References

- SENR3593, Service Manual Module of SENR3590 Service Manual
- SENR3599, Service Manual Module of SENR3595 Service Manual
- SEHS9599, Special Instruction



| Item | Part Number | Description |
|--|-------------|---------------------------|
| 4C-6594 Timing and Fuel Setting Tool Group Consists of: | | |
| 1 | 6V-9058 | Fixture Assembly |
| 2 | 6V-3075 | Indicator - Dial |
| 3 | 369-2607 | Digital Indicator |
| 4 | 6V-9056 | Set Gauge |
| 5 ¹ | 4C-6593 | Adjusting As - Valve Lash |
| 6 | 6V-7918 | Wrench |
| 7 | 8S-3675 | Point - Indicator |
| 8 | 5P-7263 | Indicator Contact Point |

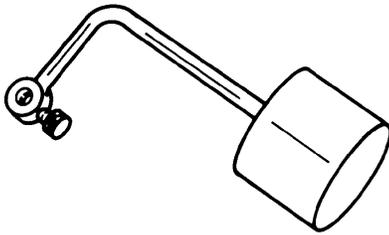
| Item | Part Number | Description |
|--|-------------|----------------------------|
| 4C-6594 Timing and Fuel Setting Tool Group Consists of: (Continued) | | |
| 9 ¹ | 4C-8753 | Extended Collet |
| 10 | 5P-7276 | Container |
| 11 | 6V-9057 | Rack Synchronizing Gauge |
| -- | 4C-6594 | Timing Tool Group |
| Not shown² | | |
| -- | 6V-7145 | Case |
| -- | 4C-6596 | Bottom Insert ¹ |
| -- | 4C-6595 | Top Insert ¹ |

¹ Parts used to upgrade a discontinued 6V-6170 to a 4C-6594 (also order an NEEG2491 Decal)

² Parts used to upgrade a discontinued 6V-6170 to a 4C-6594 (also order an NEEG2491 Decal)

1U-8795 Governor Torque Arm (Part of 9U-5106 Group)

Model: 3600 Engines



- Holds governor or actuator terminal shaft to fuel "ON" position while injectors are being adjusted
- When torque arm is installed with weight in horizontal position, 18.6 N-m (13.65 ft-lb) is applied to governor linkage
- Shaft clearance hole diameter: 16.3 mm (0.64 in)

References

SENR3594, Service Manual Module of SENR3590 Service Manual
SENR3600, Service Manual Module of SENR3595 Service Manual

| Part Number | Description |
|-------------|---------------------|
| 1U-8795 | Governor Torque Arm |

9U-5932 Camshaft Torque Extension (Part of 9U-5105 and 9U-5106 Groups)

Model: 3600 Engines



- Used to remove and install bolts retaining thick-flange camshaft segments
- Designed with minimum clearance to fit onto the bolts (conventional sockets cannot reach the bolts)
- Using the extension requires a calculation to determine the correct torque; the extension uses a 100 mm (4 in) lever arm (use Form SEHS7150 to calculate the proper torque wrench setting)

| | |
|---------------------|-----------------|
| Square drive | 1/2 in |
| Socket (12 point) | 15/16 in |
| Length of extension | 100 mm (4.0 in) |

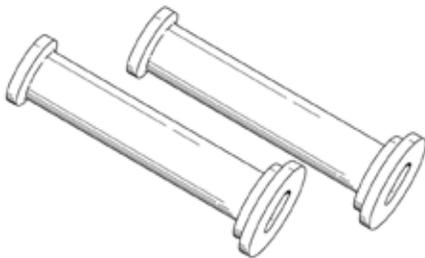
| Part Number | Description |
|-------------|---------------------------|
| 9U-5932 | Extension Camshaft Torque |

191-1135 Cylinder Liner Spacer Assembly

Essential Tool

Model: All 3600 and G3600 Engines

Warranty: Six Months



- Used to install cylinder liner into cylinder head
- Used with 4C-6987 Socket and two cylinder head stud nuts
- Used with 184-3131 Socket for 3618 Engines
- Steel tube fits over cylinder head studs
- Using two spacer assemblies will easily and evenly seat cylinder liners
- Overall length: 314.32 mm (12.375 in)

| Part Number | Description |
|-------------|-------------------------|
| 191-1135 | Cylinder Space Assembly |

146-2726 Maintenance Tool Group

Model: G3600 Engines

Warranty: Six Months

- Used to perform routine maintenance tasks on G3600 Engines

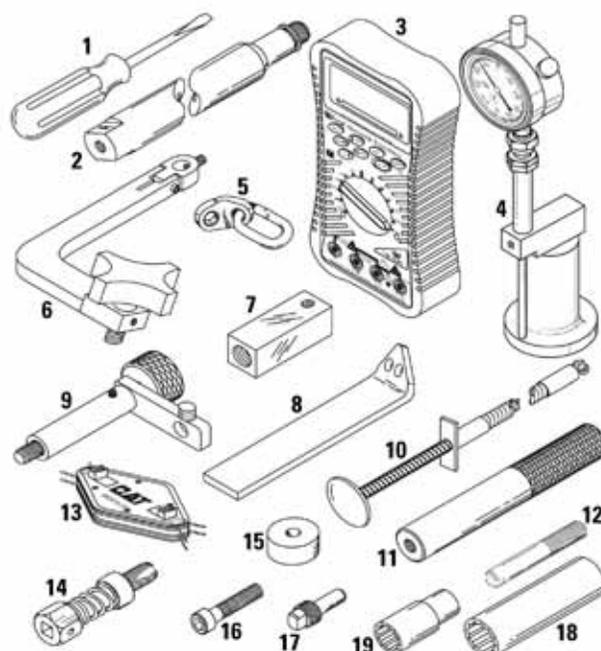
| Item (Not shown) | Description |
|------------------|---|
| NETG5044 | Software License Card (required to activate software) |

(Continued)

146-2726 Maintenance Tool Group (Continued)

Model: G3600 Engines

Warranty: Six Months



| Item | Part Number | Description | Use |
|------|-------------|---------------------------|--|
| 1 | 6V-9124 | Screwdriver | Used for terminal strips |
| 2 | 146-2739 | Cylinder Pressure Adapter | Connects outside air pressure source to cylinders on 3500 and 3600 Engines during cylinder leak down testing |
| 3 | 257-9140 | Fluke 87V Multimeter | Test and adjust electrical circuits |
| 4 | 148-2997 | Valve Recession Tool Kit | Measures valve seat recession by placing magnetic block on top of valve rotator with rod extending to top of cylinder head (used with 6V-3075 Dial Indicator or 369-2607 Digital Indicator) |
| 5 | 138-7573 | Bracket Assembly - Link | Turbo lift bracket |
| 6 | 146-2742 | GAV Lash Tool | Set gas admission valve (GAV) lash by installing in valve cover base rear bolt hole and adjusting 5P-2056 Indicator Tip on gas admission rocker arm flat (use with 147-5536 Indicator Contact Point and 6V-3075 Indicator on gas admission rocker arms with pin) |
| 7 | 143-8995 | Leak Down Check Tool | Tests check valves in prechamber |
| 8 | 9U-6244 | Support | Turbo support |
| 9 | 4C-6593 | Adjusting As - Valve Lash | Check and adjust valve lash |
| 10 | 146-2728 | Flex Pickup Tool | Remove check valve seal |
| 11 | 1P-0529 | Handle | Waste gate tool |
| 12 | 9U-6248 | Guide Bolt | Install equally spaced bolts in outer ring of holes in back of turbocharger compressor housing during assembly |
| 13 | 9U-7516 | Spark Plug Gauge | Check spark plug gap |
| 14 | 9U-7511 | Spark Plug Seat Cleaner | Spark plug seat cleaner |
| 15 | 1P-0462 | Plate, 0.937 in Diameter | Waste gate tool |

(Continued)

146-2726 Maintenance Tool Group (Continued)

Model: G3600 Engines

Warranty: Six Months

| Item | Part Number | Description | Use |
|------------------|----------------------|------------------------|--|
| 16 | 6L-5897 | Bolt, 7/8 in long | Waste gate tool |
| 17 | 143-8997 | Dummy Check Valve | Checks leak down fixture (143-8995) before testing check valves |
| 18 | 4C-4601 | Spark Plug Socket | Remove and install spark plugs |
| 19 | 9S-5031 ¹ | Deep Well Socket | Removes combustion sensor spark plug |
| -- | 146-2726 | Maintenance Tool Group | -- |
| Not shown | | | |
| -- | 285-0901 | Blowby Pickup Group | Check blow by volume |
| -- | 368-9910 | Multi-tool Group | Measures volume of blowby gas coming from crankcase breather and air velocity through radiator |

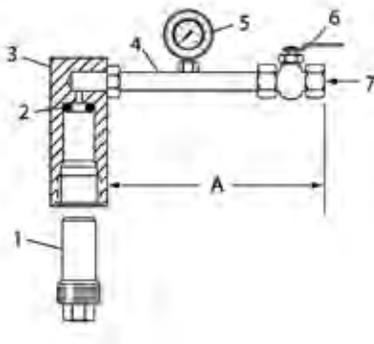
¹ Comes with insert for removing spark plugs

143-8995 Leak Down Check Tool

143-8997 Check Valve (Dummy)

Model: G3606, G3608, G3612, and G3616 Engines

Warranty: Six Months



- Used to test prechamber check valves for leakage
- When 827 kPa (120 psi) air pressure is applied, pressure cannot leak down below 689 kPa (100 psi) within five seconds
- Used with external compressed air supply, air pressure gauge with a maximum 1378 kPa (200 psi) capacity, and quick action shut-off valve
- 143-8997 Dummy Check Valve is used to verify that leak down check tool does not have any leaks
- A 2M-4453 O-ring Seal is included with leak down check tool and is a service part
- When connecting air supply, it must be as close as possible [within 300.0 mm (12.0 in) max] to inlet side of air pressure gauge
- Maximum air pressure (pressure gauge): 1378 kPa (200 psi)
- Maximum length between tool and leak down check valve: 304.0 mm (12.0 in)

| Item | Description |
|------|---------------------------------|
| 4 | Tube |
| 5 | Pressure gauge |
| 6 | Ball valve |
| 7 | Air supply |
| A | 305 mm (12.0 in) maximum length |

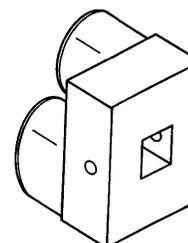
| Item | Part Number | Description |
|------|-------------|----------------------|
| 1 | 143-8997 | Dummy Check Valve |
| 2 | 2M-4453 | O-ring Seal |
| 3 | 143-8995 | Leak Down Check Tool |

4C-6583 Governor Calibration Tool

Model: 3600 Locomotive Engine with PGEV Governor

Warranty: Six Months

- Holds the governor shaft to the fuel on position when synchronizing injectors
- Makes it easier to rotate governor terminal shaft and easier to hold it in position when adjusting power setting
- Has 2 dowels on one side to fit into 2 holes on governor shaft position indicator
- 1/2 inch square drive connection on other side for attaching socket wrench as lever arm



| Part Number | Description |
|-------------|---------------------------|
| 4C-6583 | Governor Calibration Tool |

9U-5102 Main Bearing Journal Cover Assembly

Model: 3600 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|-------------------------------------|
| 9U-5102 | Main Bearing Journal Cover Assembly |

- Used to protect crankshaft bearing journals from impact damage during removal, installation, and transportation
- Made from oil resistant rubber
- Spring and hook latching device makes attaching simple and easy
- Overall size (L x W): 830.0 x 120.0 mm (32.0 x 4.7 in)

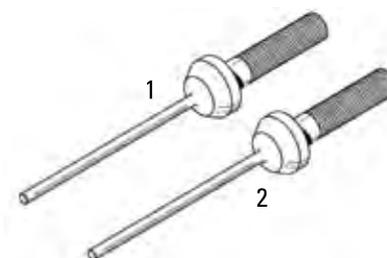


147-2285 Diesel Valve Seat Group

Model: 3600 Diesel Engines

Warranty: Six Months

- Used to measure valve seat angle after machining of seat
- Pilots in valve guide to ensure that seat is perpendicular to guide
- Features knurled handle for positive grip
- Lightly oiling tool before storage is recommended to prevent corrosion of precision machined surfaces
- Tool group includes case and foam insert



References

SEBF8129, Guideline for Reusable Parts

SEHS0095, Special Instruction

| Item | Part No. | Description | Seat Angle | Overall Length | Pilot Diameter |
|------|----------|-------------------------|------------|----------------------|------------------|
| 1 | 147-1642 | Valve Seat Angle Gauge | 30.5° | 344.50 mm (13.56 in) | 16 mm (0.630 in) |
| 2 | 147-1643 | Valve Seat Angle Gauge | 31° | 344.50 mm (13.56 in) | 16 mm (0.630 in) |
| -- | 147-2285 | Diesel Valve Seat Group | -- | -- | -- |

(Continued)

147-2285 Diesel Valve Seat Group (Continued)

Model: 3600 Diesel Engines

Warranty: Six Months

| Item | Part No. | Description | Seat Angle | Overall Length | Pilot Diameter |
|-----------|----------|--|------------|----------------|----------------|
| Not Shown | | | | | |
| — | 6V-3072 | Case - Plastic, NEEG2574 Group Decal on lid (9U-7402 Group) | -- | -- | -- |

207-5034 Stud Tensioner Tool Group

Model: 3600 Engines

Warranty: Six Months

- Used to tension cylinder head studs and main bearing studs
- Used with 8T-0820 Pressure Group and 8T-3035 Lines Group
- Used with one of these pumps: 3S-6224 Hydraulic Pump (115V) or 8S-8033 Hydraulic Pump (230V); 8T-0820 Pressure Gauge and 8T-3035 Lines Group also required (Cannot be used with 156-7166, 227-6724, 227-8834, 191-5347, and 156-7167 Hydraulic Pumps which are used with the other stud tensioning tools)
- Used with 8T-0960 Handling Tool Group to remove and install main bearings
- Simultaneously tension four cylinder head studs or two crankshaft main bearing studs (use 8T-0960 Handling Tool Group when removing crankshaft main bearings)
- 4C-5816 Retainer Collar attaches as protective device to 8T-0895 Cylinder Group before tightening or loosening crankshaft main bearing studs (helps contain 207-4607 Collar and stud in case of breakage)
- 8T-0493 Cylinder Test Stud, 8T-0495 Test Stud Spacer, and two 207-4607 Thread Collars are used to test 8T-0895 Cylinder Group
- 9U-5141 Nut Turning Handle used to loosen and tighten nuts while studs are extended (9U-5141 Nut Turning Handle replaces discontinued 4C-6986 Nut Turning Handle)
- 4C-6987 Socket used to pre-torque cylinder head nuts

References

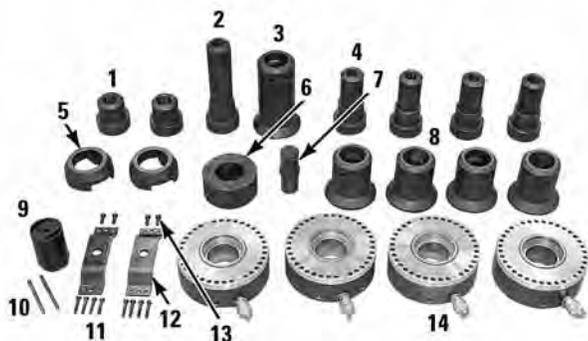
SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

SEHS9342, Special Instruction

| 8T-0895 Cylinder Group | |
|--|--|
| Applied force of each cylinder at maximum pressure | 1540 N @ 69 000 kPa (173 ton @ 10,000 psi) |
| Piston area | 223 cm ² (34.6 sq in) |
| Weight | 20 kg (45.0 lb) |



(Continued)

207-5034 Stud Tensioner Tool Group (Continued)

Model: 3600 Engines
 Warranty: Six Months

| Item | Part Number | Description |
|------------------|-------------|--------------------------------|
| -- | 207-5034 | Stud Tensioner Tool Group |
| 1 | 207-4607 | Threaded Collar (bearing stud) |
| 2 | 8T-0889 | Threaded Collar (head stud) |
| 3 | 8T-0898 | Cylinder Head Pedestal |
| 4 | 8T-0891 | Threaded Collar (head stud) |
| 5 | 8T-0896 | Bearing Pedestal |
| 6 | 8T-0494 | Test Stud Spacer |
| 7 | 8T-0493 | Cylinder Test Stud |
| 8 | 8T-0897 | Cylinder Head Pedestal |
| 9 | 4C-6987 | Socket |
| 10 | 9U-5141 | Nut Turning Handle |
| 11 | 1B-0581 | Bolt |
| 12 | 4C-5816 | Collar Retainer |
| 13 | 0L-1351 | Bolt |
| 14 | 8T-0895 | Cylinder Group |
| Not shown | | |
| -- | 8T-0911 | Cap |
| -- | 8T-0913 | Piston |
| -- | 8T-0912 | Body |
| -- | 8T-0901 | Valve |
| -- | 8T-0902 | Screw |
| -- | 8T-0903 | Screen |
| -- | 8T-0904 | Ring |
| -- | 8T-0907 | Spring |
| -- | 8T-0908 | Bolt |
| -- | 8T-0909 | Wiper |
| -- | 8T-0915 | Ring |
| -- | 8T-0917 | Ring |

8T-0820 Pressure Gauge

Model: 3600 Engines

- Used to provide pressure reading of hydraulic pumps when used with 207-5034 Stud Tensioner Group or 8T-0970 Cam Bearing Tool Group or 6V-7073 Liner Puller Group or 4C-8568 Liner Puller Group
- Used with 3S-6224 Hydraulic Pump (115 Volt) or 8S-8033 Hydraulic Pump (230 Volt); 2N-1931 Fitting, 45° Street Ell can be used to make gauge face more visible
- Liquid-filled gauge has face calibrated with both kPa and psi

References

SEN3594, Service Manual Module of SENR3590 Service Manual
 SENR3600, Service Manual Module of SENR3595 Service Manual
 SENR4259, Service Manual Module of SENR4255 Service Manual

| | |
|--------------------------|---------------------------------|
| Pressure range | 0 - 70,000 kPa (0 - 10,000 psi) |
| Operating temperature | -20° to 65° C (-4° to 150° F) |
| Male-threaded connection | 1/4 - 18 NPTF |
| Gauge diameter | 102 mm (4.0 in) |



(Continued)

8T-0820 Pressure Gauge (Continued)

Model: 3600 Engines

| Part Number | Description |
|-------------|-------------------------|
| 8T-0820 | Standard Pressure Gauge |

8T-3035 Lines Group

Model: 3600 Engines

- Used to connect hydraulically operated tool to hydraulic pump — 3S-6224 Hydraulic Pump (115V) or 8S-8033 Hydraulic Pump (230V); used in the following applications: remove and install cylinder head and crankshaft main bearings, camshaft bearings, and cylinder liners
- Used with 207-5034 Stud Tensioner Tool Group, 6V-7073 Liner Puller Group, 8T-0970 Camshaft Bearing Tool Group, 6V-7073 Liner Puller Group or 4C-8568 Liner Puller Group

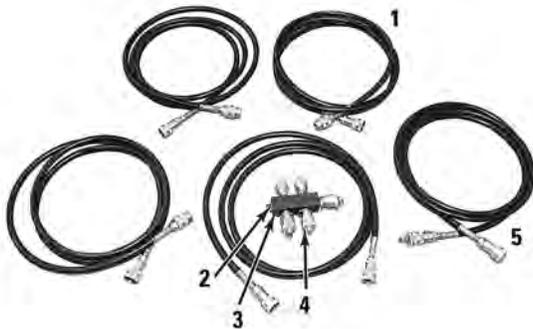
References

SENR3594, Service Manual Module of SENR3590 Service Manual

SENR3600, Service Manual Module of SENR3595 Service Manual

SENR4259, Service Manual Module of SENR4255 Service Manual

| | |
|-----------------------------------|--------------------------|
| 6D-7726 Hose Assembly | |
| Length | 3480 mm (137.0 in) |
| Maximum pressure rating | 70,000 kPa (10,000 psi) |
| Threaded connections (both ends) | 1/4 - 18 NPTF |
| 1P-2375 Coupler Assembly (male) | |
| Threaded connection | 3/8 - 18 NPTF |
| Proof pressure | 82,000 kPa (12,000 psi) |
| Burst pressure | 137,000 kPa (20,000 psi) |
| 1P-2376 Coupler Assembly (female) | |
| Threaded connection | 1/4 - 18 NPTF |
| Proof pressure | 82,000 kPa (12,000 psi) |
| Burst pressure | 144,000 kPa (21,000 psi) |
| 8T-5206 Manifold | |
| Number of ports | 6 |
| Threaded connection (female) | 3/8 - 16 NPTF |
| Plug (3/8-18 NPTF) | 3J-5390 Plug |



(Continued)

8T-3035 Lines Group (Continued)

Model: 3600 Engines

| Item | Part Number | Description |
|------|-------------|--|
| -- | 8T-3035 | Lines Group |
| 1 | 6D-7726 | Hydraulic Hose (2) |
| 2 | 3J-5390 | Plug - NPTF (Ext Hex) 3/8 in-18 NPTF external to 1/8 in-27 NPTF internal |
| 3 | 8T-5206 | Manifold |
| 4 | 1P-2375 | Coupler Assembly Quick Connective (Male) |
| 5 | 1P-2376 | Coupler Assembly Quick Connective (Female) (2) |

156-7159 Camshaft Separation Assembly

Model: 3618 Engines (serial numbers 2MW1-UP)

Warranty: Six Months

| Part Number | Description |
|-------------|------------------------------|
| 156-7159 | Camshaft Separation Assembly |

- Used to separate camshaft segments
- Replaces separating method which used jacking screws (these holes are no longer available in current camshafts)
- Used with 9X-8881 Bolt
- Bolt length: 57.2 mm (2.25 in)
- Bolt size: 5/8 - 11

Reference

REN1333-01, Service Manual

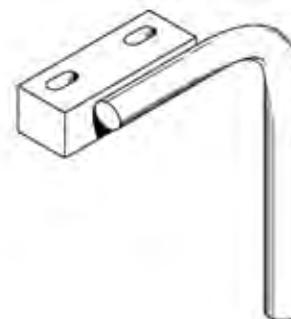
**156-7160 Piston Support**

Model: 3618 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|----------------|
| 156-7160 | Piston Support |

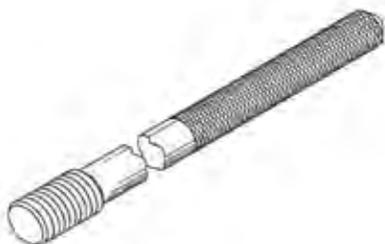
- Used to safely support piston and connecting rod assembly while replacing connecting rod bearings
- Made of lightweight aluminum for easy installation
- Mounts in place of cooling jet with existing bolts



178-5063 Rod Cap Guide (3618)

Model: 3618 Engines (2MW1-Up)

Warranty: Six Months



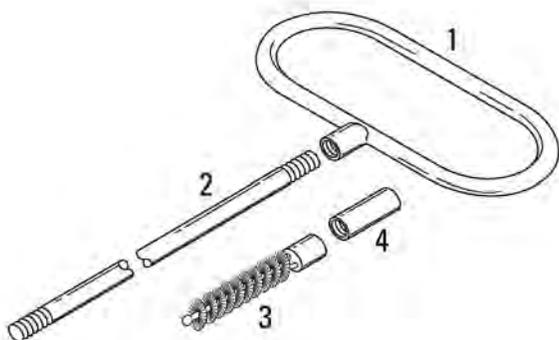
- Used to easily remove and install connecting rod cap
- Guides (2) thread into lower portion of connecting rod
- Helps prevent damage to connecting rod cap
- Thread: M24 x 3.0

| Part Number | Description |
|-------------|---------------|
| 178-5063 | Rod Cap Guide |

145-0316 Cleaning Kit

Model: 3600 Gas Engines with Two-Stage After Coolers

Warranty: Six Months



- Used to clean water tubes in 2-stage after coolers
- Soft deposits left by coolant are removed by inserting brushes into after cooler tubes and working back and forth through the length of coolant tubes
- Kit includes 9.5 mm (0.38 in) diameter brushes, rods, handle, and connector
- Rotate cleaning rods and brushes in clockwise direction to prevent parts from unscrewing

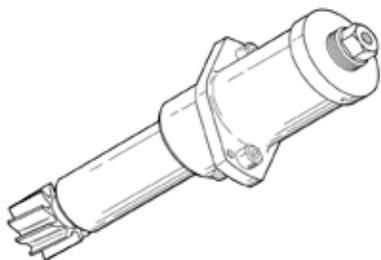
| Item | Description | Quantity |
|------|-------------|----------|
| 1 | Handle | 1 |
| 2 | Rod | 3 |
| 3 | Brush | 12 |
| 4 | Connector | 2 |

| Part Number | Description |
|-------------|--------------|
| 145-0316 | Cleaning Kit |

187-6273 Prechamber Machining Tool Group (G3600)

Model: All G3600 Engines

Warranty: Six Months



- Used to remove pitting and corrosion in lower sealing surface of prechambers
- Machines lower sealing surface of prechamber
- Maximum material removal: 0.5 mm (0.02 in)

Reference

NEHS0790, Using the 187-6273 Prechamber Machining Tool Group (G3600)

| |
|---|
| NOTICE |
| Use with caution and as a last resort to salvage cylinder heads. Excessive material removal could result in loss of core credit of the cylinder head. Follow step-by-step directions in NEHS0790 Tool Operating Manual provided with this tool. |

| Part Number | Description |
|-------------|---------------------------------|
| 187-6273 | Prechamber Machining Tool Group |

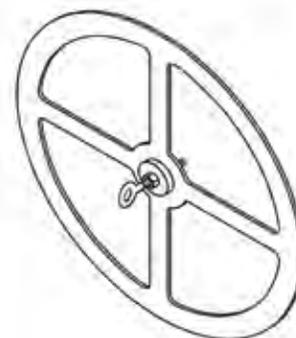
151-8689 Template Seal

Model: 3600 and G3600 Engines

Warranty: Six Months

| Part Number | Description |
|-------------|---------------|
| 151-8689 | Template Seal |

- Just outline ID and OD of template to reveal sealing surface
- Used to easily and quickly identify area of cylinder head that needs a smooth sealing surface
- Any nicks, gouges, and/or damage in this area may result in incorrect sealing



9U-7522 Head Repair Tool Group

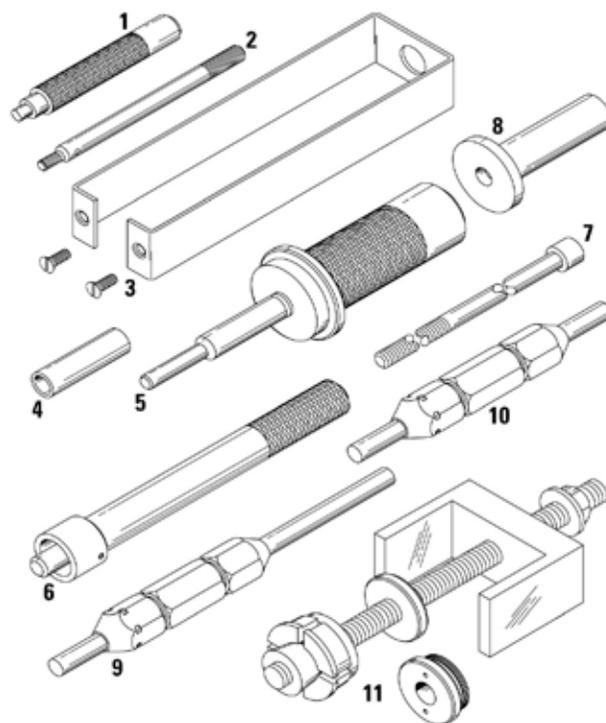
Model: All 3600 and G3600 Engines

Warranty: Six Months

- Used for general disassembly and assembly of cylinder head

References

3600 and G3600 Engine Service Manuals Cylinder Head Disassembly and Assembly Module



| Item | Part Number | Description |
|----------------|-------------|-----------------------------|
| 1 | 4C-8540 | Dowel and Plug Driver |
| 2 | 4C-8731 | Dowel Pulling Rod |
| 3 | 4C-9839 | Safety Retainer Group |
| 4 | 8T-2673 | Stop Sleeve |
| 5 | 8T-2674 | Valve Seat Driver |
| 6 ¹ | 8T-2676 | Valve Guide Driver Assembly |

| Item | Part Number | Description |
|------|-------------|---------------------------|
| 7 | 8T-2679 | Pulling Rod Assembly |
| 8 | 8T-2781 | Cylinder Support Pedestal |
| 9 | 9U-6399 | Valve Guide Gauge |
| 10 | 9U-6401 | Valve Guide Gauge |
| 11 | 130-1449 | Valve Seat Puller Group |
| 12 | 8T-2660 | Compressor Group |

(Continued)

9U-7522 Head Repair Tool Group (Continued)

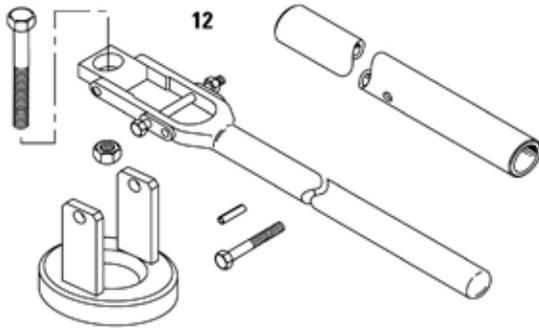
Model: All 3600 and G3600 Engines

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|------------------------|
| -- | 9U-7522 | Head Repair Tool Group |

¹ Includes discontinued 8T-2677 Driver and discontinued 8T-2678 Sleeve

Compressor Group (Item 12)

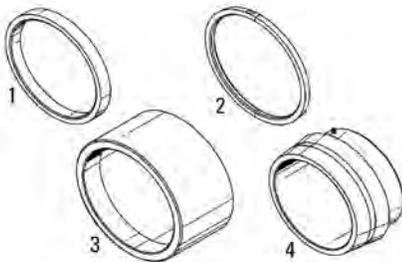


Engine Tools

148-9704 Seal Installer Group

Model: 3600 Diesel and Heavy Fuel Oil Engines

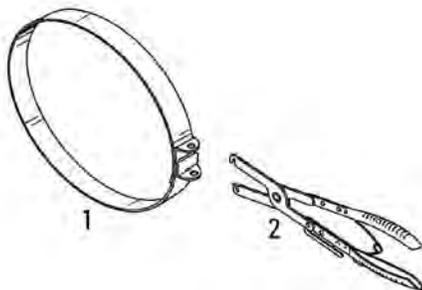
Warranty: Six Months



- Used to install seals on high pressure aftercoolers (HPAC)
- Group contains seal compressors and pliers to consecutively install both seals — makes installation easier and faster, while helping to eliminate seal damage during installation

| Item | Part Number | Description |
|------|-------------|----------------|
| 1 | 148-6442 | Ring |
| 2 | 148-6443 | Ring Insert |
| 3 | 148-6444 | Seal Driver |
| 4 | 148-6445 | Seal Installer |

148-9704 Seal Installer Group (Continued)



| Item | Part Number | Description | Qty. |
|------|-------------|------------------------|------|
| -- | 148-9704 | Seal Installer Group | -- |
| 1 | 148-9705 | Seal Ring Compressor | 2 |
| 2 | 148-9707 | Ring Compressor Pliers | 2 |

9U-6249 Cylinder Tool Group**9U-6250 Pump Tool Group**

Model: 3600 Engines
Warranty: Six Months

- Both tool groups used together to disassemble and assemble 3600 Engine turbochargers
- Used with 6V-7030 Micrometer Depth Gauge Group (metric) or 6V-2012 Micrometer Depth Gauge Group (inches), and 8T-5096 Dial Indicator Group
- Hoses and fittings working pressure: 10,000 psi (68,900 kPa)

Reference

NEHS0615, Tool Operating Manual, 3600 Turbocharger Disassembly and Assembly

| 9U-6249 Group Includes (not shown) | |
|------------------------------------|-------------|
| Media Number | Description |
| NEEG2543 | Decal |
| 9U-6250 Group Includes (not shown) | |
| Media Number | Description |
| NEEG2544 | Decal |



| Item | Part Number | Description | Qty. |
|--|----------------------|--------------------------|------|
| 9U-6249 Cylinder Tool Group (3600 Turbo) Service/Repair Parts | | | |
| -- | 9U-6249 | Cylinder Tool Group | -- |
| 2 ¹ | 9U-6244 | Support | 2 |
| 5 | 316-1493 | Hydraulic Puller Group | 1 |
| 6 ¹ | 9U-6251 | Suspension Yoke Assembly | 1 |
| 11 | 9U-6255 | Removal Housing Assembly | 1 |
| 13 | 1D-4614 | Bolt | 1 |
| 14 | 1D-5119 | Jam Nut | 1 |
| 15 | 9U-6256 | End Plug | 1 |
| 16 | 126-8290 | Spanner Wrench | 1 |
| Not shown | | | |
| -- | 4C-9658 ² | Case - Protective | 1 |
| -- | 9U-6685 | Foam Block | 1 |
| -- | 9U-6686 | Foam Block (top) | 1 |
| -- | 1U-7566 | Hex Wrench | 1 |
| -- | 1U-7564 | Hex Wrench, 5 mm | 1 |

| Item | Part Number | Description | Qty. |
|---|----------------------|-----------------------------|------|
| 9U-6250 Tool Group, Pump (3600 Turbo) Service/Repair Parts | | | |
| -- | 9U-6250 | Pump Tool Group | -- |
| 1 | 8F-0024 | Hose Assembly | 2 |
| 3 | 9U-6246 | Adapter Assembly | 1 |
| 4 | 1U-5230 | Hand Pump | 1 |
| 7 | 9U-6253 | Removal Shaft Assembly | 1 |
| 8 | 9U-6254 | Installation Shaft Assembly | 1 |
| 9 | 9U-7262 | Plate | 1 |
| 3 | 2J-3506 | Nut | 1 |
| 12 | 9U-6243 | Extension Handle | 1 |
| 17 ¹ | 9U-6248 | Guide Bolt | 3 |
| Not shown | | | |
| -- | 4C-9664 ³ | Travel Vault | 1 |
| -- | 9U-6252 | Foam Block | 1 |
| -- | 9U-6684 | Foam Block (top) | 1 |
| -- | 7J-9108 | O-ring Seal ⁴ | 4 |
| -- | 133-8951 | Screw Thrust | -- |

¹Part of 9U-5105 Basic Tool Group, 3600

²Fold-down handle

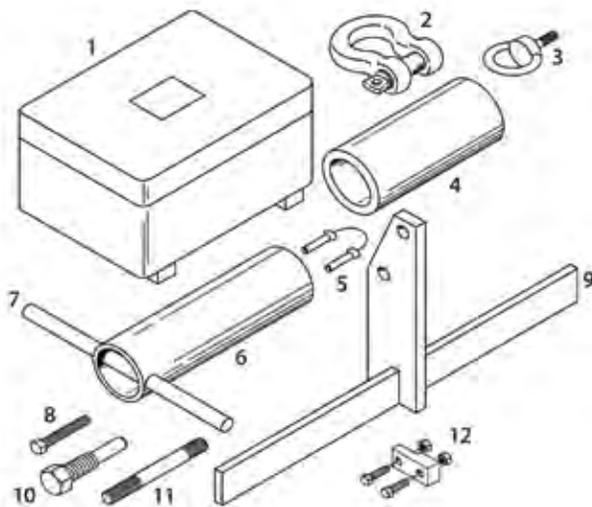
³Supplied with regular foam; Pick-N'Pluck is not available

⁴Part of 9U-6253 Removal Shaft Assembly and part of 9U-6254 Installation Shaft Assembly (both assemblies are part of 9U-6250 Pump Tool Group)

195-8104 ABB Turbocharger Tool Kit (TPL61)

Model: 3612 Marine Engines

Warranty: Six Months



- Used to disassemble and assemble ABB TPL61 turbochargers

Reference

REHS0811, Special Instruction, Disassembly and Assembly of TPL61 Turbocharger

| Item | Description | Qty. |
|-----------|------------------------|------|
| 1 | Tool Box | |
| 2 | Shackle | |
| 3 | Ring Bolt | 2 |
| 4 | Guide Tube | |
| 5 | Radial Bearing Pin | |
| 6 | Press On Bushing | |
| 7 | Bar | |
| 8 | Forcing Screw | 4 |
| 9 | Mounting Supports | 2 |
| 10 | Puller Screw | 3 |
| 11 | Stud | 2 |
| 12 | Press on Tool Assembly | 2 |
| Not shown | NEEG2923 Decal | |

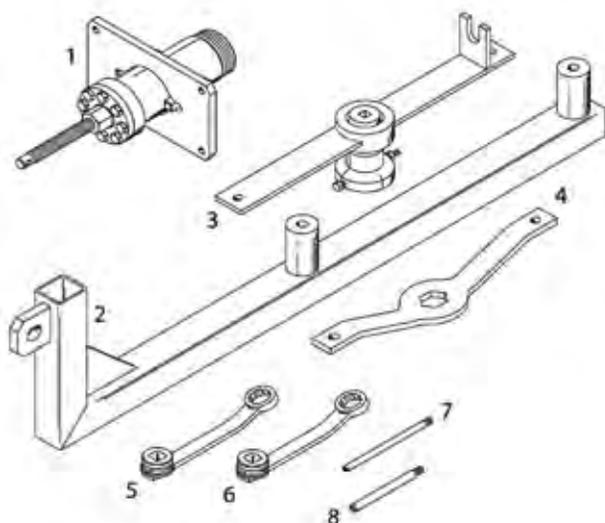
| Part Number | Description |
|-------------|---------------------------|
| 195-8104 | ABB Turbocharger Tool Kit |

187-3703 Tool Group (NA297)

Essential Tool

Model: 3600 Engines

Warranty: Six Months



- Used to disassemble and assemble Napier NA297 Turbochargers

Reference

REHS0285, Special Instruction, Disassembly and Assembly of the Napier NA297 Turbocharger

(Continued)

187-3703 Tool Group (NA297) (Continued)**Essential Tool**

Model: 3600 Engines

Warranty: Six Months

| Item | Part Number | Description |
|------|-------------|---|
| -- | 187-3703 | Tool Group (NA297) |
| 1 | 177-9811 | Turbo Thrust Collar Tool Group |
| 2 | 177-9781 | Turbo Compressor Lifting Bracket Assembly |

| Item | Part Number | Description |
|------|-------------|-----------------------------------|
| 3 | 177-9856 | Turbo Impeller Removal Tool Group |
| 4 | 177-9791 | Turbine Locking Tool |
| 5 | 178-0193 | Torque Adapter (30 mm) |
| 6 | 178-0196 | Torque Adapter (1 1/8 in) |
| 7 | 177-9809 | Turbo Bearing Guide Rod |
| 8 | 177-9852 | Insert Guide Rod |

179-1904 Stud Tensioner Tool Group**Essential Tool**

Model: 3618 Engines

Warranty: Six Months

European Union compliant, CE marked

Stud Tensioner Tool Group

- Used to simultaneously tension four cylinder head studs or two crankshaft main bearing cap studs
- Comes with seal kits for cylinder groups and pump group

Cylinder Groups

- Smaller, lighter cylinders with convenient carrying handles
- Pistons return automatically when hydraulic pressure is released
- Gear driven turning sleeve allows stud nut rotation with 1/2 inch square drive ratchet

Main Bearing Cap Handling Group

- Part of 179-1904 Stud Tensioner Tool Group
- Air cylinder raises and lowers main bearing caps for main bearing inspection or replacement
- Made of lightweight aluminum for easier use
- Allows one-person operation
- Ideal for tight engine compartments

160-0475 Support Tray

- Used to place 153-8488 Cylinder Group onto 156-7168 Main Bearing Cap Handling Group
- Used with 160-4901 Tray Support Rail
- Recommended but not included

References

NEHS0762, Tool Operating Manual, Operation and Maintenance of the 179-1904 Stud Tensioner Tool Group Used on 3618 Engines

REN1333, Service Manual, Disassembly and Assembly of 3618 Engines

| | |
|---------------------------|-----------------------|
| Hydraulic Pump (Electric) | |
| Maximum pressure | 150 mPa (21,755 psi) |
| Voltage | 230/400 V (50/60 Hz) |
| Weight | 33 kg (73 lb) |

(Continued)

179-1904 Stud Tensioner Tool Group (Continued)

Essential Tool

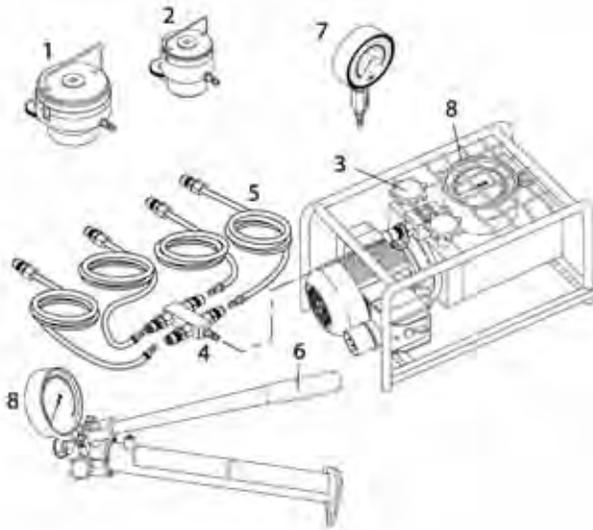
Model: 3618 Engines

Warranty: Six Months

Engine Tools

| Part Number | Description | Tensioning Force at Max. Pressure | Maximum Stroke | Overall Dimensions | Weight |
|-------------|---|---|-------------------|---|--------------------|
| 153-8487 | Stud Tensioner Cylinder Group (Cylinder Head) | 1100 kN at 150 mPa (247,289 lb at 21,755 psi) | 8 mm (0.31 in) | 161.5 mm (6.36 in) high x 143.0 mm (5.63 in) diameter | 9.6 kg (21.16 lb) |
| 153-8488 | Stud Tensioner Cylinder Group (Main Bearing) | 2015 kN at 150 mPa (452,990 lb at 21,755 psi) | 10.0 mm (0.32 in) | 182.2 mm (7.17 in) high x 188 mm (7.4 in) diameter | 18.2 kg (40.12 lb) |
| 179-1904 | Stud Tensioner Tool Group | -- | -- | -- | -- |

Stud Tensioner Tool Group



Parts Included (not shown):

Socket Extension (1/2 in drive, 127 mm (5.0 in) long)

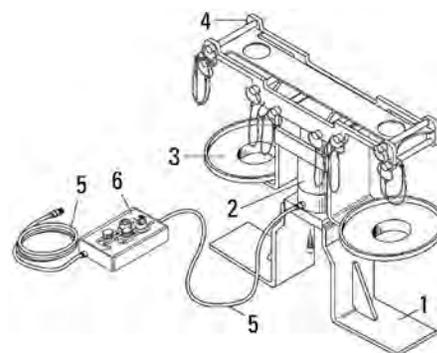
Swivel Head Ratchet (1/2 in drive)

| Item | Part Number | Description |
|------|-------------|--|
| 1 | 153-8488 | Stud Tensioner Cylinder Group (Main Bearing) |
| 2 | 153-8487 | Stud Tensioner Cylinder Group (Cylinder Head) |
| 3 | 156-7166 | Hydraulic Pump, Electric |
| 4 | 178-9313 | Distribution Coupler |
| 5 | 178-9312 | Hose Assembly |
| 6 | 156-7167 | Hydraulic Pump, Manual |
| 7 | 185-0683 | Comparison Gauge |
| 8 | 185-4436 | Pressure Gauge (service part for 227-6724, 227-8834, 1 and 191-5347 Pumps) |

| Item | Part Number | Description |
|------------------|-------------|--|
| Not shown | | |
| -- | 178-9051 | Bushing, M45 x 3 thread (Cylinder Head) |
| -- | 178-9058 | Seal Kit (for 191-5322 Cylinder Head Cylinder Group) |
| -- | 175-0184 | Bushing, M56 x 4 thread (Main Bearing) |
| -- | 175-0185 | Sleeve (Main Bearing) |
| -- | 175-0191 | Seal Kit (for 191-5323 Main Bearing Cylinder Group) |
| -- | 178-9314 | Pump Seal Kit |

Main Bearing Cap Handling Group

| Item | Part Number | Description |
|--|-------------|--------------------------|
| 156-7168 Main Bearing Cap Handling Group (part of 179-1904 Stud Tensioner Tool Group) | | |
| 1 | 160-0476 | Bearing Cap Lift Base |
| 2 | 160-0464 | Air Cylinder |
| 3 | 160-0473 | Lift Assembly |
| 4 | 178-9141 | Bearing Cap Lift Bracket |
| 5 | 5P-6011 | Air Line |
| 6 | 160-0465 | Air Control Box |



301-5215 Stud Tensioner Tool Group

229-9453 Pump Accessory Group

Hydraulic Pumps

Model: All 3600 Engines Except 3618

Warranty: Six Months

European Union compliant, CE marked

- Used to simultaneously loosen or tighten nuts on four cylinder head studs or two crankshaft main bearing cap studs
- Used with 8T-0960 Handling Tool Group for easier removal and installation of main bearing caps
- Requires one 301-5215 Group, one 229-9453 Group, and one of optional pumps listed (cannot be used with any other pumps except the ones listed as item 10)
- Compact, lightweight cylinders have convenient carrying handles
- Optional gear drive permits faster installation of nut onto stud (1/2 inch square drive ratchet)
- ISO9001 Certified

References

NEHS0866, Operation and Maintenance of Stud Tensioner Tooling Group used on 3600 Engines (except 3618)

SENR4259, Disassembly and Assembly G3606 and G3608 Engines

SENR5535, Disassembly and Assembly G3612 and G3616 Engines

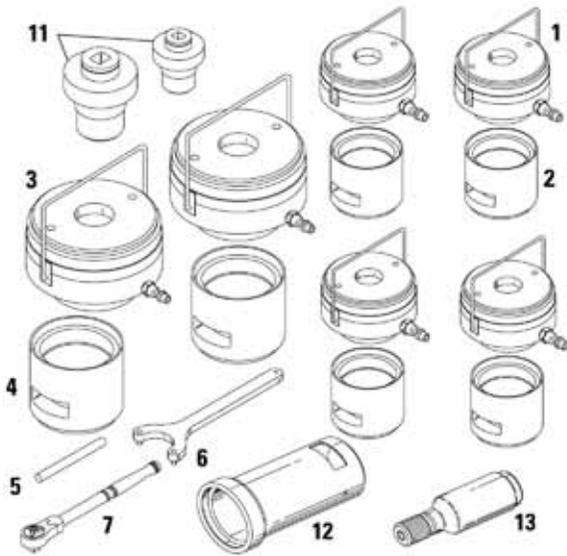
SENR3600, Disassembly and Assembly 3606 and 3608 Engines

SENR3594, Disassembly and Assembly 3612 and 3616 Engines

| Part Number | Description |
|-------------|---------------------------|
| 301-5215 | Stud Tensioner Tool Group |
| 229-9453 | Pump Accessory Group |

Basic Tooling Required for 301-5215 Stud Tensioner Tool Group

Engine Tools



| Item | Description | Qty. |
|------|---|------|
| 6 | Spanner Wrench | 2 |
| 7 | Swivel Head Ratchet (1/2 in square drive) | 2 |

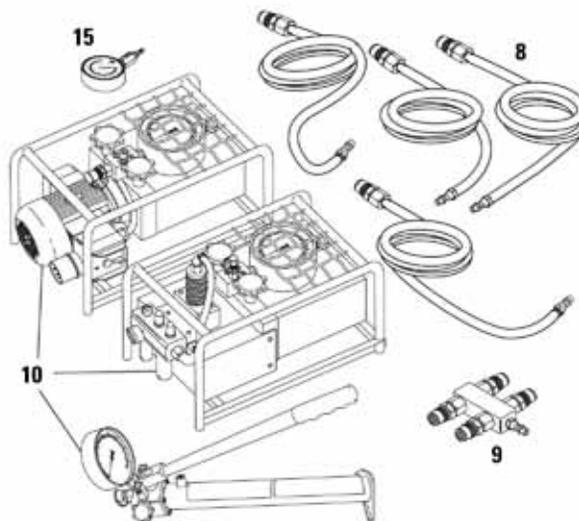
| Item | Part Number | Description | Qty. |
|--|-------------|------------------------------|------|
| 301-5215 Stud Tensioner Tool Group (required) | | | |
| 1 | 191-5322 | Cylinder Head Cylinder Group | 4 |
| 2 | 191-5333 | Cylinder Head Support | 4 |
| 3 | 191-5323 | Main Bearing Cylinder Group | 2 |
| 4 | 191-5335 | Main Bearing Support | 2 |
| 5 | 9U-5141 | Nut Turning Handle | 2 |
| 11 | 191-5324 | Bushing (for 191-5322 Group) | 4 |

| Item | Part Number | Description | Qty. |
|--|-------------|--|------|
| 301-5215 Stud Tensioner Tool Group (required) (Continued) | | | |
| 11 | 191-5326 | Bushing (for 191-5323 Group) | 2 |
| 12 | 225-5637 | Support (used with 191-5322 and 191-5324) | 2 |
| 13 | 225-5636 | Adapter (used with 191-5322 and 191-5324) | 2 |
| Not Shown | | | |
| -- | 253-3272 | Main Bearing Cylinder Group (C175) | 2 |

NOTE:

Adapter and support bushing are required for front cylinder heads adjacent to support bracket. Taller adapter and support provides necessary clearance.

Basic Tooling Required



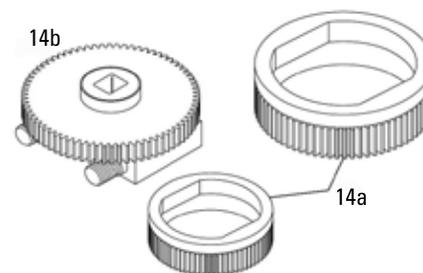
| Item | Part Number | Description | Qty. |
|---|-------------|----------------------------------|------|
| -- | 253-3274 | Pump Accessory Group (Not shown) | -- |
| Pumps, Hose, and Coupler (requires one 229-9453 Group and one pump option) | | | |
| 10 | 227-6724 | Hydraulic Pump, Electric, 120 V | 1 |
| 10 | 156-7167 | Hydraulic Pump, Manual | -- |
| 10 | 191-5347 | Hydraulic Pump, Pneumatic | 1 |

| Item | Part Number | Description | Qty. |
|---|-------------|---------------------------------|------|
| Pumps, Hose, and Coupler (requires one 229-9453 Group and one pump option) (Continued) | | | |
| 10 | 227-8834 | Hydraulic Pump, Electric, 240 V | 1 |
| 229-9453 Pump Accessory Group Includes: | | | |
| 8 | 178-9312 | Hose Assembly | 4 |
| 9 | 178-9313 | Distribution Coupler | 1 |
| 15 | 185-0683 | Comparison Gauge | 1 |
| 253-3274 Pump Accessory Group Includes:¹ | | | |
| -- | 253-3276 | Distribution Coupler | -- |

¹Also includes part numbers 178-9312 and 185-0683

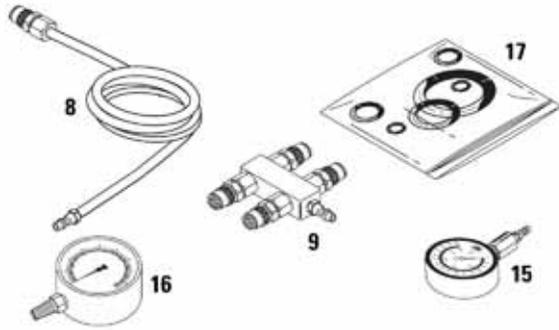
Optional Tooling

| Item | Part Number | Description | Qty. |
|---|-------------|--|------|
| Optional Gear Drive Group (permits faster rotation of nut onto stud) | | | |
| 14 | 191-5341 | Gear Drive Group (optional, includes items 14a and 14b) | 1 |
| 14a | 191-5343 | Turning Sleeve (for 191-5322 Cylinder Head Cylinder Group) | 4 |
| 14a | 192-4316 | Turning Sleeve (for 191-5323 Main Bearing Cylinder Group) | 2 |
| 14b | 191-5342 | Gear Drive Assembly | 6 |



Service/Repair Parts

Engine Tools



| Item | Part Number | Description | Qty. |
|-----------------------------|-------------|--|------|
| Service/Repair Parts | | | |
| 8 | 178-9312 | Hose Assembly | 1 |
| 9 | 178-9313 | Distribution Coupler | 1 |
| 15 | 185-0683 | Comparison Gauge | 1 |
| 16 | 185-4436 | Pressure Gauge (service part for 227-6724, 227-8834, 1 and 191-5347 Pumps) | 1 |
| 17 | 178-9058 | Seal Kit (for 191-5322 Cylinder Head Cylinder Group) | 1 |

| Item | Part Number | Description | Qty. |
|---|-------------|---|------|
| Service/Repair Parts (Continued) | | | |
| 17 | 175-0191 | Seal Kit (for 191-5323 Main Bearing Cylinder Group) | 1 |
| 17 | 227-6725 | Seal Kit (for 227-6724 Pump and 227-8834 Pump) | 1 |
| 17 | 194-8202 | Seal Kit (for 191-5347 Pump) | 1 |
| Not Shown | | | |
| -- | 253-3275 | Seal Kit (for 253-3272 Main Bearing Cylinder Group) | -- |
| -- | 253-3276 | Distribution Coupler | -- |

Optional Tooling

| | |
|---|--|
| 191-5322 Cylinder (Cylinder Head Studs) | |
| Maximum tensioning force | 1100 kN (247,289 lb) |
| Maximum operating pressure | 150 mPa (21,755 psi) |
| Effective piston surface | 73.2 cm ² (11.35 in ²) |
| Stroke | 10.0 mm (0.39 in) |
| Weight | 9.5 kg (21 lb) |
| 191-5323 Cylinder (Main Bearing Cap Studs) | |
| Maximum tensioning force | 2015 kN (452,990 lb) |
| Maximum operating pressure | 150 mPa (21,755 psi) |
| Effective piston surface | 134.3 cm ² (20.8 in ²) |
| Stroke | 10.0 mm (0.39 in) |
| Weight | 19.5 kg (43 lb) |
| 227-6724 and 227-8834 Electric Hydraulic Pump | |
| Oil quantity | 3.8 L (0.84 gal) |
| Maximum operating pressure | 150 mPa (21,755 psi) |
| Voltage, frequency | 120/240 V, 60/50 Hz |
| Weight | 33 kg (73 lb) |
| 191-5347 Pneumatic Hydraulic Pump | |
| Oil quantity | 4.0 L (0.88 gal) |
| Maximum operating pressure | 150 mPa (21,750 psi) |
| Air pressure | 3.5 - 8 bar (51 - 116 psi) |
| Air consumption | 104 - 206 gpm |
| Weight | 22 kg (48.5 lb) |
| Oil Specifications | |
| Oil viscosity at 50° C (122° F) | 1.75 E-9.1 Centistokes |
| Oil temperature (maximum) | 60° C (140° F) |
| Oil approval | HLP10 nach/acc.to VDMA 24318 bzw./resp. DIN51525 |

| Part Number | Description |
|-------------|---------------------------------|
| 227-8834 | Hydraulic Pump, Electric, 240 V |
| 191-5347 | Hydraulic Pump, Pneumatic |
| 191-5322 | Cylinder Head Cylinder Group |
| 191-5323 | Main Bearing Cylinder Group |
| 227-6724 | Hydraulic Pump, Electric, 120 V |

160-0475 Support Tray

Model: 3618 Engines

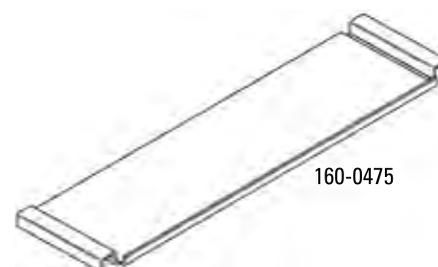
Warranty: Six Months

- Used to support 153-8488 Tensioning Cylinder being manually placed onto 156-7168 Bearing Cap Handling Group
- Tray support rail easily fits onto engine oil pan baffles

Reference

REN1333, Service Manual, Disassembly and Assembly of 3618 Engines

| Part Number | Description |
|-------------|--------------|
| 160-0475 | Support Tray |

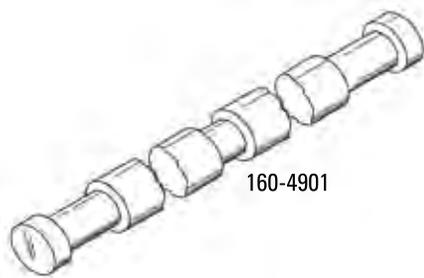


160-0475

160-4901 Support Tray Rail

Model: 3618 Engines

Warranty: Six Months



- Used to support 153-8488 Tensioning Cylinder being manually placed onto 156-7168 Bearing Cap Handling Group
- Tray support rail easily fits onto engine oil pan baffles

Reference

REN1333, Service Manual, Disassembly and Assembly of 3618 Engines

| Part Number | Description |
|-------------|-------------------|
| 160-4901 | Support Tray Rail |