

# **SERVICE MANUAL**

## **FORKLIFT**

**20D-7**

**25D-7**

**30D-7**

**33D-7**

# **HYUNDAI**

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<OLD Transmission and drive axle>

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## 1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This service manual mainly contains the necessary technical information for operations performed in a service workshop.

For ease of understanding, the manual is divided into the following sections.

### **SECTION 1 GENERAL**

This section gives the general information of the machine and explains the safety hints for maintenance.

### **SECTION 2 REMOVAL & INSTALLATION OF UNIT**

This section explains the procedures and techniques of removal and installation of each component.

### **SECTION 3 POWER TRAIN SYSTEM**

This section explains the structure of the transmission as well as control valve and drive axle.

### **SECTION 4 BRAKE SYSTEM**

This section explains the brake piping, each component and operation.

### **SECTION 5 STEERING SYSTEM**

This section explains the structure of the steering unit, priority valve, trail axle as well as steering circuit and operation.

### **SECTION 6 HYDRAULIC SYSTEM**

This section explains the structure of the gear pump, main control valve as well as work equipment circuit, each component and operation.

### **SECTION 7 ELECTRICAL SYSTEM**

This section explains the electrical circuit and each component.

It serves not only to give an understanding electrical system, but also serves as reference material for troubleshooting.

### **SECTION 8 MAST**

This section explains the structure of mast, carriage, backrest and forks.

The specifications contained in this service manual are subject to change at any time and without any advance notice. Contact your HYUNDAI distributor for the latest information.

## 2. HOW TO READ THE SERVICE MANUAL

### Distribution and updating

Any additions, amendments or other changes will be sent to HYUNDAI distributors.

Get the most up-to-date information before you start any work.

### Filing method

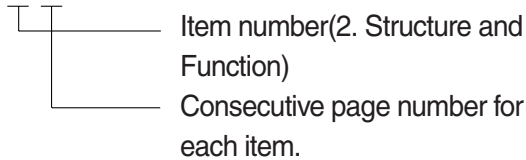
1. See the page number on the bottom of the page.

File the pages in correct order.

2. Following examples shows how to read the page number.

Example 1

2 - 3



3. Additional pages : Additional pages are indicated by a hyphen(-) and number after the page number. File as in the example.

10 - 4

10 - 4 - 1

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} Added pages

10 - 5

### Revised edition mark(①②③···)

When a manual is revised, an edition mark is recorded on the bottom outside corner of the pages.

### Revisions

Revised pages are shown at the **list of revised pages** on the between the contents page and section 1 page.

### Symbols

So that the shop manual can be of ample practical use, important places for safety and quality are marked with the following symbols.

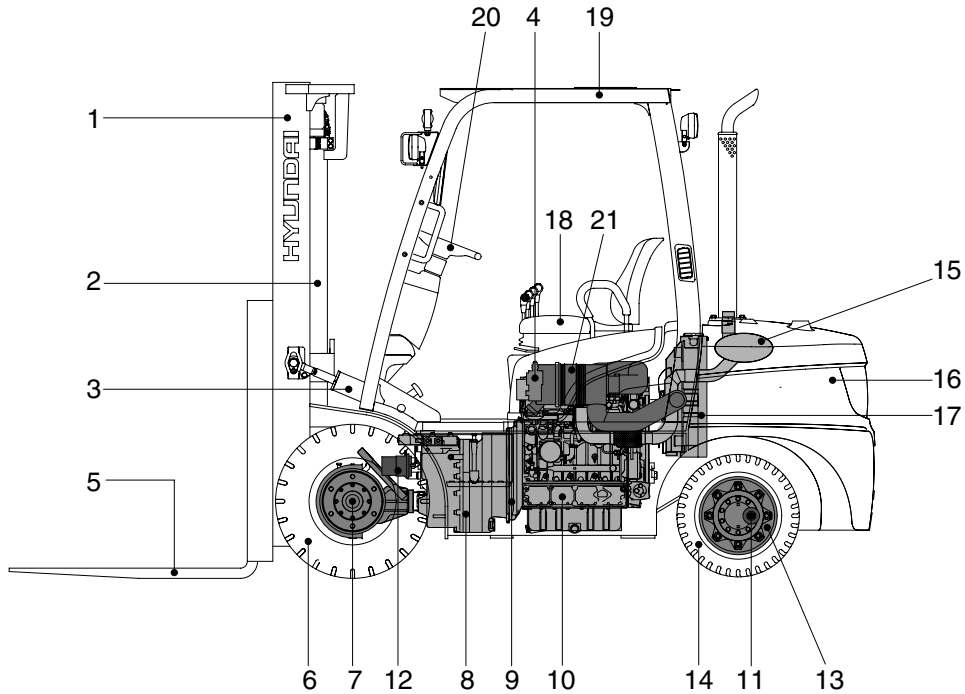
Symbol	Item	Remarks
	Safety	Special safety precautions are necessary when performing the work.
		Extra special safety precautions are necessary when performing the work because it is under internal pressure.
	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.

## SECTION 2 REMOVAL AND INSTALLATION OF UNIT

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# SECTION 2 REMOVAL & INSTALLATION OF UNIT

## GROUP 1 STRUCTURE



20D70M21

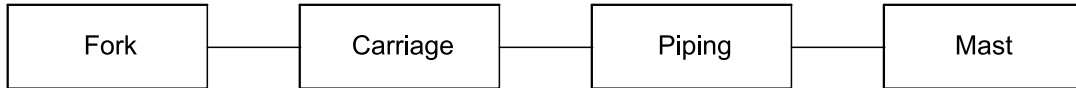
- |                      |                         |                   |
|----------------------|-------------------------|-------------------|
| 1 Mast               | 8 Transmission          | 15 Muffler        |
| 2 Lift cylinder      | 9 Torque converter      | 16 Counterweight  |
| 3 Tilt cylinder      | 10 Engine               | 17 Radiator       |
| 4 Main control valve | 11 Steering cylinder    | 18 Seat           |
| 5 Fork               | 12 Hydraulic pump       | 19 Overhead guard |
| 6 Front wheel        | 13 Steering axle (Rear) | 20 Steering wheel |
| 7 Drive axle         | 14 Rear wheel           | 21 Air cleaner    |

## GROUP 2 REMOVAL AND INSTALLATION OF UNIT

Remove and install following units as explained in the flow chart.

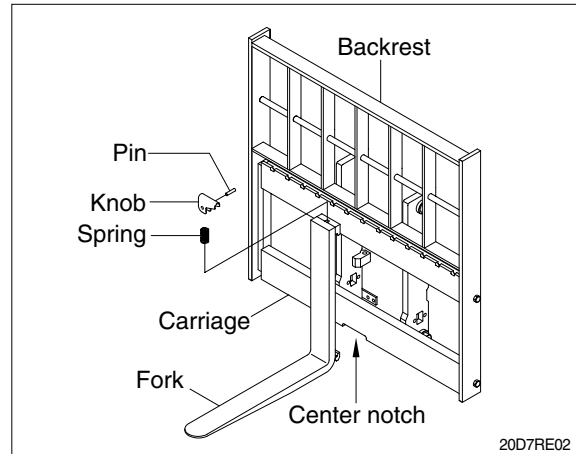
### 1. MAST

#### 1) REMOVAL



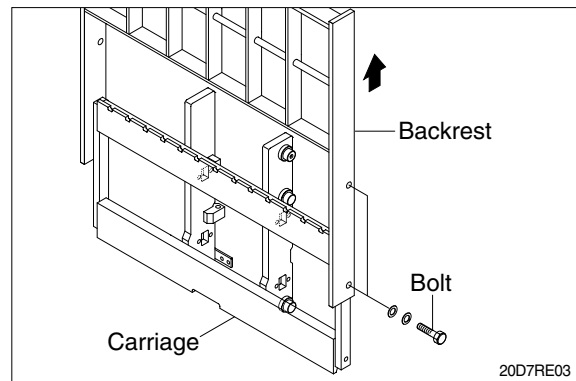
#### (1) Forks

- ① Lower the fork carriage until the forks are approximately 25mm (1in) from the floor.
  - ② Turn knob up and slide one fork at a time toward the center of the carriage where a notch has been cut in the bottom plate for easy removal.
  - ③ Remove only one fork at a time.
- ※ On larger forks it may be necessary to use a block of wood.



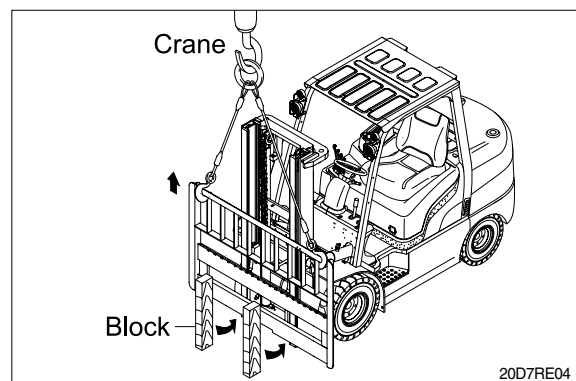
#### (2) Backrest (If necessary)

- ① Remove bolts securing backrest to fork carriage. Lift backrest straight up and remove it from carriage.



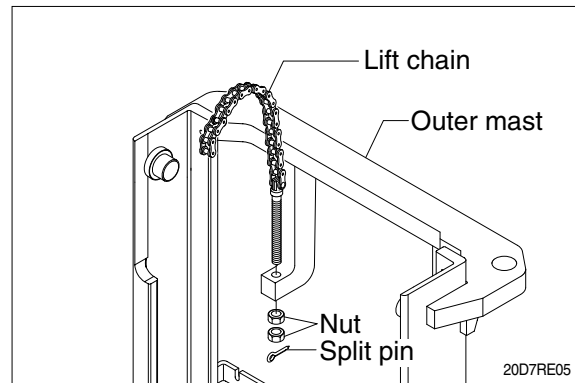
#### (3) Carriage

- ① With the mast vertical, raise the carriage high enough to place blocks under the load forks. This is done to create slack in the load chains when the carriage is lowered. Lower the carriage all the way down to the floor. Make sure the carriage is level, this will prevent any binding when the mast is raised.

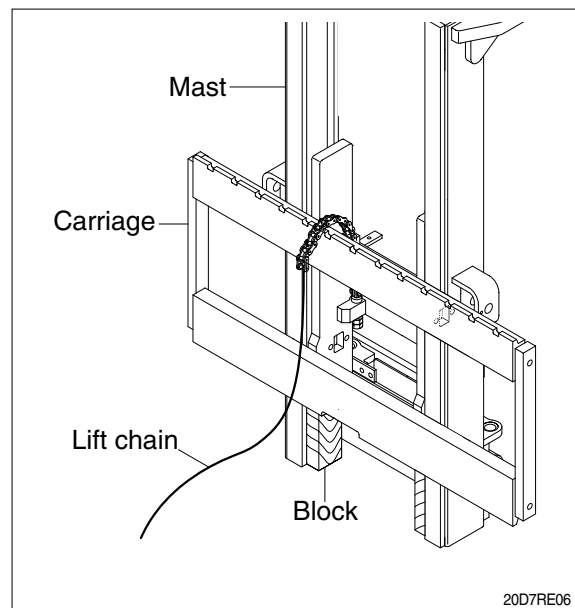




- ② While supporting lift chains, remove nuts and split pin from the anchor bolt.



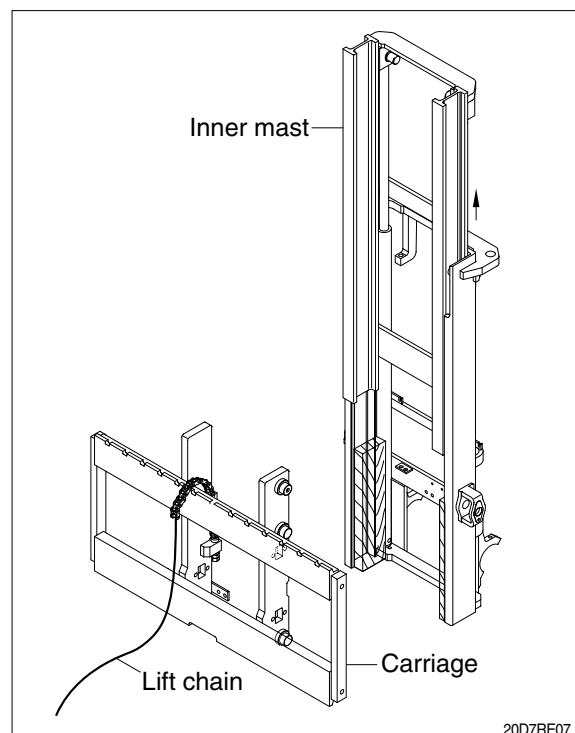
- ③ Pull the chains out of the sheaves and drape them over the front of the carriage.



- ④ Slowly raise inner mast upright until mast clears top of fork carriage. Move carriage to work area and lower the mast.

**▲ Make sure that carriage remains on floor and does not bind while mast is being raised.**

- ※ Inspect all parts for wear or damage.  
Replace all worn or damaged parts.



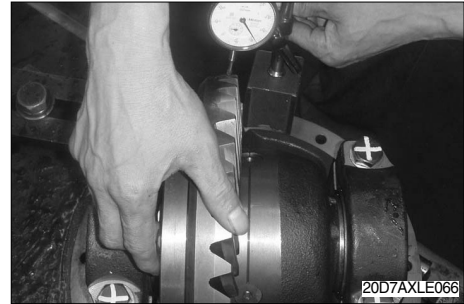
④ Fasten RING BRG ADJUST.



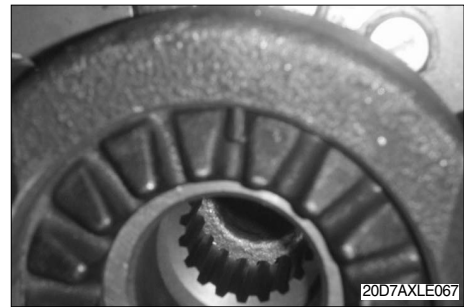
⑤ Measure backlash again.

※ Backlash of pinion shaft and ring gear is 0.15~0.2mm (0.006~0.008 in)

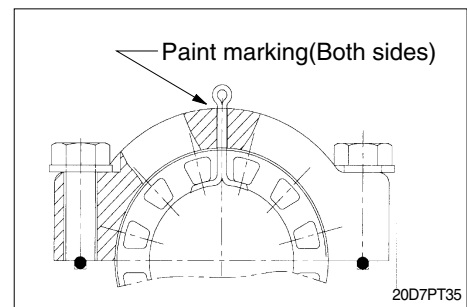
※ If backlash is wrong, carry out adjusting work.  
Adjust the left / right of RING BRG ADJUST by one and one clip.



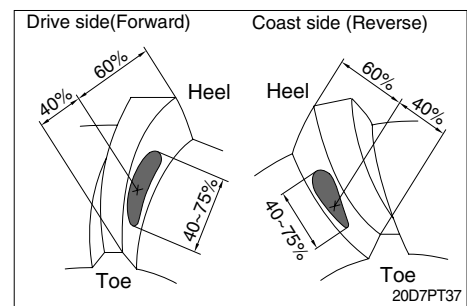
⑥ Fit position.



⑦ Assemble cotter pin.

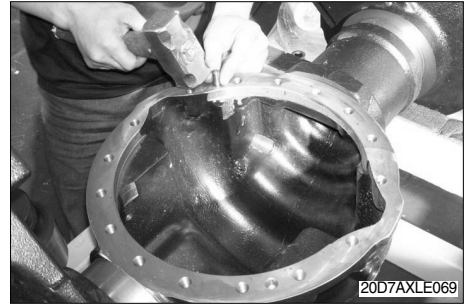


※ After assembling, adjust pattern of the gear and pinion shaft as figure.  
If pattern is not adjusted, take a measure as measuring backlash again and then reassemble.

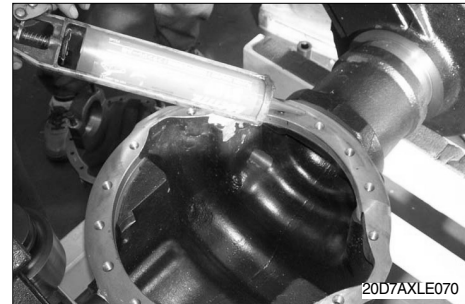


### Assembly of carrier assembly

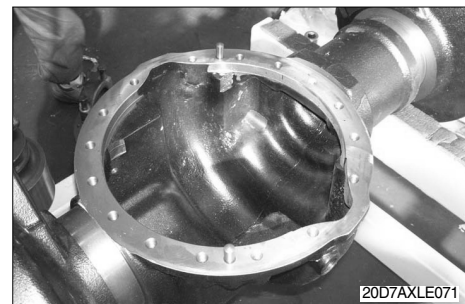
- ① Pressurize lock pin into drive axle.



- ② Spread sealant on the installation surface of carrier.



- ③ Fix assembly guide bar.

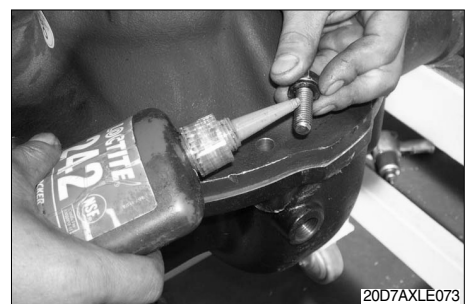


- ④ Fit carrier at drive axle housing.

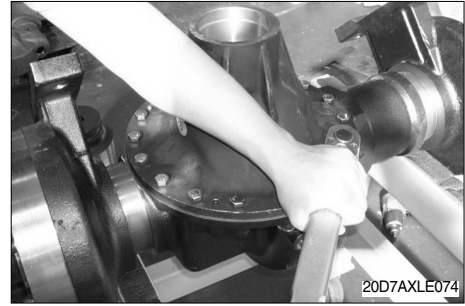
- ※ Spread loctite #5127 on drive axle housing.



- ⑤ Spread loctite #277 on the spring washer bolt.



- ⑥ Temporarily assemble bolt and confirm torque.  
· Tightening torque : 6~7 kgf · m  
(43~51 lbf · ft)



## (2) TRAVELING BRAKE SYSTEM ASSEMBLY

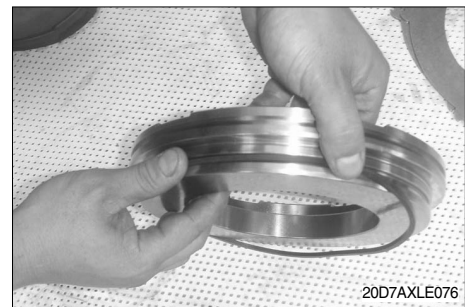
### Piston assembly

- ① Fix large quad ring into brake.



- ② Fix small quad ring into brake.

※ When assembling quad ring, pay attent to chopping.



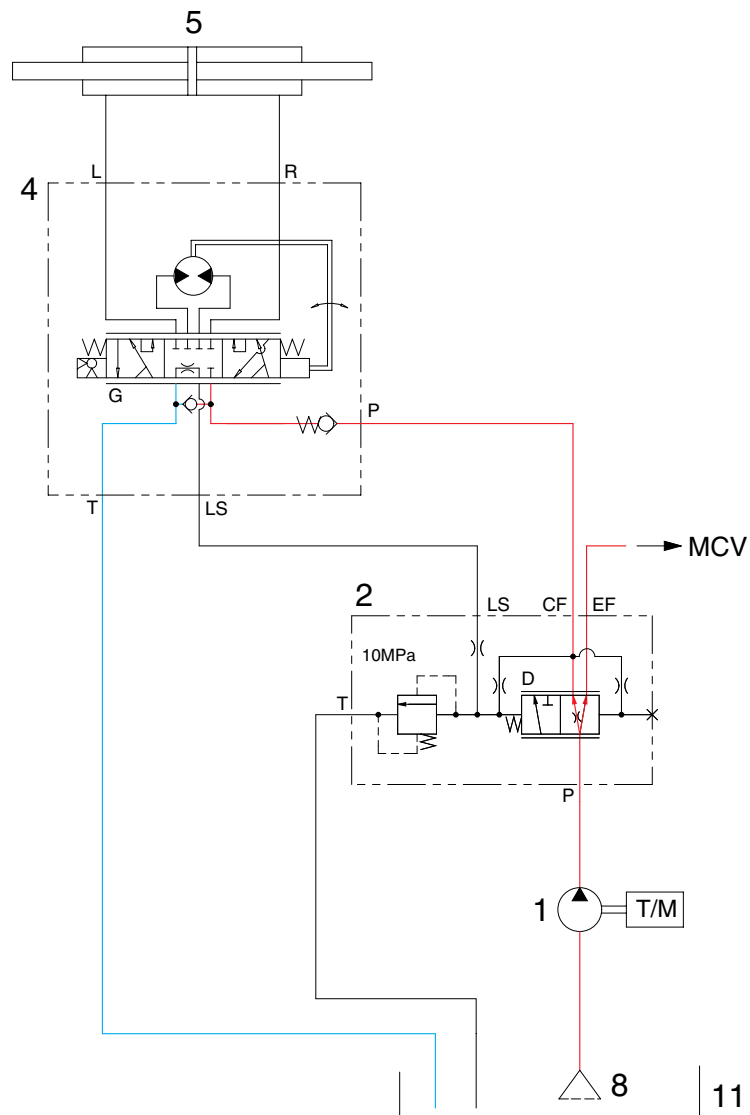
- ③ Spread oil on the piston.



- ④ Fix piston into drive axle housing.



## 1) NEUTRAL



20D7SS03

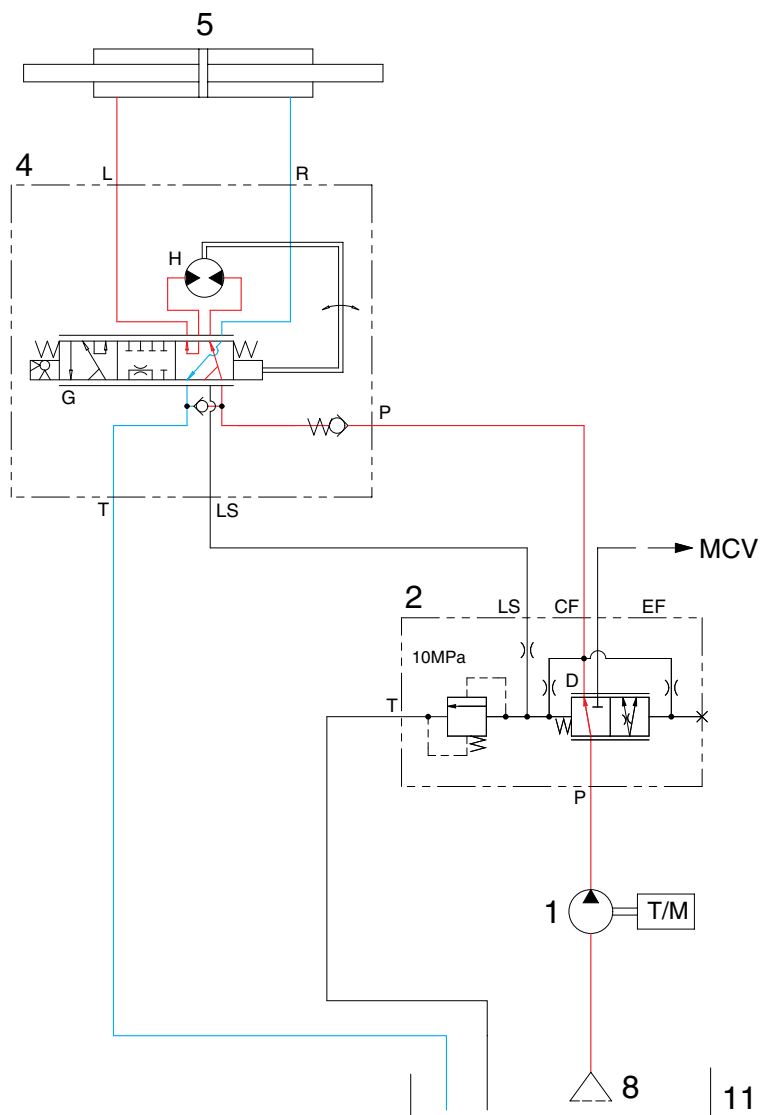
The steering wheel is not being operated so control spool(G) does not move.

The oil from hydraulic gear pump(1) enters port P of priority valve(2) and the inlet pressure oil moves the spool(D) to the left.

Oil flow into LS port to the hydraulic tank(11).

So, the pump flow is routed to the main control valve.

## 2) LEFT TURN



20D7SS04

When the steering wheel is turned to the left, the spool(G) within the steering unit(4) connected with steering column turns in left hand direction.

At this time, the oil discharged from the pump flows into the spool(G) within the steering unit(4) through the spool(D) of priority valve(2) and flows to the gerotor(H).

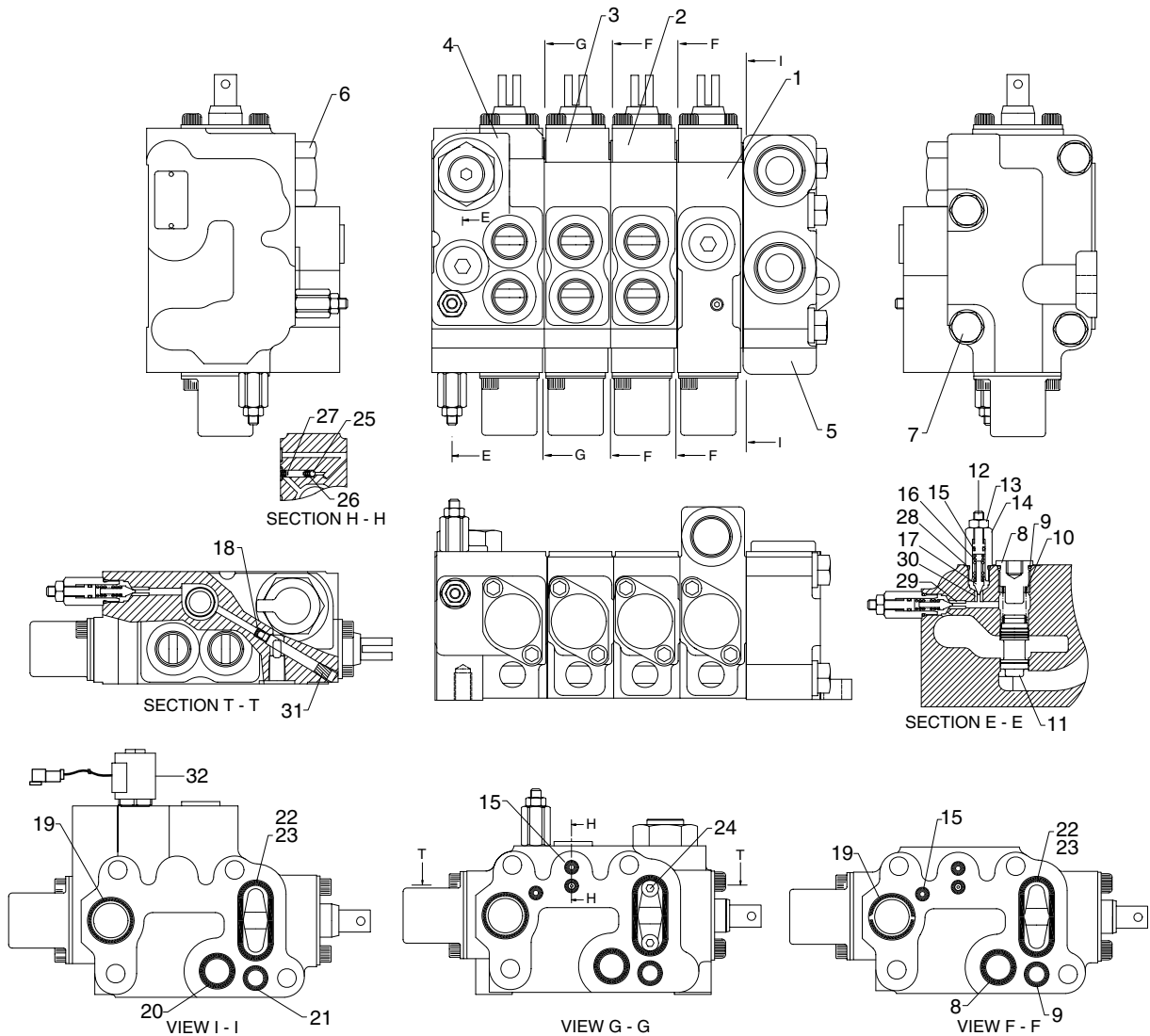
Oil flow from the gerotor(H) flows back into the spool(G) where it is directed out of the left work port(L).

Oil returned from cylinder returns to hydraulic tank(11).

When the above operation is completed, the machine turns to the left.

### 3. MAIN CONTROL VALVE

#### 1) STRUCTURE (4- Spool)



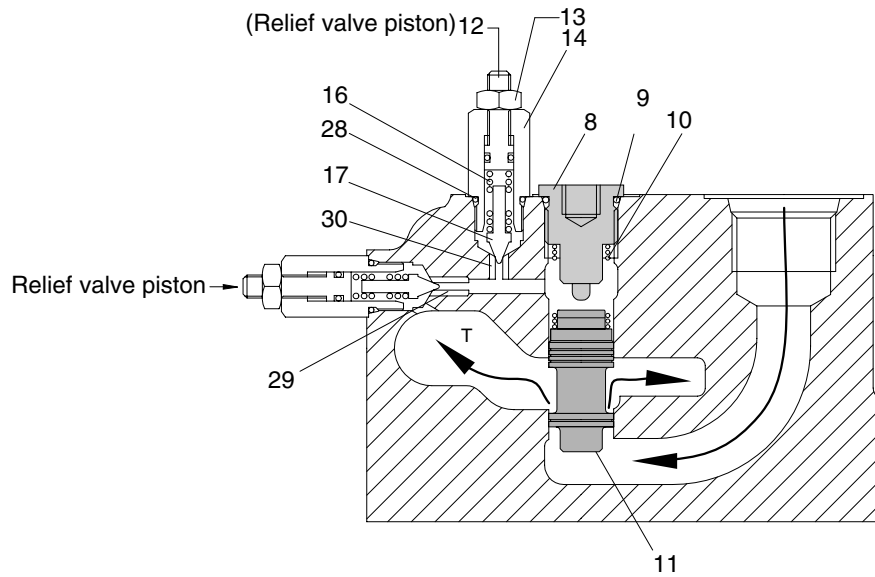
Port name	Size
Inlet port	1-1/16-12UNF-2B
Outlet port	1-1/16-12UNF-2B

20D7HS07

- |    |                  |    |               |    |                       |
|----|------------------|----|---------------|----|-----------------------|
| 1  | Lift block assy  | 12 | Relief piston | 22 | O-ring                |
| 2  | Tilt block assy  | 13 | Nut           | 23 | O-ring, retainer      |
| 3  | Aux1 block assy  | 14 | Relief plug   | 24 | Plug                  |
| 4  | Aux2 block assy  | 15 | O-ring        | 25 | Steel ball            |
| 5  | T cover          | 16 | Relief spring | 26 | Load sensor spring    |
| 6  | Gauge plug assy  | 17 | Pilot poppet  | 27 | Load sensor spring    |
| 7  | Long bolt        | 18 | Plug          | 28 | O-ring                |
| 8  | Hydrostat plug   | 19 | O-ring        | 29 | System relief seat    |
| 9  | O-ring           | 20 | O-ring        | 30 | Secondary relief seat |
| 10 | Hydrostat spring | 21 | O-ring        | 32 | Solenoid valve assy   |
| 11 | Hydrostat sleeve |    |               |    |                       |

## 2) INLET SECTION OPERATION

### (1) Structure and description



20D7HS08

- |    |                  |    |                       |
|----|------------------|----|-----------------------|
| 8  | Hydrostat plug   | 14 | Relief plug           |
| 9  | O-ring           | 16 | Relief spring         |
| 10 | Hydrostat spring | 17 | Pilot poppet          |
| 11 | Hydrostat sleeve | 28 | O-ring                |
| 12 | Relief piston    | 29 | System relief seat    |
| 13 | Nut              | 30 | Secondary relief seat |