WÄRTSILÄ NSD
CORPORATION

SULZER **RTA Engines**

Service Bulletin

RTA–50
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Technical Information to all Owners / Operators of Sulzer RTA Engines

Leakage Oil Collector in Air Spring System of Exhaust Valve

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1. INTRODUCTION

We have received some reports about the malfunction of the leakage oil collector in the return line from the air spring on RTA "-2, -U, -C and -T Series" engines.

The RTA "-2 Series" comprises the following engine types in this Service Bulletin:
RTA 52, RTA 62, RTA 72 and RTA 84M

The RTA "-2U Series" comprises the following engine types in this Service Bulletin:
RTA 52U, RTA 62U and RTA 72U

The RTA "-C Series" comprises the following engine types in this Service Bulletin:
RTA 84C, RTA 84CU and RTA 96C

The RTA "-T Series" comprises the following engine types in this Service Bulletin:
RTA 48T, RTA 58T, RTA 84T and RTA 84TB

During normal service of the main engine it can be observed that there is a slight drip of oil and a slight blow of air at the flow observation box.

In case there is no blow and no drip for some time the flow controller has to be checked according the procedure mentioned in chapter 4.
In an extreme case the system oil accumulated up to the air spring chamber could result in damage of the actuator pump drive.

A Service Bulletin should be kept in a separate file on board or the control room of a power plant and the respective pages or tables of the Service Bulletin with modifications to the Operating Manual, Maintenance Manual or Code Book should be copied and filed in the respective Manual or Book.

2. RETURN LINE OF LEAKAGE OIL FROM THE AIR SPRING

2.1. Return Line connected to the Crankcase (Today's Design)

On engines built before late 1994 and those again built recently the return line is connected to the crankcase. The layout of the return line with its collector of the leakage oil from the air spring might be different from one engine series to another. However, the working mode is always the same. The figure below shows a return line with collector of a RTA 96C engine of the latest design. Please verify on your engine accordingly.

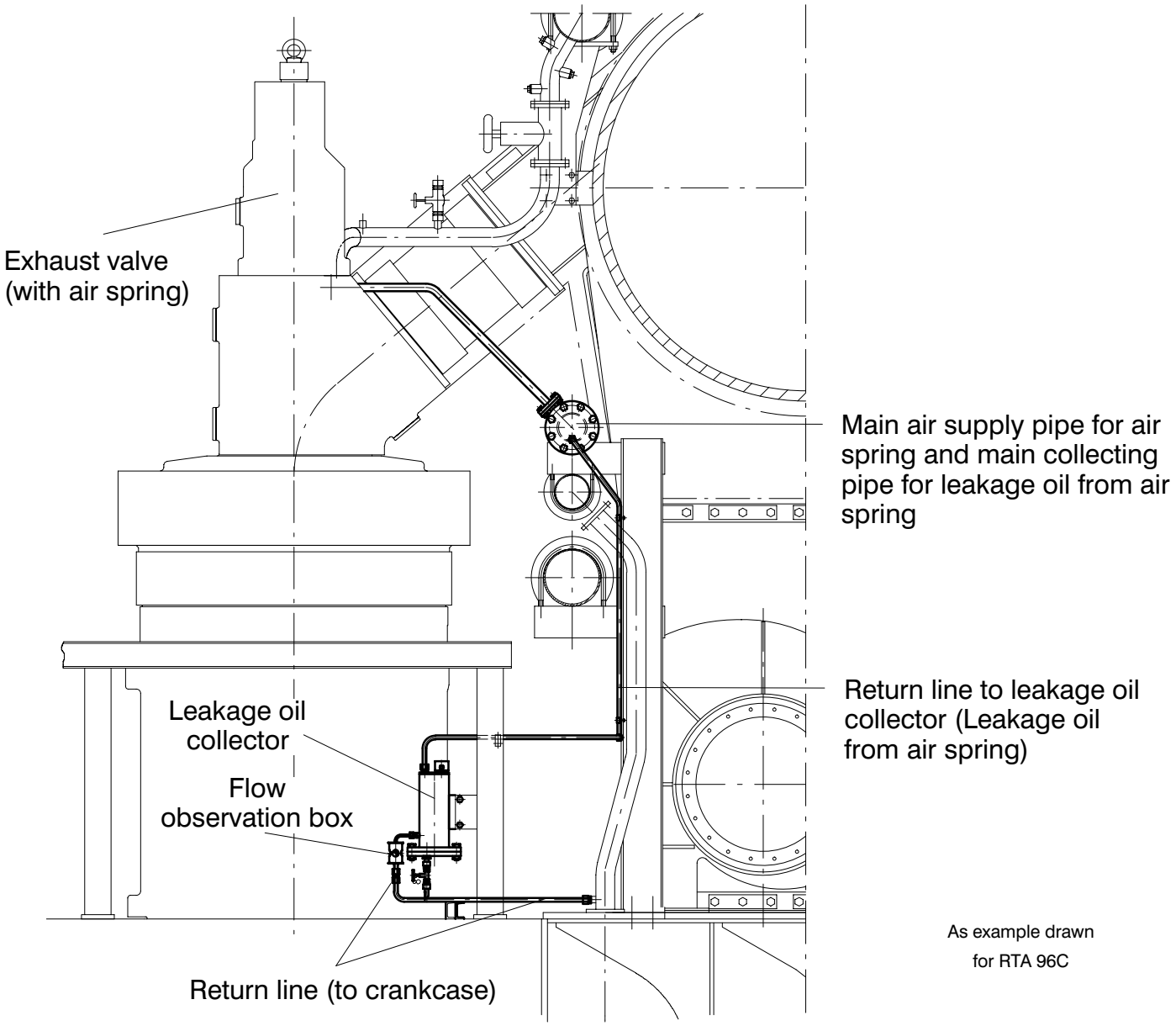

Fig. 1 Return line of Leakage Oil from Air Spring (Today's Design)

2.2. Return Line connected to the Neutral Space Drain Pipe (Previous Design)

On engines build between late 1994 and late 1998 the return line was connected to the drain pipe from the neutral space of the piston rod stuffing boxes. The layout of the return line with its collector of the leakage oil from the air spring might be different from one engine series to another. However, the working mode of the leakage oil collector is always the same. The figure below shows a return line with collector of a RTA 96C engine of the previous design. Please verify on your engine accordingly.

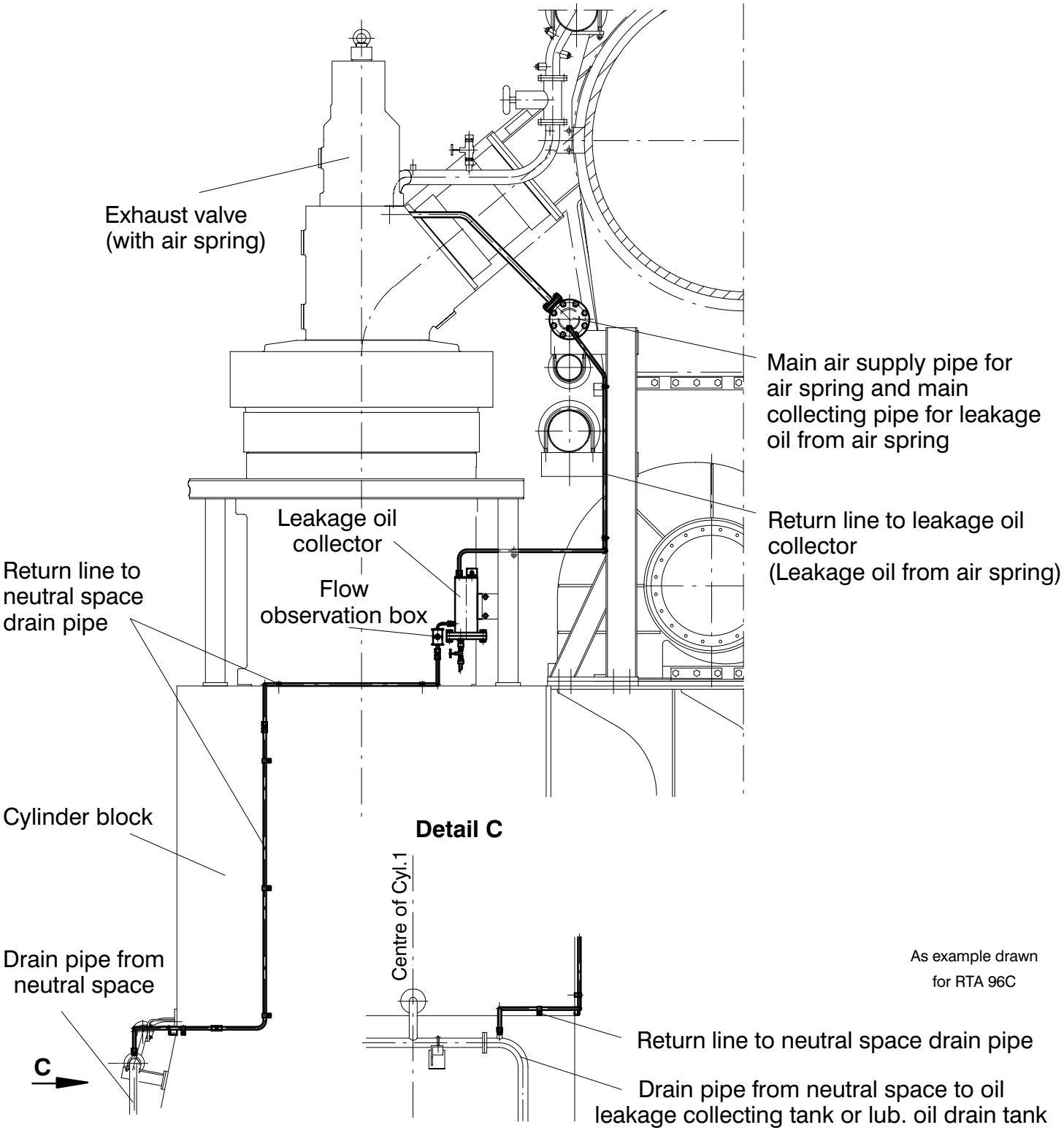

Fig. 2 Return line of Leakage Oil from Air Spring (Previous Design)

3. WORKING MODE OF THE LEAKAGE OIL COLLECTOR
(In Return line from Air Spring)

For an appropriate float control in the leakage oil collector the same is equipped with a float valve and a float switch. Under normal operating conditions the leakage oil collector is under pressure (about 7 bar air spring pressure) and any leakage oil is discharged by the float valve. The float switch activates a high level alarm if the level of the oil increases due to a possible malfunction of the float valve.

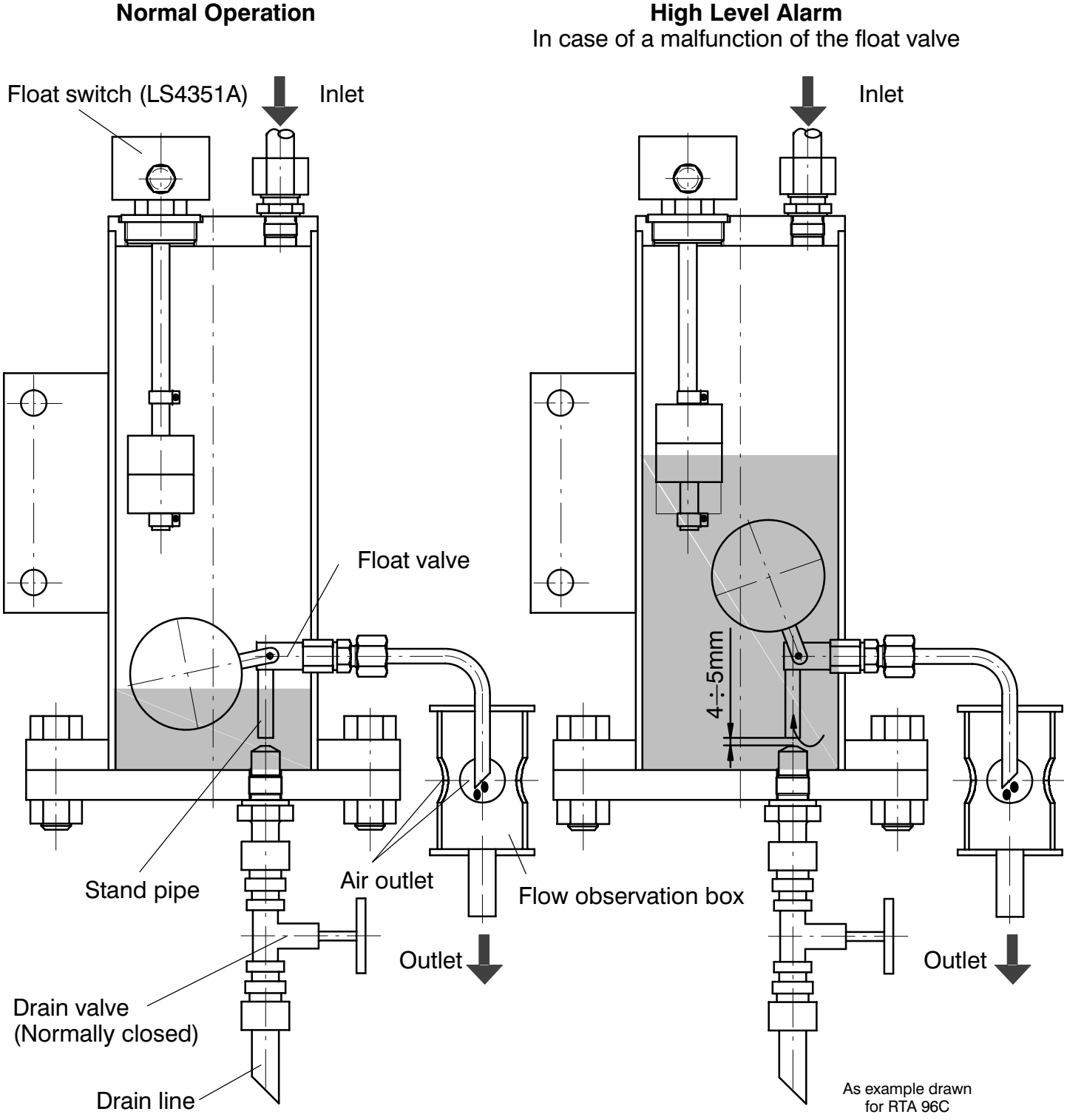

Fig. 3 Leakage Oil Collector

4. FUNCTIONAL TEST OF THE LEAKAGE OIL COLLECTOR

The functional test of the leakage oil collector can be made during a port stay.

The engine is stopped and the air spring system must be pressureless.

4.1. Testing of the Float Switch Alarm

Working sequence:

- Check wiring connections on the terminal box of the float switch
  Alarm: Level high = Contact open; Normal operation = Contact normally closed
- Check wiring connections on the terminal box E120 (DENIS-5 and DENIS-6) or E140 (DENIS-1, but not for RTA 84 engines)
- Venting of the air spring system by closing the 3/2 way shut-off cock 36HA or 4.08 (see Operation Manual Control Diagram)
- Disconnect the inlet pipe of the leakage oil collector
- Fill up system oil into the leakage oil collector (½ to ¾ full)
- Ensure that the high level alarm is actuated and on

Note: Drain system oil through drain line and restore normal operation condition prior to putting engine into operation.

4.1.1. Possible Faults on the Float Switch

We have received some reports where the wiring of the float switch or the terminal box has been wrongly or not connected at all. The consequence of such a shortcoming can be extremely dangerous.
Furthermore, a faulty or damaged float must be exchanged as soon as possible.

4.2. Functional Test of the Float Valve

Working sequence:

- Venting of the air spring system by closing the 3/2 way shut-off cock 36HA or 4.08 (if not already done)
- Disconnect the inlet pipe of the leakage oil collector (if not already done)
- Fill up system oil into the leakage oil collector (¼ full)
- Connect an air hose (Air pressure ~ 7 bar) to the inlet nipple of the leakage oil collector
- Pressurize the leakage oil collector (optional, but recommended)
- Check the oil / air flow on the flow observation box

Note: Drain system oil through drain line and restore normal operation condition prior to putting engine into operation.

4.2.1. Possible Faults on the Float Valve

- Cross section of free discharge in the float valve is clogged due to particles.
- If the float valve is not correctly mounted (sloping position) within the collector, the free movement of the float ball is not guaranteed.

- A faulty weld seam on the float ball could lead to a malfunction of the float valve, because in that case the float ball will soon be filled up with oil.
- A wrong assembled float valve (Journal position of the float ball to the float valve) could lead to a total closed valve position.
- The cross section of the oil intake at the stand pipe of the float valve is too small due to a manufacturing fault. Normal clearance: 4 ÷ 5mm.

5. NON-RETURN VALVE IN AIR INLET PIPE TO EXHAUST VALVE (AIR SPRING)

Only for RTA 84C and RTA 84CU Engines

These non-return valves (Fig. 4) have been introduced in 1995 to the RTA 84CU and later to the RTA 84C engines. The 4x4 mm groove in the nipple are important to drain the oil from the air spring chamber.

In the previous design the cross section of the oil flow between the ball and the four grooves was too small. The system oil could accumulate in the air spring chamber, resulting in damages of the valve drive.

In the latest design of the non return valve the numbers of grooves has been reduced to one only but the cross section of the oil flow has been increased.

Please verify on your engine accordingly.

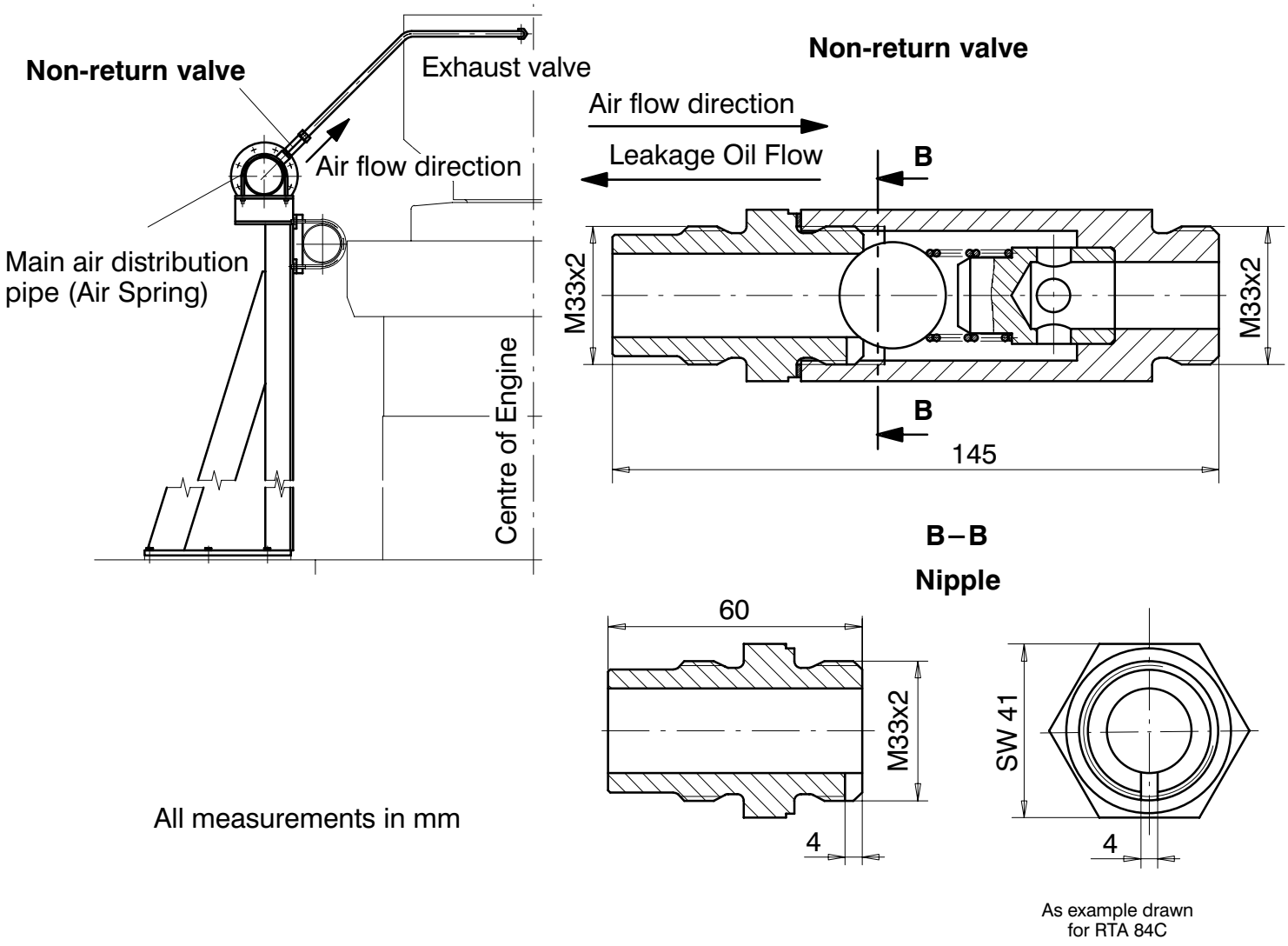

Fig. 4 Non-Return Valve in Air Inlet Pipe to Exhaust Valve (Air Spring)

6. SERVICE BULLETINS PUBLISHED FOR LARGE BORE RTA−TYPE ENGINES

We have so far published the following Service Bulletins which are valid for Large Bore RTA−Type Engines (RTA 48T to RTA 96C):

RTA−1	dated 01.03.88	**Recommendation Concerning Piston Running Behaviour**
RTA−2	dated 05.10.88	**Water Drain from Charge Air Receiver and Charge Air Temperature**
RTA−3.4	dated 30.03.98	**Fuel Injection Nozzles**
RTA−4	dated 20.11.89	**Oil Damping for Short Tie Rods**
RTA−8	dated 15.06.92	**RTA−Cylinder Liners and Reinforced Water Guide Jackets**
RTA−9	dated 20.07.92	**Cylinder Cover with Erosion / Corrosion Resistant Cladding**
RTA−10	dated 28.10.92	**RTA "−8 Series" Engines / Piston Skirt in Two Parts**
RTA−11	dated 31.03.93	**Fuel Injection Pump Regulating Linkage**
RTA−14	dated 30.11.93	**System Oil Care and Maintenance**
RTA−15	dated 10.02.94	**Elastic Studs on RTA-Type Engines**
RTA−16.1	dated 20.02.98	**Retrofit for Piston Rod Stuffing Boxes for RTA "-8 Series" Engines**
RTA−17.1	dated 28.02.95	**Circulation Valve to Fuel Injection Valve**
RTA−18.1	dated 27.08.98	**Running-in of Cylinder Liners and Piston Rings**
RTA−19	dated 28.10.94	**Oil Supply Monitoring for Geislinger Torsional Vibration Damper**
RTA−20	dated 30.11.94	**Rotational Safety Studs for Roller Guide of Fuel Pump and Exhaust Valve Actuator**
RTA−21	dated 10.04.95	**Improvement of Starting Behaviour (For engines with DENIS−1 and DENIS−5 Control Systems only!)**
RTA−22.1	dated 28.11.96	**Waisted Bolts for Piston Crown Spraying Plate of RTA 84C, 84CU, 84M and 84T Type Engines**
RTA−24.2	dated 18.05.99	**VTR..4 Turbochargers After Sales Service Information issued by ABB**
RTA−26	dated 03.01.96	**Loss of Material on Piston Crowns due to High Temperature Corrosion and Erosion (Watercooled Pistons)**
RTA−27	dated 26.04.96	**Plastic Water Separator**
RTA−28	dated 31.05.96	**Improvement of the Engine Control System**
RTA−29	dated 21.10.96	**Improved Oil Supply to the Integrated Axial Detuner equipped with Internal Oil Supply Line**
RTA−30	dated 27.11.96	**Improvement of starting behaviour on RTA engines equipped with Type PGA200 and PGA EG200 Woodward Governors**
RTA−31	dated 23.01.97	**Alphabetical Index of Topics of Service Bulletins**
RTA−33	dated 11.04.97	**Crank Pin Bearing Shell**
RTA−34	dated 28.11.97	**Fuel Injection System Modification and Maintenance**
RTA−35	dated 20.02.98	**Retrofit for Piston Rod Stuffing Boxes for RTA "-2 Series" Engines**
RTA−36	dated 25.02.98	**Reconditioning of Piston Rods of RTA "-2 Series" Engines**
RTA−37	dated 25.02.98	**Reconditioning of Piston Rods of RTA "-8 Series" Engines**
RTA−38	dated 26.02.98	**Piston Crown Loss of Material on Combustion Side**
RTA−39	dated 31.03.98	**Overhaul and Reconditioning of Pistons**
RTA−42	dated 25.09.98	**Templates for Exhaust Valve Seat and Spindle**
RTA−43	dated 20.01.99	**Piston Rings**
RTA−44	dated 26.02.99	**Tightening Instructions for the Plunger Guide Nipple**
RTA−45	dated 03.06.99	**Tightening Instructions for Screws and Waisted Studs**
RTA−46	dated 17.06.99	**Cracks in Columns**
RTA−47	dated 28.06.99	**Draining of Fuel Oil Pipes; Modification to Shut-off Valves of Fuel Pipes and Drain Plug of Fuel Pump Block**
RTA−48	dated 20.09.99	**Instruction for Replacement of NO_x Relevant Components on IMO Compliant Sulzer RTA Engines**
RTA−49	dated 08.10.99	**Gearing for Auxiliary Drives Z 42800**
RTA−50	dated 10.01.00	**Leakage Oil Collector in Air Spring System**

Should you not be in possession of the above mentioned documentation suitable for your plant, kindly contact your local Wärtsilä NSD representative for your copy.