2-1. Specifications

Main specifications of machine

Item	Unit	3-side flaps wagon		Scoop-end wagon		Swing wagon	
		Canopy	Cabin	Canopy	Cabin	Canopy	Cabin
Dimensions/Weight							
Overall length	in. (mm)	178.74 (4540)				183.07 (4650)	
Overall width	in. (mm)	78.74 (2000)					
Overall height	in. (mm)	105.32 (2675)	107.48 (2730)	105.32 (2675)	107.48 (2730)	105.32 (2675)	107.48 (2730)
Tumbler center distance	in. (mm)	125.59 (3190)					

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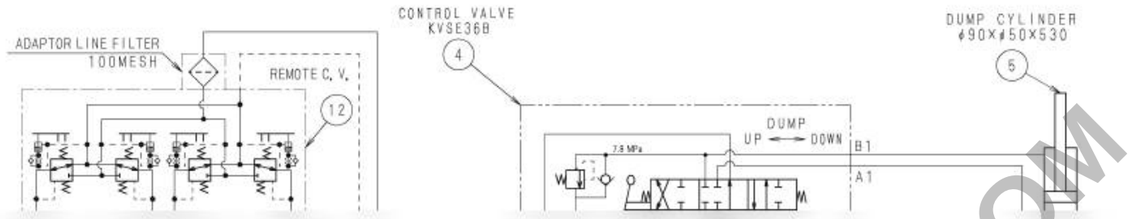
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2-3. Hydraulic Circuit Diagram

3-side flaps wagon model

Scoop-end wagon model



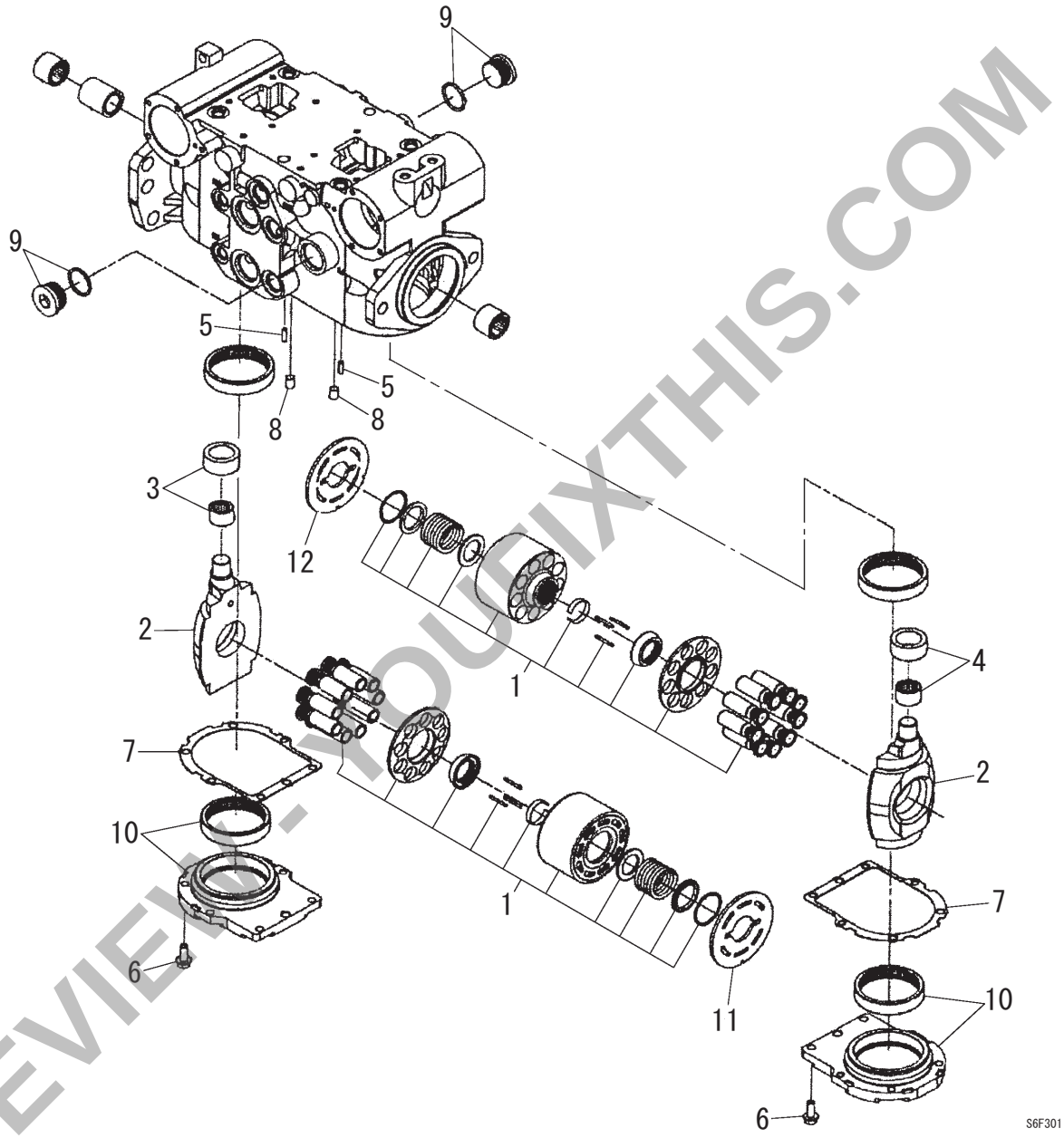
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6-3. Hydraulic Pump

1. Construction



No.	Part	Q'ty	No.	Part	Q'ty
1	Cylinder Block Kit	2	7	Gasket	2
2	Swash Plate	2	8	Pin	2
3	Bearing Assy	1	9	Plug Assy	2
4	Bearing Assy	1	10	Cover Assy	2
5	Pin	2	11	Plate	1
6	Screw	12	12	Plate	1

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3-7. Tightening Torque Table

3-7-1. Tightening Torque for Bolts and Nuts for Vehicle

1) General tightening points

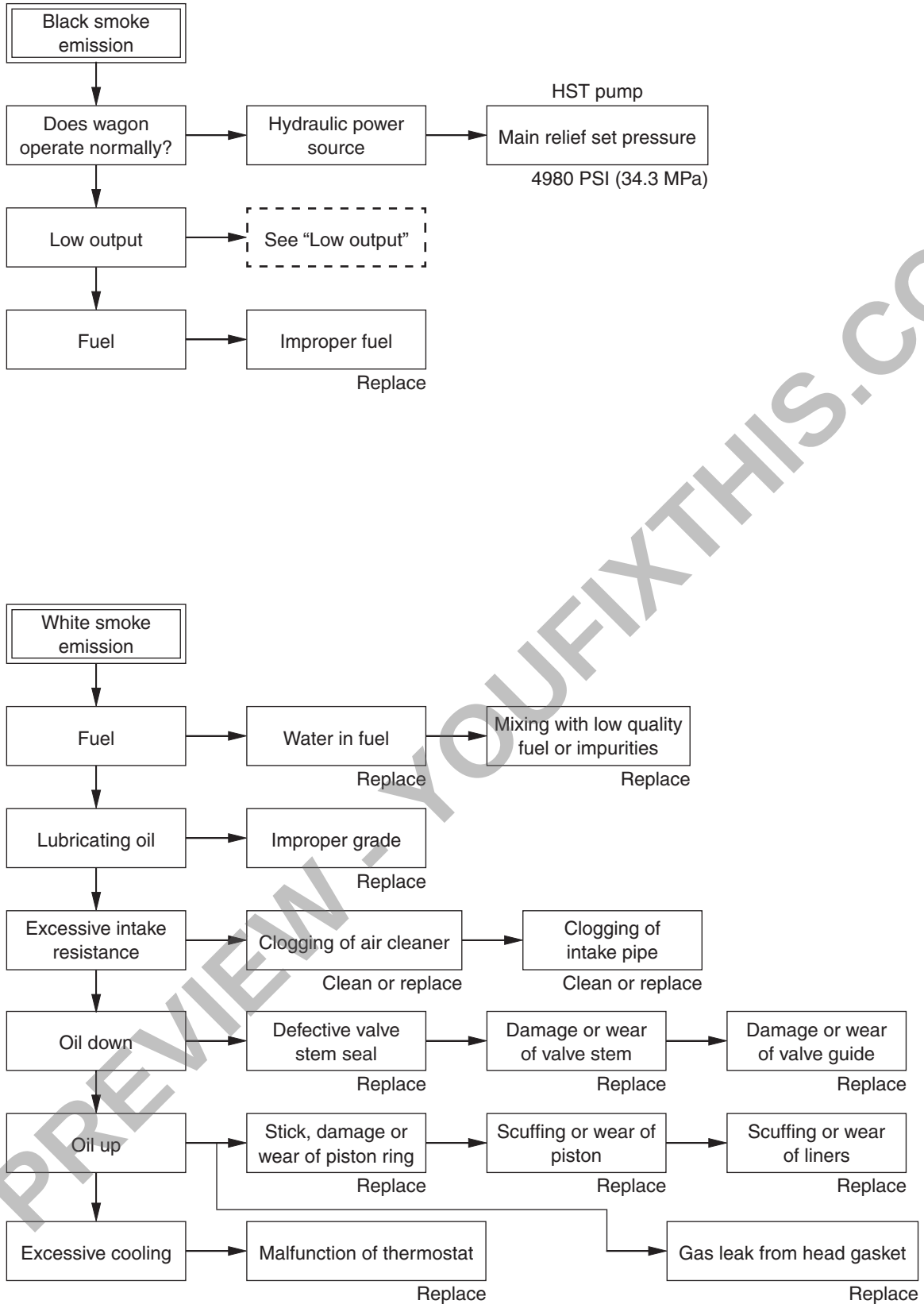
Item	Head width (b) (mm)	Size (a) × Pitch (mm) (mm)	Tightening torque	
			ft·lbf	N·m
	10	M6 × 1.0	7.2 ±0.4	9.8 ±0.5
	12, 13	M8 × 1.25	16.6 ±0.8	22.6 ±1.1



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8-1. List of Periodic Inspection and Servicing

*: Applicable to model with the relevant equipment

◇ : Check ○ : Supply ● : Replace □ : Adjust (clean) ■ : Oil & grease

Check & service items			Daily	Every 50	Every 100	Every 250	Every 500	Every 1000 hrs
General	Check falling off, breakage of parts		◇					
	Check loosened bolts & nuts, retighten		◇					
	Check engine condition		◇					
	Clean		□					
Lube oil	*Swing gear case oil	Check, resupply				○		
		Replace			●1st time			●
	Travel reduction gear oil	Check, resupply				○		
		Replace			●1st time		●	
	*Transmission oil	Check, resupply	◇					
		Replace			●1st time			●
	*Differential gear oil	Check, resupply			◇			
		Replace			●1st time			●
Hydraulic system	Hydraulic oil	Check, resupply	◇					
		Replace						●
	Clean suction filter					□1st time		□
	Replace return filter			● 1st time				●
	Replace line filter					● 1st time	●	
	Check for abnormality of hydraulic pump		◇					
Grease	Check grease-up positions, grease		■					
	Greasing the swing gears and the swing bearings					■		
Undercarriage	Check, adjust track tension		◇					
	*Check air pressure, wear, flaw in tyres		◇					
Steering equipment	Check performance, play of steering lever		◇					
	Check performance, play of travel lever		◇					
	*Check performance of speed change lever		◇					
	*Check performance of forward/reverse pedal		◇					
	*Check performance, play of steering wheel		◇					
	*Brake pedal	Stroke	◇					
		Performance	◇					
	*Parking brake	Stroke	◇					
		Performance	◇					
	Check performance of accel. lever		◇					
Electric equipment	Check front & work lights, horn		◇					
	Check hourmeter function		◇					
	Check function of change, oil and pilot lamps		◇					
	Check wire breakage, short-circuits, loosened terminals retighten		◇					
	Check, resupply battery fluid		◇					
	Check specific gravity of electrolyte					□ As re-quired		
	Check function of OK monitor		◇					

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3. Disassembly and assembly

OVERVIEW

⚠ Warning

Use of components that do not comply with rework specifications may result in loss of performance, which may constitute a safety hazard. Do not reuse components that don't comply to given specifications: replace with genuine Sauer-Danfoss service parts.

GENERAL INSTRUCTIONS

Follow these general procedures when repairing 4T variable displacement closed circuit pumps.

Remove the unit

Prior to performing major repairs, remove the unit from the vehicle/machine. Chock the wheels on the vehicle or lock the mechanism to inhibit movement. Be aware that hydraulic fluid may be under high pressure and / or hot. Inspect the outside of the pump and fittings for damage. Cap hoses and plug ports after removal to prevent contamination.

Keep it clean

Cleanliness is a primary means of assuring satisfactory pump life, on either new or repaired units. Clean the outside of the pump thoroughly before disassembly. Take care to avoid contamination of the system ports. Cleaning parts using a clean solvent wash and air drying is usually adequate.

As with any precision equipment, keep all parts free of foreign materials and chemicals. Protect all exposed sealing surfaces and open cavities from damage and foreign material. If left unattended, cover the pump with a protective layer of plastic.

Lubricate moving parts

During assembly, coat all moving parts with a film of clean hydraulic oil. This assures that these parts are lubricated during start-up.

Replace all O-rings and gaskets

Sauer-Danfoss recommends you replace all O-rings, seals, and gaskets during repair. Lightly lubricate all O-rings with clean petroleum jelly prior to assembly. Use grease that dissolves in hydraulic fluid.

Secure the unit

For major repair, place the unit in a stable position with the shaft pointing downward. It is necessary to secure the pump while removing and torquing some fasteners.

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1-1. Correct Work

"Correct Work" means to complete the operation accurately in the quickest time while following the procedures and methods described for appropriate operations.
It is important to review and check the type of service (the components to be inspected, adjusted or disassembled, and procedures to be used), tools, instruments, materials and lubricants to be used, and the precautions to be taken before starting any operation.

1-2. Safety Precautions

Follow safety rules at your workplace

- The operation and servicing of this machine is restricted to qualified persons.
- When operating or servicing the machine, follow all the safety rules, precautions and procedures.
- Any work performed by a team or with a signal person should be conducted in accordance with signals agreed on beforehand.

Wear proper clothing and safety items

- Do not wear loose clothing or jewelry that can be caught on the control levers and other machine parts. Also avoid wearing working clothes stained with oil as they can ignite.
- Be sure to wear a helmet, safety goggles, safety shoes, a mask, gloves and other protective items, as appropriate. Take particular precautions when generating metal debris, when striking metal objects with a hammer or when cleaning components with compressed air.
  Also make sure there are no persons near the machine.


E3A040

Use and inspect appropriate tools

- Using damaged or worn tools or using tools inappropriate for the required application is very dangerous, and may also cause damage to the machine. Make sure to use the tools that are appropriate for the specific job.
- Inspect the facilities and tools, especially hoisting and rigging tools, in advance.

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Be sure to read carefully and fully understand the instructions and precautions given in this manual and on the labels on the machine before you start working.

The degrees of hazards caused by improper service are represented by the following warning words and symbols:

⚠ DANGER Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This warning is used in safety messages and safety labels, and the necessary precautions are described.

⚠ WARNING Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. This warning is used in safety messages and safety labels, and the necessary precautions are described.

⚠ CAUTION Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury or damage.

IMPORTANT Indicates a potentially hazardous situation that, if not avoided, could result in damage to or reduced life of the machine.

This service manual is intended for service engineers who maintain the Yanmar construction machinery. The safety signs given in this manual do not cover all the hazardous situations that may occur when using the machinery.

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3-1. Machine Performance

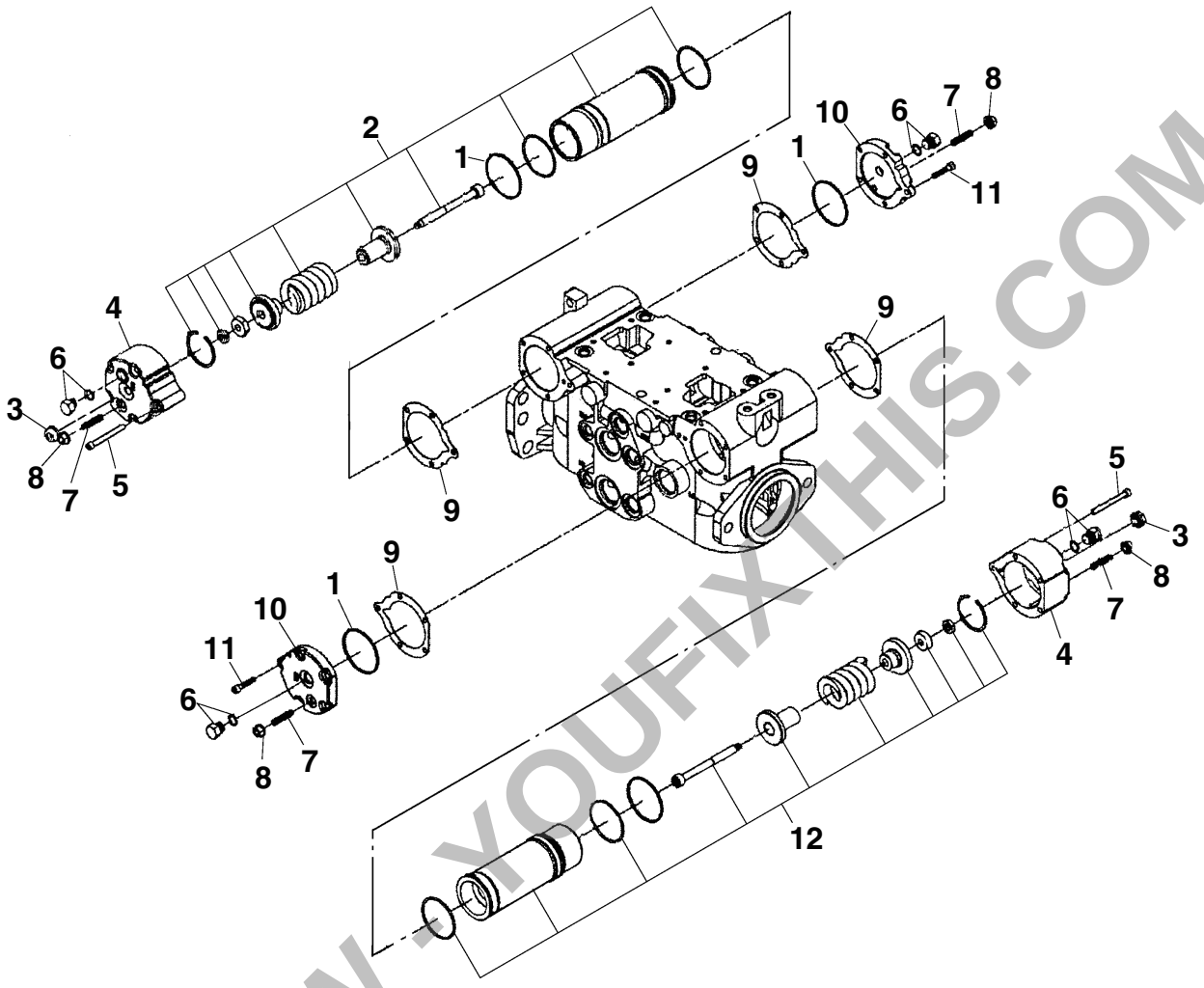
3-1-1. Reference Value Table

Item	Unit	Standard	Wear limit
Hydraulic oil pressure			
Main pressure	PSI (MPa)	4980 $^{+87}_{0}$ (34.3 $^{+0.6}_{0}$)	←
Charge pressure	PSI (MPa)	420 $^{+70}_{0}$ (2.9 $^{+0.5}_{0}$)	←
Dump pressure	PSI (MPa)	2990 $^{+280}_{-70}$ (20.6 $^{+2.0}_{-0.5}$)	←

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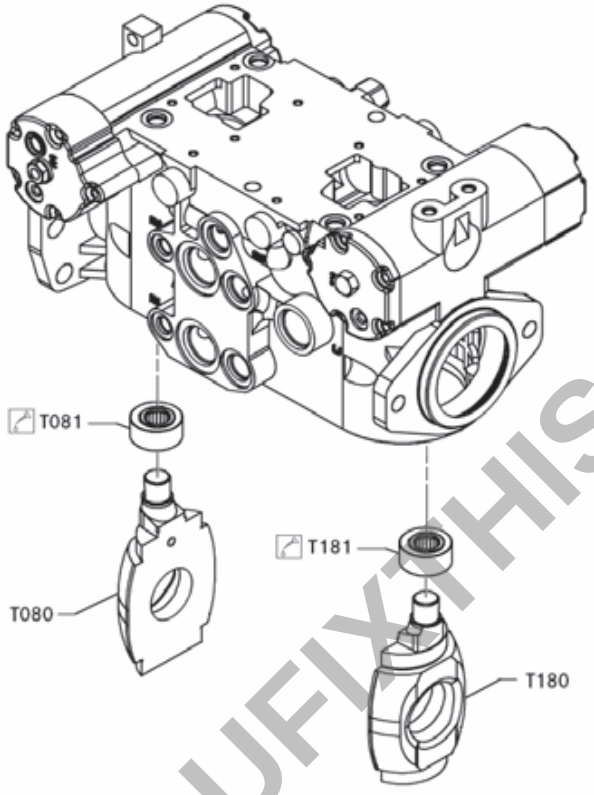
No.	Part	Q'ty	No.	Part	Q'ty
1	Back-up ring	4	8	Nut	4
2	Piston assy	1	9	Gasket	4
3	Nut	2	10	Cover	2
4	Cover	2	11	Cap screw	10
5	Cap screw	10	12	Piston assy	1
6	Plug assy	4			
7	Screw	4			

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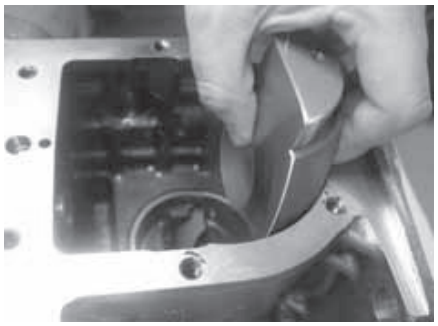
INSTALL SWASHPLATE AND CAM FOLLOWER BEARING ASSEMBLY

Installing swashplate removal and cam follower bearing assembly



1. Lubricate and install cam follower bearing assembly(T081,T181) and swashplate(T080, T180) Orient the cam follower assembly so the numbers on the bearing are visible after installing into the servo piston.
   For ease of assembly, rotate servo piston so the cam follower bearing is perpendicular to shaft centerline.





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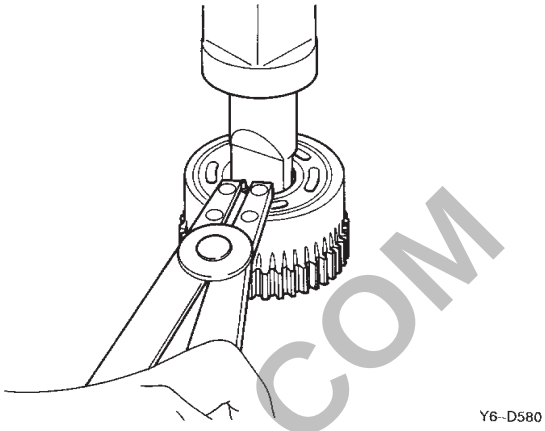
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(17) Remove the snap ring.

⚠ WARNING

Always wear appropriate protective items such as safety goggles, as component parts can jump out and cause serious bodily injury.

- Bend the snap ring by using the press-fit jig A and the press.

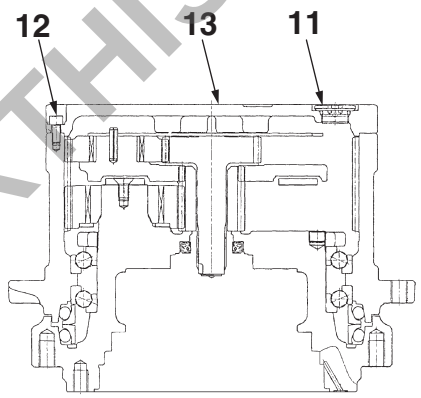

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(18) Remove the collar, the spring and the collar from the cylinder block.

(19) Remove the plug (11) and the Allen screw (12).

(20) Remove the cover (13).

- Tap the center of the cover with a plastic hammer to raise the cover and remove it.

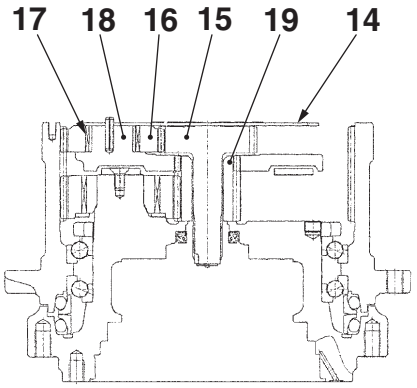


S3F434

(21) Remove the thrust plate (14) and the drive gear (15).

(22) Remove the planetary gear A (16) and the needle bearing (17).

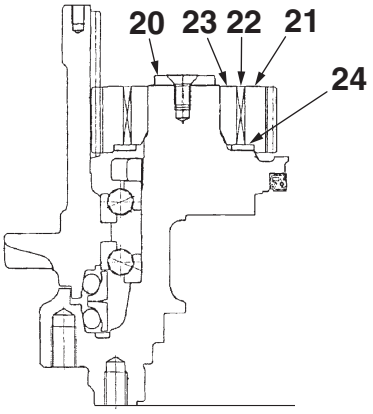
(23) Remove the holder (18) and the sun gear B (19).



S3F435

(24) Remove the screw and the thrust plate (20).

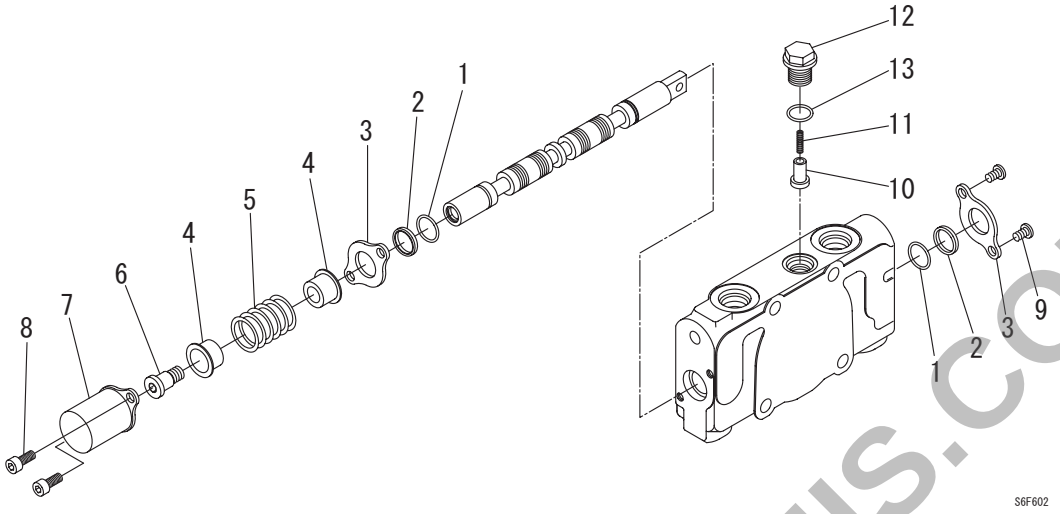
(25) Remove the planetary gear B (21), the needle bearing (22), the floating bush (23) and the thrust washer (24).



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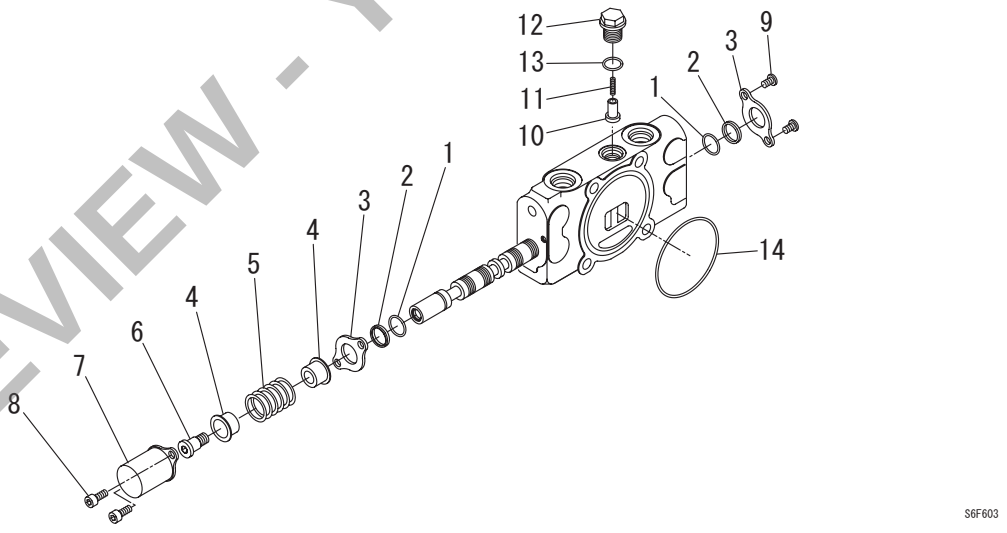
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Dump section



No.	Part	Q'ty	No.	Part	Q'ty
1	O-ring	2	8	Cap screw	2
2	Dust seal	2	9	Screw	2
3	Seal plate	2	10	Check valve	1
4	Spring seat	2	11	Spring	1
5	Spring	1	12	Plug	1
6	Cap screw	1	13	O-ring	1
7	Cover	1			

Swing section



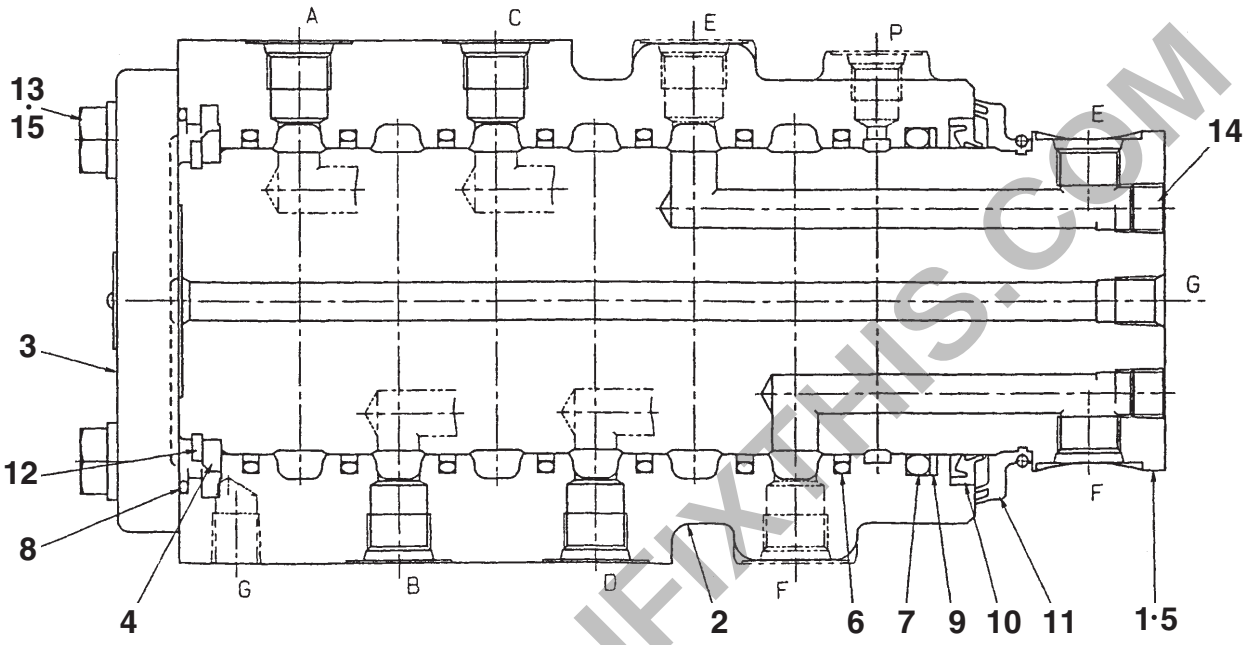
No.	Part	Q'ty	No.	Part	Q'ty
1	O-ring	2	8	Cap screw	2
2	Dust seal	2	9	Screw	2
3	Seal plate	2	10	Check valve	1
4	Spring seat	2	11	Spring	1
5	Spring	1	12	Plug	1
6	Cap screw	1	13	O-ring	1
7	Cover	1	14	O-ring	1

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6-10. Swivel Joint

1. Construction



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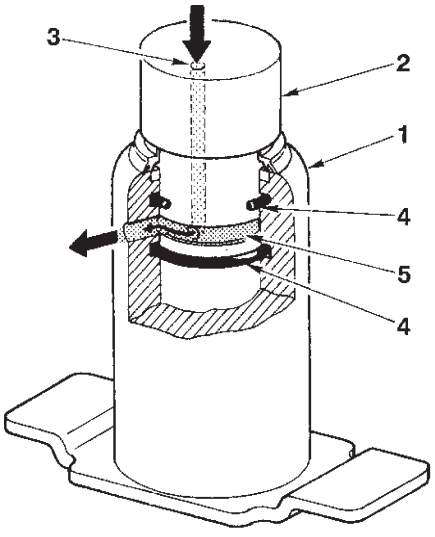
No.	Part	Q'ty	No.	Part	Q'ty	No.	Part	Q'ty
1	Shaft	1	6	Slipper seal	7	11	Dust seal	1
2	Hub	1	7	O-ring	1	12	Snap ring	1
3	Flange	1	8	O-ring	1	13	Bolt	4
4	Thrust ring	1	9	Backup ring	1	14	Plug	3
5	Pin	1	10	Dust seal	1	15	Spring washer	4

2. Operation

The swivel joint is mounted in the center of the wagon's slew axis. It serves the role of maintaining continuous connections in the hydraulic circuit regardless of the wagon's slew angle.

Above the hub (1) and shaft (2), which are capable of rotating together, ports (3) are included for oil for the necessary number of circuits only. The inner circumference surface of the hub and the outer circumference surface of the shaft, grooves are cut which serve as passages for hydraulic oil. Seals (4) are placed above and below these circumferential grooves.

Oil flowing in from a port flows constantly through this hydraulic passage (5) between the hub and shaft and the circuits can be connected without a break when the upper frame is slewing.



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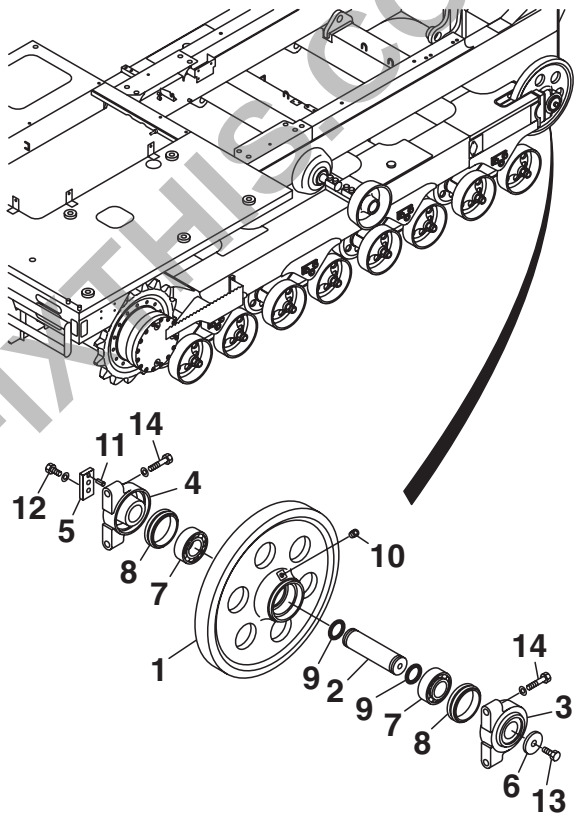
7-3-3. Disassembly and Assembly the Idler

⚠ WARNING

- **Be sure to do the replacement work on level ground.**
- **The oil temperature is very high immediately after the machine stops operating. Be sure to do the work after the oil temperature lowers sufficiently.**
- **When removing the hydraulic hose, oil may spout out due to the high internal pressure. Loosen the hydraulic hose slowly to prevent high pressure oil from contacting your eyes or skin.**

⚠ CAUTION

Take great care in handling idlers, because they are very heavy.



S3G331

1) Disassembly

(1) Hang the idler (1) temporarily, and remove the bolt (14) from the idler fork and then remove the idler assembly.

(2) Remove the plug (10) from the idler (1), and drain the oil.

(3) Remove the bolt with washer (13) from the idler shaft, and remove the plate (6) and the seal cover (3).

(4) Remove the bolt (12) from the idler shaft, and then remove the plate (5), the pin (11) and the seal cover (4).

(5) Pull out the shaft (2) from the idler (1) to the right or left.

(6) Remove the O-ring (9) from the shaft (2).

(7) Remove the floating seal (8) from the idler (1).

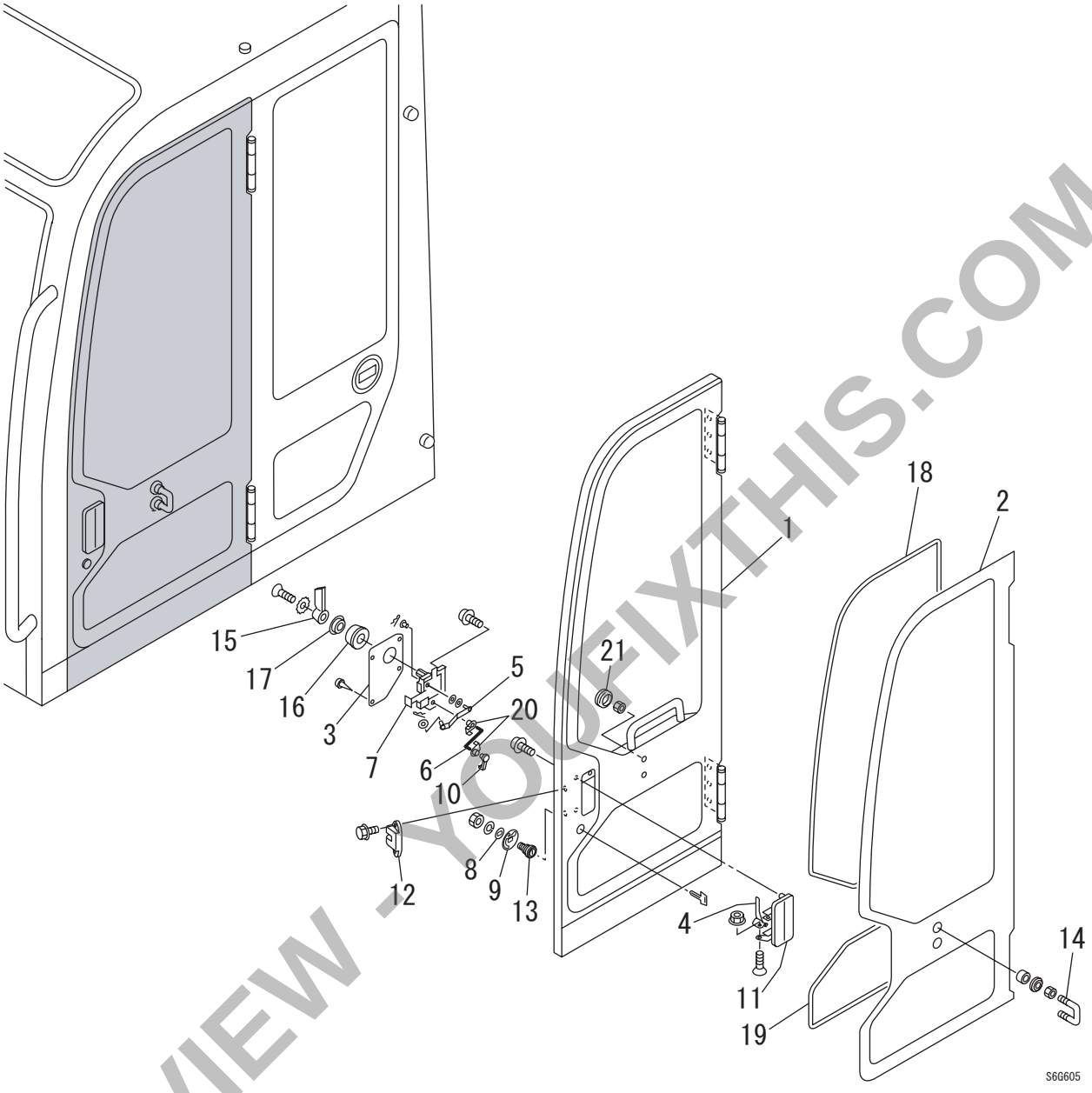
(8) Remove the bearing (7) from the idler (1).

No.	Part
1	Idler
2	Shaft
3	Seal cover
4	Seal cover
5	Plate
6	Plate
7	Bearing
8	Floating seal
9	O-ring
10	Plug
11	Spring pin
12	Bolt M10 × 30
13	Bolt M16 × 35
14	Bolt

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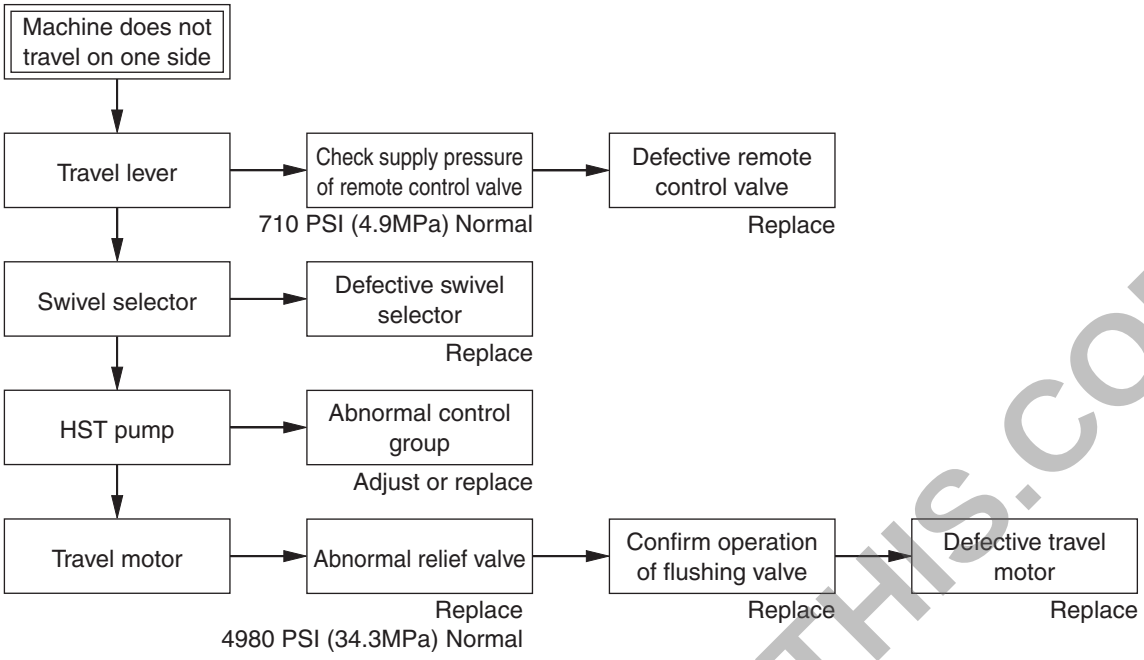
Cabin (IV)

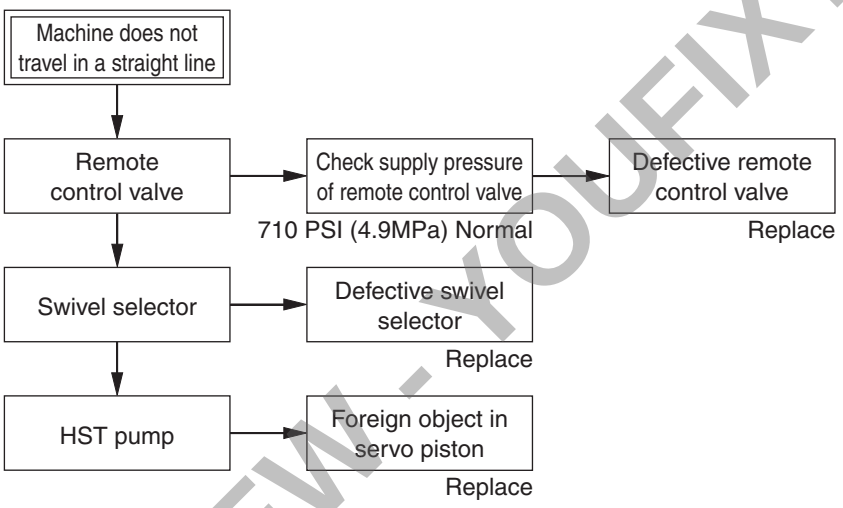


No.	Part	No.	Part	No.	Part
1	Door	9	Plate	17	Escutcheon
2	Glass	10	Holder	18	Dam
3	Cover	11	Handle	19	Dam
4	Plate	12	Lock	20	Snap
5	Plate	13	Key assembly	21	Grommet
6	Rod	14	Striker		
7	Control assembly	15	Handle		
8	Washer	16	Base		

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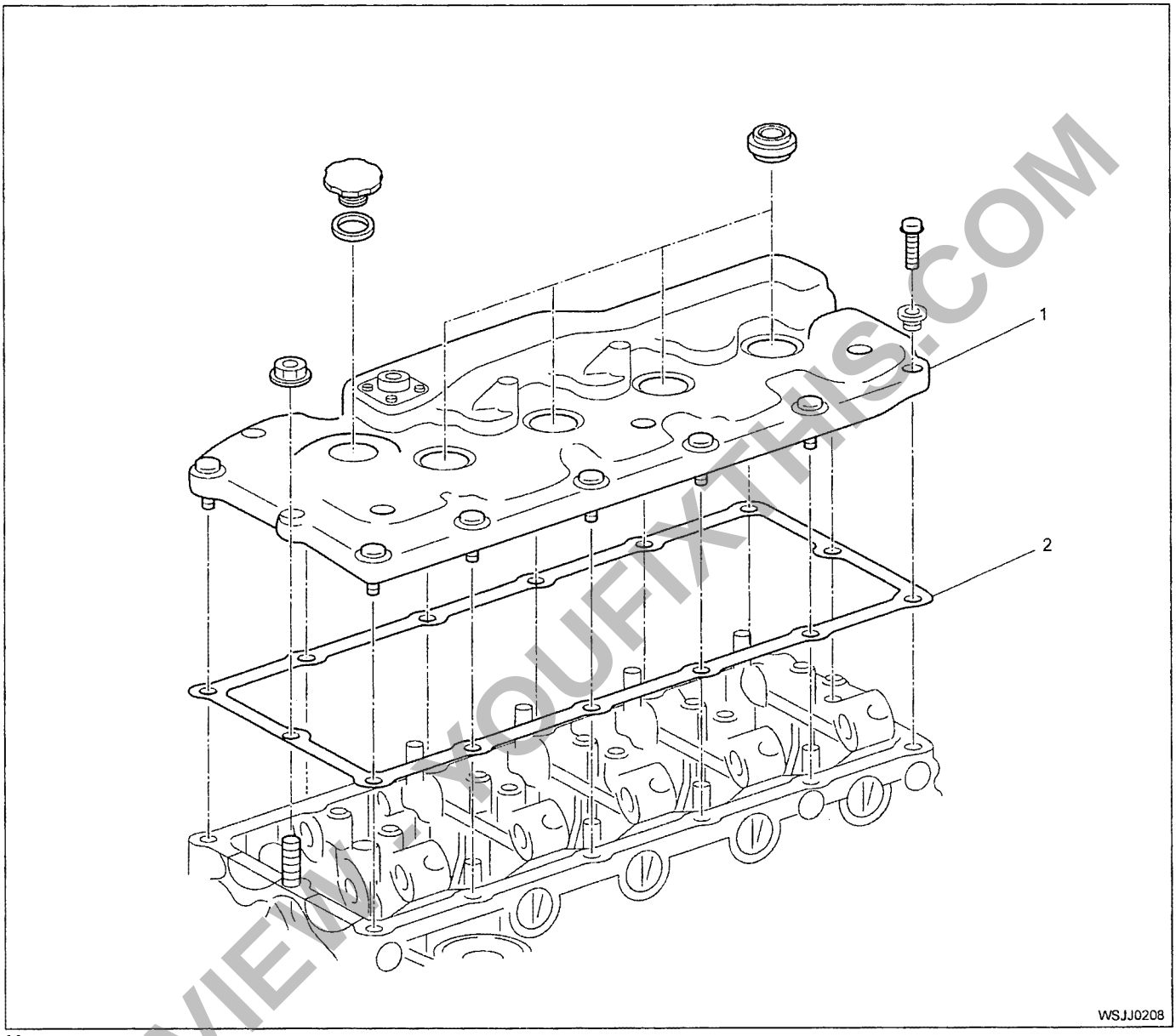


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Cylinder Head Cover

Components



Name

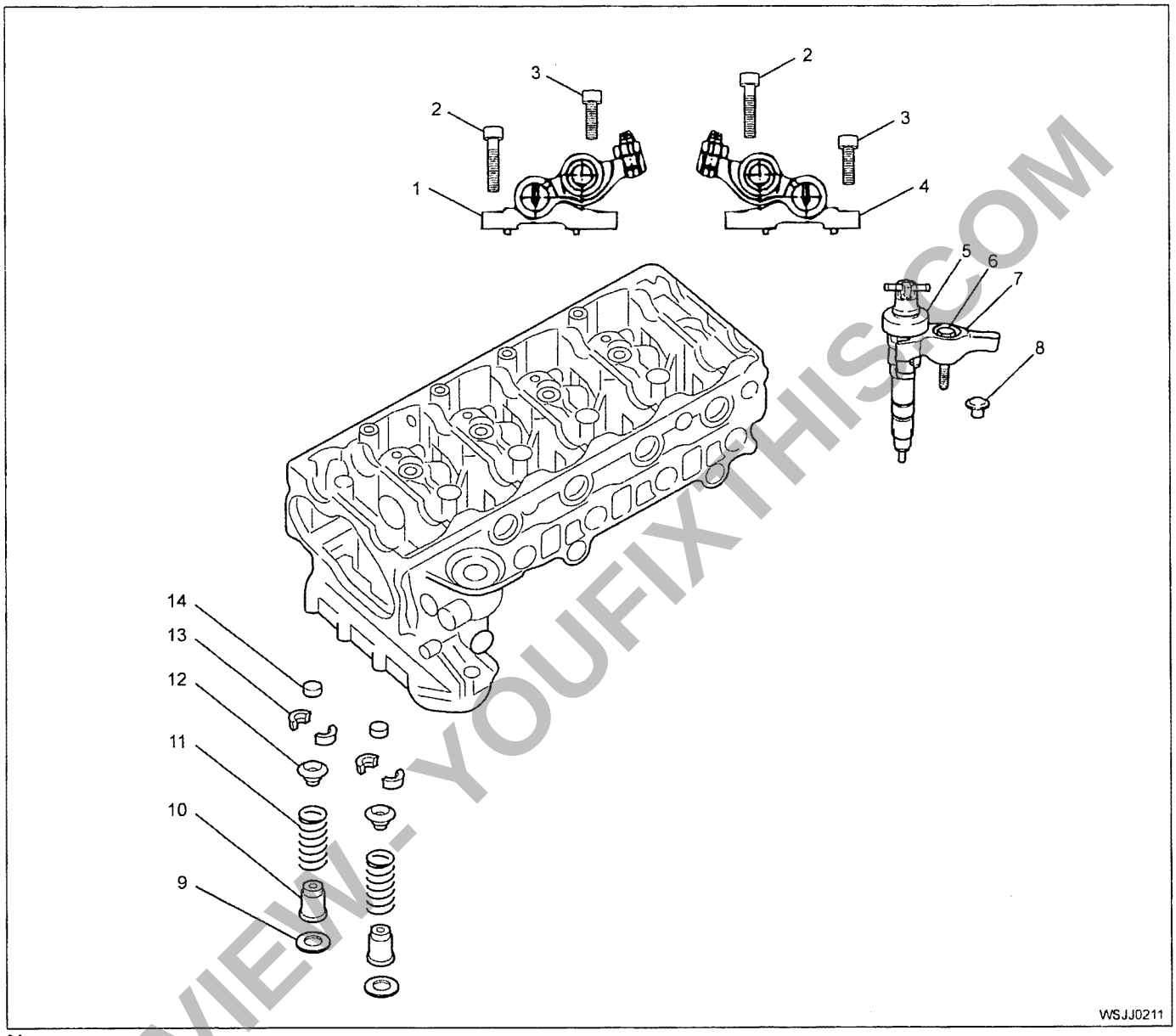
1. Head Cover
2. Head Cover Packing

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Valve Stem Seal, Valve Spring

Components



Name

1. Exhaust Rocker Arm Shaft ASM
2. Bolt (Long)
3. Bolt (Short)
4. Intake Rocker Arm Shaft ASM
5. Fuel Injector
6. Bolt
7. Nozzle Bracket
8. Pin
9. Valve Spring Seat
10. Valve Stem Oil Seal
11. Valve Spring
12. Spring Upper Seat
13. Split Collar
14. Valve Stem End Cap

Removal

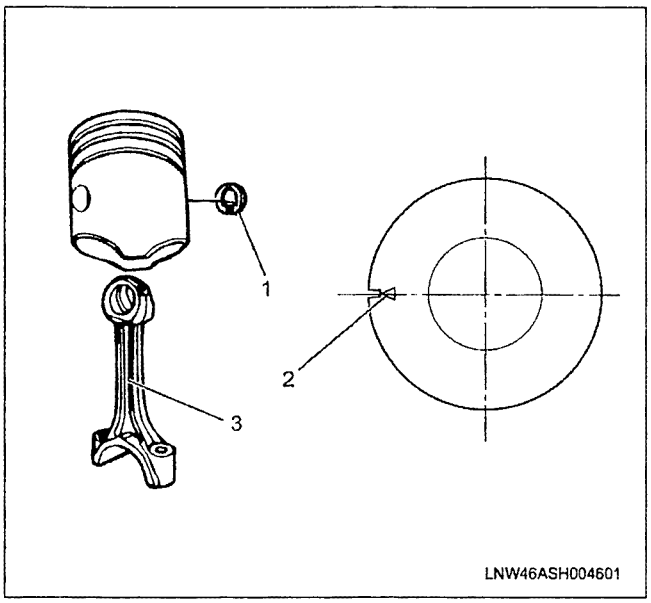
1. Remove the cylinder head cover.
   Refer to "Cylinder Head Cover".
2. Remove the camshaft ASM.
   Refer to "Camshaft ASM".
3. Remove the rocker arm shaft ASM.
   Refer to "Rocker Arm Shaft ASM".
4. Remove the valve stem end cap.

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Reassembly

1. Install the piston.
2. Install the connecting rod.
   - Install it so that the front mark of the head of the piston and the connecting rod forging mark (projecting) on the connecting rod face the same direction.
   - Install the snap ring on either side.

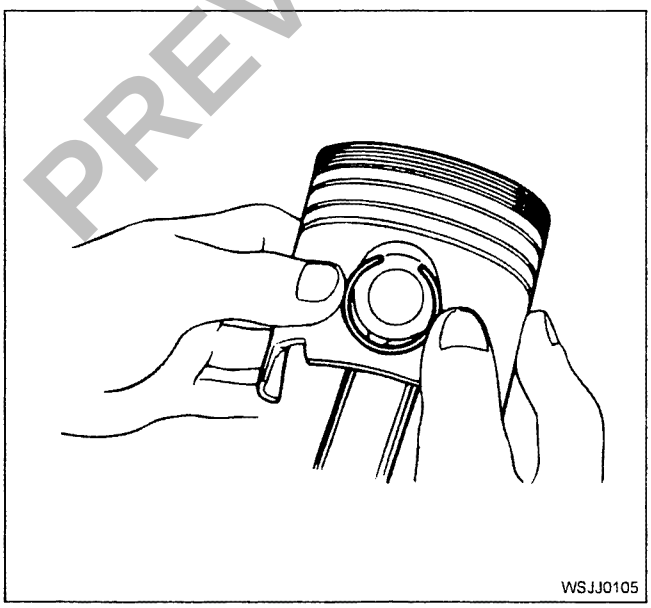


Name

1. Snap Ring
2. Front Mark
3. Forging Mark (Projecting)

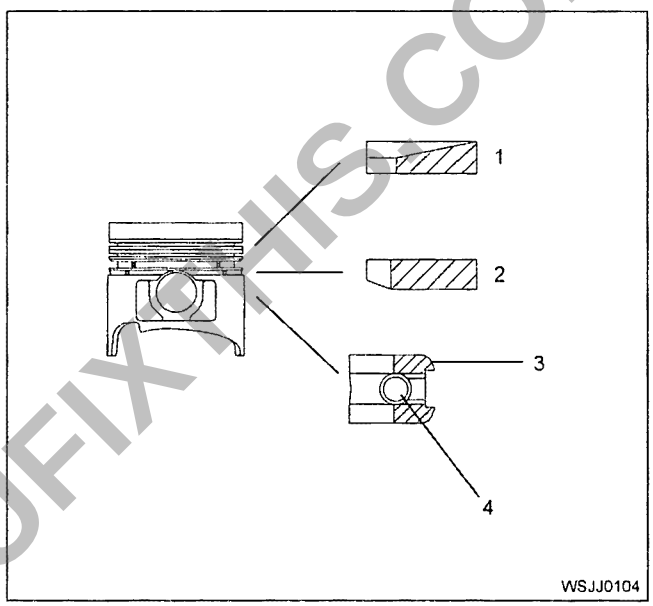
3. Apply enough engine oil on the piston pin, push it in the piston and the connecting rod small edge.
4. Assemble the snap ring.

Caution:
Make sure that the snap ring is installed in the ring groove properly. Make sure that the connecting rod moves smoothly.



5. Use the piston ring setting tool to install the piston ring.
   - Install the piston ring in the order shown in the illustration.
   - Install the piston ring with the "N" mark facing upward.
   - Install the second ring so that the yellow paint on the outer circumference comes to the right side of the end gap.

Special tool
Piston ring setting tool: 1-8522-1029-0



Name

1. Top Ring
2. Second Ring
3. Oil Ring
4. Coil Expander

Caution:
Note that the shapes are different for each piston ring.

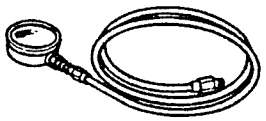
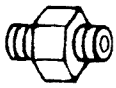
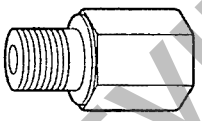
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Engine oil leakage

- In the lift up condition, confirm that there are no leaks from the cylinder head cover and oil pan.

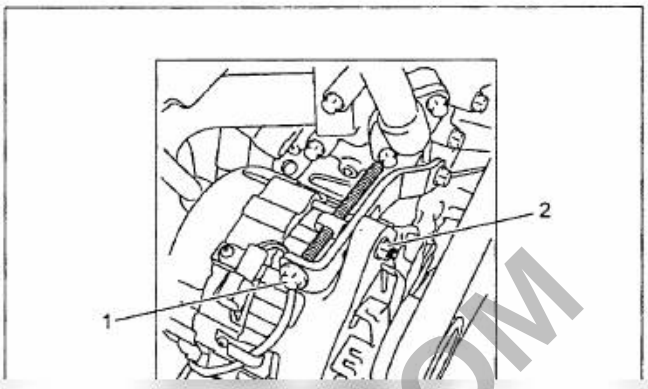
Special Tool

Illustration	Tool Number/Description / Special Tool Rank
 J43620-20	J-43620-20 Oil pressure gauge Rank B
 J43630	J-43630 Hose Rank B
 J43630-14	J-43630-14 Connector Rank A
 J46333	J-46333 Oil pressure testing adapter Rank A

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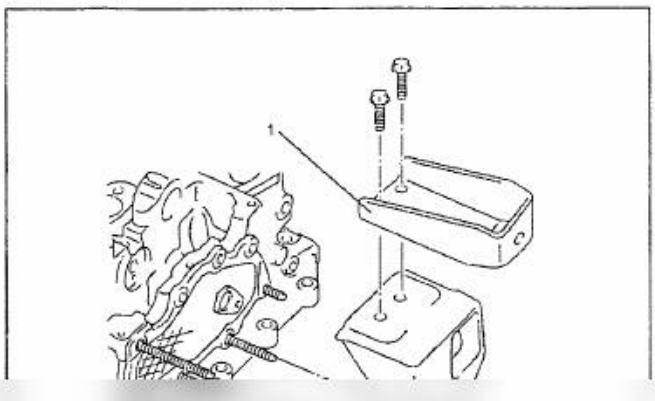




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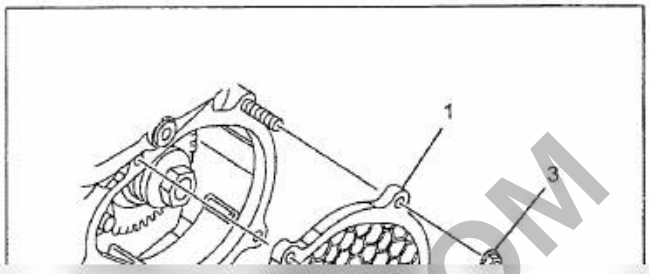
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- Tighten the bolt and nut to the specified torque.

Tightening torque: 10 N·m (1.0 kg·m/87 lb ft)



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