

# SHOP MANUAL

# PC75R-2

HYDRAULIC EXCAVATOR

SERIAL NUMBER

**PC75R-2 22E5210001** and up



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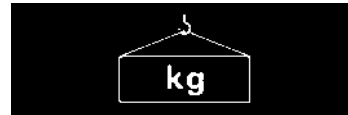
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# HOISTING INSTRUCTIONS



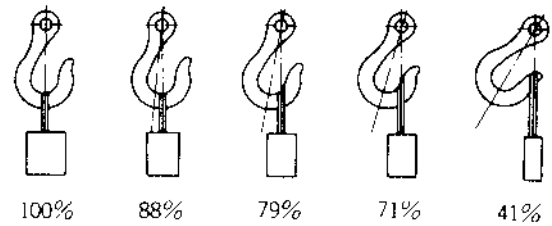
**⚠** Heavy parts (25 kg or more) must be lifted with a hoist etc. In the **Disassembly and Assembly** section, every part weighing 25 kg or more is clearly indicated with the symbol .

1. If a part cannot be smoothly removed from the machine by hoisting, the following checks should be made:
  - Check for removal of all bolts fastening the part to the relative parts.
  - Check for any part causing interference with the part to be removed.
2. **Wire ropes**
  - 1) Use adequate ropes depending on the weight of parts to be hoisted, referring to the table below:

WIRE ROPES (Standard «S» or «Z» twist ropes without galvanizing)	
Rope diameter (mm)	Allowable load (tons)
10.0	1.0
11.2	1.4
12.5	1.6
14.0	2.2
16.0	2.8
18.0	3.6
20.0	4.4
22.4	5.6
30.0	10.0
40.0	18.0
50.0	28.0
60.0	40.0

The allowable load value is estimated to be one-sixth or one-seventh of the breaking strength of the rope used.

- 2) Sling wire ropes from the middle portion of the hook. Slinging near the edge of the hook may cause the rope to slip off the hook during hoisting, and a serious accident can result.



- 3) Do not sling a heavy load with one rope alone, but sling with two or more ropes symmetrically wound on to the load.

**⚠** Slinging with one rope may cause turning of the load during hoisting, untwisting of the rope, or slipping of the rope from its original winding position on the load, which can cause dangerous accidents.

- 4) Do not sling a heavy load with ropes forming a wide hanging angle from the hook.

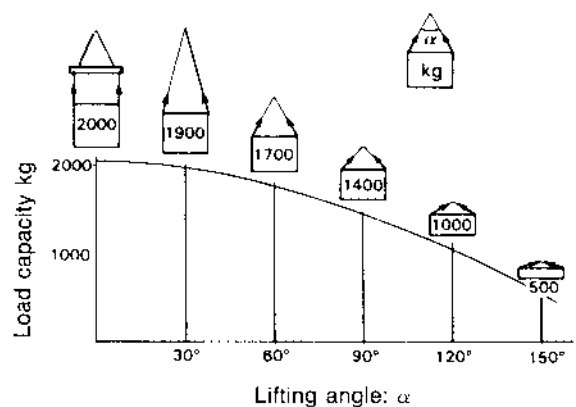
When hoisting a load with two or more ropes, the force subjected to each rope will increase with the hanging angles.

The table below shows the variation of allowable load (kg) when hoisting is made with two ropes, each of which is allowed to sling up to 1000 kg vertically, at various hanging angles.

When two ropes sling a load vertically, up to 2000 kg of total weight can be suspended.

This weight becomes 1000 kg when two ropes make a 120° hanging angle.

On the other hand, two ropes are subjected to an excessive force as large as 4000 kg if they sling a 2000 kg load at a lifting angle of 150°



**From liter to U.S. Gall.**

1 ℓ = 0.2642 U.S. Gall.

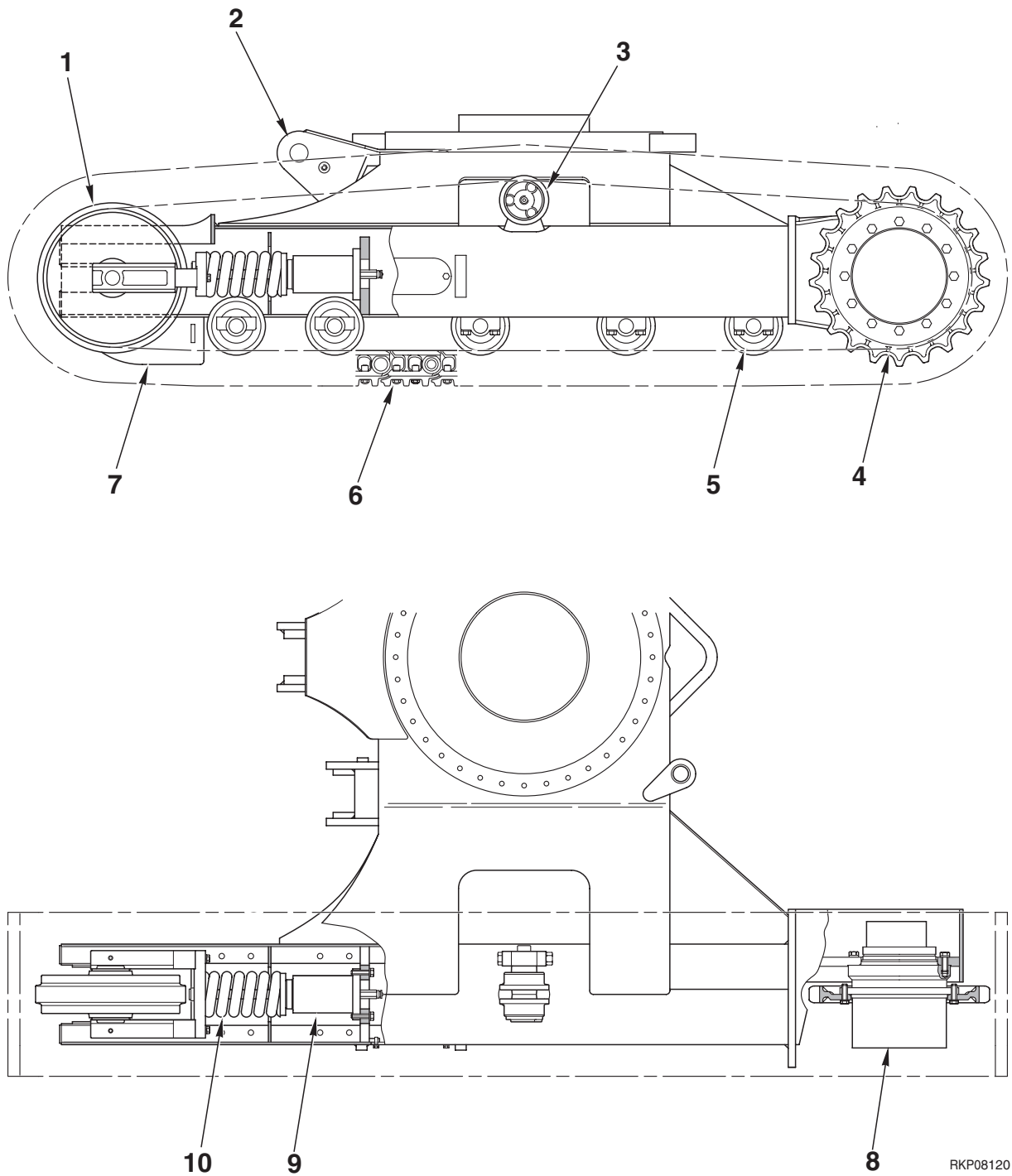
	0	1	2	3	4	5	6	7	8	9
0	0	0.264	0.528	0.793	1.057	1.321	1.585	1.849	2.113	2.378
10	2.642	2.906	3.170	3.434	3.698	3.963	4.227	4.491	4.755	5.019
20	5.283	5.548	5.812	6.076	6.340	6.604	6.869	7.133	7.397	7.661
30	7.925	8.189	8.454	8.718	8.982	9.246	9.510	9.774	10.039	10.303
40	10.567	10.831	11.095	11.359	11.624	11.888	12.152	12.416	12.680	12.944
50	13.209	13.473	13.737	14.001	14.265	14.529	14.795	15.058	15.322	15.586
60	15.850	16.115	16.379	16.643	16.907	17.171	17.435	17.700	17.964	18.228
70	18.492	18.756	19.020	19.285	19.549	19.813	20.077	20.341	20.605	20.870
80	21.134	21.398	21.662	21.926	22.190	22.455	22.719	22.983	23.247	23.511
90	23.775	24.040	24.304	24.568	24.832	25.096	25.361	25.625	25.889	26.153

**From liter to U.K. Gall.**

1 ℓ = 0.21997 U.K. Gall.

	0	1	2	3	4	5	6	7	8	9
0	0	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.950	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.699	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.778
50	10.998	11.281	11.438	11.658	11.878	12.098	12.318	12.528	12.758	12.978
60	13.198	13.418	13.638	13.858	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.818	18.037	12.257	18.477	18.697	18.917	19.137	19.357	19.577
90	19.797	20.017	20.237	20.457	20.677	20.897	21.117	21.337	21.557	21.777

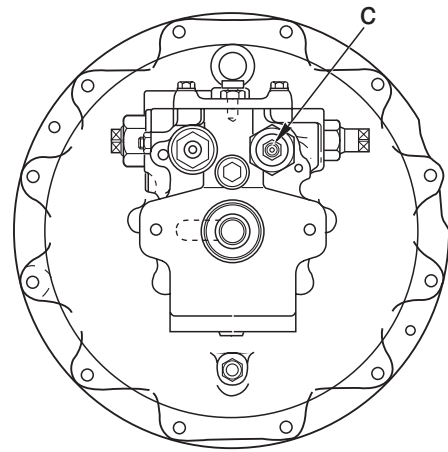
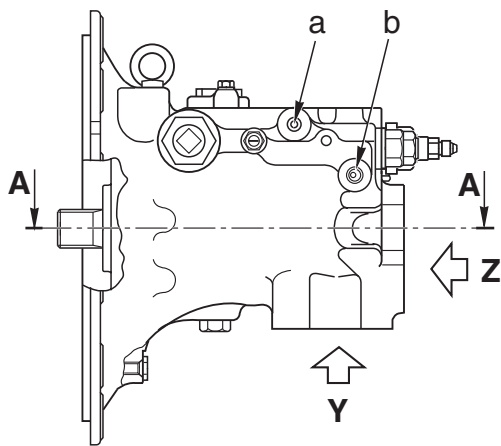
TRACK FRAME



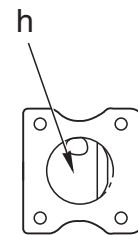
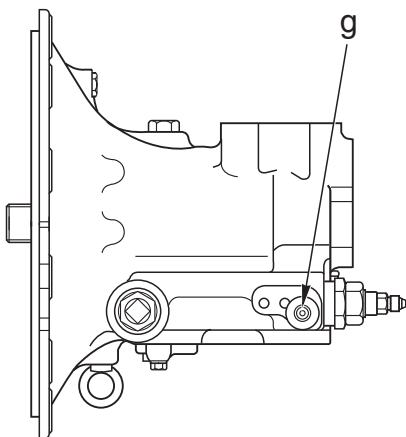
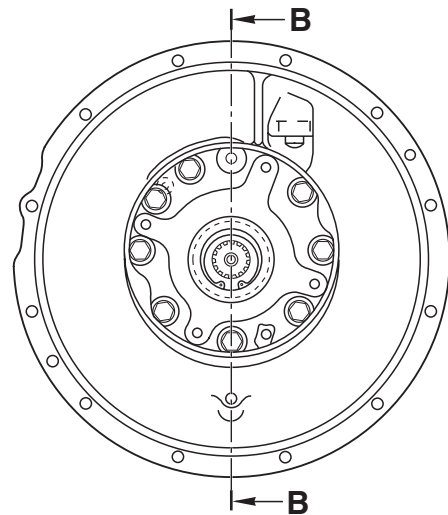
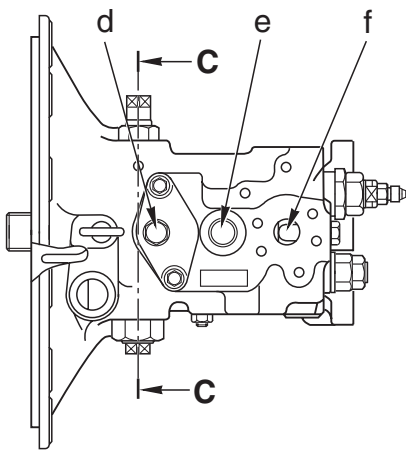
RKP08120

- |                         |                         |
|-------------------------|-------------------------|
| 1. Idler                | 5. Track roller (No. 5) |
| 2. Track frame          | 6. Track shoe           |
| 3. Carrier roller       | 7. Guard                |
| 4. Sprocket             | 8. Final drive          |
| 5. Track roller (No. 5) | 9. Idler cushion        |
|                         | 10. Recoil spring       |

1. MAIN PUMP



View Z



View Y

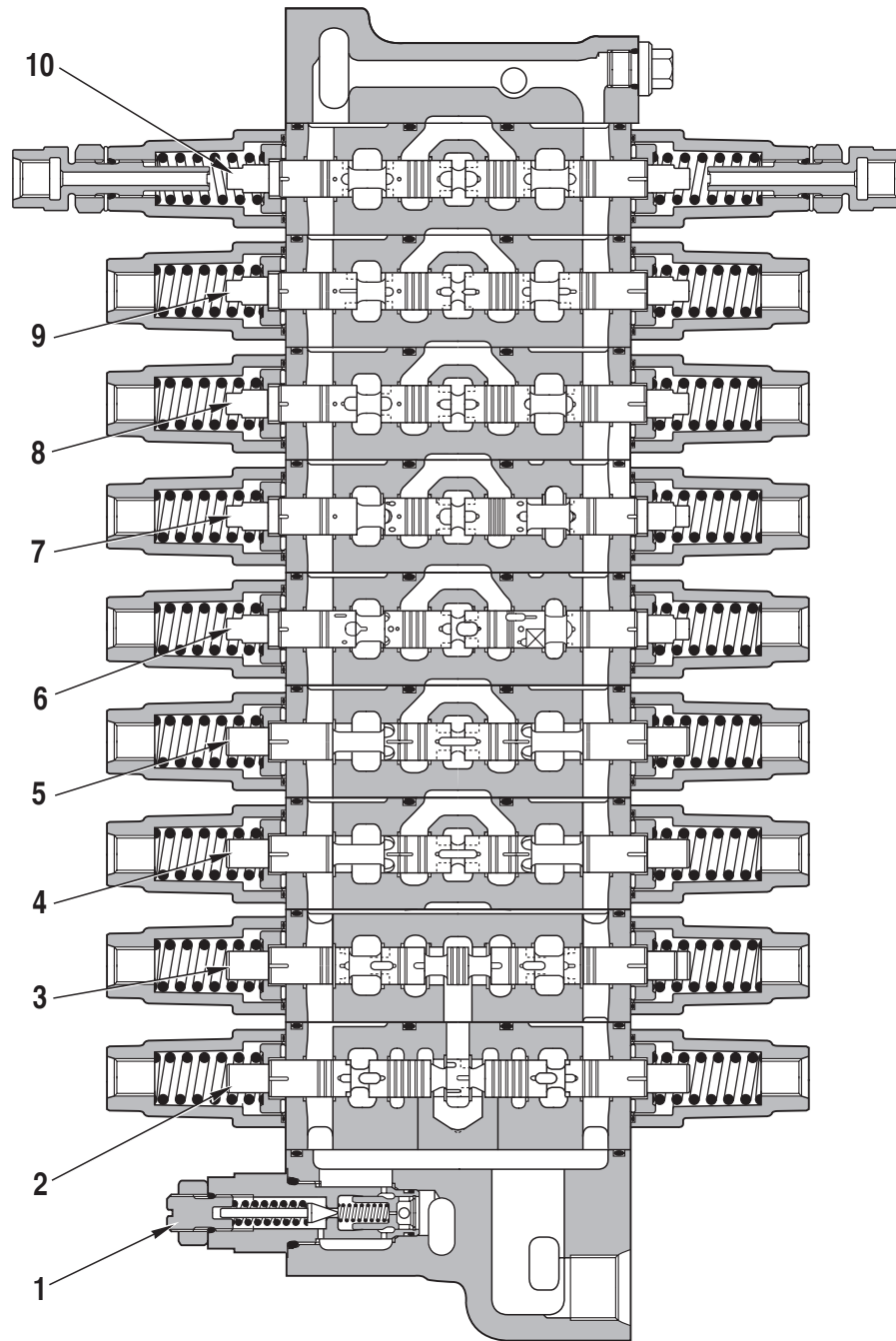
- a. PPLS Port - From control valve (P1 Port) and from servocontrol feed unit (P2 Port)
- b. PLS Port - From control valve (PLS Port)
- c. PM Port - From solenoid valve group ST1 (A Port)
- d. PDA Port - Drain air

- e. PD Port - Drain
- f. PA Port - To servocontrol feed unit
- g. PA3 Port - From gear pump (PGA Port)
- h. PS Port - From hydraulic tank

RKP08221

- When the control lever is moved to full-stroke, in other words, as the opening area of the control valve becomes large, the difference of the pump pressure **PPLS** and the **LS** pressure **PLS** (**LS** differential pressure  $\Delta\text{PLS}$ ) becomes smaller.
- **LS** pressure **PLS** introduced to the spring chamber **a** of the **LS** valve becomes more or less the same as the pump pressure **PPLS** and the piston (15) is pushed to the left side ( ← ) by the combined force of the **LS** pressure and the spring (14), closing the Port **c** and forming a path between the Ports **d** and **e**.
- Therefore, the pressure oil functioning to the chamber **X** at the large diameter side of the servo piston (1) flows to the Port **e** from the Port **d**, and then to the Port **f** of the **PC** valve.
- At this time, since the Port **f** of the **PS** valve is open to the drain inside the pump case through the inside of the piston, pressure in the chamber **X** of the large diameter side of the servo piston also becomes to the drain pressure.
- By this, the servo piston (1) is moved to the max. swash plate angle side ( ↓ ) by the pump pressure **PP** functioning to the chamber **Y** at the small diameter side.

- When the load on the actuator becomes small and the pump discharge pressure **PP** lowers, the piston (8) is pushed to the right (  $\rightarrow$  ) side by the spring force of the springs (5) and (7).
- By this action, at the same time when the path between the Ports **g** and **f** is shut out, the Port **f** becomes open to the drain circuit.
- At this time, if the **LS** valve is working to increase the pump discharge amount, because control of the **PC** valve becomes ineffective, pressure oil the chamber **X** of the large diameter side of the servo piston (1) flows from the Port **d** through the Port **e** of the **LS** valve and drains into the drain circuit from the Port **f** of the **PC** valve.
- Therefore, the servo piston (1) is shifted to the maximum swash plate angle (  $\downarrow$  ) side by the pressure **PP** in the chamber **Y** at the small diameter side.



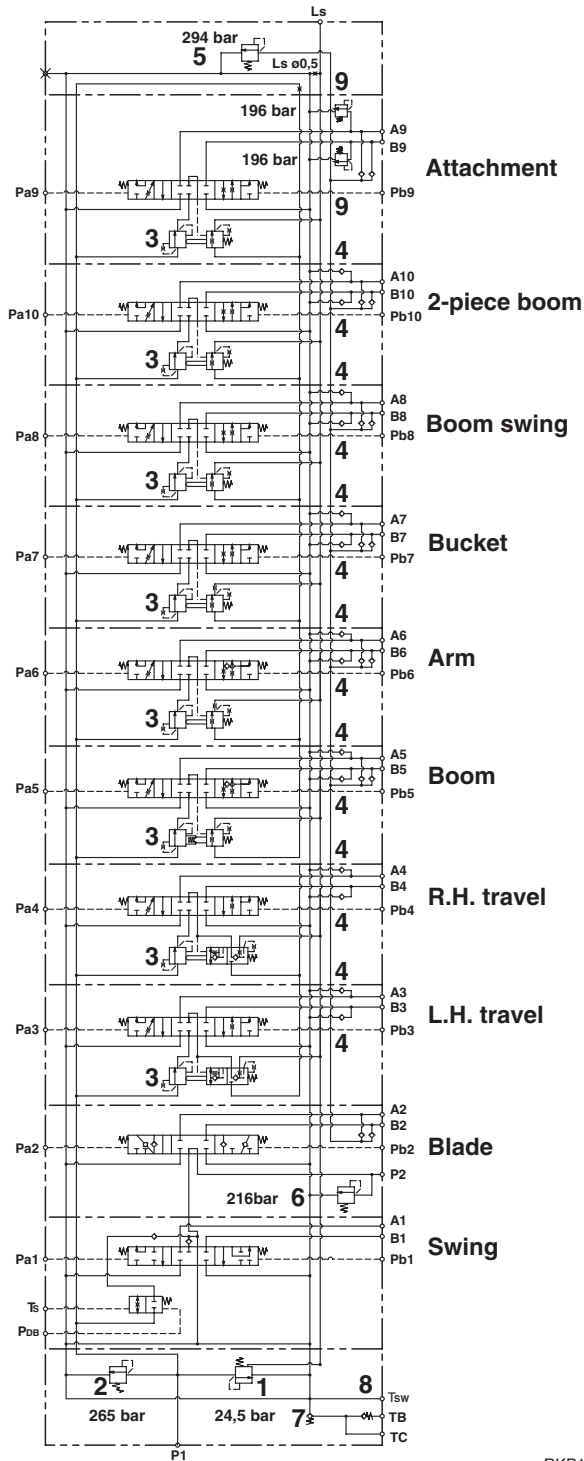
Section B - B

RKP02782

- |                                |                        |
|--------------------------------|------------------------|
| 1. Main relief valve (P1 Port) | 6. Spool (boom)        |
| 2. Spool (swing)               | 7. Spool (arm)         |
| 3. Spool (blade)               | 8. Spool (bucket)      |
| 4. Spool (L.H. travel)         | 9. Spool (boom swing)  |
| 5. Spool (R.H. travel)         | 10. Spool (attachment) |

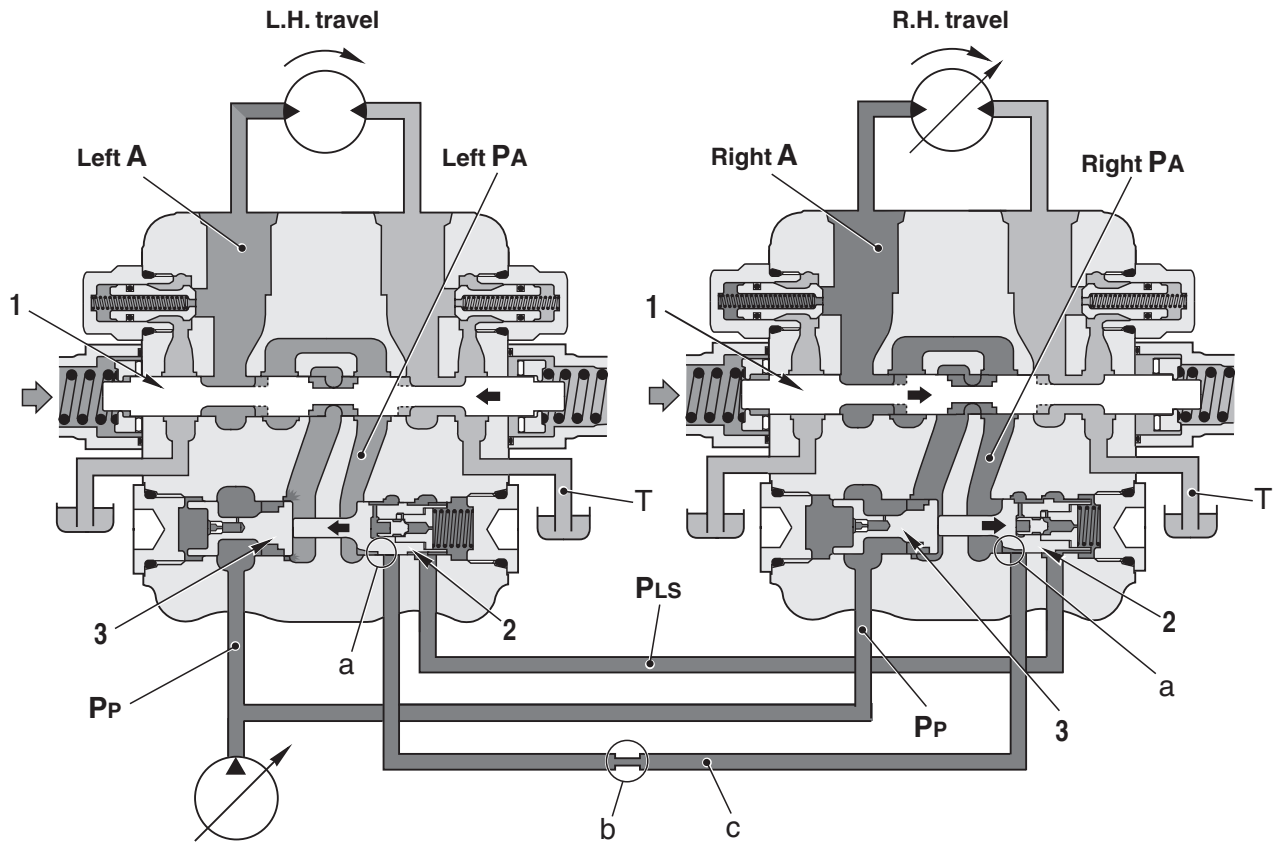
3. Operation for each function and valve

Hydraulic circuit diagram and names of valves



1. Unload valve: **LS** pressure+24.5 bar
2. Main relief valve (P1 Port) 265 bar
3. Pressure compensation valve
4. Suction valve
5. Safety valve: 294 bar
6. Main relief valve (P2 Port): 216 bar
7. Lift check valve
8. Cooler bypass valve
9. Safety valve (attachment): 196 bar

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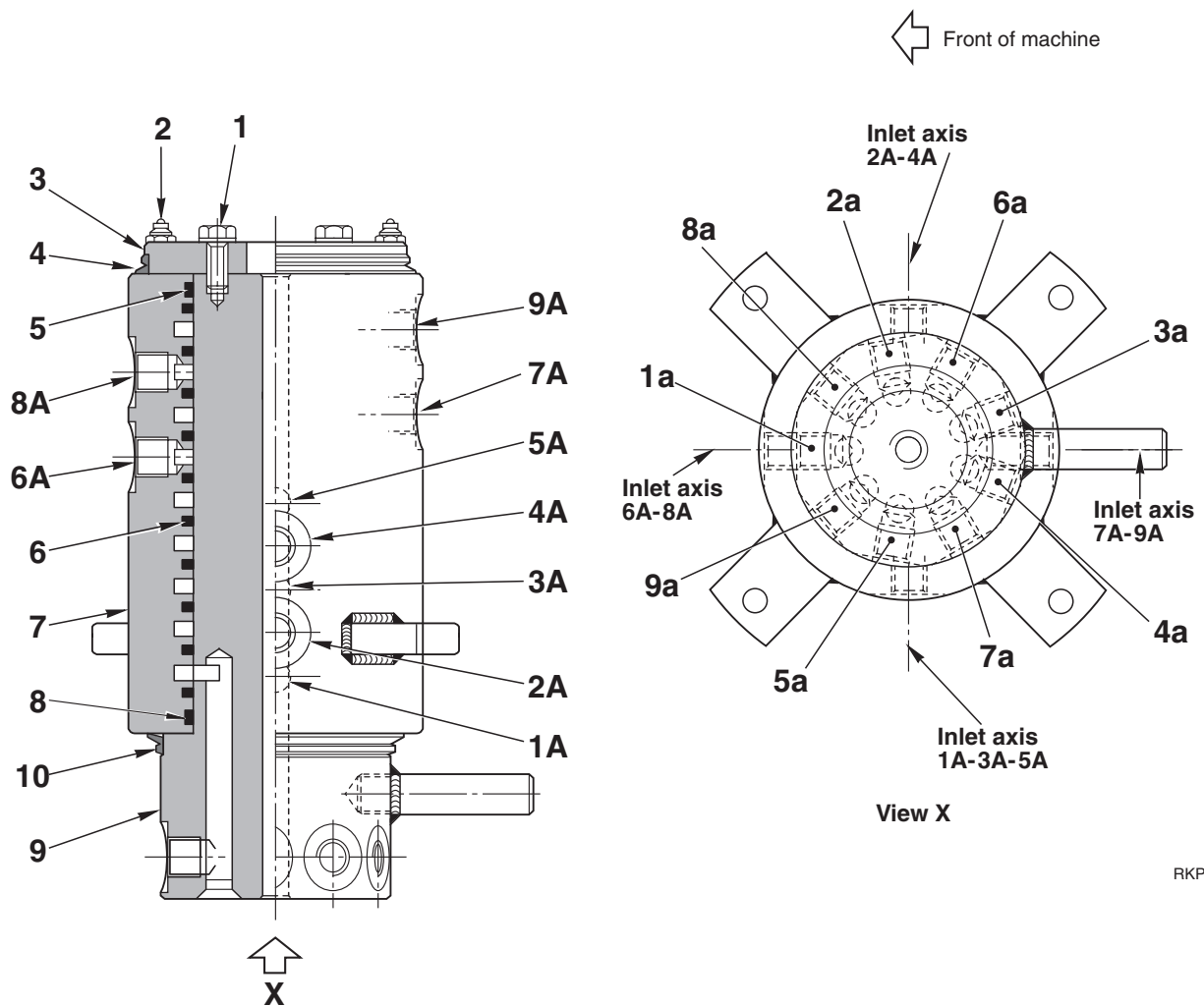


RKP03051

**When the travel steering is operated**

- During the straight travel status, if the L.H. travel spool (L.H. 1) is returned to the NEUTRAL side to operate the steering, difference is generated between the L.H. and R.H. travel actuator circuits PA's (R.H. A > L.H. A), and the LS pressure PLS becomes the same as R.H. A which has the higher load pressure.
- By this action, the flow control valve (3) at the L.H. travel side is pushed to the left ( ← ) by the LS circuit PLS, i.e. the load pressure R.H. A of the R.H. travel, and the opening of the notch a at the left side is closed, shutting off the path between the L.H. and R.H. travel circuits, enabling steering operation.
- Furthermore, the damper b is provided to ease the transient characteristics of rapid opening/closing of the path circuit when the spool is rapidly operated.

# SWIVEL JOINT



RKP10481

**FUNCTION**

- 1. Not used
- 2. Travel acceleration
- 3. Blade raise
- 4. Drain
- 5. Blade lower
- 6. L.H. travel forward
- 7. R.H. travel reverse
- 8. L.H. travel reverse
- 9. R.H. travel forward

1A. Not used

- 2A. From ST1 solenoid valve group (C Port)
- 3A. From control valve (B2 Port)
- 4A. To hydraulic tank
- 5A. From control valve (A2 Port)
- 6A. From control valve (B3 Port)
- 7A. From control valve (B4 Port)
- 8A. From control valve (A3 Port)
- 9A. From control valve (A4 Port)

- 1. Screw
- 2. Grease nipple
- 3. Cover
- 4. Guard ring
- 5. O-Ring
- 6. Seal
- 7. Rotor
- 8. O-Ring
- 9. Stator
- 10. Guard ring

- 1a. Not used
- 2a. To travel motors (D Port)
- 3a. To blade safety valve (V1 Port)
- 4a. From travel motors (C1 Port)
- 5a. To blade safety valve (V2 Port)
- 6a. To L.H. travel motor (A Port)
- 7a. To R.H. travel motor (A Port)
- 8a. To L.H. travel motor (B Port)
- 9a. To R.H. travel motor (B Port)

2. At neutral

3. When load pressure P2 is low (when moving down under own weight boom LOWER or arm IN)

Note: When load pressure P2 is lower than output pressure PR of the self-reducing pressure valve.

- Valve (2) receives force in the direction to close the passage from Port P1 → P2 from spring (3) and pressure PR (when the engine is stopped, the pressure is 0 bar).

However, when hydraulic oil flows in from Port P1, the pressure is balanced so that pressure P1 = force of spring (7) + (area  $\varnothing d \times$  pressure PR), and the opening from Port P1 → P2 is adjusted so that pressure P1 is kept at a certain value above pressure PR.

- When pressure PR goes above the set pressure, poppet (5) opens, and the hydraulic oil flows in the following circuit: Port PR hole a → inside spool (8) opening of poppet (5) → tank Port T.

As a result, a pressure difference is created on both sides of hole a inside spool (8), so spool (8) moves in the direction to close the opening from Port P1 → PR.

Pressure P1 is reduced to a certain pressure (set pressure) by the amount of opening at this point, and is supplied as pressure PR. (See Fig. 2)

4. When load pressure P2 is high

- If load pressure P2 increases and the pump discharge amount also increases because of digging operations, pressure P1 also increases (pressure P1 > force of spring (7) + (area  $\varnothing d \times$  pressure PR), so valve (2) moves to the right to the end of the stroke. As a result, the amount of opening from Port P1 → P2 increases and the resistance in the passage is reduced, so the loss of engine horsepower is reduced.

- If pressure PR goes above the set pressure, poppet (5) opens and the hydraulic oil flows in the following circuit: Port PR → hole a inside spool (8) a → opening of poppet (5) → tank Port T.

As a result, a pressure difference is created on both sides of hole a inside spool (8), so spool (8) moves in the direction to close the opening from Port P1 → PR.

Pressure P1 is reduced to a certain pressure (set pressure) by the amount of opening at this point, and is supplied as pressure PR. (See Fig. 3)

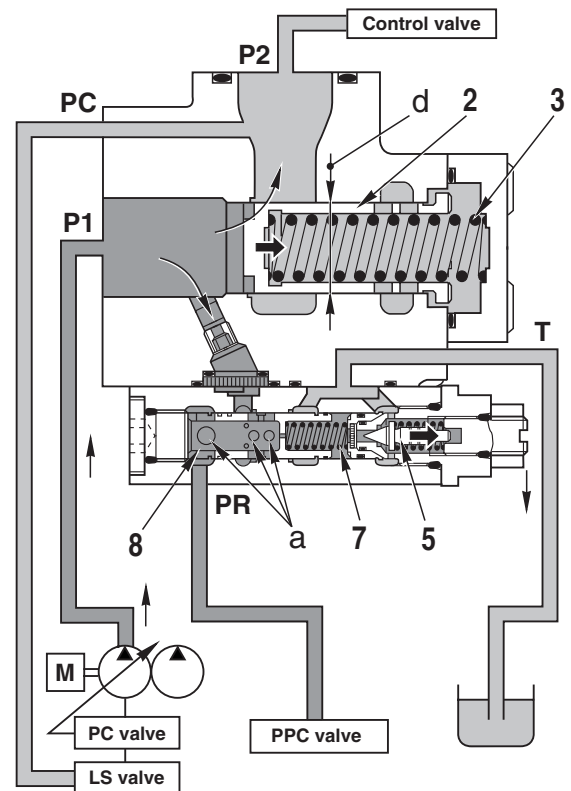


Fig. 2

RKP03881

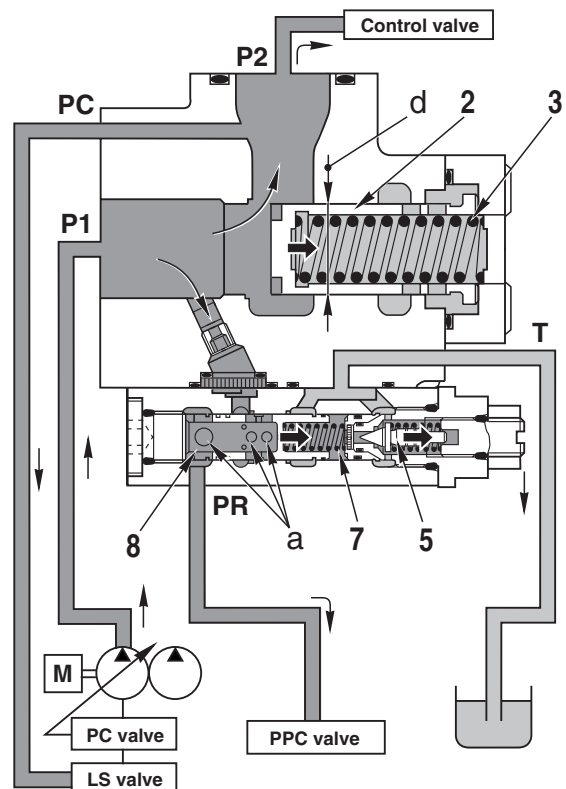


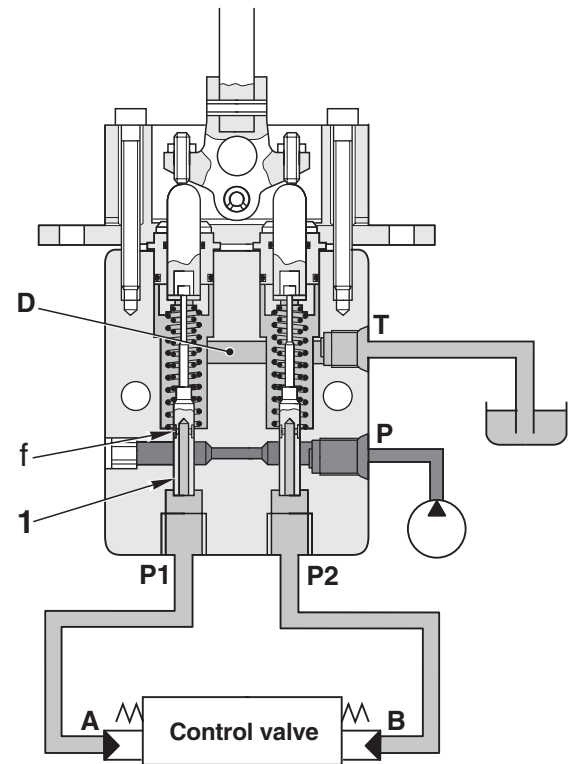
Fig. 3

RKP03891

**FUNCTION**

**1. At neutral**

Ports **A** and **B** of the control valve and Ports **P1** and **P2** of the PPC valve are connected to drain chamber **D** through fine control hole **f** in spool (1). (Fig. 1)



**Fig. 1**

RKP12911

**2. During fine control (NEUTRAL → fine control)**

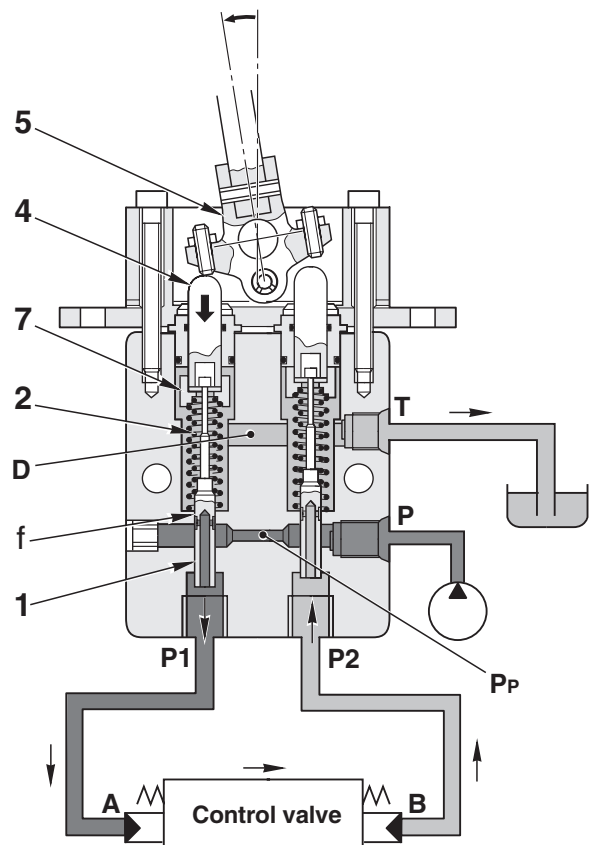
When piston (4) starts to be pushed by lever (5), re- tainer (7) is pushed; spool (1) is also pushed by me- tering spring (2), and moves down.

When this happens, fine control hole **f** is shut off from drain chamber **D**, and at almost the same time, it is connected to pump pressure chamber **PP**, so pi- lot pressure oil from the control pump passes through fine control hole **f** and goes from Port **P1** to Port **A**.

When the pressure at Port **P1** becomes higher, spool (1) is pushed back and fine control hole **f** is shut off from pump pressure chamber **PP**.

At almost the same time, it is connected to drain chamber **D** to release the pressure at Port **P1**. When this happens, spool (1) moves up or down so that the force of metering spring (2) is balanced with the pressure at Port **P1**. The relationship in the position of spool (1) and body (8) (fine control hole **f** is at a point midway between drain hole **D** and pump pres- sure chamber **PP**) does not change until retainer (7) contacts spool (1).

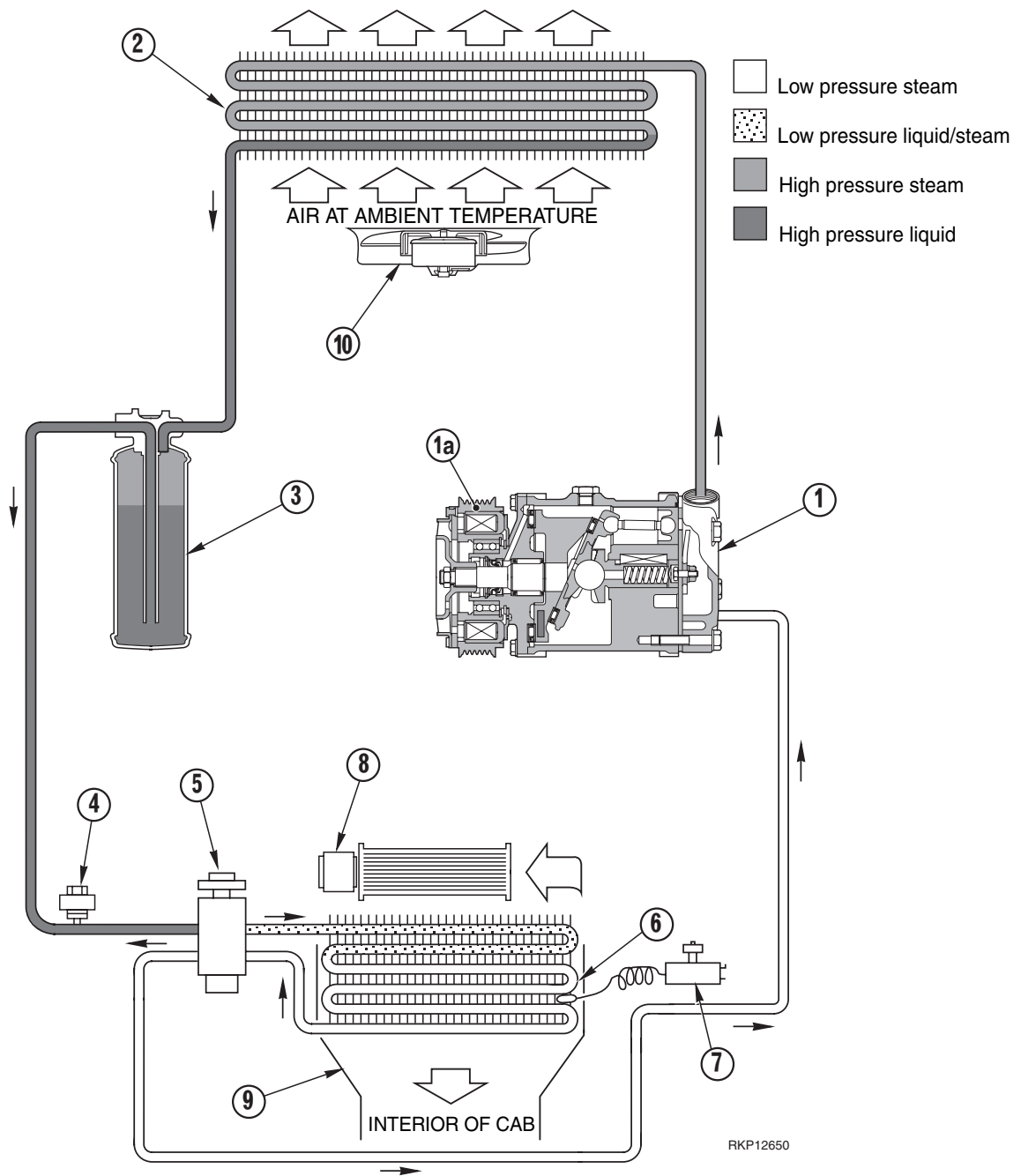
Therefore, metering spring (2) is compressed pro- portionally to the amount of movement of the control lever, so the pressure at Port **P1** also rises in pro- portion to the travel of the control lever. In this way, the control valve spool moves to a position where the pressure in chamber **A** (the same as pressure at Port **P1**) and the force of the control valve spool re- turn spring are balanced. (Fig. 2)



**Fig. 2**

RKP12901

# AIR-CONDITIONING UNIT



1. Compressor
2. Condenser
3. Drying-filter tank
4. Safety pressure
5. Expansion valve
6. Evaporator
7. Thermostatic clutch control sensor
8. Air-circulation fan in cab
9. Air conveyor
10. Condenser ventilator

### TECHNICAL DATA

Operating pressure in circuit with engine at 2500 rpm and ambient temperature at 25–30°C:

Normal pressure: 15–17 bar

Low pressure: 1.6–1.8 bar

Safety pressures:

High pressure: 20 bar

Low pressure: 2.5 bar

Coolant fluid: R134a

Quantity of coolant: 1100 <sup>-30</sup>/<sub>+50</sub> g

ELECTRICAL DIAGRAM (5/5)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

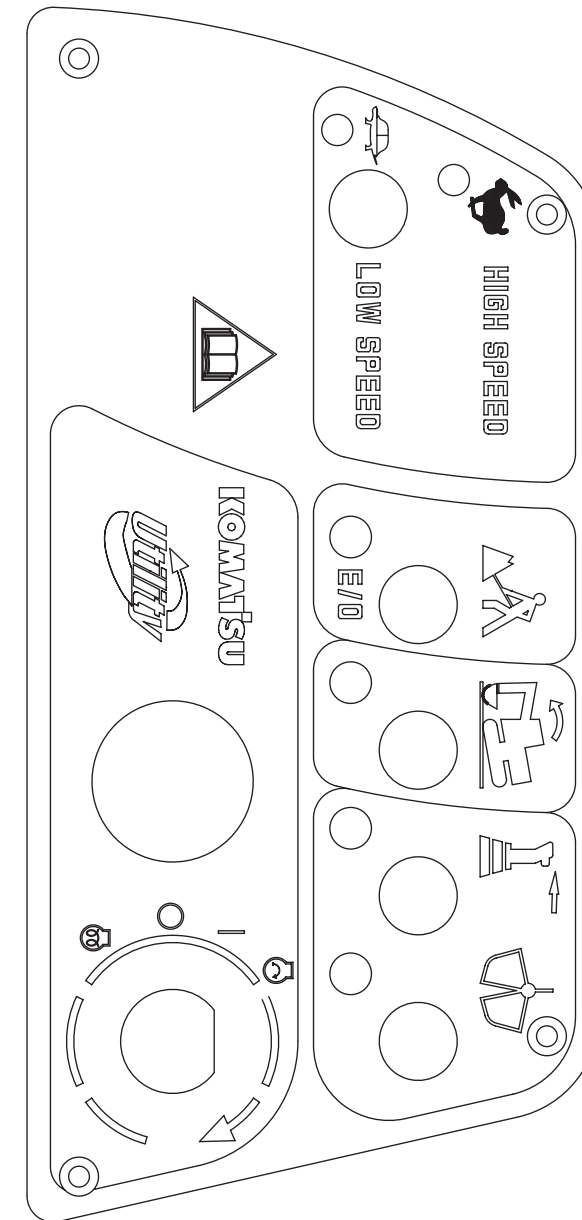
PULSANTIERA /SWITCHES PANEL

X11

POS	DESCRIZIONE FUNZIONE	DESCRIZIONE FUNZIONE
1	MASSA	GROUND
2	ALIMENTAZIONE SCHEDA/PULS.	PANEL POWER SUPPLY
3	N.C.	N.C.
4	AVV. ACUSTICO ANTIRIBALTAMENTO	ANTI OVERTURNING BUZZER
5	N.C.	N.C.
6	N.C.	N.C.
7	N.C.	N.C.
8	N.C.	N.C.
9	OUT E/V BENNA	GRAB SOLENOID VALVE OUT SIGNAL
10	OUT E/V MARTELLO	HAMMER SOLENOID VALVE OUT SIGNAL
11	ALIMENTAZIONE RELE'	RELAIS POWER
12	N.C.	N.C.
13	N.C.	N.C.
14	N.C	N.C
15	RELE' PINZA	PLIERS RELAY
16	N.C	N.C
17	OUT E/V WORKING MODE	WORKING MODE VALVE OUT SIGNAL
18	N.C	N.C

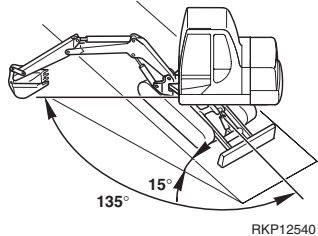
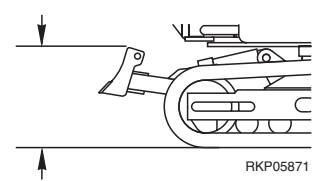
X12

POS	DESCRIZIONE FUNZIONE	DESCRIZIONE FUNZIONE
1	N.C	N.C
2	N.C	N.C
3	SEGNALE PRESS. ANTIRIBALTAMENTO	ANTI OVERTURNING PRESSURE SWITCH SIGNAL
4	N.C.	N.C.
5	N.C.	N.C.
6	PULSANTE PEDALE MARTELLO	HAMMER PEDAL BUTTON
7	PULSANTE PINZA	PLIERS BUTTON
8	P. MARTELLO / CHIUSURA BENNA MORDENTE	HAMMER OR CLOSE GRAB BUTTON
9	PULSANTE APRI BENNA MORD.	OPEN GRAB BUTTON
10	N.C.	N.C.
11	ALIMENTAZIONE RELE'	RELAIS POWER
12	OUT E/V INCREMENTO DI VELOCITA'	SPEED INCREASE VALVE OUT SIGNAL



RKP11660

FOR MACHINE

		PC75R-2			
		Test conditions	Unit	Standard value	Permissible value
Hydraulic drift of working equipment	Boom swing (Standard boom)		mm	Max. 10	Max. 15
				Boom A	
	Boom swing (2-piece boom)	<ul style="list-style-type: none"> <li>• Bucket rated load: 630 kg (with 1-piece boom) 580 kg (with 2-piece boom)</li> <li>• Engine: switched off</li> <li>• Oil temperature: 45–55 °C</li> <li>• In the same position as above, park the machine on a 15° slope and bring the turret round to 135°. Measure the extension and retraction of the cylinder after 15 mins.</li> </ul>	Boom B	Max. 12	Max. 18
		Boom A	Max. 10	Max. 15	
		Boom B	Max. 12	Max. 18	
	Blade (measure the downward movement of the edge of the blade)	 <ul style="list-style-type: none"> <li>• Engine: switched off</li> <li>• Oil temperature: 45–55 °C</li> <li>• Raise the blade and measure the height of the edge from the ground. Measure the downward after 15 mins.</li> </ul>		Max. 10	Max. 15
Internal cylinder leakage	Boom	<ul style="list-style-type: none"> <li>• Engine speed: high idling</li> <li>• Oil temperature: 45–55 °C</li> <li>• Check leakages: on the cylinder on the side opposite to the one under pressure</li> <li>★ Check one cylinder at a time</li> <li>★ For the 2-piece boom check the two cylinders individually but simultaneously.</li> </ul>	cc/min	Max. 3.5	Max. 12
	2nd boom (2 cylinders)			Max. 2.2 (ogni cilindro)	Max. 8 (ogni cilindro)
	Arm			Max. 2.2	Max. 10
	Bucket			Max. 2.2	Max. 8
	Boom swing			Max. 2.5	Max. 10
	Blade			Max. 23.5	Max. 12

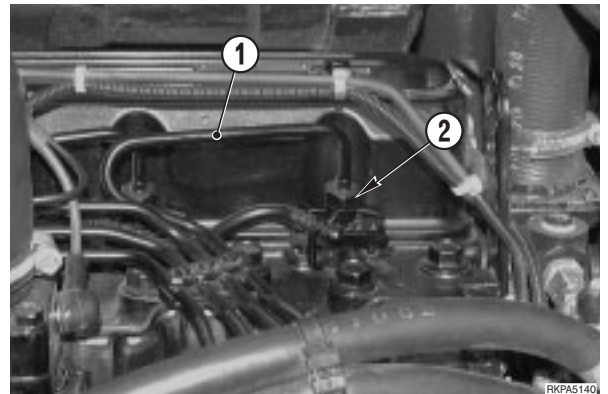
## MEASURING COMPRESSION PRESSURE

**!** When measuring the compression pressure be careful not to get caught in cooling fan, in the alternator belt or in other rotating parts.

★ Test condition:

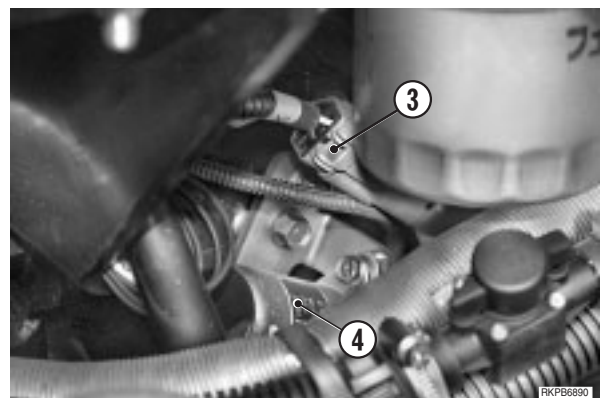
- Engine: at operating temperature
- Hydraulic oil: 55–60°C.
- Battery: at full charge
- Valve clearance: adjusted (see «ADJUSTING VALVE CLEARANCE»)

1 - Disconnect high pressure pipe (1)



2 - Remove nozzle holder assembly (2) of cylinder to be checked.

3 - Disconnect connector (3) of fuel cut-off solenoid valve (4).



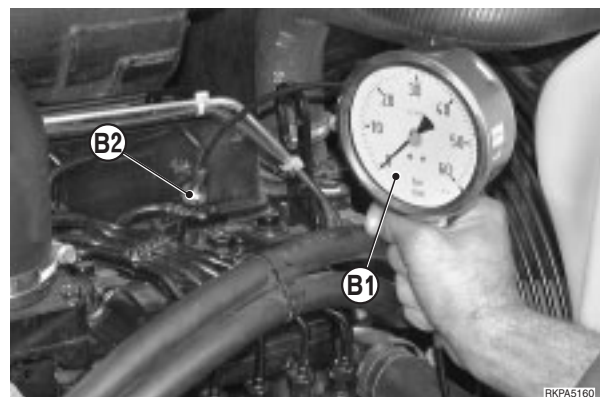
4 - Crank engine with starting motor.

5 - Install **B2** adapter and connect **B1** pressure gauge.


- ★ Check that seal is installed in the adapter and that it is not damaged.


6 - Crank engine with starting motor and measure compression pressure.

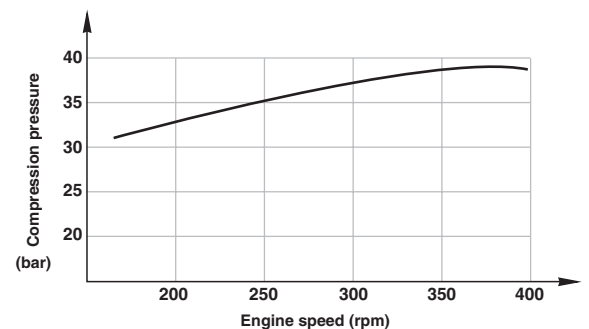
- ★ Compression value:  
 Normal:  $34.3 \pm 1$  bar  
 Minimum permissible:  $27.5 \pm 1$  bar at 250 rpm  
 ★ Difference between cylinders: 2–3 bar



7 - After measuring, install the nozzle holder assembly (2), connect high pressure pipe (1) feedback pipe and connector (3).

 Nozzle holder collar bolts: 6.9–8.8 Nm

 High pressure union: 19.6–24.5 Nm



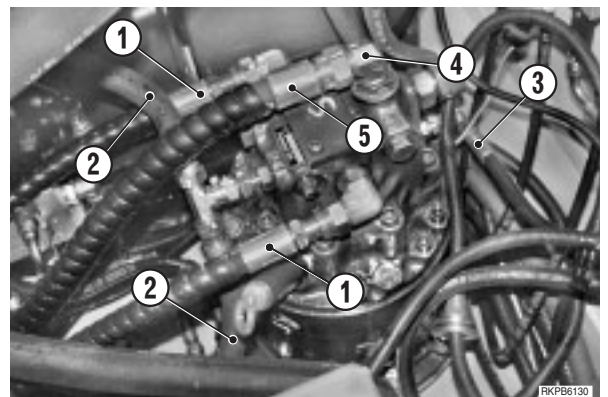
RKP10524

## 2. Bleeding air from hydraulic cylinders

- ★ Once the hydraulic cylinders or the tubes connected to them have been removed, the air must be bled as follows:
  - 1 - Start the engine and run at idling for approx. 5 minutes.
  - 2 - Run the engine at low idling, then raise and lower the boom 4-5 times in succession.
    - ★ Operate the piston rod to approx. 100 mm before the end of its stroke.
  - 3 - Increase engine speed to high idling and repeat the operations described at point 2. Reduce engine speed to low idling and take the piston through its entire stroke until the hydraulic pump has reached maximum pressure.
  - 4 - Repeat the operations (starting from point 2) for the cylinders of the 2nd boom, the arm and the bucket.

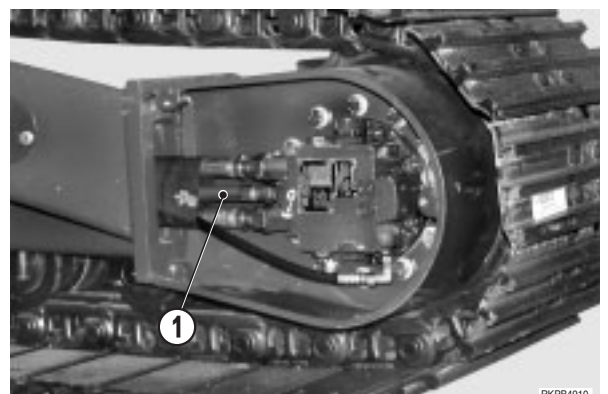
## 3. Bleeding air from swing motor

- 1 - Connect the supply pipe (1), the drainage pipes (2), the swing brake release pipe (3).
- 2 - Fill the swing motor case with hydraulic oil from union (4).
- 3 - Connect hose (5).
- 4 - Start engine at low idling for approx. 10 minutes.
- 5 - Slowly swing in both direction few times.



## 4. Air bleeding from travel motors

- 1 - Apply on drain union (1) a temporary hose to catch oil leakage.
- 2 - Start the engine and bring it to low idling speed for few minutes.
- 3 - Turn the upper structure of 90° and, pushing with boom on the bucket, raise the chain track from the ground.
- 4 - Slowly turn the raised chain track on both direction until from oil drain hose the oil comes out without air bubbles.
- 5 - Stop the engine and connect the drain hose (1).
- 6 - Repeat the drain operation also for the other chain track.



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# MEASURING TRAVEL DEVIATION

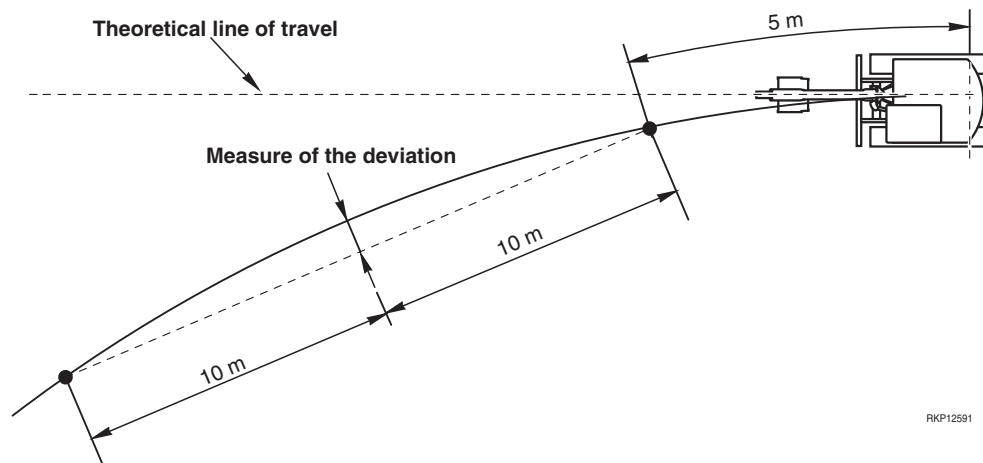
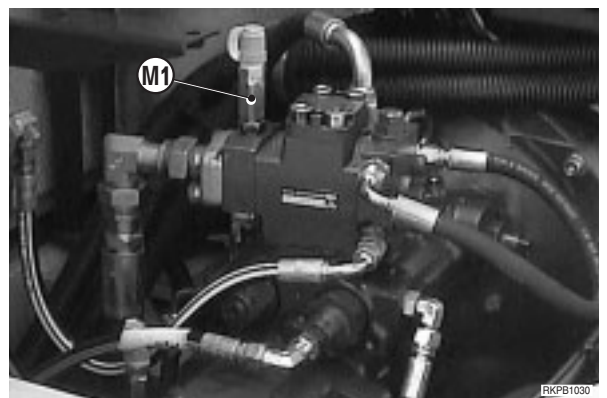
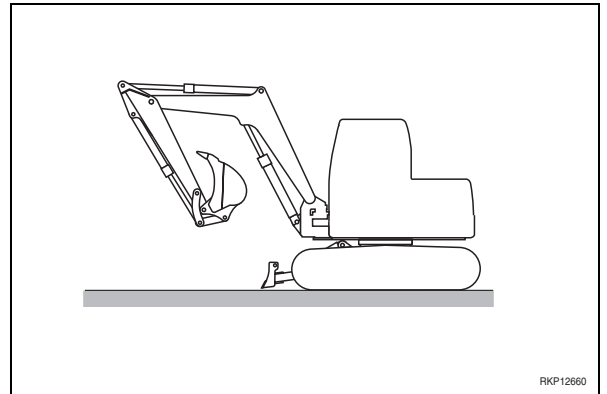
- ★ Test conditions:
  - Engine: at working temperature
  - Hydraulic oil: 45–55°C
  - WORKING MODE selector: position P.
  - Track-shoe tension: within the correct range

★ Let the machine travel over a firm, flat surface.

## 1. Measuring the deviation

⚠ Release any residual pressures.  
 † (See «RELEASING RESIDUAL PRESSURES FROM THE CIRCUITS»).

- 1 - Connect the pressure gauge **E3** (400 bar) to adapter **M1**
  - ★ Place the pressure gauge in the cab for consulting during the travel.
- 2 - For this measurement the boom, arm and bucket must be folded into the appropriate travelling positions.
  - ★ Fully extend the cylinder of the arm and bucket, and position the boom at 45°.
- 3 - Bring the engine up to high idling speed.
- 4 - Push the travel lever forwards to the end of its stroke.
- 5 - Travel for 5 metres and then measure the deviation accomplished by the machine over the next 20 metres.
  - ★ During travel operation check discharge pressure of pump P1.



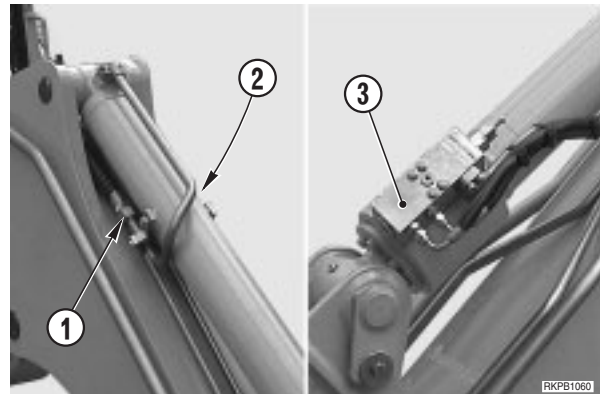
- 3 - Disconnect the hoses (1) and (2) from the pipes and plug them to keep out impurity.

**Standard**

- 4 - Plug the hose (1) feeding the cylinder on the head side and connect a provisional hose on the bottom side to collect any leaking oil.

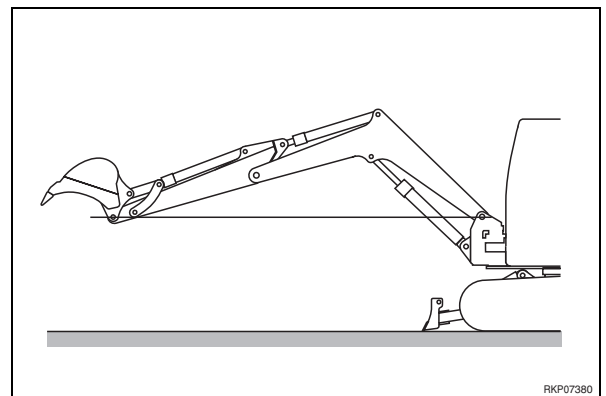
**Safety valve version**

- 5 - Remove the safety valve (3) from the cylinder and plug it to keep out impurity.
- 6 - Plug the head side cylinder port using flange H1.



**All version**

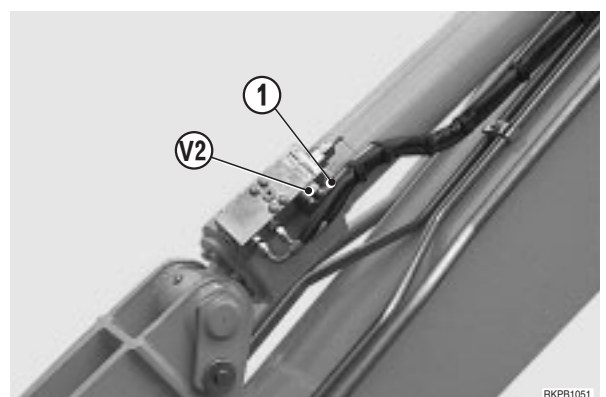
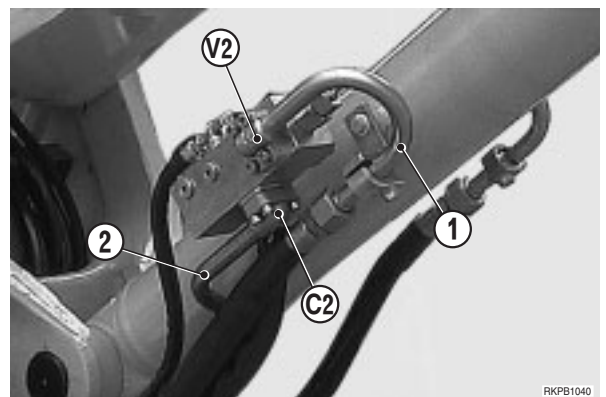
- 7 - Start the engine and raise the boom.
- 8 - Stop the engine and check the position of the arm for 5 minutes.
  - If the arm drops, the drift is due to the cylinder gasket.
  - If the arm does not drop, the drift is due to the control valve.



**3. Testing the functionality of the boom and arm safety valve.**

★ This test should be carried out after having checked that the drift is not due to the cylinder gaskets (See «BOOM TEST» and «ARM TEST»), and after having checked the valve settings (See «ADJUSTING BOOM AND ARM SAFETY VALVES»).

- 1 - Depending upon which valve is to be checked, position the machine as for the «Boom test» or for the «Arm test».
- 2 - Disconnect the hose (1) that supplies the valve (port V2).
- 3 - Disconnect:
  - For the boom**, the head side pipe.
  - For the arm**, the bottom side pipe.
- 4 - Start the engine and extend the arm completely for the «Boom test», or raise the boom for the «Arm test».
- 5 - Stop the engine and check for leakages from the valve for 5 minutes.
  - If there is any leakage, the valve is defective.

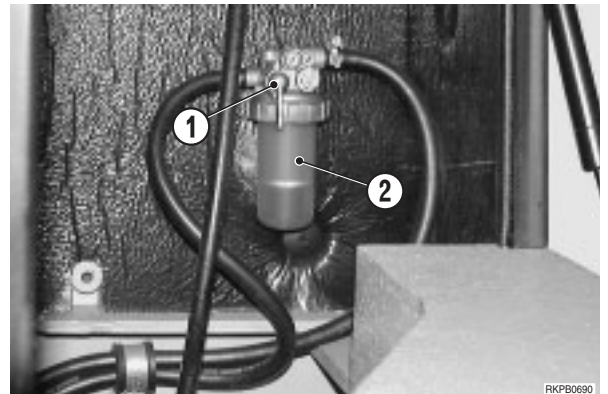


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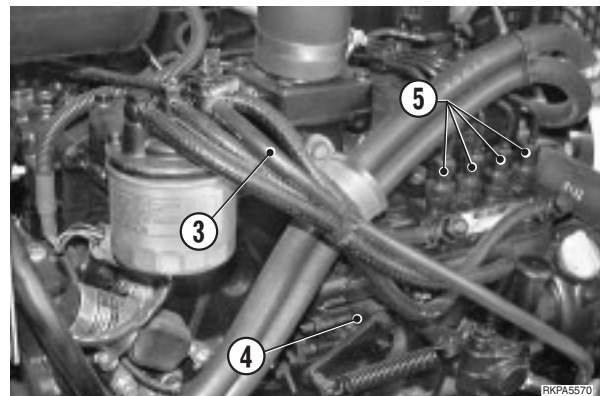
## REMOVAL OF INJECTION PUMP

- ⚠ Disconnect the cable from accumulator negative terminal (-).
- ★ Close the cock (1) of separator (2) to prevent fuel leakage.
- ★ Plug removed or disconnected pipes to avoid impurity entry.

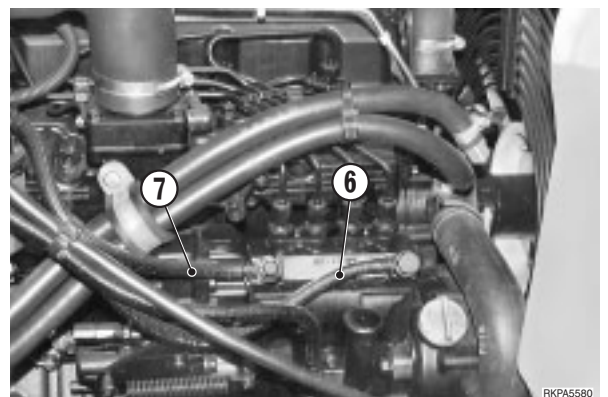


1 - Disconnect pipe (3) from fuel filter.

2 - Disconnect high pressure pipes (5) from injection pump (4). ✖ 1

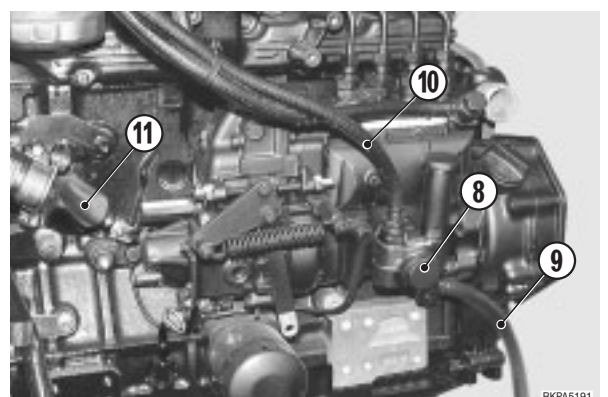


3 - Disconnect from injection pump (4) fuel feeding pipes (7) and return pipes (6). ✖ 2



4 - Disconnect pipes (9) and (10) from fuel feed-pump (8).

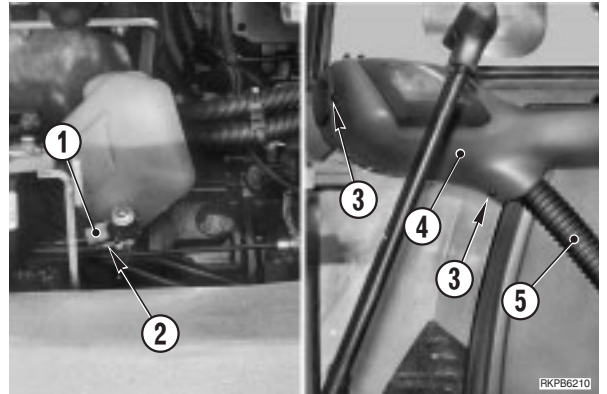
5 - Disconnect the engine stop solenoid (11) from injection pump (4) and remove the complete unit. ✖ 3



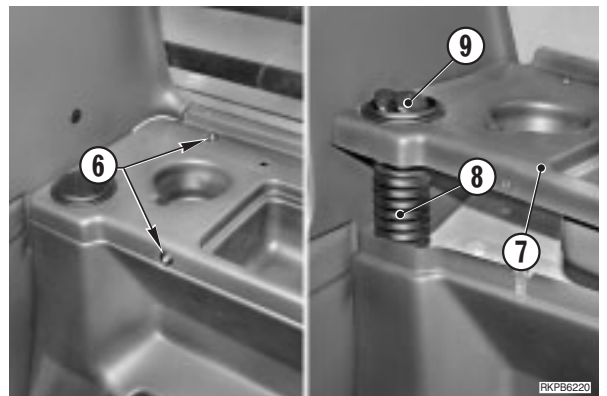
## REMOVAL OF CABIN

**!** Lower the work equipment until it is resting on the ground, switch off the engine and remove the ignition key.

- 1 - Disconnect the connector (1) and hose (2) from the windshield-washer tank and remove all the clamps fixing them.
- 2 - Remove screws (3), dashboard (4) and disconnect heating pipe (5).

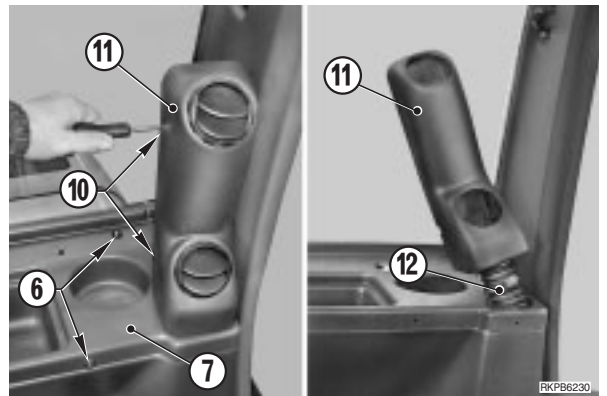


- 3 - Move the back of the operator's seat completely forward and remove the panel (7) fixing screws (6).
- 4 - Raise the panel (7), disconnect the heating hose (8) from the diffuser (9) and remove the panel (7).

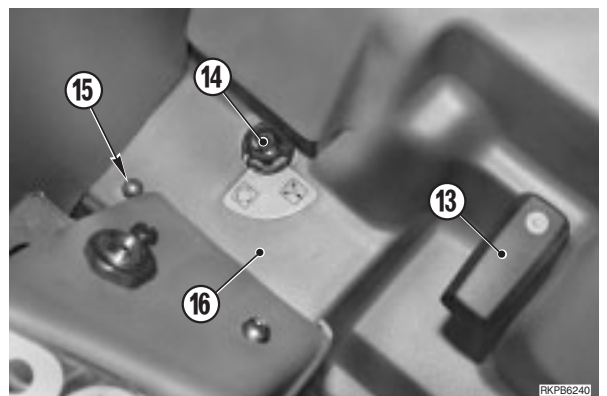


**Only for machine equipped with an air conditioning unit**  
5 - Remove screws (10).

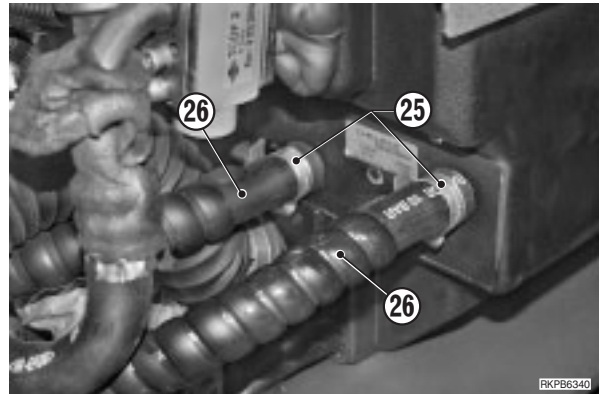
- 6 - Raise air duct (11) and disconnect pipe (12).
- 7 - Lower completely the seat, remove screws (6) and hood (7).



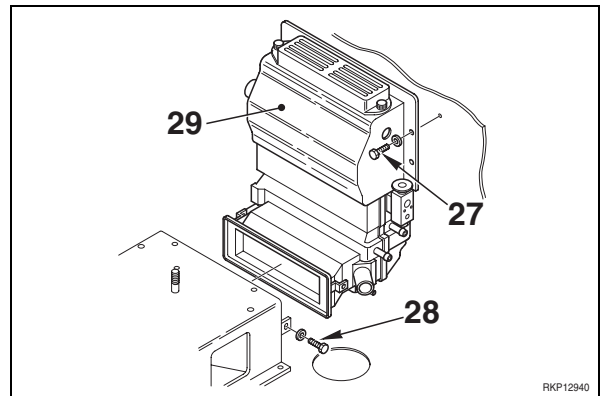
- 8 - Remove knob (13) and (14), screws (15) and hood (16).



12 - Loosen the clamps (25) and remove the pipes (26).



13 - Remove screws (27), (28) and move backward the air conditioning unit (29).



## INSTALLATION OF AIR CONDITIONING FAN UNIT

• To install, reverse the removal procedure.

1 - Make sure that the heating cock is fully open.

2 - Fill up with coolant liquid.



Quantity of coolant liquid: approx. 7.5 ℓ

3 - Start the engine to circulate the coolant liquid.

4 - Switch off the engine and top up the level.



★ Film the valve and union with anticondensate mastic.

5 - Connect the unit to the maintenance station **D1** and refill it.



Quantity of fluid R134a: 1100  $\begin{matrix} -30 \\ +50 \end{matrix}$  g

## REMOVAL OF PUMP GROUP

**!** Lower the work equipment until it is resting on the ground and switch off the engine.

**!** Release residual pressures from all circuits.  
 † (For details, see «20. TESTING AND ADJUSTMENTS»).

- Drain the hydraulic oil.



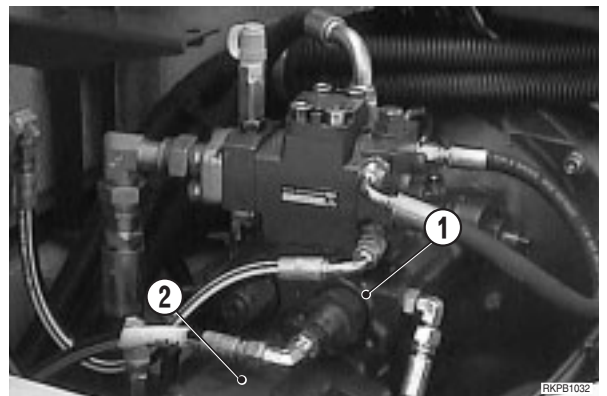
Quantity of oil: approx. 70 ℓ

1 - Remove the engine hood. (For details, see «REMOVAL OF ENGINE HOOD»).

2 - Remove left and centre rear guards.

3 - Disconnect the suction flanges and all delivery pipes from the pumps (1) and (2). **⊠ 1**

- ★ Mark the position of Load Sensing, Mode System and servo-control feed pipes in order to avoid mixing them up during installation.



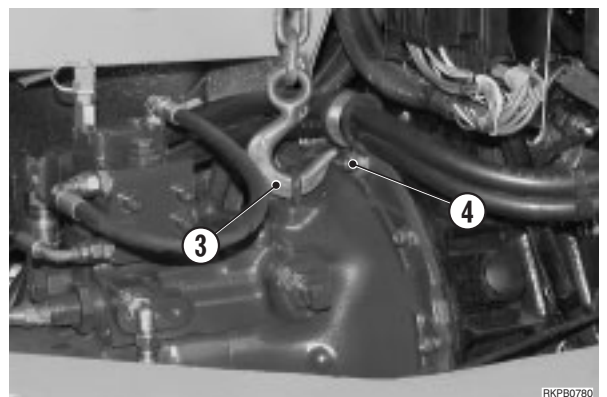
6 - Hook the assembly to the eyebolt (3) placed on the piston pump and slightly put the rope under tension.

- ★ Pass a harness under the gear pump to prevent tilting of the unit.

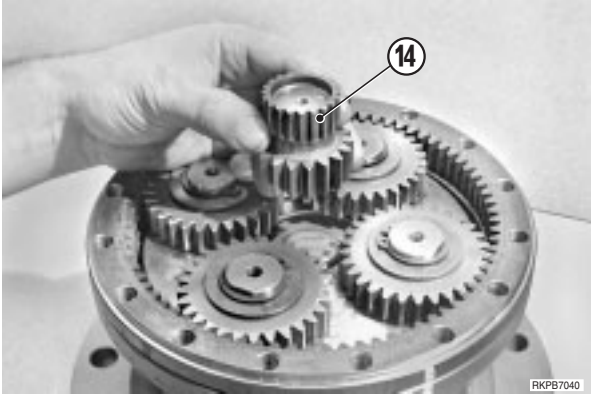
7 - Pull out the screws (4) and remove the pump group; disengage the group from the coupling joint shifting it to one side. **⊠ 2**



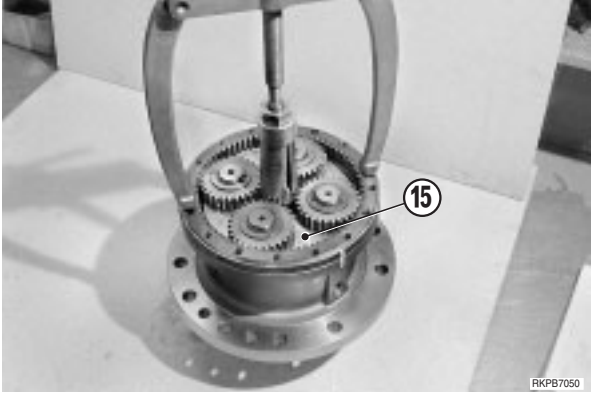
Pump group: approx 57 kg



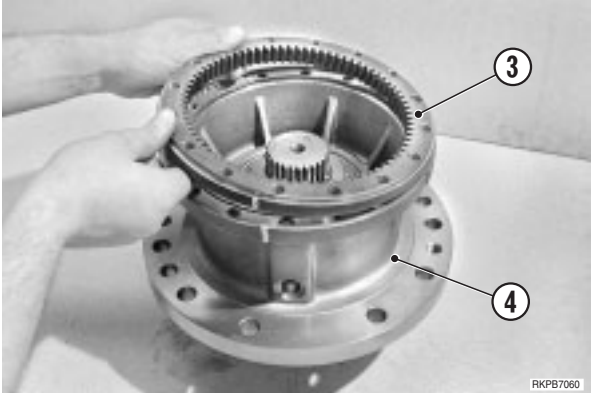
8 - Remove the pinion (14).



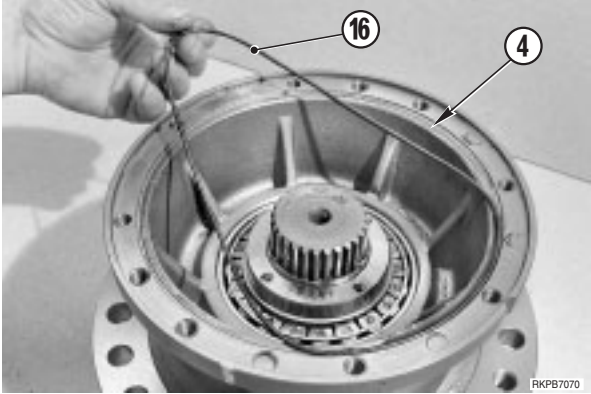
9 - Using an extractor remove the planetary carrier (15).



10 - Remove the ring gear (3) from gearbox housing (4).



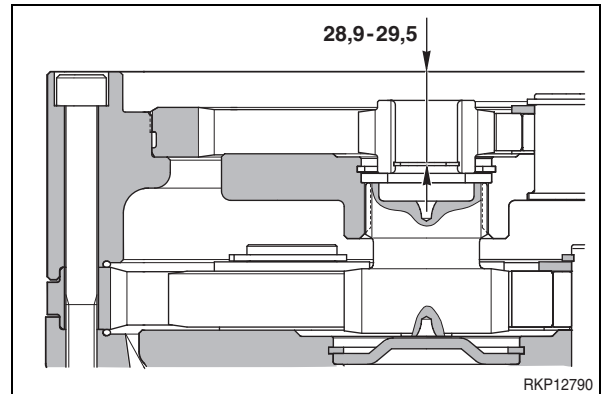
11 - Remove the O-ring (16) from gearbox housing (4).




24 - Using a caliper verify the correct assembly of the gear-box checking the axial quota **X**.

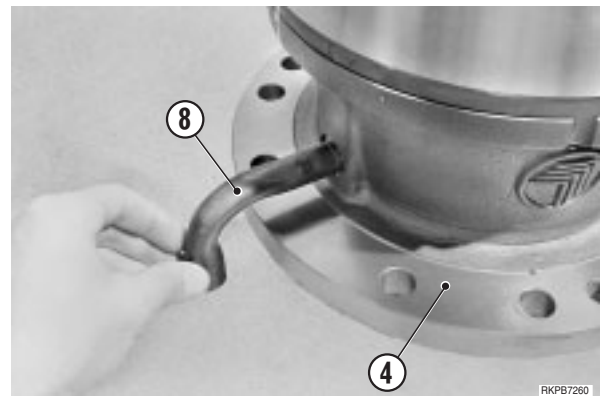
**X**= 28.9–29.5 mm

- ★ If the value is higher, reduce the sun gear (9) width in the axial direction flattening the support plane (reduction side).
- ★ If the value is lower, insert adjusting spacer between sun gear (9) and planetary carrier (11).




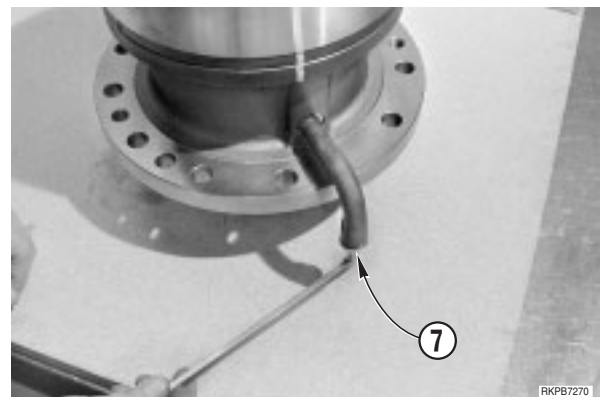
25 - Mount the union (8).

 Union: Loctite 243

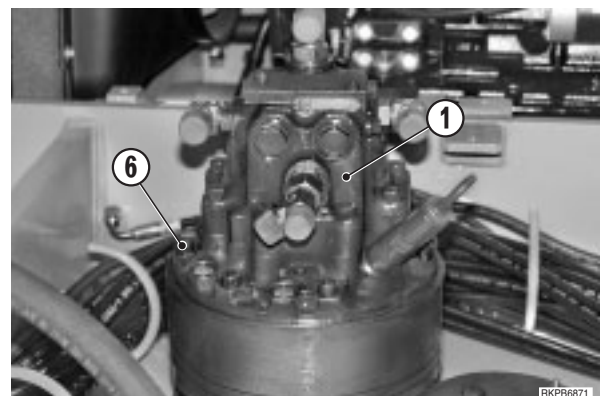


26 - Mount the plug (7).


 Plug: 20–30 Nm



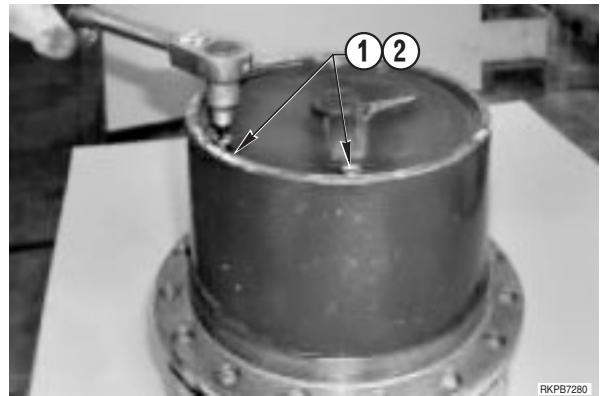
27 - Place the swing machinery (1), tighten the screws (6).



1 - Remove screw plus (1) and gaskets (2) and drain the oil.

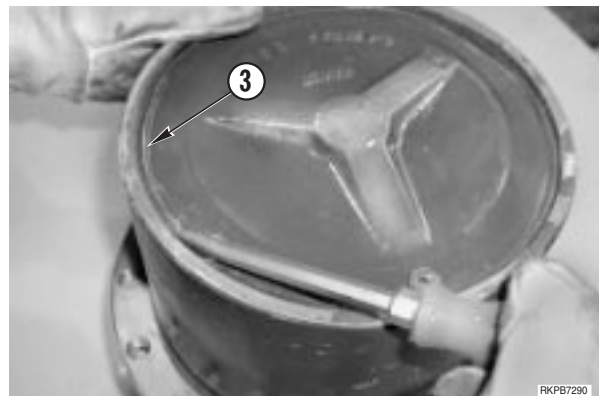
 Oil: 0.8 ℓ

★ Replace the gasket.

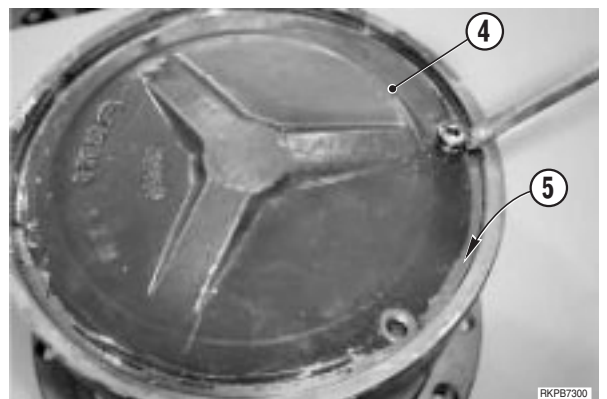


2 - Remove snap ring (3).

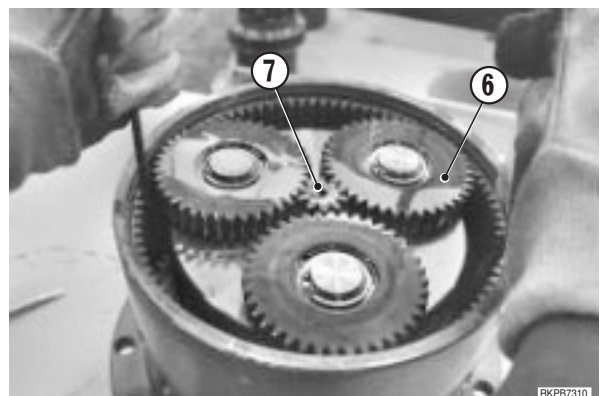
★ Replace snap ring.



3 - Remove cover (4) and O-ring (5).



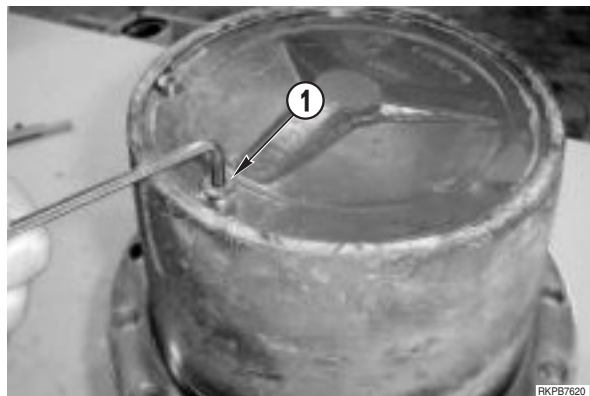
4 - Remove complete planetary stage (6) with sun gear (7) and spacer (8).



26 - Refill with oil and tighten the plugs (11).



Oil: 0.8 ℓ



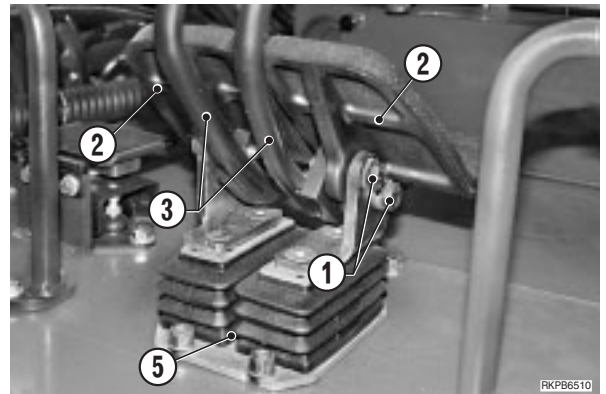
## REMOVAL OF TRAVEL PEDAL CONTROL

- Rotate the turret 90° to the left.

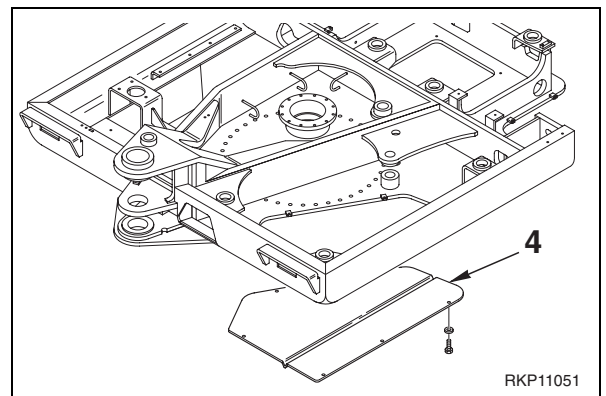
**⚠** Lower the work equipment until it is resting on the ground and switch off the engine.

**⚠** Release residual pressures from all circuits. (For details, see «20. TESTING AND ADJUSTMENTS»).

- 1 - Pull out the screws (1) and remove pedals (2) and levers (3).



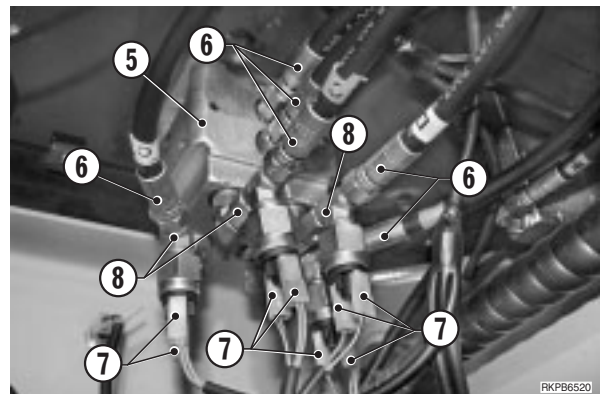
- 2 - Remove the bottom left casing (4).



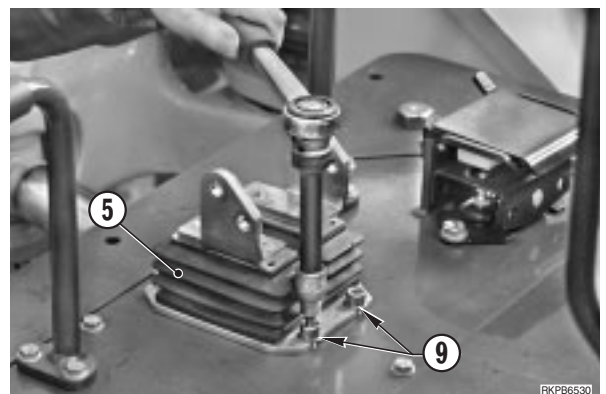
- 3 - Disconnect the pipes (6) (No. 6) from pedal (5) and the connectors (7).

★ Mark the position to avoid errors during the assembly.

- 4 - Remove the side connections (8) (No. 2) from the pedal control.



- 5 - Pull out the screws (9) and remove the pedal control (5).



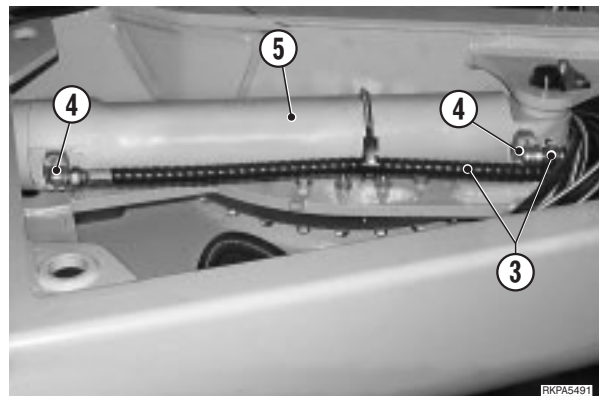
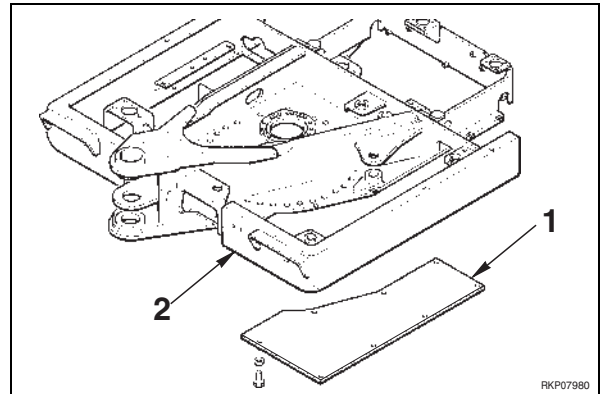
## INSTALLATION OF TRAVEL PEDAL CONTROL

- To install, reverse the removal procedure.

- 1 - Start the engine to circulate the oil.
- 2 - Bleed air from the travel motors (For details, see «20. TESTING AND ADJUSTMENTS»).

## REMOVAL OF BOOM SWING CYLINDER

- 1 - Swing the boom to the right to extend the cylinder fully.
- 2 - Swing the revolving frame 45° and rest the work equipment on the ground.
- 3 - Switch off the engine and move the PPC valve several times to release all residual pressures.
- 4 - Remove the RH front guard (1) from the revolving frame (2).
- 5 - Disconnect the tubes (3) from the cylinder and plug them. Also plug the flanges (4) of the cylinder (5).
- 6 - Disconnect the lubricator tube (6).
- 7 - Place a block beneath the cylinder head to prevent the edge of the frame making dents in the piston rod. Also place a support beneath the cylinder.
- 8 - Remove the screw (7), draw out the pin (8) and detach the piston rod from its support (9). ✖ 1 ✖ 2
- 9 - Remove the screws (10) and draw out the stop (11) and the pin (12). ✖ 2 ✖ 3 ✖ 4
- 10 - Slide the cylinder out partially from the front and, as soon as possible, put it in a sling and lift it off.
  - ★ During this operation take great care not to dent the piston rod.




## INSTALLATION OF BOOM SWING CYLINDER

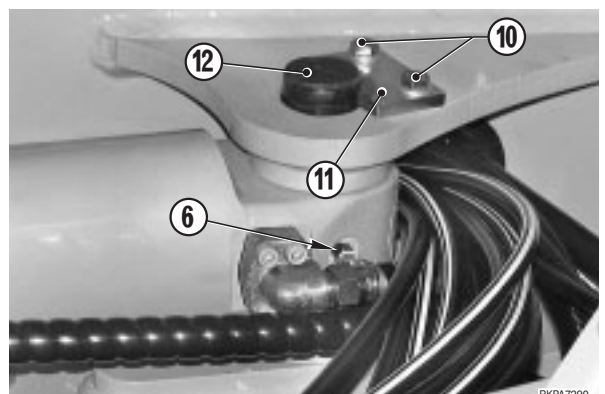
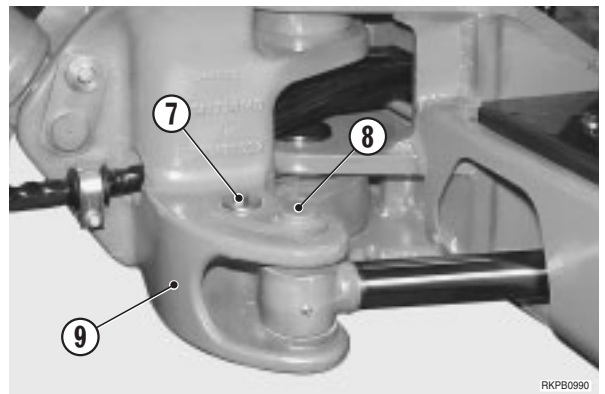
- To install, reverse the removal procedure.

- ✖ 1
- ★ Insert the spacers to a given clearance (distributed on both sides of the piston) until a clearance of 1–2 mm is obtained.

- ✖ 2
- !** When aligning the positions between hole and pin, let the engine run at minimum idling. Do not insert fingers into the hole to check the alignment.

- ✖ 3
-  Inside bushings: ASL800050

- ✖ 4
- ★ Insert the spacers to a given clearance (distributed on both sides of the cylinder) until a clearance of 0.5–1 mm is obtained.
- Start the engine and bleed air from the cylinder. (For details, see «20. TESTING AND ADJUSTMENTS»).
  - ★ After bleeding the air, check the oil level in the tank



## REMOVAL OF BUCKET

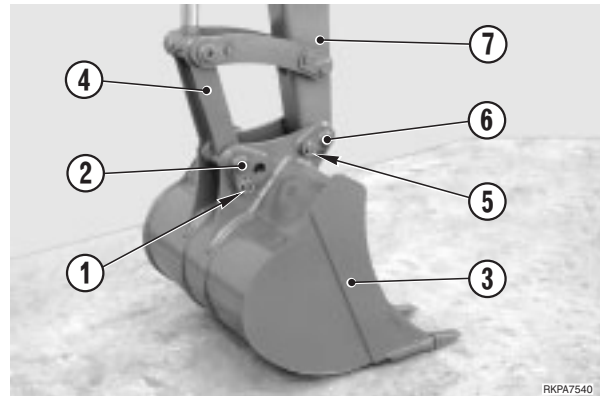
**!** Lower the bucket to the ground, resting with its back on a flat surface.

1 - Take out the safety pin (1) and the connecting pin (2) between bucket (3) and tie-rod (4).

※ 1   ※ 2   ※ 3

2 - Take out the safety pin (5) and the pin (6) that connects the bucket to the arm (7).

※ 2   ※ 3   ※ 4



## INSTALLATION OF BUCKET

• To install, reverse the removal procedure.


※ 1

★ Insert the spacers to a given clearance between bucket (3) and tie-rod (4).

※ 2

**!** When lining up the hole and the pin, let the engine turn at low idling speed. Do not insert fingers into the holes to check alignment.

※ 3

 Inside bushings: ASL800050


※ 4

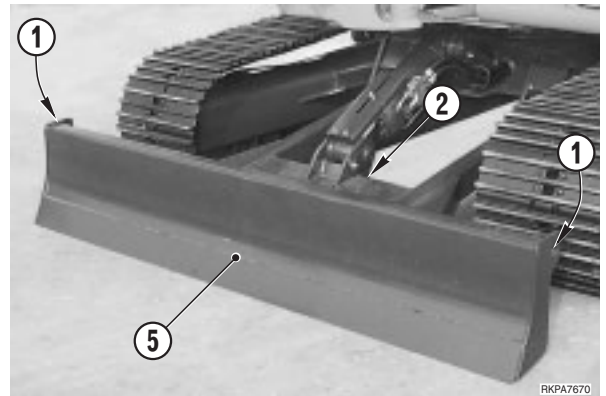
★ Insert the spacers to a given clearance (on both sides) between the bucket (3) and the arm (7), until a play of 0.5–1 mm is obtained.

## REMOVAL OF BLADE

- 1 - Remove the blade cylinder (For details, see «REMOVAL OF BLADE CYLINDER»).
- 2 - Attach the hoisting tackle to the blade, using the holes provided on the sides (1) and the piston coupling (2).
  - ★ Adjust the length of the chains to keep the group in equilibrium.
- 3 - Loosen the screws (3) and remove the pin (4).
 

✖ 1 ✖ 2 ✖ 3
- 4 - Remove the blade (5).


 Blade: 250 kg




## INSTALLATION OF BLADE

- To install, reverse the removal procedure.

✖ 1

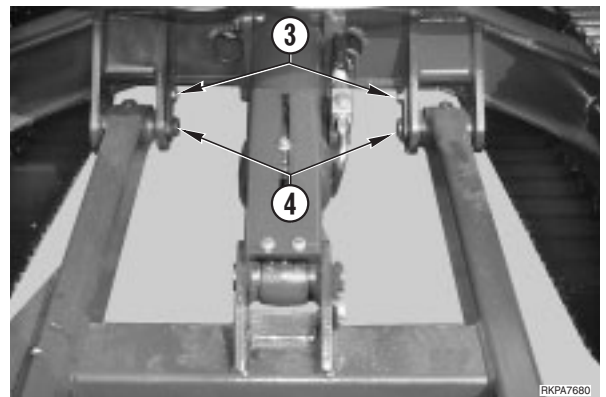
 Inside bushings: ASL800050

✖ 2

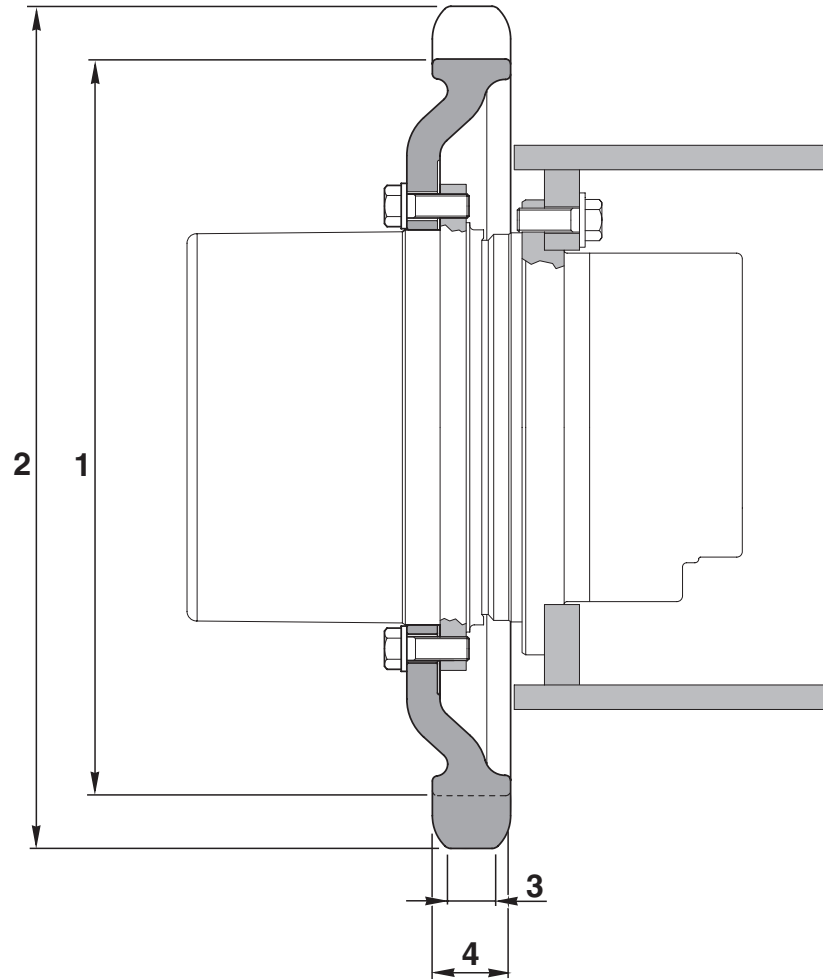
 When aligning the positions between hole and pin, run the engine at minimum idling. Do not insert fingers in the holes to check the alignment.

✖ 3

★ Insert the spacers to a given clearance (distributed on both sides of the fulcrum bushings).



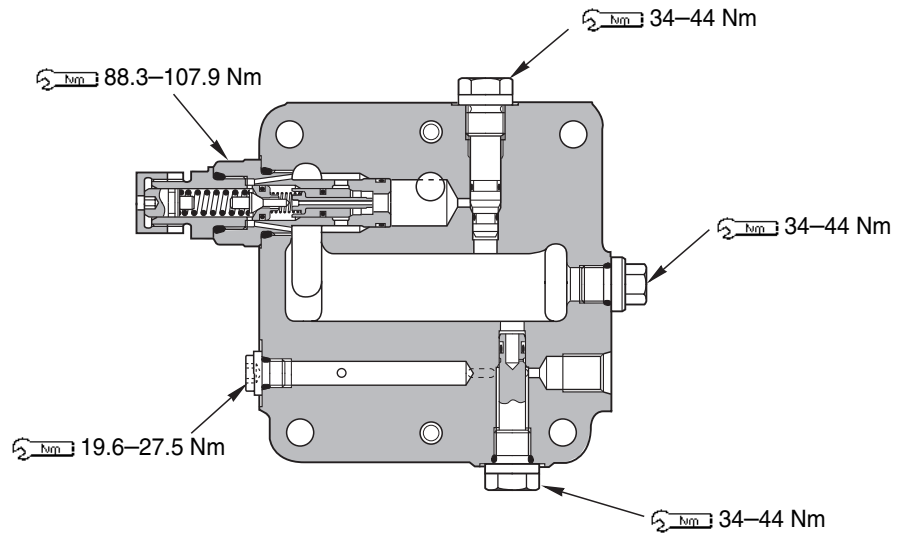
# SPROCKET



RKP10800

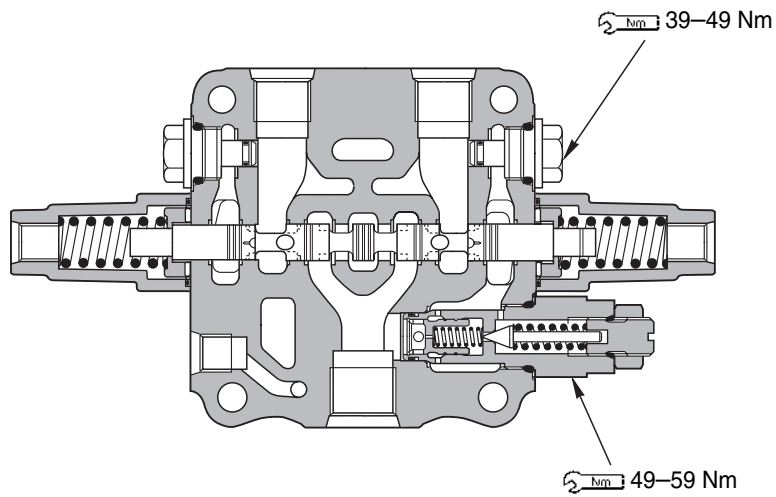
Unit: mm

No.	Check item	Criteria			Remedy
		Standard size	Tolerance	Repair limit	
1	Wear of roots of sprocket teeth	438	$\pm 3$	425	
		495	$\pm 2$	482	
3	Face width of sprocket teeth	32	—	29	
4	Face width of sprocket teeth	46	$\pm 1.5$	42	



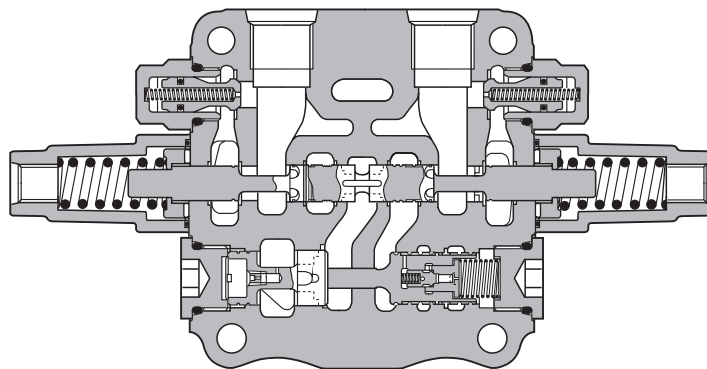
Section AA - AA

RKP02843



Section F - F

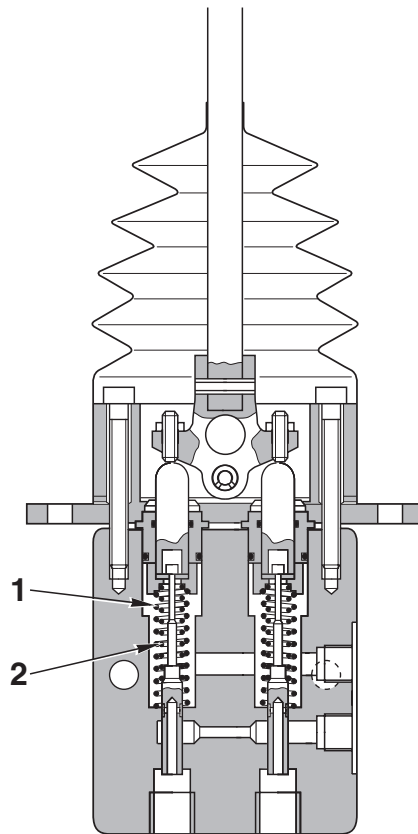
RKP02833



RKP02853

Section G - G

BLADE



Sezione A - A RKP12680

Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
		Free length x O.D.	Installed length	Installed load	Free length x O.D.	Installed load	
1	Centering spring						Replace
2	Metering spring						

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