WEBM001702

SHOP MANUAL

PC95R-2

HYDRAULIC EXCAVATOR

SERIAL NUMBER

PC95R-2 21D5210001 and up

PC95R-2 21D5220001 and up

KOMATSU

Utility

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 kg.

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

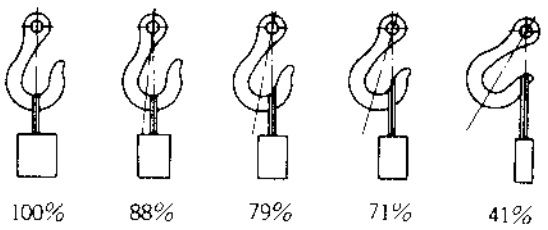
1) Use adequate ropes depending on the weight of parts to be hoisted, referring to the table below:

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.

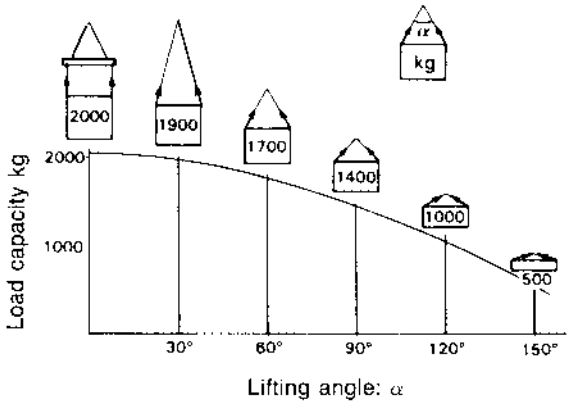
2) Sling wire ropes from the middle portion of the hook. Slinging near the edge of the hook may cause the rope to slip off the hook during hoisting, and a serious accident can result.



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 handing 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.

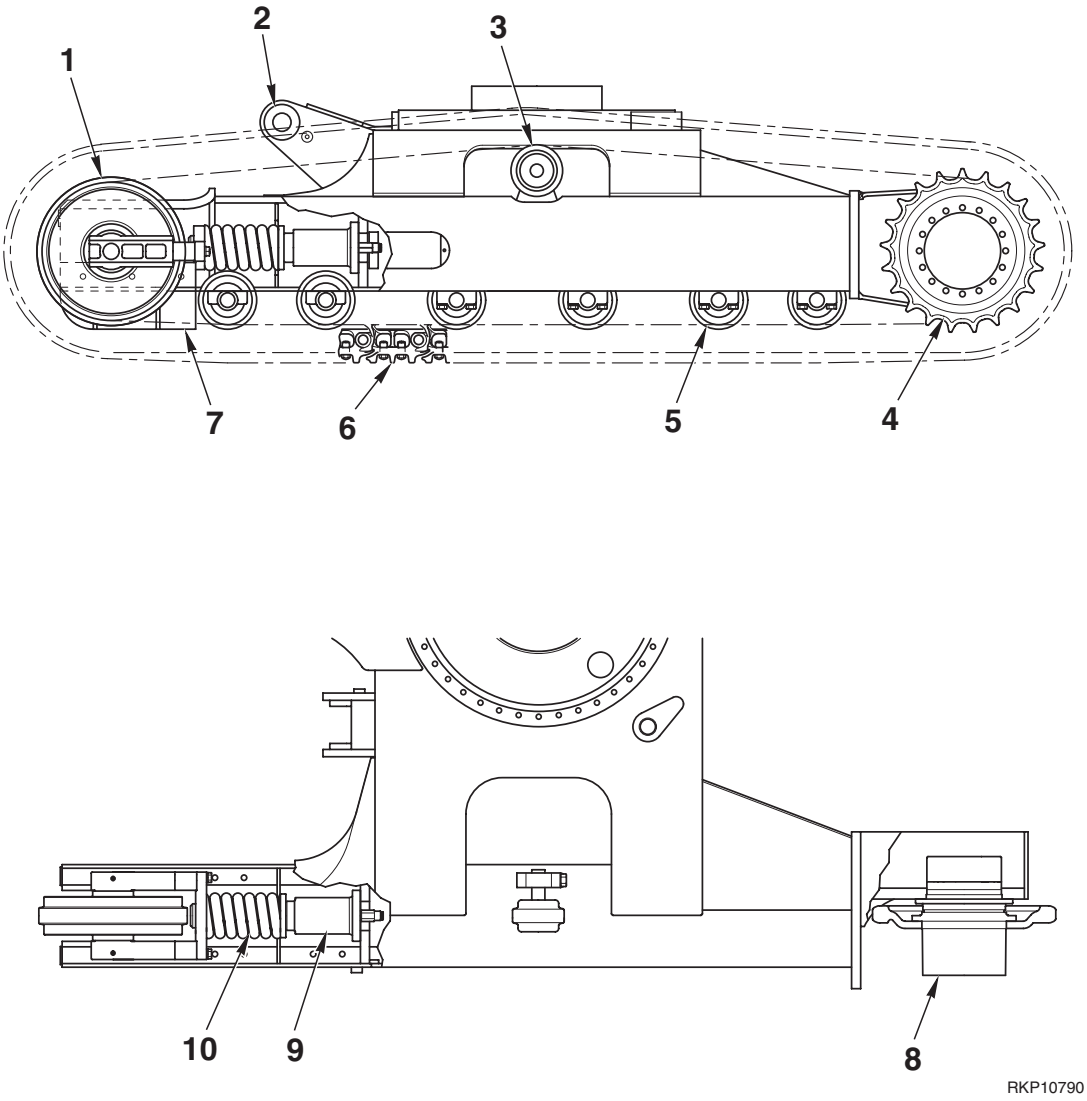
	0	1	2	3	4	5	6	7	8	9
0	0	0.264	0.528	0.793	1.057	1.321	1.585	1.849	2.113	2.378
10	2.642	2.906	3.170	3.434	3.698	3.963	4.227	4.491	4.755	5.019
20	5.283	5.548	5.812	6.076	6.340	6.604	6.869	7.133	7.397	7.661
30	7.925	8.189	8.454	8.718	8.982	9.246	9.510	9.774	10.039	10.303
40	10.567	10.831	11.095	11.359	11.624	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.

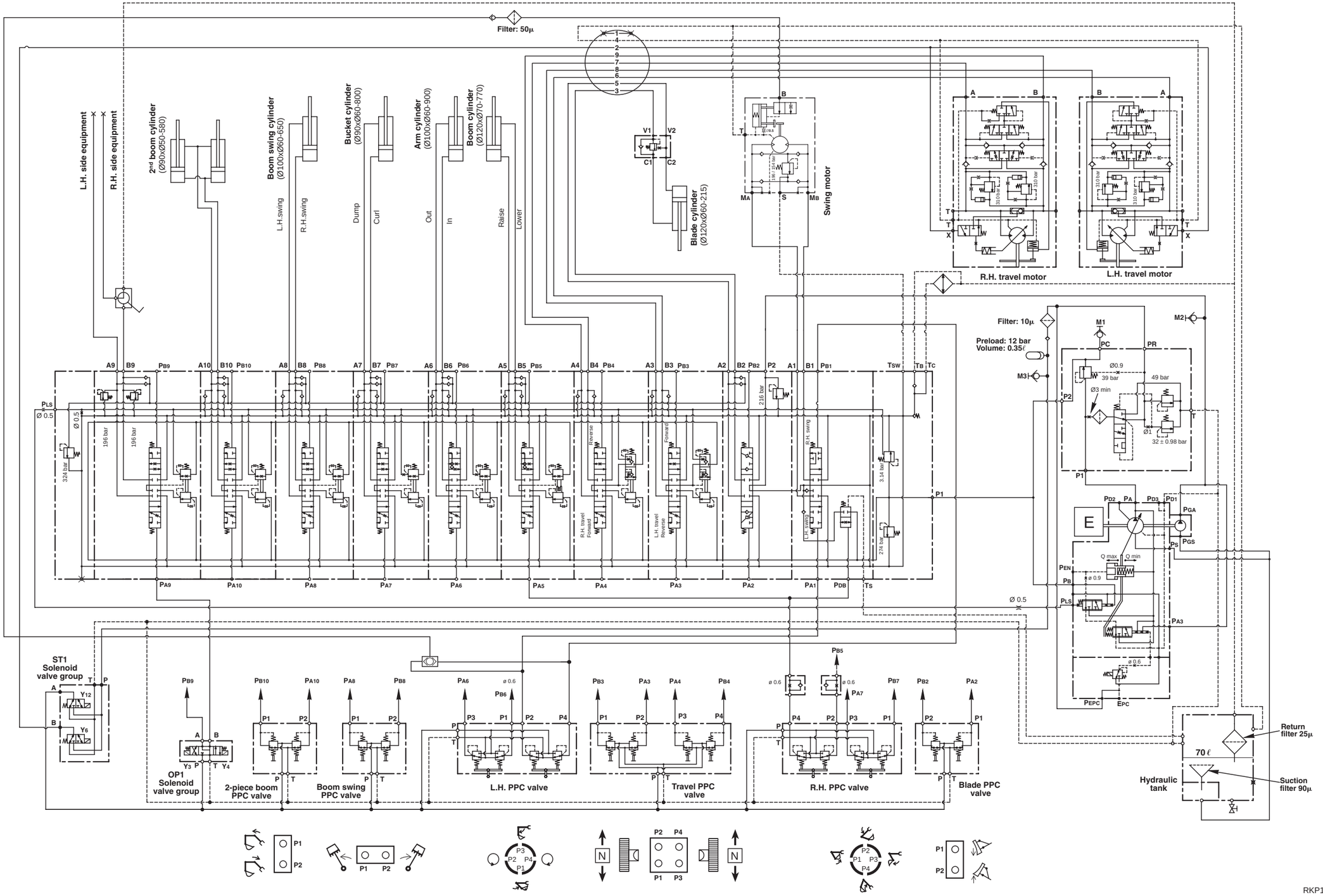
	0	1	2	3	4	5	6	7	8	9
0	0	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.950	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.969	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	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



1. Idler
2. Track frame
3. Carrier roller
4. Sprocket
5. Track roller
6. Track shoe
7. Guard
8. Final drive
9. Idler cushion
10. Recoil spring

HYDRAULIC DIAGRAM WITH 2-PIECE BOOM



RKP12371

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a) Action of PC-EPC solenoid

- The command current from resistor flows to **PC-EPC** solenoid (1).
  This command current acts on the **PC-EPC** valve and outputs the signal pressure.
  When this signal pressure is received, the force pushing piston (2) is changed.
- On the opposite side to this force pushing piston (2) is the spring set pressure of springs (4) and (6) and pump pressure **PP** pushing spool (3). Spool (3) stops at a position where the combined force pushing spool (3) is balanced, and the pressure (pressure of port **C**) output from the **CP** valve.

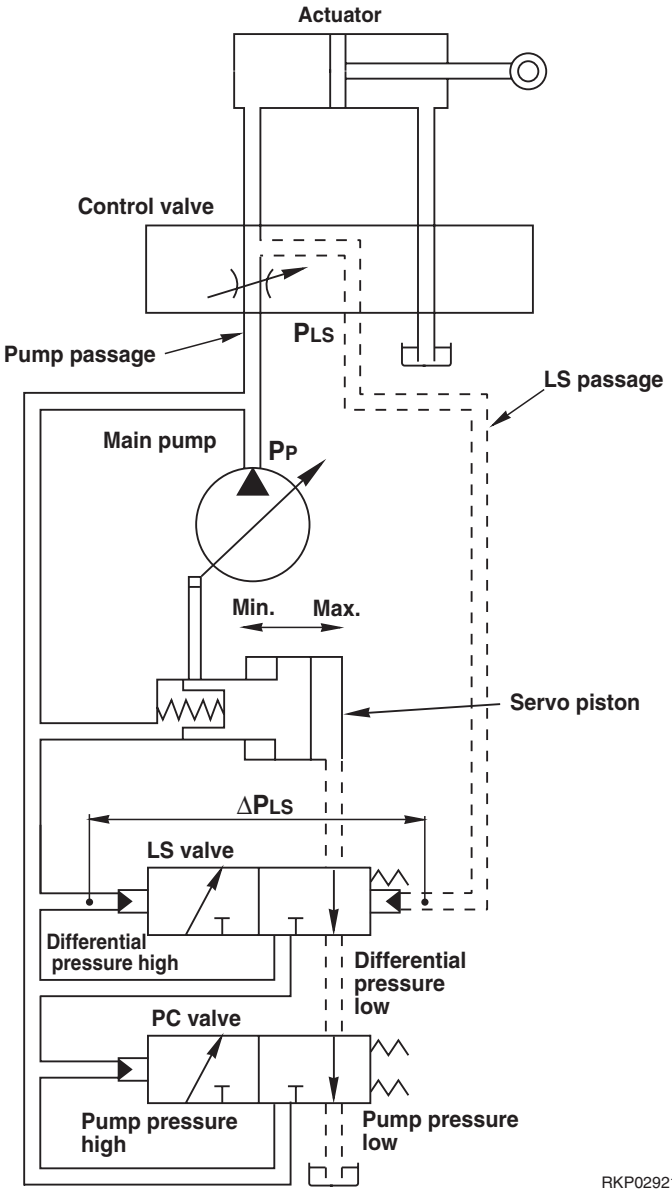
a. P1 Port - From servocontrol feed unit (P2 Port) and pump (PPLS Port)
b. P2 Port - From gear pump (PGA Port)
c. A1 Port - To swing motor (MA Port)
d. B1 Port - To swing motor (MB Port)
e. A2 Port - To swivel joint (5A Port)
f. B2 Port - To swivel joint (3A Port)
g. A3 Port - To swivel joint (8A Port)
h. B3 Port - To swivel joint (6A Port)
i. A4 Port - To swivel joint (9A Port)
j B4 Port - To swivel joint (7A Port)
k A5 Port - To boom cylinder (Bottom side)
l. B5 Port - To boom cylinder (Head side)
m. A6 Port - To arm cylinder (Head side)
n. B6 Port - To arm cylinder (Bottom side)
o. A7 Port - To bucket cylinder (Head side)
p. B7 Port - To bucket cylinder (Bottom side)
q. A8 Port - To boom swing cylinder (Head side)
r. B8 Port - To boom swing cylinder (Bottom side)
s. A9 Port - To optional attachment (L.H. side)
t. B9 Port - To optional attachment (R.H. side)
u. TSW Port - To swing motor (S1 Port)
v. TC Port - To oil cooler
x. TB Port - To hydraulic tank
y. A10 Port - To 2-piece boom cylinder (Head side)
w. B10 Port - To 2-piece boom cylinder (Bottom side)
xx. TS Port - To hydraulic tank
aa. PLS Port - To hydraulic pump (PLS Port)
Pa. PA1 Port - From L.H. PPC valve (P2 Port)
Pb. PB1 Port - From L.H. PPC valve (P4 Port)
Pc. PA2 Port - From blade PPC valve (P1 Port)
Pd. PB2 Port - From blade PPC valve (P2 Port)
Pe. PA3 Port - From travel PPC valve (P2 Port)
Pf. PB3 Port - From travel PPC valve (P1 Port)
Pg. PA4 Port - From travel PPC valve (P3 Port)
Ph. PB4 Port - From travel PPC valve (P4 Port)
Pi. PA5 Port - From R.H. PPC valve (P4 Port)
Pj. PB5 Port - From R.H. PPC valve (P2 Port)
Pk. PA6 Port - From L.H. PPC valve (P3 Port)
Pl. PB6 Port - From L.H. PPC valve (P1 Port)
Pm. PA7 Port - From R.H. PPC valve (P3 Port)
Pn. PB7 Port - From R.H. PPC valve (P1 Port)
Po. PA8 Port - From boom swing PPC valve (P1 Port)
Pp. PB8 Port - From boom swing PPC valve (P2 Port)
Pq. PA9 Port - From OP1 solenoid valve group (B Port)
Pr. PB9 Port - From OP1 solenoid valve group (A Port)
Ps. PDB Port - From R.H. PPC valve (P4 Port)
Pt. PA10 Port - From 2-piece boom PPC valve (P2 Port)
Pu. PB10 Port - From 2-piece boom PPC valve (P1 Port)

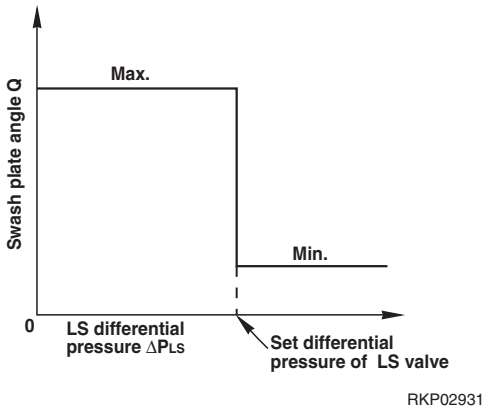
FUNCTION PRINCIPLE

1. Control of pump swash plate angle

- The pump swash plate angle (pump discharge amount) is so controlled that the **LS** differential pressure Δ**PLS**, which is the difference between the pump discharge pressure **PP** and the **LS** pressure **PLS** at the outlet Port of the control valve (actuator load pressure), is maintained at a constant level.
  (**LS** differential pressure Δ**PLS**=Pump discharge pressure **PP** – **LS** pressure **PLS**).
- If the **LS** differential pressure Δ**PLS** becomes lower than the setting pressure of the **LS** valve, the pump swash plate angle becomes larger, and if it becomes higher, the pump swash plate angle becomes smaller.

★ For the details of this action, refer to the descriptions of "HYDRAULIC PUMP"..

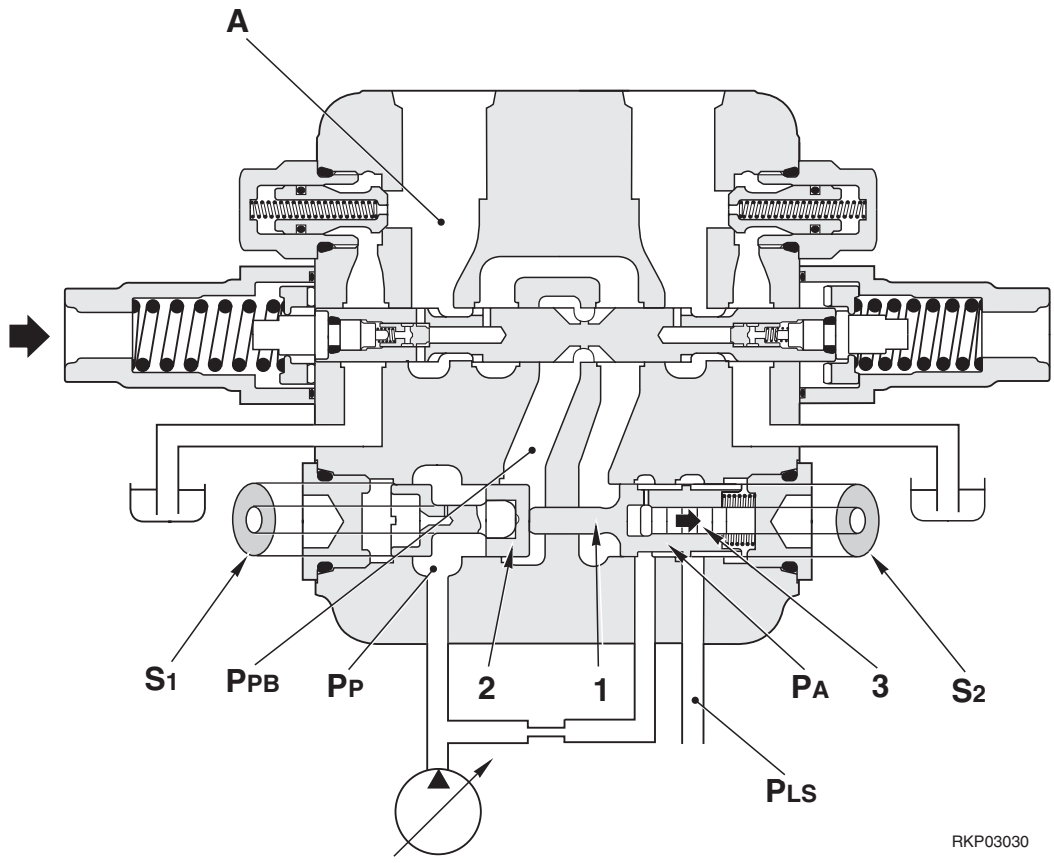




Area ratio of pressure compensation valve

FUNCTION

- The pressure compensation valve determines the compensation characteristics by carrying out fine adjustment of the area ratio (**S1/S2**) between the area **S1** of the flow control valve (2) side and the area **S2** of the pressure reducing valve (1) side to match the characteristics of each actuator.
  S1= Area of the flow control valve (2) – Area of the piston (3)
  S2= Area of the pressure reducing valve (1) – Area of the piston (3).



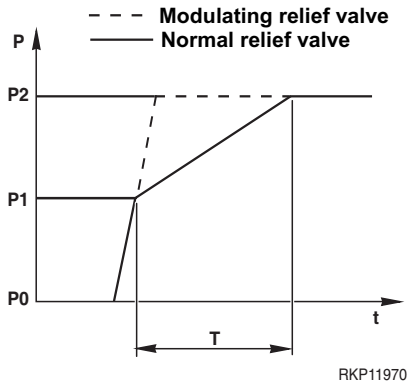
Area ratio (S1/S2) and compensation characteristics

- When the ratio is 1.00 :
  [Pump pressure **PP** – Upstream pressure of the spool notch **PPB**]≒[**LS** circuit pressure **PLS** – Actuator circuit pressure **PA** (=**A**)]
  Thus, the flow is distributed in proportion of opening areas of the spool.
- When the ratio is larger than 1.00 : **PP – PPB>PLS – PA (=A)**
  Thus, the flow is divided less than the proportion of opening areas of the spool.
- When the ratio is smaller than 1.00 : **PP – PPB<PLS – PA**
  Thus, the flow is divided more than the proportion of opening areas of the spool.

OPERATION OF THE MODULATING RELIEF VALVE

FUNCTION

- The relief valve for the swing motor has the properties to suppress the rapid increase of the relief pressure as per shown in the figure right, and serves to reduce the shock at the time of start and stop of swing.



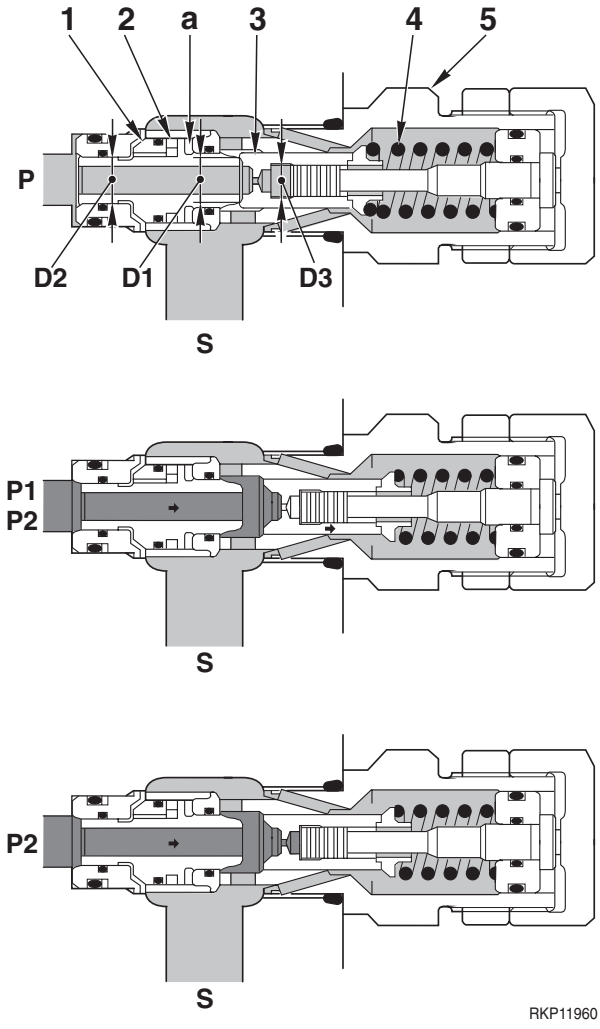
OPERATION

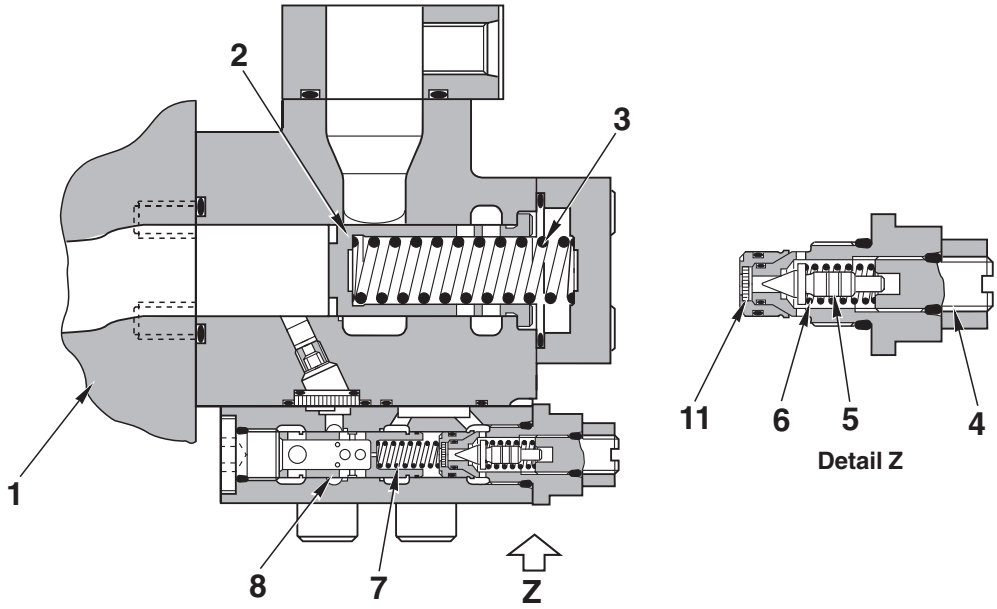
When the circuit pressure is P0

- The relief valve does not operate.

When the circuit pressure has rapidly increased

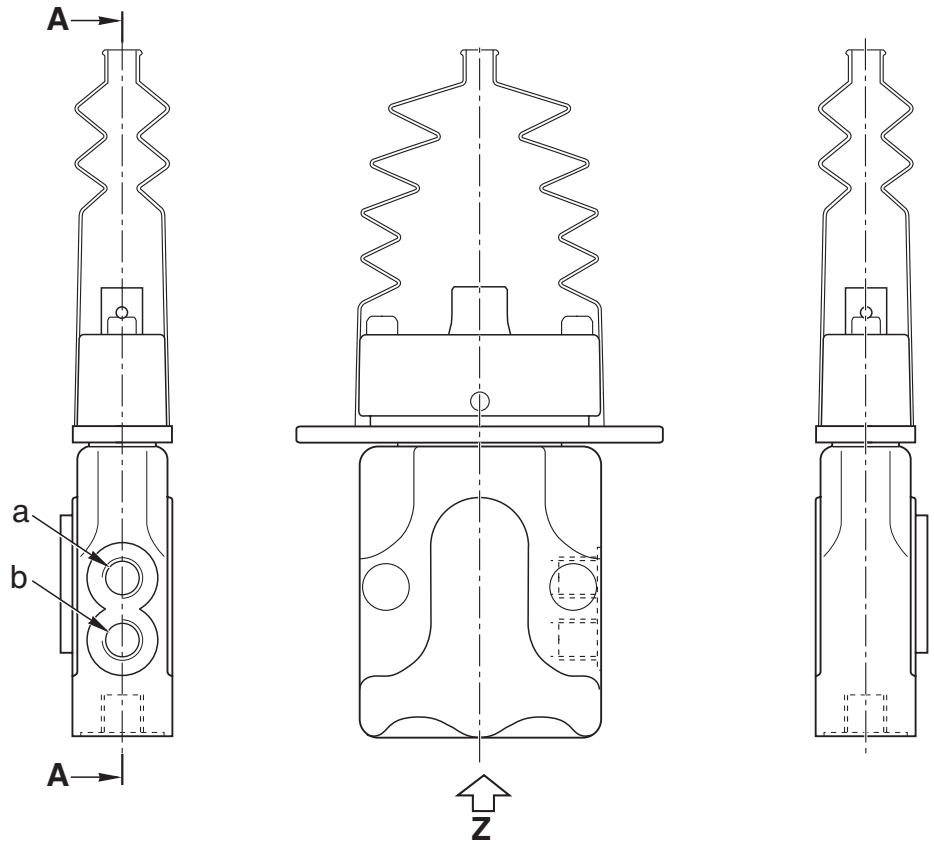
- When the circuit pressure increases to **P1,** the valve (3) starts to open bacause the oil pressure acts on the difference in area between **D1** and **D3** (**D1>D3**), thus pressing the spring (4).
  On this occasion, the seat (1) tries to follow the valve (3) because the pressure acts on the difference in area between **D1** and **D2** (**D1<D2**).
  However, the route that the oil in the chamber **a** compressed by the movement of the seat (1) can flow to the **S** port has been throttled by the ball (2), so that the movement of the seat (1) is slower than that of the valve (3).
  Therefore, during the time **T** until the seat (1) makes contact with the sleeve (5), the relief pressure gradually increases from **P1** to **P2**.





1. Hydraulic pump
2. Valve
3. Spring
4. Screw
5. Poppet
6. Spring (reducing valve pilot)
7. Spring (reducing valve)
8. Spool (reducing valve)
9. Spring (safety valve)
10. Ball
11. Filter

BLADE PPC VALVE



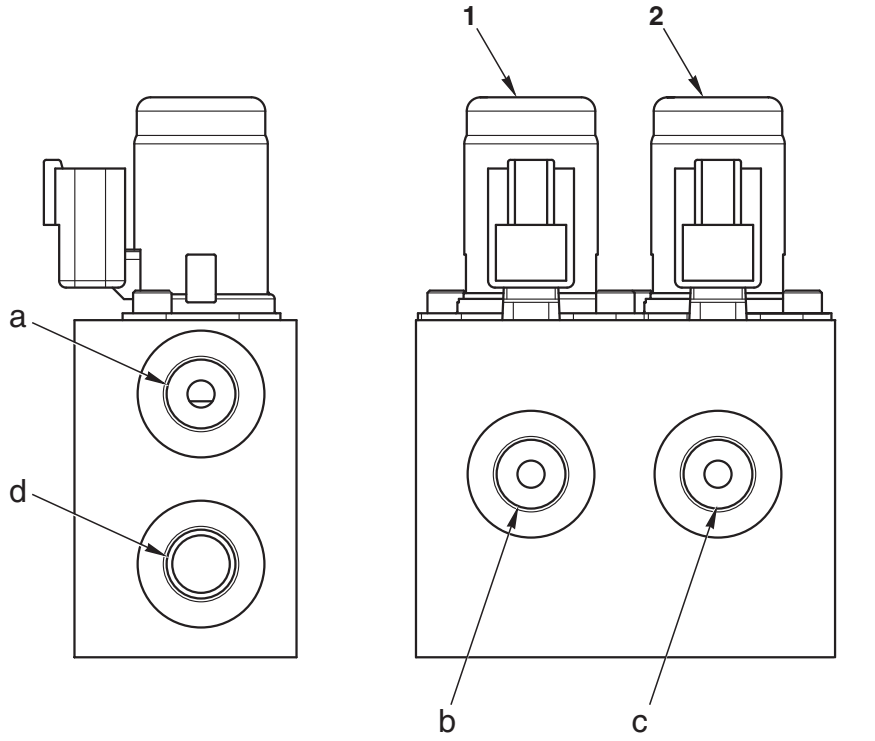
View Z

RKP12241

a. T Port - To hydraulic tank
b. P Port - From solenoid valve group (A Port)
c. P1 Port - To control valve (PA2 Port)
d. P2 Port - To control valve (PB2 Port)

SOLENOID VALVES

SOLENOID VALVE GROUP ST1



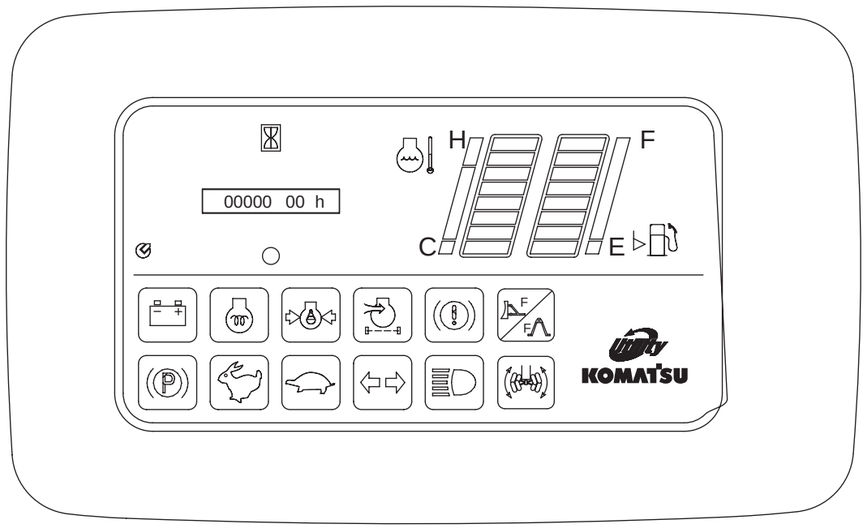
a. P Port - From servocontrol feed unit (PR Port)
b. B Port - To swivel joint (2A Port)
c. A Port - To servocontrol
d. T Port - To hydraulic tank

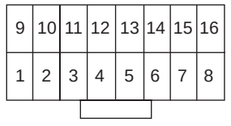
1. Y4 Travel speed increment
2. Y7 Servocontrol

ELECTRICAL DIAGRAM (4/5)

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

STRUMENTO MULTIFUNZIONALE MULTIFUNCTION





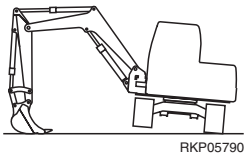
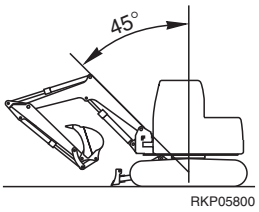
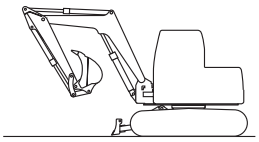
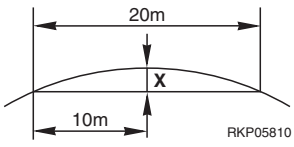
LATO FILI
WIRE SIDE VIEW

X6

PIN	FUNZIONE CONNESSA	COMANDO	COLORE FILO
1	COMUNE SPIE LENTA/VELOCE COMMON W/L SLOW/FAST GEAR	NEGATIVO	
2	STRUMENTO IND. LIV. CARB. FUEL LEVEL GAUGE	ohm	
3	STRUMENTO TEMPERATURA COOLANT TEMP. GAUGE	ohm	
4	SEGNALE DI START START SIGNAL	+50	
5			
6	MASSA GROUND	GND	
7	SPIA PALA-STABILIZZATORI (giallo) W/L SHOVEL-STABILIZER (yellow)	NEGATIVO	
8	POSITIVO ALIMENTAZIONE (+12V) POWER SUPPLY (+12V)	+15	
9	ILLUMINAZIONE NOTTURNA NIGHTLIGHT	+LUCI	
10	USCITA BUZZER BUZZER O/P	NEGATIVO	
11	SPIA AVARIA FRENI (rosso) W/L BRAKE SYSTEM FAILURE (red)	NEGATIVO	
12	SPIA PRERISCALDO (giallo) W/L PREHEAT (yellow)	POSITIVO	
13	SPIA BLOCCAGGIO PONTE (giallo) W/L AXLE BLOCKED (yellow)	NEGATIVO	
14	SPIA FILTRO ARIA (rosso) W/L AIR FILTER (red)	NEGATIVO	
15	SPIA GENERATORE (rosso) W/L CHARGE (red)	NEGATIVO	
16	SPIA PRESS. OLIO MOTORE (rosso) W/L ENGINE OIL PRESS. (red)	NEGATIVO	

RKP11650

FOR MACHINE

Machine model					PC95R-2	
Classification	Check item	Test conditions		Unit	Standard value	Permissible value
Travel	Travel motor swing speed (1) (no-load)	Measuring posture  RKP05790 • Working Mode: P position • Engine speed: high idling • Oil temperature: 45–55 °C • Rest the bucket on the ground, raise one track-shoe and mark a position on the reduction unit. Measure the rotating speed of the sprocket wheel. Repeat for the 2nd track-shoe.	Normal	rpm	36^{-4}_{+2}	30÷40
			With increment		55^{-6}_{+3}	46÷60
	Travel speed (2)	Measuring posture  RKP05800 • Engine speed: high idling • Oil temperature: 45–55 °C • On flat ground • Travel for at least 10 metres and then check on the time needed to cover 20 metres.	Normal	sec.	$23.2^{-1.7}_{+0.8}$	Max. 26 Min. 20
			With increment		$15.0^{-1}_{+0.7}$	Max. 17 Min. 13
	Travel deviation	 RKP12530 • Working Mode: P position • Engine speed: high idling • Oil temperature: 45–55 °C • Travel 20 metres on flat ground and measure the deviation. ★The surface must be hard and horizontal  RKP05810 ★Measure dimension «X»		mm	Max. 200	Max. 300

MEASURING THE ENGINE SPEED

⚠ When measuring the speed (rpm) of the engine, do not touch heated parts and take care not to become entangled in rotating elements.

★ Do not start to measure engine speed until the following conditions have been met:
- Engine cooling water temperature: 68–80°C
- Hydraulic system oil temperature: 45–55°C.

1 - Install and connect the tachometer **C1**.
★ If a stroboscopic tachometer **C2** is used, make a distinct mark on the motor pulley to facilitate the reading.

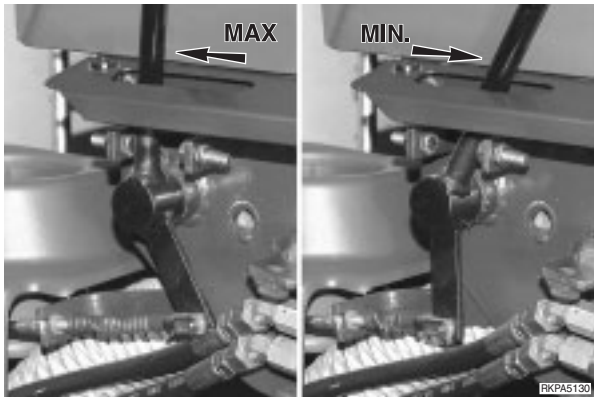
2 - Start the engine and check:
- Low idling without load (accelerator lever in «minimum» position).
- High idling without load (accelerator lever in «maximum» position).
  ★ Low idling: 1100±50 rpm
  ★ High idling: 2400±50 rpm

★ If the minimum and maximum engine speeds without load do not fall within the correct range, check the position stops of the accelerator lever and the accelerator cable sheathing (See «ACCELERATOR LEVER ADJUSTMENT») before performing the stress tests.
- Engine rpm with the pumps working.

★ Max. speed with the **P1** pump working: 2150^{-50}_{+150} rpm

★ Max. speed with the **P1** and **P2** pumps working: 2100^{-50}_{+200} rpm

★ If the efficiency is not within the permissible limits, call the Authorised Repair Shop to come and give the engine a diagnostic check.



TESTING AND ADJUSTING TRACK-SHOE TENSION

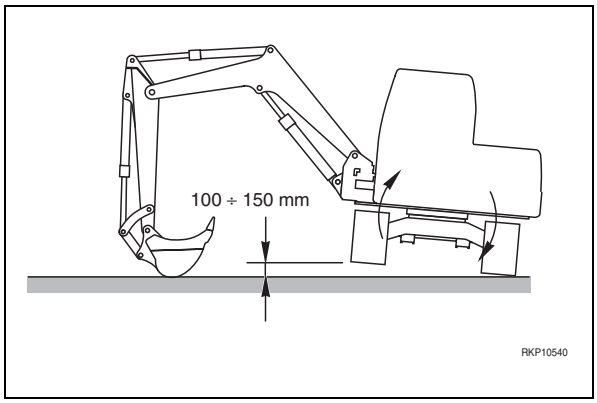
1. Test

★ Test conditions:
- Firm, flat ground.
- Work equipment resting on the ground.

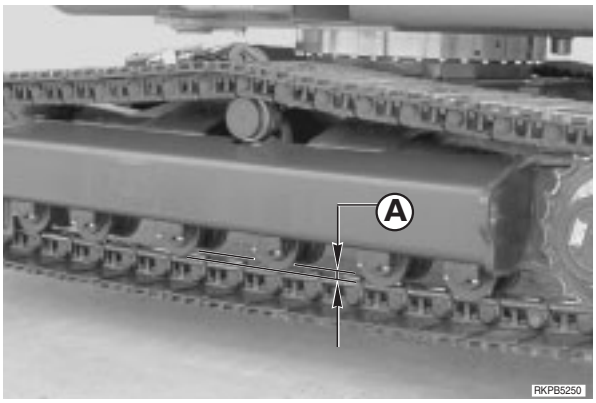
1 - Swing the turret 90° to the side of the track to be tested.

2 - Close the bucket, position the arm perpendicular to the ground and rest the bucket on the ground.

3 - Push down with the boom until the track-shoe to be tested has been raised completely from the ground.



4 - Measure the distance between the track-shoe race and the central track rollers.
★ Measure «**A**» between track roller and track-shoe: 20–25 mm

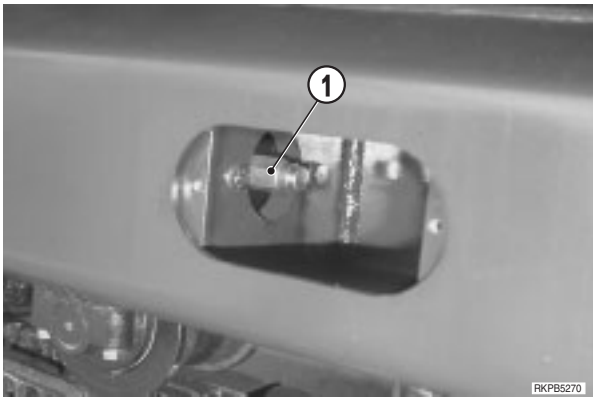


2. Adjustment

If track-shoe tension is not within permissible limits, adjust them as follows.

★ Before introducing the grease-pump (2), and on completion of the adjustment, thoroughly clean the grease nipple and the surrounding area.

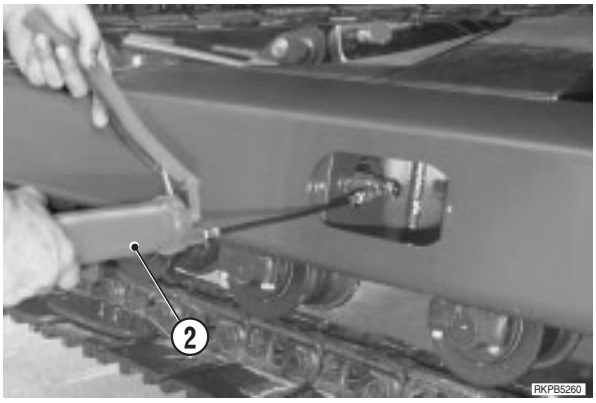
1 - If the tension is too slack.
Inject grease through the grease nipple (1).
★ If the grease proves difficult to inject, move the machine backwards and forwards slowly over a short stretch.



2 - If the tension is too tight.
Loosen the grease nipple (1) slowly to allow grease to flow out of the valve.

⚠ The grease contained in the stretching cylinder is under pressure and could injure the operator. For this reason the valve should not be loosened by more than one turn.

★ If the grease does not flow easily, move the machine backwards and forwards slowly over a short stretch.

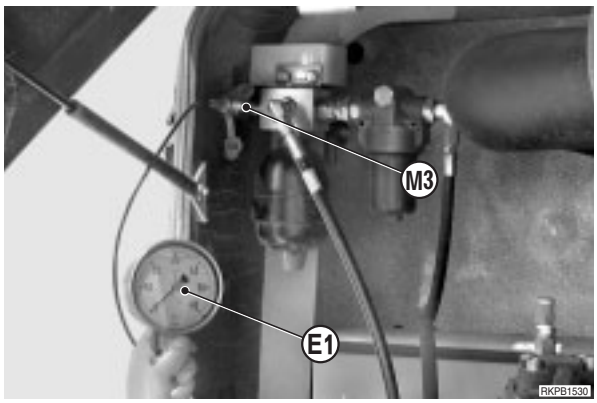


CHECKING AND ADJUSTING PRESSURES IN THE SERVOCONTROL FEED UNIT

★ Test conditions:
- Hydraulic oil: 45–55°C.

Release any residual pressures from the circuits (See «RELEASING RESIDUAL PRESSURES FROM THE CIRCUITS»).

1 - Connect the pressure gauge **E1** to the adapter **M3**.

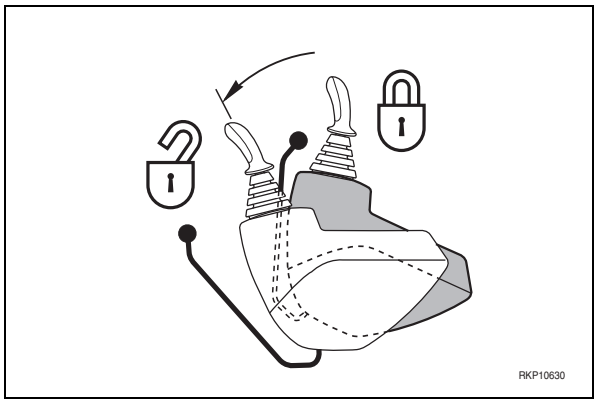


2 - Start the engine and move the accelerator into its maximum position.

3 - Put the lever of the safety device in its working position, (UNLOCKED).

4 - Bring a servocontrol circuit up to pressure by operating the work equipment (i.e. bucket).

5 - Check the working pressure on the pressure gauge **E1**
- ★ Working pressure: 32^{-2}_{+1} bar
- ★ If the working pressure is lower that the permissible value, check servocontrol feed unit valve.



3. Preparation for testing:

- **travel motors**
- **travel brakes**
- **speed increment**

1 - Relieve all residual hydraulic pressures (See «RELEASING RESIDUAL PRESSURES FROM THE CIRCUITS»).

2 - Identify the branch involved in the test (1).

3 - Disconnect the hoses (2) from the branches adjacent to the part to be tested and cap them tightly.

⚠ Make sure that the detached tubes are securely sealed, to prevent jets of high-pressure oil escaping if circuits that are not undergoing tests should accidentally become pressurised.

★ The tubes of the adjacent branches must be disconnected from the upper parts of the swivel joint.

4 - Provisional hoses (3) for collecting any oil leakages should be connected to the inlets of the branches adjacent to the one being tested.

4. Preparation for testing the blade

1 - Relieve all residual hydraulic pressures (See «RELEASING RESIDUAL PRESSURES FROM THE CIRCUITS»).

2 - Identify the branch involved in the test.

3 - Disconnect the tube corresponding to the branch to be tested from the safety valve input and cap it.

⚠ Make sure that the detached tubes are securely sealed, to prevent the escape of jets of oil at high pressure.

4 - Cap the valve to prevent entry of impurities.

5 - Disconnect from the swivel joint the hoses (2) of the branches adjacent to the branch to be tested, and cap them tightly.

⚠ Make sure that the detached hoses are securely sealed, to prevent jets of high-pressure oil escaping if the circuits that are not undergoing tests should accidentally become pressurised.

★ The tubes of adjacent branches must be disconnected from the upper parts of the swivel joint.

6 - Provisional hoses (3) to collect any leaking oil should be connected to the inlets of the branches adjacent to the one being tested.

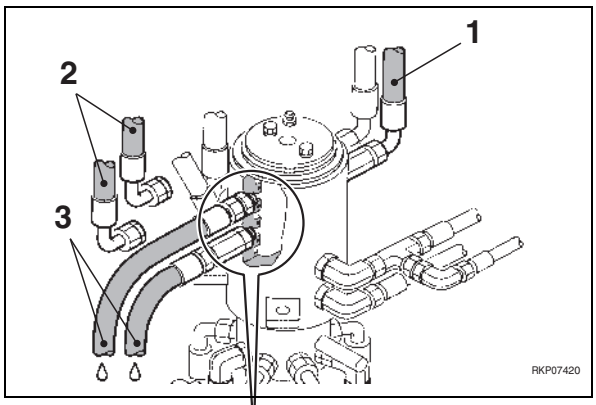
5. Test

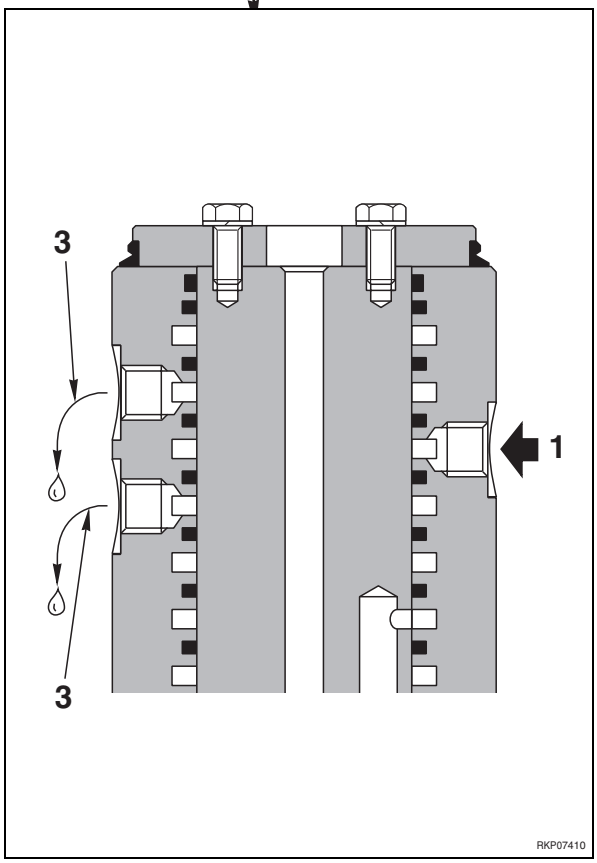
1 - Start the engine and bring it up to the test speed described for each group or component.

2 - Pressurise the branch to be tested.

3 - After 30 seconds, watch for another minute if there are any leakages.

★ If oil leaks out of one of the two provisional hoses, it means that there is a leakage in the intermediate gasket between the branch connected to the provisional hose and the pressurised branch.



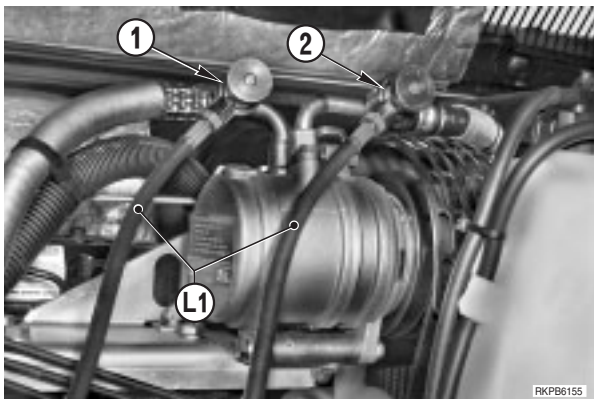


EMPTYING THE AIR-CONDITIONING UNIT

1 - Connect the maintenance station **L1** to the service valves (1) and (2) and follow the specific maintenance station instructions relative to the drainage of the unit.

2 - Disconnect the group to be substituted or reconditioned immediately after switching off the maintenance station. **Plug the removed or disconnected connection tubes tightly and with a minimum of delay.**

3 - Carefully check the quantity of anti-freeze oil recovered and contained in the disassembled parts, since the same quantity must be replaced when the air-conditioning unit is refilled.



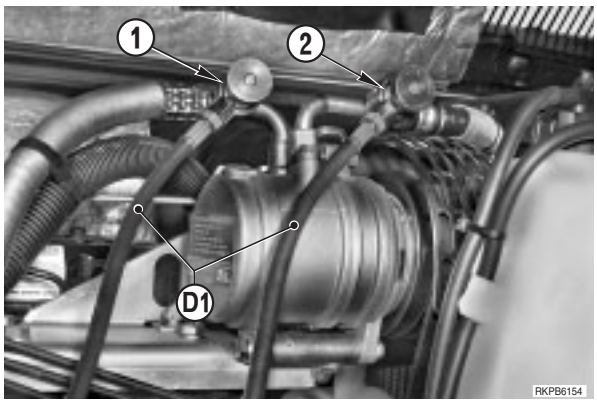
REMOVAL OF THE AIR-CONDITIONING UNIT COMPRESSOR

(Only for machines equipped with an air-conditioning unit)

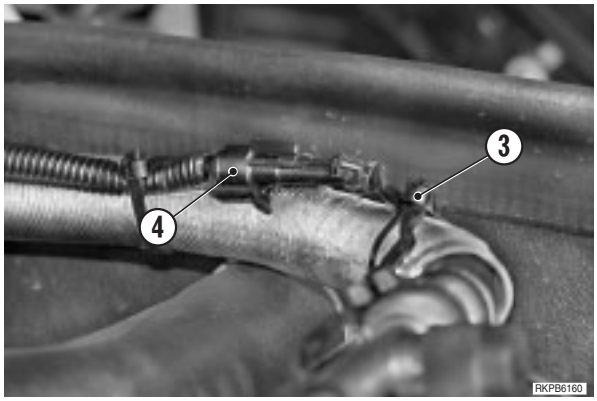
⚠ Disconnect the cable from accumulator negative terminal (–).

1 - Connect the outlets (1) and (2) to the maintenance station for air-conditioning units **D1** and drain the cooling fluid.

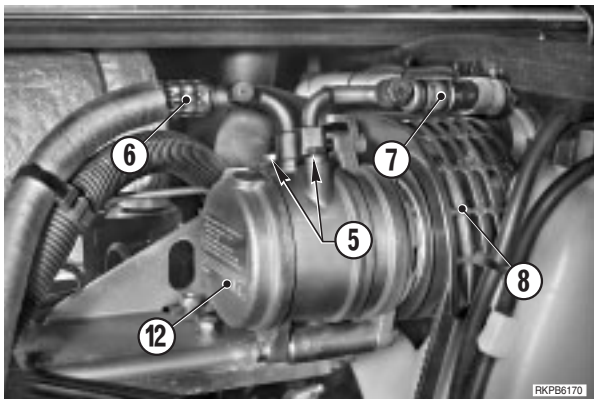
Quantity of fluid R134a: 1100 $^{-30}_{+50}$ g



2 - Remove the clamp (3) and disconnect the connector (4).

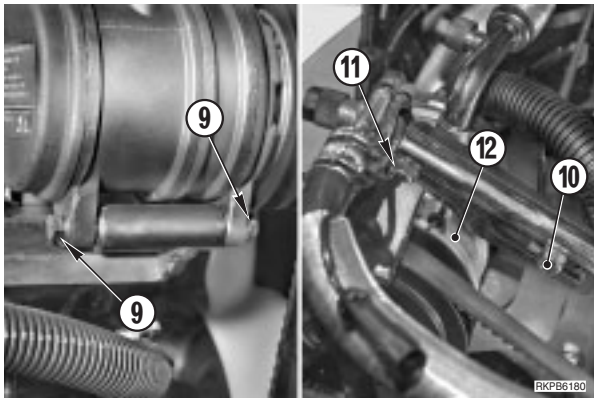


3 - Loosen screw (5) and remove return (6) and delivery (7) pipes. ※ 1



4 - Remove the fan guard (8). ※ 2

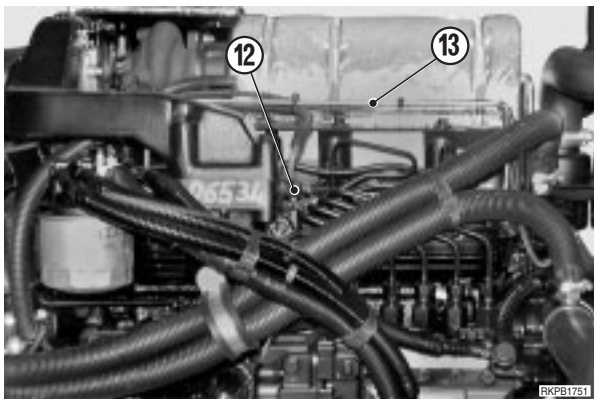
5 - Loosen screws (9), (10) and (11) to leave free the compressor (12).



9 - Disconnect the pre-heater cable (12) and remove the support (13).

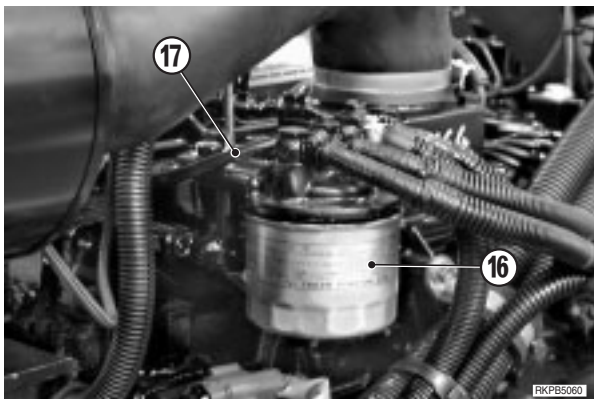
10 - Disconnect the coupling sleeve (14).

11 - Remove the muffler (15).
(For details see «REMOVAL OF THE EXHAUST PIPE-MUFFLER»).



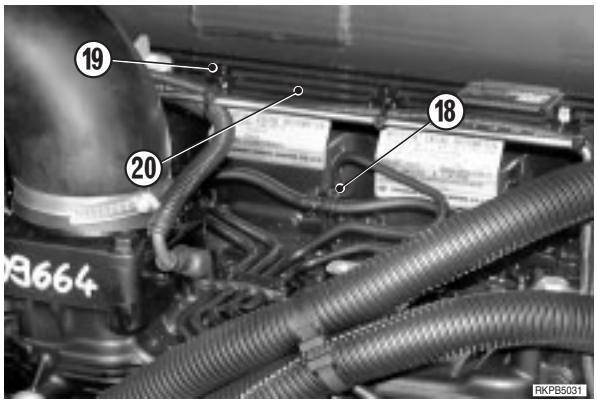
12 - Remove the fuel filter (18).

13 - Disconnect the fuel return hose (17) from the injectors.



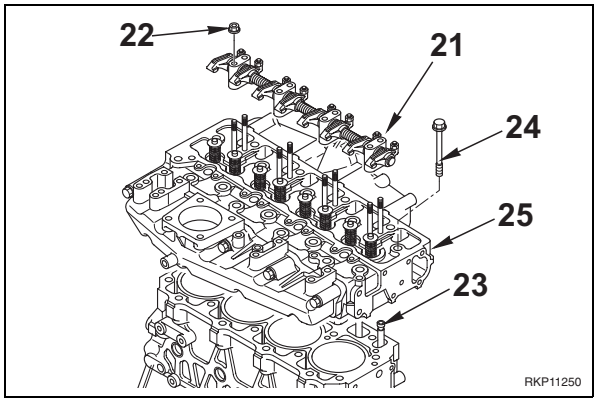
14 - Remove the injectors (18).
(For details see: «REMOVAL OF THE NOZZLE INJECTORS») ※2 ※3

15 - Loosen the nuts (19) and remove the tappet cover (20). ※4



16 - Remove the valve rocker-arm(21).
★ Loosen the nuts (22) and unscrew the tappets by 2-3 turns. ※5

17 - Take out the rocker arm control arms (23).

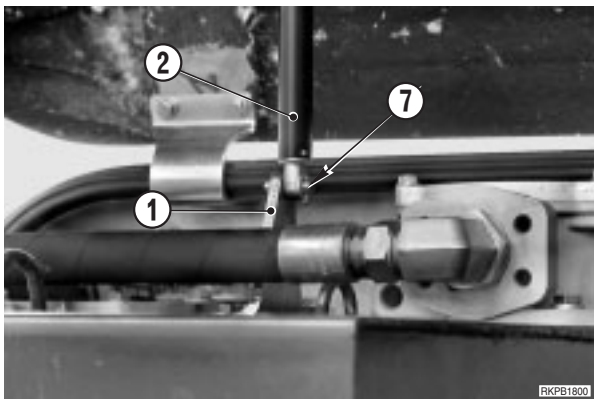


REMOVAL OF FRONT HOOD

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

1 - Detach the gas cylinder (2) from the support (1).

2 - **Only for machine equipped with an air conditioning unit:** remove the condenser unit.
(For detail see «REMOVAL OF CONDENSER UNIT»).

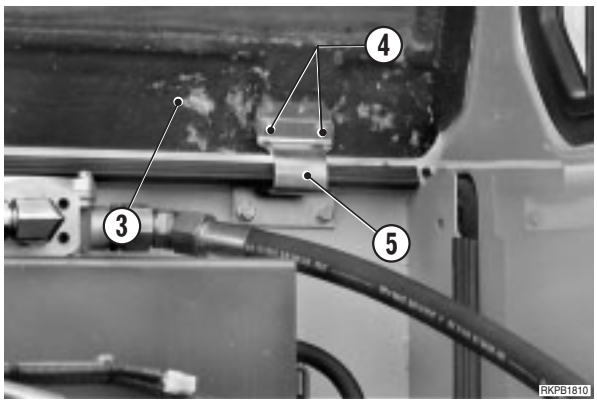


3 - While holding up the engine hood (3), remove the screws (4) that attach the hood to the hinges (5).

※ 1

★ Mark the position of any shims.

kg Engine hood: 27 kg



INSTALLATION OF FRONT HOOD

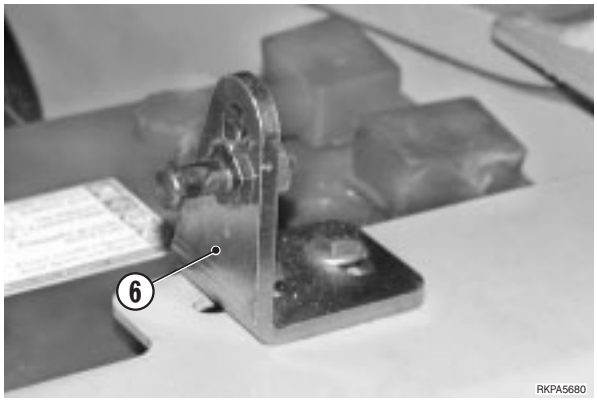
- To install, reverse the removal procedure.

※ 1

★ Position any shims.

★ Check the centering and adjustment of the closing hook (6).

⚠ Replace the cotter pins (7).



REMOVAL OF HYDRAULIC OIL TANK

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

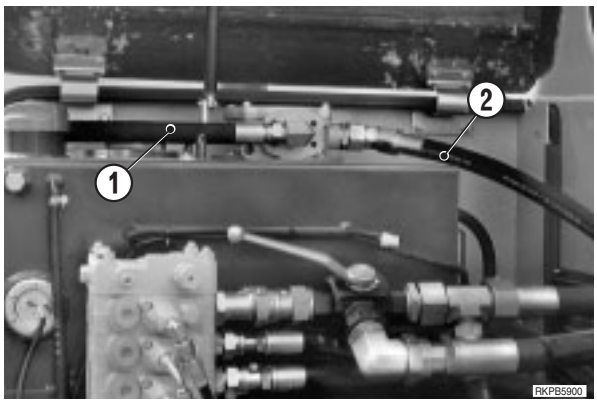
Release residual pressures from all circuits. (For details, see «20. TESTING AND ADJUSTMENTS»).

- Drain the hydraulic oil.

  Quantity of oil: approx. 74 ℓ

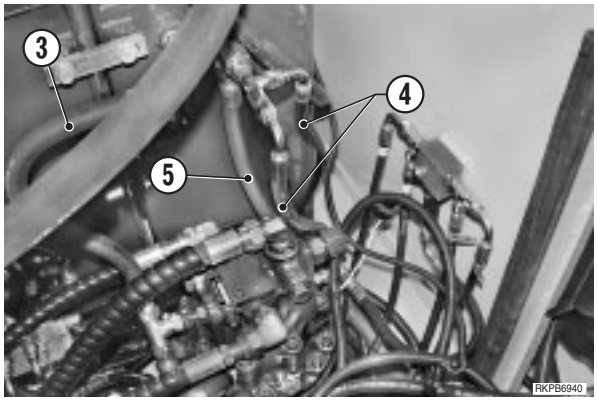
1 - Remove the fuel tank.
(For details, see «REMOVAL OF FUEL TANK»).

2 - Disconnect the return pipe (1) and (2).



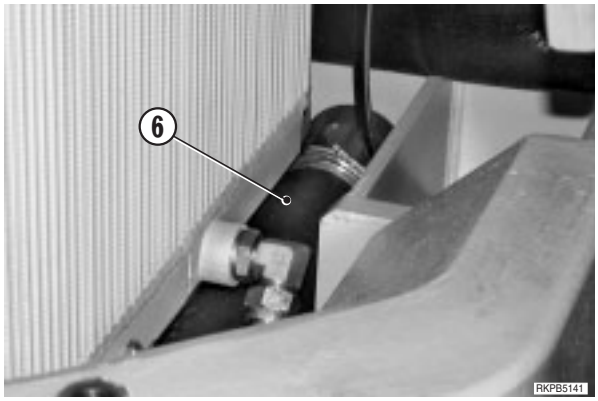
3 - Disconnect the drain pipes (3) and (4).

4 - **With arm safety valve:**
Disconnect the drain pipe (5) from safety valve.



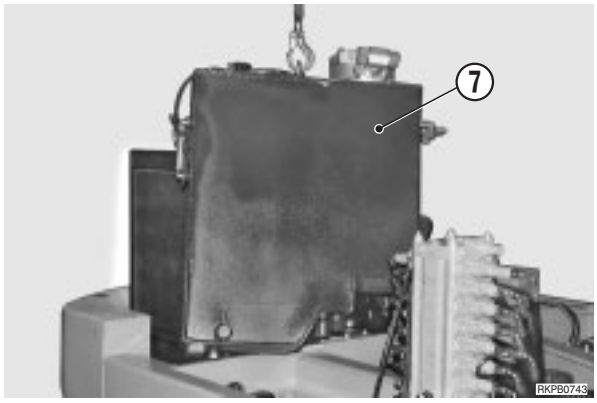
5 - Disconnect the coupling of the pump suction tube and the pipe (6).

6 - Hook the tank to the hoisting equipment and slightly put the rope under tension.



7 - Remove the bolts and the oil tank (7).

Oil tank: 62 kg



REMOVAL OF SWING MACHINERY

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

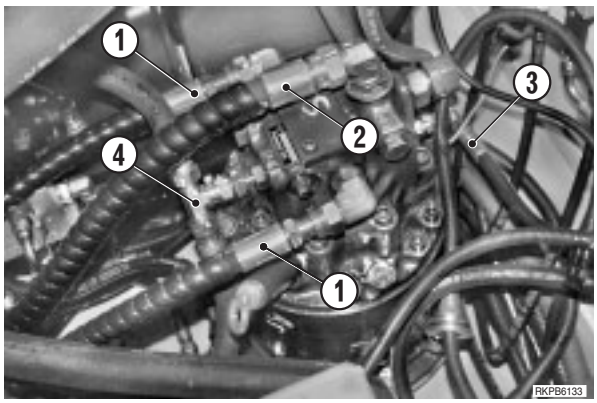
Release residual pressures from all circuits. (For details, see «20. TESTING AND ADJUSTMENTS»).

1 - Drain the reduction gear hydraulic oil.

Quantity of oil: approx. 4 ℓ

2 - Remove the front hood (For details, see «REMOVAL OF FRONT HOOD»).

3 - Disconnect the feed pipes (1), the exhaust pipe (2), the brake release pipe (3) and the drain line connection (4). ※1



4 - Remove the drain extension tube (5).

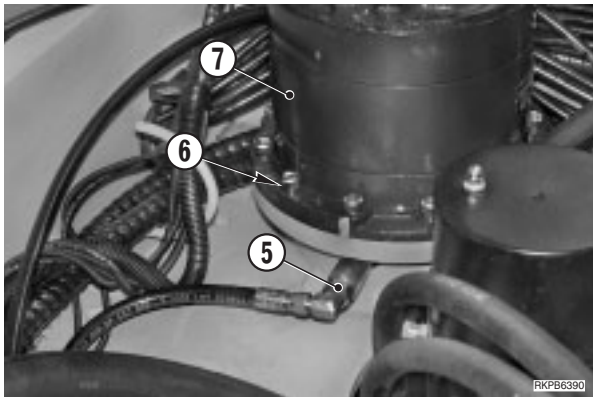
5 - Remove the check screws (6) (No. 12) of the reduction gear (7). ※2

6 - Fasten two screws into the holes opposite to each other and remove the reduction gear

7 - Sling the complete assembly and remove it.

★ During removal, slowly lift the assembly and pay particular attention not to damage the pipes or other parts.

Complete group: approx. 87 kg



INSTALLATION OF THE SWING MACHINERY

- To install, reverse the removal procedure.

★ In order to centre the holes of the pins and of the fastening screws, connect a hydraulic power unit "**A**" to the hydraulic motor and slowly rotate the motor until the correct angle for the positioning of the reduction gear has been obtained.

※1

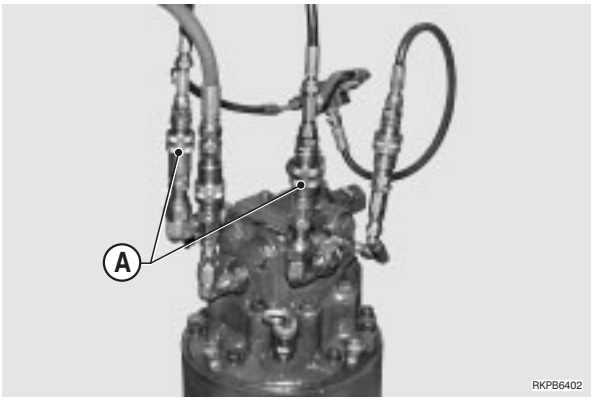
★ Fill with hydraulic oil through the breather (8).

※2

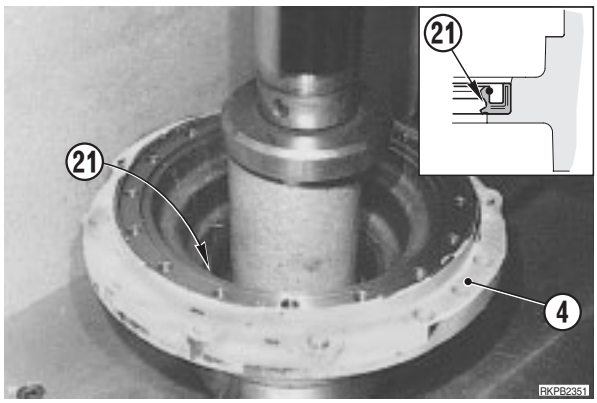
Screws: 294 Nm

1 - Start the engine to allow oil circulation in all systems and check the seals.

2 - Bleed the air from engine. (For details, see «20. TESTING AND ADJUSTMENTS»).

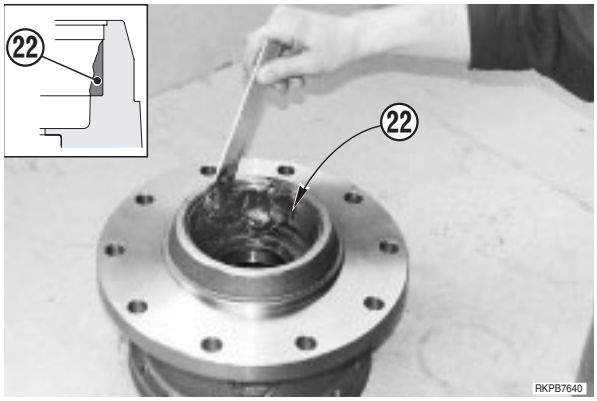


8 - Mount the sealing ring (21) in the gearbox housing (4).

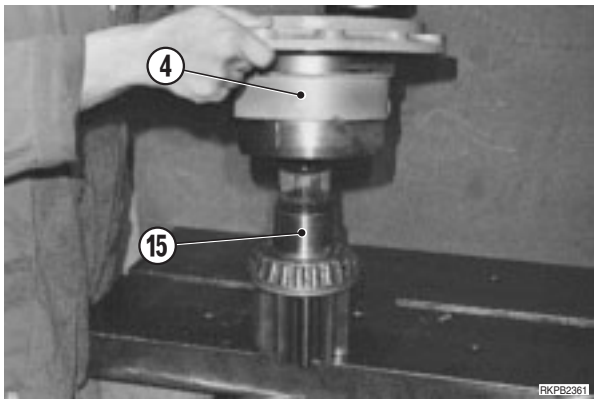


9 - Fill with grease the bearing (22) seat.

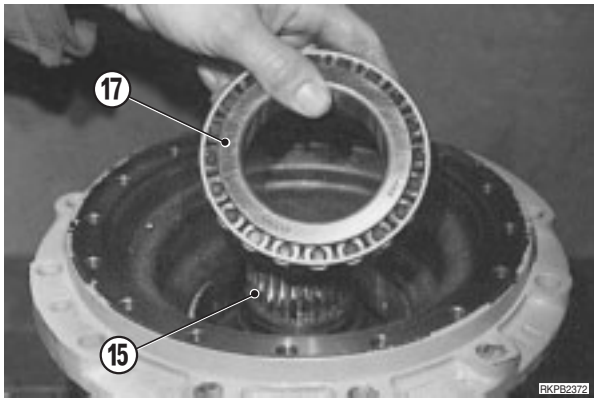
Bearing: ASL800050



10 - Position the gearbox housing (4) over the swing pinion (15).



11 - Mount the inside bearing ring (17) on the swing pinion (15).

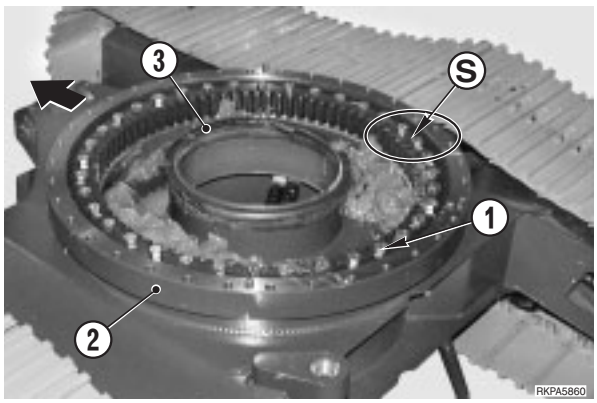


REMOVAL OF SWING CIRCLE

1 - Remove the upper revolving frame. (For details, see «REMOVAL OF UPPER REVOLVING FRAME»).

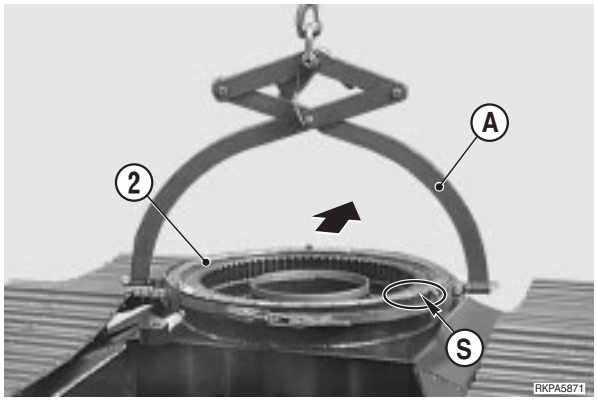
2 - Completely remove all contaminated grease.

3 - Remove the screws (1) that secure the swing circle (2).



4 - Remove the swing circle (2) using a lifting equipment "**A**". ※1

kg Swing circle: 124 kg



INSTALLATION OF SWING CIRCLE

★ Before installing the swing circle, check the condition of the central gasket (3).

⚠ For reasons of safety, when installing the swing circle, insert two screws into the front and back holes in the frame.

- To install, reverse the removal procedure.

※1

Before attaching the swing circle, check that the area marked with an «**S**» is positioned on the right-hand side of the chassis.

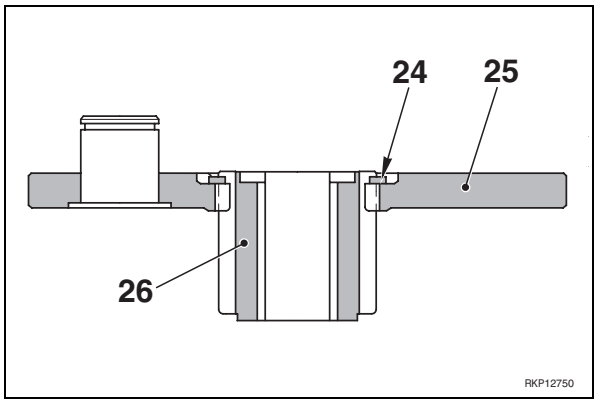
Attachment screws: Loctite 242

Attachment screws: 314 Nm

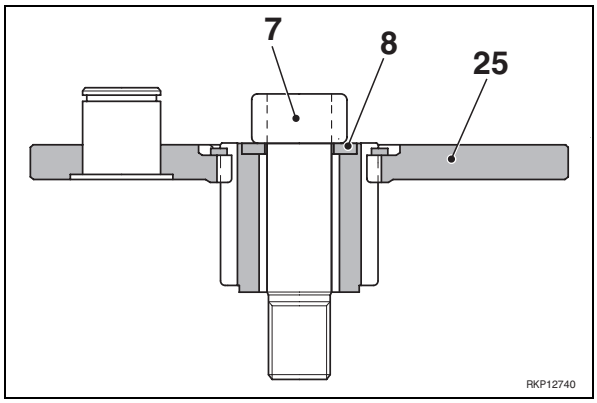
Lubricating grease: approx. 25 kg

ASSEMBLY OF THE FINAL DRIVE

1 - Insert the planetary carrier (25) into sun gear (26) and lock it with a new snap ring (24).

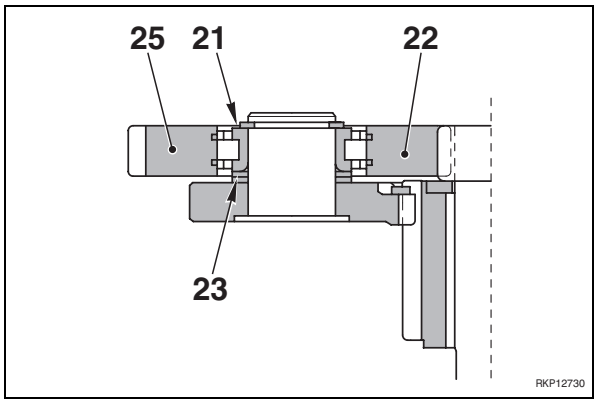


2 - Mount on the planetary carrier the roller (8) and sun gear (7).



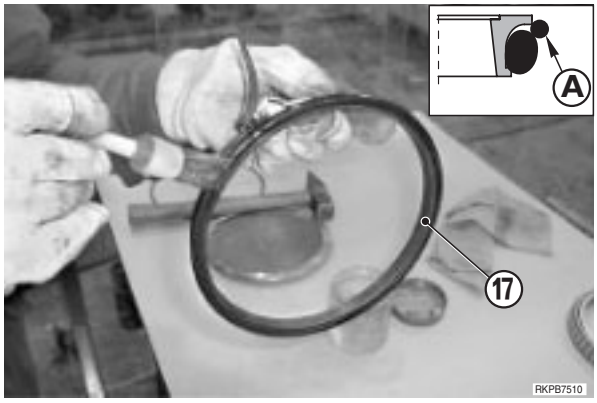
3 - Mount on the planetary carrier (25) the spacers (23) and the planetary gear (22).
- ★ Heat the planetary gear to approx. 70°C to ease the mounting.
- ★ Take care to the orientation of the planetary gear.

4 - Lock the planetary gear (21) with new snap rings (22).



5 - Degrease and dry the cavities for the seal gasket (17).

6 - To ease the next step, insert O-ring (A) (200x3) between steel ring and rubber ring.



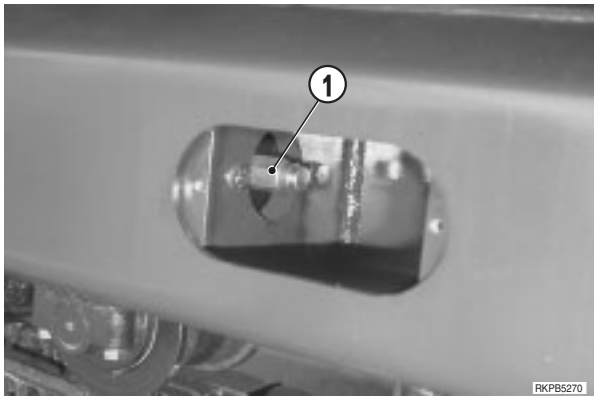
REMOVAL OF CARRIER ROLLER

1 - Slowly unscrew the lubricator (1) to let out the grease and relieve tension on the track shoe.

The grease contained in the track shoe stretching cylinder is under pressure and could cause serious injury to the operator. For this reason the valve should not be loosened by more than one turn.

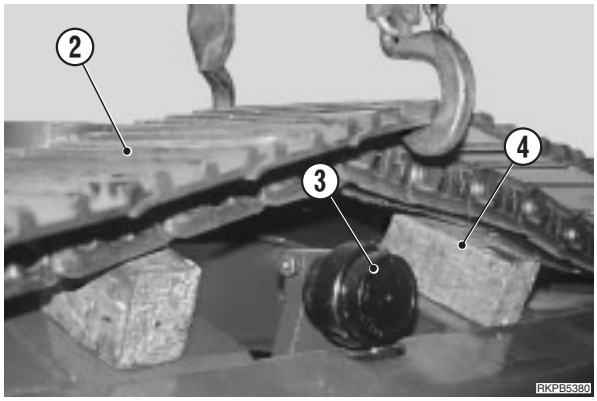
★ If the grease does not flow out easily, move the machine backwards and forwards slowly.

Lower the work equipment to the ground and switch off the engine.



2 - Raise the track shoe (2) to a height that leaves the idler (3) free. For reasons of safety, position some blocks (4).

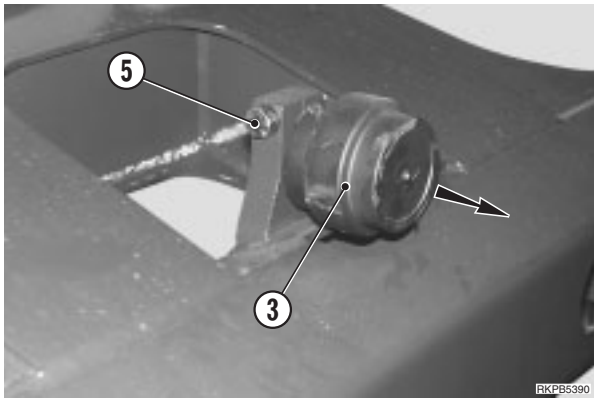
3 - Loosen the retaining screw (5) and remove the carrier roller (3).



INSTALLATION OF CARRIER ROLLER

- To install, reverse the removal procedure.

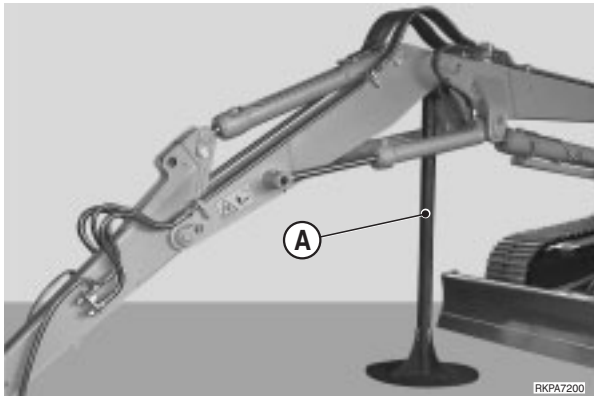
1 - Adjust track shoe tension. (For details, see «20. TESTING AND ADJUSTMENTS»).



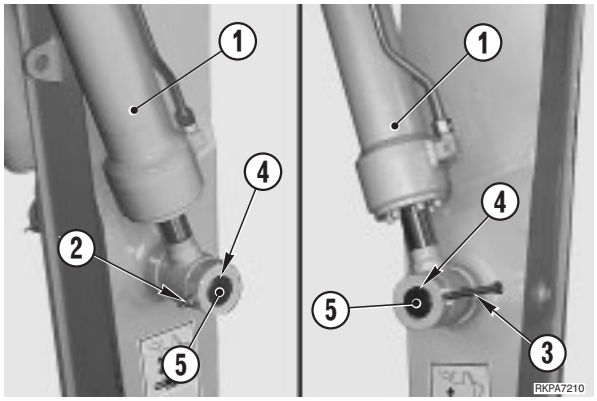
REMOVAL OF BOOM CYLINDER (For 2-piece boom)

1 - Fully extend the front work equipment, raise the boom and 2-piece boom and position a supporting stand (**A**) between them.
★ The stand should be 1.60 m high.

2 - Manoeuvre the arm until the bucket is resting on the ground. Switch off the engine.



3 - Put a sling round the RH 2nd boom cylinder (1) of the 2-piece boom and remove the self-locking nut (2), the screw (3) and the spacer (4). ※1

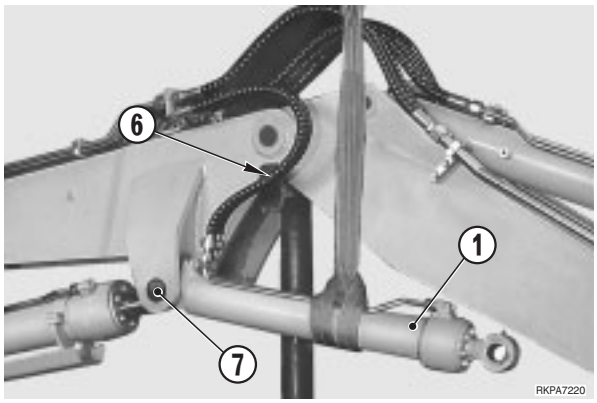


4 - Slide off the pin (5) that connects the RH 2nd boom cylinder (1) to the 2-piece boom, until the piston rod is completely disconnected. ※2 ※3 ※5

5 - Start the motor and retract the RH cylinder piston. ※3
★ To secure the piston rod in this position, tie it with wire and switch off the engine.

6 - Disconnect the tubes (6) from the RH cylinder (1) and plug them.

7 - Slide out the pin (7) until the cylinder (1) is free and remove it. ※2 ※4

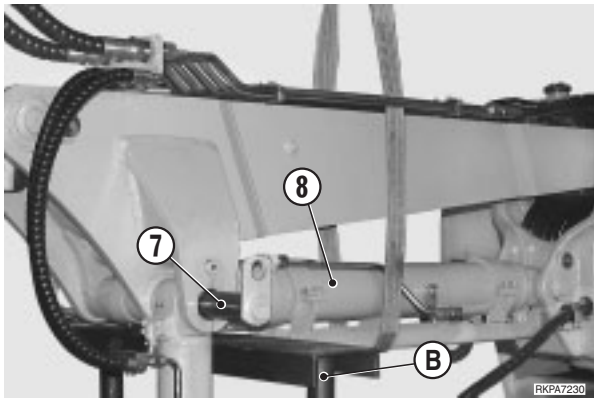


8 - Put the boom cylinder (8) in a sling.

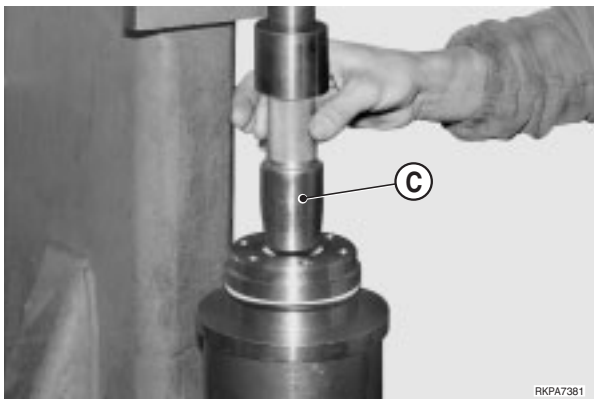
9 - Slide the pin (7) out until the boom cylinder piston rod (8) is disconnected. ※3 ※4
★ To hold the piston rod in its fully retracted position, tie it with wire and switch off the engine.

10 - Start the engine and retract the piston.

11 - Lower the cylinder (8) and rest it on a stand (B).



5 - Gauge the diameter of the internal seals, mounting the group underneath a press and using the specific gauging knuckle pin "**C**" for the diameter of the piston rod.

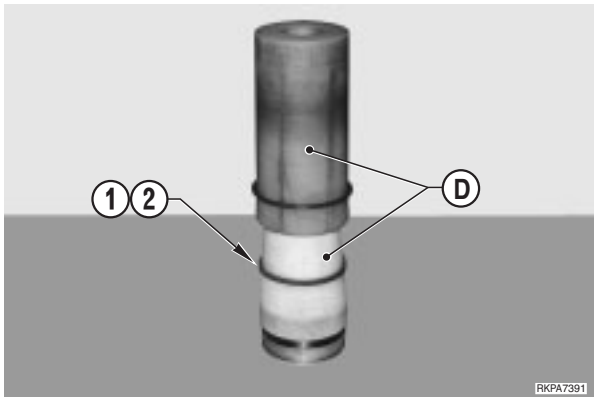


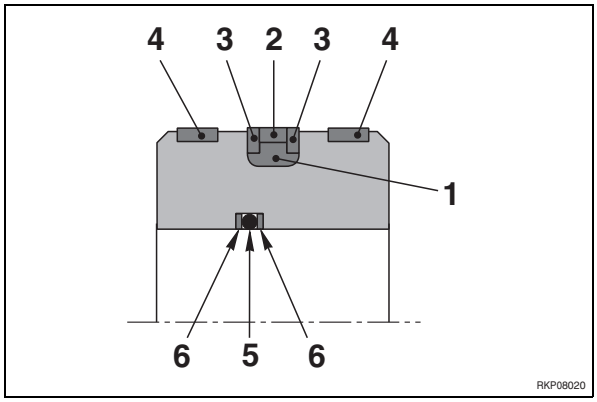
3. Piston assembly

1 - Using the suitable plunger **D**, mount the piston seal. Mount in the correct sequence the rubber ring (1), the external seal (2), and the anti-extrusion rings (3).

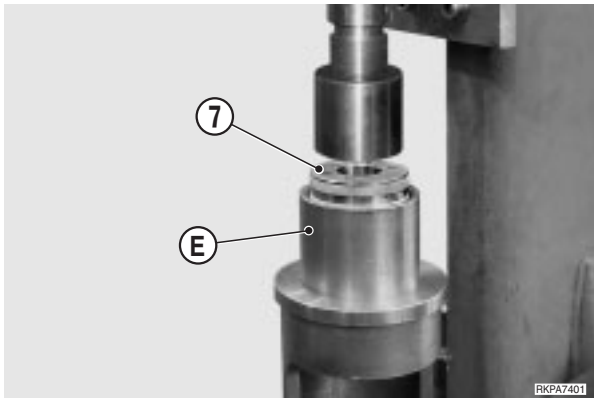
2 - Mount the guide rings (4).

3 - **For the arm and 2nd boom piston only:** Mount the O-ring (5) and the anti-extrusion rings (6) for the sealing between piston rod and piston.





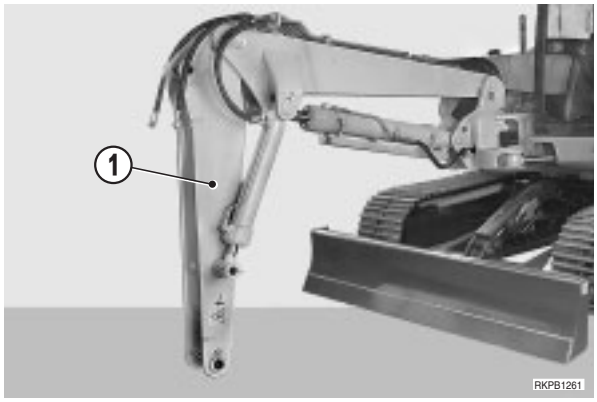
4 - Cauge the diameter of the seal (2) of the piston (7), mounting the group under a press and use the specific gauging ring "**E**" for the piston diameter.



REMOVAL OF 2nd BOOM

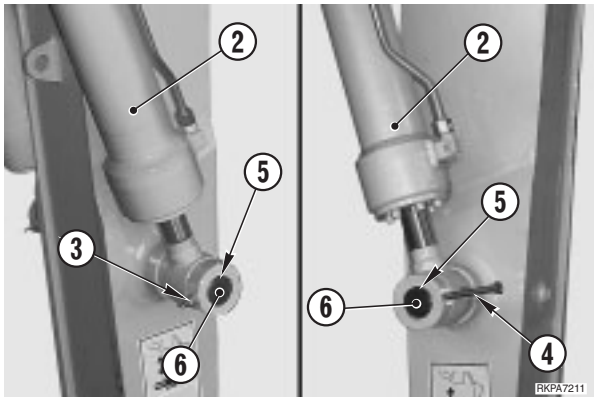
1 - Remove the bucket, the bucket cylinder, the arm cylinder and the arm. For details see:
- REMOVAL OF BUCKET
- REMOVAL OF BUCKET CYLINDER
- REMOVAL OF ARM CYLINDER
- REMOVAL OF ARM

2 - Start the engine and bring the 2-piece boom (1) into a vertical position. Lower it until it rests on the ground and switch off the engine.



3 - Put a sling round the RH cylinder (2) of the 2-piece boom and remove the nut (3), the screw (4) and the shim (5). ※1

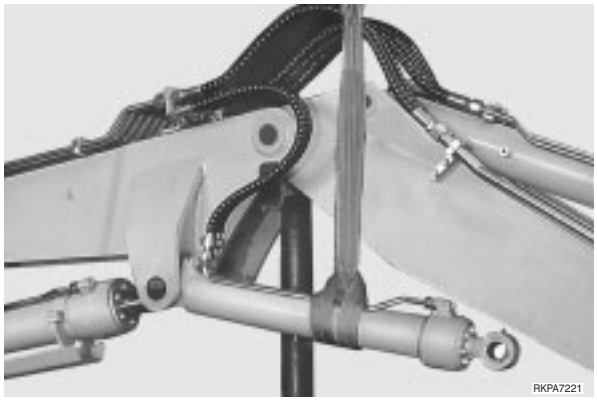
4 - Slide out the pin (6) that connects the RH cylinder (2) to the 2-piece boom (1) until the piston rod is completely disconnected. ※2 ※3



5 - Start the engine and completely retract the piston rod of the RH cylinder.
★ To hold the piston rod in a fully retracted position, tie it with wire and switch off the engine.

6 - Lower the cylinder until it is in a vertical position, leaving the boom tied up.

7 - Repeat these operations from point 3 to point 6 in order to disconnect the LH cylinder (7). ※2 ※3

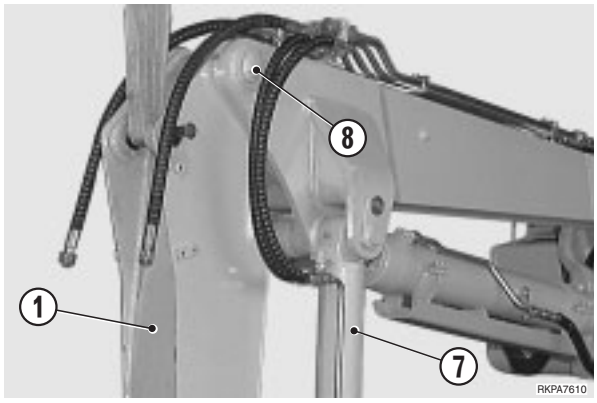


8 - Hook the 2-piece boom to the hoisting tackle.

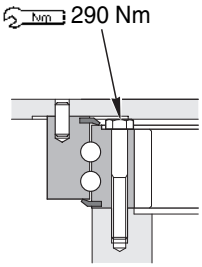
9 - Remove the screws and take out the pin (8). ※2 ※3 ※4

10 - Take off the 2-piece boom.

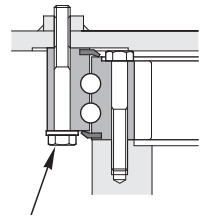
kg 2-piece boom: 195 kg



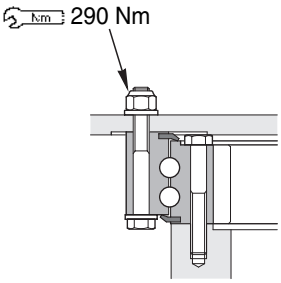
SWING CIRCLE



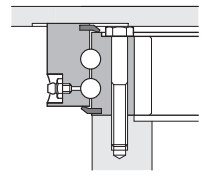
Section C - C



Section B - B



Section D - D



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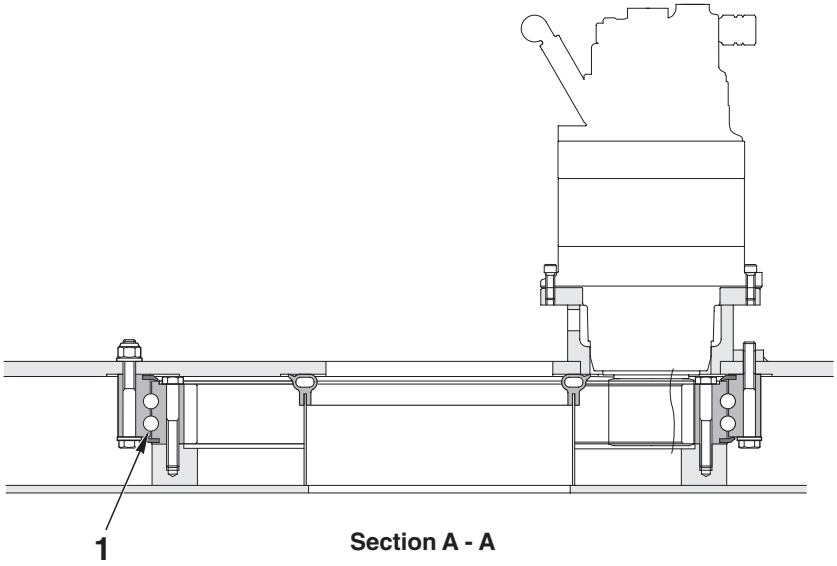
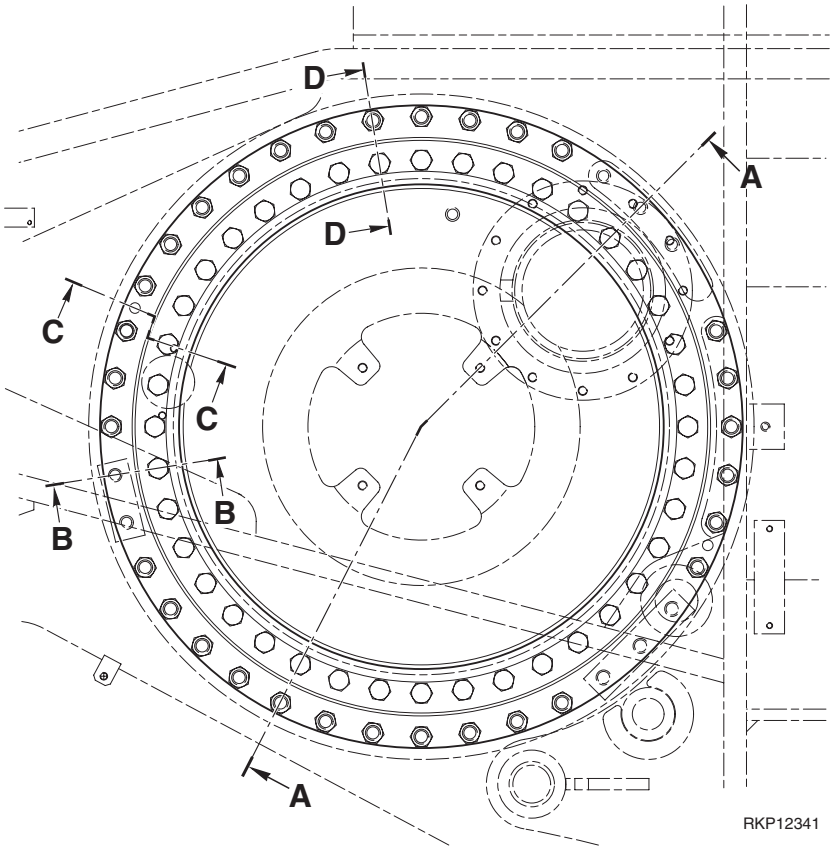


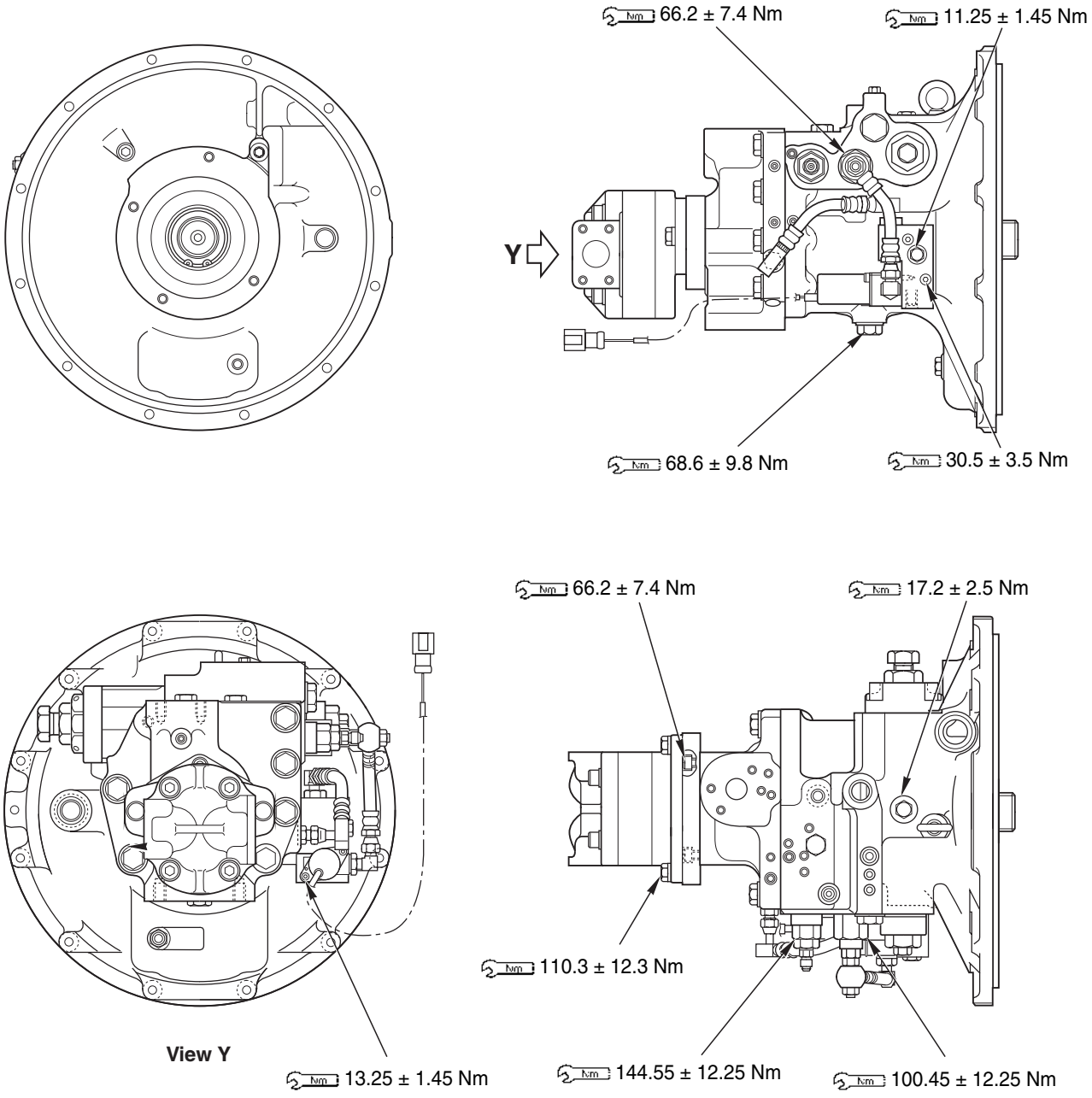
Section A - A



Unit: mm

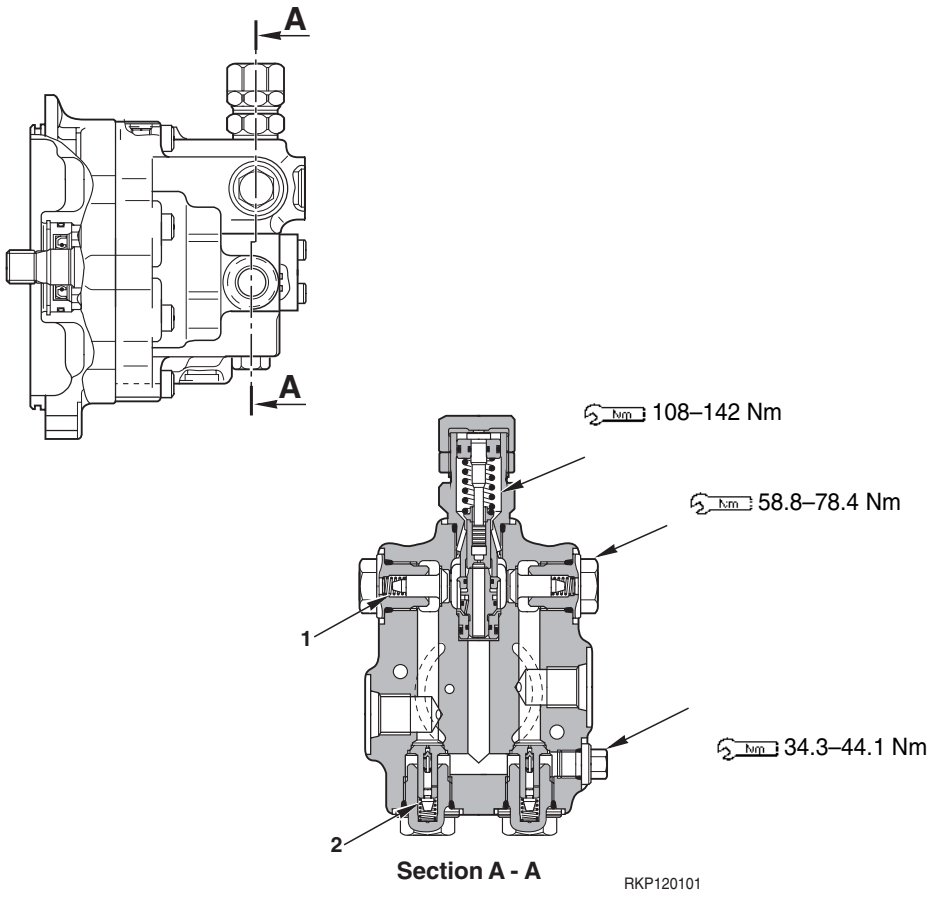
No.	Check item	Criteria		Remedy
1	Axial clearance	Standard clearance	Clearance limit	
		0.3–1.2	3	Replace

HYDRAULIC PUMP



RKP03731

SWING MOTOR



Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
1	Suction valve spring	Free length x O.D.	Installed length	Installed load	Free length x O.D.	Installed load	Replace
		–	11.5	0.9 N	–	–	
2	Shuttle valve spring	–	19.5	1.8 N	–	–	