MODEL	**240LX**
SERIES	**LX Series**
BOOK NO.	**1033**
SERIAL NO.	

MACHINE SERIAL NUMBER

The machine serial number is stamped on the serial number plate which is located at the front of the machine on the right side of the operator's cab platform. The serial number should always be furnished when ordering parts for the machine or when corresponding with the distributor or factory concerning the machine. Providing the serial number is the only way of ensuring the correct parts and/or information can be furnished.

In the event the serial plate is not readable a number is stamped on the upper revolving frame which can be used to identify the machine. The number is stamped just below the boom and between the boom hoist cylinder mounting lugs.

Torque Table

Tighten cap screws and nuts according to the table below if there are no other special instructions.

Cap Screw Name Size (Size)			**M6**	**M8**	**M10**	**M12**	**M14**	**M16**	**M18**	**M20**
Cap Screw	Spanner	[in.]	0.39	0.51	0.67	0.75	0.87	0.95	1.06	1.18
		[mm]	10	13	17	19	22	24	27	30
	Tightening torque	[lb-ft]	5.1	14.5	29.0	43.4	72.5	116.0	144.6	202.4
		[Nm]	6.9	19.6	39.2	58.8	98.1	157.2	196.0	274.0
Socket Head Cap Screw	Spanner	[in.]	0.20	0.24	0.32	0.39	0.47	0.55	0.55	0.67
		[mm]	5	6	8	10	12	14	14	17
	Tightening torque	[lb-ft]	6.5	15.9	31.1	57.8	86.8	130.1	180.8	253.1
		[Nm]	8.8	21.6	42.1	78.4	117.6	176.4	245.0	343.0

Main control valve

Five section main control valve for arm, boom acceleration, swing, option and RH travel.
Four section main control valve for arm acceleration, bucket, boom and LH travel.
Load holding valve for boom and arm.

Swing

Fixed flow, axial piston motor.
Automatic disc brake.

Upperstructure swing speed	10.4 rpm
Swing torque	55130 ft.lbs
Tail swing	9 ft 7 in
Displacement	8.9 cu in
Work output	48 gpm
Reduction ratio	22.097
Braking torque	≥ 592.6 lb-ft
Minimum brake pressure	421 psi

Travel

Two-speed, axial piston motor.
Automatic disc brake.

Slow speed	2.2 mph
Fast speed	3.4 mph
Gradeability	70% (35°)
Tractive force	43010 lbs
Displacement	10.3/6.1 cu in
Work output	56 gpm
Reduction ratio	43.246
Braking torque (including reducer)	15368 lb-ft
Number of turns at the sprockets (10 turns)	
Mode "S", fast speed	13±0.6 sec.
Mode "S", slow speed	21.4±0.7 sec.
Permitted deviation in travel over a distance of 20 m	
Mode "H", full speed	39.4 in

Undercarriage

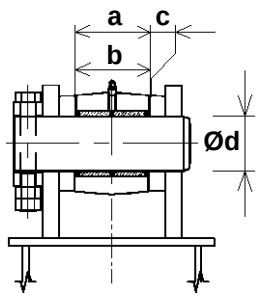
One-piece undercarriage with welded components.
Lubricated rollers and idler wheels.
Grease type track tension.

Ground pressure	
with 23.6 in track pads	6.81 psi
with 27.5 in track pads	6.09 psi
with 31.4 in track pads	5.36 psi
Track tension	11.02 to 11.81 in

Attachment

Break-out bucket (standard)	35970 lbf
Break-out bucket (higher pressure)	38890 lbf
Penetration force	
Crowd force (standard)	25850 lbf
Crowd force (higher pressure)	28100 lbf

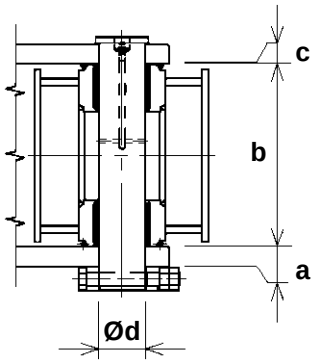
7. Bucket cylinder foot/Arm



CS01B528

Marking		Dimension (in)
a	Standard	4.56
	Limit	4.80
b	Standard	4.13
	Limit	4.05
c (a - b)	Standard	0.01 to 0.11
	Limit	Shims
Ø d (pin)	Standard	3.14
	Limit	3.11
Ø d (ring)	Standard	3.14
	Limit	3.20

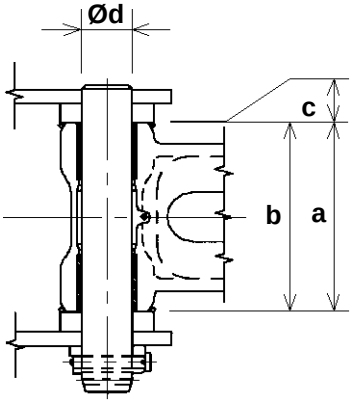
8. Connecting rod/Arm



CS01B529

Marking		Dimension (in)
a	Standard	1.57
	Limit	1.49
b	Standard	12.4
	Limit	12.3
c (play)	Standard	0.03 to 0.05
	Limit	Shims
Ø d (pin)	Standard	3.14
	Limit	3.11
Ø d (ring)	Standard	3.14
	Limit	3.20

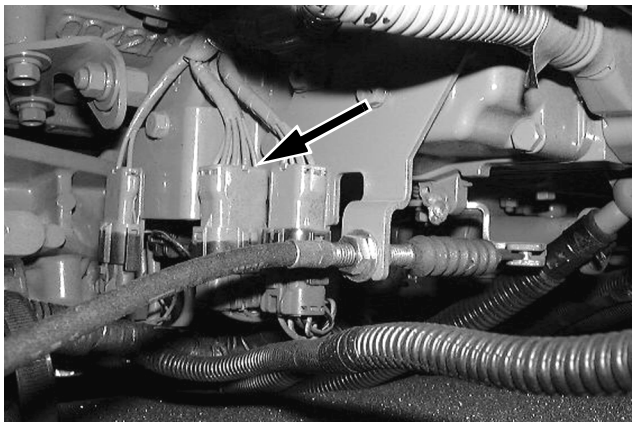
9. Compensator/Bucket



CS01B530

Marking		Dimension (in)
a	Standard	12.4
	Limit	12.7
b	Standard	12.4
	Limit	12.3
c (play)	Standard	0.03 to 0.13
	Limit	Shims
Ø d (pin)	Standard	3.54
	Limit	3.50
Ø d (ring)	Standard	3.54
	Limit	3.60

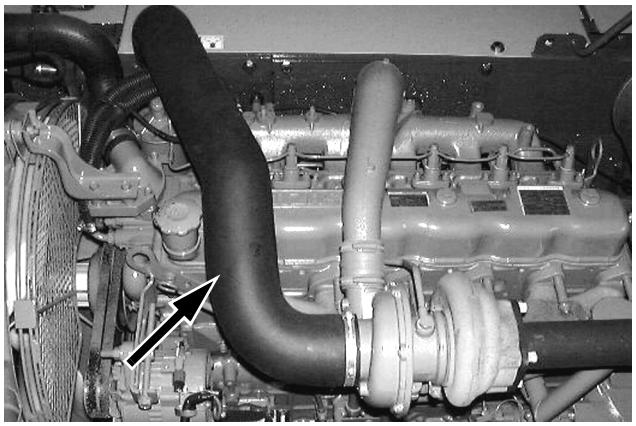
STEP 14



CD00J040

Label and disconnect the connectors to the electronic regulator and disconnect the fuel flow regulation resistance.

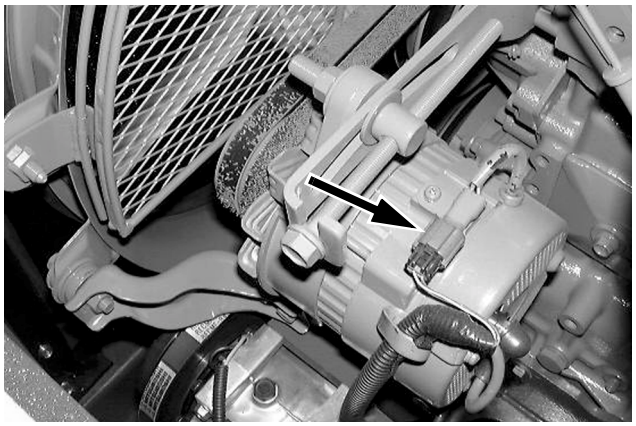
STEP 15



CD00J041

Remove the hose connecting the turbo-charger to the air filter.

STEP 16



CD00J042

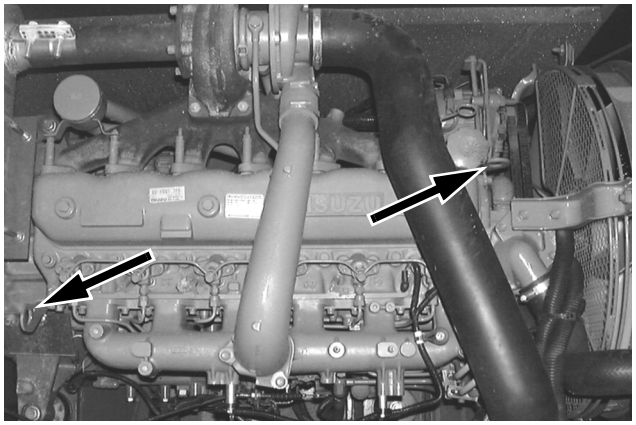
Label and disconnect the electrical connections to the alternator.

NOTE: *If the machine is equipped with air conditioning, remove the compressor mounting hardware and move the compressor away from the engine.*

STEP 17

Remove all the clips, etc, which fasten the electrical harnesses to the engine and move the harnesses out of the way.

STEP 18



CD00J043

Install a suitable lifting device on the engine lifting eyes (for the weight of the engine, see Section 1002).

Section

3001

REMOVAL AND INSTALLATION OF THE FUEL TANK

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November 2001

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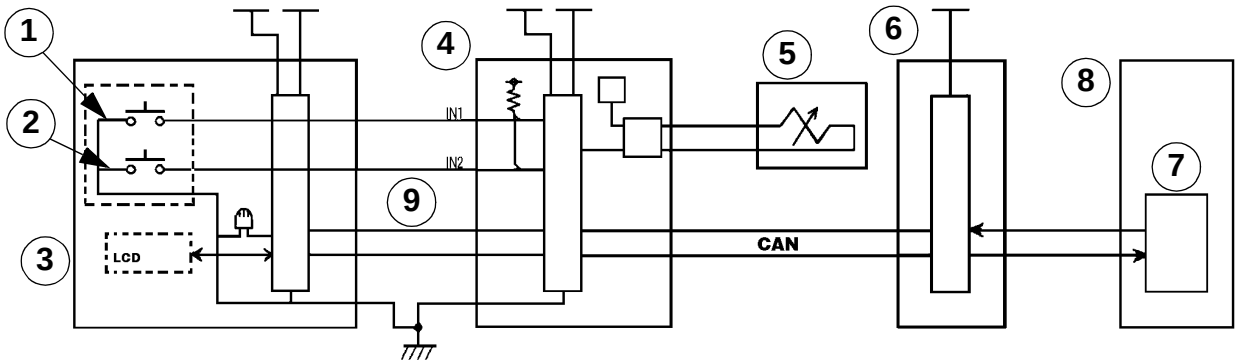
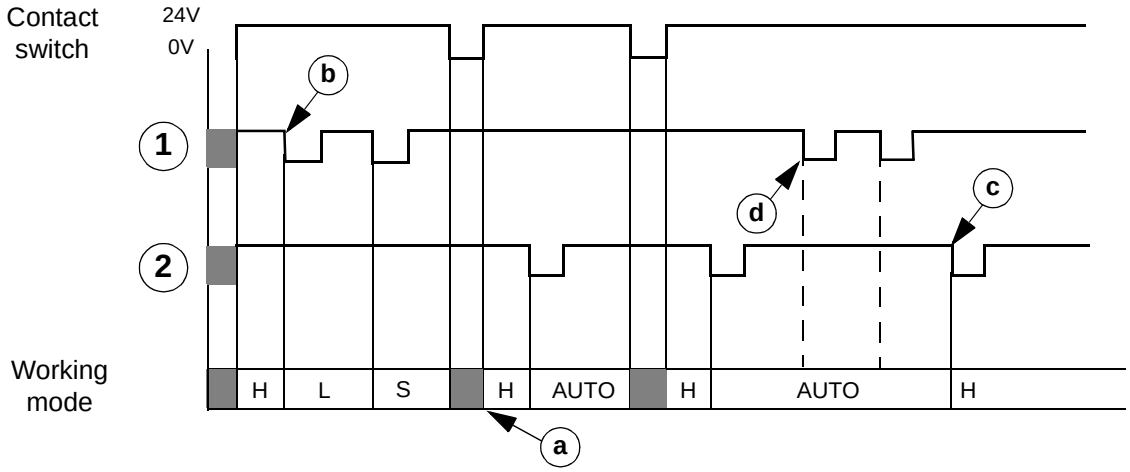
Working Mode Selection

1) Circuit configuration



CS00F505

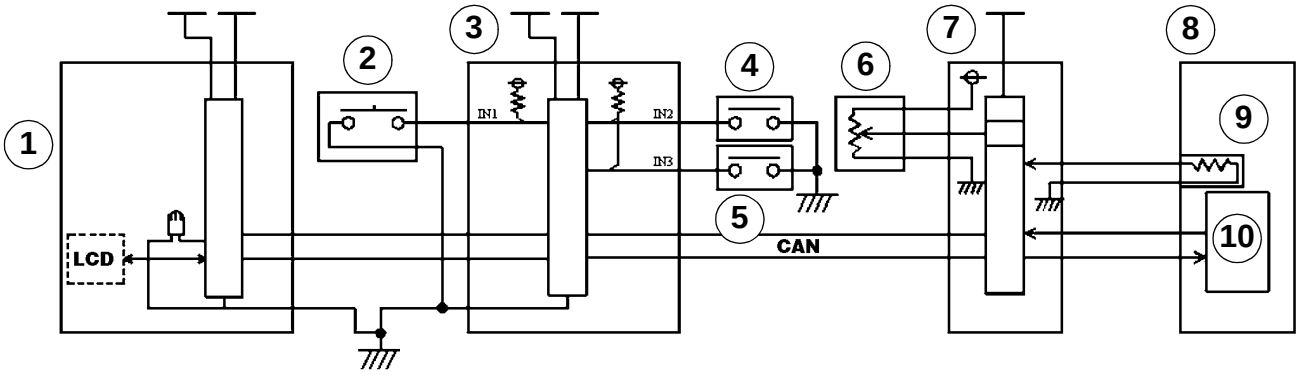
2) Timing diagram



1. Working mode switch
2. Automatic mode switch
3. Instrument panel
4. Main electronic control box
5. Proportioning valve
6. Engine electronic control box
7. Electronic acceleration
8. Engine
9. SERIES communication

Automatic Engine Warm-up

1) Circuit configuration



CS00F515

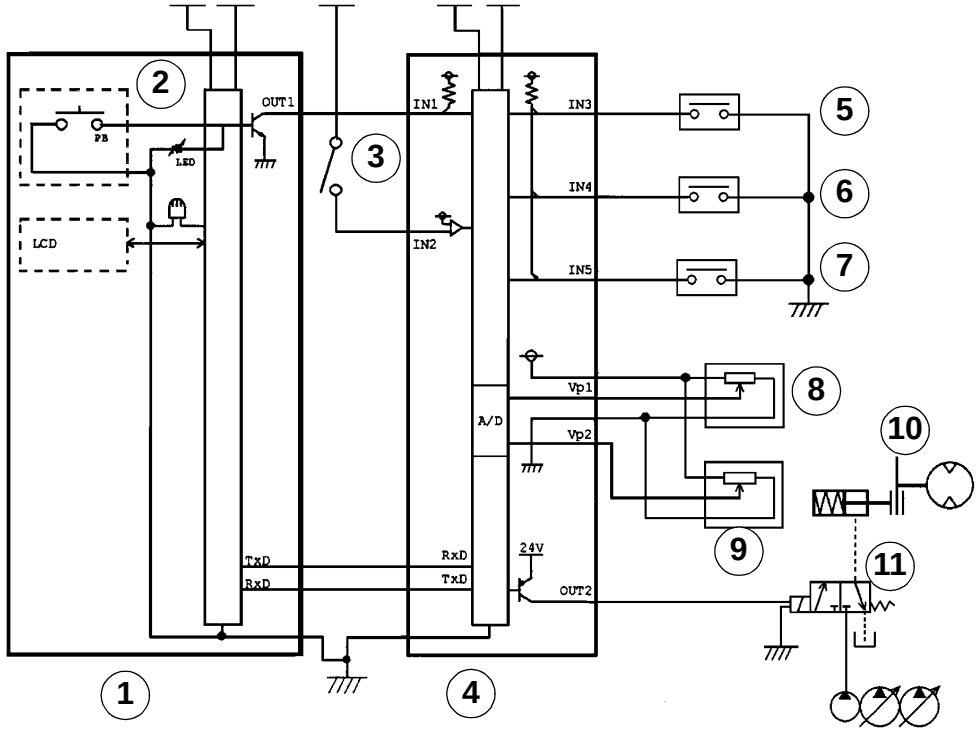
1. Instrument panel
2. Return to idle control
3. Main electronic control box
4. Pilot pressure switch
5. Travel pilot pressure switch
6. Engine throttle control
7. Engine electronic control box
8. Engine
9. Engine coolant temperature sending unit
10. Electronic acceleration

2) Operation

1. When the engine is started, if the coolant solution temperature is equal to or lower than 122°F, the main electronic control box (3) transmits an automatic engine warm-up signal to the engine electronic control box (7).
2. The engine electronic control box (7) manages the automatic engine warm-up.
3. Automatic engine warm-up conditions:
   - Coolant solution temperature (9) equal to or lower than 122°F.
   - Pilot pressure switch (4) and travel pilot pressure switch (5) not on.
   - Return to idle control (2), not on.
   - Position of engine throttle control (6), unchanged.
   - Engine speed not higher than 1800 rpm for 3 minutes.
4. If one of the above conditions is not present, the automatic engine warm-up does not operate. To perform the engine warm-up again, the engine has to be shut down and re-started.
5. When automatic engine warm-up is operating, "AUTO WARM UP" is displayed on the control screen (LCD).

Swing Brake

1) Circuit configuration



CS00F503

1. Instrument panel
2. Swing brake switch
3. Starter motor switch
4. Main electronic control box
5. Swing pilot pressure switch
6. Pilot pressure switch
7. Travel pressure switch
8. Pressure transducer P1
9. Pressure transducer P2
10. Swing brake
11. Swing brake solenoid valve

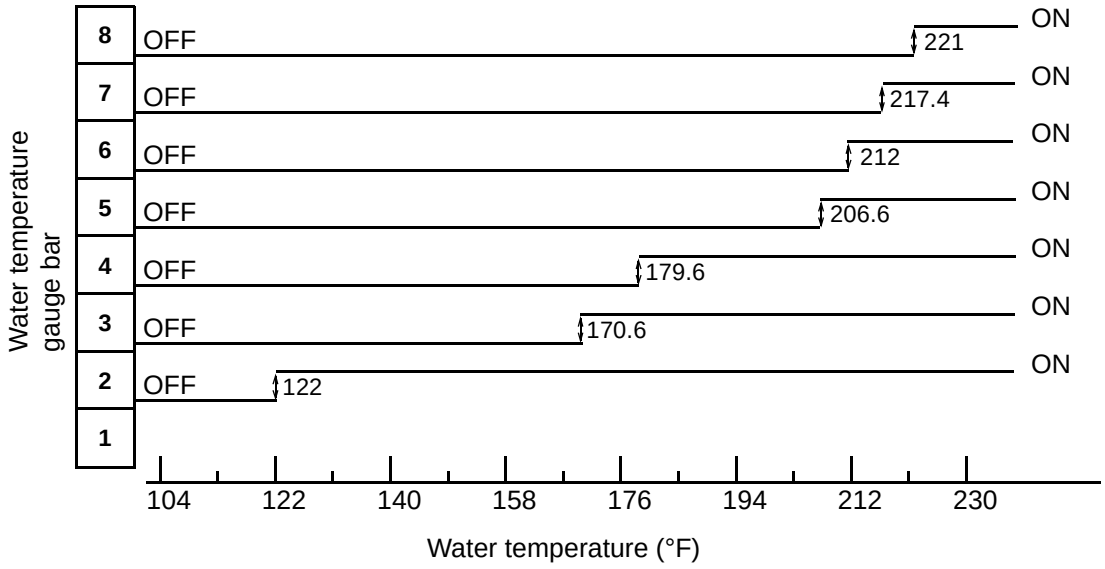
2) Swing brake control operation

When the swing brake switch (2) is operated, the red LED comes on and the swing brake locks.

When the swing brake switch is operated again, the red LED goes out, the swing brake unlocks and changes to automatic control (see paragraph 4).

While the swing is locked, the transistor OUT 2 output is activated and the swing brake (10) is locked.

The swing brake remains in the previous state even when the ignition is switched off.



2) Operation

A. The engine water temperature sending unit (5) sends a signal to the engine electronic control box (3).

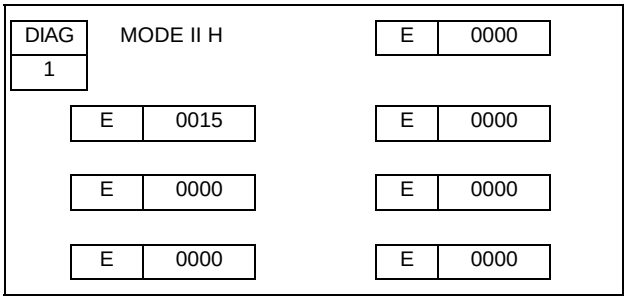
B. The engine electronic control box (3) sends the converted signal to the main electronic control box (2) via the CAN connection (8).

C. The main electronic control box (2) calculates the number of bars to display and transmits the information to the water temperature gauge (6) via the Series connection (7).

D. When the 8th bar on the water temperature gauge is displayed, the message “OVER HEAT” appears on the instrument panel control screen (1) and the audible warning device sounds.

Diagnostic Code

1. Detection of engine failures DIAG1



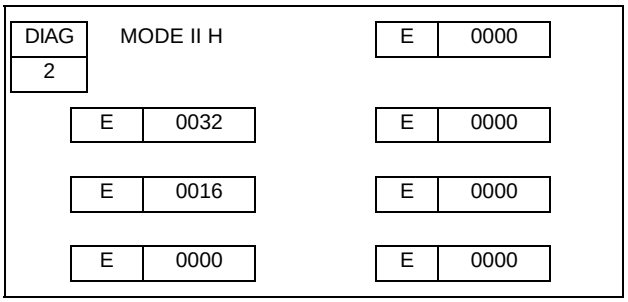
E: Failure code

Failure code

E0000: No defect
E0015: Engine water temperature sending unit
E0016: Fuel temperature sending unit
E0025: Fuel flow regulating resistance
E0031: Linear motor control circuit in electronic regulator
E0032: Electronic regulator rack position detector
E0041: Electronic regulator engine speed receiver
E0042: Engine speed detector

Example: In the screen above, there is a defect in the engine water temperature sender.

2. Previous failures in the engine DIAG2



E: Failure code

Example: The screen above shows that there is a defect in the electronic regulator rack position detector (0032) and in the fuel temperature detector (0016).

EXCAVATOR MODEL SELECTION PROCEDURE

The model of excavator is selected after reinitializing the machine code or replacing an electronic control box.

1. Starter key switch ON, the screen below appears and "?" for machine is selected:

MACHINE : SH [?] - 3	
TERRITORY : ? LANGUAGE : ?	
CONT. P / N	**KHR2668**

2. Press the travel mode switch until the required machine code is displayed.

MACHINE CODE	MACHINE MODEL
SH0120	130LX
SH0150	160LX
SH0180	Not used
SH0200	210LX
SH0220	240LX
SH0250	Not used
SH0300	Not used
SH0400	Not used
SH0800	Not used

MACHINE : SH0120- 3	
TERRITORY : ? LANGUAGE : ?	
CONT. P / N	**KHR2668**

3. Press the work mode switch. The screen below appears and "?" for territory is selected.

MACHINE : SH0120- 3	
TERRITORY : [?] LANGUAGE : ?	
CONT. P / N	**KHR2668**

4. Press the travel mode switch until the required destination code is displayed.

Destination code	destination	Pressure unit	T° unit
1	North America	psi	°F

5. Press the work mode switch. The screen below appears and "?" for language is selected.

MACHINE : SH0120- 3	
TERRITORY : 1 LANGUAGE : [?]	
CONT. P / N	**KHR2668**

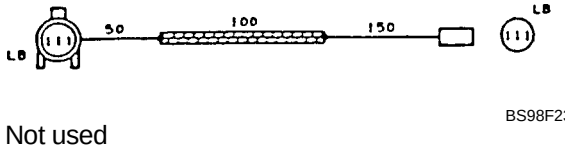
6. Press the travel mode switch to display the required language:
0 = Japanese
1 = English
2 = Thai
3 = Chinese
4 = German
5 = French
6 = Italian
7 = Spanish
8 = Portuguese
9 = Dutch
10 = Danish
11 = Norwegian
12 = Swedish
13 = Finnish
14 = Icons

MACHINE : SH0120- 3	
TERRITORY : 1 LANGUAGE : 1	
CONT. P / N	**KHR2668**

Example:

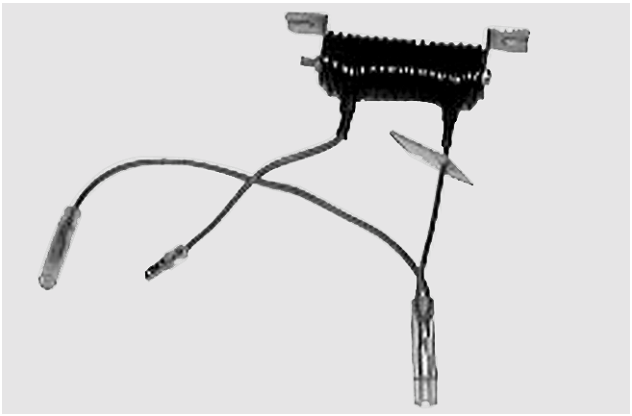
The screen above corresponds to a 130LX model excavator for North America in English.

Troubleshooting	Cause	Action
1. The 8 bars on the coolant temperature bar-graph are displayed. Starter key switch ON The temperature of the temperature sending unit (coolant) is abnormal compared to maintenance assistance CHK1 (comparison between the real temperature and the indicated temperature). See coolant temperature on CHK1 WT. Measure the real temperature YES Check problem code E0015 for the coolant temperature sending unit with the maintenance diagnostic (DIAG 1) YES Disconnect the coolant temperature sending unit connector to measure the resistance NO	Coolant temperature sending unit defective	Change the temperature sending unit
YES Disconnect connectors CN24 and CNAO to measure the resistance between the female terminals PL and BP. (Refer to the table below for the resistances). NO	Bad connection on the temperature sending unit connector (coolant)	Clean the temperature sending unit connecting terminal
YES Disconnect connectors CN7 and CNAO to measure the resistance between the female terminals PL and BP. (Refer to the table below for the resistances). NO	Bad connections on CN24	Clean connections CN24
YES	Main electronic control box defective or bad CN7 and CNAO connections	Change main electronic control box or clean the connecting terminals on CN7 and CNAO
Note: In the event of a short-circuit, the bar-graph disappears completely.		



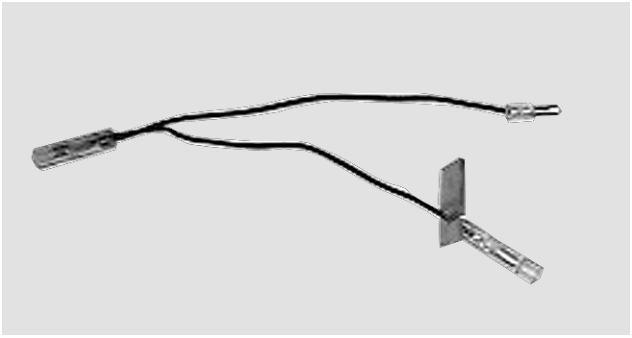
BS98F232

12. Not used



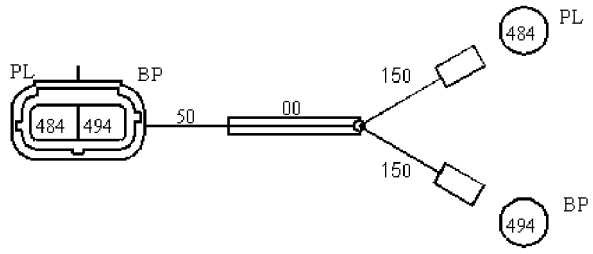
CD00N018

13. Not used



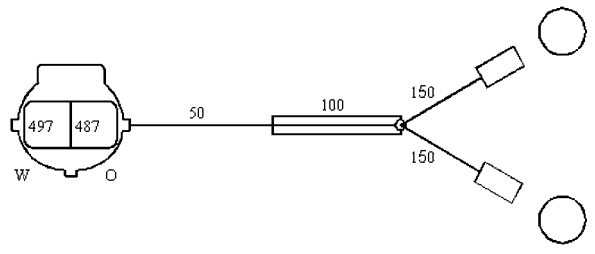
CD00N019

14. Not used



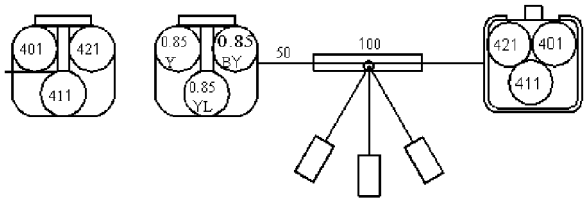
CS00E531

15. For hydraulic oil temperature and engine coolant temperature senders



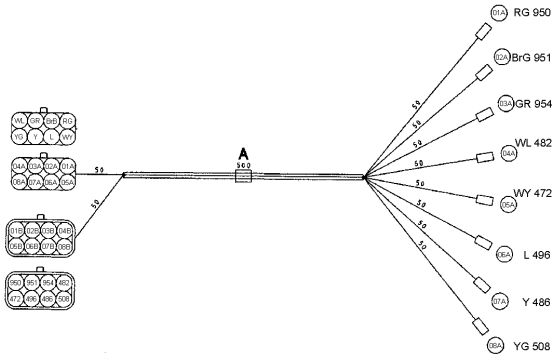
CS00E530

16. For engine speed detector



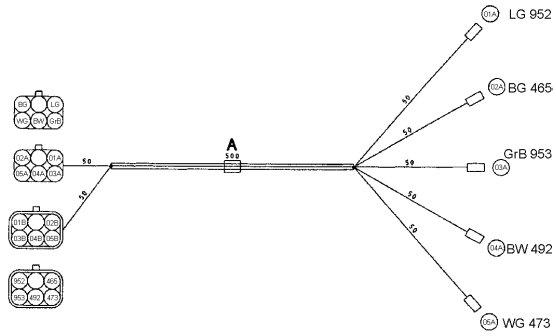
CS00E532

17. For pressure transducer



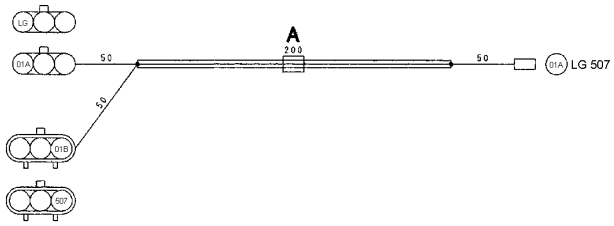
CS00J512

18. For engine governer (RED4)



CS00J513

19. For engine governer (RED4)



CS00J514

20. For engine governer (RED4)

INSPECTING THE BATTERY

NOTE: *To carry out a correct inspection of the battery, carry out each step of the inspection; this will enable you to find out the real condition of the battery.*

Visual checks

- Check cable connections are clean and correctly tightened. Remove all foreign bodies from the top of the battery.
- Check there is no damage to the battery housing, terminals and cables.
- Check the electrolyte level, see page 4.
- If you have added water to the battery, charge the battery for 15 minutes at between 15 and 25 amps to allow the water to mix correctly with the electrolyte.

Checking the specific gravity

Use an acid hydrometer to check the specific gravity of the electrolyte. The specific gravity shows the charge level in each cell.

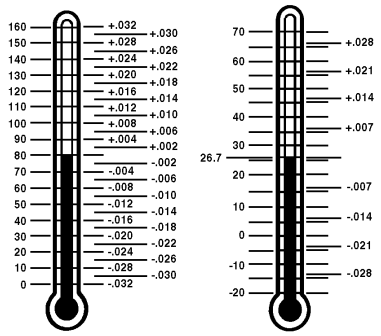
Acid hydrometers are designed to show the correct specific gravity when the electrolyte is at a temperature of 80°F (26.7°C).

Before checking the specific gravity, check the temperature of the electrolyte. If the hydrometer does not have a thermometer, use a thermometer to measure the temperature of the electrolyte. The thermometer must be graduated to at least 120°F (52°C).

1. Remove enough electrolyte from each cell to allow the float to move freely in the tube.

NOTE: *If it is not possible to check the specific gravity without first adding water to each cell, charge the battery for 15 minutes at between 15 and 25 amps to allow the water to mix correctly with the electrolyte. Then check the specific gravity.*

2. Read the float.
3. Read the thermometer if the reading is higher than 80°F (26.7°C), add specific gravity points to the reading to obtain the specific gravity. If the reading is lower than 80°F (26.7°C), subtract specific gravity points from the reading to obtain the specific gravity. See the illustration below and add or subtract specific gravity points as required.



1. Temperature in °F. 2. Temperature in °C.

JS00532A

4. Record the corrected specific gravity for each cell.
5. If the difference between the high and low readings is minimum 0.050, charge the battery and check the specific gravity again. If, after charging, the difference is still minimum 0.050, install a new battery.

NOTE: *When the battery is changed, do not install a used battery with a new battery. That would reduce the life-time of the new battery.*

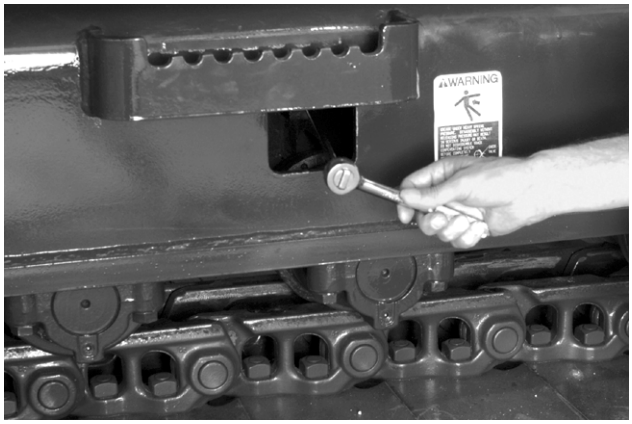
Section

5001

REMOVAL AND INSTALLATION OF THE TRACKS SET

STEP 5

Do the following procedure to decrease the track tension:



JD00273A

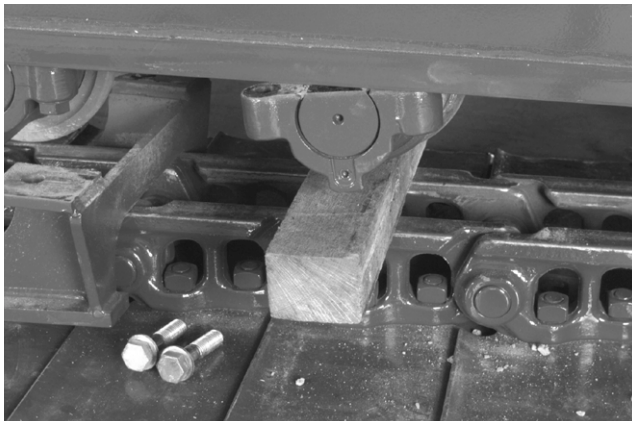
1. Do not remove the non-return check valve. Grease in the track tension cylinder is under high pressure. Release the track by gradually loosening the non-return check valve by about two turns, the grease escapes from a port in the check valve thread.

> **WARNING:** *Grease is under havy spring pressure. Disassembly without releasing pressure may result in serious injury or death. Do not disassemble the track compensating system before completely releasing the grease pressure. Release grease pressure by loosening check valve. Do not remove the non-return check valve or retaining bracket.*

2. When the track tension is correct, tighten the check valve.
3. Clean the grease from the check valve.

Installation

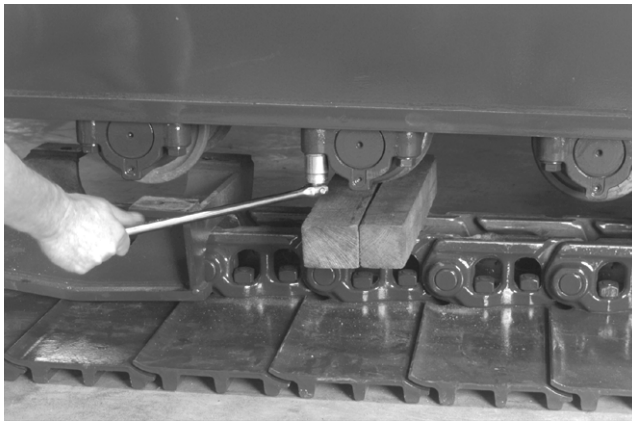
STEP 1



JD00316A

Align the lower roller in position under the lower undercarriage.

STEP 2



JD00299A

Apply Loctite 262 to the threads of the four screws. Assemble the four hardened washers and the screws.

STEP 3

Tighten the four retaining screws of the lower roller end caps to the torque (see specifications). Remove the wood blocks.

STEP 4

At each end of the track, remove the wood blocks from beneath the track. Remove the two supports from beneath the machine.

STEP 5

Refer to "Adjusting track tension", see section 5001.

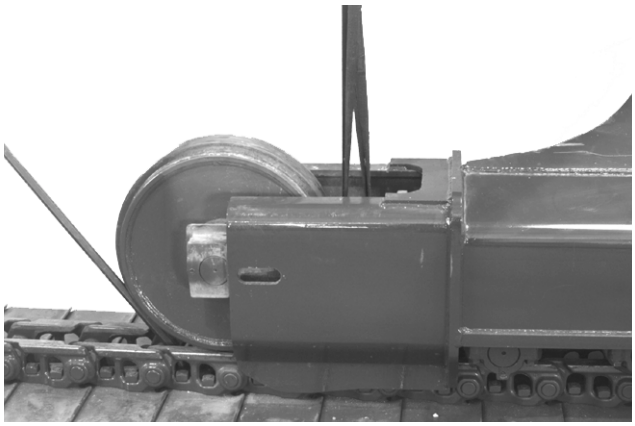
Section

5004

SPROCKET

5004

STEP 5



JD00365A

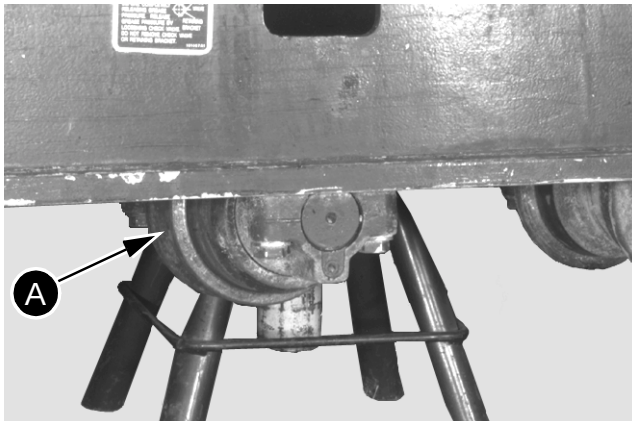
Raise the assembly and slide it into the undercarriage, with the help of a crowbar. Remove the lifting equipment.

STEP 6

See "Removing and installing a set of tracks", (section 5001), for installing the track.

Removal

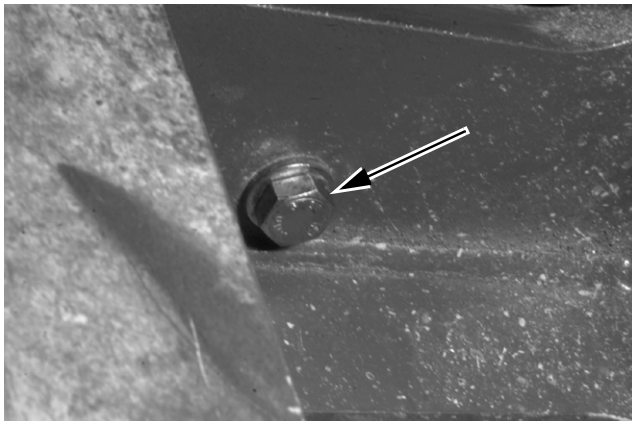
STEP 1



JD01080A

See Section 5003 "Removing the lower roller" and remove the roller (A) located under the track tension cylinder.

STEP 2



JD01081A

> **WARNING:** *Do not allow any part of your body to pass under the tension cylinder. You could be seriously injured by the tension cylinder falling, when the screws are removed which fasten it to the machine.*

Loosen the tension cylinder non-return check valve. Place wooden blocks under the tension cylinder to prevent it falling off the machine when the two screws which attach it to the machine are removed. Remove the two screws and the flat washers (2).

STEP 3

JD01082A

Using a crowbar, push the track tension cylinder piston rod into the cylinder barrel. The grease will flow out of the non-return check valve. Remove the track tension cylinder from the machine.

Disassembly

STEP 1

Using a suitable cleaning solvent and clean cloths, remove impurities and grease from the outside of the track tension cylinder.

STEP 2

Remove the two screws (3) and the locking washers (4). Remove the bracket (5).

STEP 3

Remove the grease fitting (6) from the non-return check valve.

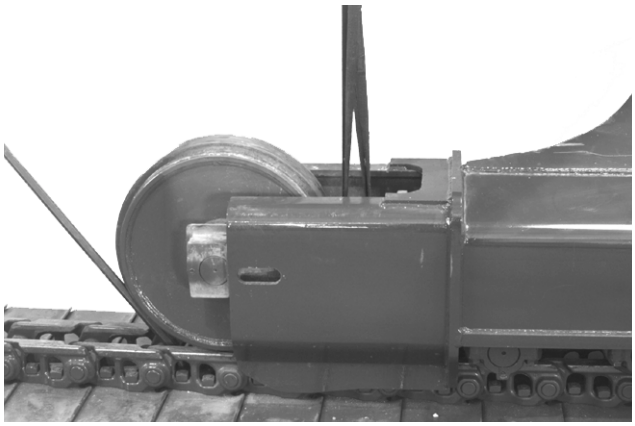
STEP 4

Remove the non-return check valve from the cylinder barrel (15).

STEP 5

If necessary, disassemble the non-return check valve by removing the poppet (7), spring (8) and the ball (9) from the non-return check valve (10).

STEP 5



JD00365A

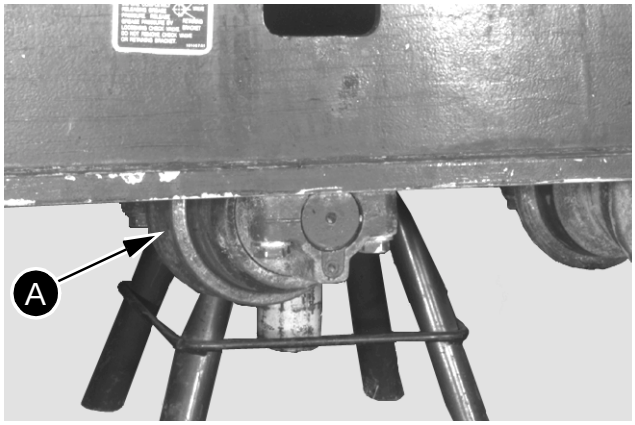
Raise the assembly and slide it into the undercarriage, with the help of a crowbar. Remove the lifting equipment.

STEP 6

See "Removing and installing a set of tracks", (section 5001), for installing the track.

Removal

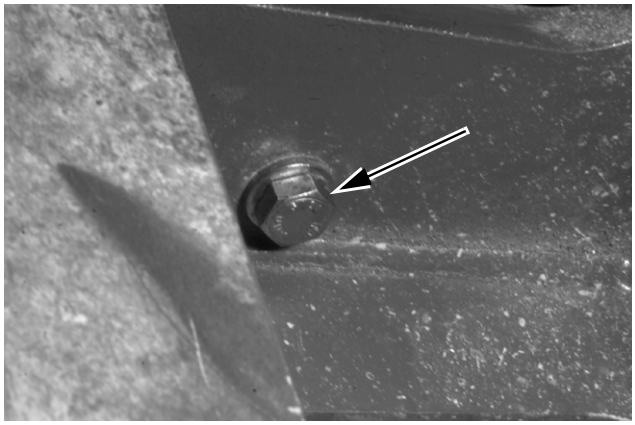
STEP 1



JD01080A

See Section 5003 "Removing the lower roller" and remove the roller (A) located under the track tension cylinder.

STEP 2



JD01081A

> **WARNING:** *Do not allow any part of your body to pass under the tension cylinder. You could be seriously injured by the tension cylinder falling, when the screws are removed which fasten it to the machine.*

Loosen the tension cylinder non-return check valve. Place wooden blocks under the tension cylinder to prevent it falling off the machine when the two screws which attach it to the machine are removed. Remove the two screws and the flat washers (2).

STEP 3

JD01082A

Using a crowbar, push the track tension cylinder piston rod into the cylinder barrel. The grease will flow out of the non-return check valve. Remove the track tension cylinder from the machine.

Disassembly

STEP 1

Using a suitable cleaning solvent and clean cloths, remove impurities and grease from the outside of the track tension cylinder.

STEP 2

Remove the two screws (3) and the locking washers (4). Remove the bracket (5).

STEP 3

Remove the grease fitting (6) from the non-return check valve.

STEP 4

Remove the non-return check valve from the cylinder barrel (15).

STEP 5

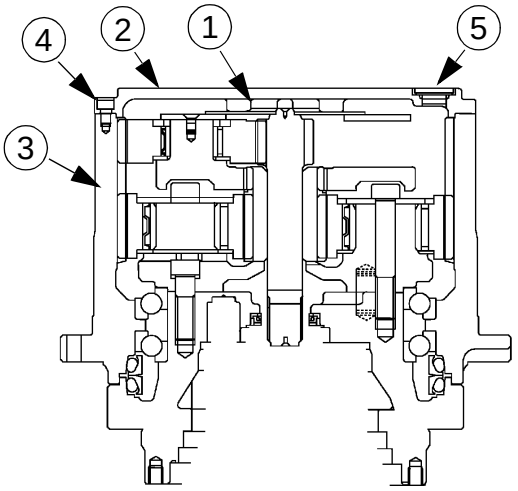
If necessary, disassemble the non-return check valve by removing the poppet (7), spring (8) and the ball (9) from the non-return check valve (10).

Section

6002

DISASSEMBLY AND ASSEMBLY OF
THE TRAVEL MOTOR/REDUCTION GEAR ASSEMBLY

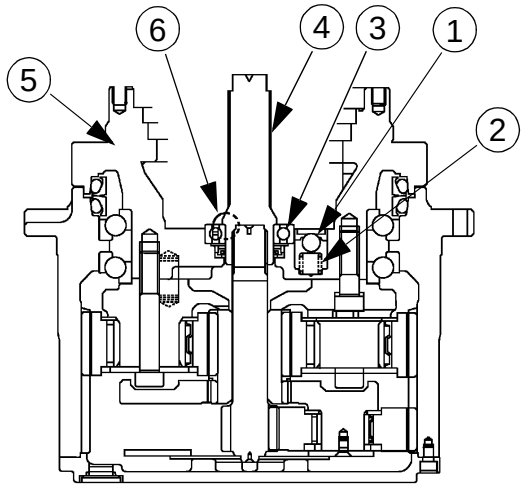
STEP 9



CI00G516

Position the shim(s) (1) calculated in step 8. Coat the face of the cover seal (2) with Loctite 504. Position the cover (2) on the hub (3) in accordance with the marks made on disassembly. Assemble and tighten the screws (4) to torque. Assemble and tighten the plugs (5) to torque. Turn the reduction gear the other way up.

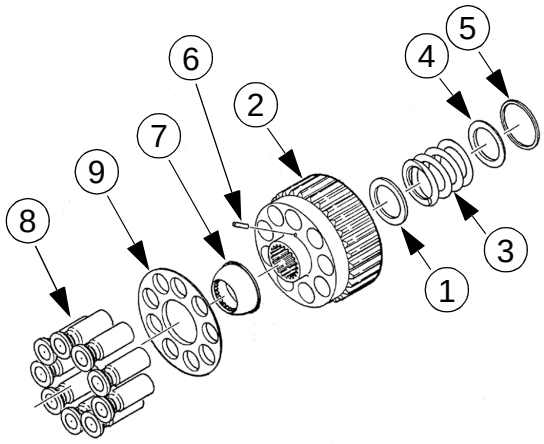
STEP 10



CI00G515

Oil the parts before assembling them. Assemble the pistons (1) complete with springs (2). Assemble the ball bearing (3) on the shaft (4) using a press. Assemble the shaft (4) complete with bearing (3) in the body (5) using a plastic mallet. Grease and position the balls (6).

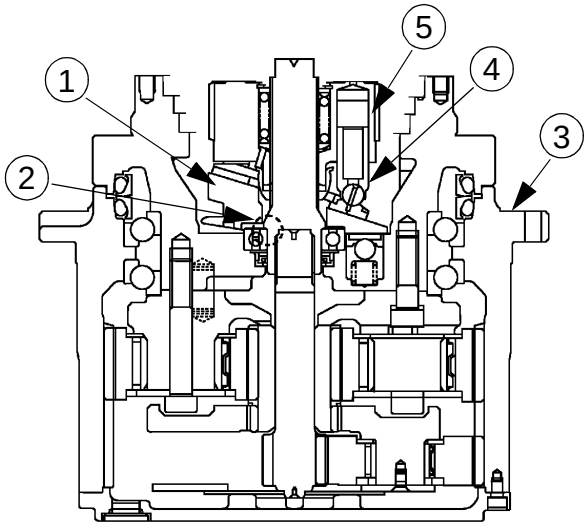
STEP 11



CI00G530

Position the spring stop (1) with the chamfer orientated towards the barrel (2). Assemble the spring (3), the shim (4) and the spring ring (5) using a press. Oil and assemble the push-rods (6) in the cylinder block (2). Assemble the spherical bushing (7) on the cylinder block (2). Oil and assemble the pistons (8) on the thrust plate (9). Assemble all the pistons (8) and the plate (9) in the cylinder block (identification marks made before disassembly).

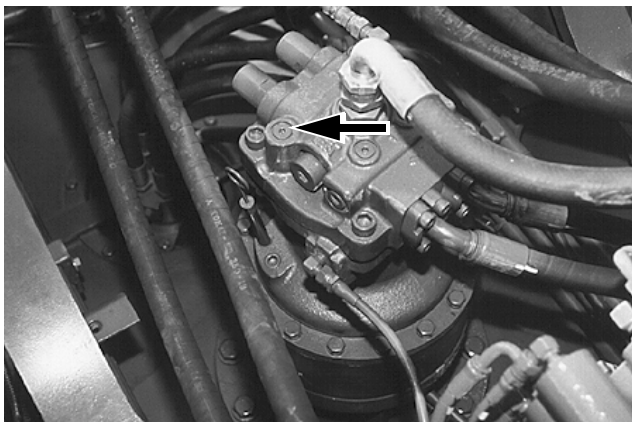
STEP 12



CI00G511

Oil and assemble the piston face plate (1) on the balls (2). Tilt the reduction gear (3). Hold the pistons (4) in the barrel (5) and position the whole assembly on the reduction gear (3) taking care not to drop the piston face plate (1) or the balls (2).

STEP 16



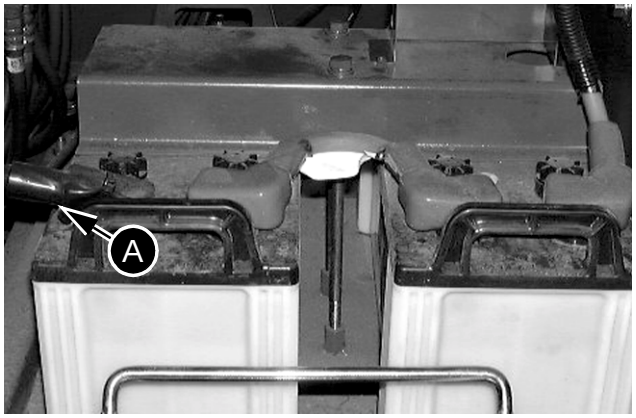
CP99A021

Remove the plug on the top of the swing motor. Fill the swing motor with hydraulic fluid via the plug orifice until the fluid starts to spill over. Then install the plug.

STEP 17

Stop and disconnect the vacuum pump from the hydraulic sump tank (see Section 8000).

STEP 18



CD00F091

Connect the ground cable (-) (A) to the battery.

STEP 19

See Section 8001 and adjust the swing motor safety valves.

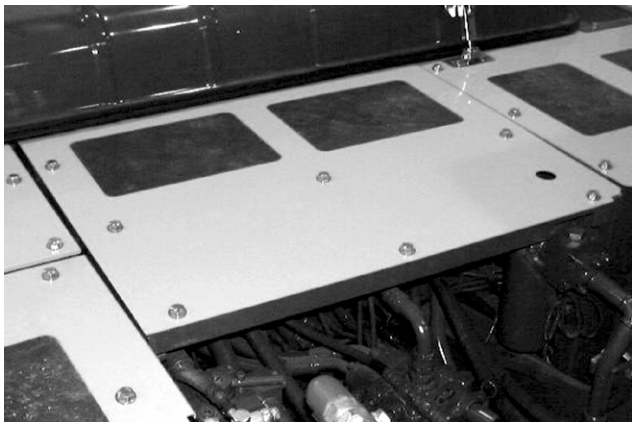
STEP 20

CD00F093

Install the central frame (1).

NOTE: *Tighten the screws to a torque of between 70 and 80 lb-ft (88 and 107 Nm) (apply Loctite 262 to the threads).*

STEP 21



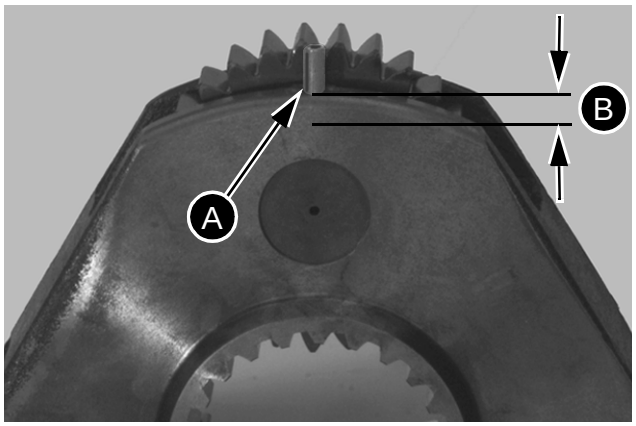
CD00F092

Install the upper access panel (1).

NOTE: *Tighten the screws to a torque of between 70 and 80 lb-ft (88 and 107 Nm) (apply Loctite 262 to the threads).*

NOTE: *Before operating the machine, start the engine, check the system for leaks and check the level of hydraulic fluid in the tank, top up if necessary.*

STEP 4



6003-107

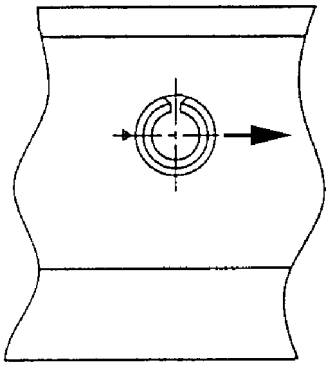
Install a new pin (A) in the shaft using a suitable tool.

Recess dimension in the plane wheel carrier:
B = 0.039in (1 mm).

Hammer by two awl strokes.

STEP 5

Position the pins in the second stage planet wheel carrier.

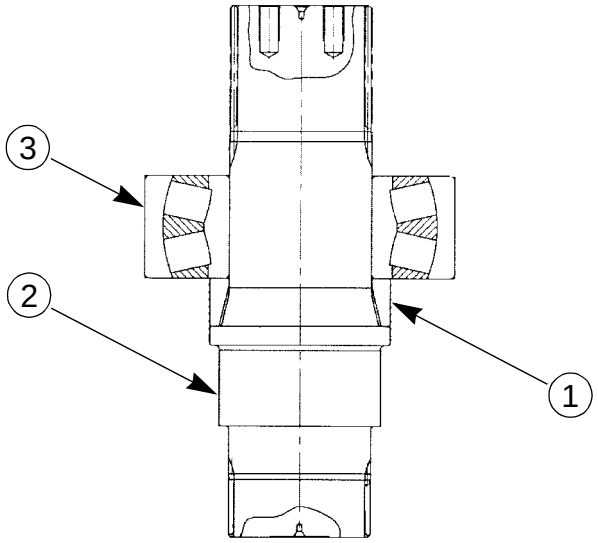


CS00K512

Boom: direction of rotation.

STEP 6

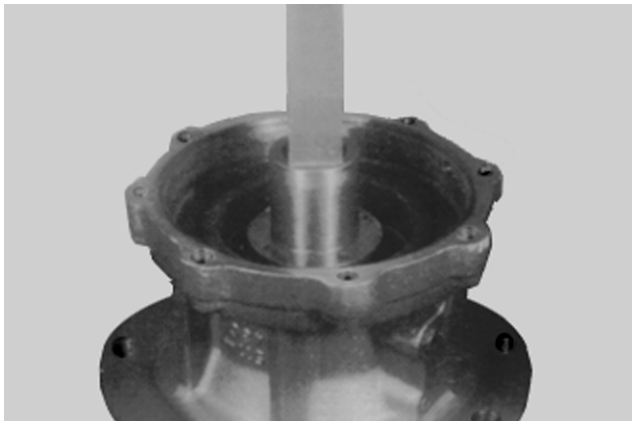
> **WARNING:** *Take precautions (gloves), risk of burns.*



CS00K513

Install the spacer (1) on the shaft (2). Heat the bearing (3) to 122°F (50°C) above the ambient temperature. Assemble the hot bearing on the shaft (2), use protective gloves.

STEP 7



JD00465A

Degrease the reduction gear housing and apply Loctite 504. Fix the reduction gear housing in a press, install the lip seal in the reduction gear housing. Lubricate the lip seal with No. 2 EP lithium grease. Assemble the bearing on the reduction gear side.

CLEANING THE HYDRAULIC SYSTEM

General

Contamination of the hydraulic system is a major cause of incorrect operation of hydraulic components. Contamination manifests itself by the presence of foreign bodies in the hydraulic fluid. Contamination of the hydraulic system can occur in any of the following situations:

1. When draining fluid or disconnecting a hydraulic line.

2. When disassembling a component.

3. Due to normal component wear.

4. Due to damaged or worn seals.

5. Due to a damaged component in the hydraulic system.

All hydraulic systems can still operate even when slightly contaminated. Components of the hydraulic system are designed to withstand a slight degree of contamination. Any increase in the degree of contamination causes serious problems in the hydraulic system.

Here is a non-exhaustive list of these problems:

1. Cylinder rod seals leak.

2. Control valve spools do not return to the neutral position.

3. Control valve spools are hard to move.

4. Hydraulic fluid is too hot.

5. Hydraulic components wear quickly.

6. Safety valves or non-return check valves do not close, due to contamination.

7. Repaired components soon fail again.

8. Cycles are slow; the machine does not have enough power.

If one of the above situations occurs, it shows excessive contamination of the hydraulic system. To eliminate this contamination effectively, use the portable filter CAS 10162A.

Types of contamination

Contamination exists basically in two forms: microscopic or visible.

1. We speak of microscopic contamination when very small particles of foreign bodies are in suspension in the hydraulic fluid. These particles are too small to be seen or felt. Microscopic contamination can be identified by the problems connected with microscopic contamination or by tests in the laboratory. Here are a few examples of the problems caused by microscopic contamination:

   A. Cylinder rod seals leak.

   B. Control valve spools do not return to the neutral position.

   C. The hydraulic system working temperature is high.

   D. Components wear quickly.

2. We speak of visible contamination when the presence of foreign bodies can be detected visually or by touch or smell. Visible contamination can cause a sudden failure of a component. Here are a few examples of problems caused by visible contamination:

   A. The fluid contains metal or other debris.

   B. The fluid contains air.

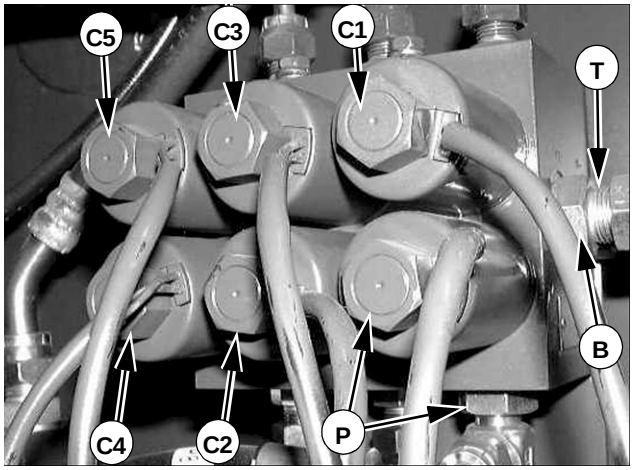
   C. The fluid is dark and thick.

   D. The fluid smells burnt.

   E. The fluid contains water.

6 Solenoid Valve Manifold

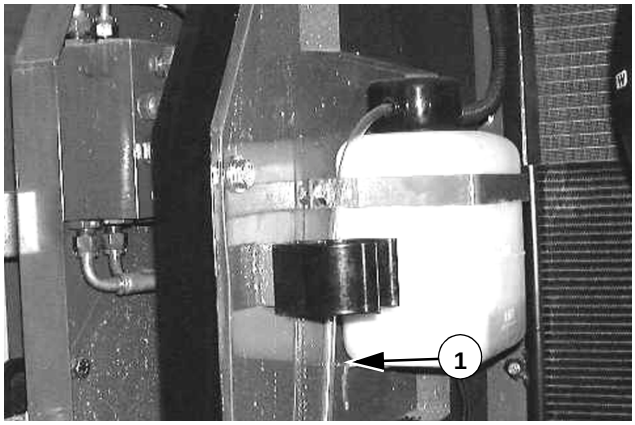
Port	Description
B	Supply to pilot manifold
T	Return to reservoir
C1	Select 2nd travel speed
C2	Swing brake control
C3	Higher pressure - 2-stage relief
C4	Cancel pilot system attachment cushion
C5	Cancel swing piloting
P	Pilot pressure cancellation control



CD00E143

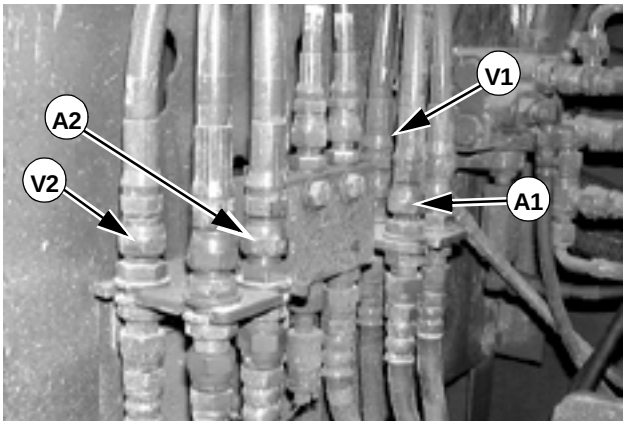
Control pattern modification

The modification consists of reversing the boom controls (raise/lower) on the right-hand control lever with the arm controls (extend/retract on the left-hand control arm).



CD01A002

Remove the mounting screws (see arrows) and move the plate (1) to gain access to the hoses.



CD01A003

Invert the V2 hose with the A2 hose and the V1 hose with the A1 hose. Put the plate back in place and tighten the mounting screws.

Pressure settings
5555 to 5630 psi

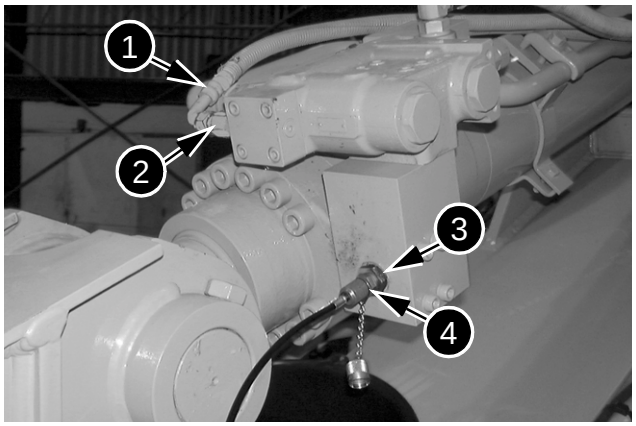
If the value is not correct, loosen the lock nut (8) and turn the screw (9) in order to adjust the pressure while turning the boom lowering control. Tighten to increase, loosen to decrease the pressure. Tighten again the lock nut (8). Shut down the engine. To decompress the large chamber cylinder, first reconnect the pilot hose (6). Start the engine in order to fill the accumulator. Shut down the engine. Decompress the hydraulic system. Remove the union plug (3). Disconnect the mail coupling joint and the union (2). Reconnect the balancing hose (1).

Checking and setting the right-hand side

Carry out the same operations as those on the right-hand side. The difference between the two valves should be less than 5 bar.

Secondary relief valves of the dipper safety valves (D1)

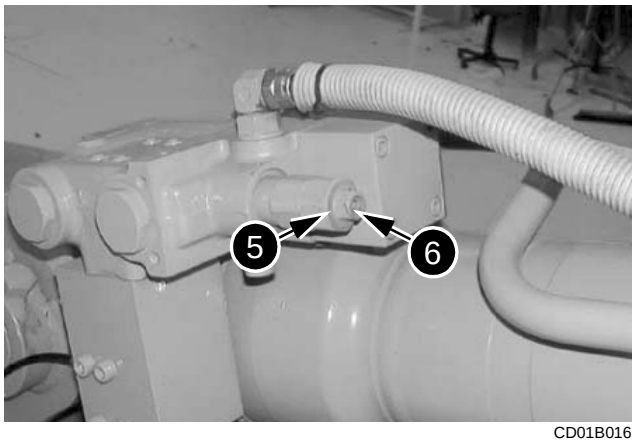
Checking and setting



CD01B017

Disconnect and plug the pilot hose (1). Put a receptacle under the union (2) to collect possible leaks. Remove the plug (3) and install a pressure detector union (4) (location 21G). Connect a 0-8000 psi pressure gauge to the pressure detector (4). Start the engine. Set the rotational velocity to 1000 rpm using the potentionmeter on the instrument panel. Lower the boom to half-height. Operate the dipper retracting control and raise the pressure settings of the valve. Repeat the operation several times while raingin the pressure each time.

Pressure settings
5555 to 5630 psi



CD01B016

If the value is not correct, loosen the lock nut (5) and turn the setting screw (6) in order to adjust the pressure. Tighten to increase, loosen to reduce the pressure. While turning the dipper retracting control, tighten the lock nut again (5). Shut down the engine. To decompress the small chamber dipper cylinder, first reconnect the pilot hose (1). Start the engine in order to fill the accumulator. Shut down the engine. Decompress the hydraulic system. Disconnect the pressure detector union (4). Fit the plug again (3).

Not Possible to Select Cushion Attachment System

No.	Tests	Results	Repairs
1	Check on diagnostic screen "CHK3" if information displayed changes to "ON" when cushion attachment is selected/deselected	Information stays on "OFF"	Check the signal at the electronic box input: Below 5 volts: change the control box 5 volts: change the electronic box
2	Check the pilot pressure at the cushion attachment solenoid valve (C4)	Pressure too low	Check the electrical supply and the solenoid valve coil (Nos. 3 and 4)
		Pressure correct (565 psi)	Repair or change the cushion attachment valve
3	Check the voltage at the electrical plug on the cushion attachment solenoid valve	Voltage < 24 V	Check the electrical harness
4	Check the cushion attachment solenoid valve coil	Infinite or 0 Ohm	Change the solenoid valve
		About 40 Ohm	Change the solenoid valve coil

The Boom or the Arm Does Not Lower

(No problems with other movements)

No.	Tests	Results	Repairs
1	Manually check the movement of the pilot spool	Difficult to move	Spool stuck or spring broken
2	Check the load holding operation	Sticking	Repair or change the load holding valve
3	Check the pilot pressure at the control valve spool	Pressure below 435 psi	Check the operation of the control lever spool, change or repair

SPECIFICATIONS

Filling capacity of the hydraulic sump tank	See Section 1002
Total capacity of the hydraulic system	See Section 1002
Hydraulic oil	See Section 1002
Weight	See Section 1002

SPECIAL TORQUE SETTINGS

Screw for fixing the hydraulic pump flange to the engine hand-wheel crankcase	See Section 1002
Screw for fixing the hydraulic sump tank cover	2 to 3.6 lb-ft (2.9 to 4.9 Nm)
Nuts for tightening the silencer retaining collars	29 lb-ft (39 Nm)
Screw for fixing the silencer bracket to the motor	47 to 55 lb-ft (64 to 74 Nm)
Dowel blocks retaining screw	151 to 166 lb-ft (205 to 225 Nm)
Splined sleeve locking screw	71 to 72 lb-ft (96 to 98 Nm)

Section

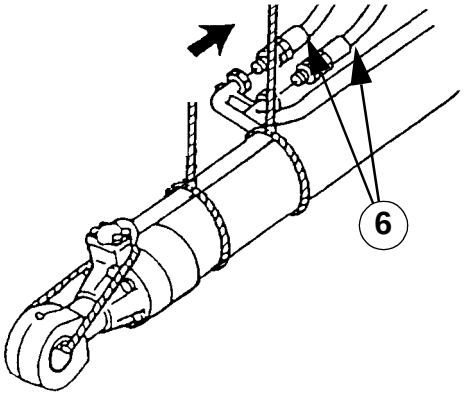
8004

REMOVAL AND INSTALLATION
OF THE MAIN HYDRAULIC CONTROL VALVE

STEP 6

Start the vacuum pump.

STEP 7

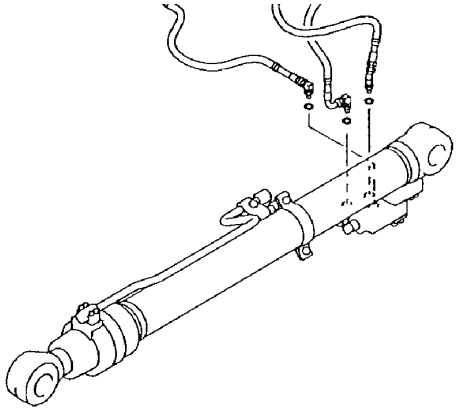


JS00582A

Disconnect the hydraulic supply hoses (6) from the boom cylinder.

STEP 8

(Only if the machine is equipped with cylinder safety valves)



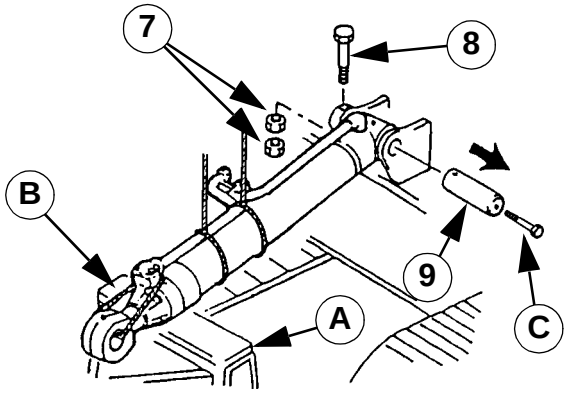
CS00G501

Disconnect the safety valve piloting hydraulic hoses and disconnect the harness from the pressure detector.

STEP 9

Plug the hoses with plugs and the unions with caps. Stop the vacuum pump.

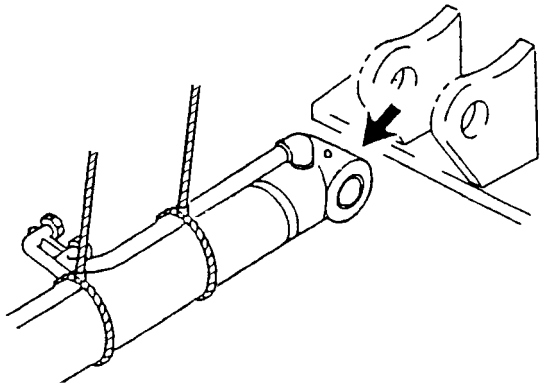
STEP 10



JS00583A

Remove the nuts (7) from the screw (8). Remove the screw from the pin (9). Install a suitable screw (C) in the threaded orifice in the pin. Use a suitable sliding hammer fastened to the screw to remove the pin. Unscrew the screw from the pin.

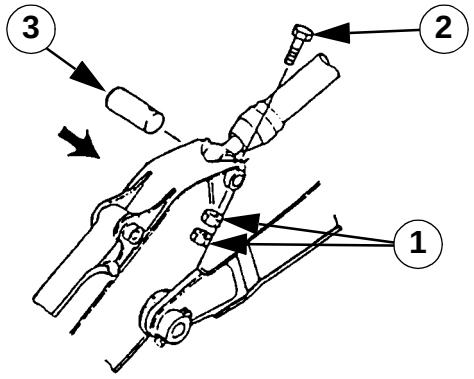
STEP 11



JS00584A

Carefully raise the boom cylinder and move it away from the machine. Place the boom cylinder on suitable stands. Remove the strap which was holding the cylinder rod to the cylinder barrel.

STEP 10



JS00607A

Install the pin (3) and the screw (2). Using a set of feeler gauges, check that there is a clearance of 0.019 to 0.118 inch (0.5 to 3 mm) between the mounting bracket and the cylinder rod mounting eye. If necessary, remove the screw and the pin and add one or more shims as required to obtain the correct clearance. Install the pin and the screw. Install the first nut (1) on the screw and tighten until the nut touches the boss. Loosen the nut a quarter of a turn and, using two wrenches, install the second nut (1) to lock the first nut in position. Remove the sling from the arm cylinder.

STEP 11

Remove the vacuum pump and bleed the air from the arm cylinder (see Section 8000).

STEP 12

Check the level of hydraulic fluid in the hydraulic sump tank. Add oil as required.

STEP 13

Lubricate the linkages.

Section

8007

REMOVAL AND INSTALLATION OF THE PILOT FUNCTION BLOCKS

Swing shuttle block

Removal and installation

NOTE: *Refer to page 3 and carry out steps 1 to 4.*

STEP 1

To make installation easier, attach identification tags to all hydraulic hoses and electrical connections of the shuttle block.

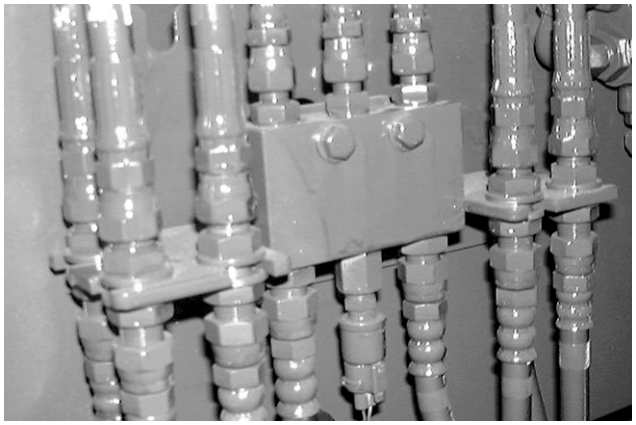
STEP 2

Start the vacuum pump.

STEP 3

Provide for a container to recover any possible hydraulic fluid leaks.

STEP 4



CD00G166

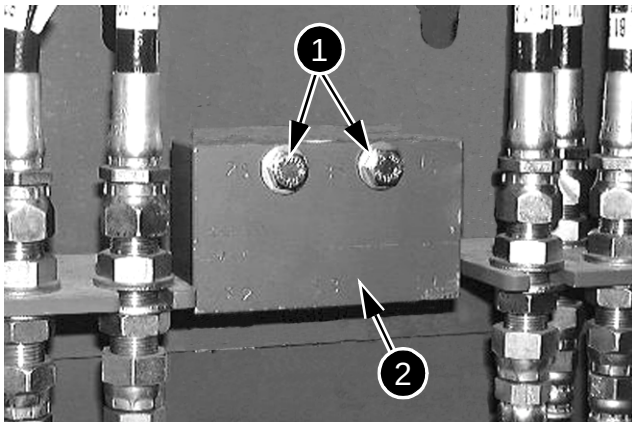
Remove and seal the hydraulic hoses (1), remove the pressure detector (2), remove the junction unions (3), put plugs on the ports of the shuttle block, then discard the O-rings.

NOTE: *When installing, replace all O-rings with new O-rings.*

STEP 5

Shut off the vacuum pump.

STEP 6

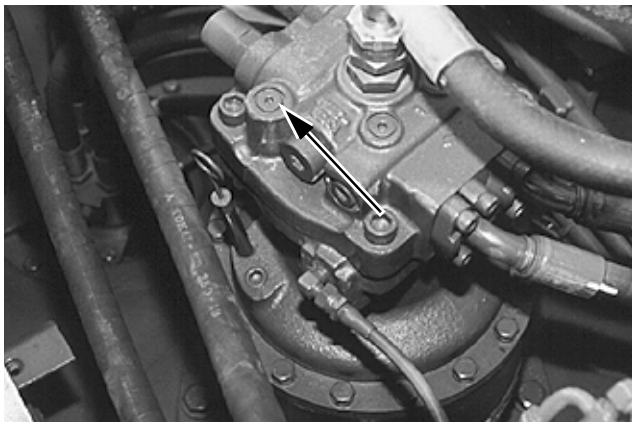


CD00G064

Remove the screws (1), then remove the shuttle block (2) from its bracket.

NOTE: *When installing, proceed in the reverse order to that of removal. Start the engine, operate the control levers, stop the engine, check the circuit for leaks and the hydraulic oil level in the reservoir, add oil if necessary.*

STEP 15



CP93A021

Remove the plug from the top of the swing motor. Fill the swing motor with hydraulic fluid via the plug orifice until the fluid starts to overflow. Then install the plug.

STEP 16

See Section 8001 and adjust the swing motor secondary relief valves.

NOTE: *Before operating the machine, start the engine, check the system for leaks and check the fluid level in the hydraulic sump tank, add oil if necessary.*

SPECIAL TORQUE SETTINGS

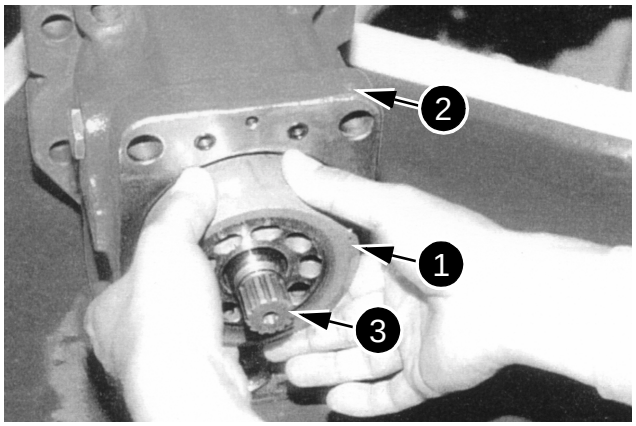
Cover retaining screws ..... 21.5 lb-ft (29 Nm)
Body retaining screws ..... 318 lb-ft (431 Nm)
Power take-off housing retaining screws ..... 24.5 lb-ft (33.3 Nm)
Control unit retaining screws ..... 21.5 lb-ft (29.4 Nm)

WEAR INSPECTION

Description of parts	Pump K3V112 DTP Standard dimension/ maximum dimension (in)	Action
Play between the piston and the cylinder bore	0.0015 / 0.0026	Replace the cylinder assembly
Play at the shoe piston and the guide	0-0.0039 / 0.011	Replace the piston or the plate assembly
Shoe thickness	0.19 / 0.18	Replace the pistons
Free height of cylinder springs	1.61 / 1.59	Replace the springs
Height of the base plate and the spherical bushing	0.47 / 0.43	Replace the base plate and the spherical bushing

Overhaul dimension of the cylinder, the distribution machined plate and the swash plate (machined surface)		
Distribution machined plate (sliding contact surface) Swash plate (at the plate) Cylinder (sliding contact surface) Irregularity of each surface	Standard roughness after grinding (in)	0.0039 RA or less
	Roughness of the surface at the wear limit (in)	0.031 RA

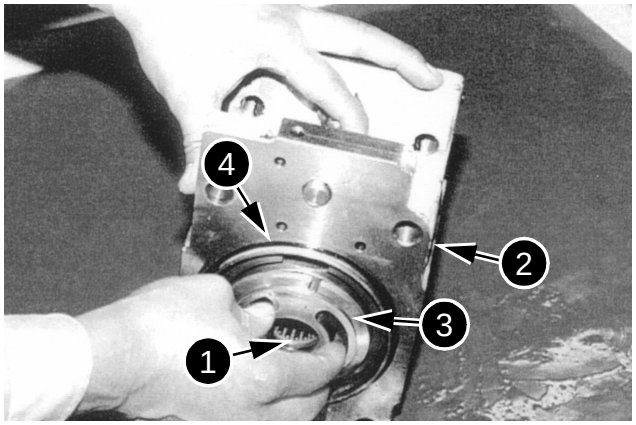
STEP 8



CD01G117

Install the springs, the spherical bushing, the pistons complete with the thrust ring on the cylinder block. Install the piston plate on the swash plate. Install the cylinder block assembly (1) in the housing (2) by engaging the splines of the spherical bushing and the cylinder block on the shaft (3).

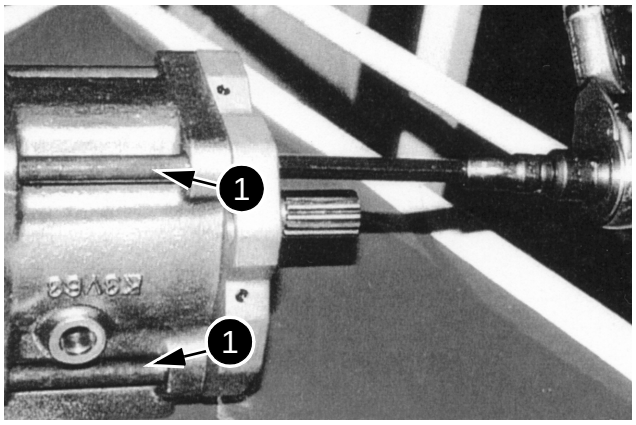
STEP 9



CD01G118

Install new needle bearings (1) in the intermediate housing (2). Use grease to stick the cylinder plate (3) on the intermediate housing (2) by adjusting it so that the retaining pin is engaged in the plate housing. Install a new seal (4). Position the intermediate housing on the pump body according to the reference marks made during disassembly.

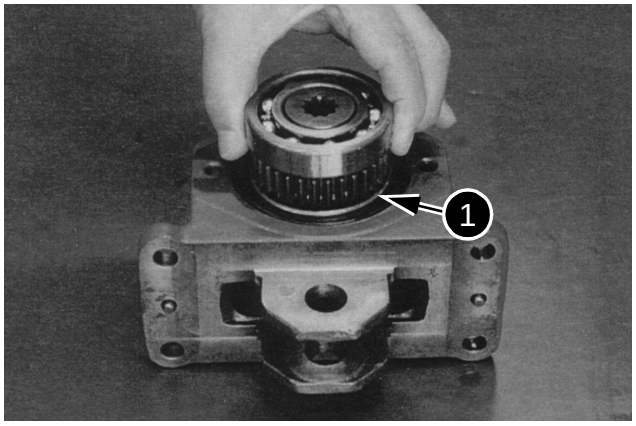
STEP 10



CD01G119

Install and tighten the screws (1) alternately to a torque of 318 lb-ft (431 Nm). Install the coupling pinion in the intermediate housing. Proceed in the same manner to install the second pump body.

STEP 11



CD01G112

Position the pinion complete (1) with two bearings on the power take-off housing, install the assembly under a press and push in until stopped. Install the snap ring.

Identifying the ports

NOTE: *Refer to Section 8001.*

Description

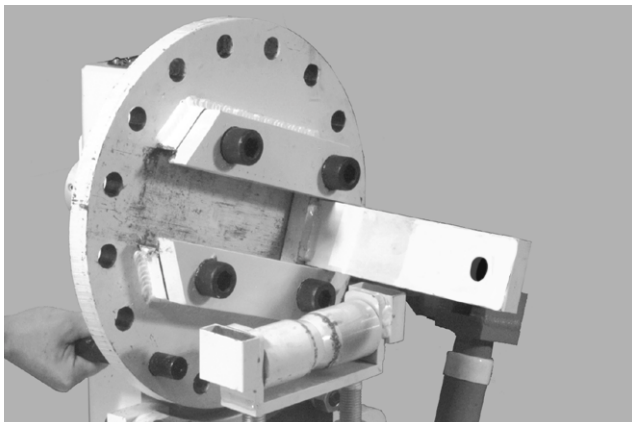
1. Main control valve housing
2. Arm spool 2
3. Boom spool 1
4. Bucket spool
5. Travel spool
6. Straight-line travel spool
7. O-ring
8. Cap
9. Cap
10. Cap
12. Cap
13. Main control valve housing
14. Arm spool 1
15. Boom spool 2
16. Swing spool
17. Option spool
18. Cap
19. Spool
20. Spring seat
21. Spring
22. Spool end screw
23. O-ring
24. Plug
25. O-ring
26. Spring
27. Spool
30. O-ring
31. Back up ring
32. Check valve
33. Spring
34. Check valve
35. Spring
36. O-ring
37. Flange
38. Check valve
39. Spring
40. Spacer assembly
41. O-ring
42. O-ring
43. Flange
44. Check valve
45. Spring
46. Plug
47. O-ring
48. Spring
49. Check valve
50. Steel ball
51. Check valve
52. Flange
53. Spacer
54. O-ring
55. Back up ring
57. Spacer
60. Plug assembly
61. Plug
62. O-ring
63. Port plug
64. O-ring
65. O-ring
66. O-ring
67. Load holding valve
68. Relief valve
69. Safety valves
70. Safety valves
72. Plug
73. Plug
74. Screw M10x1.5 L=28
75. Screw M10x1.5 L=40
76. Screw M10x1.5 L=70
77. Screw M16x2 L=130
78. Screw M6x1 L=20
81. Washer
87. Plug
88. Cap
89. O-ring
91. Plug
92. Plug
93. Plug
96. Screw
96. Plug

Section

8012

DISASSEMBLY AND ASSEMBLY OF THE ATTACHMENT CYLINDERS

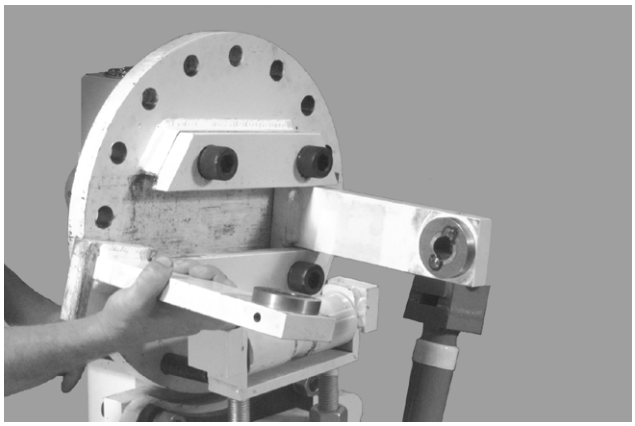
STEP 6



JD00623A

Install the stop pins on the boom tail stock.

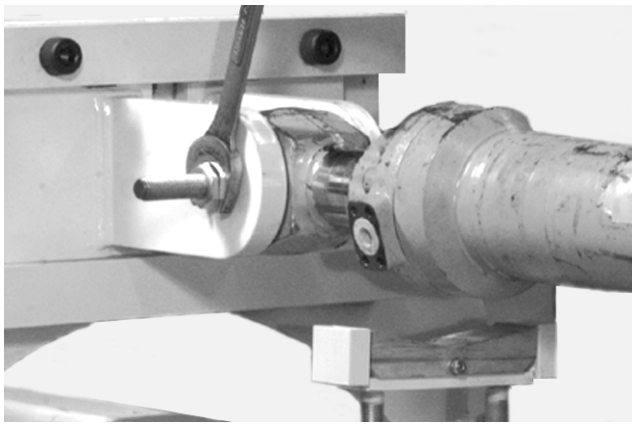
STEP 7



JD00624A

Install suitable bushings on the cylinder tail stock chuck wings. Tighten the retaining screws. Install the chuck wings on the cylinder tail chuck. Tighten the locking screws. Use the scale on the face of the chuck to aid in centering the chuck wings.

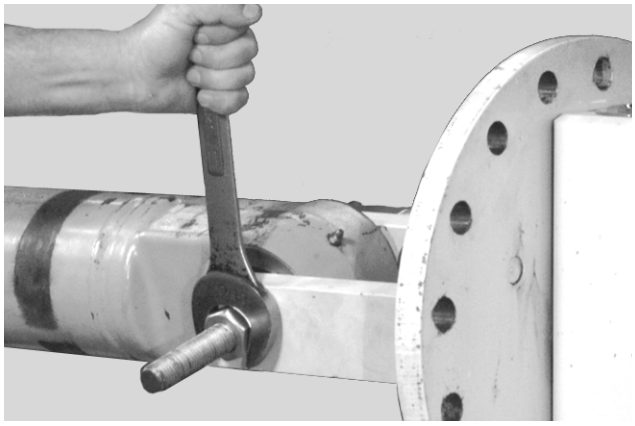
STEP 8



JD00625A

Connect lifting equipment, if necessary, to the cylinder. Position the cylinder in the repair stand with the rod end of the cylinder at the head stock chuck. Loosen the retaining screws of the tail stock chuck wings. When positioning the cylinder rod end on the head stock chuck wing, be sure that the chuck wing bushings are centred in the rod bushing. Install the screw and nuts to secure the cylinder rod end to the repair stand.

STEP 9

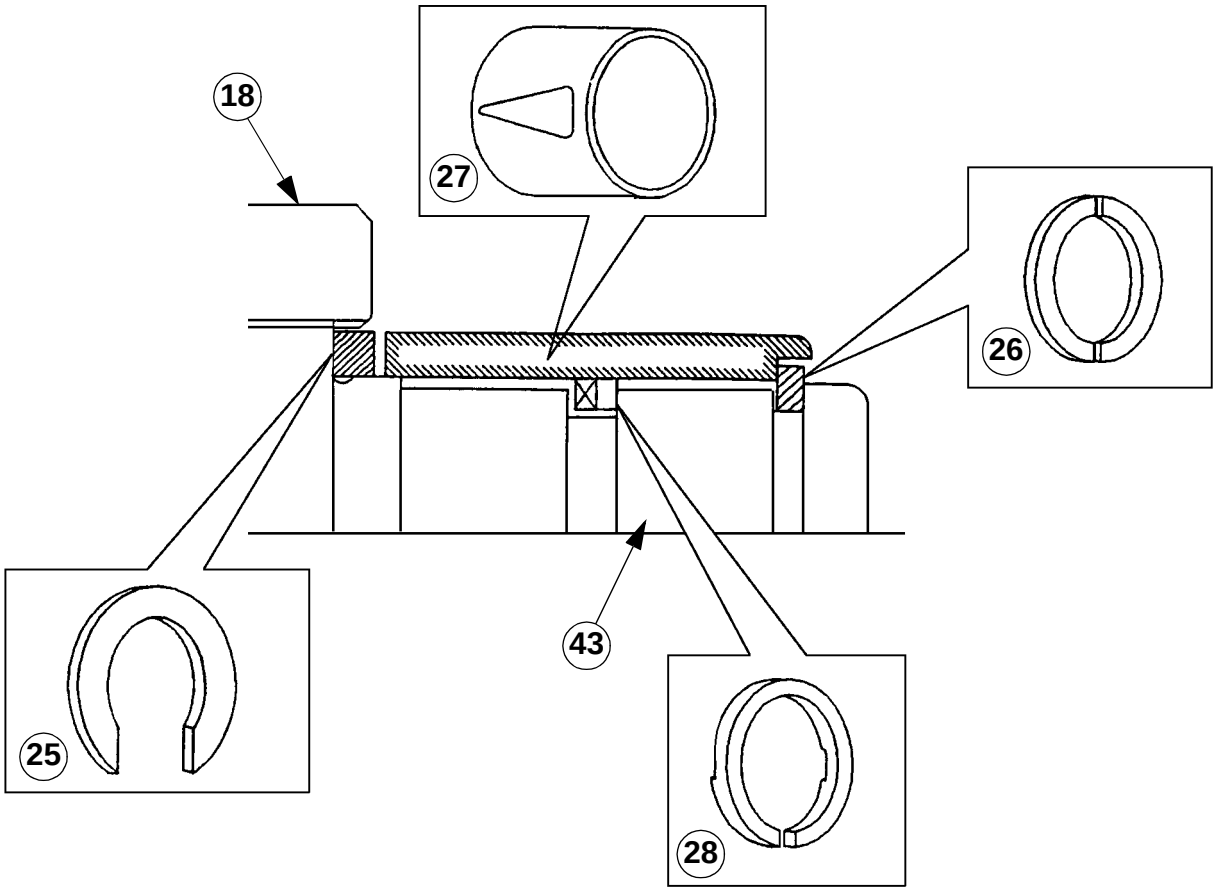


JD00626A

On the cylinder repair stand, loosen the retaining screws of the tail stock chuck wings. When positioning the cylinder barrel end on the head stock chuck wing, be sure that the bushings are centred in the cylinder barrel bushing. Install the screw and nuts to secure the cylinder barrel end to the repair stand.

NOTE: *Step 6 applies only to the arm cylinder.*

STEP 6



JS00648A

18 PISTON NUT
25 RING
26 STOPPER
27 CUSHION BUSHING
28 CUSHION RING
43 CYLINDER ROD

Install a new cushion ring (28) on the cylinder rod (43). Install the stopper (26) in the groove of the cylinder rod (43). Install the cushion bushing (27) on the cylinder rod (43) and install the ring (25) to hold the cushion bushing (27).

STEP 5

CD00G091

Remove the plate.

NOTE: *Mark the components removed in the following steps to facilitate their insertion in the correct bore during assembly.*

STEP 6

CD00G092

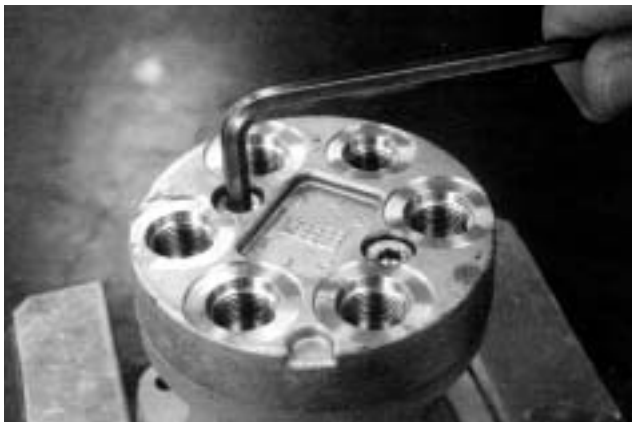
Depending on the condition of the return springs, the friction of the O-rings can keep the plunger assemblies in place in the body. In this case, use a flat screwdriver to remove the plunger assemblies. Slide the screwdriver into the external groove of the plunger assembly, taking care not to damage the plunger assembly. This must be done carefully, since the plunger assembly can be thrown out suddenly, due to the action of the return springs.

STEP 7

CD00G093

Remove the spool assembly from the joystick control.

STEP 8



CD00G094

Turn the control valve the other way up in the vice. Unscrew and remove the six screws and the sealing washers.

STEP 9

CD00G095

Remove the orifice plates and the O-ring from the body. Discard the O-ring.

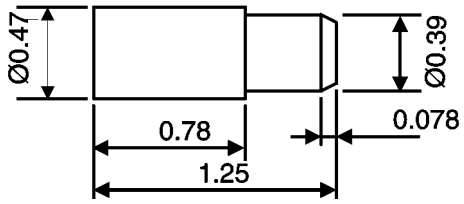
SPECIFICATIONS

Primary coolant pressure ..... Maximum 9.8 MPa (100 kgf/cm^2)
Secondary coolant pressure ..... 0 ~ 4.4 MPa (Max end of stroke control pressure)
Permissible return pressure ..... 0.3 MPa (3 kgf/cm^2)
Rated flow ..... 2.641 gal/min (10 L/min)
Operating angle ..... ± 12.4°
Hydraulic fluid ..... Mineral hydraulic fluid
Working temperature range ..... -4°C ~ +167°C (-20°C ~ +75°C)

TORQUE SETTING

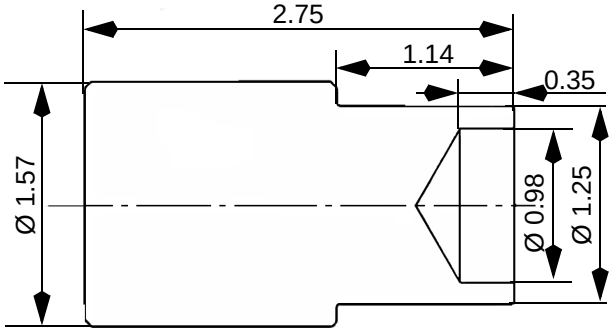
Cover retaining screws ..... 58 to 60 lb-ft (79 to 81 Nm)
Cam joint pin locking screw (apply Loctite 241) ..... 4 to 6 lb-ft (6 to 8 Nm)
Cam setting screw locking nut ..... 23 to 28 lb-ft (31.5 to 37.5 Nm)

SPECIAL TOOLS



CM99E005

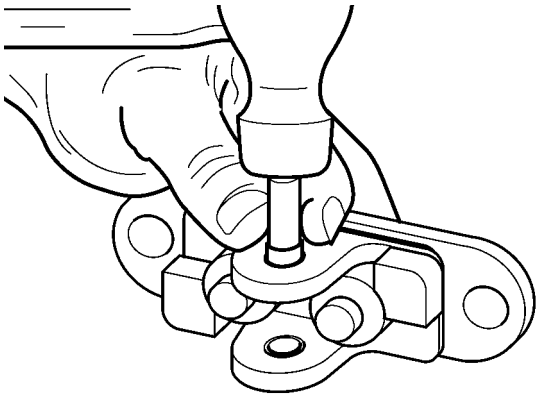
Tool for removing the cover bushing.



CS01C525

Tool for installing the stopping ring.

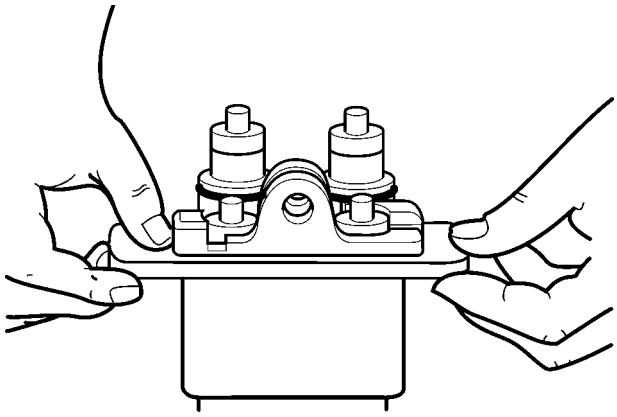
STEP 18



CI01B547

Place the cover on a flat surface and install the bushings using the special tool and a hammer.

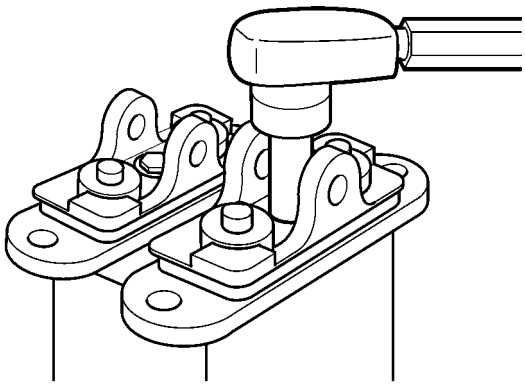
STEP 19



CI01B548

Assemble the cover on the travel pedal control body.

STEP 20

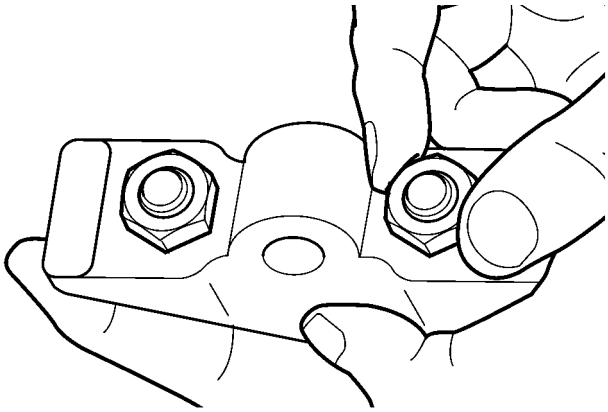


CI01B549

Tighten the cover retaining screw to the torque specified on page 3.

NOTE: *Check the proper positioning of the cover on the travel pedal control body.*

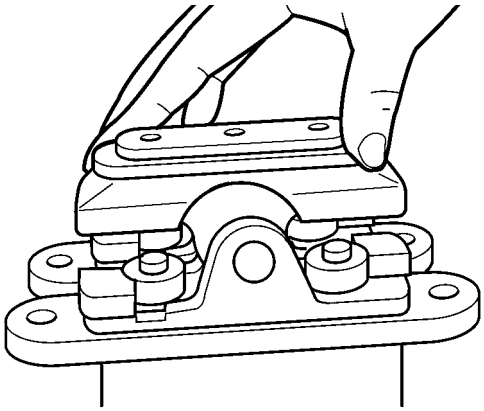
STEP 21



CI01B550

Assemble the nuts and the screws on the cam.

STEP 22

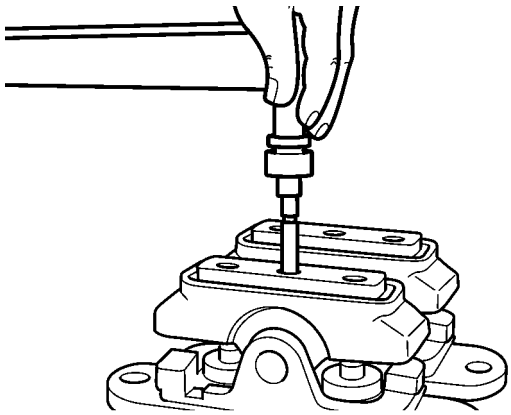


CI01B520

Position the cam on the cover; assemble the cam shaft while holding it.

NOTE: *Repeat the steps 18 to 22 for the other travel pedal control body.*

STEP 23



CI01B551

Apply Loctite 241 on the threads of the cam pin locking screw and tighten it to the torque specified on page 3.

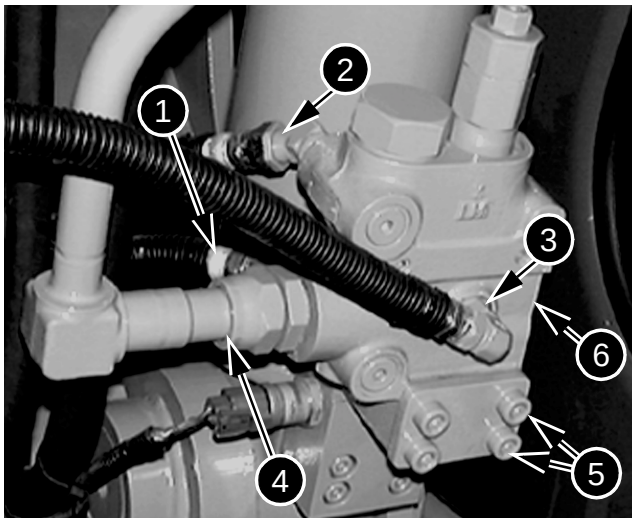
Section

8016

DISASSEMBLY AND ASSEMBLY OF THE CUSHION CONTROL

BOOM RELIEF VALVE

Marking the ports



CD00K000

1 PILOT SPOOL
2 LEAK RETURN
3 HIGH PRESSURE CIRCUIT BYPASS TOWARDS THE OTHER VALVE
4 VALVE POWER SUPPLY

Removal

NOTE: *Before performing any operation on the machine, carry out the following operations in the order shown.*
- Park the machine on hard, flat ground.
- Lower the attachment to the ground.
- Shut down the engine.
- Depressurise the hydraulic circuit (see Section 8000).

1. Remove the hoses (1), (2) and (3) and seal the unions and the hoses.
2. Remove the tube (4) and seal the ports.
3. Remove the screws (5) and remove the relief valve (6).
4. Seal the cylinder port.

Installation

When installing, use the same procedure in the reverse order of removal by assembling new seal rings.

For valve adjustment, refer to section 8001.

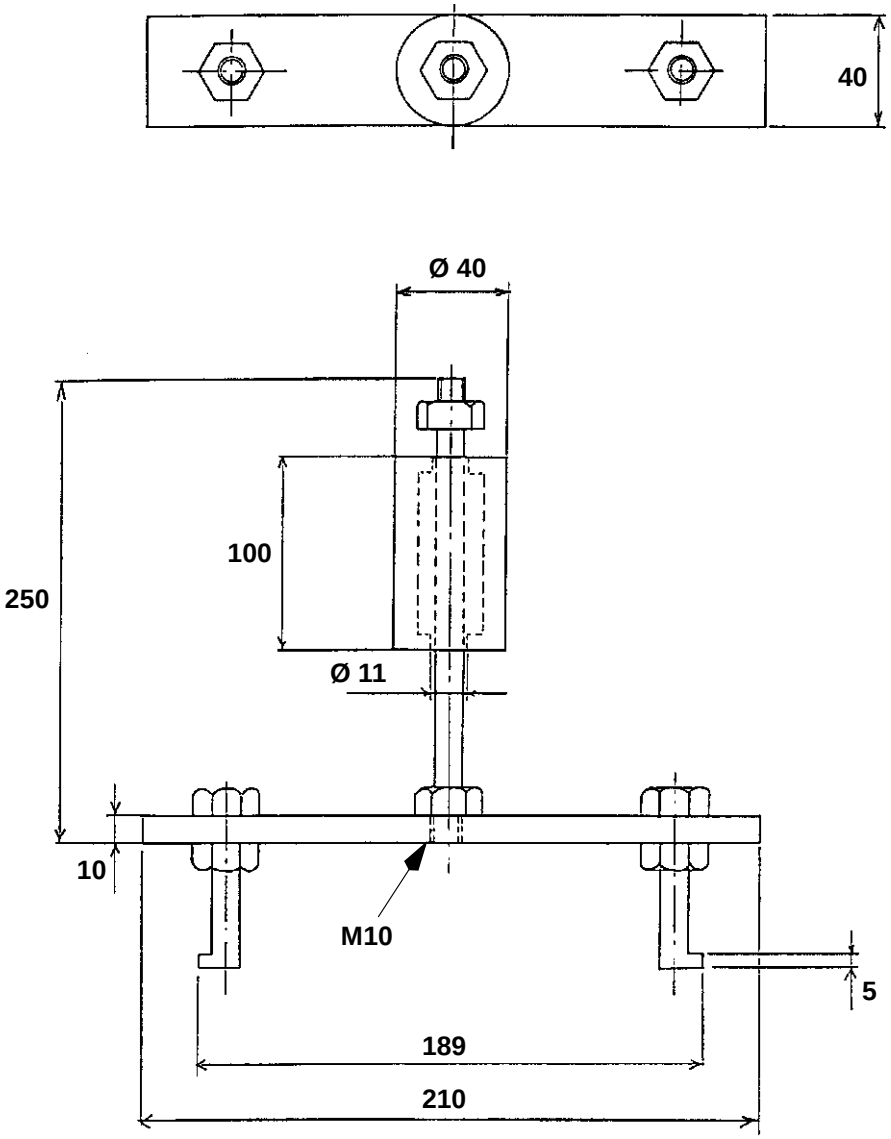
Section

8018

DISASSEMBLY AND ASSEMBLY
OF THE ROTATING JOINT

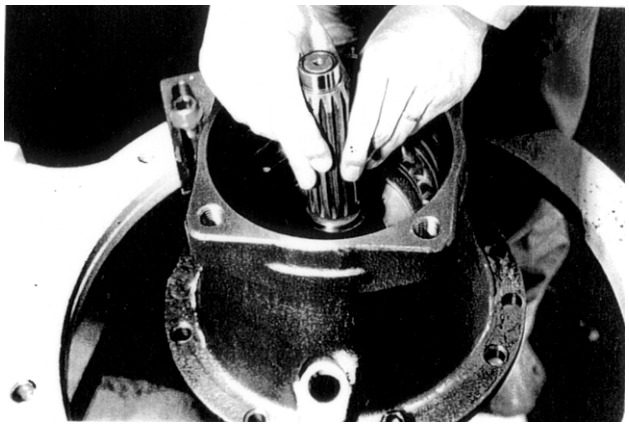
TOOL TO BE MANUFACTURED

For removal of the brake piston



CS01D501

STEP 6



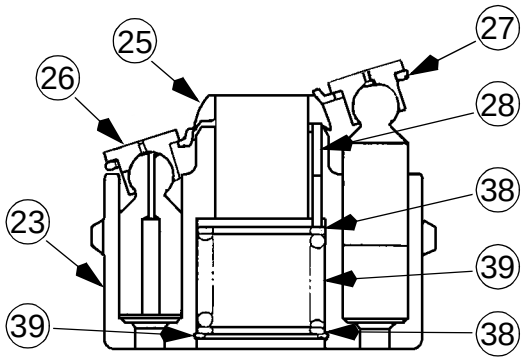
CD01D018

Protect the splines and install the shaft (31) in the housing (12) taking care not to damage the lip seal (35).

STEP 7

Apply a thin coat of grease on the plate (24) (chamfer side in contact with the housing) and install the plate in the housing (12).

STEP 8



CS01D506

Install a shim (38), the spring (39) and a shim (38) in the barrel (23). Install the retaining ring (37) on the barrel (23).

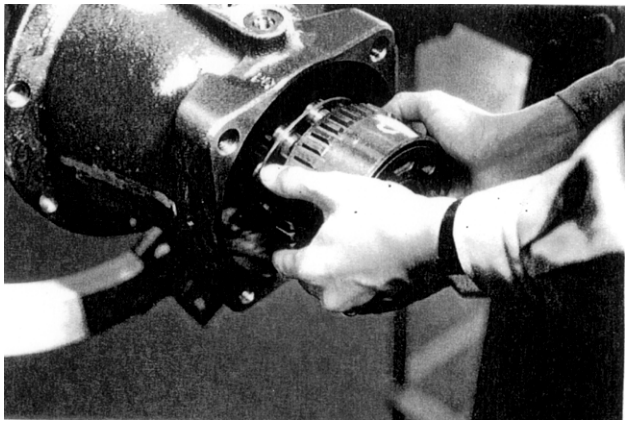
STEP 9

Install the connecting rods (28) and the spherical bearing (25) on the barrel (23).

STEP 10

Install the pistons (26) on the thrust pad (27). Apply clean hydraulic oil in the bores of the barrel (23) and install the plate/piston assembly in the barrel (23) respecting their original ports marked at the time of removal.

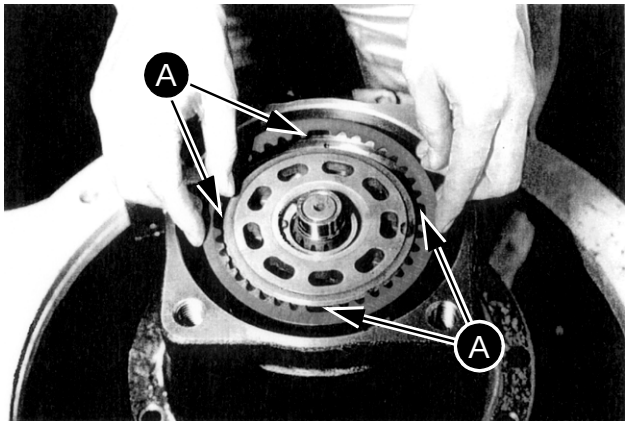
STEP 11



CD01D019

Install the equipped barrel (23) on the shaft (31).

STEP 12

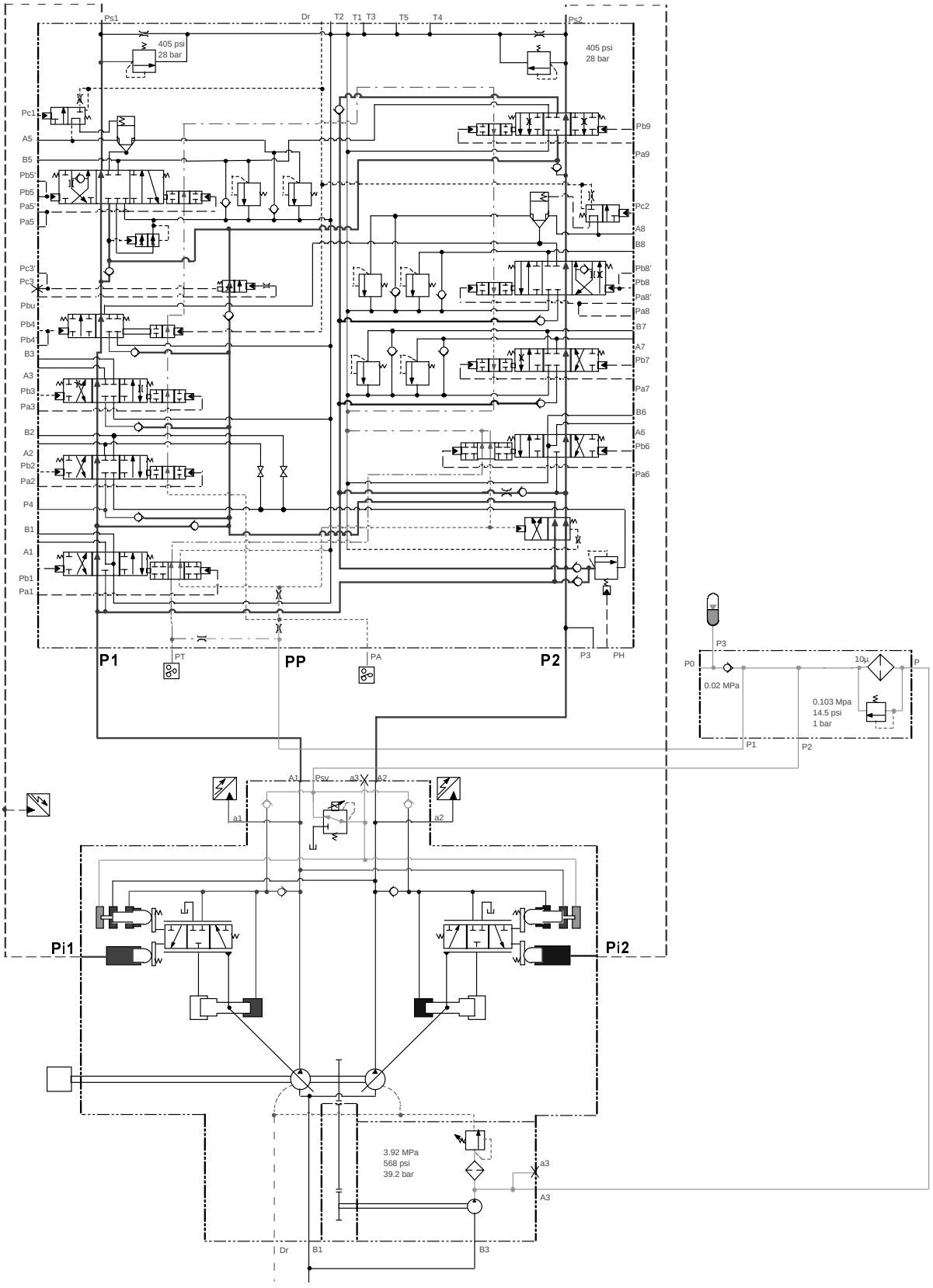


CD01D020

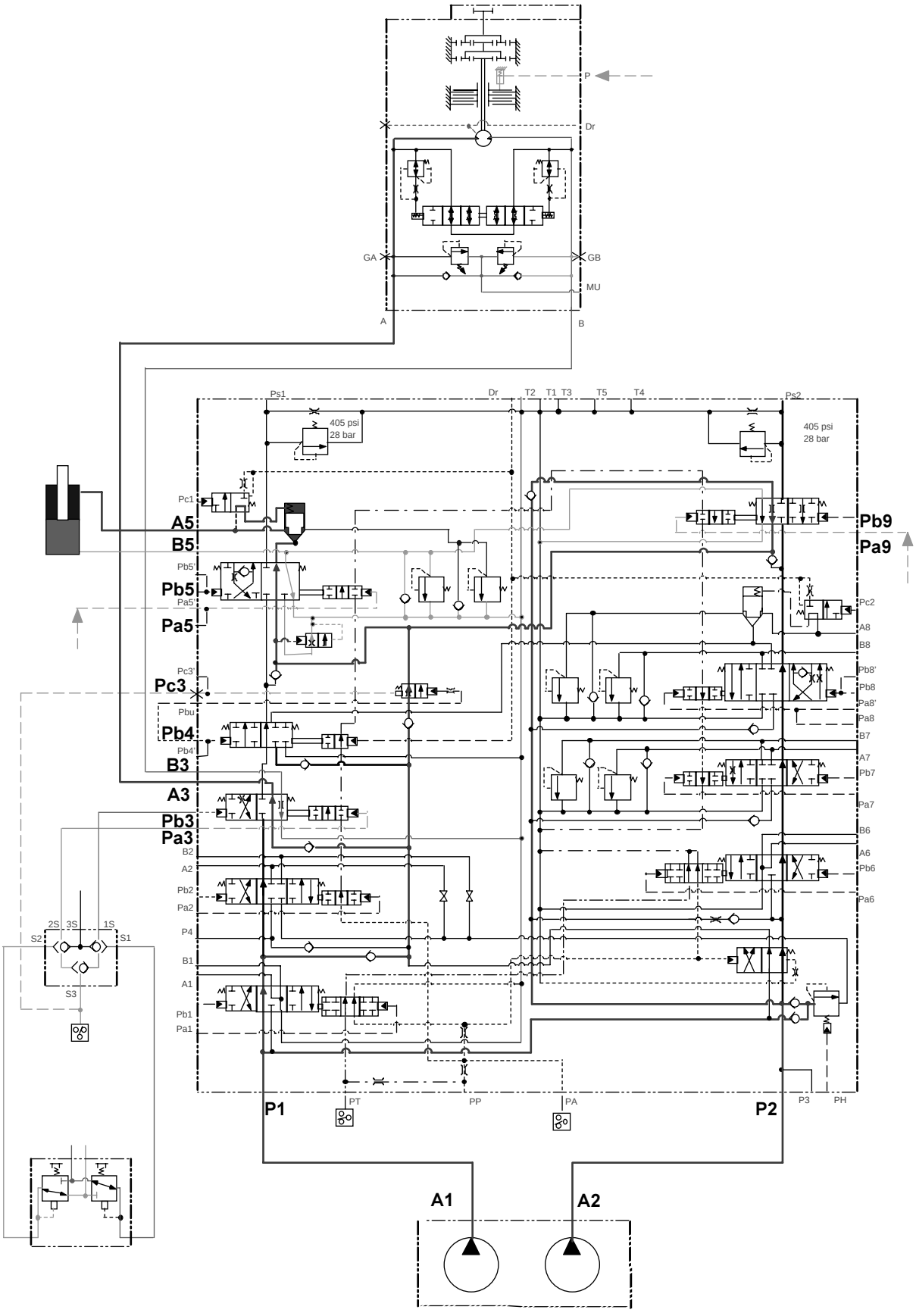
Apply clean hydraulic fluid to the two faces of the friction and disk plates. Install the disk brakes, start with a disk plate (30) then a friction plate (29) and so on. Take care in aligning the notches (A) of the friction plates.

STEP 13

Apply a thin coat of grease on the O-rings (21) and (22) and install the O-rings (21) and (22) in the housing (12).


Ps1
Dr
T2
T1
T3
T5
T4
Ps2
405 psi
28 bar
405 psi
28 bar
Pc1
A5
B5
Pb5'
Pb5
Pa5'
Pa5
Pc3'
Pc3
Pbu
Pb4
Pb4'
B3
A3
Pb3
Pa3
B2
A2
Pb2
Pa2
P4
B1
A1
Pb1
Pa1
Pb9
Pa9
Pc2
A8
B8
Pb8'
Pb8
Pa8'
Pa8
B7
A7
Pb7
Pa7
B6
A6
Pb6
Pa6
P1
PT
PP
PA
P2
P3
PH
P3
P0
10µ
P
0.02 MPa
0.103 Mpa
14.5 psi
1 bar
P1
P2
A1
Psv
a3
A2
a1
a2
Pi1
Pi2
3.92 MPa
568 psi
39.2 bar
a3
A3
Dr
B1
B3

CM00K026


P
Dr
GA
GB
MU
A
B
Ps1
Dr
T2
T1
T3
T5
T4
Ps2
405 psi
28 bar
405 psi
28 bar
Pc1
A5
B5
Pb5'
Pb5
Pa5'
Pa5
Pc3'
Pc3
Pbu
Pb4
Pb4'
B3
A3
Pb3
Pa3
B2
A2
Pb2
Pa2
P4
B1
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Pb1
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Pb9
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Pc2
A8
B8
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Pb7
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B6
A6
Pb6
Pa6
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3S
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S1
S3
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PP
PA
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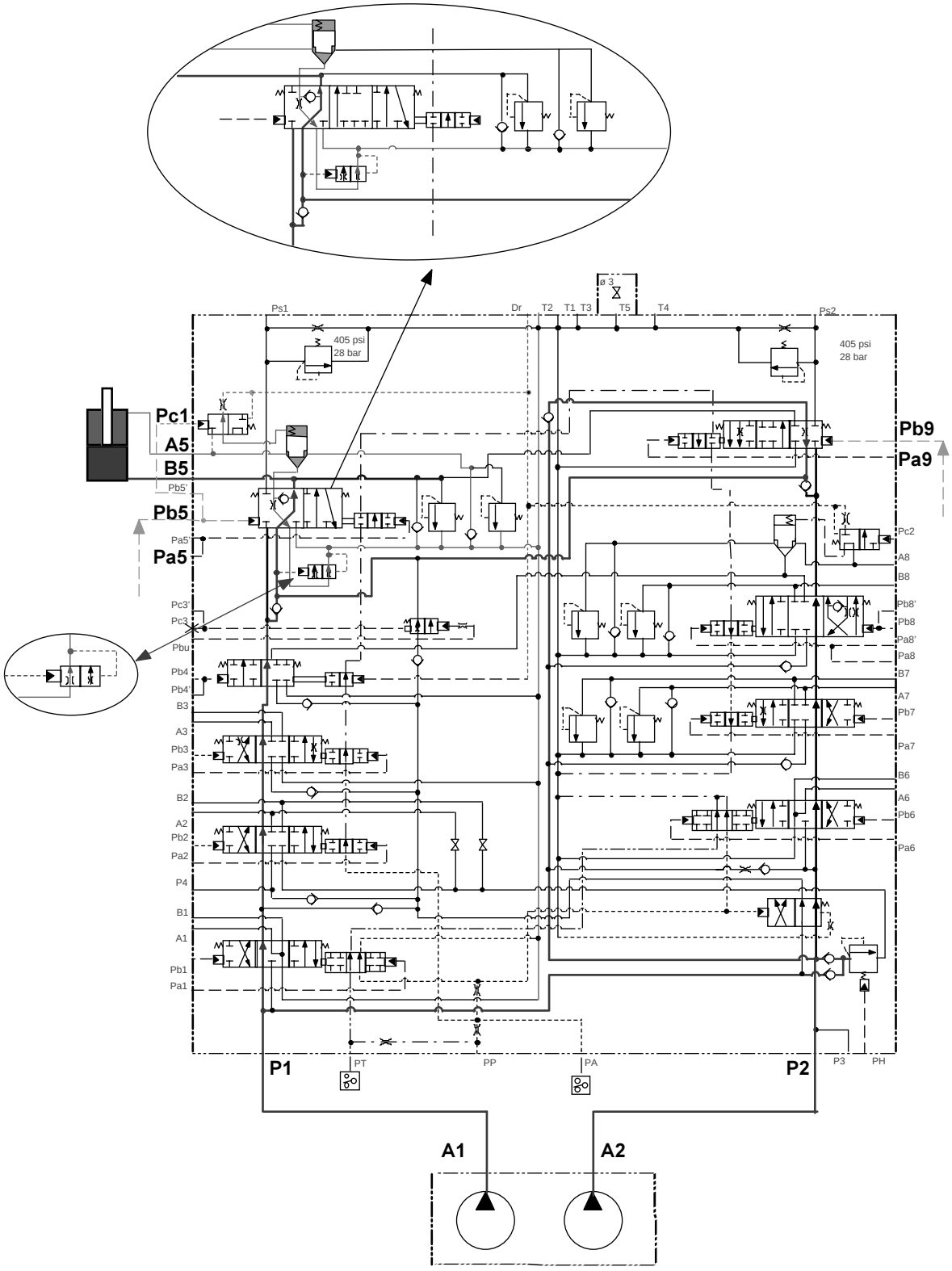
PH
P1
P2
A1
A2

CM00K017


Ps1
Dr
T2
T1
T3
ø 3
T5
T4
Ps2
405 psi
28 bar
405 psi
28 bar
Pc1
A5
B5
Pb5'
Pb5
Pa5'
Pa5
Pb9
Pa9
Pc3'
Pc3
Pbu
Pb4
Pb4'
B3
A3
Pb3
Pa3
B2
A2
Pb2
Pa2
P4
B1
A1
Pb1
Pa1
Pc2
A8
B8
Pb8'
Pb8
Pa8'
Pa8
B7
A7
Pb7
Pa7
B6
A6
Pb6
Pa6
P1
PT
PP
PA
P2
P3
PH
A1
A2

CM00K021

UPPERSTRUCTURE

Inspection

STEP 1

Inspecting the turntable bearing

If the upperstructure no longer swings regularly or makes a creaking noise, this shows that the turntable bearing is worn or damaged. If there is a time lapse before the upperstructure starts to swing, this shows that the ring gear of the turntable bearing is damaged. When an operator works with a machine, he must pay attention to any unusual noises which could indicate turntable bearing wear. If the operator hears unusual noises and if the upperstructure has a time lapse before it starts swinging, he must carry out the following inspection.

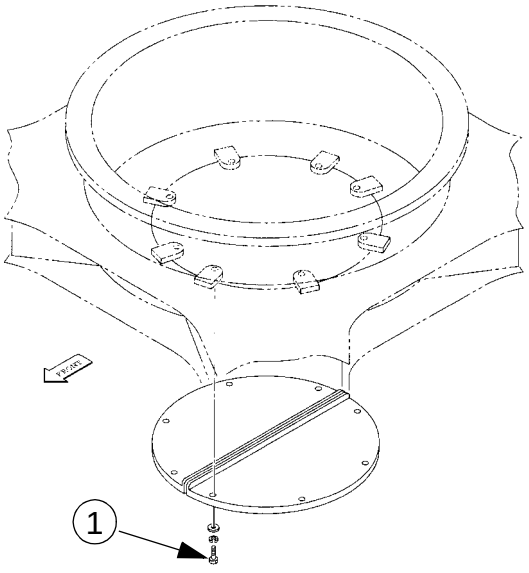
STEP 2

Park the machine on hard, level ground. Lower the attachment to the ground.

STEP 3

Reduce engine speed to idle for 30 seconds, then shut down the engine.

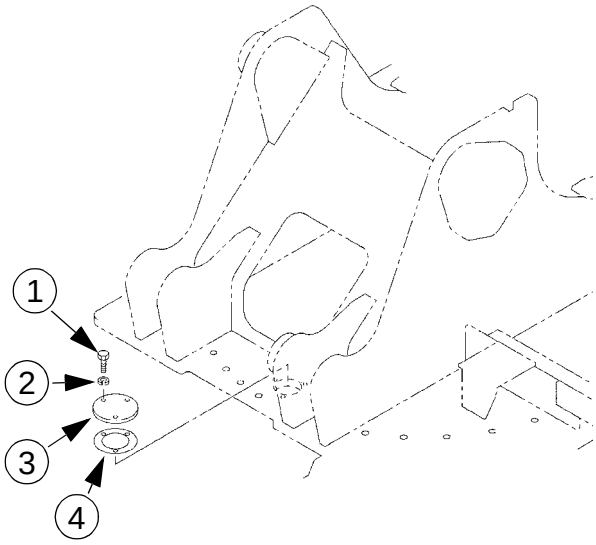
STEP 4



CI00F500

Remove the screws (1) which fasten the lower housing to the machine and remove the lower housing.

STEP 5



CI00F509

Remove the three screws (1) and lock washers (2) which fasten the access panel (3) to the machine. Remove the access panel (3). Remove and discard the access panel seal (4).

STEP 6

> **WARNING:** *If you put your hand in the ring gear access orifice when the upperstructure is swinging, you could be serious injured. Before applying grease by hand to the ring gear, always make sure that the bucket or the tool is on the ground and that the engine is shut down.*

Request help from an assistant to operate the swing gear. Check for scratches, a missing tooth, scaling, cracks or other damage to the ring gear, using a pocket torch. In the event of damage, refer to "Removing the upperstructure" and change the upperstructure turntable bearing.

STEP 7

Install a new seal on the access panel and install the access panel on the machine using screws and lock washers.

Installation

NOTE: *The numbers in brackets in the following steps refer to the illustration on page 10.*

STEP 1

Connect a suitable lifting device to the lifting eyes installed on the counterweight (1).

NOTE: *Refer to the specifications on page 2 for the weight of the counterweight.*

STEP 2

Install the same number of shims (5) as were removed during removal in step 11, at each anchorage point of the counterweight on the chassis frame.

STEP 3

Move the counterweight (1) into position on the chassis frame. Align the orifices of the counterweight with those on the chassis frame.

STEP 4

Install the four cap screws (3) and flat washers (4) to attach the counterweight (1). Tighten to the torque settings specified on page 2.

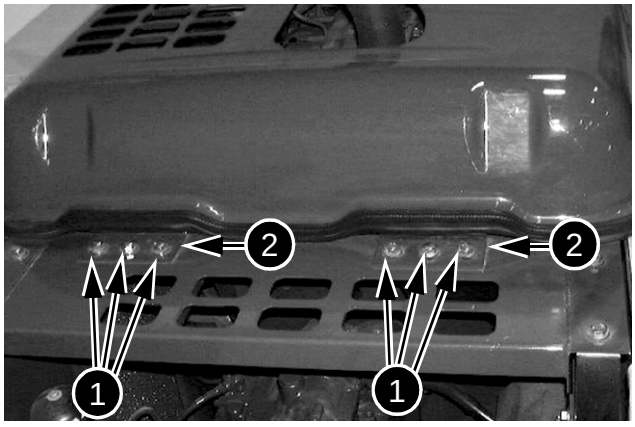
STEP 5

Disconnect the lifting equipment from the lifting eyes on the counterweight (1), disassemble the lifting eyes and re-install the plugs.

STEP 6

Connect a suitable lifting device to the engine hood. Move the engine hood into position.

STEP 7

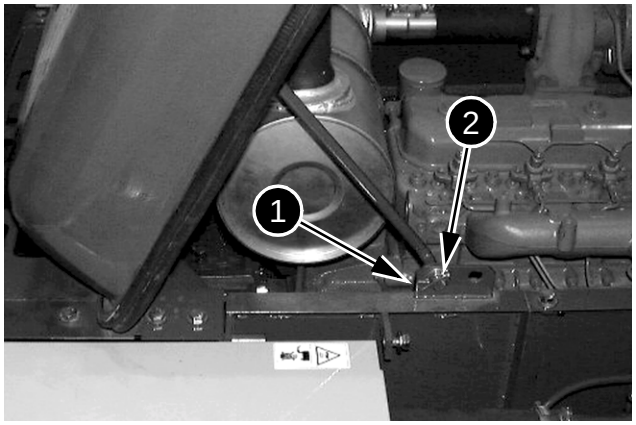


CD00F102

Install the six washers (1) and flat washers which attach the hood hinges (2).

STEP 8

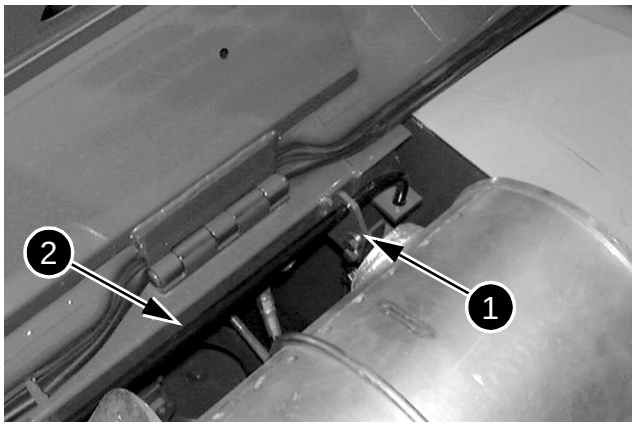
NOTE: *Have an assistant help you with this step.*



CD00F101

Install the hood support strut, install the split pin (1) and the flat washer on the engine hood safety side support bracket.

STEP 9



CD00F100

Install the retaining bar (2) using the retaining hardware (1).

STEP 10

Remove the lifting equipment from the engine hood.

STEP 7

Install the screw (2), the first nut (1) and tighten the nut until it touches the boss on the boom. Loosen the nut a quarter of a turn and use two wrenches to lock the second nut (1) onto the first.

STEP 8

Remove the lifting device from the arm.

STEP 9

Connect the arm cylinder rod to the arm and install the bucket cylinder, see Section 8005.

STEP 10

Install the bucket, see page 4.

STEP 11

Bleed the cylinders, see Section 8000.

STEP 12

Grease the linkages.

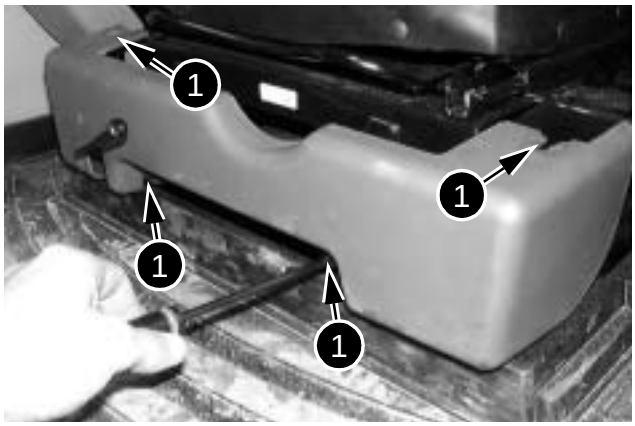
STEP 18

CD00G127

Move the LH control arm (1) on the cab side, keep it in this position using suitable lifting equipment.

NOTE: *For the RH control arm, position it behind the cab.*

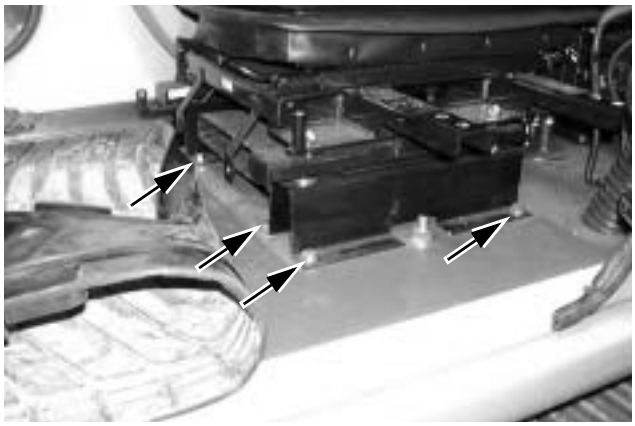
STEP 19



CD00G122

Remove the mask in front of the seat using the four screws (1).

STEP 20



CD00G123

Remove the carpet, loosen then remove the eight retaining screws from the seat. Remove the seat from the cab, with the help of an assistant.

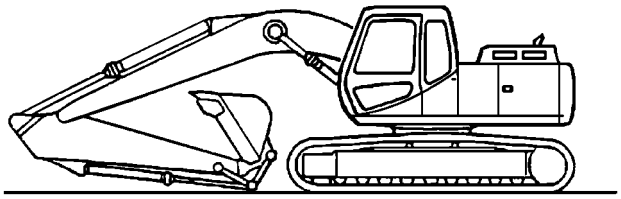
NOTE: *The seat weighs 101 pounds (46 kg) .*

Installation

To install, proceed in the reverse order from that of removal.

Removal

STEP 1



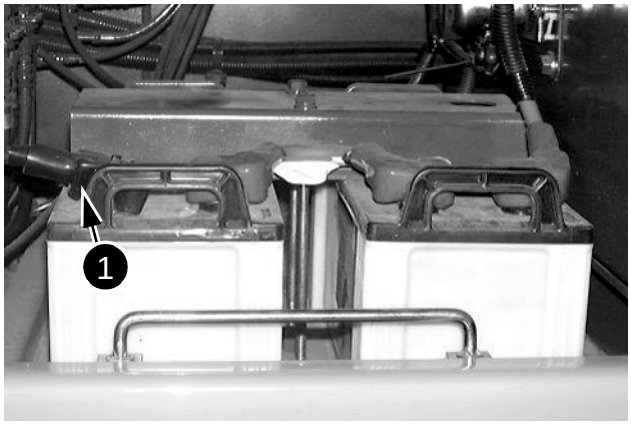
JS00163A1

Park the machine on hard, flat ground. Lower the tool to the ground.

STEP 2

Reduce the engine speed to idle for 30 seconds, then shut down the engine.

STEP 3



CD00G002

Open the left-hand side doors. Disconnect the ground cable (1) from the battery. Close the doors.

STEP 4

Raise the engine hood and lock it in the raised position.

STEP 5

WARNING: *Boiling cooling fluid can spurt out when the radiator cap is removed. To remove the cap, proceed as follows: Wait until the system has cooled down and then turn the cap slightly and wait for all the pressure to be released. You can be seriously scalded if the radiator cap or expansion reservoir cap is removed too quickly. For checking and maintenance of the cooling system, refer to the maintenance instructions.*

Make sure that the radiator has cooled down and remove the radiator cap.

STEP 6

Use a container of suitable capacity and empty the cooling system (see the operator’s manual).

STEP 7

Remove the operator's seat from the cab (see Section 9004).