

MODEL	<u>600LX</u>
SERIES	<u>LX Series</u>
BOOK NO.	<u>1118</u>
SERIAL NO.	<u>                    </u>

This manual covers the base machine information, the attachment manufacturer will have the information of additional componets added to this machine.

### **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.

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## 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

## Control valve

Five-element control valve for dipper, boom acceleration, swing, option and right travel.

Four-element control valve for dipper, bucket, boom acceleration and left travel.

Load holding relief valve for boom and dipper.

## Swing

Fixed flow engine with axial pistons.

Automatic disk brakes.

Upperstructure frame swing speed.....	9.0 rpm
Swing torque.....	
Tail swing.....	
Displacement.....	15.2 cu in
Work flow.....	95 gpm
Reduction ratio.....	27.143
Brake torque.....	Š 949 lb-ft
Minimum brake release pressure.....	421 psi
Permissible motor leak.....	4.7 gpm

## Travel

Two-speed motor with axial pistons.

Automatic disk brakes.

Low speed.....	1.9 mph
High speed.....	3.3 mph
Gradeability.....	70% (35°)
Tractive effort.....	80031 lbf
Displacement.....	17.7/10.3 cu in
Work flow.....	95.2 gpm
Reduction ratio.....	60.652
Braking torque (reduction gear excluded).....	Š 665 lb-ft
Number of sprocket turns (10 turns)	
Mode "S", high speed.....	18.2 s
Mode "S", low speed.....	30.5 s
Permissible deviation in travel over a distance of 65 ft 7 in	
Mode "H", full speed.....	39.36 in
Permissible motor leak.....	3.7 gpm

## Undercarriage

One-piece frame with fabricated elements.

Lubricated rollers and idler wheels.

Grease track tension.

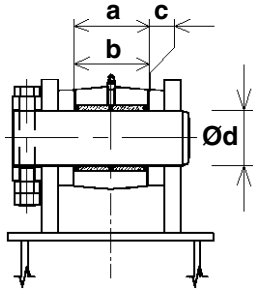
Weight load on track

with 23.6 in track pads.....	11.7 psi
with 29.5 in track pads.....	9.5 psi
with 35.4 in track pads.....	8.1 psi
Track tension.....	14.1 to 14.9 in

## Attachment

Break-out force.....	60698 lbf
Break-out force	
8 ft 3 in dipper.....	63171 lbf
11 ft 2 in dipper.....	51481 lbf

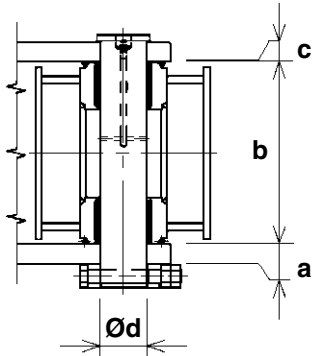
### 7. Bucket cylinder foot/Dipper



CS01B528

Mark		Dimension (in)
<b>a</b>	Standard	5.55
	Limit	5.74
<b>b</b>	Standard	5.51
	Limit	5.43
<b>c (a - b)</b>	Standard	0.039 to 0.11
	Limit	Shims
<b>Ø d (shaft)</b>	Standard	4.33
	Limit	4.29
<b>Ø d (bushing)</b>	Standard	4.33
	Limit	4.38

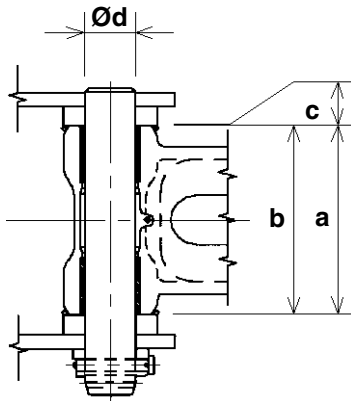
### 8. Connecting rod/Dipper



CS01B529

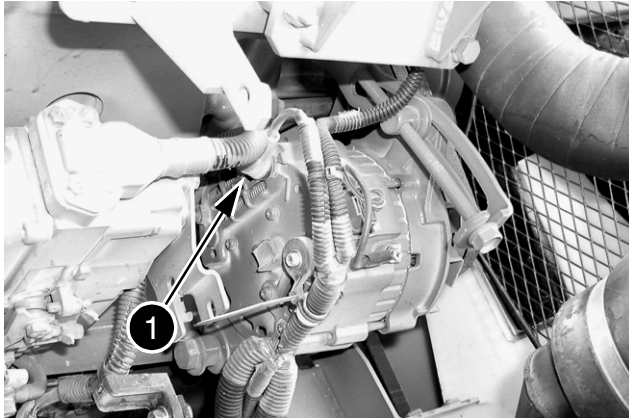
Mark		Dimension (in)
<b>a</b>	Standard	1.96
	Limit	1.85
<b>b</b>	Standard	17.40
	Limit	17.24
<b>c (play)</b>	Standard	0.06 to 0.08
	Limit	Shims
<b>Ø d (shaft)</b>	Standard	3.74
	Limit	3.70
<b>Ø d (bushing)</b>	Standard	3.74
	Limit	3.79

### 9. Compensator/Bucket



CS01B530

Mark		Dimension (in)
<b>a</b>	Standard	18.9
	Limit	19.9
<b>b</b>	Standard	18.8
	Limit	18.7
<b>c (play)</b>	Standard	0.06 to 0.15
	Limit	Shims
<b>Ø d (shaft)</b>	Standard	3.93
	Limit	3.89
<b>Ø d (bushing)</b>	Standard	3.93
	Limit	3.99

**STEP 14**

CD02K010

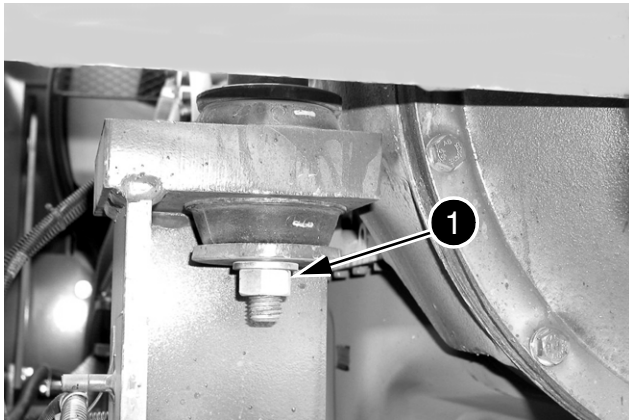
Label and disconnect the electrical connections to the alternator (1).

**STEP 15**

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

**STEP 16**

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

**STEP 17**

CD02K011

Remove the engine retaining hardware.

**NOTE:** When installing, make a visual inspection of the condition of the rubber flexible mountings and change them if necessary. Respect the colours, light blue on the fan side, light green on the hand-wheel side. Tighten the engine retaining screws to torque (see special torque settings on page 2).

**STEP 18**

When there is nothing interfering with the removal of the engine, raise the engine carefully and install it on a suitable repair bench.

**NOTE:** When installing the engine in the machine, proceed in the reverse order from removal.

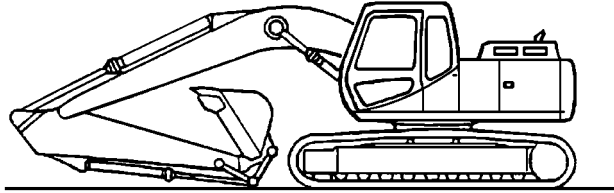
Before operating the machine, carry out the following operations:

- Bleed and prime the fuel system (see Operator's Manual).
- Fill and bleed the engine cooling system (see Operator's Manual).
- Check the hydraulic, fuel and cooling systems for leaks.
- Check the oil level in the hydraulic reservoir. Top up if necessary.

## FUEL TANK

### Removal

#### STEP 1



JS00163A1

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

#### STEP 2

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

#### STEP 3

Turn the ignition key to "ON" without starting the engine.

#### STEP 4

Attach a "DO NOT OPERATE" tag to the ignition key in the cab.

#### STEP 5

**NOTE:** *The numbers within brackets refer to the figures on pages 5 and 6.*

Remove the access panel under the fuel reservoir (1).

#### STEP 6

Open the filling plug (2) of the tank (1). Bleed the remaining fuel using the valve (3) then remove the latter. Remove the filter (19) and the fuel gauge (20).

#### STEP 7

Lift the hood of the front boot. Remove the retaining screw (4) of the access ramp (5). Remove the access ramp (5).

#### STEP 8

Remove the screws (6) on top and then inside the front boot, then remove the protective housing (7).

#### STEP 9

Remove the screws (8) and the protective plate (9) from on top of the fuel reservoir (1).

#### STEP 10

Loosen the two screws (10) located under the machine. Open the side portion of the machine and remove the two screws (11) located on the RH side of the fuel reservoir (1). Remove the protective plate of the reservoir (12).

#### STEP 11

Remove the two screws that hold the fuel oil filter. Attach labels on the two hoses. Remove the fuel oil filter by removing the two hoses and the retaining clips.

#### STEP 12

Shift the plastic protection (13) from the fuel sensor (14). Remove the retaining screws (15) then the fuel sensor (14) as well as the seal (16).

#### STEP 13

Remove the six screws (17) from the fuel tank (1), and the shims (18).

#### STEP 14

Remove the fuel tank (1) using a hoist.

#### STEP 15

See the operator's manual for removing the fuel filter.

- 52** 6 solenoid valve bank
- A3** Electronic acceleration
- B1** Coolant temperature sensor
- B2** Hydraulic oil temperature sensor
- B21** Engine oil pressure switch
- B22** Swing pilot pressure switch
- B26** Upper pilot pressure switch
- B27** Travel pilot pressure switch
- B41** Engine rpm sensor
- B42** Pump pressure sensor P1
- B43** Pressure sensor (nega-cont)
- B44** Pump pressure sensor P2 (yellow band)
- B45** Overload indicator pressure switch
- B81** Horn
  - E1** Working light (upperstructure)
  - E2** Working light (attachment)
  - E3** Working light (cab)
- F22** Fuse 20 A; main fuse for F11 and F12 circuits
- F23** Fuse 65 A; main fuse for F3 to F10 and F13 to F20 circuits
- F24** Fuse 20 A; main fuse for F2 circuit
- F25** Fuse 20 A; main fuse for F1 circuit
- F26** Fuse 30 A; relay safety
- G1** Batteries
- G2** Alternator
- H2** Travel alarm
- K7** Relay battery
- K8** Relay safety
- M1** Starter motor
- M2** Engine emergency stop motor
- M4** Washer motor
- M9** Air conditioner condenser fan motor
- R1** Glow plugs
- R2** Fuel flow adjustment resistor
- R5** Fuel sensor
- S52** Air conditioning compressor clutch switch
- S55** Reserve tank LSW
  - X1** Fuel filler pump connector
  - X2** Rotary light connector
  - Y7** Main pump proportional solenoid
  - Y8** Air conditioner magnet clutch
- Y18** Free swing solenoid valve

### 3) Mode selection switch

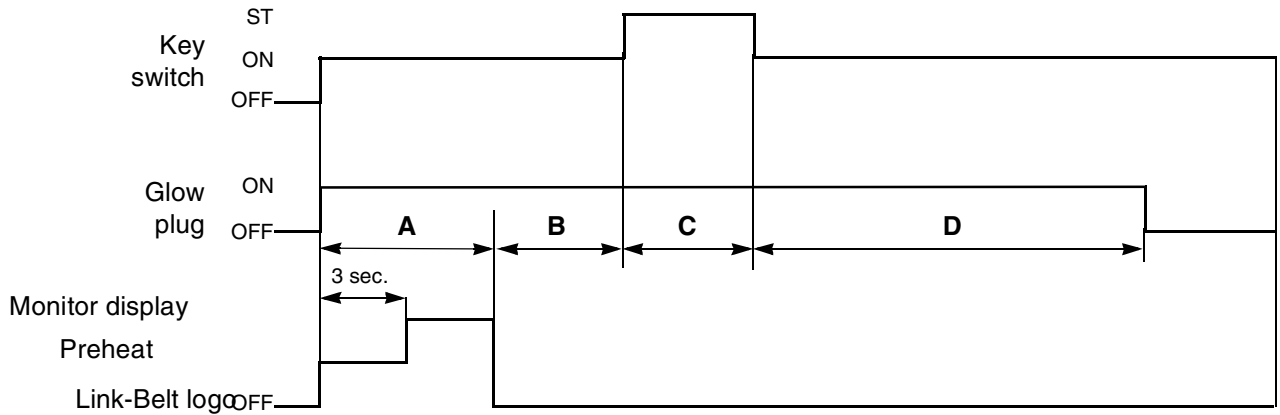
- a) When the ignition switch is turned on, the "S" mode is selected by default (except if auto mode was selected at the time of turning off the ignition switch).
- b) Each time the work mode switch (S3) is pressed, the mode changes:  
S → H → L → S → H
- c) If the auto mode switch (S4) is activated, the mode changes to auto mode. If the auto mode switch (S4) is pressed once again, the mode changes to "S" mode.
- d) When auto mode is activated, if the work mode switch (S3) is pressed, the work mode does not change.
- e) After turning off the ignition switch in auto mode, when the ignition switch is turned on again, the mode remains automatic.

### 4) Operation

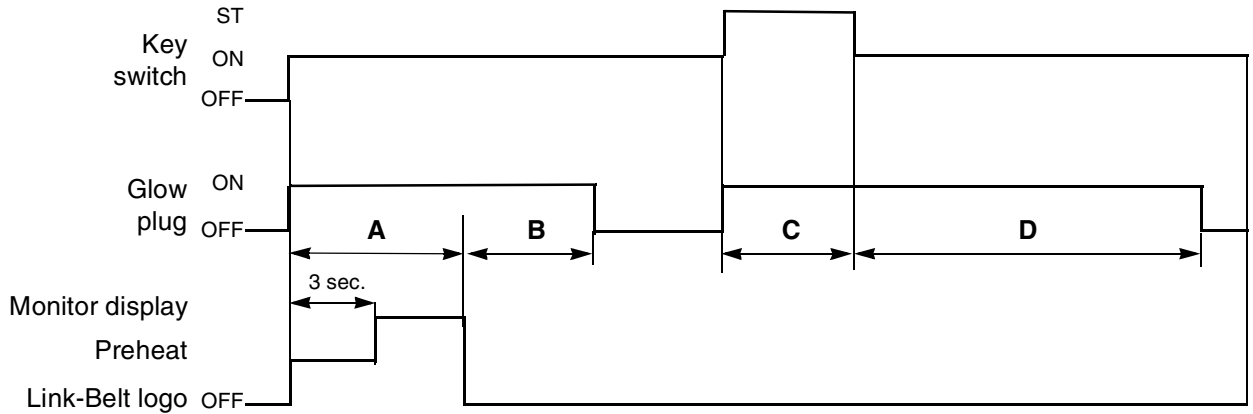
1. The work mode (S3) and auto mode (S4) switches signal is managed by the computer (A1) that changes the mode according to the input signal.
2. The computer (A1) transmits the selected mode to the monitor display (P4) via series communication (2). The monitor display (P4) displays the selected mode.
3. The computer (A1) transmits the selected mode to the engine controller (A2) via CAN communications that control the electronic acceleration (A3). The engine controller (A2) transmits the mode and the data concerning the rpm to the computer (A1) via CAN communications.
4. The computer (A1) calculates the main pump proportional solenoid (Y7) current based on the selected mode and the data on the actual rpm and the target rpm of the engine.
5. The computer (A1) transmits the new data to the monitor display (P4) via series communications.

### 5) Timing diagram

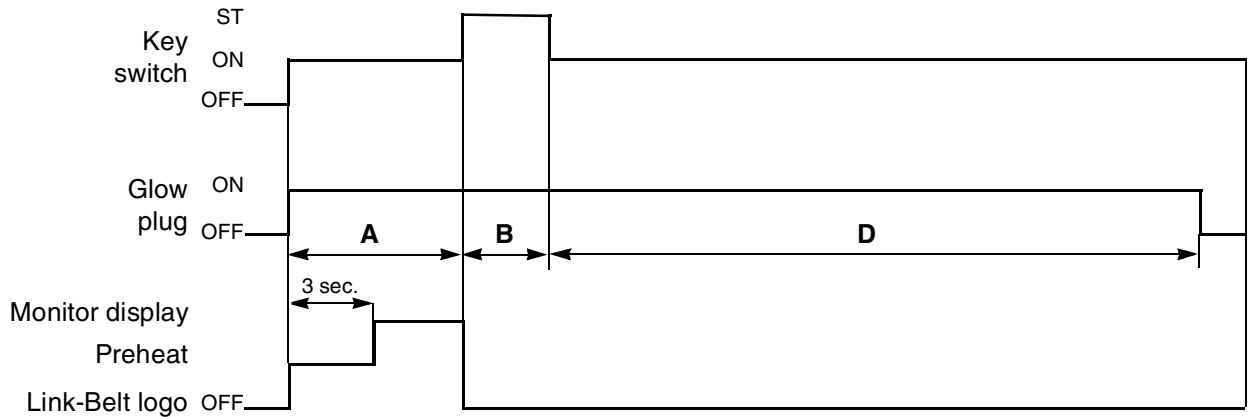
a) If the engine starts within 2 seconds following the display "ENG. PRE HEAT"



a) If the engine starts within 2 seconds following the display "ENG. PRE HEAT"



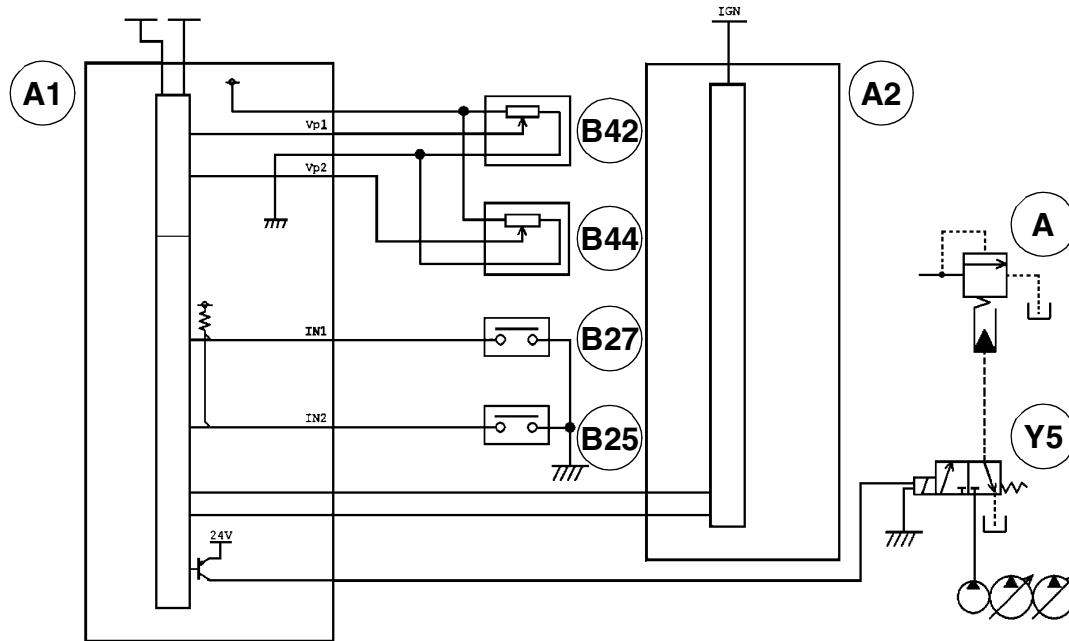
c) If the engine starts during the "ENG. PRE HEAT"



- A.** Preheat time  $T_p$
- B.** 2 seconds additional preheat
- C.** Preheat time for engine start
- D.** Time after preheat  $T_a$

# Power boost

## 1) Circuit configuration



- A** Main relief (standard)
- A1** Computer
- A2** Engine controller
- B25** Breaker pilot pressure switch

- B27** Travel pilot pressure switch
- B42** Pump pressure sensor (P1)
- B44** Pump pressure sensor (P2) (yellow band)
- Y5** Power-up solenoid valve (yellow band)

CS00F502

## 2) Increasing the pressure in each work mode

H mode (Pressure)	Automatic power boost (4554 ↔ 4975 psi)
S mode (Pressure)	Automatic power boost (4554 ↔ 4975 psi)
L mode (Pressure)	Constant power boost (4975 psi)

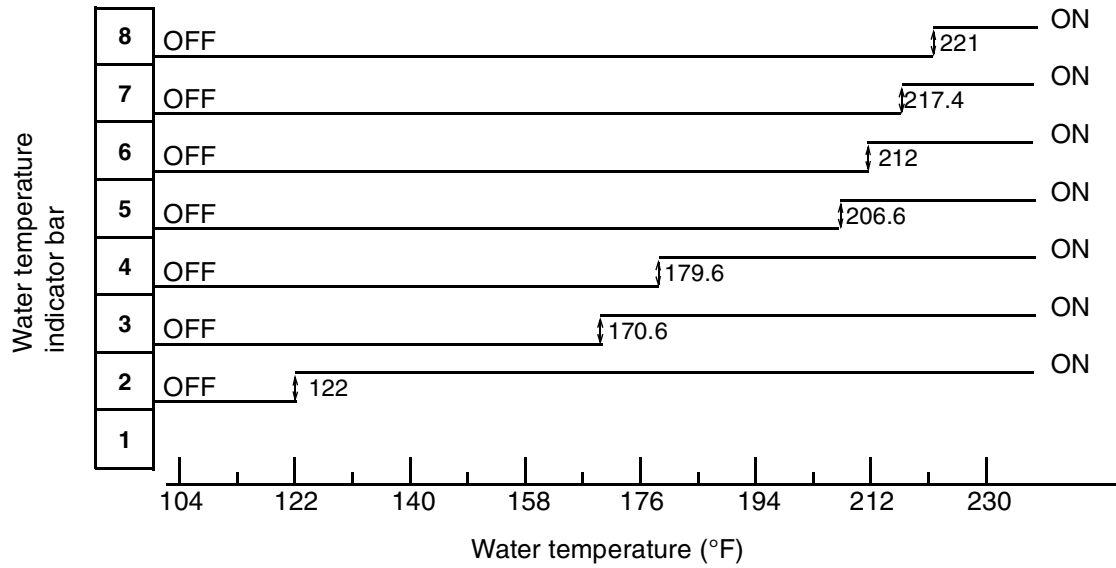
## 3) Operation

When operating in H or S mode, the computer (A1) records the ratio between:

- The engine load transmitted by the engine controller (A2).
- The hydraulic circuit load transmitted by the pump pressure sensors (P1) (B42) and (P2) (B44).

If the pump pressure (P1) or (P2) is greater than 4351 psi and the load ratio is within a range of ± 5% for 2 seconds, the computer (1) activates the power-up solenoid valve (yellow band) (Y5) for 8 seconds, which increases the main pressure.

When the travel pilot pressure switch (B27) or the optional breaker pilot pressure switch (B25) is activated, the computer (A1) deactivates the power-up solenoid valve (yellow band) (Y5).



## 2) Operation

- A. The coolant temperature sensor (B1) sends a signal to the engine controller (A2).
- B. The engine controller (A2) sends the converted signal to the computer (A1) via the CAN connection (3).
- C. The computer (A1) calculates the number of bars to display and transmits the information to the coolant temperature indicator (1) of the monitor display (P4) via the series connection (2).
- D. When the 8th bar on the coolant temperature indicator (1) is displayed, the message "OVER HEAT" appears on the monitor display (P4) of the instrument panel (P1) and the audible warning device sounds.

### 3. Previous failures in the engine DIAG3

This screen is connected to the previous screen (DIAG2) as concerns failures involving the hourmeter.

DIAG	MODE II H	E	0000
3			
E	1200	E	0000
E	1000	E	0000
E	0000	E	0000

E: Failure code

#### Example:

The screen above shows that the failure code 0032 (electronic regulator rack position detector) occurred at 1200 H and that failure code 0025 (fuel flow adjustment resistor) occurred at 1000 H.

- The numbers of hours shown indicate the time at which the failure occurred for the first time since the data was reinitialised.
- If you wish to erase the failure codes and the number of hours, press the work mode switch for 10 seconds.
- When data is erased from screens DIAG2 and DIAG3, it is recorded in the electronic control box memory (this data is only visible using an external computer).

### 4. Excavator failure detection DIAG4

DIAG	MODE II H	M	0000
4			
M	0020	M	0000
M	0000	M	0000
M	0000	M	0000

M: Failure code

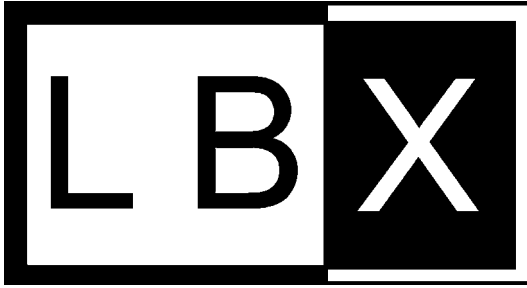
#### Failure code

M0000: No defect  
 M0010: Transistor output short-circuit  
 M0020: Hydraulic oil temperature sensor  
 M0030: Fuel sensor  
 M0040: Pump pressure sensor (P1)  
 M0050: Pump pressure sensor (P2)  
 M0060: Pressure sensor (nega-cont)  
 M0070: Key switch  
 M0080: Upper or travel pilot pressure switch  
 M0090: CAN communication circuit  
 M00A0: Computer reinitialisation  
 M00B0: Engine controller  
 M00C0: Boom cylinder pressure

#### Example:

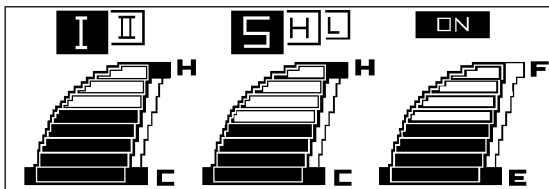
The screen above shows a failure in the hydraulic oil temperature sensor (0020).

7. After selecting the machine code, the destination code and the language code, press the auto mode switch and the screen below will appear:



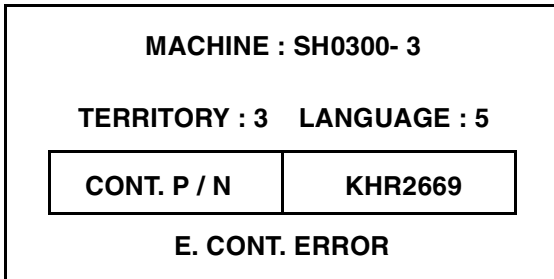
CS00J508

Then the work screen is displayed:



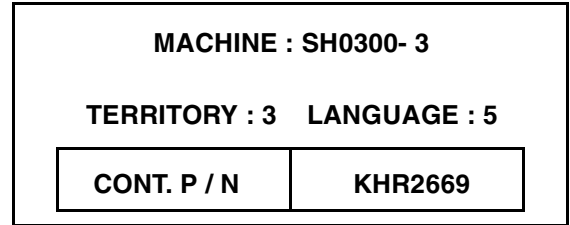
CS00F521

8. If the machine code does not correspond to the engine controller installed, the error code: "E. CONT. ERROR" appears on the screen and the audible warning device sounds.

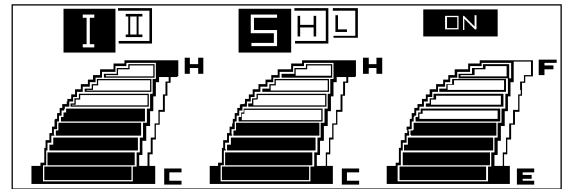


9. Check that the machine code corresponds to the engine controller installed on the excavator.
- If the machine code is wrong, start the procedure again from the beginning.
  - If the engine controller installed is not correct, change it.

10. To confirm the excavator model selection, press the auto work mode switch for 10 seconds:  
The screen below will appear:



11. Press the auto work mode switch again and the work screen will appear:

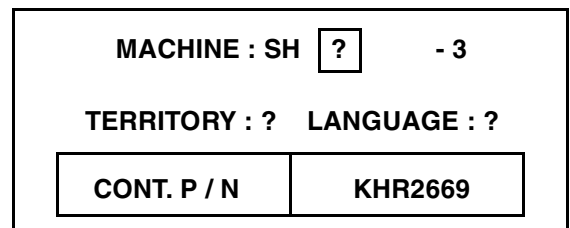


CS00F521

12. Re-initialising the data

In the excavator model selection screen, if the auto mode switch is pressed for 10 seconds, all the data will be erased and the audible warning device will sound.

If the key switch is turned OFF and then ON, the screen below will appear and the procedure starts again from the beginning.



### Changing the language code

Display the excavator model confirmation screen (press the auto mode switch for 10 seconds).

To change the language code, press the travel mode switch to display the required code.

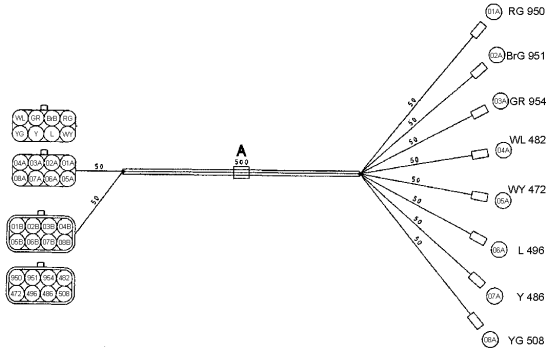
To confirm the language code, press the work mode switch and the audible warning device sounds.

Turn the key switch to OFF.

## Overheating (continued)

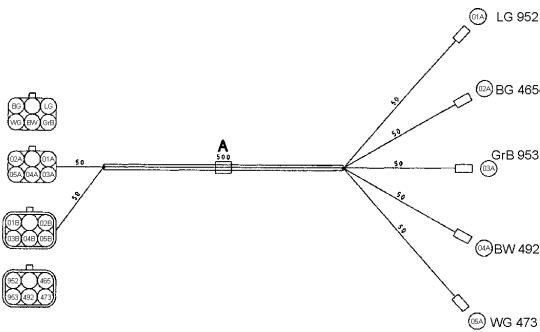
Troubleshooting	Cause	Action
<p><b>2. The hydraulic temperature bar-graph displays 8 bars.</b></p> <p>Key switch ON</p> <p>The hydraulic oil temperature sensor (B2) temperature is abnormal compared to maintenance assistance CHK1 (comparison between the actual temperature and that indicated).</p> <p>See hydraulic oil temperature in CHK1 OT. Measure the actual temperature</p> <p>YES</p> <p>See problem code M0020 for the oil temperature sensor (B2) using maintenance diagnostic (DIAG 4)</p> <p>YES</p> <p>Disconnect the hydraulic oil temperature sensor connector (B2) to measure the resistance. (Refer to the table below for the resistances).</p> <p>NO</p> <p>Disconnect the CN24 connector to measure the resistance between the male terminals OL and BO. (Refer to the table below for the resistances).</p> <p>NO</p> <p>Disconnect connector CN1 to measure the resistance between the female terminals OL and BO. (Refer to the table below for the resistances).</p> <p>NO</p> <p>YES</p>	<p>Defective hydraulic oil temperature sensor (B2)</p> <p>Bad connection on the hydraulic oil temperature sensor connector (B2)</p> <p>Bad connections on CN24</p> <p>Defective computer (A1) or bad connection on CN1</p>	<p>Replace the hydraulic oil temperature sensor (B2)</p> <p>Clean the hydraulic oil temperature sensor connecting terminal (B2)</p> <p>Clean the connecting terminal on CN24</p> <p>Replace the computer (A1) or clean the connecting terminals on CN1</p>
<p>Note: In the event of a short-circuit, the bar-graph goes off completely.</p>		

## Proportional solenoid



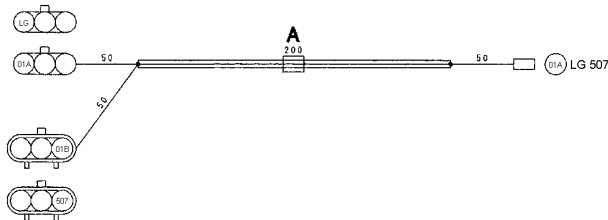
CS00J512

### 18. For electronic acceleration (RED4)



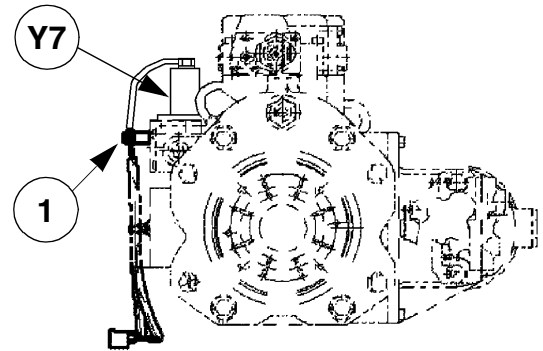
CS00J513

### 19. For electronic acceleration (RED4)



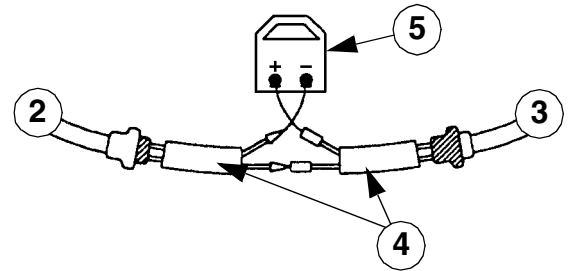
CS00J514

### 20. For electronic acceleration (RED4)



CS01M542

1. Disconnect connector (1) from the main pump proportional solenoid (Y7).



CS00E534

2. Connect the appropriate service connector (2P) (4) between the connector at the pump end (2) and the connector at the main harness end (3) and install the meter (5).

## INSPECTING THE BATTERY

**NOTE:** For a proper inspection of the battery, carry out each part of the inspection until the actual state of the battery is known.

### Visual inspection

- Check that the cable connections are clean and tightened properly. Remove all foreign bodies from the top of the battery.
- Check the box, the terminals and the battery cables for damage.
- Check the electrolyte level, see page 4.
- If you have added water to the battery, charge the battery for 15 minutes at 15 to 25 amperes to allow the water to mix correctly with the electrolyte.

### Check the specific gravity

Use a battery hydrometer to check the specific gravity of the electrolyte. The specific gravity indicates the charge level in each cell.

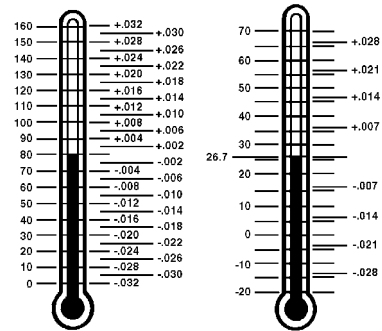
Battery hydrometers are designed to indicate the correct specific gravity when the electrolyte is at a temperature of 80°F.

Before checking the specific gravity, check the electrolyte temperature. If the hydrometer is not equipped with a thermometer, use a thermometer to measure the electrolyte temperature. The thermometer has to be calibrated at least up to 80°F.

1. Remove sufficient electrolyte from a cell so that the float moves freely in the tube.

**NOTE:** If it is not possible to check the specific gravity without first adding water to the cell, charge the battery for 15 minutes at 15 to 25 amperes 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 greater than 80°F, add specific gravity points to the reading to get the specific gravity. If the reading is less than 80°F, deduct specific gravity points from the reading to get the specific gravity. See the illustration below and add or deduct specific gravity points depending on the situation.



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 0.0019 minimum, charge the battery and check the specific gravity again. If after charging the difference is still 0.0019 minimum, install a new battery.

**NOTE:** When the battery is replaced, do not use a used battery with a new one. The life of the new battery will be reduced.

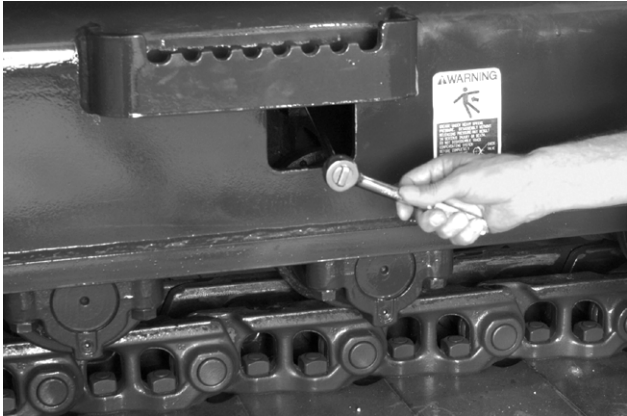
# **Section**

# **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.

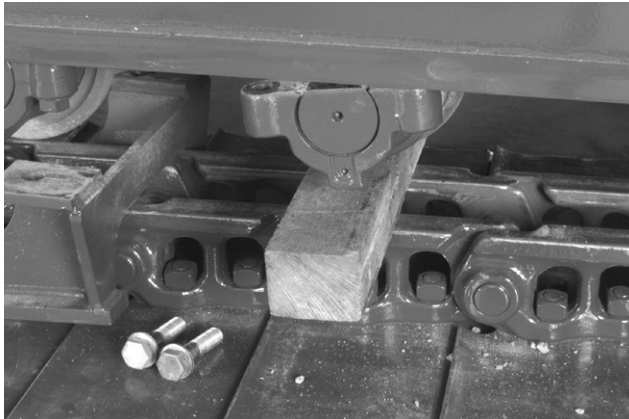


**WARNING:** Grease is under heavy spring pressure. Disassembly without releasing pressure may result in serious injury or death. Do not disassemble the track compensating system before completely releasing the grease pressure. Release grease pressure by loosening check valve. Do not remove the non-return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

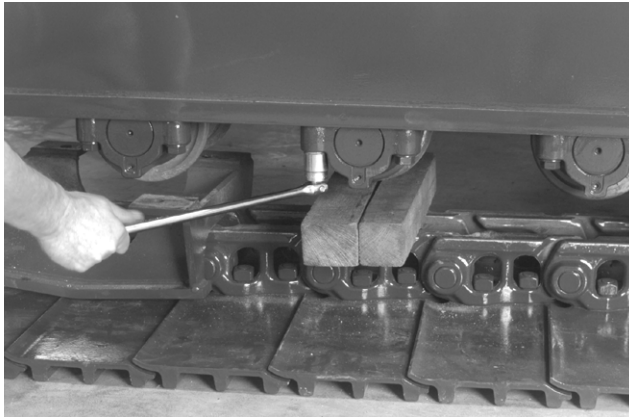
### STEP 1



JD00316A

Align the lower roller in position under the lower undercarriage.

### STEP 2



JD00299A

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

### STEP 3

Tighten the retaining screws of the lower roller end bearings to 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

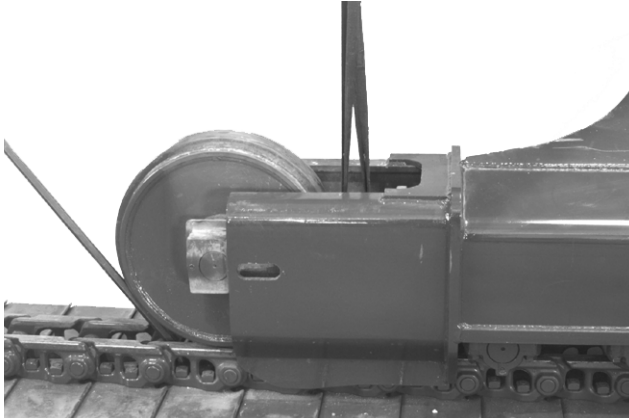
Refer to "Track tension setting" in Section 5001.

# 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.

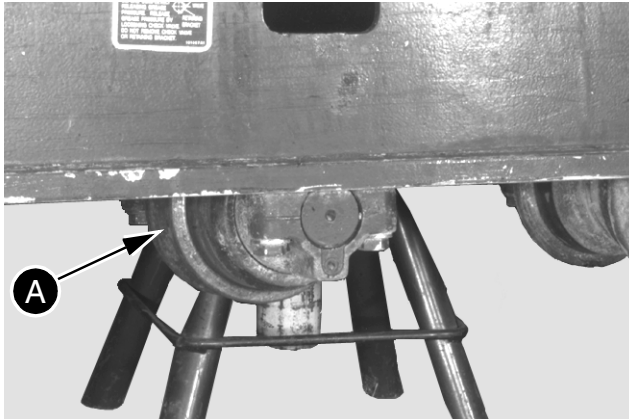
**STEP 6**

See "Removal and installation of the tracks" (Section 5001), for installing the track.

## Removal

**NOTE:** *The photos below do not correspond to the machine model, but the procedure is the same.*

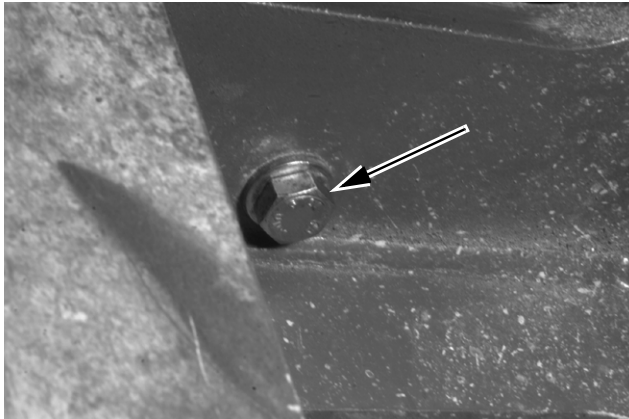
### STEP 1



JD01080A

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

### STEP 2



JD01081A

**NOTE:** *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.*

Unscrew the non-return check valve. As soon as the grease starts to flow, stop unscrewing the tension cylinder 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 pressure release orifice. 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 check valve (7), spring (8) and the ball (9) from the non-return check valve (10).

# SWING REDUCTION GEAR

## Removal

## STEP 5

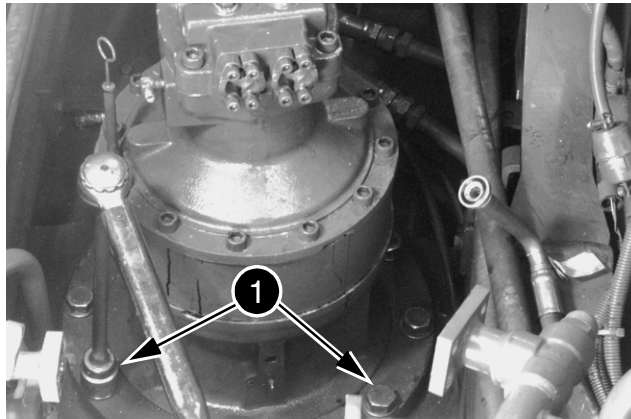
### STEP 1

Carry out Steps 1 to 10 of "Removal of the swing motor" (see Section 8008).

### STEP 2

Mark the position of the swing reduction gear on the upperstructure frame by making alignment marks on the swing reduction gear and the upperstructure frame.

### STEP 3



JD00449A

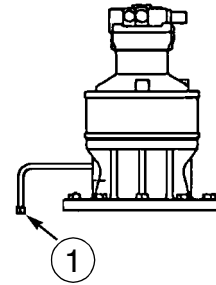
Remove the swing reduction gear retaining screws (1) and the centering pin.

### STEP 4



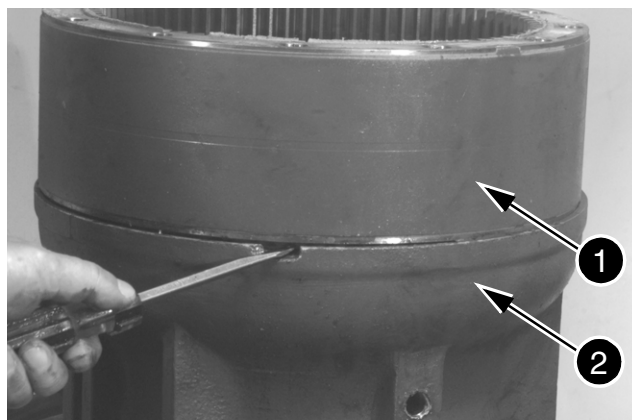
JD00437A

Carefully lift the upperstructure swing motor and reduction gear assembly, move it away from the machine.



JS00379A

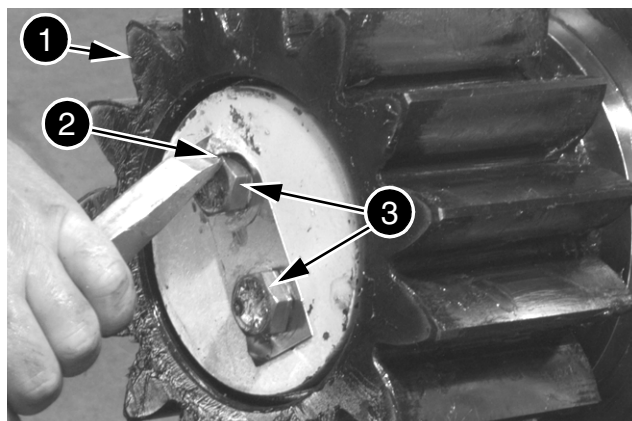
Place a container of 3.9 gallons capacity under the swing reduction gear drain plug. Remove the drain plug (1) and drain the oil. Install the drain plug.

**STEP 6**

6003-090

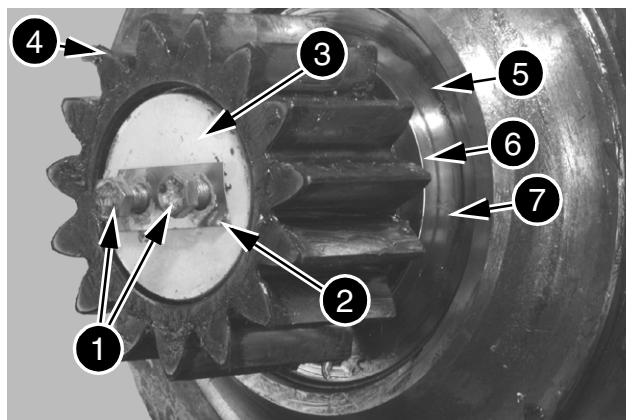
Remove the ring gear (1) from the reduction gear housing (2) using the notch in the housing for leverage.

**NOTE:** The planetary gear axles are assembled in two ways: A = assembly by hubbing the axle; B = assembly by blocking the axle (roll pin). According to the type of assembly, replace the entire planet wheel carrier or individual spare parts.

**STEP 7**

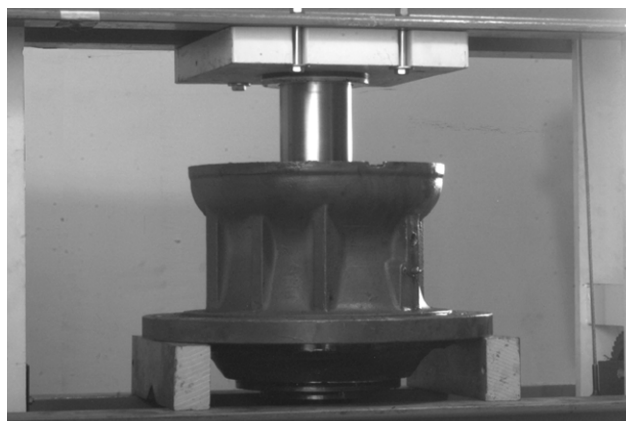
JD01464A

Turn the swing reduction gear upside down to be able to access the pinion (1). Straighten up the corners of the brake plate (2) to free the screws (3).

**STEP 8**

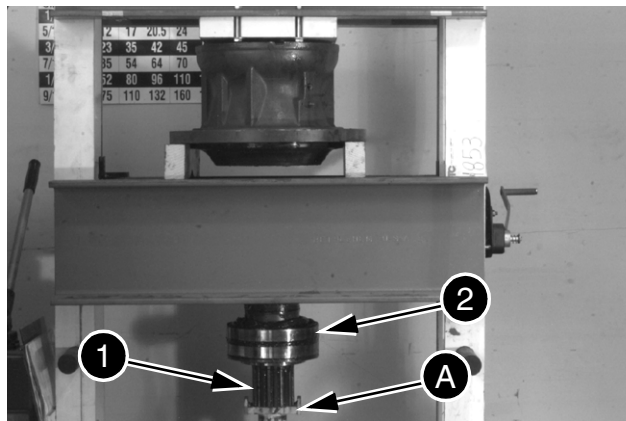
JD01465A

Remove the two screws (1), the brake plate (2), the end plate (3) and the pinion (4). Remove the snap ring (5), the stop (6) and the plate (7).

**STEP 9**

6003-096

Install the swing reduction gear in a suitable press. Place shims under the flange on the housing to hold the shaft upright.

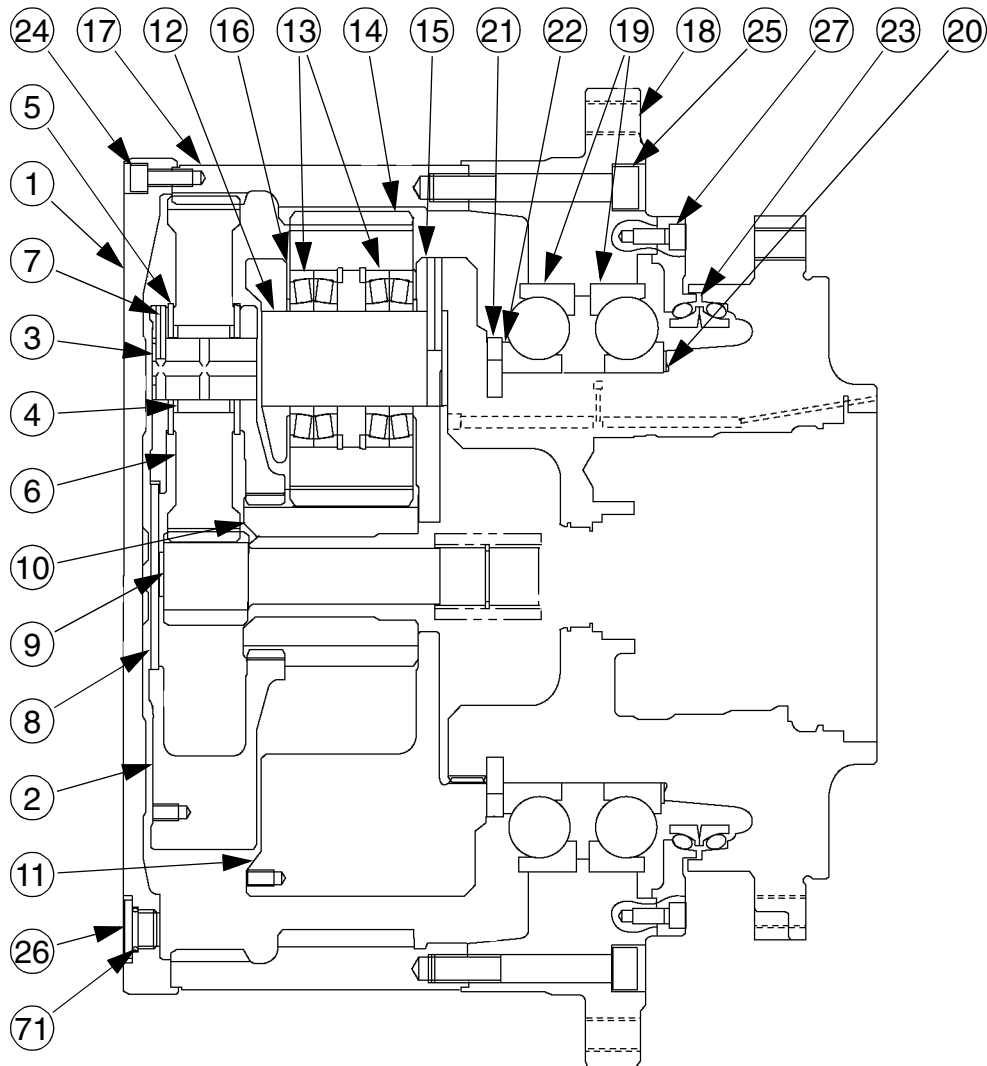
**STEP 10**

6003-097

Place a jack (A) under the shaft (1) and the bearing (2) under the press to hold and support the shaft when it has been pressed out of the housing. Press the shaft from the housing. Remove the shaft and the bearings from the press.

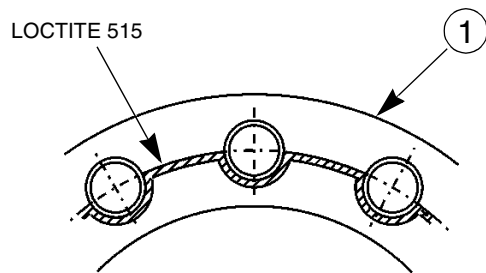
# REDUCTION GEAR

## Description



- |                      |                    |
|----------------------|--------------------|
| 1 COVER              | 15 SPRING PIN      |
| 2 SATELLITE CARRIER  | 16 THRUST WASHER   |
| 3 SATELLITE SHAFT    | 17 RING GEAR       |
| 4 NEEDLE BEARINGS    | 18 PIVOT           |
| 5 THRUST WASHER      | 19 ANNULAR BEARING |
| 6 SATELLITE          | 20 SHIM            |
| 7 SPRING PIN         | 21 LOCK WASHER     |
| 8 THRUST PLATE       | 22 THRUST RING     |
| 9 PLANETARY          | 23 FACE SEAL       |
| 10 PLANETARY         | 24 SCREW           |
| 11 SATELLITE CARRIER | 25 SCREW           |
| 12 SATELLITE SHAFT   | 26 PLUG            |
| 13 NEEDLE BEARING    | 27 SCREW           |
| 14 SATELLITE         | 71 O-RING          |

CS02G503

**STEP 20**

CS02B549

Apply Loctite 515 to the mating surfaces of cover (1) and ring gear (17) and install the cover (1) onto the ring gear (17).

**STEP 21**

CD02B027

Coat the screws (24) with Loctite 242 and tighten them to torque.

**STEP 14**

Install the portable filter on the upperstructure in such a manner that the machine can be operated. Attach the portable filter firmly to the machine.

**STEP 15**

Make sure that the electric cable is away from all moving parts.

**STEP 16**

Place the portable filter power switch in the ON position.

**STEP 17**

Start the engine, run it at half the maximum speed for 10 minutes. During those 10 minutes, stir the hydraulic fluid in the hydraulic reservoir with the long pipe.

**STEP 18**

Run the engine at maximum speed and bring the hydraulic fluid to its operating temperature by proceeding as follows:

1. Operate the bucket and dipper controls in one direction (cylinders against the stops) for 30 seconds.
2. Operate the bucket and dipper controls in the other direction (cylinders against the stops) for 30 seconds.
3. Repeat Steps 1 and 2 until the hydraulic fluid temperature reaches 113-131°F. (Third bar on the hydraulic oil temperature indicator of the monitor display on the illuminated instrument panel).

**STEP 19**

With the engine running at full speed, cycle each cylinder (in, out) twice, one after the other for 45 minutes.

**STEP 20**

With the engine running at full speed, operate the swing control several times by 180 degrees to the left and then to the right.

**STEP 21**

With the engine running at full speed, position the attachment at right angles to the frame. Use the attachment to raise the track off the ground. Operate the travel pedal, in one direction for 2 minutes and then in the other direction for 2 minutes. Repeat this cycle for 10 minutes.

**STEP 22**

Repeat Step 21 for the other track.

**STEP 23**

Bring back the engine to idle mode.

**STEP 24**

Stir the hydraulic fluid in the hydraulic reservoir for 10 minutes with the long pipe.

**STEP 25**

Shut down the portable filter and the engine.

**STEP 26**

Close the valve under the hydraulic reservoir.

**STEP 27**

Remove the inlet pipe of the valve under the hydraulic reservoir.

**STEP 28**

Remove the long pipe from the hydraulic reservoir.

**STEP 29**

Disconnect the portable filter and remove the portable filter from the machine.

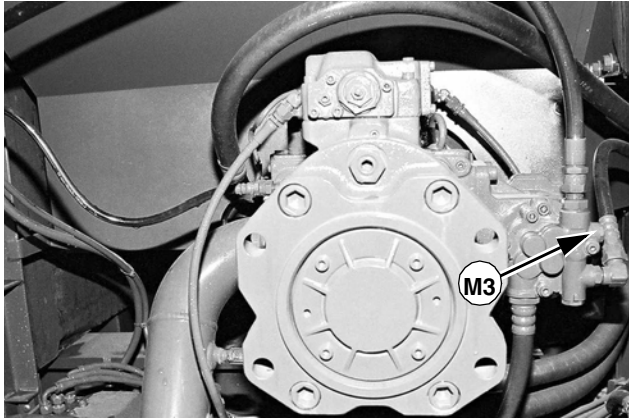
**STEP 30**

Install a vacuum pump on the hydraulic reservoir, see page 6.

**STEP 31**

Start the vacuum pump.

## Installing the pilot pressure test point

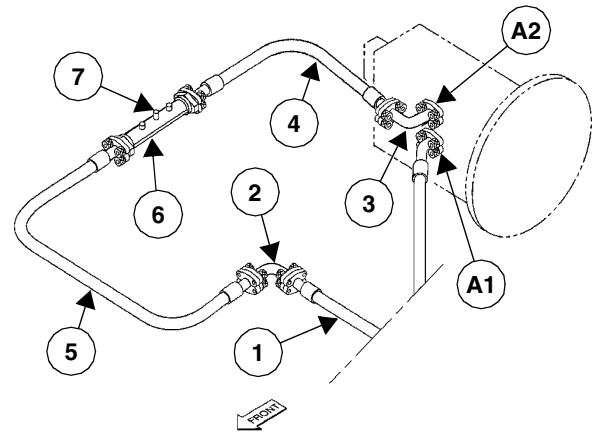


CD02C144

Install a pressure test point (M3) on the pilot circuit, using the T-pieces and the quick union supplied in the K1P0003 kit.

## Installing the flowmeter

(Checking hydraulic pump flows)



CI01M520

1. Disassemble hose (1) from port (A2) of the pump being checked.
2. Install the elbow union (2) (K1P0003) on the hose (1).
3. Connect the elbow union (3) (K1P0003) to port (A2) of the pump.
4. Install the hose (4) (K1P0011) on the elbow union (3).
5. Install the flowmeter (6) on the hoses (4).
6. Install the hose (5) (K1P0011) on the flowmeter (6) and on the elbow union (2).
7. Connect the multi-handly 2051 connecting cable to the detector plug (7) on the flowmeter (6).
8. Proceed in the same manner to check the other stage of the pump (A1).

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- Thank you very much for reading the preview of the manual.
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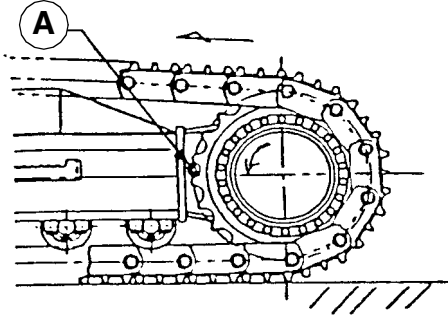


- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

### Checking and adjustment

1. Overset the secondary relief. "Attachment main relief" chapter.
2. Start the engine.



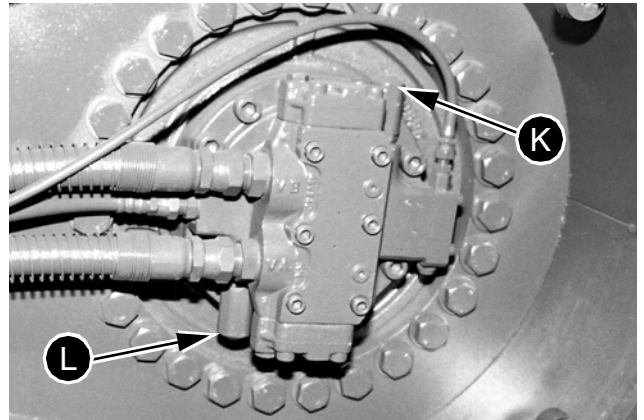
CS99B580

3. Carefully lock the travel on the side to be checked by positioning the locking pin (A) between the sprocket and the undercarriage as shown above.
4. With the engine at full speed, select mode "S".
5. Display the "CHK1" monitor display.
6. Operate and maintain the corresponding travel control (locking the sprocket).
7. Read the pressure on the monitor display, the pressure should be: Pressure setting  $5511 \pm 72$  psi .

Note the pressures if they are not correct to determine the number of shims needed for adjustment.

**One 0.0039 in shim corresponds to 145 psi pressure.**

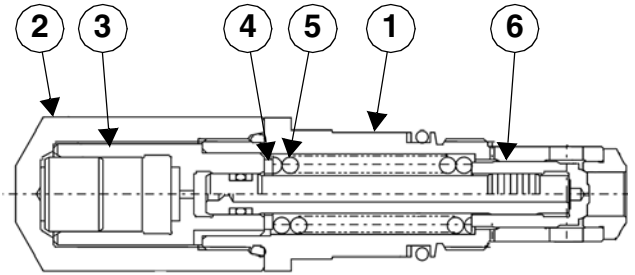
8. Go on to Step 9 if one of the secondary reliefs has to have its pressure set. Otherwise, reset the pressure on the main relief.



CD01M019

- K. Reverse secondary relief
- L Forward travel secondary relief

9. Remove the swing motor secondary relief concerned. If the two secondary reliefs have to be removed, mark them to ensure they are replaced in their original position.



CI01M519

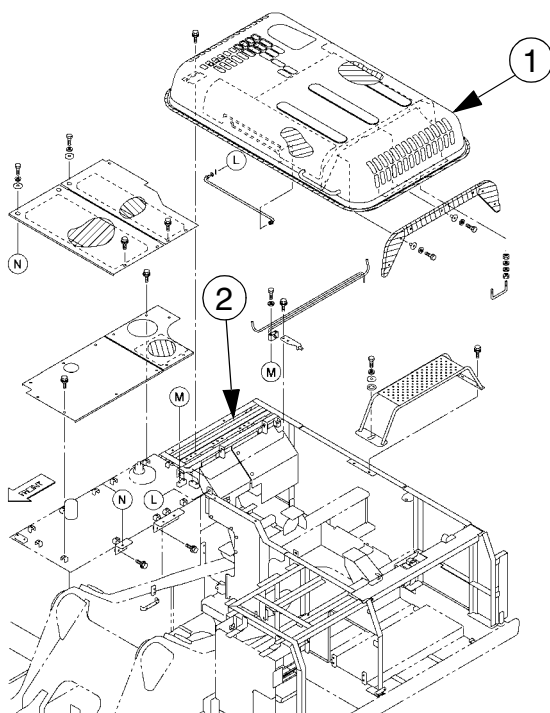
10. Tighten the body of the secondary relief (1) in a vice and remove the plug (2), the guide (3), the shims (4), the spring (5) and the check valve (6).

# Section

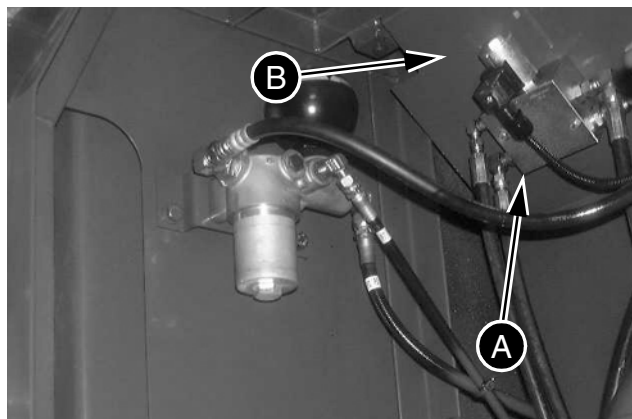
# 8002

8002

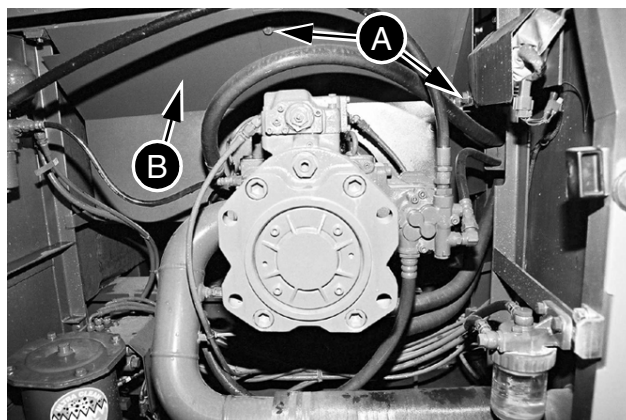
## REMOVAL AND INSTALLATION OF THE HYDRAULIC RESERVOIR

**STEP 6**

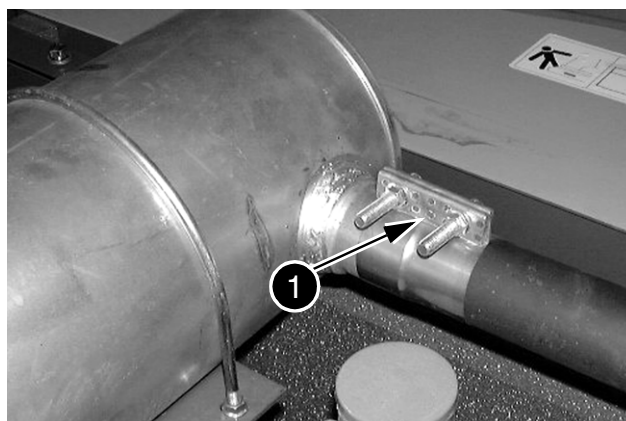
Remove the engine hood (1) then the protective grille (2). CS02B556

**STEP 7**

Disconnect all the hoses from the quick coupling control block (A). Remove the block (A) from the panel (B). CD02C147

**STEP 8**

Remove all the retaining screws (A) from the panel (B), then remove the panel (B). CD02H004

**STEP 9**

Remove the circlip (1) fastening the silencer pipe to the turbocharger. CD00F108

**NOTE:** All the engine and the exhaust system to cool down before starting any disassembly.

# Section

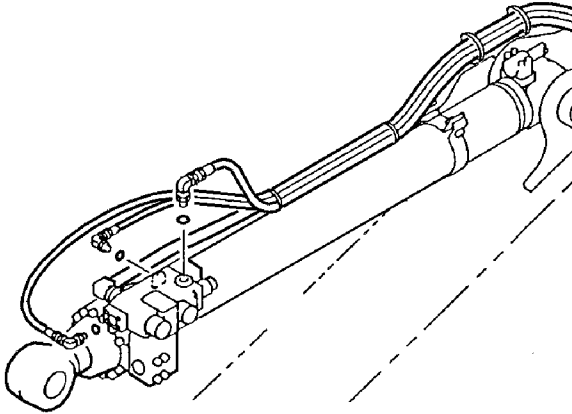
# 8005

## REMOVAL AND INSTALLATION OF THE ATTACHMENT CYLINDERS

8005

**STEP 6**

(Only if the machine is equipped with a safety valve)

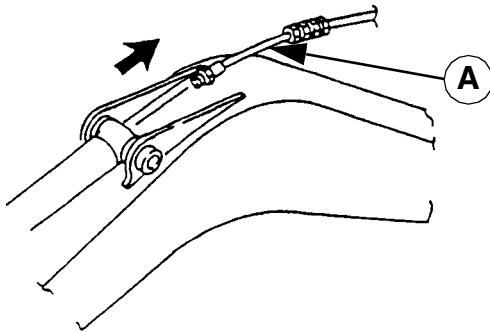


CS00G503

Disconnect the hydraulic pilot hoses from the safety valve.

**STEP 7**

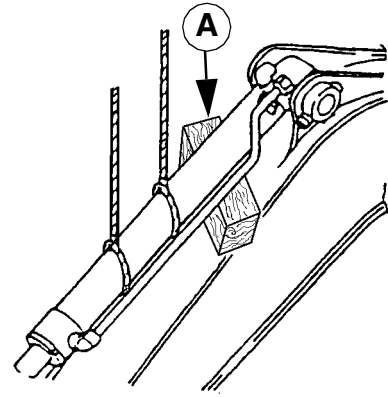
Plug the hydraulic hoses with plugs and the unions with caps. Stop the vacuum pump.

**STEP 8**

JS00599A

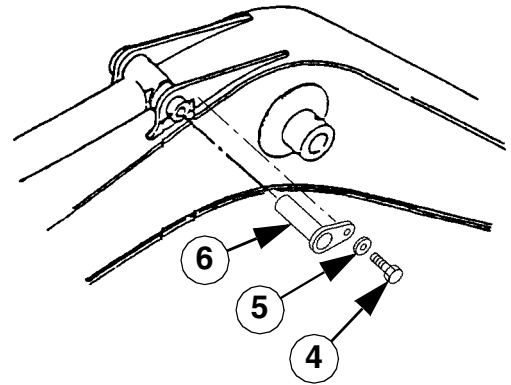
Disconnect the lubrication hose (A) from the dipper cylinder.

**NOTE:** Lift the cylinder carefully, the cylinder is heavy, its weight has to be balanced with slings during lifting.

**STEP 9**

JS00600A

Attach a suitable lifting device to the dipper cylinder. Use the total movement to get sufficient support during removal of the dipper cylinder.

**STEP 10**

CS02B567

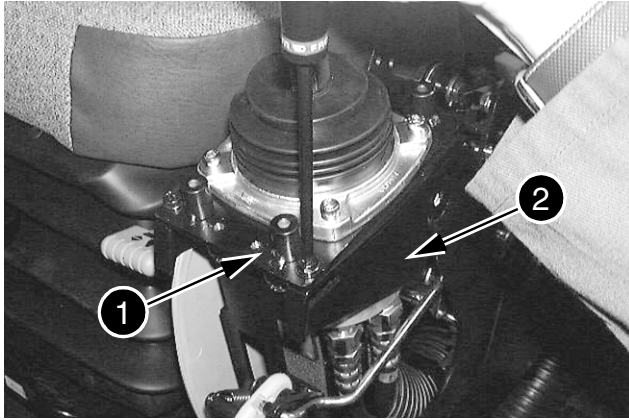
Remove the screw (4) and the washer (5). Remove the shaft (6) carefully.

# Section

# 8006

## REMOVAL AND INSTALLATION OF THE HYDRAULIC SWIVEL

8006

**STEP 14**

Loosen and remove the screws that fasten the retaining plate of the control lever (1) to the bracket (2). CD00G060

**STEP 15**

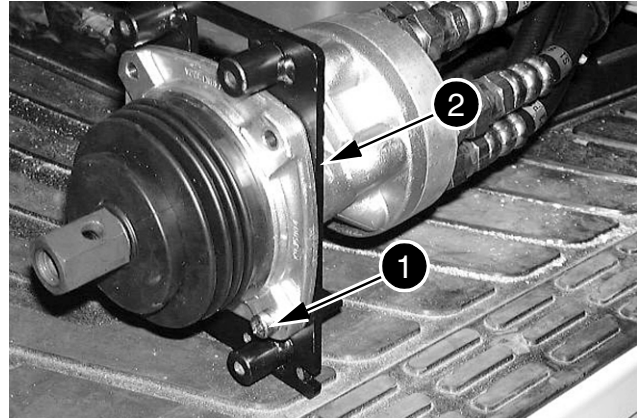
Take the control lever block (1) out from the bracket (2). CD00G061

**STEP 16**

Start the vacuum pump.

**STEP 17**

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

**STEP 18**

Attach identification tags to all hoses of the control lever block. Remove and seal the hydraulic hoses. Remove the junction unions, put plugs on the ports of the control lever block, then discard the O-rings. Loosen and remove the retaining screws (1) from the plate (2). CD00G062

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

**STEP 19**

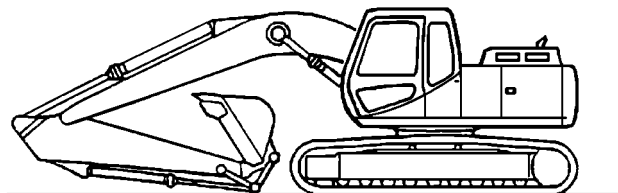
Stop the vacuum pump.

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

## SWING MOTOR

### Removal and installation

#### STEP 1



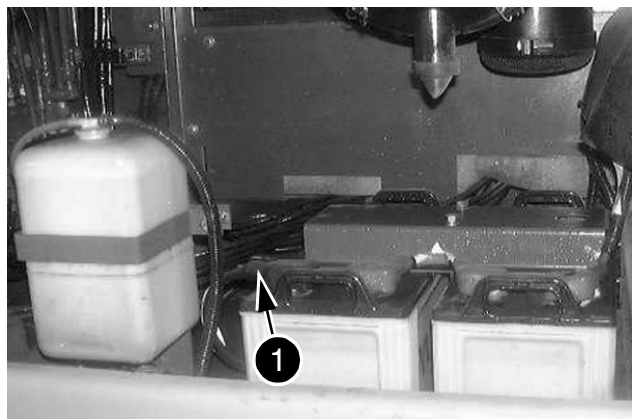
JS00163A

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

#### STEP 2

Release pressure in the hydraulic system and in the hydraulic reservoir (see Section 8000).

#### STEP 3



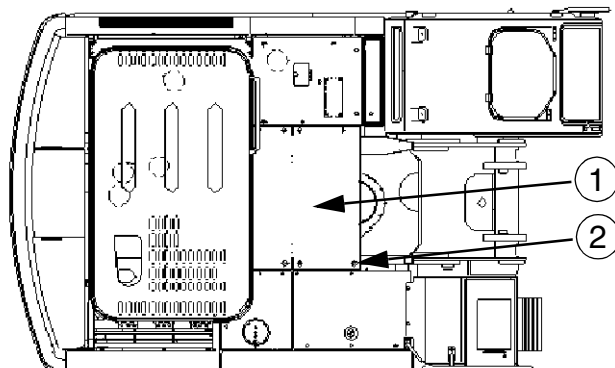
CD02H003

Disconnect the earth (-) cable (1) from the battery.

#### STEP 4

To prevent any fluid leaks when disconnecting hydraulic lines, connect a vacuum pump to the hydraulic reservoir (see Section 8000).

#### STEP 5



CS02B555

Remove the upper panel (1) retaining screws (2), then remove the upper panel (1).

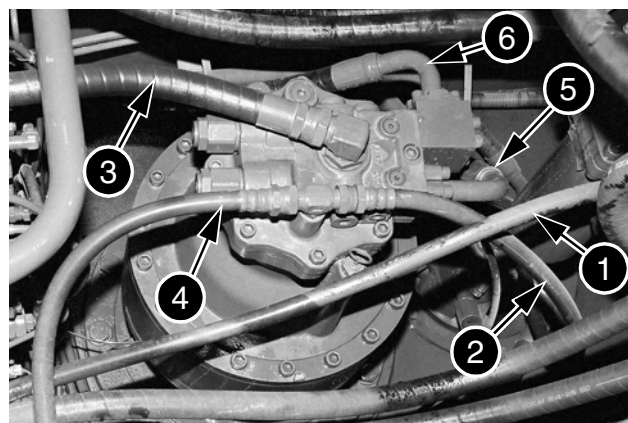
#### STEP 6

To facilitate installation, attach labels to all the hoses and hydraulic unions which are disconnected during removal.

#### STEP 7

Start the vacuum pump.

#### STEP 8



CD02E001

Attach identification tags to the hydraulic hoses. Remove the hoses (1), (2), (3), (4), (5) and (6). Plug the hoses and the unions.

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

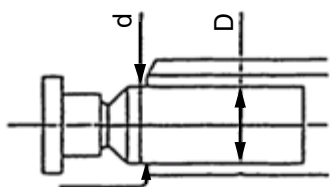
## SPECIAL TORQUE SETTINGS

Cover retaining screws .....	21 lb-ft
Body retaining screws .....	318 lb-ft
Power take-off housing retaining screws .....	72 lb-ft
Control unit retaining screws .....	21.6 lb-ft

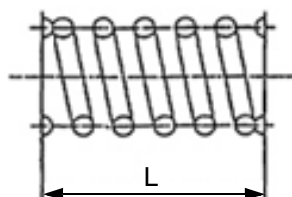
## WEAR INSPECTION

Description of parts	New / limit	Action
Play between piston/bore (D-d)	0.0016 / 0.0027	Replace the cylinder assembly
Play at the shoe piston and the guide (A)	0-0.0039 / 0.011	Replace the piston or the plate assembly
Shoe thickness (t)	0.21 / 0.19	Replace the pistons
Free height of cylinder springs (L)	1.88 / 1.85	Replace the springs
Height of the base plate and the spherical bushing (H-h)	0.93 / 0.89	Replace the base plate and the spherical bushing

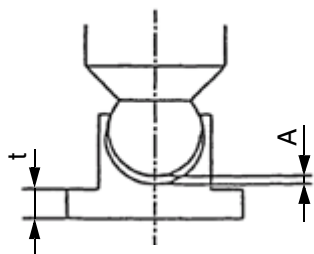
Overhaul dimension of the cylinder, the distribution machined plate and the swash plate (machined surface)		
Distribution machined plate (sliding contact surface)	Standard roughness after grinding	0.0039 RA or less
Swash plate (at the plate)	Roughness of the surface at the wear limit	0.031 RA
Cylinder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



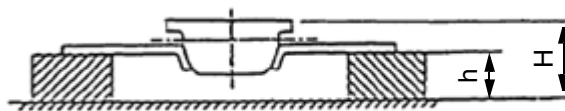
CS02B595



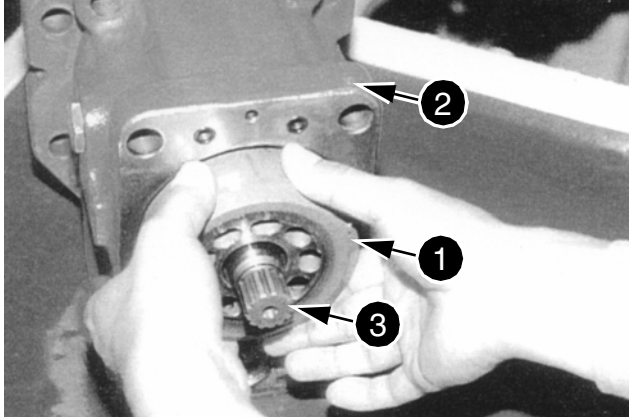
CS02B596



CS02B597

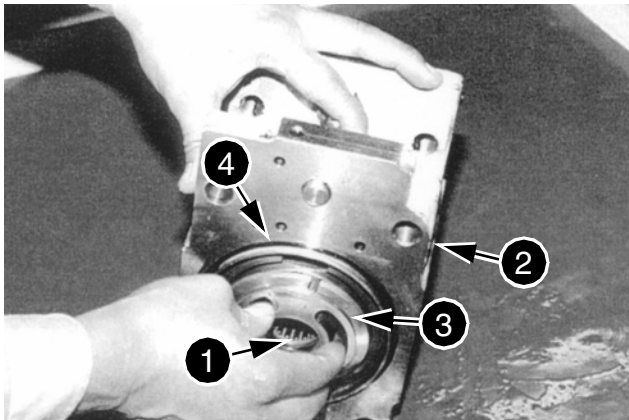


CS02B598

**STEP 8**

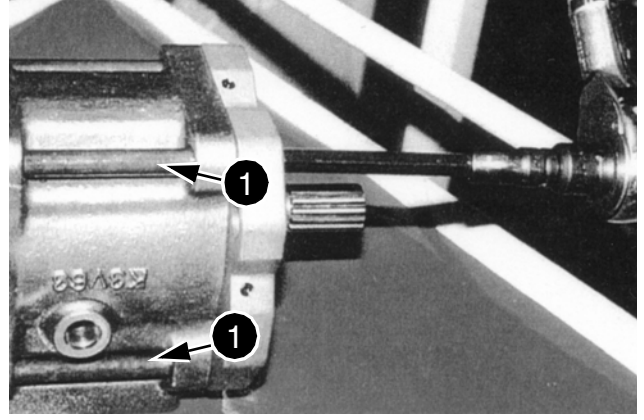
CD01G117

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**

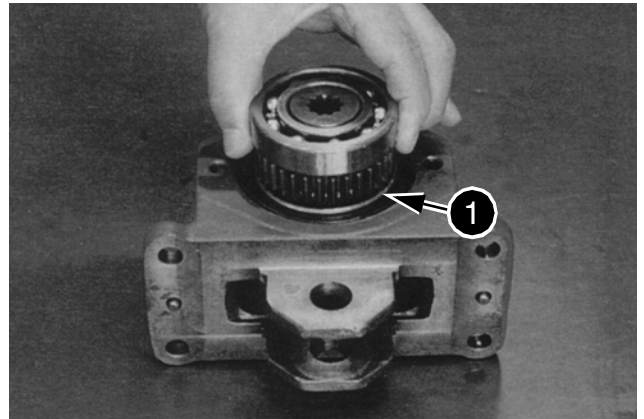
CD01G118

Install new needle bearings (1) in the intermediate housing (2). Stick the cylinder plate (3) with grease 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. Install the coupling pinion in the intermediate housing. Proceed in the same manner to install the second pump body (step 2 to 10).

**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. Control valve housing      | 63. Port plug  |
| 2. Control valve housing      | 64. O-ring     |
| 3. Dipper spool 2             | 65. Steel ball |
| 4. Bucket spool               | 66. Plug       |
| 5. Boom spool 1               | 67. Cap        |
| 6. Travel spool               | 68. Screw      |
| 7. Straight-line travel spool | 69. Cap        |
| 8. Dipper spool 1             | 70. Screw      |
| 9. Option spool               | 71. O-ring     |
| 10. Boom spool 2              | 72. Cap        |
| 11. Swing spool               | 73. Cap        |
| 12. Cap                       | 81. Washer     |
| 13. Cap                       | 91. Plug       |
| 14. O-ring                    | 96. Screw      |
| 15. Check valve               | 97. Plug       |
| 16. Spring                    |                |
| 17. Spacer                    |                |
| 18. O-ring                    |                |
| 19. Back up ring              |                |
| 20. Spool                     |                |
| 22. Spring                    |                |
| 23. Plug                      |                |
| 27. Back up ring              |                |
| 28. Check valve               |                |
| 29. Spring                    |                |
| 30. O-ring                    |                |
| 31. Check valve               |                |
| 32. Check valve               |                |
| 33. Spring                    |                |
| 34. Cap                       |                |
| 35. O-ring                    |                |
| 36. Check valve               |                |
| 37. Load holding valve        |                |
| 38. Main relief               |                |
| 39. Safety valve              |                |
| 40. Safety valve              |                |
| 42. Plug assembly             |                |
| 43. Check valve               |                |
| 44. Spring                    |                |
| 45. Plug                      |                |
| 46. O-ring                    |                |
| 47. Plug                      |                |
| 48. O-ring                    |                |
| 49. Spool                     |                |
| 51. Plug                      |                |
| 52. Plug                      |                |
| 54. Screw                     |                |
| 56. Screw                     |                |
| 59. O-ring                    |                |
| 60. O-ring                    |                |
| 61. O-ring                    |                |
| 62. O-ring                    |                |

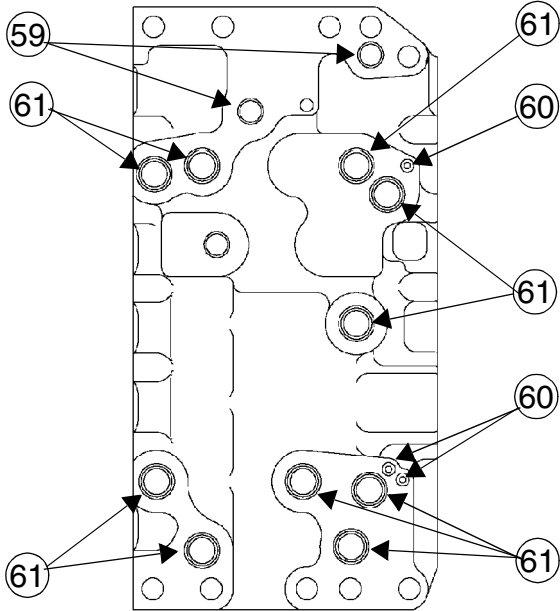
**STEP 3**

Install the plugs (52) equipped with an O-ring. Tighten to torque (see page 3).

**NOTE:** For installation of the control valve, see Section 8004.

**Assembling the sections**

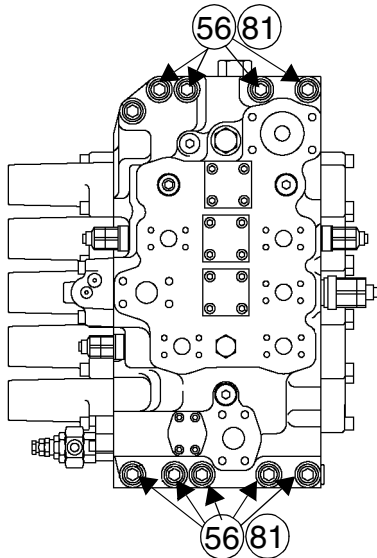
**STEP 1**



CS02K564

Install new O-rings (61) and (60).

**STEP 2**



CS02K563

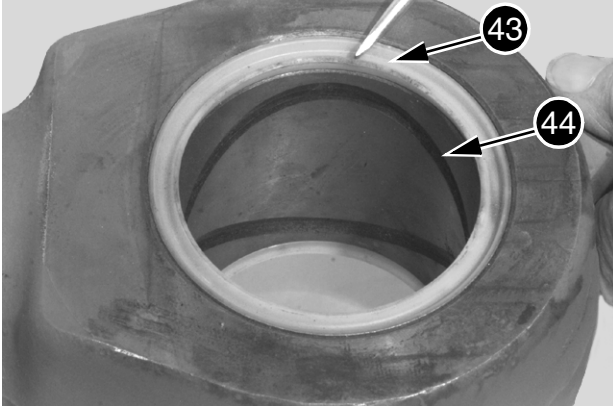
Assemble the two sections (1) and (2) using screws (56) and washers (81). Tighten to torque (see page 3).

- 1 GREASE FITTING
- 2 NOT USED
- 3 NOT USED
- 4 SCREW
- 5 SCREW
- 6 WASHER
- 7 PIPE CLAMP
- 8 HYDRAULIC PIPE
- 9 O-RING
- 10 HYDRAULIC PIPE
- 11 O-RING
- 12 NOT USED
- 13 NOT USED
- 14 NOT USED
- 15 SCREW
- 16 LOCKING WASHER
- 17 RETAINING CLIP
- 18 SCREW
- 19 BEARING
- 20 SCREW
- 21 STEEL BALL
- 22 PISTON NUT
- 23 PISTON
- 24 SEAL
- 25 NOT USED
- 26 SEALING RING
- 27 SEALING RING
- 28 SHIM
- 29 NOT USED
- 30 NOT USED
- 31 NOT USED
- 32 NOT USED
- 33 O-RING
- 34 BACK-UP RING
- 35 RING
- 36 SEAL
- 37 BACK-UP RING
- 38 WIPER SEAL
- 39 RETAINING RING
- 40 BUSHING
- 41 NOT USED
- 42 CUSHION BUSHING
- 43 WIPER SEAL
- 44 BUSHING
- 45 CYLINDER ROD
- 46 CYLINDER BARREL
- 47 O-RING

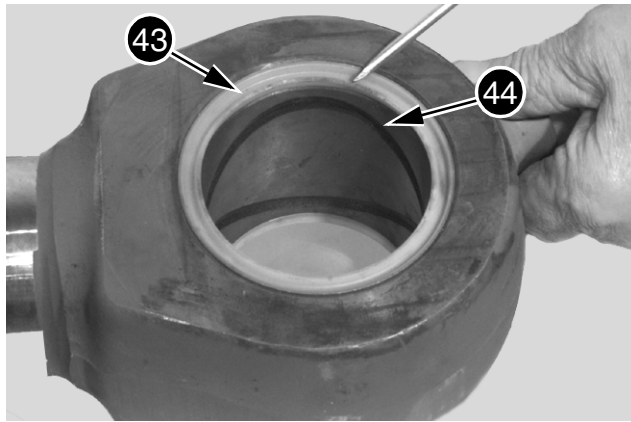
## Assembly

**NOTE:** The numbers within brackets in the following steps refer to boom cylinder, dipper cylinder and bucket cylinder schematics in this section on pages 5, 7 and 9.

### STEP 1



JD00655A



JD00654A

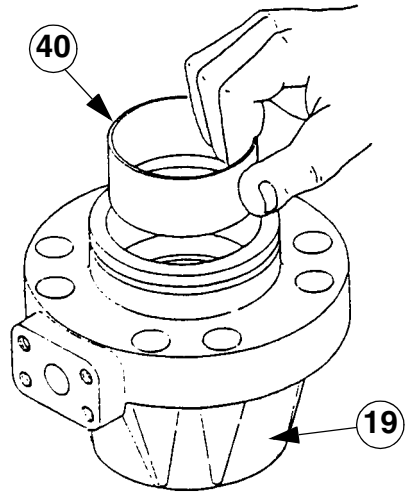
Using a suitable press and drift, install the two bushings (44). Install the four new wipers (43) with the lip side of the wipers facing out.

### STEP 2

**NOTE:** The bucket cylinder does not incorporate a seal in the cushion ring.

Install the cushion bushing (42) on the cylinder rod (45). Install a new seal (41) in the cushion bushing.

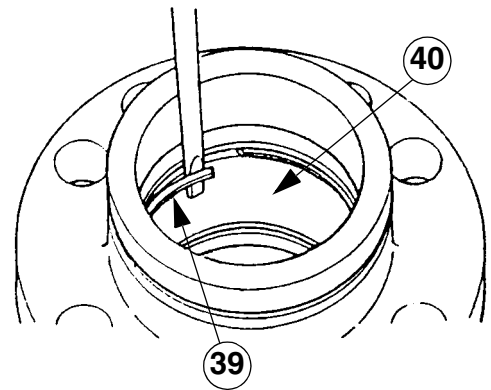
### STEP 3



JS00659A

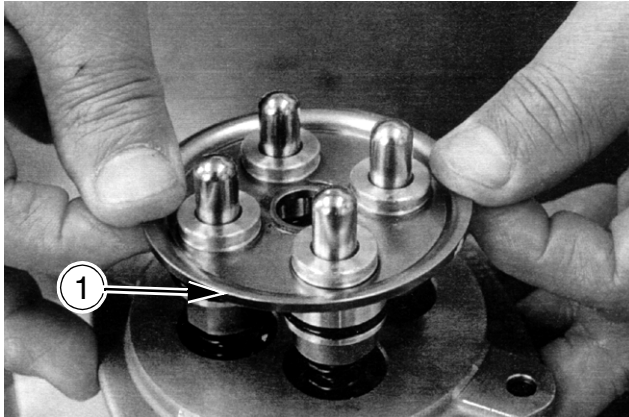
Using a suitable press and drift, install the bushing (40) in the bore of the bearing (19).

### STEP 4



JS00653A

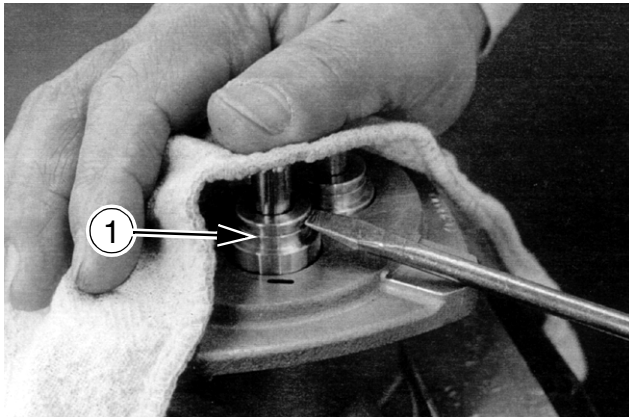
Install the retaining ring (39) in the groove of the bearing (19).

**STEP 5**

CD00G091

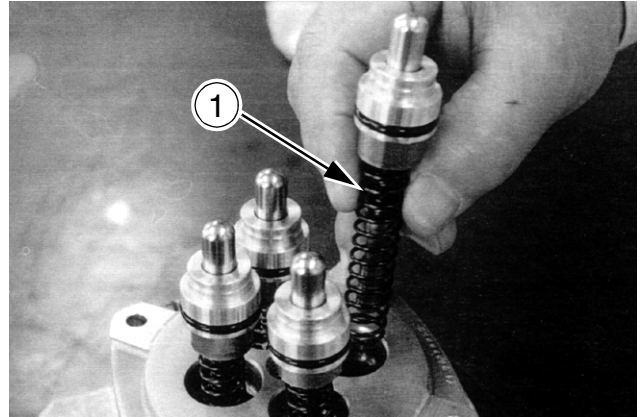
Remove the plate (1).

**NOTE:** Make marks on the components removed in the following steps to facilitate their re-installation in their corresponding bores.

**STEP 6**

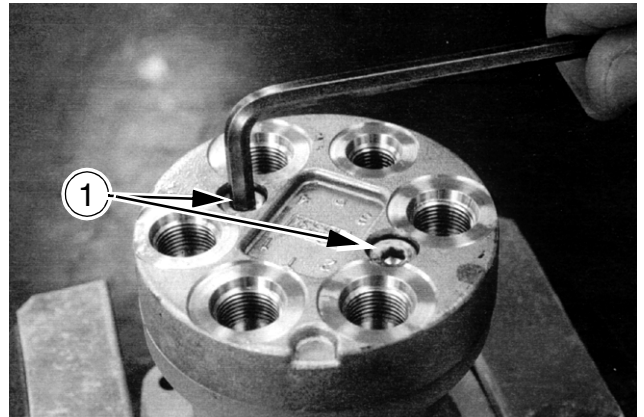
CD00G092

Depending on the condition of the return springs, the resistance to slipping of the O-rings can maintain the push-rod guides (1) in place in the body. In this case, use a flat screwdriver to remove the push-rod guides (1). Slide a screwdriver into the outer groove, making sure not to damage the push-rod guide. This must be done carefully, because the push-rod guide (1) can be ejected very suddenly under the pressure of the return springs.

**STEP 7**

CD00G093

Remove the control lever spool assembly (1).

**STEP 8**

CD00G094

Turn the control lever the other way up in the vice. Loosen and remove the screws (1) and the sealing washers.

**STEP 9**

CD00G095

Remove the cover plate (1) and the O-ring from the body. Scrap the O-ring.

## SPECIFICATIONS

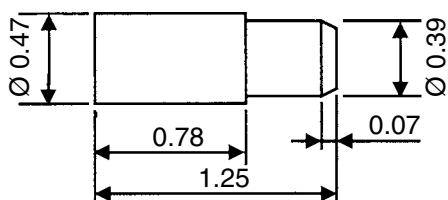
Primary pressure .....	Maximum 1421 psi
Secondary pressure .....	0 ~ 638 psi (Max end of stroke control pressure)
Permissible return pressure.....	43.5 psi
Rated flow.....	2.19 gpm
Operating angle.....	± 12.4°
Hydraulic fluid.....	Mineral hydraulic fluid
Working temperature range.....	-4°F ~ +167°F

## TORQUE SETTING

Cover retaining screws .....	58 to 60 lb-ft
Cam joint pin locking screw (apply Loctite 241) .....	4.4 to 5.9 lb-ft
Cam setting screw locking nut.....	23.2 to 27.6 lb-ft

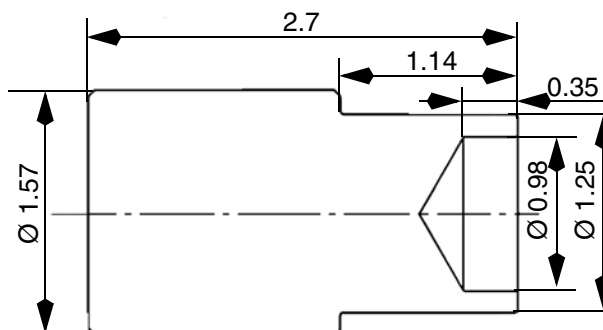
## SPECIAL TOOLS

Special tool Dimensions inch



Tool for removing the cover bushing.

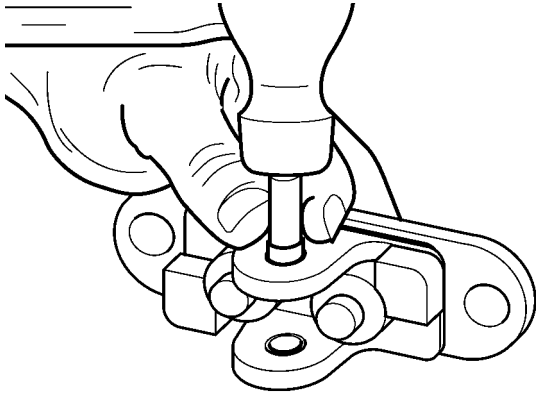
CS02M587



Tool for installing the stopping ring.

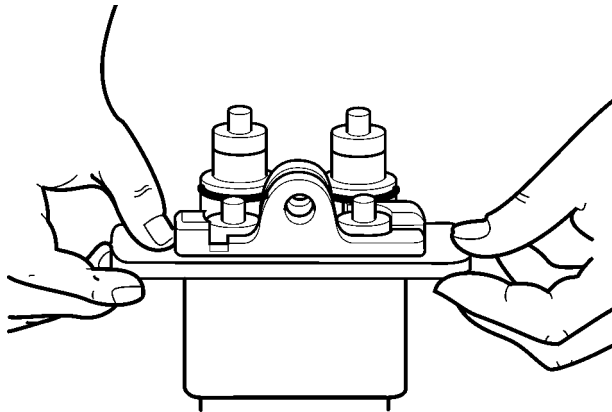
CS01C525

**STEP 18**



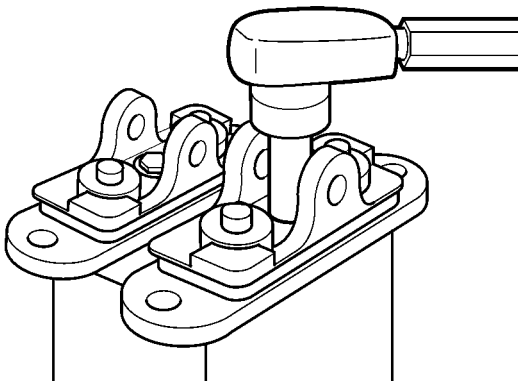
Place the cover on a flat surface and install the bushings using the special tool and a hammer. CI01B547

**STEP 19**



Assemble the cover on the control pedal body. CI01B548

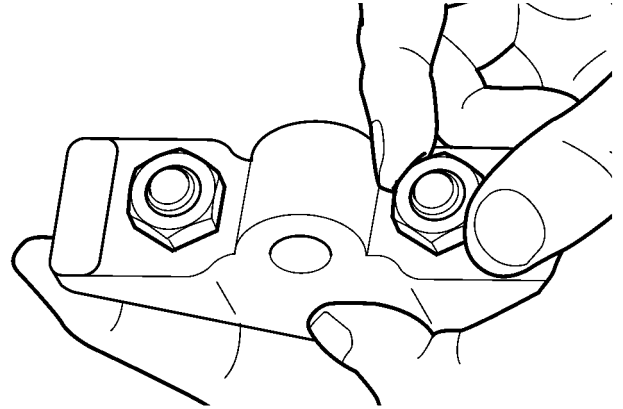
**STEP 20**



Tighten the cover retaining screw to the torque specified on page 3. CI01B549

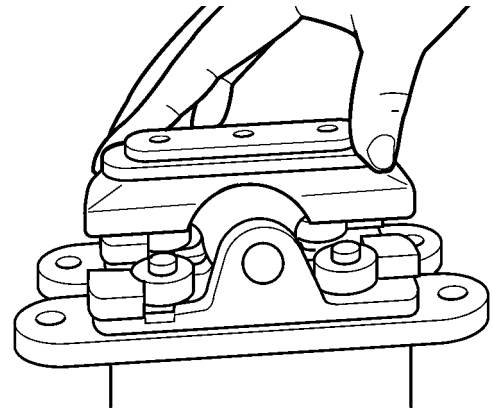
**NOTE:** Check the proper positioning of the cover on the control pedal body.

**STEP 21**



Assemble the nuts and the screws on the cam. CI01B550

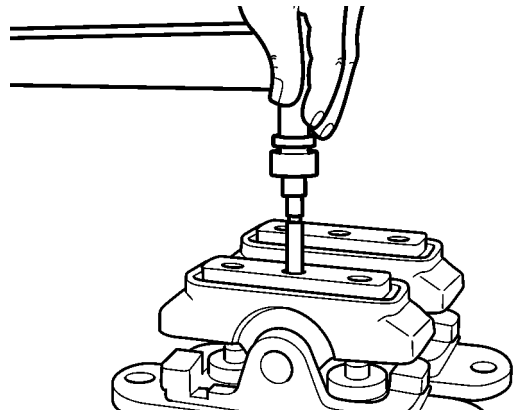
**STEP 22**



Position the cam on the cover; assemble the cam shaft while holding it. CI01B520

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

**STEP 23**



Apply Loctite 241 on the threads of the cam pin locking screw and tighten it to the torque specified on page 3. CI01B551

# Section

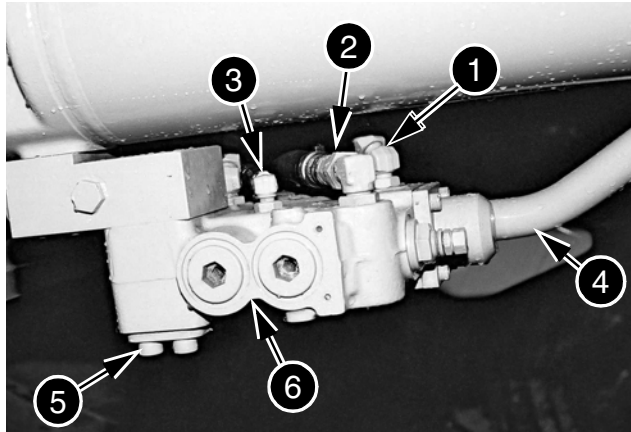
# 8016

**DISASSEMBLY AND ASSEMBLY  
OF THE CUSHION CONTROL VALVE**

**8016**

## BOOM SAFETY VALVE

### Identifying the ports



CD02C001

- 1 PILOT SPOOL
- 2 LEAK RETURN
- 3 HIGH PRESSURE CIRCUIT BYPASS TOWARDS THE OTHER VALVE
- 4 VALVE POWER SUPPLY
- 5 SCREW
- 6 SAFETY VALVE

### 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.
- Release pressure in the hydraulic circuit (see Section 8000).

Remove the hoses (1), (2) and (3) and plug the unions and the hoses.

Remove the tube (4) and plug the ports.

Remove the screws (5) and the relief valve (6).

Plug the cylinder port.

### Installation

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

For valve adjustment, see Section 8001.

# Section

# 8018

**DISASSEMBLY AND REASSEMBLY  
OF THE HYDRAULIC SWIVEL**

**8018**

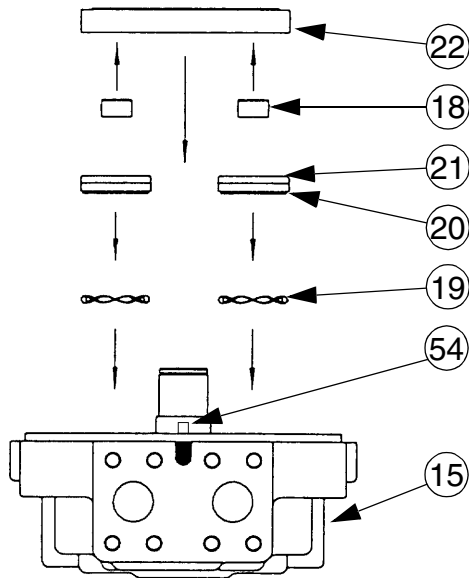
## SPECIFICATIONS

See Section 1002.

## TORQUE SETTINGS

Bypass valve plug (27) .....	57.5 lb-ft
Non-return check valve plug (52) .....	101 lb-ft
Cover screw (49) .....	116 lb-ft
Safety valve (48).....	116 lb-ft

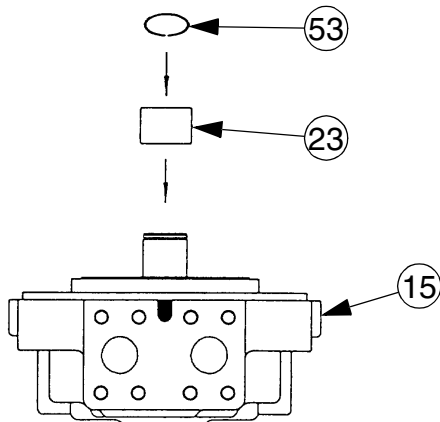
**STEP 14**



CS02J569

Install the spring washers (19) in the cover (15). Apply No. 2 EP lithium grease on the bushings (21), the new Teflon rings (20) and in the cover (15). Install a Teflon ring on each of the bushings. Install the bushings with seals in their holes in the cover. Apply No. 2 EP lithium grease on the pistons and install the pistons (18) in the distribution plate (22). Be sure that the pistons are installed in same bore as they were removed from. Install the pistons and the distribution plate (22) on the cover (15), positioning the plate hole on the stop dowel (54).

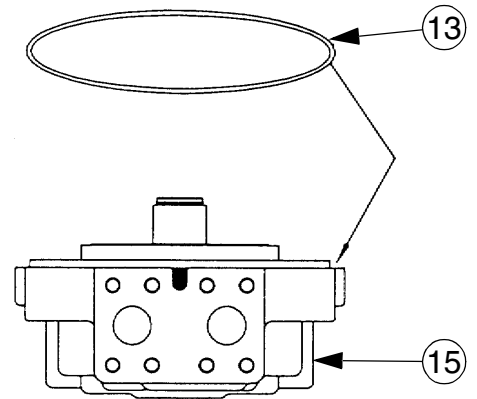
**STEP 15**



CS02C546

Install the new needle bearing inner race (23) on the shaft and install the snap ring (53).

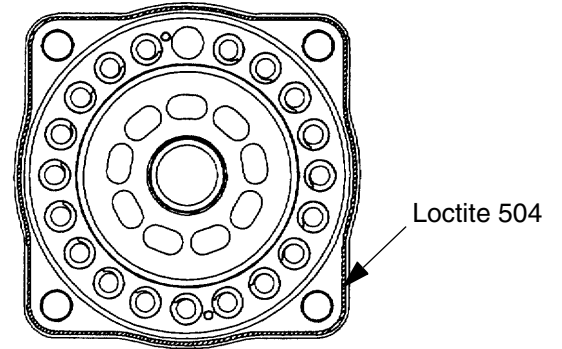
**STEP 16**



CS02C547

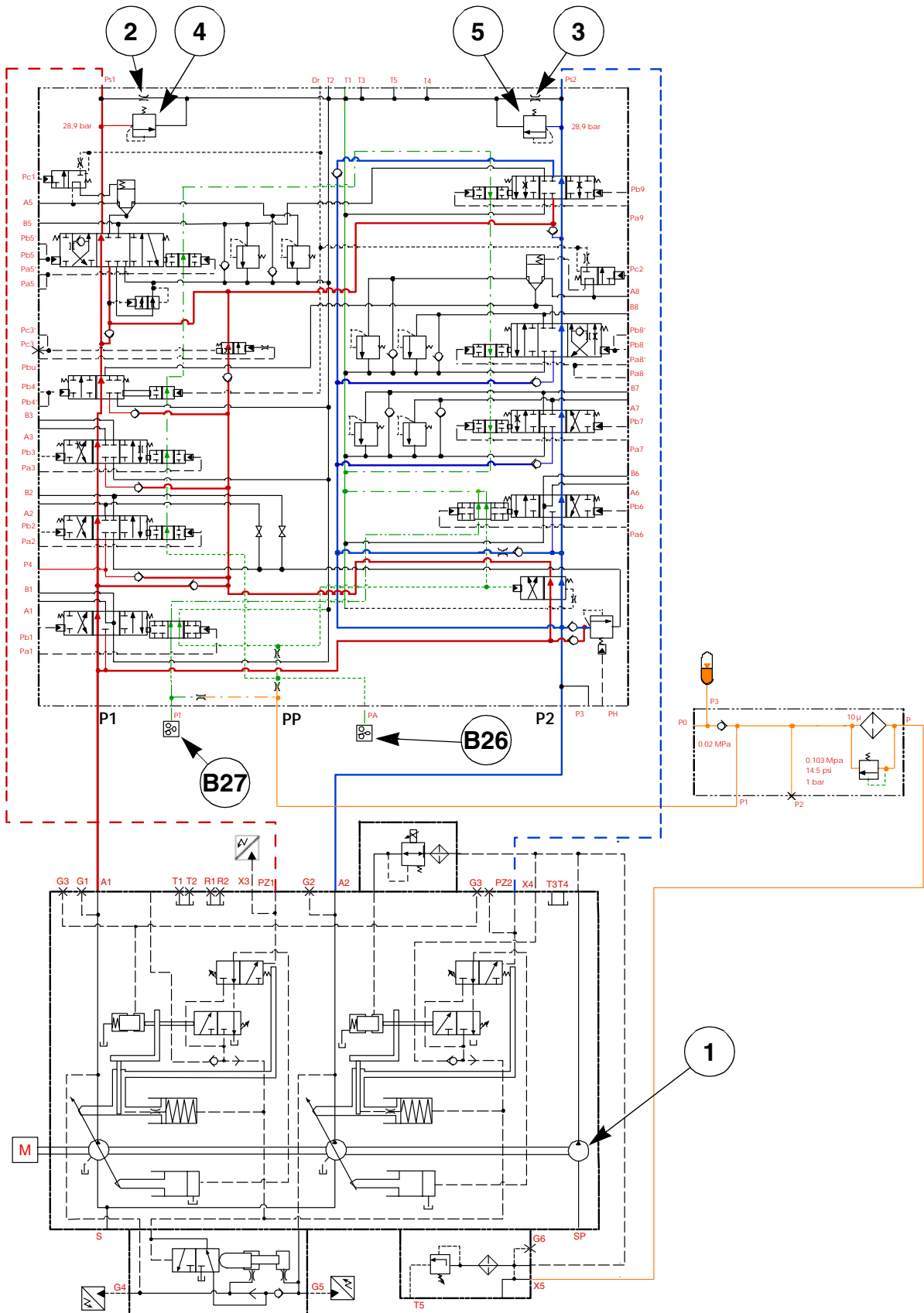
Install a new, greased O-ring (13) in the cover (15).

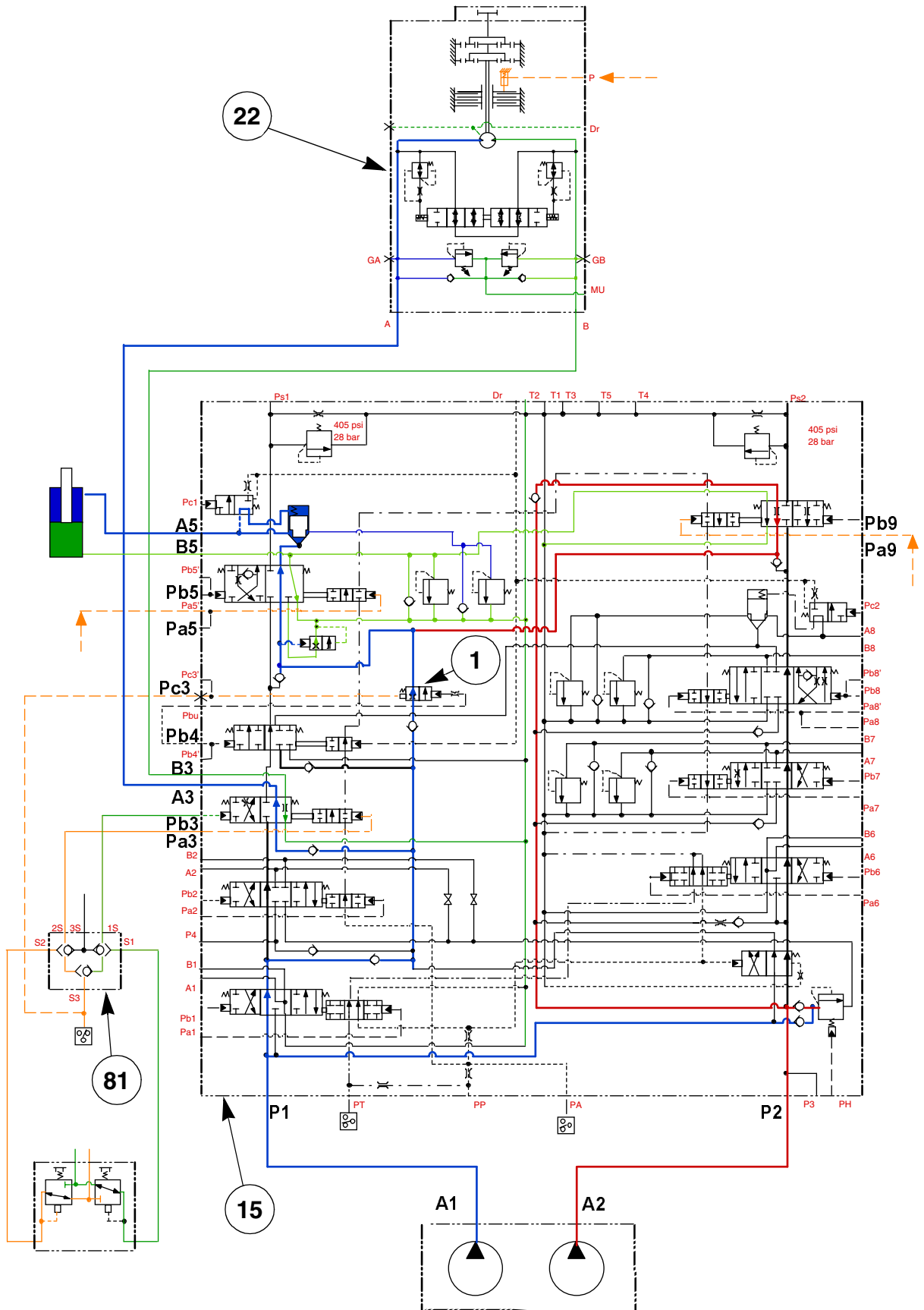
**STEP 17**



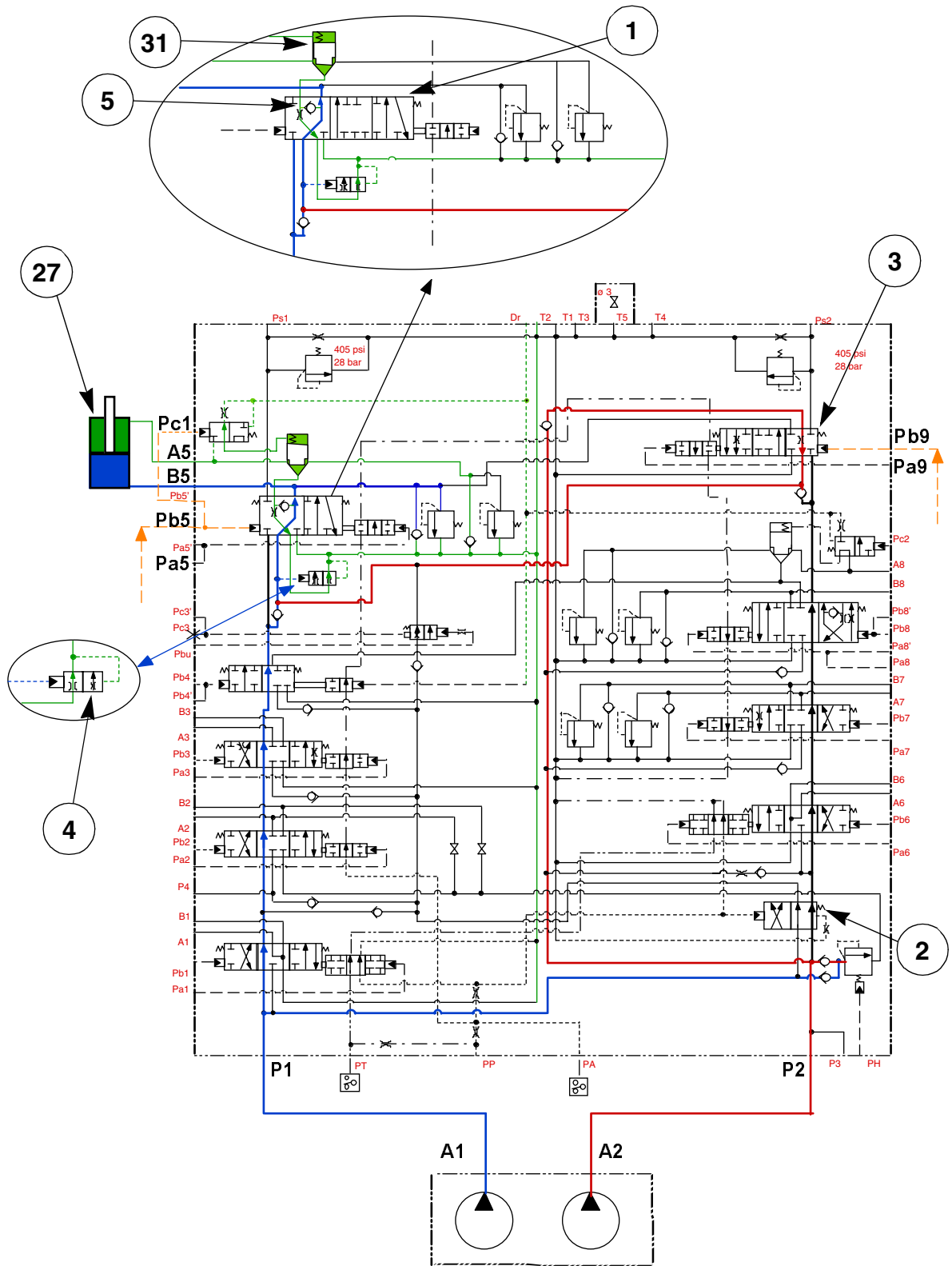
CS02C548

Apply Loctite 504 to the mating surfaces of the motor housing and the cover.



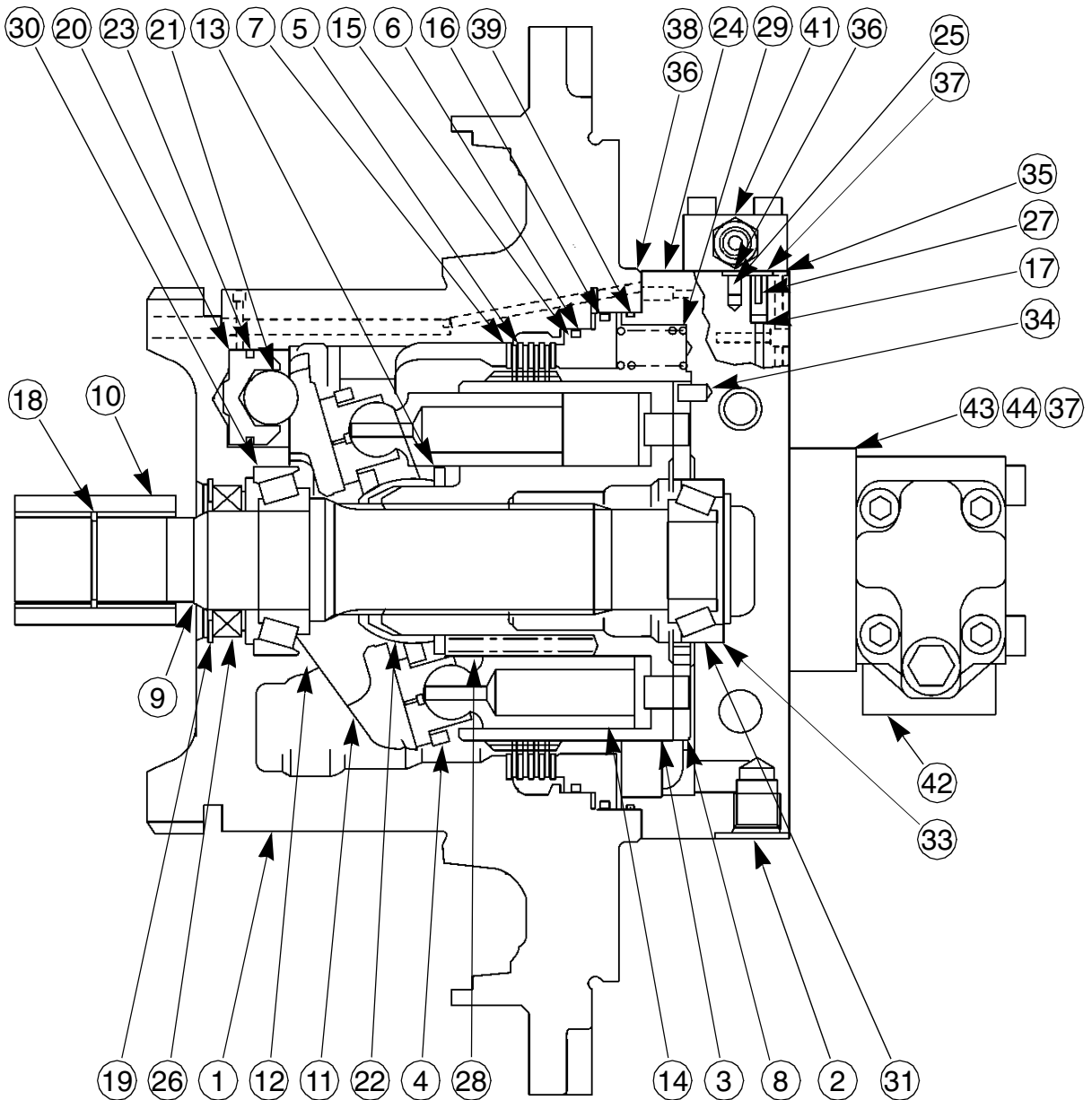


CM00K017



# TRAVEL MOTOR

## Description



- |                    |                                  |                                |
|--------------------|----------------------------------|--------------------------------|
| 1 CASING           | 17 CHECK VALVE                   | 32 HEXAGONAL SOCKET HEAD SCREW |
| 2 REAR COVER       | 18 C-SHAPED SNAP RING (FOR HOLE) | 33 SHIM                        |
| 3 CYLINDER BLOCK   | 19 CIRCULAR SNAP RING            | 34 PARALLEL PIN                |
| 4 SHOE RETAINER    | 20 INCLINED PISTON               | 35 O-RING                      |
| 5 FRICTION PLATE   | 21 STEEL BALL                    | 36 O-RING                      |
| 6 BRAKE PISTON     | 22 PIVOT                         | 37 O-RING                      |
| 7 SEPARATOR PLATE  | 23 PISTON SEAL                   | 38 O-RING                      |
| 8 VALVE PLATE      | 24 M6 THROTTLE                   | 39 O-RING                      |
| 9 SHAFT            | 25 M6 THROTTLE                   | 40 OVERLOAD VALVE              |
| 10 COUPLING        | 26 OIL SEAL                      | 41 PILOT VALVE                 |
| 11 SHOE PLATE      | 27 CHECK VALVE SPRING            | 42 BRAKE VALVE                 |
| 12 BALL JOINT      | 28 CYLINDER SPRING               | 43 SPACER                      |
| 13 SPRING BEARING  | 29 BRAKE SPRING                  | 44 O-RING                      |
| 14 PISTON ASSEMBLY | 30 BEARING                       |                                |
| 15 D-RING (SMALL)  | 31 BEARING                       |                                |
| 16 D-RING (LARGE)  |                                  |                                |

CS02B528

# Section 9002

9002

## UPPERSTRUCTURE, TURNTABLE AND COUNTERWEIGHT

## Removal

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

### STEP 1

Attach a suitable lifting device to the lifting rings of the counterweight (1). Use the total movement of the lifting device.

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

### STEP 2

Remove the four screws (2) and the flat washers (3) that fasten the counterweight (1) to the undercarriage.

### STEP 3

Raise the counterweight (1) and remove it from the machine. Place it on flat ground. Remove the lifting equipment.

### STEP 4

Remove the shims (4) from the undercarriage anchorage points.

**NOTE:** *Count the number of shims (4), remove them from each anchorage point. Keep each set of shims (5) to facilitate reassembly.*

### STEP 5

Check the state of the insulating material (5) installed on the counterweight. Change the insulating material if it is damaged.

## Installation

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

### STEP 1

Attach a suitable lifting device to the lifting rings of 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 (4) as those removed in step 4 of removal, at each anchorage point of the counterweight on the undercarriage.

### STEP 3

Move the counterweight (1) into position on the undercarriage. Align the ports of the counterweight with those on the undercarriage.

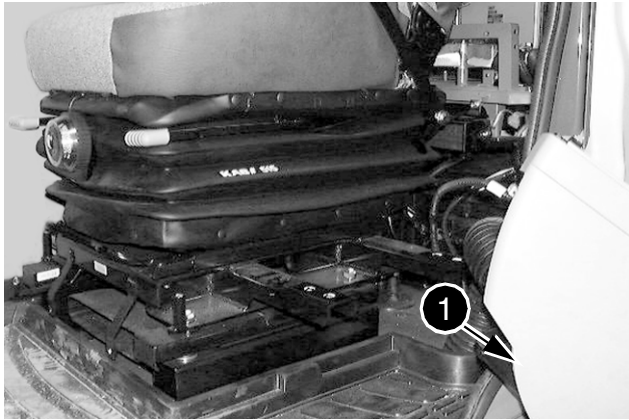
### STEP 4

Install the four screws (2) as well as the flat washers (3) to attach the counterweight (1). Tighten to the torques specified on page 2.

### STEP 5

Remove the lifting device from the lifting rings of the counterweight (1).

**STEP 18**

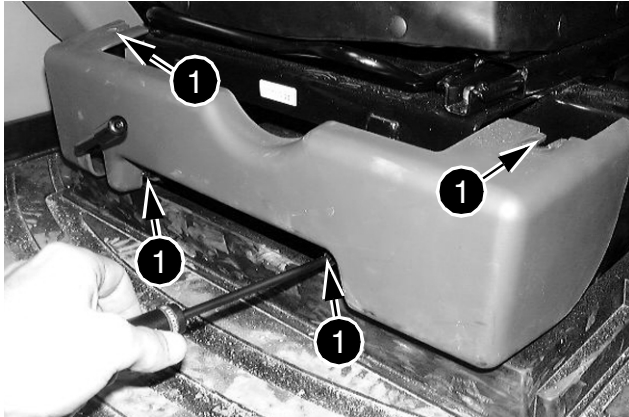


CD00G127

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.

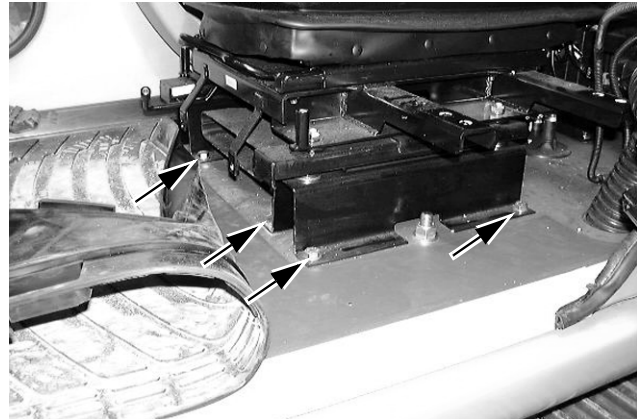
**STEP 19**



CD00G122

Remove the trim 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 lbs.

**Installation**

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

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