MODEL 800LX
SERIES LX Series
BOOK NO. 1061
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.

Section

1002

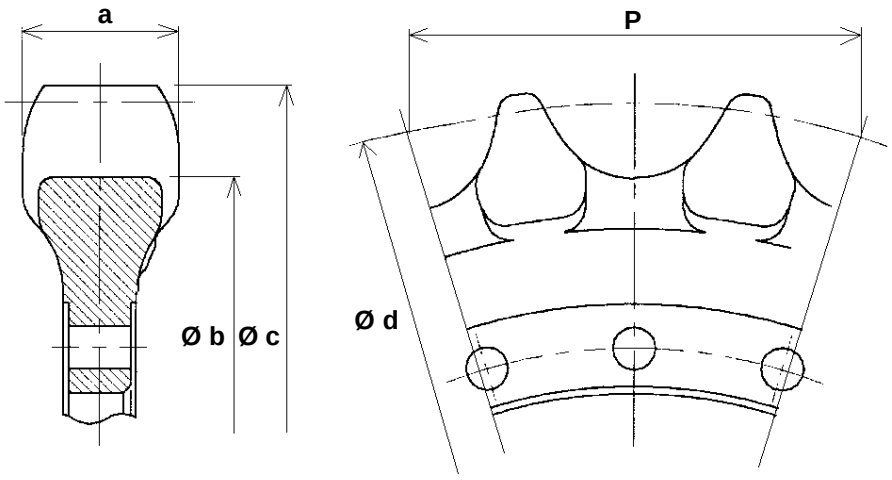
SPECIFICATIONS
AND SPECIAL TORQUE SETTINGS

May 2002

DIMENSIONS AND WEAR LIMIT OF THE TRACK-LAYER ASSEMBLY

Sprocket

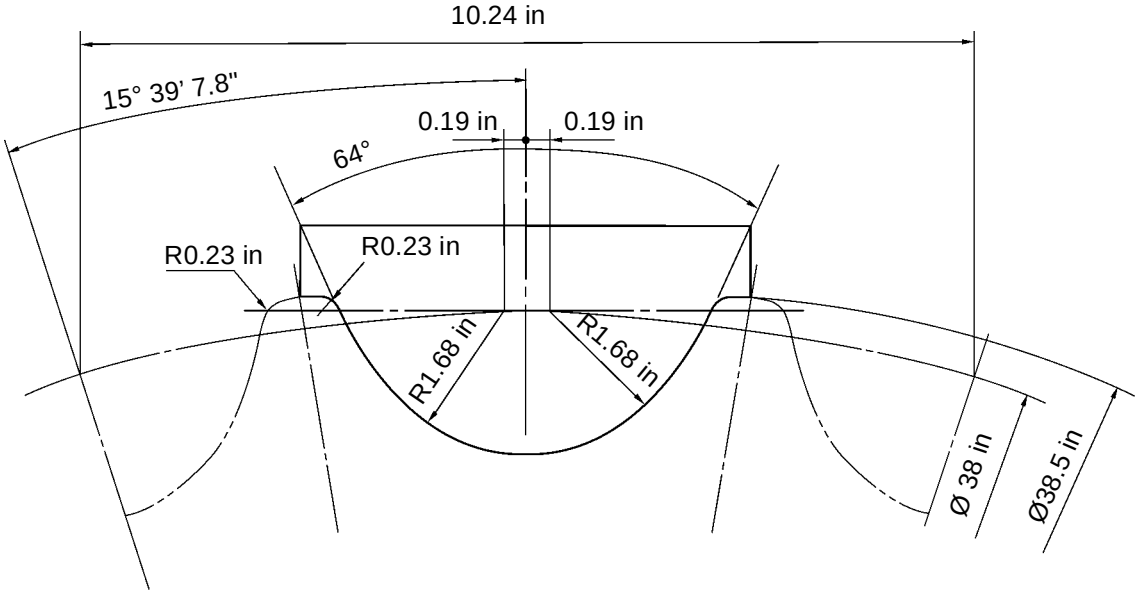
Dimensions



CS01B512

Mark		Dimension (in)
a	Standard	
	Limit	
Ø b	Standard	
	Limit	
Ø c	Standard	38.5
	Limit	
Ø d	Standard	38
	Limit	
P	Standard	10.24
	Limit	

Gauge



CI01M506

SPECIAL TORQUE SETTINGS

No.	Component	Screw (Ø)	Wrench (mm)	Torque setting (lb-ft)
1 *	Travel motor and reduction gear assembly	M27	41	964 - 1125
2 *	Sprocket	M27	41	964 - 1125
3 *	Idler wheel	-	-	-
4 *	Upper roller	M20	30	384 - 448
5 *	Lower roller	M27	41	964 - 1125
6 *	Chain guide	M27	41	964 - 1125
7	Track pad	M26	30	1171 - 1378
8	Counterweight	M42	65	1664
9*	Turntable (frame)	M30	46	1328 - 1549
10*	Turntable (upperstructure)	M30	46	1328 - 1549
11 *	Swing motor and reduction gear assembly	M24	36	664 -774
12 *	Engine	M24	36	665 - 774
13 *	Engine bracket	M14	22	127- 149
14	Radiator	M20	30	383 - 448
15 *	Hydraulic pump	M12	19	80 - 94
16 *	Hydraulic reservoir	M20	30	347 - 419
17 *	Fuel reservoir	M20	30	347 - 419
18 *	Control valve	M20	30	253
19 *	Hydraulic swivel	M16	24	197 - 230
20	Cab	M16	24	57 - 59
21	Battery	M10	17	15 - 21
22	Frame	M36	55	1881 - 2170

NOTE: *Use Loctite 262 or an equivalent on retaining screws of those components marked with an asterisk (*).*

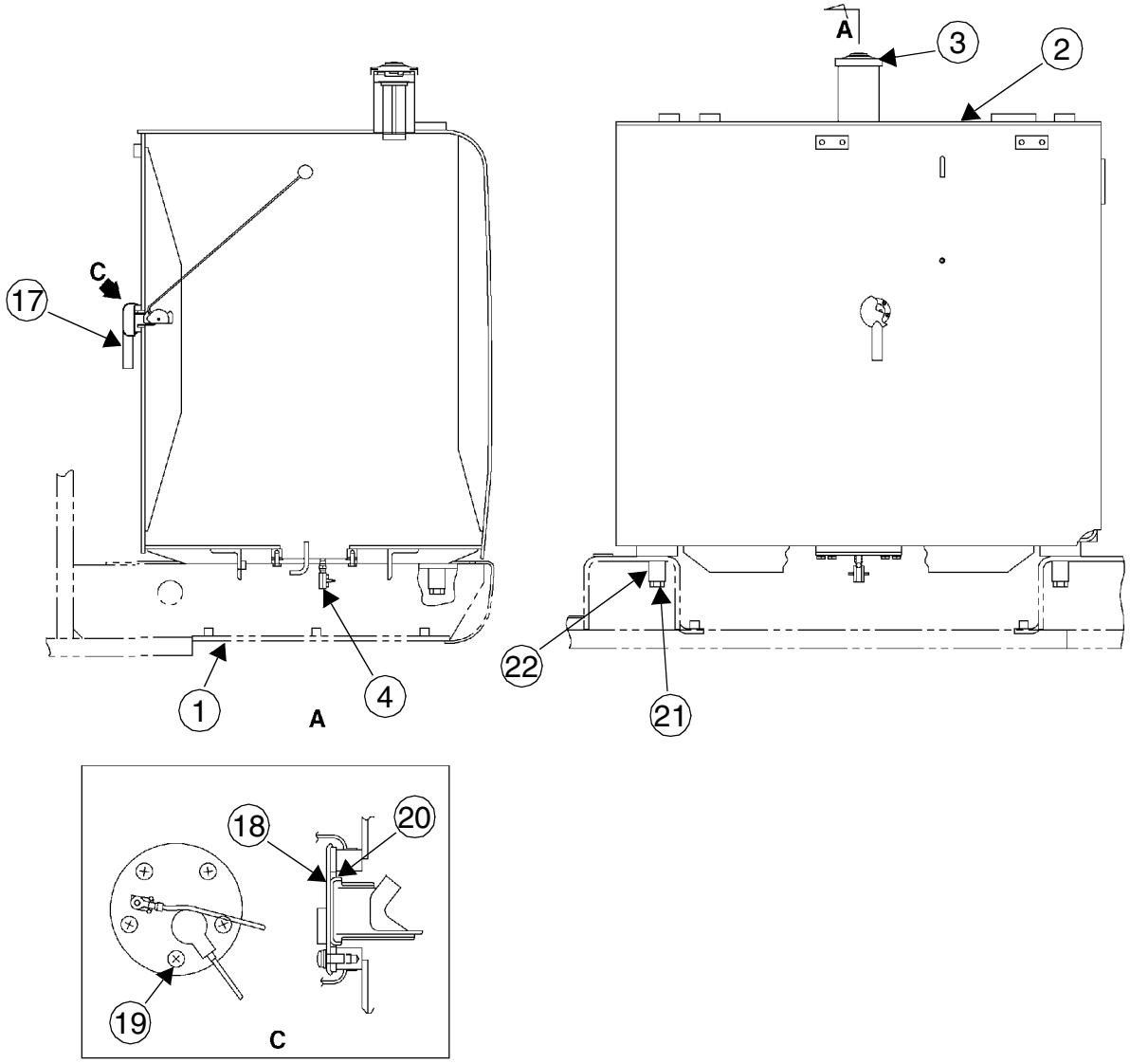
Section

2001

RADIATOR AND OIL-COOLER

May 2002

Fuel tank



CI01M510

1. Access cover plate
2. Fuel tank
3. Plug
4. Valve
17. Plastic protection
18. Fuel probe
19. Screw
20. Seal
21. Screw
22. Shims

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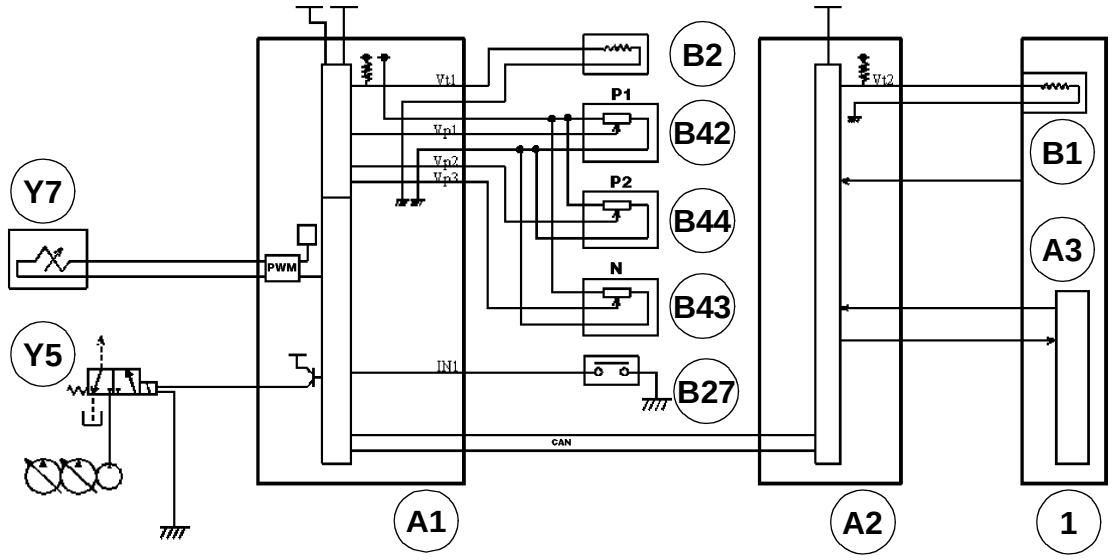
Auto mode checking

1) Circuit configuration



CS01N537

1 Engine
A1 Computer
A2 Engine controller
A3 Electronic acceleration
B1 Coolant temperature sensor
B2 Hydraulic oil temperature sensor
B27 Travel pilot pressure switch
B42 Pump pressure sensor (P1)
B43 Pressure sensor (nega-cont)
B44 Pump pressure sensor (P2) (yellow band)
Y5 Power-up solenoid valve (yellow band)
Y7 Main pump proportional solenoid

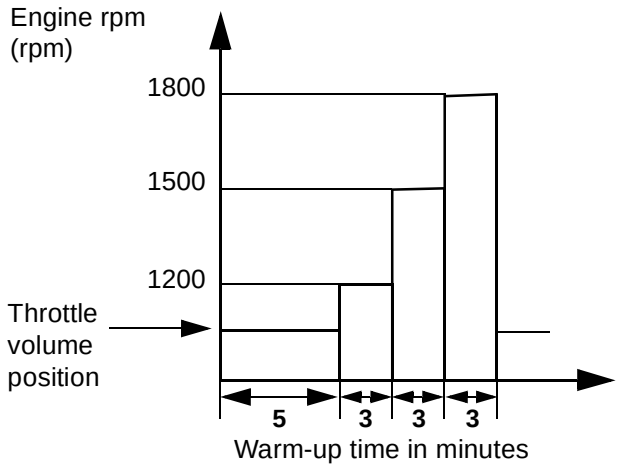
2) Description

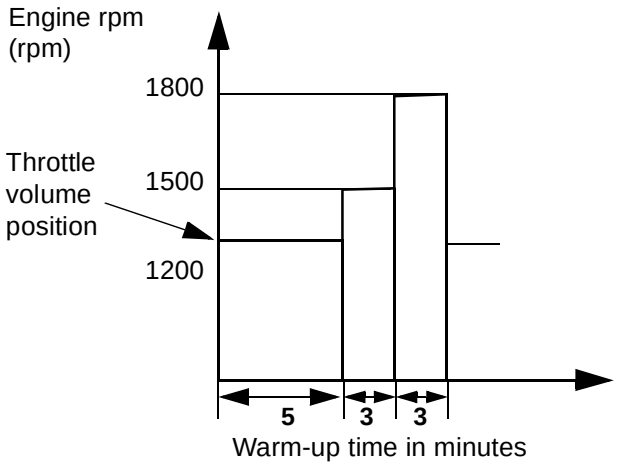
If the auto mode is selected, 2 modes, SA and LA, are available.

1. When the auto mode is selected, the LA mode is engaged and then it automatically changes to SA or LA mode depending on the work conditions.
2. If the coolant temperature is less than 122°F or the oil temperature is less than 77°F, auto mode checking does not work and the LA mode is selected. When the coolant temperature is greater than 122°F and the oil temperature is greater than 77°F, auto mode checking starts and continues to function even if the coolant and oil temperatures reduce.
3. During auto mode checking, if the travel pilot pressure switch (B27) is activated, the change of mode does not take place. (If the travel pilot pressure switch (B27) is activated in SA mode, the SA mode remains, and if the travel pilot pressure switch (B27) is activated in LA mode, the LA mode remains).

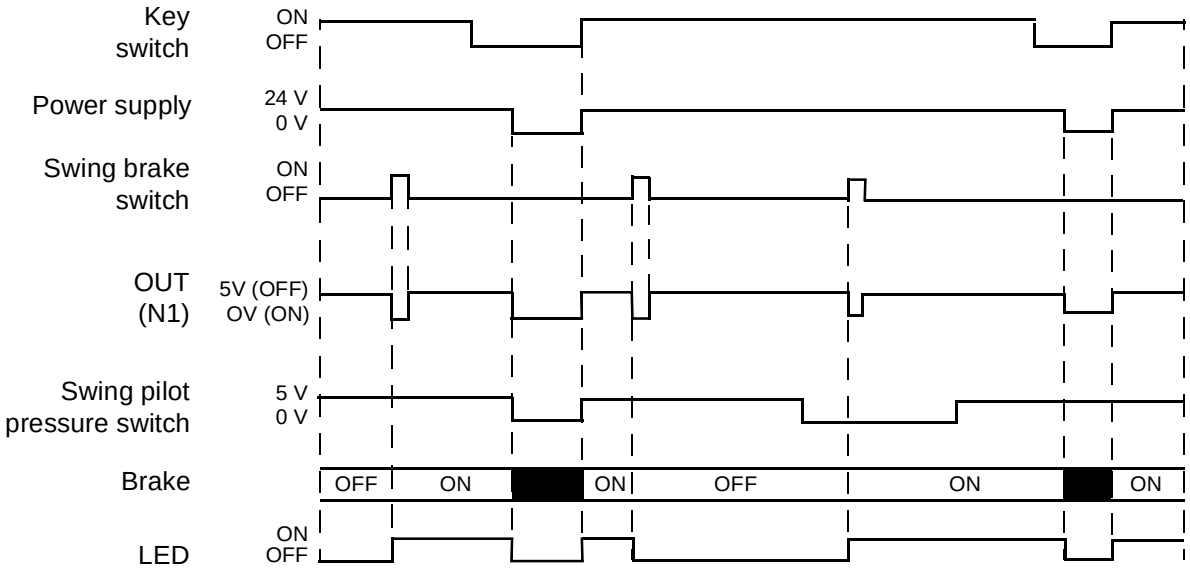
SA MODE	Engine rpm (MAX)	rpm	1750 ± 10
	Current (equal to S mode + 40 mA)	mA	540
	Hydraulic power boost	---	Automatic
LA MODE	Engine rpm (MAX)	rpm	1650 ± 10
	Current (equal to S mode)	mA	480
	Hydraulic power boost	---	Automatic

3) Timing diagram





3) Timing diagram



4) Automatic orientation brake checking

Automatic brake checking takes place when the orientation brake red LED is off.

When swing and an attachment function are simultaneously activated, the mechanical swing braking is automatically released. After the operation is stopped, the mechanical swing brake is automatically activated by the computer (A1).

The swing brake is automatically deactivated when:

- The swing pilot pressure switch (B22) is activated.
- When the pressure detected by the pressure sensors P1 (B42) or P2 (B44) is greater than 2175 psi.

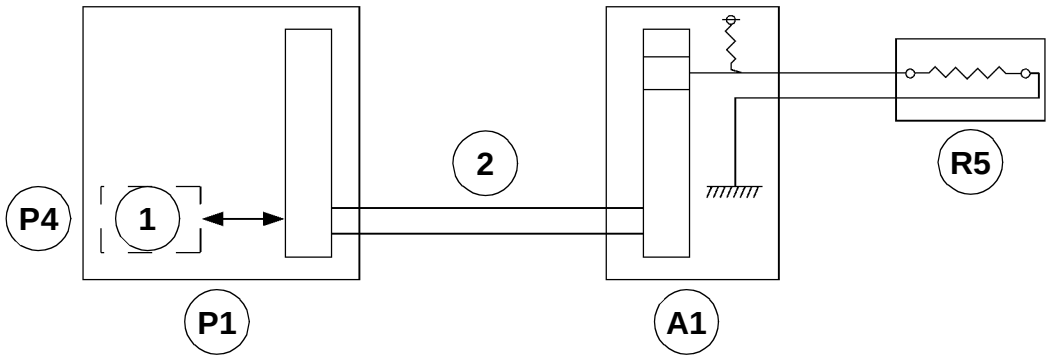
The swing brake is automatically activated when:

- The upper pilot pressure switch (B26) is deactivated for more than 5 seconds.
- The key switch (S1) is in STOP position.

When the pressure supplied by the pump (P1 or P2) exceeds 2175 psi during only travel, the mechanical swing brake is deactivated for 5 seconds then reactivated.

Fuel level

1) Circuit configuration



CM00F009

1 Fuel level indicator
2 Series connection
A1 Computer
P1 Instrument panel
P4 Monitor display
R5 Fuel sensor

2) Operation

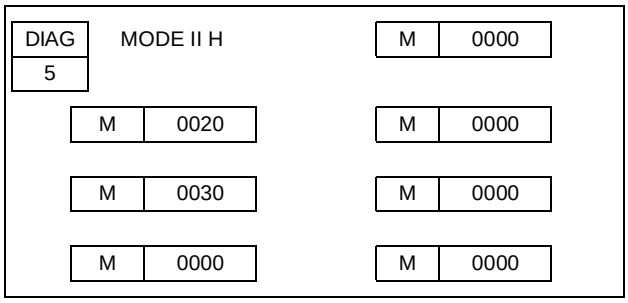
A. The fuel sensor (R5) sends a signal to the computer (A1).

B. The computer (A1) calculates the number of bars to display and sends the information to the fuel level indicator (1) via the series connection (2).

C. When only one bar is displayed on the fuel level indicator (1), the message "LOW FUEL" appears on the monitor display (P4) of the instrument panel (P1) and the audible warning device sounds.

Remaining fuel (gal)	Fuel sensor resistance (Ω)	Input voltage (V)	Bars displayed
> 206.7	10.0 - 18.1	0.455 - 0.766	8
189.2 - 206.7	18.1 - 23.9	0.766 - 0.964	7
170.9 - 189.2	23.9 - 29.6	0.964 - 1.142	6
147.8 - 170.9	29.6 - 36.5	1.142 - 1.337	5
114.6 - 147.8	36.5 - 46.3	1.337 - 1.582	4
69.2 - 114.6	46.3 - 60.8	1.582 - 1.891	3
34.9 - 69.2	60.8 - 74.7	1.891 - 2.138	2
< 34.9	74.7 - 80.0	2.138 - 2.222	1

5. Previous failures on the excavator DIAG5



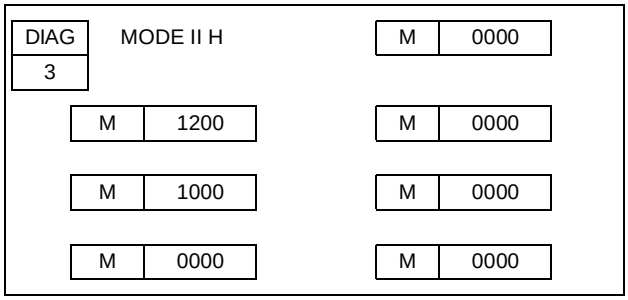
M: Failure code

Example:

The screen above shows that there is a failure in the hydraulic oil temperature sensor and in the fuel level sensor.

6. Previous failures on the excavator DIAG6

This screen is connected to the previous screen (DIAG5) as regards failures involving the hourmeter.



M: Failure code

Example:

The screen above shows that failure code 0020 (hydraulic oil temperature sensor) occurred at 1200 H and that failure code 0030 (fuel sensor) occurred at 1000 H.

A. The numbers of hours shown indicate the time at which the failure occurred for the first time since the data was reinitialised.
B. To erase the failure codes and the number of hours, press the work mode switch for 10 seconds.
C. When data is erased from screens DIAG5 and DIAG6, it is recorded in the electronic control box memory (this data is only visible using an external computer).

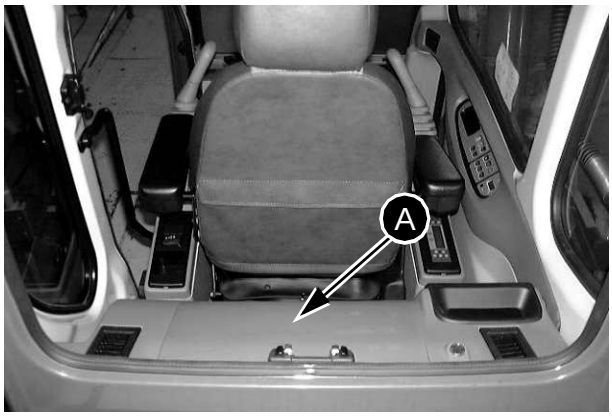
MACHINE: SH0800- 3	
TERRITORY: 3 LANGUAGE: 1	
CONT. P / N	KHR2672

Example:

In the screen opposite, the language code has changed from 5 (French) to 1 (English).

CHANGING THE ACCESS CODE FOR THE ANTI-THEFT SYSTEM

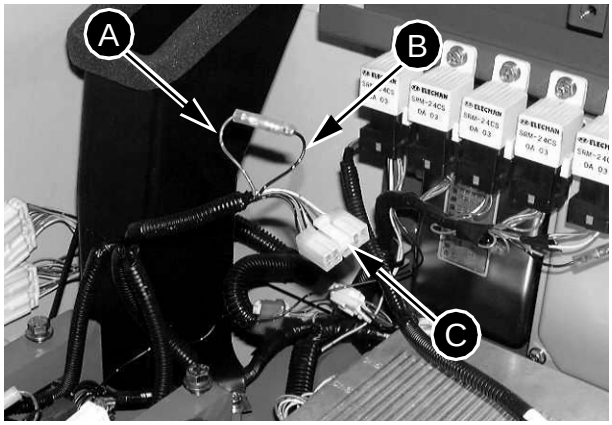
1. Remove the hood (A) located behind the operator's seat.



CD00F011

A. Hood

2. Disconnect the two wires (A) (B) covering the anti-theft system.



CD00F012

A. Violet wire marked 469 female plug
B. Black wire marked 621 male plug
C. Radio connector

3. Turn the key switch to ON and then OFF.

4. Reconnect the two wires (A) (B) covering the anti-theft system (see paragraph 2).

5. To save the new access code, consult the anti-theft protection section in the operator's manual.

Coolant and hydraulic oil temperature sensor resistances

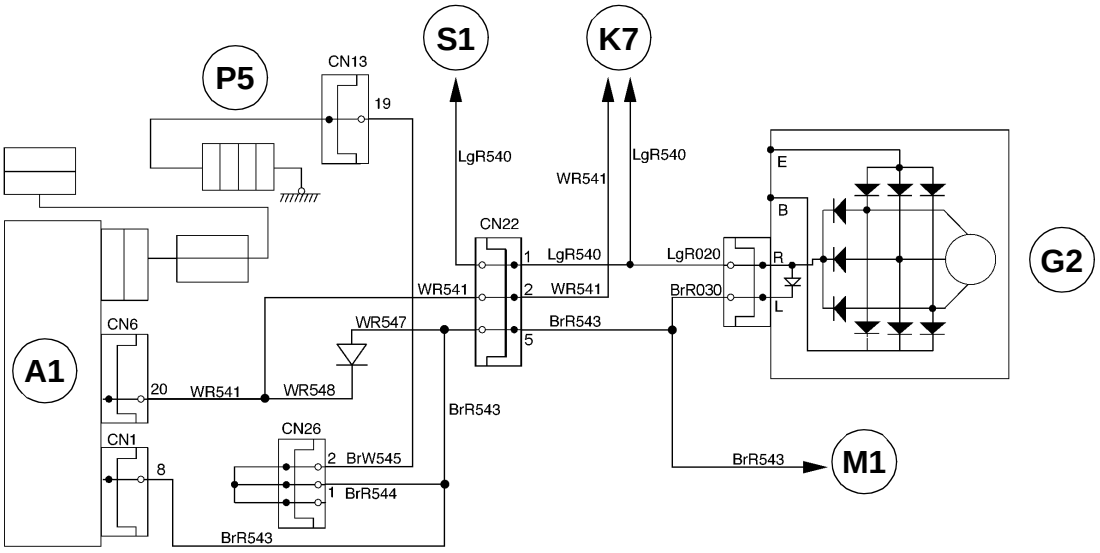
NOTE: *The resistance varies with temperature.*

Coolant or hydraulic oil temperature	Coolant temperature sensor (B1)	Hydraulic oil temperature sensor (B2)
68°F	6.08 kΩ	2.45 kΩ
86°F	4.24 kΩ	1.66 kΩ
104°F	3.02 kΩ	1.45 kΩ
122°F	2.18 kΩ	0.81 kΩ
140°F	1.61 kΩ	0.51 kΩ
158°F	1.19 kΩ	0.43 kΩ
176°F	0.91 kΩ	0.32 kΩ

Defective battery charge circuit

Description of problem No. 5

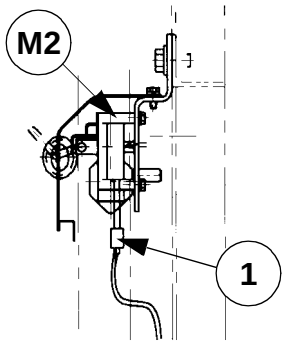
- The message is still displayed.



CM00F005

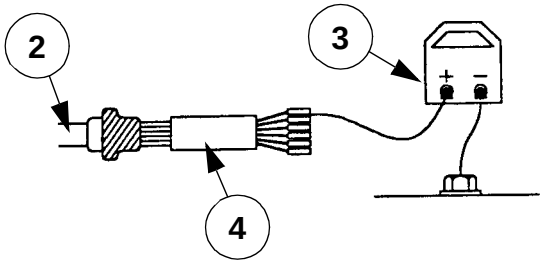
A1 Computer
G2 Alternator
K7 Relay battery
M1 Starter motor
P5 Hourmeter
S1 Key switch

Engine emergency stop motor



CS00E535

1. Disconnect the connector (1) from the engine emergency stop motor (M2).



CS99A846

2. Connect the appropriate service connector (6P)(4) to the connector at the main harness end (2) only.

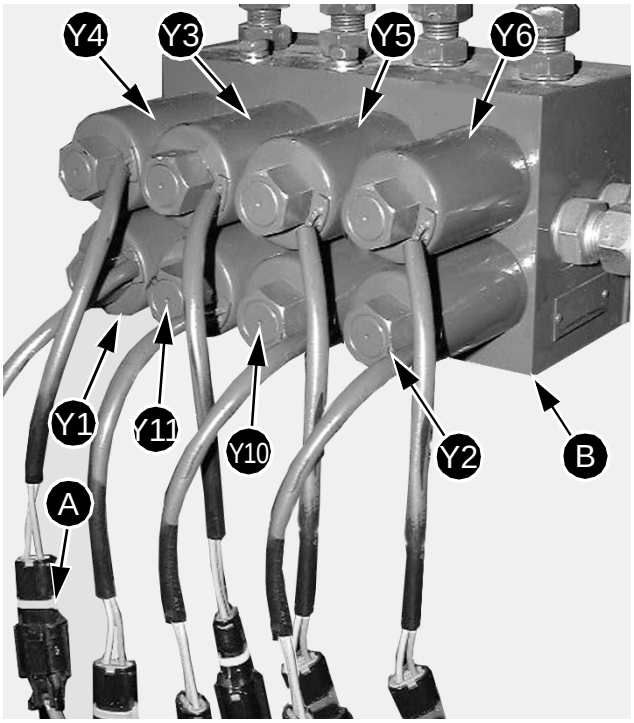
3. Make sure that wire LR (blue/red) on the service connector (4) is connected to wire LR on the main harness (2) and install the meter (3).

NOTE: *The + terminal on the meter must be connected to wire LR (blue/red) on the service connector and the - terminal to the machine earth.*

4. Turn the starter switch key to "ON", the meter reading should be 24 V.

8 solenoid valve bank

1. Disconnect connector (A) from one of the solenoids on the 8 solenoid valve bank (B)



CD01M010

Marking	Function
Y1	Swing pilot shut-off solenoid valve (green band)
Y2	Pilot pressure solenoid valve (blue band)
Y3	Swing brake solenoid valve (pink band)
Y4	2 stage travel solenoid valve (red band)
Y5	Power-up solenoid valve (yellow band)
Y6	Cushion control solenoid valve (light green band)
Y10	Boom raising priority solenoid (black band)
Y11	Negative flow control (white band)

3. Apply a charge of 15 amps to the battery for 15 seconds. Wait at least 3 minutes before continuing the test.
4. Measure and note down the electrolyte temperature.
5. Refer to the specifications for the correct charge required for this test.
6. The correct charge corresponds to half the value of the cold starting current 1.4°F.
7. Turn the charge control knob until the ammeter shows the current required. Maintain the charge for 15 seconds and read the voltmeter. Turn the charge control knob to OFF.
8. Compare the reading and the electrolyte temperature with the values below.

Electrolyte temperature	Minimum voltage
70°F minimum	9.6
60°F	9.5
50°F	9.4
40°F	9.3
30°F	9.1
20°F	8.9
10°F	8.7
0°F	8.5

A. If the test result is greater or equal to the indicated voltage, the battery is in good condition.

B. If the test result is less than the voltage indicated, replace the battery.

CHARGING THE BATTERY

WARNING: *Never try to charge a battery which has frozen electrolyte.*

Before charging the battery, check the electrolyte level.

It is difficult to state an exact charging rate since the following conditions are variable: (1) electrolyte temperature, (2) charge level, and (3) condition of the battery. Refer to the Charging Guide for correct charging time.

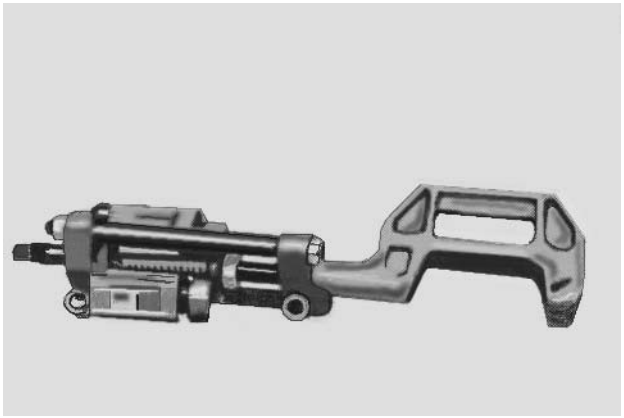
Refer to the Specifications on page 3 for the reserve charge of the battery of this machine.

Reduce the charging rate if:

1. The electrolyte is spilling out of the cells as these contain too much gas.
2. The electrolyte temperature exceeds 125°F.

NOTE: *For optimal charging, select slow charging rates. The battery is fully charged when after having charged it slowly for 3 hours, no cell emits too much gas and the specific gravity remains unchanged.*

SPECIAL TOOLS



926407

1. Track removal hydraulic press KIP0013
2. Loctite 262
3. Hammer
4. Lifting jib
5. Impact wrench
6. Torque spanner
7. Supports 10 T
8. Roller pump
9. Angle wrench K1P0014

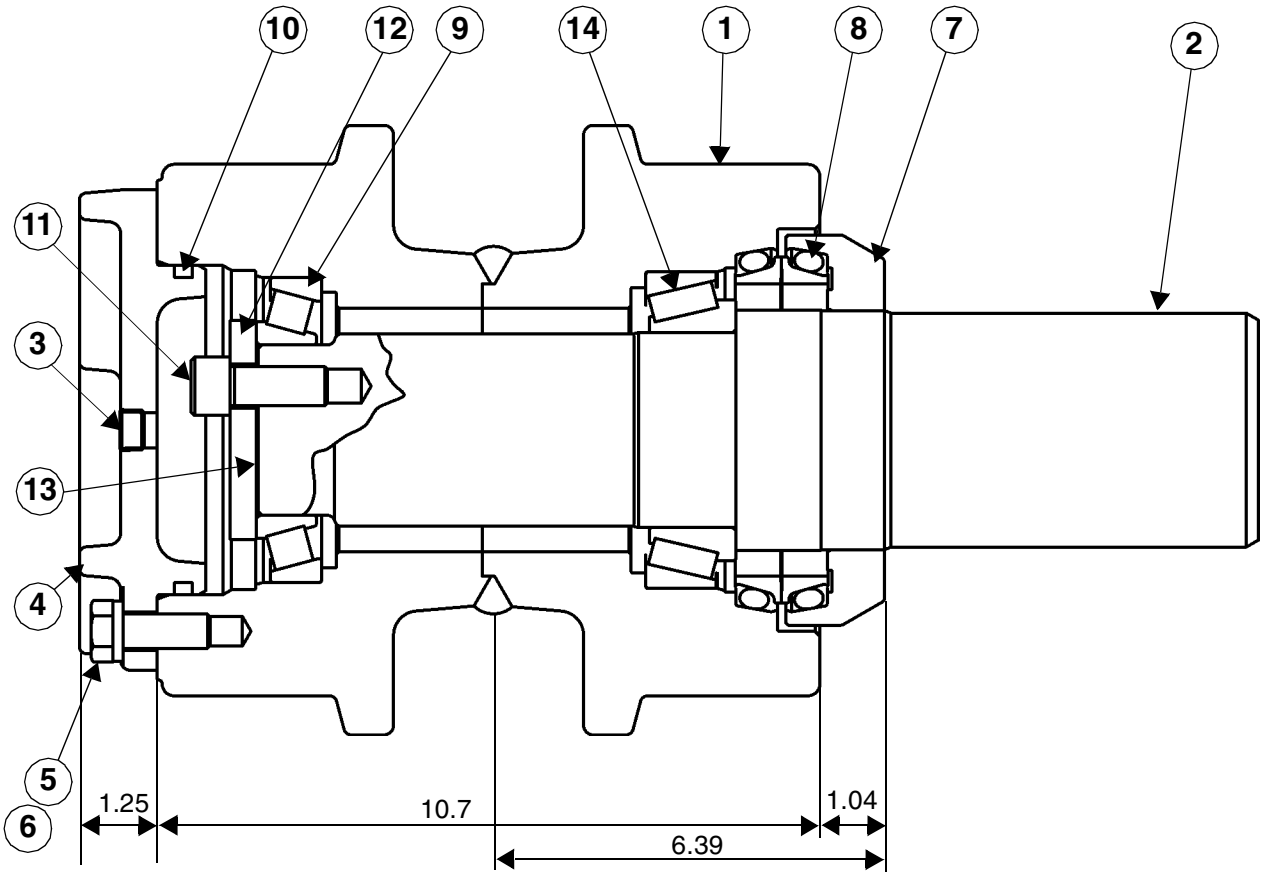
Section

5003

UPPER AND LOWER ROLLERS

February 2002

Model 2



CI01M533

1. Upper roller
2. Shaft
3. Plug
4. Cover
5. Screw
6. Brake washer
7. End bearing
8. Face seal
9. Bearing
10. O-ring
11. Screw
12. Thrust plate
13. Spacer ring
14. Bearing

Section

5004

SPROCKET

5004

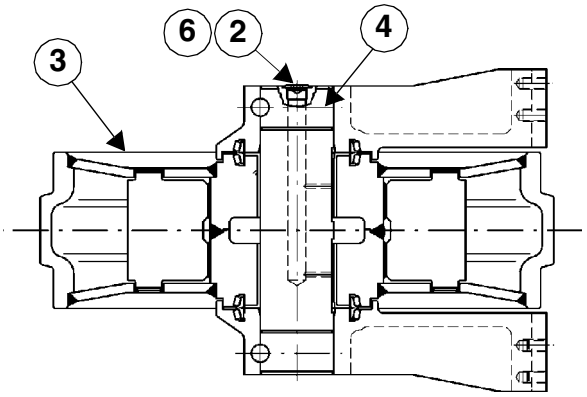
February 2002

Reconditioning

If the idler wheel is worn to the indicated limits or if it shows traces of leaks, it must be reconditioned or changed. See Section 1002 for limits of wear.

Disassembly

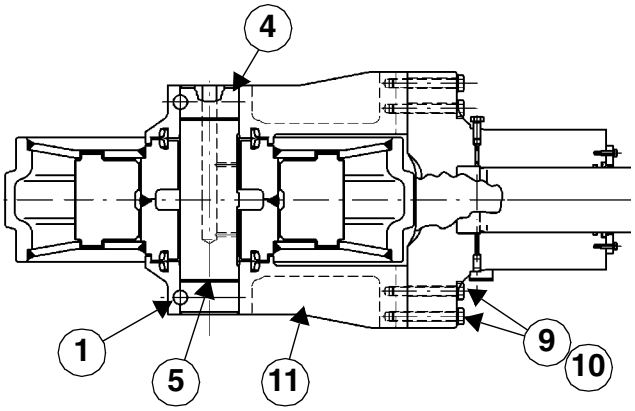
STEP 1



CI01M548

Clean the idler wheel (3) with a suitable solvent. Install the idler wheel (3) on supports, with the drain plug (2) at the bottom. Remove the drain plug (2) from the shaft (4) and drain the oil. Scrap the O-ring (6).

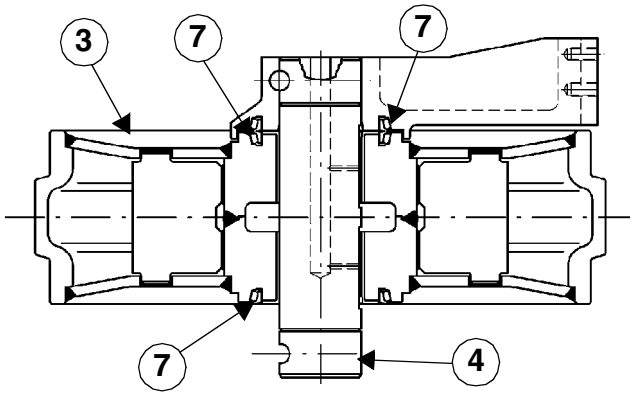
STEP 2



CI01M549

Remove the retainer pin (1). Remove the screws (9) and the washers (10) from the bracket (11). Remove the bracket (11) from the shaft (4). Remove and discard the O-ring (5).

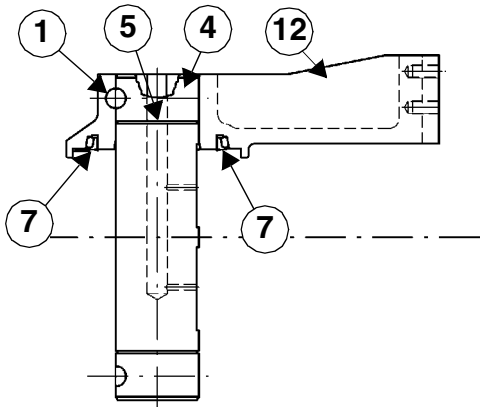
STEP 3



CI01M550

Remove the idler wheel (3) from the shaft (4). Remove and discard the face seals (7) from the idler wheel (3) using a screwdriver or similar tool. Make sure you do not damage the idler wheel seal bore (3).

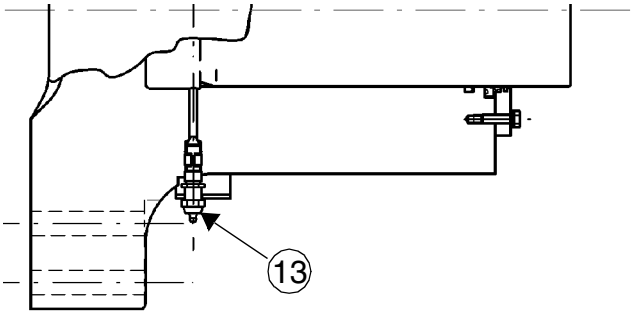
STEP 4



CI01M551

Remove the retainer pin (1). Remove the shaft (4) from the bracket (12). Remove and discard the O-ring (5). Remove and discard the face seals (7) from the bracket (12) using a screwdriver or similar tool. Be careful not to damage the seal bore in the bracket (12).

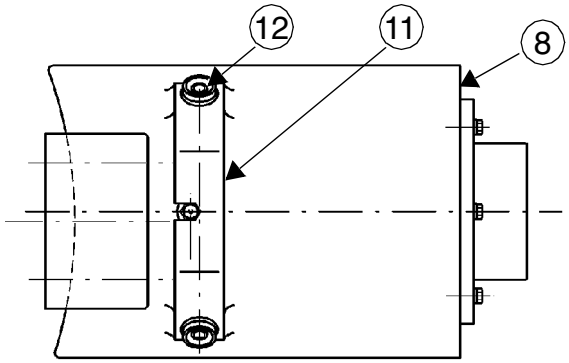
STEP 6



CI01M559

Install the non-return check valve assembly on the cylinder barrel (8), tighten to a torque of 34 lb-ft.

STEP 7



CI01M558

Install the protective plate (11) on the cylinder barrel (8) using screws (12), tighten to a torque of 34 lb-ft.

Installation

Carry out the installation procedure for the idler wheel.

TRAVEL DRIVE MOTOR AND REDUCTION GEAR

Disassembly

NOTE: *Refer to Section 6001 for the removal of the travel motor/reduction gear assembly.*

NOTE: *The numbers in brackets in the following steps refer to the schematics on pages 10 and 11.*

STEP 1

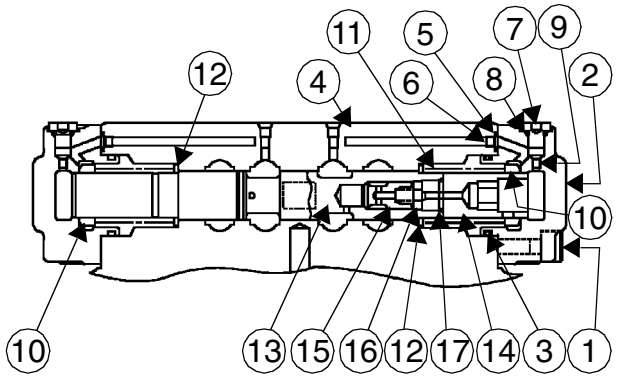
Clean the outside of the drive motor and the travel reduction gear to remove mud, impurities and other foreign bodies.

NOTE: *When removing the travel drive motor and reduction gear, place the components on a rubber mat or on a workbench covered with a clean piece of cloth. Always handle the components carefully and do not drop them. The components are manufactured to extremely precise tolerances and finish.*

STEP 2

Install the travel drive motor and the reduction gear on the workbench.

STEP 3



CS01N538

Remove the screws (1) then remove the cap (2).

NOTE: *The caps (2) are under pressure due to the spring (11).*

STEP 4

Remove and discard the O-ring (3).

STEP 5

Remove the O-ring (5) from the base plate assembly (4).

STEP 6

Remove the throttle valve (6) from the base plate assembly (4).

STEP 7

Remove the plug (7) from the cap (2). Scrap the O-ring (8).

STEP 8

Remove the closing plug (9) from the plug (2).

STEP 9

Remove the spring seats (10) and (12) and the spring (11) from the base plate assembly (4). Discard the spring seats (10) and (12).

STEP 10

Remove the spool assembly (13) from the base plate assembly (4).

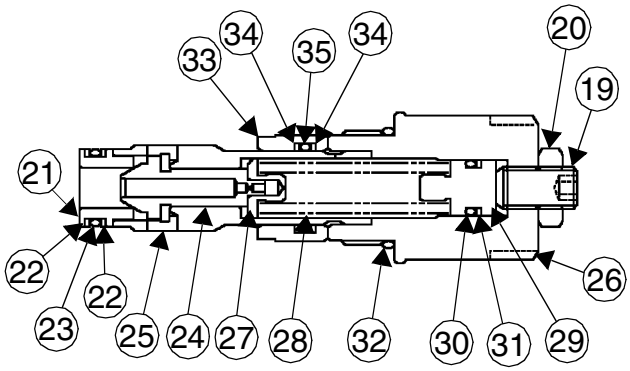
STEP 11

Remove the spool cap (14), the check valve (15) and the spring (16) from the spool assembly (13). Remove and discard the O-ring (17) from the spool cap (14).

STEP 12

Remove the safety valve assembly (18) from the base plate assembly (4).

STEP 13

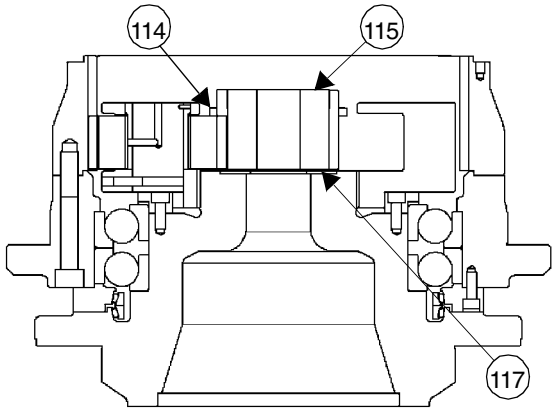


CS01N539

NOTE: *You should never touch the screw (19) or the lock nut (20) except, if the setting of the safety valve is out-of-adjustment. In this case, see Section 8001 for the valve setting.*

Remove the valve seat (21) from the valve assembly (18). Remove and discard the back up rings (22) and the O-ring (23).

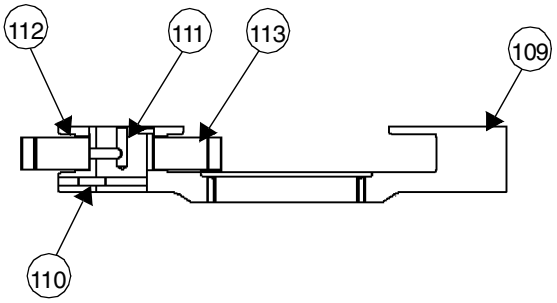
STEP 5



CS01N548

Install the plate (117), the sun gear (115) and the plate (116) in the reduction gear assembly.

STEP 6

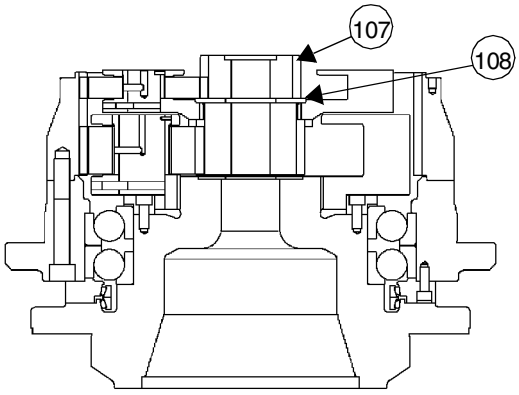


CS01N547

Install the planetary gears (113) and the spacer shims (112) on the shafts (111). Install the shaft assembly (111) on the planetary carrier (109) using a retainer pin (110). Install the planetary carrier assembly (116) in the reduction gear assembly.

NOTE: *Respect the number of shims for each pinion.*

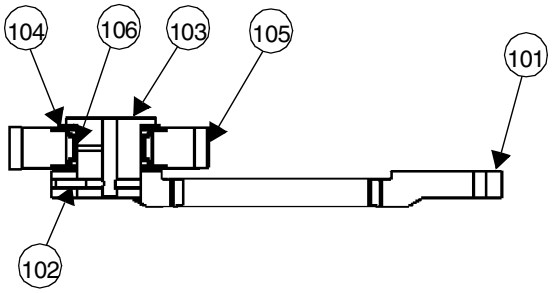
STEP 7



CS01N546

Install the plate (108), then the sun gear (107).

STEP 8

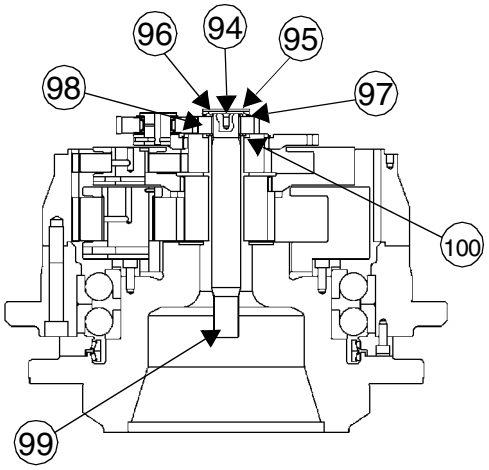


CS01N545

Install the spacer shims (104), the bearings (106) and the planetary carriers (105) on the shaft (103). Install the shaft assembly (103) on the planetary carrier (101) using a retainer pin (102). Install the planetary carrier assembly (101) in the reduction gear assembly.

NOTE: *Respect the number of shims for each pinion.*

STEP 9



CS01N544

Install the snap ring (100), the sun gear (98), the snap ring (97), the spacer shims (96), the plate (95) and the screw (94) on the shaft (99). Tighten the screw to the specified torque. Install the shaft assembly (99) on the reduction gear.

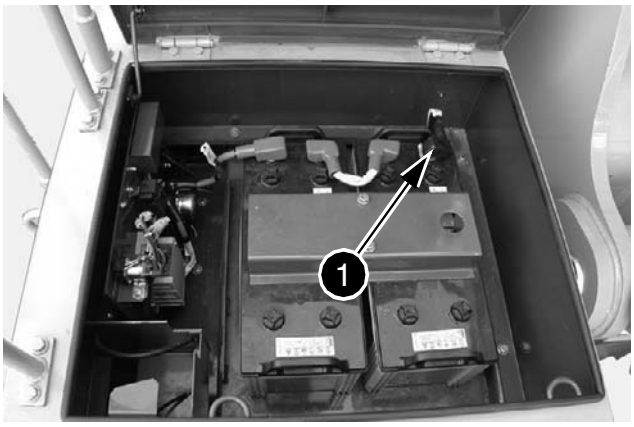
STEP 15

Refer to the removal of the hydraulic swing motor and carry out step 9 in the reverse order.

STEP 16

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

STEP 17



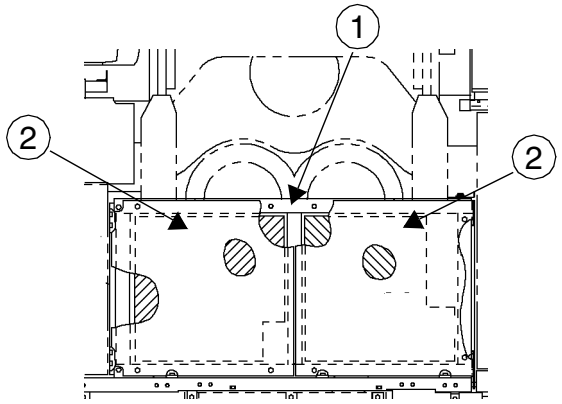
CD01C162

Connect the earth cable (-) (2) to the battery.

STEP 18

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

STEP 19



CS01N518

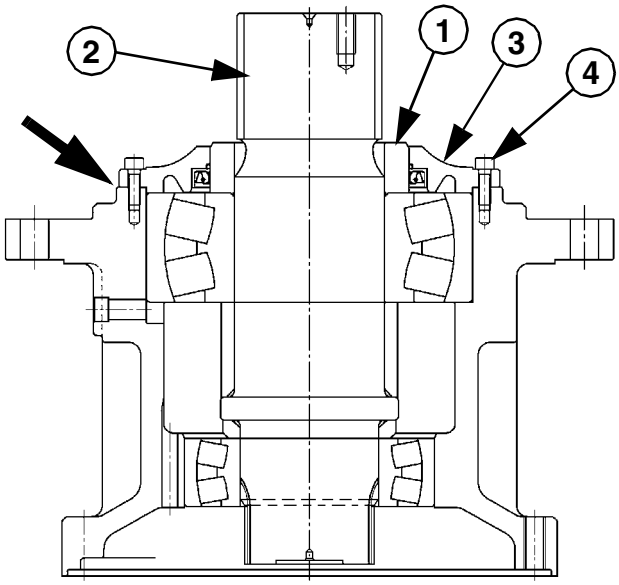
Install the central frame (1). Tighten the screws (apply Loctite 262).

STEP 20

Install the upper access panels (2). Tighten the screws (apply Loctite 262).

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

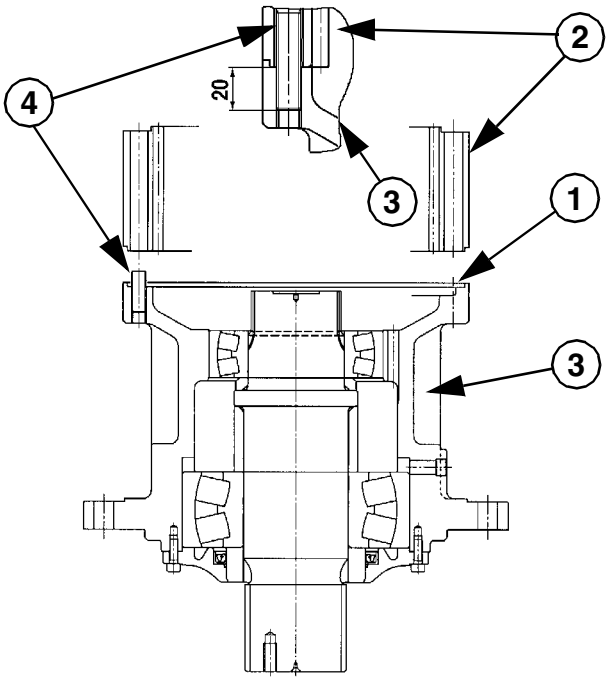
STEP 10



CS99J575

Coat the inside of the spacer (1) with sealing liquid, then install it on the shaft (2). Grease the lip seal of the cover (3). Apply sealing liquid on the contact surfaces of the cover (deflection). Install the cover (3) and tighten the screws (4) to torque.

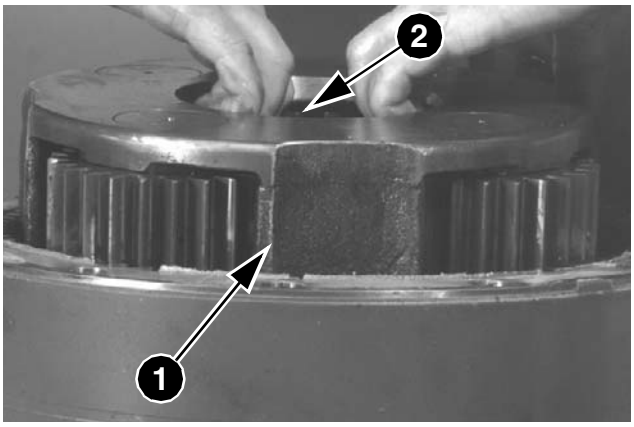
STEP 11



CS99J583

Degrease the contact surfaces (1) of the toothed housing (2) and the housing (3). Install the centring dowels (4), maintaining the dimension of 20 mm. Apply sealing liquid on the contact surfaces (1). Install the toothed housing (2) on the housing (3).

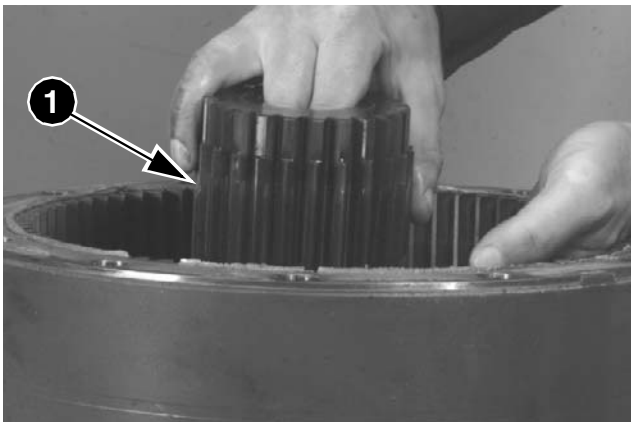
STEP 12



6003-089

Install the 2nd stage planetary assembly (1) so that it meshes with the internal teeth of the ring gear. Turn the planetary assembly slightly to engage the splines of the pinion shaft. Install the stop shim (2) at the end of the shaft.

STEP 13



6003-088

Install the second stage sun gear (1) so that it meshes with the planetary gear assembly. Check that the stop shim is properly positioned on the shaft.

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

Connect the electric cable from the portable filter to the batteries. Make sure that the electric cable is away from all moving parts.

STEP 16

Start the portable filter running.

STEP 17

Start the engine, run it at half the maximum speed for 10 minutes. During those ten 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 electric cable of the portable filter from the batteries and remove the portable filter from the machine.

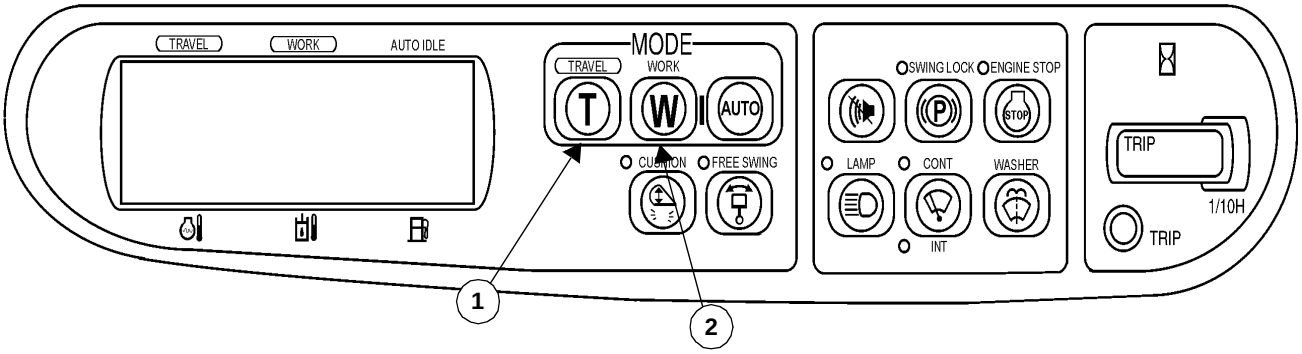
STEP 30

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

STEP 31

Start the vacuum pump.

To access this screen press the work mode and travel mode buttons.



CM00K003

Press immediately on the travel speed control (1) and on the work mode selector control (2) as shown above until the diagnostic screen CHK1 appears (3 seconds).

Warming up the engine

1. Start the engine. The engine will have warmed up in 10-15 minutes.
2. Run the engine until the message "Automatic pre-heating" disappears from the display monitor.

Warming up the hydraulic fluid

1. Actuate the bucket and dipper controls in one direction (against the cylinder stops) for 30 seconds.
2. Actuate the bucket and dipper control in the other direction (against the cylinder stops) for 30 seconds.
3. Repeat steps 1 and 2 until the hydraulic fluid temperature reaches 113-131°F.
4. Actuate the boom, swing and travel controls in both directions to warm up all the circuits to 113-131°F.

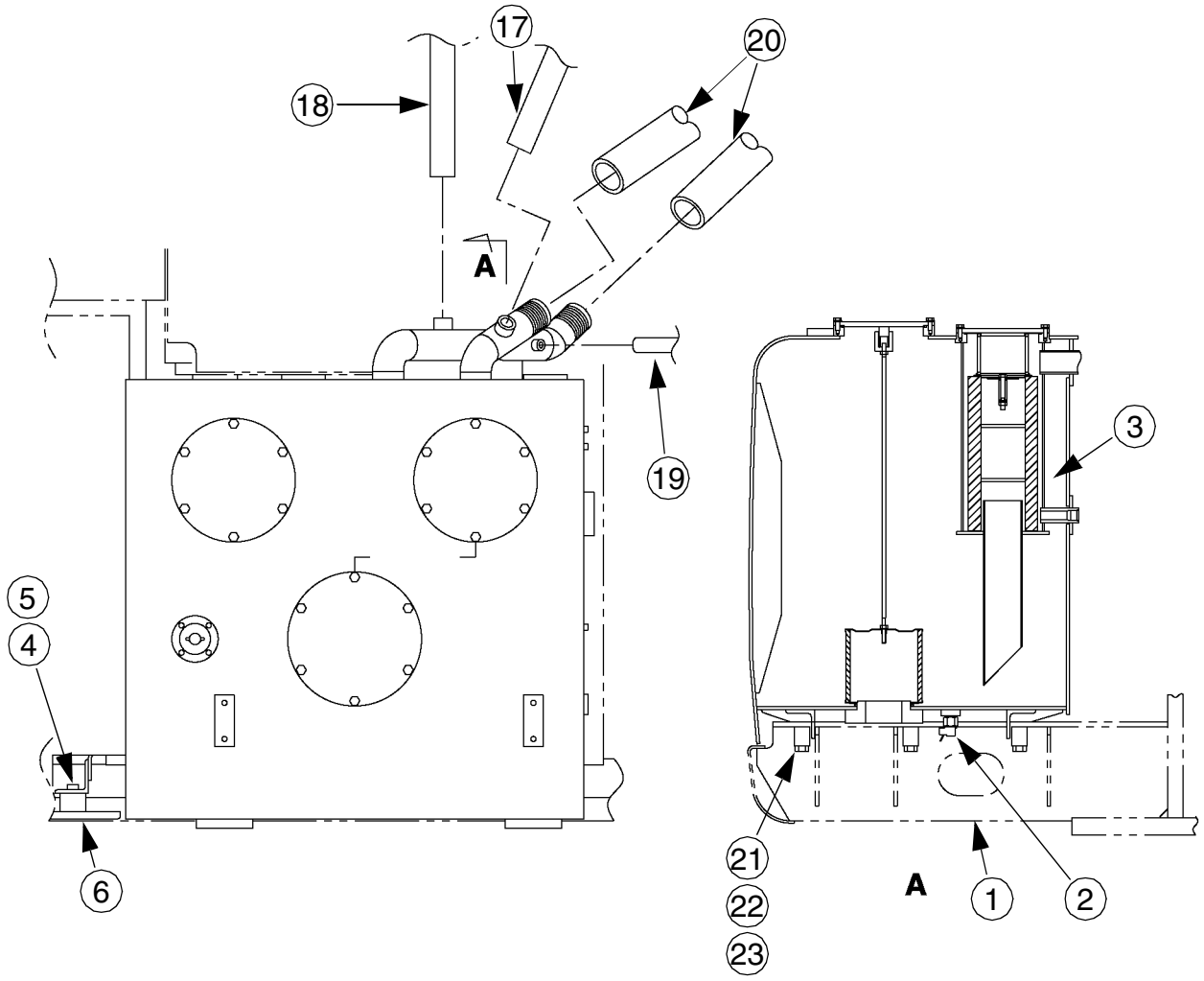
Values for one turn of the screw adjustment

Input limiter	2625 psi	
Secondary relief	5264 psi	(boom, bucket, dipper)
Swing	638 psi	
Travel	1145 psi	
Pilot pressure	304 psi	
Safety valve	1783 psi	

Not possible to select 2nd travel speed

No.	Tests	Results	Repairs
1	Press the travel speed control and check that the speed changes from I to II on the monitor display	Speed II not displayed	Refer to troubleshooting electrical failures
2	Check on the monitor display "CHK2" if the information changes to "ON" when the machine is travelling	Information stays on "OFF"	Check pressures P1 and P2 on the monitor display "CHK1" when the machine is travelling 1) Both pressures are less than 40 bar: refer to troubleshooting electrical failures 2) Both pressures are higher than 40 bar, refer to point No. 3
3	Check the negative pressure (N) of the pump	Too high	Adjust the pressure
4	Check the pilot pressure at the output from the solenoid valve (Y4)	Pressure too low	Check electrical supply and the solenoid valve coil (No. 5 and 6)
		Pressure correct 638psi	Check the pilot pressure at the travel motor displacement change spool (No. 7)
5	Check the voltage at the electrical plug on the displacement change solenoid valve	Voltage < 24 V	Check the electrical harness
6	Check the displacement change solenoid valve coil	Infinite or 0 Ohm	Change the solenoid valve
		About 40 Ohm	Replace the solenoid valve coil
7	Check the pilot pressure at the travel motor displacement change spool	Pressure too low	Internal leak at hydraulic swivel, repair or replace the hydraulic swivel
		Pressure correct 638psi	Check the travel motor displacement change spool. Repair or replace the travel motor

Hydraulic reservoir



CI01N506

1	PLATE	18	HOSE
2	DRAIN VALVE	19	HOSE
3	HYDRAULIC RESERVOIR	20	HOSE
4	SCREW	21	SCREW
5	WASHER	22	WASHER
6	PLATE	23	BRACKET
17	HOSE		

Section

8004

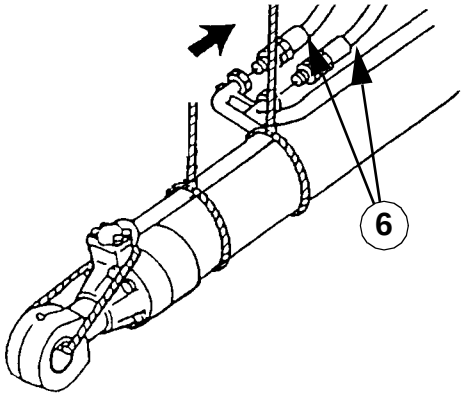
REMOVING AND INSTALLING THE MAIN HYDRAULIC CONTROL VALVE

February 2002

STEP 6

Start the vacuum pump.

STEP 7

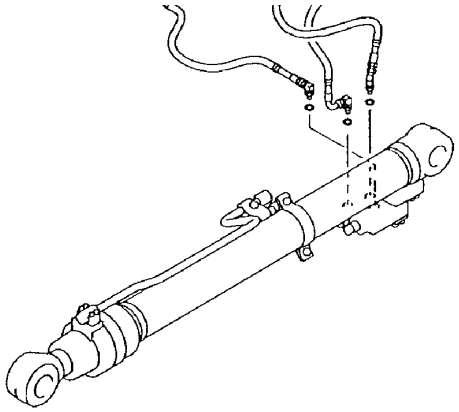


JS00582A

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

STEP 8

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



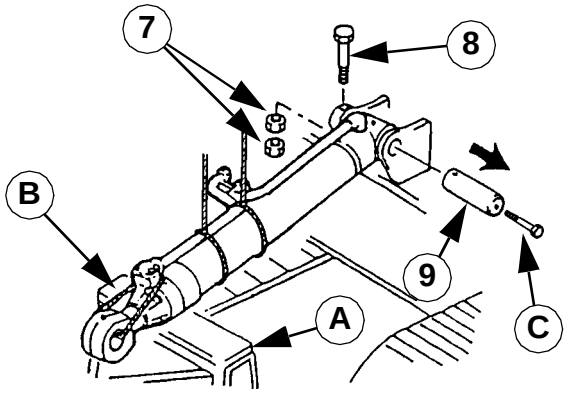
CS00G501

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.

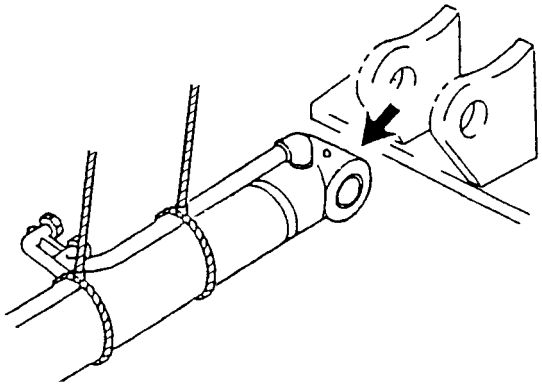
STEP 10



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.

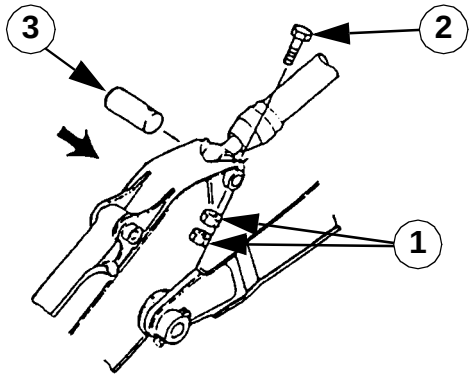
STEP 11



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 in 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 dipper cylinder.

STEP 11

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

STEP 12

Check the level of hydraulic fluid in the reservoir. Top up as required.

STEP 13

Lubricate the linkages.

Section

8007

REMOVING AND INSTALLING THE PILOT FUNCTION BLOCKS

May 2002

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.

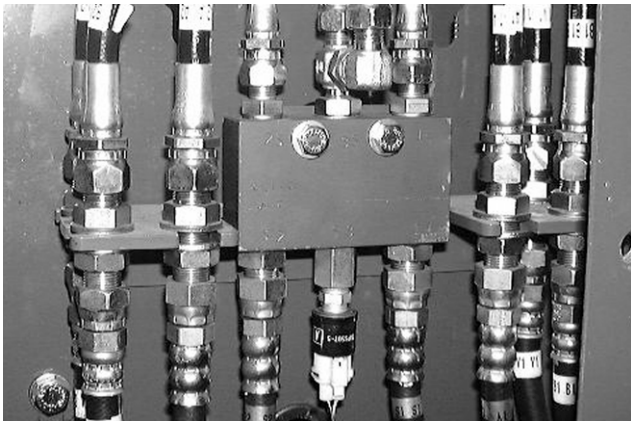
STEP 2

Start the vacuum pump.

STEP 3

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

STEP 4



CD00G063

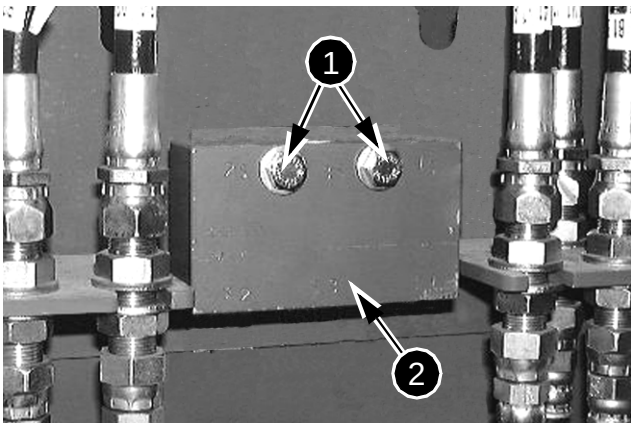
Remove and seal the hydraulic hoses, remove the pressure detector, remove the junction unions, put plugs on the ports of the shuttle block, then discard the O-rings.

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

STEP 5

Stop the vacuum pump.

STEP 6



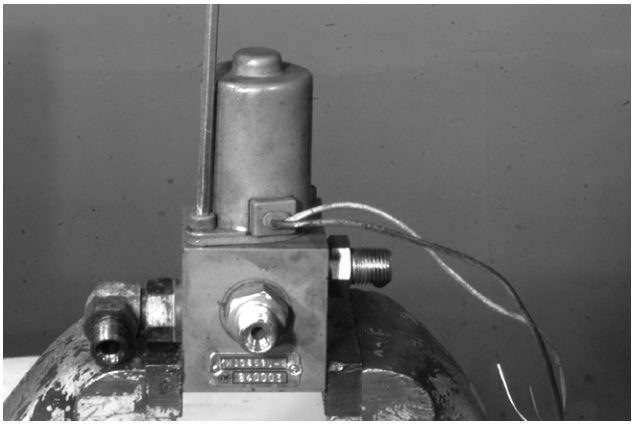
CD00G064

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, top up if necessary.*

Disassembly

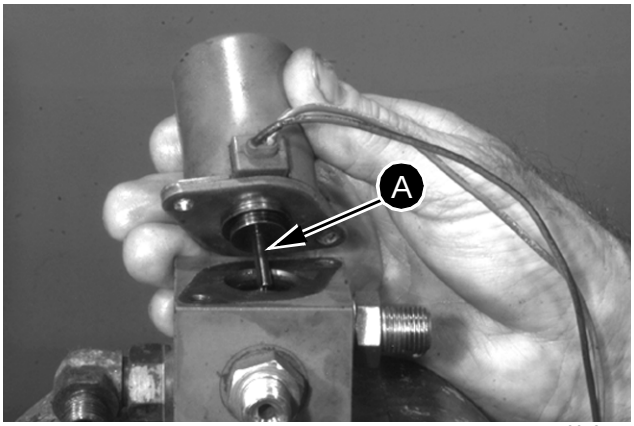
STEP 1



JD00733A

Remove the two socket head cap screws (10) holding the solenoid (9) to the valve body.

STEP 2



JD00734A

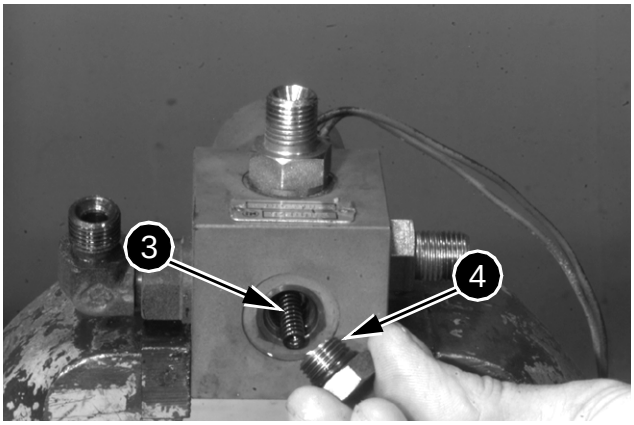
Remove the solenoid. Be careful not to drop or loose the actuating pin (A).

STEP 3

JD00735A

Remove and discard the O-ring (11).

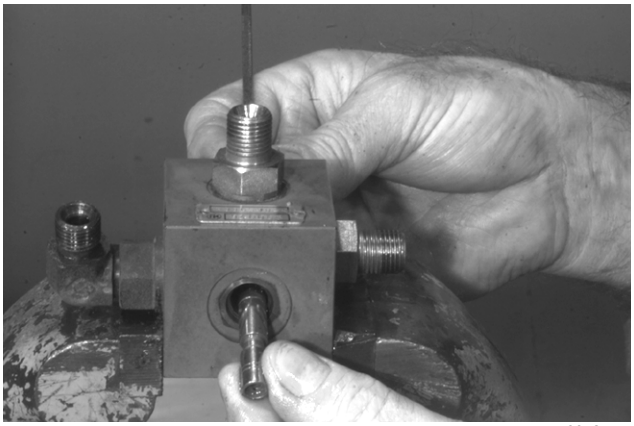
STEP 4



JD00736A

Remove the plug (5). Remove and discard the O-ring (4) from the plug. Remove the spring (3) from the valve bore.

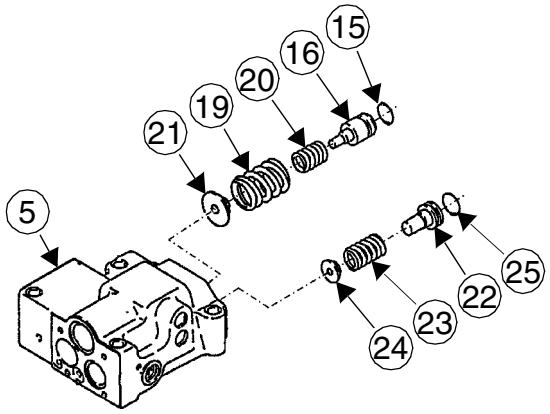
STEP 5



JD00737A

Using a suitable tool push the spool (2) through the valve body and remove from bore.

STEP 6



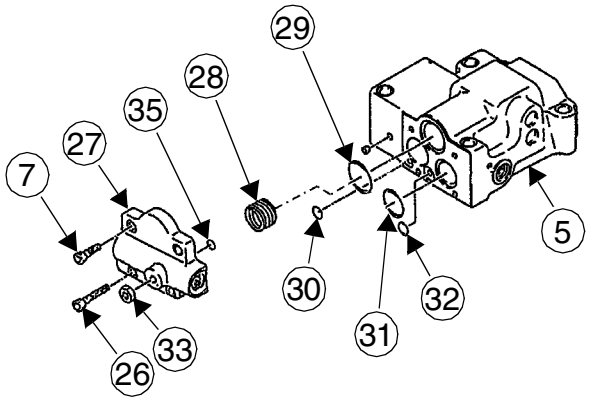
CS02A521

Remove the controller assembly (5), the outer spring (19), the inner spring (20) and the spring seat (21).

STEP 7

Remove the spring seat (22), the spring (23) and the spring seat (24). Remove and discard the O-ring (25).

STEP 8



CS02A522

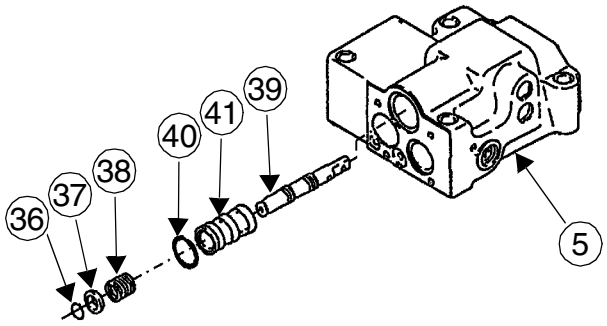
Remove the screws (7) and (26) then the pilot cover (27) from the controller assembly (5).

NOTE: *When removing the cover, the spring (28) is also removed.*

Remove and discard the O-rings (29), (30), (31), (32) and (35) of the controller assembly (5).

NOTE: *Do not remove the locknut (33), and the adjusting screw (34).*

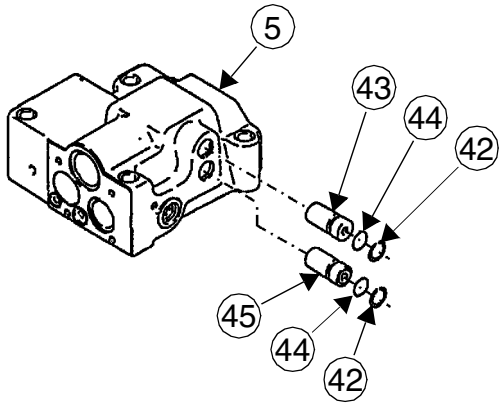
STEP 9



CS02A523

Remove the snap ring (36), the spring seat (37), then the return spring (38) from the piston (39). Then, remove the snap ring (40) and the liner (41) from the controller assembly (5).

STEP 10



CS02A524

Remove the snap rings (42), the articulation plug (43) and the adjustment plug (45) from the controller assembly (5). Remove and scrap the O-rings (44).

Section

8011

DISASSEMBLY AND REASSEMBLY OF THE CONTROL VALVE

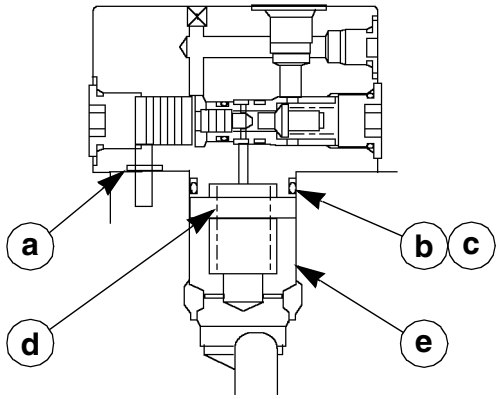
February 2002

Removing the section for dipper 2, boom 1, bucket, RH travel and straight-line travel

The numbers in brackets refer to the drawing on page 8.

Removing the boom load holding valve (14)

STEP 1



CI02A505

Unscrew the four screws and remove the boom load holding block.

STEP 2

Discard the O-rings (a) and (b) and the back-up ring (c).

STEP 3

Remove the spring (d) and the non-return check valve (e) from the control valve.

Removing from the non-return check valves (8), (9), (11)

STEP 1

Remove the dipper 2 non-return check valve from the control valve.

STEP 2

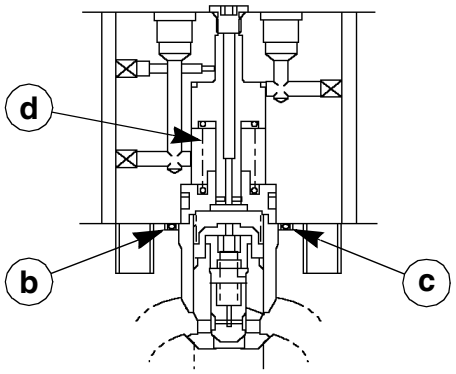
Remove the boom 1 non-return check valve from the control valve.

STEP 3

Remove the straight-line travel non-return check valves from the control valve.

Removing the boom priority block (15)

STEP 1



CI02A506

Remove the screws from the boom priority block (15).

NOTE: *Be careful of the spring (d) under pressure that can be ejected from the boom priority block.*

STEP 2

Remove the O-ring (b) and the back-up ring (c) from the control valve.

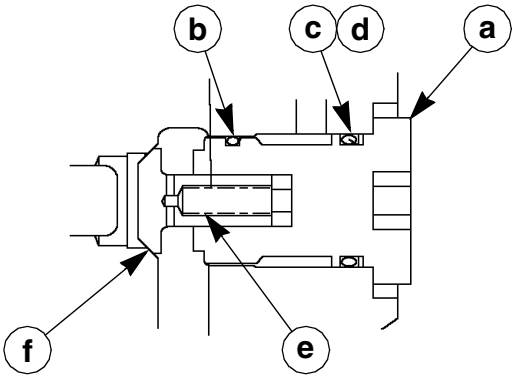
STEP 3

Remove the check valve assembly from the control valve.

Removing the connection section from the control valve (23)

Removing the non-return check valve option (24)

STEP 1



CI02A513

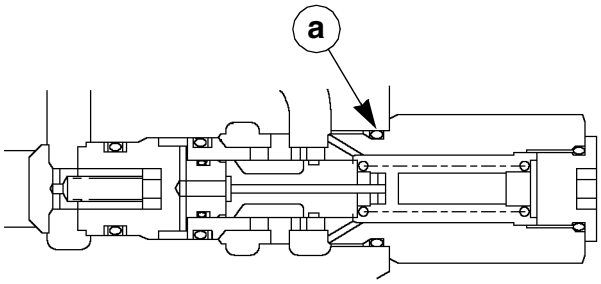
Remove the plug (a) from the section (23).

Remove the insert (b), the O-ring (c) and the back-up ring (d).

STEP 2

Remove the spring (e), then the non-return check valve (f).

Removing the free return valve (25)

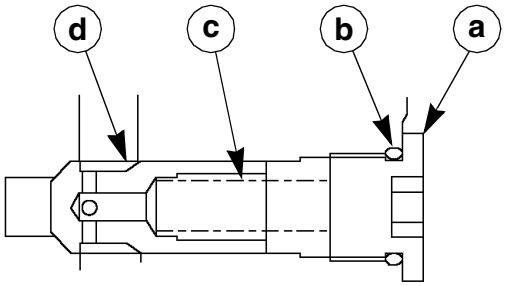


CI02A514

Remove the free return valve and discard the O-ring (a).

Removing the straight-line travel non-return check valve restrictor (26)

STEP 1



CI02A515

Remove the plug (a) and discard the O-ring (b).

STEP 2

Remove the spring (c) and remove the check valve (d).

Removing the plug (27)

Unscrew, then remove the screws, remove the cover and discard the O-ring.

Removing the plugs (28)

Remove the plug (28) and discard the O-ring.

Removing the connection section from the control valve (23)

Installing the plugs (28)

Install a new O-ring on the plugs and install the assembly on the connection section.

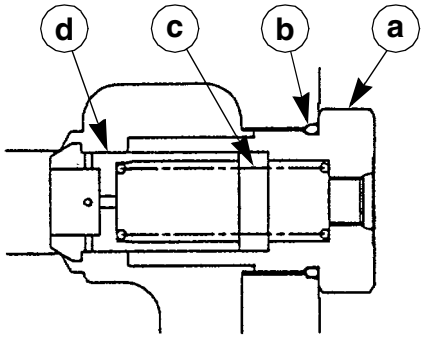
Installing the plug (27)

Install a new O-ring on the cover and install the cover on the section, tighten the screws.

NEGATIVE CONTROL RELIEFS (N1), (N2)

Disassembly

STEP 1



CS02A568

Remove the nut (a) and discard the O-ring (b).

STEP 2

Remove the spring (c) then the check valve (d).

Inspection

See "Inspection" chapter page 35.

Assembly

STEP 1

Install a new O-ring (b) on the nut (a).

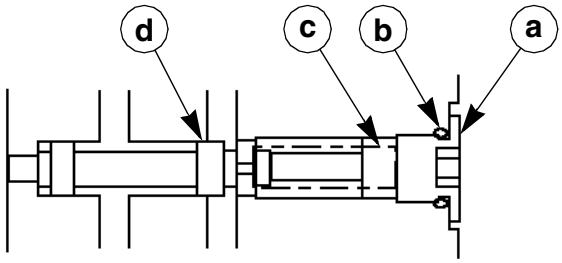
STEP 2

Install a spring (c) then a check valve (d) in the nut. Install the assembly on the control valve, tighten to a torque of 181 lb-ft.

STRAIGHT-LINE TRAVEL PILOT (18)

Disassembly

STEP 1



CI02A509

Remove the plug (a), discard the O-ring (b).

STEP 2

Remove the spring (c) then the spool (d).

Inspection

See "Inspection" chapter page 35.

Assembly

STEP 1

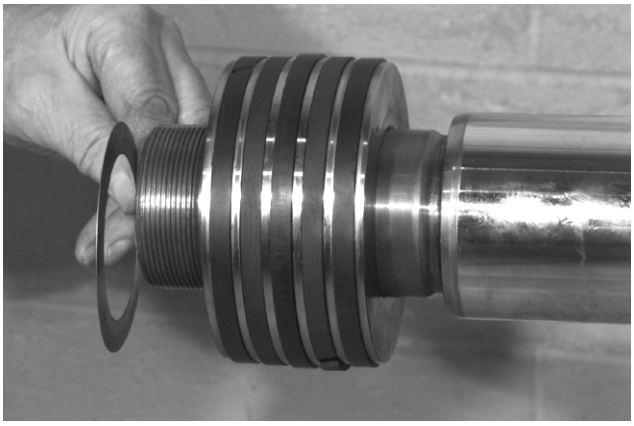
Install the spool (d) then the spring (c) in the control valve.

STEP 2

Install a new O-ring (b) on the plug (a). Install the assembly on the control valve, tighten to a torque of 21.6 lb-ft.

1 GREASE GUN
2 PLUG
3 O-RING
4 SCREW
5 HYDRAULIC PIPE
6 O-RING
7 SCREW
8 WASHER
9 PIPE CLAMP
10 HYDRAULIC PIPE
11 SCREW
12 LOCK WASHER
13 CIRCLIP
14 BLEED SCREW
15 O-RING
16 SCREW
17 BEARING
18 SCREW
19 STEEL BALL
20 PISTON NUT
21 PISTON
22 SEAL
23 BACK-UP RING
24 SEALING RING
25 SEALING RING
26 SHIM
31 O-RING
32 BACK-UP RING
33 RING
34 SEAL
35 BACK-UP RING
36 SEAL
37 WIPER SEAL
38 RETAINING RING
39 BUSHING
40 SEAL
41 CUSHION BUSHING
42 WIPER SEAL
43 BUSHING
44 CYLINDER ROD
45 CYLINDER BARREL
46 O-RING

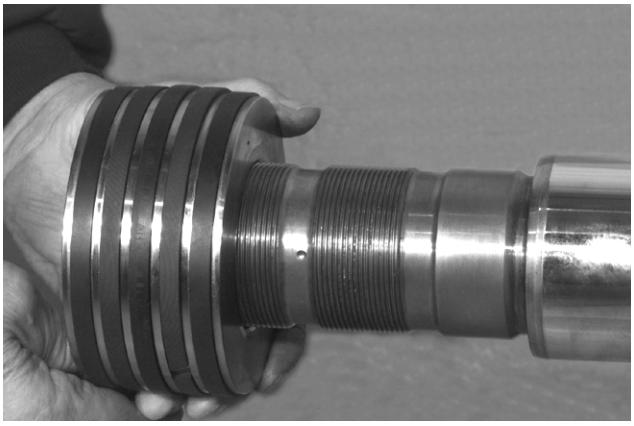
STEP 25



JD00641A

Remove the shim (26) from the rod.

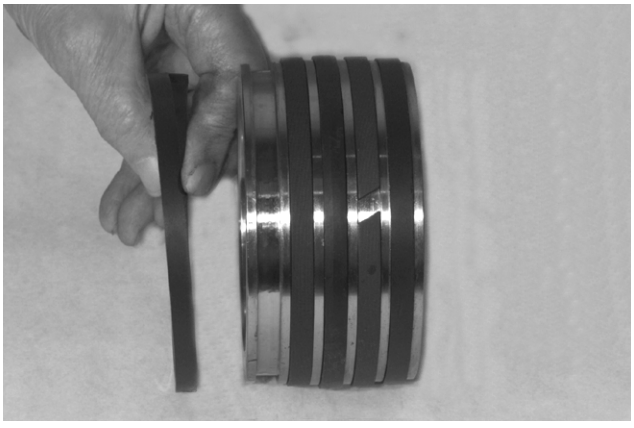
STEP 26



JD00642A

Remove the piston (21) then remove the bearing rod.

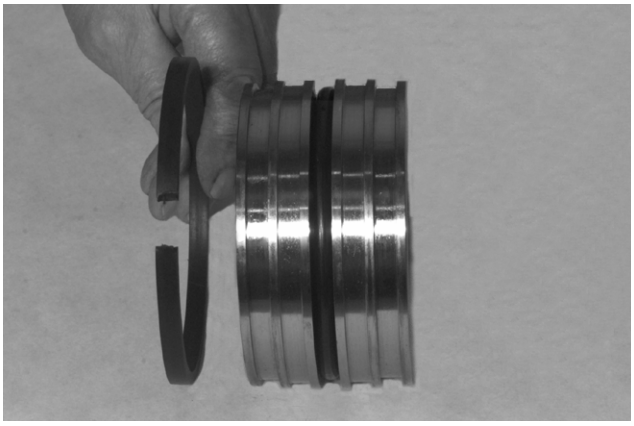
STEP 27



JD00643A

Remove the two sealing rings (25) from the piston.

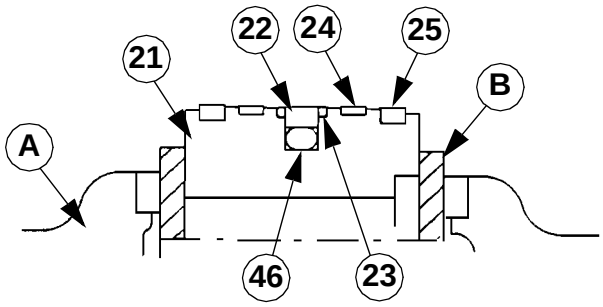
STEP 28



JD00644A

Remove the two sealing rings (24) from the piston.

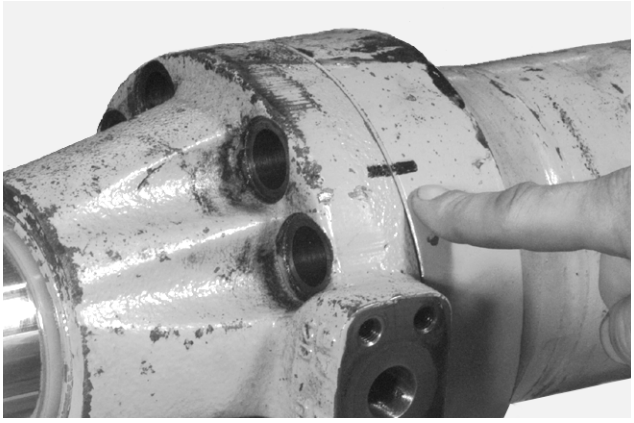
STEP 29



JS00645A

Install the piston (21) in a vice (A) with protective jaws (B). Using a suitable tool, cut or break the seal ring (22). Remove the seal ring and discard. Remove and discard the two back up rings (23). Remove the piston from the vice.

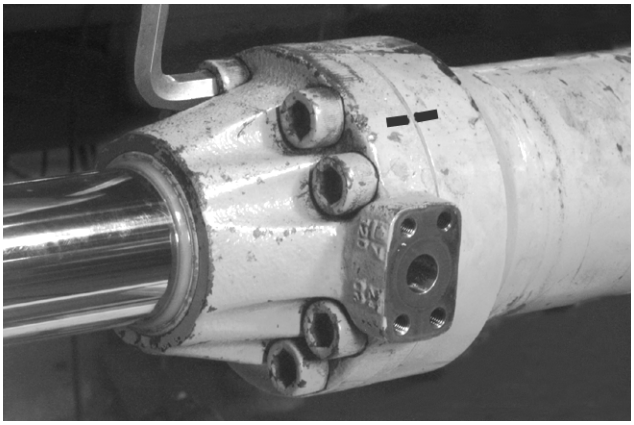
STEP 18



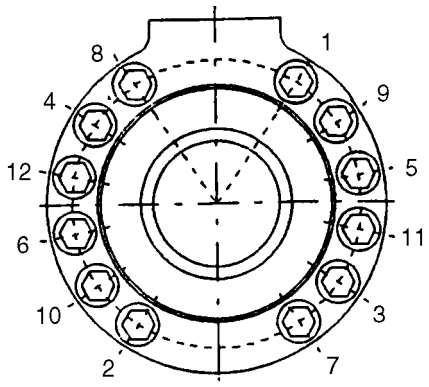
JD00662A

Using suitable means of lifting, install the tube on the repair stand in order to align the cylinder rod (44) and the bearing. Install the tube and the bearing (17) by aligning the markers.

STEP 19



JD00630A



JS00663A

Start the pump on the machine to bring the tube into contact with the bearing. Install 12 screws (16) and tighten the screws to torques (see "Specifications").

STEP 20

Attach a suitable lifting device to the cylinder. Remove the screws and chuck wings to free the cylinder from the repair stand.

STEP 21

Boom cylinder

NOTE: *The numbers within brackets in the following steps refer to the boom cylinder schematic on page 4.*

1. Install the clamps (13) on the cylinder, the washers (12) and the screws (11). Tighten the screws to torque (see "Specifications").
2. Install the two hydraulic pipes (5) and (10), the clamps (9), the washers (8) and the screws (7). Tighten the screws to torque (see "Specifications").
3. Install two new O-rings (6) on the cylinder. Connect the hydraulic pipes (5) and (10) to the cylinders. Fasten the pipes using screws (4). Tighten the screws to torque (see "Specifications").
4. Install two new O-rings (3) on the pipes. Install two plugs (2) and tighten the plugs to torque (see "Specifications").
5. Install the grease gun (1) in the cylinder.
6. Install the seal (15) and the bleed screw (14) on the bearing (17).

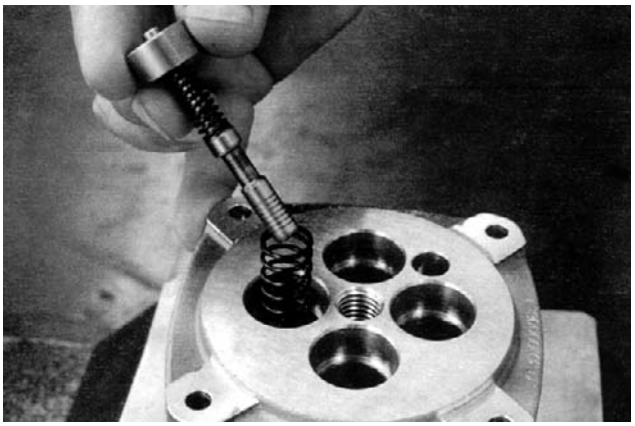
STEP 22

Dipper cylinder

NOTE: *The numbers within brackets in the following steps refer to the dipper cylinder schematic on page 6.*

1. Install the clamps (13) on the cylinder using screws (11) and washers (12). Tighten the screws to torque (see "Specifications").
2. Install the hydraulic pipes (5) and (10) on the clips (13), using clamps (9), washers (8) and screws (7). Tighten the screws to torque (see "Specifications").
3. Install the two new O-rings (6) on the cylinder. Connect the hydraulic pipes (5) and (10) to the cylinder using the screws (4). Tighten the screws to torque (see "Specifications").
4. Install the two new O-rings (3) on the pipes. Install the plugs (2). Tighten the plugs to torque (see "Specifications").
5. Install the seal (15) and the bleed screw (14) on the bearing (17).

STEP 6



CD00G106

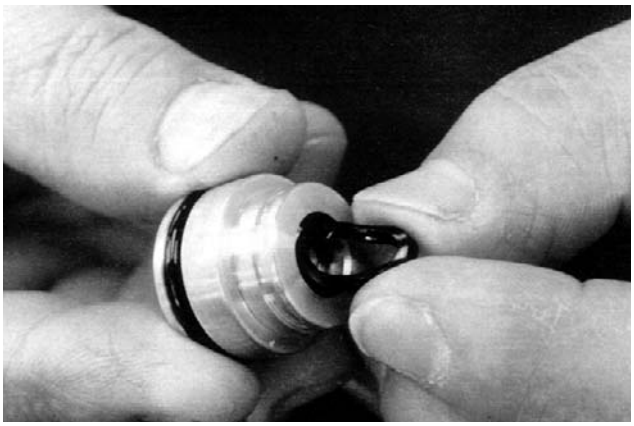
Turn the control lever the other way up in the vice. Install the return spring and the complete spool assembly in the body, respecting the positions noted during steps 5 to 7 (disassembly).

STEP 7

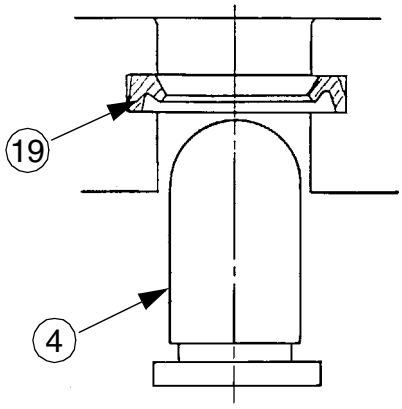
CD00G107

Install the O-ring on the plunger.

STEP 8



CD00G108



CI00G509

Install the lip seals (19) with their ends as shown above.

STEP 9

CD00G109

Coat the surfaces of the push-rod (4) with hydraulic fluid and install it in the plunger (6).

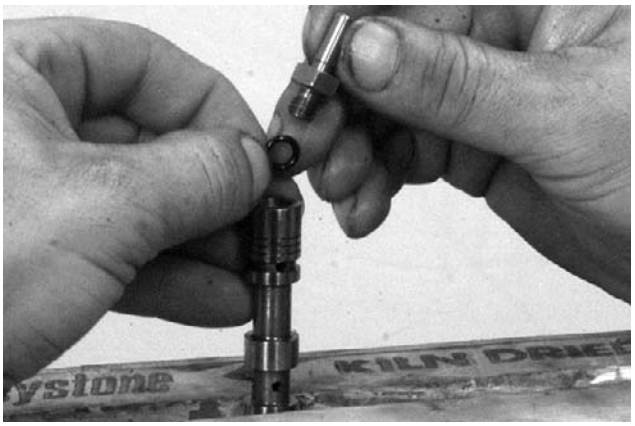
Section

8015

DISASSEMBLY AND ASSEMBLY OF THE EIGHT SOLENOID VALVE BANK

February 2002

STEP 6



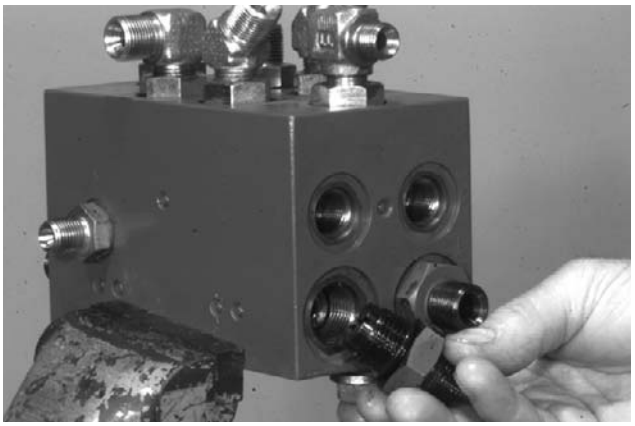
JD00554A

Remove the O-ring (12) from the spring guide (11). Scrap the O-ring.

STEP 7

Repeat steps 2 through 6 for the other spool.

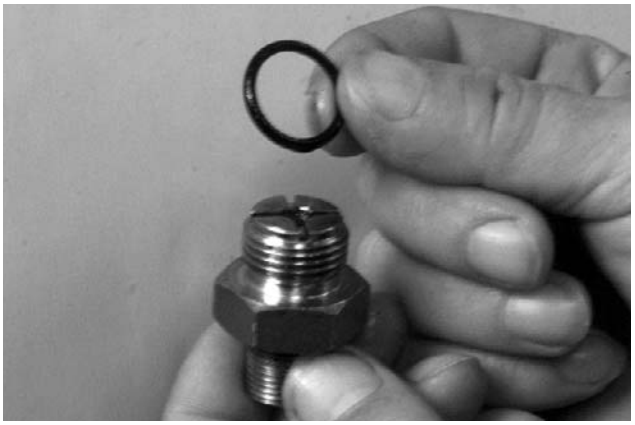
STEP 8



JD00555A

Remove the flow restriction adaptor (7) and the O-ring (6).

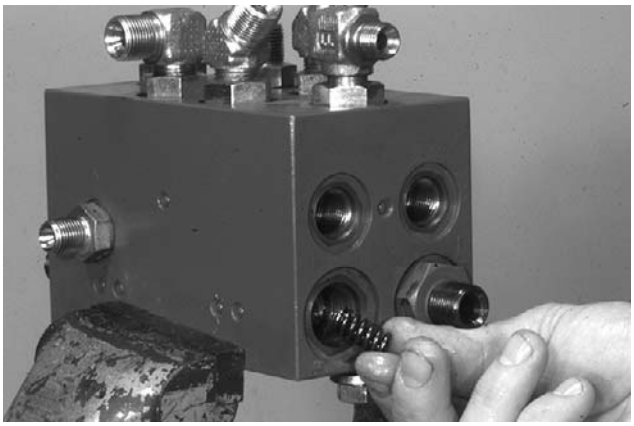
STEP 9



JD00556A

Remove and discard the O-ring (6) and the flow restriction adaptor (7).

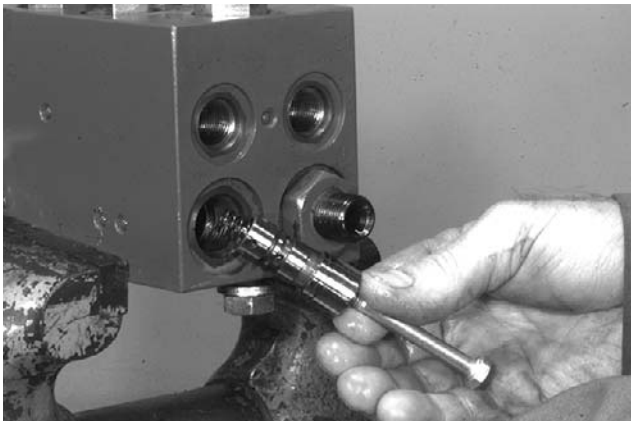
STEP 10



JD00557A

Remove the spring (4).

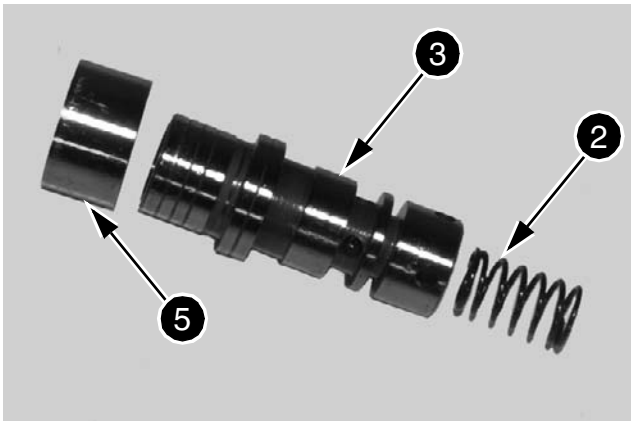
STEP 11



JD00558A

Install an M4 cap screw (A) in the tapped hole of the spool (3). Remove the spool (3) with the spacer (5) and the spring (2). Remove the M4 cap screw.

STEP 12

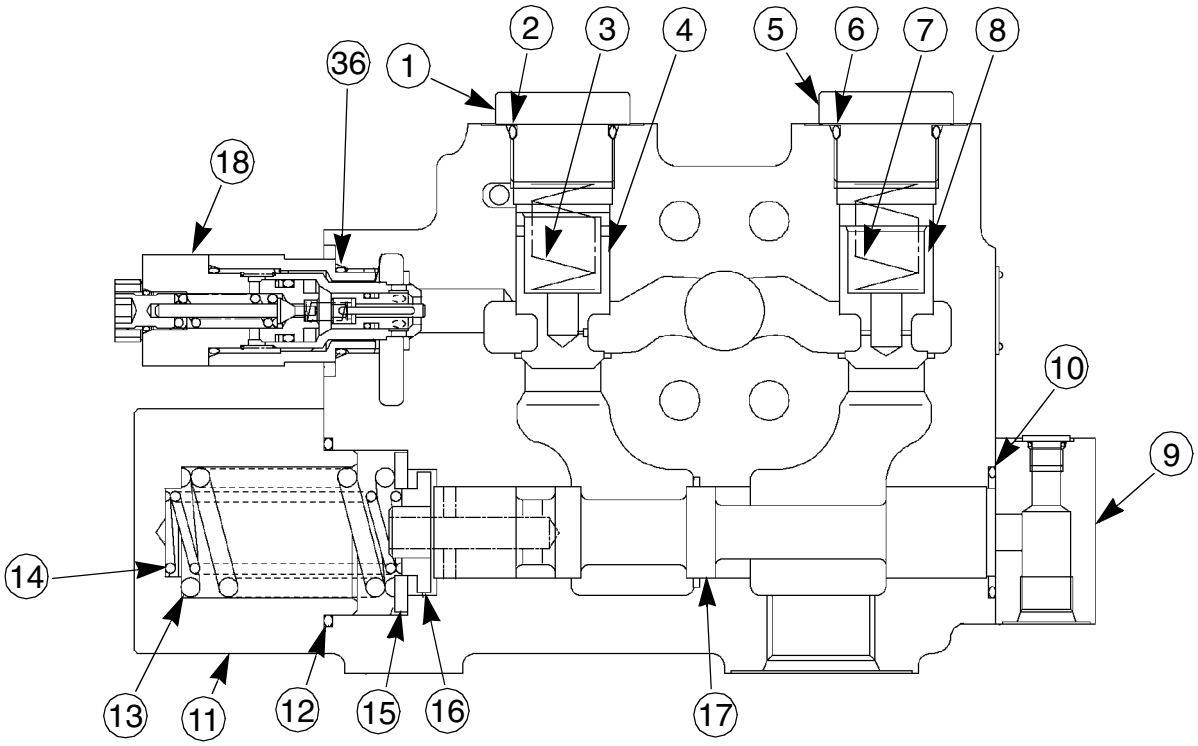


JD00559A

Remove the spring (2) and the spacer (5) from the spool (3).

STEP 13

Repeat steps 9 through 12 for the remaining three spools.



CI00K503

13. Install a joint (36) on the valve (18).
14. Install the valve (18).
15. Oil and install the check valve (4) and the spring (3) according to the markings made during disassembly, install the plug (1) equipped with a joint (2).
16. Oil and install the check valve (8) and the spring (7) according to the markings made during disassembly, install the plug (5) equipped with a joint (6).
17. Install a joint (10) and install the spool stop cap (9) using four retaining screws.
18. Oil and install the spool (17).
19. Install the spring seats (16) and (15).
20. Install the springs (13) and (14).
21. Install a joint (12) on the spool cap (11).
22. Install and fasten the spool cap (11) using the four screws.

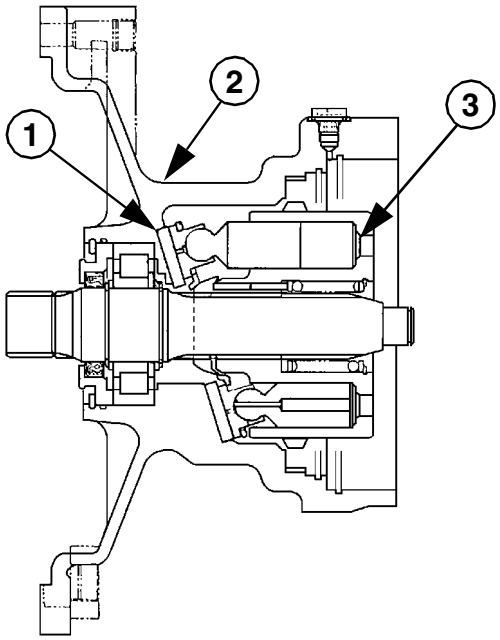
Section

8019

DISASSEMBLY AND REASSEMBLY OF THE HYDRAULIC SWING MOTOR

February 2002

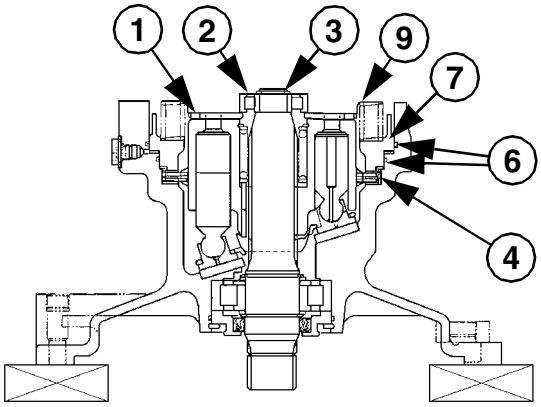
STEP 5



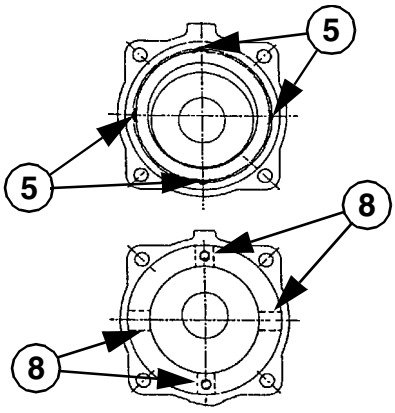
CS99J562

Install the piston plate (1), with the chamfered side turned towards the housing. Install the cylinder block (3) equipped with pistons and the guide plate.

STEP 6



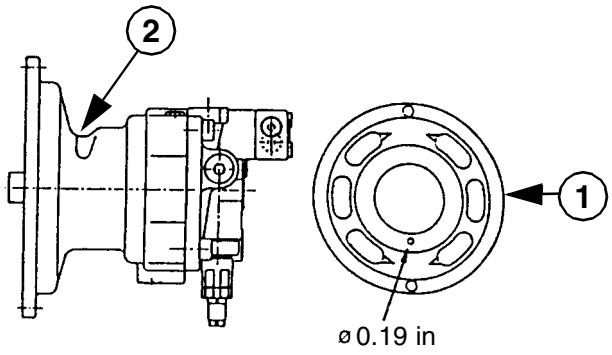
CS99J563



CS99J564

Place the housing on the shim, the control valve facing upwards. Lubricate and install the distribution machined plate (1) on the cylinder block. Heat the bearing (2) in an oven at 212°F for 10 min. Install the bearing (2) taking care to not get yourself burnt. Install the snap ring (3). Install the brake disks (4), start with a steel disk then a friction disk and so on, take care to align the notches (5) of the steel disks (see figure). Install the O-rings (6). Install the brake piston (7) by positioning the notches (8) according to the diagram. Install the spring (9).

STEP 7



CS99J565

Adjust the distribution plate (1) bore diameter 0.19 in opposite the tilt mark of the housing (2).

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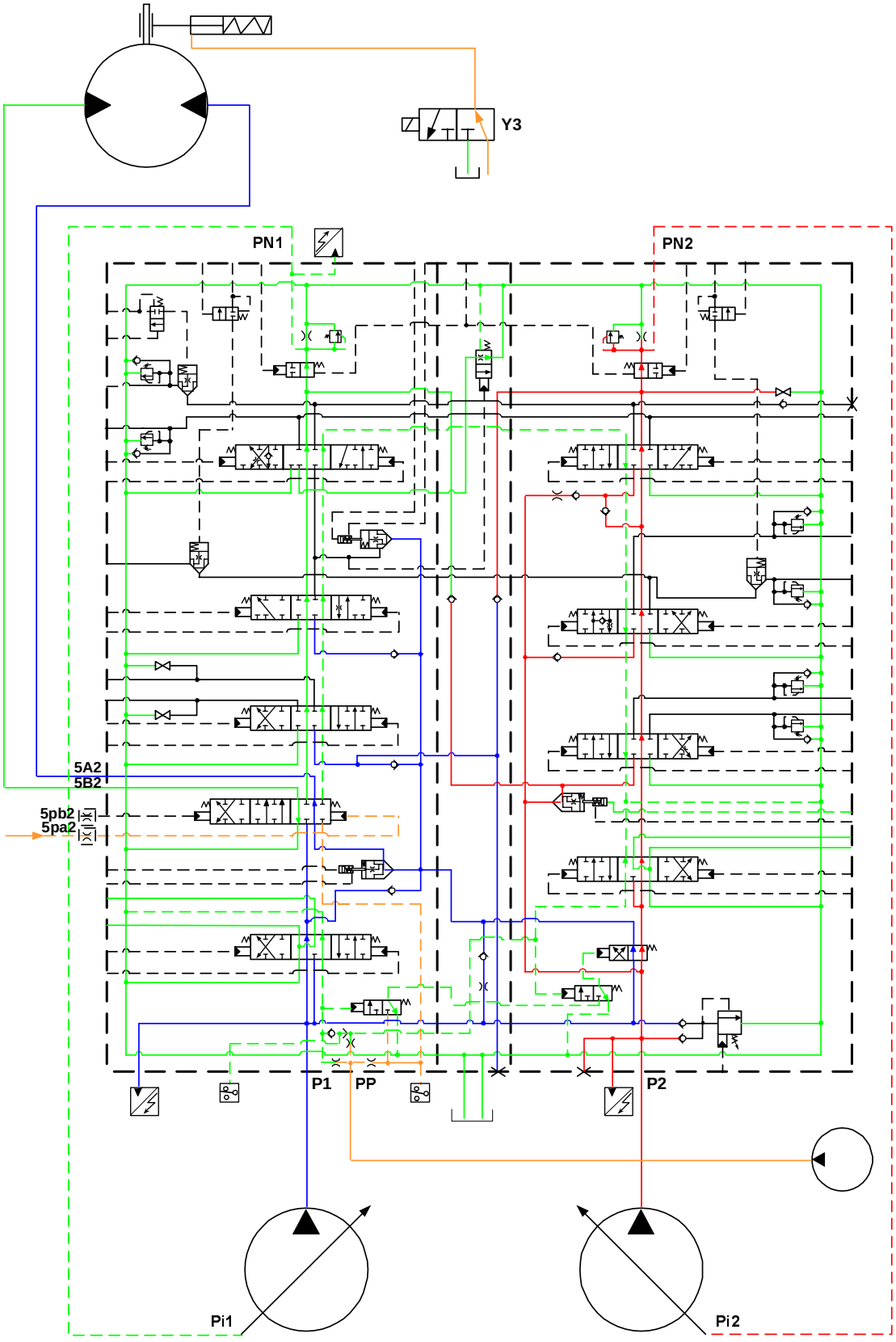
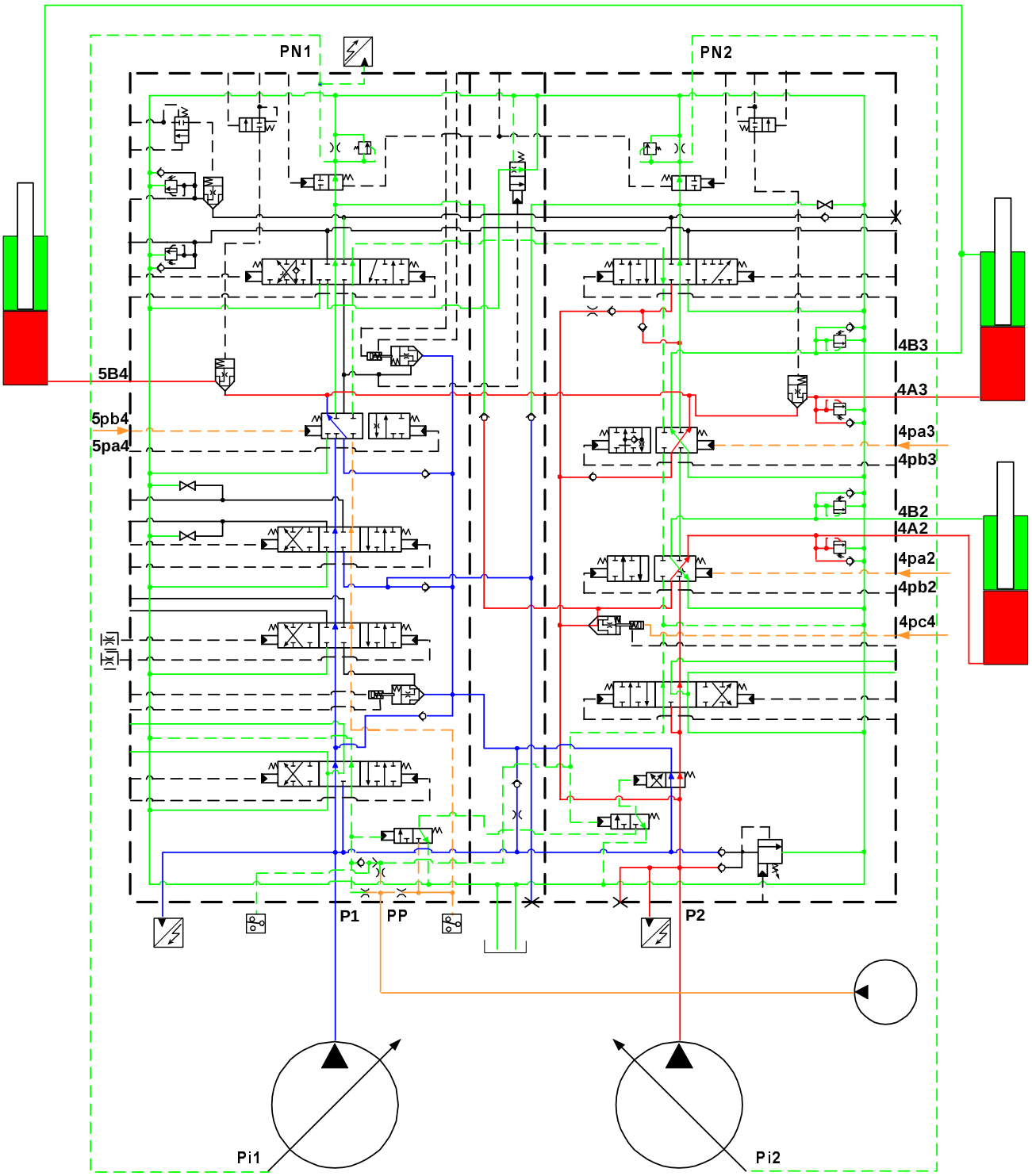
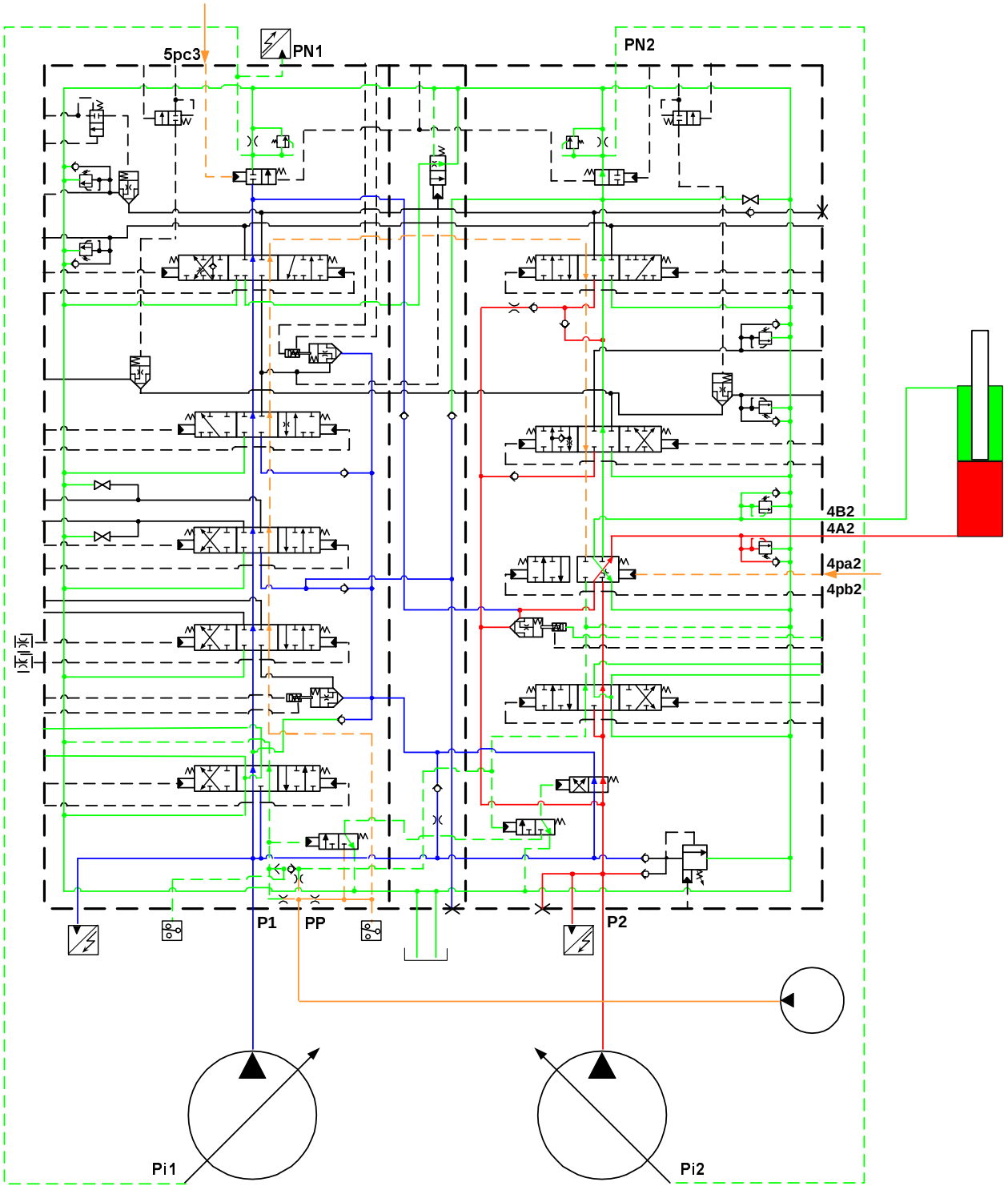


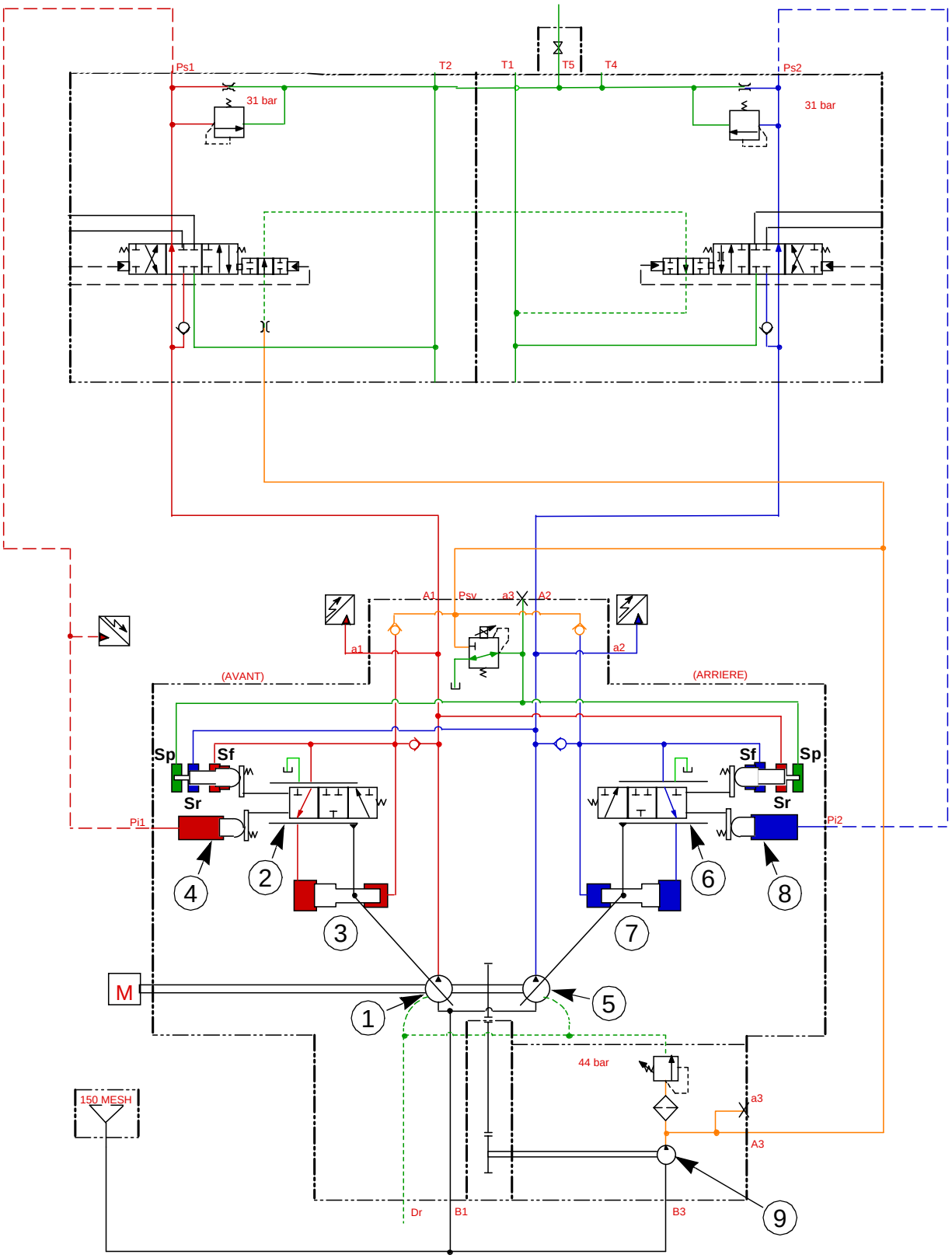
CM02A006


PN1
PN2
5B4
5pb4
5pa4
4B3
4A3
4pa3
4pb3
4B2
4A2
4pa2
4pb2
4pc4
P1
PP
P2
Pi1
Pi2

CM02A010



CM02A015


Ps1
T2
T1
T5
T4
Ps2
31 bar
31 bar
A1
Psv
a3
A2
a1
a2
(AVANT)
(ARRIERE)
Sp
Sf
Sr
Pi1
Pi2
Sf
Sp
Sr
4
2
3
6
8
7
M
1
5
44 bar
150 MESH
a3
A3
Dr
B1
B3
9

CM02A020

UPPERSTRUCTURE

Inspection

STEP 1

Checking the turntable

If the upperstructure does not revolve properly or creaks, this shows that the turntable is worn or damaged. If the upperstructure pauses before revolving, this shows that the crown wheel of the turntable is damaged. When an operator is working with the machine, he must pay attention to any unusual noises which could indicate turntable wear. If the operator hears unusual noises and if the upperstructure pauses before revolving, he must carry out the following inspection.

STEP 2

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

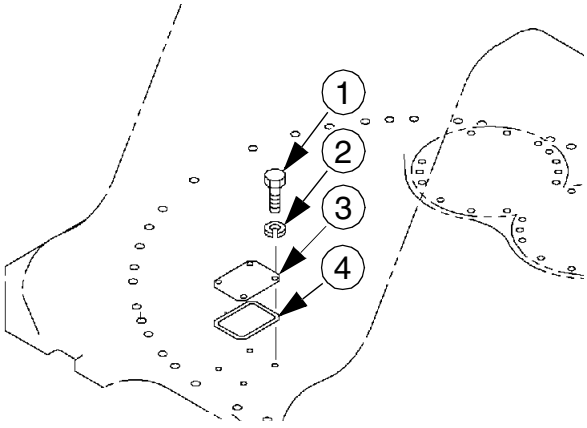
STEP 3

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

STEP 4

Remove the screws that attach the lower housing to the machine and remove the lower housing.

STEP 5



CI02A502

Remove the four screws (1) and the brake washers (2) that attach the access panel (3) to the machine. Remove the access panel (3). Remove and discard the seal from the access panel (4).

STEP 6

> **WARNING:** *If your hand is in the access port of the crown wheel when the upperstructure is revolving, you could get seriously injured. Before applying grease by hand on the crown wheel, always check that the bucket or the tool is placed on the ground and the engine is shut down.*

Ask an assistant to help you operate the swing mechanism, check for scratches, missing teeth, scaling, cracks or other damage on the crown wheel using a pocket light. In case of damage, refer to "Removing the upperstructure" and change the turntable of the upperstructure.

STEP 7

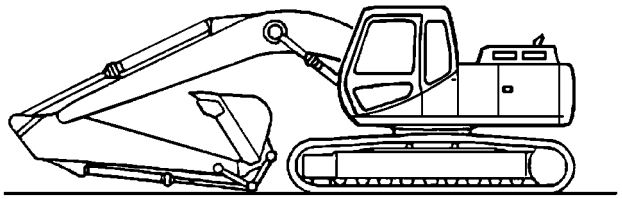
Install a new seal on the access panel and install the access panel on the machine using screws and brake washers.

STEP 8

Install the lower housing on the machine using screws and plate washers.

Removal

STEP 1

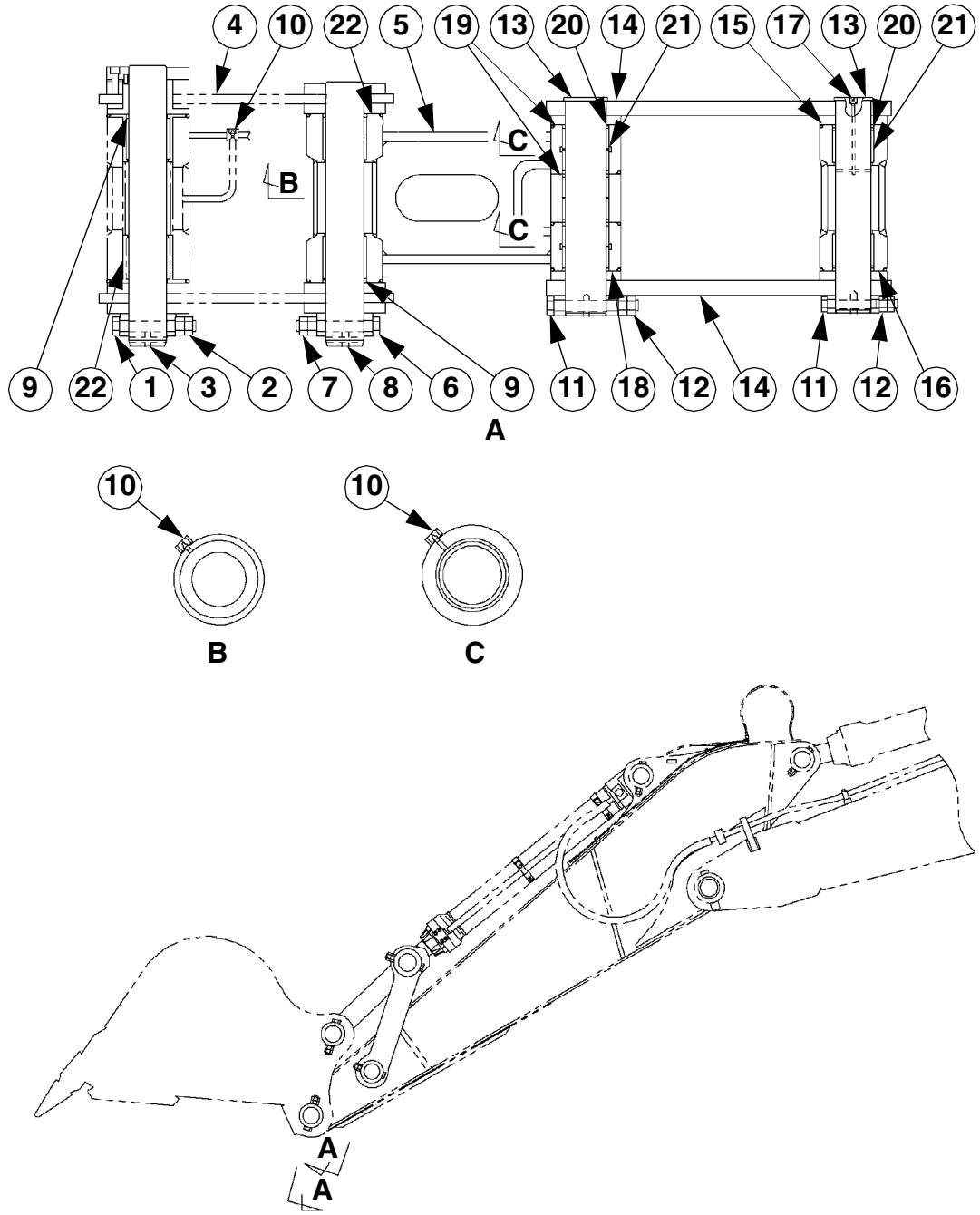


JS00163A

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

BUCKET

Description

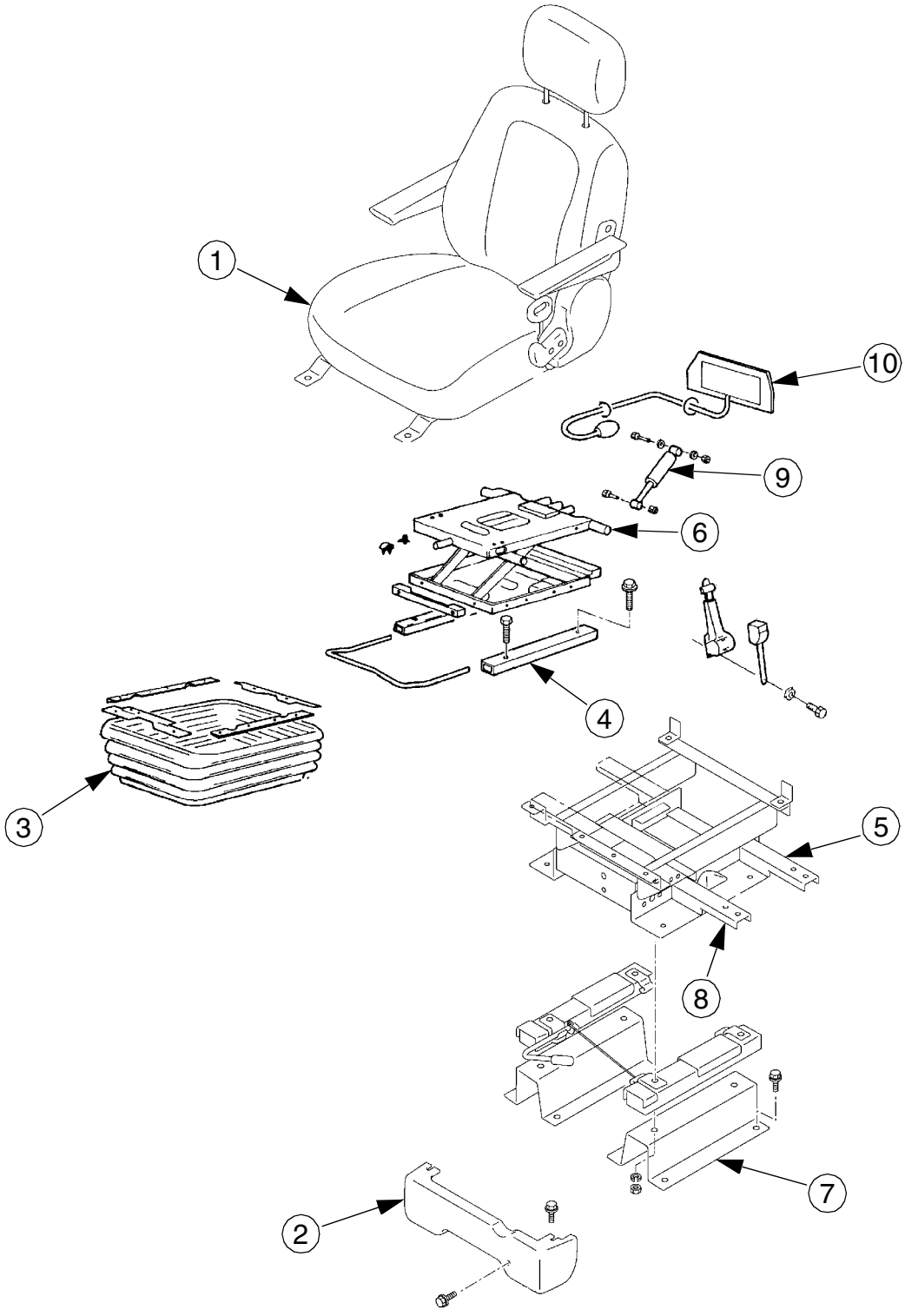


CS02A539

1 RETAINING SCREW
2 NUT
3 SHAFT
4 BUCKET
5 CONNECTING ROD
6 RETAINING SCREW
7 NUT
8 PIN
9 SEAL
10 GREASE FITTING
11 RETAINING SCREW
12 NUT
13 SHAFT
14 YOKE
15 O-RING
16 SHIM
17 GREASE FITTING
18 SHIM
19 O-RING
20 SEAL
21 BUSHING
22 BUSHING

OPERATOR'S SEAT

Description



CS02A504

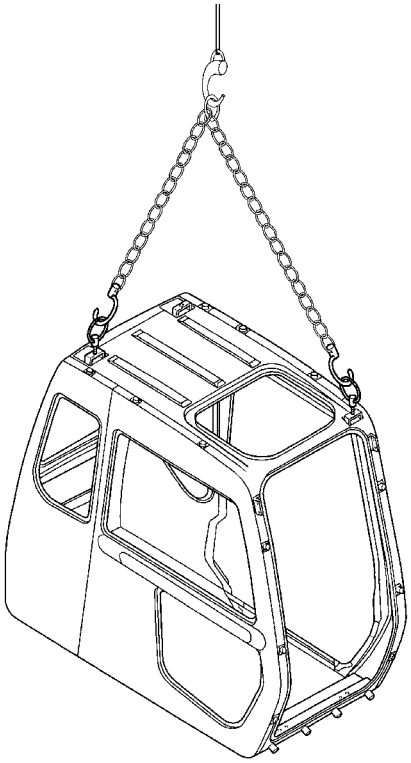
1 OPERATOR'S SEAT
2 MASK
3 BOOT
4 RAIL
5 REAR CONTROL ARM BRACKET
6 SHOCK ABSORBER
7 BRACKET
8 FRONT CONTROL ARM BRACKET
9 CYLINDER
10 BULB

STEP 19

Remove the screws and washers which fasten the cab to the upperstructure frame.

NOTE: *Keep away from the cab while it is being lowered. Make sure that the cab is not damaged during lifting or lowering. Room for manoeuvre is very limited at the rear, on the sides and inside the cab.*

STEP 20



CI99G501

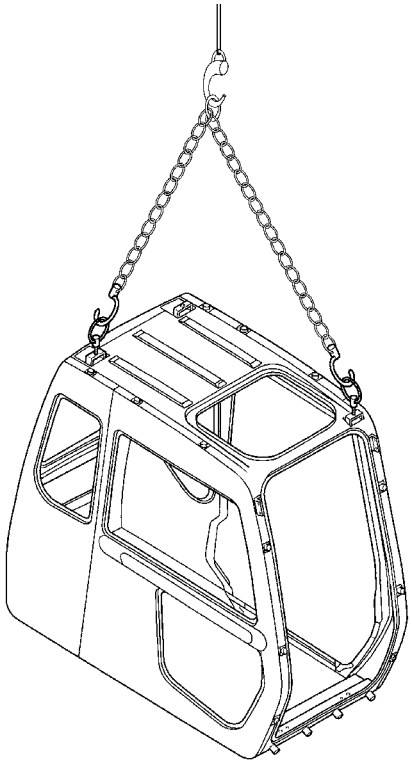
Using the lifting equipment, carefully raise the cab until it is completely away from the machine, then lower it to the ground.

NOTE: *The cab weighs 560 pounds.*

Installation

NOTE: *Keep away from the cab while it is being lowered. Make sure that the cab is not damaged during lifting or lowering. Room for manoeuvre is very limited at the rear, on the sides and inside the cab.*

STEP 1



CI99G501

Install suitable lifting rings on the top of the cab. Using suitable lifting equipment, raise the cab. Guide the cab so that it is correctly aligned with the mounting studs and orifices in the upperstructure frame.

NOTE: *The cab weighs 560 pounds.*

STEP 2

Install the screws and washers which fasten the cab to the upperstructure frame. Tighten them to a torque of 57.5 to 59 lb-ft.

STEP 3

Install the working light on the top of the cab.

Installation

NOTE: *The numbers within brackets refer to the schematic on page 13.*

STEP 1

Place the windshield wiper motor (4) in position on the cab bracket. Connect the windshield wiper motor connector (4) to the electrical harness (10).

STEP 2

Install the windshield wiper motor (4) on the cab pillar, using the screws (9) and (11).

STEP 3

CD00G134

Install the right-hand front trims in the cab using the screws.

STEP 4

Install the support (8), washer (7) and the two nuts (6). Tighten the nuts.

STEP 5

Install the rubber cap (5).

STEP 6

Install the windshield wiper arm (2) on the windshield wiper motor shaft (4), positioning the windshield wiper arm (2) in the same position as was noted at disassembly.

STEP 7

Install the nut (3) on the windshield wiper motor shaft. Tighten the nut.

STEP 8

Turn back the flap (1) located on the lower portion of the windshield wiper arm (2).

STEP 9

CD01C162

Open the RH front hood. Connect the earth cable to the battery.

STEP 10

Switch on the windshield wiper motor and check that everything is working correctly.

UNLOADING PHASE 1

1. Attachments (Boom, dipper, bucket).
2. Counterweight.
3. Boom cylinder and small accessories.

Purpose

To unload the attachments (boom, dipper, bucket) and counterweight from the trailer truck.

Warning

1. Pay proper care when placing the counterweight on the ground, for example using square lumber under the counterweight for preventing it from falling down on its side.
2. Do not remain in the lifting area under the lifted load.
3. On the first day, make sure cat walks and handrails are fitted. Boom, dipper, bucket and counterweight are fitted on the 2nd day. When unloading, place each component, attachments and other accessories in the location most suitable for reassembling work, considering the order of assembly.
4. Square lumber must be used under the boom, dipper, etc... when they are placed on the ground.

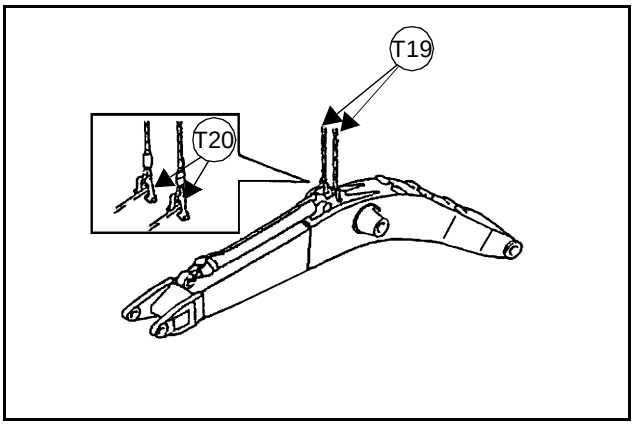
Procedure for unloading

Procedure

1. Check the setting position for Rough terrain cranes.
2. Check the sling position of the wire or the nylon sling.
3. Check there is to damage on the cables, ropes and shackles. Make sure of they are firmly fastened.
4. Take measures to prevent people entering the area under the lifted load.
5. Lift the load slowly.
6. Take precautions such as placing the protective lumber under the load when the load is lowered on the ground.

Attachments

1. Boom + dipper cylinder



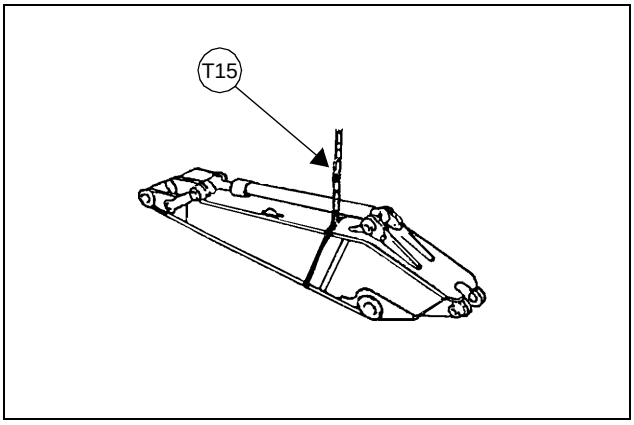
CS01K577

Weight ≃16535 lb.
Tools T19, T20.

- Fasten the dipper cylinder on the boom to prevent any damage being consed by dipper movement.

- Attach a shackle (T20) and cable (T19) to the hole provided at the side of the dipper cylinder foot, and lift the boom + dipper cylinder.

2. Dipper + bucket cylinder



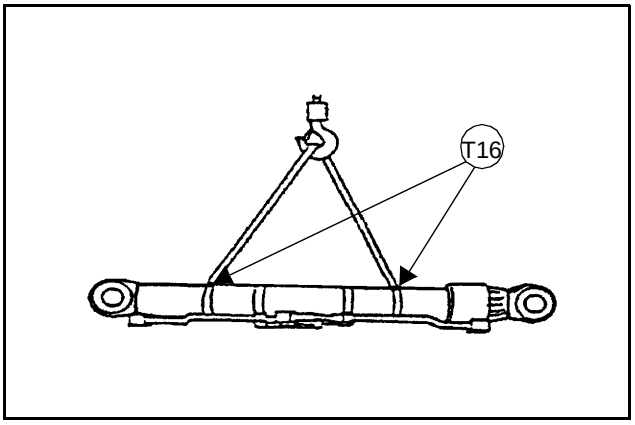
CS01K578

Weight ≃8818 lb.
Tool T15.

- Attach the nylon sling (T15) to the center portion of the dipper and lift it.

BOOM CYLINDER MOUNTING PROCEDURE

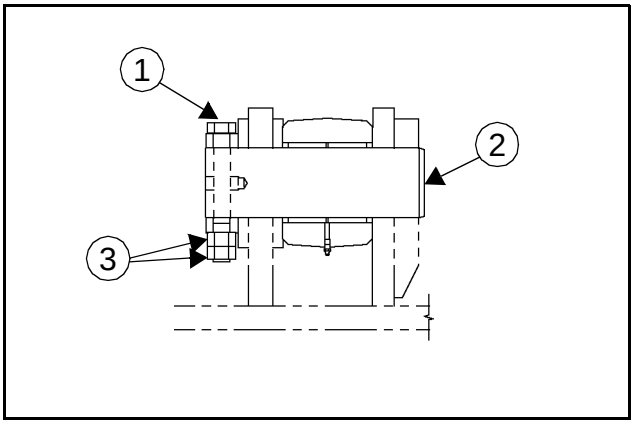
1. Apply grease on the boom cylinder botton pin.



CS01K581

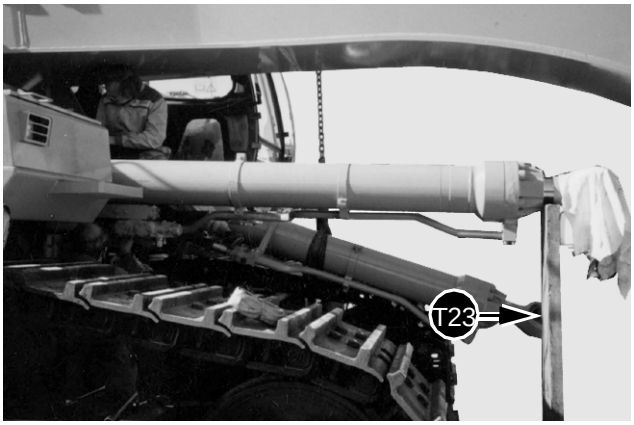
Tool T16 x 2.

2. Raise the left side boom cylinder with the nylon sling (T16) and the crane.
3. Align the boss hole of the swing frame with the boom cylinder.
4. Install the boom cylinder botton pin.



CS01K514

5. Insert the detent screw (1) in the pin (2) and fix it with the double nuts (3).



CD01K018

6. Install the stool (T23) and put the top side of the boom cylinder on the stool (1).
7. Mount the right side boom cylinder in the same manner as above.
8. Install the stool (T23) and install the top side of the right boom cylinder.