688C Excavator

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* Schematic Set Sections

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Hydraulic System

Low Pressure Pump
Comprises one body with a fixed flow for the servo-steering hydraulic circuits,

Maximum flow at 2000 rpm:	24 l/min	6.3 US gpm
Operating pressure	28 Bar	406 psi

Flow Setting Times

Boom Up	3.3 to 3.5seconds
Dipper In	4.7 to 4.9 seconds
Bucket In	3.3 to 3.5 seconds

Flow Setting Valve Rates (cylinder large chamber):

Boom raising	148 to 155 l/min	36.7 to 38.4 US gpm
Boom lowering	28 to 45 l/min	6.9 to 11.1 US gpm
Bucket opening	75 to 100 l/min	18.6 to 24.8 US gpm
Bucket closing	95 to 105 l/min	23.5 to 26 US gpm
Dipper extension	110 to 125 l/min	27.2 to 31 US gpm
Dipper retraction	122 to 130 l/min	30.2 to 32.2 US gpm
Right-hand travel in forward drive	88 to 95 l/min	23.2 to 25 US gpm
Left-hand travel in forward drive	88 to 95 l/min	23.2 to 25 US gpm
Right and left-hand travel in forward drive	176 to 190 l/min	46.5 to 50.1 US gpm
Offset backhoe	25 to 35 l/min	6.6 to 9.2 US gpm

Hydraulic Oil Test Temperature	50°C	120°F

Pressure Settings

Attachment Flow Cut-off Valve (LS1)	360 to 370 Bar	5221 to 5366 psi
Attachment Valve Bank Main Relief Valve	435 to 445 Bar	6309 to 6454 psi
Regulator		
Torque Regulator Valve, 97 l/min (25.6 US gpm) engine speed 2020 rpm at a pressure of	275 Bar	3988 psi
Load Sensing Valve (LS)	18 to 20 bar	261 to 290 psi
Travel Flow Cut-off Valve (LS2)	405 to 415 Bar	5874 to 6019 psi

Circuit Relief Valves:

Boom : raising	380 to 405 Bar	5511 to 5874 psi
Boom : lowering	400 to 435 Bar	5801 to 6309 psi
Bucket : opening, closing	380 to 405 Bar	5511 to 5874 psi
Dipper : extension, retracting	380 to 405 Bar	5511 to 5874 psi
Swing : right, left	320 to 330 Bar	4641 to 4786 psi
Travel : forward drive, reverse drive	420 to 435 Bar	6091 to 6309 psi
Boom and Dipper Anti-Drift Valve	390 to 410 Bar	5656 to 5946 psi
Boom and Dipper Safety Valve	390 to 410 Bar	5656 to 5946 psi
Low Flow (Clamshell Swing)	130 to 150 Bar	1885 to 2175 psi
Offset boom	180 to 200 Bar	2610 to 2900 psi

Intake Valves

Tappet Clearance (Cold)	0.254 mm
Face Angle	29 Degrees
Face Run-Out	0.038 mm
Valve Head Edge Thickness, Minimum	1.50 mm
Length	128.84 to 129.46 mm
OD of Stem	7.960 to 7.980 mm
Minimum Service Limit	7.940 mm
OD of Head	44.870 to 45.130 mm
Seat Angle	30 Degrees
Seat Contact Width	1.32 to 1.92 mm
Seat Run-Out	0.10 mm
Insert Height	6.84 to 6.96 mm
OD of Insert	47.063 to 47.089 mm
ID of Insert	Tapered
Valve Recession Below Head Surface	0.99 to 1.52 mm
Maximum Service Limit	1.52 mm
ID of Valve Guide Bore	8.019 to 8.039 mm
Maximum Service Limit	8.089 mm

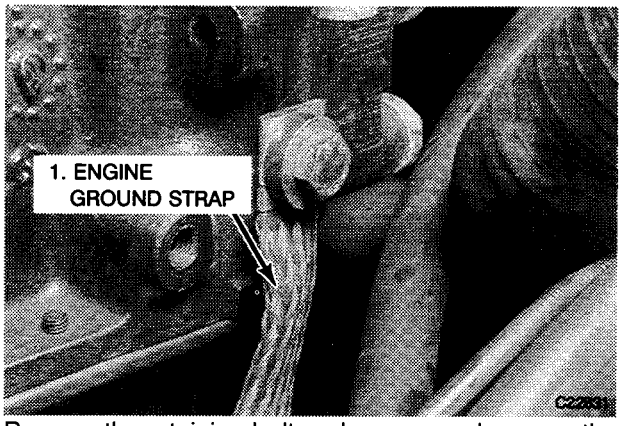
Exhaust Valves

Tappet Clearance (Cold)	0.508 mm
Face Angle	44 Degrees
Face Run-Out	0.038 mm
Valve Head Edge Thickness, Minimum	1.50 mm
OD of Head	41.870 to 42.130 mm
OD of Stem	7.960 to 7.980 mm
Minimum Service Limit	7.940 mm
Length	128.74 to 129.36 mm
Insert Seat Angle	45 Degrees
Seat Contact Width	1.47 to 2.07 mm
Seat Run-Out	0.10 mm
Insert Height	6.65 to 6.77 mm
OD of Insert	43.713 to 43.739 mm
ID of Insert	Tapered
Valve Recession Below Head Surface	0.99 to 1.52 mm
Maximum Service Limit	1.52 mm
ID of Valve Guide Bore	8.019 to 8.039 mm
Maximum Service Limit	8.089 mm

Valve Springs

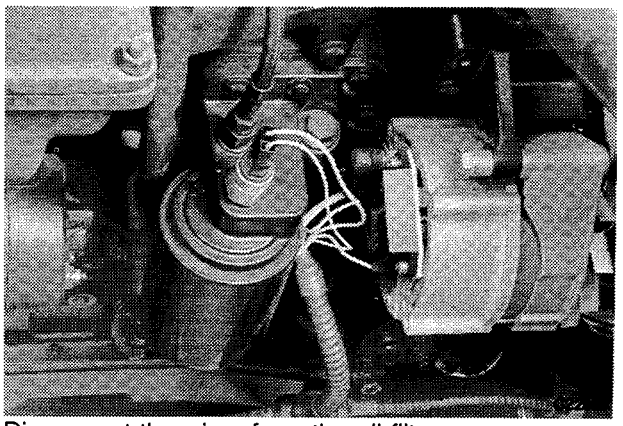
Free Length	55.63 mm
Total Coils	7.25
Wire Diameter	4.830 to 4.930 mm
Compressed to 38.53 mm	(Valve Open) 785 to 839 N
Maximum Service Limit	765 N
Compressed to 49.25 mm	(Valve Closed) 285 to 321 N
Minimum Service Limit	270 N

STEP 12



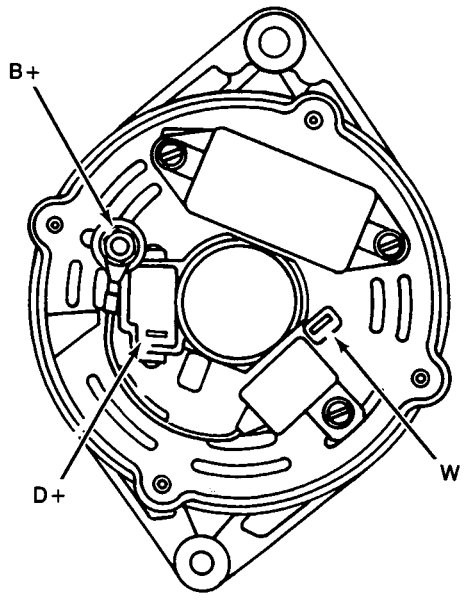
Remove the retaining bolt and spacer and remove the engine ground strap.

STEP 13



Disconnect the wires from the oil filter.

STEP 14



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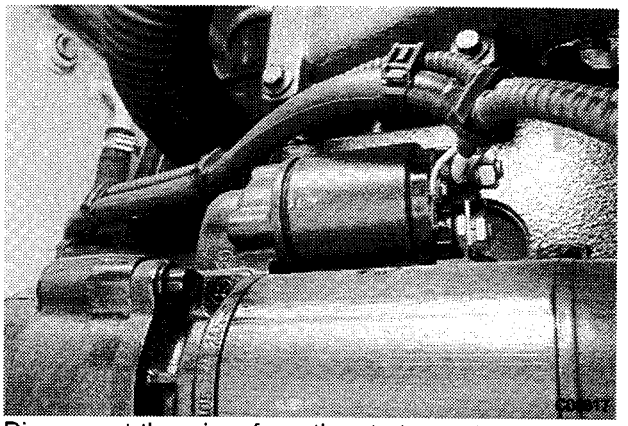
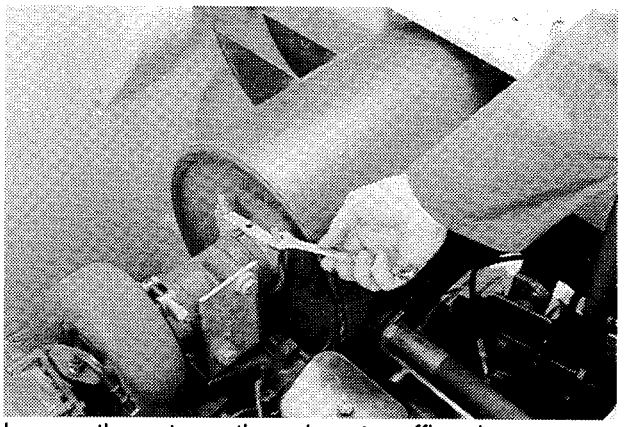
Disconnect the wires from the alternator.

STEP 15



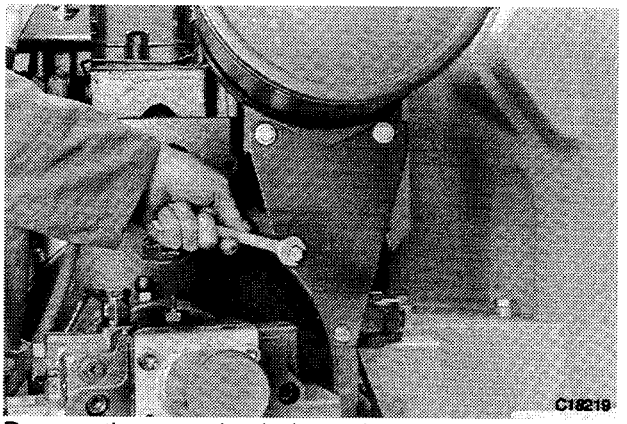
Disconnect the wires from the starter motor.

STEP 16



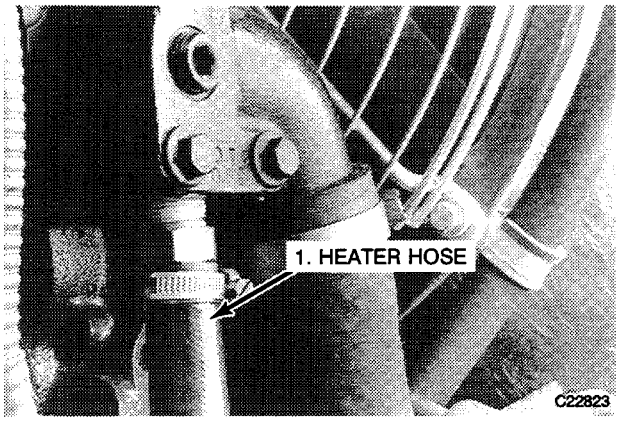
Loosen the nuts on the exhaust muffler clamp.

STEP 17



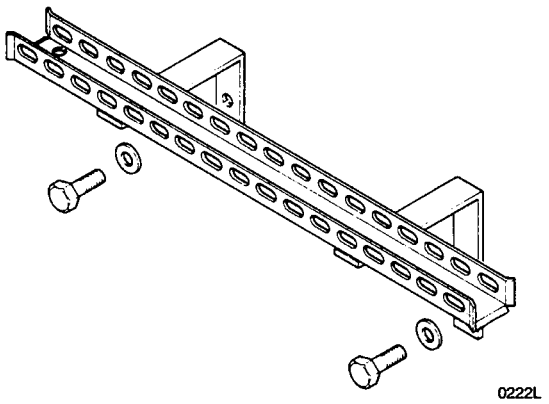
Remove the mounting bolts and spacers. Remove the exhaust muffler and bracket.

STEP 68



Install the heater hose and tighten the clamp.

STEP 69

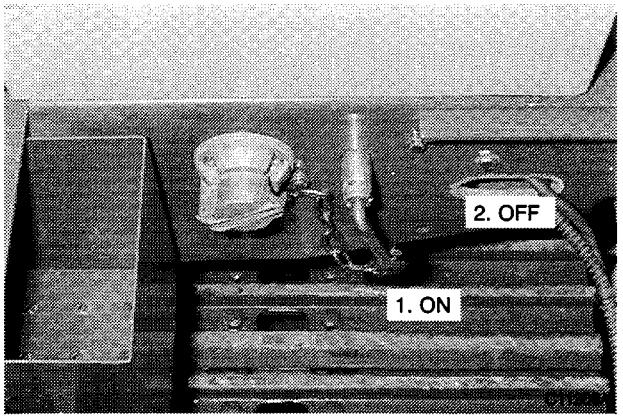


Install the wiring harness carrier and install and tighten the mounting bolts and spacers.

STEP 70

Fill the radiator with specified engine coolant. Install and tighten the radiator cap. Fill the coolant recovery reservoir with specified engine coolant up to the upper mark. Install and tighten the cap. Fill the engine with specified engine oil up to the FULL mark on the engine oil dipstick.

STEP 71



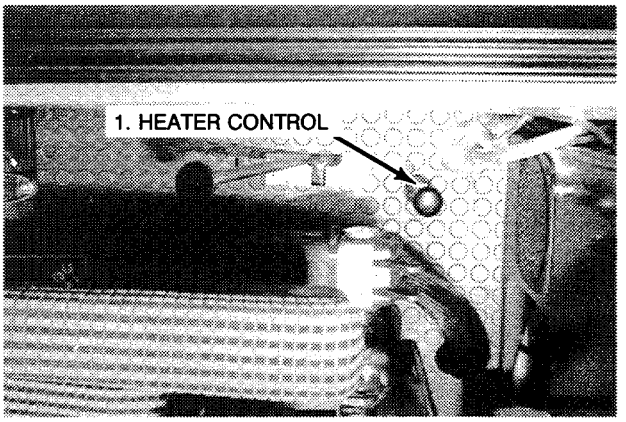
Install the key and turn the master disconnect switch to the ON position.

STEP 72

Remove air from the fuel system. Refer to Section 3410.

WARNING: *Never operate the engine in a closed building. Proper ventilation is required under all circumstances.*

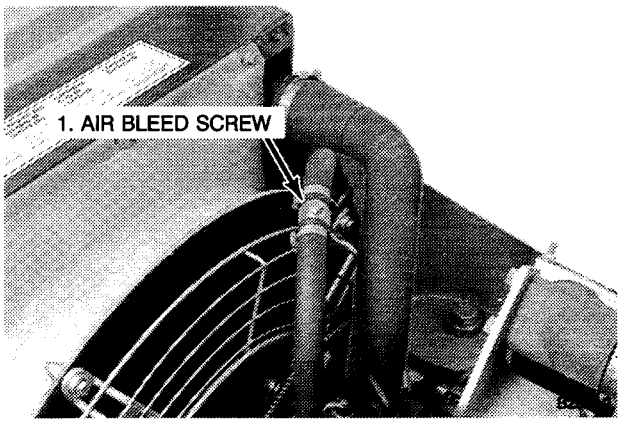
STEP 73



Push down the heater control in the cab to allow circulation of engine coolant and to allow trapped air to collect at the air bleed screw. Start and run the engine for five minutes. Stop the engine.

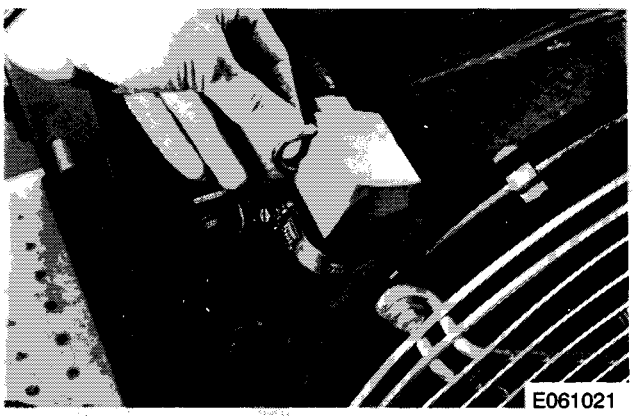
WARNING: *Hot engine coolant will spray out of air bleed screw. To avoid injury, care must be taken when removing air from the cooling system.*

STEP 74



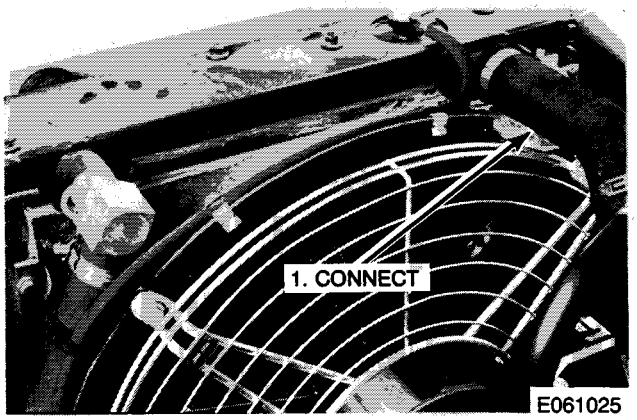
Open the air bleed screw. When there is a flow of engine coolant without air bubbles, tighten the air bleed screw.

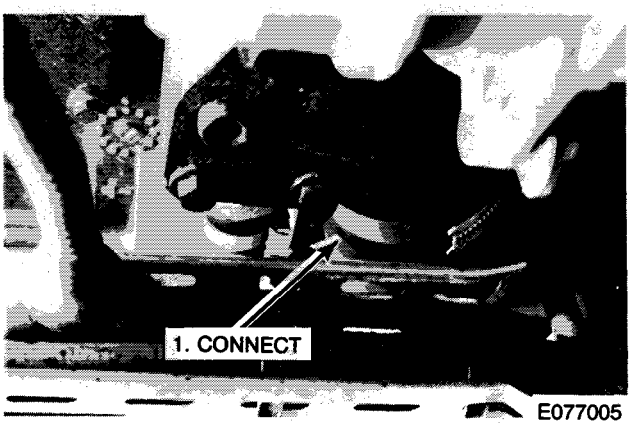
STEP 24



Connect the oil cooler feed hose and block to the oil cooler and install the clip.

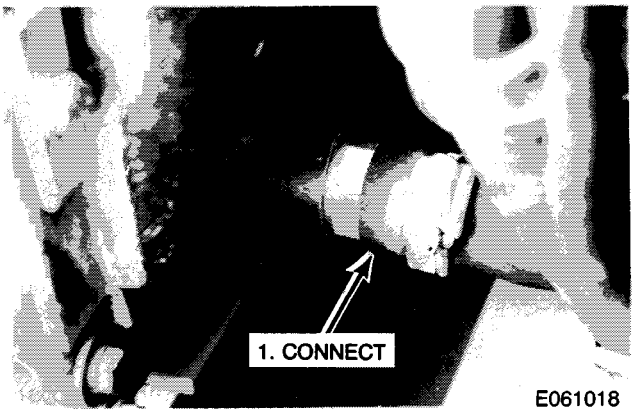
STEP 25





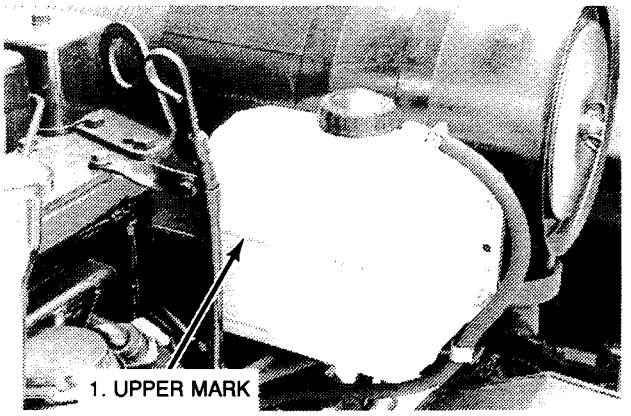
Connect the bottom and top radiator hoses and tighten the clamps.

STEP 26



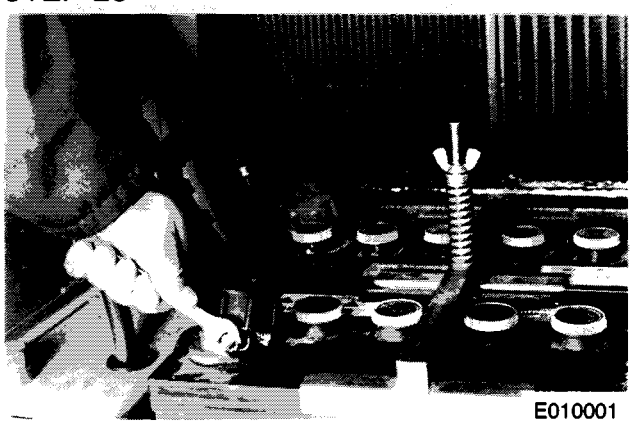
Connect the lower oil cooler hose and tighten the clamp.

STEP 27



Fill the radiator with the specified engine coolant. Install the radiator cap. Fill the coolant recovery bottle to the upper mark.

STEP 28



Install the battery securing bolts and nuts. Install the batteries and install and tighten the battery securing clamps.
Connecting the negative (−) cable last, connect the battery cables.
Install the battery cover.

Connecting Rod

Bushing	Steel Backed Leaded Bronze
Bushing ID Installed (Ream to Size)	40.053 to 40.067 mm
Maximum Service Limit	40.092 mm
Bearing Liners	Replaceable
Journal ID Without Bearing Liners	72.987 to 73.013 mm
Bearing Oil Clearance	0.038 to 0.116 mm
Maximum Service Limit	0.129 mm
Side Clearance	0.100 to 0.300 mm
Maximum Service Limit	0.330 mm
Connecting Rod Bend (Maximum)	
Without Bushing	0.200 mm
With Bushing	0.150 mm
Connecting Rod Twist (Maximum)	
Without Bushing	0.500 mm
With Bushing	0.300 mm
Connecting Rod Bolt Maximum	59.25

SPECIFICATIONS

Number of Batteries Required	2
Voltage of Each Battery	12 volts
Reserve Capacity	160 minutes
Cold Cranking Capacity at -17°C (0°F)	800 amps
Load for Capacity (Load) Test	400 amps

MAINTENANCE

Electrolyte Level

If the battery is a maintenance free battery, check the level of the electrolyte every 1000 hours of operation or six months, whichever occurs first. For all other batteries, check the level of the electrolyte every 250 hours of operation.

NOTE: *A maintenance free battery will have words Maintenance Free on the decal on the top of the battery. If the center part of the decal has been removed for access to the battery caps, it is possible that the words Maintenance Free have been removed from the decal.*

Check the level of the electrolyte more often during hot weather. The use of a large amount of water by the battery can be caused by high battery temperature or a voltage regulator setting that is too high. Keep the electrolyte level above the top of the plates in the battery at all times to prevent damage to the battery.

NOTE: *On maintenance free batteries it is necessary to remove the center part of the decal for access to the battery caps. Do not discard the center part of the decal. Install the center part of decal after the battery caps have been installed.*

If the level of the electrolyte is low, add distilled water or other clean water until the electrolyte is just below the cell opening. Do not add more water than is needed. Too much water can cause bad performance, a short service life, and corrosion around the battery.

NOTE: *Add water only. DO NOT add electrolyte.*

Inspecting and Cleaning a Battery

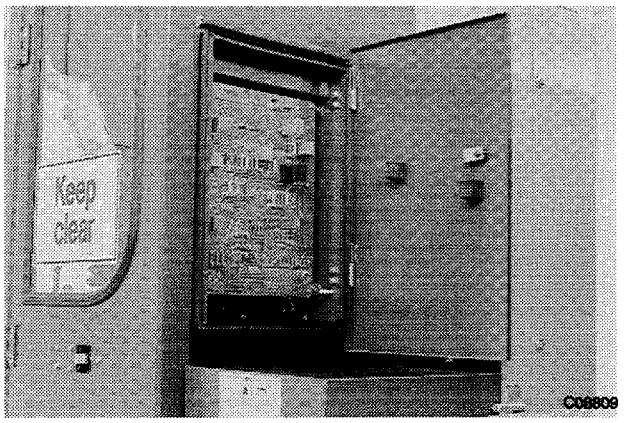
If damage causes an electrolyte leak, replace the battery.

Inspect the battery at regular intervals for dirt, corrosion, and damage. Electrolyte and dirt on the top of the battery can cause the battery to discharge by making a passage for the current to flow.

If the battery must be cleaned, remove the battery from the battery carrier and clean the battery, cable terminals, and the battery carrier. When available, use Case Battery Saver and cleaner according to the instructions on the container. Case Battery Saver and Cleaner also helps prevent corrosion. If Case Battery Saver and Cleaner is not available, use baking soda and water as a cleaner. DO NOT permit any type of cleaner to enter the cells of the battery.

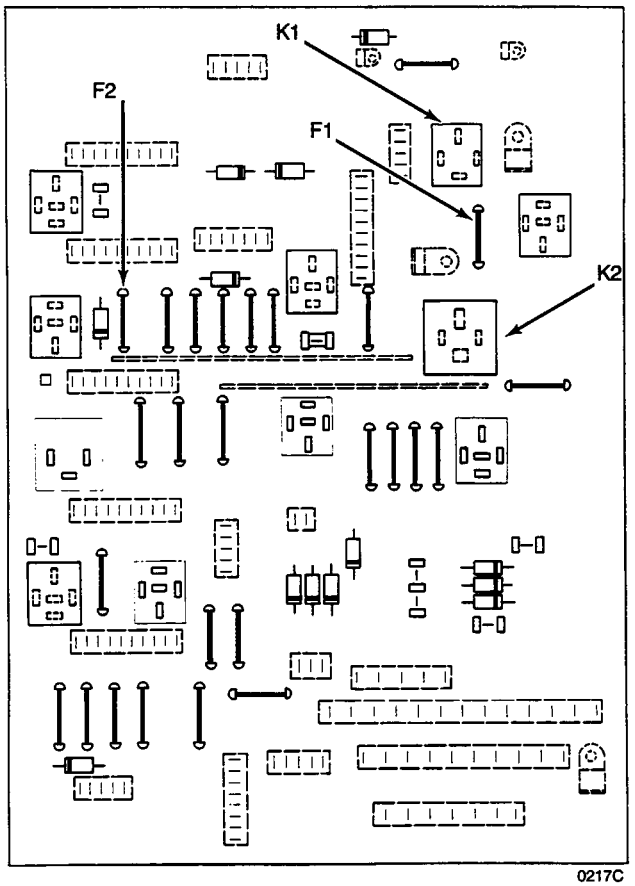
Install the battery in the machine and make sure the fasteners are tight. Apply Case Battery Saver and Cleaner or Urethane Seal Coat to the cable terminals to prevent corrosion. See the Parts Counter Catalog. DO NOT apply grease.

STEP 7



Open the cover for the main circuit board, located at the rear of the cab.

STEP 8



Check the condition of fuse F1 and fuse F2. Check for loose or corroded connections at relay K1 and relay K2.

STEP 9

Check for damaged insulation or broken wires in the starting system circuit. Repair or replace any damaged or broken wires. Refer to the electrical schematic in Section 4001.

STEP 10

If the starter motor still does not operate.correctly, do the Starter and Starter Solenoid Test on page 6.

Inspection

Use a clean, dry cloth to clean the drive clutch, the armature, the field frame, and the starter solenoid. Use cleaning solvent to clean the remainder of the parts.

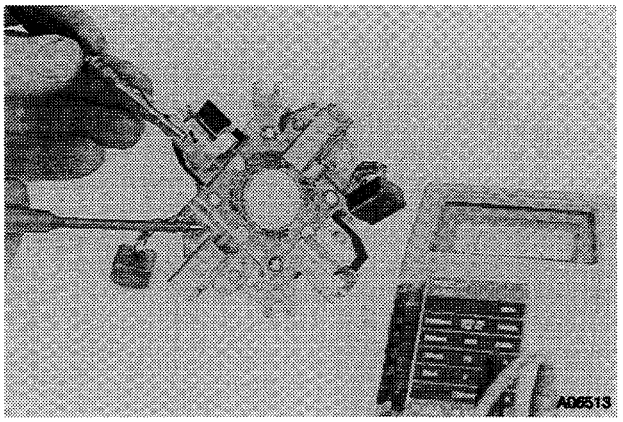
Brushes

STEP 51

Measure the length of the brushes connected to the brush holder. If the length of any brush is less than 8.5 mm (5/16 inch), both of the brushes must be replaced. Measure the length of the brushes connected to the field coil. If the length of any brush is less than 8.5 mm (5/16 inch), both of the brushes must be replaced.

Brush Holder

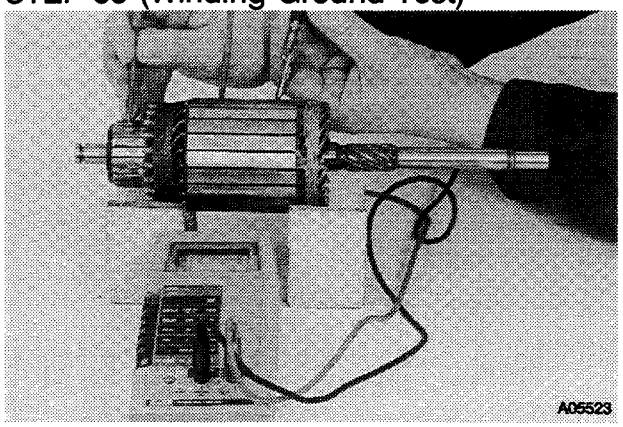
STEP 52



Connect one probe of the multimeter to the brush holder frame and the other probe to each insulated brush holder in turn. There must be no continuity. Replace the assembly if there is continuity.

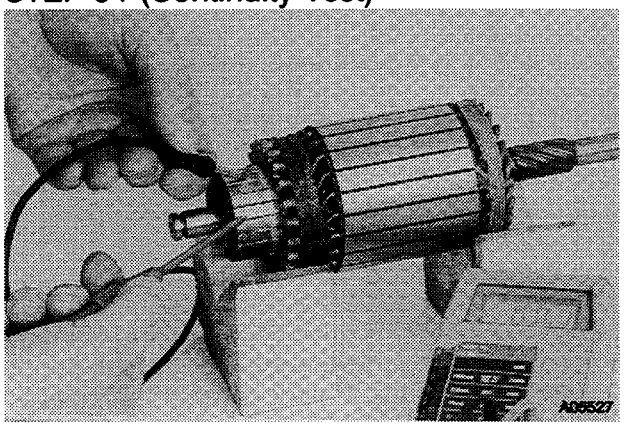
Armature

STEP 53 (Winding Ground Test)



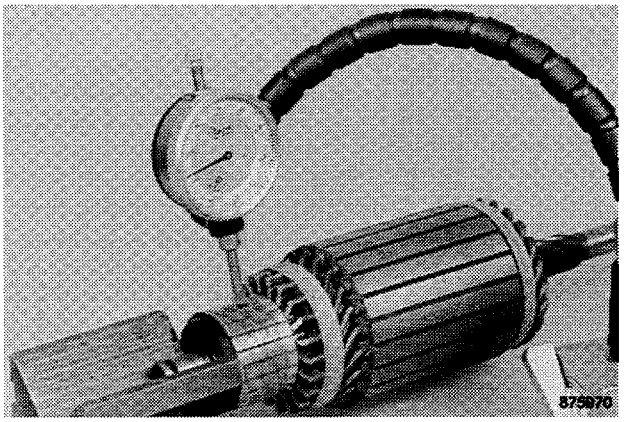
Place one probe of the multimeter to a commutator segment and the other probe to the armature core. There must be no continuity. If there is continuity, the armature has a ground and must be replaced.

STEP 54 (Continuity Test)



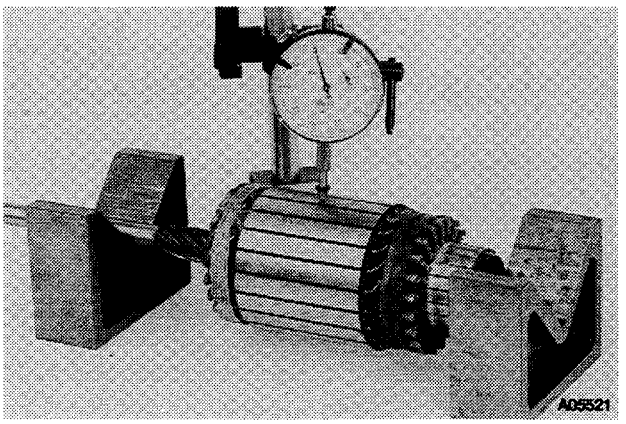
Place the probes of the multimeter to two segments of the commutator. If there is no continuity, the winding has an open circuit and the armature must be replaced.

STEP 55



Put the armature on vee-blocks as shown and check the run out of the armature with a dial indicator. The runout must not be more than 0.03 mm (0.001 inch). If necessary, put the armature in a lathe and remove enough material to make the run out less than 0.03 mm (0.001 inch).

STEP 56

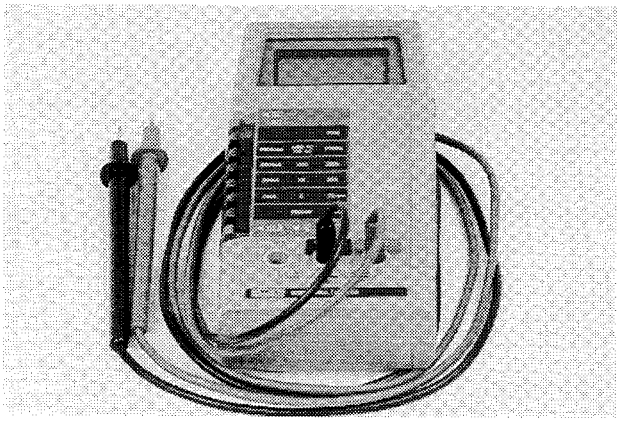


Place the armature on vee-blocks and check for distortion. If the armature is distorted it must be replaced.

SPECIAL TORQUES

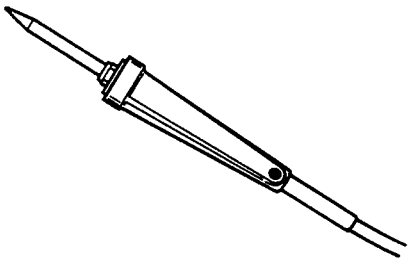
Alternator Mounting Bolts	24 Nm	18 lb ft
Pulley Retaining Nut	68 Nm	50 lb ft

SPECIAL TOOLS

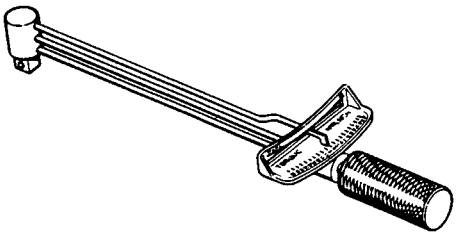


1. Multimeter
CASE Part Number CAS-1559

2. Sun Electric VAT-33 Tester



3. 1000 Watt Soldering Iron

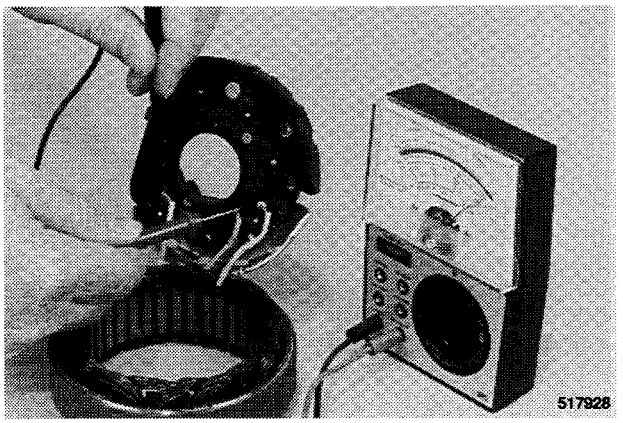


4. Torque Wrench (Nm or lb ft)

Inspection

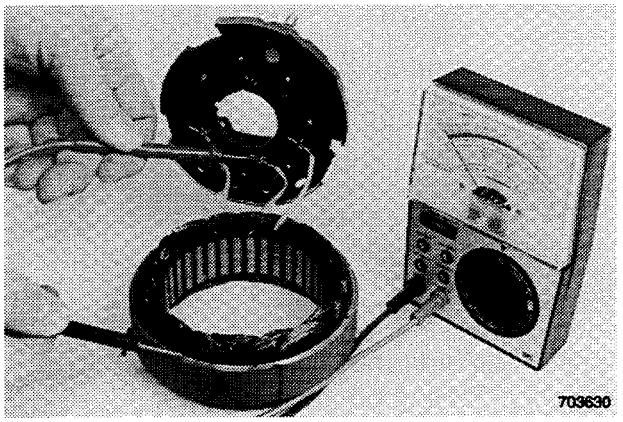
NOTE: *Use a multimeter set to read ohms for the inspection.*

STEP 21



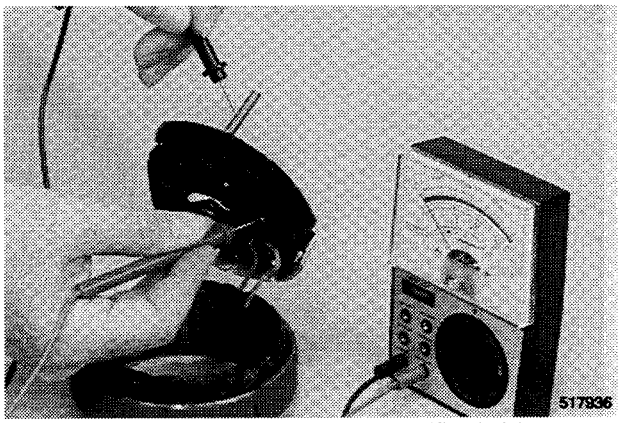
Check the stator resistance. The resistance in each coil must be 0.22 ohms. If the resistance in a coil is not 0.22 ohms, refer to STEP 25 and install a new stator.

STEP 22



Check the stator for a short circuit. Make sure the recitifer bridge does not touch the stator. Connect one lead of the multimeter to the housing of the stator. Connect the other lead of the multimeter to each of the three leads from the stator. If the pointer of the multimeter moved, there is a short circuit in the stator. Refer to STEP 25 and install a new stator.

STEP 23



Check the positive diodes in the rectifier bridge.

a. Connect the negative lead of the multimeter to the output (B+) terminal. Connect the positive lead of the multimeter to one of the leads for the positive diodes. The positive diodes are the three diodes that are closest to the output (B+) terminal. Read the multimeter.

b. Reverse the multimeter leads. Read the multimeter.

c. There must be a high reading and a low reading. If the readings are the same, replace the rectifier bridge.

d. Repeat this step for the other two positive diodes.

Section

5002

TRACKS, ROLLERS AND IDLERS

5002

For 688 Crawler Excavators

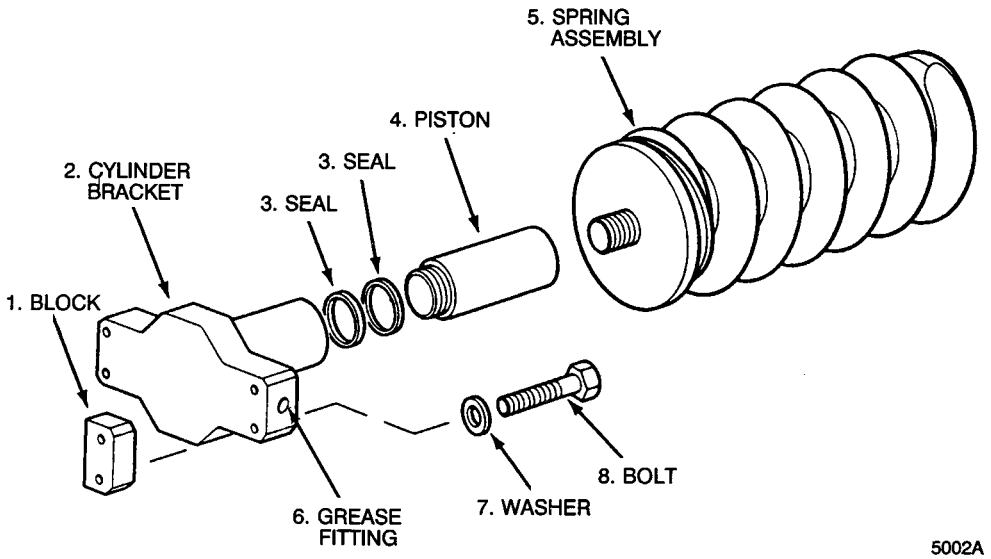
J I Case

Don 7-32130

Printed in England
January 1990

SPRING

Disassembly and Assembly



Section

5502

TRACK TROUBLESHOOTING

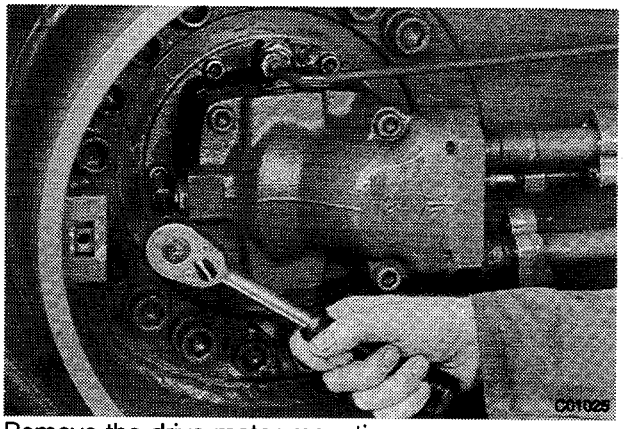
5502

J I Case

Don 7-33730

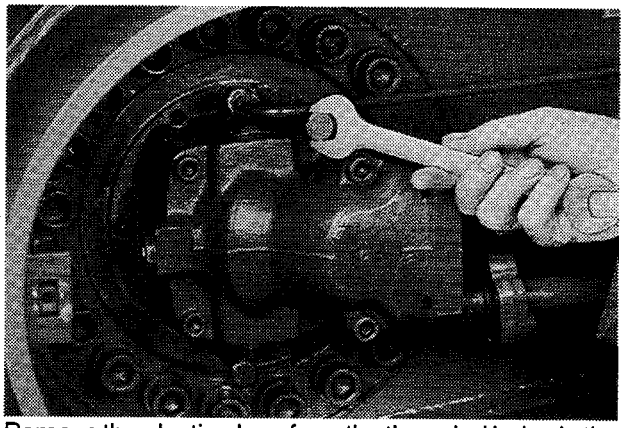
Printed in England
May 1990

STEP 7



Remove the drive motor mounting screws.

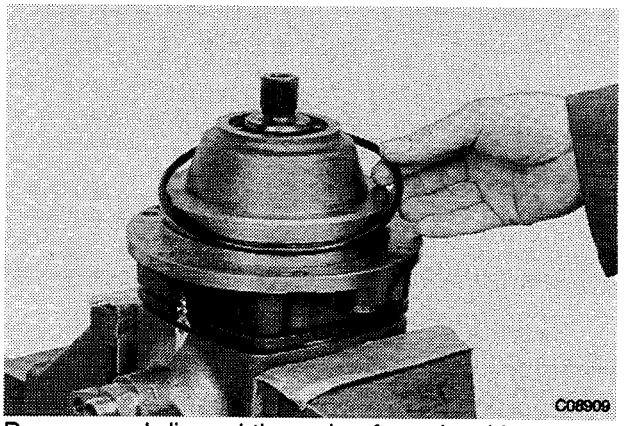
STEP 8



Remove the plastic plugs from the threaded holes in the drive motor. Install two M12(1.75) x 50 mm bolts into the threaded holes to remove the drive motor. Remove the two M12(1.75) x 50 mm bolts.

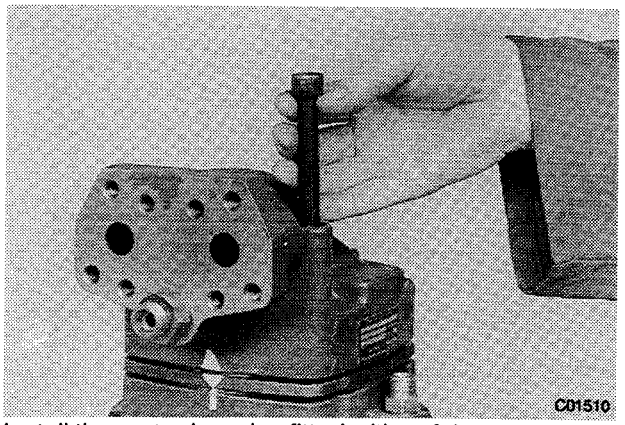
Disassembly

STEP 9



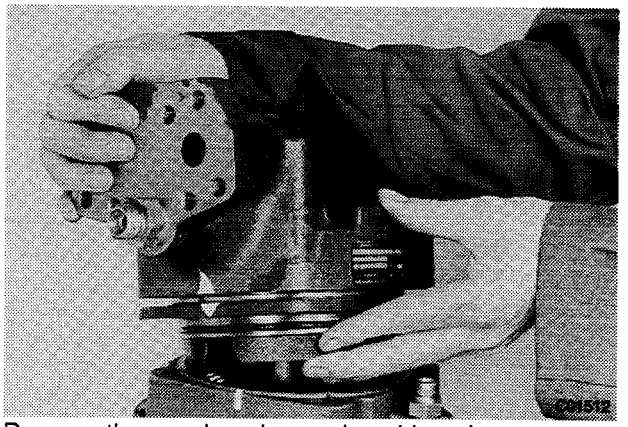
Remove and discard the o-ring from the drive motor.

STEP 10



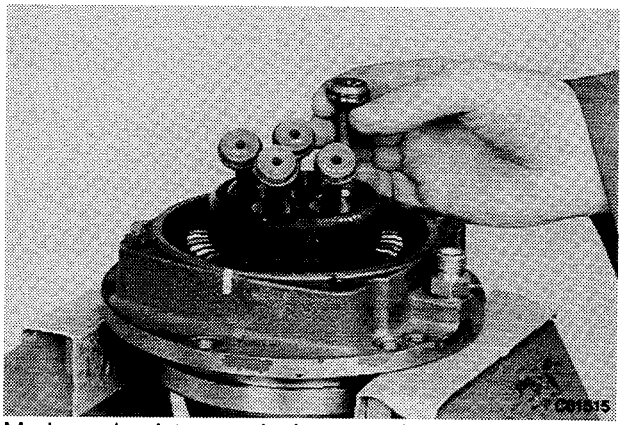
Install the motor in a vise fitted with soft jaw plates. Put marks on the front, rear and seal housings. Remove the screws from the drive motor.

STEP 11



Remove the rear housing and seal housing.

STEP 12



Mark each piston and piston socket to indicate the location of each piston. Remove each piston.

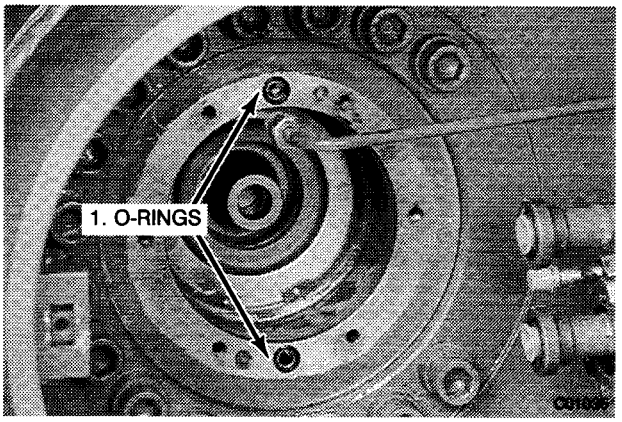
BRAKE

Disassembly

STEP 1

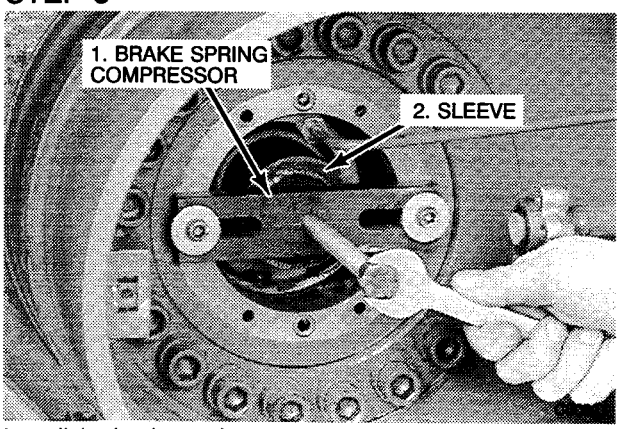
Remove the drive motor. Refer to Drive Motor Removal, Page 4, STEPS 1 to 8.

STEP 2



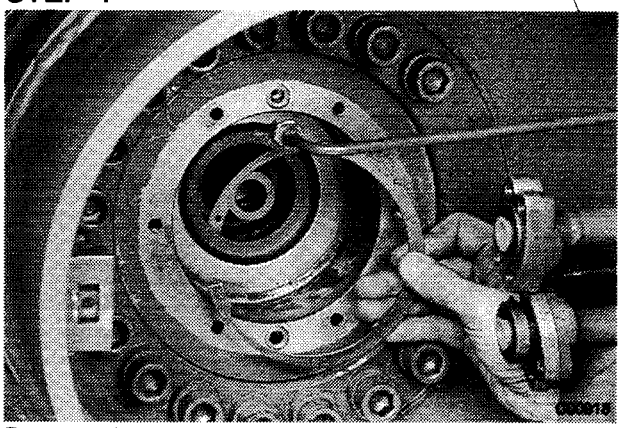
Remove and discard the o-rings from the brake housing.

STEP 3



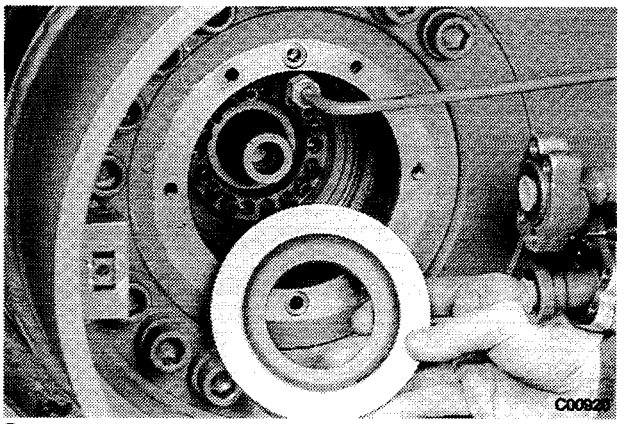
Install the brake spring compressor (refer to Tools to be made Locally, Page 3), use a sleeve between the brake spring compressor and the brake cover, tighten until the snap ring can be removed. Remove the brake spring compressor and sleeve.

STEP 4



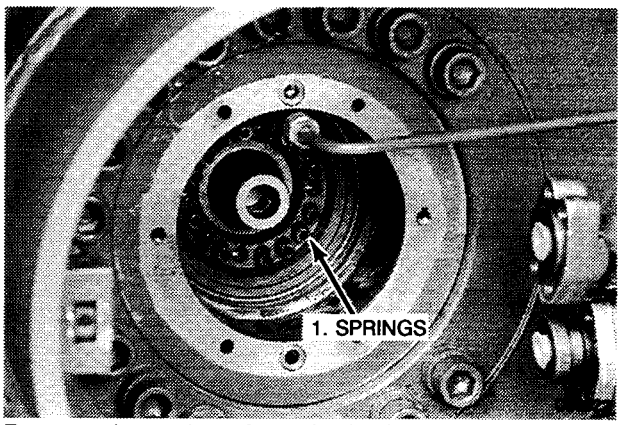
Remove the snap ring.

STEP 5



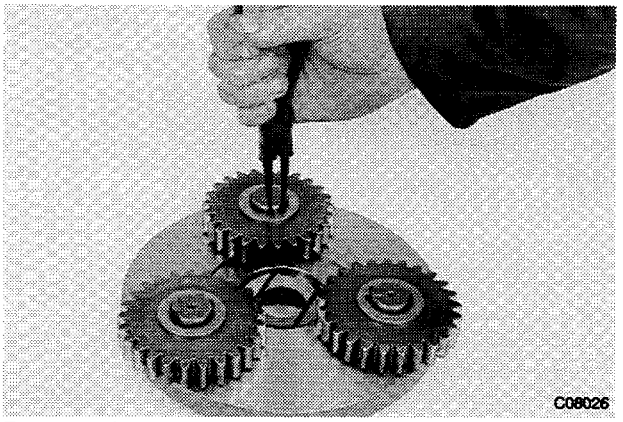
Remove the brake cap.

STEP 6



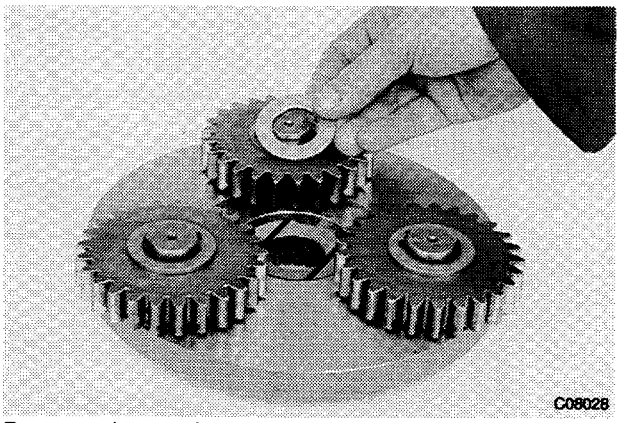
Remove the springs from the brake piston.

STEP 30



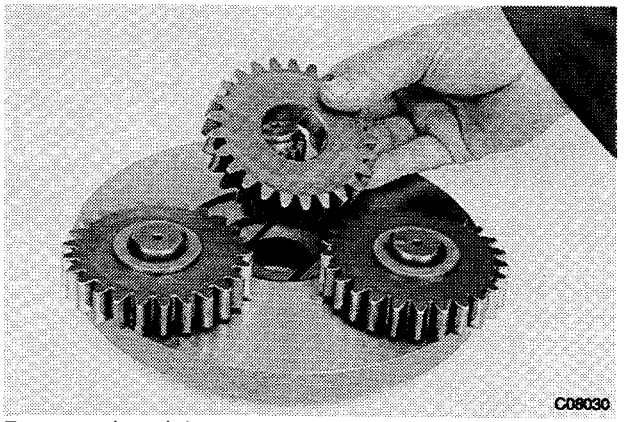
Remove the snap ring.

STEP 31



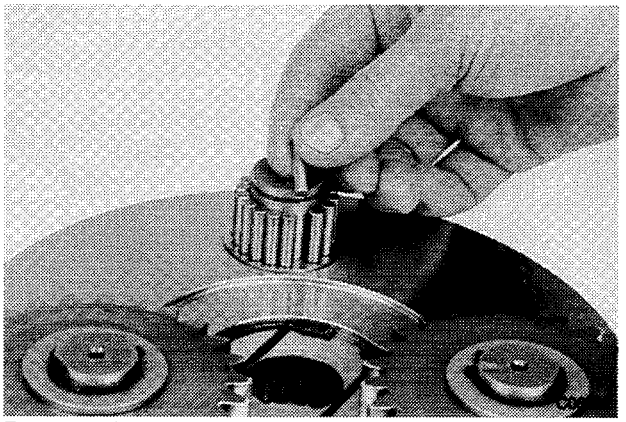
Remove the washer.

STEP 32



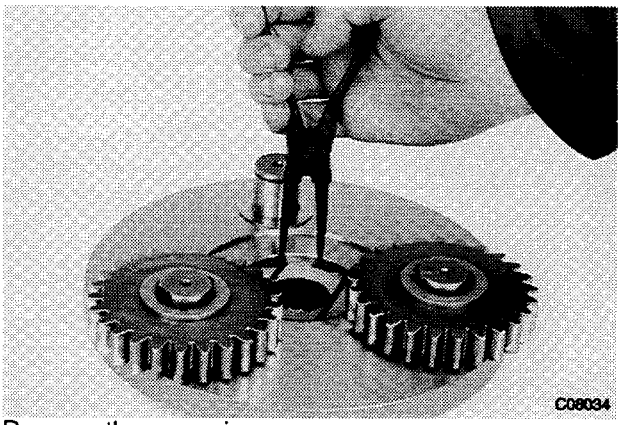
Remove the pinion gear.

STEP 33



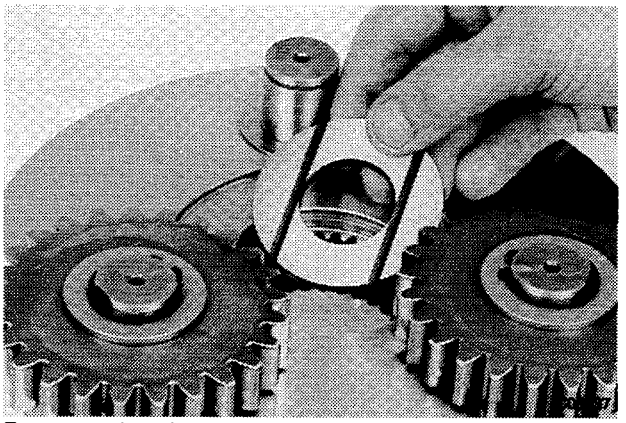
Remove the bearings.

STEP 34



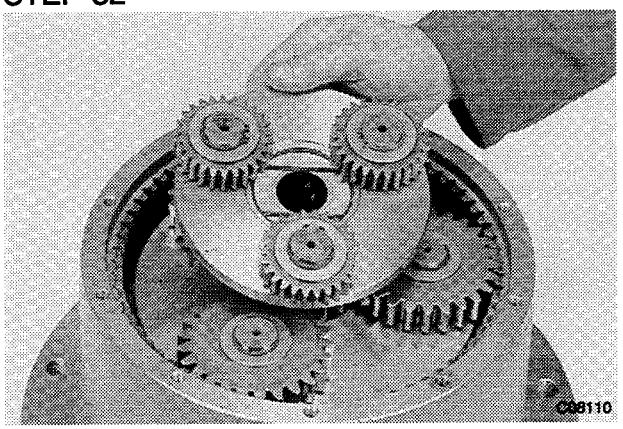
Remove the snap ring.

STEP 35



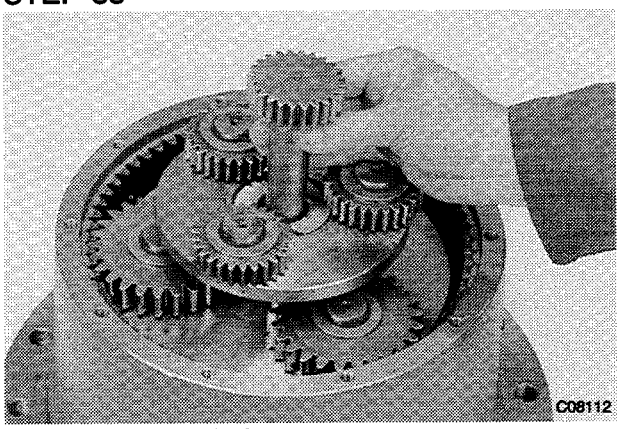
Remove the thrust washer from the second stage carrier.

STEP 82



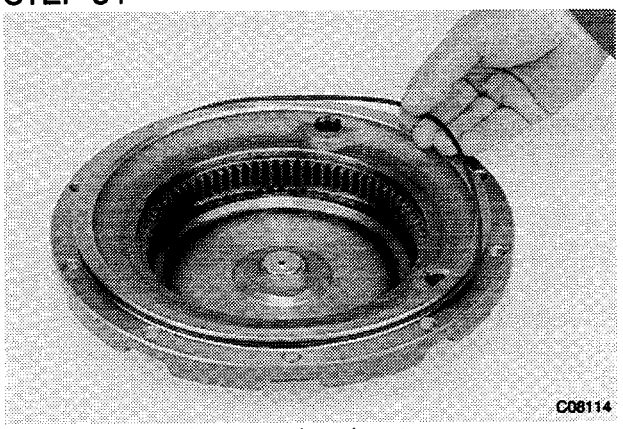
Install the first stage carrier.

STEP 83



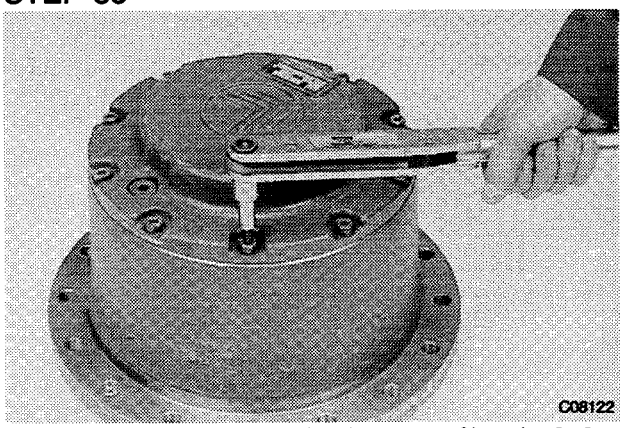
Install the pinion shaft.

STEP 84



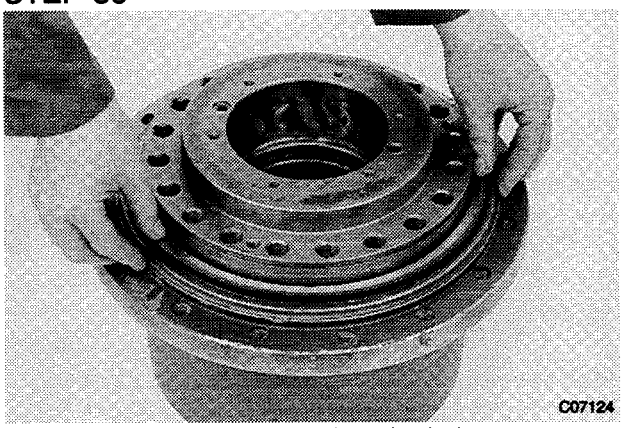
Install a new o-ring onto the planetary cover.

STEP 85



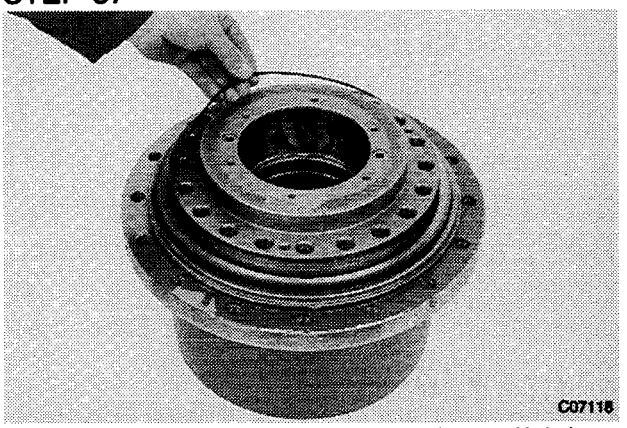
Install the planetary cover. Apply a coat of Loctite 242 to the retaining screws and tighten to a torque of 85 Nm (65 lb ft).

STEP 86



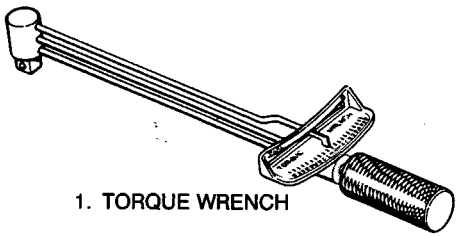
Install a new seal assembly into the hub.

STEP 87

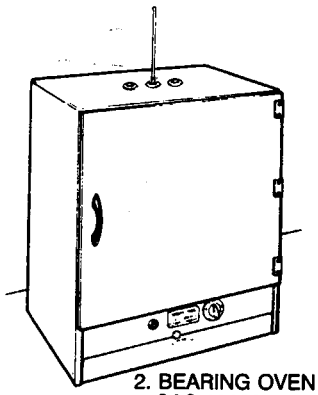


Install a new o-ring onto the brake housing and lubricate with petroleum jelly.

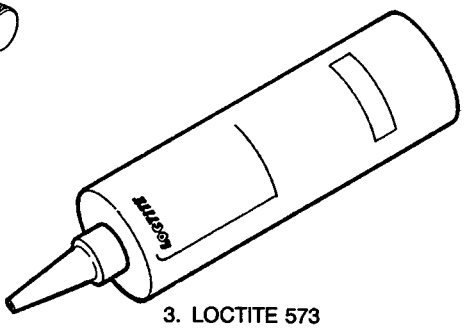
SPECIAL TOOLS



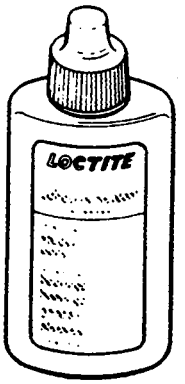
1. TORQUE WRENCH



2. BEARING OVEN
CAS-10133



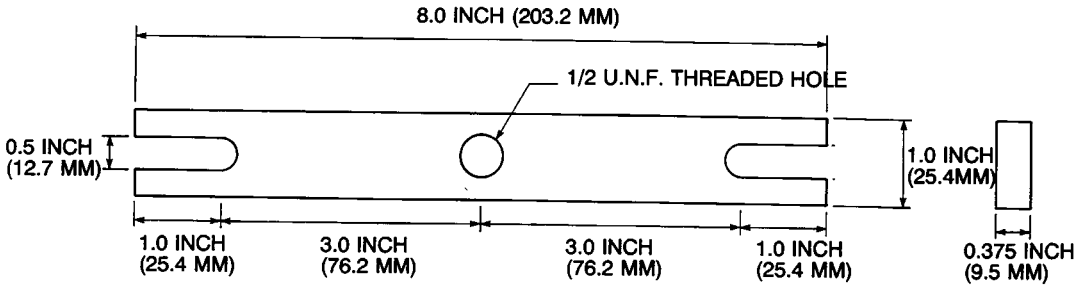
3. LOCTITE 573
CASE PART NO K965910

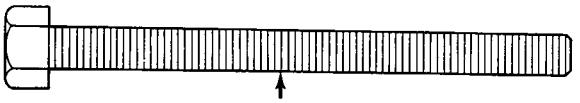


4. LOCTITE 242
CASE PART NO B17422

Tool To Be Made Locally

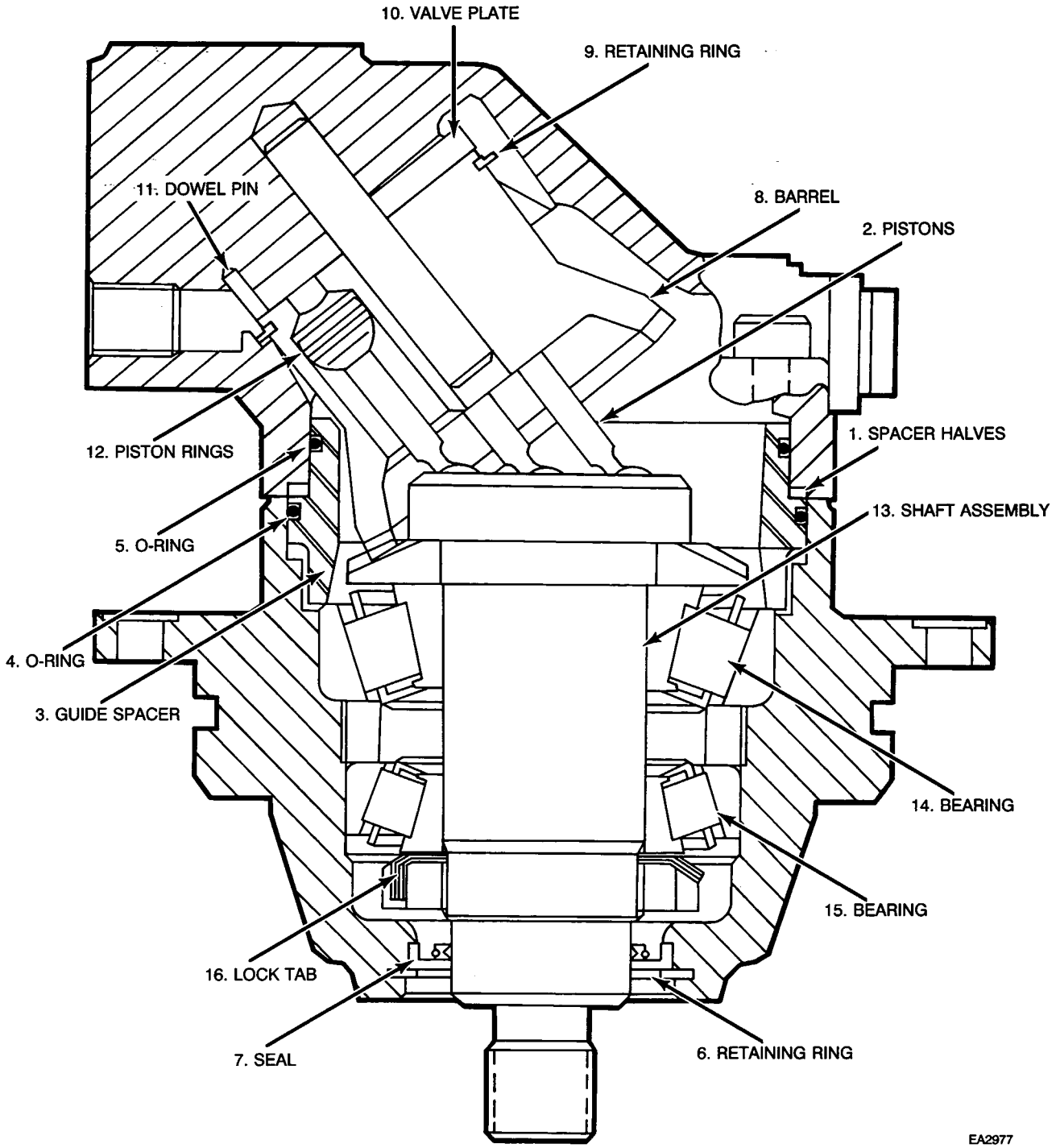
1. BRAKE SPRING COMPRESSOR



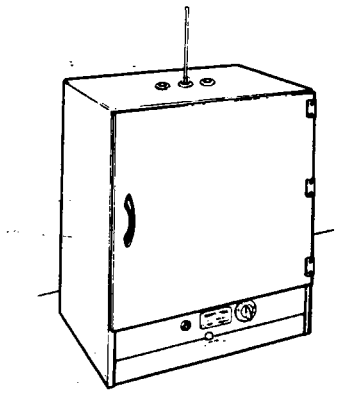


1/2 X 6 INCH U.N.F. BOLT

Swing Motor Cross Sectional Drawing

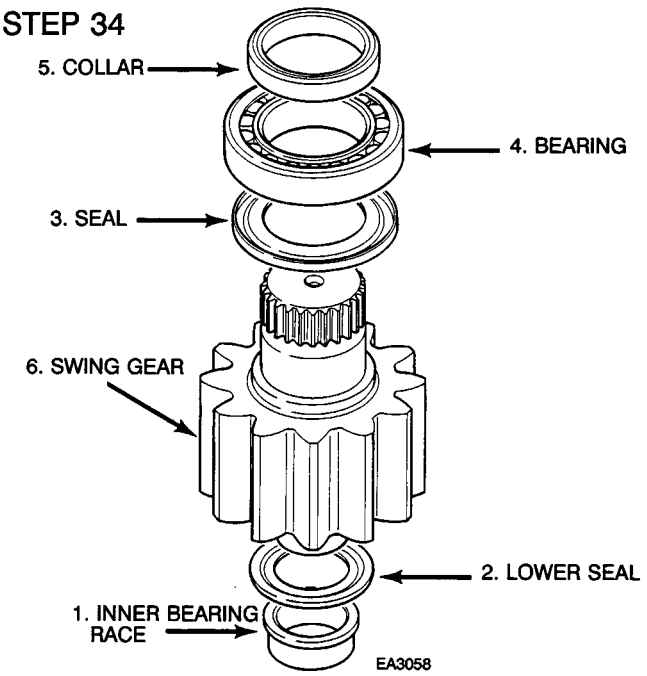


STEP 33



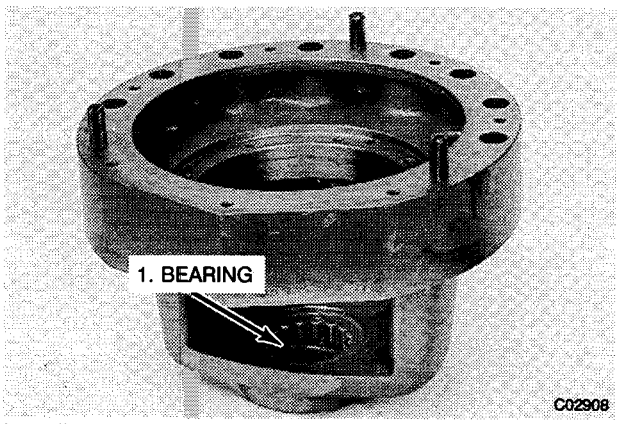
Put the bearing and inner bearing race in a bearing oven CAS-10133 (Refer to Page 3 Special Tools) and heat to a temperature of 80°C (176°F)

STEP 34



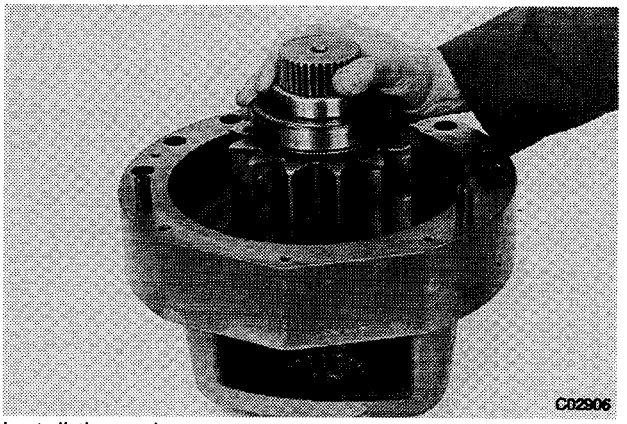
Install new seals. Wear heat protective gloves and put the bearing and inner bearing race onto the swing gear shaft and install the collar.

STEP 35



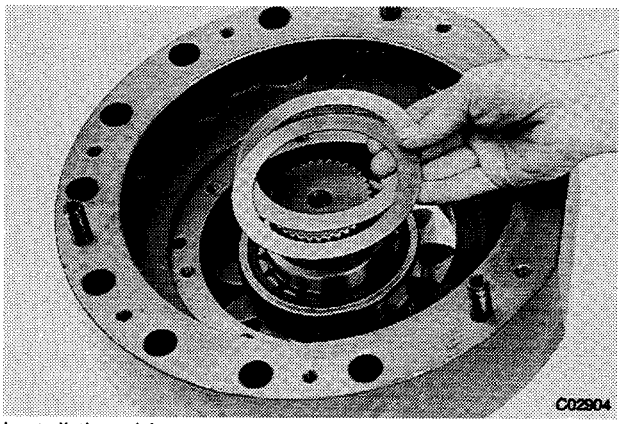
Install a new swing gear housing bearing.

STEP 36



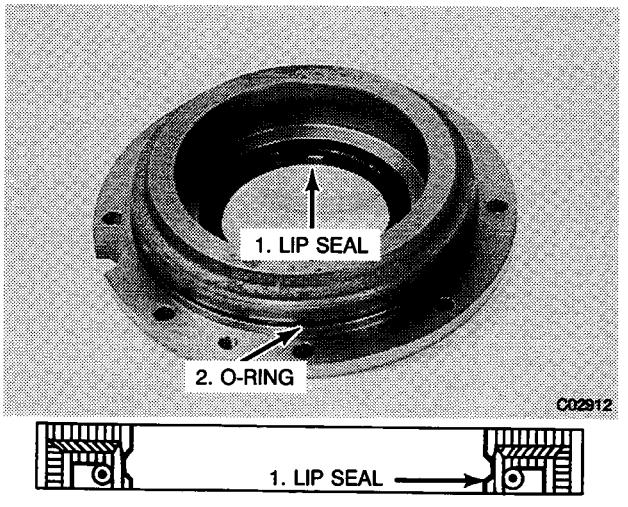
Install the swing gear.

STEP 37



Install the shims.

STEP 38

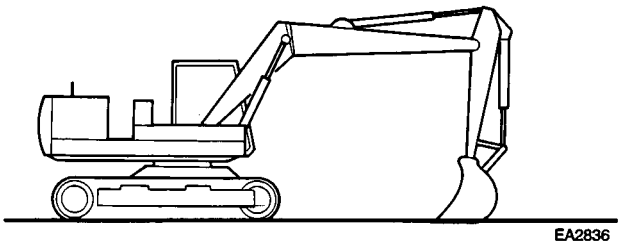


Install a new lip seal and o-ring.

Removal

WARNING: *When the machine is operating, the engine systems and the hydraulic pump systems heat up to a high temperature. To avoid the possibility of being burnt by hot metal or scalded by hot oil, allow the machine to cool before starting any maintenance work.*

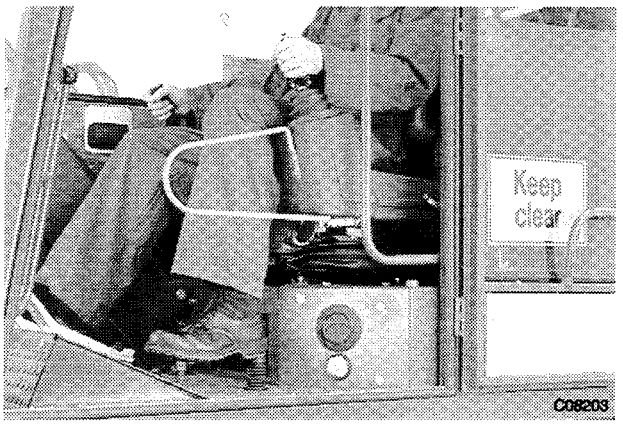
STEP 1



EA2836

Put the machine on level ground. Lower the attachment to the ground. Stop the engine and allow the systems to cool.

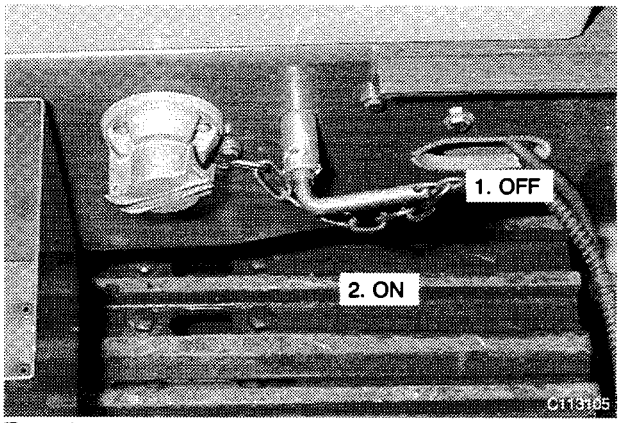
STEP 2



C06203

Operate the emergency foot pump while operating the hand control levers in all directions to release the pressure in all the hydraulic circuits.

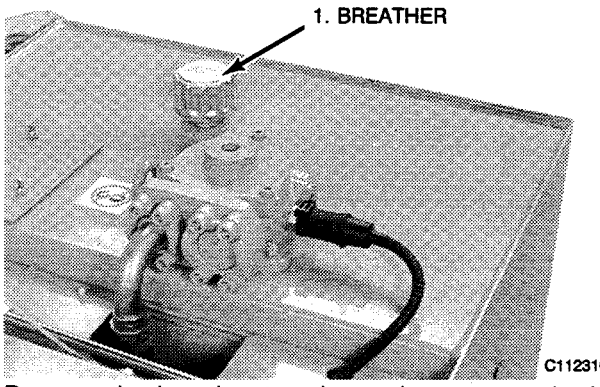
STEP 3



C11195

Turn the master disconnect switch, located under the right hand side of the walkway, to the OFF position and remove the key.

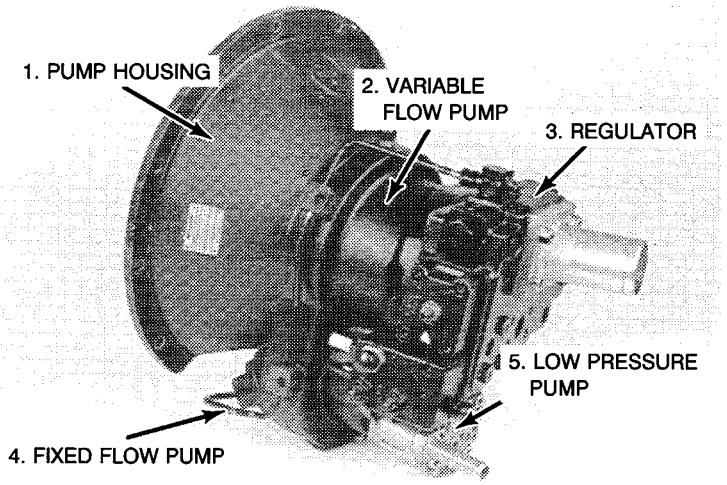
STEP 4



C11231C

Remove the breather to release the pressure in the hydraulic oil tank. Install and tighten the breather.

IDENTIFICATION OF MAJOR COMPONENTS



SPECIFICATIONS

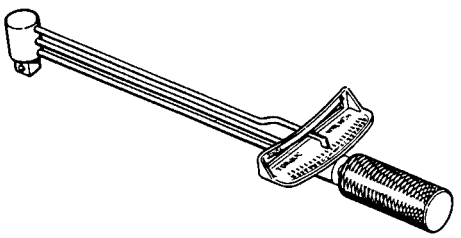
The high pressure pump comprises two bodies: one body with a variable flow for the attachment and travel hydraulic circuits and one body with a fixed flow for the upperstructure swing hydraulic circuit.

Boom Circuit Flow	150 l/min	40 US gpm
Dipper Circuit Flow	125 l/min	33 US gpm
Bucket Circuit Flow	100 l/min	27 US gpm
Travel Circuit Flow	184 l/min	49 US gpm
Upperstructure Swing Flow	44 l/min	11 US gpm
Hydraulic Oil Tank Capacity	100 litres	26.4 US gallons
Hydraulic Oil Type		MS1230 Hydraulic Fluid

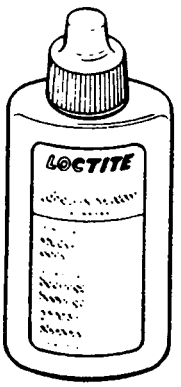
SPECIAL TORQUES

Hydraulic Oil Tank Drain Plugs	30 Nm	22 lb ft
Low Pressure Pump to High Pressure Pump Mounting Bolts	50 Nm	37 lb ft
High Pressure Pump to Engine Mounting Bolts	44 Nm	32.5 lb ft

SPECIAL TOOLS

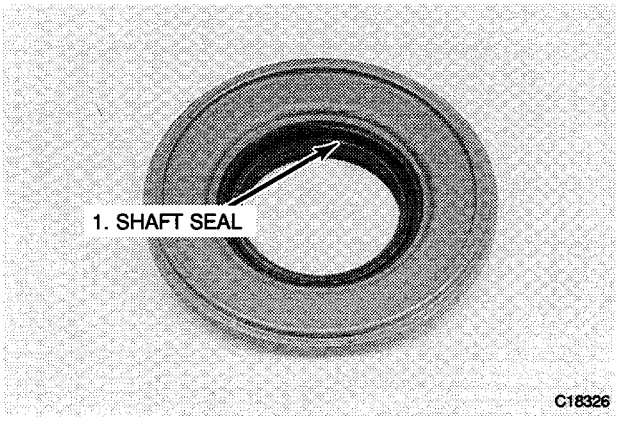


1. TORQUE WRENCH (Nm, lb ft)
(CAS 10037)



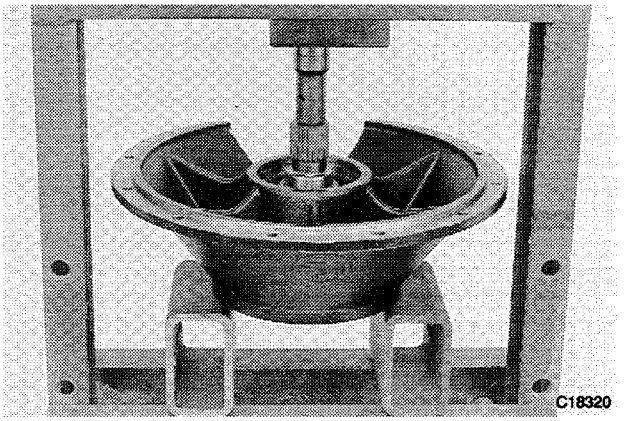
2. LOCTITE 241
(3049702R91)

STEP 51



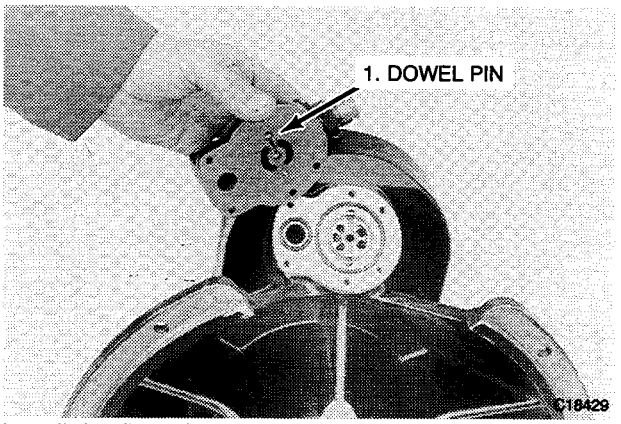
Remove and discard the shaft seal from the seal retainer.

STEP 52



Use a hydraulic press to remove the shaft assembly from the pump housing.

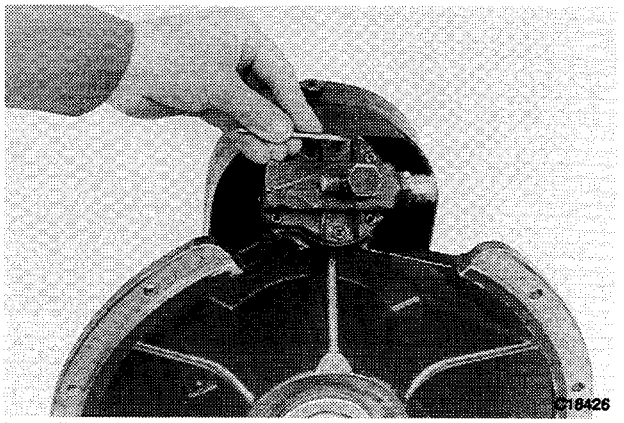
STEP 73



Install the fixed flow pump body.

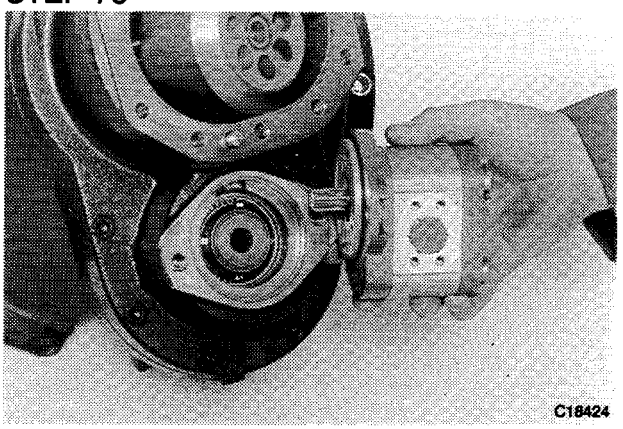
NOTE: *Make sure the dowel pin in the pump body is aligned with the hole in the swash plate.*

STEP 74



Install and tighten the fixed flow pump body retaining screws.

STEP 75

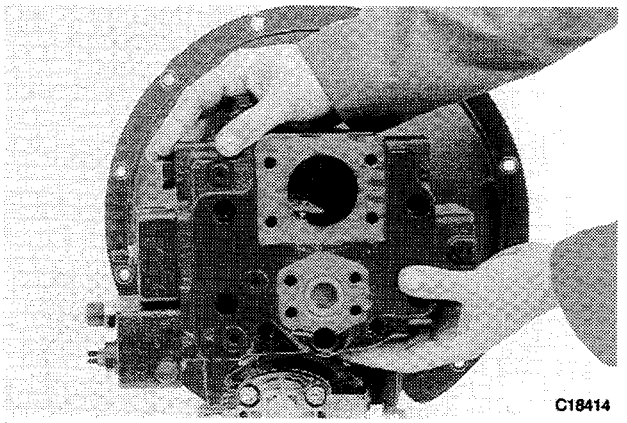


Install a new o-ring. Install the low pressure pump. Install and tighten the mounting bolts and washers to a torque of 50 Nm (37 lb ft).

STEP 76

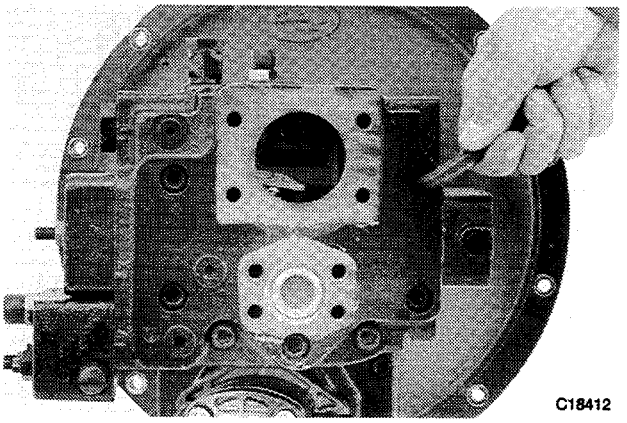
Clean the surfaces of the rear housing and the regulator. Install a new gasket onto the regulator.

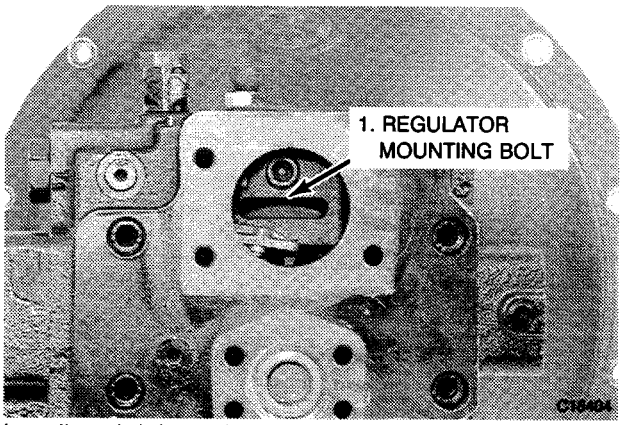
STEP 77



Install the regulator onto the rear housing.

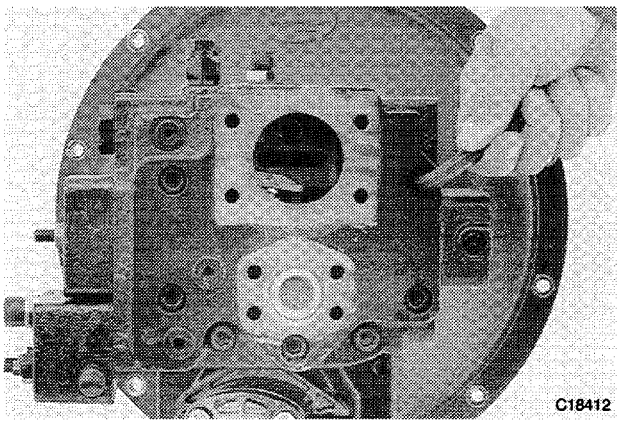
STEP 78





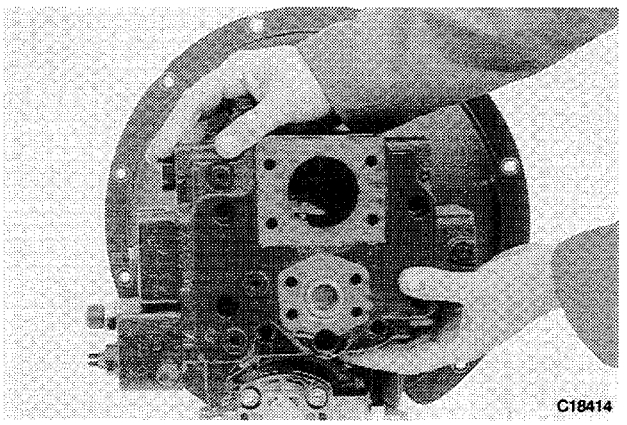
Install and tighten the regulator mounting bolts.

STEP 13



Remove the remaining regulator mounting bolts.

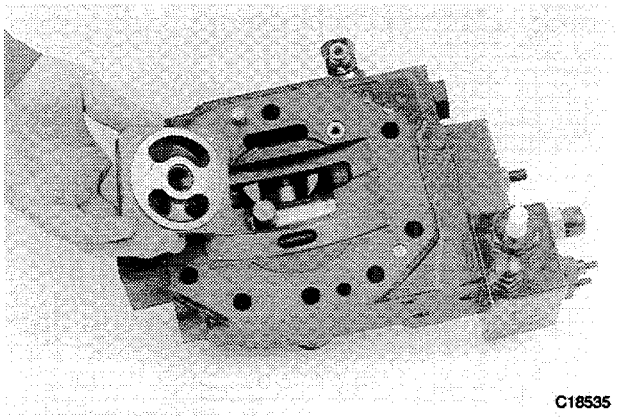
STEP 14



Remove the regulator. Remove and discard the gasket.

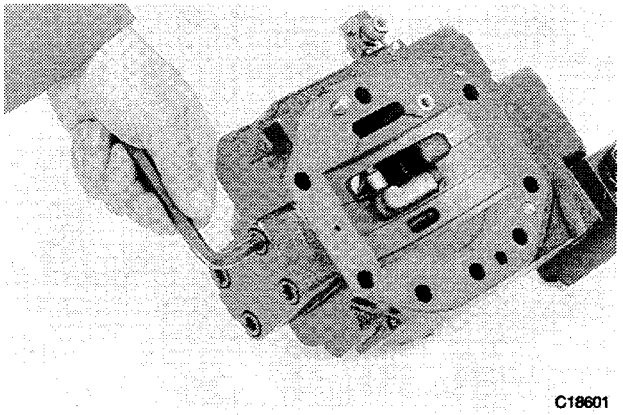
Disassembly

STEP 15



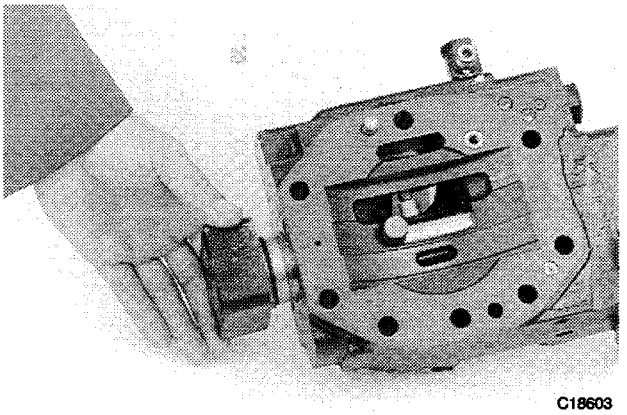
Remove the swash plate.

STEP 16



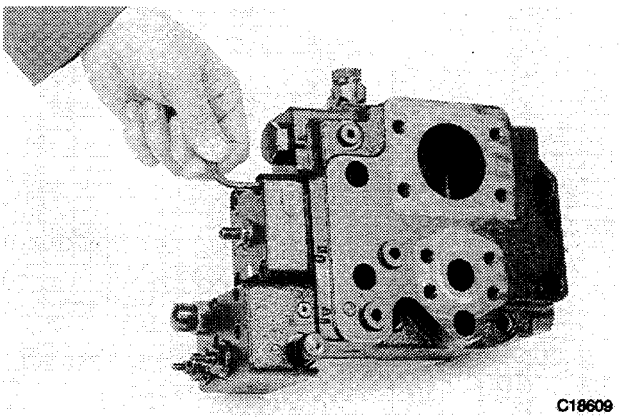
Remove the regulator cover retaining screws.

STEP 17



Remove the regulator cover. Remove and discard the o-rings.

STEP 18



Remove the regulator cover retaining screws.

NOTE : *Care must be taken when removing the regulator cover retaining screws. The regulator cover is under spring pressure from the regulator and adjustable flow valve springs.*

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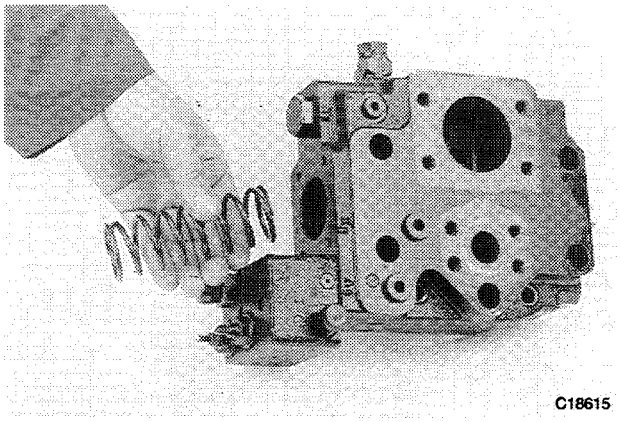
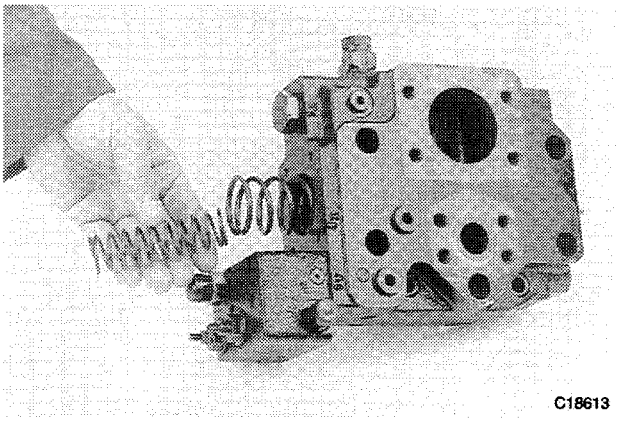
STEP 56



C18615

Install the adjustable flow valve spring.

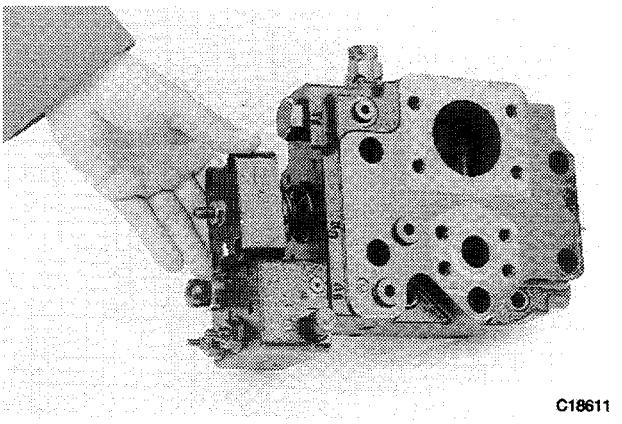
STEP 57



C18613

Install the regulator spring.

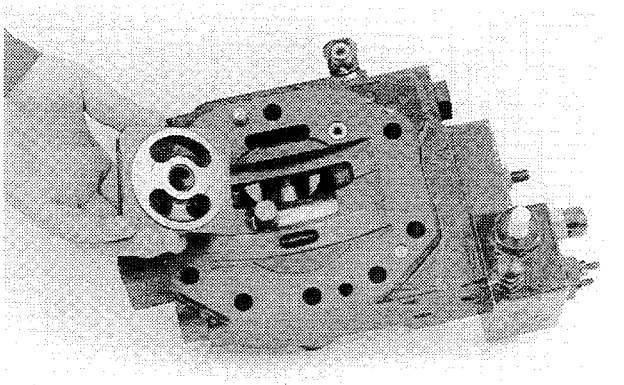
STEP 58



C18611

Install new o-rings. Install the regulator cover onto the springs. Compress the springs and install and tighten the regulator cover retaining screws.

STEP 59



C18535

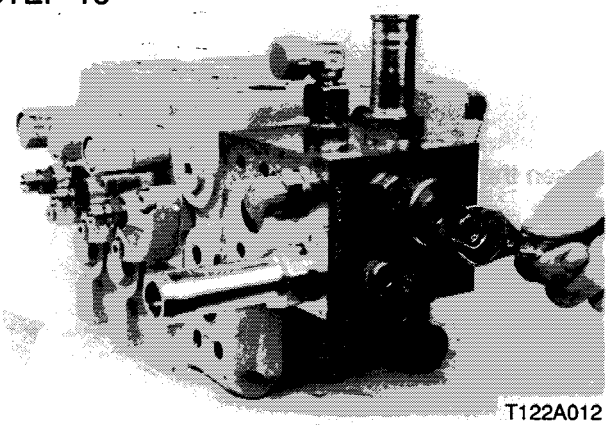
Install the swash plate onto the swash control pivot pin.

Disassembly

STEP 15

Clean the outside of the attachment valve bank to prevent contamination of the valve bores when the valves have been removed.

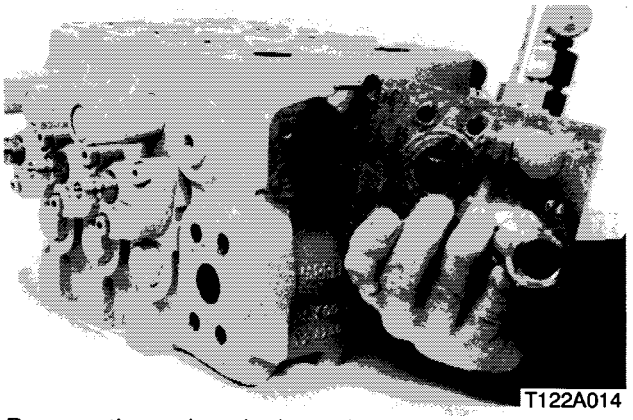
STEP 16



T122A012

Remove the two anti-cavitation valve retaining screws from the attachment valve.

STEP 17

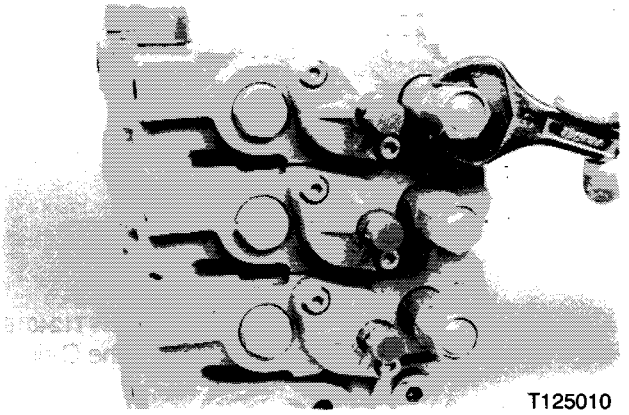


T122A014

Remove the anti-cavitation valve. Refer to Steps 94 to 106 for disassembly and assembly of the anti-cavitation valve.

NOTE: *Mark the location of all components to be removed from the attachment valve bank to ensure that they are assembled in the correct position.*

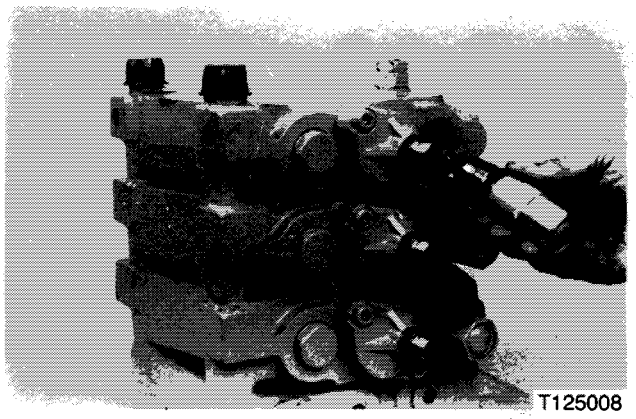
STEP 18



T125010

Loosen the circuit relief valve.

STEP 19



T125008

Remove the circuit relief valve. Remove and discard the O-ring.

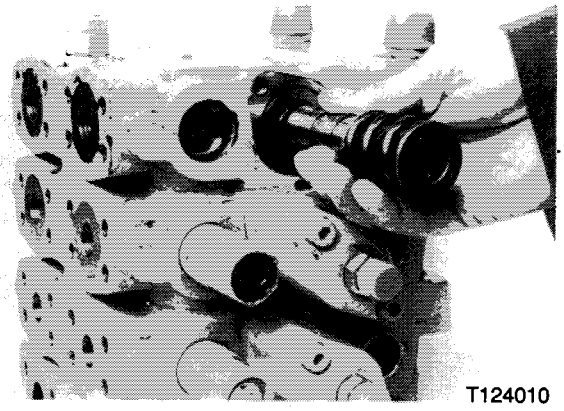
NOTE: *Refer to Steps 114 to 120 for disassembly and assembly of the circuit relief valve.*

STEP 20

T124013

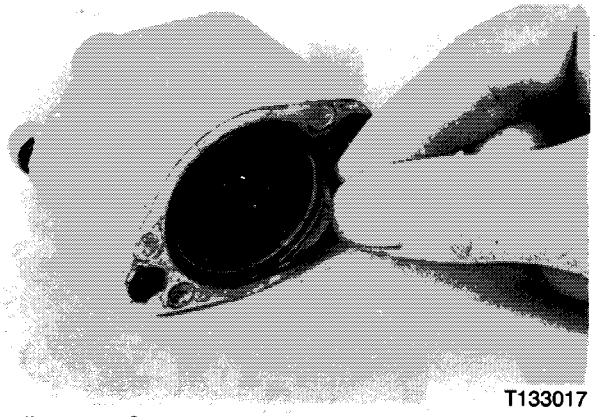
Loosen the two Allen screws securing the lower end cap.

STEP 64


T124010

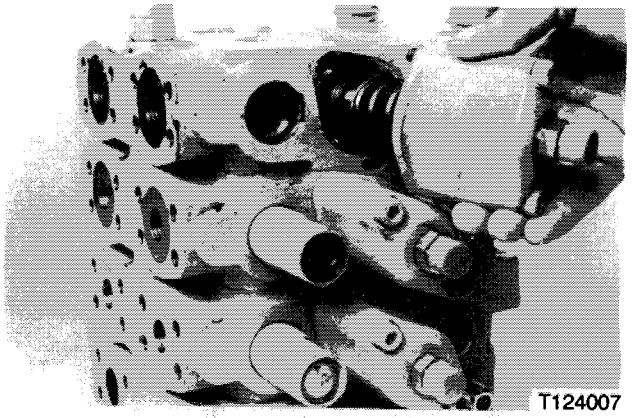
Install the valve spool assembly.

STEP 65


T133017

Install a new O-ring in the upper end cap.

STEP 66


T124007

Install the upper end cap.

STEP 67


T124004

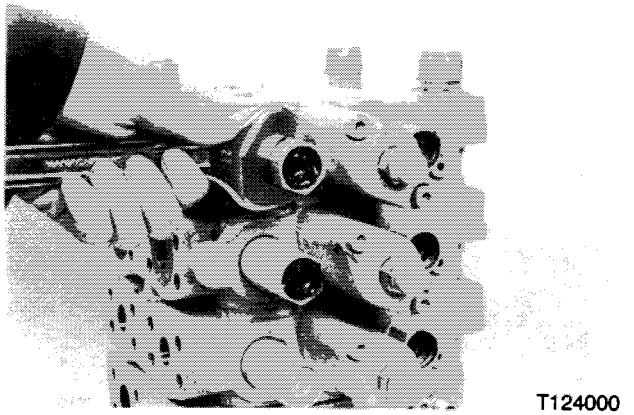
Install and tighten the end cap retaining screws to a torque of 9 to 11 Nm (72 to 96 lb in).

STEP 68


T124001

Install a new back-up ring and O-ring on the circuit relief valve. Install the circuit relief valve.

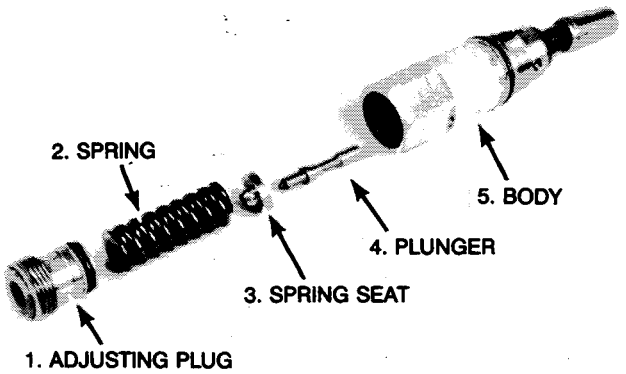
STEP 69


T124000

Tighten the circuit relief valve to a torque of 75 to 95 Nm (55 to 70 lb ft).

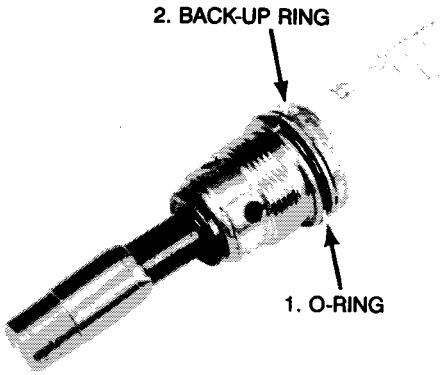
Assembly

STEP 109



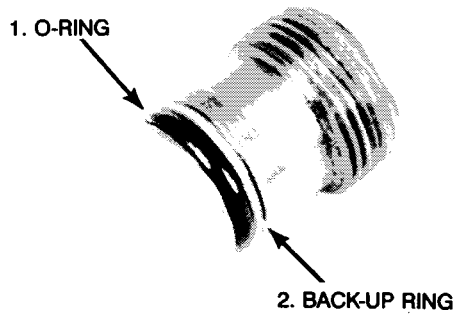
Clean and inspect the component parts of the main relief valve for wear or damage. If any of the parts are worn or damaged, replace the main relief valve.

STEP 110



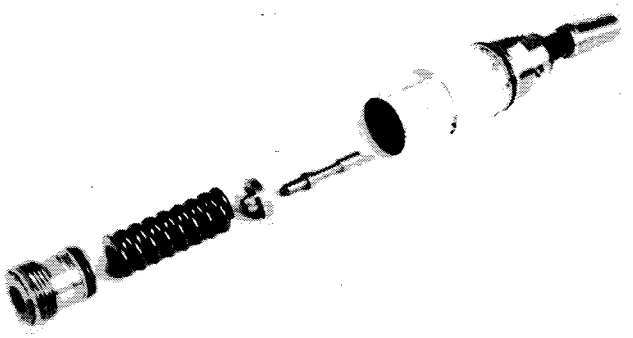
Install a new back-up ring and O-ring on the valve body.

STEP 111



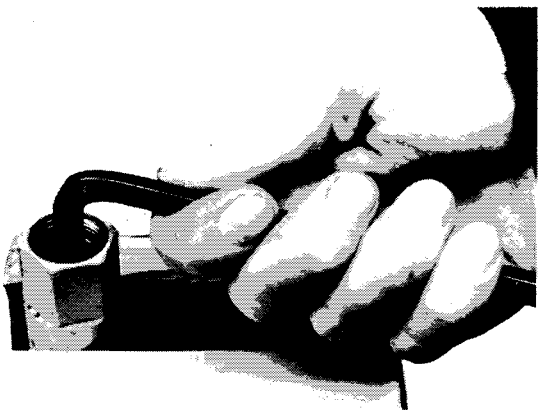
Install a new back-up ring and O-ring on the adjusting plug.

STEP 112



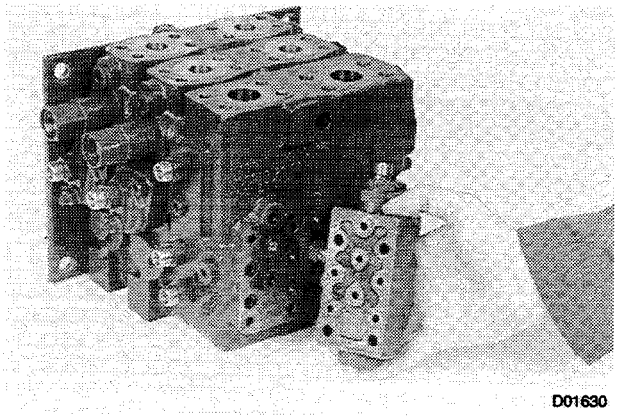
Assemble the parts of the main relief valve.

STEP 113



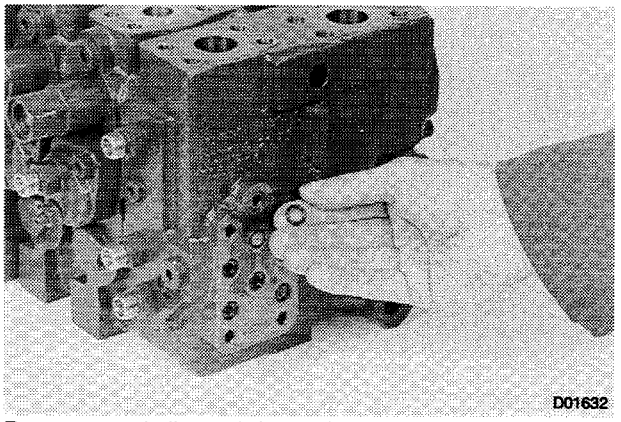
Install the valve body in a soft jawed vise. Install the adjusting plug into the valve body the same amount of turns noted on removal.

STEP 11



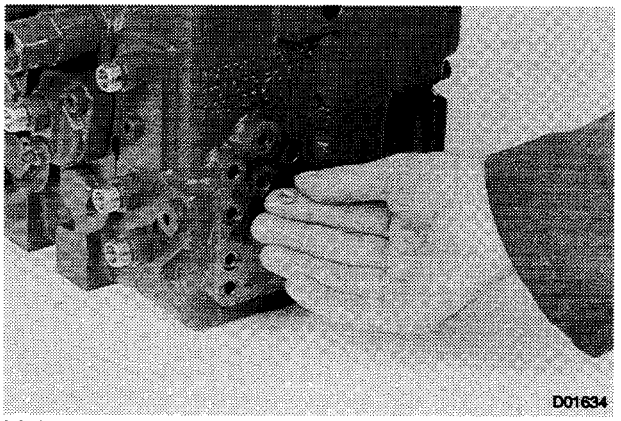
Make an alignment mark for correct assembly and remove the brake release valve from the inlet/outlet section.

STEP 12



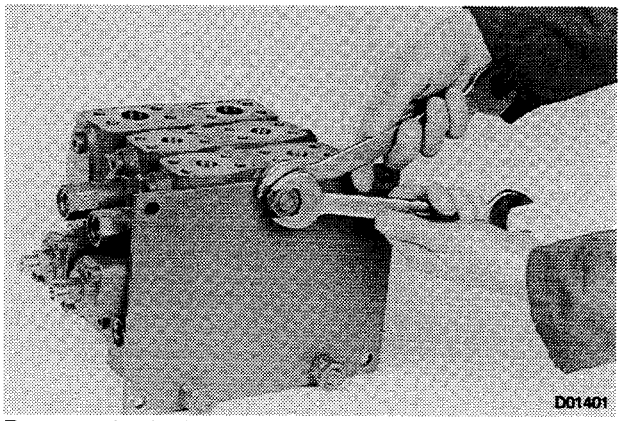
Remove and discard the o-rings.

STEP 13



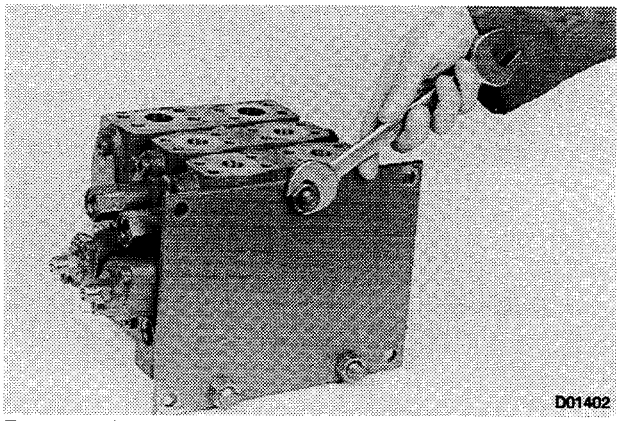
Make a note of its position and remove the restrictor.

STEP 14



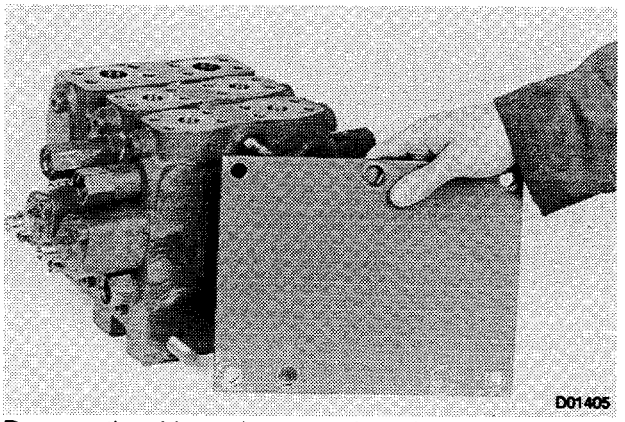
Remove the locknuts from the valve retaining studs.

STEP 15



Remove the nuts that fasten the mounting plate to the valve retaining studs.

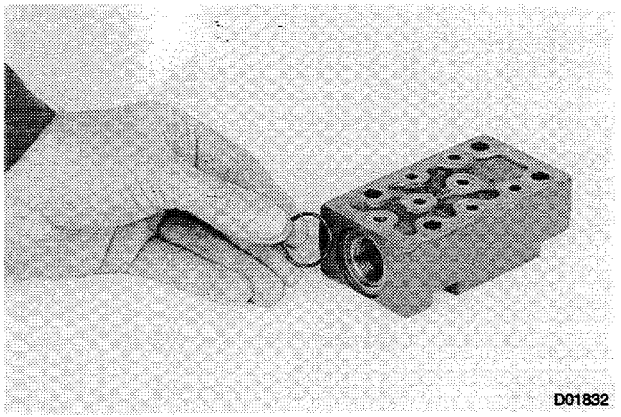
STEP 16



Remove the drive valve mounting plate.

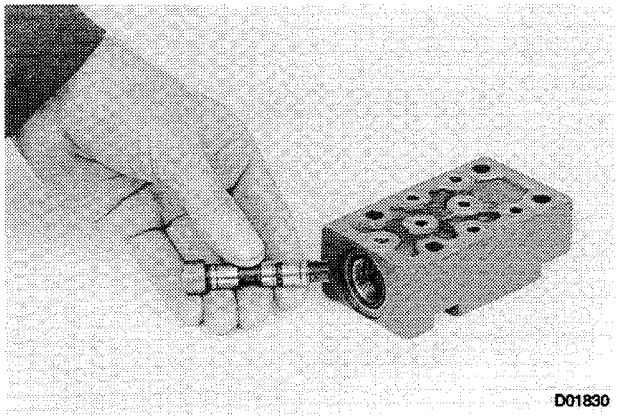
NOTE: *Lubricate all parts and o-rings with clean hydraulic oil.*

STEP 58



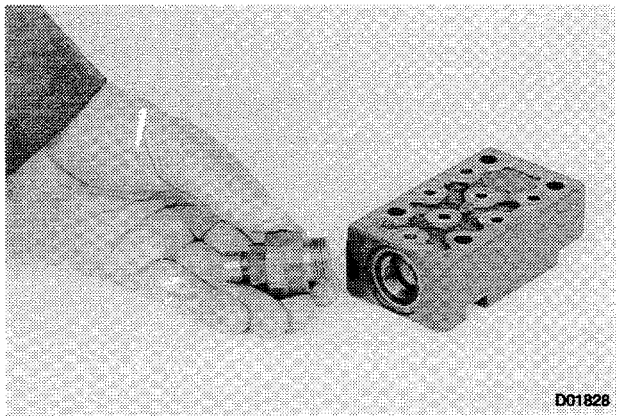
Install a new o-ring.

STEP 59



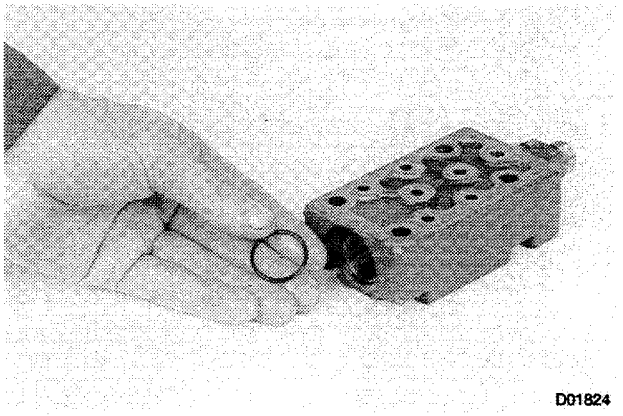
Install the valve.

STEP 60



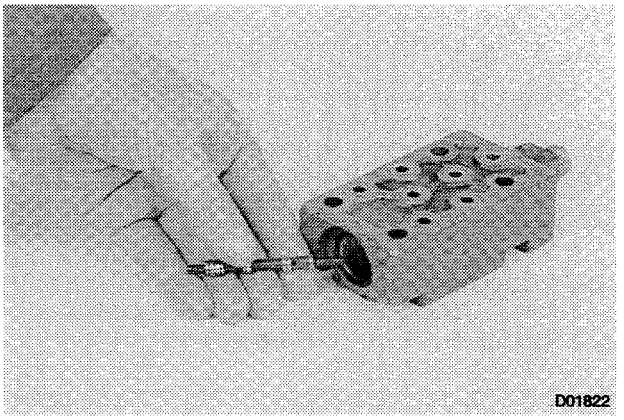
Install and tighten the connector to the brake release valve.

STEP 61



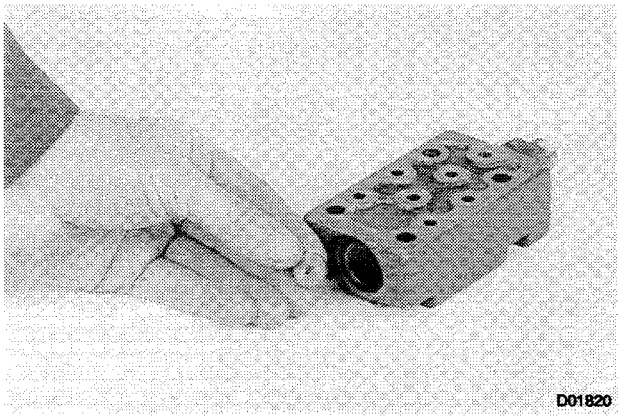
Install a new o-ring.

STEP 62

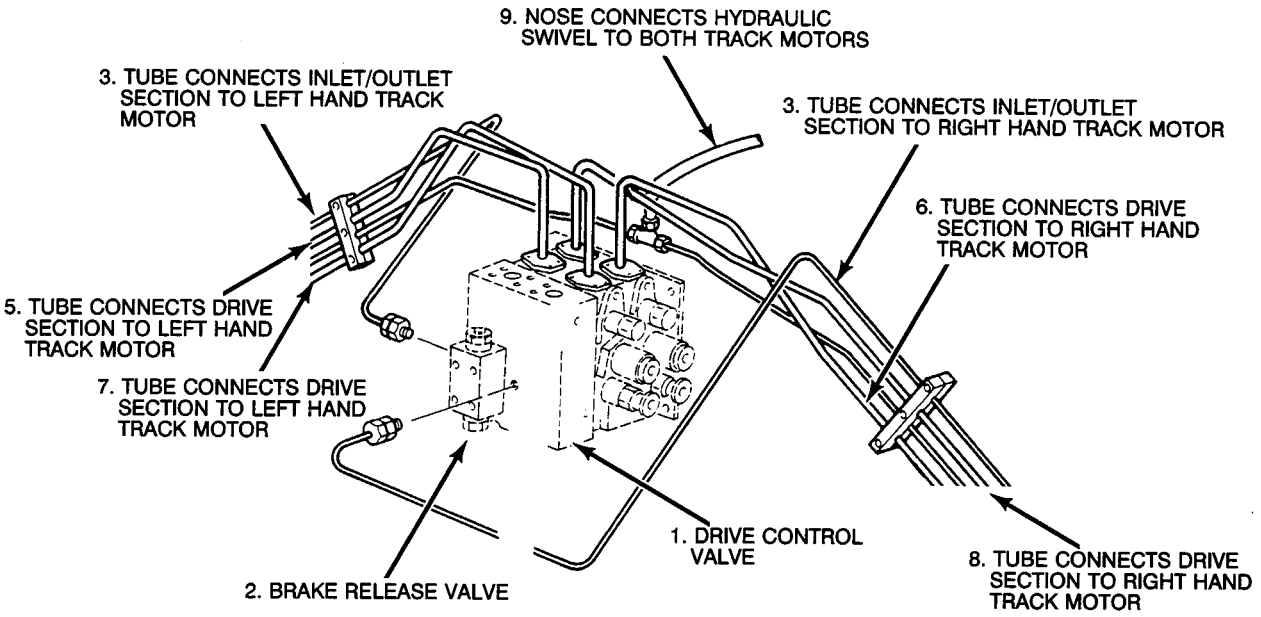


Install the spool in the same position noted during disassembly.

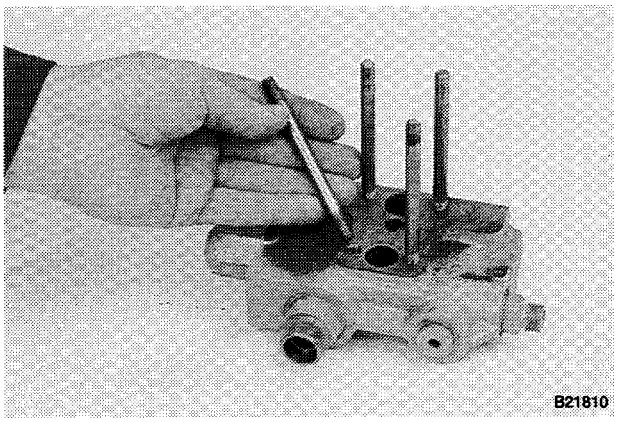
STEP 63



Install the spring seat onto the end of the spool.

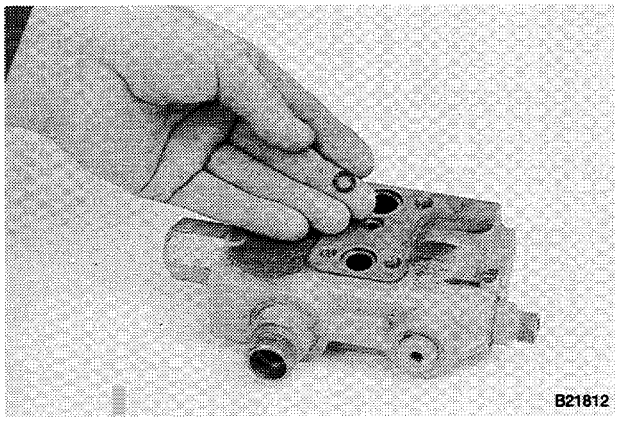

9. NOSE CONNECTS HYDRAULIC SWIVEL TO BOTH TRACK MOTORS
3. TUBE CONNECTS INLET/OUTLET SECTION TO LEFT HAND TRACK MOTOR
3. TUBE CONNECTS INLET/OUTLET SECTION TO RIGHT HAND TRACK MOTOR
6. TUBE CONNECTS DRIVE SECTION TO RIGHT HAND TRACK MOTOR
5. TUBE CONNECTS DRIVE SECTION TO LEFT HAND TRACK MOTOR
7. TUBE CONNECTS DRIVE SECTION TO LEFT HAND TRACK MOTOR
1. DRIVE CONTROL VALVE
8. TUBE CONNECTS DRIVE SECTION TO RIGHT HAND TRACK MOTOR
2. BRAKE RELEASE VALVE

STEP 24



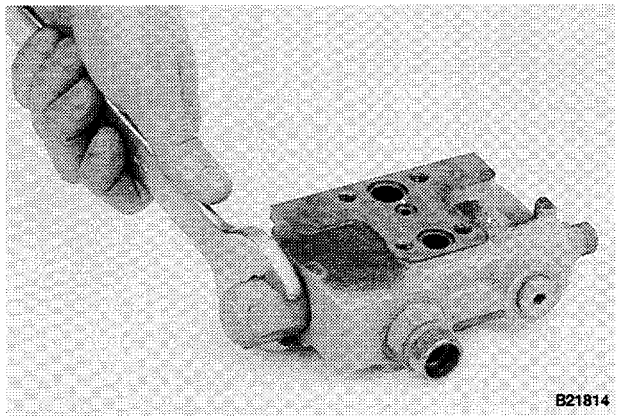
Remove the studs from the inlet body.

STEP 25



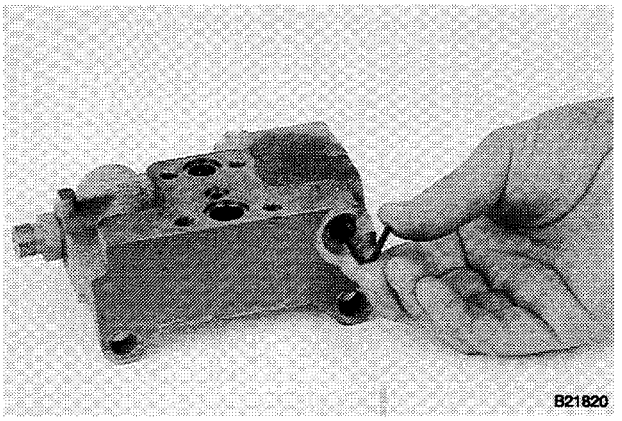
Remove and discard the o-rings.

STEP 26



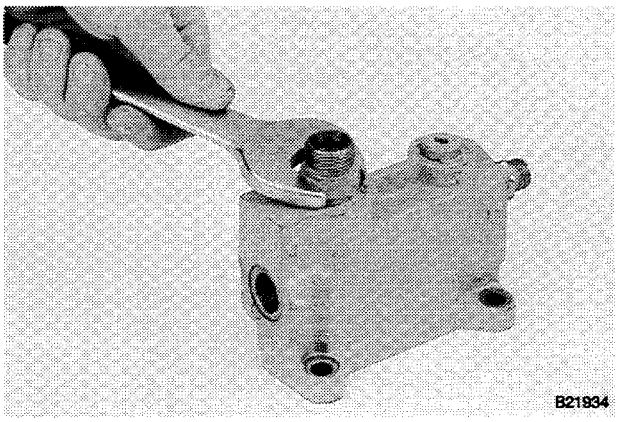
Remove the flow regulator valve assembly.

STEP 27



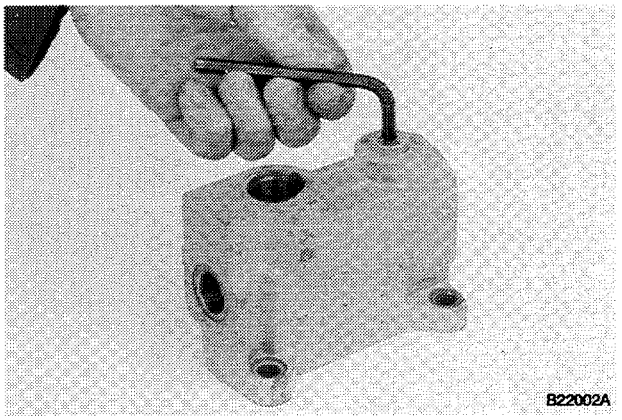
Remove the plug from the bottom of the inlet body. Using a 3mm Allen key , remove the orifice screw from the inlet body.

STEP 28



Remove the fittings.

STEP 29



Remove the plug.

Section

8007

COUNTER ROTATION VALVE

8007

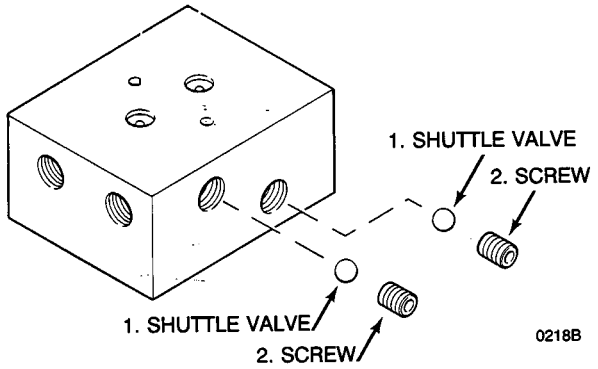
For 688 Crawler Excavators

J I Case

Don 8-89150

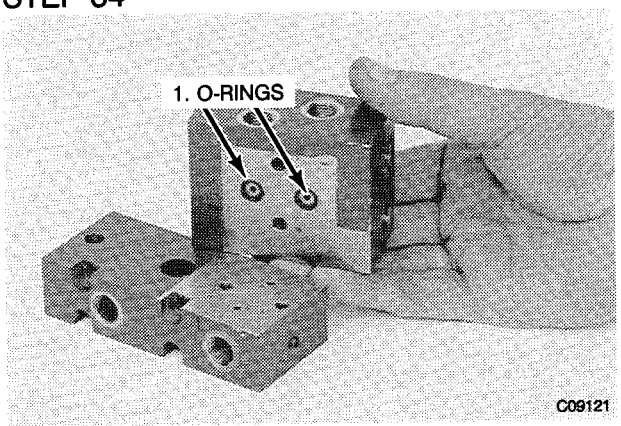
Printed in England
December 1989

STEP 33



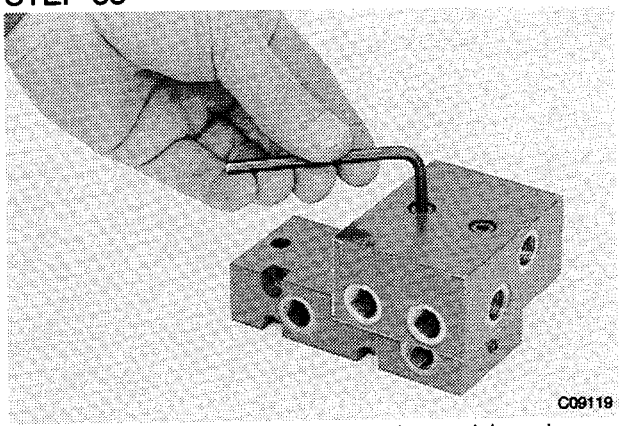
Install the shuttle valve balls between ports 1 and 5 and ports 3 and 7. Apply Loctite 270 to the threads of the screws and install and tighten the screws.

STEP 34



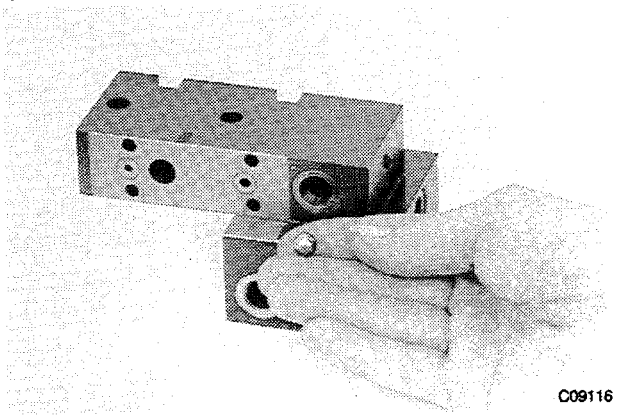
Install two new o-rings onto the manifold.

STEP 35



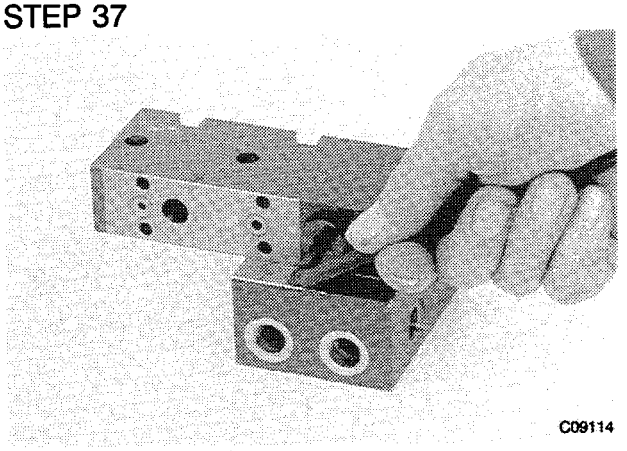
Install the manifold to the control spool housing as marked on disassembly and install and tighten the screws.

STEP 36



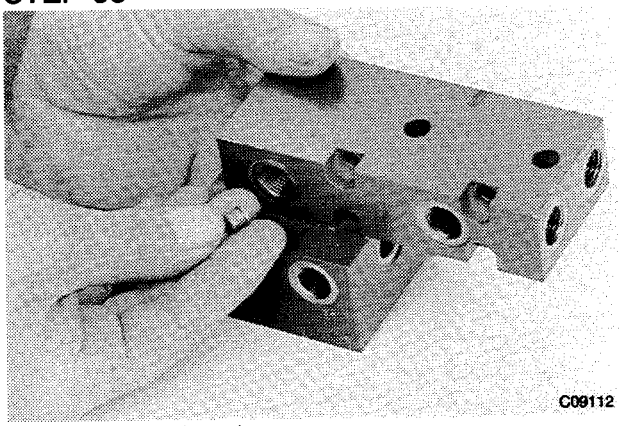
Install the ball.

STEP 37



Install and tighten the capscrew.

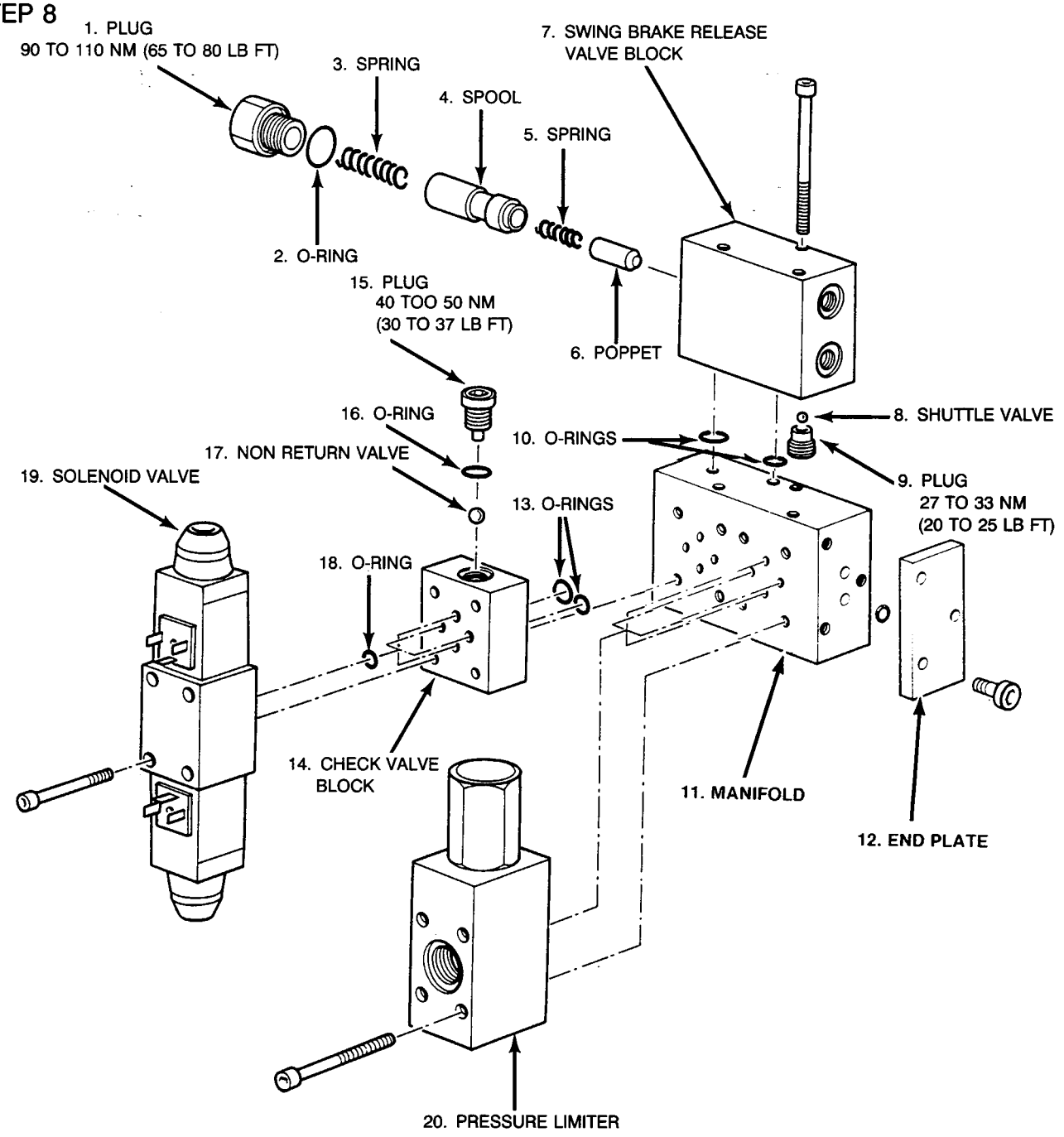
STEP 38



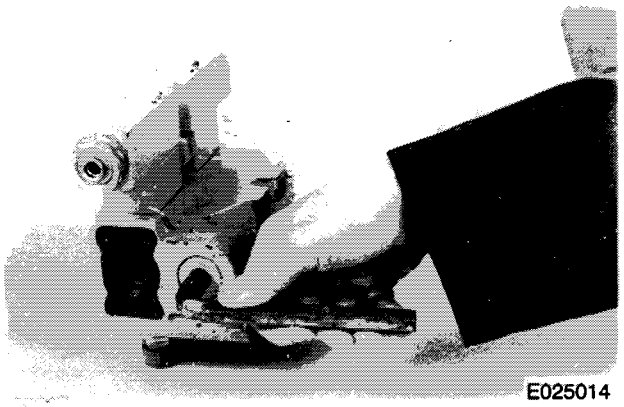
Install the shuttle valve.

Disassembly and Assembly

STEP 8



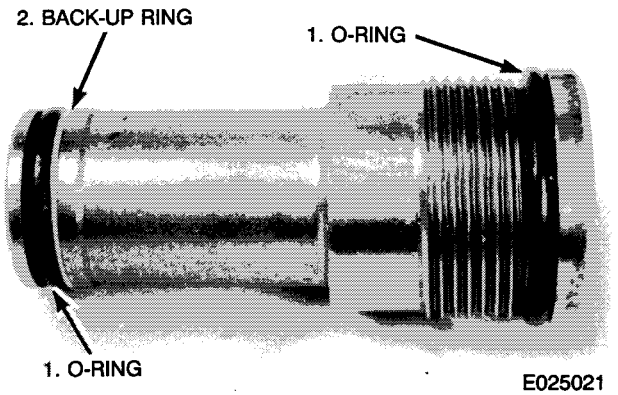
STEP 29



E025014

Remove the pressure limiter valve from the valve body.

STEP 30



E025021

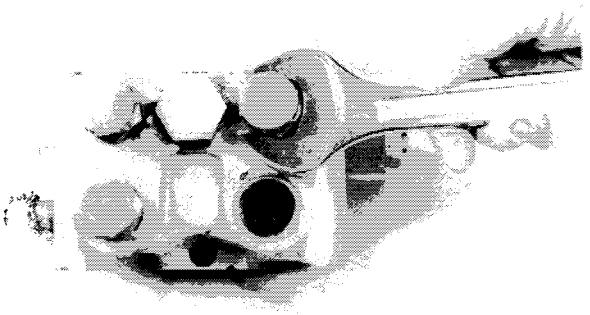
Remove and discard the O-rings and back-up rings from the pressure limiter valve.

STEP 31

E025026

Remove the plug. Remove and discard the O-ring.

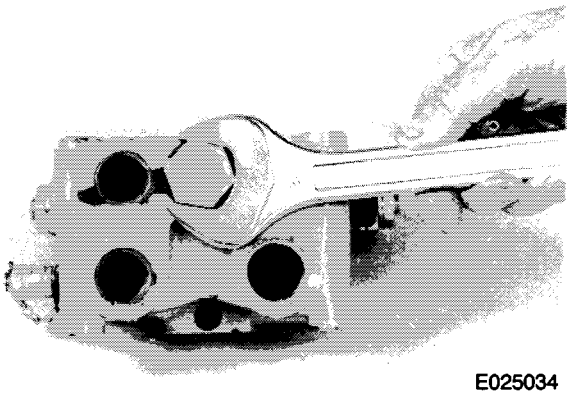
STEP 32



E025032

Remove the hydraulic connectors from the valve block and spool caps. Remove and discard the O-rings.

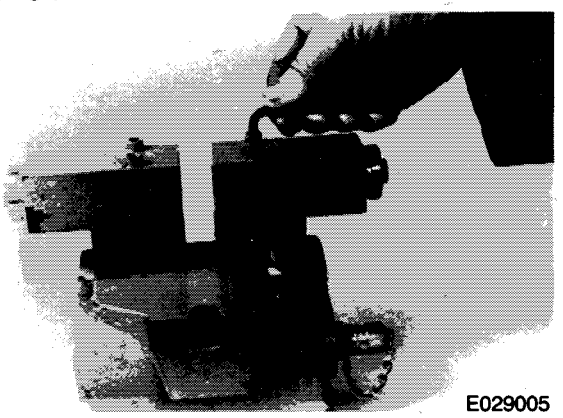
STEP 33



E025034

Remove the load check valve plug. Remove the spring and valve. Remove and discard the O-ring.

STEP 34



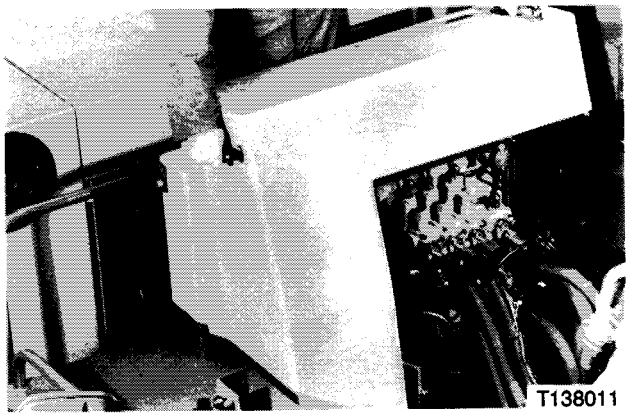
E029005

Remove the two Allen screws securing the relief valve to the valve block.

STEP 86

Refer to Section 8001 to test the pressure setting of the swing relief valves, adjust the pressure if required.

STEP 87



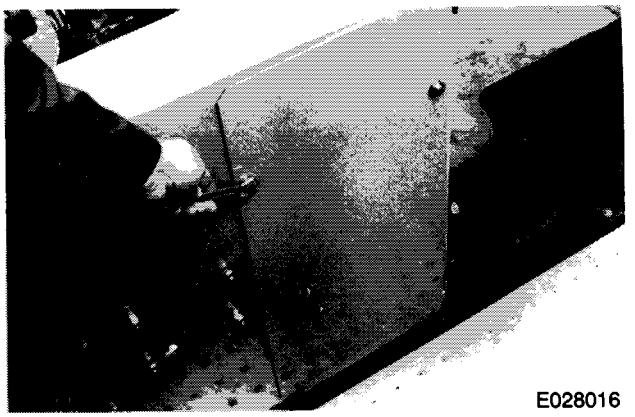
T138011

T138017

Position the valve cover, install and tighten the five retaining screws and spacers.

STEP 88

E028020



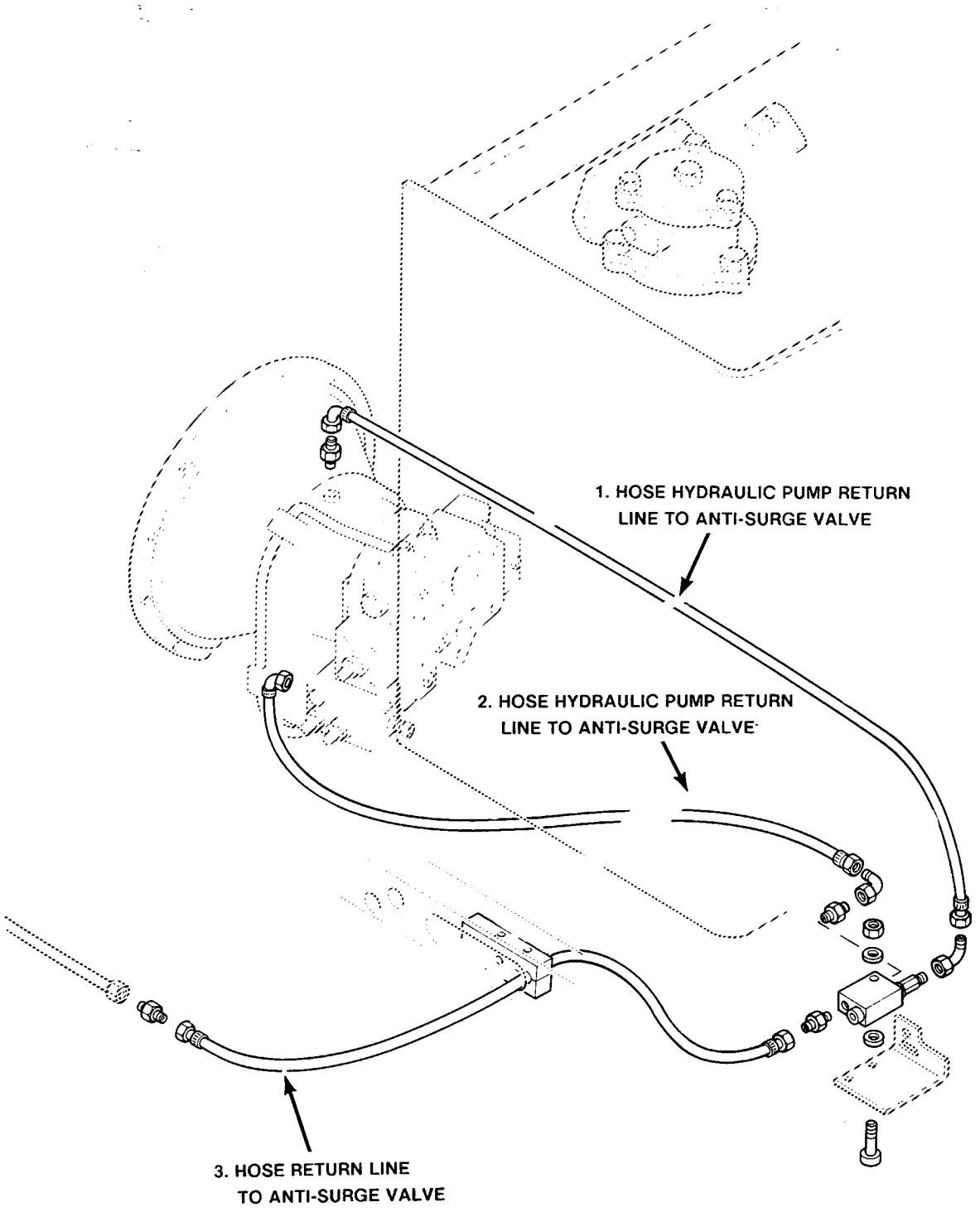
E028016

Position the right hand side cover plate, install and tighten the four retaining screws and spacers.

STEP 89

Install the access panel under the hydraulic oil tank.

Tube and Hose Installation



Section

8012

DRIVE SPEED LIMITER

8012

For 688 Crawler Excavators

J I Case

Don 8-89200

Printed in England
December1989

Section

8013

DRIVE BRAKE RELEASE VALVE

8013

For 688 Crawler Excavators

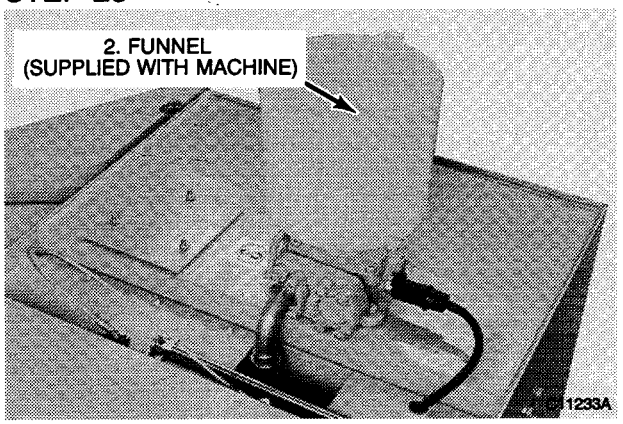
J I Case

Don 7-32190

Printed in England
January 1990

WARNING: *Never operate the engine in a closed building. Proper ventilation is required under all circumstances.*

STEP 28



Start and run the engine at LOW IDLE. Fully extend all the attachment cylinders. Stop the engine. Check the level of oil in the hydraulic oil tank. The level of oil must reach level 2 on the indicator on the front of the hydraulic oil tank. If oil is required, remove the plug from the top of the filter housing. Screw in the funnel and add specified hydraulic oil as required. Remove the funnel and install and tighten the plug.

STEP 29

Start and run the engine. Drive the machine forwards and then rearwards. Stop the engine.

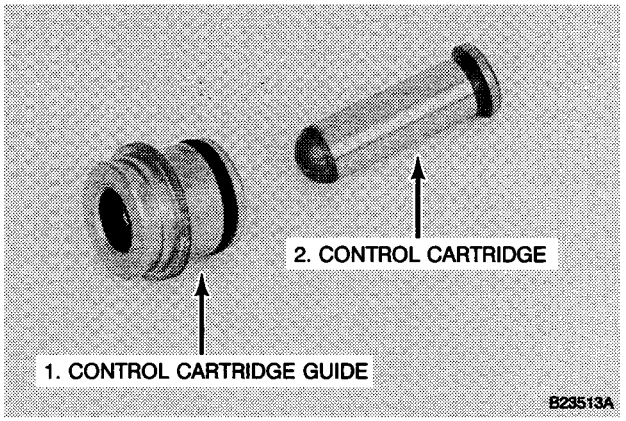
STEP 30

Check for and repair any hydraulic oil leaks at the drive brake release valve.

STEP 31

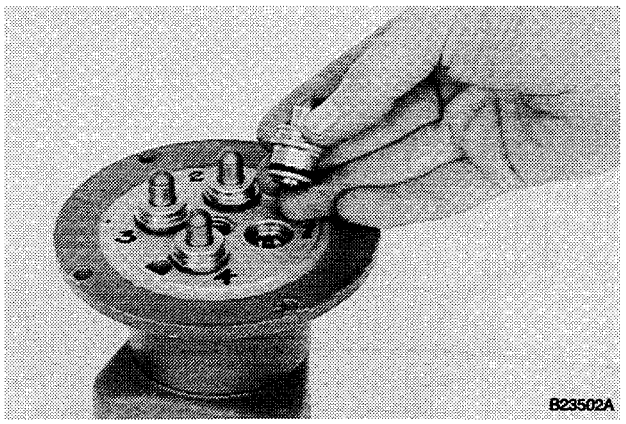
Install the valve cover and install and tighten the retaining bolts and spacers. Install the access panel under the hydraulic oil tank.

STEP 28



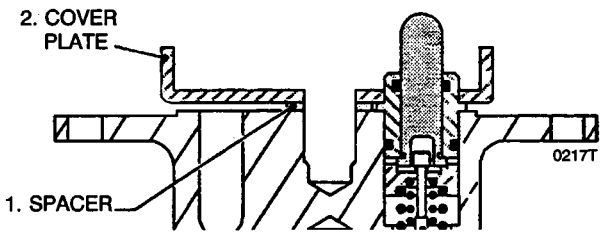
Install new o-rings onto the control cartridge guides. Install the control cartridges into the control cartridge guides.

STEP 29



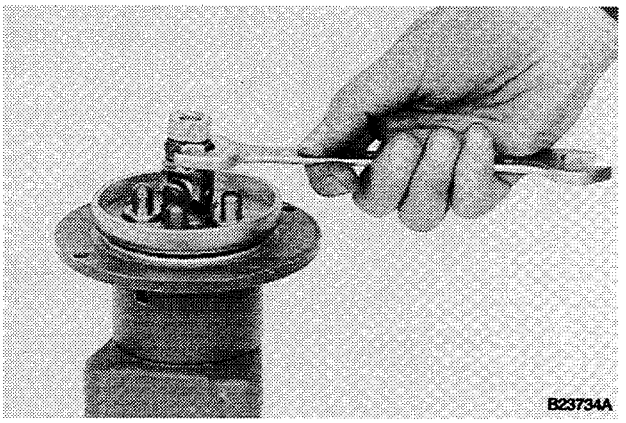
Install the control cartridge assemblies.

STEP 30



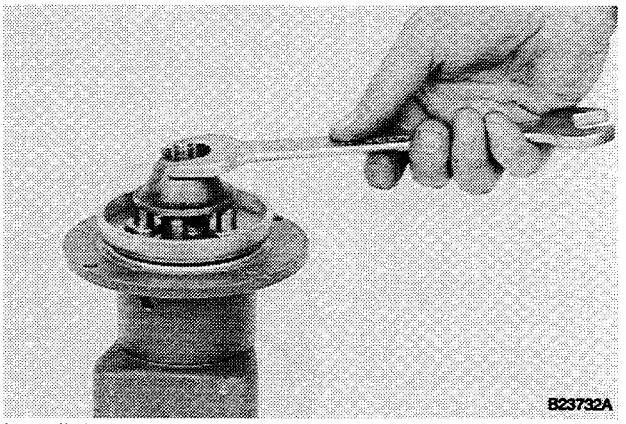
Install the spacer. Install the cover plate. For the left hand control lever only, make sure that the hole in the cover plate for the horn wire is in line with the slot in the valve body.

STEP 31



Apply Loctite 242 to the lower threads of the universal joint. Install and tighten the universal joint to a torque of 30 Nm (22 lb ft). Remove the two nuts used to remove and to install the universal joint.

STEP 32



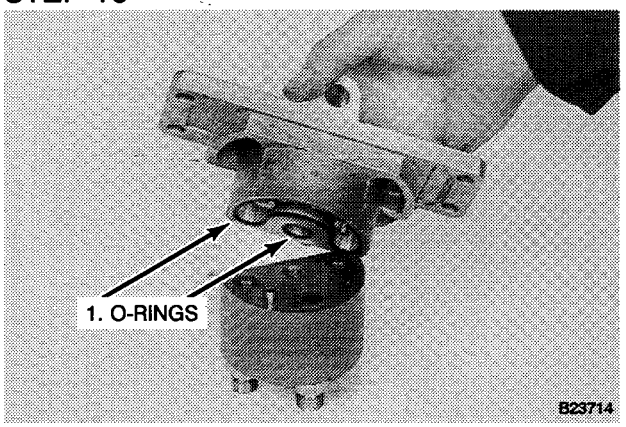
Install the control cam onto the universal joint and turn until the control cam comes into contact with the control cartridges.

STEP 33

While holding the control cam in position, install and tighten the control lever to a torque of 25 Nm (18 lb ft).
For the left hand control lever only, push the horn wire through the hole in the cover plate and install the connector.
Put the protective boot into the correct position over the cover plate.

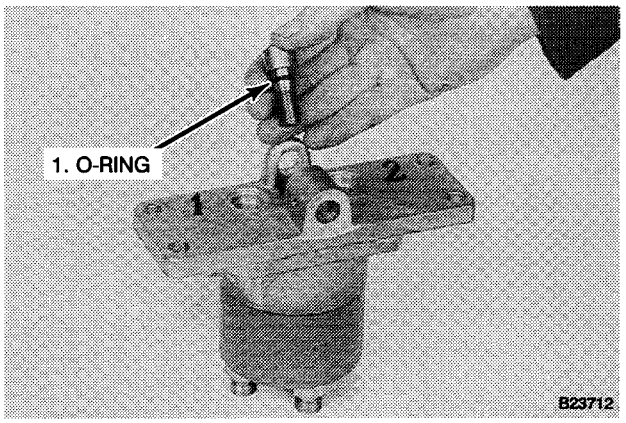
NOTE: *Lubricate all the parts and o-rings with clean hydraulic oil.*

STEP 16



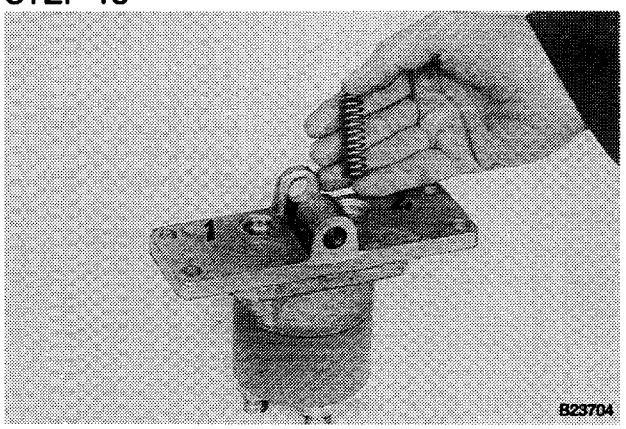
Install new o-rings onto the valve body. Make sure that the dowels are in place. Install the valve body onto the port block.

STEP 17



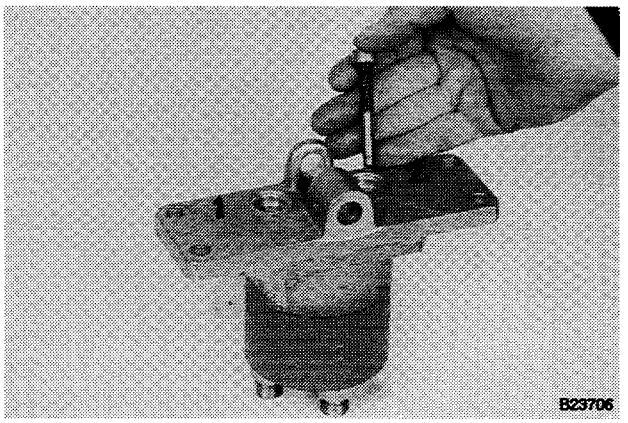
Install a new o-ring onto the retaining screw. Install and tighten the retaining screw to a torque of 60 Nm (44 lb ft).

STEP 18



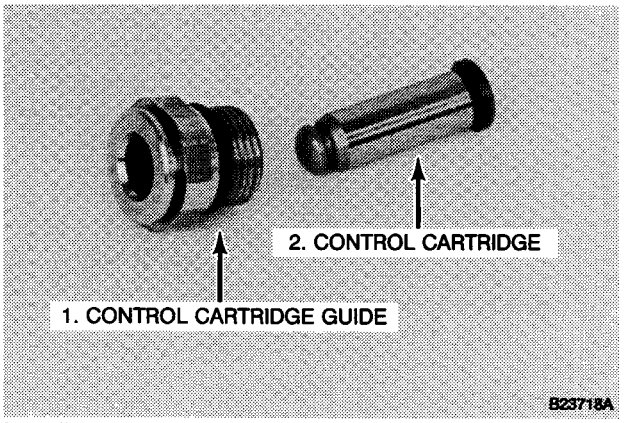
Install the large spring into the correct hole.

STEP 19



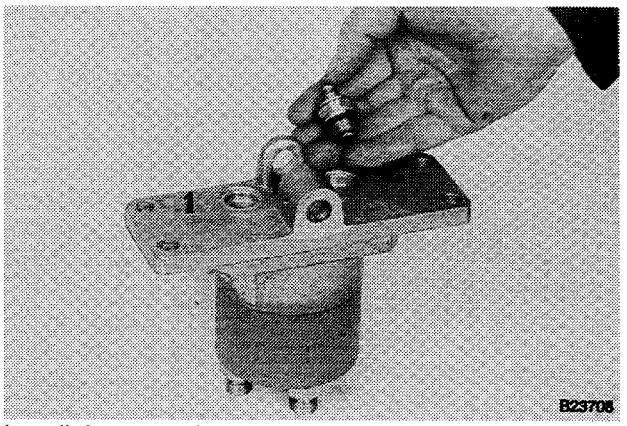
Install the spool assembly into the correct hole.

STEP 20



Install new o-rings onto the control cartridge guide. Install the control cartridge into the control cartridge guide.

STEP 21



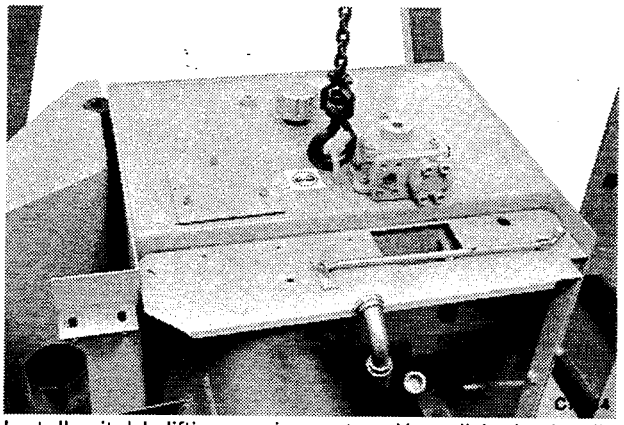
Install the control cartridge assembly and tighten to a torque of 11 Nm (8 lb ft).

STEP 22

Repeat STEPS 18 to 21 for the other spool and control cartridge assembly.

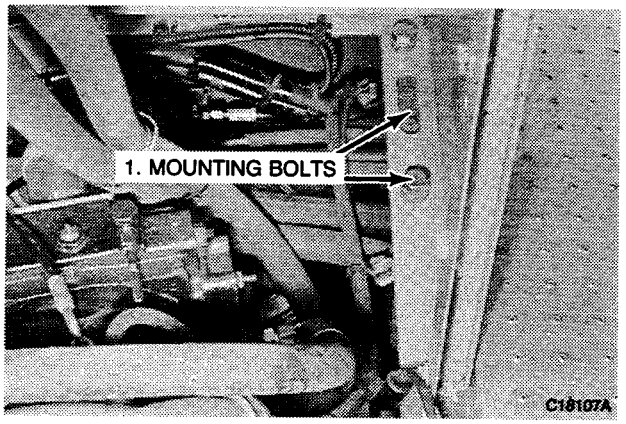
Installation

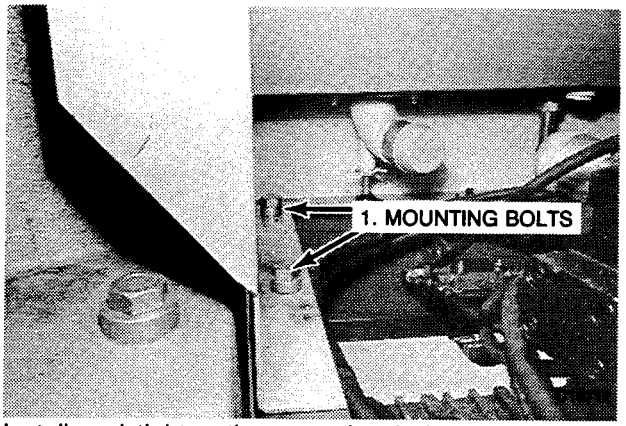
STEP 17



Install suitable lifting equipment and install the hydraulic oil tank.

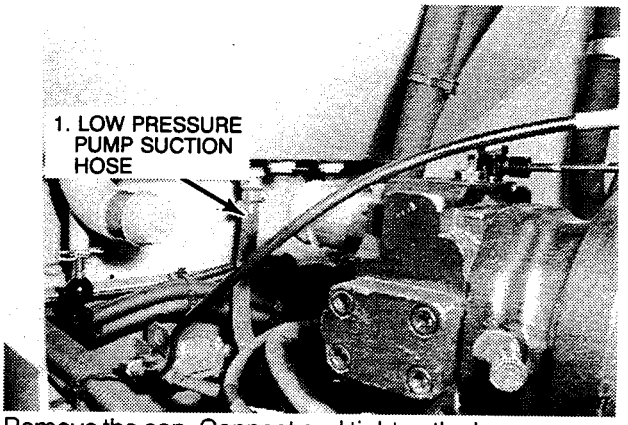
STEP 18





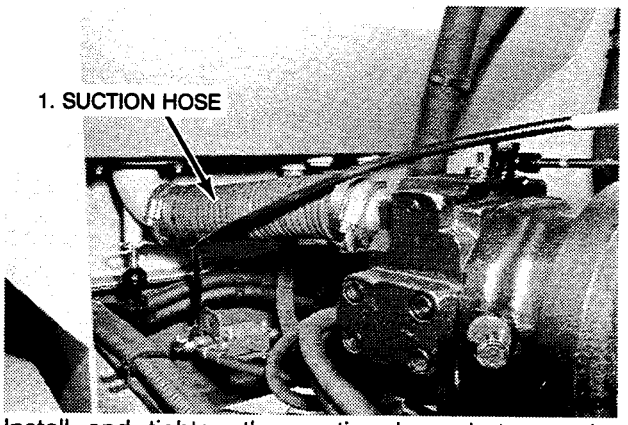
Install and tighten the mounting bolts, spacers and nuts.

STEP 19



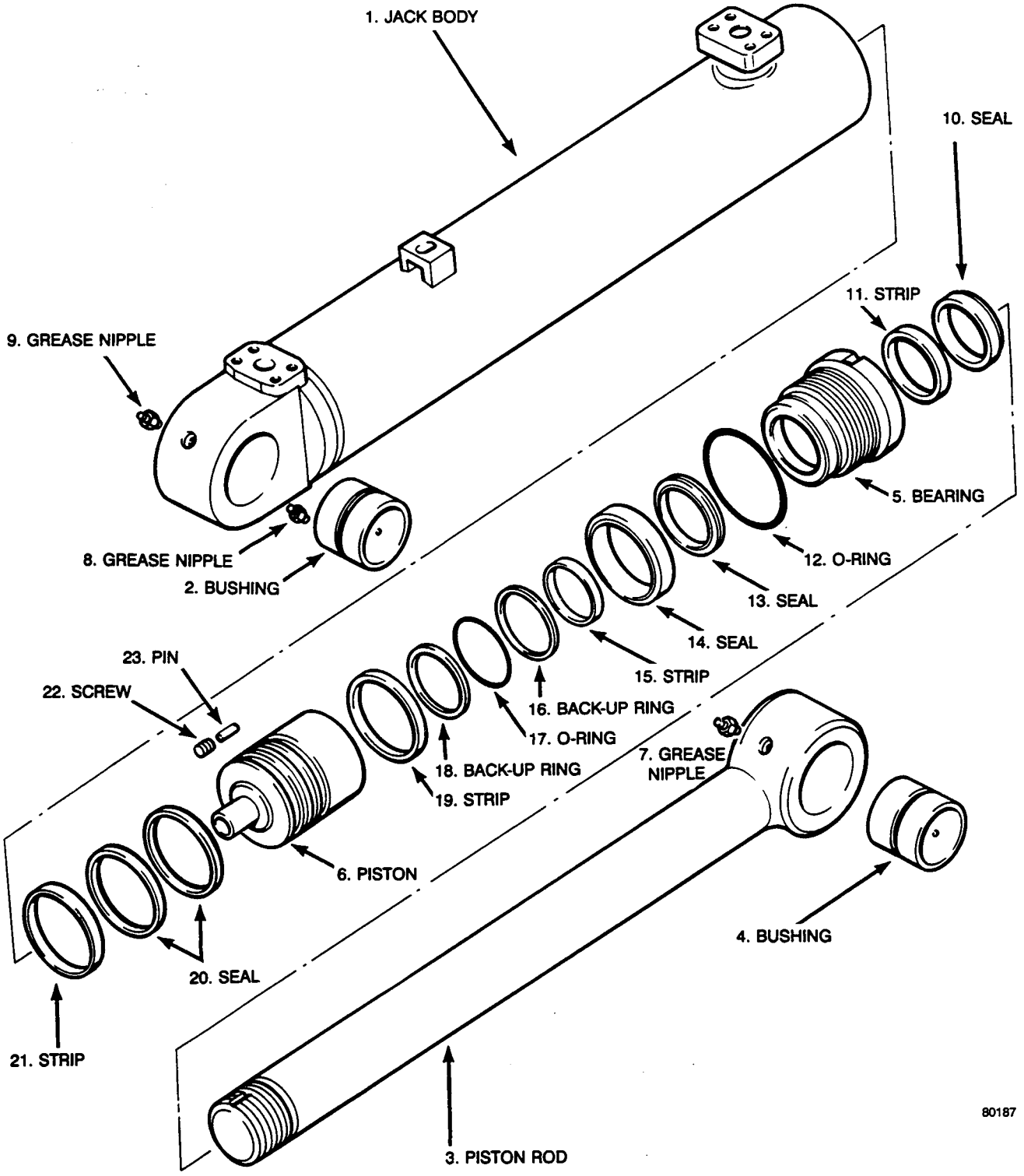
Remove the cap. Connect and tighten the low pressure pump suction hose.

STEP 20

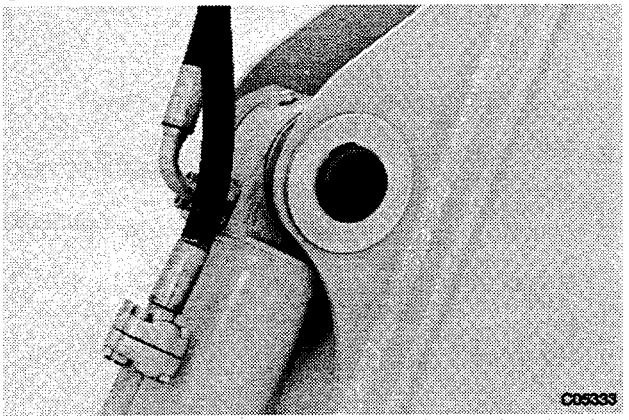


Install and tighten the suction hose between the hydraulic oil tank and the hydraulic pump.

Assembly

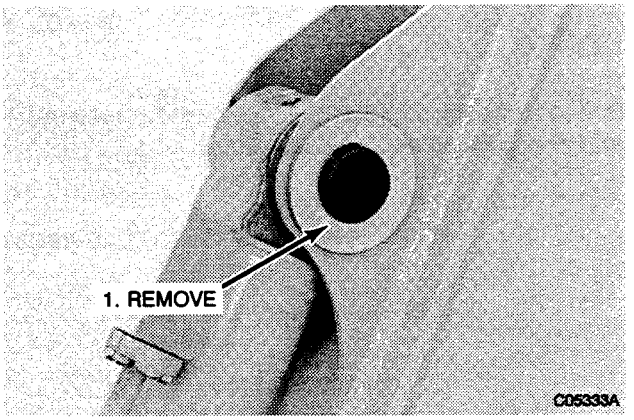

1. JACK BODY
10. SEAL
11. STRIP
9. GREASE NIPPLE
5. BEARING
8. GREASE NIPPLE
12. O-RING
2. BUSHING
13. SEAL
14. SEAL
23. PIN
15. STRIP
22. SCREW
16. BACK-UP RING
17. O-RING
7. GREASE NIPPLE
18. BACK-UP RING
19. STRIP
6. PISTON
4. BUSHING
20. SEAL
21. STRIP
3. PISTON ROD
80187

STEP 7



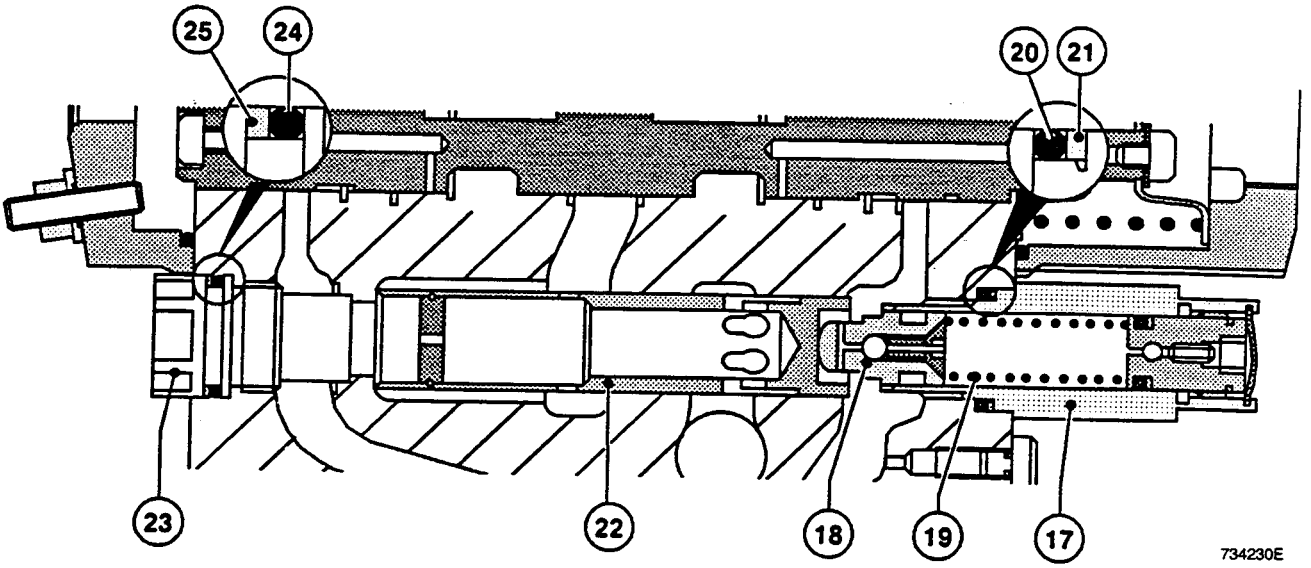
Disconnect and cap the hoses from the bucket cylinder.

STEP 8



Remove the retaining and pivot pins from the bucket cylinder. Lower the cylinder to the ground and remove the lifting equipment.

Flow Setting Valve Disassembly



NOTE: *Servicing is limited to replacing the flow setting valve cartridge, joints and seals.*

STEP 24

Remove cartridge 17.

STEP 25

Take out cartridge from its location, fitted with flow setting valve shock-absorber 18 and spring 19.

STEP 26

Remove and discard the o-ring 20 and joint 21.

STEP 27

Take out the spool 22 to make a visual check.

STEP 28

Remove plug 23.

STEP 29

Remove and discard the o-ring 24 and joint 25.

Section

9001

UPPERSTRUCTURE AND TURNTABLE BEARING

9001

For 688 Crawler Excavators

J I Case

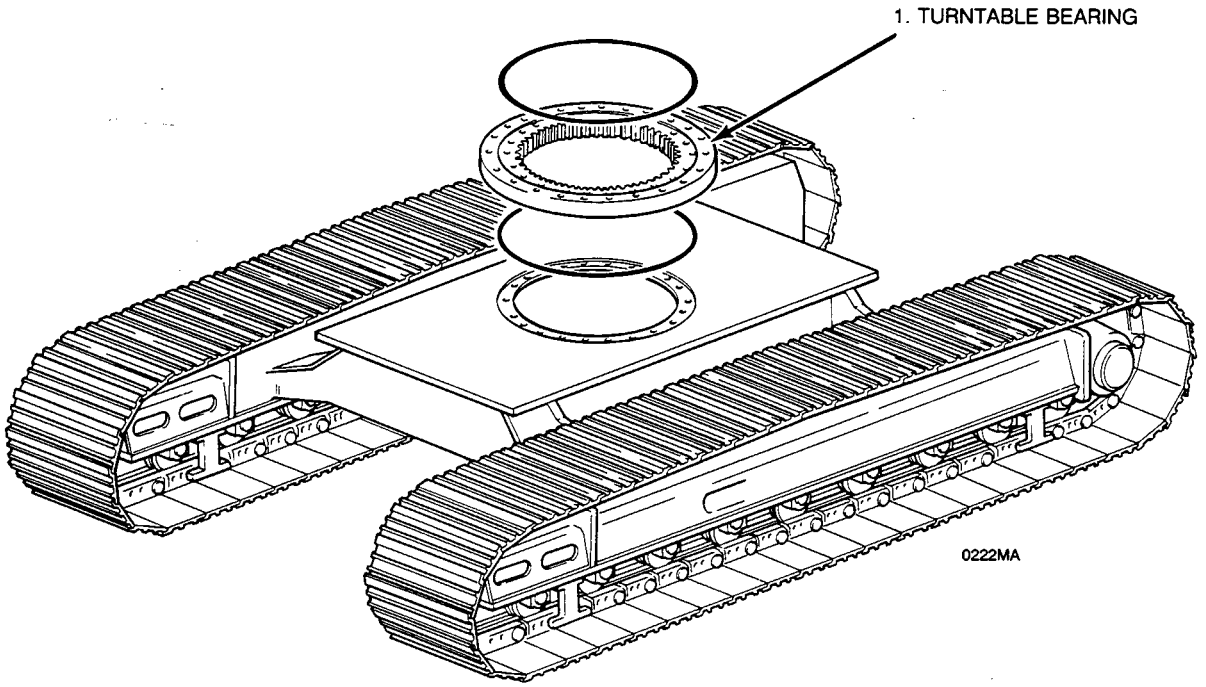
Don 8-89140

Printed in England
December 1989

TURNTABLE BEARING

Removal

STEP 27

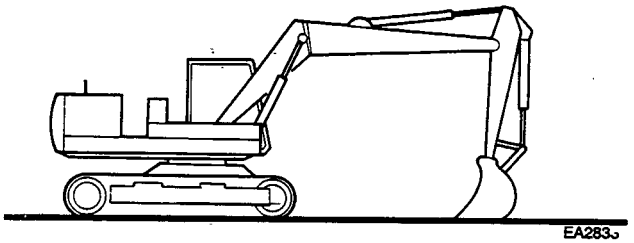


Remove the hydraulic swivel, Refer to Section 8200. Install suitable lifting equipment onto the turntable bearing. Remove the turntable bearing lower retaining bolts and spacers and remove the turntable bearing.

NOTE: *The turntable bearing weighs 135 kg (300 lb).*

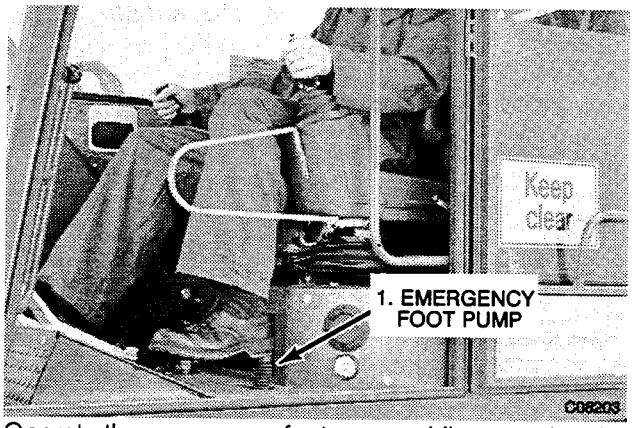
Removal

STEP 1



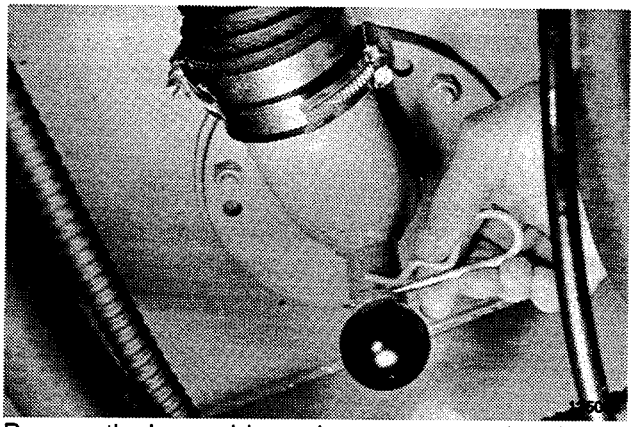
Park the machine on level ground in the position shown and stop the engine.

STEP 2



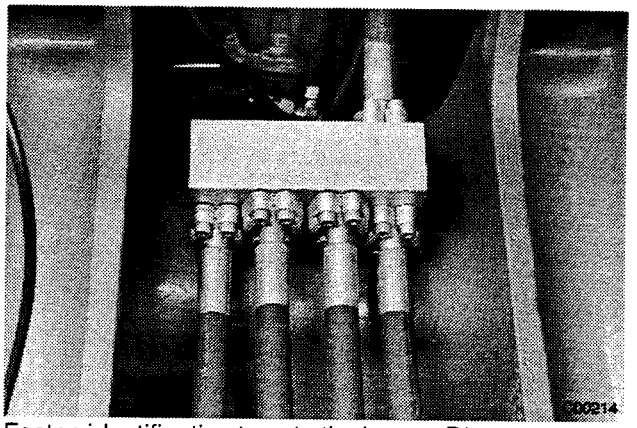
Operate the emergency foot pump while operating the boom and dipper control levers to release pressure in the hydraulic system.

STEP 3



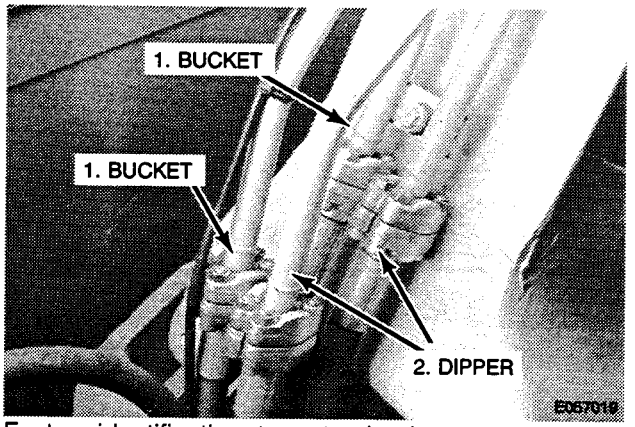
Remove the lower side engine access panel under the hydraulic oil tank. Remove the pin and pull the knob down to close the hydraulic oil tank shut-off valve.

STEP 4



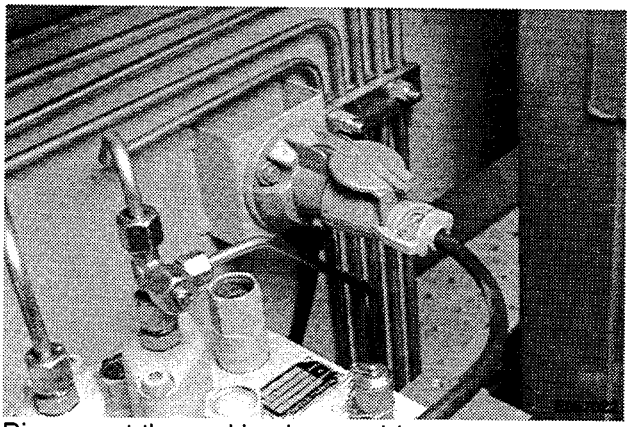
Fasten identification tags to the hoses. Disconnect and cap the boom cylinder hoses from the manifold.

STEP 5



Fasten identification tags to the hoses and tubes. Disconnect and cap the bucket and dipper hoses from the tubes.

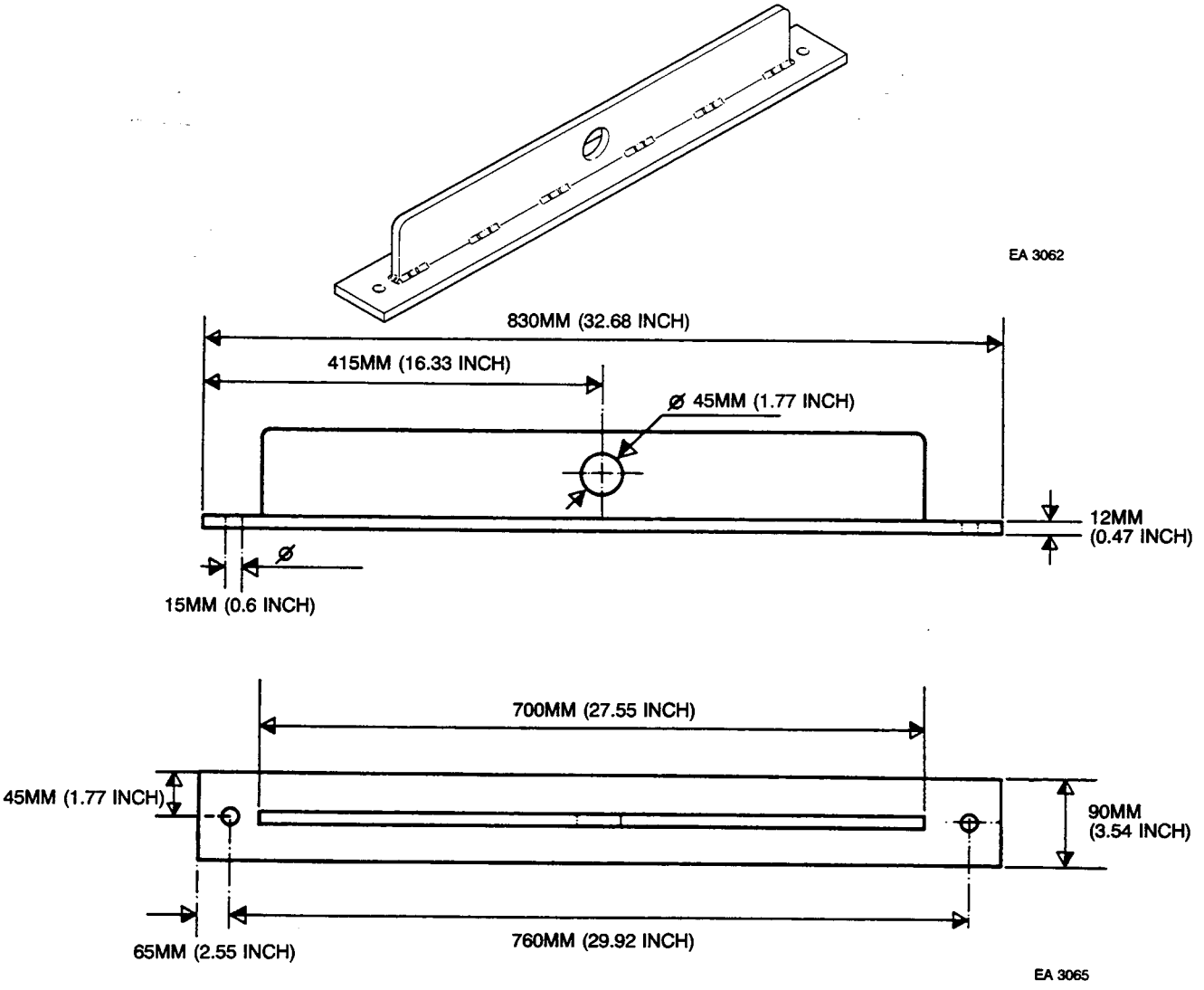
STEP 6



Disconnect the working lamp cable.

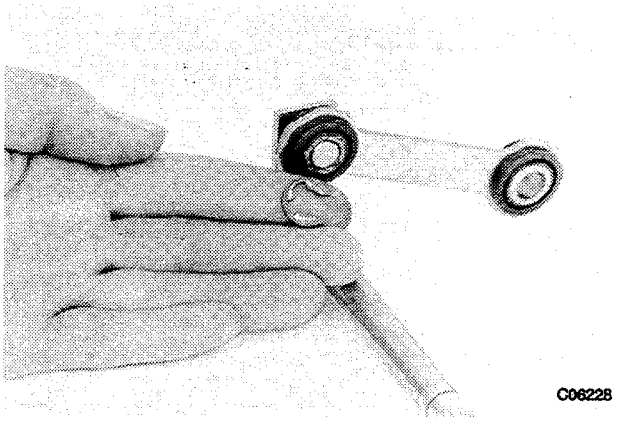
TOOLS TO BE MADE

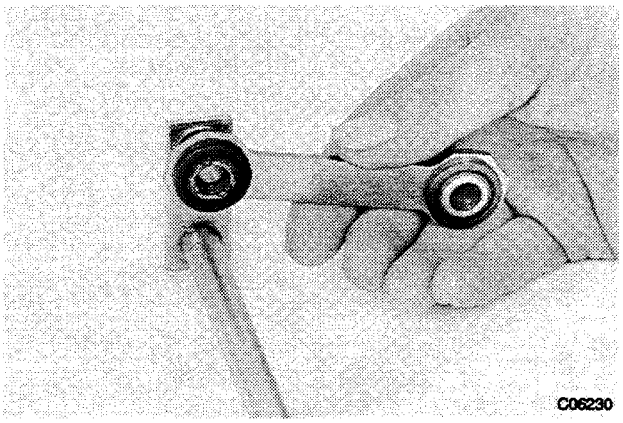
IMPORTANT: *The welding of this assembly must be carried out by an able welder.*



4. CAB LIFTING BRACKET

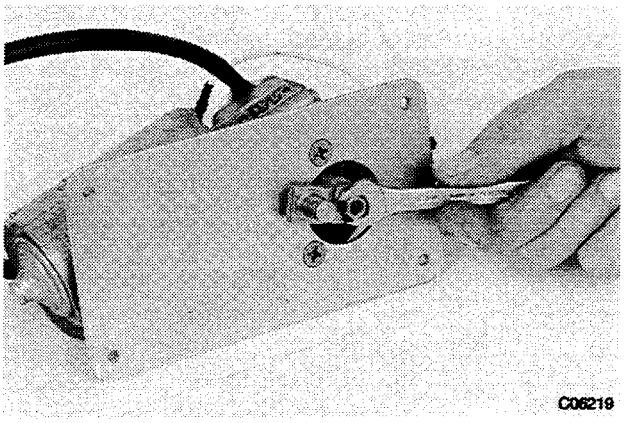
STEP 19





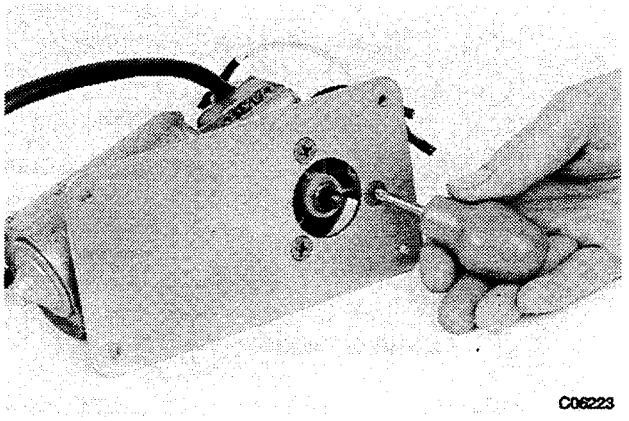
Remove the retaining clip and the pivot arm.

STEP 20



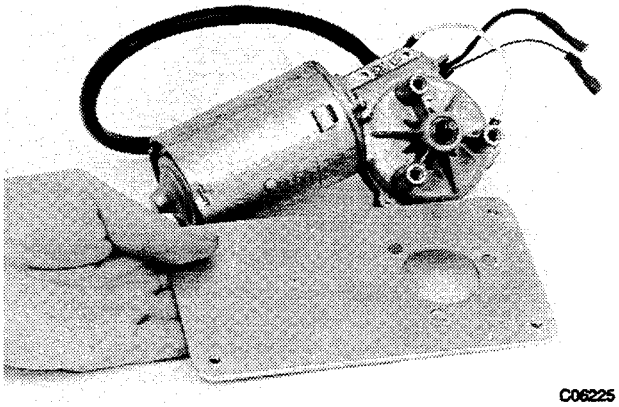
Remove the wiper motor drive lever.

STEP 21



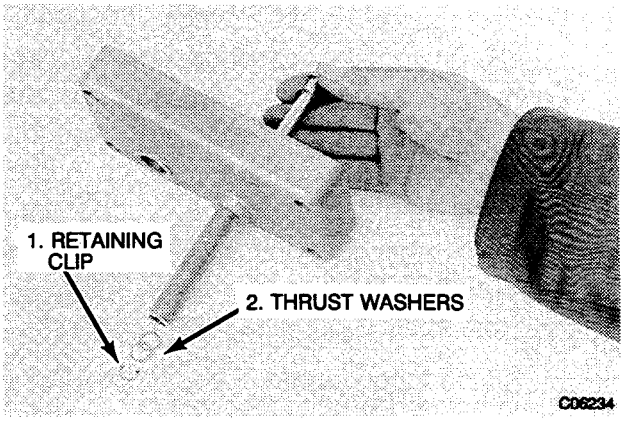
Remove the wiper motor mounting plate screws.

STEP 22



Remove the mounting plate.

STEP 23



Remove the retaining clip, thrust washers and the idler shaft.

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