CATERPILLAR®

Service Repair Manual

Model

322 322L EXCAVATOR

Product: EXCAVATOR
Model: 322-A EXCAVATOR 7WL
Configuration: 322 322L TRACK-TYPE EXCAVATORS 7WL00001-UP (MACHINE) POWERED BY 3116 ENGINE

Disassembly and Assembly
322, 322 L, 322 N & 322 LN EXCAVATORS MACHINE SYSTEMS
Media Number -SENR6159-01 **Publication Date -01/06/1998** **Date Updated -01/10/2009**

SENR61590022

Final Drive Sprockets

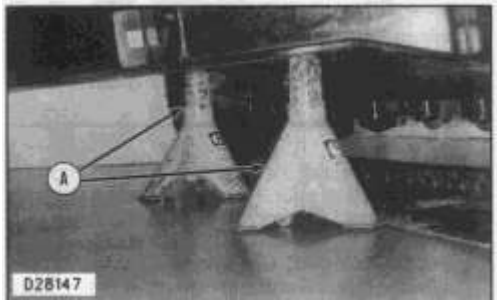
SMCS - 4164-010

Remove & Install Final Drive Sprockets

Tools Needed		A	B
8S-7640	Stand	2	
8S-7611	Tube	2	
8S-7615	Pin	2	
6V-2157	Link Bracket		1

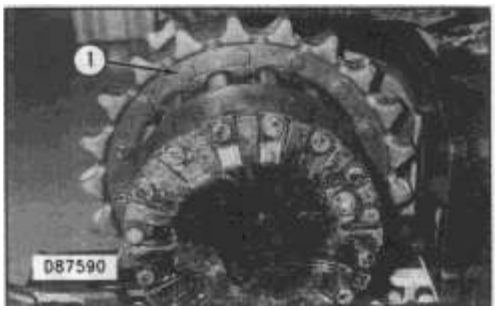
Start By:

a. separate track assemblies

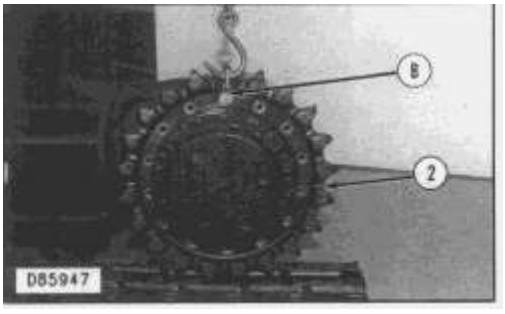


NOTE: Adjust the height of Tooling (A), so when it is installed under the frame of the machine, there is enough clearance between the sprocket and the track links for removal of the sprocket from the final drive.

1. Lift the side of the machine, and install Tooling (A) under the frame as shown.



2. Remove sixteen bolts (1) that hold the sprocket to the final drive.



Typical Example

3. Fasten Tool (B) and a hoist to sprocket (2) as shown. Remove the sprocket. The weight of the sprocket is 41 kg (90 lb).

NOTE: The following steps are for the installation of the final drive sprocket.

4. Thoroughly clean the mating surfaces of the sprocket and final drive prior to installation of the sprocket.

5. Fasten Tool (B) and a hoist to sprocket (2), and put it in position on the final drive.

6. Put a thin coat of **9S-3263** Thread Lock on the threads of sixteen bolts (1) that hold the sprocket to the final drive. Install the bolts that hold the sprocket to the final drive. Tighten the bolts to a torque of 530 ± 70 N·m (395 ± 50 lb ft).

7. Raise the machine, and remove Tooling (A) from under the frame.

End By:

a. connect track assemblies

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Media Number -SENR6159-01 **Publication Date -01/06/1998** **Date Updated -01/10/2009**

SENR61590023

Travel Brake Valves

SMCS - 4112-010; 4112-017

Remove & Install Travel Brake Valves

WARNING

At operating temperature, the hydraulic oil is hot and under pressure. Hot oil can cause burns. To prevent possible personal injury, release the pressure in the implement hydraulic circuits (boom, stick and bucket) before any hydraulic lines or components are disconnected or removed.

1. Release the pressure in the hydraulic system as follows:

a. Fully retract the rod in the stick cylinder.

b. Adjust the position of the bucket so it will be flat on the ground when the boom is lowered.

c. Lower the boom until the bucket is flat on the ground.

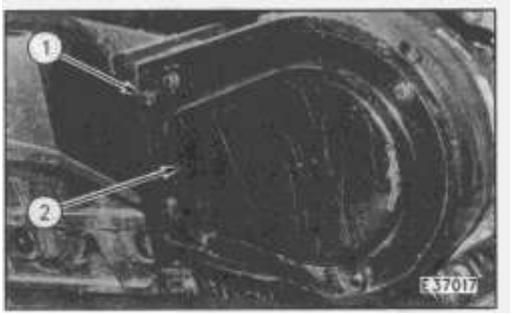
d. Shut off the engine, and put the hydraulic activation control lever in the "Lock" position.

e. Move the control levers for the boom, bucket, stick and swing through their full travel strokes. This will relieve any pressure that may be present in the pilot system.

f. Slowly loosen the Fill/Vent plug on the hydraulic oil tank to release the pressure.

g. Tighten the Fill/Vent plug on the hydraulic oil tank.

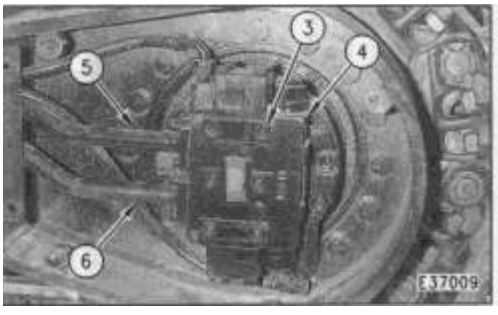
h. The pressure in the hydraulic system has now been released. Lines and components can now be removed.



2. Remove six bolts (1) and the washers that hold cover assembly (2). Remove cover assembly (2) from the inside rear of the undercarriage frame assembly.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment containing fluids. Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide", for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose of all fluids according to local regulations and mandates.



3. Disconnect pipes (5) and (6) from the travel brake valve. Put plugs in the pipes to keep dirt and debris out of the hydraulic system.

4. Remove six socket head bolts (3) that hold travel brake valve (4) to the travel motor. Using two persons, remove the travel brake valve. The weight of the travel brake valve is 25 kg (55 lb). Remove the three O-ring seals from the travel motor.

NOTE: The following steps are for the installation of the travel brake valve.

5. Thoroughly clean the travel brake valve and the mating surface on the travel motor.

6. Check the condition of the three O-ring seals used between the travel brake valve and the travel motor. If the seals are damaged, use new parts for replacement. Install the three O-ring seals in the travel motor. Put clean hydraulic oil on the seals.

7. Install travel brake valve (4) and six socket head bolts (3) that hold it. Tighten the bolts to a torque of 80 ± 8 N·m (60 ± 6 lb ft).

8. Check the condition of the O-ring seals in two pipes (5) and (6). If the seals are damaged, use new parts for replacement. Install the O-ring seals in the pipes. Connect them to the travel brake valve in their original locations.

9. Fill the hydraulic oil tank with oil to the correct level. See the Operation & Maintenance Manual for the correct filling procedure.

10. Start the machine, and check for leaks. Reinstall cover assembly (2) and bolts (1) and the washers that hold it.

Disassemble & Assemble Travel Brake Valves

Tools Needed		A
9T-3665	Threaded Rod	2
6V-8149	Nut	2
5P-8245	Washer	2
5F-7344	Crossblock	1
5F-7345	Screw	1
8B-7560	Step Plate	1

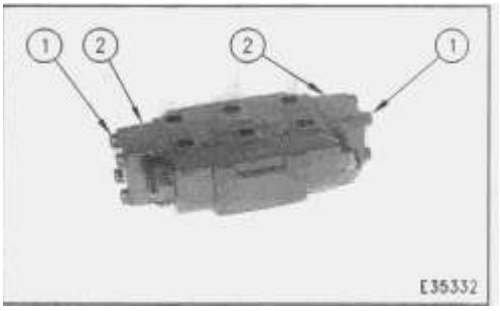
Start By:

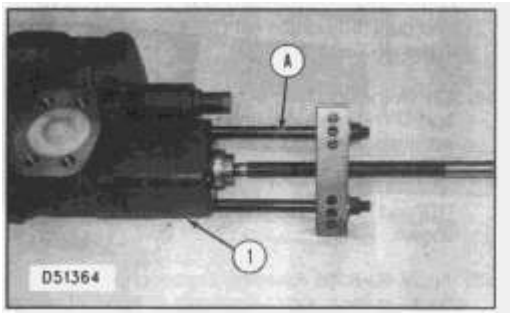
a. remove travel brake valve

1. Thoroughly clean the outside of the travel brake valve prior to disassembly.

NOTICE

During disassembly of the travel brake valve, mark all components as to their location in the valve assembly. Do not mix the parts.





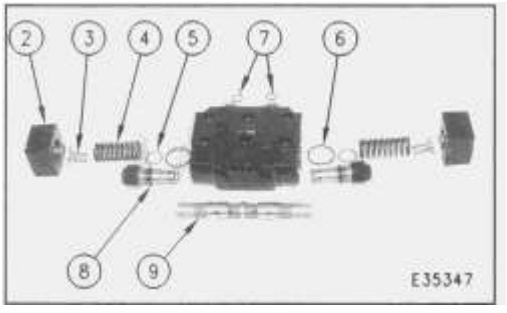
Typical Example

WARNING

There is spring pressure behind caps (2) which will cause the assembly to fly apart when socket head bolts (1) are removed. To prevent possible personal injury, use Tooling (A) to retain caps (2) when socket head bolts (1) are being removed.

2. Only remove two of the socket head bolts (1) that are diagonal to each other. Then, install Tooling (A) as shown. Tooling (A) will retain cap (2) when the two remaining socket head bolts (1) are removed. Remove two remaining socket head bolts (1). Slowly turn out Tooling (A) until the spring pressure behind cap (2) has been fully released.

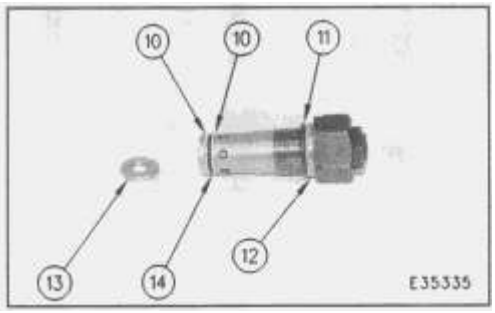
3. Remove the other cap (2) as in Step 2.

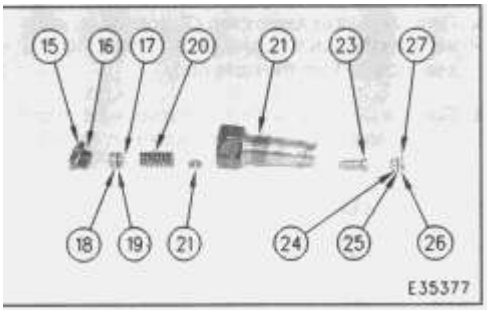


4. Remove plunger assemblies (3), springs (4) and washers (5) from the valve body. Remove spool assembly (9) from the valve body.

5. Remove O-ring seals (6) from the valve body and O-ring seals (7) from the connectors on the valve body.

6. Remove relief valve assemblies (8) from the valve body.





NOTE: Spacers (13) may have remained in the valve body during removal of relief valve assemblies (8).

7. Disassemble the relief valve assemblies. Remove spacers (13) from the valve body. Remove back-up rings (10), O-ring seal (14), O-ring seal (11) and back-up ring (12) from the relief valves.

8. Loosen nut (15). Remove screw (16), plug (17), spring (20) and retainer (21) from body (22). Remove back-up ring (18) and O-ring seal (19) from plug (17).

9. Remove seat (27) and valve (23) from body (22). Remove back-up rings (24) and (26) and O-ring seal (25) from seat (27).

NOTE: The following steps are for the assembly of the travel brake valve.

10. Thoroughly clean all parts of the travel brake valve prior to assembly.

11. Assemble relief valves (8) as indicated in Steps 12 through 14.

12. Check the condition of back-up rings (24) and (26) and O-ring seal (25). If the rings and seal are damaged, use new parts for replacement. Install back-up rings (24) and (26) and O-ring seal (25) on seat (27). Apply **1U-6396** Assembly Compound on the back-up rings and O-ring seal. Install valve (23) and seat (27) in body (22).

13. Check the condition of back-up ring (18) and O-ring seal (19). If the ring and seal are damaged, use new parts for replacement. Install back-up ring (18) and O-ring seal (19) on plug (17). Apply **1U-6396** Assembly Compound on the back-up ring and O-ring seal. Install retainer (21), spring (20) and plug (17) in body (22). Install screw (16) and nut (15). Tighten nut (15) to a torque of 70 ± 7 N·m (50 ± 5 lb ft).

14. Check the condition of back-up rings (10) and (12) and O-ring seals (11) and (14). If the rings and seals are damaged, use new parts for replacement. Install back-up ring (12) and O-ring seal (11) on the relief valve. Install back-up rings (10) and O-ring seal (14) on the relief valve as shown.

15. Apply **1U-6396** Assembly Compound on the back-up rings and O-ring seals of the relief valves. Install spacers (13) and relief valves (8) in their original location in the valve body. Tighten the relief valves to a torque of 200 ± 20 N·m (150 ± 15 lb ft).

NOTICE

Be sure the outer surface and the spool guides in each end of spool assembly (9) are thoroughly clean prior to installation in the valve body.

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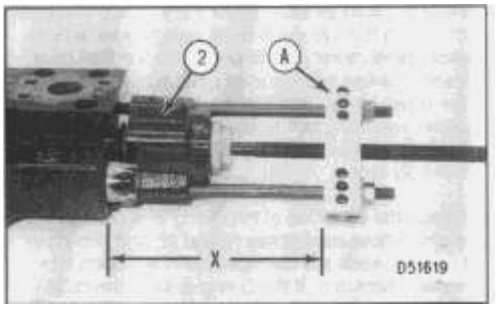
16. Put a thin coat of clean hydraulic oil on spool assembly (9), and install it in the valve body.

17. Check the condition of O-ring seals (6). If the seals are damaged, use new parts for replacement. Install O-ring seals (6) in the valve body.

18. Be sure plungers (3) are thoroughly clean prior to installation in the valve body. Put a thin coat of clean hydraulic oil on plungers (3). Install washers (5), springs (4) and plungers (3) in their original locations in the valve body.



Typical Example

NOTICE

The spool assembly and plunger assemblies in the travel brake valve will be damaged if caps (2) are not installed properly. The caps must be installed squarely with the valve body to prevent binding of the plunger assemblies on the end of the spool assembly.

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19. Be sure plunger assembly (3) is thoroughly clean prior to installation in cap (2). Install the plunger assembly in the cap. Apply clean hydraulic oil on plunger assembly (3). Install washer (5) and spring (4) in the valve body.

20. Put cap (2) in position over spring (4), and install Tooling (A) as shown. Be sure that cap (2) is square with the valve body by measuring dimension (X) on both sides of the cap. Slowly compress the cap with Tooling (A), while keeping dimension (X) the same on both sides of the cap. Do this until the cap makes contact with the valve body. Install two socket head bolts (1) to

hold the cap in position. Remove Tooling (A) from the valve. Install the other two socket head bolts (1).

21. Install the other cap (2) as in Step 20.

22. After installation of both caps (2), tighten socket head bolts (1) to a torque of 80 ± 8 N·m (60 ± 6 lb ft).

NOTE: After installation of the travel brake valve, adjust relief valves (8). See the "Testing And Adjusting" module for the correct adjustment procedure.

End By:

a. install travel brake valves

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Media Number -SENR6159-01 **Publication Date -01/06/1998** **Date Updated -01/10/2009**

SENR61590024

Travel Motors

SMCS - 4351-010; 4351-017

Remove & Install Travel Motors

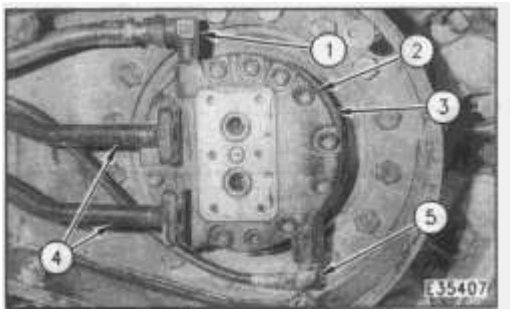
NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment containing fluids. Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide", for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose of all fluids according to local regulations and mandates.

NOTE: Prior to removing the travel brake valve for removal of the travel motor, drain the oil from the final drive into a suitable container for storage or disposal. To drain the oil, put the drain plug in the final drive at the bottom position by moving the machine. Remove the drain plug to drain the oil. The capacity of the final drive is 10 liters (2.6 U.S. gal).

Start By:

a. remove travel brake valves



View From Right Rear Side Of Undercarriage Frame Assembly

NOTE: Six socket head bolts (2) hold the travel motor to the final drive.

1. Remove two upper socket head bolts (2) that hold the travel motor to the final drive. Install two guide bolts, that are slightly longer than the original mounting bolts, in the upper two mounting bolt holes.

2. Disconnect hose assemblies (1) and (5) from the travel motor. Put plugs in the hose assemblies to keep dirt and debris out of the hydraulic system.

3. Move hose assemblies (1) and (5) and two pipes (4) clear of the travel motor.

4. Remove the four remaining socket head bolts (2) that hold travel motor (3) to the final drive. Using two persons, slide travel motor (3) out on the guide bolts. Fasten a hoist to travel motor (3), and remove it from the final drive. The weight of the travel motor is 66 kg (145 lb).

5. Remove the O-ring seal from the body of the travel motor.

NOTE: The following steps are for the installation of the travel motor.

6. Thoroughly clean the mating surfaces of the travel motor and final drive prior to installation of the travel motor.

7. Check the condition of the O-ring seal used on the body of the travel motor. If the seal is damaged, use a new part for replacement. Install the O-ring seal on the body of the travel motor. Apply clean hydraulic oil on the O-ring seal.

8. Fasten a hoist to travel motor (3). Position the travel motor on the two guide bolts. Use two persons to slide travel motor (3) into position in the final drive. Install the four lower socket head bolts (2) that hold the travel motor. Remove the guide bolts from the upper mounting bolt holes, and install two upper socket head bolts (2). Tighten the six socket head bolts (2) evenly.

9. Check the condition of the O-ring seal used in the ends of hose assemblies (1) and (5) and two pipes (4). If the seals are damaged, use new parts for replacement. Install the O-ring seals in the hose assemblies and pipes. Connect hose assemblies (1) and (5) and two pipes (4) to the travel motor in their original locations.

10. Fill the final drive with oil to the correct level. See the Operation & Maintenance Manual for the correct filling procedure.

End By:

a. install travel brake valves

Disassemble & Assemble Travel Motors

Tools Needed	A
1P-0520 Driver Group	1

Start By:

a. remove travel motors

1. Thoroughly clean the outside of the travel motor prior to disassembly. Fasten the travel motor to a suitable holding fixture in a vertical position. The weight of the travel motor is 66 kg (145 lb).

2. Put an alignment mark across the head and body of the travel motor for assembly purposes. The head must be reinstalled in its original position on the travel motor body.

NOTICE

During removal of head (2) from the travel motor body, do not scratch or damage the mating surfaces of the components.

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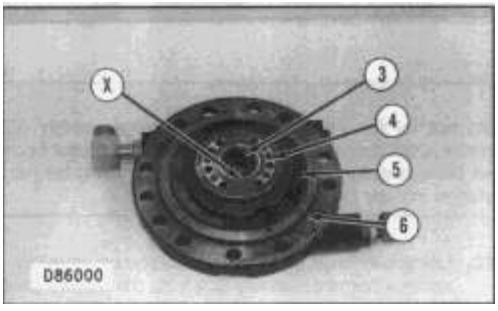
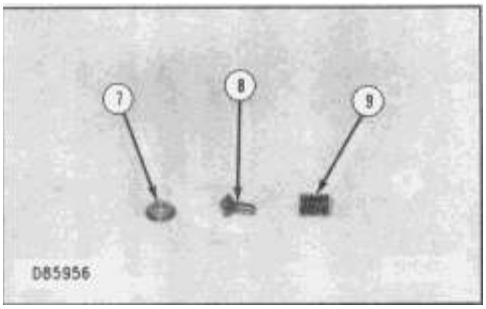
3. Remove nine socket head bolts (1) and head (2) from the travel motor body.

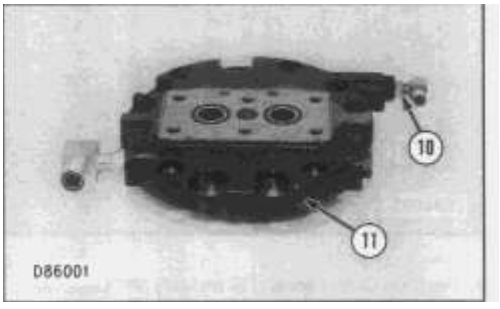




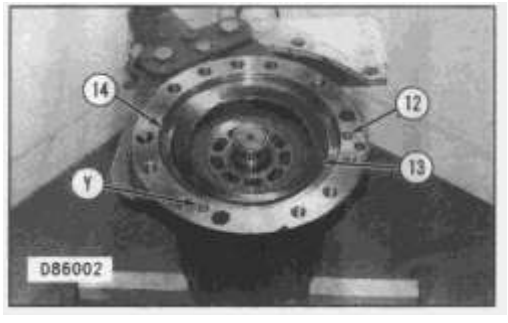
4. Turn head (2) over, and remove O-ring seal (6), shims (5), port plate (4) and bearing (3) from the head. Remove the two check valve assemblies from the head.

NOTE: There is a retainer located under spring (9). This retainer is a press fit in head (2). Do not remove the retainer.

5. Install a small diameter rod in hole (X). Tap the rod with a plastic hammer to remove spring (9), poppet (8) and seat (7) from the head.

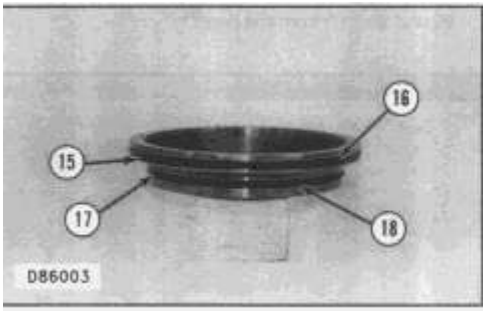


6. Remove three fittings (10) and four plugs (11) from the head. Remove the O-ring seal from each fitting. Remove the plug, O-ring seal, spool, spring, two orifices and two O-ring seals from the head.

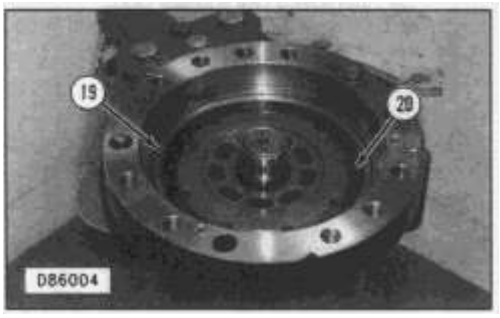


7. Remove three O-ring seals (12) and washer set (13) from the travel motor body.

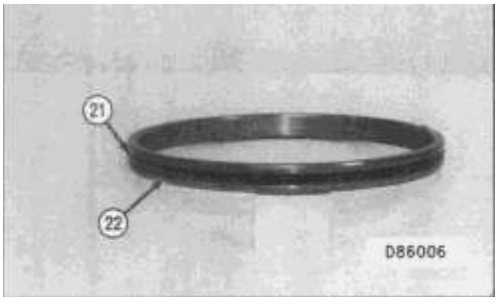
8. Place a shop towel over brake piston (14). While retaining brake piston (14) by hand, apply shop air pressure (free of water) of approximately 525 kPa (75 psi) to brake release port (Y). Brake piston (14) will move up and out of the piston guide. Remove brake piston (14) from the travel motor body.



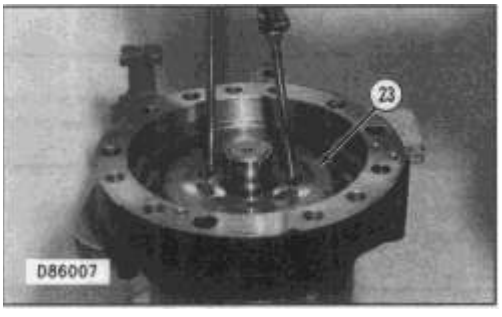
9. Remove O-ring seals (15) and (17) and back-up rings (16) and (18) from the brake piston.



10. Remove piston guide (19), three friction plates and three steel plates (20) from the travel motor body.



11. Remove O-ring seal (21) and back-up ring (22) from the piston guide.



NOTICE

Do not let the components of barrel assembly (23) come apart during removal from the travel motor body. All components in the barrel assembly must be reinstalled in their original locations.

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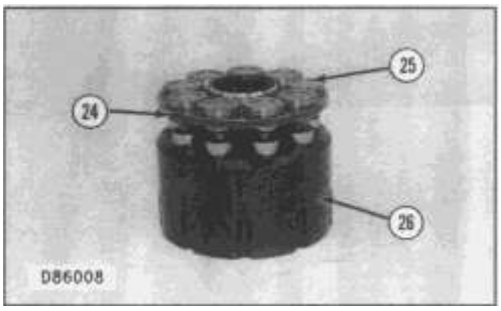
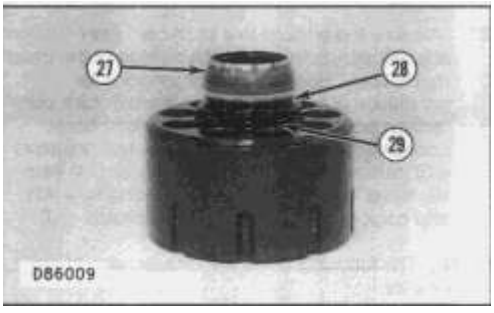
12. Using two large screwdrivers as shown, carefully remove barrel assembly (23) from the travel motor body so the components do not fall apart.

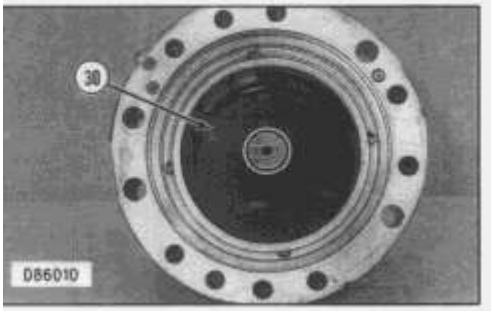


13. Shoe retainer (24) and piston shoe assemblies (25) are not serviced separately. Prior to removal of the shoe retainer and piston shoe assemblies from barrel (26), put identification marks on piston shoe assemblies (25) as to their location in shoe retainer (24) and barrel (26). The piston shoe assemblies must be reinstalled in their original bores in the shoe retainer and the barrel.

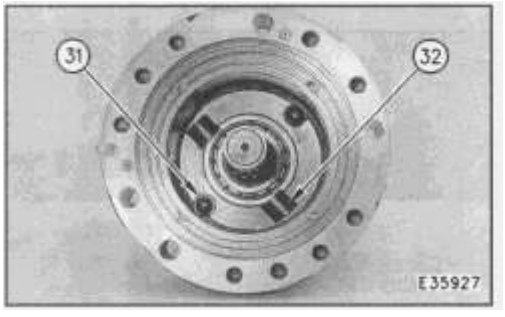
14. Remove shoe retainer (24) and piston shoe assemblies (25) from barrel (26). Separate the piston shoe assemblies from the shoe retainer.



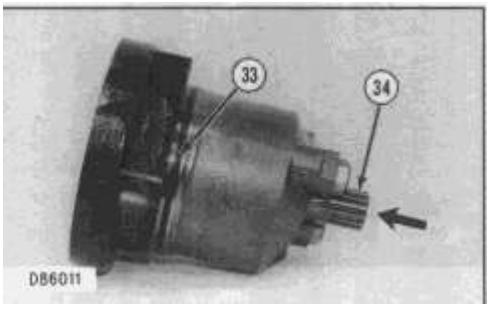
15. Remove guide (27), spacer (28) and nine springs (29) from the barrel.



16. Remove cam plate (30) from the travel motor body.

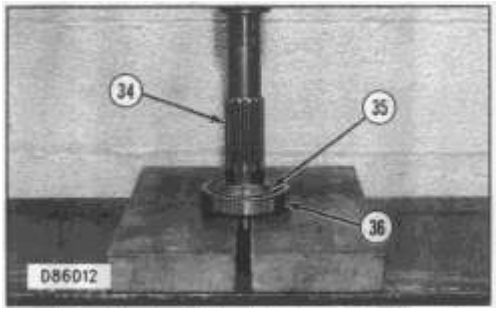


17. Put identification marks on two balls (31) and two keys (32) as to their location in the travel motor body. Remove two balls (31) and two keys (32) from the travel motor body.

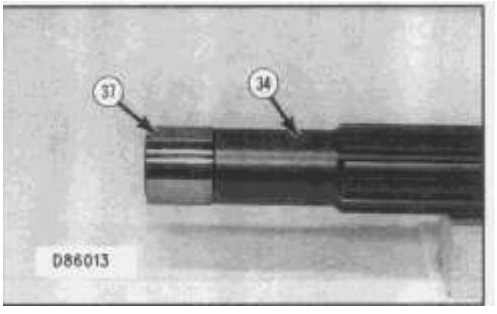


18. Remove O-ring seal (33) from the travel motor body.

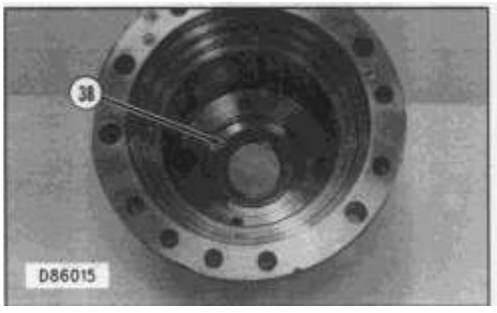
19. Using a soft faced hammer, remove shaft (34) from the travel motor body in the direction shown.



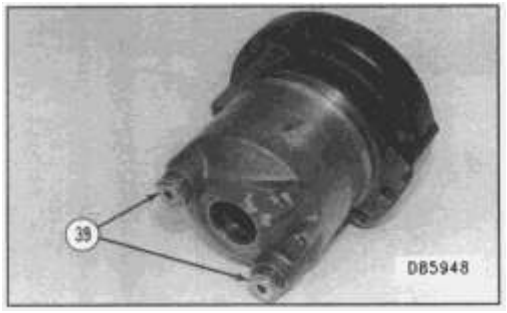
20. Remove a retaining ring (35) from each side of bearing (36). Push shaft (34) out of bearing (36) with a press.

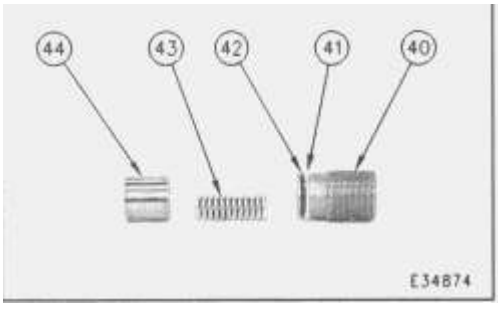


21. Remove inner race (37) from shaft (34).



22. Remove lip-type seal (38) from the travel motor body.



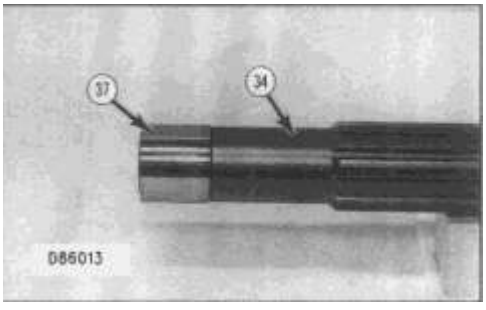


23. Measure the amount that each cam plate tension adjuster protrudes above the outside of the travel motor body. Record these dimensions for installation purposes. Remove the two cam plate tension adjusters from the travel motor body. Loosen two nuts (39), and remove two adjusters (40), two springs (43) and two pistons (44) from the travel motor body. Remove O-ring seal (42) and back-up ring (41) from each adjuster (40).

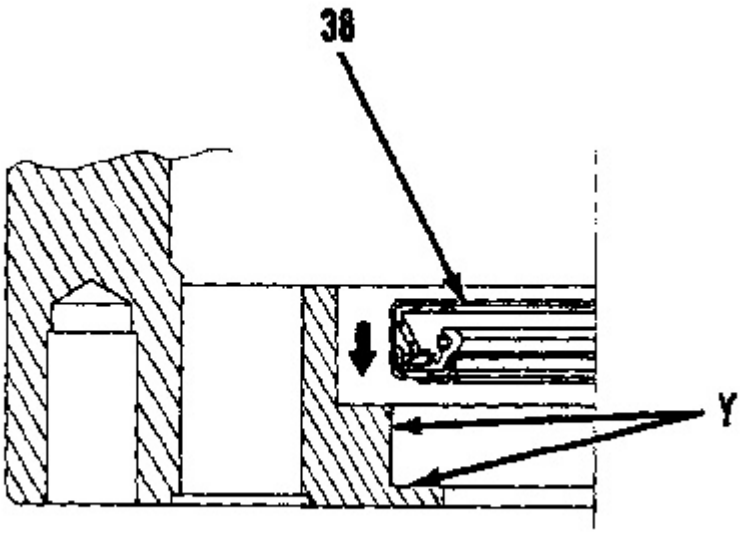
NOTE: The following steps are for assembly of the travel motor.

24. Be sure all parts of the travel motor are thoroughly clean and free of dirt and debris prior to assembly.

25. Install retaining ring (35) in the groove on shaft (34). Install bearing (36) on shaft (34) with a press. Install the bearing until it makes contact with the retaining ring. Install the other retaining ring (35) on the other side of bearing (36).



26. Install inner race (37) on the end of shaft (34) until it is seated against the shoulder on the shaft.



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27. Apply **5P-3413** Pipe Sealant or **1U-8846** Gasket Maker on surfaces (Y) of the travel motor body. Using Tool (A), install lip-type seal (38) in the body with the lip of the seal facing in as shown. Be sure the seal makes contact with the counterbore in the body after installation.

NOTICE

During installation of shaft (34) in the travel motor body, rotate the shaft slowly to be sure it does not bind.

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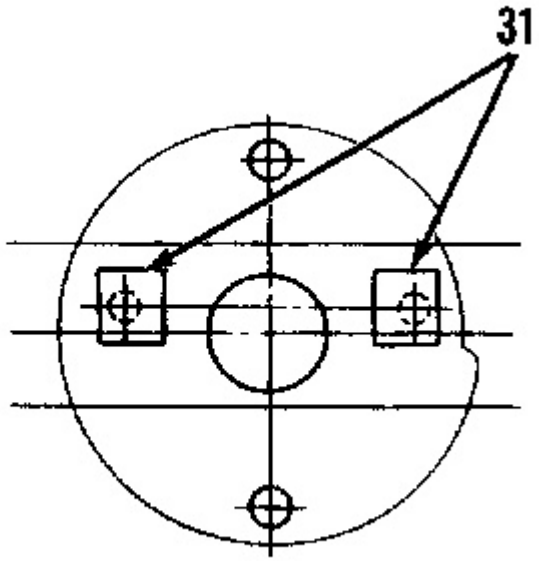
28. Apply clean hydraulic oil on the lip of lip-type seal (38). Install shaft (34) in the travel motor body with a press. Rotate the shaft slowly during installation, making sure it does not bind. Be sure the bearing on the shaft makes contact with the counterbore in the body.



NOTICE

The locating pin on each key (32) is not centered. To prevent damage to barrel assembly (23) during assembly of the travel motor, the keys must be installed as shown in the illustration. Also, the keys must be installed in their original locations in the travel motor body.

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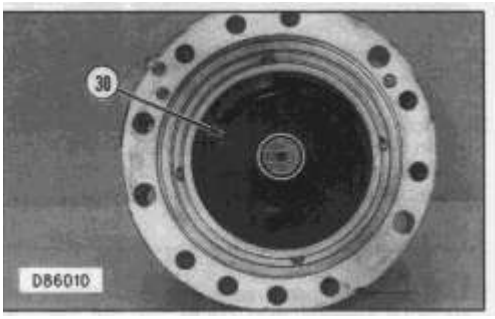
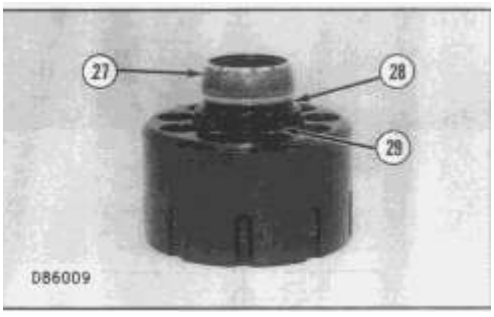
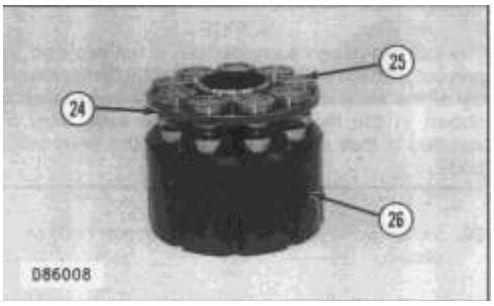
29. Install two keys (32) in the travel motor body as shown.



30. Install cam plate (30) in the travel motor body in its original position. Be sure the machined cutouts in the cam plate engage with the keys.



31. Install nine springs (29) in the barrel. Install spacer (28) and guide (27) on the barrel.



32. Install piston shoe assemblies (25) in their original bores in shoe retainer (24).

33. Apply clean hydraulic oil in the bores of the barrel and on piston shoe assemblies (25). Install the piston shoe assemblies with the shoe retainer in their original bores in barrel (26).

NOTICE

Prior to installing barrel assembly (23), be sure cam plate (30) is correctly engaged on keys (32). When the travel motor body is tilted to allow installation of barrel assembly (23), cam plate (30) can slide off of keys (32). The remainder of the travel motor can be assembled with the cam plate out of position, however extensive parts damaged will occur during the remaining assembly procedure. Use the procedure which follows to prevent parts damage.

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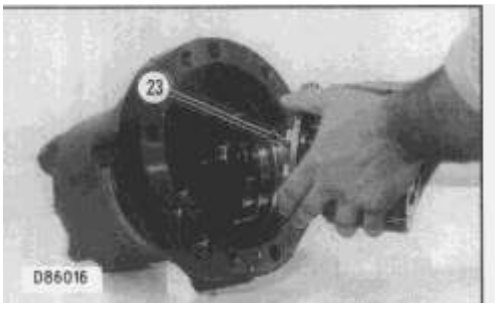
34. Apply clean hydraulic oil on the sliding surfaces of the cam plate, the piston shoe assemblies and on the splined shaft of the motor.



35. Route a piece of strong string through one of the openings for the cam plate tension adjusters, over the sliding surface of cam plate (30), and out the other opening for the cam plate tension adjusters. Hold the string tight to keep cam plate (30) properly engaged with keys (32). While keeping the string tight, put the travel motor body on its side. Do not release the tension on the string at this time. Install barrel assembly (23) on the shaft as a unit. Pull the string out of the travel motor body. It may be necessary to pull the barrel assembly and piston shoe assemblies away from the cam plate a small amount to release the string.

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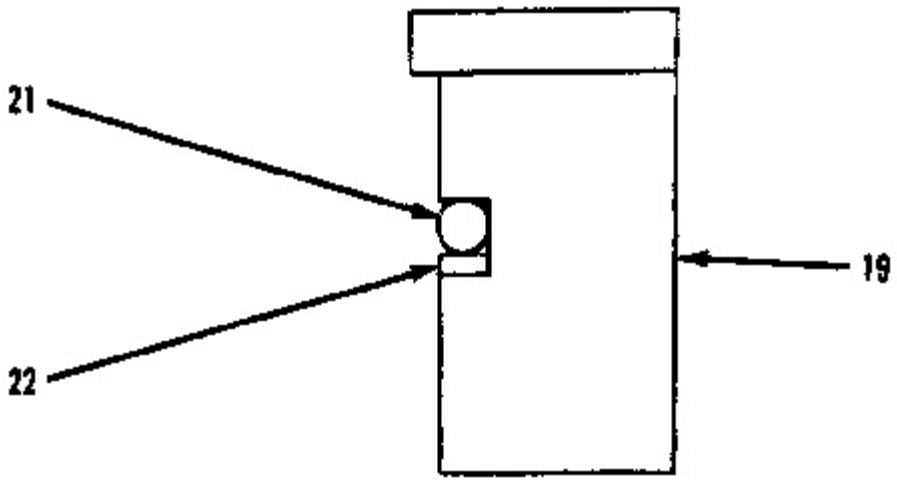
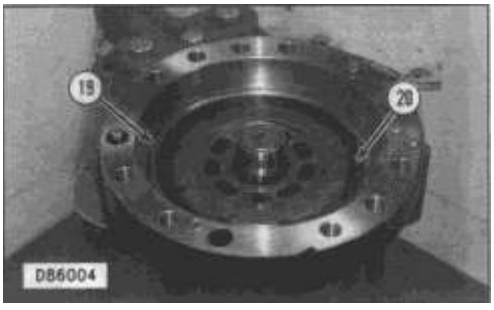


36. Check the condition of the O-ring seal and the back-up ring used on piston guide (19). If the seal or ring are damaged, use new parts for replacement. Install O-ring seal (21) and back-up ring (22) on piston guide (19) as shown.



37. Put the travel motor body in a vertical position.

38. Apply clean hydraulic oil on three friction plates and three steel plates (20). Install the plates in alternating order in the travel motor body. Start with a friction plate and end with a steel plate.

39. Apply **1U-6396** Assembly Compound on the O-ring seal and the back-up ring on piston guide (19). Install the piston guide in the travel motor body until it makes contact with the counterbore in the body.