CATERPILLAR®

Service Repair Manual

Models

330B EXCAVATOR

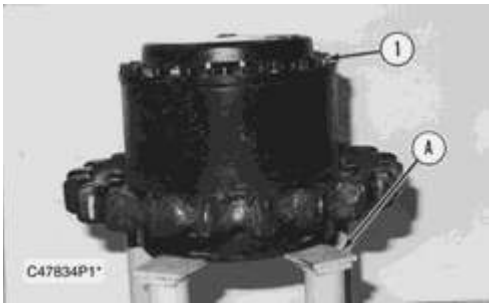
Tools Needed		A	B	C	D	E	F	G
1P-2420	Transmission Repair Stand	1						
138-7573	Link Bracket		2					
1P-1860	Pliers			1				
1P-5546	Cross Block				1		1	
6V-3142	Puller Plate				1			
5P-8248	Washer				4			
	Threaded Rod 3/4" - 16 NF x 280 mm (11 in)				1			
	Spacer 64 mm (2.5 in) O.D. 25.4 mm (1 in) I.D. 64 mm (.25 in) Thick				4			
6B-6682	Nut				1			
138-7574	Link Bracket					2		
1H-3112	Puller Assembly						1	
1P-5551	Screw						1	
5F-7465	Puller Assembly						1	
8B-7561	Plate						1	
1H-3107	Push Puller						1	
8T-9206	Seal Installer							1

Start By:

a. remove final drives

1. Thoroughly clean the outside of the final drive prior to disassembly.

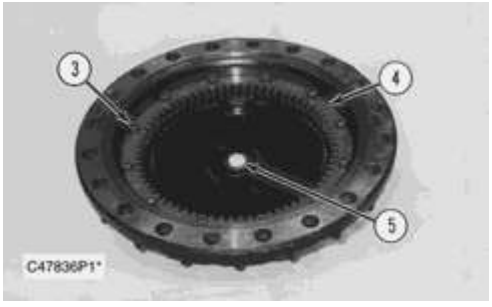
2. Put an alignment mark across the sections of the final drive for assembly purposes. The parts must be reinstalled in their original locations.



3. Fasten the final drive to Tooling (A) as shown. The combined weight of the final drive and final drive sprocket is **531 kg (1170 lb)**.

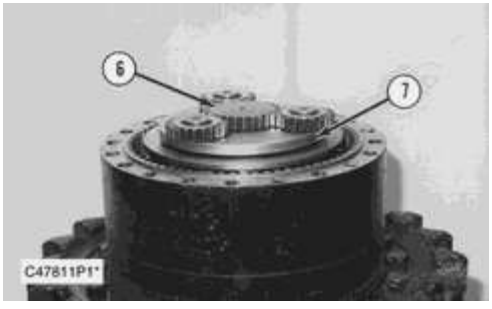
4. Remove 20 bolts (1) and the washers that hold the cover in place.

5. Using a soft faced hammer, break the seal between cover (2) and the ring gear. Fasten Tooling (B) and a hoist to cover (2) as shown. Remove the cover. The weight of the cover is **30 kg (66 lb)**.

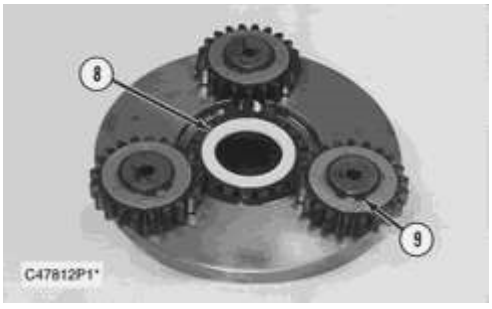


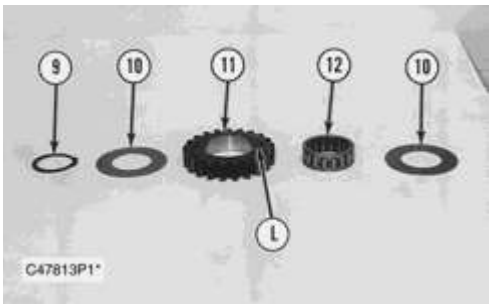
6. Remove thrust plate (5) from the cover.

7. Remove 12 socket head bolts (3) and ring gear (4) from the cover.



8. Remove sun gear (6). Remove carrier assembly (7) by lifting it straight up. The weight of the carrier assembly is **14 kg (30 lb)**.





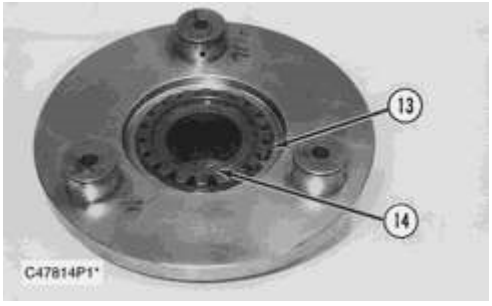
NOTE: Two spacers (8) are used with carrier assembly (7). One of the spacers fits on the top side of carrier assembly (7). The other spacer (8) is located in the carrier of carrier assembly (15).

9. Remove spacer (8) from carrier assembly (7).

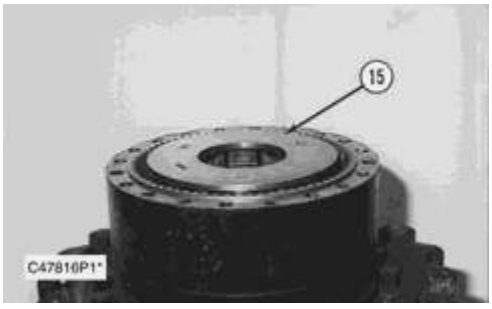
NOTE: Planetary gears (11) have identification marks (L) on them. Note the position of the identification marks in relation to the carrier for assembly purposes.

10. Remove retaining ring (9) with Tool (C). Remove two thrust washers (10) and planetary gear (11) from the carrier. Remove bearing (12) from the planetary gear.

11. Remove the other two planetary gears from the carrier as in Step 10.



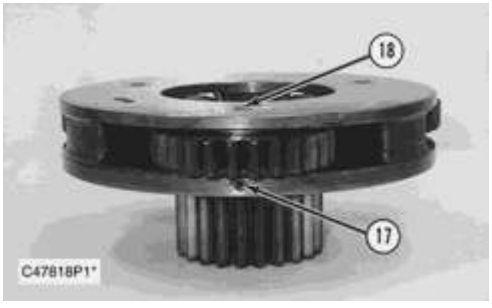
12. Using a screwdriver, remove retaining ring (13) from the carrier. Remove sun gear (14) from the carrier.

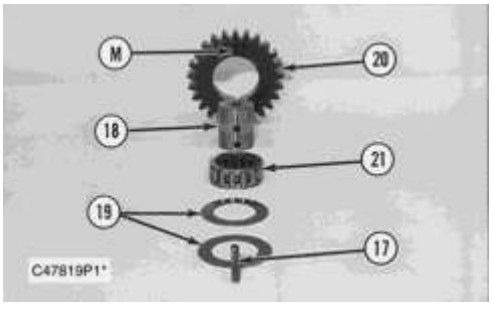


13. Using two persons, remove carrier assembly (15) by pulling it straight up. The weight of the carrier assembly is **25 kg (55 lb)**.

NOTE: Spacer (16) may remain with carrier assembly (15), or it may remain with carrier assembly (24) (Refer to the Step 19).

14. Remove the other spacer (8) (not shown) from the top side of carrier assembly (15). Remove spacer (16) from the bottom side of carrier assembly (15).



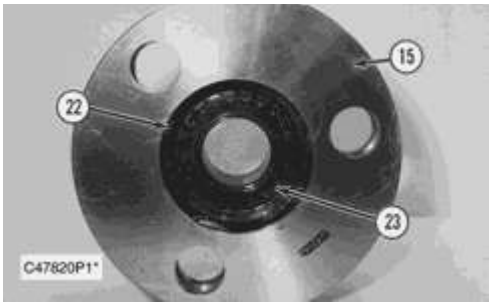


15. Drive spring pin (17) into planetary shaft (18) with a hammer and a punch.

NOTE: Planetary gears (20) have identification marks (M) on them. Note the position of the identification marks in relation to the carrier for assembly purposes.

16. Remove planetary shaft (18), two thrust washers (19) and planetary gear (20) from the carrier. Remove bearing (21) from the planetary gear. Remove spring pin (17) from planetary shaft (18) with a hammer and a punch.

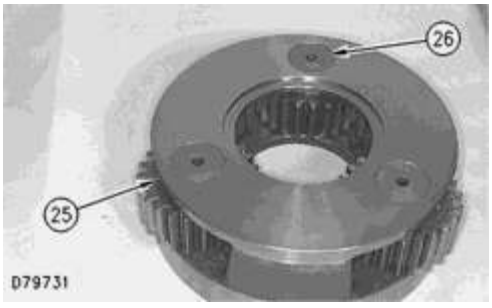
17. Remove the other two planetary gears from the carrier as in Steps 15 and 16.

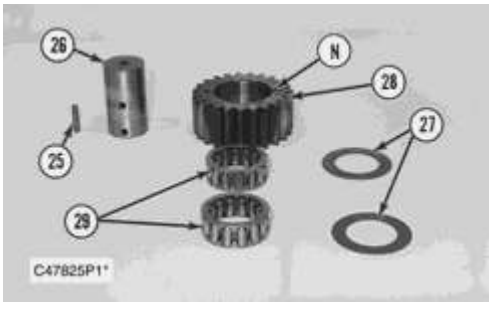


18. Using a screwdriver, remove retaining ring (22). Remove sun gear (23) from the carrier.

19. If spacer (16) was not removed in Step 14, remove it from carrier assembly (24) at this time.

20. Slide a piece of steel bar stock in between the planetary gears in carrier assembly (24) as shown. Make sure the bar stock is centered in the carrier assembly. Fasten a lifting sling and hoist to the steel bar stock as shown. Slowly lift carrier assembly (24) from the final drive. The weight of the carrier assembly is **36 kg (80 lb)**.



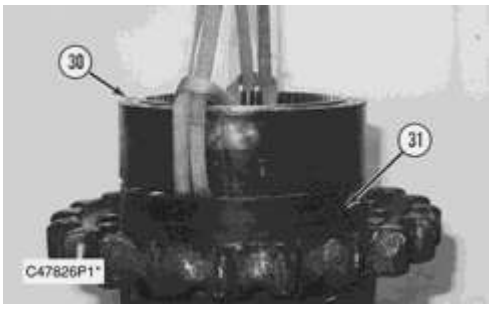


21. Drive spring pin (25) into planetary shaft (26) with a hammer and a punch.

NOTE: Planetary gears (28) have identification marks (N) on them. Note the position of the identification marks in relation to the carrier for assembly purposes.

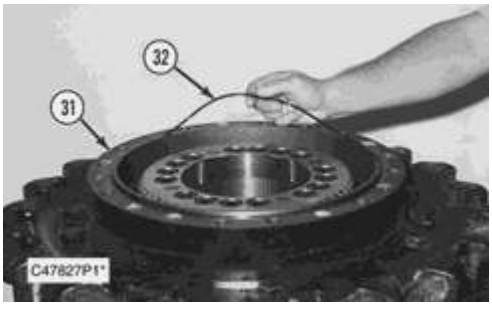
22. Remove planetary shaft (26), two thrust washers (27) and planetary gear (28) from the carrier. Remove two bearings (29) from the planetary gear. Drive spring pin (25) out of planetary shaft (26) with a hammer and a punch.

23. Remove the other two planetary gears from the carrier as in Steps 21 and 22.

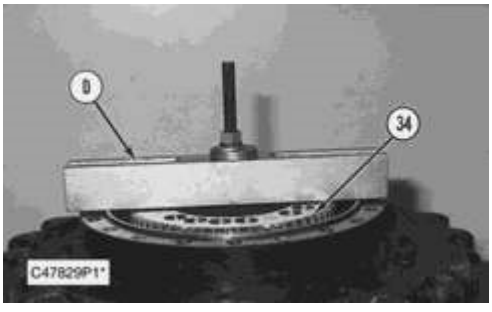


NOTE: It will be necessary to pry ring gear (30) away from main housing (31) in order to install the lifting slings.

24. Fasten lifting slings and a hoist to ring gear (30) as shown. Remove the ring gear from main housing (31). The weight of the ring gear is **66 kg (145 lb)**.

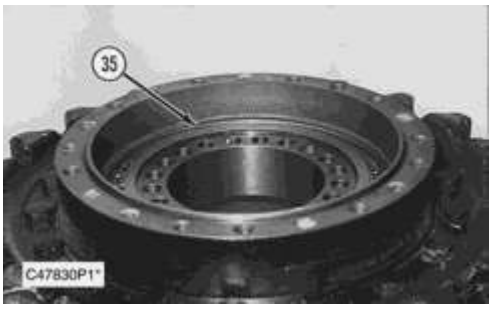


25. Remove O-ring seal (32) from main housing (31).

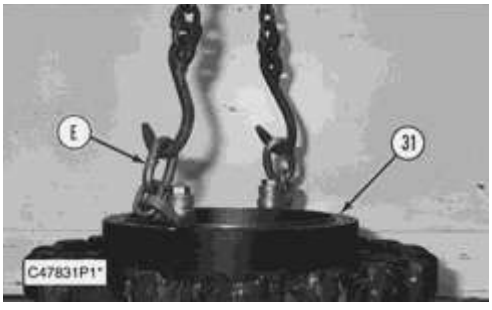


26. Remove 16 socket head bolts (33) from gear (34).

27. Using Tooling (D), remove gear (34) from the housing.

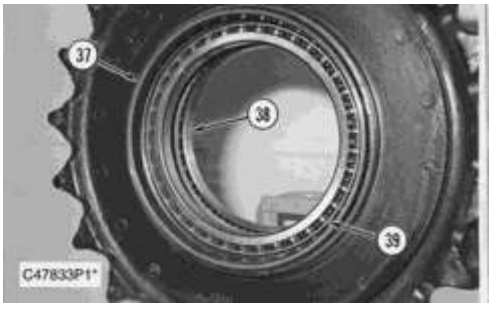


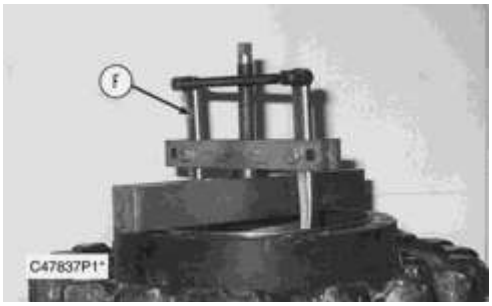
28. Remove shims (35) from the housing.



29. Fasten Tooling (E) and a hoist to main housing (31) as shown. Separate the main housing and final drive sprocket from the motor housing. The combined weight of the main housing and final drive sprocket is **approximately 191 kg (420 lb)**.

30. Remove Duo-Cone seal (36) from the motor housing.





31. Remove Duo-Cone seal (37) from the main housing.

32. Use Tooling (F) to remove bearings (38) and (39) from the main housing.

33. If necessary, remove the sprocket from the main housing. Refer to the topic "Remove & Install Final Drive Sprockets" in this module for details concerning the removal of the sprocket from the main housing.

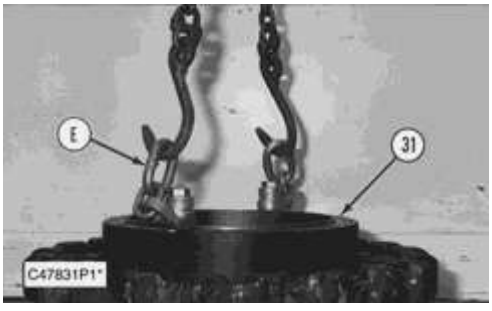
NOTE: The following steps are for the assembly of the final drives.

34. Make sure all of the parts of the final drive are thoroughly clean and free of dirt and debris prior to assembly. Check the condition of all of the O-ring seals used in the final drive. If any of the O-ring seals are damaged, us new parts for replacement. Reassemble the final drive on Tooling (A).

35. If the final drive sprocket was removed from the main housing, Refer to the topic "Remove & Install Final Drive Sprockets" in this module. This topic will give the necessary details for the installation on the sprocket on the main housing.

36. Apply **5P-3931 Anti-Seize Compound** to the surfaces inside the main housing that make contact with bearings (38) and (39). Install bearings (38) and (39) in their original locations in the main housing with a press. Install the bearings until they make contact with the counterbores in the main housing.

37. Use the following procedure to determine the correct bearing preload and the correct thickness of shims (35) used under gear (34):



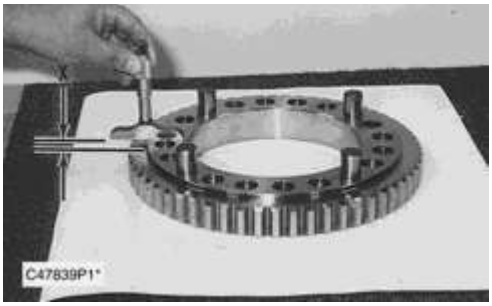
a. Fasten Tooling (E) and a hoist to main housing (31) as shown. Install the main housing on the motor housing.

b. Using a suitable press and spacer, apply a load of **4000 kg (8820 lb)**on bearing (38).

c. Rotate the main housing to seat the bearings.

d. Reduce the load on bearing (38) to **1000 ± 100 kg (2200 ± 220 lb)**.

e. With the load still on bearing (38), measure the distance between the top face of the motor housing and the inner race of bearing (38) with a depth micrometer. Take this measurement in several locations around the bearing. Find the average of the dimensions measured, and record it. Call this dimension **"Y"**.



f. Using a depth micrometer, measure the step height of gear (34) at several locations around the gear. Find the average of the dimensions measured, and record it. Call it dimension **"X"**.

g. Determine the correct thickness of the shim pack [made up of shims (35)] to be used between the motor housing and gear (34). **The shim pack thickness is equal to dimension "X" - "Y" ± 0.05 mm (.002 in)**.

NOTE: If two shims are required, install the thinner shim next to gear (34) when it is installed.

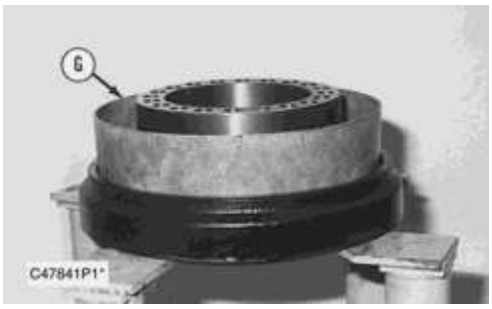
38. Remove the main housing from the motor housing.

NOTICE

Refer to the topic "Assembly and Installation Of Conventional Duo-Cone Seals" in this module.

NOTE: The rubber seals and all of the surfaces that make contact with the seals must be clean and dry. After the installation of the seals, put clean SAE 30 oil on the contact surfaces of the metal seals.

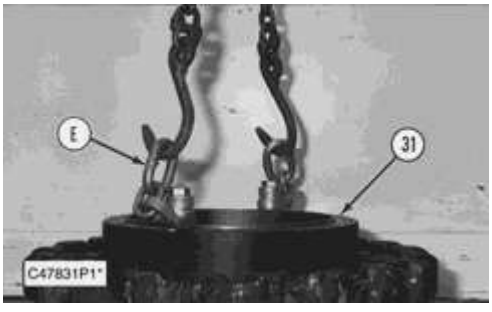
39. Install Duo-Cone seal (37) in the main housing with Tool (G).



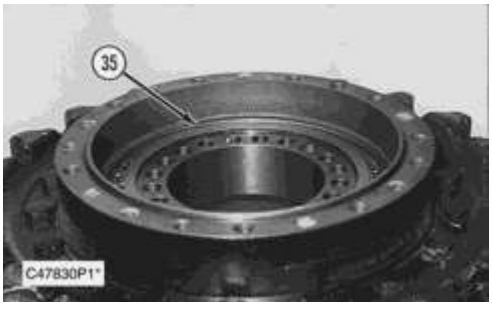
40. Install Duo-Cone seal (36) in the motor casing with Tool (G).

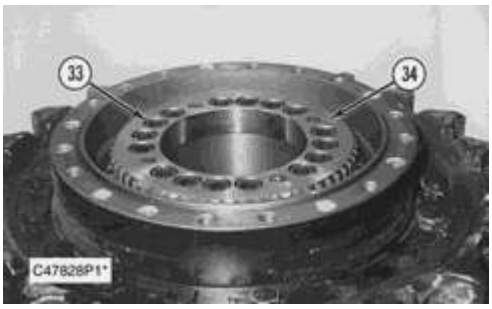
NOTICE

Do Not scratch or damage the Duo-Cone seals in the main housing or the motor housing during the assembly of these two components. After the installation of the main housing on the motor housing, there will be a small gap between the components. The gap is caused by the Duo-Cone seals and will be eliminated during the installation of gear (34).



41. Fasten Tooling (E) and a hoist to main housing (31). Put the main housing and final drive sprocket in position on the motor housing. Do Not scratch or damage the Duo-Cone seals in either component during the installation.

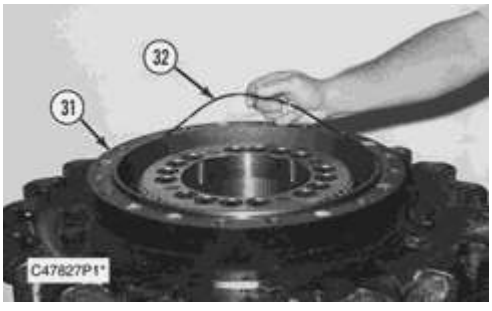




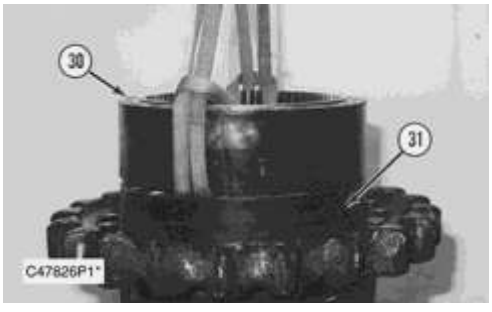
42. Apply **5P-3931 Anti-Seize Compound** on the four pins in gear (34).

43. Put shim pack (35) determined in Step 37a through 37g and gear (34) in the correct position on the motor housing. If two shims were required, put the thinner shim in contact with the gear (34). Make sure all of the holes in the components are in alignment with each other.

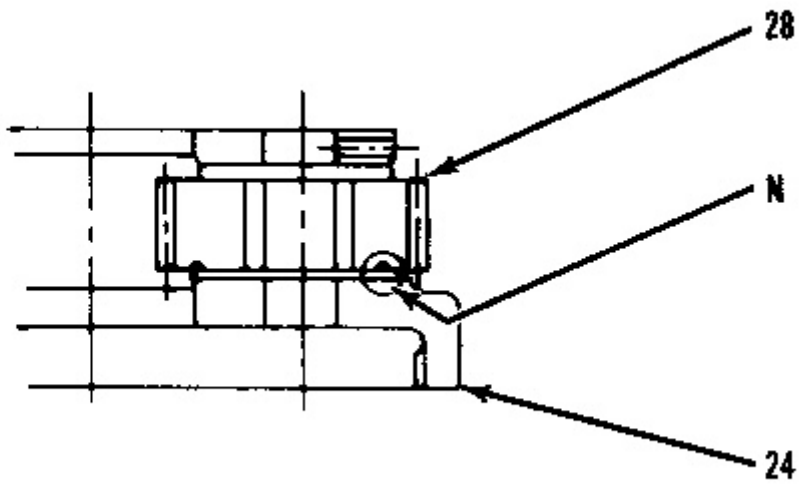
44. Apply **9S-3263 Thread Lock** on the threads of 16 socket head bolts (33). Install the socket head bolts to hold gear (34) in place. Tighten the bolts evenly and in diagonally opposite pairs to a torque of **900 ± 100 N·m (660 ± 75 lb ft)**.



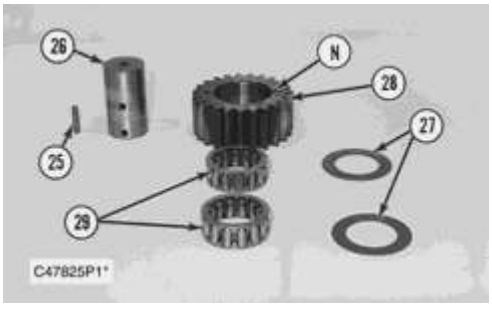
45. Install O-ring seal (32) in main housing (31).

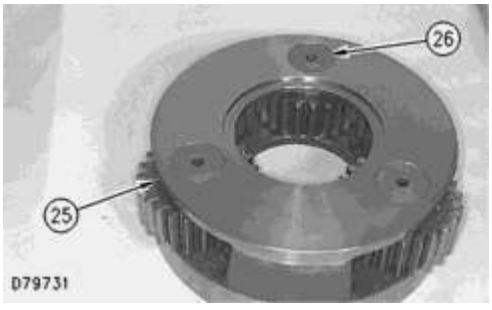


46. Thoroughly clean the mating surface of main housing (31) that makes contact with ring gear (30). Apply a bead of **1U-8846 Gasket Maker** on the mating surface of ring gear (30). Fasten lifting slings and a hoist to ring gear (30). Put the ring gear in position on the main housing. Make sure the alignment mark on the main housing and the ring gear line up with each other. It may be necessary to use a soft faced hammer to seat the ring gear on the main housing.



C28667P2*





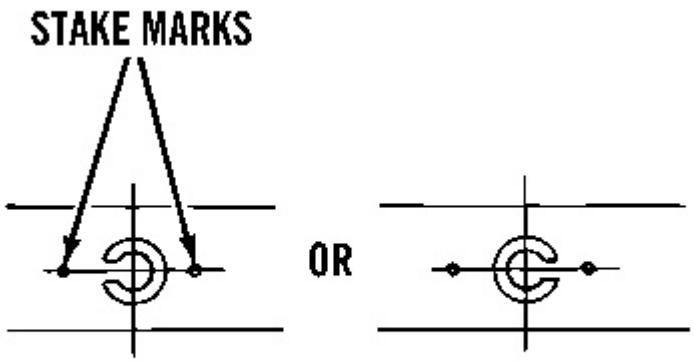
47. Assemble carrier assembly (24).

48. Put clean **SAE 30** oil on bearings (29). Install two bearings (29) in planetary gear (28).

49. Install a thrust washer (27) on each side of the planetary gear. Install the planetary gear and the thrust washers in carrier (24). Make sure identification grooves "N" are facing in the correct direction.

50. Install planetary shaft (26) in carrier (24) and through planetary gear (28). Make sure the spring pin hole in the planetary shaft is in alignment with the spring pin hole in the carrier.

51. Install spring pin (25) in the carrier and into the planetary shaft. Install the spring pin until it is even with the outside surface of the carrier and with the split in the spring pin oriented horizontal to the carrier either to the left or right.



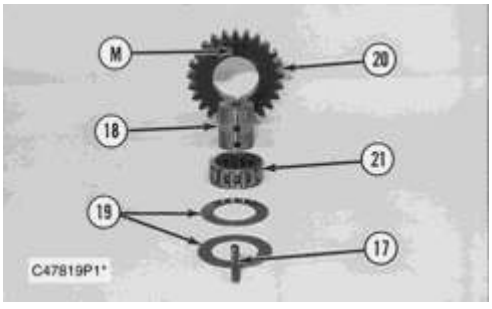
C28668P1*

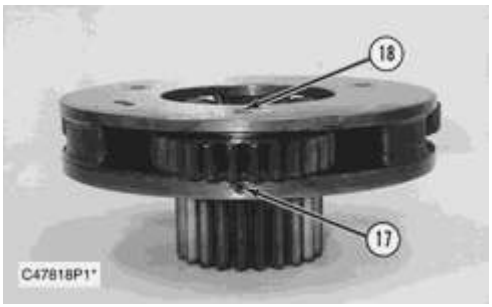
52. To prevent the spring pin from falling out, make a stake mark on each side of the spring pin hole in the carrier. Each stake mark should be approximately **1.5 mm (.06 in)** from the outside diameter of the spring pin hole.

53. Install the other two planetary gears in carrier (24) as in Steps 47 through 52.

53. Install carrier assembly (24) in ring gear (30). Slide a piece of steel bar stock in between the planetary gears in carrier assembly (24) as shown. Make sure the bar stock is centered in the carrier assembly. Fasten a lifting sling and a hoist to the steel bar stock as shown. Lower the carrier assembly into position in the ring gear. It may be necessary to move the carrier assembly back and forth to allow all of the gears to line up and mesh properly. Make sure the carrier assembly is seated properly.

54. Install spacer (16) in carrier assembly (24) as shown.





55. Assemble carrier assembly (15).

a. Install sun gear (23) in carrier (15). Make sure identification grooves "M" are facing in the correct direction as noted during disassembly of the carrier assembly.

b. Using a screwdriver, install retaining ring (22) that holds the sun gear in the carrier.

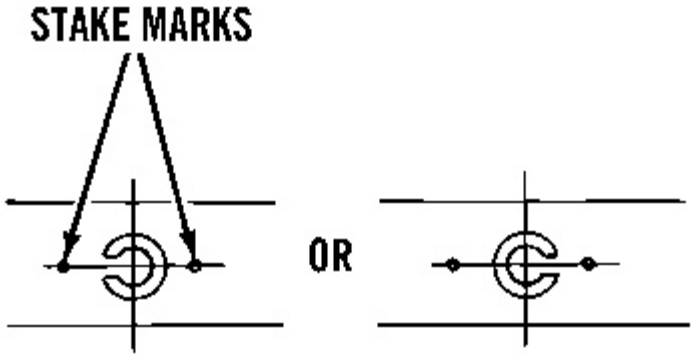
c. Put clean **SAE 30** oil on bearing (21). Install bearing (21) in planetary gear (20).

d. Install a thrust washer (19) on each side of the planetary gear.

e. Install the thrust washers and the planetary gear in carrier (15).

f. Install planetary shaft (18) in carrier (15) and through planetary gear (20). Make sure the spring pin hole in the carrier is in alignment with the spring pin hole in the planetary shaft.

56. Install spring pin (17) in the carrier and into the planetary shaft. Install the spring pin until it is even with the outside surface of the carrier and with the split in the spring pin oriented horizontal to the carrier either to the left or right.



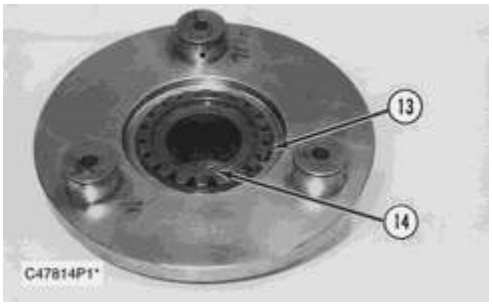
C28668P1*

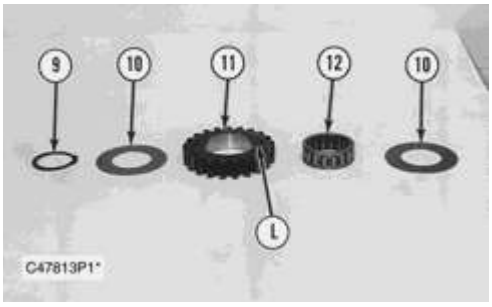
57. To prevent the spring pin from falling out, make a stake mark on each side of the spring pin hole in the carrier. Each stake mark should be approximately **1.5 to 2.5 mm (.06 to .10 in)**from the outside diameter of the spring pin hole.

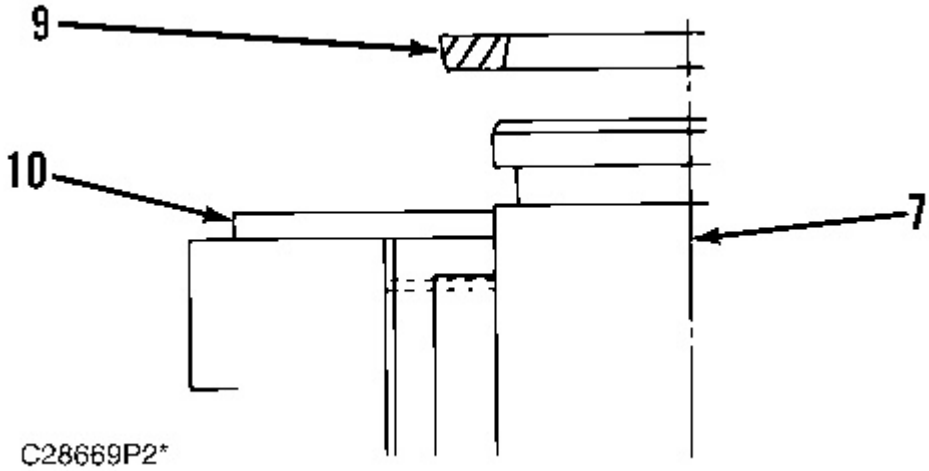
58. Install the other two planetary gears in carrier (15) as in Step 55 through 56.

59. Install carrier assembly (15) in carrier assembly (24). Move the carrier back and forth during the installation to ensure all of the gears engage properly. Make sure the carrier assembly is seated properly.

60. Install spacer (8) in the top side of carrier assembly (15).







NOTICE

Make sure retaining ring (8) is installed with the cross section of the ring as shown in illustration C28669P2.

---

61. Assemble carrier assembly (7).

a. Install sun gear (14) in carrier (7) as shown in Photo C47814P1.

b. Using a screwdriver, install retaining ring (13) that holds the sun gear in the carrier.

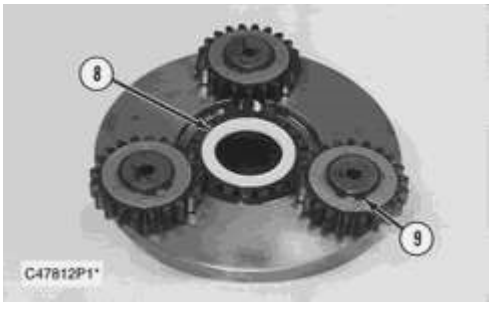
c. Put clean **SAE 30** oil on bearing (12), and install the bearing in planetary gear (11).

d. Install a thrust washer (10) on each side of the planetary gear.

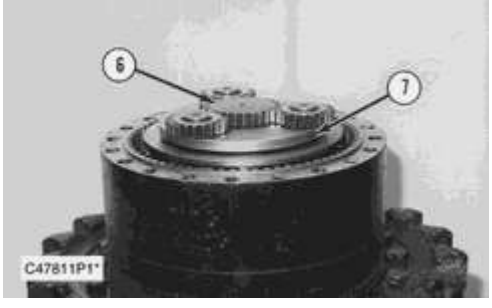
e. Install the planetary gear and the thrust washers on the shaft of carrier (7). Make sure identification marks "L" are facing in the same direction as noted during disassembly of carrier assembly (7).

f. Using Tool (C), install retaining ring (9) to hold the planetary gear in position. Make sure the retaining ring is installed with the cross section of the ring as shown in illustration C28669P2.

62. Install the other two planetary gears on carrier assembly (7) as in Step 60.

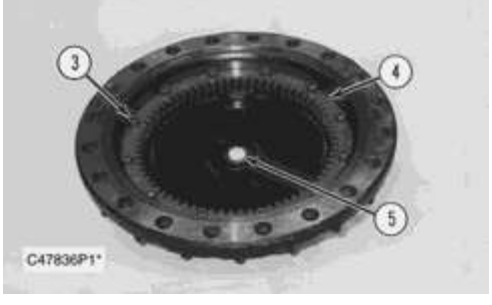


63. Install spacer (8) in carrier assembly (7).



64. Install carrier assembly (7) in carrier assembly (15). Make sure the carrier assembly is seated properly.

65. Install sun gear (6) in carrier assembly (7).



66. Put ring gear (4) in position in cover (2). Make sure all of the mounting bolt holes in both of the components are in alignment with each other.

67. Apply **9S-3263 Thread Lock** on the threads of 12 socket head bolts (3) that hold ring gear (4) in place. Install the bolts, and tighten them evenly.

68. Make sure the machined surface of ring gear (30) is thoroughly clean, free of dirt and debris and is dry. Apply a bead of **1U-8846 Gasket Maker** around the machined surface of the ring gear.

69. Fasten Tooling (B) and a hoist to cover (2). Put the cover in its original position on the ring gear. It will be necessary to rotate the cover back and forth to engage the planetary gears of carrier assembly (7) with the ring gear in the cover (2).

70. Apply **9S-3263 Thread Lock** on the threads of 20 bolts (1) that hold cover (2) in position. Install the bolts and the washers. Tighten the bolts evenly to a torque of **900 ± 100 N·m (660 ± 75 lb ft)**.

End By:

a. install final drives

Product: EXCAVATOR
Model: 330B EXCAVATOR 2RR
Configuration: ISJ HEX COMMONALITY CHART 2RR00001-UP (MACHINE)

Disassembly and Assembly
330B, 330B L & 330B LN EXCAVATORS MACHINE SYSTEMS
Media Number -SENR8973-02 **Publication Date -01/10/2004** **Date Updated -27/07/2016**

SENR89730027

Swivel Joint

SMCS - 5060-010; 5060-017

Remove & Install Swivel Joint

Tools Needed	A
138-7573 Link Bracket	1

Fluid Spillage Containment

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

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 (the boom, the stick and the bucket) before any of the hydraulic lines or any of the components are disconnected or removed.

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

a. Fully retract the stick cylinder rod.

b. Adjust the position of the bucket so that 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 place key in the "ON" position. Put the hydraulic activation control lever in the "UNLOCK" position.

e. Move the control levers for the boom, the stick and the swing to all full stroke positions. This will release any pressure that might be present in the pilot system.

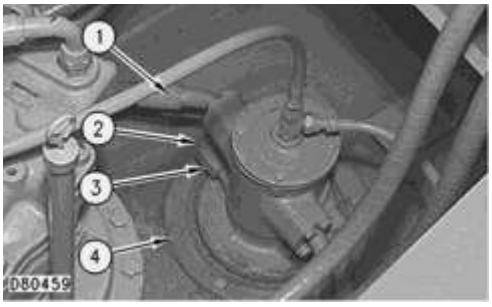
f. Return the key to "OFF" position.

g. Slowly loosen the fill plug on the hydraulic tank, and release the pressure.

h. Tighten the fill plug on the hydraulic tank.

i. The pressure in the hydraulic system has been released, the lines and the components can be removed.

2. Clean the outside of the swivel joint and the area around the swivel joint prior to the removal.



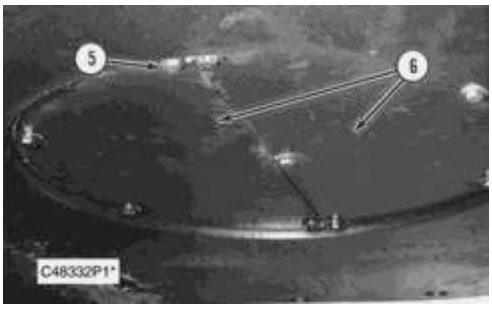
3. Oil will drain from all of the hose assemblies that are connected to the swivel joint. Place drains pans under the machine in the area of the swivel joint.

4. Put identification marks on seven hose assemblies (1) as to their location on the swivel joint. Disconnect seven hose assemblies (1) from the swivel joint. Put plugs in the ends of the hose assemblies to prevent oil loss and to keep contaminants out of the hydraulic system.

5. Remove two bolts (2) and the washers that hold setting plate (3) in position. Remove setting plate (3).

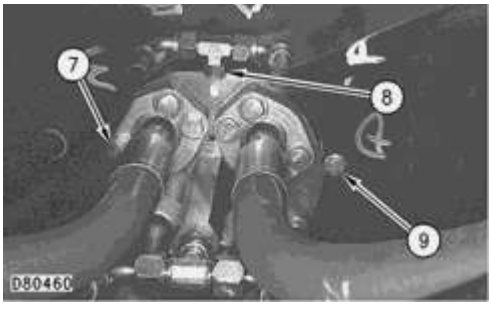
6. Remove eight bolts (4).

7. Remove one cover bolt from the swivel joint. Fasten Tool (A) to the swivel joint using the cover bolt. Fasten a hoist to Tool (A).



View From Under Machine

8. Remove bolts (5) and two cover assemblies (6) from the underside of the undercarriage frame assembly.



View From Under Machine

9. Put identification marks on eight hose assemblies (7) as to their location on the bottom of the swivel joint. Disconnect the eight hose assemblies from the bottom of the swivel joint. Put plugs in ends of the hose assemblies to prevent loss of oil and to keep contaminants out of the hydraulic system.

10. Remove tee fitting (8) from the swivel joint.

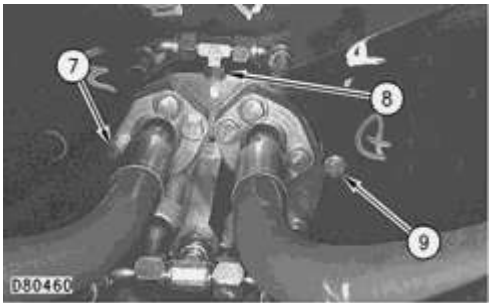
11. Cover the ports in the bottom of the swivel joint with tape to keep dirt and debris out of the unit.

12. Remove six bolts (9).

13. Remove the swivel joint from the machine. The weight of the swivel joint is **43 kg (95 lb)**.

NOTE: The following steps are for the installation of the swivel joint.

14. Make sure the threaded holes in the undercarriage frame assembly for mounting the swivel joint are clean and free of dirt and debris.



15. Apply a bead of **1U-8846 Gasket Maker** to the surface of the undercarriage frame assembly on which the swivel joint is installed.

16. Fasten Tool (A) and a hoist to the swivel joint, and put it in its original position in the undercarriage frame assembly. Make sure the identification mark on the bottom face of the swivel joint is facing toward the front of the machine.

17. Apply **9S-3263 Thread Lock** on the threads of six bolts (9). Install six bolts (9) in the bottom of the swivel joint.

18. Remove the tape from over the ports in the bottom of the swivel joint.

19. Install tee fitting (8) in the swivel group. Tighten the tee fitting to a torque of **40 ± 5 N·m (30 ± 4 lb ft)**. Make sure the tee fitting is oriented properly.

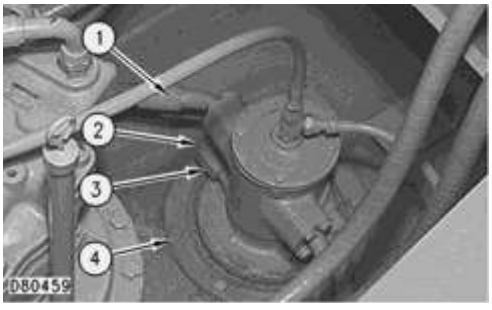
20. Check the condition of the O-ring seals in the ends of eight hose assemblies (7). If the O-ring seals are damaged, use new parts for replacement.

21. Connect the eight hose assemblies in their original location on the bottom of the swivel joint.

a. Tighten the two hose assemblies that connect to tee fitting (8) to a torque of **40 ± 5 N·m (30 ± 4 lb ft)**.

b. Tighten the two hose assemblies that connect to the center tee fitting to a torque of **80 ± 7 N·m (60 ± 5 lb ft)**.

c. Tighten the four large diameter hose assemblies that connect to the bottom of the swivel group to a torque of **80 ± 7 N·m (60 ± 5 lb ft)**.



22. Remove the hoist and Tool (A) from the top of the swivel joint. Reinstall the one cover bolt in the top of the swivel joint.

23. Install setting plate (3). Install two bolts (2) and the washers that hold the setting plate in place.

24. Check the condition of the O-ring seals in the ends of seven hose assemblies (1). If the O-ring seals are damaged, use new parts for replacement.

25. Connect seven hose assemblies (1) in their original location on the swivel joint.

a. Tighten the four large diameter hose assembly mounting bolts to a torque of **190 ± 20 N·m (140 ± 15 lb ft)**.

b. Tighten the one smaller diameter hose assembly that connects at the bottom of the swivel joint to a torque of **40 ± 5 N·m (30 ± 4 lb ft)**.

c. Tighten the two small diameter hose assemblies that connect to the top of the swivel joint to a torque of **80 ± 7 N·m (60 ± 5 lb ft)**.

NOTE: Refer to the topic "Lubricant Viscosities and Refill Capacities" in the "Operation & Maintenance Manual" for the proper filling procedure and the proper levels for the hydraulic system.

26. Fill the hydraulic oil system with oil to the correct level.

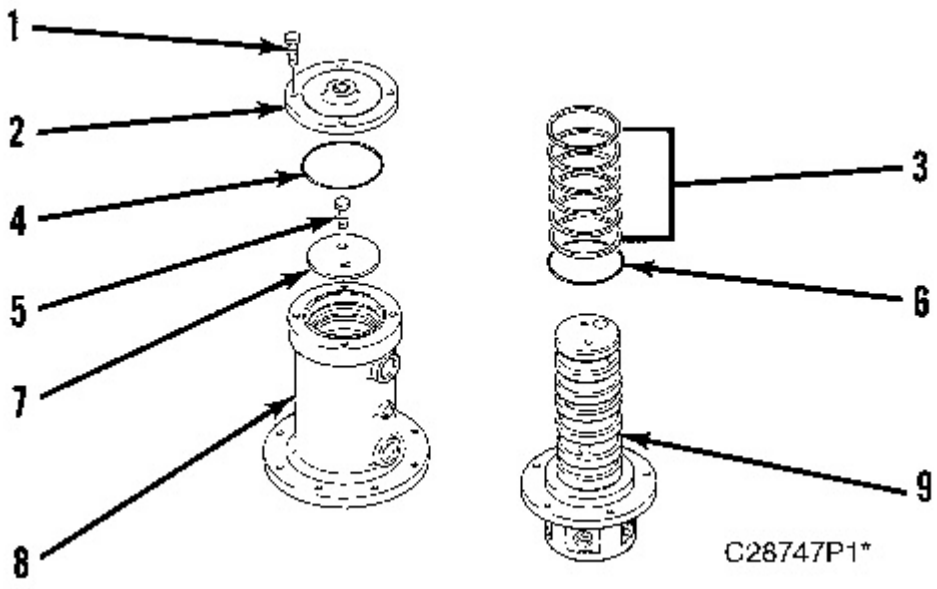
27. Start the machine, and check for leaks. Install two cover assemblies (6) on the underside of the undercarriage frame assembly.

Disassemble & Assemble Swivel Joint

Start By:

a. remove swivel joint

1. Thoroughly clean the outside of the swivel joint prior to disassembly.



2. Remove four bolts (1) and cover (2) from outside housing (8). Remove O-ring seal (4) from the outside housing.

3. Remove two bolts (5), the washers and retainer (7) from rotor (9). Remove outside housing (8) from rotor (9).

4. Turn the outside housing over, and remove O-ring seals (6) and seals (3) from the outside housing.

NOTE: The following steps are for the assembly of the swivel joint.

5. Be sure all of the parts of the swivel joint are clean and free of dirt and debris.

6. Check the condition of seals (3) and O-ring seals (6). If the seals and the O-ring seals are worn or damaged, use new parts for replacement.

Suggest:

If the above button click is invalid.

Please download this document

first, and then click the above link

to download the complete manual.

Thank you so much for reading

7. Install seals (3) and O-ring seals (6) in outside housing (8). Put clean hydraulic oil on seals (3) and O-ring seals (6).

8. Install outside housing (8) over rotor (9). Install retainer (7), two bolts (5) and the washers that hold the retainer.

9. Check the condition of O-ring seal (4). If the O-ring seal is worn or damaged, use a new part for replacement.

10. Put clean hydraulic oil on O-ring seal (4). Install the O-ring seal in the outside housing.

11. Install cover (2) and four bolts (1) that hold it.

12. Check the swivel joint for leaks. Plug the drain ports of the inside body. Apply shop air pressure in the top of the swivel joint, and check for leaks.

End By:

a. install swivel joint
