CATERPILLAR®

Service Repair Manual

Models

330F L Excavator

Product: EXCAVATOR
Model: 330F L EXCAVATOR MBX
Configuration: 330F L Excavator MBX00001-UP (MACHINE) POWERED BY C7.1 Engine

Disassembly and Assembly
326F, 329F and 330F Excavators Machine Systems
Media Number -UENR3313-07 **Publication Date -01/09/2015** **Date Updated -12/09/2018**

i07332931

Final Drive - Assemble

SMCS - 4050-016

Assembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1P-2420	Transmission Stand Group	1
B	138-7573	Link Bracket	2
C	1P-1863	Retaining Ring Pliers	1
D	138-7575	Link Bracket	3
E	4C-8359	Eyebolt	2
F	138-7574	Link Bracket	2
G	8T-9206	Duo-Cone Seal Installer As	1
	169-0503	Installation Kit	1
H	-	Loctite C5A Copper Antiseize	-
J	-	Loctite 242 Threadlocker	-
K	-	Loctite Highflex GM	-
L	FT-2770	Leak down Test Tool	1

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

Illustration 1 g03431464

Note: New final drives are equipped with angular contact ball bearings.

2. Apply Tooling (H) to the surfaces inside sprocket housing (35) that contacts the bearing cups. Install a bearing cup that is in each side of the sprocket housing with a press. Make sure that the bearing cups are properly seated.

3. Apply Tooling (H) to the surfaces inside the sprocket housing that contacts bearing cones (44).

4. Install outer bearing cone (44) in the sprocket housing.

Illustration 2 g01208625

5. Attach Tooling (F) and a suitable lifting device to sprocket housing (35). The weight of sprocket housing (35) is approximately 109 kg (240 lb). Install sprocket housing (35) on the motor housing. Carefully install inner bearing cone (42) on the sprocket housing.

Illustration 3 g01208578

6. Adjust the bearing preload of the final drive. Determine the correct number of shims (40) that are required for the proper bearing preload, as follows:

   Note: New final drives are equipped with angular contact ball bearings that require pre-load like the old roller bearings.

Illustration 4 g01208987

   a. Use a depth micrometer to measure the step height of coupling gear (38) at several locations around the gear. Find the average for the measured dimensions around the gear and record the dimension. Call this Dimension (X).

   b. Apply a load of 4000 kg (8820 lb) to the bearing cones.

   c. Rotate sprocket housing (35) several times to seat the bearing cones.

   d. Reduce the load to 1000 ± 100 kg (2205 ± 220 lb).

Illustration 5 g00631001

e. With the bearing cones loaded, measure the distance between the top face of the motor housing and the top face of the bearing cone. Take measurements in several locations around the motor housing. Find the average of the measured dimensions, and record the dimensions. Call this Dimension (Y).

f. Determine the correct thickness of the shims which are used between the bearing cones and the coupling gear . Use the following equation to determine the shim pack thickness.

Shim pack thickness ... (Y) − (X) ± 0.05 mm (0.002 inch)

Note: If two shims are required, install the thinnest shim next to the coupling gear during final assembly.

Illustration 6 g03431699

7. Attach Tooling (F) and a suitable lifting device to sprocket housing (35). Separate sprocket housing (35) from the motor housing.

Reference: Refer to Disassembly and Assembly, "Duo-Cone Conventional Seals - Install".

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

Illustration 7 g00631006

Illustration 8 g01208999

8. Use Tooling (G) to install Duo-Cone seal (43) in the sprocket housing.

Illustration 9 g00631014

Illustration 10 g03431475

9. Use Tooling (G) to install Duo-Cone seal (41) in the motor housing.

10. Apply Tooling (H) in the bores for the locating pins that are in the motor housing. Reinstall the locating pins in the motor housing.

Illustration 11 g01208625

11. Make sure that inner bearing cone (42) is seated properly on the motor housing.

    Note: Do not scratch Duo-Cone seal (41) or damage the Duo-Cone seal in the main housing, or the motor housing during assembly of the two components. After installation of the main housing on the motor housing, there will be a small gap between the components. The gap between the components is caused by the Duo-Cone seal. The gap will be eliminated during the installation of the coupling gear .

12. Fasten Tooling (F) and a suitable lifting device to sprocket housing (35). Carefully install the sprocket housing on the motor housing.

13. Install the outer bearing cone on the sprocket housing. Make sure that the outer bearing cone is properly seated.

Illustration 12 g01208578

14. Install shims (40) that were determined in Steps 6.a through 6.f on the end of the sprocket housing. If shims were required, make sure that the thinnest shim is installed on top.

Illustration 13 g01208553

15. Put coupling gear (38) in the original position on the motor housing.

16. Apply Tooling (J) on the threads of bolts (37) that hold coupling gear (38) in position. Tighten bolts (37) evenly and tighten the bolts in diagonally opposite pairs to a torque of 570 ± 80 N·m (420 ± 60 lb ft).

Illustration 14 g01208542

17. Install O-ring seal (36) in sprocket housing (35).

Illustration 15 g01208300

18. Thoroughly clean the mating surface of sprocket housing (35) that contacts ring gear (34).

19. Apply a bead of Tooling (K) on the mating surface of ring gear (34).

20. Attach Tooling (E) and a suitable lifting device to ring gear (34). Put ring gear (34) in position on the sprocket housing. The weight of ring gear (34) is approximately 66 kg (146 lb). Make sure that the alignment mark upon the sprocket housing and the ring gear line with each other.

Illustration 16 g01843479

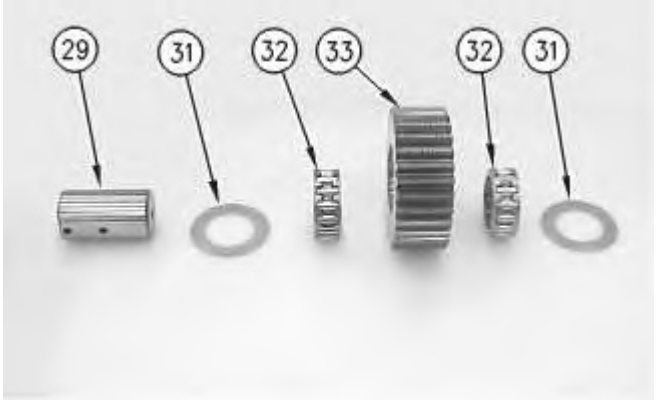

Illustration 17 g00893674

21. Assemble carrier assembly (28), as follows.
    a. Install bearings (32) in planetary gear (33).
    b. Install thrust washers (31) and planetary gear (33) in the carrier assembly.
    c. Use a deburring tool to remove the metal burr from the openings in the carrier. Install planetary shaft (29) in the carrier assembly.
    d. Drive spring pin (30) into planetary shaft (29).

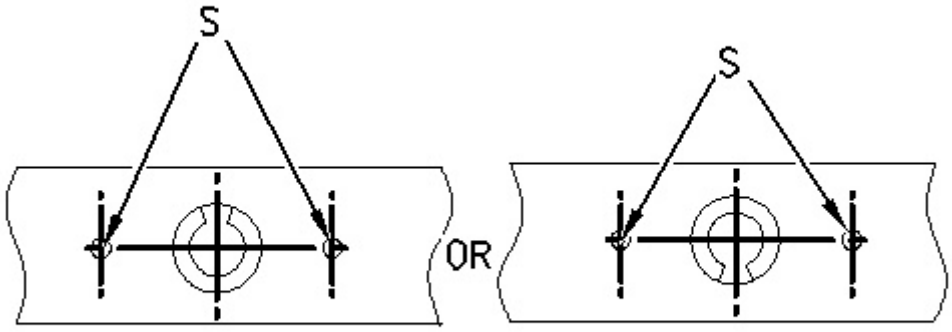

Illustration 18 g00941047

The stake mark is at position (S).

    e. Orient the split in spring pin (30) vertically to the carrier. Align the split in the spring pin to the top or to the bottom. Make a stake mark on each side of the spring pin hole in the carrier. Each stake mark should be approximately 2.25 ± 0.75 mm (0.089 ± 0.030 inch) from the outside diameter of the spring pin hole.

22. Repeat Steps 21.a through 21.e to install the other two planetary gears in the carrier assembly.

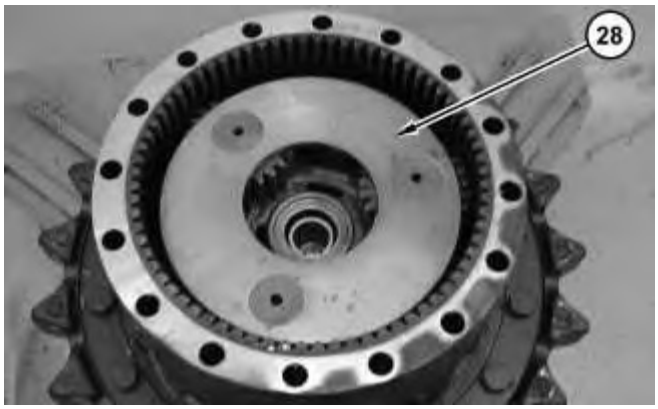

Illustration 19 g01842974

23. Use two people to install carrier assembly (28). The weight of carrier assembly (28) is approximately 38 kg (85 lb).

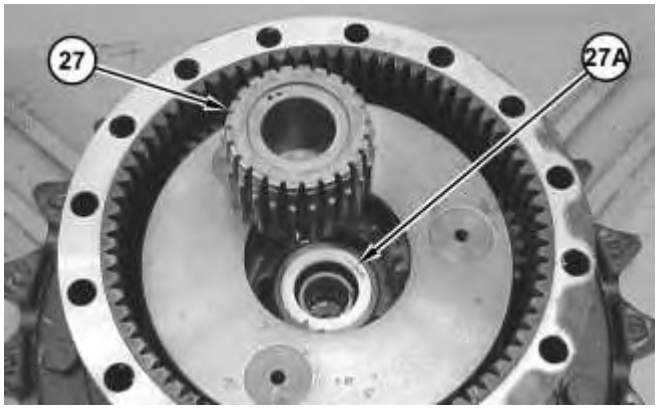

Illustration 20 g01842853

24. Install spacer (27A). Install gear (27).

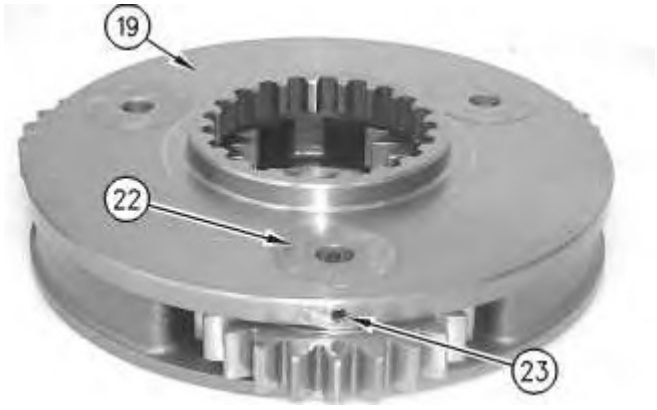

Illustration 21 g00897548

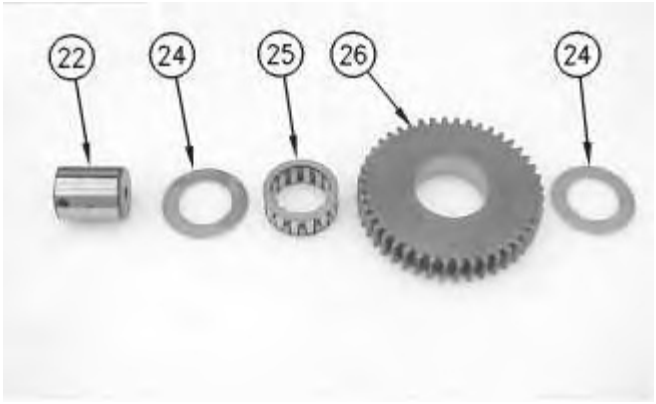

Illustration 22 g00896863

25. Assemble planetary carrier (19), as follows.

    a. Install bearing (25) in planetary gear (26).

    b. Install thrust washers (24) and planetary gear (26) in the planetary carrier.

    c. Use a deburring tool to remove the metal burr from the openings in the carrier. Install planetary shaft (22) in planetary carrier (19).

    d. Drive spring pin (23) into planetary shaft (22).

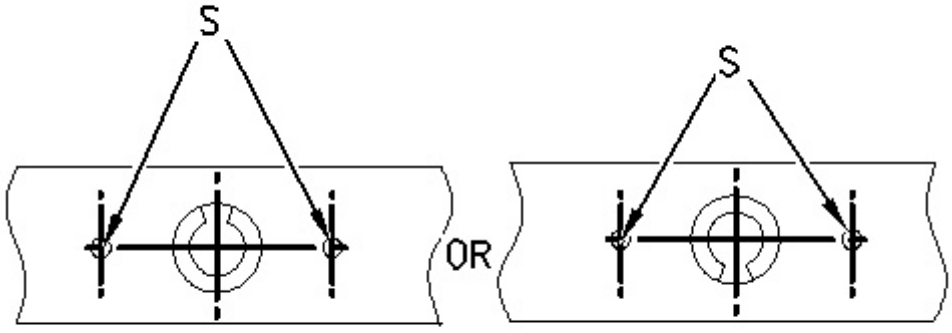

Illustration 23 g00941047

The stake mark is at position (S).

    e. Orient the split in spring pin (23) vertically to the carrier. Align the split in the spring pin to the top or to the bottom. Make a stake mark on each side of the spring pin hole in the carrier. Each stake mark should be approximately 2.25 ± 0.75 mm (0.089 ± 0.030 inch) from the outside diameter of the spring pin hole.

    f. Repeat Steps 25.a through 25.e to install the other two planetary gears in the carrier.

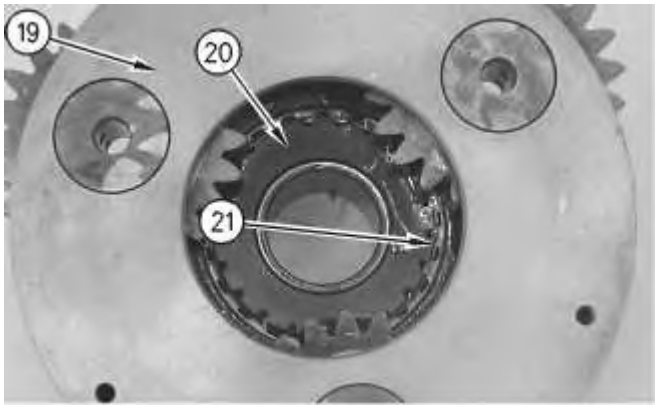

Illustration 24 g00893019

26. Position sun gear (20) in planetary carrier (19) and install retaining ring (21).

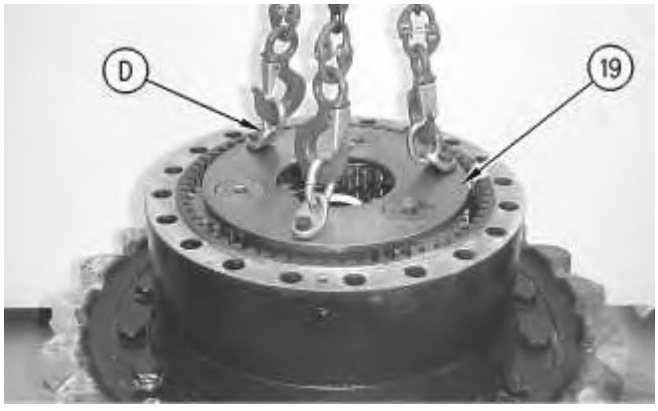

Illustration 25 g00892997

27. Use Tooling (D) and a suitable lifting device to install planetary carrier (19) into gear (34). The weight of planetary carrier (19) is approximately 48 kg (105 lb).

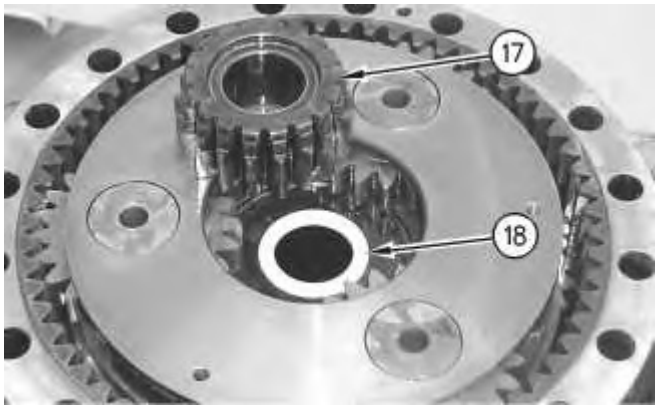

Illustration 26 g00892977

28. Install spacer (18) and gear (17).

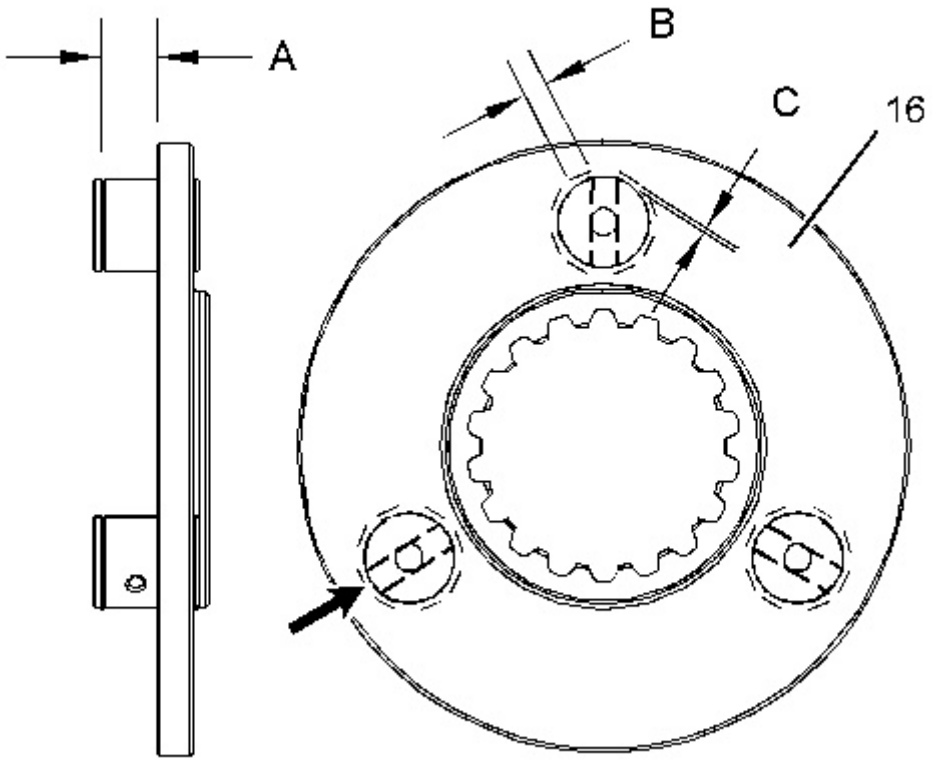

Illustration 27 g01389807

Note: Make sure that the oil passages in the shafts are oriented toward the center of carrier assembly (16).

29. Raise the temperature of carrier assembly (16). Lower the temperature of the shafts. Install the shafts into carrier assembly (16) until the groove of the shafts is at Dimension (A). Dimension (A) equals 25.00 ± 0.10 mm (0.984 ± 0.004 inch).

30. Make eight stake marks at distance of Dimension (C) from each shaft. Dimension (C) equals 2.0 ± 1.0 mm (0.08 ± 0.04 inch). The width of each stake mark should be equal to Dimension (B). Dimension (B) equals 4.0 ± 1.0 mm (0.16 ± 0.04 inch).

Illustration 28 g00892975

31. Install carrier assembly (16).

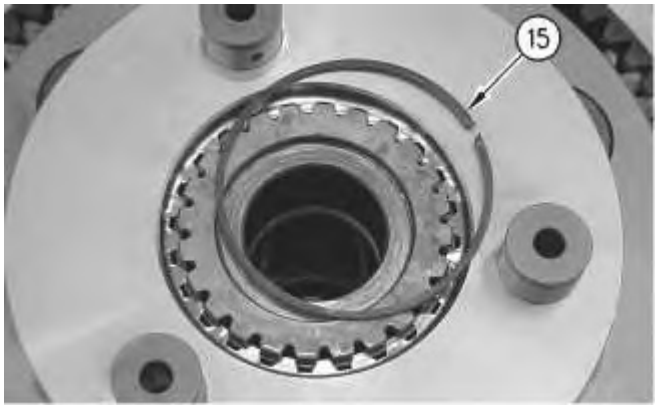

Illustration 29 g00892968

32. Install retaining ring (15).

Illustration 30 g00892965

33. Install washer (14) and bearing assembly (13). Install gear (12) and washer (11). Use Tooling (C) to install retaining ring (10).

34. Repeat Step 33 for the other two planetary gears.

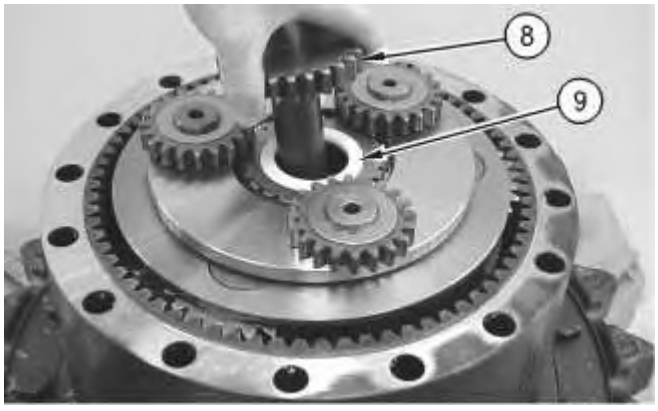

Illustration 31 g00780428

35. Install spacer (9) and gear (8).

Illustration 32 g00892906

36. Install O-ring seals (7) on plugs (5).

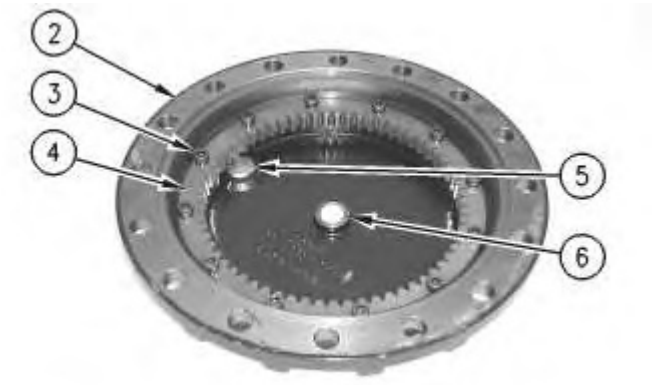

Illustration 33 g00892888

37. Install plugs (5) in cover (2). Tighten plugs (5) to a torque of 80 ± 10 N·m (59 ± 7 lb ft). Install plate (6) in cover (2). Position gear (4) and install bolts (3). Tighten bolts (3) to a torque of 60 ± 12 N·m (44 ± 9 lb ft).

38. Place a piece of solder in the center of gear (8).

    Note: You may need to apply some grease to the solder to keep the solder in position on gear (8).

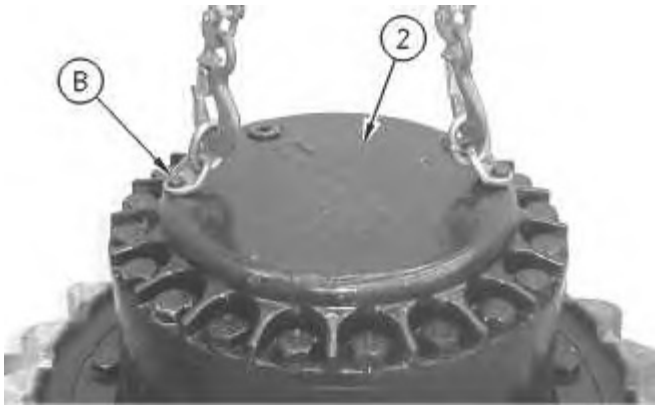

Illustration 34 g00892883

Illustration 35 g00892878

39. Use Tooling (B) and a suitable lifting device to Install cover (2). The weight of cover (2) is approximately 32 kg (70 lb).

40. Install four bolts (1) at 90 degrees from each other. Tighten bolts (1) to a torque of 400 N·m (295 lb ft).

41. Remove bolts (1).

42. Use Tooling (B) and a suitable lifting device to remove cover (2). The weight of cover (2) is approximately 32 kg (70 lb).

43. Use a micrometer to measure the thickness of the solder. Record this measurement to determine the thickness of the shims for plate (6). Adjust the shims to obtain a clearance of 1.00 -2.00 mm (0.039- 0.079 inch) between plate (6) and gear (8).

44. Apply Tooling (K) to the mating surfaces of cover (2) and the housing.

45. Use Tooling (B) and a suitable lifting device to Install cover (2). The weight of cover (2) is approximately 32 kg (70 lb).

46. Remove Tooling (B). Apply Tooling (J) to the setscrews and install the setscrew flush with the cover.

47. Install bolts (1). Tighten bolts (1) in a crisscross pattern to a torque of 420 ± 60 N·m (310 ± 44 lb ft). Turn the bolts for an additional 60 ± 5 degrees.

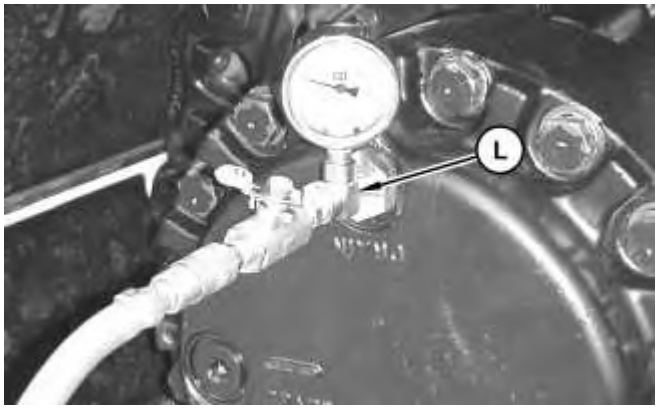

Illustration 36 g01304937

48. Remove plug (5) (not shown). Attach Tooling (L) to the cover . Reduce the air pressure at the source to 103 kPa (15 psi). Apply air pressure to Tooling (L). This air will test the Duo-Cone seals.

49. Use the ball valve on Tooling (L) to eliminate the air pressure to the final drive. A pressure of 98 kPa (14 psi) must be maintained for 30 seconds.

50. Remove Tooling (L). Install plug (5).

51. Use Tooling (E) and a suitable lifting device to remove the final drive assembly from Tooling (A). The weight of the final drive assembly is approximately 550 kg (1200 lb).

End By:

a. Install the final drive.

Product: EXCAVATOR
Model: 330F L EXCAVATOR MBX
Configuration: 330F L Excavator MBX00001-UP (MACHINE) POWERED BY C7.1 Engine

Disassembly and Assembly
326F, 329F and 330F Excavators Machine Systems
Media Number -UENR3313-07 **Publication Date -01/09/2015** **Date Updated -12/09/2018**

i07184487

Final Drive - Install

SMCS - 4050-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	8S-7640	Stand	2
	8S-7611	Tube	2
	8S-7615	Pin	2
B	439-3939	Link Bracket As	2
C	-	Loctite C5A Copper Anti-Seize	-

Illustration 1 g00712767

1. Attach Tooling (B) and a suitable lifting device to final drive (1). The weight of final drive (1) and the sprocket is approximately 312 kg (688 lb). Position the final drive in the frame.

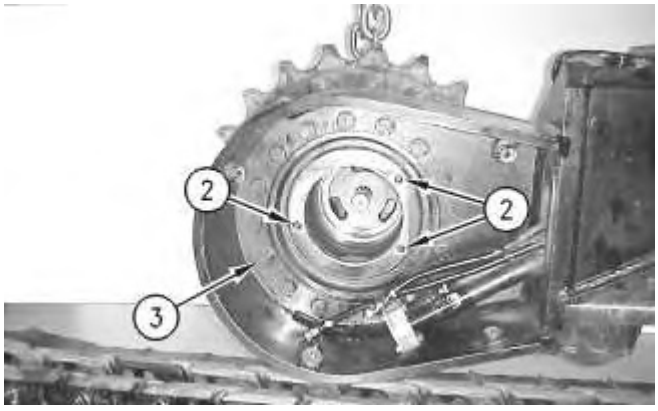

Illustration 2 g00712737

Note: Make sure that bolt holes (2) for the travel motor are in the correct position.

Note: Make sure that bolts (3), the washers, the motor housing, and the frame are clean and free of protective coating and oil.

2. Apply Tooling (C) to the threads of bolts (3). Refer to table 2 for the correct torque specification for bolts (3).

Table 2

Torque Table	
Machine Model	**Torque Specification**
326	150 ± 25 N·m (111 ± 18 lb ft) turn an extra 55 ± 5 degrees.
329 and 330	150 ± 25 N·m (111 ± 18 lb ft) turn an extra 60 ± 5 degrees.

3. Refer to Service Magazine, M0083843, "An Improved Bolt Tightening Procedure for the Critical Joints Is Now Used on All Excavators" for more detail information.

4. Remove Tooling (B) and the suitable lifting device from the final drive.

Illustration 3 g00489826

5. Lift the side of the machine to remove Tooling (A).

End By:

a. Install the travel motor.

b. Connect the track assembly.

Product: EXCAVATOR
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Media Number -UENR3313-07 **Publication Date -01/09/2015** **Date Updated -12/09/2018**

i05437569

Swivel - Remove

SMCS - 5060-011

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	311-1362	Vacuum Gauge Gp	1
B	138-7573	Link Bracket	2

Start By:

a. Release the hydraulic system pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting, and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat products.

Dispose of all fluids according to local regulations and mandates.

Illustration 1 g02523040

1. Remove the cap from the hydraulic tank. Install Tooling (A) onto the hydraulic tank. Attach an air supply hose to Tooling (A). Apply 276 to 414 kPa (40 to 60 psi) of air. This procedure will pull vacuum on the hydraulic system.

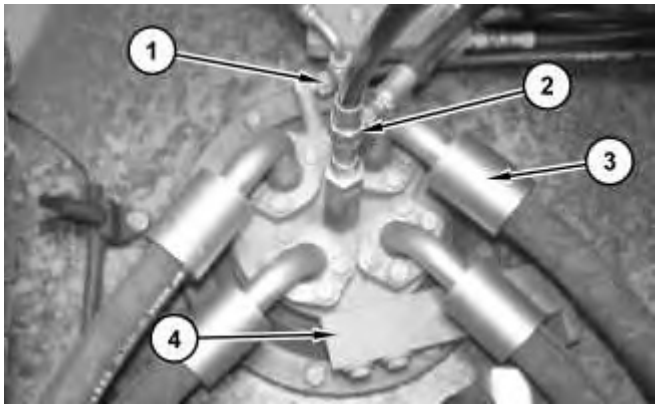

Illustration 2 g01216069

2. Disconnect hose assemblies (1), (2), and (3). Remove support (4).

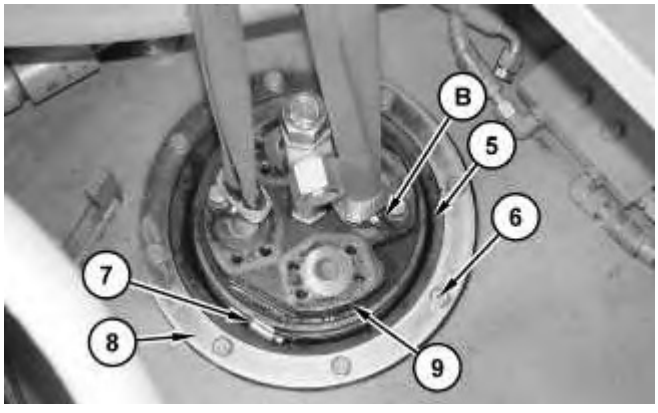

Illustration 3 g01216082

3. Attach Tooling (B) and a suitable lifting device to swivel (9). The weight of swivel (9) is approximately 45 kg (95 lb). Remove bolts (6) and retainer (8). Remove clamp (7) and boot (5).

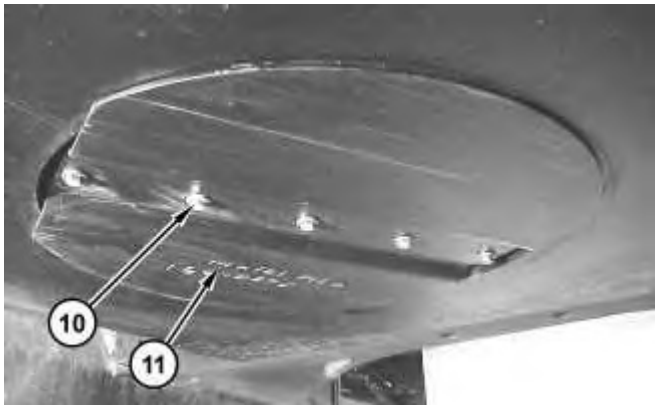

Illustration 4 g01216099

4. Remove bolts (10) and covers (11).

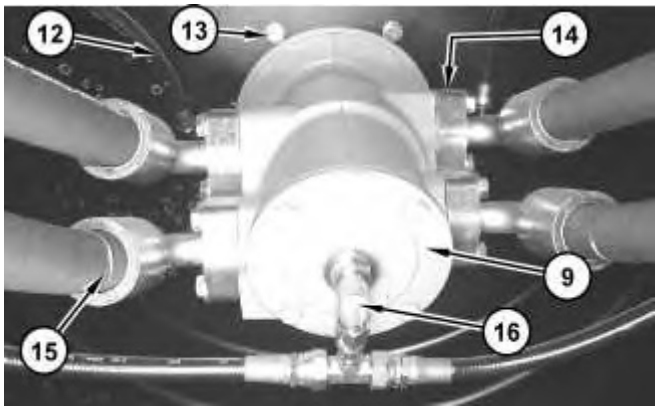

Illustration 5 g01216098

5. Disconnect hose assemblies (15). Disconnect fitting (16). Disconnect hose assemblies (12). Remove fittings (14). Remove bolts (13). Remove swivel (9).

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Media Number -UENR3313-07 **Publication Date -01/09/2015** **Date Updated -12/09/2018**

i05437922

Swivel - Disassemble

SMCS - 5060-015

Disassembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	6V-3822	Bolt	2
	6V-5839	Washer	2
	1P-5546	Crossblock	1
	5P-4168	Step Plate	1
	5F-7366	Screw	1
B	1P-2420	Transmission Repair Stand	1

Start By:

a. Remove the swivel joint.

NOTICE

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Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat products.

Dispose of all fluids according to local regulations and mandates.

Suggest:

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

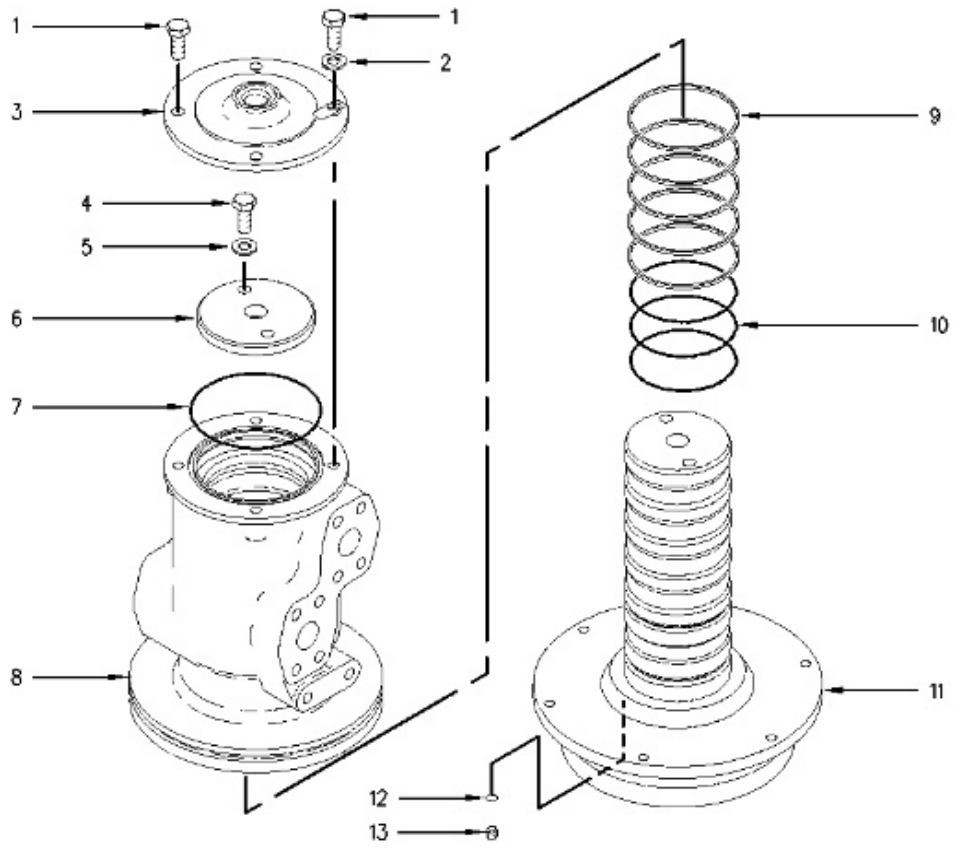

Illustration 1 g00633843

Illustration 2 g00633841

2. Use a suitable lifting device to position the swivel joint onto Tooling (B). Fasten the swivel joint to Tooling (B), as shown. The weight of the swivel joint is approximately 43 kg (95 lb).
3. Remove bolts (1), washers (2), and cover (3) from outside housing (8).
4. Remove O-ring seal (7) from outside housing (8).
5. Remove bolts (4), washers (5), and retainer (6) from rotor (11).