CATERPILLAR®

Service Repair Manual

Models

140H Motor Grader

Product: MOTOR GRADER
Model: 140H MOTOR GRADER 126
Configuration: 140H Motor Grader 12600001-UP (MACHINE) POWERED BY 3176C Engine

Disassembly and Assembly
12H, 140H and 160H Motor Graders Power Train
Media Number -RENR4108-16 **Publication Date -01/06/2018** **Date Updated -26/06/2018**

i02186165

Final Drive - Disassemble

SMCS - 4050-015

Disassembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	439-3938	Link Brackets	2
B	5P-4204	Wrench Assembly	1

Start By:

a. Remove the final drives. Refer to Disassembly and Assembly, "Final Drive - Remove"for the correct procedure.

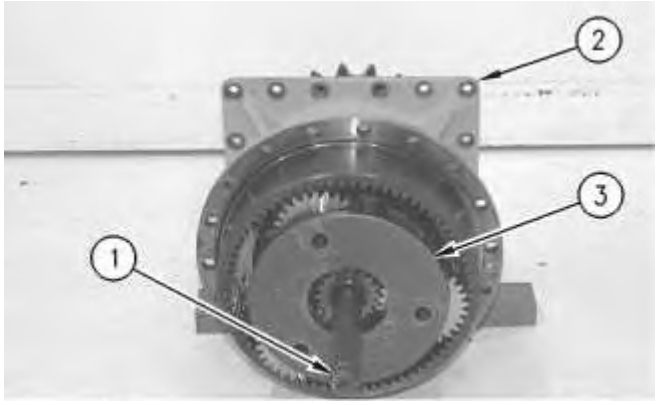

Illustration 1 g00621106

1. Remove sun gear shaft (1) from housing (2).
2. Remove planetary carrier (3) from housing (2).

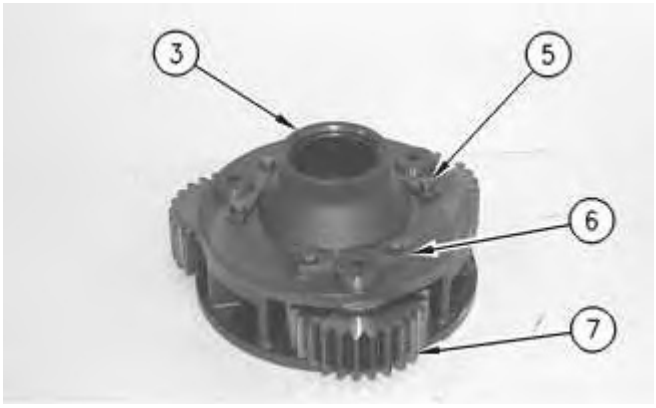

Illustration 2 g00621108

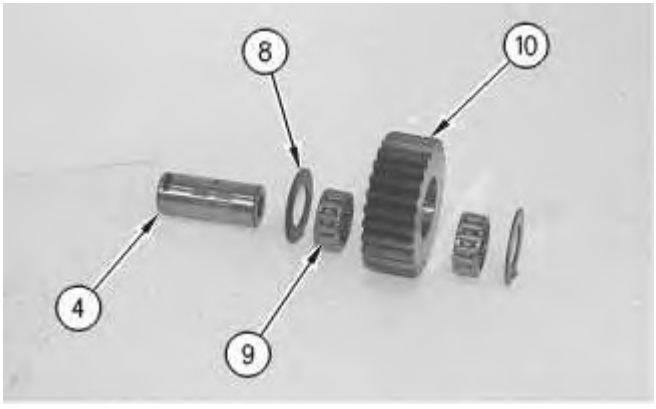

Illustration 3 g00621109

3. Remove locking bolts (5), the washers, and retainers (6) from planetary carrier (3).
4. Remove planetary shafts (4) to remove gear assemblies (7) from planetary carrier (3).

   Note: Each gear assembly (7) consists of two washers (8), two roller assemblies (9), gear (10) and planetary shaft (4).

   Note: Mark the location of the components of the gear assemblies for assembly purposes.

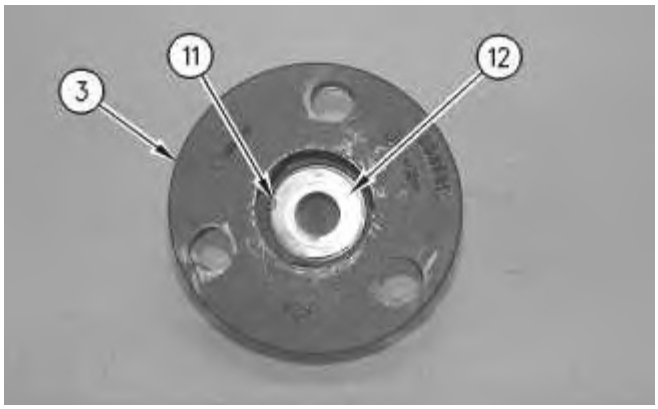

Illustration 4 g00621111

5. Remove retaining ring (11) and washer (12) from planetary carrier (3).

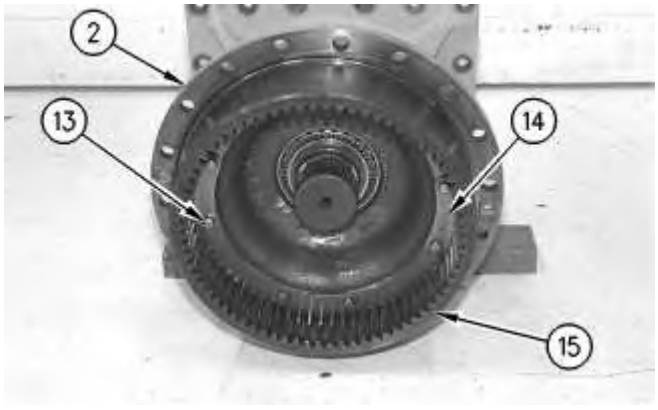

Illustration 5 g00621112

6. Remove locking bolts (13), the washers, and plates (14) to remove ring gear (15).
7. Remove ring gear (15) from the housing (2).

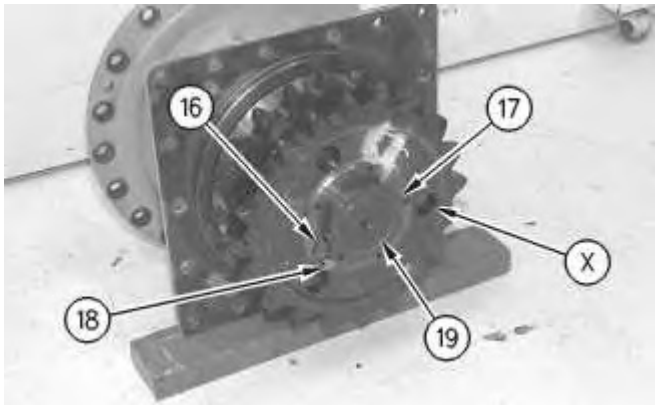

Illustration 6 g00621113

8. Remove locking bolt (18), the washer, and lock (16) which holds nut (17) to drive shaft (19).

Note: Notice that the lubrication holes (X) in sprockets (20) are in alignment. This will help in assembly procedures.

9. Use Tooling (B) (not shown) to remove nut (17) from the drive shaft (19).

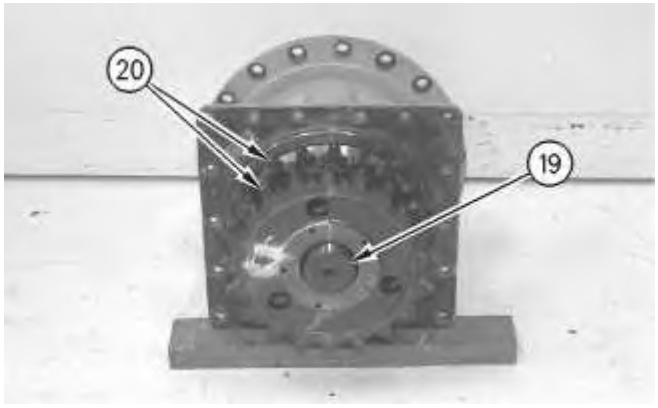

Illustration 7 g00621114

10. Remove two sprockets (20) from drive shaft (19).

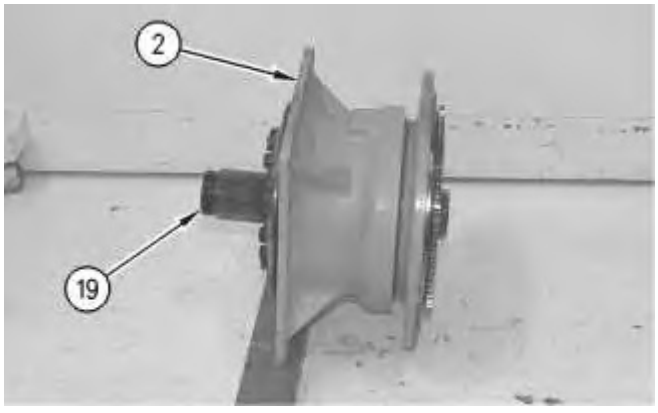

Illustration 8 g00621116

11. Remove drive shaft (19) and two roller bearing cones from housing (2). One of the roller bearing cones will be removed with drive shaft (19). The remaining roller bearing cone must be removed from the other end of housing (2). This will be completed during Step 12.

Illustration 9 g00621118

12. Remove roller bearing cone (21) from drive shaft (19).

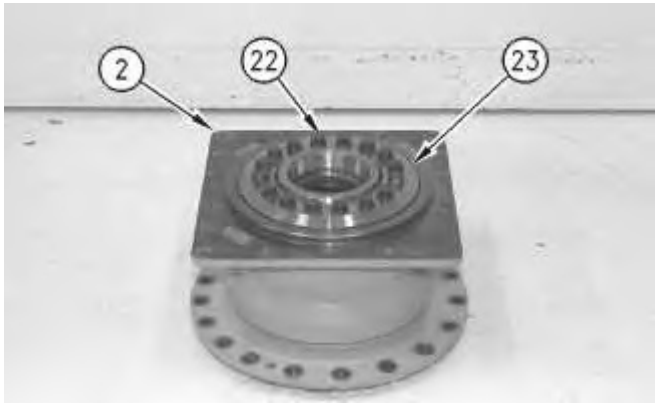

Illustration 10 g00621119

13. Remove bolts (22), the hard washers, retainer (23), the shim pack (not shown), and 10 shims (not shown) from housing (2).

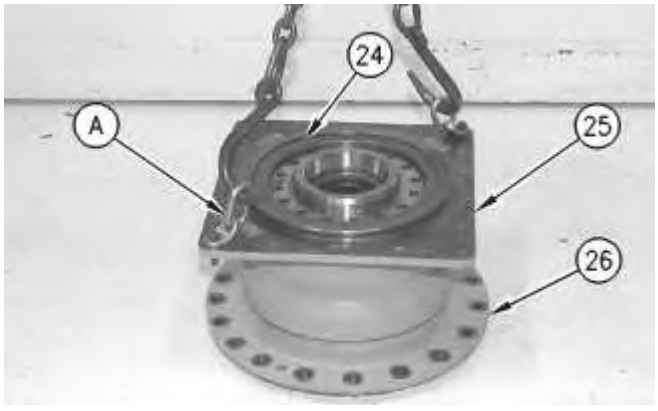

Illustration 11 g00621120

14. Attach Tooling (A) to housing (25). Secure Tooling (A) to a suitable lifting device.
15. Remove thrust washer (24) from housing (25).
16. Remove the housing (26) from housing (25).

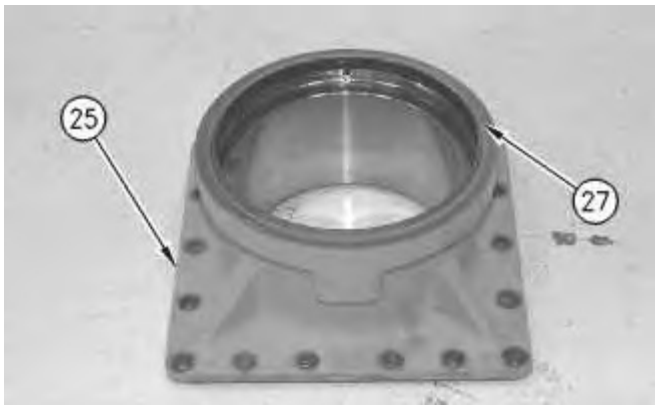

Illustration 12 g00621123

17. Remove lip seal (27) from housing (25).

    Note: Secure the pipe plug on housing (25) for assembly purposes.

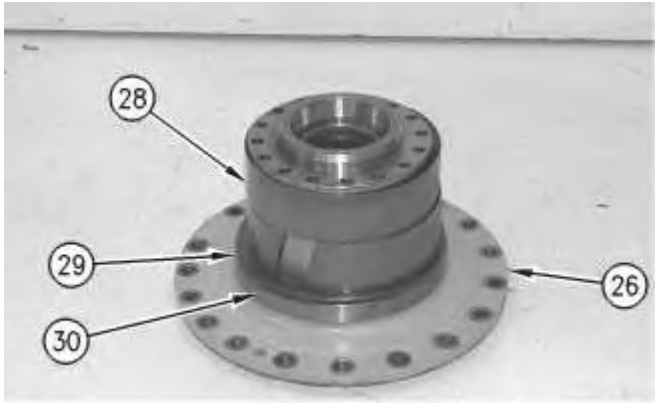

Illustration 13 g00621125

18. Remove wear rings (28) from housing (26).
19. Remove thrust washer (29) from housing (26).
20. Remove lip seal (30) from housing (26).

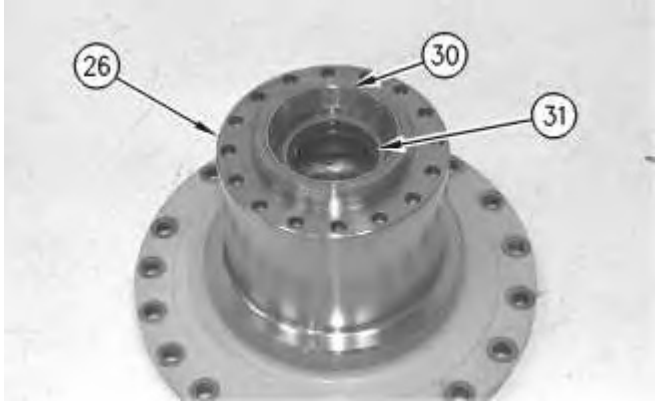

Illustration 14 g00621127

21. Remove roller bearing cup (30) from housing (26).
22. Remove lip seal (31) from housing (26).

Illustration 15 g00621128

23. Remove inner roller bearing cup (32) from housing (26).
24. Repeat Steps 1 through 23 to disassemble the remaining final drive.

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12H, 140H and 160H Motor Graders Power Train
Media Number -RENR4108-16 **Publication Date -01/06/2018** **Date Updated -26/06/2018**

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Final Drive - Assemble

SMCS - 4050-016

Assembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	439-3938	Link Bracket	2
B	5P-4204	Wrench Assembly	1
C	6V-4876	Lubricant	1
D	8T-5096	Dial Indicator Gp	1

Note: Use a suitable press to install the cones on the drive shafts and the cups. If necessary, only preheat the cones to 135 °C (275 °F) for no more than 1 hour. It is important to reseat the cone or the cup with a suitable driver after the bearing and adjacent parts have reached a uniform temperature.

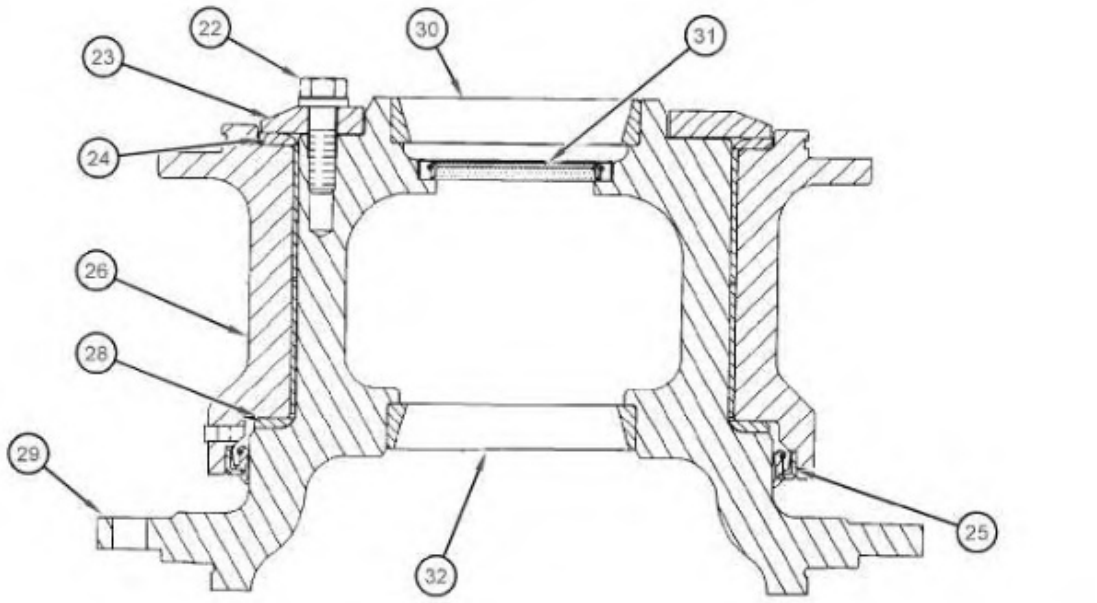

Illustration 1 g01060675

Illustration 2 g01060676

1. Lower the temperature of bearing cup (32) and install bearing cup (32) in housing (29). Check for full seating of the bearing cup with a Feeler Gauge.

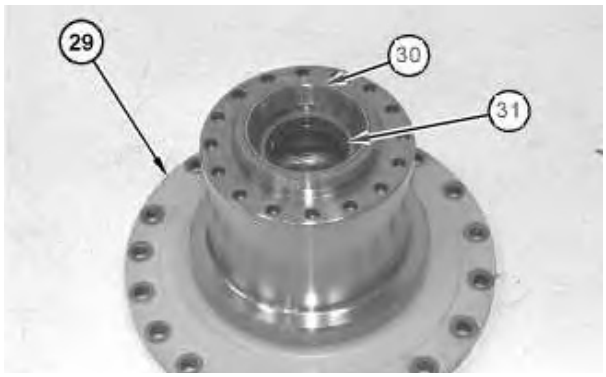

Illustration 3 g01060678

2. Place housing (29) in a vertical position with the flange downward.

3. Install lip seal (31) in housing (29). The lip of the seal must face outward. Lubricate the lip seal (31) with the lubricant which is being sealed.

4. Lower the temperature of bearing cup (30) and install bearing cup (30) in housing (29). Check for full seating of the bearing cup with a Feeler Gauge.

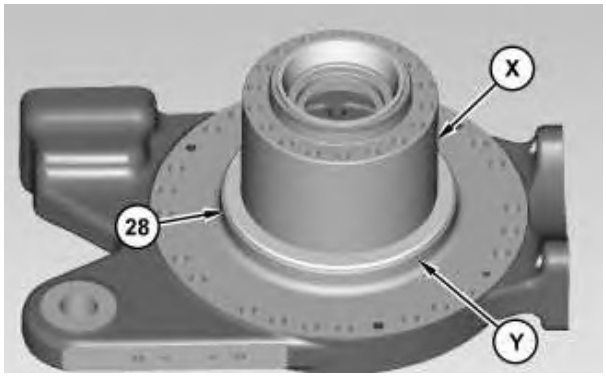

Illustration 4 g02782189

5. Apply Tooling (C) onto thrust washer (28). Apply Tooling (C) onto surface (X) and surface (Y). Install thrust washer (18).

Illustration 5 g02782206

6. Install lip seal (25) into housing (26).

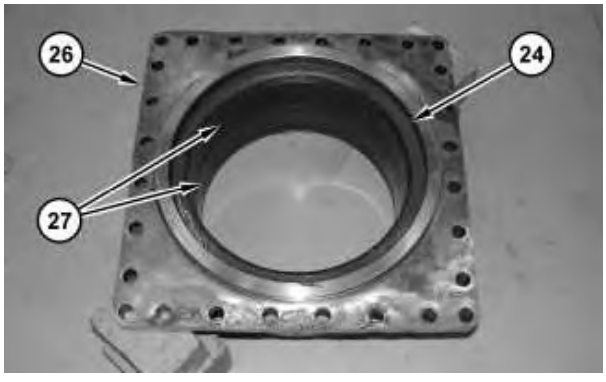

Illustration 6 g02783199

7. Turn over housing (26). Install wear sleeves (27). The diagonal cuts that are in wear sleeves (27) are separated by 90°. Apply Tooling (C) onto thrust washer (24). Install thrust washer (24).

Illustration 7 g02783245

8. Use Tooling (A) and a suitable lifting device to install housing (26). The weight of housing (26) is approximately 54 kg (120 lb). Install shims (23A). Use a suitable soft hammer to drive the wear sleeves into housing (26) until the sleeves are flush with the top of the bore surface. Do not install the shims at this time.

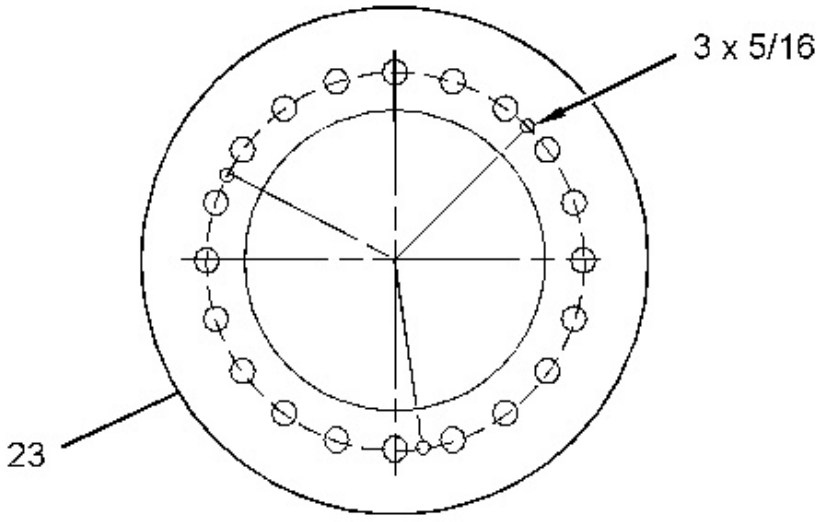

Illustration 8 g02783255

9. Drill three equally spaced 8 mm (5/16 inch) holes in retainer (23) if necessary. The holes must be centered on the existing bolt hole pattern and perpendicular to each surface.

10. Measure the thickness of retainer (23) at the three hole locations. Average the three measurements and record the result as Dimension (A).

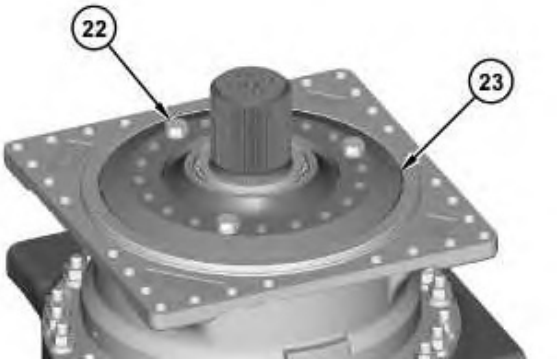

Illustration 9 g02783265

11. Install retainer (23). Install three of bolts (22). Tighten bolts (22) to a torque of 50 ± 7 N·m (37 ± 5 lb ft). Completely loosen bolts (22). Finger tighten bolts (22). Use Tooling (D) to measure the gap between the top surface of retainer (23) and the final drive housing at the three 8 mm (5/16 inch) hole locations. Record the measurement from each of the three locations as the nominal gap or Dimension (B).

12. Calculate the shim pack thickness for the three measurement locations by subtracting Dimension (A) from the Dimension (B) giving you Dimension (C). Remove bolts (22) and retainer (23).

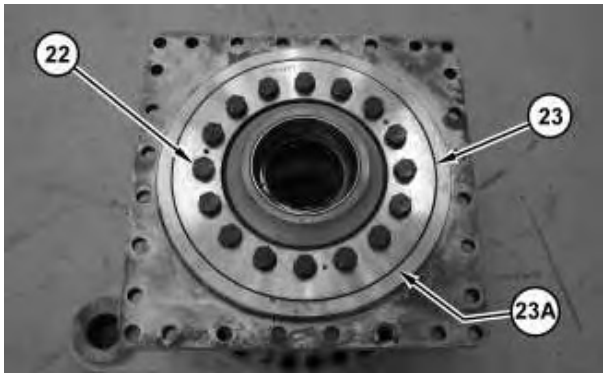

Illustration 10 g02783317

13. Install various shims (23A) that is equal to Dimension (C) plus + 0.075 - 0.025 mm (+ 0.003 - 0.001 inch). Install retainer (23). Install bolts (22). Tighten bolts (22) to a torque of 270 ± 40 N·m (199 ± 30 lb ft).

Illustration 11 g01060689

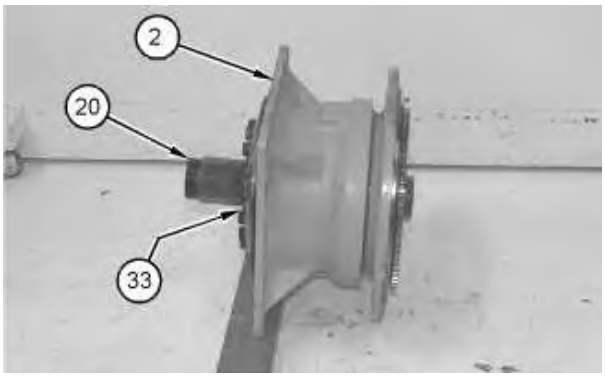

Illustration 12 g01060690

14. Preheat and install bearing cone (21) on drive shaft (20). Check for full seating of the cone with a Feeler Gauge. With the drive shaft in a vertical position, set the housing on bearing cone (21).

15. Start bearing cone (33) (not shown) on the top of drive shaft (20). Do not preheat this bearing cone. The bearing cone can be seated in position by using the sprocket during Step 17. Make sure that the bearing cone is seated in the cup.

16. Install drive shaft (20) in housing assembly (2).

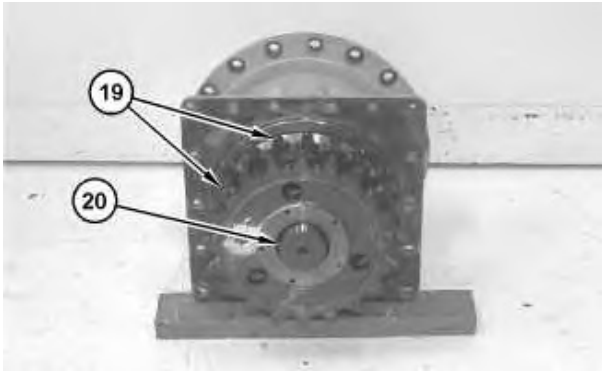

Illustration 13 g01060692

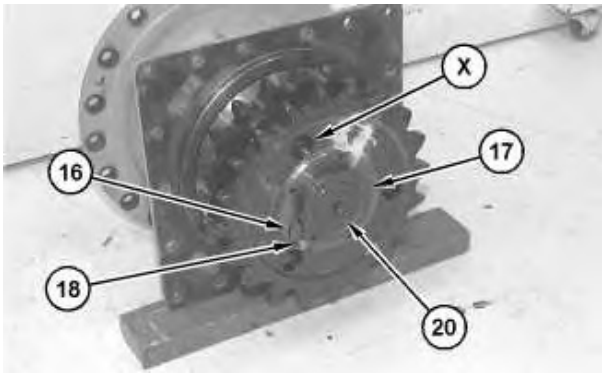

Illustration 14 g01060693

17. Place the first sprocket (19) on drive shaft (20). The large diameter must face downward.

18. Place the second sprocket (19) on drive shaft (20). The hub must face downward and the large diameter must face upward. Ensure that the lubrication holes (X) for the spline are aligned.

19. Install nut (17) to the drive shaft (20). Rotate drive shaft (20) and hit the hub of sprockets (19) while nut (17) is being tightened to a torque of 11 ± 1 N·m (100 ± 10 lb in) above seal drag.

20. Loosen nut (17) by one locking position. Hit the hub of sprockets (19) again.

21. The final torque that is needed to rotate shaft (20) should be 2 ± 1 N·m (20 ± 10 lb in) or 3.95 ± 1.13 N·m (35 ± 10 lb in)above the seal drag depending on machine model.

Table 2

Model	Rolling Torque
120H, 120K, 135H	2.95 ± 1.13 N·m (26 ± 10 lb in)
12H, 12K, 140H, 140K, 143H, 160H, 160K, 163H	3.95 ± 1.13 N·m (35 ± 10 lb in)

Note: Refer to Testing and Adjusting, "Final Drive Bearings - Adjust" for bearing adjustments when the final drive is in chassis.

22. Install bolt (18), the washer, and lock (16) which holds nut (17) to the drive shaft (20). Tighten bolt (18) to a torque of 50 ± 10 N·m (37 ± 7 lb ft).

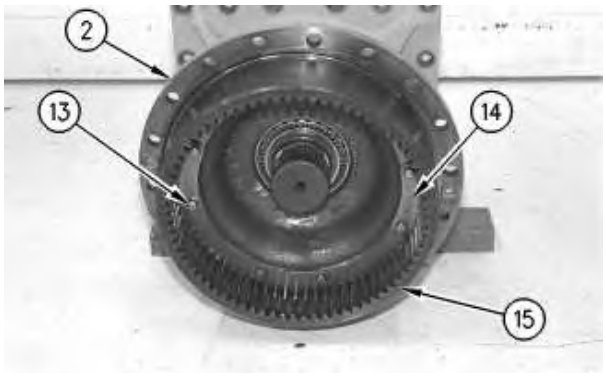

Illustration 15 g00621112

23. Position ring gear (15) to housing assembly (2).

24. Install bolts (13), the washers, and plates (14) to hold ring gear (15) to housing assembly (2). Tighten locking bolts (13) to a torque of 50 ± 10 N·m (37 ± 7 lb ft).

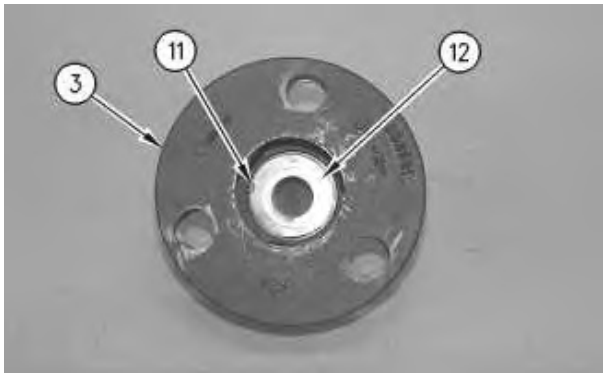

Illustration 16 g00621111

25. Install washer (12) and retaining ring (11) in planetary carrier (3).

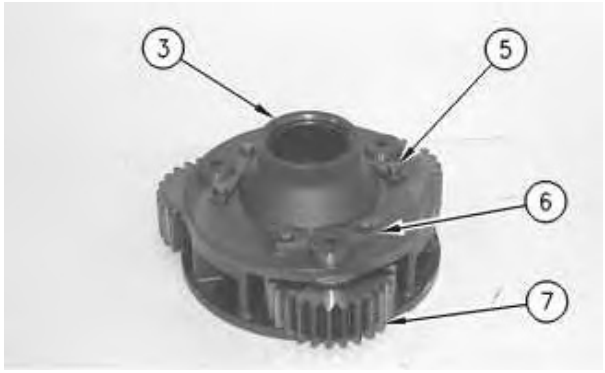

Illustration 17 g00621108

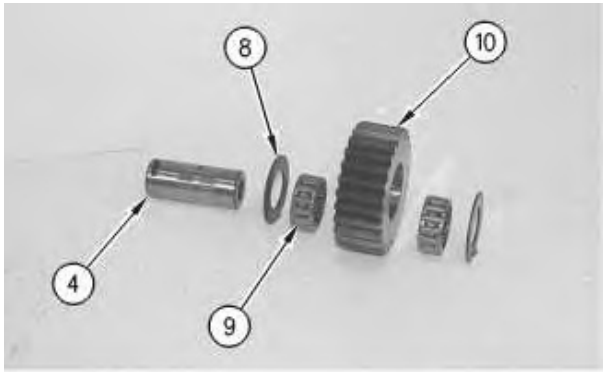

Illustration 18 g00621109

26. Install gear assemblies (7) and planetary shafts (4) in planetary carrier (3).

    Note: Each gear assembly (7) consists of two washers (8), two roller assemblies (9), planetary gear (10), and planetary shaft (4).

27. Install retainers (6), the washers, and locking bolts (5) to planetary carrier (3) to hold planetary shafts (4) and gear assemblies (7) in planetary carrier (3). Tighten locking bolts (5) to a torque of 50 ± 10 N·m (37 ± 7 lb ft).

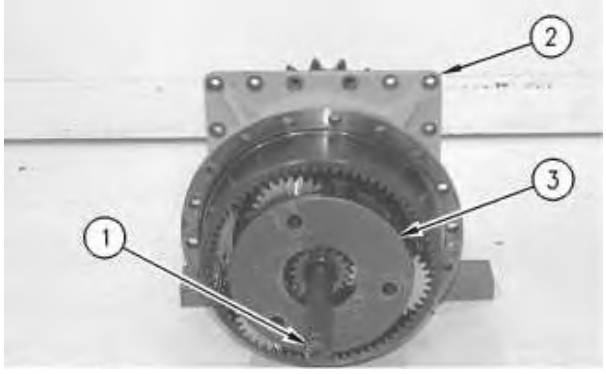

Illustration 19 g00621106

28. Install planetary carrier (3) in housing assembly (2).

29. Install sun gear shaft (1) in housing assembly (2).

30. Repeat Steps 21 through 29 to assemble the remaining final drive.

End By:

a. Install the final drives.

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Media Number -RENR4108-16 **Publication Date -01/06/2018** **Date Updated -26/06/2018**

i01920768

Final Drive - Install

SMCS - 4050-012

Installation Procedure

Note: Cleanliness is an important factor. Before assembly, all parts should be thoroughly cleaned in cleaning fluid. Allow the parts to air dry. Wiping cloths or rags should not be used to dry parts. Lint may be deposited on the parts which may cause later trouble. Inspect all parts. If any parts are worn or damaged, use new parts for replacement.

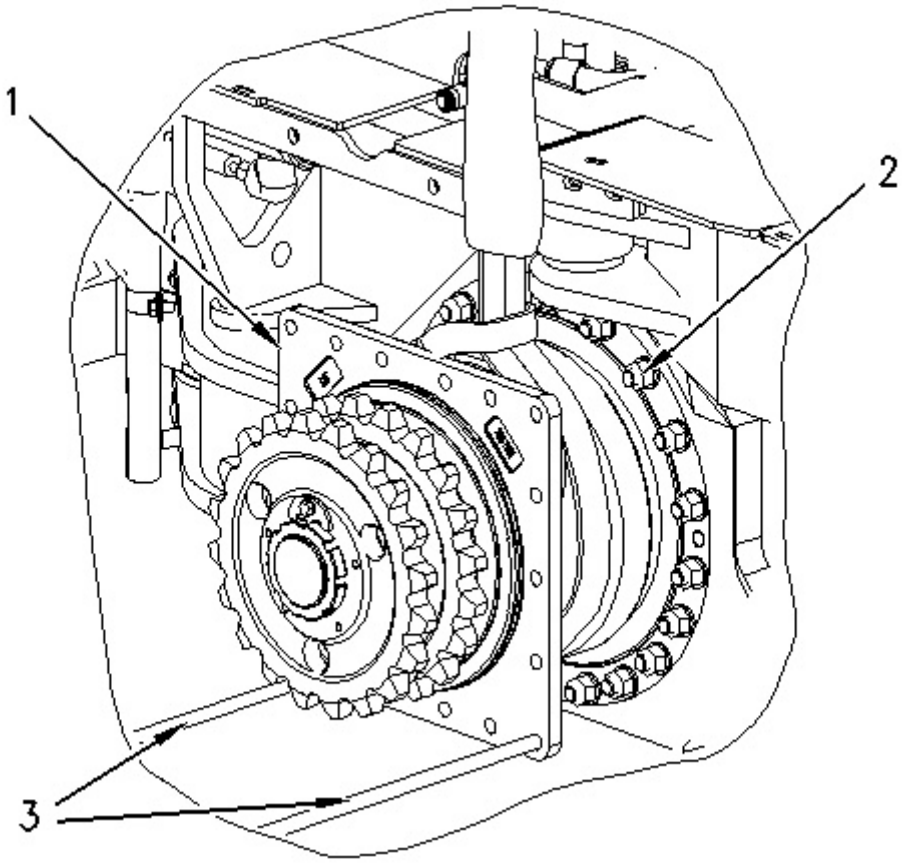

Illustration 1 g00999500

1. Attach a suitable lifting device to final drive (1). The weight of final drive (1) is approximately 272 kg (600 lb).
2. Use pry bars (3) in order to balance final drive (1). Install final drive (1). Install nuts (2). Tighten nuts (2) to a torque of 430 ± 60 N·m (317 ± 44 lb ft).
3. Fill the power train oil system. The capacity of the power train system is 47 L (12 US gal).

End By:

a. Install the tandem housing. Refer to Disassembly and Assembly, "Tandem Housing - Install".

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Disassembly and Assembly
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Media Number -RENR4108-16 **Publication Date -01/06/2018** **Date Updated -26/06/2018**

i01924681

Transmission Oil Filter Base - Remove

SMCS - 3068-011

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
ZZ	6V-9511	Face Seal Plug	1
	6V-9512	Face Seal Plug	1
	6V-9832	Cap As	1
	6V-9833	Cap As	1

Note: SERVICE DATA: TOOLING (ZZ) WILL NOT BE IDENTIFIED IN PHOTOGRAPHS IN THE REMOVAL OR THE INSTALLATION. THIS TOOLING IS SHOWN IN ORDER TO ASSIST THE EXPERIENCED SERVICEMAN.

Note: Cleanliness is an important factor. Before the disassembly procedure, the exterior of the component should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism.

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.

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

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

Dispose of all fluids according to local regulations and mandates.

Note: Put identification marks on all lines, on all hoses, on all wires, and on all tubes for installation purposes. Plug all lines, hoses, and tubes. This helps to prevent fluid loss and this helps to keep contaminants from entering the system.

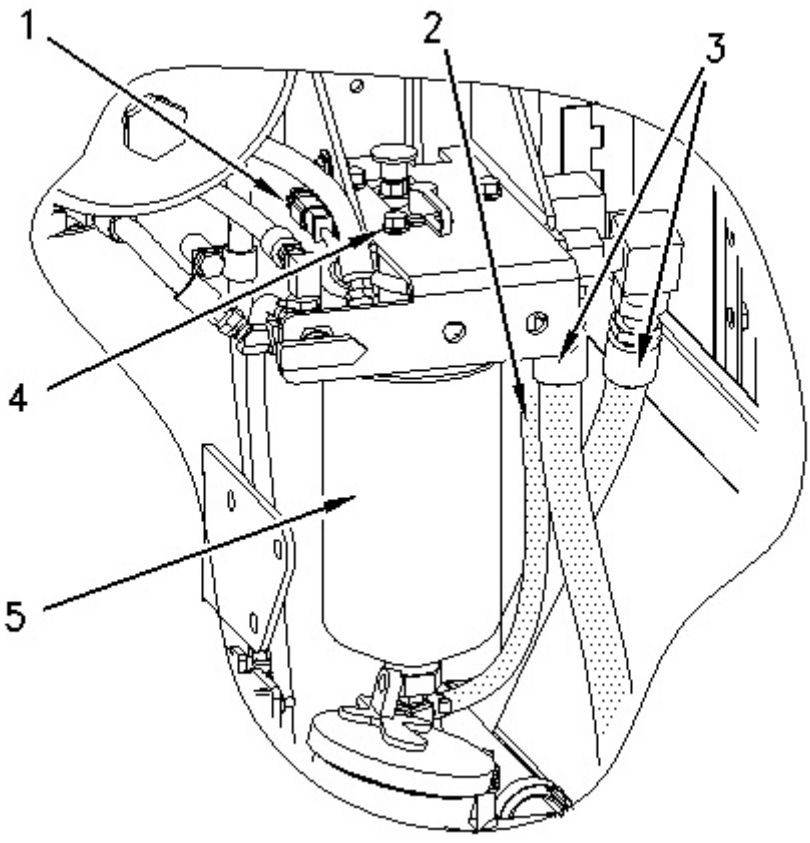

Illustration 1 g01001711

1. Disconnect harness assembly (1).
2. Disconnect hose (2) from the rear chassis support. Disconnect hose assemblies (3).
3. Remove bolts (4). Remove filter (5) and the base.
