



Service Repair Manual

Models

120K Series 2 Motor Grader

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Product: MOTOR GRADER

Model: 120K 2 MOTOR GRADER SZS

Configuration: 120K Series 2 Motor Grader SZS00001-UP (MACHINE) POWERED BY C7 Engine

Disassembly and Assembly

120K and 120K Series 2 Motor Graders Power Train

Media Number -KENR8438-04

Publication Date -01/08/2018

Date Updated -09/08/2018

i07035127

Service Brake (Wheel Spindle) - Assemble

SMCS - 4002-016

Assembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2420	Transmission Repair Stand	1
B	138-7574	Link Bracket	2
C		7/16 IN - 14 NC × 6 Guide Studs	3
		7/16 IN - 14 NC Nuts	3
		7/16 IN Washers	3
D	169-0503	Installation Kit	1
	1U-8698	Duo-Cone Seal Installer As	1
E	—	Loctite 263	-
F		SAE 30	-
G	5P-8678	Punch	1
H	8W-0789	Retainer Used on 120K	1
	9D-3075	Retainer Used on 12K, 140K, and 160K	1
J	6V-7030	Micrometer Depth Gauge Gp	1

Note: Cleanliness is an important factor. Before assembly, all parts should be thoroughly cleaned in cleaning fluid. Allow the parts to air dry. Do not use wiping cloths or rags 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.

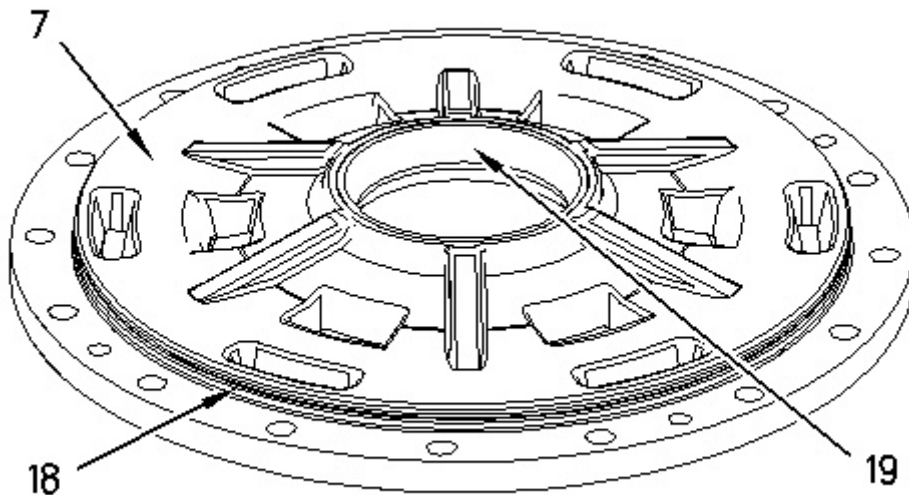


Illustration 1

g00925109

1. Lower the temperature of cup (19) to install bearing cup (19) in cover (7).
 2. Install O-ring seal (18). Lubricate O-ring seal (18) lightly with the lubricant that is being sealed.
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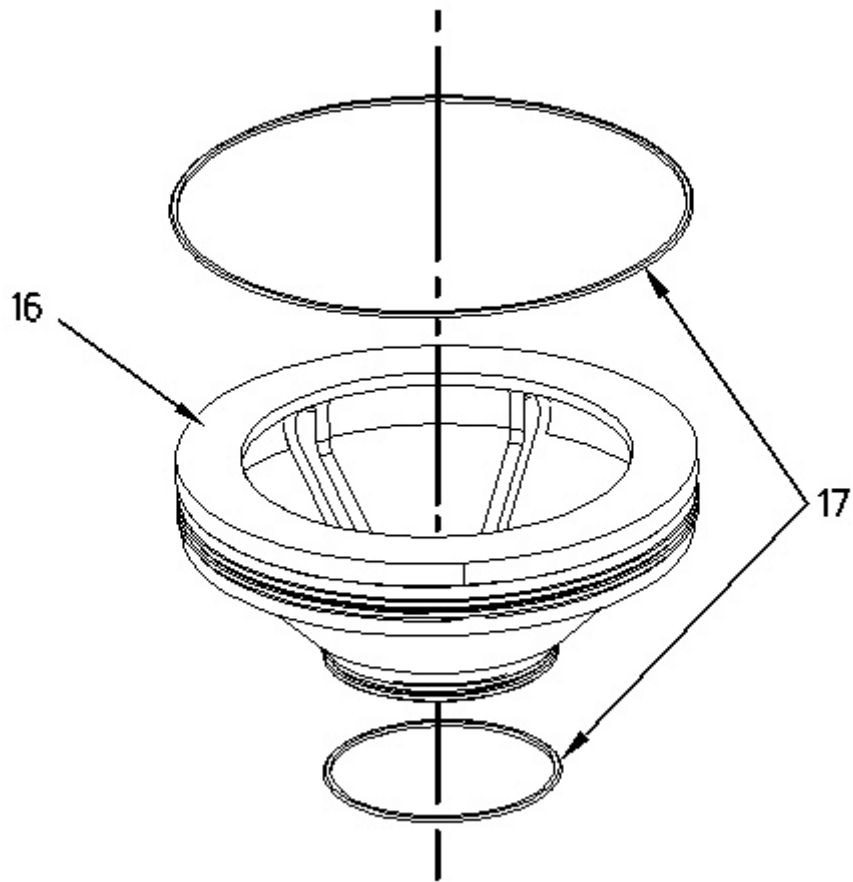


Illustration 2

g00924449

3. Install D-ring seals (17) on piston (16). Lubricate D-ring seals (17) lightly with the lubricant that is being sealed.

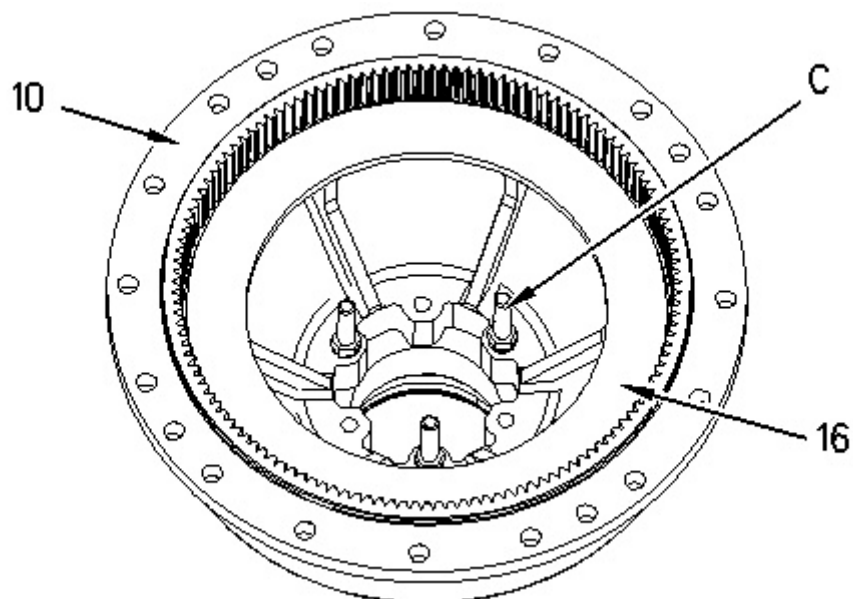


Illustration 3

g00925439

4. Install Tooling (C) on piston (16) and pull piston (16) into housing (10) evenly.

5. Remove Tooling (C).

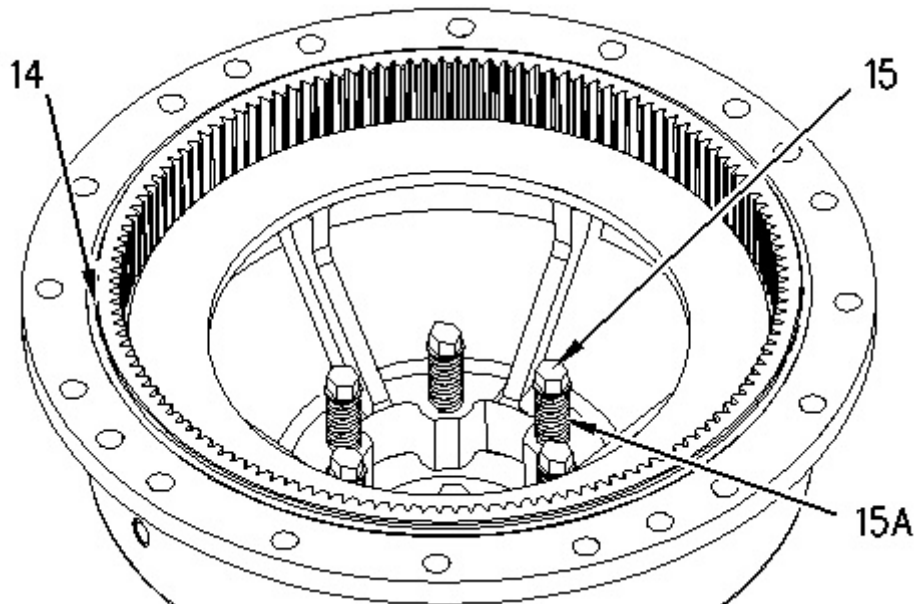


Illustration 4

g00924445



WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

6. Install springs (15A), the washers, and bolts (15). Tighten bolts (15) to a torque of $40 \pm 7 \text{ N}\cdot\text{m}$ ($30 \pm 5 \text{ lb}\cdot\text{ft}$). Install O-ring seal (14). Lubricate O-ring seal (14) lightly with the lubricant that is being sealed.
-

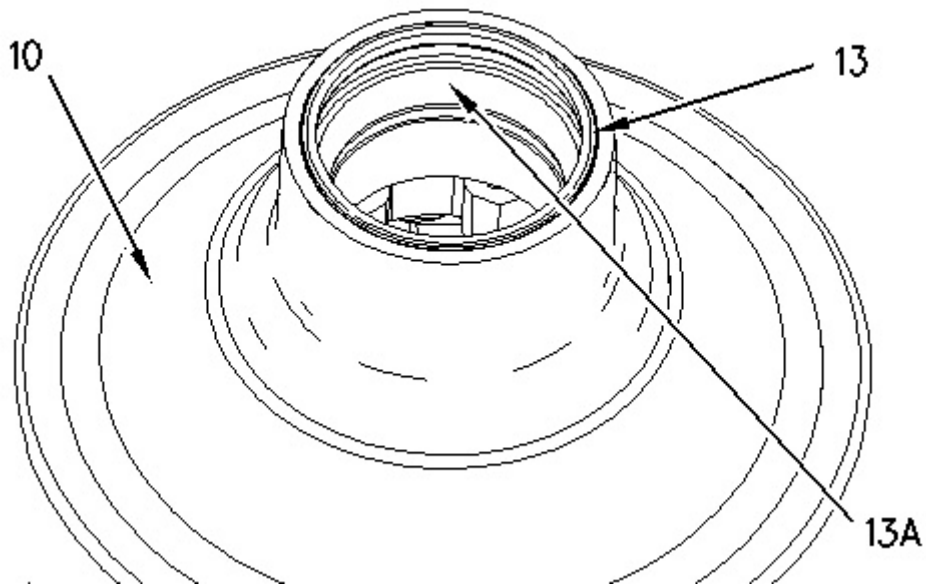


Illustration 5

g00924443

7. Lower the temperature of bearing cup (13A) to install bearing cup (13A) in housing (10).
8. Use Tooling (D) to install Duo-Cone seal (13) in housing (10). Refer to Disassembly and Assembly, "Duo-Cone Conventional Seals - Install".

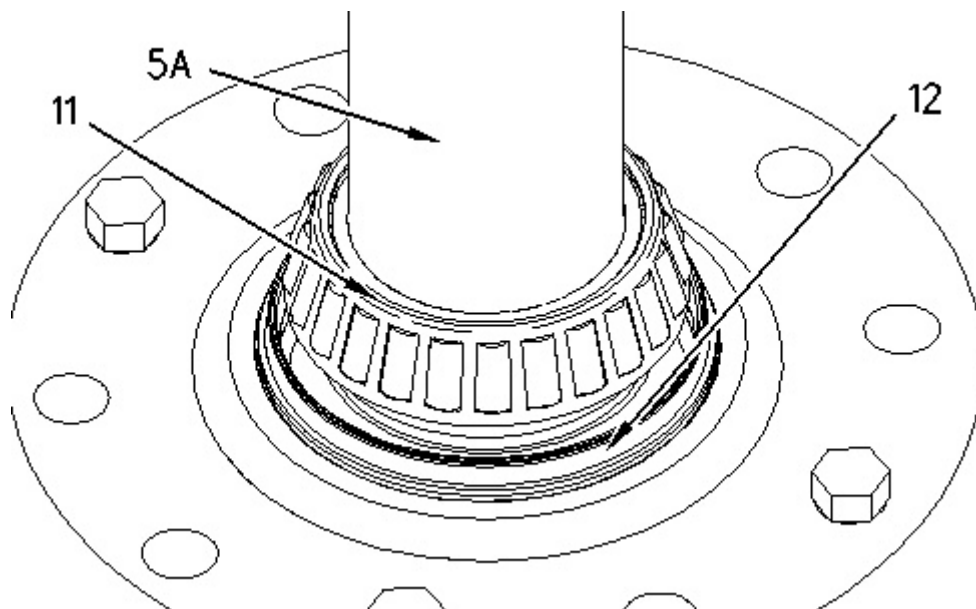


Illustration 6

g00924442

9. Use Tooling (D) to install Duo-Cone seal (12) on wheel spindle (5A). Refer to Disassembly and Assembly, "Duo-Cone Conventional Seals - Install".
10. Raise the temperature of bearing cone (11). Install bearing cone (11) on wheel spindle (5A).

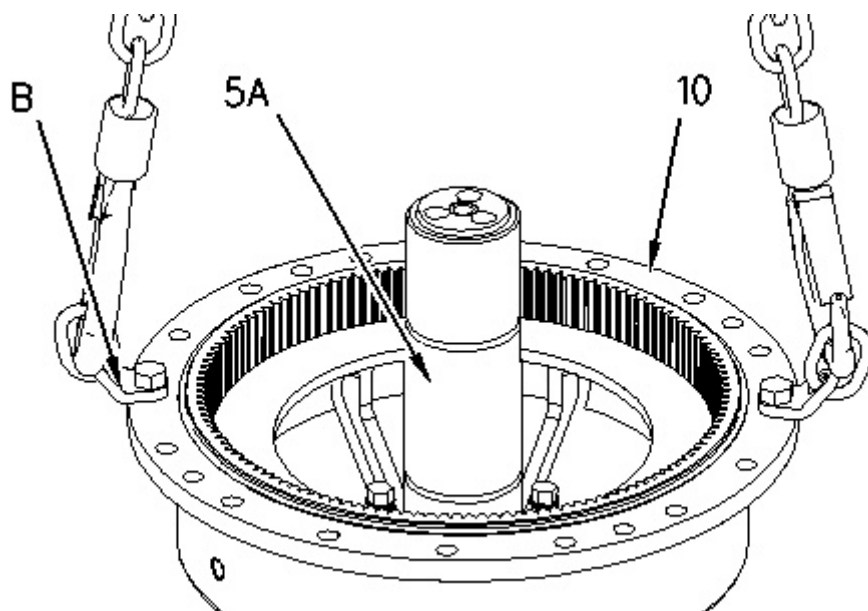


Illustration 7

g00924441

11. Install Tooling (B) and a suitable lifting device on housing (10). Position housing (10) on wheel spindle (5A). The weight of housing (10) is approximately 77 kg (170 lb).

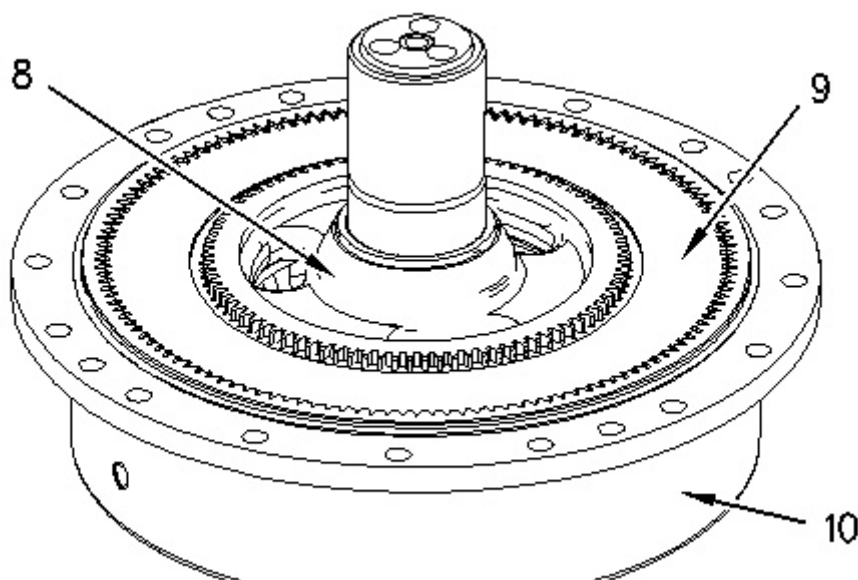


Illustration 8

g00924440

12. Apply Tooling (F) to discs (9) and friction discs. Install discs (9) and friction discs in housing (10).
13. Install hub (8).

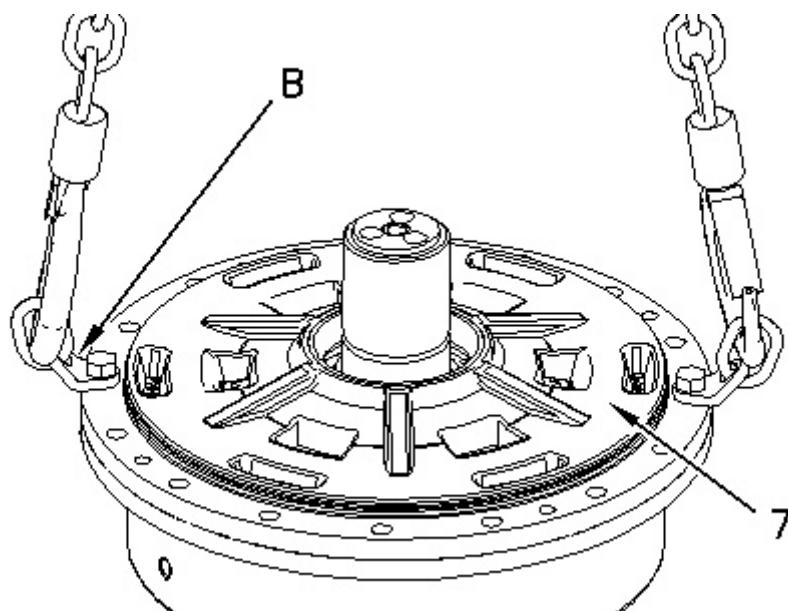


Illustration 9

g00924439

14. Attach Tooling (B) and a suitable lifting device to cover (7). Install cover (7) on housing (10). The weight of cover (7) is approximately 45 kg (100 lb).

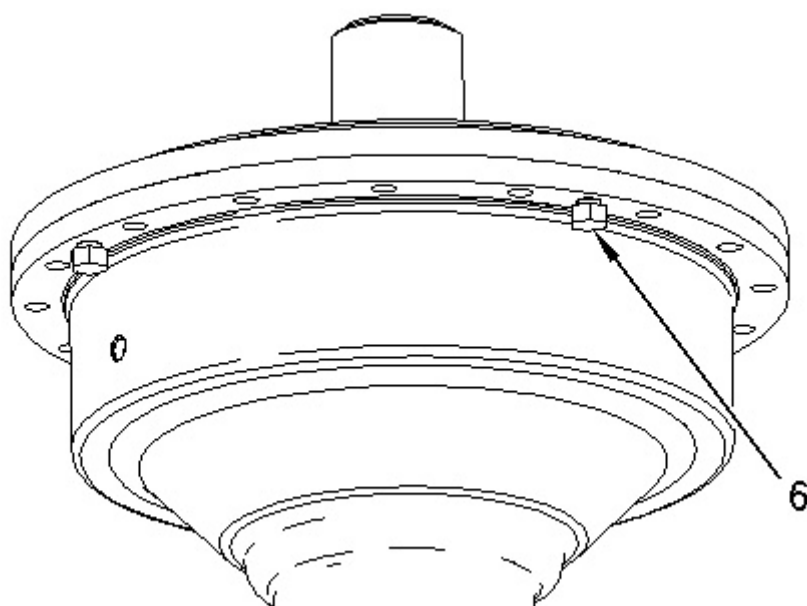


Illustration 10

g00924435

15. Install bolts (6).

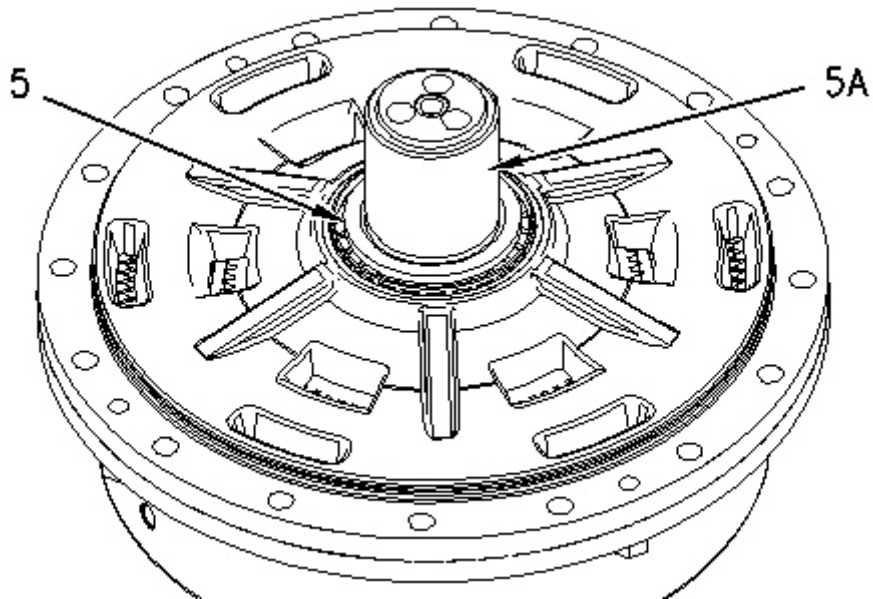


Illustration 11

g00924433

16. Install bearing cone (5) on wheel spindle (5A).

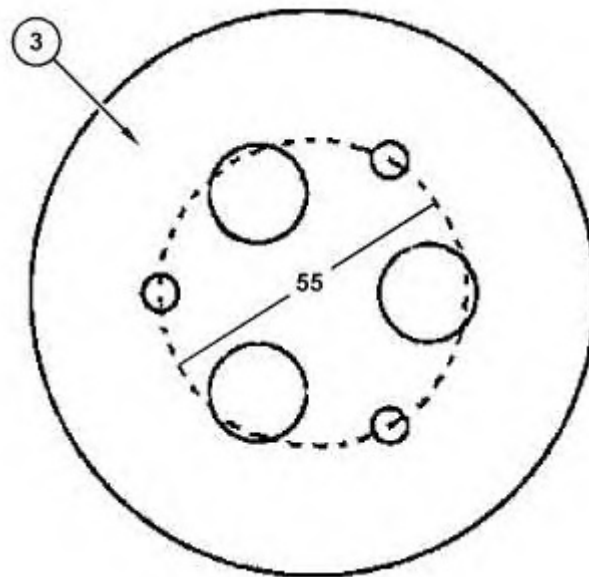


Illustration 12

g06191359

Shown is the pattern for a 12K, 140K, and 160K, the diameter of the dashed circle is 55 mm (2.165 inch)

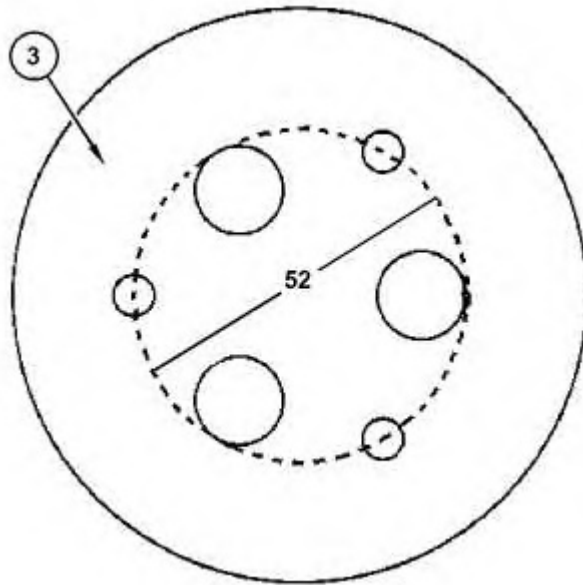


Illustration 13

g06186593

Shown is the pattern for a 120K, the diameter of the dashed circle is 52 mm (2.047 inch).

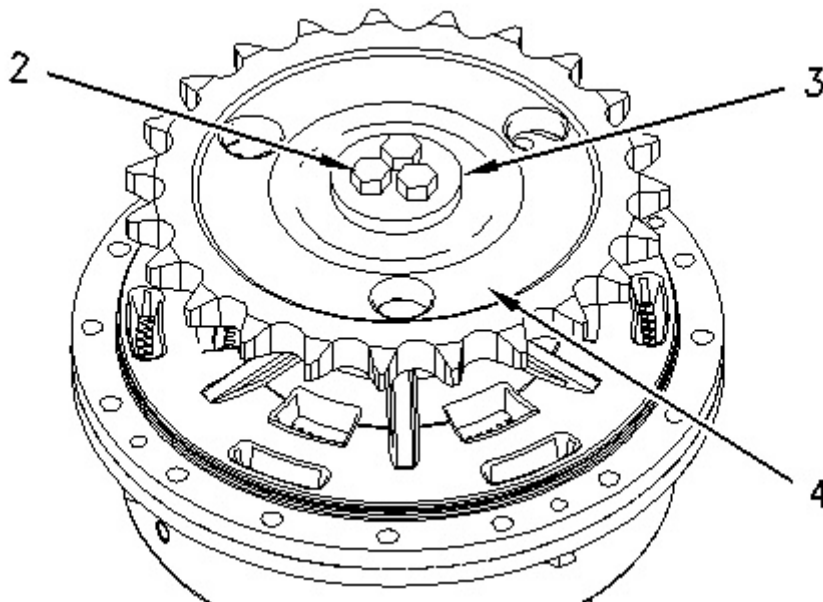


Illustration 14

g00924431

17. If necessary scribe a circle onto retainer (3). Refer to Illustration 12 if working on a 12K, 140K, or 160K and refer to Illustration 13 if working on a 120K. Drill three evenly spaced 6.4 mm (0.25 inch) diameter holes into retainer (3).

Note: Once the bearing adjustment is complete, the modified retainer can be reused.

18. Measure and record the thickness of retainer (3) .
19. Install sprocket (4). Install retainer (3). Do not use shims. Install bolts (2) finger tight against retainer (3). Tighten bolts (2) to the seating torque of 80 N·m (59 lb ft). Repeat until bolts (2) no longer move. Rotate the housing three full revolutions. Bolts (2) will have to be

tightened to 80 N·m (59 lb ft) several times. After each tightening sequence rotate, the housing three full revolutions until the bolt torque has equalized at 80 N·m (59 lb ft).

20. Loosen bolts (2) and retighten finger tight against retainer (3). Rotate the housing three full revolutions.
21. Tighten bolts (2) to a torque of 20 N·m (177 lb in). Repeat until bolts (2) no longer move. Rotate the housing three full revolutions. Bolts (2) will have to be tightened to 20 N·m (177 lb in) several times. After each tightening sequence, rotate the housing three full revolutions until the bolt torque has equalized at 20 N·m (177 lb in).

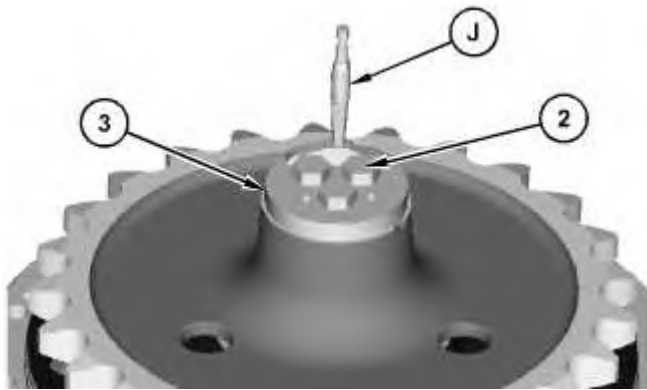


Illustration 15

g06197119

22. Using Tooling (J) to obtain measurement from the face of retainer (3) to the face of the wheel spindle. Subtract the thickness of retainer (3) calculated in Step 18. To calculate the total required shim thickness, add the preload adjustment factor in Table 2.
23. Remove bolts (2) and retainer (3). Assemble and install the shim pack calculated in Step 22. Position retainer (3). Apply Tooling (E) to bolts (2). Install bolts (2) and tighten to the final torque specified in Table 2.

Table 2

Machines	Preload Adjusting Factor	Final Torque
120K	0.159 mm (0.0063 inch)	130 ± 7 N·m (96 ± 5 lb ft)
12K, 140K, 140K2, 160K	0.035 mm (0.0013 inch)	260 ± 14 N·m (192 ± 10 lb ft)

24. Tighten tooling (G) in the drain port of the housing.

Note: Do not exceed the air pressure of the machine in the following steps.

25. Apply air pressure to the inlet port to move the piston. Check for air leaks past the seals.
26. Use tooling (G) to produce a mark on the piston that is 2.3 ± 0.8 mm ($-.09 \pm 0.03$ inch).

Note: The mark can be used later to determine the wear of the brake pack.

27. Release all air pressure from the brake. Remove the punch assembly. Ensure that there is sealant in the threads of the drain plug and then tighten the drain plug to the drain port.

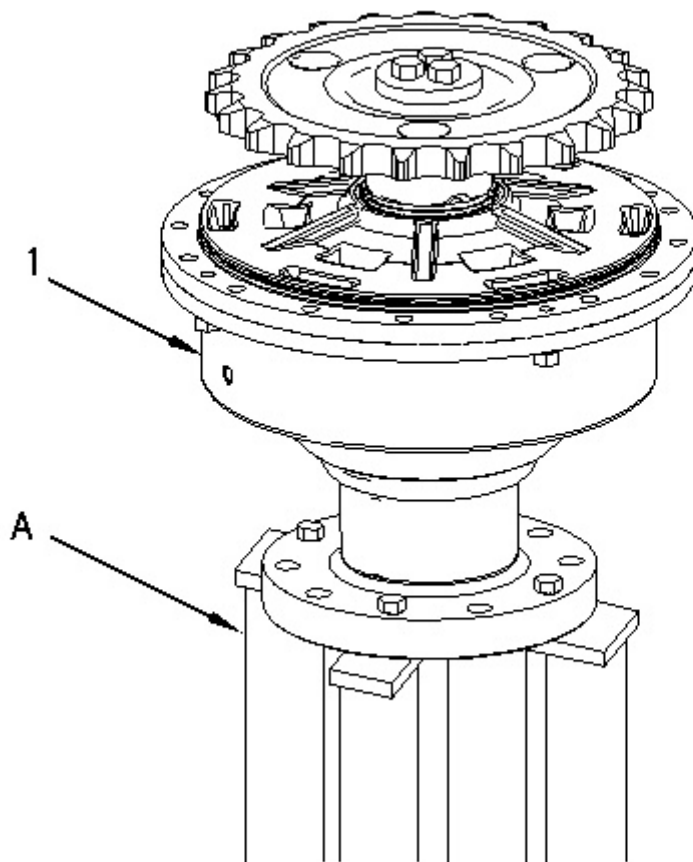


Illustration 16

g00924430

28. Remove Tooling (A) from spindle assembly (1).

End By:

- a. Install the service brake and the wheel spindle. Refer to Disassembly and Assembly, "Service Brake (Wheel Spindle) - Install" for the machine that is being serviced.

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Model: 120K 2 MOTOR GRADER SZS

Configuration: 120K Series 2 Motor Grader SZS00001-UP (MACHINE) POWERED BY C7 Engine

Disassembly and Assembly

120K and 120K Series 2 Motor Graders Power Train

Media Number -KENR8438-04

Publication Date -01/08/2018

Date Updated -09/08/2018

i03662629

Service Brake (Wheel Spindle) - Install

SMCS - 4002-012

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7574	Link Bracket	3
B	7M-7456	Bearing Mount Compound	1

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.

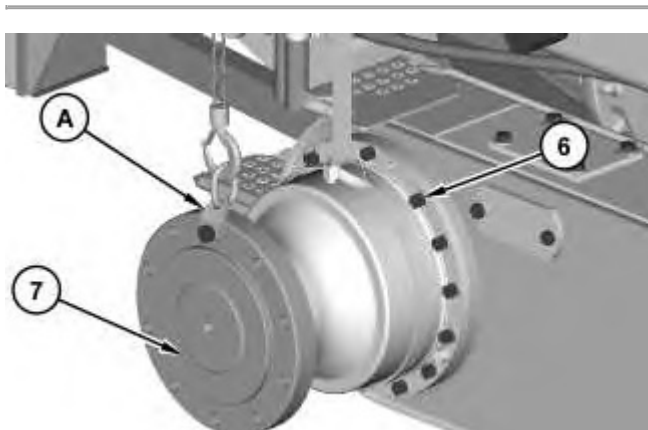


Illustration 1

g01964979

1. Attach Tooling (A), as shown. Attach a suitable lifting device to Tooling (A). Attach a suitable lifting device around service brake (7).
2. Install service brake (7). The weight of service brake (7) is approximately 250 kg (550 lb). Install bolts (6). Apply Tooling (B) to the threads of bolts (6). Tighten bolts (6) to a torque of $120 \pm 20 \text{ N}\cdot\text{m}$ ($89 \pm 15 \text{ lb ft}$).

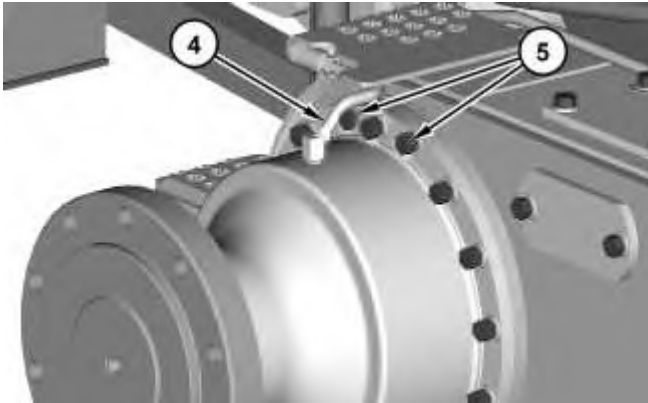


Illustration 2

g01964970

3. Install bolts (5). Apply Tooling (B) to the threads of bolt (5). Tighten bolts (5) to a torque of $120 \pm 20 \text{ N}\cdot\text{m}$ ($89 \pm 15 \text{ lb ft}$). Install tube assembly (4).

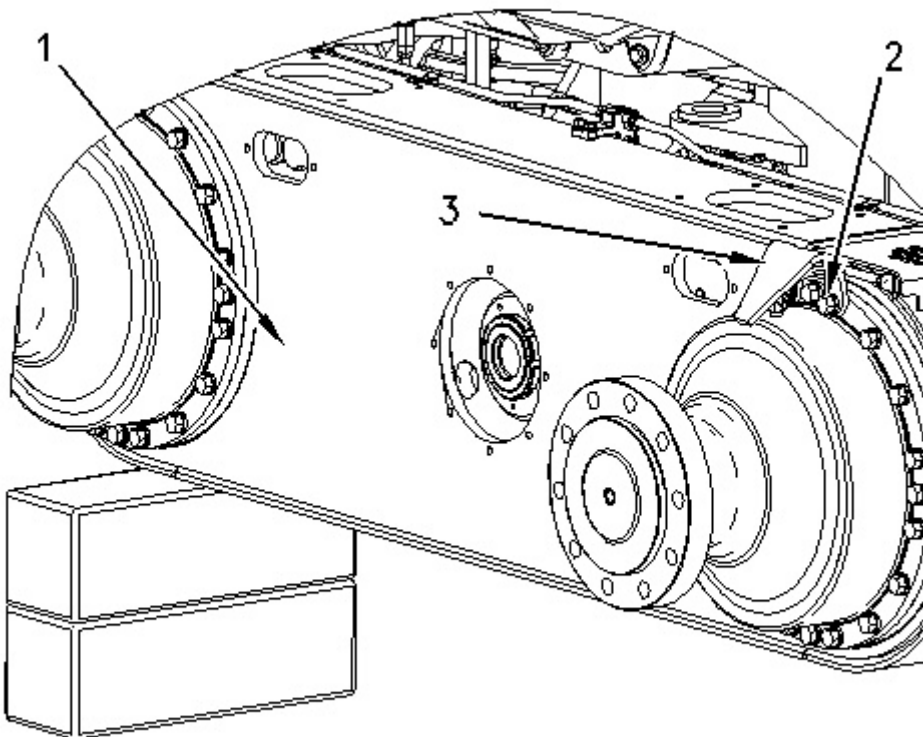


Illustration 3

g00923694

4. Install guard (3) and install bolts (2).
5. Remove the suitable blocking under tandem (1).

End By:

- a. Install the drive chains. Refer to Disassembly and Assembly, "Drive Chain - Install".

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Disassembly and Assembly

120K and 120K Series 2 Motor Graders Power Train

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Publication Date -01/08/2018

Date Updated -09/08/2018

i03361130

Tandem and Cover - Remove and Install

SMCS - 4064-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	2
B	138-7576	Link Bracket	2
C	1U-9199	Lever Puller Hoist	1

Start By:

- Remove the drive chains. Refer to the Disassembly and Assembly , "Drive Chain - Remove".

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.

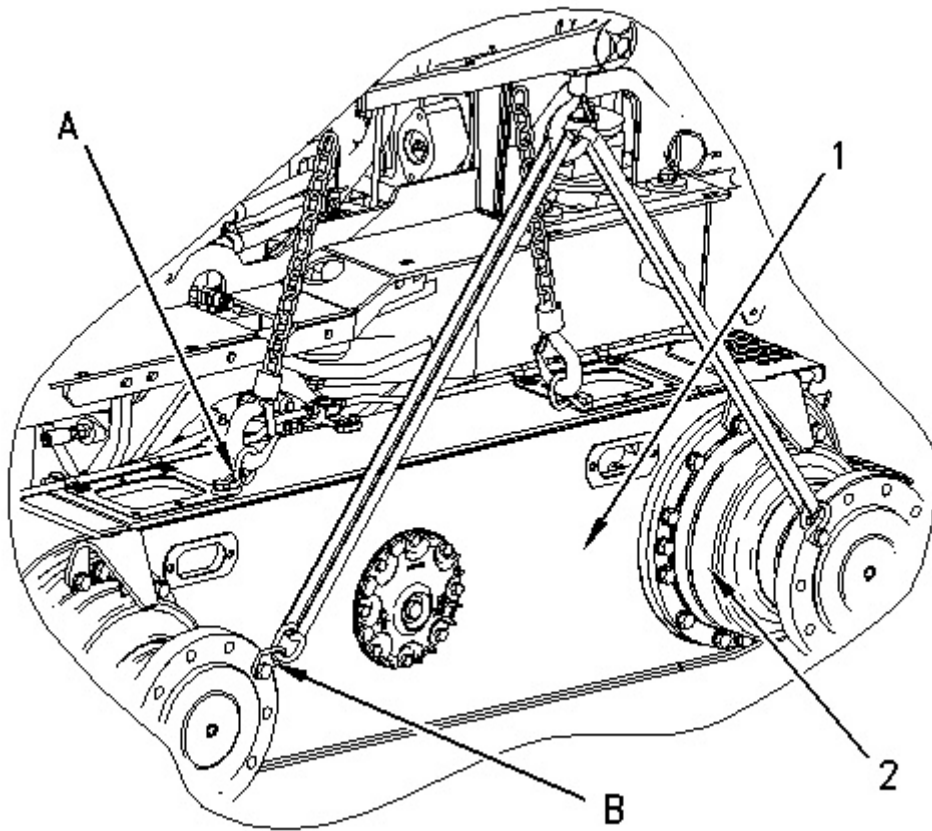


Illustration 1

g00999910

1. Install Tooling (A) on tandem housing assembly (1). Install Tooling (B) on the brake and wheel spindle housing (2). Attach Tooling (C) and a suitable lifting device to Tooling (A) and Tooling (B). The weight of the tandem housing assembly (1) is approximately 612 kg (1350 lb).
-

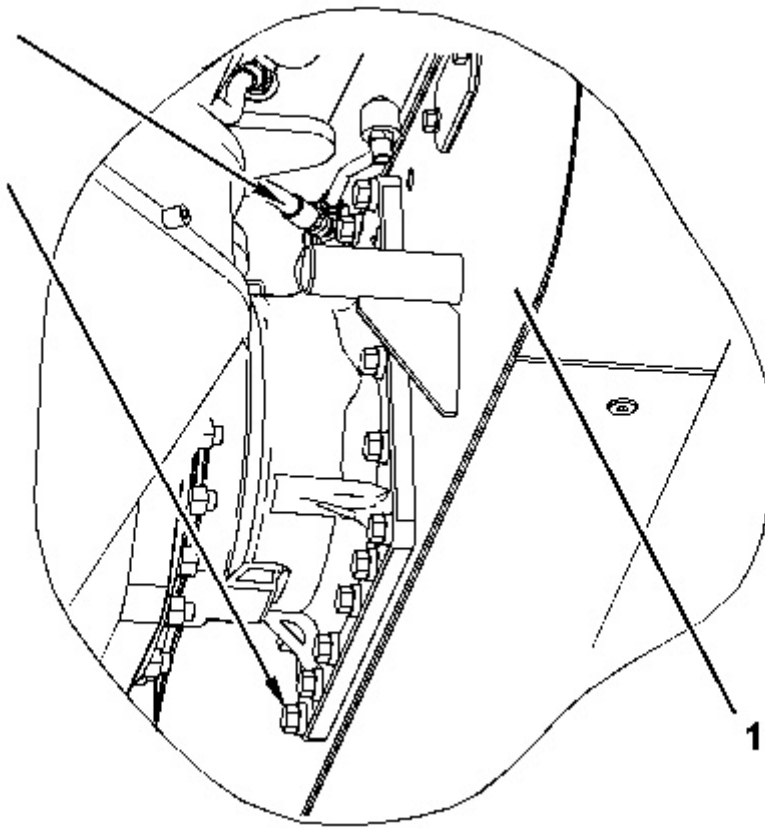


Illustration 2

g01741521

2. Disconnect hose assembly (3).
 3. Remove bolts (4). Remove tandem housing assembly (1). The weight of tandem housing assembly (1) is approximately 612 kg (1350 lb).
-

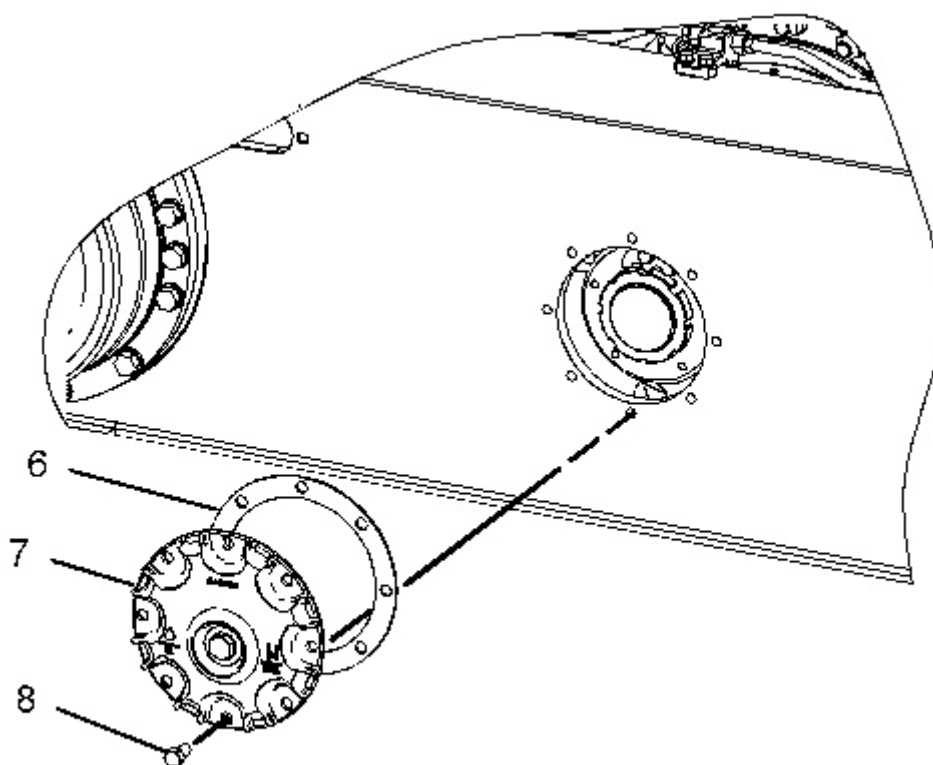


Illustration 3

g01106890

4. Remove bolts (8), cover (7), and gasket (6).

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	2
B	138-7576	Link Bracket	2
C	1U-9199	Lever Puller Hoist	1
D	155-0695	Thread Lock Compound	1

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.

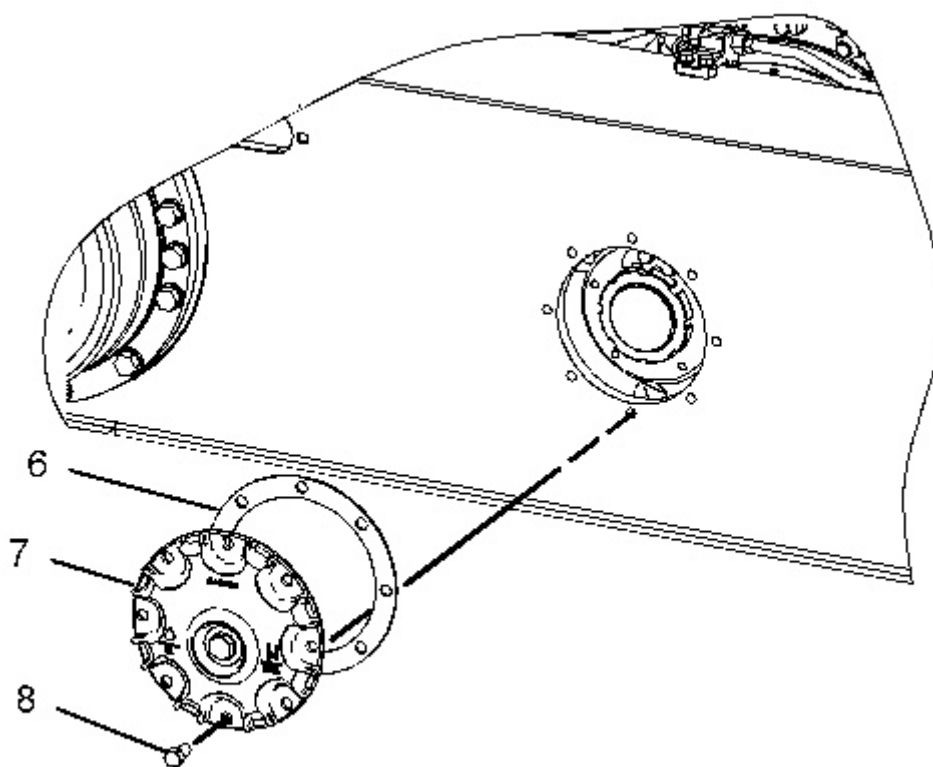


Illustration 4

g01106890

1. Install gasket (6) and cover (7).
 2. Install bolts (8). Tighten bolts (8) to a torque of 27 ± 7 N·m (20 ± 5 lb ft).
-

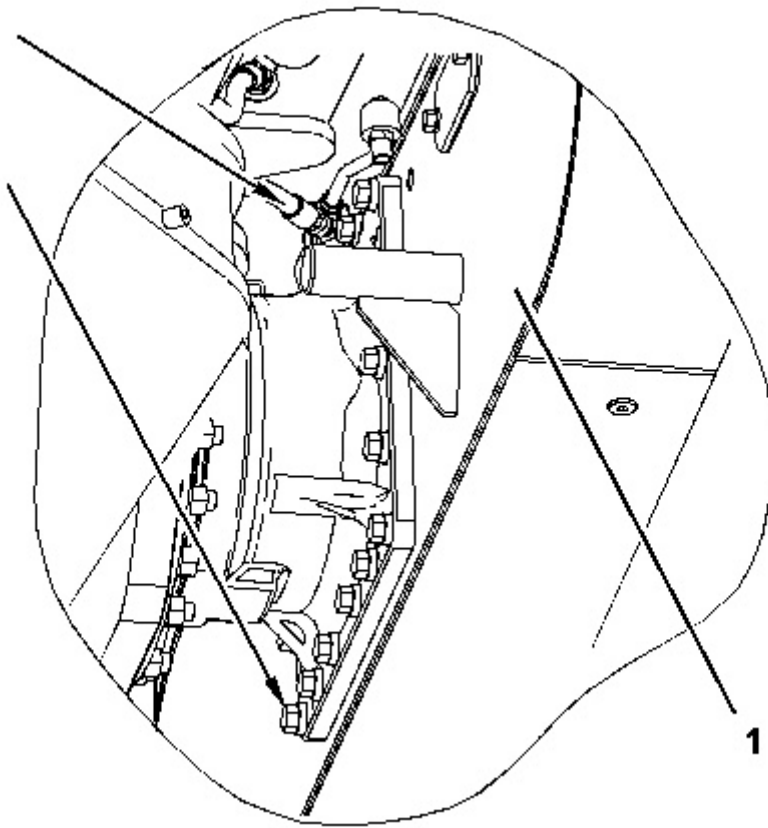


Illustration 5

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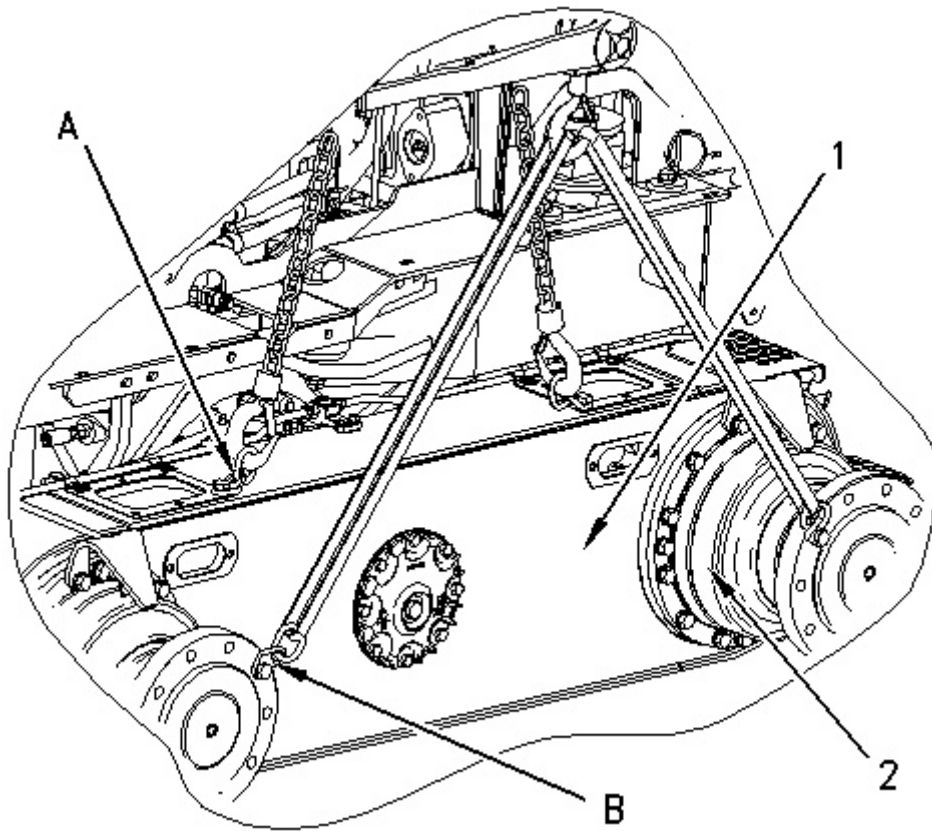


Illustration 6

g00999910

3. Install Tooling (A) on tandem housing (1). Install Tooling (B) on the brake and wheel spindle housing (2). Attach Tooling (C) and a suitable lifting device to Tooling (A) and Tooling (B).
4. Install tandem housing assembly (1). The weight of tandem housing assembly (1) is approximately 612 kg (1350 lb).
5. Apply Tooling (D) to bolts (4). Install bolts (4). For the 140K, tighten bolts (4) to a torque of $240 \pm 40 \text{ N}\cdot\text{m}$ ($177 \pm 30 \text{ lb ft}$).
6. Connect hose assembly (3).

End By:

- a. Install the drive chains. Refer to the Disassembly and Assembly manual, "Drive Chain - Install".

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Disassembly and Assembly

120K and 120K Series 2 Motor Graders Power Train

Media Number -KENR8438-04

Publication Date -01/08/2018

Date Updated -09/08/2018

i05077309

Drive Sprocket - Remove and Install

SMCS - 4072-010

Removal Procedure

Start By:

- A. Remove the tandem and the cover. Refer to Disassembly and Assembly, "Tandem and Cover - Remove and Install".
-

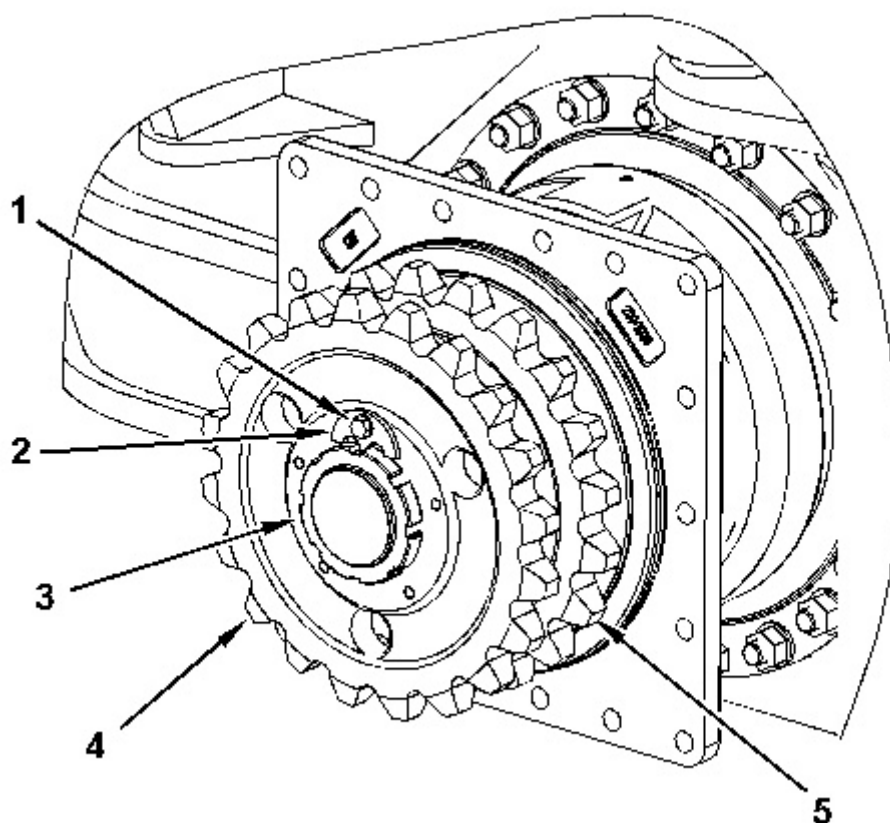


Illustration 1

g01060649

1. Remove bolt (1) and lock (2) . Remove nut (3) . Remove sprocket (4) . Remove sprocket (5) .

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	5P-4204	Wrench	1



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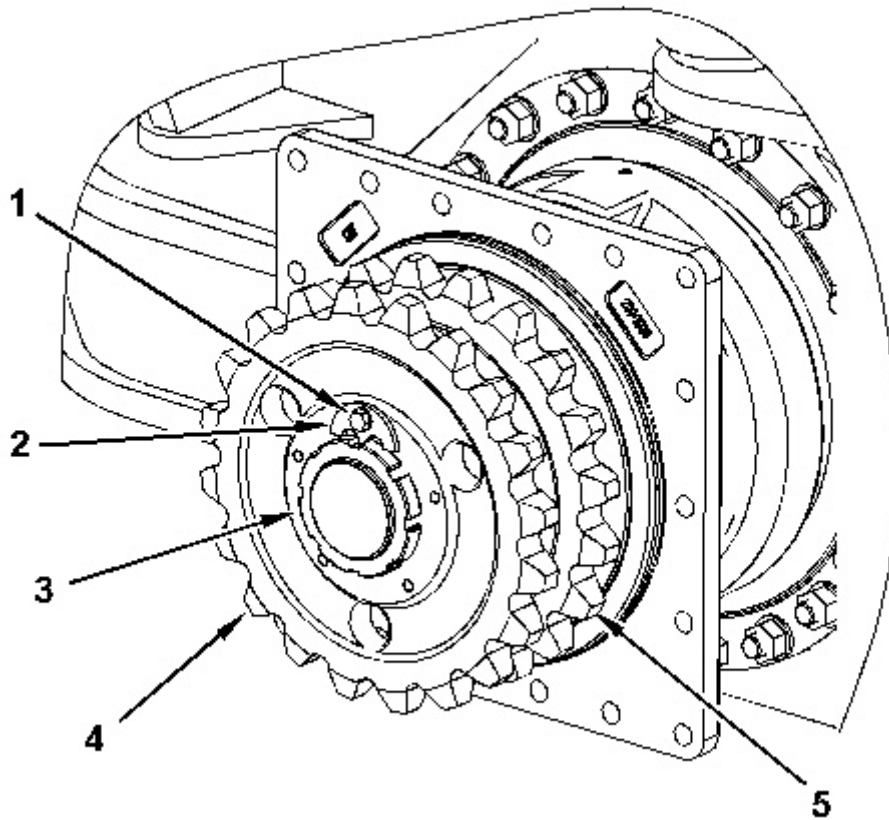


Illustration 2

g01060649

1. Install sprocket (5) . Install sprocket (4) and install nut (3) hand tight.

Note: Assemble so the teeth on both sprockets are not aligned (out of phase) with each other.

2. Tighten the nut while you rotate the shaft. Use a soft faced hammer to tap the sprockets while you tighten the nut.
3. Tighten nut (3) to a torque of $11.3 \pm 1.13 \text{ N}\cdot\text{m}$ ($100 \pm 10 \text{ lb in}$).
4. Loosen nut (3) by one locking position and tap the sprockets to ensure that the bearings are fully seated.
5. Tighten nut (3) in order to achieve a rolling torque of $3.95 \pm 1.13 \text{ N}\cdot\text{m}$ ($35 \pm 10 \text{ lb in}$) above the seal drag.
6. If nut (3) is in a locking position, install lock (2) and install bolt (1) .

Note: Bolt (1) must be replaced with a new bolt.

7. If nut (3) is not in a locking position, tighten nut (3) to the next locking position. With nut (3) in the locking position, install lock (2) , and install bolt (1) .

End By: Install the tandem and the cover. Refer to Disassembly and Assembly, "Tandem and Cover - Remove and Install".

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