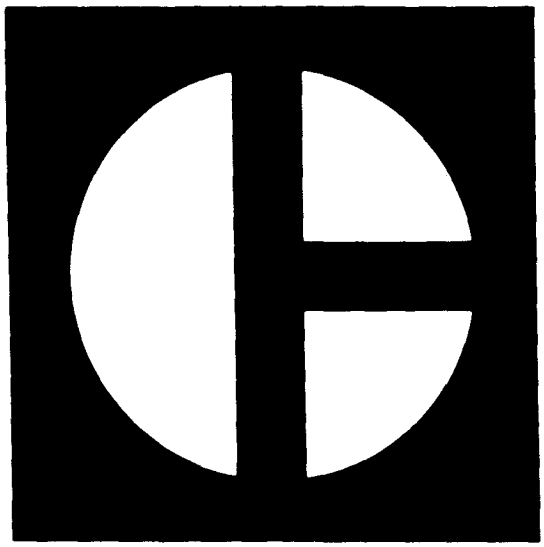
FORM NO. SENR2255-03
FOR USE IN SERVICE MANUALS:
950B & 950E WHEEL LOADERS,
SENR2249
POWER TRAIN SPECIFICATIONS,
SENR4200



SPECIFICATIONS

950B AND 950E WHEEL LOADERS POWER TRAIN

VEHICLE	TRANSMISSION
22Z1-UP	1BC1-UP
31R1-UP	2ZE1-UP
63R1-UP	3EB1-UP
65R1-UP	3EE1-UP
	4RA1-UP
	7DA1-UP
	8SA1-UP

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Introduction

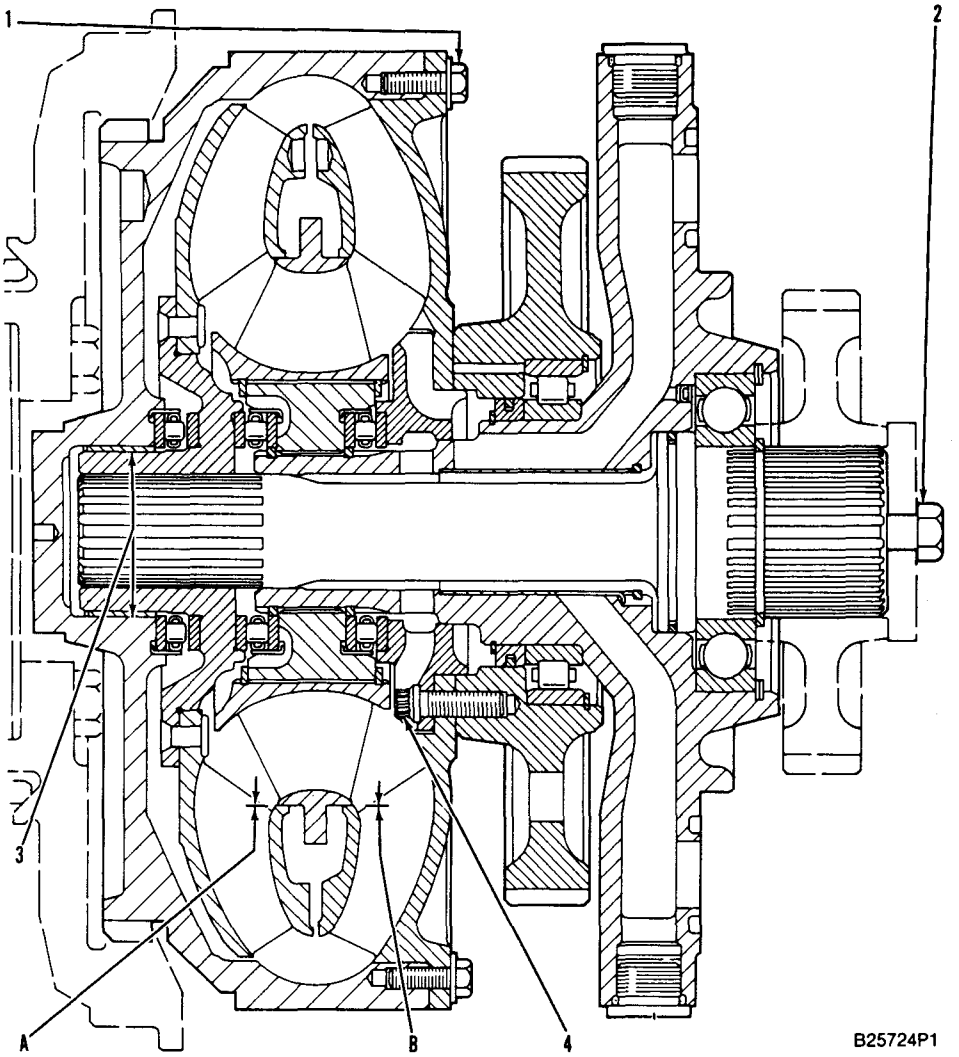
When the words "use again" are in the description, the specification given can be used to determine if a part can be used again. If the part is equal to or within the specification given, use the part again.

When the word "permissible" is in the description, the specification given is the "maximum or minimum" tolerance permitted before adjustment, repair and/or new parts are needed.

A comparison can be made between the measurements of a worn part and the specifications of a new part to find the amount of wear. A part that is worn can be safe to use if an estimate of the remainder of its service life is good. If a short service life is expected, replace the part.

REFERENCE: For Systems Operation and Testing and Adjusting make reference to 950B and 950E Power Train, Form No. SENR2256. For Power Shift Transmission Testing and Adjusting, see Form No. SENR2257.

Torque Converter



(1) Torque for 24 bolts that fasten impeller to housing ..... 30 ± 5 N•m (22 ± 4 lb ft)

(2) Torque for retaining bolt ..... 120 ± 15 N•m (90 ± 11 lb ft)

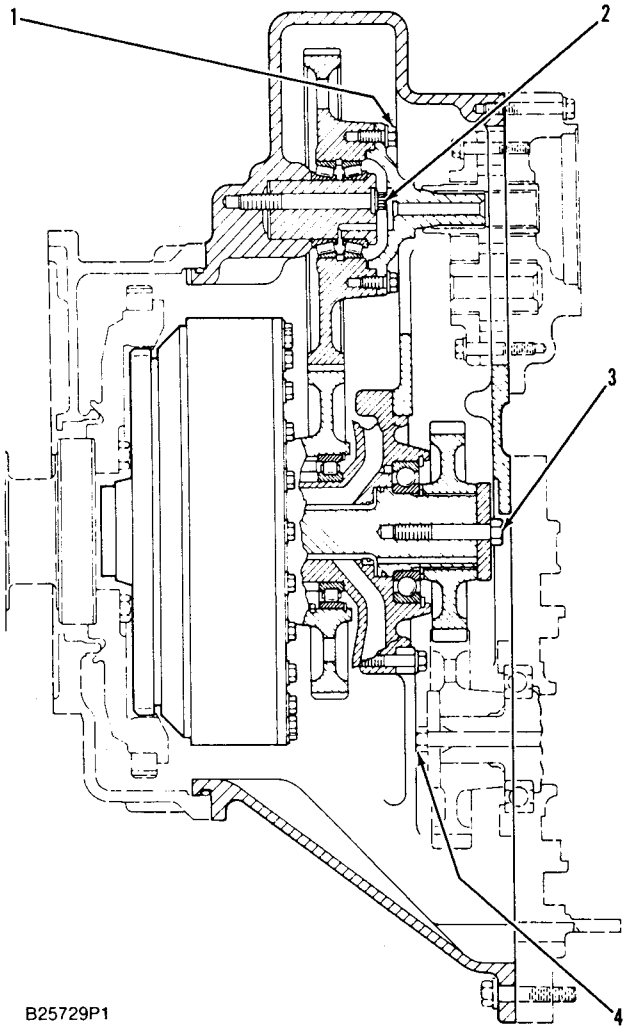
(3) Inside diameter of new bearings in housing assembly (after installation) ..... 60.388 ± 0.038 mm (2.3775 ± .0015 in.)

(4) Torque for eight bolts that fasten gear and impeller to hub ..... 50 ± 7 N•m (37 ± 5 lb ft)

Clearance between		Across the Diameter	Running*
(A) Stator & Turbine	new	0.71 to 0.91 mm (.028 to .036 in.)	0.36 to 0.46 mm (.014 to .018 in.)
	max. worn	1.83 mm (.072 in.)	0.92 mm (.036 in.)
(B) Stator & Impeller	new	0.71 to 0.91 mm (.028 to .036 in.)	0.36 to 0.46 mm (.014 to .018 in.)
	max. worn	1.83 mm (.072 in.)	0.92 mm (.036 in.)

* Half the clearance across the diameter.

Torque Converter And Pump Drive Housing



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(1) Torque for six bolts that fasten the flange to the gear ..... 50 ± 7 N•m (37 ± 5 lb ft)

(2) Tighten bolt while gear is turned to a torque of ..... 120 ± 15 N•m (90 ± 11 lb ft)

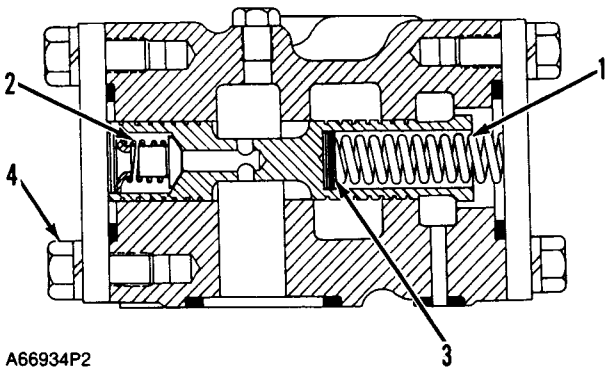
After tightening, gear must rotate freely and have 0.08 to 0.30 mm (.003 to .012 in.) end play.

(3) Torque for retaining bolts .... 120 ± 15 N•m (90 ± 11 lb ft)

(4) Torque for bolt ..... 110 ± 10 N•m (80 ± 7 lb ft)

Outlet Relief Valve For Torque Converter

3S2695



A66934P2

Pressure setting ..... 415 ± 14 kPa (60 ± 2 psi)
at a flow of ..... 76 ± 0.8 liter/min (20 ± .2 U.S.gpm)

(1) 2S1382 Spring for relief valve:
Length under test force ..... 44.2 mm (1.74 in.)
Test force ..... 103 ± 8 N (23.1 ± 1.8 lb.)
Free length after test ..... 50.04 mm (1.97 in.)
Outside diameter ..... 15.09 mm (.594 in.)

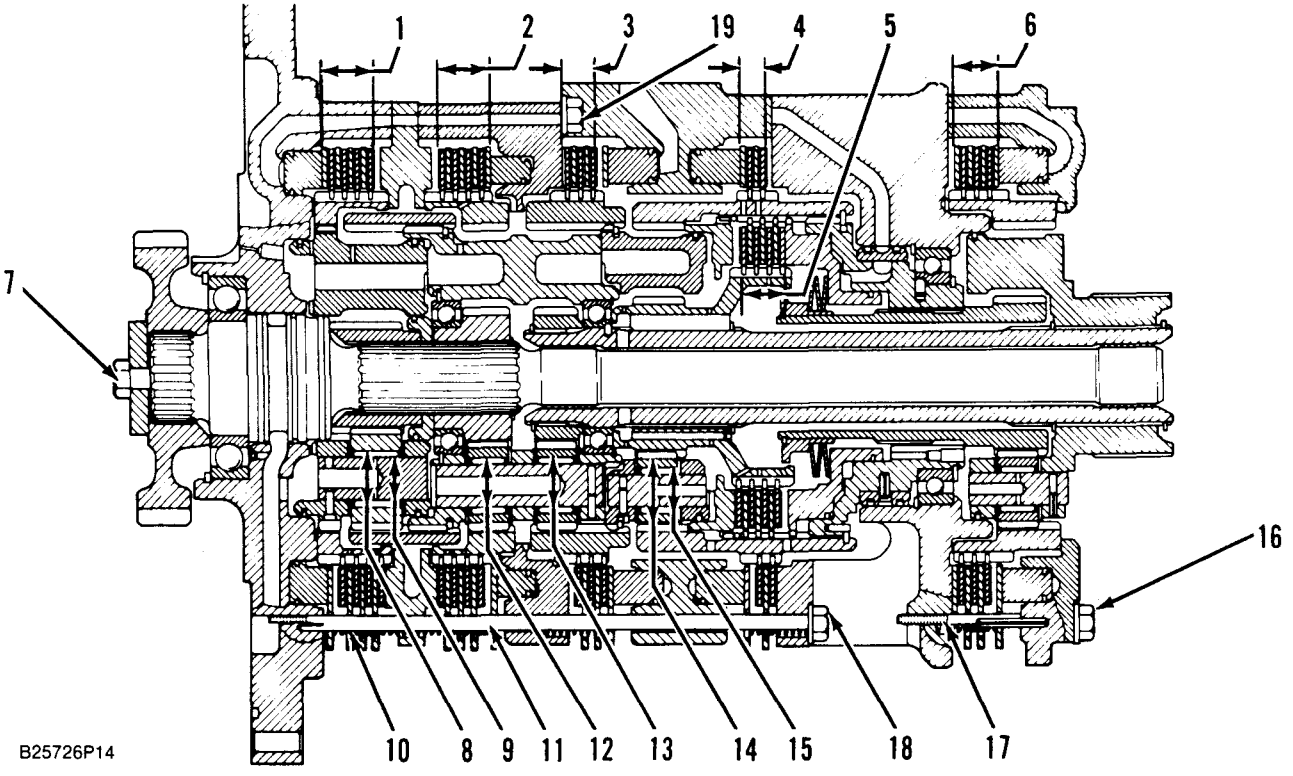
(2) 5M9548 Spring for poppet valve:
Length under test force ..... 21.34 mm (.84 in.)
Test force ..... 4.5 ± 0.4 N (1.0 ± .08 lb.)
Free length after test ..... 34.0 mm (1.34 in.)
Outside diameter ..... 12.19 mm (.48 in.)

(3) Spacer
4M1751 Spacer:
Thickness of spacer ..... 0.41 mm (.016 in.)
Outside diameter of spacer ..... 15.09 mm (.594 in.)
One spacer will change pressure ..... 19 kPa (2.7 psi)

5S7001 Spacer:
Thickness of spacer ..... 0.91 mm (.036 in.)
Outside diameter of spacer ..... 14.15 ± 0.05 mm (.557 ± .002 in.)
One spacer will change pressure ..... 40 kPa (6 psi)

(4) Torque for four bolts that fasten end covers to valve body ..... 45 ± 7 N•m (35 ± 5 lb ft)

Transmission



Refer to Guideline For Reuseable Parts. Identification And Applications Of Transmission Clutch Plates, Form No. SEBF8014.

(1) (2) Thickness of four new discs and four new plates for the No. 1 and No. 2 clutch ..... 32.52 ± 0.84 mm (1.280 ± .033 in.)

Thickness of one new 3T9961 Disc ..... 4.95 ± 0.08 mm (.195 ± .003 in.)

Thickness of one new 7G437 Plate ..... 3.18 ± 0.13 mm (.125 ± .005 in.)

(3) Thickness of three new discs and three new plates for the No. 3 clutch ..... 24.39 ± 0.63 mm (.960 ± .025 in.)

Thickness of one new 3T9961 Disc ..... 4.95 ± 0.08 mm (.195 ± .003 in.)

Thickness of one new 7G437 Plate ..... 3.18 ± 0.13 mm (.125 ± .005 in.)

(4) Thickness of two new discs and two new plates for the No. 4 clutch ..... 16.26 ± 0.42 mm (.640 ± .017 in.)

Thickness of one new 3T9961 Disc ..... 4.95 ± 0.08 mm (.195 ± .003 in.)

Thickness of one new 7G437 Plate ..... 3.18 ± 0.13 mm (.125 ± .005 in.)

(5) Thickness of four new discs and three new plates for the No. 5 clutch 29.34 ± 0.71 mm (1.155 ± .028 in.)

Thickness of one new 3T9960 Disc ..... 4.95 ± 0.08 mm (.195 ± .003 in.)

Thickness of one new 6P7968 Plate ..... 3.18 ± 0.13 mm (.125 ± .005 in.)

(6) Thickness of three new discs and four new plates for the No. 6 clutch ..... 27.57 ± 0.76 mm (1.085 ± .030 in.)

Thickness of one new 3T9961 Disc ..... 4.95 ± 0.08 mm (.195 ± .003 in.)

Thickness of one new 7G437 Plate ..... 3.18 ± 0.13 mm (.125 ± .005 in.)

(7) Torque for retaining bolt ..... 110 ± 10 N•m (80 ± 7 lb ft)

(8) Inside diameter of planet gear (new) ..... 34.399 ± 0.010 mm (1.3543 ± .0004 in.)

(9) Diameter of the shaft for the planet gears (new) ..... 26.439 ± 0.005 mm (1.0409 ± .0002 in.)

(10) Spring for No. 1 and No. 2 clutches:
7G6944 (earlier)
Quantity 4

Length under test force ..... 101.6 mm (4 in.)
Test force ..... 168.09 ± 13.45 N (37.8 ± 3 lb.)
Free length after test ..... 136.20 mm (5.4 in.)
Outside diameter ..... 12.70 mm (.5 in.)

3T7584 (later)
Quantity 4
Length under test force ..... 95 mm (3.7 in.)
Test force ..... 154 ± 12 N (34.9 ± 2.7 lb.)
Free length after test ..... 124.4 mm (4.9 in.)
Outside diameter ..... 12.70 mm (.5 in.)

(11) 7G3710 Rod:
Quantity 4
Length ..... 320 mm (12.6 in.)
Outside diameter ..... 6.00 mm (.23 in)

(12) Inside diameter of planet gears (new) for No. 2 and No. 3 clutch ..... 34.399 ± 0.010 mm (1.3543 ± .0004 in.)

(13) Diameter of the shaft for the planet gear (new) ..... 26.439 ± 0.005 mm (1.0409 ± .0002 in.)

(14) Inside diameter of planet gears (new) for No. 4 and No. 6 clutch ..... 28.108 ± 0.010 mm (1.1066 ± .0004 in.)

(15) Diameter of the shaft for the planet gears (new) for No. 4 and No. 6 clutch ..... 20.147 ± 0.005 mm (.7932 ± .0002 in.)

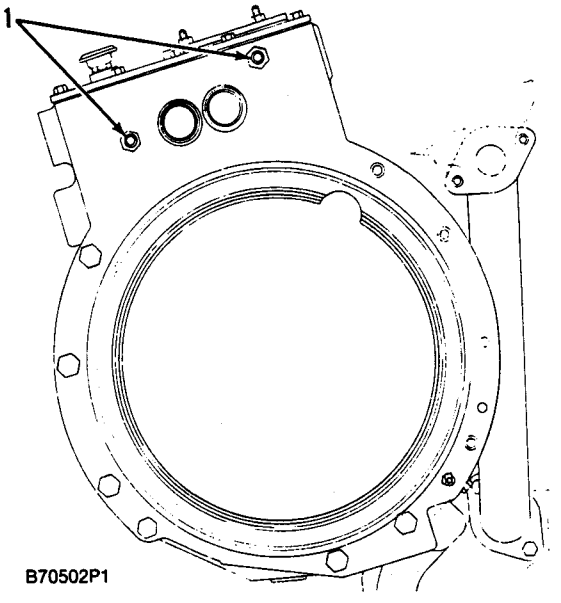
(16) Torque for six bolts ..... 110 ± 10 N•m (80 ± 7 lb ft)

(17) 7G6945 Spring for No. 3, No. 4 and No. 6 clutches:
Quantity 12
Length under test force ..... 34.10 mm (1.34 in.)
Test force ..... 132.25 ± 10.58 N (29.7 ± 2.4 lb.)
Free length after test ..... 46.9 mm (1.85 in.)
Outside diameter ..... 12.70 mm (.5 in.)

(18) All six bolts must be threaded into the housing before they are tightened to a torque of ..... 110 ± 10 N•m (80 ± 7 lb ft)

(19) All three bolts must be threaded into the housing before they are tightened to a torque of ..... 110 ± 10 N•m (80 ± 7 lb ft)

Transmission Case Group

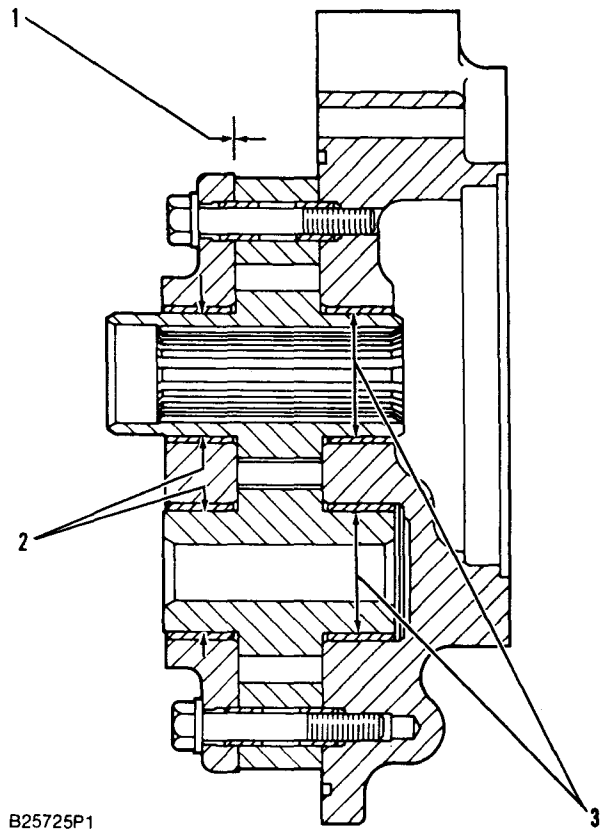


NOTE: Ten bolts and two studs fasten the transmission case and the torque converter housing together.

(1) Torque for two studs ..... 55 ± 10 N•m (41 ± 7 lb ft)

Transmission Oil Pump

7G4856



Type ..... Gear

Number of sections ..... One

Rotation (seen from drive end) ..... Counterclockwise

Bench Test

For bench test use SAE 10W oil at 49°C (120°F)

Output ..... 83 liter/min (22 U.S. gpm)
At a speed of ..... 1800 rpm
At a pressure of ..... 2400 kPa (350 psi)

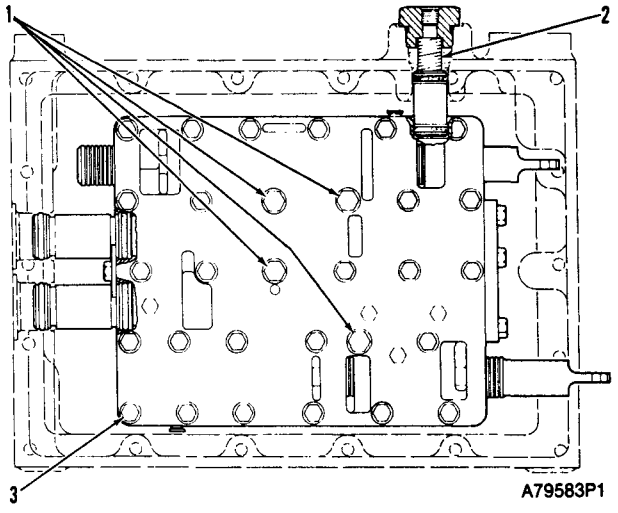
(1) Clearance between gears and covers (new) ..... 0.060 to 0.102 mm (.0020 to .0040 in.)

(2) Diameter of shafts (new) ..... 41.232 ± 0.005 mm (1.6233 ± .0002 in.)

(3) Bore of bearings after installation (new) ..... 41.283 ± 0.008 mm (1.6253 ± .0003 in.)

NOTE: Pump must rotate freely by hand.

Transmission Hydraulic Controls

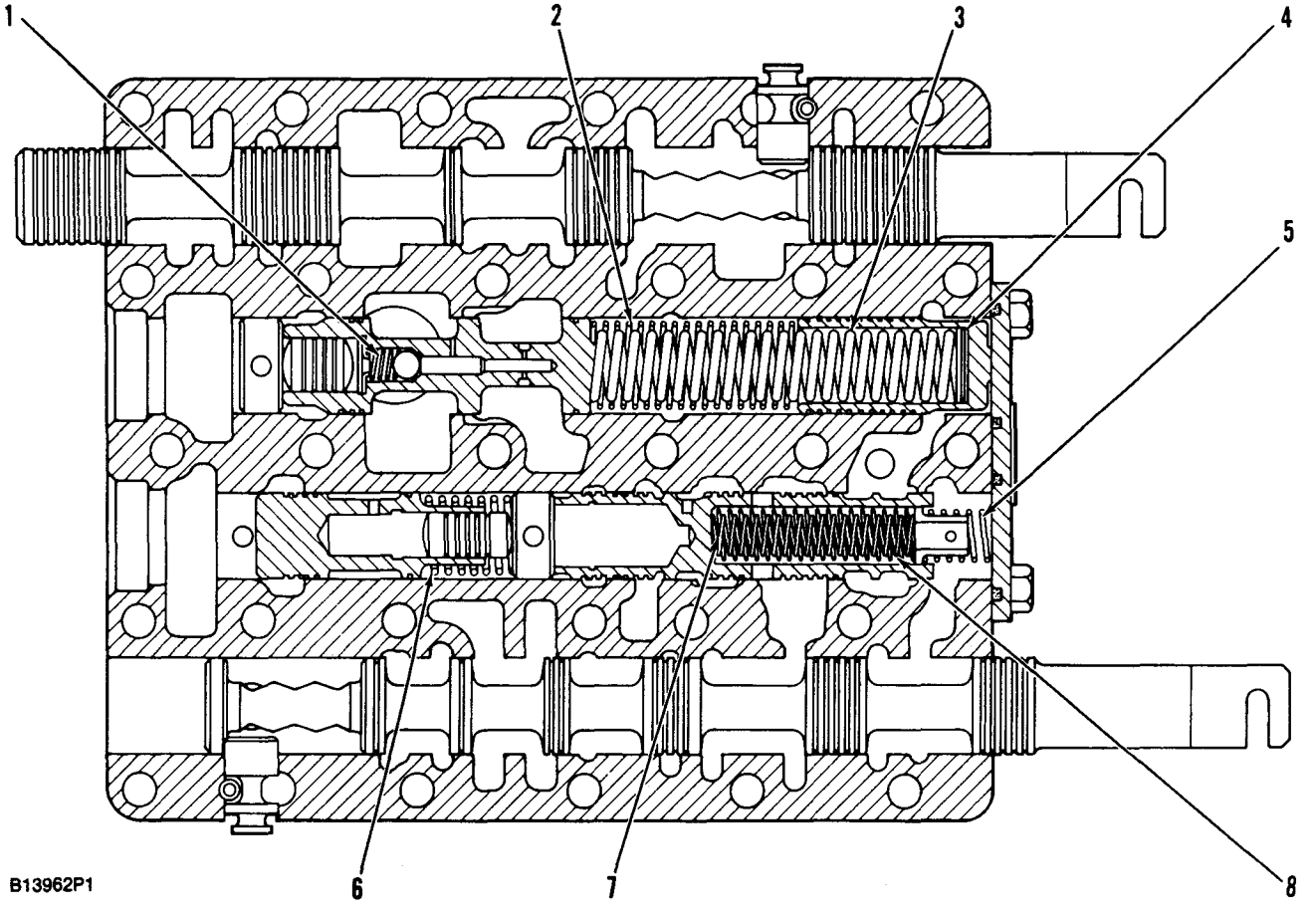


(1) Torque for four bolts that fasten valve group to planetary housing ..... 48 ± 4 N•m (35 ± 3 lb ft)

(2) 2H4406 Spring:
- Length under test force ..... 26.2 mm (1.03 in.)
- Test force ..... 140 to 167 N (32.0 to 37.5 lb.)
- Free length after test ..... 38.9 mm (1.53 in.)
- Outside diameter ..... 17.35 mm (.683 in.)

(3) Torque for 26 bolts that hold valve group together ..... 30 ± 4 N•m (22 ± 3 lb ft)

Selector And Pressure Control Valve For Transmission



(1) 4M2381 Spring:
- Length under test force ..... 12.2 mm (.48 in.)
- Test force ..... 2.30 ± 0.18 N (.517 ± .041 lb.)
- Free length after test ..... 22.6 mm (.89 in.)
- Outside diameter ..... 7.62 mm (.300 in.)

(2) 7G4842 Spring (outer):
- Color ..... two red stripes
- Length under test force ..... 36.3 mm (1.43 in.)
- Test force ..... 175 ± 6 N (39 ± 1.3 lb.)
- Free length after test ..... 68.45 mm (2.695 in.)
- Outside diameter ..... 27.79 mm (1.094 in.)

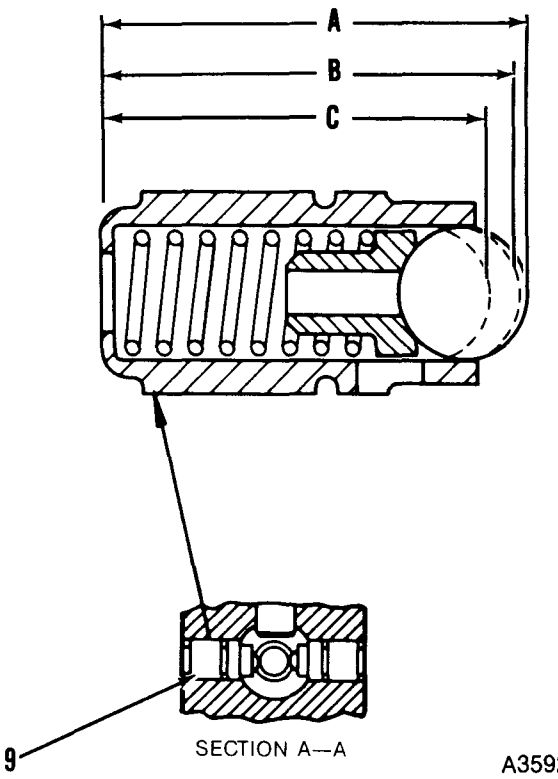
(3) 9P3041 Spring (inner)
- Color ..... two red stripes
- Length under test force ..... 85.5 mm (3.36 in.)
- Test force ..... 313 ± 11 N (70 ± 2.5 lb.)
- Free length after test ..... 117.40 mm (4.622 in.)
- Outside diameter ..... 21.21 mm (.835 in.)

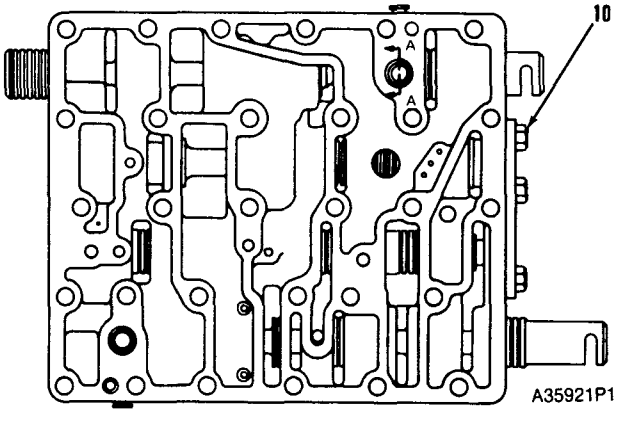
(4) Spacer

5M9622 Spacer:
- Thickness of one spacer ..... 1.60 mm (.063 in.)
- Outside diameter ..... 20.63 mm (.812 in.)
- One spacer will change pressure approximately .. 98 kPa (14.2 psi)

5M9623 Spacer:
- Thickness of one spacer ..... 0.90 mm (.035 in.)
- Outside diameter ..... 20.63 mm (.812 in.)
- One spacer will change pressure approximately .. 57 kPa (8.2 psi)

5M9624 Spacer:
- Thickness of one spacer ..... 0.25 mm (.010 in.)
- Outside diameter ..... 20.63 mm (.812 in.)
- One spacer will change pressure approximately .. 16 kPa (2.3 psi)





(5) 6P9785 Spring :

Color	yellow stripe
Length under test force	19.48 mm (.767 in.)
Test force	23.5 ± 1.2 N (5.30 ± .27 lb.)
Free length after test	32.00 mm (1.260 in.)
Outside diameter	14.83 mm (.584 in.)

(6) 6P4978 Spring for converter inlet valve:

Length under test force	27.15 mm (1.069 in.)
Test force	67 ± 3.4 N (15.4 ± .76 lb.)
Free length after test	38.10 mm (1.500 in.)
Outside diameter	24.61 mm (.969 in.)

(7) 6P9783 Spring (inner):

Color	yellow stripe
Length under test force	56.39 mm (2.220 in.)
Test force	62 ± 3 N (13.9 ± .7 lb.)
Free length after test	86.60 mm (3.488 in.)
Outside diameter	11.02 mm (.434 in.)

(8) 6P9784 Spring (outer):

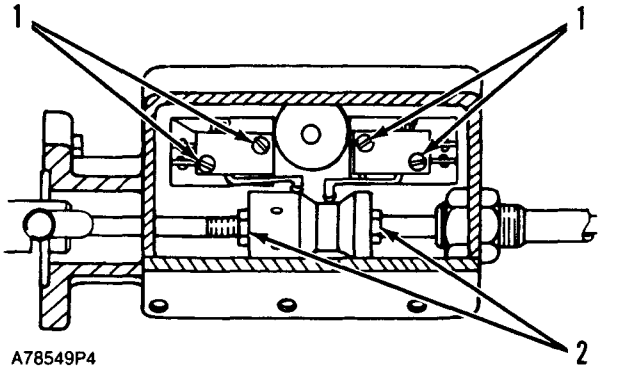
Color	yellow stripe
Length under test force	56.39 mm (2.220 in.)
Test force	130 ± 6.5 N (29.0 ± 1.50 lb.)
Free length after test	88.60 mm (3.488 in.)
Outside diameter	16.26 mm (.640 in.)

(9) 7S4607 Detent Assembly (four):

(A) Maximum free length	30.86 mm (1.215 in.)
(B) A force of 32 ± 3 N (7.2 ± .7 lb.) must hold the ball at	29.97 mm (1.180 in.)
(C) A force of 45 ± 4 N (10.1 ± 1.0 lb.) must hold the ball at	27.69 mm (1.090 in.)

(10) Torque for three bolts ..... 30 ± 7 N•m (22 ± 5 lb ft)

Transmission Neutralizer Group



(1) Earlier: Torque for four screws that fasten switches to housing ..... 0.5 ± 0.1 N•m (4 ± 1 lb in)

NOTE: Later groups have an insulator installed under the switches.

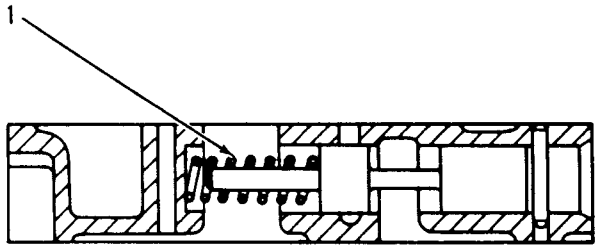
(1) Later: Tighten four screws that fasten switches to housing until the insulator begins to compress.

(2) Torque for two nuts ..... 8 ± 5 N•m (70 ± 45 lb in)

NOTE: Apply 9S3263 Locking Compound to threads before tightening nuts (2).

Transmission Neutralizer Valve

8P3040



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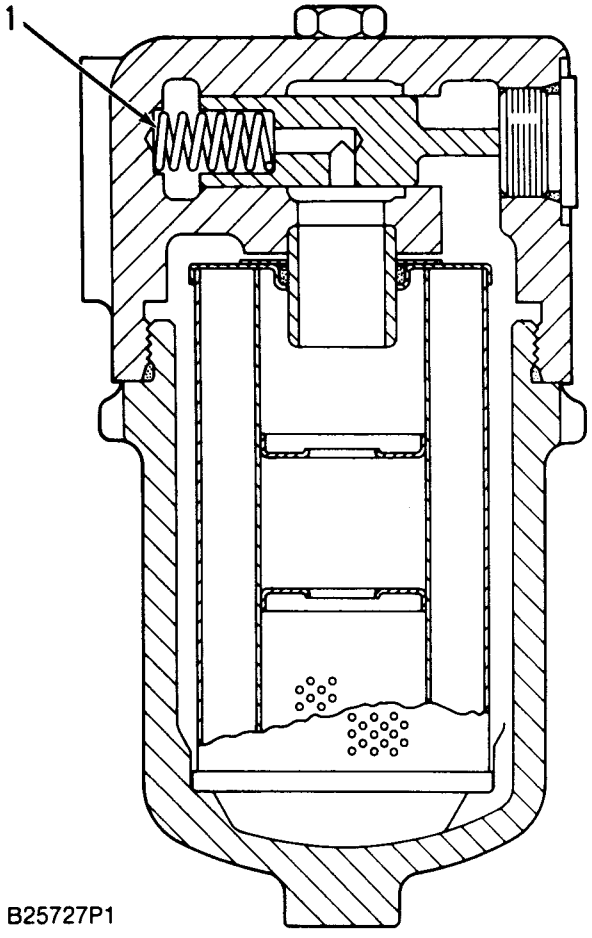
8P1556 Spring:

Length under test force ..... 52.32 mm (2.060 in.)
Test force ..... 60 ± 4.8 N (13 ± 1.10 lb.)
Free length after test ..... 75.18 mm (2.960 in.)
Outside diameter ..... 13.11 mm (.516 in.)

Transmission Oil Filter

9P1509



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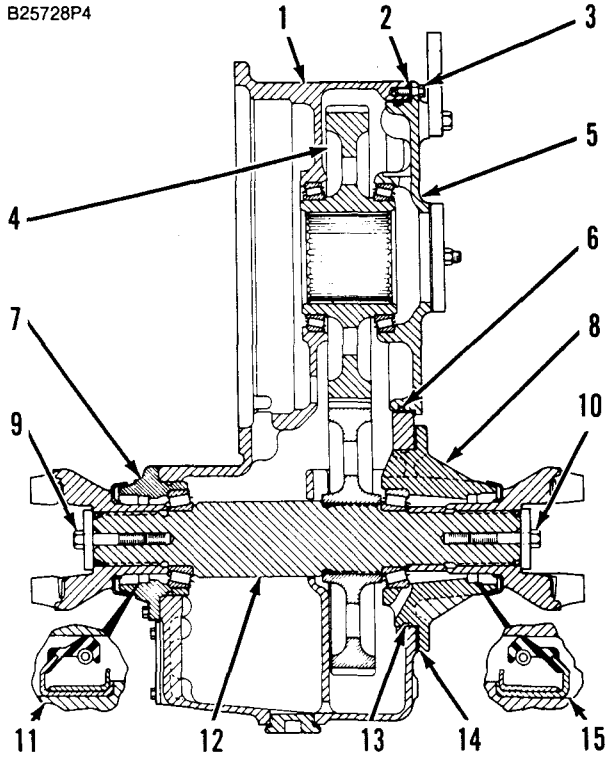
NOTICE
Do not use air wrench to tighten housing assembly.

Difference in pressure at which the bypass valve will open ..... 248 ± 21 kPa (36 ± 3 psi)

(1) 9M1986 Spring for the bypass valve:

Length under test force ..... 25.4 mm (1.00 in.)
Test force ..... 111 ± 9 N (24.9 ± 2.0 lb.)
Free length after test ..... 47.2 mm (1.86 in.)
Outside diameter ..... 12.7 mm (.50 in.)

Transfer Gears



NOTE: Apply 7M7260 Liquid Gasket to seal bore surfaces in cages (7) and (8) before installing seals (11) and (15).

(9), (10) Torque for two bolts ..... 110 ± 10 N•m (80 ± 7 lb ft)

Adjustment of Input Gear (Upper) End Play

NOTE: Bearing axis must be vertical for correct end play adjustment.

1. Make sure bearing cups and cones are fully seated.

2. Install cage (5) to case (1) using two of the cage mounting bolts (3) which are 180° apart. Do not install shims (2) or O-ring seal (6).

3. Tighten the two cage mounting bolts (3) to 1.7 N•m (15 lb in).

4. Turn gear (4) a minimum of three revolutions to seat the bearings.

5. Tighten the two cage mounting bolts (2) to 3.4 N•m (30 lb in).

6. Turn gear (4) a minimum of three revolutions to seat the bearings.

7. Retighten the two cage mounting bolts (3) to 3.4 N•m (30 lb in).

8. Measure the gap between case (1) and cage (5) at the two cage mounting bolts. (Measure between the OD of the flange and the mounting bolts).

9. Average the two measurements from Step 8 and add 0.33 mm (.013 in). This is the the thickness of shims (2) required.

10. Remove the cage and reassemble with the required shims (2) from Step 9 and O-ring seal (6).

Adjustment of Output Shaft End Play

NOTE: Bearing axis must be vertical for correct end play adjustment.

1. Make sure bearing cups and cones are fully seated.

2. Install cage (8) to case (1) using two of the cage mounting bolts (not shown) which are 180° apart. Do not install shims (14) or O-ring seal (13).

3. Tighten the two cage mounting bolts to 1.7 N•m (15 lb in).

4. Turn output shaft (12) a minimum of three revolutions to seat the bearings.

5. Tighten the two cage mounting bolts to 3.4 N•m (30 lb in).

6. Turn output shaft (12) a minimum of three revolutions to seat the bearings.

7. Retighten the two cage mounting bolts to 3.4 N•m (30 lb in).

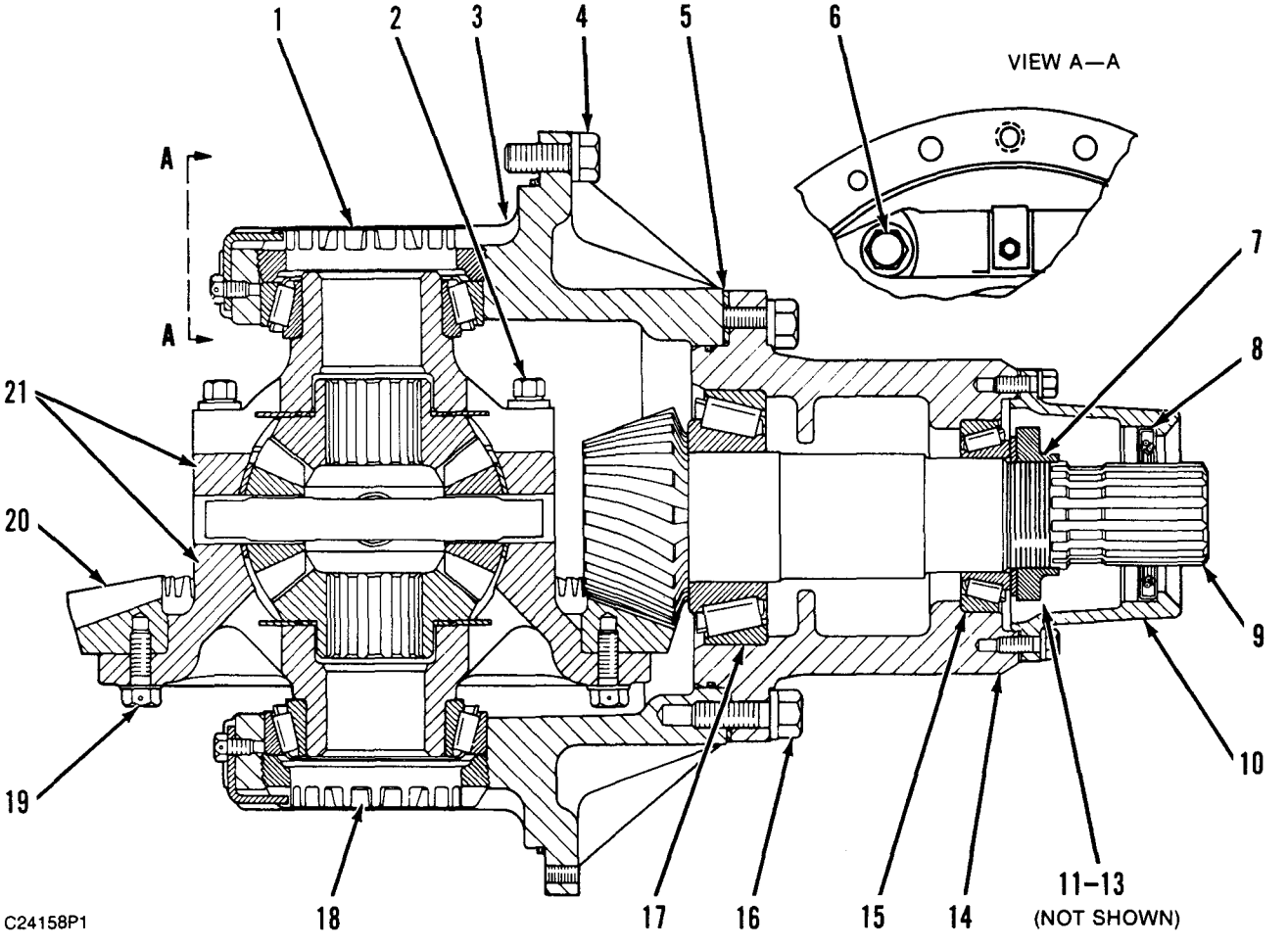
8. Measure the gap between case (1) and cage (8) at the two cage mounting bolts. (Measure between the OD of the flange and the mounting bolts).

9. Average the two measurements from Step 8 and add 0.23 mm (.009 in). This is the the thickness of shims (14) required.

10. Remove the cage and reassemble with the required shims (14) from Step 9 and O-ring seal (13).

Differential And Bevel Gear

Front And Rear



(2) Torque for 12 bolts that hold cases (21) together ..... 135 ± 15 N•m (100 ± 11 lb ft)

(4) Torque for 12 bolts that fasten the carrier assembly to the differential housing ..... 270 ± 25 N•m (200 ± 18 lb ft)

(6) Torque for four bolts that fasten bearing caps to carrier ..... 475 ± 50 N•m (350 ± 37 lb ft)

(16) Torque for 12 bolts that fasten the pinion housing to the carrier assembly ..... 270 ± 25 N•m (200 ± 18 lb ft)

(19) Torque for 24 bolts that fasten the bevel gear to the differential group ..... 135 ± 15 N•m (100 ± 11 lb ft)

Adjustment Procedure

Setting Pinion Bearing Preload

NOTE: Due to the different pinion shaft locking hardware, two different bearing preload procedures are required.

For pinion shaft assemblies that have first locknut (11), lockwasher (12), and second locknut (13):

1. Install pinion shaft (9) in housing (14) complete with bearings (15) and (17). Check to see that each cup face is fully seated against the housing shoulder.

2. Tighten first locknut (11) tight and loosen 1/8 turn.

3. Install lockwasher (12) and second locknut (13). Tighten second locknut (13) to a minimum torque of 130 N•m (95 lb ft), plus the amount needed to align the lockwasher tang with the next slot in locknut (13).

4. Check pinion shaft (9) to be sure there is zero end clearance.
5. With locknut (11), lockwasher (12) and locknut (13) installed, the torque needed to turn pinion shaft (9) (with new bearings) must be 0.7 to 1.1 N•m (6.0 to 10.0 lb in). This is the torque required to turn ONLY the pinion shaft completely assembled in its housing (NOT turning the bevel gear).

NOTE: For used bearings the torque needed to turn pinion shaft (9) must be 0.25 to 0.65 N•m (2.2 to 5.8 lb in).

6. If the torque needed to turn the pinion shaft is too high, loosen locknuts (11) and (13) 1/8 turn. Reseat bearing (17) by striking the splined end of pinion shaft (9).

Repeat Steps 2 thru 5 again and check bearing preload torque.

If preload torque is still not correct, repeat Steps 2 thru 6 until correct preload torque is obtained.

7. Once the correct preload torque is obtained, bend the lock tang into the outside nut only.
8. Install seal (8) into retainer (10) with the lip toward the bearings.

NOTE: Before installing seal (8), coat bore surface in retainer (10) with 6V5765 Sealant.

For pinion shaft assemblies with locknut (7):

1. Install pinion shaft (9) in housing (14) complete with bearings (15) and (17). Check to see that each cup face is fully seated against the housing shoulder.
2. Tighten locknut (7) until the torque needed to turn pinion shaft (9) is 0.7 to 1.1 N•m (6.0 to 10.0 lb in). This is the torque required to turn ONLY the pinion shaft completely assembled in its housing (NOT turning the bevel gear).

NOTE: For used bearings the torque needed to turn pinion shaft (9) must be 0.25 to 0.65 N•m (2.2 to 5.8 lb in).

3. Check pinion shaft (9) to be sure there is zero end clearance.
4. If the torque needed to turn the pinion shaft is too high, loosen locknut (7) 1/8 turn. Reseat bearing (17) by striking the splined end of pinion shaft (9).

Repeat Steps 2 and 3 again and check bearing preload torque.

If preload torque is still not correct, repeat Steps 2 thru 4 until correct preload torque is obtained.

5. Lock locknut (7) by peening the nut collar into the key slot on the pinion shaft. Use a punch with a spherical nose of 7.5 to 8.0 mm (.30 to .31 in.) diameter.
6. Install seal (8) into retainer (10) with the lip toward the bearings.

NOTE: Before installing seal (8), coat bore surface in retainer (10) with 6V5765 Sealant.

Setting Pinion And Bevel Gear Backlash

1. Install the pinion assembly [pinion shaft (9), bearings (15) and (17) and housing (14)] in carrier housing (3) with 80 percent of full shim pack (5). Install bolts (16). Support the carrier housing and pinion assembly so that the pinion shaft is oriented vertically downward (bearing caps up).
2. Assemble differential and bevel gear group. Remove bearing caps from carrier housing (3). With a lifting device, lower the differential and bevel gear group into the carrier housing.

NOTE: Install differential (21) into carrier (3) with bevel gear (20) on the side opposite the dowel hole in the carrier flange.

3. Install bolts (6) in each bearing cap. Torque one of the two bolts in each cap to 70 N•m (50 lb ft). Tighten the other bolt in each cap to 5 N•m (4 lb ft).
4. Move adjusting nuts (1) and (18) to a position that maintains gear backlash (but not tight gear mesh) and a slight bearing end play.
5. Reposition the whole differential assembly so that the pinion assembly is horizontal (bevel gear teeth up).
6. Measure the torque required to rotate pinion shaft (9). Record the measured torque.
7. Tighten adjusting nut (18) (nut adjacent to bevel gear) while rotating bevel gear (20) back and forth to zero backlash position. Then back off adjusting nut (18) to the nearest lock position (MAXIMUM back off movement one lug on adjusting nut).
8. Tighten adjusting nut (1) (nut opposite bevel gear) while rotating bevel gear (20) back and forth. Tighten nut (1) until a torque increase of 0.2 to 0.6 N•m (2.0 to 5.0 lb in) over the torque recorded in Step 6 is measured. This is the seated position.
9. Tighten adjusting nut (1) three lugs plus the increment to the nearest lock position.
10. Measure the backlash between bevel gear (20) and pinion shaft (9). The backlash must be 0.20 to 0.42 mm (.008 to .017 in.).
11. If the backlash does not meet specifications, loosen one nut the same amount as the opposite nut is tightened. This will maintain the bearing preload.
12. Tighten bearing cap bolts (6) to ..... 475 ± 50 N•m (350 ± 37 lb ft)

Checking Pinion And Bevel Gear Tooth Contact

NOTE: Righthand and/or lefthand differential/bevel gear groups have been used on this vehicle.

NOTE: Correct inspection and adjustment depends upon the spiral (righthand or lefthand) of the bevel gear and the gear tooth contact pattern. Illustrations A1, B1, and C1 show a righthand spiral gear. Illustrations A2, B2, and C2 show a lefthand spiral gear.

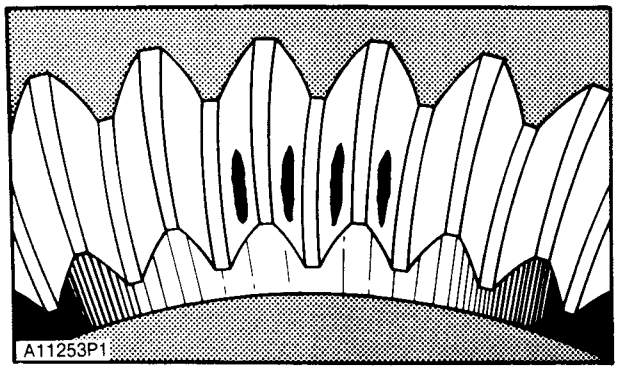


Illustration A1 (righthand spiral)

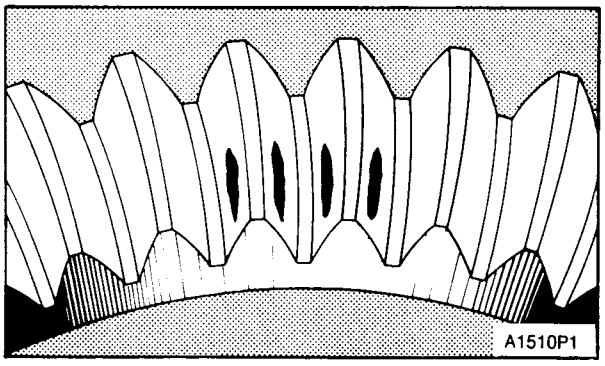


Illustration A2 (lefthand spiral)

1. After the backlash and preload adjustments have been made, the tooth contact between pinion shaft (9) and bevel gear (20) must then be checked. Do the procedure that follows:

a. Put a small amount of Prussian blue, red lead or paint on the teeth of bevel gear (20).
b. Turn pinion shaft (9) in both directions.
c. The correct area of tooth contacts starts near the inside end of the teeth of bevel gear (20) and goes a maximum of 50 percent of the length of the teeth. See Illustrations A for an example of the correct area of tooth contact.

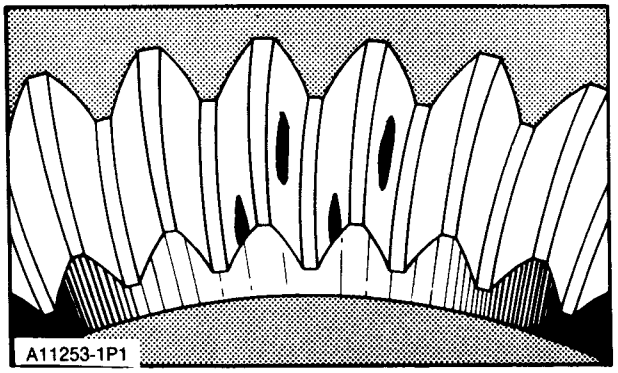


Illustration B1 (righthand spiral)

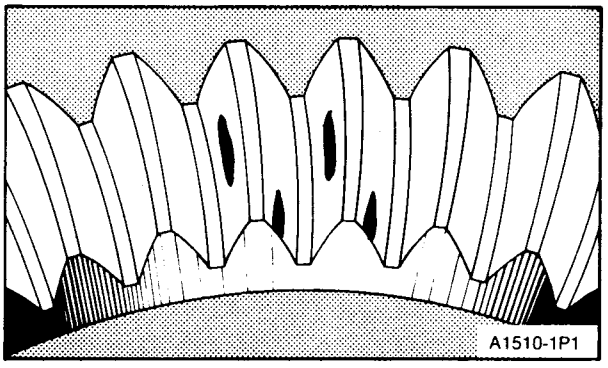


Illustration B2 (lefthand spiral)

2. If the tooth contact looks like the marks in Illustrations B, do the procedure that follows:

a. Remove some of shims (5).
b. Do Steps 3 thru 12 for Backlash Adjustment Procedure again.
c. Do Step 1 of Checking Pinion And Ring Gear Tooth Contact again.

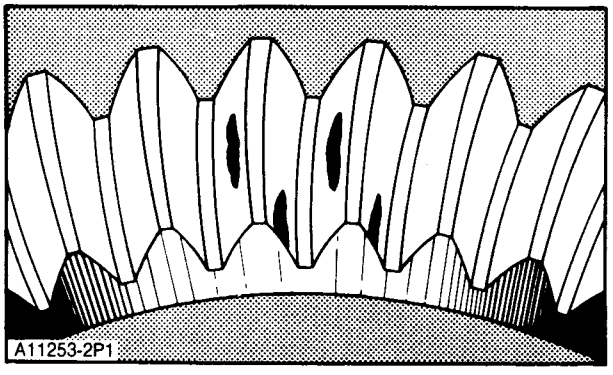


Illustration C1 (righthand spiral)

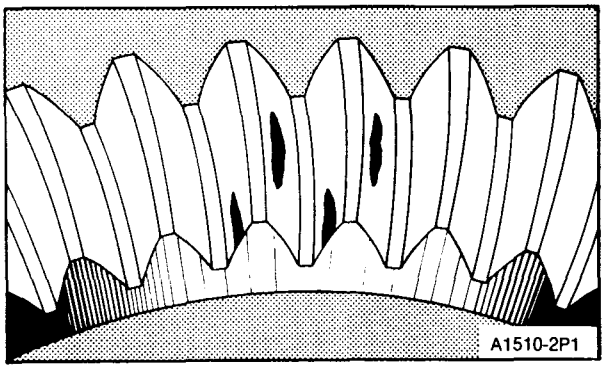


Illustration C2 (lefthand spiral)

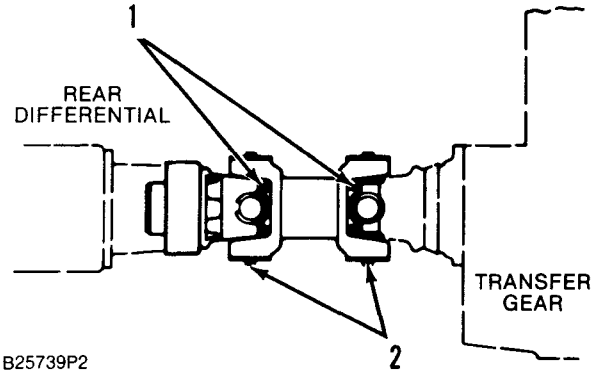
3. If the tooth contact looks like the marks in Illustrations C, do the procedure that follows:

a. Add some of shims (5).
b. Do Steps 3 thru 12 for Backlash Adjustment Procedure again.
c. Do Step 1 of Checking Pinion And Ring Gear Tooth Contact again.

NOTE: Always make sure the backlash adjustment is correct before an adjustment is made to the area of tooth contact. Several adjustments to the backlash and tooth contact may be necessary to get the correct adjustments.

4. After adjustments are made, remove the Prussian blue, red lead or paint from the gears.

Drive Shafts

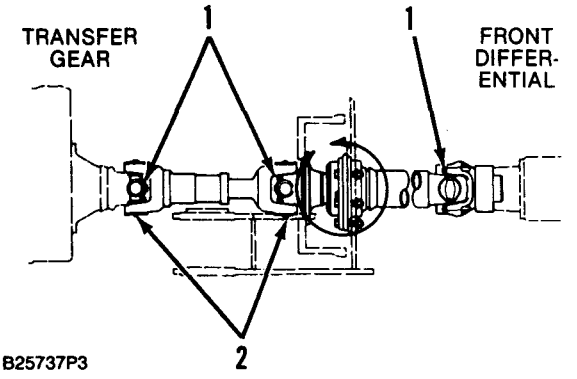


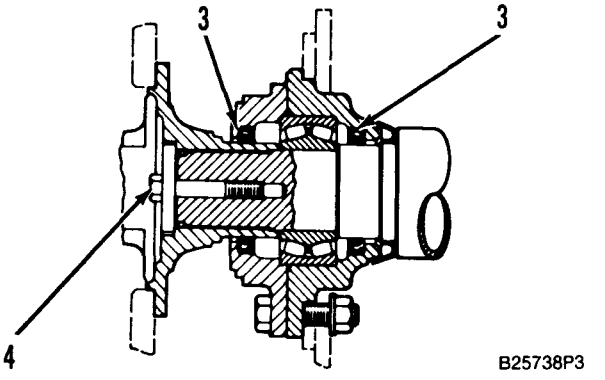
NOTICE

To prevent power train damage, all driveshaft yokes (rear and front) must be in alignment.

(1) Torque for bolts (4 per joint) that hold the universal joint ..... 60 ± 7 N•m (44 ± 5 lb ft)

(2) Torque for bolts (4 per joint) that hold the plate to the yoke ..... 50 ± 7 N•m (37 ± 5 lb ft)

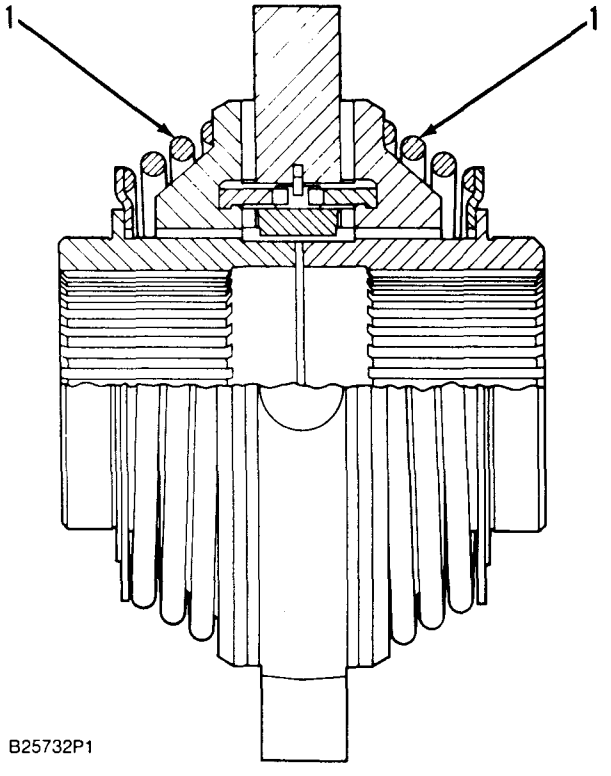




NOTE: An improved seal (3) which has a double lip is a available. This seal can not be installed wrong.

(4) Torque for retaining bolt .... 135 ± 15 N•m (100 ± 11 lb ft)

NoSpin Differential Group



B25732P1

NOTICE

The NoSpin differential is to be installed only in the rear differential.

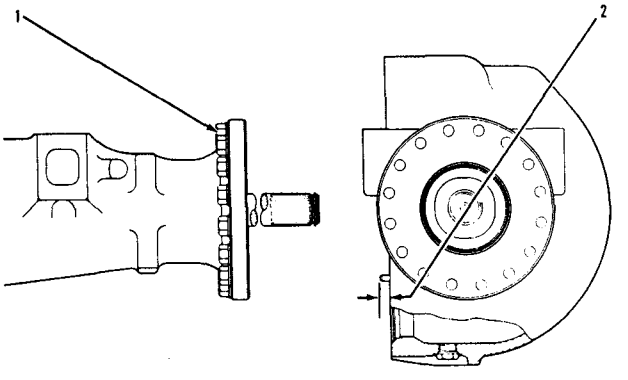
NOTE: The adjustment procedures of the NoSPIN Differential are the same as the standard differential.

(1) 3V905 Springs (two):

Length under test force ..... 22.9 mm (.90 in.)
Test force ..... 512 ± 53 N (115 ± 12 lb.)
Free length after test ..... 117.1 mm (4.61 in.)
Outside diameter ..... 128.6 mm (5.062 in.)

Axle Groups

Front Axle Group (Fixed)

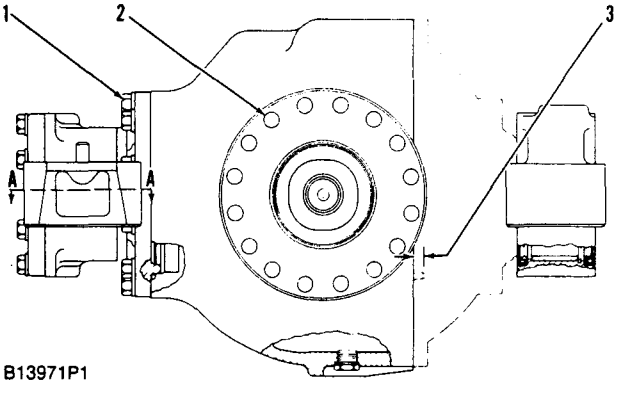


B13970P1

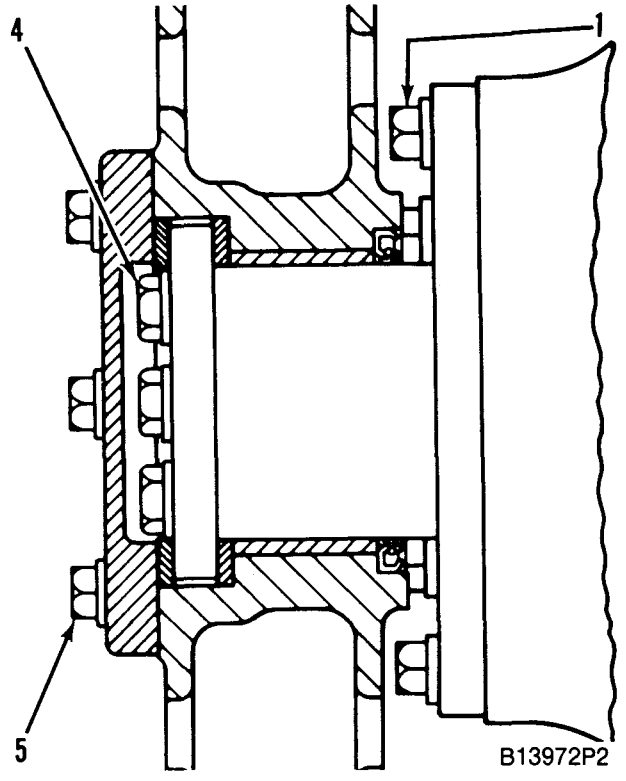
(1) Torque for 16 bolts (each side) that fasten the brakes and spindle to the axle housing assembly ..... 475 ± 50 N•m (350 ± 37 lb ft)

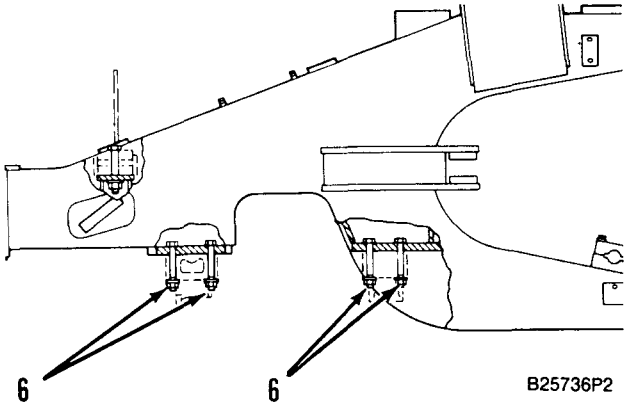
(2) Distance dowel must extend from face of housing ..... 15.8 ± 1.5 mm (.62 ± .06 in.)

Rear Axle Group (Oscillating)



B13971P1





(1) Torque for 10 bolts that fasten the trunnion to housing ..... 270 ± 25 N•m (200 ± 18 lb ft)

(2) Torque for 16 bolts (each side) that fasten the brakes and spindle to the axle housing assembly ..... 475 ± 50 N•m (350 ± 37 lb ft)

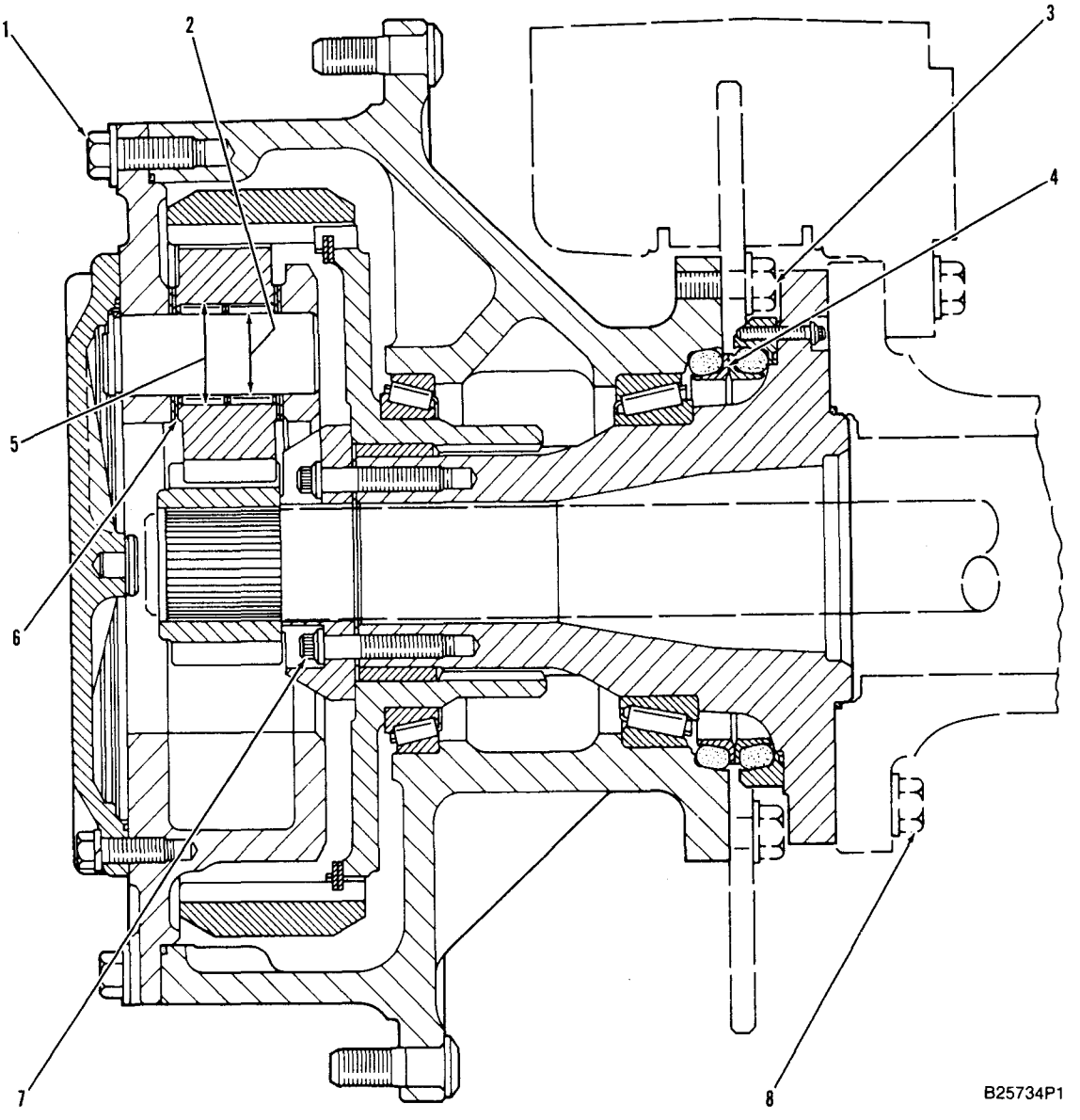
(3) Distance dowel must extend from face of housing ..... 15.8 ± 1.5 mm (.62 ± .06 in.)

(4) Torque for the bolts that hold plate to trunnion ..... 475 ± 50 N•m (350 ± 37 lb ft)

(5) Torque for six bolts that fasten the cover to the rear support assembly ..... 270 ± 25 N•m (200 ± 18 lb ft)

(6) Torque for eight bolts that fasten the axle support assemblies to the frame ..... 475 ± 50 N•m (350 ± 37 lb ft)

Final Drives, Brake And Wheels



(1) Torque for 15 bolts that fasten the carrier to wheel assembly ..... 270 ± 25 N•m (200 ± 18 lb ft)

(2) Diameter of new planet shafts ..... 42.316 ± 0.008 mm (1.6660 ± .0003 in.)

(3) Torque for 20 bolts that fasten the disc to the wheel assembly ..... 270 ± 25 N•m (200 ± 18 lb ft)

(4) Rubber toric seals and all surfaces in contact with them must be clean and dry at assembly. Put a thin layer of oil on the surfaces of the metal seals that are in contact just before installation. Put lubricant on all other seals at assembly.

(5) Inside diameter of a new planet gear ..... 51.872 ± 0.010 mm (2.0422 ± .0004 in.)

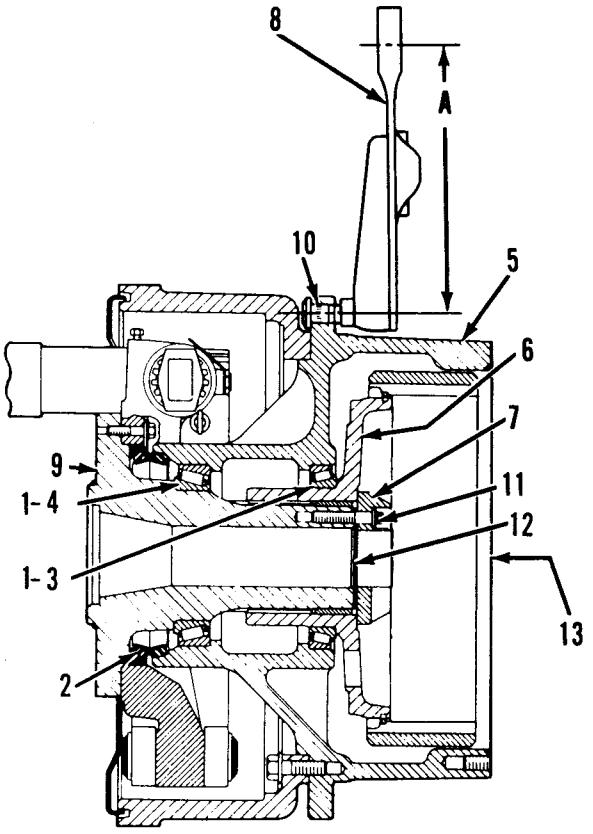
(6) Round washers must be assembled adjacent to the gear.

NOTE: See Adjustment Of The Wheel Bearings.

(7) Final torque after wheel bearings are adjusted ..... 150 ± 20 N•m (110 ± 15 lb ft)

(8) Torque for 16 bolts that fasten the brakes and spindles to the axle housing ..... 475 ± 50 N•m (350 ± 37 lb ft)

Adjustment Of The Wheel Bearings



C18875P1

1. Press wheel bearing cups (1) into the wheel. Check seating with feeler gauge.

2. Install Duo-Cone seal (2) in the wheel.

3. Install Duo-Cone seal (2) on the spindle.

4. Install outer wheel bearing cone (3) on the hub. Lightly oil the cone.

5. Install inner wheel bearing cone (4) on the spindle. Lightly oil the cone.

6. Put wheel (5) on spindle (9).

7. Place hub (6) on spindle (9).

8. Use an outside micrometer and measure the thickness of the bearing adjusting plate (7) at the three small holes. Record the average thickness.

9. Install adjusting plate (7) on spindle (9). Do not use shims (12) and do not tighten bolts (11).

10. Rotate wheel (5) to seat bearing rollers (3) and (4) on the cone.

11. While rotating wheel, tighten three of adjusting plate bolts (11) to 100 N•m (75 lb ft) to seat the parts.

12. Loosen the three bolts.

NOTE: The grip length (A) is the distance from the center of the hand to the center of the wrench square drive. Any length torque wrench can be used, but you must always grip the torque wrench distance (A) from the wheel rim mounting bolt.

13. Using torque wrench (8) on mounting bolt (10) for the wheel rim, record the rolling torque that it takes to continuously turn the wheel. This is the seal rotating torque. Grip length for torque wrench (8) is Distance (A) 203 mm (8.0 in.).

14. While rotating wheel (5), tighten three plate bolts (11) to 25 N•m (18 lb ft).

15. Use a depth micrometer and measure through the three small holes in plate (7). Record the average depth.

16. Find the difference between the two average measurements in Steps 8 and 15. The difference is the gap between the end of the spindle housing and the adjusting plate.

17. Remove plate (7). Install an amount of shims (12) equal to the same thickness as the average gap found in Step 16 plus 0.13 mm (.005 in.).

18. Reinstall plate (7) and torque plate bolts (11) evenly to 150 ± 20 N•m (110 ± 15 lb ft).

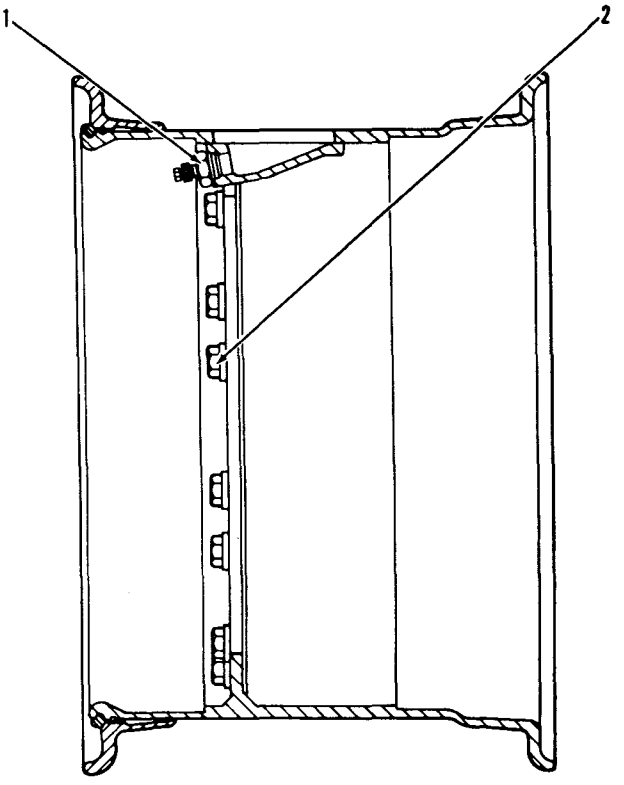
19. Attach torque wrench (8) to wheel rim mounting bolt (10) and record the torque needed to continuously rotate the wheel (the final drive is not installed). Grip length for torque wrench (8) is Distance (A) 203 mm (8.0 in.).

20. From the torque obtained in Step 19 subtract the seal rotating torque obtained in Step 13. This is the actual rolling torque for the preloaded bearings and should be 8.0 N•m (70 lb in) for NEW wheel bearings; 5.0 N•m (45 lb in) for USED wheel bearings.

NOTE: If desired, a strap iron with a nut in the center can be bolted across the wheel and the torque wrench placed directly on this nut (Location 13). In this case, the desired rotating torque will be 17.5 N•m (155 lb in) for NEW wheel bearings; 10 N•m (90 lb in) for USED wheel bearings.

NOTE: If the turning torque is quite high, disassemble the parts and check for interference. If the torque with new bearing is lower than for used bearings, measure and compute again the amount of shims needed.

Rim Group



B25731P1

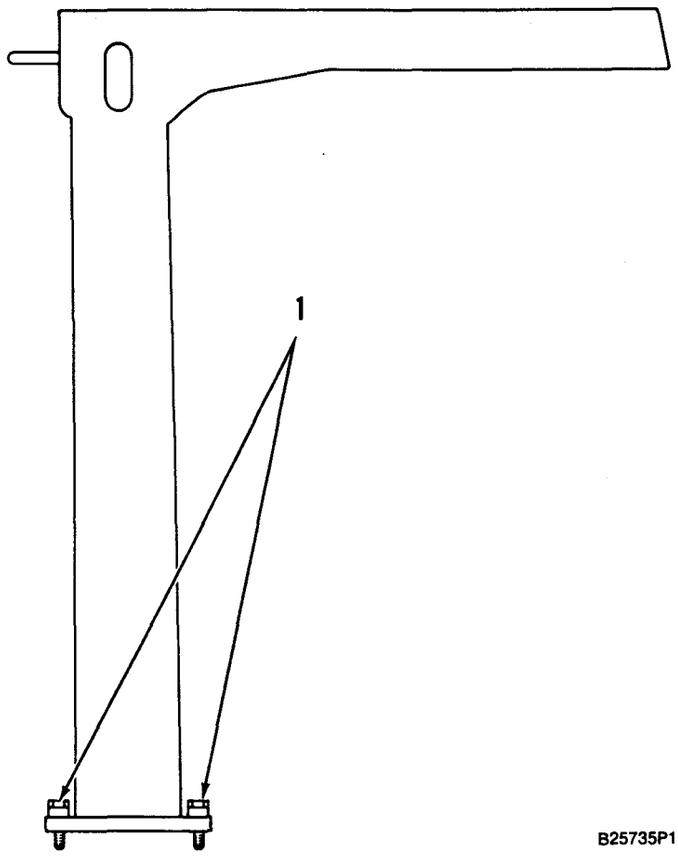
(1) Valve Assembly:
Torque for nut on early valve assembly .... 8.5 ± 0.6 N•m (75 ± 5 lb in)
Torque for valve assembly (later) ..... 20 to 23 N•m (175 to 202 lb in)

NOTE: Later rim groups use a valve assembly which threads into the rim and has an O-ring seal.

NOTE: Prior to assembly, all valve assembly seals and surfaces must be cleaned and lubricated with tire mounting compound.

(2) Torque for 16 nuts that fasten the rim to the wheel assembly ..... 475 ± 50 N•m (350 ± 37 lb ft)

ROPS Mounting Group



B25735P1

⚠ WARNING

ROPS mounting surfaces must be free of paint and be clean and dry at assembly.

(1) Torque for 12 bolts that hold the ROPS to the frame ... 570 ± 80 N•m (420 ± 60 lb ft)

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