Demonstrate Computer Literacy Level 1

Skill Number CO-OP10GN120

Full Name: SAKINAH **No ID:**

Validation Date: 05/12/25 **School:** SMKN 01 SINGOSARI

PERFORMANCE TASK:

The student must be able to complete the following tasks:

- Connect CPU, Monitor, and all computer peripherals correctly.
- Perform to turn-on and turn-off computer operation.
- Perform to use basic Microsoft office (Ms. Word, Ms. Excel, Ms. PowerPoint).
- Perform to save and print file documents.
- Perform communication & etiquette manner.

Prerequisite	Yes	No	N/A	Observation / Hints
The student must complete the knowledge assessment. Minimum passing grade 80%.	✓			Score Computer course or subject.

Tasks	Completed Yes	No	N/A	Observation / Hints
Preparation				
Prepare related literature	✓			
Prepare required equipment	✓			• A set of desktop computer completed with printer. • Microsoft Windows and Microsoft Office already installed on the computer.
Prepare related tools	✓			
Prepare Safety & Contamination Control equipment	✓			

Tasks	Completed Yes	No	N/A	Observation / Hints
Perform etiquette/manner when starting the job				
Meet the customer / assessor	✓			
Perform etiquette/manner when opening the interaction.	✓			• Perform smile & greetings. • Introduce Student's identity
Explain the purpose of Student's activity.	✓			
Ask permission to perform the job.	✓			

Tasks	Completed Yes	No	N/A	Observation / Hints
Demonstrate Computer Literacy Level 1				
Connect a set of desktop computer correctly	✓			CPU, monitor, printer, and all peripherals correctly connect
Turn-on and turn-off computer	✓			Following windows operating system procedure's
Using Ms. Word	✓			• Give specified task. • Execution and result comply with the task given
Using Ms. Excel	✓			
Using Ms. PowerPoint	✓			
Printing and saving document	✓			
Documentation:				
Take picture if needed	✓			

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- Perform to turn-on and turn-off computer operation.
- Perform to use basic Microsoft office (Ms. Word, Ms. Excel, Ms. PowerPoint).
- Perform to save and print file documents.
- Perform communication & etiquette manner.

Prerequisits	Yes	No	N/A	Observation / Hints
The student must complete the knowledge assessment. Minimum passing grade 80%.	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Preparation				
Prepare related literature	✓			
Prepare required equipment	✓			
Prepare related tools	✓			
Prepare Safety & Contamination Control equipment	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform etiquette/manner when starting the job				
Meet the customer / assessor	✓			
Perform etiquette/manner when opening the interaction.	✓			
Explain the purpose of Student's activity.	✓			
Ask permission to perform the job.	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Demonstrate Computer Literacy Level 1				
Connect a set of desktop computer correctly	✓			
Turn-on and turn-off computer	✓			
Using Ms. Word	✓			
Using Ms. Excel	✓			
Using Ms. PowerPoint	✓			
Printing and saving document	✓			
Documentation:				
Take picture if needed	✓			

Job Validasi Komputer: Sesi Interview

1. Keamanan Sistem (System Security)

Fokus: keamanan perangkat, ancaman siber, proteksi data, praktik aman.

Sub-aspek: Antivirus & Scanning

1. Cara menjalankan scan antivirus. ✓
2. Perbedaan quick/full/custom/offline scan. ✓
3. Fungsi offline scan saat menangani malware yang sulit dihapus. ✓
4. Tanda komputer terinfeksi virus/malware. ✓

Sub-aspek: Keamanan Data

1. Apa itu ransomware dan pencegahannya. ✓
2. Pentingnya backup. ✓
3. Perbedaan password dan enkripsi. ✓

Sub-aspek: Keamanan Akun

1. Fungsi dan manfaat 2FA. ✓
2. Prinsip membuat password kuat. ✓
3. Apa itu credential theft. ✓

Sub-aspek: Kebiasaan Aman

1. Apa itu phishing + contoh kasus. ✓
2. Risiko file unduhan ilegal. ✓
3. Bahaya penggunaan public WiFi. ✓

2. Aplikasi Produktivitas (Productive Tools)

Fokus: aplikasi perkantoran, kolaborasi cloud, tools dunia kerja.

Sub-aspek: Word Processing

- Perbedaan .docx & .pdf. ✓
- Fungsi Track Changes. ✓
- Cara membuat heading otomatis. ✓

Sub-aspek: Spreadsheet

- Fungsi SUM/AVERAGE/COUNT. ✓
- Perbedaan absolute vs relative reference. ✓
- Fungsi data validation. ✓

Sub-aspek: Presentasi

- Perbedaan Slide Master & layout biasa. ✓
- Prinsip presentasi efektif. ✓

Sub-aspek: Cloud Collaboration

- Hak akses Viewer/Commenter/Editor. ✓
- Fungsi version history. ✓
- Mencegah konflik file saat collaborative editing. ✓

3. AI Literacy (Literasi AI)

Fokus: pemahaman AI, jenis, penggunaan produktif, batasan, etika.

Sub-aspek: Dasar AI

- Definisi AI. ✓
- Contoh penggunaan AI di industri. ✓

Sub-aspek: Jenis AI

- Perbedaan generative AI, Computer Vision, Machine Learning. ✓
- Fungsi NLP. ✓

Sub-aspek: Penggunaan

- Contoh penggunaan AI yang produktif. ✓
- AI dalam sistem alat berat atau manufaktur. ✓

Sub-aspek: Batasan & Risiko

- Mengapa AI bisa salah. ✓
- Apa bahaya ketergantungan pada AI. ✓

Sub-aspek: Etika AI

- Bahaya memasukkan data pribadi ke AI publik. ✓
- Dampak deepfake. ✓

4. Digital Organization & File Management

Fokus: penataan data, penyimpanan, backup, perawatan storage.

- Prinsip penataan folder rapi. ✓
- Pentingnya penamaan file konsisten. ✓
- Perbedaan local & cloud backup. ✓
- Apa itu incremental backup. ✓
- Fungsi disk cleanup. ✓
- Mengapa SSD tidak perlu defrag. ✓

5. Dasar Hardware & Troubleshooting

Fokus: komponen komputer, diagnosis dasar, perawatan fisik.

- Komponen utama komputer dan fungsinya. ✓
- Perbedaan RAM dan storage. ✓
- Bahaya debu pada laptop. ✓
- Dampak suhu ruang terhadap performa. ✓
- Langkah awal saat komputer hang. ✓
- Cara mengenali kerusakan ringan pada kabel/port. ✓

6. Internet Literacy & Digital Communication

Fokus: cara berinternet yang efektif, email, pencarian informasi.

- Cara menggunakan operator pencarian. ✓
- Pentingnya verifikasi sumber. ✓
- Cara log in/log out Gmail di perangkat berbeda. ✓
- Fungsi CC dan BCC. ✓
- Apa itu digital footprint dan mengapa penting. ✓

7. Media Sosial & Literasi Digital

Fokus: dampak sosial media, cyberbullying, kesehatan digital, peran generasi muda.

Sub-aspek: Dampak Positif

- Media sosial untuk pembelajaran. ✓
- Manfaat membangun portofolio digital. ✓

Sub-aspek: Dampak Negatif

- Pengaruh media sosial terhadap kesehatan mental. ✓
- Apa itu oversharing. ✓

Sub-aspek: Cyberbullying & Kekerasan Digital

- Contoh bentuk cyberbullying. ✓
- Dampak pada korban. ✓
- Mengapa komentar negatif dapat memicu kekerasan digital. ✓

Sub-aspek: Pencegahan

- Langkah saat melihat teman dibully. ✓
- Fungsi block, report, mute. ✓

- Mengapa tidak membalas serangan. ✓

Sub-aspek: Penanganan

- Langkah sebagai korban cyberbullying. ✓
- Pentingnya menyimpan bukti. ✓

Sub-aspek: Peran Generasi Muda

- Cara menciptakan ruang digital sehat. ✓
- Contoh kampanye positif. ✓
- Pentingnya literasi digital abad 21. ✓

8. Teknologi Industri & Future Skills

Fokus: pemahaman teknologi praktis untuk dunia kerja.

Sub-aspek: IoT

- Definisi IoT. ✓
- Contoh penerapan di alat berat/otomotif. ✓

Sub-aspek: Digital Documentation

- Kelebihan manual digital. ✓
- Fungsi QR code pada mesin. ✓

Sub-aspek: Data Literacy

- Perbedaan data & informasi. ✓
- Pentingnya pencatatan digital dalam inspeksi. ✓

9. Etika Teknologi

Fokus: hak cipta, legalitas software, tanggung jawab digital.

- Apa itu plagiarisme digital. ✓
- Cara mencari gambar bebas hak cipta. ✓
- Risiko software bajakan. ✓
- Dampak hukum penggunaan software ilegal. ✓

10. Digital Ethics & Cyber Responsibility

Fokus: misinformasi, tanggung jawab digital, bias teknologi.

- Apa itu misinformasi & disinformasi. ✓
- Bahaya menyebarkan info tanpa verifikasi. ✓
- Apa itu bias algoritma di media sosial. ✓
- Mengapa memahami syarat & ketentuan platform penting. ✓

11. Digital Wellbeing (Kesehatan Digital)

Fokus: keseimbangan penggunaan teknologi dan dampaknya.

- Dampak screen time berlebihan bagi tubuh dan mental. ✓
- Apa itu digital detox dan tujuannya. ✓
- Mengapa notifikasi mengurangi fokus. ✓
- Cara menjaga kesehatan mata saat bekerja digital. ✓

12. Basic Networking Knowledge

Fokus: jaringan dasar, konektivitas, troubleshooting internet.

- Perbedaan Wi-Fi & LAN. ✓
- Apa itu IP Address. ✓
- Cara mengatasi "No Internet Connection." ✓
- Fungsi router & modem. ✓

13. Operational Safety in Technology Environments

Fokus: keselamatan dalam penanganan perangkat digital.

- Mengapa perangkat harus dimatikan sebelum dibersihkan. ✓
- Bahaya listrik statis saat memegang komponen. ✓
- Prosedur aman mencabut USB. ✓
- Mengapa posisi kabel harus diperhatikan dalam lingkungan kerja. ✓

14. Digital Finance Awareness

Fokus: transaksi digital aman, e-wallet, penipuan online.

- Apa itu OTP dan larangan membagikannya. ✓
- Ciri-ciri penipuan online. ✓
- Mengapa situs transaksi harus menggunakan https. ✓
- Risiko "phishing bank" dan cara mencegahnya. ✓

19/03/2024 **Differential and Bevel Gear (Front and Rear) - Disassemble (UENR4227-16)**

SMCS - 3256, 3258 i10135287

Disassembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1U-7502	Repair Stand	1
B	439-3938	Link Bracket As	2
C	456-4371	Lever Hoist	1
D	1P-5546	Crossblock	1
E	6V-3160	Double Acting Cylinder	1
F	1P-0520	Driver Group	1
H	6V-4070	Spanner Wrench	1
J	8B-7551	Bearing Puller	1
K	5F-7343	Bearing Puller Gp	1

Start By:

a. Remove the front or rear differential assembly. Refer to Differential and Bevel Gear (Front and Rear) - Remove and Install .

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Apply location marks on all housings and case assemblies for assembly purposes.

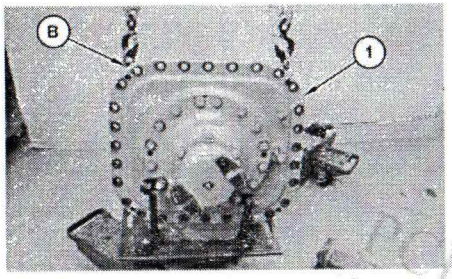


Illustration 1 g03865438

2. Attach Tooling (B) and a suitable lifting device to differential and bevel gear assembly (1). The weight of differential and bevel gear assembly (1) is approximately 322 kg (710 lb).

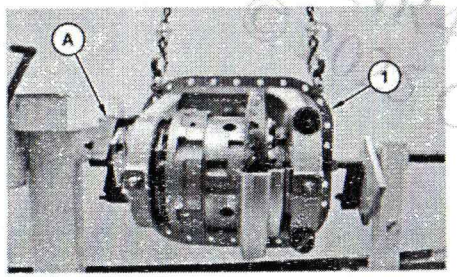


Illustration 2 g03865440

3. Position and place differential and bevel gear assembly (1) onto Tooling (A). Remove Tooling (B) and the suitable lifting device.

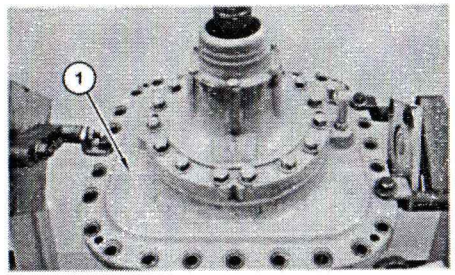


Illustration 3 g03865449

4. Rotate differential and bevel gear assembly (1) by 90 degrees.

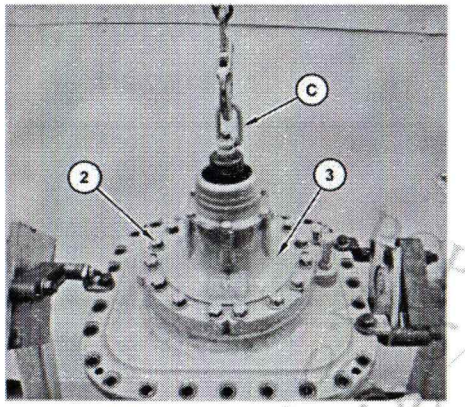


Illustration 4 g03865468

5. Attach Tooling (C) and a suitable lifting device to the yoke. The weight of pinion housing (3) is approximately 75 kg (165 lb). Remove bolts (2).

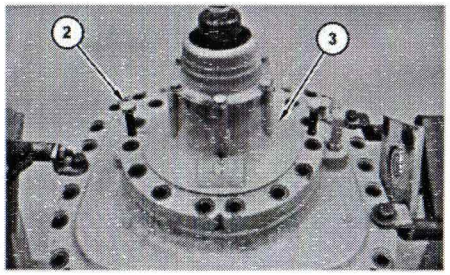


Illustration 5 g03865471

6. Install two bolts (2) in the threaded holes of pinion housing (forcing bolt holes). Tighten two bolts (2) evenly to separate pinion housing (3). Remove pinion housing (3).

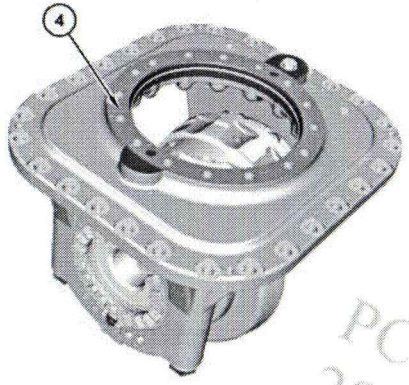


Illustration 6 g03865526

7. Remove shims (4).

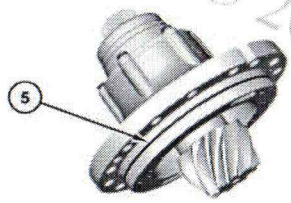


Illustration 7 g03865544

8. Remove O-ring seal (5).

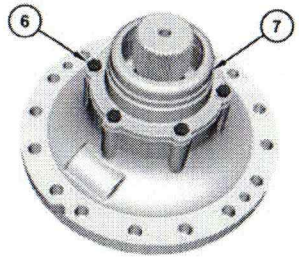


Illustration 8 g03865553

9. Position the pinion housing onto suitable cribbing.

10. Remove bolts (6) and retainer (7).

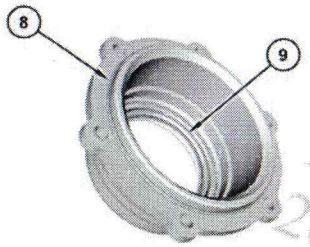


Illustration 9 g03865904

11. Remove O-ring seal (8) and lip seal (9).

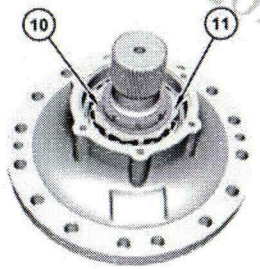


Illustration 10 g03865905

12. Remove retaining ring (10) and locking washer (11).

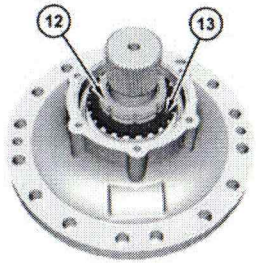


Illustration 11 g03865906

13. Use Tooling (H) (not shown) to remove locknut (12). Remove locknut (12) and notched washer (13).

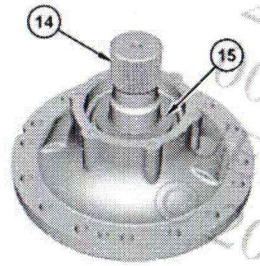


Illustration 12 g03865972

14. Use a suitable press to remove pinion shaft (14) from bearing cone (15).

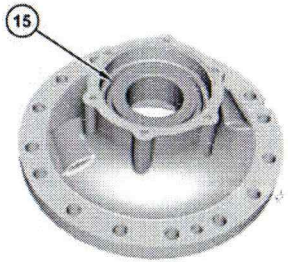


Illustration 13 g03865973

15. Remove bearing cone (15).

g03865974

Illustration 14 g03865974

Typical Example

16. Use a suitable press and Tooling (J) (not shown) to remove bearing cup (16).

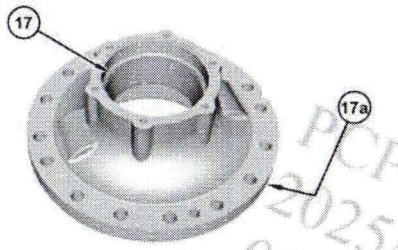


Illustration 15 g03865975

17. Remove bearing cup (17) and bearing cup (17a).

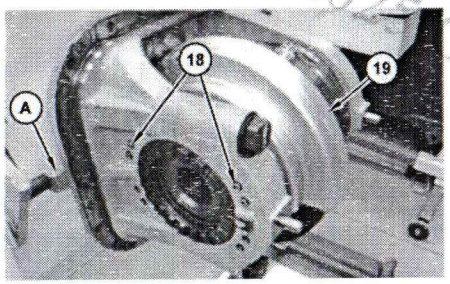


Illustration 16 g03865976

18. Rotate the carrier and differential assembly by 90 degrees on Tooling (A).

19. Remove four bolts (18) and guard (19).

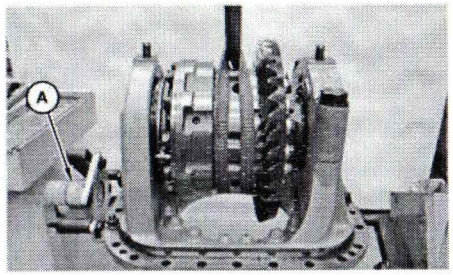


Illustration 17 g03865999

20. Use a suitable lifting device to position the carrier and differential assembly on Tooling (A). The weight of the carrier and differential assembly is approximately 234 kg (516 lb).

21. Rotate the carrier and differential assembly an additional 90 degrees on Tooling (A).

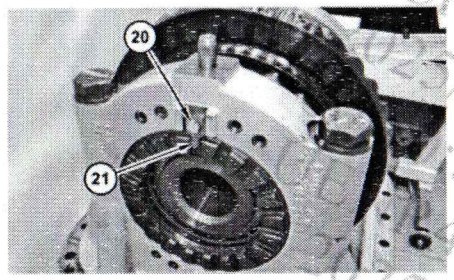


Illustration 18 g03866003

22. Remove bolt (20) and lock (21). Repeat for the opposite side.

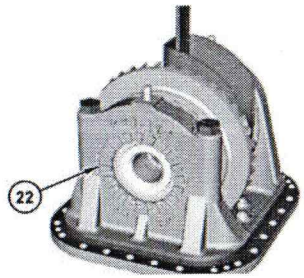


Illustration 19 g03866009

Do not remove suitable lifting device from the carrier and differential assembly.

23. Remove adjusting ring (22). Repeat for the opposite side.

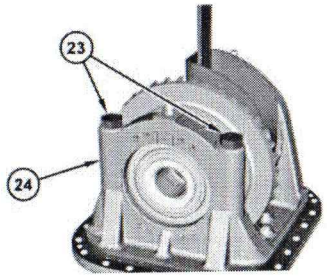


Illustration 20 g03866014

24. Remove bolts (23) and bearing cap (24).

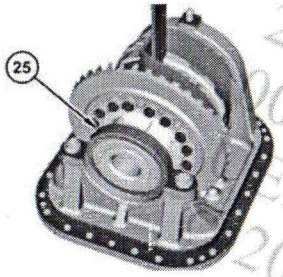


Illustration 21 g03866037

25. Remove bearing cup (25).

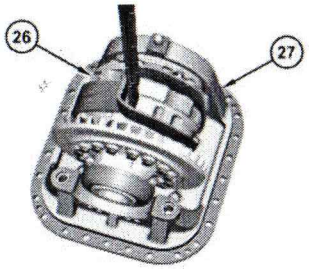


Illustration 22 g03866038

26. Use the suitable lifting device to remove differential assembly and bevel gear (26) from carrier assembly (27). The weight of differential assembly and bevel gear (26) is approximately 115 kg (254 lb).

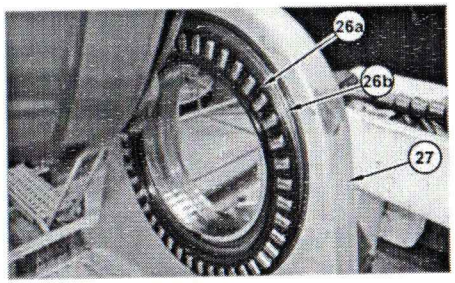


Illustration 23 g03866235

27. Remove bearing (26a) from carrier assembly (27). Remove bearing race (26b).

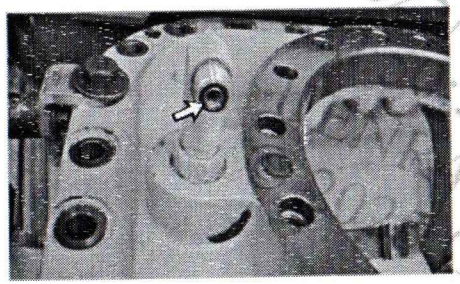


Illustration 24 g03866236

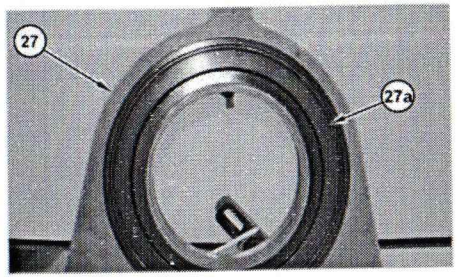


Illustration 25 g03866237

⚠ WARNING

Personal injury can result from air pressure against the piston.

The piston can come out of the housing assembly with force when air pressure is applied.

To prevent possible personal injury, the piston must be retained in the housing assembly when applying air pressure.

28. Apply air pressure to remove clutch piston (27a) from carrier assembly (27). Remove clutch piston (27a).

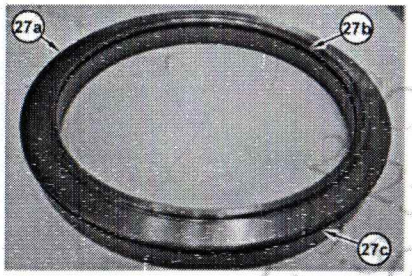


Illustration 26 g03868985

29. Remove D-ring seal (27b) and D-ring seal (27c) from clutch piston (27a).

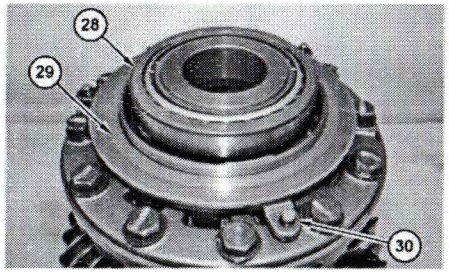


Illustration 27 g06636611

30. Position the differential assembly and bevel gear on suitable cribbing (not shown).

31. Remove bearing cup (28) and O-ring seals (30).

32. Remove thrust ring (29).

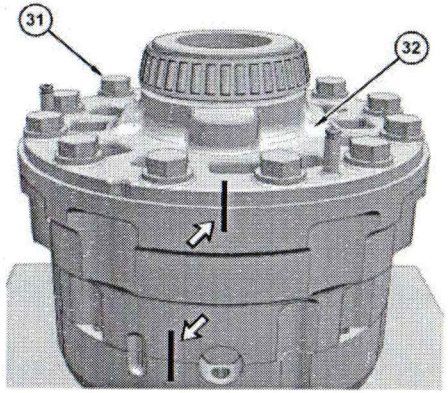


Illustration 28 g06637042

Typical Example

Note: Mark the orientation of the housing joints prior to disassembly for the assembly purposes.

33. Remove bolts (31) and top clutch housing (32).

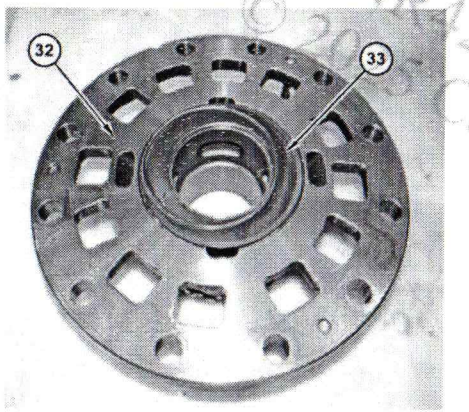


Illustration 29 g06637152

34. Remove thrust washer (33) form back side of top clutch housing (32).

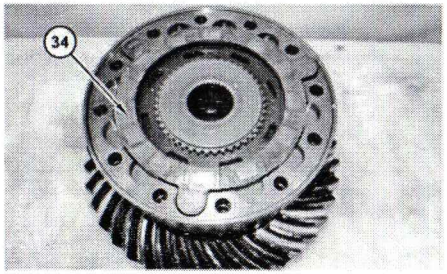


Illustration 30 g03866103

35. Remove thrust plate (34).

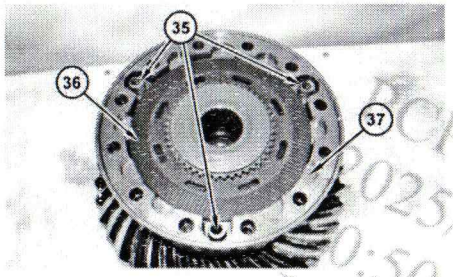


Illustration 31 g03866114

36. Remove springs (35), eight friction discs (36), and eight separator plates (37).

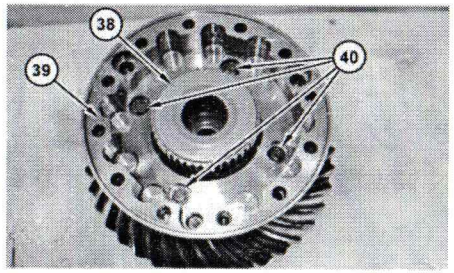


Illustration 32 g03866119

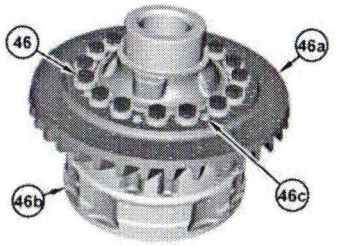


Illustration 33 g03870565

37. Remove gear (38) and bolts (40).

38. Remove spring pins (46c). Remove bolts (46). Remove bevel gear (46a) from differential housing (46b) and separate housing (39).

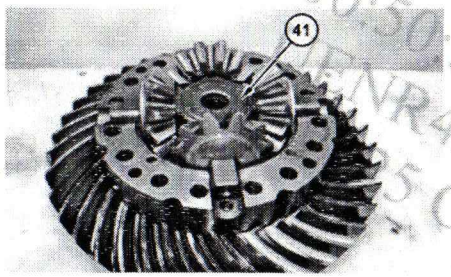


Illustration 34 g03866124

39. Remove spider gear assembly (41).

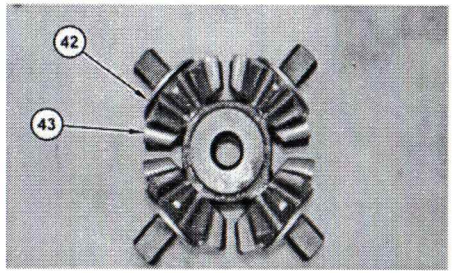


Illustration 35 g03866131

40. Remove thrust washers (42) and gears (43).

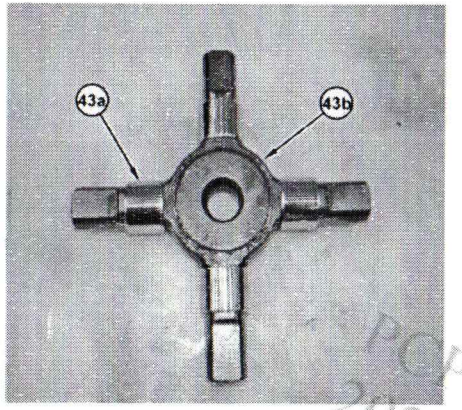


Illustration 36 g03870010

41. Remove gear sleeves (43a) from spider (43b).

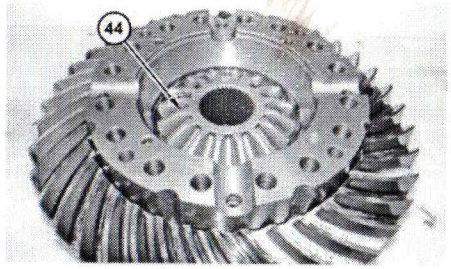


Illustration 37 g03866169

42. Remove gear (44).

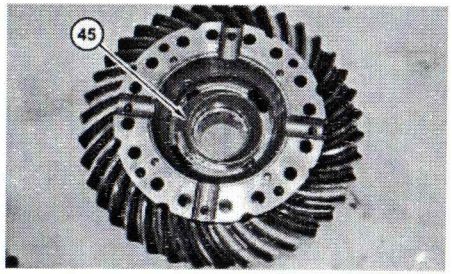


Illustration 38 g03866175

43. Remove thrust washer (45).

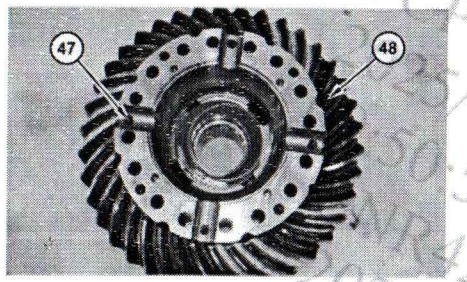


Illustration 39 g03866231

44. Remove roll pins (47) and bevel gear (48).

SMCS - 3256, 3258

i10016924

Assembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1U-7502	Repair Stand	1
B	3H-0465	Plate	2
	5F-7345	Screw	2
	8B-7551	Bearing Puller	1
	1P-5546	Crossblock	1
	6V-3160	Double Acting Cylinder	1
	1P-0520	Driver Group	1
	9U-6600	Pump	1
C	439-3938	Link Bracket As	2
D	6V-4070	Spanner Wrench	1
E	1P-1863	Retaining Ring Pliers	1
G	1P-0520	Driver Gp	1
H	-	Torque Wrench Gp	1
J	350-7768	Electric Hydraulic Pump Gp (115V)	1
	350-7769	Electric Hydraulic Pump Gp (230V)	
	478-3993	Torque Wrench	1
K	8T-5096	Tool Group	1

NOTICE

Keep all parts clean from contaminants.

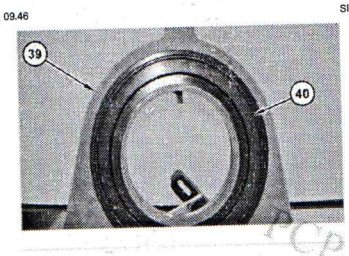


Illustration 3 g03875957

4. Use Tooling (G) to install clutch piston (40) in to carrier assembly (39).

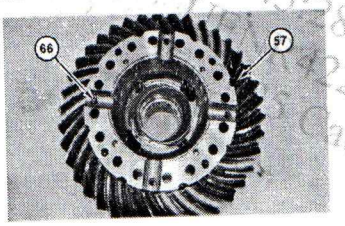
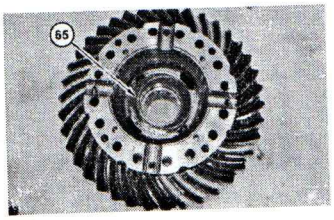


Illustration 4 g03875951

5. Install spring pins (66) to align bevel gear (57) and the differential case.

6. Raise the temperature of bevel gear (57) to between 70° C (158° F) and 120° C (248° F). Install bevel gear (57) to the differential case.



Contaminants may cause rapid wear and shortened component life.

1. Inspect all parts and clean all parts. If any parts are worn or damaged, use new Caterpillar parts for replacement.

2. Pay attention to all location marks on all housings and case assemblies for assembly purposes.

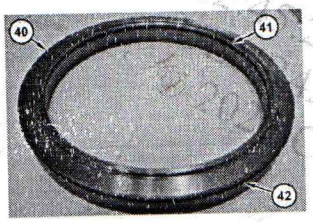


Illustration 1 g03875953

3. Install D-ring seal (41) and D-ring seal (42) in clutch piston (40). Apply a liberal amount of grease to O-ring seal (41) and to D-ring seal (42).

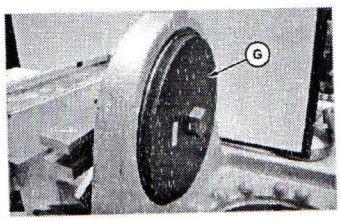


Illustration 2 g03880992

Illustration 5 g03875945

7. Install thrust washer (65).

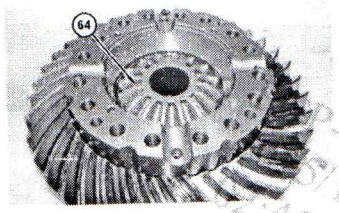


Illustration 6 g03875949

8. Lubricate gear (64) with the lubricant that is being sealed. Install gear (64). Make sure that gear (64) turns freely.

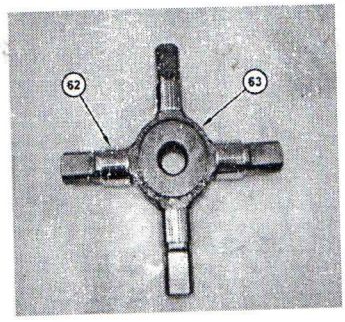


Illustration 7 g03875935

9. Lubricate spider (63) with the lubricant that is being sealed. Lubricate bearing sleeves (62) with the lubricant that is being sealed. Install bearing sleeves (62) on spider (63).

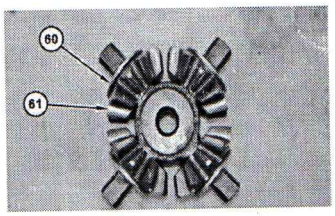


Illustration 8 g03875942

10. Lubricate gears (61) and thrust washers (60) with the lubricant that is being sealed. Install gears (61) and thrust washers (60). Make sure that gears (61) turn freely.

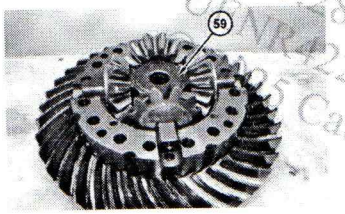
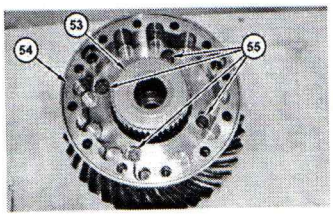


Illustration 9 g03875925

11. Install spider gear assembly (59).



a. Install four bolts (56) as indicated by Callouts (1) through (4) in Illustration 12 . To seat bevel gear (57) to differential case (58), tighten four bolts (56) in the pattern that is indicated by Callouts (1) through (4). Tighten four bolts (56) to a minimum torque of 70 N·m (52 lb ft).

b. Install remaining bolts (56) loosely (a minimum of one to two revolutions).

c. Confirm that bevel gear (57) is seated in differential case (58).

d. Allow bevel gear (57) to cool to a temperature of 30° C (86.° F) or less.

e. Loosen four initially tightened bolts (56) as indicated in Illustration 12 .

f. Tighten bolts (56) to a final torque of 95 ± 10 N·m (70 ± 7 lb ft). Turn bolts (56) an additional 180 degrees ± 10 degrees.

g. Install the bearing cone on differential case (58).

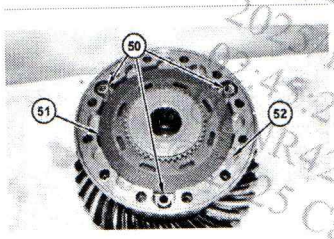


Illustration 13 g03875946

⚠ WARNING

Improper assembly of parts that are spring loaded can cause bodily injury.

To prevent possible injury, follow the established assembly procedure and wear protective equipment.

14. Thoroughly coat eight separator plates (52) and eight friction discs (51) with the lubricant that is being sealed.

Illustration 10 g03875956

Note: Align the housing to the orientation as marked during the disassembly.

12. Align and install housing (54). Lubricate gear (53) with the lubricant that is being sealed. Install gear (53) and bolts (55). Make sure that gear (53) turns freely.

13. Perform the following procedure to control preload accurately and backlash setting:

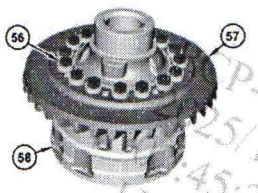


Illustration 11 g03875926

Note: Do not install all bolts (56) until the following procedure is completed.

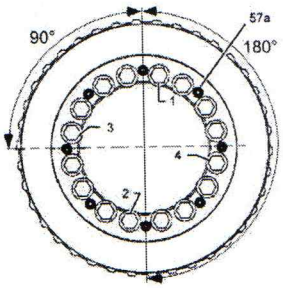


Illustration 12 g03875937

15. First install bottom separator plate (52), then install one friction disc (51). Continue until you install the last friction disc (51) at the top.

16. Install springs (50).

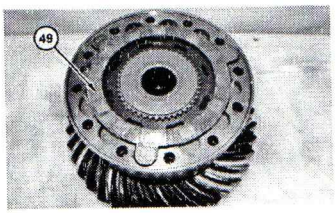


Illustration 14 g03875955

17. Install thrust plate (49).

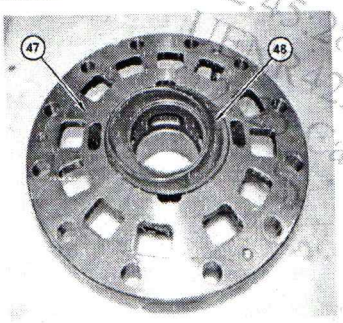


Illustration 15 g06637180

18. Lubricate thrust washer (48) with the lubricant that is being sealed. Install thrust washer (48) on back side of top clutch housing (47).

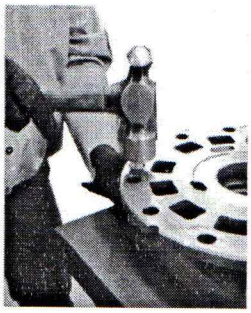


Illustration 16 g06783402

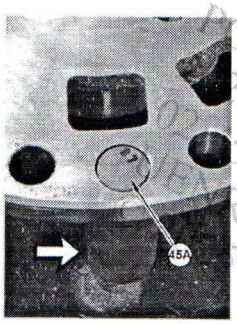


Illustration 17 g06789640

19. If dowels (45A) were removed, to install, lower the temperature of the dowels. Use a suitable hammer to install dowels (45A). Support the clutch housing during the installation of the dowels.

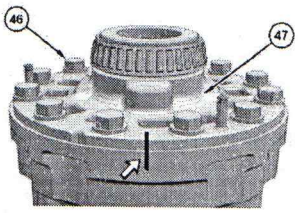


Illustration 18 g06637183

Note: Align the housing to the orientation as marked during the disassembly.

20. Align and install top clutch housing (47).

21. Install bolts (46). Tighten bolts (46) to a torque of 270 ± 40 N·m (200 ± 30 lb ft).

22. Install the bearing cone on top clutch housing (47).

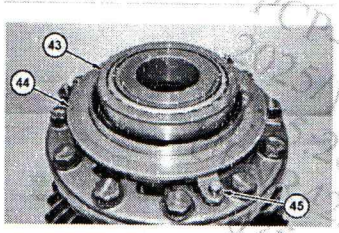


Illustration 19 g06789636

23. Install thrust ring (44).

24. Install O-ring seals (45) and bearing cup (43).

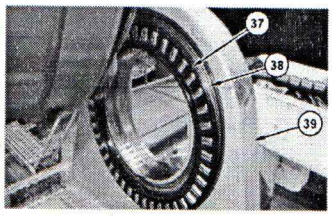


Illustration 20 g03875940

Note: You will need to hold bearing race (38) and bearing (37) in position while you install the differential and bevel gear into carrier assembly (39).

25. Position bearing race (38). Install bearing (37) onto carrier assembly (39).

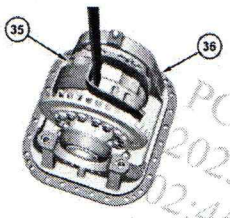


Illustration 21 g03875934

26. Use a suitable lifting device to install differential and bevel gear (35) into carrier assembly (36). The weight of differential and bevel gear (35) is approximately 115 kg (254 lb).

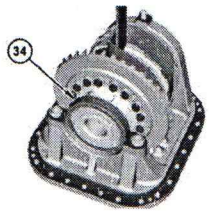


Illustration 22 g03875928

27. Install bearing cup (34).

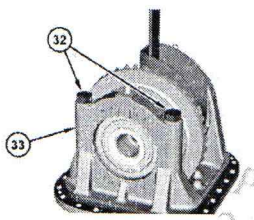


Illustration 23 g03875959

28. Install bearing cap (33). Tighten bolts (32) to a torque of 70 N·m (50 lb ft).

Note: This torque is the initial torque for bolts (32).

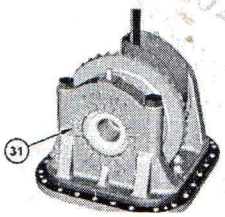


Illustration 24 g03875943

29. Install adjusting ring (31). Repeat for the opposite side. Ensure that adjusting rings (31) turn freely.

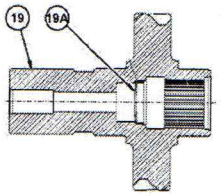


Illustration 25 g07574588

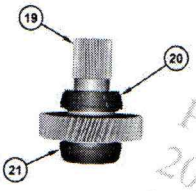


Illustration 26 g03876412

30. Install cap plug (19A) into transfer gear (19). Raise the temperature of bearing cone (20). Install bearing cone (20) onto transfer gear (19).

31. Raise the temperature of bearing cone (21). Install bearing cone (21) onto transfer gear (19).

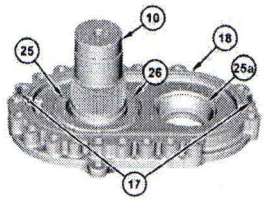


Illustration 27 g03877135

32. Install bearing cup (26). Install bearing cup (25a) into case (18).

33. Use two people to position case (18) onto pinion shaft (10). The weight of case (18) is approximately 27 kg (59 lb).

34. Raise the temperature of bearing cone (25) and install bearing cone (25) onto pinion shaft (10). Make sure that bearing cone (25) is fully seated on pinion shaft (10). Install dowels (17).

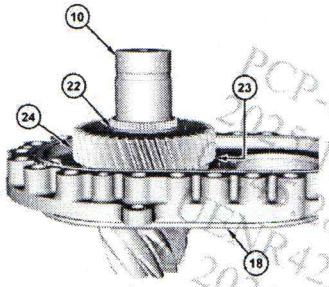


Illustration 28 g03876716

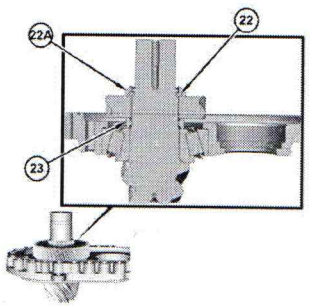


Illustration 29 g06588431

35. Install spacer (23) and gear (24) onto pinion shaft (10). Install two piece retainer (22) and one piece retainer (22A) as shown in Illustration 29 .

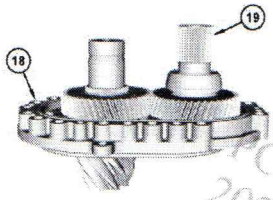


Illustration 30 g03875936

36. Install transfer gear (19) into case (18).

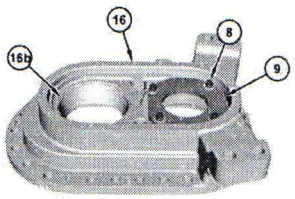


Illustration 31 g03875924

37. Install bearing cup (16b). Install cage (9), the washers, and bolts (8). Do not tighten bolts (8) now.

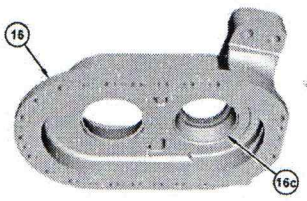


Illustration 32 g03875952

38. Install bearing cup (16c) into bearing cage (16). Make sure that bearing cup (16c) is fully seated.

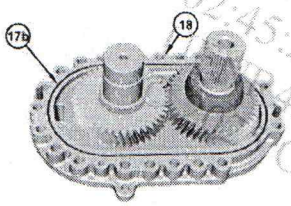


Illustration 33 g03875930

39. Install O-ring seal (17b) onto case (18).

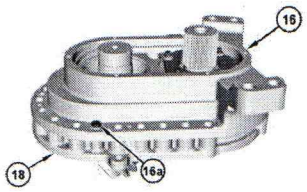


Illustration 34 g03875939

40. Align the dowel holes in bearing cage (16) with the dowels in case (18) and seat bearing cage (16) onto case (18). Install three bolts (16a) and the washers. Tighten three bolts (16a) to a torque of 55 ± 10 N·m (41 ± 7 lb ft).

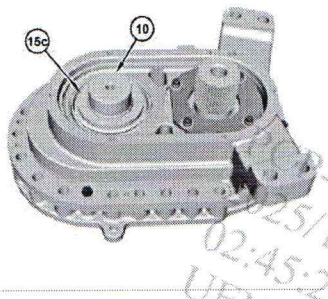


Illustration 35 g03877595

41. Raise the temperature of bearing cone (15c). Install bearing (15c) onto pinion shaft (10).

42. Perform the following Steps for setting backlash.

a. Secure the pinion housing in a suitable holding fixture.

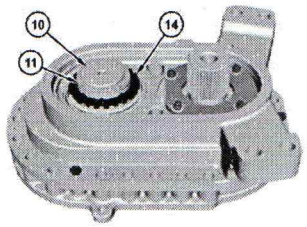


Illustration 36 g03879793

b. Install notched washer (14) and locknut (11) on pinion shaft (10). Tighten locknut (11) until you attain a rolling torque of 0.67 to 1.35 N·m (6 to 12 lb in).

Note: Rotation of the pinion is critical to achieve a proper seating of all the components.

c. Rotate the pinion several times to ensure that the bearings are fully seated.

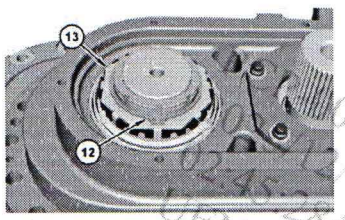


Illustration 37 g03879751

d. Install locking washer (13) so that the tabs line up with the notches on the notched washer. Locking washer (13) has eight different positions to align the

tabs with the notches in the notched washer. If locking washer (13) does not fully align with the notched washer, position locking washer (13) so that locking washer (13) is close to fitting into the notches of the notched washer. Tighten or loosen the locknut until locking washer (13) fits into the notches of the notched washer.

e. Measure the rolling torque again to confirm that the rolling torque is still 0.67 to 1.35 N·m (6 to 12 lb in).

f. If the rolling torque is still 0.67 to 1.35 N·m (6 to 12 lb in), then install retaining ring (12) into the groove of the locknut that is closer to the locking washer. Make sure that retaining ring (12) is fully seated in the groove.

g. If the rolling torque is not 0.67 to 1.35 N·m (6 to 12 lb in), repeat Step 42b through Step 42f .

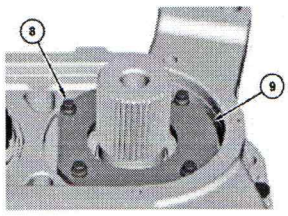


Illustration 38 g03877653

43. Remove bolts (8) and the washers from cage (9). Reinstall bolts (8) without the washers. By even amounts, tighten bolts (8) to pull cage (9) down evenly. Tighten bolts (8) to a torque of 6 ± 1 N·m (53 ± 9 lb in). Rotate the pinion three revolutions.

44. Tighten bolts (8) in even amounts to a torque of 11.30 ± 5.0 N·m (100 ± 44 lb in). Rotate the transfer gear three revolutions. Repeat this Step until bolts (8) do not move on subsequent torquing.

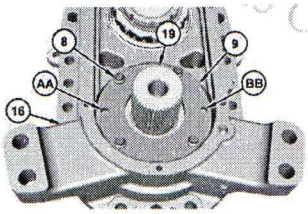


Illustration 39 g03877881

45. Use a depth micrometer to measure the distance from cage (9) to bearing cage (16) at Point (AA) and at Point (BB). Record the average measurement and call this Measurement (Y).

46. Remove cage (9). Use a depth micrometer to measure cage (9) at Point (AA) and at Point (BB). Record the average measurement and call this Measurement (X).

47. Subtract Dimension (X) from Dimension (Y). Call this Measurement (Z). This is the average gap.

48. Add 0.30 mm (0.012 inch) to Measurement (Z). This new dimension is the target for the shim pack thickness. This will give a cold bearing end play setting of 0.050 to 0.125 mm (0.002 to 0.005 inch). Use Tooling (K) to check cold bearing end play.

49. Install the determined number of shims. Install cage (9), bolts (8), and the washers. Tighten bolts (8) to a torque of 55 ± 10 N·m (41 ± 7 lb ft). Check that the transfer gear rotates freely.

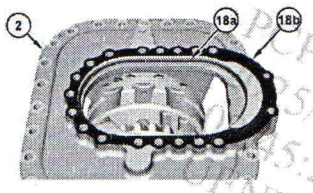


Illustration 40 g03880107

50. Reposition differential and bevel gear (2) to install O-ring seal (18a) and required shims (18b).

51. Install O-ring seal (18a).

52. Install shims (18b) in the differential and bevel gear (2).

Note: Use the original shims (18b) or provide new shims (18b) that are the same thickness as the original shims that were removed.

Note: If original shims (18b) are not available, then install 80 percent of the new shim pack. In this case, you will be required to adjust the thickness of shims (18b) after you determine the tooth contact pattern.

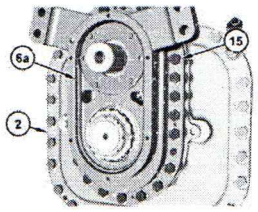


Illustration 41 g03879868

53. Use a suitable lifting device to install the case assembly onto differential and bevel gear (2). The weight of the case assembly is approximately 90 kg (200 lb). Install bolts (15). Tighten bolts (15) in a cross pattern to a torque of 270 ± 40 N·m (199 ± 30 lb ft). Install new O-ring seal (6a).

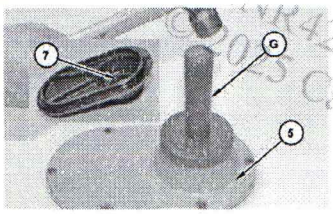


Illustration 42 g07612659

54. Apply clean oil to the outside of seal (7) prior to installation. Use Tooling (G) to install seal (7) in seal retainer (5). Apply clean oil to the lips of seal (7).

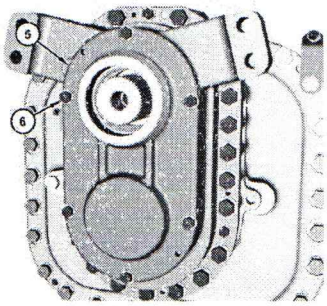


Illustration 43 g03875784

55. Install seal retainer (5). Install the washers and bolts (6).

56. Perform the following procedure to set bearing end play and to set backlash of the bevel gear.

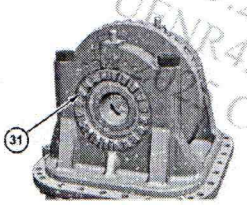


Illustration 44 g06588357

a. The bearing cups have adjusting rings (31). Adjusting rings (31) are used for setting the bearing end play and for setting the back lash of the bevel gear.

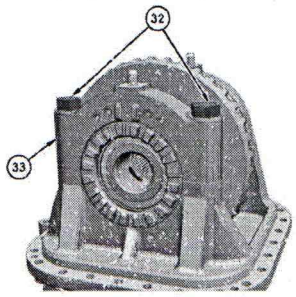


Illustration 45 g06588414

b. Ensure that bolts (32) for bearing caps (33) are tightened to a torque of 70 N·m (50 lb ft).

c. Move both adjusting rings to a position that maintains gear backlash, but not a tight gear mesh. Make sure to maintain a slight bearing end play.

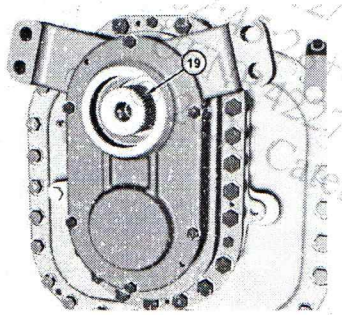


Illustration 46 g03880180

This illustration is for clarity purposes

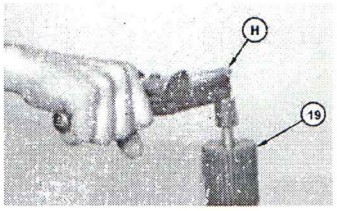


Illustration 47 g03880009

Typical example

d. Position the differential and bevel gear so that transfer gear (19) is in a vertical position. Install a suitable bolt in transfer gear (19). Use Tooling (H) to tighten the bolt until transfer gear (19) turns.

e. Measure the overall rolling torque of the differential and the pinion shaft. Record that number.

f. Advance the adjusting ring that is next to the bevel gear while you oscillate the bevel gear to a zero backlash position. Then, back off the adjusting ring to the nearest lock position (a maximum of one lug on the adjusting ring).

g. This position is the seated position. Advance the adjusting ring and rotate the bevel gear until the overall rolling torque is 1.20 to 2.48 N·m (11 to 22 lb in) above the rolling torque achieved in Step 42b .

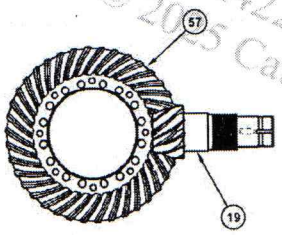


Illustration 48 g03880063

(19) Transfer gear

h. Measure the backlash in three equally spaced positions around bevel gear (57). If any of the three measurements are not equal to the specified backlash of 0.36 ± 0.12 mm (0.014 ± 0.005 inch), then retract the adjusting rings or advance the adjusting rings equally to preserve the preload. Repeat this Step until the backlash at all three locations is 0.36 ± 0.12 mm (0.014 ± 0.005 inch).

i. Check the tooth contact between the pinion shaft and the bevel gear.

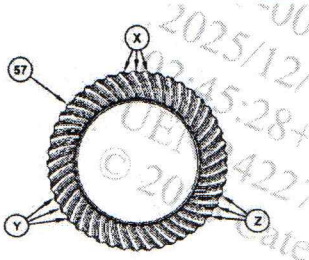


Illustration 49 g03880066

(57) Bevel gear

j. To check the tooth contact between transfer (19) and bevel gear (57), coat bevel gear (57) with a suitable rouge compound in three locations that are 120 degrees apart, as indicated by Locations (X), (Y), and (Z).

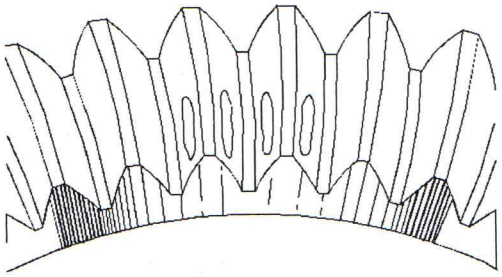


Illustration 50 g03880079

k. Rotate the pinion shaft in both directions. The acceptable bevel gear contact patter percentages are 60 percent from heel to convex, and 55 percent from heel to concave. Refer to Illustration 50 .

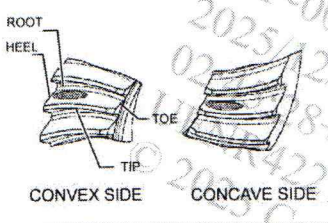


Illustration 51 g03871720

Unacceptable tooth contact pattern

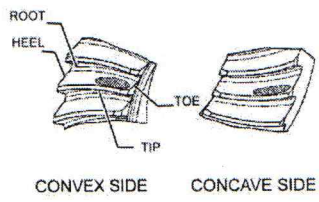


Illustration 52 g03871722

Unacceptable tooth contact pattern

l. Inspect the tooth contact pattern. If the tooth contact pattern appears like the tooth contact pattern in Illustration 51 , then some shims will need to be added and the tooth contact pattern will need to be rechecked. If the tooth contact pattern appears like the tooth contact pattern in Illustration 52 , then some shims will need to be removed.

m. If the shims are adjusted, repeat Step 50 through Step 56l .

Note: You do not have to repeat Step 54 and Step 55 .

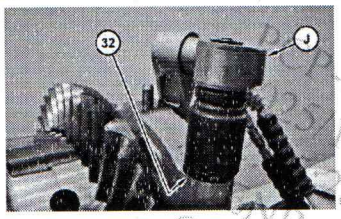


Illustration 53 g03880383

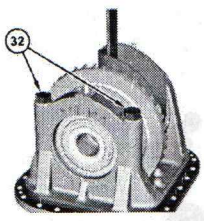


Illustration 54 g03880399

57. Use Tooling (J) to tighten bolts (32) to a torque of 1800 ± 200 N·m (1328 ± 148 lb ft).

Note: After final torque of bolts (32), re-check the gear backlash. Final torque may reduce backlash and take backlash out of spec.

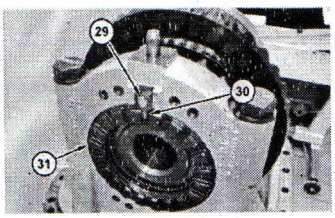


Illustration 55 g03879913