

Product: VIBRATORY COMPACTOR

Model: CS-531C VIBRATORY COMPACTOR 5ZN

Configuration: CS-531C Vibratory Compactor 5ZN00001-UP (MACHINE) POWERED BY 3116 Engine

## Disassembly and Assembly CS-531 & CS-531C VIBRATORY COMPACTORS MACHINE SYSTEMS

Media Number -KENR2583-01

Publication Date -01/04/2005

Date Updated -07/06/2005

KENR25830012

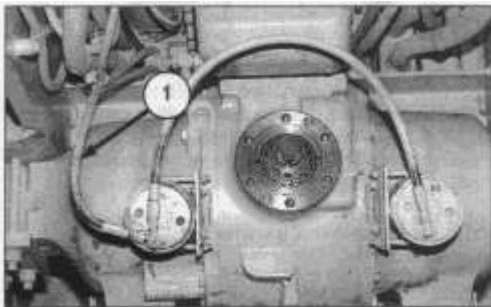
### Axle

SMCS - 3278-015; 3278-016; 3278-010

## Remove & Install Axle

Start By:

- a. remove axle gear reducer.
- b. remove wheel assemblies

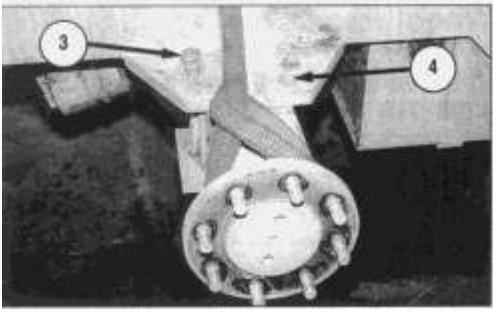


1. Disconnect hose assembly (1). Cap and plug immediately.



Typical Example

2. Fasten a lifting device to each end of axle (2).



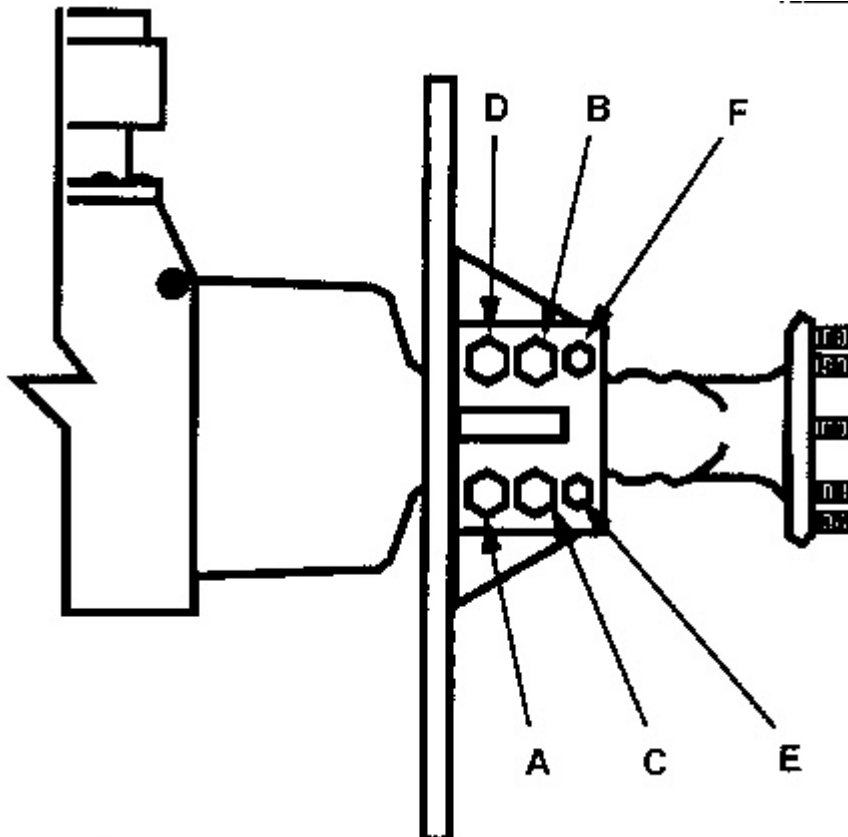
3. Remove four bolts (3) and two bolts (4) from each end of the axle.



4. Use the lifting device to lower axle (2) to a dolly or similar device. The weight of the axle is 385 kg (850 lb).

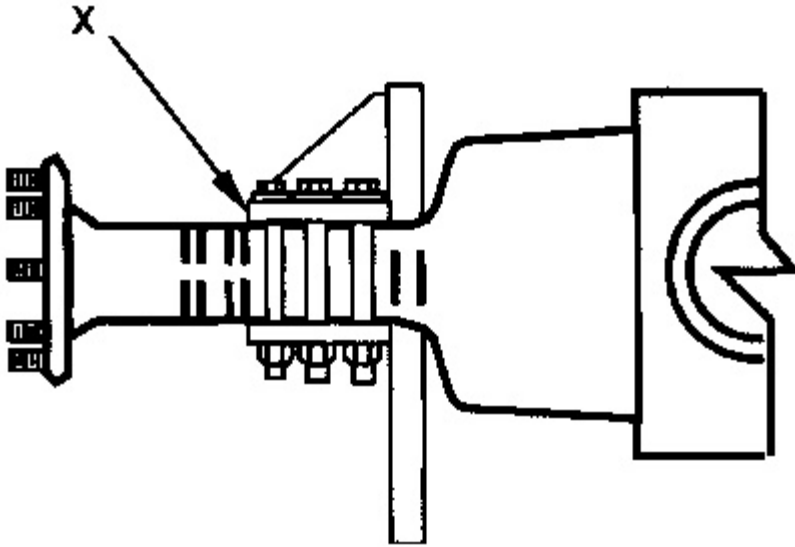
**NOTE:** The following steps are for installation of the axle.

5. Position axle (2) under the machine. Use the lifting device to raise the axle into position.

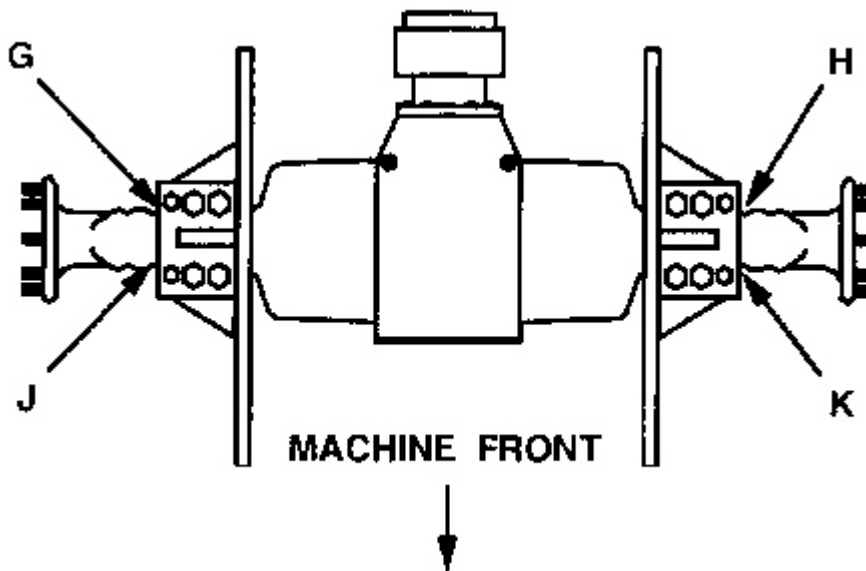


6. Install four bolts (3) and two bolts (4) on one side on the machine. Tighten the bolts in the sequence shown. Tighten four (3/4 in) bolts (3) to a torque of 275 N·m (200 lb ft). Tighten two (5/8 in) bolts (4) to a torque of 240 N·m (175 lb ft).

7. Using the same sequence, retighten four (3/4 in) bolts (3) to a torque of 430 N·m (320 lb ft). Retighten two (5/8 in) bolts (4) to a torque of 240 N·m (175 lb ft).



8. On the opposite side of the machine, measure the gap (X) between the axle and the frame.



9. Measure the gap at locations (G) and (J). If the gap is less than 1.5 mm (.06 in), repeat Steps 6 and 7 on the remaining side. If the gap at location (G) or (J) is greater than 1.5 mm (.06 in), install one **1G-8271** Shim. If the gap at location (G) or (J) is greater than 2.5 mm (.10 in), install one **1G-8271** Shim on each side of the frame. Use one shim in the gap and one shim diagonally across the gap between the frame and axle.

EXAMPLE:

- a. The bolts at locations (H) and (K) are installed and torqued first.

b. The gap is measured at locations (G) and (J). The axle makes contact with the frame at location (G) and a gap of 2.8 mm (.11 in) is measured at location (J). Install one **1G-8271** Shim at location (J) and one **1G-8271** Shim at location (H).

10. Repeat Steps 6 and 7 on the side of the axle where the shims were added.

**NOTE:** If shims were added on both sides of the axle repeat Steps 6 and 7 on both sides of the axle.

End By:

- a. install wheel assemblies.
- b. install axle gear reducer.

## Disassemble Axle

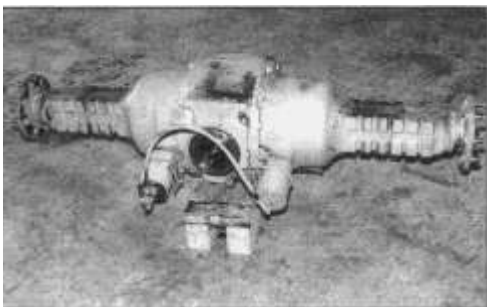
Tools Needed		A	B	C	D	E
5P-0982	Repair Stand	1				
5P-0979	Adapter Tube	1				
FT-1870	Adapter Assembly	1				
8B-7551	Bearing Puller Attach.		1		1	
5P-4170	Step Plate		1			
8B-7548	Push-Puller		1		1	
5P-9736	Link Bracket			2		
8B-7555	Adapter				2	
9S-9154	Step Plate				1	
8B-7550	Leg				2	
8T-3111	Ring Gear Installer					1

Tools Needed		F	G	H	I	J
8B-7548	Push-Puller	1				1
8B-7550	Leg	2				
5P-4167	Adapter	1				
8H-0663	Bearing Puller Attach.	1				1
1P-0498	Step Plate		1			
2P-8312	Pliers			1		
1P-1864	Pliers				1	

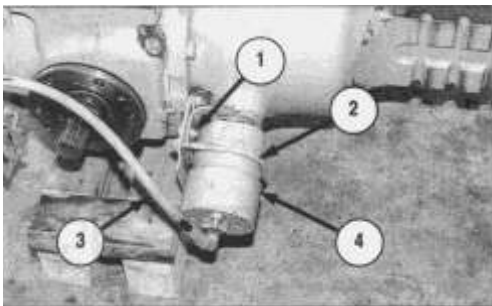
Start By:

a. remove axle.

1. Drain the oil from the axle housings.

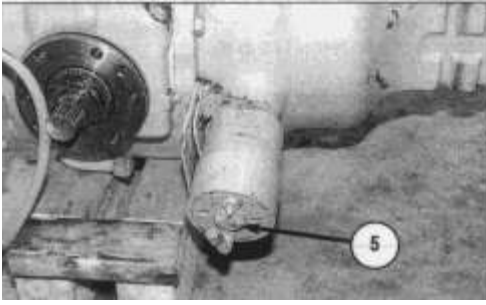


2. Use wooden blocks to support the center of the axle as shown.



3. Disconnect hose assembly (3) from brake actuator (4).

4. Remove two nuts and bolts (1). Remove the two nuts and clamp (2).

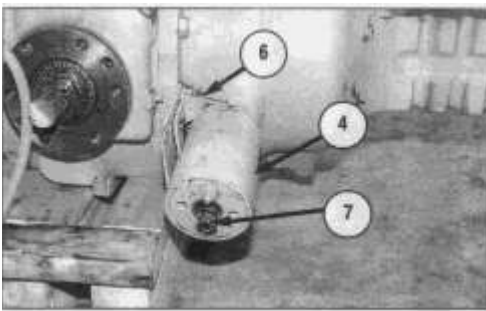


 **WARNING**

**Plug (5) is under spring pressure and could cause personal injury.  
Remove plug (5) carefully.**

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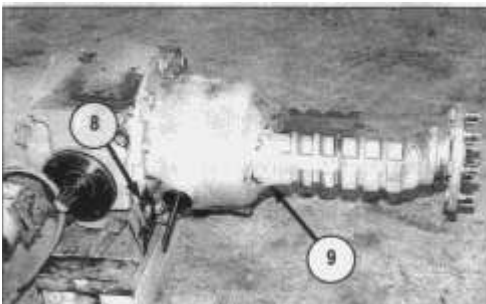
5. Remove the fitting and plug (5) from the brake actuator. Remove the O-ring seal from the plug. Check the O-ring seal for wear or damage and replace if necessary.



6. Remove spring (7) from inside brake actuator (4).

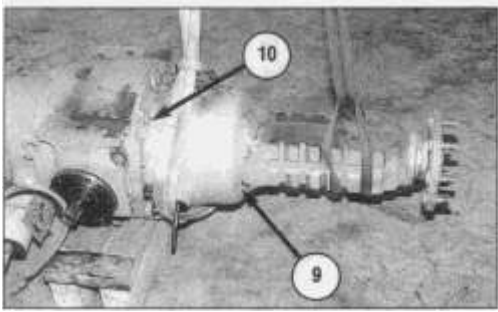
7. Remove the two nuts from inside the brake actuator. The two nuts hold the brake actuator on the brake caliper shaft.

8. Remove bracket (6) and brake actuator (4) from the left side axle housing.

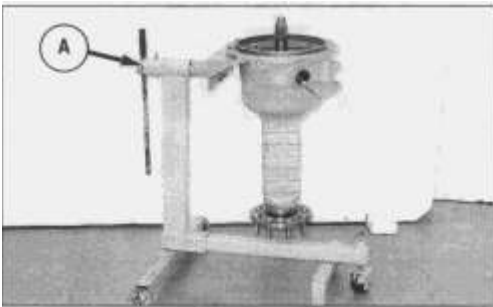


9. Remove the two nuts and bracket (8).

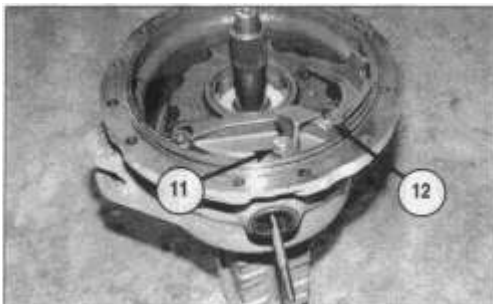
10. At the bottom of the axle assembly, remove the four bolts that fasten left side axle housing (9) to the differential housing.



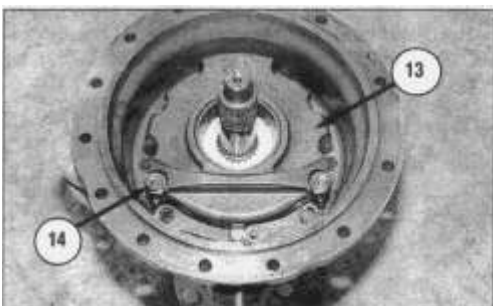
**11.** Position wooden blocks under the right side axle assembly to support it when the left side axle assembly is removed. Attach lifting straps and a hoist to left side axle assembly (9) as shown. Remove remaining seven bolts (10), and remove left side axle housing (9) from the differential housing. The weight of the left side axle housing is 117 kg (260 lb). Remove the O-ring seal from the left side axle housing. Check the O-ring seal for wear or damage and replace if necessary.



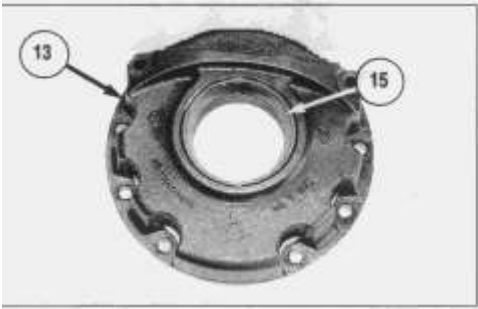
**12.** Use Tooling (A) to support left side axle assembly as shown.



**13.** Remove two bolts (11), and remove thrust block (12) from the left side axle assembly.

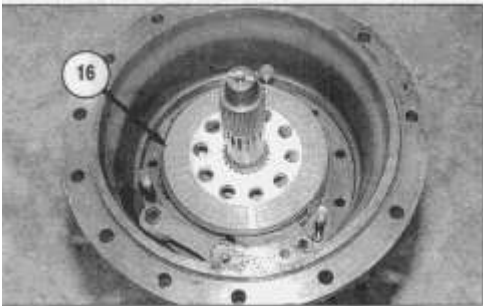


**14.** Remove two nuts (14) and the six bolts, and remove inner brake housing (13) from the left side axle assembly.



**NOTE:** The shim located under bearing cup (15) is used to adjust the differential bearing preload.

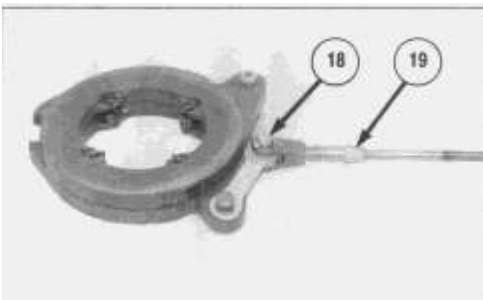
**15.** If necessary, remove bearing cup (15) and the shim from inner brake housing (13).



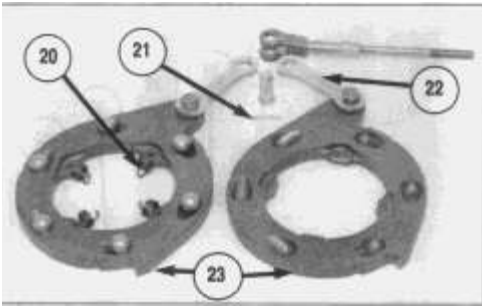
**16.** Remove two discs (16) and the plate.



**17.** Remove brake actuator assembly (17) from the left side axle assembly. The brake control rod must be removed from the seal.

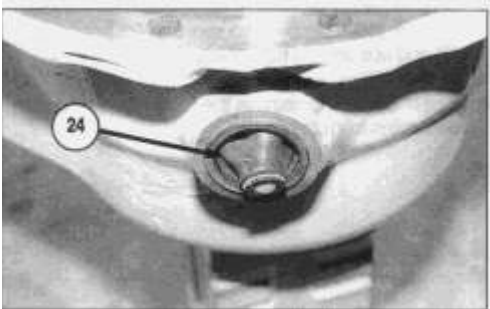




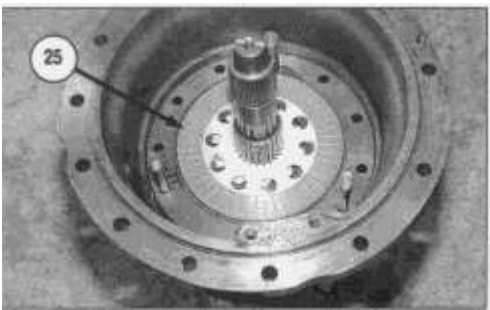


**18.** Remove cotter pin (21) and pin (18), and remove brake control rod (19) from the links.

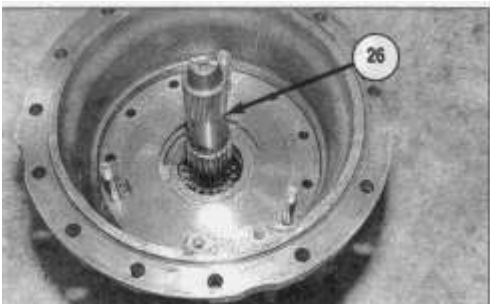
**19.** Disconnect four springs (20), and separate actuator discs (23). Remove the nut and bolt, and remove link (22) from each of the actuator discs.



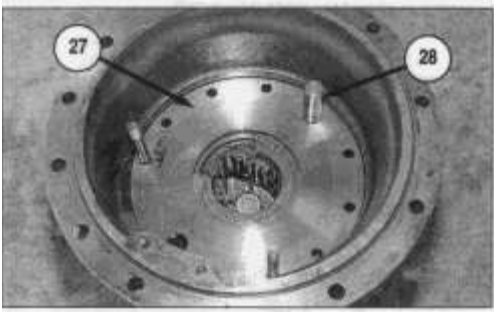
**20.** If necessary, remove seal (24) from the housing.



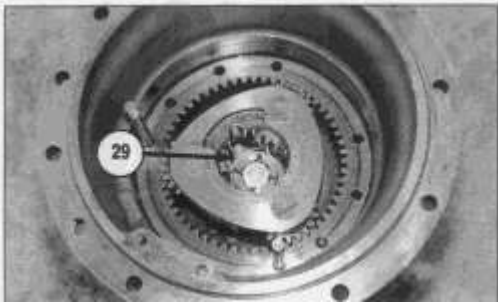
**21.** Remove two discs (25) and the plate.



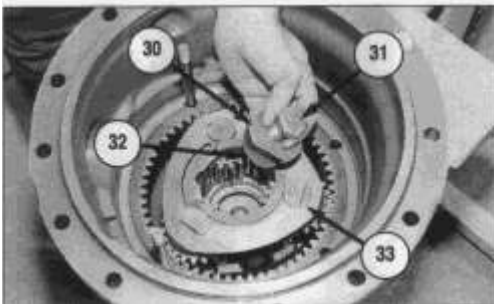
**22.** Remove sun gear (26).



**23.** Remove outer brake housing (27) and brake torque pin (28).

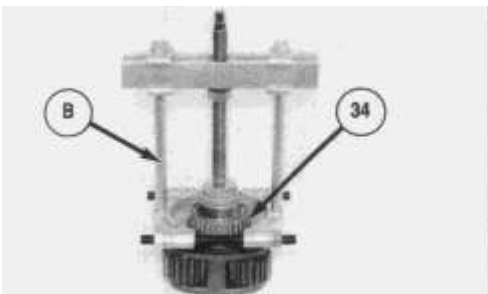


**24.** Remove lock (29) from the axle retainer bolt.

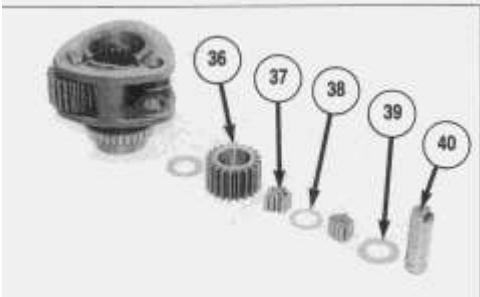


**25.** Remove axle retainer bolt (31), washer (30) and spacer (32).

**26.** Remove planetary gear group (33).



**27.** If necessary, use Tooling (B) to remove bearing (34) from the carrier.

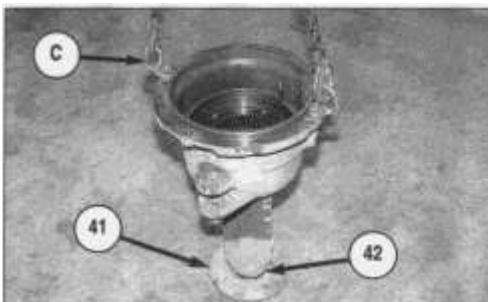


**28.** Straighten one end of retainer ring (35). Rotate the ring until a gear shaft can be removed.

**NOTE:** Keep each gear assembly together. Do not mix components between gear assemblies. Note the location of each gear assembly in the carrier for assembly purposes.

**29.** Remove gear shaft (40). Remove two washers (39) and gear (36). Remove two sets of roller bearings (37) and spacer (38) from the gear.

**30.** Repeat Step 29 to remove the remaining two gears assemblies from the carrier.

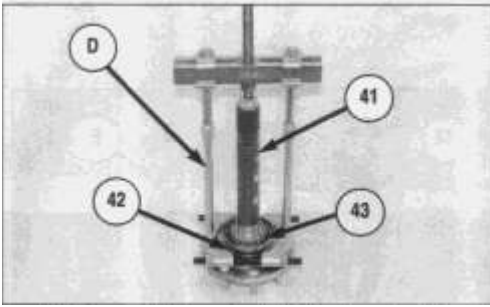


**NOTE:** Earlier axles have a conventional style seal with a retainer on the axle shaft. Later axles have a "cassette" style seal on the axle shaft.

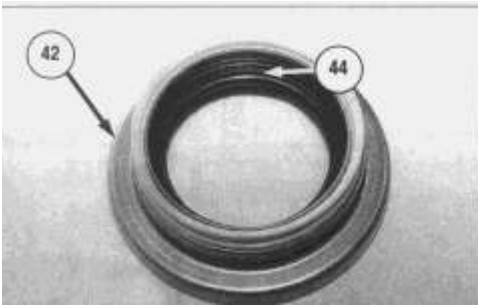
**31.** Use the following procedure to disassemble the axle shaft and seal on an earlier axle.

**a.** Use a hoist and Tooling (C) to position and support the housing as shown. Use a punch to unseat seal retainer (42).

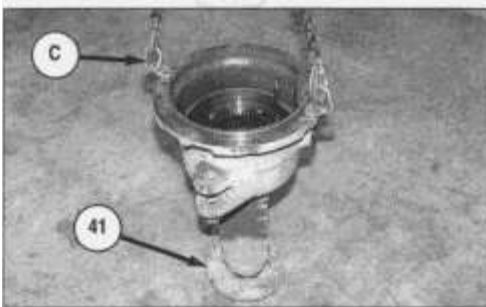
**b.** Lift the housing approximately 2.54 cm (1 in). Place a wooden block on top (splined end) of axle shaft (41), and drive the axle shaft from the housing.



**c.** If necessary, use Tooling (D) to remove seal retainer (42) and bearing (43) from axle shaft (41).



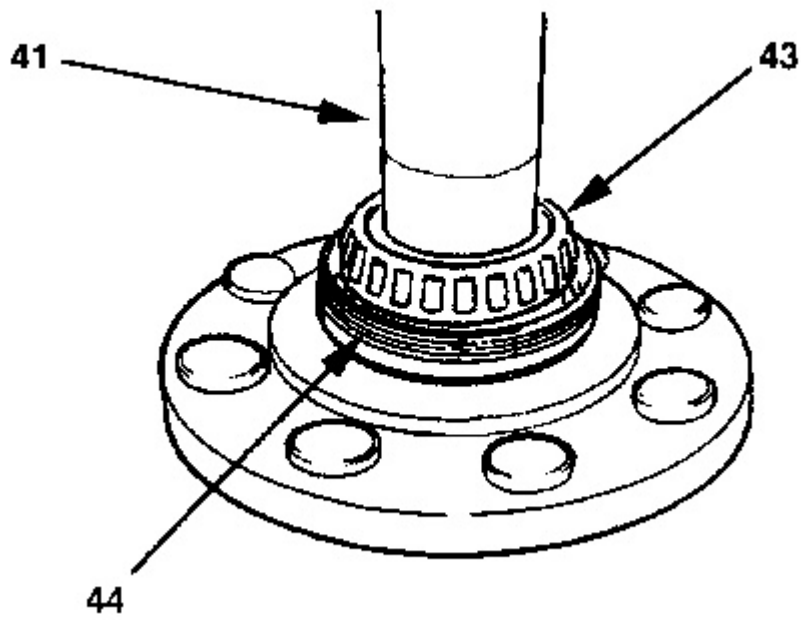
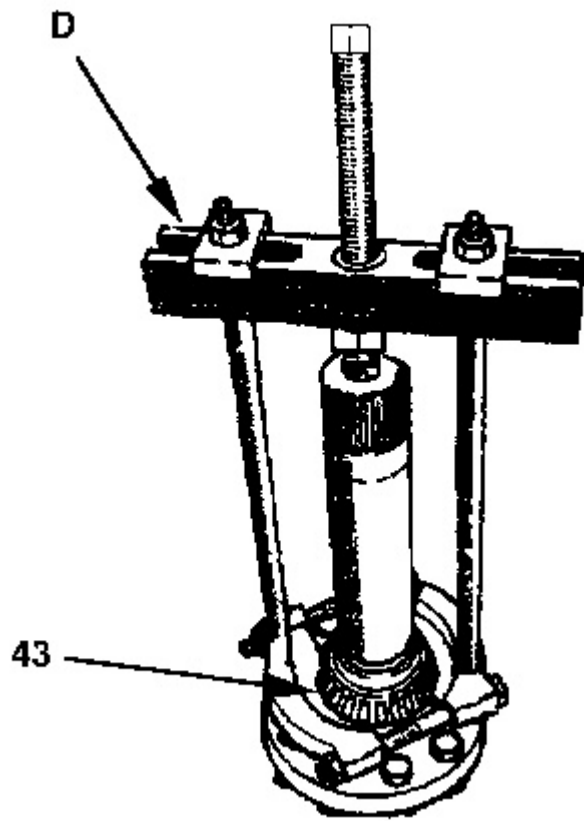
**d.** Remove seal (44) from seal retainer (42). Check the seal and seal retainer for wear or damage and replace if necessary.



**32.** Use the following procedure to disassemble the axle shaft and seal on an later axle.

**a.** Use a hoist and Tooling (C) to position and support the housing as shown.

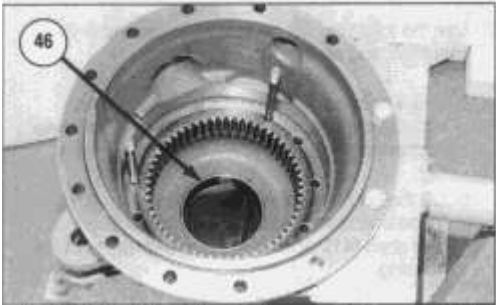
**b.** Lift the housing approximately 2.54 cm (1 in). Place a wooden block on top (splined end) of axle shaft (41), and drive the axle shaft from the housing.



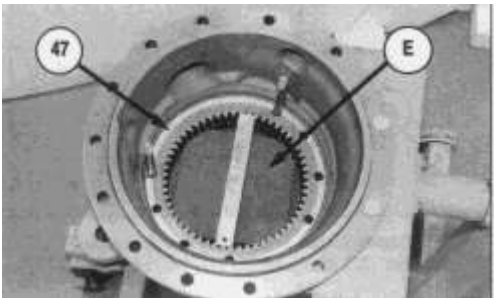
c. If necessary, use Tooling (D) to remove bearing (43) and "cassette" seal (44) from the axle shaft.



**33.** Remove bearing cup (45) from the housing.

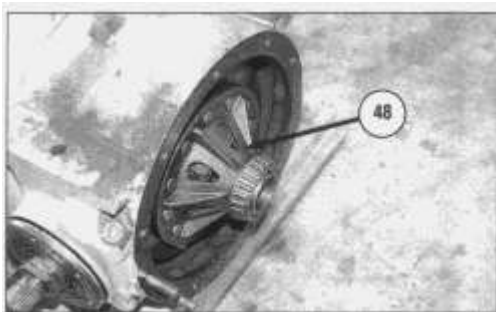


**34.** Remove bearing cup (46) from the other end of the housing.

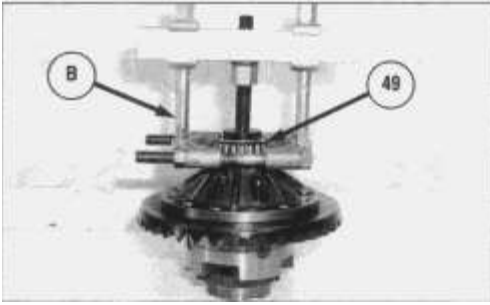


**NOTE:** Inspect ring gear (47) for signs of movement. If movement has occurred, the ring gear should be replaced.

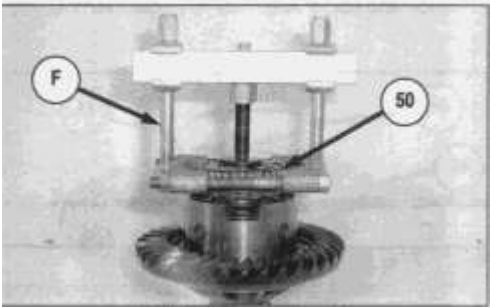
**35.** If ring gear (47) has to be removed, install Tool (E) beneath the ring gear. Remove the housing from Tooling (A), and install the housing in a press with the small end up. Use a solid rod to press on Tool (E) and remove ring gear (47).



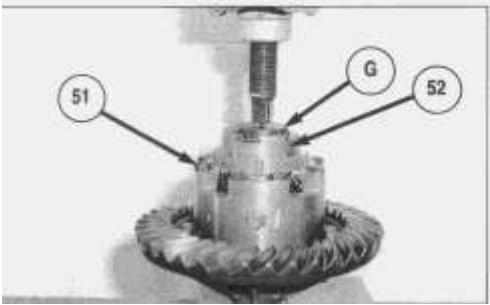
**36.** Use two persons to remove differential assembly (48) from the differential housing. The weight of the differential assembly is 36 kg (80 lb).



37. If necessary, use Tooling (B) to remove bearing assembly (49).



38. Turn the differential assembly over. If necessary, use Tooling (F) to remove bearing assembly (50).



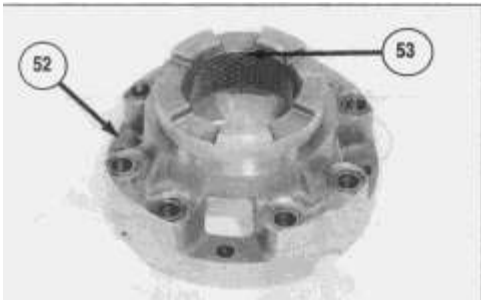
39. Put identification (location marks) on the differential case halves.



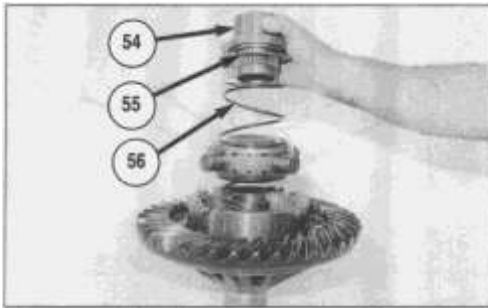
**There is spring pressure when bolts (51) are removed. Use a press as shown to prevent possible injury.**

40. Place the differential assembly in a press. Use Tool (G) and then remove eight bolts (51). Release pressure slowly to separate the differential case halves.

41. Remove differential case half (52).



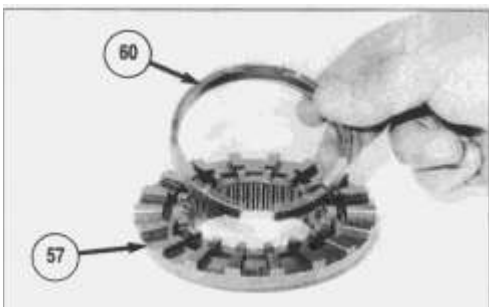
42. If necessary, remove bushing (53) from differential case half (52).



43. Remove side gear (54), spring retainer (55) and spring (56).

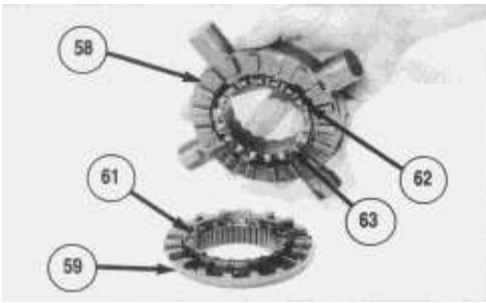


44. Remove driven clutch assembly (57), spider assembly (58) and driven clutch assembly (59) as a unit.

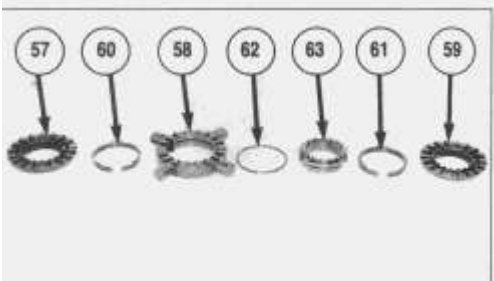


45. Remove ring (60) from driven clutch assembly (57) with Tool (H).





**46.** Separate spider assembly (58) from driven clutch assembly (59). Remove ring (61) from driven clutch assembly (59) using Tool (H). Remove retaining ring (62) and cam (63) from spider (58) using Tool (I).

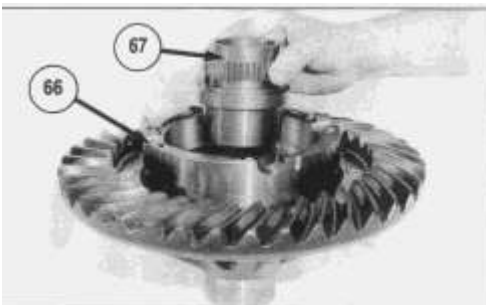


Driven clutch (57). Spider (58). Driven clutch (59). Clutch ring (60). Clutch ring (61). Retaining ring (62). Cam (63).

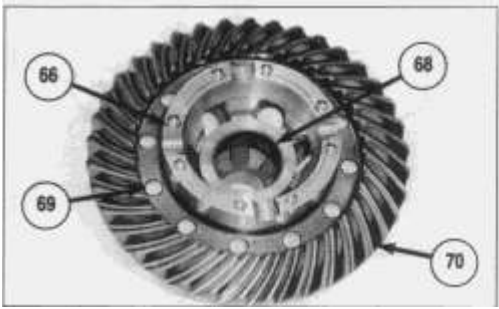
**47.** Clutch and spider assembly upon disassembly.



**48.** Remove spring (64) and spring retainer (65) (not shown) from differential case half (66).

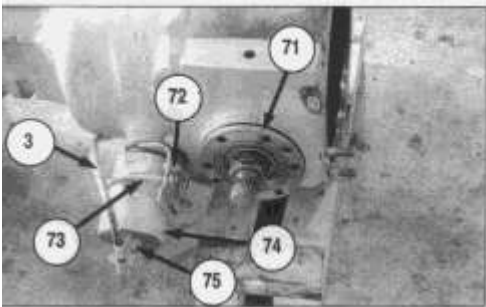


**49.** Remove side gear (67) from differential case half (66).



50. Remove bushing (68) from differential case half (66).

**NOTE:** There are twelve large rivets (69) holding gear (70) to differential case half (66). These rivets would have to be drilled out to be removed. Remove only if wear or damage necessitate.



51. Disconnect hose assembly (3) from brake actuator (74).

52. Remove two nuts and bolts (72). Remove the two nuts and clamp (73).



**WARNING**

**Plug (75) is under spring pressure and could cause personal injury.  
Remove plug (75) carefully.**

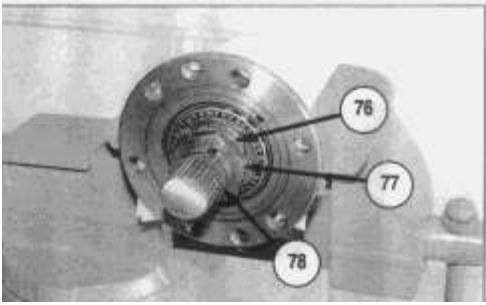
53. Remove the fitting and plug (75) from the brake actuator. Remove the O-ring seal from the plug. Check the O-ring seal for wear damage and replace if necessary.

54. Remove the spring from inside brake actuator (74).

55. Remove the two nuts from inside the brake actuator. The two nuts hold the brake actuator on the brake caliper shaft.

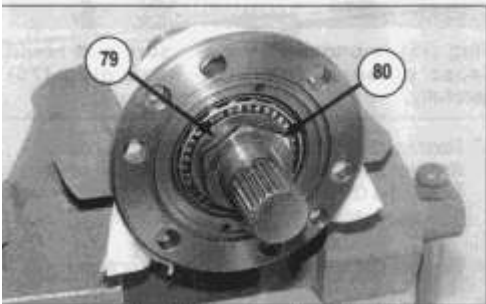
56. Remove the bracket and brake actuator (74) from the right side axle housing.

57. Remove pinion assembly (71) from the differential housing.

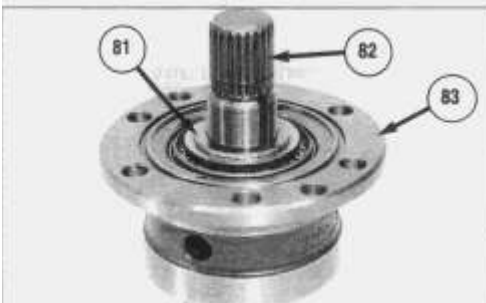


**58.** Use a soft jawed vise to hold the pinion assembly. Remove retaining ring (78) from the pinion.

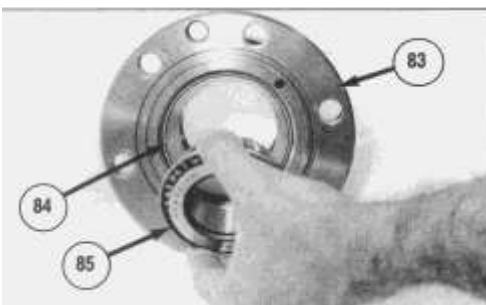
**59.** Bend tab washer (76) flat with a hammer and punch. Remove nut (77) and tab washer (76).



**60.** Bend tab washer (79) flat with a hammer and punch. Remove nut (80) and tab washer (79).

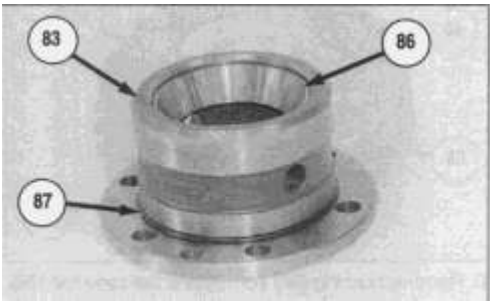


**61.** Remove washer (81), and remove housing (83) from pinion (82).



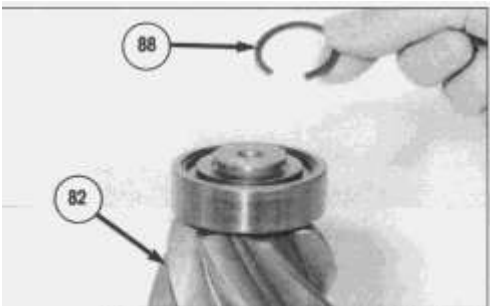
**62.** Remove bearing (85) from housing (83).

**63.** If necessary, remove bearing cup (84) from the housing.

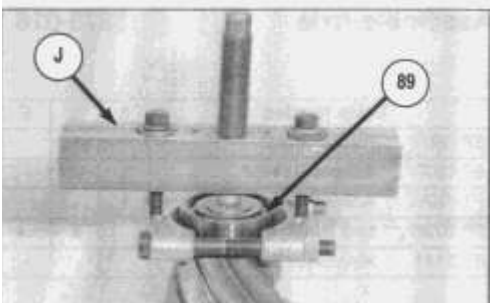


**64.** Turn housing (83) over and remove O-ring seal (87). Check the O-ring seal for wear or damage and replace if necessary.

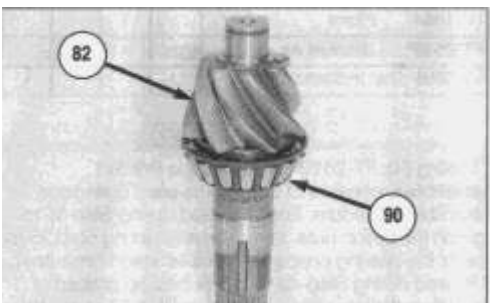
**65.** If necessary, remove bearing cup (86) from the housing.



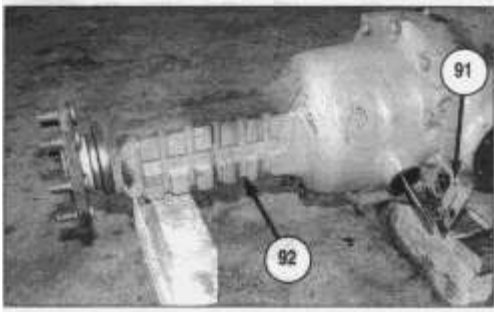
**66.** Remove retaining ring (88) from pinion (82).



**67.** Use Tooling (J) to remove bearing (89) from the pinion.

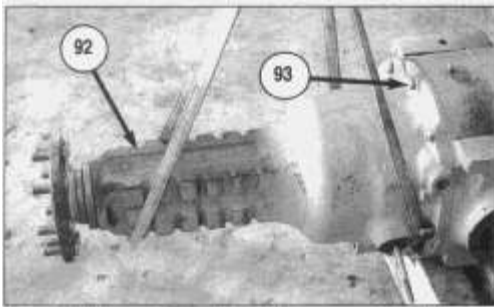


**68.** Use Tooling (J) to remove bearing (90) from pinion (82).



**69.** Remove the two nuts and bracket (91).

**70.** At the bottom of the axle assembly, remove the four bolts that fasten right side axle housing (92) to the differential housing.

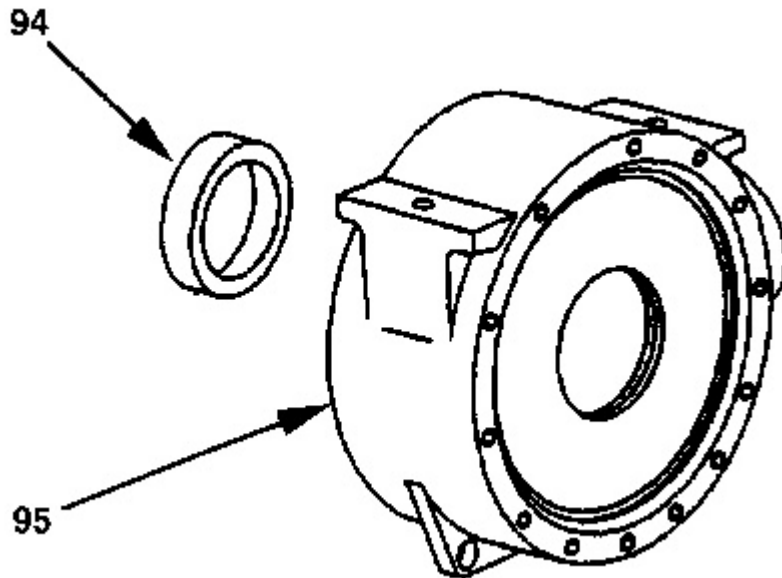


**71.** Attach lifting straps and a hoist to right side axle assembly (92) as shown. Remove remaining seven bolts (93), and remove right side axle housing (92) from the differential housing. The weight of the right side axle housing is 117 kg (260 lb). Remove the O-ring seal from the right side axle housing. Check the O-ring seal for wear or damage and replace if necessary.



**72.** Use Tooling (A) to support right side axle assembly (92) as shown.

**73.** Follow Steps 14 and 16 thru 35 for the disassembly of ride side axle assembly (92).



74. If necessary, remove bearing cup (94) from differential housing (95).

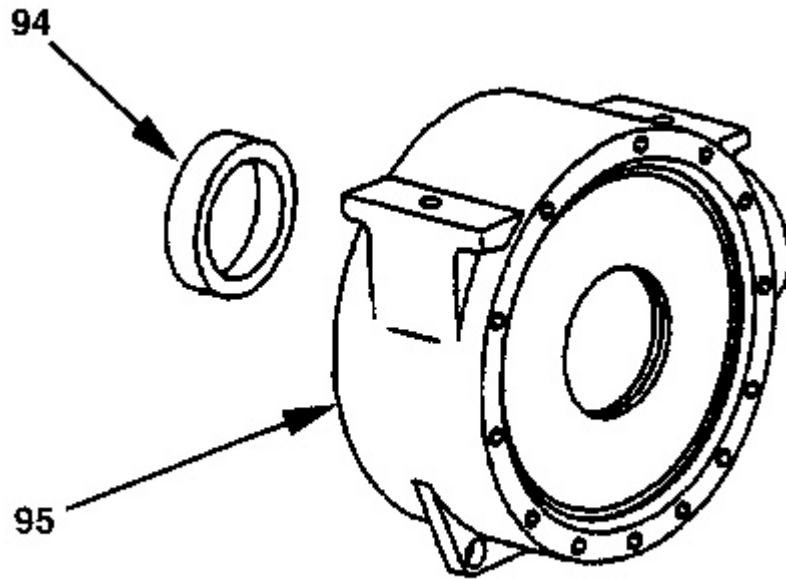
## Assemble Axle

Tools Needed		A	C	E
5P-0982	Repair Stand	1		
5P-0979	Adapter Tube	1		
FT-1870	Adapter As.	1		
5P-9736	Link Bracket		2	
8T-3111	Ring Gear Installer			1

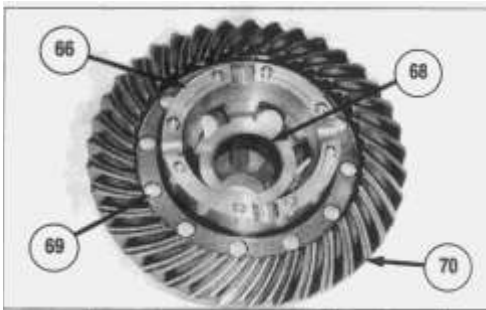
Tools Needed		G	H	I	K	L
1P-0498	Step Plate	1				
2P-8312	Pliers		1			
1P-1864	Pliers			1		
FT-2519*	Bracket As.				1	
8T-5096	Dial Indicator Gp.					1

\* Tooling (K), FT-2519 Rolling Torque Bracket Assemblies, consists of three items used during this assembly procedure. Item 1 is used during Step 55 to tighten the pinion nuts. Item 2 is used during Step 25 to check the bearing preload of the axle assemblies. Item 3 is used during Step 42

to check bearing preload of the differential assembly and during Step 55 to check bearing preload of the pinion assembly.

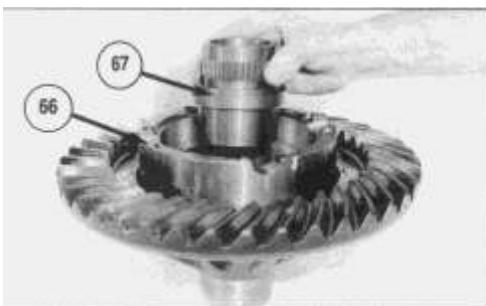


1. Install bearing cup (94) in differential housing (95).



2. Install bushing (68) in differential case half (66).

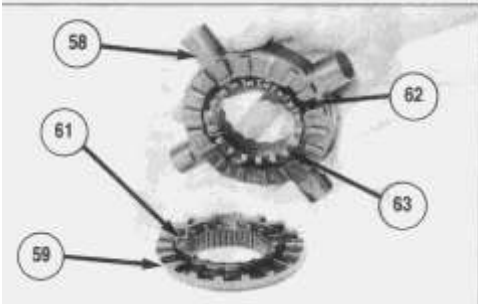
3. If removed, install gear (70) on differential case half (66) and secure with 12 **7X-3374** Nuts and **9R-6671** Bolts (69).



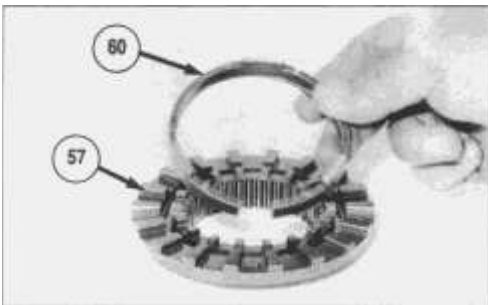
4. Install side gear (67) in differential case half (66).



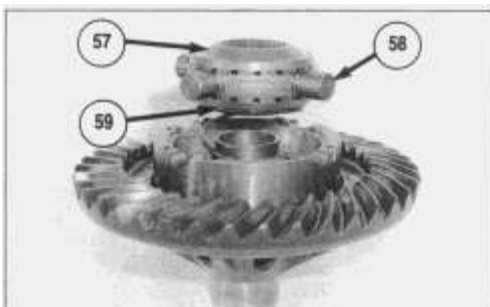
5. Install spring retainer (65) (not shown) and spring (64) over the side gear in differential case half (66).



6. Install cam (63) and retaining ring (62) in spider (58) using Tool (I). Install ring (61) in driven clutch assembly (59) using Tool (H). Position spider assembly (58) on drive clutch assembly (59).

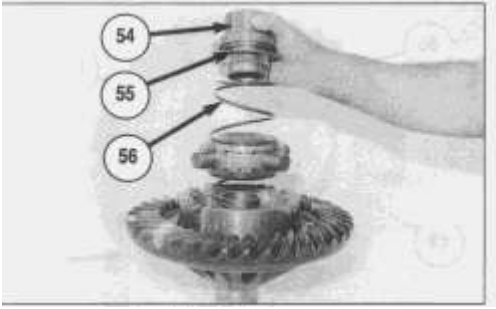


7. Install ring (60) in driven clutch assembly (57) using Tool (H).



8. Position driven clutch assembly (59), spider assembly (58) and driven clutch assembly (57) on the spring.

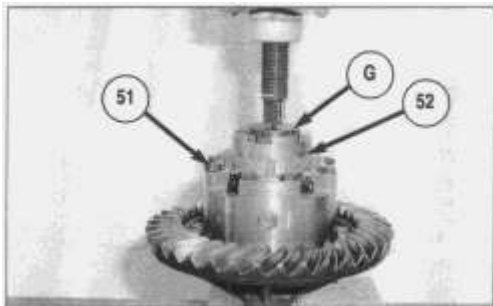




9. Install spring (56), spring retainer (55) and side gear (54).



10. Install bushing (53) in differential case half (52).

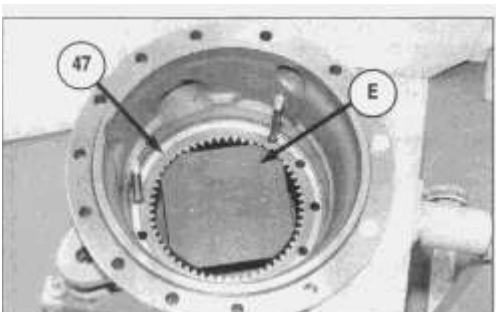


11. Place the differential assembly in a press and position differential case half (52) in its original position.

12. Use the press and Tool (G) to compress the springs together.

13. Install eight bolts (51). Tighten the bolts to a torque of 92 to 125 N·m (68 to 92 lb ft).

14. Heat bearings (49) and (50) to a temperature of 135° C (275° F). Install the bearings on the differential assembly in their original locations.



15. If ring gear (47) was removed from the right side axle housing, apply **4C-4032 Bearing Mount** on the new ring gear and put Tool (E) in position on the ring gear as shown. Use a press and a

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