

End By:

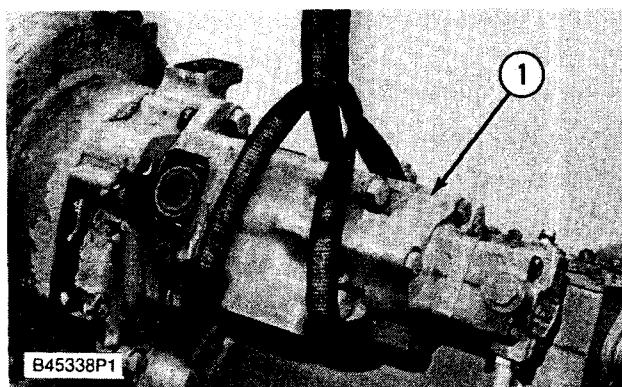
- a. install engine, torque converter, transmission and transfer gears

Torque Converter

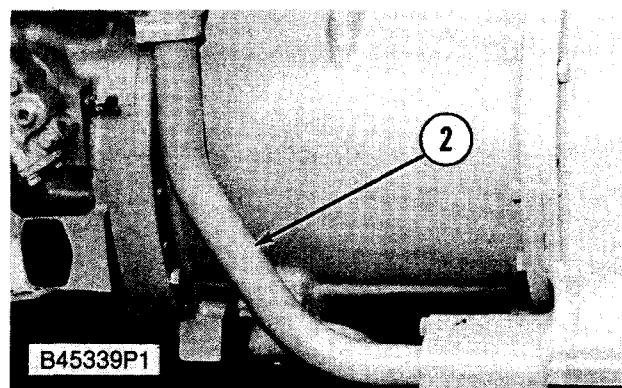
Separation And Connection Of Torque Converter From Transmission 3101-029

Start By:

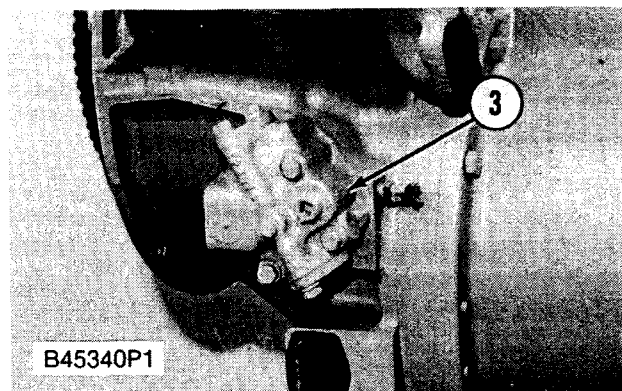
- a. separation of torque converter and transmission



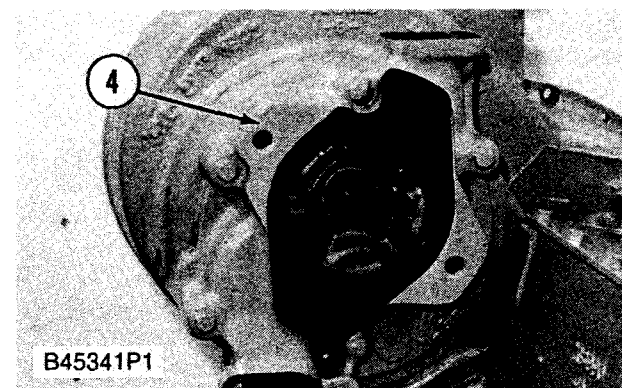
1. Fasten a hoist to hydraulic pump (1) as shown.
2. Remove the bolts and hydraulic pump (1) from the transmission oil pump. The weight of the pump is 36 kg (80 lb.).



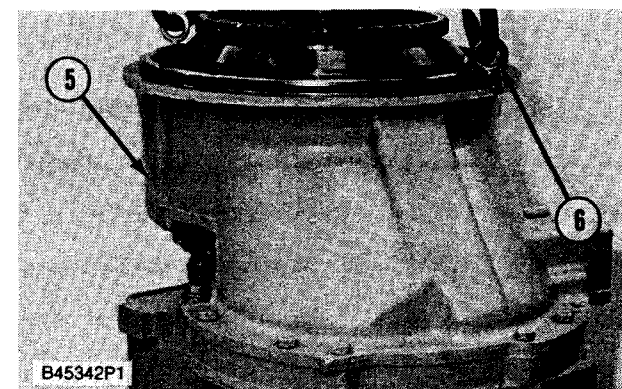
3. Remove the bolts and tube assembly (2) from the transmission oil pump and the transfer gear case.



4. Remove the bolts and outlet relief valve (3) from the torque converter.



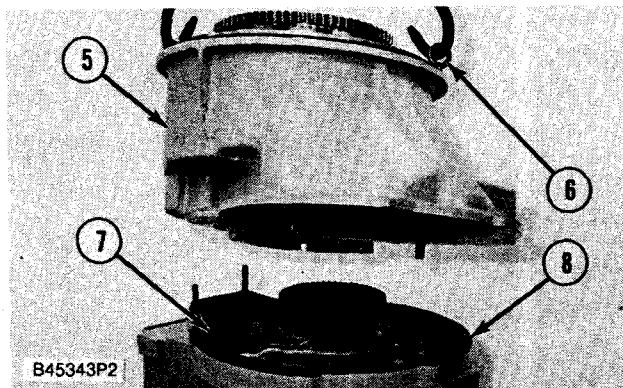
5. Remove the bolts and transmission oil pump (4) from the torque converter.



6. Put the torque converter, transmission and transfer gears in a vertical position on wood blocks with the torque converter up.
7. Fasten two 3/8" -16 NC forged eyebolts (6) and a hoist to torque converter (5) as shown.

8. Remove the bolts and nuts and remove torque converter (5) from the transmission. The weight of the torque converter is 158 kg (350 lb.).

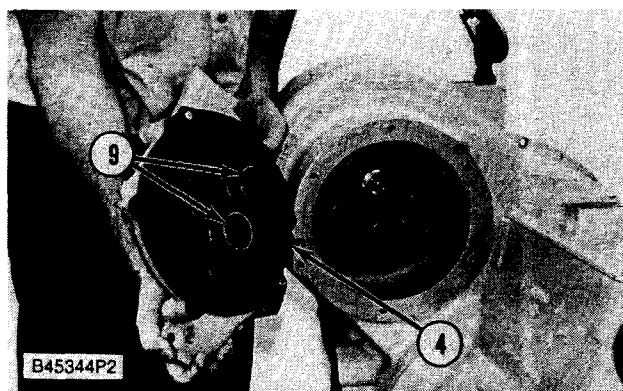
NOTE: The following steps are for the connection of the torque converter to the transmission.



9. Fasten two 3/8" -16 NC forged eyebolts (6) and a hoist to torque converter (5) as shown.

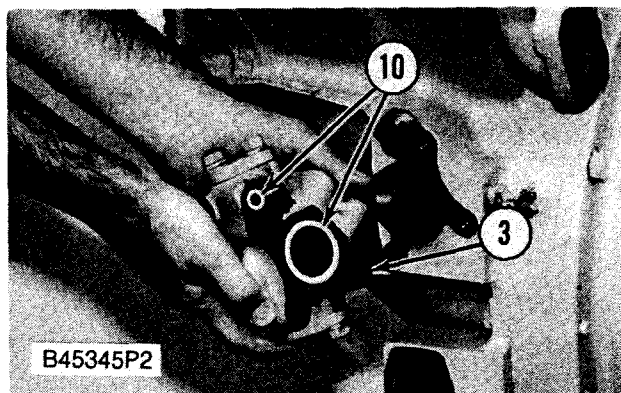
10. Make sure O-ring seal (7) is installed around the transmission case and put clean oil on it.

11. Lower torque converter (5) on to the transmission. Make sure dowels (8) on the transmission are in alignment with the holes in the torque converter.



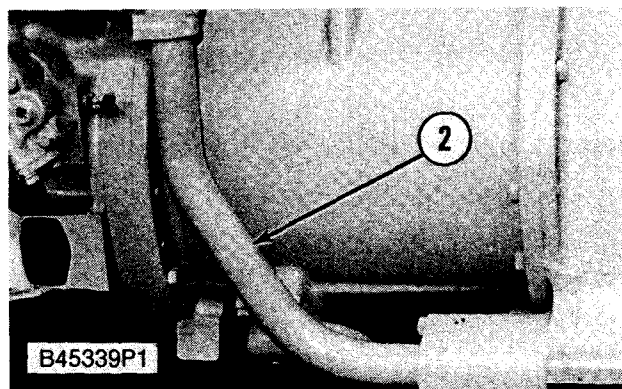
12. Install O-ring seals (9) on transmission oil pump (4) and put clean oil on them.

13. Install transmission oil pump (4) on the torque converter.



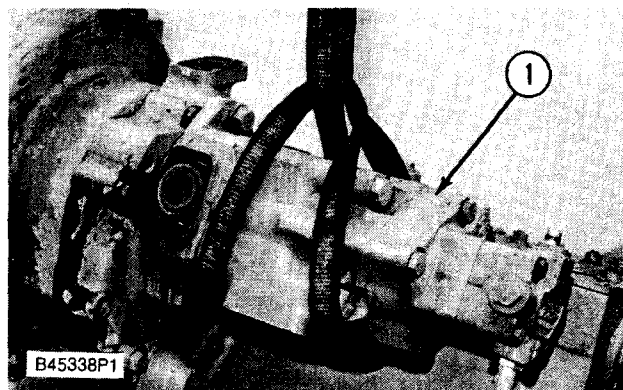
14. Install O-ring seals (10) on outlet relief valve (3) and put clean oil on them.

15. Install outlet relief valve (3) on the torque converter.



16. Install the O-ring seals on both ends of tube assembly (2) and put clean oil on them.

17. Install tube assembly (2) on the transmission oil pump and the transfer gear case.



18. Fasten a hoist to hydraulic pump (1) as shown.

19. Put the O-ring seal in position on the hydraulic pump and put clean oil on it.

20. Install hydraulic pump (1) on the transmission oil pump.

End By:

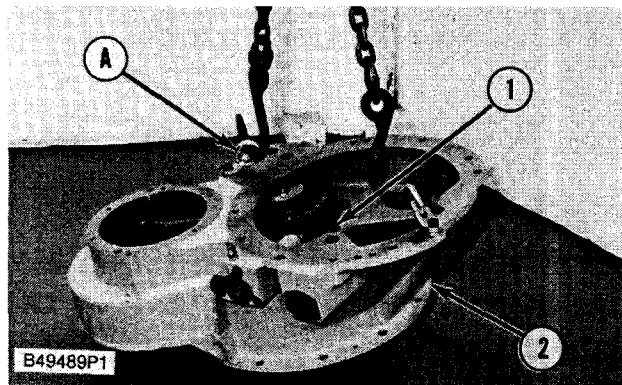
a. connection of torque converter and transmission

Disassemble Torque Converter 3101-015

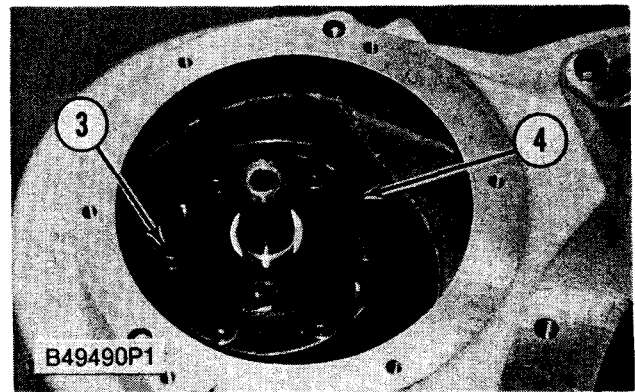
Tools Needed		A	B	C	D
5P9736	Link Bracket	2			
1H3107	Puller Assembly		1		
8B7554	Bearing Cup Puller Attachment		1		
5P4750	Screw		1		
8H684	Ratchet Box Wrench		1		
1S5188	Leg		2		
5F7344	Block		1		
2P8312	Pliers			1	
1P2321	Puller Assembly				1
9S9154	Step Plate				1

Start By:

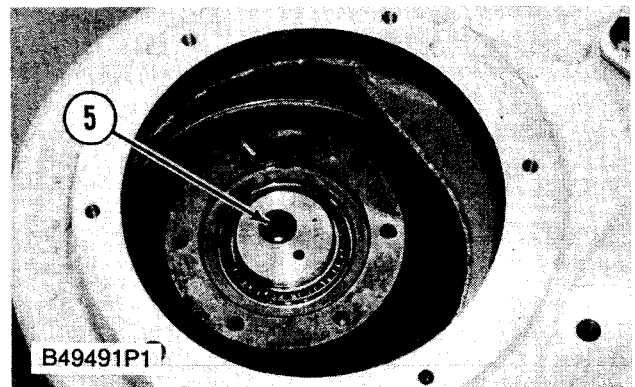
a. separation of torque converter from transmission



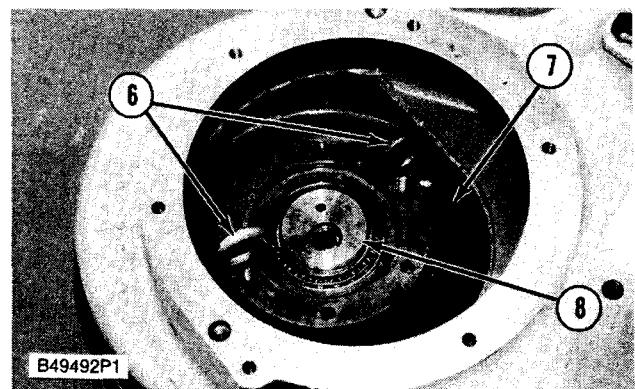
1. Install tool (A) and a hoist on housing (2) as shown.
2. Remove eight bolts (1) and remove housing (2) from the torque converter. The weight of the housing is 95 kg (210 lb.).



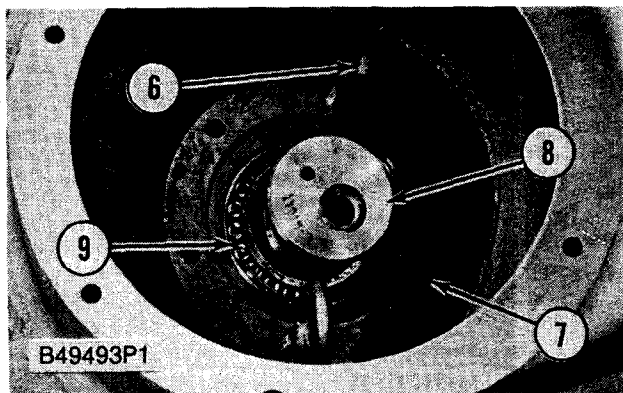
3. Remove bolts (3) and flange (4) from the gear.



4. Remove bolt (5) that holds the shaft to the housing.

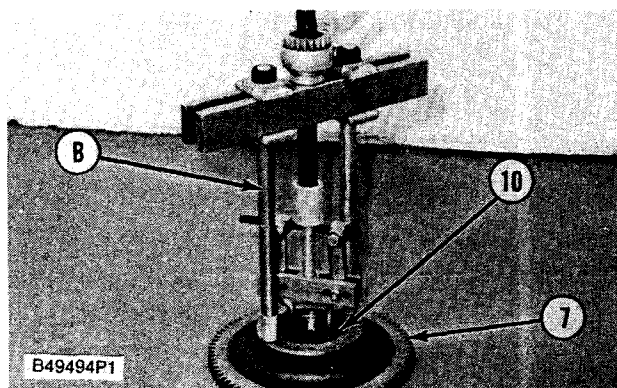


5. Install 3/8" -16 NC forged eyebolts (6) in gear (7).
6. Lift gear (7), shaft (8), the cone and spacer enough so shaft (8) is clear of the bore in the housing.
7. Move the assembly slightly over and lower it so shaft (8) is no longer in the bore of the housing.

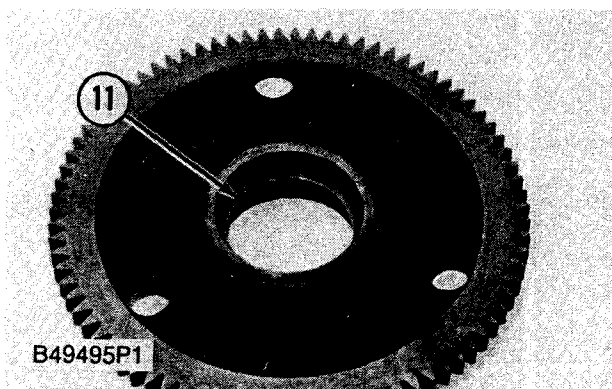


8. Remove eyebolts (6) from gear (7).

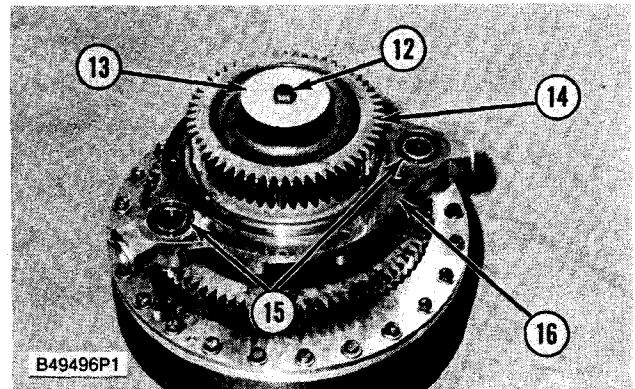
9. Remove shaft (8), bearing cones (9) and the spacer from gear (7).



10. Use tooling (B) to remove bearing cups (10) from each side of gear (7).

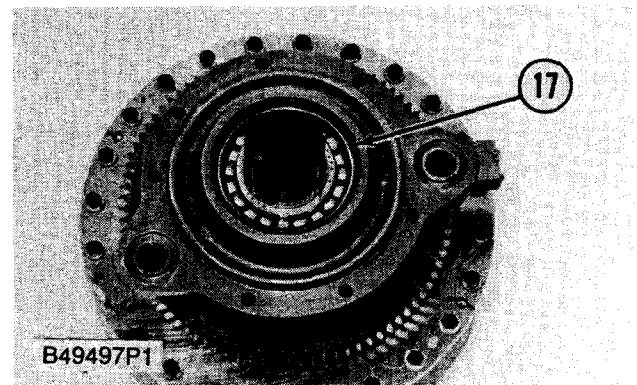


11. Remove ring (11) from the gear.

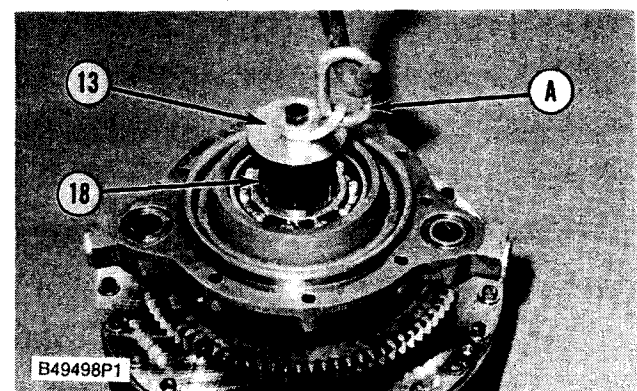


12. Remove O-ring seals (15) from carrier (16).

13. Remove bolt (12), retainer (13) and gear (14).

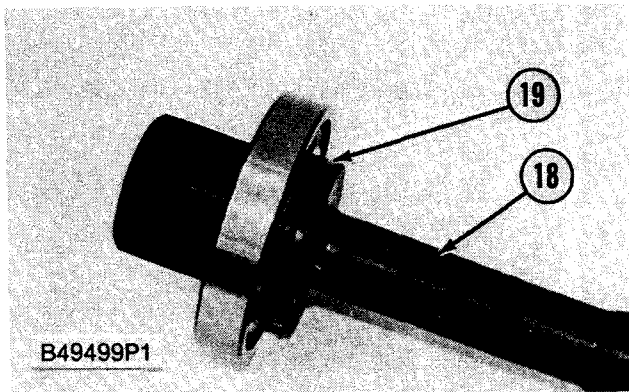


14. Remove ring (17) that holds the shaft and bearing to the carrier.

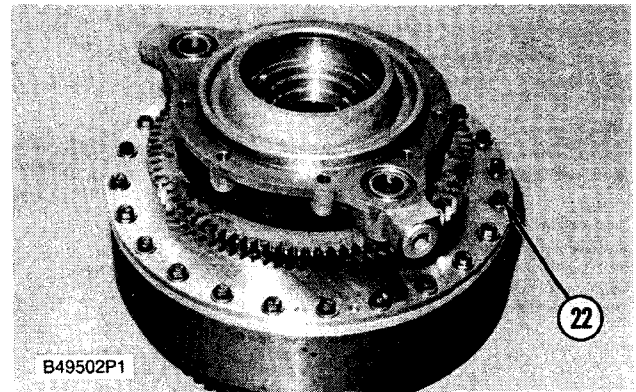


15. Install retainer (13) and one of tool (A) and a hoist on shaft (18).

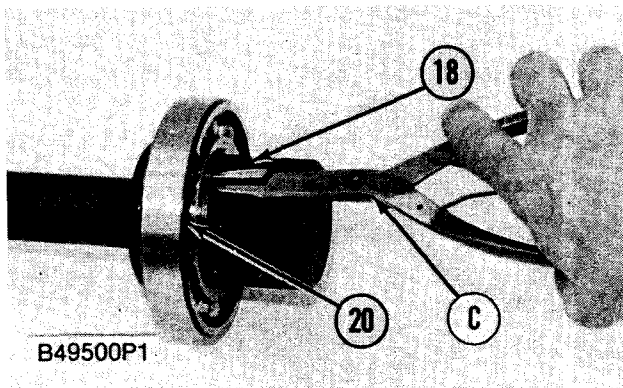
16. Lift up slightly on shaft (18) and the bearing. Use a rubber hammer and tap the carrier to free the shaft and bearing.



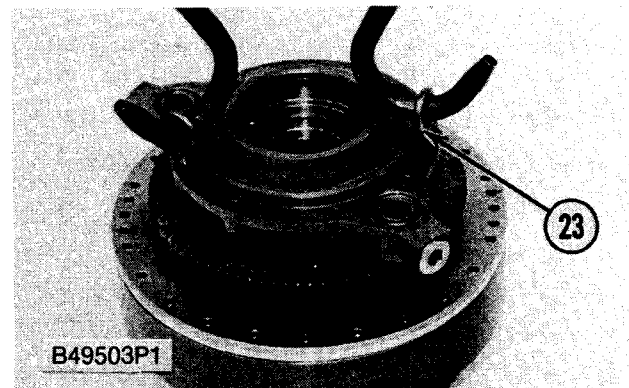
17. Remove ring (19) from shaft (18).



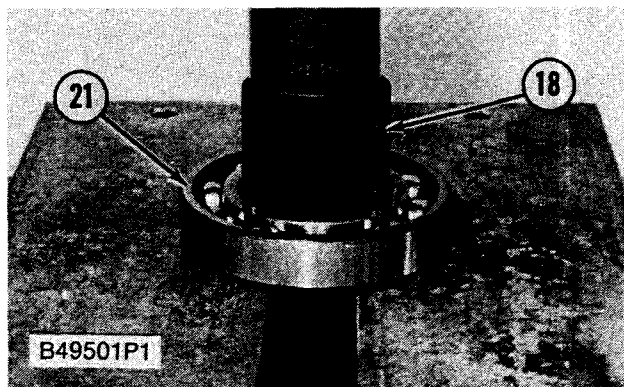
20. Remove bolts (22) that hold the impeller, plate and housing together.



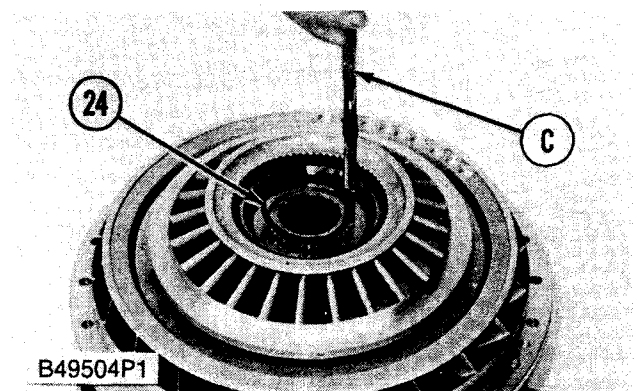
18. Use tool (C) to remove ring (20) from shaft (18).



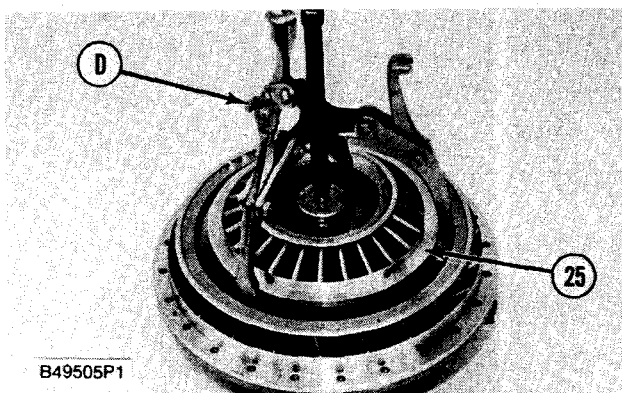
21. Install two 3/8\" -16 NC forged eyebolts (23) and a hoist to make a separation of the impeller and the carrier from the housing.



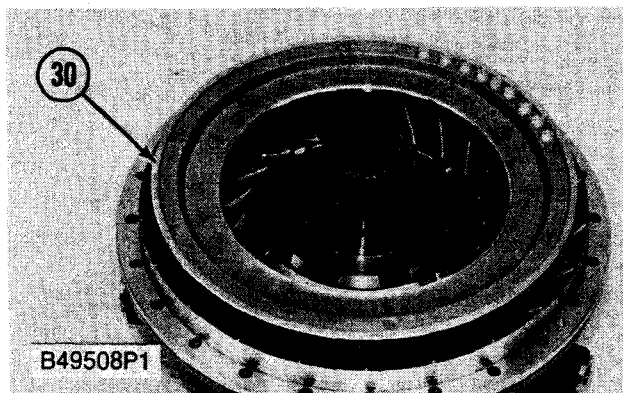
19. Use a press and push shaft (18) from bearing (21).



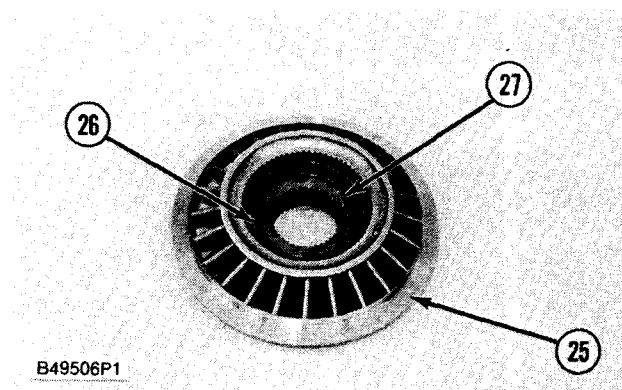
22. Use tool (C) to remove ring (24) from the carrier.



23. Use tool (D) to carefully remove stator (25) from the impeller and the carrier.

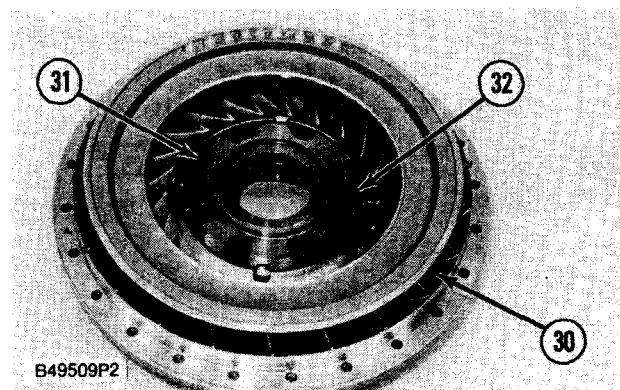


27. Remove impeller (30), the plate and the gear from the carrier.



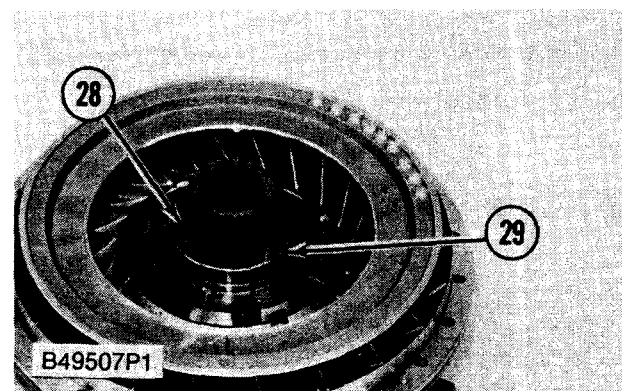
24. Remove rings (26) from each side of adapter (27).

25. Heat stator (25) and adapter (27) at 121° C (250° F) and remove adapter (27) from stator (25).

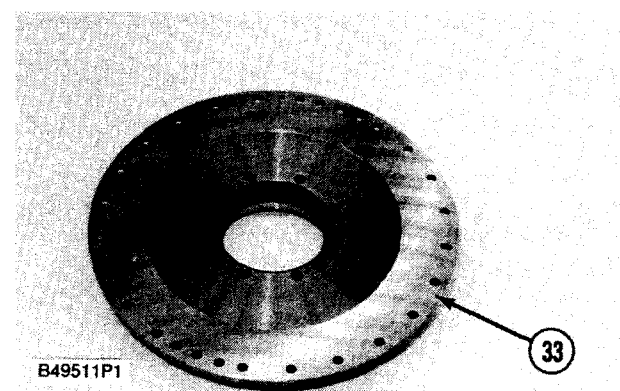


28. Remove bolts (31) and hub (32) from the impeller.

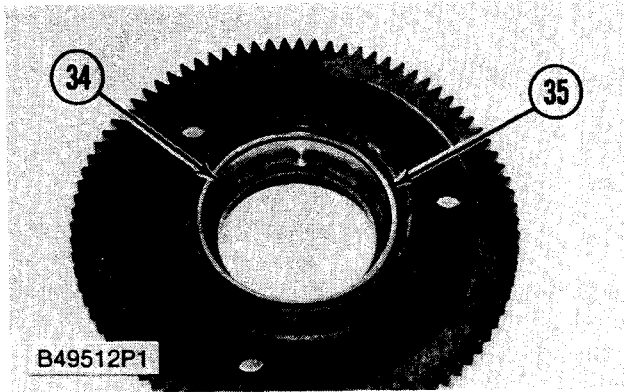
29. Remove impeller (30) from the plate and the gear.



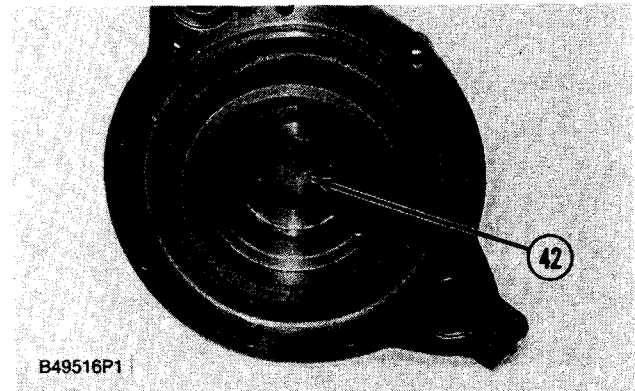
26. Remove retainer (29), two races (28) and the bearing from the impeller.



30. Remove plate (33) from the gear.

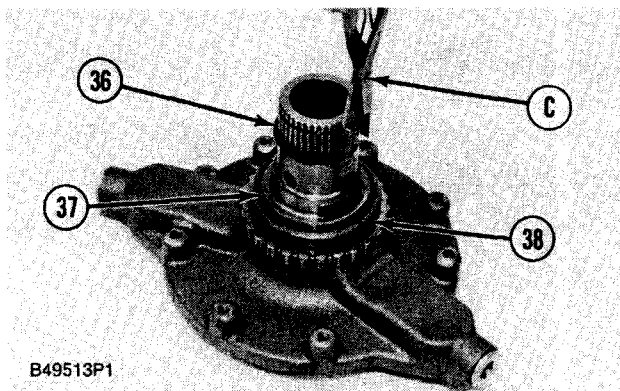


31. Remove ring (35) and race (34) from the gear.



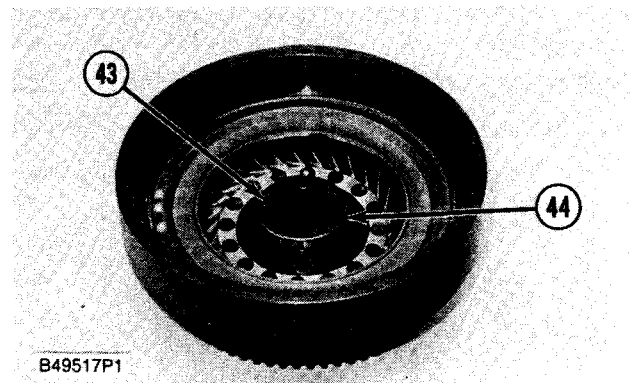
36. Remove the ring and sleeve (42) from the carrier.

NOTE: Some earlier models can have two rings.

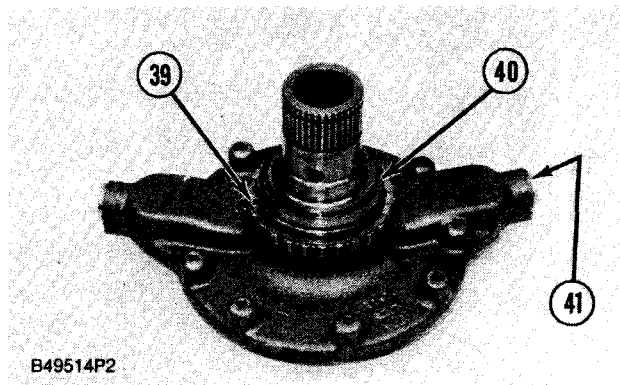


32. Use tool (C) to remove ring (36) from the carrier.

33. Remove rings (37) and (38) from the carrier.

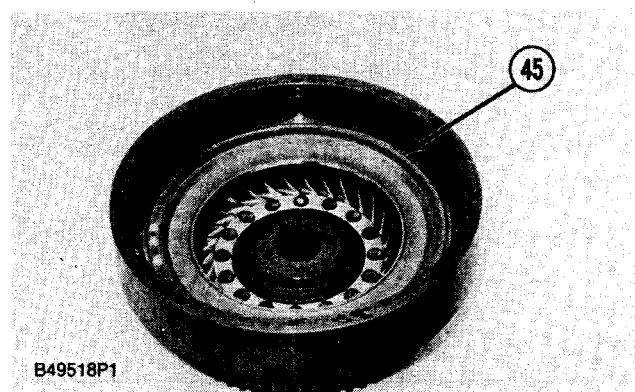


37. Remove retainer (44), two races (43) and the bearing from the turbine.

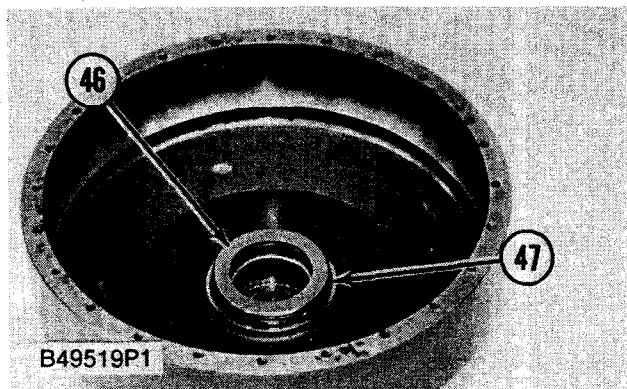


34. Remove bearing (39) and carrier (40) from the carrier.

35. Remove plug (41) from both ends of the carrier.



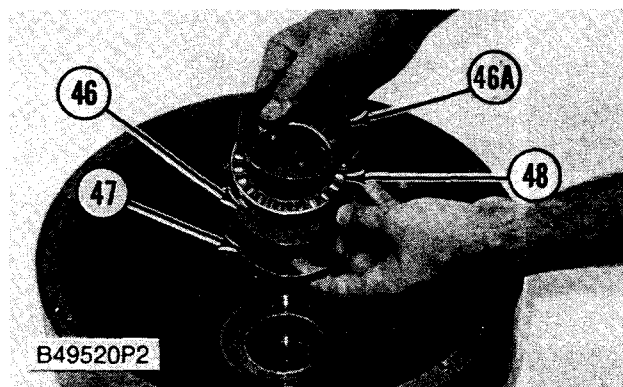
38. Remove turbine (45) from the housing.



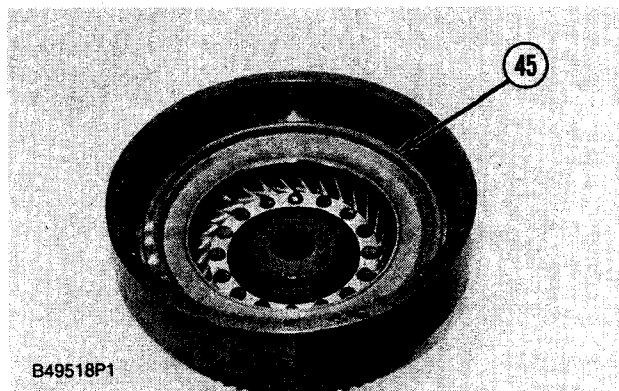
39. Remove retainer (47), two races (46) and the bearing from the housing.

Assemble Torque Converter 3101-016

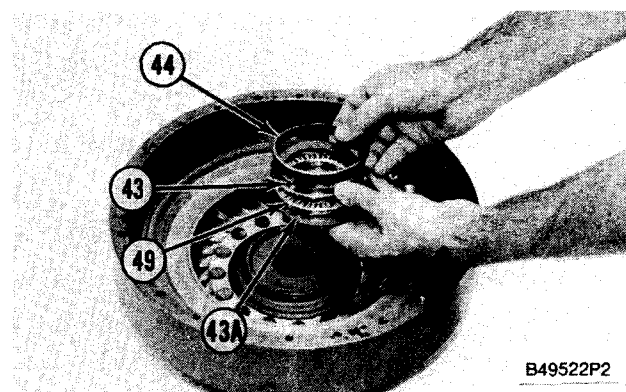
Tools Needed		A	C	E
5P9736	Link Bracket	2		
2P8312	Pliers		1	
1P520	Driver Group			1



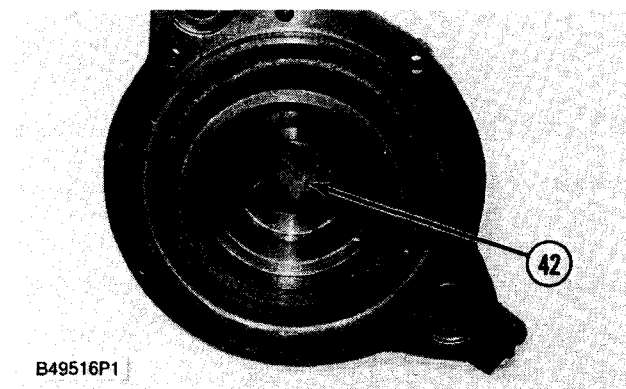
1. Install retainer (47) (with the lip down), race (46), bearing (48) and race (46A) in the housing.



2. Install turbine (45) in the housing as shown.

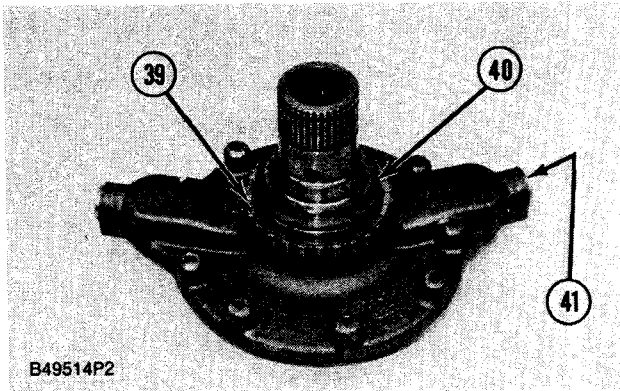


3. Install race (43), bearing (49), race (43) and retainer (44) (with the lip up) on the turbine.

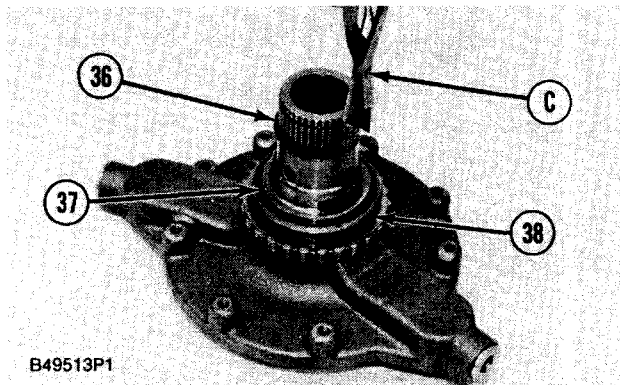


4. Install sleeve and ring (42) in the carrier.

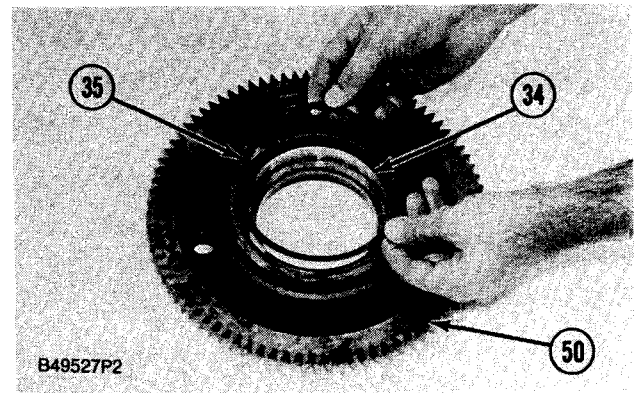
NOTE: Some earlier models can have two rings.



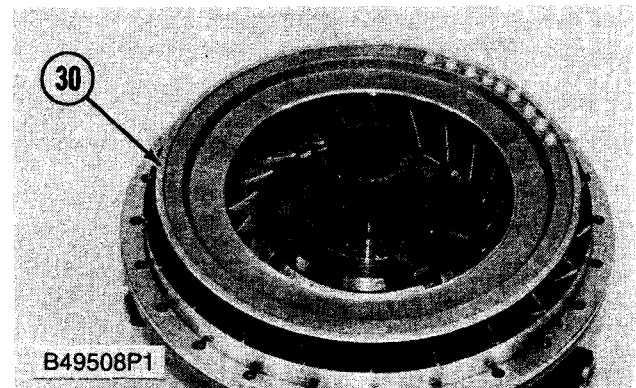
5. Install the O-ring seals on plugs (41).
6. Install plugs (41) in both sides of the carrier.
7. Heat bearing (39) to a maximum temperature of 135° C (275° F) and install it on the carrier.
8. Heat carrier (40) to a maximum temperature of 135° C (275° F) and install it on the carrier.



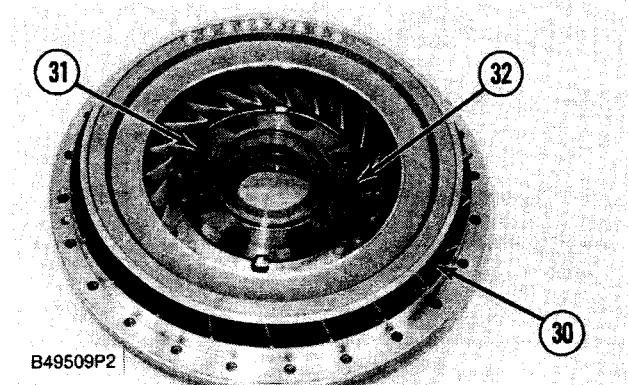
9. Install rings (37) and (38) on the carrier.
10. Use tool (C) to install ring (36) on the carrier.



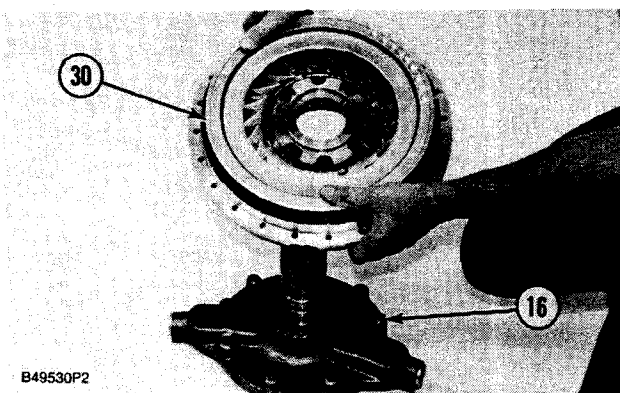
11. Lower the temperature of race (34) and install it in gear (50).
12. Install ring (35) on gear (50).



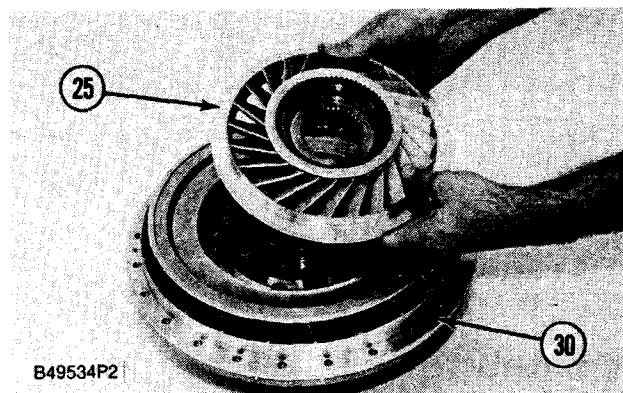
13. Put the plate and impeller (30) in position on gear (50).



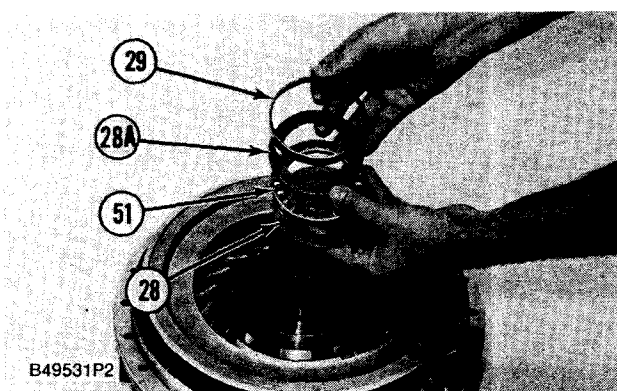
14. Put hub (32) in position on impeller (30).
15. Install bolts (31) that hold the hub, impeller, plate and the gear together. Tighten the bolts to a torque of $50 \pm 3 \text{ N}\cdot\text{m}$ ($37 \pm 2 \text{ lb}\cdot\text{ft.}$).



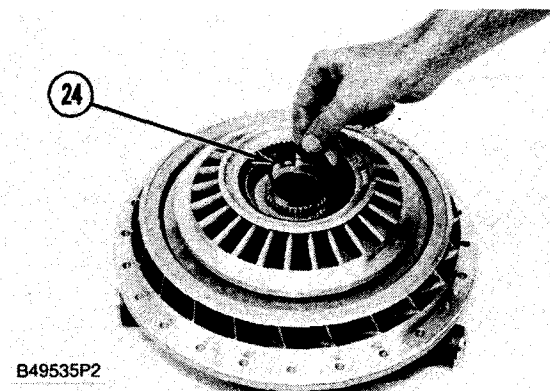
16. Install impeller (30) on carrier (16).



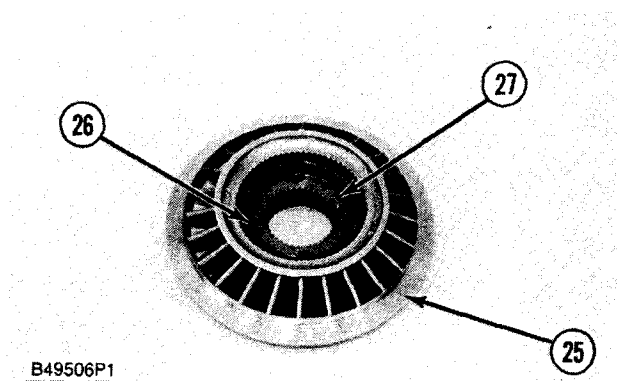
20. Install stator (25) on impeller (30).



17. Install race (28), bearing (51), race (28A) and retainer (29) (with the lip up) on the hub.

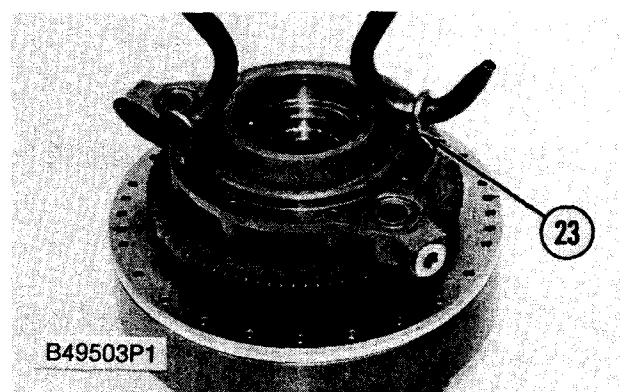


21. Install ring (24) on the shaft as shown.

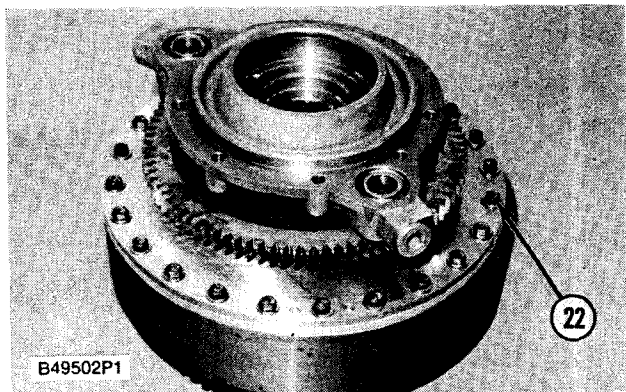


18. Heat stator (25) to a maximum temperature of 121° C (250° F) and install it on adapter (27). Make sure the adapter is in the center of the stator.

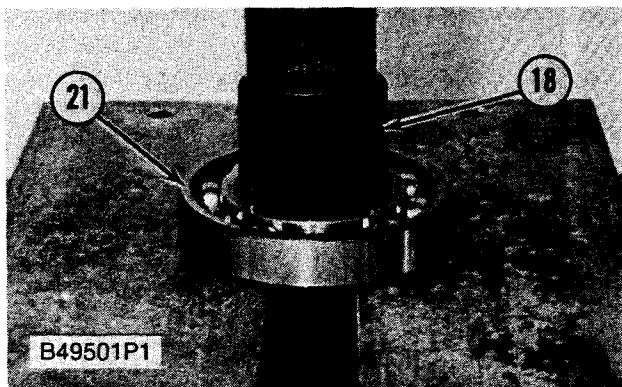
19. Install rings (26) on both sides of the stator.



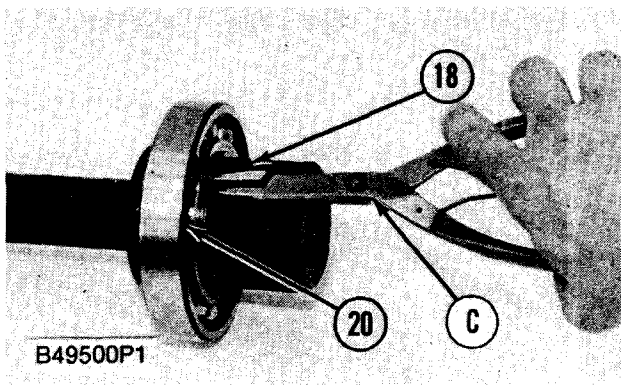
22. Install two 3/8" -16 NC forged eyebolts (23) and a hoist in the carrier. Put the carrier and the impeller in position in the housing as shown.



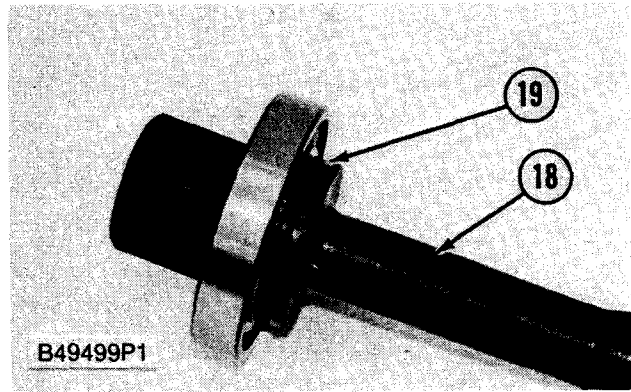
23. Install bolts (22) that hold the carrier and the impeller in the housing. Tighten the bolts to a torque of $27 \pm 2 \text{ N}\cdot\text{m}$ ($20 \pm 1 \text{ lb}\cdot\text{ft.}$).



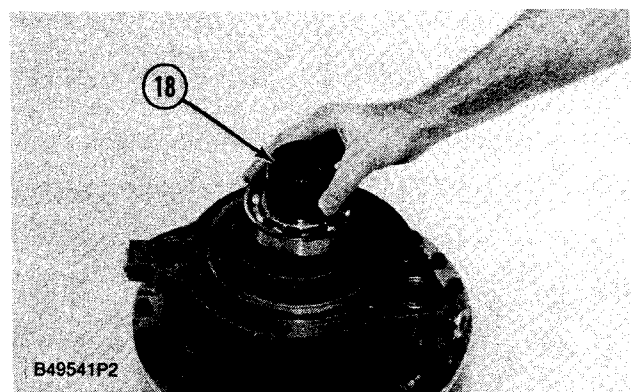
24. Use a press and install shaft (18) in bearing (21).



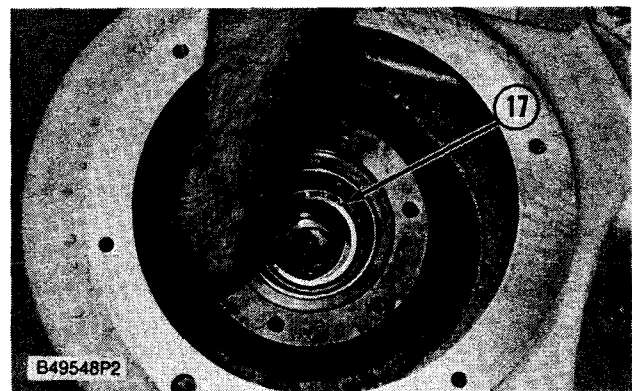
25. Use tool (C) to install ring (20) on shaft (18).



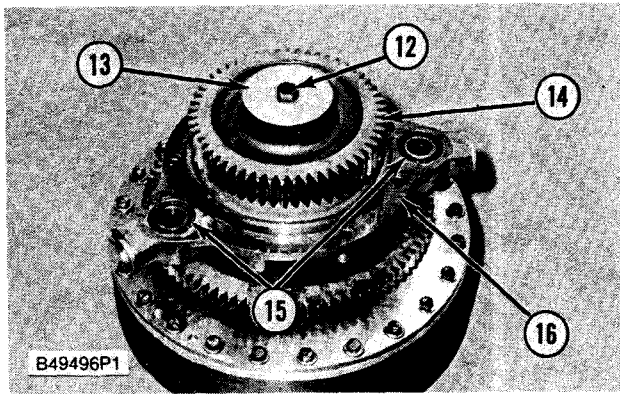
26. Install ring (19) in the groove on shaft (18).



27. Install shaft (18) and the bearing in position in the carrier as shown.



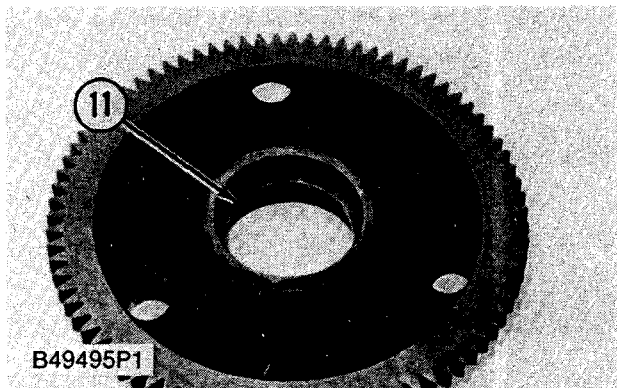
28. Install ring (17) in the carrier to hold the bearing and shaft in place.



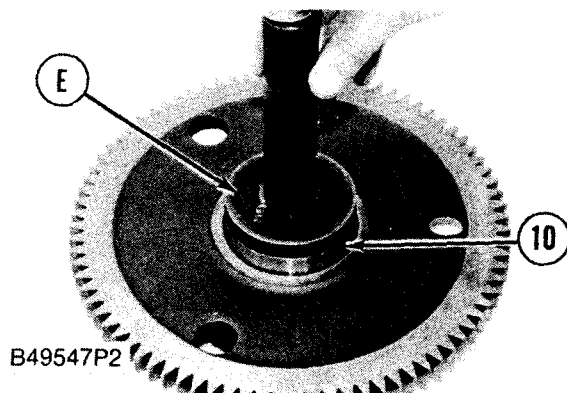
29. Install O-ring seals (15) in the carrier.

30. Install gear (14) on the shaft.

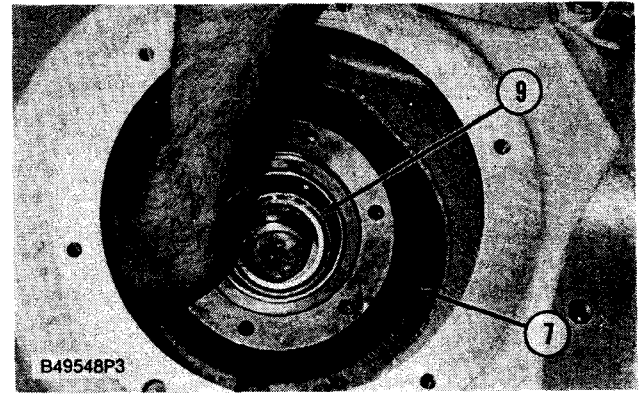
31. Install retainer (13) and bolt (12) in the shaft. Tighten the bolt to a torque of $110 \pm 10 \text{ N}\cdot\text{m}$ ($80 \pm 7 \text{ lb}\cdot\text{ft}$).



32. Install ring (11) in gear.

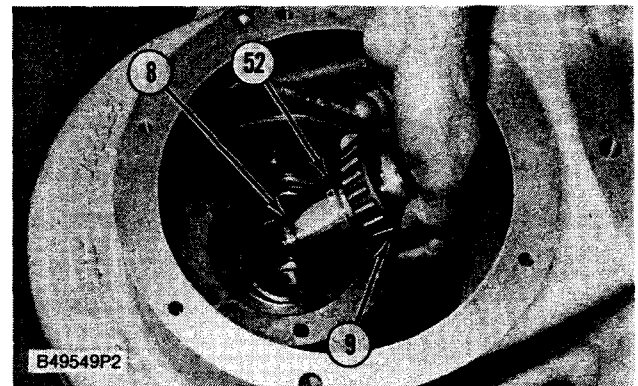


33. Use tool (E) to install bearing cups (10) in both sides of the gear.



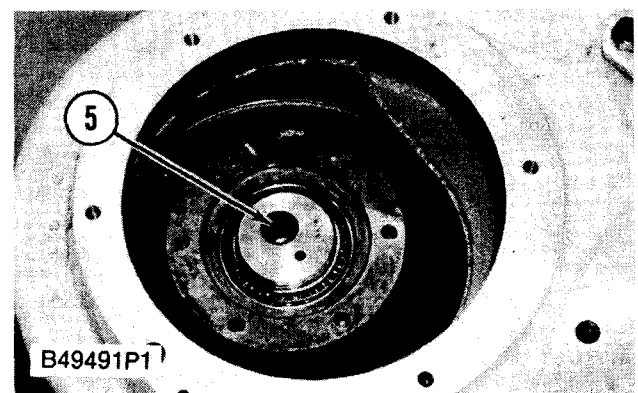
34. Install bearing (9) in gear (7).

35. Put gear (7) into position in the housing.

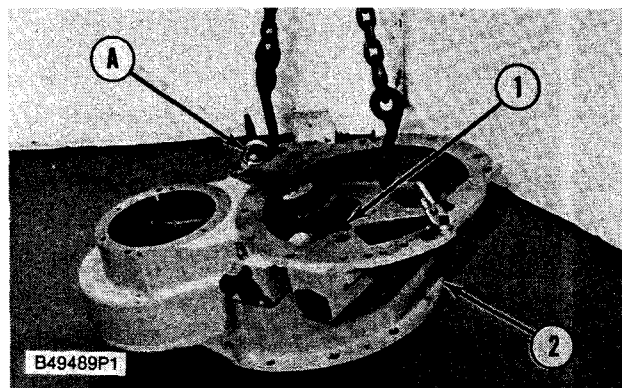
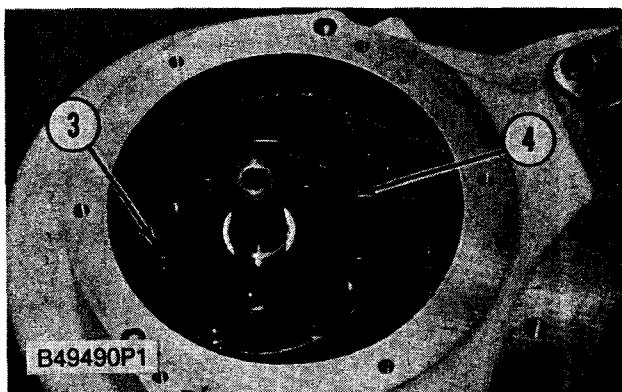


36. Install spacer (52) and bearing (9) on shaft (8) as shown.

37. Install shaft (8) in the gear. Make sure shaft (8) fits into the bore of the housing.



38. Install bolt (5) in the shaft. Tighten the bolt to a torque of $100 \pm 5 \text{ N}\cdot\text{m}$ ($80 \pm 4 \text{ lb}\cdot\text{ft}$). Rotate the gear when tightening to seat the bearing rollers.



39. Put flange (4) in position on the gear and install bolts (3). Tighten the bolts to a torque of $50 \pm 3 \text{ N}\cdot\text{m}$ ($37 \pm 2 \text{ lb}\cdot\text{ft.}$).

40. Install tooling (A) and a hoist on the housing as shown.

41. Put the housing in position on the torque converter and install bolts (1).

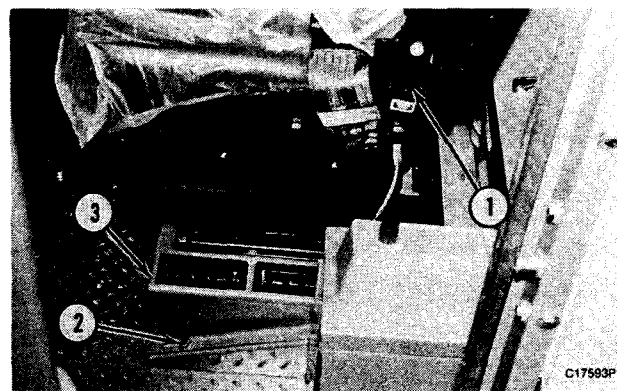
End By:

a. connection of torque converter to transmission.

Transmission Hydraulic Control Valves

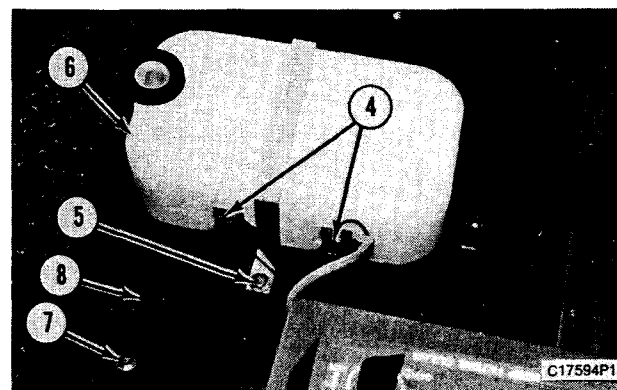
Remove Transmission Hydraulic Control Valves 3152-011

Tools Needed		A	B	C
5P8622	Shackle	1		
8S9906	Ratchet Puller	1		
5P9736	Link Bracket		1	
FT797	Lifting Bracket			1



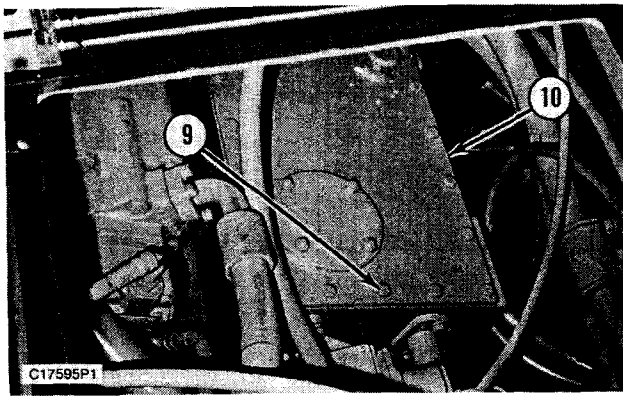
1. Remove seat (1). The weight of the seat is approximately 90.7 kg (200 lb.).

2. Remove bolts (2), and remove support assembly (3).

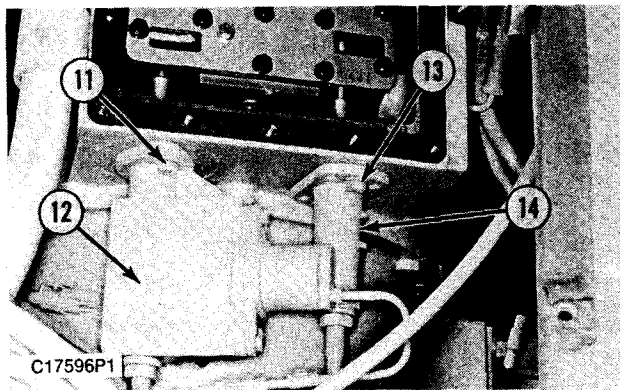


3. Disconnect hoses and wire connectors (4). Remove two bolts and washers (5) and the strip around reservoir (6). Remove the reservoir.

4. Remove bolts (7), and remove plate (8).

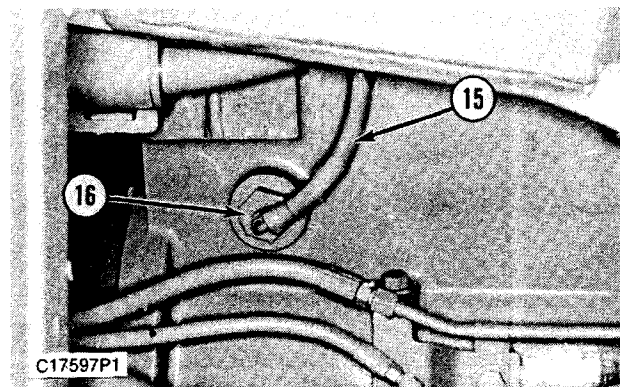


5. Remove bolts (9), and remove plate (10).

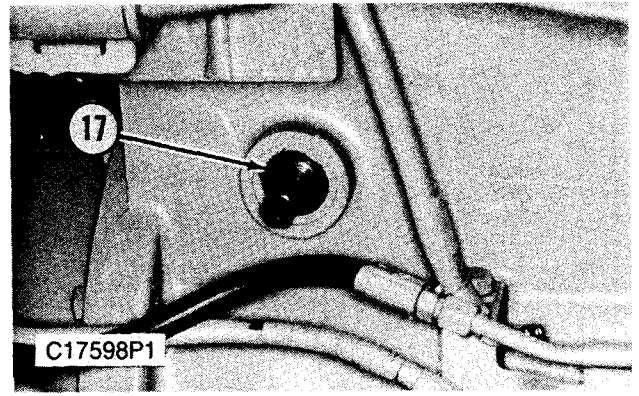


6. Remove bolts and washers (11), and remove transmission neutralizer (12).

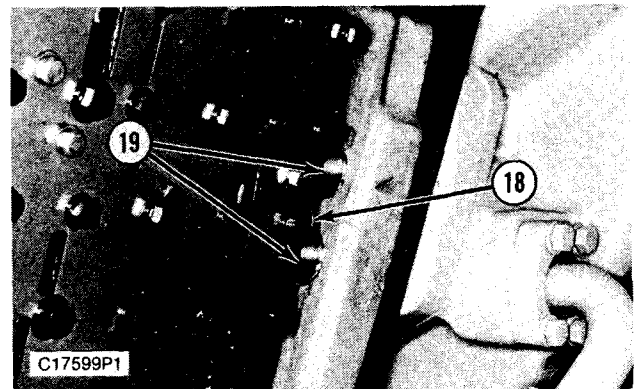
7. Remove bolts and washers (13), and remove bracket assembly (14).



8. Remove hose (15), and remove adapter and seal (16). Remove the spring behind the adapter.



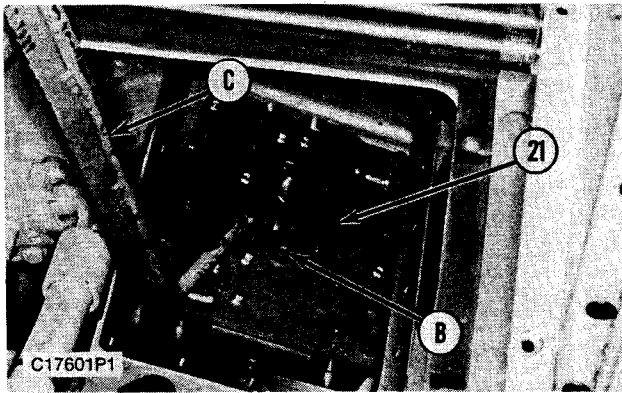
9. Install a 1/2" -13 NC bolt, 57.15 mm (2.25 in.) long in sleeve (17). Remove sleeve (17) from the transmission case. Remove the two O-ring seals from the sleeve.



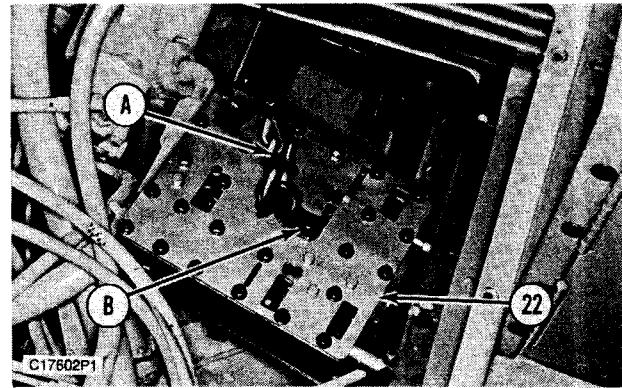
10. Remove bolt and retainer (18). Push two sleeves (19) into the torque converter to disconnect them from the valve body.



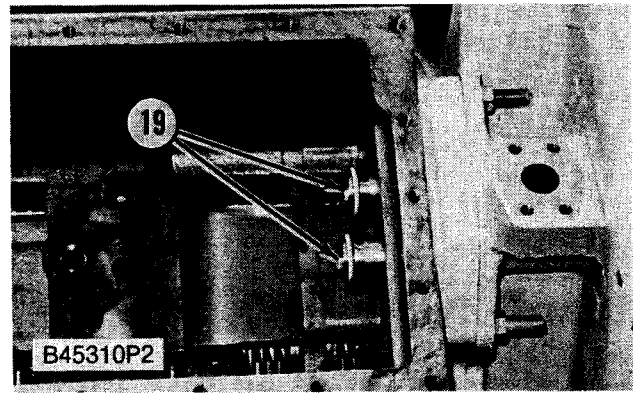
11. Install a nylon strap (20) and tooling (A) as shown.



12. Remove four bolts (21) that hold the transmission hydraulic control valves. (Photo shows bolts removed).
13. Remove a fifth bolt and install tool (B) with a 5/16" -18 NC bolt 101.6 mm (4 in.) long to the transmission hydraulic control valves.
14. Install tool (C), fastening tooling (A) to tool (B) as shown. Raise the transmission hydraulic control valves high enough to set them on top of the transmission case. (See following photo).



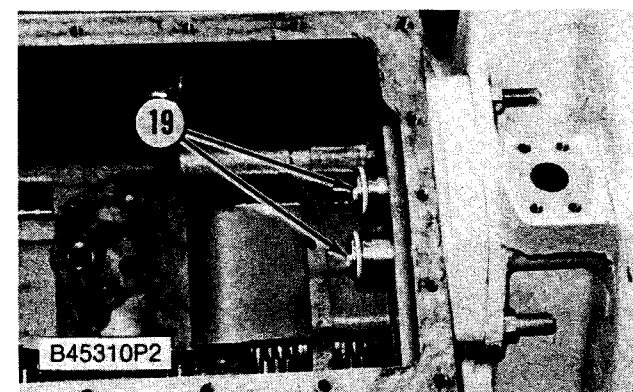
15. Remove tool (C), and fasten tool (A) to tool (B) as shown.
16. Remove transmission hydraulic control valves (22). The weight of the transmission hydraulic control valves is 32 kg (70 lb.).



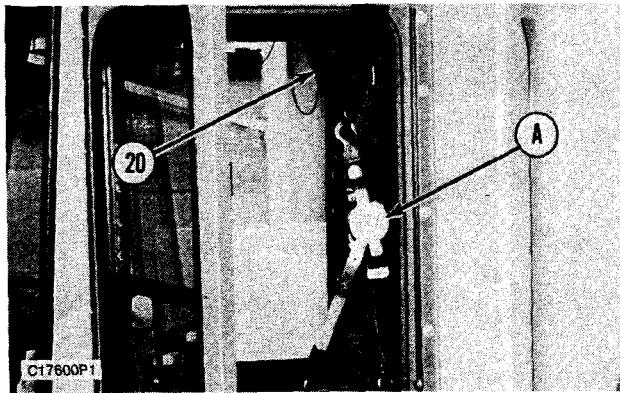
17. Remove two sleeves (19) from the transmission case. Remove the two O-ring seals from each of the sleeves.

Install Transmission Hydraulic Control Valves 3152-012

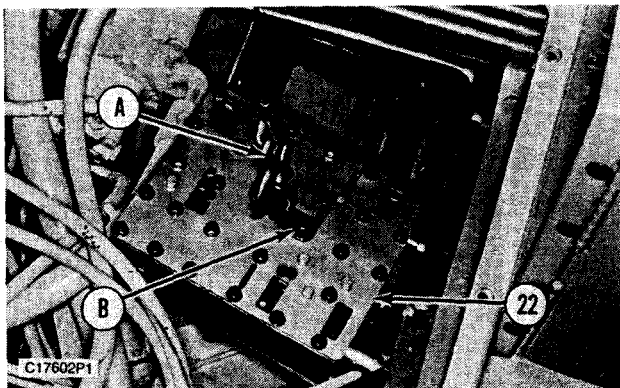
Tools Needed		A	B	C
5P8622	Shackle	1		
8S9906	Ratchet Puller	1		
5P9736	Link Bracket		1	
FT797	Lifting Bracket			1



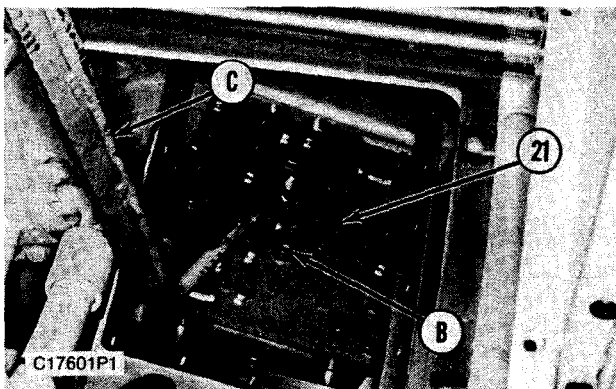
1. Check the condition of the O-ring seals for the two sleeves (19). If any are worn or damaged, make a replacement with new parts.
2. Install the O-ring seals on sleeves (19), and position the two sleeves in the transmission case to provide clearance to install the transmission hydraulic control valves.



3. Install a nylon strap (20) and tooling (A) to the roof of the cab as shown.



4. Install tooling (A) to tool (B), and set transmission hydraulic control valves (22) on top of the transmission case as shown.

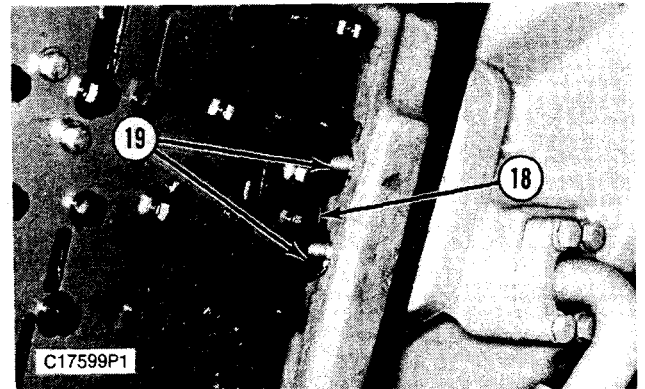


5. Unfasten tooling (A) from tool (B). Install tool (C), between tool (B) and tooling (A), as shown.

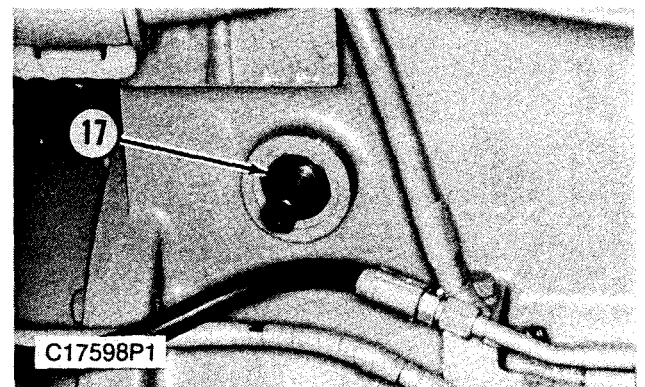
6. Put the transmission hydraulic control valves in position on the transmission and install bolts (21).

Remove tool (C) and tool (B). Tighten bolts (21) to a torque of $48 \pm 4 \text{ N}\cdot\text{m}$ ($35 \pm 3 \text{ lb}\cdot\text{ft.}$).

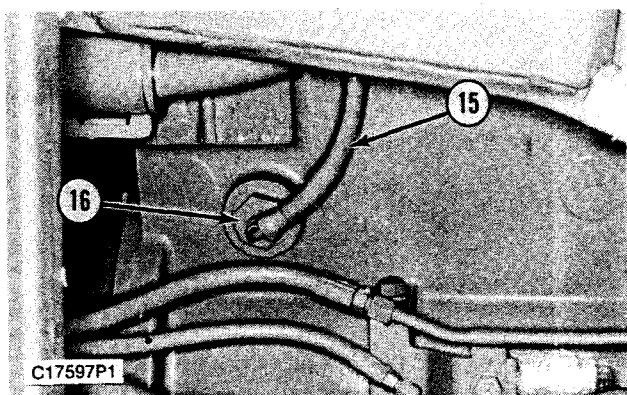
7. Install the fifth bolt (removed to install tool (B)), on the top of the hydraulic transmission control valves (22).



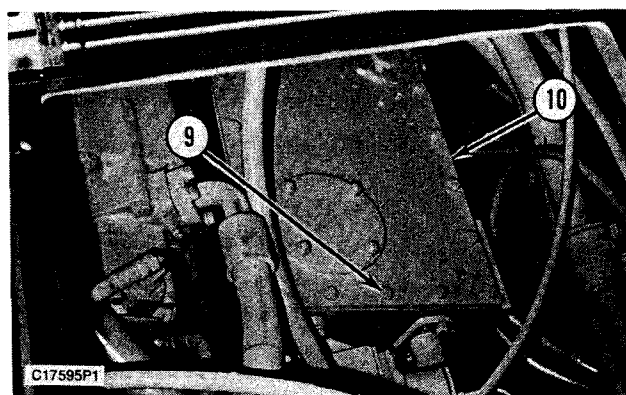
8. Slide two sleeves (19) into the transmission hydraulic control valves. Install bolt and retainer (18) that hold the sleeves in place.



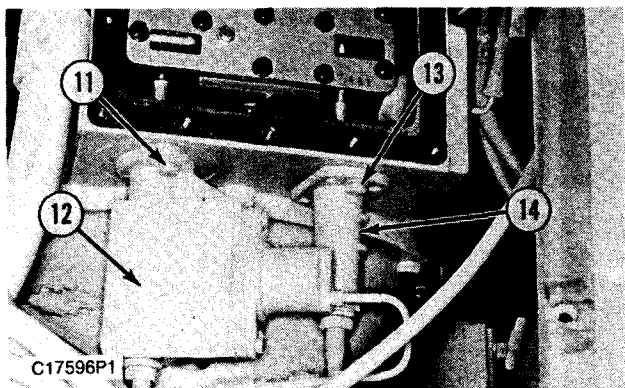
9. Check the condition of the two O-ring seals on sleeve (17). If either seal is worn or damaged, make a replacement with a new part. Install sleeve (17) in the transmission case, and remove the bolt shown in photo.



10. Put clean transmission oil on adapter and seal (16). Install the spring, adapter and seal (16). Install hose (15).

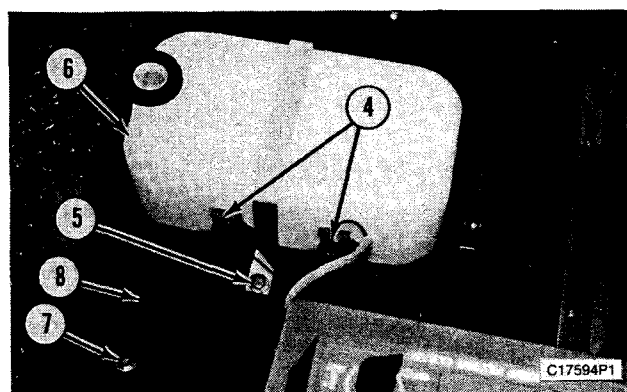


13. Position plate (10), and install the plate with bolts (9).



11. Position bracket assembly (14). Make sure the spool fork from the transmission hydraulic control valves is engaged with the cable assembly pin in bracket assembly (14). Install bolts (13).

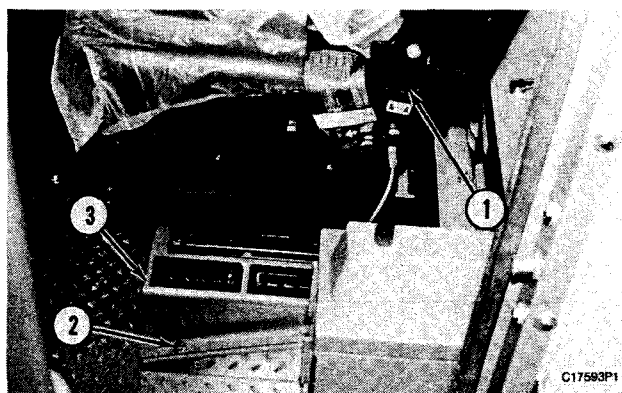
12. Position transmission neutralizer (12). Make sure the spool fork from the transmission hydraulic control valves is engaged with the cable assembly pin in the transmission neutralizer (12). Install bolts (11).



14. Position and install plate (8) with bolts (7).

15. Position reservoir (6). Install the strip around the reservoir and two bolts and washers (5).

16. Connect wire connectors and hoses (4).



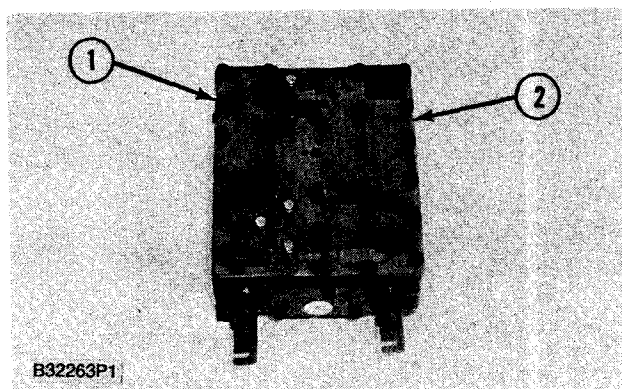
17. Position support assembly (3), and install bolts (2) that hold it.

18. Install seat (1). Check the hydraulic oil level. See the Operation and Maintenance Guide.

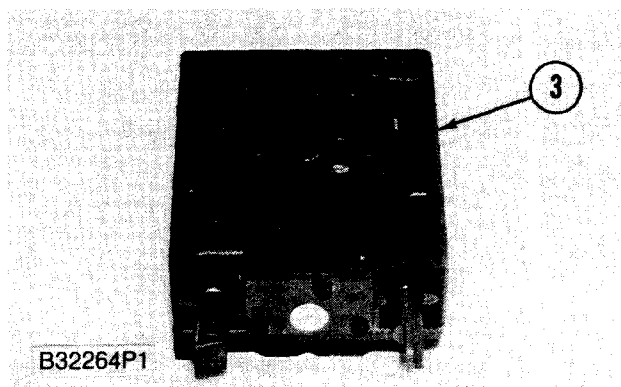
Disassemble Transmission Hydraulic Control Valves 3152-015

Start By:

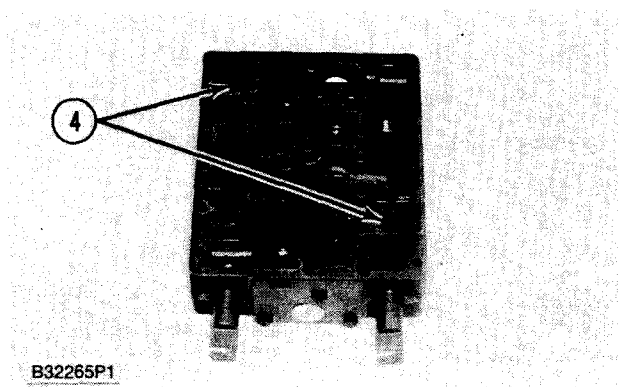
- a. remove transmission hydraulic control valves



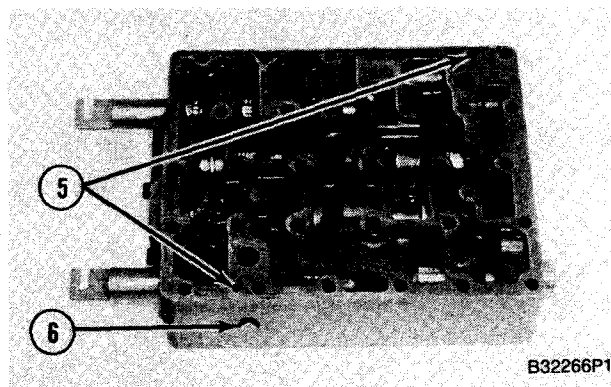
1. Remove twenty-six bolts (1) and the washers to remove plate (2) from the valve group.



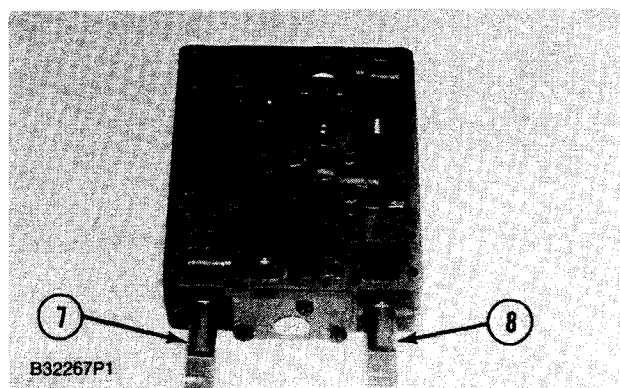
2. Remove valve group (3) from the plate and neutralizer valve group.



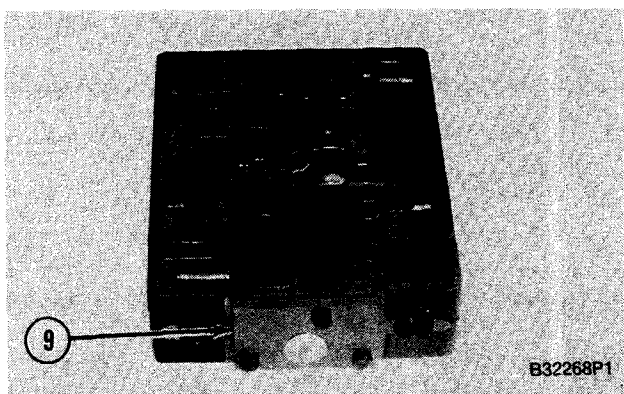
3. Remove two detent assemblies (4) from each side of the valve group. Remove the O-ring seals from the detent assemblies.



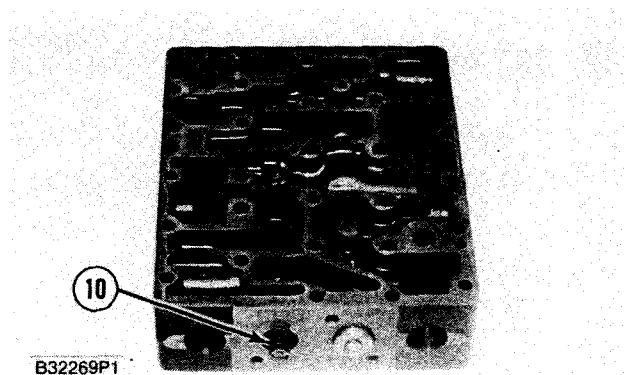
4. Remove two pins (5) and two stops (6) from the valve body.



5. Remove directional control valve spool (7) and speed control valve spool (8) from the valve body.



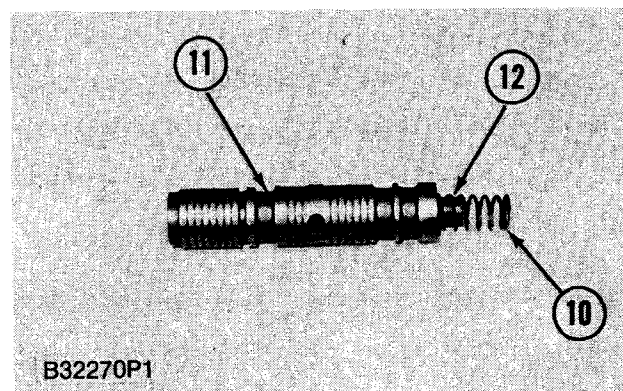
6. Remove cover (9) from the valve body.



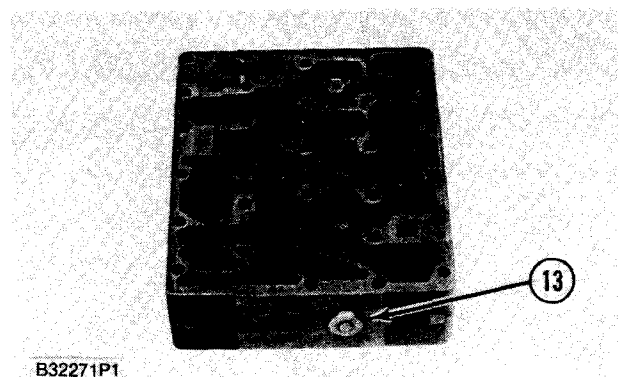
7. Remove spring (10) and the valve spool from the valve body.

WARNING

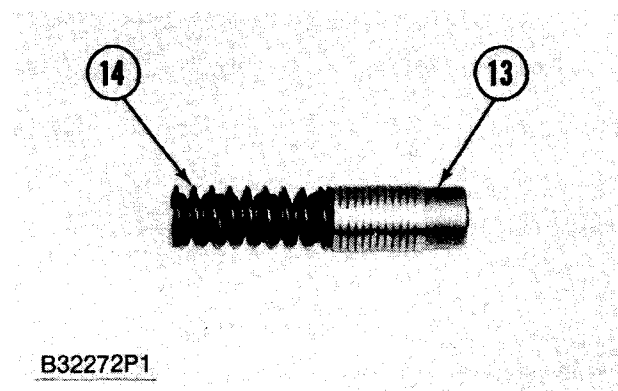
Retainer (12) and the ring have spring pressure on them. Use care to prevent injury when the retainer is removed from valve spool (11).



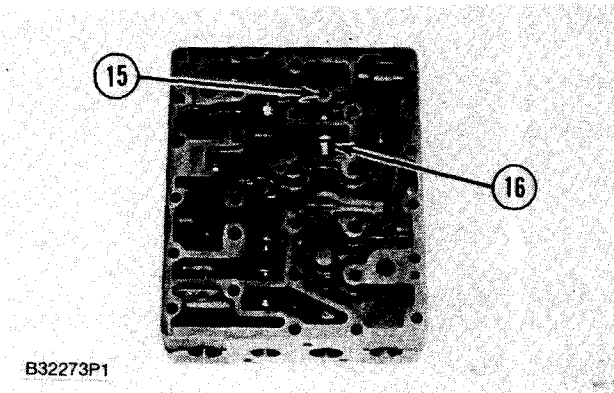
8. Remove spring (10) from retainer (12). Remove the ring that holds retainer (12) in valve spool (11). Remove retainer (12) and the two springs from valve spool (11).



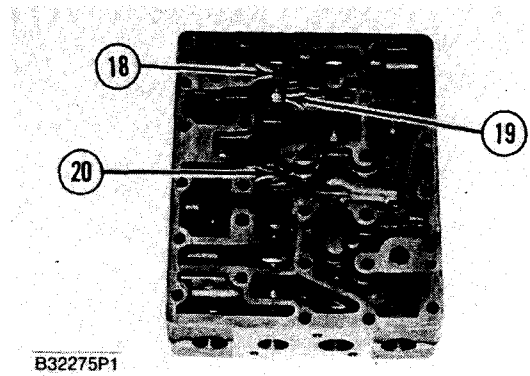
9. Remove piston (13) and the two springs from the valve body.



10. Remove springs (14) and the spacers (shims) from piston (13).



11. Remove valve spool assembly (16) from the valve body. If necessary, remove dowel (15) and the stop from the valve body.

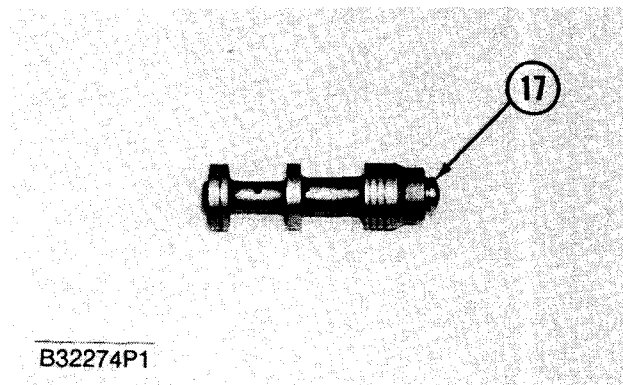


13. Remove dowel (18) and the stop to remove valve spool (19) from the valve body.

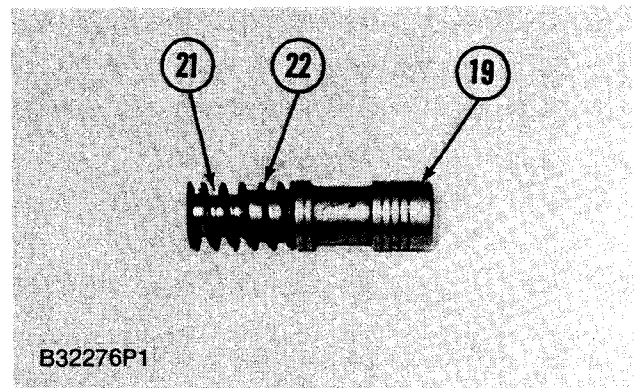
14. If necessary, remove dowel (20) and the stop from the valve body.

⚠ WARNING

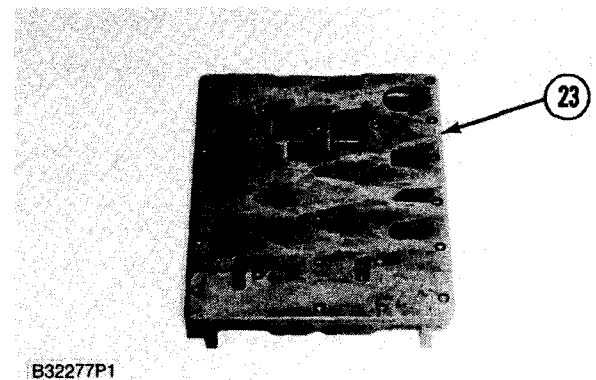
The ring that holds the retainer in valve spool assembly (16) has spring force on it. Use care to prevent injury when the ring is removed.



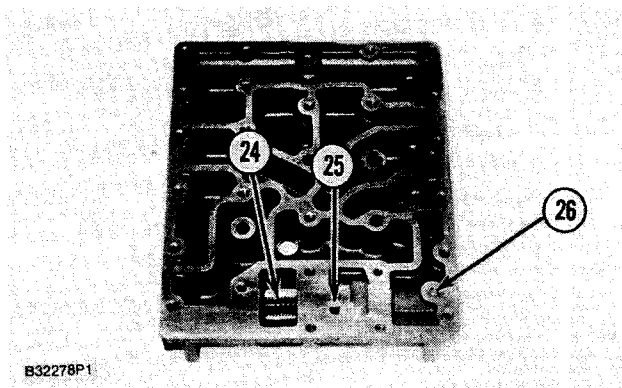
12. Remove slug (17), the ring, retainer, spring and ball from the valve spool.



15. Remove slug (21) and spring (22) from valve spool (19).

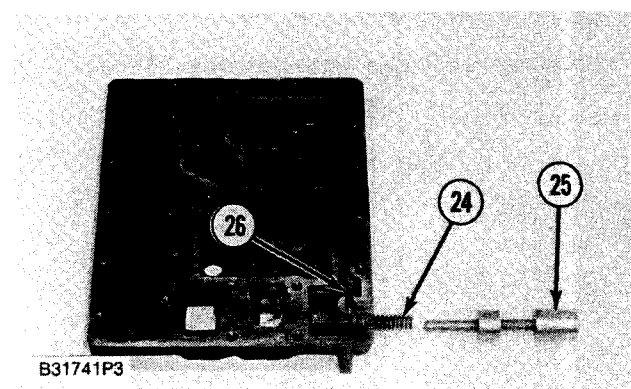


16. Remove plate (23) from the neutralizer valve manifold.

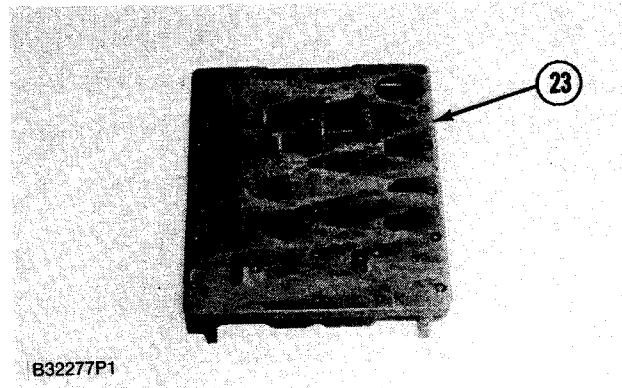


17. Remove dowel (26) to remove neutralizer valve spool (25) and spring (24) from the neutralizer manifold.

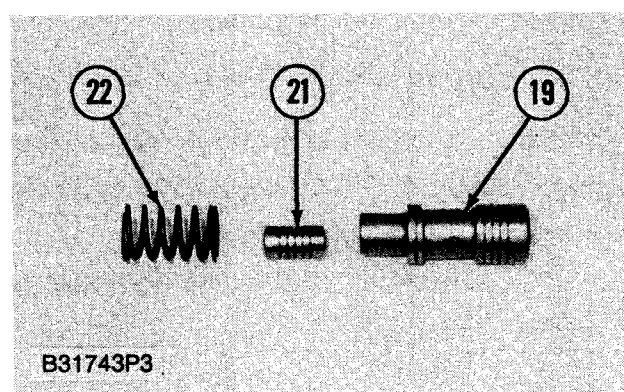
Assemble Transmission Hydraulic Control Valves 3152-016



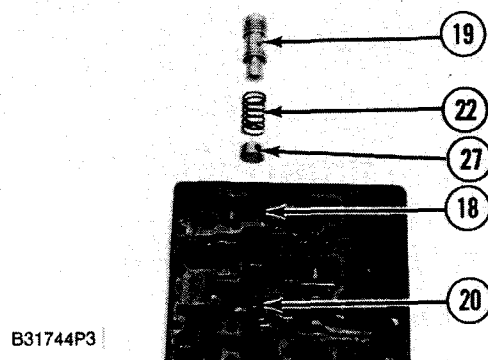
1. Install spring (24) and valve spool (25) in the neutralizer manifold as shown. Install dowel (26) to hold valve spool (25) in position.



2. Put plate (23) in position on the neutralizer manifold.

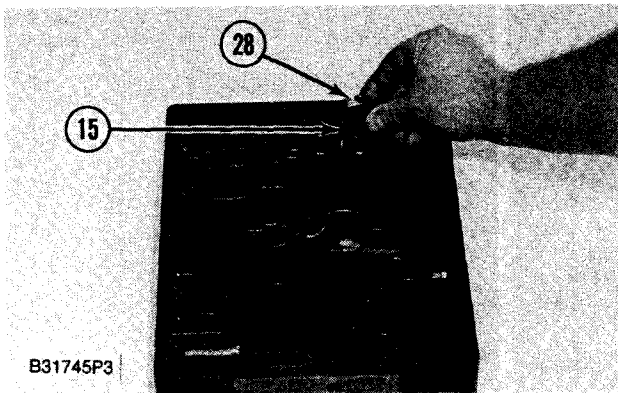


3. Install slug (21) in the end of valve spool (19). Install spring (22) on the end of valve spool (19).

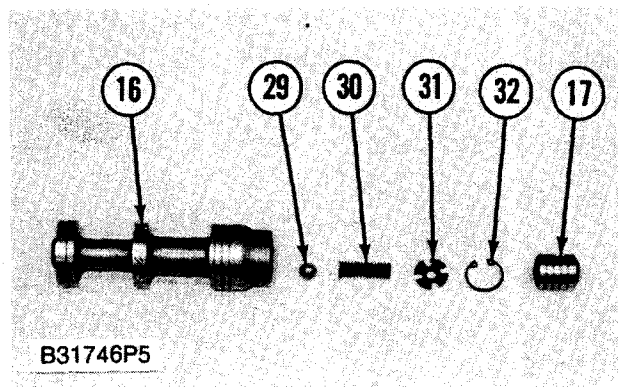


4. Install stop (27) and dowel (20) in the valve body.

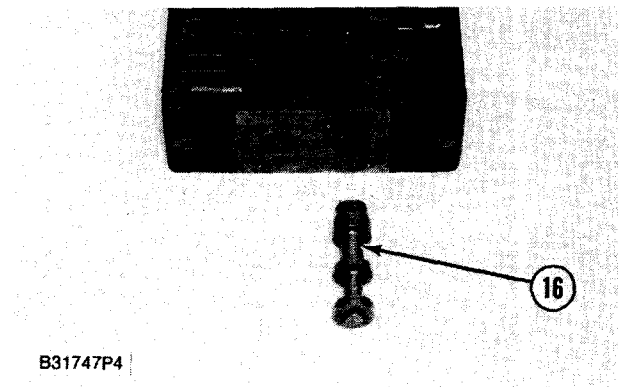
5. Install spring (22) and valve spool (19) as shown. Install the stop (not showing) and dowel (18) to hold the valve spool, slug and spring in position.



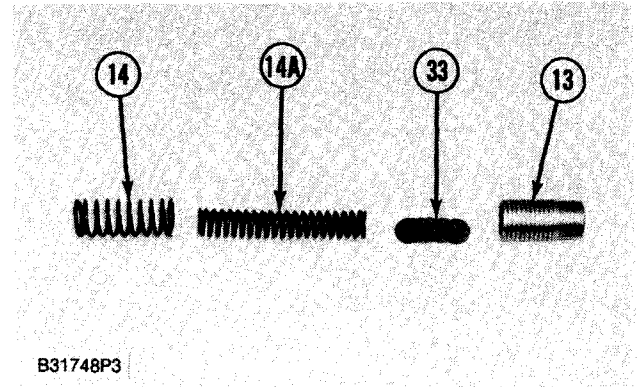
6. Install stop (28) and dowel (15) in the valve body.



7. Install ball (29), spring (30), retainer (31) and ring (32) in valve spool (16). Install slug (17) in valve spool (16).

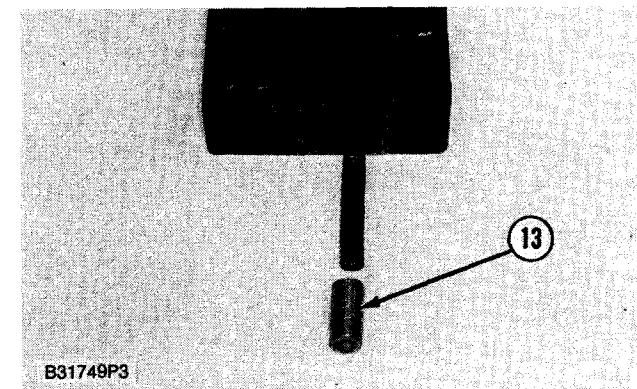


8. Install the slug and valve spool (16) in the valve body as shown.

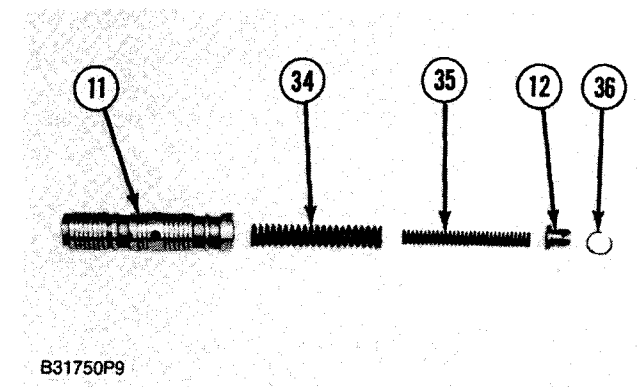


9. Install spacers (33) of the original thickness, spring (14A) and spring (14) in piston (13).

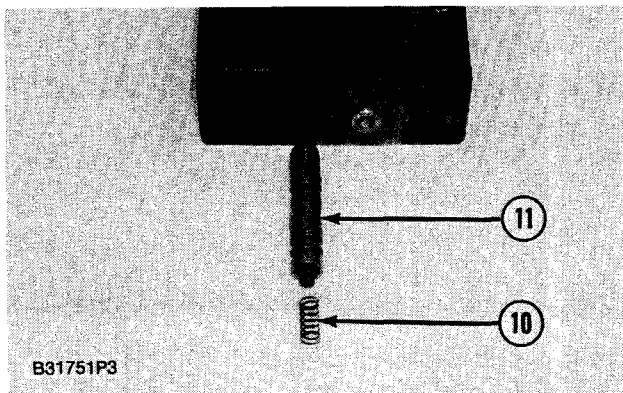
NOTE: Spacers (33) are used to set the primary pressure. See Power Shift Transmission Testing And Adjusting, Form No. SENR2152 for the correct procedure to set the primary pressure.



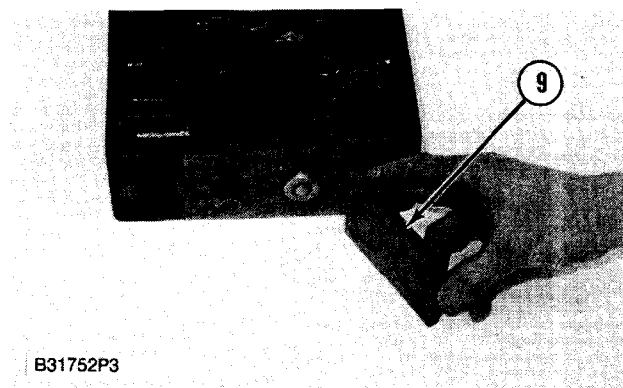
10. Install piston (13), the spacers and springs in the valve body as shown.



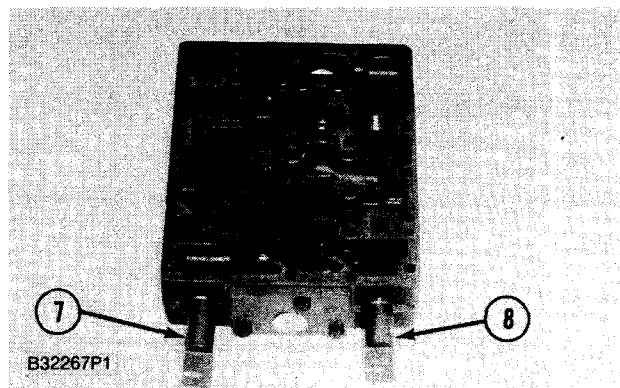
11. Install spring (34), spring (35), retainer (12) and ring (36) in valve spool (11).



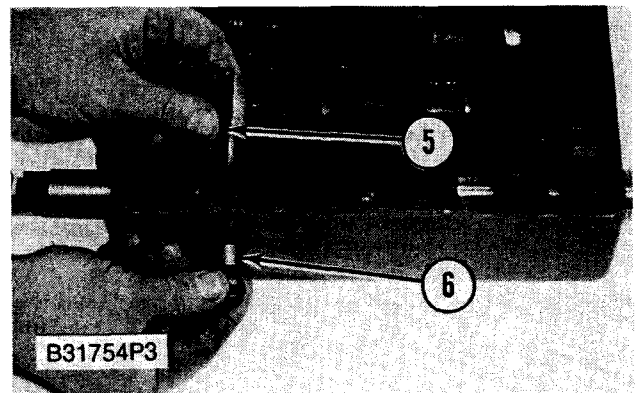
12. Install valve spool (11) and spring (10) in the valve body as shown.



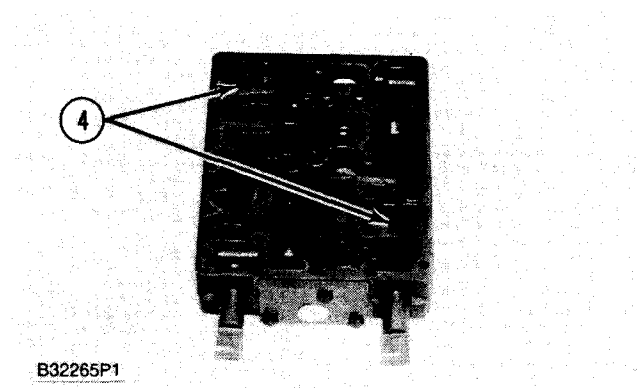
13. Install the O-ring seals in cover (9) and put clean power train oil on them. Put cover (9) in position and install the bolts to hold it to the valve body. Tighten the bolts to a torque of $30 \pm 4 \text{ N}\cdot\text{m}$ ($22 \pm 3 \text{ lb}\cdot\text{ft.}$).



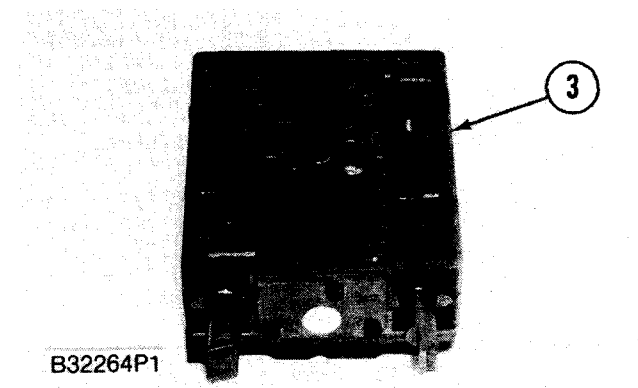
14. Install directional control valve spool (7) and speed control valve spool (8) in the valve body.



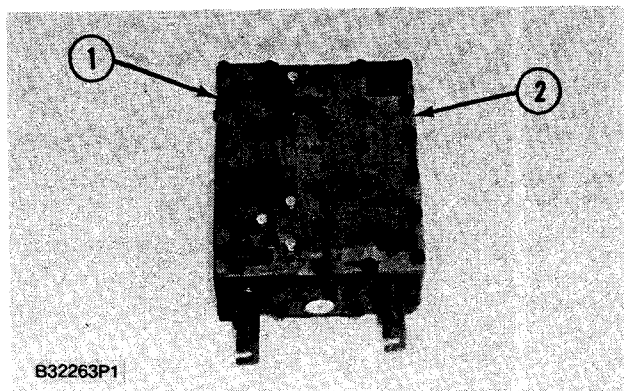
15. Put stops (6) in position in each side of the valve body. Install pins (5) to hold stops (6) in place.



16. Install the O-ring seals around each of the four detent assemblies (4) and put clean power train oil on them. Install detent assemblies (4) in each side of the valve body.



17. Put valve group (3) in position on the plate and neutralizer valve group.



18. Put plate (2) in position on the valve group. Install bolts (1) to hold the unit together. Tighten the bolts to a torque of $30 \pm 4 \text{ N}\cdot\text{m}$ ($22 \pm 3 \text{ lb}\cdot\text{ft.}$).

End By:

- a. install transmission hydraulic control valves

Transmission

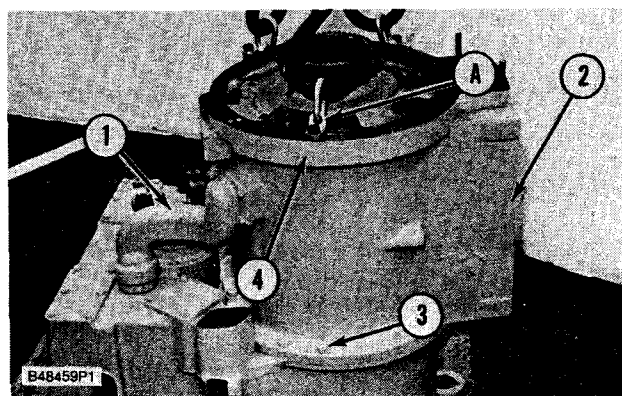
Disassemble Transmission 3150-015

Tools Needed		A	B	C	D	E	F	G
5P9736	Link Bracket	3						
1P1863	Pliers		1					
FT833	Clamp			2				
1P1862	Pliers				1			
1P520	Driver Group					1		
5P4758	Pliers						1	
FT947	Clamp							2

Tools Needed		H	J	K
6V2156	Link Bracket	2		
1P1864	Pliers		1	
8B7551	Bearing Puller Attachment			1

Start By:

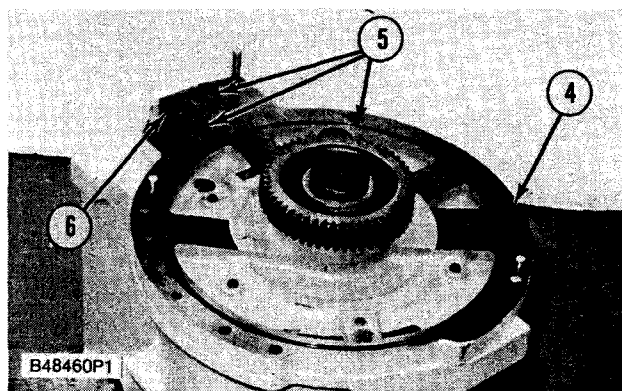
- a. remove transmission hydraulic control valve
- b. separation of torque converter from transmission



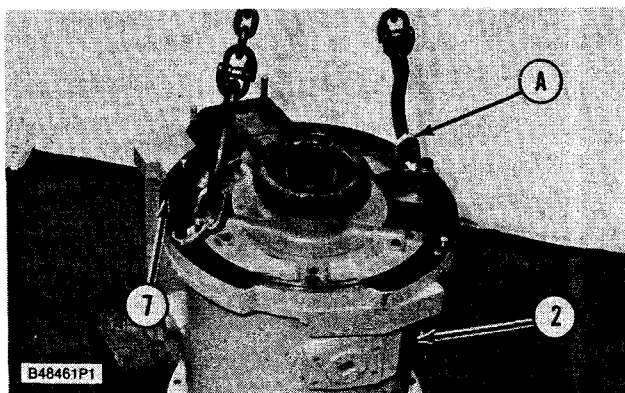
1. Fasten tooling (A) and a hoist to housing (4) as shown.

2. Remove the bolts and elbow (1) from case (2) and the transfer gear case. If necessary remove the O-ring seal from the elbow.

3. Remove bolts (3) and make a separation of the transmission from the transfer gear case. The weight of the transmission and case is approximately 340 kg (750 lb.).



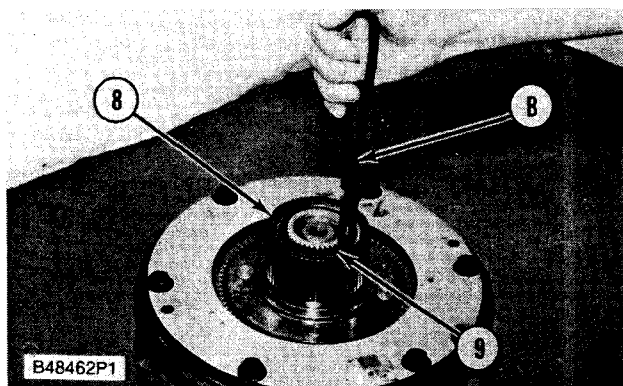
4. Remove O-ring seals (5) and (6) from housing (4).



5. Fasten a hoist to housing (4) with two of tooling (A) as shown.

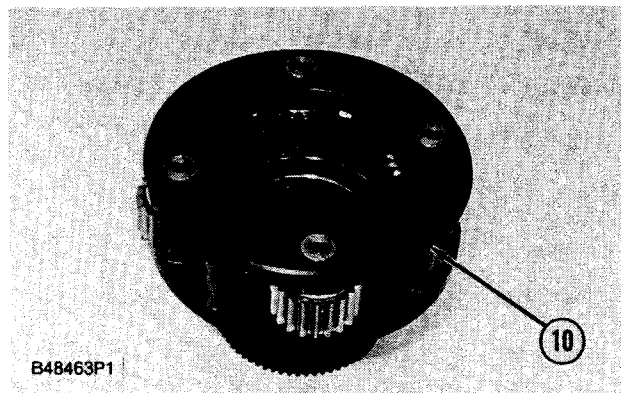
6. Remove bolts (7) and make a separation of the transmission from case (2). The weight of the transmission is approximately 293 kg (650 lb.).

7. Carefully turn the planetary group over so No. 6 (first speed) clutch housing is up.

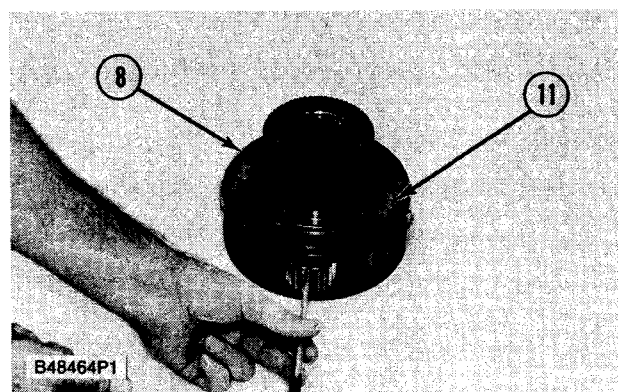


8. Use tool (B) and remove ring (9) from the shaft.

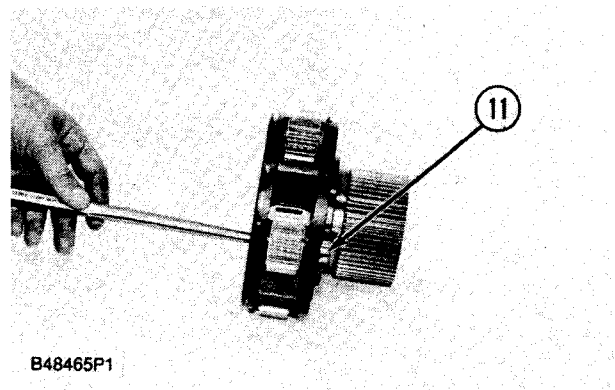
9. Remove carrier (8).



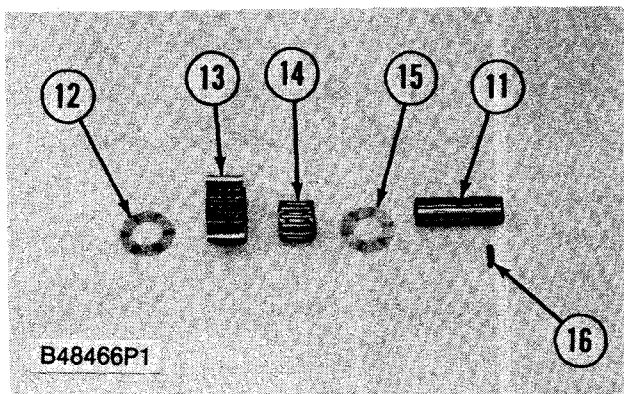
10. Remove ring (10) from the carrier.



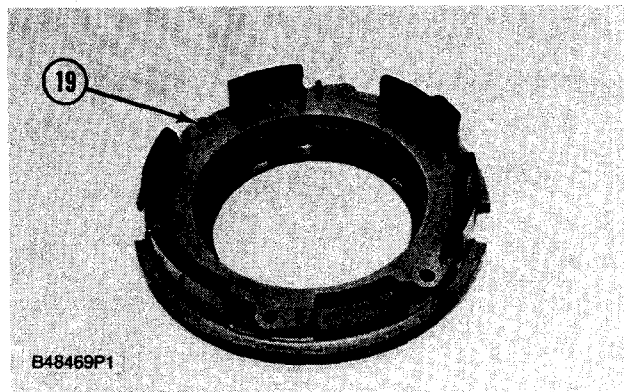
11. Use a hammer and a punch to push the pins through carrier (8) into shafts (11).



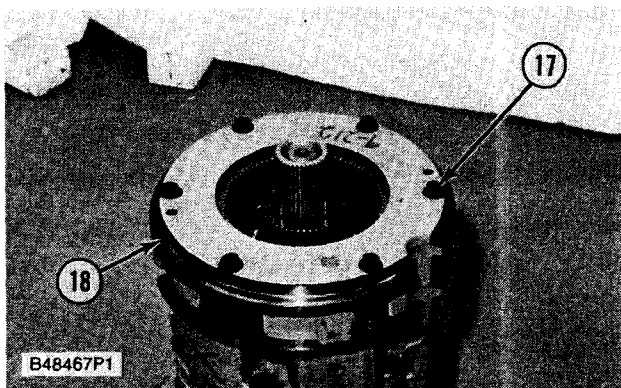
12. Use a hammer and punch and remove shafts (11) from the carrier.



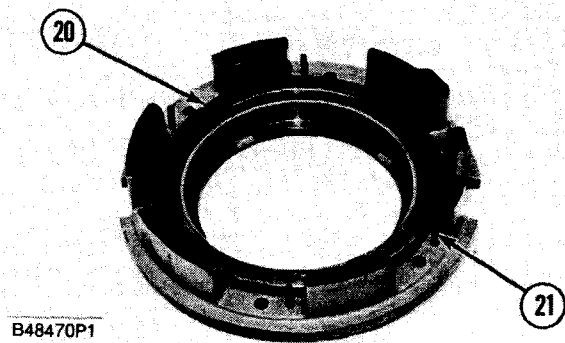
13. Remove washers (12), gears (13), bearings (14) and washers (15) from the carrier. Remove pins (16) from shafts (11).



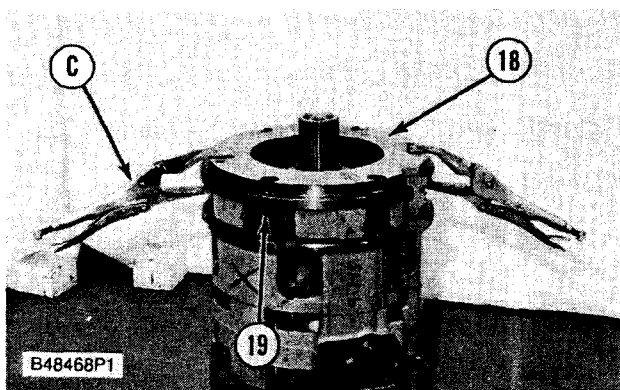
17. Remove plate (19) from the No. 6 clutch housing.



14. Remove bolts (17) that hold No. 6 clutch housing (18) to the planetary group.

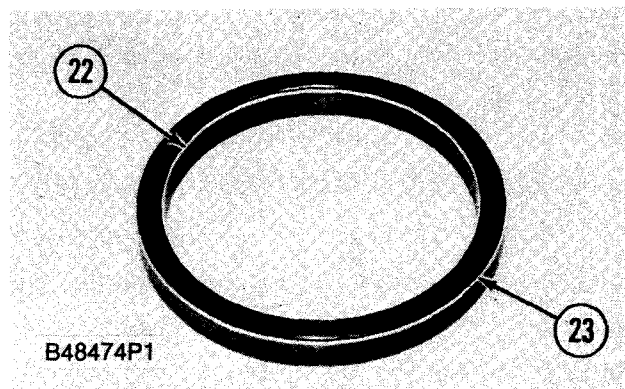


18. Remove piston (20) and pins (21) from No. 6 clutch housing.

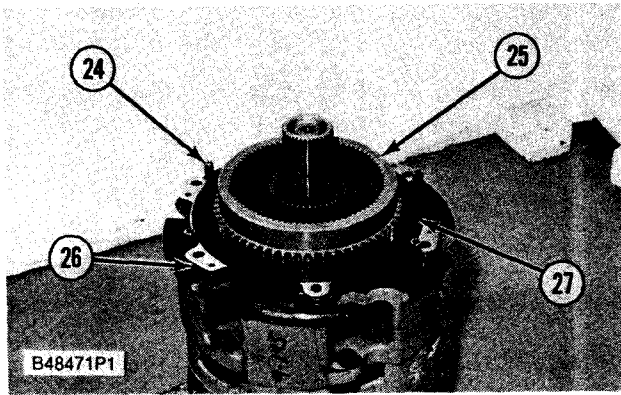


15. Install tooling (C) to hold the piston and plate (19) in the No. 6 clutch housing.

16. Remove No. 6 clutch housing (18).

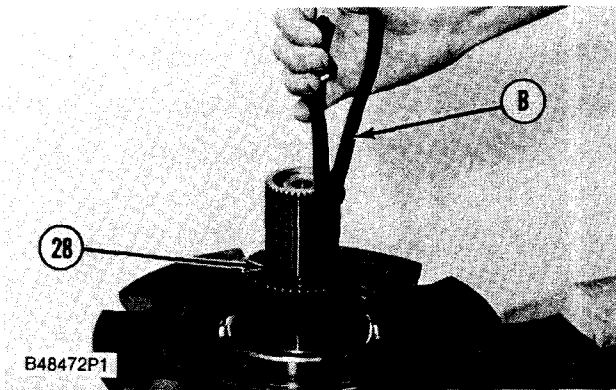


19. Remove rings (22) and (23) from the piston.

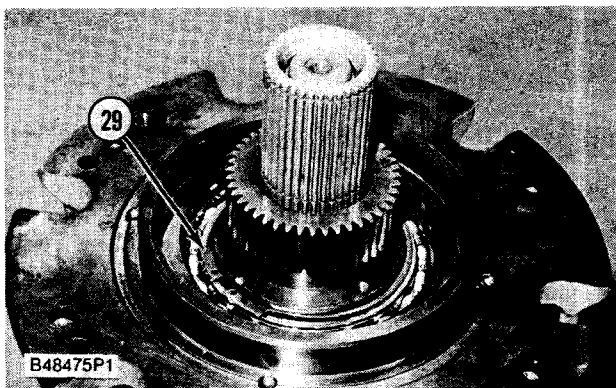


20. Remove springs (24), three discs (27) and three plates (26).

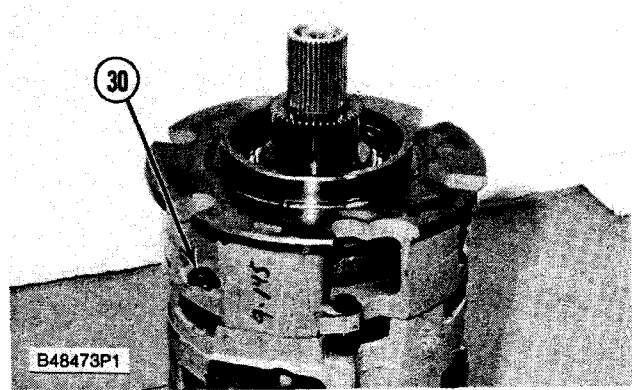
21. Remove gear (25).



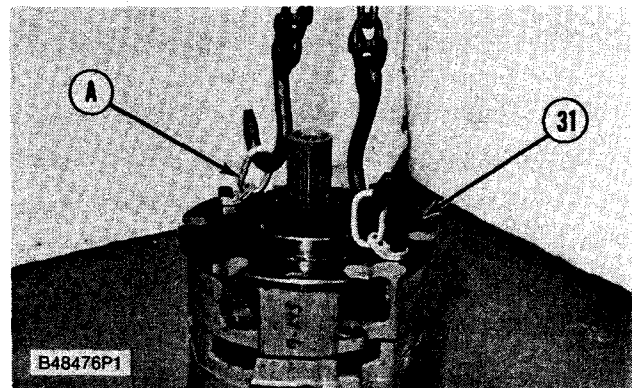
22. Use tool (B) to remove ring (28) from the shaft.



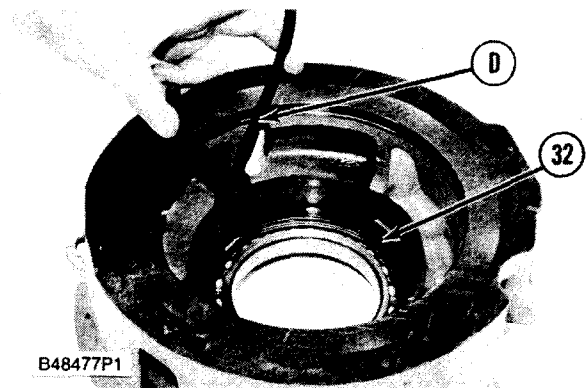
23. Use tool (B) and remove ring (29).



24. Remove bolts (30) that hold the housing to the planetary group.



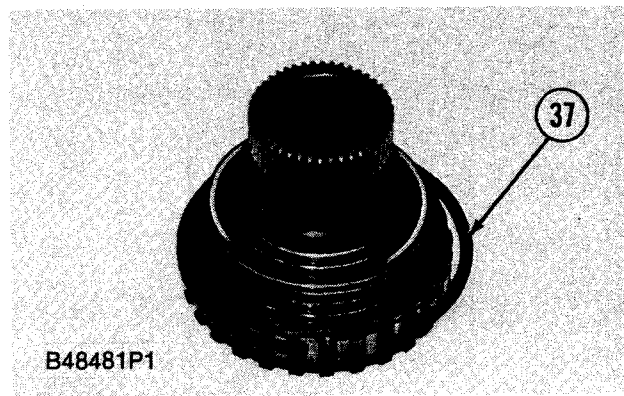
25. Install two of tooling (A) as shown and remove housing (31). The weight of the housing is 29 kg (64 lb.).



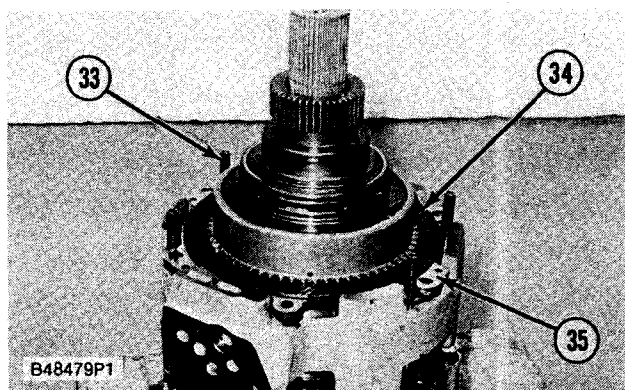
26. Remove ring (32) from the housing with tool (D).



27. Use tooling (E) to remove the bearing from the housing.

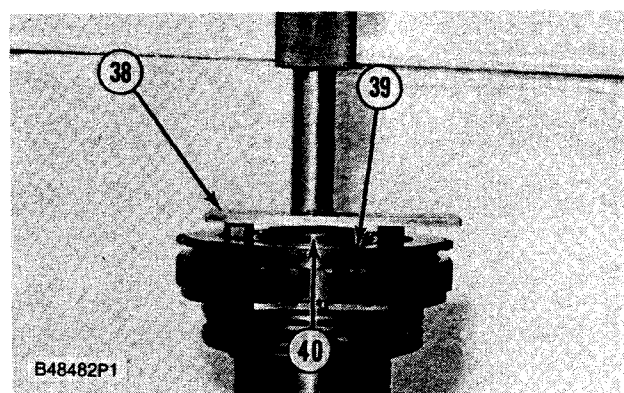


31. Remove ring (37) from the housing.

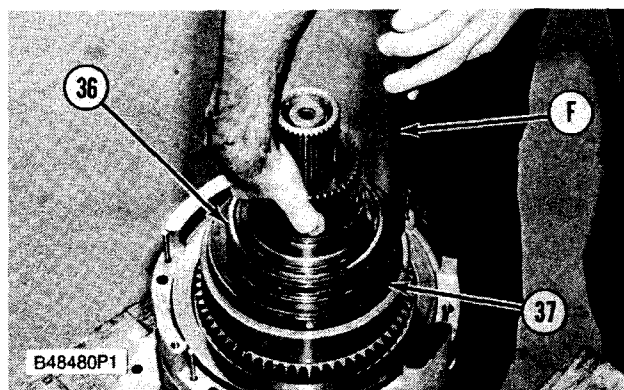


28. Remove springs (33).

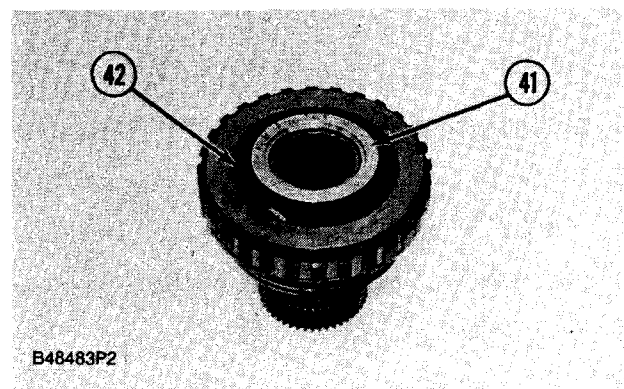
29. Remove two discs (34) and two plates (35) (third speed).



32. Use steel spacers (38) and a press to push on plate (39) and remove ring (40) from the housing.

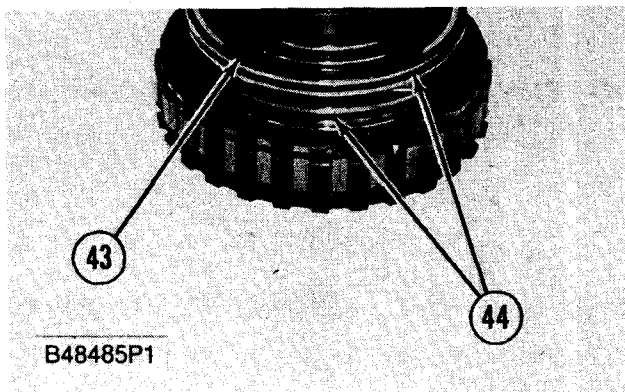


30. Use tool (F) to make a compression of ring (37) and remove housing (36).



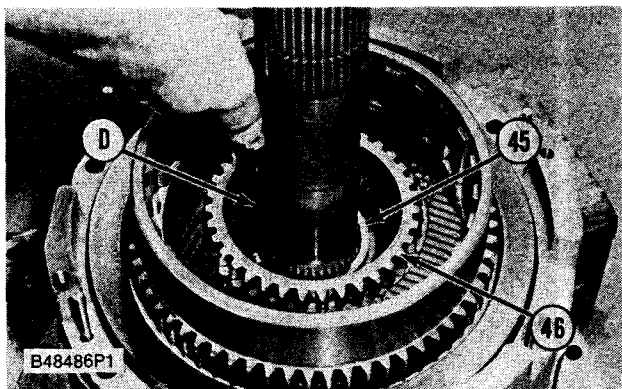
33. Remove ring (41) from the housing.

34. Remove springs (42) from the housing.



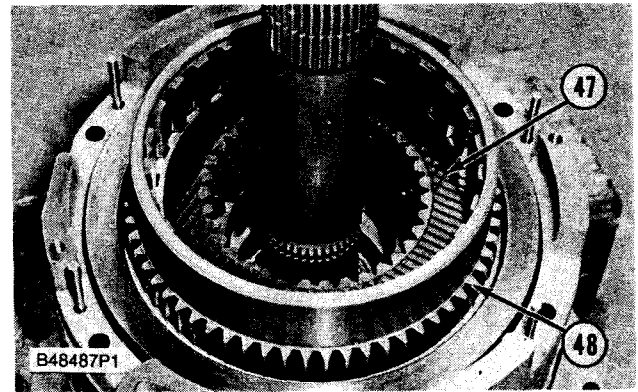
35. Remove rings (44) from the housing.

36. Do not remove seal carrier (43) from the housing unless it is worn or damaged. Use a hammer and chisel to break the carrier and remove it. After carrier (43) is removed, remove the pin that holds the carrier in position on the housing.



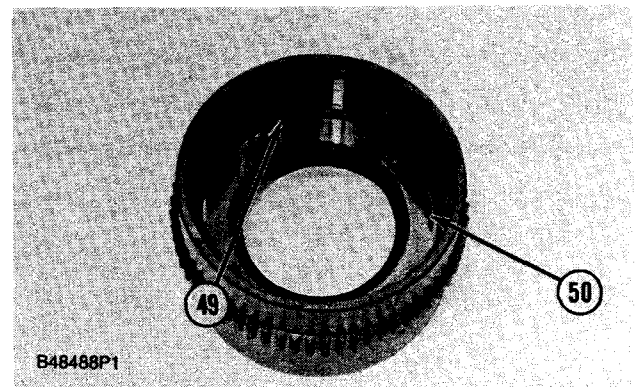
37. Use tool (D) and remove ring (45).

38. Remove gear (46).

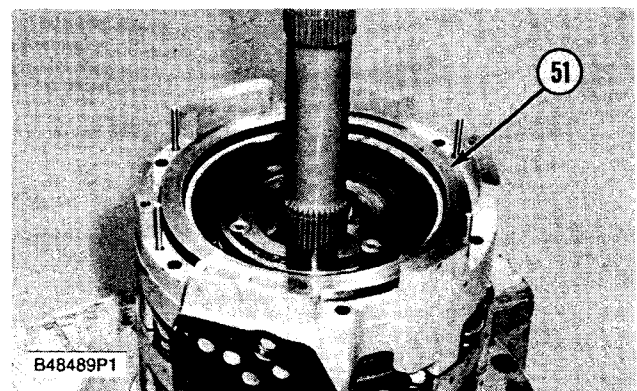


39. Remove four discs (47) and the three plates (second speed).

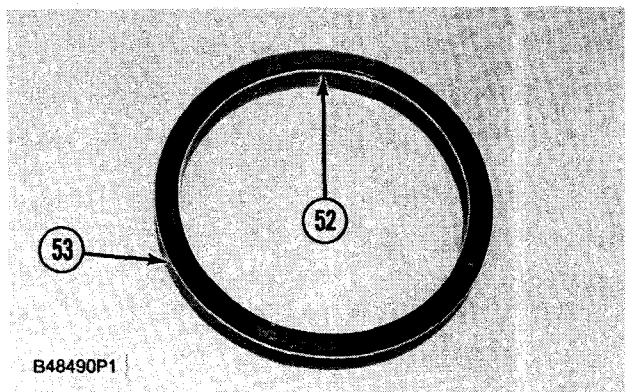
40. Remove gear (48).



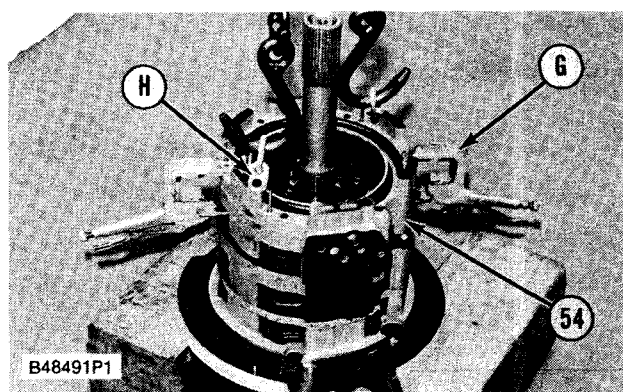
41. Remove ring (49) and plate (50) from the gear.



42. Remove piston (51) from No. 3 and 4 clutch housing.

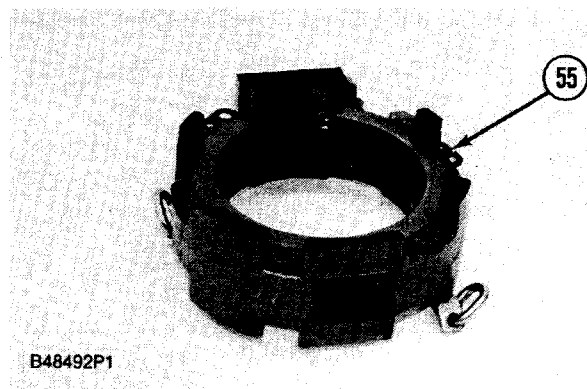


43. Remove rings (52) and (53) from the piston.

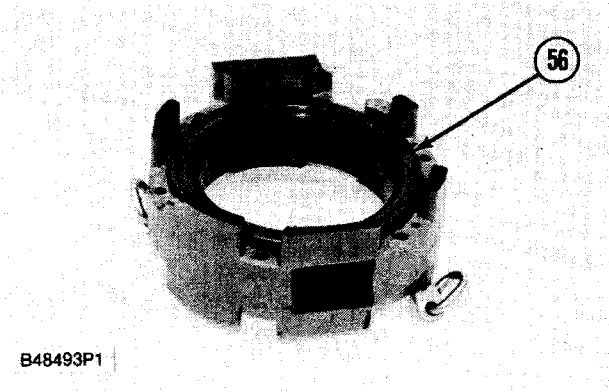


44. Install tooling (G) to hold the plate and the piston in No. 3 and 4 clutch housing (54).

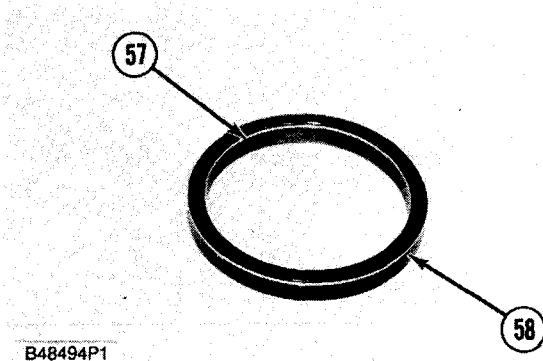
45. Install tooling (H) and a hoist and remove No. 3 and 4 clutch housing (54). The weight of the clutch housing is approximately 32 kg (70 lb.).



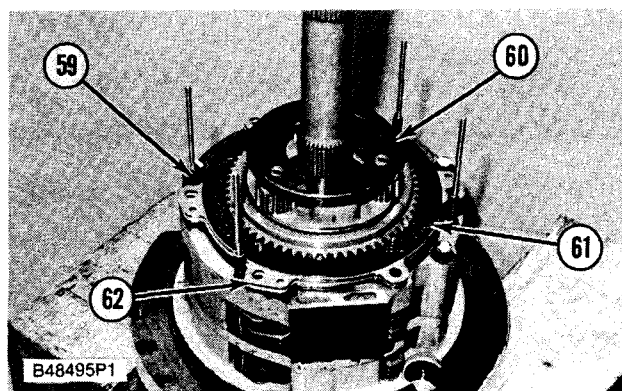
46. Remove plate (55) from No. 3 and 4 clutch housing.



47. Remove piston (56) from No. 3 and 4 clutch housing.



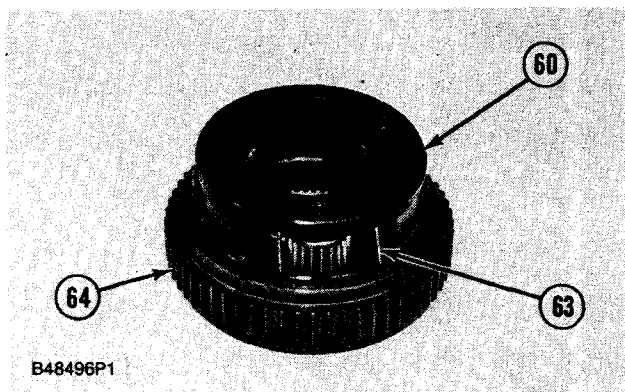
48. Remove rings (57) and (58) from the piston.



49. Remove springs (59) from the rods.

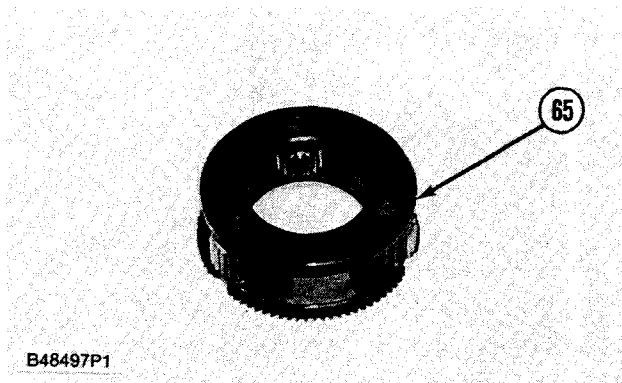
50. Remove three discs (61) and two plates (62).

51. Remove carrier (60) and No. 2 clutch housing.

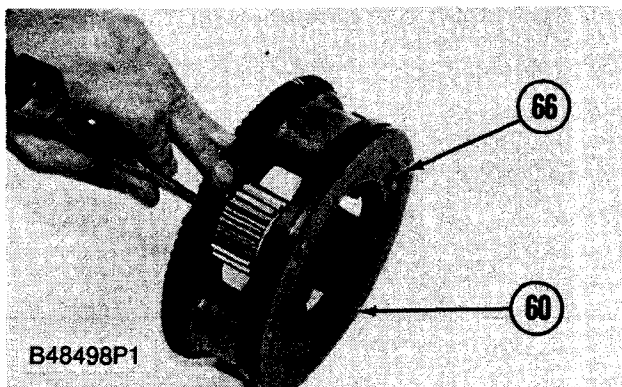


52. Use 3.175 mm (.125 in.) diameter rods (63) with a point ground on one end to put the ring under compression that holds carrier (60) and gear (64) together.

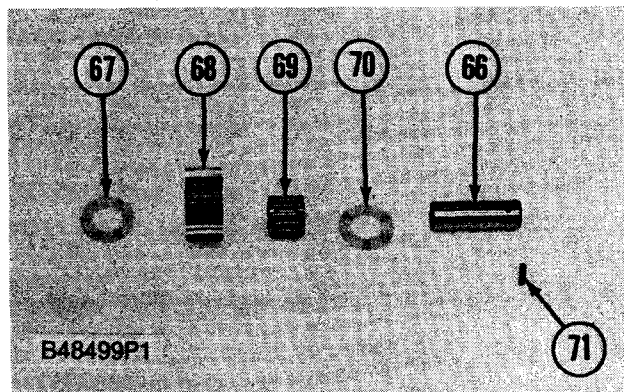
53. Remove carrier (60) from gear (64).



54. Remove ring (65) from the carrier.

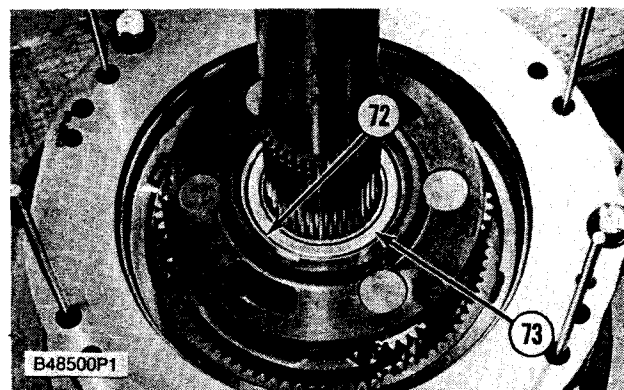


55. Use a hammer and a punch to push the pins through carrier (60) into shafts (66). Remove the shafts.

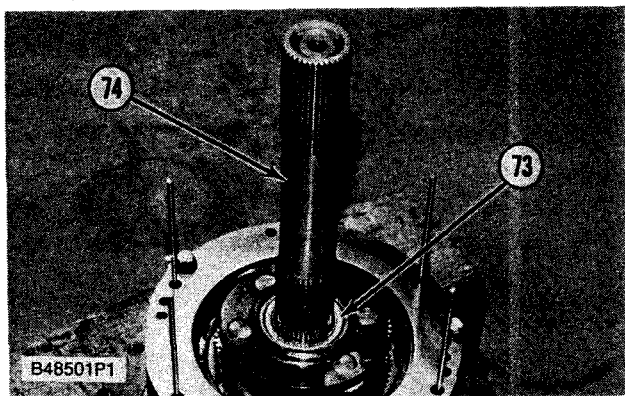


56. Remove washers (67), gears (68), bearings (69) and washers (70) from the carrier. Remove pin (71) from shaft (66).

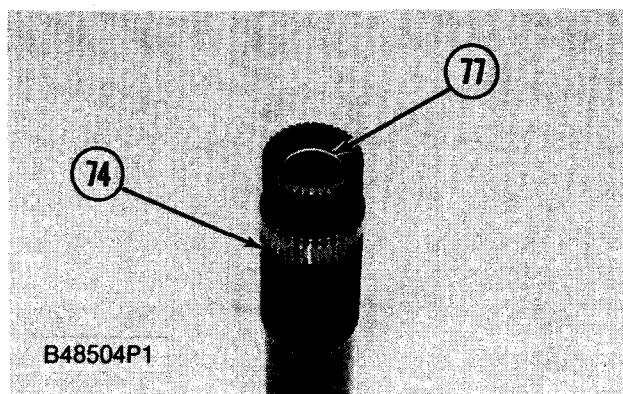
NOTE: On 950B Wheel Loaders with transmissions 4RA3914 and up and 950B Wheel Loaders with transmissions 1YE265 (Logger) and up, a plastic thrust disc (plate) has been added. The thrust disc is located between the reverse planetary carrier and the forward planetary carrier. See Service Magazine Published February 16, 1987.



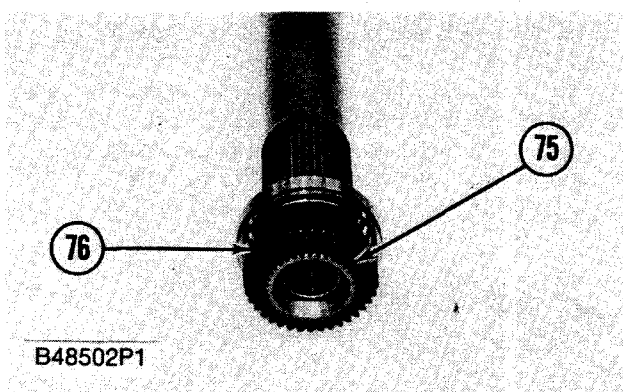
57. Remove ring (72) that holds bearing (73) in the carrier.



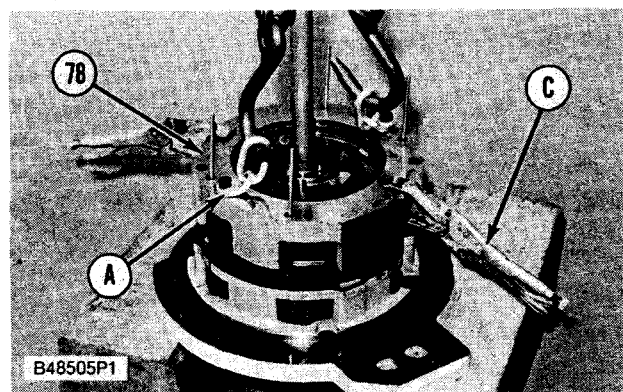
58. Remove shaft (74) and bearing (73) as a unit from the carrier.



61. If necessary, remove bearing (77) from both ends of shaft (74).

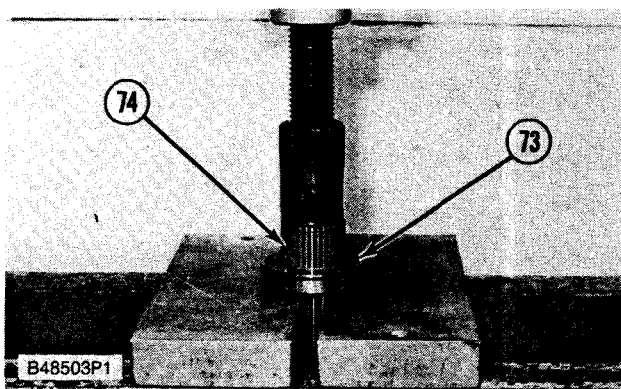


59. Use tool (J) to remove ring (75) and remove gear (76) from the shaft.

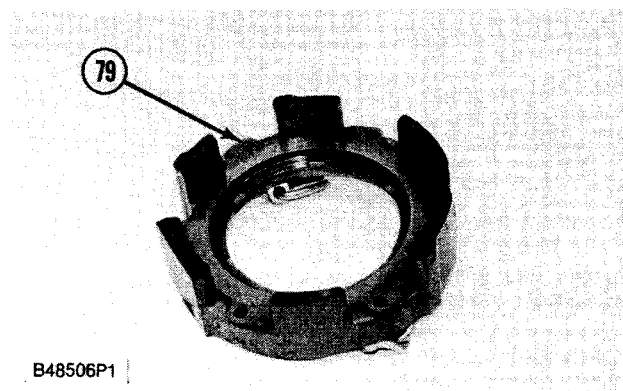


62. Use tooling (C) to hold the plate and piston in No. 2 clutch housing (78).

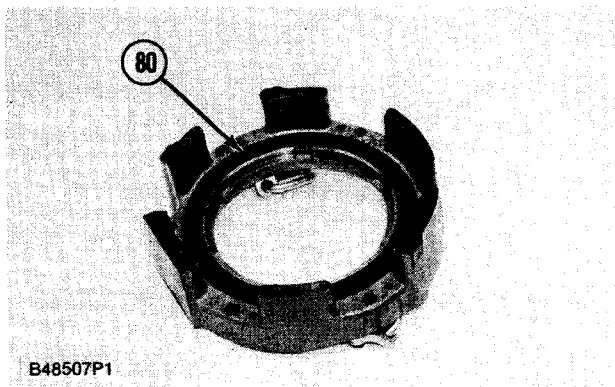
63. Install two of tooling (A) and a hoist to No. 2 clutch housing (78) and remove it. The weight of the housing is approximately 23 kg (50 lb.).



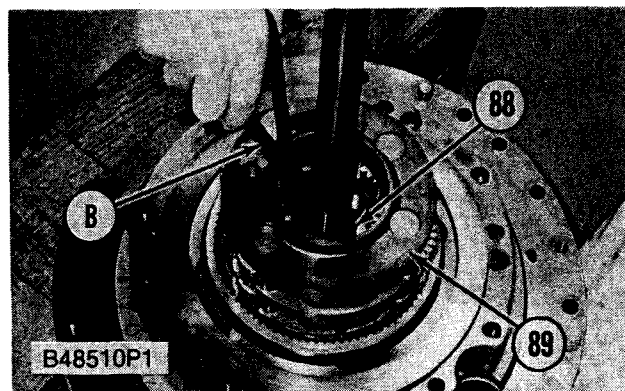
60. Use a press and push shaft (74) out of bearing (73) as shown.



64. Remove plate (79) from the No. 2 clutch housing.

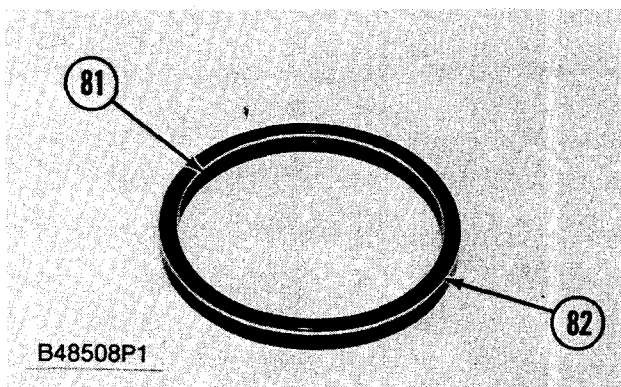


65. Remove piston (80) from the No. 2 clutch housing.

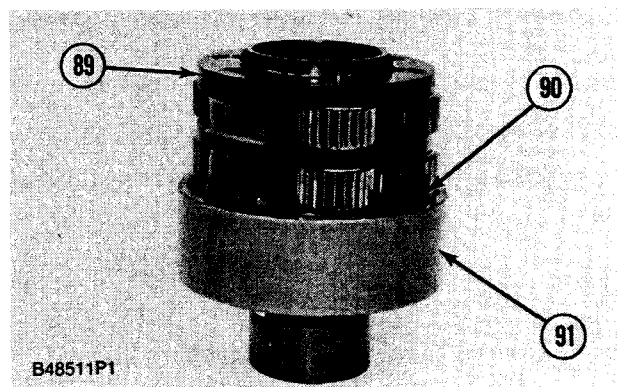


69. Use tool (B) to remove ring (88) from the shaft.

70. Remove carrier (89) and the gear (87) as a unit.

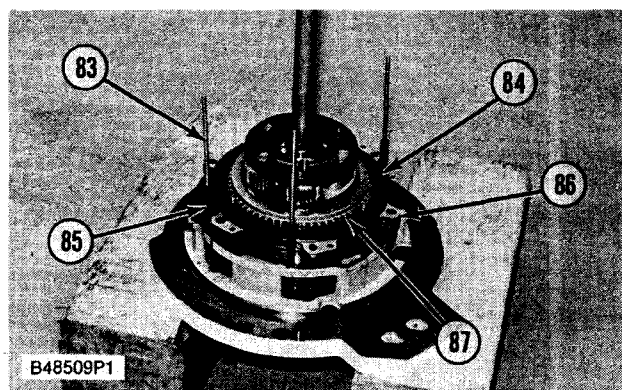


66. Remove rings (81) and (82) from the piston.



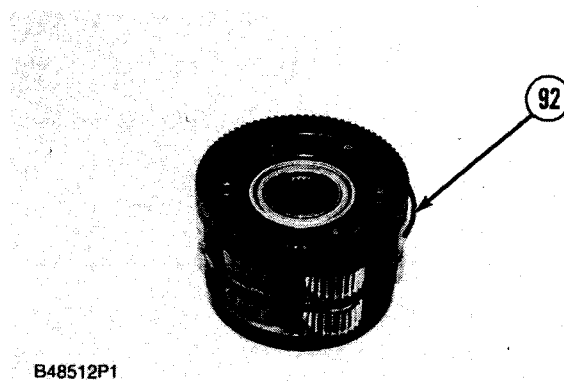
71. Place a small block under carrier (89).

72. Put 2.36 mm (.093 in.) diameter rods (90) with a point ground on one end around carrier (89) and gear (91) as shown. This will put a compression on the ring and let gear (91) be lowered from carrier (89).

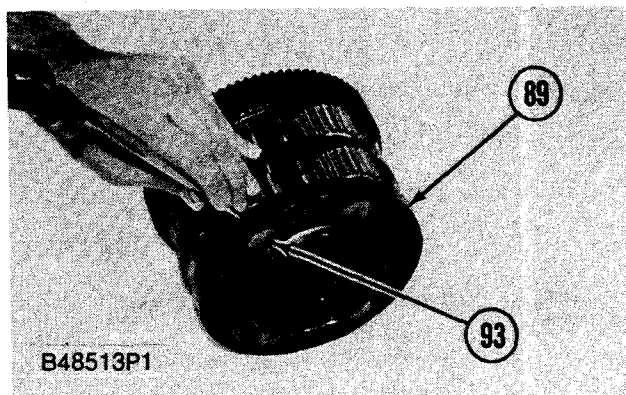


67. Remove springs (85) and rods (83).

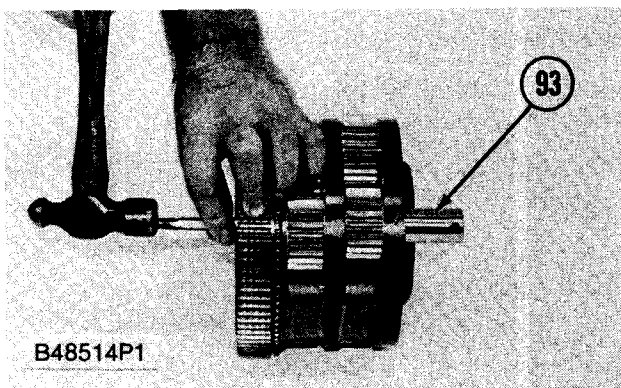
68. Remove four discs (84) and three plates (86) (forward).



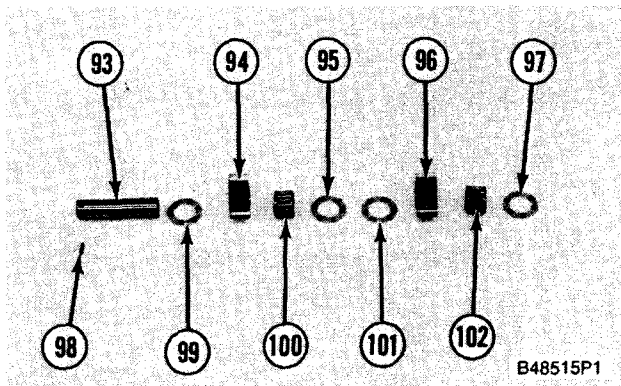
73. Remove ring (92) from the carrier.



74. Use a hammer and punch to push the pins through carrier (89) into shafts (93).

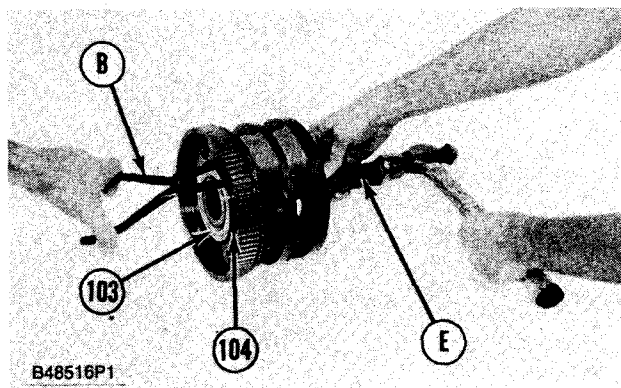


75. Use a hammer and punch and remove shafts (93) from the carrier.

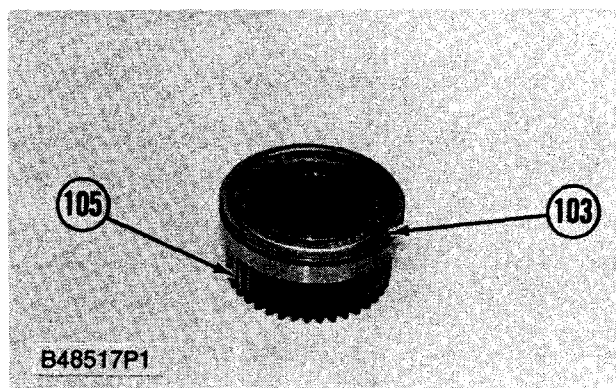


76. Remove washers (99), gears (94), bearings (100), washers (95), washers (101), gears (96), bearings (102) and washers (97) from the carrier.

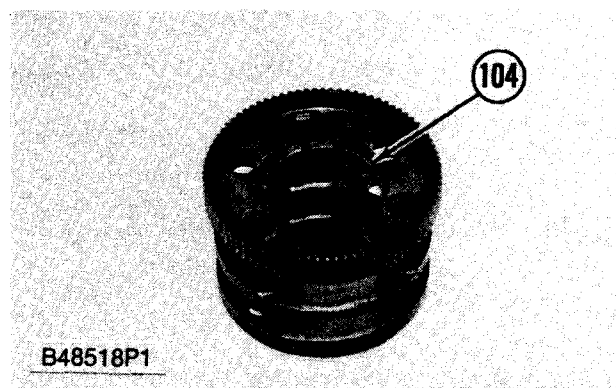
77. Remove pins (98) from shafts (93).



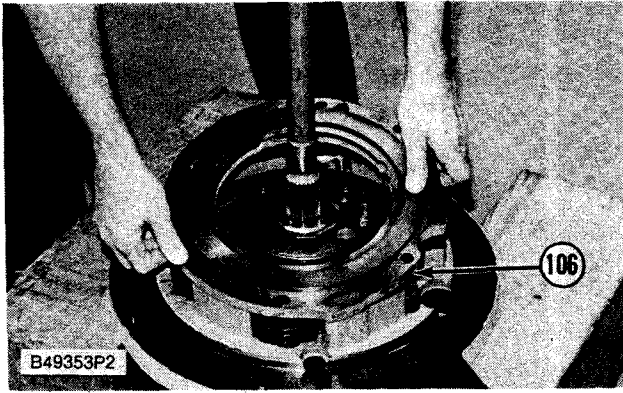
78. Use tool (B) to cause expansion of ring (104). Use tooling (E) to remove bearing (103) and the gear as a unit from the carrier.



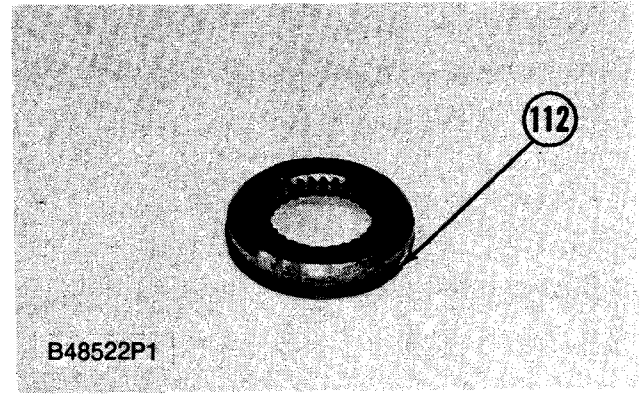
79. Use a press and remove bearing (103) from gear (105).



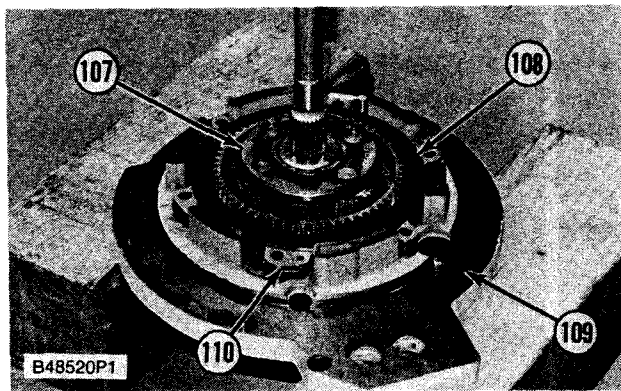
80. Remove ring (104) from the carrier.



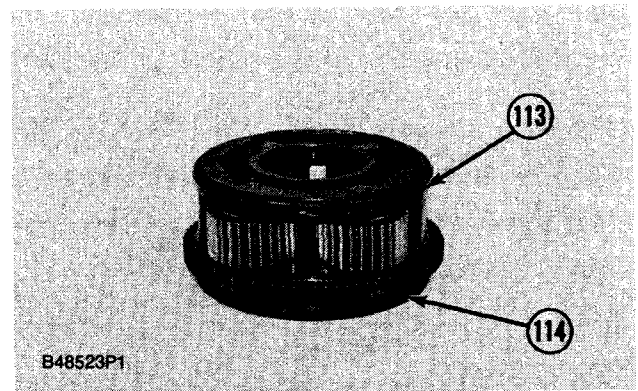
81. Remove plate (106) from the No. 1 clutch housing.



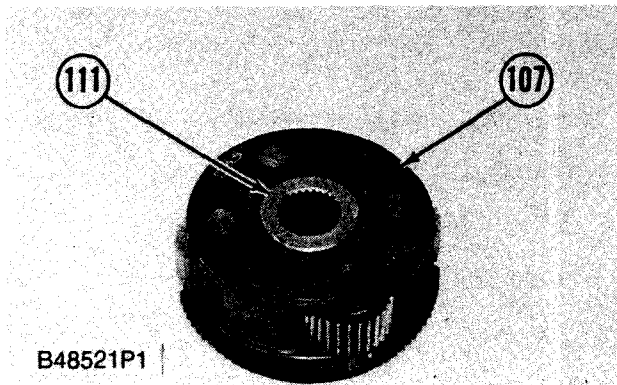
85. Remove ring (112) from the carrier.



82. Remove four discs (108) and four plates (110) (reverse) from No. 1 clutch housing (109).

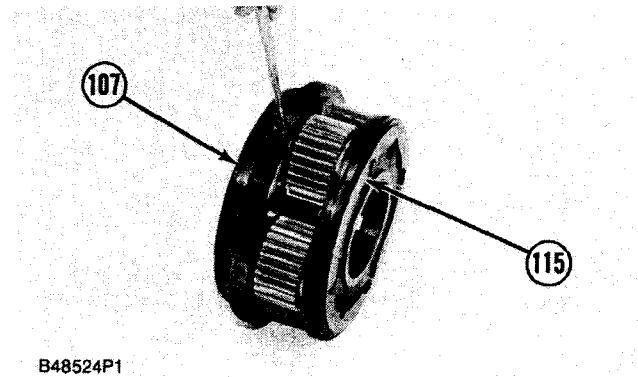


86. Remove rings (113) and (114) from the carrier.

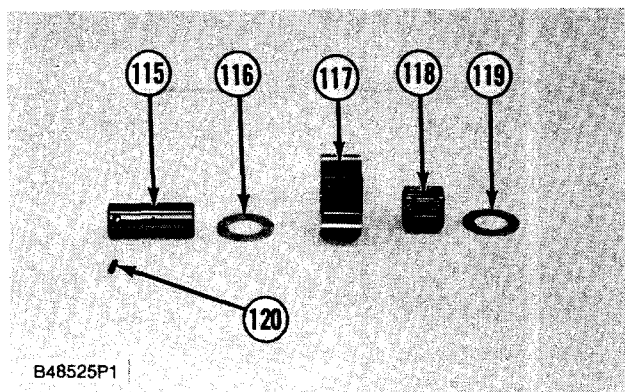


83. Remove carrier (107) from the gear.

84. Remove carrier (111) from carrier (107).

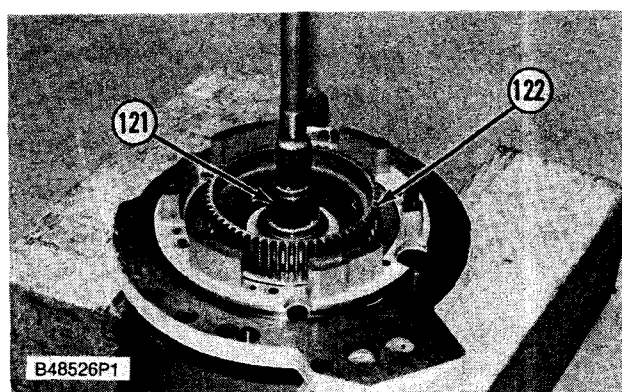


87. Use a hammer and a punch to push the pins through carrier (107) into shaft (115).

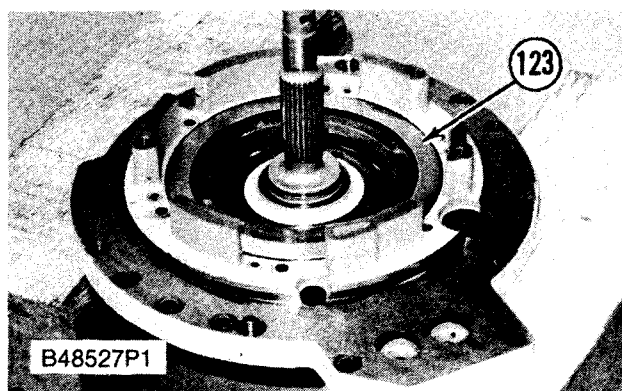


88. Remove washers (116), gears (117), bearings (118) and washers (119) from the carrier.

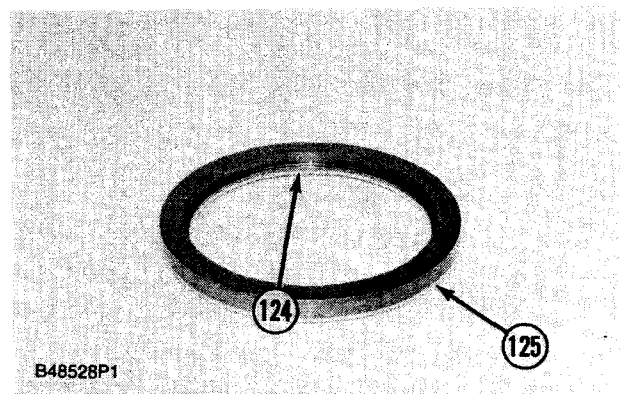
89. Remove pins (120) from shafts (115).



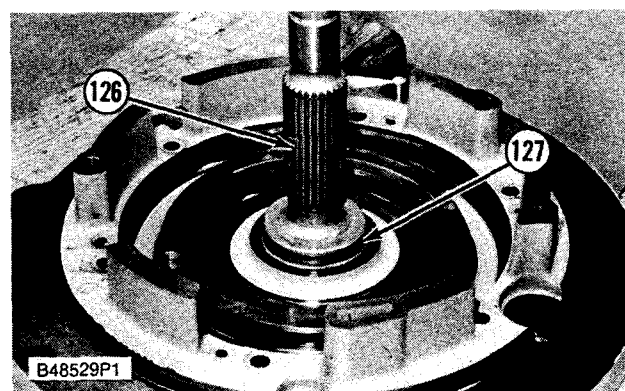
90. Remove gear (121) from the shaft and gear (122) from the No. 1 clutch housing.



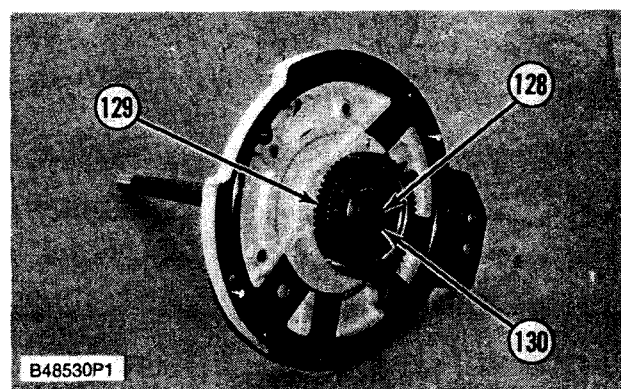
91. Remove piston (123) from the No. 1 clutch housing.



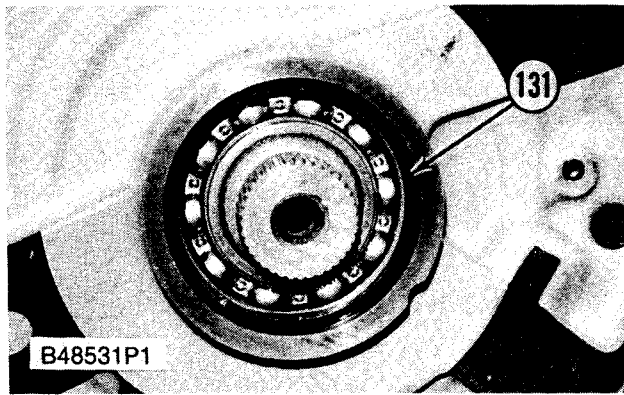
92. Remove rings (124) and (125) from the piston.



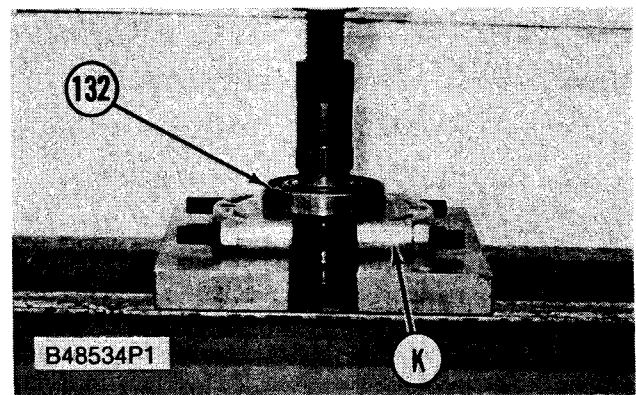
93. Remove ring (127) from shaft (126).



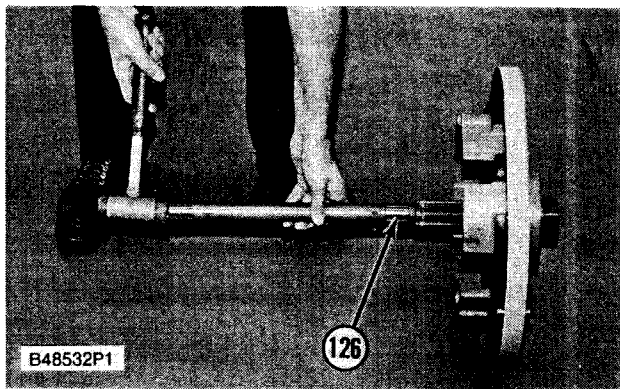
94. Remove bolt (128), retainer (130) and gear (129) from the end of the shaft.



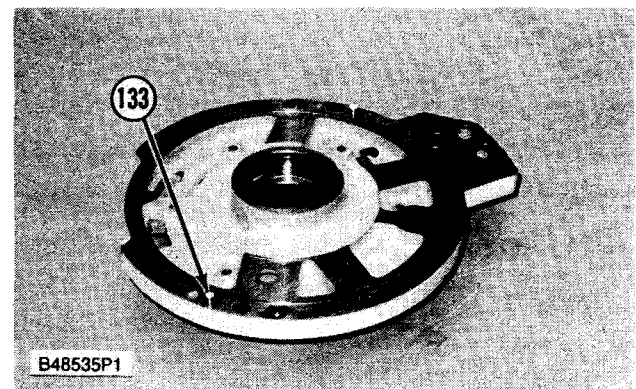
95. Remove ring (131) that holds the bearing and shaft in position in the No. 1 clutch housing.



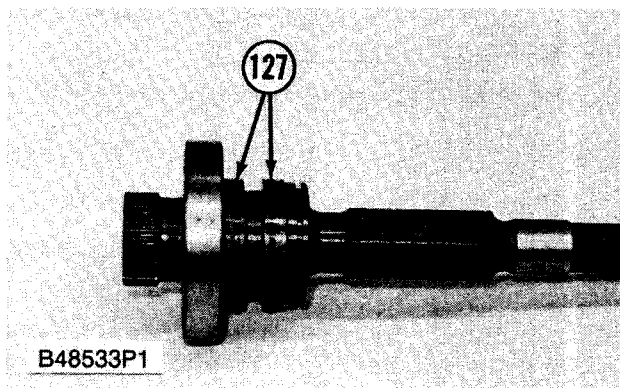
98. Use a press and tool (K) to remove bearing (132) from the shaft.



96. Use a soft hammer and remove shaft (126) and the bearing from the No. 1 clutch housing.



99. Remove dowels (133) from the No. 1 clutch housing.



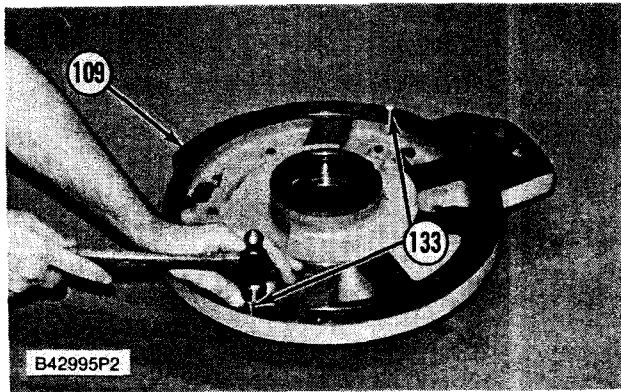
97. Remove seals (127) from the shaft.

Assemble Transmission 3150-016

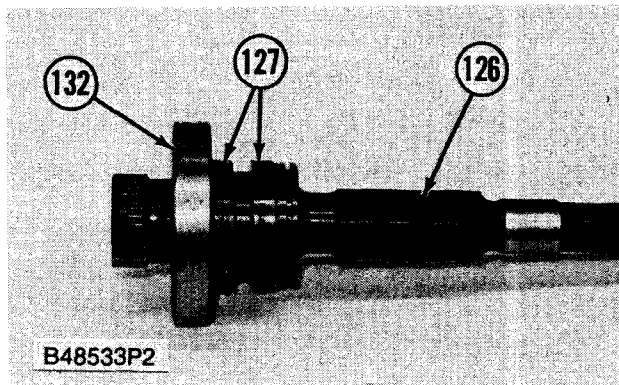
Tools Needed		A	B	C	E	F	G	H
5P9736	Link Bracket	3						
1P1863	Pliers		1					
FT833	Clamp			2				
6V2156	Link Bracket							2
FT947	Clamp						2	
5P4758	Pliers					1		
1P520	Driver Group				1			

Tools Needed		J	L	M
1P510	Driver Group		1	
1P1864	Pliers		1	
FT834	Clutch Testing Nozzle			1

NOTE: Inspect all parts for wear or damage and make replacements if needed. Put clean power train oil on the parts at assembly.

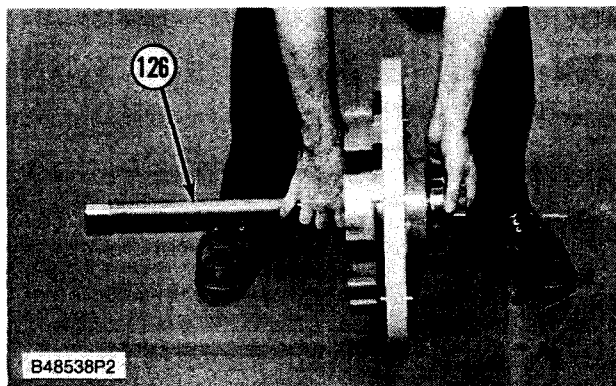


1. Install two dowels (133) in each side of No. 1 clutch housing (109). The dowels must be installed $10.5 \pm .5$ mm ($.41 \pm .020$ in.) above the outside surface.



2. Heat bearing (132) to a maximum temperature of 135°C (275°F) and install it on shaft (126) as shown.

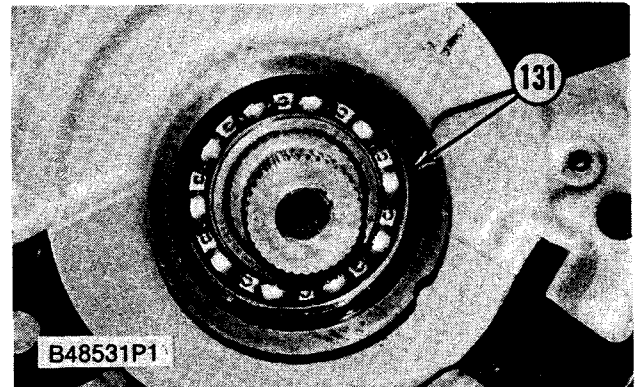
3. Install seals (127) on the shaft.



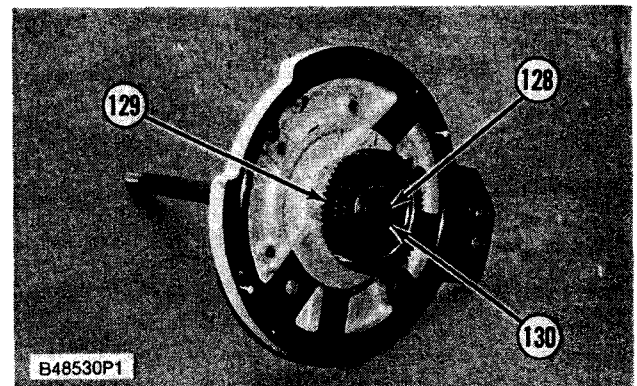
4. Carefully install shaft (126) in the No. 1 clutch housing.

NOTICE

Make sure the seals are not damaged when the shaft is installed in the bore of the No. 1 clutch housing.

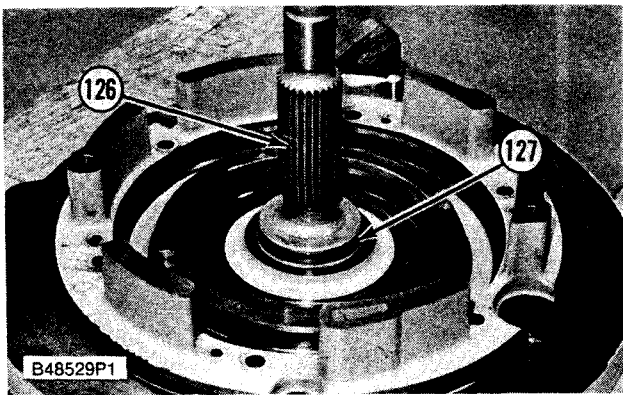


5. Install ring (131) in the No. 1 clutch housing to hold the shaft and bearing in place.

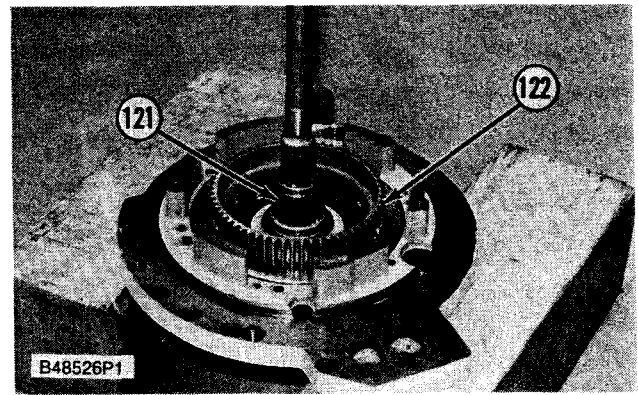


6. Install gear (129) on the end of the shaft as shown.

7. Install retainer (130) and bolt (128). Tighten the bolt to a torque of $110 \pm 10 \text{ N}\cdot\text{m}$ ($80 \pm 7 \text{ lb}\cdot\text{ft.}$).

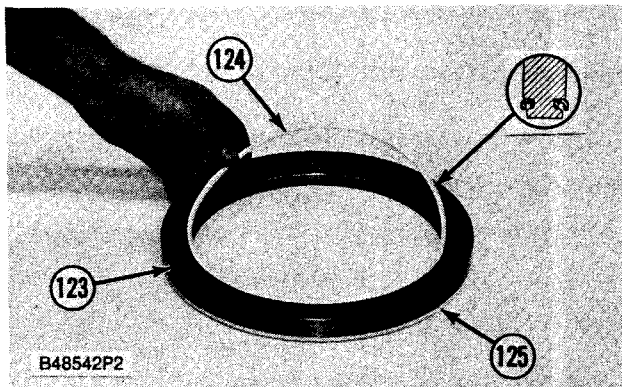


8. Install ring (127) on shaft (126).

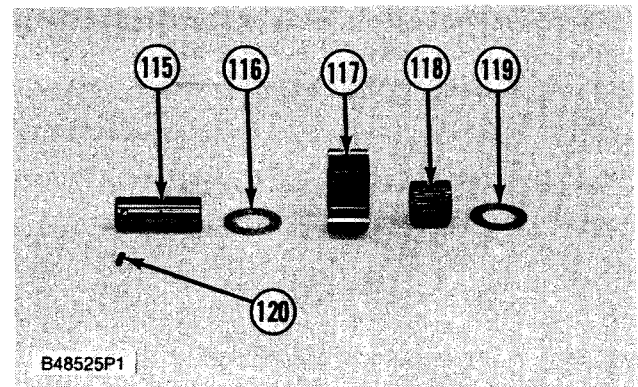


11. Install gear (122) in the No. 1 clutch housing.

12. Install gear (121) on the shaft.

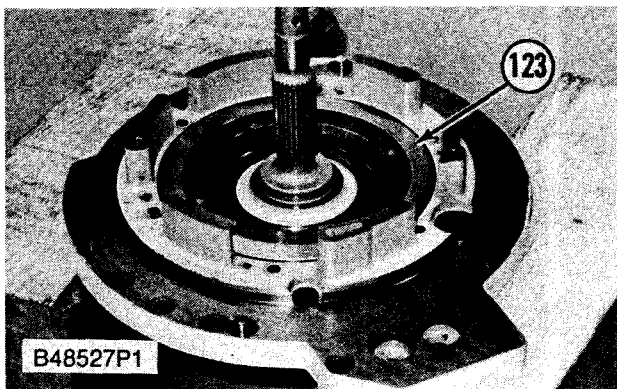


9. Install rings (124) and (125) on piston (123). Make sure the lips of the rings are as shown on the piston.

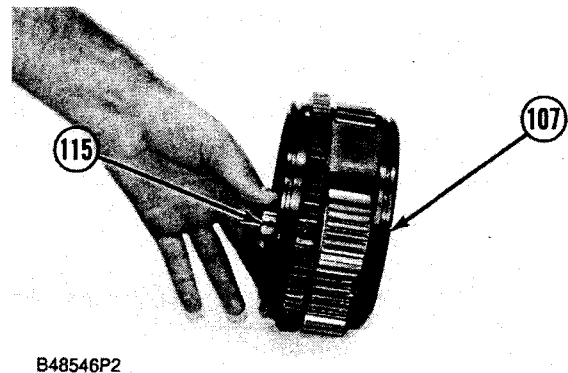


13. Install bearing (118) in gear (117).

14. Install washers (116), the gears and bearings and washers (119) in the carrier.

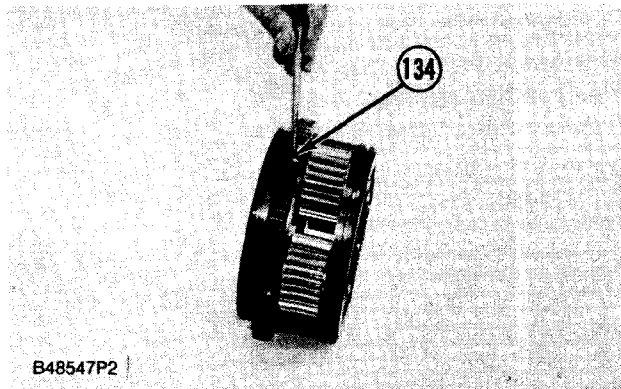


10. Install piston (123) in the No. 1 clutch housing. Make sure that the lips of the seals are down.

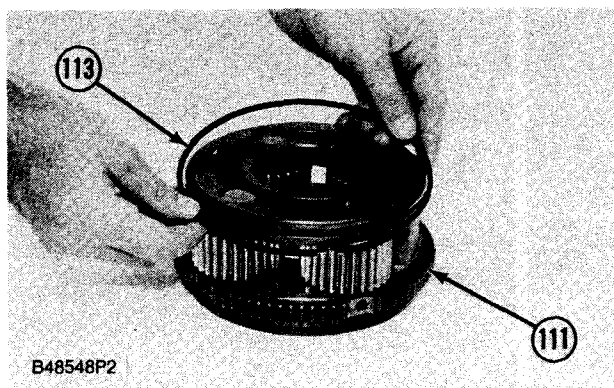


15. Install shafts (115) that hold the washers, gears and bearings in carrier (107).

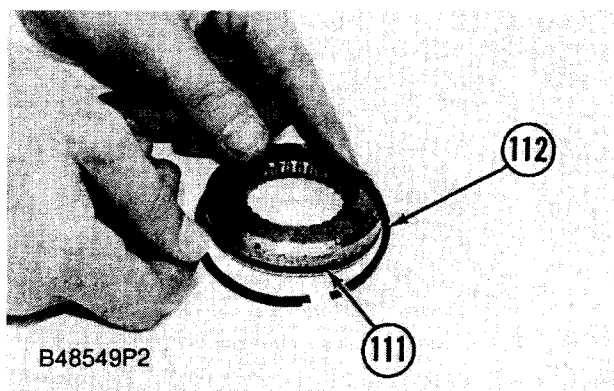
NOTE: If pins (134) are damaged, a replacement will be necessary.



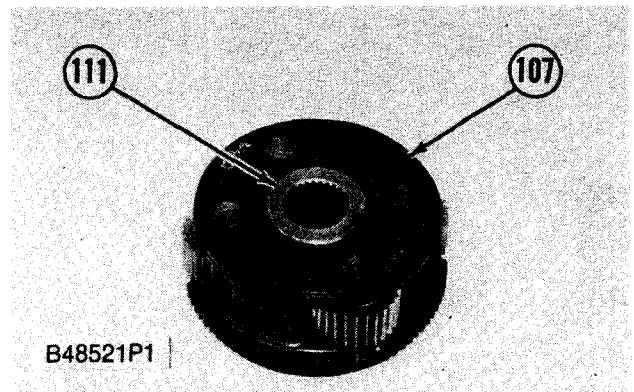
16. Use a hammer and a punch to install pins (134) that hold the shafts in the carrier. Make sure the pins are installed even with the counterbore in the carrier.



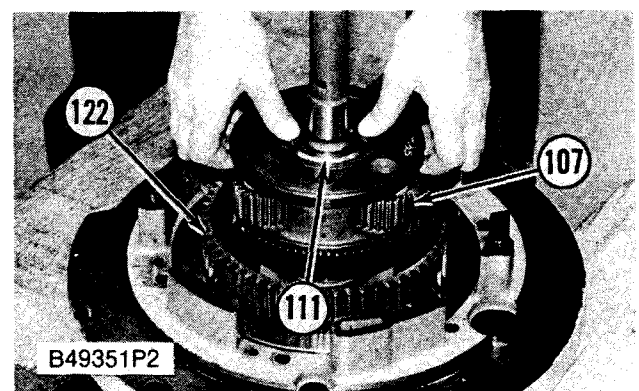
17. Install ring (113) on carrier (111).



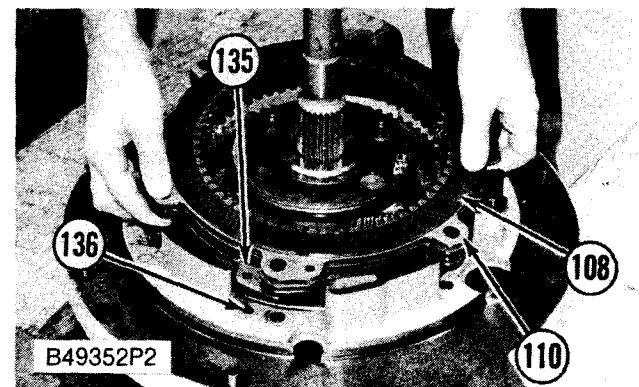
18. Install ring (112) on carrier (111).



19. Install carrier (111) in carrier (107).

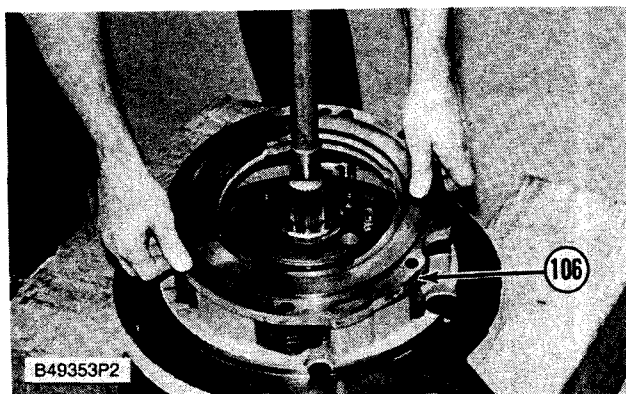


20. Make an alignment of the gear on the shaft and carrier (111) and carrier (107) with gear (122). Install carrier (107) in the No. 1 clutch housing.

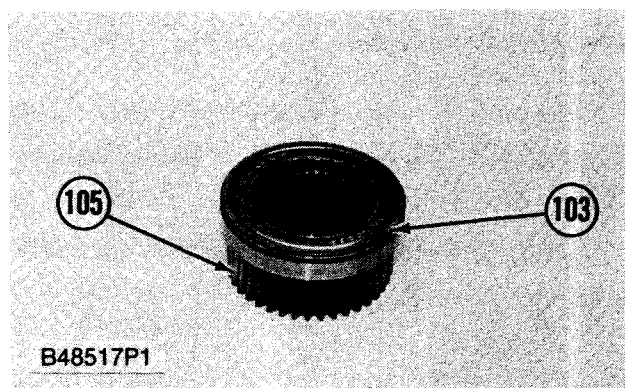


21. Install plate (135) in the No. 1 clutch housing so the small hole in the plate is in alignment with small hole (136) in the housing.

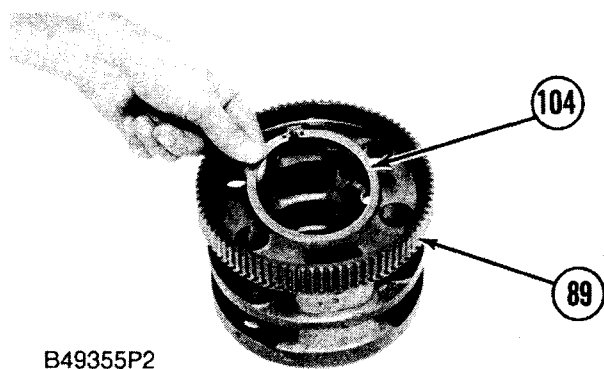
22. Install four discs (108) and three plates (110) (reverse) in the No. 1 clutch housing. Start and stop with a disc.



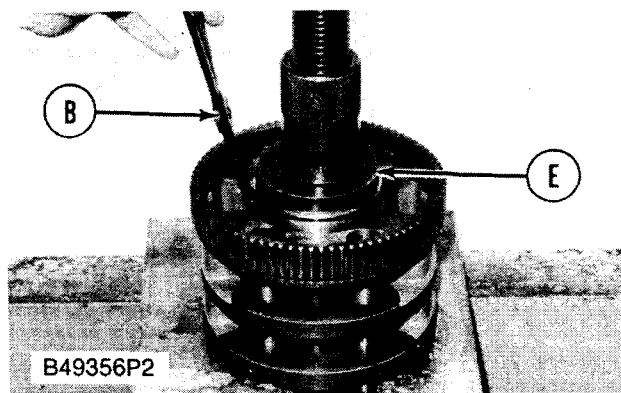
23. Put plate (106) in position on the No. 1 clutch housing as shown.



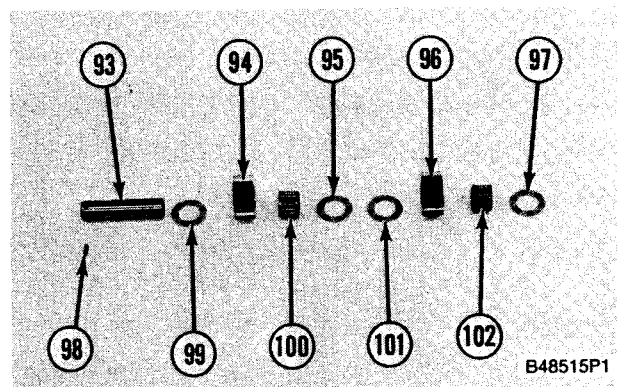
24. Heat bearing (103) to a maximum temperature of 135° C (275° F) and install it on gear (105). Make sure the bearing is installed so the groove is toward the top.



25. Install ring (104) in the groove of carrier (89) as shown.



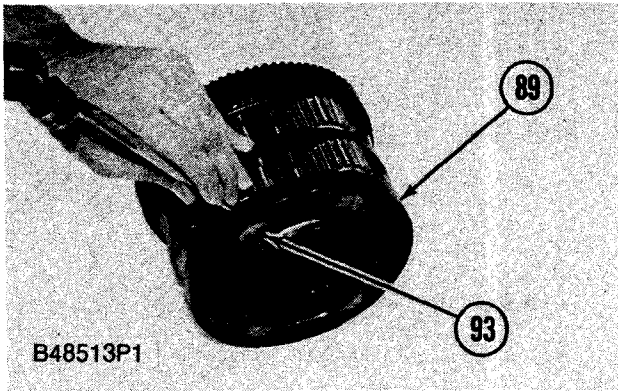
26. Use tool (B) to cause expansion of the ring. Use tooling (E) and a press to install the bearing and gear in carrier (89). The ring must be installed in the groove of the bearing.



27. Install bearings (100) in gears (94) and bearings (102) in gears (96).

28. Install washers (99), gears (94) and washers (95) in the upper carrier.

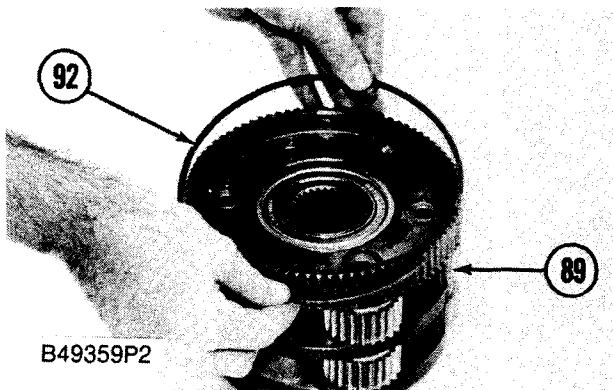
29. Install washers (101), gears (96) and washers (97) in the lower carrier.



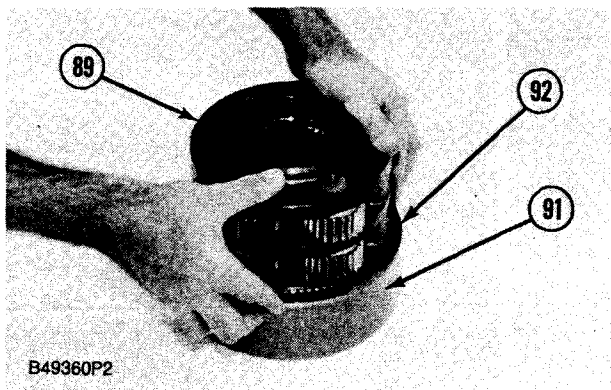
30. Install shafts (93) in the carrier that hold the washers, gears and bearing in place.

31. Use a hammer and punch to install the pins that hold shafts (93) in carrier (89).

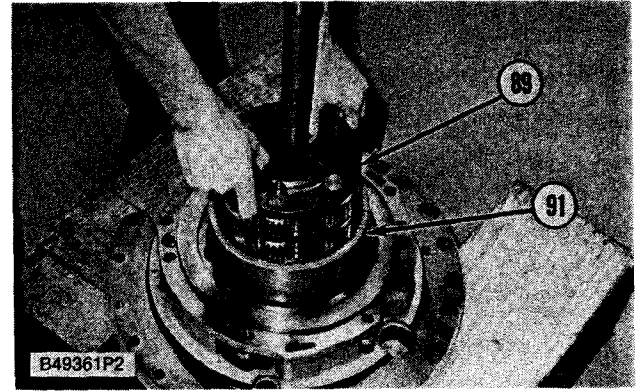
NOTE: If the pins are damaged, a replacement will be necessary.



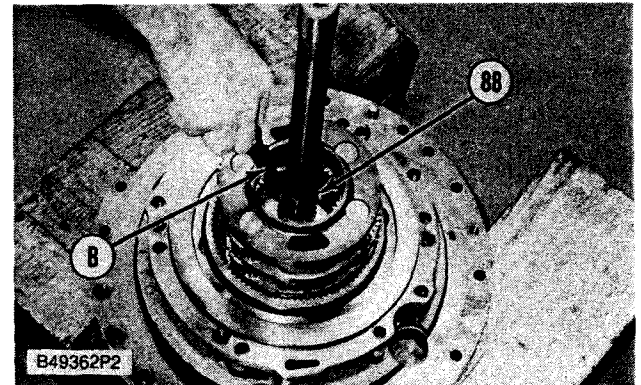
32. Install ring (92) in the groove of carrier (89).



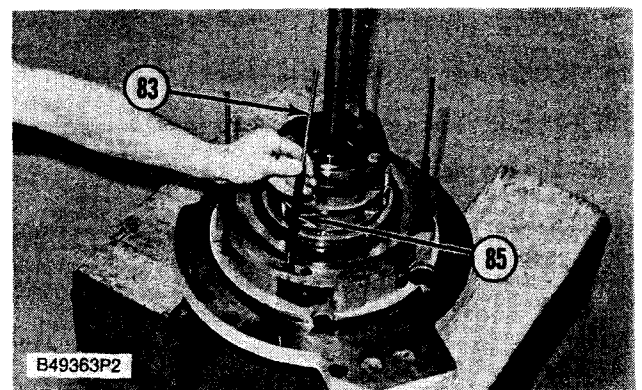
33. Make a compression of ring (92) and install carrier (89) in gear (91) until the ring fits into the groove in the gear.



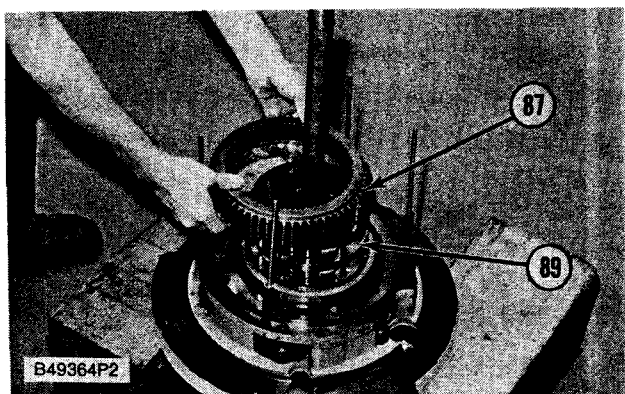
34. Install carrier (89) and gear (91) on the carrier in the No. 1 clutch housing. Make sure the gear teeth are correctly engaged.



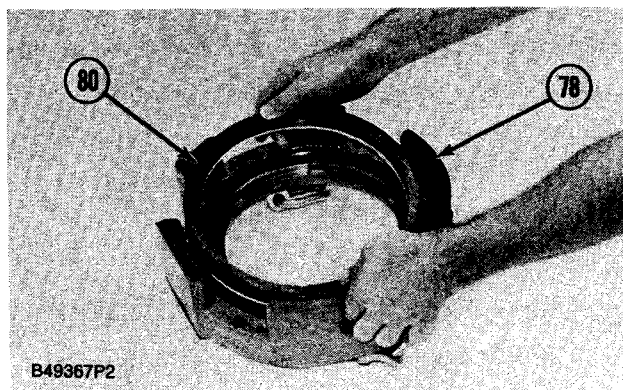
35. Use tool (B) to install ring (88) on the shaft that holds the carrier in place.



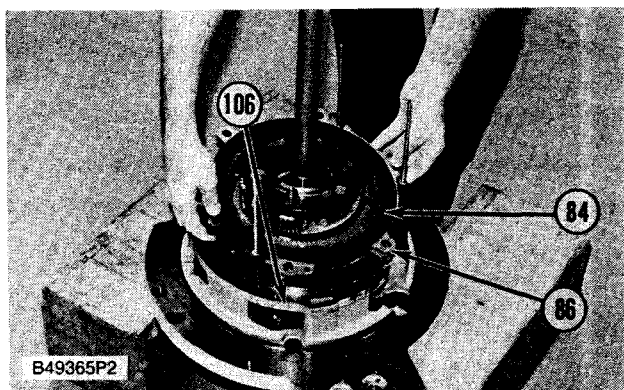
36. Install springs (85) on rods (83) and install them as shown.



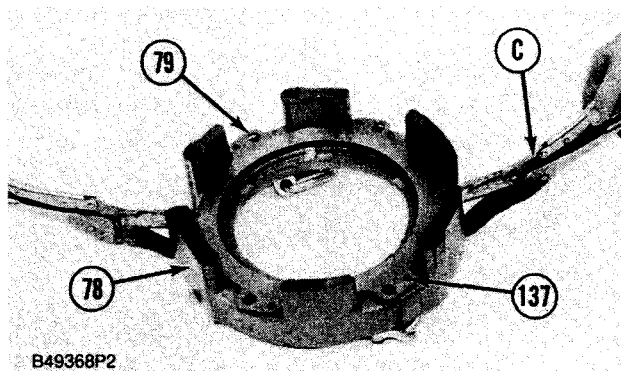
37. Install gear (87) on carrier (89). Make sure the gear teeth are correctly engaged.



40. Install piston (80) in No. 2 clutch housing (78).

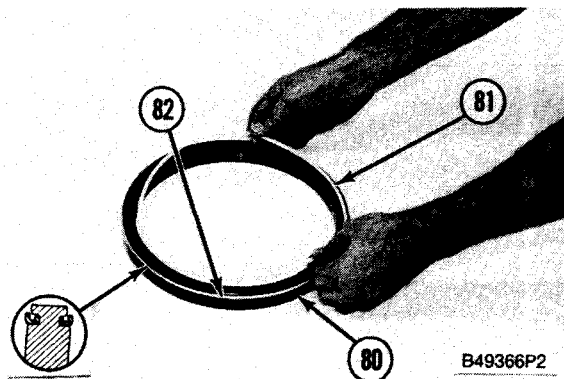


38. Install four discs (84) and three plates (86) (forward) on plate (106). Start and stop with a disc.

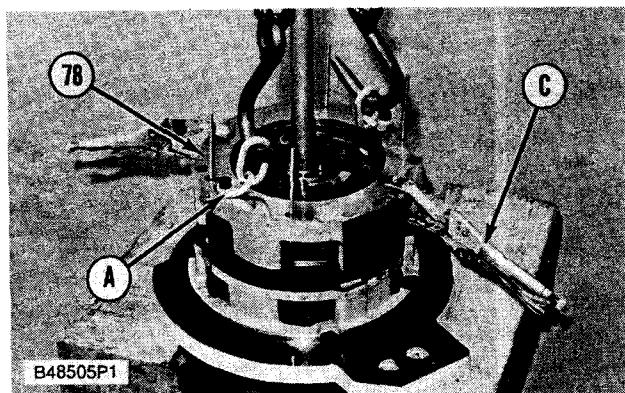


41. Install plate (79) on No. 2 clutch housing (78). Make sure small holes (137) in the plate are in alignment with the holes in the No. 2 clutch housing as shown.

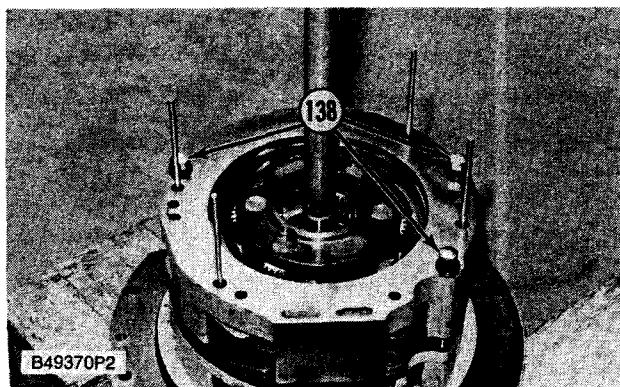
42. Install tooling (C) to hold the piston and plate in the No. 2 clutch housing.



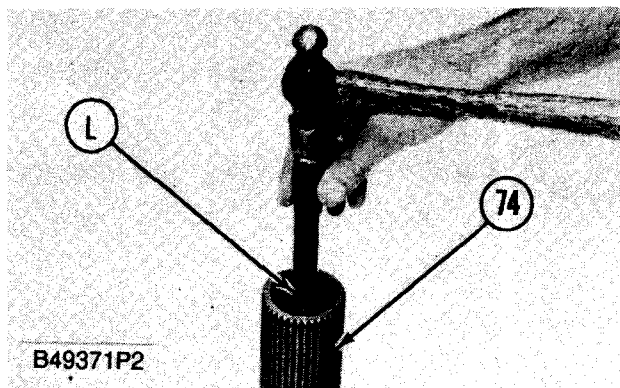
39. Install rings (81) and (82) on piston (80) as shown. Make sure the lips of the rings are as shown on the piston.



43. Install two of tooling (A) and a hoist on No. 2 clutch housing (78). Install the clutch housing on the plate as shown. The weight of the housing is approximately 23 kg (50 lb.).

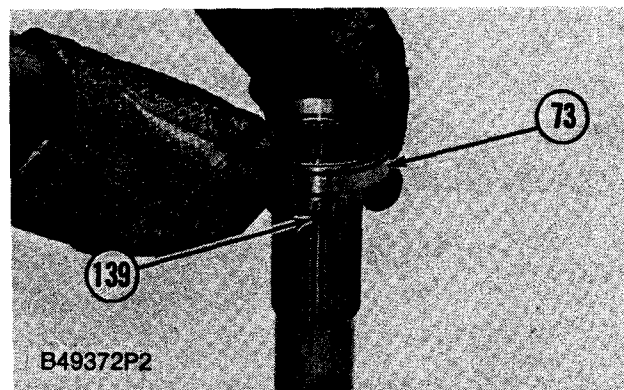


44. Install bolts (138) that hold the two housings and plate together. Tighten the bolts to a torque of $110 \pm 10 \text{ N}\cdot\text{m}$ ($80 \pm 7 \text{ lb}\cdot\text{ft.}$).

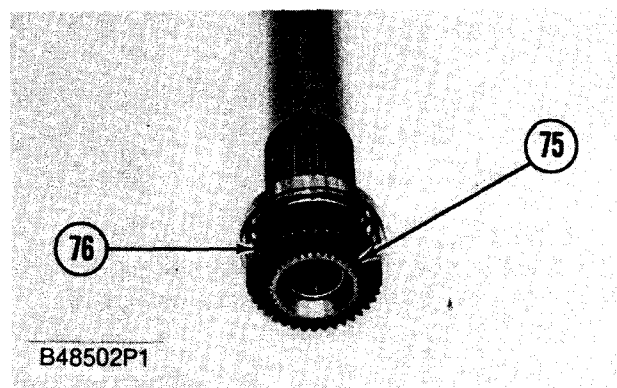


45. Lower the temperature of the two bearings and put them in position in both ends of shaft (74). Use tooling (L) to install the bearings until they are $12.0 \pm 0.5 \text{ mm}$ ($.472 \pm .020 \text{ in.}$) from the end of the shaft. The inside

diameter of the bearings must be $34.988 \pm .039 \text{ mm}$ ($1.3775 \pm .0015 \text{ in.}$) after assembly.

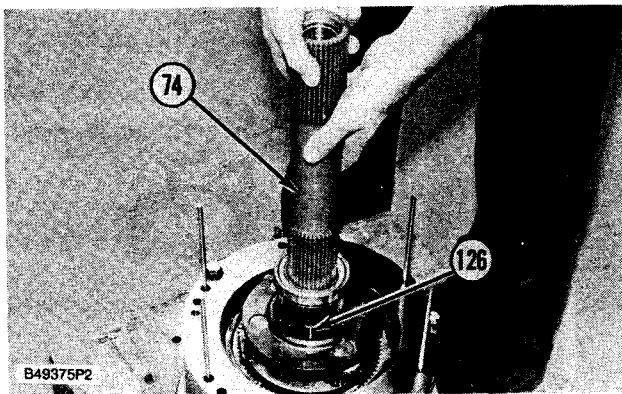


46. Heat bearing (73) to a maximum temperature of 135°C (275°F) and install it on the shaft as shown. Make sure ball (139) in the shaft fits into the notch in the bearing and the opening (slot) in the bearing is toward the top of the shaft.

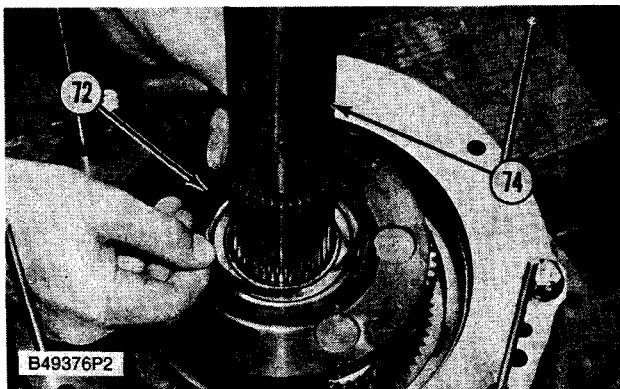


47. Install gear (76) on shaft (74) as shown.

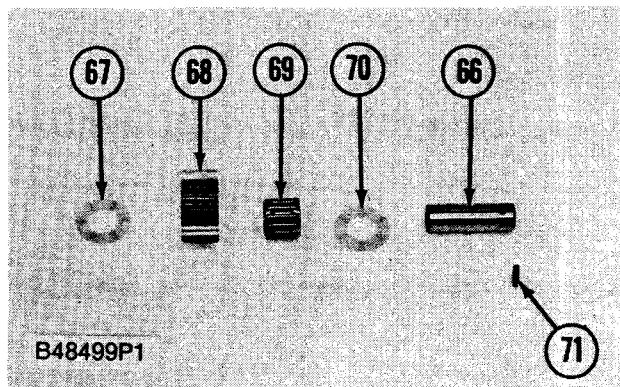
48. Use tool (J) to install ring (75) on the end of the shaft.



49. Install shaft (74) over shaft (126) as shown.

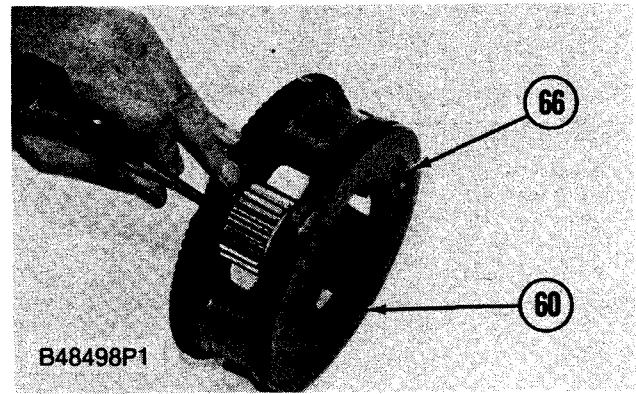


50. Install ring (72) in the carrier to hold shaft (74) in place.

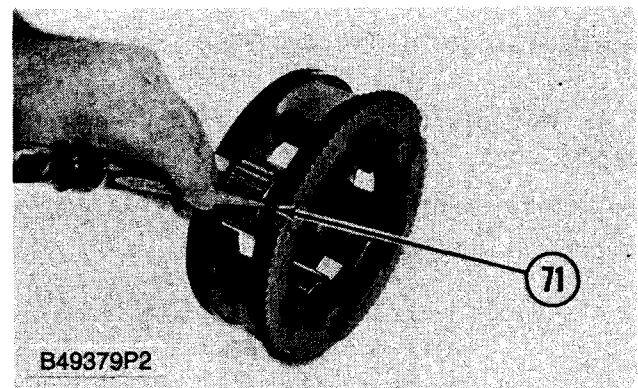


51. Install bearing (69) in gear (68).

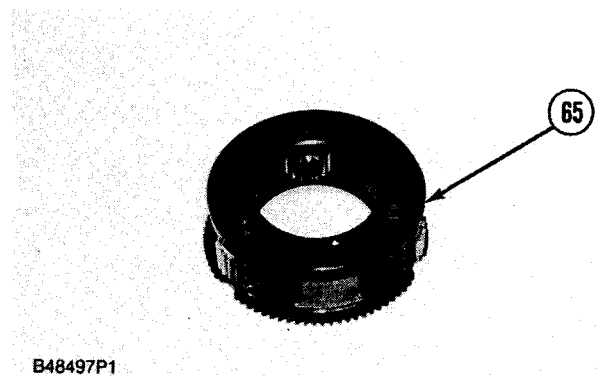
52. Install washers (67), bearings (68) and washers (70) in the carrier.



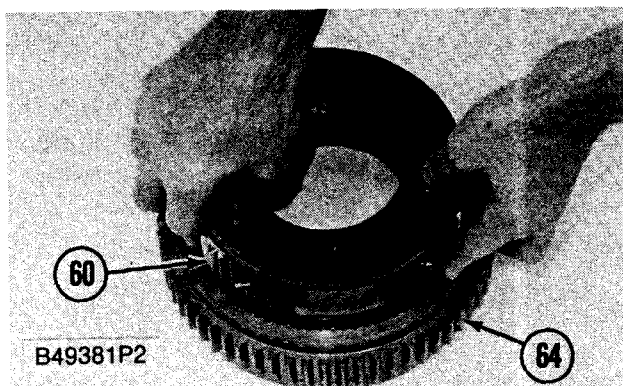
53. Install shafts (66) in carrier (60) to hold the washers, bearings and gears in place.



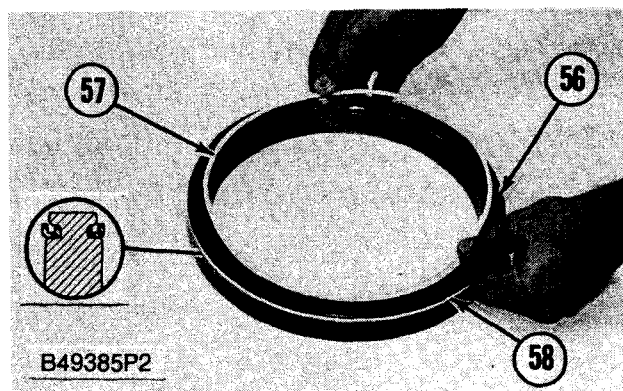
54. Use a hammer and punch to install pins (71) in the carrier that hold the shafts in place.



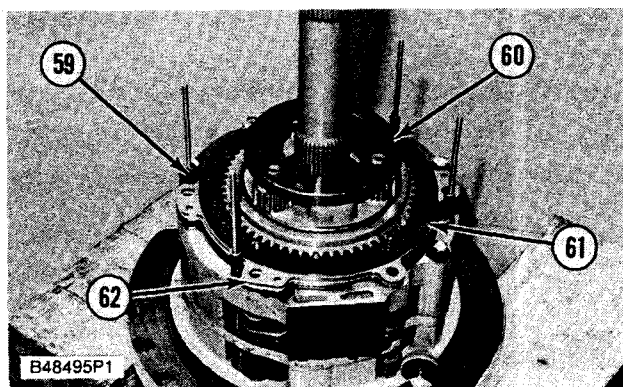
55. Install ring (65) in the groove of the carrier as shown.



56. Make a compression of ring (65) and install carrier (60) on gear (64). Install the carrier on the gear until the ring fits into the groove in the gear.



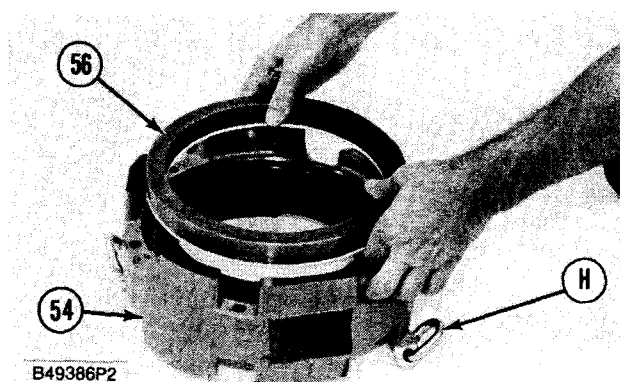
60. Install rings (57) and (58) on piston (56). Make sure the lips of the rings are as shown on the piston.



57. Install carrier (60) and gear (64) in the No. 2 clutch housing. Make sure all gear teeth are correctly engaged.

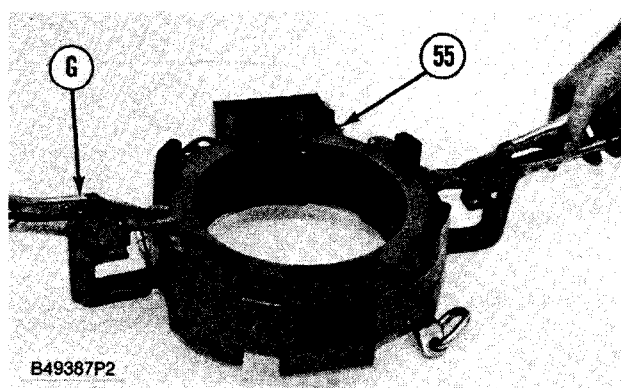
58. Install three discs (61) and two plates (62) (fourth speed). Start and stop with a disc as shown.

59. Install springs (59) on the rods.



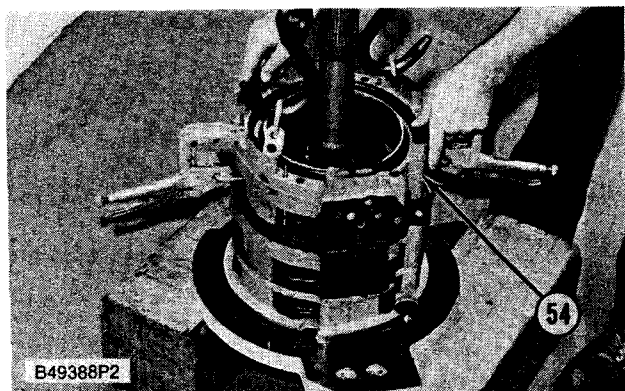
61. Install tooling (H) on No. 3 and 4 clutch housing (54).

62. Install piston (56) in No. 3 and 4 clutch housing (54) as shown. Make sure that the lips of the seals are down.

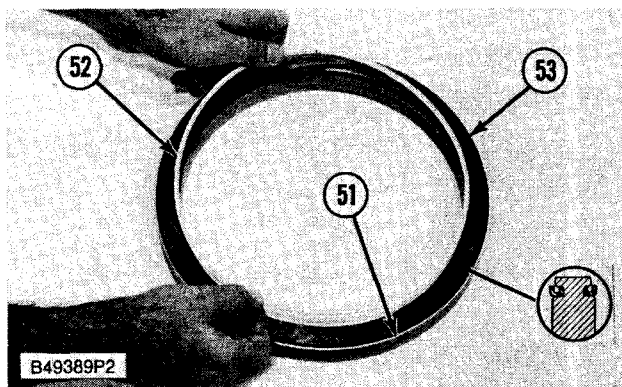


63. Install plate (55) on the clutch housing as shown. Make sure the larger holes in the plate are in alignment with the larger holes in the clutch housing.

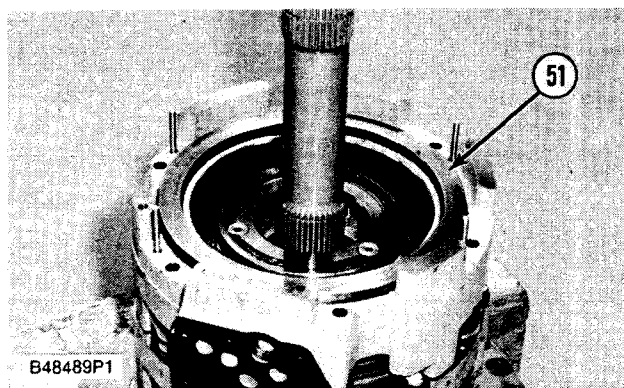
64. Install tooling (G) to hold plate (55) to the clutch housing.



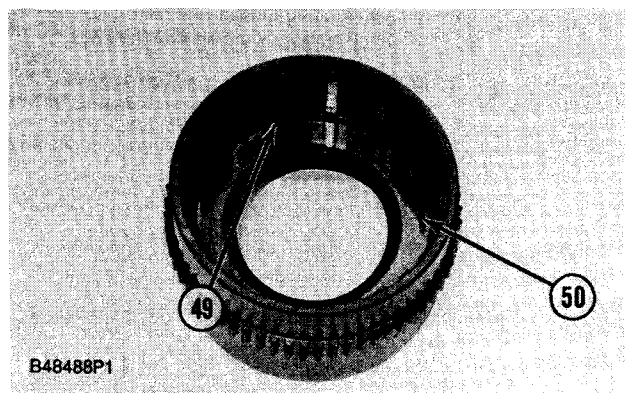
65. Fasten a hoist to No. 3 and 4 clutch housing (54) and install on the No. 2 clutch housing as shown.



66. Install rings (52) and (53) on piston (51). Make sure the lips of the rings are as shown on the piston.

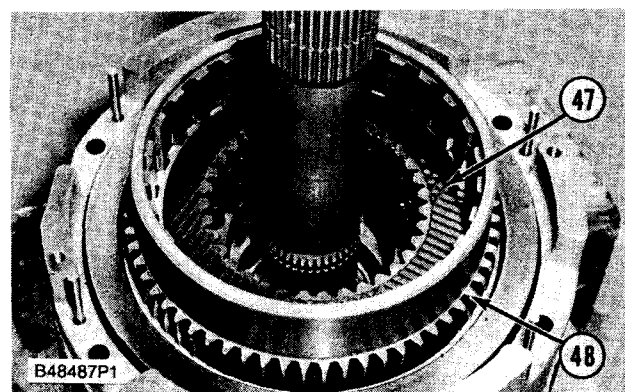


67. Install piston (51) in the No. 3 and 4 clutch housing as shown. Make sure that the lips of the seals are down.

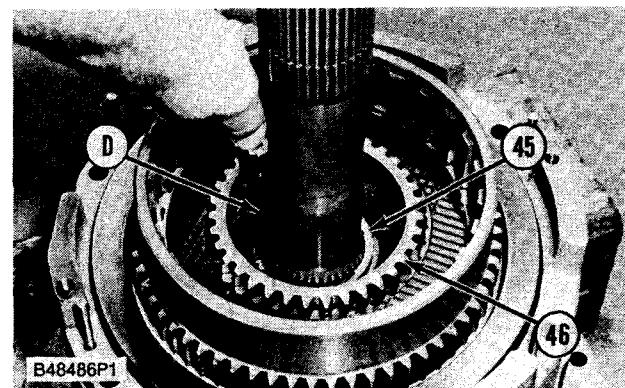


68. Install plate (50) in gear (48).

69. Install ring (49) in the gear that holds the plate in place.



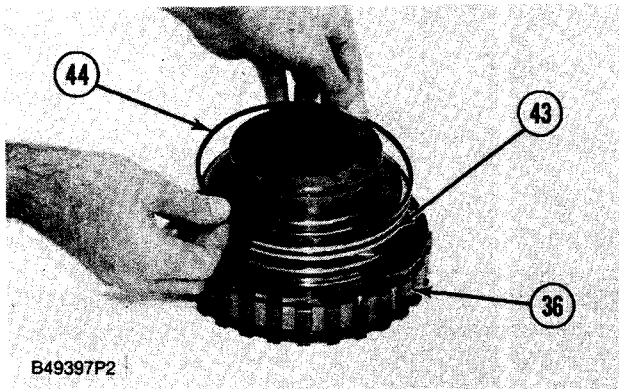
70. Install gear (48) and the plate in the No. 3 and 4 clutch housing as shown. Make sure the gear teeth on the gear are in alignment with the carrier gears.



71. Install four discs (47) and the three plates (second speed) in the gear. Start and stop with a disc.

72. Install gear (46) as shown.

73. Install ring (45) in the groove of the shaft with tool (B) as shown. (Tool (D) is used on the disassembly).



74. Heat carrier (43) to a temperature of 127° to 155° C (260° to 330° F) for a maximum of ten minutes and install it on housing (36) so the part number can be seen. Install the pin to hold carrier (43) in position. Install rings (44) on the carrier as shown.

NOTE: Use the method below only for non-metal rings to make them ready for installation.

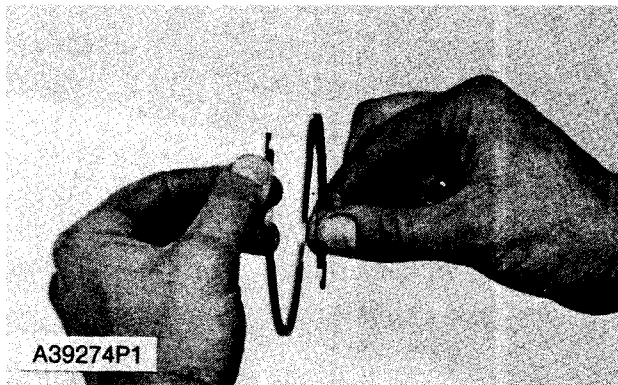


Figure 1. Correct method to make (non-metal) new rings ready for installation

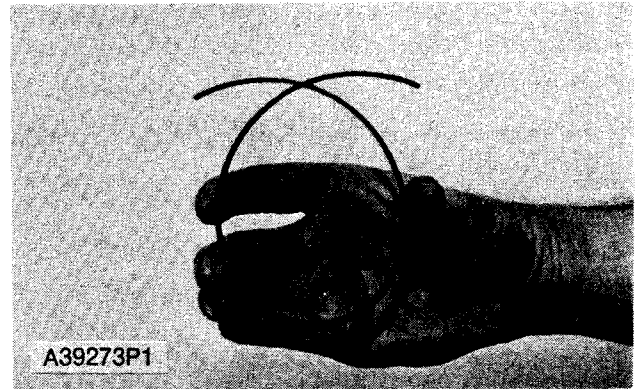
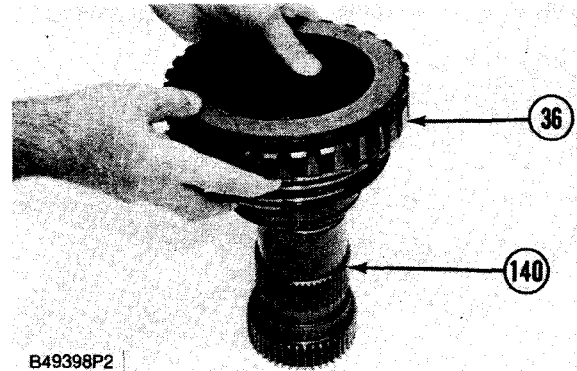
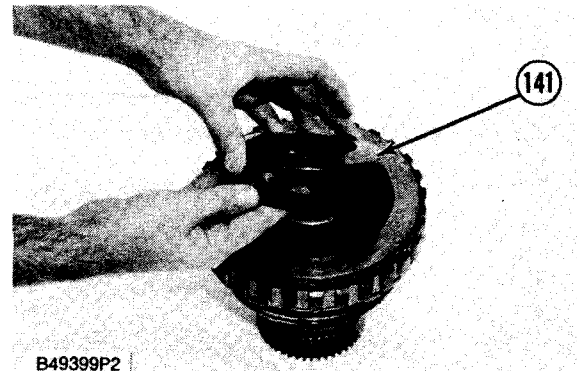


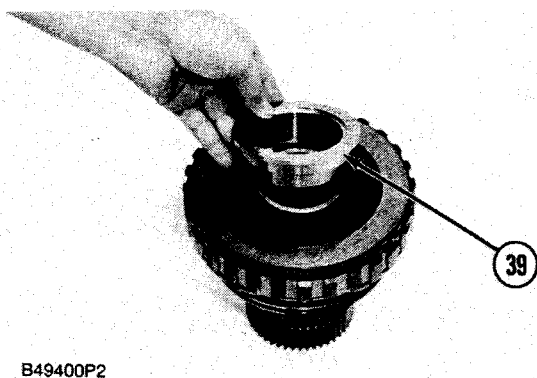
Figure 2. Wrong method to make (non-metal) new rings ready for installation



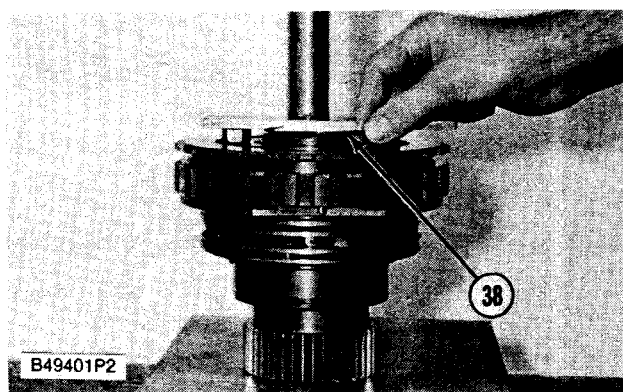
75. Put housing (36) in position on gear (140) as shown.



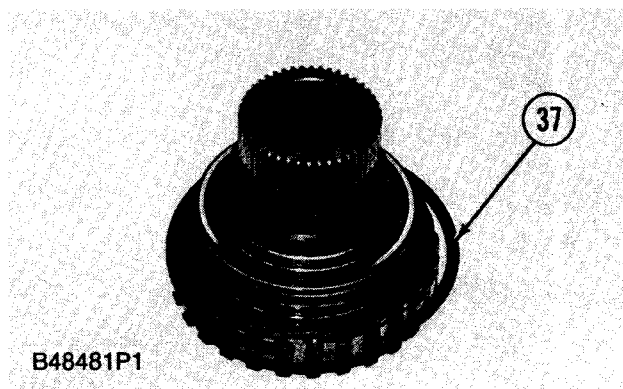
76. Install bevel spring (141) in the housings as shown. Make sure that the outside edges of the bevel springs make contact first.



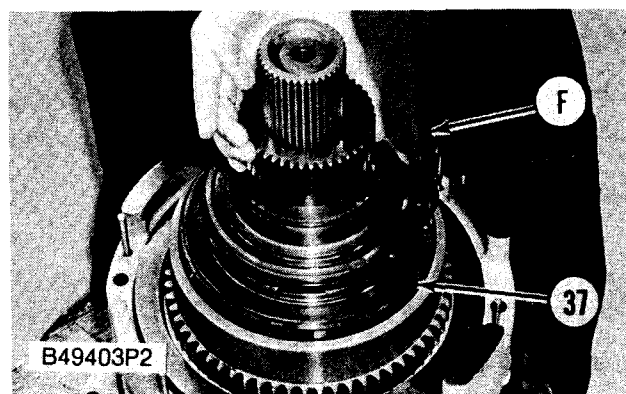
77. Install plate (39) on the housing.



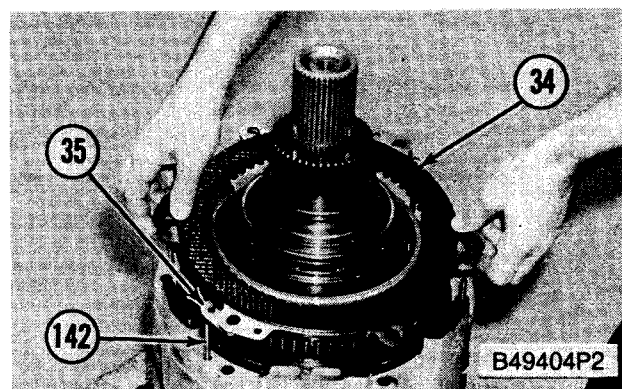
78. Use steel spacers and a press to put the plate and bevel springs under compression. Install ring (38).



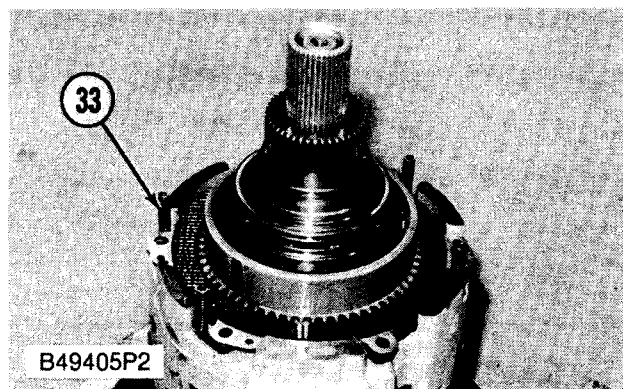
79. Install ring (37) on the housing as shown.



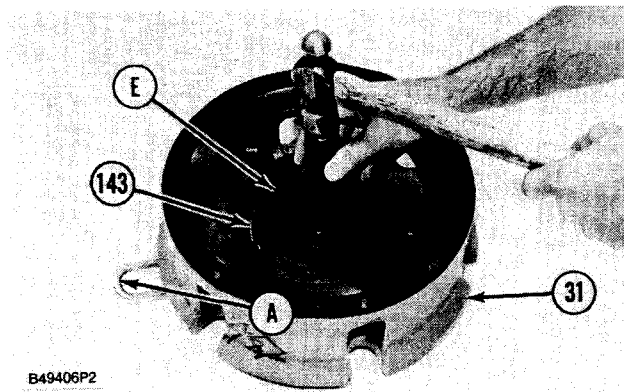
80. Put the housing and gear in position in the gear as shown. Use tool (F) to make a compression of ring (100) that holds the housing in the gear.



81. Install two plates (35) and two discs (34) (third speed) on the housing as shown. Start with a plate and end with a disc. Make sure the small hole in plate (35) is installed on rods (142) as shown.

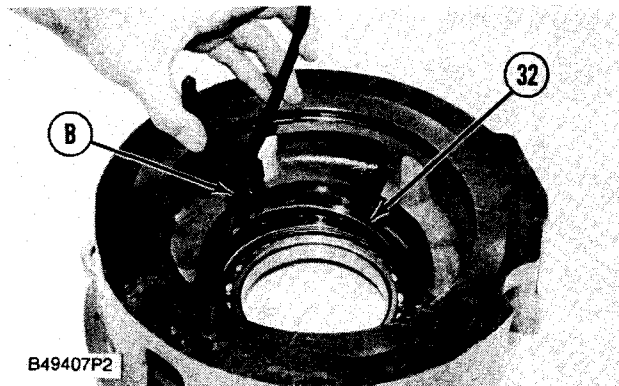


82. Install springs (33) on the rods.

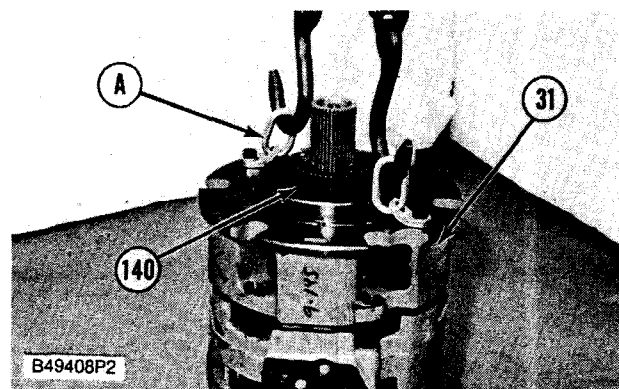


83. Install two of tooling (A) on housing (31).

84. Install bearing (143) in housing (31) with tooling (E).

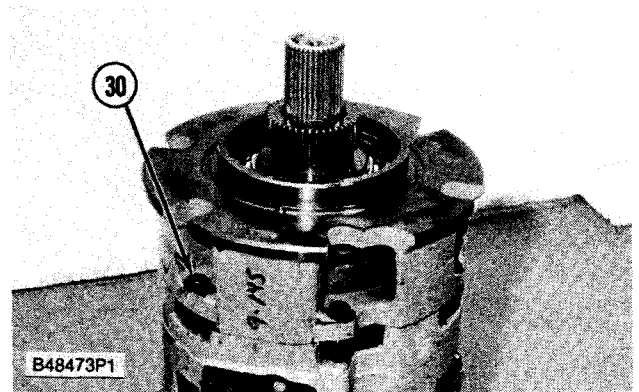


85. Use tool (B) to install ring (32) in the housing.

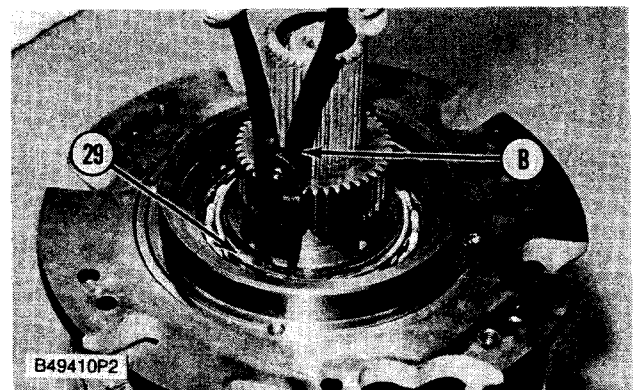


86. Install a hoist to tooling (A) and put housing (31) in position on the No. 3 and 4 clutch housing. The weight of the housing is 29 kg (64 lb.).

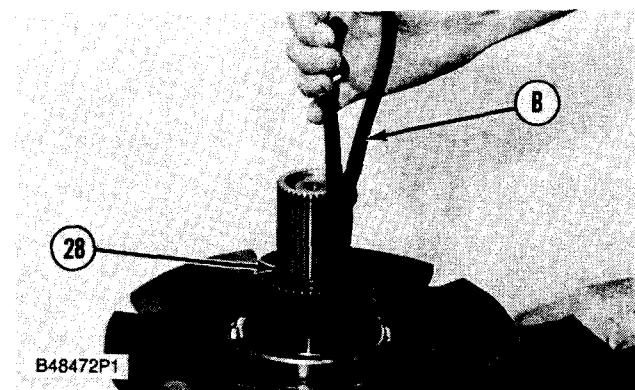
NOTE: Make sure the dowel in gear (96) and the notch in bearing (143) are in alignment. If necessary turn gear (140) to make the alignment.



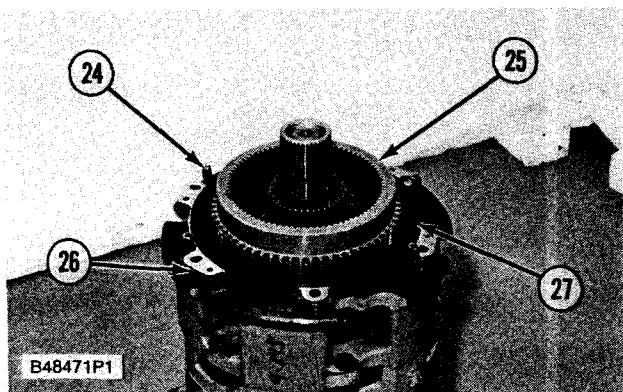
87. Install bolts (30) and tighten them to a torque of $110 \pm 10 \text{ N}\cdot\text{m}$ ($80 \pm 7 \text{ lb}\cdot\text{ft.}$).



88. Use tool (B) to install ring (29) on the housing.



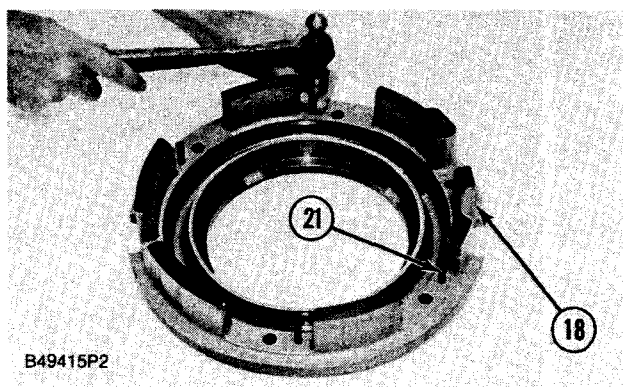
89. Use tool (B) to install ring (28) on the shaft.



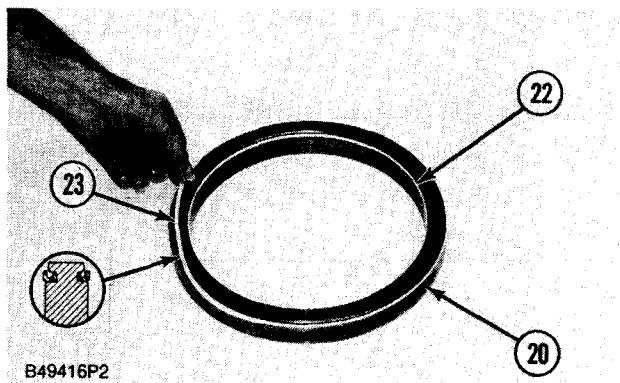
90. Install gear (25) on the housing as shown.

91. Install three discs (27) and three plates (26) on the gear. Start with a plate and stop with a disc.

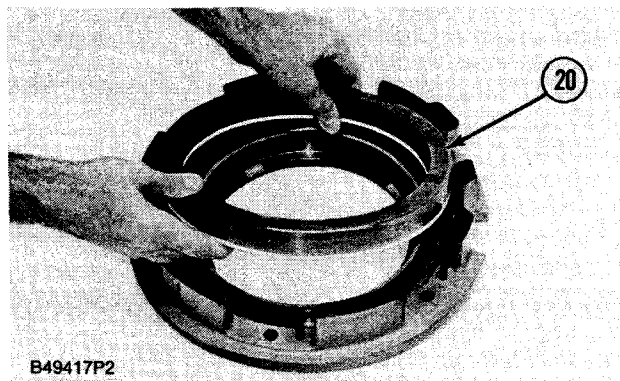
92. Install springs (24) in the holes on the housing as shown.



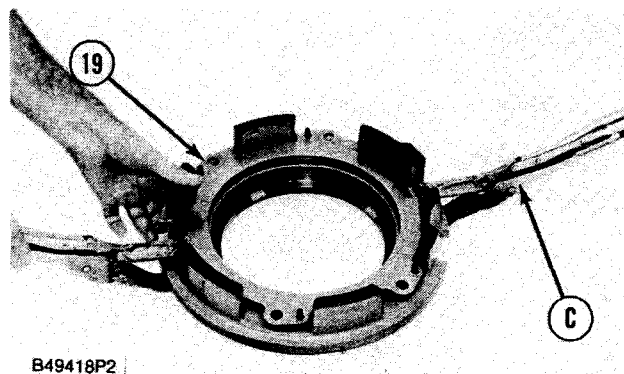
93. Install pins (21) in No. 6 clutch housing (18) as shown.



94. Install rings (22) and (23) on piston (20). Make sure the lips of the rings are as shown on the piston.

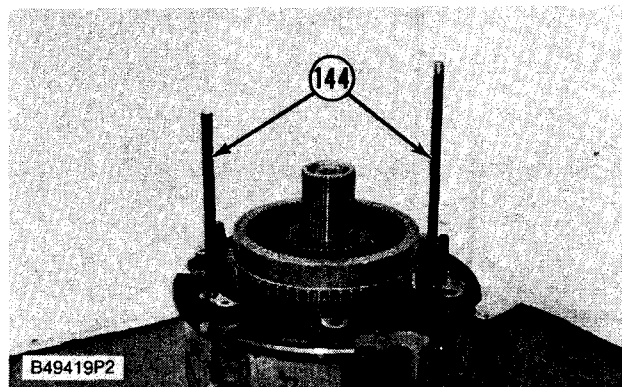


95. Install piston (20) in the No. 6 clutch housing as shown.

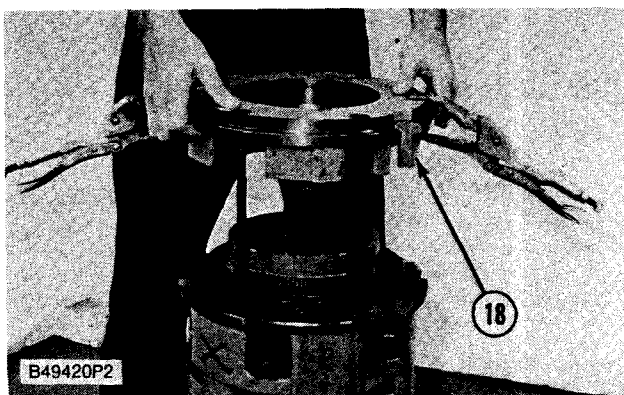


96. Install plate (19) in the No. 6 clutch housing as shown.

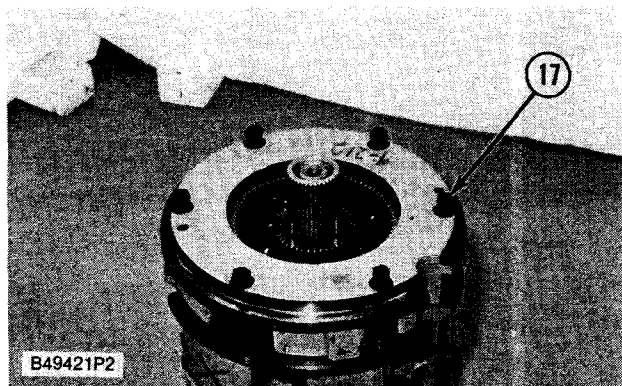
97. Use tooling (C) to hold the plate in the clutch housing.



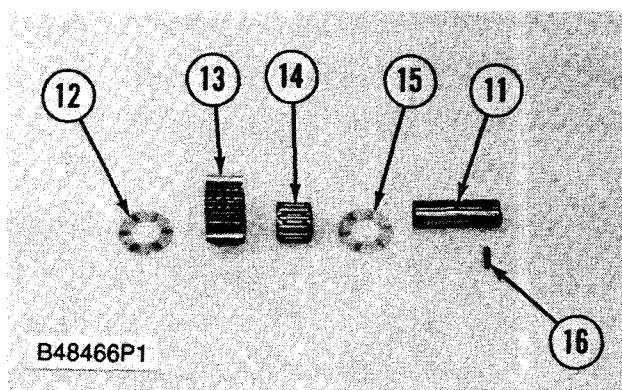
98. Install 1/2" -13 NC 10" long guide bolts (144) in the housing as shown.



99. Install No. 6 clutch housing (18) on the housing as shown.

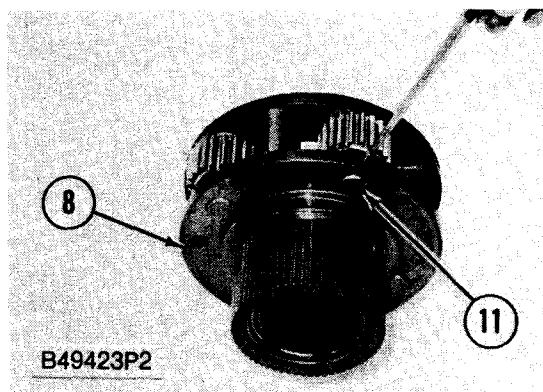


100. Remove the guide bolts. Install bolts (17) that hold the No. 6 clutch housing to the housing. Tighten the bolts to a torque of $110 \pm 10 \text{ N}\cdot\text{m}$ ($80 \pm 7 \text{ lb}\cdot\text{ft.}$).



101. Install bearings (14) in gears (13).

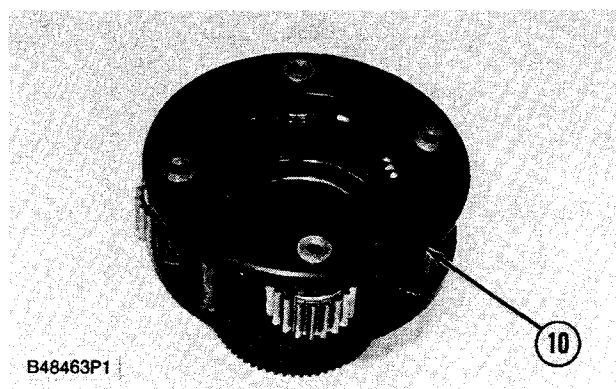
102. Install washers (12), gears (13) and washers (15) in the carrier.



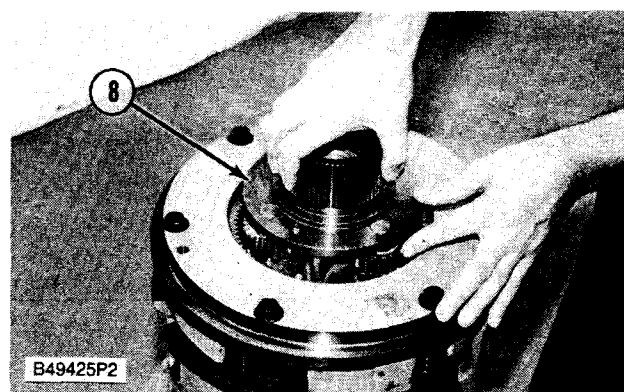
103. Install shafts (11) in carrier (8) to hold the washers, gears and bearings in place.

104. Use a hammer and a punch to install pins (16) into the carrier and shafts.

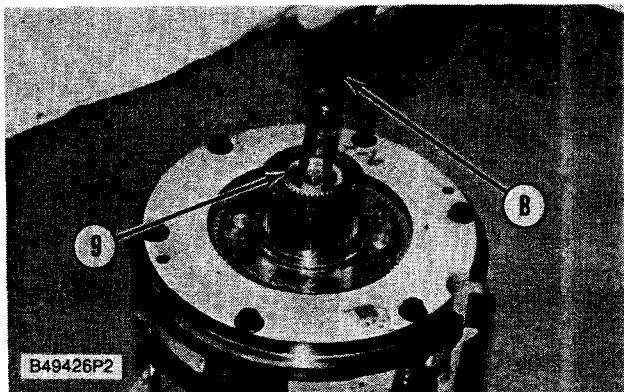
NOTE: If pins (16) are damaged, a replacement will be necessary.



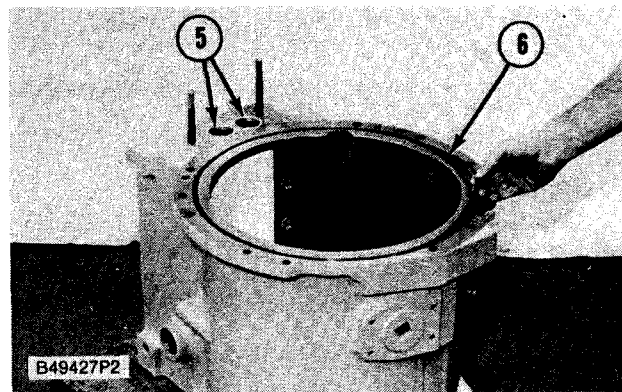
105. Install ring (10) on the carrier.



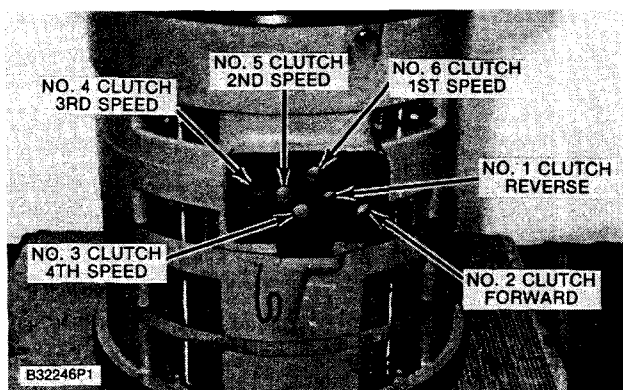
106. Make a compression of ring (10) and install carrier (8) in the gear until the ring fits into the groove of the gear.



107. Use tool (B) to install ring (9) on the shaft.

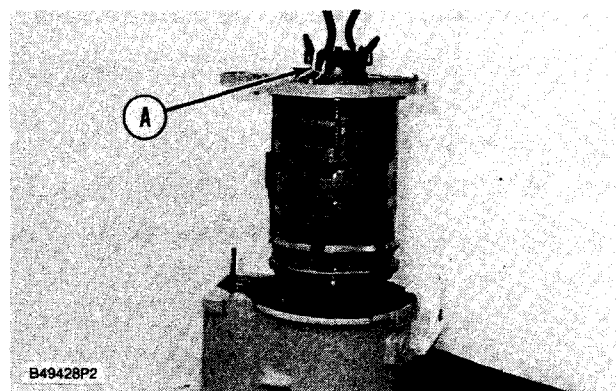


109. Install seals (5) and (6) on the transmission case.

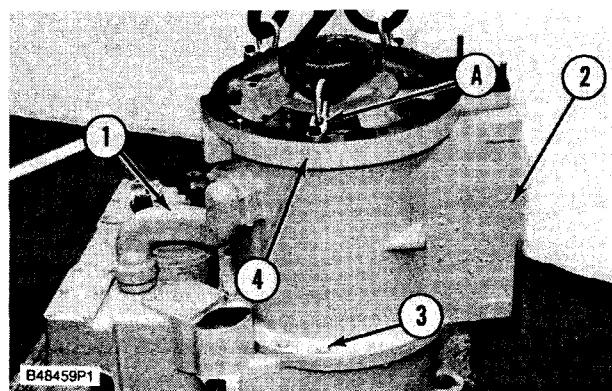


108. Check to make sure the pistons are free in their clutch housings with tool (M) as follows:

- a. Put air free of water under a pressure of 690 to 1030 kPa (100 to 150 psi) into each of the six oil passages.
- b. If the pistons do not move, put a small amount of clean SAE 30 oil in each passage. Check for movement again. If the pistons still do not move, the transmission must be disassembled and the pistons and seal rings checked.



110. Fasten two of tooling (A) and a hoist to the No. 1 clutch housing as shown. Lower the transmission into the transmission case. Install the two bolts that hold them together. The weight of the transmission is approximately 293 kg (650 lb.).



111. Fasten tooling (A) and a hoist to housing (4) and carefully lower it on the transfer gear case as shown. The weight of the transmission and case is approximately 340 kg (750 lb.).

112. Install bolts (3) that hold the transmission to the transfer gear case.

113. Make certain the O-ring seal is in position in elbow (1). Install elbow (1) on case (2).

End By:

- a. connection of torque converter to transmission
- b. install transmission hydraulic control valve

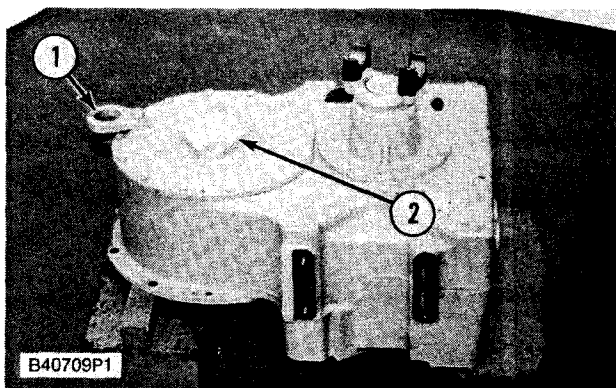
Transfer Gears

Disassemble Transfer Gears 3159-015

Tools Needed		A	B	C
1P520	Driver Group	1		
1P2322	Puller Assembly	1		
8B7556	Adapter		1	
8B7548	Puller Assembly		1	
8B7560	Step Plate		1	
8H684	Ratchet Box Wrench		1	
8B7551	Bearing Puller Attachment			1

Start By:

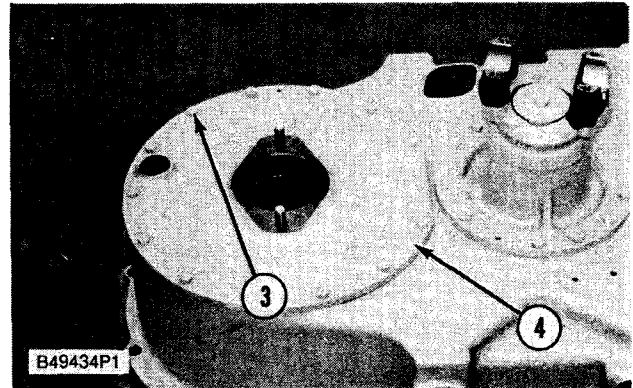
- a. separation of transmission from transfer gears (see Disassemble Transmission).



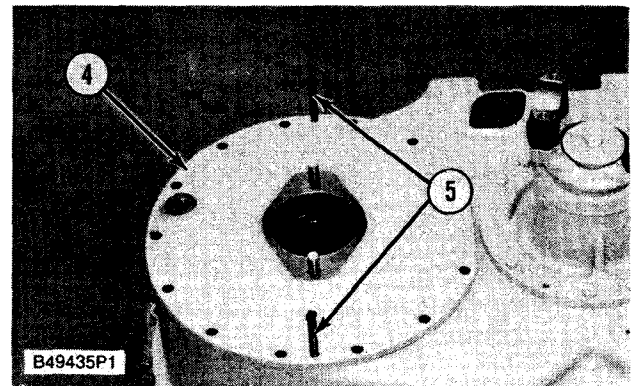
1. Fasten a hoist and turn the transfer gears over. Put the transfer gears on blocks with the back of the case up as shown. The weight of the unit is approximately 231 kg (510 lb.).

2. Remove the bolt and plate (1) from the back of the bearing cage.

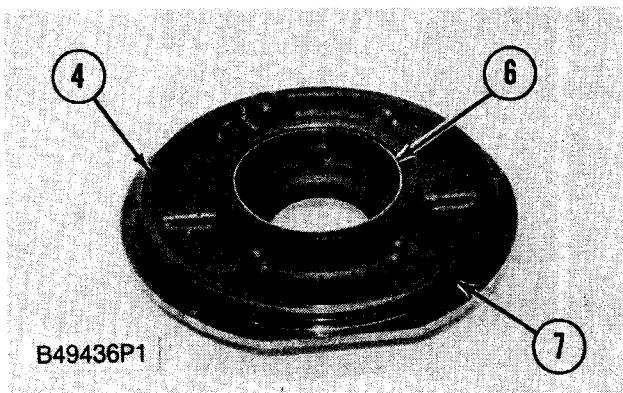
3. Remove the nuts, cover (2) and the gasket from the back of the bearing cage.



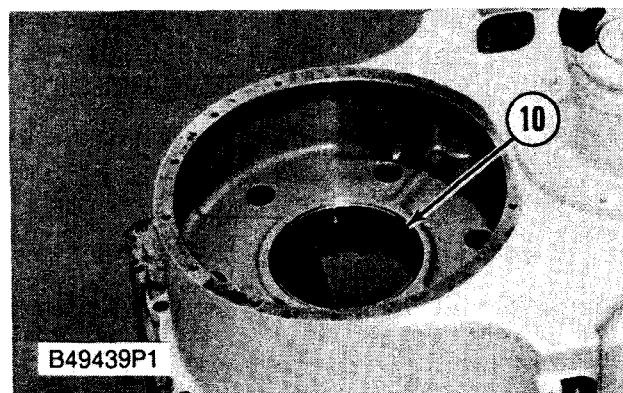
4. Remove bolts (3) that hold bearing cage (4) to the case.



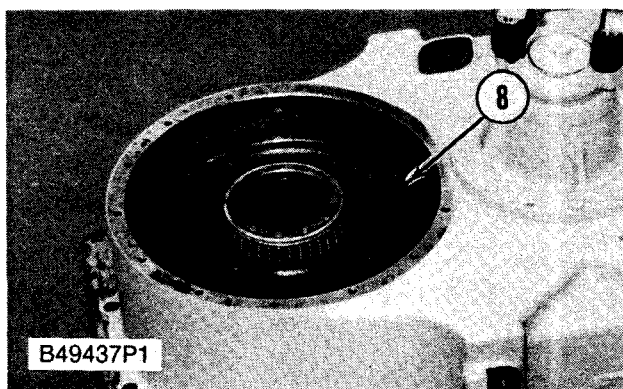
5. Use two 3/8" -16 NC forcing screws (5) to loosen bearing cage (4) and the O-ring seal from the case. Remove bearing cage (4) and the shims. Keep the shims together for assembly purposes.



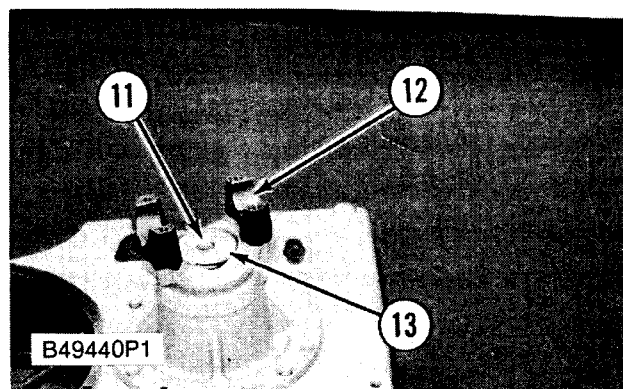
6. Remove O-ring seal (7) and bearing cup (6) from bearing cage (4).



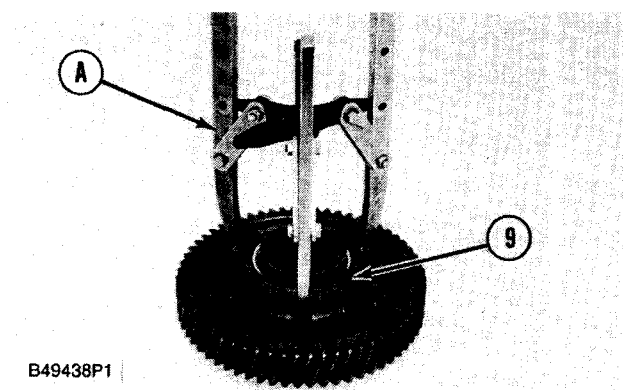
9. Remove bearing cup (10) from the case.



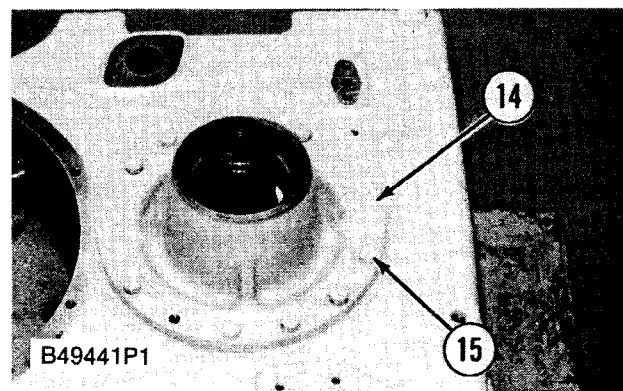
7. Fasten a hoist and remove gear (8) and the bearing cones from the case. The weight of the unit is 23 kg (50 lb.).



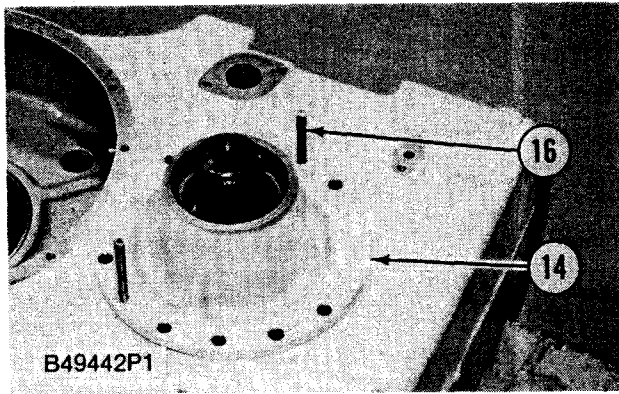
10. Remove bolt (11), retainer (13), the O-ring seal and yoke (12) from the output shaft.



8. Use tooling (A) to remove bearing cones (9) from each side of the gear.

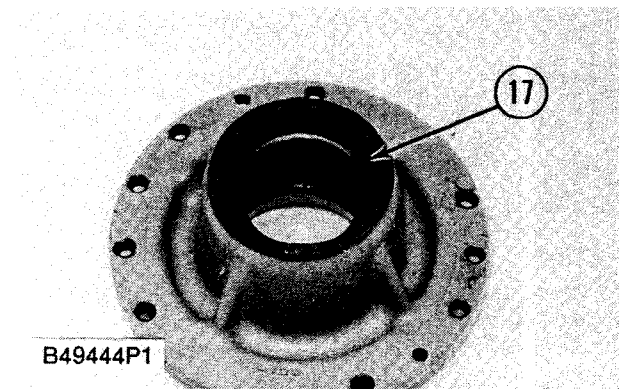


11. Remove bolts (15) that hold cage (14) to the case.

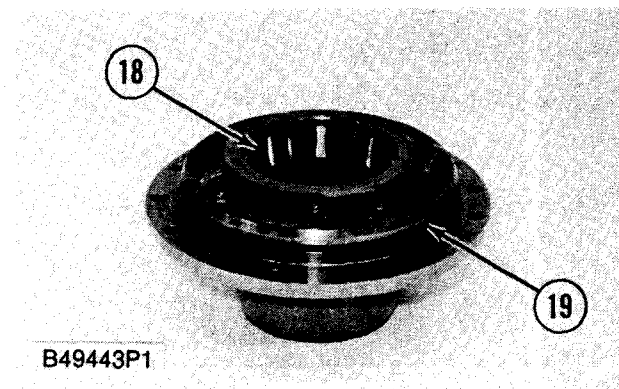


12. Use two 3/8" -16 NC forcing screws (16) to loosen cage (14) and the O-ring seal from the case.

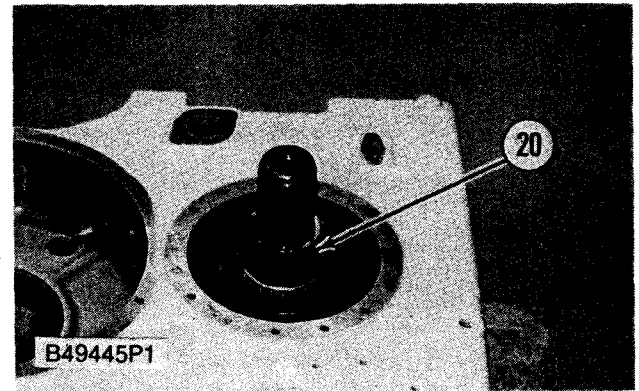
13. Remove cage (14), the O-ring seal and the shims from the case.



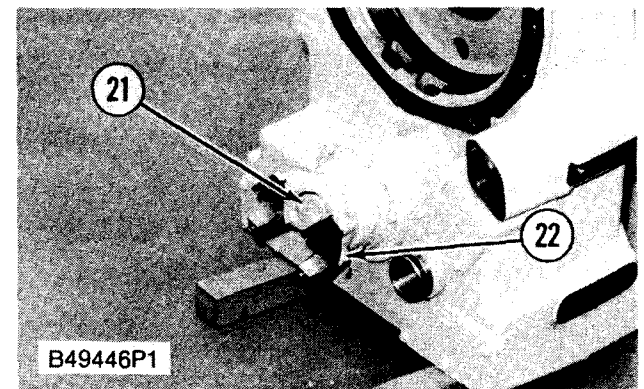
14. Remove seal (17) from the cage.



15. Remove O-ring seal (19) and bearing cup (18) from the cage.

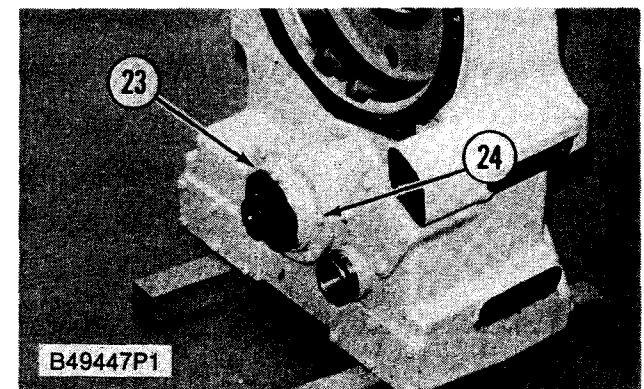


16. Remove spacers (20) from the output shaft.

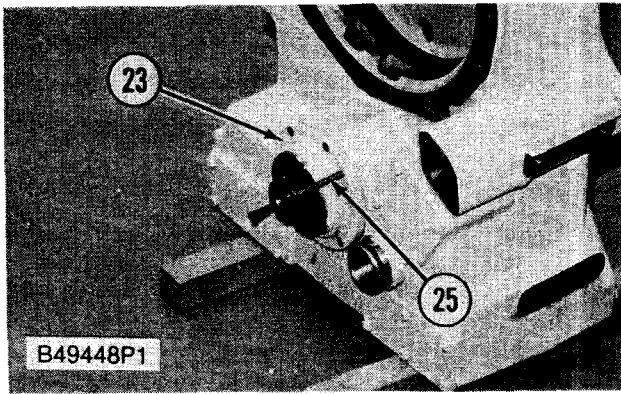


17. Fasten a hoist and put the transfer gear case in a vertical position. The weight of the unit is 186 kg (410 lb.).

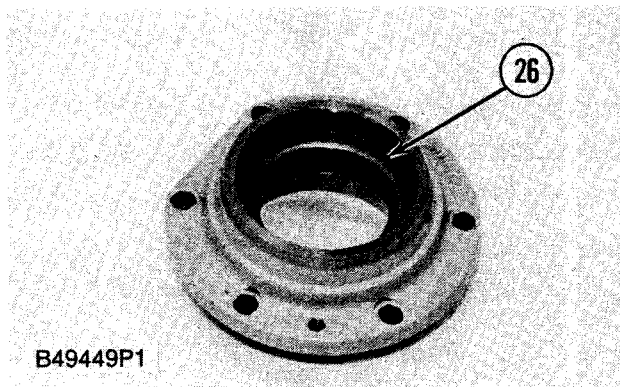
18. Remove the bolt, retainer (21), the O-ring seal and yoke (22) from the output shaft.



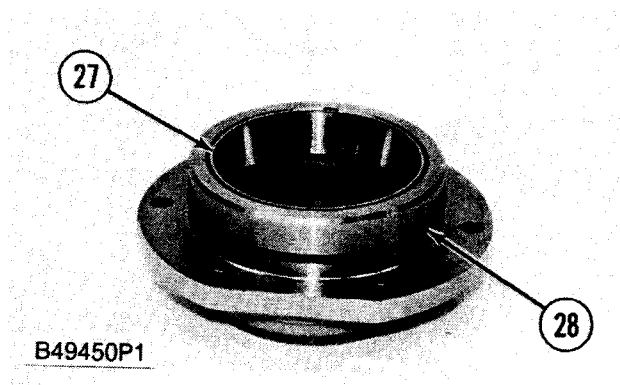
19. Remove bolts (24) that hold cage (23) to the case.



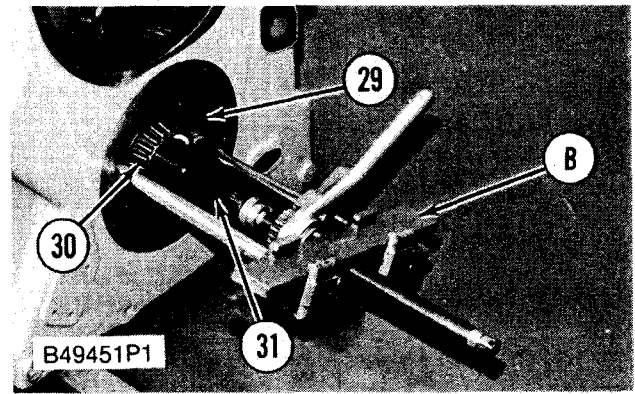
20. Install two 3/8" -16 NC forcing screws (25) to remove cage (23) from the case.



21. Remove seal (26) from the cage.



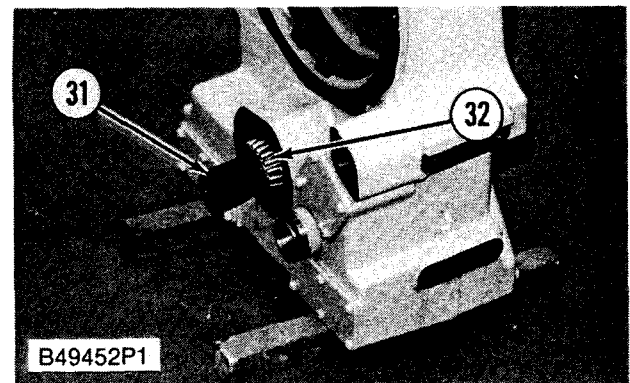
22. Remove bearing cup (27) and O-ring seal (28) from the cage.



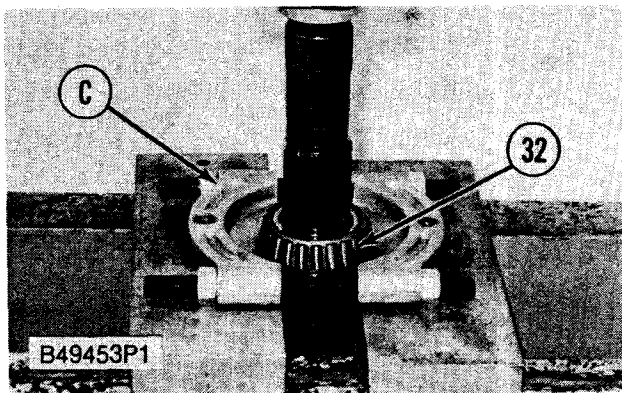
23. Fasten a nylon strap and a hoist to hold gear (29) in position.

24. Use tooling (B) to push output shaft (31) from gear (29) and bearing cone (30).

25. Remove gear (29) from output shaft (31).

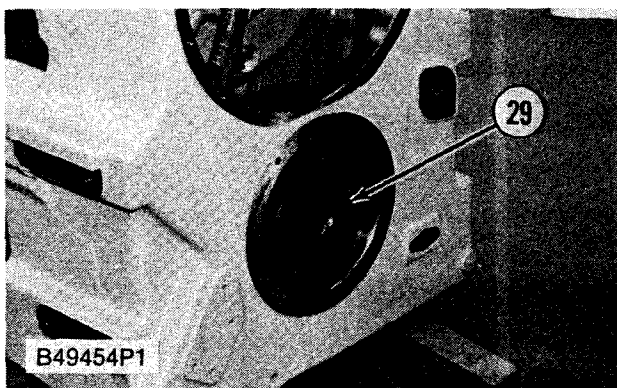


26. Remove output shaft (31) and bearing cone (32) from the case.

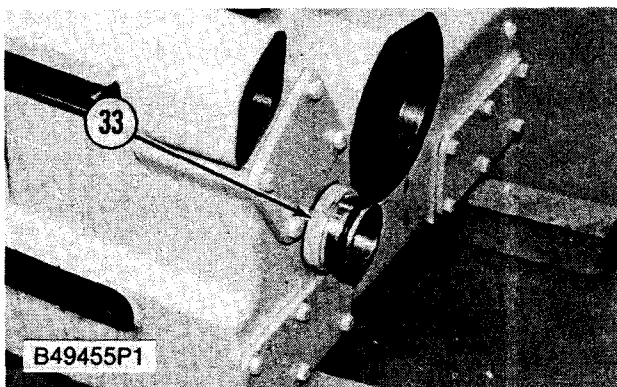


27. Use tool (C) and a press to push the output shaft from bearing cone (32).

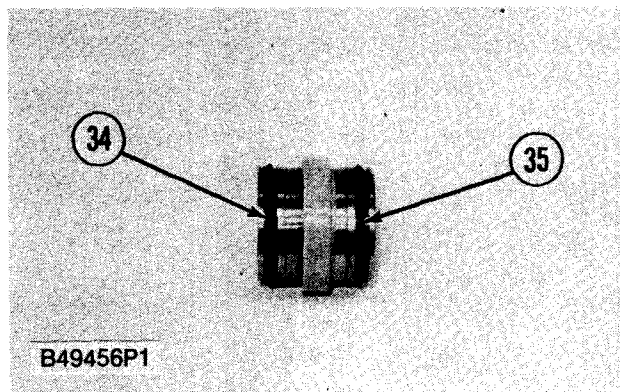
NOTE: The output shaft is free to fall when the bearing cone is removed.



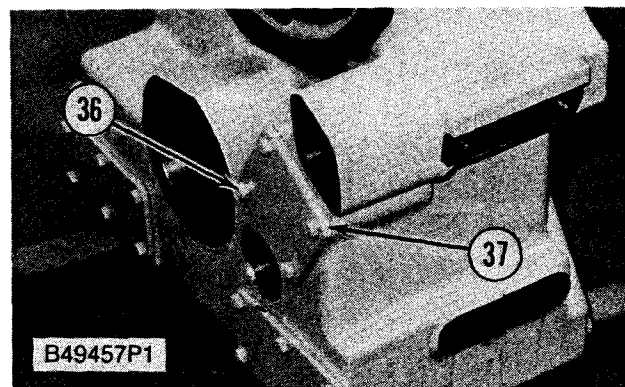
28. Remove gear (29) from the transfer gear case.



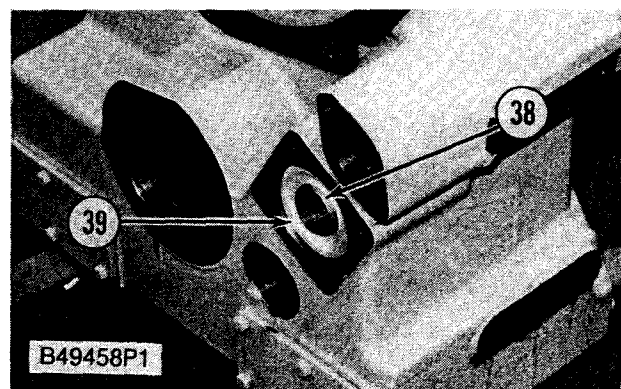
29. Remove sleeve (33) from the case.



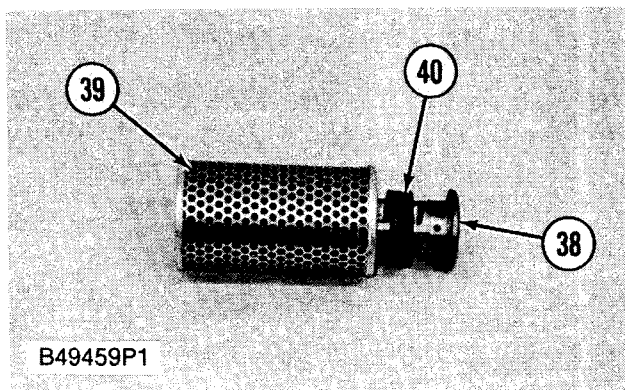
30. Remove O-ring seals (34) and (35) from the sleeve.



31. Remove bolts (36), cover (37) and the gasket from the case.



32. Remove screen (39) and tube (38) from the case.

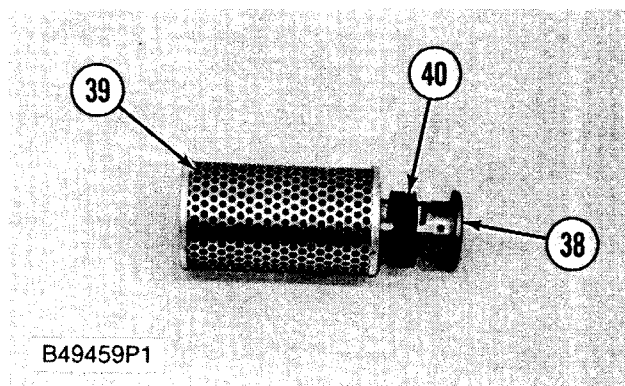


33. Make a separation of screen (39) from tube (38).

34. If necessary, remove magnets (40) from the tube.

Assemble Transfer Gears 3159-016

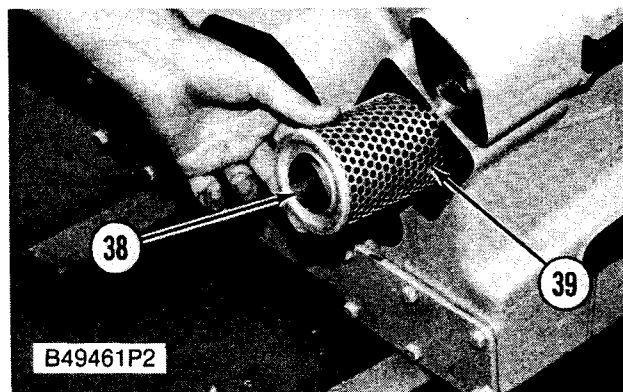
Tools Needed		A	D
1P520	Driver Group	1	
8S2328	Dial Test Indicator Group		1



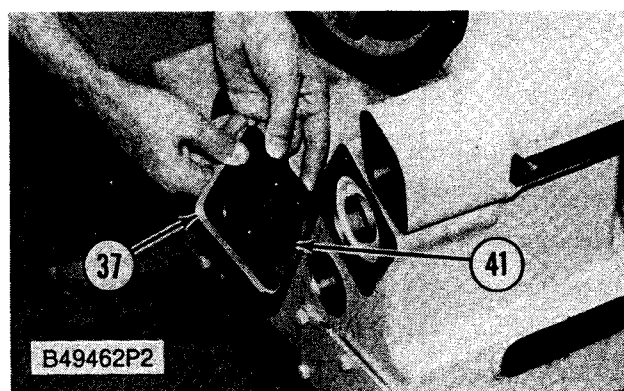
1. Make sure the magnets on the tube and the screen are clean and free of dirt and foreign material.

2. Make sure magnets (40) are in position on tube (38).

3. Install tube (38) into screen (39) as shown.

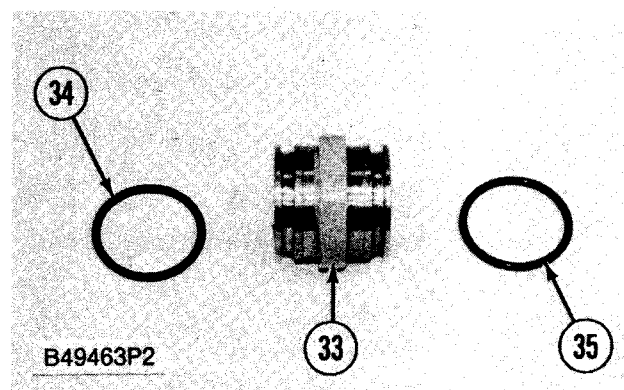


4. Install tube (38) and screen (39) into the case.



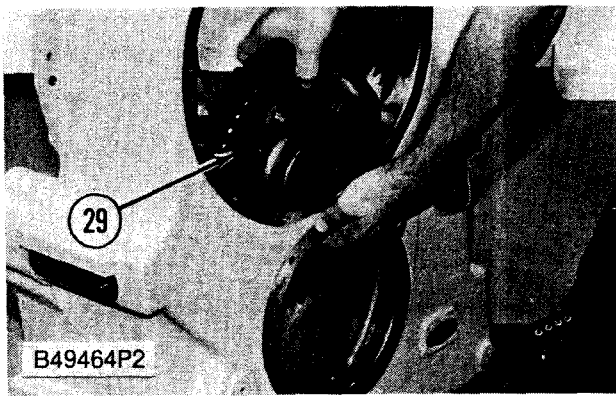
5. Put O-ring seal (41) in position on cover (37) and put clean power train oil on it.

6. Install cover (37) on the case with the four bolts.

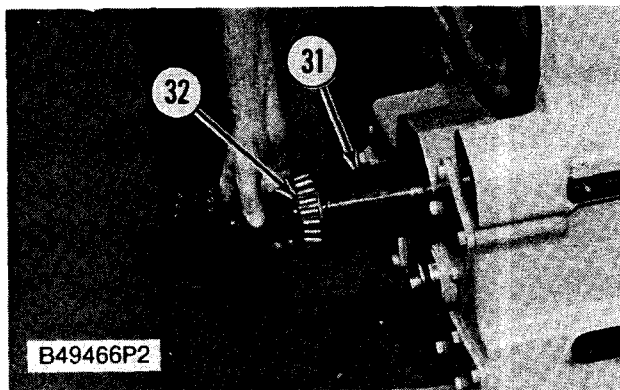


7. Install O-ring seals (34) and (35) on sleeve (33).

8. Install sleeve (33) in the case.

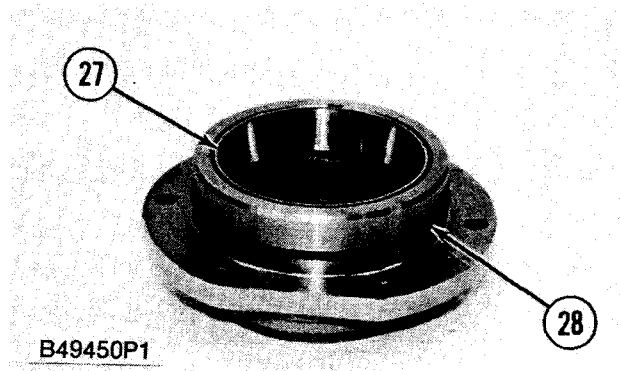


9. Put gear (29) in position in the case as shown.



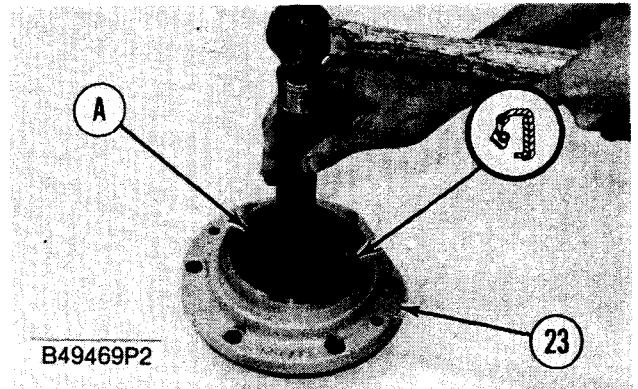
10. Heat bearing cone (32) to a maximum temperature of 135° C (275° F) and install it on output shaft (31).

11. Put the bearing and output shaft (31) in position in the case. Gear (29) must be lifted slightly to make an alignment with the output shaft.

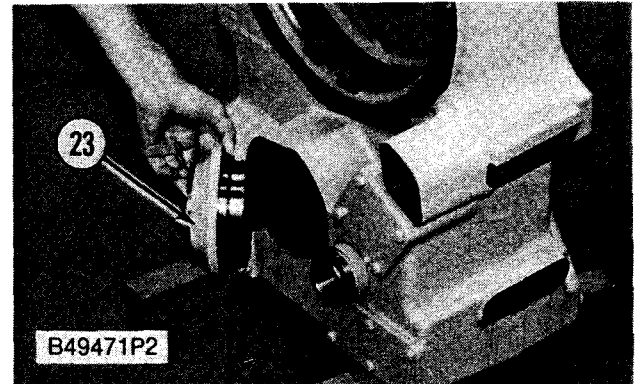


12. Lower the temperature of bearing cup (27) and install it in cage (23).

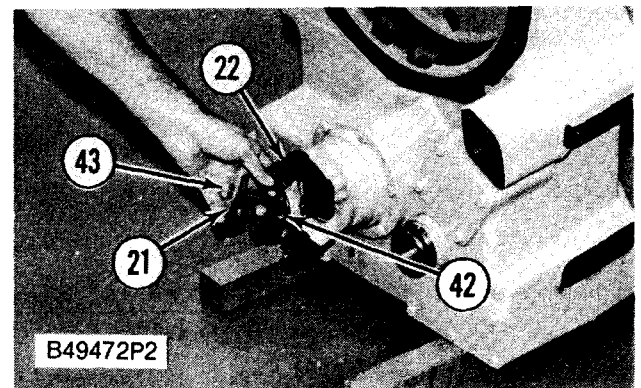
13. Install O-ring seal (28) on the cage.



14. Put 7M7260 Liquid Gasket Material in the seal bore in cage (23) and let it dry. Do not put the liquid gasket material on the lip of the seal case. Use tooling (A) and install the seal in cage (23) with the lip of the seal toward the inside as shown. Put clean power train oil on the lip of the seal.

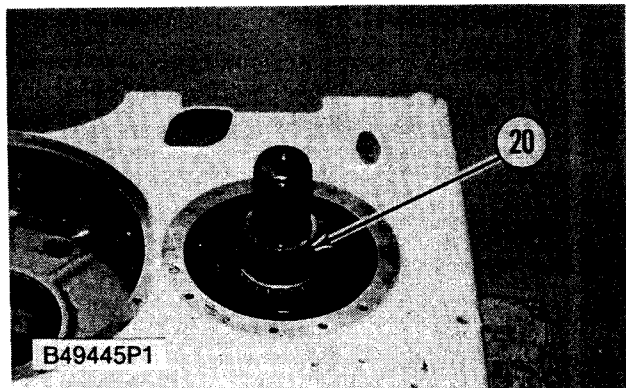


15. Put clean power train oil on the O-ring seal and install cage (23) on the case.



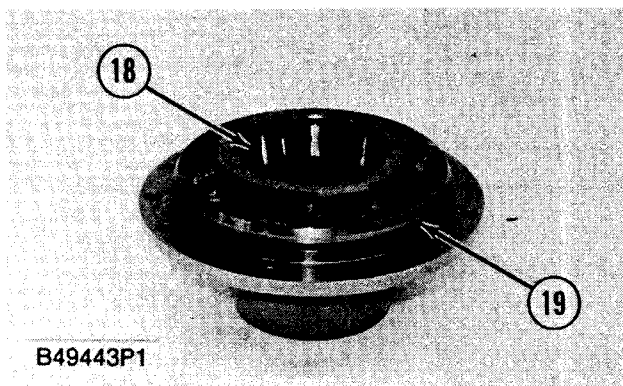
16. Install yoke (22) on the end of the output shaft.

17. Install O-ring seal (42), retainer (21) and bolt (43) on the end of yoke (22). Put clean power train oil on the O-ring seal. Tighten the bolt to a torque of 110 ± 10 N•m (80 ± 7 lb.ft.).



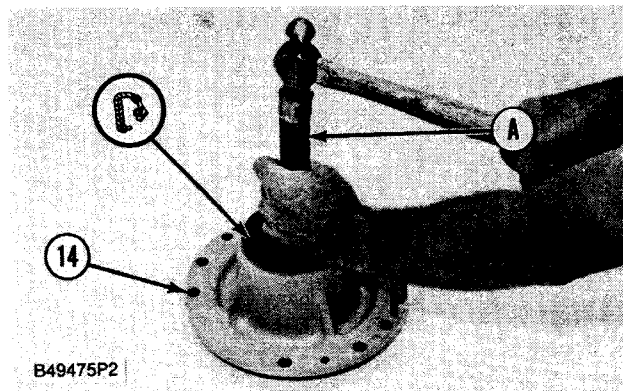
18. Use a hoist and put the transfer gear case in a horizontal position.

19. Install spacer (20) on the end of the output shaft.



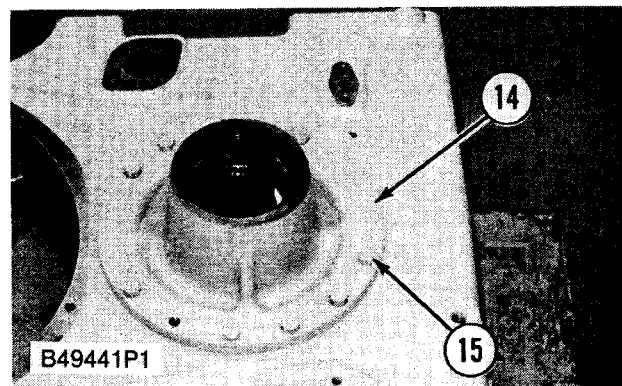
20. Lower the temperature of bearing cup (18) and install it in cage (14).

21. Install O-ring seal (19) on cage (14).

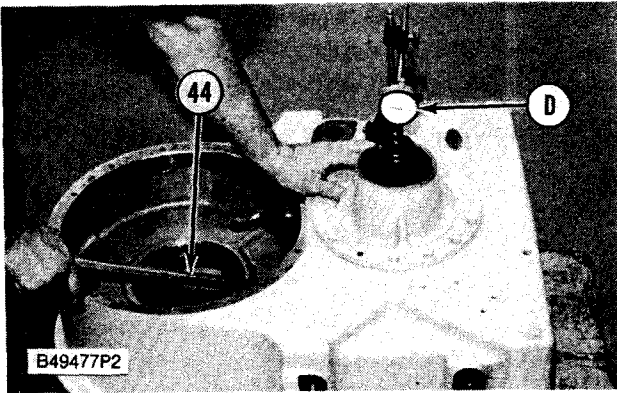


22. Put 7M7260 Liquid Gasket Material in the seal bore in cage (14) and let it dry. Do not put the liquid gasket material on the lip of the seal case. Use tooling (A) and install the seal in cage (14) with the lip of the seal toward the inside as shown. Put clean power train oil on the lip of the seal.

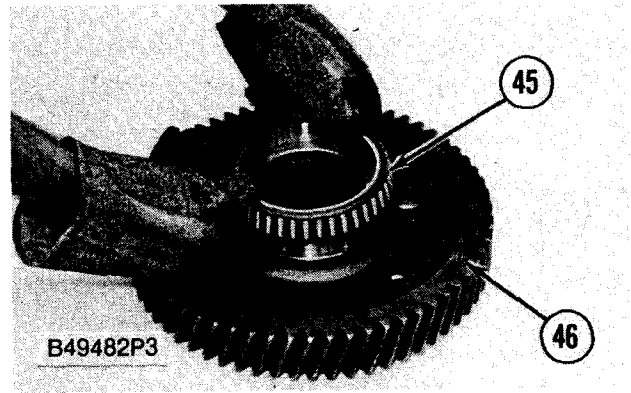
23. The bearing axis must be in a vertical position for the correct bearing adjustment.



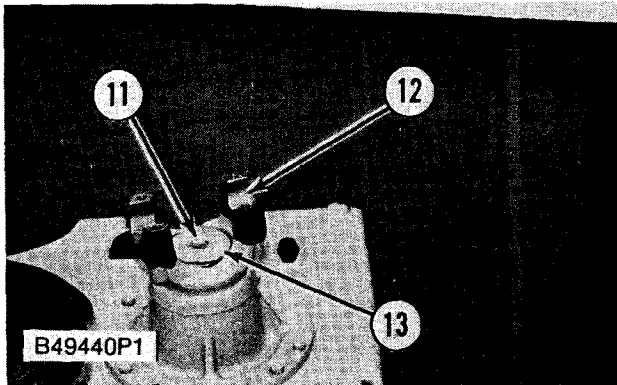
24. Install the original shims and cage (14) on the case with bolts (15).



25. Use tool (D) and a pry bar (44) to check bearing end play. Add or remove shims to get a bearing end play of 0.05 to 0.15 mm (.002 to .006 in.).

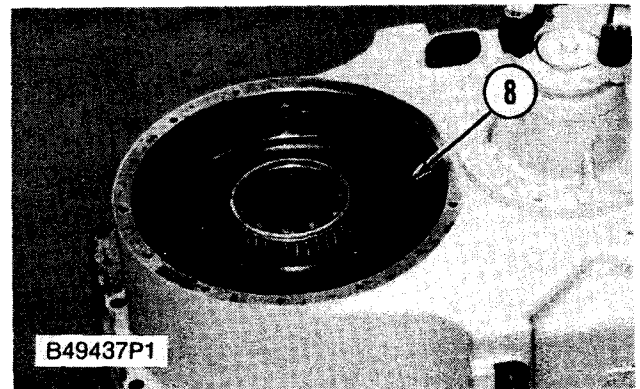


29. Heat bearing cones (45) to a maximum temperature of 135° C (275° F) and install them on each side of gear (46).

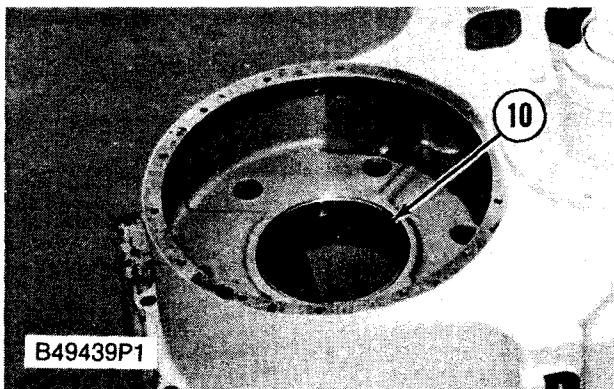


26. Install yoke (12) on the output shaft.

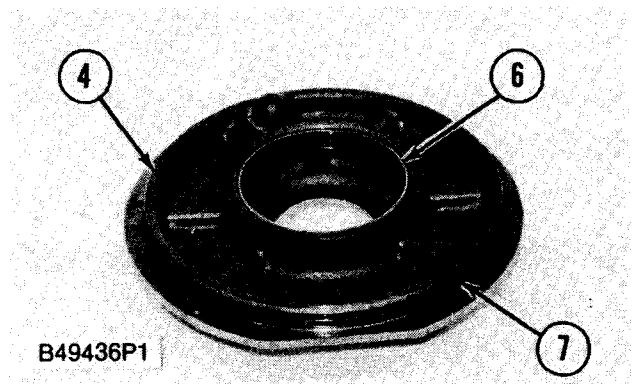
27. Put clean power train oil in the bore and on the O-ring seal. Install the O-ring seal, retainer (13) and bolt (11) on the end of the output shaft. Tighten the bolt to a torque of $110 \pm 10 \text{ N}\cdot\text{m}$ ($80 \pm 7 \text{ lb}\cdot\text{ft.}$).



30. Install gear (8) in the case as shown.

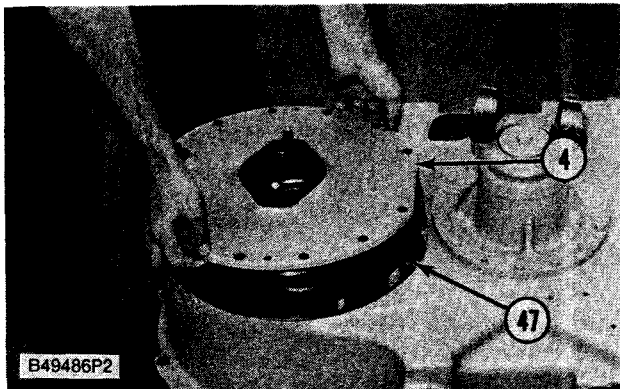


28. Lower the temperature of bearing cup (10) and install it in the case.



31. Lower the temperature of bearing cup (6) and install it in cage (4).

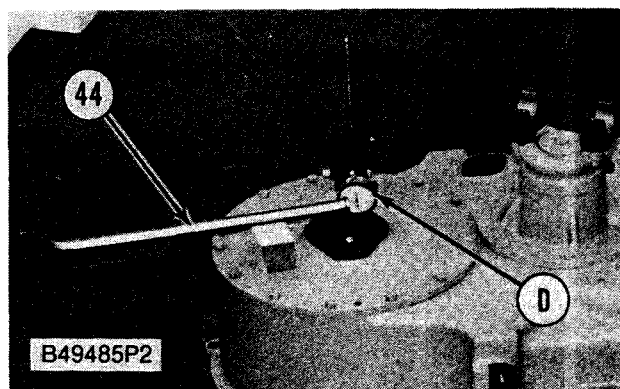
32. Put clean power train oil on O-ring seal (7) and install it on cage (4).



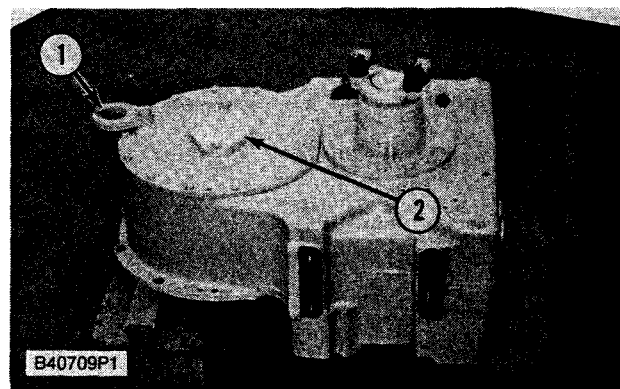
End By:

a. connection of transmission to transfer gears (see Disassemble Transmission)

33. Install original shims (47) and cage (4) on the case as shown.



34. Use tool (D) and pry bar (44) to check bearing end play. Add or remove shims to get a bearing end play of 0.05 to 0.15 mm (.002 to .006 in.)



35. Install plate (1) on the cage as shown.

36. Install the gasket and cover (2) on the cage as shown.