

Product: MOTOR GRADER

Model: 120M 2 MOTOR GRADER R9N

Configuration: 120M Series 2 Motor Grader R9N00001-UP (MACHINE) POWERED BY C7.1 Engine

Disassembly and Assembly 120M Series 2 Motor Grader Power Train

Media Number -KENR9467-02

Publication Date -01/05/2017

Date Updated -16/05/2017

i04552113

Transmission - Disassemble

SMCS - 3030-015; 3159-015; 3176-015

Disassembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	3
B	308-3471	Jack Stand Gp	3
C	1U-9202	Lever Puller Hoist	1
D	1P-1863	Retaining Ring Pliers	1
E	308-3470	Jack Stand Gp	2
F	140-7742	Sleeve	1
G	154-6181	Forcing Bolt	2
H	FT-2769	Table	1
J	4C-8156	Lifting Fixture	1
K	1U-6410	Three Jaw Puller	1
	1P-0510	Driver Gp	1
L	9U-7480	Compressing Tube	1
	5C-7201	Nut	1
	8T-4224	Hard Washer	1
	-		1

		Bolt M10 - 1.5 by 460mm	
M	8B-7548	Push-Puller Tool Gp	1
N	2P-8312	Retaining Ring Pliers	1
P	1P-2321	Combination Puller	1
	1P-0510	Driver Gp	1
R	189-0408	Shackle As	1
	3E-3882	Eyebolt	1
S	126-7175	Push-Puller Tool Gp	1
	4C-5653	Threaded Adapter	1
	1P-0510	Driver Gp	1

Start By:

- a. Remove the transmission.
- b. Remove the gear pump (transmission charging and scavenge).

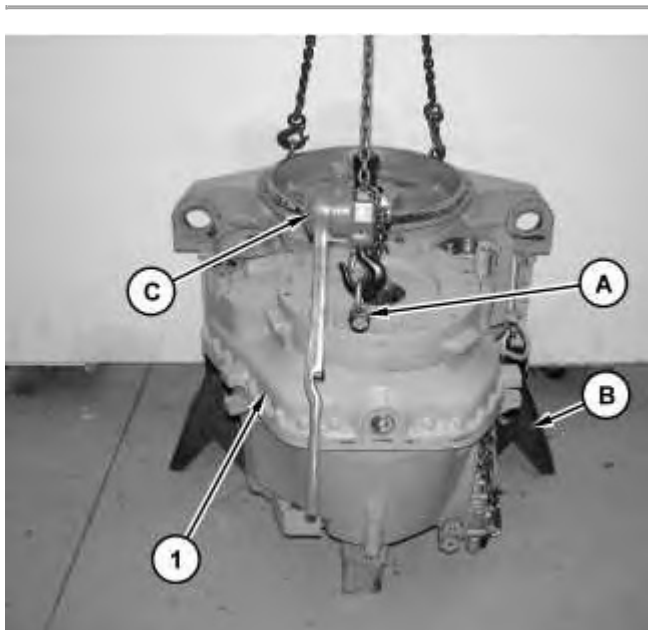


Illustration 1

g01386579

1. Use Tooling (A), Tooling (C), and a suitable lifting device to position transmission (1) onto Tooling (B) and suitable cribbing. The weight of transmission (1) is approximately 907 kg (2000 lb).

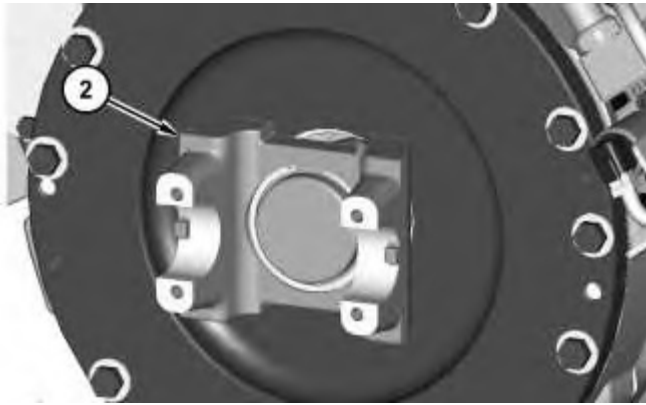


Illustration 2

g02728408

2. Remove yoke assembly (2).

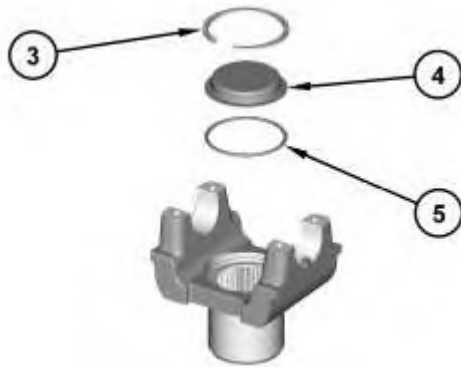


Illustration 3

g02728411

3. Remove retaining ring (3).
4. Remove cup (4). Remove O-ring seal (5).



Illustration 4

g02728429



WARNING

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

Make sure to wear all necessary protective equipment.

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

5. Remove bolts (6) in order to remove plate assembly (7).

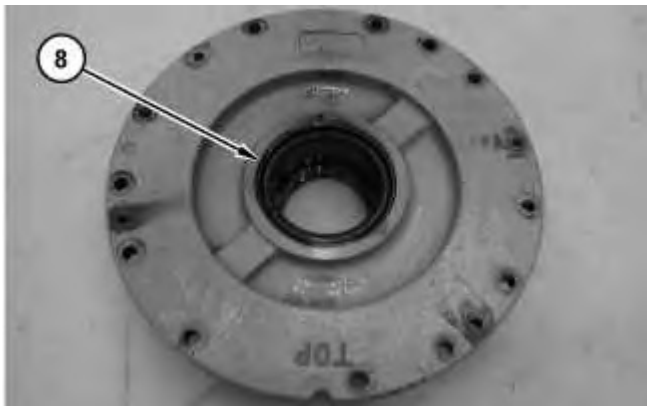


Illustration 5

g02728428

6. Remove lip seal (8).

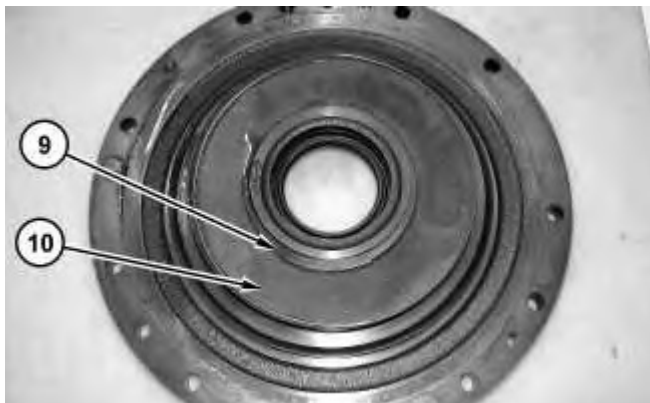


Illustration 6

g02728434

7. Use Tooling (D) to remove retaining ring (9). Remove coned disc springs (10).

Note: Note the orientation of coned disc springs (10) for assembly purposes.

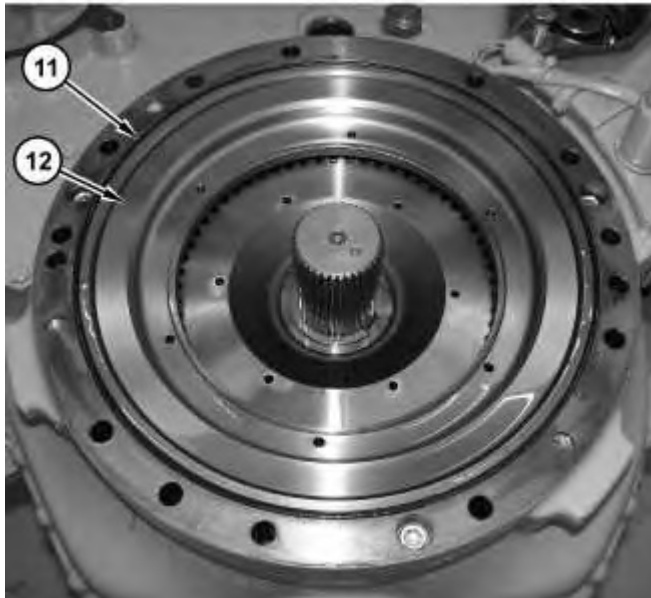


Illustration 7

g02728437

8. Remove O-ring seal (11) and piston (12).

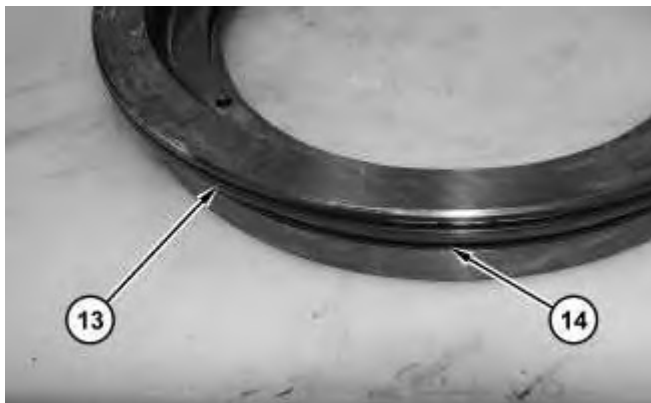


Illustration 8

g02728440

9. Remove piston seal (13). Remove piston seal (14).

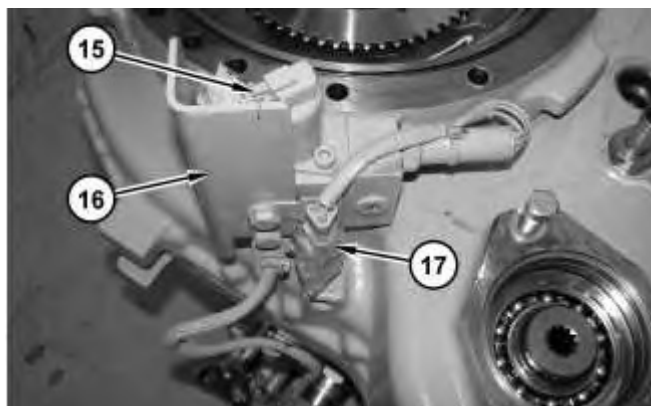


Illustration 9

g02728441

10. Disconnect harness assembly (15) and harness assembly (16). Remove guard (17).

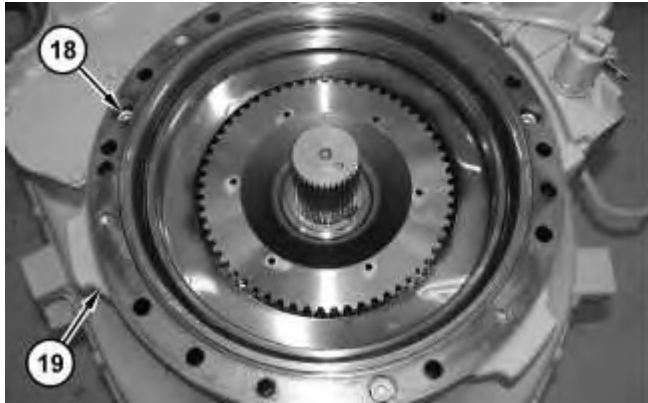


Illustration 10

g02728443

11. Remove bolts (18). Use two people in order to remove housing (19). The weight of housing (19) is approximately 20 kg (45 lb).

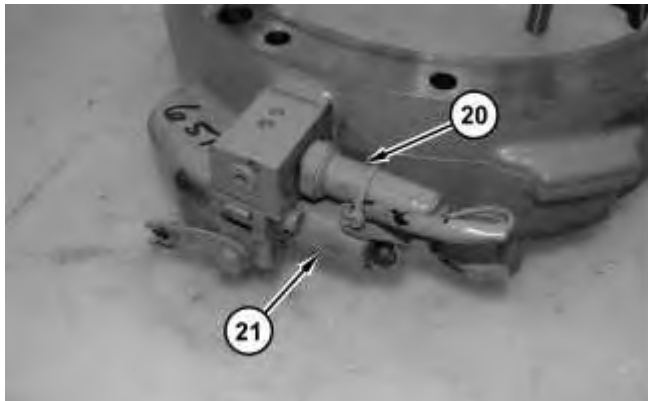


Illustration 11

g02728445

12. Remove pressure sensor (20) and the O-ring seal. Remove solenoid (21).



Illustration 12

g02728446

13. Remove O-ring seal (22), O-ring seal (23), O-ring seal (24), O-ring seals (25).



Illustration 13

g02728456

14. Remove seal (26).

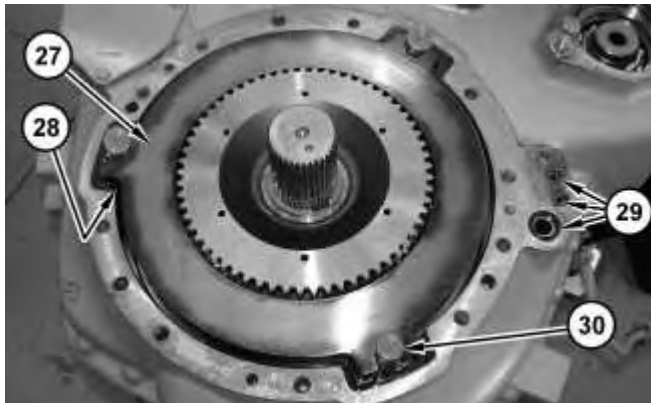


Illustration 14

g02728457

15. Remove friction discs (27) and clutch plates (28).

Note: Note the quantity and the order of friction discs (27) and clutch plates (28) for assembly purposes.

16. Remove O-ring seals (29) and dowels (30).

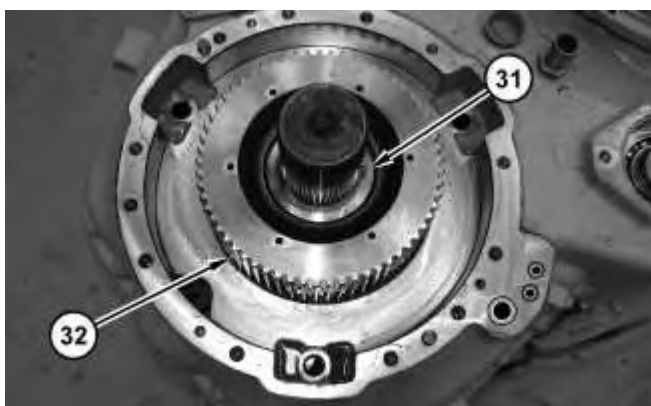


Illustration 15

g02728459

17. Remove retaining ring (31). Remove hub (32).

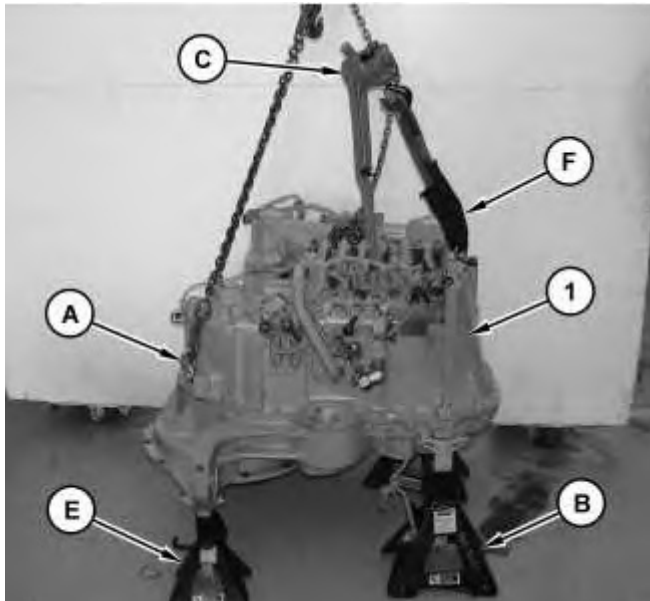


Illustration 16

g01386684

18. Attach Tooling (A), Tooling (C), Tooling (F), and a suitable lifting device to transmission (1). Use Tooling (A), Tooling (C), Tooling (F), and the suitable lifting device to position transmission (1) onto Tooling (B) and Tooling (E). The output shaft must face downward. The weight of transmission (1) is approximately 907 kg (2000 lb).

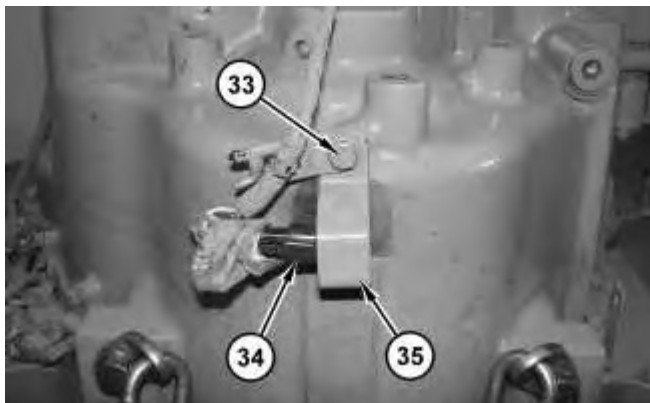


Illustration 17

g02728462

19. Remove bolt (33) to remove speed sensor (34) and guard (35).
-

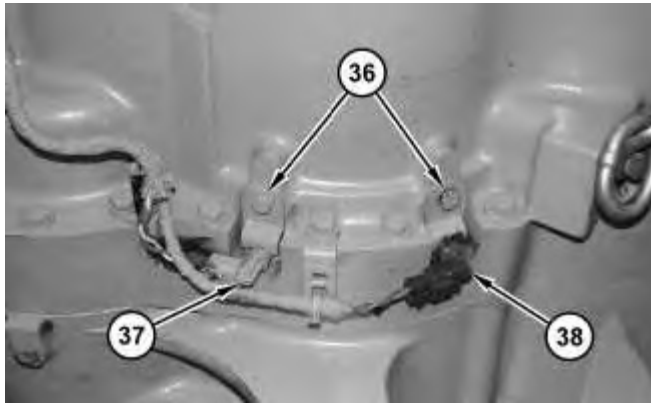


Illustration 18

g02728464

20. Remove bolts (36) to remove speed sensor (37) and speed sensor (38).



Illustration 19

g02728465

21. Remove cover (39).

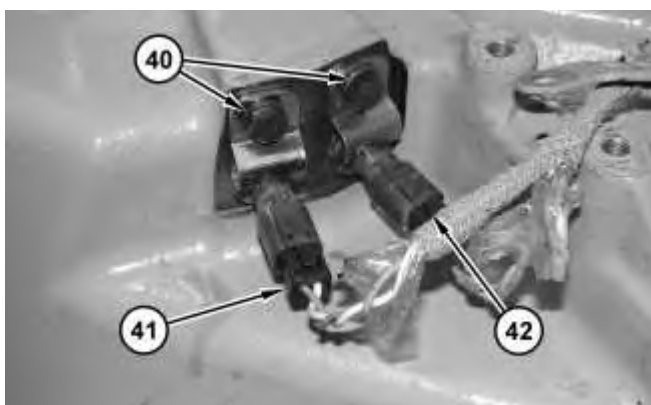


Illustration 20

g02728468

22. Remove bolts (40) to remove speed sensor (41) and speed sensor (42).

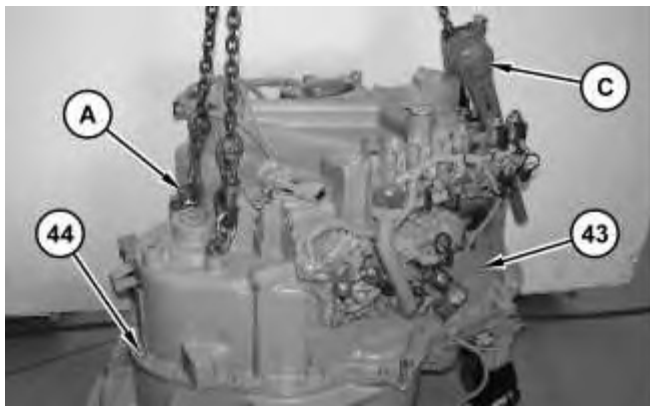


Illustration 21

g02728472

23. Attach Tooling (A), Tooling (C), and a suitable lifting device to housing (43). The weight of housing (43) is approximately 136 kg (300 lb). Remove bolts (44).
24. Use Tooling (A), Tooling (C), and the suitable lifting device in order to remove housing (43).

Note: If necessary, use Tooling (G) to assist in the removal of housing (43).

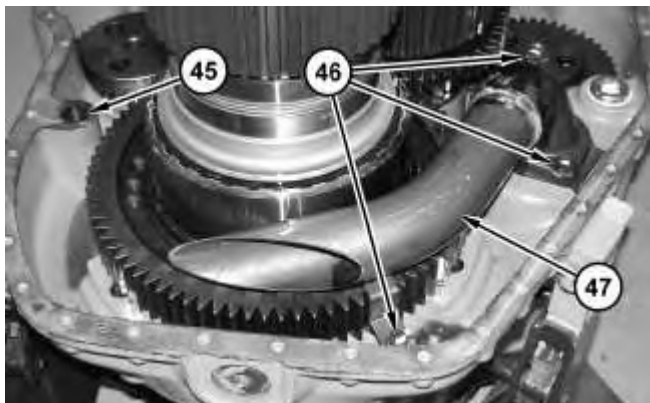


Illustration 22

g02728474

25. Remove O-ring seal (45). Remove bolts (46) and the locks. Remove tube assembly (47) and the O-ring seal.

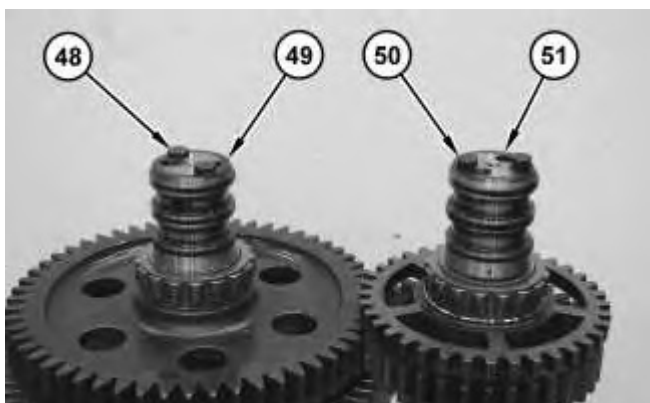


Illustration 23

g02728475

26. Remove bolts (48) in order to remove seal carrier (49). Remove bolts (50) in order to remove seal carrier (51).



Illustration 24

g02728476

27. Remove seal rings (52). Remove O-ring seals (53). Repeat this step for the remaining seal carrier.

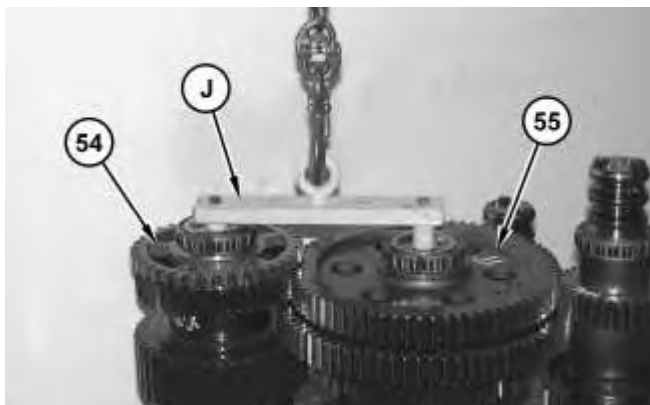


Illustration 25

g02728477

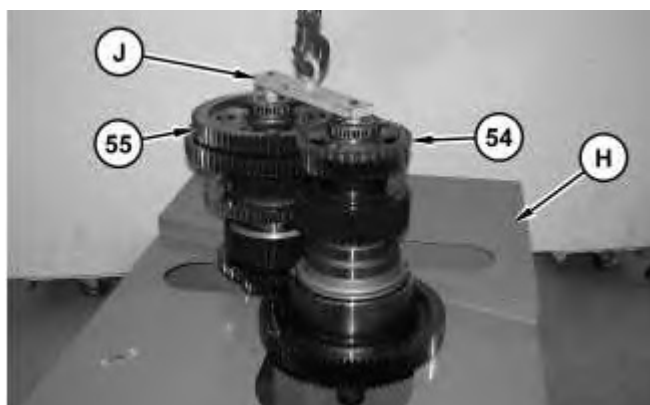


Illustration 26

g02728478

28. Use Tooling (J) and a suitable lifting device in order to remove clutch assembly (54) and clutch assembly (55). The combined weight of clutch assembly (54) and clutch assembly (55) is approximately 163 kg (360 lb).
29. Position clutch assembly (54) and clutch assembly (55) onto Tooling (H). If necessary, support clutch assembly (55) with suitable cribbing.
30. Remove Tooling (J) in order to separate clutch assembly (54) from clutch assembly (55).

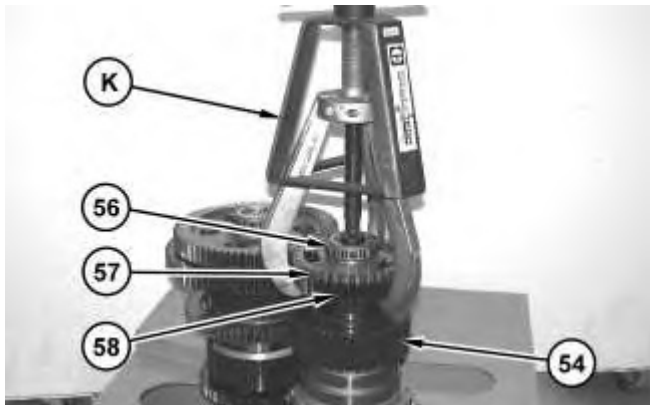


Illustration 27

g02728480

31. Use Tooling (K) in order to remove bearing (56) and rotor (57) from clutch assembly (54).

Note: Be sure to attach Tooling (K) to gear assembly (58) in order to prevent damage to rotor (57).



Illustration 28

g02728481

32. Remove thrust washer (59) and gear assembly (60).

Note: Note the orientation of thrust washer (59) for assembly purposes.



Illustration 29

g02728482

33. Remove bearing sleeves (61) from gear assembly (60).



Illustration 30

g02728483

34. Remove thrust washer (62).

Note: Note the orientation of thrust washer (62) for assembly purposes.

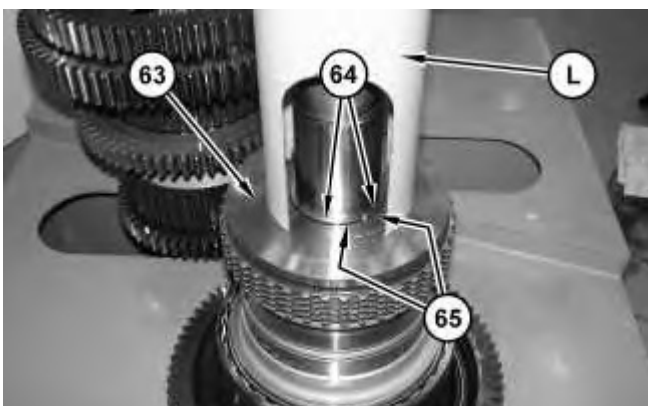


Illustration 31

g02728484

WARNING

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

Make sure to wear all necessary protective equipment.

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

35. Use Tooling (L) in order to compress hub assembly (63). Remove lock rings (64) and two half rings (65) (not shown).

Note: Note the orientation of lock rings (64) and two ring halves (65) for assembly purposes.

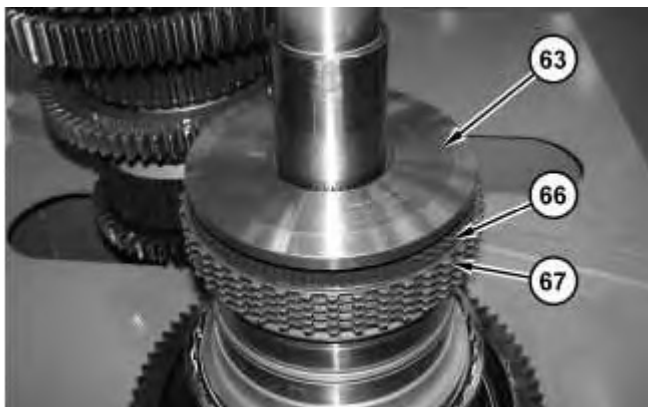


Illustration 32

g02728486

36. Remove hub assembly (63), friction discs (66), and clutch plates (67).

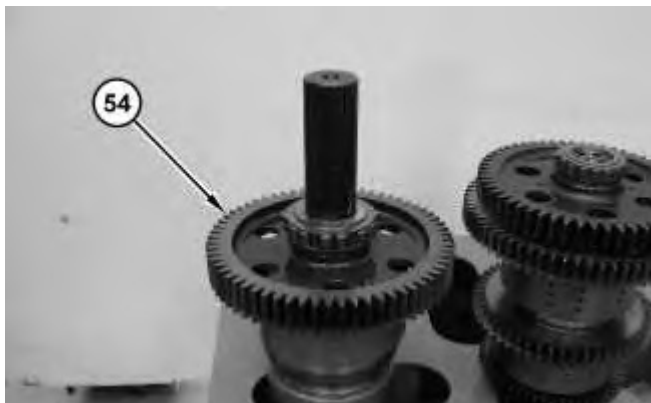
Note: Note the order of friction discs (66) and clutch plates (67) for assembly purposes.



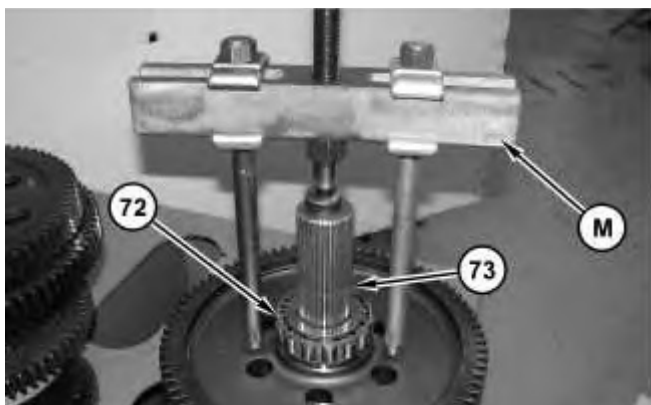
37. Remove wave spring (68) and piston (69).
-



38. Remove seal rings (70) and (71) from piston (69).
-



39. Use a suitable lifting device to turn over clutch assembly (54). The weight of clutch assembly (54) is approximately 59 kg (130 lb).
-



WARNING

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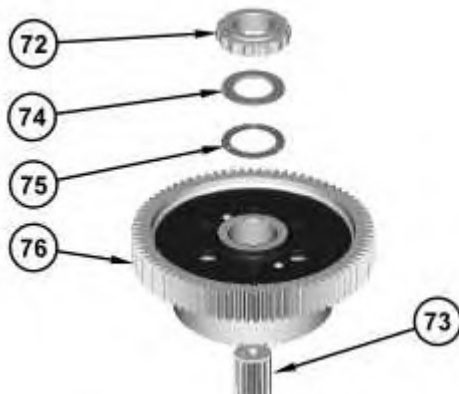


Illustration 37

g02728643

40. Use Tooling (M) to remove bearing (72) from shaft (73). Remove thrust washer (74), thrust disc (75), and gear assembly (76).

Note: Note the orientation of thrust disc (75) for assembly purposes.

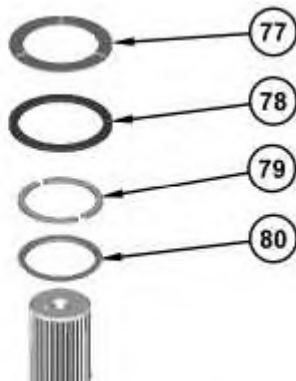


Illustration 38

g02728646

41. Remove thrust disc (77), washer (78), half rings (79), and lock rings (80).

Note: Note the orientation of thrust disc (77) for assembly purposes.

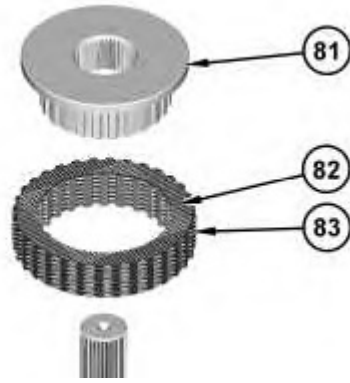


Illustration 39

g02728655

42. Remove hub assembly (81). Remove friction discs (82) and clutch plates (83).

Note: Note the orientation of friction discs (82) and clutch plates (83) for assembly purposes.

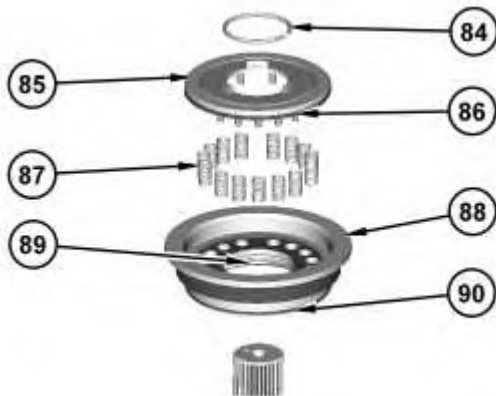


Illustration 40

g02728657

43. Use Tooling (N) in order to remove retaining ring (84).
 44. Remove balance piston (85). Remove seal ring (86) from balance piston (85).
 45. Remove springs (87).
 46. Remove piston (88). Remove seal rings (89) and (90) from piston (88).
-



Illustration 41

g02728663

47. Use Tooling (K) in order to remove inner bearing (91) from clutch assembly (55). Remove thrust disc (92) and gear (93).

Note: Note the orientation of thrust disc (92) for assembly purposes.

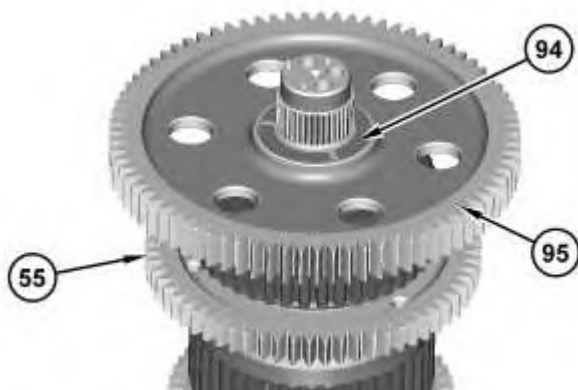


Illustration 42

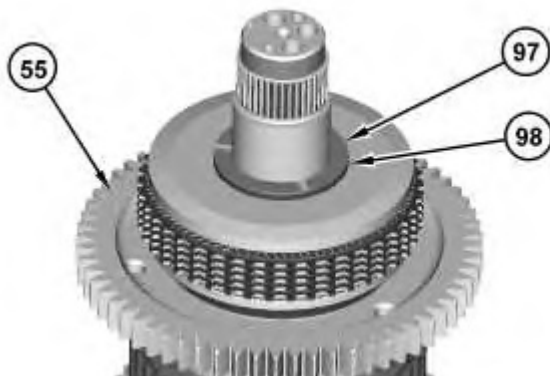
g02728664

48. Remove thrust disc (94) and gear assembly (95) from clutch assembly (55).

Note: Note the orientation of thrust disc (94) for assembly purposes.

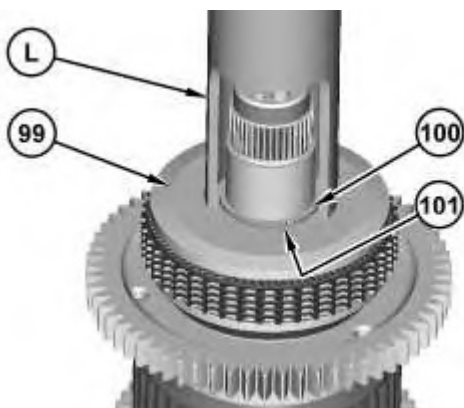


49. Remove sleeve bearing (96) from gear assembly (95).
-



50. Remove thrust disc (97) and washer (98) from clutch assembly (55).

Note: Note the orientation of thrust disc (97) for assembly purposes.



WARNING

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Make sure to wear all necessary protective equipment.

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

51. Use Tooling (L) in order to compress hub assembly (99). Remove lock rings (100) and two half rings (101) (not shown).

Note: Note the orientation of lock rings (100) and two ring halves (101) for assembly purposes.

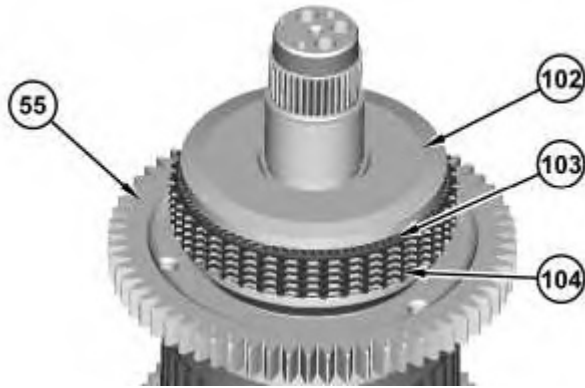


Illustration 46

g02728688

52. Remove hub assembly (102), friction discs (103), and clutch plates (104) from clutch assembly (55).

Note: Note the orientation of friction discs (105) and clutch plates (106) for assembly purposes.

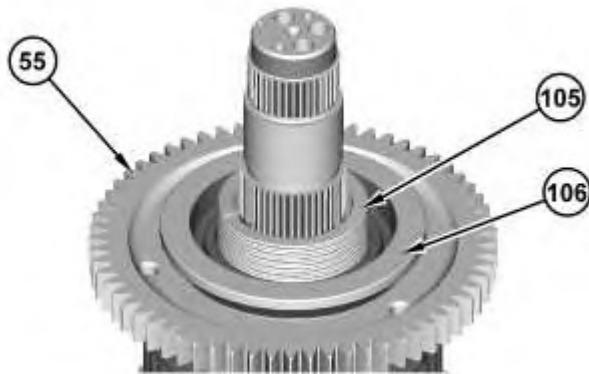


Illustration 47

g02728691

53. Remove wave spring (105) and piston (106) from clutch assembly (55).
-

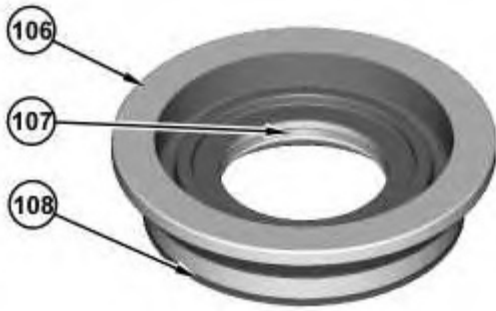


Illustration 48

g02728692

54. Remove seal rings (107) and (108) from piston (106).

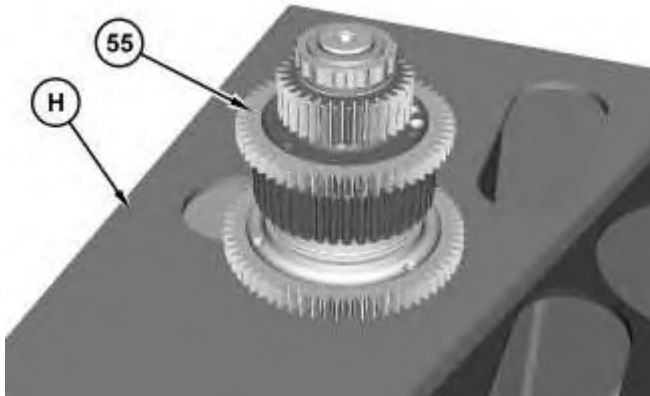


Illustration 49

g02728697

55. Use a suitable lifting device to turn over clutch assembly (55) onto Tooling (H). The weight of clutch assembly (55) is approximately 54 kg (120 lb).

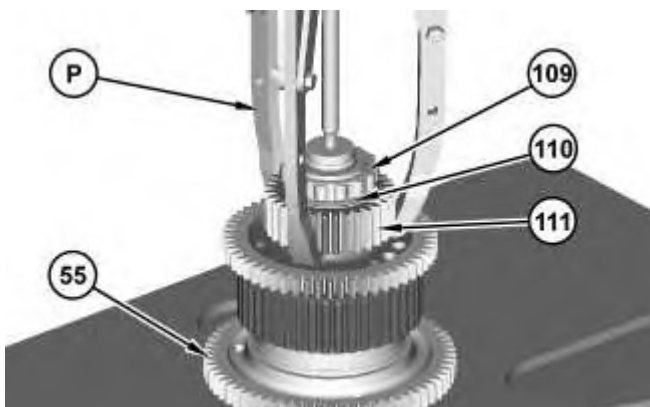


Illustration 50

g02728700

56. Use Tooling (P) in order to remove inner bearing (109), thrust disc (110), and gear (111) from clutch assembly (55).

Note: Note the orientation of thrust disc (110) for assembly purposes.

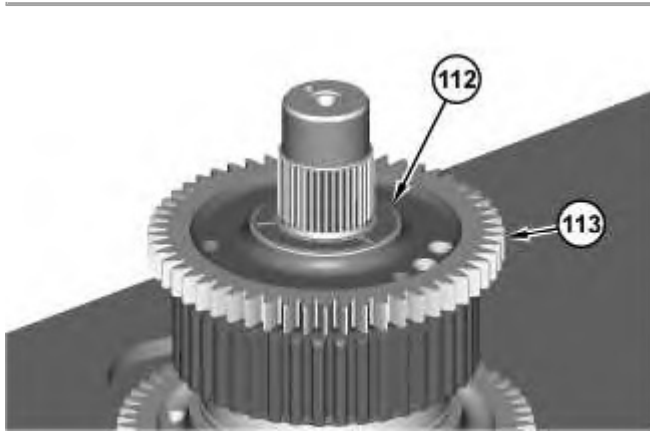


Illustration 51

g02728702

57. Remove thrust disc (112) and gear assembly (113).

Note: Note the orientation of thrust disc (112) for assembly purposes.

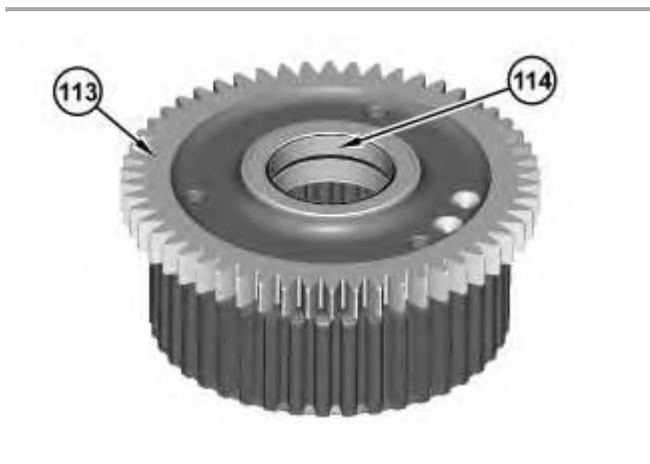
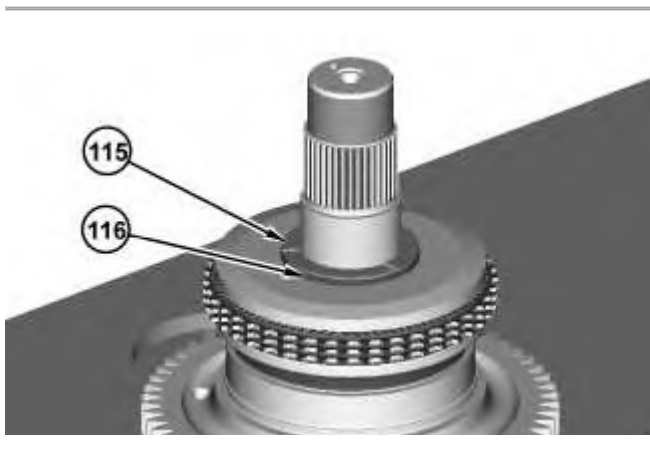


Illustration 52

g02728704

58. Remove bearing (114) from gear assembly (113).



59. Remove thrust disc (115) and washer (116).

Note: Note the orientation of thrust disc (115) for assembly purposes.

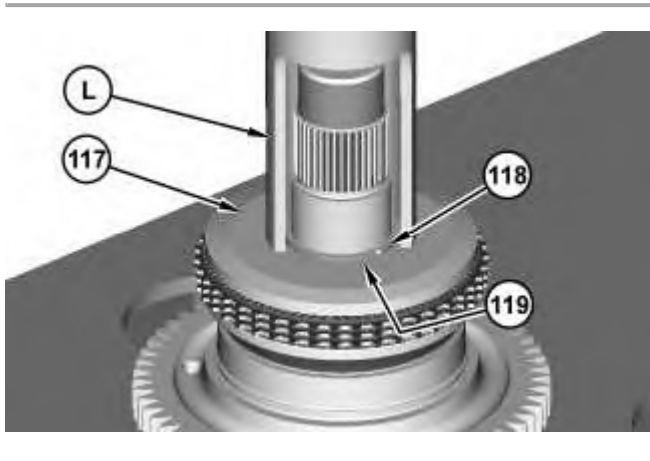


Illustration 54



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

Make sure to wear all necessary protective equipment.

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

-
60. Use Tooling (L) to compress hub assembly (117). Remove lock rings (118) and two half rings (119) (not shown).

Note: Note the orientation of lock rings (118) and two ring halves (119) for assembly purposes.

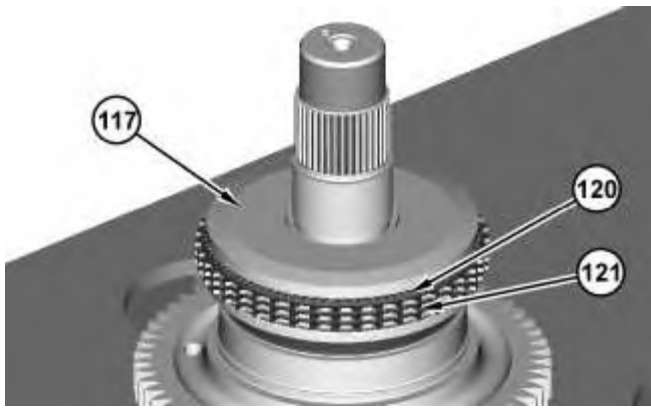


Illustration 55

g02728711

61. Remove hub assembly (117), friction discs (120), and clutch plates (121).

Note: Note the orientation of friction discs (120) and clutch plates (121) for assembly purposes.

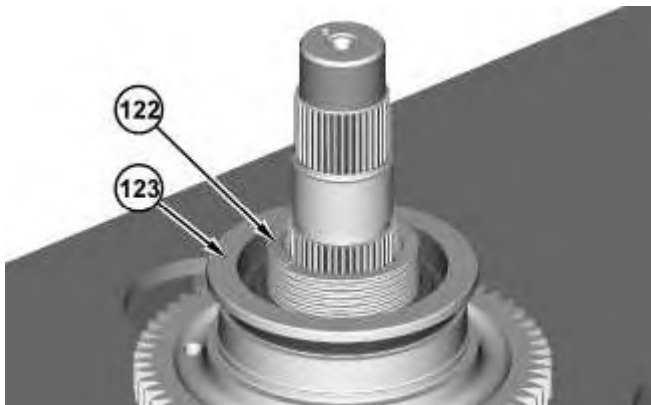


Illustration 56

g02728713

62. Remove wave spring (122) and piston (123).

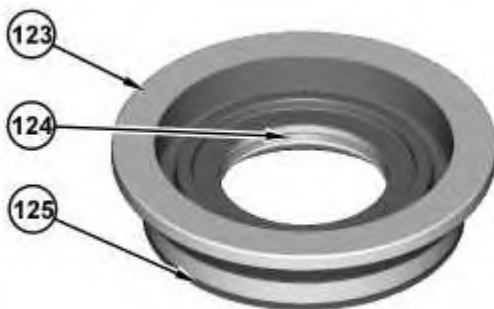


Illustration 57

g02728721

63. Remove seal rings (124) and (125) from piston (123).



Illustration 58

g02728736

64. Use Tooling (P) to remove inner bearing (126) and gear (127) from input shaft assembly (128). This step is required to remove the remaining two clutch assemblies.

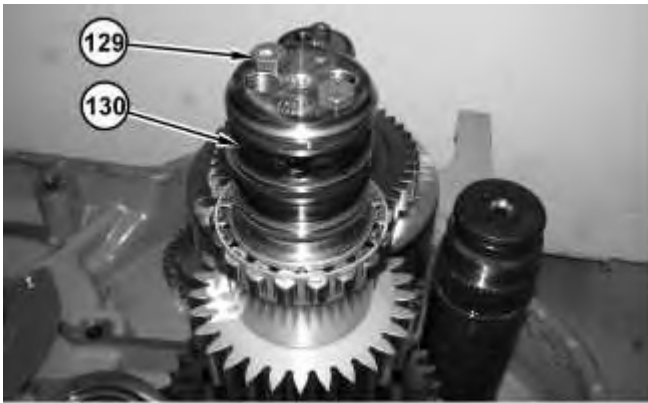


Illustration 59

g02728737

65. Remove bolts (129) to remove seal carrier (130).



Illustration 60

g02728739

66. Remove seal rings (131). Remove O-ring seals (132).
-

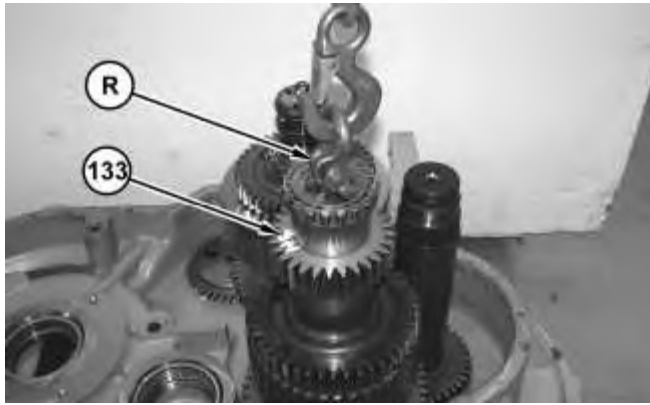


Illustration 61

g02728741

67. Attach Tooling (R) and a suitable lifting device to clutch assembly (133). The weight of clutch assembly (133) is approximately 61 kg (135 lb). Use Tooling (R) and the suitable lifting device in order to remove clutch assembly (133). Position clutch assembly (133) onto Tooling (H).

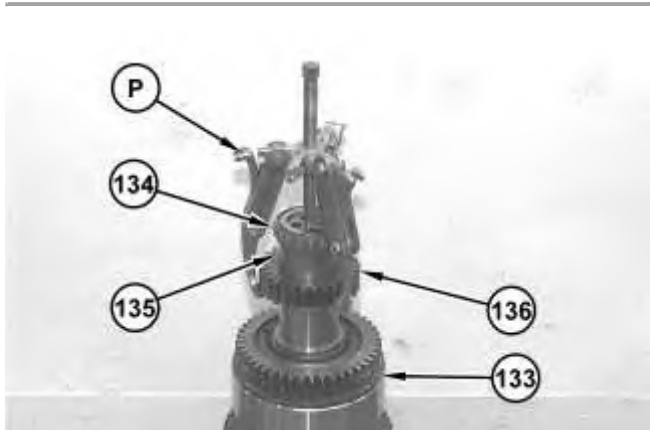


Illustration 62

g02728742

68. Use Tooling (P) in order to remove inner bearing (134), spacer (135), and gear (136) from clutch assembly (133).

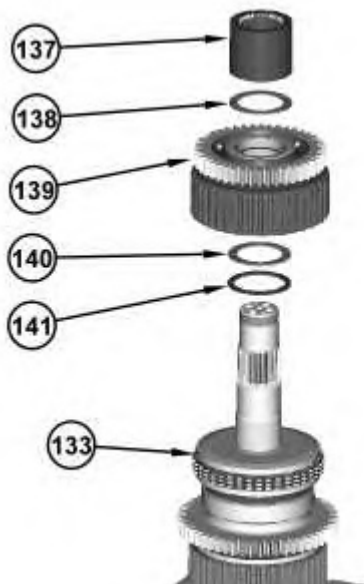


Illustration 63

g02728744

69. Remove spacer (137) and thrust disc (138) from clutch assembly (133).

Note: Note the orientation of thrust disc (138) for assembly purposes.

70. Remove gear assembly (139), thrust disc (140), and washer (141).

Note: Note the orientation of thrust disc (140) for assembly purposes.



Illustration 64

g02728746

71. Remove bearing (142) from gear assembly (139).

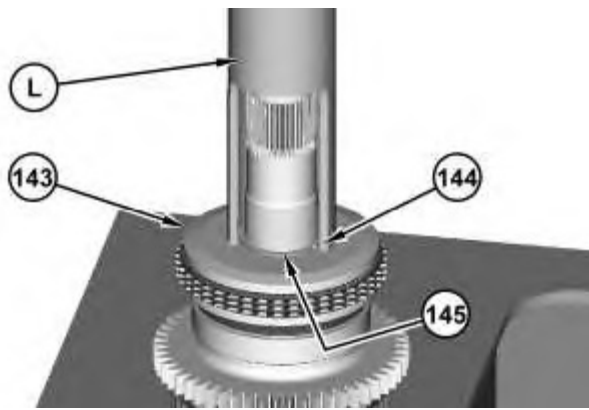


Illustration 65

g02728750

WARNING

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

Make sure to wear all necessary protective equipment.

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

-
72. Use Tooling (L) in order to compress hub assembly (143). Remove lock rings (144) and two half rings (145) (not shown).

Note: Note the orientation of lock rings (142) and two ring halves (145) for assembly purposes.

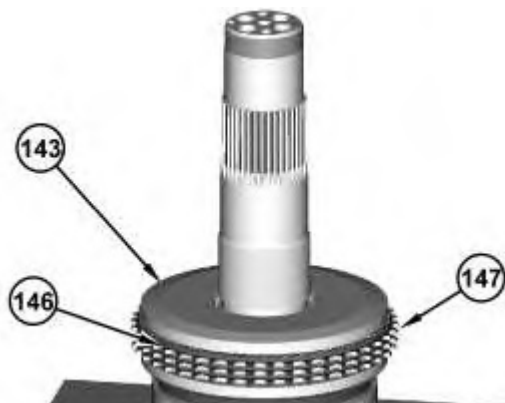


Illustration 66

g02728753

73. Remove hub assembly (143), friction discs (146), and clutch plates (147).



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