General Information

BATTERY CARE

Battery Removal and Installation (Figure 1)

1. Open the tractor hood, disconnect the battery cover attaching springs, and remove the battery cover.

⚠ WARNING

The positive battery terminal can be easily shorted to the tractor frame by a metal tool. To avoid this problem, always disconnect the negative cable first and connect it last.

2. Remove the plastic caps from the battery terminals. Disconnect the battery cables, negative cable first, by removing the two capscrews securing the cables to the terminals.
3. Loosen the capscrews that secure the battery clamp and carefully remove the battery.
4. To install the battery, follow the battery removal procedure in reverse order. Make certain the positive cable is connected first. Check the condition of the cables and replace them if necessary.

Water Level

The battery water level should be checked every 25 hours of operation. Remove the battery cover and all battery caps, and check that the water level is up to the marking ring.

NOTE

Do not allow the water level in the battery to fall below the top of the plates.

Fill each battery cell to the marking ring with distilled water. If distilled water is not available, clean tap water may be used. Before replacing the battery caps, make sure the vent holes are free of dirt and grease. Make sure that the entire top of the battery is clean.

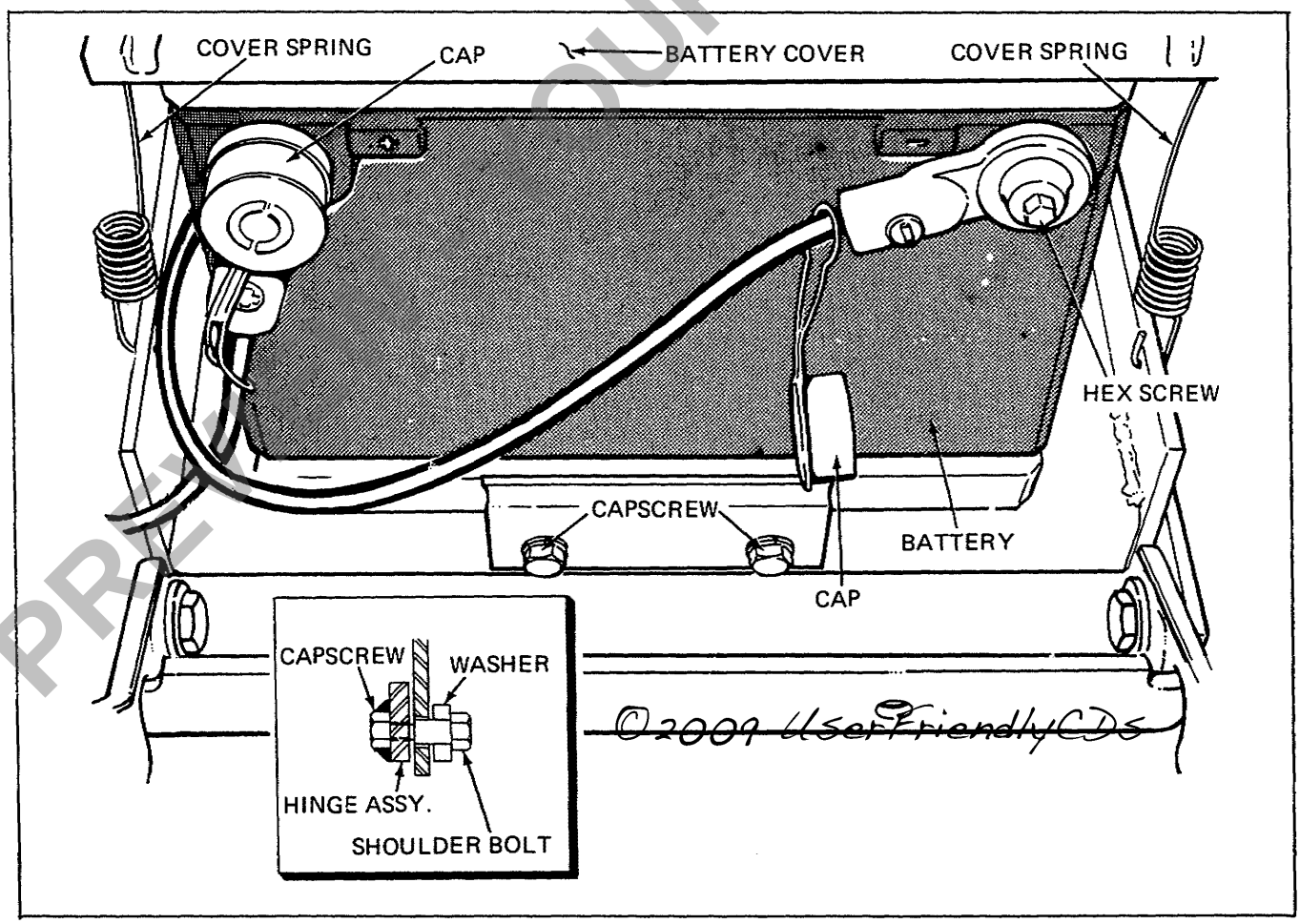


Figure 1. Battery Removal and Installation

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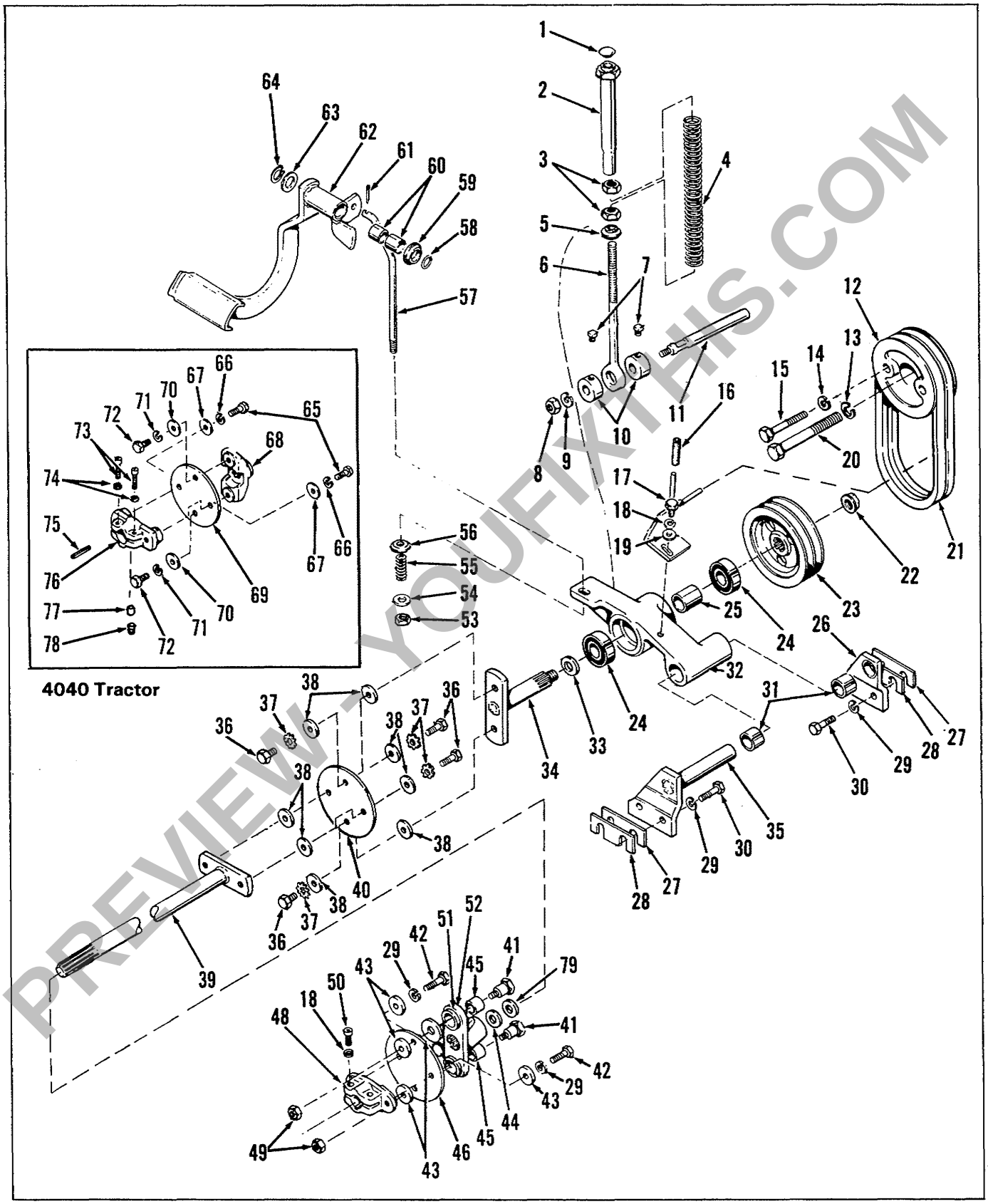


Figure 26. Clutch and Drive Shaft

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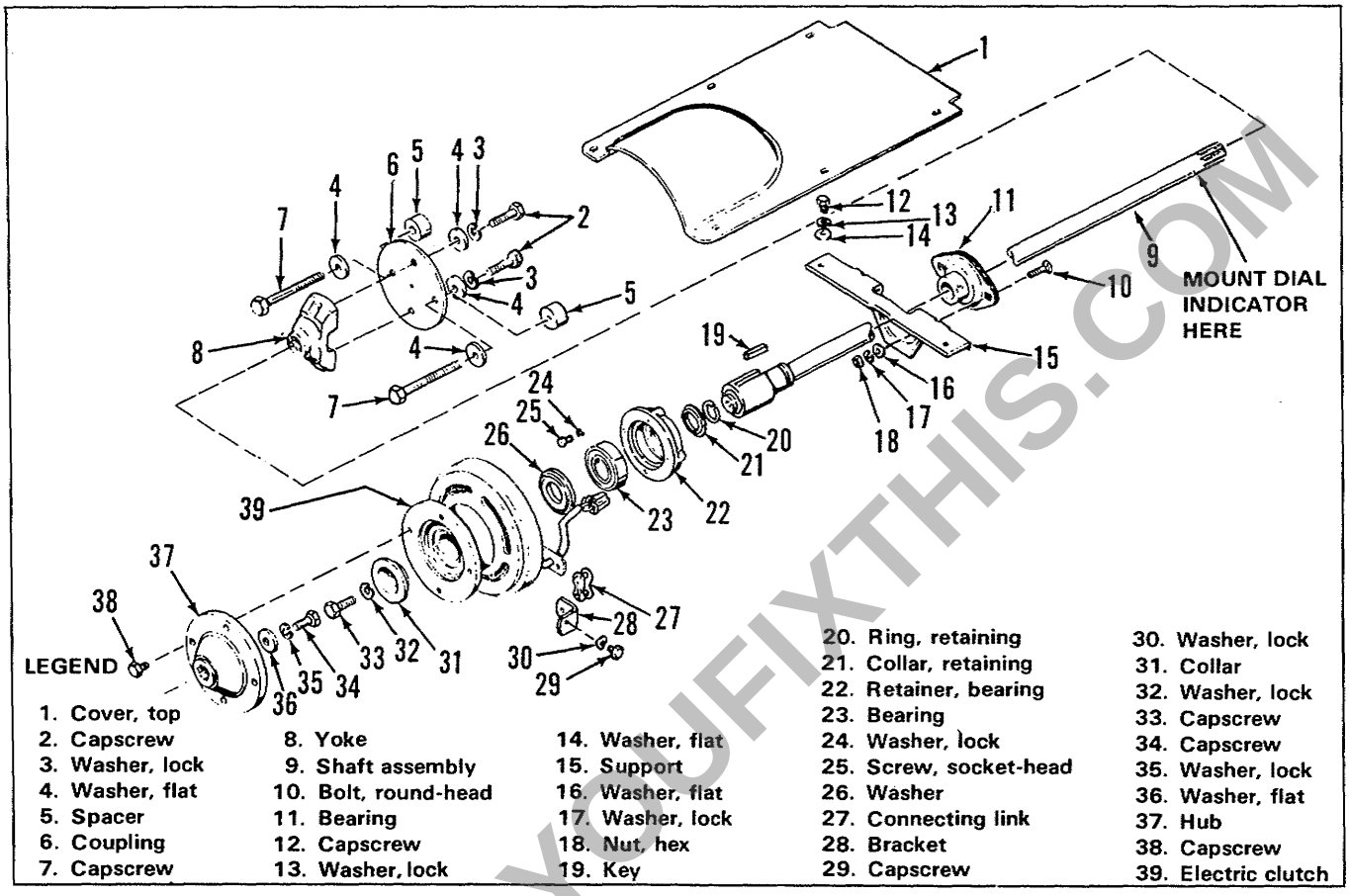
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LEGEND

1. Cover, top
2. Capscrew
3. Washer, lock
4. Washer, flat
5. Spacer
6. Coupling
7. Capscrew
8. Yoke
9. Shaft assembly
10. Bolt, round-head
11. Bearing
12. Capscrew
13. Washer, lock
14. Washer, flat
15. Support
16. Washer, flat
17. Washer, lock
18. Nut, hex
19. Key
20. Ring, retaining
21. Collar, retaining
22. Retainer, bearing
23. Bearing
24. Washer, lock
25. Screw, socket-head
26. Washer
27. Connecting link
28. Bracket
29. Capscrew
30. Washer, lock
31. Collar
32. Washer, lock
33. Capscrew
34. Capscrew
35. Washer, lock
36. Washer, flat
37. Hub
38. Capscrew
39. Electric clutch

Figure 35. Rear PTO Drive Unit (4040)

12. Block the clutch hub with a large wrench or crowbar and remove the four 5/16-18 x 1 inch long taptite screws (38, Figure 35; 35, Figure 36) securing the clutch to the clutch hub.
13. Remove the two 3/8-16 x 3-1/2 inch long capscrews (7, Figure 35; 9, Figure 36), lockwashers (3, Figure 36), flat washer (4, Figure 35 and 36) and spacers (5, Figure 35 and 36) securing the PTO coupling to the engine flywheel.
14. On the 4040 tractor, loosen the yoke setscrew. Then, on all tractors, separate the shaft assembly (9, Figure 35; 15, Figure 36) from the yoke (8, Figure 35; 10 Figure 36) and remove the PTO drive unit, then the coupling assembly from the tractor.

PTO Drive Unit Disassembly (Figures 35 and 36)

1. Where used, remove the felt (13, Figure 36) and rubber washer (14), from the shaft assembly.
2. Remove the two bolts (2, Figure 35; 12, Figure 36), flat washers (4, Figures 35 and 36), lockwashers (3, Figures 35 and 36), and hex nuts (2, Figure 36) securing the coupling (6, Figures 35 and 36) to the yoke.
3. Remove the grease fittings (11, Figure 36) and plug (7) from the yoke, and press the bushings (8) from the yoke only if they are to be replaced.
4. On the 4040 tractor, loosen the bearing collar set screw and slide the bearing (11, Figure 35) and bearing support (15) off the end of the shaft (9). Remove bearing from the support only if it must be replaced.
5. Remove the 3/8-16 x 1-1/4 inch long capscrew (33, Figure 35; 30, Figure 36) and lockwasher (32, Figure 35; 29, Figure 36) securing the clutch collar (31, Figure 35; 28, Figure 36) to the clutch (39, Figure 35; 27, Figure 36). Remove the collar.
6. On the 4040 tractor move the shaft forward to expose the retaining ring (20, Figure 35) on the bearing end of the clutch. Pry the retaining ring and bearing retaining collar (21) from the bearing retainer (22) and slide the bearing (23) from the shaft.

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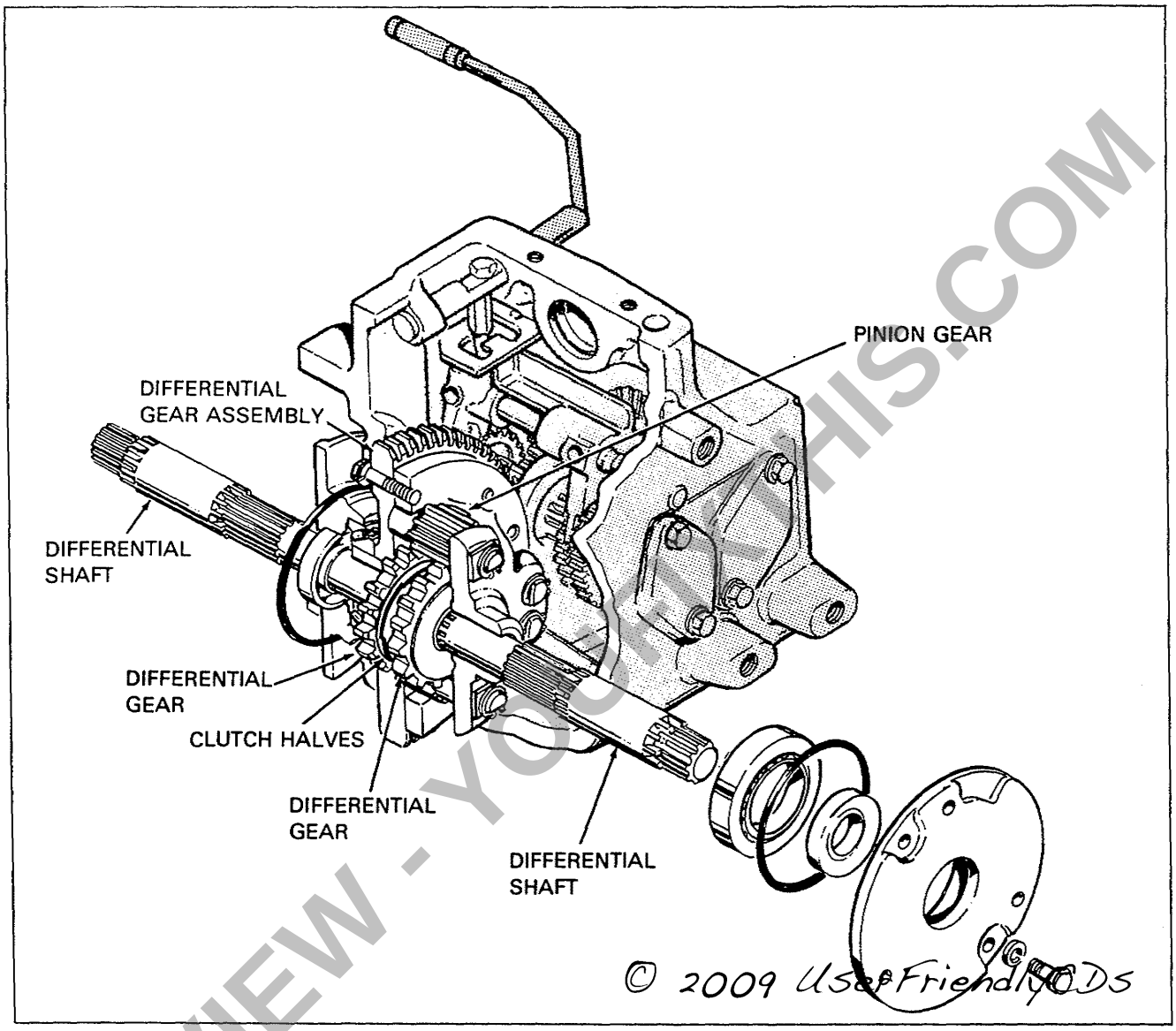


Figure 24. Differential Operation

4. Differential (Figure 24).

The differential gear assembly rotates four pairs of pinion gears. Each gear of each pair turns a separate differential gear and shaft. Both differential shafts are coupled by a slip clutch. The halves of the slip clutch are separated by four spring washers which provide a slight outward pressure on the clutch halves so if the movement of one rear wheel slows or stops, the clutch halves will slip and movement of the other wheel will continue.

5. Rear PTO (Figure 25).

The rear PTO shaft rotates with the engine flywheel to power the final drive system. The final drive shaft drives the intermediate gear which, in turn, rotates the final gear.

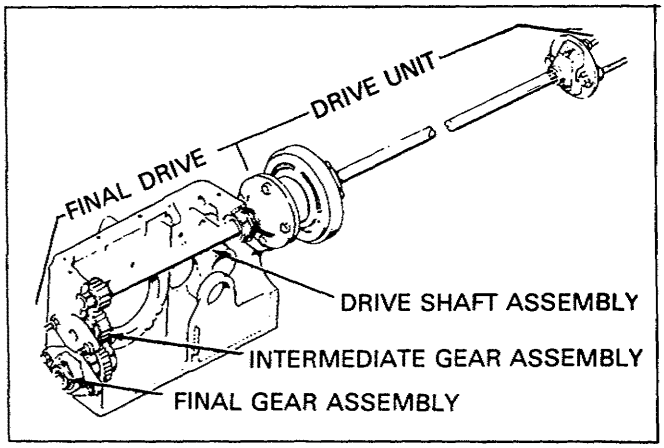


Figure 25. Rear PTO

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d. Place four pinion gears (18) on alternate pinion shafts (16) and place four spacers (17) on the remaining shafts. Repeat the procedure by placing gear on spacer and spacer on gear.

e. Align the gear assembly (15) on the gear carrier (24) with the two pins (14). Carefully secure the gear assembly by installing the six 3/8-16 x 1-1/4 inch long capscrews (10) and lockwashers (11) in opposing pairs. Secure the pinion shafts on the gear assembly side with the retaining rings.

2. Install the differential assembly.

a. Place the differential assembly in the transmission case.

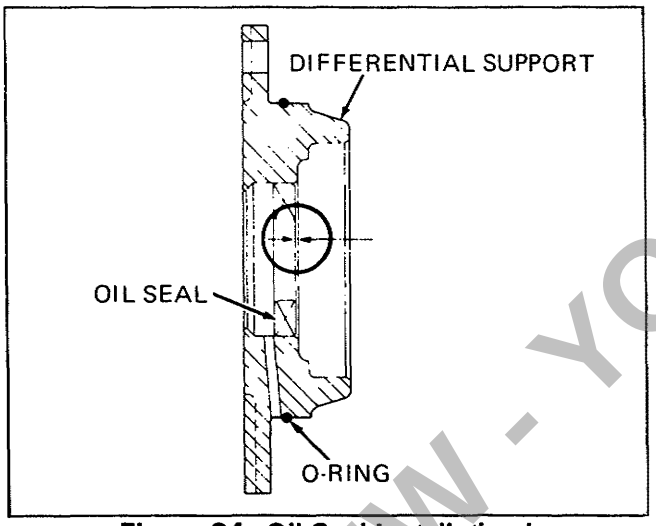


Figure 34. Oil Seal Installation in Differential Support

b. Coat new seals (6) with VC-3 and let dry. Install new seals (6) and o-rings (7) on each support (5). The oil seals must be installed to a dimension location as shown in Figure 34. Press the bearing cups (8) into each support.

c. Secure the supports (5) to the transmission case with the four 5/16-18 x 3/4 inch long capscrews (1) and lockwashers (2).

⚠ CAUTION

It is very important to make sure that the supports are fully seated in their cavities before tightening the capscrews or the casting may break.

d. Install the transmission case as outlined in Transmission Installation, steps 1 through 9.

REAR PTO

Description

The rear PTO drive unit consists of components from the engine pulley to the differential case. The rear PTO final drive consists of the components inside the transmission case.

PTO Drive Unit Removal (Figures 35 and 36)

1. Disconnect the battery.
2. Remove the cover plate.
3. Remove the seat and attaching parts. Refer to Transmission Removal and Disassembly for removal procedures.
4. Disconnect the rubber fuel lines at the fuel tank. Open the clamps that hold the fuel lines fully before moving them.
5. Remove the two capscrews and four washers mounting the oil cooler. Carefully lift the oil cooler up and toward the right side of the tractor making sure not to break the transmission oil hose connections. Handle the oil cooler with care.
6. Remove the four capscrews securing the left and upper engine shrouds and remove the shrouds.
7. Remove the steering wheel and its rubber washer by removing the 5/16-18 x 1-1/4 inch long capscrew and locknut securing them to the steering shaft.
8. Remove the six screws attaching the instrument panel assembly to the body assembly support. Carefully lift the panel up and over the steering shaft using caution not to disconnect or break the instrument wire connections.
9. Remove the left and right panel assemblies by removing the six 1/4-20 x 3/8 inch long screws.
10. Remove the remaining screws holding the body assembly support to the support assembly. Disconnect the ignition switch from the wiring harness and remove the body assembly support from the tractor.
11. Remove the clutch bracket capscrew (29, Figure 35; 25, Figure 36) and lockwasher (30, Figure 35; 26, Figure 36). Disconnect the clutch electrical connections. On the 4040 tractor, remove the two capscrews (12, Figure 35), lockwashers (13), and flatwashers (14) securing the bearing support (15) to the frame.

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19. Remove the nut (18) and lockwasher (19) attaching the pitman arm (20) to the steering gear assembly (15). Remove the arm from the gear assembly.
20. Remove the three 7/16-14 x 1 inch long capscrews (13) and lockwashers (14) holding the steering gear assembly to the frame. Carefully slide the steering gear assembly from the U-joint and remove it from the tractor.

Steering Gear Disassembly (Figures 48 and 49)

NOTE

As with any ball bearing unit, the steering gear parts must be kept free of dirt. Clean paper or towels should be spread on the work area before starting the disassembly of the steering gear.

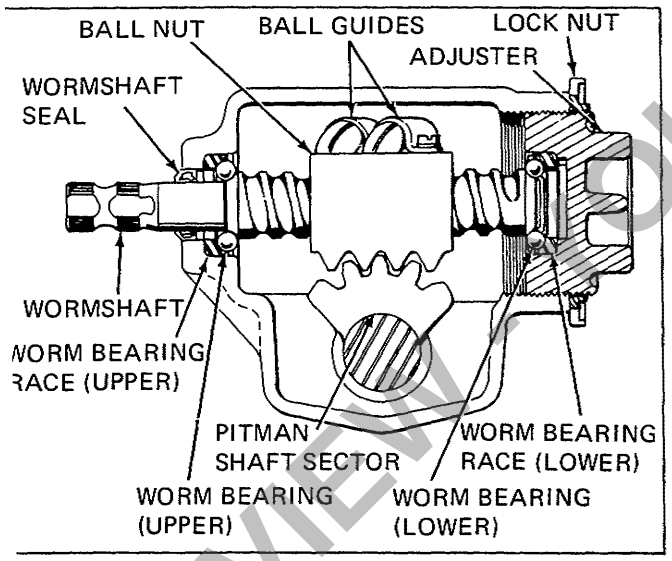


Figure 48. Steering Gear (Side View)

1. Place the steering gear in a vise. The assembly should be held by one of the mounting tabs so the worm shaft is in a horizontal position.
2. Count the number of turns made as you rotate the worm shaft so the ball nut moves from stop to stop. Then turn the shaft back exactly half way. This should place the ball nut in the center of the shaft, and the worm shaft should be in the 12 o'clock position.
3. Place a suitable container under the assembly to catch the lubricant. Remove the three self-locking bolts holding the side cover to the housing.

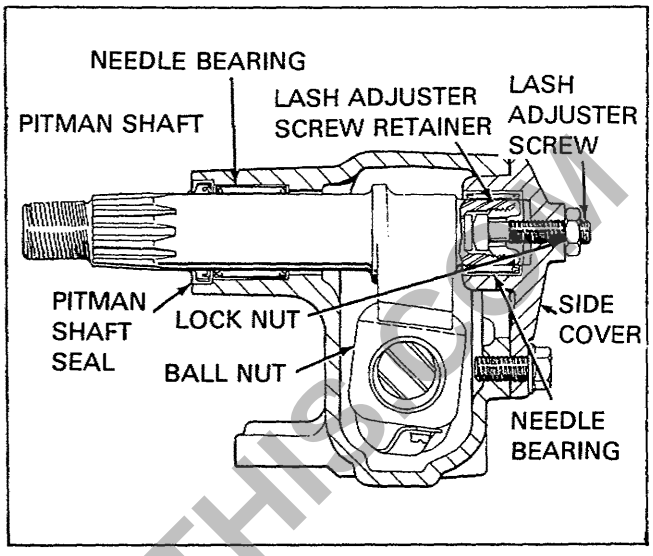


Figure 49. Steering Gear (End View)

4. Tap lightly on the end of the pitman shaft with a soft-headed mallet and pull the side cover and pitman shaft assembly from the gear housing (Figure 50).

NOTE

If the pitman shaft sector does not clear the opening in the housing easily, turn the worm shaft by hand until the sector will pass through the opening in the housing.

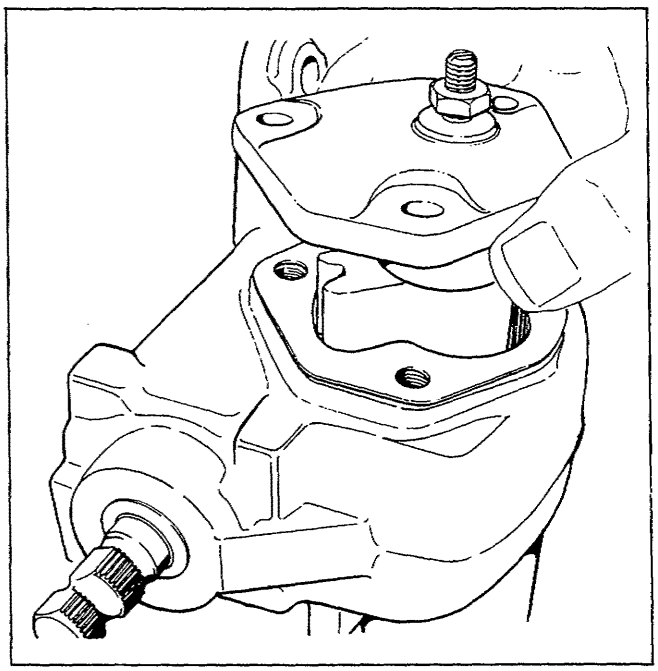


Figure 50. Removing Pitman Shaft Assembly

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