CONTENTS

ISS-1049-1 (6-67)

PRINTED IN UNITED STATES OF AMERICA

1. DESCRIPTION

The tractor and loader are powered by the 361 Series turbocharged diesel engine. This engine is a six cylinder, direct-starting, four-cycle valve-in-head type.

2. REMOVAL

NOTE: Disconnected hydraulic lines must be capped with the correct size plastic cap. If caps are not available, use tape or rubber stoppers. Openings must never be plugged with rags. This practice could introduce dirt or lint into critical hydraulic components. Tag disconnected hydraulic lines and electrical cables to facilitate correct and faster installation.

1. Except for the following items, perform the complete procedure described in the removal of the radiator in section 2, "COOLING SYSTEM."

(a) Do not remove the oil coolers. They will come off with the radiator.

(b) Do not remove the fan belts, fan shroud or the fan (finger guard does have to be removed).

(c) Do not remove the radiator mounting brackets (radiator will come off with the radiator guard).

2. Shut off the diesel fuel at the fuel tank.

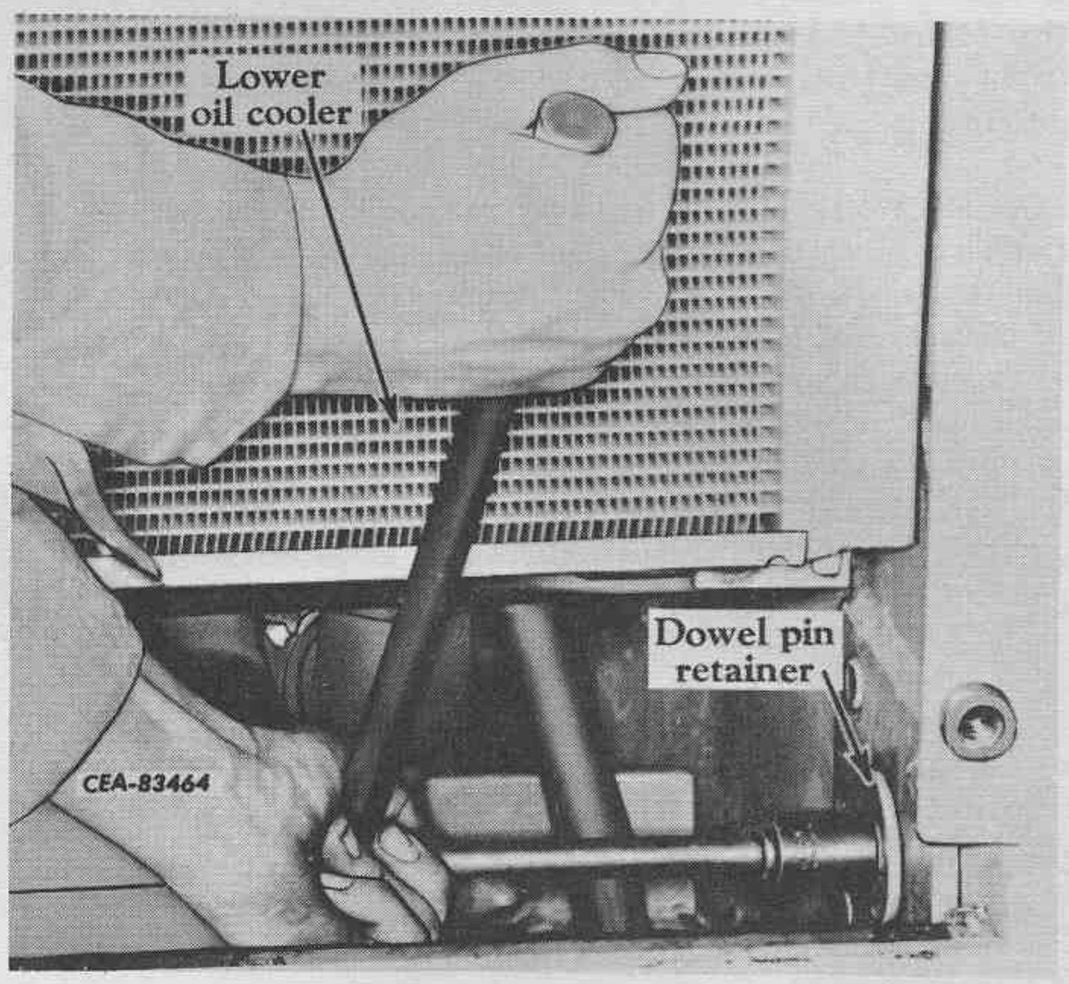
3. POWER SHIFT ONLY: Drain the blade or bucket hydraulic system by removing the plug in the underside of the hydraulic tank.

MANUAL SHIFT ONLY: Drain the clutch hydraulic system.

4. Disconnect the electrical system master switch to prevent accidental starting.

5. Attach a hoist to the engine hood mounting holes in the top of the radiator guard. Place some tension on the hoist sling.

6. Remove the cap screw, lockwasher and retainer securing each of the four radiator guard dowel pins to the inner side of the front frame (Illust. 1).



Illust. 1
Removing the Radiator Guard Dowel Pin Retainer Cap Screw.

7. Remove the 16 cap screws securing the radiator guard to the front frame. Using a spacer that will encircle the dowel pin, insert a bolt thru the spacer and into the dowel pin. Tighten the bolt to pull the dowel pin from the front frame (Illust. 2). Remove the remaining three dowel pins in the same manner.

8. MODEL 175 LOADER ONLY: With the hoist, move the radiator guard and radiator assembly forward until the outlet elbow in the bottom of the radiator is near the front frame. Raise the radiator guard to clear the outlet elbow and lower the assembly between the lift arm crossmember and front frame onto a skid (Illust. 3).

TD-15 SERIES B ONLY: With the hoist, remove the radiator guard and radiator assembly out the front of the tractor being careful to clear the front of the front frame (Illust. 3).

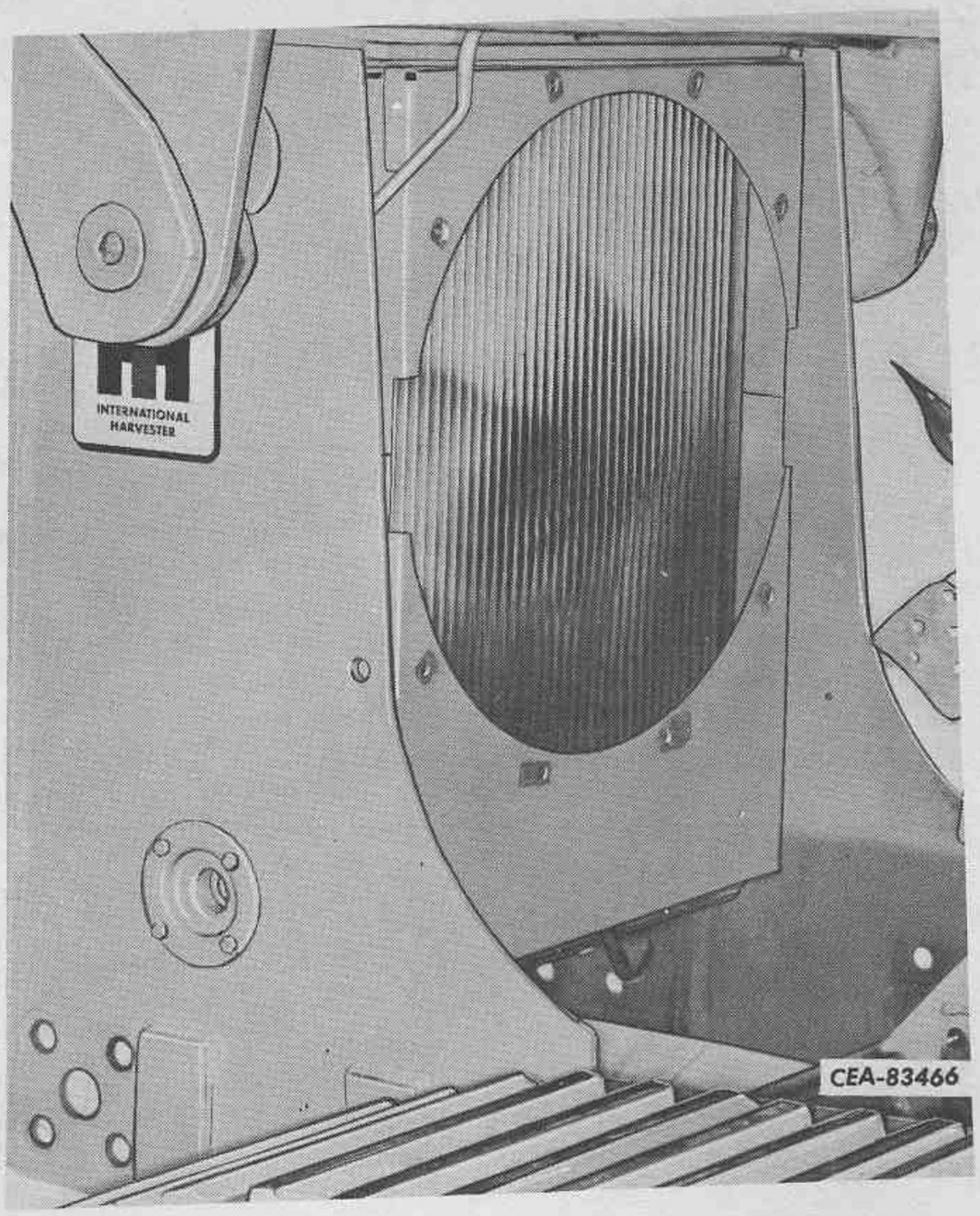
(Continued on next page)

2. REMOVAL - Continued

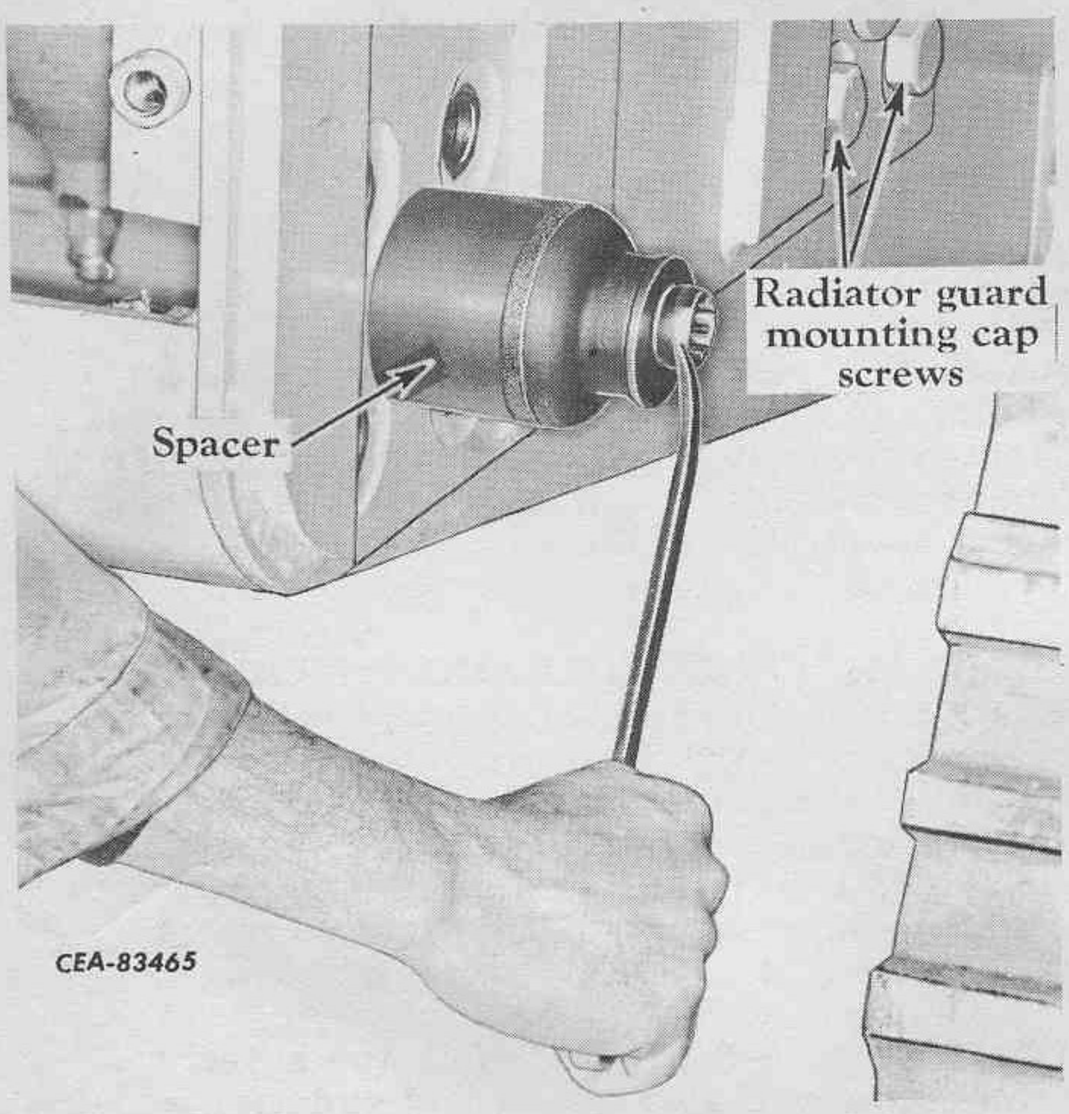
9. POWER SHIFT ONLY: Remove the cap screws and lockwashers securing the safety filter housing bracket to the left hand side of the front frame and allow the filter assembly to lay in the frame to provide clearance for engine removal (Illust. 4).

10. Remove the cranking motor. Pull up the rubber boot on the cable and remove the nut and star washer at the cranking motor solenoid to disconnect the two cables. Remove the nut and washer at the other solenoid connection and remove the cable. Remove the three cap screws and lockwashers securing the cranking motor to the flywheel housing and remove the cranking motor and solenoid. Discard the gasket.

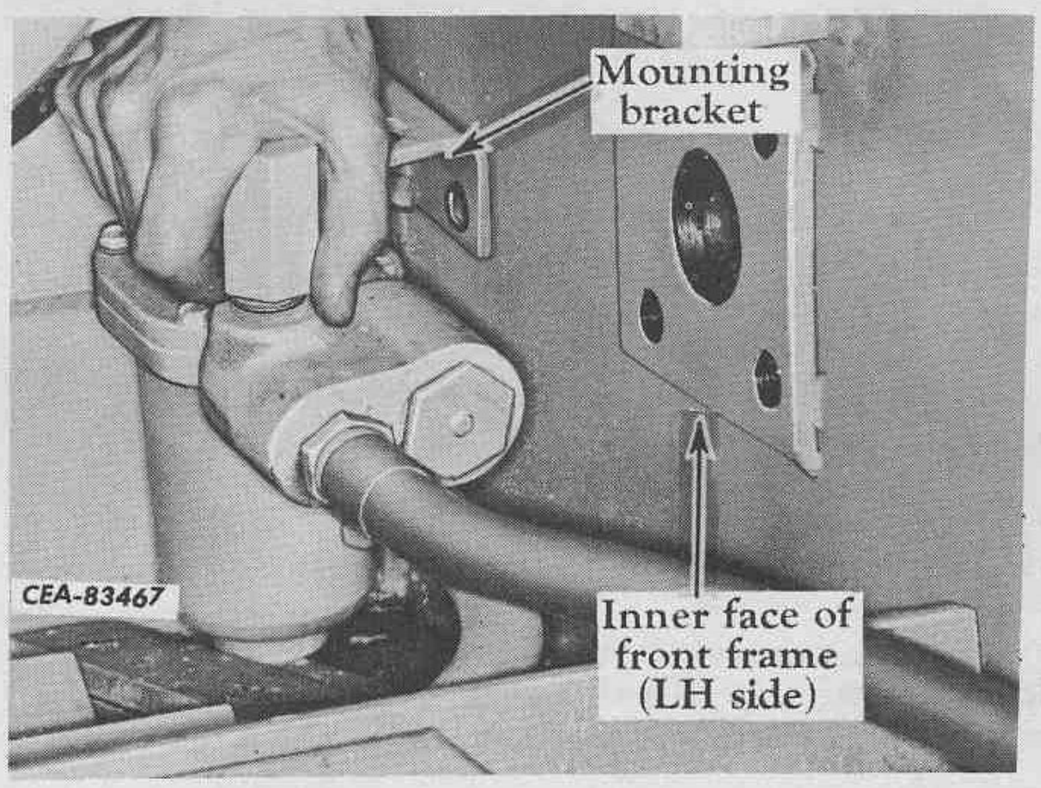
11. Disconnect the generator cables (3) at the generator. Bend back the spring clips (4 and 8) securing the generator cable harness (2) to the engine. Move the harness out of the way (Illust. 5).



Illust. 3
Removing the Radiator Guard with Radiator.

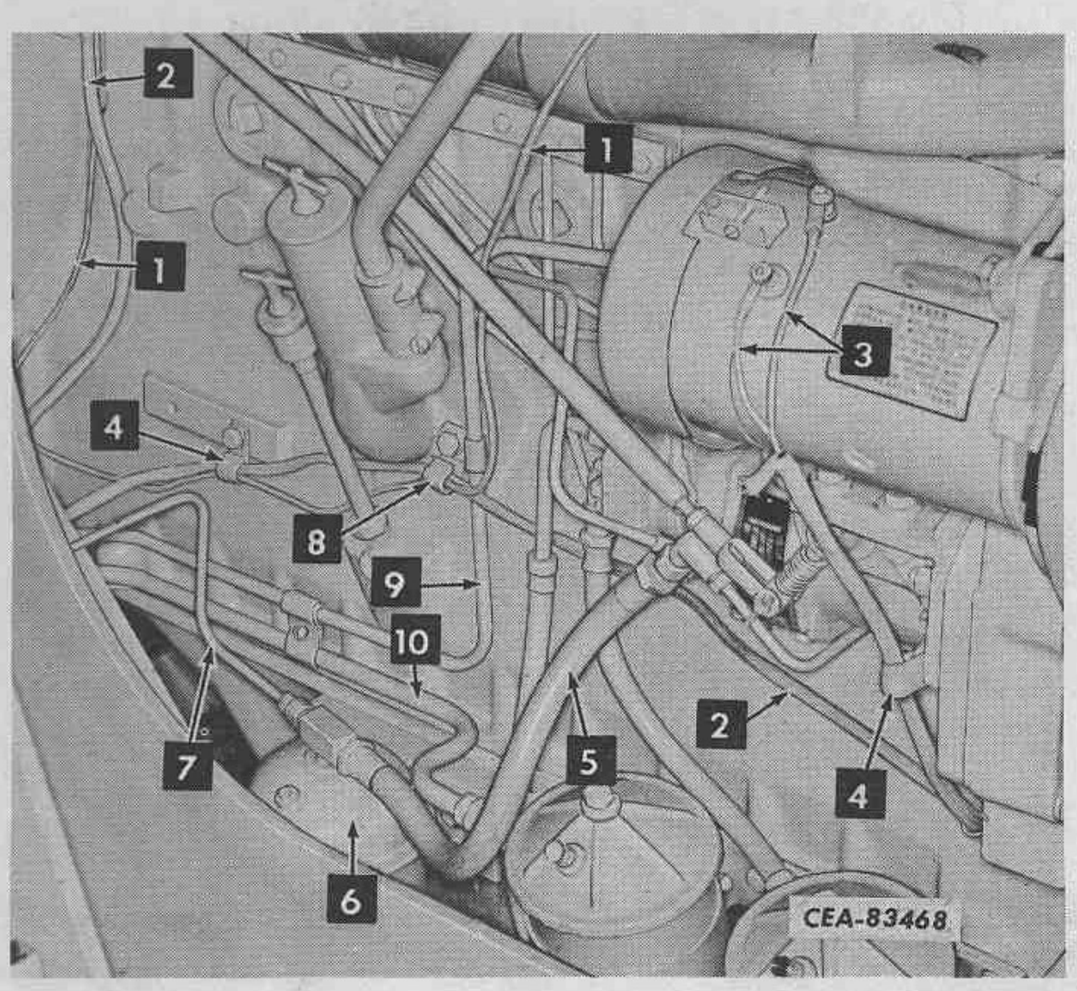


Illust. 2
Removing the Radiator Guard Dowel Pin.



Illust. 4
Removing the Safety Filter Assembly.

PRINTED IN UNITED STATES OF AMERICA



Illust. 5
Engine Disconnect Points on
R.H. Side of Engine.

1. Water temperature gauge cable.
2. Generator cable harness.
3. Generator cables.
4. Spring clips.
5. Watchdog fuel filter outlet hose (if equipped).
6. Watchdog fuel filter (if equipped).
7. Fuel oil pressure tube.
8. Fuel tube spring clip.
9. Fuel return front tube.
10. Fuel supply front tube.

12. Disconnect the water temperature gauge cable (1) at the water manifold and move it out of the way (Illust. 5).

13. Remove the watchdog fuel filter (if equipped). Remove the front cover plate from the underside of the front frame. Disconnect the filter outlet hose (5) at the pump. Disconnect the pressure gauge tube (7) at the filter tee and at the rear tube connection in front of the dash. Bend back the spring clip securing the tube (7) to the front frame and remove the tube (Illust. 5).

NOTE: To disconnect the tube (7, Illust. 5) from the rear tube, loosen the bracket securing the rear tube to the dash and push the rear tube away from the front tube to free the tube seat.

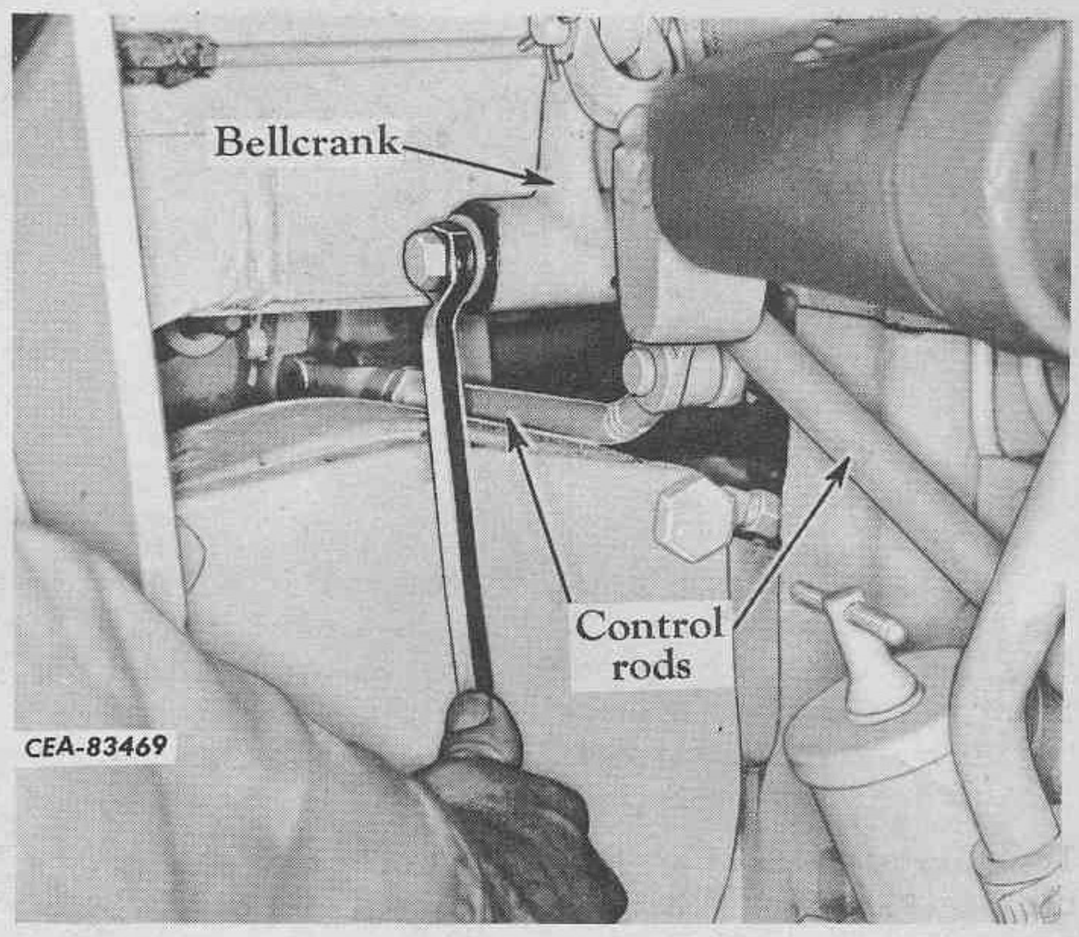
Disconnect the hose at the bottom of the filter (6, Illust. 5) and position it to be removed with the engine. Remove the four cap screws, lockwashers, flat washers and nuts securing the filter band to the mounting bracket and remove the filter.

14. Loosen the clamp on each end of the turbocharger-to-air cleaner outlet hose and pull the hose free. Move the hose out of the way being careful not to crimp the air cleaner indicator tube connected to it.

15. MODEL 175 LOADER ONLY: Loosen the clamp on each end of the turbocharger-to-air intake elbow pipe and remove the pipe. This is necessary to clear the engine between the lift arm crossmember and the front of the loader frame.

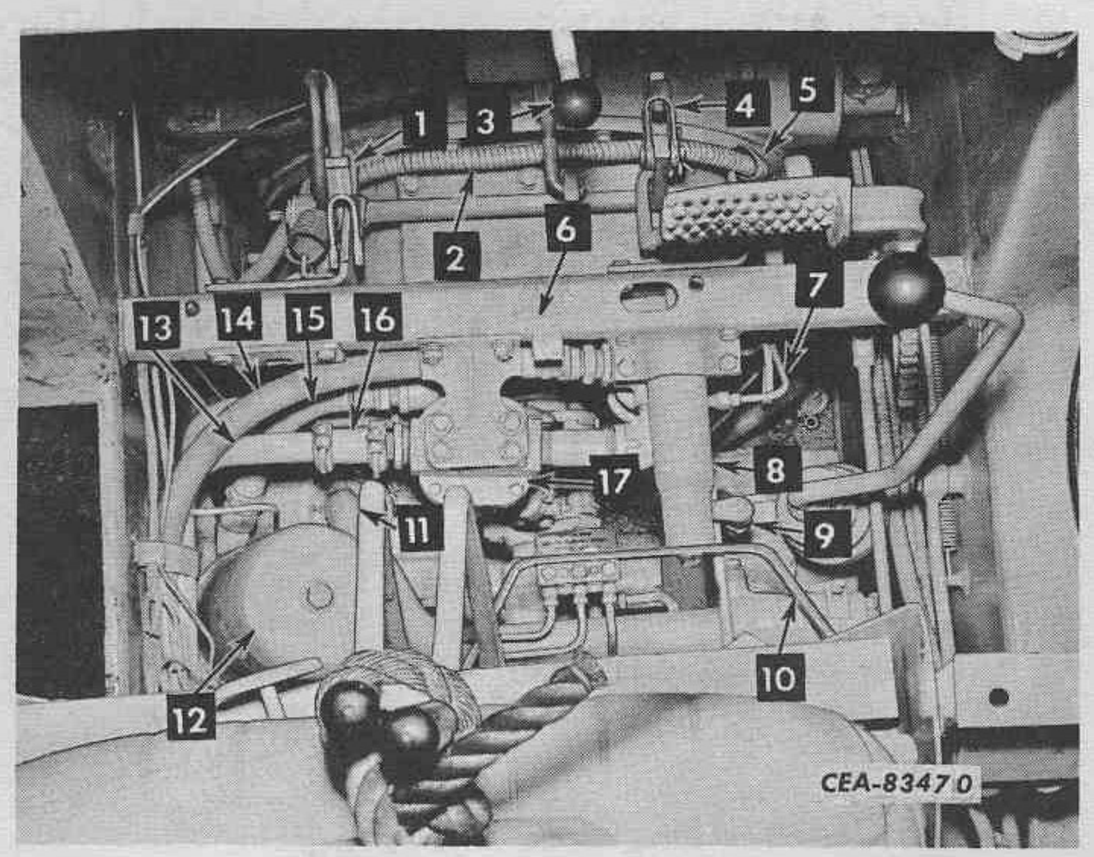
16. Loosen the wing nuts securing the air cleaner cap and remove the cap. Remove the two cap screws, lockwashers and studs securing the air cleaner to the dash and remove the air cleaner.

(Continued on next page)



Illust. 6
Removing Governor Control Rod
Bellcrank Mounting Bolt.

2. REMOVAL - Continued



Illust. 7
Platform Support Disconnect Points.
(Units Using Suction Filter with Flexible Coupling.)

1. Decelerator pedal adjustable clevis.
2. Cranking motor cable.
3. Adjustable clevis.
4. Control rod clevis.
5. Spring clip.
6. Platform support.
7. Drain tube.
8. Decelerator cylinder.
9. Decelerator cylinder inlet hose.
10. Seat support bar bracket.
11. Equipment pump inlet tube.
12. Pressure filter.
13. Suction filter inlet tube.
14. Regulator drain hose.
15. Pressure filter inlet hose.
16. Flexible coupling.
17. Suction filter.

17. Disconnect the decelerator pedal adjustable clevis (1, Illust. 7 or 7A) at the pedal by removing the cotter and end pin. Remove the L.H. front platform with decelerator pedal. Remove the R.H. front platform. Remove the rear platform (snap on type).

18. Disconnect the governor control rear rod clevis (4, Illust 7 or 7A) at the cross shaft by removing the end pin and cotter.

19. Remove the bolt and flat washer securing the governor control rod bellcrank to the side of the engine and allow the bellcrank with control rods to lay on the engine (Illust. 6). Secure the lifting eye (Illust. 12) at this position. (Lifting eye shipped with unit in tool box.)

20. Tie the steering levers back using a heavy rope.

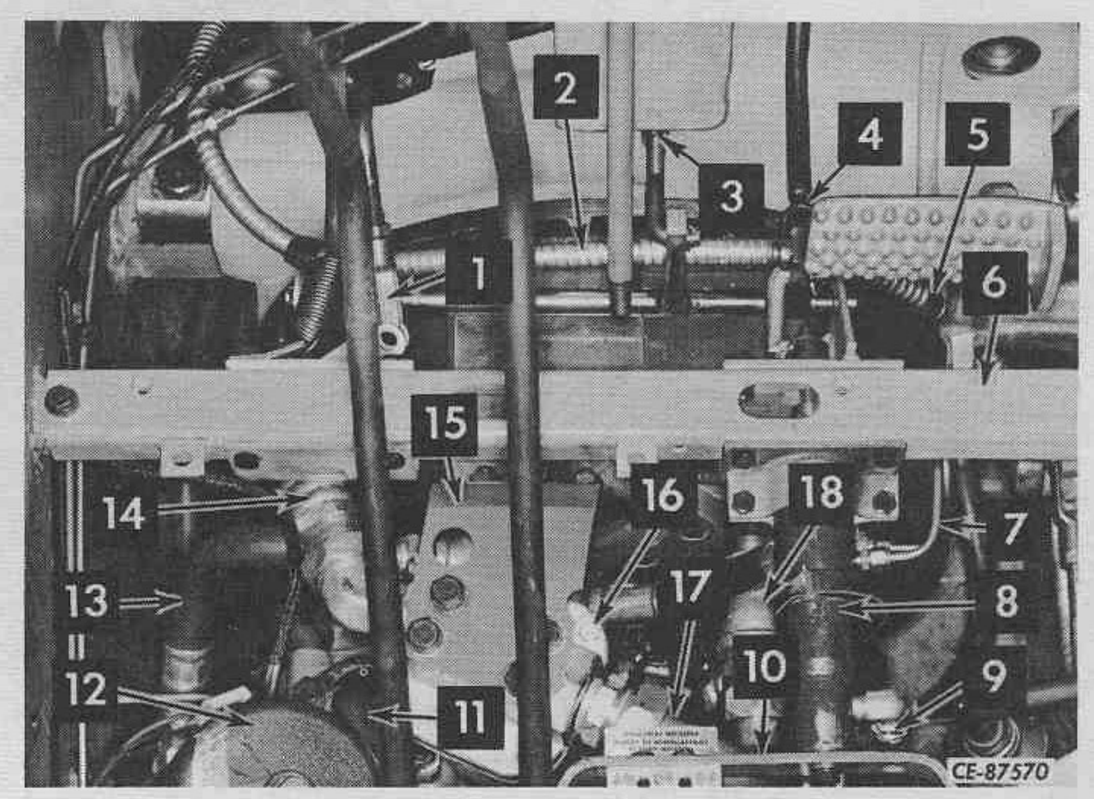
21. POWER SHIFT ONLY: Bend back the two spring clips (5) securing the cranking motor cable (2) to the torque converter and pull the cable out of the way to allow the converter to be removed with the engine (Illust. 7 or 7A).

22. Disconnect the engine oil pressure gauge tube at the connection below the dash (Illust. 12).

23. Remove the platform support (Illust. 7 or 7A):

(a) Disconnect the decelerator inlet hose (9) and drain tube (7) at the decelerator cylinder (8).

(b) Disconnect the drain tube (7) at the converter and remove the tube.



Illust. 7A
Platform Support Disconnect Points.
(Units Using Suction Filter without Flexible Coupling.)

1. Decelerator pedal adjustable clevis.
2. Cranking motor cable.
3. Adjustable clevis.
4. Control rod clevis.
5. Spring clip.
6. Platform support.
7. Drain tube.
8. Decelerator cylinder.
9. Decelerator cylinder inlet hose.
10. Seat support bar bracket.
11. Equipment pump inlet tube.
12. Pressure filter.
13. Pressure filter inlet hose.
14. Suction filter inlet hose.
15. Suction filter bracket.
16. Suction filter.
17. Suction filter outlet tube.
18. Pump inlet reducing tee.

PRINTED IN UNITED STATES OF AMERICA

(c) Remove the bolt, lock washer and flat washer securing the decelerator cylinder to the seat support bar bracket (10).

(d) SUCTION FILTER WITH FLEXIBLE COUPLING: Remove the clamp on the suction filter side of the flexible coupling (16). Loosen the clamp on the filter inlet tube side of the coupling and pull the coupling sleeve onto the inlet tube (13).

(e) SUCTION FILTER WITH FLEXIBLE COUPLING: Loosen the upper clamp on the flexible coupling below the platform support and lower the clamp onto the coupling (Illust. 8).

(f) Remove the cotter and end pin securing the adjustable clevis (3) to the bellcrank.

(g) SUCTION FILTER WITH FLEXIBLE COUPLING: Disconnect the regulator drain hose (14) at the converter elbow.

SUCTION FILTER WITHOUT FLEXIBLE COUPLING: Disconnect the regulator drain hose at the pump inlet reducing tee (18). Remove the strap securing the converter inlet hose to the decelerator cylinder (8).

(h) Remove the cap screw, lock washer and flat washer securing the platform support (6) on each side to the front frame. Remove the support with decelerator cylinder and control linkage. The suction filter will also come with the support on units equipped with flexible coupling.

24. SUCTION FILTER WITHOUT FLEXIBLE COUPLING: Disconnect the inlet hose (14) at the suction filter and the outlet tube (17) at the torque converter. Remove the hardware securing the filter bracket (15) to the bracket on the converter and remove the suction filter (16) with bracket and outlet tube (Illust. 7A).

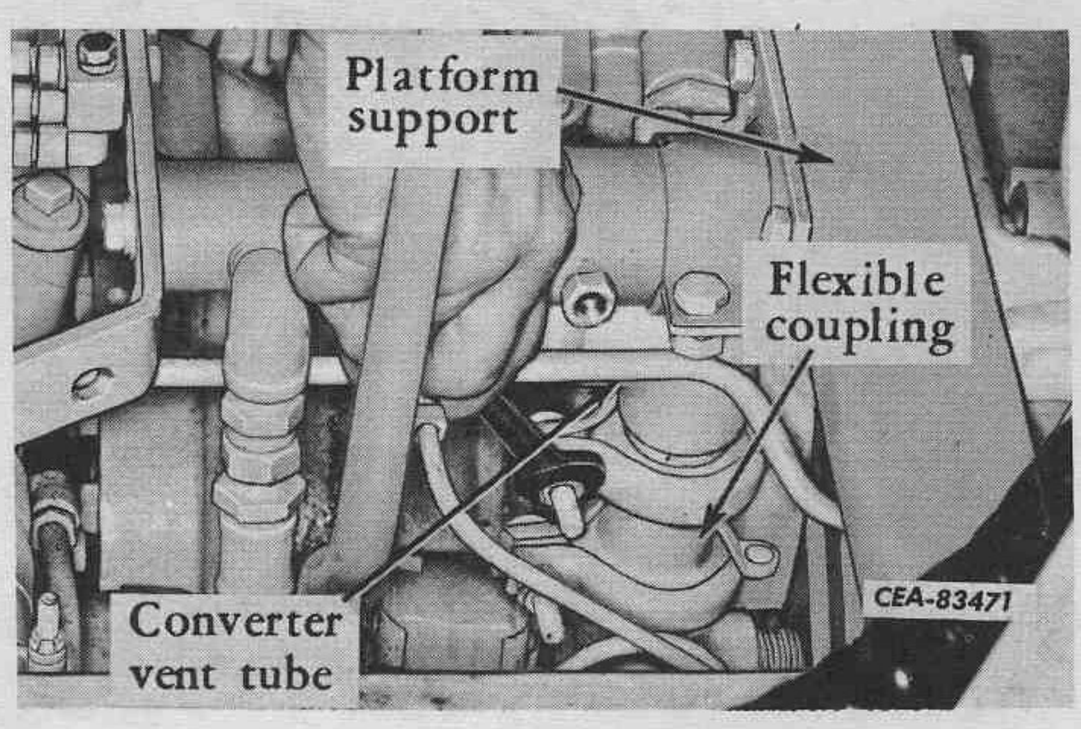
25. POWER SHIFT ONLY: Disconnect the cable at the torque converter sending unit (Illust. 9). This cable is part of the generator cable harness. Slip this cable from the spring clip on the converter housing and move the generator harness out of the way to facilitate engine removal.

26. Disconnect the fuel return front tube (9) and the fuel supply front tube (10) at the injection pump and fuel filter and at the rear fuel tubes next to the R.H. side of the front frame behind the brake pedal pivot point. Bend back the spring clip that secures the return tube to the brake pedal mounting bracket. Remove the clip (8) securing the return tube to the side of the engine. Remove the fuel front tubes (Illust. 5).

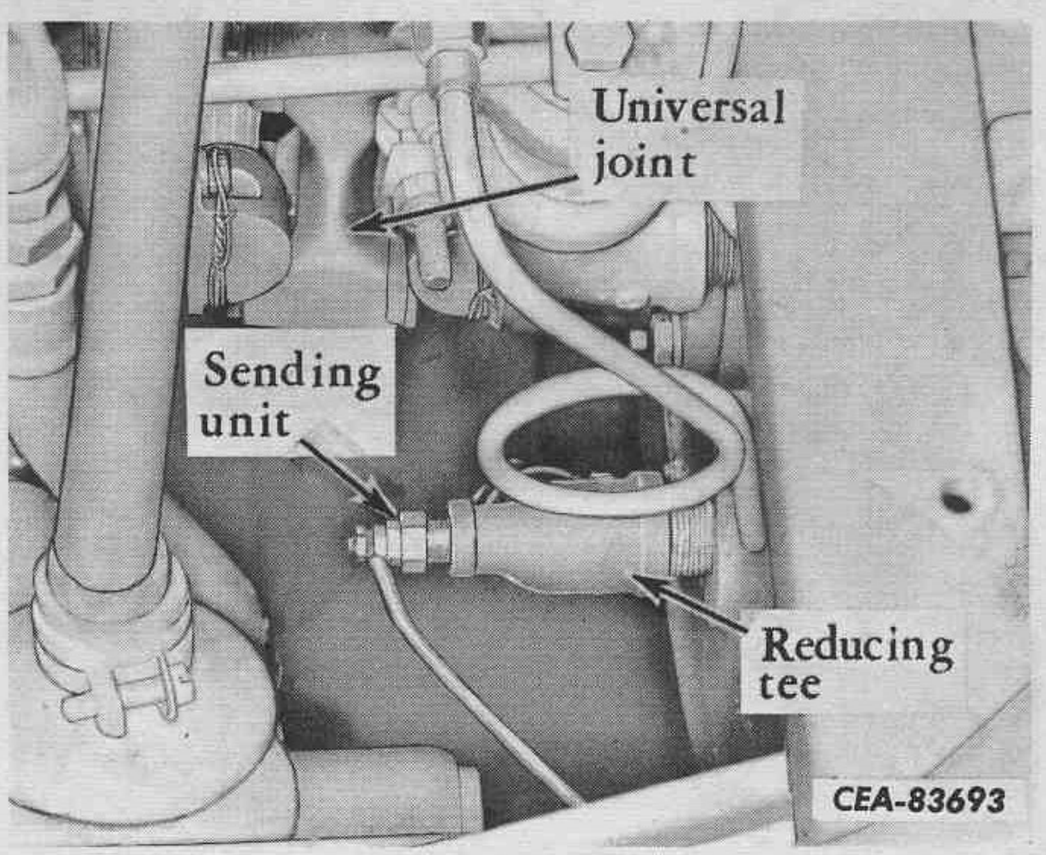
27. POWER SHIFT ONLY: Disconnect the converter inlet hose at the elbow on the left hand side of the converter housing. Disconnect the pressure filter inlet hose (15, Illust. 7) or (13, Illust. 7A) at the pressure filter.

28. POWER SHIFT ONLY: Disconnect the converter vent tube at the converter housing (Illust. 8).

(Continued on next page)



Illust. 8
Loosening Flexible Coupling Clamp (If Equipped).



Illust. 9
Torque Converter Sending Unit Connection.

2. REMOVAL - Continued

29. MANUAL SHIFT ONLY: Disconnect the hydraulic oil lines at the clutch housing. Remove the engine clutch hand lever and disconnect the transmission gear shift lock operating rod from the clutch R.H. release shaft.

TD-15 SERIES B ONLY: Disconnect the hydraulic oil lines at the equipment pump mounted to the flywheel housing. For manual shift tractors also disconnect the hydraulic oil lines at the clutch hydraulic pump mounted to the clutch housing.

MODEL 175 LOADER ONLY: Remove the cap screws, lock washers and clamp halves securing the inlet tube (11, Illust. 7 or 7A) to the top of the equipment pump. Loosen the clamp nut securing the other end of the tube and rotate the tube up to provide clearance for the pump to be removed with the engine. Remove the rear cover on the underside of the front frame and remove the cap screws, lock washers and clamp halves securing the outlet hose to the bottom of the equipment pump.

30. POWER SHIFT ONLY: Working through the rear cover opening on the underside of the front frame disconnect the transmission-to-flywheel housing hose at the bottom of the transmission and quickly cap the fitting on the transmission cover.

NOTE: If the transmission is to be removed or if any work is to be done within the rear frame, drain the rear frame before disconnecting the transmission-to-flywheel housing hose.

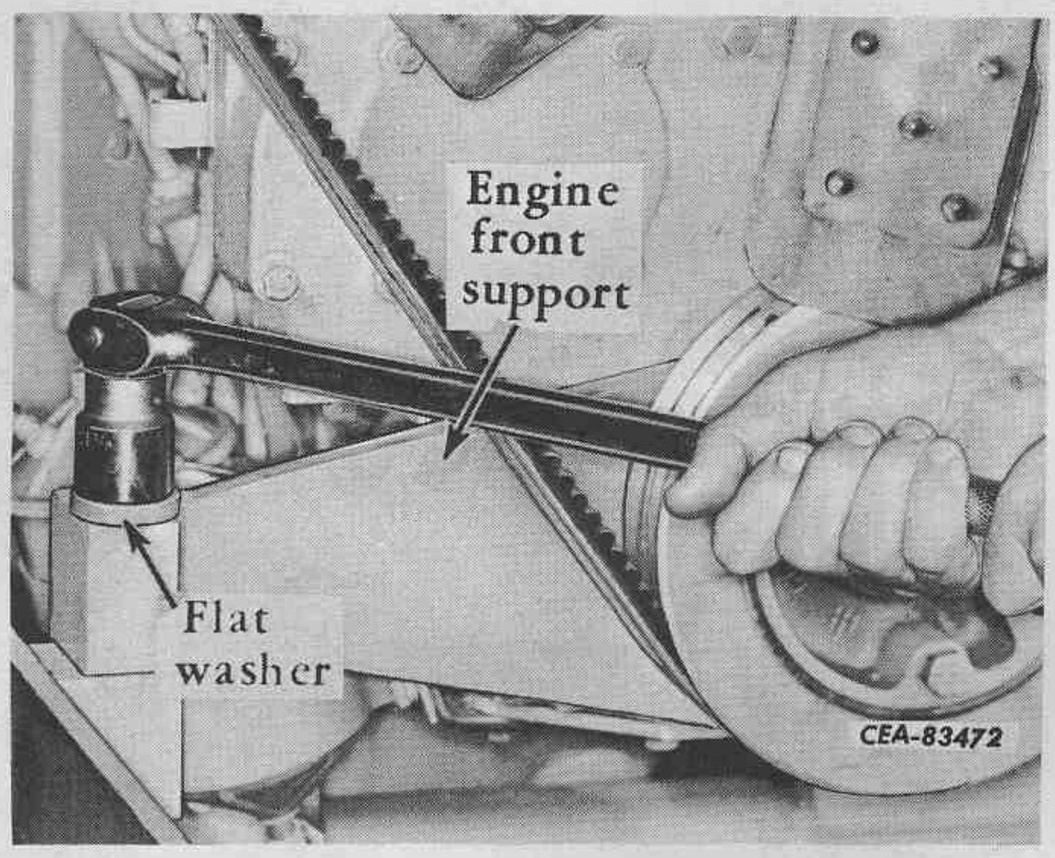
31. POWER SHIFT ONLY: Working through the rear cover opening in the underside of the front frame, disconnect the converter-to-safety filter hose at the reducing tee on the converter (Illust. 9).

32. Remove the lockwire and cap screws securing the universal joint to the transmission yoke (Illust. 9). Tape the universal joint bearing caps to the trunnion to prevent the caps from falling as the engine is removed.

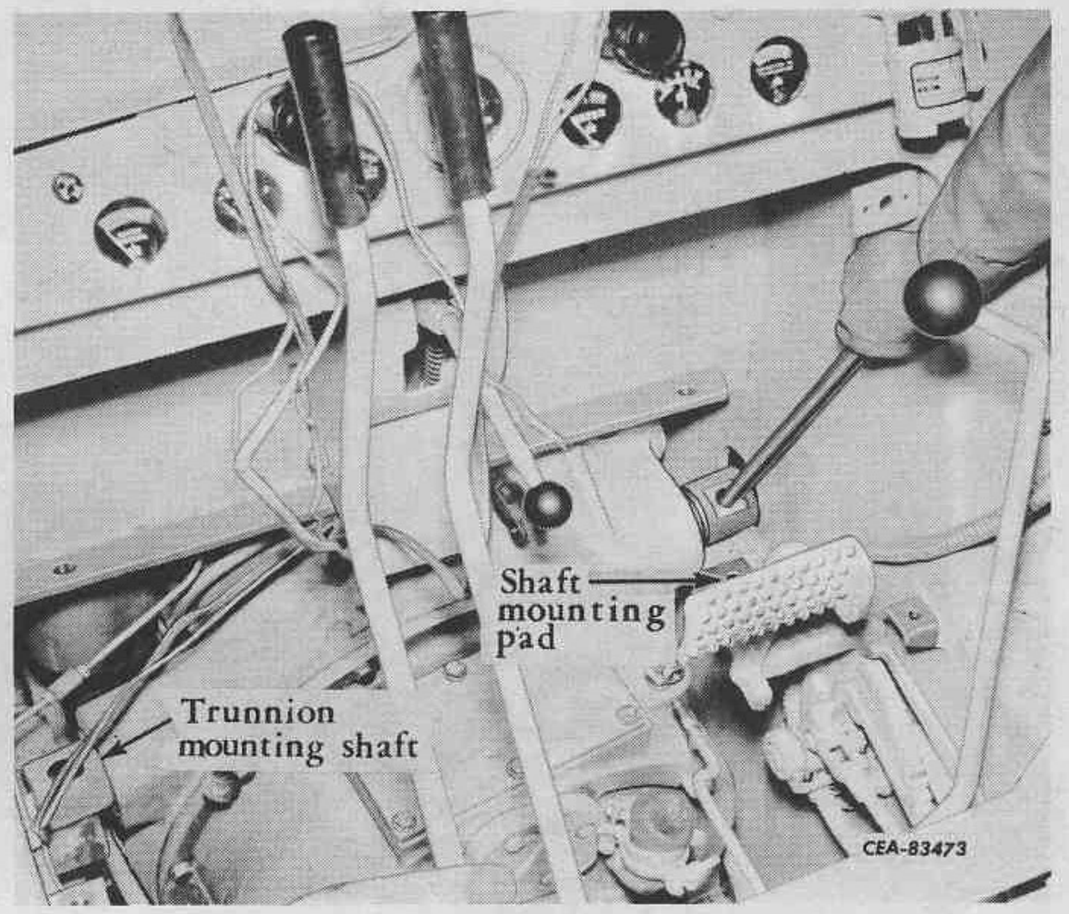
33. Check for a gap between the trunnion mounting shaft shoulder and the edge of the shaft bushing on the right hand side of the unit. Place a six to eight foot pry bar between the flywheel housing and the front frame to move the flywheel housing away from the frame member (Illust. 13). If the flywheel housing can be moved far enough away to obtain a 0.119 inch gap or more, a spacer must be welded to the shaft upon installation of the engine as described in Par. 3, "INSTALLATION."

34. Remove the cap screws and flat washers securing the engine front support to the front frame (Illust. 10).

35. Remove the cap screws securing the trunnion mounting shaft (on each end of the flywheel housing) to the front frame (Illust. 11).

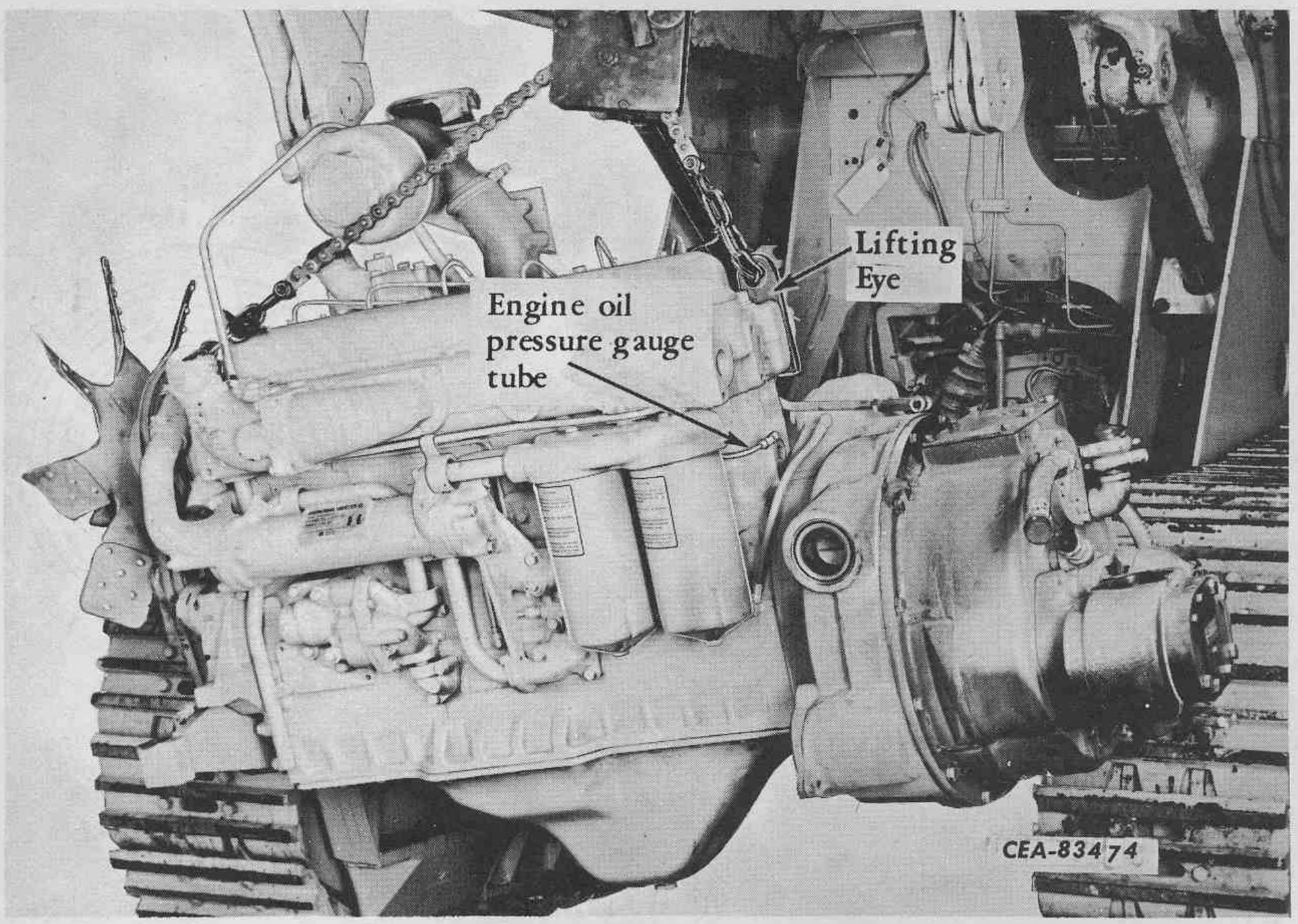


Illust. 10
Removing the Engine Front Support Mounting Cap Screws.



Illust. 11
Removing the Engine Trunnion Mounting Shaft.

PRINTED IN UNITED STATES OF AMERICA



Illust. 12
Removing the Engine.

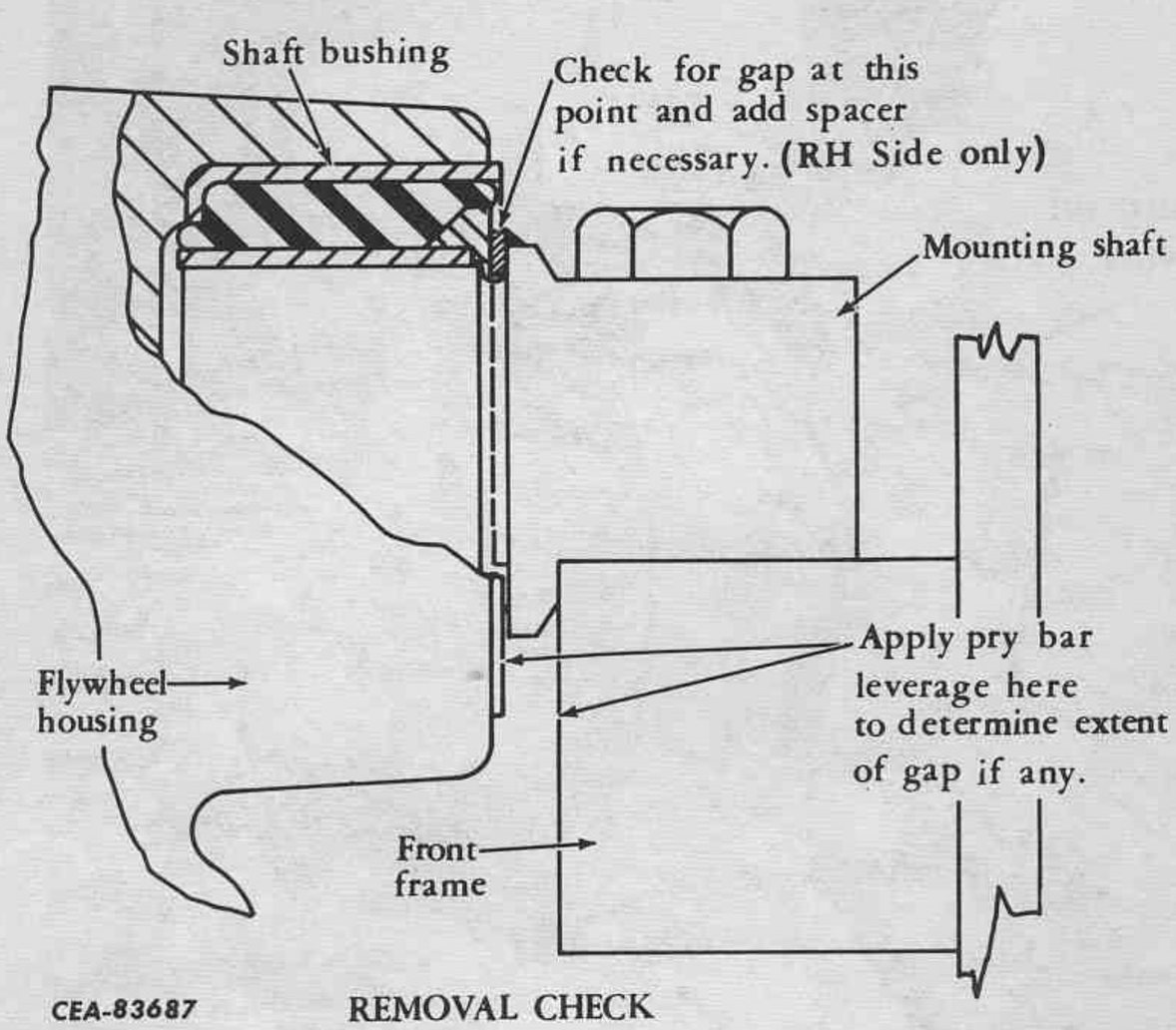
NOTE: Whenever possible, an adjusting sling as shown in Illust. 12 should be used to remove the engine. With an adjusting sling the engine can be tilted or leveled as required, reducing job time, effort and hazard.

36. Attach a hoist to the lifting eyes on the engine. Lift the engine slightly from the mounting pads, then move the engine forward as far as possible. Cock the engine to align one of the trunnion mounting shafts with the opening in the front frame and use a pry bar to free the shaft from the flywheel housing (Illust. 11). Remove the shaft from between the flywheel housing and front frame. Cock the engine in the other direction and remove the other shaft in the same manner. On the TD-15 Series B tractors, the mounting shafts can remain in the flywheel housing.

NOTE: MODEL 175 LOADER ONLY: If the trunnion mounting shaft cannot be freed with a pry bar as shown in Illust. 11, the loader lift arm must be supported and the lift cylinder disconnected at the lift arm. This will allow the cylinder to rest on the welded bracket of the frame and clear the opening in the frame for using a slide hammer to pull the mounting shaft.

37. TD-15 SERIES B ONLY: Lift the engine (with torque converter or engine clutch) up and forward from the front frame.

MODEL 175 LOADER ONLY: Lift the engine (with torque converter) up and forward until it is up to the lift arm, then turn the engine 90 degrees and lower onto a skid that will properly hold the engine and converter assembly (Illust. 12).



Illust. 13
Engine Mounting Shaft Gap Check and Spacer Installation Procedure.

3. INSTALLATION

NOTE: When installing cap screws, refer to the standard torque data chart in section 1, "GENERAL" for the proper torque.

1. If a 0.119 inch or more gap was found between the trunnion mounting shaft and bushing before removal of the engine, a spacer (refer to the parts catalog) must be welded to the right hand mounting shaft as shown in Illust. 13.

2. TD-15 SERIES B ONLY: Install the trunnion mounting shafts. Carefully position the engine (with torque converter or engine clutch attached) in the front frame. Secure the engine front support and the trunnion mounting shafts to the front frame with the cap screws. Use flat washers on the front support (Illust. 10).

MODEL 175 LOADER ONLY: Carefully position the engine (with torque converter attached) in the front frame. As the rear of the engine nears the mounting pads, insert the trunnion mounting shafts in the openings in the front frame. Then maneuver the engine to insert the shafts into their bushings in the flywheel housing. Secure the engine front support and the trunnion mounting shafts to the front frame with the cap screws. Use flat washers on the front support (Illust. 10).

PRINTED IN UNITED STATES OF AMERICA

3. Secure the universal joint to the transmission yoke. Remove the tape used to hold the bearing caps to the trunnion.

◆ CAUTION: If installing a new spider and bearing assembly, remove the soft iron strap attached to the bearing caps. This will eliminate the possibility of the straps breaking loose from the caps and causing personal injury when the engine is running (and the clutch is engaged on manual shift tractors).

4. Place the fuel return front tube (9) and the fuel supply front tube (10) in position (Illust. 5). Connect the tubes to the rear tube connections before connecting to the injection pump and fuel filter. Be sure the rubber seal used in connecting the front and rear fuel tubes together is in good condition before making the connection. At the time the fuel shut-off valve is opened, check here for possible leakage. Secure the fuel return tube with the spring clip at the bottom of the brake pedal mounting bracket. Secure the return tube to the engine with the spring clip (8, Illust. 5).

5. POWER SHIFT ONLY: Working through the rear cover opening in the underside of the front frame, connect the converter-to-safety filter hose at the reducing tee on the torque converter (Illust. 9). Also connect the transmission-to-flywheel housing hose at the bottom of the transmission cover.

6. MODEL 175 LOADER ONLY: Secure the equipment pump outlet hose to the bottom of the pump with the cap screws, lockwashers and clamp halves. Secure the inlet tube (11, Illust. 7 or 7A) to the pump with the cap screws, lockwashers and clamp halves. Tighten the hose clamp nut at the opposite end of the tube.

NOTE: Be sure the "O" rings in the ends of the tubes are in place and in good condition before securing to the pump.

TD-15 SERIES B ONLY: Connect the hydraulic oil lines to the equipment pump mounted on the flywheel housing. On manual shift tractors also connect the oil lines to the clutch hydraulic pump mounted to the clutch housing.

MANUAL SHIFT ONLY: Connect the transmission gear shift lock operating rod to the clutch release shaft. Install the clutch hand lever. Connect the hydraulic oil lines to the clutch housing.

7. Install the rear cover to the underside of the front frame.

8. POWER SHIFT ONLY: Connect the converter vent tube to the converter housing (Illust. 8). Connect the converter inlet hose to the elbow on the left hand side of the converter housing. Connect the pressure filter inlet hose (15, Illust. 7) or (13, Illust. 7A) to the pressure filter.

9. POWER SHIFT ONLY: Slip the torque converter sending unit cable (part of generator harness, through the spring clip on the converter housing and connect to the sending unit (Illust. 9).

10. SUCTION FILTER WITHOUT FLEXIBLE COUPLING: Position the suction filter (16) with outlet tube and mounting bracket (15) and secure the bracket to the mounting bracket on the torque converter. Connect the outlet tube (17) to the torque converter and the inlet hose (14) to the suction filter (Illust. 7A).

11. Install the platform support (Illust. 7 or 7A):

(a) Position the support (6) (with decelerator cylinder and control linkage attached) on the mounting pads of the front frame and secure with the cap screws, lock washers and flat washers. The suction filter used with flexible coupling should also be attached to the support.

(b) SUCTION FILTER WITH FLEXIBLE COUPLING: Connect the regulator drain hose (14) to the converter.

SUCTION FILTER WITHOUT FLEXIBLE COUPLING: Connect the regulator drain hose to the pump inlet reducing tee (18). Secure the converter inlet hose to the decelerator cylinder (8) with the strap.

(Continued on next page)

3. INSTALLATION - Continued

(c) Secure the adjustable clevis (3) to the bellcrank with the end pin and cotter.

(d) SUCTION FILTER WITH FLEXIBLE COUPLING: Secure the flexible coupling (Illust. 8) to the upper pipe nipple (refer to section 1, "GENERAL" for the proper method of installing a flexible coupling).

(e) SUCTION FILTER WITH FLEXIBLE COUPLING: Secure the flexible coupling (16) between the suction filter and filter inlet tube following procedure in step (d).

(f) Secure the decelerator cylinder to the seat support bracket bar (10) with the bolt, lock washer and flat washer.

(g) Connect the decelerator drain tube (7) to the converter and decelerator cylinder (8).

(h) Connect the decelerator cylinder inlet hose (9) at the cylinder.

12. Connect the engine oil pressure gauge tube (Illust. 12) to the rear tube connection below the dash.

13. POWER SHIFT ONLY: Place the cranking motor cable (2) in position and secure the cable to the converter housing with the two spring clips (5, Illust. 7 or 7A).

14. Remove the lifting eye (Illust. 12) from the rear, R.H. side of the engine and place it in the tool box for future use. Secure the bellcrank at this position with the bolt and flat washer (Illust. 6).

15. Secure the governor control rear rod clevis (4, Illust. 7 or 7A) to the crosshaft with the end pin and cotter.

16. Install and secure the L.H. and R.H. front platforms. Connect the adjustable clevis (1, Illust. 7 or 7A) to the decelerator pedal with the end pin and cotter.

17. Secure the air cleaner to the dash with the two studs, cap screws and lock washers. Secure the air cleaner cap with the wing nuts.

18. MODEL 175 LOADER ONLY: Install the turbocharger-to-air intake elbow pipe and secure with the clamps.

19. Position the turbocharger-to-air cleaner outlet hose and secure with hose clamps. Check the air cleaner indicator tube (connected to hose) for crimps.

20. Install the watchdog fuel filter (if equipped). Secure the filter to the mounting bracket with the four cap screws, lock washers, flat washers and nuts. Connect the final fuel filter outlet hose to the bottom of the watchdog fuel filter (6). Connect the pressure gauge tube (7) at the filter tee and at the rear tube connection in front of the dash. Tighten the mounting bolts for the bracket securing the rear tube to the dash and secure the front tube (7) to the side of the front frame with the spring clip (Illust. 5).

Connect the filter outlet hose (5, Illust. 5) at the pump. Secure the front cover plate to the underside of the front frame.

21. Position and secure the generator cable harness (2) and the water temperature gauge cable (1) with the clips (4 and 8) as shown in Illust. 5. Connect the water temperature gauge cable (1) to the water manifold and the generator cables (3) to the generator (Illust. 5).

22. Install the cranking motor. Install a new gasket and secure the cranking motor and solenoid assembly to the flywheel housing with the three cap screws and lock washers. Install and secure the three cables at the solenoid connection with the nuts, washer, and star washer.

23. POWER SHIFT ONLY: Secure the safety filter and mounting bracket to the left hand side of the front frame with the cap screws and lock washers (Illust. 4).

24. Position the radiator and radiator guard assembly in the front frame. Install the 16 cap screws which secure the guard to the front frame but do not tighten until the four dowel pins are driven into place.

PRINTED IN UNITED STATES OF AMERICA

25. Secure the dowel pins to the inner face of the front frame with the retainers, lockwashers and cap screws (Illust. 1).

26. Perform the steps necessary under installation of the radiator in section 2, "COOLING SYSTEM" to complete installation.

27. Open the diesel fuel shut-off valve at the fuel tank.

28. Be sure the water drain valve is closed and tight and fill the radiator.

29. Check the crankcase oil level (refer to the operator's manual for the correct grade and amount).

30. Check the main frame oil level (power shift units) or the clutch reservoir oil level (manual shift units) and add the proper amount for operation (refer to the operator's manual for the proper grade and level).

31. Connect the electrical system master switch.

32. Be sure the drain plug is installed and fill and vent the blade or loader hydraulic system as described in the pertinent instruction manual.

33. Start the engine and check for leaks. After the engine is up to operating temperature, recheck the coolant level and add if necessary.

34. Perform the adjustments as described in Par. 4, "ENGINE IDLE ADJUSTMENTS."

35. Install the quick disconnect platform.

4. ENGINE IDLE ADJUSTMENTS

◆ CAUTION: POWER SHIFT ONLY: The following adjustments must be made by two men. One man must be at the controls while the other does the checking. The brake pedal must be applied and locked and the manual hi-lo shift lever must be in the "NEUTRAL" position until all adjustments are performed and the engine is shut off.

With the decelerator pedal and linkage completely assembled, perform adjustments in the following sequence.

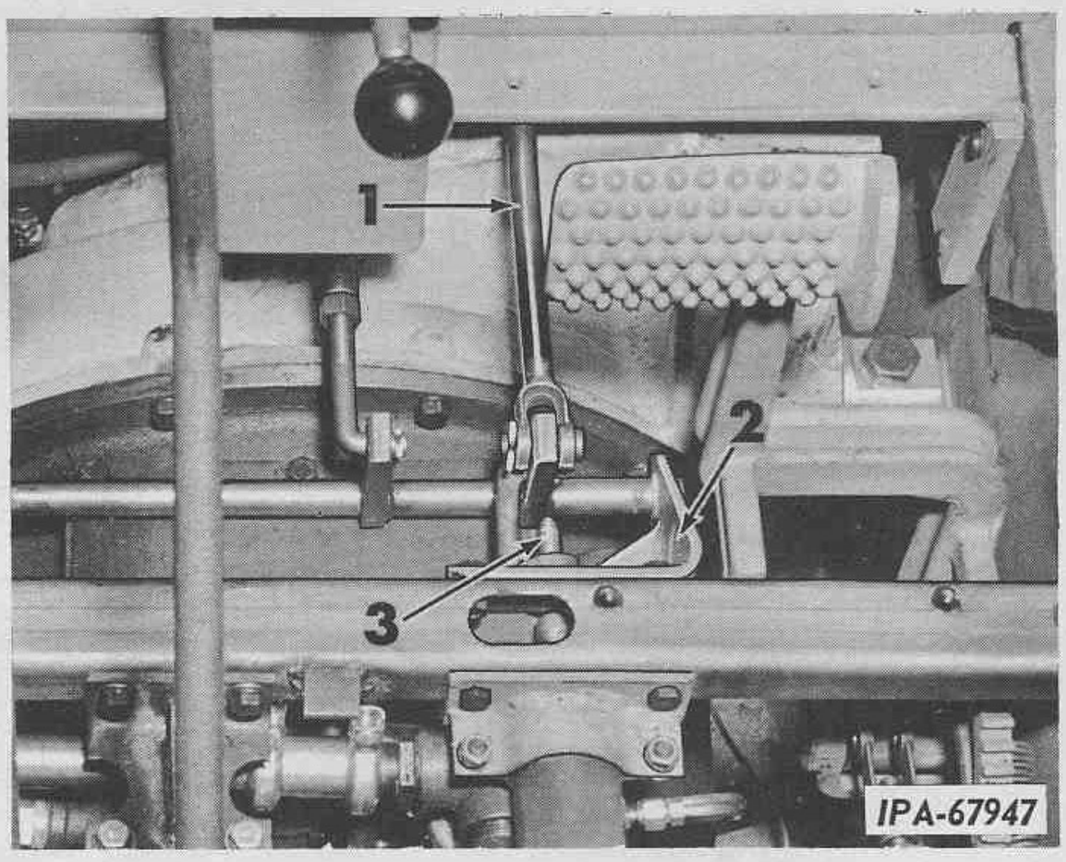
Low Idle Adjustment
(Refer to Illust. 14)

1. Remove the quick disconnect platform.

2. POWER SHIFT ONLY: Start the engine and lock the transmission gear selector hand lever in neutral with the safety lock lever.

MANUAL SHIFT ONLY: Start the engine and place the gear shift hand lever in the neutral position.

3. Move the governor control hand lever to the low idle position to obtain the low idle speed. (Refer to Section 1, "GENERAL.")



Illust. 14
Engine Idle Adjustment Points.
(Power Shift Tractor Shown.)

1. Governor control rod.
2. Cross shaft bracket.
3. Decelerator cylinder adjuster.

4. If the engine rpm is not within the range specified in section 1, the governor control rod (1) must be lengthened to decrease the rpm or shortened to increase the rpm. To change the length of the rod, loosen the jam nut at the front end of the rod. Disconnect the rod end clevis from the injection pump arm and turn the clevis to the left or right, depending on whether an engine rpm decrease or increase is desired. Tighten the jam nut and connect the clevis to the injection pump arm.

5. Repeat step 4 until the proper low idle speed is obtained. This adjustment will also determine "high idle" and "shut-off" positions.

NOTE: POWER SHIFT ONLY: If the high idle speed (refer to section 1) is to be checked, the transmission gear selector hand lever must be moved from the "NEUTRAL" position to by-pass the automatic deceleration.

Decelerator Pedal Adjustment

6. Place the governor control lever up in the high idle position and depress the decelerator pedal. With the decelerator pedal fully depressed, the engine rpm must be between 850 to 950 rpms.

7. If the engine rpm is not between 850 and 950 rpms, the decelerator pick-up lever rod must be adjusted. Disconnect the rod clevis from the decelerator pedal. Loosen the jam nut and turn the rod clevis to the left or right depending on whether engine rpm decrease or increase is necessary. Tighten the jam nut and connect the clevis to the decelerator pedal.

8. Repeat step 7 until the proper engine rpm is obtained.

Automatic Decelerator Adjustment (Power Shift Only) (Refer to Illust. 14)

9. With the engine running, the governor control lever in the high idle position and the transmission gear selector hand lever locked in the "NEUTRAL" position, adjust the decelerator cylinder adjuster as follows.

10. Reach in through the access hole in the cross shaft bracket (2) and loosen the jam nut on the adjuster (3).

11. Place a wrench on the flats of the adjuster (3) and turn the adjuster until the engine rpm is 1050-1150 rpm. (To decrease the engine rpm, turn the adjuster out; to increase the engine rpm, turn the adjuster in.) When the correct engine rpm is obtained, hold the adjuster in place and tighten the jam nut.

12. Install the platform.

PRINTED IN UNITED STATES OF AMERICA

SERVICE BULLETIN REFERENCE

NUMBER	DATE	SUBJECT	CHANGES

CONTENTS

1. DESCRIPTION

The engine clutch is installed in the tractor between the engine and the transmission. It is a three-plate, over-center, wet type clutch. The complete clutch consists of three main sections: The operating or hand lever, the driving unit and the driver unit.

The hand lever, through the clutch release shaft and fork, is used to engage or disengage the clutch. Any automatic clutch brake located on the rear of the clutch shaft becomes operative when the clutch is disengaged to facilitate shifting the transmission gears by stopping their rotation. A gear shifter lock is linked to the right hand clutch release shaft and this device locks the transmission gears in the selected position when the clutch is engaged.

The clutch driving unit consists of the release sleeve, pressure plate, cams, driving discs and drive ring which are attached to the clutch back plate. The back plate is secured to the flywheel; therefore, the unit revolves whenever the engine is running.

The clutch driven unit, which consists of the splined center with three driven discs and the clutch shaft, is supported at the front end by a pilot bearing installed in the flywheel and at the rear to the transmission input shaft through a universal joint. This independent assembly revolves as a unit with the driving unit only when the clutch is engaged.

Hydraulic Oil Flow (Illust. 1)

The clutch hydraulic system is vented through a breather mounted to the reservoir tank. The reservoir tank, located on the left hand fender, contains the oil to operate the steering booster and supply lubrication for the clutch. The oil is drawn from the reservoir tank and through a suction filter by the suction developed from the clutch pressure pump mounted to the right hand side of the clutch housing. The pump is driven through a series of gears by the engine crankshaft. A relief valve incorporated in the pump protects the pump from damage should the oil pressure become excessive. Oil from the pump is delivered to the pressure filter mounted on the left hand frame and from here to a tee where it is directed to the steering boosters and to the pressure regulator.

NOTE: On later tractors, a check valve is used between the pump and the pressure filter to reduce the possibility of the hydraulic reservoir oil siphoning back to the clutch housing when the tractor is stopped.

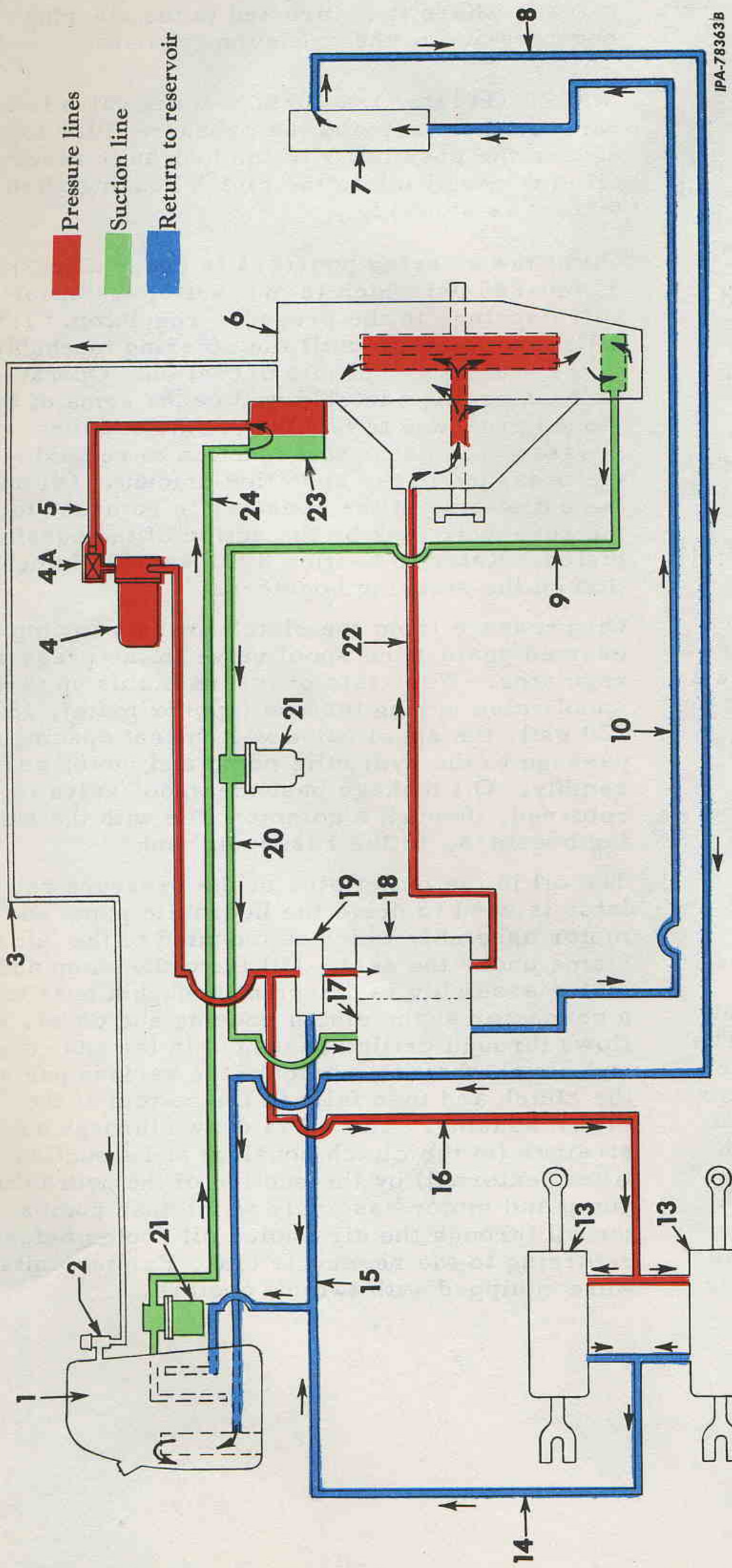
Oil at the steering boosters is under a pressure of 180-220 psi which is pre-set by the spool valve springs in the pressure regulator. This oil remains static until the steering mechanism of the tractor is put into operation. Operation of the steering controls will cause some of this stored pressure to be dissipated, and the pressure regulator will function to rebuild the pressure to the specified amount. Oil on the outlet side of the boosters is returned to the reservoir tank by the action of the booster piston. Refer to Section 8 for service information on the steering boosters.

Oil pressure from the clutch pressure pump is exerted against the spool valve in the pressure regulator. When this pressure builds up to the spool valve spring tension (approximately 180-220 psi), the spool valve will unseat opening a passage to the hydraulic pump and motor assembly. Oil leakage past the spool valve is returned, through a common line with the steering boosters, to the reservoir tank.

The oil in the outlet side of the pressure regulator is used to drive the hydraulic pump and motor assembly which is mounted to the left hand frame under the seat. Oil from the pump and motor assembly is directed through a hose to a connector at the clutch housing end cover. Oil flows through drilled passages in the end cover and clutch shaft to lubricate the various parts of the clutch and then falls to the bottom of the clutch housing. The oil is drawn through a strainer (in the clutch housing) and a suction filter (external) by the suction of the hydraulic pump and motor assembly which then pumps the oil through the air cooled oil cooler before returning to the reservoir tank. Earlier units were equipped with two oil coolers.

1. DESCRIPTION - Continued

Hydraulic Oil Flow (Illust. 1) - Continued



Illust. 1
Hydraulic Oil Flow Diagram.

1. Reservoir tank.
2. Breather filter.
3. Clutch housing vent tube.
4. Pressure filter.
4A. Check valve.
5. Clutch pump outlet.
6. Wet clutch.
7. Oil coolers.
8. Cooler outlet.
9. Clutch outlet.
10. Cooler inlet.
12. Valve-to-reservoir inlet hose.
13. Steering boosters.
14. Booster-to-reservoir inlet hose.
15. Pressure regulator-to-reservoir inlet hose.
16. Steering booster inlet.
17. Pump (pump and motor assembly).
18. Motor (pump and motor assembly).
19. Pressure regulator.
20. Pump inlet tube.
21. Suction filters.
22. Motor outlet hose.
23. Clutch pressure pump.
24. Clutch pump inlet hose.

PRINTED IN UNITED STATES OF AMERICA

2. SPECIFICATIONS

Wet Clutch

Manufacturer	Rockford
Type	Over-center
Size, inches	13-1/2
Number of clutch driven discs used	3
Allowable out-of-flatness of pressure plate, inch	.005
Release shaft bushing inside diameter (assembled in clutch housing), inches	1.252 - 1.256
Release shaft outside diameter, inches	1.245 - 1.250
Release sleeve bushing inside diameter (assembled in release sleeve), inches	1.750 - 1.752
Clutch shaft outside diameter (for release sleeve bushings), inches	1.745 - 1.747
Release fork, bushings and bearing carrier:	
Fork slot width, inch	.998 - 1.002
Bushing: OD at flats, inch	.991 - .996
ID (fits on bearing carrier), inch	.752 - .755
Bearing carrier trunnion diameter, inch	.745 - .750
Release cams and cam saddles:	
Cam diameter, inch	.870 - .872
Saddle width, inch	.875 - .877
Clearance, inch	.003 - .007
Maximum allowable total wear of cams and saddles, inch	1/16
Clutch return springs:	
Free length, inches.	1.56
Test length, inches	1.19
Test load, pounds	90 - 104

Pressure Regulator

	Free length inches	Test length inches	Test load pounds	Number of coils
Springs:				
Spool valve spring (inner)	2.98	2.156	42.9	13.5
Spool valve spring (outer)	2.98	2.156	91.1	9
Spool valve spring (internal)	.917	.550	5 to 6	12
Spool valve opening pressure:	180 - 220 psi			

Clutch Pressure Pump

Make and model	Webster, 2LCSV-IR
Rated pump delivery against 300 psi @ 1838 rpm (gallons per minute)	11
Gear thickness, inches	.8008 - .8012
Gear tip diameter, inches	1.9770 - 1.9775
Gear plate gear bore diameter, inches	1.981 - 1.982
Relief valve setting (in pump)	300 psi

Hydraulic Pump and Motor Assembly

Make and model	Webster, 4LC/MIHC-L
Gear thickness, inches:	
(Motor gear)	.5614 - .5617
(Pump gear)	1.2494 - 1.2498
Gear tip diameter, inches:	
(Motor gear)	1.9770 - 1.9775
(Pump gear)	1.9740 - 1.9745
Gear plate gear bore diameters, inches	1.981 - 1.982

2. SPECIFICATIONS

Special Bolt and Nut Torque Data
(Torques Given Are for Bolts and Nuts Lubricated With SAE-30 Engine Oil)

Reservoir tank filler and level plug	30 ft-lbs. Max.
Suction filter housing cap screws	23-26 ft-lbs.
Pressure filter case bolt	55 ft-lbs. Max.

3. CHECKING MECHANICAL PROBLEMS

Probable Cause	Remedy
Clutch Drags	
1. Improper adjustment	Adjust clutch.
2. Warped or cracked clutch disc	Replace disc.
3. Weak return springs	Replace return springs.
Clutch Slips	
1. Improper adjustment	Adjust clutch.
2. Clutch inner disc worn	Replace disc.
3. Sticking pressure plate	Repair or install new pressure plate.
Clutch Grabbing	
1. Lack of oil on facings	Refer to "Insufficient Lubrication" problem following.
2. Sticking pressure plate	Repair or install new pressure plate.
Insufficient Lubrication	
1. Oil leakage	Check all hoses and connections. Check for oil between clutch housing and flywheel housing and between clutch end cover and seal housing.
2. Faulty clutch pump or pump and motor assembly	Remove, disassemble and replace parts as necessary.
3. Faulty pressure regulator	Inspect springs, valve and body bore.
High Oil Temperature	
1. Insufficient lubrication	Refer to problem above.
2. Faulty thermal by-pass valve (if equipped)	Discard valve assembly. Refer to Paragraph 17, "INSPECTION AND REPAIR" for instructions.
Clutch Noisy	
1. Excessive clearance at driving lugs	Install new pressure plate.

PRINTED IN UNITED STATES OF AMERICA

CLUTCH ASSEMBLY

4. REMOVAL

1. Drain the hydraulic system. Run the engine at low idle until the oil reaches operating temperature and stop the engine. Remove the filler and level plug at the rear of the reservoir tank and the drain plug in the bottom of the tank. To remove the drain plug in the bottom of the flywheel housing it will first be necessary to remove the access cover from the underside of the front frame.

◆ CAUTION: Always loosen the filler and lever plug at the rear of the reservoir tank slowly, in case there is still some pressure in the system.

NOTE: When disconnecting hydraulic lines for any reason, they should be properly capped with the correct size plastic cap. If these caps are not available, tape or clean rubber corks may be used. Hydraulic openings must NEVER be plugged with rags. This practice could easily introduce dirt or lint into critical hydraulic components of the tractor.

2. Remove the decelerator pedal, pedal support and platforms.

3. Disconnect all linkage necessary to facilitate removal of the platform support channel and remove the support channel with decelerator and engine control linkage.

4. Disconnect the clutch vent tube at the clutch housing.

5. Remove the inlet and outlet hoses at the clutch pump mounted to the right side of the clutch housing. Remove the cap screws and washers securing the pump to the clutch housing and remove the pump. Discard the pump gasket (50, Illust. 2). Pull the pump drive shaft and coupling assembly from the flywheel housing.

6. Disconnect the clutch inlet hose at the clutch housing end cover. Disconnect the outlet hose at the bottom of the clutch housing. With the outlet hose removed, remove the strainer mounting cap screws and pull the strainer with "O" ring from the clutch housing to prevent it from being damaged during clutch removal.

7. Disconnect the hand lever (47) from the link (39). Loosen the lock nut and unscrew the link from the pin (38) in the clutch release shaft. Remove the pin from the shaft. Refer to Illust. 2.

8. Disconnect the transmission gear shift lock operating rod from the right hand release shaft (13, Illust. 2).

9. Disconnect the universal joint from between the transmission and clutch shafts and remove.

NOTE: Before removing the cap screws securing the universal joint, it is recommended that the bearing caps be wired to prevent the bearings from falling off the spider trunnions.

10. Remove the inspection cover and gasket from the clutch housing. Paint mark the clutch back plate to the flywheel to assure assembly in the same position and remove the back plate securing cap screws and lock washers.

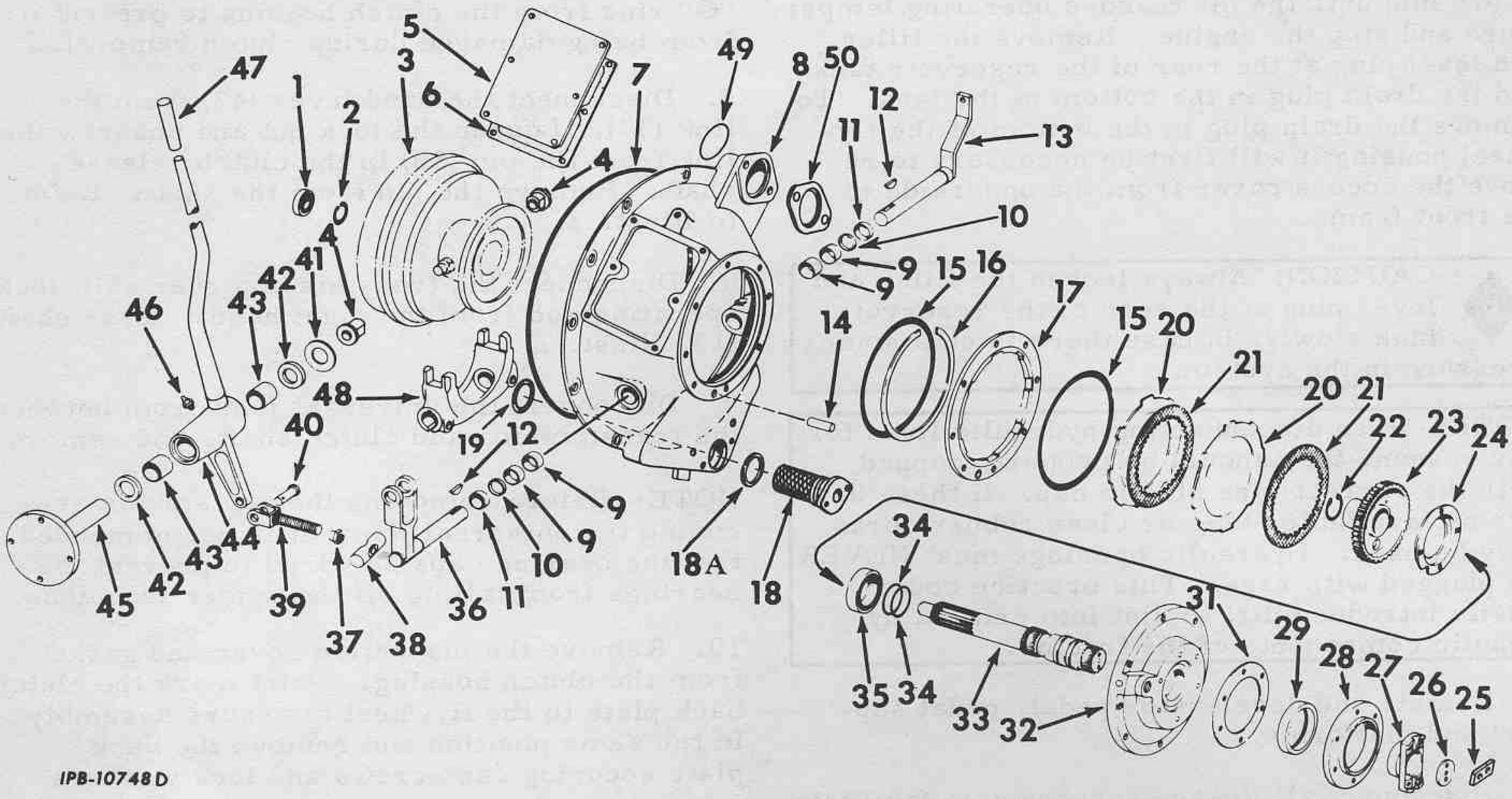
11. Attach a hoist to two top inspection cover mounting holes in the clutch housing. Remove the cap screws and lock washers securing the clutch housing to the flywheel housing. Pry the clutch housing free of the flywheel housing and lift the clutch assembly from the tractor.

NOTE: One of the clutch housing mounting cap screws is located in the clutch pressure pump mounting opening.

12. Remove and discard the "O" ring (49, Illust. 2) from the flywheel housing at the clutch pressure pump opening and (19, Illust. 2) at the clutch oil strainer opening. Cover the flywheel housing opening to prevent dust and dirt from entering.

CLUTCH ASSEMBLY

5. DISASSEMBLY

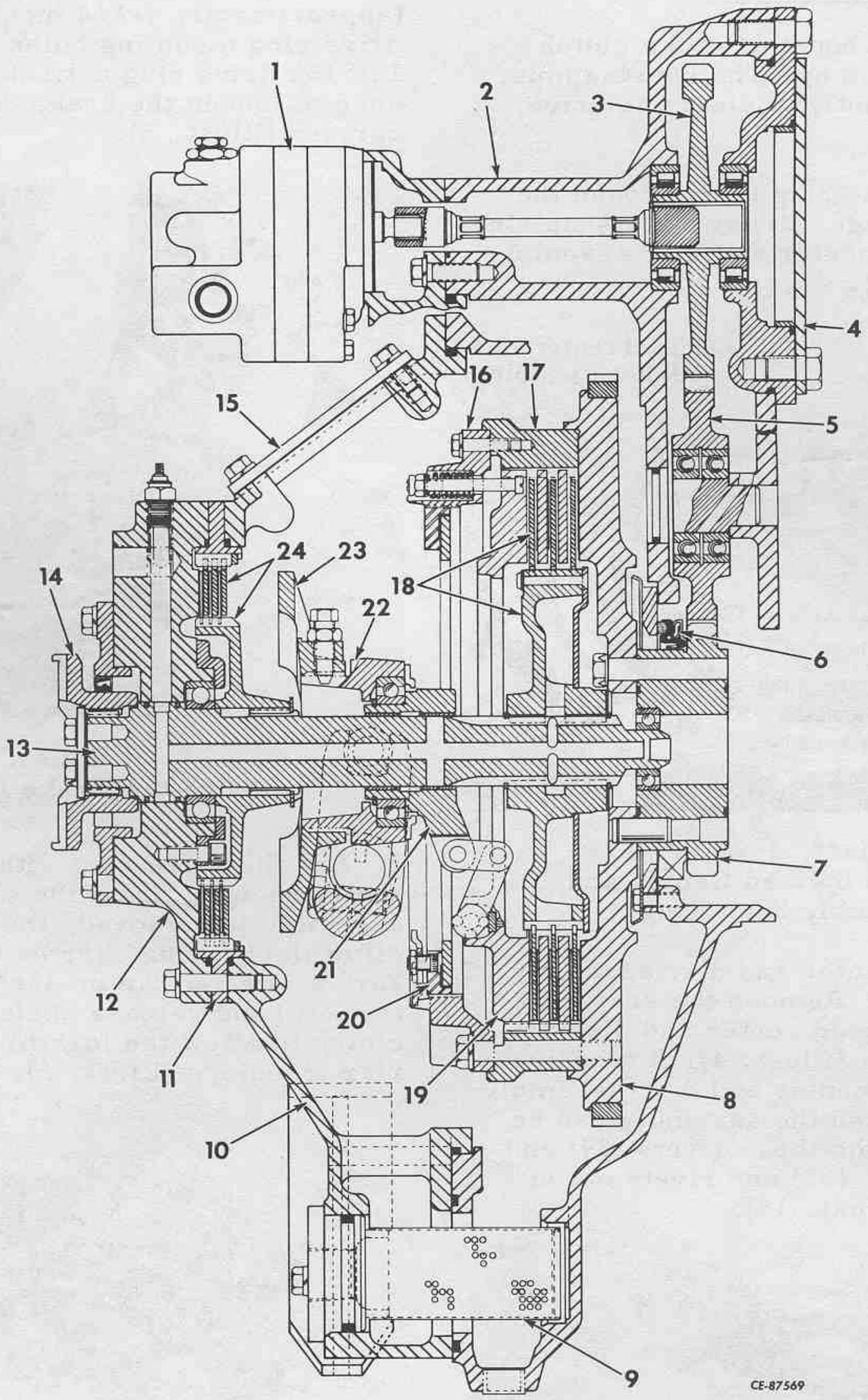


Illust. 2
Exploded View of Clutch Housing and Related Parts.

1. Pilot bearing
2. Snap ring.
3. Wet clutch.
4. Fork bushings.
5. Inspection cover.
6 Cover gasket.
7 Sealing ring.
8. Clutch housing.
9. Release shaft bushings.
10. Release shaft seal.
11. Seal wear ring
12. Key.
13. Clutch release shaft (RH)
14. Locating pin.
15. Retainer "O" ring.
16. Brake disc retaining ring.
17. Retainer.
18. Clutch sump strainer.
18A. Strainer "O" ring.
19. Clutch sump "O" ring.
20. Clutch brake plate.
21. Clutch brake plate.
22. Hub snap ring.
23. Clutch brake hub.
24. Bearing retainer.
25. Bolt lock plate.
26. End plate.
27. Drive yoke.
28. Seal cover.
29. Clutch shaft seal.
31. Seal cover gasket.
32. Housing end cover.
33. Clutch shaft.
34. Shaft sealing rings.
35. Clutch shaft bearing.
36. Clutch release shaft (LH)
37. Link lock nut.
38. Link pin.
39. Operating link.
40. Link end pin.
41. Hand lever washer.
42. Hand lever hub seal.
43. Hand lever bushing.
44. Clutch hand lever.
45. Hand lever shaft.
46. Hand lever lubrication fitting.
47. Hand lever handle.
48. Clutch release fork.
49. Clutch housing-to-flywheel housing "O" ring.
50. Clutch pressure pump gasket.

PRINTED IN UNITED STATES OF AMERICA

CLUTCH ASSEMBLY



Illust. 2A
Cross Section of Clutch Assembly.

1. Clutch pressure pump.
2. Flywheel housing.
3. Pump drive gear.
4. Power take-off pump mounting flange cover.
5. Idler gear.
6. Crankshaft rear oil seal.
7. Spacer drive gear.
8. Flywheel.
9. Oil strainer.
10. Clutch housing.
11. Outer drive ring retainer.
12. Housing end cover.
13. Clutch shaft.
14. Drive yoke.
15. Inspection cover.
16. Clutch back plate.
17. Clutch drive ring.
18. Splined center and disc assembly.
19. Clutch pressure plate.
20. Clutch adjusting ring.
21. Clutch release sleeve.
22. Clutch bearing carrier.
23. Clutch brake disc.
24. Clutch brake hub and plate assembly.

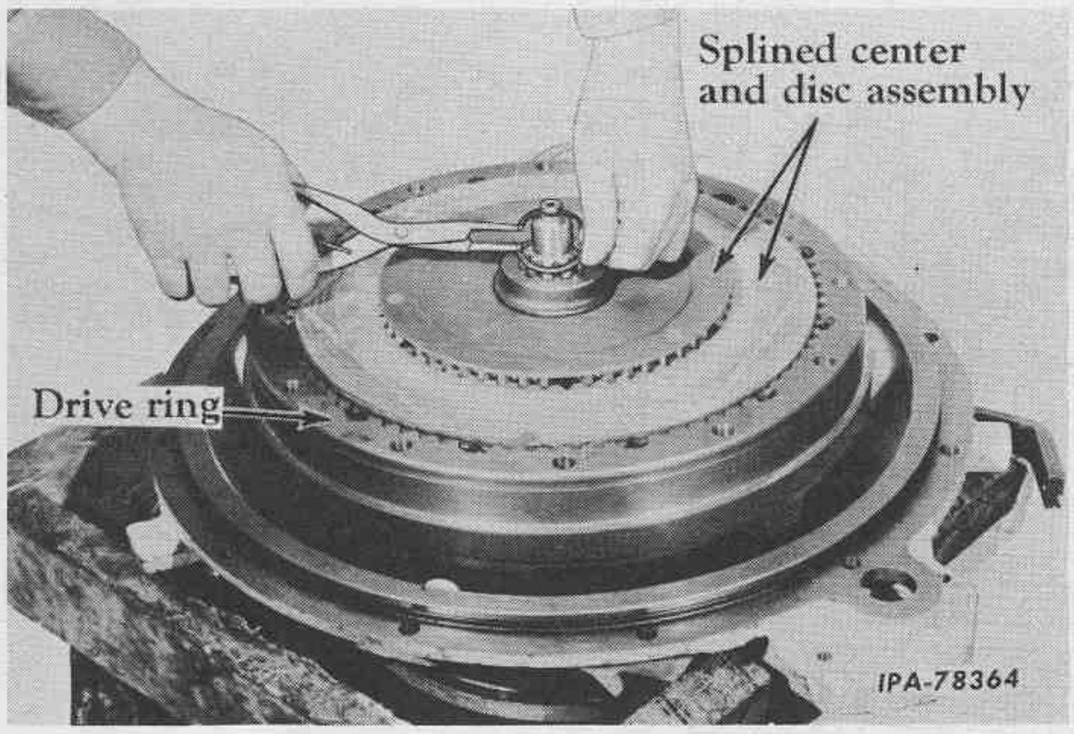
(Continued on next page)

CLUTCH ASSEMBLY

5. DISASSEMBLY - Continued

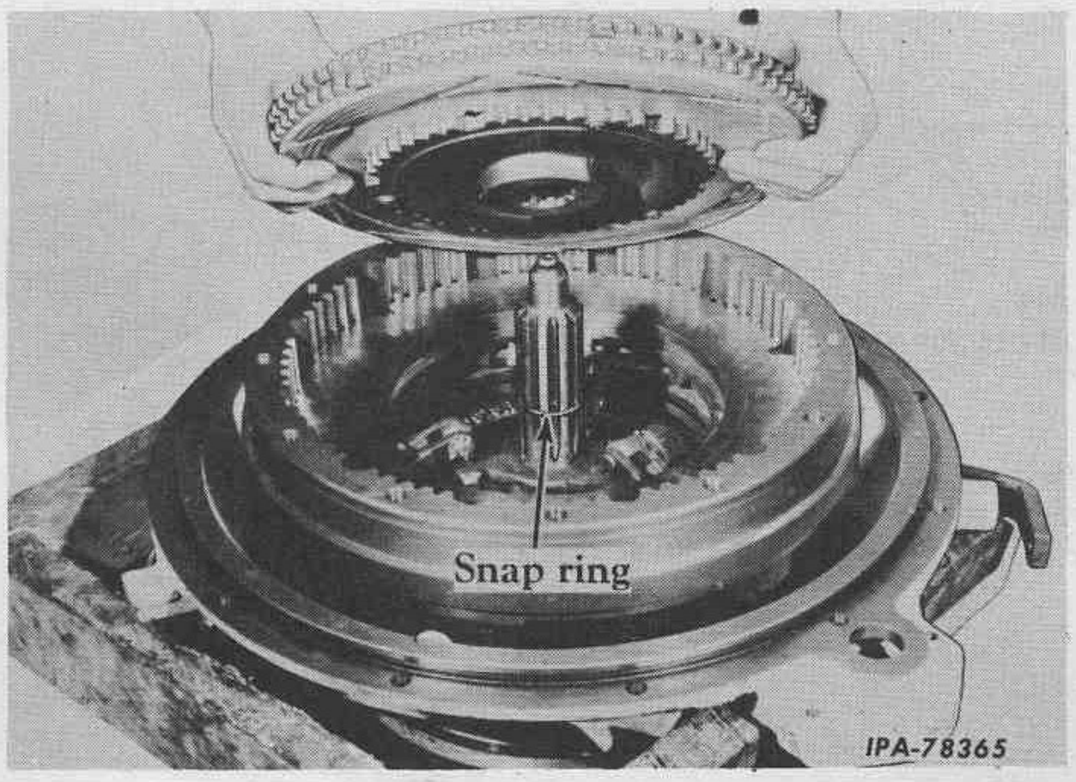
1. Support the clutch housing so the clutch drive ring (Illust. 3) is up. The housing must be blocked up sufficiently to clear the drive yoke (27, Illust. 2).

2. Remove the sealing ring from around the housing mounting flange. Remove the snap ring securing the splined center and disc assembly to the shaft (Illust. 3).



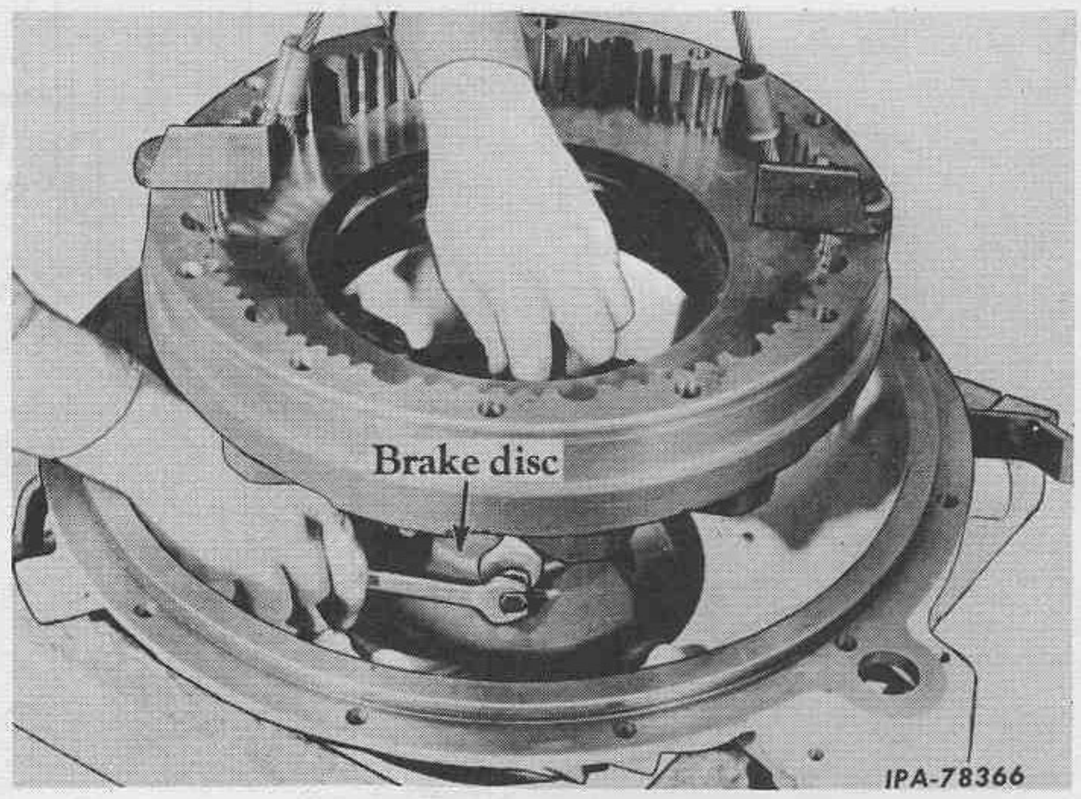
Illust. 3
Removing the Splined Center and Disc Assembly Snap Ring.

3. Lift the splined center and disc assembly from the clutch shaft. Remove the snap ring that positions the splined center and disc assembly from the shaft (Illust. 4). If a component of the splined center and disc assembly (1) needs to be replaced the assembly can be separated by cutting the three rivets (39) and removing the washers (38) and rivets out of the hub cover (34) (Illust. 13).



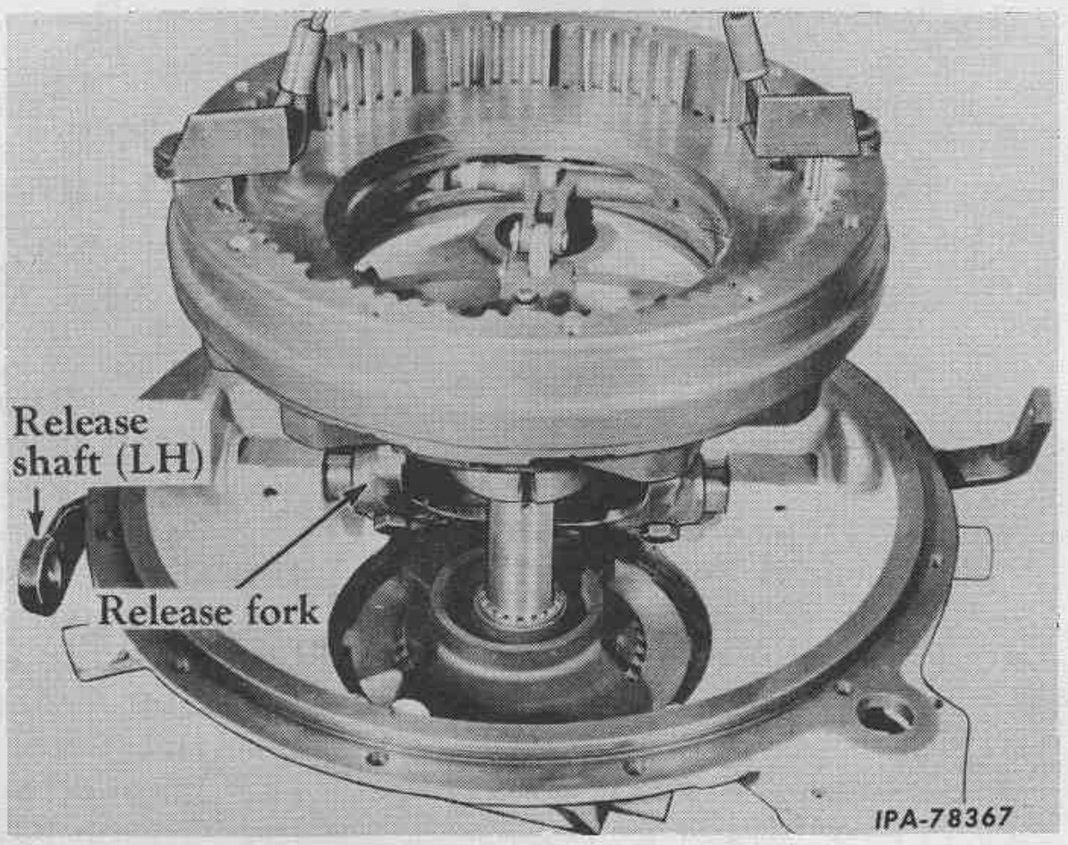
Illust. 4
Removing the Splined Center and Disc Assembly.

4. Attach a hoist by inserting two cap screws (approximately 4-1/4 inches in length) in the drive ring mounting holes and secure with nuts. Lift the drive ring until their is sufficient clearance to loosen the brake disc from the bearing carrier (Illust. 5).



Illust. 5
Removing the Brake Disc Lock Screw.

5. Lift the drive ring with back plate and camshaft assembly from the clutch housing. As the assembly is removed, the release fork will slip off of the bearing carrier trunnions. If necessary a pry bar can be used against the clevis of the left hand release shaft to fully engage the clutch to allow the fork to fall free of the carrier trunnions (Illust. 6).



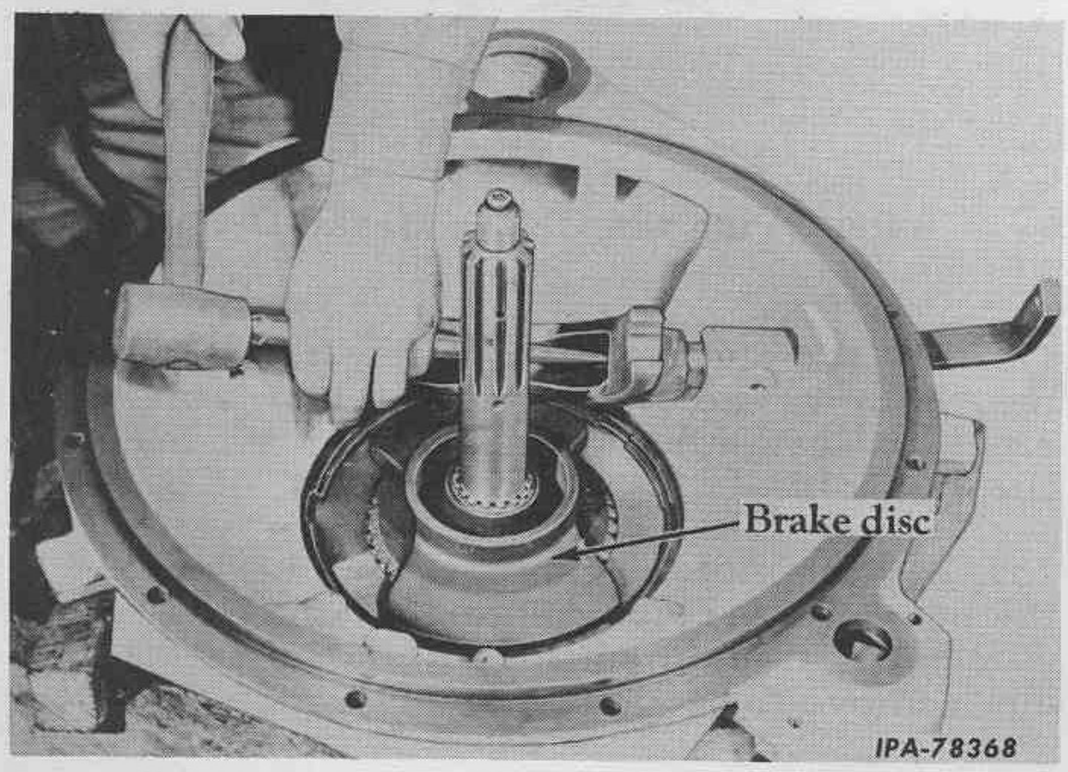
Illust. 6
Removing the Drive Ring from the Clutch Housing.

PRINTED IN UNITED STATES OF AMERICA

CLUTCH ASSEMBLY

6. Remove the bushings (4, Illust. 2) from the trunnions of the bearing carrier.

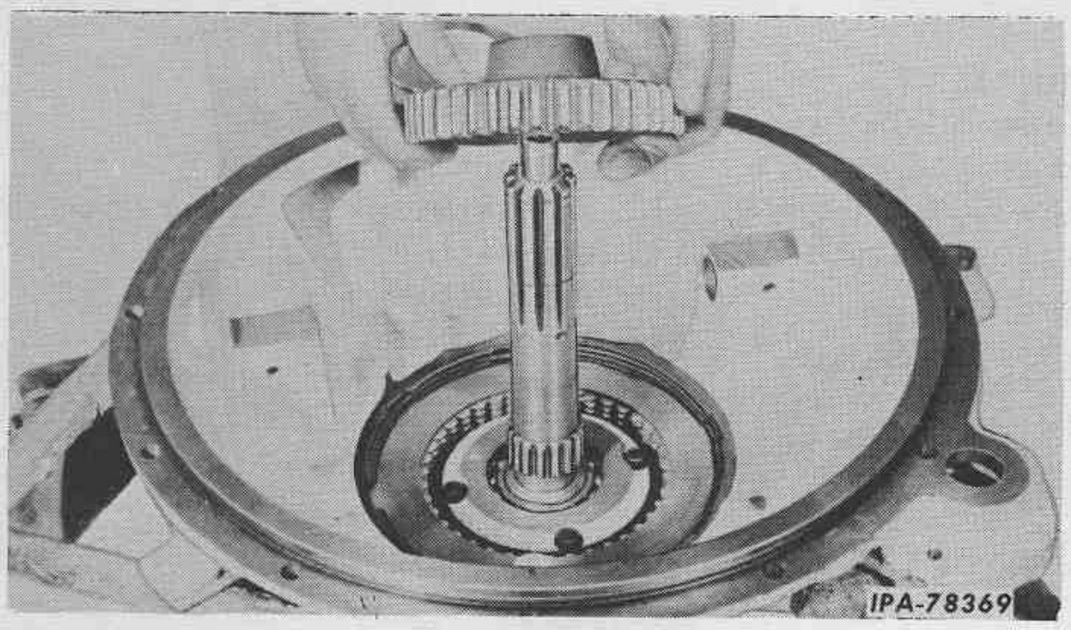
7. Remove the cap screws securing the release fork to the two clutch release shafts. Tap the shafts from the release fork until the Woodruff keys can be removed. Then tap the shafts from the clutch housing and remove the release fork. Lift the clutch brake disc from the shaft. (Illust. 7.)



Illust. 7
Removing the Clutch Release Shaft (RH).

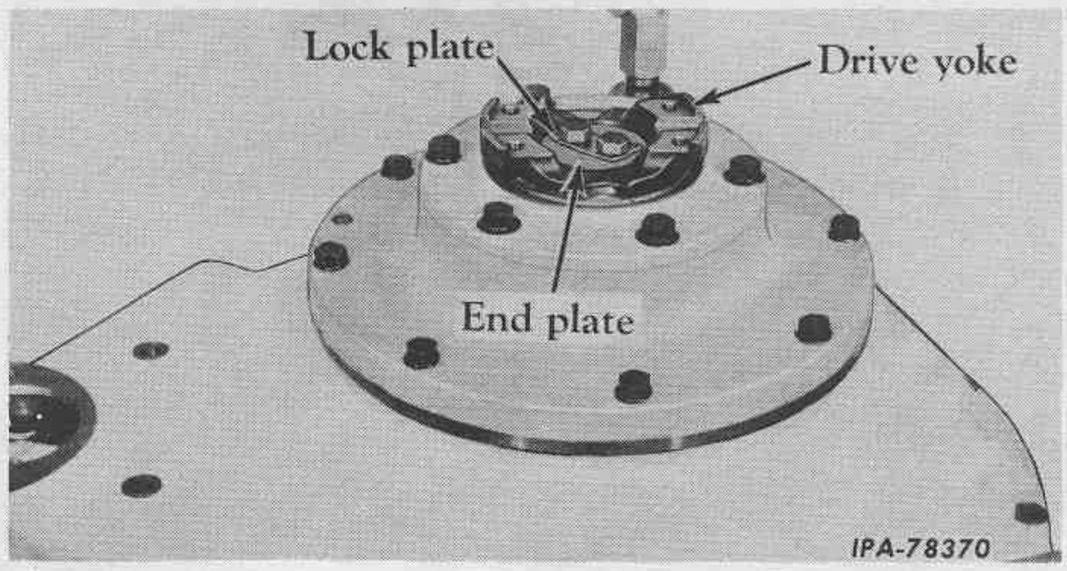
NOTE: The release shaft bushings (9), seal (10) and seal wear ring (11) will remain in the clutch housing and can easily be removed if replacement is necessary (refer to Illust. 2).

8. Remove the snap ring securing the clutch brake hub to the clutch shaft and lift off the hub (Illust. 8).



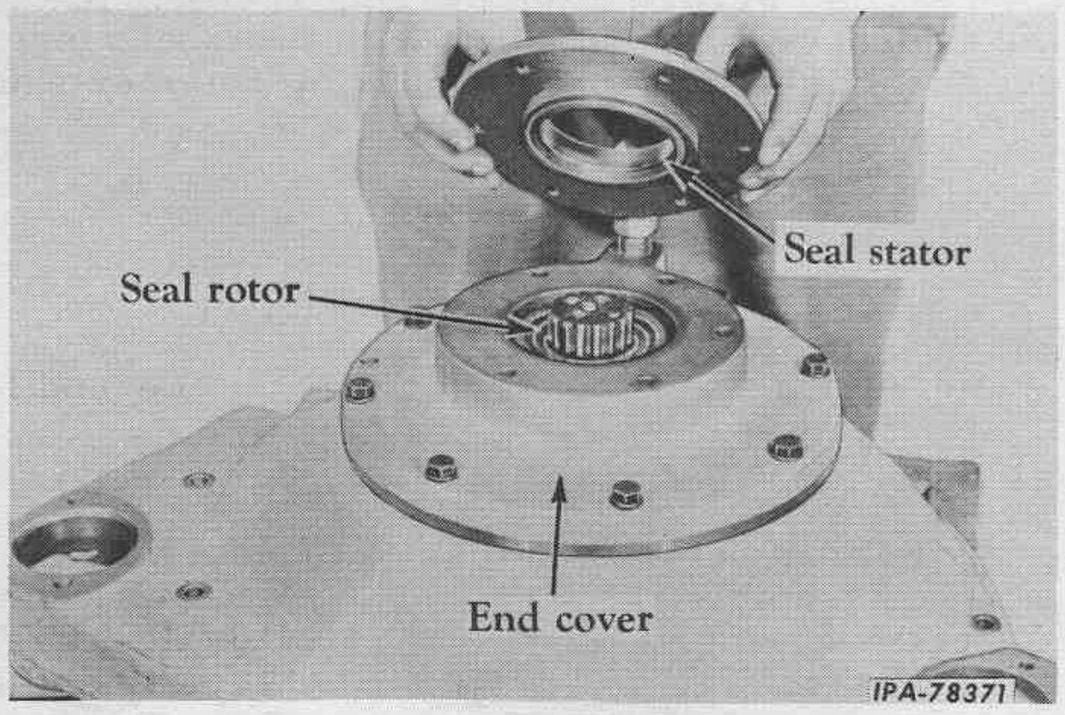
Illust. 8
Removing the Clutch Brake Hub.

9. Turn the housing over so the drive yoke is up. Remove the cap screws, lock plate and end plate. Lift the drive yoke from the shaft splines (Illust. 9).



Illust. 9
Drive Yoke, Lock Plate and End Plate Assembled.

10. METAL FACE TYPE OIL SEAL: Remove the seal cover with the stator of the oil seal and the seal cover gasket from the housing end cover. Remove the rotor of the oil seal from the shaft (Illust. 10).



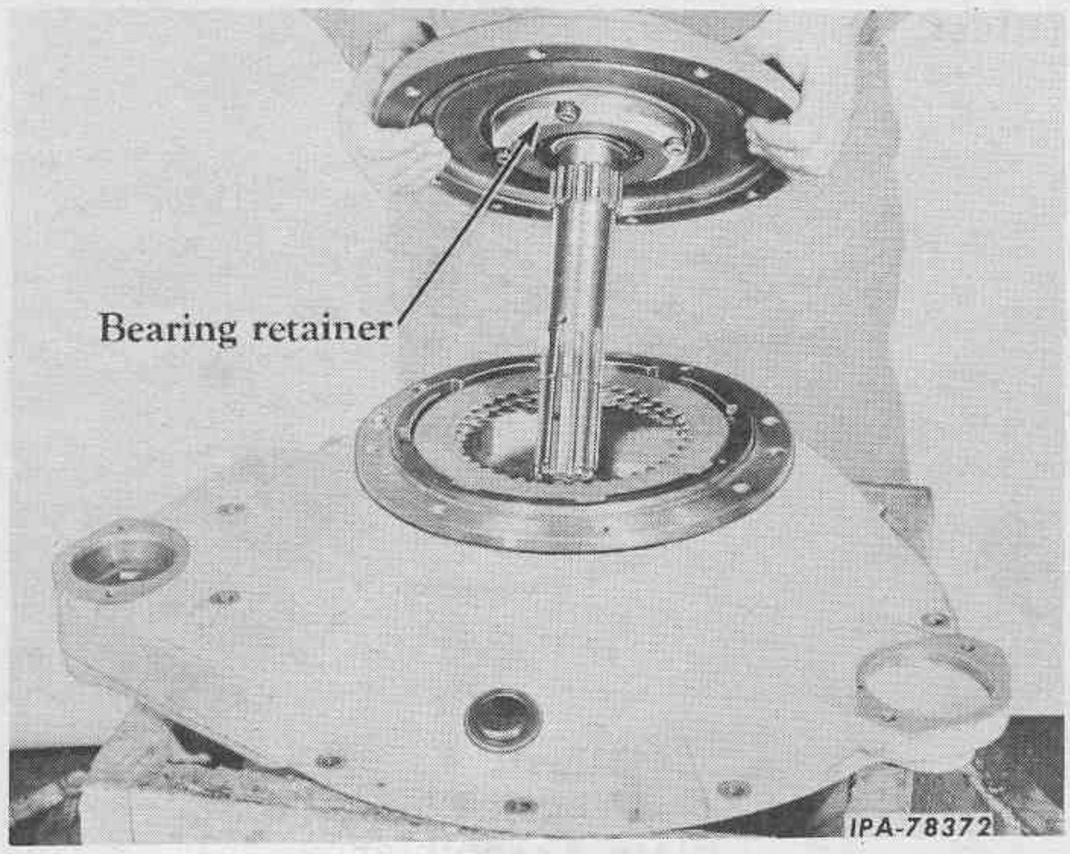
Illust. 10
Removing the Clutch Seal Cover Using Metal Face Type Oil Seal.

LIP TYPE OIL SEAL: Remove the seal cover (28) with oil seal (29) from the end cover (32). Discard the seal cover gasket (Illust. 2).

(Continued on next page)

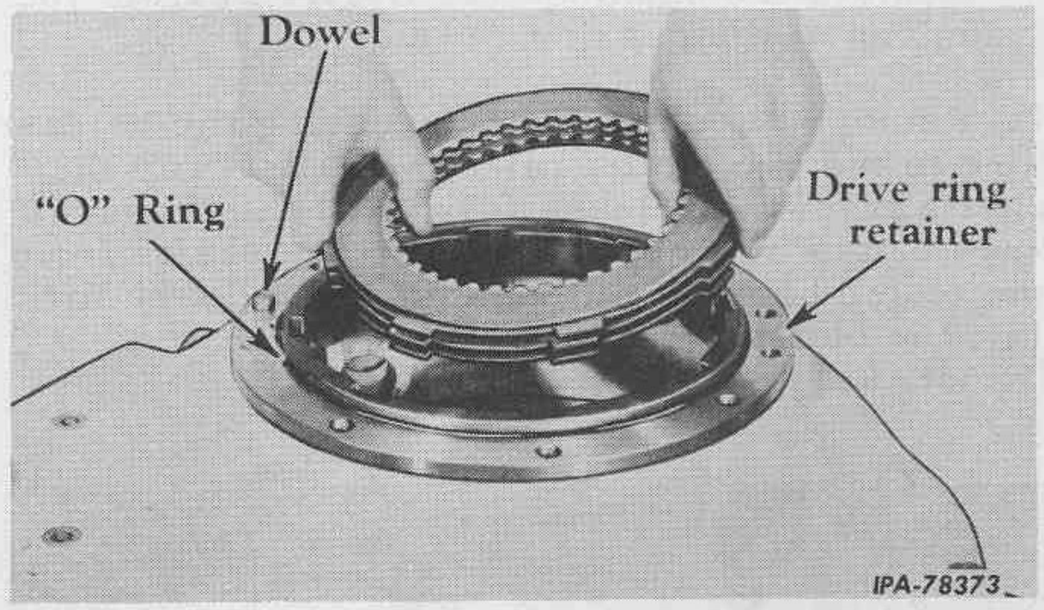
CLUTCH ASSEMBLY

5. DISASSEMBLY - Continued



Illust. 11
Removing the End Cover and Seal Assembly.

11. Remove the cap screws and washers securing the end cover and lift off the end cover and clutch shaft assembly from the housing. To separate the assembly, remove the hexsocket head screws securing the bearing retainer to the end cover. Tap the shaft with two seal rings and the ball bearing out the bearing retainer end of the housing end cover (Illust. 11).



Illust. 12
Removing the Clutch Brake Discs.

12. Lift the clutch brake plates from the housing. Remove the drive ring retainer with "O" rings and retaining snap ring from the housing (Illust. 12).

13. Lay the clutch assembly on a bench with the bearing carrier up. Remove the nuts securing the adjustment lock to the adjusting ring and remove the lock (Illust. 14).

14. CLUTCHES WITHOUT BELLEVILLE WASHER: Untread the adjusting ring from the back plate and remove the adjusting plate (Illust. 15).

(Continued on page 12)

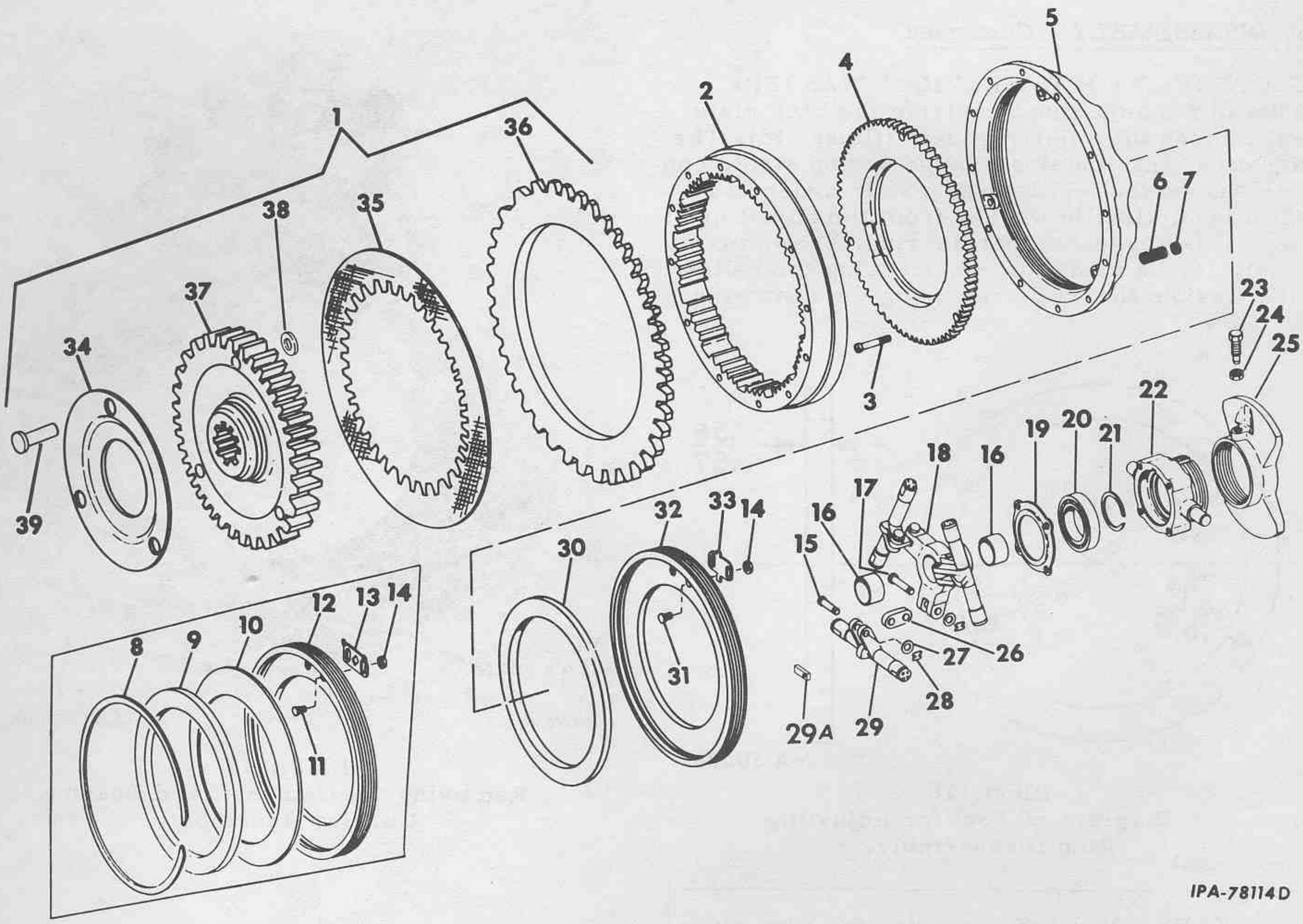
Legend for Illust. 13

1. Splined center and disc assembly.
2. Drive ring.
3. Cap screw.
4. Pressure plate.
5. Back plate.
6. Return spring.
7. Lock nut.
8. Retaining ring.**
9. Adjusting plate.**
10. Belleville washer.**
11. Adjustment lock screw.**
12. Adjusting ring.**
13. Adjustment lock.**
14. Nut.
15. Link pin (short).
16. Release sleeve bushing.
17. Link pin (long).
18. Release sleeve.
19. Bearing carrier plate.
20. Ball bearing.
21. Snap ring.
22. Bearing carrier.
23. Lock screw.
24. Jam nut.
25. Brake disc.
26. Connecting link.
27. Plain washer.
28. Link pin "X" washer.
29. Camshaft.
29A. Camblock.
30. Adjusting plate.*
31. Adjustment lock screw.*
32. Adjusting ring.*
33. Adjustment lock.*
34. Hub cover.
35. Inner disc w/facing.
36. Outer disc.
37. Splined center.
38. Washer.
39. Rivet.

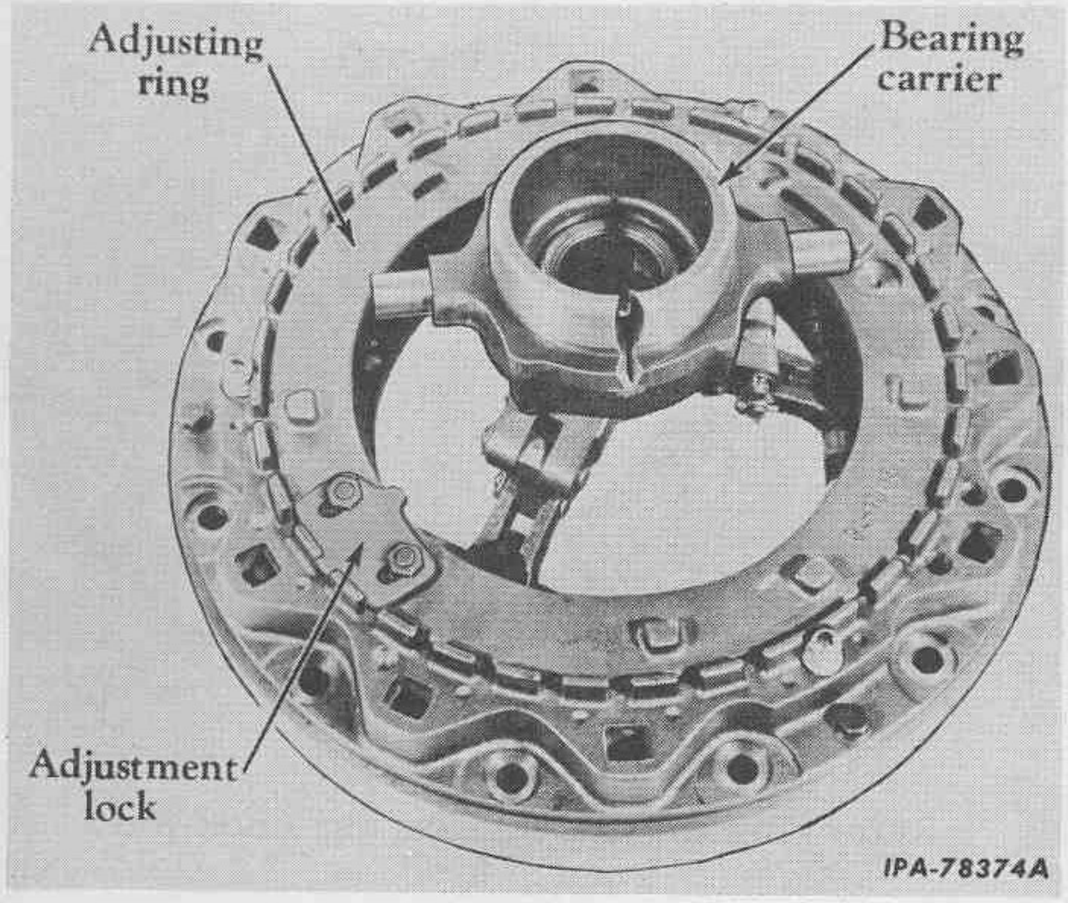
*Clutch without belleville washer.
**Clutch with belleville washer.

PRINTED IN UNITED STATES OF AMERICA

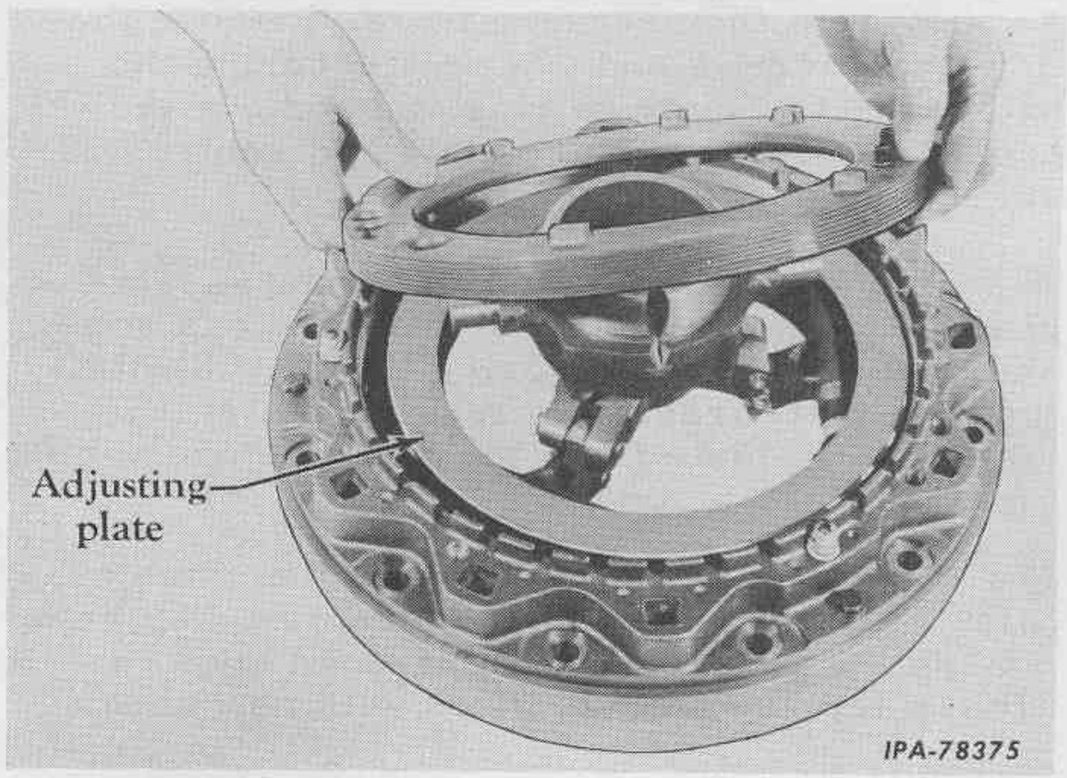
CLUTCH ASSEMBLY



Illust. 13
Exploded View of Clutch Assembly.



Illust. 14
Clutch Assembly.

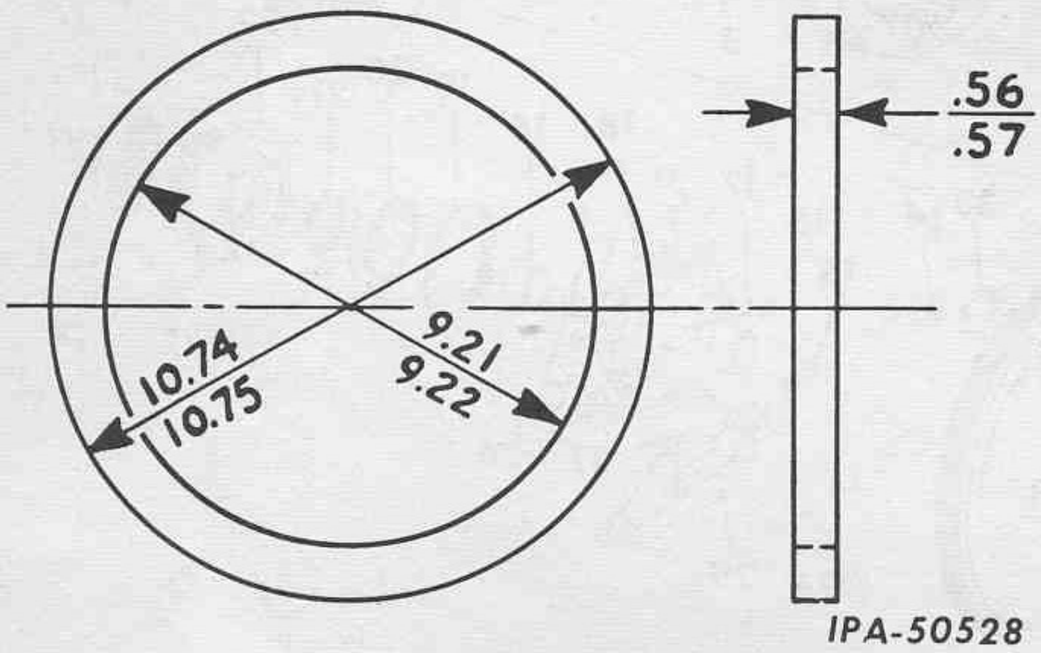


Illust. 15
Removing the Adjusting Ring.

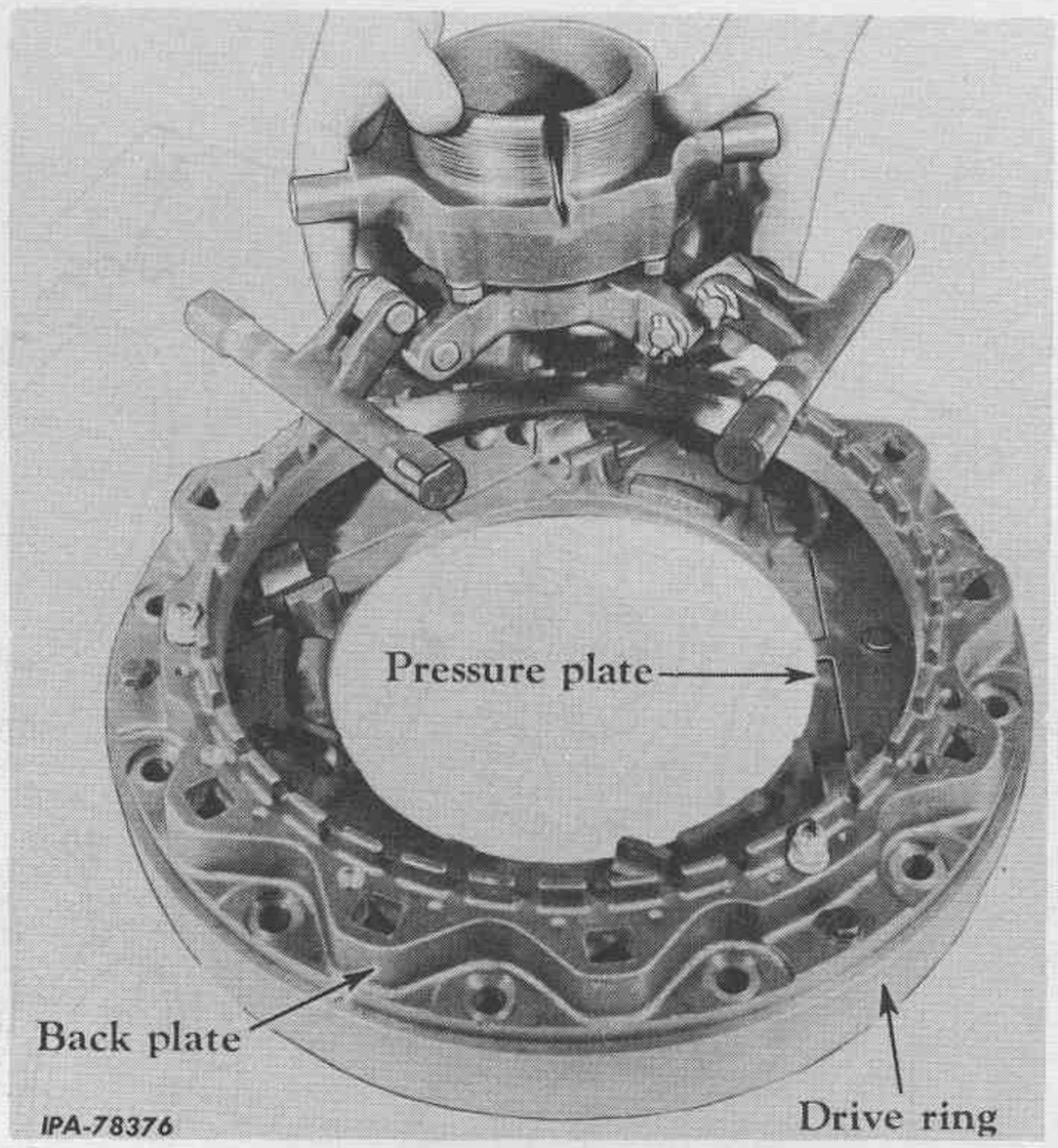
CLUTCH ASSEMBLY

5. DISASSEMBLY - Continued

CLUTCHES WITH BELLEVILLE WASHER: Untread the adjusting ring from the back plate and remove the adjusting plate (Illust. 15). The adjusting ring contains a large spring steel, conical-shaped (belleville) washer. In order to remove the belleville washer from the adjusting ring, it is suggested that the ring, shown in Illust. 16, be made for compressing the belleville washer flat while removing the snap ring.



Illust. 16
Diagram of Tool for Adjusting Ring Disassembly.



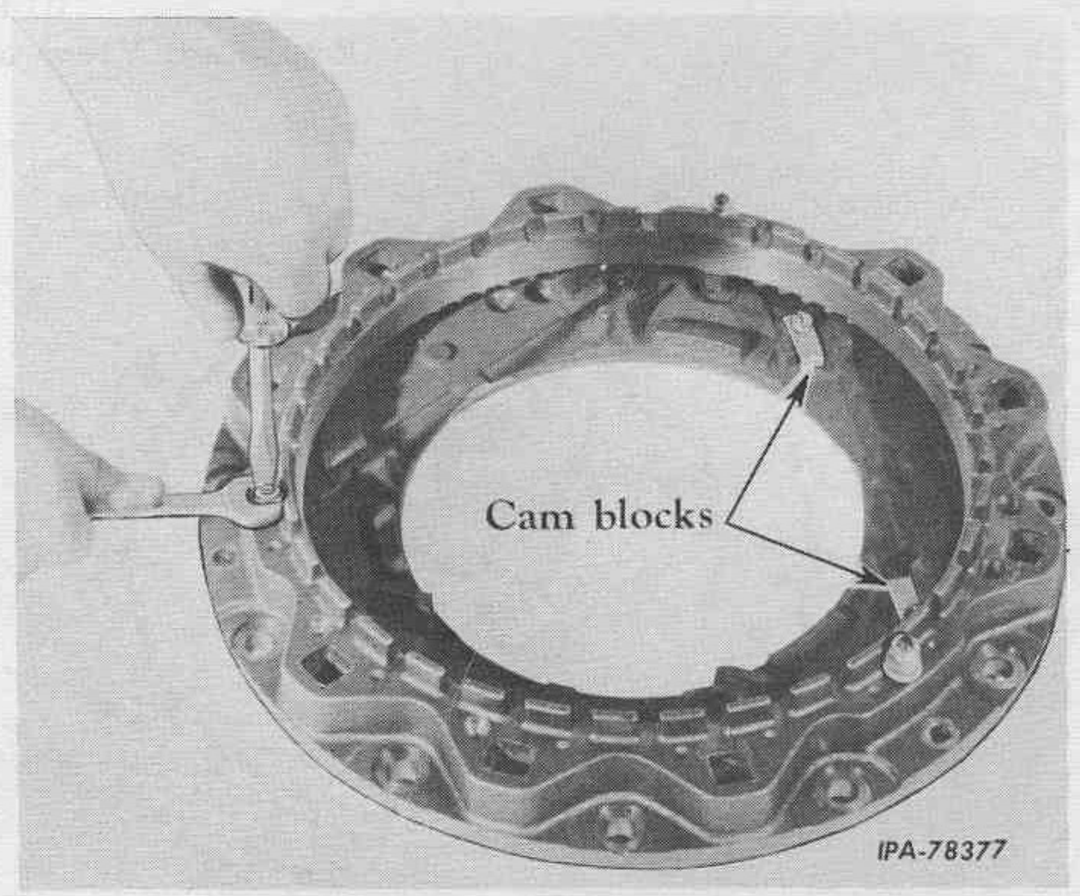
Illust. 17
Removing the Camshaft and Bearing Carrier Assembly.

◆ CAUTION: When removing the snap ring which holds the belleville washer, place the adjusting ring in a press, as this washer is retained under approximately 3400 to 3900 pounds pressure (one to two tons).

15. Lift the camshaft and bearing carrier assembly from the pressure plate. Remove the three cap screws and washers securing the back plate to the drive ring and remove the back plate with pressure plate and return springs (Illust. 17).

16. Remove the three return spring assemblies. Remove the lock nut from the cap screw and lift out the return spring (Illust. 18). Lift the back plate from the pressure plate. Lift the pressure plate from the three return spring cap screws.

17. If it is necessary to replace the camblocks (Illust. 18) they can easily be removed by removing the securing cap screw and star washer. Always replace star washers with new ones.

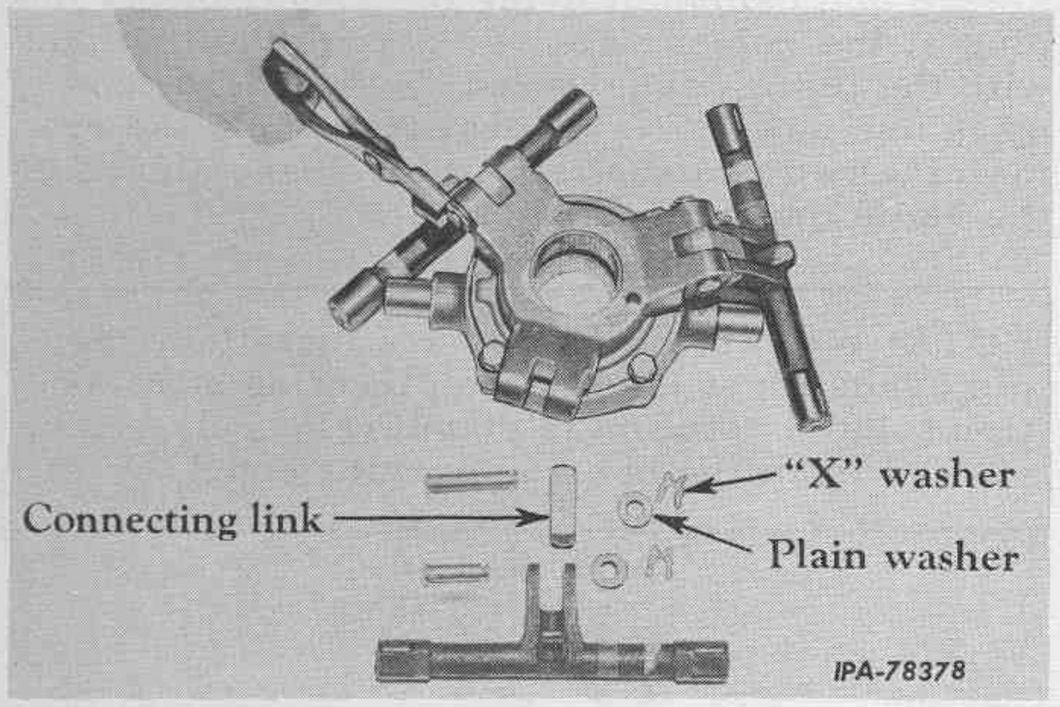


Illust. 18
Removing the Return Spring Lock Nut.

PRINTED IN UNITED STATES OF AMERICA

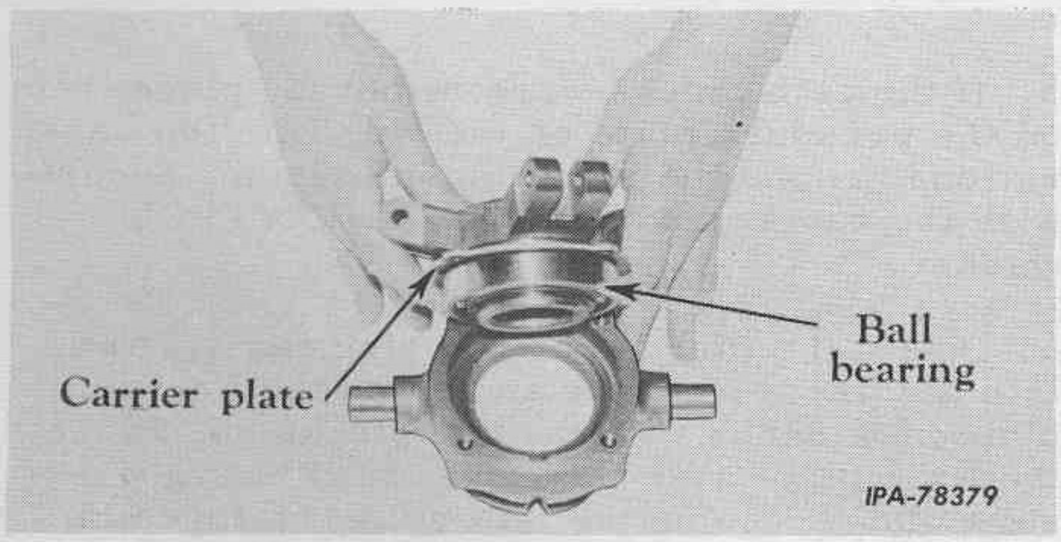
CLUTCH ASSEMBLY

18. Remove the "X" washers and plain washers securing the link pins to the camshafts and release sleeve. Tap out the link pins to separate the connecting links and camshafts from the release sleeve (Illust. 19).



Illust. 19
Removing the Link Pin "X" Washers.

19. Remove the cap screws and washers securing the release sleeve to the bearing carrier. Remove the release sleeve with carrier plate, ball bearing and bushings (Illust. 20). Do not remove the bushings or ball bearing from the release sleeve unless replacement is necessary to remove the ball bearing it will first be necessary to remove the external snap ring.



Illust. 20
Separating the Sleeve and Carrier Assembly.

6. INSPECTION AND REPAIR

1. Wash all parts thoroughly.

2. Check the condition of the clutch return springs. If they are worn or broken, replace with new ones (refer to Par. 2, "SPECIFICATIONS.")

3. Inspect the clutch brake plates and clutch inner and outer discs (in the splined center and disc assembly (1, Illust. 13) for excessive wear, grooving or damage. If any of these conditions exist replace. If a clutch inner disc (35, Illust. 13) which has facings with 11-1/2" I.D. (used on earlier clutches) needs to be replaced, install three new discs with 10" I.D. Discs with facings of different diameter must not be intermixed.

4. Inspect the pressure plate for warpage. (Refer to Par. 2, "SPECIFICATIONS.")

5. Check the operating condition of the cams. They should revolve free and easy with a snug fit. If not, the bearings are probably jammed, broken or worn, and the camshaft must be replaced. The cams on the camshaft assembly should not have excessive clearance at the cam saddles on the pressure plate. (Refer to Par. 2, "SPECIFICATIONS" for proper clearance.)

6. Inspect the bearings for cracks, scores and wear. Replace if necessary. All reusable bearings must be soaked in oil, wrapped or covered until ready for assembly.

7. Check the splines on the drive yoke, clutch shaft, brake hub and clutch splined center for wear. If wear is excessive replace. Slight burrs can be smoothed down with an oil stone.

8. Replace all sealing rings. Inspect the oil seal for excessive wear or damage and replace if necessary. If the oil seal (29, Illust. 2) is found to be unserviceable, a new seal must be installed as described in Par. 7, "REASSEMBLY."

9. Inspect the seal (10, Illust. 2) in each end of the clutch housing for wear or damage. The seal wear ring (11, Illust. 2) is a press fit on the release shaft. Whenever the release shaft seal is replaced, it is suggested that the wear ring be replaced also. Cut the wear ring to remove it from the release shaft and press the new one into position on the shaft.

(Continued on next page)

CLUTCH ASSEMBLY

6. INSPECTION AND REPAIR - Continued

10. Inspect the inside diameter of the release shaft bushings and the outside diameter of the release shafts for excessive wear or scoring. Replace parts if necessary. (Refer to Par. 2, "SPECIFICATIONS" for dimensions of new parts.)

When installing new bushings, be sure the inner bushing is flush with the inner end of the release shaft bore and the outer bushing is flush with the inner edge of the chamfer of the seal counterbore.

11. Inspect the inside diameter of the release sleeve bushings and the outside diameter of the clutch shaft for excessive wear or scoring. Replace parts as necessary. (Refer to Par. 2, "SPECIFICATIONS" for dimensions of new parts.)

When new bushings are necessary, press one in from each end of the release sleeve until it is flush with the edge of the bore.

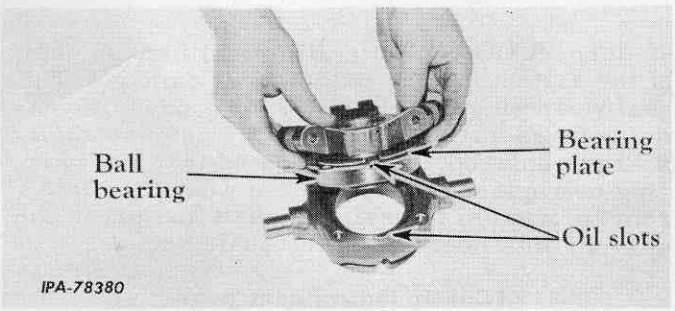
12. Check for excessive wear at the bearing carrier trunnions, bushings and release fork. (Refer to Par. 2, "SPECIFICATIONS" for dimensions of new parts.)

13. Flush out the oil passages in the clutch housing end cover and in the clutch shaft to be sure they are clean and free of obstruction.

7. REASSEMBLY

1. If the release sleeve bushings were replaced, be sure to install new ones as described in Par. 6, "INSPECTION AND REPAIR."

2. If the bearing (20, Illust. 13) needed replacement, reassemble the release sleeve. Place the bearing plate in position on the sleeve and press the bearing onto the sleeve until it bottoms on the sleeve shoulder. Install the bearing snap ring (Illust. 21).

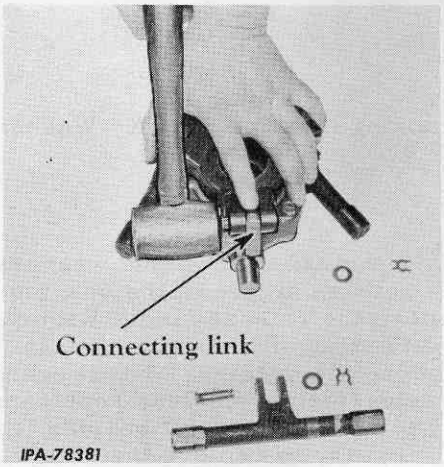


Illust. 21
Installing the Release Sleeve Assembly.

3. Install the release sleeve on the bearing carrier being sure to align the oil slot in the bearing plate and bearing carrier. Secure with the bearing plate cap screws and washers, (Illust. 21).

4. Assembly the connecting link to the release sleeve and camshaft using the longer of the link pins at the release sleeve. Secure the link pins with the plain washers and "X" washers. Always use new "X" washers. Assemble the remaining two camshafts to the release sleeve in the same manner. (Illust. 22).

NOTE: When the link pins are installed, the pin heads must lead in the direction of rotation (clutch rotation is counterclockwise when viewed from the bearing carrier end.)



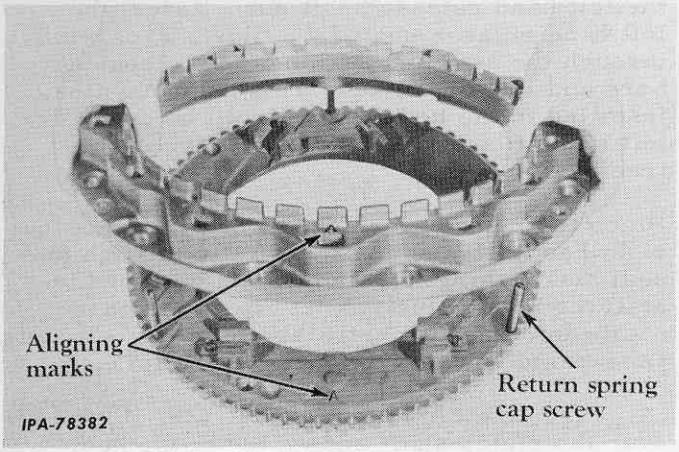
Illust. 22
Installing Camshaft Connecting Link Pin (Long).

5. If the cam blocks were removed, place them on the pressure plate so the side with the serrations around the mounting hole is up. Secure with the cap screw and external-tooth lock washer.

6. Insert the three return spring cap screws into the pressure plate and place the pressure plate on a bench with the camblocks up. Place the back plate over the cap screws in the pressure plate aligning the letter "A" stamped on the back plate and pressure plate (Illust. 23). Insert the return springs in the counterbore of the back plate and secure with the lock nuts. The lock nuts must be tightened until the top of the nut is 1/32 of an inch below the end of the cap screw (3, Illust. 13).

PRINTED IN UNITED STATES OF AMERICA

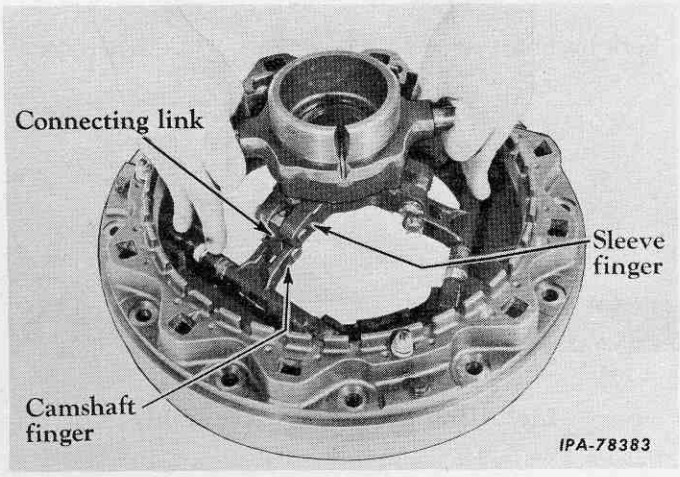
CLUTCH ASSEMBLY



Illust. 23
Installing the Clutch Back Plate.

7. Place the drive ring (2, Illust. 13) on a bench with the three threaded holes up. Position the back plate and pressure plate assembly on the drive ring aligning the letters "A" stamped on the back plate and drive ring. Secure with the three cap screws and washers.

8. Install the bearing carrier and camshaft assembly on the pressure plate. When the camshafts are in their saddles on the pressure plate, the fingers of the camshaft should be below the fingers of the release sleeve and the connecting links in a vertical position (Illust. 24).



Illust. 24
Positioning the Camshafts.

9. Be sure the threads in the adjusting ring and back plate are clean and not damaged. If equipped with a belleville washer and the adjusting ring was disassembled, install the belleville washer in the ring (concave side up) and secure with the snap ring. Use the same tool (Illust. 16) and procedure used in disassembly of the adjusting ring.

10. Place the adjusting plate (9) or (30) Illust. 13 on the camshaft assembly. Hold the bearing carrier and camshaft assembly up in the disengaged position while the adjusting ring is threaded into the back plate. Position the adjustment lock so the tabs or tab of the lock engage the slots in the back plate and secure with lock nuts (Illust. 14).

11. Install the retaining ring (16, Illust. 2) in the retainer (17, Illust. 2). Install a new "O" ring (15, Illust. 2) around the flange on each side of the drive ring retainer (17, Illust. 2) and install the retainer over the dowel in the clutch housing (Illust. 12). Tap around the outer diameter of the retainer to seat it in the housing bore.

12. Alternately stack one externally tanged brake disc and one internally splined brake disc. Install the discs on the retaining ring (16, Illust. 2) so the internally splined disc is at the top of the stack (Illust. 12).

13. Tap the ball bearing (35) into the bore of the end cover (32) and secure the bearing in the cover with the retainer (24). Use a soft mallet to seat the end cover on the dowel (14) in the clutch housing. Secure the end cover with the cap screws and washers (refer to Illust. 2).

14. Install two new sealing rings (34) in the grooves of the clutch shaft. Using a soft mallet tap the clutch shaft into the rear of the clutch housing until it bottoms on the bearing (35) (refer to Illust. 2).

15. METAL FACE TYPE SEAL: Install the rotor of the seal (29) in the end cover (32) with the sealing surface up. If the seal stator needed replacement, be sure the new one is installed so it is flush with the hub of the seal cover. Install a new cover gasket (31) and the seal cover on the end cover and secure with the cap screws and washers (refer to Illust. 2 and 10).

(Continued on next page)

CLUTCH ASSEMBLY

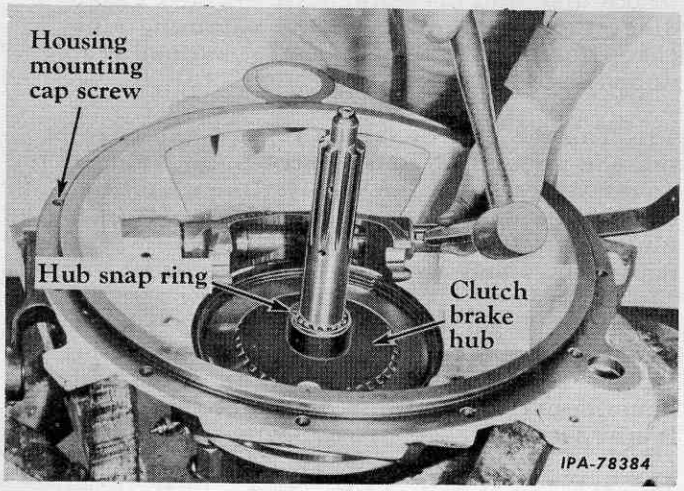
7. REASSEMBLY - Continued

LIP TYPE SEAL: Install the seal (29) into the front of the seal cover (28) (side that contacts end cover (32) until it is flush with the seal cover rear face. The seal must be installed so its part number will face the end cover when the seal cover is installed. Install a new cover gasket (31) and the seal cover on the end cover and secure with the cap screws and washers (Illust. 2).

16. Install the drive yoke on the shaft splines. Secure the yoke to the shaft with the end plate, lock plate and cap screws. Bend the ends of the lock plate against the flats of the cap screws (Illust. 9).

17. Turn the clutch housing over on the bench so the drive yoke is down.

18. Align the splines of the brake disc (21, Illust. 2). Install the clutch brake hub over the clutch shaft and engage the teeth of the hub with the disc splines. Install the hub snap ring in the shaft (Illust. 25).



Illust. 25
Installing the Right Hand Release Shaft Key.

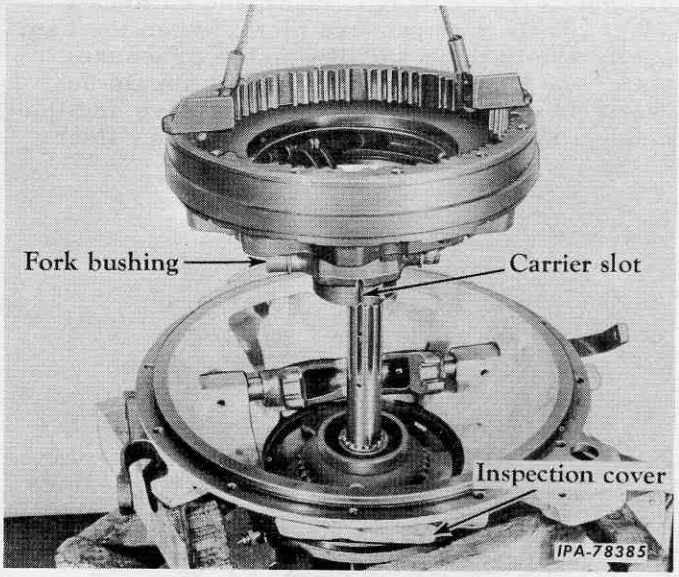
19. If the bushings (9, Illust. 2) needed replacement, be sure the new ones are installed as described in Par. 6, "INSPECTION AND REPAIR." Be sure the seal (10, Illust. 2) is installed in each of the clutch housing.

20. Lubricate the two release shafts before installing. Insert one of the clutch housing mounting screws (Illust. 25) in the hole above the left hand release shaft bore. Insert the left hand relaese shaft (36, Illust. 2) carefully through the seal and bushings in the housing bore and install the key. This shaft must be installed in the housing so it will be on the left side of housing when in position in the tractor.

Place the release fork on the shaft. Insert the right hand release shaft carefully through the seal and bushings in the housing bore and install the key. (Illust. 25). Tap the release shafts into the fork until the clamping bolt slots appear and secure the shafts to the fork.

21. Place the clutch brake disc (25, Illust. 13) over the clutch shaft and on the brake hub.

22. Move the left hand release shaft up against the clutch housing to place the release fork in the fully engaged position. Attach a hoist to the clutch drive ring and position the clutch assembly over the clutch shaft. Place the fork bushings on the pins of the bearing carrier and turn the bearing carrier so the slot in the threads is toward the inspection cover opening in the clutch housing. (Illust. 26.)



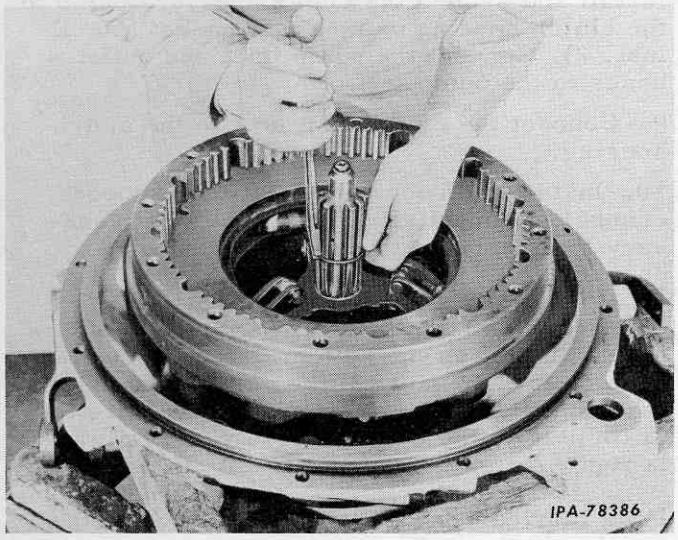
Illust. 26
Installing the Clutch Assembly.

23. Lower the clutch assembly until the bushings on the bearing carrier pins engage with the fingers of the release fork. At this time, thread the clutch brake disc (23, Illust. 13) into the bearing carrier. Lower the clutch assembly into the housing and remove the hoist. Install the

PRINTED IN UNITED STATES OF AMERICA

CLUTCH ASSEMBLY

snap ring that positions the splined center and disc assembly on the shaft (Illust. 27).



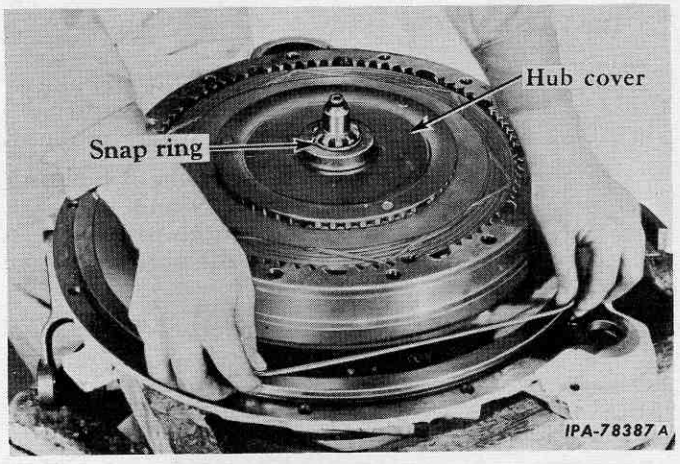
Illust. 27
Installing the Splined Center and Disc Assembly Positioning Snap Ring.

24. If the splined center and disc assembly (1, Illust. 13) was disassembled for service, reassemble as follows. From the counterbored side of the splined center, install the hub cover aligning the three rivet holes in both peices. From the opposite side of the splined center, alternately install one inner disc and one outer disc (three inner and two outer discs required) and secure the discs to the splined center with the three rivets and washers. Insert the rivets from the hub cover side, install the washers on the rivets and peen the rivet ends over the washers (refer to Illust. 2A).

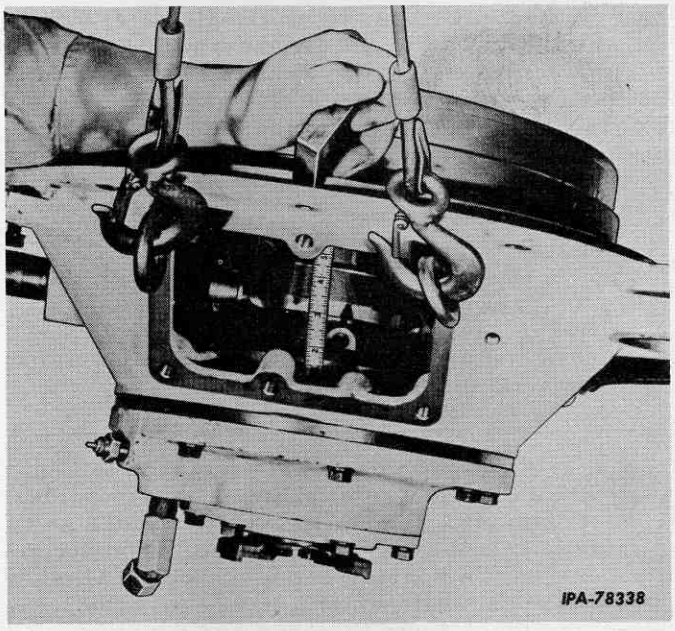
25. Install the splined center and disc assembly on the snap ring in the clutch shaft. Secure to the shaft with the snap ring. The hub cover (34, Illust. 13) in the splined center and disc assembly must face up when the assembly is installed. Install the clutch housing sealing ring around the flange of the housing (Illust. 28).

26. Attach a hoist to the two upper inspection cover mounting holes in the clutch housing and lift the assembly from the bench (Illust. 29).

27. Engage the clutch. Working through the inspection cover opening, thread the clutch brake disc on the bearing carrier until a 1-1/4 inch clearance is obtained between the finished surface of the clutch brake disc and ex-



Illust. 28
Installing the Clutch Housing Sealing Seal.



Illust. 29
Checking the Clutch Brake Disc Clearance.

ternally tanged clutch brake plate (Illust. 29). Thread the lock screw into the brake disc until it engages the slot in the bearing carrier and tighten the jam nut.

NOTE: After the brake disc clearance is obtained, continue to tighten the brake disc, if necessary, to align the lock screw opening with the slot in the bearing carrier. If the lock screw opening is in view, the brake disc should be backed off for alignment with the carrier slot.

CLUTCH ASSEMBLY

8. INSTALLATION

NOTE: The two suction filters and the pressure filter of the clutch hydraulic system should be serviced as described in the operator's manual.

1. Remove the cover from the flywheel housing opening. Install new "O" rings (19 and 49) in the flywheel housing at the clutch pressure pump opening and at the clutch oil strainer opening. (Illust. 2).

2. Position the clutch in the tractor. Turn the clutch assembly in the clutch housing to bring the paint mark on the back plate (made in removal) as close as possible with the paint mark on the flywheel. As the clutch housing is brought against the flywheel housing, the clutch shaft must enter the pilot bearing, the clutch drive ring must pilot in the flywheel; and care must be taken not to damage the sealing ring around the clutch housing flange as it enters the flywheel housing.

Secure the clutch housing to the flywheel housing and the clutch to the flywheel with the cap screws and washers. Be sure the paint mark between the back plate and flywheel are aligned before installing the mounting cap screws. One of the clutch housing mounting cap screws must be installed in the clutch pump mounting opening.

3. Install a new "O" ring on the oil strainer (18, Illust. 2) and insert the strainer in the bottom of the clutch housing. Secure with the two cap screws and washers.

4. Install the universal joint between the transmission and clutch shaft drive yokes.

◆ CAUTION: Remove the wire used to keep the bearings from falling from the spider trunnions. If installing a new spider and bearing assembly, remove the soft iron strap attached to the bearing caps. This will eliminate the possibility of the straps or wire breaking loose from the caps and causing personal injury when the engine is running and the clutch engaged.

5. Connect the transmission gear shift lock operating rod to the right hand release shaft (13, Illust. 2).

6. Insert the pin (38) in the yoke of the release shaft (36). Thread the link (39), with lock nut (37) installed, into the pin and tighten the lock nut. Secure the link to the hand lever with the end pin and cotter (refer to Illust. 2).

7. Connect the clutch outlet hose to the bottom of the clutch housing and the inlet hose to the clutch housing end cover.

8. Insert the clutch pressure pump drive shaft and coupling assembly into the flywheel housing engaging the slot in the end of the shaft with the pin located in the gear in the flywheel housing. Install and secure the clutch pressure pump to the clutch housing using a new gasket (50, Illust. 2). Connect the pump inlet and outlet hoses to the pump.

9. Connect the clutch vent tube to the clutch housing.

10. Install and secure the platform support channel. Connect all linkage that was necessary to disconnect to remove the support channel.

11. Fill the clutch hydraulic system. Be sure the drain plug in the bottom of the flywheel housing is tight. Install the access cover to the underside of the front frame. Be sure the drain plug in the bottom of the reservoir tank is tight.

Pour lubricant into the filter and level plug opening in the rear of the reservoir tank until the tank is full. Install the level and filler plug. (Refer to the operator's manual for the type and quantity of lubricant required.) (Refer to Par. 2, "SPECIFICATIONS" for the level and filler plug torque.)

12. Adjust the clutch as described in Par. 9, "CLUTCH ADJUSTMENT."

NOTE: A new engine clutch requires several adjustments during the first 50 hours of operation before clutch facings are worn in.

13. Install the clutch inspection cover (5) and gasket (6) to the clutch housing.

14. Install the platforms, decelerator pedal support and decelerator pedal.

15. Perform the engine idle adjustments as described in Section 4, "ENGINE."

16. Start the engine and check for leaks. Check the oil level in the reservoir tank after it has reached operating temperature. Stop the engine, remove the filler and level plug and, if necessary, add oil to bring the level to the plug opening. Install and torque the plug to the amount in Par. 2, "SPECIFICATIONS."

◆ CAUTION: Always loosen the filler and level plug, slowly, in case there is still some pressure in the system.

PRINTED IN UNITED STATES OF AMERICA

CLUTCH ASSEMBLY

9. CLUTCH ADJUSTMENT

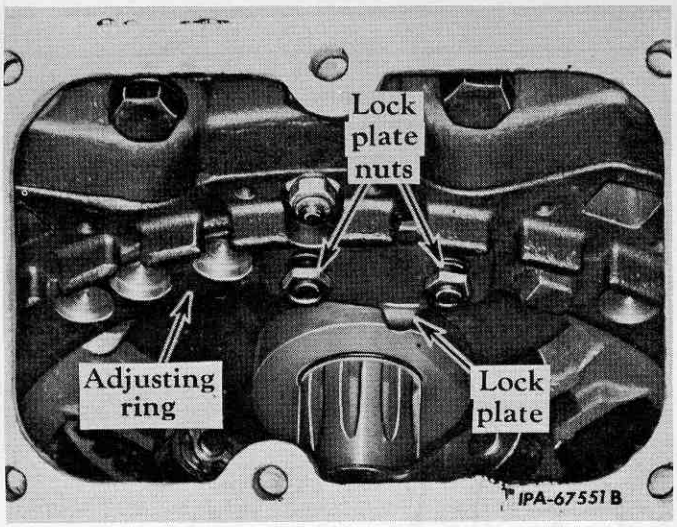
The engine clutch must be adjusted when the hand lever pull decreases to 35 pounds (20 pounds on clutches without belleville washer) or when clutch slippage is appearent under load. An adjustment must be made immediately when slippage is noticeable, as excessive heat and slippage may ruin the clutch.

NOTE: CLUTCHES NOT EQUIPPED WITH BELLEVILLE WASHER: The unit must be cold before the following adjustment is performed.

1. Remove the platforms and the clutch inspection cover.

2. Disengage the engine clutch (clutch lever pushed all the way forward); this will automatically apply the clutch brake.

3. Slowly crank the engine (by depressing the starter button intermittently until the clutch adjusting ring lock plate is accessible through the clutch inspection cover opening (Illust. 30).



Illust. 30
Engine Clutch Adjustment.

4. Place the electrical system master switch in the "OFF" position.

5. Loosen the lock plate nuts and disengage the lock plate from the lungs on the clutch back plate (Illust. 30).

6. Using a spring scale hooked near the top of the clutch lever, turn the adjusting ring in a clockwise direction until a hand lever pull of 40 to 45 pounds (25 to 30 on clutches without belleville washer) (engine stopped) is obtained. Turning the adjusting ring counterclockwise decreases hand lever pull.

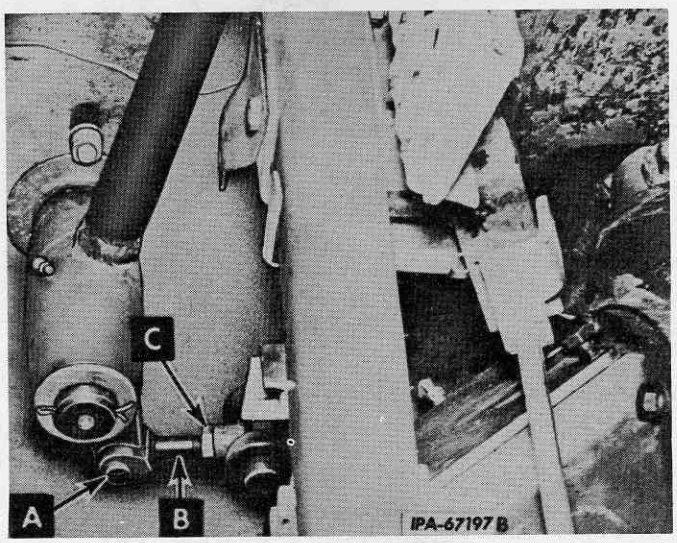
7. Re-engage the lock plate in the lugs of the back plate and tighten the lock nuts securely.

8. Engage the clutch. Check the clearance between the finished surface of the clutch brake disc and the externally tanged clutch brake plate (Illust. 29). This clearance should be approximately 1-1/4 inches. Adjustment can be made, if necessary, by loosening the jam nut (24, Illust. 13) and removing the lock screw (23, Illust. 13) from the brake disc. Then, turn the brake disc clockwise (to increase the clearance) or counterclockwise (to decrease the clearance). Secure the brake disc to the bearing carrier with the lock screw and jam nut.

NOTE: If after the proper clearance is obtained, the lock screw opening in the brake disc is not in view, continue to turn the disc clockwise to align the screw opening with the slot in the bearing carrier. If the screw opening is in view, back off on the disc to align it with the carrier slot.

9. The clutch hand lever must be positioned so it does not come into contact with the platform at either end of its travel. If necessary, the lever position can be changed by removing the cotter pin and end pin (A), loosening the lock nut (C) and rotating the connecting link (B) (Illust. 31.) Tighten lock nut and install and secure the end pin with the cotter pin.

(Continued on next page)



Illust. 31
Hand Lever Adjustment.

CLUTCH ASSEMBLY

9. CLUTCH ADJUSTMENT - Continued

10. Install the inspection cover and a new cover gasket in the clutch housing.

11. With the engine stopped, check to be sure the transmission gears can be shifted when the clutch is disengaged, and cannot be shifted when the clutch is engaged. If either of these conditions are reversed (such as shifting the transmission with the clutch engaged), adjust the gear shifter lock connecting linkage located between the right hand release shaft (on the clutch housing) and gear shifter housing (on the top of the transmission case) as follows: (Refer to Illust. 32).

(a) Disengage the engine clutch (clutch lever pushed all the way forward).

(b) Remove the pin (5) connecting the clevis (4) to the arm of the shaft (6).

(c) Position the gearshifter lock operating rod (2) back, resting on a .040 inch feeler gauge between the rod and boss of the cam lock housing (1) at point "Y."

(d) Loosen the jam nut (3). Turn the clevis (4) until the pin hole in the clevis and shaft (6) line up and the pin (5) enters freely.

(e) Install the pin (5) and secure with the cotter pin. Tighten the jam nut (3).

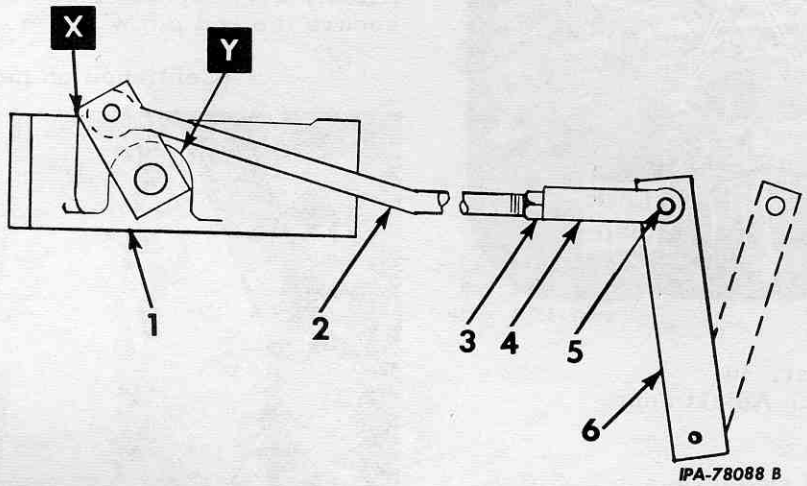
NOTE: With the rod (2) connected to the shaft (6) a clearance of approximately 1/8 inch must be obtained between the operating rod camshaft lever and the boss of the housing (1) at point "X" and a .040 inch clearance at point "Y."

12. Place the transmission gear selector lever in the neutral (N) position. Place the electrical system master switch in the "ON" position. Start the engine and operate at low idle speed (approximately the second notch in the engine speed control lever ratchet).

Engage the clutch. Then disengage the clutch and check to be sure that the universal joint stops rotating. Perform the same operation at high idle speed.

NOTE: If the clutch brake does not stop the universal joint at either high idle or low idle engine speeds, the clutch brake adjustment should be checked (Illust. 29) and the gear-shifter lock operating rod linkage shall be checked for binding as shown in Illust. 32 once again. The clutch brake action must be satisfactory at both high and low engine speeds.

13. Install the platforms.



Illust. 32
Gear Shifter Lock Connecting Linkage.

1. Gear shifter cam lock housing.
2. Gear shifter lock operating rod.
3. Jam nut.
4. Rod end clevis.
5. Rod end pin.
6. Right hand engine clutch release shaft.

CLUTCH ASSEMBLY

10. REMOVAL

1. Remove the decelerator pedal, pedal support and platforms.

2. Disconnect the pump inlet hose at the pump mounted to the right hand side of the clutch housing. Then quickly raise the inlet hose above the level of the reservoir tank to prevent the oil from draining through gravity. Disconnect the outlet hose at the pump.

NOTE: When disconnecting hydraulic lines for any reason, they should be properly capped with the correct size plastic cap. If these caps are not available, tape or clean rubber corks may be used. Hydraulic openings must NEVER be plugged with rags. This practice could easily introduce dirt or lint into critical hydraulic components of the tractor.

3. Remove the cap screws and washers securing the pump to the clutch housing and remove the pump. Discard the pump gasket (50, Illust. 2). Cover the pump drive shaft and pump mounting opening to prevent dirt and dust from entering.

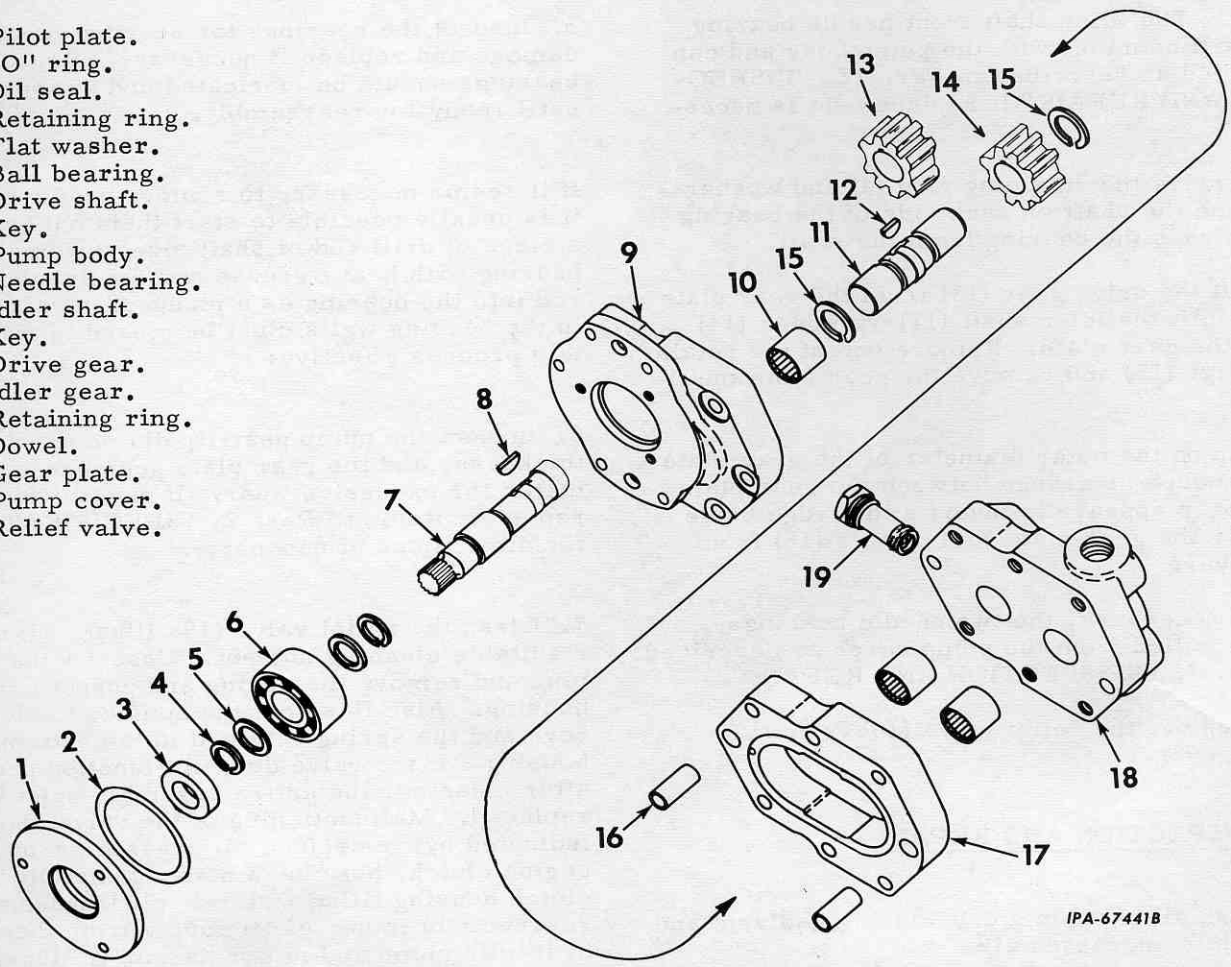
11. DISASSEMBLY

(Ref. Nos. Refer to Illust. 33)

1. Wash the exterior of the pump in cleaning solvent. With a sharp scriber, scratch a line across the edges of the pump cover, body and gear plate to facilitate proper reassembly.

(Continued on next page)

1. Pilot plate.
2. "O" ring.
3. Oil seal.
4. Retaining ring.
5. Flat washer.
6. Ball bearing.
7. Drive shaft.
8. Key.
9. Pump body.
10. Needle bearing.
11. Idler shaft.
12. Key.
13. Drive gear.
14. Idler gear.
15. Retaining ring.
16. Dowel.
17. Gear plate.
18. Pump cover.
19. Relief valve.



Illust. 33
Exploded View of Clutch Pressure Pump.

CLUTCH PRESSURE PUMP

11. DISASSEMBLY - Continued
(Ref. Nos. Refer to Illust. 33)

2. Place the pump assembly on a bench with the drive shaft facing up.

3. Remove the three machine screws securing the pilot plate (1) to the pump body (9) and remove the plate with "O" ring (2) and oil seal (3).

4. Remove the "O" ring from the pilot plate. If necessary, the oil seal can be easily tapped out the rear of the pilot plate.

5. Remove the eight cap screws and three washers securing the pump body (9), gear plate (17) and pump cover (18) together.

6. Hold the pump cover (18) and, tapping on the underside of the pump body outer flange, remove the body (9) with the drive shaft assembly. Pull the shaft (7) from the pump body.

NOTE: The idler shaft front needle bearing (10) will come off with the pump body and can be pulled as described in Par. 12, "INSPECTION AND REPAIR" if replacement is necessary.

7. Remove the retaining ring (4) and washer (5) from the shaft on each side of the bearing (6). Press the bearing from the shaft.

8. Lift the drive gear (13) from the gear plate (17). Lift the idler shaft (11) with gear (14) from the gear plate. Remove one of the retaining rings (15) and remove the gear from the shaft.

9. Tap on the outer diameter of the gear plate until enough clearance between the gear plate and cover appears to insert a thin edge blade and pry the gear plate with dowels (16) from the cover.

10. If necessary, the two needle bearings can be pulled from the pump cover as described in Par. 12, "INSPECTION AND REPAIR."

11. Remove the relief valve (19) from the pump cover.

12. INSPECTION AND REPAIR

1. Wash all parts in a dry-cleaning solvent and dry with compressed air.

2. Inspect the gear teeth and the gear plate inside diameter for chipping or cracks and replace parts as necessary.

3. Inspect the oil seal and "O" ring and replace if excessively worn or damaged.

4. Inspect the splines of the pump drive gear shaft (housed in the flywheel housing) and the drive shaft (7, Illust. 33) for excessive wear or damage. Slight burrs can be smoothed down with a stone.

Inspect the oil seal seat of the drive shaft (7, Illust. 33) for excessive wear and replace shaft if wear is excessive. If the wear has roughened the seat slightly but is not too deep, it is possible to polish with a crocus cloth to a satisfactory finish. Inspect the ball bearing seat for evidence of the bearing turning on the shaft.

5. Inspect the bearings for scoring, wear or damage and replace if necessary. Reusable bearings should be lubricated and wrapped until ready for reassembly.

If it seems necessary to remove needle bearings it is usually possible to start them out by using a piece of drill rod of shaft size, loading the bearing with heavy grease and driving the drill rod into the bearing as a plunger. Drain holes in the bearing wells must be closed to make this process effective.

6. Inspect the pump gear tip diameter, gear thickness, and the gear plate gear bore, diameter for excessive wear. If excessively worn, replace. Refer to Par. 2, "SPECIFICATIONS," for dimensions of new parts.

7. Clean the relief valve (19, Illust. 33) using a suitable cleaning solvent. Unscrew the valve plug and remove the spring and poppet from the housing. Also flush out the housing to clean its bore and the spring retained in the bottom of the housing. If the valve does not function properly after cleaning, the entire assembly must be replaced. Malfunctioning of the valve may be indicated by: a decided oil pressure drop at the engine clutch, hot clutch housing, hot oil lines, clutch housing filled with oil, oil leakage at the reservoir breather of oil supply from the hydraulic pump and motor assembly stops.

PRINTED IN UNITED STATES OF AMERICA

CLUTCH PRESSURE PUMP

13. REASSEMBLY
(Ref. Nos. Refer to Illust. 33)

NOTE: Be sure the bench area being used to assemble the pump is clean. The gears and bearings should be lubricated with the type of oil used in the clutch hydraulic system as they are assembled.

1. Install the relief valve (19) in the pump cover (18).

2. If the needle bearings were removed, press new ones into the pump cover.

NOTE: The drive shaft bearing (bearing closest to the top of the relief valve) must be pressed into the cover 0.010 inch below the cover surface. The idler shaft bearing must be pressed into the cover 0.083 inch below the cover surface. If these dimensions are not held, the pump gears will not seat properly in the gear plate.

3. Position the gear plate (17) on the pump cover, aligning the mark made in disassembly. Using a soft mallet, seat the gear plate on the pump cover.

4. Install the key (12) in the idler shaft. Place the retaining ring (15) in the groove on the shaft and install the idler gear (14) until it is up against the retaining ring. Install the remaining ring (15) on the shaft. Place the idler shaft assembly in the gear plate, being sure it seats properly in the needle bearing (0.083 inch below the cover surface).

5. Place the drive gear (13) in the gear plate.

6. Press the idler shaft front bearing (10) into the pump body (9) until it is 0.083 inch below the body surface. Position the pump body on the gear plate and, using a soft mallet, tap the body onto the plate dowels (16).

7. Install the flat washer (5) and retaining ring (4) on the drive shaft (7). Install the key (8) on the shaft and place the shaft in a press.

8. Press the ball bearing (6) on the shaft until it bottoms against the washer (5). Remove the shaft from the press and install the remaining washer (5) and retaining ring (4).

9. Position the drive shaft (7) in the pump assembly. Align the key (8) in the shaft with the keyway in the gear and lower the shaft assembly until the ball bearing is seated in the body (9).

10. If the oil seal (3) needed replacement, be sure to install the new seal so that the metal surface of the seal faces toward the front (away from the pump assembly). The seal must be installed through the rear of the plate (1) until it bottoms on the plate shoulder. Install the "O" ring (2) in the groove of the plate.

11. Secure the pump body, gear plate and pump cover together with the eight cap screws and three washers. Be sure the scribe marks made in disassembly are aligned.

12. Position the pilot plate (1) with "O" ring and oil seal on the pump body and secure with the three machine screws.

NOTE: With the pump completely assembled, the pump shaft should turn freely by hand. A momentary tightness may be encountered, but a persistant or periodic tightness requires disassembly and correction.

14. INSTALLATION

NOTE: The two suction filters and the pressure filter of the clutch hydraulic system should be serviced as described in the operator's manual.

1. Remove the covering from the pump mounting opening on the clutch housing. Install a new pump gasket (50, Illust. 2). Position the pump, inserting the splines of the pump shaft into the coupling of the pump drive shaft and coupling assembly. Secure the pump to the clutch housing with the cap screws and washers.

2. Remove the coverings from the pump inlet and outlet hoses and connect to the pump assembly. Have tools ready for connecting the inlet hose to keep as much oil as possible from draining as the hose is connected.

3. Install the platforms, decelerator pedal support and the decelerator pedal.

4. Start the engine and check for leaks. Operate the engine at low idle until the oil in the clutch system is at operating temperature. Stop the engine, remove the filler and level plug from the rear of the reservoir tank and add oil to bring the level to the plug opening. Install and torque the plug to the amount shown in Par. 2, "SPECIFICATIONS."

◆ CAUTION: Always loosen the filler and level plug slowly in case there is still some pressure in the system.

PRESSURE REGULATOR

15. REMOVAL

1. Drain the hydraulic system. Run the engine at low idle until the oil reaches operating temperature and stop the engine. Remove the filler and level plug at the rear of the reservoir tank and the drain plug in the bottom of the tank. To remove the drain plug in the bottom of the flywheel housing it will first be necessary to remove the access cover from the underside of the front frame.

◆ CAUTION: Always loosen the filler and level plug at the rear of the reservoir tank slowly, in case there is still some pressure in the system.

NOTE: When disconnecting hydraulic lines for any reason, they should be properly capped with the correct size plastic cap. If these caps are not available, tape or clean rubber corks may be used. Hydraulic openings must never be plugged with rags. This practice could easily introduce dirt or lint into critical hydraulic components of the tractor.

2. Remove the declerator pedal, pedal support and platforms.

3. Disconnect the pressure filter inlet and outlet hoses at the filter. Remove the cap screws, washers and nuts securing the pressure filter and mounting bracket to the left hand frame and remove the filter and bracket.

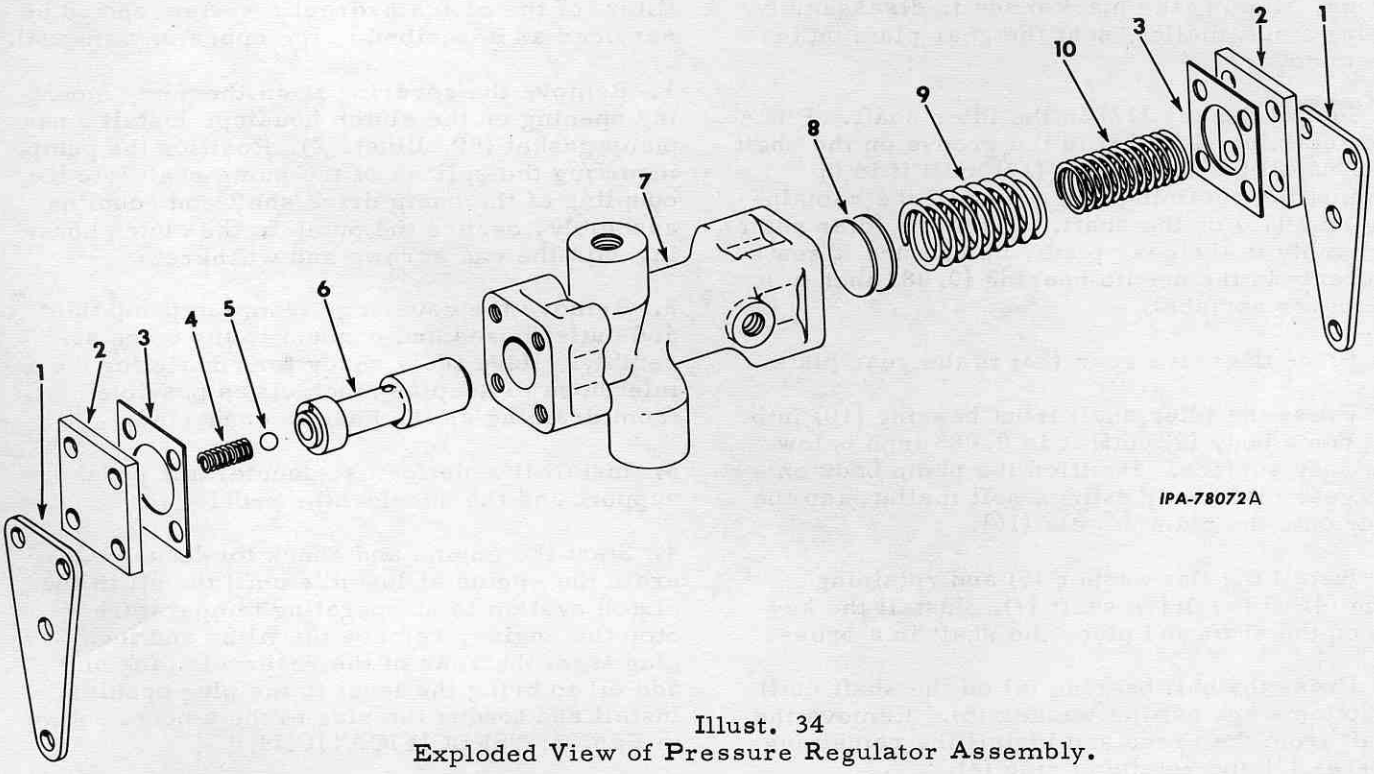
NOTE: Tag all disconnected hydraulic lines to facilitate faster and correct reassembly.

4. Disconnect the two return lines at the bottom, front side of the reservoir tank mounted on the left hand fender.

5. Disconnect the pressure regulator-to-steering booster inlet hose and the steering booster-to-reservoir tank return hose at the tees on the main frame cover between the steering boosters.

6. Disconnect the clutch inlet hose at the clutch housing end cover.

7. Disconnect the suction filter-to-hydraulic pump and motor tube at the suction filter.



Illust. 34
Exploded View of Pressure Regulator Assembly.

1. Support strap.
2. Valve end cover.
3. End cover gasket.
4. Spool valve spring (internal).
5. Spool ball.
6. Valve spool.
7. Valve housing.
8. Spring support washers.
9. Spool valve spring (outer).
10. Spool valve spring (inner).

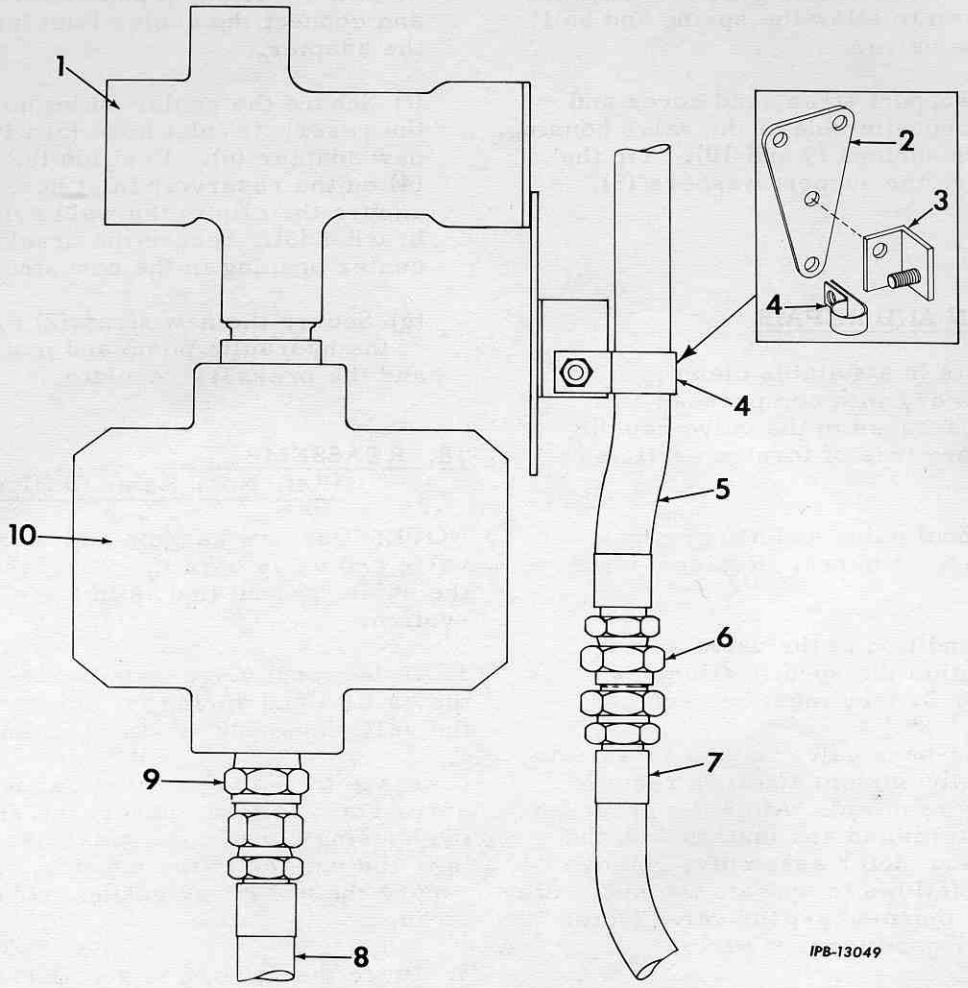
PRESSURE REGULATOR

8. Disconnect the clutch oil cooler inlet and outlet hoses at the oil coolers.

9. Remove the cap screws and washers securing the hydraulic pump and motor assembly to the left hand frame. Lift the pump and motor assembly with pressure regulator and hydraulic hoses onto the fender or to a position where the hoses at the assemblies can easily be disconnected.

10. Disconnect the three hoses at the pressure regulator fittings.

11. Remove the cap screw securing the support strap (1, Illust. 34) to each side of the hydraulic pump and motor assembly. Disconnect the reservoir inlet hose clamp bracket at the support strap. Loosen the nuts on the union connecting the regulator to the pump and motor assembly and remove the pressure regulator.



Illust. 35
Hydraulic Hose Connections Without Thermo By-Pass Valve.

1. Pressure regulator.
2. Support strap (345597R2).
3. Bracket (604937C91).
4. Hose clip (301819R1).
5. Reservoir inlet hose.
6. Adapter (606466C91).
7. Cooler outlet hose.
8. Cooler inlet hose.
9. Adapter (338784R91).
10. Hydraulic pump and motor assembly.

PRESSURE REGULATOR

16. DISASSEMBLY
(Ref. Nos. Refer to Illust. 34)

1. Remove the cap screws and washer securing the end cover (2) and support strap (1) to the valve housing. Remove the cover, cover gasket and support strap.

2. Tip the housing to allow the spool valve (6) to slide from the housing. If it is necessary to disassemble the spool valve, drive out the pin securing the ball (5) and spring (4) in the valve. Tip the valve down to allow the spring and ball to fall free of the valve.

3. Remove the support strap, end cover and cover from the opposite side of the valve housing. Lift out the valve springs (9 and 10). Tip the housing to remove the support washers (8).

17. INSPECTION AND REPAIR

1. Clean all parts in a suitable cleaning solution and blow dry with compressed air. Be sure the oil passages in the valve housing and spool valve are free of foreign particles and dirt.

2. Inspect the spool valve and housing bore for excessive wear or burrs. Replace parts as necessary.

3. Inspect the condition of the valve springs. If they are not within the specifications as described in Par. 2, they must be replaced.

4. The thermo by-pass valve is unnecessary in the clutch hydraulic system and it is recommended that it be removed. After the pressure regulator is reassembled and installed on the hydraulic pump and motor assembly, remove and add parts as follows to operate the hydraulic system without a thermo by-pass valve (refer to Illust. 35 and legend for new parts).

(a) Disconnect the reservoir inlet hose (5) at the thermo by-pass valve housing. Remove the mounting bolt securing the hose clip and clip spacer to the hydraulic pump and motor cover. Discard the clip and spacer and reinstall the mounting bolt.

(b) Disconnect the cooler inlet and outlet hoses (7 and 8) at the thermo by-pass valve housing.

(c) Remove the nipple and the thermo valve and valve housing assembly with the three elbows and one hose adapter from the bottom of the pump and motor assembly. Discard these parts.

(d) Remove the mounting strap (2) from the side of the pressure regulator that the hose (5) is to be attached. Discard the strap.

(e) Install the new adapter (9) into the bottom of the pump and motor assembly and connect the cooler inlet hose (8) to the adapter.

(f) Secure the cooler outlet hose (7) to the reservoir inlet hose (5) with the new adapter (6). Position the new clip (4) on the reservoir inlet hose and secure the clip to the weld bolt on the bracket (3). Secure the bracket to the center opening in the new strap (2).

(g) Secure the new strap (2) to the side of the hydraulic pump and motor assembly and the pressure regulator.

18. REASSEMBLY
(Ref. Nos. Refer to Illust. 34)

NOTE: Use new gaskets and lubricate the valve and valve bore upon reassembly using the same type oil that is in the clutch hydraulic system.

1. If the spool valve was disassembled, insert the ball (5) and spring (4) into the opening in the valve and secure with the pin.

2. Place the valve housing on the bench in a horizontal position. Insert the spool valve into the housing bore so the small land of the valve is to the outside of the housing. Install and secure the end cover gasket, cover and support strap.

3. Place the housing in a vertical position with the spring opening up. Place the support washers (8) in the spring bore and insert the inner and outer springs. Install and secure the remaining end cover gasket, cover and support strap.

NOTE: Because of the tension exerted by the spring assembly (9 and 10), it will be necessary to use longer cap screws to tighten the cover down until the regular cap screws can be installed.

PRINTED IN UNITED STATES OF AMERICA

19. INSTALLATION

1. Service the suction filters and the pressure filter as described in the operator's manual.

2. Install the pressure regulator on the hydraulic pump and motor assembly and secure the connecting union and the support strap (1, Illust. 34). Secure the reservoir inlet hose clamp bracket to the support strap.

3. Connect the three hoses to the pressure regulator fittings.

4. Place the hydraulic pump and motor and the pressure regulator in position in the tractor and secure the hydraulic pump and motor assembly to the left hand frame. As the assembly is lowered into position, the hydraulic hoses at the opposite ends of the assembly should be pulled back into position.

5. Connect the clutch oil cooler inlet and outlet hoses to the oil coolers.

6. Connect the suction filter-to-hydraulic pump and motor tube to the suction filter.

7. Connect the clutch inlet hose to the clutch housing end cover.

8. Connect the pressure regulator-to-steering booster inlet hose and the steering booster-to-reservoir tank return hose to the tees on the main frame cover between the steering boosters.

9. Connect the two return hoses to the bottom, front side of the reservoir tank.

10. Secure the pressure filter and mounting bracket to the left hand frame. Connect the filter inlet and outlet hoses to the pressure filter base.

11. Fill the clutch hydraulic system. (Refer to operator's manual for type and quantity of lubricant required.) Be sure the drain plug in the bottom of the reservoir tank and the drain plug in the bottom of the flywheel housing are tight. Install the access cover to the underside of the front frame.

Pour lubricant into the filler and level plug opening in the rear of the reservoir tank until the tank is full. Install the filler and level plug (refer to Par. 2, "SPECIFICATION" for the proper plug torque).

12. Install the platforms, decelerator pedal support and decelerator pedal.

13. Operate the engine and check for leaks. When oil has reached operating temperature, check the oil level in the reservoir tank. Stop the engine, remove the filler and level plug and, if necessary, add oil to bring the level to the plug opening. Install and torque the plug to the amount in Par. 2, "SPECIFICATIONS."

◆ CAUTION: Always loosen the filler and level plug slowly, in case there is still some pressure in the system.

HYDRAULIC PUMP AND MOTOR ASSEMBLY

20. REMOVAL

1. Follow the complete procedure outlined in Par. 15, "REMOVAL" for the pressure regulator; then continue with the following.

2. Disconnect the suction filter-to-hydraulic pump and motor tube at the pump and motor assembly.

3. Disconnect the pump and motor assembly- to-clutch inlet hose at the pump and motor.

4. Disconnect the cooler inlet hose at the bottom of the pump and motor assembly.

5. Wipe away all dirt from the outside of the hydraulic pump and motor assembly and select a clean, dust-free location for disassembly.

21. DISASSEMBLY
(Ref. Nos. Refer to Illust. 36)

NOTE: Scribe a mark between the pump cover and the gear plates on each side of the pump and motor assembly and between the bearing plate and each of the gear plates. This will facilitate proper reassembly and maintain the same wear pattern of the assembly.

1. Remove the cap screws and washers securing the pump cover (1) and gear plate (13) to the bearing plate (10). Tap around the outer edge of the cover with a soft hammer until it is free of the dowel pins. Remove the cover with two needle bearings (2).

2. Remove the gear plate (13) with dowel pins (14) from the bearing plate.

3. Remove the cap screws and washers securing the pump cover and gear plate (8) to the opposite side of the bearing plate (10). Tap around the outer edge of the cover with a soft hammer to free the cover with needle bearings from the dowels in the gear plate (8). Remove the gear plate with dowel pins (9) from the bearing plate.

4. Remove the gears (3 and 4) and the gear keys (5) from the shafts. Remove the shafts from the bearing plate. The gears (11 and 12) can be easily removed from the shafts after removing the outer retaining ring.

22. INSPECTION AND REPAIR

1. Wash all parts in a dry-cleaning solvent and dry with compressed air.

2. Inspect the gear teeth and the inside diameter of the gear plates for chipping or cracks and replace parts as necessary.

3. Inspect the gear tip diameters, thickness of the gears and the gear plate gear bore diameters for excessive wear. If excessively worn, replace. (Refer to Par. 2, "SPECIFICATIONS" for dimensions of new parts.)

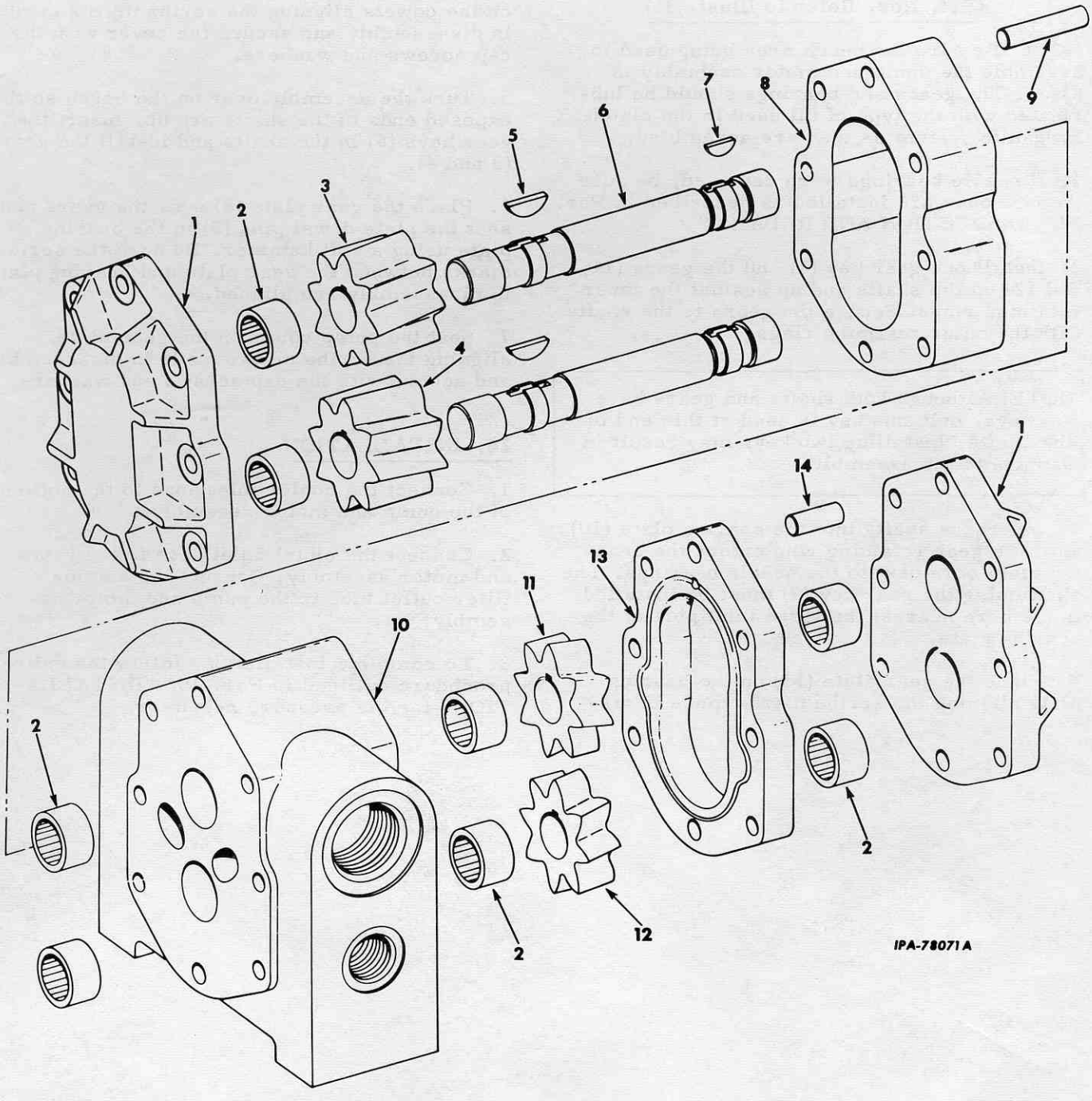
4. Inspect the needle bearings in the pump covers and in the bearing plate. If replacement of the needle bearings in the pump cover is necessary, it is usually possible to start them out by using a piece of drill rod of shaft size, loading the bearing with heavy grease and driving the drill rod into the bearing as a plunger. Drain holes in the bearing wells must be closed to make this process effective.

When installing new bearings in the pump covers, they must be pressed into the cover until they are 0.083 inch below the cover face. When installing new bearings in the bearing plate, the bearings on the side next to the gear plate (8, Illust. 36) must be pressed into the bearing plate until they are 0.010 inch below the plate surface. The bearings on the side next to the gear plate (13, Illust. 36) must be pressed into the bearing plate until they are 0.083 inch below the plate surface to provide clearance for the gear retaining ring.

5. If tractor is equipped with a thermo by-pass valve, it should be removed. Refer to instructions in the "INSPECTION AND REPAIR" paragraph under "PRESSURE REGULATOR."

PRINTED IN UNITED STATES OF AMERICA

HYDRAULIC PUMP AND MOTOR ASSEMBLY



Illust. 36
Exploded View of the Hydraulic Pump and Motor Assembly.

1. Pump cover.
2. Needle bearing.
3. Gear.
4. Gear
5. Key.
6. Shaft.
7. Key.
8. Gear plate.
9. Dowel pin.
10. Bearing plate.
11. Gear.
12. Gear.
13. Gear plate.
14. Dowel pin.

HYDRAULIC PUMP AND MOTOR ASSEMBLY

23. REASSEMBLY

(Ref. Nos. Refer to Illust. 36)

NOTE: Be sure the bench area being used to assemble the pump and motor assembly is clean. The gears and bearings should be lubricated with the type of oil used in the clutch hydraulic system as they are assembled.

1. If needle bearings were removed, be sure the new ones are installed as described in Par. 22, "INSPECTION AND REPAIR."

2. Install one gear key (7) and the gears (11 and 12) on the shafts and up against the inner retaining rings. Secure the gears to the shafts with the outer retaining rings.

NOTE: Although both shafts and gears have keyways, only one key is used at this end of the shafts. Installing two keys may result in damage to the assembly.

3. Insert the shafts into the bearing plate (10) until the gear retaining ring enters the bearing plate bore next to the needle bearings. The shaft using the gear key (7) must be installed in the bore nearest the large inlet port of the bearing plate.

4. Place the gear plate (13) on the bearing plate aligning the scribe marks made in disassembly. Use a soft hammer to seat the dowel pins (14). Install the pump cover (1) on the dowels aligning the scribe marks made in disassembly and secure the cover with the cap screws and washers.

5. Turn the assembly over on the bench so the exposed ends of the shafts are up. Insert the gear keys (5) in the shafts and install the gears (3 and 4).

6. Place the gear plate (8) over the gears and seat the plate dowel pins (9) in the bearing plate using a soft hammer. Be sure the scribe marks between the gear plate and bearing plate in disassembly are aligned.

7. Seat the pump cover on the gear plate, aligning the scribe marks made in disassembly and secure with the cap screws and washers.

24. INSTALLATION

1. Connect the cooler inlet hose to the bottom of the pump and motor assembly.

2. Connect the clutch inlet hose to the pump and motor assembly. Connect the suction filter outlet tube to the pump and motor assembly.

3. To complete installation, follow the entire procedure outlined in Par. 19, "INSTALLATION" for the pressure regulator.

PRINTED IN UNITED STATES OF AMERICA

SERVICE BULLETIN REFERENCE

NUMBER	DATE	SUBJECT	CHANGES

ISS-1049-1 (6-67)

PRINTED IN UNITED STATES OF AMERICA