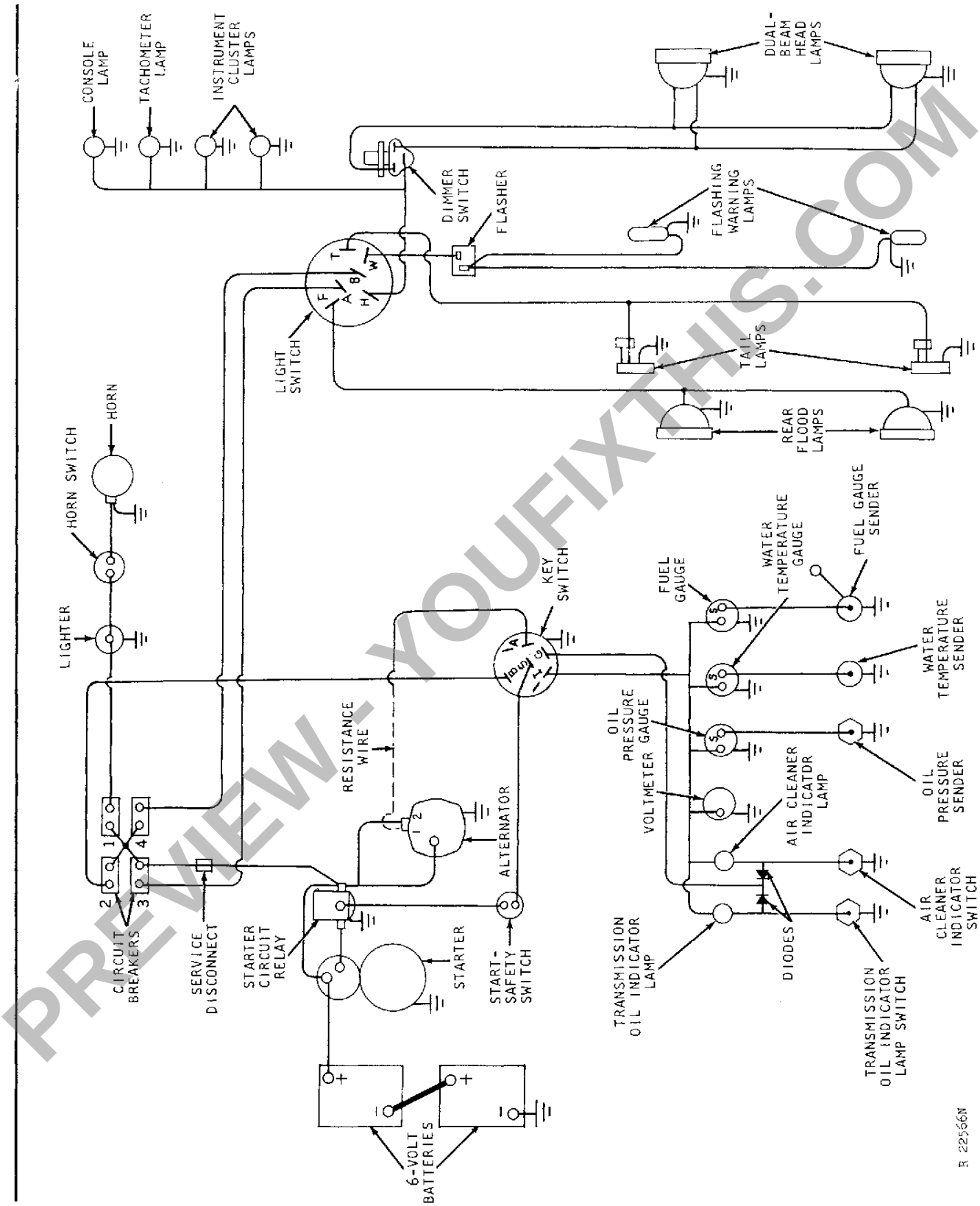


Fig. 5—Schematic Wiring Diagram of Tractor Without 4-Post Roll-Gard or Sound-Gard Body

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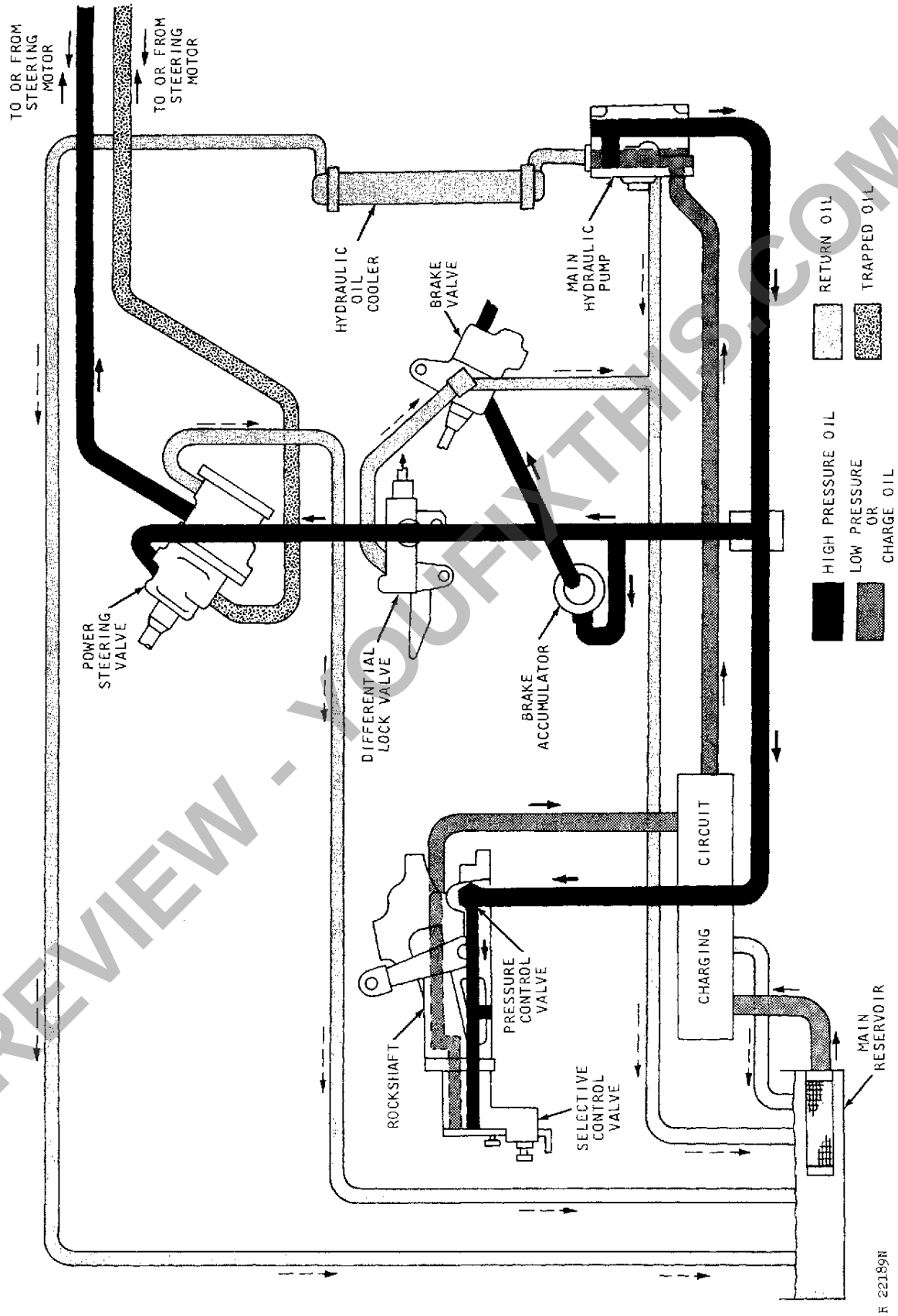


Fig. 1—Circuit Flow Diagram—Early Models

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Service	Specification	Reference
HYDRAULIC SYSTEM		
Check rockshaft and remote cylinder operation		Section 70, Group 30
Check negative signal adjustment		Section 70, Group 30
Check power steering	Smooth, easy operation	Section 70, Group 20
Check brakes and accumulator	3 in. maximum travel for one emergency application immediately after stopping engine	Operator's manual
NUTS AND CAP SCREWS		
Tighten accessible nuts and cap screws that seem to require adjustment		

RECOMMENDED TORQUE IN FOOT-POUNDS



Bolt Diameter	Plain Head*	Three Radial Dashes*	Six Radial Dashes*
1/4	6	10	14
5/16	13	20	30
3/8	23	35	50
7/16	35	55	80
1/2	55	85	120
9/16	75	130	175
5/8	105	170	240
3/4	185	300	425
7/8	160	445	685
1	250	670	1030

*The types of bolts and cap screws are identified by head markings as follows:

Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

6-Dash Head: tempered steel extra high-strength bolts and cap screws.

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Group 25
SEPARATION

REMOVING SOUND-GARD BODY

When the tractor is equipped with a Sound-Gard Body (or a 4-post Roll-Gard), it may be necessary to remove the body or Roll-Gard in order to service components that would otherwise be inaccessible.

Disconnect the battery ground cable. Remove the cowl and floor mat. Then remove the control island floor panel and disconnect body wiring harness at connectors.

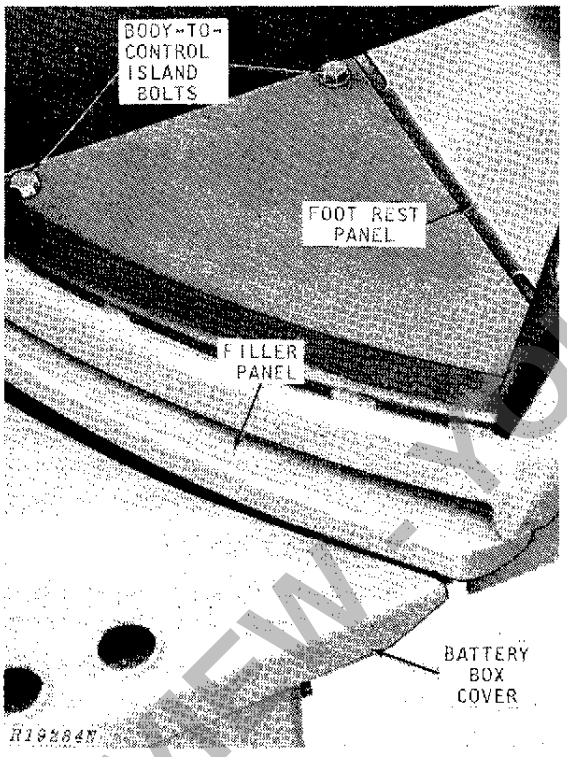


Fig. 1—Removing Panels

Remove the battery box covers, body filler panels, foot rest panels, and body-to-control island bolts (Fig. 1).

Remove the front mounting bolts (Fig. 2).

CAUTION: Follow all safety precautions found on page 80-10-6 when working with the air conditioning system.

Disconnect refrigerant couplers on tractors with air conditioning by holding the coupler body stationary with a wrench, and unscrewing coupler with another wrench. If refrigerant can be heard escaping as the coupler is loosened, retighten coupler and loosen again (Fig. 3).

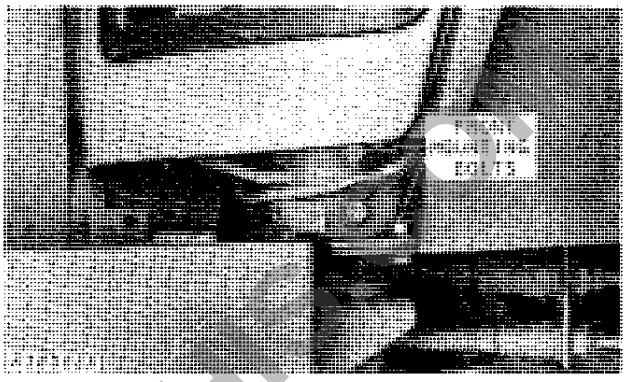


Fig. 2—Front Mounting Bolts

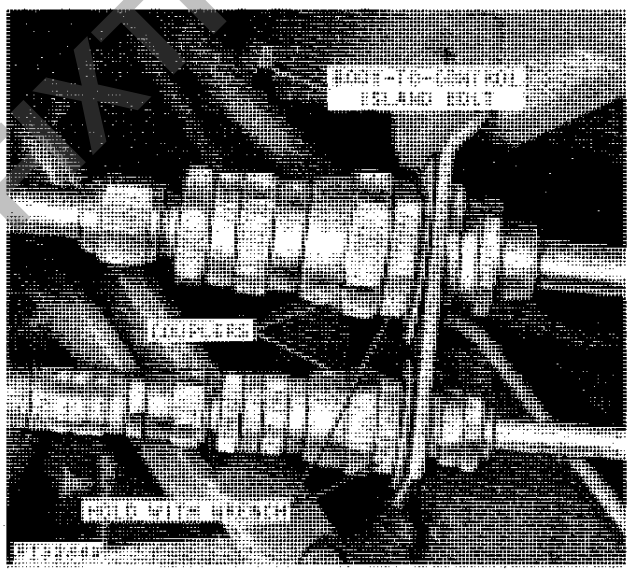


Fig. 3—Air Conditioning Couplers

Remove the body-to-rear control island bolts (Fig. 3, 4).

Disconnect transmission and speed control rods (Fig. 4). Disconnect control valve operating rod on Quad-Range tractors. On Power Shift tractors, disconnect the park lock and transmission shifter cables.

Disconnect rockshaft and selective control valve rods at the front end (Fig. 5).

Remove the mounting cap screws and lock plate.

On tractors equipped with a heater, drain the cooling system to a level below heater hose connections. Disconnect the heater hoses at connections under right-hand fender next to rear post.

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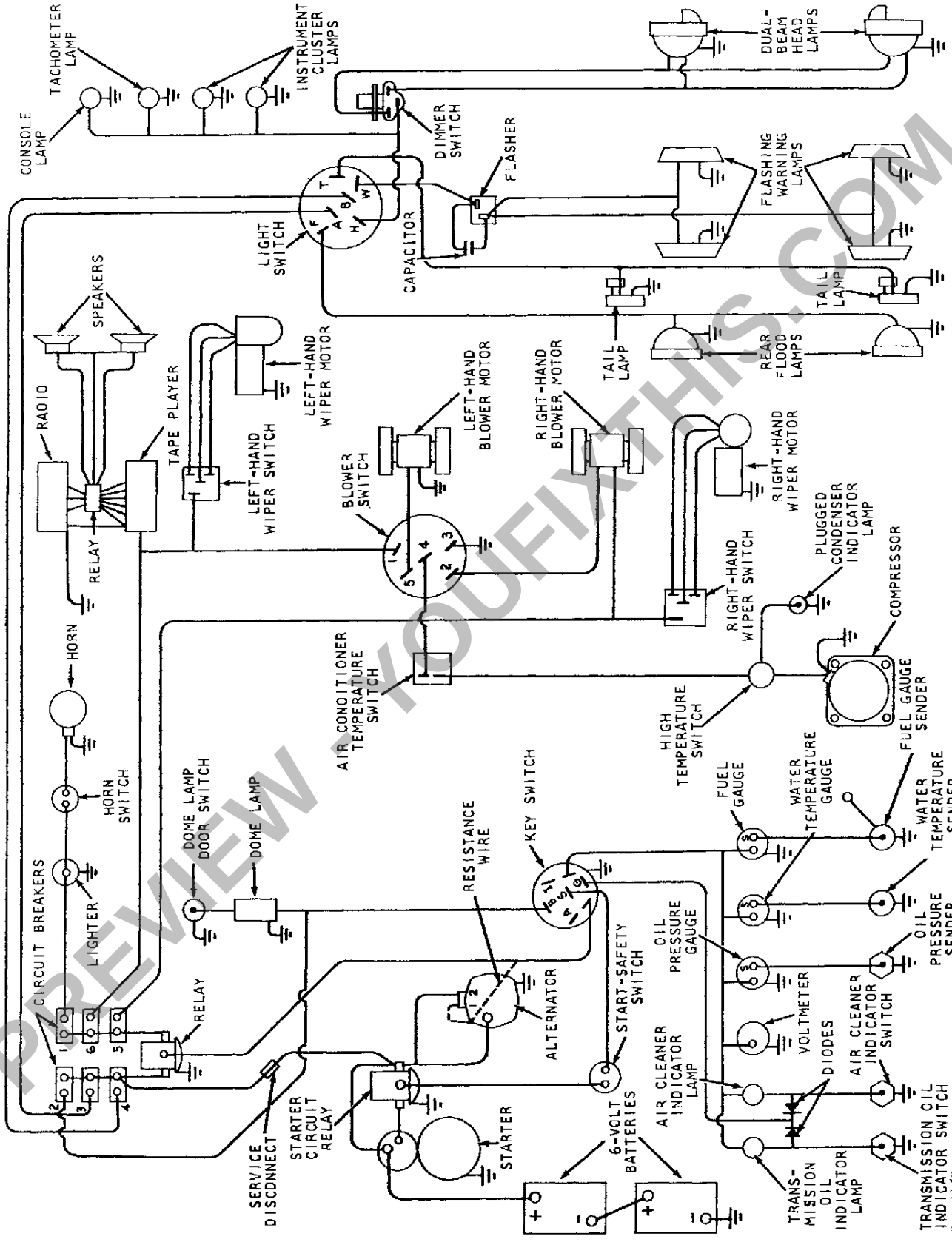


Fig. 6—Schematic Wiring Diagram of Tractor with Sound-Gard Body (T -17499 Without Electric Ether Aid)

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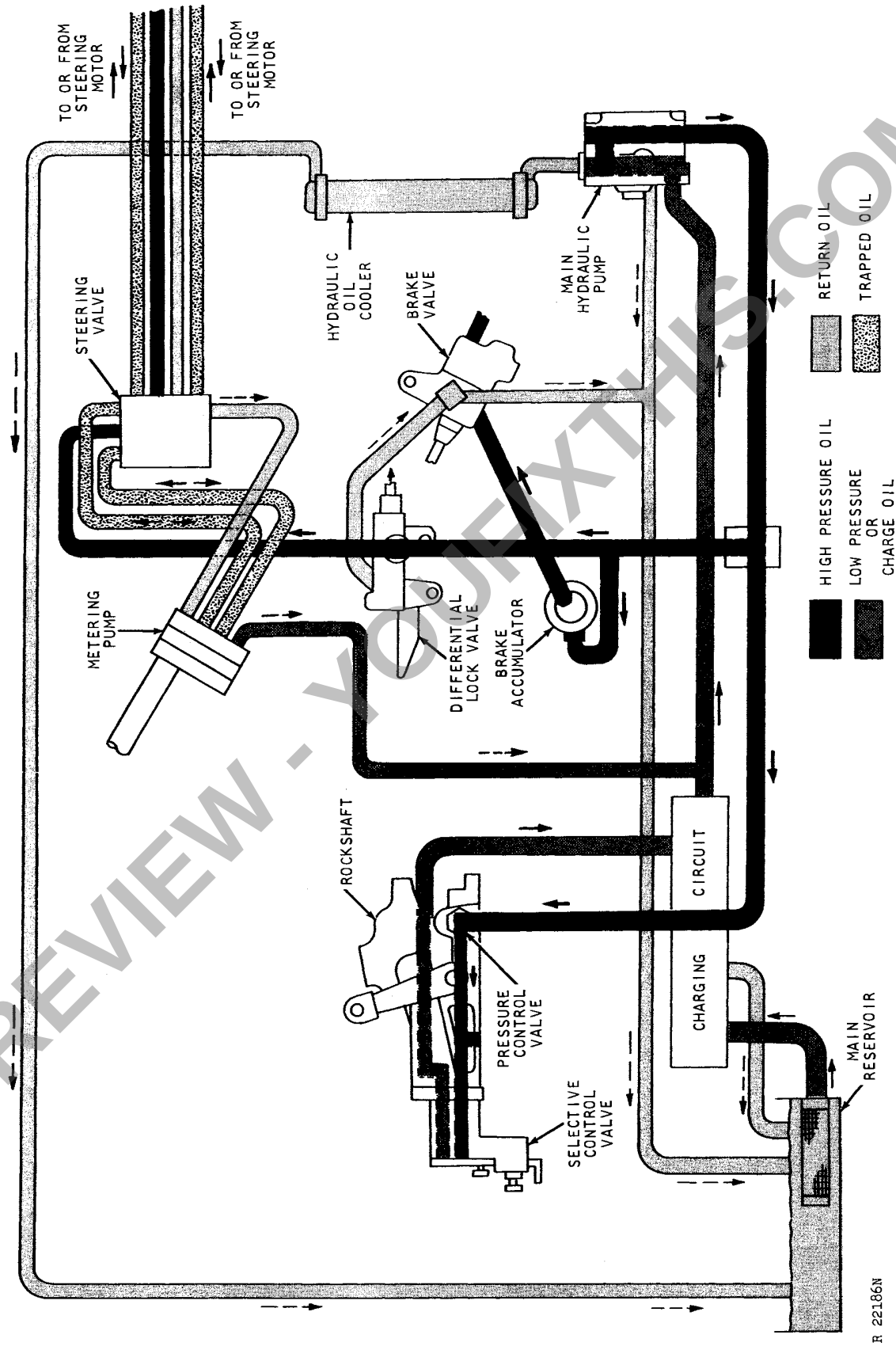


Fig. 2–Circuit Flow Diagram–Late Models

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Group 30
SPECIFICATIONS AND SPECIAL TOOLS

SPECIFICATIONS

Item	Specification
Air conditioning compressor drive belt	¼ in. deflection—15 lb. pull
Alternator drive belts	1 in. deflection—25 lb. pull
Sound-Gard Body and Control Island rubber mounts	Metal retainer caps require effort to be rotated by hand
Sound-Gard Body and Control Island rubber mounts (early models)	Metal retainer caps require effort to be rotated by hand

Item	Torque (ft-lbs)
Sound-Gard Body and Control Island rubber mounts (late models)	9-11
Hydraulic pump drive coupling	30
Hydraulic pump support to cylinder block	85
Side frames-to-engine	275
Clutch housing-to-engine	½ in.—85 ¾ in.—300
Clutch housing-to-transmission case screws and nuts	⅝ in.—170 ¾ in.—300
Axle housing or drive shaft housing-to-transmission case	170
Drive shaft housing-to-final gear housing stud nuts (Hi-Crop)	275
Fender bracket to rear axle housing U-bolt nuts	125
Nylon hydraulic bleed line	Finger tight, then 1/6-1/3 turn more

SPECIAL TOOLS

No.	Name	Use
JDE-63*	Engine Lift Brackets	Engine removal
JDG-1*	Engine Sling	Removing engine, Sound-Gard Body, or 4-post Roll-Gard
JDG-2C*	Support Stands	Tractor separation
JDG-10-1	Sound-Gard body lifting adapter	Removing Sound-Gard bodies using tractor 3-point hitch
JDG-10-2	Sound-Gard body support stand	Storage stand for Sound-Gard bodies
JDG-11*	Wrench Adapter	Measuring rotational torque on Sound-Gard body retainer caps
JDST-29	Weatherstrip Installing Tool	Installing window and windshield moulding strips on Sound-Gard bodies

**Order from: Service Tools, Inc., 1901 Indiana Avenue, Chicago, Illinois 60616.*

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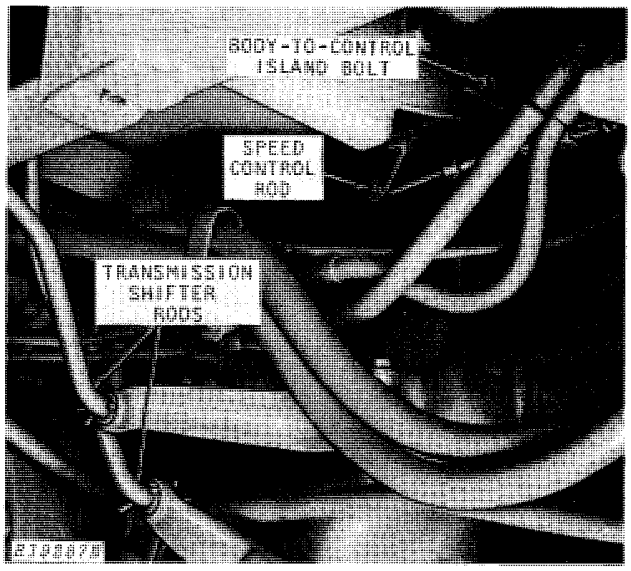


Fig. 4—Disconnecting Transmission and Speed Control Rods

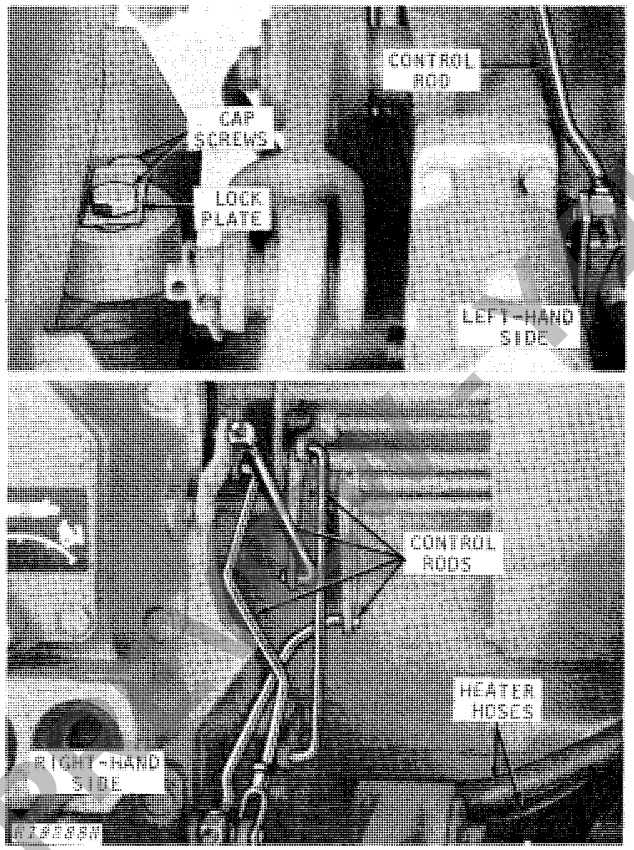


Fig. 5—Body Removal Steps (Rear)

Remove the two cap screws from on top of roof. Fasten lifting chains and connect to JDG-1 engine lift sling (Fig. 6).

IMPORTANT: Lifting chains should be as nearly vertical as possible when lifting body, to prevent undue stress on roof.

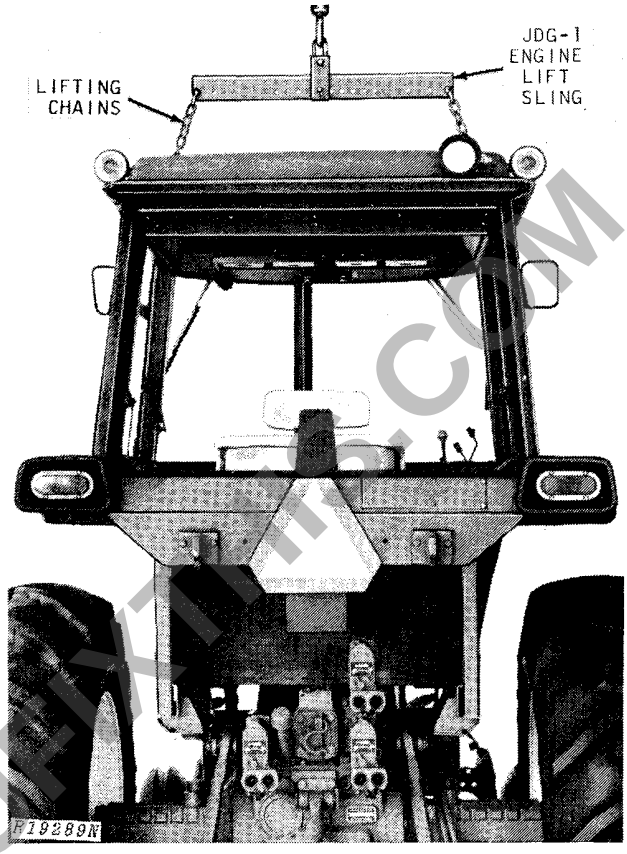


Fig. 6—Removing Sound-Gard Body

To make body removal easier, lower tilt steering wheel (if equipped). Move 3-point hitch upper lift link pins inward to provide clearance for body.

INSTALLATION

Before installing body, be sure rubber seal that contacts the control island is in good condition.

Place spacers (Fig. 7) in position (short spacer to rear) on rear axle. Tractors having 4-post Roll-Gard use steel blocks in place of the rubber mounts used on the Sound-Gard Body.

Install body on tractor (Fig. 7). Tighten the rear-most cap screw on each side first until effort is required to rotate metal retaining cap by hand. On late model tractors having retaining caps with punched holes (to receive JDG-11 wrench), tighten cap screw until 8-10 ft-lbs torque is required to rotate cap. Position lock plate and install front cap screw.

IMPORTANT: Tighten the stop bolts (front cap screws on each side) to a minimum of 110 ft-lbs torque but not more than 150 ft-lbs torque. Doing so may deform the stepped washer and crush the bushing. Roll-Gard (4-post) mounting bolts should be tightened to the same specification as the stop bolts.

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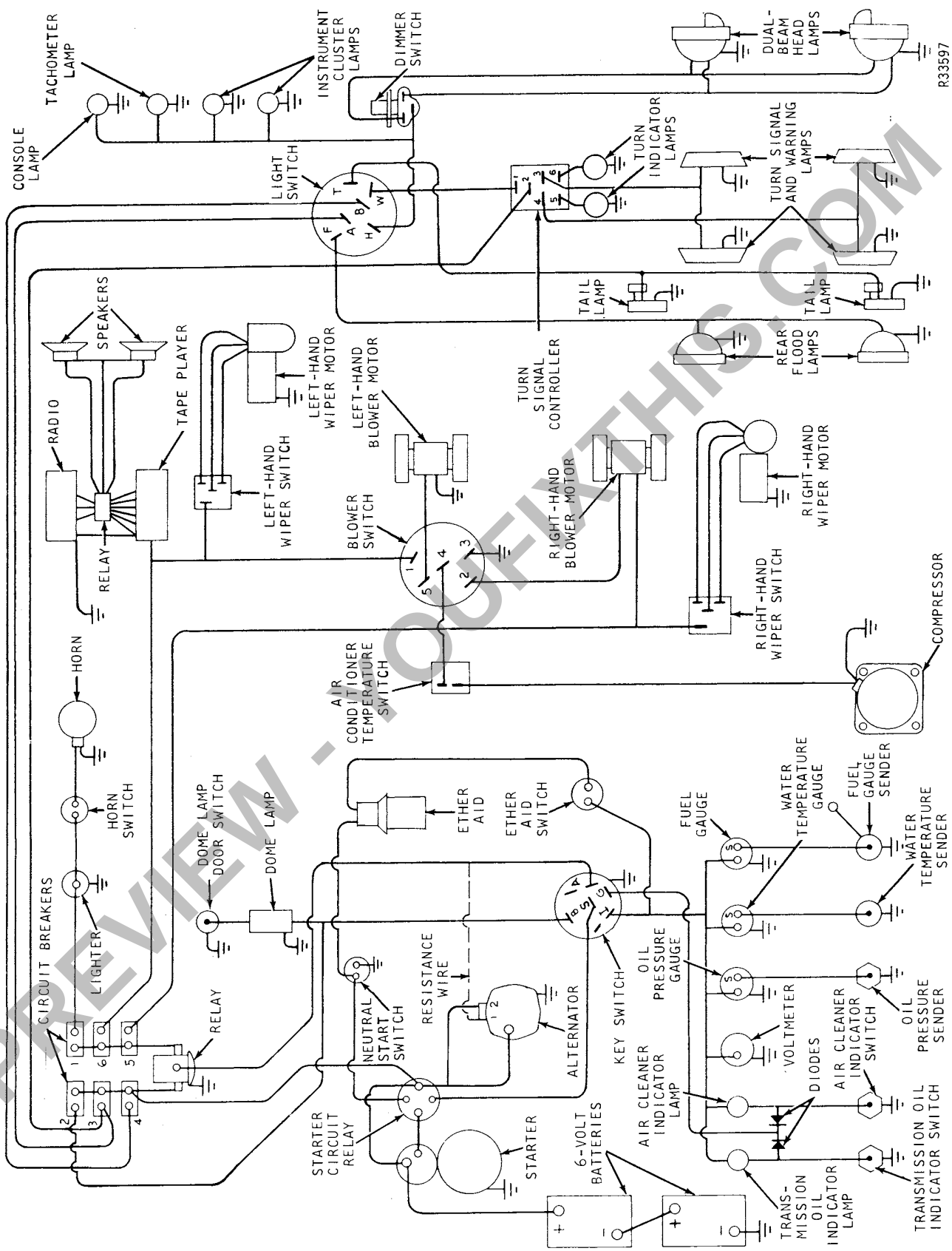


Fig. 7—Schematic Wiring Diagram of Tractor with Sound-Gard Body (T17000-)

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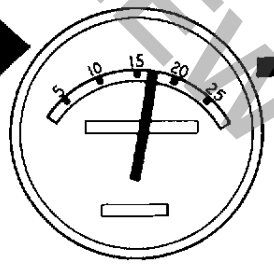
HEATING THE HYDRAULIC OIL (ALL TRACTORS)

SEQUENCE

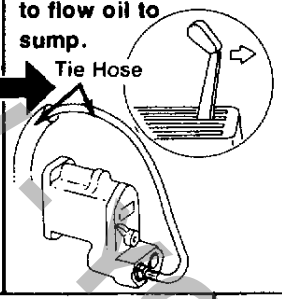
Use this procedure after preliminary checks (Step 1) have been completed.

A temperature gauge (I), jumper hose (K), jumper hose (L) and lube gauge (A) are used when heating oil. See page 6-8 for test equipment installation.

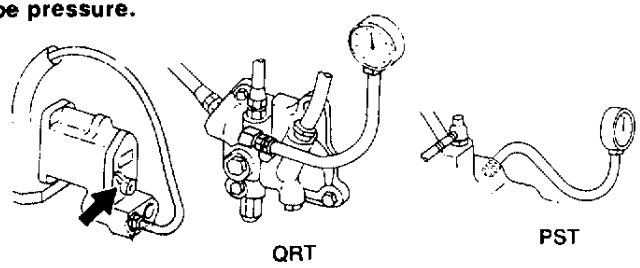
At 1700 engine rpm



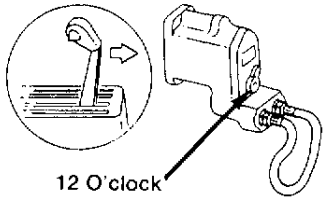
Move SCV lever to flow oil to sump.



Adjust SCV lever to get 5 PSI (SRT and QRT; 10 PSI on PST) lube pressure.



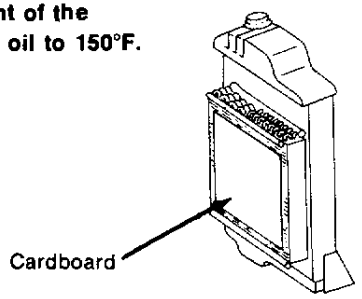
Move right hand lever to circulate oil with metering lever at 12 O'clock position.



Observe temperature gauge. Move SCV lever(s) to neutral when the desired temperature has been reached.



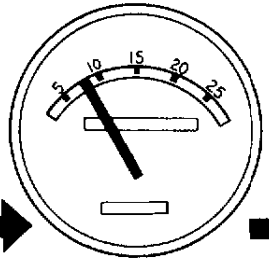
Covering the oil cooler in front of the radiator will help to heat the oil to 150°F.



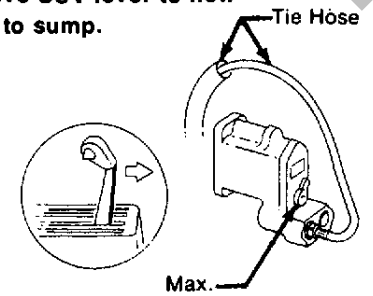
DRAINING AUXILIARY OIL RESERVOIR OR OIL COOLER

Use this procedure before installing or removing test equipment at the main pump. This will prevent oil spillage and burns from hot oil.

At 800 engine rpm



Move SCV lever to flow oil to sump.



When hose starts jumping (pump cavitation) shut off engine before moving SCV lever to neutral.

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If necessary, replace camshaft gear by removing cap screw and special washer and pressing shaft from gear.

NOTE: Do not separate the injection pump drive portion of the camshaft gear from the outer portion.

Thrust Plate

Check thrust plate for proper thickness. New part dimension is 0.1860 to 0.1890 inch. Thrust plate wear to 0.1820 inch is acceptable. If thrust plate wear or camshaft end play are excessive, check camshaft lobes, journals and bushings for wear or damage.

Camshaft Assembly

To reinstall gear, install thrust plate and spacer. Support camshaft under first journal, install Woodruff key, and place gear on camshaft with timing mark facing away from camshaft. Press gear on until tight against camshaft shoulder.

Installation

If the cam followers have been removed, reinstall, using the magnetic holding tools to hold them away from the camshaft bore until camshaft is installed.

Coat camshaft with high temperature grease such as Texaco "Molytex Grease O" or its equivalent and install camshaft in block.

See Section 30 for information regarding injection pump and injection pump drive gear installation.

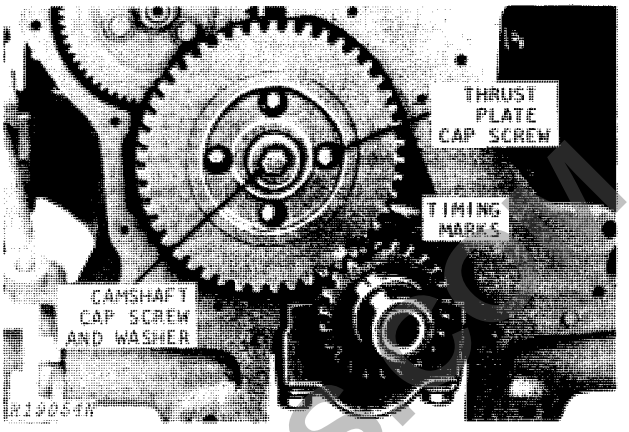


Fig. 11—Camshaft Adjustment

With No. 1 piston on "TDC" of compression stroke, align timing marks on camshaft and crankshaft (Fig. 11).

Use the following torque specifications for reassembly. Torque specifications for engine parts not covered in this group may be found in Group 35.

Location	Torque (ft-lbs)
Oil pan — ½" cap screws	85
— ⅜" cap screws	35
Cylinder head cover to cylinder	20-25
Intake manifold to cylinder head	35

Turn camshaft gear to align thrust plate holes with cylinder block holes. Secure thrust plate, washer, and cap screw in camshaft.

Tighten thrust plate cap screws to 20 ft-lbs torque. Install special washer on camshaft and tighten cap screw to 85 ft-lbs torque.

Check camshaft for 0.0025 to 0.0085 inch end play.

Install cylinder head, push rods, and timing gear cover. Tighten cylinder head as described on page 20-10-4.

Check injection pump timing and valve clearance. See Section 30 for injection pump information.

Install remaining tractor parts.

Glue rocker arm cover gasket on rocker arm cover and install.

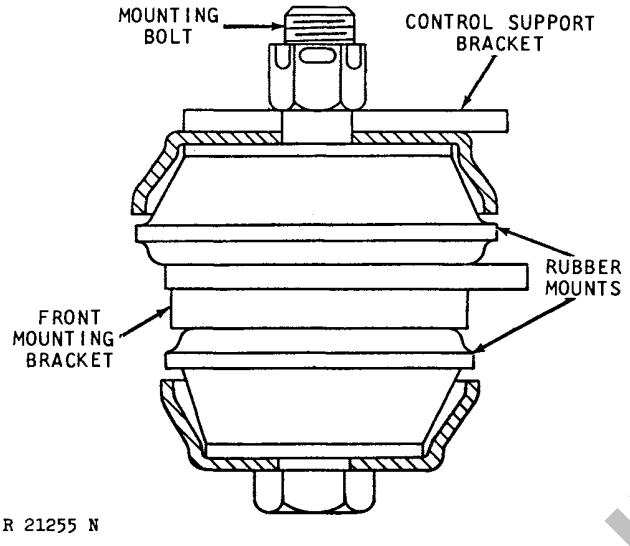
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Reverse the removal procedures given on the previous two pages.

Fill cooling system to proper level, start engine and check operation of controls.

Check for leaks around couplers on tractors with air conditioning.



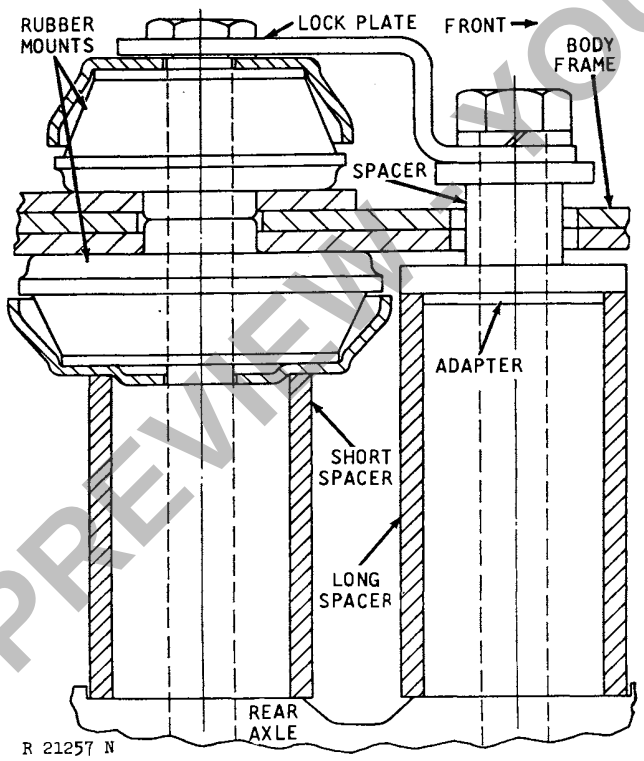


Fig. 7—Sound-Gard Body Mounts

SEPARATING ENGINE FROM CLUTCH HOUSING

⚠ CAUTION: Before separating tractor, be sure that the brake accumulator is discharged. The accumulator can be discharged by opening the right-hand brake bleed screw, and holding the brake pedal down for a few minutes.

Drain cooling system and remove cowl, side shields, grille screens, hood, and muffler.

Remove battery box covers, and disconnect battery cables. Remove batteries and battery boxes. Remove tractor step when removing left-hand battery box. Remove the long battery cable that connects both batteries.

Remove body filler panels (Fig. 1).

⚠ CAUTION: Follow all safety precautions found on page 80-10-6 when working with the air conditioning system.

Disconnect refrigerant couplers on tractors with air conditioning by holding the coupler body stationary with a wrench. If refrigerant can be heard escaping as the coupler is loosened, retighten coupler and loosen again.

IMPORTANT: Keep ends of couplers clean to prevent possible contamination in system.

On tractors with Perma-Clutch, remove the hexagonal transmission pump drive shaft from rear of transmission case (Fig. 50-15-2).

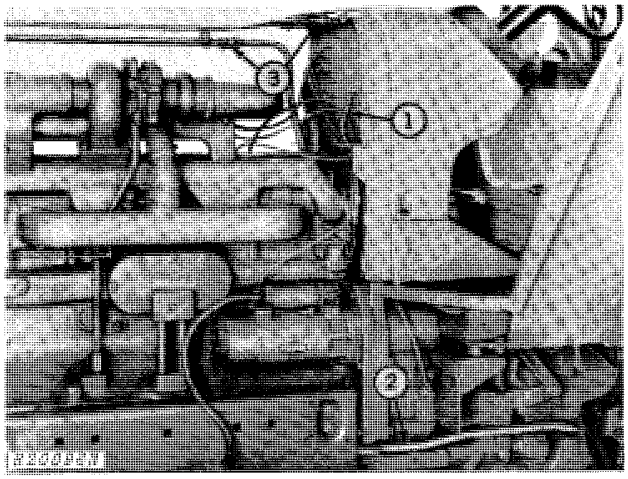


Fig. 8—Left-Hand Separation Steps

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4430 TRACTOR
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TECHNICAL MANUAL
TM-1057 (SEP-77)

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- Group 22—Late Model Power Steering
- Group 25—Power Brakes
- Group 30—Selective Control Valve, Breakaway Couplers, and Remote Cylinders
- Group 35—Specifications and Special Tools

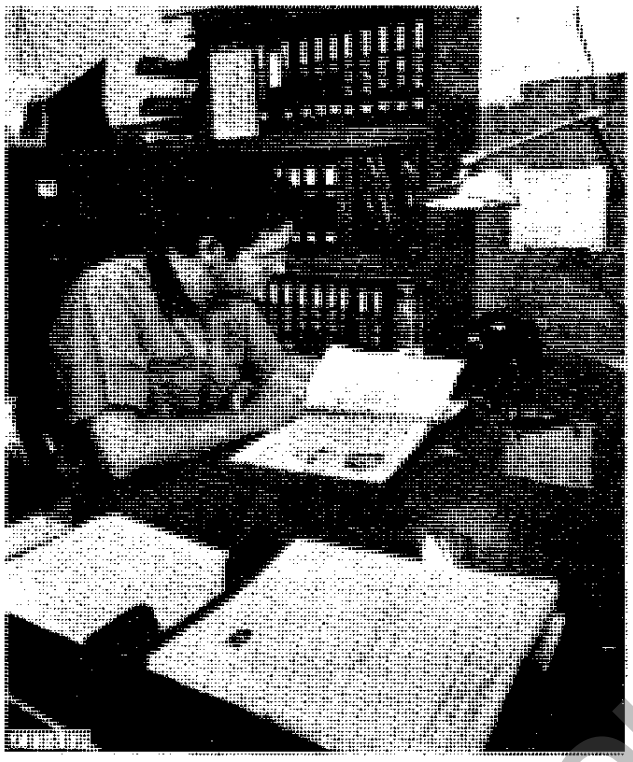
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INTRODUCTION



Use FOS Manuals for Reference

This technical manual is part of a twin concept of service:

- *FOS Manuals—for reference*
- *Technical Manuals—for actual service*

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover *basic* theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new men and for reference by experienced men.

Technical Manuals are concise service guides for a *specific* machine. Technical Manuals are on-the-job guides containing only the vital information needed by a journeyman mechanic.



When a serviceman should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.



Use Technical Manuals for Actual Service

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you—a journeyman mechanic. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

⚠ This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

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Disassembly

Use a puller and press to remove fan hub.

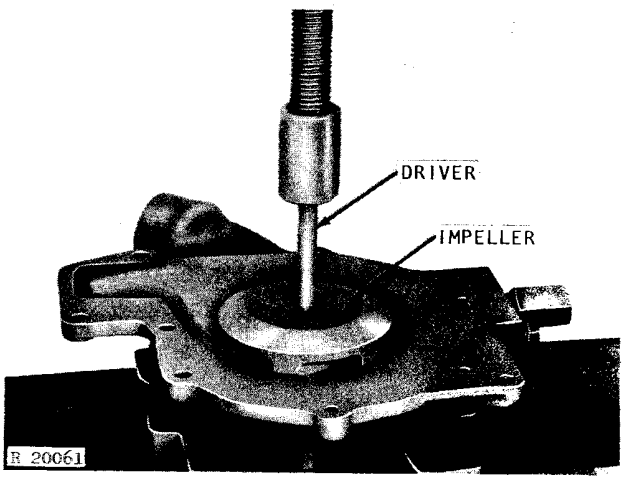


Fig. 1—Removing Bearing and Shaft

Remove bearing (Fig. 1), seal, and impeller from pump housing. Use JD-262 driver to press bearing and shaft from impeller and housing (Fig. 1).

Inspection and Repair

Inspect pump parts for wear or damage. Replace as necessary.

Pump leakage can be caused by one or more of the following conditions:

1. Cracked housing.
2. Scratched, damaged, or worn seal.
3. Damaged impeller bore. Check bore and bearing shaft for wear or damage. A new impeller I.D. is 0.6242 to 0.6252 inch. The new shaft O.D. is 0.6262 to 0.6267 inch.
4. Cracked, loose, or damaged ceramic insert.
5. Loose or defective rubber cup.
6. Failed bearing.

Leakage at the drain hole in the pump housing usually indicates a leaking seal. Replace seal, rubber cup, and ceramic insert as necessary.

Inspect ceramic insert and seal under magnification for cracks or pits in the sealing surface and replace as necessary.

Assembly

Cover bearing with a light coat of clean SAE 10W engine oil and press into housing. Outer bearing race should be flush with housing edge.

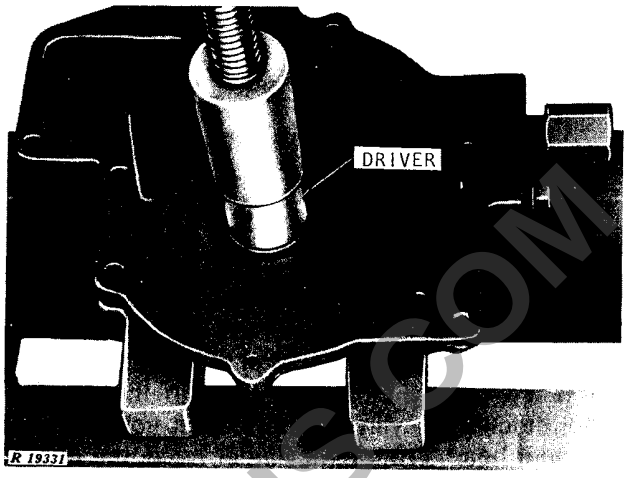


Fig. 2—Installing Seal

Coat outside diameter of seal (Fig. 2) with Permatex and press seal into place with JDE-17A driver. Be sure it is fully seated.

NOTE: Permatex used must be resistant to heat and ethylene-glycol type antifreeze.

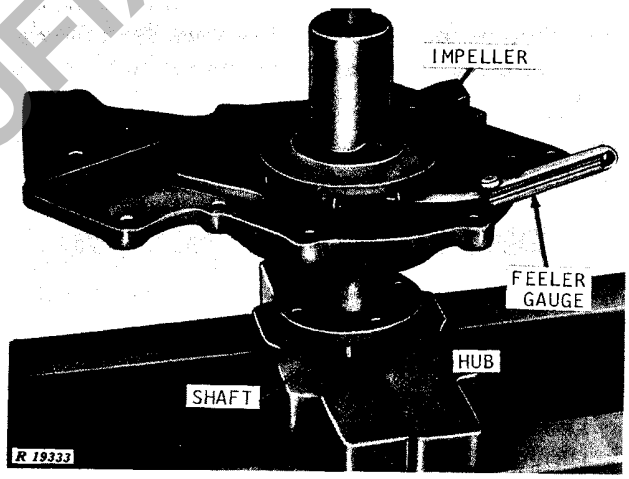


Fig. 3—Installing Impeller-Diesel

With pump resting on fan hub, press impeller into place. Be sure impeller is started straight. Press impeller until there is 0.015 to 0.025 inch clearance betwen machined surface of the housing and impeller (Fig. 3).

Support bearing shaft and press fan hub on shaft to ¼ inch above end of shaft.

NOTE: Do not press hub flush with the end of the shaft.

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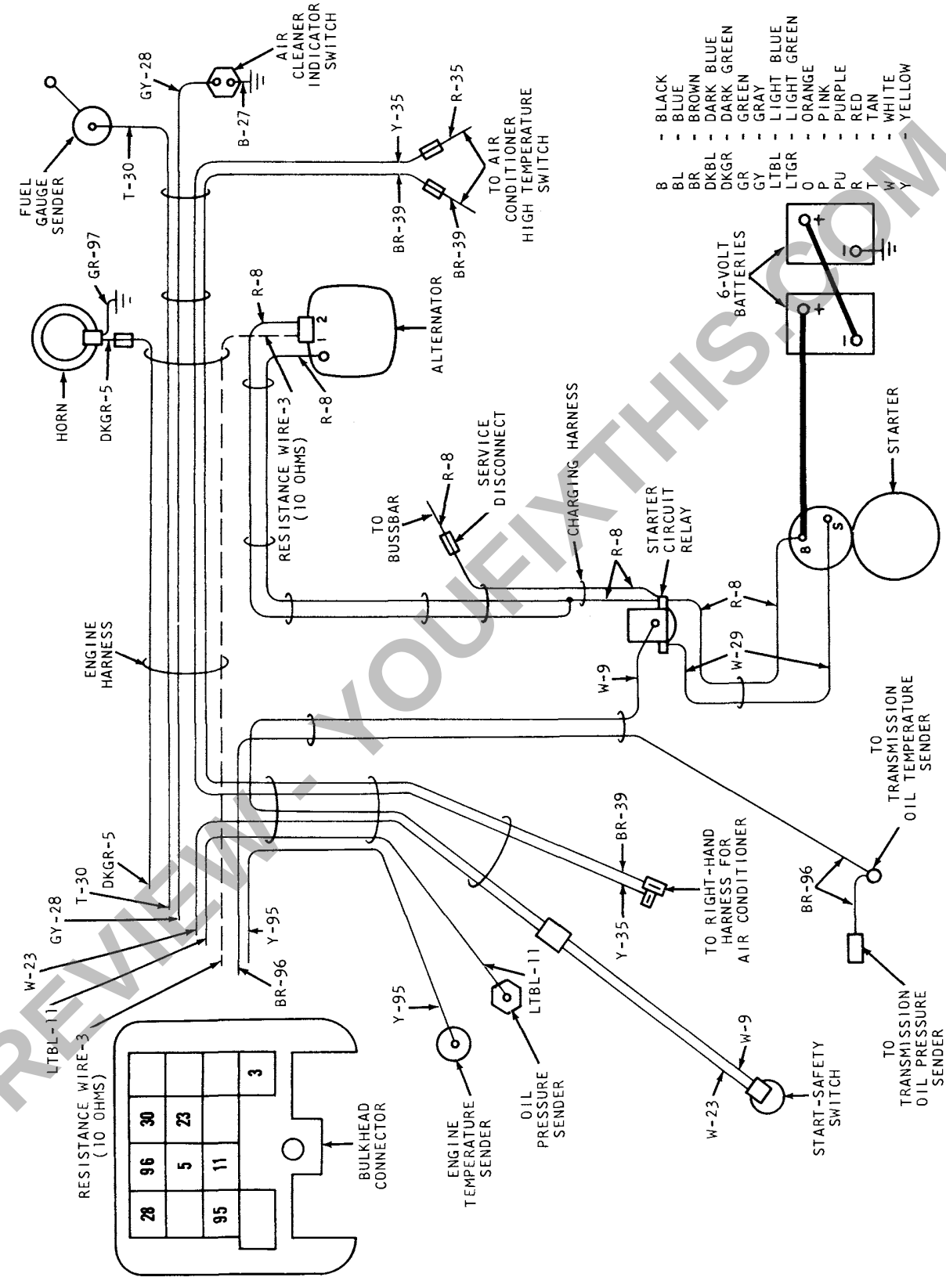
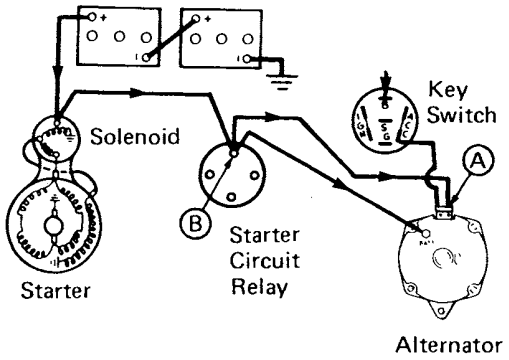
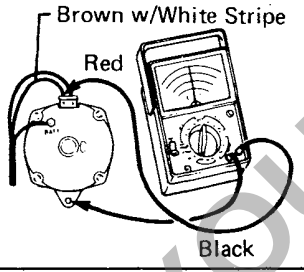
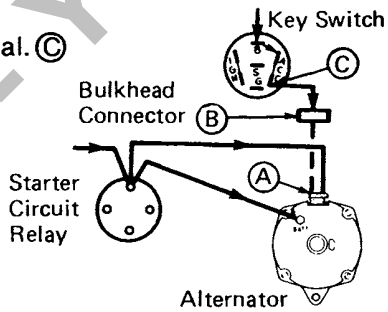
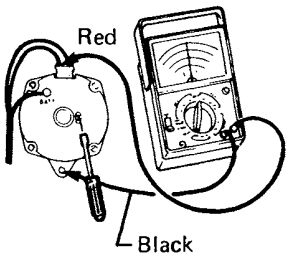


Fig. 9—Engine Harness and Charging Harness Connections (T -17499, See Fig. 14 for Starter Circuit Relay Connections on Tractors with Electric Ether Aid)

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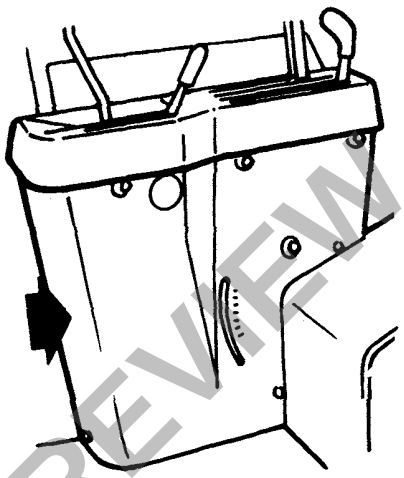
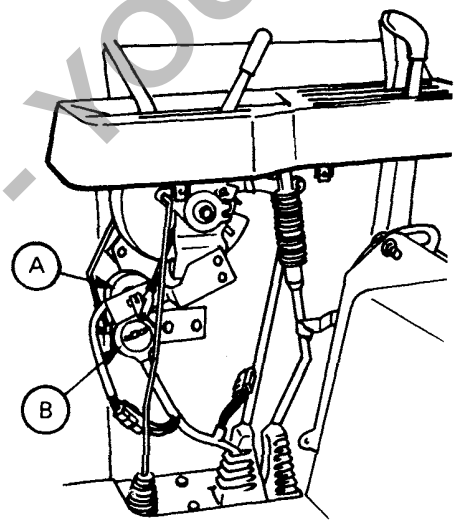
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Step	Sequence		Result
B5 There is an "OPEN" circuit between No. 2 voltage regulator terminal Ⓐ and starter circuit relay terminal Ⓑ.			Repair circuit. Then... **GO TO B4**
B6 **NO. 1 VOLTAGE REGULATOR TERMINAL CIRCUIT TEST:** (Resistance wire, 10-15 ohms.) Key switch "ON". Engine "STOPPED".	Connect voltmeter to No. 1 regulator terminal as shown: 	Spec. 2-9 volts Note: voltage regulator coupler must be connected.	In Spec. **GO TO B11** Below 2 volts **GO TO B7** Above 9 volts **GO TO B8**
B7 There is an "OPEN" circuit: 1. at key switch "ACC" terminal. Ⓒ 2. at bulkhead connector Ⓑ 3. between Ⓐ and Ⓑ (or) 4. between Ⓑ and Ⓒ			Repair circuit. Then... **GO TO B6**
B8 Key switch "ON". Engine "STOPPED". Connect voltmeter as shown. Ground field brush through test hole. Observe voltmeter reading. 		Spec. 2-9 volts	In Spec. **GO TO B9** Above Spec. **GO TO B10**

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Step	
SPEED SWITCH TEST: **On Tractor: Speed 3 or 4.** BENCH TEST: Rotate switch shaft counterclockwise to stop then rotate clockwise 1 detent. **On Tractor: Speed 1 or 2** BENCH TEST: 3 detents clockwise from stop. **On Tractor: 1R or 2R.** BENCH TEST: 5 detents clockwise from stop. *Note: Diode in circuit. Replace switch if current flow in both directions. Reconnect couplers after test or repair.	Green and blue. Tan (+) and blue (−).* Orange (+) and blue (−).* Green and blue. Tan and blue. Orange (+) and blue (−).* Purple (+) and blue (−).* Tan and yellow. Orange and yellow. Green and yellow.
	Repair circuit. Then... **GO TO C1**
(C14) **SRT:** Remove shift and hydraulic control lever console cover. 	Disconnect change and range switch couplers.  A-Change Switch B-Range Switch
Check between the following lead terminals for continuity with shift lever or switch arms positioned as indicated on next page.	
	(Continue)

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Clutch Pressure

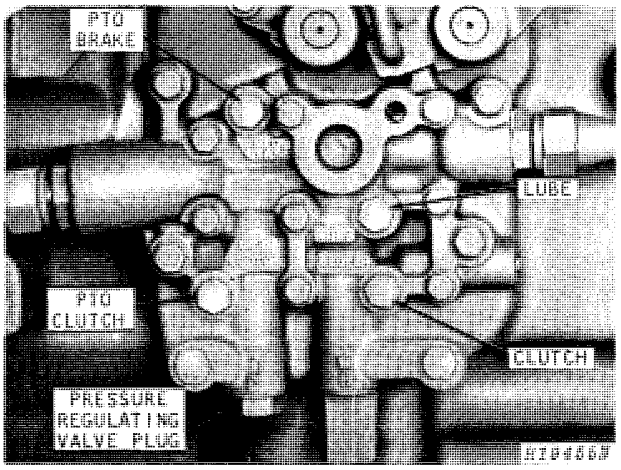


Fig. 8—Test Plug Locations

To check clutch pressure, install a 0-300 psi pressure gauge at the clutch pressure test plug (Clutch) (Fig. 8) in the pressure regulating valve housing.

Place transmission in PARK position.

Run engine at 1900 rpm. With oil at operating temperature, oil pressure should be 170 to 180 psi. If pressure is low, check the PTO clutch and brake pressure before adjusting system pressure. Low pressure may be due to low oil flow. First decrease and increase engine speed and 300 rpm and observe pressure. If pressure drops off greatly as speed is decreased and increases greatly as speed is increased, the problem is inadequate oil pump flow or an oil leak. If the pressure changes only a few psi, and the PTO clutch and brake have the same low pressure, adjust system pressure. If pressure is normal on the PTO clutch and brake, system pressure is satisfactory, but there is excessive leakage in the clutch valve circuit.

To adjust system pressure, remove hex. plug from bottom of pressure control valve housing (Fig. 8) and add or deduct shims below pressure regulating valve springs. One shim equals approximately 5 psi.

When the clutch pedal is depressed, the oil pressure should drop immediately to zero. Engage the clutch gradually. The pressure will also increase gradually if the valve is modulating properly.

PTO Clutch And Brake

Install a pressure gauge (0 to 300 psi) at the PTO clutch test plug (Fig. 8). Start engine and engage PTO clutch. At 1900 rpm engine speed clutch oil pressure should be at system pressure. If oil pressure is lower, do not put the PTO under load until the condition has been corrected.

When the PTO brake is engaged, the PTO clutch pressure should drop immediately to zero. Engage the PTO clutch gradually. The pressure should also increase gradually to approximately 130 psi and then jump to system pressure.

To test PTO brake pressure install a pressure gauge (0 to 300 psi) at the PTO brake test plug. Start the engine and pull the PTO control lever back to the brake position. At 1900 engine rpm, brake oil pressure should be at system pressure.

With the engine running at 1900 rpm push the PTO control lever forward into the fully engaged position. PTO brake pressure should drop immediately to zero.

Lubrication Pressure

Install the pressure gauge at the lubrication test plug (Lube) either on pressure regulating valve housing (Fig. 8) or on filter relief valve housing (Fig. 7). Run engine at 1900 rpm. With oil at normal operating temperature (approximately 150°F) lubrication pressure should not be less than 15 psi.

Lubrication Flow

Check transmission oil pump output as instructed in Section 70, Group 15. This measures the oil which is delivered to the oil cooler and then returned for lubrication.

Oil Pressure Switch

Remove the oil pressure switch (Fig. 7). Connect the switch to a hydraulic hand pump. Connect a 12-volt test lamp and battery across the switch leads. The switch should open as the pressure is raised to 145 to 155 psi and close when the pressure is reduced to 115 to 125 psi.

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Third Speed Reverse

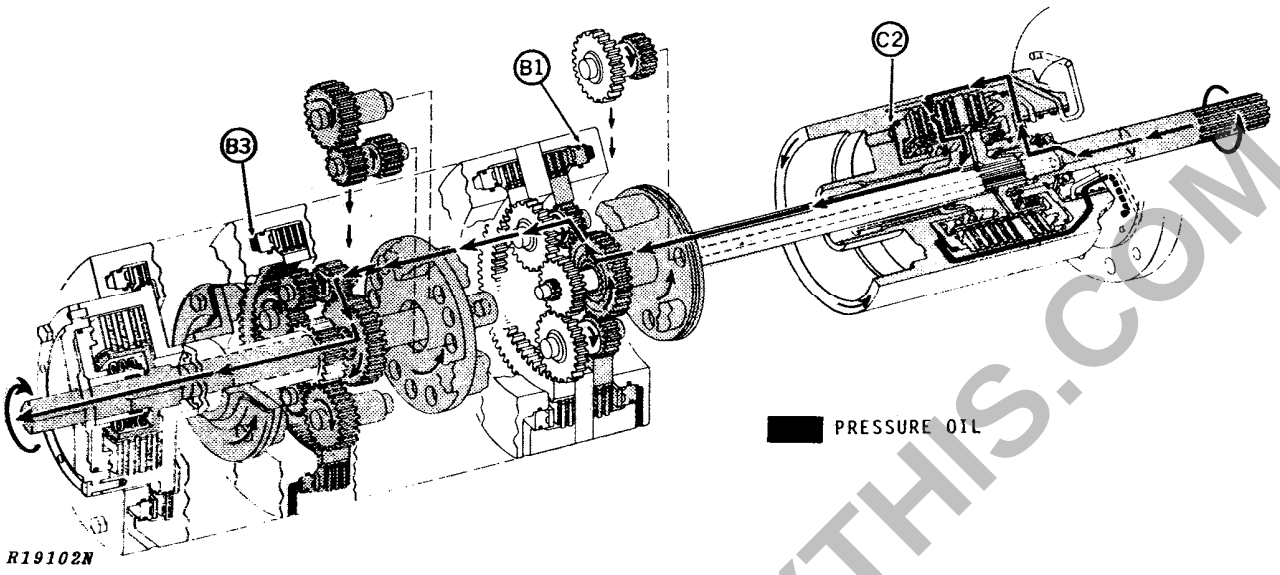


Fig. 5—Flow of Engine Power in Third Speed Reverse (PTO parts not shown)

When the transmission control lever is placed in the third speed reverse position, the hydraulic transmission control system engages C2 in the clutch pack and B1 and B3 in the planetary pack (Fig. 5).

	CLUTCH PACK		PLANETARY PACK				
3rd REVERSE	C1	(C2)	(B1)	B2	(B3)	B4	C3

Fig. 6—Clutches and Brakes Engaged for 3rd Speed Reverse

The flow of engine power is from the torsional damper to C2 in the clutch pack. The C2 clutch shaft transmits power at engine speed from C2 to the C2 sun pinion in the planetary pack.

Since B1 restrains its ring gear from turning, the planet pinions "walk around" the ring gear, forcing the planet pinion carrier to rotate in the same direction as the sun pinion, but at a slower rate of speed. The planet pinion carrier transmits power to the overdrive and reverse planetary set.

When B3 is engaged, its ring gear is restrained from turning. As the planet pinion carrier rotates, the planet pinions in mesh with the ring gear are forced to rotate on their axes, driving the inner planet pinions, which in turn force the sun pinion to rotate in the opposite direction from the planet pinion carrier. The sun pinion which is driven by the planet pinions drives the transmission reduction gears.

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Section 55
POWER FRONT-WHEEL DRIVE

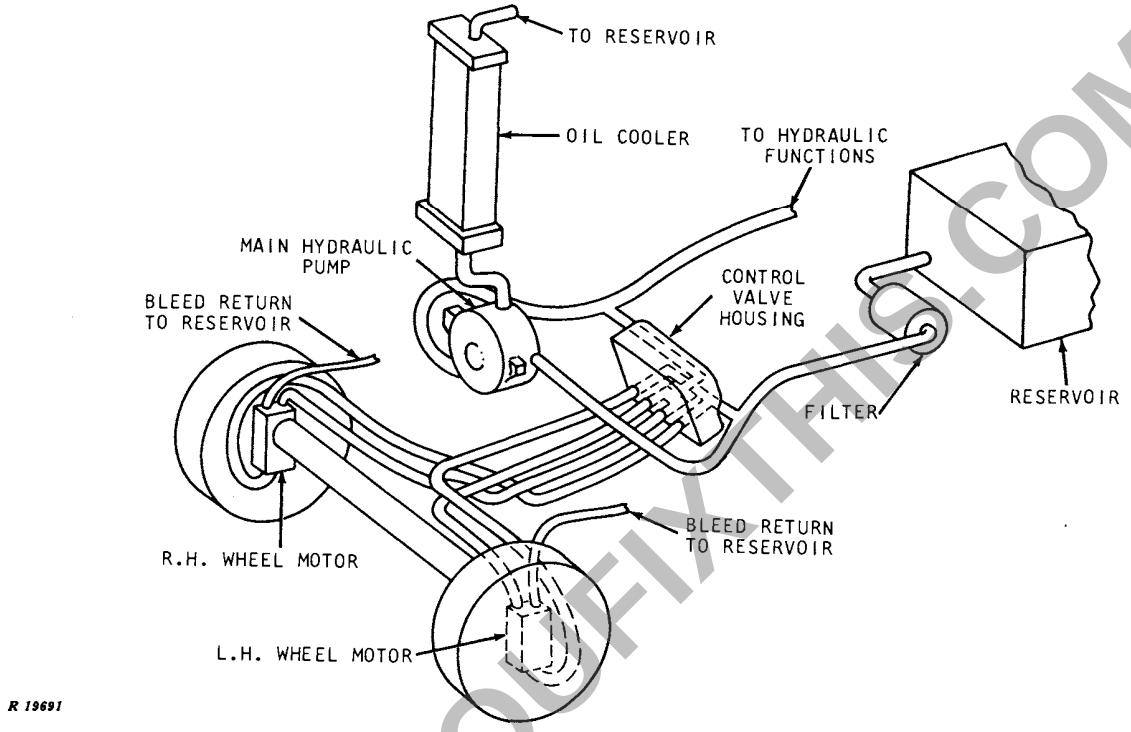


Fig. 1—Power Front-Wheel Drive Hydraulic System

GENERAL INFORMATION

The power front-wheel drive system (Fig. 1) consists of an electrical actuating system, a control valve which receives and directs pressure oil, and hydraulic front wheel drive motors located in the front wheel housings.

A double planetary gear system accomplishes the final speed reduction of about 40 to 1.

The front wheel drive can be engaged or disengaged when the tractor is in motion. A change from high to low torque or low to high torque can also be accomplished when "on the go".

The front wheel drive was not designed for normal field condition but for marginal traction conditions. However, the front wheel drive can be engaged any time in any field condition.

Control Systems

The electrical control system includes the following major components:

Drive Operating Switch

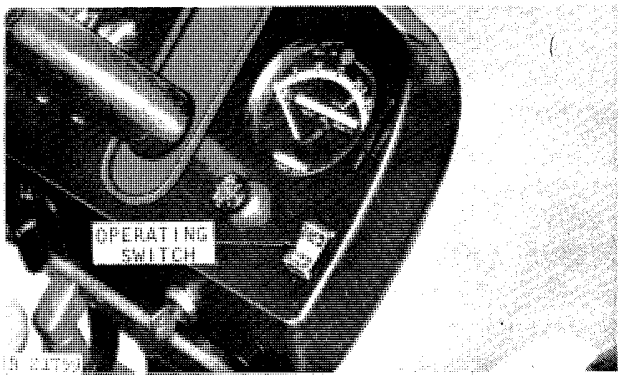


Fig. 2—Operating Switch

A single, three-position electrical switch (Fig. 2) controls the neutral or "off" position and high torque and low torque. Forward-neutral-reverse and dropout in the higher gears are synchronized with the regular transmission shift lever and clutch pedal.

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Special Tools

The following special tools are required to perform step-by-step diagnosis of all tractors.

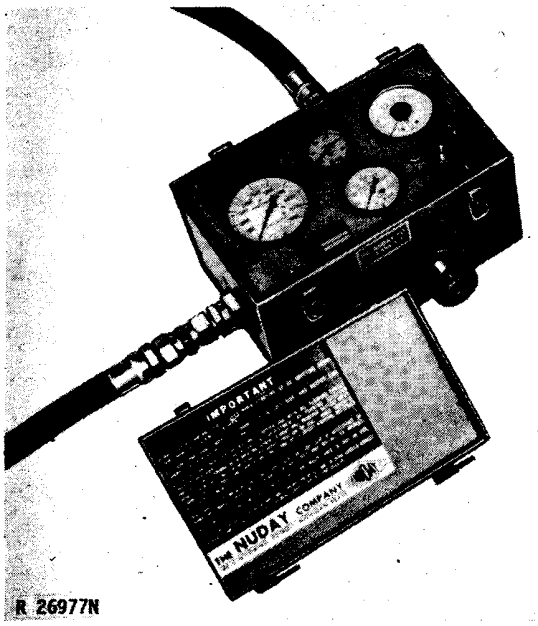
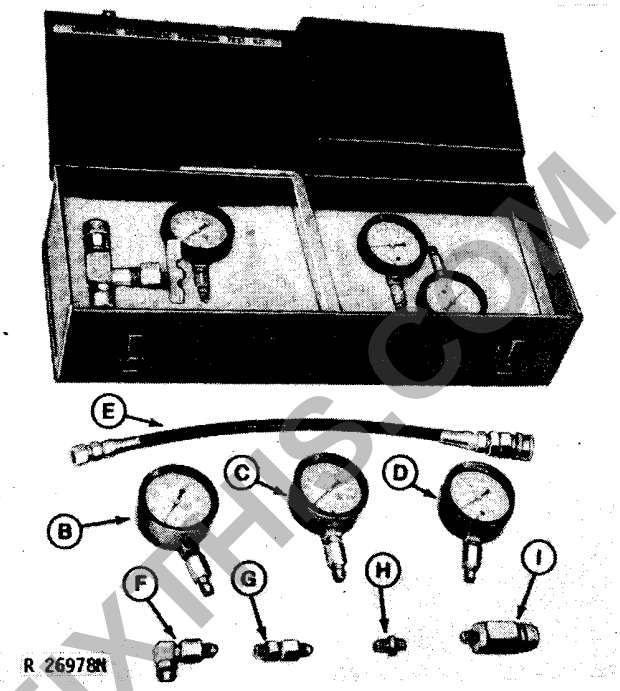


*Fig. 1–D-15017N Hydraulic Flow Meter**

(NOTE: D-1074AA Hydraulic Flow Meter may also be used)



B—0-60 psi (0-5 Bar) Pressure Gauge
C—0-300 psi (0-25 Bar) Pressure Gauge
D—0-5000 psi (0-400 Bar) Pressure Gauge
E—D-19 Hose (3 used)
F—D-6 90° Elbow
G—D-12 Adapter
H—D-5 Adapter
I —D-8 Coupling

Fig. 2–Universal Pressure Test Kit

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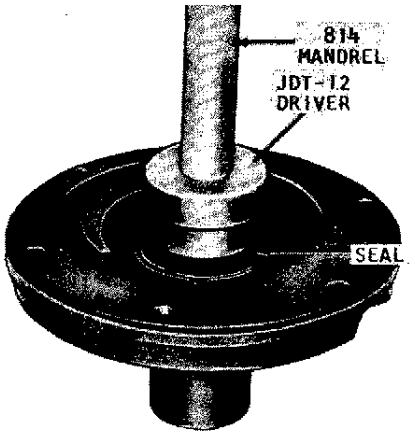


Fig. 7—Installing Oil Seal

Use JDT-12 driver (Fig. 7) to replace oil seal in pump body with lip of seal facing driver.

Install pump gears and O-ring. The non-chamfered side of the internal gear MUST be out.

Install pump body on housing and tighten cap screws to 20 ft-lbs torque.

Assemble pump housing to clutch oil manifold and clutch pack as outlined in Section 50, and install in clutch housing.

MAIN HYDRAULIC PUMP

General Information

The main hydraulic pump is a variable displacement, constant pressure, radial piston type pump. It is mounted between the engine and radiator and driven from the engine crankshaft.

An integral cam and race with needle bearings around the cam on the pump shaft actuates the pump pistons. An adjustable stroke control valve assembly on the pump is used to adjust the pump for correct system pressure.

NOTE: Tractors without power front wheel drive are equipped with a 3.0 cu. in. displacement pump. Tractors with power front wheel drive have a 4.0 cu. in. displacement pump.

Refer to "Hydraulic Pumps" in FOS Manual 10 — HYDRAULICS, for information on variable displacement pumps.

Operation

The crankcase area (1, Fig. 8) of the pump, in which the pump shaft and cam race are located, contains pressure oil to hold the pistons away from the race in standby position.

When there is a demand for oil by one or more hydraulic functions, pressure is reduced in the pump outlet gallery (12) and crankcase outlet valve assembly (15). The crankcase outlet valve then opens, allowing crankcase oil to enter the inlet side of the pump. This reduces pressure in the crankcase area, and the spring-loaded pistons (9) move toward the race (2).

As the pistons move toward the race, pressure is reduced at the spring end. This plus inlet oil pressure opens the inlet valve (6) allowing oil to fill the piston bores. At the end of the stroke, pressure on each side of the valve is equal and the valve spring is able to close the inlet valve.

The revolving race contacts the pistons, forcing them outward. The oil in the bores is forced out the discharge valve (11) into the outlet gallery. At the end of the stroke the discharge valve spring closes the discharge valve.

The pistons continue pumping until oil pressure is increased in the outlet gallery and in the center and upper area of the crankcase outlet valve. The increased pressure forces the valve down, stopping the flow of oil from the crankcase to inlet gallery.

The increased pressure oil also flows into the stroke control valve (13), opening the valve and allowing oil into the crankcase area. The race moves the pistons out and the pressure oil in the crankcase holds the pistons away from the race. The pump is again in a standby position.

By adjusting the stroke control valve, pressure at the outlet gallery can be changed. By controlling oil pressure in the crankcase, the distance pistons move toward the race, and therefore the stroke, is controlled.

Oil leakage past pistons and stroke control valve re-enters the inlet gallery via a bleed hole below the stroke control valve and inlet gallery. This oil circulation also provides pump cooling.

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1–Slotted Nut
2–Lock Plate
3–Spring
4–Spring Pin (2)
5–Screw
6–Pin
7–Load Control Arm Extension
8–Rockshaft Servo Cam Follower
9–Washer
10–Retaining Ring
11–Load Control Arm
12–Load Control
13–Arm Follower
14–Pin
15–Support
16–Screw (3)
17–Load Control Shaft
18–Bushing (2)
19–Oil Seal (2)
20–Washer (2)

Legend for Fig. 17

Repair

While the rockshaft is off the transmission case, examine the load control arm (11, Fig. 17) extension at pivot points for wear or damage. If the arm must be removed, the differential drive assembly must also be removed. See Section 50 for differential drive information.

Check for leakage around the drawbar support and transmission case. Leaking may be caused by worn load control shaft or damaged load control shaft O-rings or sealing rings.

Remove snap rings and retainers from front drawbar support. Lift drawbar support with jack and carefully remove load control shaft.

Inspect load control shaft, particularly at flex points, for wear or scoring. Use a fine emery cloth to clean up shaft.

Lower drawbar support and examine bushings, sealing rings and O-rings in transmission case and bushings in support.

Use the following specifications:

Item	Measurement	New Part
Load control shaft	O.D.	1.1230 to 1.1250 in.
Transmission case bushing at smallest point	I.D.	1.1280 to 1.1300 in.
Drawbar support bushing	I.D.	1.1540 to 1.1600 in.

Installation

DO NOT replace transmission case bushings unless NECESSARY. Frequent replacement could enlarge bushing bore and cause leakage.

To replace bushing, insert bushing in bore with chamfered end at bottom of bore. Using JDH-50-2 driver, 27512 disk (1-13/16 in.) and 27489 handle, drive bushing into case.

IMPORTANT: Be sure drivers are free from nicks and burrs. A rough driver surface could damage sealing rings.

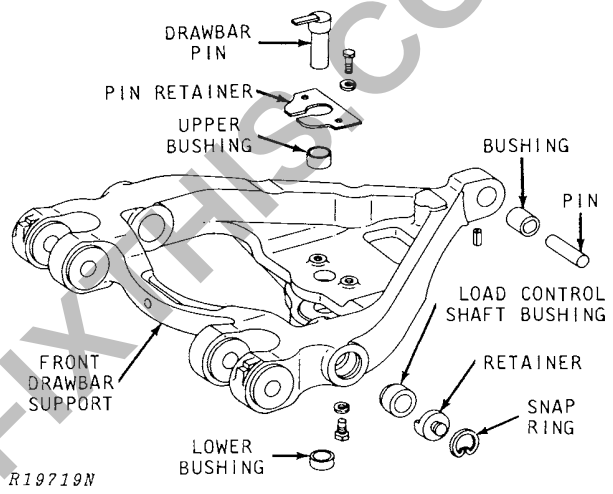


Fig. 18–Front Drawbar Support

Align front drawbar support (Fig. 18) with transmission case load control shaft bore and install 0.048-inch special washer on one side between case and support. Install as many as required of either 0.036, 0.048 or 0.062-inch special washers on the other side to provide minimum drawbar support-to-case clearance.

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EVAPORATOR

General Information

The evaporator is constructed of aluminum and greatly resembles an ordinary cooling system radiator. Refrigerant travels through tubes located within the core.

To obtain maximum cooling efficiency, the refrigerant must remain in the evaporator for a sufficient length of time to completely vaporize. Too little or too much refrigerant entering the evaporator will limit refrigerant capacity to absorb heat. The regulatory controls for the evaporator are the expansion valve and the thermostatic temperature control switch.

Removal

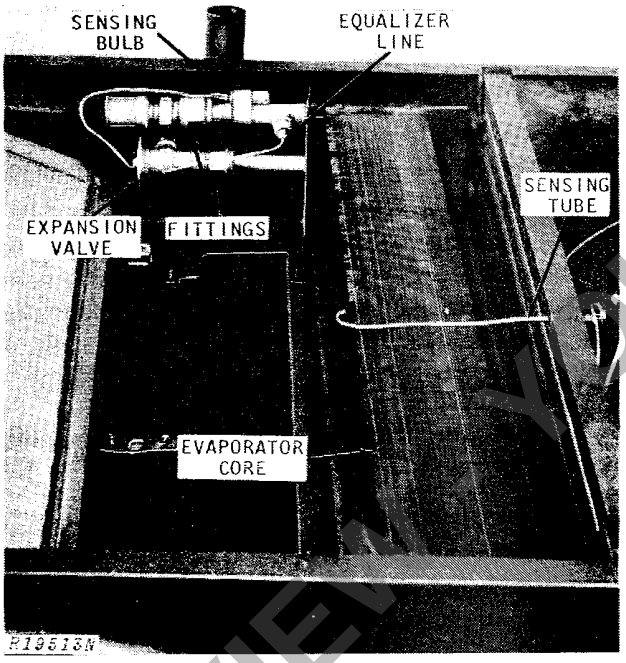


Fig. 29—Evaporator Removal

Depressurize the system as explained in DISCHARGING THE SYSTEM, page 80-10-7.

Remove the two cap screws from the top and three screws at front of roof. Raise roof, and remove the cover-to-housing sheet metal screws.

Remove the insulation from sensing bulb (Fig. 29) and expansion valve.

Disconnect sensing bulb, evaporator inlet and outlet fittings, and expansion valve equalizer line fitting. Remove sensing tube from evaporator core.

IMPORTANT: The tube connecting the bulb to the expansion valve contains a low pressure gas. To avoid improper valve action, do not kink or pinch the tube, or dent the bulb.

Remove evaporator core mounting screws, and lift out core. Note the amount of oil that drains from the core. Cap openings.

Repair

If contamination is evident in system, flush components (page 80-10-8).

Accessible minor leaks may be repaired, but the evaporator should be replaced if there is a restriction or a major leak in the core. The core should be tested with at least 50 psi when testing for leaks.

Installation

Remove caps from openings and reverse the removal instructions. Be sure to thoroughly wrap expansion valve ,sensing bulb, and adjoining section of the inlet refrigerant pipe (portion within compartment) with insulation tape to prevent condensate drip. Insulation tape must be procured locally.

Use care when tightening parts. Refer to the torque chart at the end of this group when necessary.

NOTE: If the evaporator was repaired or replaced with a new one, pour 4 fluid oz. of oil into the evaporator. If there were any major leaks in the system, refer to CHECKING AND ADDING COMPRESSOR OIL (page 80-10-17).

Evacuate and charge the system (page 80-10-7).

Perform the operational test (page 80-10-5).

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