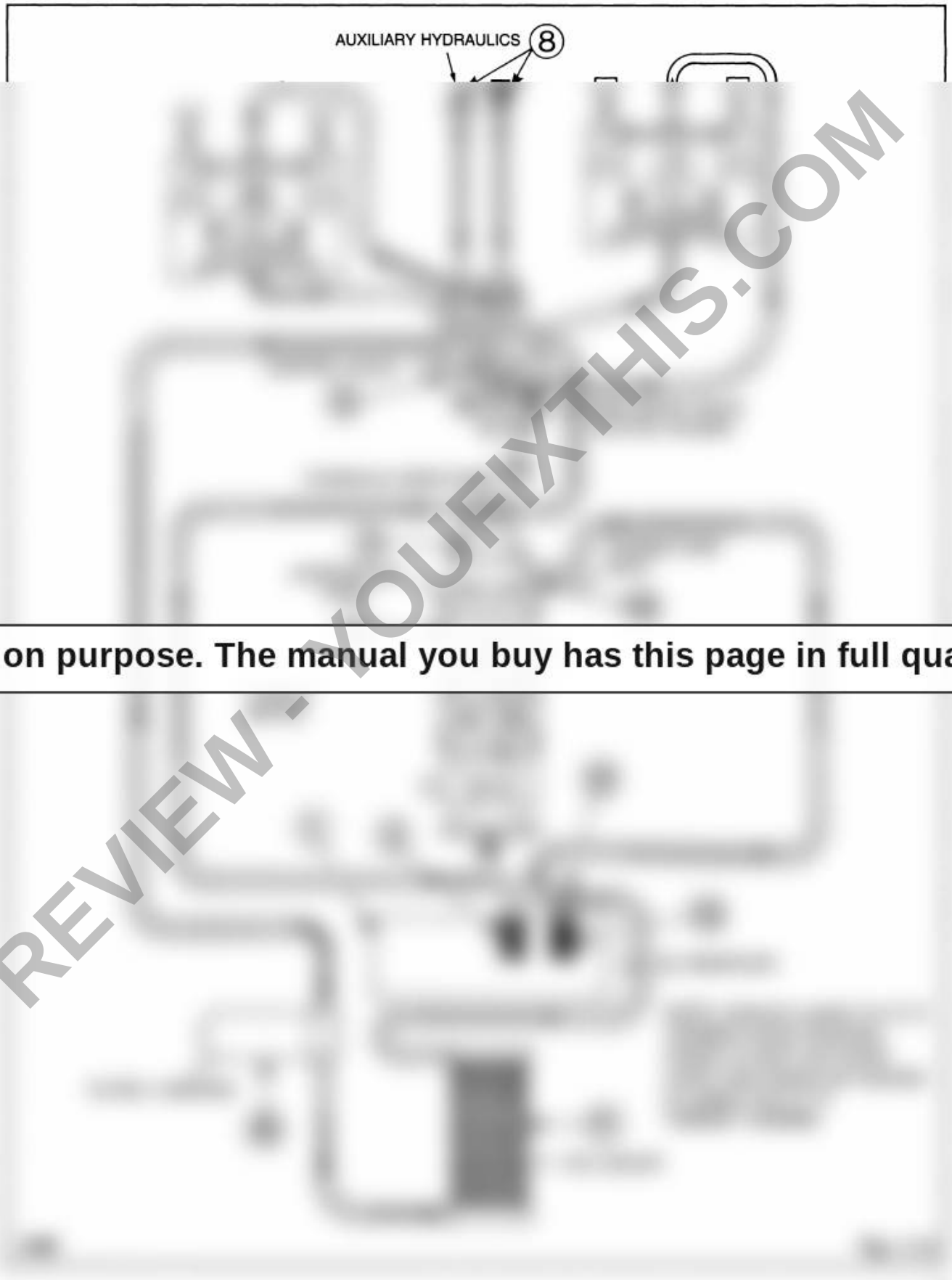
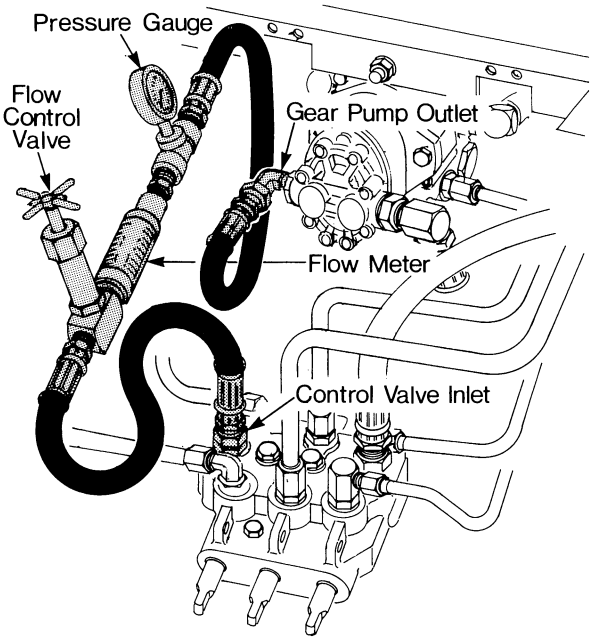
HYDRAULIC/HYDROSTATIC CIRCUIT



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1323 Fig. 1.2.3B

5. With the flow control on the tester fully open, start the engine and run it until it reaches normal operating temperature.
6. Set the engine speed to 1700 RPM and record the flow meter reading under no load conditions. (Refer to section 4.4 on setting the engine speed).
7. Apply load gradually to 2150 PSI (148 BAR). Correct the engine speed to 1700 RPM by increasing the throttle. Record the flow meter reading under load.

NOTE: The flow readings taken at no load and at 2150 PSI (148 BAR) must be at a constant 1700 RPM. If the RPM is not kept constant, the flow readings will be incorrect and pump efficiency will not be determined properly.

8. Determine pump efficiency by dividing the no-load reading into the 2150 PSI (148 BAR) reading. If the efficiency is less than 75% the pump should be repaired or if necessary replaced.
9. Disconnect the tester. If the pump is not to be removed from the loader reconnect the hydraulic line between the control valve and gear pump.

1.2.4 Removal and Replacement:

WARNING

Do not work on a loader with the boom arms in a raised position unless the boom locks are engaged.

IMPORTANT

When making repairs to the hydraulic system, keep all parts clean and remove dirt from the work area. Use caps and plugs on all lines and openings.

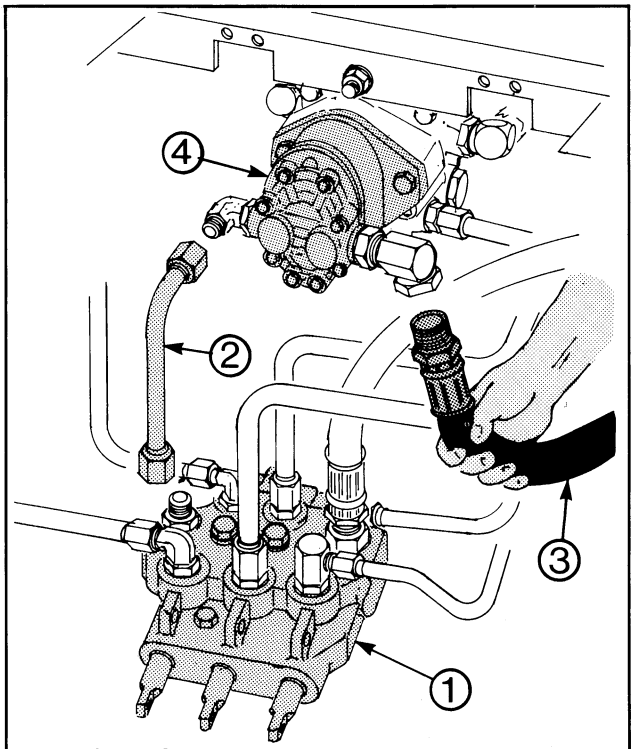
REMOVAL —

1. Raise the seat and remove the front shield.

WARNING

Never repair or tighten hydraulic hoses or fittings with the engine running or the system under pressure.

2. Disconnect the line between the hydraulic oil reservoir (fig. 1.2.4a) and the hydraulic gear pump at the gear pump inlet port. Cap the hose with a 3/4 inch N.P.T. cap to prevent loss of hydraulic oil.
3. Disconnect the line between the hydraulic gear pump and hydraulic control valve (fig. 1.2.4a).



1. CONTROL VALVE
2. LINE, GEAR PUMP TO CONTROL VALVE
3. LINE, GEAR PUMP INLET TO RESERVOIR
4. GEAR PUMP

1311 Fig. 1.2.4a

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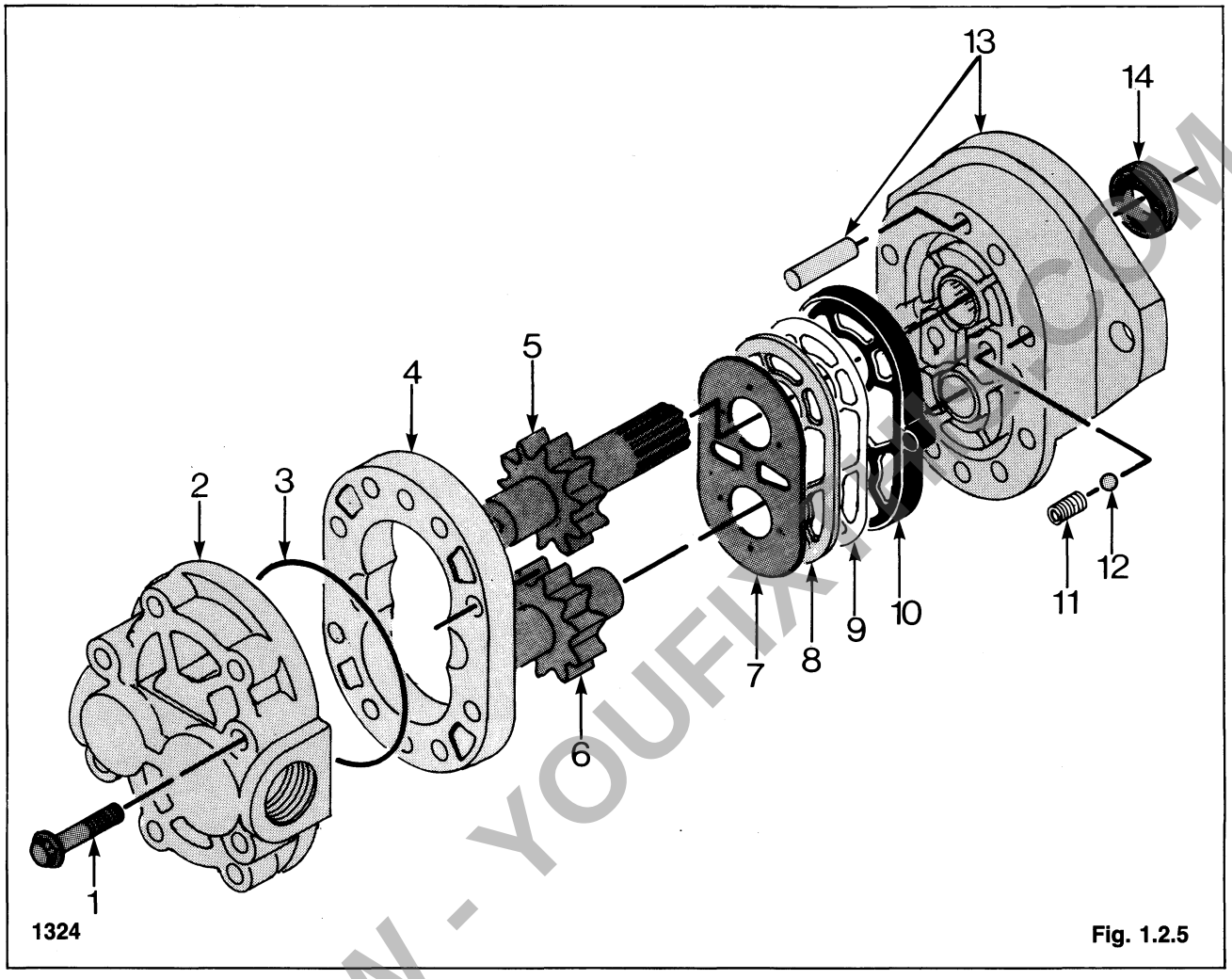


Fig. 1.2.5

1. TIE BOLTS
2. BACK PLATE ASSEMBLY
3. O-RING
4. BODY
5. DRIVE GEAR
6. IDLER GEAR
7. DIAPHRAGM
8. BACK-UP GASKET
9. PROTECTOR GASKET
10. DIAPHRAGM SEAL
11. SPRING
12. BALL
13. FRONT PLATE
14. SHAFT SEAL

DISASSEMBLY — (Refer to fig. 1.2.5)

1. Remove the eight tie bolts (1).
2. Hold the pump in both hands and tap the drive shaft against a wooden block to separate the front plate (13) from the back plate (2). The body (4) will remain with either the front plate or back plate.
3. To separate the body from the section it remains with, place the drive gear (5) in the body and tap the protruding end of the gear shaft with a plastic mallet.
4. Remove O-Ring (3) from the back plate and discard.
5. Using a sharp tool remove and discard the diaphragm (7) from the front plate.
6. Remove the two springs (11) and two balls (12) from the front plate.
7. Remove and discard the back-up gasket (8), protector gasket (9) and the diaphragm seal (10) from the front plate.
8. Remove and discard the shaft seal (14) from the front plate.

INSPECTION —

1. Thoroughly clean and dry all parts.
2. Inspect the shaft and gear assemblies for roughness or excessive wear at the bearing and seal areas.
3. Inspect the gear faces for scoring or excessive wear. Carefully remove any sharp areas on the gear teeth with emery cloth.

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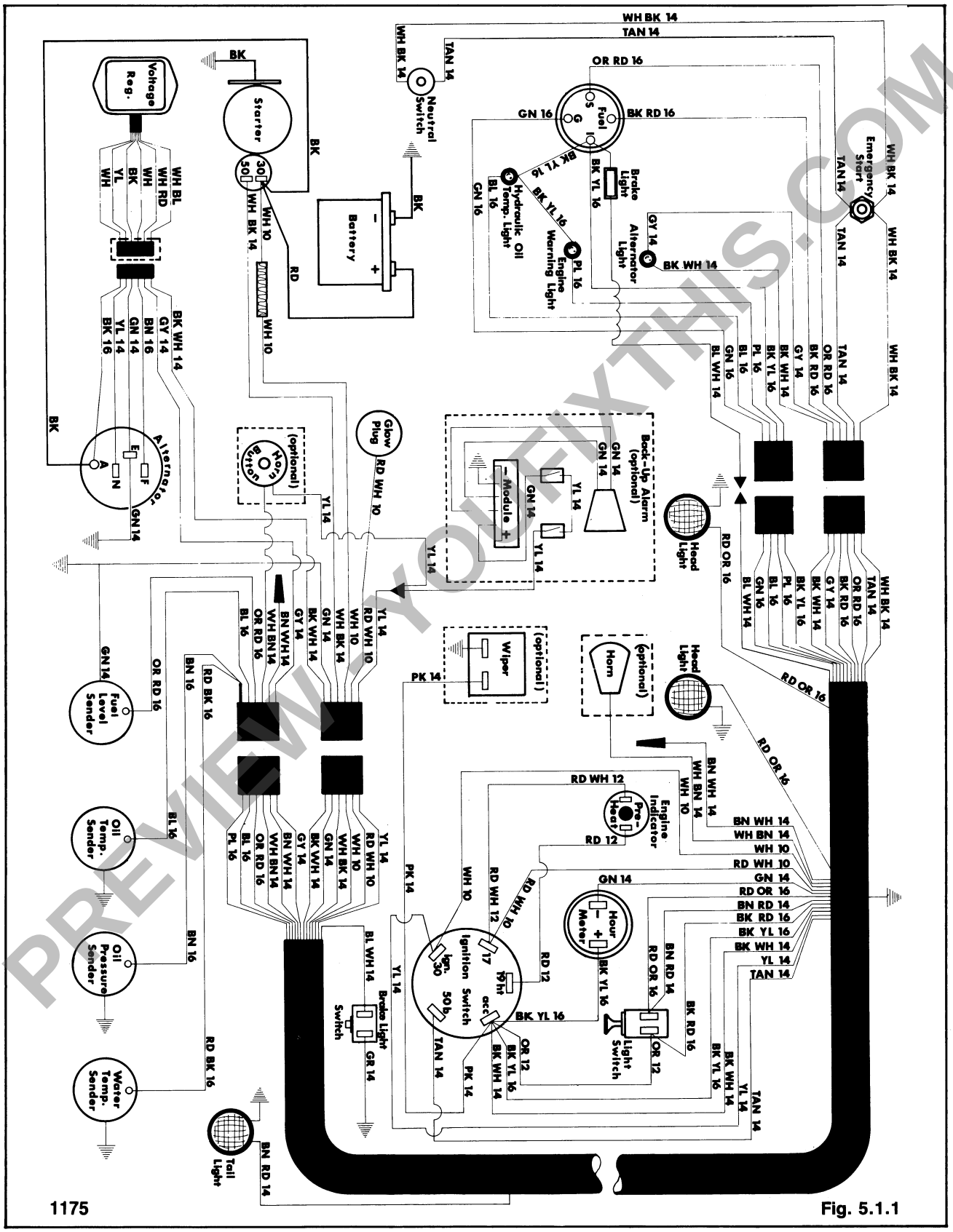
1.8 TROUBLE SHOOTING — HYDRAULIC SYSTEM

Problem	Cause	Corrective Action	Refer to Section
Loss of hydraulic power (no flow from gear pump)	Reservoir low on oil	Check for leaks. Fill reservoir with 10W30 API, SE/CD oil or Ford no. 48	1.7.3
	Universal joint between engine and pump failure	Inspect and replace damaged parts. Check for misalignment	
	Gear pump not functioning	Inspect and replace damaged parts	1.2.4 1.2.5
	Hydrostatic charge pump shaft failure	Inspect and replace damaged parts	2.2.6
	Spline coupling between front and rear hydrostatic pump failure	Inspect and replace damaged parts	2.2.6
Loss of hydraulic power (full flow from gear pump)	Auxiliary foot pedal engaged	Disengage	
	Foot pedal linkage disconnected or binding	Inspect and adjust or repair	4.2
	Relief valve failure or out of adjustment	Check pressure and adjust or repair	1.3.3
Hydraulic action jerky	Reservoir low on oil	Check for leaks. Fill with 10W30 API SE/CD oil or Ford no. 48	1.7.3
	Foot pedal linkage worn or loose	Inspect and adjust or replace damaged parts	4.2
	Air in hydraulic system	Check for leaks between oil reservoir and pump. Bleed system by extending and retracting boom cylinders several times	
	Load check valve not functioning	Inspect and replace damaged parts	1.3.5
	Control valve spool spring return mechanism not functioning	Inspect and replace damaged parts	1.3.5

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SECTION 5 — WIRING DIAGRAM



1175

Fig. 5.1.1

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7.5.2 Specifications:

General Specifications:

	CL35	CL45
[illegible]	[illegible]	[illegible]

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Cooling System (Cont.)

Thermostat	Starts to Open Full Open	160° F. (71°C) 185°F. (85°C)
Radiator Cap Pressure Rating		[illegible]

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8.1 PREVENTATIVE MAINTENANCE SCHEDULE

ITEM	SERVICE REQUIRED	8 HOURS	50 HOURS	200 HOURS	600 HOURS	1000 HOURS
Engine Oil	Check level and add if necessary. Use 10W30 API Classification SE/CD or Ford Oil No. 121.	■				
Radiator (Diesel only)	Check level and add if necessary. Fill with 50% mixture of ethylene glycol and water. Check cooling fins for dirt. If necessary blow out with compressed air.	■				
Hydraulic Oil	Check level and add if necessary. Use 10W30 API Classification SE/CD or Ford Oil No. 48.	■				
Oil Cooler	Check cooling fins for dirt. If necessary blow out with compressed air.	■				
Air Cleaner	Empty dust cap. Check condition indicator and service or replace element as required.	■				
Tires and Wheel Nuts	Check for low pressure or tire damage. Inflate standard tires 50 PSI (345 KPa), flotation tires 30-35 PSI (207-241 KPa). Check wheel nut torque 100-110 ft. lbs. (136-149 N.M.)	■				
Safety Equipment	Check all safety equipment for proper operation and condition. If necessary repair or replace.	■				
Decals	Check for damaged safety or instruction decals (see section 8.5). If necessary replace.	■				
Lubrication	Grease all fittings until excess shows.	■				
Engine Oil	Replace engine oil. Fill with 10W30 API Classification SE/CD or Ford Oil No. 121. Initial change only. Change every 200 hrs. on diesel engines and every 50 hrs. on gasoline engines.		■			
Engine Oil Filter	Replace engine oil filter. Initial change only. Change every 200 hours on diesel engines and every 100 hrs. on gasoline engines.		■			
Hydraulic Oil Filter	Change hydraulic oil filter element. Initial change only. Change every 200 hrs.		■			
Drive Chain Tension	Check and if necessary adjust. Check every 200 hours.		■			
50 Hour Service	Perform complete 50 hour service. Repeat every 200 hours.		■			
Muffler	Check and if necessary clean the muffler of any carbon or soot build up. Repeat every 100 hours.		■			
Injection Pump (Diesel only)	Check injection pump, add 10 oz. (300 cc) of oil. Check and add oil every 200 hours.			■		
Engine Oil (Diesel only)	Replace engine oil. Fill with 10W30 API Classification SE/CD or Ford Oil No. 121. Replace every 200 hours. On gasoline engines replace the oil every 50 hrs.			■		

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SAFETY PRECAUTIONS

Practically all Service work involves the need to drive the loader. The Operator's Manual, supplied with each loader, contains detailed safety precautions relating to Driving, Operating and Servicing that loader. These precautions are as applicable to the service technician as they are to the operator, and should be read, understood and practiced by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or re-assembly operations, whether within a workshop facility or out "in the field", consideration should be given to factors that may have an effect upon Safety, not only upon the mechanic carrying out the work, but also upon bystanders.

PERSONAL CONSIDERATIONS

- The wrong clothes or carelessness in dress can cause accidents. Check to see that you are suitably clothed.

  Some jobs require special protective equipment.

- **Eye Protection**

  The smallest eye injury may cause loss of vision. Injury can be avoided by wearing eye protection when engaged in chiselling, grinding, discing, welding, painting, etc.

- **Breathing Protection**

  Fumes, dust and paint spray are unpleasant and harmful. These can be avoided by wearing respiratory protection.

- **Hearing Protection**

  Loud noise may damage your hearing and the greater the exposure the worse the damage. If you feel the noise excessive, wear ear protection.

- **Hand Protection**

  It is advisable to use a protective cream before work to prevent irritation and skin contamination. After work clean your hands with soap and water. Solvents such as white spirit, paraffin, etc., may harm the skin.

- **Foot Protection**

  Substantial or protective footwear with reinforced toe-caps will protect your feet from falling objects. Additionally, oil-resistant soles will help to avoid slipping.

- **Special Clothing**

  For certain work it may be necessary to wear flame or acid-resistant clothing.

- Avoid injury through incorrect handling of components. Make sure you are capable of lifting the object. If in doubt get help.

EQUIPMENT CONSIDERATIONS

- **Machine Guards**

  Before using any machine, check to ensure that the machine guards are in position and serviceable. These guards not only prevent parts of the body or clothing coming in contact with the moving parts of the machine, but also ward off objects that might fly off the machine and cause injury.

- **Lifting Appliances**

  Always ensure that lifting equipment, such as chains, slings, lifting brackets, hooks and eyes are thoroughly checked before use. If in doubt, select stronger equipment than is necessary.

  Never stand under a suspended load or raised implement.

- **Compressed Air**

  The pressure from a compressed air line is often as high as 100 psi (6.9 bar) 7 (kgf/cm^2). It is perfectly safe if used correctly. Any misuse may cause injury.

  Never use compressed air to blow dust, filing, dirt, etc., away from your work area unless the correct type of nozzle is fitted.

  Compressed air is not a cleaning agent, it will only move dust, etc., from one place to another. Look around before using an air hose as bystanders may get grit into their eyes, ears or skin.

- **Hand Tools**

  Many cuts, abrasions and injuries are caused by defective tools. Never use the wrong tool for the job, as this generally leads either to some injury, or to a poor job.

  Never use
  — A hammer with a loose head or split handle.
  — Spanners or wrenches with splayed or worn jaws.
  — Spanners or files as hammers; or drills, clevis pins or bolts as punches.

  For removing or replacing hardened pins use a copper or brass drift rather than a hammer.

  For dismantling, overhaul and assembly of major and sub components, always use the Special Service Tools recommended.

  These will reduce the work effort, labor time and the repair cost.

  Always keep tools clean and in good working order.

- **Electricity**

  Electricity has become so familiar in day to day usage, that its potentially dangerous properties are often overlooked. Misuse of electrical equipment can endanger life.

  Before using any electrical equipment — particularly portable appliances — make a visual check to make sure that the cable is not worn or frayed and that the plugs, sockets, etc., are intact. Make sure you know where the nearest isolating switch for your equipment is located.

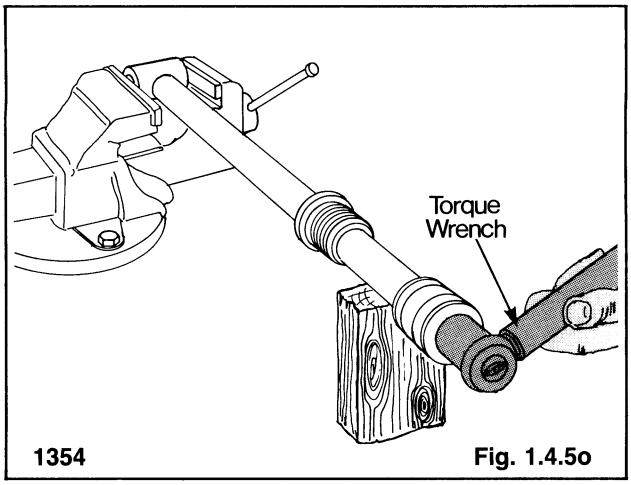
GENERAL CONSIDERATIONS

- **Solvents**

  Use only cleaning fluids and solvents that are known to be safe. Certain types of fluids can cause damage to

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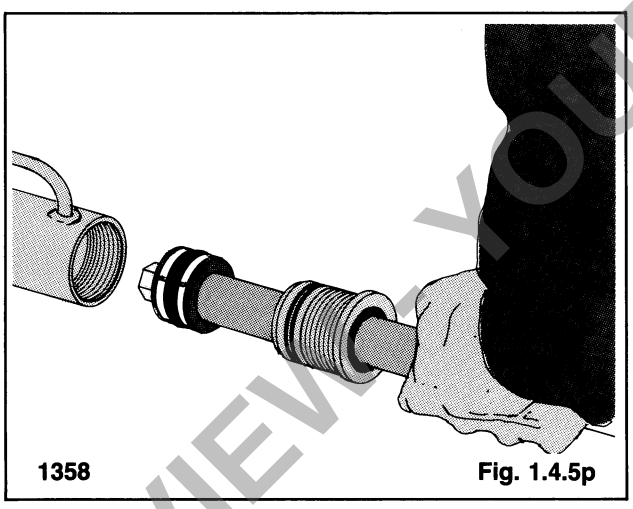
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1354 Fig. 1.4.5o

8. Place the cylinder rod in a vice and install the nut. Torque the nut to 225-250 ft. lbs. (305-339 N.M.) (fig. 1.4.5o).

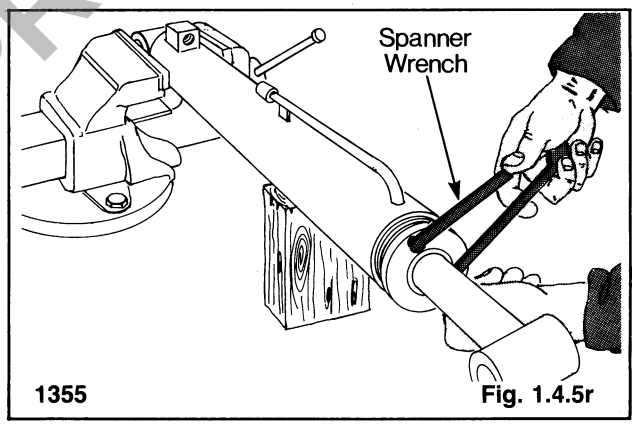
9. Coat gland and piston seals with light oil. Install the cylinder rod assembly in the cylinder barrel (fig. 1.4.5p).



1358 Fig. 1.4.5p

10. Place the cylinder body in a vice and using a spanner wrench tighten the gland.

11. Cap the hose port openings on the cylinder body until the cylinder is reinstalled on the loader.



1355 Fig. 1.4.5r

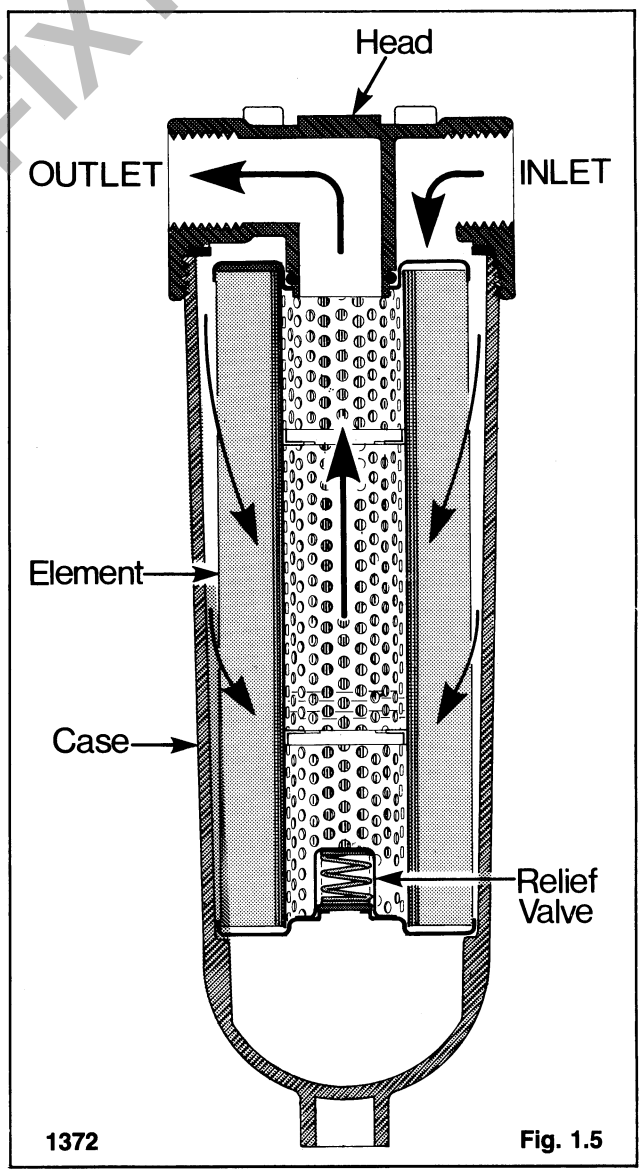
1.5 HYDRAULIC OIL FILTER

1.5.1 Specifications:

Filter type	replaceable element
Filtration rating	10 micron
Filtering area	800 sq. in. (5161 cm²)
Relief valve setting	17-19 PSI (1.2-1.3 bar)
Case capacity	1.5 qts. (1.4 l)
Max. operating pressure	250 PSI (17.2 bar)
Max. operating temperature	250°F (121°C)
Case torque	30 ft. lbs. (41 N.M.)
Initial filter replacement	50 hrs.
Filter replacement (every)	200 hrs.

1.5.2 General Information:

The hydraulic oil filter (fig. 1.5) is located on the left hand side of the machine inside the engine compartment.



1372 Fig. 1.5

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IMPORTANT

When making repairs to the hydrostatic system, keep all parts clean and remove dirt from the work area. Use caps and plugs on all lines and openings.

2.2.8 Charge Pump Removal:

The hydrostatic charge pump can be inspected and repaired without removing the front hydrostatic pump from the loader.

Discard all seals and replace as new upon reassembly.

1. Remove any attachment, raise the boom arms and engage the boom locks. Shut off fthe engine.

⚠ WARNING

Do not work on a loader with the boom arms in a raised position unless the boom locks are engaged.

⚠ WARNING

Never repair or tighten hydraulic hoses or fittings with the engine running or the system under pressure.

2. Raise the seat and remove the hydrostatic shield.

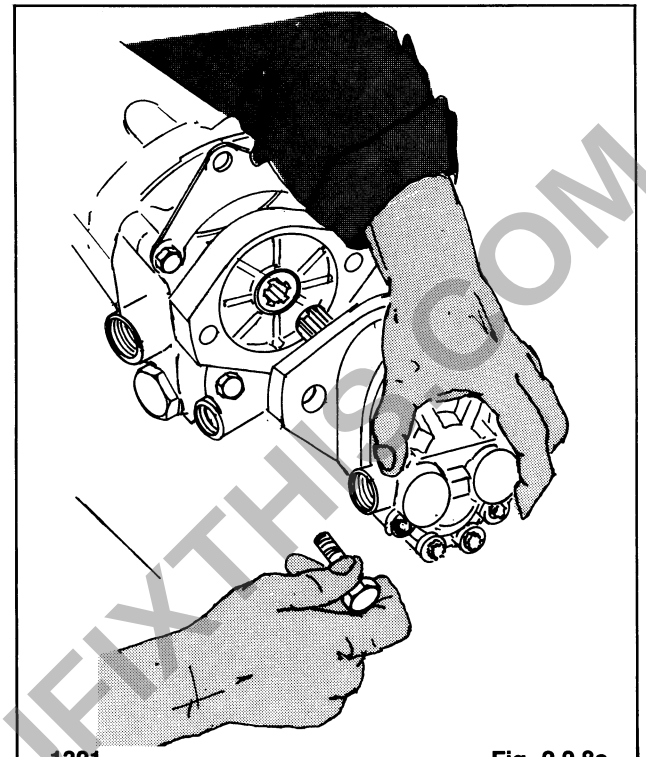
IMPORTANT

When making repairs to the hydraulic system, keep all parts clean and remove dirt from the work area. Use caps and plugs on all lines and openings.

3. Disconnect and cap the inlet and outlet lines from the hydraulic gear pump.
4. Remove the two hydraulic gear pump mounting bolts (fig. 2.2.8a).

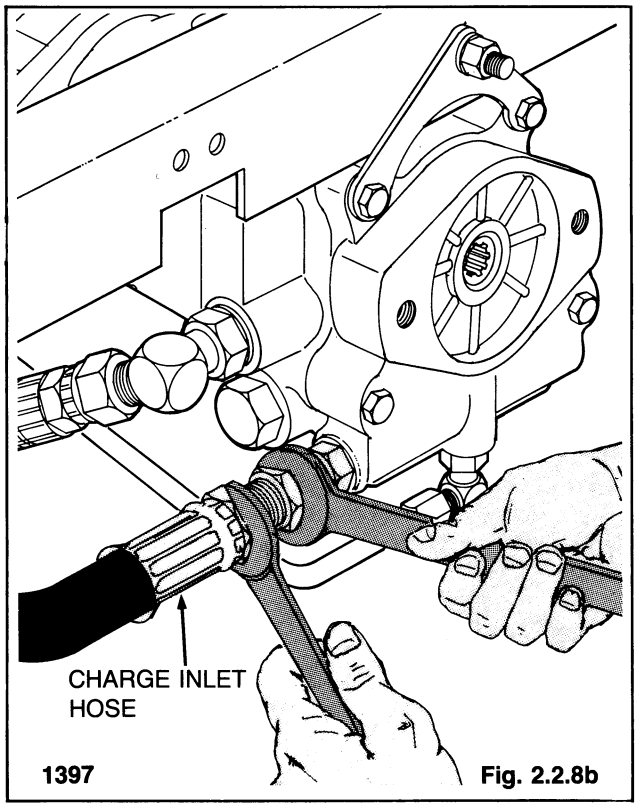
   On reassembly torque the two mounting bolts 27-31 ft. lbs. (36.6-42 N.M.).
5. Remove the hydraulic gear pump from the front hydrostatic pump (fig. 2.2.8a).

   On reassembly install a new O-ring on the hydraulic gear pump mounting flange.



1321 Fig. 2.2.8a

6. Remove the hydraulic hose from the charge pump inlet port (fig. 2.2.8b). Plug the inlet port and cap the hydraulic line.



1397 Fig. 2.2.8b

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SECTION 3
FINAL DRIVE

FINAL DRIVE **3.1**
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TROUBLE SHOOTING **3.6**

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4.2.6 Food Pedal & Lock — Removal (YG00850 Onward):

1. Remove any attachment, raise the boom arms and engage the boom locks. Shut off the engine.

WARNING **Do not work on a loader with the boom arms in a raised position unless the boom locks are engaged.**

2. Raise the seat and remove the hydrostatic shield.
3. Disconnect the seat bar linkage (fig. 4.2.6a) from the foot pedal lever.
4. Disconnect the steering lever detent linkage (fig. 4.2.6a) from the foot pedal lever.
5. Disconnect the foot pedal lock linkage from the foot pedal lever (fig. 4.2.6a).

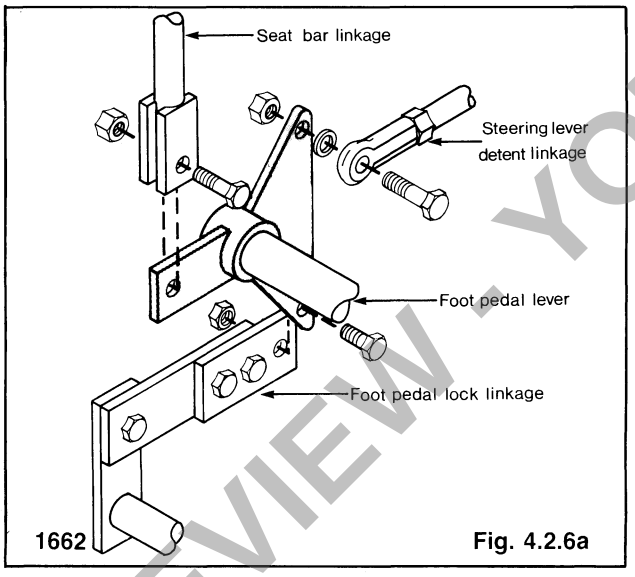


Fig. 4.2.6a

6. Disconnect the foot pedal linkages from the control valve spool (fig. 4.2.6b).
7. Disconnect the foot pedal shaft support from the main frame (fig. 4.2.6c).
8. Remove the nuts and lock washers from the bearings at both ends of the foot pedal shaft.
9. Loosen the allen screw in the set collar located on the L.H. side of the foot pedal shaft.

   Slide the set collar and bearing along the shaft until the bearing clears its mounting studs (fig. 4.2.6d).
10. Remove the foot pedals and shaft assembly from the loader.
11. Remove the foot pedal lock assembly from the housing.

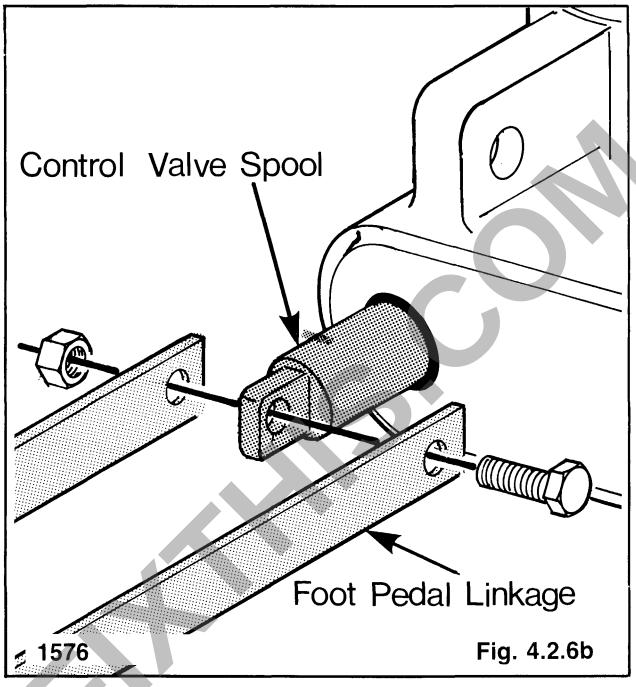


Fig. 4.2.6b

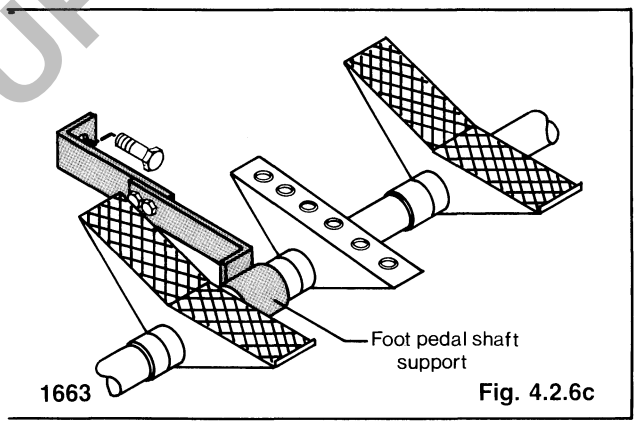


Fig. 4.2.6c

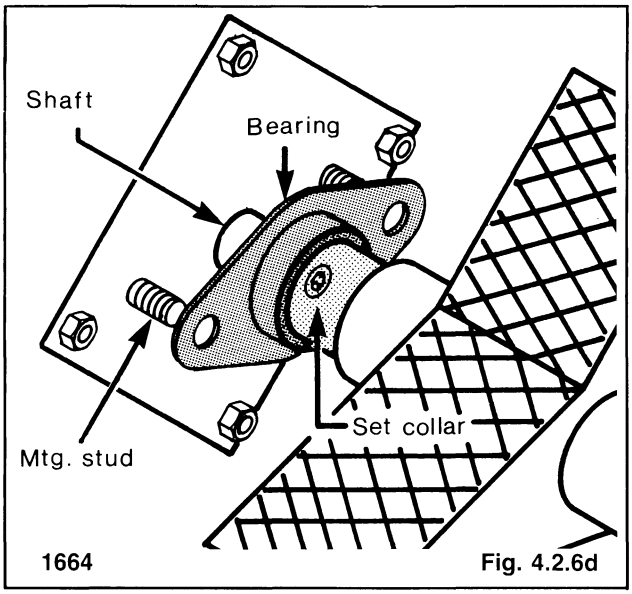


Fig. 4.2.6d

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TEST 3 — "Heat" Position:

Connect the ohmmeter leads between the terminals marked 30 and 19 on the key switch (Fig. 5.2.8d).

Turn the switch to the "Heat" position and observe the ohmmeter reading.

Test Results

Low resistance reading = Good.

High resistance reading = Faulty switch — replace.

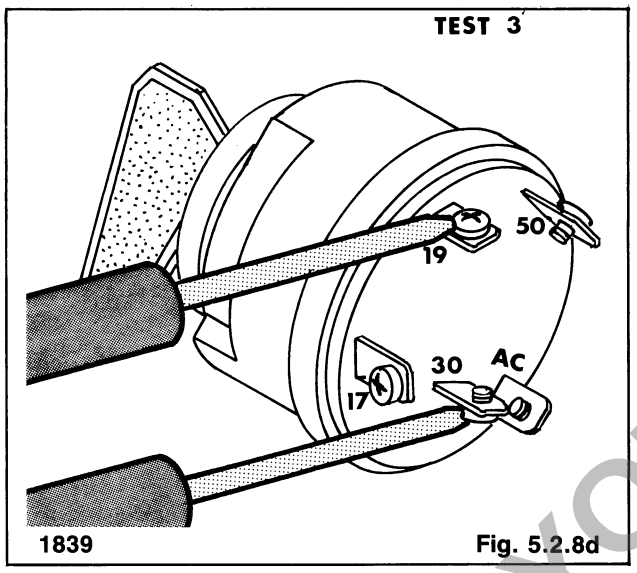


Fig. 5.2.8d

5.2.9 Over-Ride Starting Switch:

The loader starting circuit is designed so that the engine cannot be started unless the seat bar is in the up position, the steering control levers centered in neutral and the foot pedals locked.

The loader is also equipped with an over-ride start switch for use in situations such as the engine stalling.

To restart the engine using the over-ride switch, press the switch (Fig. 5.2.9A) and turn the ignition to start position. When the engine has started release the over-ride switch.

The over-ride switch must not be used for normal starting.

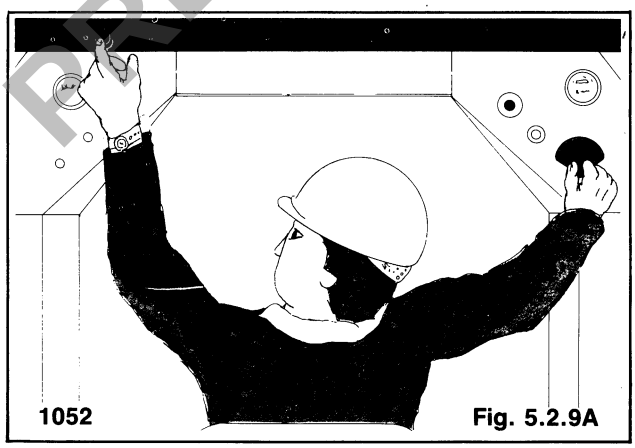


Fig. 5.2.9A

TESTING — OVER-RIDE STARTING SWITCH

Connect one ohmmeter lead to one of the terminals on the over-ride switch (Fig. 5.2.9B). Connect the other ohmmeter lead to the other terminal on the switch. Depress the button.

Test Results

Low resistance reading = Good switch.

High resistance reading = Faulty switch — replace.

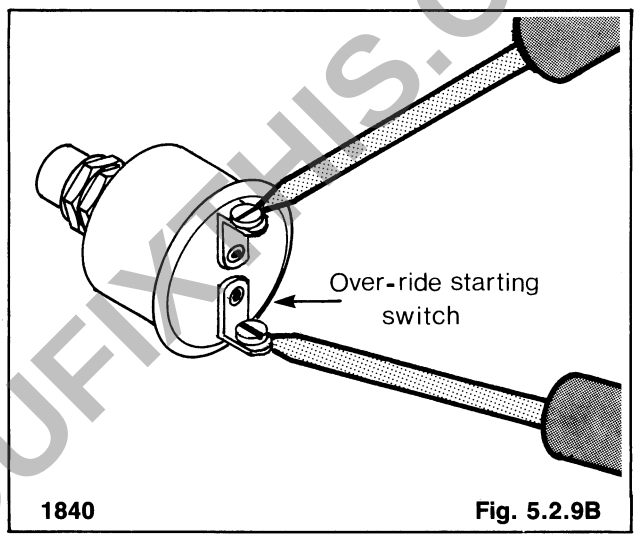


Fig. 5.2.9B

5.3 BATTERY

SAFETY PRECAUTIONS:



Lead-acid batteries contain sulfuric acid which will damage the eyes or skin on contact. Always wear goggles to avoid acid in the eyes. If acid contacts the eyes, wash immediately with much clean water and get medical attention. Wear rubber gloves and protective clothing to keep acid off the skin. If acid contacts the skin, wash off immediately with clean water.

1. When mixing battery electrolyte, it is important to pour the concentrated acid into the water and not the water into the acid.
2. When working with acid, such as filling batteries, splash-proof goggles should be worn. (Additional protective clothing may be advisable if many batteries are handled.)
3. When adding water or electrolyte, non-metallic containers and/or funnels must be used.

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6 MAIN FRAME

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- Disassembly 6.1.4
- Assembly 6.1.5
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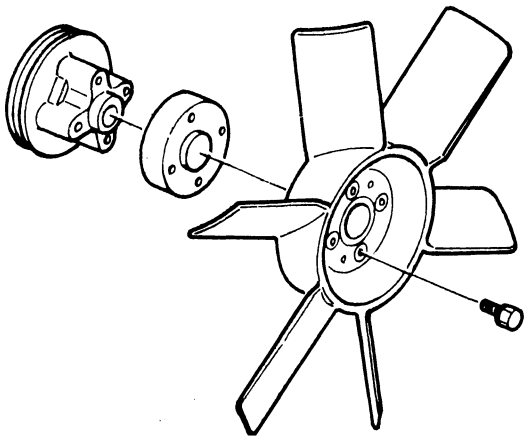
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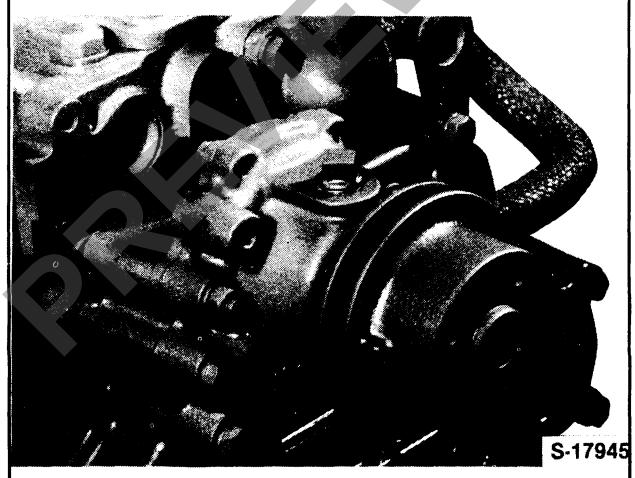


Fan

1. Fan
2. Hub Spacer
3. Pulley

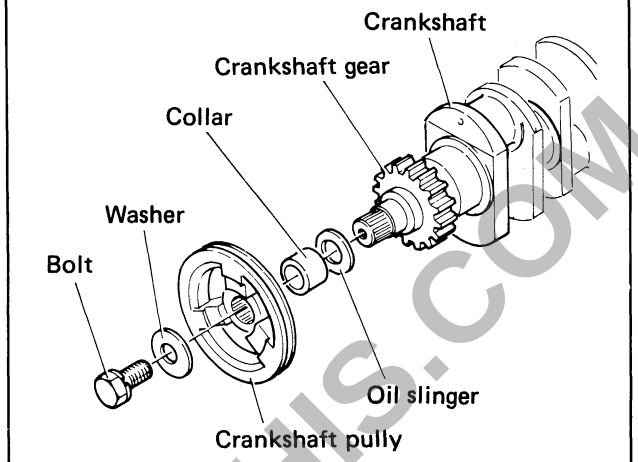
1790 Fig. 7.2.4B

5. Remove the fan assembly (Fig. 7.2.4B).
6. (CL35 ONLY)
   Remove the water pump assembly (Fig. 7.2.4C).



Water Pump Model CL35

1791 Fig. 7.2.4C



Crankshaft Pulley Removal

1792 Fig. 7.2.4D

7. Remove the crankshaft pulley retaining bolt and washer. Pull the pulley off the washer (Fig. 7.2.4D).

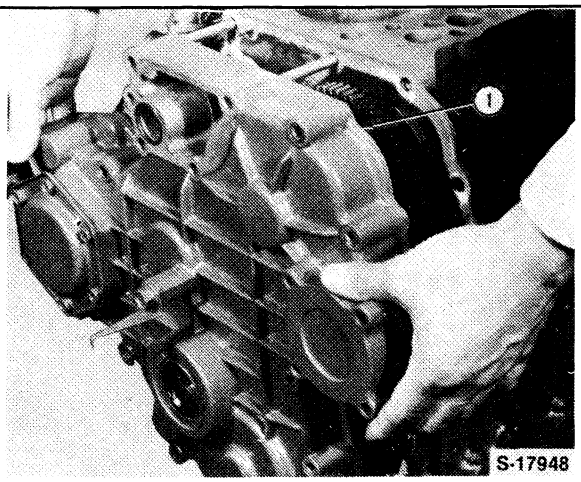
   NOTE: If necessary use a suitable puller. Do not use a hammer to loosen the pulley.

   On reassembly torque the crankshaft pulley retaining bolt to 36-43.4 ft. lbs. (49-58.8 N.m.).

8. Remove the timing gear cover retaining bolts and remove the cover and gasket (Fig. 7.2.4E).

   On reassembly tighten the timing gear cover bolts 10-13.7 ft. lbs. (13.7-18.6 N.m.).

9. Remove the collar and oil slinger.



Timing Gear Cover

1. Cover

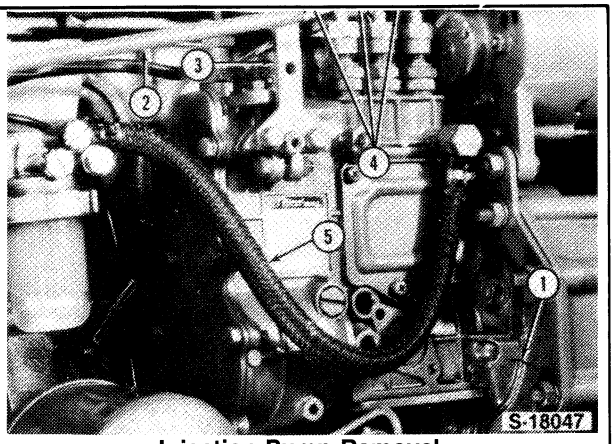
1793 Fig. 7.2.4E

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7.4.2 Injection Pump — Removal:

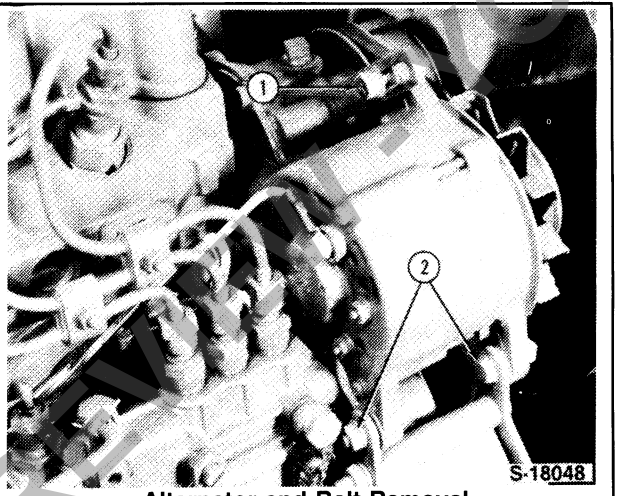
1. Using a sharp chisel, make a matching mark on the pump and front mounting plate (Fig. 7.4.2A). This will permit proper alignment of the pump during assembly.



Injection Pump Removal

1. Pump Matching Marks
2. Throttle Control Rod
3. Pump Lever
4. Injector Lines
5. Fuel Inlet Line

1876 Fig. 7.4.2A

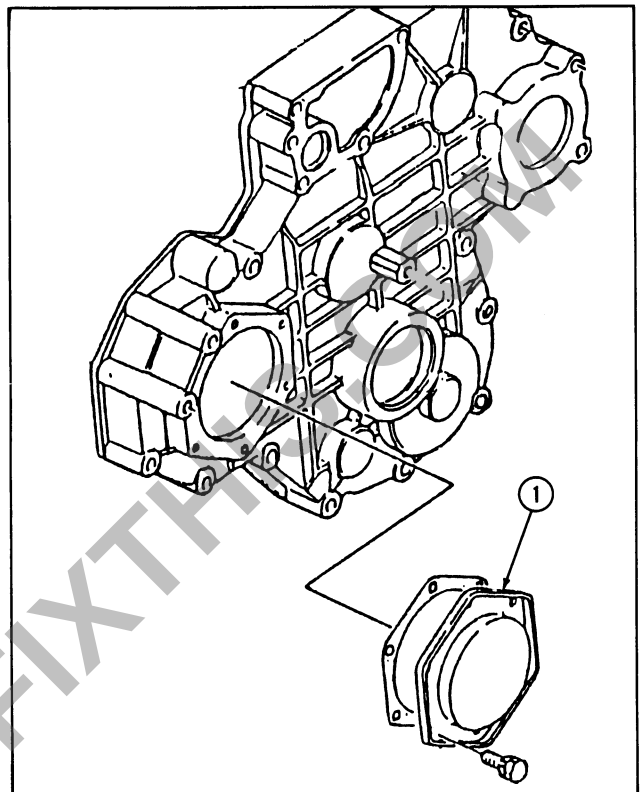


Alternator and Belt Removal

1. Alternator Adjusting Bolt
2. Alternator Mounting Bolts

1877 Fig. 7.4.2B

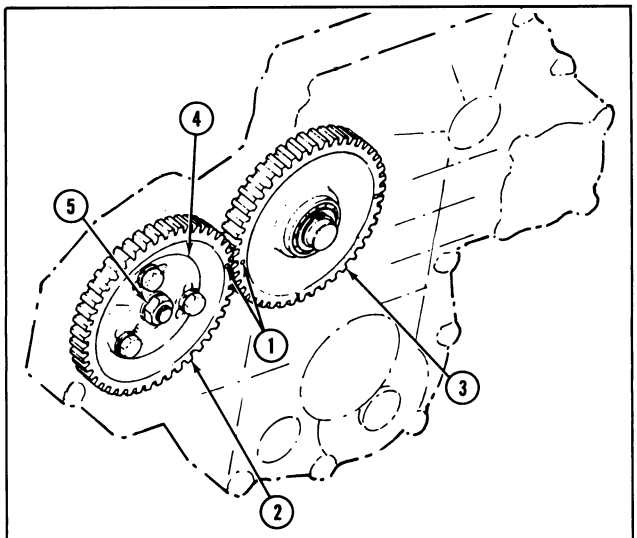
2. Remove the injection lines and cap all openings.
3. Remove the throttle control rod from the pump lever.
4. Disconnect the fuel inlet line from the pump and cap all openings.
5. Remove the alternator assembly and drive belt (Fig. 7.4.2B).
6. Remove the timing gear cover plate and gasket (Fig. 7.4.2C).



Timing Gear Cover Plate Removal

1878 1. Cover Fig. 7.4.2C

7. Rotate the crankshaft to align the idler gear and pump drive gear timing marks (Fig. 7.4.2D).
8. Remove the pump coupling retaining nut (Fig. 7.4.2D).



Injection Pump Drive Gear Alignment

1. Timing Marks
2. Pump Drive Gear
3. Idler Gear
4. Coupling
5. Retaining Nut

1879 Fig. 7.4.2D

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