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8430 and 8630 Tractors



JOHN DEERE

TECHNICAL MANUAL 8430 and 8630 Tractors

TM1143 (01NOV86) English

John Deere Tractors Works
TM1143 (01NOV86)

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**8430 AND 8630
TRACTORS
TECHNICAL MANUAL
TM-1143 (Feb-79)**

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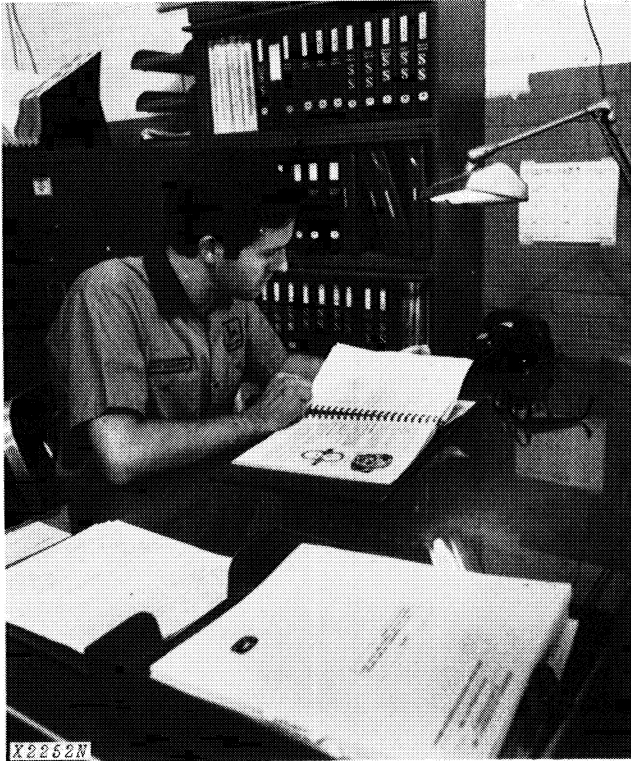
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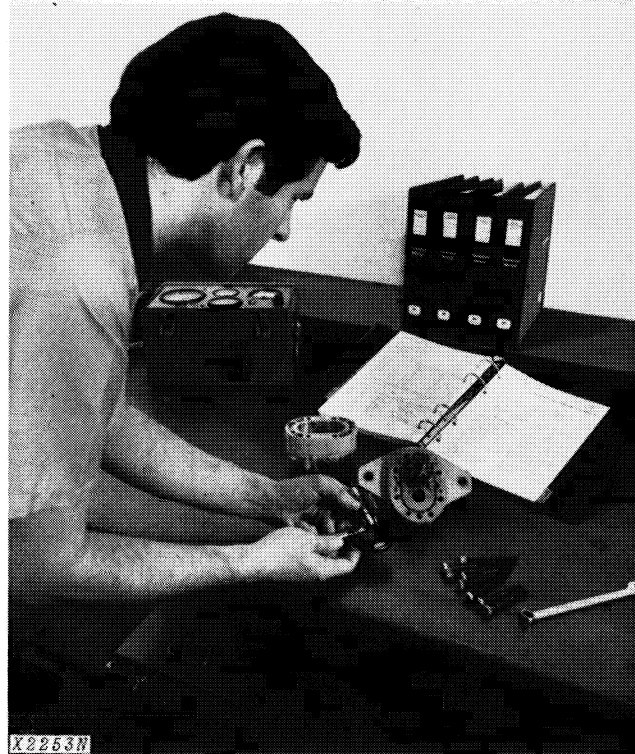
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INTRODUCTION



Use FOS Manuals for Reference



Use Technical Manuals for Actual Service

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 personnel and for reference by experienced technicians.

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



When a service person 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.

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—an experienced technician. 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.

Section 10 GENERAL

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Group 5 GENERAL TRACTOR SPECIFICATIONS

Horsepower:*

| | |
|-------------------------|--------------|
| Maximum observed at PTO | |
| 8430 | 175 (130 kW) |
| 8630 | 225 (168 kW) |

Engine:

Type 6-cylinder, in-line, valve-in-head, diesel, turbocharged, and intercooled

Engine Speeds:

| | |
|-------------------------------|------------------|
| Slow idle | 800 rpm |
| Working range | 1500 to 2100 rpm |
| Maximum transport speed | 2300 rpm |

Bore and stroke

| | |
|------------|----------------------------------|
| 8430 | 4.56 x 4.75 in. (11.6 x 12.1 cm) |
| 8630 | 5.12 x 5 in. (13.0 x 12.7 cm) |

Displacement

| | |
|------------|---------------------------------------|
| 8430 | 466 cu. in. (7636 cm ³) |
| 8630 | 619 cu. in. (10 143 cm ³) |

Compression ratio

| | |
|------------|-----------|
| 8430 | 15.5 to 1 |
| 8630 | 15.4 to 1 |

| | |
|-----------------------------|--|
| Firing order | 1-5-3-6-2-4 |
| Valve clearance | 8430 see 20-10-5 8630 see 25-10-5 |
| Injection pump timing | TDC |

Lubrication System Force-feed pressurized with full-flow oil filter and by-pass

Fuel System:

| | |
|---------------------------|------------------------------|
| Type | Direct injection |
| Injection pump type | Multiple plunger, in-line |
| Air cleaner | Dry type with safety element |

Cooling System:

| | |
|--|-----------------------------------|
| Type | Pressurized with centrifugal pump |
| Temperature controlled by heavy-duty thermostats | |
| 8430 | 2 thermostats |
| 8630 | 3 thermostats |

Capacities:

- Fuel tank 78 U.S. gals. (295 l) each tank
- Crankcase (with filter change)
 - 8430 22 U.S. qts. (21 l)
 - 8630 26 U.S. qts. (25 l)
- Transmission-hydraulic system 34 U.S. gals. (129 l)
- Cooling system
 - 8430 40 U.S. qts. (38 l)
 - 8630 44 U.S. qts. (42 l)
- Front differential 7 U.S. gals. (26 l)

Quad-Range Transmission:

- Type 2 speed, Power Shift planetary and 8 speed, syncro-range transmission with constant mesh gears
- Perma-Clutch Hydraulically operated multiple-disk wet clutch
- Gear selections 16 forward and 4 reverse
- Shifting
 - Range selector lever ... Collar shifted between ranges
 - Speed selector lever
 - Forward-rearward lever movement ... Mechanical synchronized forward speed shifting of syncro-range transmission
 - Sideways lever movement Power Shift planetary transmission speeds

Ground speeds at 2100 engine rpm, 18.4-34 tires

| Range | Speed | mph | (km/h) |
|-------|-------|------|--------|
| A | 1 | 2.1 | (3.3) |
| | 2 | 2.6 | (4.2) |
| | 3 | 3.7 | (6.0) |
| | 4 | 4.8 | (7.7) |
| | 1R | 3.8 | (6.2) |
| | 2R | 5.0 | (8.0) |
| B | 1 | 4.6 | (7.3) |
| | 2 | 5.9 | (9.5) |
| | 3 | 8.2 | (13.2) |
| | 4 | 10.6 | (17.1) |
| | 1R | 8.5 | (13.8) |
| | 2R | 11.1 | (17.9) |
| C | 1 | 5.3 | (8.6) |
| | 2 | 6.9 | (11.1) |
| | 3 | 9.6 | (15.5) |
| | 4 | 12.5 | (20.1) |
| D | 1 | 8.6 | (13.9) |
| | 2 | 11.2 | (18.0) |
| | 3 | 15.6 | (25.1) |
| | 4 | 20.3 | (32.6) |

Electrical System:

- Type 12-volt, negative grounded
- Batteries
 - 8430 Two, 6-volt, connected in series. 5D type; 800 amps cold cranking at 0°F (-17.8°C); 340 minutes reserve capacity at 25 amps
 - 8630 Two, 6-volt, connected in series; 4 type, 880 or 975** amps cold cranking at 0°F (-17.8°C); 420 minutes reverse capacity at 25 amps
- Alternator 12-volt, with transistorized regulator; 72 amp

Power Take-Off:

- Type Independent PTO with rear power take-off controlled by hand-operated clutch lever
- Clutch Multiple disk, wet clutch, hydraulically actuated
- Speed (2100 engine rpm) 1000 rpm

Hydraulic System:

- Type Closed center, constant pressure. Includes power steering, power brakes, implement control, and transmission and differential lubrication
- Standby pressure 2300 psi (15.8 MPa)

Brakes Hydraulically power-actuated disk-type operating in oil

Tires (standard)* 18.4-34, 6-ply rating

Wheel Tread: See operator's manual

Dimensions:

- Wheel base 125 in. (3.175 m)
- Over-all length 223.5 in. (5.677 m)
- Over-all height to top of muffler 134.5 in. (3.416 m)
- Over-all width-reg. axle 95.8 in. (2.434 m)
- long axle 118.4 in. (3.008 m)
- Turning radius (80-in. tread) 223 in. (5.67 m)

Shipping Weight (With equipment for average field service, less fuel and ballast)

- 8430 22,010 lbs. (9 984 kg)
- 8630 24,150 lbs. (10 954 kg)

*Additional tires sizes available

**Later models

Group 10

PREDELIVERY, DELIVERY AND AFTER-SALE SERVICE

PREDELIVERY SERVICE

Because of the shipping factors involved, plus extra finishing touches that are necessary to promote customer satisfaction, proper predelivery service is of prime importance to the dealer.

A tag pointing out the factory-recommended procedure for predelivery service is attached to each new tractor before it leaves the factory.

After completing the factory-recommended dealer checks and services listed on the predelivery tag, remove the tag from the tractor and file it with the shop order for the job. The tag will certify that the tractor has received the proper predelivery service when the portion of the customer's John Deere Delivery Receipt is completed.

NOTE: A Caplug is placed in the muffler outlet to prevent turbocharger rotation during transit. Remove Caplug before unloading tractor. Reinstall Caplug before transporting the tractor to the customer.

Temporary Tractor Storage

| Service | Specification | Reference |
|---|--|-------------------|
| Check radiator for coolant loss and antifreeze protection | 1-1/2 in. (38 mm) above baffle in radiator top tank. | ..... |
| Reduce shipping pressure of tires ..... | ..... | Operator's manual |
| Cover tractor and tires for protection and cleanliness ..... | ..... | ..... |

Before Delivering Tractor

ELECTRICAL SYSTEM

| | | |
|--|----------------------------|---------------------|
| Charge batteries ..... | ..... | FOS - 20 Manual |
| Install light switch knob ..... | ..... | ..... |
| Clean terminals and connect battery cables ..... | ..... | Section 40, Group 5 |
| Check alternator belt adjustment .. | 85-94 ft-lb (378 to 423 N) | Operator's manual |

COOLING SYSTEM

| | | |
|---------------------------------------|--|-------|
| Inspect radiator for coolant loss ... | 1-1/2 in. (38 mm) above baffle in radiator top tank. | ..... |
| Check antifreeze protection ..... | ..... | ..... |
| Tighten radiator hose clamps ..... | ..... | ..... |
| Tighten hose connections ..... | ..... | ..... |

Before Delivering Tractor—Continued

| Service | Specification | Reference |
|--|--|--|
| TIRES AND WHEELS | | |
| Adjust pressure of tires ..... | ..... | Operator's manual |
| Check wheel rim clamp nuts and wheel retainer cap screws for tightness | Rim clamp nuts—170 ft-lbs (230 Nm) Retainer cap screws—300 ft-lbs (407 Nm) | ..... |
| For single wheel operation, set front and rear wheel tread to a minimum of 80 in. (2.03 m) and add at least 1000 lb. (454 kg) ballast to each wheel..... | ..... | Operator's Manual |
| For hillside operation, use double wheels only ..... | ..... | Operator's Manual |
| LUBRICATION | | |
| Check crankcase oil level..... | To upper marks on dipstick | Operator's manual |
| Check transmission-hydraulic system oil level | To top of "SAFE" range on dipstick. John Deere Hy-GARD™ Transmission and Hydraulic Oil | Operator's manual |
| Check front differential oil level | To level of filler plug opening. SAE 90 gear lubricant | Operator's manual and Section 50, Group 30 |
| Lubricate grease fittings | John Deere Multipurpose Lubricant | Operator's manual |
| ENGINE | | |
| Check air cleaner ..... | ..... | Operator's manual |
| Tighten air intake hose clamps..... | ..... | ..... |
| Fill fuel tank and start engine | Capacity 78 U.S. gallons (295 l) each tank | Operator's manual |
| Check operation of starter, alternator, flasher, gauges, and indicator lights ..... | ..... | Operator's Manual |
| Check engine timing..... | TDC | Section 20, Group 10 |
| Check engine speeds | 800 rpm, slow idle speed 2300 rpm, fast idle speed | Section 30, Groups 15 and 20 |

Before Delivering Tractor—Continued

| Service | Specification | Reference |
|--|---|----------------------|
| OPERATION | | |
| Shift transmission through all speeds | | Operator's manual |
| Check throttle linkage for free operation | | Section 30, Group 20 |
| Adjust headlights and check operation | | Operator's manual |
| Check power takeoff operation | | Operator's manual |
| Check brakes and accumulator | 3 in. (7.6 cm) maximum travel when brakes have been bled, and accumulator is working properly | Operator's manual |
| Check air conditioning, heater, and pressurizer operation | | Operator's manual |
| Check hydraulic system operation; steering, rockshaft, and remote cylinder | | Operator's manual |
| Check seat operation | | Operator's manual |
| GENERAL | | |
| Tighten accessible nuts and cap screws | | |
| Clean tractor and touch up paint .. | | |

DELIVERY SERVICE

A thorough discussion of the operation and service of a new tractor at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. A portion of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

Many complaints have arisen simply because the owner has not shown how to operate and service his new tractor properly. Spend enough time, at the customer's convenience, to introduce the owner to his new tractor and explain to him how to operate and service it properly.

IMPORTANT: Install Caplug in muffler outlet if transporting tractor to customer. This will prevent damage to the turbocharger caused by air passing through the turbocharger and rotating it without lubrication when the engine is stopped.

The following procedure is recommended before the service person and owner complete the delivery acknowledgments portion of the delivery receipt.

Using the tractor operator's manual as a guide, be sure that the owner understands these points thoroughly:

1. Controls and instruments.
2. How to start and stop the engine.
3. The importance of the break-in period.
4. How to use liquid or cast-iron ballast.
5. All functions of the hydraulic system.
6. Using the power takeoff.
7. The importance of safety.
8. The importance of lubrication and periodic services.

After explaining and demonstrating the above features, have the owner sign the delivery receipt and give him the operator's manual.

AFTER-SALE INSPECTION

The purchaser of a new John Deere tractor is entitled to a free inspection within the warranty period after the equipment has been "run in." The terms of this after-sale inspection are outlined on the back of the John Deere Delivery Receipt.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from his tractor. At the same time, the inspection should reveal whether or not the tractor is being operated, lubricated, and serviced properly.

If the recommended after-sale service inspection is followed, the dealer can eliminate a needless volume of service work by preventing minor irregularities from developing into serious problems later on. This will promote strong dealer-customer relations and present the dealer an opportunity to answer questions that may have arisen during the first few days of operation. During the inspection service, the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended within the first 100 hours of tractor operation.

Inspection Procedure

| Service | Specification | Reference |
|--|---|--|
| COOLING SYSTEM | | |
| Check radiator coolant level..... | 1-1/2 in. (38 mm) above baffle in radiator top tank | ..... |
| Clean external surface of radiator core..... | ..... | ..... |
| Tighten hose clamps and check connections for leaks..... | ..... | ..... |
| FUEL SYSTEM | | |
| Remove water and foreign matter from filter sediment bowl..... | ..... | Operator's manual |
| Bleed fuel system..... | ..... | Operator's manual |
| Tighten loose connections and check entire system for leaks, correct if necessary..... | ..... | ..... |
| Check air cleaner elements and aspirator. Clean primary element if necessary..... | ..... | Operator's manual |
| ELECTRICAL SYSTEM | | |
| Check specific gravity of batteries.. | Full charge - 1.260 at 80°F (27°C).... | Operator's manual |
| Check level of battery electrolyte.. | To bottom of filler neck in each cell..... | Operator's manual Operator's manual |
| Check alternator belt tension..... | 85-94 lbs. (378-423 N)..... | Operator's manual |

Inspection Procedure—Continued

| Service | Specification | Reference |
|--|---|--|
| Start engine and check operation of starter, lights, and indicator lamps ..... | ..... | Operator's manual |
| LUBRICATION | | |
| Check crankcase oil level..... | To upper marks on dipstick | Operator's manual |
| Check transmission-hydraulic system oil level | In "SAFE" range on dipstick. Use John Deere Hy-GARD Transmission and Hydraulic Oil..... | Operator's manual |
| Check front differential oil level.... | To level with filler plug opening Use SAE 90 Gear Lubricant | Operator's manual and Section 50, Group 30 |
| ENGINE | | |
| Check valve clearance..... | Intake: 0.013 to 0.017 in. (0.33 to 0.43 mm) Exhaust: 0.023 to 0.027 in. (0.58 to 0.68 mm) | |
| Check engine speed under load, fuel consumption, and horsepower | Specification | Group 15 of this Section. |
| Check air intake connections..... | ..... | ..... |
| TRACTOR AND POWER TRAIN | | |
| Shift transmission through all speeds ..... | ..... | Operator's manual |
| Check power steering | Smooth, easy operation | Section 70, Group 20 |
| Check brakes and accumulator.... | 3 inches (7.6 cm) maximum brake travel when brakes have been bled and accumulator is working properly | Operator's manual |

*Later model 6619 engine

Inspection Procedure—Continued

| Service | Specification | Reference |
|---|---------------|-----------------------------|
| HYDRAULIC SYSTEM | | |
| Check rockshaft and remote cylinder operation | | Section 70, Group 30 and 35 |
| Check entire tractor for leaks. Inspect drive shafts, hydraulic system pipes and hoses, and check tractor cab controls for proper operation | | Operator's manual |
| NUTS AND CAP SCREWS | | |
| Tighten accessible nuts and cap screws that seem to require adjustment | | |

TORQUE CHART

| Diameter | B-Grade* | | D-Grade* | | F-Grade* | | G-Grade* | |
|-----------------|----------|---------|----------|---------|----------|----------|----------|----------|
| | lb-ft | Nm | lb-ft | Nm | lb-ft | Nm | lb-ft | Nm |
| 1/4 inch | 6 | (8.1) | 10 | (13.6) | 14 | (19) | 15 | (20.3) |
| 5/16 inch | 13 | (17.6) | 20 | (27.1) | 30 | (40.7) | 32 | (42.4) |
| 3/8 inch | 23 | (31.2) | 35 | (47.5) | 50 | (67.8) | 56 | (75.9) |
| 7/16 inch | 35 | (47.5) | 55 | (74.6) | 80 | (108.5) | 92 | (124.7) |
| 1/2 inch | 55 | (74.6) | 85 | (115.3) | 120 | (162.7) | 140 | (189.8) |
| 9/16 inch | 75 | (101.7) | 130 | (176.3) | 175 | (237.3) | 200 | (271.2) |
| 5/8 inch | 105 | (142.4) | 170 | (230.5) | 240 | (325.4) | 280 | (379.7) |
| 3/4 inch | 185 | (250.9) | 300 | (406.8) | 425 | (576.3) | 497 | (673.9) |
| 7/8 inch | 160 | (217) | 445 | (603.4) | 685 | (928.9) | 800 | (1084.8) |
| 1 inch | 250 | (339) | 670 | (908.5) | 1030 | (1396.7) | 1200 | (1627.2) |

*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.

12 9 or 12.9: tempered steel extremely high-strength bolts and cap screws.

Group 15 TUNE-UP

Before tuning up a tractor, determine whether a tune-up will restore operating efficiency. When there is doubt, the following preliminary tests will help to determine if the engine can be tuned up. If the condi-

tion is satisfactory, proceed with the tune-up. Choose from the following procedures only those necessary to restore the unit.

Preliminary Engine Testing

| Operation | Specification | Section-Group Reference |
|--|--|--------------------------------|
| Dynamometer Test (at 2100 engine rpm full load) ... (See Page 15-4 for PTO-Engine Speed relationship) | Compare with previous recorded output; compare with output after tune-up | FOS - 30 Manual, Chapter 12 |
| Compression Test | 330-380 at 200-250 rpm | FOS - 30 Manual, Chapter 12 |
| Engine Coolant Check Test | No air bubbles or oil film in radiator | FOS - 30 Manual, Chapter 12 |

Engine Tune-up

| Operation | Specification | Section-Group Reference |
|--|--|--------------------------------|
| Air Intake System | | |
| Service air cleaner and check system for leaks ..... | ..... | FOS - 30 Manual, Chapter 12 |
| Manifold pressure | Reading at 2100 rpm 8430 - 19 to 23 psi (131 to 159 kPa) 8630 - 14 to 17 psi (95 to 117 kPa) . | 30-10 |
| Check system for restrictions using water manometer..... | ..... | FOS - 30 Manual, Chapter 12 |
| Normal reading, inches of water (with clean filter elements)..... | 16 in. (40.6 cm) at 2100 rpm (full load) | ..... |
| Maximum permitted reading..... | 25 in. (63.5 cm) at 2100 rpm (full load) | ..... |
| Check restriction indicator light operation | 24-26 in. (61.0-66.0 cm) ..... | ..... |
| Exhaust System | | |
| Check system for leaks ..... | ..... | FOS - 30 Manual, Chapter 12 |
| Check muffler and exhaust pipe for restrictions ..... | ..... | FOS - 30 Manual, Chapter 12 |

Engine Tune-up—Continued

| Operation | Specification | Section-Group Reference |
|--|--|----------------------------|
| Crankcase Ventilating System | | |
| Check system for restrictions | | FOS -30 Manual, Chapter 12 |
| Cooling System | | |
| Clean grill screen, radiator core, and oil cooler core | | 20-30, 25-30 |
| Clean and flush system; check thermostat | | 20-30, 25-30 |
| Check pressure cap | 6.25 to 7.50 psi (43 to 52 kPa) | |
| release pressure | | 20-30, 25-30 |
| Tighten hose clamps | | ---- |
| Cylinder Head and Valves | | |
| Cylinder head cap screw torque | | |
| 8430 (in sequence) | 125 to 135 ft-lbs (169 to 183 Nm) - "F" grade cap screws 135 to 165 ft-lbs (183 to 224 Nm) - "G" grade cap screws | 20-10 |
| 8630 (in sequence) | 205 to 215 ft-lbs (278 to 293 Nm) | 25-10 |
| Set valve clearance | | |
| 8430 | Intake: 0.018-in. (0.46 mm) Exhaust: 0.028-in. (0.71 mm) | 20-10 |
| 8630 | Intake: 0.013 to 0.017 in. (0.33 to 0.43 mm) Exhaust: 0.023 to 0.027 in. (0.58 to 0.68 mm) | 25-10 |
| Diesel Fuel System | | |
| Check fuel tanks for water | | 30-15 |
| Check fuel pump pressure | Approx. 20 psi (138 kPa) | 30-15 |
| Change filter | | 30-15 |
| Injection Pump: | | |
| Service and check timing | TDC | 30-15 |
| Adjust throttle linkage | 2300 rpm fast idle speed | 30-20 |
| | 800 rpm slow idle speed | 30-20 |
| Lubrication system | | |
| Check engine oil pressure (2100 rpm) | 40 - 55 psi (275 - 379 kPa) (8430 and 8630) | 20-25, 25-25 |
| Charging System | | |
| Check battery specific gravity | 1.240 - 1.260 | 40-10 |
| Check battery water consumption and electrolyte level | | 40-10 |
| Clean battery, cables, and box | | 40-10 |
| Check alternator belt tension | 85-94 lbs (423 to 467 N) | 40-10 |
| Check alternator output | 65 amps minimum (2000 engine rpm) | 40-10 |
| Check alternator regulated voltage | 14.1 - 14.7 volts (operating) | 40-10 |

Engine Tune-Up—Continued

| Operation | Specification | Section-Group Reference |
|--|-------------------------------|-------------------------|
| Starting System | | |
| Check start-safety switch operation ..... | ..... | 40-15 |
| Check battery voltage when starting | Min. 9 volts (cranking) | 40-15 |
| Check starter current draw | Approx. 525 amps | 40-15 |
| Check operation of gauges and indicator lights ..... | ..... | 40-25 |

Final Engine Test

| Operation | Specification | Section-Group Reference |
|---|--|---------------------------------------|
| Dynamometer Test (at 2100 engine rpm) | Compare with previous recorded output; record for future use | FOS - 30 Manual - ENGINES, Chapter 12 |

Tractor Tune-up

| Operation | Specification | Section-Group Reference |
|--|---|-------------------------|
| Transmission | | |
| Check shifting ..... | ..... | 50-10 & 20 |
| Check for proper operation without excessive noise ..... | ..... | 50-20 |
| Power Take-Off | | |
| Check for proper operation without excessive noise ..... | ..... | 50-15 |
| Check brake pedal travel | 3-inch (7.6 cm) maximum travel with brakes bled and with accumulator working properly | 70-25 |
| Check tire inflation | See operator's manual ..... | ..... |
| Clutch oil pump (at main pump inlet) | 10 gpm (0.63 l/s) at 2100 rpm | 70-15 |
| Main hydraulic pump | Standby pressure—2200 to 2300 psi (15.2 to 15.9 MPa) | 70-15 |
| | Capacity—28.5 gpm (1.79 l/s) at 2000 psi (13.8 MPa) and 1750 rpm | 70-15 |
| Pressure control valve | 1600 to 1700 psi (11.0 to 11.7 MPa) at 800 rpm | 70-10 |
| Selective control valve | 3 to 18 gpm (0.19 to 1.14 l/s) at 1500 psi (10.34 MPa) and 1750 rpm | 70-35 |

Tractor Tune-Up—Continued

| Operation | Specification | Section-Group Reference |
|---|--|-------------------------|
| Rockshaft: | | |
| Lift cycle time (75 degrees rotation) | 2.7 to 2.9 seconds at 2100 rpm | 70-5 |
| Maximum oil flow | 16 gpm (1.01 l/s) at 2000 psi | 70-30 |
| | (13.8 MPa) and 1900 rpm | |
| Lever position (ZERO load control) | Just fully raised with lever front edge at "0" on quadrant | 70-30 |

Hydraulic system pressures, flow rates, or cycle times are for conditions specified in Section 70—transmission-hydraulic oil at 140 to 160°F (60 to 71°C), proper test equipment, correct test sequence, etc.

ENGINE-PTO SPEED RELATIONSHIP

| Engine RPM | PTO Speed | Rated PTO Horsepower* |
|------------------|-----------|------------------------|
| 2100 (Full load) | 993 | 175 (8430); 225 (8630) |
| 2300 (Fast idle) | 1088 | — |

*Factory Observed.

Group 20 LUBRICATION

GENERAL INFORMATION

Carefully written and illustrated instructions are included in the tractor operator's manual. Remind your customer to follow the recommendations in these instructions.

For your convenience when servicing the tractor, the following chart showing capacities and type of lubricant for the various components has been included. Additional lubrication information is on page 20-2.

| Component | Capacity | Type of Lubricant | Interval of Service |
|-----------------------------------|--|---|--|
| Engine Crankcase | 22 U.S. quarts (21 L) with filter change (8430) 26 U.S. quarts (25 L) with filter change (8630) | See "Engine Lubricating Oils" in this group | 10 Hours - Check level 100 Hours - Change oil 200 Hours - Replace filter and change oil |
| Transmission and Hydraulic system | 34 U.S. gallons (129 L) (dry system) 26 U.S. gallons (98 L) (refill) | John Deere Hy-GARD Transmission and Hydraulic Oil | 200 Hours - Check level 600 Hours - Replace filter 1200 Hours - Change oil and filter |
| Front differential | 7 U.S. gallons (26 L) | SAE 90 gear lubricant | 1200 Hours - Change oil |
| Grease Fittings | ..... | John Deere Multi-purpose Lubricant | See Operator's Manual |

LUBRICANTS

ENGINE LUBRICATING OILS



We recommend John Deere Torq-Gard[™] Supreme engine oil for use in the engine crankcase. Torq-Gard Supreme is compounded specifically for use in John Deere engines and provides superior lubrication under all conditions. NEVER PUT ADDITIVES IN THE CRANKCASE. Torq-Gard Supreme oil was formulated to provide all the protection your engine needs. Additives could reduce this protection rather than help it.

If Torq-Gard Supreme is not used, use an engine oil that conforms to one of the following specifications.

SINGLE VISCOSITY OILS

API Service CD/SD
MIL-L-2104C
Series 3*

MULTI-VISCOSITY OILS

API Service CC/SE, CC/SD, or SD
MIL-L-46152

* As further assurance of quality, the oil should also be identified as suitable for API service designation SD.

Depending on the expected atmospheric temperature at start for the fill period, use oil of viscosity as shown in the following chart.

Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level more frequently.

Other Oils

| Air Temperature | John Deere Torq-Gard Supreme Oil | Single Viscosity Oil | Multi-Viscosity Oil |
|----------------------------|----------------------------------|----------------------|---------------------|
| Above 32°F (0°C) | SAE 30 | SAE 30 | Not recommended |
| -10 to 32°F** (-23 to 0°C) | SAE 10W-20 | SAE 10W | SAE 10W-30 |
| Below -10°F (-23°C) | SAE 5W-20 | SAE 5W | SAE 5W-20 |

** SAE 5W-20 oil may be used where required to insure optimum lubrication at starting, particularly for an engine subjected to -10°F (-23°C) or lower for several hours.

TRANSMISSION HYDRAULIC OILS

Use only John Deere Hy-GARD Transmission and Hydraulic Oil or its equivalent in the transmission hydraulic system. Other types of oil will not give satisfactory service and may result in eventual damage. This special oil, available from your John Deere dealer, may be used in all weather conditions.

NOTE: John Deere Hy-GARD Transmission and Hydraulic Oil may be added to or mixed with John Deere Type 303 Special-Purpose Oil.

GEAR LUBRICANT

Use an SAE 90 gear lubricant meeting API service designation GL-5 and military specification MIL-L-2105B in the front differential housing.

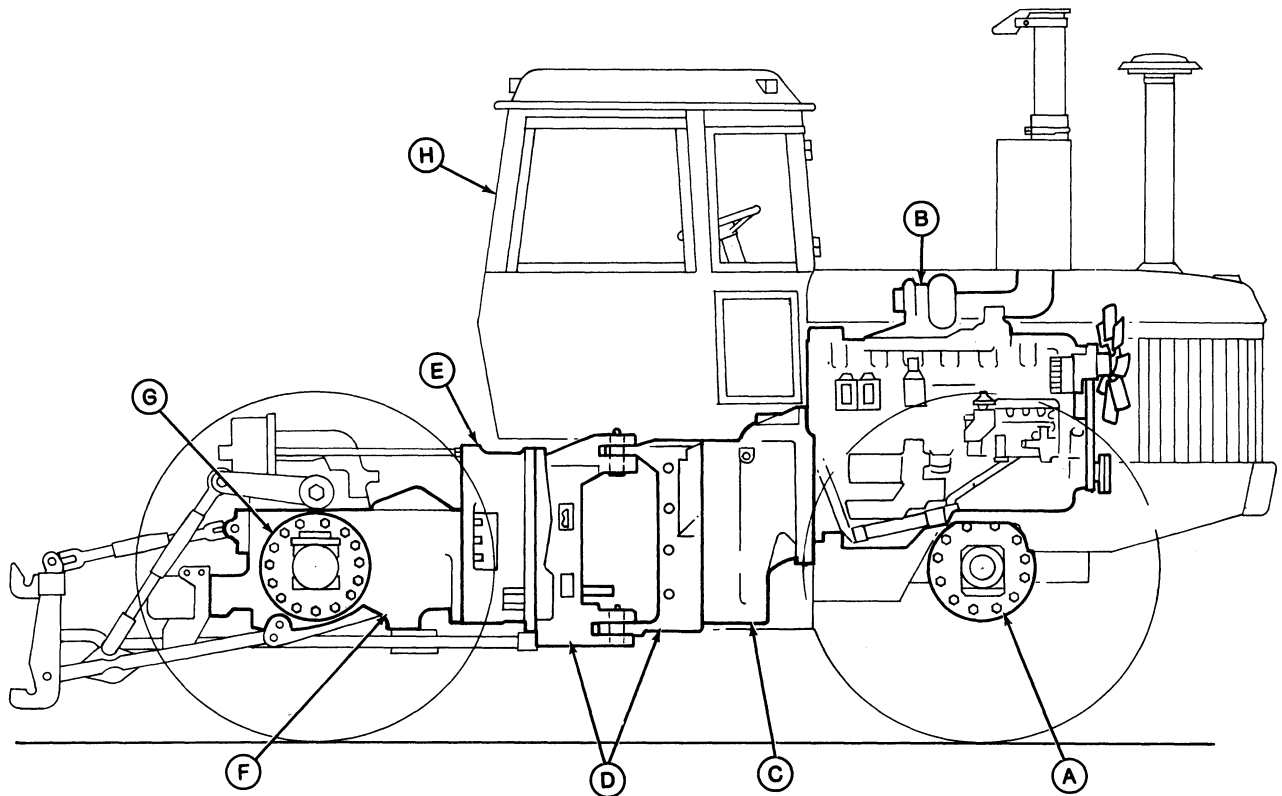
GREASES

Use John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease for all grease fittings. Application of grease as instructed in the lubrication section will provide proper lubrication and will keep contamination out of bearings.

STORING LUBRICANTS

Your tractor can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

Group 25 SEPARATION



R 25270N

A—Front Drive
B—Engine
C—Clutch Housing

D—Hinge
E—Torque Divider
F—Transmission

G—Final Drive
H—Sound Gard Body

Fig. 1-Basic Separation Components

GENERAL INFORMATION

Separation of the tractor may be subdivided into the following components (Fig. 1): Front drive (A), engine (B), front end, clutch housing (C), front hinge, hinge pin, rear hinge, torque divider (E), transmission (F), final drive (G) and Sound-Gard body (H). Basic separation of these components will be explained within this group, except for the Sound-Gard body covered in Section 80, and final drive covered in Section 50.

⚠ CAUTION: Always use the hinge lock bars, provided with the tractor, whenever front or rear of tractor is raised. See operator's manual for installation of lock bars.

It is important to determine beforehand, which component has to be removed and the best method to use in removing the component, in order to perform the required service in the shortest possible time. For example, it is possible to gain access to the engine clutch two different ways: (1) Removing engine and tractor front end from clutch housing, (2) Removing tractor front end, then removing engine from clutch housing. The method selected will be determined by the total service requirements for any particular job, and on personal choice.

Once a basic component has been removed from the tractor, refer to the appropriate section of this manual for detailed service information.

FRONT DRIVE ASSEMBLY

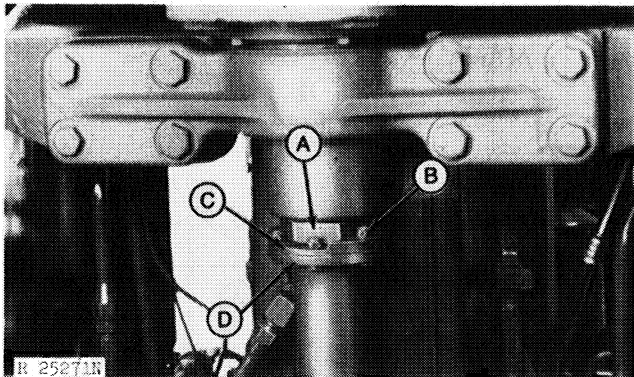
GENERAL INFORMATION

The front drive assembly may be removed with or without the drive support (C, Fig. 4). Removing the drive with support provides additional room to work on the front portion of the engine. Remove the drive assembly without the support when repair is to be made on the drive assembly only.

WITH FRONT DRIVE SUPPORT

Removal

⚠ CAUTION: Before disconnecting drive shaft, jack up one of the four wheels to relieve any torque that may have built up in the power train. Personal injury could result if drive shaft "unwinds" while it is being disconnected.



A—Lock Nut
B—Cap Screw And Nut
C—Front Retainer Half
D—Rear Retainer Half

Fig. 2-Front Drive Shaft Spline Coupling

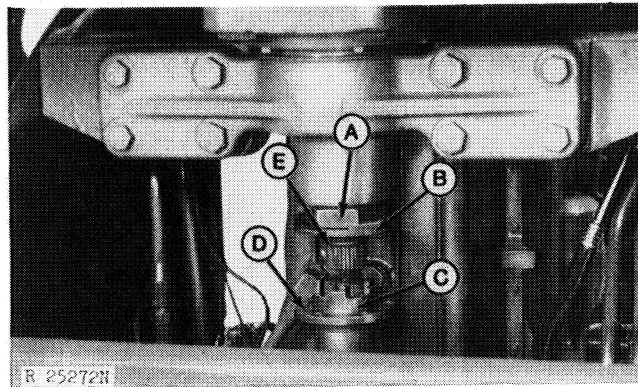
Remove the cap screws (B, Fig. 2) from the coupler retainer (D) and remove retainer. The front and rear halves of the retainer house a split washer that fits into the coupling groove.

Script a line on spline coupling and nut to ease installation.

Move the coupling rearward to disconnect splined pinion shaft from drive shaft (Fig. 3). The coupling may not move easily because of the drag exerted by two O-rings; one on the pinion shaft (E), and one on the drive shaft under coupling. These O-rings retain the gear oil from the front differential used to lubricate the splines on pinion shaft and drive shaft.

If equipped, disconnect front differential vent hose at cap.

Install Lifting Bracket (D-05153ST). See Fig. 7.

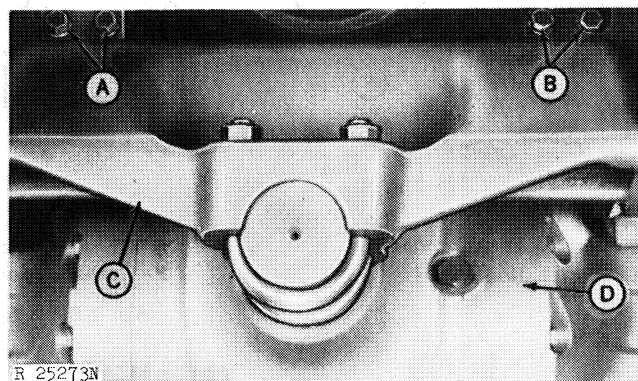


A—Lock Nut
B—Retainer Half
C—Splined Coupling
D—Rear Retainer Half
E—O-Ring

Fig. 3-Drive Shaft Disconnected

Block the rear wheels and position a floor jack under the lifting bar.

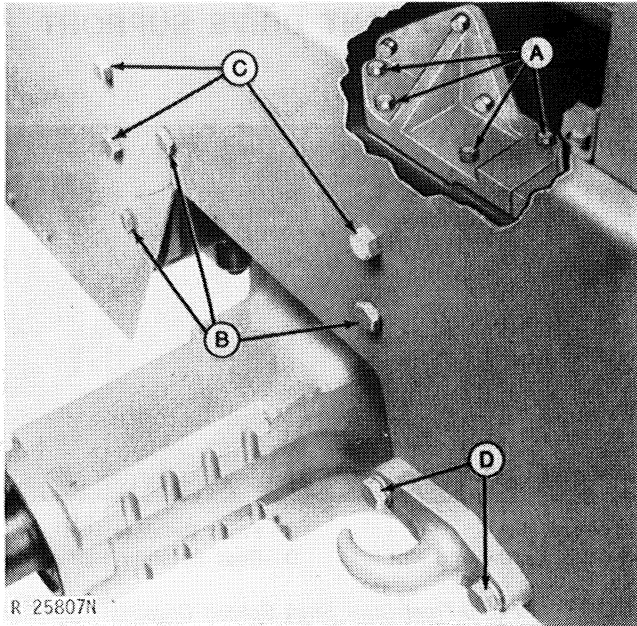
Use a jack with a 12-ton load capacity or greater to raise the front end of the tractor.



A—3/4 x 3-1/4" Cap Screws
B—3/4 x 3" Cap Screws
C—Front Support
D—Front Differential Case

Fig. 4-Front Drive Support

Remove the four front axle support-to-engine front support cap screws (A and B, Fig. 4) located just inside the side frames at top of axle support.

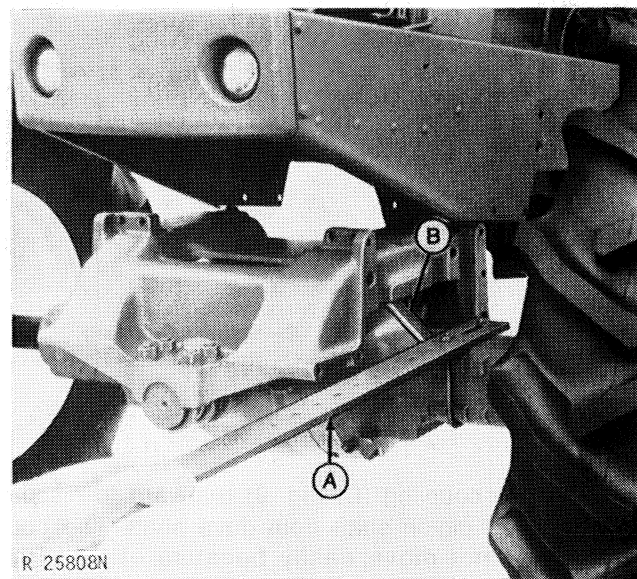


- | | |
|--|---|
| A—Support Cap Screws (5/8" x 2-3/4") | C—Cap Screws (3/4" x 1-3/4") |
| B—Special Hex. Bolt (3/4" x 2-3/4") | D—Tow Hook Cap Screws (3/4" x 2-3/4") |

Fig. 5-Side Frame-To-Support Cap Screws (8630)

Remove the engine support-to-axle support cap screws (A, Fig. 5) from the top of both engine supports. (Using the JDE-36 Adapter makes removal of cap screws easier.)

Remove the three side frame-to-support screws (C, Fig. 5), the three special hex. bolts (B), and the two tow hook cap screws (D) from both sides of tractor.

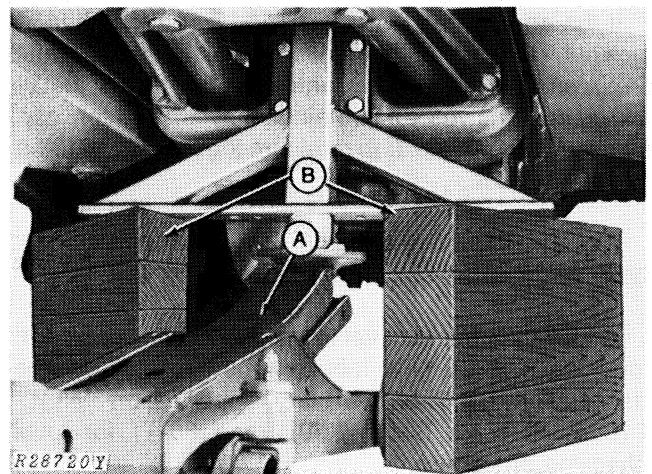


- | | |
|----------------------|----------------------------|
| A—Support Bar | B—Hinge Locking Bar |
|----------------------|----------------------------|

Fig. 6-Removing Front Drive With Support

⚠ CAUTION: When removing or installing front drive assembly with support, the differential and support may turn upside down if assembly is allowed to get out of balance. Keep differential and support balanced or supported to prevent possible injury.

Fasten a support bar or plate to the front drive housing (A, Fig. 6) to help control the assembly during removal. Insert a hinge locking bar under each side of housing (B, Fig. 6) to prevent tipping during removal. Raise the front end of tractor high enough to permit axle and support to clear side frames. Balance assembly and move out from front of tractor.



- A—Floor Jack Under Lifting Bar**

- B—Blocking Under Lifting Bar**

Fig. 7-Lifting Bar and Jack

Place blocking under lifting bar (B, Fig. 7) to support tractor while repairing drive housing or support.

WITH FRONT DRIVE SUPPORT—Continued

Installation

Move the drive assembly in position and carefully lower tractor front end into position. Install screws (see Fig. 4 and 5 for sizes) and tighten the side frame-to-support screws to 300 ft-lbs (407 Nm) torque. Tighten the support-to-engine front support screws to 300 ft-lbs (407 Nm) torque.

Inspect the axle drive pinion shaft O-ring (E, Fig. 3) and replace if in poor condition. Lightly lubricate splines on pinion shaft. Move the coupler forward and engage coupler tangs into notches.

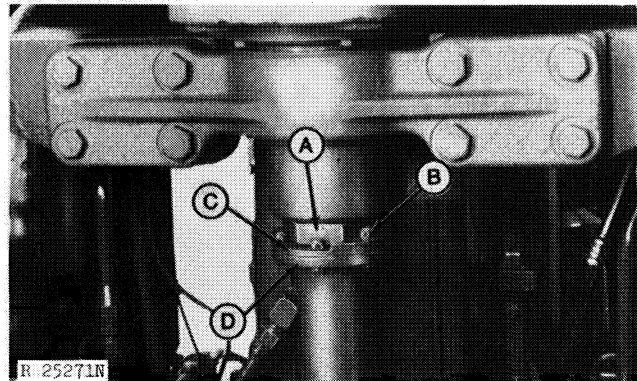
If the coupler tangs will not line up with notches in lock nut, raise one of the front final drives with jack until tire is off floor. Rotate tire until splines line up. Install two keeper halves and retainer halves. Tighten cap screws (B, Fig. 2) holding retainers together to 35 ft-lbs (47 Nm) torque.

Remove the lifting bar and floor jack. Install hood, grille screens, air stack and muffler.

Check the gear oil level in the differential housing. If low, use SAE 90 gear lubricant meeting API service designation GL-5 and military specification MIL-L-2105B. Refer to Section 50, Page 30-11 for level checking procedure.

WITHOUT FRONT DRIVE SUPPORT

Removal

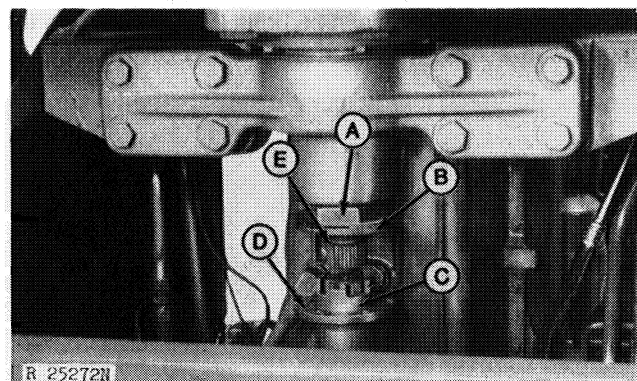


A—Lock Nut
B—Cap Screw and Nut
C—Front Retainer Half
D—Rear Retainer Half

Fig. 8-Front Drive Shaft Splined Coupling

Remove the cap screws (B, Fig. 8) from the coupler retainer and remove retainer. The front and rear halves of the retainer house two keeper halves that fit into the coupling groove.

CAUTION: Before disconnecting drive shaft, jack up one of the four wheels to relieve any torque that may have built up in the power train. Personal injury could result if drive shaft “unwinds” while it is being disconnected.



A—Lock Nut
B—Front Retainer Half
C—Splined Coupling
D—Rear Retainer Half
E—O-Ring

Fig. 9-Coupling Disconnected

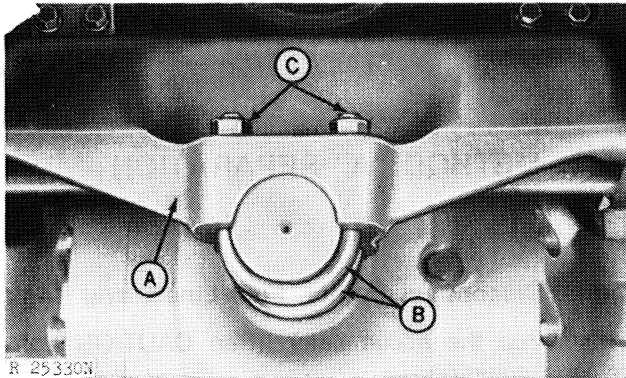
Move the coupling (C, Fig. 9) rearward to disconnect splined pinion shaft from drive shaft. The coupling may not move easily because of the drag exerted by two O-rings; one on the pinion shaft (E), and one on the drive shaft under coupling. These O-rings retain the gear oil from the front differential used to lubricate the splines on pinion shaft and drive shaft.

If equipped, disconnect front differential vent hose at cap.

Install Lifting Bar (D-05153ST) following manufacturers' instructions.

Block the rear wheels and position a floor jack under the lifting bar.

Use a jack with a 12-ton load capacity or greater to raise the front end of the tractor.

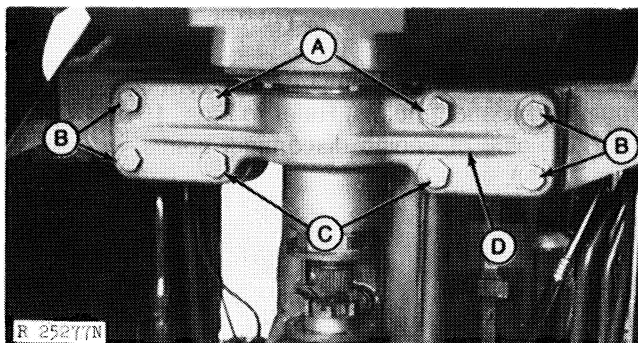


A—Drive Support
 B—U-Bolts

C—U-Bolt Nuts

Fig. 10-Removing U-Bolts

Raise the floor jack enough to take weight off the front drive assembly. Place blocks under lifting bar (Fig. 7). Remove the U-bolt nuts (C, Fig. 10) and U-bolts (B) from drive support (A).



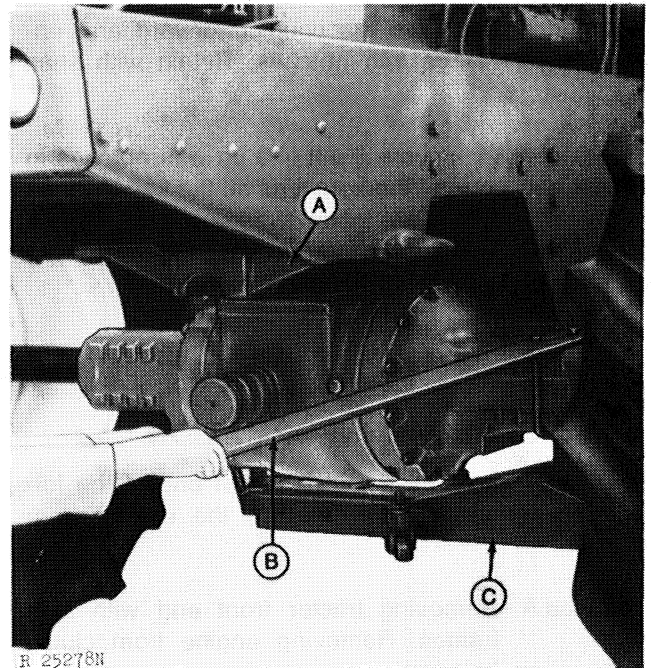
A—7/8" x 4-1/4" Cap Screws
 B—3/4" x 3-1/4" Cap Screws
 C—7/8" x 3-1/2" Cap Screws
 D—Rear Support

Fig. 11-Removing Rear Support Cap Screws

Remove the eight front drive rear support cap screws (A, B, and C, Fig. 11).



CAUTION: Keep differential balanced or supported to prevent possible injury.



A—Axle Support
 B—Support Bar

C—Floor Jack Under Lifting Bar

Fig. 12-Removing Axle Without Support

Fasten a support bar (B, Fig. 12) to the drive housing to keep assembly from rotating on axles. Raise the front of tractor high enough to allow the drive assembly to be pulled forward from under tractor.

Refer to Section 50, Group 30 and 35 for repair.

Installation

Move the drive assembly in position under tractor. Make sure that the two spacers are in place in drive rear support. Carefully lower front end onto drive assembly.

Install cap screws (see Fig. 11 for sizes) in rear support. Note that the 7/8 x 4-1/4 in. (A) screws are used in the holes having the spacers. Tighten the 3/4-in. screws to 300 ft-lbs (407 Nm) torque, and tighten the 7/8-in. screws to 445 ft-lbs (603 Nm) torque. The U-bolts should be evenly positioned in drive support and the nuts tightened to 450 ft-lbs (610 Nm) torque.

Installation—Continued

Inspect the drive pinion shaft O-ring (E, Fig. 9) and replace if in poor condition. Lightly lubricate splines on pinion shaft. Move the coupler forward and engage coupler tangs into notches. Retain with snap ring.

If the coupler tangs will not line up with notches in lock nut, raise one of the front tires off the floor. Rotate tire until splines line up. Install two keeper halves and retainer halves. Tighten cap screws (B, Fig. 8) holding retainers together to 35 ft-lbs (47 Nm) torque.

Tighten cap screws (B, Fig. 8) holding retainers together to 35 ft-lbs (47 Nm) torque.

Remove the lifting bar, floor jack and blocks.

Check the gear oil level in the differential housing. If low, use SAE 90 gear lubricant meeting API service designation GL-5 and military specification MIL-L-2105B. Refer to Section 50, Page 30-11 for level checking procedure.

ENGINE

GENERAL INFORMATION


Evaluate, and then select the best one of the following two methods of removing the engine from chassis:

Method A - Removing tractor front end with side frames; Removing engine from clutch housing -

This method provides the best accessibility to many components besides the engine. Requires removal of the fuel tanks and side frames from front hinge.

Method B - Removing engine, tractor front end, and side frames from clutch housing and hinge; Removing engine from side frames -

Probably the best method to use for gaining access to the engine clutch. Requires removal of fuel tanks and side frames.

 **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 pumping the brake pedal until brake pedal goes all way down. Make sure no one is close to tractor when starting engine or that no one works around hinge with the engine running.

METHOD "A" SEPARATION

Removal

Engine Disconnect Points, Fuel Lines, and Tank

Discharge the accumulator. (See CAUTION from previous column.)

Remove muffler, air stack, grille screens, and hood. Disconnect battery ground cable. Drain cooling system.

Disconnect front drive shaft from front drive. (See previous instruction under FRONT AXLE DRIVE ASSEMBLY for instructions.)

If equipped, disconnect front differential vent hose at Hi-Lo bearing quill.

Refer to Figs. 13 and 14 for right-hand side of engine disconnect points. Refer to Figs. 15 and 16 for left-hand side of engine disconnect points.

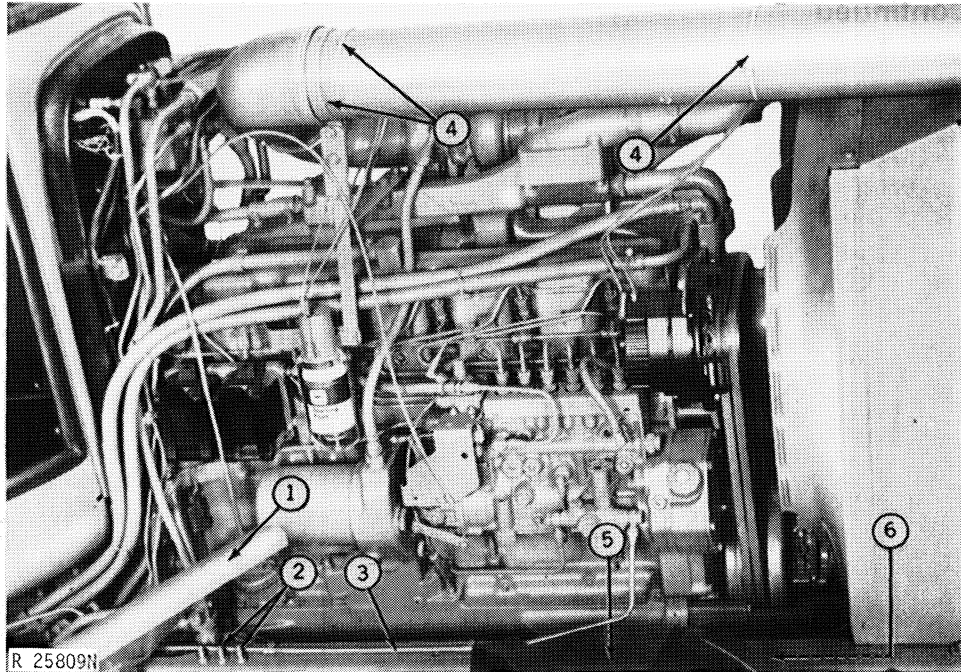


Fig. 13-Right-Hand Removal Procedures (8430)

1. Remove both fuel tanks. Refer to Section 30, Group 15 for removal procedure.

2. Disconnect grease fittings from top of side frames. Hold fitting body with wrench and remove lock nut on top. Place lock nut back on fitting after removal.

3. Remove fuel inlet line to the injection pump. Line is held to frame by two clamps.

4. Cut plastic straps from air intake pipe and remove support from pipe. Loosen clamp at rear of turbo charger and at air cleaner. Remove intake as one piece.

5. Use a JDE-36 Wrench and remove the engine support-to-axle drive support cap screws from engine mounting supports.

6. Remove the four front axle support-to-engine front support cap screws.

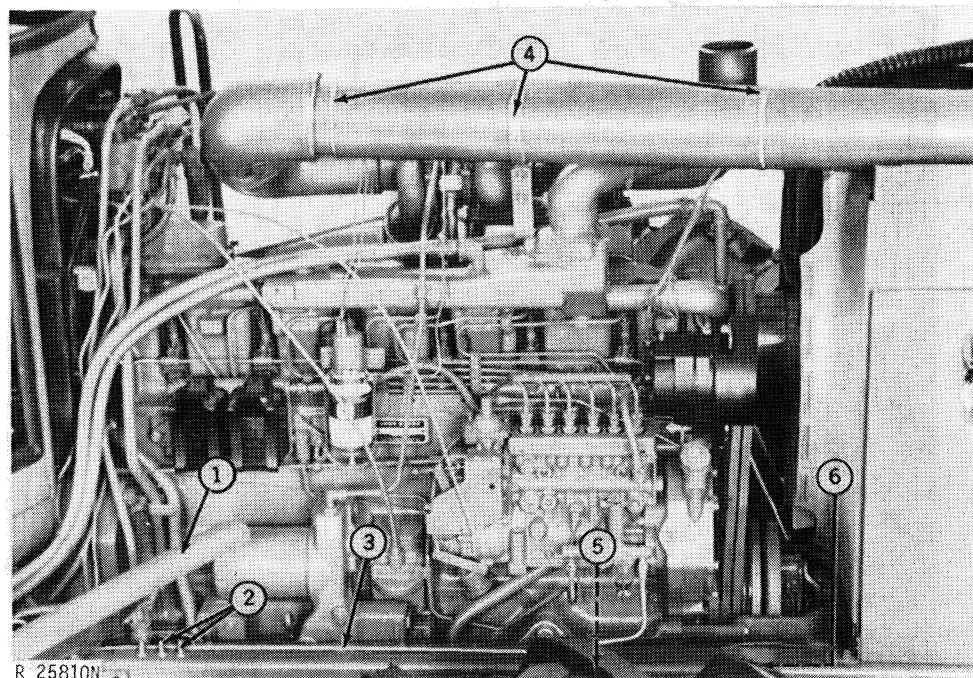


Fig. 14-Right-Hand Removal Procedures (8630)

Removal—Continued

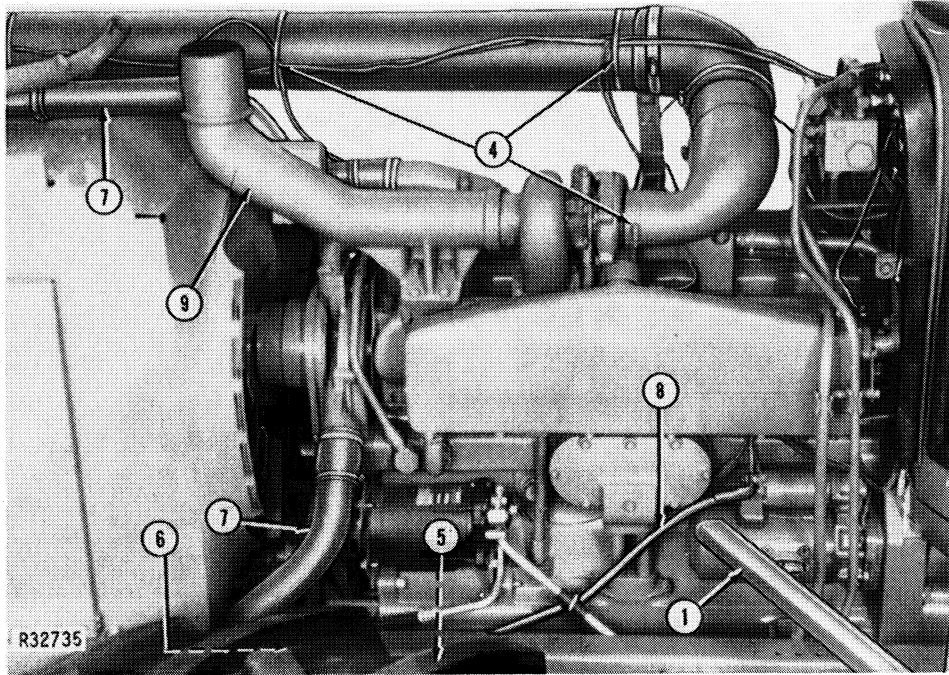


Fig. 15-Left-Hand Removal Procedures (8430)

- 7. Disconnect the upper and lower radiator hoses from radiator.
- 8. Disconnect battery-to-starter cable from starter.
- 9. Remove exhaust elbow (8430 only).

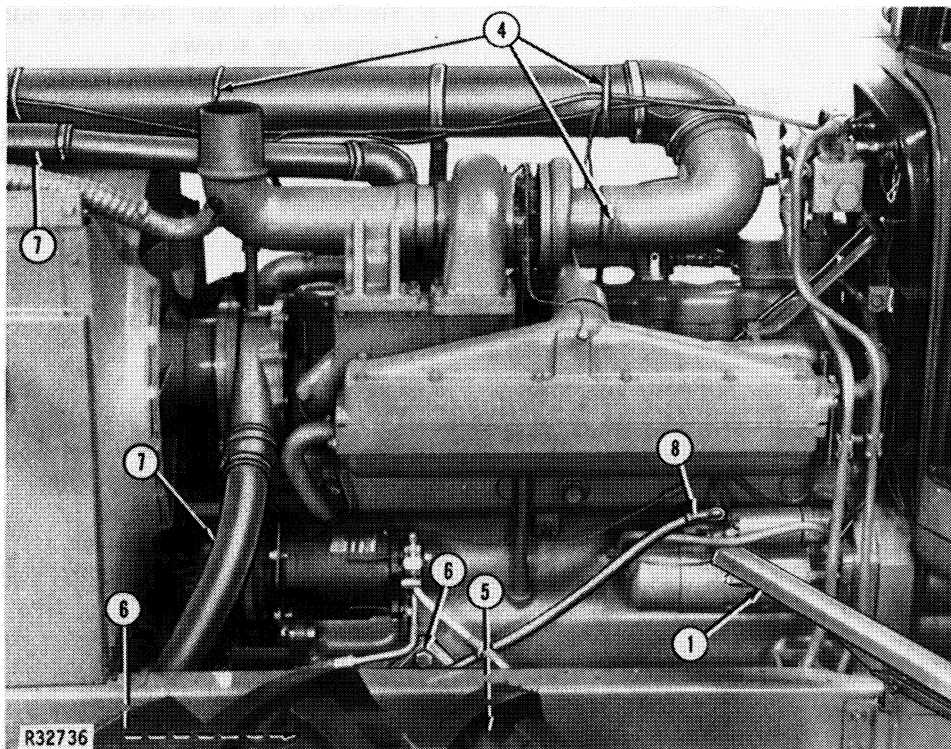


Fig. 16-Left-Hand Removal Procedures (8630)

Front End Assembly

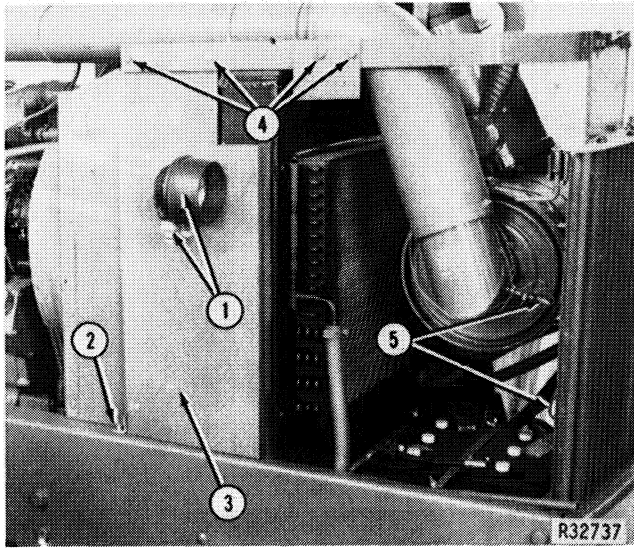


Fig. 17-Right-Hand Removal Points

IMPORTANT: Disconnect battery-to-starter cable from starter.

Refer to Figs. 17 and 18 and perform the following:

1. Disconnect wires from front flood lamps. Remove cap screw from bottom of flood lamp and remove lamp. Remove snap ring and washer from flood lamp post.
2. Remove cap screw securing side panel to side frame.
3. Remove side panels from tractor support.
4. Remove cap screws securing fan shroud tie straps. Leave one cap screw in place in front on each strap. Tilt straps upward.

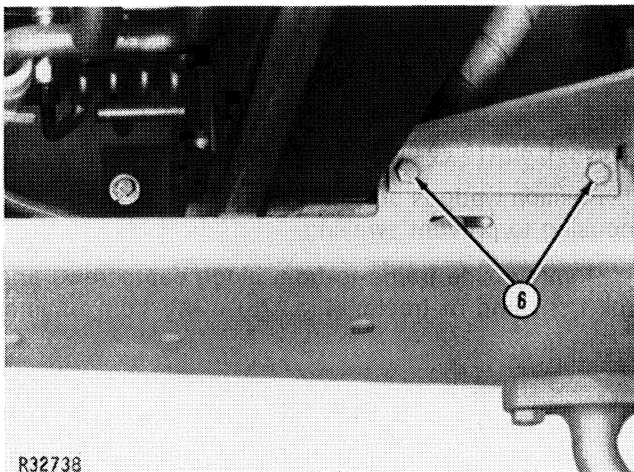


Fig. 18-Left-Hand Removal Points

5. Disconnect wiring from air restrictor indicator, horn and front head lamps and pull wiring back onto top of engine.

6. Remove the cap screws securing the fan shroud support to the side frames. Remove fan attaching cap screws and wire fan to shroud so fan cannot fall out.

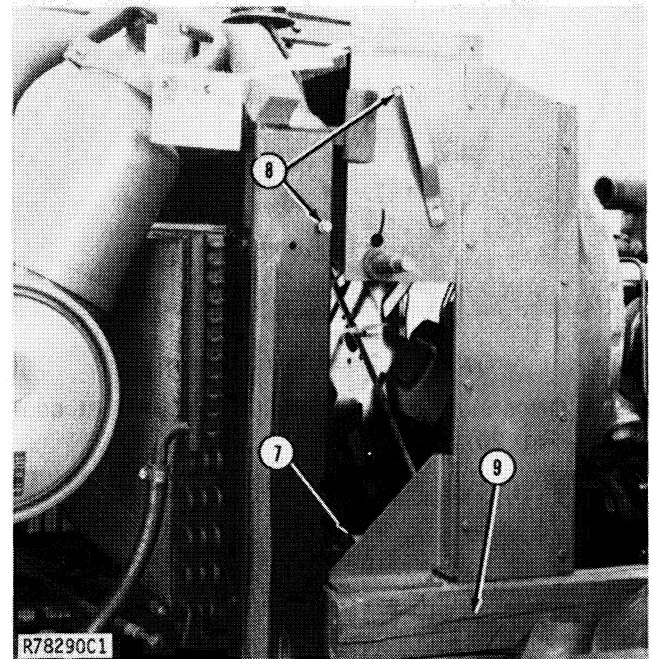


Fig. 19-Blocking Of Shroud Support

7. Remove oil cooler hose from top hydraulic pump and adjustable elbow from pump.

8. Remove cap screws at radiator from radiator tie straps. Tilt strap upward.

IMPORTANT: Wire shroud to air stack support to prevent shroud from moving during separation.

9. Place a 4 x 4 block of wood between shroud and frame on right and left sides.

Front End Assembly—Continued

(Not Illustrated) From inside the Sound-Gard, remove the floor mat and floor panel.

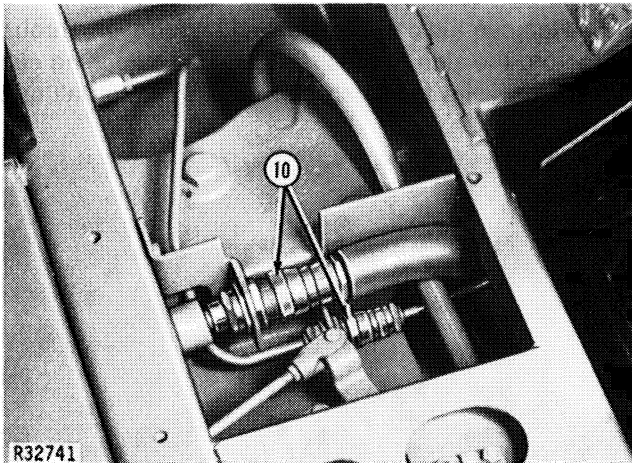


Fig. 20—Air Conditioning Couplings

10. Disconnect the air conditioning lines at couplings (Fig. 20).

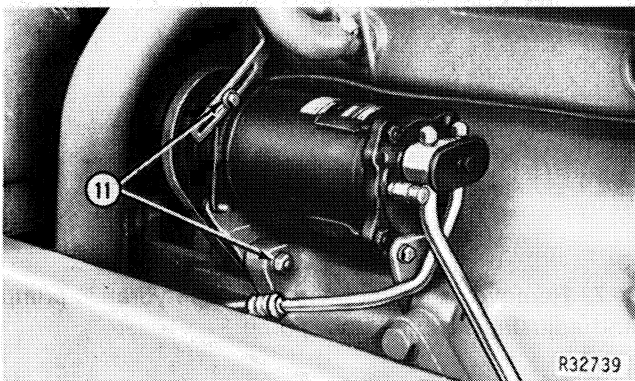


Fig. 21—Air Compressor

11. Remove cap screw and bolt at front of air conditioning compressor and rotate compressor to remove fan belt.

(Not Illustrated) Remove compressor from block without removing refrigerant lines. Secure compressor and refrigerant lines to frame and remove with frame upon separation.

Install Lifting Bracket (D-05153ST) following manufacturers' instructions. (Fig. 7).

NOTE: The Method "A" separation can also be done using the Rear Support Stand (D-05150ST).

To use this method, remove the drawbar. Bolt the first mounting pad to the drawbar mounting pad. Position second mounting pad under rear hinge.

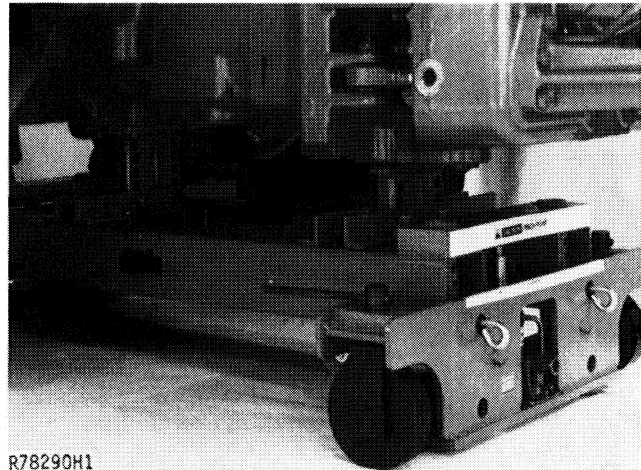


Fig. 22—Rear Support Stand Installed

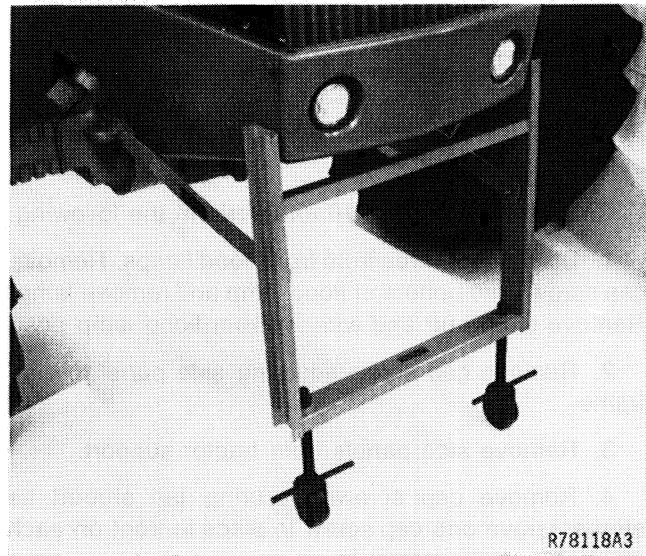


Fig. 23—Front Support Stand Installed

Install Front Support (D-5152ST) following manufacturers' instructions. (Fig. 23).

Place a 12-ton or larger floor jack under the lifting bracket, and raise until front end of tractor begins to lift.

Position wedges between side frame and front axle housing to prevent swaying.

Remove side frame-to-front hinge cap screws and roll front end of tractor (Fig. 23) away from engine.

Engine

With the front end assembly moved away from the engine, direct access to the components attached to the engine is obtained.

Use the following illustrations for reference and proceed with engine removal following the numbered sequence.

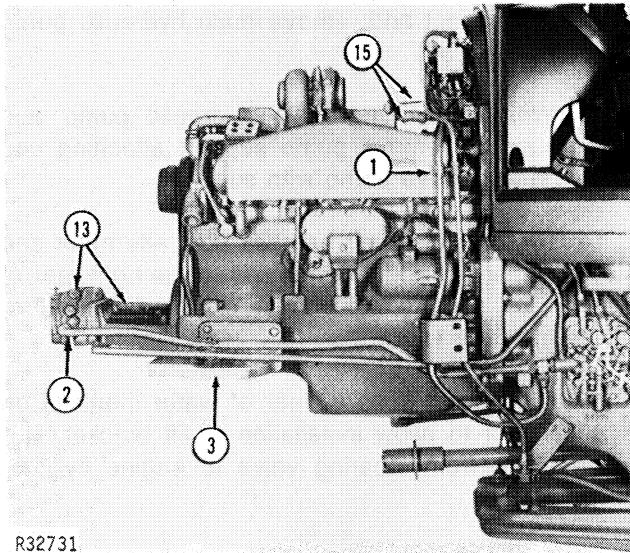


Fig. 24-Left-Hand Removal Points (8430)

1. Remove clamps holding steering lines to engine block.

2. Disconnect and remove the inlet line to the main hydraulic pump. (Line is retained by a clamp on the engine support.)

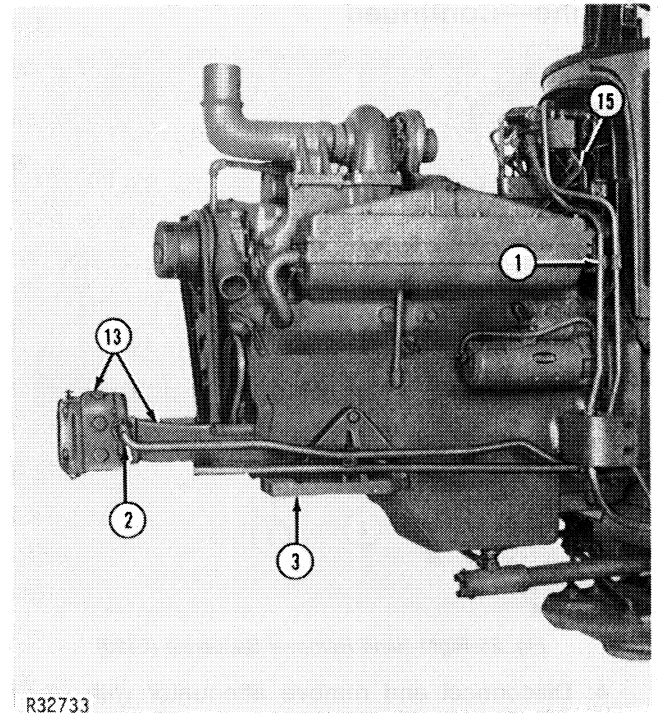


Fig. 25-Left-Hand Removal Points (8630)

3. Remove engine support-to-axle support cap screws from engine. Remove engine supports.

Engine—Continued

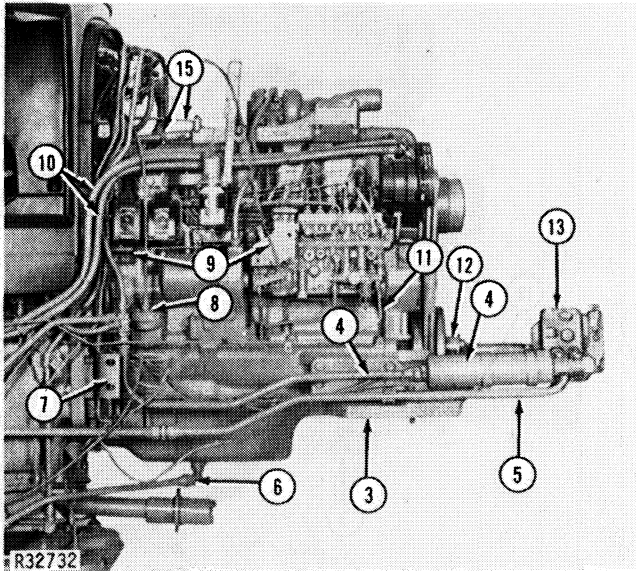


Fig. 26-Right-Hand Removal Sequence (8430)

4. Disconnect and remove attenuator with elbow and rear oil line.
5. Remove high pressure outlet line from pump and rear coupler.
6. Disconnect flange and drain engine oil from crankcase.
7. Remove engine-to-side frame bracket and vertical brace from engine.

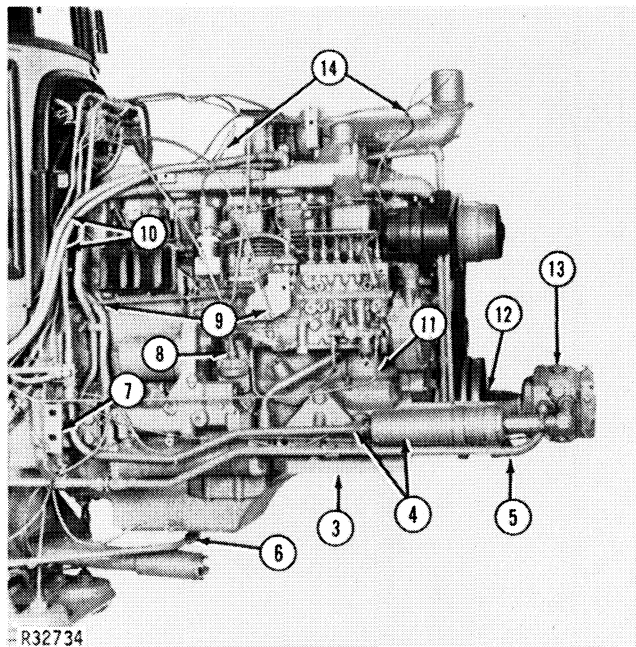


Fig. 27-Right-Hand Removal Sequence (8630)

8. Disconnect tachometer.
9. Disconnect fuel shut-off cable. Disconnect speed control rod at turnbuckle.
10. Disconnect water hoses to heater.
11. Disconnect and remove fuel inlet line, if not already done.
12. Disconnect and remove main hydraulic pump drive coupler.
13. While supporting main hydraulic pump and pump support, remove pump support attaching cap screws and remove pump with support.
14. Disconnect wiring harness from alternator and electric ether aid and pull harness to the right rear of engine. Be sure to disconnect engine temperature gauge indicator wire.
15. Disconnect hose at rear of water manifold on 8430 Tractor to allow installation of lift bracket. Remove brace from steering valve to engine cylinder head.

On the 8430 engine, attach the JDE-63 Lifting Bracket to the front and second from rear cylinder head bolts. The JDG-1-9 Lifting Brackets are installed on the 8630 engine. (Fig. 28).

Install the JDG-1 Engine Lift Sling onto Engine Lifting Brackets. Hook Sling to overhead hoist. The approximate balance point for engines is halfway between No. 3 and No. 4 cylinders. Fig. 28 illustrates the balance position.