


JOHN DEERE
STEEL BOLT
EQUIPMENT





To the Purchaser

Read this manual carefully to learn how to operate and service your engine.

 This safety symbol is used for important safety messages. When you see this symbol, follow the safety message to avoid personal injury.

Read the contents to learn where each section is. Use the alphabetical index for fast reference.

Left, right, front, and rear in this manual are determined by facing the flywheel (rear) end of the engine.

Write your engine serial number and accessory codes in the spaces on page 1. Your dealer needs this information when you order parts.

The warranty for this engine is on your copy of the engine registration.

This manual shows U.S. units of measure and their metric equivalents.

Contents

	Page
Safety Rules	2
Instruments	4
Operation	5
Fuels and Lubricants	7
Periodic Maintenance	9
Maintenance	25
Diagnosis	35
Storage	49
Crime Prevention Tips	50
Specifications	52
Index	53

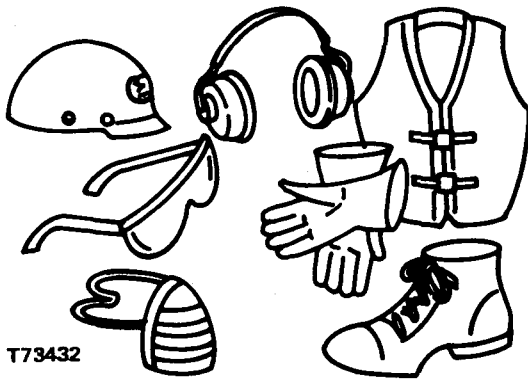


Safety Rules

Safety Depends on You

MAKE SURE YOU OPERATE AND SERVICE YOUR ENGINE CORRECTLY.

Only qualified persons should operate the engine.



T73432

Wear safety equipment...

T73432



T45672

and fairly tight clothing.

Keep hands, feet, and clothing away from power-driven parts.

T45672



T73433

T73433

Keep a first-aid kit and a fire extinguisher near the engine.

Keep the extinguisher fully charged. Learn to use it correctly.

Keep hands, feet, and controls free of water, grease, and mud.

Do not leave the engine while it is running unless it is designed to run unattended.

Safety Before You Start The Engine

Walk all the way around the engine. Make sure the area is clear before you start or service the engine.

Do not operate your engine if it has an unsafe condition. Put a tag on the engine where other operators will see it.

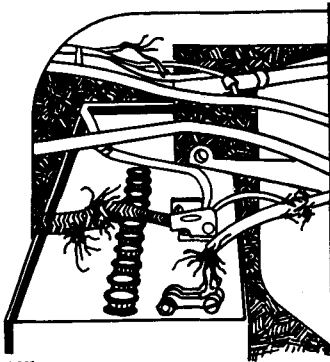
Start the engine **ONLY** in a well-ventilated place.

Remove trash from the engine and surrounding area daily.

Use a heavy-duty grounded cord to connect coolant heater to electrical power.

Do not plug into electrical power unless heating element is immersed in coolant. Sheath could burst and result in personal injury.

Electrical System Safety



T52240N

T52240N

Check daily for worn or frayed wires and loose connections.

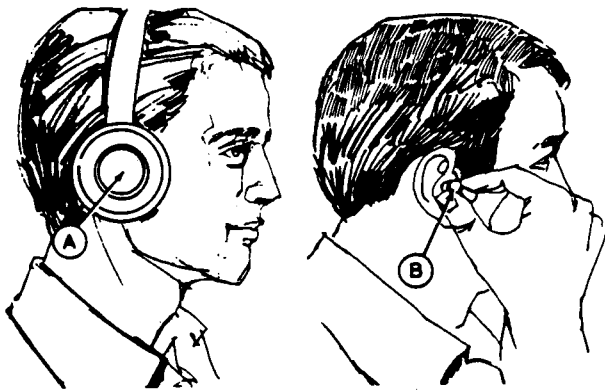
Before you make adjustments on the engine or electrical system, disconnect the battery ground (–) cable unless the procedure calls for battery power.

Keep sparks and flames away from batteries.

Before you connect or disconnect a battery charger, turn off the charger.

Before you use a booster battery, read the instructions on page 5.

Hearing Safety



X7662

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs (A) or earplugs (B) to protect against objectionable or uncomfortable loud noise.

Safety During Service

Do not add grease or oil to the engine while it is running.

Do not run the engine while you make adjustments and repairs unless the procedure is approved.

Fuel Safety

BE CAREFUL when you work with fuel:

- Do not fill fuel tank if engine is hot or running.
- Do not smoke when you fill the fuel tank or work on the engine.

Safety with High Pressure Fluids



X9811

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.



Operation

PRE-START INSPECTION

Before you start the engine for the first time each day, check the following:

1. Fluid levels: oil, coolant, fuel.
2. Air restriction indicator.
3. Turbocharger mounting and connections for air or oil leaks.
4. Hardware: loose or missing parts.
5. Components: bent, broken, or badly worn parts.

STARTING THE ENGINE

CAUTION: Do not start the engine unless it is safe to do so.

CAUTION: Start engine **ONLY** in a well-ventilated place.

1. Connect the fuel shut-off wire.
2. Move the throttle to one-third speed.
3. Turn the start switch key on.
4. Push the safety switch button (page 4).
5. Crank the engine. Do not crank the engine longer than 20 seconds. Wait 2 minutes before you try again.
6. When the engine starts, release the key and safety switch button.
7. Move the throttle to half speed.

Turbocharged Engines

If the engine has not run for several weeks:

1. Disconnect the electric shut-off wire from the injection pump to keep the engine from starting.
2. Crank the engine until the oil pressure gauge shows pressure. Do not crank engine more than 20 seconds.
3. Connect the shut-off wire.
4. Start the engine.
5. Do not run the engine faster than 1000 rpm until oil pressure is 14 psi (100 kPa).

Cold Weather Starting

During cold weather, use starting aids when necessary.

Starting Aid

Use the starting aid when the temperature is below 32°F (0°C).

CAUTION: Starting fluid is highly flammable.

Crank the engine several revolutions, then inject starting fluid into the air intake system.

IMPORTANT: Inject starting fluid **ONLY** while the engine is cold and cranking. Do not inject fluid for more than one or two seconds at a time. Stop injecting fluid as soon as the engine starts and runs smoothly.

Coolant Heater

Use coolant heater when temperature is below -4°F (-20°C).

Connect the coolant heater to 115-volt electrical power 10 hours before you start the engine.

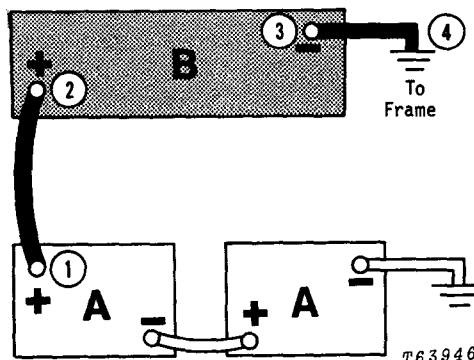
CAUTION: Use a heavy-duty grounded cord to connect coolant heater to electrical power.

Do not plug into electrical power unless heating element is immersed in coolant. Sheath could burst and result in personal injury.

Booster Batteries for 12-Volt Systems

Connect batteries in the order shown. Make the last connection (4) to the frame.

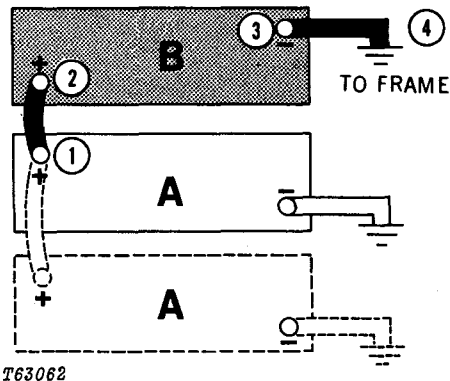
CAUTION: Keep flames and sparks away from batteries.



A—Machine Batteries
(two 6-volt batteries
in series)

B—Booster Battery
(12 volt)

6 Operation



A — Machine Batteries
(one or more
12-volt batteries)

B — Booster Battery
(12 volt)

ENGINE WARM-UP

Run the engine at half speed 5 minutes.

Do not use slow or fast idle during warm-up.

Operate engine under lighter loads and lower speeds than normal for 30 minutes.

NORMAL OPERATING CONDITIONS

Coolant temperature should be 180° to 200°F (82° to 93°C).

Minimum oil pressure at slow idle (800 rpm) and normal operating temperature:

Three-cylinder engines: 20 psi (140 kPa)

All other engines: 14 psi (100 kPa)

STOPPING THE ENGINE

1. Run at half speed without load for 2 minutes.
2. Move the throttle to slow idle.
3. Stop the engine.

NOTE: Run a generator set engine 3 to 5 minutes without load before you stop it.

IMPORTANT: If the engine stops while operating under load, remove the load. Start the engine immediately. Run the engine at half speed for 30 seconds before you add a load.

ENGINE SPEEDS

See chart on page 52.

Do not run the engine at slow idle unless it is necessary.

Stationary Power Units

1. The engine runs at any speed from slow idle to fast idle. For constant operation keep speed above 1500 rpm.
2. Run standby units without load for 30 minutes every 2 weeks.
3. To break in the engine, run it under load.
4. Run the engine regularly under load.
5. To stop engine, remove load (disengage clutch) and run engine at normal operational speed for 3 to 5 minutes.
6. Move speed control to slow idle and stop engine.

Generator Set Engines

1. 50 Hz generator sets run at 1500 rpm and 60 Hz sets run at 1800 rpm.
2. Run standby units without load for 30 minutes every 2 weeks.
3. To break in the engine, run it under load.
4. Run the engine regularly under load.



Fuels and Lubricants

FUELS

Use **ONLY** clean, high-quality fuel.

Use Grade No. 2-D fuel above 40°F (4°C).

Use Grade No. 1-D fuel at temperatures below 40°F (4°C).

Use Grade No. 1-D fuel for all air temperatures at altitudes above 5000 ft (1 500 m).

IMPORTANT: If fuel sulfur content exceeds 0.5 per cent, the engine oil drain interval must be reduced by 50 per cent (to 100 hours).

Use fuel with less than 1.0 per cent sulfur. If possible, use fuel with less than 0.5 per cent sulfur.

For maximum filter life, sediment and water should not be more than 0.10 per cent.

The cetane number should be 40 minimum. If you operate your machine where air temperatures are normally low or where altitudes are high, you may need fuel with a higher cetane number.

Cloud Point—For cold weather operation, cloud point should be 10°F (6°C) below lowest normal air temperature.

Storing Fuels

NOTE: Diesel fuels stored for a long period of time may form gum and plug filters.

Keep fuel in a clean container in a protected area. Water and sediment must be removed before fuel gets to the engine. Do not use de-icers to remove water from fuel. Do not depend on fuel filters to remove water.

If possible, install a water separator at the storage tank outlet. See your John Deere dealer for this part.

IMPORTANT: Keep all dirt, scale, water or other foreign material out of fuel.

Store fuel drums on their sides with plugs up.

Filling the Fuel Tank

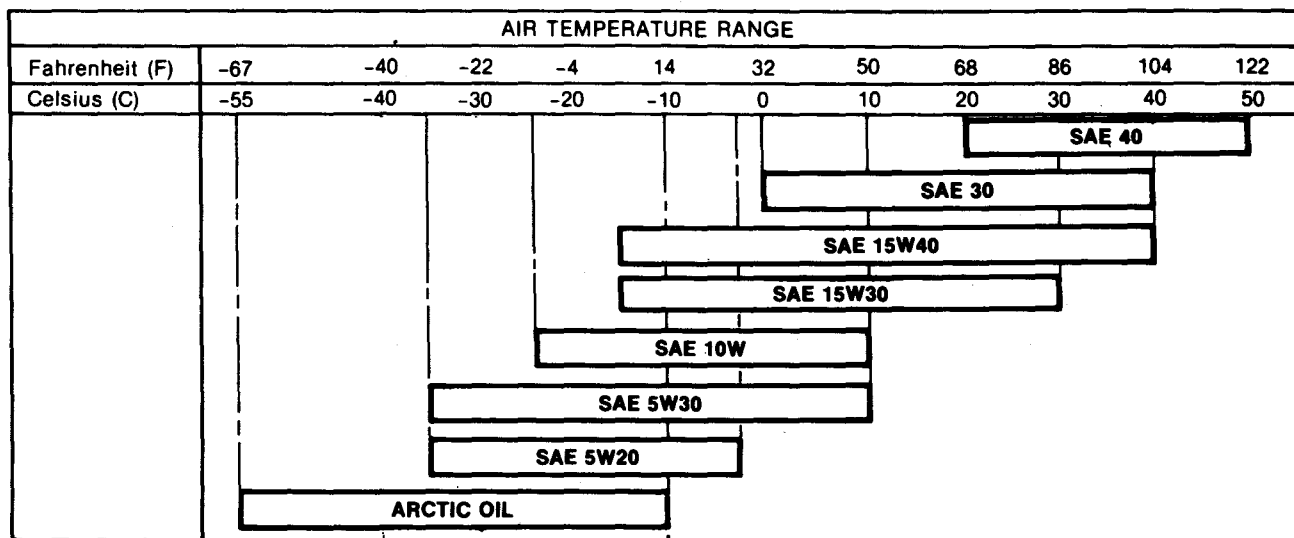


CAUTION: Handle fuel carefully. If the engine is hot or running, do not fill the fuel tank. Do not smoke while you fill fuel tank or work on fuel system.

To avoid condensation, fill the fuel tank at the end of each day's operation.

LUBRICANTS

Engine Oils



Depending upon the expected air temperature range between oil changes, use oil viscosity shown on the temperature chart above.

Additives are not required nor recommended.

John Deere TORQ-GARD SUPREME® engine oil is recommended. If other oils are used, they must have the following minimum specifications:

Oil Specification	Use
API Service CD/SC (MIL-L-2104C)	Recommended
API Service CC/SC* or MIL-L-46152*	For SAE 5W20, SAE 5W30 and arctic oil only, use if recommended oil is not available
MIL-L-46167*	For arctic oil only

*Change oil at 100 hours, which is half the normal drain interval.

Special Conditions

Conditions in certain areas may require use of lubricants or procedures which are not in this manual. See your John Deere dealer for information.

Storing and Handling Lubricants

Store lubricants in clean containers in an area protected from dust, moisture, and other contamination.

When you handle lubricants, use clean containers.



Periodic Maintenance

SERVICE INTERVALS

The Series 300 OEM engines need regular service. Read this section carefully to learn the correct services for your engine.

Use the engine hour meter to determine when your engine needs service.

Intervals on the periodic maintenance chart are for operation under normal conditions. If you run the engine under difficult conditions, then you should service it at shorter intervals.

BREAK-IN PERIOD

NOTE: If air temperatures are above 50°F (10°C), engine oil can be replaced with seasonal viscosity oil earlier than 100 hours.

Check engine oil level daily or every 10 hours if operation is continuous. If oil must be added, use seasonal viscosity oil.

During first 100 hours, avoid unnecessary engine idling. If engine would be idling longer than 5 minutes, stop engine.

If coolant temperature gets above 195°F (90°C), reduce load on engine. Unless temperature drops quickly, stop engine and find cause.

If air temperatures are above 85°F (30°C), replace engine oil with seasonal viscosity oil before operating engine at extended full load or speeds above 1900 rpm.

Drain Break-In oil at 100 hours MAXIMUM.

PERIODIC MAINTENANCE CHART**AS REQUIRED**

Item	Service	Material
1. Air cleaner	Check restriction indicator. Clean primary element or install new elements.	JDFE
2. Belt(s)	Check tension.	
3. Injection nozzles	See your John Deere distributor/dealer for service.	

DAILY OR EVERY 10 HOURS

4. Engine oil	Check level: between marks on dipstick.	EO
5. Radiator	Check coolant level: half-way between radiator core and filler neck. Check for leaks. Clean radiator fins if necessary.	Soft water Antifreeze

EVERY 100 HOURS

6. Batteries	Check electrolyte level: to bottom of filler neck. Clean terminals. Tighten clamps.	Distilled water
--------------	---	-----------------

EVERY 200 HOURS

7. Engine oil	Drain and fill.	EO
8. Engine oil filter	Install new filter.	JDF

Material Key:

EO —Engine Oil

DF —Diesel Fuel

JDFE—John Deere Filter Element

EVERY 500 HOURS

Item	Service	Material
9. Fuel filter	Install new element.	JDFE
10. Air intake hoses	Check for cracks and loose connections.	
11. Radiator	Add non-chromate rust inhibitor.	Rust inhibitor
12. Fuel transfer pump*	Clean strainer.	DF

EVERY 1000 HOURS

13. Engine valves	Check and adjust valve clearance.	
14. Engine speeds	Check idle speeds.	
15. Engine breather	Remove and clean	DF

EVERY SPRING AND FALL

16. Cooling system	Drain, flush, and fill. Clean radiator fins.	Soft water Antifreeze
17. Engine oil and filter	Drain and fill. Install new filter.	EO JDF

*For 3179D, 4239D and T, and 6359D and T engines only.

DETAILED PERIODIC MAINTENANCE

AS REQUIRED

1. Air Cleaner

Check the restriction indicator. If indicator shows red, or if engine smokes too much or loses power, clean the primary element and the cup.

Before you service the air cleaner, stop the engine.

IMPORTANT: Install a new primary element:

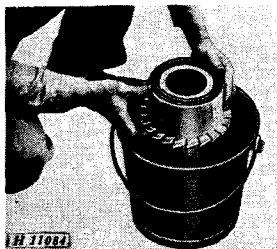
1. If the element shows damage.
2. If the element will not clean.

IMPORTANT: Install a new secondary element:

1. If a primary element is damaged and needs to be replaced.
2. If the element is visibly dirty.

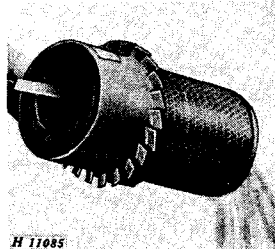
IMPORTANT: Do not clean a secondary element. Install a new element.

Oily or Sooty Element



Washing Element

H11084



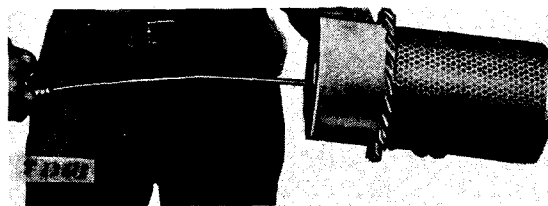
Rinsing Element

H11085

IMPORTANT: Do not wash the element in fuel oil, oil, gasoline, or solvent. Do not use compressed air to dry an element.

1. Add John Deere R36757 Filter Element Cleaner or an equivalent non-sudsing detergent to water. Move the element up and down in this solution to loosen dirt.
2. Flush the element with clean water. Use water pressure under 40 psi (280 kPa).
3. Shake water from element. Do not install the element until it is dry.

Dusty Element



T13511

Cleaning the Element with Compressed Air

Remove element. Pat element with the palm of your hand, NOT ON HARD SURFACE.

If this does not remove dust, use compressed air under 30 psi (210 kPa).

Blow clean, dry air up and down the pleats, from inside to outside. Be careful not to make a break in the element.

After Cleaning

Inspect element for damage. Put a lighted bulb inside element. Throw away an element that shows slightest break.

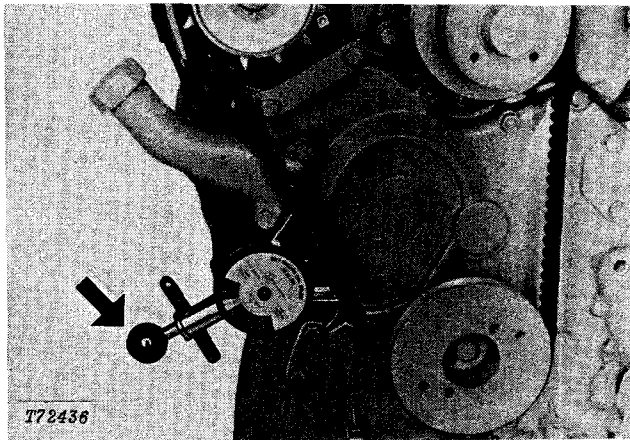
Inspect element gasket for damage. Install a new element if gasket is missing or damaged.

Clean inside of air cleaner body with clean, damp cloth. Put element in cleaner body. Fasten it with wing nut. Be sure gasket is in place between element and wing nut. Tighten wing nut finger tight.

Push the reset button of the filter indicator.

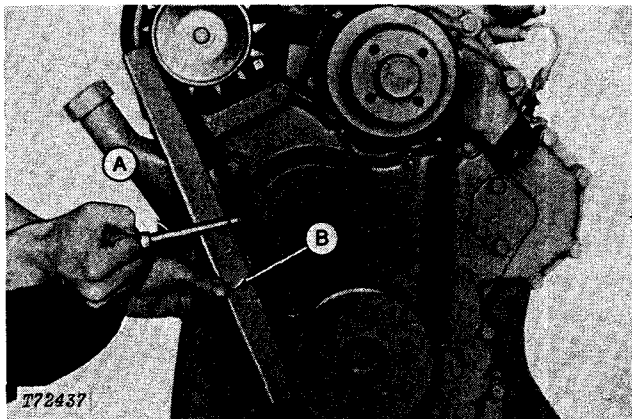
2. Belt(s)

Check and adjust alternator-fan belt tension.



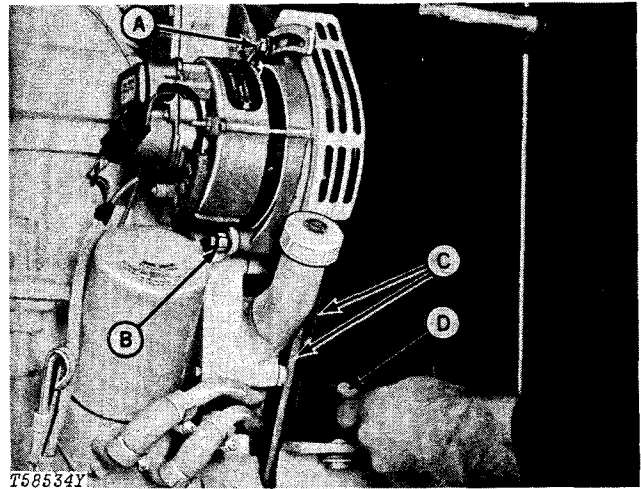
Strand Tension Gauge

Strand tension gauge: Immediately after the engine stops (run the engine at least 5 minutes), check the belt tension. If tension is less than 50 lb. (223 N), let the engine cool 10 to 15 minutes. Then make tension 90 lb. (400 N).



A—Tension Tester

B—Straight Edge



A—Adjusting Strap Cap Screw
B—Bracket Cap Screw

C—Fan Belts
D—Tension Tester

Tension Tester on 6239 Engine

NOTE: If your engine has two belts (C), check and adjust front belt only.

Tension tester: A force of 20 lb. (89 N) halfway between the pulleys should move the belt 3/4 in. (19 mm). Use a straight edge to measure distance belt moves.

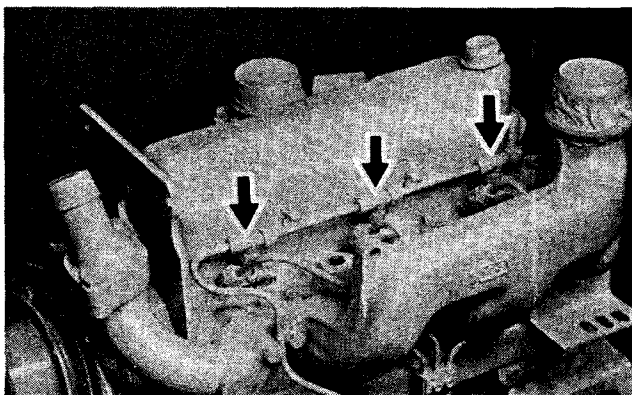
Adjustment: Loosen the alternator bracket and adjusting strap cap screws. **PULL THE FRONT ALTERNATOR FRAME ONLY** to tighten the belt. Tighten the cap screws.

Inspect belts regularly for wear or damage. If your engine has two belts and needs a new belt, always install two new belts.

3. Injection Nozzles

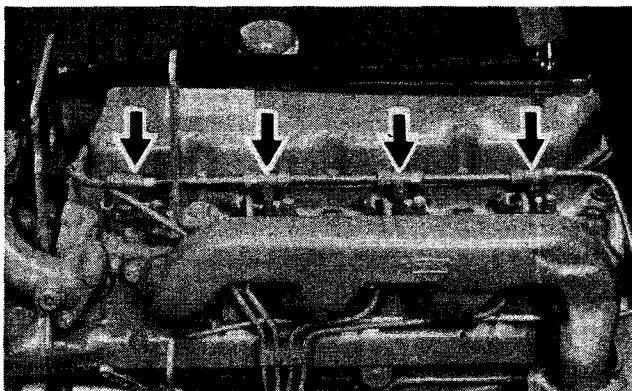
If injection nozzles are not operating correctly, the engine will not run normally. See your John Deere distributor/dealer for service on the injection nozzles.

IMPORTANT: Do not remove injection nozzles.



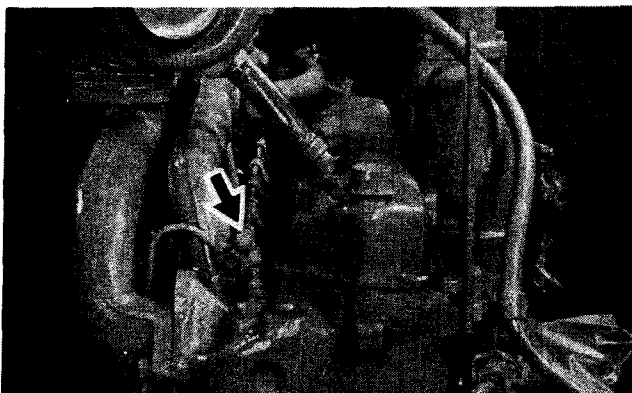
Fuel Injection Nozzles (3164 Engine)

T77880



Fuel Injection Nozzles (4219 Engine)

T77881



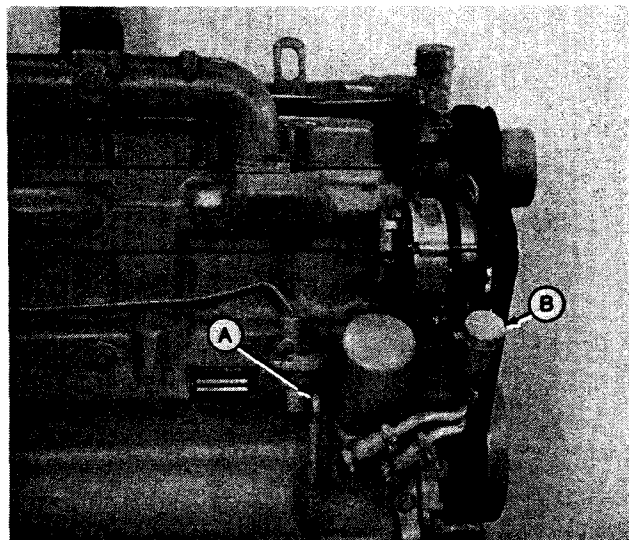
Fuel Injection Nozzles (6329 Engine)

T77882

DAILY OR EVERY 10 HOURS

4. Engine Oil

Check the engine oil level.

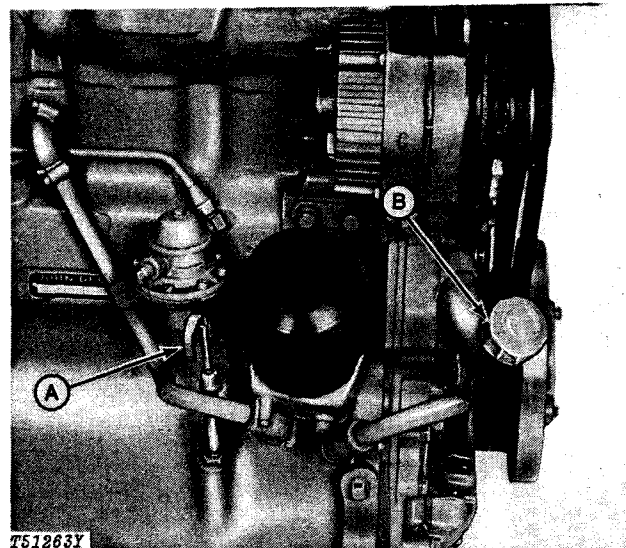


T5953AH

A—Dipstick

B—Filler Cap

6329 Engine



T51263Y

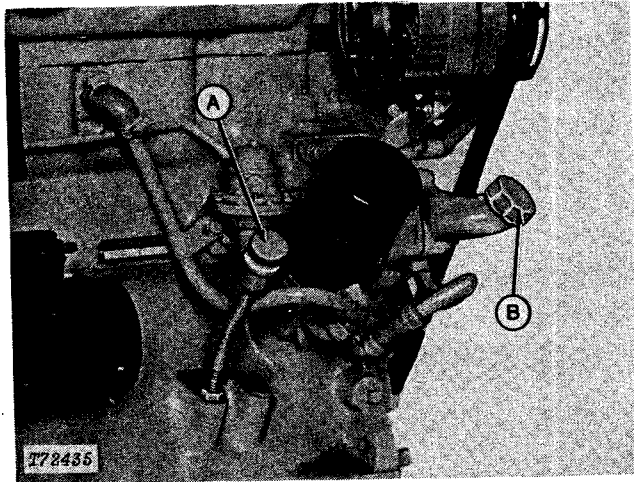
A—Dipstick

T51263Y

B—Filler Cap

6359 Engine

NOTE: Fuel transfer pump shown is on early engines.



A—Dipstick

B—Filler Cap

4239 Engine

Stop the engine.

Oil level must be at lower mark on dipstick.

When oil level is checked after engine has not been run for several hours, oil level must be at upper mark on dipstick.

If necessary, remove filler cap (B). Add oil specified in Fuels and Lubricants chapter.

If oil is below bottom mark on dipstick, do not run engine.

5. Radiator

CAUTION: Do not remove radiator cap unless engine is cool. Then turn the cap slowly to the stop. Release all pressure before you remove cap.

Check the coolant level daily before you start the engine. Coolant should be halfway between the radiator core and the filler neck.

If not, add coolant specified on page 23.

Tighten filler cap.

Clean trash from radiator.

Check for leaks.

EVERY 100 HOURS

6. Batteries

Check electrolyte level. Fill each cell to bottom of filler neck with distilled water.

IMPORTANT: If you add water to battery in freezing weather, run the engine two or three hours or charge the battery.

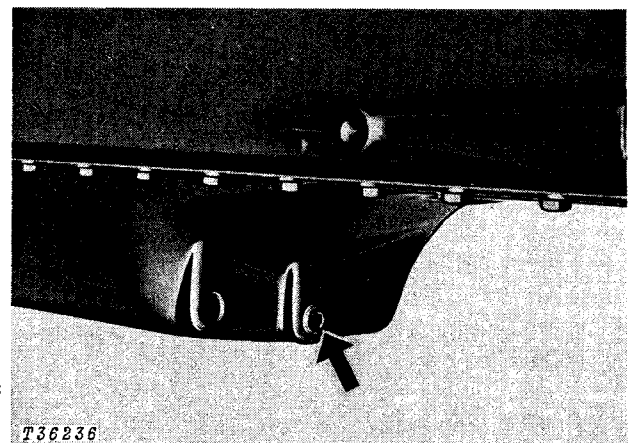
Clean terminals with a stiff brush. Tighten clamps. Apply petroleum jelly to terminals.

EVERY 200 HOURS

7. Engine Oil

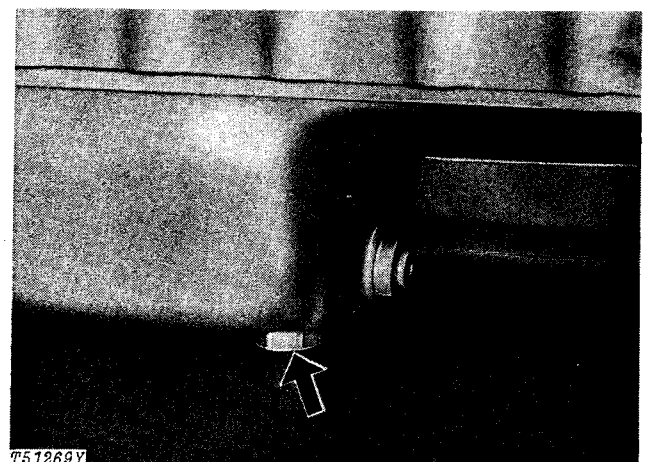
Change engine oil every 200 hours.

NOTE: If fuel has more than 0.5 percent sulfur, change oil every 100 hours.



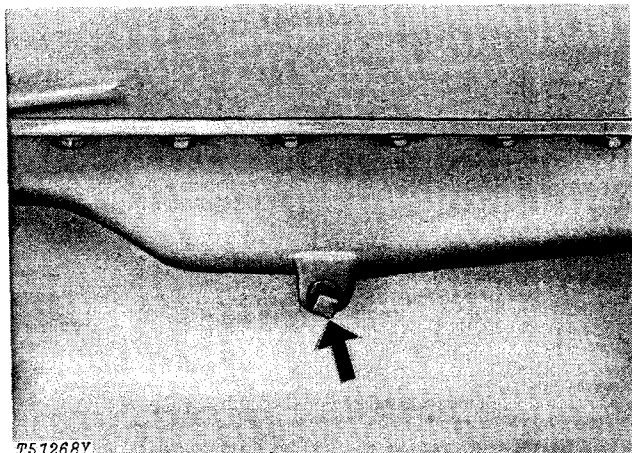
T36236

Engine Oil Drain Plug (6329 Engine)



T51268Y

Engine Oil Drain Plug (4219 Engine)



T51268Y

T51268Y

Engine Oil Drain Plug (6359 Engine)

1. Warm the engine.
2. Stop the engine.
3. Remove engine oil drain plug.
4. Drain oil.

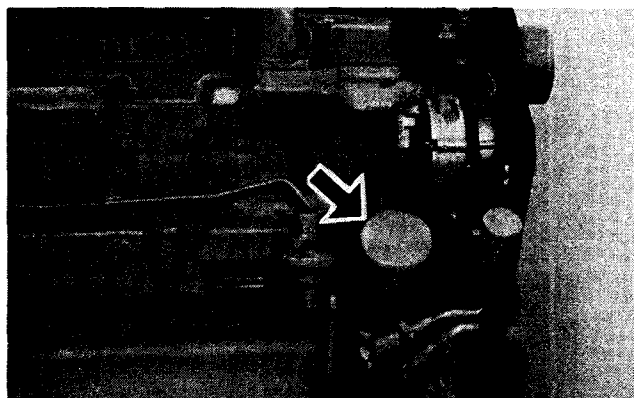
NOTE: Change filter while oil drains. See Item 8.

5. Install plug.
6. Fill engine with oil specified on page 8.

See specifications chart on page 52 for oil capacity of your engine.

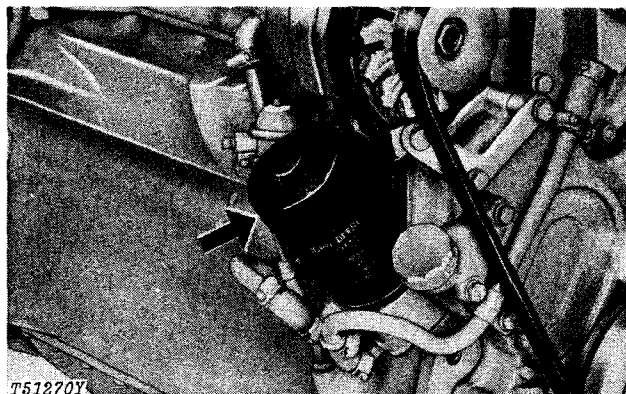
8. Engine Oil Filter

Install a new engine oil filter.



T5953AH1

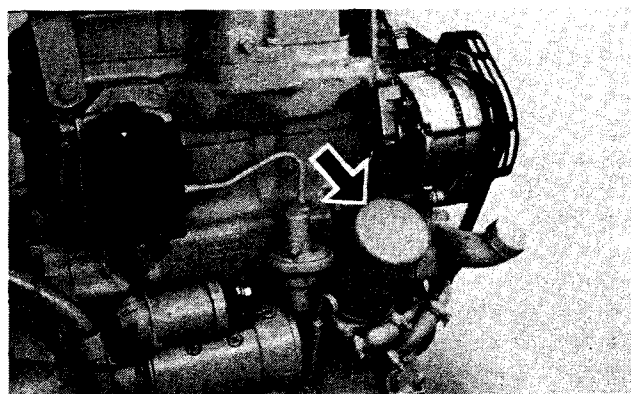
Oil Filter (6329 Engine)



T51270Y

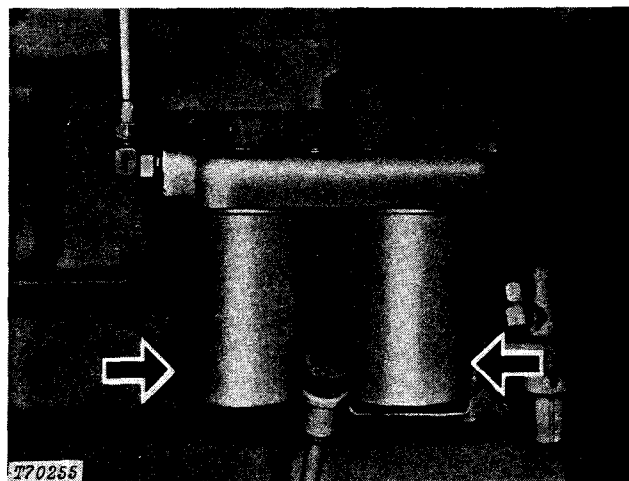
T51270Y

Oil Filter (6359 Engine)



T5953AK

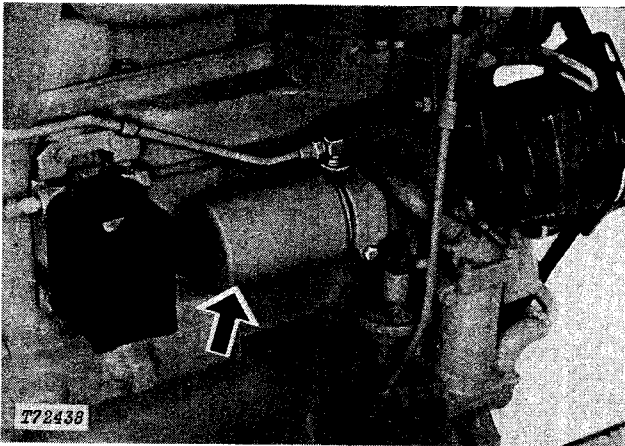
Oil Filter (3164 Engine)



T70255

T70255

Oil Filters (6414 Engine)



Oil Filter (4276 Engine)

T72438

1. Turn the filter counterclockwise to remove it. Throw it away.
2. Clean the mounting surface.
3. Put a film of oil on the gasket of the new filter.
4. Tighten the filter clockwise until the gasket touches the mounting surface.
5. Tighten the filter 1/2 to 3/4 turn more.

IMPORTANT: Before you start a turbocharged engine after a filter change, disconnect the electric shut-off wire from the injection pump. Crank the engine for 20 seconds. Connect the shut-off wire.

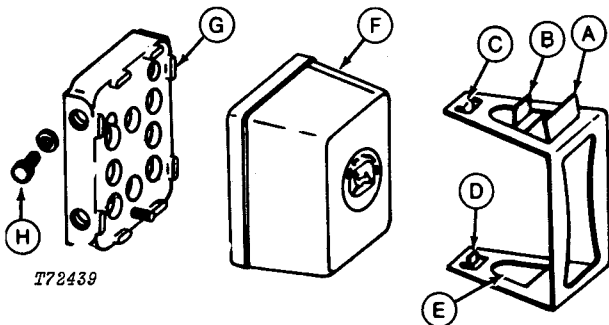
6. Start the engine. Check for leaks around the filter. Tighten the filter again, if necessary, but only enough to stop leaks.
7. Check the engine oil level.

EVERY 500 HOURS

9. Fuel Filter

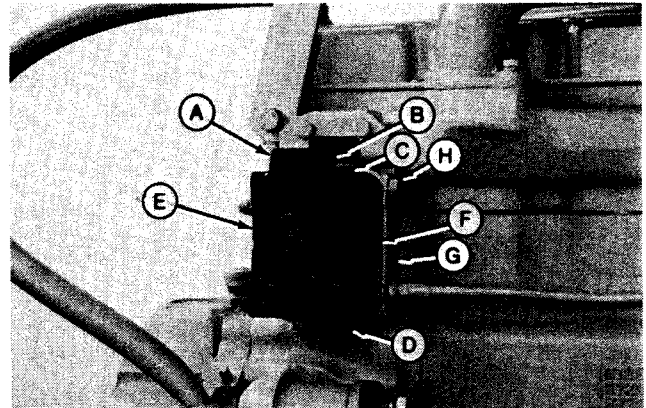
Install a new fuel filter element.

NOTE: Change the element at 500 hours or once a year. If you operate the engine under difficult conditions, change the element more often.



T72439

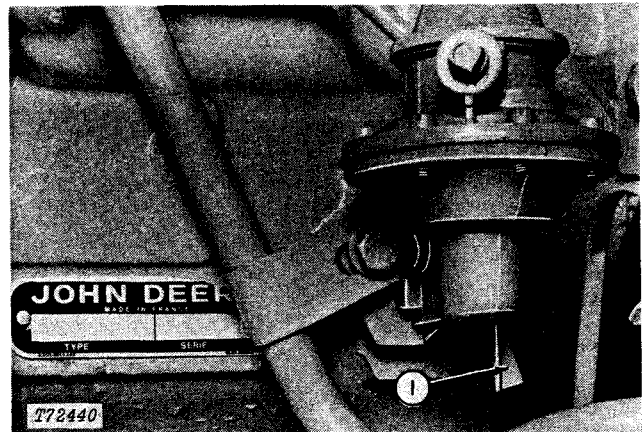
T72439



6329 Engine

T5953AF

1. Push tab (A) and pull tab (B) to disengage hook (C).
2. Disengage hook (D).
3. Remove spring (E).
4. Remove element (F).
5. Clean the filter body (G) and spring pin.
6. Install new element. Install spring.
7. Remove air from fuel system.
8. Loosen bleed screw (H).



T72440

9. Pump the primer lever (I) until fuel without bubbles flows from around the bleed screw.
- NOTE:** See page 25 for more information on removing air from the fuel system.
10. Tighten the bleed screw.
11. Push the primer lever down.
- NOTE:** Pump shown is on early engines.

10. Air Intake Hoses

Check the clamps on the hoses which connect the air cleaner and the engine. If necessary, tighten the hose clamps. Inspect the hoses for cracks.

NOTE: On later machines, the air cleaner is installed under the hood.

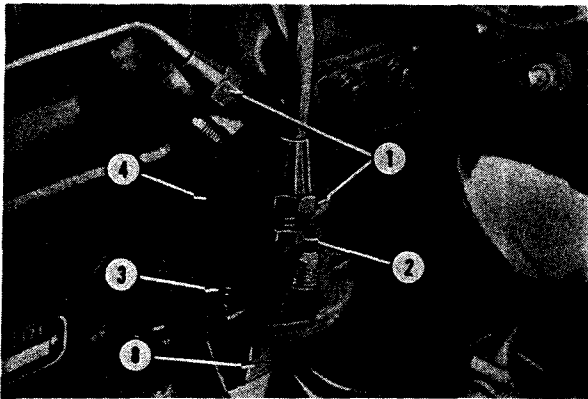
11. Radiator

Add non-chromate rust inhibitor to coolant. See page 24 for more information on rust inhibitor.

12. Fuel Transfer Pump (for 3179D, 4239D and T, and 6359D and T Engines only)

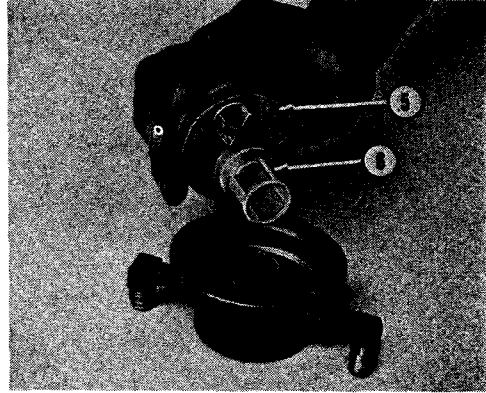
Clean the strainer.

Corona (BCD) Pump



T86729

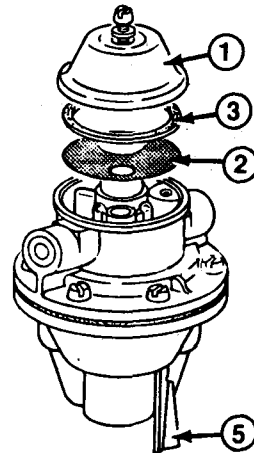
1. Disconnect fuel lines.
2. Plug fuel tank line.
3. Loosen cap screws.
4. Remove bowl.



T86730

5. Remove valve plate.
6. Clean strainer with diesel fuel. If strainer is damaged, install a new one.
7. Assemble pump.
8. Pump the primer lever until bowl is full of fuel.

AC Pump (Early Engines)



T86731

1. Remove and clean bowl.
2. Remove strainer. Wash it in diesel fuel.
3. If gasket is damaged, install a new one.
4. Install bowl and strainer loosely.
5. Pump the primer lever until bowl is full of fuel. Push lever down on final stroke.
6. Tighten the bowl.

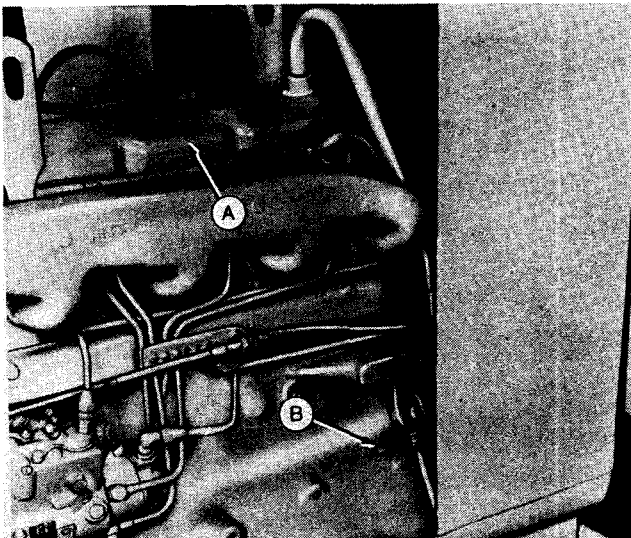
EVERY 1000 HOURS

13. Engine Valves

IMPORTANT: Any time the air intake system is opened it must be tested for leaks before the machine is returned to service. (See Air Intake Leak Test on page 21.)

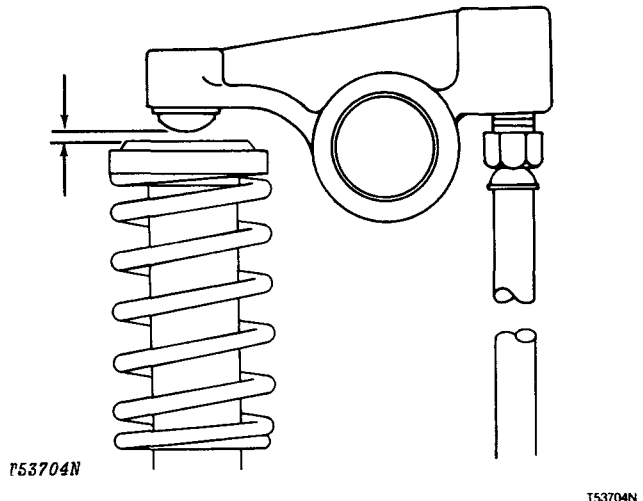
Check valve clearance. Adjust valves if necessary.

NOTE: Check or adjust valves when engine is hot or cold.



T82772

1. Remove valve cover (A).
2. Remove timing pin (B) if equipped or use JD300002 Timing Pin.
3. Turn flywheel until timing pin non-threaded end engages flywheel when No. 1 piston is at top dead center (TDC) of its compression stroke. Both valves on No. 1 cylinder will be closed and the pushrods will be loose. If the pushrods are not loose, remove the timing pin, rotate the flywheel one revolution (360°), and install the timing pin in the flywheel.



Valve Clearance

Intake valve clearance: 0.014 in. (0.36 mm)
Exhaust valve clearance: 0.018 in. (0.46 mm)

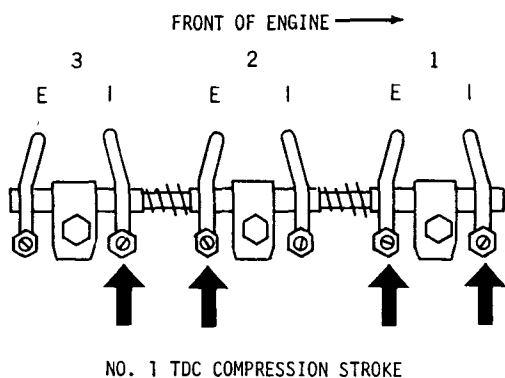


T81224

Use a feeler gauge to measure clearance. Turn nut to adjust clearance.

NOTE: Some engines have an adjusting screw lock located in top of rocker arm adjusting screw threaded hole. If equipped, loosen lock screw several turns before adjusting valve clearance. After adjusting valve clearance tighten lock screw to 84 ± 36 lb-in ($9.5 \pm N\cdot m$).

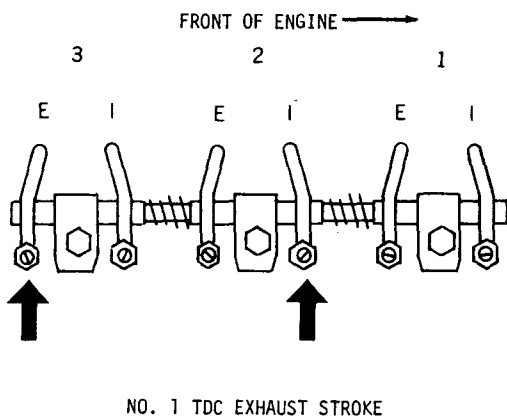
Three-Cylinder Engine



T53705N

Adjust valve clearance:
Exhaust valves: 1E, 2E
Intake valves: 1I, 3I

Remove timing pin. Turn flywheel 360°. Install pin.



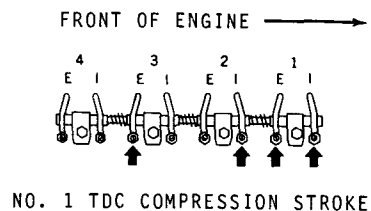
T53706N

Adjust valve clearance:
Exhaust valve: 3E
Intake valve: 2I

T53705N

T53706N

Four-Cylinder Engine

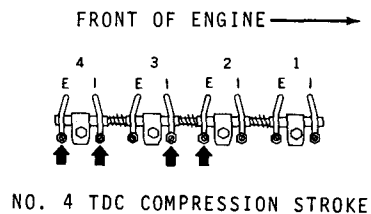


T48312N

T48312N

Adjust valve clearance:
Exhaust valves: 1E, 3E
Intake valves: 1I, 2I

Remove timing pin. Turn flywheel 360°. Install pin.

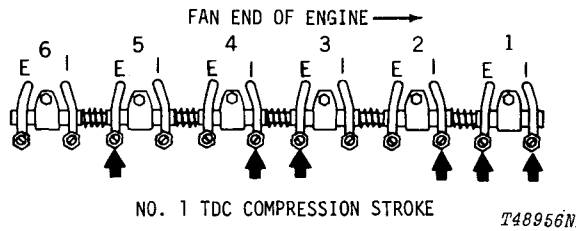


T48313N

T48313N

Adjust valve clearance:
Exhaust valves: 2E, 4E
Intake valves: 3I, 4I

Six-Cylinder Engine



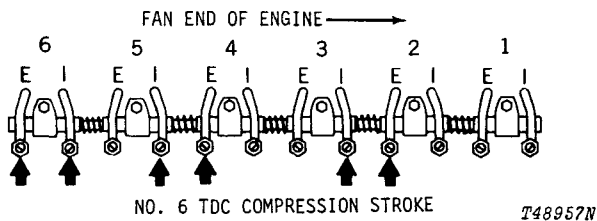
T48956N

Adjust Valve clearance:

Exhaust valves: 1E, 3E, 5E

Intake valves: 1I, 2I, 4I

Remove timing pin. Turn flywheel 360°. Install pin.



T48957N

Adjust valve clearance:

Exhaust valves: 2E, 4E, 6E

Intake valves: 3I, 5I, 6I

AIR INTAKE SYSTEM LEAK TEST

1. Plug air cleaner inlet opening using adjustable seal plug or equivalent.
2. Remove start aid spray nozzle and install pressure gauge.
3. Connect a regulated and continuous, 13.8-20.7 kPa (2-3 psi), filtered air supply to the pressure gauge.
4. If air intake system fails to pressurize, plug exhaust manifold outlet using adjustable seal plug or equivalent or turn engine over slightly to shut partially opened valves.
5. Spray all connections from the air cleaner housing to the air intake manifold with any harmless soapy solution.
6. No leakage is permitted between the air cleaner housing and the air intake manifold.
7. Repair as required.
8. Disconnect air supply and remove pressure gauge.
9. Install start aid spray nozzle.

NOTE: Make certain the nozzle is pointing against the air flow when installed.

14. Engine Speeds

Warm the engine. Use a tachometer to check engine speeds.

See engine speeds on page 52.

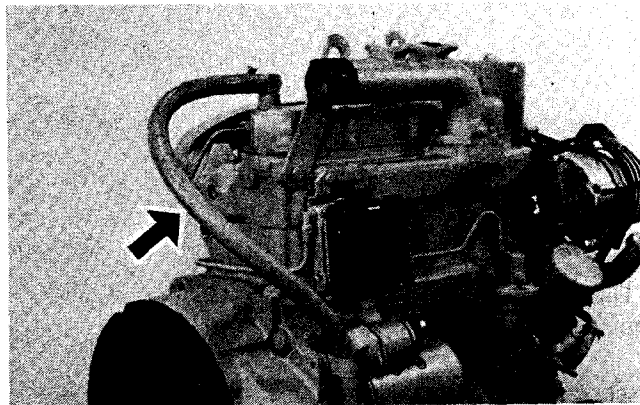
If engine speeds are not correct, see your John Deere distributor/dealer for service.

15. Engine Breather

Remove the vent tube. Clean it with diesel fuel.

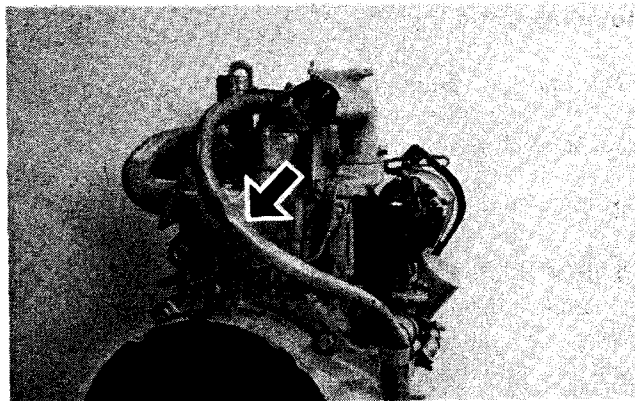
If you operate the engine in dusty conditions, clean the tube at shorter intervals.

Install the tube. Be sure the O-ring fits correctly in the rocker arm cover.



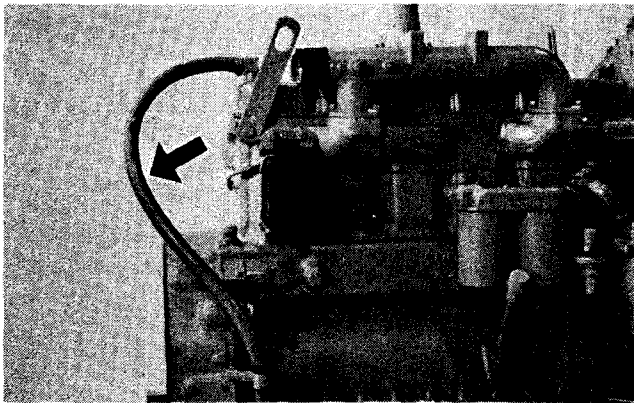
T5953AJ

Vent Tube (3164 Engine)



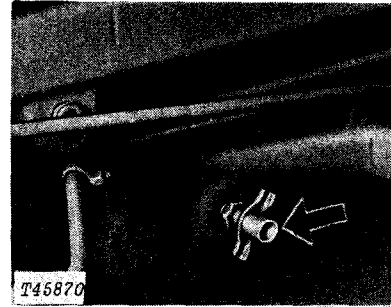
T5953AD

Vent Tube (4219 Engine)



Vent Tube (6414 Engine)

T5953AE



T5953AI

Cylinder Block Drain Plug (3164 Engine) (Later engines)

EVERY SPRING AND FALL

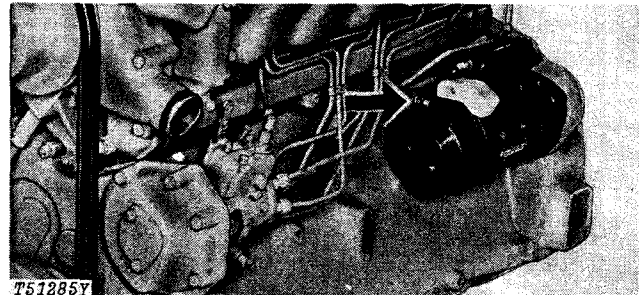
16. Cooling System

Drain, flush, and fill the cooling system with correct coolant.

CAUTION: Do not remove the radiator cap unless the engine is cool. Then loosen the cap slowly to the stop. Release all pressure before you remove the cap.

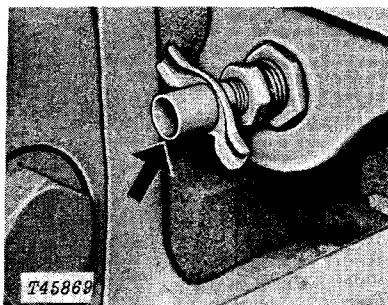
To drain the cooling system completely:

1. Open the radiator drain cock.
2. Open the cylinder block drain cock.
3. Remove the coolant drain plug of the engine oil cooler (if equipped).



T51285Y

Cylinder Block Drain Cock (6359 Engine)



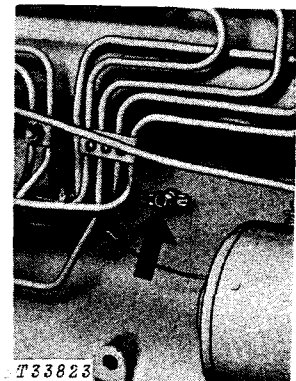
T45869

Radiator Drain (4219 Engine)



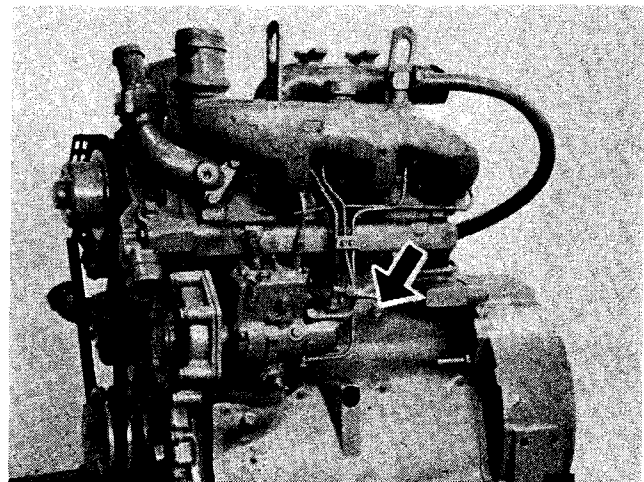
T33822

Radiator Drain Cock



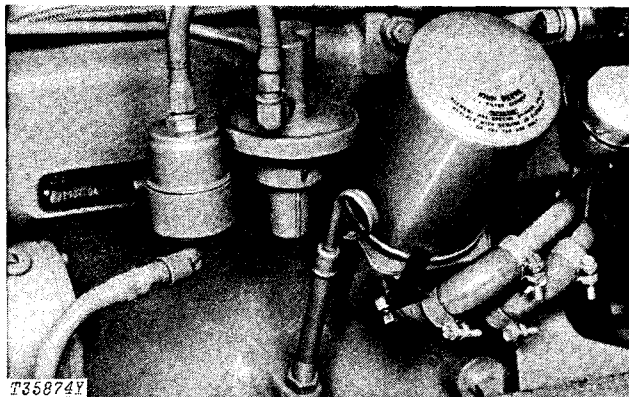
T33823

Cylinder Block Drain Cock
6414 Engine

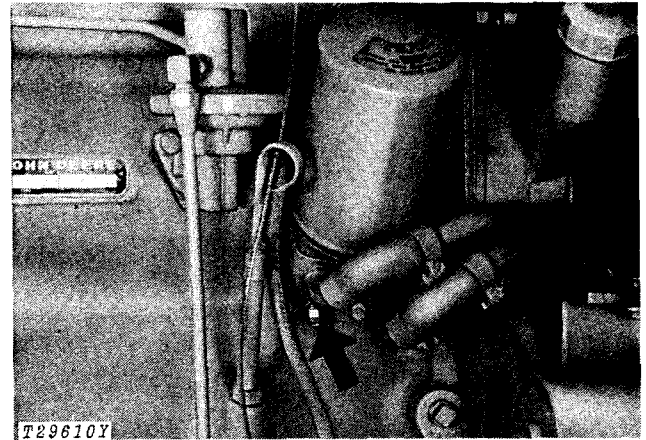


T51286Y

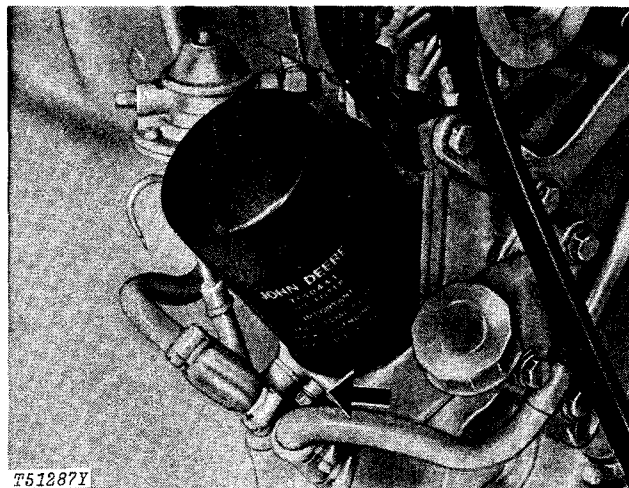
Cylinder Block Drain Plug (3164 Engine) (Later engines)



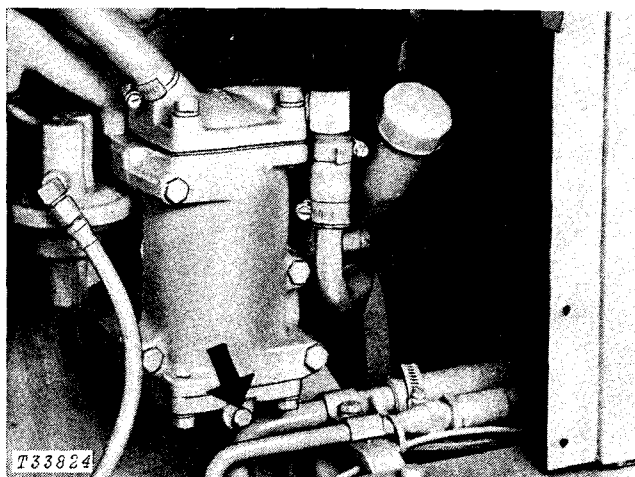
Engine Oil Cooler Drain Plug (4219 Engine)



Engine Oil Cooler Drain Plug (6329 Engine)



Engine Oil Cooler Drain Plug (6359 Engine)



Engine Oil Cooler Drain Plug (6414 Engine)

Flush the cooling system with John Deere Cooling System Cleaner, John Deere Cooling System Quick Flush, or an equivalent radiator cleaning compound.

For cold weather, use a solution of ethylene glycol antifreeze and clean, soft water. A chart on the anti-freeze can will tell you how much antifreeze to use for the freeze protection needed in your area.

If you operate your engine in extremely cold temperatures, see your John Deere distributor/dealer for information on arctic operation.

For temperatures above freezing, fill the cooling system with clean, soft water.

Add a non-chromate rust inhibitor every 500 hours or 6 months after you change coolant. Add inhibitor when you fill cooling system with water, or if you replace 1/3 or more of coolant. If you install antifreeze, do not add inhibitor for 500 hours or 6 months.

Add John Deere Cooling System Sealer or an equivalent to seal minor leaks in the cooling system.

Keep radiator fins clean. Use compressed air or water pressure.

Check hoses, clamps, and connections. Install new hoses periodically.

17. Engine Oil and Filter

Drain and fill engine with oil specified on page 8. Install a new oil filter.

NOTE: If you have not run the engine 100 hours before the season changes, change the oil and oil filter.



Maintenance

This section gives you general service information on the following:

Fuel System

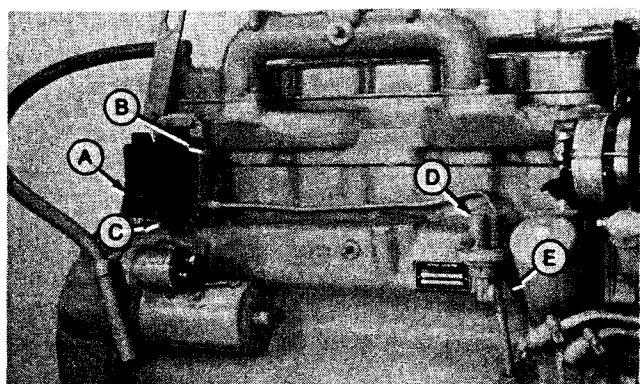
Electrical System

Miscellaneous Components

These systems and parts need service to keep your engine in the best possible condition. See your John Deere distributor/dealer for assistance.

FUEL SYSTEM

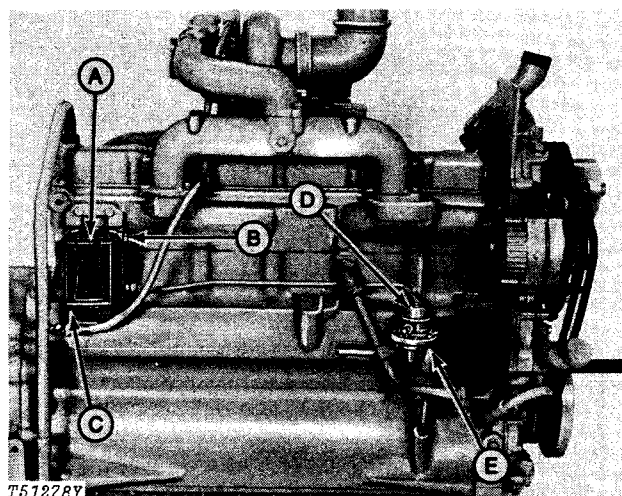
COMPONENTS



T5953AG

- | | |
|-------------------|----------------------|
| A—Fuel Filter | D—Fuel Transfer Pump |
| B—Bleed Screw | E—Fuel Transfer Pump |
| C—Fuel Drain Plug | Primer Lever |

Fuel System Components (6329 Engine)

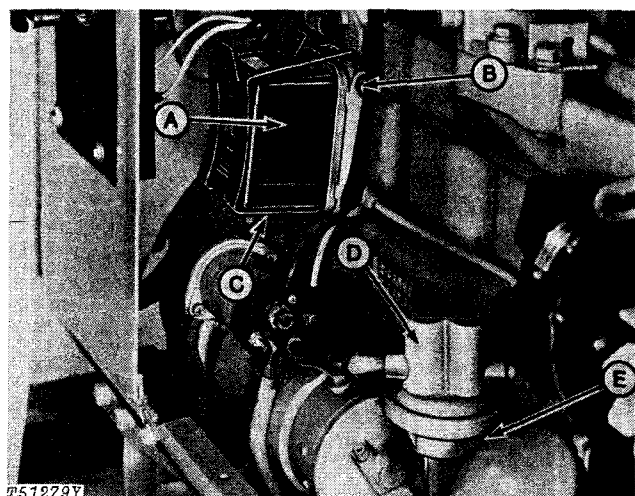


T51278Y

T51278Y

- | | |
|-------------------|----------------------|
| A—Fuel Filter | D—Fuel Transfer Pump |
| B—Bleed Screw | E—Fuel Transfer Pump |
| C—Fuel Drain Plug | Primer Lever |

Fuel System Components (6359 Engine) (Early engines)



T51279Y

T51279Y

- | | |
|-------------------|----------------------|
| A—Fuel Filter | D—Fuel Transfer Pump |
| B—Bleed Screw | E—Fuel Transfer Pump |
| C—Fuel Drain Plug | Primer Lever |

Fuel System Components (4219 Engine)

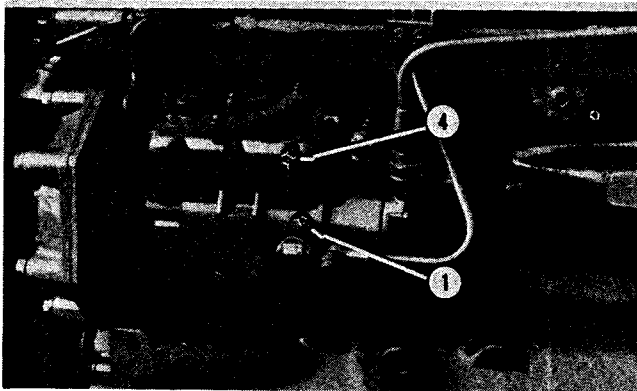
REMOVING AIR FROM FUEL SYSTEM

Remove air from fuel system:

- If you remove the fuel filter.
- If you remove the sediment bowl.
- If the engine runs out of fuel.

See page 17 for procedure.

If 3179 engine will not start after you remove air from fuel system, remove air from Roto Diesel Injection Pump.



T86732

Removing Air From Injection Pump (3179 Engine)

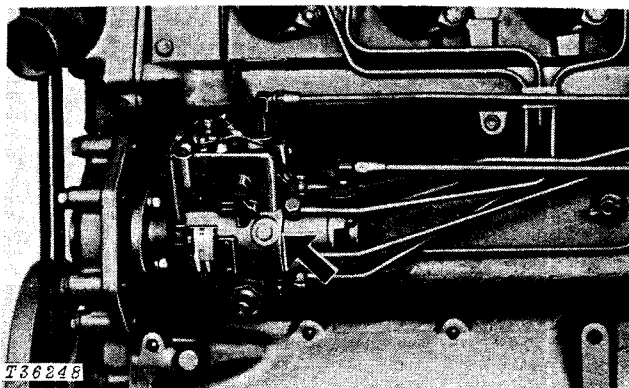
1. Loosen lower bleed screw.
2. Pump primer lever until fuel free of bubbles flows from around screw. Push lever down.
3. Tighten bleed screw to 2.5 lb-ft (3.5 N-m).
4. Loosen upper bleed screw.
5. Repeat steps 3 and 4.

FUEL INJECTION PUMP

If you change the injection pump in any way not approved by the manufacturer, the warranty could be affected. See your copy of the John Deere warranty.

Do not work on an injection pump that is not operating correctly. See your John Deere distributor/dealer for service.

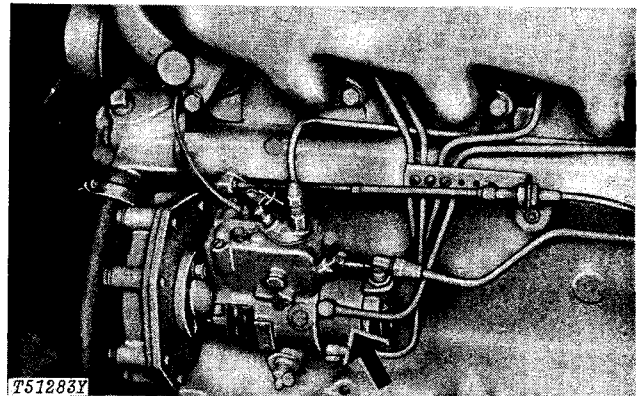
IMPORTANT: Do not clean a warm injection pump with steam or water.



T36248

T36248

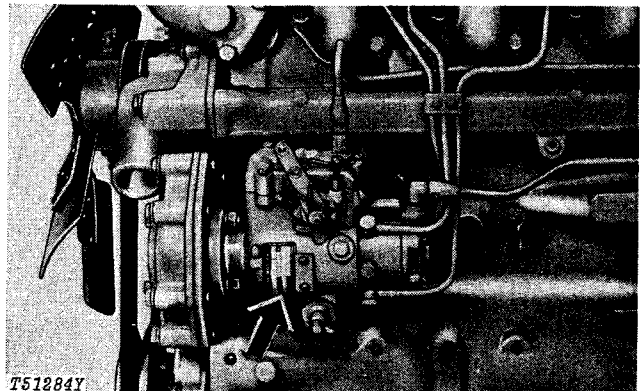
Fuel Injection Pump (6329 Engine)



T51283Y

T51283Y

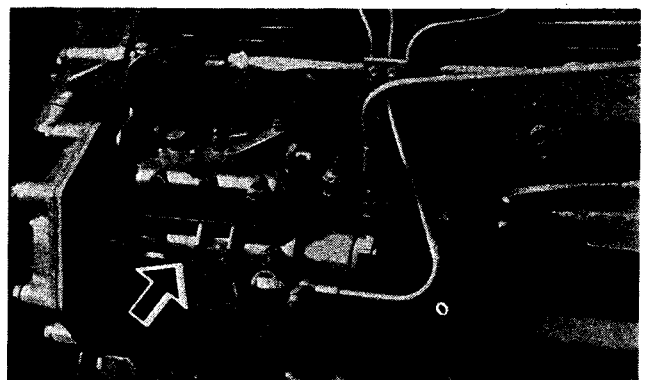
Fuel Injection Pump (4219 Engine)



T51284Y

T51284Y

Fuel Injection Pump (3164 Engine)

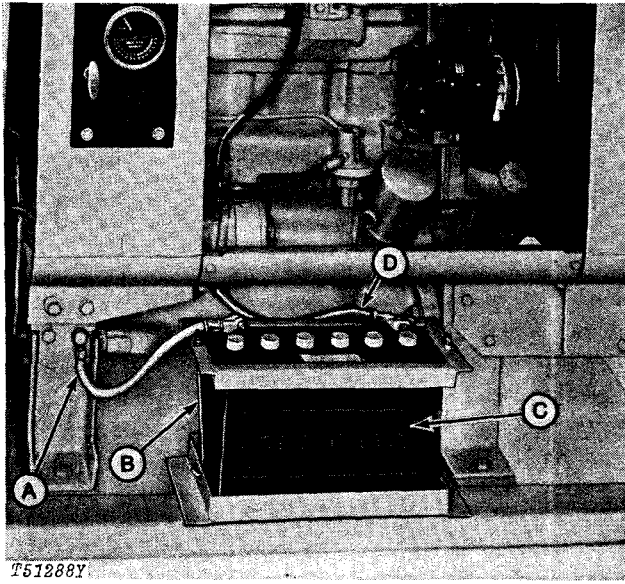


T86733

Fuel Injection Pump (3179 Engine)

ELECTRICAL SYSTEM BATTERIES

IMPORTANT: Before you work on the electrical system, disconnect the battery negative (-) cable.



A—Negative Ground Cable
B—Battery Hold-Down

C—Battery
D—Positive Cable To Starter

Battery (4219 Engine)

CAUTION: Sulfuric acid in batteries is a poison and could cause severe burns. Avoid contact with skin, eyes, and clothes. When you work around batteries, protect eyes and face from battery fluid and explosion.

Antidotes for Sulfuric Acid:

External

1. Flush skin well with water.
2. Flush eyes for 15 minutes.
3. Get medical attention immediately.

Internal

1. Drink a large amount of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical treatment immediately.

Battery gases can explode. Keep cigarettes, sparks, and flames away from batteries.

CAUTION: Do not use booster cables or adjust post connections unless you know the correct procedure. See page 5.

When you charge a battery or use a battery in a closed space, be sure there is enough ventilation.

Keep batteries where children cannot reach them.

Keep vent caps tight and level.

Cleaning Batteries

Keep the batteries clean. Wipe them with a damp cloth. Be sure vent plugs are tight.

To remove corrosion from terminals, remove the battery cables. Wash the terminals with a solution of 1/4 lb. (0.1 L) of baking soda and 1 qt. (0.9 L) of water. Flush batteries and compartment with water.

Checking Specific Gravity

Check the specific gravity of electrolyte in each battery cell.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.

NOTE: In tropical areas use 1.225 for the full-charged reading. In cold areas, use 1.280 for the full-charge reading.

Cold Weather Battery Service

Keep the electrolyte at the correct level. Keep batteries fully charged.

Storing Batteries

If the engine will be stored for more than 30 days, remove the battery. Store the battery in a cool place. Keep the battery fully charged.

BOOSTER BATTERIES

A battery charger may be used as a booster to start the engine if the specific gravity of the battery is above 1.150.

IMPORTANT: If the reading of the specific gravity of the battery is below 1.150, do not use a battery charger as a booster.

STARTER

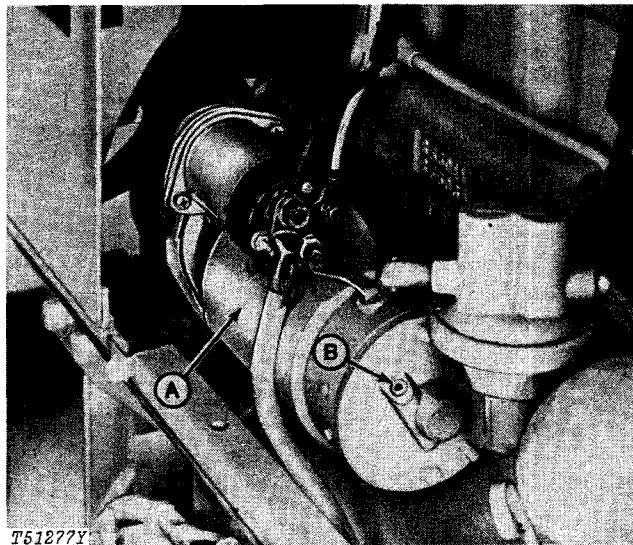
Slow Starter Operation

If the starter cranks the engine slowly, check for the following:

1. Too small or weak battery.
2. Dirty, loose, or corroded cables or wires.
3. Wrong engine oil.
4. Low air temperature.
5. Battery cables too small.

Lubricating Wicks (Delco-Remy Only)

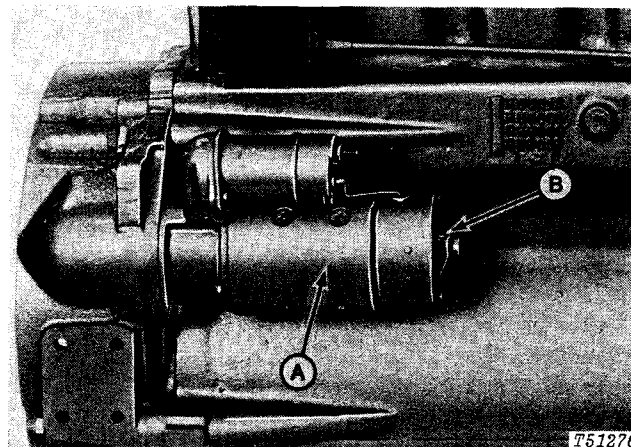
Lubricate wicks approximately every 1000 hours.



A—Starter Motor

B—Pipe Plug

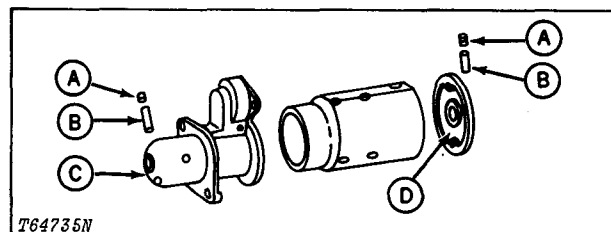
4219 Engine



A—Starter Motor

B—Pipe Plug

6329 Engine



A—Pipe Plugs
B—Wicks

C—Drive End Housing
D—Commutator End Frame

Delco-Remy Starter

1. Remove starter.
2. Remove pipe plugs (A).
3. Lubricate wicks (B) with John Deere TORQ-GARD SUPREME engine oil or equivalent. Wicks should be full of oil.
4. Install pipe plugs.
5. Install starter.

ALTERNATOR AND REGULATOR

Precautions For Alternator and Regulator

When battery is connected, follow these rules:

1. Before you work on or near the alternator or regulator, disconnect the ground strap.
2. **DO NOT TRY TO POLARIZE THE ALTERNATOR OR REGULATOR.**
3. **BEFORE** you connect the battery, be sure the alternator wires are correctly connected.
4. **DO NOT** ground the alternator output terminal.
5. If the battery is connected, or if the alternator is charging, **DO NOT** disconnect or connect any alternator or regulator wires.
6. Connect battery or a booster battery in the correct polarity.
7. If the engine is running and if the alternator is charging, **DO NOT** disconnect the battery.
8. Before you charge the battery, disconnect positive (+) cable.

IMPORTANT: Connect electrical wires only as shown on the wiring diagram, page 30.

MISCELLANEOUS COMPONENTS

Fire Extinguisher



T74091

Check fire extinguisher gauge (shown) regularly for correct charge.

Keep the extinguisher fully charged.

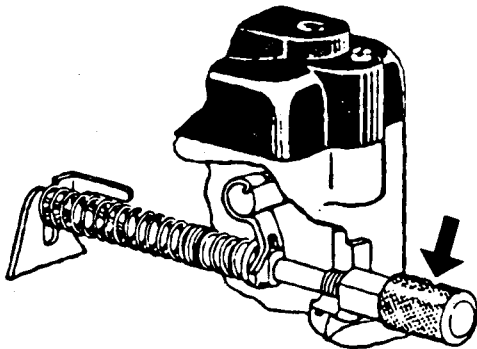
Electric Cold-weather Starting Aid



CAUTION: Use a heavy-duty grounded cord to connect coolant heater to electrical power.

Do not plug into electrical power unless heating element is immersed in coolant. Sheath could burst and result in personal injury.

Variable Speed Adjustment (generator set engines only) (Stanadyne injection pumps only)



T86735

For precise adjustment of generator set engine speeds:

1. Warm engine to normal operating temperature.
2. Run engine at rated speed.
3. apply full load.
4. Remove load.
5. Note the no-load speed or frequency.
6. Disconnect throttle linkage or cable.




NOTE: Spring-loaded type throttle lever (shown) need not be disconnected.

7. Turn knob (shown) to adjust droop.
8. Adjust and connect throttle linkage or cables.

Torque Values

NOTE: Torques shown are for dry (no lubrication on threads) hardware.

NOTE: Torque wrench tolerance is ± 10 percent of specified torque.

Cap Screw Size-Inches	Customary Hardware					
		Grade B		Grade D		Grade F
	lb-ft.	(N-m)	lb-ft.	(N-m)	lb-ft.	(N-m)
1/4	----	----	10	(14)	14	(19)
5/16	----	----	20	(27)	30	(41)
3/8	----	----	35	(47)	50	(68)
7/16	35	(47)	55	(75)	80	(108)
1/2	55	(75)	85	(115)	120	(163)
9/16	75	(102)	130	(176)	175	(237)
5/8	105	(142)	170	(230)	240	(325)
3/4	185	(251)	300	(407)	425	(576)
7/8	160	(217)	445	(603)	685	(929)
1	250	(339)	670	(908)	1030	(1396)
1-1/8	330	(447)	910	(1234)	1460	(1979)
1-1/4	480	(651)	1250	(1695)	2060	(2793)

T88884

Metric Hardware

NOTE: Torques shown are for hardware with SAE 30W oil on threads.

NOTE: Torque wrench tolerance is ± 10 percent of specified torque.

Metric Standard Thread

Thread	8.0		10.0		12.0	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M5	5.9	(4.4)	7.9	(5.8)	9.8	(7.2)
M6	9.0	(7.2)	13.6	(10.2)	16.7	(12.3)
M8	24.6	(18.1)	34.4	(25.4)	40.2	(29.6)
M10	48.1	(35.5)	67.8	(50.0)	81.5	(60.1)
M12	84.4	(62.2)	118.0	(87.0)	142.0	(105.0)
M14	133.0	(98.0)	187.0	(138.0)	226.0	(167.0)
M16	206.0	(152.0)	290.0	(214.0)	348.0	(257.0)
M18	285.0	(210.0)	396.0	(294.0)	476.0	(351.0)
M20	402.0	(296.0)	570.0	(420.0)	677.0	(499.0)
M22	540.0	(398.0)	765.0	(564.0)	914.0	(674.0)
M24	697.0	(514.0)	980.0	(723.0)	1180.0	(870.0)

Metric Fine Thread

Thread	8.0		10.0		12.0	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M8 x 1	26.5	(19.5)	37.3	(27.5)	44.2	(32.8)
M10 x 1	47.1	(34.7)	68.8	(50.7)	81.5	(60.1)
M12 x 1.5	88.4	(65.2)	123.0	(91.0)	147.0	(108.0)
M14 x 1.5	147.0	(108.0)	208.0	(152.0)	246.0	(181.0)
M16 x 1.5	221.0	(163.0)	309.0	(226.0)	373.0	(275.0)
M18 x 1.5	319.0	(235.0)	451.0	(333.0)	540.0	(398.0)
M20 x 1.5	451.0	(333.0)	628.0	(463.0)	756.0	(557.0)
M22 x 1.5	599.0	(442.0)	845.0	(623.0)	1030.0	(760.0)
M24 x 2	765.0	(564.0)	1080.0	(796.0)	1275.0	(940.0)
M26 x 2	1130.0	(833.0)	1570.0	(1150.0)	1915.0	(1412.0)

TUBE AND HOSE FITTING, 37° FLARE AND 30° CONE SEAT CONNECTOR SERVICE RECOMMENDATIONS

1. Inspect the flare and the flare seat. They must be free of dirt and defects. If repeated leaks occur, inspect for defects with a magnifying glass. If burrs and raised nicks on the connector body cannot be removed with a slip stone, replace the connector.
2. Defects in the tube flare cannot be repaired. Replace the tube. Overtightening a defective flared fitting will not stop leaks.
3. As a field repair, a ductile truncated cone shaped washer can be used between the tube flare and connector body. These washers are soft enough to fill defects in the seat and flare. They will also seal the connection. Ductile washers are available from industrial supply houses.
4. Align the tube with the fitting before attempting to start the nut. Failure to do so can cause a deformed flare and subsequent leaks. Install hoses without twists. A twisted hose attempts to straighten out when pressure is applied. This exerts a torque on the connection, eventually causing failure.
5. Lubricate the connection with hydraulic fluid, petroleum jelly or soap. Tighten the swivel nut by hand until it is snug.
6. Mark a line across the nut and connector body. This line will serve as a visual indicator as to whether the nut has been tightened and by how much.
7. Using two wrenches, one on the connector body and a torque wrench on the nut, tighten the nut to the torque value as shown in the chart. In the case of a hose, it may be necessary to use three wrenches to prevent twisting.

TUBE AND HOSE FITTING, 37° FLARE AND 30° CONE SEAT CONNECTOR TORQUE

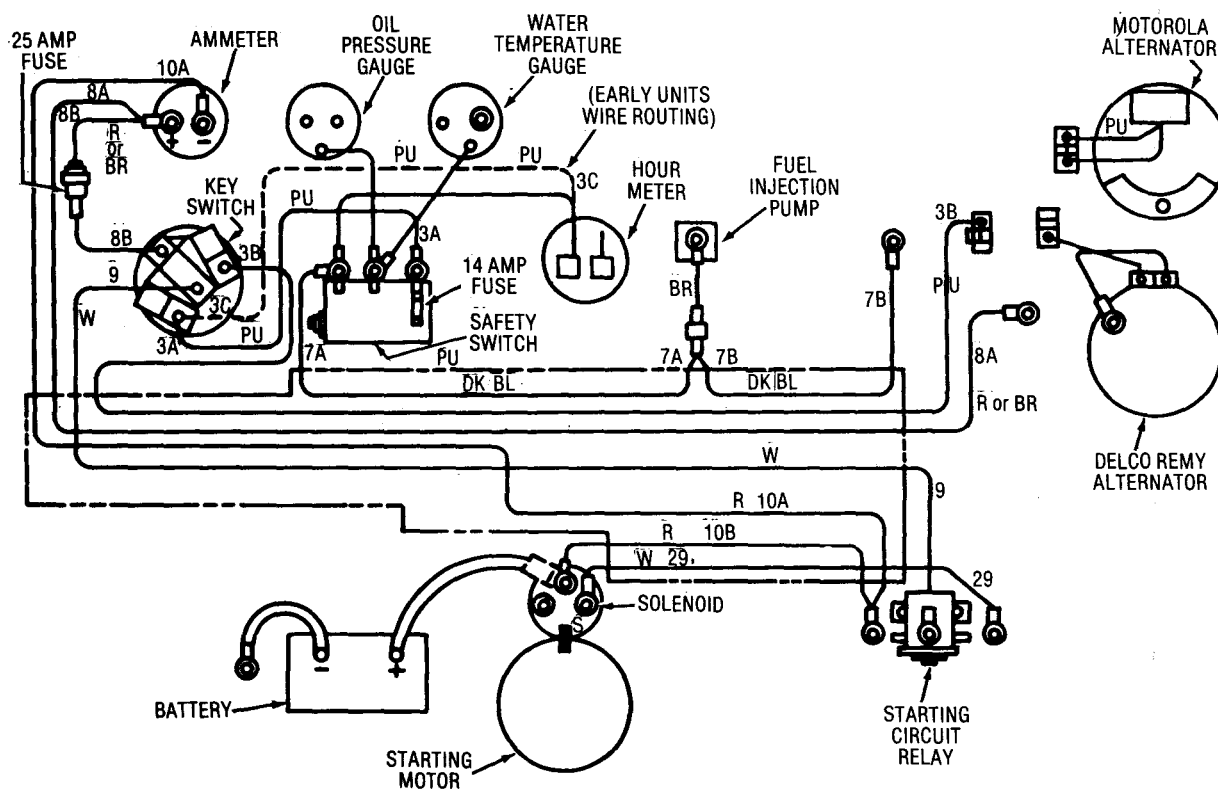
Thread Size	Torque ¹		New ² Number of Flats	Used ² Number of Flats
	N·m	(lb-ft)		
3/8-24 UNF	8	(6)	2-1/2	1
7/16-20 UNF	12	(9)	2-1/2	1
1/2-20 UNF	16	(12)	2-1/2	1
9/16-18 UNF	24	(18)	2	1
3/4-16 UNF	46	(34)	2	1
7/8-14 UNF	62	(46)	1-1/2	1
1-1/16-12 UN	102	(75)	1	3/4
1-3/16-12 UN	122	(90)	1	3/4
1-5/16-12 UN	142	(105)	3/4	3/4
1-5/8-12 UN	190	(140)	3/4	3/4
1-7/8-12 UN	217	(160)	1/2	1/2

¹ Tolerance of $\pm 10\%$.

² To be used if a torque wrench cannot be used. After tightening fitting by hand, put a mark across the fittings, then tighten fitting the number of flats shown.

³ Flare connection seal by deforming or squeezing the tube between the nut and the connector. More deformation is possible with new parts than with old. Therefore, if a torque wrench is not used for re-assembly, the values in this column must be used to prevent damage.

ELECTRICAL WIRING DIAGRAM

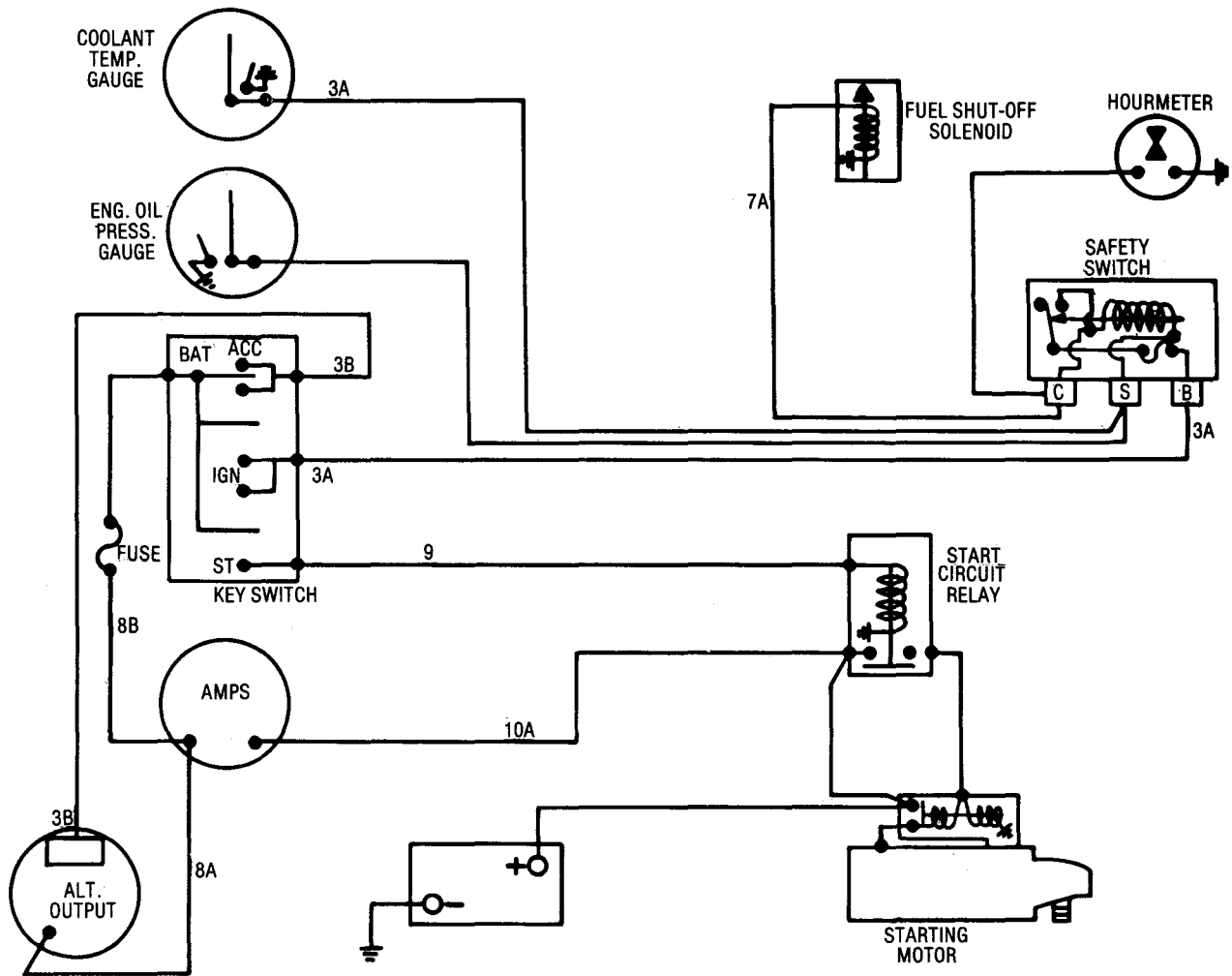


R —Red
 O —Orange
 BL —Blue
 BR —Brown

W —White
 PU —Purple
 DK —Dark

T88014

ELECTRICAL SCHEMATIC





Diagnosis/Engine

NOTE: Diagnostic charts are arranged from most probable and simplest to verify, to least likely more difficult to verify. Remember the following steps when diagnosing a problem.

Step 1. Diagnostic Charts

Step 2. Adjustments and/or see your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Engine Will Not Start Or Starts Hard	Wrong starting procedure.	Use correct procedure.
	Fuel pump primer lever is up.	Push lever down.
	Fuel tank empty.	Check fuel quantity.
	Fuel tank vent plugged.	Remove cap and listen to sound of air entering tank.
	Water in fuel or water frozen in fuel line.	Drain water from fuel tank trap. Change filter. Inspect fuel filter for water.
	Debris in fuel or improper type of fuel.	Check inlet strainer and outlet strainer for debris. Check water trap for debris with a flash light through the filter neck toward bottom right corner of fuel tank. Check fuel.
	Air leak on suction side of fuel system.	Check for bubbles in fuel filter and tighten connections. Inspect fuel lines for damaged lines.
	No electrical power to injection pump solenoid.	Turn key switch to "On". Must hear click at injection pump. Reset circuit breaker.
	Wrong engine oil.	Use correct oil.
	Fuel transfer pump diaphragm leaking.	Check engine oil for fuel dilution.
	Slow cranking speed.	Check battery and connections.
	Restricted air filter.	Check air filter restriction indicators and air filters.
	Stuck injection pump metering valve.	Tap injection pump housing (lightly). If engine now starts, see your John Deere dealer.
	Faulty electric shut-off solenoid.	See your John Deere dealer.
	Improper injection pump timing.	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Engine Will Not Start Or Starts Hard—Continued	Defective injection pump.	See your John Deere dealer.
	Defective injection nozzle(s).	See your John Deere dealer.
	Worn compression rings or low compression.	See your John Deere dealer.
	Blown head gasket.	See your John Deere dealer.
Engine Surges Or Stalls Frequently	Air in fuel.	Inspect filter for evidence of air in fuel. Tighten connections and bleed fuel system.
	Fuel tank vent plugged.	Remove cap and listen to sound of air entering tank. Replace cap.
	Debris in fuel or improper type of fuel.	Check fuel tank inlet strainer and outlet strainer for debris. Check water trap for debris with a flash light through filter neck toward bottom right corner of fuel tank. Check fuel.
	Water in fuel.	Drain water trap and inspect filter element for water.
	Fuel filter plugged.	Replace filter.
	Return line from injection pump to tank restricted.	See your John Deere dealer.
	Restrictor fitting on top fitting in injection pump plugged.	See your John Deere dealer.
	Injection pump metering valve sticking.	See your John Deere dealer.
	Fuel injection pump out of time.	See your John Deere dealer.
	Engine overheating.	See problem "Engine Overheats."
	Defective fuel transfer pump.	See your John Deere dealer.
	Defective fuel injection pump.	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Engine Surges or Stalls Frequently—Continued	Defective injection nozzle(s).	See your John Deere dealer.
	Improper valve clearance.	Check and adjust valve clearance.
	Valves sticking or burned.	See your John Deere dealer.
	Worn or broken compression rings or cylinder head gasket leaking.	See your John Deere dealer.
Engine Misses	Air in fuel.	Check for evidence of air in filter. Tighten connections and bleed fuel system.
	Debris in fuel or wrong fuel.	Check fuel tank strainer (with flash light) and examine fuel. Check fuel filter for debris. Clean.
	Idle speeds out of adjustment (too low).	See your John Deere dealer.
	Fuel injection pump out of time.	See your John Deere dealer.
	Defective fuel transfer pump.	See your John Deere dealer.
	Injection pump governor faulty or metering valve sticking.	See your John Deere dealer.
	Engine overheating.	See problem "Engine Overheats."
	Incorrect valve clearance.	Check and adjust valve clearance.
	Bent push rods.	See your John Deere dealer.
	Cylinder head gasket leaking.	See your John Deere dealer.
	Valve sticking or burned.	See your John Deere dealer.
	Worn or broken compression rings.	See your John Deere dealer.
	Defective fuel injection pump.	See your John Deere dealer.
	Defective injection nozzle(s).	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Engine Does Not Develop Full Power	Engine overloaded.	Reduce load.
	Fuel tank strainer plugged.	Check water trap for debris with a flash light through filter neck toward bottom right corner of fuel tank. .
	Fuel filter clogged.	Replace fuel filter.
	Wrong grade of fuel.	Drain and add correct fuel.
	Air system restricted.	Check air filter restriction indicator and air filters.
	Engine overheating.	See problem "Engine Overheats."
	Incorrect high idle speed (too low).	See your John Deere dealer.
	Incorrect engine or injection pump timing.	See your John Deere dealer.
	Injection pump return fuel tube or fittings are restricted.	See your John Deere dealer.
	Fuel transfer pump malfunction.	See your John Deere dealer.
	Fuel line restricted.	See your John Deere dealer.
	Air leak in intake manifold.	See your John Deere dealer.
	Incorrect valve clearance.	Adjust valve clearance.
	Injection pump delivery or governor faulty.	See your John Deere dealer.
	Defective turbocharger.	See your John Deere dealer.
	Engine temperature low.	See problem "Engine Runs Cold."

Continued on next page

Problem	Possible Cause	Verification/Solution
Engine Does Not Develop Full Power Continued	Defective injection nozzle.	See your John Deere dealer.
	Muffler restricted.	See your John Deere dealer.
	Low compression.	See your John Deere dealer.
	Worn camshaft.	See your John Deere dealer.
	Engine overloaded.	Reduce load.
Engine Emits Excessive Black or Greay Exhaust Smoke	Restricted air filter.	Check air filter restriction indicator and air filters. Replace.
	Incorrect grade of fuel.	Use correct grade of fuel.
	Incorrect injection pump timing.	See your John Deere dealer.
	Air leak between turbo and manifold.	Check. Repair.
	Faulty speed advance.	See your John Deere dealer.
	Excessive fuel delivery.	See your John Deere dealer.
	Defective injection nozzle(s).	See your John Deere dealer.
	Defective turbocharger.	See your John Deere dealer.
	Cold engine.	Warm engine to normal operating temperature.
Engine Emits Excessive Blue or White Smoke	Cranking speed too slow.	Check batteries and connections.
	Incorrect grade of fuel.	Use correct grade of fuel.
	Thermostat faulty.	Remove and check thermostat.
	Injection pump out of time.	See your John Deere dealer.
	Engine running too cold.	See your John Deere dealer.
	Defective injection nozzle(s).	See your John Deere dealer.
	Low compression.	See your John Deere dealer.
	Excessive wear in liners and/or piston rings stuck.	See your John Deere dealer.
Slow Acceleration	Improper fuel.	Use correct grade of fuel.
	Defective fuel injection pump.	See your John Deere dealer.
	Defective injection nozzle(s)	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Detonation (Excess Engine Knock)	Stuck ether applicator.	See your John Deere dealer.
	Low coolant temperature.	See problem "Engine Runs Cold."
	High coolant temperature.	See problem "Engine Overheats."
	Incorrect injection pump timing or injection pump advance faulty.	See your John Deere dealer.
Abnormal Engine Noise	Low or incorrect engine oil.	Add correct oil to proper level.
	Engine oil diluted.	Inspect engine oil. Determine cause. See your John Deere dealer.
	Incorrect fuel injection pump timing.	See your John Deere dealer.
	Turbocharger failure.	See your John Deere dealer.
	Excessive valve clearance.	Adjust valve clearance.
	Bent push rods.	See your John Deere dealer.
	Worn rocker arm shafts.	See your John Deere dealer.
	Loose connecting rod caps.	See your John Deere dealer.
	Loose main bearing caps.	See your John Deere dealer.
	Worn main bearings.	See your John Deere dealer.
	Worn connecting rod bearings.	See your John Deere dealer.
	Incorrect cam timing.	See your John Deere dealer.
	Scored piston.	See your John Deere dealer.
	Worn piston pin bushings and pins.	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Low Oil Pressure	Low oil level.	Add oil to proper level. Inspect engine oil.
	Plugged oil filter.	Install new filter.
	Wrong viscosity oil/oil diluted with diesel fuel.	Change oil. See your John Deere dealer.
	Defective oil pressure gauge or sensor.	See your John Deere dealer.
	Defective oil pressure control valve.	See your John Deere dealer.
	Turbocharger shaft seal leaking.	See your John Deere dealer.
	Plugged oil pump intake screen.	See your John Deere dealer.
	Loose oil pump drive gear.	See your John Deere dealer.
	Worn oil pump gear or housing.	See your John Deere dealer.
	Excessive main bearing clearance.	See your John Deere dealer.
	Excessive connecting rod bearing clearance.	See your John Deere dealer.
	Cracked cylinder block.	See your John Deere dealer.
	Leakage at internal oil passage.	See your John Deere dealer.
High Oil Pressure	Wrong viscosity oil (too thick).	Change oil/check for antifreeze in oil.
	Defective oil pressure gauge or sender.	See your John Deere dealer.
	Defective oil pressure control valve.	See your John Deere dealer.
Engine Uses Too Much Oil	Wrong engine oil.	Use correct oil.
	Oil leaks.	Check for leaks in lines, around gaskets and drain plug.
	Coolant temperature too high.	See problem "Engine Overheats."
	Air intake system plugged.	Check air cleaner and hoses.

Problem	Possible Cause	Verification/Solution
Engine Overheats	Low coolant level.	Fill cooling system and check for leaks.
	Low engine oil level.	Add oil.
	Loose or broken fan belt.	Tighten or replace belt.
	Fan on backwards.	Check for correct fan installation.
	Radiator dirty or plugged.	Check air flow. Clean radiator.
	Radiator shroud missing damaged or baffles missing.	Inspect. Repair or replace.
	Engine overloaded.	Reduce load.
	Improper fuel.	Use correct grade of fuel.
	Defective radiator cap.	Replace cap.
	Faulty gauge or sender.	See your John Deere dealer.
	Incorrect injection pump timing.	See your John Deere dealer.
	Excessive leakage in hydraulic system.	See your John Deere dealer.
	Faulty thermostats (stuck closed).	See your John Deere dealer.
	Thermostats missing, cooling system coated with lime deposits.	Flush cooling system. See your John Deere dealer.
	Defective water pump.	See your John Deere dealer.
	Excessive fuel delivery.	See your John Deere dealer.
	Scored piston.	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Engine Runs Cold	Defective temperature gauge or sender.	See your John Deere dealer.
	Defective thermostat (struck open).	See your John Deere dealer.
Oil In Coolant Or Coolant In Oil	Leaking heat exchanger.	See your John Deere dealer.
	Leaking cylinder head gasket.	See your John Deere dealer.
	Leaking cylinder liner package.	See your John Deere dealer.
	Cracked cylinder liner.	See your John Deere dealer.
	Cracked cylinder block.	See your John Deere dealer.
Excessive Fuel Consumption	Air system restricted.	Check filter restriction indicator and air filters. Replace.
	Leaking in fuel system.	Inspect. Repair.
	Incorrect grade of fuel.	Drain, refill with correct fuel.
	Engine not at correct temperature.	Check thermostats.
	Leak in intake or exhaust system (turbocharged engines).	Check both systems. Install new parts if necessary.
	Incorrect injection pump timing.	See your John Deere dealer.
	Faulty turbocharger.	See your John Deere dealer.
	Faulty injection nozzles.	See your John Deere dealer.
Turbocharge Excessively Noisy or Vibrates	Bearings not lubricated.	See your John Deere dealer.
	Air leak in engine, intake or exhaust manifold.	See your John Deere dealer.
	Improper clearance between turbine wheel and turbine housing.	See your John Deere dealer.
	Broken blades on turbine.	See your John Deere dealer.

44 *Diagnosis/Engine*

Problem	Possible Cause	Verification/Solution
Oil Dripping From Turbocharger Adapter	Damaged or worn bearings and/or worn seals.	See your John Deere dealer. Check for proper engine service intervals or dirt entering internally into engine. Check vent tube to ensure tube is not plugged. Clean.
	Turbocharger oil return line carbon build up where line passes exhaust manifold.	Remove line. Inspect, clean.
Excessive Drag in Turbocharger Rotating Members	Carbon build-up behind turbine wheel caused by combustion deposits.	See your John Deere dealer.
	Dirt build-up behind compressor wheel caused by air intake leaks.	See your John Deere dealer.
	Bearing seizure or dirty or worn bearings, caused by excessive temperature, unbalanced wheel, dirty oil, oil starvation, or insufficient lubrication.	See your John Deere dealer.



Diagnosis/Battery

Problem	Possible Cause	Verification/Solution
Battery Uses Too Much Water	Cracked battery case.	Replace battery.
	High ambient temperature.	Refill with water.
	Shorted cell.	Check if one or more cells take more water than the others.
Cracked Battery Case	Battery being overcharged.	See your John Deere dealer.
	No battery hold down clamp.	Replace battery and install hold down clamp.
	Loose battery hold down clamp.	Replace battery and install hold down clamp.
	Battery hold down clamp too tight.	Replace battery and install battery hold down clamp correctly.
Low Battery Output	Frozen battery.	Keep battery fully charged in cold weather.
	Low water level.	Add water.
	Dirty or wet battery top causing discharge.	Clean and wipe dry battery top.
	Corroded or loose battery cables.	Clean and tighten battery cables.
	Broken battery post.	Wiggle battery post by hand, if post wiggles or turns, replace battery.
	Low battery voltage.	See your John Deere dealer.
	Defective battery cell.	See your John Deere dealer.
	Excessive electrical load.	See your John Deere dealer.
	Wrong size battery.	See your John Deere dealer.
Battery Will Not Take A Charge	Alternator-fan belt loose or faulty.	Tighten belt or install new belt.
	Alternator not charging.	Check belt tension. See your John Deere dealer.



Diagnosis/Starting Circuit

Problem	Possible Cause	Verification/Solution
Starting Motor Will Not Turn	Defective starter.	Listen for "Click" from starter solenoid. If click is heard, the starter control circuit is functioning. If "Click" is not heard, see your John Deere dealer.
	Defective start relay.	With vehicle in neutral, and clutch pedal depressed, open engine service door and listen for "click" from starter relay when the key switch is on and the start button is pushed. If click is heard, the key switch, circuit breaker, start fuse connectors, start button, and neutral start switch are functioning and the starter relay, relay ground, or starter is defective. See your John Deere dealer.
	Circuit breaker tripped.	Open engine service door and push reset button "IN" on back side of circuit breaker.
	Defective start fuse.	Check and replace, if necessary.
	Loose "bullet" connectors on start fuse holder.	See your John Deere dealer.
	Loosen "RED" connector.	Remove battery cover and push connectors together.
	Loose or corroded connections.	Clean and tighten connections.
	Low battery power.	Check electrolyte level of each cell. Check specific gravity of each cell.
	Defective key switch.	See your John Deere dealer.
	Defective start switch.	See your John Deere dealer.
	Defective start relay.	See your John Deere dealer.
	Defective start relay ground.	See your John Deere dealer.
	Defective start relay contacts.	See your John Deere dealer.
	Defective battery.	See your John Deere dealer.
	Corroded, loose or broken battery post.	See your John Deere dealer.

Problem	Possible Cause	Verification/Solution
Starting Motor Will Not Turn—Continued	Excessive engine load.	See your John Deere dealer.
	Defective wiring.	See your John Deere dealer.
Starter Solenoid Chatters	Poor or corroded connections at battery, battery ground strap or starter.	Inspect, clean, and tighten if necessary.
	Low battery voltage.	See your John Deere dealer.
Starting Motor Spins But Will Not Crank Engine	Piston gear not moving into engine flywheel ring gear.	See your John Deere dealer.
	Broken teeth on flywheel.	See your John Deere dealer.
Engine Cranks Slowly	Loose or corroded battery cables.	Inspect and clean or tighten.
	Loose battery ground cable.	Open left engine service door and inspect and tighten battery ground cable.
	Battery cables too small.	Change to correct size.
	Excessive engine load.	Change engine oil to proper grade for temperature.
	Low battery voltage.	See your John Deere dealer.
Starting Motor Continues To Run	Starter solenoid stuck.	Lightly tap on case of starter solenoid.
	Starter not disengaging.	Lightly tap on starter case to determine if starter "shift" lever is stuck.
	Starter relay stuck "ON."	Lightly tap on starter relay to determine if relay is stuck.
	Defective wiring harness.	See your John Deere dealer.
Noises Produced When Engine is Cranking	Broken teeth in ring gear.	See your John Deere dealer.
	Overrunning clutch slipping.	See your John Deere dealer.
	Defective starting motor.	See your John Deere dealer.



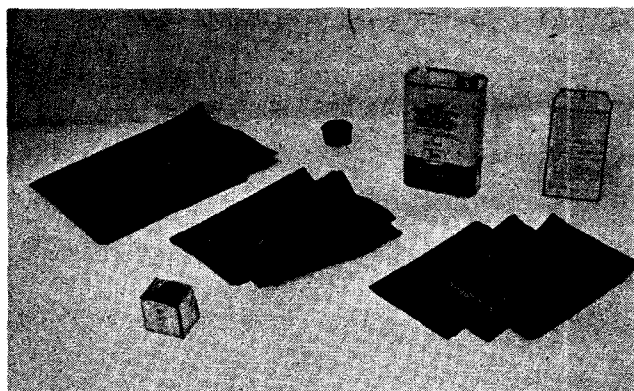
Diagnosis/Charging Circuit

Problem	Possible Cause	Verification/Solution
Charging Indicator Light	Loose or glazed alternator belt. Engine rpm low.	Check belt—replace if glazed, tighten if loose. Raise engine rpm above 1000 rpm. If light remains on see your John Deere dealer.
	Defective diode or phase winding.	Increase engine rpm to fast idle—if light goes out or gets dim, indicates a defective diode or phase winding. See your John Deere dealer.
	Excessive electrical load from added accessories.	See your John Deere dealer.
	Loose or corroded electrical connections on battery, ground strap, starter, or alternator.	Inspect, clean, or tighten electrical connections.
	Defective battery.	See your John Deere dealer.
	Defective regulator or alternator.	See your John Deere dealer.
Alternator Light "Out" But Low Charging System Voltage	Defective indicator light bulb.	Inspect and replace if necessary.
	Defective gauges fuse.	Turn key switch "on" and look for any gauge movement. Replace fuse.
	Defective wiring harness.	See your John Deere dealer.
High Charging System Voltage	Poor connection or broken wire between alternator and starter solenoid.	See your John Deere dealer.
	Defective regulator.	See your John Deere dealer.
Noisy Alternator	Worn or defective bearings in alternator.	Remove belt and feel for rough bearing while turning alternator pulley.
	Defective drive belt.	Inspect and replace if necessary.
	Pulley not aligned.	Inspect.
	Loose alternator belt or mounting.	Inspect and tighten if necessary.
	Defective diodes.	See your John Deere dealer.



Storage

STORING THE ENGINE



T85452

Before you store your engine, see your John Deere distributor/dealer for an Engine Storage Protection Kit (AR41785) or equivalent.

Follow directions on the tag in this kit.

IMPORTANT: Inhibitor easily changes to gas. Seal or tape an opening immediately after you use inhibitor.

Also, follow these steps:

1. Repair worn or damaged parts. Install new parts if necessary.
2. Loosen the alternator and fan belts.
3. Clean the air cleaner element.
4. Put grease or corrosion preventive on unpainted metal surfaces.
5. Paint areas that need it.
6. Store the engine in a dry, protected place. If the unit must be stored outside, cover it.

REMOVING THE ENGINE FROM STORAGE

1. Follow instructions on the tag of the Engine Storage Protection Kit.
2. Remove grease and corrosion preventive from engine.
3. Adjust alternator and fan belts.
4. Fill fuel tank. Bleed fuel system.



CAUTION: Start engine **ONLY** in a well-ventilated place.

To start and warm the engine:

1. Disconnect the electric shut-off wire from the injection pump.
2. Crank the engine until the oil pressure gauge shows pressure.

IMPORTANT: Do not crank the engine for more than 20 seconds.

3. After the gauge shows pressure, connect the shut-off wire.
4. Start the engine.
5. Run the engine several minutes at one-third speed.

IMPORTANT: Before you run the engine under load, check carefully operation of all engine systems.

NOTE: After extended storage follow these steps:

1. Check condition of all hoses and connections.
2. Warm the engine.
3. Stop the engine.
4. Install new fuel filter, engine oil filter, and engine oil.



Crime Prevention Tips

TAKE A BITE OUT OF
CRIME

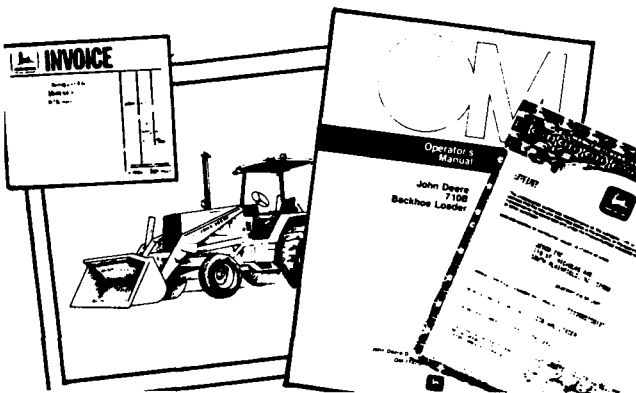
© 1979 The Advertising Council, Inc.



TS140



TS156



TS157

Good Advice

Keep your machine damage-free and **YOURS!**

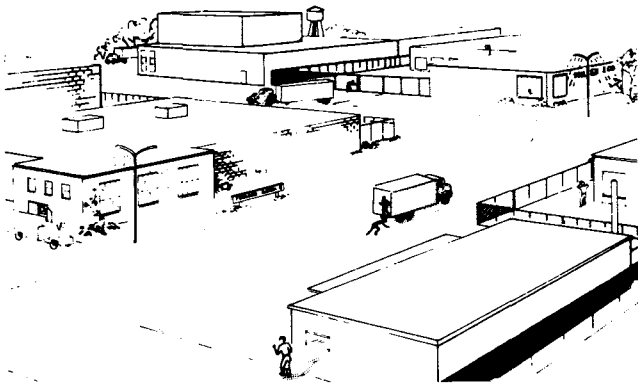
Follow the advice on these pages to reduce vandalism, discourage theft, and help recover your machine if it is stolen.

Record identification Numbers

1. Record Product Identification Number (PIN) of unit and identification numbers of engine, component, attachment, etc. **EXACTLY** as they appear on the plates.
2. Check that the complete and correct numbers appear on all documentation (insurance, financial, warranty, manufacturer's certificate of origin, etc.). Keep all documents in a safe location.
3. If available, participate in an "Owner Applied Numbering Program" and mark your own machines.

Maintain Documented Proof Of Ownership

1. Keep in a safe location all documents (invoices, warranty cards, manufacturer's certificate of origin, if available, etc.) that accompanied your machines at the time of purchase.
2. Take color photographs of each machine from several angles.
3. Maintain an up-to-date inventory of all machines. Check regularly to insure no machines have been stolen.



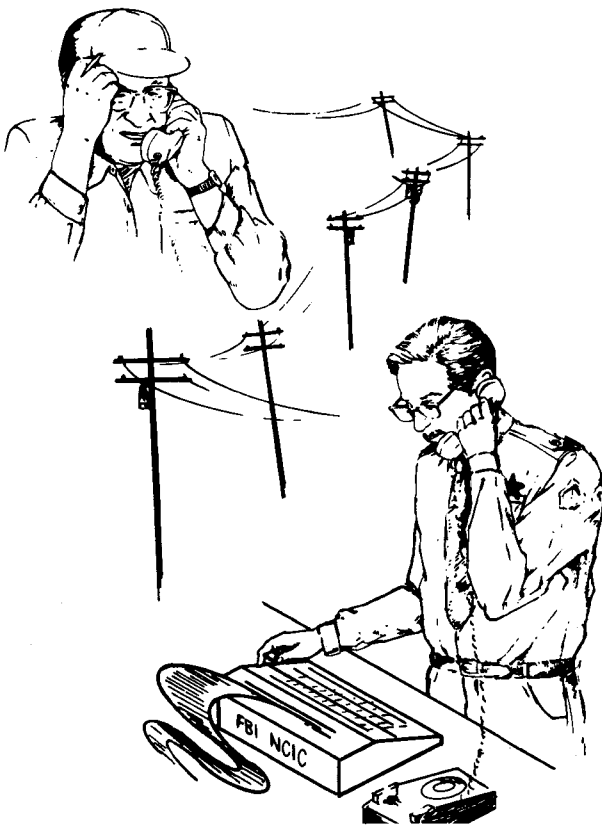
TS159

Reduce Vandalism

1. Install vandal protection devices especially if parking machine in high-risk areas.
2. Solicit assistance for watching machine from individuals residing in the area.
3. Take written notes and report to law enforcement all suspicious vehicles or persons.
4. Participate in a "Neighborhood Watch Program."

Report Theft

1. If a theft occurs, notify the law enforcement agency having jurisdiction and the insurance carrier immediately.
2. Give a full description and a complete identification number(s) to the investigating officer and insurance carrier.
3. If available, provide the investigating officer with photographs of the actual machine, manufacturer's literature and knowledge of any identifiable marks that would assist in identifying the machine.
4. Ask for verification that the stolen machine has been entered into the National Crime Information Center (NCIC) operated by the FBI in Washington D.C.
5. Notify your John Deere dealer of the theft and request that, if possible, a notice be posted that provides the description and identification information.
6. Regularly check the identification plates on all machines and report any removed plates to law enforcement immediately. Promptly contact your dealer and order a duplicate identification plate.



TS146

Specifications



UNIT OF		Series 300											
SPECIFICATION	MEASURE	3164DF	3179DF	4219DF	4239DF	4239TF	4276DF	4276TF	6329DF	6359DF	6359TF	6414DF	6414TF
Number of cylinders		3	3	4	4	4	4	4	6	6	6	6	6
Fuel		Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Bore	in (mm)	4.02 (102)	4.19 (106)	4.02 (102)	4.19 (106)	4.19 (106)	4.19 (106)	4.19 (106)	4.02 (102)	4.19 (106)	4.19 (106)	4.19 (106)	4.19 (106)
Stroke	in. (mm)	4.33 (110)	4.33 (110)	4.33 (110)	4.33 (110)	4.33 (110)	5.00 (127)	5.00 (127)	4.33 (110)	4.33 (110)	4.33 (110)	5.00 (127)	5.00 (127)
Displacement	cu. in. cm ³	164 (2690)	179 (2940)	219 (3590)	239 (3917)	239 (3917)	276 (4520)	276 (4520)	329 (5390)	359 (5885)	359 (5885)	414 (6780)	414 (6780)
Compression ratio		17.2:1	17.2:1	17.2:1	17.2:1	16.8:1	16.8:1	16.8:1	17.2:1	17.2:1	16.8:1	16.8:1	16.8:1
Rated speed	RPM	2500	2500	2500	2500	2500	2500	2200	2500	2500	2500	2200	2200
Power (maximum intermittent) @ RS without fan	hp kW	52 (38)	56 (42)	70 (53)	75 (56)	94 (70)	80 (60)	95 (72)	104 (77)	113 (84)	142 (106)	115 (87)	142 (107)
Power (continuous) @ 2200 rpm without fan	hp kW	44 (33)	47 (35)	59 (44)	63 (47)	78 (58)	68 (51)	80 (60)	87 (65)	95 (71)	114 (85)	103 (77)	121 (90)
Fast idle	RPM	2700	2700	2700	2700	2700	2700	2400	2700	2700	2700	2400	2400
Slow idle	RPM	800	800	800	800	800	800	800	800	800	800	800	800
Torque @ RPM (max.) without fan	lb/ft (N·m) @ 1500	128 (174) @ 1500	144 (195) @ 1300	168 (228) @ 1400	187 (254) @ 1300	226 (306) @ 1600	206 (279) @ 1100	263 (357) @ 1500	243 (330) @ 1400	280 (380) @ 1200	338 (459) @ 1400	320 (434) @ 1100	396 (537) @ 1500
Basic Weight	lb (kg)	695 (315)	695 (315)	845 (383)	845 (383)	975 (442)	950 (431)	975 (442)	1145 (519)	1145 (519)	1250 (567)	1220 (553)	1250 (567)
Flywheel housing and flywheel (SAE No.)		2 4	4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4
Nozzles	mm	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Fuel filter area	in. ² cm ²	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)	800/400 (5162/2581)
Dimensions:													
Width	in. (mm)	19.88 (505)	19.88 (505)	19.72 (500.9)	19.72 (500.9)	19.72 (500.9)	19.72 (500.9)	19.72 (500.9)	19.62 (498.5)	19.62 (498.5)	19.62 (498.5)	19.62 (498.5)	19.62 (498.5)
Height	in. (mm)	32.01 (813)	32.01 (813)	32.03 (812.6)	31.9 (810.3)	37.16 (943.9)	33.31 (848.1)	37.16 (943.9)	31.78 (807.2)	38.72 (983.5)	40.73 (1033.1)	36.58 (929.1)	42.15 (1070.6)
Length	in. (mm)	27.64 (702.1)	27.64 (702.1)	32.68 (830)	32.72 (830)	33.58 (852.9)	32.72 (831.1)	33.58 (853)	44.39 (1127.5)	43.63 (1108.2)	43.63 (1108.2)	43.63 (1108.2)	43.63 (1108.2)
Engine oil capacity with filter change	qt. (L)	9 (8.5)	9 (8.5)	9 (8.5)	9 (8.5)	15 (14)	15* (14)	15 (14)	12 (11.4)	18 (17)	18 (17)	18 (17)	18 (17)
without filter change	qt. (L)	8 (7.6)	8.5 (8)	8 (7.6)	8 (7.6)	14 (13.2)	14* (13.2)	14 (13.2)	11 (10.4)	17 (16)	17 (16)	17 (16)	17 (16)

*Optional oil pan capacity is 9 qt. (8.5 L) with filter change and 8 qt. (7.6 L) without filter change.



Index

A	L-M
Accessory Code List 1	Lubricants 8
Air Cleaner 12	Maintenance 25
Air Intake Hoses 18	Miscellaneous Components 29
Alternator 29	N
Alternator-Fan Belt(s) 13	Normal Operating Conditions 6
Air Intake System Leak Test 21	Nozzles, Fuel Injection 14
B	O
Batteries 15,27	Operation 5,6
Booster Batteries 5,6,27	P
C	Periodic Maintenance 9-24
Cold Weather Starting 5	Periodic Maintenance Chart 10,11
Coolant Heater 5	Periodic Maintenance, Detailed 12-24
Cooling System 23,24	Pre-Start Inspection 5
Crime Prevention Tips 50	R
E	Radiator 15,18
Electrical System 27-29	Regulator 29
Engine Breather 22	Removing Air From Fuel System 17,25
Engine Oil 8,14-16,24	S
Engine Oil Filter 16,24	Safety Rules 2,3
Engine Serial Number 1	Serial Number 1
Engine Speeds 6,22,52	Service Intervals 9
Engine Valves 19-21	Specifications 52
Engine Warm-Up 6	Starter 28
F	Starting Aid 5
Fan Belt 13	Starting the Engine 5
Filter, Fuel 17	Stopping the Engine 6
Fire Extinguisher 29	Storage 49
Fuel Injection Nozzles 14	T
Fuel Injection Pump 26	Throttle 3,6
Fuel System 25,26	Torque Charts 30
Fuel System Components 25	Transfer Pump, Fuel 17
Fuel System, Removing Air 17,25,26	Diagnosis 35-48
Fuel Tank, Filling 7	V
Fuel Transfer Pump 18	Valve Adjustment 19-21
Fuels 7	Variable Speed Adjustment 30-32
G-H	Vent Tube 20
Gauges 4	W
Hoses, Air Intake 17	Warm-Up 6
I	Wiring Diagram 33
Injection Nozzles, Fuel 14	
Injection Pump, Fuel 26	
Instruments 4	

JOHN DEERE SERVICE LITERATURE AVAILABLE...

To order these publications, fill out the form below and mail it with payment to the address given. Make checks payable to Deere & Co. Service Publications. Please allow three weeks for delivery. Prices include handling, taxes and postage to anywhere in the U.S.A. and Canada.

John Deere Distribution Service Center, Department S/P
1400 3rd Ave., Moline, Ill. 61265

Please send to...

Name _____

Address _____

Town _____

State _____ Zip _____

Title	Order No.	Qty.	Price Each
Parts Catalog - 3164D	PC-1416		\$ 6.75
3179D	PC-3178		4.50
4219D	PC-1417		6.75
4239D and T	PC-3153		6.75
4276D and T	PC-1469		9.00
6329D	PC-1418		6.75
6359D and T	PC-3154		6.75
6414D and T	PC-1471		6.75
Operator's Manual Series 300 OEM Engines	OM-T80497		\$ 4.50
Technical Manual Series 300 OEM Engines	TM-1190		\$34.50

NOTE: If you want manuals or catalogs for equipment not shown on this list, list the model number, serial number and name of the equipment below.

FMO Manual - Tractors	FMO-10102B		\$13.80
FMO Manual - Tillage	FMO-111B		13.80
FMO Manual - Planting	FMO-12102B		10.90
FMO Manual - Crop Chemicals	FMO-13102B		12.70
FMO Manual - Hay & Forage Harvesting	FMO-14102B		13.80
FMO Manual - Combine Harvesting	FMO-15102B		10.90
FMO Manual - Preventive Maintenance	FMO-16102B		12.70
FMO Manual - Machinery Management	FMO-17102B		10.90
FMO Manual - Machine Safety	FMO-18102B		12.70
FMO Set of 9 Manuals above	FMO-394 Set		101.00
FOS Manual - Hydraulics	FOS-1003B		8.50
FOS Manual - Electrical Systems	FOS-2004B		9.80
FOS Manual - Engines	FOS-3005B		11.20
FOS Manual - Power Trains	FOS-4004B		8.50
FOUR FOS MANUALS (above)	FOS-90 Set		34.20
FOS Manual - Shop Tools	FOS-5103B		4.25
FOS Manual - Welding	FOS-5204B		6.90
FOS Manual - Belts and Chains	FOS-5303B		4.25
FOS Manual - Bearings and Seals	FOS-5403B		5.60
FOS Manual - Tires and Tracks	FOS-5505B		5.60
FOS Manual - Mowing and Spraying Equipment	FOS-5603B		4.25
FOS Manual - Air Conditioning	FOS-5704B		6.90
FOS Manual - Fuels, Lubricants and Coolants	FOS-5804B		5.60
FOS Manual - Fiber Glass	FOS-5902B		4.25
FOS Manual - Fasteners	FOS-6002B		5.60
FOS Manual - Ident. of Parts Failures	FOS-6102B		6.90
SET OF ELEVEN FOS MANUALS FOS-51B, 52B, 53B, 54B, 55B, 56B, 57B, 58B, 59B, 60B and 61B	FOS-71 Set		54.10
SET OF ALL FIFTEEN FOS MANUALS	FOS-181 Set		88.30
Conservation Farming	FC-10101B		13.80
Machinery Maintenance	FMW-10101B		5.50

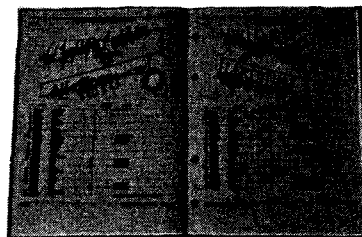
Illinois State Residents add 6% for ROT

Check or money order in U.S. Dollars enclosed Total
(Do not send cash or stamps)

Prices listed will be effective until 31 December 1984.

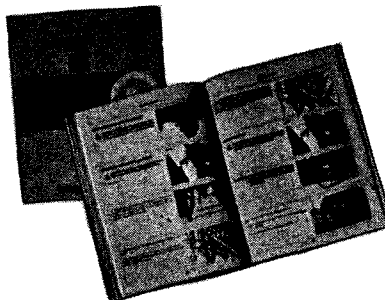
SP-319 Litho in U.S.A. APR-84

PARTS CATALOG



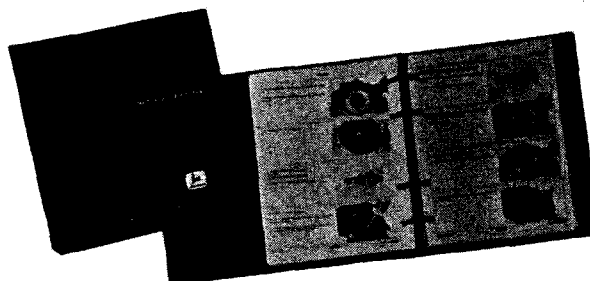
A parts catalog containing exploded view illustrations and lists of all parts is useful when purchasing service parts. Helps identify the correct parts. Useful in assembling and disassembling.

OPERATOR'S MANUAL



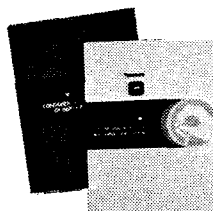
An extra copy of the operator's manual may be important if the copy furnished with your machine is misplaced.

TECHNICAL MANUAL



The technical manual is a service guide for your machine. Included in the manual are specifications, diagnosis and adjustments, illustrations of special assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

FMO AND FOS MANUALS



These are basic manuals covering most all types and makes of agricultural machinery. FMO manuals tell you how to *operate* machines; FOS manuals tell you how to *service* machines. Each manual starts with basic theory and is fully illustrated with colorful diagrams and photographs. Both the "whys" and "hows" of adjustments and repairs are covered in this reference library.

Service to keep you on the job

We, at your John Deere dealers, pride ourselves in having what it takes to help keep you on the job...

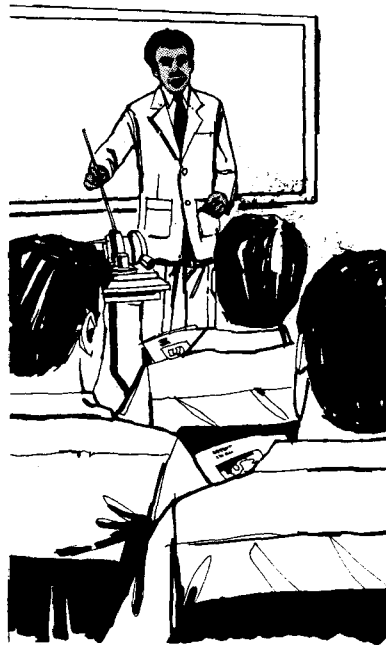
John Deere Parts.

We help minimize downtime by putting the right parts in your hands in a hurry. That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.



The right tools.

Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly... to save you time and money.



Well-trained technicians.

School is never out for John Deere service technicians. Training schools are held regularly to be sure our personnel know your equipment and how to maintain it. Result? Experience you can count on!



Prompt service.

Our goal is to provide prompt, efficient care when you want it and where you want it. We can make repairs at your place or at ours, depending on the circumstances. See us. Depend on us.

John Deere Service Superiority: We'll be around when you need us