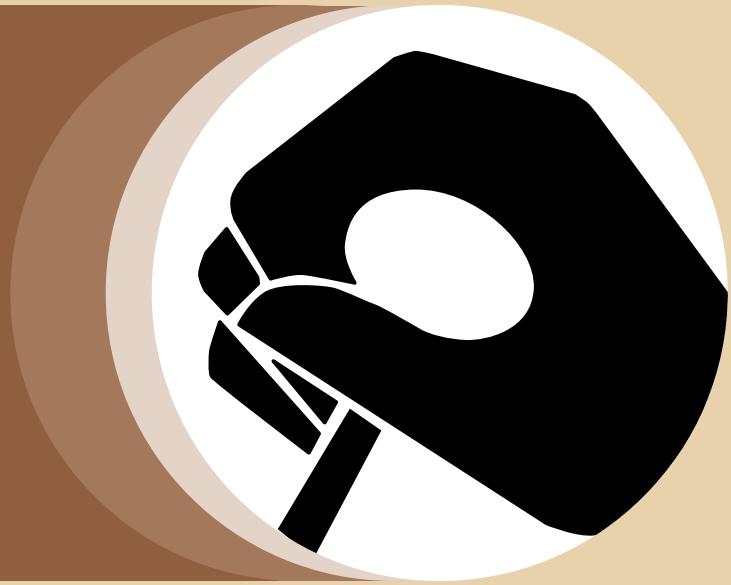
Series 400
6076 (—499999)
OEM Diesel Engines

1996 EPA Certification Levels
(U.S.A.)

OPERATION AND SERVICE MANUAL



Deere Power Systems Group
OMRG25412 (10MAR97)
(This manual replaces OMRG25412 L5 and OMRG17286 D1)

LITHO IN U.S.A.
ENGLISH

JOHN DEERE

DEERE POWER

Introduction

READ THIS MANUAL carefully to learn how to operate and service your engine correctly. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your engine and should remain with the engine when you sell it.

MEASUREMENTS IN THIS MANUAL are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by standing at the drive or flywheel end (rear) of the engine and facing toward the front of the engine.

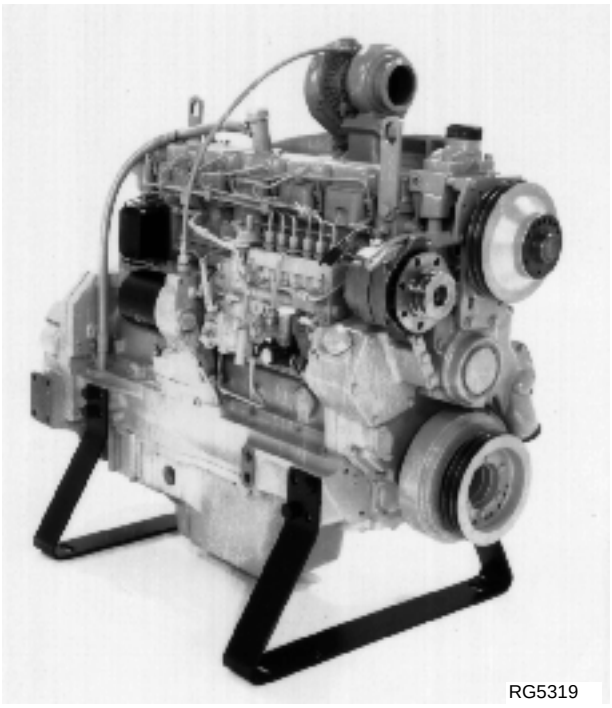
WRITE ENGINE SERIAL NUMBERS and option codes in the spaces indicated in the Record Keeping Section. Accurately record all the numbers. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the engine.

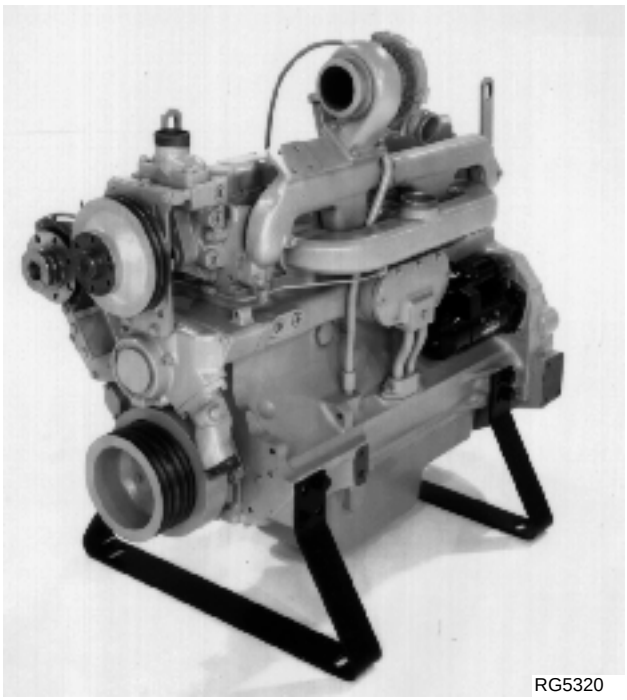
SETTING FUEL DELIVERY beyond published factory specifications or otherwise overpowering will result in loss of warranty protection for this engine.

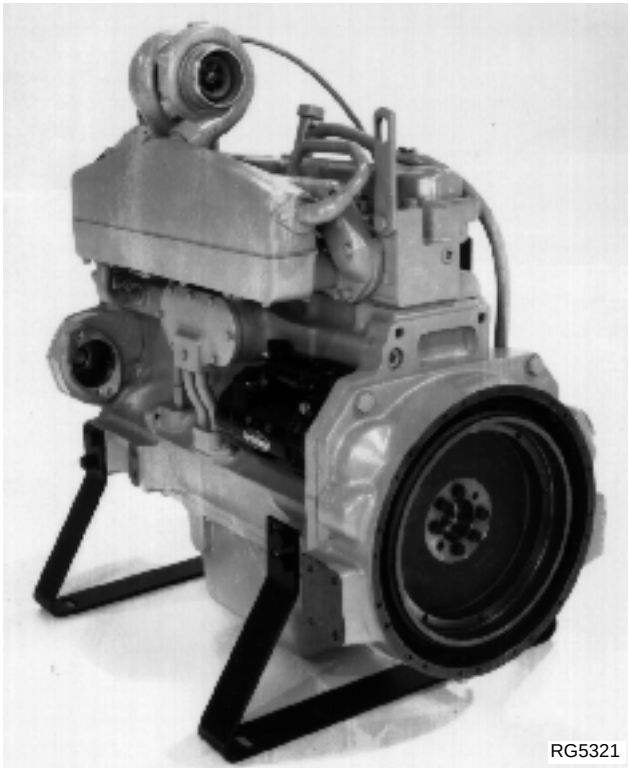
CERTAIN ENGINE ACCESSORIES such as radiator, air cleaner, and instruments are optional equipment on John Deere OEM Engines. These accessories may be provided by the equipment manufacturer instead of John Deere. This operator's manual applies only to the engine and those options available through the John Deere distribution network.

CALIFORNIA PROPOSITION 65 WARNING
Diesel engine exhaust and some of its constituents are know to the State of California to cause cancer, birth defects and other reproductive harm.

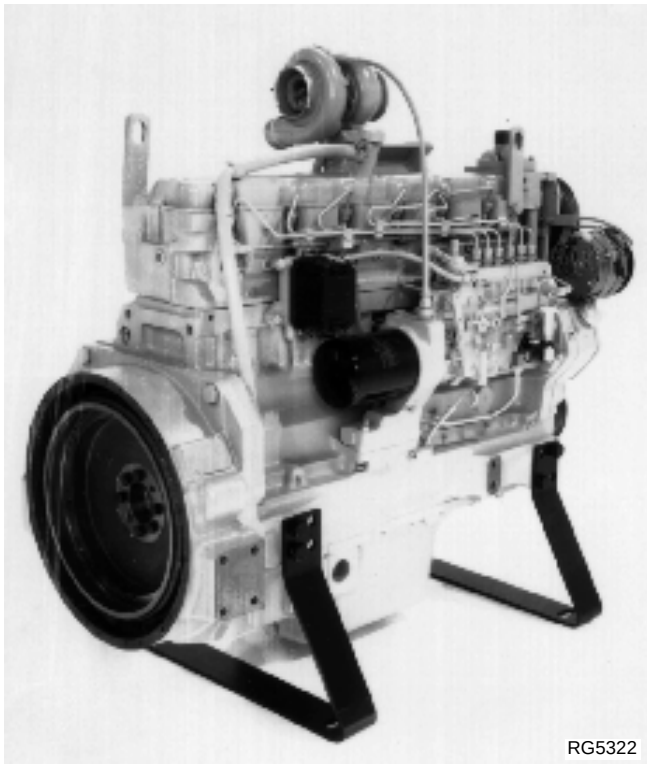
Identification Views







6076AF Engine with Auxiliary Drive



6076HF Engine

Contents

Continued on next page

All information, illustrations, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

OMRG25412 (03MAR97)

Record Keeping

RECORD ENGINE SERIAL NUMBER

The engine serial number plate is located on the right-hand side of engine block between oil filter housing and injection pump.

Your engine will have one of three engine serial number plates:

A—John Deere Name Plate
B—DDA/DDC Unit Number Plate
C—Generic Plate

Record all of the numbers and letters found on your engine serial number plate in the spaces provided below.

This information is very important for repair parts or warranty information.

Engine Serial Number (1st line)

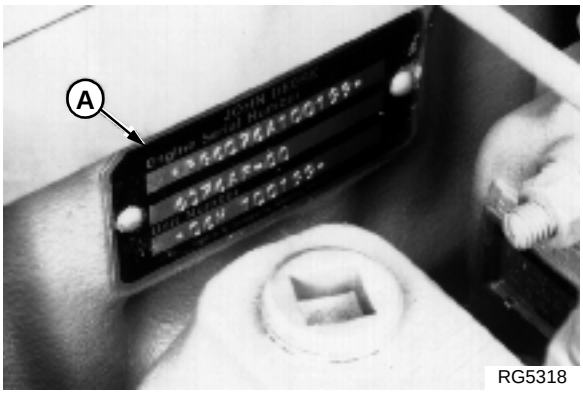
_____

Application Data or Type (2nd line)

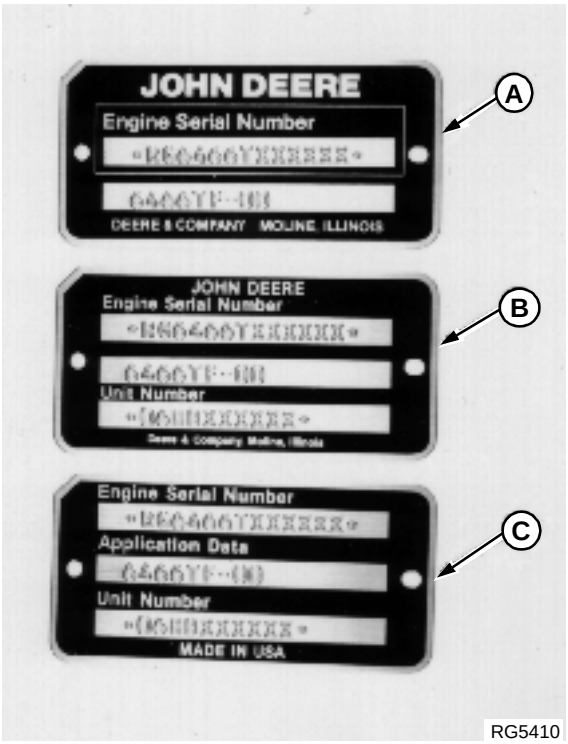
_____

Unit Number (3rd line—provided on DDA/DDC or generic plate only)

_____

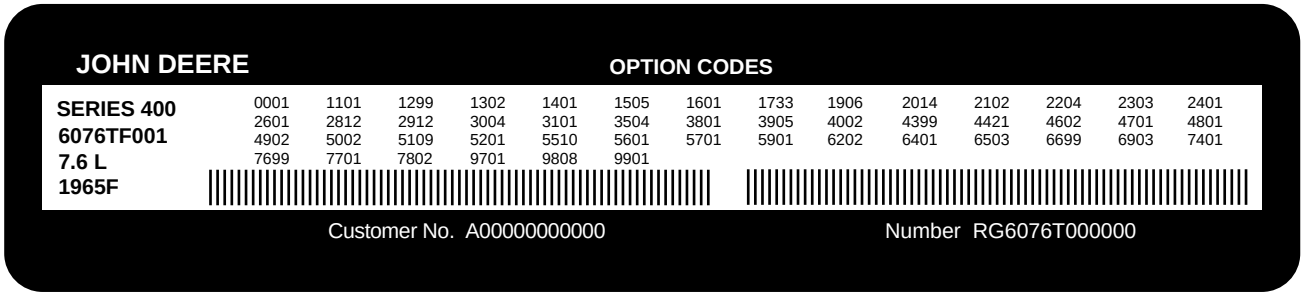


RG5318



RG5410

ENGINE OPTION CODES



RG8526

In addition to the serial number plate, OEM engines have an engine option code label affixed to the rocker arm cover. These codes indicate which of the engine options were installed on your engine at the factory. When in need of parts or service, furnish your authorized servicing dealer or engine distributor with these numbers.

The first two digits of each code identify a specific group, such as alternators. The last two digits of each code identify one specific option provided on your engine, such as a 24-volt, 42-amp alternator.

If an engine is ordered without a particular component, the last two digits of that functional group option code will be 99, 00, or XX. The following list shows only the first two digits of the code numbers. For future reference such as ordering repair parts, it is important to have these code numbers available. To ensure this availability, enter the third and fourth digits shown on your engine option code label in the spaces provided on the following page.

NOTE: Your engine option code label may not contain all option codes if an option has been added after the engine left the producing factory.

If option code label is lost or destroyed, consult your servicing dealer or engine distributor selling the engine for a replacement.

ENGINE OPTION CODES—CONTINUED

Option Codes	Description	Option Codes	Description
11 _____	Rocker Arm Cover	35 _____	Fuel Filter
12 _____	Oil Filler	39 _____	Thermostat Housing
13 _____	Crankshaft Pulley	40 _____	Dipstick
14 _____	Flywheel Housing	43 _____	Starting Aid
15 _____	Flywheel	44 _____	Electronic Speed Sensor
16 _____	Fuel Injection Pump	52 _____	Gear-driven Auxiliary Drive
17 _____	Air Intake Manifold	55 _____	Transport Skid/Shipping Stand
19 _____	Oil Pan	56 _____	Paint Option
20 _____	Water Pump	57 _____	Water Pump Inlet
21 _____	Thermostat Cover	62 _____	Alternator Mounting
22 _____	Thermostat	64 _____	Exhaust Elbow
23 _____	Fan Drive	65 _____	Turbocharger
24 _____	Fan Belt	74 _____	A/C Compressor Mounting
26 _____	Engine Coolant Heater	78 _____	Air Compressor
28 _____	Exhaust Manifold	91 _____	Special Equipment (Factory Installed)
30 _____	Starting Motor	97 _____	Special Equipment (Field Installed)
31 _____	Alternator	98 _____	Shipping
32 _____	Instrument Panel		

NOTE: These option codes are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

RECORD PTO SERIAL NUMBER

Serial number and model number are located on cover plate (A) of PTO housing. Record the numbers in the following spaces:

Serial Number

_____

Model Number

_____

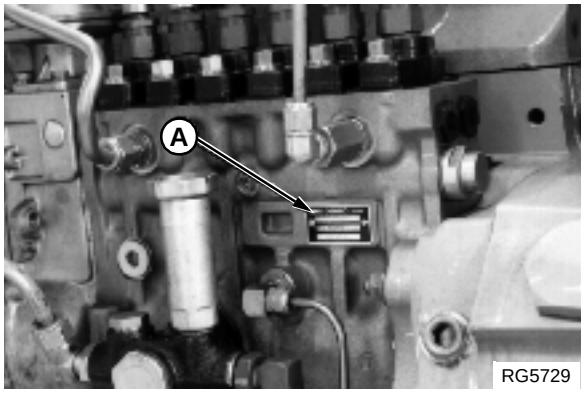
RECORD FUEL INJECTION PUMP MODEL NUMBER

Record the fuel injection pump model and serial information found on the serial number plate (A).

Model No. _____ RPM _____

Manufacturer's No. _____

Serial No._____



Safety

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

T81389

UNDERSTAND SIGNAL WORDS

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

TS187

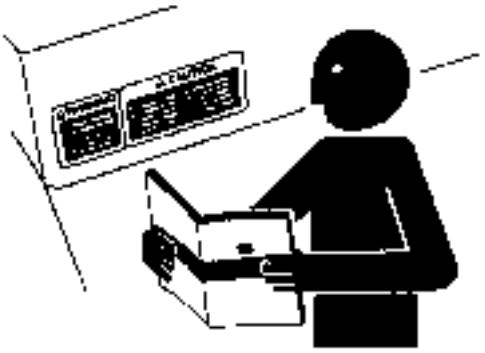
FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.



TS201

PREVENT BYPASS STARTING

Avoid possible injury or death from engine runaway.

Do not start engine by shorting across starter terminal. Engine will start with PTO engaged if normal circuitry is bypassed.

Start engine only from operator's station with PTO disengaged or in neutral.

RG5419

HANDLE FUEL SAFELY—AVOID FIRES

Handle fuel with care: it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.

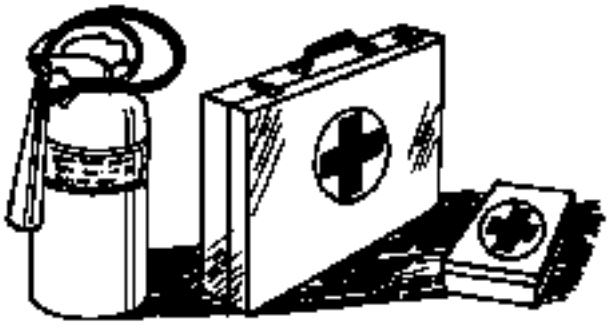
TS202

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291

HANDLE STARTING FLUID SAFELY

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.

TS1356

WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

TS206

PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

TS207

HANDLE CHEMICAL PRODUCTS SAFELY

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)

TS1132

STAY CLEAR OF ROTATING DRIVELINES

Entanglement in rotating driveline can cause serious injury or death.

Keep master shield and driveline shields in place at all times. Make sure rotating shields turn freely.

Wear close fitting clothing. Stop the engine and be sure the PTO driveline is stopped before making adjustments or performing any type service on the engine or PTO-driven equipment.

TS1644

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

TS218

WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

TS220

AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

X9811

AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

TS953

REMOVE PAINT BEFORE WELDING OR HEATING

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

TS220

SERVICE COOLING SYSTEM SAFELY

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281

AVOID HARMFUL ASBESTOS DUST

TS220

Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

Components in products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates, and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding material containing asbestos. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, apply a mist of oil or water on the material containing asbestos.

Keep bystanders away from the area.

DISPOSE OF WASTE PROPERLY

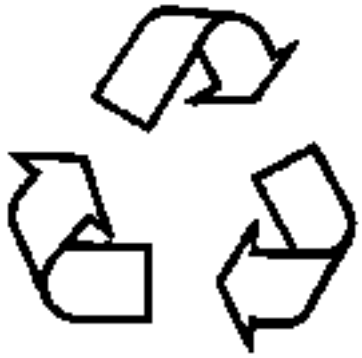
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133

Fuels, Lubricants, and Coolant

DIESEL FUEL

Consult your local fuel distributor for properties of the diesel fuel available in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or ASTM D975 are recommended.

In all cases, the fuel must meet the following properties:

- **Cetane Number 40 minimum.** Cetane number greater than 50 is preferred, especially for temperatures below -20° C (-4° F) or elevations above 1500 m (5000 ft).
- **Cold Filter Plugging Point (CFPP)** below the expected low temperature OR **Cloud Point** at least 5° C (9° F) below the expected low temperature.
- **Fuel Lubricity** Should pass a minimum of 3100 gram load level as measured by the BOCLE scuffing test.
- **Sulfur Content**
  - — Sulfur content should not exceed 0.5%. Sulfur content less than 0.05% is preferred.
  - — If diesel fuel with sulfur content greater than 0.5% sulfur content is used, reduce the service interval for engine oil and filter by 50%.
  - — DO NOT use diesel fuel with sulfur content greater than 1.0%.

Bio-diesel fuels with properties meeting DIN 51606 or equivalent specification may be used.

DO NOT mix used engine oil or any other type of lubricant with diesel fuel.

LUBRICITY OF DIESEL FUELS

Diesel fuel must have adequate lubricity to ensure proper operation and durability of fuel injection system components.

Diesel fuels for highway use in the United States and Canada now require sulfur content less than 0.05%. Diesel fuel in the European Union will require sulfur content less than 0.05% by 1 October 1996.

Experience shows that some low sulfur diesel fuels may have inadequate lubricity and their use may reduce performance in fuel injection systems due to inadequate lubrication of injection pump components. The lower concentration of aromatic compounds in these fuels also adversely affects injection pump seals and may result in leaks.

Use of low lubricity diesel fuels may also cause accelerated wear, injection nozzle erosion or corrosion, engine speed instability, hard starting, low power, and engine smoke.

Fuel lubricity should pass a minimum of 3300 gram load level as measured by the BOCLE scuffing test.

ASTM D975 and EN 590 specifications do not require fuels to pass a fuel lubricity test.

If fuel of low or unknown lubricity is used, add John Deere PREMIUM DIESEL FUEL CONDITIONER (or equivalent) at the specified concentration. John Deere PREMIUM DIESEL FUEL CONDITIONER is available in winter and summer formulas. Consult your John Deere engine distributor or servicing dealer for more information.

DIESEL FUEL STORAGE

Proper fuel storage is critically important. Use clean storage and transfer tanks. Periodically drain water and sediment from bottom of tank. Store fuel in a convenient place away from buildings.

IMPORTANT: DO NOT store diesel fuel in galvanized containers. Diesel fuel stored in galvanized containers reacts with zinc coating on container to form zinc flakes. If fuel contains water, a zinc gel will also form. The gel and flakes will quickly plug fuel filters, damage injection nozzles, and injection pump.

DO NOT use brass-coated containers for fuel storage. Brass is an alloy of copper and zinc.

Store diesel fuel in plastic, aluminum, and steel containers specially coated for diesel fuel storage.

Avoid storing fuel over long periods of time. If fuel is stored for more than a month prior to use, or there is a slow turnover in fuel tank or supply tank, add a fuel conditioner such as John Deere PREMIUM DIESEL FUEL CONDITIONER (or equivalent) to stabilize the fuel and prevent water condensation. John Deere PREMIUM DIESEL FUEL CONDITIONER is available in winter and summer formulas. Fuel conditioner also reduces fuel gelling and controls wax separation during cold weather.

Consult your John Deere engine distributor or servicing dealer for recommendations and local availability. Always follow manufacturer's directions on label.

FILLING FUEL TANK

CAUTION: Handle fuel carefully. Never fill tank while engine is hot or running.

DO NOT smoke while filling fuel tank or servicing fuel system.

IMPORTANT: The fuel tank is vented through filler cap. If a new filler cap is required, always replace it with an original vented cap.

Fill fuel tank at the end of each day's operation to prevent condensation in tank as moist air cools and freezing during cold weather.

TS202

MINIMIZING THE EFFECT OF COLD WEATHER ON DIESEL ENGINES

John Deere diesel engines are designed to operate effectively in cold weather.

However, for effective starting and cold weather operation, a little extra care is necessary. The information below outlines steps that can minimize the effect that cold weather may have on starting and operation of your engine. See your authorized engine distributor or servicing dealer for additional information and local availability of cold weather aids.

Use Grade No. 1-D Fuel

When temperatures fall below 5° C (40° F), Grade No. 1-D fuel is best suited for cold weather operation. Grade No. 1-D fuel has a lower cloud point and a lower pour point.

Cloud point is the temperature at which wax will begin to form in the fuel and this wax causes fuel filters to plug. **Pour point** is the temperature at which fuel begins to thicken and become more resistant to flow through fuel pumps and lines.

NOTE: On an average, Grade No. 1-D fuel has a lower BTU (heat content) rating than Grade No. 2-D fuel. When using Grade No. 1-D fuel you may notice a drop in power and fuel efficiency, but should not experience any other engine performance effects. Check the grade of fuel being used before troubleshooting for low power complaints in cold weather operation.

Coolant Heaters

Engine block heaters (coolant) are an available option to aid cold weather starting.

Seasonal Viscosity Oil and Proper Coolant Concentration

Use seasonal grade viscosity engine oil based on expected air temperature range between oil changes and a proper concentration of low silicate antifreeze as recommended. (See DIESEL ENGINE OIL and ENGINE COOLANT SPECIFICATIONS later in this section).

Diesel Fuel Flow Additive

IMPORTANT: Treat fuel when outside temperature drops below 0° C (32° F). For best results, use with untreated fuel. Follow all recommended instructions on label.

Use John Deere Premium Diesel Fuel Conditioner (Winter) or equivalent to treat fuel during the cold weather season. This winter formulation is a combination diesel fuel conditioner and anti-gel additive.

Winterfronts

Use of fabric, cardboard, or solid winterfronts is not recommended with any John Deere engine. Their use can result in excessive engine coolant, oil and charge air temperatures. This can lead to reduced engine life, loss of power and poor fuel economy. Winterfronts may also put abnormal stress on fan and fan drive components potentially causing premature failures.

If winterfronts are used, they should never totally close off the grill frontal area. Approximately 25% area in the center of the grill should remain open at all times. At no time should the air blockage device be applied directly to the radiator core.

Radiator Shutters

If equipped with a thermostatically controlled radiator shutter system, this system should be regulated in such a way that the shutters are completely open by the time the coolant reaches 93° C (200° F) to prevent excessive intake manifold temperature. Manually controlled systems are not recommended.

If air-to-air aftercooling is used, the shutters must be completely open by the time the intake manifold air temperature reaches the maximum allowable temperature out of the charge air cooler.

For more information, see your John Deere engine distributor or servicing dealer.

ENGINE BREAK-IN OIL

New engines are filled at the factory with John Deere ENGINE BREAK-IN OIL. During the break-in period, add John Deere ENGINE BREAK-IN OIL as needed to maintain the specified oil level.

Change the oil and filter after the first 100 hours of operation of a new or rebuilt engine.

After engine overhaul, fill the engine with John Deere ENGINE BREAK-IN OIL.

If John Deere ENGINE BREAK-IN OIL is not available, use a diesel engine oil meeting one of the following during the first 100 hours of operation:

- API Service Classification CE
- ACEA Specification E1
- CCMC Specification D4

After the break-in period, use John Deere PLUS-50™ or other diesel engine oil as recommended in this manual.

IMPORTANT: Do not use John Deere PLUS-50 oil or engine oils meeting API CG4, API CF4, ACEA E3, ACEA E2, or CCMC D5 performance levels during the first 100 hours of operation of a new or rebuilt engine. These oils will not allow the engine to break-in properly.

DIESEL ENGINE OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oil is preferred.

- **John Deere PLUS-50™**

If John Deere PLUS-50 engine oil and a John Deere oil filter are used, the service interval for oil and filter changes may be extended by 50 hours.

The following oil is also recommended:

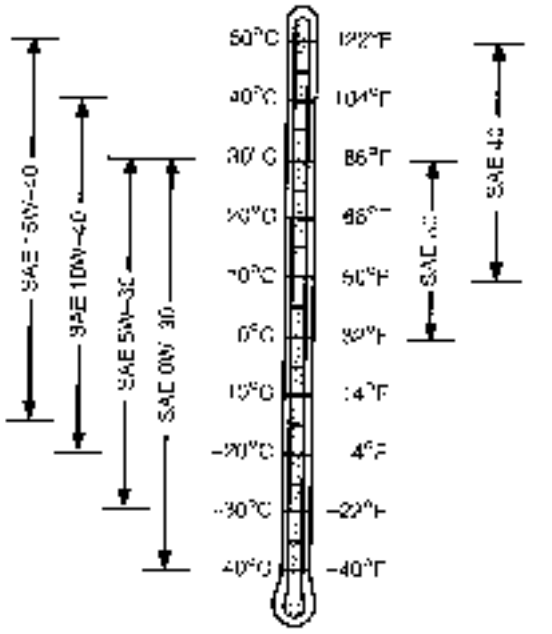
- John Deere TORQ-GARD SUPREME®

Other oils may be used if they meet one or more of the following:

- John Deere UNI-GARD™
- API Service Classification CG-4
- API Service Classification CF-4
- ACEA Specification E3
- ACEA Specification E2
- CCMC Specification D5
- CCMC Specification D4

Multi-viscosity diesel engine oils are preferred.

If diesel fuel with sulfur content greater than 0.5% is used, reduce the service interval by 50%.



TS1647

MIXING OF LUBRICANTS

In general, avoid mixing different brands or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements.

Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

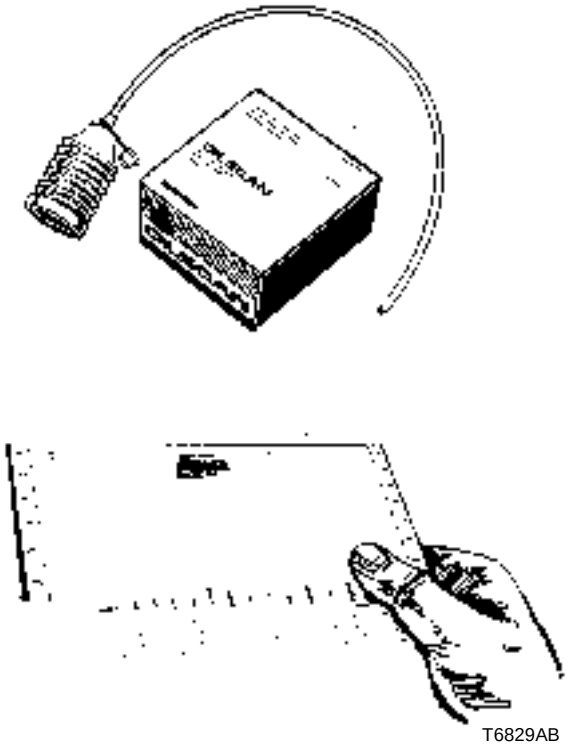
Consult your John Deere engine distributor or servicing dealer to obtain specific information and recommendations.

OILSCAN® AND COOLSCAN™

OILSCAN and CoolScan are John Deere sampling programs to help you monitor machine performance and identify potential problems before they cause serious damage.

Oil and coolant samples should be taken from each system prior to its recommended change interval.

Check with your John Deere dealer for the availability of OILSCAN and CoolScan kits.



T6829AB

ALTERNATIVE AND SYNTHETIC LUBRICANTS

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements listed in this manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

Re-refined base stock products may be used if the finished lubricants meets performance requirements

LUBRICANT STORAGE

Your equipment can operate at top efficiency only if clean lubricants are used.

Use clean containers to handle all lubricants.

Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

GREASE

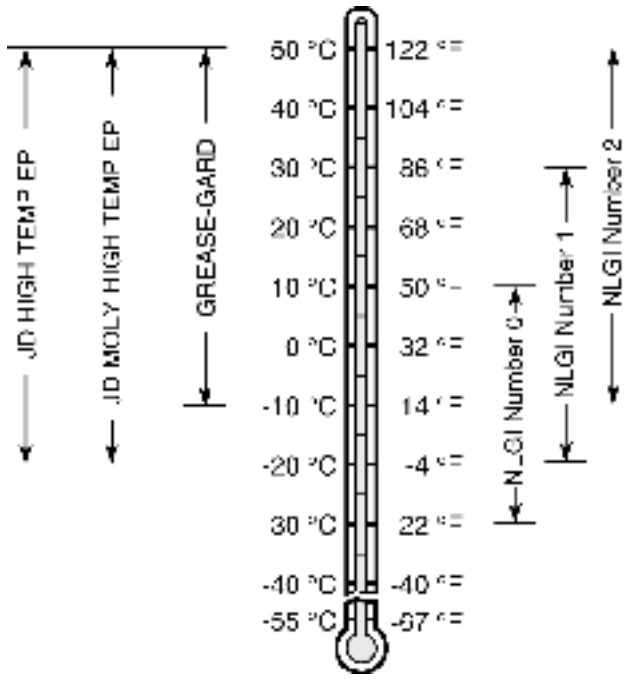
Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following greases are preferred:

- John Deere HIGH TEMPERATURE EP GREASE
- John Deere MOLY HIGH TEMPERATURE EP GREASE
- John Deere GREASE-GARD™

Other greases may be used if they meet one of the following:

- NLGI Performance Classification GC-LB



RG7241

ENGINE COOLANT RECOMMENDATIONS

Contact your engine distributor or servicing dealer to determine what the cooling system of this engine is filled with and the winter protection freeze level.

Solutions of antifreeze and supplemental coolant additives MUST be used year-round for freeze protection, boil-over protection, and to provide a stable, noncorrosive environment for seals, hoses and metal engine parts.

The following engine coolant is preferred for service:

— John Deere PREDILUTED ANTIFREEZE/SUMMER COOLANT

— John Deere COOL-GARD™, where available

The following engine coolant is also recommended:

— John Deere ANTIFREEZE/SUMMER COOLANT CONCENTRATE in a 40 to 60 percent mixture of concentrate and quality water

- **JOHN DEERE PREDILUTED ANTIFREEZE/SUMMER COOLANT**

This product contains all the necessary ingredients that make up the proper coolant solution: chemically pure water, ethylene glycol (low silicate antifreeze), and supplemental coolant additives (SCAs). It is ready to use; no mixing is required.

John Deere Prediluted Antifreeze/Summer Coolant permits extended service life to 3000 hours or 36 months of operation.

- **JOHN DEERE COOL-GARD™**

In certain geographical areas, John Deere COOL-GARD is marketed for use in the engine cooling system. This product contains all the necessary ingredients that make up the proper coolant solution: chemically pure water, ethylene glycol (low silicate antifreeze), and supplemental coolant additives (SCAs). It is ready to add to cooling system as is; no mixing or supplemental coolant additives required. Contact your John Deere Parts Network for local availability.

John Deere COOL-GARD has a service life of 2000 hours or 24 months of operation.

- **JOHN DEERE ANTIFREEZE/SUMMER COOLANT CONCENTRATE**

This product contains ethylene glycol (low silicate antifreeze) and supplemental coolant additives (SCAs). It must be mixed with quality water, as described later in this section, before adding to the engine cooling system. The proportion of water to be used depends upon the lowest freeze protection temperature desired according to the following table:

% CONCENTRATE	FREEZE PROTECTION LIMIT
40	-24° C (-12° F)
50	-37° C (-34° F)
60	-52° C (-62° F)

John Deere Antifreeze/Summer Coolant Concentrate has a service life of 2000 hours or 24 months of operation.

ENGINE COOLANT SPECIFICATIONS

Engine coolants are a combination of three chemical components: ethylene glycol (antifreeze), inhibiting coolant additives, and quality water.

Coolant solutions of quality water, ethylene glycol concentrate (antifreeze), and supplemental coolant additives (SCAs) MUST be used year-round to protect against freezing, boil-over, liner erosion or pitting, and to provide a stable, noncorrosive environment for seals, hoses, and metal engine parts.

Some products, including John Deere PREDILUTED ANTIFREEZE/SUMMER COOLANT and John Deere COOL-GARD, are fully formulated coolants that contain all three components in their correct concentrations. Do not add an initial charge of supplemental coolant additives to these fully formulated products.

Some coolant concentrates, including John Deere ANTIFREEZE/SUMMER COOLANT CONCENTRATE, contain both ethylene glycol antifreeze and inhibiting coolant additives. Mix these products and quality water, but do not add an initial charge of supplemental coolants additives.

Coolants meeting ASTM D5345 (prediluted coolant) or ASTM D4985 (coolant concentrate) require an initial charge of supplemental coolants additives.

Water Quality:

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol base engine coolant concentrate. All water used in the cooling system should meet the following minimum specifications for quality:

Water Quality Specifications

Item	Parts Per Million	Grains Per U.S. Gallon
Chlorides (maximum)	40	2.5
Sulfates (maximum)	100	5.9
Total Dissolved Solids (maximum)	340	20
Total Hardness (maximum)	170	10
pH Level	5.5—9.0	

Ethylene Glycol Concentrate (Antifreeze):

IMPORTANT: Do not use cooling system sealing additives or antifreeze that contains sealing additives.

The use of John Deere coolant products, as outlined on the previous page, is **strongly recommended** .

If John Deere coolant products are not used, other low silicate ethylene glycol base coolants for heavy-duty diesel engines may be used when mixed with quality water and supplemental coolant additives (SCAs), if they meet one of the following specifications:

- ASTM D5345 (prediluted coolant)
- ASTM D4985 (coolant concentrate) in a 40% to 60% mixture of concentrate with quality water.

Coolants meeting these specifications require addition of supplemental coolant additives (SCAs), formulated for heavy-duty diesel engines, for protection against corrosion and cylinder liner erosion and pitting.

IMPORTANT: Never use automotive-type coolants (such as those meeting ASTM D3306 or ASTM D4656). These coolants do not contain the correct additives to protect heavy-duty diesel engines. They often contain a high concentration of silicates and may damage the engine or cooling system.

ENGINE COOLANT SPECIFICATIONS—CONTINUED

Supplemental Coolant Additives (SCAs):

IMPORTANT: DO NOT over-inhibit antifreeze solutions, as this can cause silicate-dropout. When this happens, a gel-type deposit is created which retards heat transfer and coolant flow causing engine to overheat.

NOTE: John Deere Prediluted Antifreeze/Summer Coolant, John Deere Antifreeze/Summer Coolant Concentrate, and John Deere COOL-GARD contain supplemental coolant additives (SCAs). However, as the coolant solution loses its effectiveness, additives will need to be added.

John Deere Liquid Coolant Conditioner

Operating without proper coolant additive will result in increased corrosion, cylinder liner erosion and pitting, and other damage to the engine and cooling system. A simple mixture of ethylene glycol and water WILL NOT give adequate protection.

The use of supplemental coolant additives reduces corrosion, erosion and pitting.These chemicals reduce the number of vapor bubbles in the coolant and help form a protective film on cylinder liner surfaces. This film acts as a barrier against the harmful effects of collapsing vapor bubbles.

Inhibit the antifreeze-coolant mix with a non-chromate inhibitor. John Deere Liquid Coolant Conditioner is recommended as a supplemental coolant additive in John Deere engines.

IMPORTANT: Check inhibitors between drain intervals every 600 hours or 12 months of operation. Replenish inhibitors by the addition of a supplemental coolant additive as necessary.

DO NOT use soluble oil.

Additives eventually lose their effectiveness and must be recharged with additional supplemental coolant additives available in the form of liquid coolant conditioner. See TESTING ENGINE COOLANT and REPLENISHING SUPPLEMENTAL COOLANT ADDITIVES (SCAs) BETWEEN COOLANT CHANGES, as described later in this section.

TESTING DIESEL ENGINE COOLANT

Maintaining adequate concentrations of glycol and inhibiting additives in the coolant is critical to protect the engine and cooling system against freezing, corrosion, and cylinder liner erosion and pitting.

Test the coolant solution at 600 hours or 12 month intervals and whenever excessive coolant is lost through leaks or overheating to ensure the necessary protection.

Coolant Test Strips

Coolant test strips are available from your John Deere dealer. These test strips provide a simple, effective method to check the freeze point and additive levels of your engine coolant.

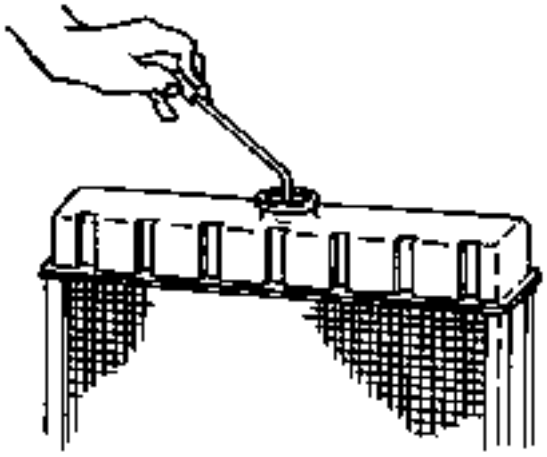
RG7397

Compare the results to the supplemental coolant additive (SCA) chart to determine the amount of inhibiting additives in your coolant and whether more John Deere Liquid Coolant Conditioner should be added.

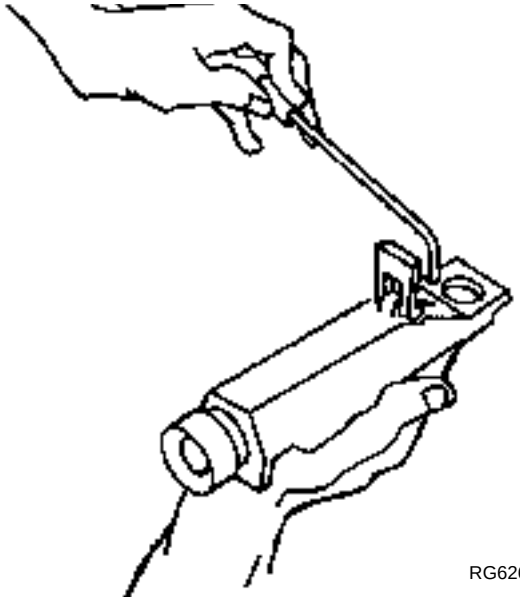
CoolScan

For a more thorough evaluation of your coolant, perform a CoolScan analysis, where available. See your John Deere engine distributor or servicing dealer for information about CoolScan.

REPLENISHING SUPPLEMENTAL COOLANT ADDITIVES (SCAs) BETWEEN COOLANT CHANGES



RG6261



RG6262

IMPORTANT: Do not add supplemental coolant additives when the cooling system is drained and refilled with John Deere ANTIFREEZE/SUMMER COOLANT or John Deere COOL-GARD.

Through time and use, the concentration of coolant additives is gradually depleted during engine operation. Periodic replenishment of inhibitor is required, even when John Deere ANTIFREEZE/SUMMER COOLANT or John Deere COOL-GARD is used. The cooling system must be recharged with additional supplemental coolant additives available in the form of liquid coolant conditioner.

Maintaining the correct coolant conditioner concentration (SCAs) and freeze point is essential in your cooling system to protect against liner pitting and corrosion, and freeze-ups due to incorrect coolant dilution.

John Deere LIQUID COOLANT CONDITIONER is recommended as a supplemental coolant additive in John Deere engines.

Test the coolant solution at 600 hours or 12 months of operation using either John Deere coolant test strips or a COOLSCAN analysis. If a COOLSCAN analysis is not available, recharge system per instructions printed on label of John Deere Liquid Coolant Conditioner.

IMPORTANT: ALWAYS maintain coolant at correct level and concentration. DO NOT operate engine without coolant for even a few minutes.

If frequent coolant makeup is required, the glycol concentration should be checked with JT05460 Refractometer to assure that the desired freeze point is maintained. Follow manufacturer's instructions provided with refractometer.

Add the manufacturer's recommended concentration of supplemental coolant additive. DO NOT add more than the recommended amount.

The use of non-recommended supplemental coolant additives may result in additive drop-out and gelation of the coolant.

If other coolants are used, consult the coolant supplier and follow the manufacturer's recommendation for use of supplemental coolant additives.

See ENGINE COOLANT SPECIFICATIONS earlier in this section for proper mixing of coolant ingredients before adding to the cooling system.

OPERATING IN WARM TEMPERATURE CLIMATES

John Deere engines are designed to operate using glycol base engine coolants.

Always use a recommended glycol base engine coolant, even when operating in geographical areas where freeze protection is not required.

IMPORTANT: Water may be used as coolant in *emergency situations only*.

Foaming, hot surface aluminum and iron corrosion, scaling, and cavitation will occur when water is used as the coolant, even when coolant conditioners are added.

Drain system and refill with recommended glycol base engine coolant as soon as possible.

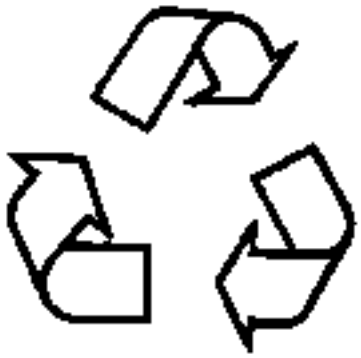
DISPOSING OF COOLANT

Improperly disposing of engine coolant can threaten the environment and ecology.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133

INSTRUMENT (GAUGE) PANEL

All controls and instruments are optional equipment on John Deere OEM Engines. They may be provided by the equipment manufacturer instead of John Deere. The following information applies only to those controls and gauges provided by John Deere.

IMPORTANT: Any time an electric gauge or meter does not register correctly, replace it with a new one. Do not attempt to repair it.

Following is a brief description of the components on the John Deere instrument (gauge) panel:

NOTE: A combination tachometer and hour meter is also an available option. See your authorized servicing dealer or engine distributor.

A—Electric Hour Meter - Hour meter indicates the operating hours of the engine while key switch is in the “ON” position. The hour meter should be used as a guide for scheduling periodic service.

B—Coolant Temperature Gauge - Indicates the engine coolant temperature.

C—Tachometer - Tachometer senses engine speed from a speed sensor in front timing gear cover and indicates engine speed in revolutions per minute (rpm).

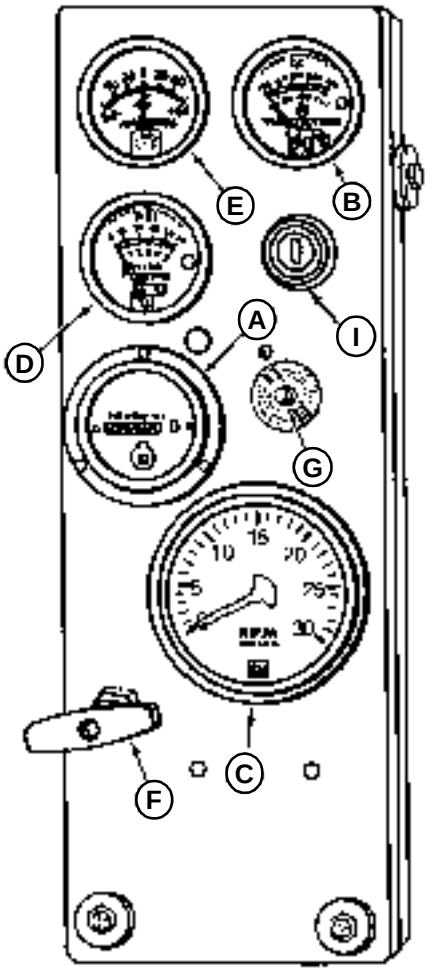
D—Oil Pressure Gauge - Indicates engine oil pressure.

E—Ammeter - Indicates charging current within electrical system.

F—Hand Throttle - Controls engine speed.

G—Reset (Safety) Switch - Overrides safety shutdown switch when depressed and held in during engine startup. Hold button in until engine oil pressure is at a safe operating level.

H—Key Switch - The four position key switch controls the electrical system.

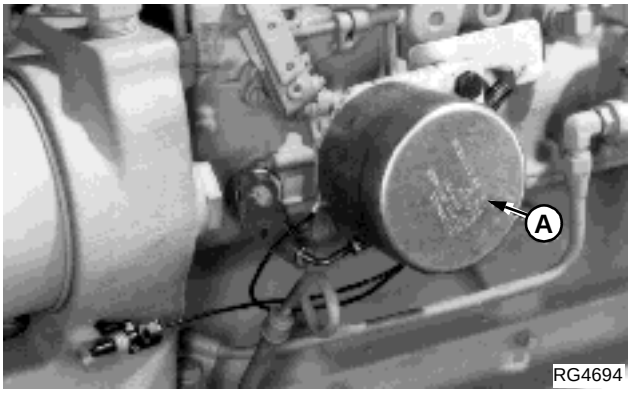


RG4477

A—Electric Hour Meter
B—Coolant Temperature Gauge
C—Tachometer
D—Oil Pressure Gauge
E—Ammeter
F—Hand Throttle
G—Reset (Safety) Switch
H—Key Switch

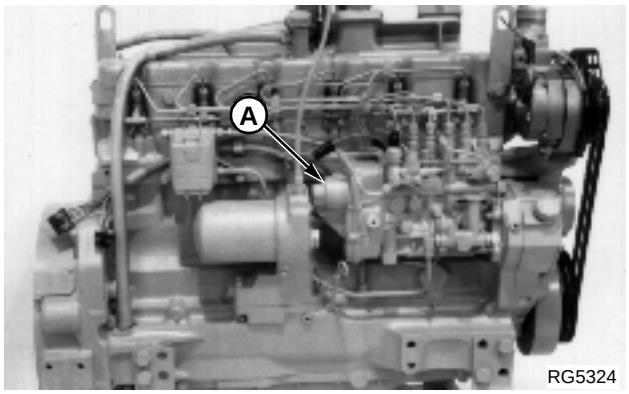
NOTE: Kits are available of electric shut-off solenoid mounted onto injection pump (as shown) or toward rear of engine directly below fuel filter base.

A—Electric Shut-off Solenoid-Mechanical (Regular) Governor



NOTE: In some cases the electronic engine control unit (ECU, not shown) senses potential engine problems and automatically shuts engine down before any damage occurs.

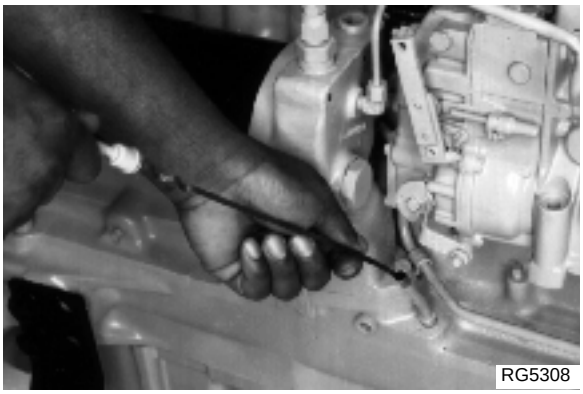
A—Electronically Controlled Electric Governor



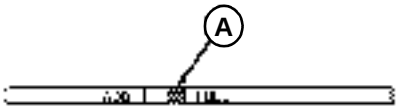
NORMAL ENGINE OPERATION

- Observe engine coolant temperature and engine oil pressure. Temperatures and pressures will vary between engines and with changing operating conditions, temperatures, and loads.
- Normal engine coolant operating temperature range is 82°–94° C (180°–202° F). If coolant temperature rises above 112° C (234° F), reduce load on engine. Unless temperature drops quickly, stop engine and determine cause before resuming operation.
- Operate the engine under a lighter load and at slower than normal speed for first 15 minutes after start-up. DO NOT run engine at slow idle.
- Stop engine immediately if there are any signs of part failure. Symptoms that may be early signs of engine problems are:
  - — Sudden drop in oil pressure
  - — Abnormal coolant temperatures
  - — Unusual noise or vibration
  - — Sudden loss of power
  - — Excessive black exhaust
  - — Excessive fuel consumption
  - — Excessive oil consumption
  - — Fluid leaks

BREAK-IN SERVICE



RG5308



RG5420

The engine is ready for normal operation, however, thorough break-in during the first 100 hours will result in a more satisfactory long-term engine performance and life. DO NOT exceed 100 hours of operation with break-in oil.

1. This engine is factory-filled with John Deere Engine Break-in Oil. Operate the engine at heavy loads with minimal idling during the break-in period.

2. If the engine has significant operating time at idle, constant speeds, and/or light load usage, or make-up oil is required in the first 100 hour period, a longer break-in period may be required. In these situations, an additional 100 hour break-in period is recommended using a new change of John Deere Engine Break-In Oil and new John Deere oil filter.

IMPORTANT: Do not add makeup oil until the oil level is BELOW the add mark on dipstick. John Deere Engine Break-In Oil (TY22041) should be used to make up any oil consumed during the break-in period.

IMPORTANT: DO NOT use PLUS-50™ Engine Oil during break-in period of a new engine or engine that has had a major overhaul. PLUS-50 oil will not allow a new or overhauled engine to properly wear during this break-in period.

3. Check oil more frequently during engine break-in period. If oil must be added during this period, John Deere Engine Break-In Oil is preferred. See ENGINE BREAK-IN OIL, in Fuels, Lubricants, and Coolant Section.

IMPORTANT: DO NOT fill above the top of the crosshatch pattern or the FULL mark, whichever is present. Oil levels anywhere within crosshatch are considered in the acceptable operating range.

ENGINE SPECIFICATIONS*

Oil Pressure at Rated Full Load Speed . . . . . 276 - 345 kPa (2.76 - 3.45 bar) (40 - 50 psi)

Coolant Temperature Range . . . . . 82° - 94° C (180°- 202° F)

** At normal operating temperature of 115°C (240°F) sump.*

BREAK-IN SERVICE—CONTINUED

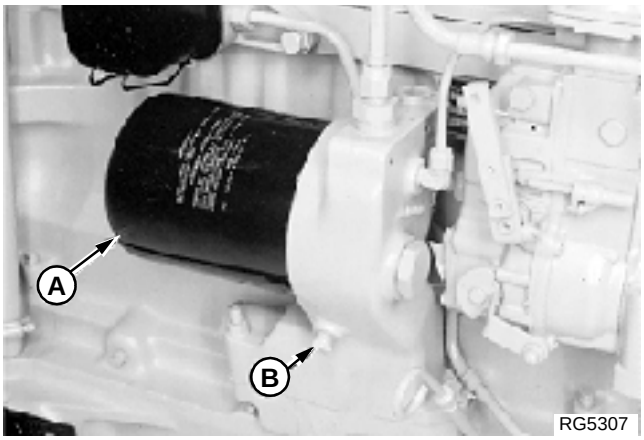
4. During the first 20 hours, avoid prolonged periods of engine idling or sustained maximum load operation.

5. If engine will idle longer than 5 minutes, stop engine.

6. After the first 100 hours maximum, drain engine oil, drain oil filter base (B) and replace engine oil filter (A). (See CHANGE ENGINE OIL AND REPLACE FILTER in Lubrication and Maintenance/250 Hour Section.) Fill crankcase with seasonal viscosity grade oil. (See DIESEL ENGINE OIL, in Fuels, Lubricants, and Coolant Section.)

NOTE: Some increase in oil consumption may be expected when low viscosity oils are used. Check oil levels more frequently.

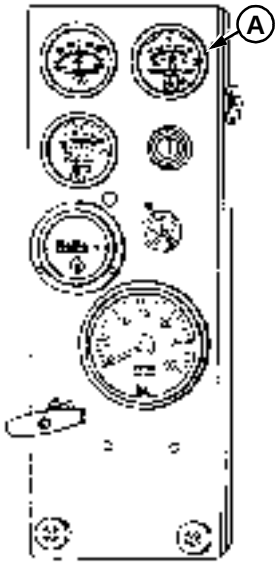
If air temperature is below -10° C (14° F), use an engine block heater.



7. Watch coolant temperatures (A) closely. If coolant temperature rises above 99° C (210° F), reduce load on engine. Unless temperature drops quickly, stop the engine and determine the cause before resuming operation.

NOTE: When the coolant temperature gauge reads approximately 104° C (240° F), the engine will shutdown automatically, if equipped with recommended safety controls.

8. The tension on newly installed V-belt should be checked daily for the first few days of operation because of the initial stretching. Also, check belts for proper alignment and seating in pulley grooves. (See CHECK AND ADJUST ALTERNATOR AND FAN BELT TENSION in Lubrication and Maintenance/250 Hour Section.)

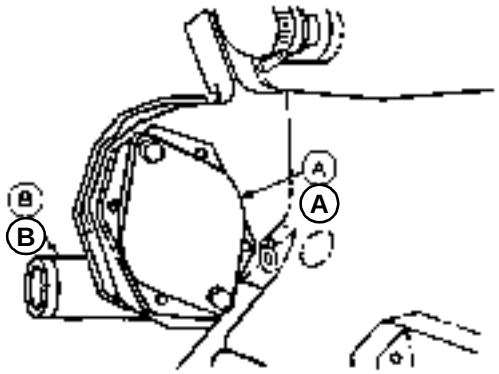


RG4674

AUXILIARY GEAR DRIVE LIMITATIONS

IMPORTANT: When attaching an air compressor, hydraulic pump, or other accessory to be driven by the auxiliary gear drive (engine timing gear train at front of engine), power requirements of the accessory must be limited to values listed below:

- **37 kW (50 HP) Continuous Operation**
- **45 kW (60 HP) Intermittent Operation**



RG4717

A—Auxiliary Drive Gear Rear Cover
B—Water Pump Inlet Tube

STANDBY POWER UNITS

To assure that your engine will deliver efficient standby operation when needed, start engine and run at rated speed (with 50%—70% load) for 30 minutes every 2 weeks. DO NOT allow engine to run extended period of time with no load.

STARTING THE ENGINE

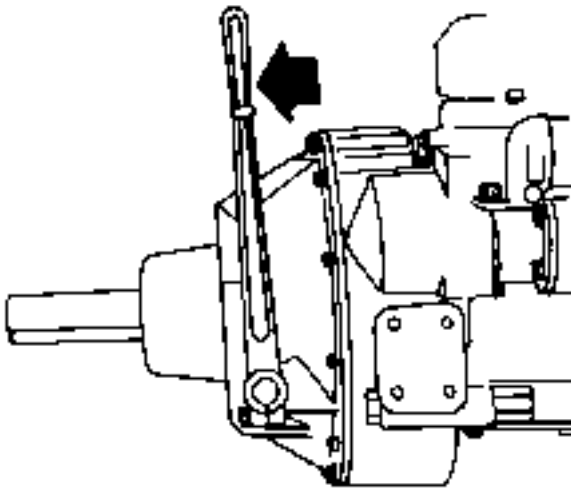
The following instructions apply to the optional controls and instruments available through the John Deere Parts Distribution Network. The controls and instruments for your engine may be different from those shown here; always follow manufacturer's instructions.

CAUTION: Before starting engine in a confined building, install proper outlet exhaust ventilation equipment. Always use safety approved fuel storage and piping.

NOTE: If temperature is below 0°C (32°F), it may be necessary to use cold weather starting aids (See COLD WEATHER OPERATION, later in this section).

1. Perform all prestarting checks outlined in Daily Prestarting Checks, earlier in this section.
2. Open the fuel supply shut-off valve, if equipped.
3. If equipped with PTO clutch, pull lever (arrow) rearward (away from engine) to disengage PTO clutch.

TS220



RG5602

STARTING THE ENGINE—CONTINUED

4. Pull hand throttle (A) 1/3 of the way out. Turn the handle in either direction to lock it in place.

5. If equipped, depress and hold reset button (B) while starting.

IMPORTANT: Do not operate the starter for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait at least 2 minutes before trying again. If engine does not start after four attempts, see Troubleshooting Section.

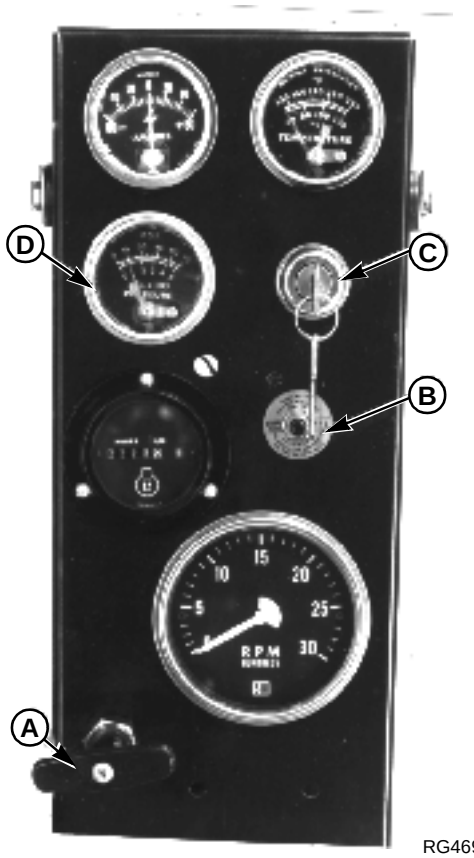
6. Turn the key switch (C) clockwise to crank the engine. When the engine starts, release the key so that it returns to the “ON” position.

IMPORTANT: If the key switch is released before the engine starts, wait until the starter and the engine stop turning before trying again. This will prevent possible damage to the starter and/or flywheel.

7. After the engine starts, continue to hold the reset button in until the oil pressure gauge (D) reads at least 103 kPa (1.03 bar) (15 psi). The safety controls will not allow the engine to run at a lower oil pressure unless the reset button is held in.

IMPORTANT: Should the engine die when operating under load, immediately disengage PTO clutch and restart the engine. Overheating of turbocharger parts may occur when oil flow is stopped.

8. Check all gauges for normal engine operation. If operation is not normal, stop the engine and determine the cause.



RG4695

A—Hand Throttle
B—Reset Button
C—Key Switch
D—Oil Pressure Gauge

COLD WEATHER OPERATION

Additional information on cold weather operation is available from your authorized servicing dealer.

CAUTION: Starting fluid is highly flammable. DO NOT use starting fluid on engines equipped with air intake heaters.

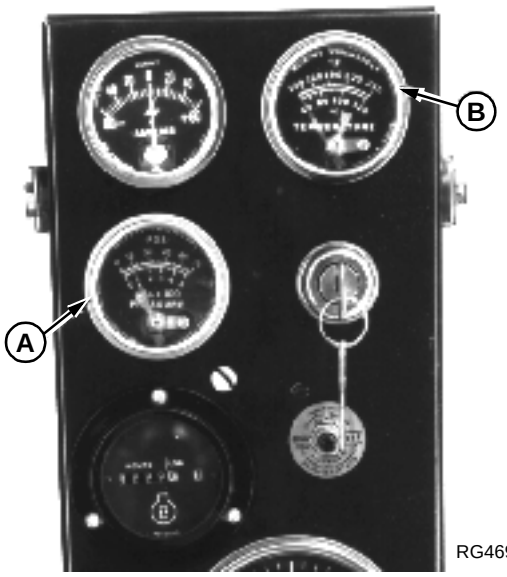
DO NOT use starting fluid near fire, sparks, or flames. DO NOT incinerate or puncture a starting fluid container.

TS1356

WARMING ENGINE

IMPORTANT: To assure proper lubrication, operate engine at or below 1200 rpm with no load for 1–2 minutes. Extend this period 2–4 minutes when operating at temperatures below freezing.

Engines used in generator set applications where the governor is locked at a specified speed may not have a slow idle function. Operate these engines at high idle for 1 to 2 minutes before applying the load. This procedure does not apply to standby generator sets where the engine is loaded immediately upon reaching rated speed.



RG4696

1. Check oil pressure gauge (A) as soon as engine starts. If gauge needle does not rise above minimum oil pressure specification of 103 kPa (1.03 bar) (15.0 psi) within 5 seconds, stop the engine and determine the cause. Normal engine oil pressure is 310 ±34 kPa (3.10 bar ± 0.34 bar) (45 ±5 psi) at rated full load speed (1800–2500 rpm) with oil at normal operating temperature of 105° C (220° F).

2. Watch coolant temperature gauge (B). Do not place engine under full load until it is properly warmed up. The normal engine coolant temperature range is 82°–94° C (180°–202° F).

NOTE: It is a good practice to operate the engine under a lighter load and at lower speeds than normal for the first few minutes after start-up.

CHANGING ENGINE SPEED–STANDARD (MECHANICAL) GOVERNOR

To increase engine speed, turn handle (A) to the horizontal position and pull out until desired engine speed is obtained. Turn the handle in either direction to lock throttle position. The handle is pushed inward to decrease engine speed.

NOTE: Engines equipped with electronically controlled electric governors run at a constant speed and are programmable controlled.

RG4697

ENGINE SPEEDS

6076TF, HF, and AF Engines are designed to insure optimum performance at the speeds given below. Have your authorized servicing dealer or engine distributor adjust engine speeds as needed.

Recommended engine speeds are as follows:

Engine	Normal Working Range (Minimum* — Maximum**) rpm	Fast Idle Speed rpm	Rated Speed rpm
6076TF			
Standard Mechanical Governor	1500-2200	2420	2200
3–5% Mechanical Governor	1500-1800	1890	1800
6076AF			
Standard Mechanical Governor	1500-2200	2420	2200
3–5% Mechanical Governor	1500-1800	1890	1800
Electric Governor	1500-1800	1890	1800
6076HF			
Standard Mechanical Governor	1500-2200	2420	2200
3–5% Mechanical Governor	1500-1800	1890	1800
Electric Governor	1500-1800	1890	1800

- Slow idle speeds are set at 800-850 rpm at the producing factory on all engines. Equipment manufacturers will reset slow idle according to specific application. Refer to your machine technical manual for this specification.
- Fast idle speeds are 10% (approximately 200 rpm) greater than rated speed on standard governor engines and 3-5% (100 rpm maximum) greater than rated speed on generator set engines with a 3-4% governor.
- Rated speed is the speed obtained when engine is operating at full throttle and full load.

**The engine will run at any speed from slow idle to fast idle. For constant operation, keep speed at or above 1500 rpm.*

***Generator set engines (3-5% governor) usually run at 1500 rpm (50 Hz) or 1800 rpm (60 Hz) when operating under load depending on cycles of AC current.*

IDLING ENGINE

Avoiding unnecessary engine idling. Prolonged idling may cause the engine coolant temperature to fall below its normal range. This, in turn, causes crankcase oil dilution, due to incomplete fuel combustion, and permits formation of gummy deposits on valves, pistons, and piston rings. It also promotes rapid accumulation of engine sludge and unburned fuel in the exhaust system.

Once an engine is warmed to normal operating temperatures, engine should be idled at slow idle speed. Slow idle speed for this engine is 800—850 rpm at factory. If engine must be left running more than 3 or 4 minutes, minimum engine speed should be 1200 rpm. DO NOT allow engine to idle longer than 5 minutes. If an engine will be idling for more than 5 minutes, stop and restart later.

NOTE: Generator set applications where the governor is locked at a specified speed may not have a slow idle function. these engines will idle at no load governed speed (high idle).

STOPPING THE ENGINE

1. Pull PTO clutch lever (arrow) rearward (away from engine) to disengage clutch, if equipped.

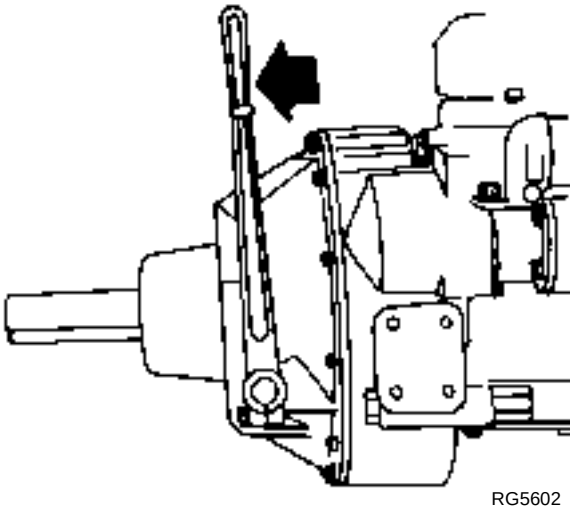
2. Move the throttle lever (A) to slow idle on standard (mechanical) governor engines.

IMPORTANT: Before stopping an engine that has been operating at working load, idle engine at least 2 minutes at 1000–1200 rpm to cool hot engine parts.

Engines in generator set applications, where the governor is locked at a specified speed and no slow idle function is available, run engine for at least 2 minutes at fast idle and no load.

3. Turn key switch to “OFF” position to stop the engine. Remove ignition key.

IMPORTANT: Make sure that exhaust stack cap (rain cap) is installed when engine is not running. This will prevent water and dirt from entering engine.



RG5602

RG4697

USING A BOOSTER BATTERY OR CHARGER

A 12-volt booster battery can be connected in parallel with battery(ies) on the unit to aid in cold weather starting. ALWAYS use heavy duty jumper cables.

CAUTION: Gas given off by battery is explosive. Keep sparks and flames away from battery. Before connecting or disconnecting a battery charger, turn charger off. Make last connection and first disconnection at a point away from battery. Always connect NEGATIVE (–) cable last and disconnect this cable first.

NOTE: 6076 engines are available with 12-volt or 24-volt electrical systems. See your John Deere Dealer or Engine Distributor for additional information on using booster batteries.

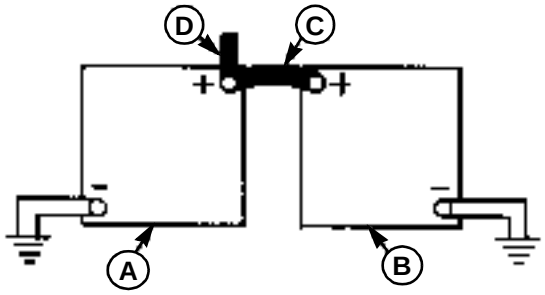
IMPORTANT: Be sure polarity is correct before making connections. Reversed polarity will damage electrical system. Always connect positive to positive and negative to ground. Always use 12-volt booster battery for 12-volt electrical systems and 24-volt booster battery(ies) for 24-volt electrical systems.

1. Connect booster battery or batteries to produce the required system voltage for your engine application.

NOTE: To avoid sparks, DO NOT allow the free ends of jumper cables to touch the engine.

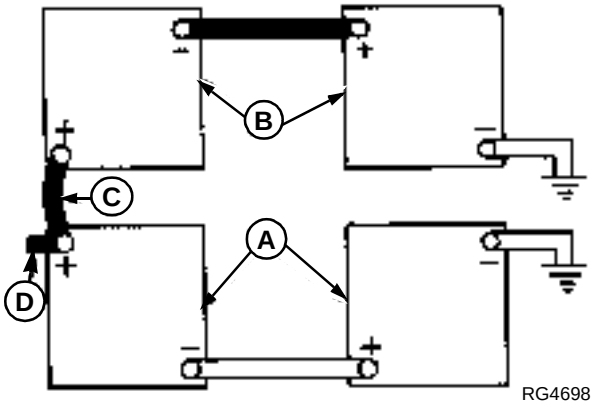
2. Connect one end of jumper cable to the POSITIVE (+) post of the booster battery.
3. Connect the other end of the jumper cable to the POSITIVE (+) post of battery connected to starter.
4. Connect one end of the other jumper cable to the NEGATIVE (–) post of the booster battery.
5. ALWAYS complete the hook-up by making the last connection of the NEGATIVE (–) cable to a good ground on the engine frame and away from the battery(ies).
6. Start the engine. Disconnect jumper cables immediately after engine starts. Always disconnect NEGATIVE (–) cable first.

TS204



RG4678

12-Volt System



RG4698

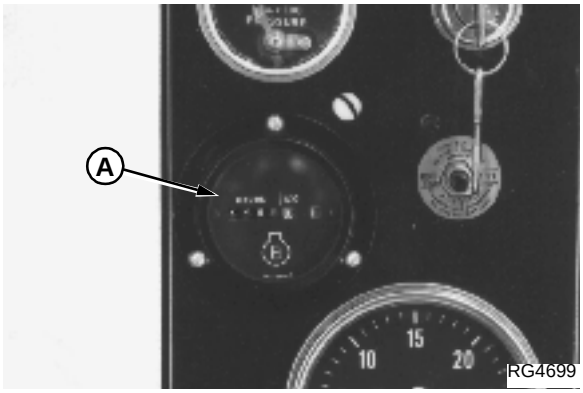
24-Volt System

A—12-Volt Machine Battery (ies)
B—12-Volt Booster Battery (ies)
C—Booster Cable
D—Cable to Starting Motor

OBSERVE SERVICE INTERVALS

Using hour meter (A) as a guide, perform all services at the hourly intervals indicated on following pages. At each scheduled maintenance interval, perform all previous maintenance operations in addition to the ones specified. Keep a record of hourly intervals and services performed using charts provided in Lubrication and Maintenance Records Section.

IMPORTANT: Recommended service intervals are for normal operating conditions. Service MORE OFTEN if engine is operated under adverse conditions. Neglecting maintenance can result in failures or permanent damage to the engine.



USE CORRECT FUELS, LUBRICANTS, AND COOLANT

IMPORTANT: Use only fuels, lubricants, and coolants meeting specifications outlined in Fuels, Lubricants and Coolant section when servicing your John Deere Engine.

Consult your John Deere Servicing Distributor or your nearest John Deere Parts Network for recommended fuels, lubricants, and coolant. Also available are necessary additives when operating engines in tropical, arctic, or any other adverse conditions.

LUBRICATION AND MAINTENANCE SERVICE INTERVAL CHART—STANDARD

Item	Lubrication and Maintenance Service Intervals				
	Daily	**50 Hours/ Every 2 weeks**	**250 Hours**	**600 Hours/ 12 Months**	**1200 Hours/ 24 Months**
Check Engine Oil and Coolant Level	•				
Lubricate PTO Release Bearing	•				
Check Dust Unloader Valve on Air Cleaner and Restriction Gauge*	•				
Visual Walkaround Inspection	•				
Check Fuel Filter		•			
Lubricate PTO Clutch Shaft Bearing		•			
Change Engine Oil and Filter**			•		
Service Fire Extinguisher			•		
Service Battery			•		
Check Fan and Alternator Belt Tension			•		
Check PTO Clutch Adjustment			•		
Check Weep Hole - Gear Driven Water Pumps			•		
Lubricate PTO Clutch Internal Levers & Linkage				•	
Clean Crankcase Vent Tube				•	
Replace Fuel Filter Element				•	
Check Air Intake Hoses and Connections				•	
Replace Air Cleaner Elements and Check Air Intake System				•	
Check Cooling System				•	
Coolant Solution Analysis-Add SCAs as needed				•	
Check and Adjust Engine Speeds					•
Check Crankshaft Vibration Damper					•
Adjust Engine Valve Clearance					•
Pressure Test Cooling System					•
Flush Cooling System and Replace Thermostats***					•

** Replace primary air cleaner element when restrictor indicator shows a vacuum of 625 mm (25 in.) of H_2O.*

***Change engine oil for the first time after 100 hours of (break-in) operation, then at every 250 hours thereafter. If PLUS-50 oil is used along with a John Deere oil filter, the oil change interval may be extended by 50 hours.*

**** If John Deere Antifreeze/Summer Coolant Concentrate or John Deere COOL-GARD is used, the flushing interval may be extended to 2000 hours. If John Deere Prediluted Antifreeze/Summer Coolant is used, the flushing interval may be extended to 3000 Hours or 36 months, whichever comes first.*

LUBRICATION AND MAINTENANCE SERVICE INTERVAL CHART—STANDBY POWER UNITS

NOTE: The service intervals in the Lubrication and Maintenance Sections that follow reflect standard engines. Use service intervals listed below for standby power units. Match service items below, to titles in Lubrication and Maintenance Sections for procedures.

Item	Lubrication and Maintenance Service Intervals			
	Every 2 weeks	250 Hours or 12 Months	600 Hours or 12 Months	1200 Hours or 24 Months
Operate Engine at Rated Speed and 50%—70% Load a Minimum of 30 Minutes.	•			
Check Engine Oil and Coolant Level	•			
Check Dust Unloader Valve on Air Cleaner and Restriction Gauge*	•			
Visual Walkaround Inspection	•			
Check Fuel Filter	•			
Service Fire Extinguisher		•		
Service Battery		•		
Change Engine Oil and Replace Filter**		•		
Check Alternator and Fan Belt Tension and Belt Wear		•		
Check Weep Hole - Gear Driven Water Pumps		•		
Clean Crankcase Vent Tube			•	
Replace Fuel Filter Element			•	
Check Air Intake Hoses and Connections			•	
Replace Air Cleaner Elements and Check Air Intake System			•	
Check Cooling System			•	
Coolant Solution Analysis-Add SCAs as needed			•	
Check and Adjust Engine Speeds				•
Check Crankshaft Vibration Damper				•
Adjust Engine Valve Clearance				•
Pressure Test Cooling System				•
Flush Cooling System and Replace Thermostats***				•
Adjust Droop on Generator Set Engines				•

** Replace primary air cleaner element when restrictor indicator shows a vacuum of 625 mm (25 in.) of H_2O.*

***Change engine oil for the first time after 100 hours of (break-in) operation, then at every 250 hours thereafter. If PLUS-50 oil is used along with a John Deere oil filter, the oil change interval may be extended by 50 hours.*

**** If John Deere Antifreeze/Summer Coolant Concentrate or John Deere COOL-GARD is used, the flushing interval may be extended to 2000 hours. If John Deere Prediluted Antifreeze/Summer Coolant is used, the flushing interval may be extended to 3000 Hours or 36 months, whichever comes first.*

DAILY PRESTARTING CHECKS

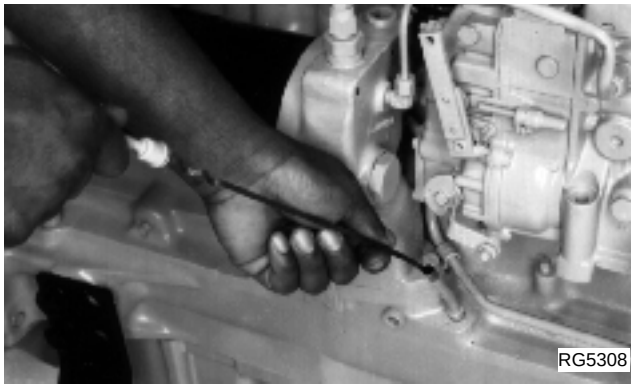
Do the following BEFORE STARTING THE ENGINE for the first time each day:

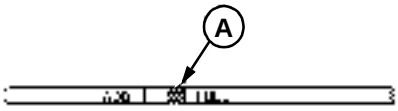
IMPORTANT: DO NOT add makeup oil until the oil level is BELOW the add mark.

1. Check engine oil. Always keep oil level at full mark on dipstick. Add oil as required. (See DIESEL ENGINE OIL in Fuels, Lubricants, and Coolant Section for oil specifications.)

Oil fill locations are either on rocker arm cover or on injection pump gear cover housing.

IMPORTANT: DO NOT fill above the top mark on the dipstick. Oil levels anywhere within crosshatch are considered in the acceptable operating range.


RG5308



RG5420

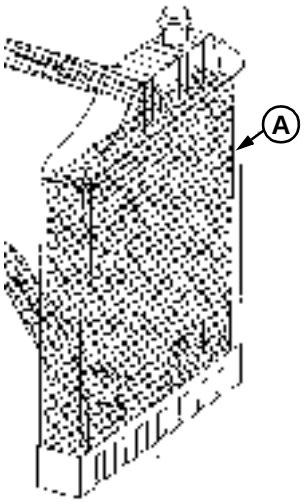
CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Only remove filler cap when engine is cold or when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281

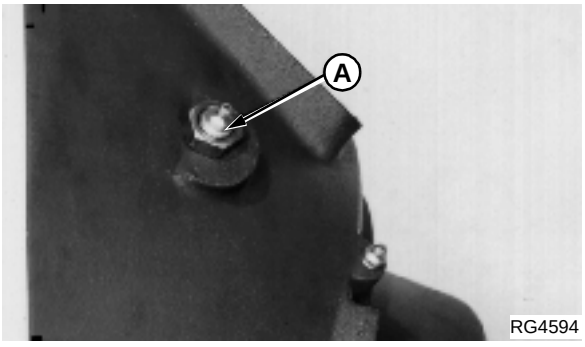
2. Check the coolant level when engine is cold. Coolant level should be at bottom of filler neck. Fill radiator (A) with proper coolant solution if level is low. (See ADDING COOLANT in Service As Required Section.) Check overall cooling system for leaks.

Refer to your vehicle's operator's manual for recommendations for non-John Deere supplied accessories.



RG4675

3. Apply one shot of John Deere Multi-Purpose Lubricant or its equivalent at PTO release bearing grease fitting (A). DO NOT over lubricate.

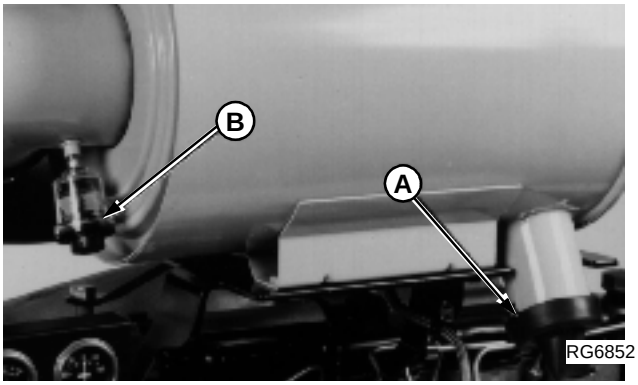


RG4594

4. If the air cleaner has an automatic dust unloader valve (A), squeeze the unloader valve on air cleaner assembly to clear away dust buildup.

If equipped with restriction indicator gauge (B), check gauge to determine if air cleaner needs to be serviced. (See REPLACING AIR FILTER CLEANER ELEMENT in Service As Required Section.

IMPORTANT: Maximum air intake restriction is 6.25 kPa (0.06 bar) (1.0psi) (25 in. H_2O). A clogged air cleaner element will cause excessive intake restriction and a reduced air supply to the engine.



5. Make a thorough inspection of the engine compartment. Look for oil or coolant leaks, worn fan and accessory drive belts, loose connections and trash build-up. Remove trash build-up and have repairs made as needed if leaks are found.

NOTE: Wipe all fittings, caps, and plugs before performing any maintenance to reduce the chance of system contamination.

Inspect:

- Radiator for leaks and trash build-up.
- Air intake system hoses and connections for cracks and loose clamps.
- Fan, alternator, and accessory drive belts for cracks, breaks or other damage.
- Water pump for coolant leaks.

NOTE: It is normal for a small amount of leakage to occur as the engine cools down and parts contract. Excessive coolant leakage may indicated the need to replace the water pump seal. Contact your engine distributor or servicing dealer for repairs.

CHECKING FUEL FILTER

Periodically the fuel filter should be checked for water or debris.

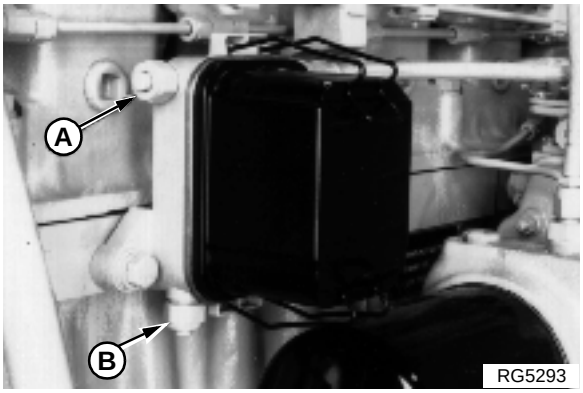
IMPORTANT: Drain water into a suitable container and dispose of properly.

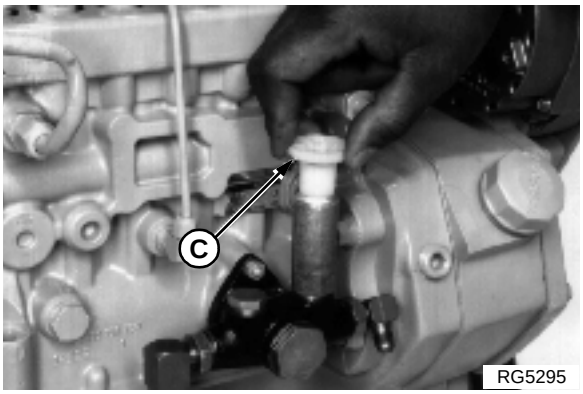
1. Loosen drain plug (B) at bottom of fuel filter two or three turns.
2. Loosen air bleed plug (A) at top of fuel filter base two full turns and drain water from bottom until fuel starts to drain out.
3. When fuel starts to drain out, tighten drain plug (B) securely.

After draining water from the fuel filter

4. Operate primer lever of the fuel supply pump (C) until fuel flow is free from air bubbles.
5. Tighten bleed plug securely, continue operating hand primer until pumping action is not felt. Push hand primer inward (toward engine) as far as it will go.

If the fuel system needs further bleeding of air, see BLEED FUEL SYSTEM in Service As Required section.

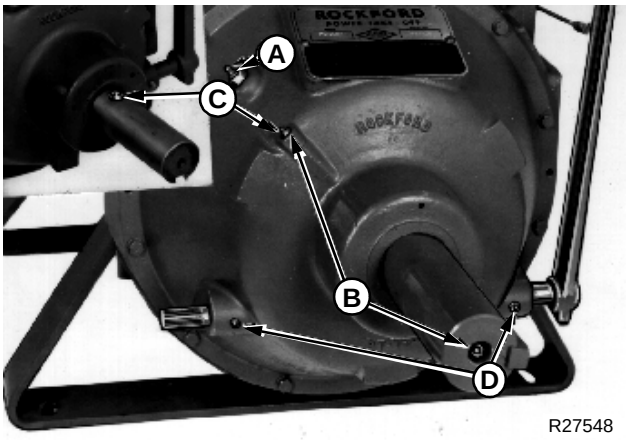




LUBRICATING PTO CLUTCH SHAFT BEARINGS

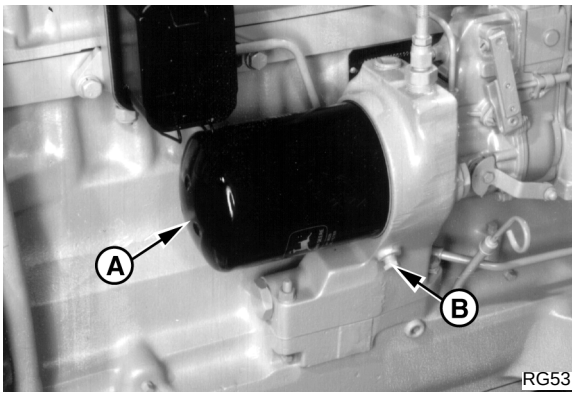
Apply one or two shots of John Deere Multipurpose Lubricant or equivalent at clutch drive shaft bearing fitting (B) and pilot bearing fittings (D). DO NOT over-lubricate to avoid getting oil on clutch facings.

IMPORTANT: Lubricate release bearing fitting (A) daily or at 10 hour intervals for continuous operation. (See LUBRICATION AND MAINTENANCE in Engine Operating Guidelines Section.)



A—Release Bearing Grease Fitting
B—Fittings for Side-Loaded Drive
C—Fittings for In-Line Drive
D—Lever Shaft Fittings

CHANGING ENGINE OIL AND REPLACING OIL FILTER



NOTE: Change engine oil and filter for the first time after 100 hours maximum of operation, then every 250 hours thereafter.

If John Deere PLUS-50 engine oil and a John Deere oil filter are used, the oil and filter change interval may be extended by 50 hours.

OILSCAN is a John Deere sampling program to help you monitor machine performance and identify potential problems before they cause serious damage. OILSCAN kits are available from your John Deere dealer. Oil samples should be taken prior to the oil change. Refer to instructions provided with the kit.

1. Run engine approximately 5 minutes to warm up oil. Stop engine.
2. Remove oil pan drain plug and drain crankcase oil while warm. Remove plug (B) and drain oil from oil filter housing.
3. Remove and discard full-flow filter element (A). Remove engine oil filter and packing. Clean filter mounting pad.

IMPORTANT: Filtration of oils is critical to proper lubrication. Always change filter regularly. Use filter meeting John Deere performance specifications.

4. Oil new packing and install new full-flow filter element. Hand tighten element 1/2 to 3/4 turn after packing contacts filter housing. DO NOT overtighten filter element.
5. Install all drain plugs removed to drain oil.
6. Fill engine crankcase with clean John Deere engine oil. (See DIESEL ENGINE OIL in Fuels, Lubricants, and Coolant Section for determining correct engine oil.

Oil fill quantities for 6076TF, AF, HF engines are listed below.

Oil Pan Option Code	Oil Pan Part No.	Crankcase Oil Capacity
1904	R73692	21.0L (22.0 qt)
1906	RE45439	24.0L (25.5 qt)
1906	RE18726	24.0L (25.5 qt)
1916	R94338	26.0L (27.5 qt)
1922	R86396	29.0L (30.5 qt)

NOTE: Since optional oil pans are available on most OEM Engines, crankcase oil capacity may vary slightly from amount shown. ALWAYS fill crankcase to full mark on dipstick. Dipsticks with a crosshatch pattern are considered full if the oil is anywhere within the range of the crosshatch. DO NOT overfill.

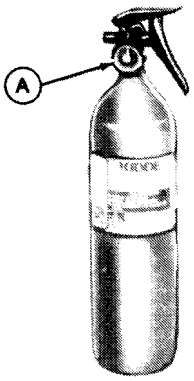
IMPORTANT: Immediately after completing oil change, crank engine for 30 seconds without depressing reset button on instrument panel. This will help insure adequate lubrication to engine components.

7. Start engine and run to check for possible leaks.
8. Stop engine and check oil level after 10 minutes. Oil level reading should be on upper mark of dipstick.

SERVICING FIRE EXTINGUISHER

A fire extinguisher (A) is available from your authorized servicing dealer or engine distributor.

Read and follow the instructions which are packaged with it. The extinguisher should be inspected at least every 100 hours of engine operation or once a month. Once extinguisher is operated, no matter how long, it must be recharged. Keep record of inspections on the tag which comes with the extinguisher instruction booklet.



RW4918

SERVICING BATTERY

TS204

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded NEGATIVE (–) battery clamp first and replace it last.

1. On regular batteries, check electrolyte level. Fill each cell to bottom of filler neck with distilled water.

NOTE: Low-maintenance or maintenance-free batteries should require little additional service. However, electrolyte level can be checked by cutting the center section of decal on dash-line, and removing cell plugs. If necessary, add clean, soft water to bring level to bottom of filler neck.

2. Keep batteries clean by wiping them with a damp cloth. Keep all connections clean and tight. Remove any corrosion, and wash terminals with a solution of 1 part baking soda and 4 parts water. Tighten all connections securely.

NOTE: Coat battery terminals and connectors with a mixture of petroleum jelly and baking soda to retard corrosion.

3. Keep battery fully charged, especially during cold weather. If a battery charger is used, turn charger off before connecting charger to battery(ies). Attach POSITIVE (+) battery charger lead to POSITIVE (+) battery post. Then attach NEGATIVE (–) battery charger lead to a good ground.

CAUTION: Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

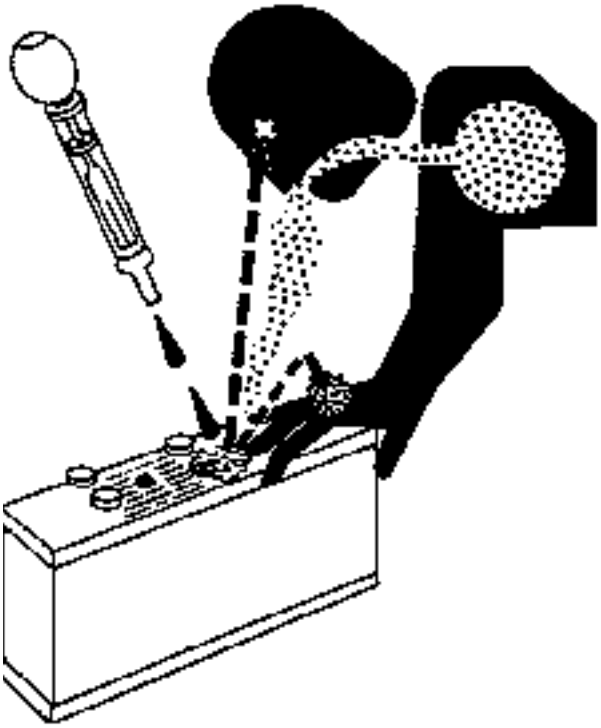
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10–15 minutes. Get medical attention immediately.

If acid is swallowed:

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



TS203

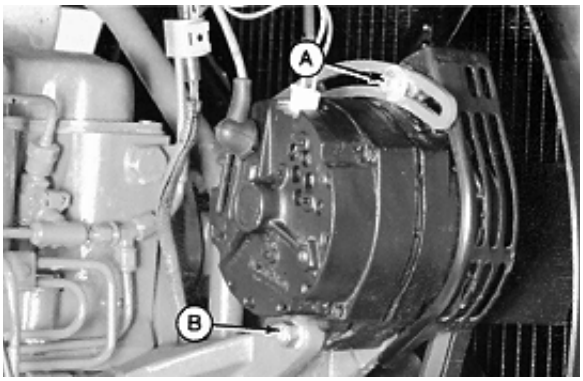
NOTE: Maintenance-free batteries should require little additional service. However, electrolyte level can be checked by cutting the center section of decal on dash-line, and removing cell plugs. If necessary, add clean soft water to bring level to bottom of filler neck.

IMPORTANT: In freezing weather, run engine at least 30 minutes to assure thorough mixing after adding water.

If necessary to replace battery, replacement battery(s) must meet or exceed the following recommended capabilities at -18°C (0°F):

12-Volt System. . . . . .800 Cold Cranking Amps
24-Volt System. . . . . .570 Cold Cranking Amps

CHECK AND ADJUST ALTERNATOR AND FAN BELT TENSION



NOTE: Too little tension causes slippage or "slip and grab," causing the belt to break. If the belt does not break, the slip will cause excess cover wear, burn spots and overheating.

Too much tension causes belt heating and excessive stretch, as well as damage to drive components such as sheaves and shafts. Excessive tightness will also place heavier loads on the bearings causing them to fail. Remember that V-belts should ride on the sides of standard sheaves not on the bottom of the groove.

1. Check alternator belt tension using JDG529 Belt Tension Gauge (A) or equivalent belt tension gauge capable of measuring 579—623 N (130—140 lb force).

NOTE: Engines having dual belts, check front belt tension only. Measure tension on the long part of the belt as illustrated.

IMPORTANT: Do not pry against alternator rear frame. Do not tighten or loosen belts while they are hot.

2. If belts need adjustment, loosen alternator bracket cap screw (A) and nut (B) on mounting bolt.

3. Apply outward pressure to alternator front frame until strand tension is read on tension gauge.

	Tension New Belt	**Tension Used* Belt**
Single Belt	578—622 N (130—140 lb force)	378—423 N (85—95 lb force)
Dual	423—467 N (95—104 lb force)	378—423 N (85—95 lb force)

4. Tighten alternator bracket cap screw and nut securely.

5. Immediately after a 10 minute run-in of new or used belts, recheck and adjust belt tension as shown in table above.

6. If tension is not within specifications, wait 10 minutes, loosen belt and retighten to 378—423 N (85—95 lb force) strand tension.

** Belts are considered used after 10 minutes of operation.*

CHECK PTO CLUTCH ADJUSTMENT

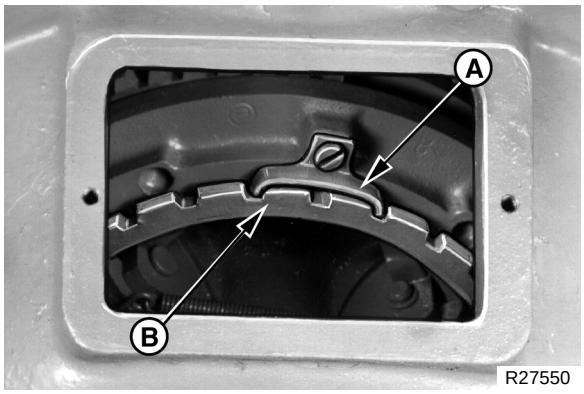
TS198

CAUTION: Never attempt to service the PTO while it is in operation. Loose clothing could get caught in moving parts; keep clothing tight against body. Use extreme care when working around the PTO.

1. Measure clutch engagement force at handle grip with a spring scale. The engagement force should be 289—333 N (65—75 lb-force).

IMPORTANT: Improper adjustment of the PTO clutch might shorten clutch life. Make sure adjustments are made properly.

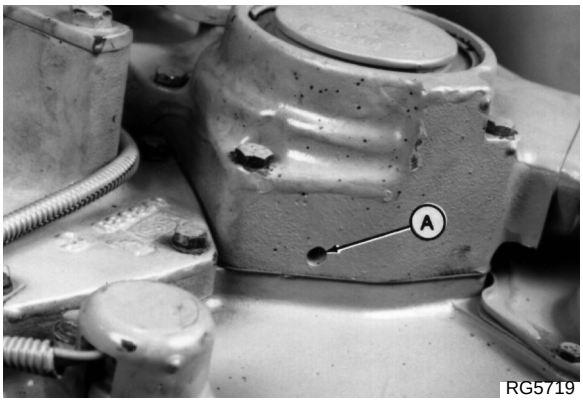
2. If adjustments are needed, disengage clutch and stop engine. Remove cover plate from clutch housing (shown removed).
3. Remove lock screw and adjusting lock (A) from clutch body splines.
4. Turn adjusting ring (B) to adjust clutch engagement pressure.
5. Measure engagement pressure at clutch handle with spring scale.
6. Install lock screw and adjusting lock in clutch body hub splines when specified engagement pressure is achieved.
7. Tighten screw securely.
8. Recheck clutch engagement force with spring scale. Install cover plate. Disengage clutch.



R27550

A—Adjusting Lock
B—Adjusting Ring

CHECK AND CLEAN WATER PUMP WEEP HOLE — GEAR-DRIVEN WATER PUMPS



The gear driven water pump weep hole (A) can plug from fine dust mixing with normal water pump seal misting.

Remove the foam filter from the weep hole located in the bottom of the water pump housing. 6076 engines with gear driven water pumps began using a foam filter at Engine Serial Number (101935—).

Inspect the water pump weep hole for any restrictions. Insert a heavy gage wire to make sure the hole is open. The depth of the weep hole is 63.5 mm (2.5 in.).

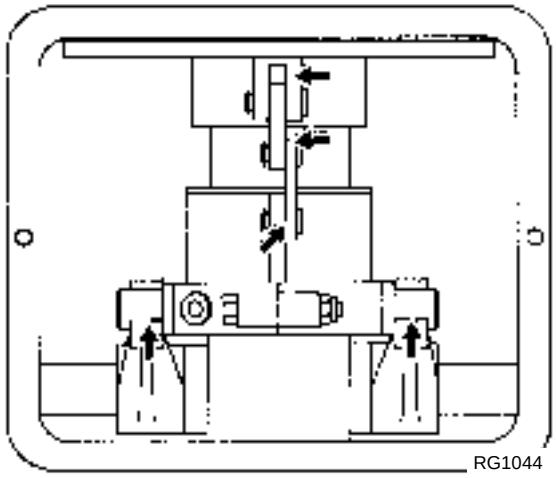
Compress R98527 foam filter with fingers. Insert the filter in the weep hole until it is flush with the bottom of the water pump housing.

LUBRICATING PTO CLUTCH INTERNAL LEVERS AND LINKAGE

CAUTION: Never attempt to service the PTO while it is in operation. Loose clothing could get caught in moving parts; keep clothing tight against body. Use extreme care when working around the PTO.

TS198

1. Remove the PTO housing cover and apply one shot of John Deere Multipurpose Lubricant or equivalent (See FUELS, LUBRICANTS, and COOLANT Section) to each pivot point of each clutch linkage (upper three arrows).
2. Apply one shot of John Deere Multipurpose Lubricant or equivalent to the two PTO release lever shaft fittings (lower two arrows).

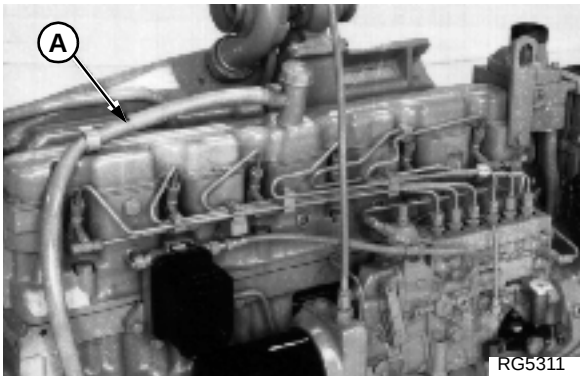


RG1044

CLEANING CRANKCASE VENT TUBE

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

1. Remove and clean crankcase tube (A).
2. install vent tube and tighten hose clamp securely after cleaning.

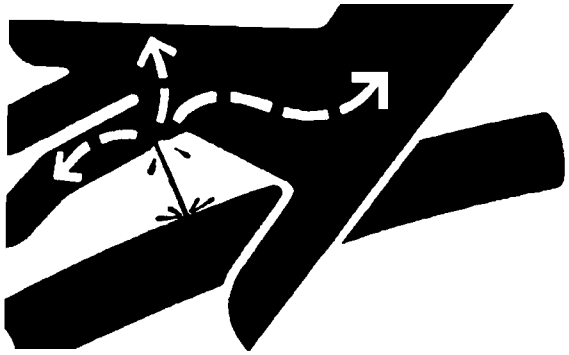


RG5311

RELIEVE SYSTEM PRESSURE

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel 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 injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result. Doctors unfamiliar with this type of injury may call Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.



X9811

REPLACE SINGLE FUEL FILTER

1. Close fuel shut-off valve at bottom of fuel tank (not illustrated).
2. Loosen bleed plug (A) and remove drain plug (B) to drain from fuel filter.

NOTE: Keep a small container under drain plug to catch draining fuel.

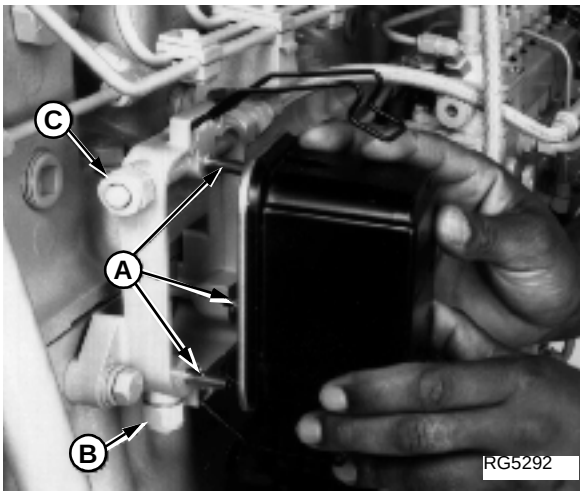
3. With fuel filter firm against base, lift up on top retaining spring and pull down on bottom retaining spring. Pull fuel filter off guide pins of fuel filter base and discard.

RG5291

4. Install new fuel filter onto guide pins (A) on fuel filter base. Hold filter firmly against base.

NOTE: Secure retaining spring by pushing on center (at highest point) until it is seated in groove.

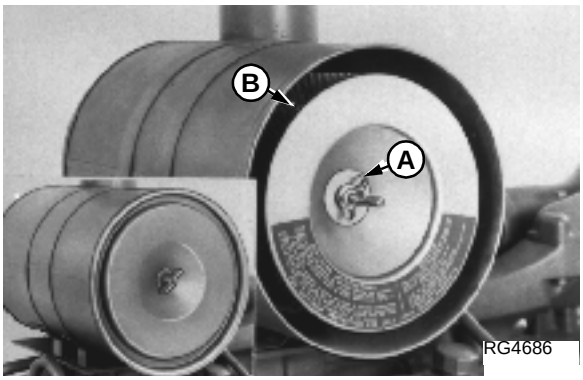
5. Secure bottom retaining spring first, then secure top retaining spring.
6. Install drain plug (B), shown installed. Tighten bleed plug (C) and drain plug securely. Do not overtighten.
7. Open fuel shut-off valve and bleed the fuel system as described later in the Service.



REPLACE AIR CLEANER ELEMENTS

This procedure applies to John Deere air cleaner kits. Refer to manufacturers instructions for servicing air cleaners not supplied by Deere.

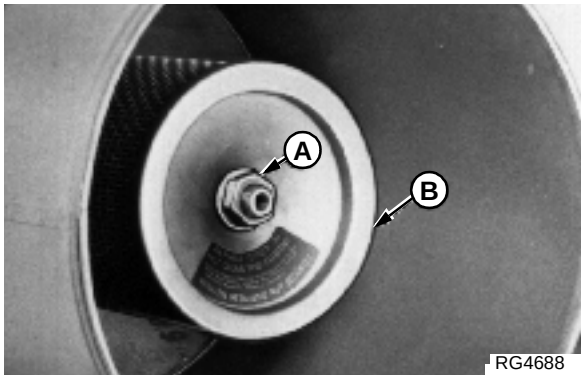
1. Remove wing nut and remove air cleaner cover from canister.
2. Remove wing nut (A) and remove primary air cleaner assembly (B) from canister.



IMPORTANT: Clean dirt from inside of canister before removing secondary element.

3. Remove retaining nut/air restriction indicator (A) and secondary element (B). Replace secondary element with new element immediately to prevent dust from entering air intake system.

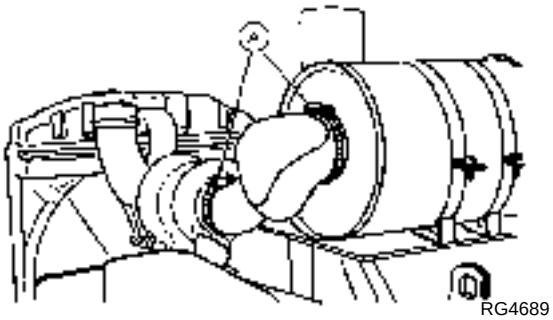
4. Install new primary element and cover assembly. Tighten wing nut securely.

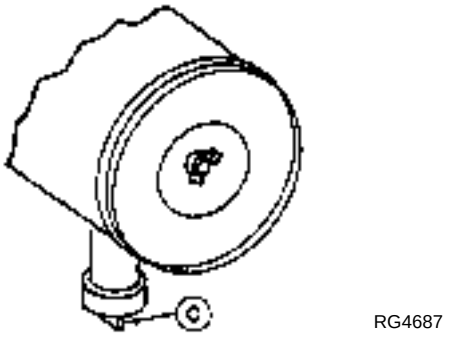


CHECK AIR INTAKE SYSTEM

1. Check the clamps (A) on the piping that connects the air cleaner to the turbocharger. Tighten the clamps as necessary. This will help prevent dirt from entering the air intake system, causing internal engine damage.

2. Inspect rubber dust unloader valve (C) on bottom of air cleaner for cracks or plugging. Correct as necessary.





CHECKING COOLING SYSTEM

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281

IMPORTANT: Air must be expelled from cooling system when system is refilled. Loosen temperature sending unit fitting at rear of cylinder head or plug in thermostat housing to allow air to escape when filling system. Retighten fitting or plug when all the air has been expelled.

1. Check entire cooling system for leaks. Tighten all clamps securely.
2. Thoroughly inspect all cooling system hoses. Replace hoses when hard or cracked.
3. In tropical areas where John Deere Liquid Coolant Conditioner is used with clean, soft water; drain, flush and add new coolant as specified in Fuels, Lubricants, and Coolant Section.

CHECKING EFFECTIVENESS OF COOLANT SOLUTION

When your coolant has accumulated 600 hours or 12 months of operating time, the effectiveness of your engine coolant should be evaluated by obtaining a coolant sample.

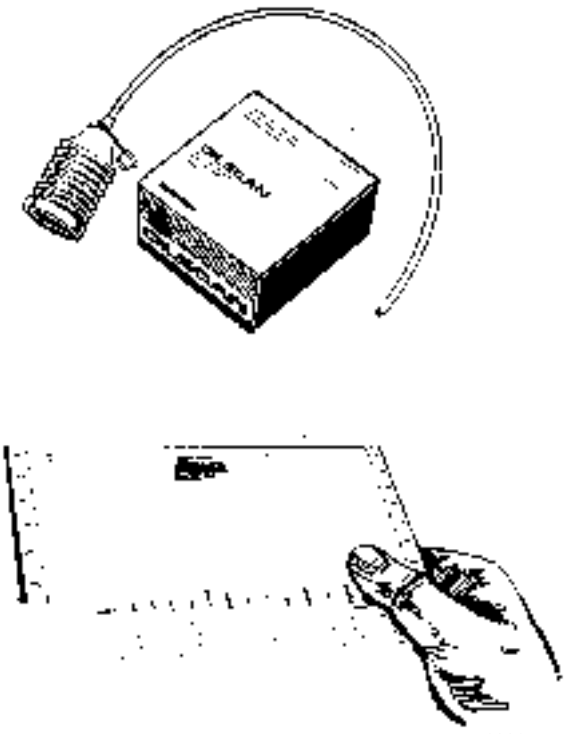
Maintaining the correct coolant conditioner concentration (SCAs) and freeze point is essential in your cooling system to protect against liner pitting, corrosion, and freeze-ups due to incorrect coolant dilution.

A coolant strip test kit provides a simple effective way to check freeze point and molybdate/nitrite levels.

For a more thorough evaluation of your coolant, CoolScan™ is a John Deere sampling program to help you monitor the effectiveness of your engine's coolant solution and identify potential problems before they cause serious damage.

TY16175 or TY16176 3-Way Heavy Duty Coolant Test Kit and DS0251 CoolScan kits are available from your John Deere dealer. Refer to instructions provided with kits.

Usually recharging your engine coolant with the recommended amount of TY16004 or TY16005 Liquid Coolant Conditioner at 600 hours or 12 months of operation is adequate. However, with a CoolScan analysis report you will be given a more thorough evaluation of your engine coolant condition along with detailed service recommendations. (See ADDING SUPPLEMENTAL COOLANT ADDITIVES, later in this section.)



T6829AB

RG7297

ADDING SUPPLEMENTAL COOLANT ADDITIVES (SCAs)

After 600 hours or 12 months of engine operating time, recharge your engine coolant with the recommended amount (see label on container) of TY16004 or TY16005 Liquid Coolant Conditioner.

IMPORTANT: TY16004 or TY16005 Liquid Coolant Conditioner is a non-chromate inhibitor and should be used only with low silicate, ethylene-glycol base antifreeze. It does not protect the cooling system from freezing.

Liquid Coolant Conditioner

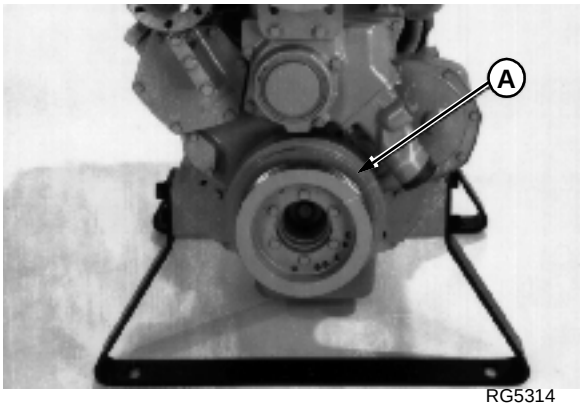
CHECKING AND ADJUSTING ENGINE SPEEDS

If equipped with a tachometer on the instrument panel, observe the tachometer to verify engine speeds. (Refer to FUEL INJECTION PUMP SPECIFICATIONS later in this manual for engine speed specifications.)

CHECK CRANKSHAFT VIBRATION DAMPER

1. Remove belts (shown removed).
2. Grasp vibration damper (A) with both hands and attempt to turn it in both directions. If rotation is felt, damper is defective and should be replaced.

IMPORTANT: The vibration damper assembly is not repairable and should be replaced every 4500 hours or 60 months, whichever occurs first.

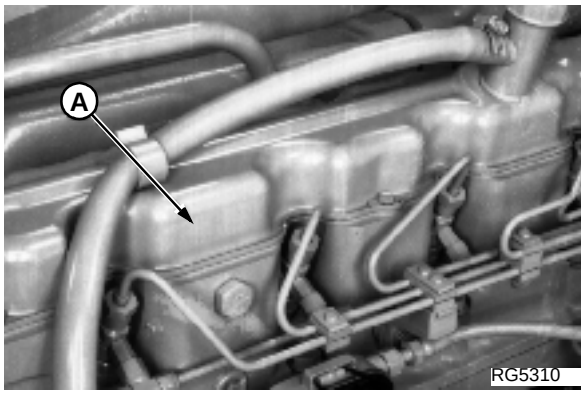


RG5314

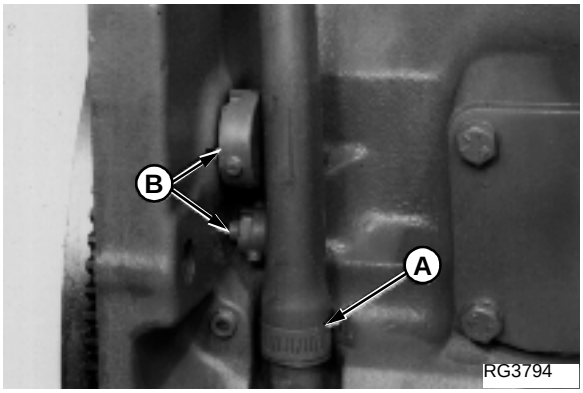
ADJUST ENGINE VALVE CLEARANCE

Adjust engine valve clearance, or have your authorized servicing dealer or engine distributor adjust the valve clearance.

IMPORTANT: Valve clearance should be adjusted after every 1200 hours of engine operation.



CHECK AND ADJUST VALVE CLEARANCE



Too little valve clearance throws valves out of time. Valves open too early and close too late. This causes the valves to overheat due to hot combustion gases rushing past valve when out of time. Overheating lengthens valve stems which prevents proper seating of valves. The valves seat so briefly or poorly that normal heat transfer into the cooling system does not have time to take place, causing burned valves and low power.

Too much valve clearance causes a lag in valve timing causing engine valve train imbalance. The fuel-air mixture enters the cylinders late during intake stroke. The exhaust valve closes early and prevents waste gases from being completely removed from cylinders. Also, the valves close with a great deal of impact, which may crack or break the valves and scuff the camshaft and followers.

IMPORTANT: Valve clearance MUST BE checked and adjusted with engine COLD.

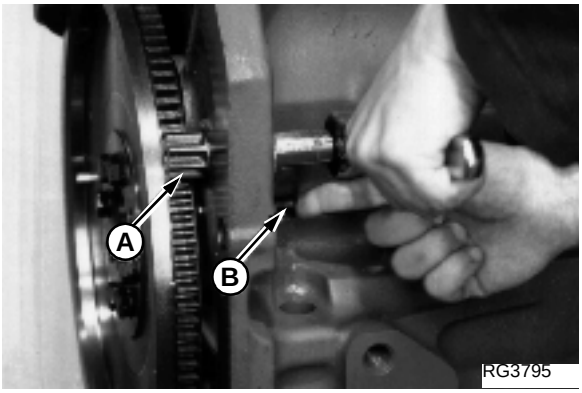
1. Remove rocker arm cover with ventilator tube (A).
2. Remove plastic plugs (B).

IMPORTANT: Visually inspect contact surfaces of valve tips or wear caps and rocker arm wear pads. Check all parts for excessive wear, breakage, or cracks. Replace parts that show visible damage.

Rocker arms that exhibit excessive valve clearance will require a more thorough inspection for the necessity to replace potentially damaged parts.

3. Rotate engine with the JDE81-1 Flywheel Turning Tool (A) until JDE81-4 Timing Pin (B) engages timing hole in flywheel.

If the rocker arms for No. 1 cylinder are loose, the engine is at No. 1 “TDC-Compression.” If the rocker arms for No. 6 cylinder are loose, the engine is at No. 6 “TDC-Compression.” Rotate the engine one full revolution to No. 1 “TDC-Compression.”



4. With engine lock-pinned at “TDC” of No. 1 piston's compression stroke, check and adjust (as needed) valve clearance on Nos. 1, 3 and 5 exhaust valves and Nos. 1, 2 and 4 intake valves.

VALVE CLEARANCE SPECIFICATIONS

Intake Valves ..... 0.38 mm (0.015 in.)

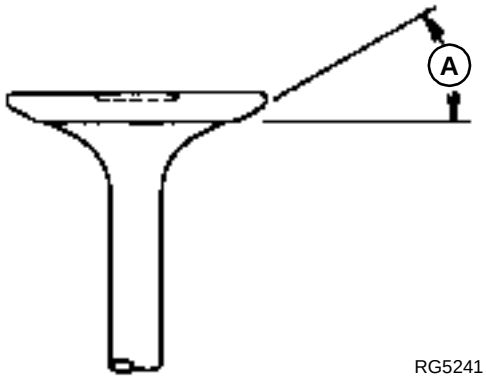
Exhaust Valves ..... 0.51 mm (0.020 in.)

5. If valve clearance needs to be adjusted, loosen the locknut on rocker arm adjusting screw. Turn adjusting screw until feeler gauge slips with a slight drag. Hold the adjusting screw from turning with screwdriver and tighten locknut to 27 N•m (20 lb-ft). Recheck clearance again after tightening locknut. Readjust clearance as necessary.

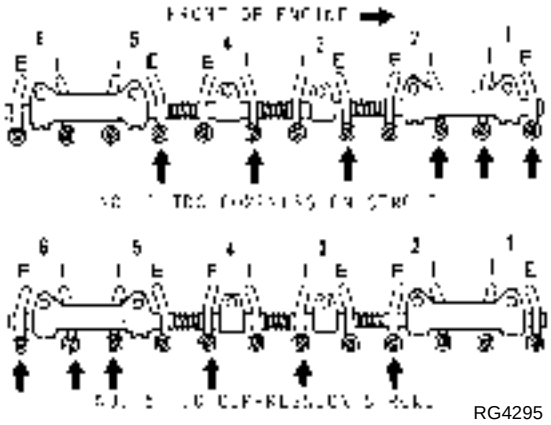
6. Rotate flywheel 360 degrees until No. 6 piston is at “TDC” of its compression stroke. Rocker arms for No. 6 piston should be loose.

7. Check and adjust (as needed) valve clearance to the same specifications on Nos. 2, 4 and 6 exhaust and Nos. 3, 5, and 6 intake valves. Tighten valve adjusting screw locknut to 27 N·m (20 lb-ft).

8. Recheck clearance on all valves again after locknut is tightened.

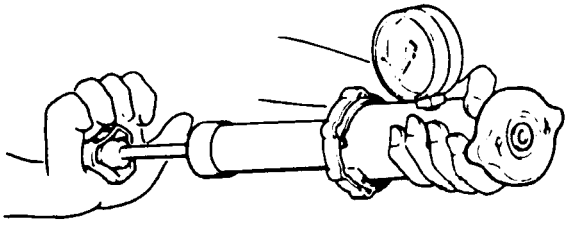


RG5241

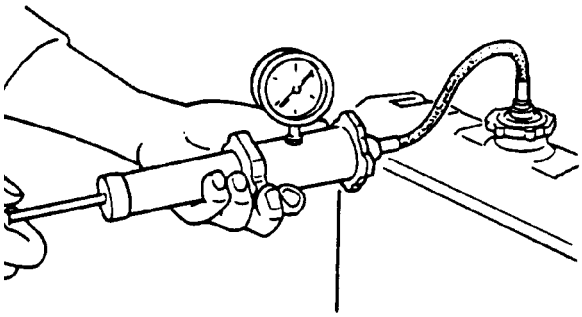


RG4295

PRESSURE TESTING COOLING SYSTEM



RG6557



RG6558

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Test Radiator Cap:

1. Remove radiator cap and attach to D05104ST Tester as shown.
2. Pressurize cap to 50 kPa (0.5 bar) (7 psi)*. Gauge should hold pressure for 10 seconds within the normal range if cap is acceptable.

If gauge does not hold pressure, replace radiator cap.

3. Remove the cap from gauge, turn it 180°, and retest cap. This will verify that the first measurement was accurate.

Test Cooling System:

NOTE: Engine should be warmed up to test overall cooling system.

1. Allow engine to cool, then carefully remove radiator cap.
2. Fill radiator with coolant to the normal operating level.

IMPORTANT: DO NOT apply excessive pressure to cooling system, doing so may damage radiator and hoses.

3. Connect gauge and adapter to radiator filler neck. Pressurize cooling system to 50 kPa (0.5 bar) (7 psi)*.
4. With pressure applied, check all cooling system hose connections, radiator, and overall engine for leaks.

If leakage is detected, correct as necessary and pressure test system again.

If no leakage is detected, but the gauge indicated a drop in pressure, coolant may be leaking internally within the system or at the block-to-head gasket. Have your servicing dealer or distributor correct this problem immediately.

**Test pressures recommended are for all Deere OEM cooling systems. On specific vehicle applications, test cooling system and pressure cap according to the recommended pressure for that vehicle.*

FLUSHING COOLING SYSTEM

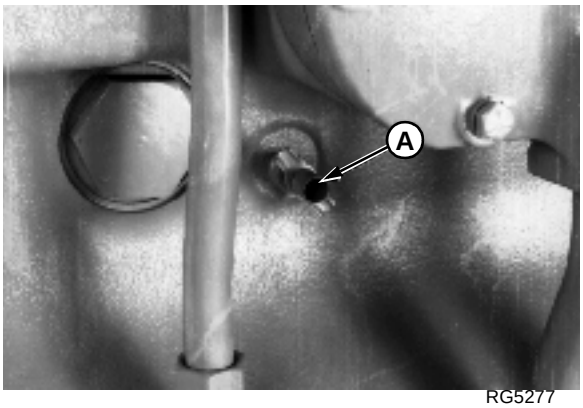
CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281

The cooling system has a coolant filter conditioner, standard on all engines. Radiator, fan, and coolant heater are some of the optional cooling system components. For efficient operation, drain old coolant, flush the entire system, replace thermostats, and fill with clean antifreeze solution.

1. Pressure test entire cooling system and pressure cap if not previously done. (See PRESSURE TESTING COOLING SYSTEM, earlier in this section.)
2. Slowly open the engine system filler cap or radiator cap to relieve pressure and allow coolant to drain faster.
3. On left side, open drain valve (A) on engine block and drain coolant.
4. Open drain valve on radiator and drain coolant from radiator. Loosen radiator cap.
5. Remove thermostats at this time, if not previously done. Install cover (without thermostats) and tighten cap screws to 47 N·m (35 lb-ft).
6. Close all drain valves after coolant has drained. Fill the cooling system with clean water. Run the engine about 10 minutes to stir up possible rust or sediment.



RG5277

FLUSHING COOLING SYSTEM—CONTINUED

7. Stop engine and immediately drain the water from system before rust and sediment settle.

8. After draining water, close drain valves and fill the cooling system with clean water and TY15979 John Deere Heavy Duty Cooling System Cleaner or an equivalent cleaner such as Fleetguard® RESTORE™. Follow the manufacturer's directions on label.

9. After cleaning the cooling system, fill with water to flush the system. Run the engine about 10 minutes, then drain out flushing water.

10. Close all drain valves on engine and radiator.

11. Install new thermostats and cover using new gasket. Tighten all cap screws to 47 N·m (35 lb-ft).

IMPORTANT: Air must be expelled from cooling system when system is refilled. Loosen temperature sending unit fitting in cylinder head or plug in thermostat housing to allow air to escape when filling system. Retighten fitting or plug when all the air has been expelled.

12. Fill cooling system with coolant. Follow recommendations. (See ADDING COOLANT in Service As Required section.)

13. Run engine until it reaches operating temperature. This mixes the solution uniformly and circulates it through the entire system. The normal engine coolant temperature range is 82°—94°C (180°—202°F).

NOTE: Coolant level should be approximately 19 mm (3/4 in.) below bottom of radiator filler neck.

14. After running engine, check coolant level and check entire cooling system for leaks.

Fleet guard is a registered trademark of Cummins Engine Company.

RESTORE™ is a trademark of Fleetguard.

CHANGING ENGINE RATED SPEED FROM 1800 RPM TO 1500 RPM AND ADJUSTING DROOP—GENERATOR SET ENGINES

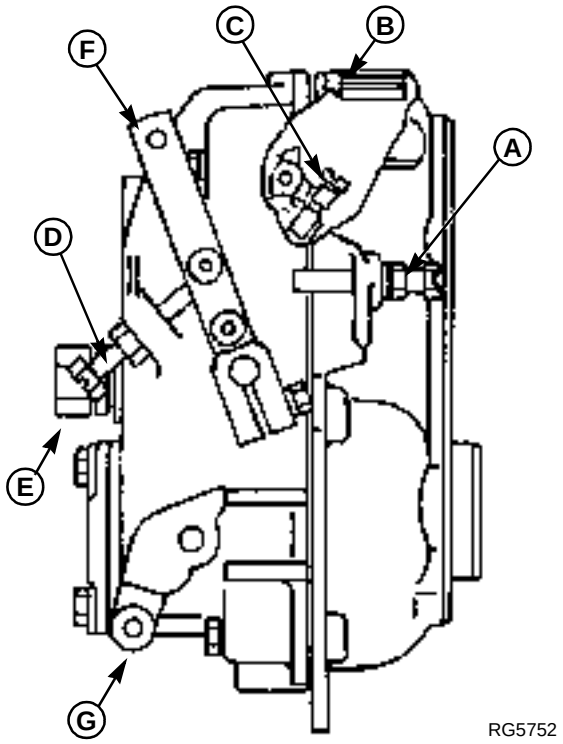
1. Start engine and apply 50% load at rated speed until it reaches operating temperature. Remove cap nuts from adjusting screws before making adjustments.
2. When the engine has reached normal operating temperature, adjust fast idle (stop) screw (A) clockwise (CW) to 1500 rpm (50 Hz) with 100% (full) load.
3. Remove load and back out the idle (bumper) spring screw (E), while observing the corresponding drop in engine rpms until engine quits losing speed.
4. Screw in idle (bumper) spring screw until engine speed increases 5—10 rpm.
5. Check for specified no-load (frequency). If governor regulation is within 5—7% range, proceed to Step 8.

NOTE: A noticeable click will occur at each 1/4 turn of droop adjusting screw. One click CW will increase no-load speed approximately 10 rpm, counter-clockwise (CCW) will reduce speed by 10 rpm.

6. If governor regulation is above 7% or below 5%, stop engine and remove droop adjusting screw access plug (B, shown removed) from top of governor housing.

   a. Back out slow idle (adjusting) screw (D) and bumper screw. Pull back on throttle lever (F, toward rear of governor housing) by hand until the droop adjusting screw (C) inside housing can be adjusted through the access plug hole.

   b. Screw the droop screw in (CW) counting the turns until screw bottoms out. Then, return screw to original setting.



A—Fast Idle (Stop) Screw
B—Droop Adjusting Screw Access Plug Location
C—Droop Adjusting Screw
D—Slow Idle (Adjusting) Screw
E—Idle (Bumper) Spring Screw
F—Throttle Lever
G—Mechanical Shutoff Lever

CHANGING ENGINE RATED SPEED FROM 1800 RPM TO 1500 RPM AND ADJUSTING DROOP—GENERATOR SET ENGINES—CONTINUED

c. Screw in the droop screw (CW) no more than 1/2 turn (two clicks) at a time to reduce governor droop. CCW no more than two clicks at a time to increase governor droop (to reduce governor sensitivity).

d. Replace access plug in top of governor housing. Start engine, apply full (100%) load, and readjust high idle adjusting screw until 1500 rpm (50Hz) is obtained at the specified power.

e. Screw in idle (bumper) spring until engine speed increases 5—10 rpm.

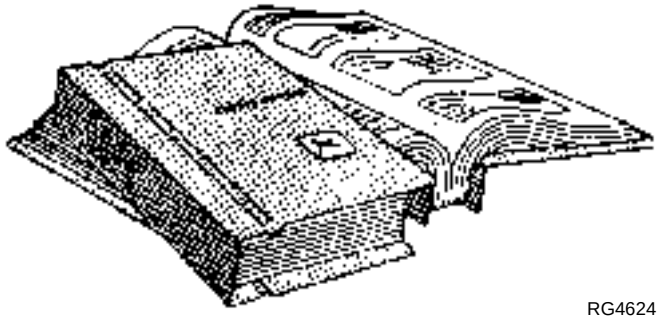
7. Repeat Steps 6 (a—d) until governor regulation is within 5—7% range.

8. Replace all cap nut onto adjusting screws and tighten lock nut securely.

Service As Required

ADDITIONAL SERVICE INFORMATION

This is not a detailed service manual. If you want more detailed service information, use the form in the back of this manual to order a component technical manual.



RG4624

ADDING COOLANT

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281

IMPORTANT: • Never pour cold liquid into a hot engine, as it may crack cylinder head or block. DO NOT operate engine without coolant for even a few minutes.

• John Deere TY15161 Cooling System Sealer may be added to the radiator to stop leaks. DO NOT use any other stop-leak additives in the cooling system.

• Air must be expelled from cooling system when coolant is added.

1. Loosen temperature sending unit fitting at rear of cylinder head or plug in side of thermostat housing to allow air to escape when filling system.

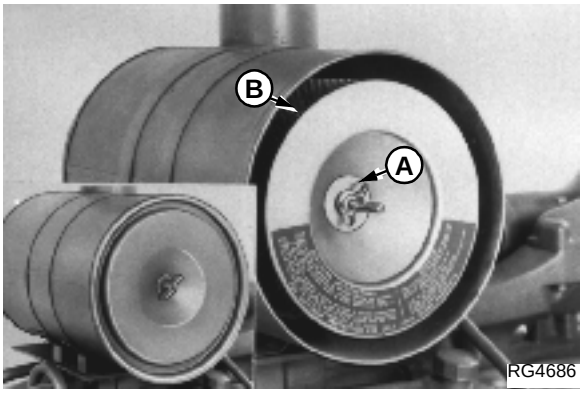
IMPORTANT: When adding coolant to the system, use the appropriate coolant solution. (See ENGINE COOLANT SPECIFICATIONS in Fuels, Lubricants, and Coolant Section for mixing of coolant ingredients before adding to cooling system.)

Do not overfill cooling system. A pressurized system needs space for heat expansion without overflowing at top of radiator.

2. Fill until coolant level touches bottom of radiator filler neck.

3. Tighten plugs and fittings when air has been expelled from system.

REMOVING AND REPLACING AIR CLEANER FILTER ELEMENTS

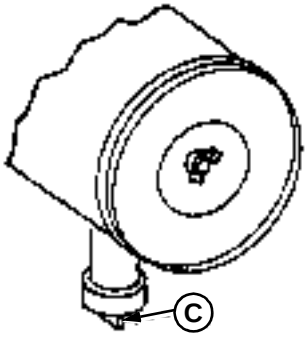


IMPORTANT: ALWAYS REPLACE primary air cleaner element when air restriction indicator shows a vacuum of 635 mm (25 in.) H_20, is torn, or visibly dirty.

NOTE: This procedure applies to John Deere air cleaner kits. Refer to manufacturer's instructions for servicing air cleaners not supplied by John Deere.

1. Remove wing nut and remove canister cover shown in small illustration inset.
2. Remove wing nut (A) and remove primary element (B) from canister.
3. Thoroughly clean all dirt from inside canister.

NOTE: Some engines may have a dust unloader valve (C) on the air cleaner. If equipped, squeeze valve tip to release any trapped dirt particles.



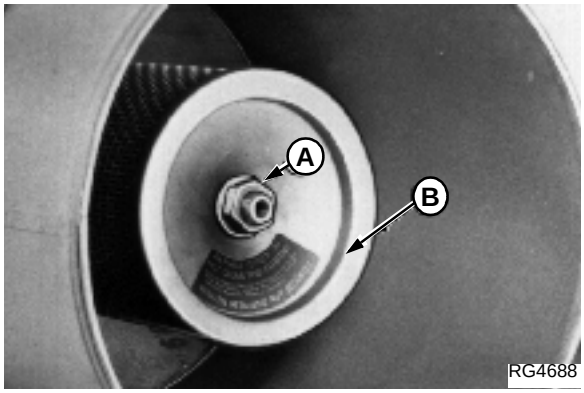
IMPORTANT: Remove secondary (safety) element (B) ONLY for replacement. DO NOT attempt to clean, wash, or reuse secondary element. Replacement of secondary element is usually necessary ONLY when primary element has a hole in it.

4. To replace secondary element, remove retaining nut (A) and secondary element. immediately replace secondary element with new element to prevent dust from entering air intake system.

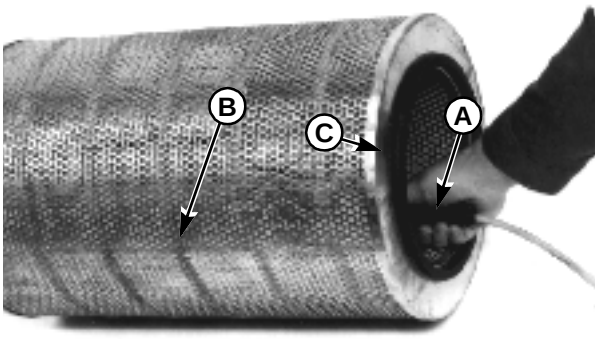
5. Install new primary element and cover assembly. Tighten wing nut securely.

IMPORTANT: Whenever the air cleaner has been serviced or had cover removed, ALWAYS fully depress the air restriction indicator reset button (if equipped) to assure accurate readings.

6. Fully depress air restriction indicator reset button and release to reset indicator.



INSPECTING PRIMARY FILTER ELEMENT



RW4768A

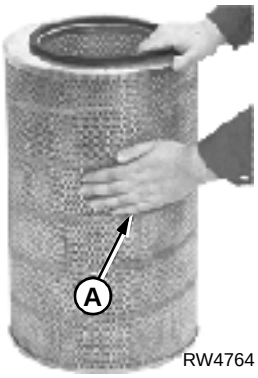
Inspect filter for damage after cleaning or to determine if it is practical to clean filter.

1. Hold a bright light inside element (A) and check carefully for holes. Discard any element which shows the smallest hole or rupture.
2. Be sure outer screen (B) is not dented. Vibration would quickly wear a hole in filter.
3. Be sure filter gasket (C) is in good condition. If gasket is damaged or missing, replace element.

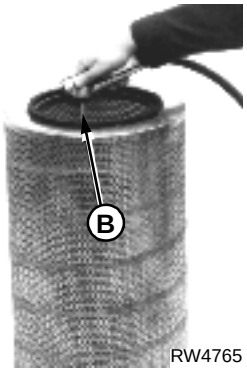
IMPORTANT: Air cleaner MUST BE DRY before storing in plastic bag.

If the filter is to be stored for later use, place it in a plastic bag to protect it from dust and damage.

CLEANING PRIMARY FILTER ELEMENT



RW4764



RW4765

IMPORTANT: Always replace secondary (safety) filter elements. DO NOT attempt to clean them.

Do not blow air from outside portion of filter with air nozzle. Wear safety glasses and remove bystanders.

1. Gently pat sides of element with palm of hand (A) to loosen dirt. DO NOT tap element against a hard surface.

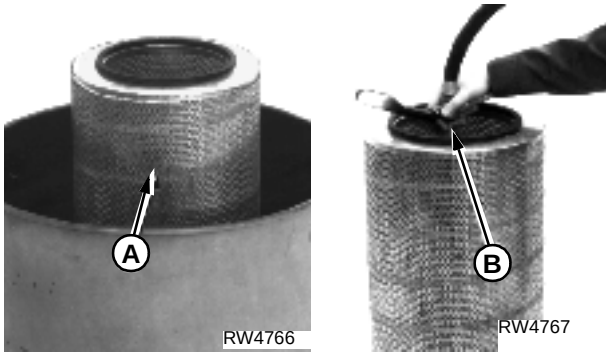
CAUTION: Only a special air cleaning gun (B) should be used. Concentrated air pressure from an ordinary air nozzle may severely damage filter element. Do not exceed 210kPa (2.1 bar) (30 psi) when cleaning filter element.

2. Insert the cleaning gun into element, hold air nozzle about 25.4 mm (1.0 in.) from perforated metal retainer. Force air through filter from inside to outside and move air gun up and down pleats to remove as much dirt as possible.
3. Repeat steps 1 and 2 to remove additional dirt.
4. Inspect element for damage after cleaning. Replace element if any damage is found.

WASHING PRIMARY FILTER ELEMENT

IMPORTANT: Never wash element in gasoline or any solvent. Never use compressed air on a wet element. Do not oil element.

Use extreme caution when washing filters as washing can damage filtering media which could result in failure.



Although filter elements can be washed, replacement is highly recommended. Wash oily or sooty filter only if you have a second clean filter available since it may take up to 3 days to dry after washing.

1. Blow dust from the filter with compressed air or flush with clean water.
2. Soak filter for at least 15 minutes in a solution of warm water and John Deere R36757 Filter Element Cleaner. Agitate the filter gently to flush out dirt after soaking.
3. Rinse element thoroughly from inside (B) with clean water. Keep water pressure under 280 kPa (2.8 bar) (40 psi) to avoid damaging filtering pleats.
4. Allow element to dry completely before using. This usually takes from one to three days. Do not oven dry or use drying agents. Protect element from freezing until dry.
5. Inspect element before installing. (See INSPECTING PRIMARY FILTER ELEMENT, in this section.)

Service As Required

ELEMENT STORAGE

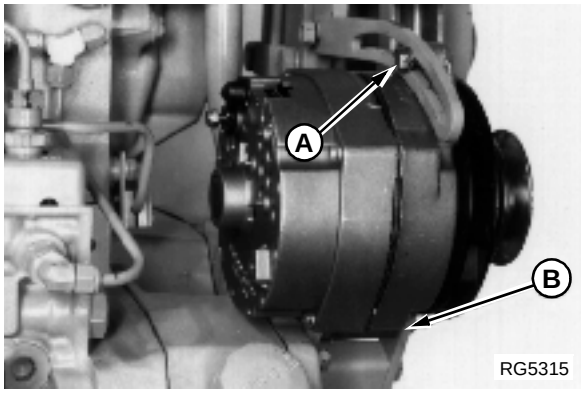
Seal element in a plastic bag and store in shipping container to protect against dust and damage.

IMPORTANT: Air cleaner element MUST BE DRY before storing in plastic bag.

INSPECT FAN AND ALTERNATOR BELTS

IMPORTANT: Do not pry against rear frame. Do not tighten or loosen belts while they are hot.

1. Loosen alternator adjusting cap screws (A) and mounting bolt (B).
2. Rotate top of alternator toward engine and remove belt.
3. Inspect belt for fraying, cracks, or wear. Replace as necessary. (See CHECK AND ADJUST ALTERNATOR AND FAN BELT TENSION in Lubrication and Maintenance/250 Hour section.)



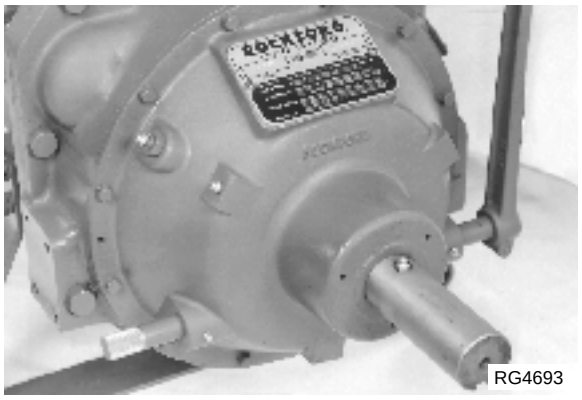
POWER TAKE-OFF (PTO) CLUTCH

CAUTION: Entanglement in rotating driveline can cause serious injury or death. Keep shield on PTO drive shaft (A) between the clutch housing and the engine driven equipment at all times during engine operation. Wear close fitting clothing. Stop the engine and be sure PTO driveline is stopped before making adjustments.

TS198

Proper performance of the power take-off unit will be related to the care it is given. Lubricate it periodically and keep the clutch properly adjusted. (See Lubrication and Maintenance/250 Hour Section.)

If the power take-off does not work properly after adjustment and lubrication, contact your authorized servicing dealer or engine distributor.



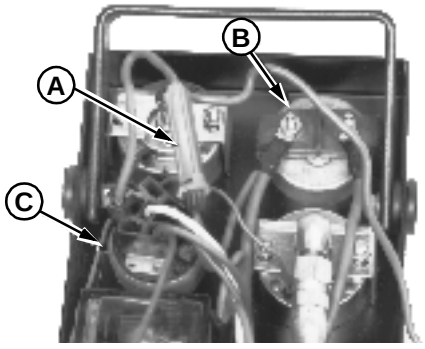
RG4693

CHECK FUSES

The following instructions apply to engines equipped with a John Deere instrument panel.

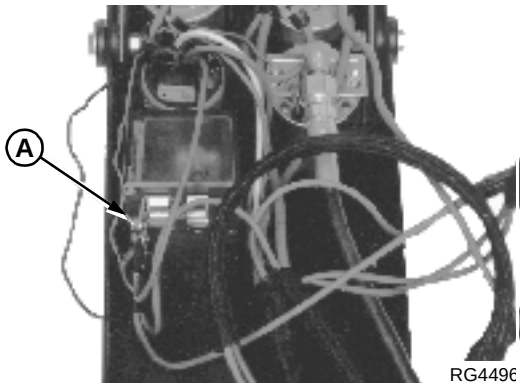
On North American Sourced Instrument (Gauge) Panels:

1. Check the fuse (A) between the ammeter (B) and key switch (C) located on back side of instrument panel. If defective replace with an equivalent 25-amp fuse.



RG4493

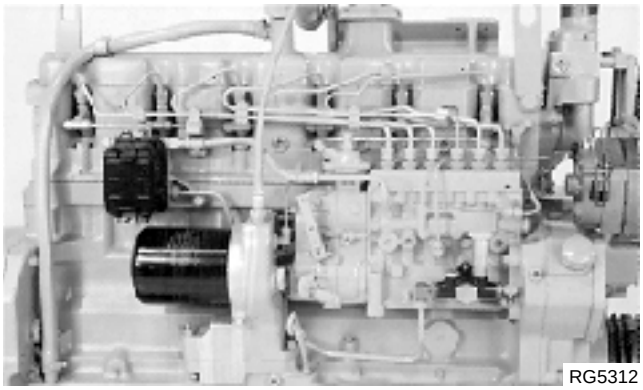
2. Check the fuse (A) mounted on the bottom of the magnetic safety switch. If defective, install an equivalent 14-amp fuse.



DO NOT MODIFY FUEL SYSTEM

IMPORTANT: Modification or alteration of the injection pump, the injection pump timing, or the fuel injectors in ways not recommended by the manufacturer will terminate the warranty obligation to the purchaser.

Do not attempt to service injection pump or fuel injectors yourself. Special training and tools are required. (See your authorized servicing dealer or engine distributor.)



BLEEDING THE FUEL SYSTEM

X9811

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel 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.

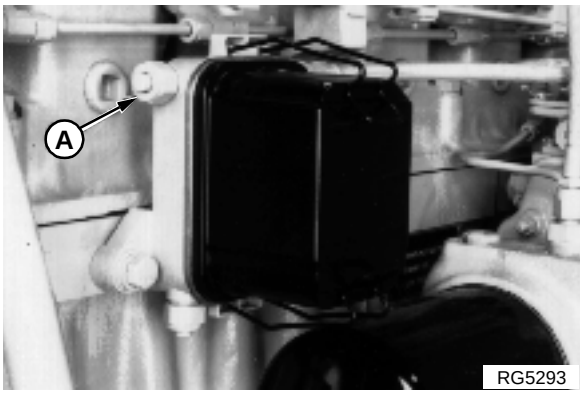
If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

Whenever the fuel system has been opened up for service (lines disconnected or filters removed), it will be necessary to bleed air from the system.

The fuel system may be bled at one of several locations. On some engine applications it may be necessary to consult your operator's manual and choose the locations best for your engine/machine application.

1. Loosen bleed plug (A) on fuel filter base.

IMPORTANT: When bleeding the fuel system on engines equipped with electronic governors, the key switch must be at the "ON" position.



RG5293

2. Unscrew hand primer (A) on fuel supply pump until it can be pulled by hand.

3. Operate the hand primer until a smooth flow of fuel, free of bubbles, comes out of the filter bleed plug hole.

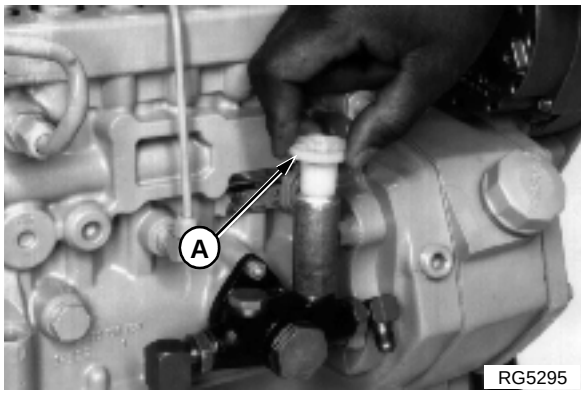
4. Gently stroke the hand primer down and close the bleed plug. Tighten plug securely. DO NOT overtighten. Continue operating hand primer until slight pressure is felt. The pressure indicates that fuel has filled the gallery in the injection pump.

IMPORTANT: Be sure hand primer is all the way down in barrel before tightening to prevent internal thread damage.

5. Lock hand primer in position.

NOTE: If the engine will not start, it may be necessary to loosen the fuel lines at the injection nozzle to bleed air from system. Put the hand throttle in slow idle position. Push the engine fuel shut-off control knob all the way in. Turn the engine with the starter until fuel without air flows from the loose fuel line connections. Tighten the connections.

If the engine still will not start, see your authorized servicing dealer or engine distributor.



Troubleshooting

GENERAL TROUBLESHOOTING INFORMATION

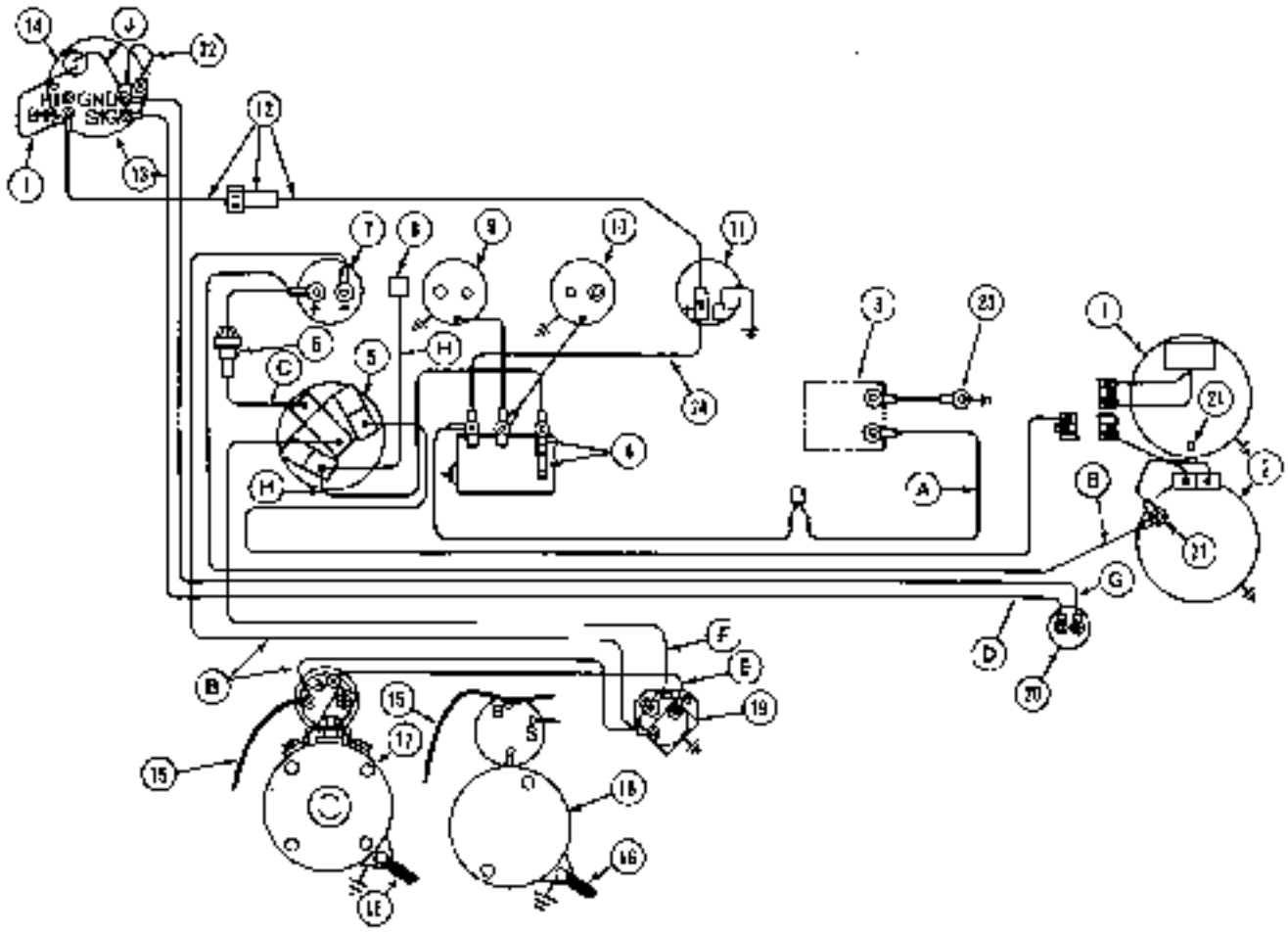
Troubleshooting engine problems can be difficult. An engine wiring diagram is provided in this section to help isolate electrical problems on power units using John Deere wiring harness and instrument (gauge) panel.

Later in this section is a list of possible engine problems that may be encountered accompanied by possible causes and corrections. The illustrated diagrams and troubleshooting information are of a general nature, final design of the overall system for your engine application may be different. See your engine distributor or servicing dealer if you are in doubt.

A reliable program for troubleshooting engine problems should include the following basic diagnostic thought process:

- Know the engine and all related systems.
- Study the problem thoroughly.
- Relate the symptoms to your knowledge of engine and systems.
- Diagnose the problem starting with the easiest things first.
- Double-check before beginning the disassembly.
- Determine cause and make a thorough repair.
- After making repairs, operate the engine under normal conditions to verify that the problem and cause was corrected.

WIRING DIAGRAM—12-VOLT SYSTEM

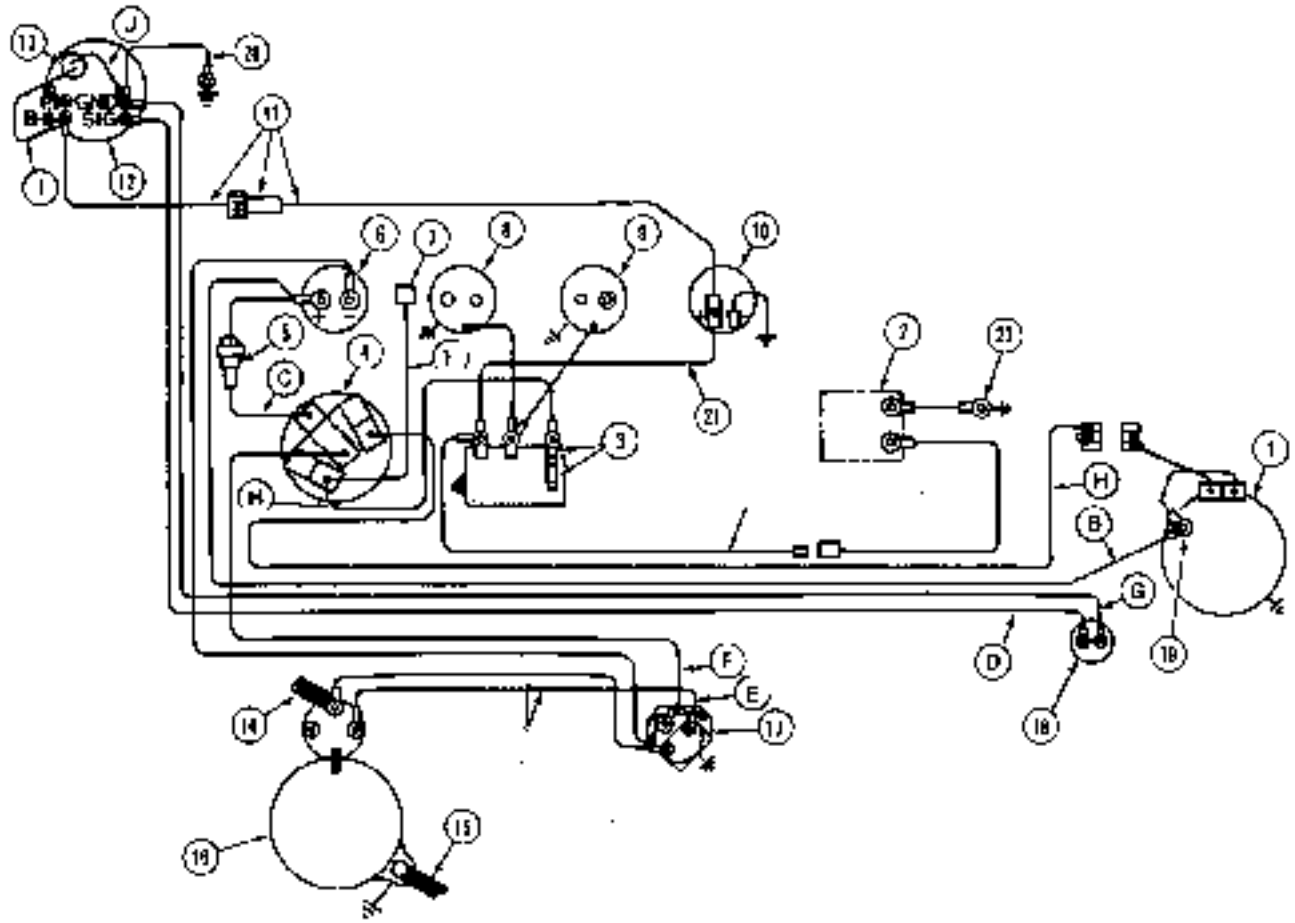


RG4655

1—Motorola Alternator
2—Delco-Remy Alternator
3—Rack Puller or Shut-Off Solenoid
4—Safety Switch With SFE 14-Amp Fuse
5—Key Switch
6—Fuseholder With MDL 25-Amp Fuse
7—Ammeter
8—This Terminal Not Used
9—Oil Pressure Gauge
10—Water Temperature Gauge
11—Hour Meter
12—RE18166 Lead With 3-Amp MDX Fuse
13—Tachometer With Hour Meter
14—RE18187 Light
15—Positive Battery Cable
16—Negative Battery Cable
17—Delco-Remy Starting Motor
18—John Deere Starting Motor
19—Starter Circuit Relay
20—Magnetic Speed Sensor
21—Output Terminal
22—AT26016 Ground Lead
23—AR93161 Ground Lead
24—AR67341 Wiring Lead
A—14 Gauge—Dark Blue
*B—8 Gauge—Red or Brown
C—12 Gauge—Red or Brown
D—18 Gauge—Red
E—10 Gauge—White
F—14 Gauge—White
G—18 Gauge—Black or Black With White Stripe
H—16 Gauge—Purple
I—18 Gauge—Yellow
J—18 Gauge—Brown

*Brown wiring leads not used at starter circuit relay (Key 19).

WIRING DIAGRAM—24-VOLT SYSTEM



RG4667

1—Delco-Remy Alternator
2—Shut-Off Solenoid
3—Safety Switch With SFE 14-Amp Fuse
4—Key Switch
5—Fuseholder With MDL 25-Amp Fuse
6—Ammeter
7—This Terminal Not Used
8—Oil Pressure Gauge
9—Water Temperature Gauge
10—Hour Meter
11—RE18166 Lead With 3-Amp MDX Fuse
12—Tachometer With Hour Meter
13—RE18187 Light
14—Positive Battery Cable
15—Negative Battery Cable
16—John Deere Starting Motor
17—Starter Circuit Relay
18—Magnetic Speed Sensor
19—Output Terminal
20—AT26016 Ground Lead (To Instrument Panel)
21—AR67341 Wiring Lead
22—AR93161 Ground Lead
A—14 Gauge—Dark Blue
***B—8 Gauge—Red or Brown**
C—12 Gauge—Red or Brown
D—18 Gauge—Red
E—10 Gauge—White
F—14 Gauge—White
G—18 Gauge—Black or Black With White Stripe
H—16 Gauge—Purple
I—18 Gauge—Yellow
J—18 Gauge—Brown

**Brown wiring leads not used at starter circuit relay (Key 17).*

ENGINE TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION
Engine hard to start or will not start	Improper starting procedure.	Review starting procedure.
	No fuel.	Check fuel tank.
		Check shut-off valve wiring connection (Elec. Gov. only)
	Air in fuel line.	Bleed fuel line.
	Cold weather.	Use cold weather starting aids.
	Slow starter speed.	See “Starter Cranks Slowly”.
	Crankcase oil too heavy.	Use oil of proper viscosity.
	Improper type of fuel.	Consult fuel supplier; use proper type fuel for operating conditions.
	Water, dirt or air in fuel system.	Drain, flush, fill and bleed system.
	Clogged fuel filter.	Replace filter elements.
	Dirty or faulty injection nozzles.	Have authorized dealer or engine distributor check injectors.
	Injection pump shut-off not reset.	Turn key switch to “OFF” then to “ON”.
Engine knocks	Insufficient oil.	Add oil.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Low coolant temperature.	Remove and check thermostats.
	Engine overheating.	See “Engine Overheats”.
Engine runs irregularly or stalls frequently	Low coolant temperature.	Remove and check thermostats.
	Clogged fuel filter.	Replace filter element.
	Water, dirt or air in fuel system.	Drain, flush, fill and bleed system.
	Dirty or faulty injection nozzles.	Have authorized dealer or engine distributor check injectors.
Below normal engine temperature	Defective thermostat.	Remove and check thermostats.
	Defective temperature gauge or sender.	Check gauge, sender, and connections.

Continued on next page

SYMPTOM	PROBLEM	SOLUTION
Lack of power	Engine overloaded.	Reduce load.
	Intake air restriction.	Service air cleaner.
	Clogged fuel filter.	Replace filter element.
	Improper type of fuel.	Use proper fuel.
	Overheated engine.	See “Engine Overheats”.
	Below normal engine temperature.	Remove and check thermostats.
	Improper valve clearance.	See your authorized servicing dealer or engine distributor.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Turbocharger not functioning.	See your authorized servicing dealer or engine distributor.
	Leaking exhaust manifold gasket.	See your authorized servicing dealer or engine distributor.
	Defective aneroid control line.	See your authorized servicing dealer or engine distributor.
	Restricted fuel hose.	Clean or replace fuel hose.
	Low fast idle speed.	See your authorized servicing dealer or engine distributor.
Low oil pressure	Low oil level.	Add oil.
	Improper type of oil.	Drain, fill crankcase with oil of proper viscosity and quality.
High oil consumption	Crankcase oil too light.	Use proper viscosity oil.
	Oil leaks.	Check for leaks in lines, gaskets and drain plug.
	Restricted crankcase vent tube.	Clean vent tube.
	Defective turbocharger.	See your authorized servicing dealer or engine distributor.

Continued on next page

SYMPTOM	PROBLEM	SOLUTION
Engine emits white smoke	Improper type of fuel.	Use proper fuel.
	Low engine temperature.	Warm up engine to normal operating temperature.
	Defective thermostat.	Remove and check thermostats.
	Defective injection nozzles.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
Engine emits black or gray exhaust smoke	Improper type of fuel.	Use proper fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce load.
	Injection nozzles dirty.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
	Turbocharger not functioning.	See your authorized servicing dealer or engine distributor.
Engine overheats	Engine overloaded.	Reduce load.
	Low coolant level	Fill radiator to proper level, check radiator and hoses for loose connections or leaks.
	Faulty radiator cap.	Have serviceman check.
	Loose or defective fan belts.	Adjust belt tension. Replace as required.
	Low engine level.	Check oil level. Add oil as required.
	Cooling system needs flushing.	Flush cooling system.
	Defective thermostat.	Remove and check thermostats.
	Defective temperature gauge or sender.	Check water temperature with thermometer and replace if necessary.
	Incorrect grade of fuel.	Use correct grade of fuel.

Continued on next page

SYMPTOM	PROBLEM	SOLUTION
High fuel consumption	Improper type of fuel.	Use proper fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overload.	Reduce load.
	Improper valve clearance.	See your authorized servicing dealer or engine distributor.
	Injection nozzles dirty.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
	Defective turbocharger.	See your authorized servicing dealer or engine distributor.
	Low engine temperature.	Check thermostats.

ELECTRICAL SYSTEM TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION
Voltmeter indicates low battery voltage (key on and engine stopped)	Defective battery.	See your authorized servicing dealer or engine distributor.
	Low charging voltage.	Have your authorized servicing dealer or engine distributor check charging circuit.
	High resistance in charging circuit.	Have your authorized servicing dealer or engine distributor check charging circuit.
	Voltmeter malfunction.	Have your authorized servicing dealer or engine distributor check voltmeter.
Voltmeter indicates low charging voltage (engine running)	Low engine speed.	Increase speed.
	Slipping belts.	Tighten belts.
	Defective battery.	See your authorized servicing dealer or engine distributor.
	Defective alternator.	See your authorized servicing dealer or engine distributor.
	Excessive load.	Remove load.
Voltmeter indicates excessive charging voltage	Faulty connection to alternator.	Check wiring connections.
	Defective regulator. Voltmeter malfunction.	Have your authorized servicing dealer or engine distributor check alternator.
Batteries will not charge	Loose or corroded connections.	Clean and tighten connections.
	Sulfated or worn-out batteries.	See your authorized servicing dealer or engine distributor.
	Loose or defective alternator belt.	Clean and tighten connections.

Continued on next page

SYMPTOM	PROBLEM	SOLUTION
Starter inoperative	PTO engaged.	Disengage PTO.
	Loose or corroded connections.	Clean and tighten loose connections.
	Low battery output.	See your authorized servicing dealer or engine distributor.
	Faulty or misadjusted starter safety switch or starter solenoid malfunction.	See your authorized servicing dealer or engine distributor.
	Blown fuse (MDL-25).	Replace fuse.
Starter cranks slowly	Low battery output.	See your authorized servicing dealer or engine distributor.
	Crankcase oil too heavy.	Use proper viscosity oil.
	Loose or corroded connections.	Clean and tighten loose connections.
Starter and hour meter functions; rest of electrical system does not function	Blown fuse on magnetic switch.	Replace fuse. (14 amp)
Entire electrical system does not function	Faulty battery connection.	Clean and tighten connections.
	Sulfated or worn-out batteries.	See your authorized servicing dealer or engine distributor.
	Blown fuse (MDL-25).	Replace fuse.

Storage

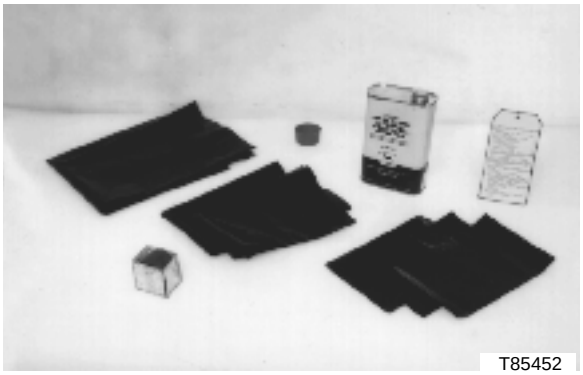
ENGINE STORAGE GUIDELINES

1. John Deere engines can be stored outside for up to three (3) months with no long term preparation IF COVERED BY WATERPROOF COVERING.
2. John Deere engines can be stored in a standard overseas shipping container for up to three (3) months with no long term preparation.
3. John Deere engines can be stored inside, warehoused, for up to six (6) months with no long term preparation.
4. John Deere engines expected to be stored more than six (6) months, long term storage preparation MUST BE taken. (See PREPARING ENGINE FOR LONG TERM STORAGE, later in this section.)
5. For John Deere engines not yet installed in machines, run a line from a container of AR41937 Nucle Oil to the fuel transfer pump intake, and another line from the fuel return manifold to the tank, so that Nucle Oil is circulated through the injection system during cranking.

USE AR41785 ENGINE STORAGE KIT

See your John Deere servicing dealer or engine distributor for an AR41785 Engine Storage Kit. Closely follow instructions provided with this kit.

IMPORTANT: Inhibitors can easily change to gas. Seal or tape each opening immediately after adding inhibitor.


T85452

PREPARING ENGINE FOR LONG TERM STORAGE

The following storage preparations are good for long term engine storage up to one year. After that, the engine should be started, warmed up, and retreated for an extended storage period.

IMPORTANT: Any time your engine will not be used for over six (6) months, the following recommendations for storing it and removing it from storage will help to minimize corrosion and deterioration. Use the AR41785 Engine Storage Kit. Follow recommended service procedure included with storage kit.

1. Change engine oil and replace filter. Used oil will not give adequate protection. (See CHANGE ENGINE OIL AND FILTER in Lubrication and Maintenance/250 Hour Section.)
2. Service air cleaner. (See REPLACING AIR CLEANER FILTER ELEMENTS in Service As Required Section.)
3. Draining and flushing of cooling system is not necessary if engine is to be stored only for several months. However, for extended storage periods of a year or longer, it is recommended that the cooling system be drained, flushed, and refilled. Refill with appropriate coolant. (See RECOMMENDED ENGINE COOLANT in Fuels, Lubricants, and Coolant Section and ADDING COOLANT in Service As Required Section.)
4. Drain fuel tank and add 30 ml (1 oz) of inhibitor to the fuel tank for each 15 L (4 U.S. gal) of tank capacity. Completely drain fuel filter and close fuel valve, if equipped.
5. Add 30 ml (1 oz) of inhibitor to the engine crankcase for each 0.95 L (1 qt) of crankcase oil.
6. Disconnect air intake piping from the manifold. Pour 90 ml (3 oz) of inhibitor into intake system and reconnect the piping.
7. Crank the engine several revolutions with starter (do not allow the engine to start).
8. Remove fan/alternator V-belt, if desired.
9. Remove and clean batteries. Store them in a cool, dry place and keep them fully charged.
10. Disengage the PTO clutch.
11. Clean the exterior of the engine with salt-free water and touchup any scratched or chipped painted surfaces with a good quality paint.
12. Coat all exposed (machined) metal surfaces with grease or corrosion inhibitor if not feasible to paint.
13. Seal all openings on engine with plastic bags and tape supplied in storage kit. Follow instructions supplied in kit.
14. Store the engine in a dry protected place. If engine must be stored outside, cover it with a waterproof canvas or other suitable protective material and use a strong waterproof tape.

REMOVING ENGINE FROM LONG TERM STORAGE

Refer to the appropriate section for detailed services listed below or have your authorized servicing dealer or engine distributor perform services that you may not be familiar with.

1. Remove all protective coverings from engine. Unseal all openings in engine and remove covering from electrical systems.
2. Remove the batteries from storage. Install batteries (fully charged) and connect the terminals.
3. Install fan/alternator V-belts if removed.
4. Fill fuel tank.
5. Perform all appropriate prestarting checks. (See DAILY PRESTARTING CHECKS in Engine Operating Guidelines Section.)

IMPORTANT: DO NOT operate starter more than 30 seconds at a time. Wait at least 2 minutes for starter to cool before trying again.

6. Crank engine for 20 seconds with starter (do not allow the engine to start). Wait 2 minutes and crank engine an additional 20 seconds to assure bearing surfaces are adequately lubricated.
7. Start engine and run at low idle and no load for several minutes. Warm up carefully and check all gauges before placing engine under load.
8. On the first day of operation after storage, check overall engine for leaks and check all gauges for correct operation.

GENERAL OEM SPECIFICATIONS

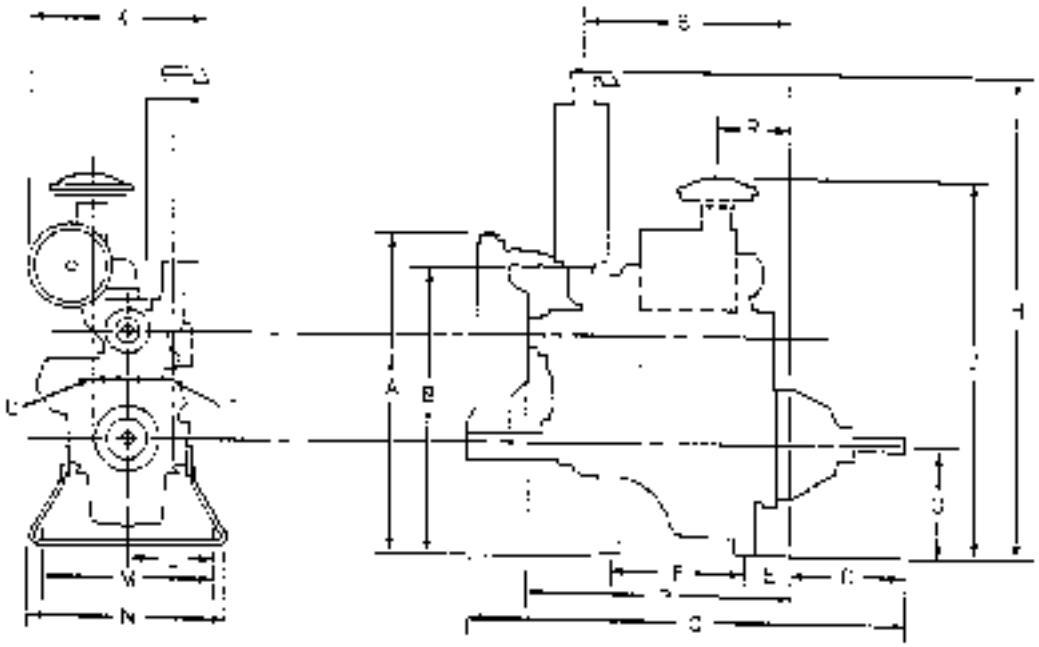
ITEM	UNIT OF MEASURE	6076T	6076A	6076H
Number of Cylinders	——	6	6	6
Fuel	——	diesel	diesel	diesel
Bore	mm (in.)	116 (4.56)	116 (4.56)	116 (4.56)
Stroke	mm (in.)	121 (4.75)	121 (4.75)	121 (4.75)
Displacement	L (cu.in.)	7.6 (466)	7.6 (466)	7.6 (466)
Compression Ratio	——	15.5:1	15.5:1	15.5:1
Valve Clearance				
Intake	mm (in.)	0.38 (0.015)	0.38 (0.015)	0.38 (0.015)
Exhaust	mm (in.)	0.51 (0.020)	0.51 (0.020)	0.51 (0.020)
Slow Idle speed	RPM	850	850	850
Fast Idle speed				
7—10% (Std.) Mech. Governor	RPM	2420	2420	2420
Rated Speed				
7—10% (Std) Mech. Governor	RPM	2200	2200	2200
3—5% Mechanical Governor	RPM	1500/1800	1500/1800	—
Electronic Governor	RPM	—	1800	1800
Industrial power rating @ rated speed without fan				
Intermittent	kW (HP)	149 (200)	186, 168 (250, 225)	205 (275)
Continuous	kW (HP)	127 (170)	160 (215)	175 (235)
Torque (max) @ RPM without fan		@ 1400	@ 1500	@ 1500
	N·m (ft-lb)	840 (619)	1045 (771)	1119 (825)

GENERAL OEM SPECIFICATIONS—CONTINUED

ITEM	UNIT OF MEASURE	6076T	6076A	6076H
Auxiliary Drive				
Power Output (Maximum)				
Intermittent	kW (HP)	45 (60)	45 (60)	45 (60)
Continuous	kW (HP)	37 (50)	37 (50)	37 (50)
Drive Ratio	—	1.05:1 drive: crankshaft	1.05:1 drive: crankshaft	1.05:1 drive: crankshaft
Engine Rotation*	——	counter- clockwise*	counter- clockwise*	counter- clockwise*
Crankcase capacity with filter change**	L (qt)	25 (26)	25 (26)	25 (26)
PTO shaft diameter	mm (in.)	57 (2.25)	64 (2.5)	64 (2.5)
Basic Weight (dry)	kg (lb)	794 (1746)	831 (1829)	794 (1746)
Physical Dimensions: (including flywheel housing, flywheel, and electrics)				
Width	mm (in.)	572 (22.5)	572 (22.5)	572 (22.5)
Height	mm (in.)	1173 (46.2)	1173 (46.2)	1173 (46.2)
Length	mm (in.)	1229 (48.4)	1229 (48.4)	1229 (48.4)

**As viewed from flywheel end of engine.*

***Since optional oil pans are available on most OEM Engines, crankcase oil capacity may vary. (See CHANGE ENGINE OIL AND FILTER in the Lubrication and Maintenance/250 Hour section for crankcase capacities with filter change.)*



RG1030

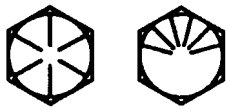
A—Height—to—Radiator Cap
B—Height—to—Exhaust Elbow
C—Overall Length
D—PTO Assembly Length
E—Rear Mounting Hole—to—Flywheel
F—Mounting Holes Length
G—Crankshaft Height
H—Height-to-Top of Muffler
J—Height-to-Top of Air Cleaner
K—Width Less Radiator
K1—Width With Radiator (Not Shown)
L—Crankshaft-to-Mounting Hole
M—Mounting Holes Width
N—Overall Mount Width
P—Block Length
R—Air Cleaner-to-Flywheel
S—Muffler-to-Flywheel
T—Crankshaft-to-Exhaust Manifold (Left)
U—Crankshaft-to-Air Intake (Right)

Dimension mm (in.)	6076TF	6076AF	6076HF
A	1321 (52.0)	1334 (52.5)	1321 (52.0)
B	1283 (50.5)	1283 (50.5)	1283 (50.5)
C	1753 (69.0)	1794 (70.6)	1753 (69.0)
D	394 (15.5)	410 (16.13)	394 (15.5)
E	236 (9.3)	236 (9.3)	236 (9.3)
F	711 (28.0)	711 (28.0)	711 (28.0)
G	381 (15.0)	381 (15.0)	381 (15.0)
H	2190 (86.2)	2190 (86.2)	2190 (86.2)
J	1549 (61.0)	1549 (61.0)	1549 (61.0)

Dimension mm (in.)	6076TF	6076AF	6076HF
K	546 (21.5)	559 (22.0)	546 (21.5)
K1	622 (24.5)	775 (30.5)	622 (24.5)
L	324 (12.8)	324 (12.8)	324 (12.8)
M	648 (25.5)	648 (25.5)	648 (25.5)
N	800 (31.5)	800 (31.5)	800 (31.5)
P	1208 (47.5)	1208 (47.5)	1208 (47.5)
R	381 (15.0)	381 (15.0)	381 (15.0)
S	1092 (43.0)	1092 (43.0)	1092 (43.0)
T	167 (6.6)	167 (6.6)	167 (6.6)
U	25 (1.0)	25 (1.0)	25 (1.0)

(Specifications and design subject to change without notice.)

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES

SAE Grade and Head Markings	**NO MARK**	**1 or 2[b]** 	**5** **5.1** **5.2** 	**8** **8.2** 
SAE Grade and Nut Markings	**NO MARK**	**2** 	**5** 	**8** 

Size	Grade 1				Grade 2[b]				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	240	175	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	400	300	510	375	400	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

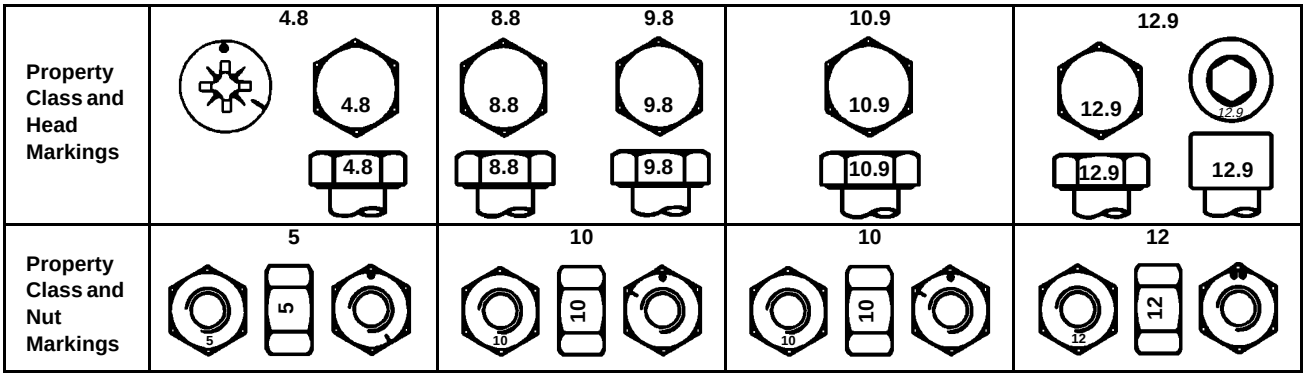
Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

[b] Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length

METRIC BOLT AND CAP SCREW TORQUE VALUES



Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical class.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

Lubrication and Maintenance Records

USING LUBRICATION AND MAINTENANCE RECORDS

Refer to specific Lubrication and Maintenance Section for detailed service procedures.

1. Keep a record of the number of hours you operate your engine by regular observation of hour meter.
2. Check your record regularly to learn when your engine needs service.
3. DO ALL the services within an interval section. Write the number of hours (from your service records) and the date in the spaces provided. For a complete listing of all items to be performed and the service intervals required, refer to the quick-reference chart near the front of the Lubrication and Maintenance Section.

IMPORTANT: The service recommendations covered in this manual are for the accessories that are provided by John Deere. Follow manufacturer's service recommendations for servicing engine driven equipment not supplied by Deere.

DAILY (PRESTARTING) SERVICE

- Check engine oil level.
- Check coolant level.
- Check air cleaner dust unloader valve and air restriction indicator, if equipped.
- Lubricate PTO release bearing
- Visual walkaround inspection.

50 HOURS/EVERY 2 WEEKS SERVICE

- Check fuel filter
- Lubricate PTO clutch shaft bearings.

Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									

250 HOUR SERVICE

- Change engine oil and filter.*
- Service fire extinguisher
- Service battery.
- Check alternator/fan belt tension.
- Check PTO clutch adjustment.
- Check weep hole - gear-driven water pumps.

Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									

** If John Deere PLUG-50 oil is used along with a John Deere oil filter, the oil change interval may be extended by 50 hours.*

600 HOUR/12 MONTH SERVICE

- Lubricate PTO clutch internal levers and linkage.
- Clean crankcase vent tube.
- Replace single fuel filter element.
- Replace air cleaner elements.
- Check air intake hoses, connections, and system.
- Check cooling system
- Coolant solution analysis - add SCAs as needed.

Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									

1200 HOUR/24 MONTH SERVICE

- Check and adjust valve clearance.
- Test and flush cooling system.*
- Check crankcase vibration damper.
- Adjust speed (droop) — generator set engines

Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									

** If John Deere Antifreeze/Summer Coolant Concentrate or John Deere COOL-GARD is used, the flushing interval may be extended to 2000 hours. If John Deere Prediluted Antifreeze/Summer Coolant is used, the flushing interval may be extended to 3000 hours or 36 months, whichever occurs first.*

SERVICE AS REQUIRED

- Service air cleaner.
- Inspect fan and alternator belts.
- Add coolant
- Check fuses.
- Check PTO clutch.

Hours									
Date									
Hours									
Date									
Hours									
Date									

Emission System Warranty

EMISSIONS CONTROL SYSTEM CERTIFICATION LABEL

The emissions warranty described below applies only to those engines marketed by John Deere that have been certified by the United States Environmental Protection Agency (EPA) and/or California Air Resources Board (CARB); and used in the United States in non-road mobile (self-propelled or portable/transportable*) equipment. The presence of an emissions label like the one shown signifies that the engine has been certified with the EPA and/or CARB. The EPA and CARB warranties only apply to new engines having the certification label affixed to the engine and sold as stated above in the geographic areas governed by the regulating agencies.

NOTE: The hp/kW rating on the engine emissions certification label specifies the gross engine hp/kW, which is flywheel power without fan. In most applications this will not be the same rating as the advertised vehicle hp/kW rating.

RG8667

** Equipment moved at least once every 12 months.*

U.S. EMISSIONS CONTROL WARRANTY STATEMENT (*UNITED STATES ONLY*)

Emissions control-related parts and components are warranted by John Deere for five years or 3000 hours of operation, whichever occurs first. John Deere further warrants that the engine covered by this warranty was designed, built, and equipped so as to conform at the time of sale with all U.S. emissions standards at the time of manufacture, and that it is free of defects in materials and workmanship which would cause it not to meet these standards within the period of five years or 3000 hours of operation, whichever occurs first.

Warranties stated in this manual refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately as the “John Deere New Off-Highway Engine Warranty”.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT *(CALIFORNIA ONLY)*

Your Warranty Rights and Obligations

The California Air Resources Board (CARB) and John Deere are pleased to explain the emission control system on your new engine. In California, new heavy-duty engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect, or improper maintenance of your engine.

Your emissions control system includes:

- Fuel Metering System
  - Fuel Injection System
- Air Induction System
  - Intake Manifold
  - Turbocharger System
  - Charge Air Cooling System
- Miscellaneous Items used in above systems

Where a warrantable condition exists, i.e. failure due to defect in John Deere-supplied material and/or workmanship, John Deere will repair your heavy-duty engine at no cost to you including diagnosis, parts and labor.

John Deere's Warranty Coverage:

The emission control system of your heavy-duty engine is warranted for five years or 3000 hours of operation, whichever occurs first. If any emission-related part on your engine is defective, the part will be repaired or replaced by John Deere. Warranties stated in this manual refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately as the "John Deere New Off-Highway Engine Warranty".

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT—CONTINUED

Owner's Warranty Responsibilities:

As the heavy-duty engine owner, you are responsible for the performance of the required maintenance as outlined in this Operation and Maintenance Manual. John Deere recommends that you retain all receipts covering maintenance on your heavy-duty engine, but John Deere cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

However, as the heavy-duty engine owner, you should be aware that John Deere may deny you warranty coverage if your heavy-duty engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

Your engine is designed to operate on diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.

You are responsible for initiating the warranty process. The CARB suggests that you present your heavy-duty engine to the nearest John Deere engine service dealer as soon as a problem is suspected. The warranty repairs should be completed by the service dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400 or the State of California Air Resources Board, Mobile Source Operation Division, PO Box 8001, El Monte, CA 91731-2990.

The warranty period begins on the date the engine is delivered to an ultimate purchaser, or when otherwise put into service. John Deere warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board, and that it is free from defects in materials and workmanship which would cause the failure of a warranted part.

Any warranted part which is scheduled for replacement as required maintenance by this Operation and Maintenance Manual is warranted by John Deere for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement point, the part shall be repaired or replaced under the warranty. Any such part repaired or replaced under warranty is warranted for the remainder of the period prior to the first scheduled replacement point for the part.

Any warranted part which is not scheduled for replacement as required maintenance, or which is scheduled only for regular inspection to the effect of repairing or replacing as necessary, is warranted for the warranty period.

Repair or replacement of a warranted part will be performed at no charge to you by a John Deere engine service dealer. You will not be charged for diagnostic labor which leads to the determination that a warranted part is defective, if the diagnostic work is performed by a John Deere engine service dealer.

John Deere is liable for damages to other engine components caused by the failure under warranty of any warranted part.

Any replacement part may be used in the performance of any maintenance or repairs, and such use will not reduce the warranty obligations of John Deere. However, the use of add-on or modified parts are grounds for disallowing a warranty claim.

John Deere Service Literature Available

OPERATOR'S MANUAL

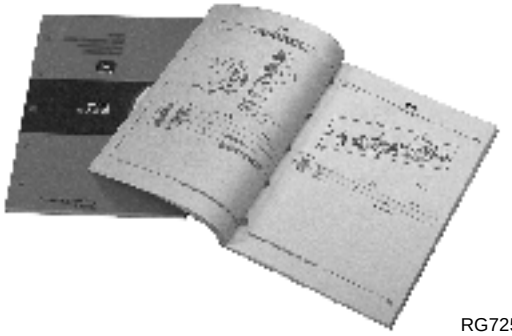
The operator's manual provides safety, operating, maintenance, and service information about John Deere engine.

An extra copy of the operator's manual is available. The operator's manual and safety signs on your engine may also be available in other languages. (See your John Deere dealer to order.)

RG7258

PARTS CATALOG

The parts catalog lists service parts available for your engine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.



RG7252

TECHNICAL AND SERVICE MANUALS

Technical and service manuals are service guides for your machine. Included in the manual are specifications, diagnosis, and adjustments; also illustrations of assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

Component technical manuals are require for some products. These supplemental manuals cover specific components.

RG7254

FMO AND FOS MANUALS

Covering all types of vehicles, regardless of manufacturer, each book starts with basic theory and proceeds through complex systems. There are four series:

- Farm Business Management (FBM)
- Fundamentals of Machine Operation (FMO)
- Fundamentals of Service (FOS)
- Fundamentals of Compact Equipment Service (FCP)


TS1646

John Deere Distribution Service Center
Service Publications Department
P.O. Box 186, Moline, IL 61266-0186

To order, fill out this form and mail it to the address above. Check for prices with your John Deere dealer or call **1-800-522-7448**. You may also place credit card orders by calling this number. Make checks payable to Deere & Co. Service Publications. Allow three weeks for delivery. No COD orders. Do not send cash or stamps. If you want manuals or catalogs for equipment not shown on this list, provide the model number, serial number, and name of product.

Name _____

Address _____

City _____

State _____ Zip _____

Phone ( ) _____

Title	Order Number	Price Each	x Quantity	= Total
6076 (–499999) OEM Engines				
Operator's Manual (English)	OMRG25412		x	=
Parts Catalog	PC2182		x	=
Component Technical Manual 6076 (–499999) Engines	CTM6		x	=
OEM Engine Accessories	CTM67		x	=
Alternators and Starting Motors	CTM77		x	=
FOS Manual—Hydraulics	FOS1005NC		x	=
FOS Manual—Electronic and Electrical Systems	FOS2007NC		x	=
FOS Manual—Engines	FOS3007NC		x	=
FOS Manual—Power Trains	FOS4006NC		x	=
FOS Manual—Shop Tools	FOS5105NC		x	=
FOS Manual—Welding	FOS5207NC		x	=
FOS Manual—Belts and Chains	FOS5305NC		x	=
FOS Manual—Bearings and Seals	FOS5405NC		x	=
FOS Manual—Tires and Tracks	FOS5507NC		x	=
FOS Manual—Air Conditioning	FOS5708NC		x	=
FOS Manual—Fuels, Lubricants, & Coolant	FOS5807NC		x	=
FOS Manual—Fasteners	FOS6004NC		x	=
FOS Manual—Identification of Parts Failures	FOS6104B		x	=
1-inch 3-Ring Binder (400 pages max.)	SX2062		x	=
1-1/2 inch 3-Ring Binder (600 pages max.)	SX2063L		x	=
3-1/2 inch 3-Post Binder (1400 pages max.)	SX2064L		x	=
Labels for 3-Ring and 3-Post Binders	SX2065		x	=
4 inch 4-Post Expandable (2000 pages max.)	SX2056FX			
Label for 4-Post Expandable Binder	SX2015		x	=
		Subtotal		

Method of Payment

❒ Check or Money Order enclosed
❒ John Deere ❒ Farm Plan
❒ Master Card ❒ Discover
❒ Visa ❒ American Express

_____
Credit Card Account Number (13 or 16 digits)

Expiration date:_____

_____
Your Signature

Subtotal	Shipping & Handling
$ 0.50 to $24.99	$3.50
25.00 to 49.99	5.00
50.00 to 99.99	6.50
100.00 to 199.99	9.00
200.00 and over	4.5% of subtotal

Optional shipping available. Please check and add cost to normal shipping above.
❒ 1 day air. $15.00
❒ 2 day air. $10.00

Illinois state residents add 6.25% and Iowa state residents add 5% for Retail Occupation Tax or show tax exemption number. Other states excluded.	
Total Shipping & Handling	
Amount Due in U.S. Dollars (Prices subject to change without notice.)	

Index

Page

S

T

V

W

John Deere Service Keeps You On the Job

JOHN DEERE PARTS

We help minimize downtime by putting genuine John Deere 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.

TS100

THE RIGHT TOOLS

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


TS101

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!


TS102

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.


TS103


SAFETY
live with it