Power Units for Generator Sets Stage II and Non-Certified Engines (Saran-Built)

OPERATOR'S MANUAL

Power Units for Generator Sets Stage II and Non-Certified Engines (Saran-Built)

OMCD16564 Issue F8 (ANGLAIS)

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

John Deere Usine De Saran
(This manual replaces OMCD16564 B7)
European Version
Printed in Germany

Introduction

Foreword

THIS MANUAL COVERS the following engines for generator sets:

Non Emission Certified Engines (Mechanical Fuel System)
CD3029DF128
CD3029TF158
CD4039DF008
CD4039TF008
CD4045DF158
CD4045HF158
CD4045TF158
CD4045TF258
CD6068HF158
CD6068HF258
CD6068TF158
CD6068TF258

Emission Certified Engines (Stage II according to Directive 97/68/EC)
CD3029HFS70 (Mechanical Fuel System)
CD3029HFU70 (Mechanical Fuel System)
CD3029TFS70 (Mechanical Fuel System)
CD3029TFU70 (Mechanical Fuel System)
CD4045HFS72 (DE10 Fuel System)
CD4045HFS73 (HPCR System, 2-Valve Head)
CD4045HFS80 (Mechanical Fuel System)
CD4045HFS82 (HPCR System, 2-Valve Head)
CD4045HFS83 (HPCR System, 2-Valve Head)
CD4045HFU72 (DE10 Fuel System)
CD4045HFU79 (HPCR System, 2-Valve Head)
CD4045TFU70 (Mechanical Fuel System)
CD6068HFS72 (DE10 Fuel System)
CD6068HFS73 (HPCR System, 2-Valve Head)
CD6068HFS76 (HPCR System, 4-Valve Head)
CD6068HFS77 (HPCR System, 4-Valve Head)
CD6068HFS82 (HPCR System, 2-Valve Head)
CD6068HFS83 (HPCR System, 2-Valve Head)
CD6068HFS89 (HPCR System, 4-Valve Head)
CD6068HFU72 (DE10 Fuel System)
CD6068HFU74 (HPCR System, 4-Valve Head)
CD6068HFU79 (HPCR System, 2-Valve Head)

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 metric. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

WRITE ENGINE SERIAL NUMBERS and option codes in the spaces indicated in the Serial Number 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 or machine.

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.

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

Information relative to emissions regulations
Depending on final destination, this engine can meet the emissions regulations according to the US Environmental Protection Agency (EPA), California Air Resources Board (CARB) and for Europe, the Directive 97/68/EC relating the measures against the emissions of gaseous and particulates pollutants from internal combustion engines. In this case an emission label is stuck on the engine.

Emission regulations prohibit tampering with the emission-related components listed below which would render that component inoperative or to make any adjustment on the engine beyond published specifications. It is also illegal to install a part or component where the principal effect of that component is to bypass, defeat, or render inoperative any engine component or device which would affect the engine conformance to the emissions regulations. To summarize, it is illegal to do anything except return the engine to its original published specifications.

List of emission-related components:
- Fuel injection pump
- Intake manifold
- Turbocharger
- Charge air cooling system
- Piston

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

DPSG,CD03523,1 –19–05JUN08–2/2

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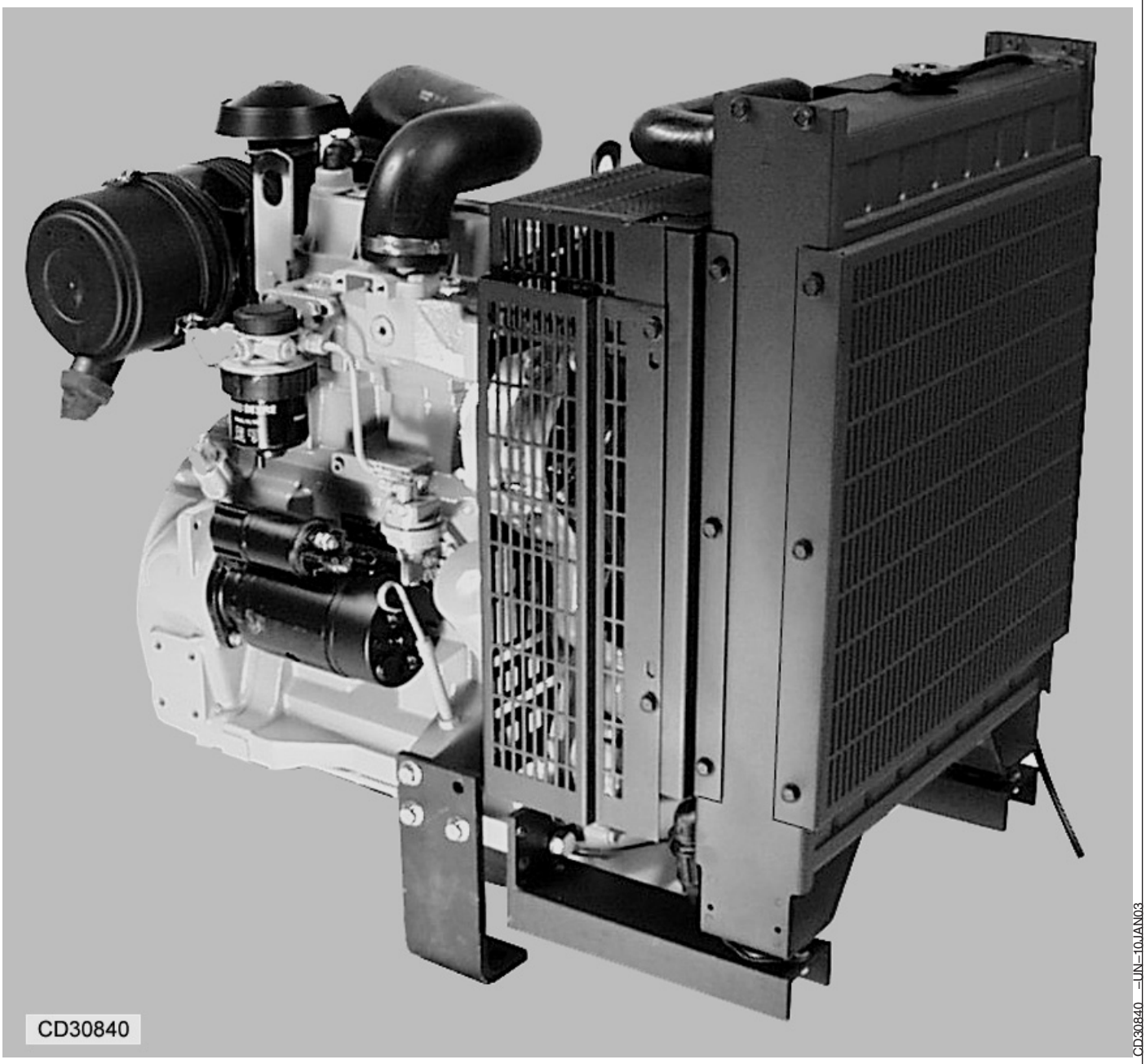
Continued on next page

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.

Identification views



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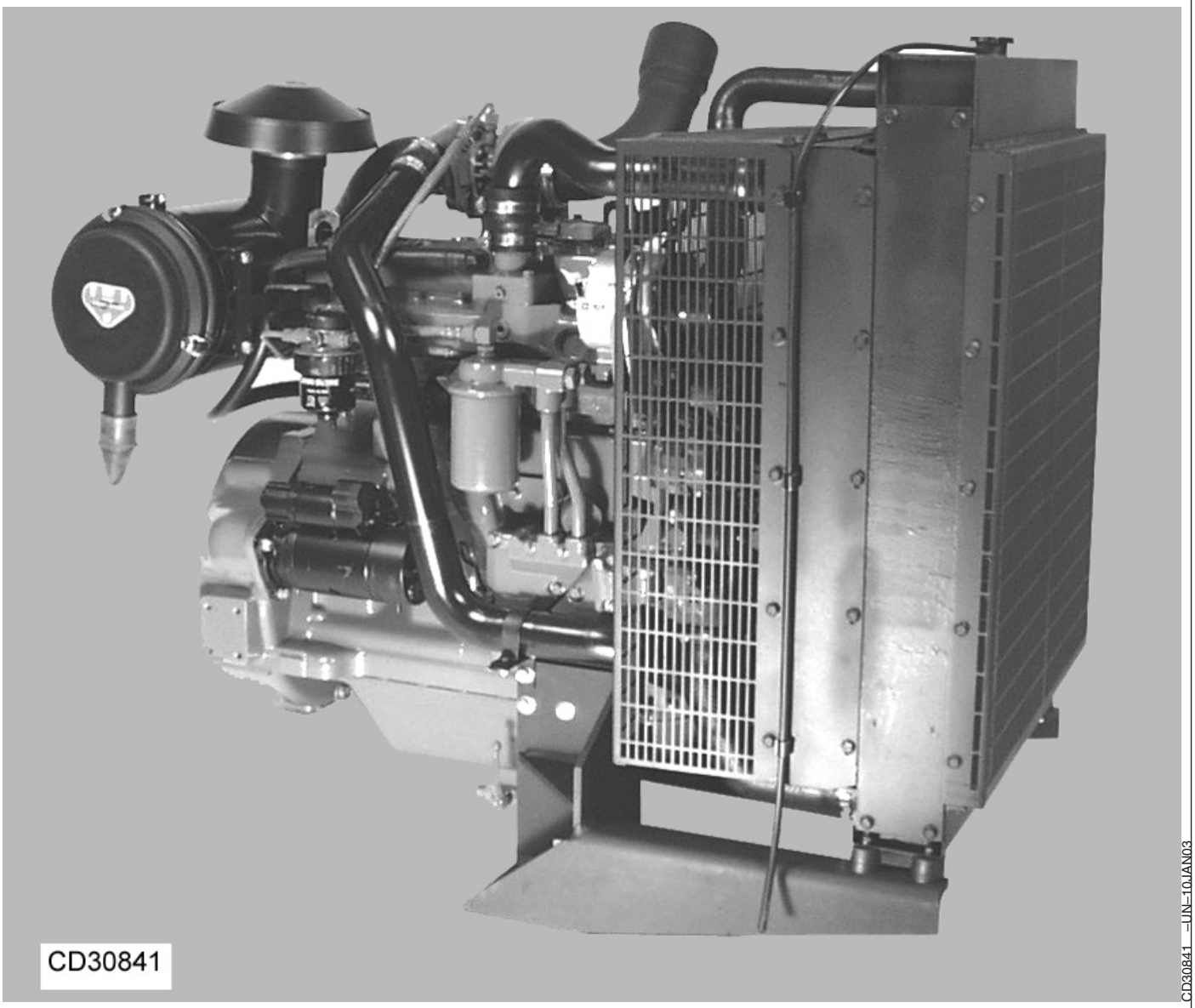
DPSG,CD03523,3 –19–22JAN07–1/3



4045HF158

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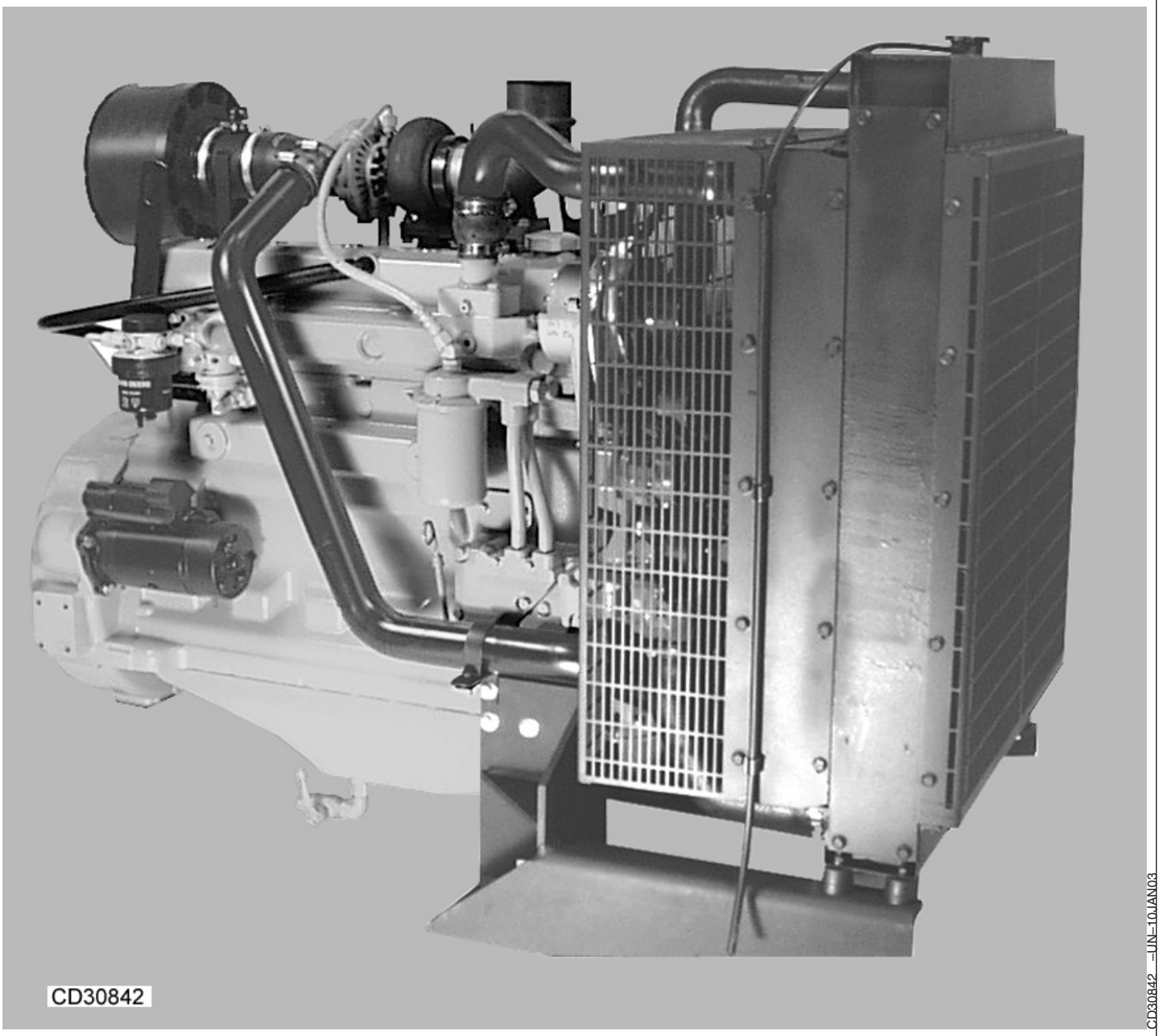
DPSG,CD03523,3 –19–22JAN07–2/3



6068HF258

DPSG,CD03523,3 –19–22JAN07–3/3

Maintenance Records

Using maintenance records

To obtain the best performance, economy and service life from your engine, ensure service is carried out according to this present manual and recorded in the following pages. It is recommended that your engine Distributor or your Dealer carry out this service work and stamp the appropriate case.

Keeping an accurate account of all service performed on your engine will give more value to the machine when resell it.

John Deere oils and coolants have been formulated to give maximum protection and performance to your engine. We recommend only genuine John Deere service products and replacement parts.

To protect your rights under the warranty ensure all scheduled services are carried out and recorded. If your engine is covered by extended warranty, it is important to maintain this record for the duration of the warranty.

DPSG,CD03523,6 –19–22JAN07–1/1

100 Hours of operation

❒ Engine oil, drain ❒ Engine oil filter, replace ❒ Hose connections, check	

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,7 –19–22JAN07–1/1

500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,8 –19–22JAN07–1/1

1000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Air intake system, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,9 –19–22JAN07–1/1

1500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,10 –19–22JAN07–1/1

2000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Cooling system, drain and flush (if COOL-GARD is not used)

❒ Valve clearance, adjust (POWERTech)

❒ Air intake system, check

❒ Vibration damper, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,59 –19–22JAN07–1/1

2500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

❒ Cooling system, drain and flush (if COOL-GARD is used)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,60 –19–22JAN07–1/1

3000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Air intake system, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,61 –19–22JAN07–1/1

3500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,62 –19–22JAN07–1/1

4000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Cooling system, drain and flush (if COOL-GARD is not used)

❒ Valve clearance, adjust (POWERTech)

❒ Air intake system, check

❒ Vibration damper, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,63 –19–22JAN07–1/1

4500 Hours of operation

❒ Engine oil, drain

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

❒ Vibration damper, replace (6 cyl.)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,64 –19–22JAN07–1/1

5000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Injection nozzles, replace

❒ Air intake system, check

❒ Cooling system, drain and flush (if COOL-GARD is used)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,65 –19–22JAN07–1/1

5500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,66 –19–22JAN07–1/1

6000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Cooling system, drain and flush (if COOL-GARD is not used)

❒ Valve clearance, adjust (POWERTech)

❒ Air intake system, check

❒ Vibration damper, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,67 –19–22JAN07–1/1

6500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,68 –19–22JAN07–1/1

7000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Air intake system, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,69 –19–22JAN07–1/1

7500 Hours of operation

❒ Engine oil, drain	❒ Cooling system, drain and flush (if COOL-GARD is used)
❒ Engine oil filter, replace	
❒ Fuel filter, replace	
❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)	
❒ Valve clearance, adjust (300-Series)	

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,70 –19–22JAN07–1/1

8000 Hours of operation

❒ Engine oil, drain	❒ Cooling system, drain and flush (if COOL-GARD is not used)
❒ Engine oil filter, replace	❒ Valve clearance, adjust (POWERTech)
❒ Fuel filter, replace	❒ Air intake system, check
❒ Check belt and tensioning system	❒ Vibration damper, check
❒ Crankcase vent tube, clean	

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,71 –19–22JAN07–1/1

8500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,72 –19–22JAN07–1/1

9000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Air intake system, check

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,73 –19–22JAN07–1/1

9500 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Belt, check tension and wear (300-Series and POWERTech with manual tensioner)

❒ Valve clearance, adjust (300-Series)

Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,74 –19–22JAN07–1/1

10000 Hours of operation

❒ Engine oil, drain

❒ Engine oil filter, replace

❒ Fuel filter, replace

❒ Check belt and tensioning system

❒ Crankcase vent tube, clean

❒ Air intake system, check

❒ Cooling system, drain and flush

❒ Valve clearance, adjust (POWERTech)

❒ Thermostat, replace

❒ Vibration damper, check

❒ Injection nozzles, replace

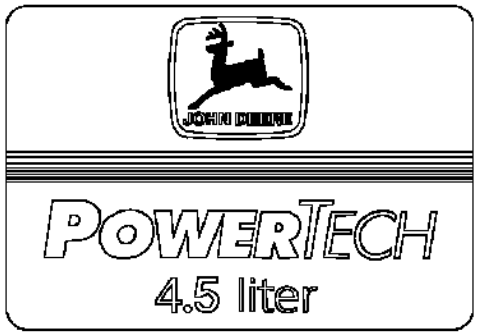
Number of hours: Date: Job done by:	Observation:	Dealer or distributor stamp

DPSG,CD03523,75 –19–22JAN07–1/1

Serial Numbers

POWERTech® label

A label is located on the rocker arm cover which identifies each engine as a John Deere POWERTECH® engine.

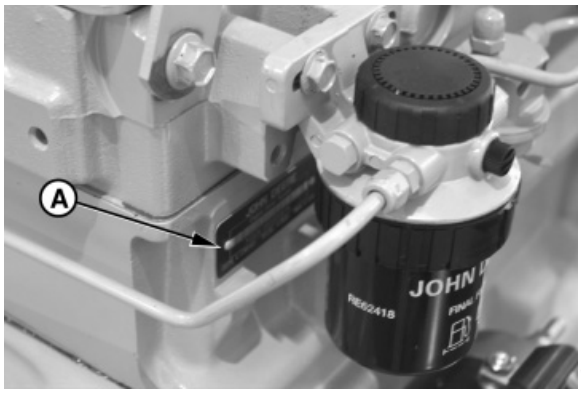


RG8041 –UN–15JAN99

POWERTECH is a trademark of Deere & Company

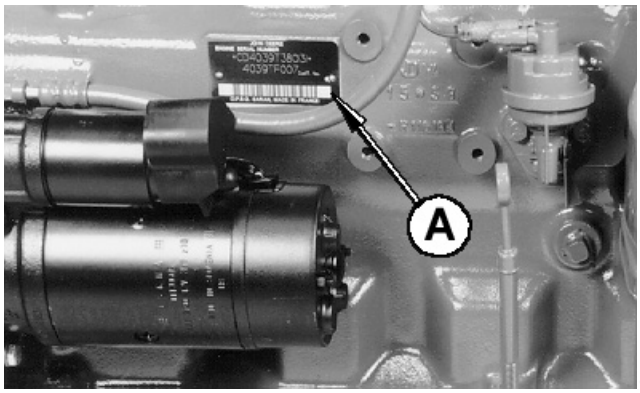
DPSG,CD03523,11 –19–22JAN07–1/1

Engine serial number plate



RG8007 –UN–15JAN99

4045 and 6068 Engines



CD30746 –UN–24SEP99

3029 and 4039 Engines

Each engine has a 13–digit John Deere serial number. The first two digits identify the factory that produced the engine:

"CD" indicates the engine was built in Saran, France

Your engine's serial number plate (A) is located on the right-hand side of cylinder block behind the fuel filter for 4045 and 6068 engines and near the fuel supply pump on 3029 and 4039 engines.

DPSG,CD03523,12 –19–22JAN07–1/1

Record engine serial number

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 (B)

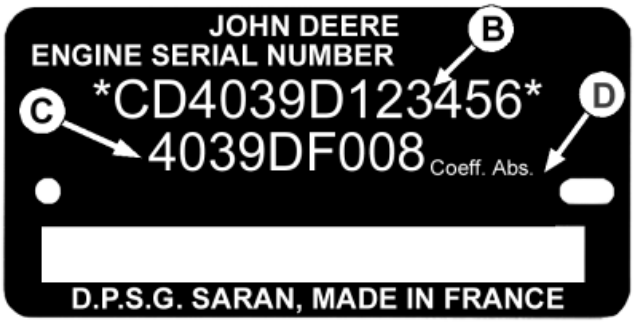
_____

Engine Model Number (C)

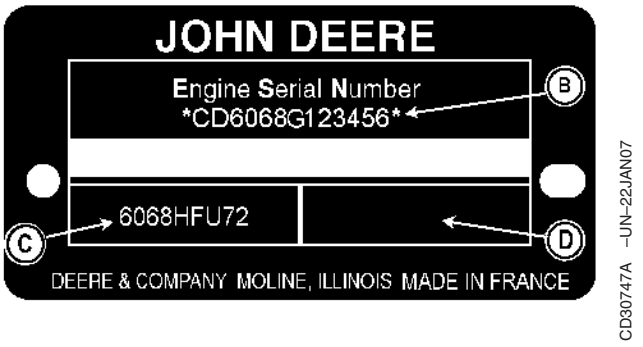
_____

Coefficient of Absorption Value (D)

_____



3029 and 4039 engine plate



4045 and 6068 engine plate

DPSG,CD03523,13 –19–22JAN07–1/1

Engine option codes

Engine option code label

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.

An additional sticker may be also delivered (in a plastic bag attached to the engine or inserted in the machine documentation). It is recommended to stick this option code list sticker either:

- On this page of your Operator's manual below this section.

or

- On the "Engine Owner's Warranty" booklet under the title OPTION CODES (Engine manufacturing configuration).

NOTE: The Machine Manufacturer may have already stuck it at a specific accessible place (inside the enclosure or close to a maintenance area).

The engine option code label includes an engine base code (A). This base code must also be recorded along with the option codes. At times it will be necessary to furnish this base code to differentiate two identical option codes for the same engine model.

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 12-volt, 55-amp alternator.

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.

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 list on the next page 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.

Continued on next page

NOTE: 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 Base Code:_____

Option Codes	Description	Option Codes	Description
11____	Rocker Arm Cover	50____	Oil Pump
12____	Oil Filler Neck	51____	Cylinder Head With Valves
13____	Crankshaft Pulley	52____	Auxiliary Gear Drive
14____	Flywheel Housing	53____	Fuel Heater
15____	Flywheel	54____	Oil heater
16____	Fuel Injection Pump	55____	Shipping stand
17____	Air inlet	56____	Paint Option
18____	Air cleaner	57____	Coolant Inlet
19____	Oil pan	59____	Oil Cooler
20____	Coolant pump	60____	Add-on Auxiliary Drive Pulley
21____	Thermostat Cover	62____	Alternator Mounting
22____	Thermostat	63____	Low Pressure Fuel Line
23____	Fan Drive	64____	Exhaust Elbow
24____	Fan Belt	65____	Turbocharger
25____	Fan	66____	Temperature Switch
26____	Engine Coolant Heater	67____	Electronic Tachometer Sensor
27____	Radiator	68____	Damper
28____	Exhaust Manifold	69____	Engine Serial Number Plate
29____	Ventilator System	72____	ECU Electronic Software Option
30____	Starting Motor	74____	Air conditioner Compressor Mounting
31____	Alternator	75____	Air Restriction Indicator
32____	Instrument Panel	76____	Oil Pressure Switch
35____	Fuel Filter	81____	Primary Fuel Filter
36____	Front Plate	83____	Electronic Software
37____	Fuel Transfer Pump	84____	Electrical Wiring Harness
39____	Thermostat Housing	86____	Fan Pulley
40____	Oil Dipstick	87____	Automatic Belt Tensioner
41____	Belt Driven Front Auxiliary Drive	88____	Oil Filter
43____	Starting Aid	91____	Special Equipment (Factory Installed)
44____	Timing Gear Cover with Gears	94____	Vehicle Timing
45____	Balancer Shaft	95____	Identification label
46____	Cylinder Block With Liners and Camshaft	97____	Special Equipment (Field Installed)
47____	Crankshaft and Bearings	98____	Shipping
48____	Connecting Rods and Pistons		
49____	Valve Actuating Mechanisms		

DPSG,CD03523,14 –19–22JAN07–2/2

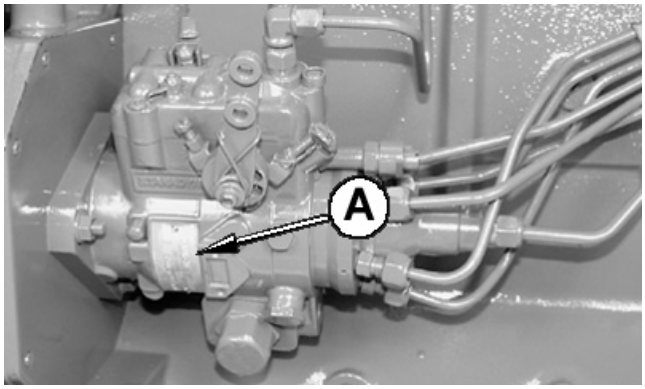
Record fuel injection pump model number

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

Model No. _____ RPM _____

Manufacturer's No. _____

Serial No. _____



DPSG,CD03523,15 –19–22JAN07–1/1

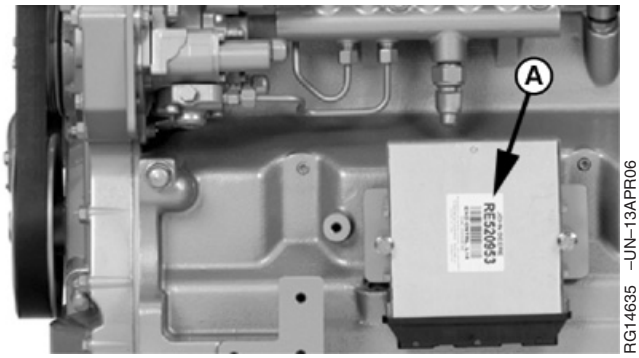
Record Engine Control Unit (ECU) Serial Number

Record the part number and serial number information found on the serial number label (A) on the Engine Control Unit (ECU) mounted on or near the engine.

Part No._____

Serial No._____

A—Serial Number Label



Record Engine Control Unit (ECU) Serial Number

CD03523,0000189 –19–06FEB07–1/1

Record High-Pressure Fuel Pump Model Number

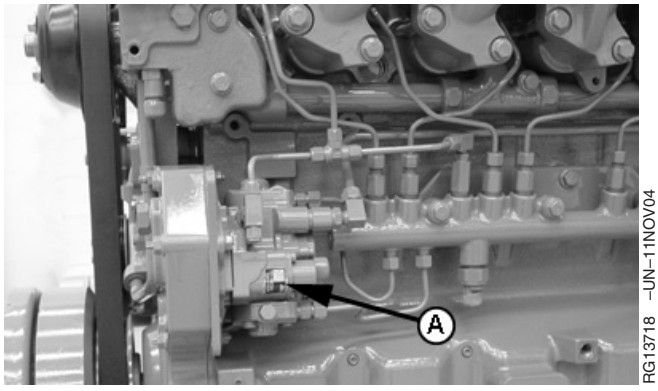
Record the high-pressure fuel pump model and serial number information found on the serial number plate (A).

Model No._____ RPM_____

Manufacturer's No._____

Serial No._____

A—Serial Number Plate



Record High-Pressure Fuel Pump Serial Number

CD03523,000018A –19–06FEB07–1/1

Recognize Safety Information

This is a 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 –UN–07DEC88

DX,ALERT –19–29SEP98–1/1

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 –19–30SEP88

DX,SIGNAL –19–03MAR93–1/1

Do Not Open High-Pressure Fuel System

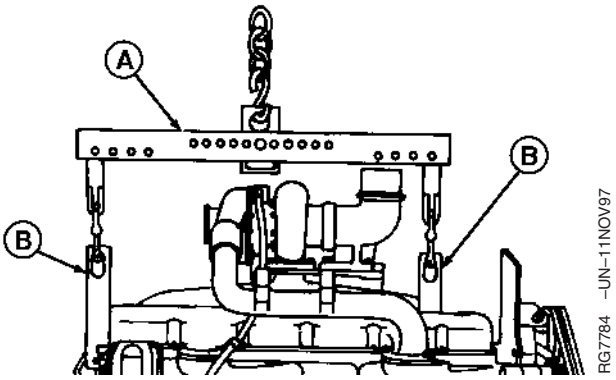
High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect or attempt repair of fuel lines, sensors, or any other components between the high-pressure fuel pump and nozzles on engines with High Pressure Common Rail (HPCR) fuel system.

Only technicians familiar with this type of system can perform repairs. (See your John Deere dealer.)

TS1343 –UN–18MAR92

DX,WW,HPCR1 –19–07JAN03–1/1

Engine lifting procedure



CAUTION: The only recommended method for lifting the engine is with JDG23 Engine Lifting Sling (A) and safety approved lifting straps (B) that come with engine. Use extreme caution when lifting and NEVER permit any part of the body to be positioned under an engine being lifted or suspended.

Lift engine with longitudinal loading on lifting sling and lifting straps only. Angular loading greatly reduces lifting capacity of sling and straps.

NOTE: If engine does not have lifting straps, universal straps can be procured through service parts under part numbers JD-244-1 and JD-244-2.

1. If not equipped, install lifting straps and torque to 200 N•m (145 lb-ft).

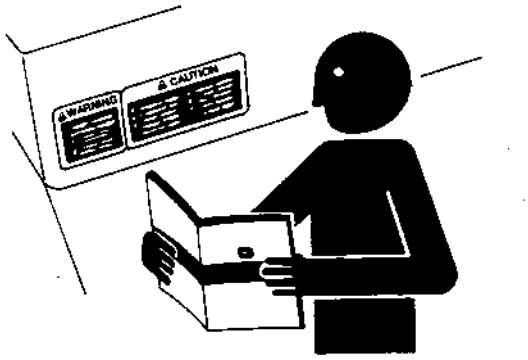
2. Attach JDG23 Engine Lifting Sling (A) to engine lifting straps (B) and overhead hoist.

IMPORTANT: Lifting straps are designed to lift the engine and accessories such as radiator, air filter and other small components. If larger components, such as power take-off, transmission, generator air compressor... etc, are attached to engine, the lifting straps provided with engine or through parts channel are not intended for this purpose. Technician is responsible for providing adequate lifting devices under these situations. See machine manuals for additional information on removing engine from machine.

3. Carefully move engine to desired location.

DPSG,CD03523,95 –19–22JAN07–1/1

Follow Safety Instructions



TS201 –UN–23AUG88

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.

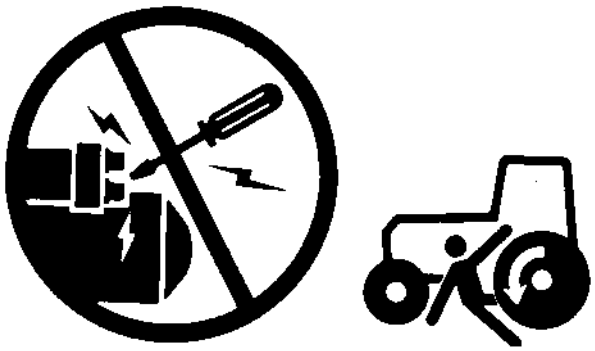
DX,READ –19–03MAR93–1/1

Prevent Machine Runaway

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.



TS177 –UN–11JAN89

DX,BYPAS1 –19–29SEP98–1/1

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 –UN–23AUG88

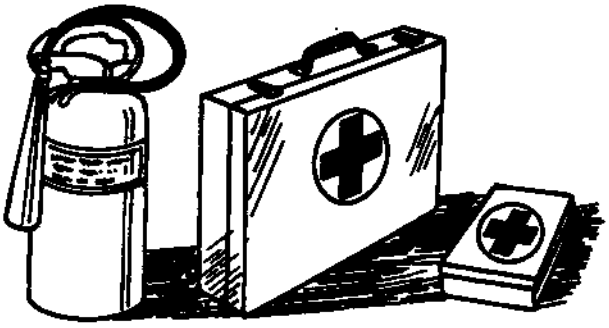
DX,FIRE1 –19–03MAR93–1/1

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 –UN–23AUG88

DX,FIRE2 –19–03MAR93–1/1

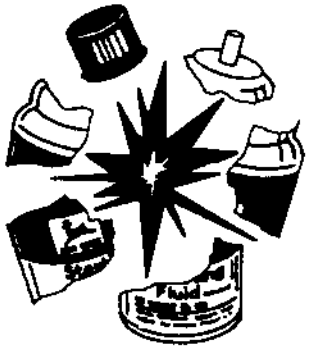
Handle Starting Fluid Safely

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 –UN–18MAR92

DX,FIRE3 –19–16APR92–1/1

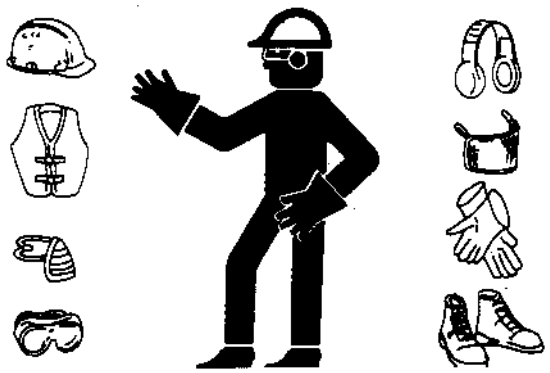
Wear Protective Clothing

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

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.

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



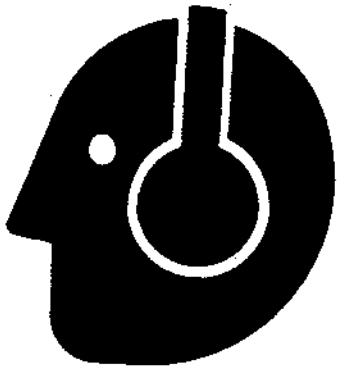
TS206 –UN–23AUG88

DX,WEAR –19–10SEP90–1/1

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 –UN–23AUG88

DX,NOISE –19–03MAR93–1/1

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 –UN–26NOV90

DX,MSDS,NA –19–03MAR93–1/1

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 –UN–22AUG95

CD,PTO –19–22JAN07–1/1

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.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

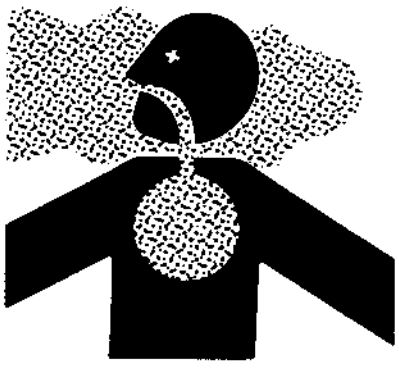
TS218 –UN–23AUG88

DX,SERV –19–17FEB99–1/1

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.

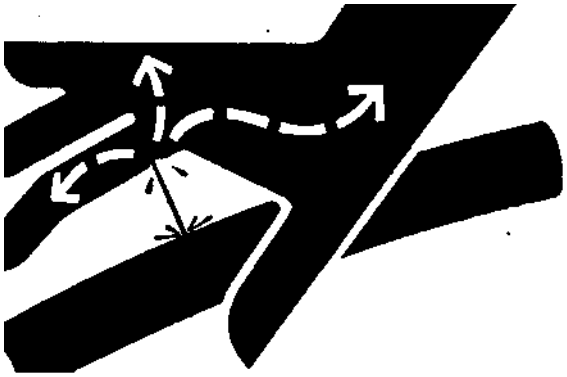
If you do not have an exhaust pipe extension, open the doors and get outside air into the area.



TS220 –UN–23AUG88

DX,AIR –19–17FEB99–1/1

Avoid High-Pressure Fluids



X9811 –UN–23AUG88

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.

DX,FLUID –19–03MAR93–1/1

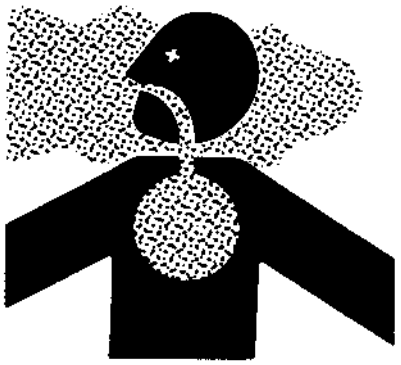
Avoid Heating Near Pressurized Fluid Lines

TS953 –UN–15MAY90

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 accidentally burst when heat goes beyond the immediate flame area.

DX,TORCH –19–10DEC04–1/1

Remove Paint Before Welding or Heating



TS220 –UN–23AUG88

Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- 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.

Do not use a chlorinated solvent in areas where welding will take place.

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT –19–24JUL02–1/1

Service Cooling System Safely

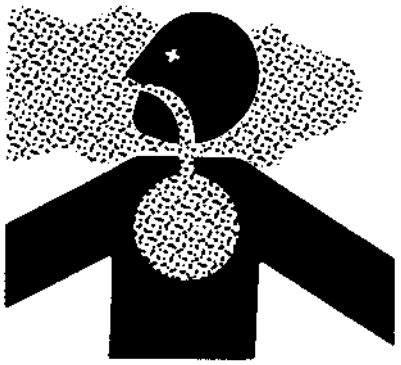
TS281 –UN–23AUG88

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.

DX,RCAP –19–04JUN90–1/1

Avoid Harmful Asbestos Dust



TS220 –UN–23AUG88

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

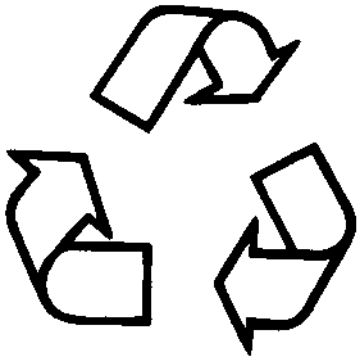
Components in products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates, and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos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

DX,DUST –19–15MAR91–1/1

Dispose of Waste Properly



TS1133 –UN–26NOV90

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.

DX,DRAIN –19–03MAR93–1/1

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. Renewable diesel is basically identical to petroleum diesel fuel that is created by Hydrotreating fats and oils. Renewable diesel that meets EN 590 or ASTM D975 is acceptable for use at all percentage mixture levels.

Required fuel properties

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

Cetane number of 45 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) should be at least 5°C (9°F) below the expected lowest temperature or **Cloud Point** below the expected lowest ambient temperature.

Fuel lubricity should pass a maximum scar diameter of 0.45 mm as measured by ASTM D6079 or ISO 12156-1.

Sulfur content:

- Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.
- Use of diesel fuel with sulfur content less than 0.10% (1000 ppm) is STRONGLY recommended.
- Use of diesel fuel with sulfur content 0.10% (1000 ppm) to 0.50% (5000 ppm) may result in REDUCED oil and filter change intervals as shown in the table.
- BEFORE using diesel fuel with sulfur content greater than 0.50% (5000 ppm), contact your John Deere dealer.

IMPORTANT: Do not mix used diesel engine oil or any other type of lubricating oil with diesel fuel.

IMPORTANT: Improper fuel additive usage may cause damage on fuel injection equipment of diesel engines.

DX,FUEL1 –19–05OCT07–1/1

Handling and Storing Diesel Fuel

CAUTION: Handle fuel carefully. Do not fill the fuel tank when engine is running.

DO NOT smoke while you fill the fuel tank or service the fuel system.

Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.

Keep all storage tanks as full as practicable to minimize condensation.

Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering.

Monitor water content of the fuel regularly.

When using bio-diesel fuel, the fuel filter may require more frequent replacement due to premature plugging.

Check engine oil level daily prior to starting engine. A rising oil level may indicate fuel dilution of the engine oil.

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

When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel and prevent water condensation. Contact your fuel supplier for recommendations.

DX,FUEL4 –19–19DEC03–1/1

Diesel 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
- API Service Classification CD
- API Service Classification CC
- ACEA Oil Sequence E2
- ACEA Oil Sequence E1

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

IMPORTANT: Do not use PLUS-50 oil or engine oils meeting any of the following during the first 100 hours of operation of a new or rebuilt engine:

API CJ-4	**ACEA E7**
API CI-4 PLUS	**ACEA E6**
API CI-4	**ACEA E5**
API CH-4	**ACEA E4**
API CG-4	**ACEA E3**
API CF-4	
API CF-2	
API CF	

These oils will not allow the engine to break-in properly.

PLUS-50 is a trademark of Deere & Company.

DX,ENOIL4 –19–13SEP06–1/1

Diesel Engine Oil

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

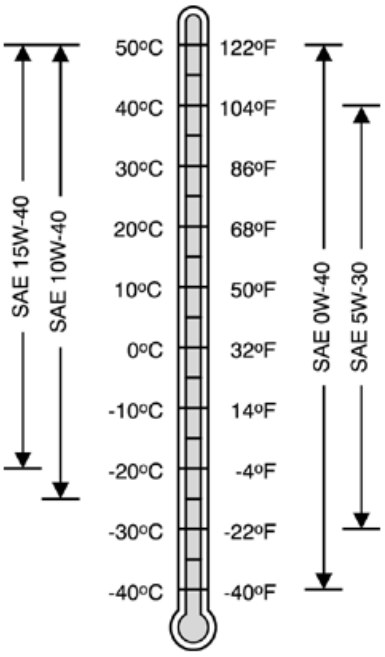
Depending on Emission Regulation requirements, the oil recommendations are different. Refer to the chart to identify the proper oil to be used.

Non Emission Certified Engines	Stage II Emission Certified Engines
John Deere PLUS-50™ (Preferred)	John Deere PLUS-50™ (Preferred)
John Deere TORQ-GARD SUPREME™	John Deere TORQ-GARD SUPREME™
ACEA-E3, ACEA-E2	ACEA-E7, ACEA-E6, ACEA-E5, ACEA-E4, ACEA-E3
API-CH4, API-CG4, API-CF4	API-CJ4, API-CI4 PLUS, API-CI4, API-CH4

Multi-viscosity diesel engine oils are preferred.

If diesel fuel with sulfur content greater than 0.5% is used or if oil does not meet the classification above, reduce the service interval by 50%.

DO NOT use diesel fuel with sulfur content greater than 1%.



Oil Viscosities for Air Temperature Ranges

PLUS-50 is a trademark of Deere & Company
TORQ-GARD SUPREME is a trademark of Deere & Company

CD,ENOIL –19–25JAN07–1/1

Lubricant Storage

Your equipment can operate at top efficiency only when 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.

DX,LUBST –19–18MAR96–1/1

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 dealer to obtain specific information and recommendations.

DX,LUBMIX –19–18MAR96–1/1

Diesel Engine Coolant

The engine cooling system is filled to provide year-round protection against corrosion and cylinder liner pitting, and winter freeze protection to -37°C (-34°F).

John Deere COOL-GARD is preferred for service.

If John Deere COOL-GARD is not available, use a low silicate ethylene glycol or propylene glycol base coolant concentrate in a 50% mixture of concentrate with quality water.

The coolant concentrate shall be of a quality that provides cavitation protection to cast iron and aluminum parts in the cooling system. John Deere COOL-GARD meets this requirement.

Freeze protection

A 50% mixture of ethylene glycol engine coolant in water provides freeze protection to -37°C (-34°F).

A 50% mixture of propylene glycol engine coolant in water provides freeze protection to -33°C (-27°F).

If protection at lower temperatures is required, consult your John Deere dealer for recommendations.

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 and propylene glycol base engine coolant concentrate.

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

IMPORTANT: Do not mix ethylene glycol and propylene glycol base coolants.

DX,COOL8 –19–16NOV01–1/1

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

DX,COOL6 –19–18MAR96–1/1

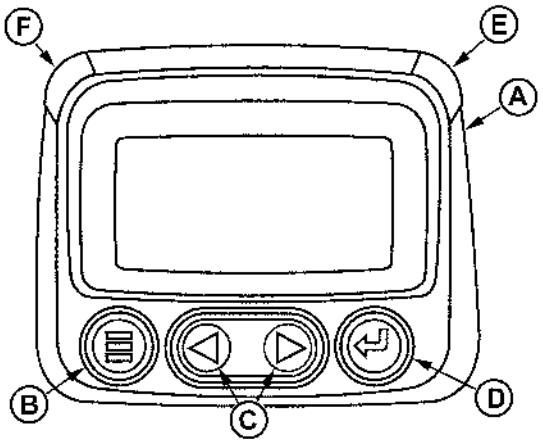
Using Diagnostic Gauge to Access Engine Information (Optional equipment)

NOTE: Generator sets powered by an electronically controlled engine (DE10 or HPCR fuel system) can be optionally equipped with the diagnostic gauge shown. Depending on the generator set manufacturer, other instrumentations can be used. Refer to the generator set documentation for more information.

The diagnostic gauge (A) allows the operator to view many readouts of engine functions and trouble codes (DTCs). The gauge is linked to the electronic control system and its sensors. This allows the operator to monitor engine functions and to troubleshoot the engine systems when needed.

Press the menu key (B) to access the various engine functions in sequence. The displays can be selected as either customary English or metric units. The following menu of engine parameters can be displayed on the diagnostic gauge window:

- Engine hours
- Engine rpm
- System voltage
- Percent engine load at the current rpm
- Coolant temperature
- Oil pressure
- Throttle position
- Intake manifold temperature
- Current fuel consumption
- Active service (diagnostic) codes
- Stored service (diagnostic) codes from the engine
- Set the units for display
- View the engine configuration parameters



RG13132 –UN–09SEP03

Diagnostic Gauge

A—Diagnostic Gauge
B—Menu Key
C—Arrow Keys
D—Enter Key
E—Red "STOP ENGINE" Indicator Light
F—Amber "WARNING" Indicator Light

Continued on next page

CD03523,000018B –19–22JAN07–1/2

NOTE: Engine parameters which can be accessed will vary with the engine application. Six languages for readouts are available and can be selected during setup of gauge.

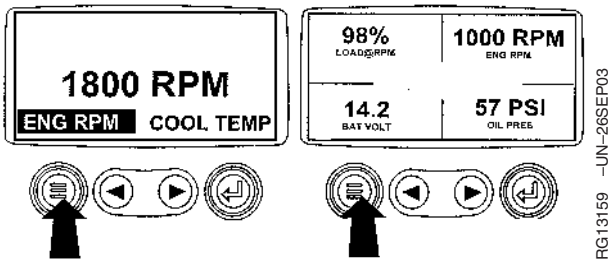
The diagnostic gauge includes a graphical backlit Liquid Crystal Display (LCD) screen. The display can show either a single parameter or a quadrant display showing four parameters simultaneously. The diagnostic gauge uses two arrow keys (C) for scrolling through the engine parameter list and viewing the menu list and an enter key (D) for selecting highlighted items. The red (E) and amber (F) lights are used to signal active trouble code received by the diagnostic gauge.

CD03523,000018B –19–22JAN07–2/2

Main Menu Navigation

NOTE: The engine does not need to be running to navigate the diagnostic gauge screens. If engine start up is desired, See Starting The Engine. All of the engine values illustrated on the diagnostic gauge indicate the engine is running.

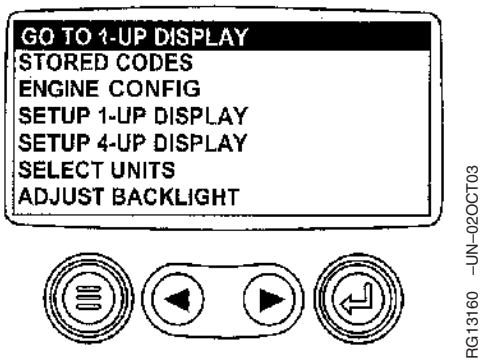
1. Turn the key switch to the ON position. Starting at the single or four engine parameter display, press the "Menu" key.



Menu Key

OURGP11,00000A9 –19–03SEP03–1/5

2. The first seven items of the "Main Menu" will be displayed.

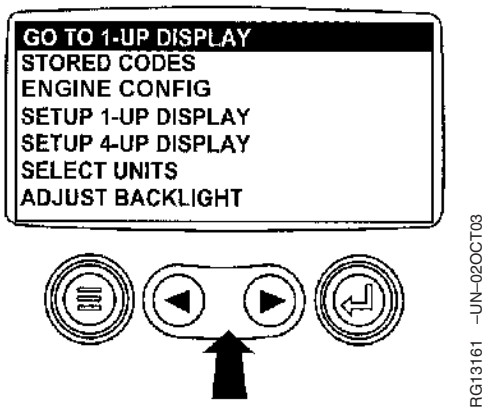


Menu Display

Continued on next page

OURGP11,00000A9 –19–03SEP03–2/5

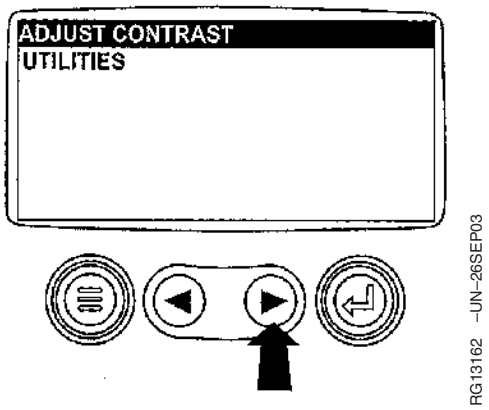
3. Pressing the "Arrow" keys will scroll through the menu selections.



Main Menu Items

OURGP11,00000A9 –19–03SEP03–3/5

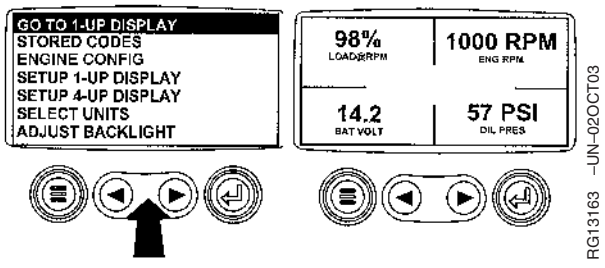
4. Pressing the right arrow key will scroll down to reveal the last items of "Main Menu" screen, highlighting the next item down.



Last Items On Main Menu

OURGP11,00000A9 –19–03SEP03–4/5

5. Use the arrow keys to scroll to the desired menu item or press the "Menu Button" to exit the main menu and return to the engine parameter display.



Use Arrow Buttons To Scroll / Quadrant Display

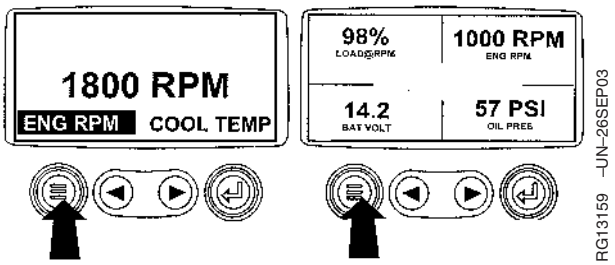
OURGP11,00000A9 –19–03SEP03–5/5

Engine Configuration Data

NOTE: The engine configuration data is a read only function.

NOTE: The engine does not need to be running to navigate the diagnostic gauge screens. If engine start up is desired, See Starting The Engine. All of the engine values illustrated on the diagnostic gauge indicate the engine is running.

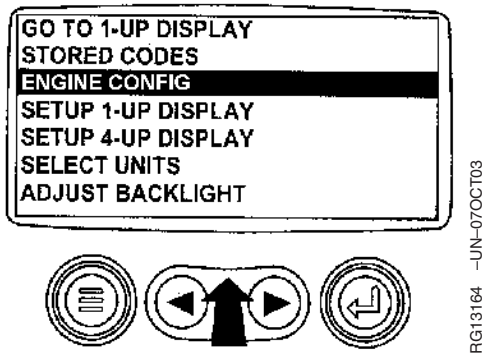
1. Turn the key switch to the ON position. Starting at the single or four engine parameter display, press the "Menu" key.



Menu Key

OURGP11,00000AB –19–03SEP03–1/6

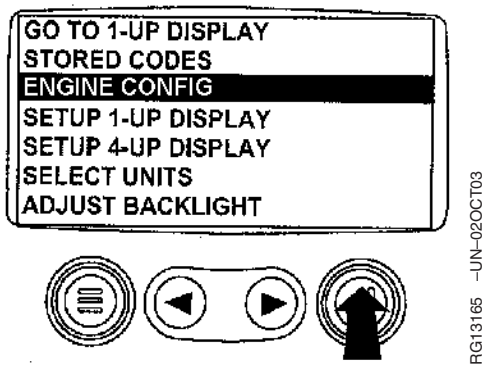
2. The main menu will be displayed. Use the "Arrow" keys to scroll through the menu until "Engine Config" is highlighted.



Select Engine Configuration

OURGP11,00000AB –19–03SEP03–2/6

3. Once "Engine Config" menu item has been highlighted, press the "Enter" key to view the engine configuration data.

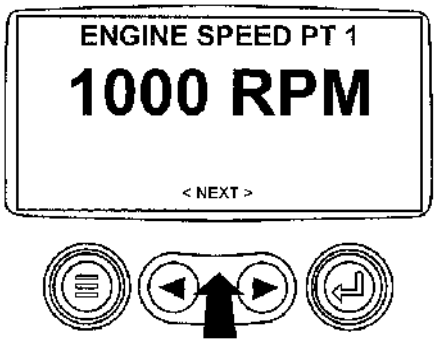


Enter Key

Continued on next page

OURGP11,00000AB –19–03SEP03–3/6

4. Use the "Arrow" keys to scroll through the engine configuration data.

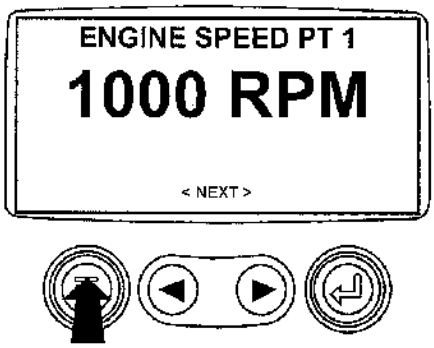


RG13166 –UN–29SEP03

Use Arrow Keys To Scroll

OURGP11,00000AB –19–03SEP03–4/6

5. Press the "Menu" key to return to the main menu.

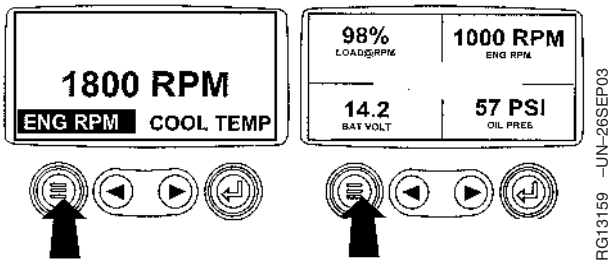


RG13167 –UN–29SEP03

Return To Main Menu

OURGP11,00000AB –19–03SEP03–5/6

6. Press the "Menu" key to exit the main menu and return to the engine parameter display.



RG13159 –UN–26SEP03

Exit Main Menu

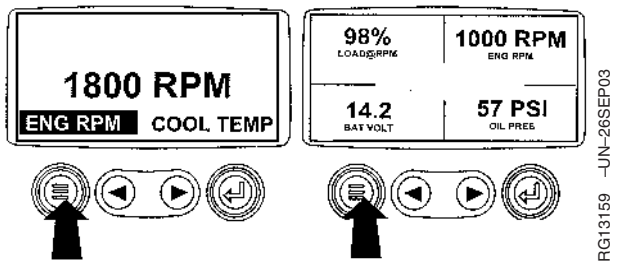
OURGP11,00000AB –19–03SEP03–6/6

Accessing Stored Trouble Codes

NOTE: The engine does not need to be running to navigate the diagnostic gauge screens. If engine start up is desired, See Starting The Engine. All of the engine values illustrated on the diagnostic gauge indicate the engine is running.

For description of trouble codes, see chart in Troubleshooting Section.

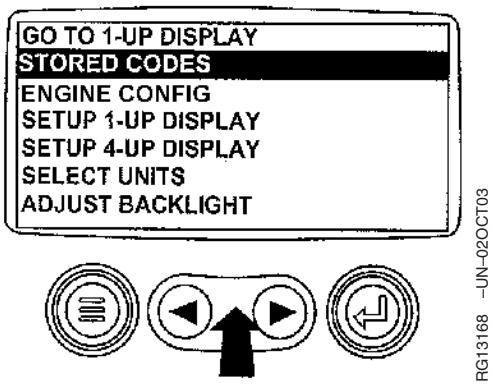
1. Turn the key switch to the ON position. Starting at the single or four engine parameter display, press the "Menu" key.



Menu Key

OURGP11,00000AC –19–03SEP03–1/6

2. The main menu will be displayed. Use the "Arrow" keys to scroll through the menu until "Stored Codes" is highlighted.

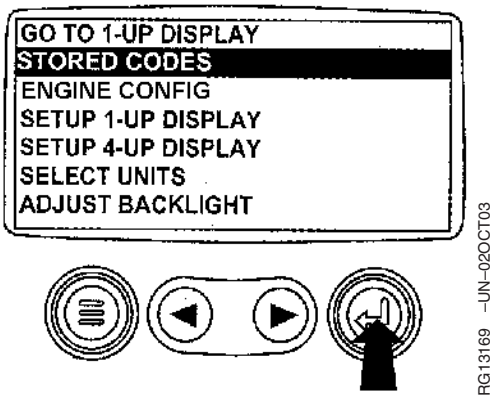


Select Stored Codes

Continued on next page

OURGP11,00000AC –19–03SEP03–2/6

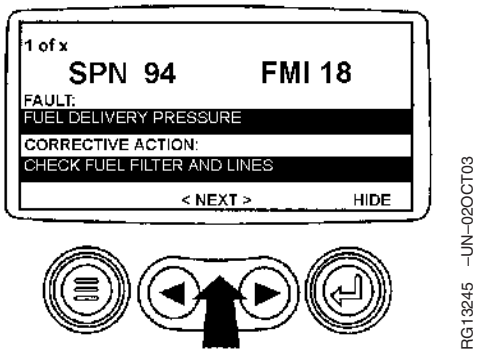
3. Once the "Stored Codes" menu item has been highlighted press the "Enter" key to view the stored codes.



Enter Key

OURGP11,00000AC –19–03SEP03–3/6

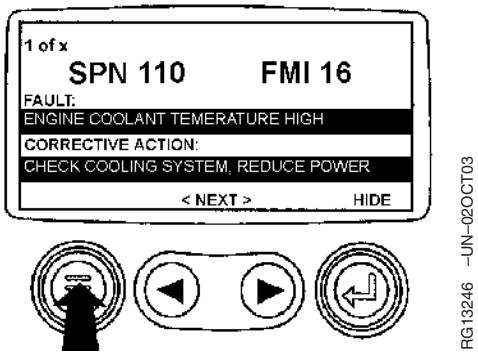
4. If the word "Next" appears above the "Arrow" keys, there are more stored codes that may be viewed. Use the "Arrow" key to scroll to the next stored code.



Use Arrow Keys To Scroll

OURGP11,00000AC –19–03SEP03–4/6

5. Press the "Menu" key to return to the main menu.

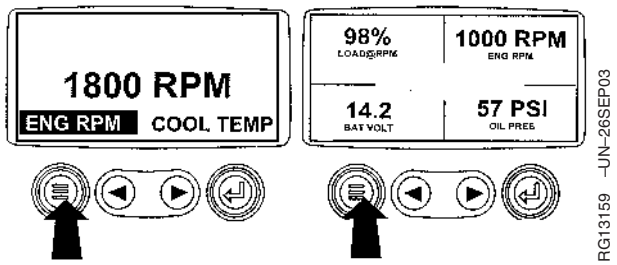


Return To Main Menu

Continued on next page

OURGP11,00000AC –19–03SEP03–5/6

6. Press the "Menu" key to exit the main menu and return to the engine parameter display.



Exit Main Menu

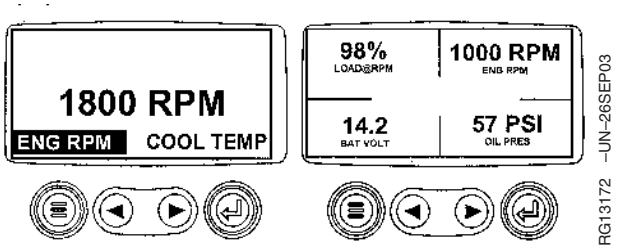
OURGP11,00000AC –19–03SEP03–6/6

Accessing Active Trouble Codes

NOTE: The engine does not need to be running to navigate the diagnostic gauge screens. If engine start up is desired, See Starting The Engine. All of the engine values illustrated on the diagnostic gauge indicate the engine is running.

For description of trouble codes, see chart in Troubleshooting Section.

1. During normal operation the single or four parameter screen will be displayed.

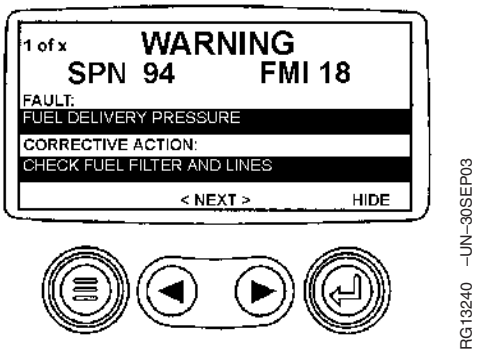


Normal Operation

OURGP11,00000AD –19–03SEP03–1/7

2. When the diagnostic gauge receives a trouble code from an engine control unit, the single or four parameter screen will be replaced with the "Warning" message. The SPN and FMI number will be displayed along with a description of the problem and the corrective action needed.

IMPORTANT: Ignoring active trouble codes can result in severe engine damage.

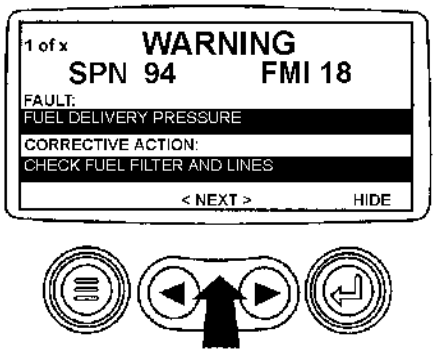


Active Trouble Codes Displayed

Continued on next page

OURGP11,00000AD –19–03SEP03–2/7

3. If the word "Next" appears above the arrow keys, there are more trouble codes that can be viewed by using the arrow keys to scroll to the next trouble code.



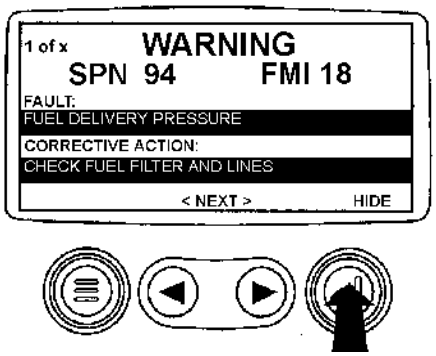
RG13241 –UN–30SEP03

Use Arrow Keys To Scroll

OURGP11,00000AD –19–03SEP03–3/7

IMPORTANT: Ignoring active trouble codes can result in severe engine damage.

4. To acknowledge and hide the code and return to the single or four parameter display, press the "Enter" Key.

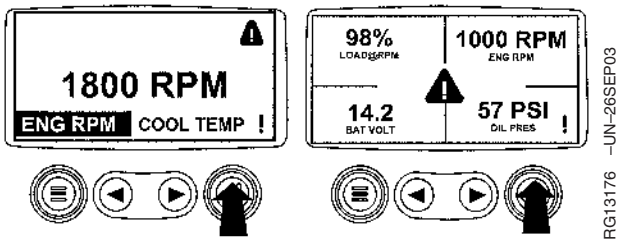


RG13242 –UN–30SEP03

Hide Trouble Codes

OURGP11,00000AD –19–03SEP03–4/7

5. The display will return to the single or four parameter display, but the display will contain the warning icon. Pressing the "Enter" key will redisplay the hidden trouble code.



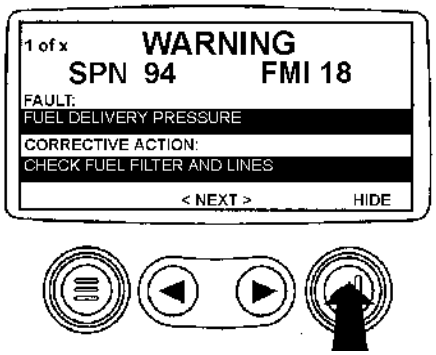
RG13176 –UN–26SEP03

Active Trouble Code Icon

OURGP11,00000AD –19–03SEP03–5/7

IMPORTANT: Ignoring active trouble codes can result in severe engine damage.

6. Pressing the "Enter" key once again will hide the trouble code and return the screen to the single or four parameter display.



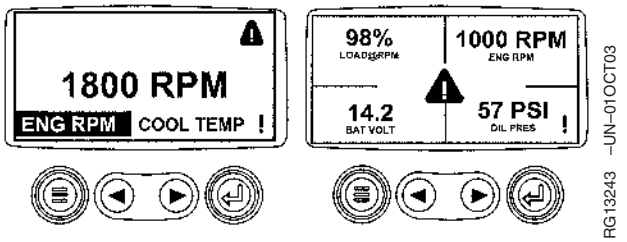
RG13242 –UN–30SEP03

Enter Key

Continued on next page

OURGP11,00000AD –19–03SEP03–6/7

7. The single or four parameter screen will display the warning icon until the trouble code condition is corrected.

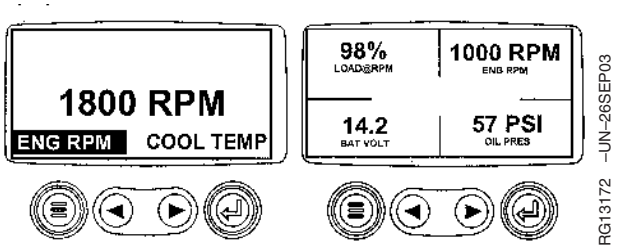


Active Trouble Code Condition

OURGP11,00000AD –19–03SEP03–7/7

Engine Shutdown Codes

1. During normal operation the single or four parameter screen will be displayed.

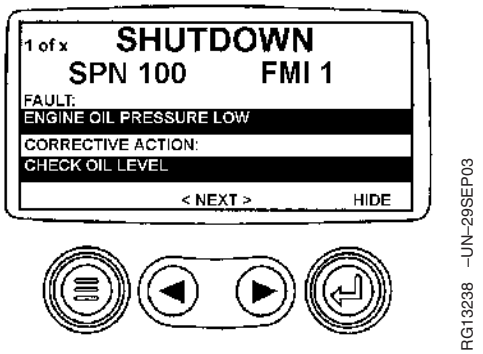


Normal Operation

OURGP11,00000AE –19–03SEP03–1/6

2. When the diagnostic gauge receives a severe trouble code from an engine control unit, the single or four parameter screen will be replaced with the "Shutdown" message. The SPN and FMI number will be displayed along with a description of the problem and the corrective action needed.

   If the word "Next" appears above the arrow keys, there are more trouble codes that can be viewed by using the arrow keys to scroll to the next trouble code.

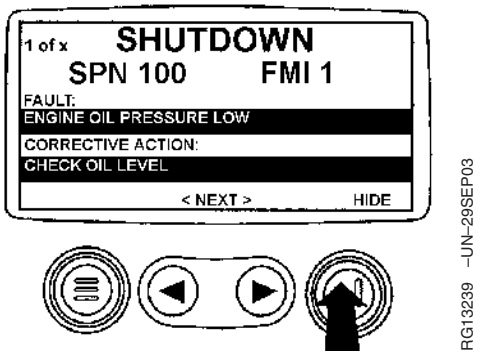


Shutdown Message

OURGP11,00000AE –19–03SEP03–2/6

3. To acknowledge and hide the trouble code and return to the single or four parameter display, press the "Enter" key".

IMPORTANT: Ignoring the shutdown message can result in severe engine damage.



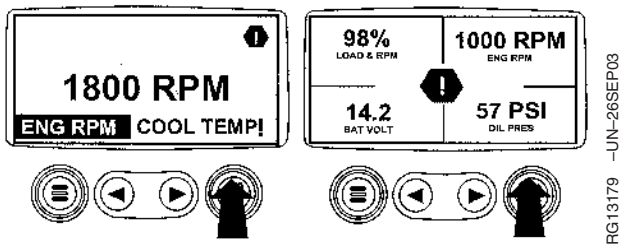
Hide Trouble Code

Continued on next page

OURGP11,00000AE –19–03SEP03–3/6

4. The display will return to the single or four parameter display, but the display will contain the "Shutdown" icon. Pressing the "Enter" key will redisplay the hidden trouble code.

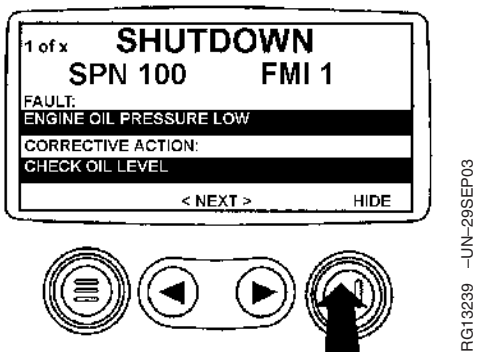
IMPORTANT: Ignoring the shutdown message can result in severe engine damage.



Flashing Shutdown Icon

OURGP11,00000AE –19–03SEP03–4/6

5. Pressing the "Enter" key once again will hide the trouble code and return the screen to the single or four parameter display.

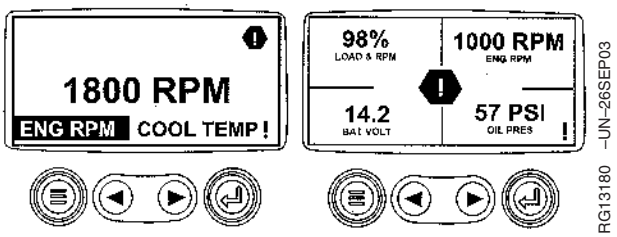


Redisplay Trouble Code

OURGP11,00000AE –19–03SEP03–5/6

6. The single or four parameter screen will display the shutdown icon until the trouble code condition is corrected.

IMPORTANT: Ignoring the shutdown message can result in severe engine damage.

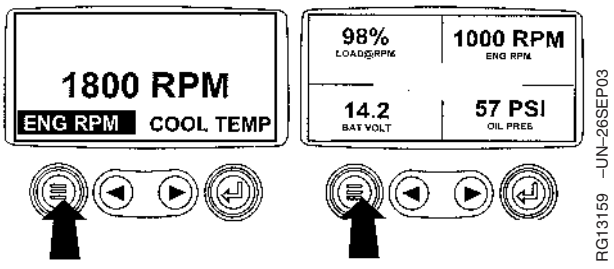


Shutdown Icon

OURGP11,00000AE –19–03SEP03–6/6

Adjusting Backlighting

1. Turn the key switch to the ON position. Starting at the single or four engine parameter display, press the "Menu" key.

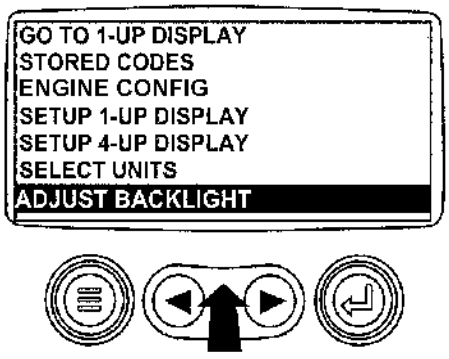


Menu Key

Continued on next page

OURGP11,0000237 –19–21OCT03–1/6

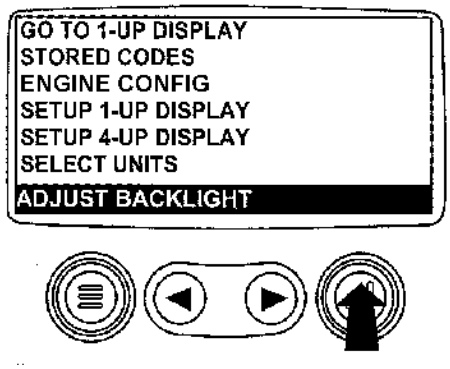
2. The main menu will be displayed. Use the "Arrow" keys to scroll through the menu until "Adjust Backlight" is highlighted.



Select Adjust Backlight

OURGP11,0000237 –19–21OCT03–2/6

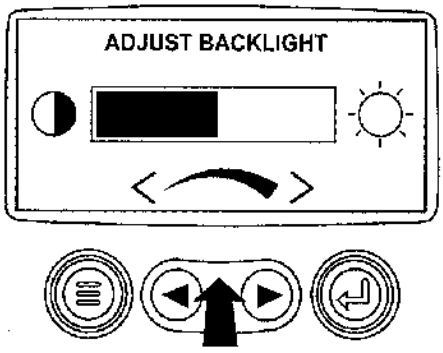
3. Once the "Adjust Backlight" menu item has been highlighted, press the "Enter" key to activate the "Adjust Backlight" function.



Press Enter Key

OURGP11,0000237 –19–21OCT03–3/6

4. Use the "Arrow" keys to select the desired backlight intensity.

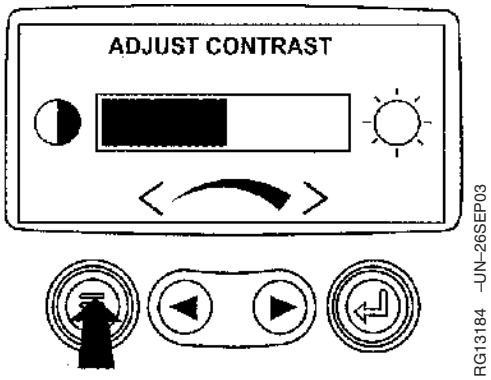


Adjust Backlight Intensity

Continued on next page

OURGP11,0000237 –19–21OCT03–4/6

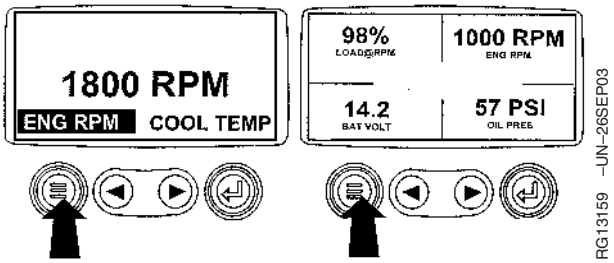
5. Press the "Menu" key to return to the main menu.



Return To Main Menu

OURGP11,0000237 –19–21OCT03–5/6

6. Press the "Menu" key to exit the main menu and return to the engine parameter display.

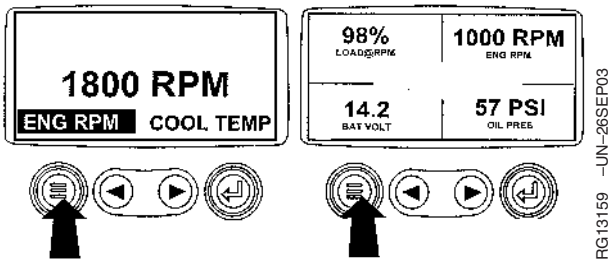


Exit Main Menu

OURGP11,0000237 –19–21OCT03–6/6

Adjusting Contrast

1. Turn the key switch to the ON position. Starting at the single or four engine parameter display press the "Menu" key.

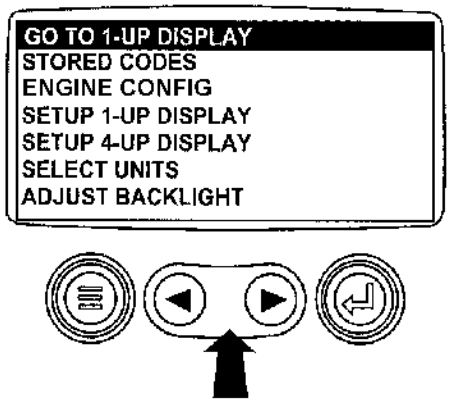


Menu Key

Continued on next page

OURGP11,00000AF –19–03SEP03–1/6

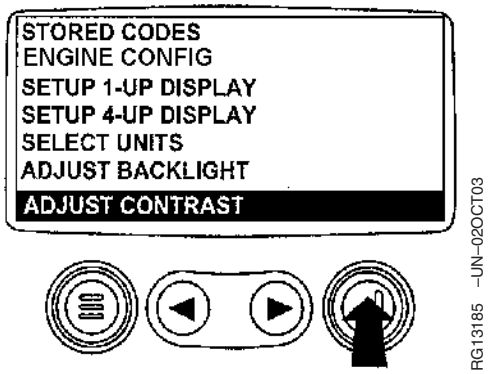
2. The main menu will be displayed. Use the "Arrow" keys to scroll through the menu until "Adjust Contrast" is highlighted.



Select Adjust Contrast

OURGP11,00000AF –19–03SEP03–2/6

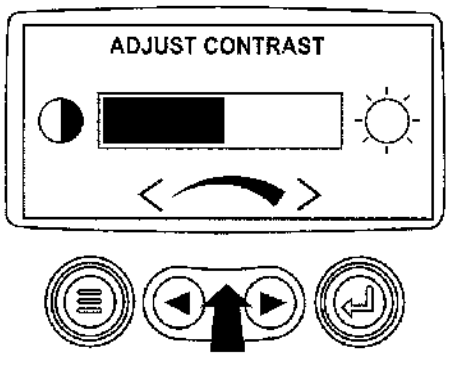
3. Once the "Adjust Contrast" menu item has been highlighted, press the "Enter" key to activate the "Adjust Contrast" function.



Press Enter Key

OURGP11,00000AF –19–03SEP03–3/6

4. Use the "Arrow" keys to select the desired contrast intensity.

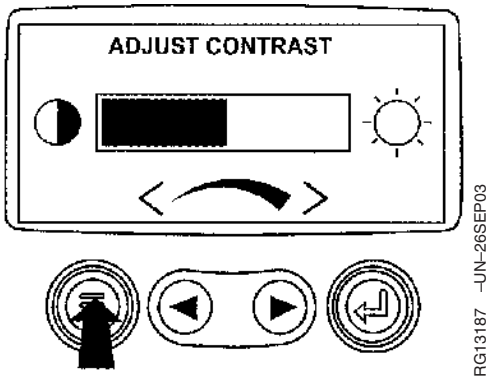


Adjust Contrast Intensity

Continued on next page

OURGP11,00000AF –19–03SEP03–4/6

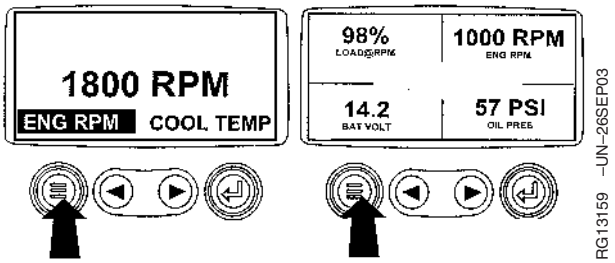
5. Press the "Menu" key to return to the main menu.



Return To Main Menu

OURGP11,00000AF –19–03SEP03–5/6

6. Press the "Menu" key to exit the main menu and return to the engine parameter display.

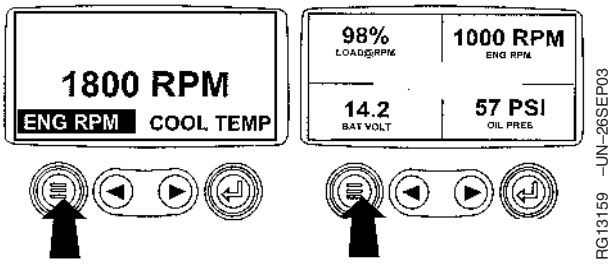


Exit Main Menu

OURGP11,00000AF –19–03SEP03–6/6

Selecting Units Of Measurement

1. Turn the key switch to the ON position. Starting at the single or four engine parameter display, press the "Menu" key.

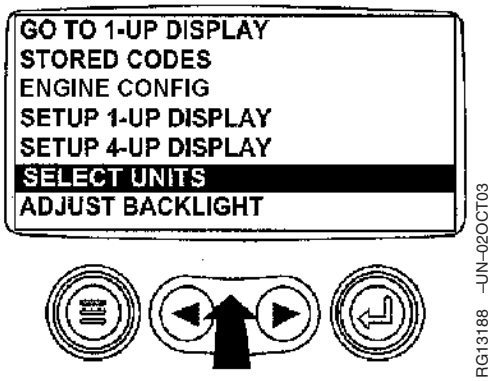


Menu Key

Continued on next page

OURGP11,00000B0 –19–03SEP03–1/7

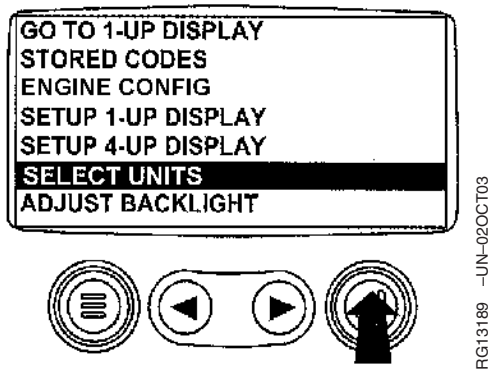
2. The main menu will be displayed. Use the "Arrow" keys to scroll through the menu until "Select Units" is highlighted.



Select Units

OURGP11,00000B0 –19–03SEP03–2/7

3. Once the "Select Units" menu item has been highlighted press the "Enter" key to access the "Select Units" function.



Press Enter Key

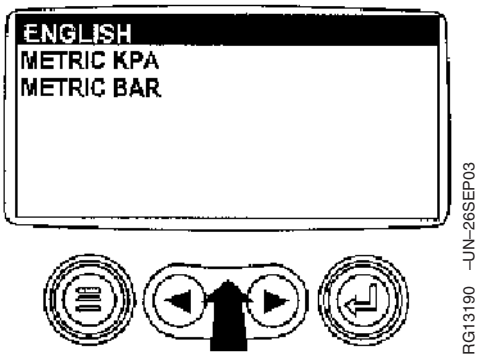
OURGP11,00000B0 –19–03SEP03–3/7

4. There are three choices for units of measurement, English, Metric kPa or Metric Bar.

   English is for Imperial units, with pressures displayed in PSI and temperatures in °F.

   Metric kPa and Metric bar are for IS units, with pressures displayed in kPa and bar respectively, and temperatures in °C.

   Use the "Arrow" keys to highlight the desired units of measurement.

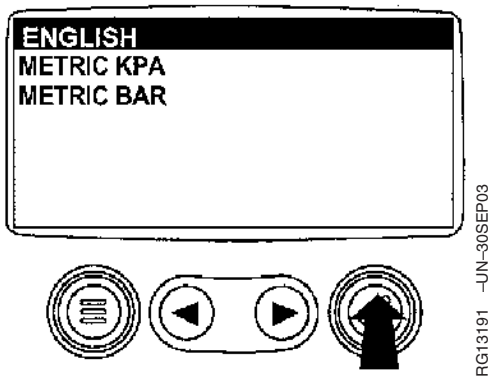


Select Desired Units

Continued on next page

OURGP11,00000B0 –19–03SEP03–4/7

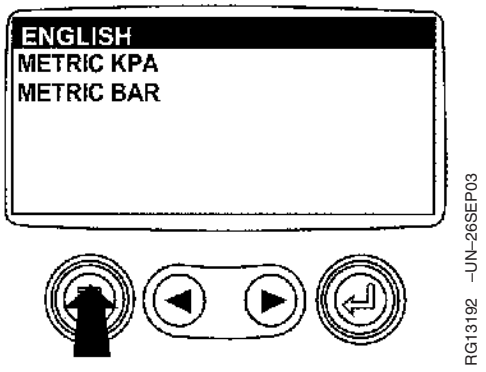
5. Press the "Enter" key to select the highlighted units.



Press Enter Key to Select

OURGP11,00000B0 –19–03SEP03–5/7

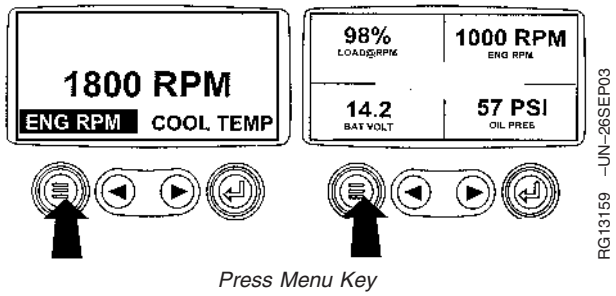
6. Press the "Menu" key to return to the main menu.



Return To Main Menu

OURGP11,00000B0 –19–03SEP03–6/7

7. Press the "Menu" key to return to the engine parameter display.

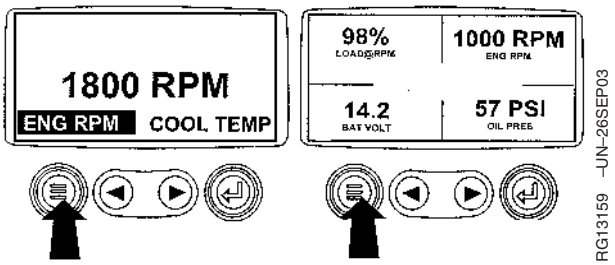


Press Menu Key

OURGP11,00000B0 –19–03SEP03–7/7

Setup 1-Up Display

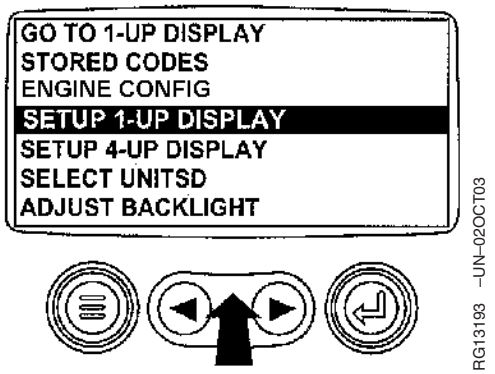
1. Turn the key switch to the ON position. Starting at the single engine parameter display, press the "Menu" key.



Menu Key

OURGP11,00000B1 –19–03SEP03–1/18

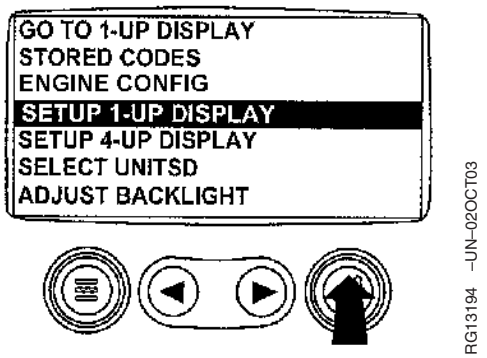
2. Use the "Arrow" keys to scroll through the menu until "Setup 1-Up Display" is highlighted.



Setup 1-Up Display

OURGP11,00000B1 –19–03SEP03–2/18

3. Once "Setup 1-Up Display" menu item has been highlighted press the "Enter" key to access the "Setup 1-Up Display" function.



Press Enter Key

Continued on next page

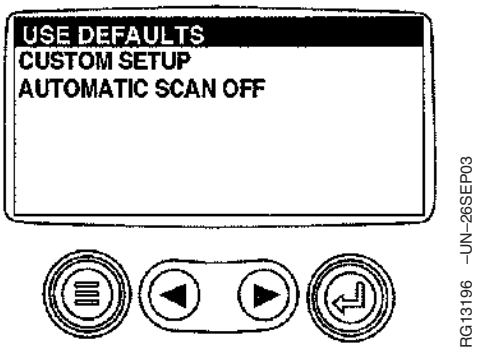
OURGP11,00000B1 –19–03SEP03–3/18

4. Three options are available for modification of the 1-Up Display.

   a. **Use Defaults** – This option contains the following engine parameters for display: Engine Hours, Engine Speed, Battery Voltage, % Load, Coolant Temperature and Oil Pressure.

   b. **Custom Setup** – This option contains a list of engine parameters. Engine parameters from this list can be selected to replace any or all of the default parameters. This option can be used to add parameters available for scrolling in the 1-Up Display.

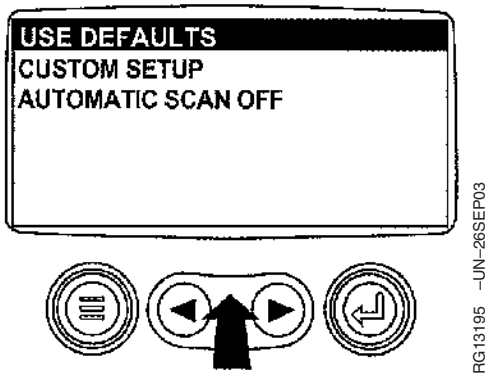
   c. **Automatic Scan** – Selecting the scan function will allow the 1-Up Display to scroll through the selected set of parameters one at a time, momentarily pausing at each.



1-Up Display Options

OURGP11,00000B1 –19–03SEP03–4/18

5. **Use Defaults** - To select "Use Defaults" use the Arrow keys to scroll to and highlight "Use Defaults" in the menu display.

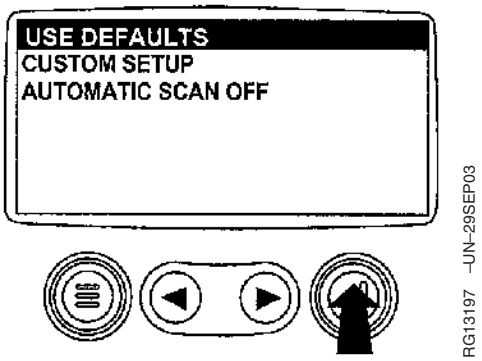


Select Defaults

Continued on next page

OURGP11,00000B1 –19–03SEP03–5/18

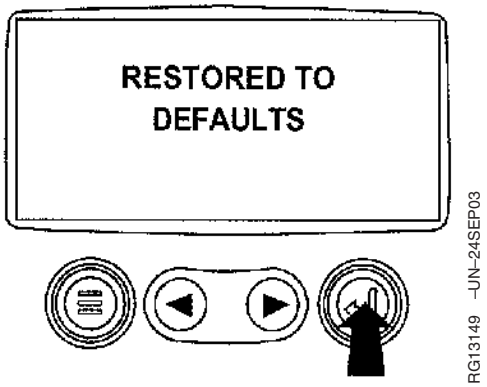
6. Press the "Enter" key to activate the "Use Defaults" function.



Defaults Selected

OURGP11,00000B1 –19–03SEP03–6/18

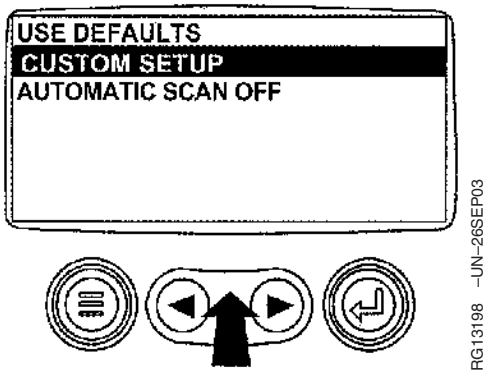
7. The display parameters are reset to the factory defaults, then the display will return to the "Setup 1-Up Display" menu.



Restored To Defaults

OURGP11,00000B1 –19–03SEP03–7/18

8. **Custom Setup** - To perform a custom setup of the 1-Up Display, use the arrow buttons to scroll to and highlight "Custom Setup" on the display.

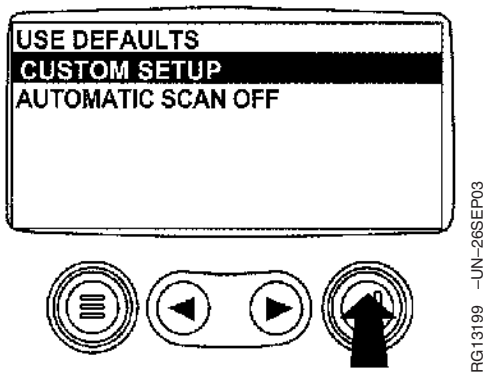


Select Custom Setup

Continued on next page

OURGP11,00000B1 –19–03SEP03–8/18

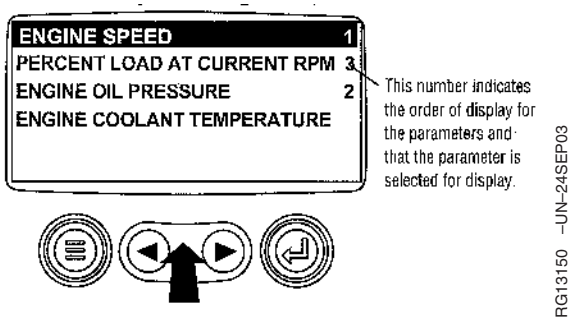
9. Press the "Enter" key to display a list of engine parameters.



Engine Parameters

OURGP11,00000B1 –19–03SEP03–9/18

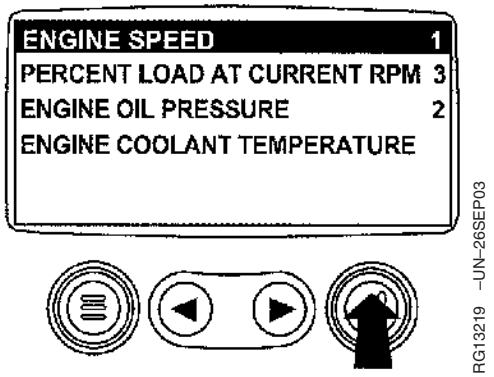
10. Use the "Arrow" keys to scroll to and highlight a selected parameter (parameter with a number to right of it).



Select Parameters

OURGP11,00000B1 –19–03SEP03–10/18

11. Press the "Enter" key to deselect the selected parameter, removing it from the list of parameters being displayed on the 1-Up Display.

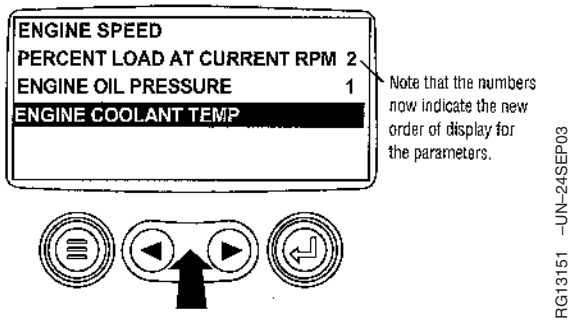


Deselect Parameters

Continued on next page

OURGP11,00000B1 –19–03SEP03–11/18

12. Use the "Arrow" keys to scroll and highlight the desired parameter that has not been selected for display (parameter without a number to right of it).

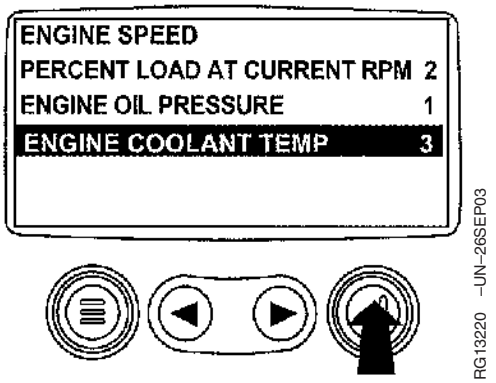


Select Desired Parameters

OURGP11,00000B1 –19–03SEP03–12/18

13. Press the "Enter" key to select the parameter for inclusion in the Single Engine Parameter Display.

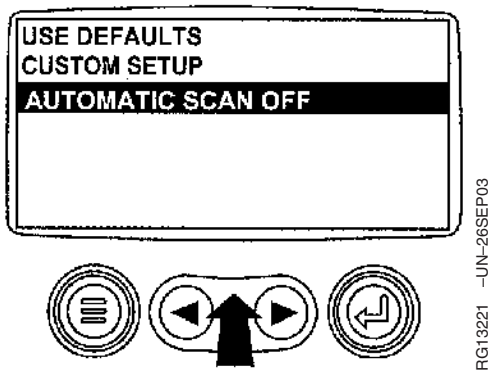
14. Continue to scroll through and select additional parameters for the custom 1-Up Display. Press the "Menu" key at any time to return to the "Custom Setup" menu.



Select Parameters For Display

OURGP11,00000B1 –19–03SEP03–13/18

15. **Automatic Scan** - Selecting the scan function will allow the 1- Up Display to scroll through the selected set of parameters one at a time. Use the "Arrow" keys to scroll to the "Automatic Scan" function.

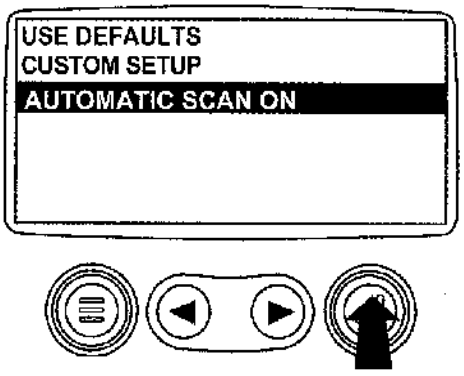


Automatic Scan Off

Continued on next page

OURGP11,00000B1 –19–03SEP03–14/18

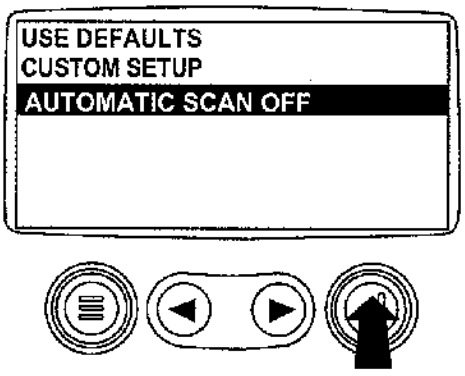
16. Press the "Enter" key to toggle the "Automatic Scan" function on.



Automatic Scan On

OURGP11,00000B1 –19–03SEP03–15/18

17. Press the "Enter" key again to toggle the "Automatic Scan" function off.

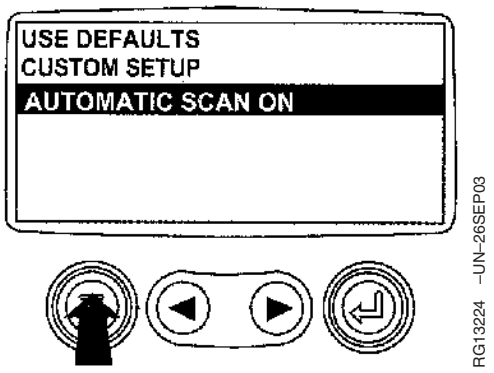


Automatic Scan Off

Continued on next page

OURGP11,00000B1 –19–03SEP03–16/18

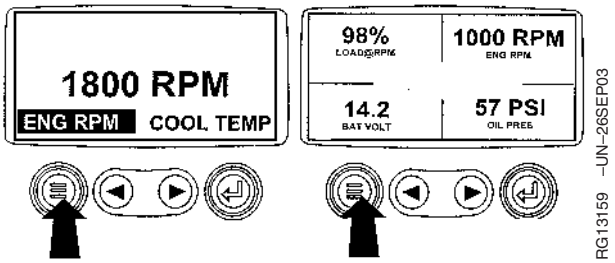
18. Once the "Use Defaults", "Custom Setup" and "Automatic Scan" functions have been set, press the "Menu" key to return to the main menu.



Menu Key

OURGP11,00000B1 –19–03SEP03–17/18

19. Press the "Menu" key to exit the main menu and return to the engine parameter display.

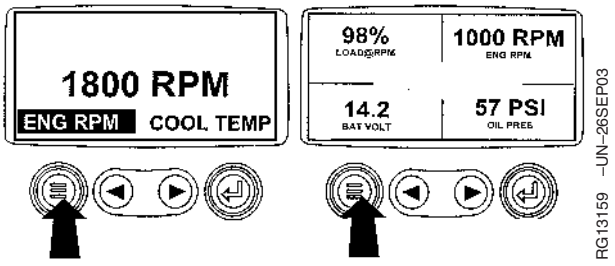


Exit Main Menu

OURGP11,00000B1 –19–03SEP03–18/18

Setup 4-Up Display

1. Turn the key switch to the ON position. From the single or four engine parameter display, press the "Menu" key.

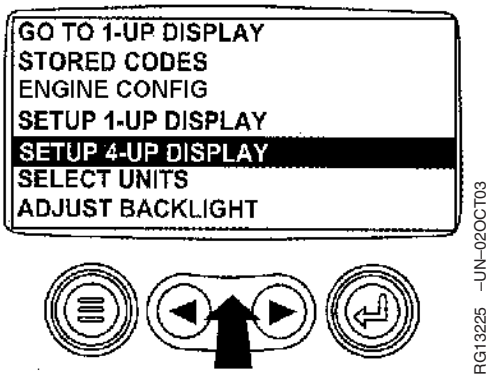


Menu Key

Continued on next page

OURGP11,00000B2 –19–03SEP03–1/14

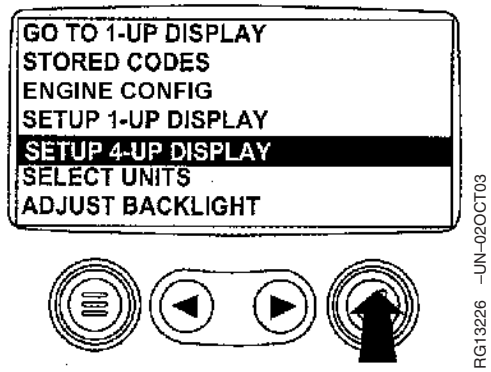
2. The main menu will be displayed. Use the "Arrow" keys to scroll through the menu until "Setup 4-Up Display" is highlighted.



Select Setup 4-Up Display

OURGP11,00000B2 –19–03SEP03–2/14

3. Once the "Setup 4-Up Display" menu item has been highlighted, press the "Enter" key to activate the "Setup 4-Up Display" menu.



Press Enter Key

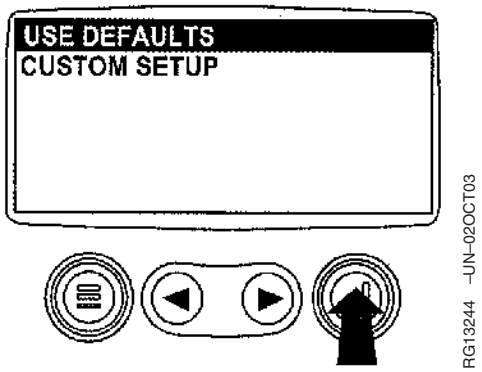
Continued on next page

OURGP11,00000B2 –19–03SEP03–3/14

4. Two options are available for the 4-Up Display.

   a. **Use Defaults** – This option contains the following engine parameters for display: Engine Speed, Battery Voltage, Coolant Temperature and Oil Pressure.

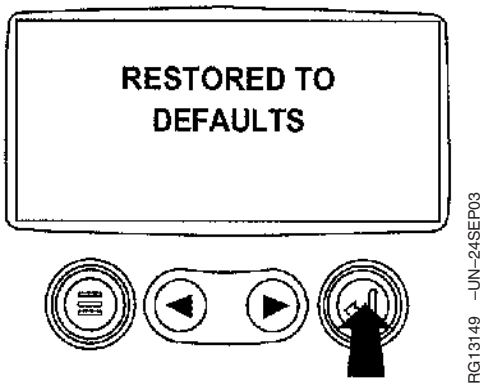
   b. **Custom Setup** – This option contains a list of engine parameters. Engine parameters from this list can be selected to replace any or all of the default parameters.



Select Factory Defaults

OURGP11,00000B2 –19–03SEP03–4/14

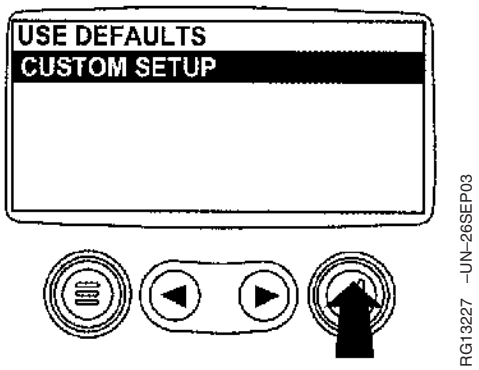
5. To reset the display parameters to the factory defaults, scroll to and highlight "Use Defaults". Press the "Enter" key to activate the "Use Defaults" function. A message indicating the display parameters are reset to the factory defaults will be displayed, then the display will return to the "Setup 4-Up Display" menu.



Restored To Defaults

OURGP11,00000B2 –19–03SEP03–5/14

6. **Custom Setup** - To perform a custom setup of the 4-Up Display, use the arrow buttons to scroll to and highlight "Custom Setup" on the display.

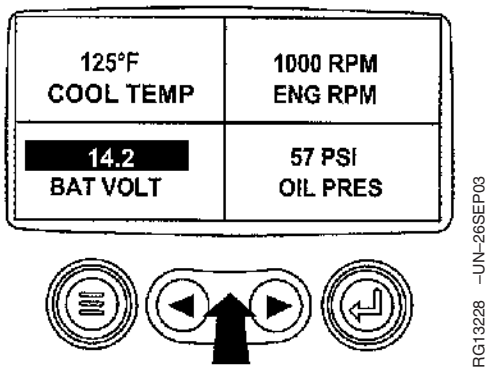


Custom Setup

Continued on next page

OURGP11,00000B2 –19–03SEP03–6/14

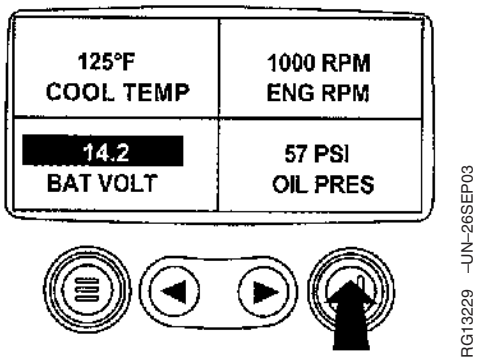
7. The quadrant with the highlighted parameter value is the current selected parameter. Use the "Arrow" keys to highlight the value in the quadrant you wish to change to a new parameter.



Select Parameters

OURGP11,00000B2 –19–03SEP03–7/14

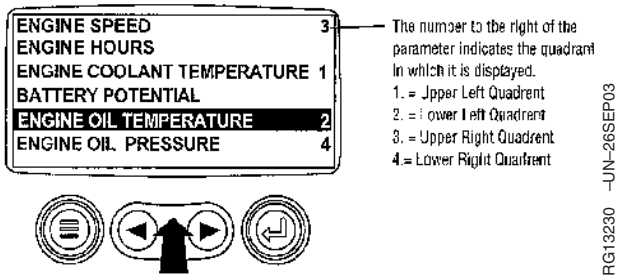
8. Press the "Enter" key and a list of engine parameters will be displayed.



List Of Engine Parameters

OURGP11,00000B2 –19–03SEP03–8/14

9. The parameter that is highlighted is the selected parameter for the screen. Use the "arrow" keys to highlight the new parameter to be placed in the "4-Up Display".

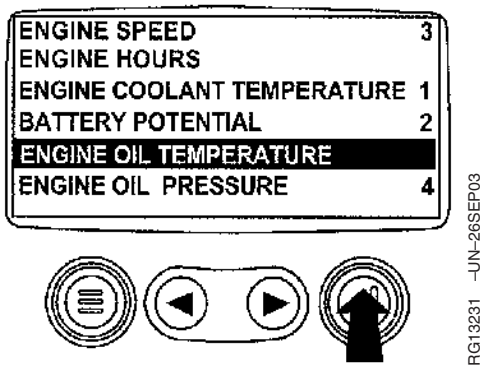


Select Desired Engine Parameter

Continued on next page

OURGP11,00000B2 –19–03SEP03–9/14

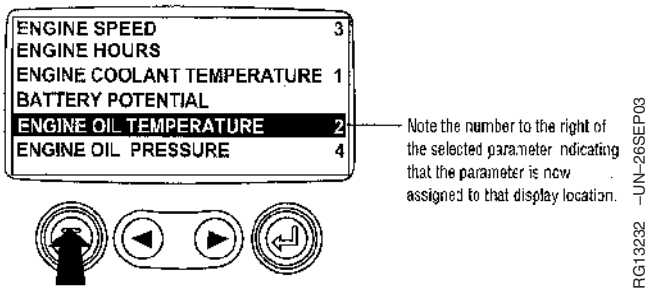
10. Press the "Enter" key to change the selected parameter in the quadrant to the new parameter.



Enter Selected Parameter

OURGP11,00000B2 –19–03SEP03–10/14

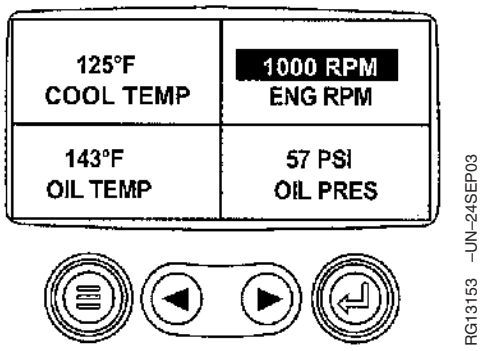
11. Use the "Menu" keys to return to the "4-Up Custom Setup" screen.



Return To 4-Up Custom Setup

OURGP11,00000B2 –19–03SEP03–11/14

12. The selected quadrant has now changed to the new selected parameter.



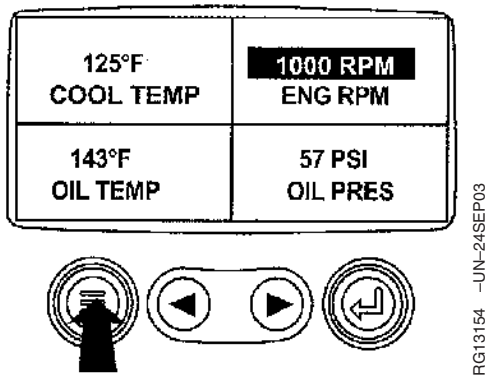
4-Up Display

Continued on next page

OURGP11,00000B2 –19–03SEP03–12/14

13. Repeat the parameter selection process until all spaces are as desired.

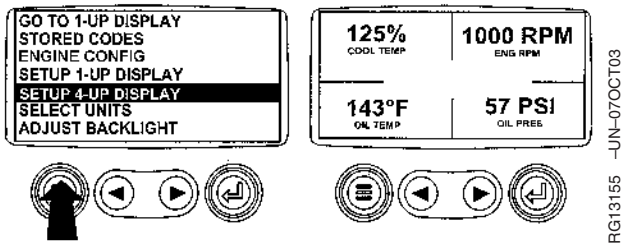
14. Press the "Menu" key to return to the main menu.



Return To Main Menu

OURGP11,00000B2 –19–03SEP03–13/14

15. Press the "Menu" key to exit the main menu and return to the engine parameter display.



Select Remaining Parameters

OURGP11,00000B2 –19–03SEP03–14/14

Break-in period

Within first 100 hours of operation:
During the first 100 hours of operation, avoid overloading, excessive idling and no-load operation.

If oil has to be added during this time, see ENGINE BREAK-IN OIL.

NOTE: During the break-in period a higher-than-usual oil consumption should be considered as normal.

After first 100 hours of operation:
After the first 100 hours, drain the crankcase and change the oil filter (see CHANGING ENGINE OIL AND FILTER). Fill crankcase with seasonal viscosity grade oil (see DIESEL ENGINE OIL).

Check tension of alternator belt.

Check connections of air intake hoses.

Check for proper tightening of cap screws all around the engine.

DPSG,CD03523,17 –19–22JAN07–1/1

Starting the engine

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).

1. Perform all prestarting checks outlined in Maintenance/Daily Section.
2. Open the fuel supply shut-off valve, if equipped.
3. Activate the starter motor switch to crank the engine and release it as soon as engine starts.

NOTE: Do not operate the starter motor more than 20 seconds at a time.

DPSG,CD03523,18 –19–22JAN07–1/1

Cold weather operation

Depending on equipment, various cold weather starting aids are available to assist in starting the engine at temperature below 0° C (32 °F).

Continued on next page

DPSG,CD03523,19 –19–06FEB07–1/4

Air intake heater

CAUTION: DO NOT use starting fluid on engines equipped with grid-type air intake heater or glow plug (s). Ether starting fluid is highly flammable and may explode, causing serious injury.

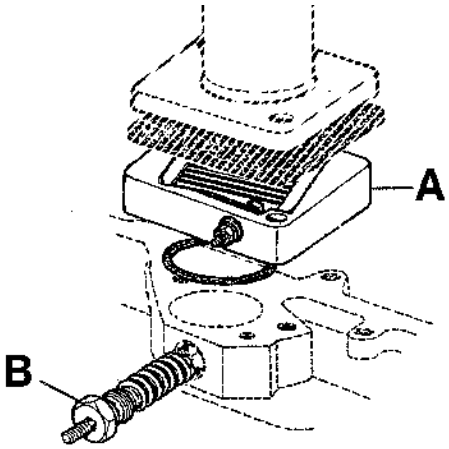
NOTE: On engines with electronically controlled fuel system (DE10, HPCR), the air intake heater operates automatically, controlled by the ECU. An engine preheater indicator light comes on when the key switch is turned ON. In warm weather, the light comes on briefly for a light check. In cold weather, the light remains ON during the automatic operation of the air intake heater or glow plug (s). Operating time depends on temperature. Do not crank engine until light goes OFF.

- **3029 and 4039 engines** are optionally equipped with the single glow plug (B) screwed in cylinder head intake manifold. Activate the glow plug (preheater position) for 30 seconds maximum then start the engine.
- **4045 and 6068 engines** (except HPCR, 4-valve head) are optionally equipped with the grid-type air heater (A) installed between cylinder head and air intake pipe.
  - For mechanical fuel system, activate the heating element (preheater position) for 30 seconds maximum then start the engine.
  - For electronically controlled engines (DE10, HPCR 2-valve head), turn key switch ON, but DO NOT crank engine until engine preheater indicator light turns OFF.
- **HPCR, 4-valve head engines** are equipped with glow plugs (one per cylinder) (C). Turn key switch ON, but DO NOT crank engine until preheater indicator light turns OFF.

A—Grid-Type heater (4045 and 6068 non HPCR 4-valve head engines)
B—Single Glow Plug (3029 and 4039 engines)
C—Multiple Glow Plugs (HPCR 4-valve head engines)

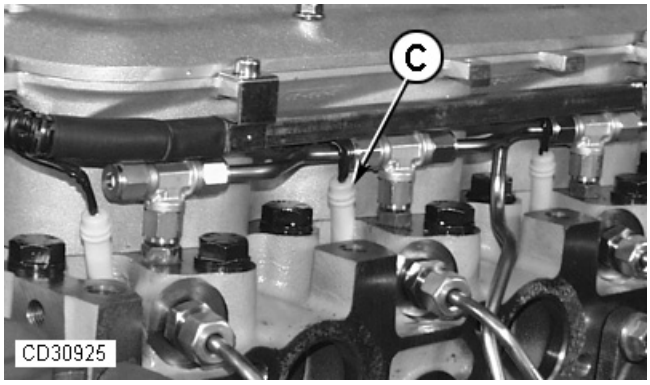
TS1356 –UN–18MAR92

Handle starting fluid with care



CD30750 –UN–03SEP99

Glow Plug or Grid-Type air heater



CD30925 –UN–23JAN07

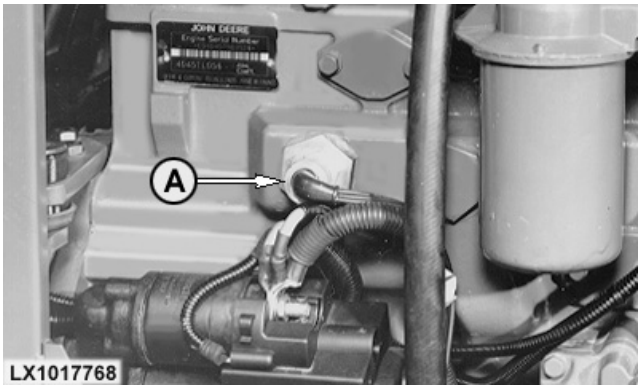
Glow Plugs on HPCR, 4-valve head engine

Continued on next page

Coolant heater

Connect plug of coolant heater (A) to a proper power source (110 or 220 V).

At an ambient temperature of -15°C (5°F), the heating process takes approximatively 2 hours. Extend heating period if ambient temperature is lower.

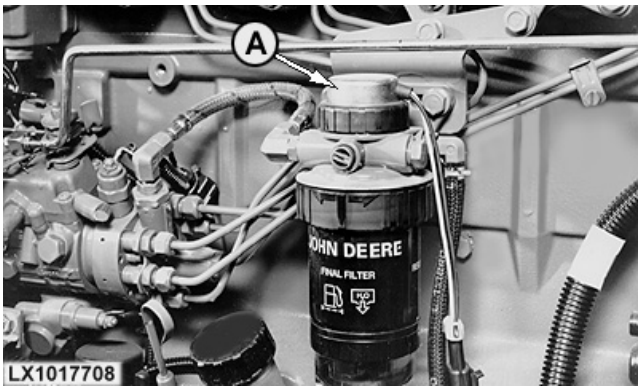


LX1017768 –UN–24OCT97

DPSG,CD03523,19 –19–06FEB07–3/4

Fuel preheater

Fuel preheater (A) switches ON and OFF automatically in relation with the ambient temperature.



LX1017708 –UN–09OCT97

DPSG,CD03523,19 –19–06FEB07–4/4

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.

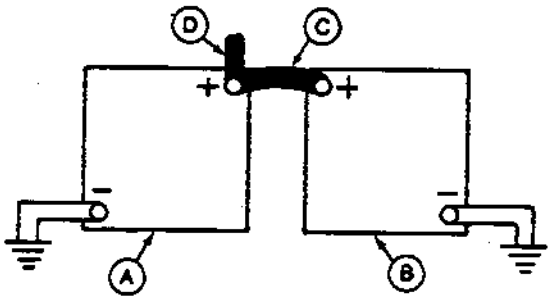
IMPORTANT: Be sure polarity is correct before making connections. Reversed polarity will damage electrical system. Always connect positive to positive and negative to ground. Always use 12-volt booster battery for 12-volt electrical systems and 24-volt booster battery(ies) for 24-volt electrical systems.

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.

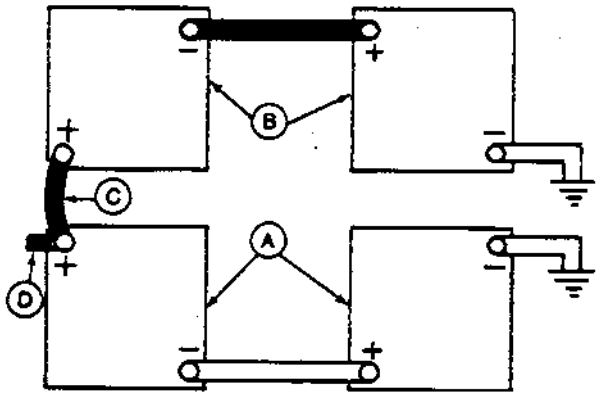
2. Connect one end of jumper cable to the POSITIVE (+) post of the booster battery.
3. Connect the other end of the jumper cable to the POSITIVE (+) post of battery connected to starter.
4. Connect one end of the other jumper cable to the NEGATIVE (–) post of the booster battery.
5. ALWAYS complete the hookup 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. Disconnect NEGATIVE (–) cable first.

TS204 –UN–23AUG88



RG4678 –UN–14DEC88

12-Volt System



RG4698 –UN–14DEC88

24-Volts System

A—12-Volt Machine battery (ies)
B—12-Volt Booster battery (ies)
C—Booster cable
D—Cable to starter motor

DPSG,CD03523,20 –19–22JAN07–1/1

Engine operation

Warming engine
Operate engine at high idle for 1 to 2 minutes before applying the load.

NOTE: This procedure does not apply to standby generator sets where the engine is loaded immediately upon reaching rated speed.

Normal engine operation
Compare engine coolant temperature and engine oil pressure with specifications below:

	Specification
Minimum oil pressure at full load rated speed[1]—Pressure	275 kPa (2.75 bar) (40 psi)
Coolant temperature range—Temperature	82°—94°C (180°—202°F)

Stop engine immediately if coolant temperature is above or oil pressure below specifications or if there are any signs of part failure. Symptoms that may be early signs of engine problems could be:

- Sudden loss of power
- Unusual noise or vibration
- Excessive black exhaust
- Excessive fuel consumption
- Excessive oil consumption
- Fluid leaks

Recommendation for turbocharger engines
Should the engine stall when operating under load, IMMEDIATELY restart it to prevent overheating of turbocharger components.

Idling engine
Avoid excessive 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. If an engine will be idling for more than 5 minutes, stop and restart later.

NOTE: Generator set applications have the governor locked at a specified speed and do not have a slow idle function. These engines idle at no load governed speed (fast idle).

[1]Oil at normal operating temperature of 115°C (240°F).

DPSG,CD03523,21 –19–22JAN07–1/1

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.

DPSG,CD03523,22 –19–22JAN07–1/1

Stopping the engine

1. Before stopping, run engine for at least 2 minutes at fast idle and no load.
2. Stop the engine.

DPSG,CD03523,23 –19–22JAN07–1/1

Changing Generator Frequency

Generator sets powered by 6068HFU74 engine are dual-frequency; 50 Hz (1500 rpm) or 60 Hz (1800 rpm). Refer to the generator set documentation for more information.

CD03523,000018C –19–26JAN07–1/1

Observe service intervals

Using hour meter 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 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.

DPSG,CD03523,24 –19–22JAN07–1/1

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 engine distributor, servicing dealer or your nearest John Deere Parts Network for recommended fuels, lubricants, and coolant. Also available are necessary additives for use when operating engines in tropical, arctic, or any other adverse conditions.

TS100 –UN–23AUG88

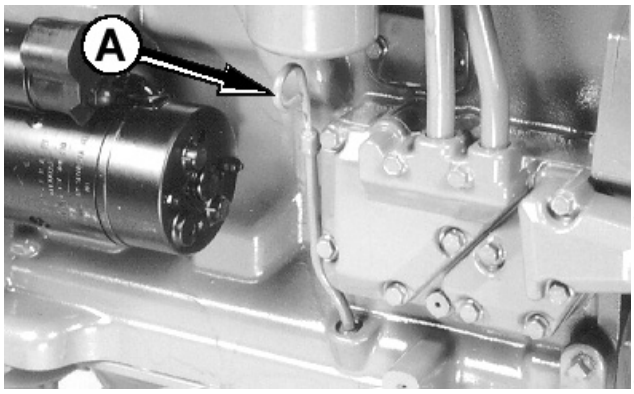
DPSG,CD03523,25 –19–22JAN07–1/1

Maintenance interval chart

Item	10 H / daily	500 H	1000 H / 1 year	2000 H / 2 years	2500 H / 3 years	As required
Check engine oil and coolant level	•					
Check air filter restriction indicator[a]	•					
Change engine oil and filter[b]		•				
Replace fuel filter element(s)		•				
Check belt tension and automatic tensioner[c]		•	•			
Check and adjust valve clearance[d]			•	•		
Clean crankcase vent tube			•			
Check air intake hoses, connections and system			•			
Pressure test cooling system			•			
Check vibration damper (6 cyl.)[e]				•		
Check engine speed and speed drop governor				•		
Drain and flush cooling system[f]				•	•	
Drain water and sediment from fuel filter						•
Clean filter element (see note a)						•
Test thermostat and injection nozzles (see your dealer)[g]						•
Test glow plugs (HPCR, 4-valve head)				•		
[a]Clean air filter element when restriction indicator is red. Replace filter element after 6 cleanings or once a year.						
[b]Change oil and filter after the first 100 hours of operation, then every 500 hours maximum thereafter (see DIESEL ENGINE OIL information). Change oil and filter at least once a year.						
[c]Check belt tension every 500 hours on 3029 and 4039 engines and on 4045 and 6068 engines with manual tensioner. Check automatic belt tensioner every 1000 hours/1 year on 4045 and 6068 engines when equipped.						
[d]Have your authorized servicing dealer or engine distributor adjust valve clearance as follows. After the first 500 hours of operation then every 1000 hours thereafter on 3029 and 4039 engines. Every 2000 hours on 4045 and 6068 engines.						
[e]Have your authorized dealer or engine distributor replace the vibration damper every 4500 hours/5 years.						
[f]Drain and flush cooling system every 2500 hours/3 years when John Deere COOL-GARD coolant is used. Otherwise every 2000 hours/2 years.						
[g]Contact your dealer when thermostat or injection nozzles are suspected to be defective. Replace injection nozzles every 5000 hours and thermostat every 10000 hours.						

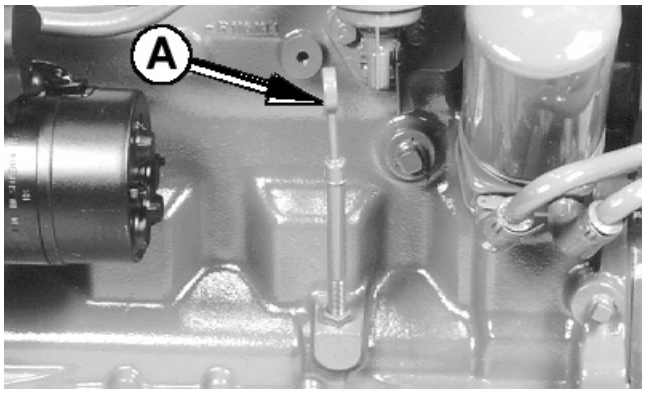
DPSG,CD03523,26 –19–25JAN07–1/1

Daily prestarting checks



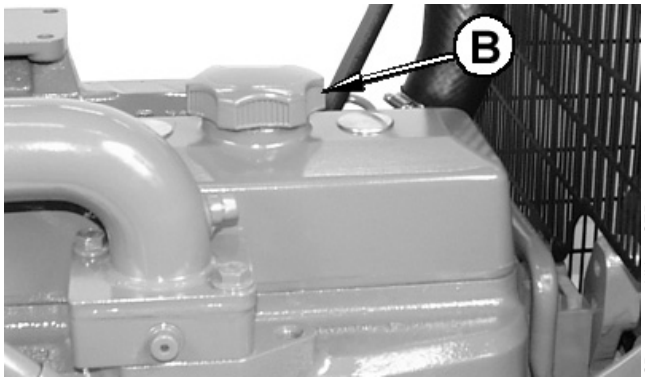
CD30753 –UN–26AUG99

4045 and 6068 engines

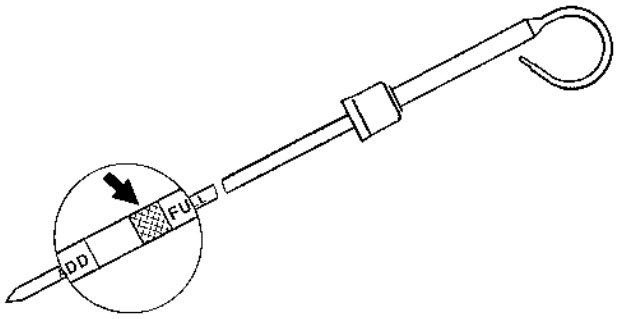


CD30754 –UN–26AUG99

3029 and 4039 engines



CD30755 –UN–24SEP99



FD000047

FD000047 –UN–13MAR96

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 level on dipstick (A). Add as required, using seasonal viscosity grade oil. (See DIESEL ENGINE OIL). Add oil at rocker arm cover filler cap (B).

IMPORTANT: DO NOT fill above the crosshatch area. Oil levels anywhere within crosshatch are considered in the acceptable operating range.

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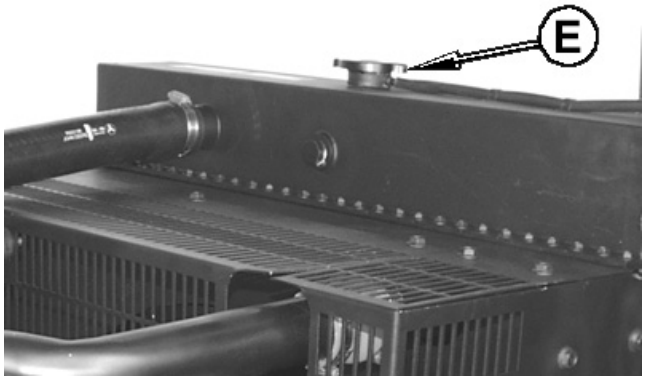
DPSG,CD03523,27 –19–07FEB07–1/4

TS281 –UN–23AUG88



CD30756 –UN–26AUG99

2.

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.

Remove radiator cap (E) and check coolant level which should be at bottom of filler neck. Fill radiator with proper coolant solution if level is low. (See DIESEL ENGINE COOLANT). Check entire cooling system for leaks.

DPSG,CD03523,27 –19–07FEB07–2/4

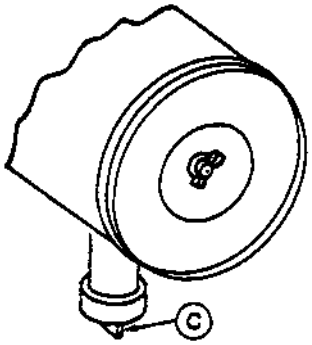
3. If air filter has a dust unloader valve (C), squeeze valve tip to release any trapped dirt particles.

4. Check air intake restriction indicator (D). When indicator is red, air filter needs to be cleaned.

IMPORTANT: Maximum air intake restriction is 6.25 kPa (0.06 bar) (1.0 psi) (25 in. H2O). 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.

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



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CD30757 –UN–26AUG99

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DPSG,CD03523,27 –19–07FEB07–3/4

6.

NOTE: Engines with mechanical fuel system have a single fuel filter while electronically controlled engines (DE10 and HPCR fuel systems) have two fuel filters (primary and final). Moreover these electronically controlled engines may be equipped with a water sensor at the fuel filters. An indicator light on the instrument panel will signal the operator that water should be drained from filter bowls.

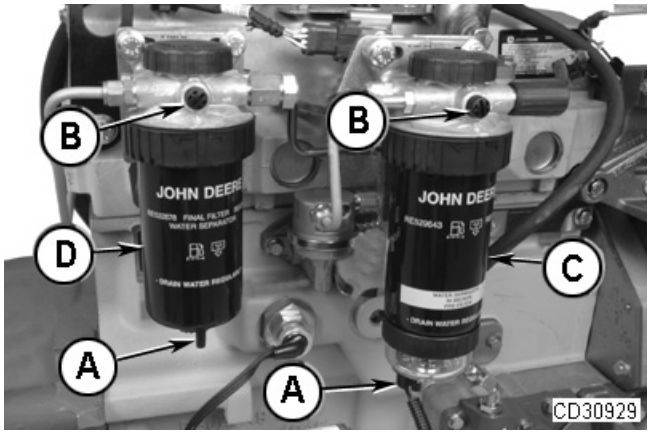
Check fuel filters (C) and (D) for water and debris as follows:

a. Loosen drain plug(s) (A) at bottom of fuel filter(s) or bowl(s) two or three turns.

b. Loosen air bleed plug(s) (B) two full turns and drain water into a suitable container.

c. When fuel starts to drain out, tighten drain plug(s) securely.

d. Bleed fuel system.



Drain fuel filter(s)

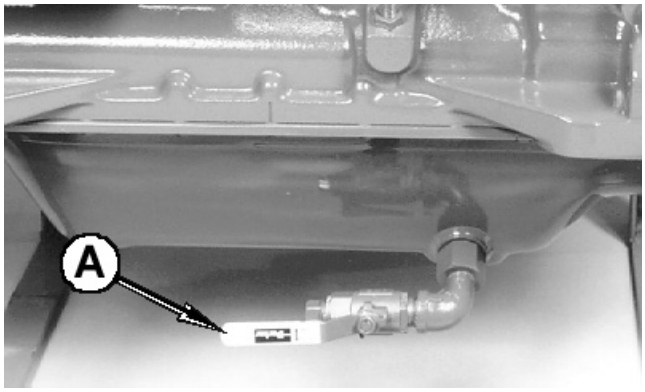
A—Drain plug
B—Air bleed plug
C—Primary fuel filter
D—Final fuel filter

DPSG,CD03523,27 –19–07FEB07–4/4

Changing engine oil and filter

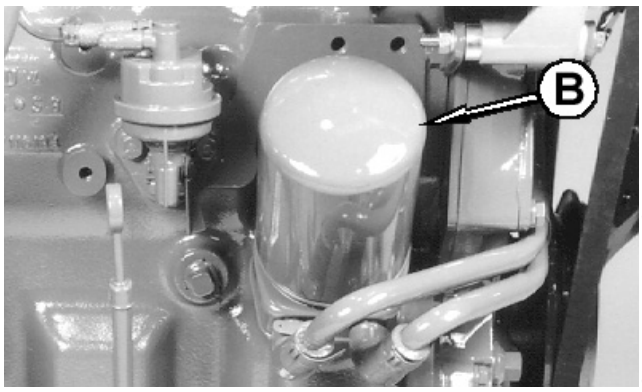
IMPORTANT: Filtration of oils is critical to proper lubrication. Always change filter regularly. Use filter meeting John Deere performance specifications.

NOTE: Change engine oil and filter for the first time after 100 hours maximum of operation, then every 500 hours thereafter. Change oil and filter at leat once a year.

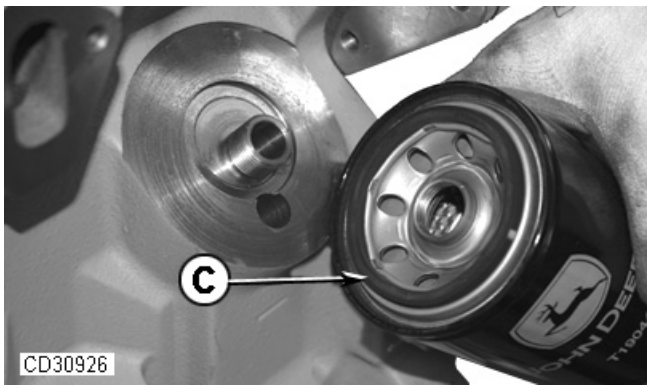


1. Run engine approximately 5 minutes to warm up oil. Shut engine off.
2. Open oil pan drain valve (A).
3. Drain crankcase oil from engine while warm.

DPSG,CD03523,29 –19–06FEB07–1/4



Oil filter on 3029 and 4039 engines



Oil new filter element packing

4. Replace oil filter
   - **3029 and 4039 engines**
     a. Remove and discard oil filter element (B) using a suitable filter wrench.
     b. Oil new packing (C) and install new filter element. Hand tighten element according to values printed on filter element. If values are not provided, tighten element approximately 3/4 — 1-1/4 turn after packing contacts filter housing. DO NOT overtighten filter element.

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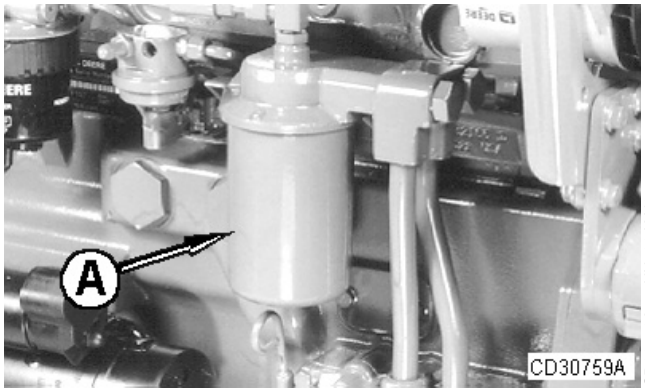
DPSG,CD03523,29 –19–06FEB07–2/4

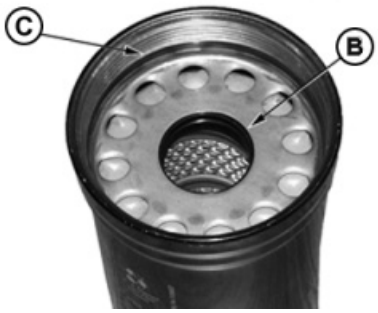


CD30759A –UN–29JAN07

Oil filter on 4045 and 6068 engines

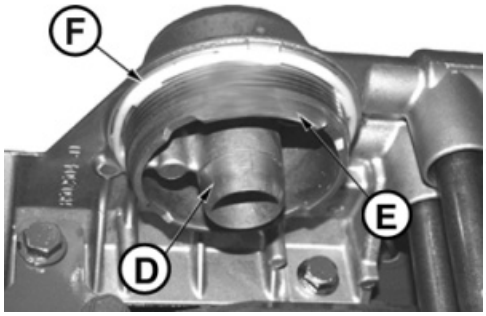
- **4045 and 6068 engines**
  a. Remove and discard oil filter element (A) using a suitable filter wrench.
  b. Apply clean engine oil to inner (B) and outer (C) seals and to filter threads.
  c. Wipe both sealing surfaces of the header (D, E) with a clean rag. Ensure notches in dust seal (F) are properly installed in the slots in the housing. Replace dust seal if damaged.
  d. Install and tighten oil filter by hand until firmly against dust seal (F). DO NOT overtighten.

5. Close oil pan drain valve.



RG11617 –UN–24OCT01

Oil filter seals



RG11618 –UN–24OCT01

Filter and mounting header

A—Oil filter element
B—Inner seal
C—Outer seal
D—Sealing surface
E—Sealing surface
F—Dust seal

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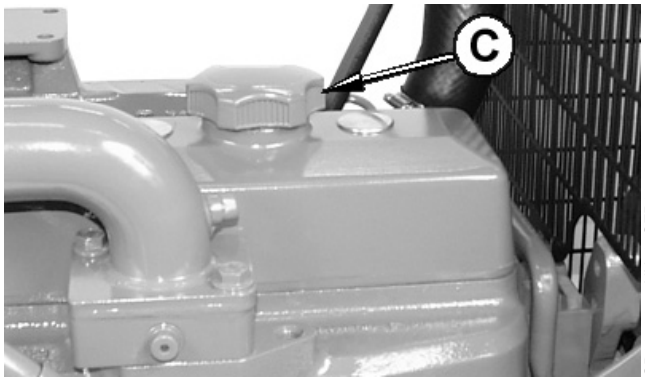
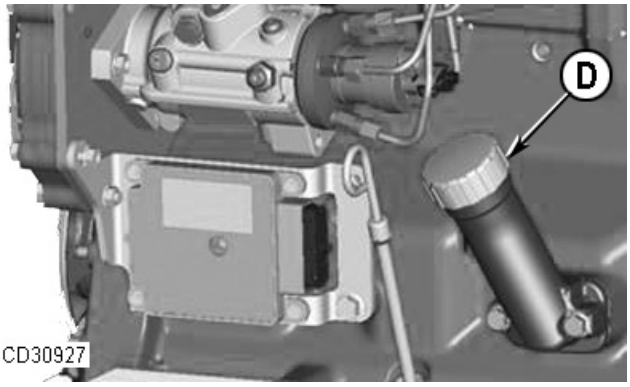
DPSG,CD03523,29 –19–06FEB07–3/4



Oil filler cap on rocker arm cover



Oil filler neck on engine side

6. Fill engine crankcase with correct John Deere engine oil through opening on rocker arm cover (C) or on the side of the engine (D). See DIESEL ENGINE OIL Section for determining correct engine oil.

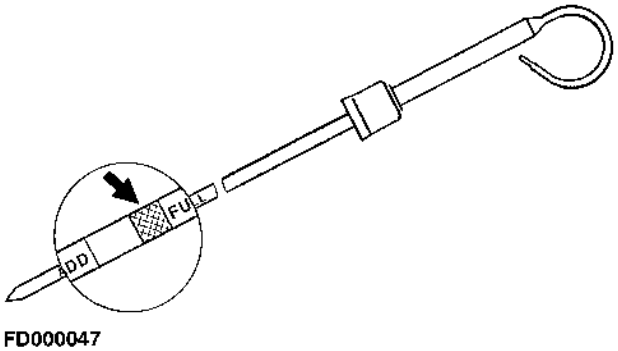
   To determine the correct oil fill quantity for your engine, see the Specifications Section.

NOTE: Crankcase oil capacity may vary slightly. ALWAYS fill crankcase to full mark or within crosshatch on dipstick, whichever is present. DO NOT overfill.

IMPORTANT: Immediately after completing any oil change, crank engine for 30 seconds without permitting engine to start. This will help insure adequate lubrication to engine components before engine starts.

7. Start engine and run to check for possible leaks.

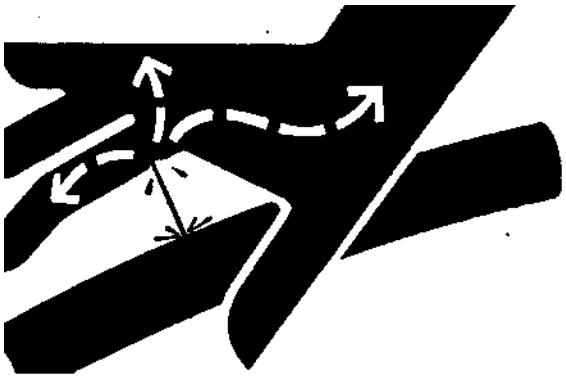
8. Stop engine and check oil level after 10 minutes. If necessary, top up.



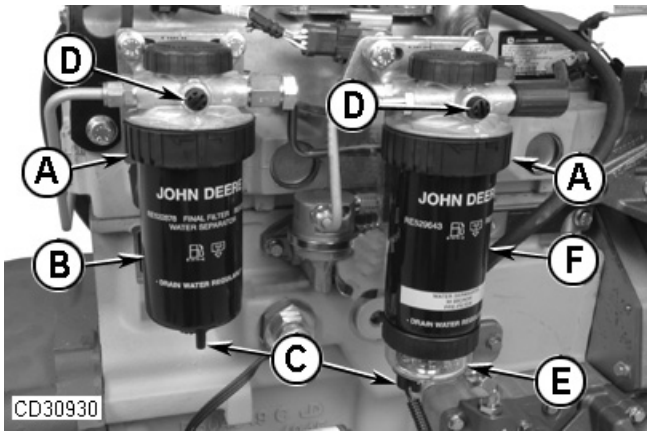
Oil dipstick

DPSG,CD03523,29 –19–06FEB07–4/4

Replacing fuel filter element(s)



X9811 –UN–23AUG88



CD30930 –UN–07FEB07

Fuel filters

A—Retaining ring
B—Final fuel filter element
C—Drain plug
D—Bleed plug
E—Water separator bowl
F—Primary fuel filter element

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 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.

NOTE: Engines with mechanical fuel system have a single fuel filter while electronically controlled engines (DE10, HPCR) have two fuel filters (primary and final). Both the primary and the final filters have to be replaced together at the same time.

1. Thoroughly clean fuel filter assembly and surrounding area.
2. Loosen drain plug (C) and drain fuel into a suitable container.

NOTE: Lifting up on retaining ring as it is rotated helps to get it past raised locators.

3. Firmly grasp the retaining ring (A) and rotate it clockwise 1/4 turn. Remove ring with filter element (B).

IMPORTANT: Do not dump the old fuel into the new filter element. This could cause fuel injection problem.

A plug is provided with the new element for plugging the used element.

4. Inspect filter mounting base for cleanliness. Clean as required.

Continued on next page

NOTE: Raised locators on fuel filter canister must be indexed properly with slots in mounting base for correct installation.

5. Install new filter element dry onto mounting base. Be sure element is properly indexed and firmly seated on base. It may be necessary to rotate filter for correct alignment.

6. Install retaining ring onto mounting base making certain dust seal is in place on filter base. Hand tighten ring (about 1/3 turn) until it ”snaps” into the detent. DO NOT overtighten retaining ring.

NOTE: The proper installation is indicated when a "click" is heard and a release of the retaining ring is felt.

7. Bleed the fuel system.

DPSG,CD03523,30 –19–07FEB07–2/2

Checking belt (3029 and 4039 Engines)

1. Inspect belt for cracks, fraying, or stretched out areas. Replace as necessary.

2. Check belt tension using one of following methods:

   a) Use of JDG529 Tension Gauge (A)

Specification

Belt tension—New belt	578—622 N (130—140 lb-force)
Used belt	378—423 N (85—94 lb-force)

NOTE: Belt is considered used after 10 minutes of operation.

b) Use of tension tester (B) and straightedge (C)
A 89 N (20 lb) force applied halfway between pulleys should deflect belt by 19 mm (0.75 in.).

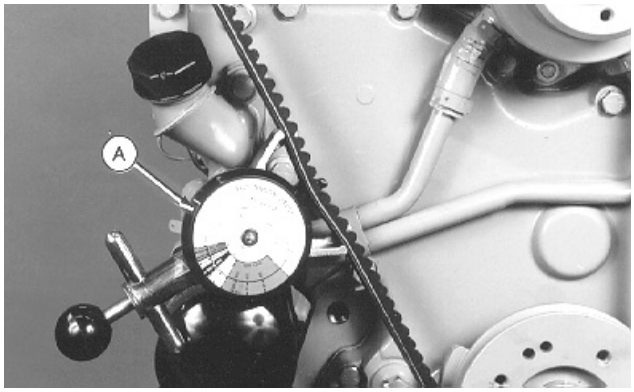
3. If adjustment is necessary, loosen alternator nuts (D) and (E). Pull alternator frame outward until belt is correctly tensioned.

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

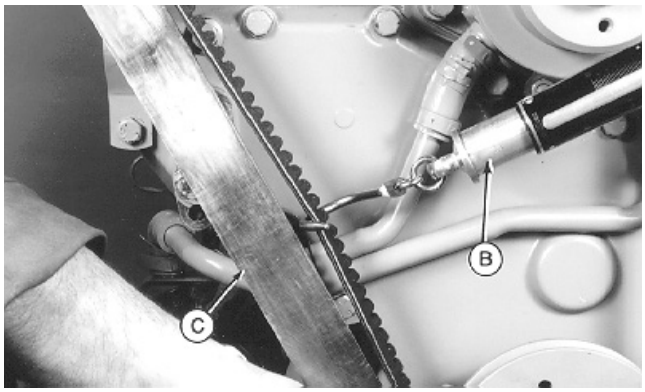
4. Tighten alternator bracket nuts firmly.

5. Run engine for 10 minutes then recheck belt tension.

A—JDG529 Tension Gauge
B—Tension tester
C—Straightedge
D—Upper nut
E—Lower nut



CD30644 –UN–04MAY98



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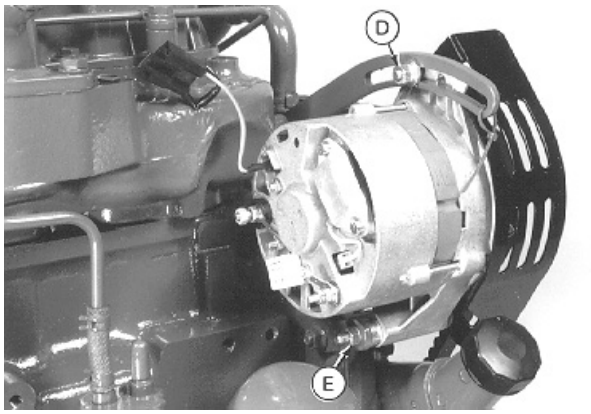


CD30646 –UN–04MAY98

DPSG,CD03523,31 –19–30JAN07–1/1

Checking belt (4045 and 6068 Engines with manual tensioner)

Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary.

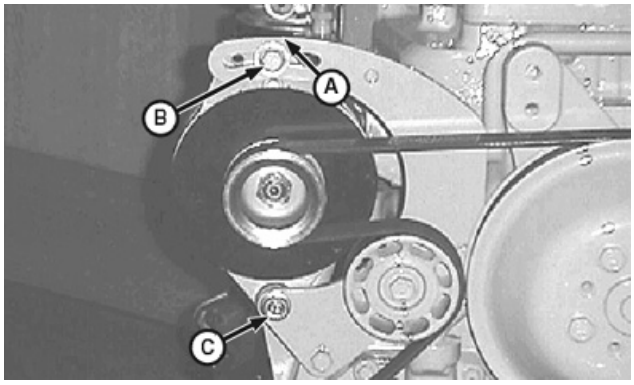
NOTE: Belt adjustment is measured using a gauge stamped on the top edge of the alternator bracket.

1. Loosen cap screws (B) and (C).
2. Slide alternator in slot by hand to remove all excess slack in belt. Scribe a reference mark (D) on line with notch (E) on upper alternator bracket.

IMPORTANT: Do not pry against alternator rear frame.

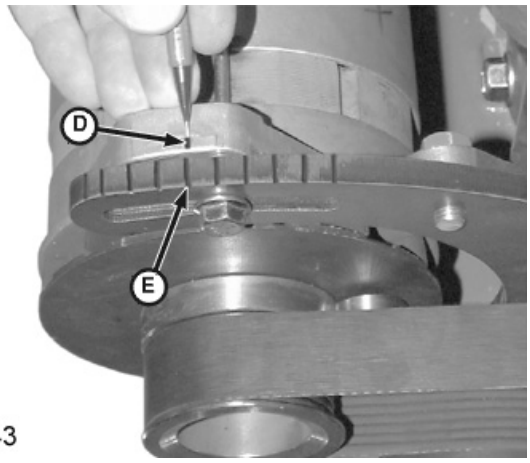
3. Using the gauge (A) on the alternator bracket, stretch belt by prying outward on alternator front frame. Stretch the belt 1 gauge unit for a used belt and 1.5 gauge units for a new belt.
4. Tighten cap screws (B) and (C).

A—Belt gauge
B—Cap screw
C—Cap screw
D—Reference mark
E—Alternator upper bracket notch



RG9132 –UN–04OCT99

Manual belt tensioner on 4045 and 6068 engines



CD30843

CD30843 –UN–10JAN03

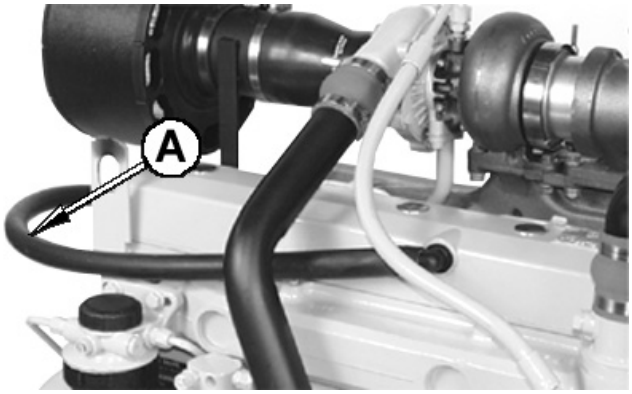
Reference marks

DPSG,CD03523,57 –19–30JAN07–1/1

Cleaning crankcase vent tube

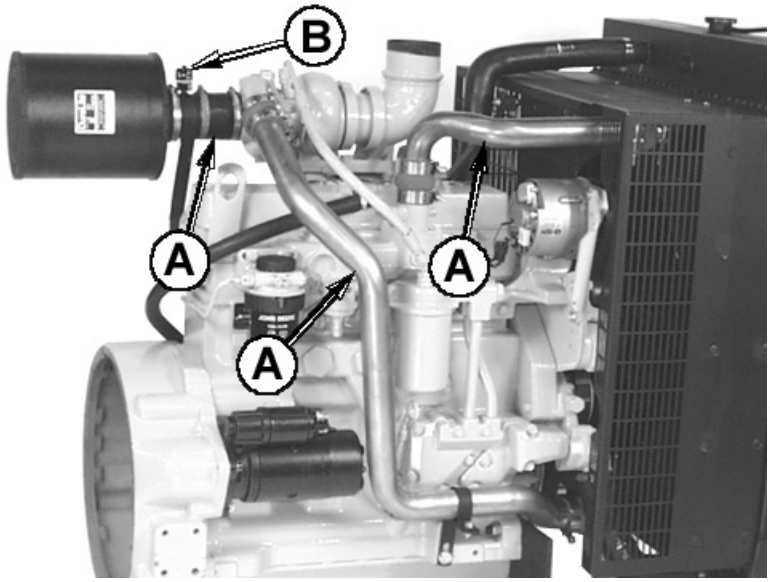
If you operate the engine in dusty conditions, clean the tube at shorter intervals.

1. Remove and clean crankcase vent tube (A).
2. Install the vent tube. Be sure the O-ring fits correctly in the rocker arm cover for elbow adapter. Tighten hose clamp securely.



DPSG,CD03523,32 –19–22JAN07–1/1

Checking air intake system



IMPORTANT: The air intake system must not leak. Any leak, no matter how small, may result in engine failure due to abrasive dirt and dust entering the intake system.

1. Inspect all intake hoses (piping) for cracks. Replace as necessary.
2. Check clamps on piping (A) which connect the air filter, engine and, if present, turbocharger and air-to-air radiator. Tighten clamps as necessary.
3. Test air restriction indicator (B) for proper operation. Replace indicator as necessary.

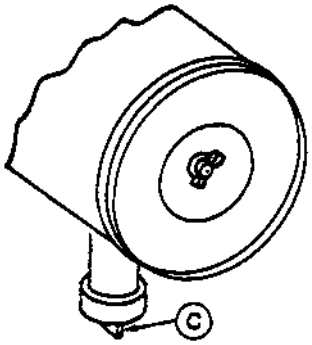
Continued on next page

DPSG,CD03523,33 –19–22JAN07–1/2

4.

If engine has a rubber dust unloader valve (C), inspect the valve on bottom of air filter for cracks or plugging. Replace as necessary.

5. Service air filter as necessary.



RG4687 –UN–20DEC88

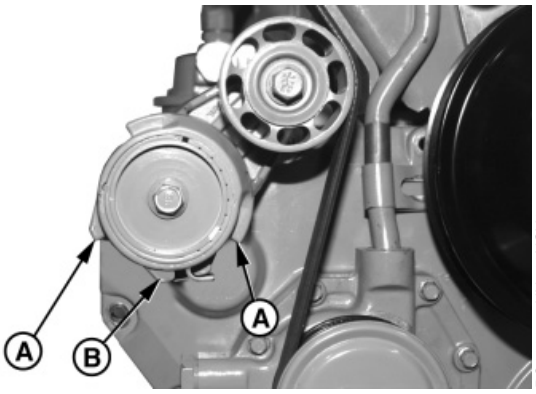
DPSG,CD03523,33 –19–22JAN07–2/2

Checking automatic belt tensioner (4045 and 6068 Engines)

Belt drive systems equipped with automatic (spring) belt tensioners cannot be adjusted or repaired. The automatic belt tensioner is designed to maintain proper belt tension over the life of the belt. If tensioner spring tension is not within specification, replace tensioner assembly.

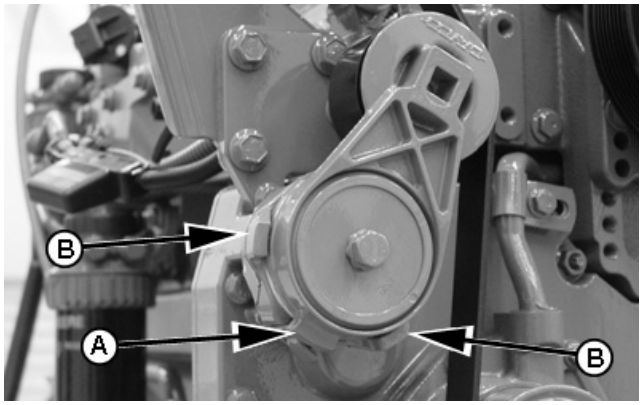
- **Checking belt wear**
  The belt tensioner is designed to operate within the limit of arm movement provided by the cast stops (A and B) when correct belt length and geometry is used. If the tensioner stop on swing arm (A) is hitting the fixed stop (B), check mounting brackets (alternator, belt tensioner, idler pulley, etc.) and the belt length. Replace belt as needed (see REPLACING FAN AND ALTERNATOR BELTS).

A—Swing arm stop
B—Fixed cast stop



RG8098 –UN–18NOV97

Earlier design tensioner



RG13744 –UN–11NOV04

Later design tensioner

Continued on next page

DPSG,CD03523,34 –19–30JAN07–1/2

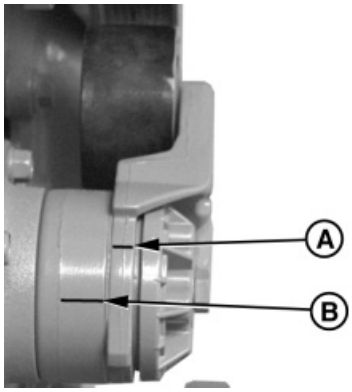
- **Checking tensioner spring tension**
  A belt tension gauge will not give an accurate measure of the belt tension when automatic spring tensioner is used. Measure tensioner spring tension using a torque wrench and procedure outlined below:
  a. Release tension on belt using a breaker bar and socket on tension arm. Remove belt from pulleys.
  b. Release tension on tension arm and remove breaker bar.
  c. Put a mark (A) on swing arm of tensioner as shown.
  d. Measure 21 mm (0.83 in.) from (A) and put a mark (B) on tensioner mounting base.

NOTE: Earlier engines have a LEFT-HAND thread roller cap screw while later engines have a 12.7 mm (1/2 in.) square hole in tensioner.

  e. Install torque wrench on roller cap screw or in square hole so that it is aligned with center of roller and tensioner as shown. Rotate the swing arm using a torque wrench until marks (A and B) are aligned.
  f. Record torque wrench measurement and compare with specification below. Replace tensioner assembly as required.

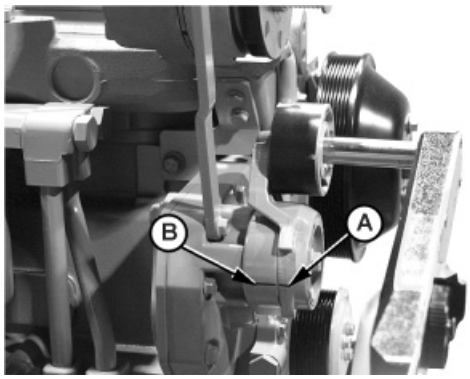
Specification

Spring—Force..... 18—22 N•m (13—16 lb-ft)



RG7977 –UN–14NOV97

Marks on tensioner



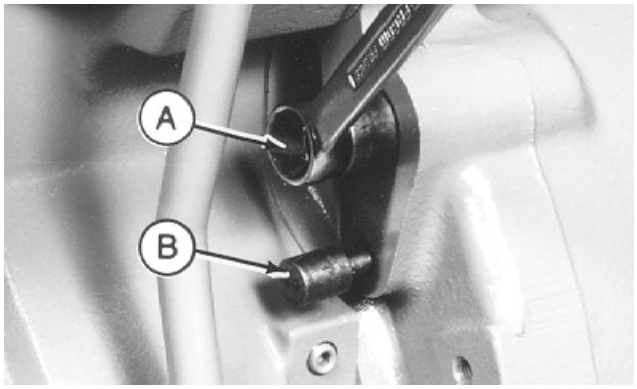
RG12054 –UN–08JAN02

Align marks

A—Mark on swing arm
B—Mark on tensioner mounting base

DPSG,CD03523,34 –19–30JAN07–2/2

Check and adjust engine valve clearance (3029 and 4039 Engines)



CD30544 –UN–19MAY98

NOTE: Valve clearance must be adjusted after the first 500 hours of operation, then every 1000 hours thereafter.

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

1. Remove rocker arm cover and crankcase vent tube.

2. Using JDE83 or JDG820 Flywheel Turning Tool (A), rotate engine flywheel in running direction (clockwise viewed from water pump) until No.1 piston (front) has reached top dead center (TDC) on compression stroke. Insert timing pin JDE81-4 or JDG1571 (B) into flywheel bore.

DPSG,CD03523,35 –19–31JAN07–1/4

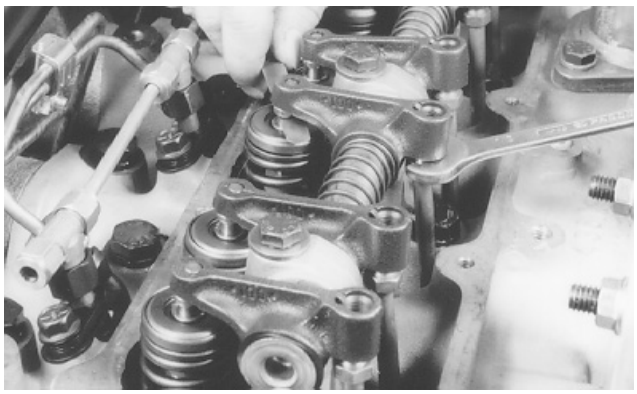
3. Check and adjust valve clearance to specifications according to following procedures.

Specification

Valve clearance (engine cold)—	
Intake	0.35 mm (0.014 in.)
Exhaust	0.45 mm (0.018 in.)

NOTE: If rocker arm is equipped with adjusting screw and jam nut (A), tighten jam nut to 27 N•m (20 lb-ft) after adjusting valve clearance.

4. Reinstall rocker arm cover and crankcase vent tube.


CD30545 –UN–19MAY98

RG6307 –UN–03AUG92

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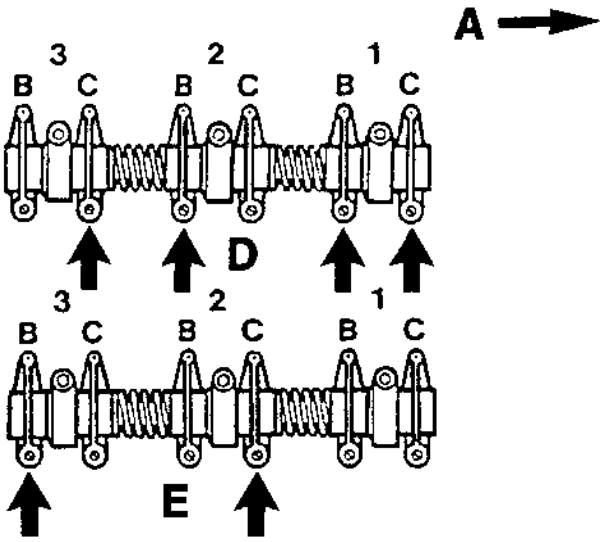
DPSG,CD03523,35 –19–31JAN07–2/4

- **3-Cylinder Engine:**

NOTE: Firing order is 1-2-3

a. Lock No. 1 piston at TDC compression stroke (D).
b. Adjust valve clearance on No. 1 and 2 exhaust valves and No.1 and 3 intake valves.
c. Rotate flywheel 360°. Lock No. 1 piston at TDC exhaust stroke (E).
d. Adjust valve clearance on No. 3 exhaust valve and No. 2 intake valve.



CD30549 –UN–16JUN98

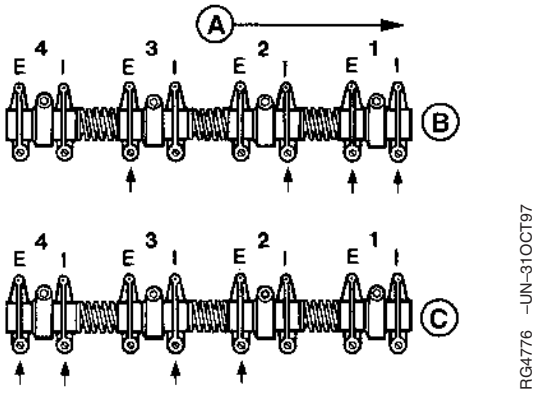
A—Front of engine
B—Exhaust valve
C—Intake valve
D—No.1 Piston at TDC compression stroke
E—No.1 Piston at TDC exhaust stroke

DPSG,CD03523,35 –19–31JAN07–3/4

- **4-Cylinder Engine:**

NOTE: Firing order is 1-3-4-2

a. Lock No. 1 piston at TDC compression stroke (B).
b. Adjust valve clearance on No. 1 and 3 exhaust valves and No.1 and 2 intake valves.
c. Rotate flywheel 360°. Lock No. 4 piston at TDC compression stroke (C).
d. Adjust valve clearance on No. 2 and 4 exhaust valves and No. 3 and 4 intake valves.

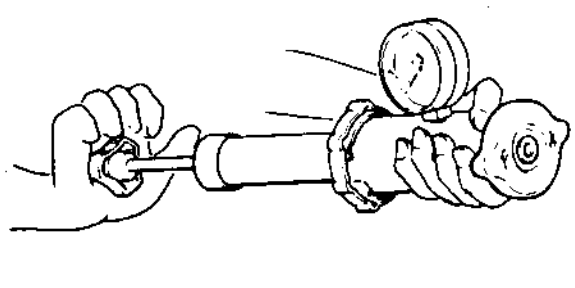


RG4776 –UN–31OCT97

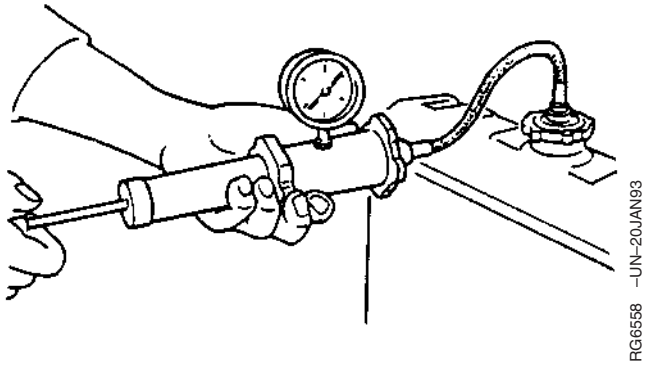
A—Front of engine
B—No.1 Piston at TDC compression stroke
C—No.4 Piston at TDC compression stroke
E—Exhaust valve
I—Intake valve

DPSG,CD03523,35 –19–31JAN07–4/4

Pressure testing cooling system



Test radiador cap



Test cooling system

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

Shut off engines. 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 specification listed. Gauge should hold pressure for 10 seconds within the normal range if cap is acceptable.

   If gauge does not hold pressure, replace radiator cap.

Specification

Radiator Cap Calibration—
Pressure..... 70 kPa (0.7 bar) (10 psi) for 10 seconds minimum

3. Remove the cap from gauge, turn it 180°, and retest cap to confirm measurement.

Test Cooling System

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

1. Allow engines 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 specification listed for radiator cap.
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 engine distributor or servicing dealer correct this problem immediately.

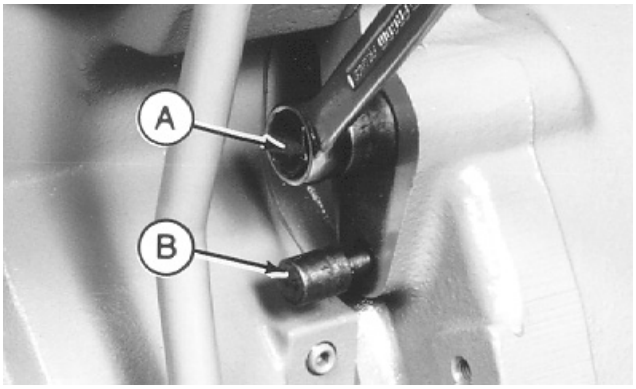
CD03523,00000EC –19–22JAN07–1/1

Check and adjust engine valve clearance (4045 and 6068 Engines)

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

1. Remove rocker arm cover and crankcase vent tube.

2. Using JDE83 or JDG820 Flywheel Turning Tool (A), rotate engine flywheel in running direction (clockwise viewed from water pump) until No.1 piston (front) has reached top dead center (TDC) on compression stroke. Insert timing pin JDE81-4 (B) into flywheel bore.



CD30544 –UN–19MAY98

DPSG,CD03523,36 –19–31JAN07–1/4

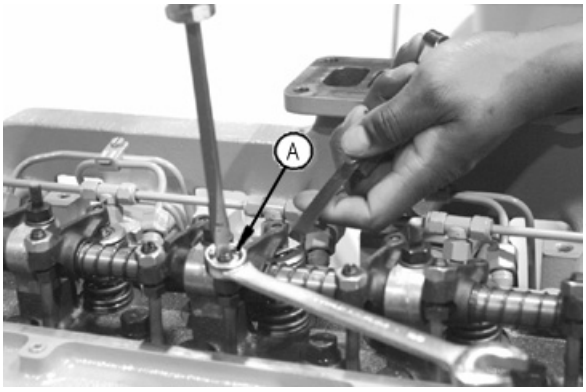
3. Check and adjust valve clearance to specifications according to following procedures.

Specification

Valve clearance (engine cold)—	
Intake	0.35 mm (0.014 in.)
Exhaust	0.45 mm (0.018 in.)

4. If valves need adjusting, 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 after tightening locknut. Readjust clearance as necessary

5. Reinstall rocker arm cover and crankcase vent tube.



RG7409 –UN–06AUG96

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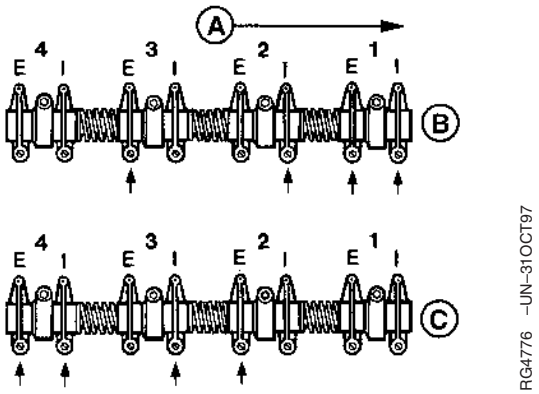
DPSG,CD03523,36 –19–31JAN07–2/4

- **4-Cylinder Engine:**

NOTE: Firing order is 1-3-4-2

a. Lock No. 1 piston at TDC compression stroke (B).
b. Adjust valve clearance on No. 1 and 3 exhaust valves and No.1 and 2 intake valves.
c. Rotate flywheel 360°. Lock No. 4 piston at TDC compression stroke (C).
d. Adjust valve clearance on No. 2 and 4 exhaust valves and No. 3 and 4 intake valves.



RG4776 –UN–31OCT97

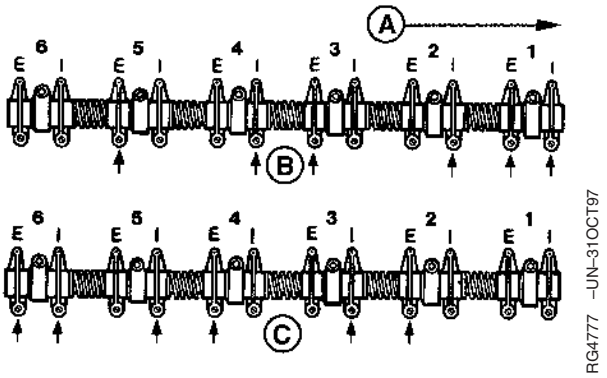
A—Front of engine
B—No.1 Piston at TDC compression stroke
C—No.4 Piston at TDC compression stroke
E—Exhaust valve
I—Intake valve

DPSG,CD03523,36 –19–31JAN07–3/4

- **6-Cylinder Engine:**

NOTE: Firing order is 1-5-3-6-2-4.

a. Lock No. 1 piston at TDC compression stroke (B).
b. Adjust valve clearance on No. 1, 3, and 5 exhaust valves and No. 1, 2, and 4 intake valves.
c. Rotate flywheel 360°. Lock No. 6 piston at TDC compression stroke (C).
d. Adjust valve clearance on No. 2, 4, and 6 exhaust valves and No. 3, 5, and 6 intake valves.



RG4777 –UN–31OCT97

A—Front of engine
B—No.1 Piston at TDC compression stroke
C—No.6 Piston at TDC compression stroke
E—Exhaust valve
I—Intake valve

DPSG,CD03523,36 –19–31JAN07–4/4

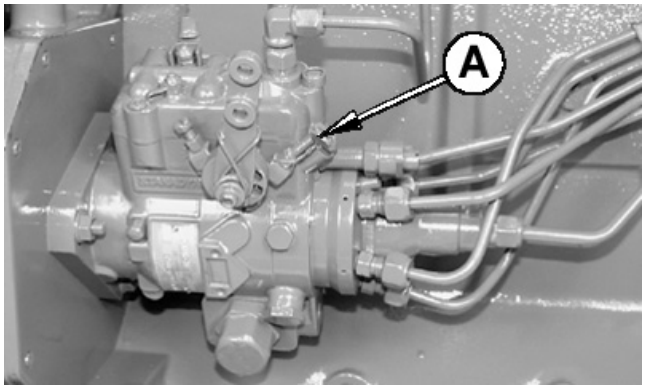
Checking engine speed (Mechanical fuel system)

NOTE: Most engines for generator set application (1500 rpm for 50 Hz or 1800 rpm for 60 Hz) run only at fast idle and therefore they do not have slow idle.

Specification

Fast idle—50 Hz Generator set	1550—1580 rpm
60 Hz Generator set	1865—1890 rpm

NOTE: Fast idle is settled by the factory then the idle adjusting screw (A) is sealed to prevent from tampering. Fast idle adjustment can only be done by an authorized fuel system agent.



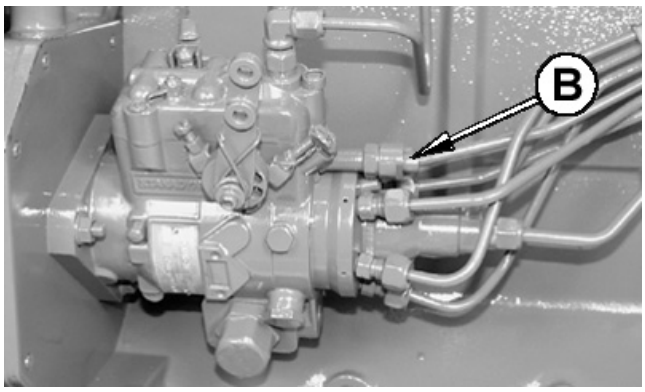
A—Fast idle adjusting screw

DPSG,CD03523,38 –19–31JAN07–1/1

Adjust speed droop governor (Mechanical fuel system)

1. Warm engine to normal operating temperature.
2. Run engine at fast idle.
3. Apply full load.
4. If specified power cannot be obtained, turn screw (B) to adjust droop until the requested power is reached.

NOTE: If surging exits upon removing the load, turn screw (B) clockwise to eliminate.



B—Speed droop governor adjusting screw

DPSG,CD03523,39 –19–31JAN07–1/1

Checking crankshaft vibration damper (6-CYLINDER ENGINE ONLY)

1. Remove belts (shown removed).

2. Grasp vibration damper 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 5 years, whichever occurs first.

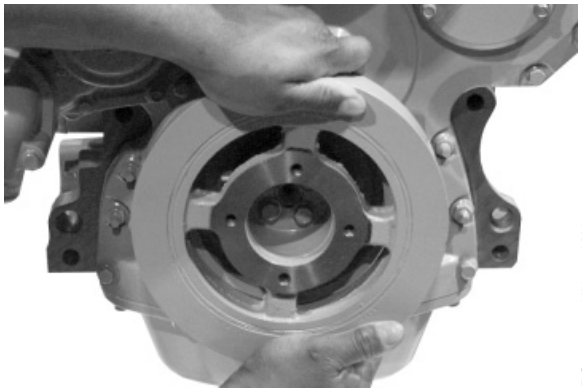
3. Check vibration damper radial runout by positioning a dial indicator so probe contacts damper outer circumference.

4. With engine at operating temperature, rotate crankshaft using JDG820 or JDE83 Flywheel Turning Tool.

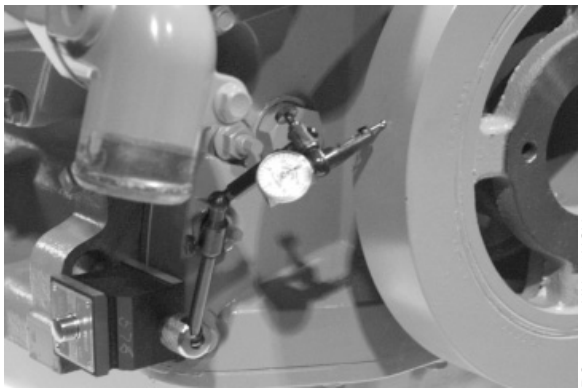
5. Note dial indicator reading. If runout exceeds specifications given below, replace vibration damper.

Specification

Damper—Maximum radial runout ..... 1.50 mm (0.060 in.)



RG8018 –UN–15JAN99



RG7508 –UN–23NOV97

DPSG,CD03523,40 –19–22JAN07–1/1

Drain and flush cooling system

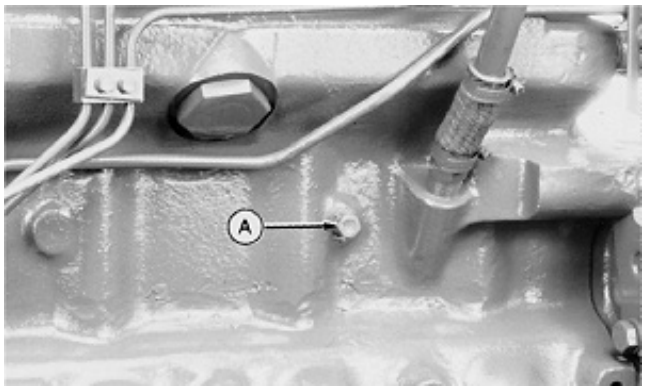
NOTE: Drain and flush cooling system every 2500 hours/3 years when John Deere COOL-GARD coolant is used. Otherwise every 2000 hours/2 years

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

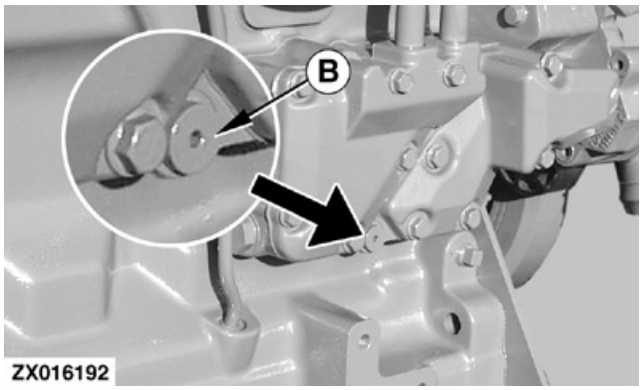
Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

1. Slowly open the radiator cap.
2. Remove engine block drain plug (A).
3. On POWERTech engines, remove oil cooler housing drain plug (B).
4. Open radiator drain valve (C). Drain all coolant from radiator.
5. Close all drain orifices after coolant has drained.
6. Fill the cooling system with clean water. Run engine until water passes through the thermostat to stir up possible rust or sediment.
7. Stop engine and immediately drain the water from system before rust and sediment settle.
8. After draining water, close all drain orifices and fill the cooling system with cleaning product such as PMCC2610 or PMCC2638 Cooling System Cleaners available from your John Deere Dealer. Follow manufacturer's directions on label.
9. After cleaning the cooling system, drain cleaner and fill with water to flush the system. Run engine until water passes through the thermostat, then drain out flushing water.


TS281 –UN–23AUG88



RG4894 –UN–14DEC88



ZX016192 –UN–11JAN99

CD30765 –UN–27AUG99

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DPSG,CD03523,41 –19–06JUN08–1/3

10. Check cooling system hoses for proper condition. Replace as necessary.

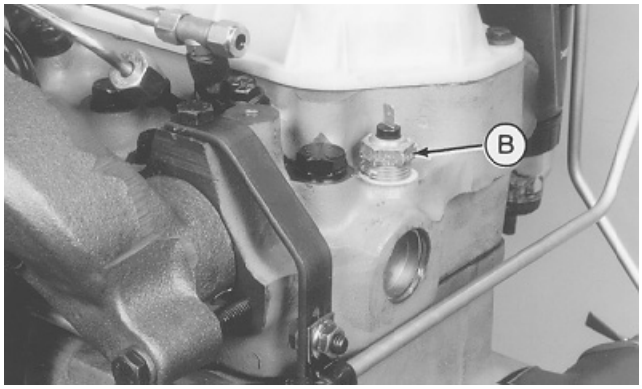
11. Close all drain orifices and fill the cooling system with specified coolant (see DIESEL ENGINE COOLANT).

Specification	
Cooling system capacity—	
CD3029DF128	14.5 L (15.5 qt)
CD3029TF158	14.5 L (15.5 qt)
CD3029HFS70	14.5 L (15.5 qt)
CD3029TFS70	14.5 L (15.5 qt)
CD3029HFU70	14.5 L (15.5 qt)
CD3029TFU70	14.5 L (15.5 qt)
CD4039DF008	16.5 L (17.5 qt)
CD4039TF008	16.5 L (17.5 qt)
CD4045DF158	20 L (21 qt)
CD4045HF158	28 L (29.5 qt)
CD4045TF158	25 L (26.5 qt)
CD4045TF258	25 L (26.5 qt)
CD4045HFS72	28 L (29.5 qt)
CD4045HFS73	32 L (34 qt)
CD4045HFS80	25 L (26.5 qt)
CD4045HFS82	32 L (34 qt)
CD4045HFS83	32 L (34 qt)
CD4045HFU72	28 L (29.5 qt)
CD4045HFU79	32 L (34 qt)
CD4045TFU70	25 L (26.5 qt)
CD6068HF158	32 L (34 qt)
CD6068HF258	32 L (34 qt)
CD6068TF158	28 L (29.5 qt)
CD6068TF258	28 L (29.5 qt)
CD6068HFS72	32 L (34 qt)
CD6068HFS73	32 L (34 qt)
CD6068HFS76	35 L (37 qt)
CD6068HFS77	35 L (37 qt)
CD6068HFS82	32 L (34 qt)
CD6068HFS83	32 L (34 qt)
CD6068HFS89	35 L (37 qt)
CD6068HFU72	32 L (34 qt)
CD6068HFU74	35 L (37 qt)
CD6068HFU79	32 L (34 qt)

Continued on next page

12. When refilling cooling system, loosen temperature sensor (B) or plug at the rear of cylinder head to allow air to escape.

13. Run engine until it reaches operating temperature then check coolant level and entire cooling system for leaks.

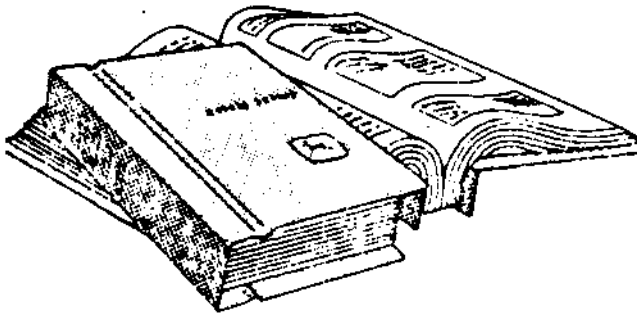


DPSG,CD03523,41 –19–06JUN08–3/3

Additional service information

This manual does not allow a complete repair of your engine. If you want want more detailed service information the following publications are available from your regular parts channel.

- PC2451 — Parts Catalog for Non-Emission Certified engines
- PC3235 — Parts Catalog for Stage II Emission Certified engines
- CTM3274 — Component Technical Manual for 3029 and 4039 engines (English)
- CTM104 — Component Technical Manual for 4045 and 6068 base engines (English)
- CTM207 — Component Technical Manual for Mechanical Fuel Systems on 4045 and 6068 engines (English)
- CTM320 — Component Technical Manual for HPCR Fuel System on 4045 and 6068 with 4-Valve Head Engines (English)
- CTM331 — Component Technical Manual for DE10 Fuel Systems on 4045 and 6068 engines (English)
- CTM502 — Component Technical Manual for HPCR Fuel System on 4045 and 6068 with 2-Valve Head Engines (English)
- CTM67 — Component Technical Manual for OEM Engine accessories (English only)
- CTM77 — Component Technical Manual for Alternators and Starter Motors (English only)



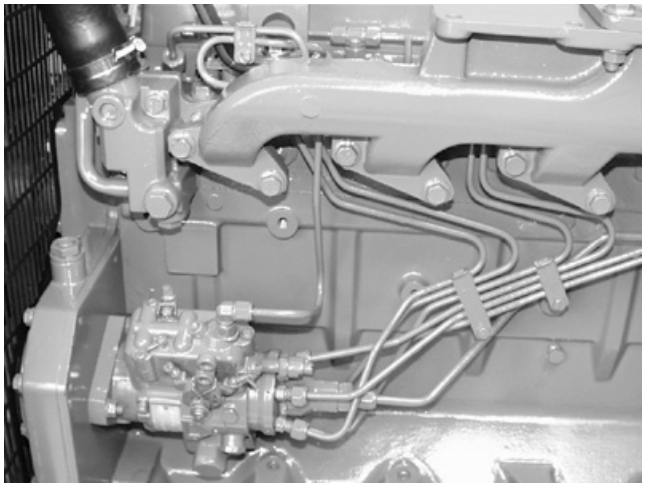
RG4624 –UN–15DEC88

DPSG,CD03523,42 –19–31JAN07–1/1

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 special tools are required. (See your authorized servicing dealer or engine distributor.)



CD30768 –UN–24SEP99

DPSG,CD03523,43 –19–22JAN07–1/1

Clean or replace air filter (one-piece)

CD30766 –UN–06SEP99

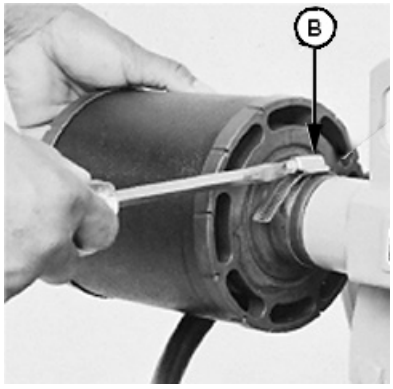
Clean air filter when restriction indicator (A) is red. Air filter can be cleaned up to six times. Thereafter, or at least once a year, it must be replaced.

Proceed as follows:

1. Thoroughly clean all dirt around air filter area.

2. Loosen clamp (B) then remove air filter.

IMPORTANT: Never reinstall an air filter which shows evidence of bad condition (punched, dented...) allowing no filtered air to enter the engine.



RG9912 –UN–25FEB99

3. Clean air filter with compressed air working from ”clean” to ”dirty” side.

NOTE: Compressed air pressure must not exceed 600 kPa (6 bar; 88 psi).

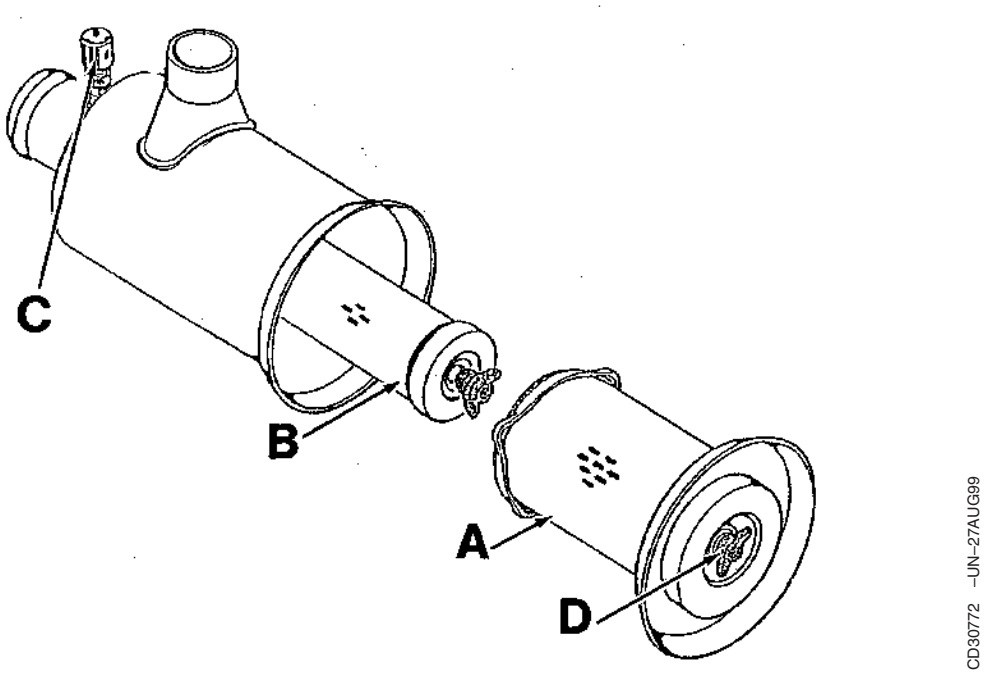
4. Mark air filter to keep track of each cleaning operation.

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

6. Check air system entirely for proper condition (see CHECKING AIR INTAKE SYSTEM).

DPSG,CD03523,44 –19–22JAN07–1/1

Clean or replace air filter element



A—Primary element **B—Secondary (safety) element** **C—Air restriction indicator** **D—Wing nut**

Clean air filter when restriction indicator (C) is red. Replace both primary (A) and secondary (B) filter elements after primary element has been cleaned six times or at least once a year.

Proceed as follows:

1. Thoroughly clean all dirt around air filter area.

2. Remove wing nut (D) and remove primary element (A) from canister.

IMPORTANT: Do not attempt to clean the secondary (safety) element (B). It must be only replaced as recommended.

3. Thoroughly clean all dirt from inside canister.

IMPORTANT: If primary element shows evidence of bad condition (punched, dented...), replace both the primary and the secondary elements.

4. Clean primary element with compressed air working from ”clean” to ”dirty” side.

NOTE: Compressed air pressure must not exceed 600 kPa (6 bar; 88 psi).

5. Mark air filter to keep track of each cleaning operation.

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

7. Check air system entirely for proper condition (see CHECKING AIR INTAKE SYSTEM).

DPSG,CD03523,58 –19–22JAN07–1/1

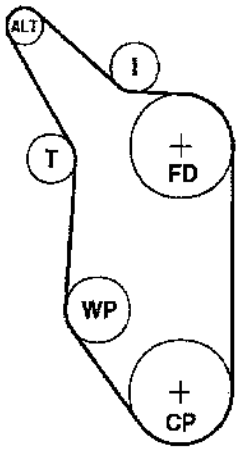
Replacing fan and alternator belt (4045 and 6068 Engines)

NOTE: Refer to CHECKING BELT TENSIONER SPRING TENSION AND BELT WEAR for additional information on the belt tensioner.

1. Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary.
2. On engines with automatic belt tensioner, release tension on belt using a breaker bar and socket on tension arm.

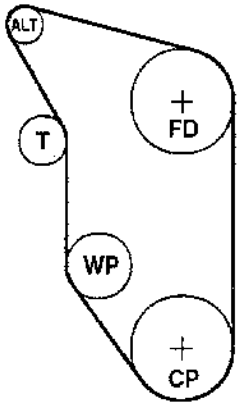
   On engines with manual tensioner, loosen cap screws holding the alternator.
3. Remove poly V-belt from pulleys and discard belt.
4. Install new belt, making sure belt is correctly seated in all pulley grooves. Refer to belt routing at right for your application.
5. Apply tension to belt (See CHECKING BELT).
6. Start engine and check belt alignment.

ALT—Alternator
CP—Crank Pulley
FD—Fan Drive
I—Idler Pulley
T—Tensioner
WP—Water Pump



CD30769 –UN–01SEP99

Installation on 4045 engines

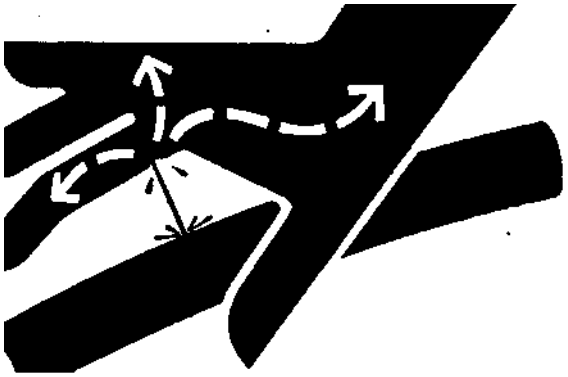


CD30770 –UN–01SEP99

Installation on 6068 engines

DPSG,CD03523,45 –19–31JAN07–1/1

Bleeding the fuel system

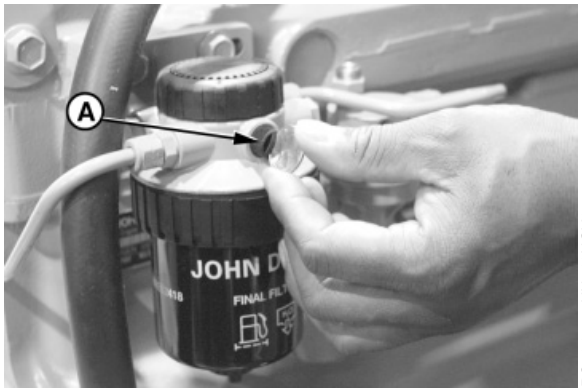


X9811 –UN–23AUG88

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.

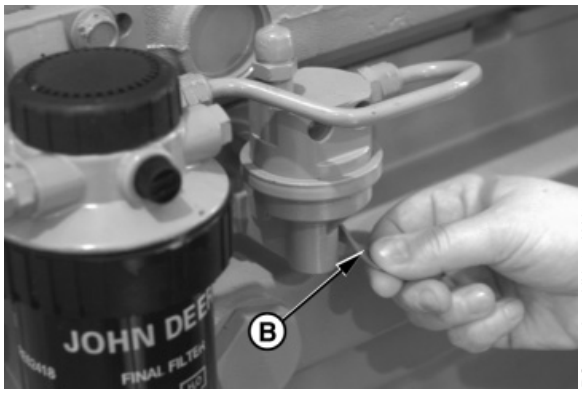
If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

NOTE: Engines with mechanical fuel system have a single fuel filter while electronically controlled engines (DE10 and HPCR fuel systems) have two fuel filters (primary and final). 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. On dual fuel filter system, bleed air only from final filter.



RG7947 –UN–13NOV97

Fuel filter bleed screw



RG8013A –UN–15JAN99

Fuel pump primer lever

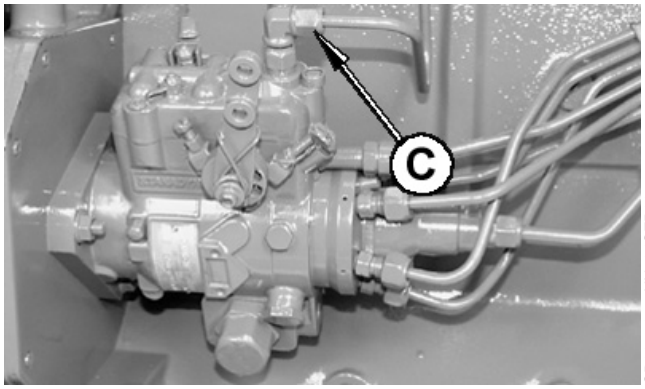
A.) Mechanical and DE10 fuel systems

1. Loosen the air bleed screw (A) two full turns. On DE10 fuel system, loosen only air bleed screw on final fuel filter.
2. Operate supply pump primer lever (B) until fuel flow is free from air bubbles.
3. Tighten bleed screw securely, continue operating hand primer until pumping action is not felt.
4. Start engine and check for leaks.

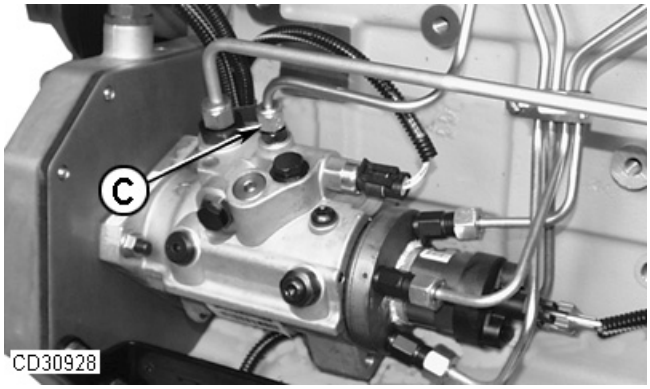
If engine does not start, it will be necessary to bleed air from fuel system at fuel injection pump or injection nozzles as explained next.

Continued on next page

DPSG,CD03523,46 –19–09FEB07–1/4



Mechanical injection pump return line



DE10 Fuel return line

- **At Fuel Injection Pump:**
  a. Slightly loosen fuel return line connector (C) at fuel injection pump.
  b. Operate fuel supply pump primer lever until fuel, without air bubbles, flows from fuel return line connection.
  c. Securely tighten return line connector.

DPSG,CD03523,46 –19–09FEB07–2/4

- **At Fuel Injection Nozzles:**
  a. Using two open-end wrenches, loosen fuel line connection at injection nozzle.
  b. Crank engine over with starting motor, (but do not start engine), until fuel free from bubbles flows out of loosened connection. Retighten connection to 27 N•m (20 lb-ft).
  c. Repeat procedure for remaining injection nozzles (if necessary) until all air has been removed from fuel system.

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

Bleed fuel system at fuel injection nozzles

Continued on next page

DPSG,CD03523,46 –19–09FEB07–3/4

TS1343 –UN–18MAR92

RG12220 –UN–24MAY02

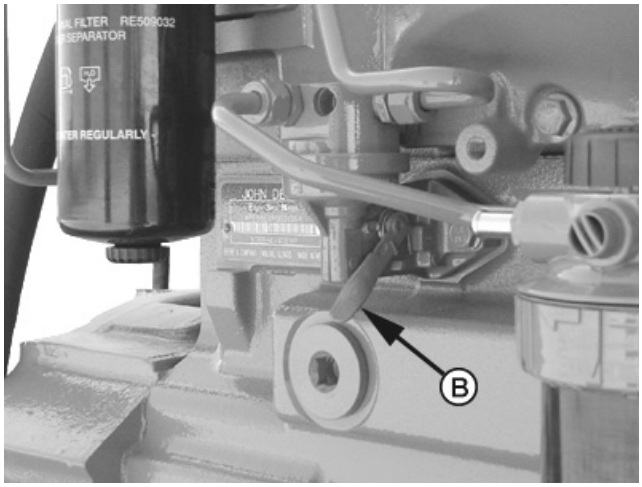
Final fuel filter bleed screw

B.) HPCR fuel system (2 or 4-valve head)

CAUTION: High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect fuel lines between the high pressure fuel pump and nozzles. Only bleed the fuel system at the fuel filter bleed screw (A).

1. Loosen the air bleed screw (A) two full turns on final filter base only.
2. Operate fuel supply pump primer lever (B) until fuel flow is free from air bubbles.
3. Tighten bleed screw securely. Continue operating primer until pumping action is not felt.
4. Start engine and check for leaks.

If engine will not start, repeat steps 1-4.



RG12221 –UN–24MAY02

Fuel supply pump primer lever

DPSG,CD03523,46 –19–09FEB07–4/4

General troubleshooting information

Troubleshooting electronically controlled engine problems can be difficult. The first thing to do is to identify the type of problem which can be mechanical or electrical.

An engine wiring layout is provided in this section to identify electrical components (engine controller, sensors, connectors...).

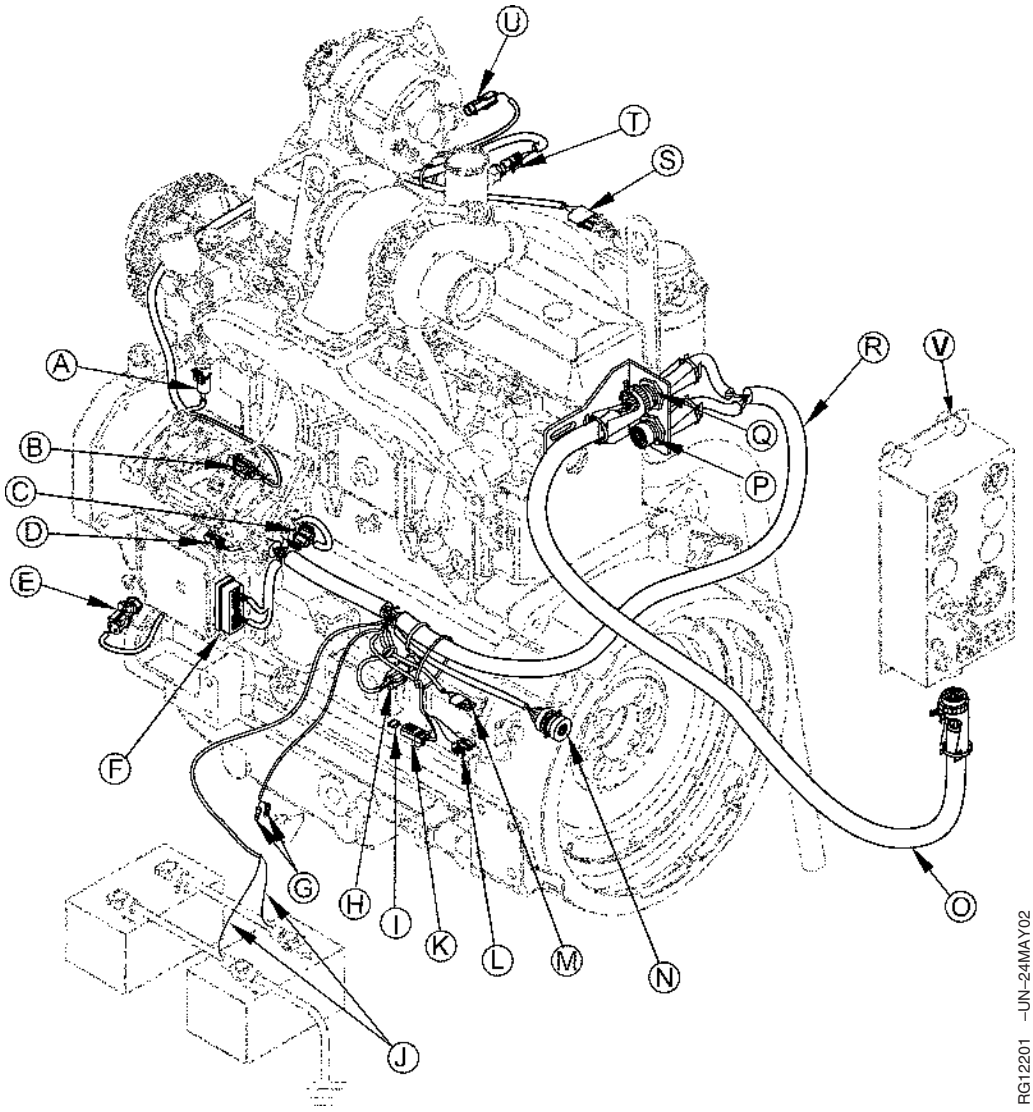
Later in this section is a list of possible engine problems and diagnostic trouble codes that may be encountered accompanied by possible causes and corrections. This troubleshooting information is of a general nature. See also the generator documentation for a complete information of your application.

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.

CD03523,000018D –19–08FEB07–1/1

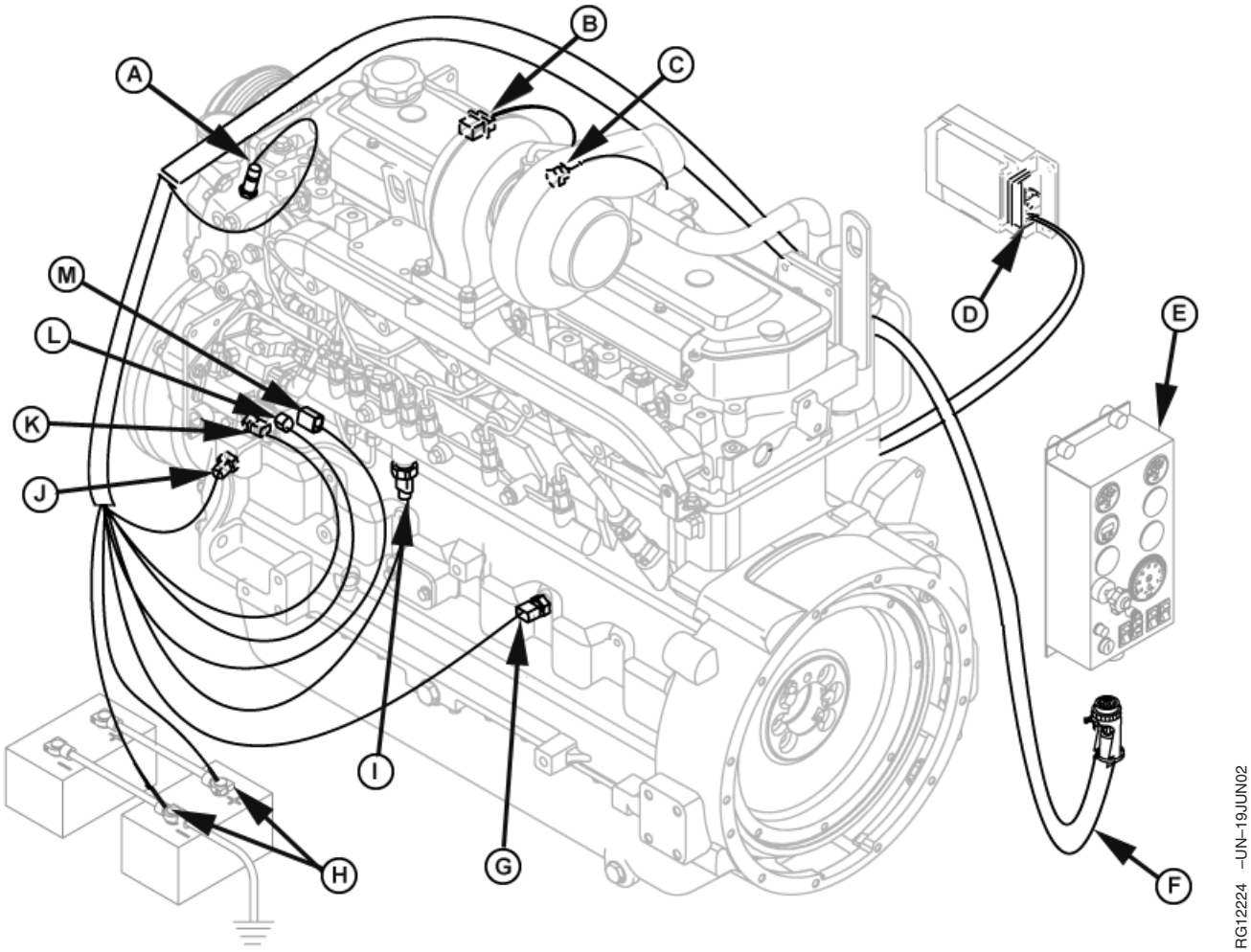
Engine Wiring Layout (Electronic Fuel System With Stanadyne DE10 Injection Pump)



A—Coolant Temperature Sensor Connector
B—Fuel Temperature Sensor Connector
C—Injection Pump Solenoid Connector
D—SAE 1939 CAN Connector
E—Crankshaft Position Sensor Connector
F—ECU Connector
G—Starter Relay Connector
H—Oil Pressure Sensor Connector
I—Main System Fuse (10 amp)
J—Power and Ground Battery Connections
K—Fuse Holder
L—Transient Voltage Protection (TVP) Module Connector
M—Remote ON/ OFF Connector
N—CAN Network Diagnostic Connector
O—Instrument Panel Connector Harness
P—23-pin Optional Feature Connector (Extended-feature ECU only)
Q—21-pin Instrument Panel Connector
R—Engine Wiring Harness
S—Fuel Heater Connector
T—Manifold Air Temperature (MAT) Sensor Connector
U—Alternator Ignition Connector
V—Optional Instrument Panel or Generator Instrument Panel

CD03523,000018E –19–02FEB07–1/1

Engine Wiring Layout (Electronic Fuel System With Denso High Pressure Common Rail)



6068HFU74 Engine shown

A—Engine Coolant Temperature (ECT) Sensor
B—Electronic Injector Connector
C—Manifold Air Temperature (MAT) Sensor
D—ECU Connector
E—Optional Instrument Panel or Generator Instrument Panel
F—Engine Wiring Harness
G—Engine Oil Pressure Sensor Connector
H—Power and Ground Battery Connections
I—Fuel Rail Pressure Sensor
J—Crankshaft Position Sensor
K—Pump Position Sensor
L—Pump Control Valve Solenoid
M—Fuel Temperature Sensor

CD03523,000018F –19–02FEB07–1/1

Engine troubleshooting

Symptom	Problem	Solution
Engine cranks but will not start	Incorrect starting procedure.	Verify correct starting procedure.
	No fuel.	Check fuel in tank and manual shut-off valve.
	Exhaust restricted.	Check and correct exhaust restriction.
	Fuel filter plugged or full of water.	Replace fuel filter or drain water from filter.
	Injection pump not getting fuel or air in fuel system.	Check fuel flow at supply pump or bleed fuel system.
	Faulty injection pump or nozzles.	Consult authorized diesel repair station for repair or replacement.
Engine hard to start or will not start	Engine starting under load.	Remove load.
	Improper starting procedure.	Review starting procedure.
	No fuel.	Check fuel tank.
	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 element.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
	Injection pump shut-off not reset.	Turn key switch to ”OFF” then to ”ON”.

Continued on next page

Symptom	Problem	Solution
Engine knocks	Low engine oil level.	Add oil to engine crankcase.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Low coolant temperature.	Remove and check thermostat.
	Engine overheating.	See ”Engine Overheats”.
Engine runs irregularly or stalls frequently	Low coolant temperature.	Remove and check thermostat.
	Clogged fuel filter.	Replace fuel filter element.
	Water, dirt, or air in fuel system.	Drain, flush, fill, and bleed system.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
Below normal engine temperature	Defective thermostat.	Remove and check thermostat.
	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 elements.
	Improper type of fuel.	Use proper fuel.
	Overheated engine.	See ”Engine Overheats”.
	Below normal engine temperature.	Remove and check thermostat.
	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.

Continued on next page

Symptom	Problem	Solution
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.
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 thermostat.
	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.

Continued on next page

Symptom	Problem	Solution
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.
	Stretched poly V-belt or defective belt tensioner.	Check automatic belt tensioner and check belts for stretching. Replace as required.
	Low engine oil level.	Check oil level. Add oil as required.
	Cooling system needs flushing.	Flush cooling system.
	Defective thermostat.	Remove and check thermostat.
	Defective temperature gauge or sender.	Check water temperature with thermometer and replace, if necessary.
	Incorrect grade of fuel.	Use correct grade of fuel.
High fuel consumption	Improper type of fuel.	Use proper type of fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	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 thermostat.

Electrical troubleshooting

Symptom	Problem	Solution
Undercharged system	Excessive electrical load from added accessories.	Remove accessories or install higher output alternator.
	Excessive engine idling.	Increase engine rpm when heavy electrical load is used.
	Poor electrical connections on battery, ground strap, starter, or alternator.	Inspect and clean as necessary.
	Defective battery.	Test battery.
	Defective alternator.	Test charging system.
Battery uses too much water	Cracked battery case.	Check for moisture and replace as necessary.
	Defective battery.	Test battery.
	Battery charging rate too high.	Test charging system.
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.
	Stretched poly V-belt or defective belt tensioner.	Adjust belt tension or replace belts.
Starter will not crank	Engine under load	Remove load
	Loose or corroded connections.	Clean and tighten loose connections.
	Low battery output voltage.	See your authorized servicing dealer or engine distributor.
	Faulty start circuit relay.	See your authorized servicing dealer or engine distributor.
	Blown fuse.	Replace fuse.

Continued on next page

Symptom	Problem	Solution
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.
Entire electrical system	Faulty battery connection.	Clean and tighten connections.
	Sulfated or worn-out batteries.	See your authorized servicing dealer or engine distributor.
	Blown fuse.	Replace fuse.

DPSG,CD03523,50 –19–22JAN07–2/2

Displaying Of Diagnostic Trouble Codes (DTCs)

There are several different methods for displaying both stored and active DTCs from the ECU via a fault lamp or a diagnostic gauge on the electronic instrument panel.

2-DIGIT CODES

Some engines display Service Codes or DTCs as 2-digit codes read from a fault lamp which gives blink codes.

SPN/FMI CODES

Stored and active diagnostic trouble codes are output on the diagnostic gauge on the Deere electronic instrument panel according to the J1939 standard as a two-part code as shown on the tables on the following pages.

The first part is a six-digit Suspect Parameter Number (SPN) followed by a two-digit Failure Mode Identifier (FMI) code. In order to determine the exact failure, both parts (SPN and FMI) of the code are needed.

The SPN identifies the system or the component that has the failure; for example SPN 000110 indicates a failure in the engine coolant temperature circuit.

The FMI identifies the type of failure that has occurred; for example FMI 03 indicates value above normal. Combining SPN 000110 with FMI 03 yields engine coolant temperature input voltage too high, or the equivalent of 2-digit fault code 18.

If diagnosing an application that shows DTCs as SPNs and FMIs, using the following list, determine the equivalent 2-digit code and have your dealer use the diagnostic procedure in the component technical manual for that 2-digit code.

Always contact your servicing dealer for help in correcting diagnostic trouble codes which are displayed for your engine.

CD03523,0000190 –19–02FEB07–1/1

Using blink code method for retrieving Diagnostic Trouble Codes (DTC's)

NOTE: The method below applies to applications having a fault lamp on instrument panel (refer to the generator documentation for more information).

The Electronic Control Unit (ECU) has the ability to display DTCs using blinking sequence of the fault lamp.

NOTE: The ECU blinks the codes in 2-digit codes only. See LISTING OF DIAGNOSTIC TROUBLE CODES (DTCS) later in this Group.

1. Press down Override Shutdown Switch while turning the ignition switch "ON".

2. The Fault Lamp will begin to flash a code number. For example, flash three times...short pause...flash two times...long pause. This example is code 32.

3. The ECU begins the flashing sequence by flashing a code 32, this indicates the start of blinking active codes. If there are any active DTCs, the ECU will flash its 2–digit number. If there is more than one active DTC, the ECU will flash each code in numerical order. If there are no active DTCs, the Fault Lamp will flash a code 88.

4. Following the active codes, the Fault Lamp will flash a code 33. This indicates the start of blinking stored codes. If there are any stored DTCs, the Fault Lamp will flash its 2–digit number. If there is more than one stored DTC, the ECU will flash each code in numerical order. If there are no stored DTCs, the Fault Lamp will flash a code 88.

5. Once complete, this sequence will repeat.

6. When complete, turn ignition "OFF".

As an example, if an engine had an active DTC 18 and stored DTC 53, the flashing sequence would be: flash three times...short pause...flash two times...long pause...flash one time...short pause...flash eight times...long pause...flash three times...short pause...flash three times...long pause...flash five times...short pause...flash three times.

CD03523,0000191 –19–02FEB07–1/1

Using diagnostic gauge for retrieving Diagnostic Trouble Codes (DTC's)

NOTE: The method below applies on applications having the optional diagnostic gauge shown (refer to the generator documentation for more information).

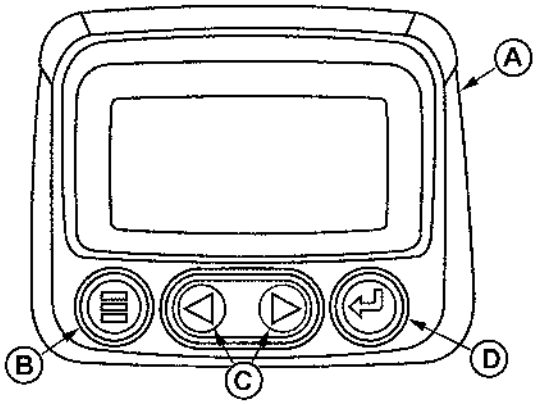
1. Make sure all engine mechanical and other systems not related to the electronic control system are operating properly. (See ENGINE TROUBLESHOOTING in this section).

NOTE: Diagnostic gauge (A) uses the menu key (B) to access various engine functions, two arrow keys (C) to scroll through the engine parameter list and view the menu list, and an enter key (D) for selecting highlighted items.

2. Read and record DTC(s) displayed on LCD of diagnostic gauge (A). For procedure to access diagnostic trouble codes, refer to "Using Diagnostic Gauge to Access Engine Information", earlier in this manual.

3. Go to the LISTING OF DIAGNOSTIC TROUBLE CODES (DTCs) later in this section, to interpret the DTC(s) present.

4. Contact your nearest engine distributor or servicing dealer with a list of DTC(s) so that necessary repairs can be made.



RG13740 –UN–11NOV04

Trouble Code Display On Instrument Panel

A—Diagnostic Gauge
B—Menu Key
C—Arrow Keys
D—Enter Key

CD03523,0000192 –19–02FEB07–1/1

Listing of Diagnostic Trouble Codes (DTCs)

NOTE: Not all of these codes are used on all OEM engine applications

Trouble Codes

DTC's Listing in Ascending SPN/FMI Codes

SPN	FMI	Description of Fault	Corrective Action
000028	03	Throttle #3 Signal Out of Range High	Check Sensor and Wiring
	04	Throttle #3 Signal Out of Range Low	Check Sensor and Wiring
000029	03	Throttle #2 Signal Out of Range High	Check Sensor and Wiring
	04	Throttle #2 Signal Out of Range Low	Check Sensor and Wiring
000084	31	Vehicle Speed Signal Unreliable	Contact Servicing Dealer
000091	03	Throttle #1 Signal Out of Range High	Check Switch and Wiring
	04	Throttle #1 Signal Out of Range Low	Check Switch and Wiring
	09	Throttle #1 Communication Signal Erratic	Check Sensor and Wiring
000094	03	Low Pressure Fuel Signal Out of Range High	Check Sensor and Wiring
	04	Low Pressure Fuel Signal Out of Range Low	Check Sensor and Wiring
	10	Low Pressure Fuel Rate of Change Abnormal	Contact Servicing Dealer
	13	Low Pressure Fuel Out of Calibration	Contact Servicing Dealer
	17	High Pressure Fuel System- Pressure Slightly Low	Contact Servicing Dealer
000097	00	Water in Fuel Continuously Detected	Contact Servicing Dealer
	03	Water-in-Fuel Signal Out of Range High	Check Sensor and Wiring
	04	Water-in-Fuel Signal Out of Range Low	Check Sensor and Wiring
	16	Water in Fuel Detected	Stop and Drain Water Separator
000100	01	Engine Oil Pressure Signal Extremely Low	Check Oil Level
	03	Engine Oil Pressure Signal Out of Range High	Check Sensor and Wiring
	04	Engine Oil Pressure Signal Out of Range Low	Check Sensor and Wiring
	18	Engine Oil Pressure Signal Moderately Low	Check Oil Level
000105	00	Intake Manifold Air Temperature Signal Extremely High	Check Air Cleaner, Aftercooler, or Room Temperature
	03	Intake Manifold Air Temperature Signal Out of Range High	Check Sensor and Wiring
	04	Intake Manifold Air Temperature Signal Out of Range Low	Check Sensor and Wiring
	16	Intake Manifold Air Temperature Signal Moderately High	Check Air Cleaner, Aftercooler, or Room Temperature
000107	00	Air Filter Pressure Differential Extremely High	Check for plugged air filter
000110	00	Engine Coolant Temperature Signal Extremely High	Check Cooling System, Reduce Power
	03	Engine Coolant Temperature Signal Out of Range High	Check Sensor and Wiring
	04	Engine Coolant Temperature Signal Out of Range Low	Check Sensor and Wiring
	15	Engine Coolant Temperature Signal Slightly High	Check Cooling System, Reduce Power
	16	Engine Coolant Temperature Signal Moderately High	Check Cooling System, Reduce Power
000111	01	Engine Coolant Level Low	Check Operator's Manual, "Adding Coolant"
000158	17	ECU Power Down Error (Internal ECU Problem)	Contact Servicing Dealer
000160	02	Axle Speed Signal Unreliable	Contact Servicing Dealer
000174	00	Fuel Temperature Signal Extremely High	Add Fuel or Switch Fuel Tanks
000174	03	Fuel Temperature Signal Out of Range High	Check Sensor and Wiring
	04	Fuel Temperature Signal Out of Range Low	Check Sensor and Wiring
	16	Fuel Temperature Signal Moderately High	Add Fuel or Switch Fuel Tanks
000189	00	Engine Speed Derate Condition Exists	Check Fault Codes or Contact Servicing Dealer

Continued on next page

SPN	FMI	Description of Fault	Corrective Action
000190	00	Engine Speed Extremely High	Reduce Engine Speed
	16	Engine Speed Moderately High	Reduce Engine Speed
000611	03	Injector Shorted to Power	Check Wiring
	04	Injector Shorted to Ground	Check Wiring
000620	03	Sensor Supply 2 Voltage High	Check Wiring
	04	Sensor Supply 2 Voltage Low	Check Wiring
000627	01	All Injector Currents Are Low	Check Battery Voltage and Wiring
000629	13	ECU Programming Error	Contact Service Dealer
000636	02	Engine Position Sensor Signal Unreliable	Check Sensor and Wiring
	08	Engine Position Sensor Signal Missing	Check Sensor and Wiring
	10	Engine Position Sensor Signal Rate of Change Abnormal	Check Sensor and Wiring
000637	02	Engine Timing Sensor Signal Unreliable	Check Sensor and Wiring
	07	Engine Timing and Position Sensors Out of Sync	Check Sensor and Wiring
	08	Engine Timing Sensor Signal Missing	Check Sensor and Wiring
	10	Engine Timing Signal Rate of Change Abnormal	Check Sensor and Wiring
000639	13	CAN Bus Error (Communication network problem)	Contact Servicing Dealer
000651	05	Injector Number 1 Circuit Has High Resistance	Check Injector Wiring or Injector Solenoid
	06	Injector Number 1 Circuit Has Low Resistance	Check Injector Wiring or Injector Solenoid
	07	Injector Number 1 Not Responding	Injector Failed or Flow Limiter Closed
000652	05	Injector Number 2 Circuit Has High Resistance	Check Injector Wiring or Injector Solenoid
	06	Injector Number 2 Circuit Has Low Resistance	Check Injector Wiring or Injector Solenoid
	07	Injector Number 2 Not Responding	Injector Failed or Flow Limiter Closed
000653	05	Injector Number 3 Circuit Has High Resistance	Check Injector Wiring or Injector Solenoid
	06	Injector Number 3 Circuit Has Low Resistance	Check Injector Wiring or Injector Solenoid
	07	Injector Number 3 Not Responding	Injector Failed or Flow Limiter Closed
000654	05	Injector Number 4 Circuit Has High Resistance	Check Injector Wiring or Injector Solenoid
	06	Injector Number 4 Circuit Has Low Resistance	Check Injector Wiring or Injector Solenoid
	07	Injector Number 4 Not Responding	Injector Failed or Flow Limiter Closed
000655	05	Injector Number 5 Circuit Has High Resistance	Check Injector Wiring or Injector Solenoid
	06	Injector Number 5 Circuit Has Low Resistance	Check Injector Wiring or Injector Solenoid
	07	Injector Number 5 Not Responding	Injector Failed or Flow Limiter Closed
000656	05	Injector Number 6 Circuit Has High Resistance	Check Injector Wiring or Injector Solenoid
	06	Injector Number 6 Circuit Has Low Resistance	Check Injector Wiring or Injector Solenoid
	07	Injector Number 6 Not Responding	Injector Failed or Flow Limiter Closed
000898	09	Vehicle Speed or Torque Message Unreliable	Contact Servicing Dealer
000970	31	External Shutdown Commanded	Not Engine Fault. Check Other Shutdown Devices
000971	31	External Fuel Derate Switch Active	Not Engine Fault. Check Other Shutdown Devices
001069	09	Tire Size Invalid	Contact Servicing Dealer
	31	Tire Size Error	Contact Servicing Dealer
001079	03	Sensor Supply 1 Voltage High	Check Wiring
	04	Sensor Supply 1 Voltage Low	Check Wiring
001080	03	Fuel Rail Pressure Sensor Supply Voltage High	Check Wiring
	04	Fuel Rail Pressure Sensor Supply Voltage Low	Check Wiring
001109	31	Engine Protection Shutdown Warning	Shut Down Engine, Check Fault Codes
001110	31	Engine Protection Shutdown	Shut Down Engine, Check Fault Codes
001347	03	High Pressure Fuel Pump Control Valve Signal Out of Range High	Contact Servicing Dealer
	05	High Pressure Fuel Pump Solenoid Number 1 Circuit Has High Resistance	Check Pump Wiring
	07	High Pressure Fuel Pump Not Able to Meet Required Rail Pressure	Check Fuel Filter and Lines
001568	02	Requested Torque Curve Signal Unreliable	Contact Servicing Dealer
001569	31	Engine in Derate Condition	Check Fault Codes

Continued on next page

SPN	FMI	Description of Fault	Corrective Action
002000	13	Security Violation	Contact Servicing Dealer

OURGP12,00001E2 –19–15MAR06–3/3

Intermittent Fault Diagnostics (With Electronic Controls)

Intermittent faults are problems that periodically ”go away”. A problem such as a terminal that intermittently doesn’t make contact can cause an intermittent fault. Other intermittent faults may be set only under certain operating conditions such as heavy load, extended idle, etc. When diagnosing intermittent faults, take special note of the condition of wiring and connectors, since a high percentage of intermittent problems originate here. Check for loose, dirty or disconnected connectors. Inspect the wiring routing, looking for possible shorts caused by contact with external parts (for example, rubbing against sharp sheet metal edges). Inspect the connector vicinity, looking for wires that have pulled out of connectors, poorly positioned terminals, damaged connectors and corroded or damaged splices and terminals. Look for broken wires, damaged splices, and wire-to-wire shorts. Use good judgement if component replacement is thought to be required.

NOTE: The engine control unit (ECU) is the component LEAST likely to fail.

Suggestions for diagnosing intermittent faults:

- If the problem is intermittent, try to reproduce the operating conditions that were present when the diagnostic trouble code (DTC) set.
- If a faulty connection or wire is suspected to be the cause of the intermittent problem: clear DTCs, then check the connection or wire by wiggling it while watching the diagnostic gauge to see if the fault resets.

Possible causes of intermittent faults:

- Faulty connection between sensor or actuator harness.
- Faulty contact between terminals in connector.
- Faulty terminal/wire connection.
- Electromagnetic interference (EMI) from an improperly installed 2-way radio, etc., can cause faulty signals to be sent to the ECU.

NOTE: Refer also to generator documents for more information about connections and wirings.

CD03523,0000193 –19–05FEB07–1/1

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).

DPSG,CD03523,51 –19–22JAN07–1/1

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.

1. Change engine oil and replace filter. Used oil will not give adequate protection. (See CHANGING ENGINE OIL AND FILTER).
2. Service air cleaner. (See CLEAN OR REPLACE AIR FILTER).
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 DIESEL ENGINE COOLANT).
4. Fill the fuel tank.
5. Remove fan/alternator belt, if desired.
6. Remove and clean batteries. Store them in a cool, dry place and keep them fully charged.
7. Clean the exterior of the engine with salt-free water and touchup any scratched or chipped painted surfaces with a good quality paint.
8. Coat all exposed (machined) metal surfaces with grease or corrosion inhibitor if not feasible to paint.
9. Seal all openings on engine with plastic bags and tape.
10. 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.

DPSG,CD03523,53 –19–22JAN07–1/1

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 belt if removed.
4. Check for filled fuel tank.
5. Perform all appropriate prestarting checks. (See DAILY PRESTARTING CHECKS).

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 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.

DPSG,CD03523,54 –19–22JAN07–1/1

General engine pack specifications (Non-Emission Certified Engines)

ITEM	UNIT OF MEASURE	3029DF128	3029TF158	4039DF008	4039TF008
Number of Cylinders		3	3	4	4
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5
Stroke	mm	110	110	110	110
Displacement	L	2.9	2.9	3.9	3.9
Compression Ratio		17.8:1	17.8:1	17.8:1	17.8:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)	26 (35)	36 (49)	35 (48)	55 (75)
POWER[a] @ 1500 rpm (Standby)	kW (hp)	30 (41)	40 (54)	38 (52)	61 (83)
POWER[a] @ 1800 rpm (Prime)	kW (hp)	30 (41)	40 (54)	41 (56)	67 (91)
POWER[a] @ 1800 rpm (Standby)	kW (hp)	34 (46)	45 (61)	47 (64)	73 (99)
Width (overall)	mm	582	582	588	588
Length (overall)	mm	888	888	1016	1016
Height (overall)	mm	931	979	960	979
Weight (dry)[b]	kg	345	350	475	487
Engine oil quantity	L	6	8	12	12
Engine coolant quantity	L	14.5	14.5	16.5	16.5

[a]With Fan
[b]Approximate

Continued on next page

ITEM	UNIT OF MEASURE	4045DF158	4045HF158	4045TF158	4045TF258
Number of Cylinders		4	4	4	4
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5
Stroke	mm	127	127	127	127
Displacement	L	4.5	4.5	4.5	4.5
Compression Ratio		17.6:1	17.0:1	17.0:1	17.0:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)	41 (56)	88 (120)	61 (83)	72 (98)
POWER[a] @ 1500 rpm (Standby)	kW (hp)	42 (57)	96 (131)	68 (92)	80 (109)
POWER[a] @ 1800 rpm (Prime)	kW (hp)	48 (65)	108 (147)	72 (98)	80 (109)
POWER[a] @ 1800 rpm (Standby)	kW (hp)	51 (69)	120 (163)	79 (107)	88 (120)
Width (overall)	mm	606	798	606	652
Length (overall)	mm	1038	1209	1191	1225
Height (overall)	mm	959	1197	1027	1027
Weight (dry)[b]	kg	493	599	505	520
Engine oil quantity	L	8	12	12	12
Engine coolant quantity	L	20	28	25	25

[a]With Fan
[b]Approximate

Continued on next page

ITEM	UNIT OF MEASURE	6068HF158	6068HF258	6068TF158	6068TF258
Number of Cylinders		6	6	6	6
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5
Stroke	mm	127	127	127	127
Displacement	L	6.8	6.8	6.8	6.8
Compression Ratio		17.0:1	17.0:1	17.0:1	17.0:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)	134 (182)	160 (218)	92 (125)	105 (143)
POWER[a] @ 1500 rpm (Standby)	kW (hp)	148 (201)	177 (241)	101 (137)	116 (158)
POWER[a] @ 1800 rpm (Prime)	kW (hp)	164 (223)	179 (243)	108 (147)	124 (169)
POWER[a] @1800 rpm (Standby)	kW (hp)	187 (254)	200 (272)	119 (162)	137 (186)
Width (overall)	mm	798	798	652	652
Length (overall)	mm	1500	1500	1364	1364
Height (overall)	mm	1136	1204	1070	1070
Weight (dry)[b]	kg	705	764	651	651
Engine oil quantity	L	20	32	20	20
Engine coolant quantity	L	32	32	28	28

[a]With Fan
[b]Approximate

DPSG,CD03523,55 –19–05FEB07–3/3

General engine pack specifications (Stage II Emission Certified Engines)

ITEM	UNIT OF MEASURE	3029HFS70	3029HFU70	3029TFS70	3029TFU70
Number of Cylinders		3	3	3	3
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5
Stroke	mm	110	110	110	110
Displacement	L	2.9	2.9	2.9	2.9
Compression Ratio		17.2:1	17.2:1	17.2:1	17.2:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)	37 (50)	37 (50)	28 (37)	28 (37)
POWER[a] @ 1500 rpm (Standby)	kW (hp)	41 (56)	41 (56)	31 (41)	31 (41)
POWER[a] @ 1800 rpm (Prime)	kW (hp)				
POWER[a] @1800 rpm (Standby)	kW (hp)				
Width (overall)	mm	582	582	582	582
Length (overall)	mm	888	888	888	888
Height (overall)	mm	974	974	974	974
Weight (dry)[b]	kg	350	350	350	350
Engine oil quantity	L	8	8	8	8
Engine coolant quantity	L	14.5	14.5	14.5	14.5

[a]With Fan
[b]Approximate

Continued on next page

ITEM	UNIT OF MEASURE	4045HFS72	4045HFS73	4045HFS80	4045HFS82
Number of Cylinders		4	4	4	4
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5
Stroke	mm	110	110	127	127
Displacement	L	4.5	4.5	4.5	4.5
Compression Ratio		17.0:1	19.0:1	19.0:1	19.0:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)	75 (100)	94 (126)		
POWER[a] @ 1500 rpm (Standby)	kW (hp)	83 (111)	103 (138)		
POWER[a] @ 1800 rpm (Prime)	kW (hp)			67 (90)	85 (114)
POWER[a] @1800 rpm (Standby)	kW (hp)			74 (99)	94 (126)
Width (overall)	mm	751	765	600	765
Length (overall)	mm	1362	1365	1230	1365
Height (overall)	mm	1137	1162	1010	1162
Weight (dry)[b]	kg	505	505	505	505
Engine oil quantity	L	16	16	12	16
Engine coolant quantity	L	28	32	25	32

[a]With Fan
[b]Approximate

Continued on next page

ITEM	UNIT OF MEASURE	4045HFS83	4045HFU72	4045HFU79	4045TFU70
Number of Cylinders		4	4	4	4
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5
Stroke	mm	110	127	127	127
Displacement	L	4.5	4.5	4.5	4.5
Compression Ratio		19.0:1	17.0:1	19.0:1	17.0:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)		75 (100)	94 (126)	55 (75)
POWER[a] @ 1500 rpm (Standby)	kW (hp)		83 (111)	103 (138)	61 (83)
POWER[a] @ 1800 rpm (Prime)	kW (hp)	107 (143)			
POWER[a] @1800 rpm (Standby)	kW (hp)	118 (158)			
Width (overall)	mm	765	751	765	600
Length (overall)	mm	1365	1362	1365	1230
Height (overall)	mm	1162	1137	1162	1010
Weight (dry)[b]	kg	505	505	505	505
Engine oil quantity	L	16	16	16	12
Engine coolant quantity	L	32	28	32	25

[a]With Fan
[b]Approximate

Continued on next page

ITEM	UNIT OF MEASURE	6068HFS72	6068HFS73	6068HFS76	6068HFS77	6068HFS82
Number of Cylinders		6	6	6	6	6
Fuel		Diesel	Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5	106.5
Stroke	mm	127	127	127	127	127
Displacement	L	6.8	6.8	6.8	6.8	6.8
Compression Ratio		17.0:1	19.0:1	17.0:1	17.0:1	19.0:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)	112 (150)	139 (186)	167 (224)	189 (253)	
POWER[a] @ 1500 rpm (Standby)	kW (hp)	123 (165)	153 (205)	184 (247)	207 (277))	
POWER[a] @ 1800 rpm (Prime)	kW (hp)					134 (180)
POWER[a] @1800 rpm (Standby)	kW (hp)					147 (197)
Width (overall)	mm	784	784	960	960	784
Length (overall)	mm	1500	1500	1509	1509	1500
Height (overall)	mm	1137	1137	1381	1381	1137
Weight (dry)[b]	kg	764	764	764	764	764
Engine oil quantity	L	32	32	32	32	32
Engine coolant quantity	L	32	32	35	35	32

[a]With Fan
[b]Approximate

Continued on next page

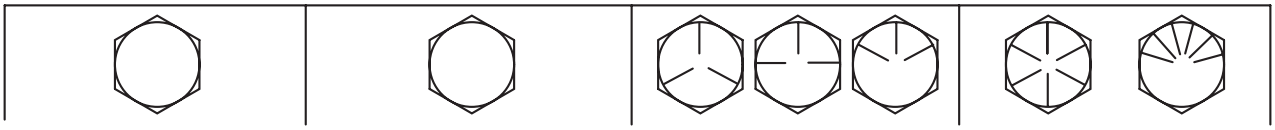
ITEM	UNIT OF MEASURE	6068HFS83	6068HFS89	6068HFU72	6068HFU74	6068HFU79
Number of Cylinders		6	6	6	6	6
Fuel		Diesel	Diesel	Diesel	Diesel	Diesel
Bore	mm	106.5	106.5	106.5	106.5	106.5
Stroke	mm	127	127	127	127	127
Displacement	L	6.8	6.8	6.8	6.8	6.8
Compression Ratio		19.0:1	17.0:1	17.0:1	17.0:1	19.0:1
POWER[a] @ 1500 rpm (Prime)	kW (hp)			111 (149)	166(223) / 188 (252)	139 (186)
POWER[a] @ 1500 rpm (Standby)	kW (hp)			123 (165)	184 (247) / 207 (277))	153 (205)
POWER[a] @ 1800 rpm (Prime)	kW (hp)	161(216)	214 (287)		191(256)	
POWER[a] @1800 rpm (Standby)	kW (hp)	177 (237)	235 (315)		201 (269)	
Width (overall)	mm	784	960	784	960	812
Length (overall)	mm	1500	1509	1500	1509	1532
Height (overall)	mm	1137	1381	1137	1381	1200
Weight (dry)[b]	kg	764	764	764	764	764
Engine oil quantity	L	32	32	32	32	32
Engine coolant quantity	L	32	35	32	35	32

[a]With Fan
[b]Approximate

CD03523,0000194 –19–06JUN08–5/5

Unified Inch Bolt and Screw Torque Values

TS1671 –UN–01MAY03



Bolt or	SAE Grade 1				SAE Grade 2[a]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
Screw	Lubricated[b]		Dry[c]		Lubricated[b]		Dry[c]		Lubricated[b]		Dry[c]		Lubricated[b]		Dry[c]	
Size	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N•m	lb-ft	N•m	lb-ft
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N•m	lb-ft	N•m	lb-ft				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N•m	lb-ft														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

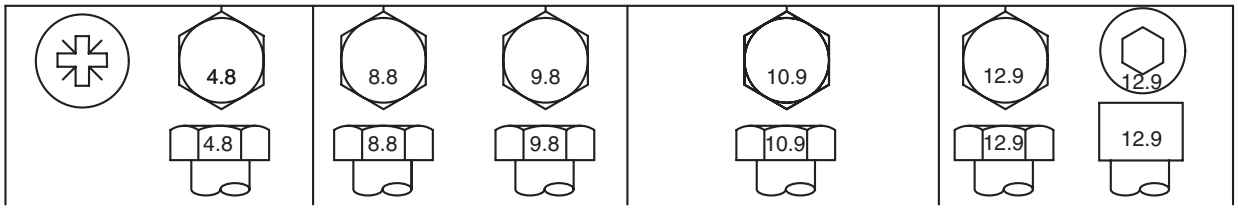
[a]Grade 2 applies for hex cap screws (not hex bolts) up to 6. in (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

[b]"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C zinc flake coating.

[c]"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B zinc flake coating.

DX,TORQ1 –19–24APR03–1/1

Metric Bolt and Screw Torque Values



TS1670 –UN–01MAY03

Bolt or	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
Screw	Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]	
Size	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N•m	lb-ft														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

[a] "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C zinc flake coating.

[b] "Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B zinc flake coating.

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