

PowerTech™ 4.5 L and 6.8 L Diesel Engines Base Engine

COMPONENT TECHNICAL MANUAL PowerTech™ 4.5L and 6.8L Diesel Engines— Base Engine

CTM104 07NOV12 (ENGLISH)

For complete service information also see:

PowerTech™ Diesel Engines—Mechanical Fuel Systems	CTM207
PowerTech™ Diesel Engines—Level 4 Electronic Fuel Systems with Bosch VP44 Pump.....	CTM170
PowerTech™ Diesel Engines—Level 12 Electronic Fuel Systems with Stanadyne DE10 Pump.....	CTM331
PowerTech™ Diesel Engines—Level 1 Electronic Fuel Systems with Delphi/Lucas DP201 Pump.....	CTM284
PowerTech™ Diesel Engines—Level 11 Electronic Fuel Systems with Denso HPCR.....	CTM220
PowerTech™ Diesel Engines and PowerTech™ Plus—Level 14 Electronic Fuel Systems with Denso HPCR	CTM320
PowerTech™ Diesel Engines and PowerTech™ E—Level 16 Electronic Fuel Systems with Denso HPCR	CTM502
Alternators and Starter Motors	CTM77
OEM Engine Accessories	CTM67
Application List.....	CTM106819
JDPS Master Tool Manual.....	TM111119

John Deere Power Systems

LITHO IN U.S.A.

Introduction

Foreword


This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

This manual (CTM104) covers only the engine base for all PowerTech™ 4.5L and 6.8L engines including PowerTech™ "Plus" engine model as well as PowerTech™ "E" and PowerTech™ "M" engine models. It is one of eight volumes on 4.5L and 6.8L engines. The following seven companion manuals cover fuel system and electronics repair, operation and diagnostics:

- CTM207—Mechanical Fuel Systems
- CTM170—Level 4 Electronic Fuel Systems with Bosch VP44 Pump
- CTM331—Level 12 Electronic Fuel Systems with Stanadyne DE10 Pump
- CTM284—Level 1 Electronic Fuel Systems with Delphi/Lucas DP201 Pump
- CTM220—Level 11 Electronic Fuel Systems with Denso High Pressure Common Rail
- CTM320—Level 14 Electronic Fuel Systems with Denso High Pressure Common Rail
- CTM502—Level 16 Electronic Fuel Systems with Denso High Pressure Common Rail

Other manuals will be added in the future to provide additional information on electronic fuel systems as needed.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.

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

Use this component technical manual in conjunction with the machine technical manual. An application

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listing in Section 01, Group 001 identifies product-model/component type-model relationship. See the machine technical manual for information on component removal and installation, and gaining access to the components.

Information is organized in sections and groups for the various components requiring service instruction. Section 05 summarizes all applicable essential tools, service equipment and tools, other materials needed to do the job, and service parts kits. Section 06 summarizes all specifications, wear tolerances, and torque values.

Before beginning repair on an engine, clean the engine and mount on a repair stand. (See Section 02, Group 010.)

This manual contains SI Metric units of measure followed immediately by the U.S. customary units of measure. Most hardware on these engines is metric sized.

Some components of this engine may be serviced without removing the engine from the machine. Refer to the specific machine technical manual for information on components that can be serviced without removing the engine from the machine and for engine removal and installation procedures.

Read each block of material completely before performing service to check for differences in procedures or specifications. Follow only the procedures that apply to the engine model number you are working on. If only one procedure is given, that procedure applies to all the engines in the manual.

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.

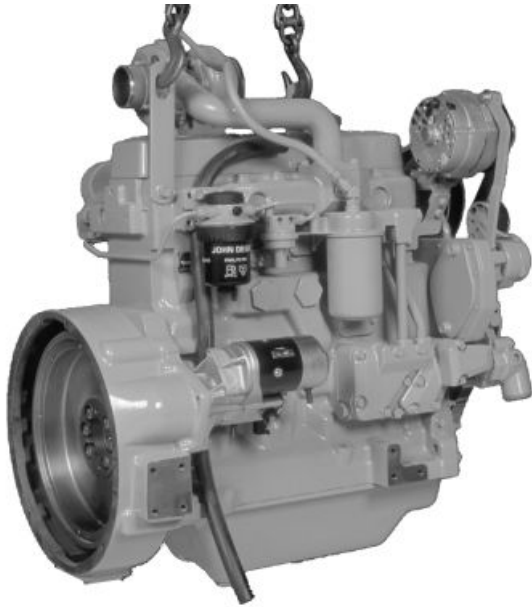
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Record of Changes

Publication and Translation Date			
CTM104 _ 17DEC09			
Section-Group	Group Title	Block Title	Comment
01-001	Engine Identification and Application Charts	Engine Application Charts	Moved to Application manual (CTM106819)
02-050	Camshaft, Balancer Shafts and Timing Gear Train	Time Camshaft and Fuel Injection Pump (Non-HPCR Engines)	Add procedure for injection pump with lock shaft timing.
04-150	Observable Diagnostics and Tests	Test Engine Compression Pressure	Added new compression adapter JDG10824, JDG11064, JDG11065
06-210	Diagnostic Specifications	Intake Manifold Pressure (Turbocharger Boost) Specifications	Update with new applications: <ul style="list-style-type: none"> • J06068HCQ07 • PE6068HT082/083/085 • J06068HCQ04 • PE4045HLV56/58/60/62/64/66 • PE6068AFM75 • JO6068HBM04

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PowerTech™ 4.5L Engine—Tier 1/Stage I



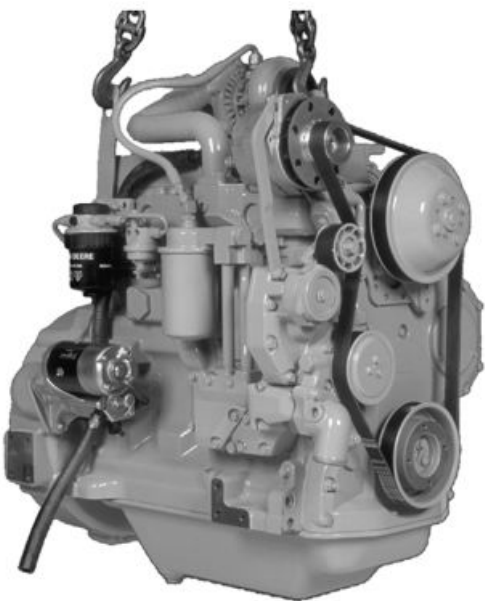
3/4 Right Rear View

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3/4 Left Rear View

RG7638—UN—23NOV97



3/4 Right Front View

RG7639—UN—23NOV97



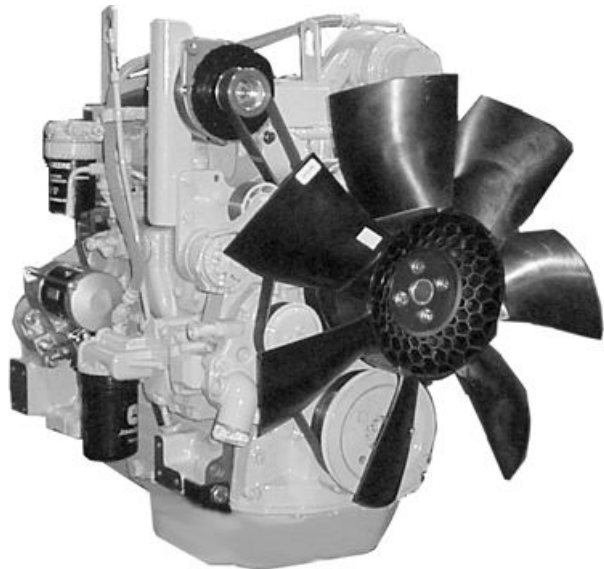
3/4 Left Front View

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PowerTech™ 4.5L Engine—Tier 2/Stage II



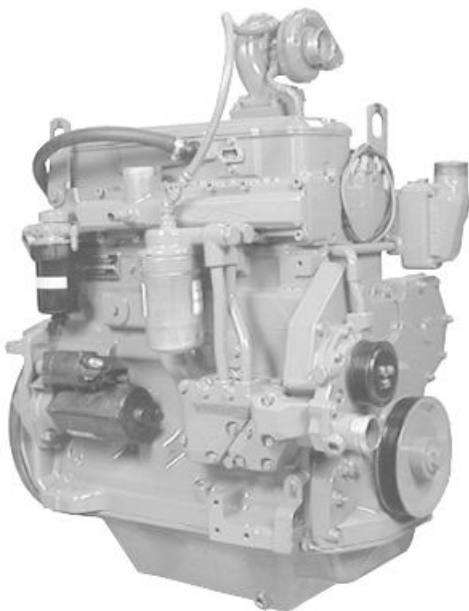
3/4 Right Front View—Two-Valve Head Engine

RG11932 —UN—06NOV01



3/4 Left Rear View—Two-Valve Head Engine

RG11931 —UN—06NOV01



3/4 Right Front View—Four-Valve Head Engine

RG13617A —UN—18MAY04



3/4 Left Rear View—Four-Valve Head Engine

RG13618A —UN—18MAY04

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**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

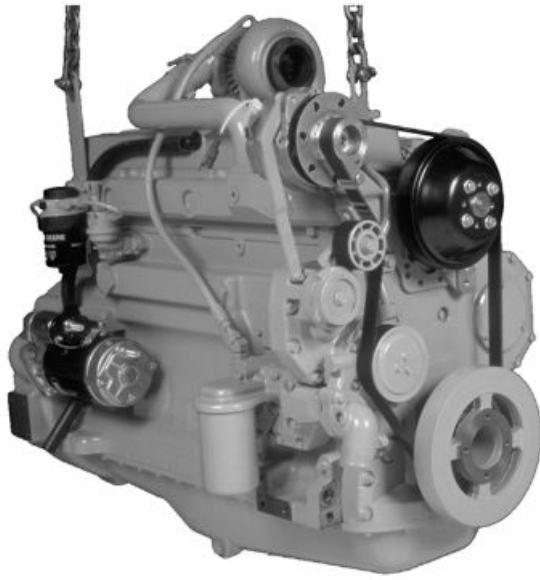
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NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**

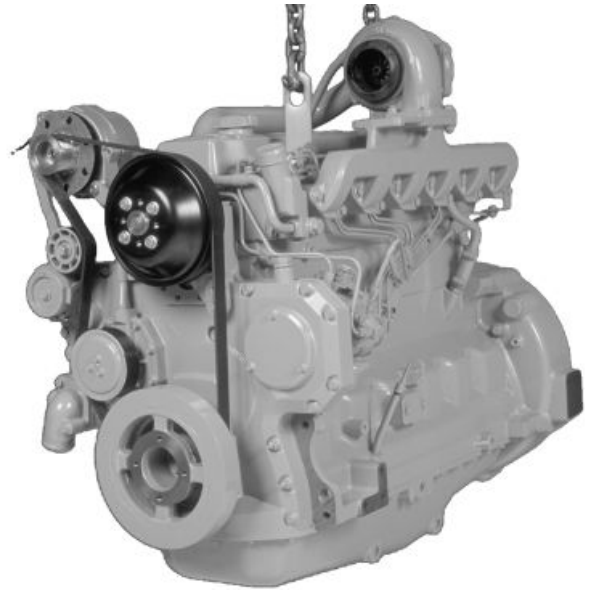
**Have any questions please write to me:
admin@servicemanualperfect.com**

PowerTech™ 6.8L Engine—Tier 1/Stage I



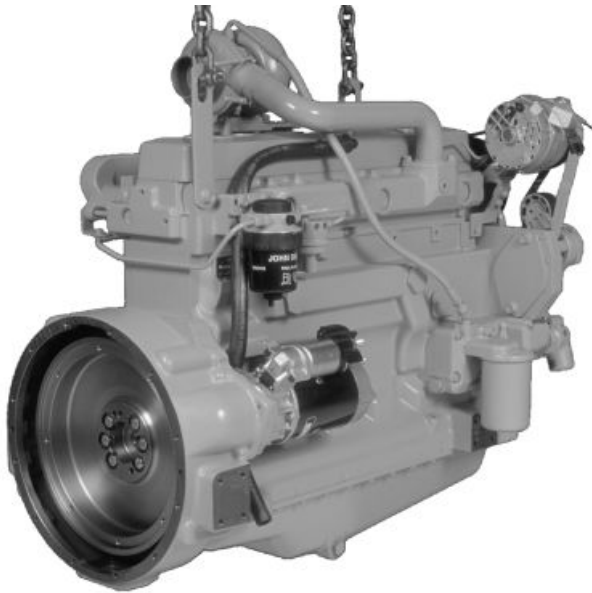
3/4 Right Front View

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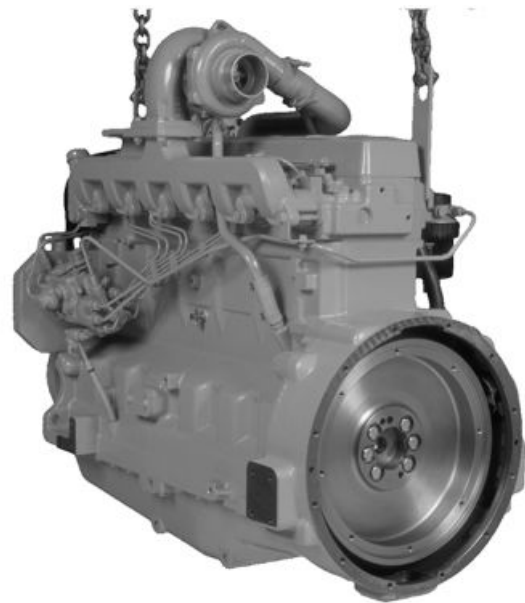
3/4 Left Front View

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3/4 Right Rear View

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3/4 Left Rear View

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PowerTech™ 6.8L Engine—Tier 2/Stage II



3/4 Right Front View—Two-Valve Head Engine

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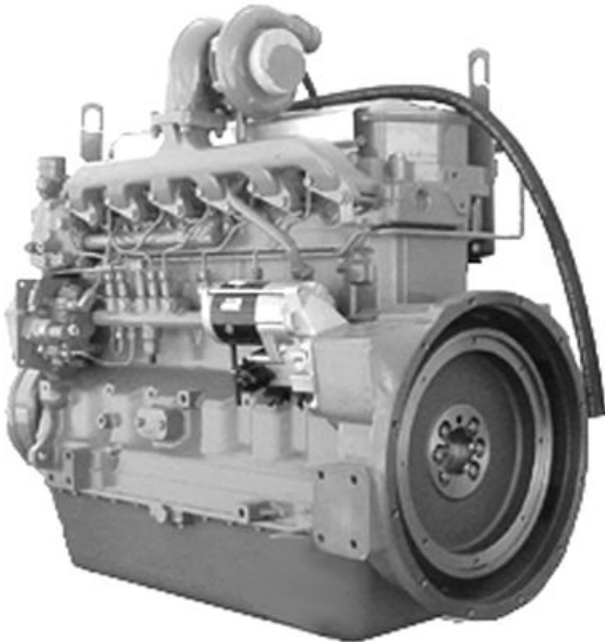


3/4 Left Rear View—Two-Valve Head Engine

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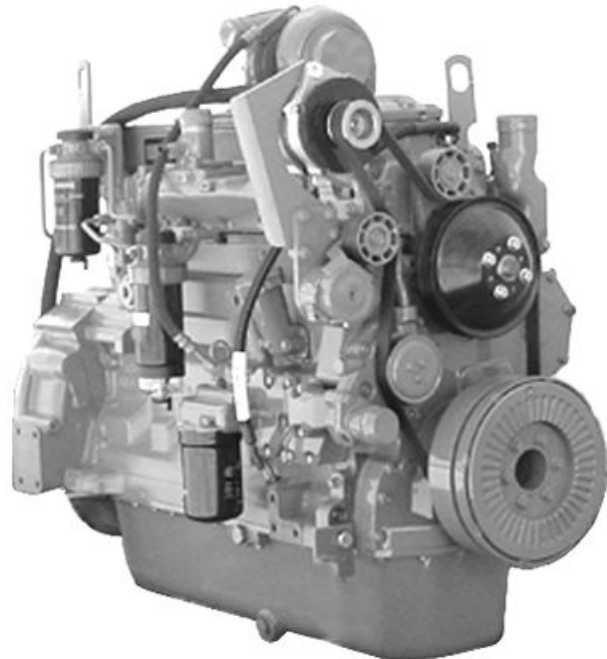
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PowerTech™ 6.8L Engine With Electronic Fuel System—Tier 2/Stage II



6068HF475 Four-Valve Engine (Level 11 Electronic Fuel System with Denso High Pressure Common Rail)

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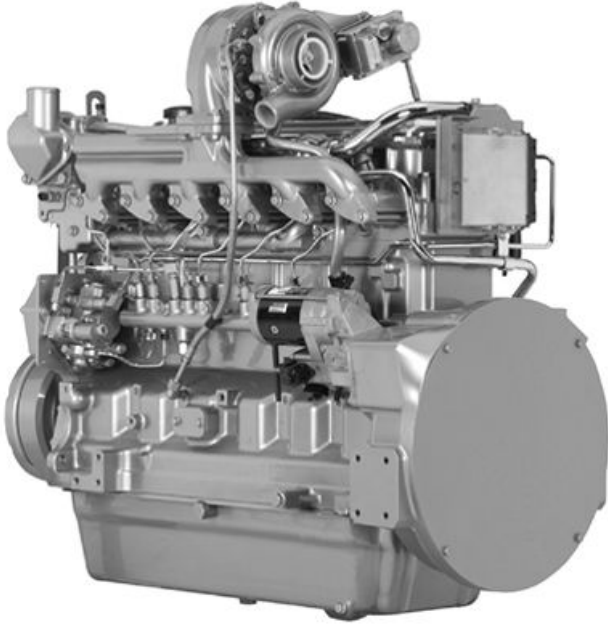


6068HF475 Four-Valve Engine

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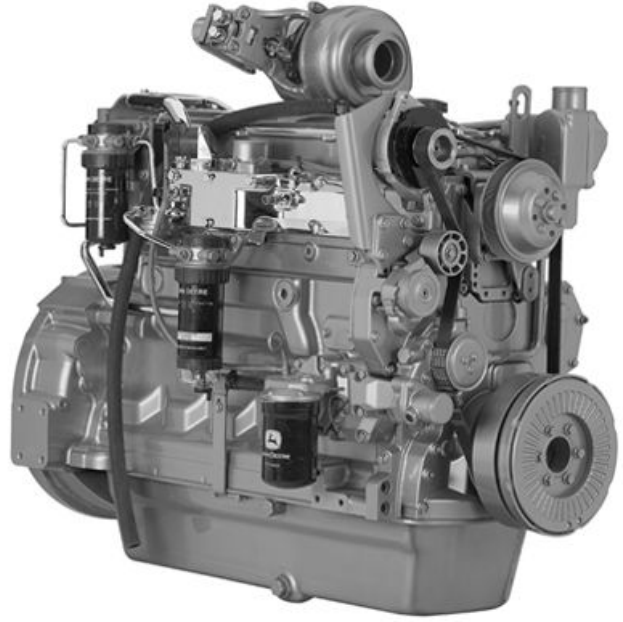
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PowerTech™ Plus 6.8L Engine With Electronic Fuel System—Tier 3/Stage IIIA



6068HF485 Engine Shown (Electronic Fuel System With Denso High Pressure Common Rail)

RG13547—JUN—11NOV04



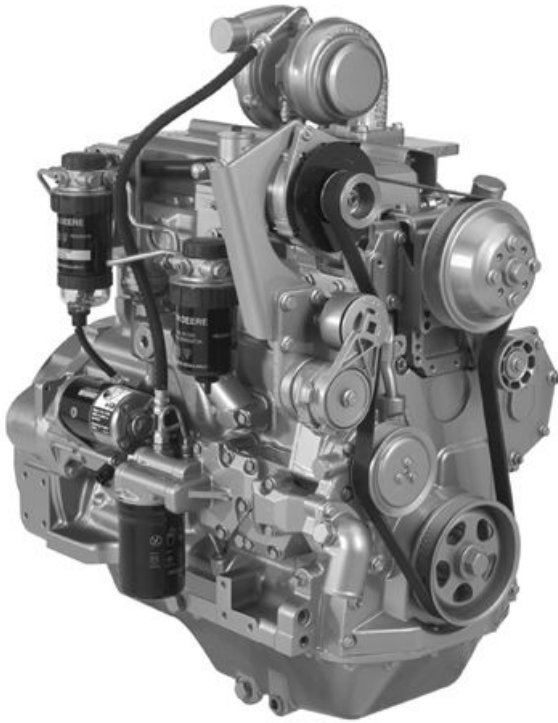
6068HF485 Shown

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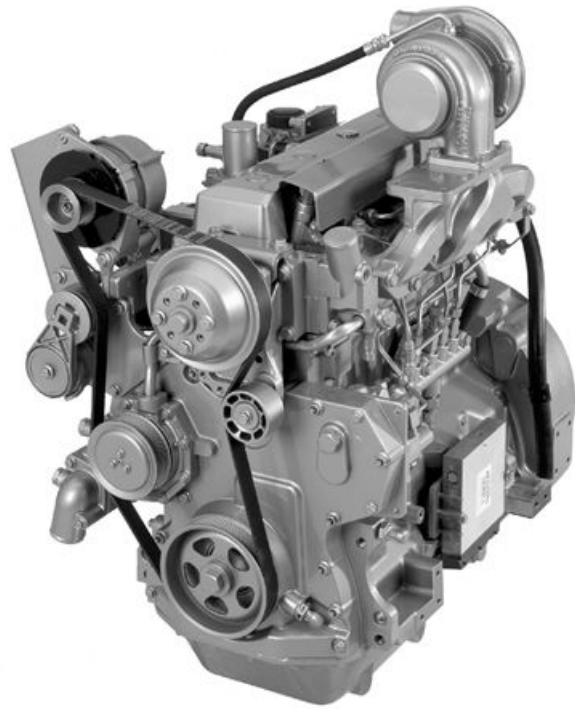
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PowerTech™ E 4.5 L Engine With Electronic Fuel Systems (HPCR Fuel System) (Two-Valve Cylinder Head)



4045HF285 Engine

RG14632 —UN—13APR06



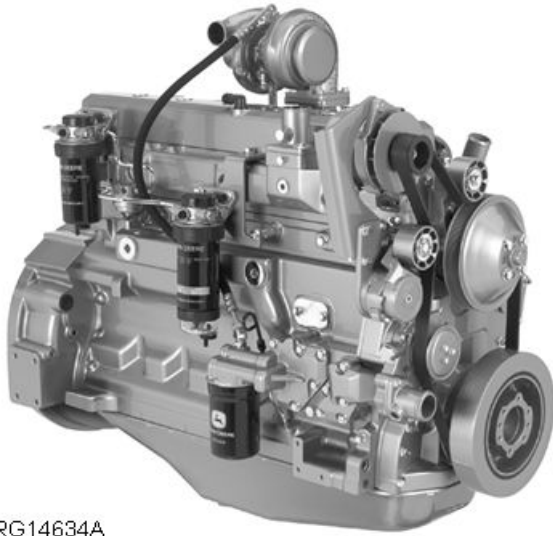
4045HF285 Engine

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PowerTech™ E 6.8 L Engine With Electronic Fuel Systems (HPCR Fuel System) (Two-Valve Cylinder Head Model)



RG14634A

6068HF285 Engine (3/4 Right Front View)

RG14634A —UN—29NOV07



CD31001

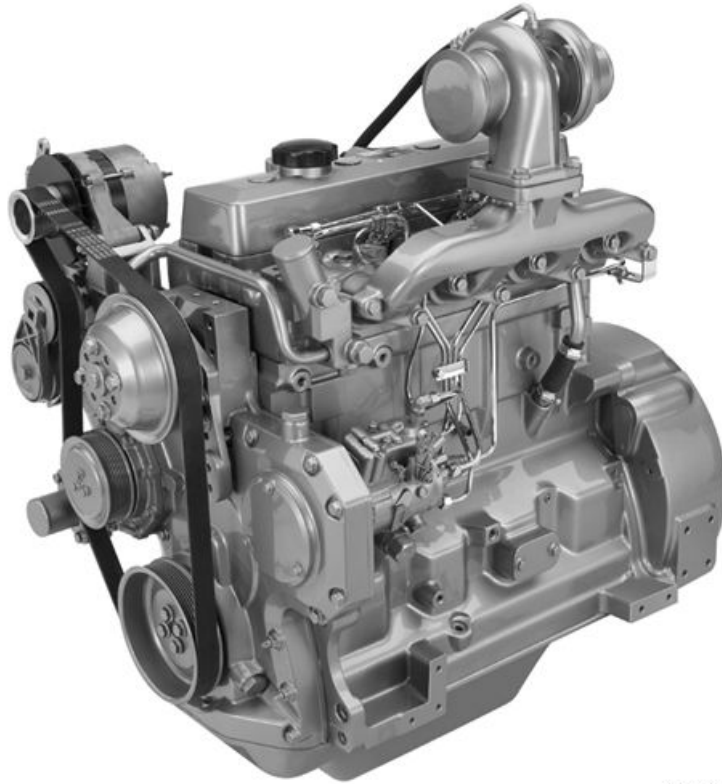
6068HF285 Engine (3/4 Left Front View)

CD31001 —UN—29NOV07

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PowerTech™ M 4.5 L Engine with Mechanical Fuel System and 17 mm Injectors



CD31002

4045HF280 Engine (3/4 Left Front View)

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*Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication.
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Section 01 General Information

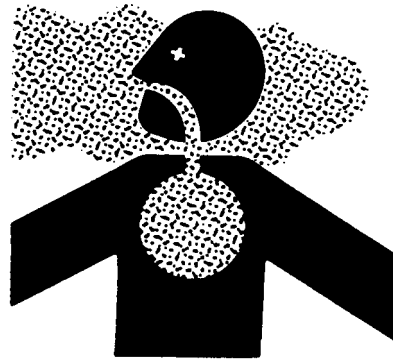
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Work In Ventilated Area

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.



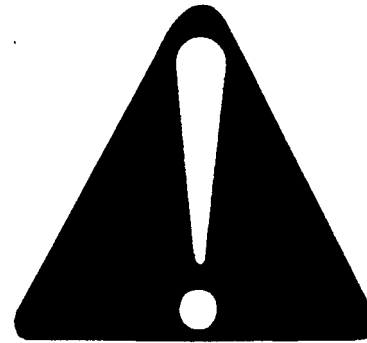
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DX,AIR -19-17FEB99-1/1

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.



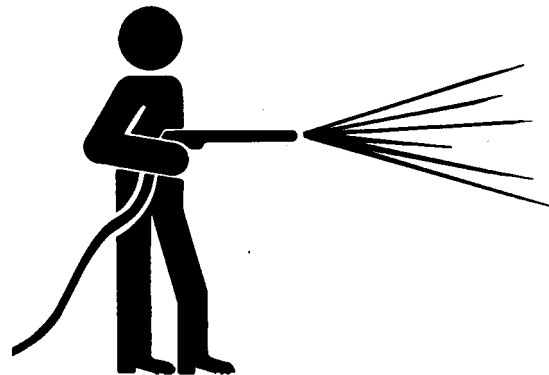
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DX,ALERT -19-29SEP98-1/1

Work in Clean Area

Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



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DX,CLEAN -19-04JUN90-1/1

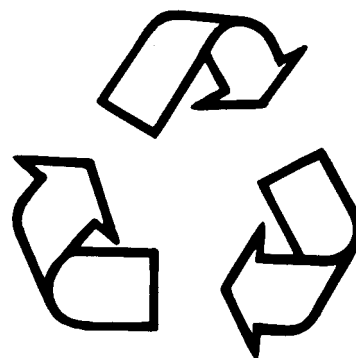
Dispose of Waste Properly

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

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

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

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



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

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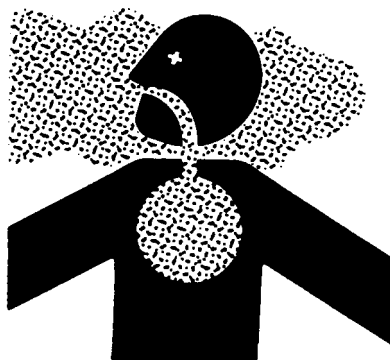
TS1133 —UN—26NOV90

Avoid Harmful Asbestos Dust

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

TS220 —UN—23AUG88

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.

Use only an approved fuel container for transporting flammable liquids.

Never fill fuel container in pickup truck with plastic bed liner. Always place fuel container on ground before refueling. Touch fuel container with fuel dispenser nozzle before removing can lid. Keep fuel dispenser nozzle in contact with fuel container inlet when filling.



Do not store fuel container where there is an open flame, spark, or pilot light such as within a water heater or other appliance.

DX,FIRE1 -19-12OCT11-1/1

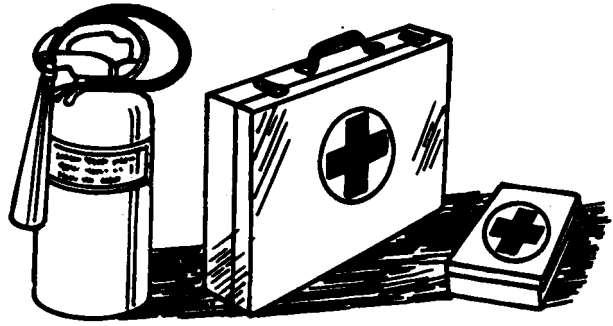
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Prepare for Emergencies

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

Handle Fluids Safely—Avoid Fires

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



TS227—UN—23AUG88

DX,FLAME -19-29SEP98-1/1

Avoid High-Pressure Fluids

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

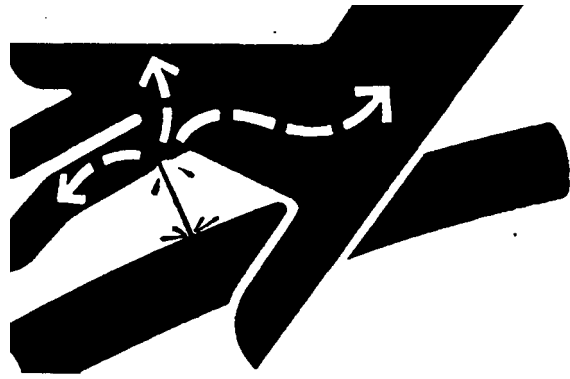
Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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 in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

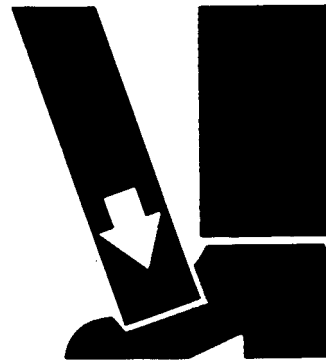
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DX,FLUID -19-12OCT11-1/1

Use Proper Lifting Equipment

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.

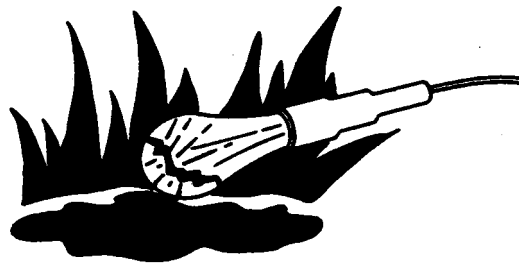


TS226 —UN—23AUG88

DX,LIFT -19-04JUN90-1/1

Illuminate Work Area Safely

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



TS223 —UN—23AUG88

DX,LIGHT -19-04JUN90-1/1

Live With Safety

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.



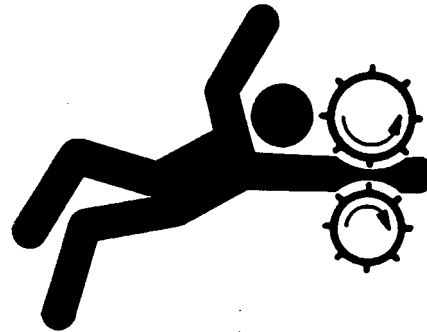
TS231 —19—07OCT88

DX,LIVE -19-25SEP92-1/1

Service Machines Safely

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



TS228 —UN—23AUG88

DX,LOOSE -19-04JUN90-1/1

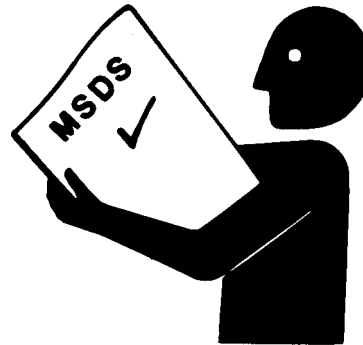
Handle Chemical Products Safely

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

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

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

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

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.



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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