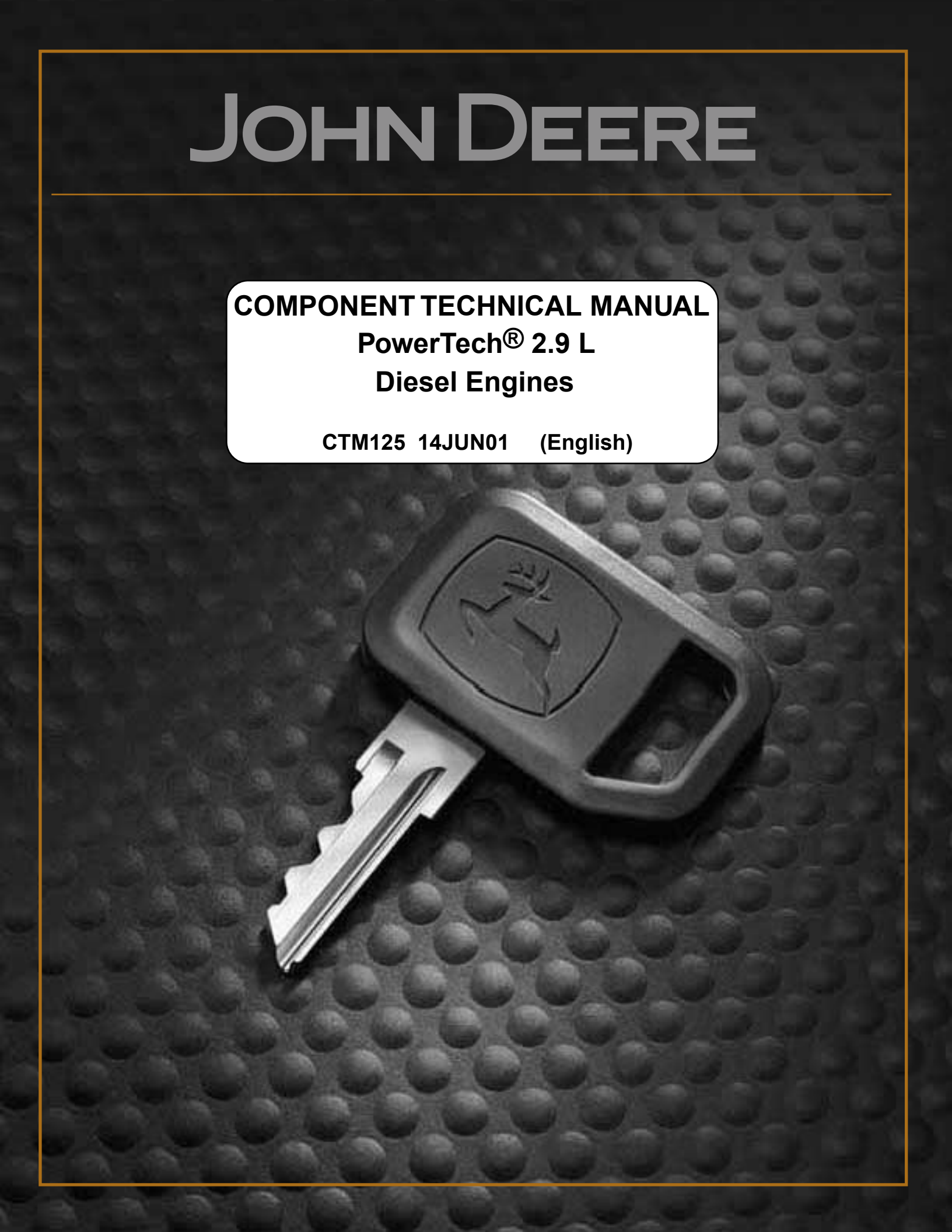
JOHN DEERE

COMPONENT TECHNICAL MANUAL
PowerTech® 2.9 L
Diesel Engines

CTM125 14JUN01 (English)



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.

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 listing in the introduction 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.

This manual is divided in three parts: repair, operation and tests, tools and specifications. Repair sections contain necessary instructions to repair the component. Operation and tests sections help you identify the majority of routine failures quickly. Tools and specifications sections are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values

Information is organized in groups for the various components requiring service instruction.

Component Technical Manuals are concise service guides for specific components. Component technical manuals are written as stand-alone manuals covering multiple machine applications.

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

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.

CD03523,00000DB –19–03JAN01–1/1

John Deere Dealers

The changes listed below make your CTM obsolete. **Discard CTM 125 dated 26JUN98 and replace with this new manual.** Also, copy these pages and route through your Service Department.

INTRODUCTION

- Updated engine application charts.

GROUP 01

- Updated engine model designation.
- Updated engine oil and coolant application guidelines.

GROUP 02

- Updated engine lifting and cleaning procedures.

GROUP 03

- Updated sealant application guidelines.
- Updated engine break-in procedure.

GROUP 05

- Revised procedure for installation of rocker arm shaft.

GROUP 10

- Added general information on connecting rods to include new Precision Joint™ connecting rod.
- Revised procedures for removal, inspection and installation of connecting rods, bearings and caps.
- Updated information for cap and plug installation in cylinder block.

GROUP 15

- Added procedure to remove crankshaft pulley with bolt-in weights.

GROUP 20

- Added procedure to remove crankshaft front oil seal.
- Added procedure to remove timing gear cover.

GROUP 25

- Revised torque specification for oil drain plug.

GROUP 30

- Updated information to install coolant heater.
- Added exploded view showing radiator installed by John Deere.

GROUP 35

- Updated turbocharger boost pressure specifications.
- Added exploded view showing air filters installed by John Deere.

GROUP 40

- Updated injection pump specifications including dynamic timing and power rate.
- Added procedure to replace throttle lever on STANADYNE pump.
- Added procedure to adjust aneroid on STANADYNE pump.
- Added procedure to remove and install DELPHI/LUCAS fuel injection pump.
- Added information on Rate Shaping Nozzle (RSN).

GROUP 110

- Added procedure to test cooling system and radiator cap.

GROUP 120

- Added information for DELPHI/LUCAS fuel injection pump operation.
- Added procedure to test shut-off solenoid on DELPHI/LUCAS pump.
- Added information on cold start advance operation and test.

- Added information on light load advance operation and test.
- Added information on Rate Shaping Nozzle (RSN).

GROUP 200

- All essential tools listed throughout this manual are consolidated in this group for ease of reference.

GROUP 205

- All service equipment and recommended tools listed throughout this manual are consolidated in this group for ease of reference.

GROUP 210

- All dealer fabricated tools listed throughout this manual are consolidated in this group for ease of reference.

GROUP 300

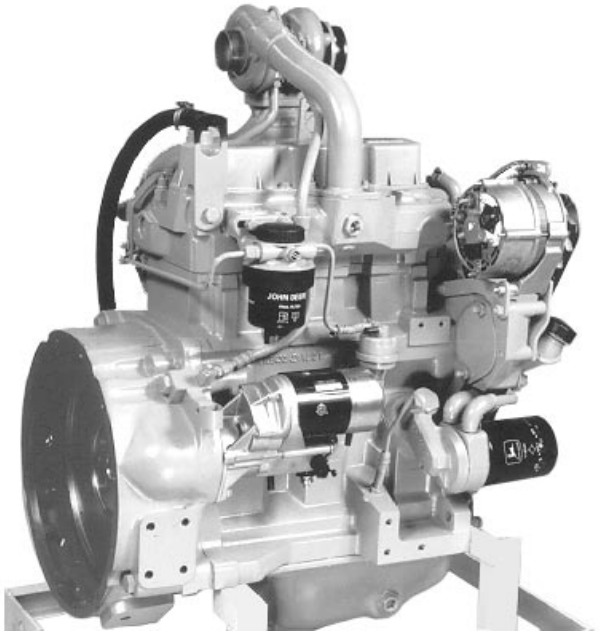
- All repair specifications listed throughout this manual are consolidated in this group for ease of reference.

GROUP 305

- All test and diagnostic specifications listed throughout this manual are consolidated in this group for ease of reference.

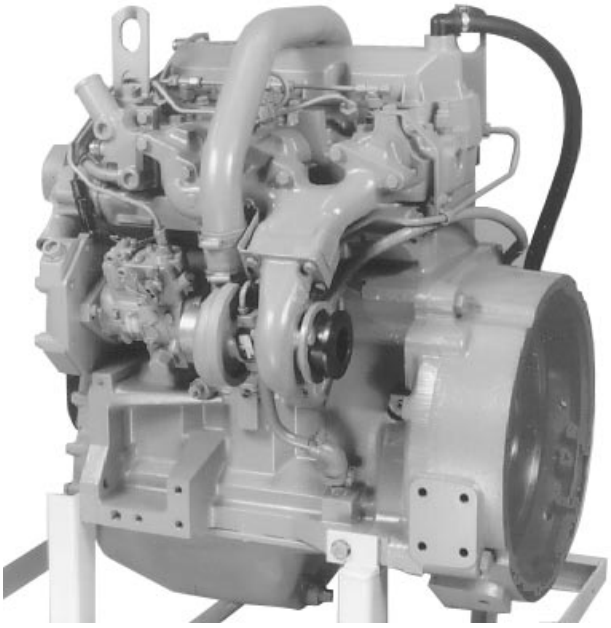
CD03523,00000DC –19–03JAN01–2/2

POWERTECH® 2.9 L Engines



CD30517A –UN–23FEB01

3/4 Right Rear View



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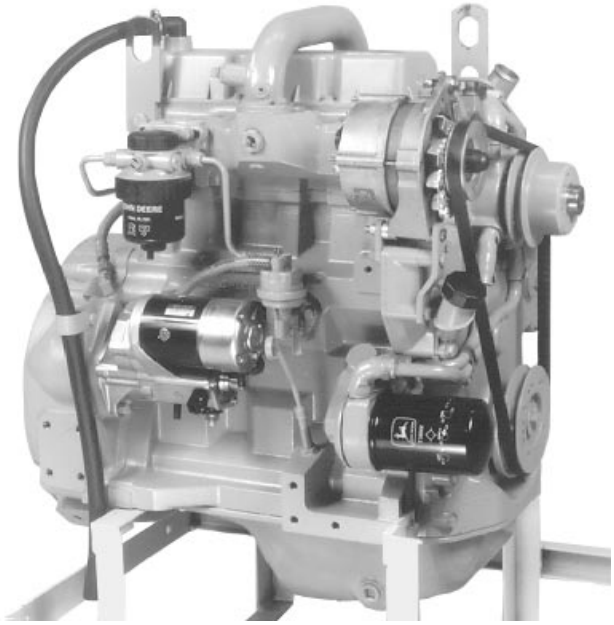
3/4 Left Rear View



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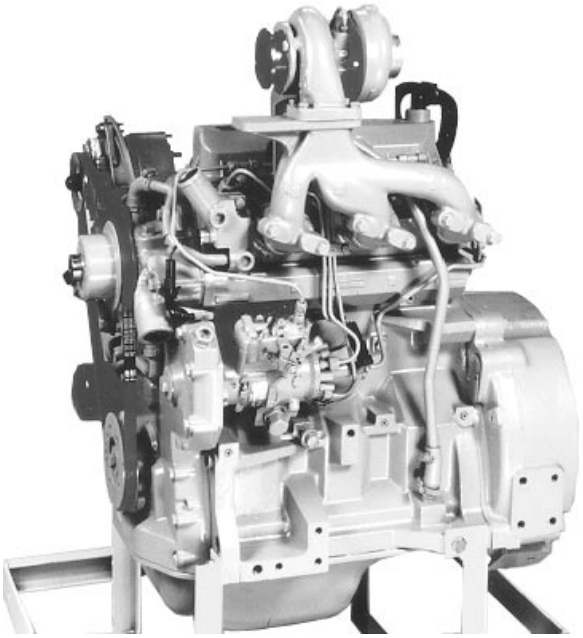
3/4 Right front View



CD30520A –UN–23FEB01

3/4 Left front View

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DPSG,OUOE003,33 –19–28DEC98–1/1

Engine application chart

This component technical manual (CTM125) covers repair of *POWERTECH*® 2.9 L engines produced by John Deere SARAN “CD” (France) and by John Deere TORREON “PE” (Mexico). Refer to the chart below to know which applications is covered by this manual.

NOTE: Information on how to remove and reinstall the engine in the vehicle is contained in the relevant Technical Manual.

5000-SERIES TRACTORS (Agritalia-built)	**ENGINE MODEL**	**OBSERVATIONS**
5300/5300N	CD3029DAT01	Non-Certified
5400/5400N	CD3029TAT02	Non-Certified

5010-SERIES TRACTORS (Agritalia-built)	**ENGINE MODEL**	**OBSERVATIONS**
5310/5310N	CD3029DAT50	Certified
5410/5410N	CD3029TAT50	Certified

5010-SERIES TRACTORS (Augusta-built)	**ENGINE MODEL**	**OBSERVATIONS**
5105	PE3029DLV51	Certified
5205	PE3029DLV52	Certified
5210	CD3029DLV50	Certified
5210	PE3029DLV50	Certified
5210	PE3029DLV53	Certified
5210	PE3029DLV54	Certified
5310/5310N	CD3029TLV50	Certified
5310/5310N	PE3029TLV50	Certified
5310/5310N	PE3029TLV52	Certified

5020-SERIES TRACTORS (Augusta-built)	**ENGINE MODEL**	**OBSERVATIONS**
5220	PE3029DLV53	Certified
5320/5320N	PE3029TLV52	Certified

ENGINES FOR GOLDONI TRACTORS

Engine model	**Observations**
CD3029DFG21	Non-Certified
CD3029DFG22	Non-Certified
CD3029TFG21	Non-Certified
CD3029DFG51	Certified
CD3029TFG51	Certified

OEM Engines (Non-Certified)			
Engine Model	**Observations**	**Engine Model**	**Observations**
CD3029DF120		CD3029TF120	
CD3029DF121		CD3029TF121	
CD3029DF122		CD3029TF123	
CD3029DF123		CD3029TF160	Auxiliary drive
CD3029DF124		CD3029TF161	Auxiliary drive
CD3029DF128	Power Unit	CD3029TF162	Auxiliary drive
CD3029DF160	Auxiliary drive	CD3029TF163	Auxiliary drive
CD3029DF161	Auxiliary drive	PE3029TF120	
CD3029DF162	Auxiliary drive	PE3029TF160	Auxiliary drive
CD3029DF163	Auxiliary drive		
CD3029DF164	Auxiliary drive		
CD3029DF165	Auxiliary drive		
PE3029DF120			
PE3029DF160	Auxiliary drive		

OEM Engines (Certified)			
Engine Model	**Observations**	**Engine Model**	**Observations**
CD3029DF150		CD3029TF150	
CD3029DF151		CD3029TF151	
CD3029DF152		CD3029TF152	
CD3029DF180		CD3029TF180	Auxiliary drive
PE3029DF150		PE3029TF150	
PE3029DF180	Auxiliary drive	PE3029TF180	Auxiliary drive

CD,CTM125,002 –19–03JAN01–2/2

Information relative to emissions regulations

Depending on the final destination, engines 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 particles and gaseous pollutant from internal combustion engines. Such engines are called “CERTIFIED” and receive an emission label stuck on the engine.

The 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’s conformance to the emission 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 system
- Intake manifold
- Turbocharger
- Charge air cooling system
- Piston

CD03523,00000DD –19–04JAN01–1/1

Contents

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.

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Page

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

Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

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

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

TS204 –UN–23AUG88

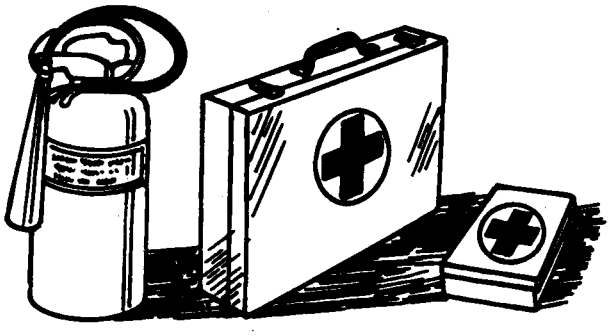
DX,SPARKS –19–03MAR93–1/1

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

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2

Prevent Acid Burns

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

Avoid the hazard by:

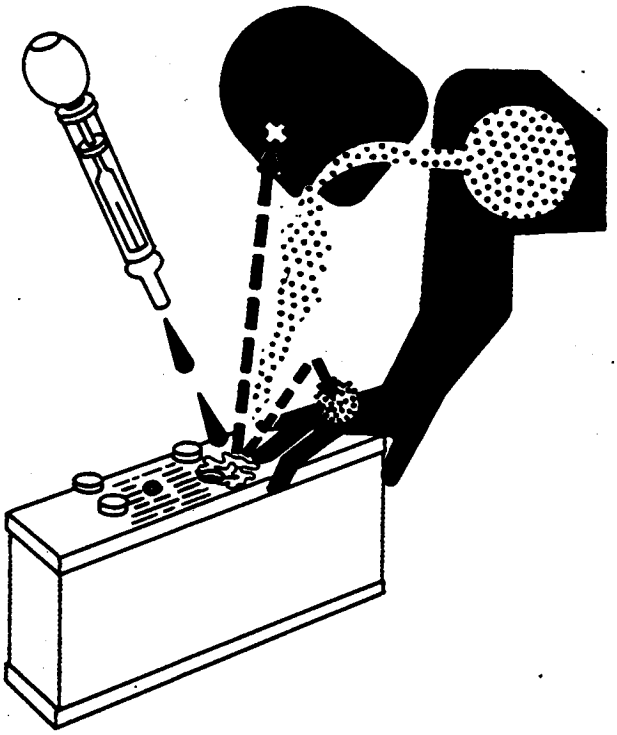
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

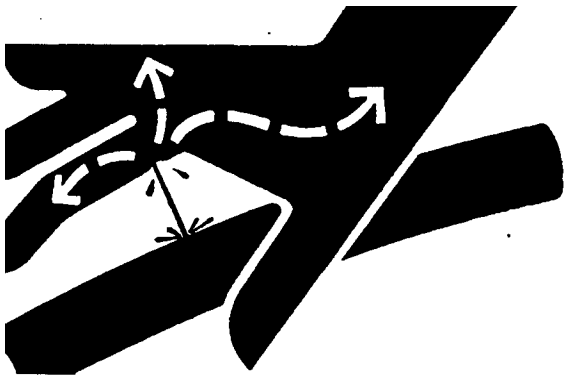
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 –UN–23AUG88

DX,POISON –19–21APR93–1/1

Avoid High-Pressure Fluids



X9811 –UN–23AUG88

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

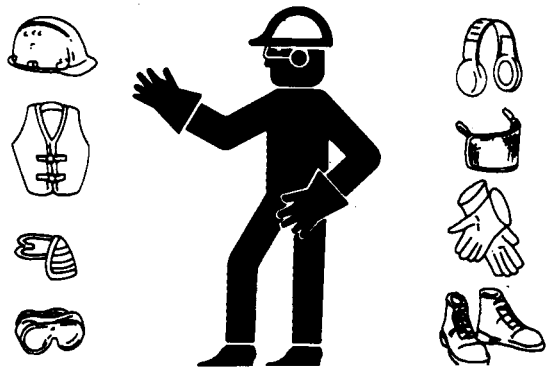
Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

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

Wear Protective Clothing



TS206 –UN–23AUG88

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.

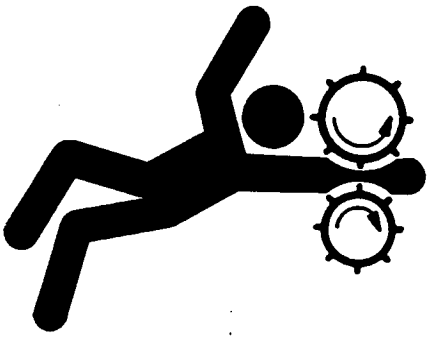
Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

DX,WEAR –19–10SEP90–1/1

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.



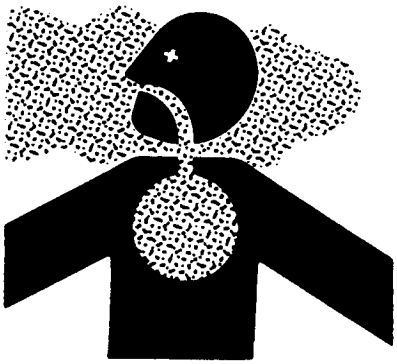
TS228 –UN–23AUG88

DX,LOOSE –19–04JUN90–1/1

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



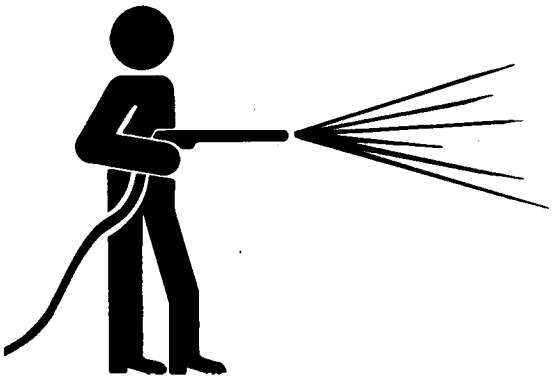
TS220 –UN–23AUG88

DX,AIR –19–17FEB99–1/1

Work in Clean Area

Before starting a job:

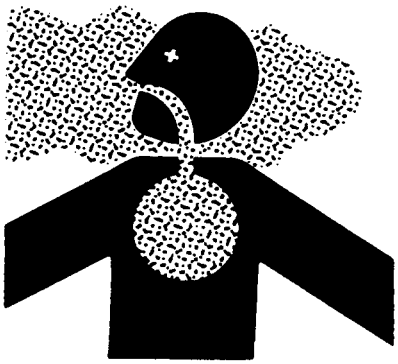
- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



T6642EJ –UN–18OCT88

DX,CLEAN –19–04JUN90–1/1

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.

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

Remove paint before welding or heating:

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

DX,PAINT –19–03MAR93–1/1

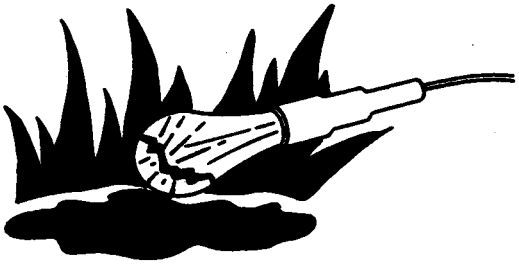
Avoid Heating Near Pressurized Fluid Lines

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 be accidentally cut when heat goes beyond the immediate flame area.

DX,TORCH –19–03MAR93–1/1

Illuminate Work Area Safely



TS223 –UN–23AUG88

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.

DX,LIGHT –19–04JUN90–1/1

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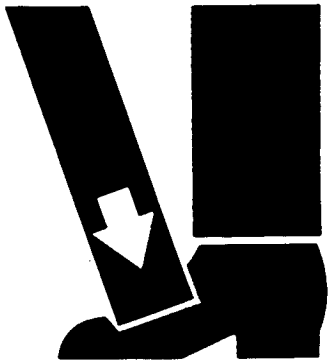
Use Proper Lifting Equipment

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

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

Use Proper Tools

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.

TS779 –UN–08NOV89

DX,REPAIR –19–17FEB99–1/1

Dispose of Waste Properly

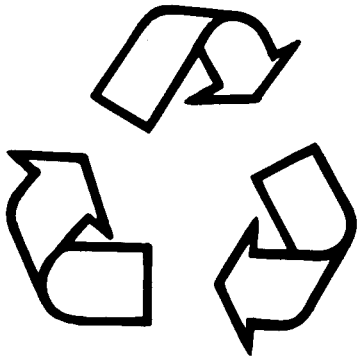
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

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.



TS1133 –UN–26NOV90

DX,DRAIN –19–03MAR93–1/1

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8

Live With Safety

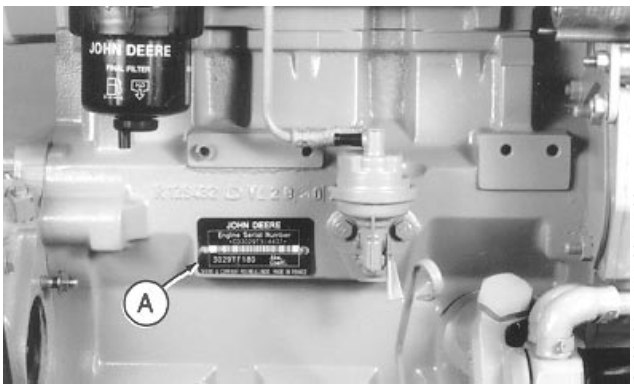
Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

TS231 –19–07OCT88

DX,LIVE –19–25SEP92–1/1

Engine Identification

Engines can be identified from the serial number plate (A) located on the right-hand side of engine.



CD30521 –UN–30APR98

1. Each engine has a 13-digit John Deere engine serial number (B) identifying the producing factory, engine model designation, and a 6-digit sequential number. The following is an example:

CD3029D500000

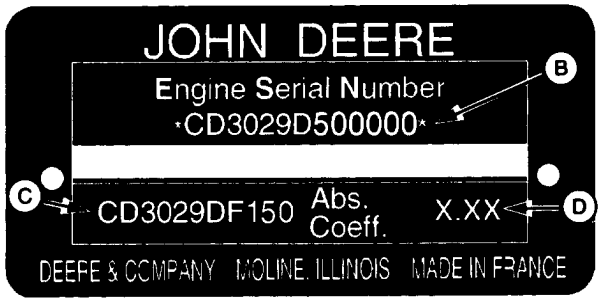
CD	Producing factory CD= Saran-FRANCE PE= Torreon-MEXICO
3029	Engine model designation 3 = Number of cylinders 029 = Total displacement (029 = 2.9 liters)
D	Aspiration code D= Naturally Aspirated T= Turbocharger
500000	Sequential serial number

2. The second line of information (C) identifies the engine/machine or OEM relationship. See “ENGINE APPLICATION CHART” earlier in this manual.

3029DF150

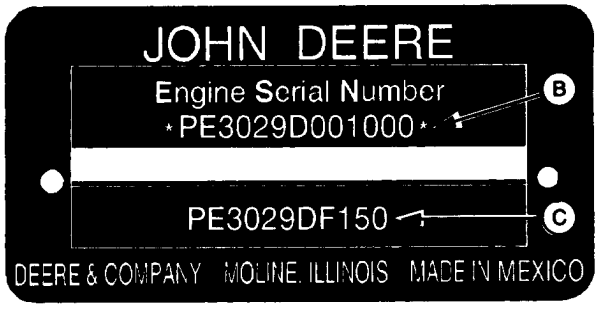
3029D	See above
F	User code AT= Agritalia-built tractors F = OEM applications FG= Goldony (Italy) KV= John Deere Knoxville LV== John Deere Augusta
150	Application number

3. The second line can also contains the absorption coefficient (D) of smoke emissions (Saran-built engines only).



CD30522 –UN–17JUN98

Saran Engine Plate



CD30523 –UN–17JUN98

Torreon Engine Plate

CD,CTM125,003 –19–04JAN01–1/1

01
2

OEM Engine Option Code Label

An option code label is secured to the top of the valve cover and identifies the factory installed options on each OEM engine to ensure correct parts acquisition.

Always provide option code information and engine base code when ordering repair parts. A listing of option codes is given in Parts Catalogs and Operator's Manual.

NOTE: Before "hot tank" cleaning, ensure that option codes are recorded elsewhere.

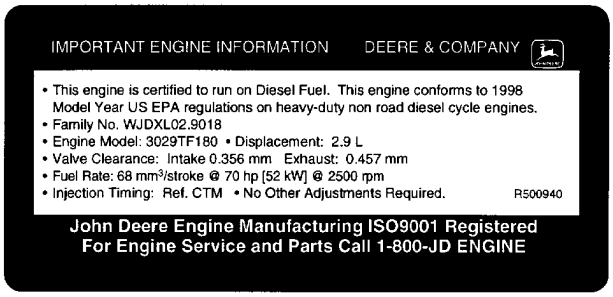
CD30524 –UN–27MAY98

Option Code Label

CD,CTM125,004 –19–01DEC97–1/1

Emission Certified Engine Label

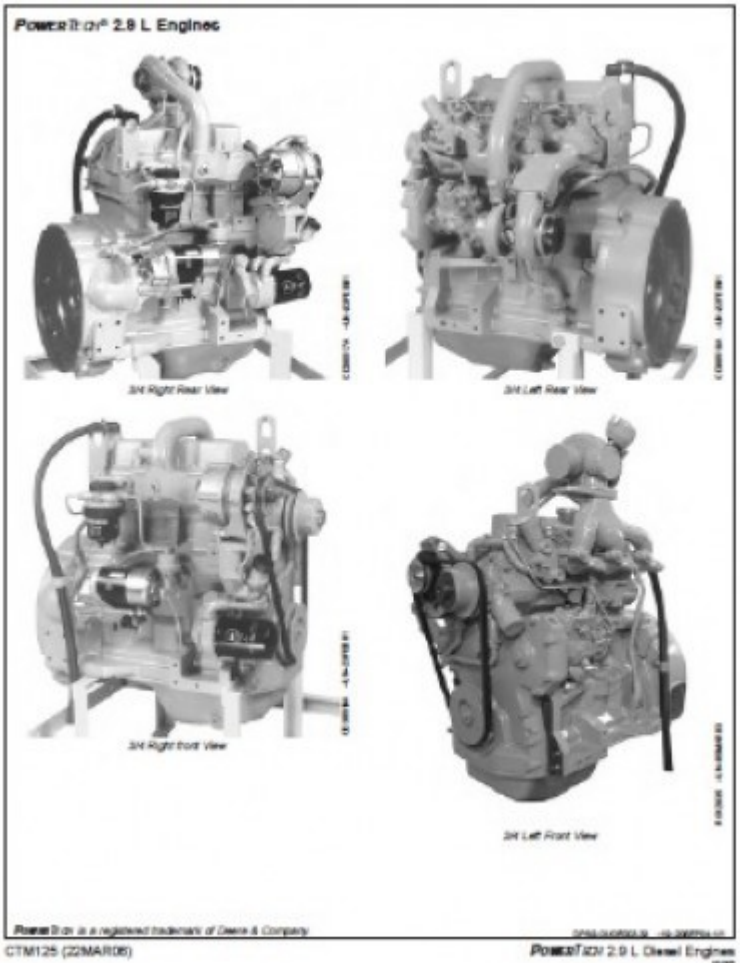
Emission certified engines have a label, like the one shown, stuck on the rocker arm cover. Information on this label states the conditions this engine is emission certified.



CD30697 –UN–17JUN98

Emission Label

CD,CTM125,228 –19–01DEC97–1/1



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