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

GROUP 05
- Revised procedure for installation of rocker arm shaft.
- 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 10
- Added procedure to remove crankshaft pulley with bolt-in weights.

GROUP 15
- 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.
- Added procedure to test shut-off solenoid on DELPHI/LUCAS pump.
- Added information on cold start advance operation and test.

Precision Joint is a trademark of Deere & Company

CTM125 (14JUN01)
PowerHive 2.9 L Diesel Engines
© 2001 John Deere
Introduction

- 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.
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)

- 5300/5300N: CD3029DAT01 Non-Certified
- 5400/5400N: CD3029TAT02 Non-Certified

### 5010-SERIES TRACTORS (Agritalia-built)

- 5310/5310N: CD3029DAT50 Certified
- 5410/5410N: CD3029TAT50 Certified

### 5010-SERIES TRACTORS (Augusta-built)

- 5105: PE3029DLV51 Certified
- 5205: PE3029DLV52 Certified
- 5210: PE3029DLV53 Certified
- 5210: PE3029DLV54 Certified
- 5310/5310N: CD3029TLV50 Certified
- 5310/5310N: PE3029TLV50 Certified
- 5310/5310N: PE3029TLV52 Certified

### 5020-SERIES TRACTORS (Augusta-built)

- 5220: PE3029DLV53 Certified
- 5320/5320N: PE3029TLV52 Certified

### ENGINES FOR GOLDONI TRACTORS

- CD3029DFG21: Non-Certified
- CD3029DFG22: Non-Certified
- CD3029TFG21: Non-Certified
- CD3029DFG51: Certified
- CD3029TFG51: Certified
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Introduction

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
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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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Moline, Illinois
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A John Deere ILLUSTRATION
Manual

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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.

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 voltmeter or hydrometer.

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

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.
Safety

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.
Avoid High-Pressure Fluids

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

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

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

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

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.
Service Machines Safely

Tie long hair behind your head. Do not wear a necklace, 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.

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.

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.
Safety

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.
Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

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

Avoid Heating Near Pressurized Fluid Lines

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

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.
Safety

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.

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.