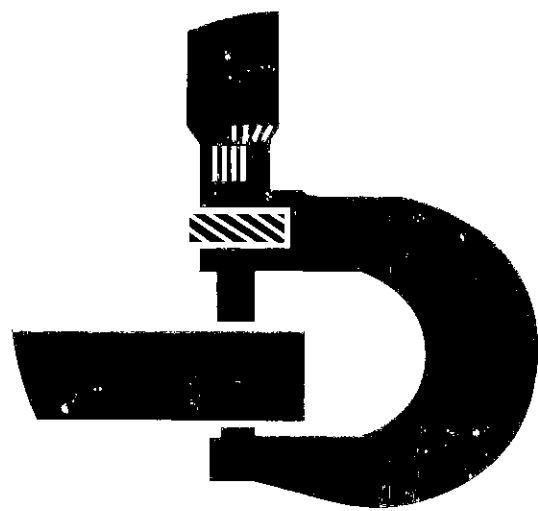


# **POWERTECH<sup>®</sup> 4.5L & 6.8L 4045 and 6068 Diesel Engines**



For complete service information also see:

- |                                       |       |
|---------------------------------------|-------|
| Alternators and Starting Motors ..... | CTM77 |
| OEM Engine Accessories .....          | CTM67 |

Deere Power Systems Group  
CTM104 (12OCT98)

LITHO IN U.S.A.  
ENGLISH



Please Do Not Make Copies Of This Manual

# Introduction

## FORWARD

This Component Technical Manual (CTM104) covers the recommended repair and test procedures for the following **POWERTECH**® Engines:

- 4.5 L **POWERTECH**® Engines produced in Dubuque, Iowa; Saran, France and Torreon, Mexico.
- 6.8 L **POWERTECH**® Engines produced in Dubuque, Iowa; Saran, France and Torreon, Mexico.

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 Group 01 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 two parts: repair and operation and tests. Repair sections (03-40) contain necessary instructions to repair the component. Operation and tests sections (100-115) help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerance, and torque values.

Before beginning repair on an engine, clean the engine and mount on a repair stand. (See Group 03.)

This manual contains SI Metric unit 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.

## Introduction

**John Deere Dealers**

The changes listed below make your CTM obsolete. **Discard CTM104 dated 01JUN96 and replace with this new manual.** Also, copy these pages and route through your Service Department.

**GROUP 01**

- Updated engine model designation chart.
- Updated engine application charts.

**GROUP 02**

- Updated engine oil and coolant application guidelines.

**GROUP 04**

- Updated sealant application guidelines.

**GROUP 05**

- Revised valve lift specifications.

**GROUP 10**

- Revised procedure for removal, inspection and reinstallation of piston cooling orifices.
- Added procedures for service of Precision Joint™ connecting rods used on newer engines.
- Revised procedure for installation of piston rings.
- Revised piston protrusion specifications.

**GROUP 15**

- Revised procedure and specifications for removal and installation of vibration damper to include available options.
- Revised procedure for removal and installation of front oil seal and wear sleeve.
- Revised procedure for removal of flywheel.
- Revised procedure for removal and installation of rear oil seal and wear sleeve.

- Revised procedure for removal, inspection and reinstallation of piston cooling orifices.

**GROUP 16**

- Revised valve lift specifications.
- Revised procedure for removal and installation of timing gear cover.
- Revised procedure for removal and installation of cam-driven auxiliary drive.
- Revised idler gear endplay, timing gear backlash and camshaft specifications.
- Revised procedure for removal and installation of balancer shaft.
- Added procedure for removal and installation of mechanical tachometer adapter.
- Revised procedure for removal and installation of front plate.
- Revised procedure for removal and installation of idler gear shafts and bushings.
- Revised procedure for transfer of front plate timing mark.

**GROUP 20**

- Revised procedure for removal and installation of oil filter base.
- Revised procedure for removal and installation of oil cooler assembly.
- Revised procedures for removal and installation of oil dipstick tubes.
- Revised procedure for removal and installation of oil pump.
- Revised oil pan retaining cap screw specifications.

**GROUP 25**

- Added procedure for removal and installation of dual thermostat water manifold.
- Revised procedure for removal and installation of auto belt tensioner.

## Introduction

- Revised procedure and specifications for removal and installation of fan drive assembly.
- Revised procedure for removal and installation of coolant heater.
- Added procedure for removal and installation of temperature switch for cold start advance.
- Added cooling system deaeration procedure.
- Added manual belt tensioner adjustment procedure.

**GROUP 30**

- Revised turbocharger radial and axial bearing specifications.
- Added turbocharger wastegate actuator adjustment.
- Added procedure for removal and installation of air intake pipe.
- Added procedure for removal and installation of air heater.
- Revised procedure for removal and installation of exhaust manifold.

**GROUP 35**

- Revised procedure for removal and installation of primary and final fuel filters.
- Revised procedure for removal and installation of rotary fuel supply pump.
- Revised procedures for static timing of rotary and in-line injection pumps.
- Revised procedure for installation of in-line injection pump.
- Revised aneroid repair procedures.
- Revised procedure for transfer of front plate timing mark.

**GROUP 40**

- Added new Group 40 covering removal and installation of starting motors and alternators.

**GROUP 100**

- Revised altitude performance specifications.
- Revised dynamometer test specifications.

- Revised engine break-in procedure.
- Added engine oil consumption information.

**GROUP 105**

- Added engine cranking speed test.
- Revised engine crankcase pressure (blow-by) check.

**GROUP 110**

- Added turbocharger boost pressure specifications for engines in all machine applications.
- Added turbocharger oil seal leak test.
- Added intake and exhaust restriction check.
- Added exhaust leak check.
- Added turbocharger wastegate test.

**GROUP 115**

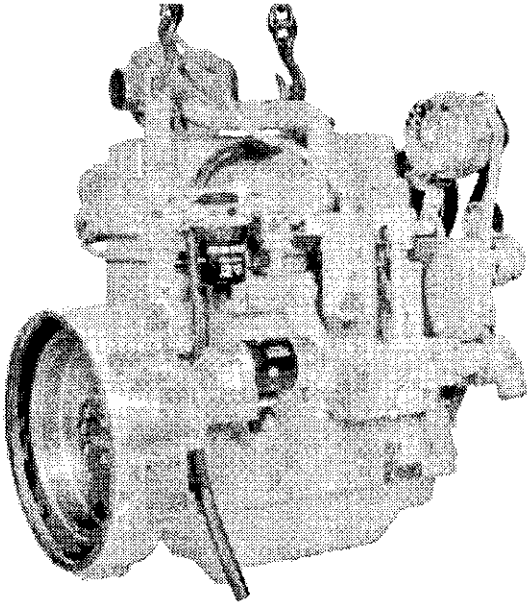
- Revised rotary fuel injection pump specifications.
- Added procedure for using TIMETRAC as a tachometer.
- Added procedure for static timing of in-line injection pumps.
- Revised theory of operation on rotary fuel supply pump.
- Added fuel shut-off solenoid test (Lucas pumps).
- Revised theory of operation on primary fuel filter.
- Added theory of operation on final fuel filter.
- Added theory of operation and operational checks on cold start advance and light load advance.
- Added fuel supply quality check.
- Added air in fuel test.
- Added restricted fuel return line check.
- Added pressure check for in-line fuel supply pumps.

**GROUP 199**

- Added dealer fabricated tool DFRG5, Injection Pump Front Plate Timing Mark Transfer Tool.
- Added dealer fabricated tool Engine Oil Dipstick Tube Driver for 6010 Series Tractors.

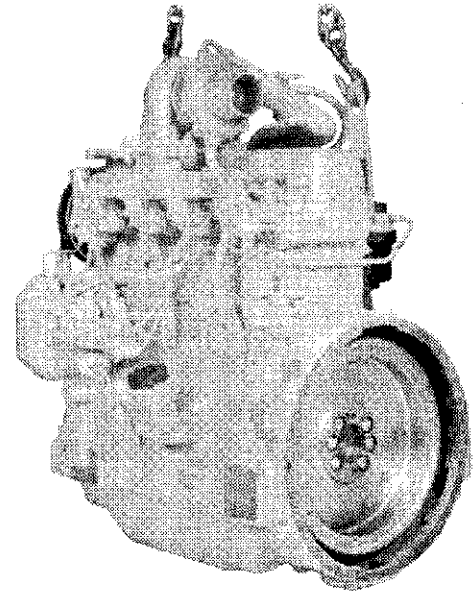
Introduction

**POWERTECH® 4.5 L ENGINE**



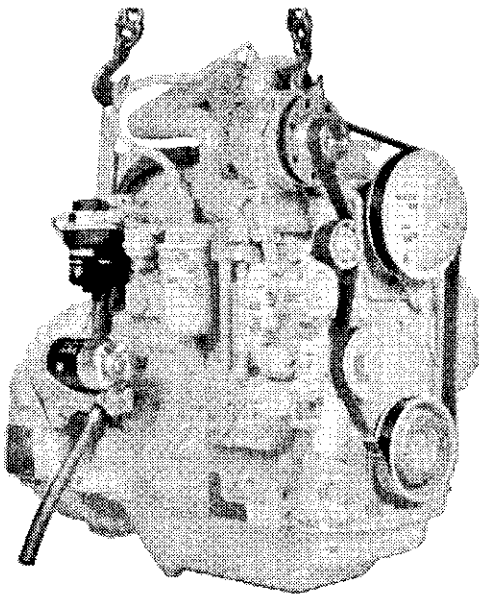
3/4 Right Rear View

RG7636 -UN-



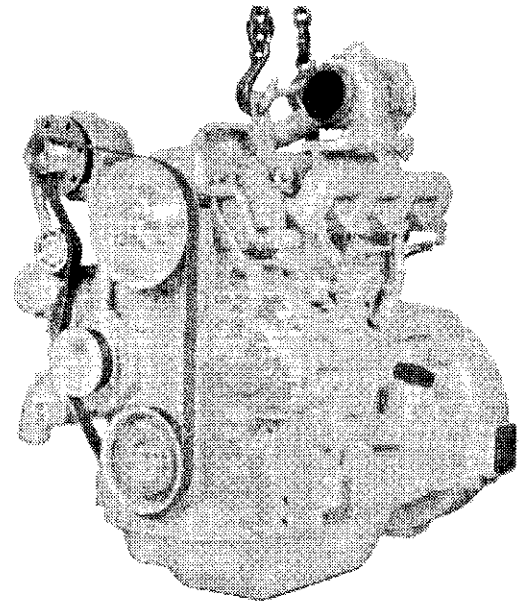
3/4 Left Rear View

RG7638 -UN-



3/4 Right Front View

RG7639 -UN-



3/4 Left Front View

RG7637 -UN-

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Thank you very much  
for your reading.  
Please click here  
to get more information.