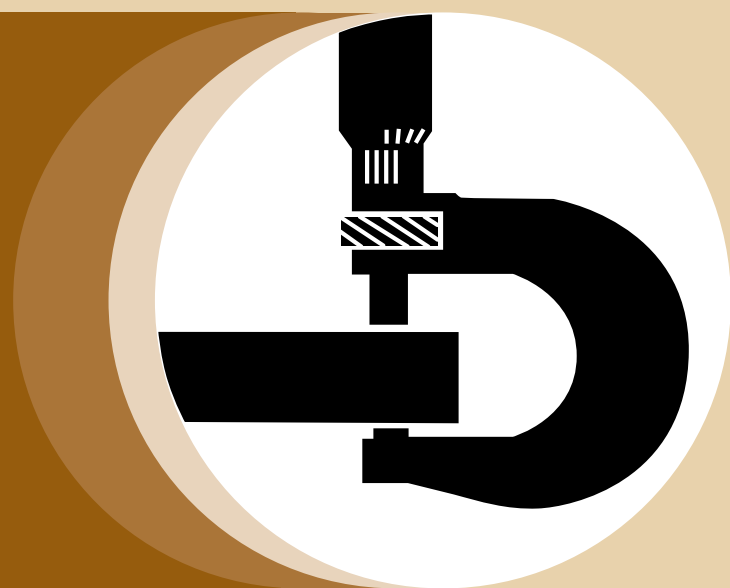


Series 300
3179, 4239, 6359,
4276, and 6414
Diesel Engines

COMPONENT
TECHNICAL
MANUAL



Deere Power Systems Group
CTM4 (28OCT95)

LITHO IN U.S.A.
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 two parts: repair and operation and tests. Repair sections contain

necessary instructions to repair the component. Operation and tests sections 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 tolerances, and torque values.

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.

JOHN DEERE DEALERS

IMPORTANT: The changes listed below make your current CTM obsolete. Discard CTM4, dated 24 Jan 90. Please copy this page and route through your service department.

- Specifications listed at the beginning of each group have been updated.
- Engine model designation and application charts have been updated to include the latest product models. (Group 01.)
- Engine break-in oil information has been added. Engine coolant requirements and specifications have been revised. (Group 02.)
- Methods for properly lifting of engines have been revised and added. (Group 03.)
- Valve clearance checking and adjustment procedure revised to show that these procedures **MUST BE** done with engine **COLD**. Cylinder head removal, inspection, and installation procedures have been revised. (Group 05.)
- Main thrust bearing, compression ring, piston pin length and crankshaft rod journal specifications have been added. Tools required for piston and rod assembly have been updated. Procedures for measuring piston skirt, piston pin bore and piston-to-liner clearance have been revised. (Group 10.)
- Specifications for six-piece thrust bearing and main bearing cap screw torque for Dubuque and Saran-built engines have been added. (Group 15.)
- Crankshaft gear removal and installation procedures, crankshaft grinding guidelines and specifications chart have been revised. (Group 15.)
- Procedures for installing upper idler shaft for Saran engines requiring a special washer has been added. (Group 16.)
- Procedures for both aluminum and composite material timing gear covers have been added. (Group 16.)
- Description of standard-flow and high-flow oil coolers have been added. (Group 20.)
- Procedures for identifying and installing the oil bypass valve, which reflect a new design configuration have been added. (Group 20.)
- Water pump procedures have been revised to reflect a unitized (one-piece) water seal. (Group 25.)
- Checking Water Pump Cap Screw Protrusion procedure has been added for Saran 4-and 6-cylinder OEM engines. (Group 25.)
- Removal and installation procedures for the aftercooler have been added. (Group 30.)
- Turbocharger radial bearing clearance and axial bearing endplay procedures have been revised. (Group 30.)
- Engine break-in procedures have been revised. (Group 100.)
- Removal and installation procedures for the fuel shut-off solenoid have been added. Procedures for the removal, repair, and installation of the fuel injection pumps have been revised. (Group 35.)
- Fuel injection pump specifications chart has been updated to include dynamic timing values for all engine models. Procedures for dynamic timing using TIME TRAC® Kit has been added. Check and Adjust Engine Speed procedure for Lucas CAV and Stanadyne pumps have been added. (Group 115.)

ABOUT THIS MANUAL

This Component Technical Manual (CTM4) covers the recommended repair procedures for the following engines:

- All 179 cu. in. (2.9 L), 239 cu. in. (3.9 L), and 359 cu. in. (5.9 L) produced in Saran, France having Engine Serial No. (CD394145—).
- All 239 cu. in. (3.9 L) and 359 cu. in. (5.9 L) produced in Dubuque, Iowa having Engine Serial No. (T0100001—300000).
- All 276 cu. in. (4.5 L) and 414 cu. in. (6.8 L) produced in Dubuque, Iowa having Engine Serial No. (T0100001—300000). These engines have serial number plates with raised letters and numbers, and were manufactured November 1983 or later.

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

This manual contains SI Metric units of measure, followed immediately by the U.S. customary units of measure.

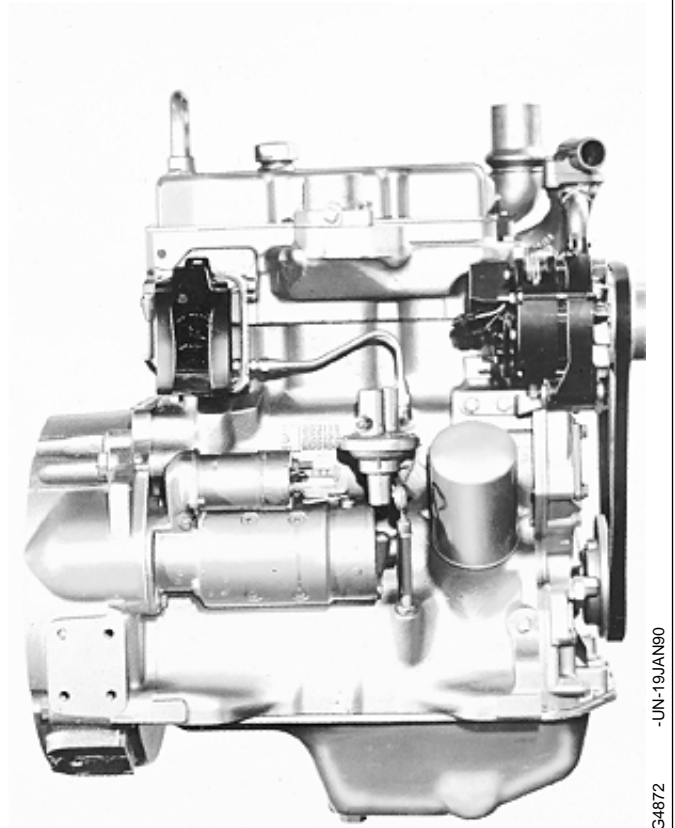
Direction of engine crankshaft rotation in this manual is referenced from facing the flywheel looking toward water pump. Front of engine is water pump end.
NORMAL CRANKSHAFT ROTATION IS COUNTERCLOCKWISE.

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

Read each module completely before performing service to check for differences in procedure 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 300 Series Diesel Engines in this manual.

S11,2000,DF -19-28SEP95

3179D ENGINE IDENTIFICATION

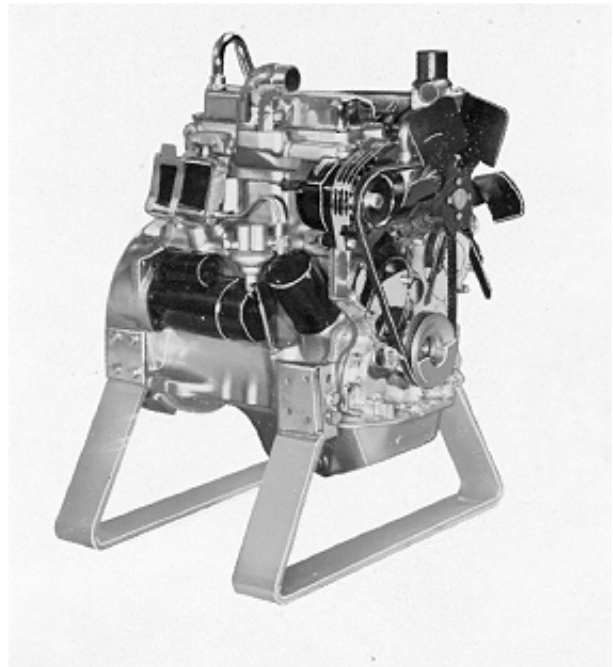


3179D Engine

RG.CTM4,DW610 -19-01NOV95

RG4872 -UN-19JAN90

4276D ENGINE IDENTIFICATION

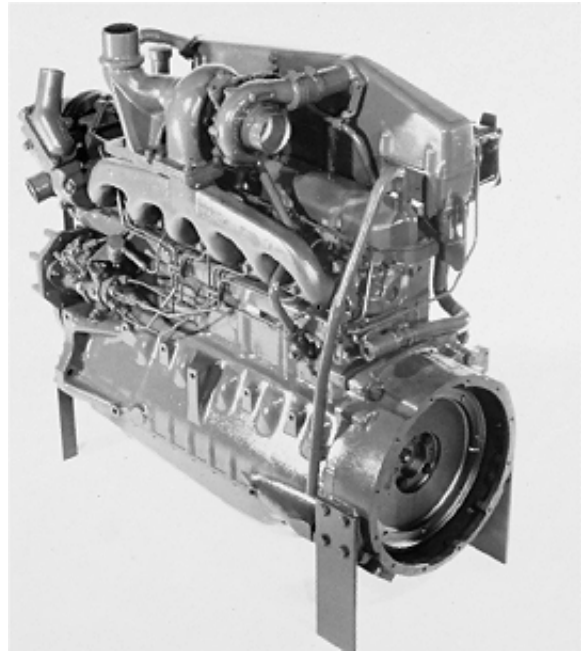


4276D Engine

RG.CTM4,DW611 -19-28SEP95

RG4873 -UN-19JAN90

6359A ENGINE IDENTIFICATION

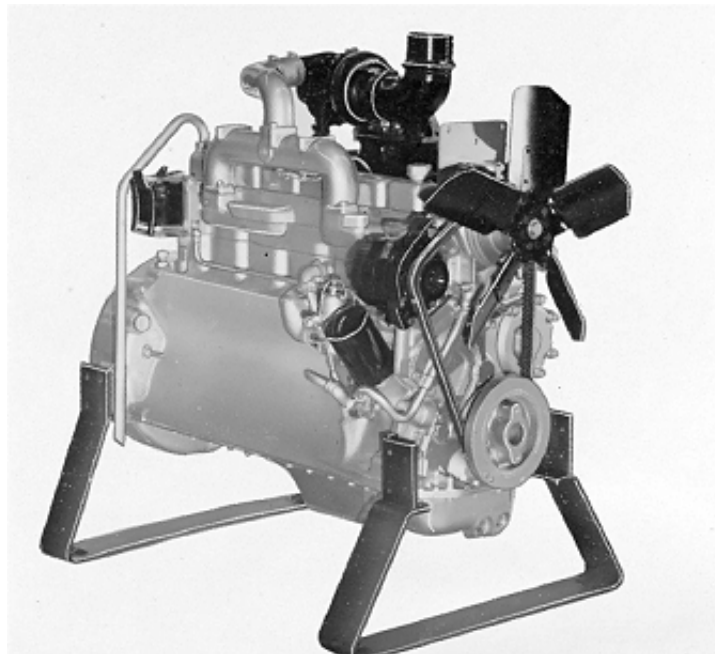


6359A Engine

RG4875
-UN-19JAN90

RG,CTM4,DW612 -19-28SEP95

6359T ENGINE IDENTIFICATION



6359T Engine

RG4874
-UN-19JAN90

RG,CTM4,DW613 -19-28SEP95

Contents

	Page		Page
Group 00—Safety		Group 04—Engine Rebuild Guide	
Group 01—General Information		Engine Disassembly Sequence	04-1
Unified Inch Bolt and Cap Screw Torque Values	01-1	Sealant Application Guidelines	04-2
Metric Bolt and Cap Screw Torque Values	01-2	Engine Assembly Sequence	04-4
Engine Model Designation	01-3	Group 05—Cylinder Head and Valves	
Engine Serial Number Plate Information	01-5	Special or Essential Tools	05-1
Engine Application Chart	01-7	Service Equipment and Tools	05-4
Group 02—Fuels, Lubricants, and Coolant		Specifications	05-5
Diesel Fuel	02-1	Other Material	05-9
Lubricity of Diesel Fuels	02-1	Check and Adjust Valve Clearance	05-10
Engine Break-In Oil	02-2	Measure Valve Lift	05-14
Diesel Engine Oil	02-3	Remove Cylinder Head	05-16
OILSCAN® and COOLSCAN™	02-4	Disassemble and Inspect Rocker Arm Shaft Assembly	05-19
Alternative and Synthetic Lubricants	02-4	Assemble Rocker Arms on Shaft	05-21
Grease	02-5	Clean and Inspect Push Rods	05-21
Engine Coolant Requirements	02-6	Make Preliminary Valve Checks	05-22
Recommended Engine Coolant	02-7	Check Valve Recess in Cylinder Head	05-23
Engine Coolant Specifications	02-9	Remove Valve Assembly	05-23
Replenishing Supplemental Coolant Additives (SCA's)	02-11	Inspect and Measure Valve Springs	05-24
Operating in Tropical Conditions	02-12	Inspect Valve Rotators and Wear Caps	05-24
Flush and Service Cooling System	02-13	Clean Valves	05-25
Disposing of Coolant	02-14	Inspect and Measure Valves	05-25
Group 03—Engine Mounting		Grind Valves	05-26
Engine Repair Stand	03-1	Inspect and Clean Cylinder Head	05-27
Safety Precautions	03-2	Check Cylinder Head Flatness	05-27
Install 300 Series Adapters on Repair Stand	03-3	Measure Cylinder Head Thickness	05-28
Engine Lifting Procedure	03-3	Clean Injection Nozzle Bores	05-28
Clean Engine	03-4	Clean Valve Guides	05-29
Disconnect Turbocharger Oil Inlet Line	03-4	Measure Valve Guides	05-29
Mount Engine on Repair Stand	03-5	Knurl Valve Guides	05-30
Engine Mounted on Repair Stand	03-6	Clean and Inspect Valve Seats	05-30
		Grind Valve Seats	05-31
		Remove Valve Seat Inserts	05-33
		Measure Valve Seat Bore in Cylinder Head	05-34
		Install Valve Seat Inserts	05-35
		Install Valves	05-35

Continued on next page

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	Page		Page
00		Clean and Inspect Connecting Rod Pin Bore	10-32
	05-36	Install Piston Pin Bushing in Connecting Rod	10-32
01	05-36	Inspect and Clean Cylinder Block	10-33
	05-37	Clean Cylinder Liner O-Ring Bore	10-34
	05-38	Measure Cylinder Block Main Bearing Bore	10-34
02	05-39	Measure Camshaft Follower Bore	10-35
	05-39	Measure Camshaft Bearing Bore	10-35
	05-39	Measure Balancer Shaft Bore—4-Cylinder Engines	10-36
03	05-39	Measure Cylinder Block Top Deck Flatness	10-37
	05-40	Inspect Piston Cooling Orifices	10-38
04	05-40	Measure Liner Flange Thickness and Block Counterbore Depth	10-38
	05-41	Recheck Cylinder Liner Standout (Height Above Block)	10-39
	05-41	Install Steel Ball in Oil Passage of Service Cylinder Block	10-41
	05-42	Install Cylinder Liner O-Rings and Packings	10-42
	05-42	Install Cylinder Liner	10-43
	05-45	Assemble Piston and Connecting Rod	10-44
05	05-45	Install Piston Rings	10-45
	05-47	Install Piston and Connecting Rod Assembly	10-46
	05-48	Check Engine Rotation For Excessive Tightness	10-48
	05-49	Measure Piston Protrusion	10-49
10		Complete Final Assembly	10-49
		Group 10—Cylinder Block, Liners, Pistons, and Rods	
15	10-1	Special or Essential Tools	
	10-3	Service Equipment and Tools	
	10-3	Other Material	
	10-4	Specifications	
16	10-8	Remove Pistons and Connecting Rods	
	10-11	Remove Cylinder Liners	
	10-13	Complete Disassembly of Cylinder Block (If Required)	
20	10-14	Preliminary Liner, Piston and Rod Checks	
	10-15	Disassemble Piston and Rod Assembly	
	10-16	Clean Pistons	
25	10-17	Visually Inspect Pistons	
	10-18	Install Piston Pin	
	10-19	Clean Cylinder Liners	
30	10-19	Visually Inspect Cylinder Liners	
	10-20	Check Piston Ring Groove Wear	
	10-21	Measure Piston Skirt	
	10-22	Determine Piston-to-Liner Clearance	
35	10-23	Deglaze Cylinder Liners	
	10-24	Replace Piston and Liner Sets	
	10-25	Determine Piston Type	
100	10-26	Measure Piston Protrusion	
	10-27	Inspect and Measure Connecting Rod Bearings	
	10-29	Inspect Rod and Cap	
105	10-30	Inspect Piston Pins and Bushings	
	10-31	Remove Piston Pin Bushing	
		Group 15—Crankshaft, Main Bearings, and Flywheel	
	15-1	Special or Essential Tools	
	15-4	Service Equipment and Tools	
	15-5	Specifications	
	15-8	Other Material	
	15-9	Crankshaft and Main Bearing Failure Analysis	
	15-10	Inspect Vibration Damper (6-Cylinder Engine)	
	15-11	Remove Pulley or Vibration Damper Pulley	
	15-12	Install Pulley or Vibration Damper Pulley	
	15-13	Checking Vibration Damper or Pulley (Front PTO)	
	15-14	Removing Vibration Damper or Pulley (Front PTO)	

Continued on next page

	Page		Page
Install Vibration Damper or Pulley (Front PTO)	15-15	Remove Timing Gear Cover	16-13
Replace Front Crankshaft Oil Seal (Without Removing Cover)	15-16	Remove Auxiliary Drive Gears	16-14
Check Crankshaft End Play	15-19	Measure Camshaft End Play	16-14
Inspect Flywheel	15-20	Measure Balancer Shaft End Play—4-Cylinder Engines	16-15
Check Flywheel Housing Face Runout	15-20	Measure Timing Gear Backlash	16-16
Check Flywheel Face Flatness	15-21	Measure Idler Gear End Play	16-17
Remove Flywheel	15-21	Remove Camshaft	16-17
Replace Flywheel Ring Gear	15-22	Visually Inspect Camshaft	16-18
Install Flywheel	15-23	Measure Camshaft Thrust Plate Clearance	16-19
Crankshaft Rear Oil Seal and Wear Sleeve General Information	15-24	Inspect and Measure Camshaft Bearing Bore ID and Journal OD	16-19
Remove Two-Piece Crankshaft Oil Seal and Wear Sleeve	15-24	Measure Camshaft Lobe Height	16-20
Remove Unitized Crankshaft Rear Oil Seal and Wear Sleeve	15-27	Remove and Install Camshaft Gear	16-20
Install Crankshaft Rear Oil Seal and Wear Sleeve	15-28	Inspect Camshaft Followers	16-21
Remove Flywheel Housing	15-30	Replace Tachometer Drive Gear	16-22
Remove Crankshaft Main Bearings	15-30	Remove Balancer Shafts—If Equipped (4-Cylinder Engines)	16-23
Check Main Bearing Clearance	15-31	Inspect and Measure Balancer Shaft Bushings and Journals	16-24
Remove and Install Crankshaft Gear with Crankshaft Installed	15-32	Remove and Install Balancer Shaft Bushings in Block	16-25
Remove Crankshaft	15-33	Install Oversize Balancer Shaft Bushings in Block—4239 Engines	16-26
Remove Crankshaft Rear Wear Sleeve with Crankshaft Removed	15-34	Inspect Balancer Shaft Gears and Thrust Plates	16-27
Inspect Crankshaft	15-35	Remove and Install Balancer Shaft Gears	16-28
Measure Assembled ID of Bearings and OD of Crankshaft Journal	15-36	Remove Balancer Shaft	16-29
Measure Main Thrust Journal Width and Thrust Bearing Width	15-37	Remove Cylinder Block Front Plate	16-29
Crankshaft Grinding Guidelines	15-38	Measure Idler Gear Bushing and Shaft	16-31
Crankshaft Grinding Specifications	15-40	Remove and Install Idler Gear Bushings	16-31
Measure Assembled ID of Main Bearing Caps	15-40	Remove Lower and Upper Idler Shafts	16-32
Inspect Piston Cooling Orifices	15-42	Clean and Inspect Front Plate	16-33
Install Main and Thrust Bearing Inserts in Block	15-43	Replace Engine Front Plate	16-34
Install Crankshaft	15-44	Transfer Fuel Injection Pump Timing Mark Onto Replacement Front Plate	16-35
Install Flywheel Housing	15-46	Install Idler Shaft Spring Pins	16-35
Complete Final Assembly	15-48	Install Upper Idler Shaft in Front Plate	16-36
		Install Lower Idler Shaft in Front Plate	16-36
		Install Engine Front Plate	16-38
		Install and Time Balancer Shafts—If Equipped (4-Cylinder Engines)	16-39
		Install and Time Camshaft and Fuel Injection Pump	16-42
		Clean and Inspect Timing Gear Cover	16-44
		Install Ball Bearings and Dowels	16-44
		Install Drive Gear	16-45
		Install Timing Gear Cover	16-46
		Install Crankshaft Front Oil Seal	16-49
Group 16—Camshaft, Balancer Shafts, and Timing Gear Train			
Special or Essential Tools	16-1		
Service Equipment and Tools	16-3		
Other Materials	16-3		
Specifications	16-4		
Auxiliary Gear Drive Specifications	16-10		
Measure Valve Lift	16-11		

Continued on next page

110

115

199

INDX

110

Install Idler Gear and Output Gear	16-50
Complete Final Assembly	16-51

115

Group 20—Lubrication System

Special or Essential Tools	20-1
Service Equipment and Tools	20-2
Other Material	20-2
Specifications	20-3
Engine Crankcase Oil Fill Quantities	20-6
Identify Oil Cooler Type—3179, 4239, 6359 Engines	20-14
Remove, Inspect, & Install Standard-Flow Oil Cooler (3179, 4239, 6359)	20-14
Remove and Install High-Flow Oil Cooler (6359 Engines)	20-15
Remove Distributor Base—High-Flow Cooler (6359)	20-16
Inspect and Repair Distributor Base—High Flow Oil Cooler (6359)	20-16
Install Distributor Base—High-Flow Oil Cooler (6359)	20-17
Remove Oil Cooler (4276, 6414 Engines)	20-17
Repair Oil Cooler (4276, 6414 Engines)	20-17
Install Oil Cooler (4276, 6414 Engines)	20-18
Remove and Inspect Oil Bypass Valve (3179, 4239, 6359 Engines)	20-19
Measure Oil Bypass Valve Length and Cylinder Block Bore	20-20
Install Oil Bypass Valve (3179, 4239, 6359 Engines)	20-20
Remove and Install Oil Cooler/Filter Bypass Valve (4276, 6414 Engines)	20-21
Remove & Install Oil Pressure Regulating Valve/Seat (3179, 4239, 6359)	20-21
Remove, Inspect and Install Oil Pressure Regulating Valve (4276, 6414)	20-22
Repair Oil Pressure Regulating Valve (4276, 6414 Engines)	20-23
Remove Oil Filter Adapter (3179, 4239, 6359 Engines)	20-24
Install Oil Filter Adapter (3179, 4239, 6359 Engines)	20-25
Remove, Install, and Adjust Dipstick Tube	20-26
General Oil Pump Information	20-26
Replace Oil Pump Pick-Up Tube Assembly	20-27
Remove Standard Capacity Oil Pump	20-27
Inspect and Measure Clearances (Standard Capacity Oil Pump)	20-28

199

INDX

Complete Standard Capacity Oil Pump Disassembly	20-29
Assemble Standard Capacity Oil Pump	20-30
Install Standard Capacity Oil Pump	20-31
Remove High Capacity Oil Pump	20-33
Inspect and Measure Clearances (High Capacity Oil Pump)	20-34
Complete High Capacity Oil Pump Disassembly	20-35
Assemble High Capacity Oil Pump	20-36
Install High Capacity Oil Pump	20-36
Install Oil Pan	20-38

Group 25—Cooling System

Special or Essential Tools	25-1
Service Equipment and Tools	25-1
Other Material	25-2
Specifications	25-3
Remove, Test, and Install Thermostats	25-10
Remove and Install Thermostat Housing/Water Manifold	25-11
General Water Pump Information	25-13
Remove Low Flow (Standard Duty) Water Pump	25-14
Disassemble Low Flow (Standard Duty) Water Pump	25-15
Inspect and Clean Low Flow (Standard Duty) Water Pump Parts	25-17
Assemble Low Flow (Standard Duty) Water Pump	25-18
Install Low Flow (Standard Duty) Water Pump	25-21
Remove High Flow (Heavy-Duty) Water Pump	25-22
Disassemble High Flow (Heavy-Duty) Water Pump	25-22
Inspect and Clean High Flow (Heavy-Duty) Water Pump Parts	25-26
Assemble High Flow (Heavy-Duty) Water Pump	25-27
Checking Water Pump Cap Screw Protrusion	25-31
Install High Flow (Heavy-Duty) Water Pump	25-33
Inspect and Install Fan Blade Assembly	25-34
Remove Coolant Heater—If Equipped	25-34
Install Coolant Heater—If Equipped	25-35

Group 30—Air Intake and Exhaust System

Other Material	30-1
Specifications	30-1

Continued on next page

Contents

	Page		Page
Extending Turbocharger Life	30-3	Repair Sofabex and AC Fuel Supply Pumps	35-13
Remove Turbocharger—4239T and 6359T & A Engines	30-5	Repair Corona Fuel Supply Pump	35-13
Turbocharger Failure Analysis	30-7	Install Fuel Supply Pump	35-15
Turbocharger Seven-Step Inspection	30-9	Fuel Injection Pump Timing	35-15
Perform Radial Bearing Clearance Test—K.K.K.	30-13	Fuel Injection Pump—General Information	35-16
Perform Axial Bearing End Play Test—K.K.K.	30-14	Remove Roto Diesel/Lucas CAV Fuel Injection Pump	35-17
Perform Radial Bearing Clearance Test—AiResearch/Garrett	30-14	Repair Roto Diesel/Lucas CAV Fuel Injection Pump	35-20
Perform Axial Bearing End Play Test—AiResearch/Garrett	30-15	Install Roto Diesel/Lucas CAV Fuel Injection Pump	35-21
Repair Turbocharger	30-16	Timing Roto Diesel/Lucas CAV Injection Pump (Front Plate Installed)	35-24
Disassemble and Inspect Turbocharger	30-17	Remove Stanadyne Pump—Model JDB & DB2 (Non-Retained Drive Shaft)	35-27
Replace Center Housing and Rotating Assembly	30-18	Remove Stanadyne Model JDB & DB2 Pump with Non-Retained Drive Shaft	35-28
Prelube Turbocharger	30-19	Repair Stanadyne Model JDB and DB2 Fuel Injection Pump	35-30
Install K.K.K. and AiResearch/Garrett Turbocharger	30-19	Install Non-Retained Drive Shaft in Stanadyne Model JDB & DB2 Pump	35-30
Turbocharger Break-In	30-21	Install Stanadyne Model JDB & DB2 Pump with Non-Retained Drive Shaft	35-31
Remove, Inspect, and Install Intake Manifold	30-22	Remove Stanadyne Model DB2 (Retained Drive Shaft) & DB4 Injection Pump	35-34
Remove Cross-Over Tube Assembly—If Equipped	30-23	Inspect Injection Pump Drive Gear I.D. and Shaft O.D.	35-38
Inspect and Repair Cross-Over Tube Assembly—If Equipped	30-23	Repair Stanadyne Fuel Injection Pump	35-38
Install Cross-Over Tube Assembly—If Equipped	30-24	Install Stanadyne Model DB2 (Retained Drive Shaft) and DB4 Pump	35-39
Remove Aftercooler and Intake Manifold (6359A)	30-25	Remove Stanadyne Model DM4 Fuel Injection Pump	35-42
Inspect and Repair Aftercooler (6359A)	30-26	Repair Stanadyne Fuel Injection Pump	35-43
Inspect and Repair Intake Manifold (6359A)	30-26	Install Stanadyne Model DM4 Fuel Injection Pump	35-44
Install Intake Manifold and Aftercooler (6359A)	30-27	Replace Engine Front Plate	35-46
Remove, Inspect, and Install Exhaust Manifold	30-28	Transfer Fuel Injection Pump Timing Mark onto Replacement Front Plate	35-47
Group 35—Fuel System		Aneroid Replacement	35-48
Special or Essential Tools	35-1	Aneroid Field Adjustment	35-48
Service Equipment and Tools	35-3	Aneroid Workshop Adjustment	35-49
Other Material	35-4	Remove Fuel Injection Nozzles	35-50
Specifications	35-5	Clean Fuel Injection Nozzle Bore	35-51
Relieve Fuel System Pressure	35-8	Clean Injection Nozzles	35-52
Replace Fuel Filter	35-9	Diagnose Injection Nozzle Malfunction	35-53
Remove Fuel Supply Pump	35-10	Test Injection Nozzles	35-55
Bench Test Fuel Supply Pump	35-11	Disassemble Injection Nozzles	35-58
		Inspect and Clean Nozzle Body	35-59

Continued on next page

	Page		Page
Inspect and Clean Valve and Valve Seat	35-60	Pressure Test Cooling System and Radiator Cap	105-25
Inspect Valve Adjusting Mechanism	35-62	Inspect Thermostat and Test Opening Temperature	105-26
Assemble Injection Nozzles	35-63		
Adjust Fuel Injection Nozzles	35-63		
Install Seals on Injection Nozzle	35-66		
Install Injection Nozzles	35-66		
Repair Leak-Off Line Assembly	35-67		
		Group 110—Air Intake System Operation and Tests	
Group 100—Engine Tune-Up and Break-In		Special or Essential Tools	110-1
Special or Essential Tools	100-1	Service Equipment and Tools	110-1
Effects of Altitude and Temperature on Engine Performance	100-1	Test Specifications	110-2
Preliminary Engine Testing	100-2	Diagnosing Air Intake Malfunctions	110-3
General Tune-Up Recommendations	100-3	How the Air Intake and Exhaust System Works	110-4
Dynamometer Test	100-4	Air Cleaner Operation	110-5
Dynamometer Test Specifications	100-5	Diagnosing Turbocharger Malfunctions	110-6
Engine Break-In Guidelines	100-9	How the Turbocharger is Lubricated	110-7
Perform Engine Break-In	100-10	Turbocharger Operation	110-7
Check Crankcase Ventilation System	100-11	How the Aftercooler Works	110-8
Check Air Intake System	100-11	Check Intake Manifold Pressure (Turbo Boost)	110-9
Check Exhaust System	100-11	Air Filter Restriction Indicator Switch Test	110-10
Check and Service Cooling System	100-12		
Check Electrical System	100-13		
		Group 115—Fuel System Operation and Tests	
Group 105—Engine System Operation and Tests		Special or Essential Tools	115-1
Special or Essential Tools	105-1	Service Equipment and Tools	115-2
Engine Test Specifications	105-3	Fuel System Test Specifications	115-3
Engine—Sectional View	105-4	Saran Fuel Injection Pump Specifications	115-4
General Engine Description	105-5	Dubuque Fuel Injection Pump Specifications	115-7
How the Lubrication System Works—4239T Shown	105-6	Fuel Injection Pump Timing	115-9
Oil Cooler Operation—4276 and 6414 Engines	105-8	Check and Adjust Injection Pump Dynamic Timing	115-9
How the Cooling System Works—Standard Flow Oil Cooler	105-9	Check Roto Diesel/Lucas CAV Injection Pump Static Timing	115-17
How the Cooling System Works—High-Flow Oil Cooler	105-10	Check Stanadyne DB2 Pump Static Timing	115-20
How the Crankshaft Gear-Drive Auxiliary Drive Works	105-11	Check Stanadyne JDB Injection Pump Static Timing	115-21
Head Gasket Joint Construction and Operation	105-13	Check Stanadyne DM4 Injection Pump Static Timing	115-22
Diagnosing Head Gasket Joint Failures	105-14	Fuel System Operation	115-24
Head Gasket Inspection and Repair Sequence	105-17	Diagnose Fuel System Malfunctions	115-25
Diagnosing Engine Malfunctions	105-19	Fuel Supply Pump Operation—If Equipped	115-29
Test Engine Compression Pressure	105-22	Diagnose Supply Pump Malfunction	115-30
Check Engine Oil Pressure	105-23	Measure Fuel Supply Pump Pressure—If Equipped	115-31
Measure Engine Crankcase Pressure (Blow-By)	105-24	Rectangular Final Fuel Filter Operation	115-32
		Bleed the Fuel System	115-33
		Continued on next page	

	Page
Roto Diesel/Lucas CAV Fuel Injection Pump	
Operation	115-36
Stanadyne DM4 Fuel Injection Pump	
Operation	115-38
Stanadyne DB2/DB4 Fuel Injection Pump	
Operation	115-40
Diagnose Fuel Injection Pump	
Malfunctions	115-42
Check and Adjust Engine Speeds on	
Lucas CAV Pump	115-43
Adjust Variable Speed on Generator Set	
Engines (Lucas CAV)	115-44
Check and Adjust Engine Speeds on	
Stanadyne Pump	115-45
Adjust Variable Speed on Generator Set	
Engines—Stanadyne	115-46
Changing Gen Set Engine Rated	
Speed—Stanadyne	115-47
Fuel Injection Nozzles—General	
Information/Operation	115-49
Diagnose Malfunction—Fuel Injection	
Nozzle	115-50
Test Fuel Injection Nozzles (Engine	
Running)	115-51
Fuel Drain Back Test Procedure	115-51
Group 199—Dealer Fabricated Tools	
How to Make Tools	199-1
DFRG2—Injection Pump Front Plate	
Timing Mark Transfer Tool	199-1
DFRG3—Cylinder Liner Holding Fixture	199-2

Index

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.



DX,FLAME -19-04JUN90

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-UN-23AUG88
TS227

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).



DX,SPARKS -19-03MAR93

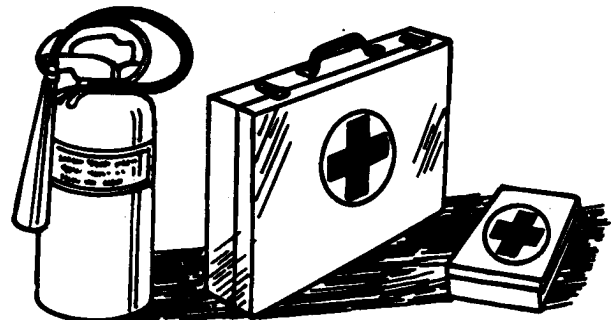
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TS204

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.



DX,FIRE2 -19-03MAR93

-UN-23AUG88
TS291

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:

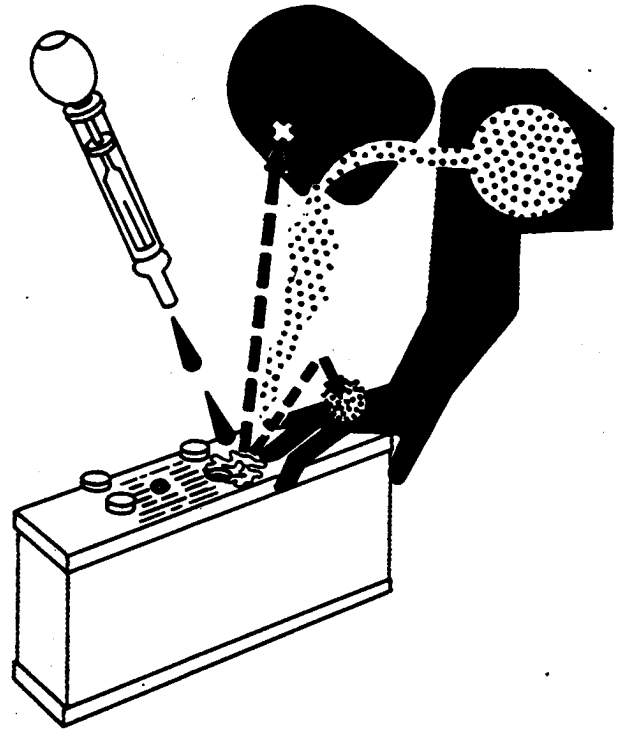
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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.



T5203 -UN-23AUG88

DX,POISON -19-21APR93

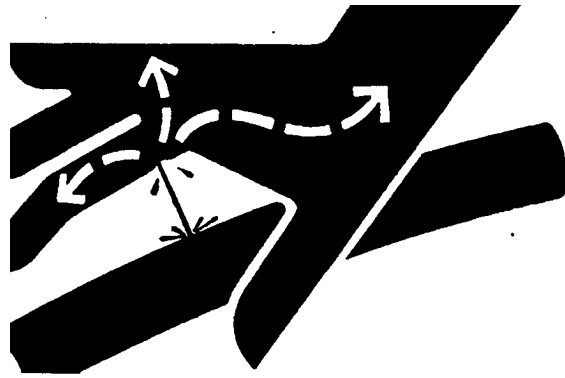
AVOID HIGH-PRESSURE FLUIDS

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.



DX,FLUID -19-03MAR93

X9811 -UN-23AUG88

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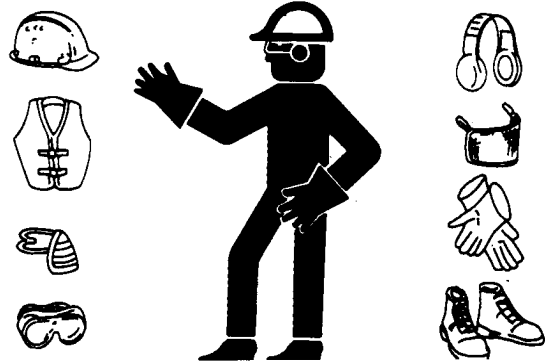
WEAR PROTECTIVE CLOTHING

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.



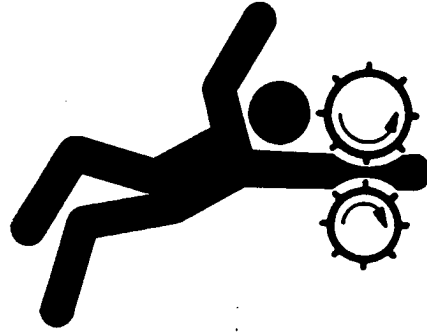
DX,WEAR -19-10SEP90

TS206 -UN-23AUG88

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.



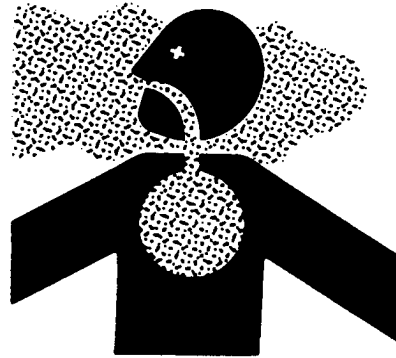
DX, LOOSE -19-04JUN90

TS228 -UN-23AUG88

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.



DX, AIR -19-04JUN90

TS220 -UN-23AUG88

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.



DX, LIGHT -19-04JUN90

TS223 -UN-23AUG88

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.



DX,PAINT -19-03MAR93

TS220 -UN-23AUG88

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.



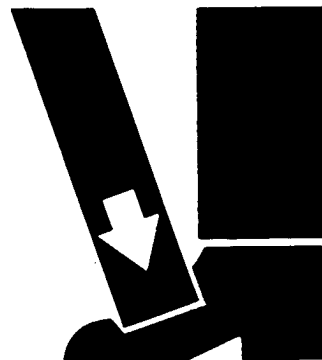
DX,TORCH -19-03MAR93

TS953 -UN-15MAY90

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.



DX,LIFT -19-04JUN90

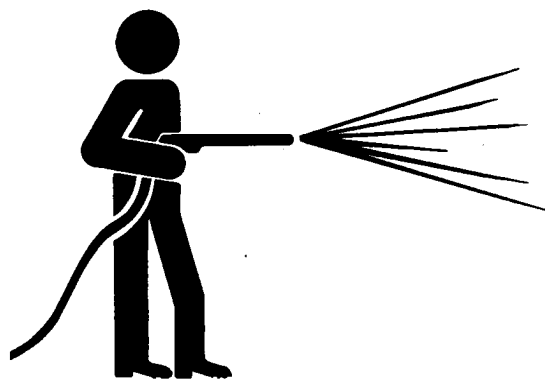
TS226 -UN-23AUG88

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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.



DX,CLEAN -19-04JUN90

T6642EJ -UN-18OCT88

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.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.



DX,SERV -19-03MAR93

TS218 -UN-23AUG88