

300 Series OEM Engines



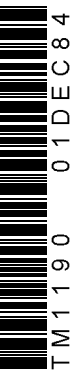
JOHN DEERE

TECHNICAL MANUAL 300 Series OEM Engines

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John Deere Engine Works
TM1190 (01DEC84)

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ENGLISH



300 SERIES OEM ENGINES

Technical Manual
TM-1190 (Dec-84)

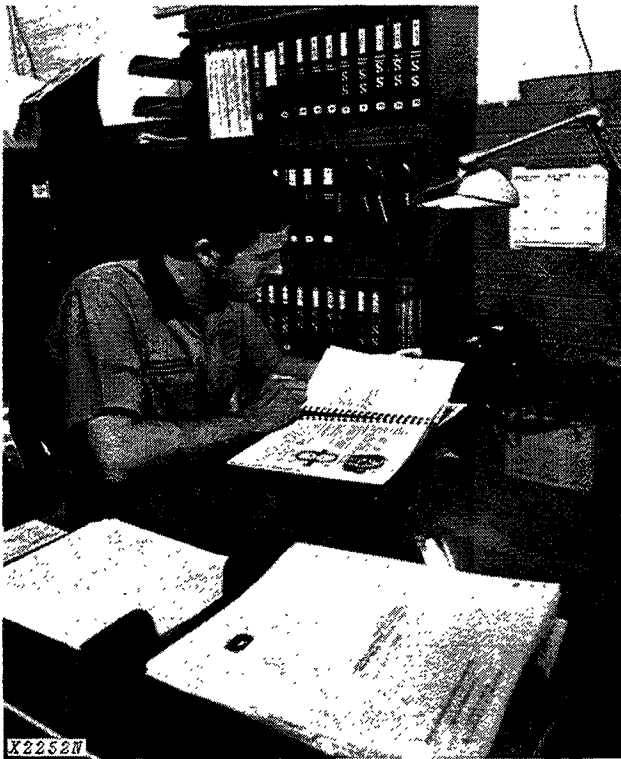
SECTIONAL CONTENTS OF THIS MANUAL

Section I - General Information	1
Section 4 - Engine	4
Section 5 - Engine Auxiliary Systems	5
Section 16 - Electrical Systems	16
Section 19 - Sheet Metal and Styling	19
Section 40 - PTO Drive	40
Section 90 - System Testing	90

The specifications and design information contained in this manual were correct at the time it was printed. It is John Deere's Policy to continually improve and update our machines. Therefore, the specifications and design information are subject to change without notice. Wherever applicable, specifications and design information are in accordance with SAE and ICED standards.

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INTRODUCTION



Use FOS Manuals for Reference



Use Technical Manuals for Actual Service

This technical manual is part of a twin concept of service:

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

•FOS Manuals—for reference

Fundamentals of Service (FOS) Manuals cover basic theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new personnel and for reference by experienced service technicians.



When a service technician should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.

•Technical Manuals—for actual service

Technical Manuals are *concise* service guides for a *specific* machine. Technical manuals are on-the-job guides containing only the vital information needed by an experienced service technician.

This technical manual was planned and written for you—an experienced service technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Some features of this manual:

- Inside front cover - "Table of Contents".
- Section I - Contents
- Sections 4 through 40 - Removal, repair, testing (components removed), installation, and adjustment.
- Section 90 - Detailed explanation of system operation, diagnosis, visual inspection, testing, and adjustments.
- Specifications grouped and illustrated at the end of each section.

SECTION AND GROUP CONTENTS OF THIS MANUAL

SECTION I - GENERAL INFORMATION

Group I - Contents

SECTION 4 - ENGINE

Group 0400 - Removal and Installation
Group 0401 - Crankshaft and Main Bearings
Group 0402 - Camshaft and Valve Actuating Means
Group 0403 - Connecting Rods and Pistons
Group 0404 - Cylinder Block
Group 0407 - Oiling System
Group 0408 - Ventilating System
Group 0409 - Cylinder Head and Valves
Group 0410 - Exhaust Manifold
Group 0413 - Fuel Injection System
Group 0414 - Intake Manifold
Group 0415 - Engine Balancer
Group 0416 - Turbocharger
Group 0417 - Water Pump
Group 0418 - Thermostats, Housing and Piping
Group 0419 - Engine Oil Cooler
Group 0420 - Fuel Filter
Group 0421 - Fuel Transfer Pump
Group 0422 - Starting Motor and Fastening
Group 0423 - Alternator and Generator Mountings
Group 0429 - Fan Drive
Group 0433 - Flywheel, Housing and Fastenings
Group 0499 - Specifications and Special Tools

SECTION 5 - ENGINE AUXILIARY SYSTEMS

Group 0510 - Cooling Systems
Group 0515 - Speed Controls
Group 0520 - Intake Systems
Group 0599 - Specifications and Special Tools

SECTION 16 - ELECTRICAL SYSTEMS

Group 1672 - Alternator, Regulator and Charging System Wiring
Group 1674 - Wiring Harness and Switches
Group 1676 - Instruments and Indicators
Group 1699 - Specifications and Special Tools

SECTION 19 - SHEET METAL AND STYLING

Group 1910 - Hood or Engine Enclosure

SECTION 40 - PTO DRIVE

Group 4052 - PTO Clutch
Group 4099 - Specifications and Special Tools

SECTION 90 - SYSTEM TESTING

Group 9010 - Engine
Group 9015 - Electrical System
Group 9035 - Specifications and Special Tools

OEM ENGINES SERVICED BY THIS TECHNICAL MANUAL

3-164D
3-179D
4-219D
4-239D
4-239T
4-276D

4-276T
6-329D
6-359D
6-359T
6-414D
6-414T

Accessible Hardware Torque Values

The table below gives correct torque values for various bolts and cap screws. The table lists torques in the U.S. unit of measure (lb-ft), SI metrics (Nm) and conventional metrics (kg/m). Most hardware used is high-strength (note dashes on hex. heads).




The types of bolts and cap screws are identified by head markings as follows:

Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

6-Dash Head: tempered steel extra high-strength bolts and cap screws.

Machine bolts and cap screws 7/8-inch (22.2 mm) and larger are sometimes formed hot rather than cold, which accounts for the lower torque.

RECOMMENDED TORQUE - COARSE AND FINE THREADS									
									
BOLT DIAMETER	PLAIN HEAD			THREE DASHES			SIX DASHES		
	LB-FT	Nm	Kg-m	LB-FT	Nm	Kg-m	LB-FT	Nm	Kg-m
1/4	NOT USED	NOT USED	NOT USED	10	14	1	14	19	2
5/16	NOT USED	NOT USED	NOT USED	20	27	3	30	41	4
3/8	NOT USED	NOT USED	NOT USED	35	47	5	50	68	7
7/16	35	47	5	55	75	8	80	108	11
1/2	55	75	8	85	115	12	120	163	17
9/16	75	102	10	130	176	18	175	237	24
5/8	105	142	15	170	230	24	240	325	33
3/4	185	251	26	300	407	42	425	576	59
7/8	160	217	22	445	603	62	685	929	95
1	250	339	35	670	908	93	1030	1396	142
1-1/8	330	447	46	910	1234	126	1460	1979	202
1-1/4	480	651	66	1250	1695	173	2060	2793	285

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ALPHABETICAL INDEX

A		
Air cleaner	0520-1	
Alternator and generator mounting	0423-1	
Alternator, regulator and charging system wiring	1672-3	
Amp meter	1676-2	
B		
Balancer shafts	0415-1	
C		
Camshaft and valve actuating means	0402-1	
Charging circuit testing (Delco-Remy alternator)	9015-8	
Charging circuit testing (Motorola alternator)	9015-5	
Connecting rods and pistons	0403-1	
Cooling manifold	0418-1	
Cooling system, engine	0510-3	
Crankshaft and main bearings	0401-1	
Crankshaft front oil seal	0402-3	
Crankshaft front wear ring	0401-6	
Crankshaft gear	0401-5	
Crankshaft rear oil seal	0401-6	
Crankshaft rear wear ring	0401-6	
Crankshaft pulley	0429-2	
Cylinder block	0404-1	
Cylinder head and valves	0409-1	
D		
Delco-Remy alternator	1672-3	
Delco-Remy starting motor	0422-1	
Diagnosing malfunctions:		
Engine system testing	9010-5	
Dipstick	0407-18	
E		
Electrical schematic	9015-11	
Electrical system	1672-1	
Electrical system testing	9015-1	
Charging circuit	9015-5	
Starting circuit	9015-1	
Engine:		
Alternator and generator mounting	0423-1	
Camshaft and valve actuating means	0402-1	
Connecting rods and pistons	0403-1	
Crankshaft and main bearings	0401-1	
Cylinder block	0404-1	
Cylinder head and valves	0409-1	
Engine balancer	0415-1	
Exhaust manifold	0410-1	
Fan drive	0429-1	
Flywheel, housing and fastenings	0433-1	
Engine:—Continued		
Fuel filter	0420-1	
Fuel injection system	0413-1	
Fuel transfer pump	0421-1	
Intake manifold	0414-1	
Oil cooler	0419-1	
Oiling system	0407-1	
Removal and installation	0400-5	
Starting motor and fastenings	0422-1	
Thermostats, housings and water piping	0418-1	
Turbocharger	0416-1	
Ventilating system	0408-1	
Water pump	0417-1	
Engine auxiliary systems:		
Cooling system	0510-3	
Intake system	0520-1	
Speed controls	0515-1	
Engine removal and installation	0400-5	
Engine system testing and adjustments:		
Compression pressure test	9010-9	
Engine cooling system test	9010-11	
Engine oil pressure test	9010-10	
Engine performance test using turbocharger boost pressure	9010-14	
Fuel transfer pump pressure test	9010-11	
Governor speed droop adjustment	9010-11	
Injection pump cam advance	9010-13	
Speed control linkage adjustment	9010-12	
Exhaust manifold	0410-1	
F		
Fan belt	0429-1	
Fan drive	0429-1	
Filter, fuel	0420-1	
Flywheel, housing and fastenings	0433-2	
Fuel filter	0420-1	
Fuel injection nozzles	0413-20	
Fuel injection pump	0413-1	
Fuel transfer pump	0421-1	
G		
Gauge, pressure	1676-3	
Gauge, temperature	1676-3	
H		
Hood	1910-3	
Hour meter	1676-2	

I

Instruments and indicators 1676-1
Amp meter 1676-2
Hour meter 1676-2
Pressure gauge 1676-3
Safety switch 1676-4
Tachometer 1676-1
Temperature gauge 1676-3
Intake manifold 0414-1
Intake system 0520-1

J

John Deere starting motor 0422-11

M

Malfunctions, diagnosing:
Engine system testing 9010-5
Manifold, exhaust 0410-1
Manifold, intake 0414-1
Motorola alternator 1672-9

N

Nozzle, fuel injection 0413-11

O

Oil bypass valve 0407-4
Oil cooler, engine 0419-1
3-164D, 4-219D, 4-239D, 4-239T, 6-329D,
6-359D and 6-359T engines 0419-1
4-276D, 4-276T, 6-414D and
6-414T engines 0419-3
Oil filter 0407-1
Oil filter nipple 0407-2
Oiling system, engine 0407-1
Oil pan 0407-4
Oil pressure control valve 0407-5
Oil pump 0407-10

P

Pressure gauge 1676-3
PTO clutch 4052-3
Pump, engine oil 0407-1
Pump, engine water 0417-1
Pump, fuel injection 0413-1
Pump, fuel transfer 0421-1

R

Radiator 0510-3
Rocker arms and push rods 0402-17
Rods and pistons 0403-1

S

Safety switch 1676-4
Special tools:
Camshaft and valve actuating means 0499-94
Connecting rods and pistons 0499-96
Crankshaft and main bearings 0499-93
Cylinder block 0499-97
Cylinder head and valves 0499-99
Electrical system 1699-4
Electrical system testing 9035-8
Engine balancer 0499-103
Engine removal and installation 0499-92
Engine system testing 9035-4
Fuel injection system 0499-101
Oiling system, engine 0499-98
Starting motor and fastenings 0499-106
Turbocharger 0499-104
Water pump 0499-105
Specifications and torque values:
Camshaft and valve actuating means 0499-4
Connecting rods and pistons 0499-11
Crankshaft and main bearings 0499-2
Cylinder block 0499-15
Cylinder head and valves 0499-23
Electrical system 1699-1
Electrical system testing 9035-6
Engine balancer 0499-79
Engine break-in 0499-1
Engine cooling system 0599-1
Engine system testing 9035-1
Fan drive 0499-90
Flywheel, housing and fastenings 0499-90
Fuel injection system 0499-27
Intake manifold 0499-78
Oil cooler, engine 0499-84
Oiling system, engine 0499-17
PTO clutch 4099-1
Starting motor and fastenings 0499-85
Thermostats, housings and water
piping 0499-83
Turbocharger 0499-80
Water pump 0499-81
Speed controls, engine 0515-1
Starting circuit testing 9015-1
Starting motor, Delco-Remy 0422-1
Starting motor, John Deere 0422-11
Switch, safety 1676-4

T

Tachometer	1676-1
Temperature gauge	1676-3
Tests and adjustments:	
Alternator components	1672-14
Electrical system	9015-1
Engine system	9010-9
Starting motor, Delco-Remy	0422-1
Starting motor, John Deere	0422-12
Turbocharger	0416-2
Thermostats, housings and water piping	0418-1
Timing gear	0402-9
Timing gear cone	0402-2
Turbocharger	0416-1

V

Ventilating system	0408-1
Vertical tachometer drive	0433-1
Vibration damper	0401-8

W

Water pump	0417-1
Wiring harness and switches	1674-1
Wiring diagram	9015-12

Section 4 ENGINE

CONTENTS OF THIS SECTION

	Page		Page
GROUP 0400 - REMOVAL AND INSTALLATION		GROUP 0402 - CAMSHAFT AND VALVE ACTUATING MEANS—Continued	
General Information	0400-5	Timing Gear	0402-9
Removal	0400-7	Removal	0402-9
Installation	0400-10	Repair	0402-11
GROUP 0401 - CRANKSHAFT AND MAIN BEARINGS		Installation	0402-12
Crankshaft and Main Bearings	0401-1	Rocker Arms and Push Rods	0402-17
Removal	0401-1	Removal	0402-17
Crankshaft End Play	0401-1	Repair	0402-17
Repair	0401-2	Installation	0402-18
Installation	0401-3	Valve Clearance Adjustment	0402-19
Crankshaft gear	0401-5	GROUP 0403 - CONNECTING RODS AND PISTONS	
Removal	0401-5	Removal	0403-1
Repair	0401-5	Repair	0403-3
Crankshaft Front Wear Ring	0401-6	Installation	0403-9
Removal	0401-6	GROUP 0404 - CYLINDER BLOCK	
Installation	0401-6	Removal	0404-1
Crankshaft Front Oil Seal	0401-6	Repair	0404-3
Crankshaft Rear Oil Seal and Wear Ring ..	0401-6	Installation	0404-6
Removal	0401-6	GROUP 0407 - OILING SYSTEM	
Repair	0401-6	Oil Filter	0407-1
Installation	0401-7	Removal	0407-1
Vibration Damper	0401-8	Installation	0407-1
Installation	0401-8	Oil Filter Nipple	0407-1
GROUP 0402 - CAMSHAFT AND VALVE ACTUATING MEANS		Removal	0407-2
Valve Lift Check	0402-1	Installation	0407-3
Timing Gear Cover	0402-2	Oil Pan	
Removal	0402-2	Removal	0407-4
Repair	0402-2	Repair	0407-4
Installation	0402-3	Installation	0407-4
Crankshaft Front Oil Seal	0402-3	Oil Bypass Valve	
Removal	0402-3	Removal	0407-4
Installation	0402-3	Repair	0407-4
Camshaft	0402-3	Installation	0407-4
Removal	0402-3	Oil Pressure Control Valve	
Repair	0402-6	3-164D, 3-179D, 4-219D, 4-239D, 4-239T, 6-329D, 6-359D, or 6-359T Engine	0407-5
Installation	0402-7	Removal	0407-5
		Repair	0407-5
		Installation	0407-6

CONTENTS OF THIS SECTION—Continued

	Page		Page
GROUP 0407 - OILING SYSTEM—Continued		GROUP 0413 - FUEL INJECTION SYSTEM	
Oil Pressure Control Valve—Continued		Fuel Injection Pump	0413-1
4-276D, 4-276T, 6-414D		Removal	0413-1
or 6-414T Engine	0407-7	Repair	0413-6
Removal	0407-7	Installation	0413-9
Disassembly	0407-7	Bleeding	0413-19
Repair	0407-8	Fuel Injection Nozzles	0413-20
Assembly	0407-8	Removal	0413-20
Installation	0407-9	Repair	0413-21
Oil Pump		Installation	0413-22
3-164D, 3-179D, 4-219D,			
6-329D, or 6-359D Engine	0407-10	GROUP 0414 - INTAKE MANIFOLD	
Removal	0407-10	Removal	0414-1
Inspection and Disassembly	0407-10	Repair	0414-1
Repair	0407-12	Installation	0414-1
Assembly	0407-12		
Installation	0407-13	GROUP 0415 - ENGINE BALANCER	
4-239T, 4-276D, 4-276T, 6-359T,		General Information	0415-1
6-414D, or 6-414T Engine	0407-14	Removal	0415-1
Removal	0407-14	Repair	0415-2
Inspection and Disassembly	0407-14	Installation	0415-3
Repair	0407-16		
Assembly	0407-16	GROUP 0416 - TURBOCHARGER	
Installation	0407-17	General Information	0416-1
Dipstick and Dipstick Nipple	0407-18	Removal	0416-1
Removal	0407-18	Testing	0416-2
Repair	0407-18	Radial Bearing Movement	0416-2
Installation	0407-19	Axial Bearing Movement	0416-2
		Repair	0416-2
GROUP 0408 - VENTILATING SYSTEM		Installation	0416-8
General Information	0408-1		
Removal	0408-1	GROUP 0417 - WATER PUMP	
Repair	0408-1	Removal	0417-1
Installation	0408-1	Disassembly	
		3-164, 3-179D, 4-219D, 4-239D,	
GROUP 0409 - CYLINDER HEAD AND VALVES		4-276D, or 6-329D Engine	0417-2
Removal	0409-1	4-239T, 4-276T, 6-359D,	
Disassembly	0409-2	6-359T, 6-414D, or 6-414T Engine	0417-3
Repair	0409-2	Repair	0417-4
Assembly	0409-7	Assembly	0417-5
Installation	0409-7	Installation	0417-7
GROUP 0410 - EXHAUST MANIFOLD		GROUP 0418 - THERMOSTATS, HOUSINGS, AND	
General Information	0410-1	WATER PIPING	
Removal	0410-1	Thermostat	0418-1
Repair	0410-1	Removal	0418-1
Installation	0410-1	Repair	0418-2
		Installation	0418-2

Contents continued on next page

CONTENTS OF THIS SECTION—Continued

Page	Page
GROUP 0419 - OIL COOLER	GROUP 0429 - FAN DRIVE
3-164D, 3-179D, 4-219D and 6-329D Engines:	Fan Belt 0429-1
Removal 0419-1	Removal 0429-1
Repair 0419-2	Repair 0429-1
Installation 0419-2	Installation 0429-1
4-276D, 4-276T, 6-414D and	Crankshaft Pulley 0429-2
6-414T Engines:	Removal 0429-2
Removal 0419-3	Repair 0429-2
Repair 0419-3	Installation 0429-3
Installation 0419-5	
GROUP 0420 - FUEL FILTER	GROUP 0433 - FLYWHEEL, HOUSING, AND FASTENINGS
General Information 0420-1	Vertical Tachometer Drive 0433-1
Removal 0420-1	Removal 0433-1
Installation 0420-1	Repair 0433-1
GROUP 0421 - FUEL TRANSFER PUMP	Installation 0433-1
General Information 0421-1	Flywheel 0433-2
Removal 0421-1	Removal 0433-2
Repair 0421-1	Repair 0433-2
Installation 0421-2	Installation 0433-3
GROUP 0422 - STARTING MOTOR AND FASTENINGS	Flywheel Ring Gear 0433-4
General Information 0422-1	Removal 0433-4
Delco-Remy Starting Motor 0422-1	Installation 0433-4
Removal 0422-1	Flywheel Housing 0433-4
Testing and Diagnosis 0422-1	Removal 0433-4
Testing Pull-in Windings 0422-1	Repair 0433-5
Testing Hold-in Windings 0422-1	Installation 0433-5
No Load Starting Motor Test 0422-2	GROUP 0499 - SPECIFICATIONS AND SPECIAL TOOLS
Repair 0422-4	Specifications and Torque Values:
Assembly 0422-8	Engine Break-In 0499-1
Installation 0422-10	Crankshaft and Main Bearings 0499-2
John Deere Starting Motor 0422-11	Camshaft and Valve Actuating Means 0499-4
Removal 0422-11	Connecting Rods and Pistons 0499-11
Tests 0422-12	Cylinder Block 0499-15
Solenoid Pull-in Test 0422-12	Oiling System 0499-17
Solenoid Return Test 0422-12	Cylinder Head and Valves 0499-23
No Load Test 0422-13	
Repair 0422-15	
Assembly 0422-20	
GROUP 0423 - ALTERNATOR AND GENERATOR MOUNTING	
General Information 0423-1	
Removal 0423-1	
Installation 0423-1	

Contents continued on next page

CONTENTS OF THIS SECTION—Continued

	Page		Page
GROUP 0499 - SPECIFICATIONS AND SPECIAL TOOLS—Continued		GROUP 0499 - SPECIFICATIONS AND SPECIAL TOOLS—Continued	
Specifications and Torque Values—Continued		Specifications and Torque Values—Continued	
Fuel Injection System	0499-27	Fuel Injection Nozzle:	
Test Stand	0499-27	19762 - AR56290	0499-67
Fuel Injection Pump:		20500 - AR56290	0499-68
R3432F900 - RE12266	0499-28	20291 - AR68364	0499-69
R3432F920 - RE12267	0499-28A	20504 - AR68364	0499-70
R3448F160 - RE15699	0499-28B	20631 - AR73673	0499-71
R3448F210 - RE15697	0499-28C	22042 - AR88239	0499-72
R3462F950 - RE15698	0499-28D	22205 - AR88240	0499-73
R3462F920 - RE15700	0499-28E	22044 - AR88241	0499-74
JDB331MD2406 - AR49904	0499-28F	2203 - AR89563 and AR89564	0499-75
JDB435AL2442 - AR51747	0499-29	22265 - AR90023 and AR90024	0499-76
JDB635AL2446 - AR51568	0499-30	Injection Nozzle Torque	0499-77
JDB331CM2667 - AR66282	0499-31	Intake Manifold	0499-78
DM4627MD2684 - AR66395	0499-32	Engine Balancer	0499-79
JDB431CM2701 - AR66995	0499-33	Turbocharger	0499-80
JDB635CM2757 - AR66996	0499-34	Water Pump	0499-81
JDB435MD2793 - AR70530	0499-35	Thermostats, Housings, and	
JDB435MD2802 - AR51747	0499-36	Water Piping	0499-83
JDB435CM2819 - AR70531	0499-37	Oil Cooler	0499-84
DM4627AL2824 - AR70778	0499-38	Starting Motor and Fastenings	0499-85
DM4627HB2825 - AR70551	0499-39	Fan Drive	0499-90
DM4627HB2826 - AR70780	0499-40	Flywheel, Housing, and	
DM4427MD2876 - AR71421	0499-41	Fastenings	0499-90
DM4427HB2915 - AR70538	0499-42	Special Tools:	
DM4427NH2957 - AR76503	0499-43	Removal and Installation	0499-92
JDB435CM2974 - AR77422	0499-44	Crankshaft and Main Bearings	0499-93
JDB333CM3009 - AR79211	0499-45	Camshaft and Valve Actuating	
JDB435CM3010 - AR79212	0499-46	Means	0499-94
JDB635CM3011 - AR79213	0499-47	Connecting Rods and Pistons	0499-96
JDB435MD3021 - AR78647	0499-48	Cylinder Block	0499-97
DM4427MD3051 - AR80325	0499-49	Oiling System	0499-98
DM4627MD3052 - AR80352	0499-50	Cylinder Head and Valves	0499-99
JDB435MD3053 - AR80230	0499-51	Fuel Injection System	0499-101
JDB635MD3142 - AR80603	0499-52	Engine Balancer	0499-103
DM4627HB3220 - AR80353	0499-53	Turbocharger	0499-104
JDB435CM3223 - AR80233	0499-54	Water Pump	0499-105
DM4427HB3224 - AR80326	0499-55	Starting Motor and Fastenings	0499-106
JDB635CM3243 - AR80604	0499-56		
DM4427NW3262 - AR87186	0499-57		
DM4627AL3335 - AR70778	0499-58		
DM4627NH3642 - AR89482	0499-59		
DM4427NH3776 - AR90716	0499-60		
DM4427HB3986 - AR99951	0499-60A		
DM4627HB3987 - AR99952	0499-61		
DM4627MD4012 - AR104000	0499-62		
DM4627ABE4083 - AR100427	0499-63		
DM4627ABE4118 - AR100427	0499-64		
DM4427AL4299 - RE16150	0499-64A		
DM46274444 - RE19914	0499-64B		
Injection Pump Torque	0499-65		

Group 0400 REMOVAL AND INSTALLATION



GENERAL INFORMATION

Learn principles of operation of engines from "Basic Engine" in Fundamentals of Service Manual 30 - ENGINES.

Design Characteristics

The 3-164D, 3-179D, 4-219D, 4-239D, 4-276D, 6-329D, 6-359D, and 6-414D engines have:

1. Internal combustion
2. Four strokes per cycle
3. In-line type cylinder block
4. Diesel fueling
5. Valves in cylinder head
6. Natural aspiration
7. Liquid coolant
8. Pressure lubrication

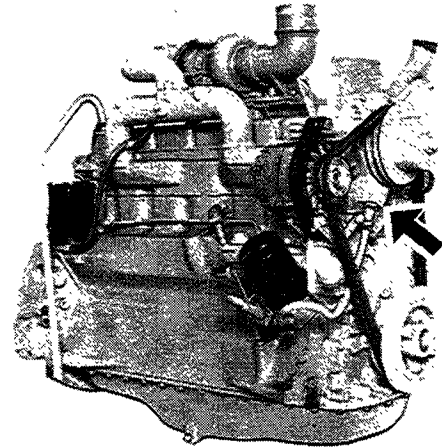
The 4-239T, 4-276T, 6-359T, and 6-414T engines have:

1. Internal combustion
2. Four strokes per cycle
3. In-line type cylinder block
4. Diesel fueling
5. Valves in cylinder head
6. Turbocharger
7. Liquid coolant
8. Pressure lubrication

Front Reference

The water pump (Fig. 1) end is the "front" of the engine.

4



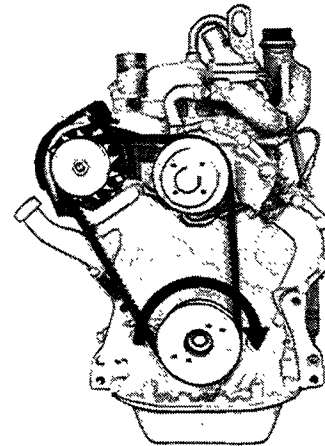
T70243

Fig. 1-Water Pump

T70243

Direction of Crankshaft Rotation

The crankshaft turns clockwise when viewed from the water pump end.



T70244

Fig. 2-Crankshaft Rotation

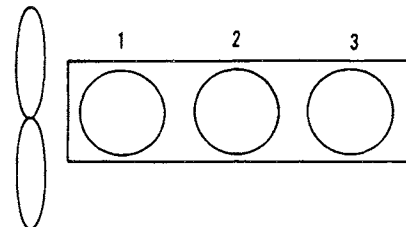
T70244

Firing Order

3-164 and 3-179 Engine

Firing order is:

1-2-3



T70245

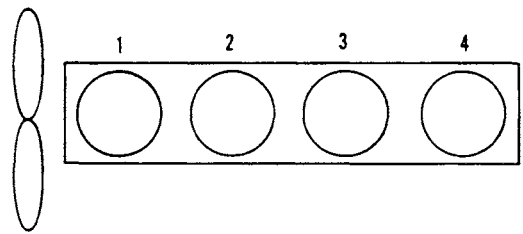
Fig. 3-Cylinder Arrangement

T70245

4-219, 4-239, and 4-276 Engines

Firing order is:

1-3-4-2



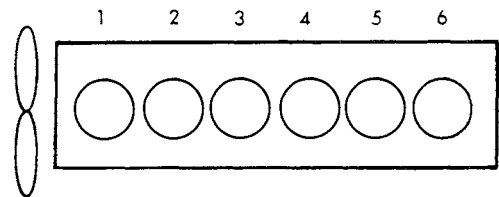
T70246

Fig. 4-Cylinder Arrangement

6-329, 6-359, and 6-414 Engines

Firing order is:

1-5-3-6-2-4



T70655

Fig. 5-Cylinder Arrangement

REMOVAL

Disconnect battery negative (-) cable. Disconnect battery positive (+) cable from starting motor.

Remove engine side shields (2, Fig. 6) (Group 1910).

Remove muffler.

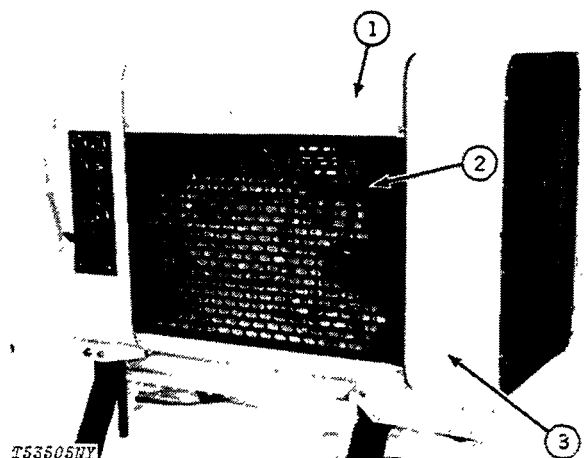
Remove hood (1, Fig. 6) (Group 1910).

⚠ CAUTION: Do not drain cooling system until upper radiator tank feels cool.

Drain engine cooling system.

Drain engine oil.

Disconnect fuel inlet line at fuel transfer pump.



T53505HY

Fig. 6-Engine Enclosure

Disconnect tachometer drive cable (3, Fig. 7) from flywheel housing.

Disconnect air cleaner hose on right side of engine.

Remove rear panel (1, Fig. 7) with air cleaner (2) attached.

Remove front shroud (3, Fig. 6).

4

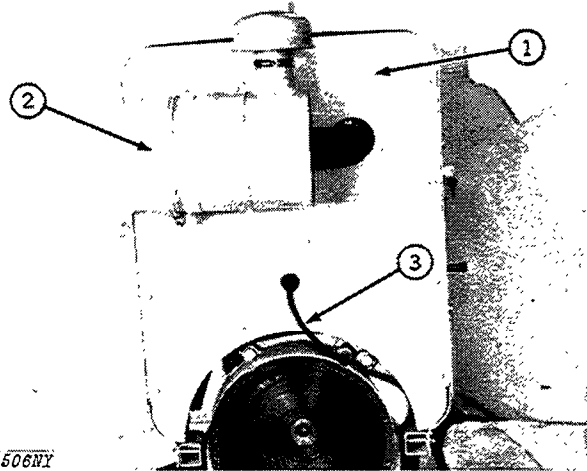


Fig. 7-Engine Enclosure Rear Panel

Disconnect speed control cable (1, Fig. 8) and bracket (2).

NOTE: Tag wires and terminals for reassembly.

Disconnect fuel shut-off wiring (3, Fig. 8) from fuel injection pump (4).

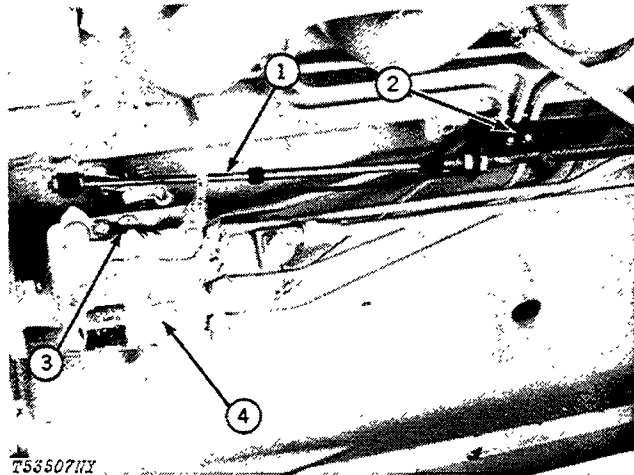


Fig. 8-Speed Control Cable and Fuel Shut-Off Wiring

Disconnect alternator wiring (1, Fig. 9) from alternator.

Disconnect solenoid wiring (2, Fig. 9) from solenoid.

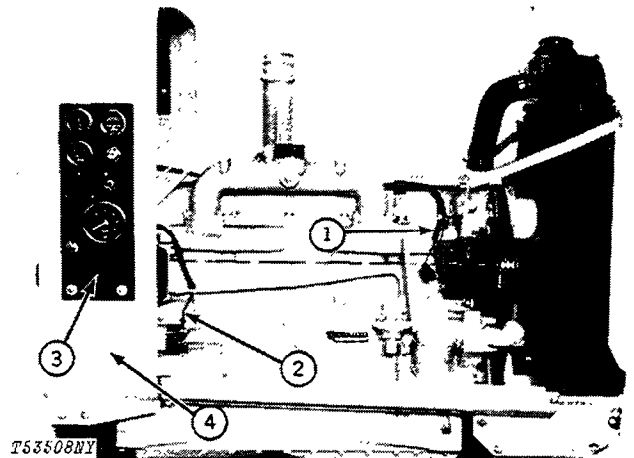


Fig. 9-Solenoid and Alternator Wiring

Disconnect temperature sending unit (1, Fig. 10) from rear of cylinder head.

Disconnect oil pressure hose (2, Fig. 10) from rear of cylinder block.

Remove rear shroud (4, Fig. 9) with instrument panel (3) attached.

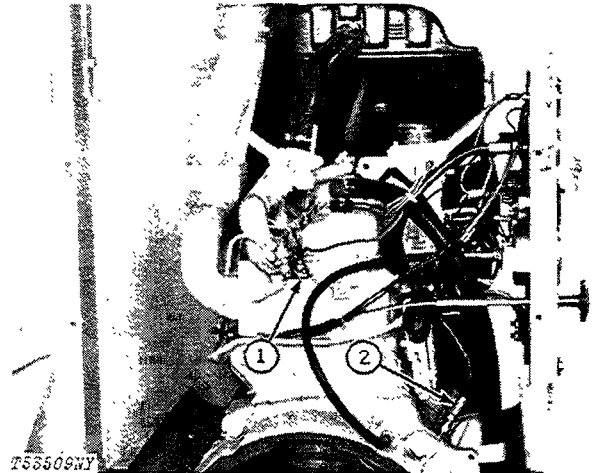


Fig. 10-Oil Pressure Hose and Temperature Sending Unit

Attach hoist with D01043AA Load-Positioning Sling (1, Fig. 11) to engine lifting eyes (2).

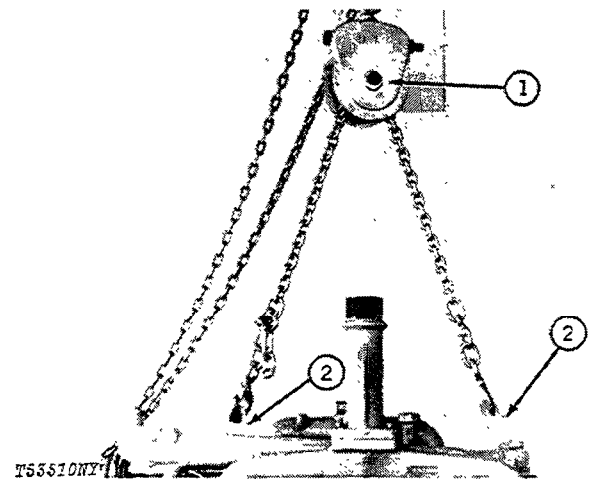


Fig. 11-D-01043AA Load Positioning Sling Attached

Remove engine mounting hardware (1, Fig. 12) at four corners of engine.

Raise hoist to remove engine.

Cap or plug air inlet tube, fuel inlet fitting, and exhaust manifold tube. Steam-clean engine thoroughly.

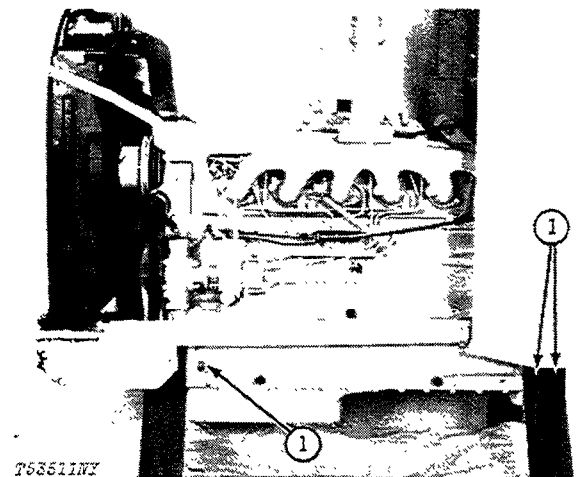


Fig. 12-Engine Mounting Hardware

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INSTALLATION

Mounting Engine in D01003AA Stand

Attach hoist with D01043AA Load-Positioning Sling (1, Fig. 11) to engine lifting eyes (2).

Lift engine into position on D01003AA Engine Stand. Refer to Fig. 13 to mount three or four cylinder engine. Refer to Fig. 14 to mount six cylinder engine.

4 Adjust engine stand rods and install cap screws holding rod brackets to engine.

CAUTION: Tighten all engine stand mounting hardware securely before removing hoist.

Check that all engine stand mounting hardware is tight.

Remove hoist and sling (1, Fig. 11) from engine.

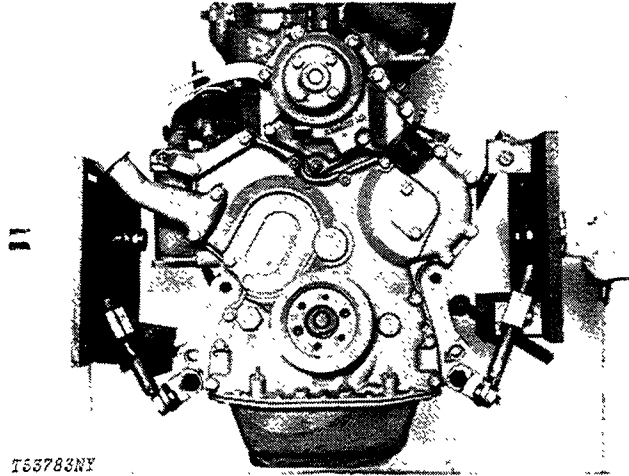


Fig. 13-Three or Four Cylinder Engine Mounted in D01003AA Engine Stand

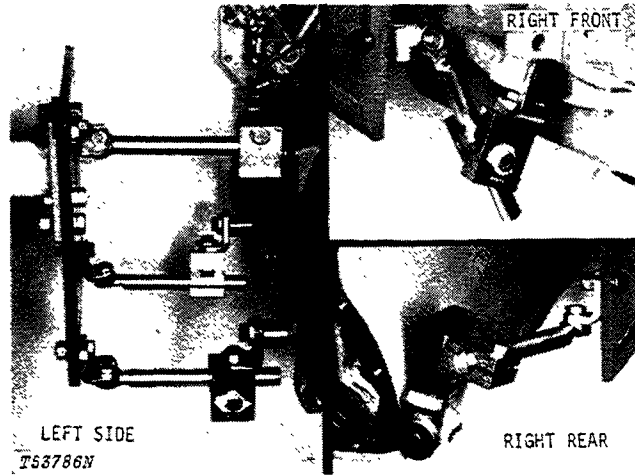


Fig. 14-Six Cylinder Engine Mounting Points

Mounting Engine in Enclosure

Attach hoist with D01043AA Load-Positioning Sling (1, Fig. 11) to engine lifting eyes (2).

Lift engine into position on enclosure mounting skid. Install engine mounting hardware (1, Fig. 12) at lower four corners of engine.

Remove load-positioning sling and hoist from engine.

Install rear shroud (4, Fig. 9) with instrument panel (3) attached.

Connect oil pressure hose (2, Fig. 10) to rear of cylinder block.

Connect temperature sending unit (1, Fig. 10) to rear of cylinder head.

Connect solenoid wiring (2, Fig. 9).

Connect alternator wiring (1, Fig. 9).

Connect fuel shut-off wiring (3, Fig. 8) to fuel injection pump (4).

Connect speed control cable (1, Fig. 8) and install bracket (2).

Install front shroud (3, Fig. 6).

Install rear panel (1, Fig. 7) with air cleaner (2) attached.

Connect air cleaner hose to intake tube on right side of engine.

Connect tachometer drive cable (3, Fig. 7) to fly-wheel housing.

Connect fuel inlet line to fuel transfer pump.

Fill crankcase to correct level using proper oil.

Fill radiator to correct level using proper coolant.

Install hood (1, Fig. 6).

Install muffler.

Install engine side shields (2, Fig. 6).

Connect battery positive (+) cable to starter.

Connect battery negative (-) cable to battery.

Adjust speed control linkage if necessary (Group 0515).