

300 Series OEM Engines



TECHNICAL MANUAL 300 Series OEM Engines

TM1190 (01DEC84) English

John Deere Engine Works
TM1190 (01DEC84)

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300 SERIES OEM ENGINES

Technical Manual
TM-1190 (Dec-84)

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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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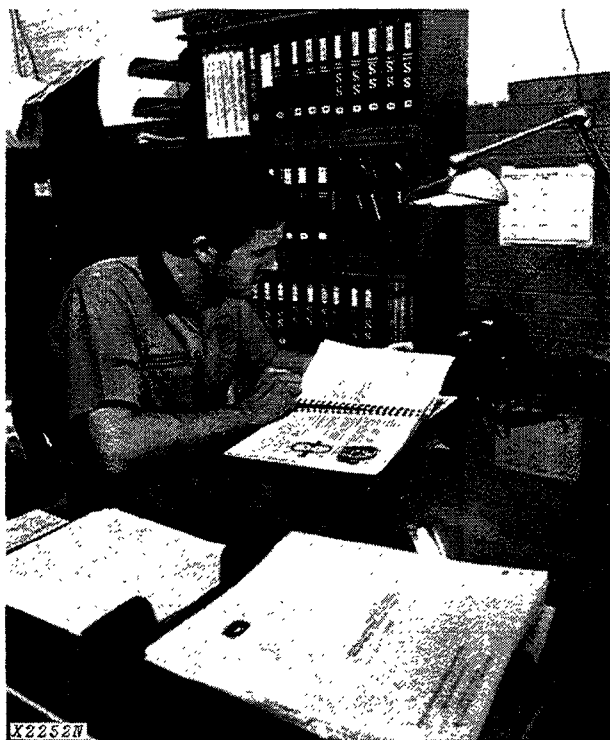
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INTRODUCTION



Use FOS Manuals for Reference

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.



Use Technical Manuals for Actual Service

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.

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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
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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:

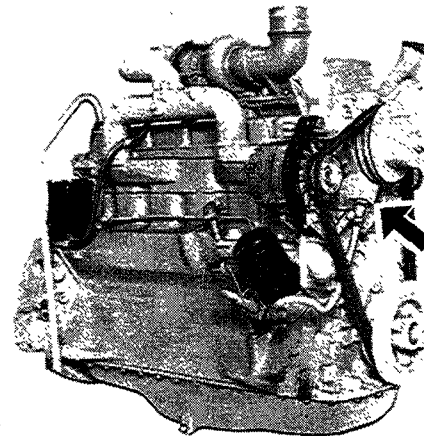
1. Internal combustion
2. Four strokes per cycle
3. In-line type cylinder block
4. Diesel fueling
5. Valves in cylinder head
6. Natural aspiration
7. Liquid coolant
8. Pressure lubrication

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.



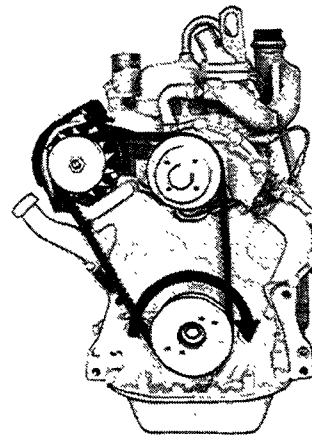
T70243

T70243

Fig. 1-Water Pump

Direction of Crankshaft Rotation

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



T70244

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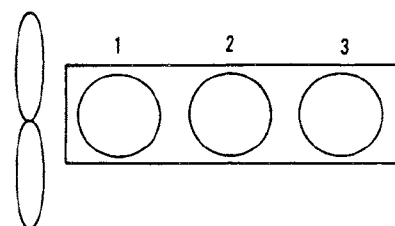
Fig. 2-Crankshaft Rotation

Firing Order

3-164 and 3-179 Engine

Firing order is:

1-2-3



T70245

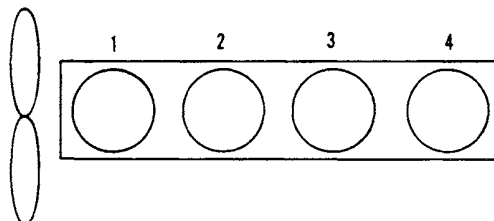
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Fig. 3-Cylinder Arrangement

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

Firing order is:

1-3-4-2



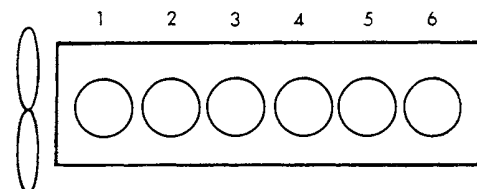
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Fig. 4-Cylinder Arrangement

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.

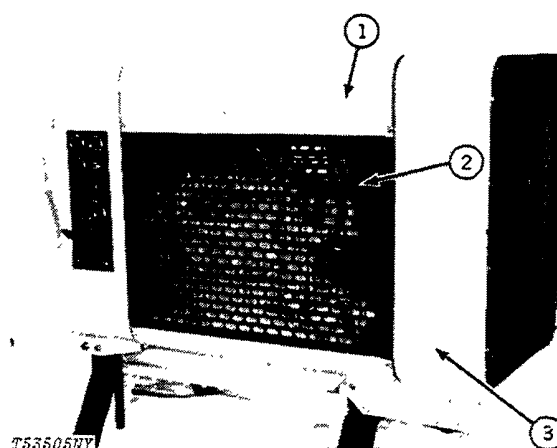
Remove hood (1, Fig. 6) (Group 1910).

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.



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Fig. 6-Engine Enclosure