

**16, 18, 20
and 24HP
Onan Engines**

**John Deere Horicon Works
CTM2 (19APR90)**

LITHO IN U.S.A.
ENGLISH

Introduction

This component technical manual (CTM) contains necessary instructions to repair the engine.

Use this component technical manual in conjunction with the machine technical manual. An engine application listing in the introduction identifies product-model/engine type-model relationship. See the machine technical manual for:

- Engine removal and installation.
- Theory of operation, diagnostic, and testing procedures.

N CAUTION: THIS SAFETY-ALERT SYMBOL MEANS ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.

When you see this symbol on your machine or in your manual, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

INTRODUCTION

This manual is part of a total service support program.

FOS MANUALS—REFERENCE

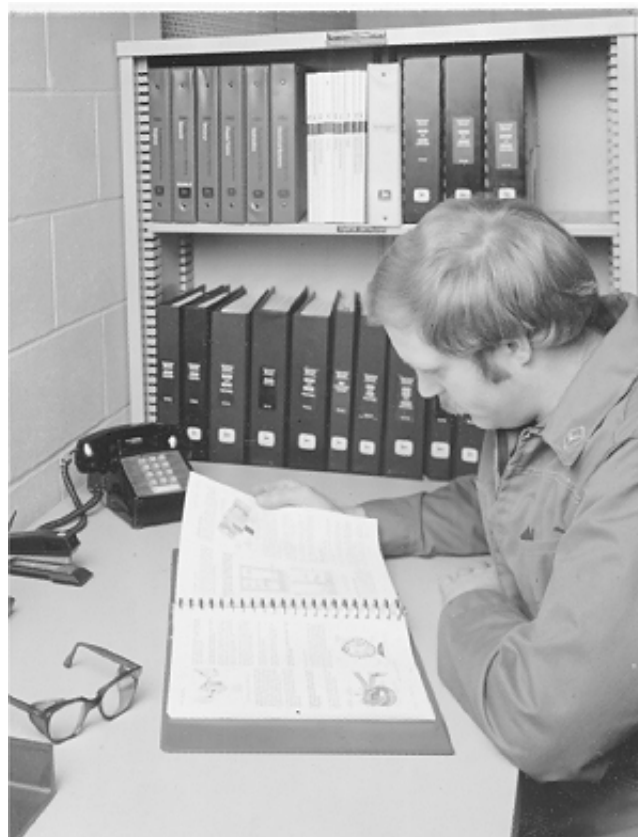
TECHNICAL MANUALS—MACHINE SERVICE

COMPONENT MANUALS—COMPONENT SERVICE

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

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

Component Technical Manuals are concise service guides for specific components. Component Technical Manuals are written as stand alone manuals covering multiple machine applications.



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FEATURES OF THIS TECHNICAL MANUAL

John Deere ILLUSTRATION format emphasizing illustrations and concise instructions in easy-to-use modules.

Emphasis on diagnosis, analysis, and testing so you can understand the problem and correct it.

Diagnostic information presented with the most logical and easiest to isolate problems first to help you identify the majority of routine failures quickly.

Step-by-step instructions for teardown and assembly.

Summary listing at the beginning of each group of all applicable specifications, wear tolerances, torque values, essential tools, and materials needed to do the job.

An emphasis throughout on safety—so you do the job right without getting hurt.

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 when you need to know correct service procedures or specifications.



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ABOUT THIS MANUAL

This Component Technical Manual (CTM-2) covers the recommended repair procedures for all 16, 18, 20, and 24 HP Onan Engines removed from the machine. These engines can be repaired on a clean work bench or put on an engine stand.

Some components may be serviced without removing the engine from the machine. You may want to determine the repair procedure before you remove the engine. Refer to the machine technical manual for engine removal and installation procedures.

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ENGINE SERIAL NUMBER PLATE

The engine serial number plate is located under the air cleaner.

Refer to the engine model designation on your engine's serial number plate to identify repair information covered in the Component Technical Manual.



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BASIC ENGINE SPECIFICATIONS

| ENGINE | B43E | B43G | P218G | B48G and P220G | T260 |
|--------------|--------------------------------------|------------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| CYLINDER | 2 | 2 | 2 | 2 | 2 |
| CYCLE | 4 | 4 | 4 | 4 | 4 |
| BORE | 82.55 mm (3.25 in.) | 82.55 mm (3.25 in.) | 82.55 mm (3.25 in.) | 82.55 mm (3.25 in.) | 90.42 mm (3.56 in.) |
| STROKE | 66.55 mm (2.62 in.) | 66.55 mm (2.62 in.) | 73 mm 2.875 in.) | 73 mm (2.87 in.) | 76.20 mm (3.00 in.) |
| DISPLACEMENT | 710 cm ³ (43.3 cu in.) | 710 cm ³ (43 cu in.) | 782 cm ³ 47.7 cu in.) | 782 cm ³ (48 cu in.) | 983 cm ³ (60 cu in.) |
| *HORSEPOWER | 12kW (16 hp) | 13.5 kW (18 HP) | 13.4 kW (18 hp) | 15 kW (20 hp) | 18 kW (24 hp) |

**Horsepower rating is established by engine manufacturer in accordance with Standard International Combustion Institute procedure. It is corrected to (60 °F) and 29.92 hg barometer. Laboratory test engines are equipped with air cleaner and muffler.*

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ENGINE APPLICATION CHART

Refer to the engine application chart to identify product-model/engine type-model relationship.

CONSUMER PRODUCTS

Lawn and Garden Tractors

| Machine No. | Engine Model |
|-------------|---------------|
| 316 | B43E or P218G |
| 318 | B43G or P218G |
| 420 | B48G or P220G |

Front Mowers

| Machine No. | Engine Model |
|-------------|---------------|
| F910 | B48G or P220G |
| F930 | T260 |

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ENGLISH TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is $\pm 20\%$.

| Bolt Diameter | Plain Head* | | Three Radial Dashes* | | Six Radial Dashes* | |
|---------------|-------------|-----|----------------------|-----|--------------------|------|
| | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m |
| 1/4 in. | 6 | 8 | 9 | 12 | 12 | 16 |
| 5/16 in. | 10 | 14 | 18 | 24 | 25 | 34 |
| 3/8 in. | 20 | 27 | 30 | 41 | 45 | 61 |
| 7/16 in. | 30 | 41 | 50 | 68 | 70 | 95 |
| 1/2 in. | 45 | 61 | 75 | 101 | 110 | 149 |
| 9/16 in. | 70 | 95 | 110 | 150 | 155 | 210 |
| 5/8 in. | 95 | 128 | 155 | 210 | 215 | 290 |
| 3/4 in. | 165 | 225 | 270 | 365 | 385 | 520 |
| 7/8 in. | 170 | 230 | 435 | 590 | 620 | 840 |
| 1 in. | 255 | 345 | 660 | 895 | 930 | 1260 |

Torque figures indicated above and in the Specification Sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

* Torque value for bolts and cap screws are identified by their head markings.

S11,2000,DD -19-11JUL85

METRIC TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is $\pm 20\%$.

| Bolt Diameter | Property Class 8.8* | | Property Class 10.9* | |
|---------------|---------------------|-----|----------------------|------|
| | lb-ft | N-m | lb-ft | N-m |
| M5 | 5 | 6 | 7 | 9 |
| M6 | 8 | 10 | 11 | 15 |
| M8 | 18 | 25 | 26 | 35 |
| M10 | 37 | 50 | 52 | 70 |
| M12 | 66 | 90 | 92 | 125 |
| M16 | 166 | 225 | 229 | 310 |
| M20 | 321 | 435 | 450 | 610 |
| M24 | 554 | 750 | 775 | 1050 |

Torque figure indicated above and in the Specification Sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

* Torque value for bolts and cap screws are identified by their head markings.

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SPECIFICATIONS

| Item | Measurement | Specification |
|---------------------------|-------------|------------------------------------|
| Breather Valve Cover Bolt | Torque | 2 ± 1 N·m (18 ± 9 lb-in.) |

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REMOVE AIR CLEANER

1. Remove wing nut and cover.



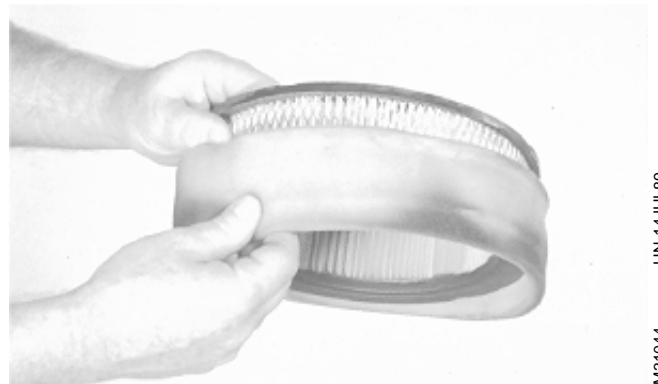
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2. Remove lock nut and air cleaner element.



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3. Remove precleaner. Wash precleaner as necessary.



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4. Wash precleaner in warm, soapy water. Rinse in clean water. Squeeze precleaner to remove most of water. Let precleaner air dry.



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5. Hold a lighted bulb inside air cleaner element. If you can see the light through element and the paper appears clean, the element is still usable. If the element is oily, dirty, bent, torn, crushed or obstructed in any way, install a new element.

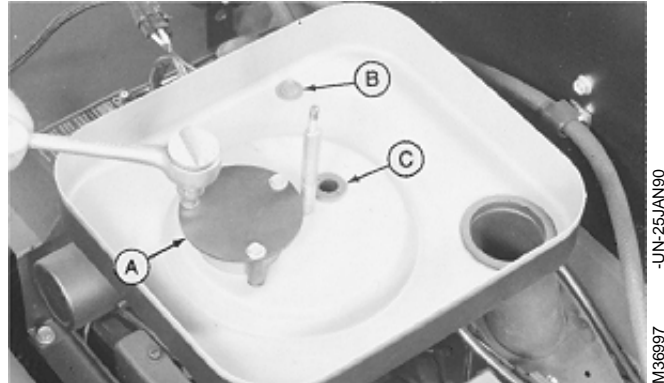


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IMPORTANT: Close choke and all openings to keep objects from falling into carburetor, flywheel housing, and air intake system.

6. Remove three cap screws and splash plate (A).
7. Remove two base cap screws (B).
8. Push breather hose (C) from air cleaner base.
9. Lift air cleaner base from carburetor.
10. Clean inside of base and cover.
11. Inspect air intake hose for cracks or deterioration; replace if necessary.



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