A Few Words About Safety

SERVICE INFORMATION

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you and/or others. It could also damage this Honda product or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of special tools. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of this product.

If you need to replace a part, use Honda Genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of this product. Any error or oversight while servicing this product can result in faulty operation, damage to the product, or injury to others.

**WARNING**

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts-wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practice, we recommend that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

**WARNING**

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles, or face shields anytime you hammer, drill, grind, or work around pressurized air, pressurized liquids, springs or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have engine-power equipment up in the air. Anytime you lift this product with a hoist, make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:
  - Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
  - Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
  - Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.
- Gasoline vapors and hydrogen gasses from battery are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.
  - Use only a nonflammable solvent, not gasoline, to clean parts.
  - Never store gasoline in an open container.
  - Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.
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How to use this manual

INTRODUCTION

This manual covers the service and repair procedures for Honda GX240R2/RT2/UT2, GX270UT2, GX340R2/RT2/UT2, and GX390RT2/T2/UT2 engines.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at anytime without notice.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the publisher. This includes text, figures, and tables.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to this Honda product, other property, or the environment.

SAFETY MESSAGES

Your safety, and the safety of others, are very important. To help you make informed decisions, we have provided safety messages and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing these products. You must use your own good judgement.

You will find important safety information in a variety of forms, including:

- Safety Labels – on the product.
- Safety Messages – preceded by a safety alert symbol 🔴 and one of three signal words, DANGER, WARNING, or CAUTION. These signal words mean:

  🟢 DANGER You WILL be KILLED or SERIOUSLY HURT if you don’t follow instructions.
  🔴 WARNING You CAN be KILLED or SERIOUSLY HURT if you don’t follow instructions.
  🔴 CAUTION You CAN be HURT if you don’t follow instructions.

- Instructions – how to service these products correctly and safely.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. American Honda Motor Co., Inc. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATSOEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION. THIS MANUAL IS WRITTEN FOR PERSONS WHO HAVE ACQUIRED BASIC KNOWLEDGE OF MAINTENANCE ON Honda products.

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SERVICE PUBLICATION OFFICE

Date of Issue: October 2010
### SERVICE RULES

- Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda’s design specifications may damage the unit.
- Use the special tools designed for the product.
- Install new gaskets, O-rings, etc. when reassembling.
- When torquing bolts or nuts, begin with larger-diameter or inner bolts first and tighten to the specified torque diagonally, unless a particular sequence is specified.
- Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
- After reassembly, check all parts for proper installation and operation.
- Many screws used in this machine are self-tapping. Be aware that cross-threading or overtightening these screws will strip the threads and ruin the hole.

Use only metric tools when servicing this unit. Metric bolts, nuts and screws are not interchangeable with non-metric fasteners. The use of incorrect tools and fasteners will damage the unit.

### SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<td><img src="image" alt="Symbol" /></td>
<td>Replace the part(s) with new one(s) before assembly.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Use the recommended engine oil, unless otherwise specified.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Use water resistant molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: UNILITE M No.2 manufactured by KYODO YUSHI, Japan</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Use marine grease (water resistant urea based grease).</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Apply a locking agent. Use a medium strength locking agent unless otherwise specified.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Apply sealant.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Use automatic transmission fluid.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Indicates the diameter, length, and quantity of metric bolts used.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Indicates the reference page.</td>
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</table>
# How to use this manual

## ABBREVIATIONS

Throughout this manual, the following abbreviations are used to identify the respective parts or systems:

<table>
<thead>
<tr>
<th>Abbrev. term</th>
<th>Full term</th>
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<tr>
<td>ACG</td>
<td>Alternator</td>
</tr>
<tr>
<td>A/F</td>
<td>Air Fuel Ratio</td>
</tr>
<tr>
<td>API</td>
<td>American Petroleum institute</td>
</tr>
<tr>
<td>Approx.</td>
<td>Approximately</td>
</tr>
<tr>
<td>Assy.</td>
<td>Assembly</td>
</tr>
<tr>
<td>ATDC</td>
<td>After Top Dead Center</td>
</tr>
<tr>
<td>ATF</td>
<td>Automatic Transmission Fluid</td>
</tr>
<tr>
<td>ATT</td>
<td>Attachment</td>
</tr>
<tr>
<td>BAT</td>
<td>Battery</td>
</tr>
<tr>
<td>BDC</td>
<td>Bottom Dead Center</td>
</tr>
<tr>
<td>BTDC</td>
<td>Before Top Dead Center</td>
</tr>
<tr>
<td>BARO</td>
<td>Barometric Pressure</td>
</tr>
<tr>
<td>CKP</td>
<td>Crankshaft Position</td>
</tr>
<tr>
<td>Comp.</td>
<td>Complete</td>
</tr>
<tr>
<td>CMP</td>
<td>Camshaft Position</td>
</tr>
<tr>
<td>CYL</td>
<td>Cylinder</td>
</tr>
<tr>
<td>DLC</td>
<td>Data Link Connector</td>
</tr>
<tr>
<td>EBT</td>
<td>Engine Block Temperature</td>
</tr>
<tr>
<td>ECT</td>
<td>Engine Coolant Temperature</td>
</tr>
<tr>
<td>ECM</td>
<td>Engine Control Module</td>
</tr>
<tr>
<td>EMT</td>
<td>Exhaust Manifold Temperature</td>
</tr>
<tr>
<td>EOP</td>
<td>Engine Oil Pressure</td>
</tr>
<tr>
<td>EX</td>
<td>Exhaust</td>
</tr>
<tr>
<td>F</td>
<td>Front or Forward</td>
</tr>
<tr>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>HO2S</td>
<td>Heated Oxygen sensor</td>
</tr>
<tr>
<td>IAB</td>
<td>Intake Air Bypass</td>
</tr>
<tr>
<td>IAC</td>
<td>Idle Air Control</td>
</tr>
<tr>
<td>IAT</td>
<td>Intake Air Temperature</td>
</tr>
<tr>
<td>I.D.</td>
<td>Inside diameter</td>
</tr>
<tr>
<td>IG or IGN</td>
<td>Ignition</td>
</tr>
<tr>
<td>IN</td>
<td>Intake</td>
</tr>
<tr>
<td>INJ</td>
<td>Injection</td>
</tr>
<tr>
<td>L.</td>
<td>Left</td>
</tr>
<tr>
<td>MAP</td>
<td>Manifold Absolute Pressure</td>
</tr>
<tr>
<td>MIL</td>
<td>Malfunction Indicator Lamp</td>
</tr>
<tr>
<td>O.D.</td>
<td>Outside Diameter</td>
</tr>
<tr>
<td>OP</td>
<td>Optional Part</td>
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<td>PGM-FI</td>
<td>Programmed-Fuel Injection</td>
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<tr>
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<tr>
<td>Qty</td>
<td>Quantity</td>
</tr>
<tr>
<td>R.</td>
<td>Right</td>
</tr>
<tr>
<td>SAE</td>
<td>Society of Automotive Engineers</td>
</tr>
<tr>
<td>SCS</td>
<td>Service Check Signal</td>
</tr>
<tr>
<td>STD</td>
<td>Standard</td>
</tr>
<tr>
<td>SW</td>
<td>Switch</td>
</tr>
<tr>
<td>TDC</td>
<td>Top Dead Center</td>
</tr>
<tr>
<td>TP</td>
<td>Throttle Position</td>
</tr>
<tr>
<td>VTEC</td>
<td>Variable Valve Timing &amp; Valve Lift Electronic Control</td>
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**Color Code**

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</tr>
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<td>Gr</td>
</tr>
<tr>
<td>Brown</td>
<td>Br</td>
</tr>
<tr>
<td>Light green</td>
<td>Lg</td>
</tr>
<tr>
<td>Red</td>
<td>R</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
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SERIAL NUMBER LOCATION

The engine serial number (1), type (2), and model (3) are stamped on the crankcase.

Refer to them when ordering parts or making technical inquiries.
### SPECIFICATIONS

#### TYPE CODE

**GX240**

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## DIMENSIONS AND WEIGHTS

### GX240

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*: P. T. O. type [page 1-3]
### SPECIFICATIONS

#### EQUIPMENT VARIATION

Indicates the difference compared with values shown in the table of P. T. O. variation on page 1-5.

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*1: No fuel tank and muffler, use low profile type air cleaner.

#### GX270

##### P.T.O. VARIATION

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*: P. T. O. type [page 1-3]
## EQUIPMENT VARIATION

Indicates the difference compared with values shown in the table of P. T. O. variation on page 1-6.

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<td>-</td>
<td>+ 96 mm (3.8 in)</td>
<td>-</td>
<td>+ 34 mm (1.3 in)</td>
<td>-</td>
</tr>
<tr>
<td>Overall height difference</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>- 119 mm (4.7 in)</td>
</tr>
<tr>
<td>Dry weight difference</td>
<td>- 0.9 kg (2.0 lbs)</td>
<td>+ 0.2 kg (0.4 lbs)</td>
<td>+ 2.5 kg (5.5 lbs)</td>
<td>+ 3.2 kg (7.1 lbs)</td>
<td>- 4.4 kg (9.7 lbs)</td>
</tr>
<tr>
<td>Operating weight difference</td>
<td>- 0.9 kg (2.0 lbs)</td>
<td>+ 0.2 kg (0.4 lbs)</td>
<td>+ 2.5 kg (5.5 lbs)</td>
<td>+ 3.2 kg (7.1 lbs)</td>
<td>- 4.4 kg (9.7 lbs)</td>
</tr>
</tbody>
</table>

*1: No fuel tank, muffler, and low profile type air cleaner.

## GX340

### P.T.O. VARIATION

<table>
<thead>
<tr>
<th>Model Overall length</th>
<th>P.T.O.*</th>
<th>GX340R2</th>
<th>GX340RT2</th>
<th>GX340U2</th>
<th>GX340UT2</th>
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</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>E type</td>
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</tr>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>440 mm (17.3 in)</td>
</tr>
<tr>
<td></td>
<td>L type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>405 mm (15.9 in)</td>
</tr>
<tr>
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<td>P type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>405 mm (15.9 in)</td>
</tr>
<tr>
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<td>Q type</td>
<td>-</td>
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<td>-</td>
<td>405 mm (15.9 in)</td>
</tr>
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<tr>
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<td>-</td>
<td>430 mm (16.9 in)</td>
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<td>425 mm (16.7 in)</td>
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<td>E type</td>
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<td>-</td>
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</tr>
<tr>
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<tr>
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<td>Q type</td>
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<td>460 mm (18.1 in)</td>
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<tr>
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<td>S type</td>
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<td>-</td>
<td>460 mm (18.1 in)</td>
</tr>
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<td>Overall height</td>
<td>E type</td>
<td>313 mm (12.3 in)</td>
<td>-</td>
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</tr>
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<td>H type</td>
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<td>448 mm (17.6 in)</td>
</tr>
<tr>
<td></td>
<td>L type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>448 mm (17.6 in)</td>
</tr>
<tr>
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<td>P type</td>
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<td>-</td>
<td>-</td>
<td>448 mm (17.6 in)</td>
</tr>
<tr>
<td></td>
<td>Q type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>448 mm (17.6 in)</td>
</tr>
<tr>
<td></td>
<td>S type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>448 mm (17.6 in)</td>
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<td>V type</td>
<td>-</td>
<td>313 mm (12.3 in)</td>
<td>-</td>
<td>448 mm (17.6 in)</td>
</tr>
<tr>
<td>Dry weight</td>
<td>E type</td>
<td>27.3 kg (60.2 lbs)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>H type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>35.2 kg (77.6 lbs)</td>
</tr>
<tr>
<td></td>
<td>L type</td>
<td>-</td>
<td>-</td>
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<td>35.2 kg (77.6 lbs)</td>
</tr>
<tr>
<td></td>
<td>P type</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>31.7 kg (69.9 lbs)</td>
</tr>
<tr>
<td></td>
<td>Q type</td>
<td>-</td>
<td>-</td>
<td>31.7 kg (69.9 lbs)</td>
<td>31.7 kg (69.9 lbs)</td>
</tr>
<tr>
<td></td>
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<td>-</td>
<td>-</td>
<td>31.7 kg (69.9 lbs)</td>
</tr>
<tr>
<td></td>
<td>V type</td>
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<td>27.3 kg (60.2 lbs)</td>
<td>-</td>
<td>31.7 kg (69.9 lbs)</td>
</tr>
<tr>
<td>Operating weight</td>
<td>E type</td>
<td>33.4 kg (73.6 lbs)</td>
<td>-</td>
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<td>41.2 kg (90.8 lbs)</td>
</tr>
<tr>
<td></td>
<td>L type</td>
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<td>-</td>
<td>-</td>
<td>41.2 kg (90.8 lbs)</td>
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<tr>
<td></td>
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<td>37.8 kg (83.3 lbs)</td>
</tr>
<tr>
<td></td>
<td>Q type</td>
<td>-</td>
<td>-</td>
<td>37.8 kg (83.3 lbs)</td>
<td>37.8 kg (83.3 lbs)</td>
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<td>S type</td>
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<td>37.8 kg (83.3 lbs)</td>
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<td>V type</td>
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<td>33.4 kg (73.6 lbs)</td>
<td>-</td>
<td>37.8 kg (83.3 lbs)</td>
</tr>
</tbody>
</table>

*: P. T. O. type. (page 1-4)
### SPECIFICATIONS

#### EQUIPMENT VARIATION

Indicates the difference compared with values shown in the table of P. T. O. variation on page 1-7.

<table>
<thead>
<tr>
<th>Variation</th>
<th>Cyclone air cleaner type</th>
<th>Starter motor type</th>
<th>Control box type</th>
<th>Low profile type *1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+ 6 mm (0.2 in)</td>
</tr>
<tr>
<td>difference</td>
<td>+ 93 mm (3.7 in)</td>
<td>± 5 mm (0.2 in)</td>
<td>+ 39 mm (1.5 in)</td>
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</tr>
<tr>
<td>Overall width</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>- 135 mm (5.3 in)</td>
</tr>
<tr>
<td>difference</td>
<td>+ 0.2 kg (0.4 lbs)</td>
<td>+ 2.5 kg (5.5 lbs)</td>
<td>+ 3.2 kg (7.1 lbs)</td>
<td>- 4.4 kg (9.7 lbs)</td>
</tr>
<tr>
<td>Overall height</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>difference</td>
<td>+ 0.2 kg (0.4 lbs)</td>
<td>+ 2.5 kg (5.5 lbs)</td>
<td>+ 3.2 kg (7.1 lbs)</td>
<td>- 4.4 kg (9.7 lbs)</td>
</tr>
</tbody>
</table>

*1: No fuel tank and muffler, use low profile type air cleaner.

#### GX390

##### P.T.O. VARIATION

<table>
<thead>
<tr>
<th>Model</th>
<th>P.T.O.*</th>
<th>GX390R2/RT2</th>
<th>GX390T2</th>
<th>GX390U2/UT2</th>
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<td>H type</td>
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<td>-</td>
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<td>440 mm (17.3 in)</td>
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<td>-</td>
<td>405 mm (15.9 in)</td>
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<td>Q type</td>
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<td>-</td>
<td>405 mm (15.9 in)</td>
</tr>
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<td>S type</td>
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<td>-</td>
<td>380 mm (15.0 in)</td>
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<td>V type</td>
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<td>425 mm (16.7 in)</td>
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<td>H type</td>
<td>-</td>
<td>-</td>
<td>460 mm (18.1 in)</td>
</tr>
<tr>
<td></td>
<td>L type</td>
<td>-</td>
<td>-</td>
<td>460 mm (18.1 in)</td>
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<td>P type</td>
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<td>-</td>
<td>460 mm (18.1 in)</td>
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<tr>
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<td>Q type</td>
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<td>460 mm (18.1 in)</td>
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<td>H type</td>
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<td>448 mm (17.6 in)</td>
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<td>448 mm (17.6 in)</td>
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<td>V type</td>
<td>447 mm (17.6 in)</td>
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<td>448 mm (17.6 in)</td>
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</tr>
<tr>
<td></td>
<td>L type</td>
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<td>-</td>
<td>35.2 kg (77.6 lbs)</td>
</tr>
<tr>
<td></td>
<td>P type</td>
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</tr>
<tr>
<td></td>
<td>Q type</td>
<td>29.9 kg (65.9 lbs)</td>
<td>31.7 kg (69.9 lbs)</td>
<td>31.7 kg (69.9 lbs)</td>
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<td>-</td>
<td>31.7 kg (69.9 lbs)</td>
</tr>
<tr>
<td></td>
<td>V type</td>
<td>29.9 kg (65.9 lbs)</td>
<td>-</td>
<td>31.7 kg (69.9 lbs)</td>
</tr>
<tr>
<td>Operating weight</td>
<td>H type</td>
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<td>-</td>
<td>41.2 kg (90.8 lbs)</td>
</tr>
<tr>
<td></td>
<td>L type</td>
<td>-</td>
<td>-</td>
<td>41.2 kg (90.8 lbs)</td>
</tr>
<tr>
<td></td>
<td>P type</td>
<td>-</td>
<td>-</td>
<td>37.8 kg (83.3 lbs)</td>
</tr>
<tr>
<td></td>
<td>Q type</td>
<td>31.4 kg (69.2 lbs)</td>
<td>37.8 kg (83.3 lbs)</td>
<td>37.8 kg (83.3 lbs)</td>
</tr>
<tr>
<td></td>
<td>S type</td>
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<td>V type</td>
<td>31.4 kg (69.2 lbs)</td>
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<td>37.8 kg (83.3 lbs)</td>
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*: P. T. O. type. [page 1-4](#)
# ENGINE SPECIFICATIONS

## GX240

<table>
<thead>
<tr>
<th>Model</th>
<th>GX240R2</th>
<th>GX240RT2</th>
<th>GX240U2</th>
<th>GX240UT2</th>
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<tbody>
<tr>
<td>Description</td>
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</tr>
<tr>
<td>Code</td>
<td>GCBPK</td>
<td>GCBJT</td>
<td>GCBPK</td>
<td>GCBJT</td>
</tr>
<tr>
<td>Type</td>
<td>4 stroke, overhead valve, single cylinder, inclined by 25°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>270 cm³ (16.5 cu-in)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bore x stroke</td>
<td>77.0 x 58.0 mm (3.0 x 2.3 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net power (SAE J1349)*1</td>
<td>5.9 kW (7.9 HP) / 3,600 min⁻¹ (rpm)*2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous rated power</td>
<td>4.6 kW (6.1 HP) / 3,600 min⁻¹ (rpm)</td>
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<td></td>
</tr>
<tr>
<td>Maximum net torque (SAE J1349)*1</td>
<td>18.3 N·m (1.86 kgf m, 13.4 lbf ft) / 2,500 min⁻¹ (rpm)</td>
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<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>8.5:1</td>
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</tr>
<tr>
<td>Fuel consumption (at continuous rated power)</td>
<td>2.2 liters (0.58 US gal, 0.48 Imp gal) / h</td>
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<td>Ignition system</td>
<td>C.D.I.(Capacitor Discharge Ignition) type magneto ignition</td>
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<tr>
<td>Ignition timing</td>
<td>B.T.D.C. 10° / 1,400min⁻¹ (rpm)</td>
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</tr>
<tr>
<td>Spark advance performance</td>
<td>B.T.D.C. 10° - 20°</td>
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<tr>
<td>Spark plug</td>
<td>BPR6ES (NGK) / W20EPR-U (DENSO)</td>
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</tr>
<tr>
<td>Lubrication system</td>
<td>Forced splash</td>
<td></td>
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</tr>
<tr>
<td>Oil capacity</td>
<td>1.1 liters (1.16 US qt, 0.97 Imp qt)</td>
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<td>Recommended oil</td>
<td>SAE 10W-30 API service classification SJ or later</td>
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<td>Cooling system</td>
<td>Forced air</td>
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<td>Starting system</td>
<td>Recoil, Recoil and Starter motor</td>
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<tr>
<td>Stopping system</td>
<td>Ignition exciter coil circuit open</td>
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<td>Carburetor</td>
<td>Horizontal type, butterfly valve</td>
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<td>Air cleaner</td>
<td>Dual element type, Cyclone type, Oil bath type, Low profile type</td>
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</tr>
<tr>
<td>Governor</td>
<td>Mechanical centrifugal</td>
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<tr>
<td>Breather system</td>
<td>Reed valve type</td>
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<tr>
<td>Fuel used</td>
<td>Unleaded gasoline with a pump octane rating 86 or higher</td>
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<tr>
<td>Reduction case oil capacity (1/2 reduction with clutch)</td>
<td>0.3 liters (0.32 US qt, 0.26 Imp qt)</td>
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<td></td>
</tr>
<tr>
<td>Clutch (1/2 reduction with clutch)</td>
<td>Type</td>
<td>Centrifugal</td>
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<td></td>
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<td>Engagement start</td>
<td>1,800 min⁻¹ (rpm)</td>
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<tr>
<td>Lock</td>
<td>2,200 min⁻¹ (rpm)</td>
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<td></td>
</tr>
</tbody>
</table>

*1: The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 rpm (net power) and at 2,500 rpm (max net torque). Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.

*2: Base type includes a balancer, dual type air cleaner, and standard type muffler.
### SPECIFICATIONS

**GX270**

<table>
<thead>
<tr>
<th>Description</th>
<th>GX270R2</th>
<th>GX270RT2</th>
<th>GX270U2</th>
<th>GX270UT2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>4 stroke, overhead valve, single cylinder, inclined by 25°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>270 cm³ (16.5 cu-in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bore x stroke</td>
<td>77.0 x 58.0 mm (3.0 x 2.3 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net power (SAE J1349)*1</td>
<td>6.3 kW (8.4 HP) / 3,600 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous rated power</td>
<td>5.1 kW (6.8 HP) / 3,600 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum net torque (SAE J1349)*1</td>
<td>19.1 N·m (1.94 kgf m, 14.1 lbf ft) / 2,500 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>8.5:1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel consumption (at continuous rated power)</td>
<td>2.4 Liters (0.63 US gal, 0.53 Imp gal) / h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignition system</td>
<td>C.D.I.(Capacitor Discharge Ignition) type magneto ignition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignition timing</td>
<td>B.T.D.C. 10° / 1,400min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark advance performance</td>
<td>B.T.D.C. 10° - 20°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>BPR6ES (NGK) / W20EPR-U (DENSO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication system</td>
<td>Forced splash</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil capacity</td>
<td>1.1 Liters (1.16 US qt, 0.97 Imp qt)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended oil</td>
<td>SAE 10W-30 API service classification SJ or later</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling system</td>
<td>Forced air</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting system</td>
<td>Recoil, Recoil and Starter motor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stopping system</td>
<td>Ignition exciter coil circuit open</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carburetor</td>
<td>Horizontal type, butterfly valve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Dual element type, Cyclone type, Oil bath type, Low profile type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor</td>
<td>Mechanical centrifugal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breather system</td>
<td>Reed valve type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel used</td>
<td>Unleaded gasoline with a pump octane rating 86 or higher</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction case oil capacity (1/2 reduction with clutch)</td>
<td>0.3 Liters (0.32 US qt, 0.26 Imp qt)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Clutch (1/2 reduction with clutch)</td>
<td>Type: Centrifugal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engagement start: 1,800 min⁻¹ (rpm)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Lock: 2,200 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 rpm (net power) and at 2,500 rpm (max net torque). Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.*
### SPECIFICATIONS

**GX340**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description code</th>
<th>GX340R2</th>
<th>GX340RT2</th>
<th>GX340U2</th>
<th>GX340UT2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td>GCBKK</td>
<td>GCBET</td>
<td>GCBKK</td>
<td>GCBET</td>
</tr>
<tr>
<td><strong>Displacement</strong></td>
<td>4 stroke, overhead valve, single cylinder, inclined by 25°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bore x stroke</strong></td>
<td>88.0 x 64.0 mm (3.5 x 2.5 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*<em>Net power (SAE J1349)(^<em>1)</em></em></td>
<td>8.0 kW (10.7 HP) / 3,600 min(^{-1}) (rpm)(^*2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Continuous rated power</strong></td>
<td>6.3 kW (8.4 HP) / 3,600 min(^{-1}) (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*<em>Maximum net torque (SAE J1349)(^<em>1)</em></em></td>
<td>26.4 N·m (2.69 kgf·m, 19.5 lbf·ft) / 2,500 min(^{-1}) (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression ratio</strong></td>
<td>8.2:1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuel consumption (at continuous rated power)</strong></td>
<td>3.1 Liters (0.82 US gal, 0.68 Imp gal) / h</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ignition system</strong></td>
<td>C.D.I. (Capacitor Discharge Ignition) type magneto ignition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ignition timing</strong></td>
<td>B.T.D.C. 10° / 1,400min(^{-1}) (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spark advance performance</strong></td>
<td>B.T.D.C. 10°-22°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spark plug</strong></td>
<td>BPR6ES (NGK) / W20EPR-U (DENSO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lubrication system</strong></td>
<td>Forced splash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oil capacity</strong></td>
<td>1.1 Liters (1.16 US qt, 0.97 Imp qt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recommended oil</strong></td>
<td>SAE 10W-30 API service classification SJ or later</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cooling system</strong></td>
<td>Forced air</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Starting system</strong></td>
<td>Recoil, Recoil and Starter motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stopping system</strong></td>
<td>Ignition exciter coil circuit open</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carburetor</strong></td>
<td>Horizontal type, butterfly valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air cleaner</strong></td>
<td>Dual element type, Cyclone type, Oil bath type, Low profile type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Governor</strong></td>
<td>Mechanical centrifugal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breather system</strong></td>
<td>Reed valve type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuel used</strong></td>
<td>Unleaded gasoline with a pump octane rating 86 or higher</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^*1\): The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 rpm (net power) and at 2,500 rpm (max net torque). Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.

\(^*2\): Base type includes a balancer, dual type air cleaner, and standard type muffler.
**SPECIFICATIONS**

**GX390**

<table>
<thead>
<tr>
<th>Model</th>
<th>GX390R2</th>
<th>GX390RT2</th>
<th>GX390U2</th>
<th>GX390UT2</th>
<th>GX390T2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>4 stroke, overhead valve, single cylinder, inclined by 25°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Displacement</strong></td>
<td>389 cm³ (23.7 cu-in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bore x stroke</strong></td>
<td>88.0 x 64.0 mm (3.5 x 2.5 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>**Net power (SAE J1349)**¹</td>
<td>8.7 kW (11.7 HP) / 3,600 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Continuous rated power</strong></td>
<td>7.0 kW (9.4 HP) / 3,600 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>**Maximum net torque (SAE J1349)**¹</td>
<td>26.5 N·m (2.7 kgf·m, 19.5 lbf·ft) / 2,500 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression ratio</strong></td>
<td>8.2 ± 0.2:1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuel consumption</strong>&lt;br&gt;(at continuous rated power)</td>
<td>3.5 Liters (0.92 US gal, 0.77 Imp gal) / h</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ignition system</strong></td>
<td>C.D.I.(Capacitor Discharge Ignition) type magneto ignition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ignition timing</strong></td>
<td>B.T.D.C. 10° / 1,400 min⁻¹ (rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spark plug</strong></td>
<td>BPR6ES (NGK) / W20EPR-U (DENSO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lubrication system</strong></td>
<td>Forced splash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oil capacity</strong></td>
<td>1.1 Liters (1.16 US qt, 0.97 Imp qt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recommended oil</strong></td>
<td>SAE 10W-30 API service classification SJ or later</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Cooling system</strong></td>
<td>Forced air</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Starting system</strong></td>
<td>Recoil, Recoil and Starter motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stopping system</strong></td>
<td>Ignition primary circuit open</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Carburetor</strong></td>
<td>Horizontal type, butterfly valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air cleaner</strong></td>
<td>Dual element type, Cyclone type, Low profile type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Governor</strong></td>
<td>Mechanical centrifugal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breather system</strong></td>
<td>Reed valve type</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Fuel used</strong></td>
<td>Unleaded gasoline with a pump octane rating 86 or higher</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹: The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 rpm (net power) and at 2,500 rpm (max net torque). Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.
PERFORMANCE CURVES
GX240

ENGINE SPEED (rpm)
2000 3000 3600

OUTPUT

NET POWER

NET TORQUE

RECOMMENDED OPERATING SPEED RANGE

TORQUE
12 11 1.6 1.7 1.8 1.9 2.0 1.5

(lbf·ft) (kgf·m)

14 13 12 11

20

ENGINE SPEED (rpm)

2000 3000 3600

(N·m) (PS) (KW)
13 14 15

7 6 5

5 4 3 2

4 3 2 1

18 16 14 12 10

(kW) (HP) (PS)
GX340

**Engine Speed (rpm)**

2000 3600

**Output Torque (N·m)**

4 28

**NET TORQUE**

**NET POWER**

**Recommended Operating Speed Range**

gx240ut2_gx270ut2_gx340ut2_gx390ut2
SPECIFICATIONS

GX390

<table>
<thead>
<tr>
<th>ENGINE SPEED (min⁻¹ [rpm])</th>
<th>RECOMMENDED OPERATING SPEED RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>3600</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTPUT</th>
<th>NET POWER (KW)</th>
<th>NET TORQUE (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2.2</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>2.3</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>2.4</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>2.5</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>2.6</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>2.7</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>2.8</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTPUT</th>
<th>NET POWER (HP)</th>
<th>NET TORQUE (lbf·ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>7</td>
<td>14</td>
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<td>9</td>
<td>16</td>
<td>26</td>
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<td>10</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>18</td>
<td>28</td>
</tr>
</tbody>
</table>

NET POWER (KW) | NET TORQUE (N·m)
DIMENSIONAL DRAWINGS

*: P. T. O. type. (page 1-3)

GX240
WITHOUT REDUCTION UNIT TYPE

Unit: mm (in)

CONTROL BOX
(If equipped)

CRANKSHAFT (P. T. O.)

STARTER MOTOR
(If equipped)

GX240UT2 * V: 400 (15.7)
GX240RT2 * V: 420 (16.5)
* W: 370 (14.6)

* E: 360 (14.2)
* P/Q: 380 (15.0)
* S: 355 (14.0)
SPECIFICATIONS
WITH REDUCTION UNIT TYPE

Unit: mm (in)

**CONTROL BOX**
(If equipped)

With control box type: 462 (18.2)
Without control box type: 428 (16.9)

**REDUCTION UNIT**

**STARTER MOTOR**
(If equipped)

**P. T. O. SHAFT**

**GX240UT2/UT2: 422 (16.6)**

**GX270UT2/GX340UT2/GX390UT2**

---

* L/H: 209.9 (8.26)
* R: 187.2 (7.37)

* L/H: 68.1 (2.68)
* R: 90.8 (3.57)

* L/H: 140.3 (5.52)
* R: 188.5 (7.42)

* L: 405 (15.9)
* H: 425 (16.7)
* R: 440 (17.3)
SPECIFICATIONS

WITH REDUCTION UNIT TYPE

Unit: mm (in)

CONTROL BOX
(if equipped)

STARTER MOTOR
(if equipped)

REDUCTION UNIT

P. T. O. SHAFT

With control box type: 462 (18.2)
Without control box type: 428 (16.9)
GX340

WITHOUT REDUCTION UNIT TYPE

Unit: mm (in)

CONTROL BOX
(If equipped)

With control box type: 499 (19.6)

Without control box type: 460 (18.1)

CRANKSHAFT (P. T. O.)

* E: 365 (14.4)
* P/Q: 405 (15.9)
* S: 380 (15.0)
GX340RT2 * V: 430 (16.9)
GX340UT2 * V: 425 (16.7)
SPECIFICATIONS

WITH REDUCTION TYPE

Unit: mm (in)

REDUCTION UNIT

P. T. O. SHAFT

With control box type: 499 (19.6)
Without control box type: 460 (18.1)

195.5 (7.70)
105 (4.1)
103 (4.1)
17 (0.7)
27 (1.1)

448 (17.6)
142 (5.6)
201 (7.9)
133.5 (5.28)

* H: 148.3 (5.84)
* L: 155 (6.1)

* H: 452 (17.8)
* L: 440 (17.3)

479 (18.8)
121.8 (4.80)
98 (3.9)
159 (6.3)
232.9 (9.17)
68.1 (2.68)

447 (17.6)
448 (17.6)

440 (17.3)

gx240ut2_gx270ut2_gx340ut2_gx390ut2
## GX390

### WITHOUT REDUCTION TYPE

**Unit:** mm (in)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(in)</td>
</tr>
<tr>
<td><strong>Control Box</strong> (If equipped)</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>447 (17.6)</td>
</tr>
<tr>
<td>Height</td>
<td>195.5 (7.70)</td>
</tr>
<tr>
<td><strong>Crankshaft (P. T. O.)</strong></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>141.5 (5.57)</td>
</tr>
<tr>
<td>Height</td>
<td>200.6 (7.90)</td>
</tr>
<tr>
<td><strong>With control box type:</strong> 498.6 (19.63)</td>
<td></td>
</tr>
<tr>
<td><strong>Without control box type:</strong> 460 (18.1)</td>
<td></td>
</tr>
</tbody>
</table>

**STARTER MOTOR** (If equipped)

- Width: 105 (4.1)
- Height: 103 (4.1)
- Depth: 27 (1.1)

**Excerpt GX390UT2: 448 (17.6)**

- P/Q: 405 (15.9)
- S: 380 (15.0)
- V: 425 (16.7)
SPECIFICATIONS

P.T.O. DIMENSIONAL DRAWINGS

GX240

*: P. T. O. type. (page 1-3)

L TYPE*: (WITH REDUCTION UNIT)

W TYPE*

Unit: mm (in)

P.D.127 (5.0)

M8 x 1.25 (6 PLACES)

7.00-7.05
(0.276-0.278)

M8 x 1.25

10 (0.4)

68.1 (2.68)

103 (4.1)

P. T. O. SHAFT

REDUCTION UNIT

P.D.160.1 (6.3)

Φ7.15 (Φ0.281)
(2 PLACES)

M8 x 1.25

(4 PLACES)

Φ8.51 (Φ0.335)
(4 PLACES)

CRANKSHAFT (P. T. O.)

Unit: mm (in)

80 (3.1)

55 (2.2)

15.5 (0.61)

75 (3.0)

Φ69 (Φ0.5)

28 (1.1)

60.0 (2.36)

66.7 (2.63)

20.9-21.0
(0.82-0.83)

Φ24.947-24.980
(Φ0.9822-0.9835)

42 (1.7)

7.00-7.05
(0.276-0.278)

10 (0.4)

68.1 (2.68)

103 (4.1)
SPECIFICATIONS

GX240•GX270

* : P. T. O. type. (page 1-3)

E TYPE*

\[
\begin{align*}
45^\circ & \quad 30^\circ & \quad 30^\circ & \quad 45^\circ \\
\text{P. D.165.1 (6.50)} & \quad \text{M8 x 1.25 (2 PLACES)} & \quad \text{\Phi 8.51 (\Phi 0.335) (4 PLACES)} & \quad \text{CRANKSHAFT (P. T. O.)}
\end{align*}
\]

Unit: mm (in)

H TYPE* (WITH REDUCTION UNIT)

\[
\begin{align*}
45^\circ & \quad 45^\circ \\
\text{\Phi 7.15 (\Phi 0.281) (6 PLACES)} & \quad \text{6.312 - 6.363 (0.2485 - 0.2505)} & \quad \text{85.7 (3.37)} \\
\text{70 (2.8)} & \quad \text{80 (3.1)} & \quad \text{85.7 (3.37)} \\
\text{10 (0.4)} & \quad \text{68.1 (2.68)} & \quad \text{63 (2.5)}
\end{align*}
\]

Unit: mm (in)
SPECIFICATIONS

S TYPE*

- M8 x 1.25 (2 PLACES)
- P.D. 165.1 (6.50)
- CRANKSHAFT (P. T. O.)

V TYPE*

- 5/16 - 24UNF - 2B (2 PLACES)
- 3/8 - 16UNC - 2B (4 PLACES)
- CRANKSHAFT (P. T. O.)
R TYPE* (WITH 1/2 REDUCTION UNIT)

Unit: mm (in)

M8 x 1.25 (4 PLACES)

35 (1.4) 35 (1.4)

7.000 - 7.036 (0.2756 - 0.2770)

17.9 - 18.0 (0.70 - 0.71)

25 (1.0)

21.947 - 21.980 (0.8641 - 0.8654)

53 (2.1)

50 (2.0)

REDUCTION UNIT

P. T. O. SHAFT

90.8 (3.57)
SPECIFICATIONS

GX340•GX390

*: P.T.O. type (page 1-4)

H TYPE (WITHOUT REDUCTION)

Unit: mm (in)

L TYPE* (WITH REDUCTION)

Unit: mm (in)
**P TYPE**

**Q TYPE**
SPECIFICATIONS

S TYPE*

V TYPE*

Unit: mm (in)

CRANKSHAFT (P. T. O.)

CRANKSHAFT (P. T. O.)
# 2. SERVICE INFORMATION

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<td>Big end I.D.</td>
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<td>Big end oil clearance</td>
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<td><strong>Cylinder barrel (Crankcase)</strong></td>
<td>Camshaft bearing I.D.</td>
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<td><strong>Crankcase cover</strong></td>
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<td><strong>Valves</strong></td>
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<td>Valve stem O.D. IN</td>
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<td>Valve stem O.D. EX</td>
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<td>Valve guide I.D. IN</td>
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<tr>
<td></td>
<td>Valve guide I.D. EX</td>
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<td></td>
<td>Valve seat width</td>
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<td>Valve spring free length</td>
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<td>Valve spring perpendicularity</td>
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<tr>
<td><strong>Camshaft</strong></td>
<td>Cam height IN</td>
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<td></td>
<td>Cam height EX</td>
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<td>Camshaft O.D.</td>
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## SERVICE INFORMATION

<table>
<thead>
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<th>Part</th>
<th>Item</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carburetor</td>
<td>Main jet</td>
<td>BE70R A: #85</td>
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<td></td>
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<td>BE71F A: #85</td>
<td>–</td>
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<tr>
<td></td>
<td>Pilot screw opening</td>
<td>BE70R A: 1 turn out</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BE71F A: 1 turn out</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Float height</td>
<td>13.2 (0.52)</td>
<td>–</td>
</tr>
<tr>
<td>Spark plug</td>
<td>Gap</td>
<td>0.7 – 0.8 (0.028 – 0.031)</td>
<td>–</td>
</tr>
<tr>
<td>Ignition coil</td>
<td>Air gap</td>
<td>0.2 – 0.6 (0.01 – 0.02)</td>
<td>–</td>
</tr>
<tr>
<td>Starter motor</td>
<td>Brush length</td>
<td>7.0 (0.28)</td>
<td>3.5 (0.14)</td>
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<td></td>
<td>Mica depth</td>
<td>1.0 (0.04)</td>
<td>0.2 (0.01)</td>
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<tr>
<td>Charge coil</td>
<td>Resistance 1A</td>
<td>3.00 – 4.00 Ω</td>
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<tr>
<td></td>
<td>3A</td>
<td>0.62 – 0.93 Ω</td>
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<td></td>
<td>10A</td>
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<td>18A</td>
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<tr>
<td>Lamp coil</td>
<td>Resistance 12V - 15 W</td>
<td>1.04 – 1.56 Ω</td>
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<td>12V - 25 W</td>
<td>0.30 – 0.46 Ω</td>
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<td>12V - 50 W</td>
<td>0.29 – 0.44 Ω</td>
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### GX270

<table>
<thead>
<tr>
<th>Part</th>
<th>Item</th>
<th>Standard</th>
<th>Service limit</th>
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</thead>
<tbody>
<tr>
<td>Engine</td>
<td>Maximum speed (at no load)</td>
<td>3,850 ± 150 min⁻¹ (rpm)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Idle speed</td>
<td>1,400 ± 150 min⁻¹ (rpm)</td>
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<tr>
<td></td>
<td>Cylinder compression</td>
<td>0.59 -0.83 MPa (6.0-8.5 kgf/cm², 85-121 psi) / 600 min⁻¹ (rpm)</td>
<td>–</td>
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<tr>
<td>Cylinder head</td>
<td>Warpage</td>
<td>–</td>
<td>0.10 (0.004)</td>
</tr>
<tr>
<td>Cylinder</td>
<td>Sleeve I.D.</td>
<td>77.000 – 77.017 (3.0315 – 3.0322)</td>
<td>77.17 (3.038)</td>
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<tr>
<td>Piston</td>
<td>Skirt O.D.</td>
<td>76.975 – 76.985 (3.0305 – 3.0309)</td>
<td>76.85 (3.026)</td>
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<tr>
<td>Piston-to-cylinder clearance</td>
<td>0.015 – 0.042 (0.0006 – 0.0017)</td>
<td>0.12 (0.005)</td>
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<tr>
<td>Piston pin bore I.D.</td>
<td>18.002 – 18.008 (0.7087 – 0.7090)</td>
<td>18.042 (0.7103)</td>
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<tr>
<td>Piston pin</td>
<td>Pin O.D.</td>
<td>17.994 – 18.000 (0.7084 – 0.7087)</td>
<td>17.95 (0.707)</td>
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<td>0.002 – 0.014 (0.0001 – 0.0006)</td>
<td>0.08 (0.003)</td>
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<tr>
<td>Piston rings</td>
<td>Ring side clearance Top</td>
<td>0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<td></td>
<td>Second</td>
<td>0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<tr>
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<td>Ring end gap Top</td>
<td>0.200 – 0.350 (0.0079 – 0.0138)</td>
<td>1.0 (0.04)</td>
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<td>Second</td>
<td>0.350 – 0.500 (0.0138 – 0.0197)</td>
<td>1.0 (0.04)</td>
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<td>0.2 – 0.7 (0.01 – 0.03)</td>
<td>1.0 (0.04)</td>
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<tr>
<td>Piston rings</td>
<td>Ring width Top</td>
<td>1.160 – 1.175 (0.0457 – 0.0463)</td>
<td>1.140 (0.0449)</td>
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<td>Second</td>
<td>1.160 – 1.175 (0.0457 – 0.0463)</td>
<td>1.140 (0.0449)</td>
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<td>Connecting rod</td>
<td>Small end I.D.</td>
<td>18.005 – 18.020 (0.7089 – 0.7094)</td>
<td>18.07 (0.711)</td>
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<td>Big end side clearance</td>
<td>0.1 – 0.4 (0.004 – 0.016)</td>
<td>1.0 (0.04)</td>
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<td>Big end I.D.</td>
<td>33.025 – 33.039 (1.3002 – 1.3007)</td>
<td>33.07 (1.302)</td>
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<td>0.040 – 0.064 (0.0016 – 0.0025)</td>
<td>0.12 (0.005)</td>
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<tr>
<td>Crankshaft</td>
<td>Crank pin O.D.</td>
<td>32.975 – 32.985 (1.2982 – 1.2986)</td>
<td>32.92 (1.296)</td>
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<td>Crankshaft runout</td>
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<td>0.1 (0.004)</td>
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<tr>
<td>Cylinder barrel (Crankcase)</td>
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<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
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<td>Crankcase cover</td>
<td>Camshaft bearing I.D.</td>
<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
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<td>EX: 0.20 ± 0.02</td>
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<td>Valve stem O.D.</td>
<td>IN: 6.575 – 6.590 (0.2589 – 0.2594)</td>
<td>6.44 (0.254)</td>
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<td>EX: 6.535 – 6.550 (0.2573 – 0.2579)</td>
<td>6.40 (0.252)</td>
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<td>Valve guide I.D.</td>
<td>IN/EX: 6.600 – 6.612 (0.2598 – 0.2603)</td>
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<td>EX: 0.050 – 0.077 (0.0020 – 0.0030)</td>
<td>0.12 (0.005)</td>
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<td>Valve seat width</td>
<td>IN: 1.0 – 1.2 (0.04 – 0.05)</td>
<td>2.0 (0.08)</td>
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<td>Main jet</td>
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<td>Pilot screw opening</td>
<td>BE21JA: 2 turns out</td>
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<td>Float height</td>
<td>13.2 (0.52)</td>
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<tr>
<td>Spark plug</td>
<td>Gap</td>
<td>0.7 – 0.8 (0.028 – 0.031)</td>
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<tr>
<td>Ignition coil</td>
<td>Air gap</td>
<td>0.2 – 0.6 (0.01 – 0.02)</td>
<td>–</td>
</tr>
<tr>
<td>Starter motor</td>
<td>Brush length</td>
<td>7.0 (0.28)</td>
<td>3.5 (0.14)</td>
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<td>Mica depth</td>
<td>1.0 (0.04)</td>
<td>0.2 (0.01)</td>
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<td>3A: 0.62 – 0.93 Ω</td>
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<td>10A: 0.16 – 0.24 Ω</td>
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<td>18A: 0.10 – 0.30 Ω</td>
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<td>Lamp coil</td>
<td>Resistance</td>
<td>12V - 15 W: 1.04 – 1.56 Ω</td>
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## GX340

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<td>Engine</td>
<td>Maximum speed (at no load)</td>
<td>3,850 ± 150 min⁻¹ (rpm)</td>
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<td></td>
<td>Idle speed</td>
<td>1,400 ± 150 min⁻¹ (rpm)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Cylinder compression</td>
<td>0.51 - 0.69 MPa (5.2 - 7.0 kgf/cm², 74 - 100 psi) / 600 min⁻¹ (rpm)</td>
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<tr>
<td>Cylinder head</td>
<td>Warpage</td>
<td>–</td>
<td>0.10 (0.004)</td>
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<tr>
<td>Cylinder</td>
<td>Sleeve I.D.</td>
<td>88.000 – 88.017 (3.4646 – 3.4652)</td>
<td>88.170 (3.4713)</td>
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<td>Piston-to-cylinder clearance</td>
<td>0.015 – 0.052 (0.0006 – 0.0020)</td>
<td>0.12 (0.005)</td>
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<td>Piston pin bore I.D.</td>
<td>20.002 – 20.008 (0.7875 – 0.7877)</td>
<td>20.042 (0.7891)</td>
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<td>Piston pin</td>
<td>Pin O.D.</td>
<td>19.994 – 20.000 (0.7872 – 0.7874)</td>
<td>19.950 (0.7854)</td>
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<td>Piston rings</td>
<td>Piston pin-to-piston pin bore clearance</td>
<td>0.002 – 0.014 (0.0001 – 0.0006)</td>
<td>0.08 (0.003)</td>
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<td></td>
<td>Ring side clearance</td>
<td>Top: 0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<tr>
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<td></td>
<td>Second: 0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<tr>
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<td>Ring end gap</td>
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<td>Valves</td>
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<td>Valve clearance EX</td>
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<td>EX 6.535 – 6.550 (0.2572 – 0.2578)</td>
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<td>BE80P A: 1 - 3/4 turns out</td>
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<td>Spark plug</td>
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<td>Ignition coil</td>
<td>Air gap 0.2 – 0.6 (0.01 – 0.02)</td>
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<td>Starter motor</td>
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<td>18A 0.10 - 0.30 Ω</td>
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<td>Resistance 12V - 15 W</td>
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<td>12V - 50 W 0.29 - 0.44 Ω</td>
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### SERVICE INFORMATION

#### GX390

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<th>Part</th>
<th>Item</th>
<th>Standard</th>
<th>Service limit</th>
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<tbody>
<tr>
<td><strong>Engine</strong></td>
<td>Maximum speed (at no load)</td>
<td>3,850 ± 150 min⁻¹ (rpm)</td>
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<td></td>
<td>Idle speed</td>
<td>1,400 ± 150 min⁻¹ (rpm)</td>
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<td></td>
<td>Cylinder compression</td>
<td>0.51-0.69 MPa (5.2-7.0 kgf/cm², 74-100 psi) / 600 min⁻¹ (rpm)</td>
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<td><strong>Cylinder head</strong></td>
<td>Warpage</td>
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<td>Sleeve I.D.</td>
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<td>88.170 (3.4710)</td>
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<td><strong>Piston</strong></td>
<td>Skirt O.D.</td>
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<td>Oil (side rail)</td>
<td>0.2 – 0.7 (0.01 – 0.03)</td>
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<td>Ring width</td>
<td>Top 1.160 – 1.190 (0.0457 – 0.047)</td>
<td>1.140 (0.0449)</td>
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<td>Second 1.160 – 1.175 (0.0457 – 0.0463)</td>
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<td><strong>Connecting rod</strong></td>
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<td>0.1 – 0.4 (0.004 – 0.016)</td>
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<td>Big end oil clearance</td>
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<td>0.12 (0.005)</td>
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<td><strong>Crankshaft</strong></td>
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<td>35.975 – 35.985 (1.4163 – 1.4167)</td>
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<td><strong>Cylinder barrel</strong></td>
<td>Camshaft bearing I.D.</td>
<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
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<td><strong>Crankcase cover</strong></td>
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<tr>
<td><strong>Valves</strong></td>
<td>Valve clearance IN</td>
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<td>Valve spring free length</td>
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<td>31.985 – 32.185 (1.2592 – 1.2671)</td>
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<td>3.5 (0.14)</td>
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<td>0.2 (0.01)</td>
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<td>3A</td>
<td>0.62 - 0.93 Ω</td>
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<td>10A</td>
<td>0.16 - 0.24 Ω</td>
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<td>18A</td>
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<td>Lamp coil</td>
<td>Resistance</td>
<td>12V25W</td>
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## SERVICE INFORMATION

### TORQUE VALUES

#### ENGINE TORQUE VALUES

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<th>Tread Dia. (mm)</th>
<th>Torque values</th>
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<td>Crankcase cover bolt</td>
<td>M8 x 1.25</td>
<td>24 2.4 17</td>
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<tr>
<td>Cylinder head bolt</td>
<td>M10 x 1.25</td>
<td>35 3.5 26</td>
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<td>Oil drain plug bolt</td>
<td>M12 x 1.5</td>
<td>22.5 2.25 17</td>
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<tr>
<td>Connecting rod bolt</td>
<td>M8 x 1.25 (Special bolt)</td>
<td>14 1.4 10</td>
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<td>Rocker arm pivot bolt</td>
<td>M8 x 1.25 (Special bolt)</td>
<td>24 2.4 17</td>
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<td>M6 x 0.5</td>
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<td>Oil level switch nut</td>
<td>M10 x 1.25</td>
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<td>M16 x 1.5 (Special nut)</td>
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<td>Flywheel nut (GX340, GX390)</td>
<td>M16 x 1.5 (Special nut)</td>
<td>170 17.3 125</td>
</tr>
<tr>
<td>Fuel tank nut/bolt</td>
<td>M8 x 1.25</td>
<td>24 2.4 18</td>
</tr>
<tr>
<td>Fuel tank joint</td>
<td>M10 x 1.25</td>
<td>2 0.2 1.5</td>
</tr>
<tr>
<td>Air cleaner elbow nut</td>
<td>M6 x 1.0</td>
<td>9 0.9 6.6</td>
</tr>
<tr>
<td>Muffler nut</td>
<td>M8 x 1.25</td>
<td>24 2.4 17</td>
</tr>
<tr>
<td>Exhaust pipe nut</td>
<td>M8 x 1.25</td>
<td>24 2.4 17</td>
</tr>
<tr>
<td>Gear case cover bolt (With reduction)</td>
<td>M8 x 1.25</td>
<td>24 2.4 17</td>
</tr>
<tr>
<td>Primary drive gear bolt (With reduction)</td>
<td>M8 x 1.25</td>
<td>24 2.4 17</td>
</tr>
<tr>
<td>Engine stop switch tapping screw</td>
<td>M3 x 1.06</td>
<td>0.45 0.046 0.33</td>
</tr>
<tr>
<td>Recoil starter center screw</td>
<td>M5 x 0.8 (Special bolt)</td>
<td>3.9 0.40 2.9</td>
</tr>
<tr>
<td>Fuel strainer cup</td>
<td>M24 x 1.0</td>
<td>3.9 0.40 2.9</td>
</tr>
</tbody>
</table>

#### STANDARD TORQUE VALUES

<table>
<thead>
<tr>
<th>Item</th>
<th>Tread Dia. (mm)</th>
<th>Torque values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 mm</td>
<td>2.1</td>
<td>0.21 1.5</td>
</tr>
<tr>
<td>5 mm</td>
<td>4.3</td>
<td>0.43 3.1</td>
</tr>
<tr>
<td>6 mm</td>
<td>9.0</td>
<td>0.90 6.6</td>
</tr>
<tr>
<td>Bolt and nut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 mm</td>
<td>5.3</td>
<td>0.53 3.9</td>
</tr>
<tr>
<td>6 mm</td>
<td>10</td>
<td>1.0 7</td>
</tr>
<tr>
<td>8 mm</td>
<td>22</td>
<td>2.2 16</td>
</tr>
<tr>
<td>10 mm</td>
<td>34</td>
<td>3.5 25</td>
</tr>
<tr>
<td>12 mm</td>
<td>54</td>
<td>5.5 40</td>
</tr>
<tr>
<td>Flange bolt and nut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 mm</td>
<td>5.4</td>
<td>0.55 3.9</td>
</tr>
<tr>
<td>6 mm</td>
<td>12</td>
<td>1.2 9</td>
</tr>
<tr>
<td>8 mm</td>
<td>23</td>
<td>2.3 17</td>
</tr>
<tr>
<td>10 mm</td>
<td>40</td>
<td>4.0 30</td>
</tr>
<tr>
<td>SH (Small head) flange bolt</td>
<td>6 mm</td>
<td>9.0 0.90 6.6</td>
</tr>
<tr>
<td>CT (Cutting threads) flange bolt (Retightening)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 mm</td>
<td>5.4</td>
<td>0.55 4.0</td>
</tr>
<tr>
<td>6 mm</td>
<td>12</td>
<td>1.2 9</td>
</tr>
</tbody>
</table>
# LUBRICATION & SEAL POINT

<table>
<thead>
<tr>
<th>Location</th>
<th>Material</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crankshaft pin, journal, and gear</td>
<td>Engine oil</td>
<td></td>
</tr>
<tr>
<td>Crankcase bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crankcase cover bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston outer surface and piston pin hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston pin outer surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder inner surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecting rod big and small end bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecting rod bolt threads and seating surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camshaft cam profile, bearing, decompressor, and gear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve lifter shaft and slipper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve stem seal contact area of seal lip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve stem sliding surface and stem end</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Push rod end</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tappet adjusting screw and nut threads and seating surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocker arm shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flywheel nut threads and seating surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor weight holder gear and journal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor holder shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor slider</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor arm shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder head bolt threads and seating surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocker arm pivot threads and pivot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balancer shaft bearing and gear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.T.O. shaft bearing and gear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive sprocket and P.T.O. shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counter shaft bearing and gears</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch friction disc and clutch plate (GX270)</td>
<td>Engine oil</td>
<td>1/2 reduction with clutch</td>
</tr>
<tr>
<td>Oil seal lip</td>
<td>Multi-purpose grease</td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recoil starter case cutout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recoil starter ratchet sliding surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recoil starter spring retainer inside</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camshaft cam profile</td>
<td>Use molybdenum solution (mixture of the engine oil and molybdenum grease with the ratio 100 g grease: 70 cc oil)</td>
<td>When installing a new camshaft</td>
</tr>
<tr>
<td>Recoil starter center screw threads</td>
<td>Hondalock 1, Threebond® 2430 or equivalent</td>
<td></td>
</tr>
</tbody>
</table>
SPECIAL TOOLS

Special tools used in this manual can be ordered using normal American Honda parts ordering procedures.

<table>
<thead>
<tr>
<th>Tool Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Float level gauge</td>
<td>07401-0010000</td>
</tr>
<tr>
<td>Remover weight</td>
<td>07936-371020A</td>
</tr>
<tr>
<td>Valve guide driver, 6.6 mm</td>
<td>07942-6570100</td>
</tr>
<tr>
<td>Bearing driver attachment, 32 × 35 mm</td>
<td>07746-0010100</td>
</tr>
<tr>
<td>Bearing driver attachment, 42 × 47 mm</td>
<td>07746-0010300</td>
</tr>
<tr>
<td>Bearing driver attachment, 52 × 55 mm</td>
<td>07746-0010400</td>
</tr>
<tr>
<td>Bearing driver attachment, 72 × 75 mm</td>
<td>07746-0010600</td>
</tr>
<tr>
<td>Driver, 40 mm I. D.</td>
<td>07746-0030100</td>
</tr>
<tr>
<td>Inner bearing driver attachment, 35 mm</td>
<td>07746-0030400</td>
</tr>
<tr>
<td>Pilot, 15 mm</td>
<td>07746-0040300</td>
</tr>
<tr>
<td>Pilot, 20 mm</td>
<td>07746-0040500</td>
</tr>
<tr>
<td>Pilot, 30 mm</td>
<td>07746-0040700</td>
</tr>
</tbody>
</table>
There are two convenient ways to order: online or by toll-free phone.

- To order online, go to the IN: SERVICE > Tools > Tool and Equipment Program > Online Catalog, and then search by model number.
- To order by phone, call 1-888-424-6857.
  Customer service representatives are available from 7:30 AM until 7:00 PM CT, Monday through Friday.
Connection of regulator/rectifier, charge/lamp coil, sub wire harness, and auto throttle solenoid depend on the application of the engine; therefore, this manual does not indicate those parts.

ENGINE STOP SWITCH TYPE

[Diagram showing harness routing and connections]
COMBINATION SWITCH (CONTROL BOX) TYPE

PURSE LOCK CLIP
- To starter motor
- To ignition coil (YELLOW)
- To ignition coil (BLACK)
- To ignition coil (RED)

ENGINE WIRE HARNESS (To ignition coil)

STOP SWITCH CORD HOLDER

CABLE STRAP/FASTENER TUBE
- YELLOW
- RED
- BLACK

To starter motor

CABLE STRAP
- GRAY
- TO control box

FASTENER TUBE
- WHITE
- To oil level switch

COMBINATION SWITCH WIRE
- To 1 A / 3 A charge coil
- INSIDE

To control box

INSIDE

To starter motor

CABLE STRAP/FASTENER TUBE
- TO control box
- WHITE
- BLACK / WHITE
WITH CHARGE COIL / LAMP COIL

18 A CHARGE COIL TYPE:

10 A CHARGE COIL TYPE:

1 A / 3 A CHARGE COIL TYPE:
12 V - 25 W LAMP COIL TYPE:
SERVICE INFORMATION

TUBE ROUTING

FUEL TUBE

3 mm

TUBE CLAMP

40 mm

SUPPORTER RUBBER

CARBURETOR SIDE

TUBE CLAMP

TUBE CLIP

TUBE CLAMP

BREATHER TUBE

INSERT DEPTH MARK

CARBURETOR SIDE

SUPPORTER RUBBER

TUBE CLAMP

TUBE CLIP

TUBE CLAMP

BREATHER TUBE

INSERT DEPTH MARK

FUEL TUBE
### 3. MAINTENANCE

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<th>Page</th>
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<td>ENGINE OIL CHANGE</td>
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<td>3-9</td>
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<td>SPARK PLUG REPLACEMENT</td>
<td>3-10</td>
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<td>SPARK ARRESTER CLEANING (if equipped)</td>
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<td>3-13</td>
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<td>3-14</td>
</tr>
<tr>
<td>FUEL TUBE CHECK</td>
<td>3-14</td>
</tr>
</tbody>
</table>
## MAINTENANCE

### MAINTENANCE SCHEDULE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Perform at every indicated month or operating hour interval, whichever comes first.</th>
<th>REGULAR SERVICE PERIOD (2)</th>
<th>Each use</th>
<th>First month or 20 hrs.</th>
<th>Every 3 months or 50 hrs.</th>
<th>Every 6 months or 100 hrs.</th>
<th>Every year or 300 hrs.</th>
<th>Refer to page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine oil</td>
<td>Check level</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>3-3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>3-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction case oil (applicable types)</td>
<td>Check level</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>3-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>3-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Check</td>
<td>○</td>
<td>○ (1)</td>
<td>○ (*) (1)</td>
<td>3-6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean (Cyclone type)</td>
<td>Every 6 months or 150 hours</td>
<td>3-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replace (Cyclone type)</td>
<td>Every 2 years or 600 hours</td>
<td>3-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment cup</td>
<td>Clean</td>
<td>○</td>
<td>○</td>
<td>3-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>Check–adjust</td>
<td>○</td>
<td>○</td>
<td>3-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replace</td>
<td>○</td>
<td>○</td>
<td>3-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark arrester (If equipped)</td>
<td>Clean</td>
<td>○</td>
<td>○</td>
<td>3-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idle speed</td>
<td>Check–adjust</td>
<td>○</td>
<td>○</td>
<td>3-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve clearance</td>
<td>Check–adjust</td>
<td>○</td>
<td>○</td>
<td>3-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel tank and filter</td>
<td>Clean</td>
<td>○</td>
<td>○</td>
<td>3-14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel tube</td>
<td>Check</td>
<td>Every 2 years (Replace if necessary)</td>
<td>3-14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Service more frequently when used in dusty areas.

(2) For commercial use, log hours of operation to determine proper maintenance intervals.

(*) Internal vent carburetor with dual element type only.

(**) Replace paper element type only.
ENGINE OIL LEVEL CHECK

Place the engine on a level surface.
Remove the oil filler cap (1), and wipe the oil level gauge (2) clean.
Insert the oil filler cap without screwing it into the oil filler neck (3).
Remove the oil filler cap and check oil level shown on the oil level gauge.
If the oil level is low, fill with recommended oil to the upper level (4) of the oil filler neck.

SAE 10W - 30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the recommended range.

RECOMMENDED OIL:
SAE 10W-30 API service classification SJ or later
Tighten the oil filler cap securely.
MAINTENANCE

ENGINE OIL CHANGE

Drain the oil in the engine while the engine is warm. Warm oil drains quickly and completely.

Place the engine on a level surface, and place a suitable container under the drain plug bolt.

Remove the oil filler cap (1), drain plug bolt (2), and drain plug washer (3) to drain the oil into the suitable container.

Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash, pour it on the ground, or pour it down a drain.

⚠️ CAUTION

Used engine oil contains substances that have been identified as carcinogenic. If repeatedly left in contact with the skin for prolonged periods, it may cause skin cancer. Wash your hands thoroughly with soap and water as soon as possible after contact with used engine oil.

Install a new drain plug washer (3) and tighten the drain plug bolt (2) to the specified torque.

**TORQUE: 22.5 N·m (2.25 kgf-m, 17 lbf·ft)**

Fill with recommended oil to the upper level mark of the oil level dipstick (page 3-3).

Engine oil capacity: 1.1 ℓ (1.16 US gal, 0.97 Imp gal)

Tighten the oil filler cap securely.
REDUCTION CASE OIL (1/2 reduction unit with clutch)

Oil level check

Place the engine on a level surface.

Remove the reduction oil cap / oil level gauge (1), and wipe the oil level gauge clean.

Insert the oil level gauge without screwing it into the oil filler neck (2).

Remove the oil level gauge and check oil level shown on the oil level gauge.

If the oil level is low, fill with recommended oil to the upper level (3) of the oil level gauge.

SAE 10W - 30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the recommended range.

RECOMMENDED OIL:
SAE 10W-30 API service classification SE or later

Tighten the oil level gauge securely.

Oil Change

Drain the oil in the engine while the engine is warm. Warm oil drains quickly and completely.

Place the engine on a level surface, and place a suitable container under the drain plug bolt.

Remove the reduction oil cap / oil level gauge (1), drain plug bolt (2), and drain plug washer (3) to drain the oil into the suitable container.

Please dispose of used oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash, pour it on the ground, or pour it down a drain.

Install a new drain plug washer and tighten the drain plug bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Fill with recommended oil to the upper level mark of the oil level gauge.

Reduction oil case capacity: 0.3 g (0.32 US gal, 0.26 Imp gal)

Tighten the oil level gauge securely.
MAINTENANCE

AIR CLEANER CHECK/CLEANING/ REPLACEMENT

DUAL ELEMENT TYPE:
A dirty air filter will restrict air flow to the carburetor, reducing engine performance. If the engine is operated in dusty areas, clean the air cleaner more often than specified in the MAINTENANCE SCHEDULE.

**NOTICE**
Operating the engine without the air filters or with the filters installed loosely will allow dirt to enter the engine, causing rapid engine wear. Install the air filters securely.

Remove the nut (1) and the air cleaner cover (2).
Remove the wing nut (3) and air filter assembly (4)(5).
Separate the inner filter (Paper) (4) from the outer filter (Foam) (5). Carefully check both filters for holes or tears and replace if damaged.
Clean the filters if they are to be reused ([page 3-7](#)).
Install the elements in the reverse order of removal.

CYCLONE TYPE:
A dirty air filter will restrict air flow to the carburetor, reducing engine performance. If the engine is operated in dusty areas, clean the air cleaner more often than specified in the MAINTENANCE SCHEDULE.

**NOTICE**
Operating the engine without the air filters or with the filters installed loosely will allow dirt to enter the engine, causing rapid engine wear. Install the air filters securely.

Remove the wing nut (1) and the air cleaner cover (2).
Remove the wing nut (3) and air filter assembly (4)(5).
Separate the inner filter (Paper) (4) from the outer filter (Foam) (5). Carefully check both filters for holes or tears and replace if damaged.
Check the packing (6) for damage.
Clean the filters if they are to be reused (see below).
Install the elements in the reverse order of removal.
LOW PROFILE TYPE:
A dirty air filter will restrict air flow to the carburetor, reducing engine performance. If the engine is operated in dusty areas, clean the air cleaner more often than specified in the MAINTENANCE SCHEDULE.

NOTICE
Operating the engine without the air filter or with the filter installed loosely will allow dirt to enter the engine, causing rapid engine wear. Install the air filter securely.

Remove the air cleaner case lid spring (1) and air cleaner cover (2).

Remove the air cleaner element (3).

Carefully check the air cleaner element and replace if damaged.

Clean the filter if it is to be reused (see below).

Install the element in the reverse order of removal.

FILTER (FOAM) TYPE:
Clean the filter (1) in warm soapy water (2), rinse, and allow to dry thoroughly, or clean with a non-flammable solvent and allow to dry thoroughly.

Dip the filter in oil (3), and squeeze out all the excess oil. Clean engine oil is recommended for general use; Motul Air Filter Oil is recommended for operation in dusty areas.

Excess oil will restrict air flow through the foam element and may cause the engine to smoke at startup.

Check the air cleaner case packing for deterioration or damage. Make sure the air cleaner packing is installed securely.

Install the cleaner in the reverse order of removal.

INNER FILTER (PAPER) TYPE:
Tap the inner filter (1) lightly several times on a hard surface to remove excess dirt, or blow compressed air lightly (207 kPa (2.11 kgf/cm², 30 psi) or less) through the paper filter from the inside out. Never try to brush the dirt off; brushing will force dirt into the fibers.

Wipe dirt from the inside of the air cleaner case and the air cleaner cover, using a rag.

Check the air cleaner case packing for deterioration or damage. Make sure the air cleaner packing is installed securely.

Install the cleaner in the reverse order of removal.
MAINTENANCE

SEDIMENT CUP CLEANING

⚠️ WARNING
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
• Keep heat, sparks, and flame away.
• Handle fuel only outdoors.
• Wipe up spills immediately.

Turn the fuel valve lever (1) to the OFF position.
Remove the sediment cup (2) and the O-ring (3).
Release the tabs (5) and remove the cup filter (4).
Clean the sediment cup and the cup filter with non-flammable solvent and allow them to dry thoroughly.
Install the cup filter as the direction shown in the illustration.
Install a new O-ring and tighten the sediment cup to the specified torque.

**TORQUE: 3.9 N·m (0.40 kgf·m, 2.9 lbf·ft)**

Check the sediment cup for any sign of fuel leakage.
SPARK PLUG CHECK/ADJUSTMENT

CAUTION

If the engine has been running, the engine will be very hot. Allow it to cool before proceeding.

Remove the spark plug cap, and then remove the spark plug (1) using a spark plug wrench (2).

Visually check the spark plug. Replace the plug if it is heavily fouled or the insulator (1) is cracked or chipped.
Check the sealing washer (2) for damage.
Replace the spark plug if the sealing washer is damaged (page 3-10).

SPARK PLUG: BPR6ES (NGK) W20EPR-U (DENSO)

Measure the plug gap with a wire-type feeler gauge. If the measurement is out of the specification, adjust by bending the side electrode.

PLUG GAP: 0.7 – 0.8 mm (0.028 – 0.031 in)

Install the spark plug finger-tight to seat the washer, and then tighten 1/8 – 1/4 turn with a spark plug wrench.

NOTICE

A loose spark plug can become very hot and can damage the engine. Overtightening can damage the threads in the cylinder block.

Install the spark plug cap securely.
MAINTENANCE

SPARK PLUG REPLACEMENT

⚠️ CAUTION
If the engine has been running, the engine will be very hot. Allow it to cool before proceeding.

Remove the spark plug cap, and then remove the spark plug (1) using a spark plug wrench (2).

Verify the new spark plug gap is correct (page 3-9).

Install a new spark plug finger-tight to seat the washer, and then tighten 1/2 turn with a spark plug wrench.

SPARK PLUG: BPR6ES (NGK) W20EPR-U (DENSO)

NOTICE
A loose spark plug can become very hot and can damage the engine. Overtightening can damage the threads in the cylinder block.

Install the spark plug cap securely.

SPARK ARRESTER CLEANING
(if equipped)

⚠️ CAUTION
The engine and the muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Allow it to cool before proceeding.

SOLID PROTECTOR TYPE

Remove the muffler cover (page 14-2), if equipped.

Remove the 5 x 8 mm tapping screws (1), 6 x 10 mm tapping screw (2), and muffler protector (3).

Remove the 5 x 8 mm tapping screws (4) and spark arrester (5).
SEPARATED PROTECTOR TYPE

Remove the muffler cover (page 14-2), if equipped.

Remove the 4 x 6 mm tapping screws (1), and exhaust deflector (2), if equipped.

Remove the 5 x 8 mm tapping screws (3), R. muffler protector (4), and L. muffler protector (5).

Remove the 5 x 8 mm tapping screws (6) and spark arrester (7).

CLEANING

**NOTICE**

*Be careful to avoid damaging the screen.*

Clean the carbon deposits from the spark arrester screen (1) with a soft wire brush (2).

Check the spark arrester screen for damage. If the screen is damaged, replace the spark arrester.

Install the spark arrester in the reverse order of removal.
MAINTENANCE

IDLE SPEED CHECK/ADJUSTMENT

Start the engine and allow it to warm up to normal operating temperature. For units equipped with Auto Throttle, turn the Auto Throttle switch ON.

Turn the throttle stop screw (1) to obtain the specified idle speed.

IDLE SPEED: 1,400 ± 150 min⁻¹ (rpm)

VALVE CLEARANCE CHECK/ADJUSTMENT

Remove the head cover bolt (1), the head cover (2), and the head cover packing (3).

Disconnect the spark plug cap from the spark plug.

Set the piston near top dead center of the cylinder compression stroke (both valves fully closed) by pulling the recoil starter slowly. When the piston is near top dead center of the compression stroke, the triangle mark (1) on the starter pulley (2) will align with the top hole (3) on the recoil starter case (4).

If the exhaust valve is open, use the recoil starter to turn the crankshaft one additional turn and align the triangle mark on the starter pulley with the top hole on the recoil starter case again.

Insert a thickness gauge (1) between the valve rocker arm (2) and valve stem (3) to measure the valve clearance.

VALVE CLEARANCE:
IN: 0.15 ± 0.02 mm
EX: 0.20 ± 0.02 mm

If adjustment is necessary, proceed as follows.
MAINTENANCE

Hold the rocker arm pivot (1) and loosen the pivot adjusting nut (2).

Turn the rocker arm pivot to obtain the specified clearance.

**VALVE CLEARANCE:**

IN: 0.15 ± 0.02 mm

EX: 0.20 ± 0.02 mm

Hold the rocker arm pivot and retighten the pivot adjusting nut to the specified torque.

**TORQUE:** 10 N·m (1.0 kgf·m, 7 lbf·ft)

Recheck the valve clearance, and if necessary, readjust the clearance.

Check the head cover packing for damage or deterioration, and install it to the head cover.

Attach the cylinder head cover to the cylinder head, and tighten the head cover bolt securely.

---

**COMBUSTION CHAMBER CLEANING**

Remove the cylinder head (page 12-3).

Attach a soft wire brush to an electric drill and clean any carbon deposits from the combustion chamber.

**NOTICE**

Do not remove the valves from the cylinder head when cleaning the combustion chamber; this could damage the valve seats.

Do not press the wire brush with force against the combustion chamber; this could damage the cylinder head.
MAINTENANCE

FUEL TANK AND FILTER CLEANING

Drain the fuel into a suitable container. Remove the fuel tank (1) and fuel tank joint (2) (page 6-3). Clean the fuel tank joint and fuel tank with non-flammable solvent, and allow them to dry thoroughly. Install the fuel tank (page 6-3). Check the installation part of the fuel tank for any sign of fuel leakage.

WARNING
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

FUEL TUBE CHECK

Check the fuel tube (1) for deterioration, cracks, or signs of leakage.

ENGINE SERVICE BULLETIN #40 =>

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.
4. TROUBLESHOOTING

BEFORE TROUBLESHOOTING ........ 4-2

TROUBLESHOOTING ................. 4-2
TROUBLESHOOTING

BEFORE TROUBLESHOOTING

• Use a known-good battery for troubleshooting.
• Check for sufficient fresh fuel in the fuel tank.
• Check that the connectors are connected securely.
• Read the circuit tester’s operation instructions carefully, and observe the instructions during inspection.
• Disconnect the battery cable before continuity inspection.

TROUBLESHOOTING

HARD STARTING

• Check the engine oil level before troubleshooting.

Without starter motor:
Pull the recoil starter and check whether the engine cranks.

Cranks

With starter motor:
Turn the combination switch to the START position and check whether the engine cranks.

Cranks

Loosen the carburetor drain screw, and check the fuel flow from the fuel tank.

Fuel

Check the spark plug (page 3-9).

Normal

Perform the spark test (page 9-4).

Spark

Go to page 4-3

Cannot be cranked

Perform the STARTING SYSTEM TROUBLESHOOTING (page 10-2).

Check the recoil starter (page 10-7).
- If the recoil starter operates correctly when removed but is hard to pull when installed on the engine, check the camshaft decompressor operation (page 13-20).
- If the recoil starter operates correctly when removed but cannot be pulled when installed on the engine, disassemble the engine and repair or replace the faulty part(s).

Does not crank

Check for clogged fuel filter, fuel tube, and fuel strainer screen (page 6-3).

No fuel

Check the sediment cup (page 3-8).
Disassemble the carburetor to clean the carburetor ports, jets, and nozzles (page 6-13).

Dry

Wet

If spark plug is correct, clean and dry the electrodes, and then restart the engine, taking care that the choke valve is not closed too much.
If the engine does not start and the electrode is wet again, check the carburetor float valve (page 6-14).

No spark

Perform the IGNITION SYSTEM TROUBLESHOOTING (page 9-2).
Perform the cylinder compression test (page 12-5).

Compression is too high

- Check the valve clearance (page 3-12) and then perform the cylinder compression test. If the cylinder compression is too high, remove carbon deposits from the combustion chamber (page 3-13).

Compression is too low

- Check the valve clearance (page 3-12), and then perform the cylinder compression test. If the cylinder compression is too low, perform a leak down test. If there is air leakage in the engine, check the following:
  - Valve seat width (page 12-5)
  - Valve face irregularly worn (page 12-6)
  - Valve spring free length (page 12-7)
  - Cylinder sleeve (page 13-13)
  - Piston skirt O.D. (page 13-14)
  - Piston ring side clearance (page 13-15)
  - Piston ring width (page 13-16)
  - Piston ring end gap (page 13-16)
  - Decompressor operation (page 13-20)

Normal

Restricted

- Clean the spark arrester (page 3-10).

Check for a restricted spark arrester (if equipped).

Not restricted

Restart the engine according to the starting procedure.

Check the valve clearance (page 3-12), and then perform the cylinder compression test. If the cylinder compression is too low, perform a leak down test. If there is air leakage in the engine, check the following:

- Valve seat width (page 12-5)
- Valve face irregularly worn (page 12-6)
- Valve spring free length (page 12-7)
- Cylinder sleeve (page 13-13)
- Piston skirt O.D. (page 13-14)
- Piston ring side clearance (page 13-15)
- Piston ring width (page 13-16)
- Piston ring end gap (page 13-16)
- Decompressor operation (page 13-20)
TROUBLESHOOTING

ENGINE SPEED DOES NOT INCREASE OR STABILIZE

Check the air cleaner element (page 3-6).

Clogged

Clean the air cleaner element (page 3-6).

Clean

Abnormal

Adjust the valve clearance (page 3-12).

Abnormal

Check the valve clearance (page 3-12).

Normal

Check that the cylinder head is correctly tightened (page 12-3).

Check for defective cylinder head gasket, valves, or valve seats (page 12-4).

Check for worn piston, piston rings, or cylinder (page 13-13).

Check the main jet for blockage (page 6-13).

Clogged

Disassemble and clean the carburetor (page 6-13).

Clear

High cylinder compression

Check for carbon deposits in the combustion chamber.

Low cylinder compression

Check the valve clearance (page 3-12).

Check around the air intake joint and carburetor; replace the insulator and/or gasket if necessary.

Check secondary air leaks. Is it normal?

No

Yes

Check the cylinder compression (page 12-5).

Normal

Go to page 4-5
ENGINE DOES NOT STOP WHEN COMBINATION/ENGINE STOP SWITCH IS TURNED OFF

- Check the engine oil level before troubleshooting.

Check the combination/engine stop switch (page 11-5).

Abnormal

Replace the combination (page 11-4)/engine stop switch (page 5-2).

Normal

Check the wire harness connecting the combination/engine stop switch and the ignition circuit for open or short circuit and for proper connection.

Abnormal

Replace or repair the engine wire harness.

Normal

Check the ignition coil (page 9-5).

Replace the ignition coil if abnormalities are found, and recheck.
ENGINE DOES NOT STOP WHEN ENGINE OIL LEVEL IS LOW

Check the oil level switch (page 11-5).

- Abnormal: Replace the oil level switch (page 13-5).
- Normal:
  - Check the wire harness connecting the oil level switch and ignition coil for open or short circuit and proper connection.
  - No continuity: Replace or repair the engine wire harness.
  - Continuity:
    - Check the ignition coil (page 9-5).
      Replace the ignition coil if abnormalities are found, and recheck.

ENGINE WIRE HARNESS
FAN COVER REMOVAL/INSTALLATION.  . 5-2
FAN COVER REMOVAL/INSTALLATION

Remove the recoil starter (page 10-3).

Remove the auto throttle (If equipped).

Open the harness clip and disconnect the engine stop switch connector (Without control box type).

When installing, refer to the HARNESS AND TUBE ROUTING (page 2-12).
FUEL SYSTEM

TOOLS

Float level gauge
07401-0010000
**WARNING**

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

Turn the fuel valve lever to the OFF position.
Set a commercially available tube clip to the fuel tube.

---

**FUEL TANK REMOVAL/INSTALLATION**

INSTALLATION:
Before installing, check for deterioration or cracks.

INSTALLATION:
Before installing, check the screen of the fuel filter for clogs or damage.

INSTALLATION:
Before installing, check the screen of the fuel strainer for clogs or damage.

---

**FUEL TANK JOINT**

- 2 N·m (0.2 kgf·m, 1.5 lbf·ft)
- Before installing, check the screen of the fuel filter for clogs or damage.

---

**TUBE CLIP**

- BOLT (8 x 25 mm) (2)
- 24 N·m (2.4 kgf·m, 17 lbf·ft)

---

**O-RING**

INSTALLATION:
Before installing, check for deterioration or cracks.

---

**B8 TUBE CLAMP (2)**

---

**FUEL TUBE**

INSTALLATION:
Before installing, check for deterioration or cracks.

---

**FUEL FILTER**

INSTALLATION:
Before installing, check the screen of the fuel filter for clogs or damage.

---

**FUEL FILLER CAP**

INSTALLATION:
Before installing, check for deterioration or cracks.

---

**FUEL GAUGE (If equipped)**

INSTALLATION:
Install the fuel gauge as shown.

---

**FUEL TANK**

INSTALLATION:
Before installing, check the screen of the fuel strainer for clogs or damage.

---

**ENGINE SERVICE BULLETIN #40 =>**
FUEL SYSTEM

**FUEL FILLER CAP REMOVAL/INSTALLATION**

Turn the fuel level gauge (1) to align the fuel filler cap tether hole (2) with the cutout (3) of the fuel filler neck, and then remove the fuel filler cap (4).

Before installing, check the air vent hole of the fuel filler cap for clogs. If necessary, clean it using low-pressure compressed air.

Set the fuel tank cap to the fuel filler neck by aligning the projections (5) of the cap with the cutouts of the fuel filler neck and fuel level gauge, and then turn the fuel tank cap clockwise 180 degrees to lock it.

---

**FUEL FILTER REMOVAL/INSTALLATION**

Remove or install the fuel filter by aligning the cutout (1) of the fuel filter with the fuel filler cap tether (2) as shown.

Before installing, check the screen of the fuel strainer for clogs or damage.
AIR CLEANER REMOVAL/INSTALLATION

Dual Element type:

INSTALLATION:
After installing the air cleaner elbow, insert the breather tube to the hole of the cylinder head cover as shown.

Viewed from air cleaner side
Cyclone type:

**Removal/Installation:**

Before installing, check for damage. Note the installation direction.

**Nut (6 mm) (2)**

9 N·m (0.9 kgf·m, 7 lbf·ft)

**Installation:**

Before installing, check for damage. Note the installation direction.

**Removal/Installation:**

Remove and install the air cleaner elbow with the fuel valve lever in the OFF position and the choke lever in the CLOSE position. Before installation, clean the inside of the air cleaner elbow.
Low profile type:

**CHOKE ROD**
- INSTALLATION: Position the choke rod as shown and insert it into the carburetor choke arm.

**BREATHER TUBE**
- INSTALLATION: After installing the air cleaner elbow, insert the breather tube to the hole of the cylinder head cover as shown.

**CARBURETOR SPACER**
- INSTALLATION: Before installing, check for damage. Note the installation direction.

**CHOKE ROD**
- **CHOKE ARM**
- **BREATHER TUBE**
- **HIGH TENSION CORD**
- **GROMMET**
- **VIEWED FROM AIR CLEANER SIDE**

**AIR CLEANER STAY**

**CHOKE DIAPHRAGM ASSEMBLY**

**AIR CLEANER BASE**

**AIR CLEANER COLLAR (4)**

**AIR CLEANER COLLAR (2)**

**AIR CLEANER CASE**

**AIR CLEANER CASE SEAL**

**SEALING CAP**

**BOLT (6 x 32 mm)**

**BOLT (5 x 32 mm)**

**AIR CLEANER COLLAR (2)**

**NUT (6 mm) (2)**

**9 N·m (0.9 kgf·m, 7 lbf·ft)**

**AIR CLEANER STAY**

**AIR CLEANER COVER**

**AIR CLEANER COVER SEAL**
FUEL SYSTEM

CARBURETOR REMOVAL/INSTALLATION

Dual element or cyclone type air cleaner:

**WARNING**

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

Turn the fuel valve lever to the OFF position.
Remove the air cleaner (page 6-5).
Set a commercially available tube clip to the fuel tube.
Disconnect the fuel tube from the carburetor.
Remove the drain screw of the carburetor to drain completely.

GOVERNOR ROD/THROTTLE RETURN SPRING

REMOVAL/INSTALLATION:
Pull the carburetor assembly to a point where the groove of the throttle arm lines up with the governor rod, and then lift the governor rod out of the hole of the throttle arm and unhook the throttle return spring. Installation is in the reverse order of removal.

INSTALLATION:
Before installing, clean the passage thoroughly with compressed air.
Install the carburetor insulator with the vent groove facing toward the carburetor. After installing, clamp the high tension cord to the carburetor insulator.

CARBURETOR INSULATOR

INSTALLATION:
Before installing, clean the passage thoroughly with compressed air.
Install the carburetor insulator with the vent groove facing toward the carburetor. After installing, clamp the high tension cord to the carburetor insulator.

GOVERNOR ROD

THROTTLE RETURN SPRING

B8 / D8 TUBE CLAMP

FUEL TUBE

CARBURETOR PACKING

CARBURETOR INSULATOR

HIGH TENSION CORD

CARBURETOR PACKING

FUEL TUBE

B8 / D8 TUBE CLAMP
Low profile type air cleaner:

**WARNING**

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

Turn the fuel valve lever to the OFF position.
Remove the air cleaner (page 6-7).
Set a commercially available tube clip to the fuel tube.
Disconnect the fuel tube from the carburetor.
Remove the drain screw of the carburetor to drain completely.

**GOVERNOR ROD/THROTTLE RETURN SPRING**

**REMOVAL/INSTALLATION:**
Pull the carburetor assembly to a point where the groove of the throttle arm lines up with the governor rod, and then lift the governor rod out of the hole of the throttle arm and unhook the throttle return spring.
Installation is in the reverse order of removal.

**FUEL TUBE**

**D8 TUBE CLAMP**

**INSULATOR PACKING**

**CARBURETOR INSULATOR**

**INSTALLATION:**
Before installing, clean the passage thoroughly with compressed air.
Install the carburetor insulator with the vent groove facing toward the carburetor.
After installing, clamp the high tension cord to the carburetor insulator.

**HIGH TENSION CORD**

**CARBURETOR PACKING**

**CARBURETOR**

**GOVERNOR ROD/THROTTLE RETURN SPRING**

**DASH POT CHECK VALVE**

**TUBE CLAMP**

**ASSEMBLY:**
Install the dash pot into the tube clamp with the black end towards the choke diaphragm.

To control base stay (NON-HANDY LEVER B)

**REMOVAL/INSTALLATION:**
Remove the fuel tube.
Dual element or cyclone type air cleaner:

**WARNING**
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

**CAUTION**
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Remove the carburetor (page 6-8).
Before disassembly, clean the outside of the carburetor.

**ASSEMBLY:**
Before installing, clean thoroughly with low-pressure compressed air.
Lightly lubricate the O-ring to ensure easy installation into the

PILOT JET SET

ASSEMBLY:
Before installing, clean thoroughly with low-pressure compressed air.

SET COLLAR

PAN SCREW (3 x 6 mm) (2)

THROTTLE STOP SCREW

ADJUSTMENT: (page 3-12)

MAIN NOZZLE

ASSEMBLY:
Before installing, clean thoroughly with low-pressure compressed air.

O-RING

O-RING

PILOT SCREW

REPLACEMENT: (page 6-15)

MAIN JET

ASSEMBLY:
Before installing, clean thoroughly with low-pressure compressed air.

O-RING

FLOAT CHAMBER

ASSEMBLY:
Install the float chamber to the carburetor body at an angle as shown.

SET SCREW GASKET

DRAIN SCREW GASKET

DRAIN SCREW

FLOAT VALVE SPRING

FLOAT VALVE

FUEL VALVE PACKING

FUEL VALVE LEVER

VALVE LEVER SPRING

LEVER SETTING PLATE

CUP FILTER

REMOVAL/INSTALLATION: (page 3-8)
Low profile type air cleaner:

⚠️ **WARNING**
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

⚠️ **CAUTION**
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Remove the carburetor (page 6-8).

Before disassembly, clean the outside of the carburetor.

---

**ASSEMBLY:**
Before installing, clean thoroughly with low-pressure compressed air.

**PILOT JET SET**
**ASSEMBLY:**
Before installing, clean thoroughly with low-pressure compressed air.
Lightly lubricate the O-ring to ensure easy installation into the carburetor body.

**FLOAT VALVE SPRING**
**ASSEMBLY:**
Check for smooth movement after installation.

**FLOAT CHAMBER**
**ASSEMBLY:**
Install the float chamber to the carburetor body at an angle as shown.

**O-RING**

---

**PILOT SCREW**
**REPLACEMENT:** (page 6-15)

---

**THROTTLE STOP SCREW**
**ADJUSTMENT:** (page 3-12)

---

**MAIN JET**
**ASSEMBLY:**
Before installing, clean thoroughly with low-pressure compressed air.

**FLOAT PIN**

---

**MAIN NOZZLE**
**ASSEMBLY:**
Before installing, clean thoroughly with low-pressure compressed air.

---

**SET COLLAR**

---

**DRAIN SCREW**

---

**SET BOLT**
FUEL SYSTEM

Main jet number

<table>
<thead>
<tr>
<th>Carburetor identification Number (1) + (2)</th>
<th>Main Jet Number</th>
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<tbody>
<tr>
<td>BE21J A</td>
<td># 88</td>
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<tr>
<td>BE70R A</td>
<td># 85</td>
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<tr>
<td>BE71F A</td>
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</table>

CHOKE DIAPHRAGM DISASSEMBLY/ASSEMBLY

Remove the choke diaphragm assembly (page 6-7).

---

**Diagram Elements:**
- Manual Choke Rod
- Choke Rod Grommet
- Diaphragm Stay
- E Ring
- Thrust Washer (2.7 x 8 mm)
- Choke Diaphragm
- Lever Collar
- Screw (5 x 12 mm) (2)
- Choke Lever Seal
- Arm Pivot Bush
- Choke Lever Seal
- Plain Washer (5 mm)
- E Ring
- Choke Rod Guide
- Choke Rod Stopper
- Choke Lever Washer
- Choke Lever
- Rod Joint
- Choke Lever Rod
CARBURETOR BODY CLEANING

**CAUTION**

To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

**NOTICE**

• Some commercially available chemical cleaners are very caustic. These cleaners may damage plastic parts such as the O-ring, the float and the float seat of the carburetor. Check the container for instructions. If you are in doubt, do not use these products to clean Honda carburetors.
• High air pressure may damage the carburetor body. Use low air pressure (30 psi or less) when cleaning passages and ports.

Clean the carburetor body with non-flammable solvent. Clean thoroughly the following passages and ports with low-pressure compressed air.

– Pilot screw hole (1)
– Pilot jet hole (2)
– Pilot air jet (3)
– Main air jet (4)
– Transition ports (5)
– Pilot outlet (6)
– Main nozzle holder (7)
– External vent port (8)

CARBURETOR INSPECTION

FLOAT LEVEL HEIGHT

Place the carburetor in the position as shown. Measure the distance between the float top and carburetor body when the float just contacts the seat without compressing the valve spring.

**TOOL:**

Float level gauge (1) 07401-0010000

**FLOAT HEIGHT:** 13.2 mm (0.52 in)

If the measured float height is out of specification, check the float valve and the float valve spring (page 6-14).

If the float valve and the float valve spring are normal, replace the float (page 6-10).
FUEL SYSTEM

FLOAT VALVE

Check the float valve (1) and its seat (2) for wear or contamination.
Before installation, check for wear or a weak spring (3).
Check the operation of the float valve.

CHOKE DIAPHRAGM INSPECTION

Check for smooth operation by pressing the rod with a finger.
Connect a vacuum pump to the choke diaphragm and apply vacuum. The diaphragm should hold.
Replace the choke diaphragm if necessary.
PILOT SCREW REPLACEMENT

Leave the pilot screw (1) and limiter cap (2) in place during carburetor cleaning. Remove only if necessary for carburetor repair.

Removal of the limiter cap requires breaking the pilot screw. A new pilot screw and limiter cap must be installed.

When the limiter cap has been broken off, remove the broken pilot screw.

Place the spring on the replacement pilot screw, and install it on the carburetor.

Turn the pilot screw in until it is lightly seated, then turn the screw out the required number of turns.

<table>
<thead>
<tr>
<th>Model</th>
<th>Carburetor identification Number (3) + (4)</th>
<th>Pilot screw opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX240</td>
<td>BE70R A</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BE71F A</td>
<td>1</td>
</tr>
<tr>
<td>GX270</td>
<td>BE21J A</td>
<td>2</td>
</tr>
<tr>
<td>GX340</td>
<td>BE80N A</td>
<td>1 - 3/4</td>
</tr>
<tr>
<td></td>
<td>BE80M A</td>
<td>1 - 3/4</td>
</tr>
<tr>
<td></td>
<td>BE80P A</td>
<td>1 - 3/4</td>
</tr>
<tr>
<td>GX390</td>
<td>BE21J A</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>BE84A A</td>
<td>2 - 1/8</td>
</tr>
<tr>
<td></td>
<td>BE84B A</td>
<td>2 - 1/8</td>
</tr>
<tr>
<td></td>
<td>BE84C A</td>
<td>2 - 1/8</td>
</tr>
<tr>
<td></td>
<td>BE84D A</td>
<td>1 - 1/2</td>
</tr>
<tr>
<td></td>
<td>BE84A A</td>
<td>1 - 7/8</td>
</tr>
<tr>
<td></td>
<td>BE88B A</td>
<td>1 - 7/8</td>
</tr>
<tr>
<td></td>
<td>BE89C A</td>
<td>1 - 7/8</td>
</tr>
<tr>
<td></td>
<td>BE88F A</td>
<td>1 - 7/8</td>
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<tr>
<td></td>
<td>BE88G A</td>
<td>1 - 7/8</td>
</tr>
<tr>
<td></td>
<td>BE88J A</td>
<td>1 - 7/8</td>
</tr>
<tr>
<td></td>
<td>BE89Y A</td>
<td>2 - 1/8</td>
</tr>
<tr>
<td></td>
<td>BE89Z A</td>
<td>1 - 1/2</td>
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<tr>
<td></td>
<td>BE94E A</td>
<td>1 - 5/8</td>
</tr>
<tr>
<td></td>
<td>BE94F A</td>
<td>1 - 5/8</td>
</tr>
</tbody>
</table>

Apply Loctite® 638 to the inside of the limiter cap, then install the cap so the stop prevents the pilot screw from being turned counterclockwise.

Be careful to avoid turning the pilot screw while installing the limiter cap. The pilot screw must stay at its required setting.
FUEL SYSTEM

CHOKE SET REPLACEMENT

Remove the carburetor (page 6-8).

Pull out the choke valve plate (1).

Remove the choke shaft (2) and install a new choke shaft.

Insert a new choke valve plate into the slit (3) of the choke shaft.

Be sure the choke shaft is in the position between the projections (4) of the choke valve plate.

CYLINDER STUD BOLT REPLACEMENT

Thread two nuts onto the stud bolt and tighten them together, and then use a wrench to turn the stud bolt out.

Install new stud bolts.

SPECIFIED LENGTH

| STUD BOLT (8 x 98) | 82.0 mm (3.23 in) |
| STUD BOLT (8 x 106) | 90.0 mm (3.54 in) |
| STUD BOLT (8 x 115) | 99.0 mm (3.90 in) |
| STUD BOLT (8 x 123) | 107.0 mm (4.21 in) |
| STUD BOLT (8 x 131.5) | 115.5 mm (4.55 in) |
7. GOVERNOR SYSTEM

GOVERNOR ARM/CONTROL BASE ASSY. REMOVAL/INSTALLATION

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FIXED THROTTLE OPERATION TYPE. 7-3
AUTO THROTTLE (IF EQUIPPED) REMOVAL/INSTALLATION
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CONTROL BASE ASSY. DISASSEMBLY/ASSEMBLY

MANUAL OPERATION TYPE ........ 7-6
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SOLENOID (AUTO THROTTLE) INSPECTION ................. 7-10
GOVERNOR SYSTEM

GOVERNOR ARM/CONTROL BASE ASSY.
REMOVAL/INSTALLATION

MANUAL OPERATION TYPE

Remove the following parts.

- Air cleaner (page 6-5)
- Muffler (page 14-2)
- Fuel tank (page 6-3)
- Tube clamp (page 6-8)

Installation is in the reverse of removal. Adjust the maximum speed (page 7-8).

REMOTE CABLE
(Commercially available)
(If equipped)

GOVERNOR SPRING

SCREW (4 x 6 mm)
(If equipped)

CONTROL BASE ASSY.

GOVERNOR ROD/THROTTLE RETURN SPRING

REMOVAL/INSTALLATION:
Pull the carburetor assy. (1) away from the engine to a point where the groove (2) of the throttle arm lines up with the governor rod (3), and then lift the governor rod out of the hole of the throttle arm and unhook the throttle return spring (4).

OUTER HOLE

BOLT (6 x 12 mm) (3)

GOVERNOR ARM

GOVERNOR ARM BOLT

GOVERNOR ARM SHAFT

BOLT (6 x 12 mm) (3)

NUT (6 mm)
FIXED THROTTLE OPERATION TYPE

Remove the following parts.

- Air cleaner (page 6-5)
- Muffler (page 14-2)
- Fuel tank (page 6-3)
- Tube clamp (page 6-8) (If equipped)

Installation is in the reverse of removal.
Adjust the maximum speed (page 7-8).

GOVERNOR ROD/THROTTLE RETURN SPRING

REMOVAL/INSTALLATION:
Pull the carburetor assy. (1) out to a point where the groove (2) of the throttle arm lines up with the governor rod (3), and then lift the governor rod out of the hole of the throttle arm and unhook the throttle return spring (4).

CONTROL BASE ASSY.
(If equipped)

BOLT (6 x 12 mm) (3)

GOVERNOR SPRING
INSTALLATION:
Install with the long end of the spring toward the control base assy.
Hook the governor spring to the outer hole of the governor arm.

CONTROL BASE ASSY.
(If equipped)
GOVERNOR SYSTEM

AUTO THROTTLE (IF EQUIPPED)
REMOVAL/INSTALLATION

Remove the fuel tank (page 6-3).

GX240•GX270
GOVERNOR SYSTEM

GX340•GX390

CHOKE RETURN SPRING

BOLT (6 x 12 mm) (2)

To the units connected from engine.

SCREW (5 x 8 mm) (2)

THROTTLE LEVER

SOLENOID

To the units connected from engine.
GOVERNOR SYSTEM

CONTROL BASE ASSY.
DISASSEMBLY/ASSEMBLY

MANUAL OPERATION TYPE

Remove the control base assy (page 7-2).

ASSEMBLY:
After tightening the nut fully, loosen it 1-1/2 turns.

ASSEMBLY:
Install the control lever washer by aligning the cutout of the control lever washer with the claw of the control base.

ASSEMBLY:
Note the installation direction.

ASSEMBLY:
Adjust the maximum speed (page 7-8).

INSTALLATION:
Install with the short end of the spring toward the control base.
Hook the cable return spring to the hole of the control lever.

STOPPER COLLAR
SCREW (5 x 25 mm)
(If equipped)

CLAW
SELF-LOCK NUT (6 mm)

CONTROL LEVER WASHER

LEVER SPRING

CONTROL LEVER SPACER

CONTROL BASE

CONTROL ADJUST SPRING

CABLE RETURN SPRING

WIRE HOLDER
(If equipped)

CIRCLIP (5 mm)
(If equipped)

SCREW (5 x 32 mm)
(If equipped)

ASSEMBLY:
Adjust the maximum speed (page 7-8).

STOPPER COLLAR
(If equipped)

SCREW (4 x 6 mm)
(If equipped)
REMOTE LEVER A TYPE
Remove the control base assy (page 7-2).

REMOTE LEVER B TYPE
Remove the control base assy (page 7-2).

ASSEMBLY:
Adjust the maximum speed (page 7-8).
GOVERNOR SYSTEM

MAXIMUM SPEED ADJUSTMENT

MANUAL CONTROL TYPE

Remove the fuel tank (page 6-3).
Loosen the 6 mm nut (1) of the governor arm.
Turn the governor arm (2) counter clockwise to fully open the carburetor throttle valve (3).
Rotate the governor arm shaft (4) as far as it will go in the same direction the governor arm moved to open the throttle valve.
Tighten the 6 mm nut securely.
Install the fuel tank (page 6-3).
Start the engine and allow it to warm up to normal operating temperature.
Move the control lever (5) to run the engine at the specified maximum speed, and hold the control lever.
Turn the 5 x 32 mm screw or 5 x 25 mm (6) of the control to obtain the specified maximum speed.

MAXIMUM SPEED: 3,850 ± 150 min⁻¹ (rpm)

AUTO THROTTLE TYPE

Remove the fuel tank (page 6-3).
Loosen the two 6 x 12 mm flange bolts, and move the Auto Throttle solenoid away from the governor arm.
Loosen the nut on the governor arm pinch bolt.
Move the governor rod end ① of the governor arm in the direction shown.

Move the governor spring end ② of the governor arm in the direction shown.

Holding both sections of the governor arm in alignment so that the two stops are in contact with one another, move the governor arm in the direction shown until the throttle is completely open, and hold it in that position.

Rotate the governor arm shaft (4) as far as it will go in the same direction it was just moved by the governor arm, and then tighten the governor arm pinch bolt.

There may be a slight bend in the governor arm when it is released; this will not affect governor operation.

Move the Auto Throttle solenoid until its actuator arm just contacts the governor arm, and tighten the two 6 x 12 mm flange bolts.

Install the gas tank (page 6-3).

Turn the Auto Throttle switch to the OFF position, and start the engine. Allow it to warm to normal operating temperature.

Move the control lever (5) to run the engine at the specified maximum speed, and hold the control lever.

Turn the limiting screw to obtain the specified maximum speed.

MAXIMUM SPEED: $3,850 \pm 150 \text{ min}^{-1}$ (rpm)

Check the Auto Throttle speed, and adjust if necessary (Refer to page 3-12).
GOVERNOR SYSTEM

SOLENOID (AUTO THROTTLE)
INSPECTION

Remove the fuel tank (page 6-3).

Connect a 12V battery (1) to the solenoid terminals (2) and check for proper operation.

The throttle lever (3) and governor arm (4) should move with the battery connected. The choke return spring (5) should bring the throttle lever and governor arm to its normal position when the battery is removed.
CHARGING SYSTEM

TOOLS

Puller collar set
07APC-ZY1A100
CHARGING SYSTEM

BEFORE TROUBLESHOOTING

- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Read the circuit tester's operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before continuity inspection.

CHARGING SYSTEM TROUBLESHOOTING

1A / 3A charge coil type:
Check the circuit protector (page 11-6).

Normal

Abnormal

1A / 3A charge coil type:
Check the silicon rectifier (page 11-6).

Normal

Abnormal

Replaced silicon rectifier (page 11-4).

1A / 3A charge coil type:
Check the regulator rectifier (page 11-7).

Normal

Abnormal

Replace the regulator rectifier (page 11-4).

Check the harness connecting the charge coil and battery for open or short circuit and for proper connection.
If necessary, replace or repair the harness.
COOLING FAN/FLYWHEEL REMOVAL/INSTALLATION

REMOVAL
Remove the following parts:
- Fan cover (page 5-2).
- Ignition coil (page 9-3).

FLYWHEEL

REMOVAL:
Remove the flywheel using the special and commercially available tools shown below. Do not hit the flywheel with a hammer.

SPECIAL WOODRUFF KEY (25 x 18 mm)

FLYWHEEL PULLER SET OCT-7403 (Commercially available)

FLYWHEEL

STRAP WRENCH S-17 (Commercially available)

FLYWHEEL

SPECIAL NUT (16 mm)

REMOVAL:
Hold the flywheel with a commercially available strap wrench S-17 and remove the 16 mm special nut. Take care not to damage the cooling fan.

STRAP WRENCH S-17 (Commercially available)

SPECIAL NUT (16 mm)

STRAIGHT WRENCH

TOOL:
Puller collar set 07APC-ZY1A100
**CHARGING SYSTEM**

**INSTALLATION**

Clean the tapered parts (1) of dirt, oil, grease, and other foreign material before installation. Be sure there are no metal parts or other foreign material on the magnet part (2) of the flywheel.

Set the 25 x 18 mm special woodruff key (3) in the key groove (4) of the crankshaft securely.

Install the flywheel (5) by aligning the key slot (6) with special woodruff key on the crankshaft.

**NOTICE**

*The flywheel may push the 25 x 18 mm special woodruff key out of its slot; check after installation.*

Attach the cooling fan (1) to the flywheel (2) by aligning the three projections of the cooling fan with the holes of the flywheel.

Attach the starter pulley (3) by aligning the hole of the pulley with the projection at the center of the cooling fan.

Apply a light coat of oil to the threads and the seating surface of the 16 mm special nut (1), and loosely tighten the nut.

Hold the flywheel (2) with a commercially available strap wrench S-17 (3), and tighten the 16 mm special nut to the specified torque.

**TORQUE:** 170 N·m (17.3 kgf·m, 125 lbf·ft)

Install the following parts:

- Ignition coil ([page 9-3](#)).
- Fan cover ([page 5-2](#)).
CHARGE / LAMP COIL (IF EQUIPPED)
REMOVAL/INSTALLATION

Remove the following parts:
- Fan cover (page 5-2)
- Ignition coil (page 9-3)
- Remove the flywheel (page 8-7)

Remove the coil connector or connectors.

Installation is in the reverse of removal.

Install the cord clamp (page 2-12).

Adjust the maximum speed (page 7-8).
CHARGING SYSTEM

CHARGE COIL INSPECTION

10A/18A CHARGE COIL/LAMP COIL TYPE

Disconnect the charge/lamp coil connectors.

Measure the resistance between the terminals of the charge/lamp coil.

**Resistance:**
- Charge coil 10 A: 0.16 - 0.24 Ω
- Charge coil 18 A: 0.10 - 0.30 Ω
- Lamp coil 12 V-25 W: 0.30 - 0.46 Ω

Check for continuity between each terminal and engine ground.

There should be no continuity.

- If the measured resistance is not within the range specification or if any wire has continuity to engine ground, replace the charge coil (page 8-9).
- If the resistance is good and the flywheel is ok, replace the charge coil and retest.

1A/3A CHARGE COIL TYPE

Disconnect the charge coil connector.

Check for continuity between terminal and engine ground.

**Resistance:**
- Charge coil 1 A: 3.00 - 4.00 Ω
- Charge coil 3 A: 0.62 - 0.93 Ω

There should be no continuity.

If the resistance is good and the flywheel is ok, replace the charge coil and retest.
9. IGNITION SYSTEM

SYSTEM DIAGRAM .......................... 9-2
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IGNITION COIL INSPECTION ............... 9-5
IGNITION COIL

SYSTEM DIAGRAM

IGNITION SYSTEM TROUBLESHOOTING

NO SPARK AT SPARK PLUG

• Check the engine oil level before troubleshooting.

Check continuity between the oil level switch terminal and engine ground (page 11-5).

Abnormal
Replace the oil level switch (page 13-5).

Normal
Check the harness connecting the ignition coil and the combination/engine stop switch for open or short circuit and for proper connection (page 4-5).

Abnormal
Replace or repair the engine wire harness.

Normal
Check the engine stop switch (page 11-5)/combination switch (page 11-5).

Abnormal
Replace the engine stop switch (page 5-2)/combination switch (page 11-4).

Normal
Check the ignition coil (page 9-5).

Abnormal
Replace the ignition coil (page 9-3).
IGNITION COIL REMOVAL/INSTALLATION

Remove the following parts:

- Air cleaner (page 6-5)
- Fuel tank (page 6-3)
- Fan cover (page 5-2)

IGNITION COIL INSTALLATION:
Install the Ignition coil as shown.

ENGINE WIRE HARNESS INSTALLATION:
Clamp the engine wire harness to the ribs of the cylinder barrel as shown.

BOLT (6 x 28 mm) (2)
IGNITION COIL

IGNITION COIL INSTALLATION

Attach the ignition coil (1) and loosely tighten the two 6 x 28 mm flange bolts (2).

Insert the thickness gauge (3) of proper thickness between the ignition coil and the flywheel.

IGNITION COIL AIR GAP:
0.2 – 0.6 mm (0.01 – 0.02 in)

**NOTICE**

Adjust the ignition coil air gap equally on both sides.

Push the ignition coil firmly against the flywheel and tighten the 6 x 28 mm flange bolts securely.

Remove the thickness gauge.

SPARK TEST

Inspect the following before performing the spark test.

• Faulty spark plug
• Loose spark plug cap
• Water in the spark plug cap (Leaking the ignition coil secondary voltage)
• Loose ignition coil connector.

Disconnect the spark plug cap from the spark plug.

Remove the spark plug and reattach the spark plug cap.

Ground the spark plug to the cylinder head.

Crank the engine by pulling the recoil starter forcefully and check whether sparks jump across the electrode.

If there is no spark, replace the spark plug with a known good one and retest.

SPARK PLUG CAP INSPECTION

Remove the spark plug cap from the high tension cord.

Attach the tester probes to the terminal connected to the spark plug and terminal connected to the high tension cord of the spark plug cap.

There should be a continuity between the terminals.

If there is no continuity, replace the spark plug cap.
IGNITION COIL INSPECTION

Disconnect the spark plug cap from the spark plug.
Remove the spark plug cap from the high tension cord (1).
Disconnect the engine wire harness connector (2) from the ignition coil.

Measure the resistance between the terminals and be sure that the measurements are within the specifications in the below.

Use a tester that is equivalent to or higher than the performance specified, internal resistance: 20 kΩ/VDC, 9 kΩ/VAC

Be careful not to touch the metallic part of the tester probe with your fingers; otherwise, the correct resistance value cannot be obtained.

Read the tester manufacturer’s operation instructions carefully before operating the tester. Follow the instructions of the Service Manual. Be sure the tester’s battery is fully charged, and check the meter before using the tester.

<table>
<thead>
<tr>
<th></th>
<th>(+) Prove</th>
<th>Terminal number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GND</td>
<td>HIGH-TENSION CORD</td>
</tr>
<tr>
<td>GND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIGH-TENSION CORD</td>
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<tr>
<td>EXT (+)</td>
<td>5 - 14</td>
<td>10 - 26</td>
</tr>
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<td>EXT (-)</td>
<td>∞</td>
<td>∞</td>
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<tr>
<td>LED</td>
<td>4</td>
<td></td>
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<tr>
<td>OIL ALT</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Unit: kΩ
10. STARTING SYSTEM

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STARTING SYSTEM

SYSTEM DIAGRAM

STARTING SYSTEM TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE

Check the battery condition.

Normal

Check the battery voltage between the starter motor side positive (+) battery cable terminal and engine ground.

Normal

Check the continuity between BAT terminal (White) and ST terminal (Black/white) of the combination switch in the START position (page 11-5).

Continuity

Not blown

Replace the combination switch (page 11-4).

Blown

Replace the blade fuse (page 11-4).

No continuity

Check the blade fuse in the control box (page 11-7).

Abnormal

Check the battery condition.

Replace with a known-good battery.

If the battery runs down again, perform the CHARGING SYSTEM TROUBLESHOOTING (page 8-6).

Low voltage

Replace battery positive (+) cable.

Abnormal

Perform the starter motor performance test (page 10-10). If necessary disassemble the starter motor (page 10-8) and check each part (page 10-10).

Abnormal

Replace the starter solenoid (page 10-9).
RECOIL STARTER REMOVAL/INSTALLATION

BOLT (6 x 10 mm) (3)

INSTALLATION:
Remove dirt and debris before installation.
Position the recoil starter case for best starter grip location.
STARTING SYSTEM

RECOIL STARTER DISASSEMBLY

**CAUTION**
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Remove the recoil starter (page 10-3).
RECOIL STARTER ASSEMBLY

**CAUTION**
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Pass the recoil starter rope (1) through the hole (2) of the recoil starter pulley (3), and then tie the rope as shown.

**NOTICE**
Before installing the recoil starter rope, check for fray or wear.
Wind the recoil starter rope onto the recoil starter pulley counterclockwise.

Hook the outer hook (1) of the starter return spring (2) to the groove (3) of the recoil starter pulley (4), and then install the starter return spring by winding it in the starter pulley.

Apply grease to the cutout (1) of the recoil starter case (2). 
Set the recoil starter pulley (3) to the recoil starter case by aligning the inner hook (4) of the starter return spring with the cutout of the recoil starter case.
Apply grease to the two ratchets (1).
Install the two ratchets and the two ratchet springs (2) to the recoil starter pulley as shown.

Apply grease to the inside of the spring retainer (1).
Set the friction spring (2) and the spring retainer to the recoil starter pulley in the direction as shown.
Apply locking agent (Hondalock 1, Threebond® 2430 or equivalent) to the threads of the center screw (3).
Hold the spring retainer and tighten the center screw to the specified torque.

**TORQUE: 3.9 N·m (0.40 kgf·m, 2.9 lbf·ft)**

Turn the recoil starter pulley (1) more than 2 turns counterclockwise to preload the starter return spring.
Be sure to hold the recoil starter pulley.

Pass the recoil starter rope through hole (1) of the recoil starter case, the starter grip (2), and reinforcement grip (3), and then tie the rope as shown.
Check the recoil starter operation [page 10-7].
RECOIL STARTER INSPECTION

RECOIL STARTER OPERATION

Remove the recoil starter (page 10-3).

Pull the starter grip several times to inspect that the ratchets (1) are operated properly (the ratchet ends come out from the spring retainer (2)).

STARTER PULLEY

Remove the recoil starter (page 10-3).

Inspect the square holes (1) of the starter pulley (2) for deformation.
STARTING SYSTEM

STARTER MOTOR REMOVAL/INSTALLATION

Disconnect the starter motor wires from the starter motor.

Remove the fan cover (page 5-2).
STARTER MOTOR DISASSEMBLY/ASSEMBLY

Remove the starter motor (page 10-8).

HOUSING
ASSEMBLY:
Make sure there is no obstruction on the magnets.

INSULATOR
INSPECTION:
Check for cracks or damage.

STARTER SOLENOID WIRE

CENTER BRACKET

NEGATIVE BRUSH (2)

STARTER SOLENOID

POSITIVE BRUSH

INSULATOR

OVERRUNNING CLUTCH

PINION GEAR

RODDING SPRING (4)

GASKET

BRUSH HOLDER

SOLENOID WIRE

CENTER BRACKET

REDUCTION GEAR

STARTER SOLENOID WIRE

POSITIVE BRUSH

OVERRUNNING CLUTCH

PINION GEAR

RODDING SPRING (4)

GASKET

BRUSH HOLDER

STARTER SOLENOID WIRE

CENTER BRACKET

REDUCTION GEAR

STARTER SOLENOID WIRE

CENTER BRACKET

REDUCTION GEAR

STARTER SOLENOID WIRE

CENTER BRACKET

REDUCTION GEAR

STARTER SOLENOID WIRE

CENTER BRACKET

REDUCTION GEAR

STARTER SOLENOID WIRE

CENTER BRACKET

REDUCTION GEAR
BRUSH HOLDER INSTALLATION

Note the installation direction.

Install the insulator (1), brush holder (2), negative brush terminals (3), and two 4 x 14 mm screws (4) to the center bracket as shown.

Install the brush springs (5) and brushes, and push the brushes in the holders with a suitable wire (6) so that they do not interfere with the commutator.

INSPECTION

PERFORMANCE TEST

Measure starter performance while cranking the engine.

STARTER MOTOR PERFORMANCE:
UNLOAD:
CRANKING VOLTAGE: 9.9 V
CRANKING CURRENT: 103 A
ENGINE CRANKING SPEED: 2,300 min⁻¹ (rpm) min.

NO LOAD:
CRANKING VOLTAGE: 11.5 V
CRANKING CURRENT: 31 A max.

• To get accurate results, the test must be conducted in the normal ambient temperature.
• Battery: 55B24 (12 V 36 AH/5 HR)
• Battery cable: 15 sq. x 1.5 m (4.9 ft.) each for battery positive cable and battery negative cable.

If the measurement is out of specification, disassemble and inspect the starter motor.

STARTER SOLENOID

Remove the starter solenoid wire (1) from the starter solenoid (2).

Connect the positive (+) lead of a 12V battery to the solenoid terminal and the negative (-) lead to the solenoid body. Measure the resistance between the battery and starter motor terminals as shown. Continuity should exist when the battery is connected and not exist when the battery is disconnected.
STARTING SYSTEM

BRUSH LENGTH

Measure the brush length.

If the negative brush length is less than the service limit, replace the brush and brush holder.

If the positive brush length is less than the service limit, replace the center bracket and brush holder.

STANDARD: 7.0 mm (0.28 in)
SERVICE LIMIT: 3.5 mm (0.14 in)

BRUSH CONTINUITY CHECK

Check for continuity between the positive (+) brushes (1) and negative (-) brushes (2).

There should be continuity between both the positive brushes.
There should be continuity between both the negative brushes.
There should be no continuity from either positive brush to either negative brush.

If the correct continuity of the positive (+) brushes is not obtained, replace the center bracket (page 10-9).
If the correct continuity of the negative (-) brushes is not obtain, replace the negative (-) brushes.

ARMATURE MICA DEPTH

Visually inspect the commutator surface for dust, rust, or other damage. If necessary, wipe it with a clean lint-free cloth. If rusted or damaged, dress with a fine emery cloth.

When the mica is clogged, or its depth is smaller than the service limit value, recut the grooves using a hacksaw blade or a small file.

STANDARD: 1.0 mm (0.04 in)
SERVICE LIMIT: 0.2 mm (0.01 in)
STARTING SYSTEM

ARMATURE CONTINUITY CHECK - COMMUTATOR TO SHAFT
Check for continuity between the commutator and the armature shaft.
Replace the armature if continuity exists between any of the commutator segments and the armature shaft (page 10-9).

ARMATURE CONTINUITY CHECK - COMMUTATOR SEGMENTS
Check for continuity between segments. If an open circuit (no continuity) exists between any two segments, replace the armature (page 10-9).

OVERRUNNING CLUTCH
Check the pinion gear shaft (1) for smooth axial movement.
Apply oil or replace the overrunning clutch if necessary.
Check the pinion gear (2) operation by holding the pinion gear shaft and turning the pinion gear. The pinion gear should turn counterclockwise freely and should not turn clockwise.
Check the pinion gear for wear or damage, and replace the overrunning clutch if necessary.
If the pinion gear is worn or damaged, the flywheel ring gear must be inspected.

STARTER SOLENOID WIRE
Check the starter solenoid wire for continuity.
# 11. OTHER ELECTRICAL

<table>
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<th>Page</th>
</tr>
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<tr>
<td>Fuse Inspection</td>
<td>11-7</td>
</tr>
<tr>
<td>Regulator/Rectifier Inspection</td>
<td>11-7</td>
</tr>
</tbody>
</table>
OTHER ELECTRICAL

COMPONENT LOCATION

- ENGINE STOP SWITCH
- OIL LEVEL SWITCH
- CONTROL BOX
CONNECT BOX REMOVAL/INSTALLATION

Disconnect the control box wires.

When installing, refer to the HARNESS AND TUBE ROUTING (with circuit protector) (page 2-12).

Connection of control box wires are depending on the application of the engine, therefore, it does not indicate those parts in this manual.
OTHER ELECTRICAL

CONTROL BOX DISASSEMBLY/ASSEMBLY

Remove the control box (page 11-3).

- **10 A REGULATOR/RECTIFIER**
  - (If equipped)
- **18 A REGULATOR/RECTIFIER**
  - (If equipped)
- **COMBINATION SWITCH WASHER**
- **COMBINATION SWITCH NUT**
- **18 A REGULATOR/RECTIFIER**
  - (If equipped)
- **SILICON RECTIFIER**
  - (If equipped)
- **SHORT CIRCUIT PROTECTOR**
  - (If equipped)
- **LONG CIRCUIT PROTECTOR**
  - (If equipped)
- **ASSEMBLY:**
  - Align the tab with the cut out in the case mounting bracket and the control panel.
- **ASSEMBLY:**
  - Note the installation direction.
- **CONTROL CASE**
- **CASE MOUNTING BRACKET**
- **CONTROL PANEL**
- **COMBINATION SWITCH WASHER**
- **COMBINATION SWITCH NUT**
- **PAN SCREW**
  - (3 x 12 mm) (2)
  - (If equipped)
- **CONTROL CASE**
- **SPECIAL SCREW**
  - (6 x 12 mm)
- **WIRE BAND**
- **COMBINATION SWITCH**
- **COMBINATION SWITCH**
- **protector lens**
  - (If equipped)
- **tab**
OIL LEVEL SWITCH INSPECTION

Disconnect the engine wire harness from the oil level switch.
Check continuity between the switch terminal and engine ground.
There should be no continuity when the engine is full of oil.
Drain the engine oil completely (page 3-4).
Check continuity between the switch terminal and engine ground.
There should be continuity.
Check continuity between the switch terminals while filling the engine oil.
The ohmmeter reading should go from continuity to no continuity as the oil is filled.
If the correct continuity is not obtained, replace the oil level switch (page 13-5).

ENGINE STOP SWITCH INSPECTION

Remove the engine stop switch connectors.
Check continuity between the terminals at each switch position.

<table>
<thead>
<tr>
<th>Switch position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>Yes</td>
</tr>
<tr>
<td>OFF</td>
<td>No</td>
</tr>
</tbody>
</table>
If the correct continuity is not obtained, replace the engine stop switch (page 5-2).

COMBINATION SWITCH INSPECTION

With Circuit Protector
Check continuity between the terminals at each switch position.
If the correct continuity is not obtained, replace the combination switch (page 11-3).
OTHER ELECTRICAL

Without Circuit Protector

Check continuity between the terminals at each switch position.

If the correct continuity is not obtained, replace the combination switch (page 11-3).

<table>
<thead>
<tr>
<th>EXT(+)</th>
<th>EXT(-)</th>
<th>ST</th>
<th>BAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>START</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SILICON RECTIFIER INSPECTION

Check continuity between the terminals. There should be continuity in one direction only. Replace the rectifier if there is continuity in both directions or in neither direction.

CIRCUIT PROTECTOR INSPECTION

Remove the circuit protector (page 11-4).

Check continuity between the terminals. There should be continuity in the ON position (button in) and no continuity in the OFF position (button out). Replace the circuit breaker if the correct continuity is not obtained.
OTHER ELECTRICAL

FUSE INSPECTION

Remove the blade type fuse (page 11-4).

Visually inspect the fuse to see if it is blown. Check continuity across the two blades. Replace the fuse if it is blown or there is no continuity across the blades.

REGULATOR/RECTIFIER INSPECTION

Measure the resistance between the terminals and be sure that the measurements conform to the ranges shown in the table.

10A TYPE

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>1 - 200</td>
<td>1 - 200</td>
<td>0.5 - 100</td>
</tr>
<tr>
<td>3</td>
<td>0.1 - 50</td>
<td>0.1 - 50</td>
<td>1 - 50</td>
</tr>
</tbody>
</table>

Unit: kΩ

18A TYPE

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4 - 400</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>2 - 230</td>
<td>3</td>
<td>2 - 230</td>
</tr>
<tr>
<td>1</td>
<td>2 - 230</td>
<td>1 - 600</td>
<td>1 - 600</td>
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<tr>
<td>3</td>
<td>0.09 - 400</td>
<td>0.09 - 400</td>
<td>1 - 600</td>
</tr>
</tbody>
</table>

Unit: kΩ

Use a tester that is equivalent to or higher than the performance specified, internal resistance: 20 kΩ/VDC, 9 kΩ/VAC

Be careful not to touch the metallic part of the tester probe with your fingers; otherwise, the correct resistance value cannot be obtained.

Read the tester manufacturer’s operation instructions carefully before operating the tester. Follow the instructions of the Service Manual. Be sure the tester’s battery is fully charged, and check the meter before using the tester.
12. CYLINDER HEAD/VALVES

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INSTALLATION .............................. 12-3

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<th>Valve guide reamer, 6.6 mm</th>
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</thead>
<tbody>
<tr>
<td>07942-6570100</td>
<td>07984-ZE2000D</td>
</tr>
</tbody>
</table>
CYLINDER HEAD/VALVES

CYLINDER HEAD REMOVAL/INSTALLATION

Set the piston at top dead center of the cylinder compression stroke (page 3-12).

Remove the following parts:

- Air cleaner (page 6-5)
- Carburetor (page 6-10)
- Control base assy (page 7-2)
- Muffler (page 14-2)

Installation is in the reverse order of removal.

Check the valve clearance, and if necessary, adjust the clearance (page 3-12).

HEAD COVER PACKING

INSTALLATION:
Note the installation direction.

HEAD COVER WASHER

HEAD COVER

HEAD COVER BOLT

BOLT (10 x 80) (4)

(Apply to the threads and seating surface)

REMOLVEMENT/INSTALLATION:
Loosen and tighten the four 10 x 80 mm flange bolts in a crisscross pattern in 2 – 3 steps.
TORQUE: 35 N·m (3.5 kgf·m, 26 lbf·ft)

DOWEL PIN (12 x 20 mm) (2)

FAN COVER

CYLINDER HEAD GASKET

INSTALLATION: Before installing the cylinder head, remove any carbon deposits from the combustion chamber (page 3-13), and inspect the valve seat. After installing the cylinder head, measure the cylinder compression.
CYLINDER HEAD/VALVES

INTAKE/EXHAUST VALVE SPRING RETAINER

DISASSEMBLY:
Push down and slide the valve spring retainer to the side so that the valve stem slips through the hole at the side of the valve spring retainer.
Do not remove the valve spring retainer while the cylinder head is installed to the cylinder barrel, or the valve will drop into the cylinder.

EXHAUST VALVE

ASSEMBLY:
Do not interchange with the intake valve.
The exhaust valve is smaller than the intake valve.
VALVE HEAD DIAMETER: 31mm

INTAKE VALVE

ASSEMBLY:
Do not interchange with the exhaust valve.
The intake valve is larger than the exhaust valve.
VALVE HEAD DIAMETER: 33mm

ASSEMBLY:
Before installing the push rods, check the ends of the push rods for wear.
Be sure the ends of the push rods are firmly seated in the valve lifters.

ROCKER ARM PIVOT (2)
(Apply oil to the threads and pivot)

VALVE SPRING (2)

PUSH ROD (2)

VALVE STEM SEAL

SPARK PLUG

PIVOT BOLT 8 mm (2)
24 N·m (2.4 kgf·m, 17 lbf·ft)

PUSH ROD GUIDE PLATE
6 x 12 (CT bolt)

SHROUD

VALVE SPRING SEAT

EXHAUST VALVE GUIDE

CYLINDER HEAD

INTAKE VALVE GUIDE

ROCKER ARM

PIVOT (2)

PIVOT ADJUSTING NUT (2)
10 N·m (1.0 kgf·m, 7 lbf·ft)

VALVE GUIDE CLIP

VALVE HEAD

Apply oil to the tappet surface and pivot

VALVE HEAD/VALVES

CYLINDER HEAD DISASSEMBLY/ASSEMBLY

Remove the cylinder head (page 12-3).
CYLINDER HEAD/VALVES

INSPECTION

CYLINDER COMPRESSION CHECK

Start the engine and warm up to normal operating temperature.

Turn the fuel valve lever to the OFF position, and then loosen the drain screw to drain the carburetor.

Remove the spark plug cap (1) from the spark plug.

Remove the spark plug using a spark plug wrench.

Pull the recoil starter several times to expel unburned gas.

Attach a commercially available compression gauge set EEPV303A (2) to the spark plug hole.

Pull the recoil starter forcefully to measure stable cylinder compression.

CYLINDER COMPRESSION:

0.51 - 0.69 MPa (5.2 - 7.0 kgf/cm², 74 - 100 psi) / 600 min⁻¹ (rpm)

CYLINDER HEAD WARPAGE

Remove the carbon deposits from the combustion chamber (page 3-13).

Check the spark plug hole and valve areas for cracks.

Check the cylinder head warpage using a straightedge (1) and thickness gauge (2).

SERVICE LIMIT: 0.10 mm (0.004 in)

If the measurement is more than the service limit, replace the cylinder head (page 12-3).

VALVE SEAT WIDTH

Remove the carbon deposits from the combustion chamber (page 3-13).

Inspect each valve for face irregularities.

If necessary, replace the valve (page 12-4).

Apply a light coat of Prussian Blue or erasable felt-tipped marker ink to each valve seat.

Insert the valve, and snap it closed against its seat several times. Be sure the valve does not rotate on the seat. The transferred marking compound will show any area of the valve face that is not concentric.

Measure the valve seat width of the cylinder head.

STANDARD: 1.0 – 1.2 mm (0.04 – 0.05 in)

SERVICE LIMIT: 2.0 mm (0.08 in)

If the measurement is more than the service limit, recondition the valve seat (page 12-10).

Check whether the valve seat contact area of the valve is too high or too low.

If the valve seat is too high or too low, recondition the valve seat (page 12-10).
CYLINDER HEAD/VALVES

VALVE GUIDE I.D.

Ream the valve guide (1) to remove any carbon deposits before measuring.

TOOL:
Valve guide reamer 6.6 (2) 07984-ZE20001

**NOTICE**

*Turn the special tool (Valve guide reamer) clockwise, never counterclockwise.*

*Continue to rotate the special tool while removing it from the valve guide.*

Measure and record each valve guide I.D.

**STANDARD:** 6.600 – 6.615 mm (0.2598 – 0.2604 in)
**SERVICE LIMIT:** 6.66 mm (0.262 in)

If the measured valve guide I.D. is more than the service limit, replace the valve guide [page 12-8].

VALVE FACE

Inspect each valve for face irregularities.

If necessary, replace the valve [page 12-4].
VALVE STEM O.D.
Inspect each valve for bending or abnormal stem wear. If necessary, replace the valve. Measure and record each valve stem O.D.

STANDARD:
IN: 6.575 – 6.590 mm (0.2588 – 0.2594 in)
EX: 6.535 – 6.550 mm (0.2572 – 0.2578 in)

SERVICE LIMIT:
IN: 6.44 mm (0.254 in)
EX: 6.40 mm (0.252 in)

If the measurement is less than the service limit, replace the valve.

GUIDE-TO-STEM CLEARANCE
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

STANDARD:
IN: 0.010 – 0.040 mm (0.0004 – 0.0016 in)
EX: 0.050 – 0.080 mm (0.0020 – 0.0032 in)

SERVICE LIMIT:
IN: 0.11 mm (0.004 in)
EX: 0.13 mm (0.005 in)

If the calculated clearance is more than the service limit, replace the following:
– Valves
– Valve guide

VALVE SPRING FREE LENGTH
Measure the valve spring free length.

STANDARD: 39.0 mm (1.54 in)
SERVICE LIMIT: 37.5 mm (1.48 in)

If the measured length is less than the service limit, replace the valve spring.
VALVE SPRING PERPENDICULARITY

Measure the valve spring perpendicularity.

SERVICE LIMIT: 1.5°

If the measured perpendicularity is more than the service limit, replace the valve spring (page 12-4).

PUSH ROD RUNOUT

Check both ends of the push rod for wear.

Check the push rod for straightness.

If necessary, replace the push rod (page 12-4).

VALVE GUIDE REPLACEMENT

Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.

Use a hot plate or oven to heat the cylinder head evenly to 150°C (300°F).

⚠️ CAUTION ⚠️

To avoid burns, use heavy gloves when handling the heated cylinder head.

NOTICE

• Do not use a torch to heat the cylinder head; warpage of the cylinder head may result.
• Do not get the cylinder head hotter than 150°C (300°F); excessive heat may loosen the valve seat.

Remove the heated cylinder head from the hot plate and support it with wooden blocks.
Drive the valve guides (1) out of the cylinder head from the combustion chamber side.

**TOOL:**
Valve guide driver 6.6 mm (2) 07942-6570100

**NOTICE**
*When driving the valve guides out, be careful not to damage the cylinder head.*

Remove the new valve guides from the refrigerator one at a time as needed.

Install the new valve guides from the valve spring side of the cylinder head.

**TOOL:**
Valve guide driver 6.6 mm (1) 07742-6570100

Exhaust valve guide (2):
Drive the exhaust valve guide until the valve guide clip (3) is fully seated as shown.

Intake valve guide (4):
Drive the intake valve guide to the specified height (measured from the end of the valve guide to the cylinder head as shown).

**IN VALVE INSTALLATION HEIGHT:**
5 mm (0.2 in)

After installing the valve guide, check the guide for damage.

Replace the valve guide if damaged.

Let the cylinder head cool to room temperature.

Ream the valve guide ([page 12-9](#)).

**VALVE GUIDE REAMING**

For best results, be sure the cylinder head is at room temperature before reaming valve guides.

Coat the reamer and valve guide with cutting oil.

**TOOL:**
Valve guide reamer 6.6 mm (1) 07984-ZE2000D

Rotate the reamer clockwise through the valve guide the full length of the reamer.

**NOTICE**
*Turn the special tool (valve guide reamer) clockwise, never counterclockwise.*

*Continue to rotate the special tool while removing it from the valve guide.*

Thoroughly clean the cylinder head to remove any cutting residue.
CYLINDER HEAD/VALVES

Check the valve guide bore; it should be straight, round, and centered in the valve guide. Insert the valve and check operation. If the valve does not operate smoothly, the guide may have been bent during installation.

Replace the valve guide if it is bent or damaged.

Check the valve guide-to-stem clearance.

VALVE SEAT RECONDITIONING

Thoroughly clean the combustion chamber and valve seats to remove carbon deposits [page 3-13].

Apply a light coat of Prussian Blue or erasable felt-tipped marker ink to the valve seat.

Insert the valve, and snap it closed against its seat several times. Be sure the valve does not rotate on the seat. The transferred marking compound will show any area of the seat that is not concentric.

Measure the valve seat width of the cylinder head.

STANDARD: 1.0 – 1.2 mm (0.04 – 0.05 in)
SERVICE LIMIT: 2.0 mm (0.08 in)

If the measurement is more than the service limit, recondition the valve seat.

Check whether the valve seat contact area of the valve is too high or too low.

If the valve seat is too high or too low, recondition the valve seat.

Valve seat cutters (1)/grinder or equivalent valve seat refacing equipment is recommended to correct a worn valve seat.

NOTICE

*Turn the cutter clockwise, never counterclockwise. Continue to turn the cutter as you lift it from the valve seat.*
The 30° cutter removes material from the top edge (contact too high).

**TOOLS:**
Solid pilot bar, 6.6 mm NWY100-6.60
Cutter, 30 x 45 degrees NWYCU128

The 60° cutter removes material from the bottom edge (contact too low).

**TOOLS:**
Solid pilot bar, 6.6 mm NWY100-6.60
Cutter, 60 degree NWYCU114

Be sure that the width of the finished valve seat is within specification.

**STANDARD:** 1.0 – 1.2 mm (0.04 – 0.05 in)
**SERVICE LIMIT:** 2.0 mm (0.08 in)

Make a light pass with the 45° cutter to remove any possible burrs at the edge of the seat.

**TOOLS:**
Solid pilot bar, 6.6 mm NWY100-6.60
Cutter, 30 x 45 degrees NWYCU128

After resurfacing the seats, inspect for even valve seating.

Apply Prussian Blue compound or erasable felt-tipped marker ink to the valve seat. Insert the valve, and snap it closed against its seat several times. Be sure the valve does not rotate on the seat.

The seating surface, as shown by the transferred marking compound, should have good contact all the way around.

Thoroughly clean the cylinder head to remove all cutting residue.

Lap the valves into their seats, using a commercially available valve lapper and lapping compound.

After lapping, wash all residual compound off the cylinder head and valve.

**NOTICE**
- Do not push the valve against the seat with force during lapping. Apply a light pass with the valve lapper.
- Avoid lapping the valve in the same position as it causes uneven wear. Lap the valve by turning the lapper slowly.
- Take care not to allow the lapping compound to enter the gap between the stem and guide.

Adjust the valve clearance after assembly (page 3-12).
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### CRANKCASE

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<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remover weight</td>
<td>07936-371020A</td>
<td><img src="image1" alt="Remover weight" /></td>
</tr>
<tr>
<td>Bearing driver attachment, 32×35 mm</td>
<td>07746-0010100</td>
<td><img src="image2" alt="Bearing driver attachment" /></td>
</tr>
<tr>
<td>Bearing driver attachment, 42×47 mm</td>
<td>07746-0010300</td>
<td><img src="image3" alt="Bearing driver attachment" /></td>
</tr>
<tr>
<td>Bearing driver attachment, 52×55 mm</td>
<td>07746-0010400</td>
<td><img src="image4" alt="Bearing driver attachment" /></td>
</tr>
<tr>
<td>Bearing driver attachment, 72×75 mm</td>
<td>07746-0010600</td>
<td><img src="image5" alt="Bearing driver attachment" /></td>
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<td>Driver, 40 mm I.D.</td>
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<td>Inner bearing driver attachment, 35 mm</td>
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<td><img src="image7" alt="Inner bearing driver attachment" /></td>
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<td>Pilot, 15 mm</td>
<td>07746-0040300</td>
<td><img src="image8" alt="Pilot" /></td>
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<td>07746-0040500</td>
<td><img src="image9" alt="Pilot" /></td>
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<td>07746-0040700</td>
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<td>Pilot, 35 mm</td>
<td>07746-0040800</td>
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<tr>
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<td>------------------</td>
</tr>
<tr>
<td><strong>Driver</strong></td>
<td><strong>Bearing remover, 15 mm</strong></td>
<td><strong>Bearing driver attachment, 45×50 mm</strong></td>
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<tr>
<td>07749-0010000</td>
<td>07936-KC10500</td>
<td>07946-6920100</td>
</tr>
<tr>
<td><img src="image" alt="Driver" /></td>
<td><img src="image" alt="Bearing remover" /></td>
<td><img src="image" alt="Bearing driver attachment" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bearing driver attachment, 62×64 mm</th>
<th>Inner bearing driver attachment, 30 mm [in combination with 07746-0030300]</th>
</tr>
</thead>
<tbody>
<tr>
<td>07947-6340400</td>
<td>07746-0030300</td>
</tr>
<tr>
<td><img src="image" alt="Bearing driver attachment" /></td>
<td><img src="image" alt="Inner bearing driver attachment" /></td>
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</tbody>
</table>
CRANKCASE

CRANKCASE COVER REMOVAL/INSTALLATION

Drain the engine oil (page 3-4).
Remove the key (7 x 7 x 33 mm) / (6.3 x 6.3 x 43 mm) (if equipped).

Diagram showing parts such as crankcase cover, oil filler cap, dowel pin, key, oil seal lip, bearing, and bolt details.

Key points:
- Drain engine oil (page 3-4).
- Remove key (7 x 7 x 33 mm) / (6.3 x 6.3 x 43 mm) (if equipped).

Technical specifications and installation notes are detailed in the diagram and text.

---

OIL FILLER CAP
(Oil seal lip)
(Bearing)

Dowel pin (8 x 12 mm) (2)
Case cover packing

Key (7 x 7 x 33 mm) / (6.3 x 6.3 x 43 mm) (if equipped)

Bolt (8 x 40 mm) (7)
24 N·m (2.4 kgf·m, 17 lbf·ft)

Oil filler cap (with oil level gauge)

Oil filler cap packing (2)
CRANKSHAFT/BALANCER WEIGHT/PISTON REMOVAL/INSTALLATION

Remove the following parts:
- Cylinder head (page 12-3)
- Fuel tank (page 6-3)
- Flywheel (page 8-7)

LOCK PIN (10 mm)

INSTALLATION:
Install the lock pin immediately after installing the governor arm shaft in the direction as shown. The 10 mm lock pin must be installed with the straight side of the 10 mm lock pin against the groove of the governor arm shaft.

PISTON

INSTALLATION:
Install the piston to the cylinder barrel with the mark on the piston head toward the push rod hole of the cylinder head.

CAMSHAFT

See BALANCER WEIGHT/CAMSHAFT INSTALLATION on page 13-6.

CRANKSHAFT

INSTALLATION:
Before installing the crankshaft, check the oil seal of the cylinder barrel for damage or hardening. Be careful not to damage the oil seal when installing the crankshaft.

REMOVAL:
When removing the valve lifters, mark so that the intake and exhaust sides can be distinguished.

INSTALLATION:
Attach the valve lifters to the cylinder barrel immediately before installing the camshaft.
CRANKCASE

BALANCER WEIGHT/CAMSHAFT INSTALLATION

Install the balancer weight (1) to the cylinder barrel by aligning the punch marks (2) of the balancer weight and the crankshaft (3) (marked on the balancer drive gear (4)).

Install the camshaft (1) to the cylinder barrel by aligning the punch marks (2) of the camshaft and the crankshaft (3) (marked on the timing gear (4)).
1/2 OR 1/6 REDUCTION UNIT
DISASSEMBLY/ASSEMBLY

Remove the recoil starter [page 10-3].

BOLT (8 x 25 mm)

DISASSEMBLY/ASSEMBLY:
Hold the 16 mm special nut of the flywheel and remove/install the 8 x 25 mm flange bolt.
TORQUE: 24 N·m (2.4 kgf·m, 17 lbf·ft)

16 mm SPECIAL NUT

PRIMARY DRIVE GEAR

KEY
(7 x 7 x 33 / 6.3 x 6.3 x 43 mm)

WASHER
(8 mm)

DOWEL PIN
(8 x 14 mm)

P.T.O. SHAFT

COUNTER SHAFT

GEAR CASE COVER

BOLT (8 x 35 mm) (6) (GX270)
BOLT (8 x 40 mm) (6) (GX390)
24 N·m (2.4 kgf·m, 17 lbf·ft)

CHAIN CASE COVER PACKING
CRANKCASE

1/2 REDUCTION UNIT (CHAIN TYPE)
DISASSEMBLY/ASSEMBLY (GX240 ONLY)

**ASSEMBLY:**
Attach the P.T.O. drive chain to the P.T.O. shaft and sprocket, and install in the crankcase cover as a set.

**P.T.O. SHAFT OIL SEAL**
(30 x 46 x 8 mm)

**CHAIN CASE COVER**

**ASSEMBLY:**
Be careful not to damage the lip of the oil seal when installing the P.T.O. shaft to the chain case cover.

**DRIVE SPROCKET**

**ASSEMBLY:**
Attach the P.T.O. drive chain to the P.T.O. shaft and sprocket, and install in the crankcase cover as a set.

**BOLT (8 x 25 mm)**

24 N·m (2.4 kgf·m, 17 lbf·ft)

**WASHER (8 mm)**

**P.T.O. SHAFT**

**ASSEMBLY:**
Attach the P.T.O. drive chain to the P.T.O. shaft and sprocket, and install in the crankcase cover as a set.

**KEY (7 x 7 x 33 mm)**

**CHAIN CASE COVER PACKING**

**BOLT (8 x 40 mm) (6)**
1/2 REDUCTION UNIT WITH CLUTCH
DISASSEMBLY/ASSEMBLY (GX270 ONLY)

Drain the oil (page 3-5).
After installation, fill the oil (page 3-5).

REDUCTION CASE

ASSEMBLY:
Be careful not to damage the lip of the oil seal when installing it onto the crankshaft.

DRIVE SPROCKET

ASSEMBLY:
Attach the drive chain to the P.T.O. shaft and sprocket and install in the reduction case as a set.

CLUTCH CENTER

ASSEMBLY:
Be careful not to damage the lip of the oil seal when installing the P.T.O. shaft into the reduction cover.

BEARING (6205)
CLUTCH FRICTION DISC (2)
CLUTCH PLATE (2)
CLUTCH WEIGHT HOLDER Assy.

ASSEMBLY:
Note the installation sequence.

BEARING (6206)

ASSEMBLY:
Align the groove of the clutch weight holder with clutch center key when installing.

P.T.O. SHAFT

ASSEMBLY:
Note the installation sequence.

DRAIN PLUG WASHER
DRAIN BOLT
23 N·m (2.3 kgf·m, 17 lbf·ft)
GOVERNOR DISASSEMBLY/ASSEMBLY

Remove the crankcase cover (page 13-4).

GOVERNOR SLIDER

ASSEMBLY:
Spread the governor weight to install the governor sliders. After installing the governor slider, check to be sure it moves smoothly.

GOVERNOR WEIGHT(3)

REASSEMBLY:
After installing the governor weight, check to be sure they move smoothly.

GOVERNOR WEIGHT HOLDER CLIP

ASSEMBLY:
Install firmly into the groove of the governor shaft.

GOVERNOR WEIGHT HOLDER

GOVERNOR WEIGHT PIN (3)

CRANKCASE COVER

PLAIN WASHER (6 mm)

GROOVE
Remove the piston (page 13-5).

NOTE: Honing should be performed on engines with cast iron sleeves (page 13-16) whenever the piston rings are replaced and the existing cylinder is within service limits and reused.

PISTON RING SET

ASSEMBLY:
Be sure that the top ring and second ring are not interchanged. Install the top ring and second ring on the piston with the maker mark side facing up. Check that the piston rings rotate smoothly after installing them. Space the piston ring end gaps 120 degrees apart, and do not align the ring end gaps with the piston pin bore.

PISTON PIN CLIP (20 mm) (2)

ASSEMBLY:
Install by setting one end of the piston pin clip in the groove of the piston pin bore, holding the other end with long needle pliers, and rotating the clip in. Do not align the end gap of the piston pin clip with the cutout of the piston pin bore.

CONNECTING ROD UPPER

ASSEMBLY:
Set the connecting rod upper with the long end toward the mark on the piston head.

NOTE: Honing should be performed on engines with cast iron sleeves (page 13-16) whenever the piston rings are replaced and the existing cylinder is within service limits and reused.
CAM SHAFT HOLDER I.D.: CRANKCASE COVER SIDE

Measure the camshaft holder I.D. of the crankcase cover.

**STANDARD:** 16.000 – 16.018 mm
(0.6299 – 0.6306 in)

**SERVICE LIMIT:** 16.05 mm (0.632 in)

If the measurement is more than the service limit, replace the crankcase cover (page 13-4).

Inspect the camshaft O.D. with this inspection (page 13-20).

CAM SHAFT HOLDER I.D.: CYLINDER BARREL SIDE

Measure the camshaft holder I.D. of the cylinder barrel assembly.

**STANDARD:** 16.000 – 16.018 mm
(0.6299 – 0.6306 in)

**SERVICE LIMIT:** 16.05 mm (0.632 in)

If the measurement is more than the service limit, replace the cylinder barrel (page 13-5).

Inspect the camshaft O.D. with this inspection (page 13-20).

CYLINDER SLEEVE I.D.

Measure and record the cylinder I.D. at three levels in both the “X” axis (perpendicular to crankshaft) and the “Y” axis (parallel to crankshaft). Take the maximum reading to determine cylinder wear and taper.

**GX240/GX270**

**STANDARD:** 77.000 – 77.017 mm
(3.0315 – 3.0322 in)

**SERVICE LIMIT:** 77.17 mm (3.038 in)

**GX340/GX390**

**STANDARD:** 88.000 – 88.017 mm
(3.4646 – 3.4652 in)

**SERVICE LIMIT:** 88.17 mm (3.471 in)

If the measurement is more than the service limit, replace the cylinder barrel (page 13-5).

Inspect the piston skirt O.D. with this inspection (page 13-14).
CRANKCASE

PISTON SKIRT O.D.

Measure and record the piston O.D. at a point 10 mm (0.4 in) from the bottom of the skirt and 90 degrees to the piston pin bore.

If the measurement is less than the service limit, replace the piston (page 13-5).

Inspect the cylinder sleeve I. D. with this inspection (page 13-13).

GX240/GX270
STANDARD: 76.975 – 76.985 mm (3.0305 – 3.0309 in)
SERVICE LIMIT: 76.85 mm (3.026 in)

GX340/GX390
STANDARD: 87.975 – 87.985 mm (3.4636 – 3.4640 in)
SERVICE LIMIT: 87.85 mm (3.459 in)

If the measurement is less than the service limit, replace the piston (page 13-5).

Inspect the cylinder sleeve I. D. with this inspection (page 13-13).

PISTON-TO-CYLINDER CLEARANCE

Subtract the piston skirt O.D. from the cylinder sleeve I.D. to obtain the piston-to-cylinder clearance.

STANDARD: 0.015 – 0.042 mm (0.0006 – 0.0016 in)
SERVICE LIMIT: 0.12 mm (0.005 in)

If the calculated clearance is more than the service limit, replace the piston (page 13-12) and recheck the clearance.

If the clearance is still more than the service limit with the new piston, replace the cylinder barrel (page 13-5).

PISTON PIN BORE I.D.

Measure and record the piston pin bore I.D. of the piston.

GX240/GX270
STANDARD: 18.002 – 18.008 mm (0.7087 – 0.7090 in)
SERVICE LIMIT: 18.042 mm (0.7103 in)

GX340/GX390
STANDARD: 20.002 – 20.008 mm (0.7875 – 0.7877 in)
SERVICE LIMIT: 20.042 mm (0.7891 in)

If the measurement is less than the service limit, replace the piston (page 13-12).

Inspect the piston pin O. D. with this inspection (page 13-15).
PISTON PIN O.D.
Measure and record the piston pin O.D. at three points (both ends and middle). Take the minimum reading to determine piston pin O.D.

GX240/GX270
STANDARD: 17.994 – 18.000 mm (0.7084 – 0.7087 in)
SERVICE LIMIT: 17.95 mm (0.707 in)

GX340/GX390
STANDARD: 19.994 – 20.000 mm (0.7872 – 0.7874 in)
SERVICE LIMIT: 19.950 mm (0.7854 in)

If the measurement is less than the service limit, replace the piston pin (page 13-12).
Inspect the piston pin bore I.D. (page 13-14).
Inspect the connecting rod small end I.D. (page 13-17) with this inspection.

PISTON PIN-TO-PISTON PIN BORE CLEARANCE
Subtract the piston pin O.D. from the piston pin bore I.D. to obtain the piston pin-to-piston pin bore clearance.

STANDARD: 0.002 – 0.014 mm (0.0001 – 0.0006 in)
SERVICE LIMIT: 0.08 mm (0.003 in)

If the calculated clearance is more than the service limit, replace the piston pin (page 13-12) and recheck the clearance.
If the clearance is still more than the service limit with the new piston pin, replace the piston (page 13-12).

PISTON RING SIDE CLEARANCE
Measure the clearance between each piston ring and ring groove of the piston using a feeler gauge.

STANDARD:
Top (GX240/GX270): 0.030 – 0.060 mm (0.0012 – 0.0024 in)
Top (GX340/GX390): 0.015 – 0.060 mm (0.0006 – 0.0024 in)
Second: 0.030 – 0.060 mm (0.0012 – 0.0024 in)

SERVICE LIMIT:
Top/second: 0.15 mm (0.006 in)

If any of the measurements is more than the service limit, inspect the piston ring width.
If the piston ring width is normal, replace the piston (page 13-12) and reinspect the clearance.
If necessary, replace the piston rings (top, second, oil) as a set (page 13-12) and reinspect the clearance.
If any of the measurements is still more than the service limit with the new piston rings, replace the piston (page 13-12).
CRANKCASE

PISTON RING WIDTH

Measure each piston ring width.

**STANDARD:**
- Top (GX240/GX270): 1.160 – 1.175 mm
  (0.0457 – 0.0463 in)
- Top (GX340/GX390): 1.160 – 1.19 mm
  (0.0457 – 0.047 in)
- Second: 1.160 – 1.175 mm
  (0.0457 – 0.0463 in)

**SERVICE LIMIT:**
- Top: 1.140 mm (0.0449 in)
- Second: 1.140 mm (0.0449 in)

If any of the measurements is less than the service limit, replace the piston rings (top, second, oil) as a set (page 13-12).

PISTON RING END GAP

Before inspection, check whether the cylinder sleeve I.D. is within the specification.

Measure each piston ring end gap using a feeler gauge.

**STANDARD:**
- Top: 0.200 – 0.350 mm
  (0.0079 – 0.0138 in)
- Second: 0.350 – 0.500 mm
  (0.0138 – 0.0197 in)
- Oil (side rail): 0.2 – 0.7 mm (0.01 – 0.03 in)

**SERVICE LIMIT:**
- Top: 1.0 mm (0.04 in)
- Second: 1.0 mm (0.04 in)
- Oil (side rail): 1.0 mm (0.04 in)

If any of the measurements is more than the service limit, replace the piston rings (top, second, oil) as a set (page 13-12).

Cast iron sleeves should be honed whenever the piston rings are replaced and the existing cylinder is within service limits and reused.

CYLINDER HONING

Apply honing oil to the 400-grit flex honing tool and cylinder wall.

Using a 400 grit honing tool, lightly hone the cylinder in a smooth up-down motion only long enough to remove the surface glaze.

Check your progress often to avoid removing more material than required.

Follow the tool manufacturer's instructions for drill motor speed.

The surface should not be too smooth, but exhibit fine scores in a 60-degree cross-hatch pattern.

When honing is complete, thoroughly clean the cylinder with hot soapy water and then immediately dry with a lint-free towel.

Never use solvent to clean the cylinder wall as it will redistribute the grit on the cylinder walls.

Check the cylinder I.D. and taper again to make sure they are within service limits.

Apply clean motor oil to the freshly honed surface to prevent oxidation.
CONNECTING ROD BIG END SIDE CLEARANCE

Measure the clearance between the connecting rod big end and crankshaft using a feeler gauge.

STANDARD: 0.1 – 0.4 mm (0.004 – 0.016 in)
SERVICE LIMIT: 1.0 mm (0.04 in)

If the measurement is more than the service limit, replace the connecting rod (page 13-12) and recheck the clearance.

If the clearance is still more than the service limit with the new connecting rod, replace the crankshaft (page 13-5).

CONNECTING ROD SMALL END I.D.

Measure the connecting rod small end I.D.

GX240/GX270
STANDARD: 18.005 – 18.020 mm (0.7089 – 0.7094 in)
SERVICE LIMIT: 18.07 mm (0.711 in)

GX340/GX390
STANDARD: 20.005 – 20.020 mm (0.7876 – 0.7882 in)
SERVICE LIMIT: 20.07 mm (0.790 in)

If the measurement is more than the service limit, replace the connecting rod (page 13-12).

CONNECTING ROD BIG END I.D.

Set the connecting rod lower to the connecting rod upper and tighten the connecting rod bolts to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Measure the connecting rod big end I.D.

GX240/GX270
STANDARD: 33.025 – 33.039 mm (1.3002 – 1.3007 in)
SERVICE LIMIT: 33.07 mm (1.302 in)

GX340/GX390
STANDARD: 36.025 – 36.039 mm (1.4183 – 1.4189 in)
SERVICE LIMIT: 36.07 mm (1.420 in)

If the measurement is more than the service limit, replace the connecting rod (page 13-12).
CRANKCASE

CRANK PIN O.D.
Measure the crank pin O.D. of the crankshaft.

GX240/GX270
STANDARD: 32.975 – 32.985 mm
(1.2982 – 1.2986 in)
SERVICE LIMIT: 32.92 mm (1.296 in)

GX340/GX390
STANDARD: 35.975 – 35.985 mm
(1.4163 – 1.4167 in)
SERVICE LIMIT: 35.93 mm (1.415 in)

If the measurement is less than the service limit, replace the crankshaft (page 13-5).

CONNECTING ROD BIG END OIL CLEARANCE
Clean all oil from the crank pin and connecting rod big end surface.
Place a piece of plastigauge on the crank pin, install the connecting rod upper and the connecting rod lower, and tighten the connecting rod bolts to the specified torque.
TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

NOTE:
Do not rotate the crankshaft while the plastigauge is in place.

Remove the connecting rod and measure the plastigauge.

STANDARD: 0.040 – 0.064 mm
(0.0016 – 0.0025 in)
SERVICE LIMIT: 0.12 mm (0.005 in)

If the clearance is more than the service limit, inspect the connecting rod big end I.D. and the crank pin O.D.
If necessary replace the part that is not within the service limit and reinspect the clearance.
CRANKCASE

CRANKSHAFT RUNOUT

Set the crankshaft on V-blocks and measure the runout using a dial indicator.

SERVICE LIMIT: 0.1 mm (0.003 in)

If the measured runout is more than the service limit, replace the crankshaft (page 13-5).

GX240/270:
L TYPE: 31 mm (1.2 in)
P TYPE: 32 mm (1.3 in)
W TYPE: 24 mm (0.9 in)

GX340/390:
L TYPE: 36 mm (1.4 in)
P TYPE: 32 mm (1.3 in)
W TYPE: 24 mm (0.9 in)

L/P/W TYPE ONLY:
MEASURE POINT

16 mm (0.6 in)

GX240/270:
16 mm (0.6 in)
GX340/390:
17 mm (0.7 in)
CRANKCASE

CAMSHAFT CAM HEIGHT

Measure the cam height of the camshaft.

GX240/GX270
STANDARD:
IN: 31.945 – 32.145 mm (1.2577 – 1.2655 in)
EX: 31.666 – 31.866 mm (1.2467 – 1.2546 in)
SERVICE LIMIT:
IN: 31.35 mm (1.234 in)
EX: 31.35 mm (1.234 in)

GX340/GX390
STANDARD:
IN: 32.498 – 32.698 mm (1.2794 – 1.2873 in)
EX: 31.985 – 32.185 mm (1.2592 – 1.2671 in)
SERVICE LIMIT:
IN: 32.198 mm (1.2676 in)
EX: 29.886 mm (1.1766 in)

If the measurement is less than the service limit, replace the camshaft (page 13-5).

CAMSHAFT O.D.

Measure the camshaft O.D. of the camshaft.

STANDARD: 15.966 – 15.984 mm (0.6286 – 0.6293 in)
SERVICE LIMIT: 15.92 mm (0.627 in)

If the measurement is less than the service limit, replace the camshaft (page 13-5).

DECOMPRESSOR WEIGHT

Check for worn and weakened spring.
If the return spring (1) is worn or weakened, replace the weight return spring.
Check that the decompressor weight moves smoothly.
If the decompressor weight does not move correctly, replace the camshaft (page 13-5).
RADIAL BALL BEARING

Clean the bearing with solvent and dry it thoroughly.

Turn the inner race (outer race: cylinder barrel side crankshaft bearing only) of the radial ball bearing with your finger and check for play.

Replace the radial ball bearing if it is noisy or has excessive play.
CRANKCASE

1/2 OR 1/6 REDUCTION UNIT
INSPECTION

RADIAL BALL BEARING
Clean the bearing with solvent and dry it thoroughly.
Turn the inner race of the radial ball bearing with your finger and check for play.
Replace the radial ball bearing if it is noisy or has excessive play.

PRIMARY DRIVE GEAR
Check for worn and weakened primary drive gear.
If necessary, replace the primary drive gear (page 13-7).

P.T.O. SHAFT
Check for worn and weakened gear of the P.T.O. shaft.
If necessary, replace the P.T.O. shaft (page 13-7).

COUNTER SHAFT
Check for worn and weakened gears of the counter shaft.
If necessary, replace the counter shaft (page 13-7).
1/2 REDUCTION UNIT (CHAIN TYPE)  
INSPECTION (GX240 ONLY)

RADIAL BALL BEARING

Clean the bearing with solvent and dry it thoroughly.

Turn the inner race of the radial ball bearing with your finger and check for play.

Replace the radial ball bearing if it is noisy or has excessive play.

DRIVE SPROCKET/P.T.O. SHAFT/ DRIVE CHAIN

Check for worn or damaged teeth on the drive sprocket (1) and P.T.O. shaft (2).

Check for a worn or damaged drive chain (3).

If necessary, replace the drive sprocket, P.T.O. shaft, and drive chain as a set (page 13-8).
CRANKCASE

1/2 REDUCTION UNIT WITH CLUTCH INSPECTION (GX270 ONLY)

RADIAL BALL BEARING
Clean the bearing with solvent and dry it thoroughly.
Turn the inner race of the radial ball bearing with your finger and check for play.
Replace the radial ball bearing if it is noisy or has excessive play.

CLUTCH FRICTION DISC
Measure the clutch friction disk thickness.

STANDARD: 3.5 mm (0.14 in)
SERVICE LIMIT: 3.0 mm (0.12 in)

CLUTCH PLATE
Check the clutch plate warpage on a flat plate using a feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)
GX240/GX270 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CRANKCASE COVER SIDE)

LOCATION

(OUTSIDE)

CRANKSHAFT OIL SEAL (30 x 46 x 8 mm)

BALANCER WEIGHT BEARING (6202) (If equipped) (page 13-28)

CRANKSHAFT BEARING (6206)

EXCEPT REDUCTION TYPE: (INSIDE)

REDUCTION TYPE: (INSIDE)

BALANCER WEIGHT BEARING (6202) (If equipped) (page 13-28)

CRANKSHAFT BEARING (6206)
CRANKCASE

CRANKSHAFT BEARING (6206)
Drive out the radial ball bearing (1).
Apply oil to the circumference of a new bearing (2).
Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment 62 x 64 mm (3) 07947-6340400
Pilot 30 mm (4) 07746-0040700
Driver 15 x 135 mm (5) 07749-0010000

CRANKSHAFT OIL SEAL
(30 x 46 x 8 mm)
Remove the oil seal from the crankcase cover.
Apply grease to the lip of a new oil seal (1).
Drive the oil seal in the position as shown using the special tools.

TOOLS:
Attachment 45 x 50 mm (2) 07946-6920100
Driver 15 x 135 mm (3) 07749-0010000

EXCEPT WKT2 TYPE:
1 mm (0.04 in)
WET2 TYPE:
6 mm (0.2 in)
GX340/GX390 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CRANKCASE COVER SIDE)

LOCATION

ALL TYPES: (OUTSIDE)

EXCEPT REDUCTION TYPE: (INSIDE)

REDUCTION TYPE: (INSIDE)

Bearings and seals diagram showing
- Crankshaft oil seal (35 x 52 x 8 mm)
- Balancer weight bearing (6202)
- Crankshaft bearing (6207)
CRANKCASE

BALANCER WEIGHT BEARING (6202)

Pull out the radial ball bearing (1) using the special tools.

TOOLS:
Bearing remover, 15 mm (2) 07936-KC10500
Remover weight (3) 07936-371020A

Apply oil to the circumference of a new bearing (4).
Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 32 x 35 mm (5) 07746-0010100
Pilot, 15 mm (6) 07746-0040300
Driver (7) 07749-0010000

CIRCUMFERENCE
CRANKSHAFT BEARING (6207)

Drive out the radial ball bearing (1).
Apply oil to the circumference of a new bearing (2).
Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 72 x 75 mm (3) 07746-0010600
Pilot 35 mm (4) 07746-0040800
Driver (5) 07749-0010000

CRANKSHAFT OIL SEAL (35 x 52 x 8 mm)

Remove the oil seal from the crankcase cover.
Apply grease to the lip of a new oil seal (1).
Drive the oil seal in the position as shown using the special tools.

TOOLS:
Attachment 52 x 55 mm (2) 07746-0010400
Driver (3) 07749-0010000
CRANKCASE

GX240/GX270 CRANKSHAFT BEARING REPLACEMENT (FLYWHEEL SIDE)

CRANKSHAFT BEARING (6206)

- Install the 16 mm special nut (1) tightening the flywheel to protect the crankshaft threads.
- Pull out the radial ball bearing (2) using a commercially available bearing puller (3).
- Apply oil to the inner surface of the new bearing (4) inner race (5).
- Drive the radial ball bearing until it is fully seated on the end of the crankshaft using the special tools and hydraulic press.

TOOLS:
- Attachment 30 mm I.D. (6) 07746-0030300
- Inner driver 40 mm I.D. (7) 07746-0030100
GX340/GX390 CRANKSHAFT BEARING REPLACEMENT (FLYWHEEL SIDE)

CRANKSHAFT BEARING (6207)

- Install the 16 mm special nut (1) tightening the flywheel to protect the crankshaft threads.
- Pull out the radial ball bearing (2) using a commercially available bearing puller (3).
- Apply oil to the inner surface of the new bearing (4) inner race (5).
- Drive the radial ball bearing until it is fully seated on the end using the special tools and hydraulic press.

TOOLS:
- Attachment, 35 mm I.D. (6) 07746-0030400
- Driver, 40 mm I.D. (7) 07746-0030100
CRANKCASE

GX270 CRANKSHAFT/BALANCER WEIGHT BEARING/ OIL SEAL REPLACEMENT (CYLINDER BARREL SIDE)

LOCATION

CRANKSHAFT OIL SEAL (30 x 46 x 8 mm)

Remove the oil seal from the cylinder barrel.
Apply grease to the lip of a new oil seal (1).
Drive the oil seal in the position as shown using the special tools.

TOOLS:
Attachment 45 x 50 mm (2) 07946-6920100
Driver 15 x 135 mm (3) 07749-0010000

BALANCER WEIGHT BEARING (6202)
(If equipped) (page 13-33)
GX340/GX390 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CYLINDER BARREL SIDE)

LOCATION

CRANKSHAFT OIL SEAL (35X52X8 mm)

BALANCER WEIGHT BEARING (6202)

GOVERNOR ARM SHAFT OIL SEAL (8X14X5 mm)

BALANCER WEIGHT BEARING (6202)
Pull out the radial ball bearing (1) using the special tools.

TOOLS:
Bearing remover, 15 mm (2) 07936-KC10500
Remover weight (3) 07936-371020A

Apply oil to the circumference of a new bearing (4).
Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 32 x 35 (5) 07746-0010100
Pilot, 15 mm (6) 07746-0040300
Driver (7) 07749-0010000
GOVERNOR ARM SHAFT OIL SEAL  
(8 x 14 x 5 mm)  
Remove the oil seal from the cylinder barrel.  
Apply grease to the lip of a new oil seal (1).  
Drive the oil seal in the position as shown using the  
special tools.  

TOOLS:  
Pilot, 14 mm (2) 07746-0041200  
Driver (3) 07749-0010000  

CRANKSHAFT OIL SEAL  
(35 x 52 x 8 mm)  
Remove the oil seal from the cylinder barrel.  
Apply grease to the lip of a new oil seal (1).  
Drive the oil seal in the position as shown using the  
special tools.  

TOOLS:  
Attachment, 52 x 55 mm (2) 07746-0010400  
Driver (3) 07749-0010000
COUNTER SHAFT/P.T.O. SHAFT BEARING / OIL SEAL REPLACEMENT (GEAR CASE COVER SIDE)

LOCATION

COUNTER SHAFT BEARING (6202) (6302)
Pull out the radial ball bearing (1) using the special tools.

TOOLS:
Bearing remover, 15 mm (2) 07936-KC10500
Remover weight (3) 07936-371020A

Apply oil to the circumference of a new bearing (4).

Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 32 x 35 mm (5) 07746-0010100
Pilot, 15 mm (6) 07746-0040300
Driver (7) 07749-0010000
CRANKCASE

P.T.O. SHAFT BEARING (6206)
Drive out the radial ball bearing (1).
Apply oil to the circumference of a new bearing (2).
Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 62 x 64 mm (3) 07947-6340400
Pilot, 30 mm (4) 07746-0040700
Driver (5) 07749-0010000

P.T.O. SHAFT OIL SEAL
(30 x 46 x 8 mm)
Remove the oil seal from the crankcase cover.
Apply grease to the lip of a new oil seal (1).
Drive the oil seal in the position as shown using the special tools.

TOOLS:
Attachment, 45 x 50 mm (2) 07946-6920100
Driver (3) 07749-0010000

P.T.O type (page 1-3).
**GX240/GX270 COUNTER SHAFT/P.T.O. SHAFT BEARING REPLACEMENT (CRANKCASE COVER SIDE)**

**LOCATION**

COUNTER SHAFT BEARING (6302)

Remove the crankcase cover.

Drive out the radial ball bearing (1) using the special tools.

Apply oil to the circumference of a new bearing (2).

Drive the radial ball bearing until it is fully seated on the end using the special tools.

**TOOLS:**
- Attachment 42 x 47 mm (3) 07746-0010300
- Pilot 15 mm (4) 07746-0040300
- Driver 15 x 135 mm (5) 07749-0010000

P.T.O. SHAFT BEARING (6204) (page 13-39)
COUNTER SHAFT BEARING (6202)

Remove the crankcase cover (page 13-4).

Drive out the radial ball bearing (1) using the special tools.

Apply oil to the circumference of a new bearing (2).

Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 32 x 35 mm (3) 07746-0010100
Pilot, 15 mm (4) 07746-0040300
Driver (5) 07749-0010000
P.T.O. SHAFT BEARING (6204)

Remove the crankcase cover (page 13-4).

Drive out the radial ball bearing (1).

Apply oil to the circumference of a new bearing (2).

Drive the radial ball bearing until it is fully seated on the end using the special tools.

TOOLS:
Attachment, 42 x 47 mm (3) 07746-0010300
Pilot, 20 mm (4) 07746-0040500
Driver (5) 07749-0010000

CIRCUMFERENCE
CRANKCASE

GX240/GX270 CRANKSHAFT/P.T.O. SHAFT OIL SEAL REPLACEMENT (1/2 REDUCTION WITH CLUTCH)

LOCATION

P.T.O. SHAFT OIL SEAL
(30 x 50 x 7 mm)

Remove the oil seal from the reduction cover.
Apply grease to the lip of a new oil seal (1).
Drive the oil seal in the position as shown using the special tools.

TOOLS:
Attachment 45 x 50 mm (2) 07946-6920100
Driver 15 x 135 mm (3) 07749-0010000

CRANKSHAFT OIL SEAL
(30 x 46 x 8 mm)

Remove the oil seal from the reduction case.
Apply grease to the lip of a new oil seal (1).
Drive the oil seal in the position as shown using the special tools.

TOOLS:
Attachment 45 x 50 mm (2) 07946-6920100
Driver 15 x 135 mm (3) 07749-0010000
14. MUFFLER

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MUFFLER

MUFFLER REMOVAL/INSTALLATION

⚠️ CAUTION

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Allow it to cool before proceeding.

SOLID PROTECTOR TYPE

Remove the muffler cover (if equipped) (page 14-4).

---

MUFFLER PROTECTOR

TAPPING SCREW (5 x 8 mm) (4)

SPARK ARRESTER (if equipped) (GX340/GX390 shown)

CLEANING: see page 3-11

BAFFLE FLANGE (if equipped)

TAPPING SCREW (5 x 8 mm) (2)

EXHAUST PIPE PROTECTOR (if equipped)

BOLT (6 x 12 mm)

NUT (8 mm) (3)

24 N·m (2.4 kgf·m, 17 lbf·ft)

EXHAUST PIPE

MUFFLER

GASKET (if equipped)

GX240/GX270 SPARK ARRESTER

MUFFLER GASKET (if equipped)

TAPPING SCREW (6 x 10 mm)

NUT (8 mm) (3)

24 N·m (2.4 kgf·m, 17 lbf·ft)

EXHAUST PIPE GASKET
MUFFLER

SEPARATED PROTECTOR TYPE

R. MUFFLER PROTECTOR

TAPPING SCREW (5 x 8 mm) (4)

L. MUFFLER PROTECTOR

TAPPING SCREW (5 x 8 mm) (2)

SPARK ARRESTER (If equipped)

CLEANING:

MUFFLER CAP (If equipped)

TAPPING SCREW (4 x 6 mm) (If equipped)

TAPPING SCREW (5 x 8 mm) (2) (If equipped)

MUFFLER

GASKET (If equipped)

EXHAUST PIPE PROTECTOR (If equipped)

BOLT (6 x 12 mm)

NUT (8 mm) (3)

24 N·m (2.4 kgf·m, 17 lbf·ft)

EXHAUST PIPE GASKET

NUT (8 mm) (2)

24 N·m (2.4 kgf·m, 17 lbf·ft)
MUFFLER

MUFFLER COVER REMOVAL/INSTALLATION (IF EQUIPPED)

**CAUTION**

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Allow it to cool before proceeding.
EXHAUST PIPE STUD BOLT REPLACEMENT

Thread two nuts onto the exhaust pipe stud bolt (1) and tighten them together, and then use a wrench to turn the stud bolt out.

Install new stud bolts as shown.

SPECIFIED LENGTH:
STUD BOLT (8 x 41): 25 mm (0.98 in)
STUD BOLT (8 x 48): 32mm (1.26 in)
15. WIRING DIAGRAMS

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WIRING DIAGRAMS

HOW TO READ A WIRING DIAGRAM & RELATED INFORMATION

This section explains how to use the connector drawings, symbols, and wiring diagram, when troubleshooting.

HOW TO READ CONNECTOR DRAWINGS

Connector drawings show the terminal number, pin arrangement, number of pins, and the type of the terminal (male or female).

Both the male and female connectors are shown for the common connectors, while only the main wire harness side connectors are shown for the dedicated connectors.

Double frame connectors represent male connectors and the single frame connectors represent female connectors.

The gender of the connector is determined by the type of terminals the connector contains. Male connectors have male terminals. Female connectors have female terminals. Typically, the smaller plastic plastic shell of a female connector inserts inside the larger plastic shell of a male connector when they are joined.

Terminals in a female connector are numbered from left to right, top to bottom looking at the wire side. Terminals in a male connector are numbered from left to right, top to bottom looking at the terminal side.

Both the male and female connectors are shown by viewing them from the terminal side.
HOW TO READ A WIRING DIAGRAM

TERMINAL SYMBOL
It shows the shape of each terminal to identify whether it is a male or female terminal.

TERMINAL No.

CONNECTOR/TERMINAL No.
Every connector and terminal has a number to help the users find the location and shape of the connector and the terminal arrangement by referring to the "Connector general layout drawing" and/or the "Connector drawing." All the connector/terminal numbers shown in this Service Manual are either of those shown in this section.

1: Connector that relays from a harness to a harness (Circled No. in black background)
1: Connector that connects to electrical equipment (Circled No. in white background)
C: Connector (Circled C followed with No. in white background)
T: Terminal (Circled T followed with No. in white background)
GND: Ground (Circled GND followed with No. in white background)
WIRING DIAGRAMS

NO CHARGE COIL TYPE WIRING DIAGRAM

1A/3A CHARGE COIL TYPE WIRING DIAGRAM
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How to use this manual

A Few Words About Safety

SERVICE INFORMATION

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you and/or others. It could also damage this Honda product or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of special tools. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda must determine the risks to their personal safety and the safe operation of this product.

If you need to replace a part, use Honda Genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer’s Safety

Proper service and maintenance are essential to the customer’s safety and the reliability of this product. Any error or oversight while servicing this product can result in faulty operation, damage to the product, or injury to others.

⚠️ WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts-wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

⚠️ WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles, or face shields anytime you hammer, drill, grind, or work around pressurized air, pressurized liquids, springs, or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have equipment hoisted in the air. Anytime you lift this product with a hoist, make sure that the hoist hook is securely attached to the product.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gasses from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
- Never store gasoline in an open container.
- Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.
INTRODUCTION
This supplement covers the construction, function, and servicing procedures of the Honda iGX270UT2 iGX390T2/UT2 Engines. For service information that is not covered in this supplement, please refer to the GX270UT2 GX390RT2/T2/UT2 base shop manuals (part number 61Z5F00Z 61Z5F00).

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at anytime without notice.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the publisher. This includes text, figures, and tables.

As you read this manual, you will find information that is preceded by a "NOTICE" symbol. The purpose of this message is to help prevent damage to this Honda product, other property, or the environment.

SAFETY MESSAGES
Your safety and the safety of others are very important. To help you make informed decisions, we have provided safety messages and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing these products. You must use your own good judgement.

You will find important safety information in a variety of forms, including:

- Safety Labels – on the product.
- Safety Messages – preceded by a safety alert symbol †, and one of three signal words, DANGER, WARNING, or CAUTION.

These signal words mean:

⚠️ DANGER ⚠️ You WILL be KILLED or SERIOUSLY HURT if you don’t follow instructions.

⚠️ WARNING ⚠️ You CAN be KILLED or SERIOUSLY HURT if you don’t follow instructions.

⚠️ CAUTION ⚠️ You CAN be HURT if you don’t follow instructions.

- Instructions – how to service these products correctly and safely.

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SERVICE PUBLICATION OFFICE
Date of Issue: September 2010
# How to use this manual

## SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it will be explained specifically in the text without the use of the symbols.

<table>
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<th>Symbol</th>
<th>Description</th>
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<tr>
<td><img src="replace.png" alt="Replace" /></td>
<td>Replace the part(s) with new one(s) before assembly.</td>
</tr>
<tr>
<td><img src="engine_oil.png" alt="Use the recommend engine oil" /></td>
<td>Use the recommend engine oil, unless otherwise specified.</td>
</tr>
<tr>
<td><img src="molybdenum_oil.png" alt="Use molybdenum oil solution" /></td>
<td>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).</td>
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<tr>
<td><img src="multi-purpose_grease.png" alt="Use multi-purpose grease" /></td>
<td>Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).</td>
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<td><img src="locking_agent.png" alt="Apply a locking agent" /></td>
<td>Apply a locking agent. Use a medium strength locking agent unless otherwise specified.</td>
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<td><img src="sealant.png" alt="Apply sealant" /></td>
<td>Apply sealant.</td>
</tr>
<tr>
<td><img src="automatic_transmission_fluid.png" alt="Use automatic transmission fluid" /></td>
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</tr>
<tr>
<td><img src="bolts.png" alt="Indicates the diameter, length, and quantity of metric bolts used." /></td>
<td>(O x O) (Q) Indicates the diameter, length, and quantity of metric bolts used.</td>
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<td><img src="reference_page.png" alt="Indicates the reference page." /></td>
<td>page 1-1 Indicates the reference page.</td>
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<td>Control base Assy.</td>
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<td><strong>GX390UT2/T2</strong></td>
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<td><strong>iGX390UT2/T2</strong></td>
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<tr>
<td>18 A CHARGE COIL TYPE:</td>
<td><img src="gx270ut2_gx270ut2_gx390ut2_gx390ut2" alt="Diagram" /></td>
</tr>
<tr>
<td>1 A/3 A CHARGE COIL TYPE:</td>
<td><img src="gx270ut2_gx270ut2_gx390ut2_gx390ut2" alt="Diagram" /></td>
</tr>
<tr>
<td>LAMP COIL TYPE:</td>
<td><img src="gx270ut2_gx270ut2_gx390ut2_gx390ut2" alt="Diagram" /></td>
</tr>
<tr>
<td>Governor arm/</td>
<td><img src="gx270ut2_gx270ut2_gx390ut2_gx390ut2" alt="Diagram" /></td>
</tr>
<tr>
<td>governor rod</td>
<td></td>
</tr>
</tbody>
</table>
### OUTLINE OF CHANGES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine wire harness</td>
<td><strong>GX270UT2</strong> <strong>GX390UT2/T2</strong></td>
</tr>
<tr>
<td>Recoil starter</td>
<td><img src="image1.png" alt="Recoil starter" /></td>
</tr>
<tr>
<td>Starter motor</td>
<td><img src="image3.png" alt="Starter motor" /></td>
</tr>
<tr>
<td>Control box</td>
<td><img src="image5.png" alt="Control box" /></td>
</tr>
</tbody>
</table>

With circuit protector type

Without circuit protector type
### OUTLINE OF CHANGES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto throttle solenoid</td>
<td></td>
</tr>
<tr>
<td>Case cover packing</td>
<td></td>
</tr>
<tr>
<td>Crankcase/ oil level switch/ governor arm shaft</td>
<td></td>
</tr>
<tr>
<td>Crankcase cover</td>
<td></td>
</tr>
</tbody>
</table>

**ITEM**

- Auto throttle solenoid
- Case cover packing
- Crankcase/ oil level switch/ governor arm shaft
- Crankcase cover

**MODEL**

- GX270UT2 GX390UT2/T2
- iGX270UT2 iGX390UT2/T2

**Diagram:**

- Crankcase/ oil level switch/ governor arm shaft:
  - CRANKCASE
  - OIL LEVEL SWITCH
  - GOVERNOR ARM SHAFT

- Crankcase cover:
  - GOVERNOR WEIGHT
  - CRANKCASE COVER
  - GOVERNOR WEIGHT HOLDER
1. SPECIFICATIONS

SERIAL NUMBER LOCATION ..................1-2

ENGINE SPECIFICATIONS ..................1-3

TYPE CODE .....................................1-2

DIMENSIONAL DRAWINGS ....................1-4

DIMENSIONS AND WEIGHTS SPECIFICATIONS ..................................1-3

P.T.O. DIMENSIONAL DRAWINGS ..........1-5
SPECIFICATIONS

SERIAL NUMBER LOCATION

The engine serial number (1), description code (2) and type (3) are stamped on the crankcase.

Refer to it when ordering parts or making technical inquiries.

TYPE CODE

<table>
<thead>
<tr>
<th>Model</th>
<th>GX270UT2</th>
<th>GX390T2</th>
<th>GX390UT2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>QZX4</td>
<td>VZX</td>
<td>VZX7</td>
</tr>
<tr>
<td>P. T. O.</td>
<td>Q type</td>
<td>V type</td>
<td>V type</td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>VZX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. T. O.</td>
<td>V type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>VZX7</td>
<td>VZX8</td>
<td></td>
</tr>
<tr>
<td>P. T. O.</td>
<td>V type</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## DIMENSIONS AND WEIGHTS SPECIFICATIONS

### P.T.O. VARIATION

<table>
<thead>
<tr>
<th>Model</th>
<th>GX270UT2</th>
<th>GX390UT2</th>
<th>GX390T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>Q type* 380 mm (15.0 in)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>V type* 400 mm (15.7 in)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Overall width</td>
<td>Q type* 462 mm (18.2 in)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>V type* 462 mm (18.2 in)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Overall height</td>
<td>Q type* 422 mm (16.6 in)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>V type* 422 mm (16.6 in)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Dry weight</td>
<td>Q type* 29.4 kg (64.8 lbs)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>V type* 29.4 kg (64.8 lbs)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Operating weight</td>
<td>Q type* 34.2 kg (75.4 lbs)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>V type* 34.2 kg (75.4 lbs)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*: P.T.O. type [page 1-2].

## ENGINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>GX270UT2</th>
<th>GX390UT2</th>
<th>GX390T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description code</td>
<td>GCBGT</td>
<td>GCBCT</td>
<td>GCBDT</td>
</tr>
<tr>
<td>Type</td>
<td>4 stroke, overhead valve, single cylinder, inclined by 25°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>270 cm³ (16.5 cu-in)</td>
<td>389 cm³ (23.7 cu-in)</td>
<td></td>
</tr>
<tr>
<td>Bore x stroke</td>
<td>77.0 x 58.0 mm (3.0 x 2.3 in)</td>
<td>88.0 x 64.0 mm (3.5 x 2.5 in)</td>
<td></td>
</tr>
<tr>
<td>Net power (SAE J1349)*1</td>
<td>6.3 kW (8.4 HP) / 3,600 min⁻¹ (rpm)</td>
<td>8.7 kW (11.7 HP) / 3,600 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Continuous rated power</td>
<td>5.1 kW (6.8 HP) / 3,600 min⁻¹ (rpm)</td>
<td>7.0 kW (9.4 HP) / 3,600 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Maximum net torque (SAE J1349)*1</td>
<td>19.1 N·m (1,95 kgf·m, 14.1 lbf·ft) / 2,500 min⁻¹ (rpm)</td>
<td>26.5 N·m (2.7 kgf·m, 19.5 lbf·ft) / 2,500 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>8.5 : 1</td>
<td>8.2 : 1</td>
<td></td>
</tr>
<tr>
<td>Fuel consumption (at continuous rated power)</td>
<td>2.4 Liters (0.63 US gal, 0.53 Imp gal)/h</td>
<td>3.5 Liters (0.92 US gal, 0.77 Imp gal) / h</td>
<td></td>
</tr>
<tr>
<td>Ignition system</td>
<td>C.D.I.(Capacitor Discharge Ignition) type magneto ignition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>BPR6ES (NGK) / W20EPR-U (DENSO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication system</td>
<td>Forced splash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil capacity</td>
<td>1.1 Liters (1.16 US qt, 0.97 Imp qt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended oil</td>
<td>SAE 10W-30 API service classification SJ or later</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling system</td>
<td>Forced air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting system</td>
<td>Recoil and Starter motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stopping system</td>
<td>Ignition primary circuit open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carburetor</td>
<td>Horizontal type, butterfly valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Dual element type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor</td>
<td>STR (Self Tuning Regulator) governor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breather system</td>
<td>Reed valve type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel used</td>
<td>Unleaded gasoline with a pump octane rating 86 or higher</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 min⁻¹ (rpm) (net power) and at 2,500 min⁻¹ (rpm) (maximum net torque). Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.
SPECIFICATIONS

DIMENSIONAL DRAWINGS

*: P. T. O. type [page 1-2].

Unit: mm (in)
SPECIFICATIONS

P.T.O. DIMENSIONAL DRAWINGS

*: P. T. O. type (page 1-2).

Q TYPE* (GX270UT2)

Unit: mm (in)

V TYPE*

Unit: mm (in)
## 2. SERVICE INFORMATION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINTENANCE STANDARDS</td>
<td>2-2</td>
</tr>
<tr>
<td>TORQUE VALUES</td>
<td>2-2</td>
</tr>
<tr>
<td>LUBRICATION &amp; SEAL POINT</td>
<td>2-2</td>
</tr>
<tr>
<td>HARNESS AND TUBE ROUTING</td>
<td>2-3</td>
</tr>
</tbody>
</table>
**SERVICE INFORMATION**

**MAINTENANCE STANDARDS**

<table>
<thead>
<tr>
<th>Part</th>
<th>Item</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>Maximum speed (at no load)</td>
<td>3,600 min⁻¹ (rpm)*</td>
<td>–</td>
</tr>
<tr>
<td>Cylinder</td>
<td>compression</td>
<td>GX270UT2 1.31 MPa (13.4 kgf/cm², 190 psi) / 1,400 min⁻¹ (rpm)</td>
<td>–</td>
</tr>
<tr>
<td>Cylinder</td>
<td>compression</td>
<td>GX390T2/UT2 1.29 MPa (13.2 kgf/cm², 187 psi) / 1,400 min⁻¹ (rpm)</td>
<td>–</td>
</tr>
<tr>
<td>Carburetor</td>
<td>Main jet</td>
<td>GX270UT2 BE90A A: #85</td>
<td>–</td>
</tr>
<tr>
<td>Carburetor</td>
<td>Main jet</td>
<td>GX390T2/UT2 BE92B A: #100</td>
<td>–</td>
</tr>
<tr>
<td>Carburetor</td>
<td>Pilot screw opening</td>
<td>GX270UT2 BE90A: 1 - 1/2 turns out</td>
<td>–</td>
</tr>
<tr>
<td>Carburetor</td>
<td>Pilot screw opening</td>
<td>GX390T2/UT2 BE92B A: 3 turns out</td>
<td>–</td>
</tr>
<tr>
<td>Starter</td>
<td>Motor brush length</td>
<td>10 (0.4)</td>
<td>6 (0.2)</td>
</tr>
<tr>
<td>Starter</td>
<td>Motor mica depth</td>
<td>–</td>
<td>0.2 (0.01)</td>
</tr>
<tr>
<td>Charge</td>
<td>coil resistance</td>
<td>0.9 A</td>
<td>5.1 - 7.7 Ω</td>
</tr>
<tr>
<td>Power coil</td>
<td>Resistance</td>
<td>2.9 - 4.5 Ω</td>
<td>–</td>
</tr>
</tbody>
</table>

*: This figure is caused by basic program in the ECM. The engine speed is different depending on the program in the ECM.

**TORQUE VALUES**

**ENGINE TORQUE VALUES**

<table>
<thead>
<tr>
<th>Item</th>
<th>Tread Dia. (mm)</th>
<th>Torque values N·m</th>
<th>kgf·m</th>
<th>lbf·ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter motor stud bolt</td>
<td>M10 x 1.25</td>
<td>40</td>
<td>4.1</td>
<td>30</td>
</tr>
<tr>
<td>Fan cover stud bolt</td>
<td>M8 x 1.25</td>
<td>23</td>
<td>2.3</td>
<td>17</td>
</tr>
<tr>
<td>Combination switch nut</td>
<td>M18 x 1.0</td>
<td>4.9</td>
<td>0.50</td>
<td>3.6</td>
</tr>
<tr>
<td>ECM screw/washer</td>
<td>M4 x 0.7</td>
<td>2.1</td>
<td>0.21</td>
<td>1.5</td>
</tr>
<tr>
<td>Motor case set screw A/B</td>
<td>M4 x 0.7</td>
<td>2.1</td>
<td>0.21</td>
<td>1.5</td>
</tr>
<tr>
<td>Starter motor nut</td>
<td>M8 x 1.25</td>
<td>8.8</td>
<td>0.90</td>
<td>6.5</td>
</tr>
<tr>
<td>Jet set screw</td>
<td>M5 x 0.8</td>
<td>0.3</td>
<td>0.03</td>
<td>0.22</td>
</tr>
</tbody>
</table>

**LUBRICATION & SEAL POINT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Material</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crankcase cover mating surface</td>
<td>Liquid sealant (HondaBond HT, HondaBond 4, or equivalent)</td>
<td></td>
</tr>
</tbody>
</table>
HARNESS AND TUBE ROUTING

- Power Coil Cord
- Harness Clip
- Engine Wire Harness
- Carburetor Insulator
- Ignition Coil
- Breather Tube
- High Tension Cord
- Engine Wire Harness
- Fuel Tube
- Power Coil Cord
3. MAINTENANCE

MAINTENANCE SCHEDULE .......................... 3-2
VALVE CLEARANCE CHECK/ADJUSTMENT ............... 3-3
COMBUSTION CHAMBER CLEANING ................. 3-4
FUEL TUBE CHECK ........................................ 3-5
## MAINTENANCE SCHEDULE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REGULAR SERVICE PERIOD (2)</th>
<th>Refer to page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Each use</td>
<td>First month or 20 hrs.</td>
</tr>
<tr>
<td>Engine oil</td>
<td>Check level</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Change</td>
<td>O</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Check</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Clean</td>
<td>O(1)</td>
</tr>
<tr>
<td></td>
<td>Replace</td>
<td>O</td>
</tr>
<tr>
<td>Sediment cup</td>
<td>Clean</td>
<td>O</td>
</tr>
<tr>
<td>Spark plug</td>
<td>Check-adjust</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Replace</td>
<td>O</td>
</tr>
<tr>
<td>Spark arrester (Applicable types)</td>
<td>Check-clean</td>
<td>O</td>
</tr>
<tr>
<td>Valve clearance</td>
<td>Check-adjust</td>
<td>O</td>
</tr>
<tr>
<td>Fuel tank and filter</td>
<td>Clean</td>
<td>O</td>
</tr>
<tr>
<td>Fuel tube</td>
<td>Check</td>
<td>Every 2 years (Replace if necessary)</td>
</tr>
</tbody>
</table>

(1) Service more frequently when used in dusty areas.

(2) For commercial use, log hours of operation to determine proper maintenance intervals.

(*) Refer to page of base shop manual (GX390RT2/T2/UT2: 61Z5F00)
VALVE CLEARANCE CHECK/ADJUSTMENT

Remove the head cover bolt (1), the head cover (2), and the head cover packing (3).

Disconnect the spark plug cap from the spark plug.
Set the piston near top dead center of the cylinder compression stroke (both valves fully closed) by pulling the recoil starter slowly. When the piston is near top dead center of the compression stroke, the triangle mark (1) on the starter pulley (2) will align with the projection (3) on the fan cover (4).

If the exhaust valve is opened, use the recoil starter to turn the crankshaft one additional turn and align the triangle mark on the starter pulley with the projection on the fan cover again.

Insert a thickness gauge (1) between the valve rocker arm (2) and valve stem (3) to measure the valve clearance.

VALVE CLEARANCE:
IN: 0.15 ± 0.02 mm
EX: 0.20 ± 0.02 mm

If adjustment is necessary, refer to page 3-4.
Hold the rocker arm pivot (1) and loosen the pivot adjusting nut (2).

Turn the rocker arm pivot to obtain the specified clearance.

**VALVE CLEARANCE:**

IN: 0.15 ± 0.02 mm  
EX: 0.20 ± 0.02 mm

Hold the rocker arm pivot and retighten the pivot adjusting nut to the specified torque.

**TORQUE:** 10 N·m (1.0 kgf·m, 7 lbf·ft)

Recheck the valve clearance, and if necessary, readjust the clearance.

Check the head cover packing for damage or deterioration, and install it to the head cover.

Attach the cylinder head cover to the cylinder head, and tighten the head cover bolt securely.

---

**COMBUSTION CHAMBER CLEANING**

Remove the cylinder head (page 12-2).

Clean any carbon deposits from the combustion chamber (1).
FUEL TUBE CHECK

⚠️ WARNING
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
• Keep heat, sparks, and flame away.
• Handle fuel only outdoors.
• Wipe up spills immediately.

Remove the harness cover (1) [page 6-2].
Check the fuel tube (2) for deterioration, cracks, or signs of leakage.
Install the harness cover [page 6-2].
4. TROUBLESHOOTING

BEFORE TROUBLESHOOTING .......... 4.2  TROUBLESHOOTING .......................... 4.2
TROUBLESHOOTING

BEFORE TROUBLESHOOTING

- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Check for sufficient fresh fuel in the fuel tank.
- Read the circuit tester’s operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before continuity inspection.

TROUBLESHOOTING

* Refer to page of base shop manual (GX390RT2/T2/UT2: 6LZ5F00E3)

GENERAL SYMPTOMS AND POSSIBLE CAUSES

**Engine does not start or is hard to start.**

- ENGINE OIL level low.  
  Inspection: *(page 3-3)*

- FUEL FILTER clogged.  
  Cleaning: *(page 3-14)*

- SPARK PLUG faulty.  
  Inspection: *(page 3-9)*

- IGNITION COIL faulty.  
  Inspection: *(page 9-5)*

- OIL LEVEL SWITCH faulty.  
  Inspection: page *(page 11-5)*

  **Wire Harness faulty.**  
  Check the wire harness connecting the ECM, combination switch, oil level switch, and the ignition coil for open or short circuit and for proper connection.  
  Inspection:  
  - Engine wire harness *(page 4-4, 4-5, 4-6)*  
  - Charging coil wire *(page 8-5)*

- CHARGE/POWER COIL faulty.  
  Inspection: *(page 8-5)*

**Engine lacks power.**

- CONTROL GEAR BOX faulty.  
  Inspection: *(page 6-5)*

- COMBINATION SWITCH faulty.  
  Inspection: *(page 11-6)*

- ECM faulty.  
  Replacement: *(page 6-4)*

- AIR CLEANER ELEMENT clogged.  
  Cleaning: *(page 3-6)*

- SPARK ARRESTER clogged.  
  Cleaning: *(page 3-10)*

- CARBURETOR faulty.  
  Disassemble: *(page 6-4)*  
  Inspection: *(page 6-13)*

- VALVE CLEARANCE incorrect.  
  Readjustment: *(page 3-3)*

- VALVE or VALVE SEAT worn or damaged.  
  Inspection: *(page 12-5)*  
  Recondition: *(page 12-10)*

- CYLINDER, PISTON, or PISTON RING worn.  
  Disassembly: *(page 13-3, 13-12)*  
  Inspection: *(page 13-T3)*
TROUBLESHOOTING

HARD STARTING

Check whether the oil level indicator is ON.

- ON: Add the recommended engine oil (page 3-3)*.

- OFF: Turn the combination switch to the START position and check whether the engine cranks.

Cranks

- Cranks: Perform the STARTING SYSTEM TROUBLESHOOTING (page 10-2).

- Fuel: Loose the carburetor drain screw, and check the fuel flow from the fuel tank.

- No fuel: Check for clogged fuel tube, fuel filter, and fuel valve.

- No spark: Perform the IGNITION SYSTEM TROUBLESHOOTING (page 9-2).

- Spark: Perform the cylinder compression test (page 12-5)*.
  
  GX270UT2:
  1.31 MPa (13.4 kgf/cm², 190 psi)/1,400 min⁻¹ (rpm)
  
  GX390T2/UT2:
  1.29 MPa (13.2 kgf/cm², 187 psi)/1,400 min⁻¹ (rpm)

- Compression is too high: Check the valve clearance (page 3-3) and then perform the cylinder compression test. If the cylinder compression is too high, remove carbon deposits in the combustion chamber (page 3-4).

- Dry: Disassemble the carburetor to check for clogged ports, jets, and nozzles (page 6-13)*.

- Wet: If spark plug gap is correct, clean and dry the electrodes, and then restart the engine. If the engine does not start and the electrodes are wet again, check the carburetor float valve (page 6-14)*.

- Normal: Check the spark plug (page 3-9)*.

- Damp: Perform the spark test (page 9-4)*.

- Go to page 4-4
Troubleshooting

Compression is normal

Check for continuity between the oil level switch terminal and cylinder barrel.

Compression is too low

Check the valve clearance (page 3-3), and then perform the cylinder compression test (page 12-5)*.
If the cylinder compression is too low, perform a leak down test.
If there is no air leakage in the engine, check the following:
- Valve spring free length (page 12-7)*
- Valve seat width (page 12-5)*
- Valve face irregularly worn (page 12-6)*
- Decompressor operation (page 13-20)*
- Piston ring side clearance (page 13-15)*
- Piston ring width (page 13-16)*
- Piston ring end gap (page 13-16)*
- Piston skirt O.D. (page 13-14)*
- Cylinder sleeve I.D. (page 13-13)*

No continuity

Replace the oil level switch (page 11-5).

No continuity

Replace the engine wire harness (page 11-7).

Check for engine wire harness connecting the combination switch and the ignition coil for continuity.

No continuity

Replace the combination switch (page 11-3).

Check for continuity between the EXT (+) wire (Red) and EXT (-) wire (Black) with the combination switch in the ON position (page 11-6).

Abnormal

Check the control gear box and ECM (page 6-5).

Normal

Replace the ignition coil (page 9-3).

Remove the air cleaner elbow (page 6-5)* and check that the choke valve is closed when turning the starter motor or pulling the recoil starter.
ENGINE SPEED DOES NOT INCREASE OR STABILIZE

Check whether the oil level indicator is ON.

- **ON**
  - Add the recommended engine oil (page 3-3)*.
- **OFF**
  - Check the external connected switch and wire harness for failure or open circuit.
    - **Normal**
      - Replace the external switch and/or wire harness.
    - **Abnormal**
      - Replace the engine wire harness (page 11-7).

Check the engine wire harness connecting the ECM and each switch for continuity.

- **Continuity**
  - Replace the ECM (page 6-4).
- **No continuity**
  - Replace the engine wire harness (page 11-7).

Check whether the engine retains 1,400 min⁻¹ (rpm) constantly when the external connected switch is operated.

- **Constant**
  - Replace the ECM (page 6-4).
- **Not constant**
  - Remove the air cleaner elbow (page 6-5)* and check whether the choke valve is closed when turning on the starter motor or pulling the recoil starter.

Abnormal

Check the control gear box (page 6-5).
TROUBLESHOOTING

ENGINE DOES NOT STOP WHEN COMBINATION SWITCH IS TURNED OFF

Check the engine wire harness connecting the combination switch and the ignition coil for continuity between the EXT (+) wire (Red) and EXT (−) (Black).

Continuity
Replace the engine wire harness (page 11-7).

No continuity
Replace the combination switch (page 11-3).

Check the combination switch connecting the engine wire harness for continuity between the EXT (+) wire (Red) and EXT (−) wire (Black) with the combination switch in the OFF position (page 11-6).

ENGINE DOES NOT STOP WHEN ENGINE OIL LEVEL IS LOW

Check whether the oil level indicator is ON.

ON
Add the recommended engine oil (page 3-3)*.

OFF
Replace the oil level switch (page 11-5).

Check for continuity between the oil level switch terminal and the cylinder barrel (page 4-4).

No continuity
Replace the engine wire harness (page 11-7).

Check the engine wire harness between the oil level switch and the ignition coil for continuity.

Replace the ignition coil (page 9-3).
5. FAN COVER

FAN COVER REMOVAL/INSTALLATION···5-2
FAN COVER

FAN COVER REMOVAL/INSTALLATION

Remove the following:

- Recoil starter (page 10-3)
- Control box (page 11-3)
- Carburetor (page 6-3)

When installing, refer to HARNESS AND TUBE ROUTING (page 2-3).
FUEL SYSTEM

FUEL TANK REMOVAL/INSTALLATION

**WARNING**
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

Turn the fuel valve lever to the OFF position.
Set a commercially available tube clamp to the fuel tube.
Remove the control box (page 11-3).

---

**FUEL TANK JOINT**
2 N·m (0.2 kgf·m, 1.5 lbf·ft)
INSTALLATION:
Before installing, check the screen of the fuel strainer for clogs or damage.

---

**FUEL TUBE CLAMP**
(Commercially available)

---

**FUEL TANK**

---

**FUEL TUBE**

---

**O-RING**

---

**FUEL TANK COVER**

---

**TAPPING SCREW**
(5 x 20 mm) (2)

---

**FUEL TUBE CAP**
PACKING

**INSTALLATION:**
Before installing, check for deterioration or cracks.

---

**FUEL FILLER CAP**

---

**FUEL FILLER CAP PACKING**

**INSTALLATION:**
Before installing, check for deterioration or cracks.
CARBURETOR REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3)

**WARNING**

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

Turn the fuel valve lever to the OFF position.
Remove the harness cover (page 6.2).
Remove the air cleaner (page 6.5)*.
Remove the ECM connector and power coil connector.
Set a commercially available tube clamp to the fuel tube.
Disconnect the fuel tube from the carburetor.
Remove the drain bolt to drain the carburetor completely.

---

**INSTALLATION:**

Before installing, clean the passage thoroughly with compressed air.
Install the carburetor insulator with the vent groove facing toward the carburetor.
After installing, clamp the high tension cord to the carburetor insulator.

---

*Diagram of fuel system components including fuel tube, ECM connector, power coil connector, fuel tube clamp, B8/D8 tube clamp, drain bolt, carburetor insulator, and high tension cord.*
FUEL SYSTEM

CARBURETOR DISASSEMBLY/ASSEMBLY

ECM REMOVAL/INSTALLATION

Remove the carburetor (page 6-3).

**NOTICE**

Carefully pull the control motor connector from the ECM. Do not pull on the wires; you might break them or damage the connector.

![Diagram of ECM and control motor connector]

- **ECM SCREW/WASHER (4 x 20 mm)** (4)
  - 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)
- **O-RING**
  - Replace if necessary.

![Diagram of carburetor assembly]

- **CARBURETOR ASSY./CONTROL GEAR BOX ASSY.**
CONTROL GEAR BOX DISASSEMBLY/ASSEMBLY

CONTROL GEAR BOX DISASSEMBLY

Remove the ECM (page 6-4).

When removing the motor case set, hold the choke valve fully open as shown.

**INSPECTION:** Check for damage or warpage.
FUEL SYSTEM

CONTROL GEAR BOX ASSEMBLY

Apply grease to the O-rings.

Install the O-ring to the groove of the carburetor Assy.
securely.

Install the O-ring and choke lever to the motor case set.

Install the plate to the choke lever arm and install the choke lever arm/plate to the choke lever.

When installing the motor case set, hold the choke valve fully open as shown.

Install the washers and motor case set screws A/B.

Tighten the motor case set screws A/B to the specified torque.

TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

Align the cutouts of choke lever arm and choke lever.

CARBURETOR ASSY.

O-RING

Replace if necessary.

CUTOUT

CHOKE LEVER

WASHER (4 mm) (2)

MOTOR CASE SET SCREW B (4 mm) (2)
2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

PLATE

MOTOR CASE SET SCREW A (4 x 17 mm) (2)
2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

CHOKE LEVER ARM

CHOKE VALVE

O-RING

Replace if necessary.
Hook the spring (1) to the choke control lever B (2) and choke control lever A (3).

Install the choke control lever (1) and a new special clip B (2) securely.

Install the middle gear (1) to the throttle gear (2).
- Engage the middle gear and throttle gear as shown. Install a new special clip A (3) securely.
FUEL SYSTEM

CARBURETOR DISASSEMBLY/ASSEMBLY

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3)

⚠️ WARNING
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

⚠️ CAUTION
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Remove the control gear box (page 6-5).
Before disassembly, clean the outside of the carburetor.

PILOT JET SET

ASSEMBLY:
Before installing, clean thoroughly with low-pressure compressed air. Lightly lubricate the O-ring to ensure easy installation into the carburetor body.

PILOT SCREW
REPLACEMENT: (page 6-15*)
PILOT SCREW OPENING: (page 2-2)

MAIN NOZZLE

ASSEMBLY:
Before installing, clean thoroughly with low-pressure compressed air.

MAIN JET

ASSEMBLY:
Before installing, clean thoroughly with low-pressure compressed air.

FLOAT CHAMBER

ASSEMBLY:
Install the float chamber to the carburetor body at an angle as shown.

20°
CHOKE SET REPLACEMENT

Remove the control gear box (page 6-5).

Hold the choke valve fully open and pull out the choke valve plate (1).

Remove the choke shaft (2) and return spring (3).

Install the return spring and new choke shaft with the return spring ends hooked to the bosses.

Insert a new choke valve plate into the slit (4) of the choke shaft.

Be sure the choke shaft is in the position between the projections (5) of the choke valve plate.

CONTROL MOTOR/WAX HEATER INSPECTION

Remove the ECM (page 6-4).

Measure the resistance between the control motor connector terminals.

<table>
<thead>
<tr>
<th></th>
<th>No.5 (R)</th>
<th>No.6 (G)</th>
<th>No.8 (Bu)</th>
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</thead>
<tbody>
<tr>
<td>No.1 (Y)</td>
<td>52 – 90</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>No.2 (O)</td>
<td>52 – 90</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>No.3 (Br)</td>
<td>–</td>
<td>52 – 90</td>
<td>–</td>
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<tr>
<td>No.4 (Bl)</td>
<td>–</td>
<td>52 – 90</td>
<td>–</td>
</tr>
<tr>
<td>No.7 (W)</td>
<td>–</td>
<td>–</td>
<td>36 – 98</td>
</tr>
</tbody>
</table>

Unit: Ω

If the measured resistance is out of the specification, replace the motor case set (page 6-5).
FUEL SYSTEM

TECHNICAL FEATURES/STR (Self Tuning Regulator) GOVERNOR

OUTLINE

This engine has a STR (Self Tuning Regulator) governor that enables stable engine starting and fast engine warm-up with no manual operation before and after engine starting.
The STR governor controls both throttle valve and choke valve with one throttle control motor inside the carburetor. The heater, combined with a thermally-linked wax unit (Heater Assy.), controls the choke valve while starting a warm or cold engine.
The battery is not required to actuate the STR governor. The recoil starter allows the STR to function.
CONSTRUCTION

CHOKE SHAFT
Transmits the driving power from the choke control lever to the choke valve.

EXTRA CHOKE LEVER
Supports starting by manual opening the choke valve when the engine is warmed.

CHOKE CONTROL LEVER
Transmits the driving power from the control motor or heater Assy. to the choke shaft.

THROTTLE GEAR
Transmits driving power to the throttle valve.

MIDDLE GEAR
• Transmits the driving power to the throttle gear.
• Adjusts the driving power from the choke control lever to the choke lever with its cam.

CONTROL MOTOR
Controls the throttle and choke opening value after starting the engine.

HEATER ASSY.
  • THERMALLY-LINKED WAX UNIT
    • Adjusts the choke valve opening value by its characteristics when starting.
  • HEATER
    • Warms up the thermally-linked wax by current from the ECM.
**FUEL SYSTEM**

**FUNCTION**

When starting:
1. The thermally-linked wax (1) is expanded due to the ambient temperature, so the shaft (2) connected to the wax is moved.
2. The shaft connected to the wax pushes the choke control lever (3), which moves the choke shaft (4) to adjust the choke valve (5) opening.

![Diagram of fuel system during starting](image)

After starting – Engine warming up:
The ECM turns the control motor (1) to adjust the throttle valve (2) opening with the middle gear (3) engaging to the control motor and the throttle gear (4) linking to the throttle valve. At this time, the engine speed is maintained constantly at approximately 3,600 min\(^{-1}\) (rpm) since the choke valve (5) opening is restricted with the choke control cam (6) on the middle gear.

![Diagram of fuel system during engine warming up](image)
Engine warming up – Normal running:
The ECM applies current to the Positive Temperature Coefficient Heater in the heater Assy. (1) to warm up the thermally-linked wax, by calculating the data from temperature sensor in the ECM, finally open the choke valve (2). The ECM shifts to normal running mode after detecting that warm-up is complete by receiving the temperature data from the sensor, and stops the current to the heater.

When stopping:
To stop the engine, turn the engine stop switch off to open the throttle valve (1) beyond the fully open position.
8. CHARGING SYSTEM

SYSTEM DIAGRAM .............................................. 8-2
BEFORE TROUBLESHOOTING ............................ 8-2
CHARGING SYSTEM TROUBLESHOOTING ........... 8-3

CHARGE / POWER COIL REMOVAL/ INSTALLATION .............................. 8-4
CHARGE/POWER COIL INSPECTION ................. 8-5
BEFORE TROUBLESHOOTING

- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Read the circuit tester’s operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before continuity inspection.
CHARGING SYSTEM TROUBLESHOOTING

Check the main fuse 30 A (page 11-3).

Abnormal

Replace the main fuse 30 A (page 11-3).

Normal

Check the charge coil (page 8-5).

Abnormal

Replace the charge coil (page 8-4).

Normal

Check the rectifier (page 11-6).

Abnormal

Replace the rectifier (page 11-3).

Normal

Check the power coil (page 8-5).

Abnormal

Replace the power coil (page 8-4).

Normal

Replace the ECM (page 6-4) and recheck the power coil (page 8-5).

Normal

Check the harness connecting to the charge coil and battery for open or short circuit and for proper connection. If necessary, replace or repair the harness.
CHARGING SYSTEM

CHARGE / POWER COIL REMOVAL/ INSTALLATION

(*) Refer to page of base shop manual (GX240/GX270/GX340GX390UT2, part number 61Z5F00E3).

Remove the following:
- Fan cover (page 5-2)
- Ignition coil (page 9-3)
- Starter motor (page 10-8)
- Flywheel (page 8-7)*

Installation is in the reverse of removal.

When installing the cord clamp, refer to HARNESS AND TUBE ROUTING (page 2-3).

---

GX270UT2:
- BOLT (6 x 12 mm)
- BOLT (6 x 28 mm) (2)
- BOLT (6 x 25 mm) (2)

GX390T2/UT2:
- BOLT (6 x 12 mm)
- BOLT (6 x 40 mm) (2)
- BOLT (6 x 35 mm) (2)

0.9 A CHARGE COIL
CHARGE/POWER COIL INSPECTION

POWER COIL
(*) Refer to page of base shop manual (GX240/GX270/GX340/390UT2, P/N 61Z5F00E3).
Remove the air cleaner element (page 6-5)*.
Disconnect the power coil connector.
Check for continuity between the terminals of power coil connector. (Engine wire harness side)
Resistance: 2.9 – 4.5 Ω
Check for continuity between each terminal and engine ground.
There should be no continuity.
• If the measured resistance is not within the range specification or if any wire has continuity to engine ground, replace the power coil (page 8-4).
• If the resistance is good and the flywheel is ok, replace the ECM and recheck.

CHARGE COIL
Remove the control box (page 11-3).
Measure the resistance between the terminals of the charge coil.
Resistance: 5.1 – 7.7 Ω
Check for continuity between each terminal and engine ground.
There should be no continuity.
• If the measured resistance is not within the range specification or if any wire has continuity to engine ground, replace the charge coil (page 8-4).
• If the resistance is good and the flywheel is ok, replace the rectifier and recheck.
9. IGNITION SYSTEM

SYSTEM DIAGRAM ........................................9-2
IGNITION SYSTEM
TROUBLESHOOTING ......................................9-2
IGNITION COIL REMOVAL/
INSTALLATION .............................................9-3
IGNITION SYSTEM TROUBLESHOOTING

NO SPARK AT SPARK PLUG

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3)

- Check the engine oil level before troubleshooting.

Check for continuity between the oil level switch terminal and engine ground (page 4-4).

Continuity

Replace the oil level switch (page 11-5).

No continuity

Check the engine wire harness connecting the ignition coil and the combination switch for open or short circuit and for proper connection (page 4-4).

Abnormal

Replace or repair the engine wire harness (page 11-7).

Normal

Check the combination switch (page 11-6).

Abnormal

Replace the combination switch (page 11-3).

Normal

Check the ignition coil (page 9-5)*.

Abnormal

Replace the ignition coil (page 9-3).
IGNITION COIL REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX390RT2/T2/UT2: 61Z5F00)

Remove the fan cover (page 5-2).

When installing the ignition coil, refer to IGNITION COIL INSTALLATION (page 9-4)*.

INSTALLATION:
Install the ignition coil as shown.

HIGH TENSION CORD
SPARK PLUG CAP
IGNITION COIL CONNECTOR
ENGINE WIRE HARNESS
BOLT (6 x 28 mm) (2)

SPARK PLUG
BREATHER TUBE
CARBURETOR INSULATOR
HIGH TENSION CORD
STARTING SYSTEM TROUBLESHOOTING

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3)

STARTER MOTOR DOES NOT OPERATE

- **Check the battery condition.**
  - **Normal**
  - **Abnormal**

- **Check the battery voltage between the starter motor side positive (+) battery cable terminal and engine ground.**
  - **Normal**
  - **Low voltage**
  - **Replace positive (+) battery cable.**

- **Check the continuity between BAT terminal (White) and ST terminal (Black/white) of the combination switch in the START position.**
  - **Normal**
  - **No continuity**
    - **Check the main fuse in the control box.**
      - **Not blown**
        - **Replace the combination switch.**
      - **Blown**
        - **Replace the main fuse.**

- **Check the starter solenoid.**
  - **Normal**
  - **Abnormal**
    - **Replace the starter solenoid.**

- **Perform the starter motor performance test.**
  - **If necessary disassemble the starter motor and check the each parts.**
RECOIL STARTER REMOVAL/INSTALLATION

NUT (8 mm) (4)
STARTING SYSTEM

RECOIL STARTER DISASSEMBLY

**CAUTION**
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed springs.

Remove the recoil starter (page 10-3).

---

**Components:**
- CENTRE SCREW
- SPRING RETAINER
- FRICTION SPRING
- RECOIL STARTER PULLEY
- RECOIL STARTER ROPE
- CENTER SCREW
- RATCHET (2)
- RATCHET SPRING (2)
- STARTER RETURN SPRING
- CLIP (4)
- ROPE COVER (4)
- RECOIL STARTER CASE
- REINFORCEMENT GRIP
- STARTER GRIP
- RECOIL STARTER COVER
**RECOIL STARTER ASSEMBLY**

**CAUTION**
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed springs.

Install the recoil starter cover (1) to the recoil starter case (2).

- Align the recoil starter cover pawls (3) with the recoil starter case tabs (4).

Install the rope cover (5) to the recoil starter cover bosses (6).

Install the clips (7) securely.

- Replace the clips if necessary.

Pass the recoil starter rope (1) through the hole (2) of the recoil starter pulley (3), and then tie the rope as shown.

**NOTICE**
*Before installing the recoil starter rope, check for fray or wear.*

Wind the recoil starter rope onto the recoil starter pulley counterclockwise.

---

*Image showing the recoil starter assembly steps marked with numbers (1) to (7).*
STARTING SYSTEM

Hook the outer hook (1) of the starter return spring (2) to the groove (3) of the recoil starter pulley (4), and then install the starter return spring by winding it.

Apply grease to the cutout (1) of the recoil starter case (2).
Set the recoil starter pulley (3) to the recoil starter case by aligning the inner hook (4) of the starter return spring with the cutout of the recoil starter case.

Apply grease to the two ratchets (1).
Install the two ratchets and the two ratchet springs (2) to the recoil starter pulley (3) as shown.

Apply grease to the inside of the spring retainer (1).
Set the friction spring (2) and the spring retainer to the recoil starter pulley in the direction as shown.
Apply locking agent (Honda Lock 1, Threebond® 2430, or equivalent) to the threads of the center screw (3).
Hold the spring retainer and tighten the center screw securely.
STARTING SYSTEM

Turn the recoil starter pulley (1) more than 2 turns counterclockwise to preload the starter return spring. Be sure to hold the recoil starter pulley.

Pass the recoil starter rope through hole (1) of the recoil starter case, the starter grip (2), and reinforcement grip (3), and then tie the rope as shown.

Check the recoil starter operation [page 10-7].

RECOIL STARTER INSPECTION

RECOIL STARTER OPERATION

Remove the recoil starter [page 10-3].

Pull the starter grip several times to inspect that the ratchets (1) are operated properly (the ratchet ends come out from the spring retainer (2).

STARTER PULLEY

Remove the recoil starter [page 10-3].

Inspect the square holes (1) of the starter pulley (2) for deformation.
STARTING SYSTEM

STARTER MOTOR REMOVAL/INSTALLATION

Disconnect the starter solenoid wires from the starter motor.
Remove the fan cover (page 5-2).
STARTER MOTOR DISASSEMBLY/ASSEMBLY

Remove the starter motor (page 10-8).

**LOCK RING**

**DISASSEMBLY:**
Hold the armature upright, place an offset wrench over the pinion stop collar, and drive the collar down exposing the lock ring. Remove the lock ring; then remove the collar and overrunning clutch.

**ASSEMBLY:**
Make sure there is no obstruction on the magnets.

**YOKES**

**INSPECTION:**
Check for cracks or damage.
STARTING SYSTEM

FRONT BRACKET/REAR BRACKET ASSEMBLY

Install the rear bracket (1) to the armature/yoke (2) by aligning the brush terminal grommet (3) with the cutout (4) of the rear bracket.

Attach the pinion drive lever (5) to the starter solenoid (6). Set the pinion drive lever to the overrunning clutch (7).

Hold the pinion drive lever, starter solenoid, and yoke together, and install the front bracket (8). Tighten the through bolts to secure the front bracket and rear bracket (page 10-9).

INSPECTION

PERFORMANCE TEST

Measure starter performance while cranking the engine.

STARTER MOTOR PERFORMANCE:
UNDER LOAD:
CRANKING VOLTAGE: 9.0 V
CRANKING CURRENT: 150 A
ENGINE CRANKING SPEED: 1,900 min⁻¹ (rpm) min.

NO LOAD:
CRANKING VOLTAGE: 11.5 V
CRANKING CURRENT: 50 A max.

• To get accurate results, the test must be conducted in the normal ambient temperature.
• Battery: 32A19 (12 V 24AH/5HR)
• Battery cable: 8 sq. x 1.5 m (4.9 ft.) total length of battery positive cable and battery negative cable.

If the measurement is out of specification, disassemble and inspect the starter motor.

STARTER SOLENOID

Remove the starter solenoid (1) (page 10-9).

Connect a 12 V battery between the starter terminal and the switch body and check for continuity between the terminals.

Continuity should exist when the battery is connected and not exist when the battery is disconnected.
**BRUSH LENGTH**

Measure the brush length.

If the brush length is less than the service limit, replace the brush (page 10-13).

STANDARD: 10 mm (0.4 in)
SERVICE LIMIT: 6 mm (0.2 in)

---

**BRUSH CONTINUITY CHECK**

Check for continuity between the brushes.

There should be continuity between both the positive brushes.
There should be continuity between both the negative brushes.
There should be no continuity from either positive brush to either negative brush.

If the correct continuity of the brushes is not obtained, replace the brushes (page 10-13).

---

**ARMATURE MICA DEPTH**

Visually inspect the commutator surface for dust, rust, or other damage. If necessary, wipe it with a clean lint-free cloth. If rusted or damaged, dress with a fine emery cloth.

When the mica is clogged, or its depth is smaller than the service limit value, recut the grooves using a hacksaw blade or a small file.

SERVICE LIMIT: 0.2 mm (0.01 in)

---

**ARMATURE CONTINUITY CHECK - COMMUTATOR TO SHAFT**

Check for continuity between the commutator and the armature shaft.

Replace the armature if continuity exists between any of the commutator segments and the armature shaft (page 10-9).
STARTING SYSTEM

ARMATURE CONTINUITY CHECK - COMMUTATOR SEGMENTS

Check for continuity between segments. If an open circuit (no continuity) exists between any two segments, replace the armature (page 10-9).

ARMATURE CONTINUITY CHECK - COMMUTATOR TO CORE

Check for continuity between the commutator segments and the armature coil core. Replace the armature if continuity exists between any of the commutator segments and the armature coil core (page 10-9).

OVERRUNNING CLUTCH

Hold the pinion gear (1) as shown and check that the gear turns clockwise and slides smoothly.
If necessary, apply oil or replace the overrunning clutch.
Check the pinion gear for wear or damage, and replace the overrunning clutch if necessary.
If the pinion gear is worn or damaged, the flywheel ring gear must be inspected.
**BRUSH REPLACEMENT**

Cut off the brush lead (1) at the point shown and remove the brush (2).

Remove the remaining brush lead and deposited solder from the terminal (3).

Hold a new brush (1) in the same direction of the removed brush and put a new plate (2) over the new brush and terminal (3), and press it using a pair of pliers as shown.

Solder the plate (1) on the terminal (2).

- Before soldering, heat the pressed part of the plate well to mark sure solder (3) reaches the end of the pressed part.
- Prevent solder from flowing down the brush lead.
- Do not allow solder to run down onto the field winding of the yoke.
- File the brush so that the brush and commutator can fit using an emery paper #500 or #600.
### 11. OTHER ELECTRICAL

<table>
<thead>
<tr>
<th>Component</th>
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<tr>
<td>Component Location</td>
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<td>11-6</td>
</tr>
<tr>
<td>Engine Wire Harness Removal/Installation</td>
<td>11-7</td>
</tr>
</tbody>
</table>
OTHER ELECTRICAL

COMPONENT LOCATION

CONTROL BOX

OIL LEVEL SWITCH
CONTROL BOX REMOVAL/INSTALLATION

When installing the control box, refer to HARNESS AND TUBE ROUTING (page 2-3).

CONTROL BOX DISASSEMBLY/ASSEMBLY

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3)
Remove the control box (page 11-3).
OTHER ELECTRICAL

When assembling the control box, refer to HARNESS AND TUBE ROUTING (page 2-3).
OIL LEVEL SWITCH REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3).

Drain the engine oil [page 3-4].

Disconnect the oil level switch connector (1).

Remove the two 6 x 16 mm flange bolts (2), oil level switch (3), and O-ring (4).

Installation is in the reverse order of removal.

Replace the O-ring with a new one.

NOTICE

• Install the oil level switch to the crankcase securely as shown.
• Wrong assembly can cause the engine trouble.

OIL LEVEL SWITCH INSPECTION

Remove the oil level switch [page 11-5].

Check for continuity between the oil level switch terminals as follows:

1. Hold the oil level switch (1) in the direction as shown. There should be continuity.
2. Hold the switch in the direction as shown. There should be no continuity.
3. Hold the switch in the direction as shown and dip the float section of the switch into a container of oil. There should be no continuity.

If the correct continuity is not obtained, replace the oil level switch [page 11-5].
OTHER ELECTRICAL

COMBINATION SWITCH INSPECTION

Check for continuity between the terminals at each switch position.

If the correct continuity is not obtained, replace the combination switch (page 11-3).

<table>
<thead>
<tr>
<th>OFF</th>
<th>ON</th>
<th>START</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXT (+) (R)</td>
<td>EXT (-) (B1)</td>
<td>BAT (W)</td>
</tr>
</tbody>
</table>

INDICATOR INSPECTION

Remove the indicator (page 11-3).

Measure the resistance between the terminal and plate.
- Some testers have reverse polarity.

Unit: kΩ

<table>
<thead>
<tr>
<th>(+) Tester probe</th>
<th>Terminal (1)</th>
<th>Plate (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-) Tester probe</td>
<td>Terminal (1)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Plate (2)</td>
<td>∞</td>
</tr>
</tbody>
</table>

RECTIFIER INSPECTION

Measure the resistance between the terminals and be sure that the measurements conform to the ranges shown in the table.
- Some testers have reverse polarity.

Unit: kΩ

<table>
<thead>
<tr>
<th>(+) Tester probe</th>
<th>W (1)</th>
<th>Gr (2)</th>
<th>G (3)</th>
<th>Gr (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-) Tester probe</td>
<td>W (1)</td>
<td>–</td>
<td>∞</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Gr (2)</td>
<td>7</td>
<td>–</td>
<td>∞</td>
</tr>
<tr>
<td></td>
<td>G (3)</td>
<td>–</td>
<td>7</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Gr (4)</td>
<td>7</td>
<td>–</td>
<td>7</td>
</tr>
</tbody>
</table>
ENGINE WIRE HARNESS REMOVAL/INSTALLATION

Remove the fan cover (page 5-2).
Remove the fuel tank (page 6-2).
Release the engine wire harness (1) from the harness clip (2).
Remove the 6 x 12 mm flange bolt (3) and cord clamp (4).
Disconnect the ignition coil connector (5) and remove the engine wire harness.
Installation is in the reverse order of removal.
12. CYLINDER HEAD/VALVES

CYLINDER HEAD REMOVAL/
INSTALLATION..............................................12-2
CYLINDER HEAD/VALVES

CYLINDER HEAD REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3).

Set the piston at top dead center of the cylinder compression stroke (page 3-3).

Remove the following:
- Air cleaner (page 6-5)*
- Carburetor (page 6-3)
- Fan cover (page 5-2)
- Muffler (page 14-2)*

Installation is in the reverse order of removal.

Check the valve clearance, and if necessary, adjust the clearance (page 3-3).

HEAD COVER PACKING

INSTALLATION:
Note the installation direction.

CYLINDER HEAD GASKET

INSTALLATION:
Before installing the cylinder head, remove any carbon deposits from the combustion chamber, and inspect the valve seats.
After installing the cylinder head, measure the cylinder compression.

REMOVAL/INSTALLATION:
Loosen and tighten the four 10 x 80 mm flange bolts in a crisscross pattern in 2 – 3 steps.
TORQUE: 35 N m (3.5 kgf m, 26 lbf ft)
13. CRANKCASE

CRANKCASE COVER REMOVAL/INSTALLATION ........................................ 13-2
CRANKSHAFT/BALANCER/PISTON REMOVAL/INSTALLATION ........... 13-3
CRANKCASE COVER REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z500E3).

Drain the engine oil (page 3-4)*

Remove the key (6.3 x 6.3 x 43 mm) (If equipped).

REMOVAL:
Insert a screwdriver into the recess as shown and remove the crankcase cover from the cylinder barrel by gently prying the screwdriver.

INSTALLATION:
Clean the mating surfaces of the crankcase cover and the cylinder barrel with a degreasing cleaning agent or a clean shop towel. Apply liquid sealant (HondaBond HT, HondaBond 4, or equivalent) to the mating surface on the crankcase cover as shown.

Wait for 30 minutes after assembly. Do not add oil or start the engine during this period.

Apply a bread about 1.0 – 1.5 mm (0.04 – 0.06 in)
CRANKSHAFT/BALANCER/PISTON REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX390RT2/T2/UT2: 61Z5F00)

Remove the following:
- Cylinder head (page 12-2)
- Fuel tank (page 6-2)
- Flywheel (page 8-7)*
- Crankcase cover (page 13-2)

PISTON

INSTALLATION:
Install the piston to the cylinder barrel with the mark on the piston head toward the push rod hole of the cylinder head.

Viewed from cylinder head side

VALVE LIFTER

REMOVAL:
When removing the valve lifters, mark so that the intake and exhaust sides can be distinguished.
INSTALLATION:
Install the valve lifters in the cylinder barrel immediately before installing the camshaft.

CAMSHAFT

See BALANCER WEIGHT/CAMSHAFT INSTALLATION on page 13-6

CRANKSHAFT

INSTALLATION:
Before installing the crankshaft, check the oil seal of the cylinder barrel for damage or hardening. Be careful not to damage the oil seal when installing the crankshaft.

INSTALLATION:
Set the connecting rod lower with the oil dipper toward the camshaft.

DRAIN PLUG BOLT (12 x 15 mm) (2)
22.5 N·m (2.25 kgf·m, 17 lbf·ft)

DRAIN PLUG WASHER (12 mm) (2)

(Oil seal lip)

BALANCER WEIGHT (GX390T2/UT2)

CONNECTING ROD BOLT (8 x 40.5 mm) (2)
14 N·m (1.4 kgf·m, 10 lbf·ft)
(Apply to the threads and seating surface)

CONNECTING ROD LOWER
How to use this manual

A Few Words About Safety

SERVICE INFORMATION

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you and/or others. It could also damage this Honda product or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of special tools. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda must determine the risks to their personal safety and the safe operation of this product.

If you need to replace a part, use Honda Genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer’s Safety

Proper service and maintenance are essential to the customer's safety and the reliability of this product. Any error or oversight while servicing this product can result in faulty operation, damage to the product, or injury to others.

FOR YOUR SAFETY

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles, or face shields anytime you hammer, drill, grind, or work around pressurized air, pressurized liquids, springs, or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have equipment hoisted in the air. Anytime you lift this product with a hoist, make sure that the hoist hook is securely attached to the product.

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gasses from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
- Never store gasoline in an open container.
- Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.
INTRODUCTION
This supplement covers the construction, function, and servicing procedures of the Honda iGX240UT2 iGX340UT2 Engines.

For service information that is not covered in this supplement, please refer to the GX240R2/RT2/U2/UT2, GX270R2/RT2/U2/UT2, GX340R2/RT2/T2/U2/UT2, and GX390RT2/T2/UT2 base shop manual and supplement Y.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at anytime without notice.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the publisher. This includes text, figures, and tables.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to this Honda product, other property, or the environment.

SAFETY MESSAGES
Your safety and the safety of others are very important. To help you make informed decisions, we have provided safety messages and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing these products. You must use your own good judgement.

You will find important safety information in a variety of forms, including:

- Safety Labels – on the product.
- Safety Messages – preceded by a safety alert symbol and one of three signal words, DANGER, WARNING, or CAUTION.

These signal words mean:

⚠️ DANGER ⚠️ You WILL be KILLED or SERIOUSLY HURT if you don’t follow instructions.

⚠️ WARNING ⚠️ You CAN be KILLED or SERIOUSLY HURT if you don’t follow instructions.

⚠️ CAUTION ⚠️ You CAN be HURT if you don’t follow instructions.

- Instructions – how to service these products correctly and safely.

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SERVICE PUBLICATION OFFICE
Date of Issue: April 2012
How to use this manual

SYMBOLS
The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it will be explained specifically in the text without the use of the symbols.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Replace" /></td>
<td>Replace the part(s) with new one(s) before assembly.</td>
</tr>
<tr>
<td><img src="image" alt="Use Engine Oil" /></td>
<td>Use the recommended engine oil, unless otherwise specified.</td>
</tr>
<tr>
<td><img src="image" alt="Use Molybdenum Oil Solution" /></td>
<td>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).</td>
</tr>
<tr>
<td><img src="image" alt="Use Multi-Purpose Grease" /></td>
<td>Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).</td>
</tr>
<tr>
<td><img src="image" alt="Use Marine Grease" /></td>
<td>Use marine grease (water resistant urea based grease).</td>
</tr>
<tr>
<td><img src="image" alt="Apply Locking Agent" /></td>
<td>Apply a locking agent. Use a medium strength locking agent unless otherwise specified.</td>
</tr>
<tr>
<td><img src="image" alt="Apply Sealant" /></td>
<td>Apply sealant.</td>
</tr>
<tr>
<td><img src="image" alt="Use Automatic Transmission Fluid" /></td>
<td>Use automatic transmission fluid.</td>
</tr>
</tbody>
</table>

(Ø X Ø) (O) Indicates the diameter, length, and quantity of metric bolts used.

Page 1-1 Indicates the reference page.
## OUTLINE OF CHANGES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>iGX270UT2 : iGX390UT2/T2</td>
</tr>
<tr>
<td>Charge/power coil</td>
<td>iGX240UT2 : iGX340UT2</td>
</tr>
<tr>
<td></td>
<td><em>iGX240UT2 QZX4, QZA2, QZAV types</em></td>
</tr>
<tr>
<td></td>
<td><em>iGX340UT2 QZX4, QZA2, QZAV types:</em></td>
</tr>
<tr>
<td></td>
<td><em>iGX240UT2 QZA2, QZAV types</em></td>
</tr>
<tr>
<td></td>
<td><em>iGX340UT2 QZAV types</em></td>
</tr>
<tr>
<td></td>
<td><em>iGX340UT2 QZN2 type:</em></td>
</tr>
<tr>
<td></td>
<td><em>0.9 A CHARGE COIL</em></td>
</tr>
<tr>
<td></td>
<td><em>12 A CHARGE COIL</em></td>
</tr>
<tr>
<td></td>
<td><em>iGX340UT2 QZN2 type:</em></td>
</tr>
<tr>
<td>Regulator/rectifier</td>
<td><em>iGX340UT2 QZN2 type:</em></td>
</tr>
</tbody>
</table>

[Diagram of charge/power coil and regulator/rectifier]
## OUTLINE OF CHANGES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine wire harness</td>
<td>iGX270UT2 · iGX390UT2/T2</td>
</tr>
<tr>
<td></td>
<td>iGX240UT2 · iGX340UT2</td>
</tr>
<tr>
<td>Control box</td>
<td>iGX240UT2 QZ4, QZA2 types/</td>
</tr>
<tr>
<td></td>
<td>iGX340UT2 QZ4, QZA2, QZN2 types:</td>
</tr>
<tr>
<td></td>
<td>iGX240UT2 QZAV type/iGX340UT2 QZAV type:</td>
</tr>
<tr>
<td></td>
<td>iGX340UT2 QZN2 type:</td>
</tr>
</tbody>
</table>
1. SPECIFICATIONS

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DIMENSION AND WEIGHT SPECIFICATIONS ..................... 1-3

ENGINE SPECIFICATIONS ........................................ 1-3

DIMENSIONAL DRAWINGS ........................................... 1-4

P.T.O. DIMENSIONAL DRAWINGS ................................. 1-5
SPECIFICATIONS

SERIAL NUMBER LOCATION

The engine serial number (1), description code (2), and type (3) are stamped on the crankcase.
Refer to them when ordering parts or making technical inquiries.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>P. T. O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>iGX240UT2</td>
<td>QZX4</td>
<td>QZA2</td>
</tr>
<tr>
<td></td>
<td>QZAV</td>
<td>Q type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>P. T. O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>iGX340UT2</td>
<td>QZX4</td>
<td>QZA2</td>
</tr>
<tr>
<td></td>
<td>QZAV</td>
<td>QZN2</td>
</tr>
<tr>
<td></td>
<td>Q type</td>
<td></td>
</tr>
</tbody>
</table>
### DIMENSION AND WEIGHT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>iGX240UT2</th>
<th>iGX340UT2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>384 mm (15.1 in)</td>
<td>409 mm (16.1 in)</td>
</tr>
<tr>
<td>Overall width</td>
<td>462 mm (18.2 in)</td>
<td>484 mm (19.1 in)</td>
</tr>
<tr>
<td>Overall height</td>
<td>422 mm (16.6 in)</td>
<td>448 mm (17.6 in)</td>
</tr>
<tr>
<td>Dry weight</td>
<td>30.3 kg (66.8 lbs)</td>
<td>36.4 kg (80.2 lbs)</td>
</tr>
<tr>
<td>Operating weight</td>
<td>35.1 kg (77.4 lbs)</td>
<td>41.7 kg (91.9 lbs)</td>
</tr>
</tbody>
</table>

### ENGINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>iGX240UT2</th>
<th>iGX340UT2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description code</td>
<td>GCBJT</td>
<td>GCBET</td>
</tr>
<tr>
<td>Type</td>
<td>4 stroke, overhead valve, single cylinder, inclined by 25°</td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>270 cm³ (16.5 cu-in)</td>
<td>389 cm³ (23.7 cu-in)</td>
</tr>
<tr>
<td>Bore x stroke</td>
<td>77.0 x 58.0 mm (3.0 x 2.3 in)</td>
<td>88.0 x 64.0 mm (3.5 x 2.5 in)</td>
</tr>
<tr>
<td>Net power (SAE J1349)*1</td>
<td>5.9 kW (7.9 HP)/3,600 min⁻¹ (rpm)</td>
<td>8.0 kW (10.7 HP)/3,600 min⁻¹ (rpm)</td>
</tr>
<tr>
<td>Continuous rated power</td>
<td>4.6 kW (6.1 HP)/3,600 min⁻¹ (rpm)</td>
<td>6.3 kW (8.4 HP)/3,600 min⁻¹ (rpm)</td>
</tr>
<tr>
<td>Maximum net torque (SAE J1349)*1</td>
<td>18.3 N·m (1.86 kgf·m, 13.4 lbf ft)/2,500 min⁻¹ (rpm)</td>
<td>26.4 N·m (2.6 kgf·m, 19.4 lbf ft)/2,500 min⁻¹ (rpm)</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>8.5 : 1</td>
<td>8.2 : 1</td>
</tr>
<tr>
<td>Fuel consumption at continuous rated power</td>
<td>2.2 Liters (0.58 US gal, 0.48 Imp gal)/h</td>
<td>3.1 Liters (0.82 US gal, 0.68 Imp gal)/h</td>
</tr>
<tr>
<td>Ignition system</td>
<td>C.D.I. (Capacitor Discharge Ignition) type magneto ignition</td>
<td></td>
</tr>
<tr>
<td>Ignition timing</td>
<td>B.T.D.C. 10°/1,400 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>BPR6ES (NGK)/W20EPR-U (DENSO)</td>
<td></td>
</tr>
<tr>
<td>Lubrication system</td>
<td>Forced splash</td>
<td></td>
</tr>
<tr>
<td>Oil capacity</td>
<td>1.1 Liters (1.16 US qt, 0.97 Imp qt)</td>
<td></td>
</tr>
<tr>
<td>Recommended oil</td>
<td>SAE 10W-30, API service classification SJ or later</td>
<td></td>
</tr>
<tr>
<td>Cooling system</td>
<td>Forced air</td>
<td></td>
</tr>
<tr>
<td>Starting system</td>
<td>Recoil starter and Starter motor</td>
<td></td>
</tr>
<tr>
<td>Stopping system</td>
<td>Ignition primary circuit open</td>
<td></td>
</tr>
<tr>
<td>Carburetor</td>
<td>Horizontal type, butterfly valve</td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Dual element type</td>
<td></td>
</tr>
<tr>
<td>Governor</td>
<td>STR (Self Tuning Regulator) governor</td>
<td></td>
</tr>
<tr>
<td>Breather system</td>
<td>Flat valve type</td>
<td></td>
</tr>
<tr>
<td>Fuel used</td>
<td>Unleaded gasoline with a pump octane rating 86 or higher</td>
<td></td>
</tr>
</tbody>
</table>

*1: The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 min⁻¹ (rpm) (net power) and at 2,500 min⁻¹ (rpm) (maximum net torque). Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.
P.T.O. DIMENSIONAL DRAWINGS

Q TYPE

Unit: mm (in)
2. SERVICE INFORMATION

MAINTENANCE STANDARDS ······ 2-2
TORQUE VALUES ·························· 2-4
LUBRICATION & SEAL POINTS ·················· 2-4
HARNESS AND TUBE ROUTING ·················· 2-5
## MAINTENANCE STANDARDS

### iGX240UT2

<table>
<thead>
<tr>
<th>Part</th>
<th>Item</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine</strong></td>
<td>Maximum speed (at no load)</td>
<td>3,600 ± 150 min(^{-1}) (rpm)*</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Idle speed</td>
<td>1,400 ± 150 min(^{-1}) (rpm)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Cylinder compression</td>
<td>1.31 MPa (13.4 kgf/cm(^2), 190 psi)/1,400 min(^{-1}) (rpm)</td>
<td>–</td>
</tr>
<tr>
<td><strong>Cylinder head</strong></td>
<td>Warpage</td>
<td>–</td>
<td>0.10 (0.004)</td>
</tr>
<tr>
<td><strong>Cylinder</strong></td>
<td>Sleeve I.D.</td>
<td>77,000 – 77,017 (3.0315 – 3.0322)</td>
<td>77.17 (3.038)</td>
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<tr>
<td><strong>Piston</strong></td>
<td>Skirt O.D.</td>
<td>76,975 – 76,985 (3.0305 – 3.0309)</td>
<td>76.85 (3.026)</td>
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<tr>
<td></td>
<td>Piston-to-cylinder clearance</td>
<td>0.015 – 0.042 (0.0006 – 0.0016)</td>
<td>0.12 (0.005)</td>
</tr>
<tr>
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<td>Piston pin bore I.D.</td>
<td>18.002 – 18.008 (0.7087 – 0.7090)</td>
<td>18.042 (0.7103)</td>
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<td><strong>Piston pin</strong></td>
<td>Pin O.D.</td>
<td>17.994 – 18.000 (0.7872 – 0.7874)</td>
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<td>Piston pin-to-piston pin bore clearance</td>
<td>0.002 – 0.014 (0.0001 – 0.0006)</td>
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<td><strong>Piston rings</strong></td>
<td>Ring side clearance</td>
<td>Top 0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<tr>
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<td>Second 0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
</tr>
<tr>
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<td>Ring end gap</td>
<td>Top 0.200 – 0.350 (0.0079 – 0.0138)</td>
<td>1.0 (0.04)</td>
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<td>Second 0.350 – 0.500 (0.0138 – 0.0197)</td>
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<td>Oil (side rail) 0.2 – 0.7 (0.01 – 0.03)</td>
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<td>Ring width</td>
<td>Top 1.160 – 1.175 (0.0457 – 0.0463)</td>
<td>1.140 (0.0449)</td>
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<td>Second 1.160 – 1.175 (0.0457 – 0.0463)</td>
<td>1.140 (0.0449)</td>
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<td><strong>Connecting rod</strong></td>
<td>Small end I.D.</td>
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<td>0.1 – 0.4 (0.004 – 0.016)</td>
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<td>33.025 – 33.039 (1.3002 – 1.3007)</td>
<td>33.07 (1.302)</td>
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<tr>
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<td>Big end oil clearance</td>
<td>0.040 – 0.064 (0.0016 – 0.0025)</td>
<td>0.12 (0.005)</td>
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<td><strong>Crankshaft</strong></td>
<td>Crankpin O.D.</td>
<td>32.975 – 32.985 (1.2982 – 1.2986)</td>
<td>32.92 (1.296)</td>
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<td>Crankshaft runout</td>
<td>–</td>
<td>0.1 (0.004)</td>
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<tr>
<td><strong>Cylinder barrel</strong></td>
<td>Camshaft bearing I.D.</td>
<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
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<tr>
<td><strong>Crankcase cover</strong></td>
<td>Camshaft bearing I.D.</td>
<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
</tr>
<tr>
<td><strong>Valves</strong></td>
<td>Valve clearance</td>
<td>IN 0.15 ± 0.02 (0.006 ± 0.001)</td>
<td>–</td>
</tr>
<tr>
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<td></td>
<td>EX 0.20 ± 0.02 (0.008 ± 0.001)</td>
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<tr>
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<td>Valve stem O.D.</td>
<td>IN 6.575 – 6.590 (0.2588 – 0.2594)</td>
<td>6.44 (0.254)</td>
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<td>EX 6.535 – 6.550 (0.2572 – 0.2578)</td>
<td>6.40 (0.252)</td>
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<tr>
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<td>Valve guide I.D.</td>
<td>IN/EX 6.600 – 6.615 (0.2598 – 0.2604)</td>
<td>6.66 (0.262)</td>
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<tr>
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<td>Guide-to-stem clearance</td>
<td>IN 0.010 – 0.040 (0.0004 – 0.0016)</td>
<td>0.10 (0.004)</td>
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<td>EX 0.050 – 0.080 (0.0020 – 0.0032)</td>
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<td>Valve seat width</td>
<td>1.0 – 1.2 (0.04 – 0.05)</td>
<td>2.0 (0.08)</td>
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<td></td>
<td>Valve spring free length</td>
<td>39.0 (1.54)</td>
<td>37.5 (1.48)</td>
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<tr>
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<td>Valve spring perpendicularity</td>
<td>–</td>
<td>1.5° max</td>
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<tr>
<td><strong>Camshaft</strong></td>
<td>Cam height</td>
<td>IN 31.945 – 32.145 (1.2577 – 1.2655)</td>
<td>31.35 (1.234)</td>
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<tr>
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<td></td>
<td>EX 31.666 – 31.866 (1.2467 – 1.2546)</td>
<td>31.35 (1.234)</td>
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<tr>
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<td>Camshaft O.D.</td>
<td>15.966 – 15.984 (0.6286 – 0.6293)</td>
<td>15.92 (0.627)</td>
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<tr>
<td><strong>Carburetor</strong></td>
<td>Main jet</td>
<td>BE938 A: #82</td>
<td>–</td>
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<td></td>
<td>Pilot screw opening</td>
<td>BE938 A: 1 turn out</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Float height</td>
<td>13.2 (0.52)</td>
<td>–</td>
</tr>
<tr>
<td><strong>Spark plug</strong></td>
<td>Gap</td>
<td>0.7 – 0.8 (0.028 – 0.031)</td>
<td>–</td>
</tr>
<tr>
<td><strong>Ignition coil</strong></td>
<td>Air gap</td>
<td>0.2 – 0.6 (0.01 – 0.02)</td>
<td>–</td>
</tr>
<tr>
<td><strong>Starter motor</strong></td>
<td>Brush length</td>
<td>10 (0.4)</td>
<td>6 (0.2)</td>
</tr>
<tr>
<td></td>
<td>Mica depth</td>
<td>–</td>
<td>0.2 (0.01)</td>
</tr>
<tr>
<td><strong>Charge coil</strong></td>
<td>Resistance</td>
<td>QZX4 type (0.9 A) 5.1 – 7.7 Ω</td>
<td>–</td>
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<td></td>
<td>QZAZ, QZAV types (2.9 A) 0.4 – 0.8 Ω</td>
<td>–</td>
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<tr>
<td><strong>Power coil</strong></td>
<td>Resistance</td>
<td>2.9 – 4.5 Ω</td>
<td>–</td>
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*: This figure is caused by basic program in the ECM. The engine speed is different depending on the program in the ECM.
SERVICES INFORMATION

iGX340UT2

<table>
<thead>
<tr>
<th>Part</th>
<th>Item</th>
<th>Standard</th>
<th>Service limit (mm)</th>
</tr>
</thead>
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<tr>
<td>Engine</td>
<td>Maximum speed (at no load)</td>
<td>3,600 ± 150 min⁻¹ (rpm)*</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Idle speed</td>
<td>1,400 ± 150 min⁻¹ (rpm)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Cylinder compression</td>
<td>1.29 MPa (13.2 kgf/cm², 187 psi)</td>
<td>1,400 min⁻¹ (rpm)</td>
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<tr>
<td>Cylinder head</td>
<td>Warpage</td>
<td>–</td>
<td>0.10 (0.004)</td>
</tr>
<tr>
<td>Cylinder</td>
<td>Sleeve I.D.</td>
<td>88,000 – 88,017 (3.4646 – 3.4652)</td>
<td>88,17 (3.471)</td>
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<tr>
<td>Piston</td>
<td>Skirt O.D.</td>
<td>87,975 – 87,985 (3.4635 – 3.4640)</td>
<td>87,95 (3.459)</td>
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<td>Piston-to-cylinder clearance</td>
<td>0.015 – 0.042 (0.0006 – 0.0016)</td>
<td>0.12 (0.005)</td>
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<tr>
<td>Piston pin</td>
<td>Pin O.D.</td>
<td>19,994 – 20,000 (0.7872 – 0.7874)</td>
<td>19,950 (0.7854)</td>
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<tr>
<td>Piston pin-to-piston pin bore clearance</td>
<td>–</td>
<td>0.002 – 0.014 (0.0001 – 0.0006)</td>
<td>0.08 (0.003)</td>
</tr>
<tr>
<td>Piston rings</td>
<td>Ring side clearance Top</td>
<td>0.030 – 0.060 (0.0006 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<tr>
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<td>Ring side clearance Second</td>
<td>0.030 – 0.060 (0.0012 – 0.0024)</td>
<td>0.15 (0.006)</td>
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<td>Ring end gap</td>
<td>0.200 – 0.350 (0.0079 – 0.0138)</td>
<td>1.0 (0.04)</td>
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<td>Ring end gap</td>
<td>0.350 – 0.500 (0.0138 – 0.0197)</td>
<td>1.0 (0.04)</td>
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<td></td>
<td>Oil (side rail)</td>
<td>0.2 – 0.7 (0.01 – 0.03)</td>
<td>1.0 (0.04)</td>
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<tr>
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<td>Ring width</td>
<td>1.160 – 1.175 (0.0457 – 0.0463)</td>
<td>1.140 (0.0449)</td>
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<tr>
<td>Connecting rod</td>
<td>Small end I.D.</td>
<td>20.005 – 20.020 (0.7876 – 0.7882)</td>
<td>20.07 (0.790)</td>
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<tr>
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<td>Big end side clearance</td>
<td>0.1 – 0.4 (0.004 – 0.016)</td>
<td>1.0 (0.04)</td>
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<tr>
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<td>Big end I.D.</td>
<td>36.025 – 36.039 (1.4183 – 1.4189)</td>
<td>36.07 (1.420)</td>
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<td>Big end oil clearance</td>
<td>0.040 – 0.064 (0.0016 – 0.0025)</td>
<td>0.12 (0.005)</td>
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<tr>
<td>Crankshaft</td>
<td>Crankpin O.D.</td>
<td>35.975 – 35.985 (1.4163 – 1.4167)</td>
<td>35.93 (1.415)</td>
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<tr>
<td>Crankshaft runout</td>
<td>–</td>
<td>–</td>
<td>0.1 (0.003)</td>
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<tr>
<td>Cylinder barrel</td>
<td>Camshaft bearing I.D.</td>
<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
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<tr>
<td>Crankcase cover</td>
<td>Camshaft bearing I.D.</td>
<td>16.000 – 16.018 (0.6299 – 0.6306)</td>
<td>16.05 (0.632)</td>
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<tr>
<td>Valves</td>
<td>Valve clearance</td>
<td>0.15 ± 0.02 (0.006 ± 0.001)</td>
<td>–</td>
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<tr>
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<td>Valve stem O.D.</td>
<td>6.575 – 6.590 (0.2588 – 0.2594)</td>
<td>6.44 (0.254)</td>
</tr>
<tr>
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<td>Valve stem O.D.</td>
<td>6.535 – 6.550 (0.2572 – 0.2578)</td>
<td>6.40 (0.252)</td>
</tr>
<tr>
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<td>Valve guide I.D.</td>
<td>6.600 – 6.615 (0.2598 – 0.2604)</td>
<td>6.66 (0.262)</td>
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<tr>
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<td>Guide-to-stem clearance</td>
<td>0.010 – 0.040 (0.0004 – 0.0016)</td>
<td>0.10 (0.004)</td>
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<tr>
<td></td>
<td>Guide-to-stem clearance</td>
<td>0.050 – 0.080 (0.0020 – 0.0032)</td>
<td>0.12 (0.005)</td>
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<tr>
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<td>Valve seat width</td>
<td>1.0 – 1.2 (0.04 – 0.05)</td>
<td>2.0 (0.08)</td>
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<td>Valve spring free length</td>
<td>39.0 (1.54)</td>
<td>37.5 (1.48)</td>
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<td>Valve spring perpendicularity</td>
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<td>1.5° max.</td>
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<tr>
<td>Camshaft</td>
<td>Cam height</td>
<td>31.945 – 32.145 (1.2577 – 1.2655)</td>
<td>31.35 (1.234)</td>
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<td>Camshaft O.D.</td>
<td>31.666 – 31.866 (1.2467 – 1.2546)</td>
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<td>Carburetor</td>
<td>Main jet</td>
<td>BE91A A: #95</td>
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<td></td>
<td>Pilot screw opening</td>
<td>BE91A A: 1 turn out</td>
<td>–</td>
</tr>
<tr>
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<td>Float height</td>
<td>13.2 (0.52)</td>
<td>–</td>
</tr>
<tr>
<td>Spark plug</td>
<td>Gap</td>
<td>0.7 – 0.8 (0.028 – 0.031)</td>
<td>–</td>
</tr>
<tr>
<td>Ignition coil</td>
<td>Air gap</td>
<td>0.2 – 0.6 (0.01 – 0.02)</td>
<td>–</td>
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<tr>
<td>Starter motor</td>
<td>Brush length</td>
<td>10 (0.4)</td>
<td>6 (0.2)</td>
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<tr>
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<td>Mica depth</td>
<td>–</td>
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<td>Charge coil</td>
<td>Resistance</td>
<td>QZX4 type (0.9 A)</td>
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<td>QZA2, QZAV type (2.9 A)</td>
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<td>QZN2 type</td>
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*: This figure is caused by basic program in the ECM. The engine speed is different depending on the program in the ECM.
## SERVICE INFORMATION

### TORQUE VALUES

#### ENGINE TORQUE VALUES

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<tr>
<th>Item</th>
<th>Thread Dia. (mm)</th>
<th>Torque values</th>
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<tr>
<td>Crankcase cover bolt</td>
<td>M8 x 1.25</td>
<td>24</td>
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<tr>
<td>Cylinder head bolt</td>
<td>M10 x 1.25</td>
<td>35</td>
</tr>
<tr>
<td>Oil drain bolt</td>
<td>M12 x 1.5</td>
<td>22.5</td>
</tr>
<tr>
<td>Connecting rod bolt</td>
<td>M8 x 1.25 (Special bolt)</td>
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</tr>
<tr>
<td>Rocker arm pivot bolt</td>
<td>M8 x 1.25 (Special bolt)</td>
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<tr>
<td>Rocker arm pivot adjusting nut</td>
<td>M6 x 0.5</td>
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<tr>
<td>Spark plug</td>
<td>M14 x 1.25</td>
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<td>Exhaust pipe nut</td>
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<tr>
<td>Jet set screw</td>
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#### LUBRICATION & SEAL POINTS

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<th>Remarks</th>
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<td>Engine oil</td>
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<tr>
<td>Piston pin outer surface</td>
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<tr>
<td>Piston rings</td>
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<tr>
<td>Cylinder inner surface</td>
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<tr>
<td>Connecting rod big and small end bearings</td>
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<tr>
<td>Connecting rod bolt threads and seating surface</td>
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<tr>
<td>Camshaft cam profiles and bearings</td>
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<td>Valve lifter stem and slipper</td>
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<td>Valve stem sliding surface and stem end</td>
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<td>Rocker arm tappet surfaces and pivot</td>
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<td>Rocker arm pivot threads and pivot</td>
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<td>Flywheel nut threads and seating surface</td>
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<td>Cylinder head bolt threads and seating surface</td>
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<td>Balancer shaft bearings and gear</td>
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<td>Each oil seal lip</td>
<td>Multi-purpose grease</td>
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<td>Each O-ring</td>
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<td>Recoil starter case cutout</td>
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<td>Recoil starter ratchet sliding surface</td>
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<td>Recoil starter spring retainer inside</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camshaft cam profile</td>
<td>Use molybdenum solution (mixture of the engine oil and molybdenum grease with the ratio 100 g grease: 70 cc oil)</td>
<td>When installing a new camshaft</td>
</tr>
<tr>
<td>Recoil starter center screw threads</td>
<td>Threebond® 2430 or equivalent</td>
<td></td>
</tr>
<tr>
<td>Crankcase cover mating surface</td>
<td>Liquid sealant (Hondabond HT, Hondabond 4, or equivalent)</td>
<td></td>
</tr>
</tbody>
</table>
HARNESS AND TUBE ROUTING

QZX4, QZA2, QZAV types:

QZX4 type: 0.9 A CHARGE COIL
QZA2, QZAV types: 2.9 A CHARGE COIL
QZN2 type:
QXX4, QZA2, QZN2 types:
SERVICE INFORMATION

QZAV type:

- TO ECM (ENGINE CONTROL MODULE)
- TO IGNITION COIL
- TO OIL LEVEL SWITCH
- TO CONTROL BOX
- GROUND TERMINAL
- STARTER MOTOR
- COMBINATION SWITCH HARNESS
- OIL LEVEL SWITCH
- STARTER MOTOR
- TO CHARGE COIL
4. TROUBLESHOOTING

BEFORE TROUBLESHOOTING .......................... 4-2

TROUBLESHOOTING ........................................ 4-2
TROUBLESHOOTING

BEFORE TROUBLESHOOTING

- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Check for sufficient fresh fuel in the fuel tank.
- Read the circuit tester’s operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before continuity inspection.

TROUBLESHOOTING

(*) Refer to page of base shop manual (GX240 GX270 GX340 GX390)
(**) Refer to page of base shop manual (iGX270UT2 iGX390T2/UT2 Supplement Y)

ENGINE SPEED DOES NOT INCREASE OR STABILIZE (QZAV type)

Check whether the oil level indicator is ON.

- OFF: Add the recommended engine oil (page 3-3*).

Check the external connected control and wire harness for failure or open circuit.

- Abnormal: Replace the external control and/or wire harness.

Check the engine wire harness connecting the ECM and each control for continuity.

- No continuity: Replace the engine wire harness (page 11-7**).

Check whether the engine retains 1,400 min\(^{-1}\) (rpm) constantly when the external connected control is operated.

- Not constant: Replace the ECM (page 6-4**).

Remove the air cleaner elbow (page 6-5*) and check whether the choke valve is closed when turning on the starter motor or pulling the recoil starter.

- Abnormal: Check the control gear box (page 6-5**).
8. CHARGING SYSTEM

CHARGING SYSTEM DIAGRAM .................. 8-2
BEFORE TROUBLESHOOTING .................. 8-2
CHARGING SYSTEM TROUBLESHOOTING ......... 8-3
CHARGE/POWER COIL REMOVAL/INSTALLATION ................ 8-4
CHARGE/POWER COIL INSPECTION .............. 8-6
CHARGING SYSTEM

CHARGING SYSTEM DIAGRAM

QZX4, QXA2, QZAV types:

QZN2 type:
BEFORE TROUBLESHOOTING

- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Read the circuit tester’s operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before continuity inspection.

CHARGING SYSTEM TROUBLESHOOTING

(*) Refer to page of base shop manual (GX240 GX270 GX340 GX390)
(**) Refer to page of base shop manual (iGX270UT2 iGX390T2/UT2 Supplement Y)

[DIAGRAM] Check the main fuse 30 A (page 11-7*).
  Normal
  Abnormal

[DIAGRAM] Check the charge coil (page 8-6).
  Normal
  Abnormal

QZX4, QZA2, QZAV types: Check the rectifier (page 11-6**).
  Normal
  Abnormal

QZN2 type: Check the regulator/rectifier (page 11-4).
  Normal
  Abnormal

Check the wire harness connecting to the charge coil and battery for open or short circuit and for proper connection.
If necessary, replace or repair the wire harness.

[DIAGRAM] Replace the main fuse 30 A (page 11-2).

[DIAGRAM] Replace the charge coil (page 8-4).

[DIAGRAM] Replace the rectifier (page 11-2).

[DIAGRAM] Replace the regulator/rectifier (page 11-3).
CHARGING SYSTEM

CHARGE/POWER COIL REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (iGX270UT2 iGX390T2/UT2 Supplement Y)
(**) Refer to page of base shop manual (GX240 GX270 GX340 GX390)

Remove the following:
- Fan cover (page 5-2*)
- Ignition coil (page 9-3*)
- Starter motor (page 10-8*)
- Flywheel (page 8-7**)

Installation is in the reverse of removal.

When installing the cord clamp, refer to HARNESS AND TUBE ROUTING (page 2-5).

QZX4, QZA2, QZAV types:

![Diagram of CHARGE/POWER COIL REMOVAL/INSTALLATION]

<table>
<thead>
<tr>
<th>Type</th>
<th>Bolt Specifications</th>
</tr>
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<tbody>
<tr>
<td>iGX240UT2 QZX4</td>
<td>BOLT (6 x 25 mm) (2)</td>
</tr>
<tr>
<td>iGX240UT2 QZA2</td>
<td>BOLT (6 x 32 mm) (2)</td>
</tr>
<tr>
<td>iGX340UT2 QZX4</td>
<td>BOLT (6 x 35 mm) (2)</td>
</tr>
<tr>
<td>iGX340UT2 QZA2</td>
<td>BOLT (6 x 40 mm) (2)</td>
</tr>
</tbody>
</table>

QZX4 type: 0.9 A CHARGE COIL
QZA2, QZAV types: 2.9 A CHARGE COIL
QZN2 type:

- CORD GROMMET
- CORD CLAMP
- BOLT (6 x 12 mm)
- BOLT (6 x 40 mm) (4)
- 12 A CHARGE COIL
- CORD CLAMP
- CORD GROMMET
CHARGING SYSTEM

CHARGE/POWER COIL INSPECTION

CHARGE COIL

(*) Refer to page of base shop manual (iGX270UT2 iGX390T2/UT2 Supplement Y).

Remove the control box (page 11-3*).

Measure the resistance between the terminals of the charge coil.

Resistance:
- QZX4 type (0.9 A): 5.1 – 7.7 Ω
- QZA2, QZAV types (2.9 A): 0.4 – 0.8 Ω
- QZN2 type (12 A): 0.22 – 0.34 Ω

Check for continuity between each terminal and engine ground.

There should be no continuity.
- If the measured resistance is not within the range specification or if any wire has continuity to engine ground, replace the charge coil (page 8-4).
- If the resistance is good and the flywheel is OK, replace the rectifier (QZX4, QZA2, QZAV types) or regulator/rectifier (QZN2 type), and recheck.

POWER COIL

(*) Refer to page of base shop manual (GX240 GX270 GX340 GX390).

Remove the air cleaner element (page 6-5*).

Disconnect the power coil connector [1].

Check for continuity between the terminals of the power coil connector. (Engine wire harness side)

Resistance:
- QZX4, QZA2, QZAV types: 2.9 – 4.5 Ω
- QZN2 type: 2.8 – 4.4 Ω

Check for continuity between each terminal and engine ground.

There should be no continuity.
- If the measured resistance is not within the range specification or if any wire has continuity to engine ground, replace the power coil (page 8-4).
- If the resistance is good and the flywheel is ok, replace the ECM and recheck.
CONTROL BOX DISASSEMBLY/ ASSEMBLY ......................................................... 11-2

OIL LEVEL SWITCH REMOVAL/ INSTALLATION ................................................. 11-4

REGULATOR/RECTIFIER INSPECTION ................................................................. 11-4
OTHER ELECTRICAL

CONTROL BOX DISASSEMBLY/ASSEMBLY

(*) Refer to page of base shop manual (iGX270UT 2 iGX390T2/UT2 Supplement Y)
(**) Refer to page of base shop manual (GX240 GX270 GX340 GX390)

Remove the control box (page 11-3*).
When assembling the control box, refer to HARNESS AND TUBE ROUTING (page 2-5).

QZX4, QZA2, QZAV types:
QZN2 type:

- **Fuse Box Cover**
  - Screw (6 x 8 mm)
  - Screw/Washer (4 x 10 mm)

- **Fuse Box**
  - Main Fuse 30 A
  - Inspection: (page 11-7)**

- **Sub-Wire Harness**
  - Indicator
  - Inspection: (page 11-6*)

- **Switch Box Bracket**
  - Combination Switch Nut (18 mm)
  - 4.9 N·m (0.50 kgf·m, 3.6 lbf·ft)

- **Combination Switch**
  - Tapping Screws (4 x 14 mm) (2)

- **Control Panel**
  - Grommets
  - Tapping Screws (4 x 14 mm) (2)

- **Regulator/Rectifier**
  - Inspection: (page 11-4)
OTHER ELECTRICAL

OIL LEVEL SWITCH REMOVAL/INSTALLATION

(*) Refer to page of base shop manual (GX240 GX270 GX340 GX390).

Drain the engine oil (page 3-3*).

Disconnect the oil level switch connector (1).

Remove the two 6 x 16 mm flange bolts (2), oil level switch (3), and O-ring (4).

Installation is in the reverse order of removal.

Replace the O-ring with a new one.

NOTICE

• Install the oil level switch to the crankcase securely as shown.
• Wrong assembly can cause engine trouble.

REGULATOR/RECTIFIER INSPECTION

Measure the resistance between the terminals and be sure that the measurements conform to the ranges shown in the table.

Use a tester that has an internal resistance equal to or greater than 20 kΩ/VDC, 9 kΩ/VAC.

Be careful not to touch the metallic part of the tester probe with your fingers; otherwise, the correct resistance value cannot be obtained.

Read the tester manufacturer's operation instructions carefully before operating the tester. Follow the instructions of the Service Manual. Be sure the tester's battery is fully charged, and check that the meter display is working before using the tester.

<table>
<thead>
<tr>
<th>Tester (+) probe</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (−) probe</td>
<td>1</td>
<td>—</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>∞</td>
<td>∞</td>
<td>1-600</td>
<td>2-230</td>
<td>2-600</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>∞</td>
<td>∞</td>
<td>—</td>
<td>0.09-40</td>
<td>2-400</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>∞</td>
<td>∞</td>
<td>2-230</td>
<td>—</td>
<td>10-1,000</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>∞</td>
<td>∞</td>
<td>2-230</td>
<td>4-400</td>
<td>10-1,000</td>
</tr>
</tbody>
</table>

Unit: kΩ
WIRING DIAGRAMS

WIRING DIAGRAMS

QZX4, QZA2, QZAV types:

[Diagram of wiring connections with labels and codes for lead colors and positions]

QZAV type:

[Diagram of wiring connections with labels and codes for lead colors and positions]
QZN2 type:

[Diagram of the QZN2 type]
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