

## How to use this manual

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# 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 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 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 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/U2/UT2, GX270UT2, GX340R2/RT2/U2/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.

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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 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.

	Replace the part(s) with new one(s) before assembly.
	Use the recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	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
	Use marine grease (water resistant urea based grease).
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use automatic transmission fluid.
(O x O) (O)	Indicates the diameter, length, and quantity of metric bolts used.
<a href="#">page 1-1</a>	Indicates the reference page.

## How to use this manual

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# ABBREVIATIONS

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

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

Bl	Black	G	Green	Br	Brown	Lg	Light green
Y	Yellow	R	Red	O	Orange	P	Pink
BU	Blue	W	White	Lb	Light blue	Gr	Gray

# 1. SPECIFICATIONS

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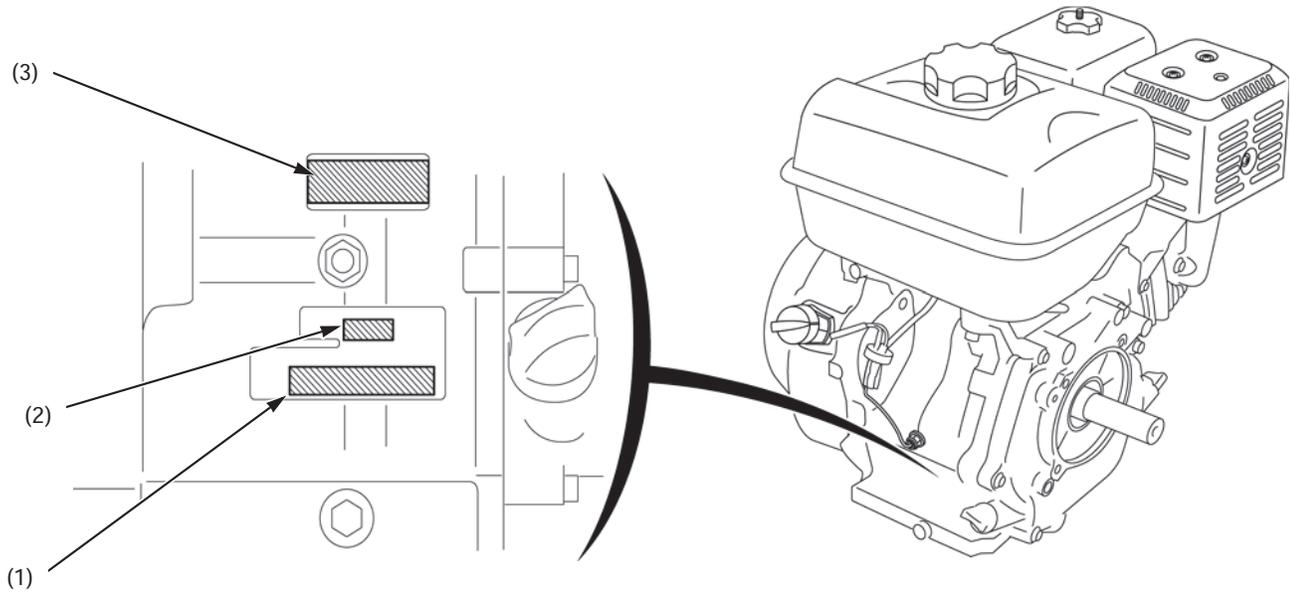
## SPECIFICATIONS

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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**

Model	GX240R2	GX240RT2	GX240U2	GX240UT2	GX240UT2
Type	EDN2	VMT2	LX2	HA2	LX2
P. T. O.	E type	V type	L type	H type	L type

Model	GX240UT2	GX240UT2	GX240UT2	GX240UT2	GX240UT2
Type	LXQ4	PA2	QA2	QAE2	QAG2
P. T. O.	L type	P type	Q type	Q type	Q type

Model	GX240UT2	GX240UT2	GX240UT2	GX240UT2	GX240UT2
Type	RA2	SXE4	SXQ4	VXB7	VXB9
P. T. O.	R type	S type	S type	V type	V type

Model	GX240UT2
Type	WKT2
P. T. O.	W type

**GX270**

Model	GX270UT2				
Type	HA2	HEA2	PA2	PAE2	QA2
P. T. O.	H type		P type		Q type

Model	GX270UT2				
Type	QA26	QAE2	QAG2	QAQ4	QAR2
P. T. O.	Q type				

Model	GX270UT2				
Type	QAW	QH26	QHB4	QHQ4	QKE4
P. T. O.	Q type				

Model	GX270UT2				
Type	QME2	QXB7	QXE4	QXE8	QXQ4
P. T. O.	Q type				

Model	GX270UT2				
Type	QXUZ	RA2	RHE4	RHQ4	SHQ4
P. T. O.	Q type	R type			S type

Model	GX270UT2				
Type	SMC4	SWC4	SXQ4	VA2	VKQ4
P. T. O.	S type		V type		E type

Model	GX270RT2				
Type	VSD7	VXB7	VXE7	VXU1	
P. T. O.	V type				

## SPECIFICATIONS

### GX340

Model	GX340R2	GX340RT2	GX340RT2	GX340RT2	GX340RT2	GX340RT2
Type	EDN2	VDE2	VWC	VWE	VWE	VWE2
P. T. O.	E type	V type				
Model	GX340U2	GX340UT2	GX340UT2	GX340UT2	GX340UT2	GX340UT2
Type	QA2	HA2	LXQ4	PKT2	QA2	QA2
P. T. O.	Q type	H type	L type	P type	Q type	Q type
Model	GX340UT2	GX340UT2	GX340UT2	GX340UT2	GX340UT2	GX340UT2
Type	QAE2	QAP2	QNE2	SE	SXE4	SXE4
P. T. O.	Q type	Q type	Q type	S type	S type	S type
Model	GX340UT2	GX340UT2	GX340UT2	GX340UT2	GX340UT2	GX340UT2
Type	SXQ4	VA2	VX8	VXB7	VXB7	VXB7
P. T. O.	S type	V type				

### GX390

Model	GX390RT2					
Type	QNB2	QTT	QWA2	VAG2	VC2	VC2
P. T. O.	Q type					
Model	GX390RT2					
Type	VDE2	VK2	VKB2	VWE	VXG	VXG
P. T. O.	V type					
Model	GX390UT2					
Type	QAPW	HA2	LX2	PA2	PAE2	PAE2
P. T. O.	Q type					
Model	GX390UT2					
Type	QA2	QAA2	QAE2	QC2	QDW9	QDW9
P. T. O.	Q type					
Model	GX390UT2					
Type	QNE2	QNR2	QWA4	QWT2	QXC9	QXC9
P. T. O.	Q type					
Model	GX390UT2					
Type	SM32	SNC	VA2	VM2	VXE2	VXE2
P. T. O.	S type					

## DIMENSIONS AND WEIGHTS

### GX240

#### P.T.O. VARIATION

Model	P.T.O.*	GX240R2	GX240RT2	GX240U2	GX240UT2
Overall length	E type	360 mm (14.2 in)	-	-	-
	H type	-	-	-	425 mm (16.7 in)
	L type	-	-	405 mm (15.9 in)	405 mm (15.9 in)
	P type	-	-	-	380 mm (15.0 in)
	Q type	-	-	-	380 mm (15.0 in)
	R type	-	-	-	440 mm (17.3 in)
	S type	-	-	-	355 mm (14.0 in)
	V type	-	420 mm (16.5 in)	-	400 mm (15.7 in)
	W type	-	-	-	<b>370 mm (14.6 in)</b>
Overall width	E type	428 mm (16.9 in)	-	-	-
	H type	-	-	-	428 mm (16.9 in)
	L type	-	-	428 mm (16.9 in)	428 mm (16.9 in)
	P type	-	-	-	428 mm (16.9 in)
	Q type	-	-	-	428 mm (16.9 in)
	R type	-	-	-	428 mm (16.9 in)
	S type	-	-	-	428 mm (16.9 in)
	V type	-	428 mm (16.9 in)	-	428 mm (16.9 in)
	W type	-	-	-	428 mm (16.9 in)
Overall height	E type	303 mm (11.9 in)	-	-	-
	H type	-	-	-	422 mm (16.6 in)
	L type	-	-	422 mm (16.6 in)	422 mm (16.6 in)
	P type	-	-	-	422 mm (16.6 in)
	Q type	-	-	-	422 mm (16.6 in)
	R type	-	-	-	422 mm (16.6 in)
	S type	-	-	-	422 mm (16.6 in)
	V type	-	303 mm (11.9 in)	-	422 mm (16.6 in)
	W type	-	-	-	422 mm (16.6 in)
Dry weight	E type	21.4 kg (47.2 lbs)	-	-	-
	H type	-	-	-	26.5 kg (58.4 lbs)
	L type	-	-	26.5 kg (58.4 lbs)	26.5 kg (58.4 lbs)
	P type	-	-	-	25.8 kg (56.9 lbs)
	Q type	-	-	-	25.8 kg (56.9 lbs)
	R type	-	-	-	30.1 kg (66.1 lbs)
	S type	-	-	-	25.8 kg (56.9 lbs)
	V type	-	21.4 kg (47.2 lbs)	-	25.8 kg (56.9 lbs)
	W type	-	-	-	25.8 kg (56.9 lbs)
Operating weight	E type	26.1 kg (57.5 lbs)	-	-	-
	H type	-	-	-	31.5 kg (69.4 lbs)
	L type	-	-	31.5 kg (69.4 lbs)	31.5 kg (69.4 lbs)
	P type	-	-	-	30.5 kg (67.2 lbs)
	Q type	-	-	-	30.5 kg (67.2 lbs)
	R type	-	-	-	35.0 kg (77.2 lbs)
	S type	-	-	-	30.5 kg (67.2 lbs)
	V type	-	26.1 kg (57.5 lbs)	-	30.5 kg (67.2 lbs)
	W type	-	-	-	30.5 kg (67.2 lbs)

\*: 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](#).

Variation	No balancer type	Cyclone air cleaner type	Starter motor type	Control box type	Low profile type *1
Overall length difference	-	-	-	-	+ 20 mm (0.8 in)
Overall width difference	-	+ 96 mm (3.8 in)	-	+ 34 mm (1.3 in)	-
Overall height difference	-	-	-	-	- 119 mm (4.7 in)
Dry weight difference	- 0.9 kg (2.0 lbs)	+ 0.2 kg (0.4 lbs)	+ 2.5 kg (5.5 lbs)	+ 3.2 kg (7.1 lbs)	- 4.4 kg (9.7 lbs)
Operating weight difference	- 0.9 kg (2.0 lbs)	+ 0.2 kg (0.4 lbs)	+ 2.5 kg (5.5 lbs)	+ 3.2 kg (7.1 lbs)	- 4.4 kg (9.7 lbs)

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

## GX270

### P.T.O. VARIATION

Model	P.T.O.*	GX270R2/RT2/U2/UT2
Overall length	E type	340 mm (13.4 in)
	H type	425 mm (16.7 in)
	P type	380 mm (15.0 in)
	Q type	
	S type	355 mm (14.0 in)
	V type	400 mm (15.7 in)
	R type	440 mm (17.3 in)
	Overall width	E type
H type		
P type		
Q type		
S type		
V type		
R type		
Overall height		E type
	H type	
	P type	
	Q type	
	S type	
	V type	
	E type	
	Dry weight	E type
H type		26.5 kg (58.4 lbs)
P type		25.8 kg (57.0 lbs)
Q type		
S type		
V type		
R type		30.0 kg (66.1 lbs)
Operating weight		E type
	H type	31.5 kg (69.4 lbs)
	P type	30.5 kg (67.0 lbs)
	Q type	
	S type	
	V type	
	R type	35.0 kg (77.2 lbs)

\*: 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 1-6](#).

Variation	No balancer type	Cyclone air cleaner type	Starter motor type	Control box type	Low profile type *1
Overall length difference	-	-	-	-	+ 20 mm (0.8 in)
Overall width difference	-	+ 96 mm (3.8 in)	-	+ 34 mm (1.3 in)	-
Overall height difference	-	-	-	-	- 119 mm (4.7 in)
Dry weight difference	- 0.9 kg (2.0 lbs)	+ 0.2 kg (0.4 lbs)	+ 2.5 kg (5.5 lbs)	+ 3.2 kg (7.1 lbs)	- 4.4 kg (9.7 lbs)
Operating weight difference	- 0.9 kg (2.0 lbs)	+ 0.2 kg (0.4 lbs)	+ 2.5 kg (5.5 lbs)	+ 3.2 kg (7.1 lbs)	- 4.4 kg (9.7 lbs)

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

**GX340****P.T.O. VARIATION**

Model	P.T.O.*	GX340R2	GX340RT2	GX340U2	GX340UT2
Overall length	E type	365 mm (14.4 in)	-	-	-
	H type	-	-	-	452 mm (17.8 in)
	L type	-	-	-	440 mm (17.3 in)
	P type	-	-	-	405 mm (15.9 in)
	Q type	-	-	405 mm (15.9 in)	405 mm (15.9 in)
	S type	-	-	-	380 mm (15.0 in)
	V type	-	-	430 mm (16.9 in)	-
Overall width	E type	460 mm (18.1 in)	-	-	-
	H type	-	-	-	460 mm (18.1 in)
	L type	-	-	-	460 mm (18.1 in)
	P type	-	-	-	460 mm (18.1 in)
	Q type	-	-	460 mm (18.1 in)	460 mm (18.1 in)
	S type	-	-	-	460 mm (18.1 in)
	V type	-	-	460 mm (18.1 in)	-
Overall height	E type	313 mm (12.3 in)	-	-	-
	H type	-	-	-	448 mm (17.6 in)
	L type	-	-	-	448 mm (17.6 in)
	P type	-	-	-	448 mm (17.6 in)
	Q type	-	-	448 mm (17.6 in)	448 mm (17.6 in)
	S type	-	-	-	448 mm (17.6 in)
	V type	-	-	313 mm (12.3 in)	-
Dry weight	E type	27.3 kg (60.2 lbs)	-	-	-
	H type	-	-	-	35.2 kg (77.6 lbs)
	L type	-	-	-	35.2 kg (77.6 lbs)
	P type	-	-	-	31.7 kg (69.9 lbs)
	Q type	-	-	-	31.7 kg (69.9 lbs)
	S type	-	-	31.7 kg (69.9 lbs)	31.7 kg (69.9 lbs)
	V type	-	-	27.3 kg (60.2 lbs)	-
Operating weight	E type	33.4 kg (73.6 lbs)	-	-	-
	H type	-	-	-	41.2 kg (90.8 lbs)
	L type	-	-	-	41.2 kg (90.8 lbs)
	P type	-	-	-	37.8 kg (83.3 lbs)
	Q type	-	-	-	37.8 kg (83.3 lbs)
	S type	-	-	37.8 kg (83.3 lbs)	37.8 kg (83.3 lbs)
	V type	-	-	33.4 kg (73.6 lbs)	-

\*: 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](#).

Variation	Cyclone air cleaner type	Starter motor type	Control box type	Low profile type *1
Overall length difference	-	-	-	+ 6 mm (0.2 in)
Overall width difference	+ 93 mm (3.7 in)	± 5 mm (0.2 in)	+ 39 mm (1.5 in)	-
Overall height difference	-	-	-	- 135 mm (5.3 in)
Dry weight difference	+ 0.2 kg (0.4 lbs)	+ 2.5 kg (5.5 lbs)	+ 3.2 kg (7.1 lbs)	- 4.4 kg (9.7 lbs)
Operating weight difference	+ 0.2 kg (0.4 lbs)	+ 2.5 kg (5.5 lbs)	+ 3.2 kg (7.1 lbs)	- 4.4 kg (9.7 lbs)

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

## GX390

### P.T.O. VARIATION

Model	P.T.O.*	GX390R2/RT2	GX390T2	GX390U2/UT2
Overall length	H type	-	-	452 mm (17.8 in)
	L type	-	-	440 mm (17.3 in)
	P type	-	-	405 mm (15.9 in)
	Q type	405 mm (15.9 in)		
	S type	-	-	380 mm (15.0 in)
	V type	425 mm (16.7 in)	-	425 mm (16.7 in)
Overall width	H type	-	-	460 mm (18.1 in)
	L type	-	-	460 mm (18.1 in)
	P type	-	-	460 mm (18.1 in)
	Q type	458 mm (18.0 in)	460 mm (18.1 in)	460 mm (18.1 in)
	S type	-	-	460 mm (18.1 in)
	V type	458 mm (18.0 in)	-	460 mm (18.1 in)
Overall height	H type	-	-	447 mm (17.6 in)
	L type	-	-	448 mm (17.6 in)
	P type	-	-	448 mm (17.6 in)
	Q type	447 mm (17.6 in)	448 mm (17.6 in)	448 mm (17.6 in)
	S type	-	-	448 mm (17.6 in)
	V type	447 mm (17.6 in)	-	448 mm (17.6 in)
Dry weight	H type	-	-	35.2 kg (77.6 lbs)
	L type	-	-	35.2 kg (77.6 lbs)
	P type	-	-	31.7 kg (69.9 lbs)
	Q type	29.9 kg (65.9 lbs)	31.7 kg (69.9 lbs)	31.7 kg (69.9 lbs)
	S type	-	-	31.7 kg (69.9 lbs)
	V type	29.9 kg (65.9 lbs)	-	31.7 kg (69.9 lbs)
Operating weight	H type	-	-	41.2 kg (90.8 lbs)
	L type	-	-	41.2 kg (90.8 lbs)
	P type	-	-	37.8 kg (83.3 lbs)
	Q type	31.4 kg (69.2 lbs)	37.8 kg (83.3 lbs)	37.8 kg (83.3 lbs)
	S type	-	-	37.8 kg (83.3 lbs)
	V type	31.4 kg (69.2 lbs)	-	37.8 kg (83.3 lbs)

\*: P. T. O. type. ([page 1-4](#))

# ENGINE SPECIFICATIONS

## GX240

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

\*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

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

\*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**

Model	GX340R2	GX340RT2	GX340U2	GX340UT2
Description code	GCBKK	GCBET	GCBKK	GCBET
Type	4 stroke, overhead valve, single cylinder, inclined by 25°			
Displacement	389 cm <sup>3</sup> (23.7 cu-in)			
Bore x stroke	88.0 x 64.0 mm (3.5 x 2.5 in)			
Net power (SAE J1349)*1	8.0 kW (10.7 HP) / 3,600 min-1 (rpm)*2			
Continuous rated power	6.3 kW (8.4 HP) / 3,600 min-1 (rpm)			
Maximum net torque (SAE J1349)*1	26.4 N·m (2.69 kgf·m, 19.5 lbf·ft) / 2,500 min-1 (rpm)			
Compression ratio	8.2: 1			
Fuel consumption (at continuous rated power)	3.1 Liters (0.82 US gal, 0.68 Imp gal) / h			
Ignition system	C.D.I.(Capacitor Discharge Ignition) type magneto ignition			
Ignition timing	B.T.D.C. 10° / 1,400min-1 (rpm)			
Spark advancer performance	B.T.D.C. 10°- 22°			
Spark plug	BPR6ES (NGK) / W20EPR-U (DENSO)			
Lubrication system	Forced splash			
Oil capacity	1.1 Liters (1.16 US qt, 0.97 Imp qt)			
Recommended oil	SAE 10W-30 API service classification SJ or later			
Cooling system	Forced air			
Starting system	Recoil, Recoil and Starter motor			
Stopping system	Ignition exciter coil circuit open			
Carburetor	Horizontal type, butterfly valve			
Air cleaner	Dual element type, Cyclone type, Oil bath type, Low profile type			
Governor	Mechanical centrifugal			
Breather system	Reed valve type			
Fuel used	Unleaded gasoline with a pump octane rating 86 or higher			

\*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

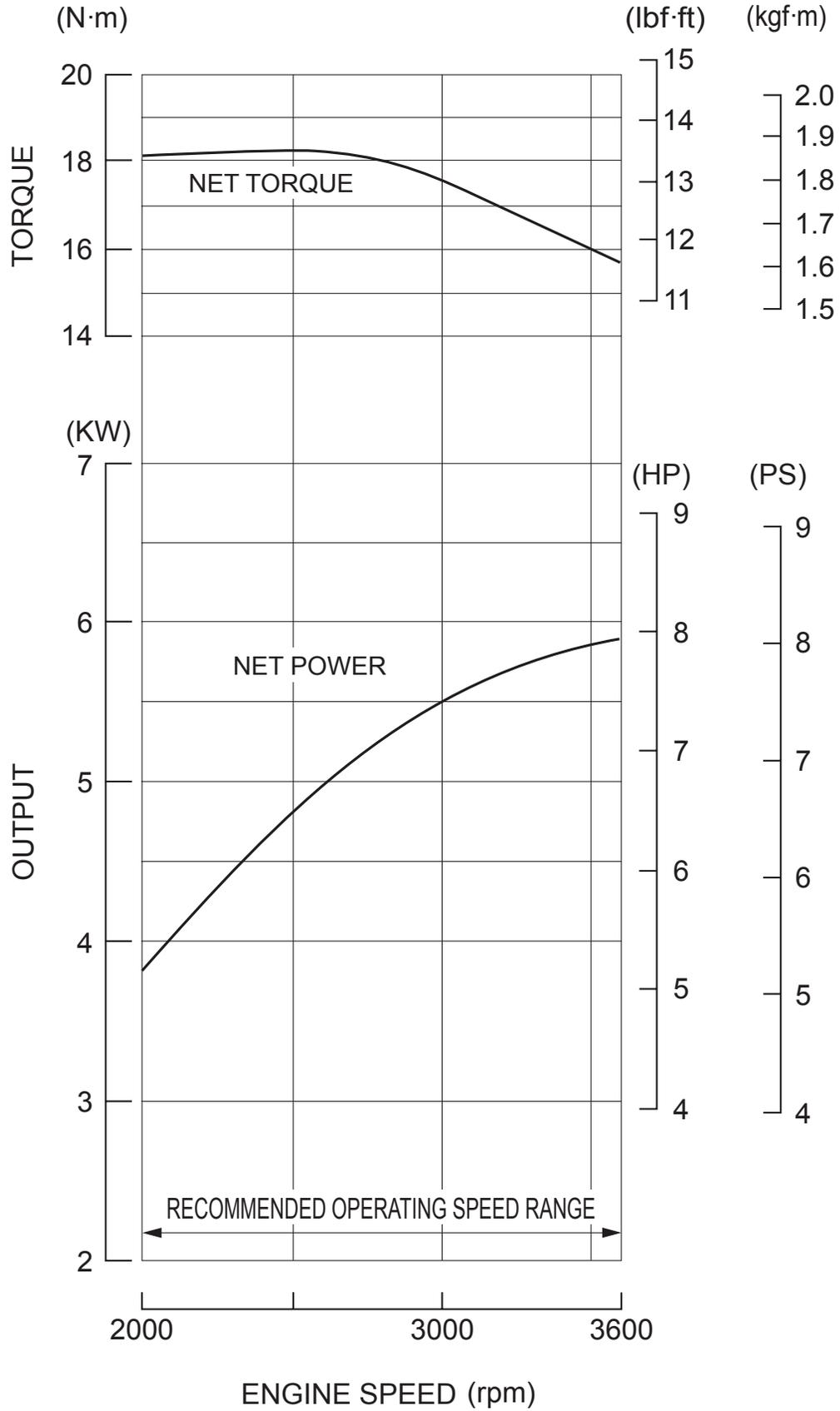
### GX390

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

\*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.

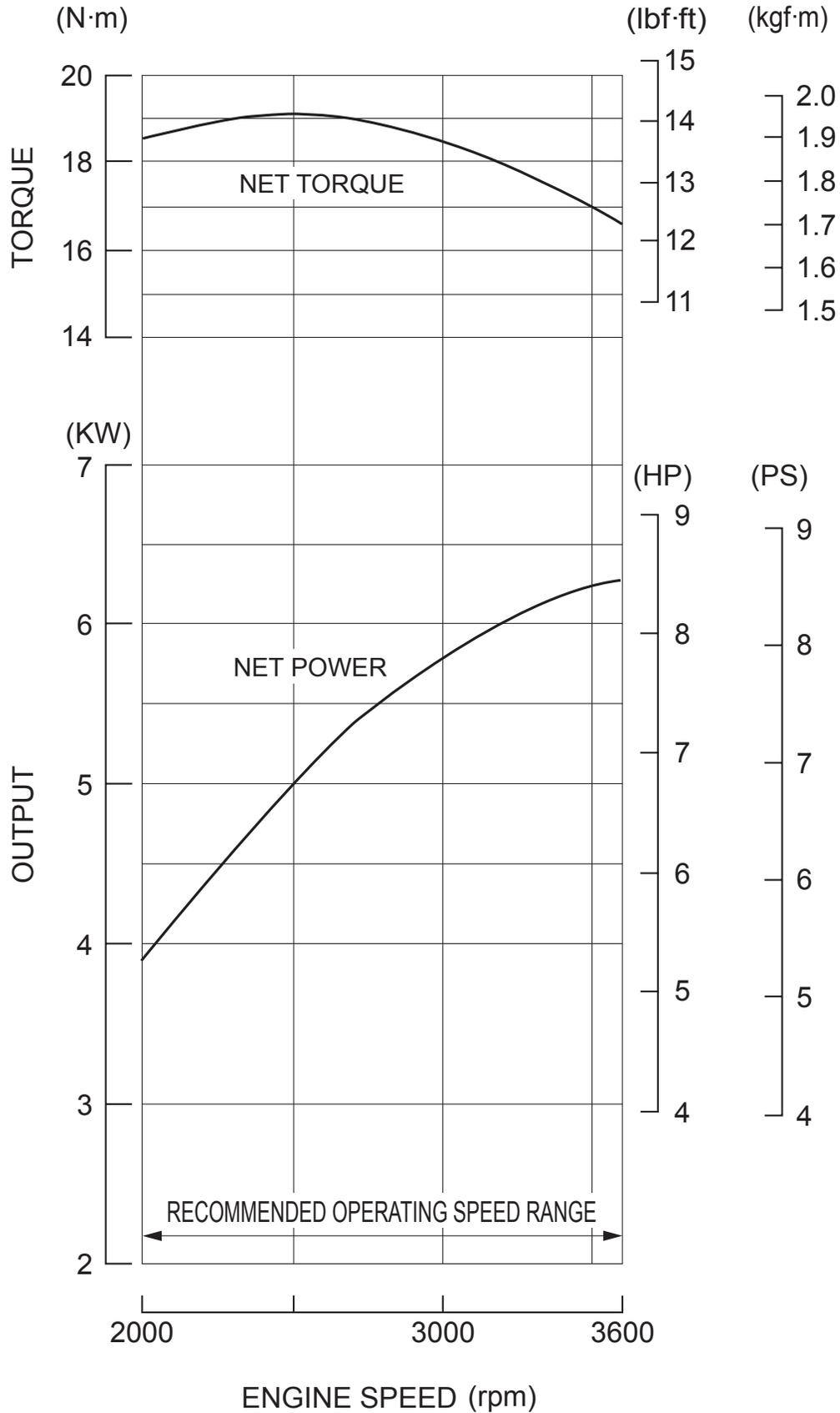
# PERFORMANCE CURVES

GX240

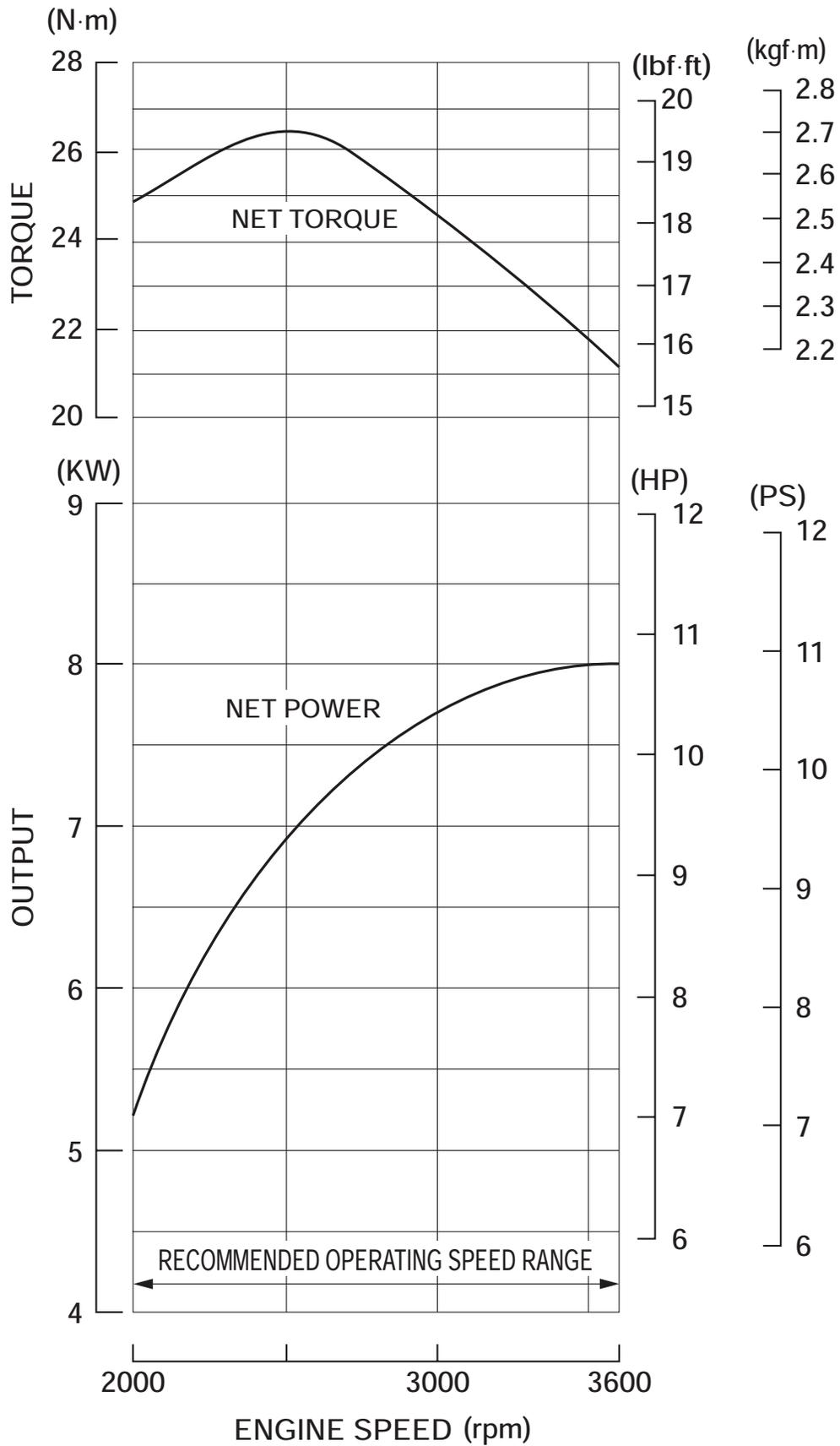


**SPECIFICATIONS**

**GX270**

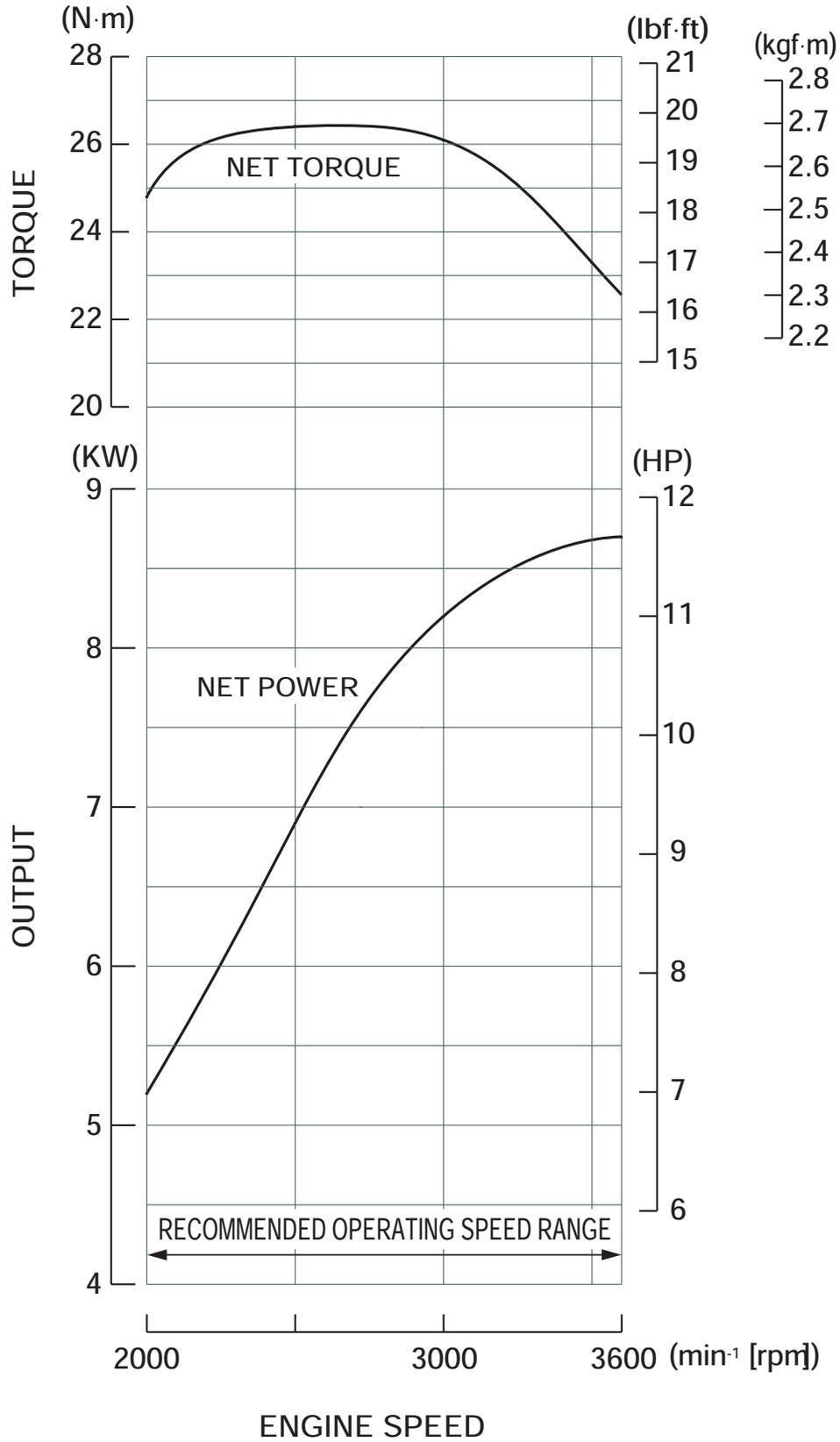


**GX340**



**SPECIFICATIONS**

**GX390**



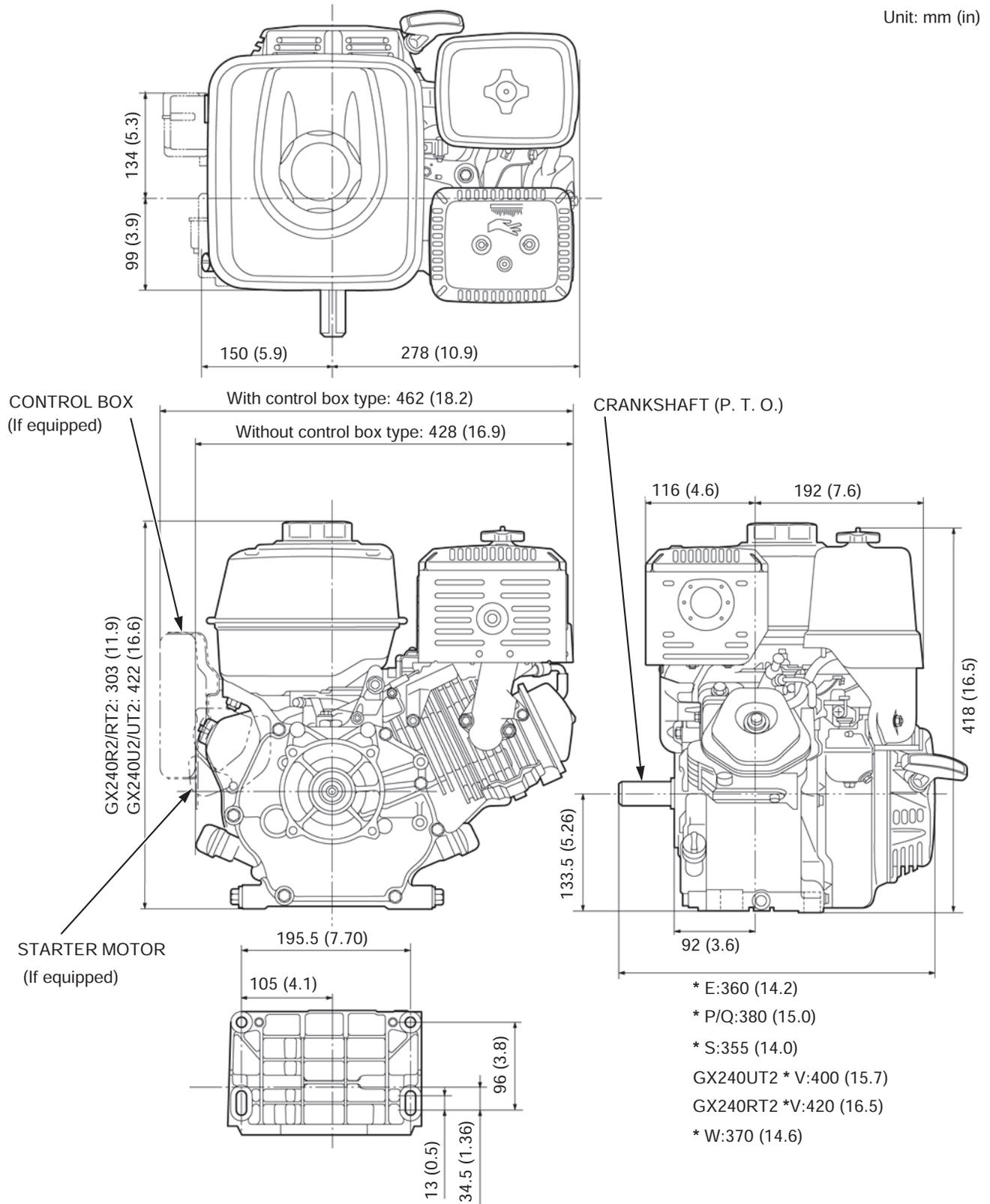
# DIMENSIONAL DRAWINGS

\*: P. T. O. type. [\(page 1-3\)](#)

## GX240

### WITHOUT REDUCTION UNIT TYPE

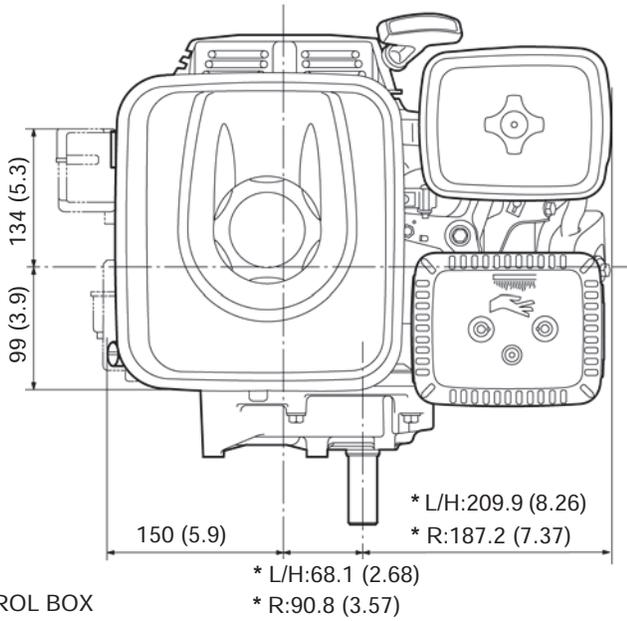
Unit: mm (in)



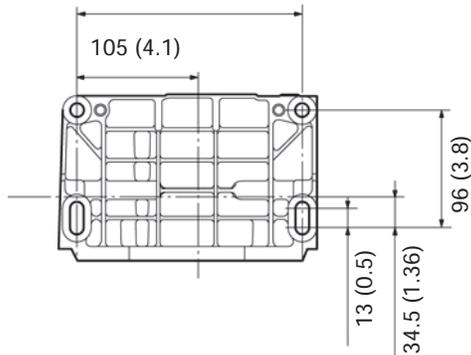
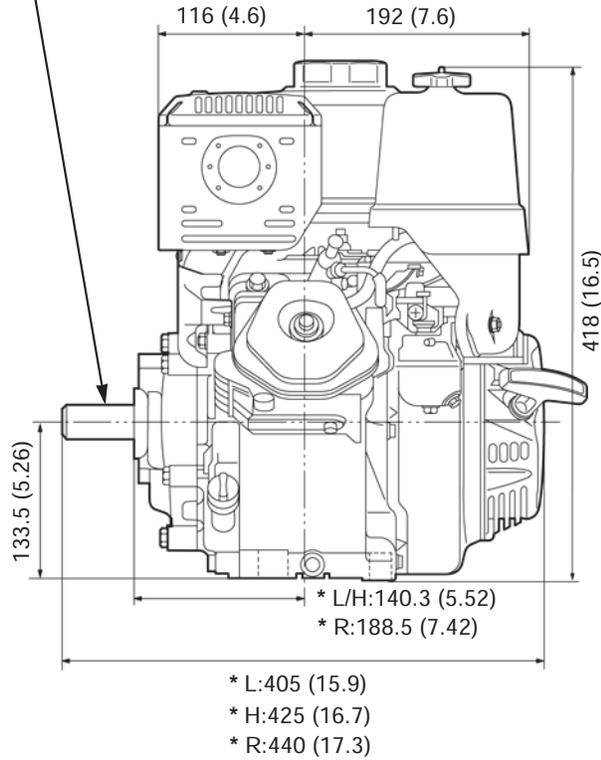
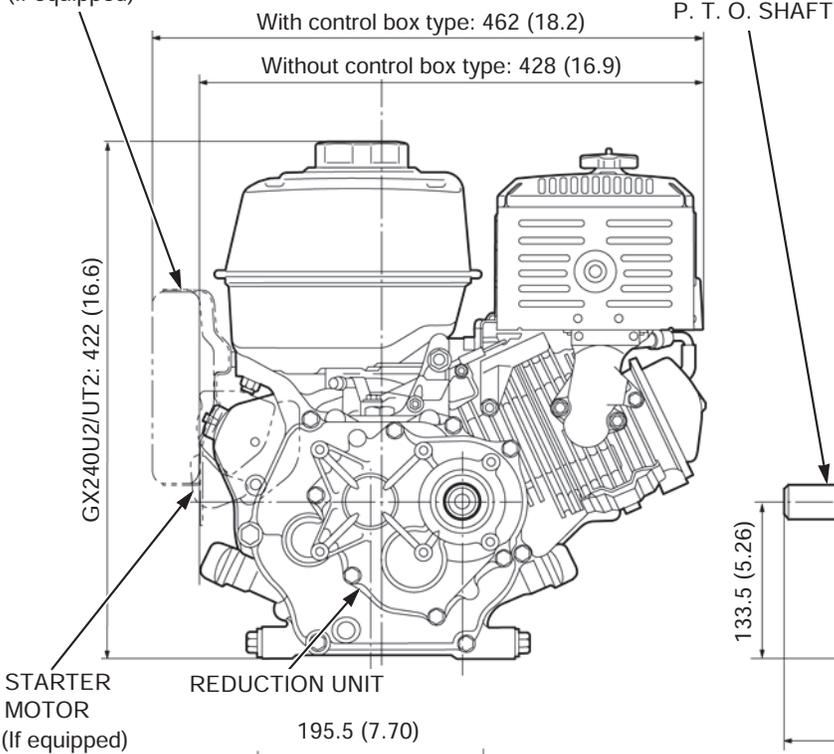
# SPECIFICATIONS

## WITH REDUCTION UNIT TYPE

Unit: mm (in)



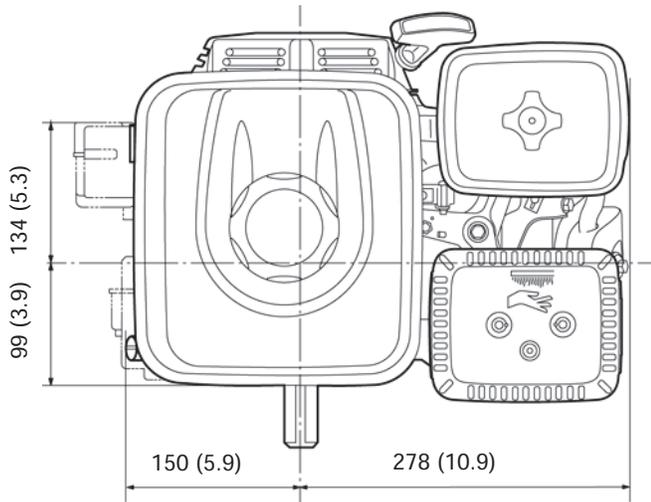
CONTROL BOX  
(If equipped)



**GX270**

**WITHOUT REDUCTION UNIT TYPE**

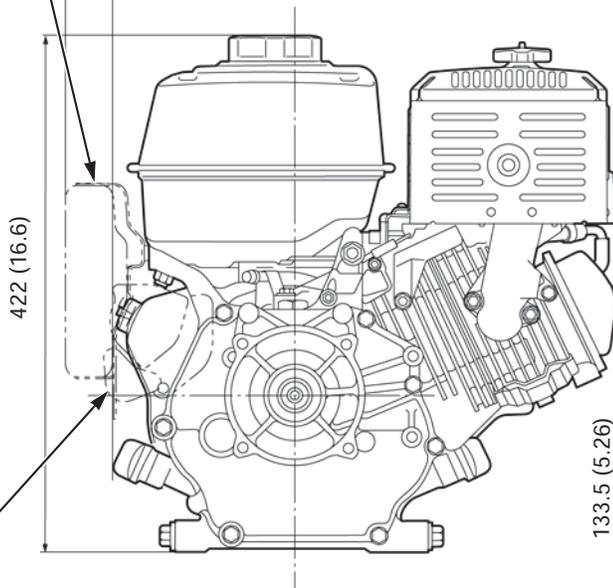
Unit: mm (in)



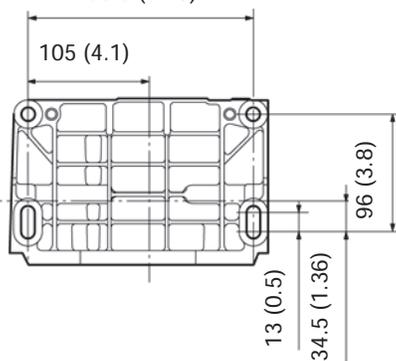
CONTROL BOX  
(If equipped)

With control box type: 462 (18.2)

Without control box type: 428 (16.9)



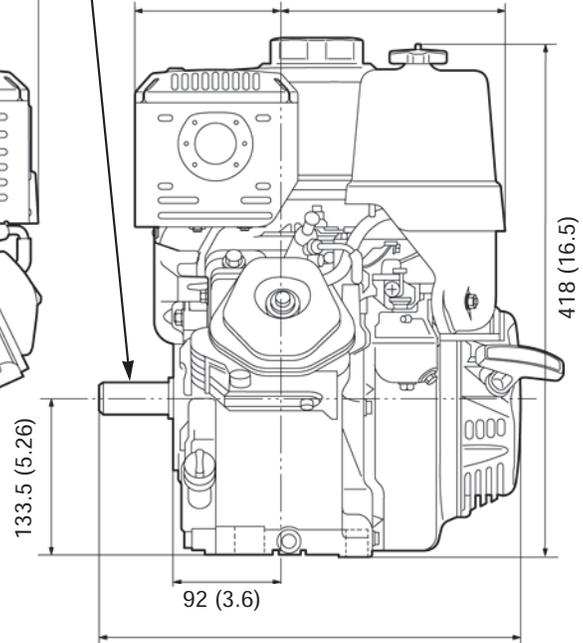
STARTER MOTOR  
(If equipped)



CRANKSHAFT (P. T. O.)

116 (4.6)

192 (7.6)



\* E:340 (13.4)

\* P/Q:380 (15.0)

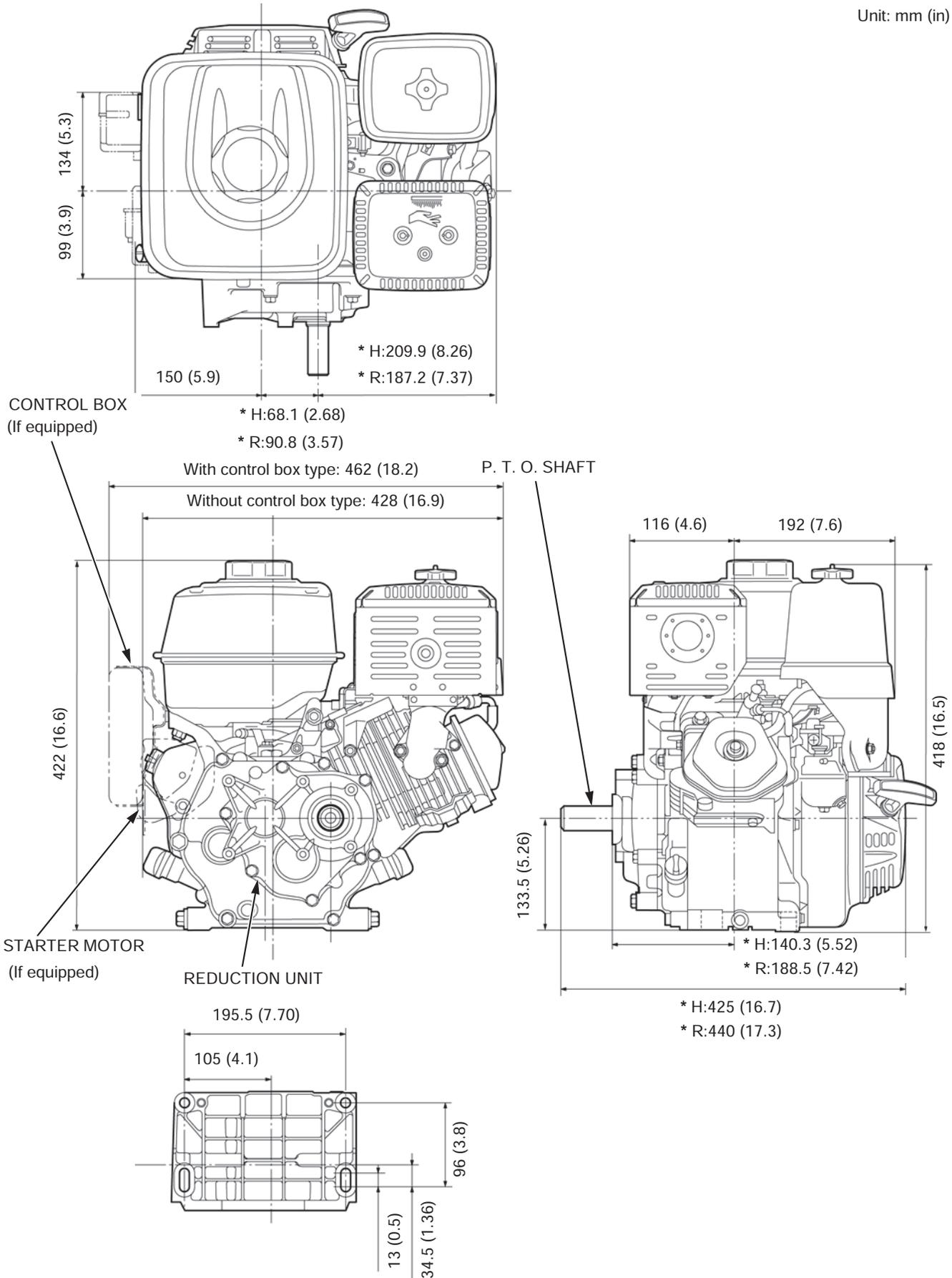
\* S:355 (14.0)

\* V:400 (15.7)

# SPECIFICATIONS

## WITH REDUCTION UNIT TYPE

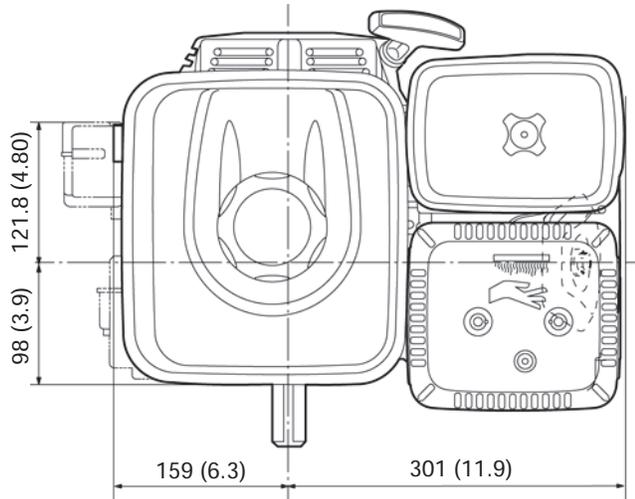
Unit: mm (in)



**GX340**

**WITHOUT REDUCTION UNIT TYPE**

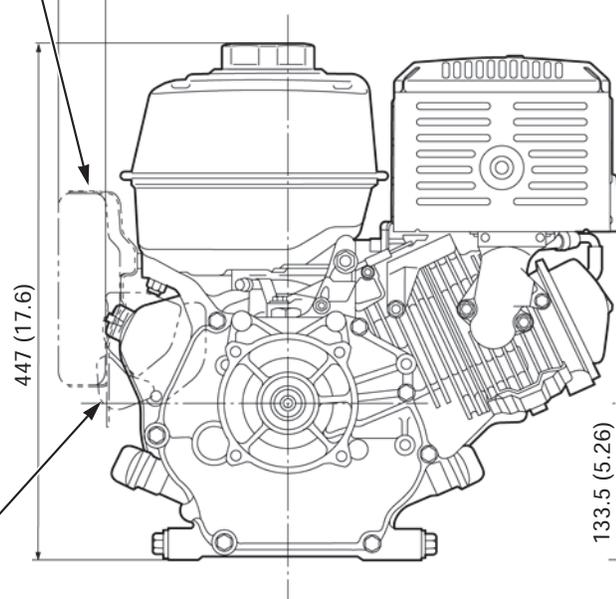
Unit: mm (in)



CONTROL BOX  
(If equipped)

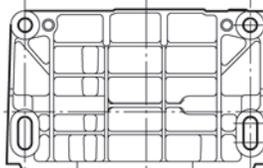
With control box type: 499 (19.6)

Without control box type: 460 (18.1)



STARTER MOTOR  
(If equipped)

105 (4.1)



17 (0.7)

27 (1.1)

CRANKSHAFT (P. T. O.)

141.5 (5.57)

201.0 (7.91)

133.5 (5.26)

100 (3.9)

\* E:365 (14.4)

\* P/Q:405 (15.9)

\* S:380 (15.0)

GX340RT2 \* V:430 (16.9)

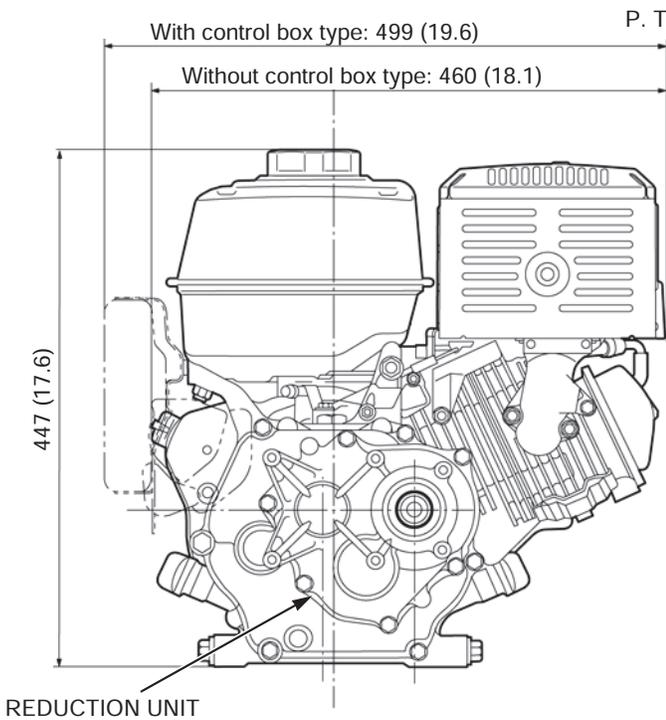
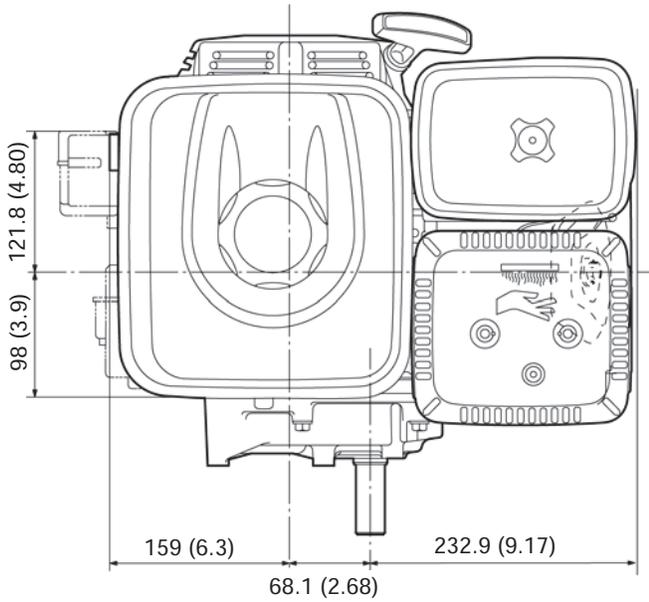
GX340UT2 \* V:425 (16.7)

GX340R2/RT2: 313 (12.3)  
GX340U2/UT2:448 (17.6)

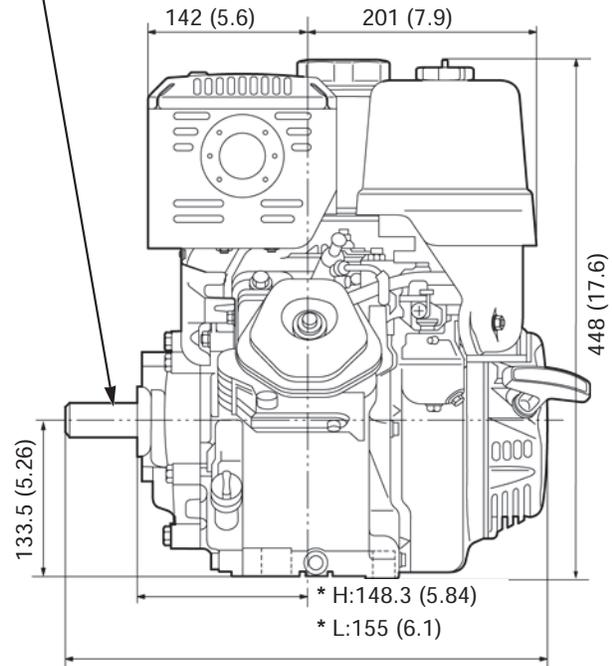
# SPECIFICATIONS

## WITH REDUCTION TYPE

Unit: mm (in)



P. T. O. SHAFT

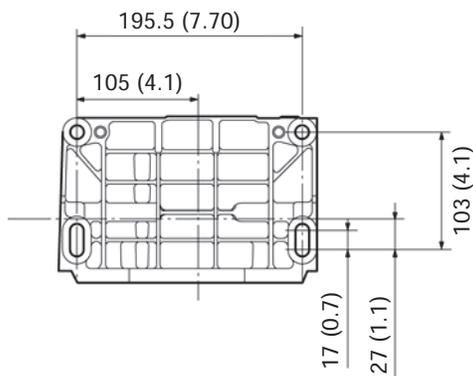


\* H:148.3 (5.84)

\* L:155 (6.1)

\* H:452 (17.8)

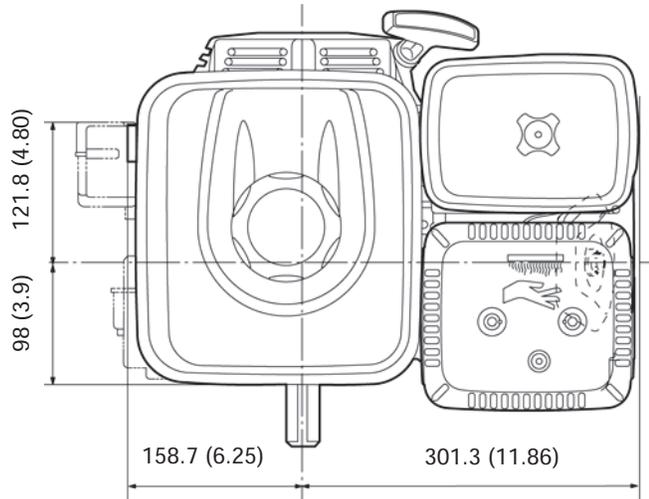
\* L:440 (17.3)



**GX390**

**WITHOUT REDUCTION TYPE**

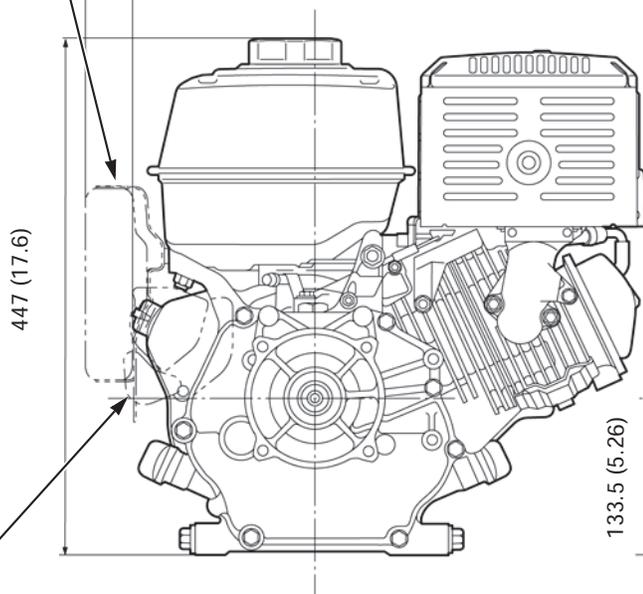
Unit: mm (in)



CONTROL BOX  
(If equipped)

With control box type: 498.6 (19.63)  
Without control box type: 460 (18.1)

CRANKSHAFT (P. T. O.)



STARTER MOTOR  
(If equipped)

141.5 (5.57) 200.6 (7.90)

133.5 (5.26)

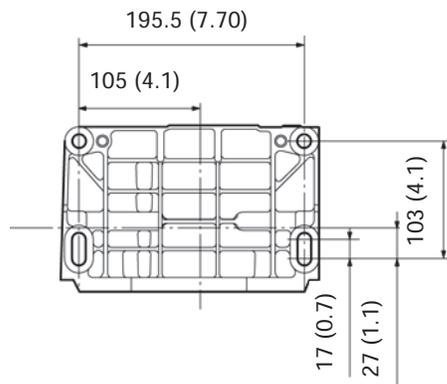
EXCEPT GX390UT2: 448 (17.6)

100 (3.9)

\* P/Q:405 (15.9)

\* S:380 (15.0)

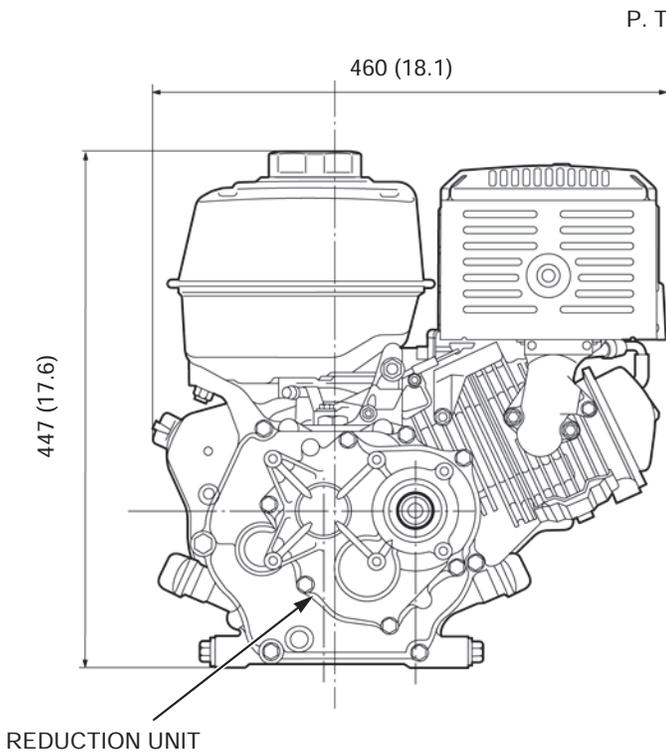
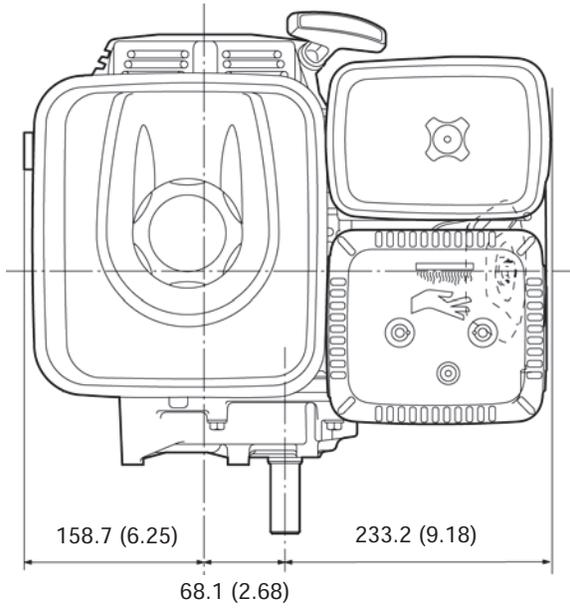
\* V:425 (16.7)



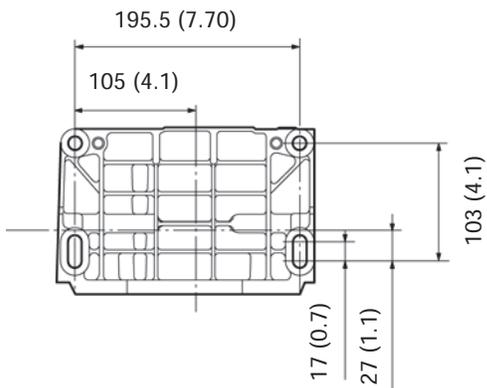
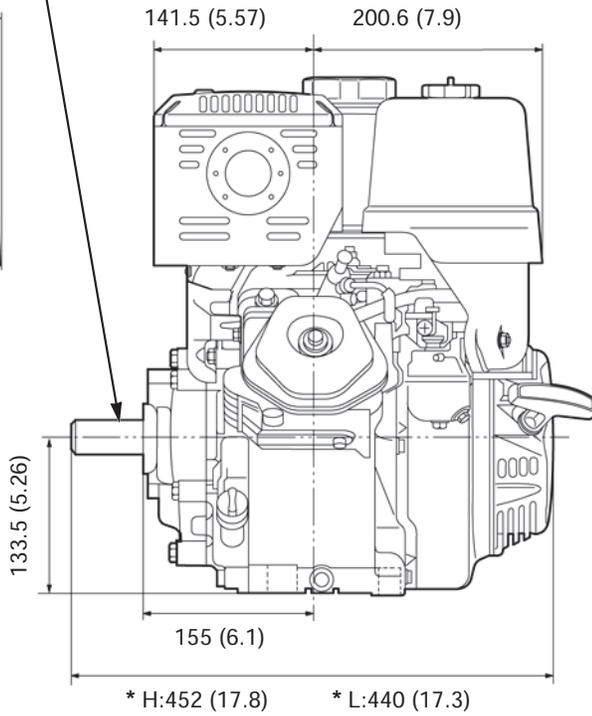
# SPECIFICATIONS

## WITH REDUCTION UNIT TYPE

Unit: mm (in)



P. T. O. SHAFT

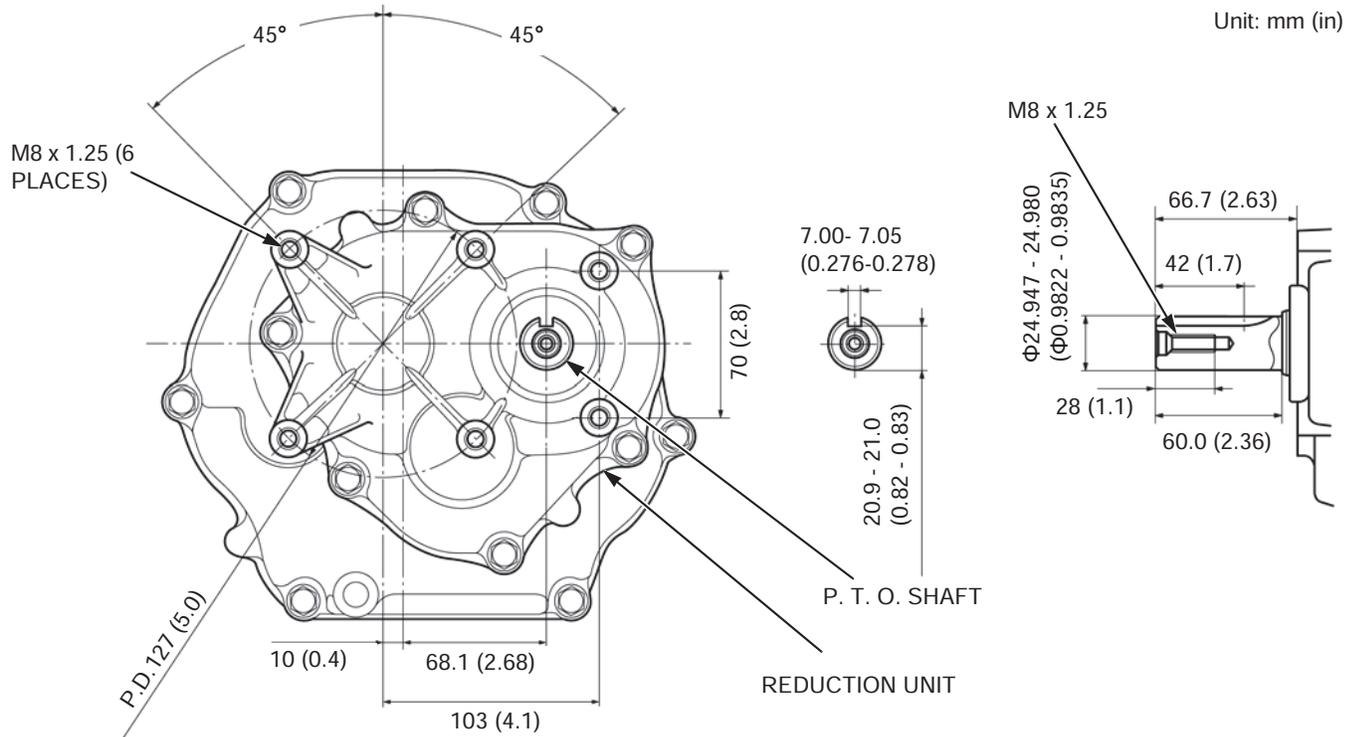


# P.T.O. DIMENSIONAL DRAWINGS

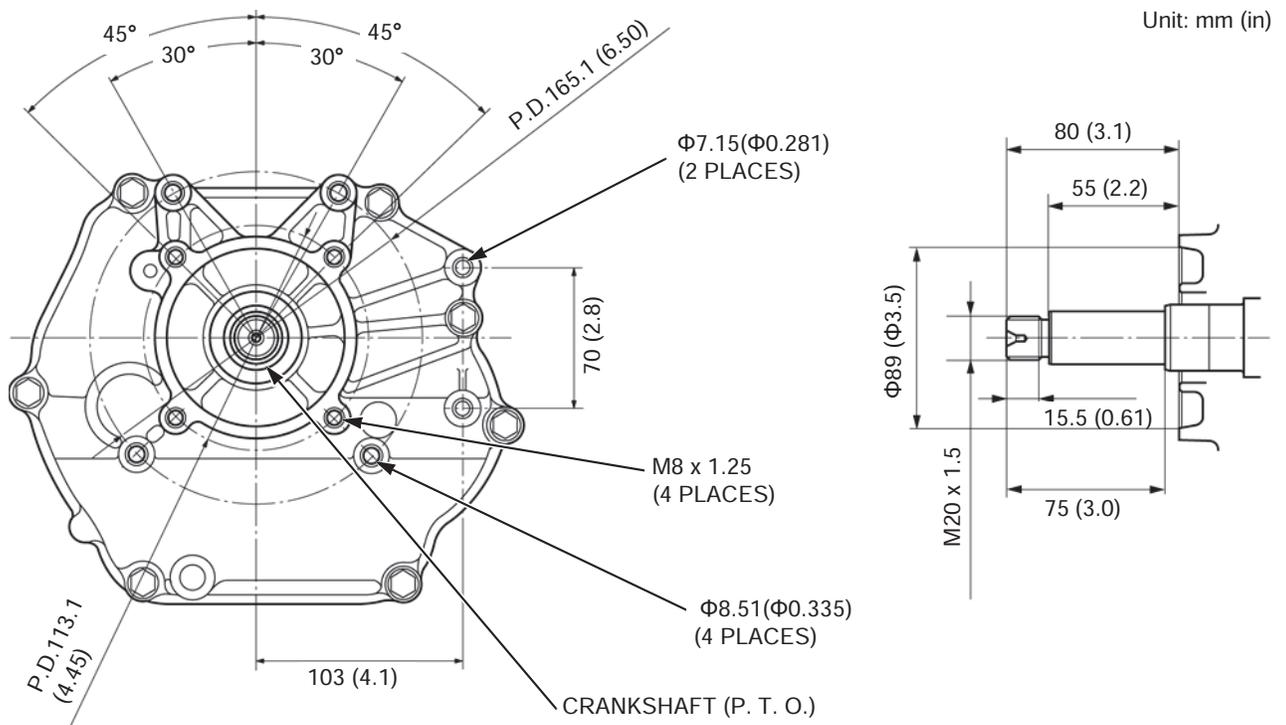
## GX240

\*: P. T. O. type. [\(page 1-3\)](#)

### L TYPE\* (WITH REDUCTION UNIT)



### W TYPE\*

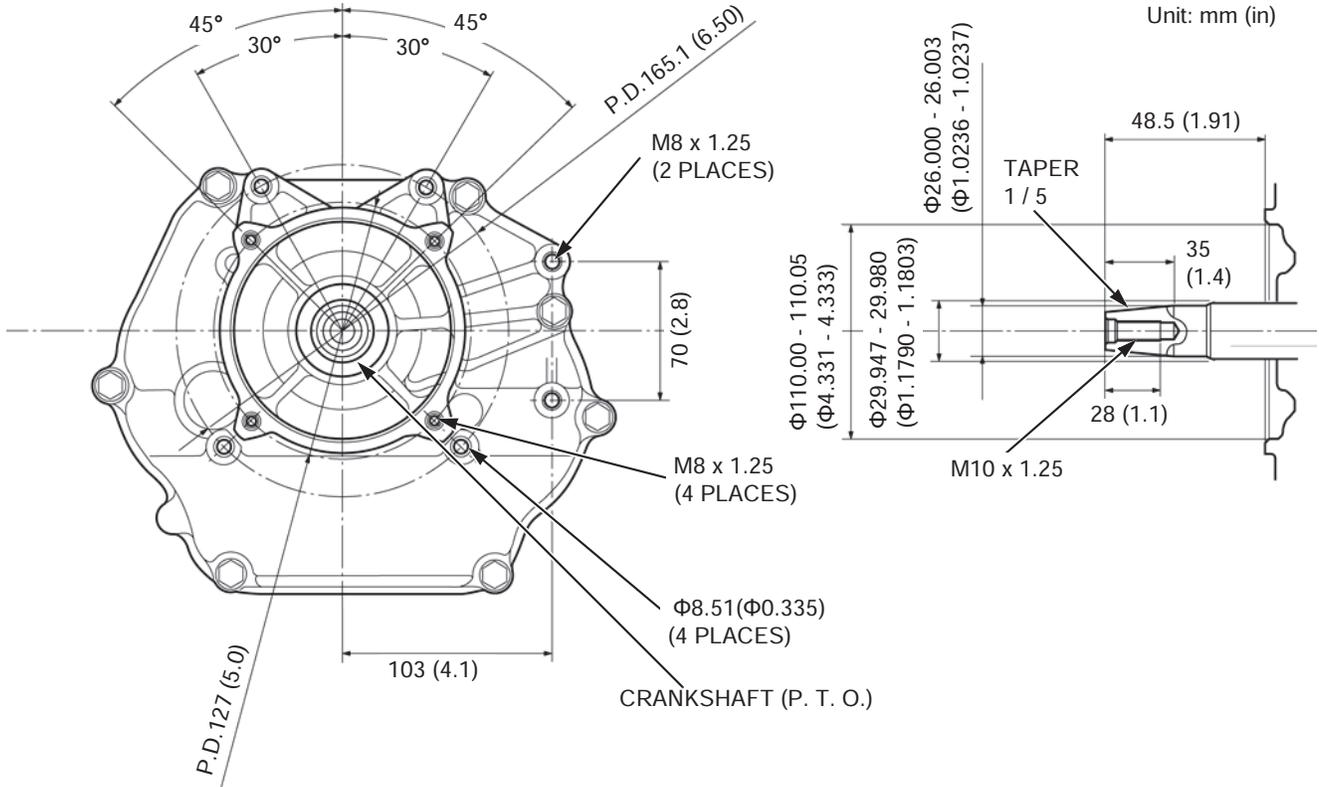


# SPECIFICATIONS

## GX240•GX270

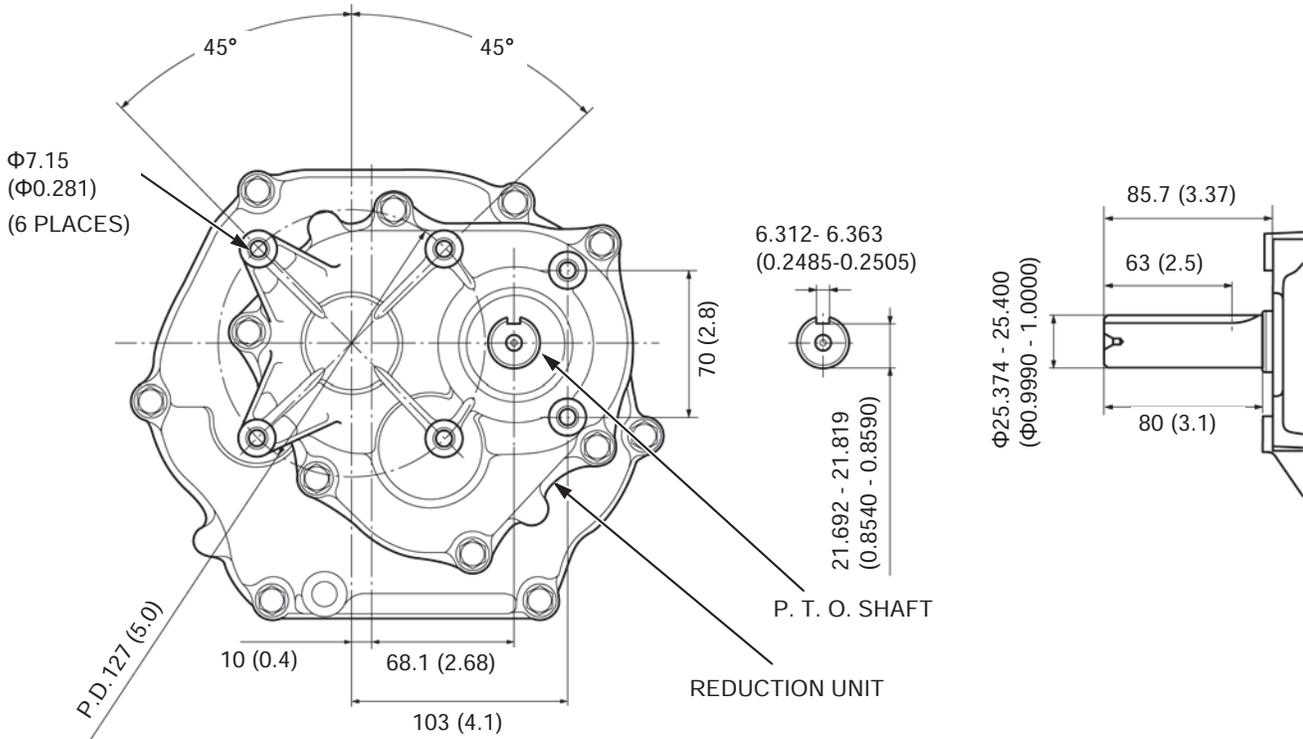
\*: P. T. O. type. ([page 1-3](#))

### E TYPE\*



### H TYPE\* (WITH REDUCTION UNIT)

Unit: mm (in)



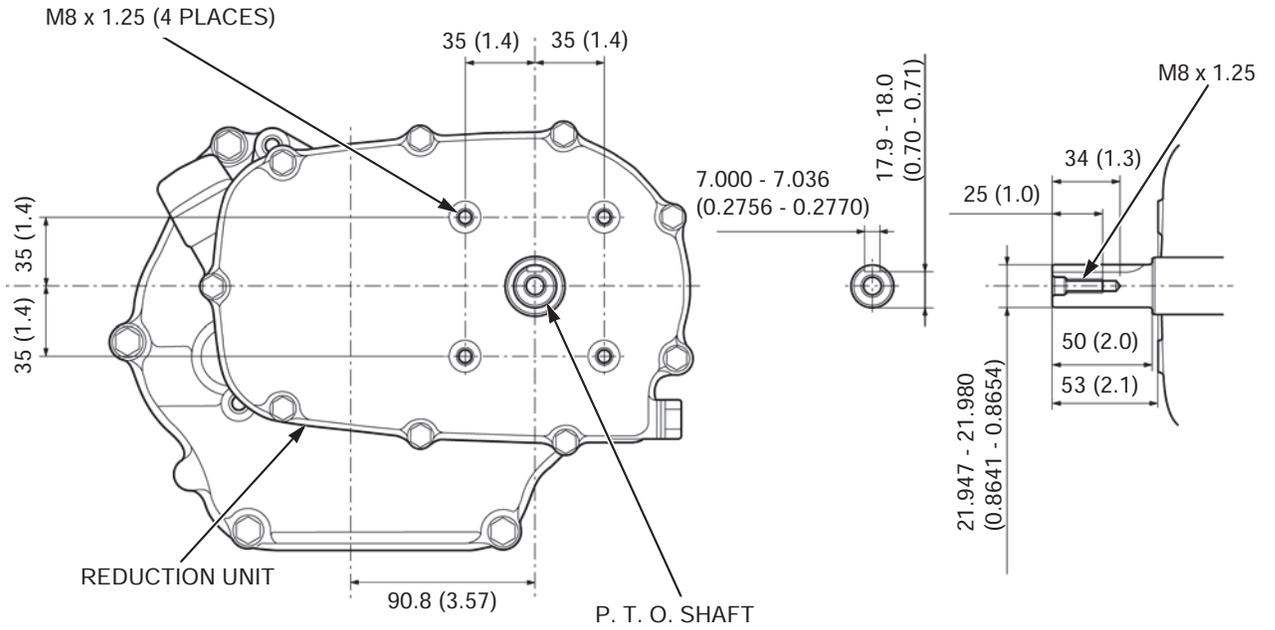




# SPECIFICATIONS

## R TYPE\* (WITH 1/2 REDUCTION UNIT)

Unit: mm (in)



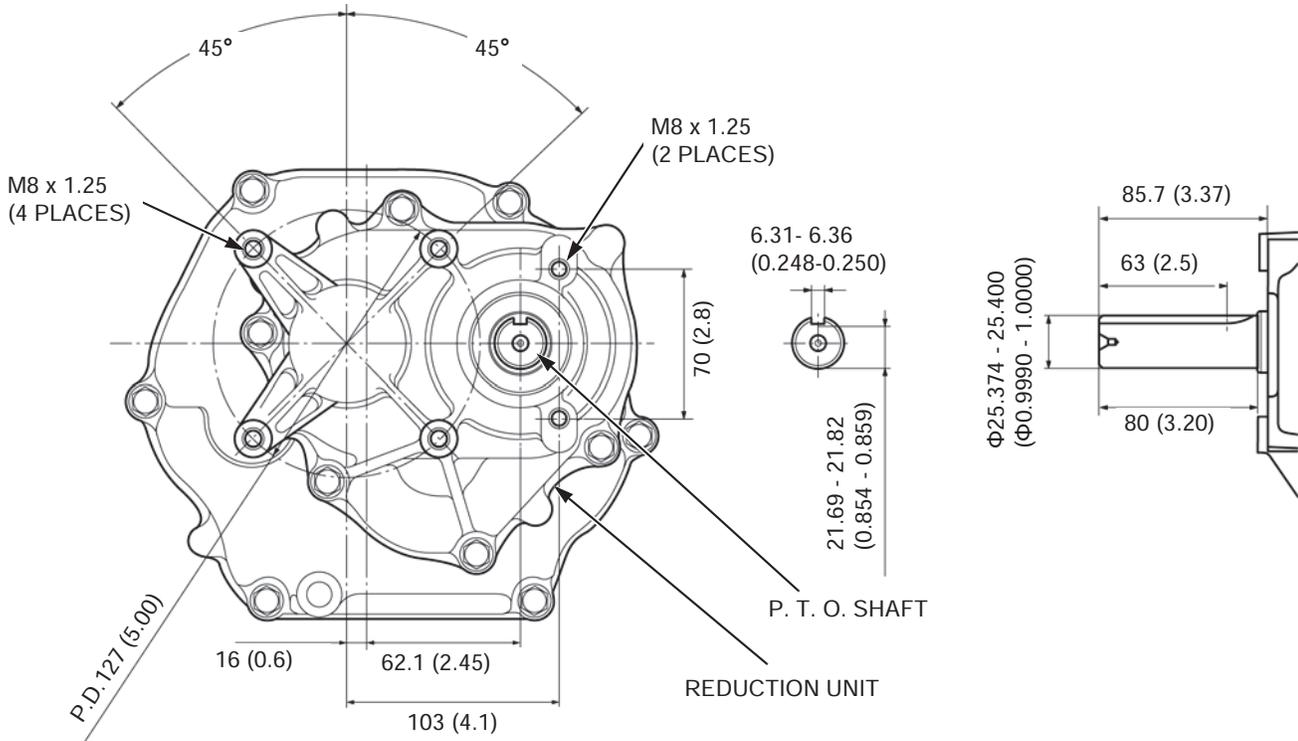
## SPECIFICATIONS

### GX340•GX390

\*: P.T.O. type [\(page 1-4\)](#)

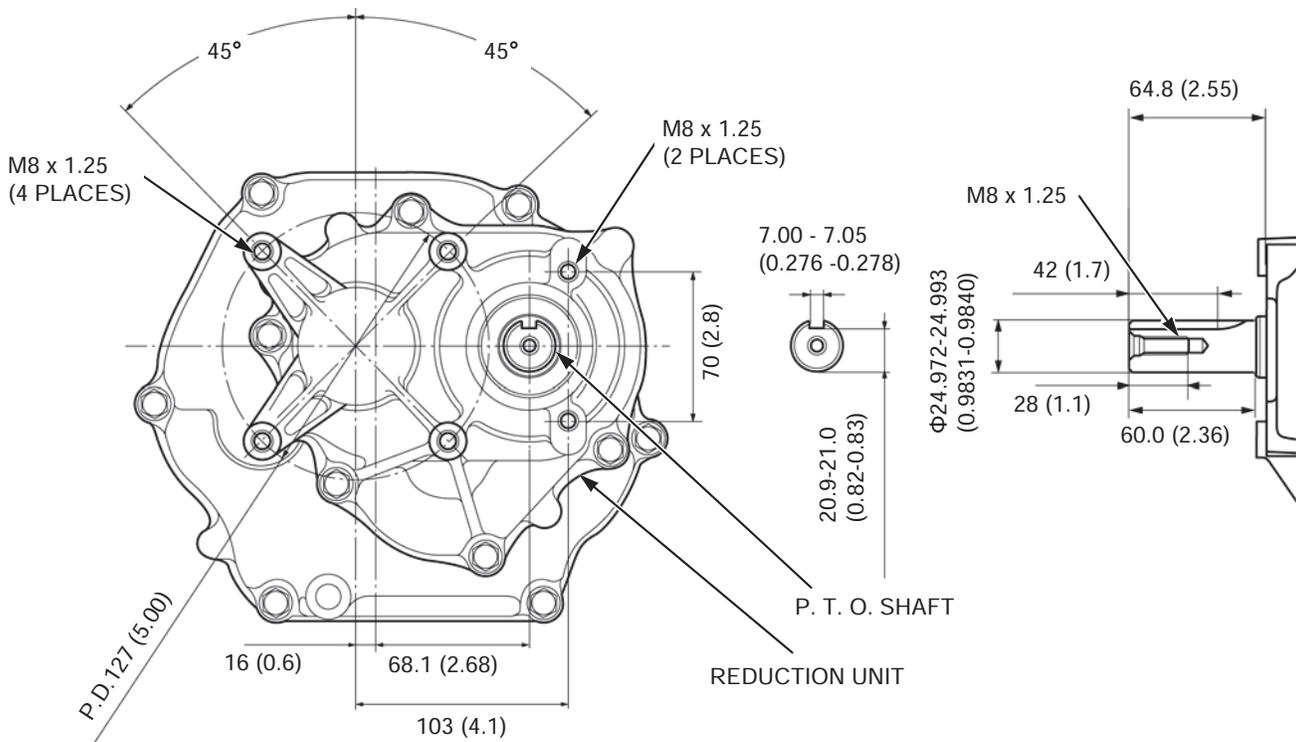
#### H TYPE (WITHOUT REDUCTION)

Unit: mm (in)



#### L TYPE\* (WITH REDUCTION)

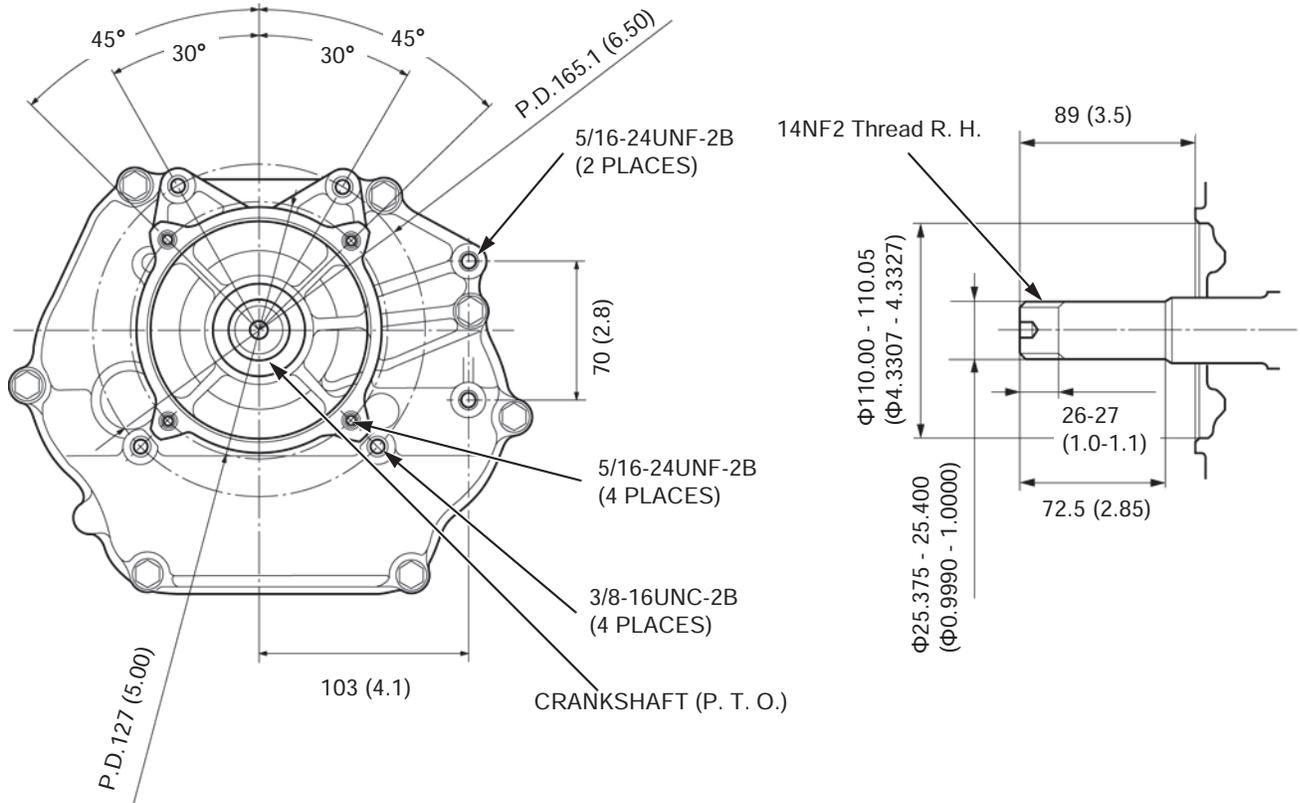
Unit: mm (in)



# SPECIFICATIONS

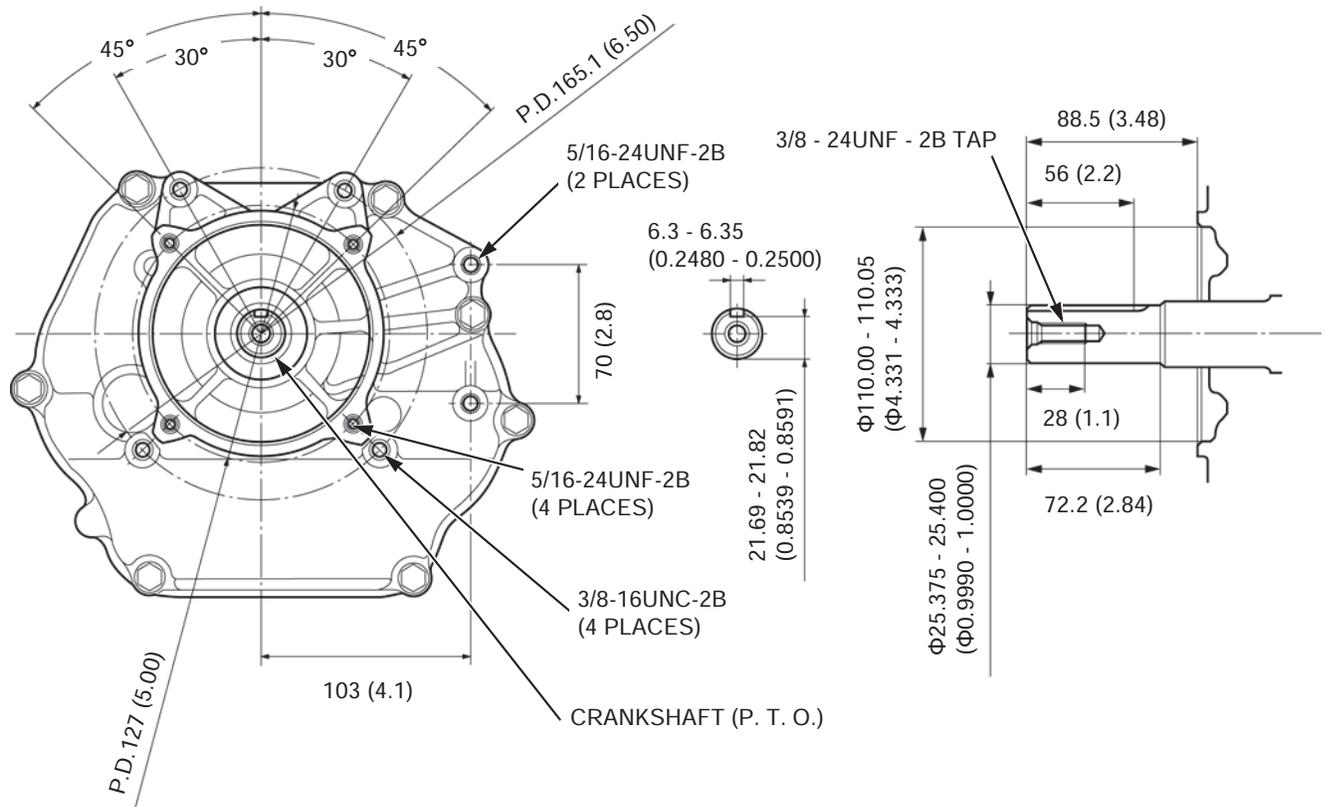
## P TYPE\*

Unit: mm (in)



## Q TYPE\*

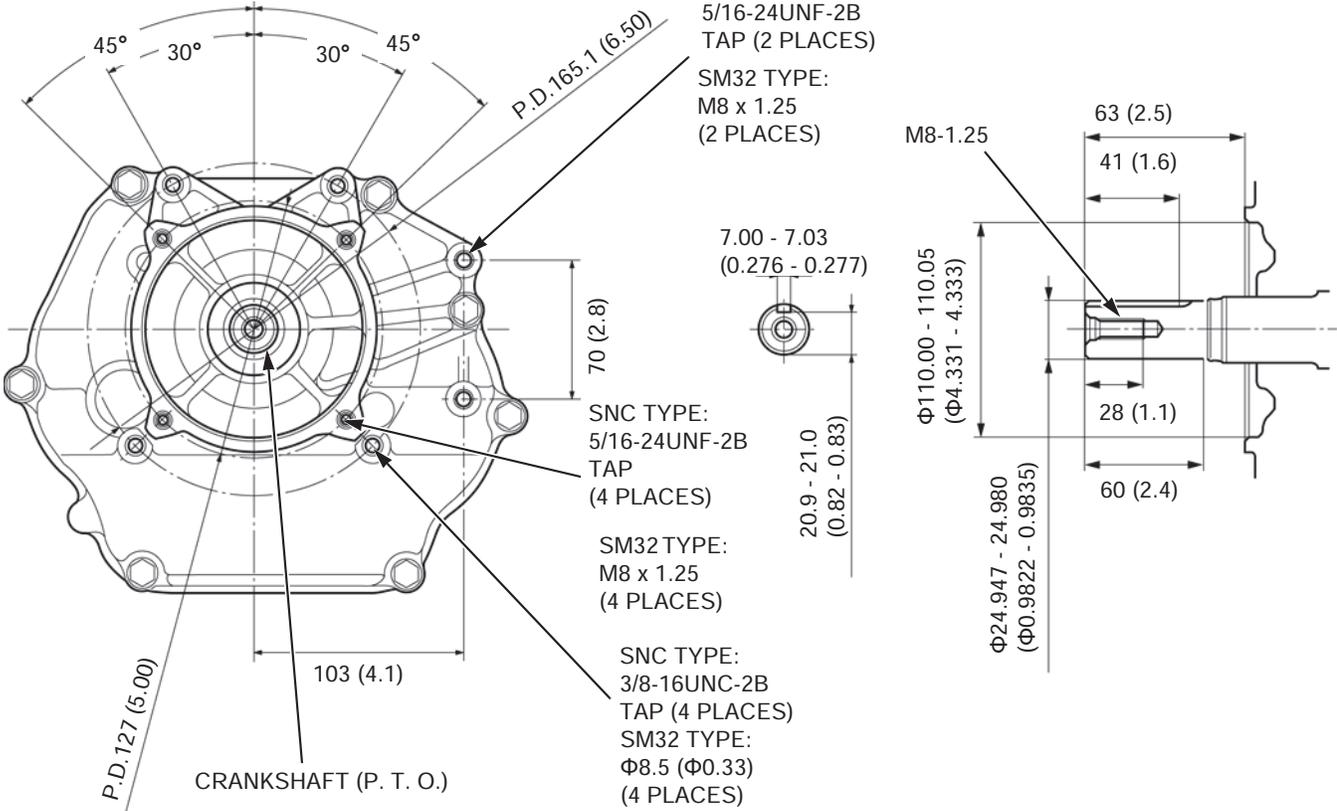
Unit: mm (in)



# SPECIFICATIONS

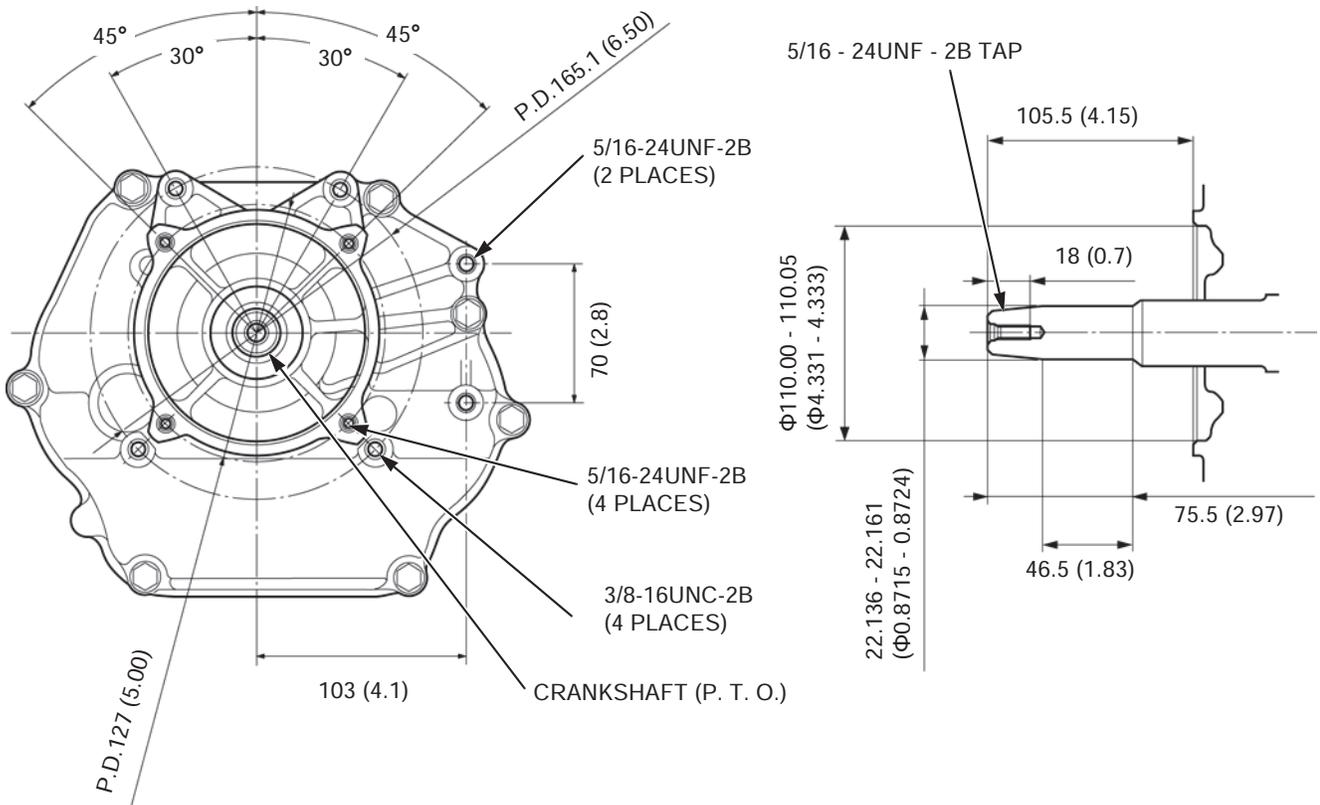
## S TYPE\*

Unit: mm (in)



## V TYPE\*

Unit: mm (in)



## 2. SERVICE INFORMATION

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### MAINTENANCE STANDARDS

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## SERVICE INFORMATION

## MAINTENANCE STANDARDS

## GX240

Unit: mm (in)

Part	Item		Standard	Service limit
Engine	Maximum speed (at no load)		3,850 ± 150 min <sup>-1</sup> (rpm)	–
	Idle speed		1,400 ± 150 min <sup>-1</sup> (rpm)	–
	Cylinder compression		0.59 - 0.83 MPa (6.0 - 8.5 kgf/cm <sup>2</sup> , 85 - 121 psi) / 600 min <sup>-1</sup> (rpm)	–
Cylinder head	Warpage		–	0.10 (0.004)
Cylinder	Sleeve I.D.		77.000 – 77.017 (3.0315 – 3.0322)	77.17 (3.038)
Piston	Skirt O.D.		76.975 – 76.985 (3.0305 – 3.0309)	76.85 (3.026)
	Piston-to-cylinder clearance		0.015 – 0.042 (0.0006 – 0.0017)	0.12 (0.005)
	Piston pin bore I.D.		18.002 – 18.008 (0.7087 – 0.7090)	18.042 (0.7103)
Piston pin	Pin O.D.		17.994 – 18.000 (0.7084 – 0.7087)	17.95 (0.707)
	Piston pin-to-piston pin bore clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)
Piston rings	Ring side clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
		Second	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
	Ring end gap	Top	0.200 – 0.350 (0.0079 – 0.0138)	1.0 (0.04)
		Second	0.350 – 0.500 (0.0138 – 0.0197)	1.0 (0.04)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Ring width	Top	1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)
Second		1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)	
Connecting rod	Small end I.D.		18.005 – 18.020 (0.7089 – 0.7094)	18.07 (0.711)
	Big end side clearance		0.1 – 0.4 (0.004 – 0.016)	1.0 (0.04)
	Big end I.D.		33.025 – 33.039 (1.3002 – 1.3007)	33.07 (1.302)
	Big end oil clearance		0.040 – 0.064 (0.0016 – 0.0025)	0.12 (0.005)
Crankshaft	Crank pin O.D.		32.975 – 32.985 (1.2982 – 1.2986)	32.92 (1.296)
	Crankshaft runout		–	0.1 (0.004)
Cylinder barrel (Crankcase)	Camshaft bearing I.D.		16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)
Crankcase cover	Camshaft bearing I.D.		16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)
Valves	Valve clearance	IN	0.15 ± 0.02	–
		EX	0.20 ± 0.02	–
	Valve stem O.D.	IN	6.575 – 6.590 (0.2589 – 0.2594)	6.44 (0.254)
		EX	6.535 – 6.550 (0.2573 – 0.2579)	6.40 (0.252)
	Valve guide I.D.	IN/EX	6.600 – 6.615 (0.2598 – 0.2604)	6.66 (0.262)
	Guide-to-stem clearance	IN	0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
		EX	0.050 – 0.080 (0.0020 – 0.0031)	0.12 (0.005)
	Valve seat width		1.0 – 1.2 (0.04 – 0.05)	2.0 (0.08)
	Valve spring free length		39.0 (1.54)	37.5 (1.48)
Valve spring perpendicularity		–	1.5° max.	
Camshaft	Cam height	IN	31.945 – 32.145 (1.2577 – 1.2655)	31.35 (1.234)
		EX	31.666 – 31.866 (1.2467 – 1.2546)	31.35 (1.234)
	Camshaft O.D.		15.966 – 15.984 (0.6286 – 0.6293)	15.92 (0.627)

## SERVICE INFORMATION

Part	Item	Standard	Service limit
Carburetor	Main jet	BE70R A: #85 BE71F A: #85	–
	Pilot screw opening	BE70R A: 1 turn out BE71F A: 1 turn out	–
	Float height	13.2 (0.52)	–
Spark plug	Gap	0.7 – 0.8 (0.028 – 0.031)	–
Ignition coil	Air gap	0.2 – 0.6 (0.01 – 0.02)	–
Starter motor	Brush length	7.0 (0.28)	3.5 (0.14)
	Mica depth	1.0 (0.04)	0.2 (0.01)
Charge coil	Resistance	1A	3.00 - 4.00 Ω
		3A	0.62 - 0.93 Ω
		10A	0.16 - 0.24 Ω
		18A	0.10 - 0.30 Ω
Lamp coil	Resistance	12V - 15 W	1.04 - 1.56 Ω
		12V - 25 W	0.30 - 0.46 Ω
		12V - 50 W	0.29 - 0.44 Ω

## GX270

Unit: mm (in)

Part	Item	Standard	Service limit
Engine	Maximum speed (at no load)	3,850 ± 150 min <sup>-1</sup> (rpm)	–
	Idle speed	1,400 ± 150 min <sup>-1</sup> (rpm)	–
	Cylinder compression	0.59 - 0.83 MPa (6.0-8.5 kgf/cm <sup>2</sup> , 85-121 psi) / 600 min <sup>-1</sup> (rpm)	–
Cylinder head	Warpage	–	0.10 (0.004)
Cylinder	Sleeve I.D.	77.000 – 77.017 (3.0315 – 3.0322)	77.17 (3.038)
Piston	Skirt O.D.	76.975 – 76.985 (3.0305 – 3.0309)	76.85 (3.026)
	Piston-to-cylinder clearance	0.015 – 0.042 (0.0006 – 0.0017)	0.12 (0.005)
	Piston pin bore I.D.	18.002 – 18.008 (0.7087 – 0.7090)	18.042 (0.7103)
Piston pin	Pin O.D.	17.994 – 18.000 (0.7084 – 0.7087)	17.95 (0.707)
	Piston pin-to-piston pin bore clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)
Piston rings	Ring side clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)
		Second	0.030 – 0.060 (0.0012 – 0.0024)
	Ring end gap	Top	0.200 – 0.350 (0.0079 – 0.0138)
		Second	0.350 – 0.500 (0.0138 – 0.0197)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)
	Ring width	Top	1.160 – 1.175 (0.0457 – 0.0463)
Second		1.160 – 1.175 (0.0457 – 0.0463)	
Connecting rod	Small end I.D.	18.005 – 18.020 (0.7089 – 0.7094)	18.07 (0.711)
	Big end side clearance	0.1 – 0.4 (0.004 – 0.016)	1.0 (0.04)
	Big end I.D.	33.025 – 33.039 (1.3002 – 1.3007)	33.07 (1.302)
	Big end oil clearance	0.040 – 0.064 (0.0016 – 0.0025)	0.12 (0.005)
Crankshaft	Crank pin O.D.	32.975 – 32.985 (1.2982 – 1.2986)	32.92 (1.296)
	Crankshaft runout	–	0.1 (0.004)
Cylinder barrel (Crankcase)	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)
Crankcase cover	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)

## SERVICE INFORMATION

Part	Item	Standard	Service limit	
Valves	Valve clearance	IN	0.15 ± 0.02	–
		EX	0.20 ± 0.02	–
	Valve stem O.D.	IN	6.575 – 6.590 (0.2589 – 0.2594)	6.44 (0.254)
		EX	6.535 – 6.550 (0.2573 – 0.2579)	6.40 (0.252)
	Valve guide I.D.	IN/EX	6.600 – 6.612 (0.2598 – 0.2603)	6.66 (0.262)
	Guide-to-stem clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.10 (0.004)
		EX	0.050 – 0.077 (0.0020 – 0.0030)	0.12 (0.005)
	Valve seat width		1.0 – 1.2 (0.04 – 0.05)	2.0 (0.08)
Valve spring free length		39.0 (1.54)	37.5 (1.48)	
Valve spring perpendicularity		–	1.5° max.	
Camshaft	Cam height	IN	31.945 – 32.145 (1.2577 – 1.2655)	31.35 (1.234)
		EX	31.666 – 31.866 (1.2467 – 1.2546)	31.35 (1.234)
	Camshaft O.D.		15.966 – 15.984 (0.6286 – 0.6293)	15.92 (0.627)
Carburetor	Main jet	#88	–	
	Pilot screw opening	BE21J A: 2 turns out	–	
	Float height	13.2 (0.52)	–	
Spark plug	Gap	0.7 – 0.8 (0.028 – 0.031)	–	
Ignition coil	Air gap	0.2 – 0.6 (0.01 – 0.02)	–	
Starter motor	Brush length	7.0 (0.28)	3.5 (0.14)	
	Mica depth	1.0 (0.04)	0.2 (0.01)	
Charge coil	Resistance	1A	3.00 - 4.00 Ω	–
		3A	0.62 - 0.93 Ω	–
		10A	0.16 - 0.24 Ω	–
		18A	0.10 - 0.30 Ω	–
Lamp coil	Resistance	12V - 15 W	1.04 - 1.56 Ω	–
		12V - 25 W	0.30 - 0.46 Ω	–
		12V - 50 W	0.29 - 0.44 Ω	–

## GX340

Unit: mm (in)

Part	Item	Standard	Service limit	
Engine	Maximum speed (at no load)	3,850 ± 150 min <sup>-1</sup> (rpm)	–	
	Idle speed	1,400 ± 150 min <sup>-1</sup> (rpm)	–	
	Cylinder compression	0.51 - 0.69 MPa (5.2 - 7.0 kgf/cm <sup>2</sup> , 74 - 100 psi) / 600 min <sup>-1</sup> (rpm)	–	
Cylinder head	Warpage	–	0.10 (0.004)	
Cylinder	Sleeve I.D.	88.000 – 88.017 (3.4646 – 3.4652)	88.170 (3.4713)	
Piston	Skirt O.D.	87.965 – 87.985 (3.4632 – 3.4640)	87.85(3.459)	
	Piston-to-cylinder clearance	0.015 – 0.052 (0.0006 – 0.0020)	0.12 (0.005)	
	Piston pin bore I.D.	20.002 – 20.008 (0.7875 – 0.7877)	20.042 (0.7891)	
Piston pin	Pin O.D.	19.994 – 20.000 (0.7872 – 0.7874)	19.950 (0.7854)	
	Piston pin-to-piston pin bore clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)	
Piston rings	Ring side clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
		Second	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
	Ring end gap	Top	0.200 – 0.350 (0.0079 – 0.0138)	1.0 (0.04)
		Second	0.350 – 0.500 (0.0138 – 0.0197)	1.0 (0.04)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Ring width	Top	1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)
Second		1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)	

## SERVICE INFORMATION

Part	Item		Standard	Service limit
Connecting rod	Small end I.D.		20.005 – 20.020 (0.7876 – 0.7882)	20.07 (0.790)
	Big end side clearance		0.1 – 0.4 (0.004 – 0.016)	1.0 (0.04)
	Big end I.D.		36.025 – 36.039 (1.4183 – 1.4189)	36.07 (1.420)
	Big end oil clearance		0.040 – 0.064 (0.0016 – 0.0025)	0.12 (0.005)
Crankshaft	Crank pin O.D.		35.975 – 35.985 (1.4163 – 1.4167)	35.93 (1.415)
	Crankshaft runout		–	0.1 (0.003)
Cylinder barrel (Crankcase)	Camshaft bearing I.D.		16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)
Crankcase cover	Camshaft bearing I.D.		16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)
Valves	Valve clearance	IN	0.15 ± 0.02	–
		EX	0.20 ± 0.02	–
	Valve stem O.D.	IN	6.575 – 6.590 (0.2588 – 0.2594)	6.44 (0.254)
		EX	6.535 – 6.550 (0.2572 – 0.2578)	6.40 (0.252)
	Valve guide I.D.	IN/EX	6.600 – 6.615 (0.2598 – 0.2604)	6.66 (0.262)
	Guide-to-stem clearance	IN	0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
		EX	0.050 – 0.080 (0.0020 – 0.0031)	0.12 (0.005)
	Valve seat width		1.0 – 1.2 (0.04 – 0.05)	2.0 (0.08)
Valve spring free length		39.0 (1.54)	37.5 (1.48)	
Valve spring perpendicularity		–	1.5° max.	
Camshaft	Cam height	IN	31.945 – 32.145 (1.2577 – 1.2655)	31.35 (1.234)
		EX	31.666 – 31.866 (1.2467 – 1.2546)	31.35 (1.234)
	Camshaft O.D.		15.966 – 15.984 (0.6286 – 0.6293)	15.92 (0.627)
Carburetor	Main jet		BE80N A: #98 BE80M A: #98 BE80P A: #98	–
	Pilot screw opening		BE80N A: 1 - 3/4 turns out BE80M A: 1 - 3/4 turns out BE80P A: 1 - 3/4 turns out	–
	Float height		13.2 (0.52)	–
Spark plug	Gap		0.7 – 0.8 (0.028 – 0.031)	–
Ignition coil	Air gap		0.2 – 0.6 (0.01 – 0.02)	–
Starter motor	Brush length		7.0 (0.28)	3.5 (0.14)
	Mica depth		1.0 (0.04)	0.2 (0.01)
Charge coil	Resistance	1A	3.00 - 4.00 Ω	–
		3A	0.62 - 0.93 Ω	–
		10A	0.16 - 0.24 Ω	–
		18A	0.10 - 0.30 Ω	–
Lamp coil	Resistance	12V - 15 W	1.04 - 1.56 Ω	–
		12V - 25 W	0.30 - 0.46 Ω	–
		12V - 50 W	0.29 - 0.44 Ω	–

## SERVICE INFORMATION

### GX390

			mm (in)	
Part	Item	Standard	Service limit	
Engine	Maximum speed (at no load)	3,850 ± 150 min <sup>-1</sup> (rpm)	–	
	Idle speed	1,400 ± 150 min <sup>-1</sup> (rpm)	–	
	Cylinder compression	0.51-0.69 MPa (5.2-7.0 kgf/cm <sup>2</sup> , 74-100 psi) / 600 min <sup>-1</sup> (rpm)	–	
Cylinder head	Warpage	–	0.10 (0.004)	
Cylinder	Sleeve I.D.	88.000 – 88.017 (3.4646 – 3.4652)	88.170 (3.4710)	
Piston	Skirt O.D.	87.975 – 87.985 (3.4635 – 3.4640)	87.85 (3.459)	
	Piston-to-cylinder clearance	0.015 – 0.042 (0.0006 – 0.0016)	0.12 (0.005)	
	Piston pin bore I.D.	20.002 – 20.008 (0.7875 – 0.7877)	20.042 (0.7891)	
Piston pin	Pin O.D.	19.994 – 20.000 (0.7872 – 0.7874)	19.950 (0.7854)	
	Piston pin-to-piston pin bore clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)	
Piston rings	Ring side clearance	Top	0.015 – 0.060 (0.0006 – 0.0024)	
		Second	0.030 – 0.060 (0.0012 – 0.0024)	
	Ring end gap	Top	0.200 – 0.350 (0.0079 – 0.0138)	
		Second	0.350 – 0.500 (0.0138 – 0.0197)	
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	
	Ring width	Top	1.160 – 1.190 (0.0457 – 0.047)	
Second		1.160 – 1.175 (0.0457 – 0.0463)		
Connecting rod	Small end I.D.	20.005 – 20.020 (0.7876 – 0.7882)	20.07 (0.790)	
	Big end side clearance	0.1 – 0.4 (0.004 – 0.016)	1.0 (0.04)	
	Big end I.D.	36.025 – 36.039 (1.4183 – 1.4189)	36.07 (1.420)	
	Big end oil clearance	0.040 – 0.064 (0.0016 – 0.0025)	0.12 (0.005)	
Crankshaft	Crank pin O.D.	35.975 – 35.985 (1.4163 – 1.4167)	35.93 (1.415)	
	Crankshaft runout	–	0.1 (0.003)	
Cylinder barrel (Crankcase)	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)	
Crankcase cover	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)	
Valves	Valve clearance	IN	0.15 ± 0.02	
		EX	0.20 ± 0.02	
	Valve stem O.D.	IN	6.575 – 6.590 (0.2588 – 0.2594)	
		EX	6.535 – 6.550 (0.2572 – 0.2578)	
	Valve guide I.D.	IN/EX	6.600 – 6.615 (0.2598 – 0.2604)	
	Guide-to-stem clearance	IN	0.010 – 0.040 (0.0004 – 0.0016)	
		EX	0.050 – 0.080 (0.0020 – 0.0032)	
	Valve seat width		1.0 – 1.2 (0.04 – 0.05)	
Valve spring free length		39.0 (1.54)		
Valve spring perpendicularity		–	1.5° max.	
Camshaft	Cam height	IN	32.498 – 32.698 (1.2794 – 1.2873)	
		EX	31.985 – 32.185 (1.2592 – 1.2671)	
	Camshaft O.D.		15.966 – 15.984 (0.6286 – 0.6293)	
			29.886 (1.1766)	
			15.92 (0.627)	

## SERVICE INFORMATION

Part	Item		Standard	Service limit
Carburetor	Main jet	BE84A A	#100	-
		BE84B A	#100	
		BE84C A	#100	
		BE84D A	#105	
		BE88A A	#88	
		BE88B A	#88	
		BE88C A	#88	
		BE88F A	#88	
		BE88G A	#88	
		BE88J A	#88	
		BE89Y A	#100	
		BE89Z A	#105	
		BE94E A	#108	
		BE94F A	#108	
	Pilot screw opening	BE84A A	2 - 1/8 turns out	-
		BE84B A	2 - 1/8 turns out	
		BE84C A	2 - 1/8 turns out	
		BE84D A	1 - 1/2 turns out	
		BE88A A	1 - 7/8 turns out	
		BE88B A	1 - 7/8 turns out	
		BE88C A	1 - 7/8 turns out	
		BE88F A	1 - 7/8 turns out	
		BE88G A	1 - 7/8 turns out	
		BE88J A	1 - 7/8 turns out	
		BE89Y A	2 - 1/8 turns out	
BE89Z A	1 - 1/2 turns out			
BE94E A	1 - 5/8 turns out			
BE94F A	1 - 5/8 turns out			
	Float height	13.2 (0.52)	-	
Spark plug	Gap	0.7 - 0.8 (0.028 - 0.031)	-	
Ignition coil	Air gap	0.2 - 0.6 (0.01 - 0.02)	-	
Starter motor	Brush length	7.0 (0.28)	3.5 (0.14)	
	Mica depth	1.0 (0.04)	0.2 (0.01)	
Charge coil	Resistance	1A	3.00 - 4.00 $\Omega$	-
		3A	0.62 - 0.93 $\Omega$	-
		10A	0.16 - 0.24 $\Omega$	-
		18A	0.10 - 0.30 $\Omega$	-
Lamp coil	Resistance	12V25W	0.30 - 0.46 $\Omega$	-

**SERVICE INFORMATION****TORQUE VALUES****ENGINE TORQUE VALUES**

Item	Tread Dia. (mm)	Torque values		
		N·m	kgf·m	lbf·ft
Crankcase cover bolt	M8 x 1.25	24	2.4	17
Cylinder head bolt	M10 x 1.25	35	3.5	26
Oil drain plug bolt	M12 x 1.5	22.5	2.25	17
Connecting rod bolt	M8 x 1.25 (Special bolt)	14	1.4	10
Rocker arm pivot bolt	M8 x 1.25 (Special bolt)	24	2.4	17
Rocker arm pivot adjusting nut	M6 x 0.5	10	1.0	7
Oil level switch nut	M10 x 1.25	10	1.0	7
Flywheel nut (GX240, GX270)	M16 x 1.5 (Special nut)	128	13.1	94
Flywheel nut (GX340, GX390)	M16 x 1.5 (Special nut)	170	17.3	125
Fuel tank nut/bolt	M8 x 1.25	24	2.4	18
Fuel tank joint	M10 x 1.25	2	0.2	1.5
Air cleaner elbow nut	M6 x 1.0	9	0.9	6.6
Muffler nut	M8 x 1.25	24	2.4	17
Exhaust pipe nut	M8 x 1.25	24	2.4	17
Gear case cover bolt (With reduction)	M8 x 1.25	24	2.4	17
Primary drive gear bolt (With reduction)	M8 x 1.25	24	2.4	17
Engine stop switch tapping screw	M3 x 1.06	0.45	0.046	0.33
Recoil starter center screw	M5 x 0.8 (Special bolt)	3.9	0.40	2.9
Fuel strainer cup	M24 x 1.0	3.9	0.40	2.9

**STANDARD TORQUE VALUES**

Item	Tread Dia. (mm)	Torque values		
		N·m	kgf·m	lbf·ft
Screw	4 mm	2.1	0.21	1.5
	5 mm	4.3	0.43	3.1
	6 mm	9.0	0.90	6.6
Bolt and nut	5 mm	5.3	0.53	3.9
	6 mm	10	1.0	7
	8 mm	22	2.2	16
	10 mm	34	3.5	25
	12 mm	54	5.5	40
Flange bolt and nut	5 mm	5.4	0.55	3.9
	6 mm	12	1.2	9
	8 mm	23	2.3	17
	10 mm	40	4.0	30
SH (Small head) flange bolt	6 mm	9.0	0.90	6.6
CT (Cutting threads) flange bolt (Retightening)	5 mm	5.4	0.55	4.0
	6 mm	12	1.2	9

## SERVICE INFORMATION

**LUBRICATION & SEAL POINT**

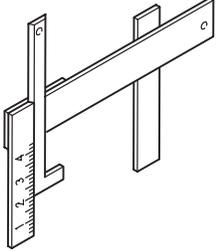
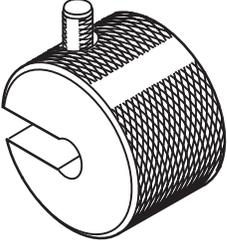
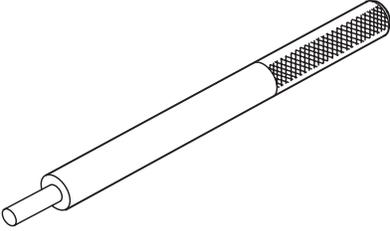
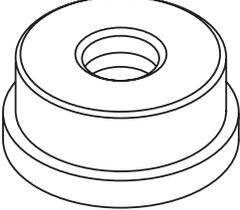
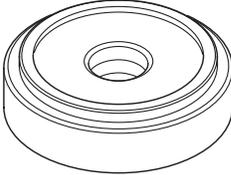
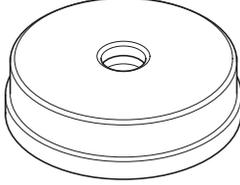
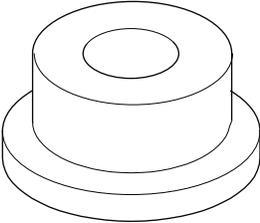
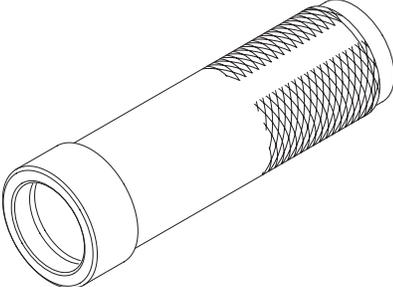
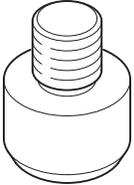
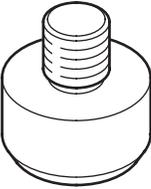
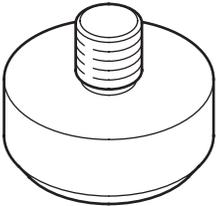
Location	Material	Remarks
Crankshaft pin, journal, and gear	Engine oil	
Crankcase bearing		
Crankcase cover bearing		
Piston outer surface and piston pin hole		
Piston pin outer surface		
Piston ring		
Cylinder inner surface		
Connecting rod big and small end bearing		
Connecting rod bolt threads and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

## SERVICE INFORMATION

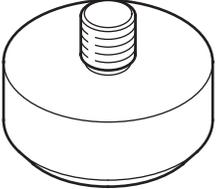
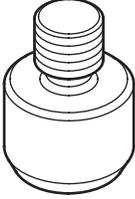
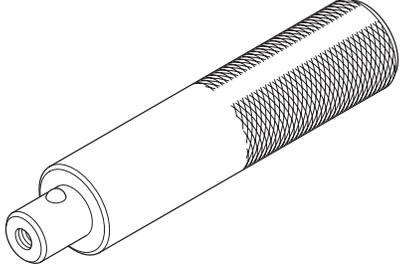
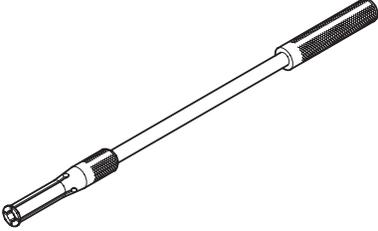
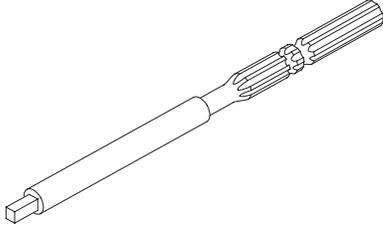
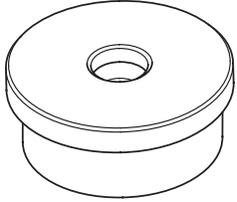
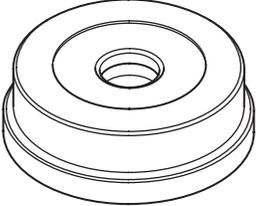
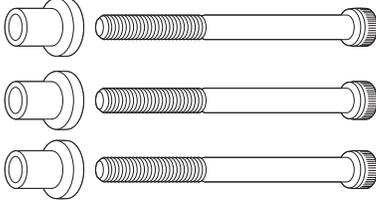
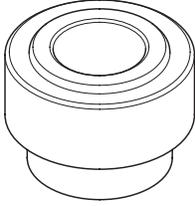
### TOOLS

#### SPECIAL TOOLS

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

<p>Float level gauge 07401-0010000</p> 	<p>Remover weight 07936-371020A</p> 	<p>Valve guide driver, 6.6 mm 07942-6570100</p> 
<p>Bearing driver attachment, 32 × 35 mm 07746-0010100</p> 	<p>Bearing driver attachment, 42 × 47 mm 07746-0010300</p> 	<p>Bearing driver attachment, 52 × 55 mm 07746-0010400</p> 
<p>Bearing driver attachment, 72 × 75 mm 07746-0010600</p> 	<p>Driver, 40 mm I. D. 07746-0030100</p> 	<p>Inner bearing driver attachment, 35 mm 07746-0030400</p> 
<p>Pilot, 15 mm 07746-0040300</p> 	<p>Pilot, 20 mm 07746-0040500</p> 	<p>Pilot, 30 mm 07746-0040700</p> 

**SERVICE INFORMATION**

<p>Pilot, 35 mm 07746-0040800</p> 	<p>Pilot, 14 mm 07746-0041200</p> 	<p>Driver handle 07749-0010000</p> 
<p>Bearing remover, 15 mm 07936-KC10500</p> 	<p>Valve guide reamer, 6.6 mm 07984-ZE20001</p> 	<p>Bearing driver attachment, 45 x 50 mm 07946-6920100</p> 
<p>Bearing driver attachment, 62 x 64 mm 07947-6340400</p> 	<p>Puller collar set 07APC-ZY1A100</p> 	<p>Inner bearing driver attachment, 30 mm (in combination with 07746-0030100) 07746-0030300</p> 

**COMMERCIALLY AVAILABLE TOOLS**

Tool name	Tool number	Application
Digital multimeter	FLU88	Electrical testing
Valve seat cutter, 30 x 45 degree	NWYCU128	Valve seat reconditioning
Valve seat cutter, 60 degree	NWYCU114	
Solid pilot bar, 6.6 mm	NWY100-6.60	
T handle	NWYTW505	
Strap wrench	S-17	
Ring compressor	LIL18500	Flywheel removal
Valve lapper	LIL21100	
Flywheel puller	OTC7403	
Compression gauge	EPPV303A	Compression testing
Leak down tester	KLIAT1006M	
Cylinder bore gauge	FFL52548007	Cylinder honing
400-grit flex hone tool	Based on bore size	
Variable speed heavy-duty drill		

There are two convenient ways to order: online or by toll-free phone.

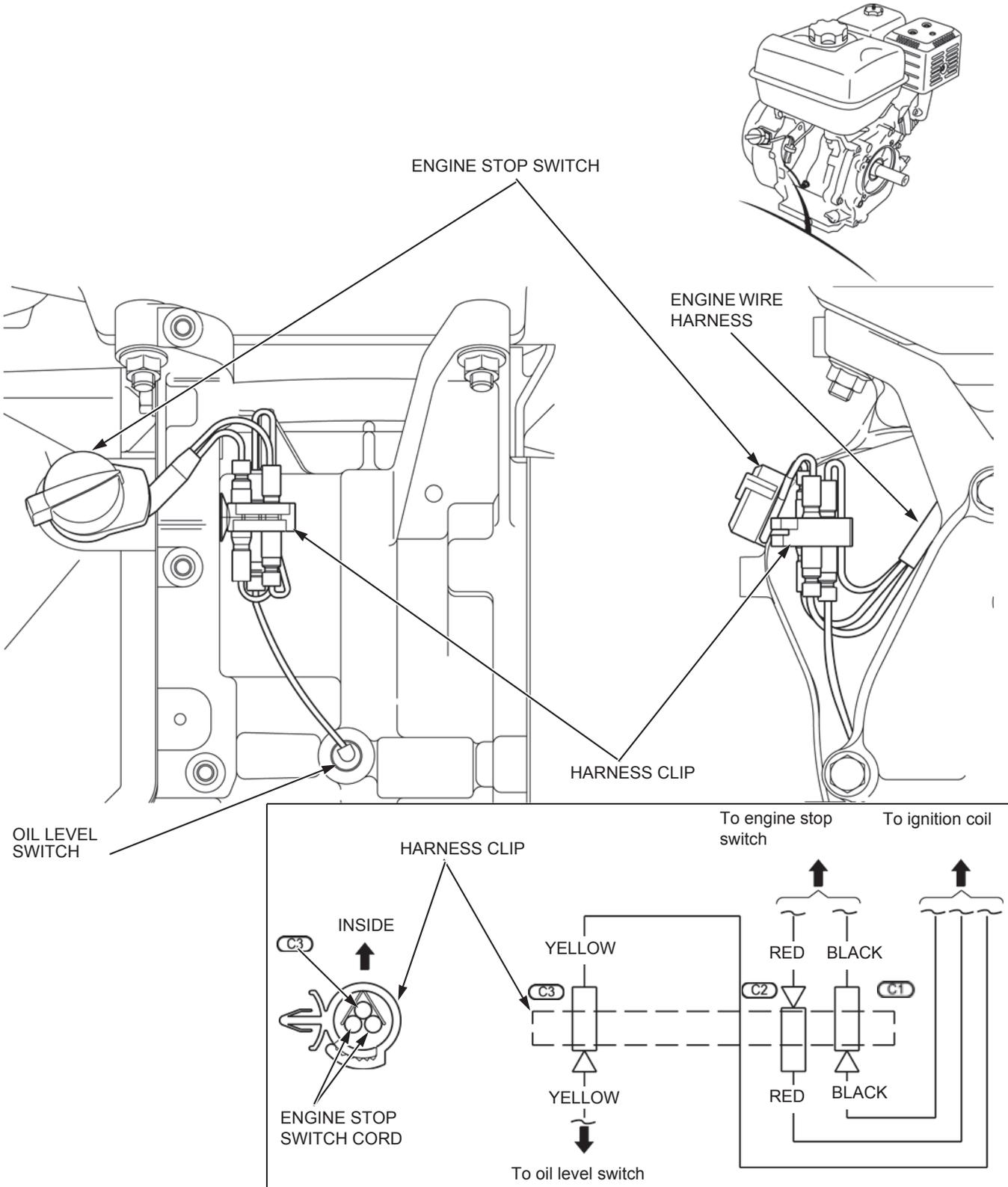
- To order online, go to the iN: SERVICE>Tools>Tool and Equipment Program>Online Catalog, and then search by model number.
- To order by phone, call 1-888-424-6857.  
Customer service representatives are available from 7:30 AM until 7:00 PM CT, Monday through Friday.

## SERVICE INFORMATION

# HARNESS ROUTING

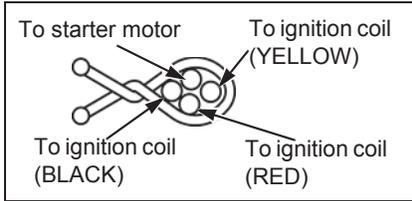
Connection of regulator/rectifier, charge/lamp coil, sub wire harness, and auto throttle solenoid depend on the application of the engine; therefore, this manual does not indicate those parts.

## ENGINE STOP SWITCH TYPE

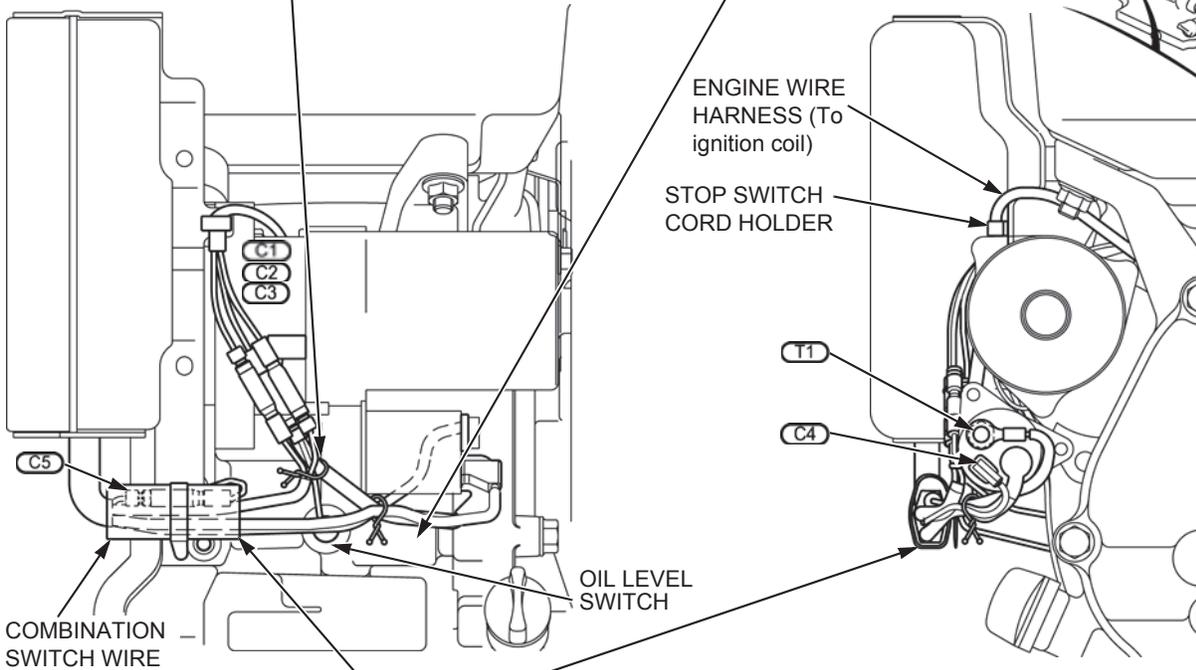
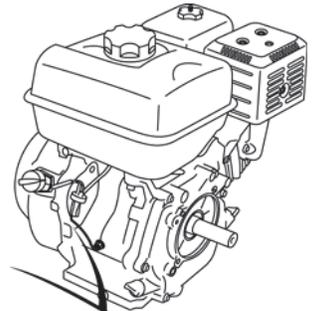
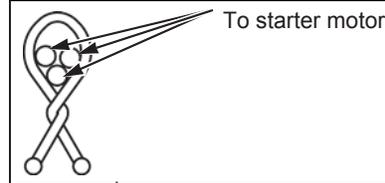


### COMBINATION SWITCH (CONTROL BOX) TYPE

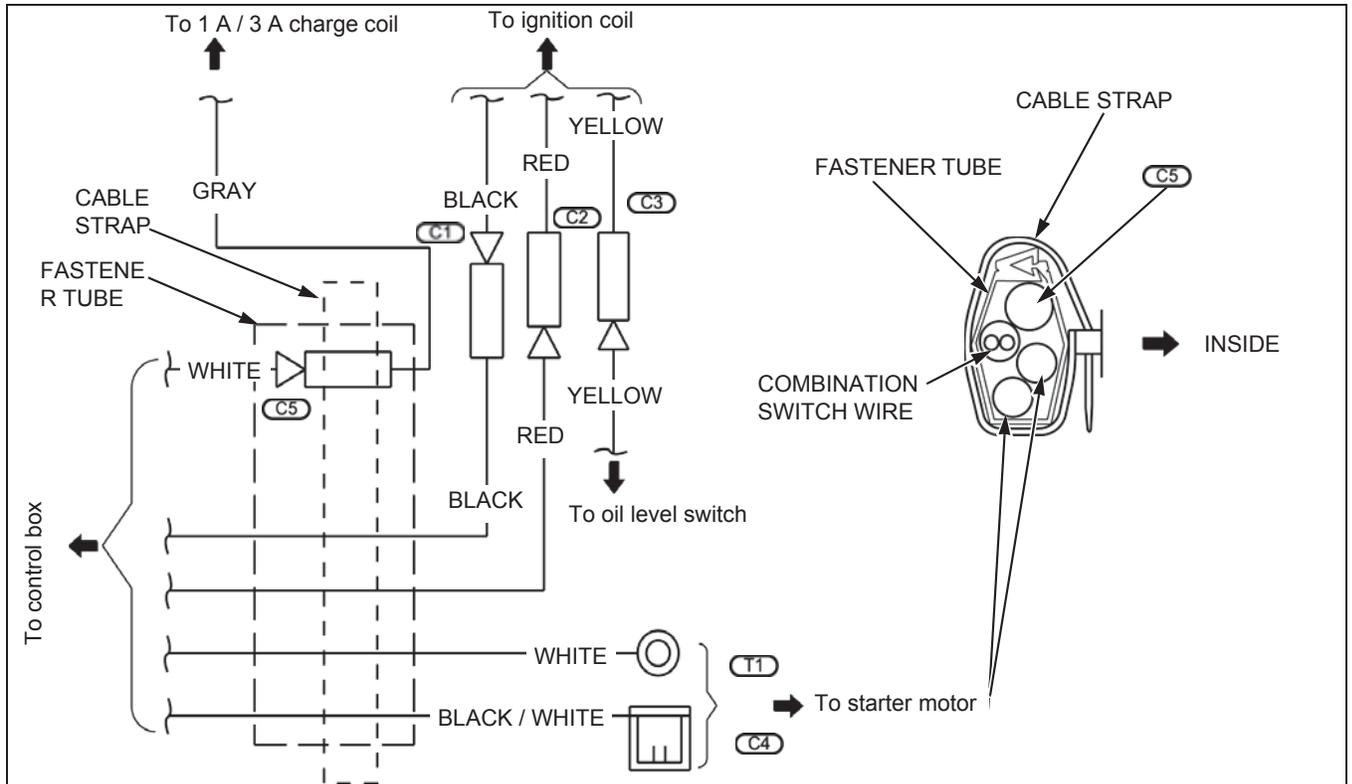
#### PURSE LOCK CLIP



#### PURSE LOCK CLIP

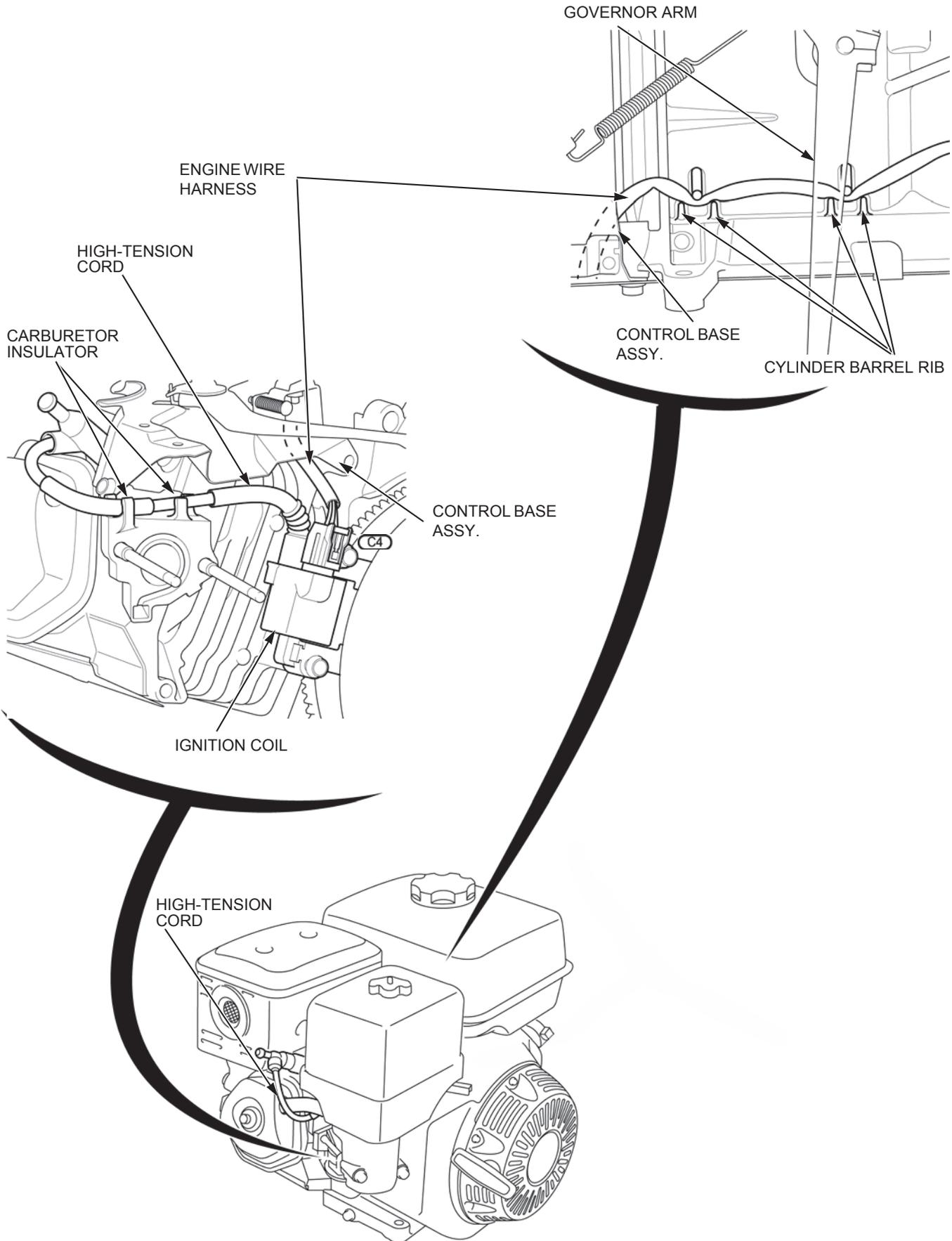


#### CABLE STRAP/FASTENER TUBE

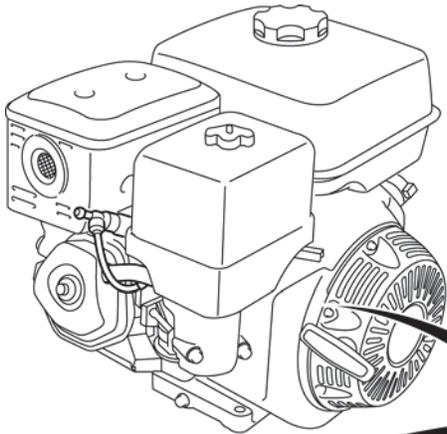


# SERVICE INFORMATION

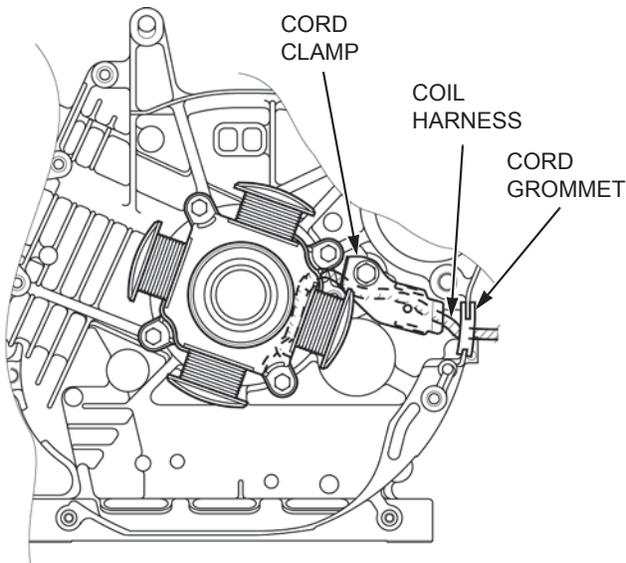
## ALL TYPES



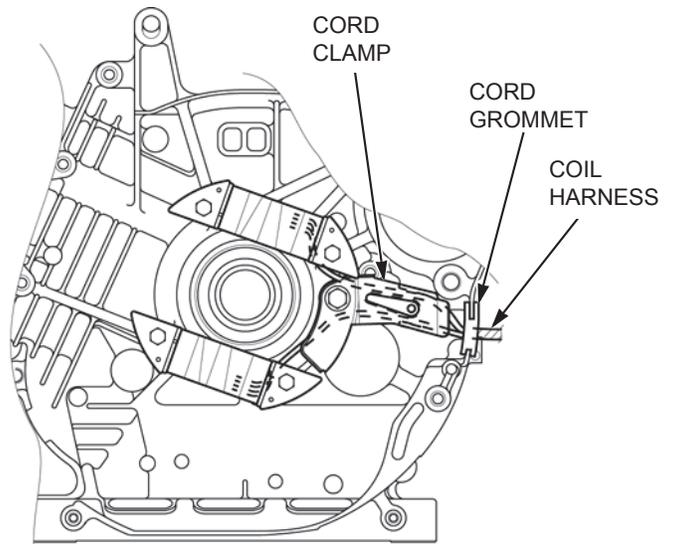
**WITH CHARGE COIL / LAMP COIL**



18 A CHARGE COIL TYPE:

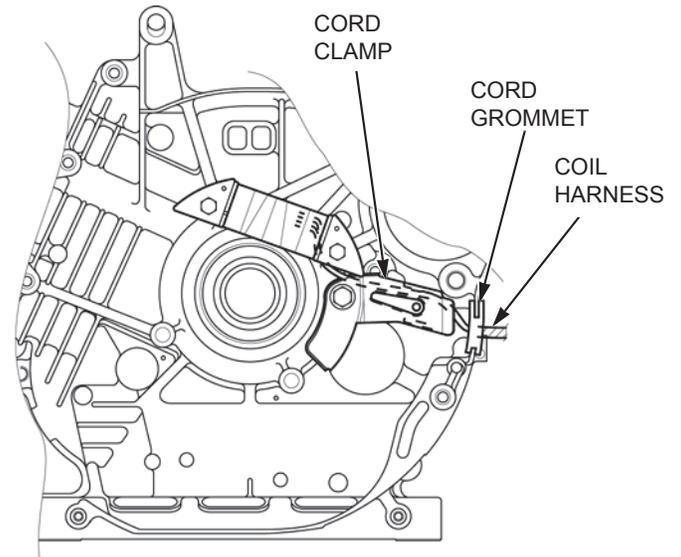


10 A CHARGE COIL TYPE:



1 A / 3 A CHARGE COIL TYPE:

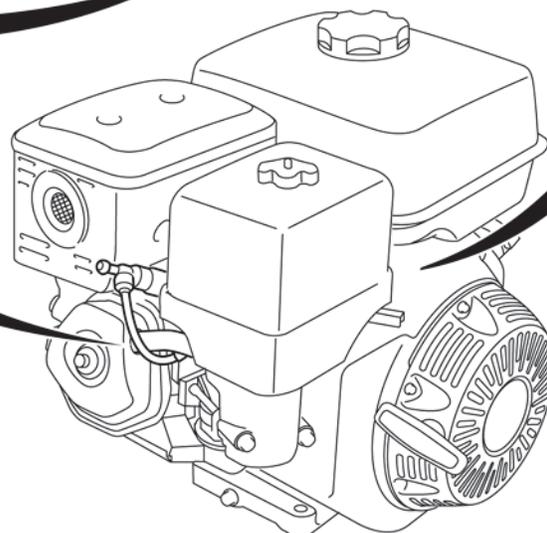
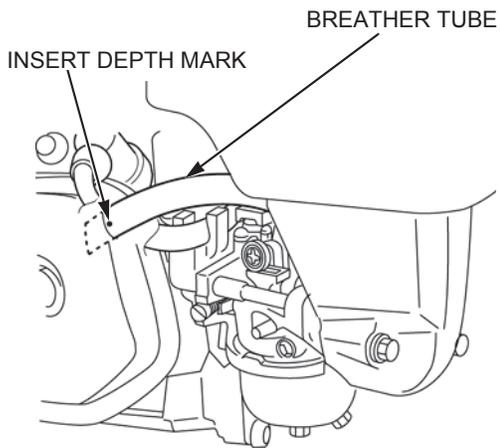
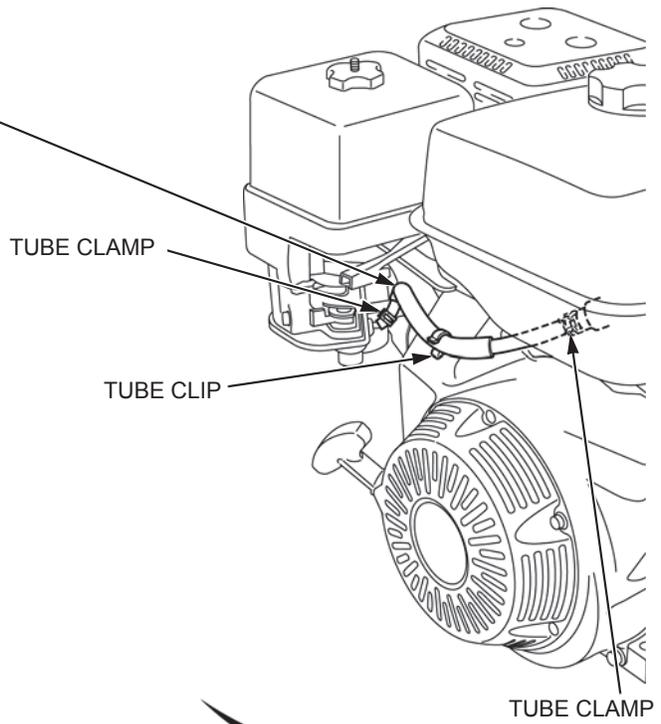
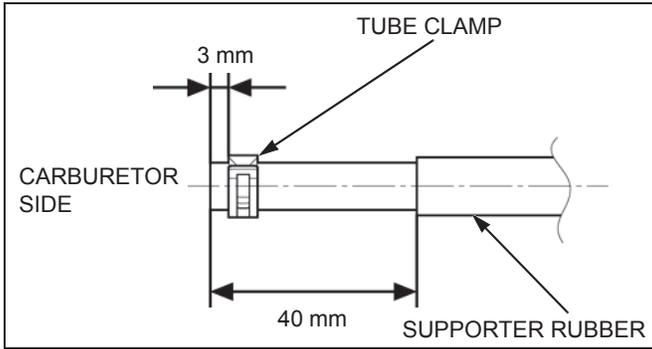
12 V - 25 W LAMP COIL TYPE:



## SERVICE INFORMATION

# TUBE ROUTING

### FUEL TUBE



# 3. MAINTENANCE

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<b>MAINTENANCE SCHEDULE</b> . . . . .	<b>3-2</b>	<b>SPARK PLUG REPLACEMENT</b> . . . . .	<b>3-10</b>
<b>ENGINE OIL LEVEL CHECK</b> . . . . .	<b>3-3</b>	<b>SPARK ARRESTER CLEANING</b> (if equipped) . . . . .	<b>3-10</b>
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**MAINTENANCE****MAINTENANCE SCHEDULE**

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

(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

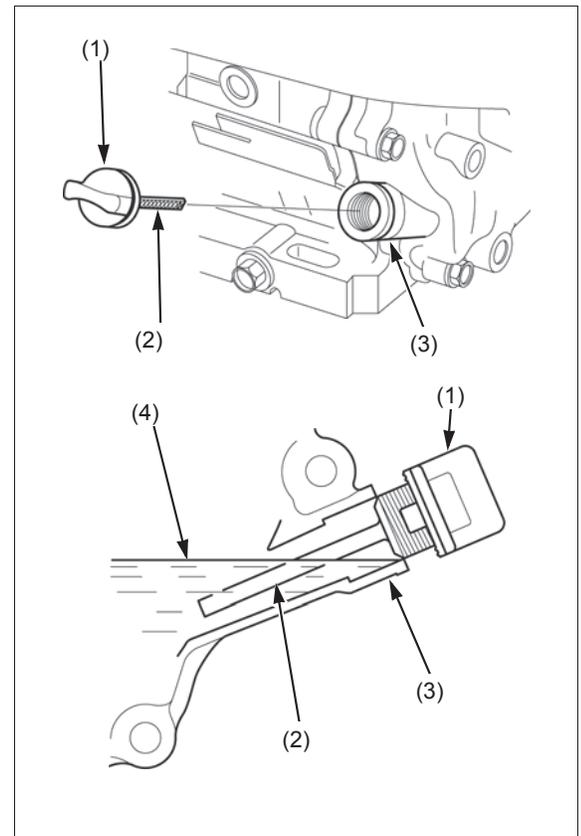
Place the engine on a level surface.

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.

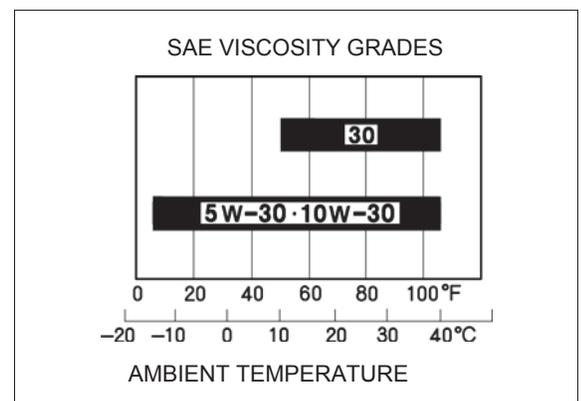


SAE 10W - 30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the recommended range.

### 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.

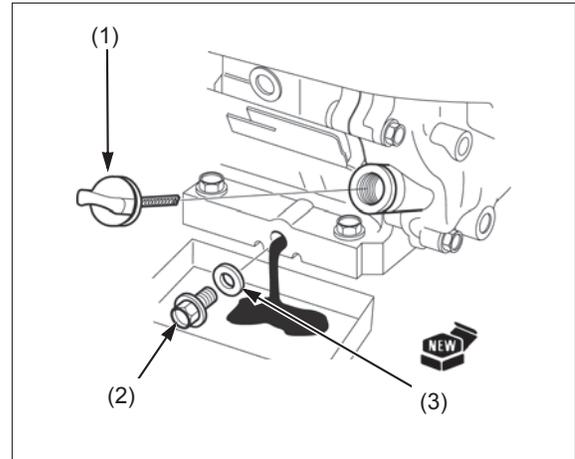
Install a new drain plug washer (3) and tighten the drain plug bolt (2) to the specified torque.

**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.

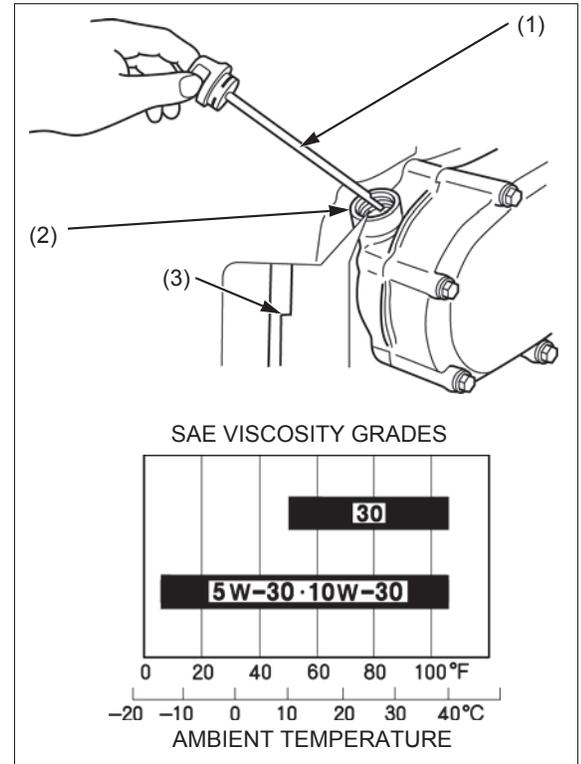
If the oil level is low, fill with recommended oil to the upper level (3) of the oil level gauge.

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.

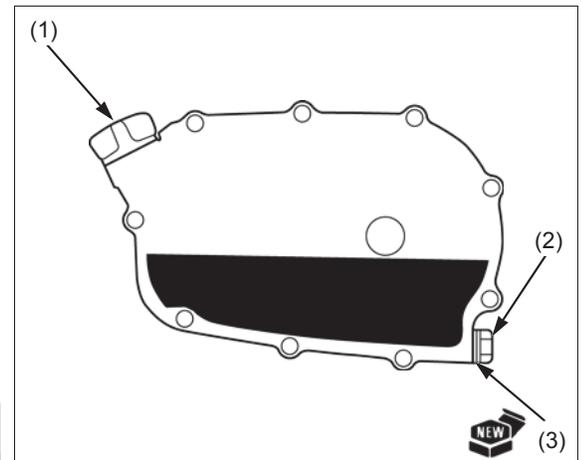
Place the engine on a level surface, and place a suitable container under the drain plug bolt.

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.

### ⚠ 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 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 ℓ (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.*

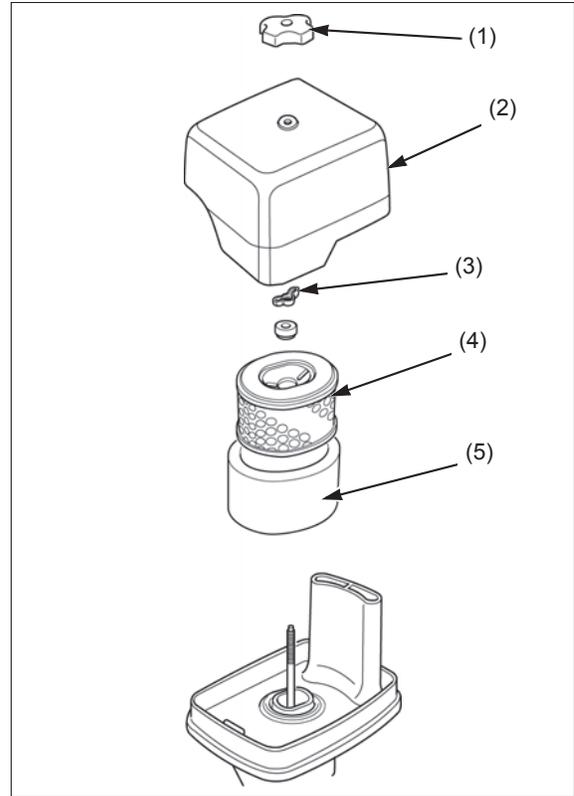
Remove the nut (1) and the air cleaner cover (2).

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).

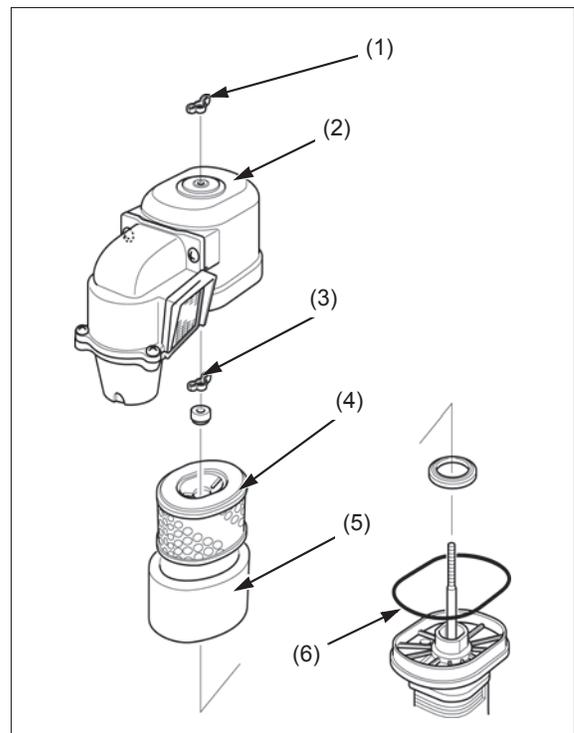
Remove the wing nut (3) and air filter assembly (4)(5).

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.*

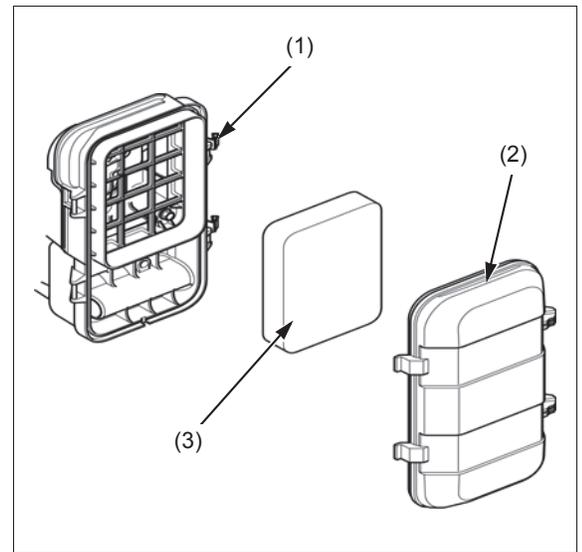
Remove the air cleaner case lid spring (1) and air cleaner cover (2).

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:**

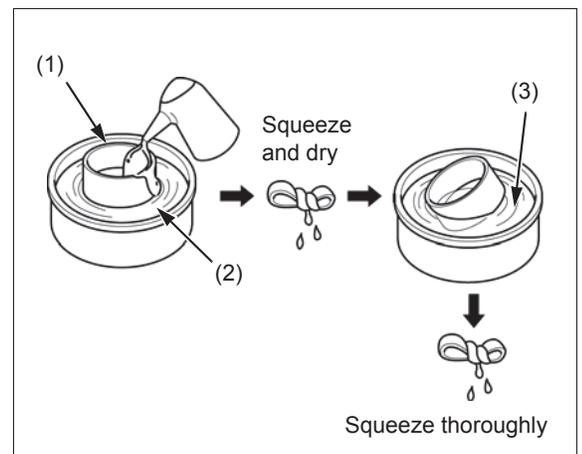
Clean the filter (1) in warm soapy water (2), rinse, and allow to dry thoroughly, or clean with a non-flammable solvent and allow to dry thoroughly.

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.

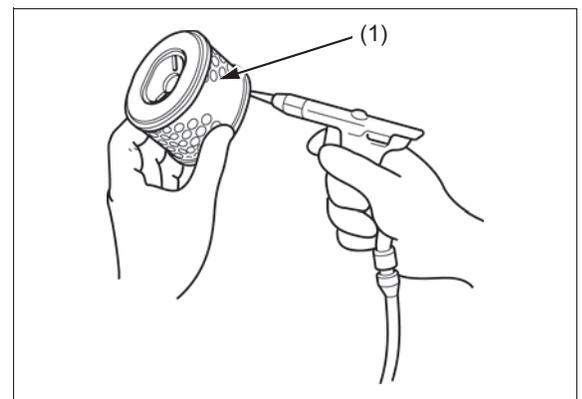
**INNER FILTER (PAPER) TYPE:**

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/cm<sup>2</sup>, 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.

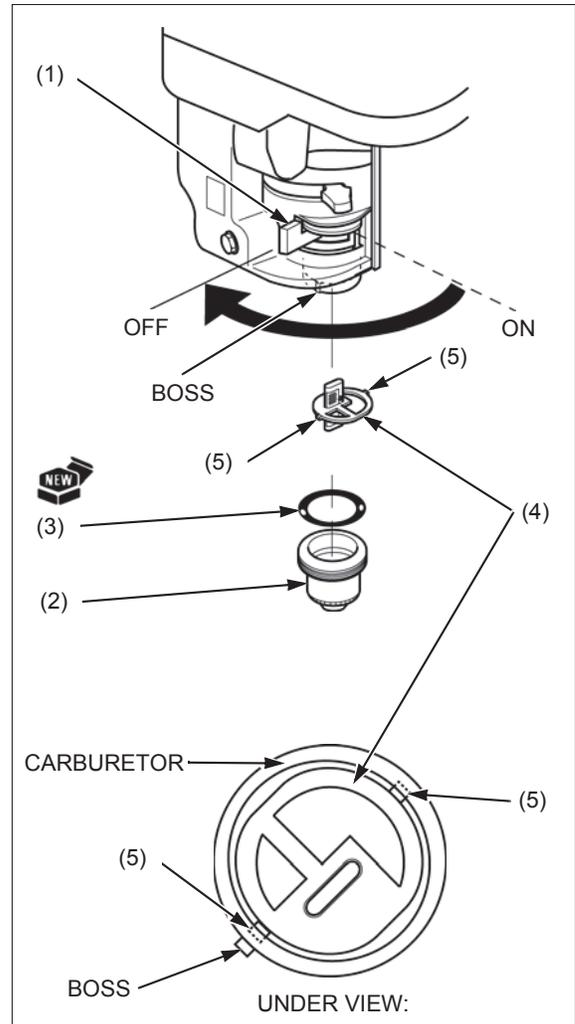
Install the cup filter as the direction shown in the illustration.

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.

ENGINE SERVICE BULLETIN #40 =>

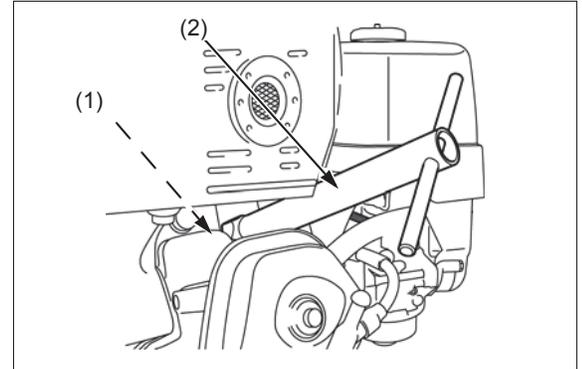


## SPARK PLUG CHECK/ADJUSTMENT

### ⚠ 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).

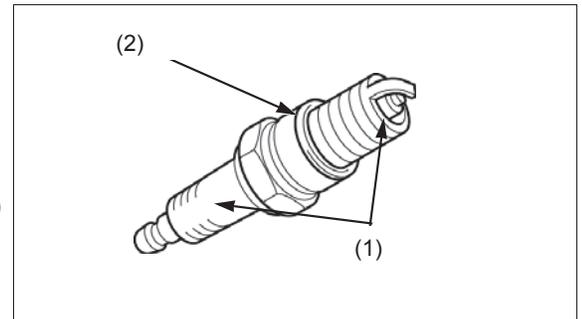


Visually check the spark plug. Replace the plug if it is heavily fouled or the insulator (1) is cracked or chipped.

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.

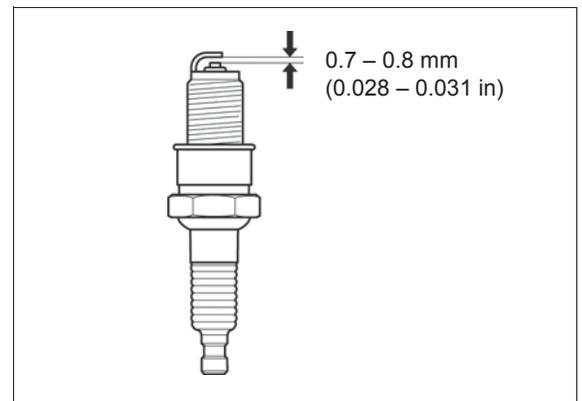
**PLUG GAP: 0.7 – 0.8 mm (0.028 – 0.031 in)**

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](#)).

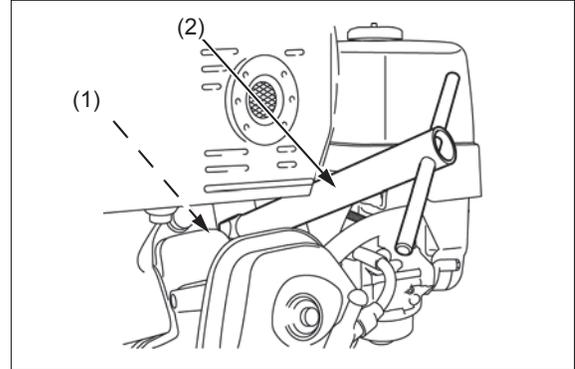
Install a new spark plug finger-tight to seat the washer, and then tighten 1/2 turn with a spark plug wrench.

**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

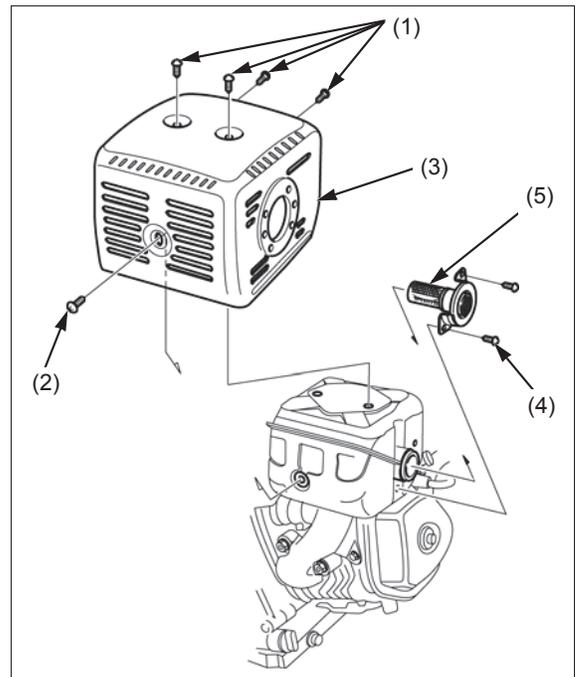
The engine and the muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Allow it to cool before proceeding.

### 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).



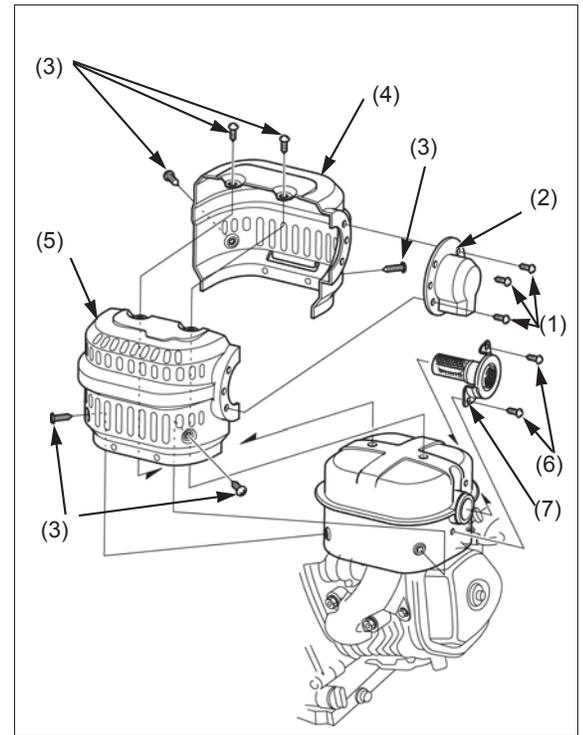
## SEPARATED PROTECTOR TYPE

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

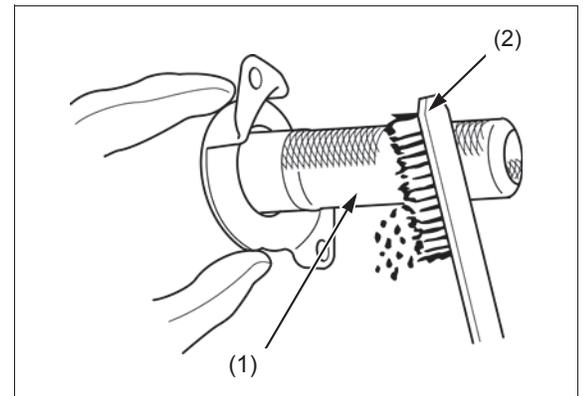
### NOTICE

*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.



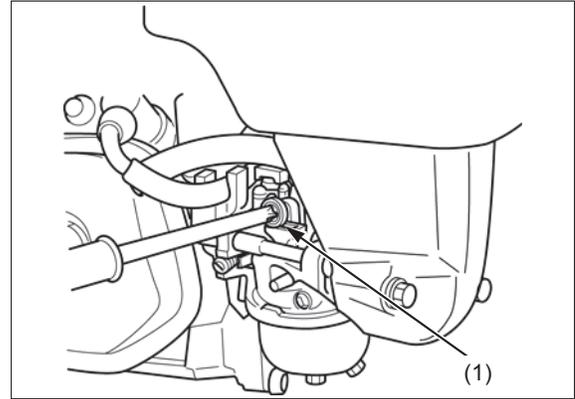
## MAINTENANCE

### 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.

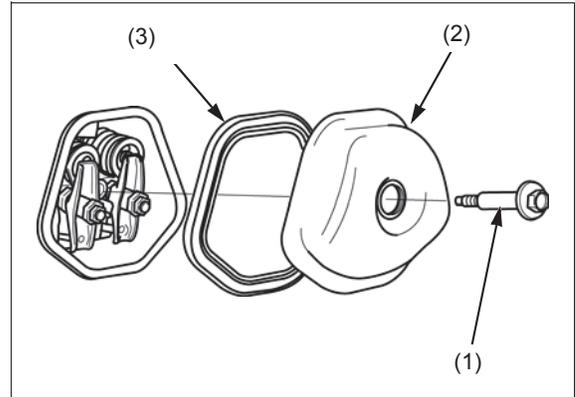
Turn the throttle stop screw (1) to obtain the specified idle speed.

**IDLE SPEED:**  $1,400 \pm 150 \text{ min}^{-1} \text{ (rpm)}$



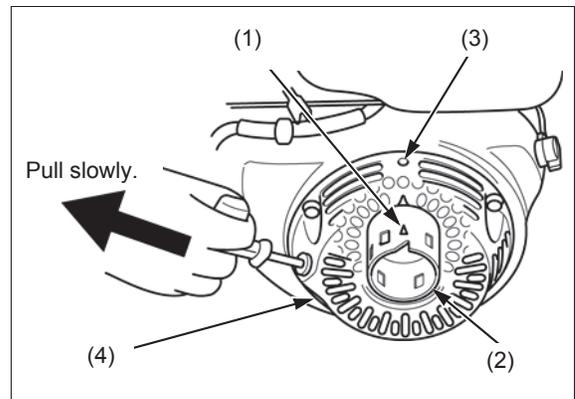
### VALVE CLEARANCE CHECK/ADJUSTMENT

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.

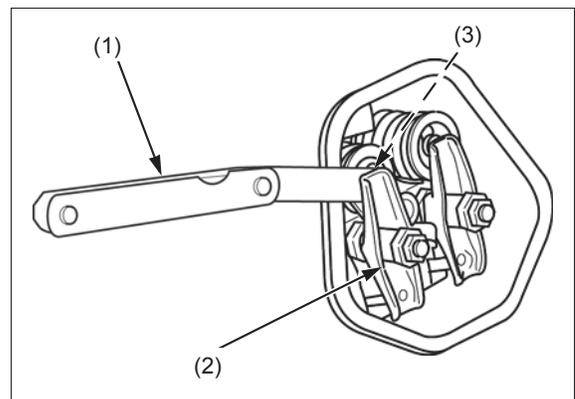
Insert a thickness gauge (1) between the valve rocker arm (2) and valve stem (3) to measure the valve clearance.

**VALVE CLEARANCE:**

**IN:  $0.15 \pm 0.02 \text{ mm}$**

**EX:  $0.20 \pm 0.02 \text{ mm}$**

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:  $0.15 \pm 0.02$  mm**

**EX:  $0.20 \pm 0.02$  mm**

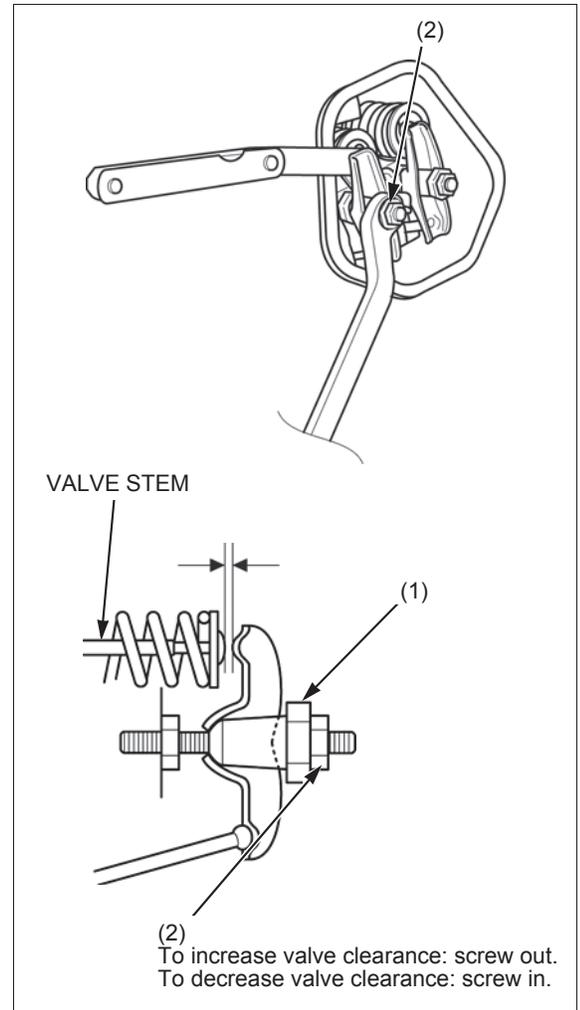
Hold the rocker arm pivot and retighten the pivot adjusting nut to the specified torque.

**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**

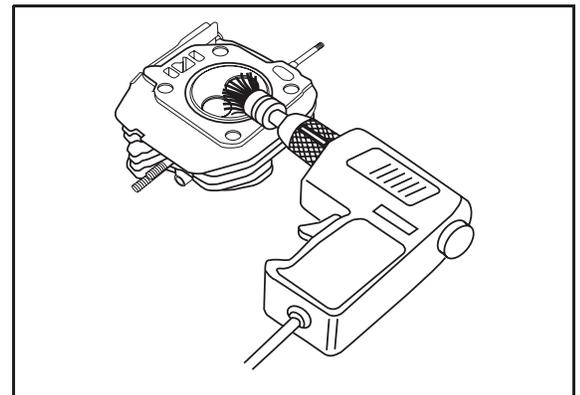
Remove the cylinder head ([page 12-3](#)).

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

#### **⚠ 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.

Drain the fuel into a suitable container.

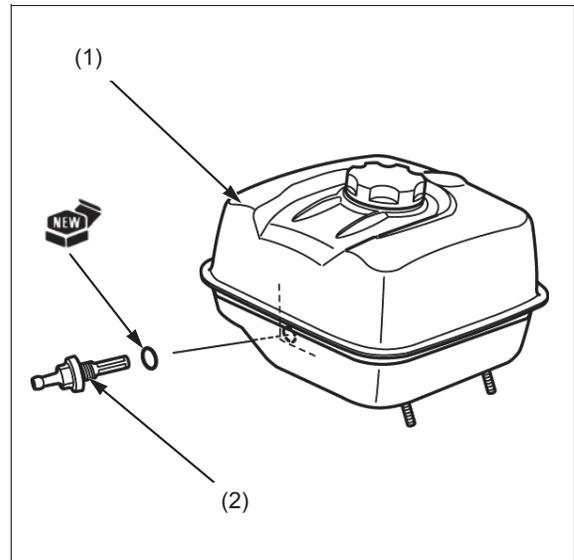
Remove the fuel tank (1) and fuel tank joint (2) ([page 6-3](#)).

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.

**ENGINE SERVICE BULLETIN #40 =>**



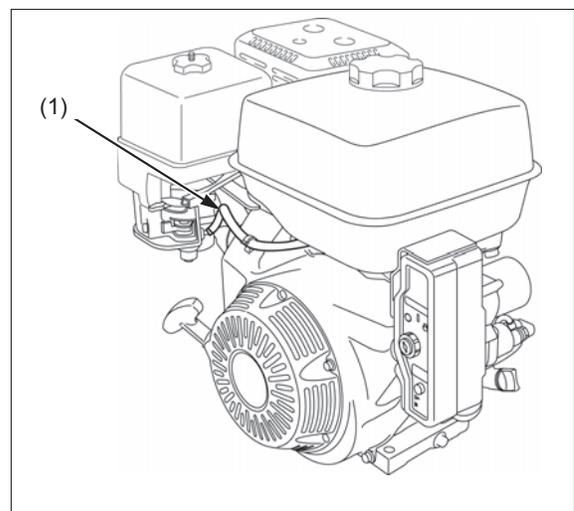
### FUEL TUBE CHECK

#### **⚠ 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.

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



# 4. TROUBLESHOOTING

---

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

## TROUBLESHOOTING

### BEFORE TROUBLESHOOTING

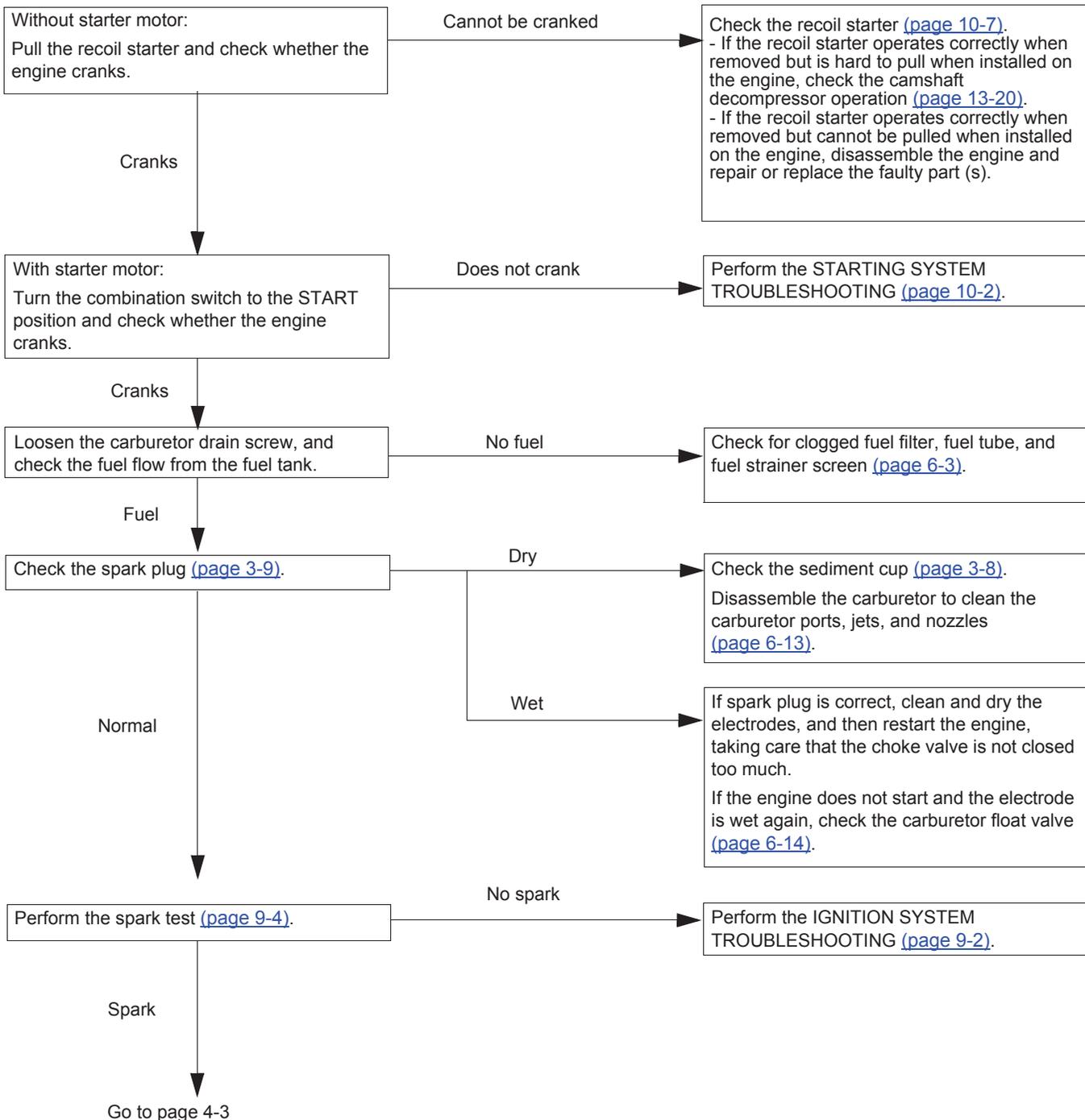
- Use a known-good battery for troubleshooting.
- Check for sufficient **fresh** fuel in the fuel tank.
- Check that the connectors are connected securely.
- Read the circuit tester's operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before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

## TROUBLESHOOTING

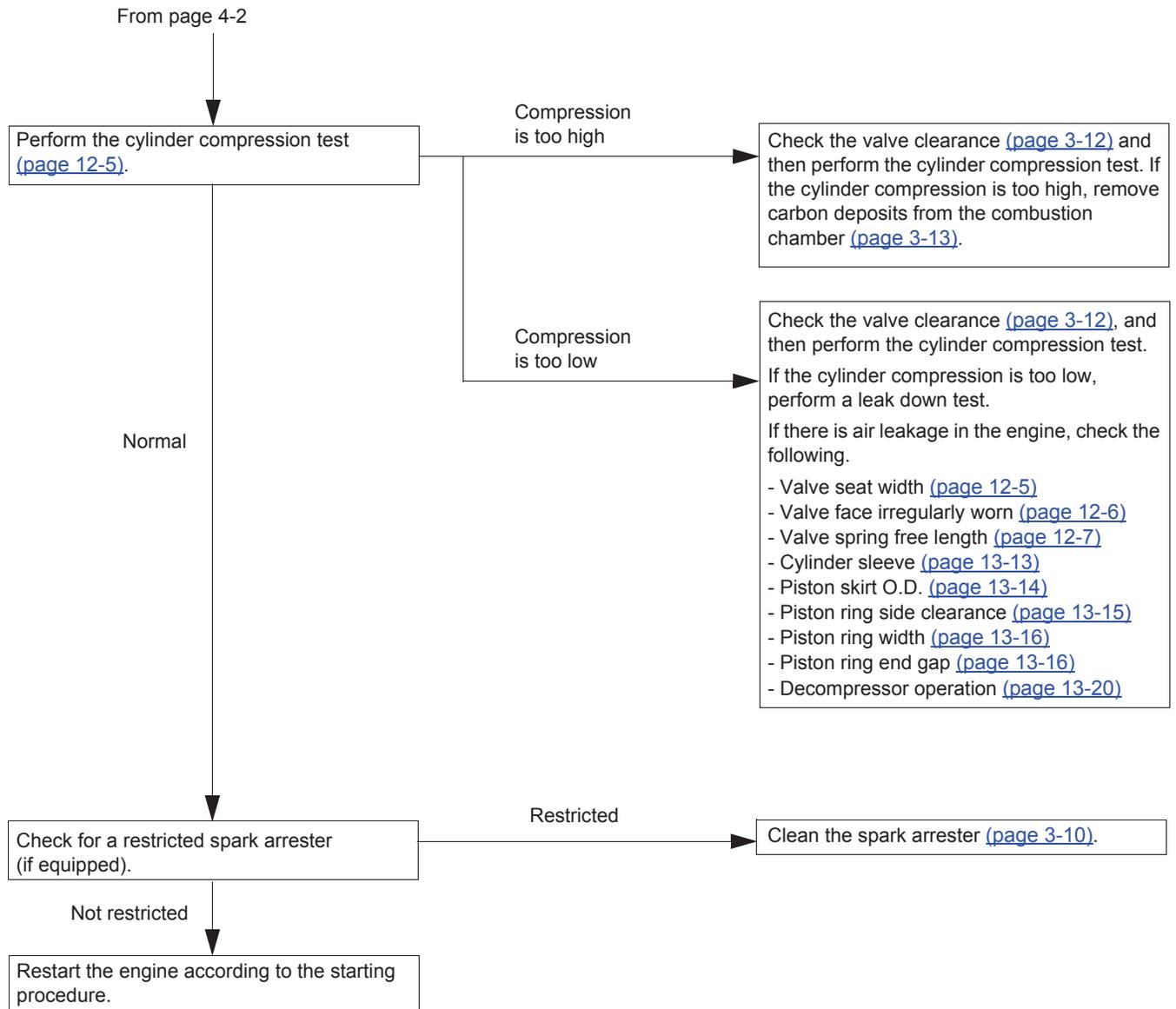
### HARD STARTING

**ENGINE SERVICE BULLETIN #40 =>**

- Check the engine oil level before troubleshooting.

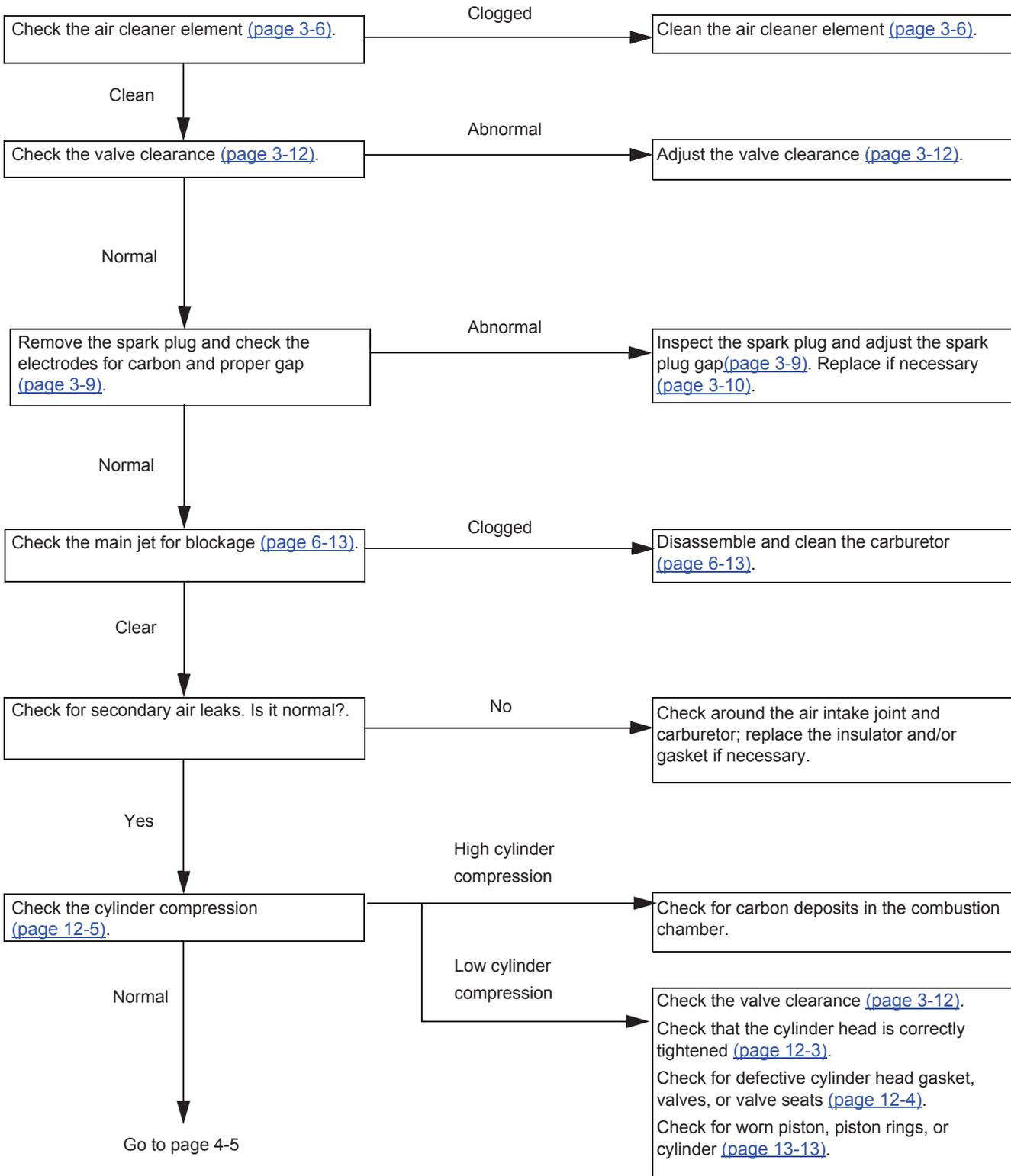


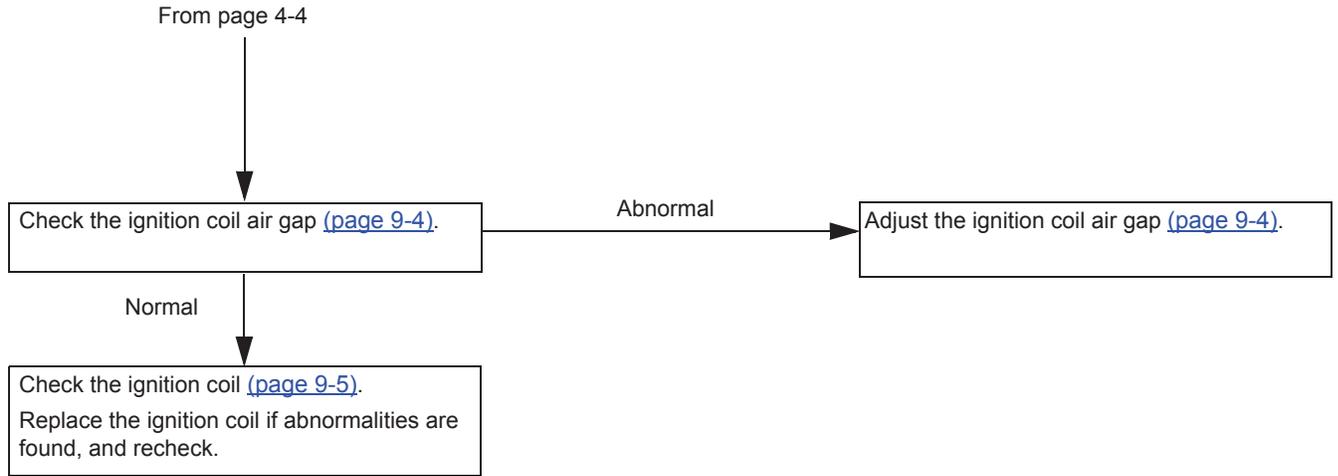
## TROUBLESHOOTING



## TROUBLESHOOTING

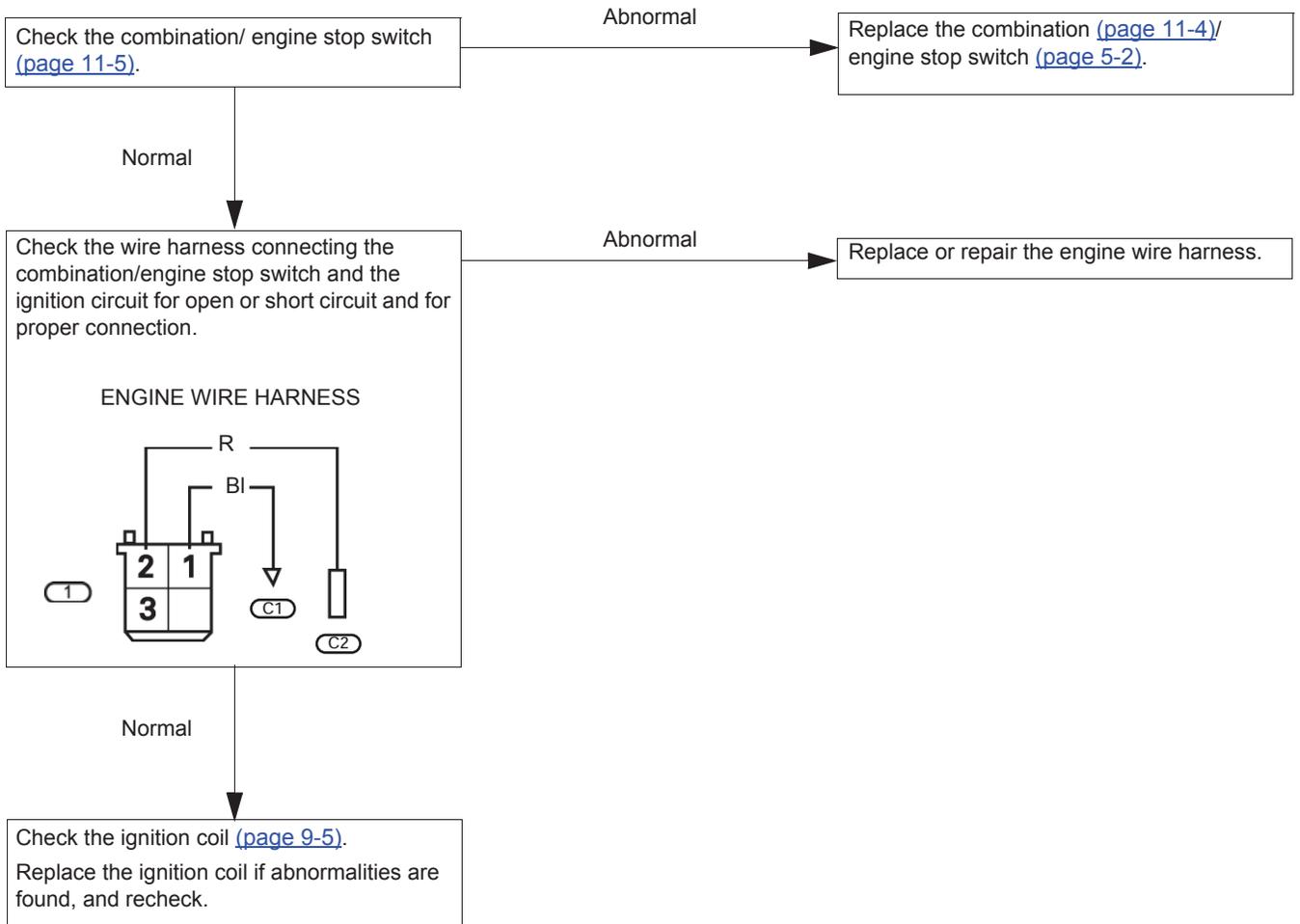
### ENGINE SPEED DOES NOT INCREASE OR STABILIZE





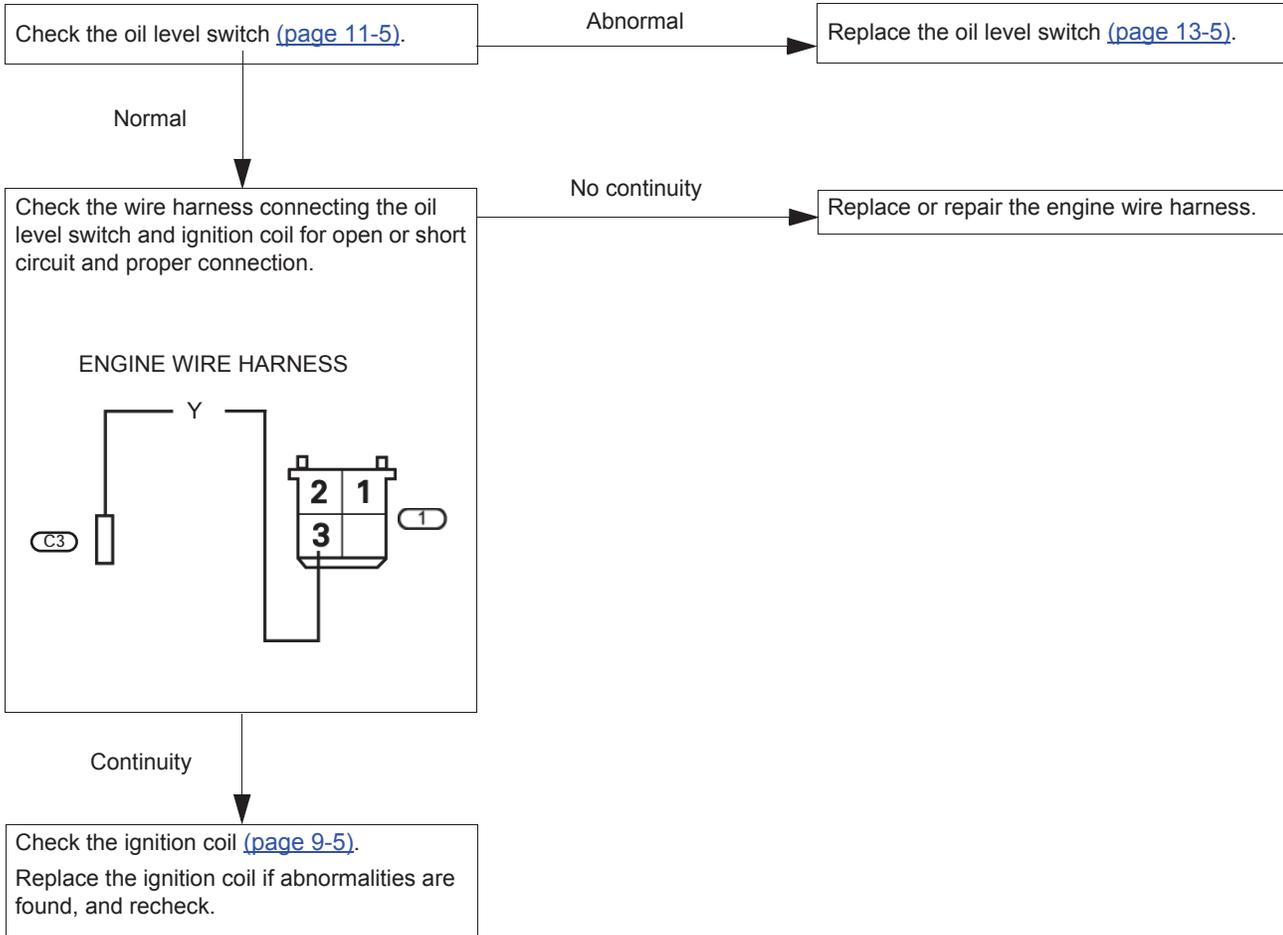
**ENGINE DOES NOT STOP WHEN COMBINATION/  
ENGINE STOP SWITCH IS TURNED OFF**

- Check the engine oil level before troubleshooting.



## TROUBLESHOOTING

### ENGINE DOES NOT STOP WHEN ENGINE OIL LEVEL IS LOW



FAN COVER REMOVAL/INSTALLATION . . 5-2

## COVER

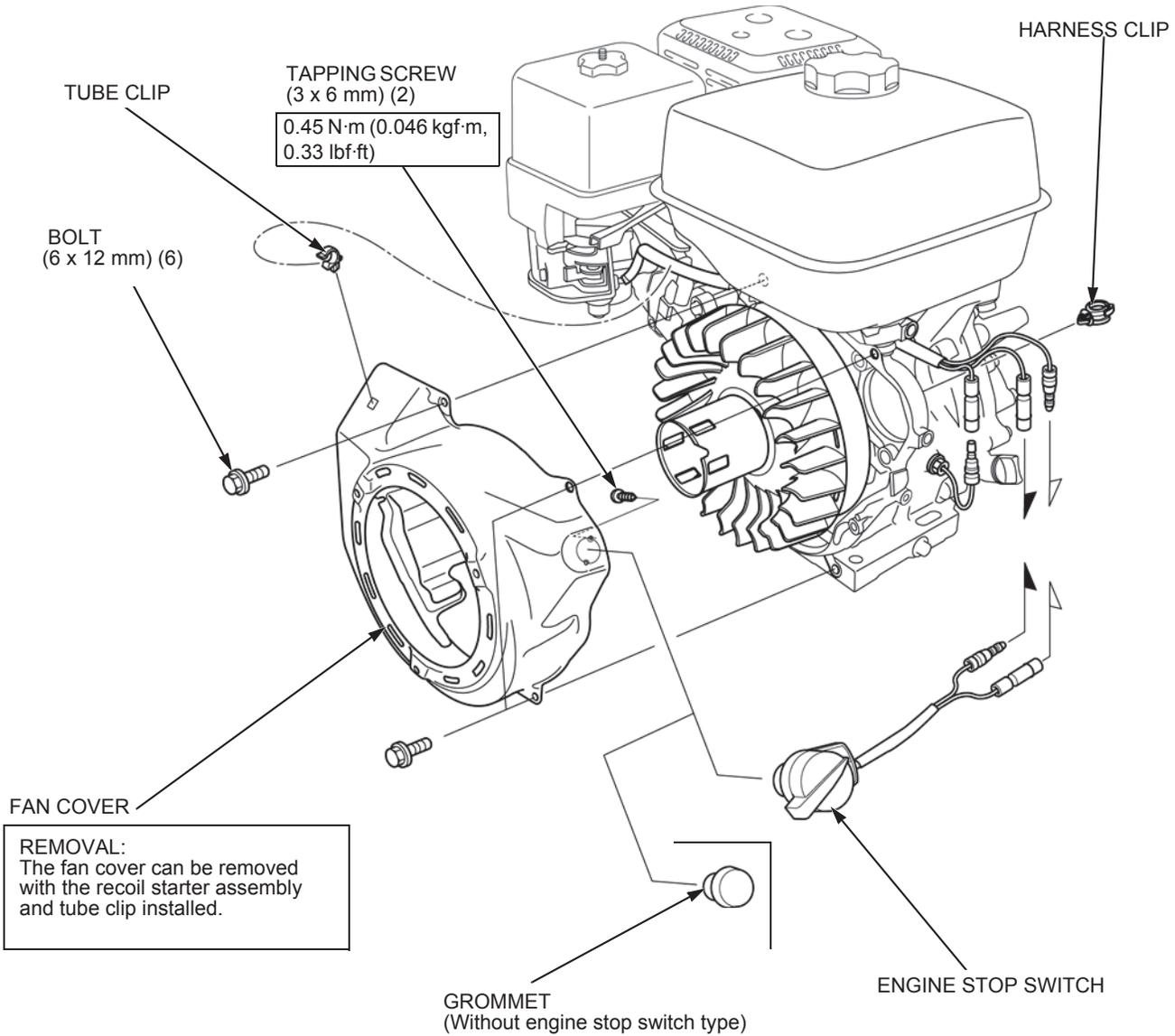
### FAN COVER REMOVAL/INSTALLATION

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](#)).



# 6. FUEL SYSTEM

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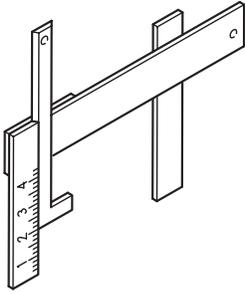
TOOLS .....	6-2	CARBURETOR BODY CLEANING .....	6-13
FUEL TANK REMOVAL/INSTALLATION ..	6-3	CARBURETOR INSPECTION .....	6-13
AIR CLEANER REMOVAL/INSTALLATION .....	6-5	CHOKE DIAPHRAGM INSPECTION .....	6-14
CARBURETOR REMOVAL/INSTALLATION .....	6-8	PILOT SCREW REPLACEMENT .....	6-15
CARBURETOR DISASSEMBLY/ASSEMBLY .....	6-10	CHOKE SET REPLACEMENT .....	6-16
CHOKE DIAPHRAGM DISASSEMBLY/ ASSEMBLY .....	6-12	CYLINDER STUD BOLT REPLACEMENT .....	6-16

## FUEL SYSTEM

---

### TOOLS

Float level gauge  
07401-0010000



# FUEL TANK REMOVAL/INSTALLATION

## ⚠ WARNING

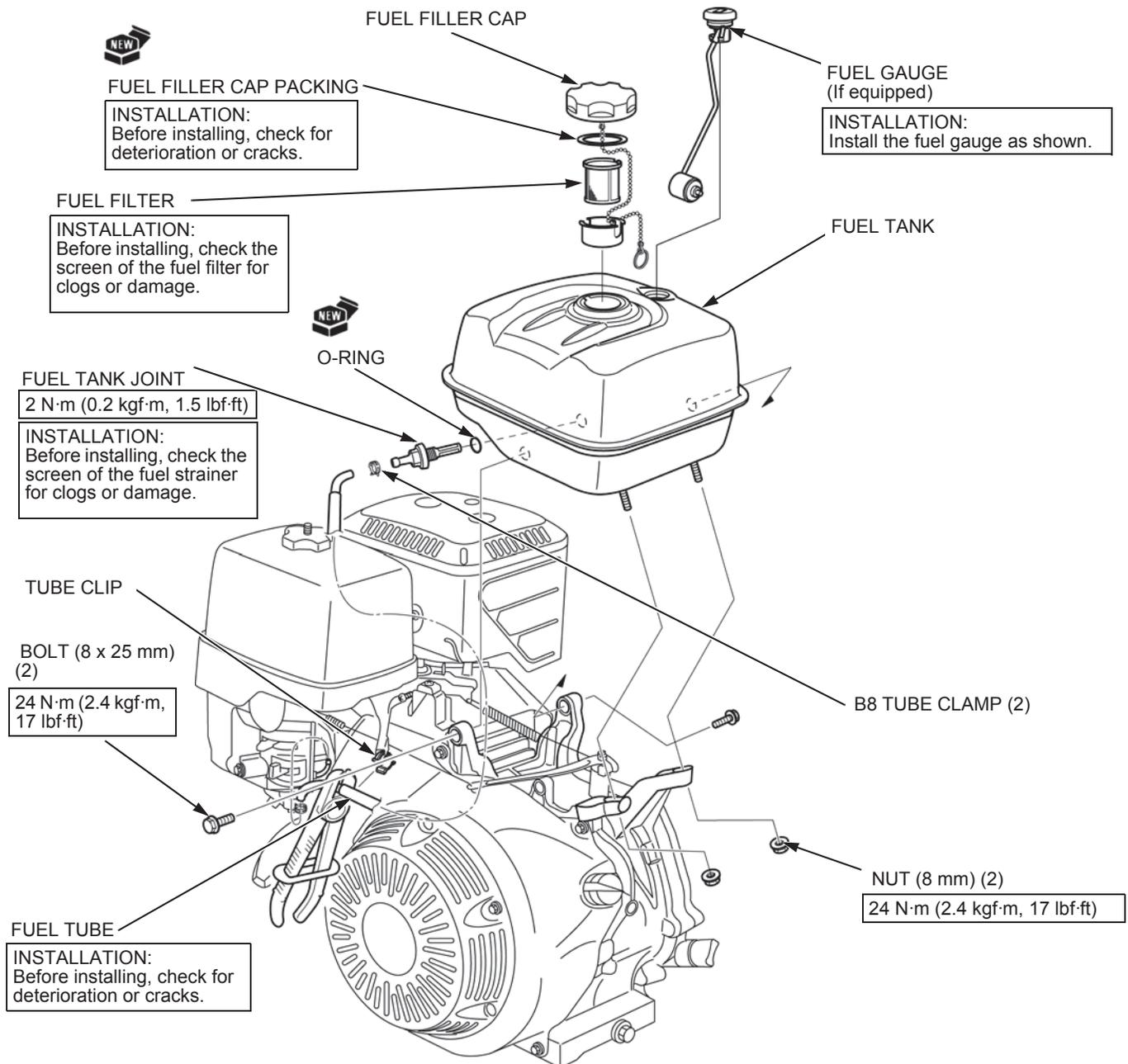
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.

- 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 clip to the fuel tube.

**ENGINE SERVICE BULLETIN #40 =>**



## FUEL SYSTEM

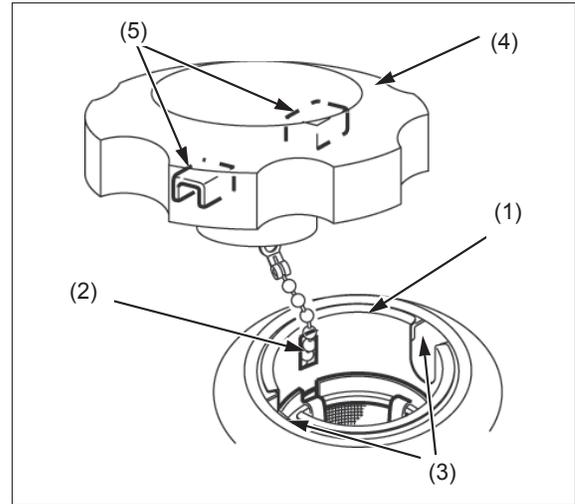
### FUEL FILLER CAP REMOVAL/ INSTALLATION

**ENGINE SERVICE BULLETIN #40 =>**

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.

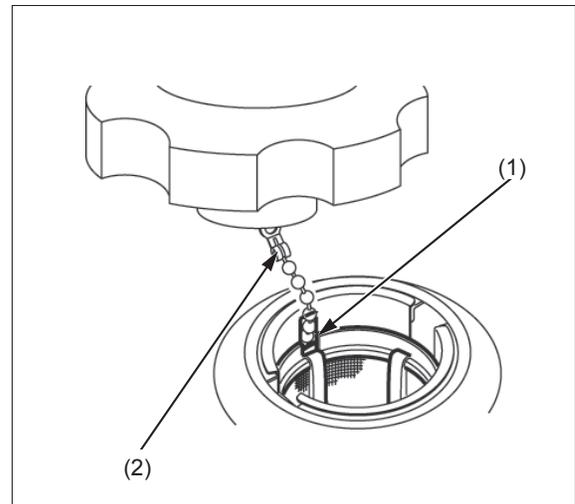
Set the fuel tank cap to the fuel filler neck by aligning the projections (5) of the cap with the cutouts of the fuel filler neck and fuel level gauge, and then turn the fuel tank cap clockwise 180 degrees to lock it.



### 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.

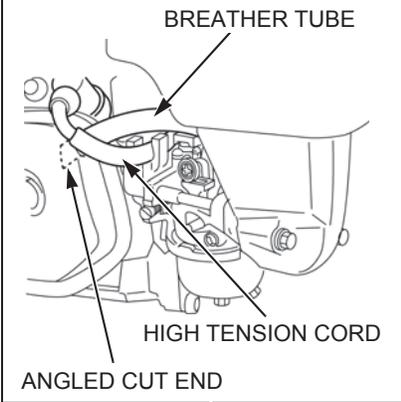


# AIR CLEANER REMOVAL/ INSTALLATION

Dual Element type:

## BREATHER TUBE

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



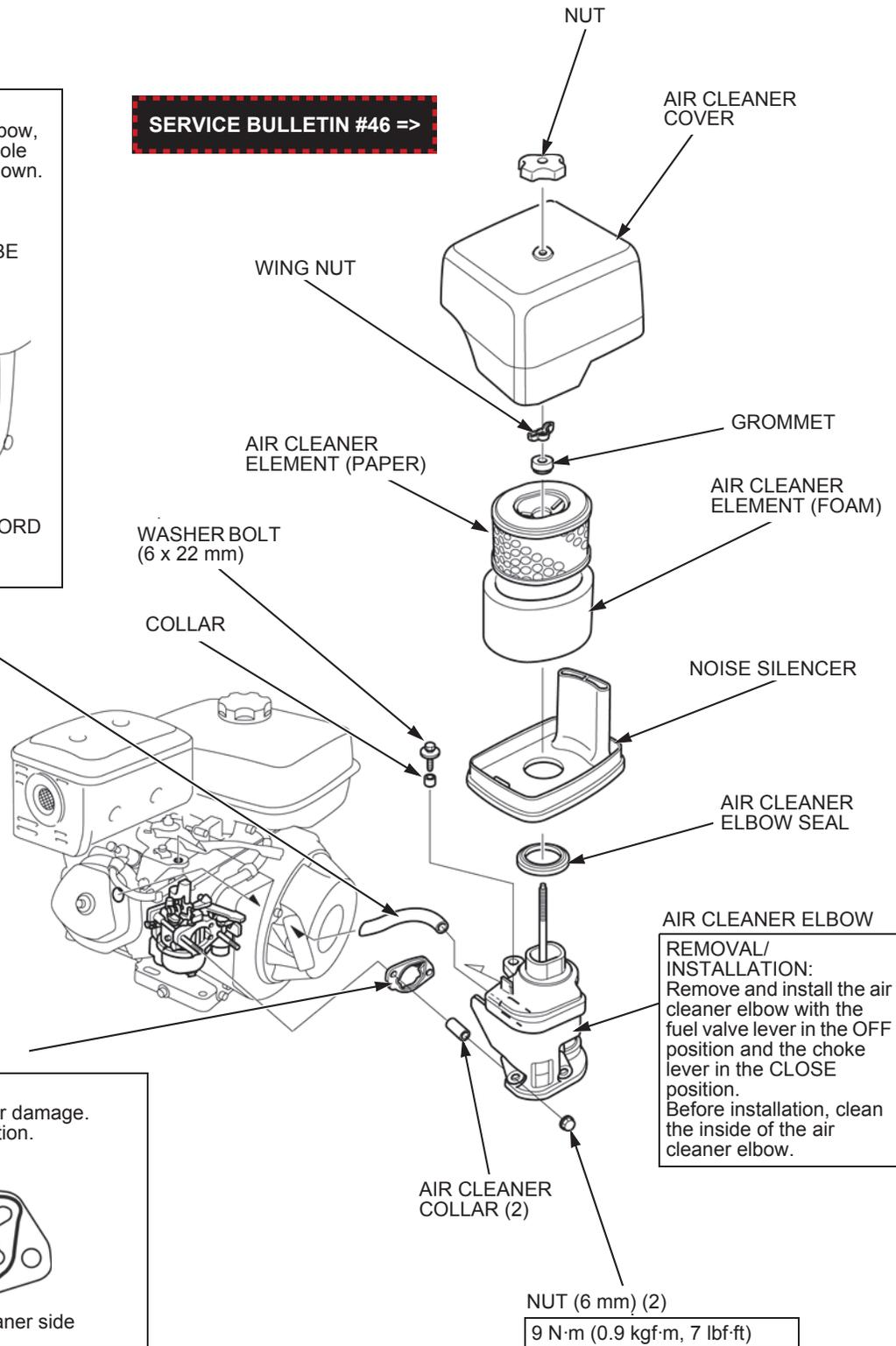
**SERVICE BULLETIN #46 =>**

## CARBURETOR SPACER

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



Viewed from air cleaner side



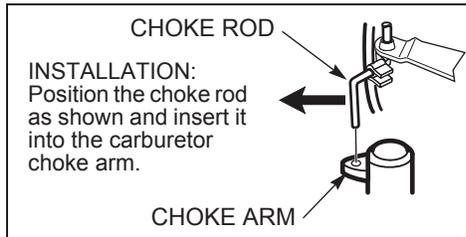
**AIR CLEANER ELBOW**  
**REMOVAL/  
INSTALLATION:**  
Remove and install the air cleaner elbow with the fuel valve lever in the OFF position and the choke lever in the CLOSE position. Before installation, clean the inside of the air cleaner elbow.

NUT (6 mm) (2)  
9 N·m (0.9 kgf·m, 7 lbf·ft)

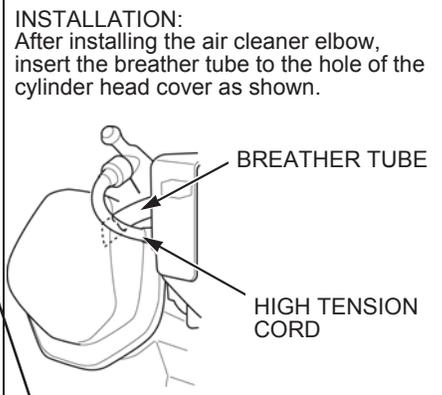


Low profile type:

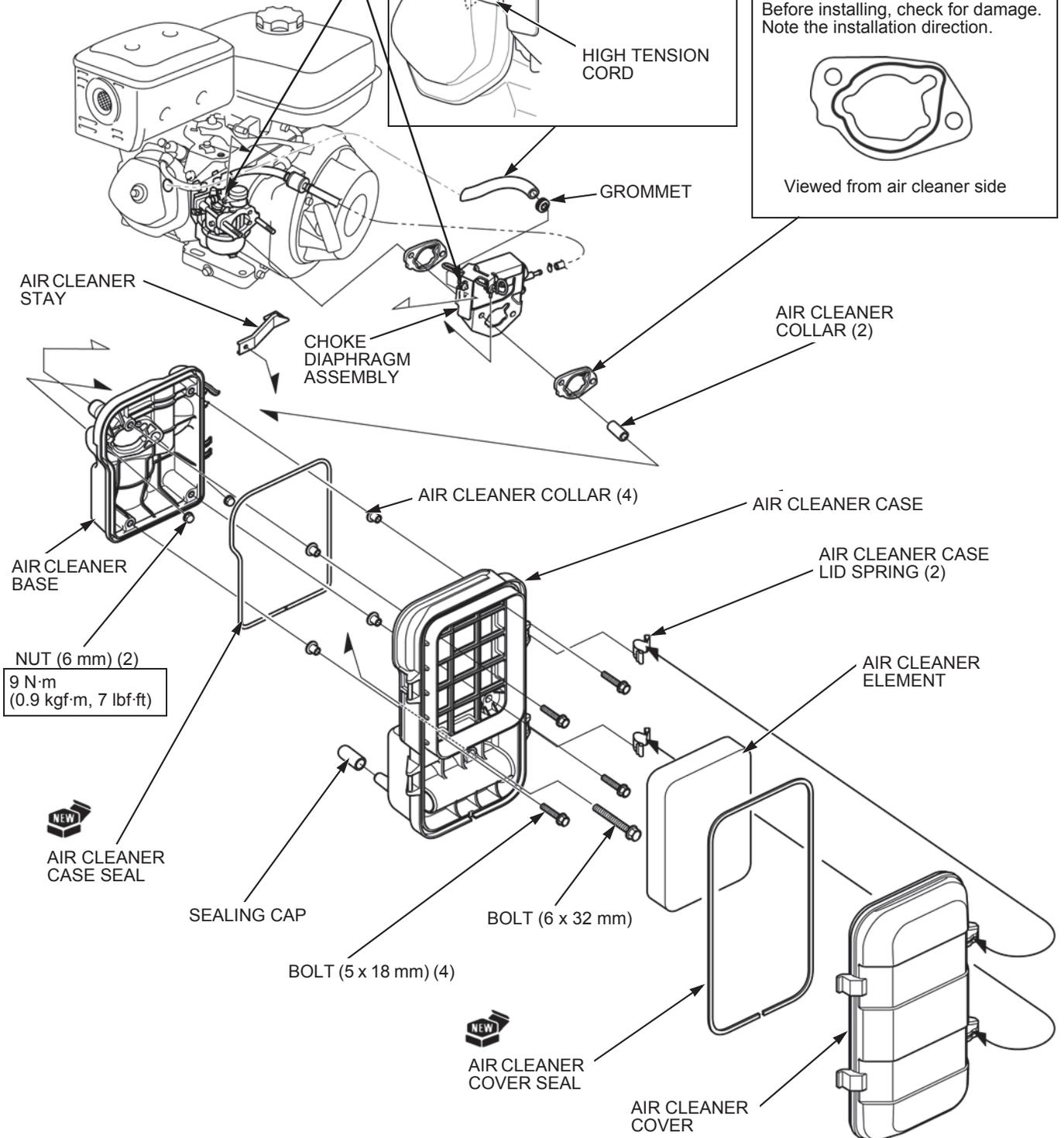
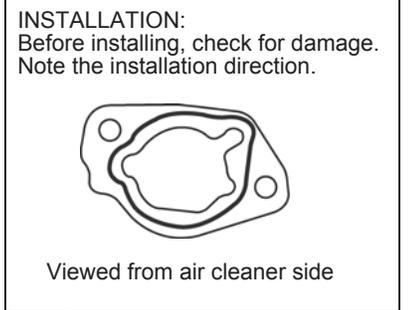
CHOKE ROD



BREATHER TUBE



CARBURETOR SPACER



## 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.

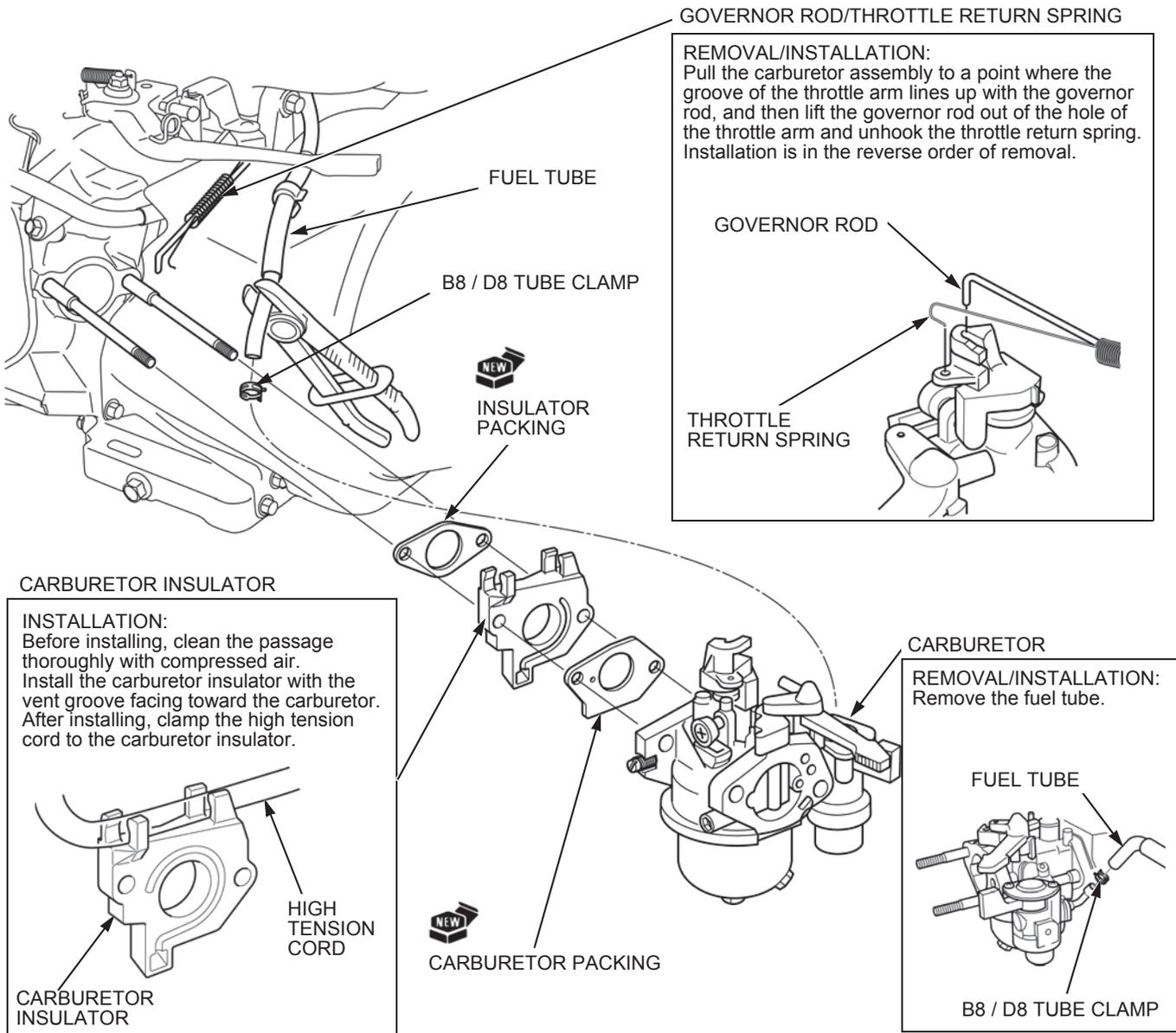
- Keep heat, sparks, and flame away.
- Handle fuel only outdoors.
- Wipe up spills immediately.

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.





## FUEL SYSTEM

# CARBURETOR DISASSEMBLY/ ASSEMBLY

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

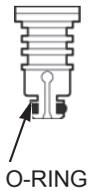
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Remove the carburetor ([page 6-8](#)).

Before disassembly, clean the outside of the carburetor.

#### PILOT JET SET

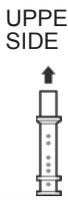
**ASSEMBLY:**  
Before installing, clean thoroughly with low-pressure compressed air. Lightly lubricate the O-ring to ensure easy installation into the



O-RING

#### MAIN NOZZLE

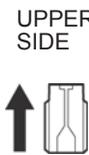
**ASSEMBLY:**  
Before installing, clean thoroughly with low-pressure compressed air.



UPPER SIDE

#### MAIN JET

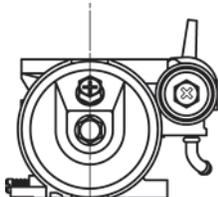
**ASSEMBLY:**  
Before installing, clean thoroughly with low-pressure compressed air.



UPPER SIDE

#### FLOAT CHAMBER

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



#### SET COLLAR



O-RING

THROTTLE STOP SCREW  
ADJUSTMENT: ([page 3-12](#))

PILOT SCREW  
REPLACEMENT  
:([page 6-15](#))

LIMITER CAP

FLOAT

FLOAT PIN



O-RING



SET SCREW GASKET

SET SCREW

PAN SCREW  
(3 x 6 mm) (2)

CHOKE LEVER

LEVER SETTING  
PLATE

VALVE LEVER  
SPRING

FUEL VALVE  
LEVER

FUEL VALVE  
PACKING

SPRING PIN  
(2 x 12 mm)

CUP FILTER

REMOVAL/INSTALLATION:  
([page 3-8](#))



O-RING

SEDIMENT CUP

FLOAT VALVE

FLOAT VALVE SPRING



DRAIN SCREW GASKET

DRAIN SCREW

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**

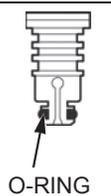
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

Remove the carburetor ([page 6-8](#)).

Before disassembly, clean the outside of the carburetor.

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.



SET COLLAR

THROTTLE STOP SCREW  
ADJUSTMENT: ([page 3-12](#))

PILOT SCREW  
REPLACEMENT: ([page 6-15](#))

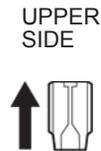
LIMITER CAP



O-RING

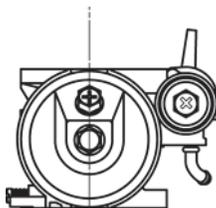
MAIN JET

**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.



DRAIN SCREW



O-RING

MAIN NOZZLE

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



SET BOLT

FLOAT PIN

FLOAT VALVE

FLOAT VALVE SPRING

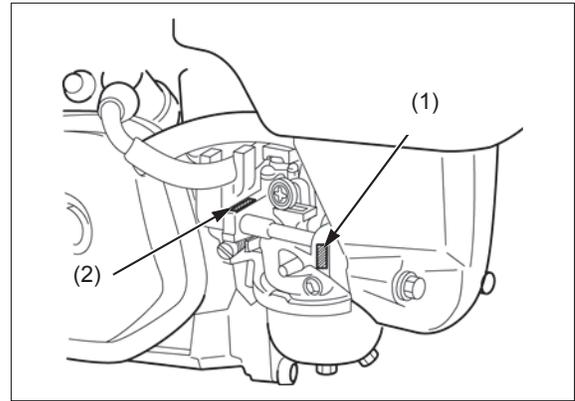
FLOAT

**ASSEMBLY:**  
Check for smooth movement after installation.

## FUEL SYSTEM

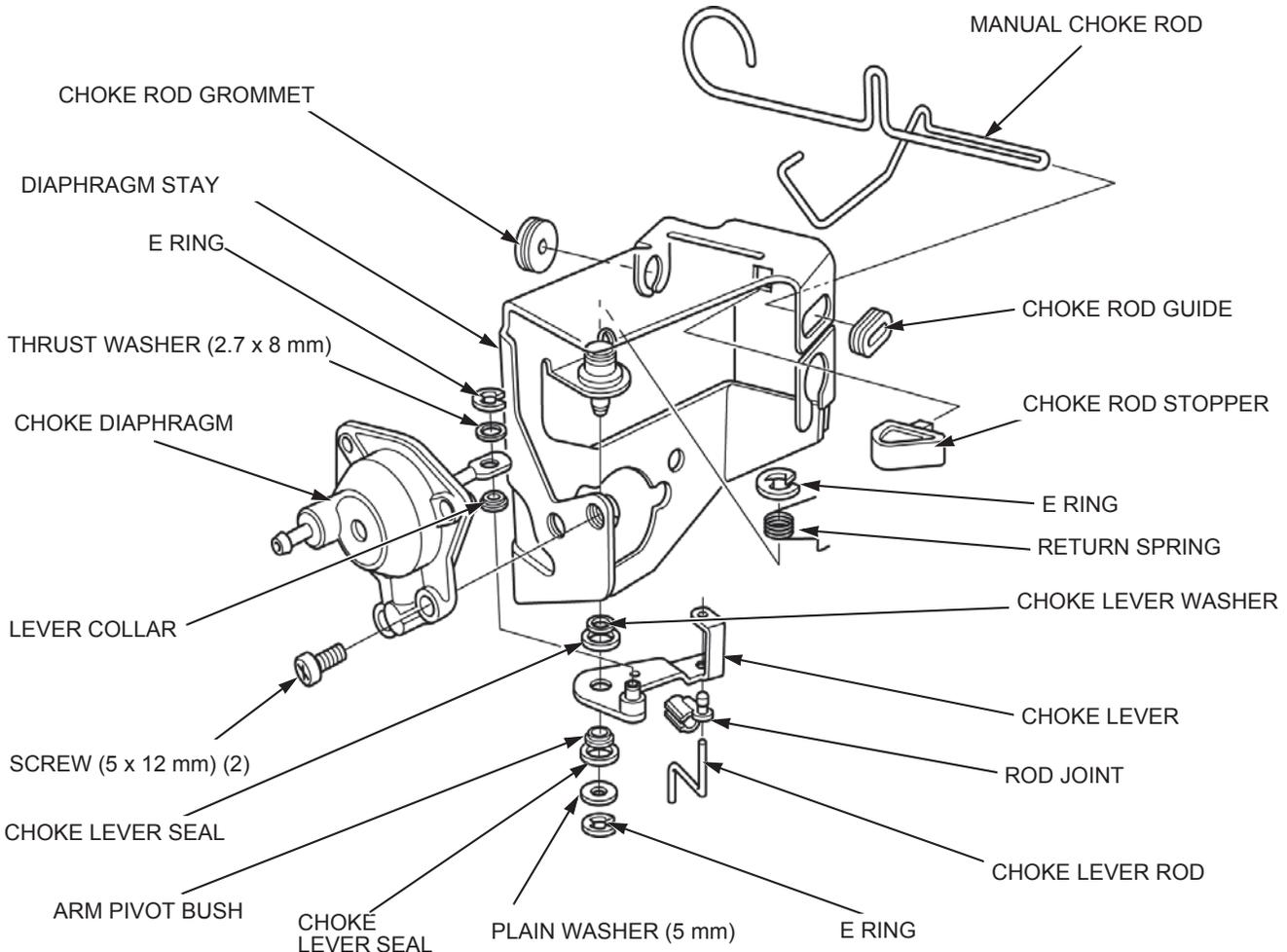
### Main jet number

Carburetor identification Number (1) + (2)	Main Jet Number
BE21J A	# 88
BE70R A	# 85
BE71F A	# 85
BE80N A	# 98
BE80M A	# 98
BE80P A	# 98
BE84A A	# 100
BE84B A	# 100
BE84C A	# 100
BE84D A	# 105
BE88A A	# 88
BE88B A	# 88
BE89C A	# 88
BE88F A	# 88
BE88G A	# 88
BE88J A	# 88
BE89Y A	# 100
BE89Z A	# 105
BE94E A	# 108
BE94F A	# 108



## CHOKE DIAPHRAGM DISASSEMBLY/ASSEMBLY

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



## CARBURETOR BODY CLEANING

### ⚠ CAUTION

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

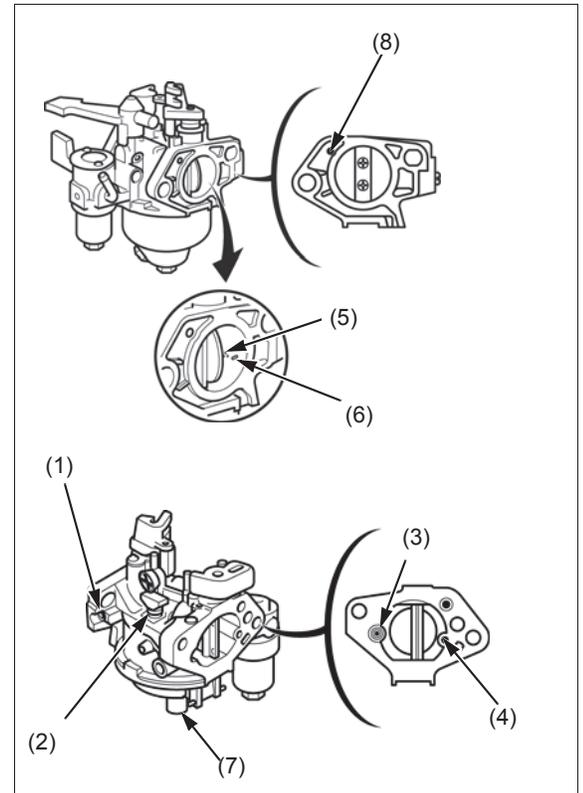
### NOTICE

- 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.

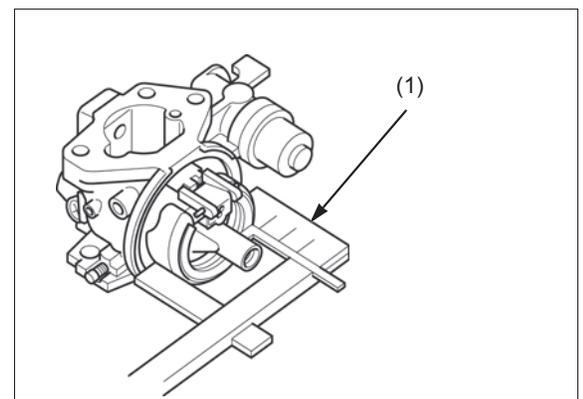
#### TOOL:

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](#)).



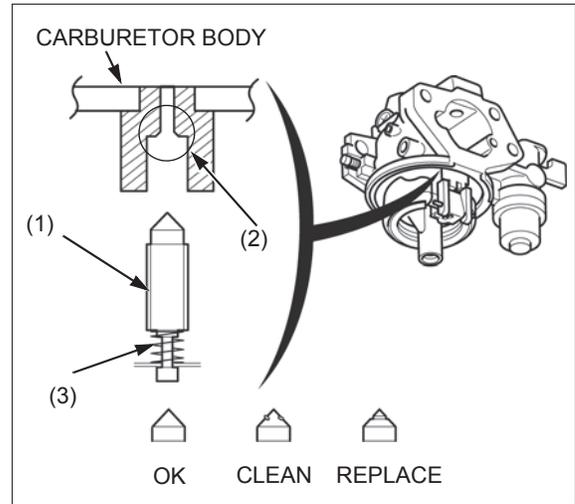
## FUEL SYSTEM

### 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.

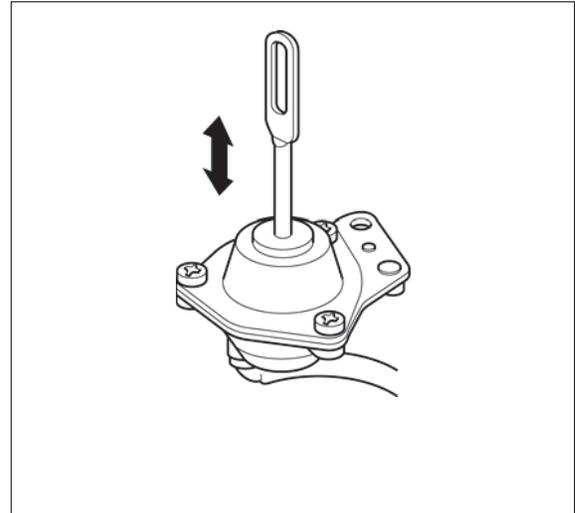


### CHOKE DIAPHRAGM INSPECTION

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.

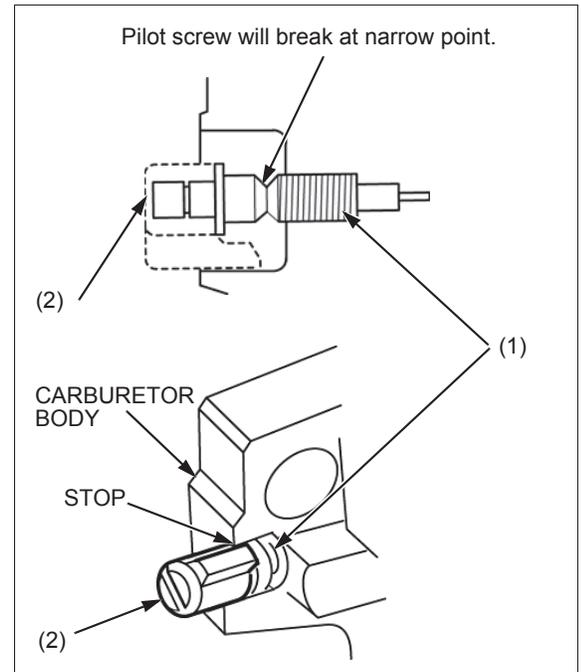
Place the spring on the replacement pilot screw, and install it on the carburetor.

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

Model	Carburetor identification Number (3) + (4)	Pilot screw opening
GX240	BE70R A	1
	BE71F A	1
GX270	BE21J A	2
GX340	BE80N A	1 - 3/4
	BE80M A	1 - 3/4
	BE80P A	1 - 3/4
GX390	BE21J A	2
	BE84A A	2 - 1/8
	BE84B A	2 - 1/8
	BE84C A	2 - 1/8
	BE84D A	1 - 1/2
	BE88A A	1 - 7/8
	BE88B A	1 - 7/8
	BE89C A	1 - 7/8
	BE88F A	1 - 7/8
	BE88G A	1 - 7/8
	BE88J A	1 - 7/8
	BE89Y A	2 - 1/8
	BE89Z A	1 - 1/2
	BE94E A	1 - 5/8
	BE94F A	1 - 5/8

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

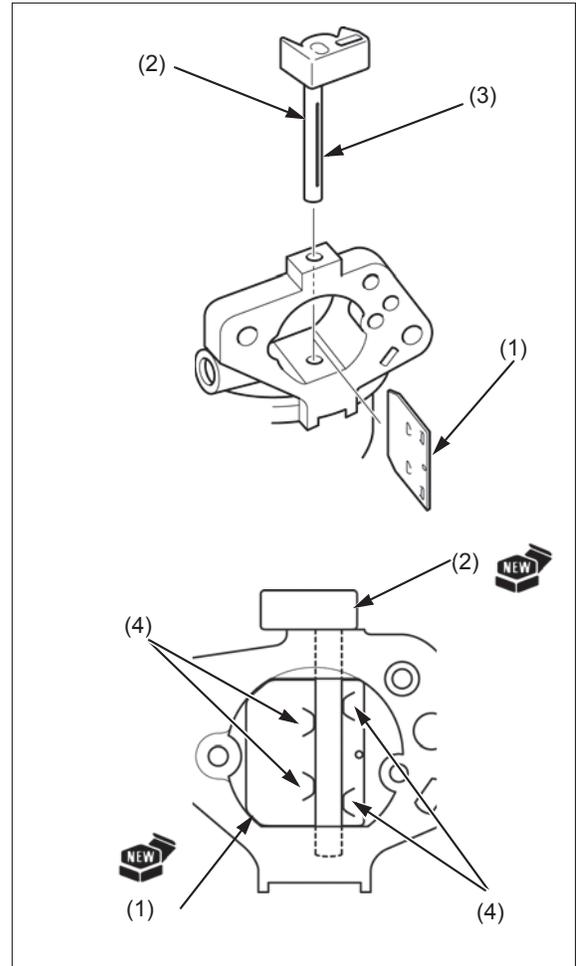
Remove the carburetor ([page 6-8](#)).

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

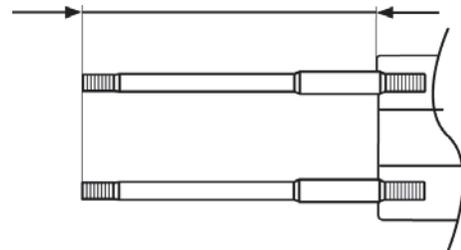
Thread two nuts onto the stud bolt and tighten them together, and then use a wrench to turn the stud bolt out.

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)

STUD BOLT (8 x 98):	82.0 mm (3.90 in)
STUD BOLT (8 x 106):	90.0 mm (3.90 in)
STUD BOLT (8 x 115):	99.0 mm (4.55 in)
STUD BOLT (8 x 123):	107.0 mm (3.90 in)
STUD BOLT (8 x 131.5):	115.5 mm (4.55 in)



# 7. GOVERNOR SYSTEM

---

## GOVERNOR ARM/CONTROL BASE ASSY. REMOVAL/INSTALLATION

MANUAL OPERATION TYPE . . . . . 7-2

FIXED THROTTLE OPERATION TYPE. 7-3

## AUTO THROTTLE (IF EQUIPPED) REMOVAL/ INSTALLATION

GX240•GX270. . . . . 7-4

GX340•GX390. . . . . 7-5

## CONTROL BASE ASSY. DISASSEMBLY/ ASSEMBLY

MANUAL OPERATION TYPE . . . . . 7-6

REMOTE LEVER A TYPE . . . . . 7-7

REMOTE LEVER B TYPE . . . . . 7-7

MAXIMUM SPEED ADJUSTMENT . . . . . 7-8

SOLENOID (AUTO THROTTLE)  
INSPECTION . . . . . 7-10

## GOVERNOR SYSTEM

# GOVERNOR ARM/CONTROL BASE ASSY. REMOVAL/INSTALLATION

### MANUAL OPERATION TYPE

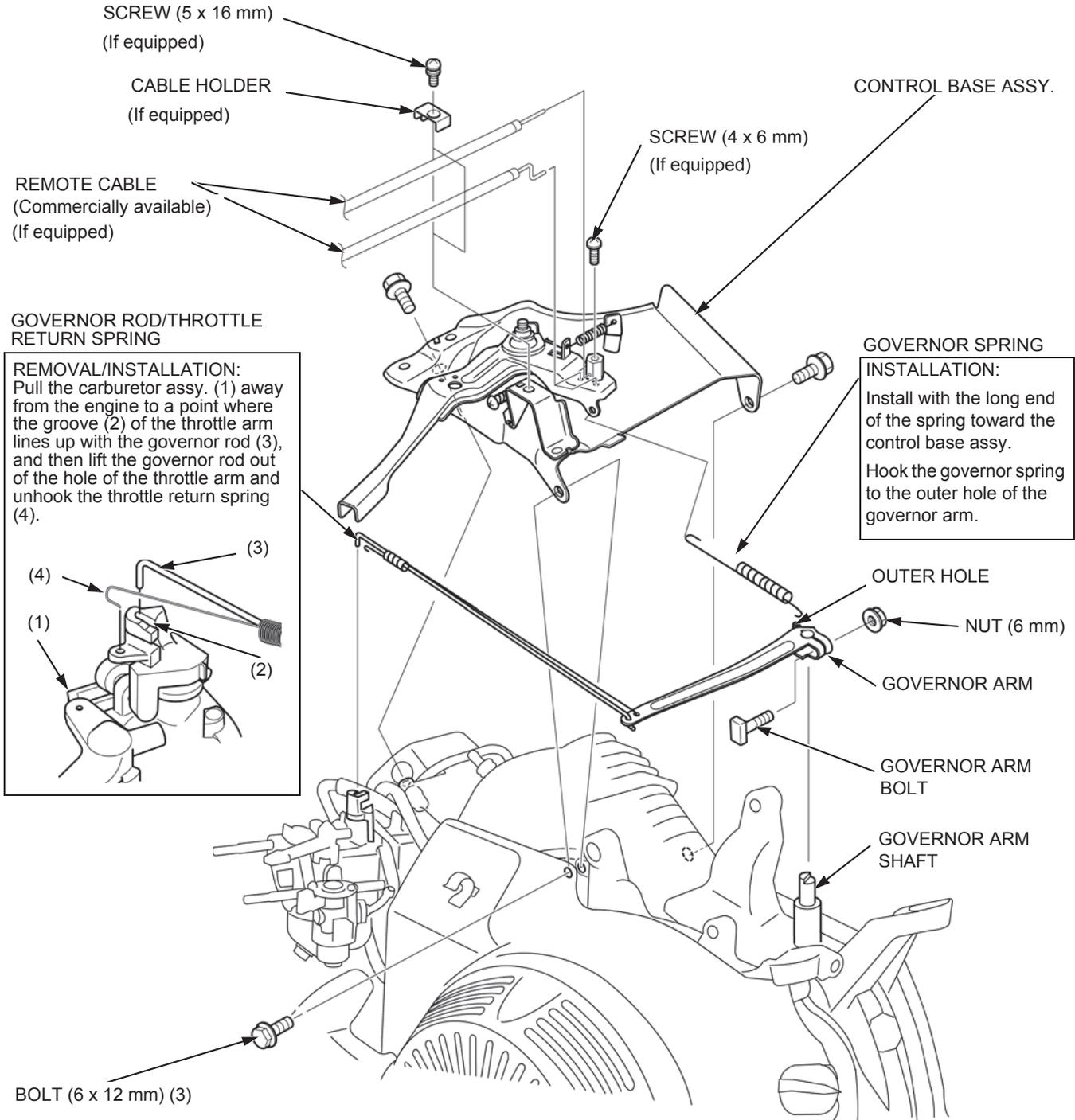
Remove the following parts.

- 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](#)).

**SERVICE BULLETIN #47 =>**



# GOVERNOR SYSTEM

## FIXED THROTTLE OPERATION TYPE

Remove the following parts.

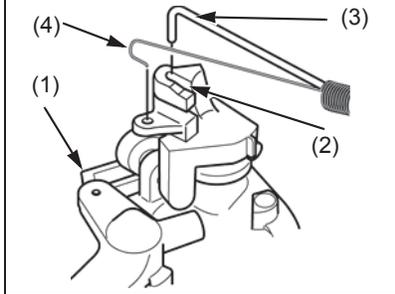
- Air cleaner (page 6-5)
- Muffler (page 14-2)
- Fuel tank (page 6-3)
- Tube clamp (page 6-8) (If equipped)

Installation is in the reverse of removal.

Adjust the maximum speed (page 7-8).

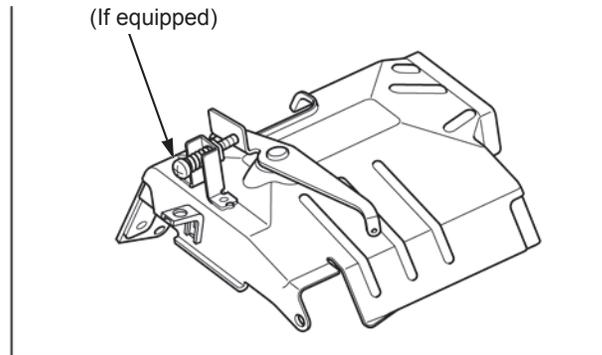
### GOVERNOR ROD/THROTTLE RETURN SPRING

**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).



**SERVICE BULLETIN #47 =>**

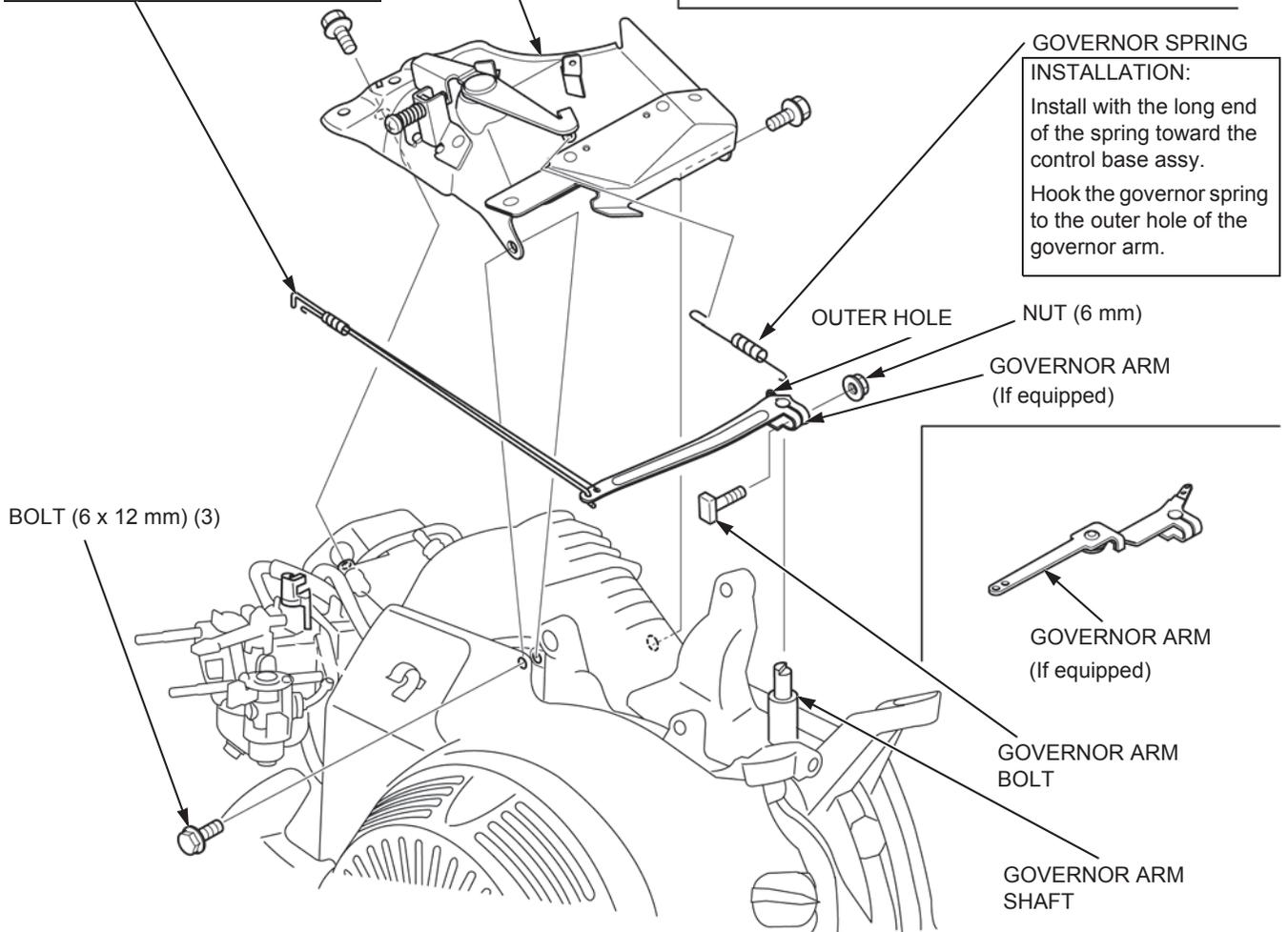
CONTROL BASE ASSY.  
(If equipped)



CONTROL BASE ASSY.  
(If equipped)

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.



OUTER HOLE NUT (6 mm)

GOVERNOR ARM  
(If equipped)

BOLT (6 x 12 mm) (3)

GOVERNOR ARM  
(If equipped)

GOVERNOR ARM  
BOLT

GOVERNOR ARM  
SHAFT

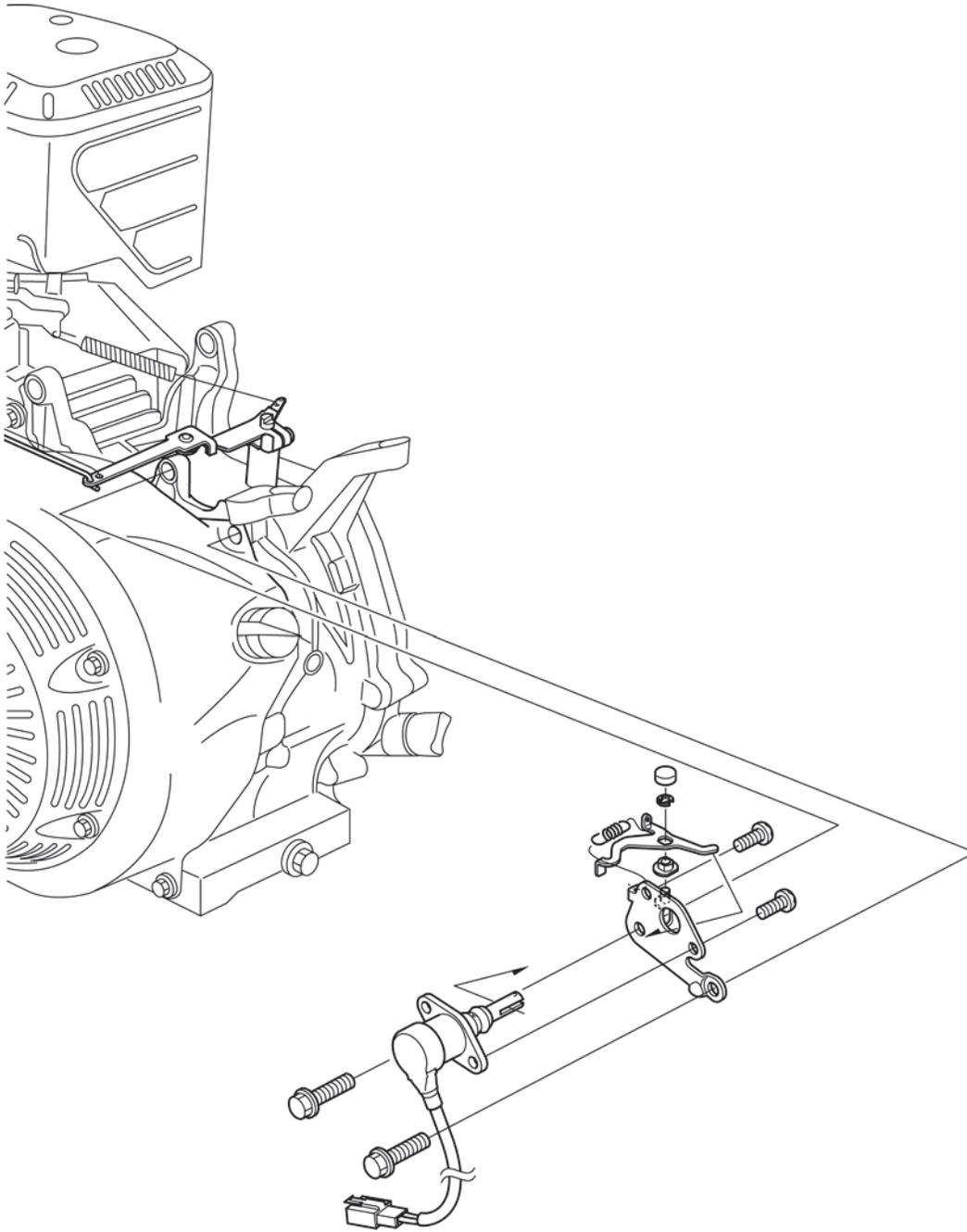
## GOVERNOR SYSTEM

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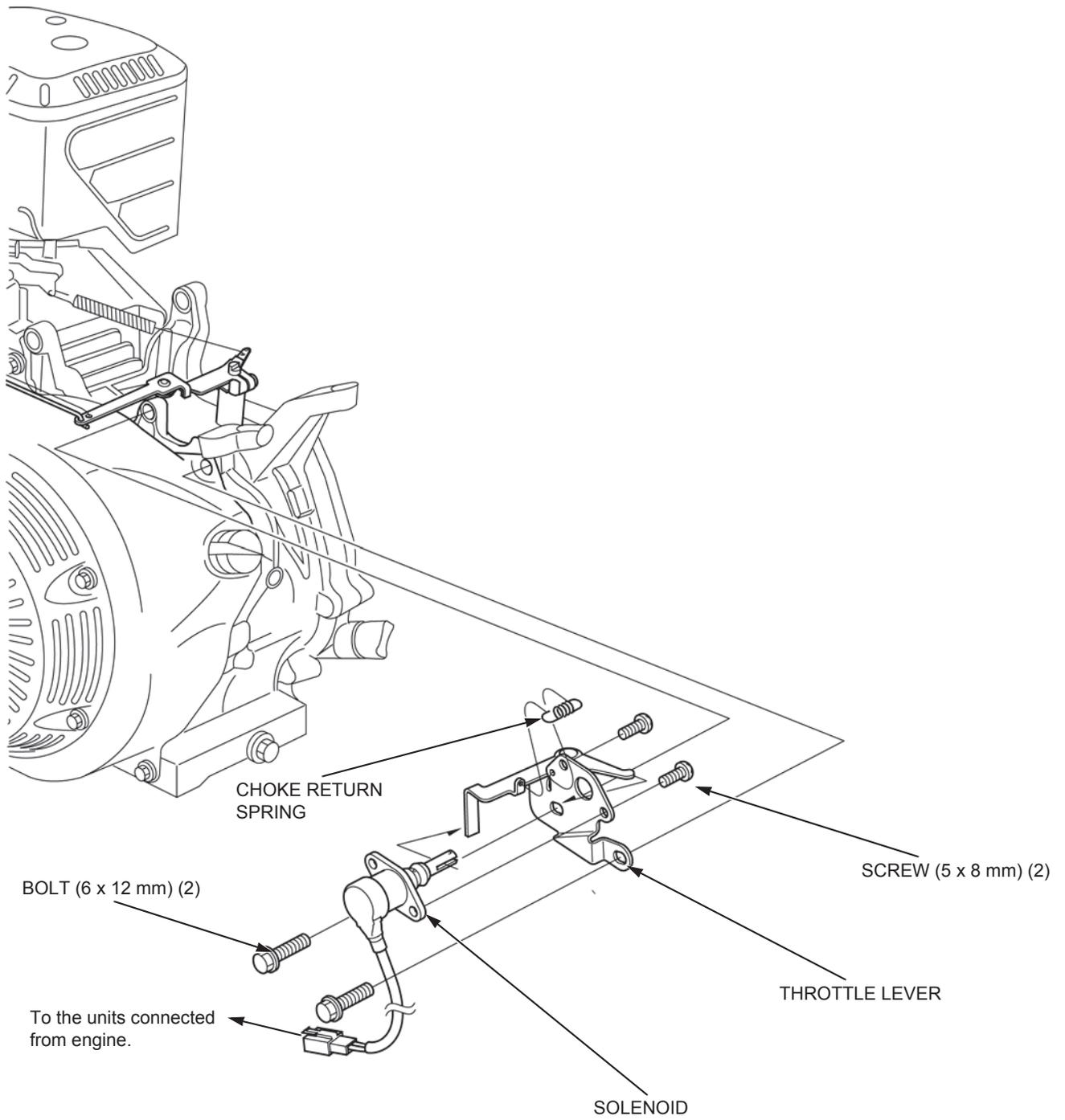
# AUTO THROTTLE (IF EQUIPPED) REMOVAL/INSTALLATION

Remove the fuel tank ([page 6-3](#)).

**GX240•GX270**



**GX340•GX390**

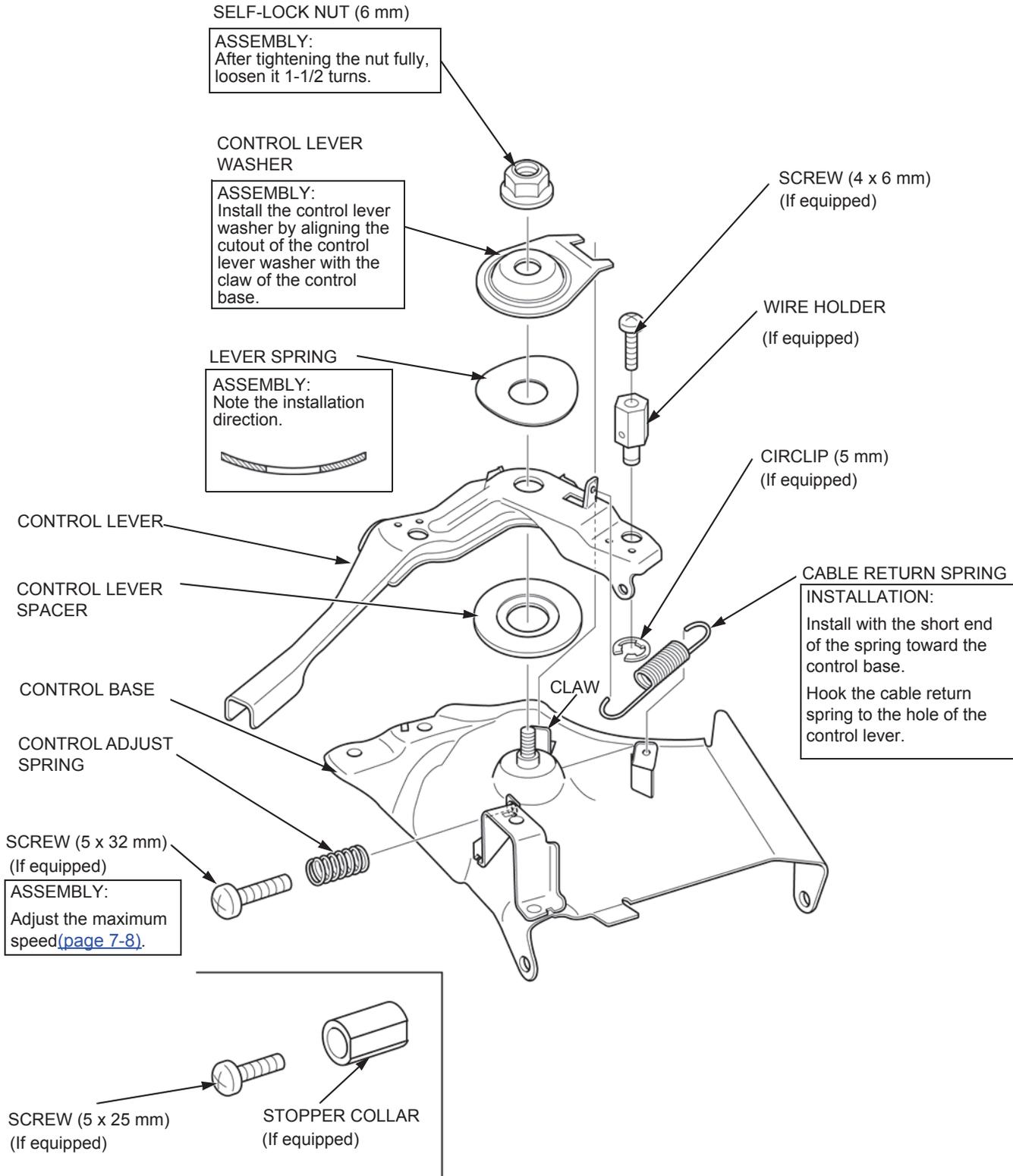


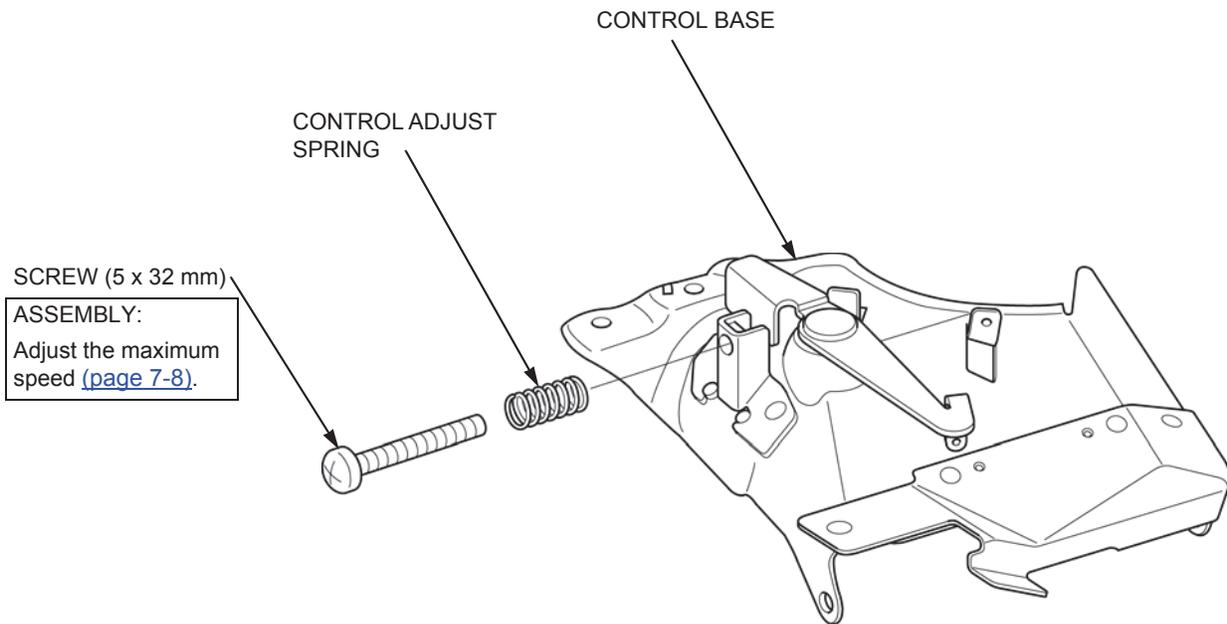
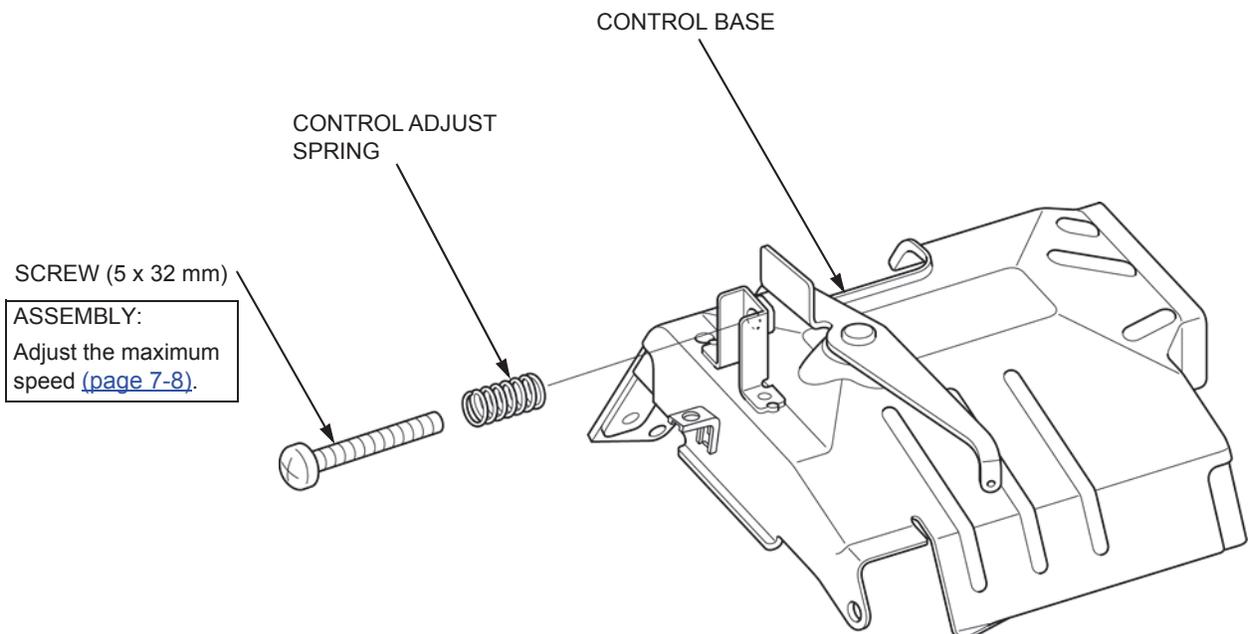
## GOVERNOR SYSTEM

# CONTROL BASE ASSY. DISASSEMBLY/ASSEMBLY

### MANUAL OPERATION TYPE

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



**REMOTE LEVER A TYPE**Remove the control base assy ([page 7-2](#)).**REMOTE LEVER B TYPE**Remove the control base assy ([page 7-2](#)).

## 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.

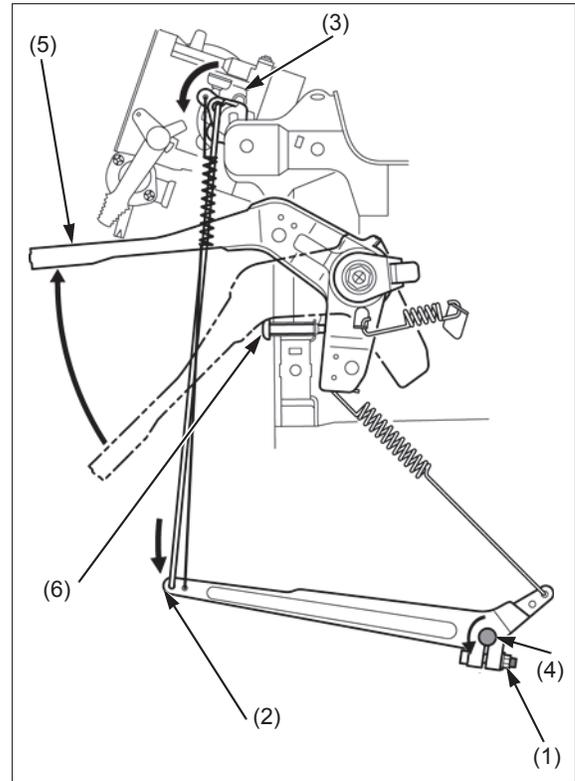
Install the fuel tank ([page 6-3](#)).

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

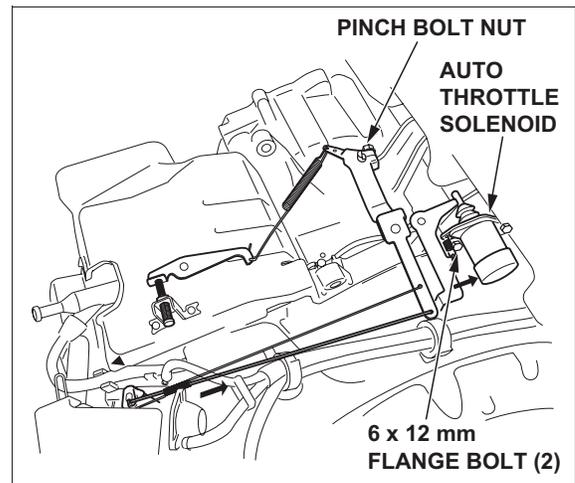


#### AUTO THROTTLE TYPE

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.



## GOVERNOR SYSTEM

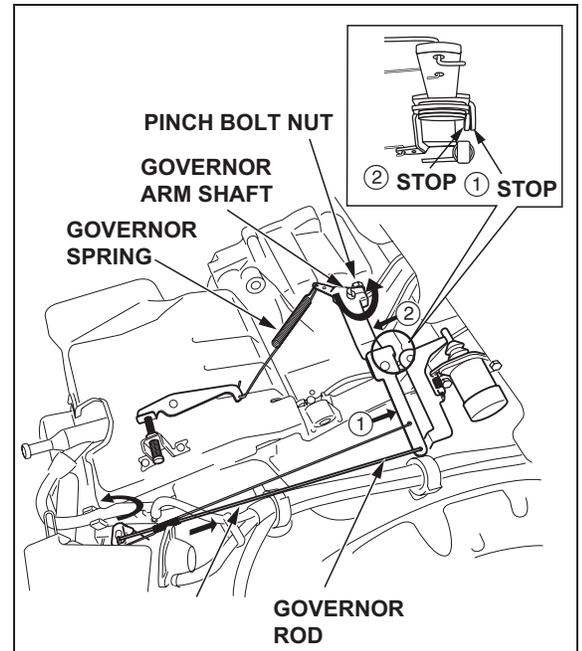
Move the governor rod end ① of the governor arm in the direction shown.

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](#)).

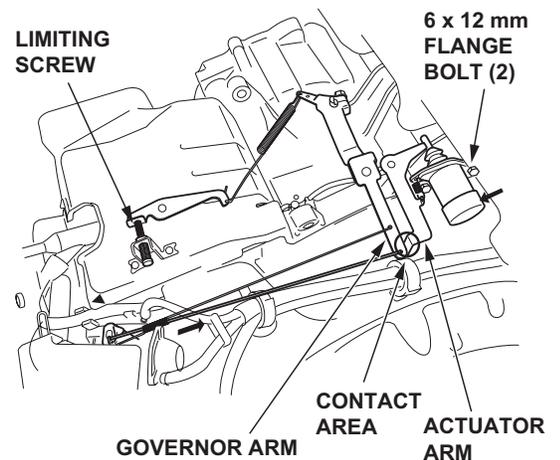
Turn the Auto Throttle switch to the OFF position, and start the engine. Allow it to warm to normal operating temperature.

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](#)).



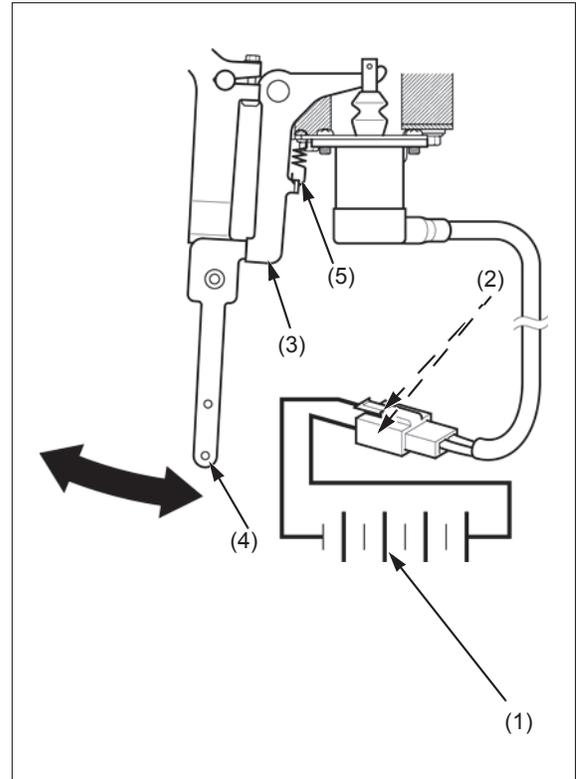
## GOVERNOR SYSTEM

### 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.



# 8. CHARGING SYSTEM

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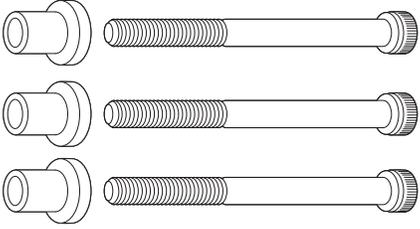
TOOLS .....	8-2	COOLING FAN/FLYWHEEL REMOVAL/ INSTALLATION .....	8-7
SYSTEM DIAGRAM .....	8-3	CHARGE / LAMP COIL (IF EQUIPPED) REMOVAL/INSTALLATION .....	8-9
BEFORE TROUBLESHOOTING .....	8-6	CHARGE COIL INSPECTION .....	8-10
CHARGING SYSTEM TROUBLESHOOTING .....	8-6		

## CHARGING SYSTEM

---

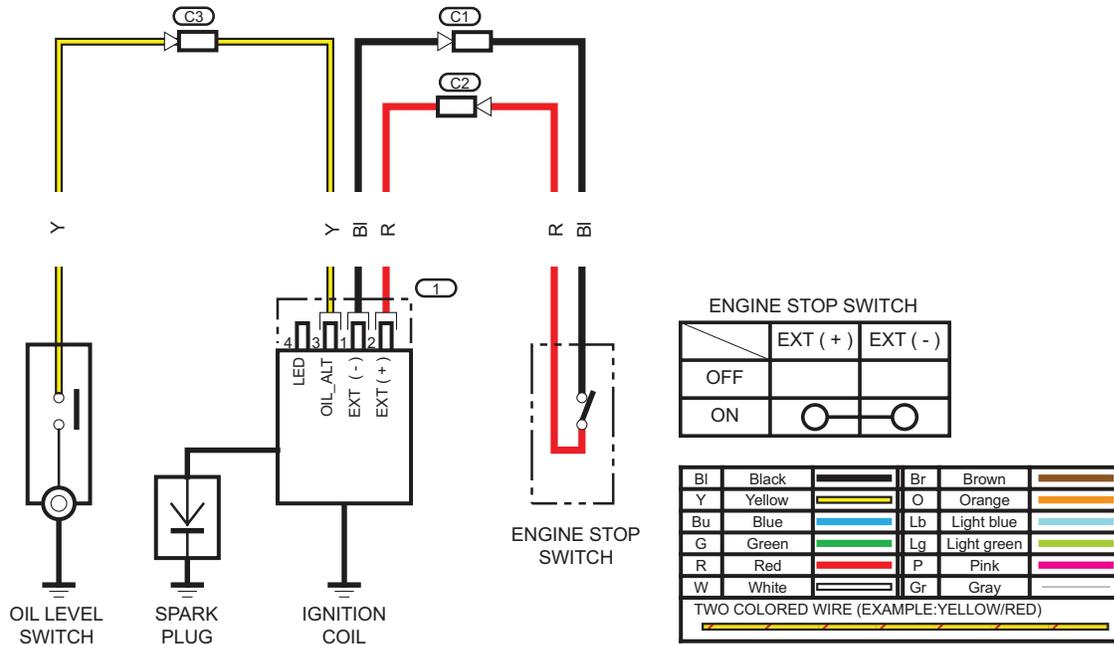
### TOOLS

**Puller collar set  
07APC-ZY1A100**

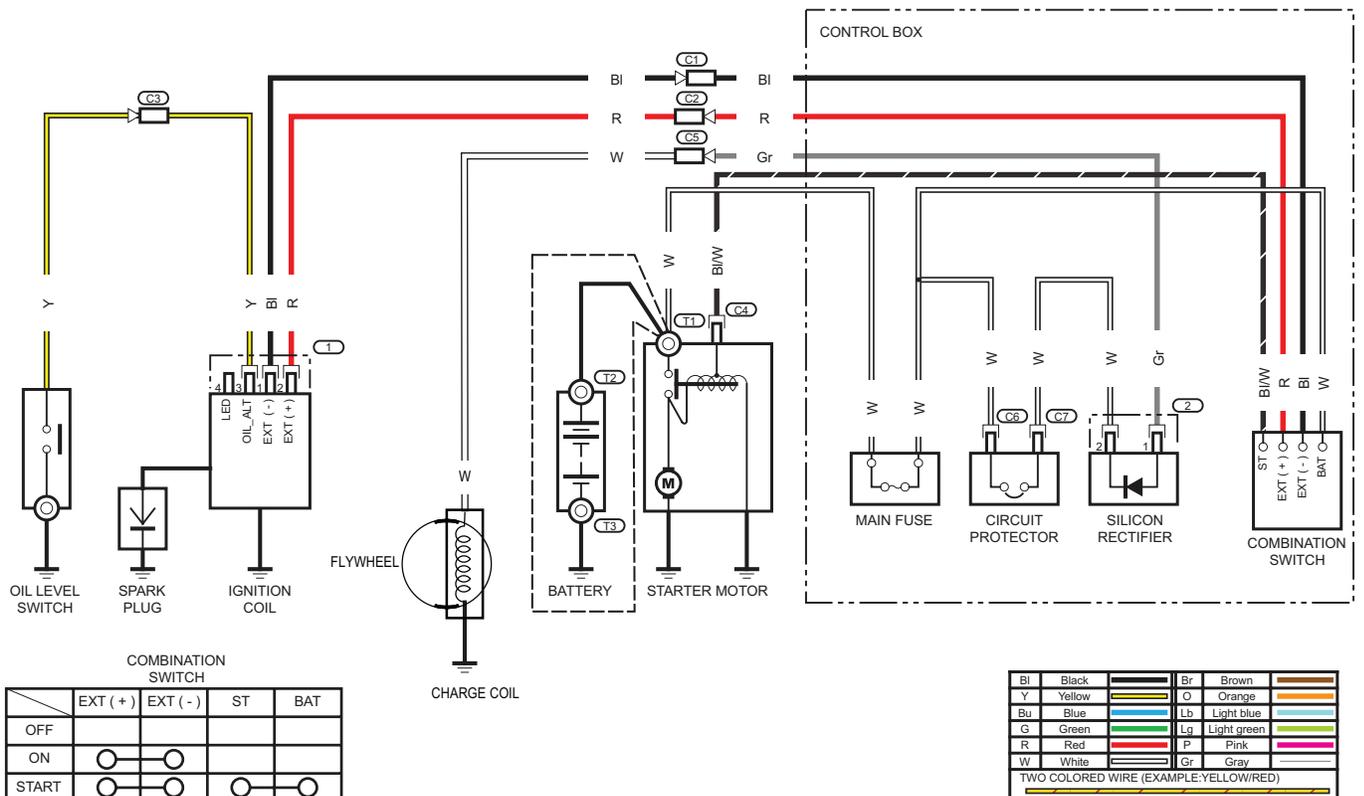


# SYSTEM DIAGRAM

## NO CHARGE COIL TYPE

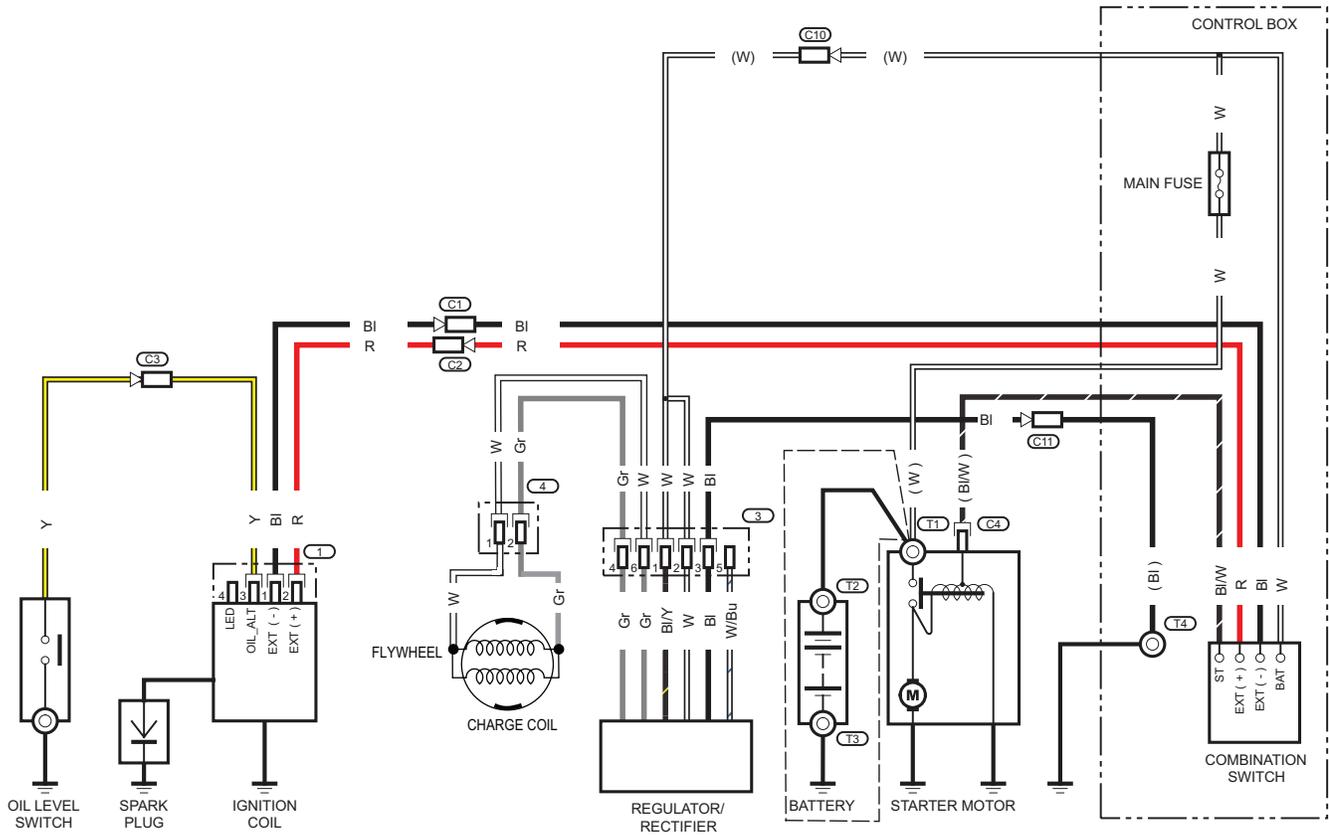


## 1/3A CHARGE COIL TYPE



# CHARGING SYSTEM

## 10A CHARGE COIL TYPE



COMBINATION SWITCH

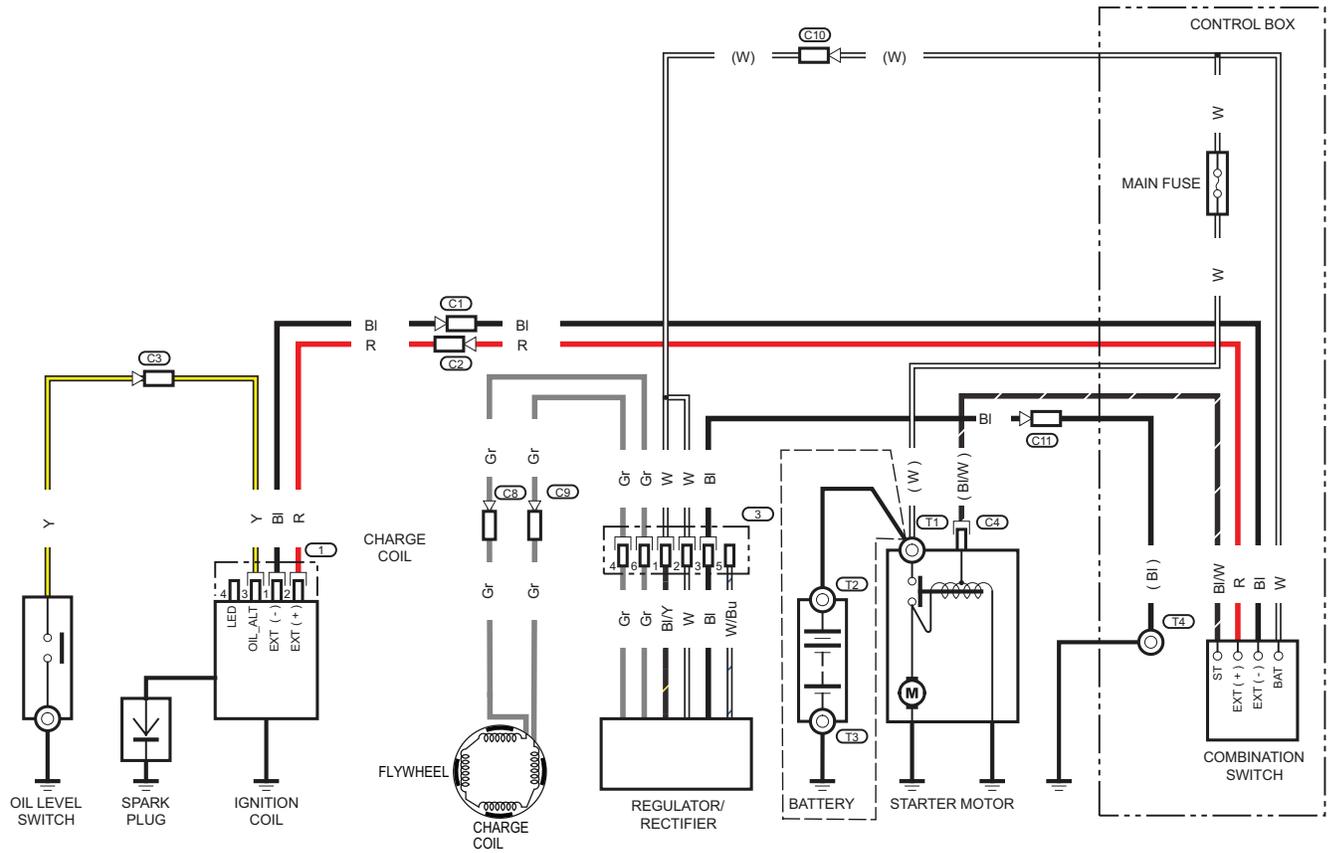
	EXT (+)	EXT (-)	ST	BAT
OFF				
ON	○	○		
START	○	○	○	○

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

TWO COLORED WIRE (EXAMPLE:YELLOW/RED)

# CHARGING SYSTEM

## 18A CHARGE COIL TYPE



COMBINATION SWITCH

	EXT (+)	EXT (-)	ST	BAT
OFF				
ON	○	○		
START	○	○	○	○

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

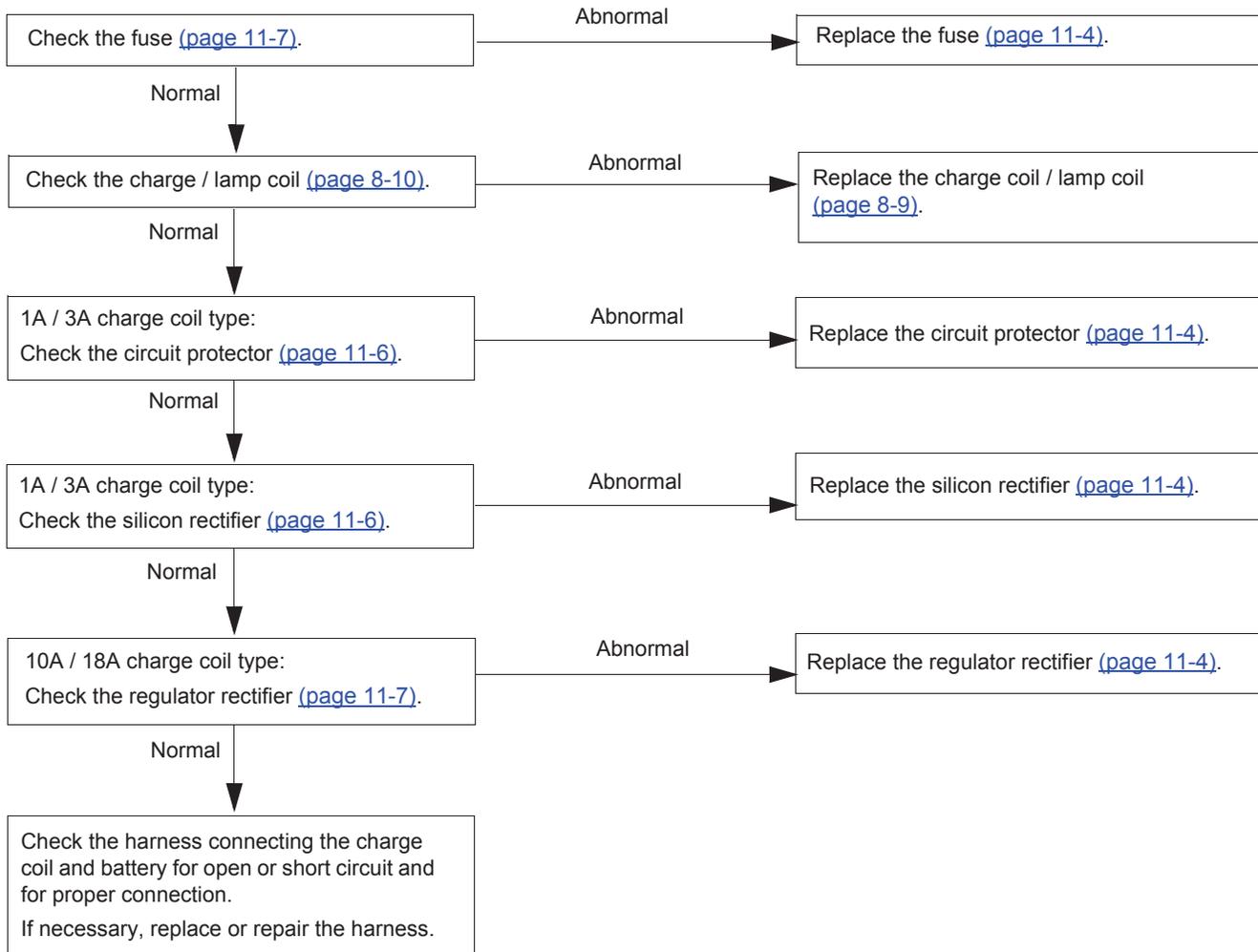
TWO COLORED WIRE (EXAMPLE: YELLOW/RED)

## 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

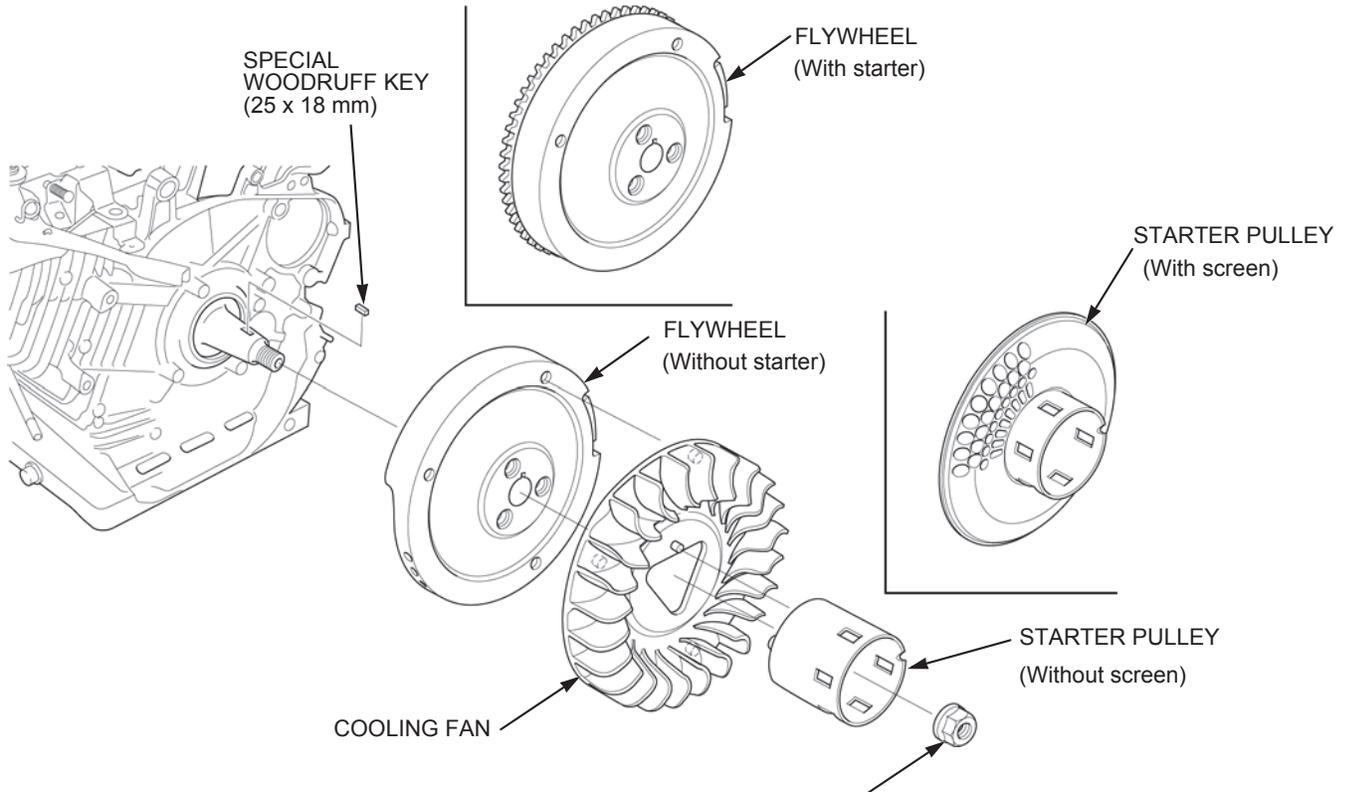


# COOLING FAN/FLYWHEEL REMOVAL/INSTALLATION

## REMOVAL

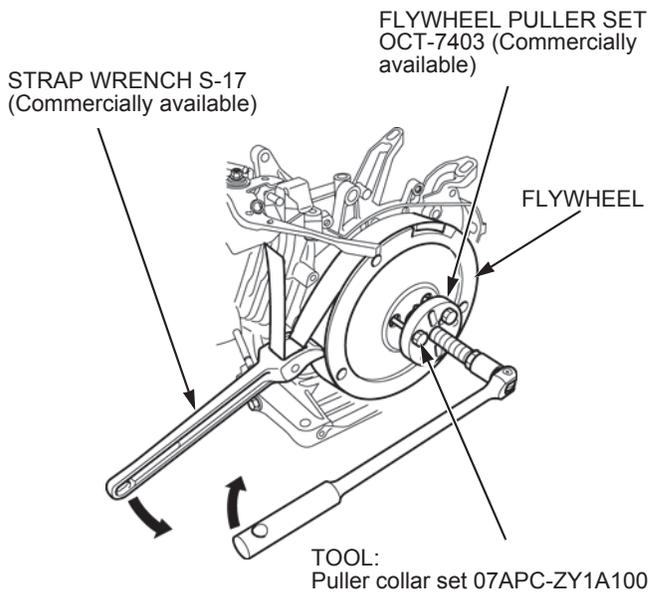
Remove the following parts:

- Fan cover ([page 5-2](#)).
- Ignition coil ([page 9-3](#)).



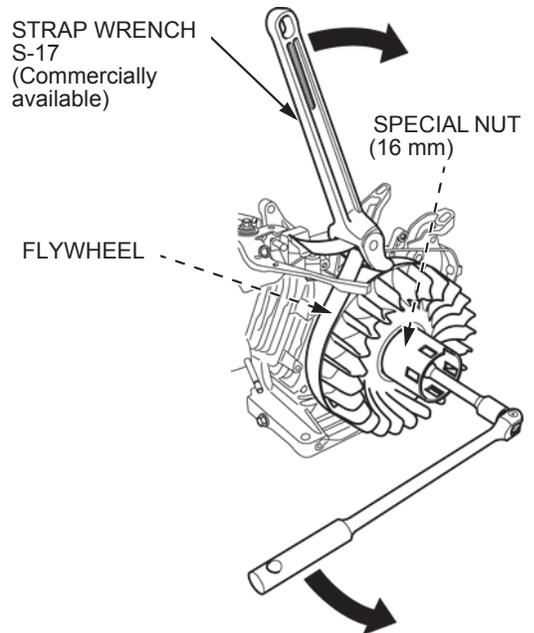
### FLYWHEEL

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



### SPECIAL 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.



## CHARGING SYSTEM

### INSTALLATION

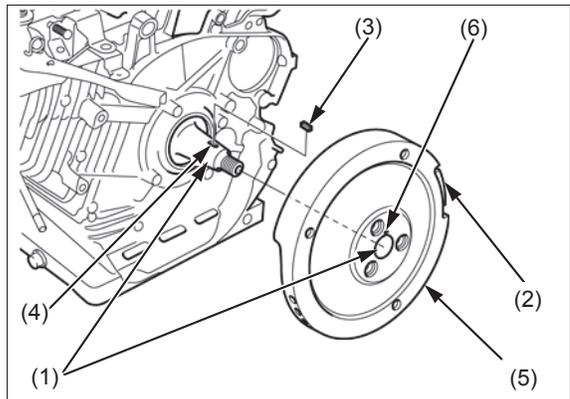
Clean the tapered parts (1) of dirt, oil, grease, and other foreign material before installation. Be sure there are no metal parts or other foreign material on the magnet part (2) of the flywheel.

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.

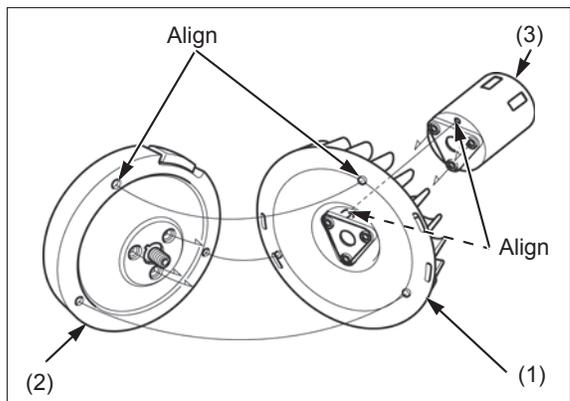
#### NOTICE

*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.



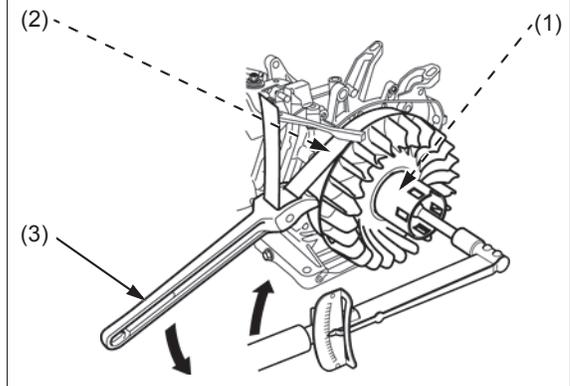
Apply a light coat of oil to the threads and the seating surface of the 16 mm special nut (1), and loosely tighten the nut.

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:

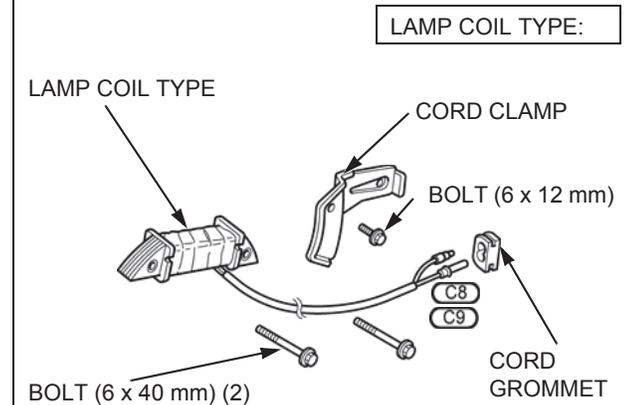
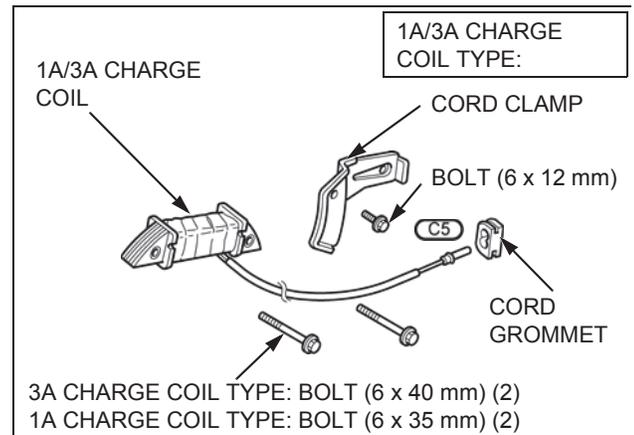
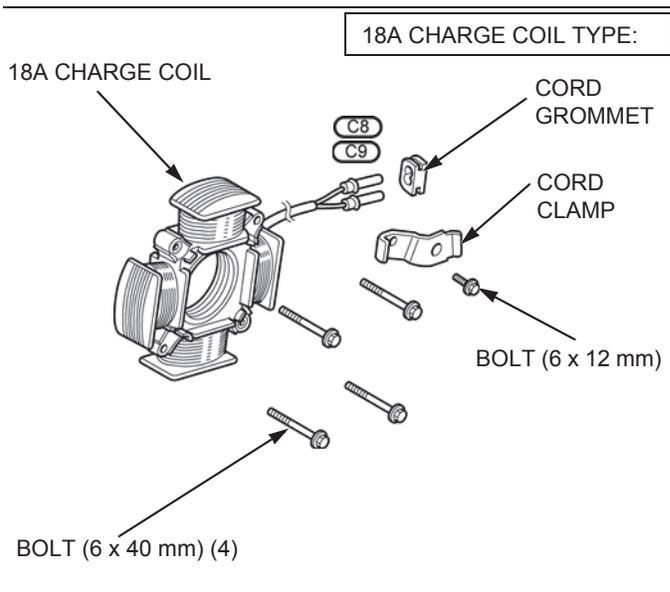
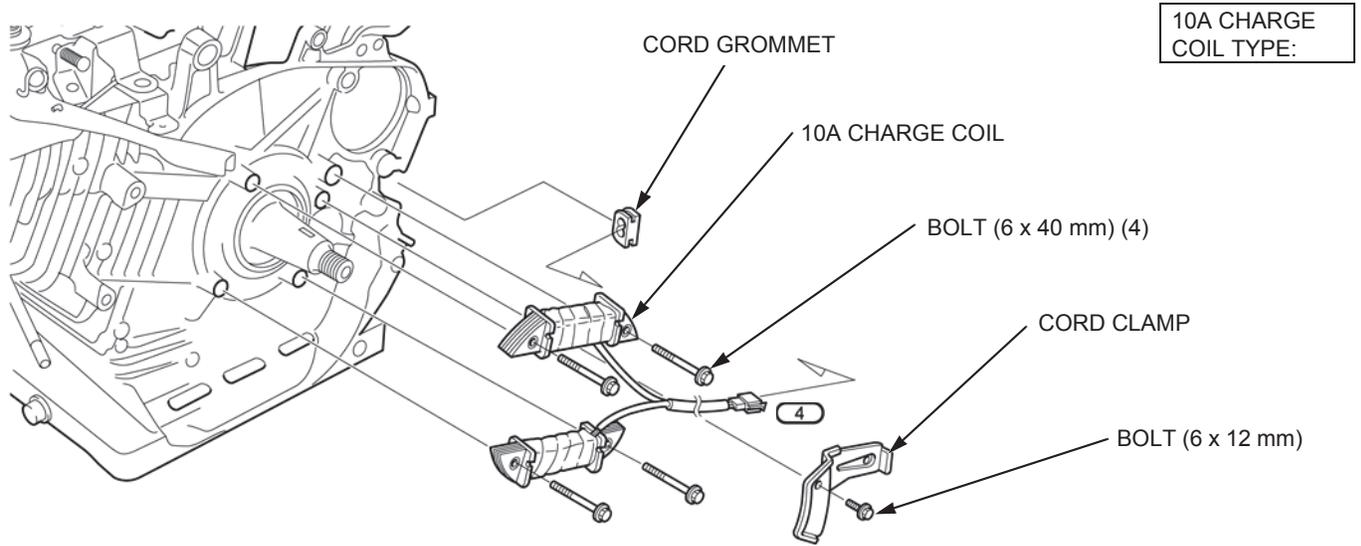
- Fan cover ([page 5-2](#))
- Ignition coil ([page 9-3](#))
- Remove the flywheel ([page 8-7](#))

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  $\Omega$

**Charge coil 18 A:** 0.10 - 0.30  $\Omega$

**Lamp coil 12 V-25 W:** 0.30 - 0.46  $\Omega$

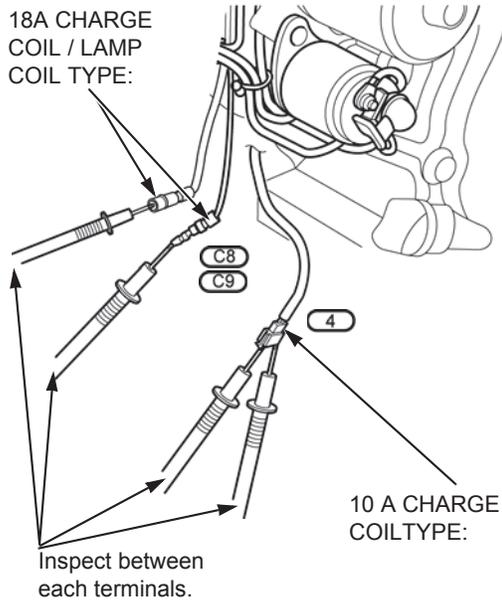
Check for continuity between each terminal and engine ground.

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.

10 A / 18 A CHARGE COIL / LAMP COIL TYPE:

18A CHARGE  
COIL / LAMP  
COIL TYPE:



#### 1A/3A CHARGE COIL TYPE

Disconnect the charge coil connector.

Check for continuity between terminal and engine ground.

**Resistance:**

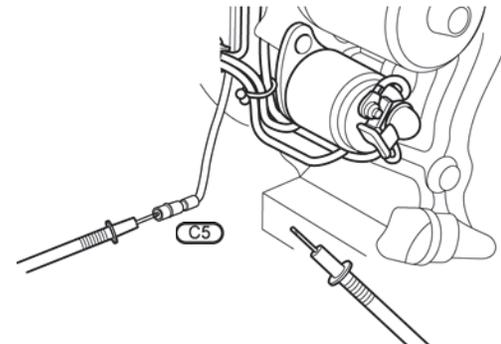
**Charge coil 1 A:** 3.00 - 4.00  $\Omega$

**Charge coil 3 A:** 0.62 - 0.93  $\Omega$

There should be no continuity.

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

1A / 3A CHARGE COIL TYPE:



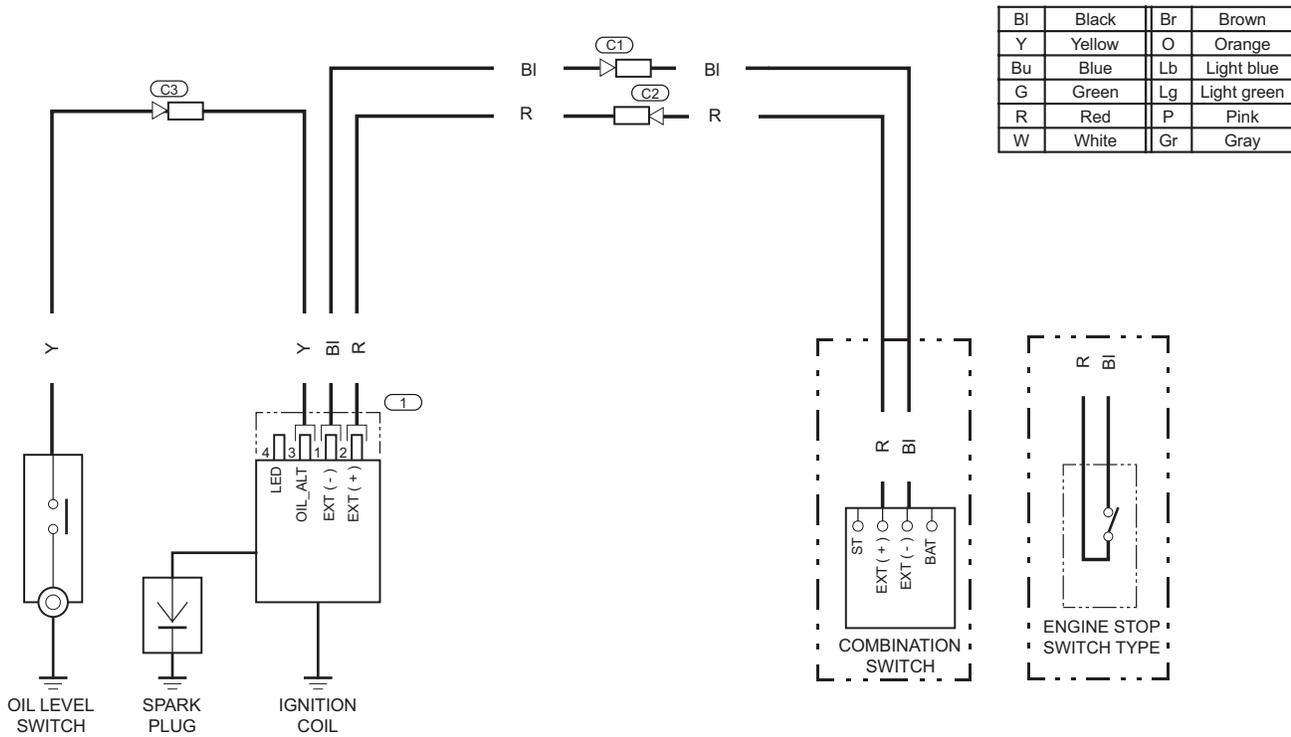
# 9. IGNITION SYSTEM

---

SYSTEM DIAGRAM . . . . .	9-2	IGNITION COIL INSTALLATION . . . . .	9-4
IGNITION SYSTEM TROUBLESHOOTING .	9-2	SPARK TEST . . . . .	9-4
IGNITION COIL REMOVAL/ INSTALLATION . . . . .	9-3	SPARK PLUG CAP INSPECTION . . . . .	9-4
		IGNITION COIL INSPECTION . . . . .	9-5

# IGNITION COIL

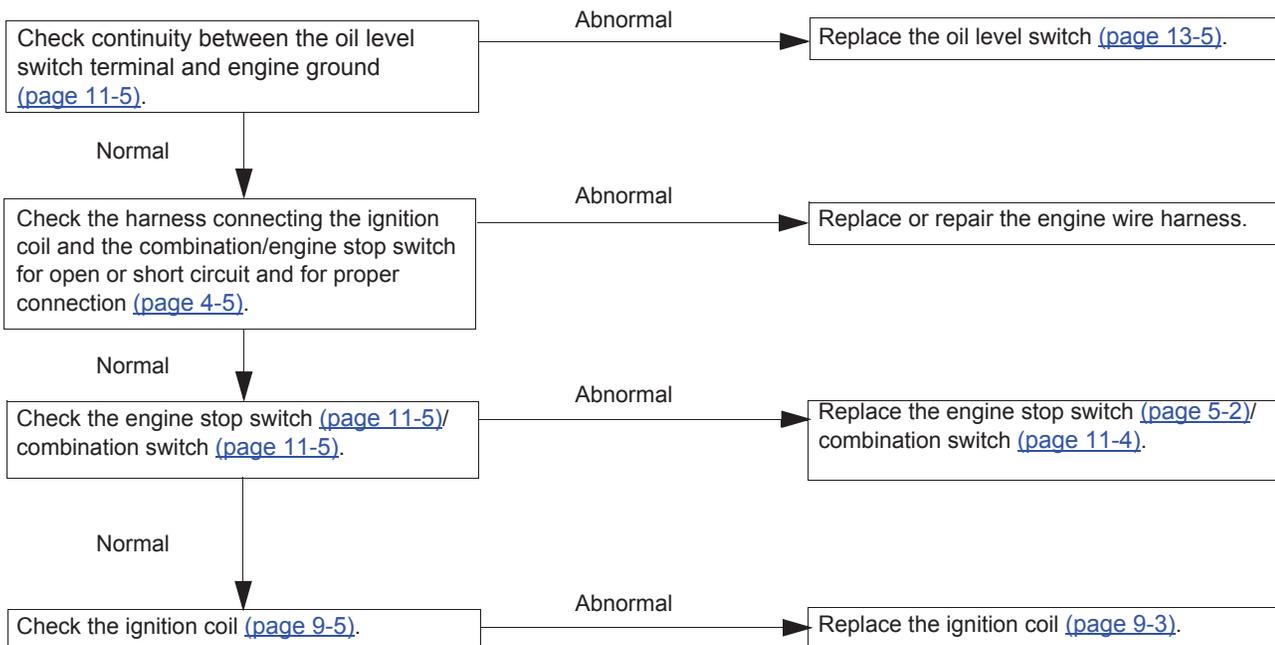
## SYSTEM DIAGRAM



## IGNITION SYSTEM TROUBLESHOOTING

### NO SPARK AT SPARK PLUG

- Check the engine oil level before troubleshooting.



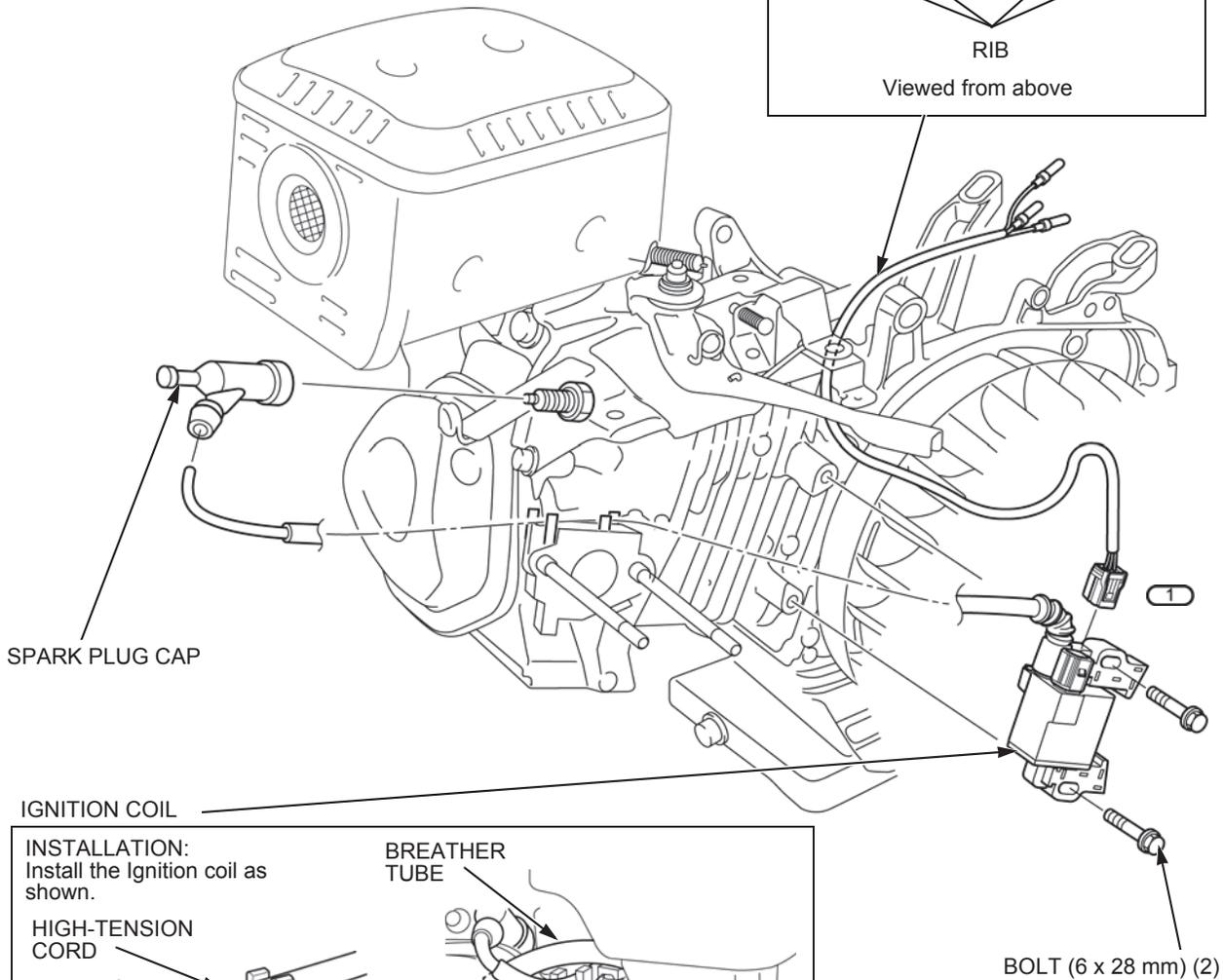
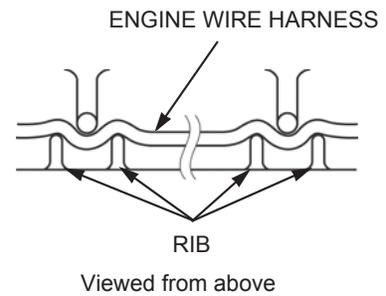
# IGNITION COIL REMOVAL/ INSTALLATION

Remove the following parts:

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

## ENGINE WIRE HARNESS

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



## IGNITION COIL

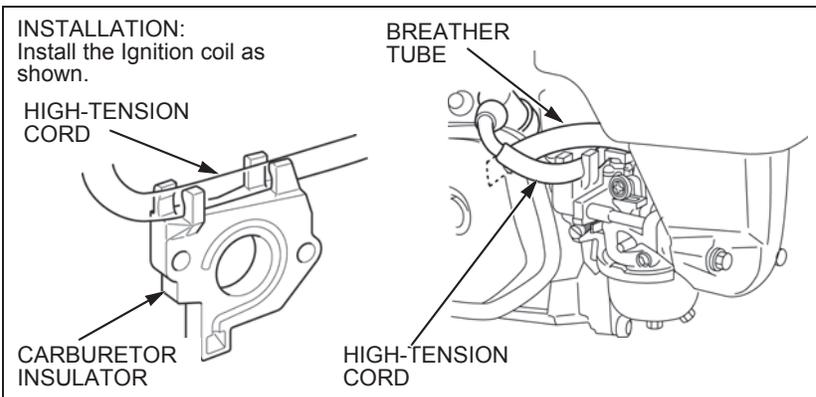
INSTALLATION:  
Install the Ignition coil as shown.

HIGH-TENSION  
CORD

CARBURETOR  
INSULATOR

BREATHER  
TUBE

HIGH-TENSION  
CORD



## 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.

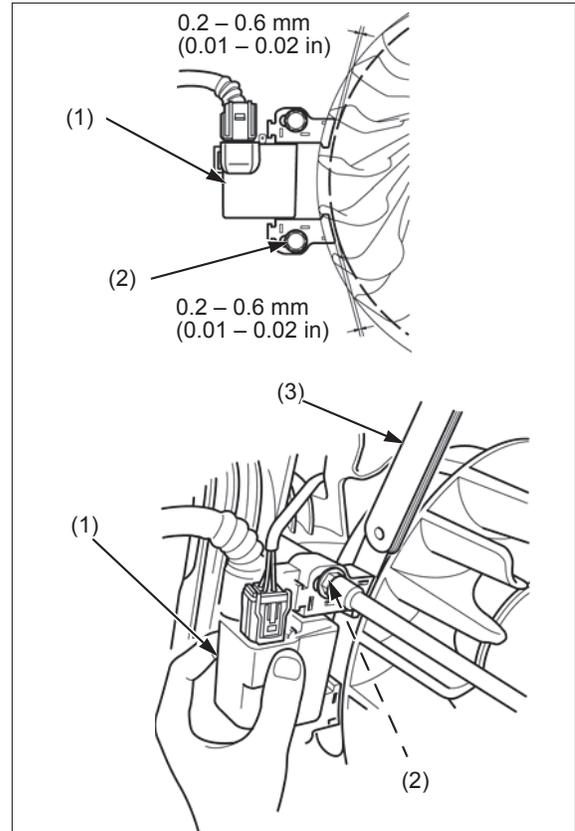
**IGNITION COIL AIR GAP:**  
**0.2 – 0.6 mm (0.01 – 0.02 in)**

#### 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.

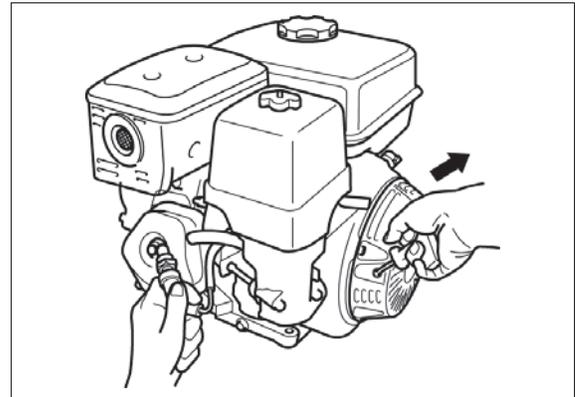
Disconnect the spark plug cap from the spark plug.

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.



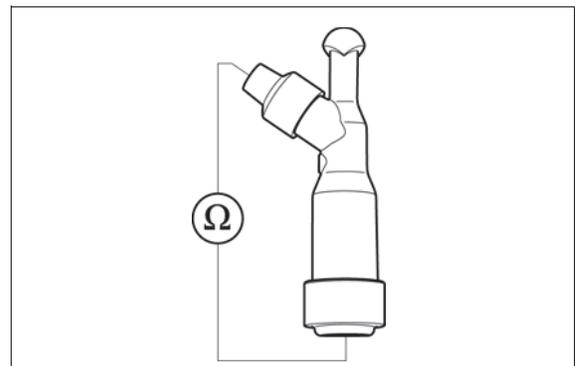
### SPARK PLUG CAP INSPECTION

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).

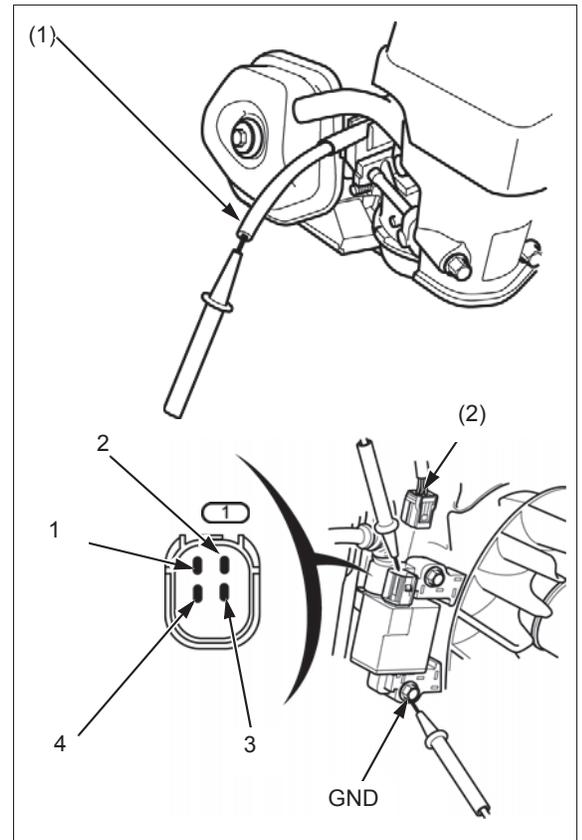
Disconnect the engine wire harness connector (2) from the ignition coil.

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.



Unit: kΩ

		(+ ) Prove					
		GND	HIGH-TENSION CORD	Terminal number			
				EXT (+) 2	EXT (-) 1	LED 4	OIL ALT 3
(-) Probe	GND		6 - 11	1 - 10	∞	7 - 45	5 - 30
	HIGH-TENSION CORD	6 - 11		7 - 24	∞	14 - 72	12 - 47
	Terminal number						
	EXT (+) 2	5 - 14	10 - 26		∞	15 - 76	6 - 26
	EXT (-) 1	∞	∞	∞		∞	∞
	LED 4	∞	∞	∞	∞		∞
OIL ALT 3	∞	∞	∞	∞	∞		

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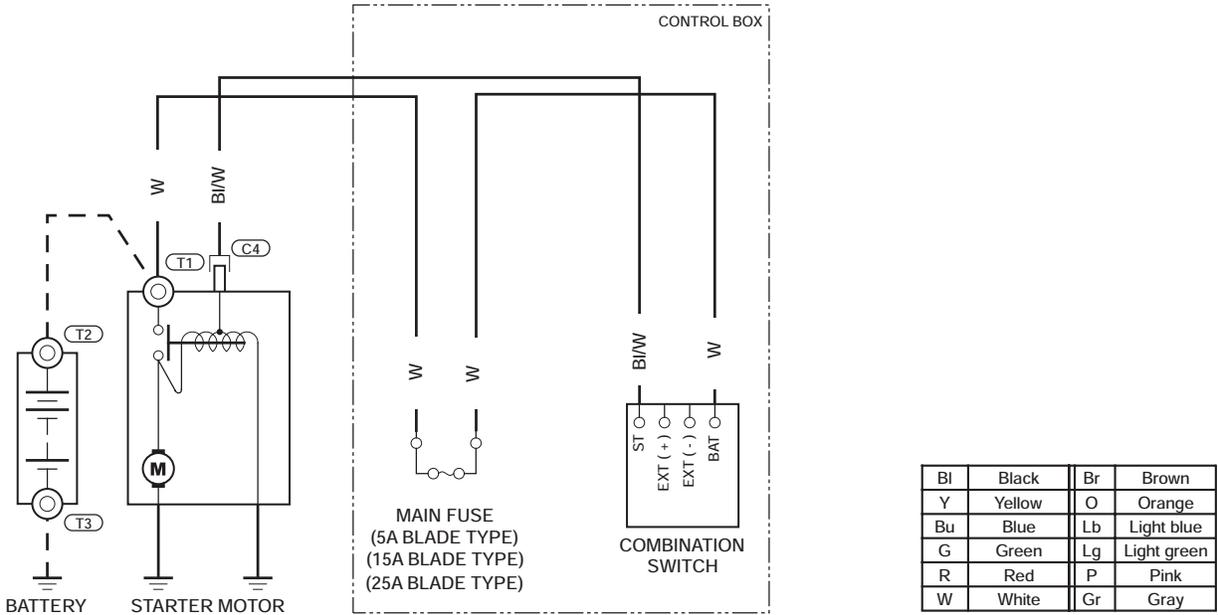
# MEMO

# 10. STARTING SYSTEM

---

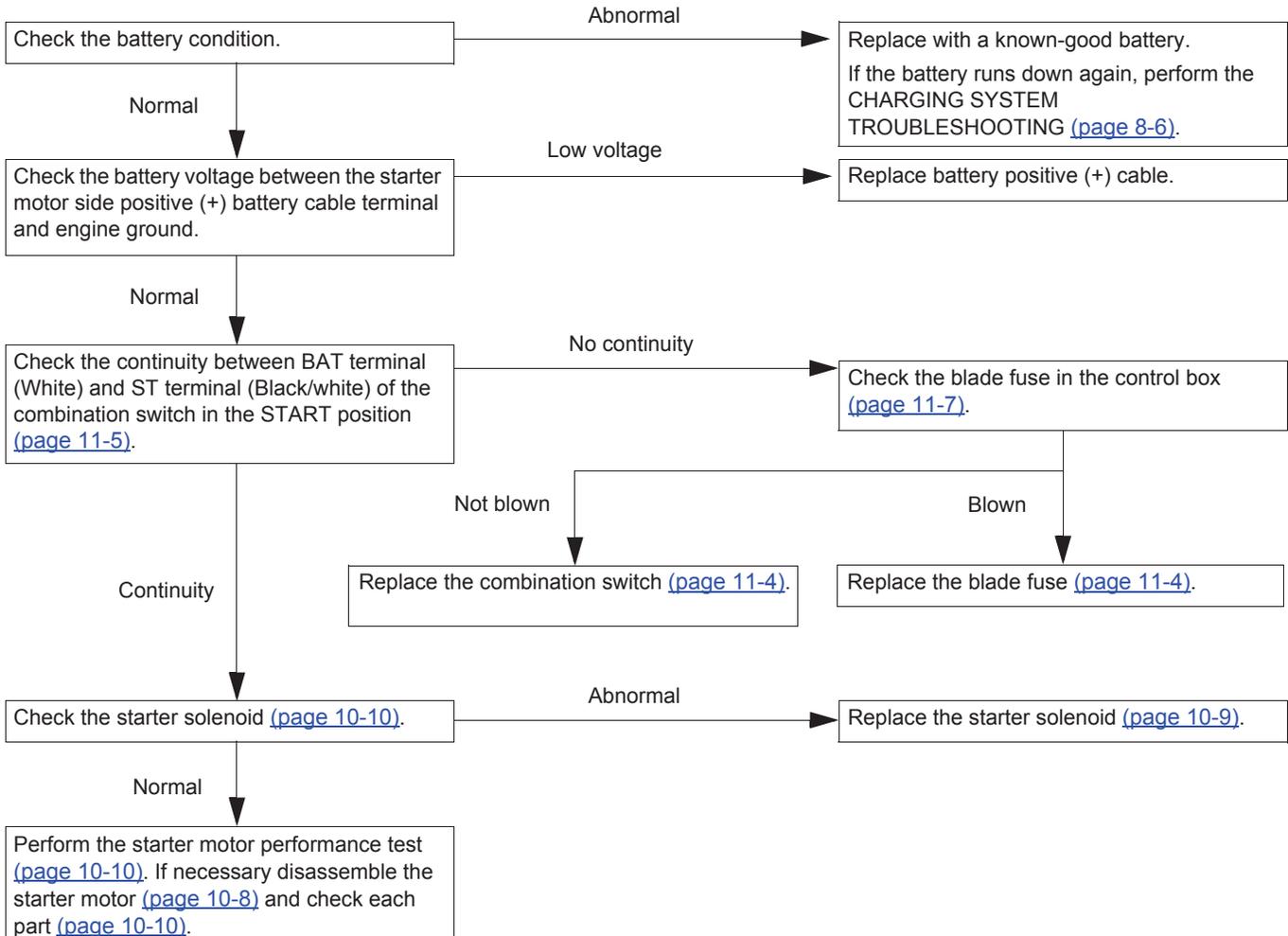
SYSTEM DIAGRAM . . . . .	10-2	RECOIL STARTER INSPECTION . . . . .	10-7
STARTING SYSTEM TROUBLESHOOTING . . . . .	10-2	STARTER MOTOR REMOVAL/ INSTALLATION . . . . .	10-8
RECOIL STARTER REMOVAL/ INSTALLATION . . . . .	10-3	STARTER MOTOR DISASSEMBLY/ ASSEMBLY . . . . .	10-9
RECOIL STARTER DISASSEMBLY . . . . .	10-4	INSPECTION . . . . .	10-10
RECOIL STARTER ASSEMBLY . . . . .	10-5		

# STARTING SYSTEM SYSTEM DIAGRAM

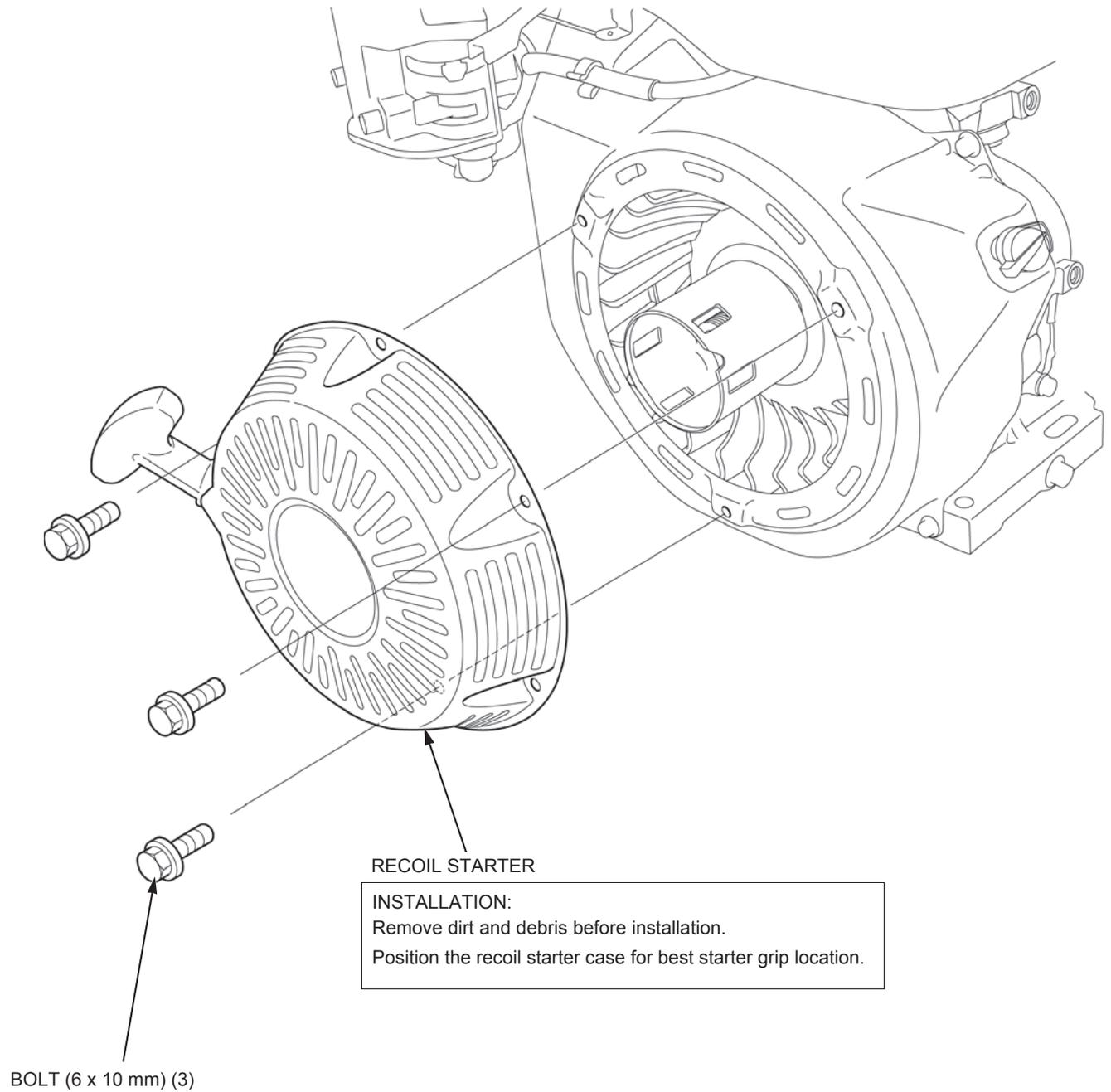


## STARTING SYSTEM TROUBLESHOOTING

### STARTER MOTOR DOES NOT OPERATE



# RECOIL STARTER REMOVAL/ INSTALLATION



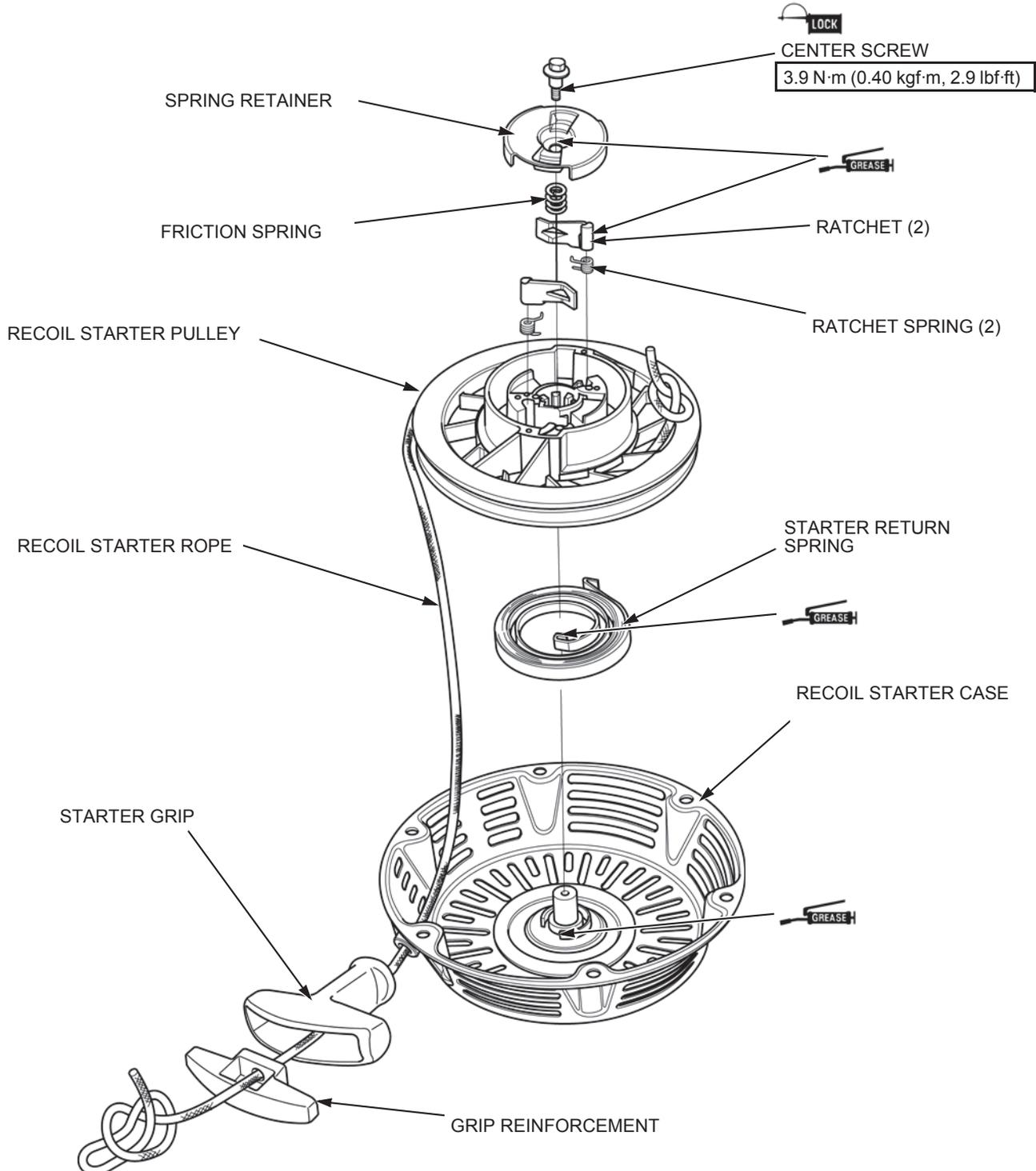
## STARTING SYSTEM

# 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

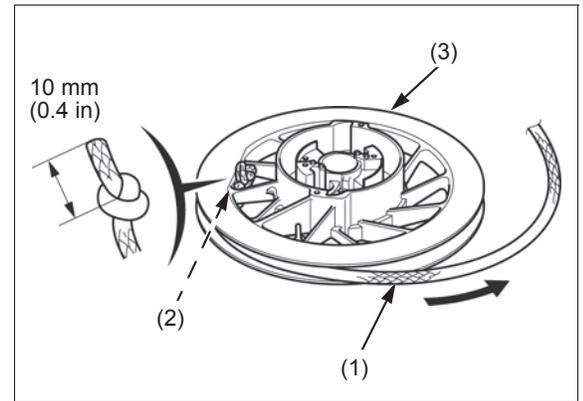
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

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

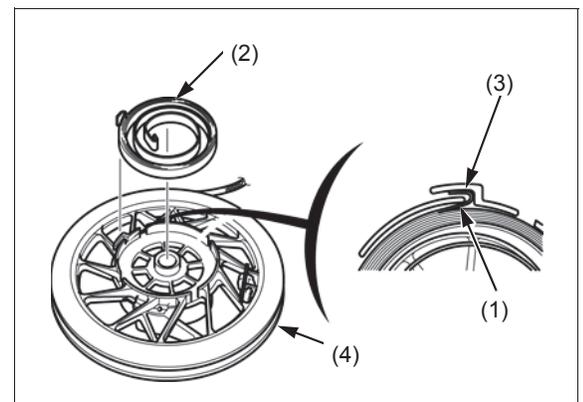
### NOTICE

Before installing the recoil starter rope, check for fray or wear.

Wind the recoil starter rope onto the recoil starter pulley counterclockwise.

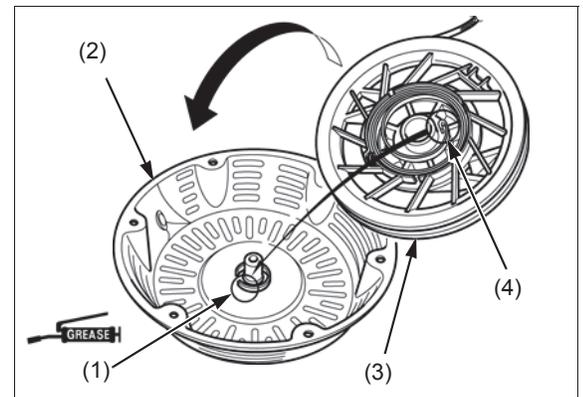


Hook the outer hook (1) of the starter return spring (2) to the groove (3) of the recoil starter pulley (4), and then install the starter return spring by winding it in the starter pulley.



Apply grease to the cutout (1) of the recoil starter case (2).

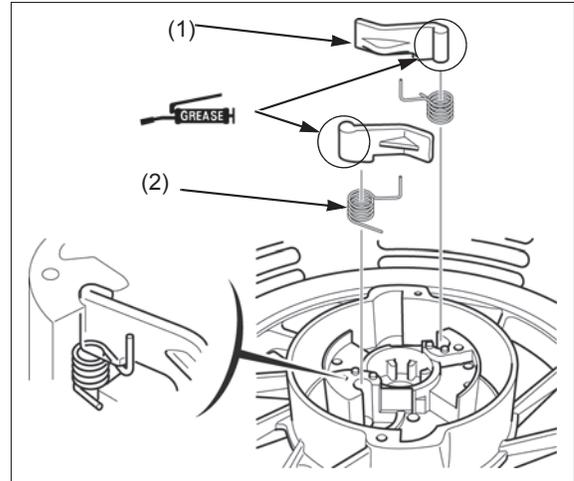
Set the recoil starter pulley (3) to the recoil starter case by aligning the inner hook (4) of the starter return spring with the cutout of the recoil starter case.



## STARTING SYSTEM

Apply grease to the two ratchets (1).

Install the two ratchets and the two ratchet springs (2) to the recoil starter pulley as shown.



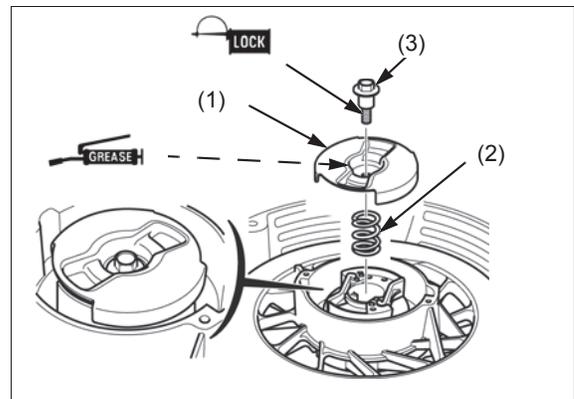
Apply grease to the inside of the spring retainer (1).

Set the friction spring (2) and the spring retainer to the recoil starter pulley in the direction as shown.

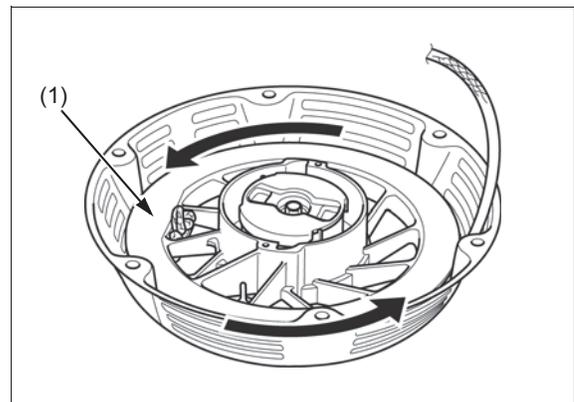
Apply locking agent (Hondalock 1, Threebond® 2430 or equivalent) to the threads of the center screw (3).

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)**

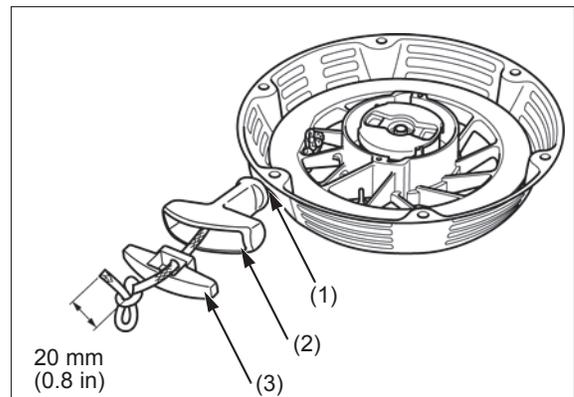


Turn the recoil starter pulley (1) more than 2 turns counterclockwise to preload the starter return spring. Be sure to hold the recoil starter pulley.



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](#)).

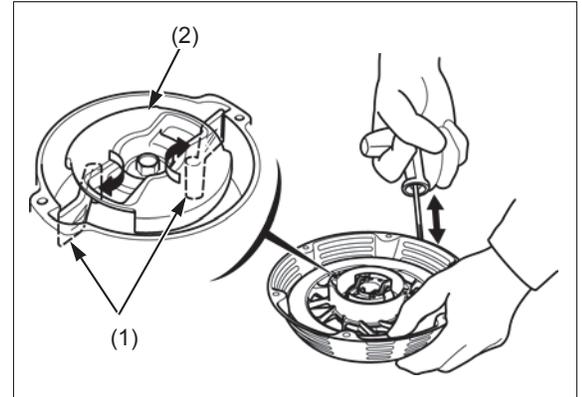


## RECOIL STARTER INSPECTION

### RECOIL STARTER OPERATION

Remove the recoil starter ([page 10-3](#)).

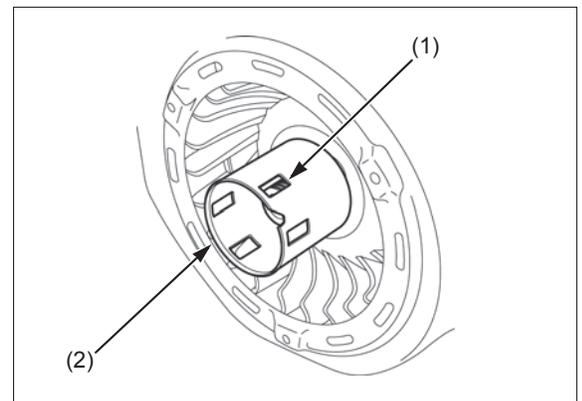
Pull the starter grip several times to inspect that the ratchets (1) are operated properly (the ratchet ends come out from the spring retainer (2)).



### STARTER PULLEY

Remove the recoil starter ([page 10-3](#)).

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

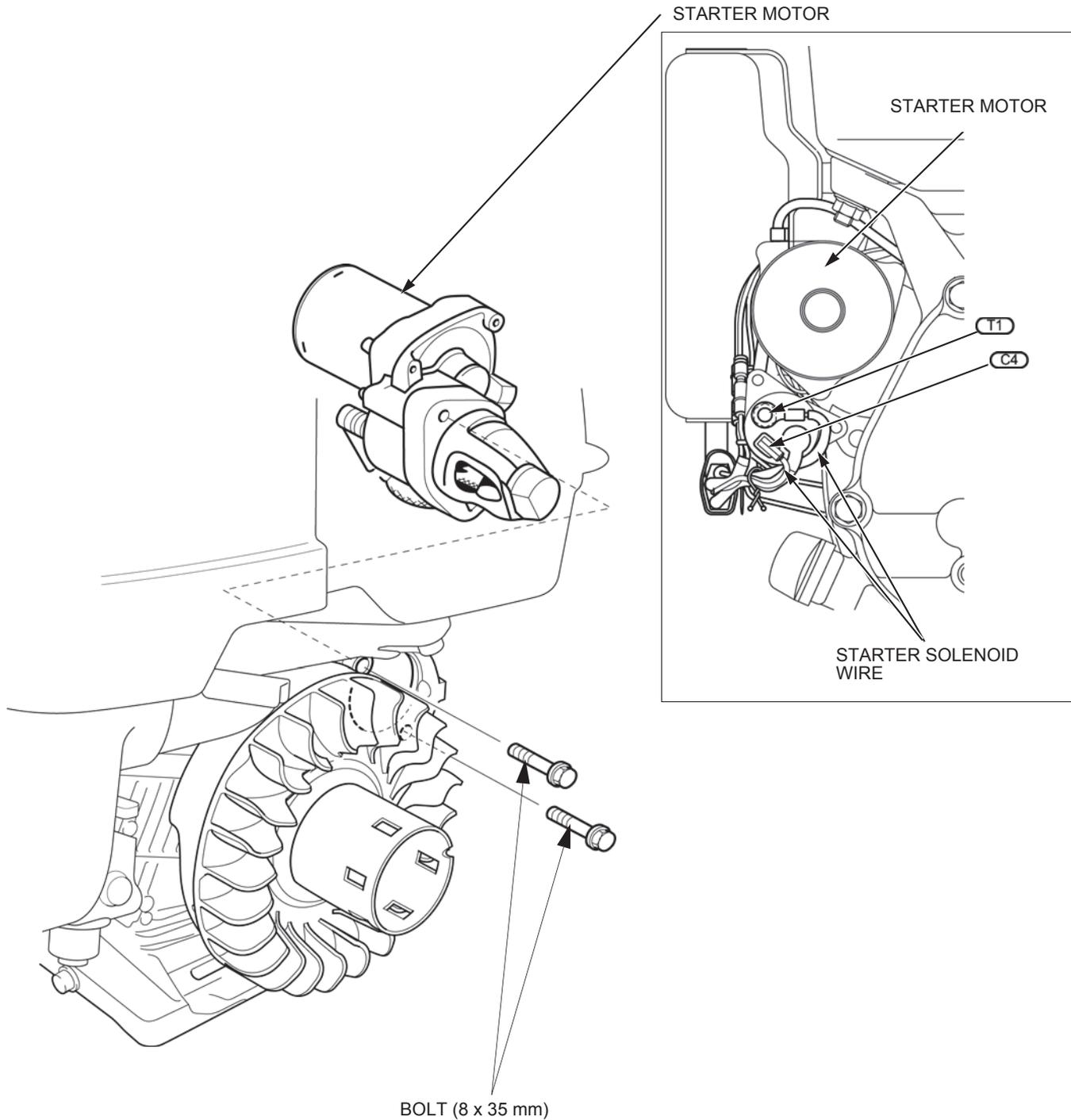


## STARTING SYSTEM

# STARTER MOTOR REMOVAL/INSTALLATION

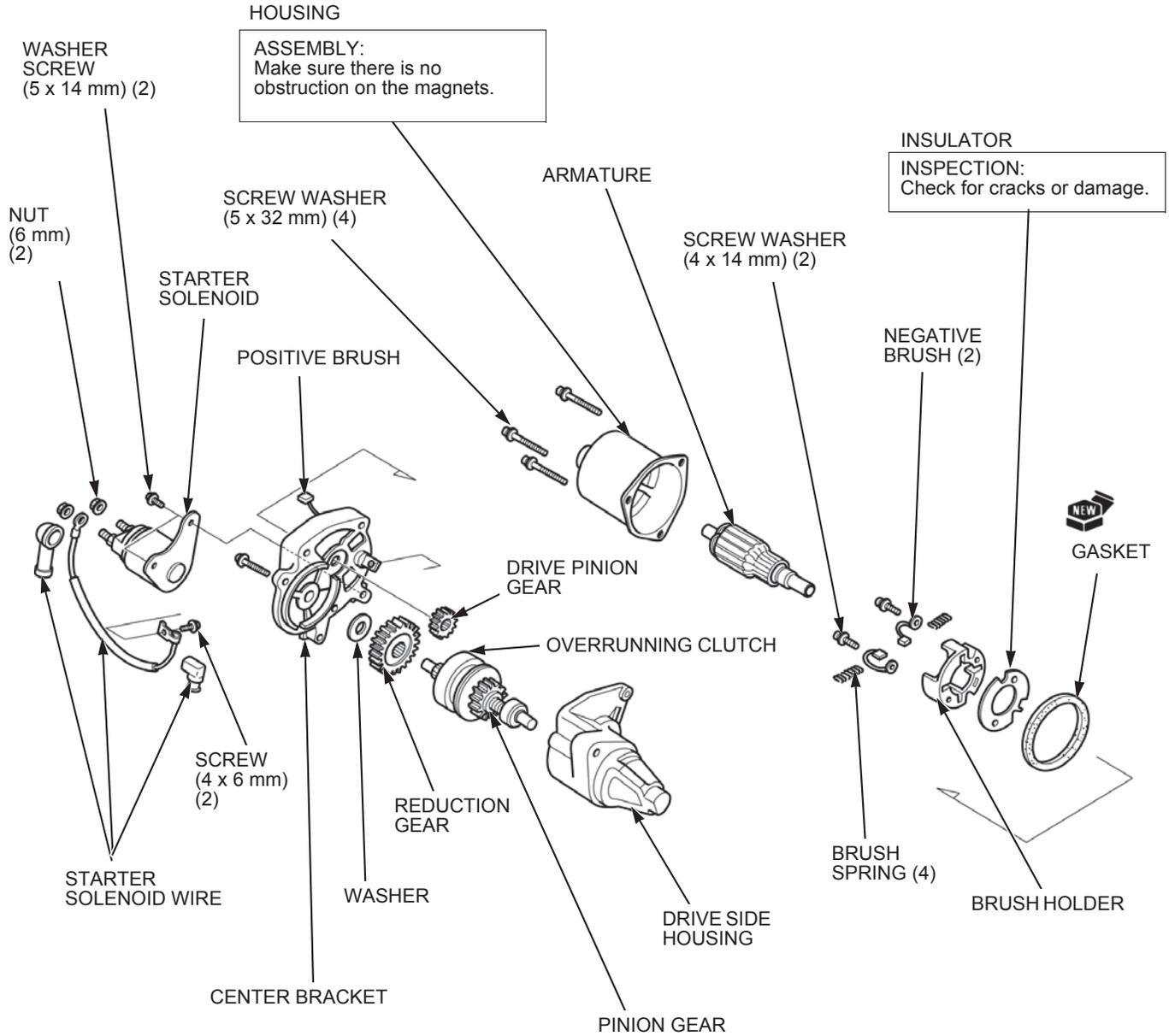
Disconnect the starter motor wires from the starter motor.

Remove the fan cover ([page 5-2](#)).



# STARTER MOTOR DISASSEMBLY/ASSEMBLY

Remove the starter motor ([page 10-8](#)).



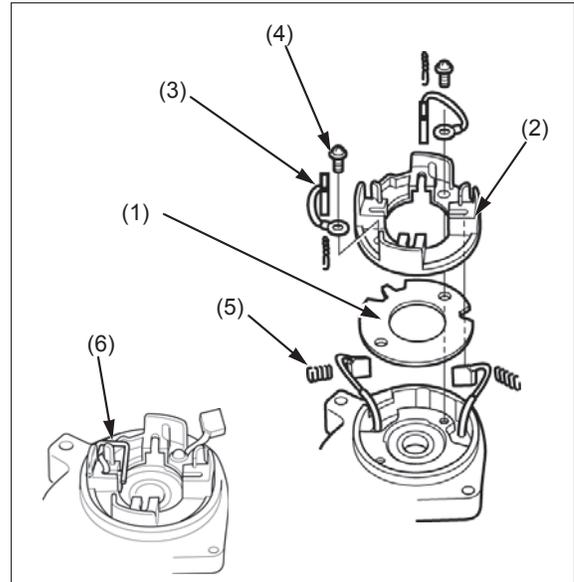
## STARTING SYSTEM

### 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: UNDER LOAD:

**CRANKING VOLTAGE:** 9.9 V  
**CRANKING CURRENT:** 103 A  
**ENGINE CRANKING SPEED:** 2,300 min<sup>-1</sup> (rpm) min.

#### NO LOAD:

**CRANKING VOLTAGE:** 11.5 V  
**CRANKING CURRENT:** 31 A max.

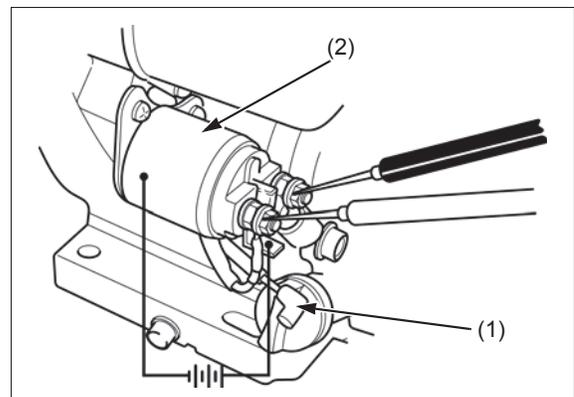
- To get accurate results, the test must be conducted in the normal ambient temperature.
- Battery: 55B24 (12 V 36 AH/5 HR)
- Battery cable: 15 sq. x 1.5 m (4.9 ft.) each for battery positive cable and battery negative cable.

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

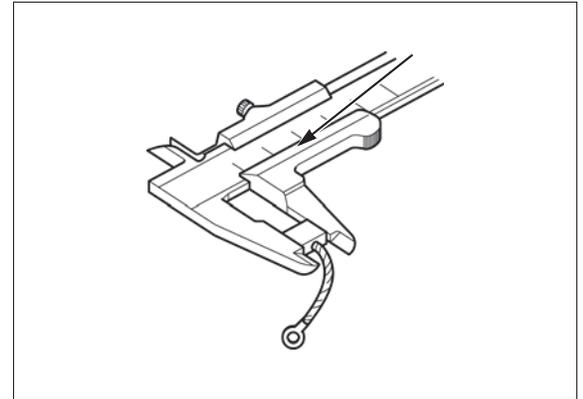
Measure the brush length.

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).

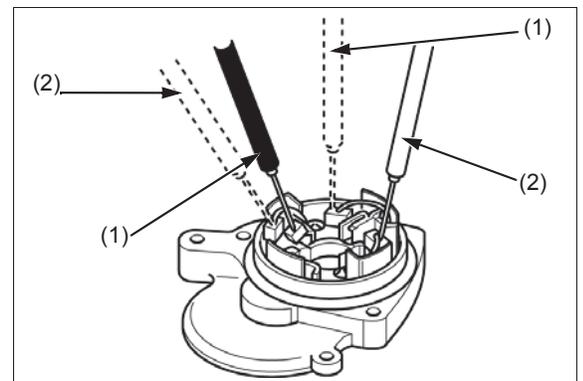
There should be continuity between both the positive brushes.

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.



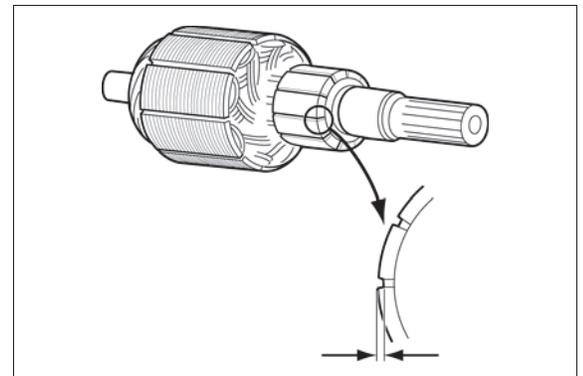
### ARMATURE MICA DEPTH

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)

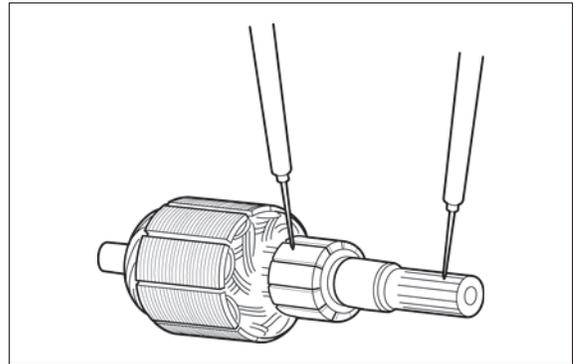


## STARTING SYSTEM

### ARMATURE CONTINUITY CHECK - COMMUTATOR TO SHAFT

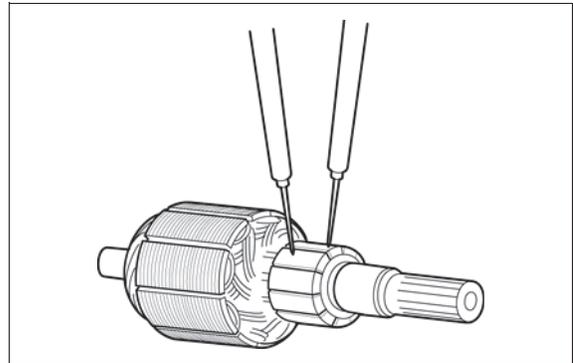
Check for continuity between the commutator and the armature shaft.

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.

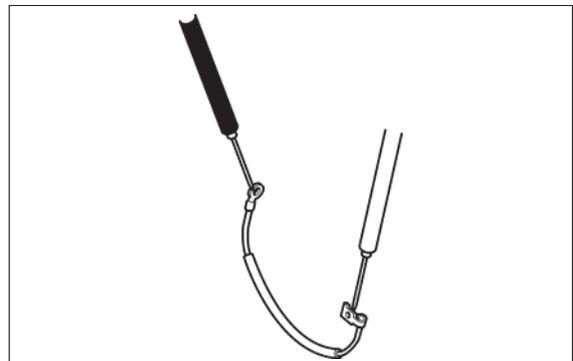
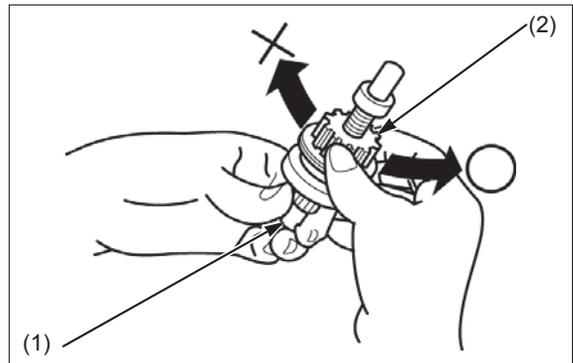
Check the pinion gear (2) operation by holding the pinion gear shaft and turning the pinion gear. The pinion gear should turn counterclockwise freely and should not turn clockwise.

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

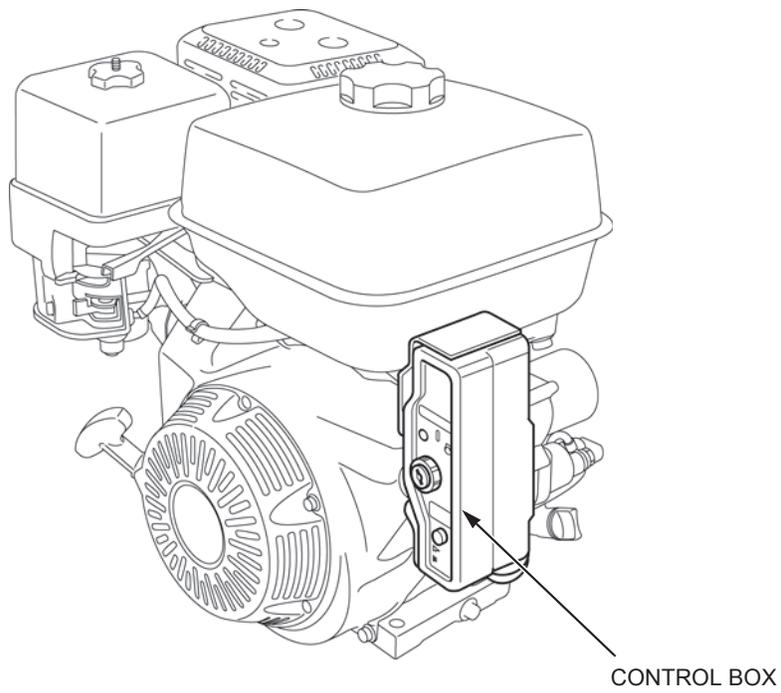
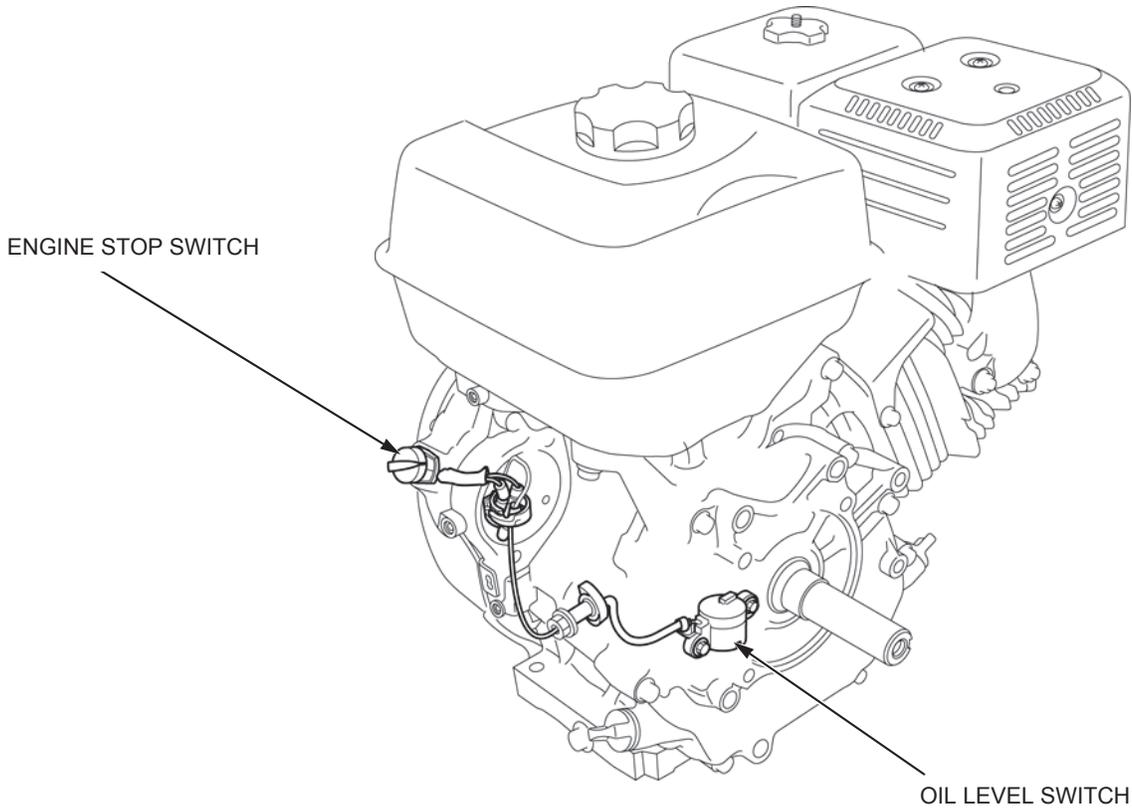
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COMPONENT LOCATION . . . . .	11-2	COMBINATION SWITCH INSPECTION . .	11-5
CONTROL BOX REMOVAL/ INSTALLATION . . . . .	11-3	SILICON RECTIFIER INSPECTION . . . . .	11-6
CONTROL BOX DISASSEMBLY/ ASSEMBLY . . . . .	11-4	CIRCUIT PROTECTOR INSPECTION . . . .	11-6
OIL LEVEL SWITCH INSPECTION . . . . .	11-5	FUSE INSPECTION . . . . .	11-7
ENGINE STOP SWITCH INSPECTION . . .	11-5	REGULATOR/RECTIFIER INSPECTION .	11-7

## OTHER ELECTRICAL

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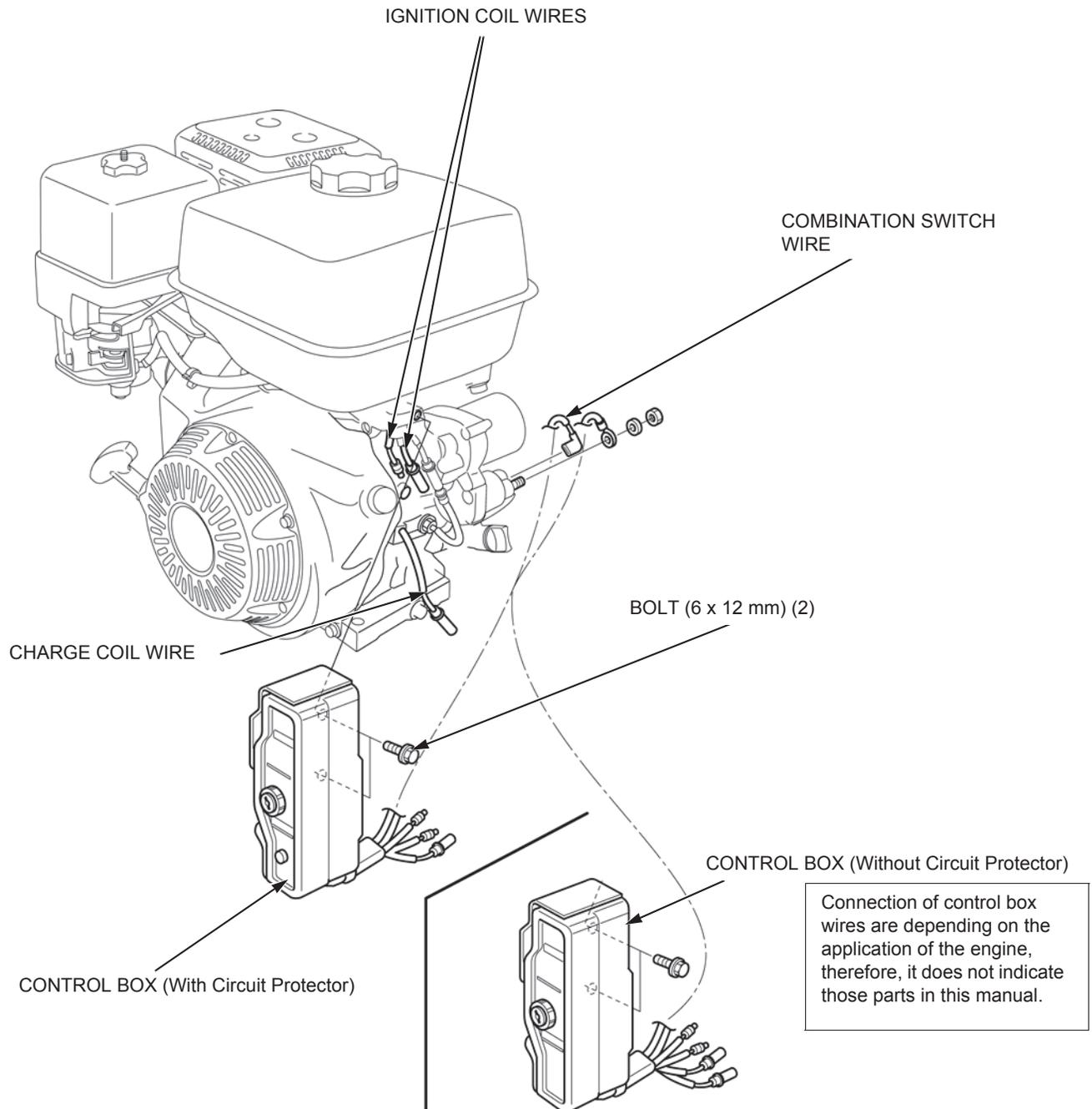
## COMPONENT LOCATION



## CONTROL BOX REMOVAL/INSTALLATION

Disconnect the control box wires.

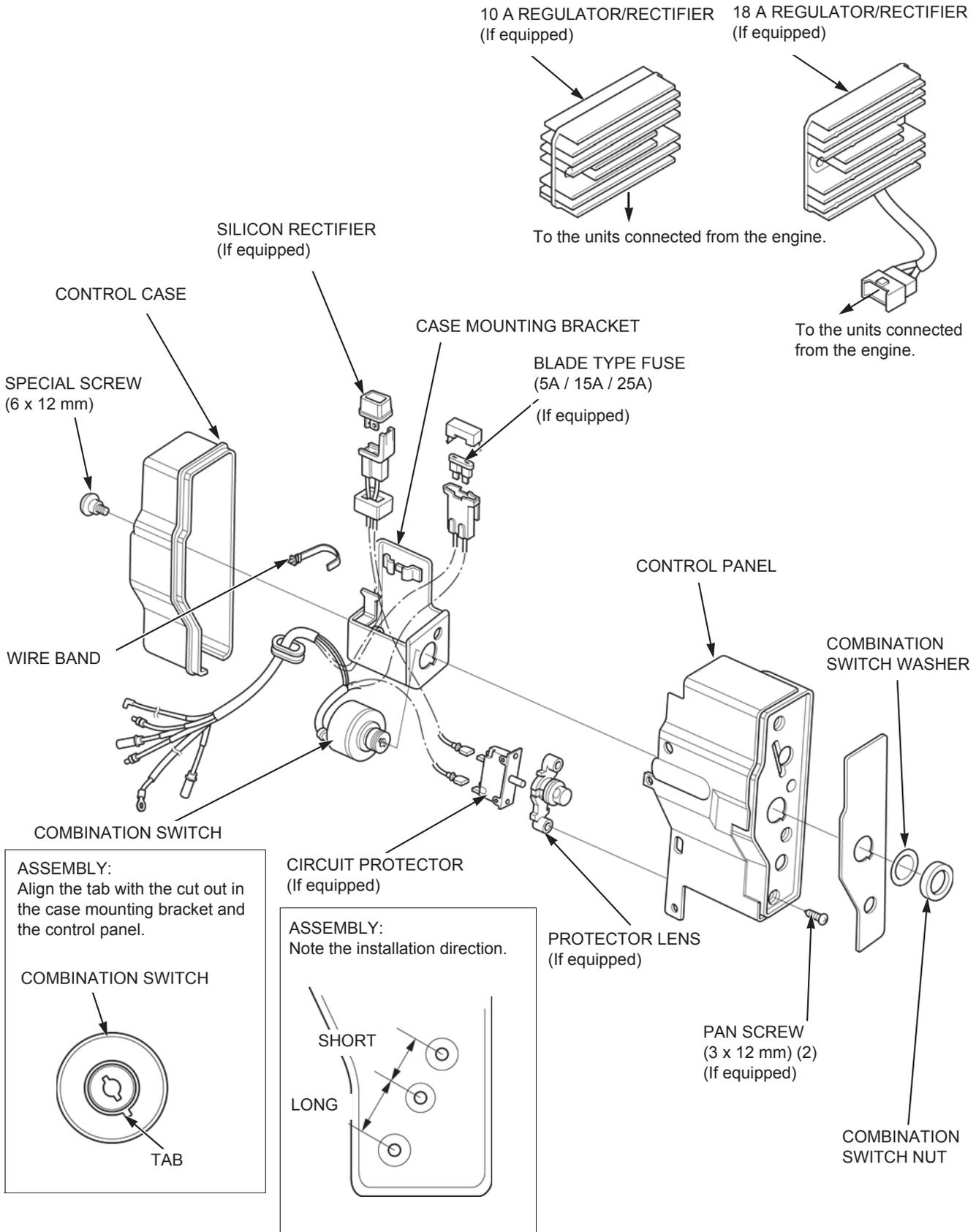
When installing, refer to the HARNESS AND TUBE ROUTING (with circuit protector) ([page 2-12](#)).



**OTHER ELECTRICAL**

**CONTROL BOX DISASSEMBLY/ASSEMBLY**

Remove the control box [\(page 11-3\)](#).



## 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](#)).

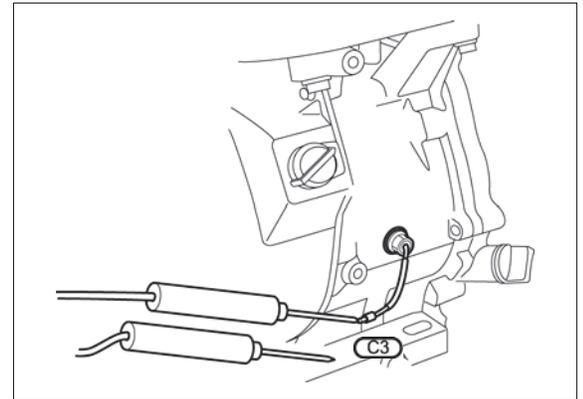
Check continuity between the switch terminal and engine ground.

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](#)).



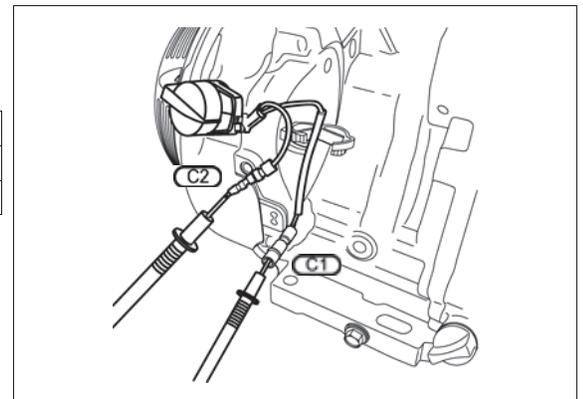
## ENGINE STOP SWITCH INSPECTION

Remove the engine stop switch connectors.

Check continuity between the terminals at each switch position.

Switch position	Continuity
ON	Yes
OFF	No

If the correct continuity is not obtained, replace the engine stop switch ([page 5-2](#)).

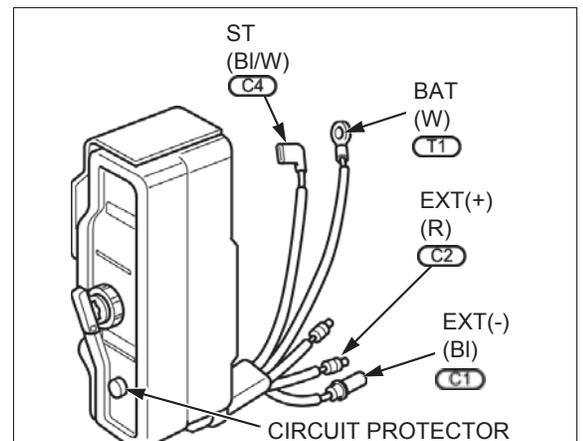


## COMBINATION SWITCH INSPECTION

### 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](#)).



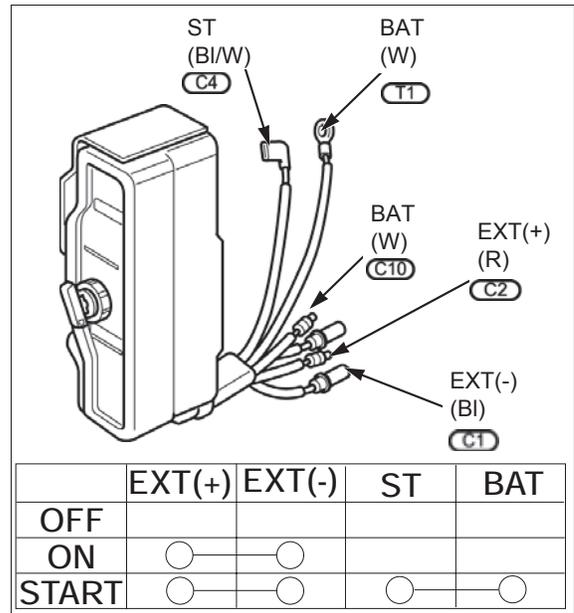
	EXT(+)	EXT(-)	ST	BAT
OFF				
ON	○	○		
START	○	○	○	○

## OTHER ELECTRICAL

### Without Circuit Protector

Check continuity between the terminals at each switch position.

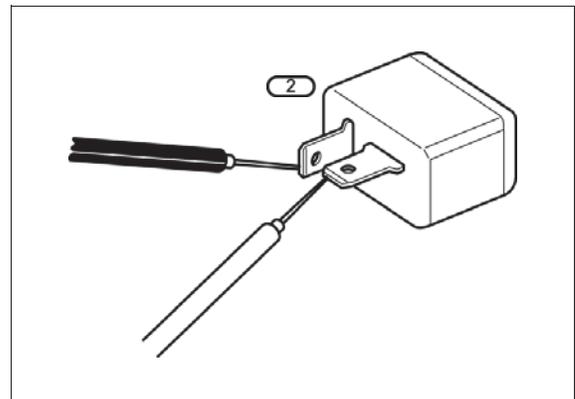
If the correct continuity is not obtained, replace the combination switch ([page 11-3](#)).



## SILICON RECTIFIER INSPECTION

Remove the silicon rectifier ([page 11-4](#)).

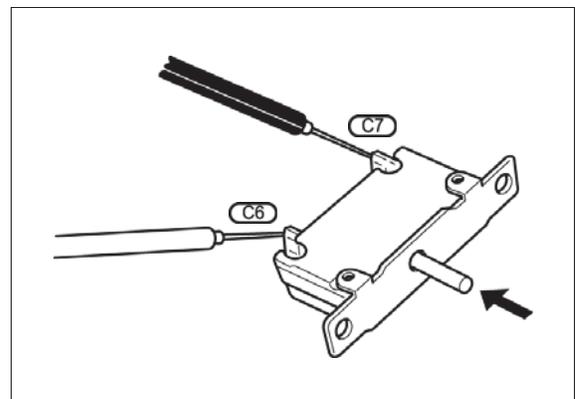
Check continuity between the terminals. There should be continuity in one direction only. Replace the rectifier if there is continuity in both directions or in neither direction.



## CIRCUIT PROTECTOR INSPECTION

Remove the circuit protector ([page 11-4](#)).

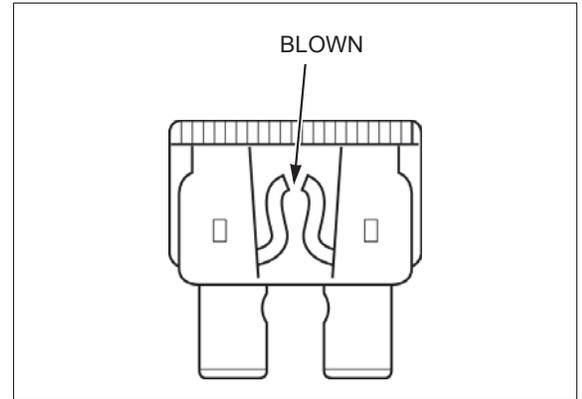
Check continuity between the terminals. There should be continuity in the ON position (button in) and no continuity in the OFF position (button out). Replace the circuit breaker if the correct continuity is not obtained.



## 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.



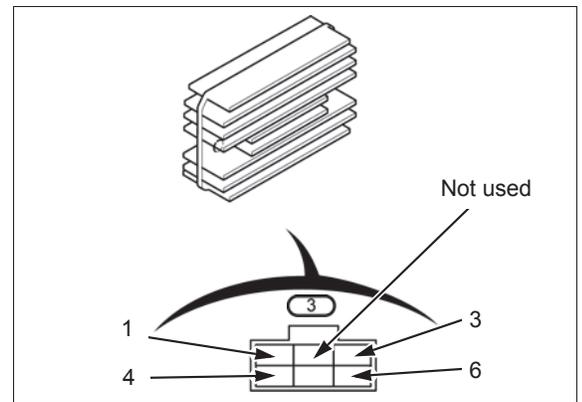
## REGULATOR/RECTIFIER INSPECTION

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

### 10A TYPE

Unit: kΩ

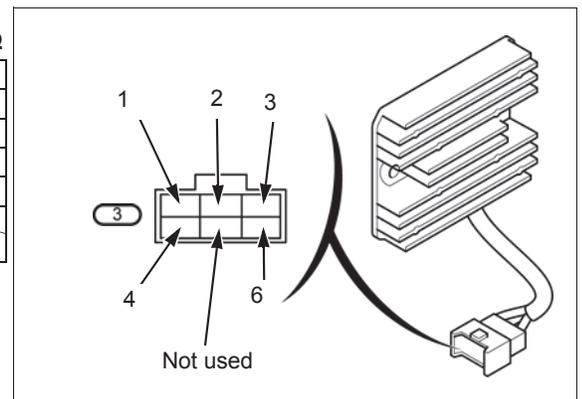
	4	6	1	3
4		∞	∞	∞
6	∞		∞	∞
1	1 - 200	1 - 200		0.5 - 100
3	0.1 - 50	0.1 - 50	∞	



### 18A TYPE

Unit: kΩ

	4	6	1	2	3
4		4 - 400	∞	∞	2 - 230
6	4 - 400		∞	∞	2 - 230
1	∞	∞		∞	∞
2	2 - 230	2 - 230	∞		1 - 600
3	0.09 - 400	0.09 - 400	∞	∞	



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.

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# MEMO

# 12. CYLINDER HEAD/VALVES

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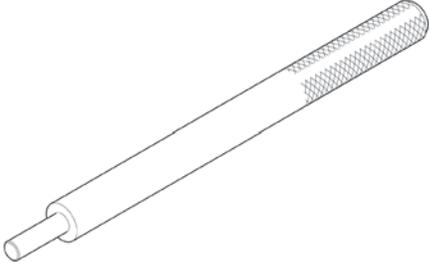
<b>TOOLS</b> .....	<b>12-2</b>	<b>CYLINDER HEAD/VALVES INSPECTION</b>	<b>12-5</b>
<b>CYLINDER HEAD REMOVAL/ INSTALLATION</b> .....	<b>12-3</b>	<b>VALVE GUIDE REPLACEMENT</b> .....	<b>12-8</b>
<b>CYLINDER HEAD DISASSEMBLY/ ASSEMBLY</b> .....	<b>12-4</b>	<b>VALVE GUIDE REAMING</b> .....	<b>12-9</b>
		<b>VALVE SEAT RECONDITIONING</b> .....	<b>12-10</b>

## CYLINDER HEAD/VALVES

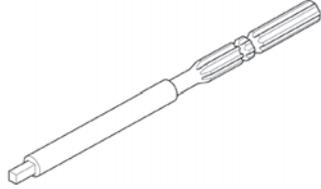
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### TOOLS

**Valve guide driver, 6.6 mm**  
**07942-6570100**



**Valve guide reamer, 6.6 mm**  
**07984-ZE2000D**



# CYLINDER HEAD REMOVAL/INSTALLATION

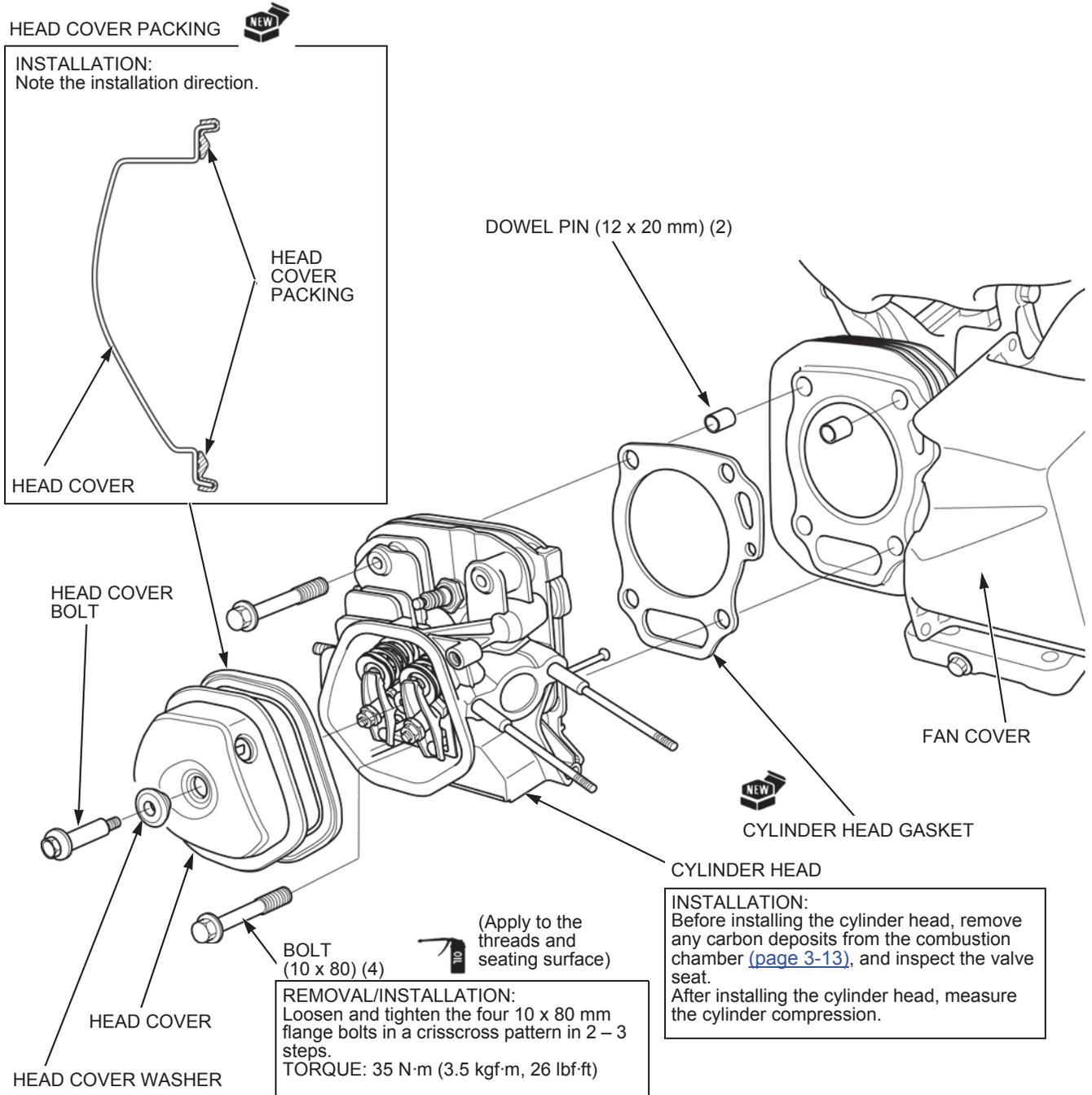
Set the piston at top dead center of the cylinder compression stroke ([page 3-12](#)).

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](#)).



## CYLINDER HEAD/VALVES

# CYLINDER HEAD DISASSEMBLY/ ASSEMBLY

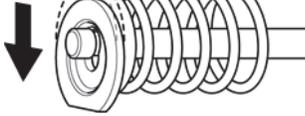
Remove the cylinder head (page 12-3).

### 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

VALVE SPRING SEAT

EXHAUST VALVE GUIDE

CYLINDER HEAD

SPARK PLUG

VALVE GUIDE CLIP

INTAKE VALVE

#### ASSEMBLY:

Do not interchange with the exhaust valve.

The intake valve is larger than the exhaust valve.

VALVE HEAD  
DIAMETER: 33mm

INTAKE VALVE GUIDE

SHROUD

VALVE STEM SEAL

6 x 12 (CT bolt)

VALVE SPRING (2)

PUSH ROD GUIDE PLATE

PUSH ROD (2)

#### 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.

PIVOT ADJUSTING NUT (2)

10 N·m (1.0 kgf·m, 7 lbf·ft)

PIVOT BOLT 8 mm (2)

24 N·m (2.4 kgf·m, 17 lbf·ft)

ROCKER ARM PIVOT (2)

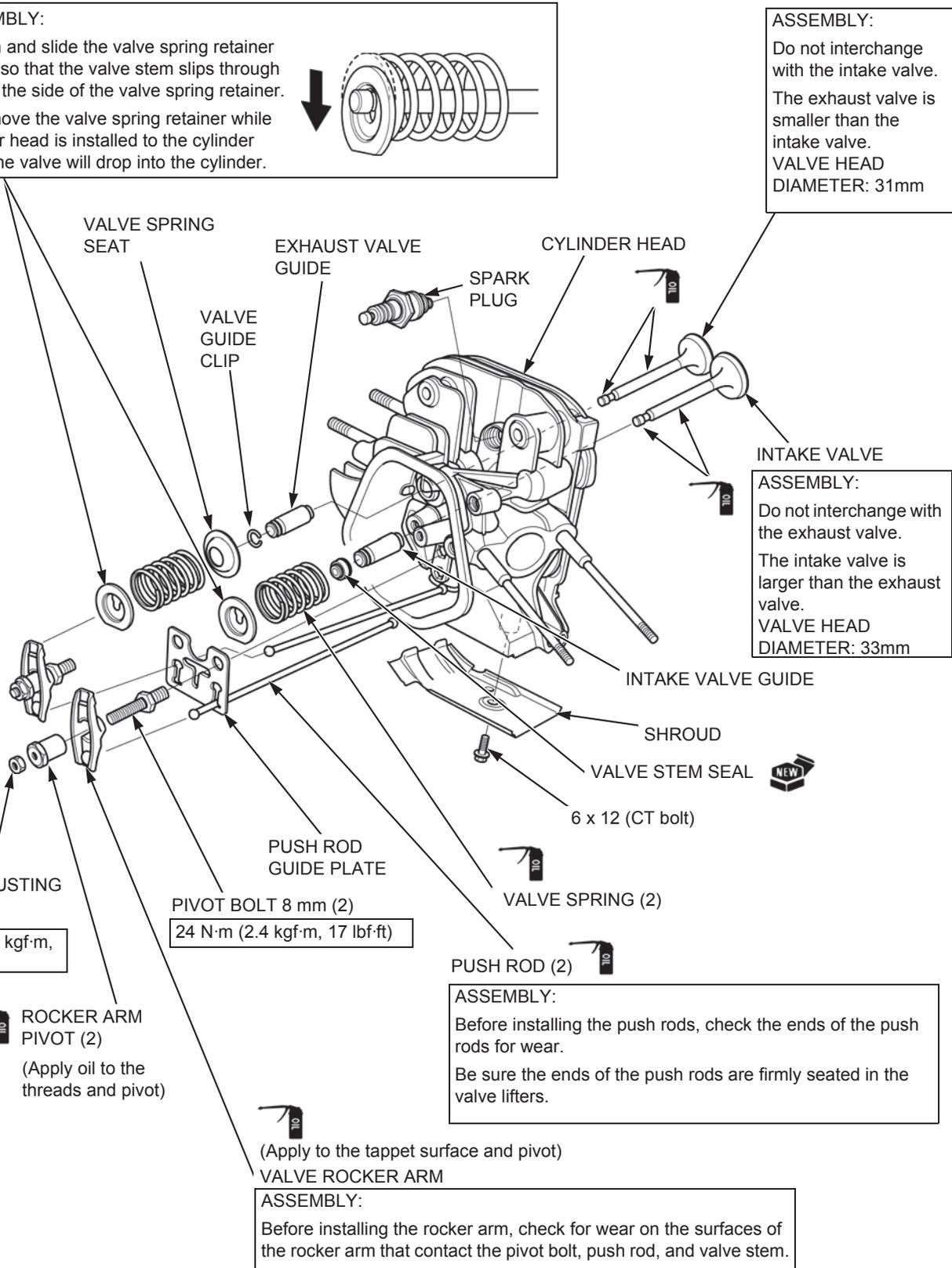
(Apply oil to the threads and pivot)

(Apply to the tappet surface and pivot)

VALVE ROCKER ARM

#### ASSEMBLY:

Before installing the rocker arm, check for wear on the surfaces of the rocker arm that contact the pivot bolt, push rod, and valve stem.



## 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.

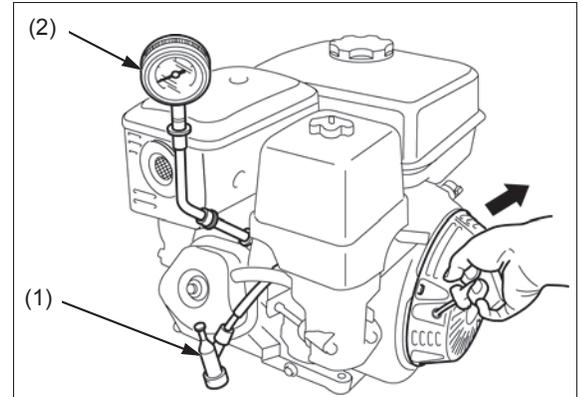
Pull the recoil starter several times to expel unburned gas.

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/cm<sup>2</sup>, 74 - 100 psi) / 600 min<sup>-1</sup> (rpm)**



### CYLINDER HEAD WARPAGE

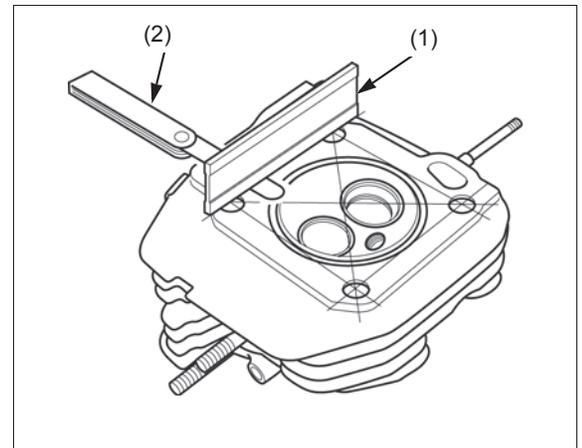
Remove the carbon deposits from the combustion chamber ([page 3-13](#)).

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.

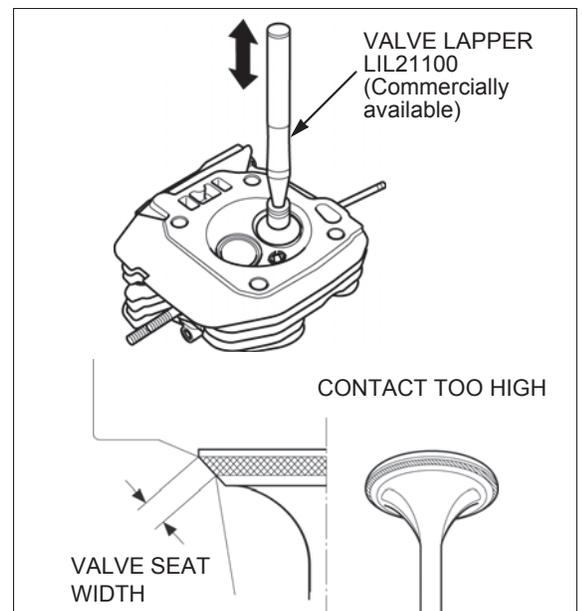
#### STANDARD: 1.0 - 1.2 mm (0.04 - 0.05 in)

#### 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.

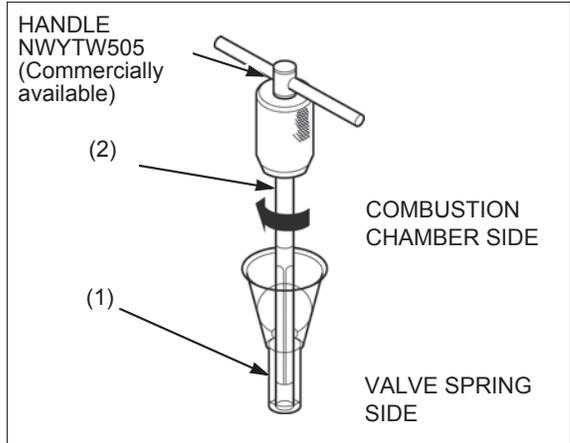
#### TOOL:

Valve guide reamer 6.6 (2)    **07984-ZE20001**

#### NOTICE

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

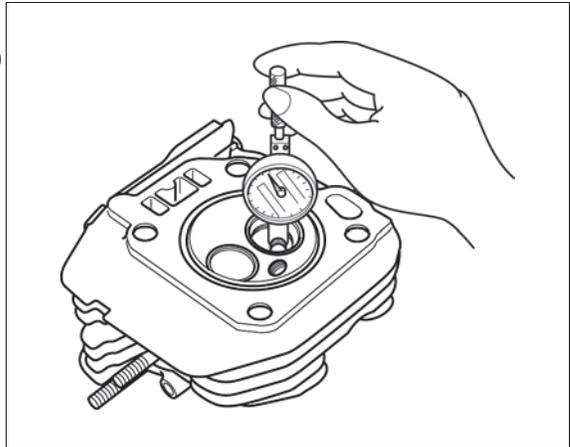
*Continue to rotate the special tool while removing it from the valve guide.*



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)

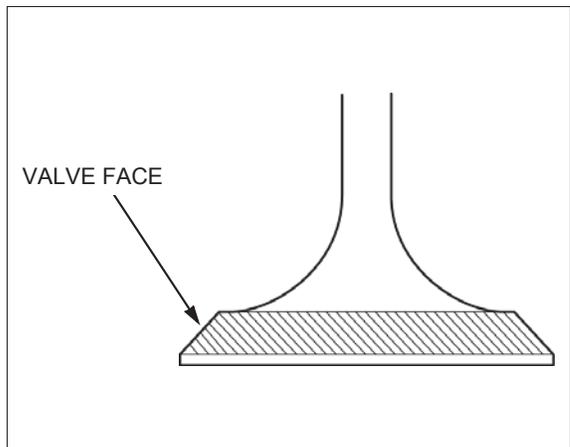
If the measured valve guide I.D. is more than the service limit, replace the valve guide ([page 12-8](#)).



### 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 ([page 12-4](#)).

Measure and record each valve stem O.D.

**STANDARD:**

**IN:** 6.575 – 6.590 mm (0.2588 – 0.2594 in)

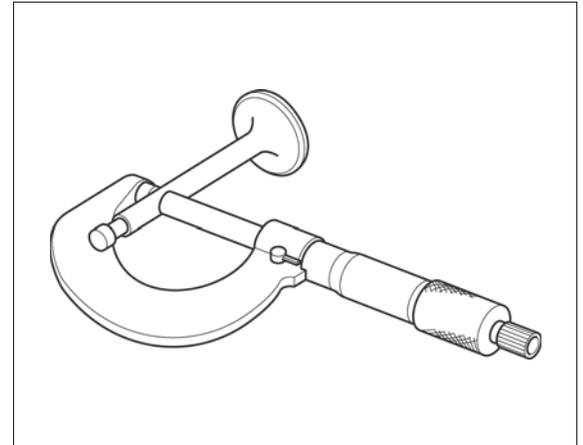
**EX:** 6.535 – 6.550 mm (0.2572 – 0.2578 in)

**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 ([page 12-4](#)).

**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 ([page 12-4](#))
- Valve guide ([page 12-8](#))

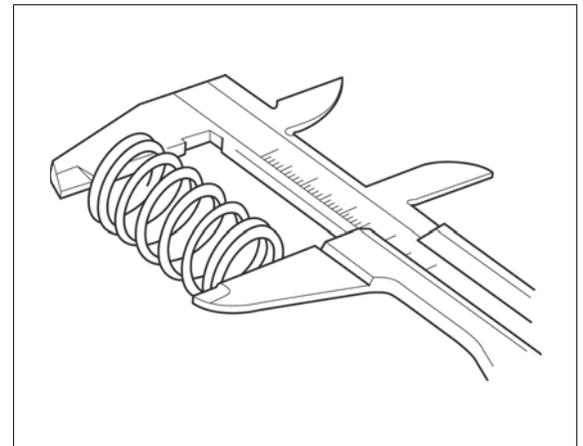
**VALVE SPRING FREE LENGTH**

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 ([page 12-4](#)).



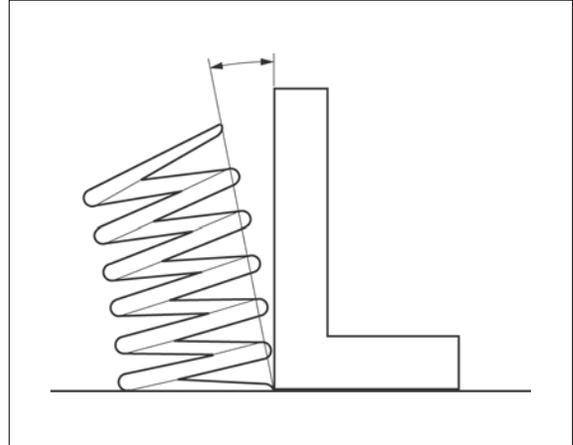
## CYLINDER HEAD/VALVES

### 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](#)).

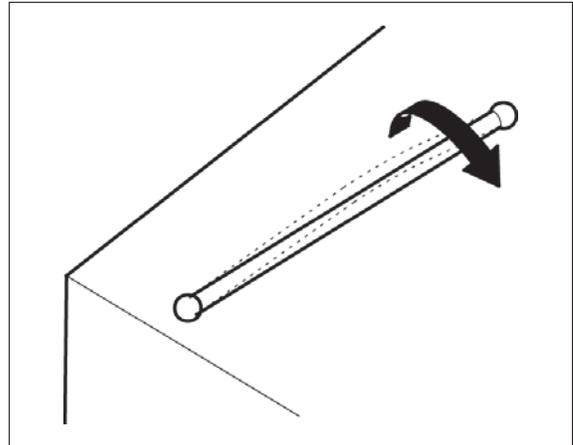


### PUSH ROD RUNOUT

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).

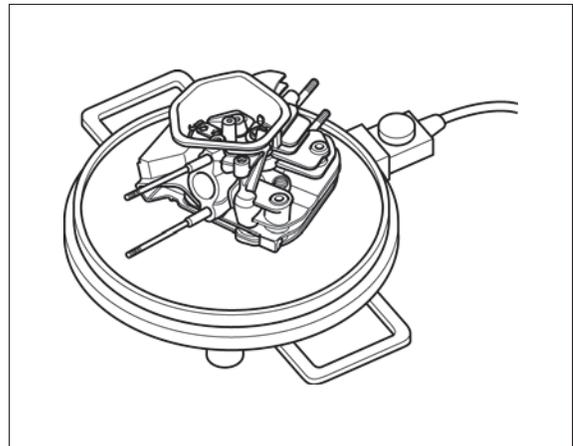
### ⚠ CAUTION

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.



## CYLINDER HEAD/VALVES

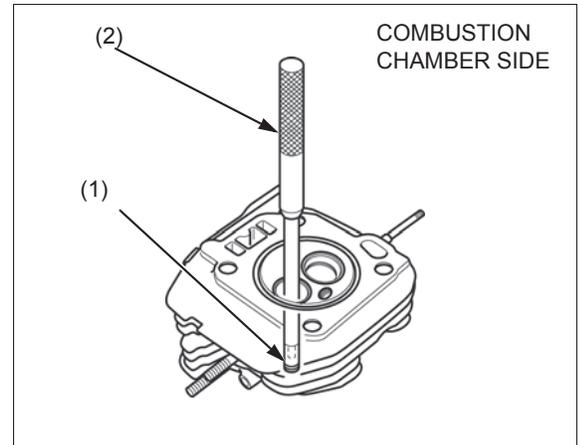
Drive the valve guides (1) out of the cylinder head from the combustion chamber side.

**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:**

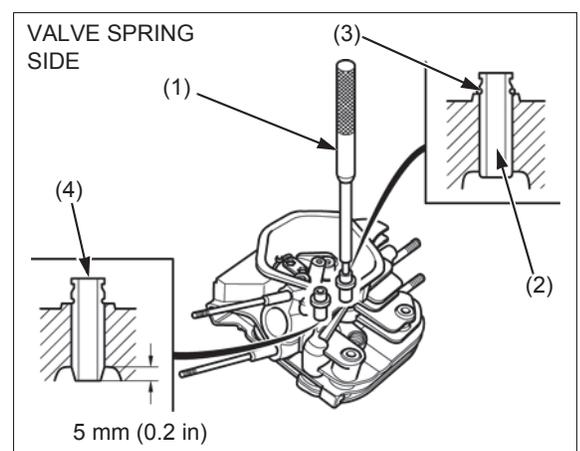
**5 mm (0.2 in)**

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**

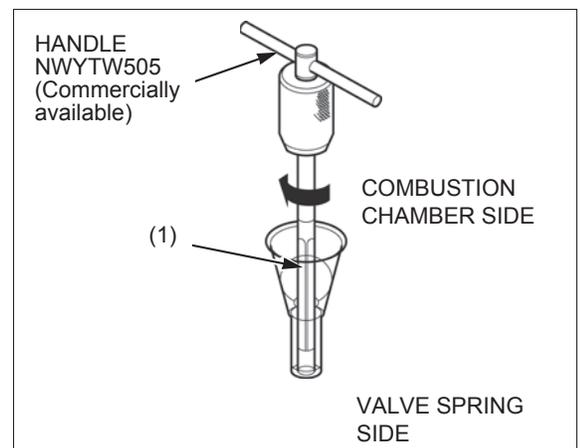
Rotate the reamer clockwise through the valve guide the full length of the reamer.

**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.

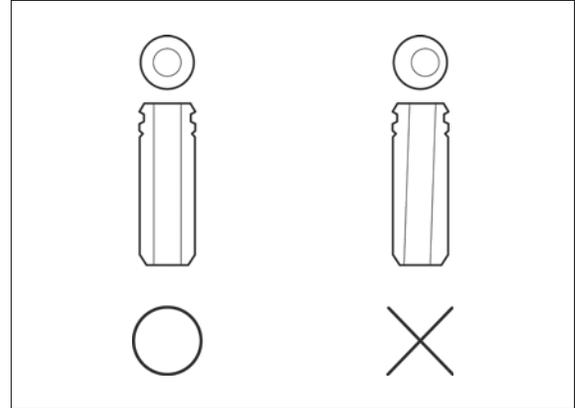


## CYLINDER HEAD/VALVES

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.

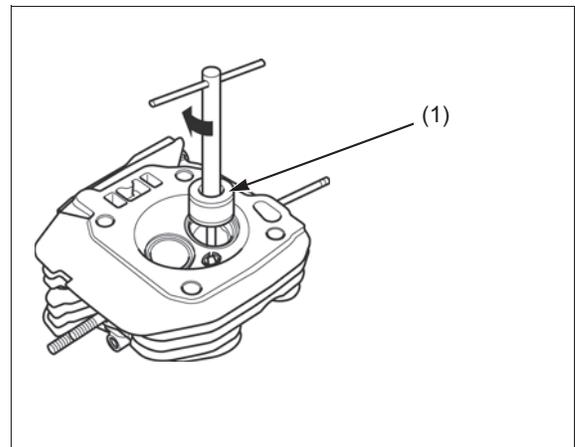
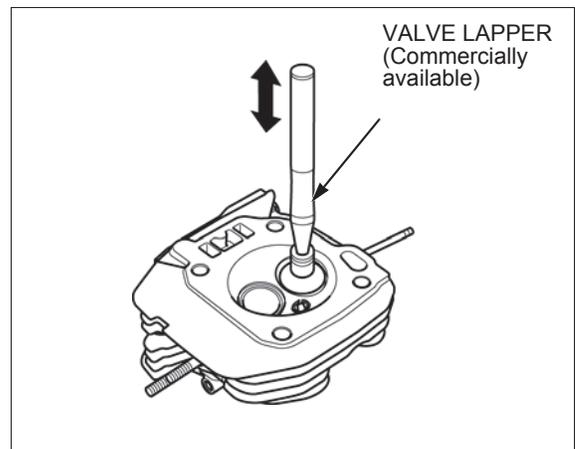
Check whether the valve seat contact area of the valve is too high or too low.

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.*



## CYLINDER HEAD/VALVES

The 30° cutter removes material from the top edge (contact too high).

**TOOLS:**

**Solid pilot bar, 6.6 mm  
Cutter, 30 x 45 degrees**

**NWY100-6.60  
NWYCU128**

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

**TOOLS:**

**Solid pilot bar, 6.6 mm  
Cutter, 60 degree**

**NWY100-6.60  
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  
Cutter, 30 x 45 degrees**

**NWY100-6.60  
NWYCU128**

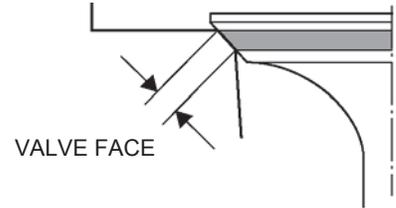
After resurfacing the seats, inspect for even valve seating.

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.

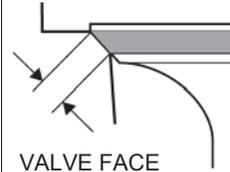
The seating surface, as shown by the transferred marking compound, should have good contact all the way around.

Thoroughly clean the cylinder head to remove all cutting residue.

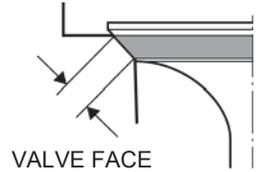
CONTACT OK



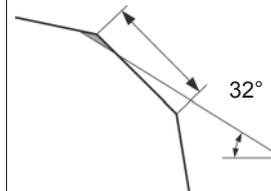
CONTACT TOO HIGH



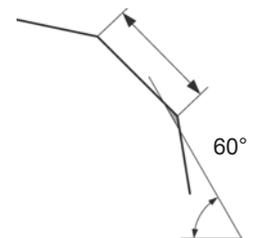
CONTACT TOO LOW



VALVE FACE



VALVE FACE



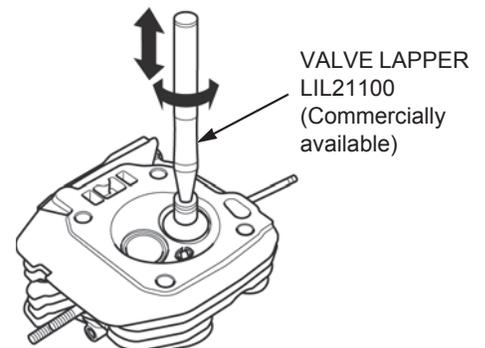
Lap the valves into their seats, using a commercially available valve lapper and lapping compound.

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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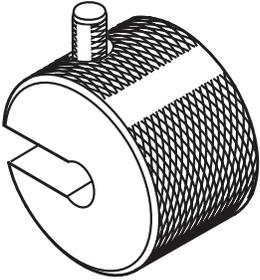
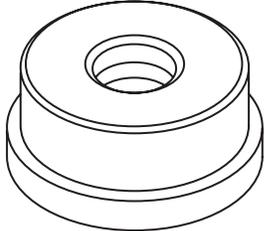
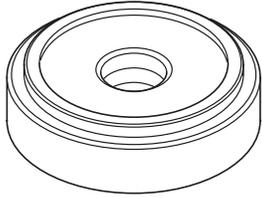
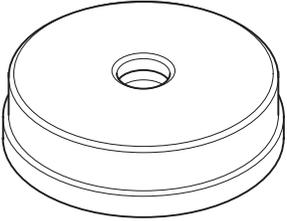
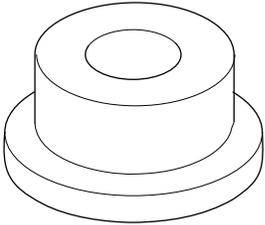
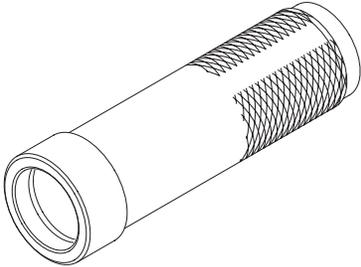
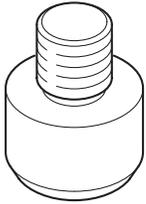
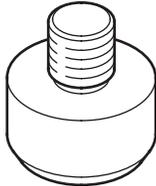
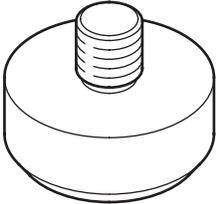
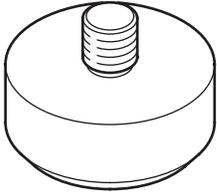
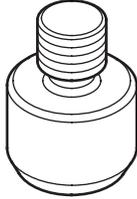
# MEMO

# 13. CRANKCASE

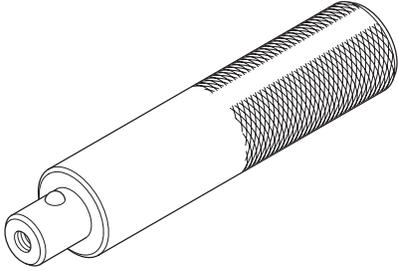
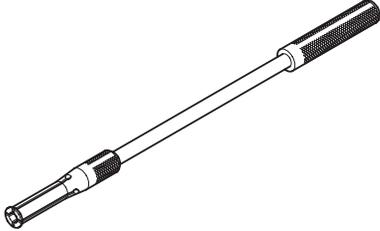
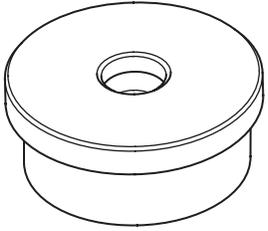
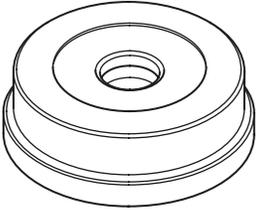
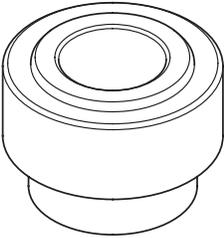
<b>TOOLS</b> .....	<b>13-2</b>	<b>GX240/GX270 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CRANKCASE COVER SIDE)</b> .....	<b>13-25</b>
<b>CRANKCASE COVER REMOVAL/INSTALLATION</b> .....	<b>13-4</b>	<b>GX340/GX390 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CRANKCASE COVER SIDE)</b> .....	<b>13-27</b>
<b>CRANKSHAFT/BALANCER WEIGHT/PISTON REMOVAL/INSTALLATION</b> .....	<b>13-5</b>	<b>GX240/GX270 CRANKSHAFT BEARING REPLACEMENT (FLYWHEEL SIDE)</b> ...	<b>13-30</b>
<b>BALANCER WEIGHT/CAMSHAFT INSTALLATION</b> .....	<b>13-6</b>	<b>GX340/GX390 CRANKSHAFT BEARING REPLACEMENT (FLYWHEEL SIDE)</b> ...	<b>13-31</b>
<b>1/2 OR 1/6 REDUCTION UNIT DISASSEMBLY/ASSEMBLY</b> .....	<b>13-7</b>	<b>GX270 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CYLINDER BARREL SIDE)</b> .....	<b>13-32</b>
<b>1/2 REDUCTION UNIT (CHAIN TYPE) DISASSEMBLY/ASSEMBLY (GX240 ONLY)</b> .....	<b>13-8</b>	<b>GX340/GX390 CRANKSHAFT/BALANCER WEIGHT BEARING/OIL SEAL REPLACEMENT (CYLINDER BARREL SIDE)</b> .....	<b>13-33</b>
<b>1/2 REDUCTION UNIT WITH CLUTCH DISASSEMBLY/ASSEMBLY (GX270 ONLY)</b> .....	<b>13-9</b>	<b>COUNTER SHAFT/P.T.O. SHAFT BEARING/OIL SEAL REPLACEMENT (GEAR CASE COVER SIDE)</b> .....	<b>13-35</b>
<b>GOVERNOR DISASSEMBLY ASSEMBLY</b> .....	<b>13-11</b>	<b>GX240/GX270 COUNTER SHAFT/P.T.O. SHAFT BEARING REPLACEMENT (CRANKCASE COVER SIDE)</b> .....	<b>13-37</b>
<b>PISTON DISASSEMBLY/ASSEMBLY</b> ...	<b>13-12</b>	<b>GX340/GX390 COUNTER SHAFT/P.T.O. SHAFT BEARING REPLACEMENT (CRANKCASE COVER SIDE)</b> .....	<b>13-38</b>
<b>CRANKCASE COVER/CYLINDER BARREL/PISTON/CONNECTING ROD/CRANKSHAFT/CAMSHAFT INSPECTION</b> .....	<b>13-13</b>	<b>GX240/GX270 CRANKSHAFT/P.T.O. SHAFT OIL SEAL REPLACEMENT (1/2 REDUCTION WITH CLUTCH)</b> .....	<b>13-40</b>
<b>1/2 OR 1/6 REDUCTION UNIT INSPECTION</b> .....	<b>13-22</b>		
<b>1/2 REDUCTION UNIT (CHAIN TYPE) INSPECTION (GX240 ONLY)</b> .....	<b>13-23</b>		
<b>1/2 REDUCTION UNIT WITH CLUTCH INSPECTION (GX270 ONLY)</b> .....	<b>13-24</b>		

# CRANKCASE

## TOOLS

<p><b>Remover weight</b> 07936-371020A</p> 	<p><b>Bearing driver attachment,</b> 32×35 mm 07746-0010100</p> 	<p><b>Bearing driver attachment,</b> 42×47 mm 07746-0010300</p> 
<p><b>Bearing driver attachment,</b> 52×55 mm 07746-0010400</p> 	<p><b>Bearing driver attachment,</b> 72×75 mm 07746-0010600</p> 	<p><b>Driver, 40 mm I.D.</b> 07746-0030100</p> 
<p><b>Inner bearing driver attachment,</b> 35 mm 07746-0030400</p> 	<p><b>Pilot, 15 mm</b> 07746-0040300</p> 	<p><b>Pilot, 20 mm</b> 07746-0040500</p> 
<p><b>Pilot, 30 mm</b> 07746-0040700</p> 	<p><b>Pilot, 35 mm</b> 07746-0040800</p> 	<p><b>Pilot, 14 mm</b> 07746-0041200</p> 

## CRANKCASE

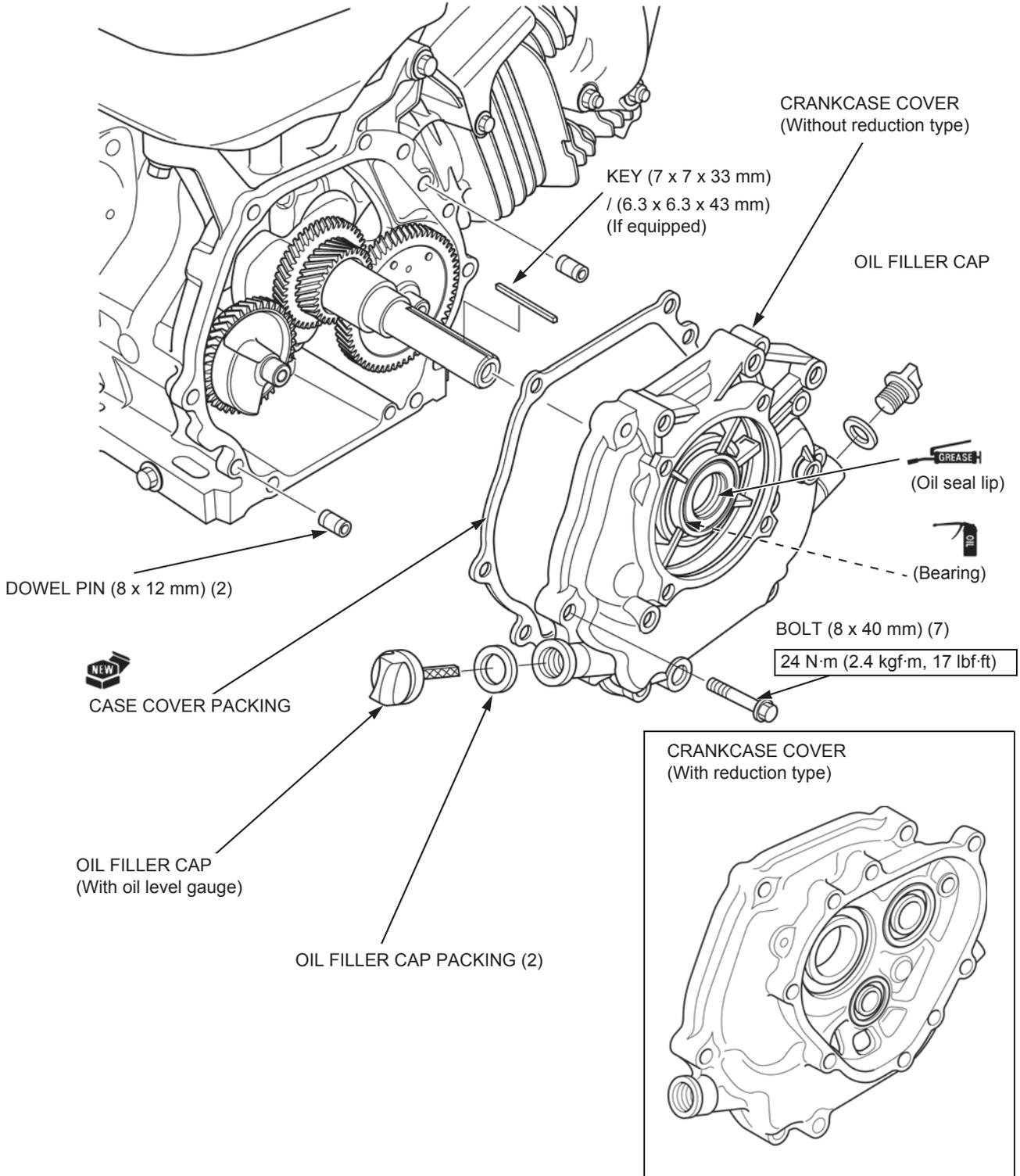
<p><b>Driver</b> 07749-0010000</p> 	<p><b>Bearing remover, 15 mm</b> 07936-KC10500</p> 	<p><b>Bearing driver attachment, 45×50 mm</b> 07946-6920100</p> 
<p><b>Bearing driver attachment, 62×64 mm</b> 07947-6340400</p> 	<p><b>Inner bearing driver attachment, 30 mm [in combination with 07746-0030300]</b></p> 	

## 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).



# 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.



MARK

Viewed from cylinder head side



DRAIN PLUG  
WASHER (12 mm) (2)

OIL LEVEL  
SWITCH NUT  
(10 mm)

10 N·m (1.0 kgf·m,  
7 lbf·ft)

DRAIN PLUG  
BOLT (2)

22.5 N·m (2.25  
kgf·m, 17 lbf·ft)

WASHER (8.2 x 17 x 0.8 mm)

GOVERNOR ARM SHAFT



OIL LEVEL SW

BOLT (6 X 12 mm) (2)

BALANCER  
WEIGHT



CONNECTING ROD BOLT (2)

14 N·m (1.4 kgf·m, 10 lbf·ft)

(Apply oil to the threads  
and seating surface)

GREASE  
(Oil seal lip)

GROOVE

CONNECTING ROD LOWER

### INSTALLATION:

Set the connecting rod lower with the oil dipper toward the camshaft.

VALVE LIFTER

### 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.

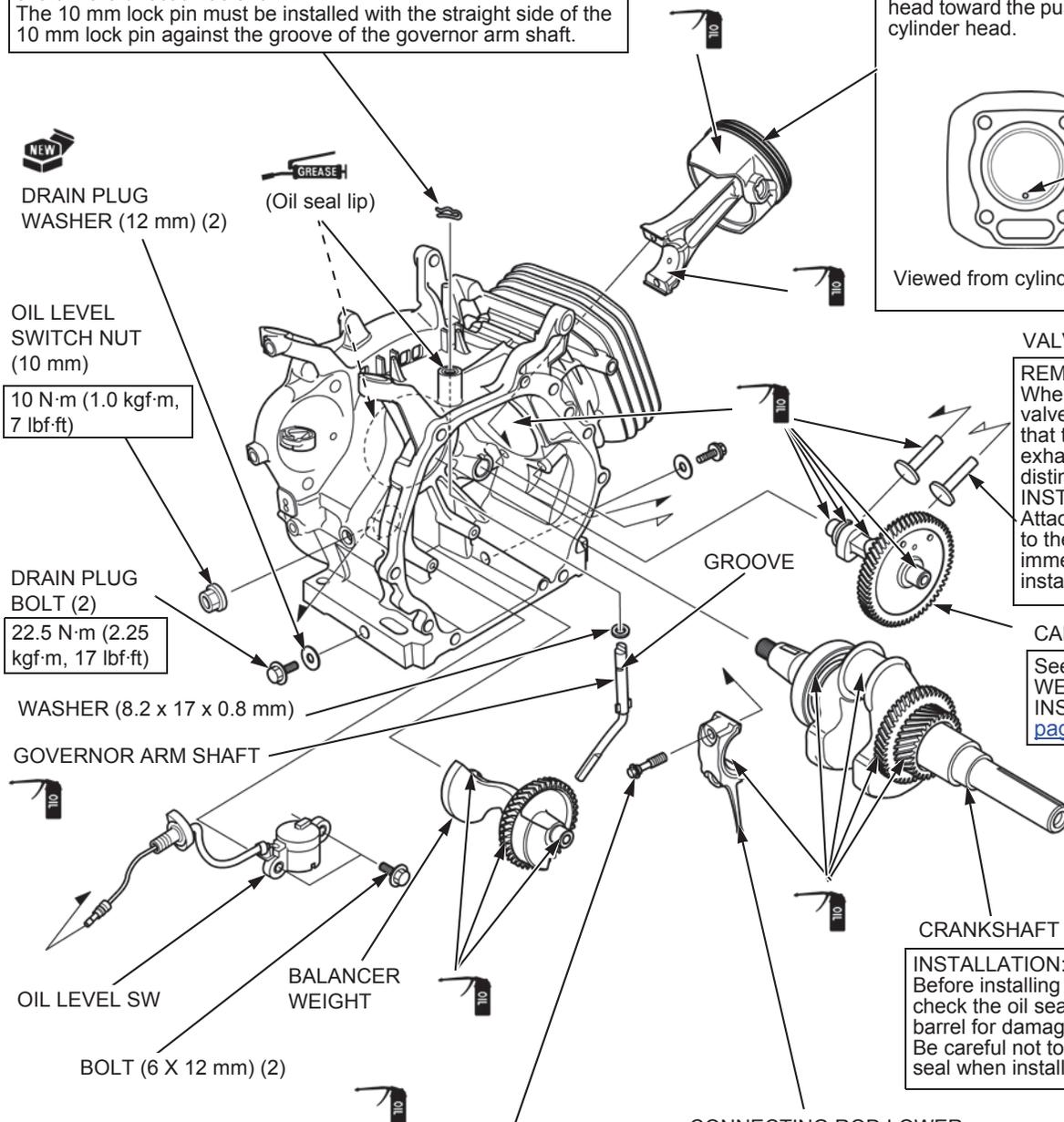
CAMSHAFT

See BALANCER  
WEIGHT/CAMSHAFT  
INSTALLATION on  
[page 13-6](#).

CRANKSHAFT

### INSTALLATION:

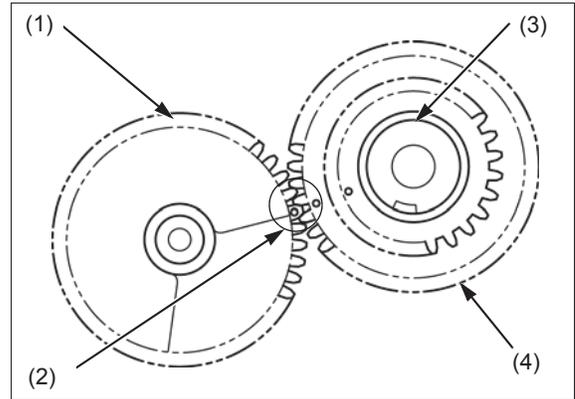
Before installing the crankshaft, check the oil seal of the cylinder barrel for damage or hardening. Be careful not to damage the oil seal when installing the crankshaft.



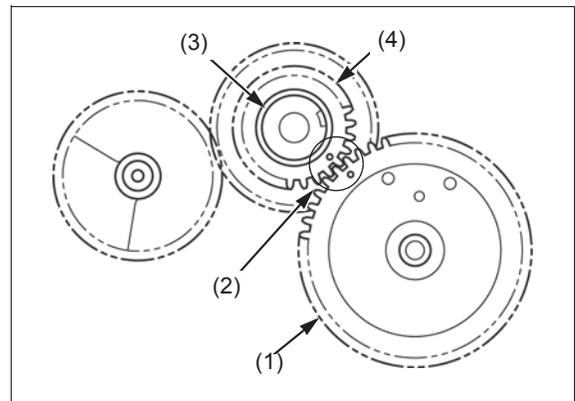
## CRANKCASE

### 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)).

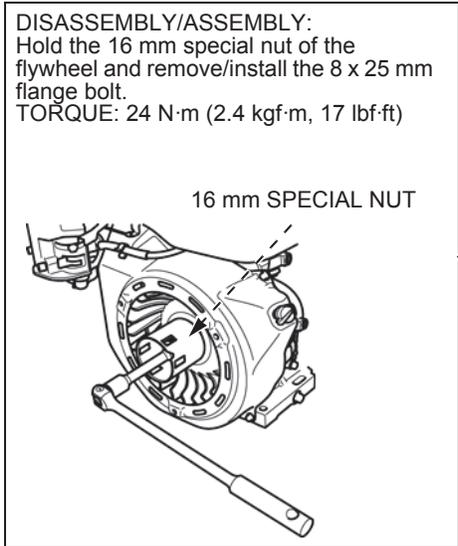


# 1/2 OR 1/6 REDUCTION UNIT DISASSEMBLY/ASSEMBLY

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)



**PRIMARY DRIVE GEAR**

**WASHER (8 mm)**

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

**DOWEL PIN (8 x 14 mm)**

**P.T.O. SHAFT**

**GEAR CASE COVER**

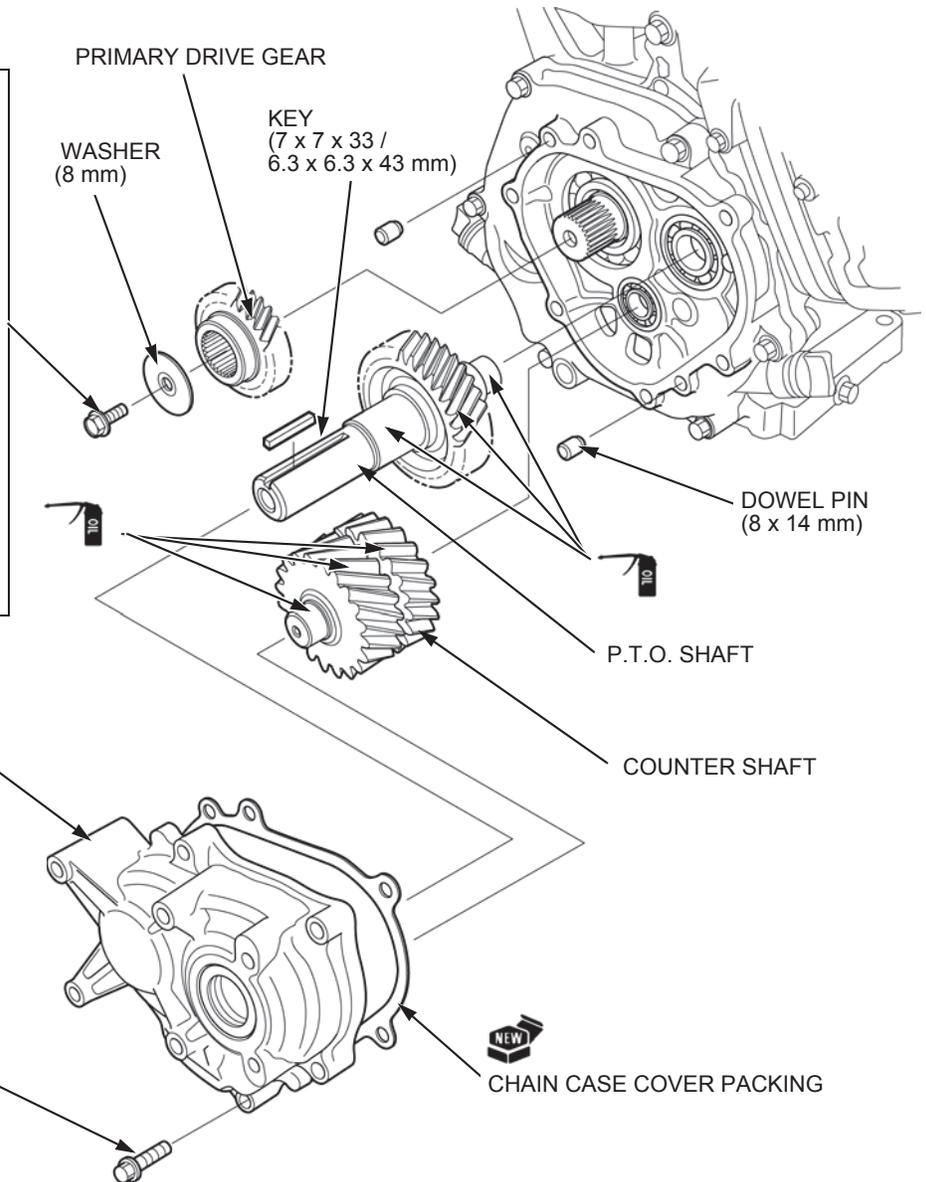
**COUNTER SHAFT**

**BOLT (8 x 35 mm) (6) (GX270)**  
**BOLT (8 x 40 mm) (6) (GX390)**

**24 N·m (2.4 kgf·m, 17 lbf·ft)**

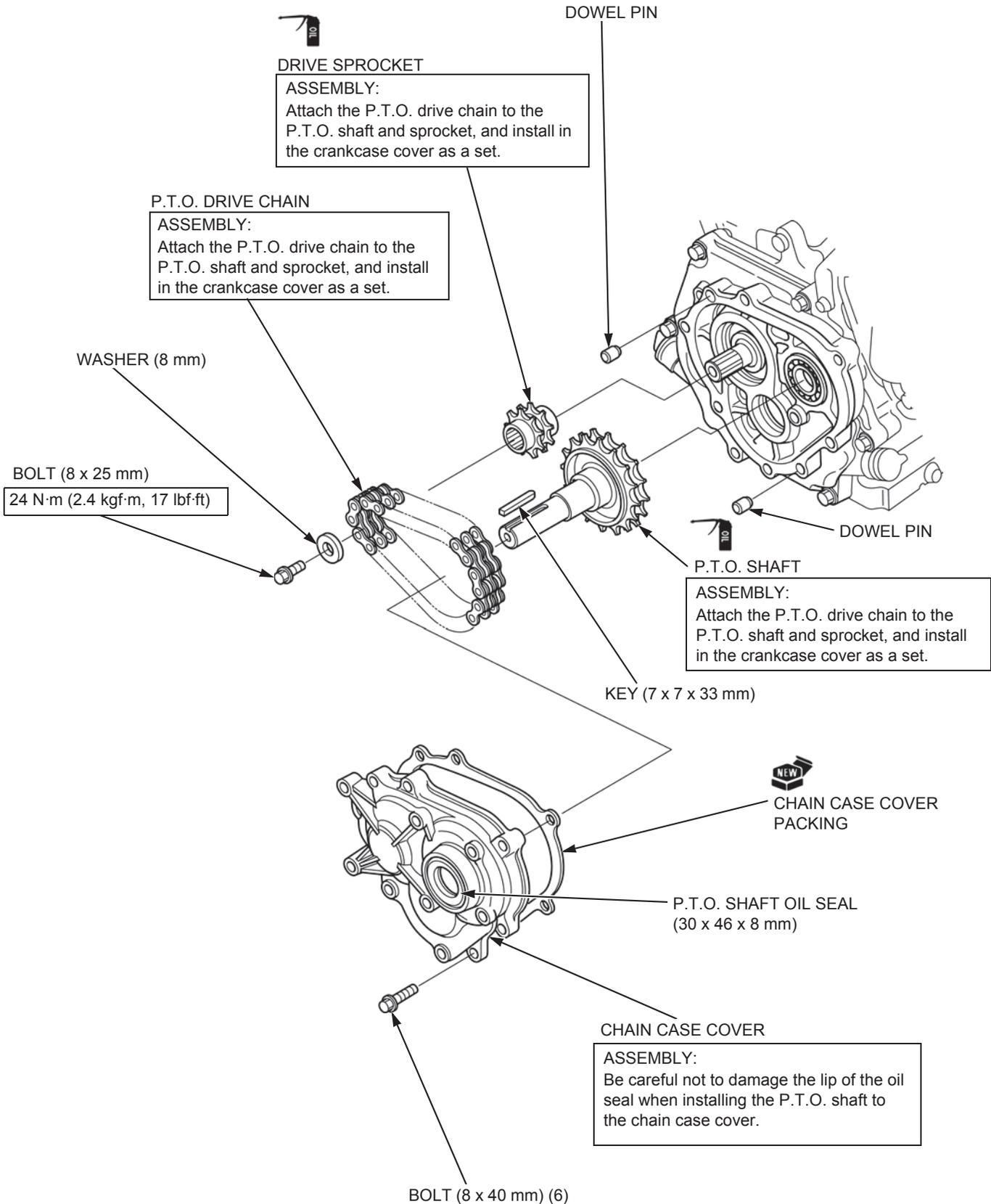


**CHAIN CASE COVER PACKING**



# CRANKCASE

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



# 1/2 REDUCTION UNIT WITH CLUTCH DISASSEMBLY/ASSEMBLY (GX270 ONLY)

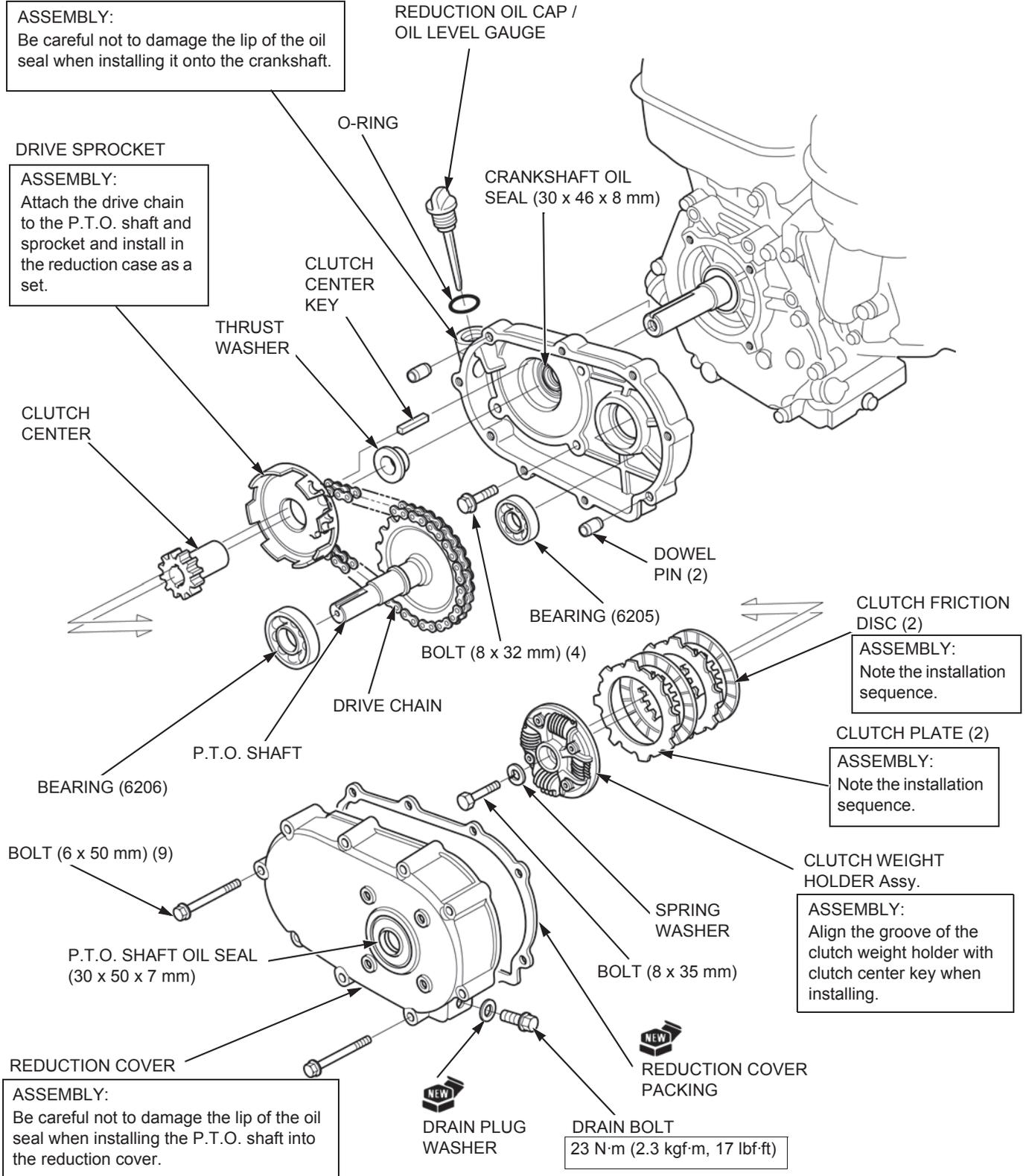
Drain the oil ([page 3-5](#)).  
After installation, fill the oil ([page 3-5](#)).

## REDUCTION CASE

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

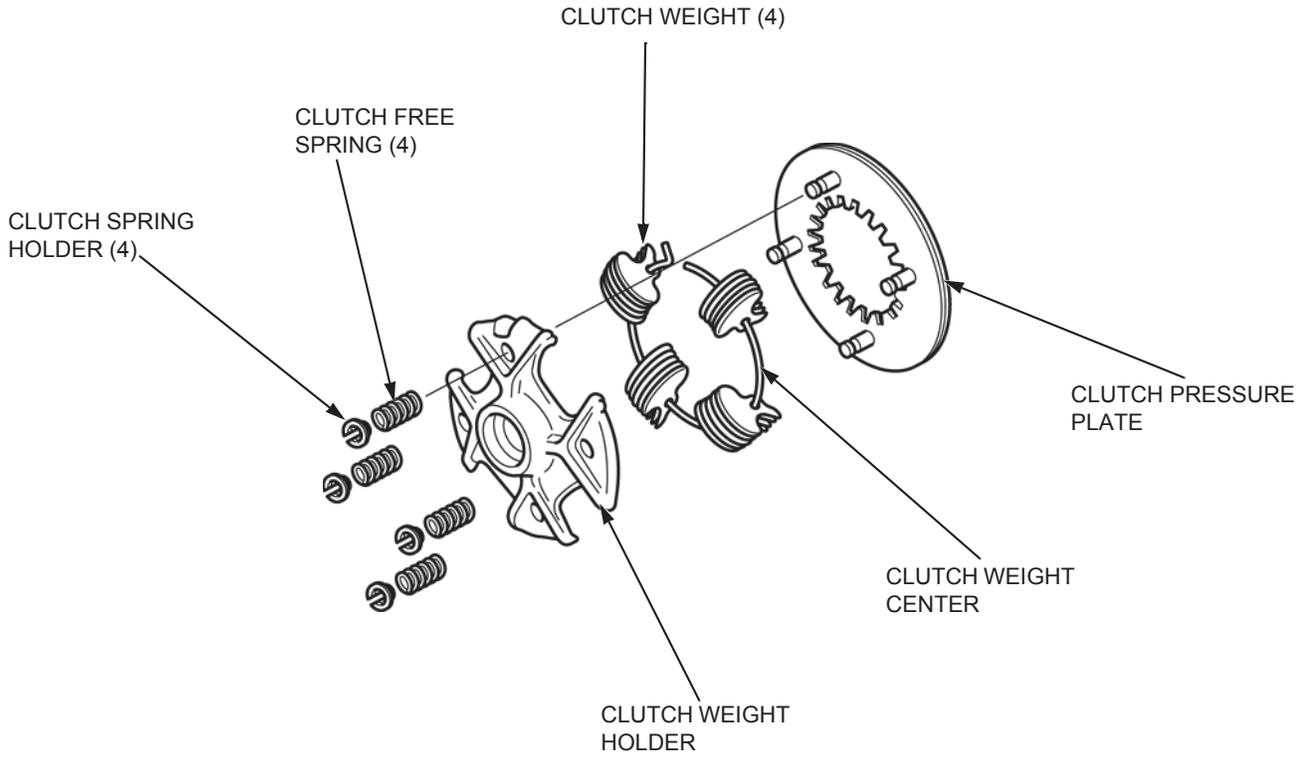
## DRIVE SPROCKET

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



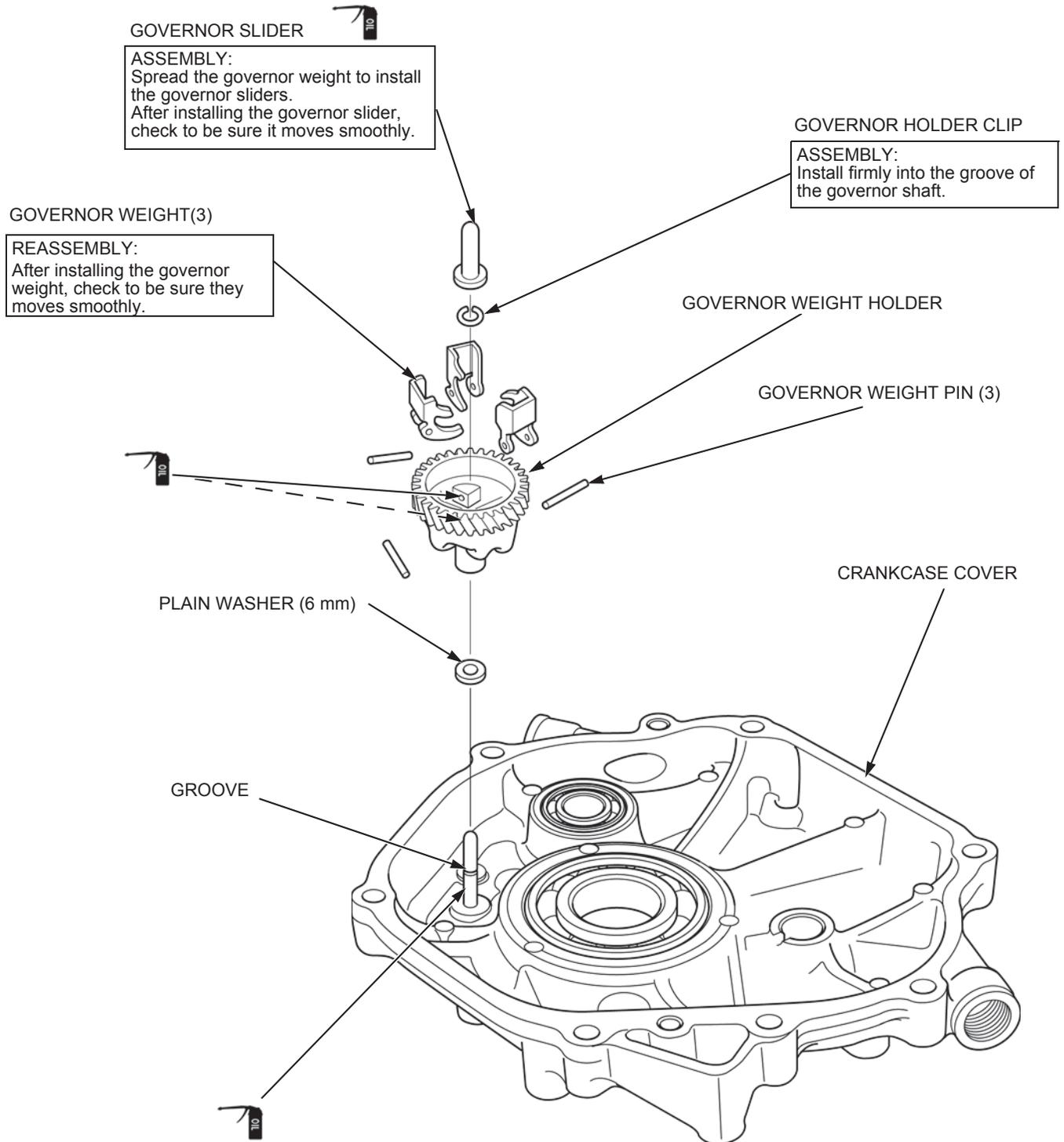
## CRANKCASE

### CLUTCH WEIGHT HOLDER ASSY. DISASSEMBLY/ASSEMBLY



# GOVERNOR DISASSEMBLY/ASSEMBLY

Remove the crankcase cover ([page 13-4](#)).



## CRANKCASE

# PISTON DISASSEMBLY/ASSEMBLY

Remove the piston ([page 13-5](#)).

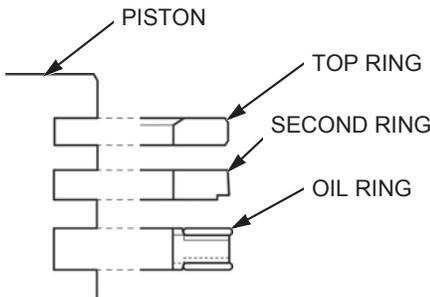
NOTE: Honing should be performed on engines with cast iron sleeves ([page 13-16](#)) whenever the piston rings are replaced and the existing cylinder is within service limits and reused.



### 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.



MAKER MARK

TOP RING  
(Chrome plated)

SECOND RING

SIDE RAIL

OIL RING  
(COMBINATION RING)

SPACER

SIDE RAIL

10 mm (0.4 in)

10 mm (0.4 in)

MARK



PISTON

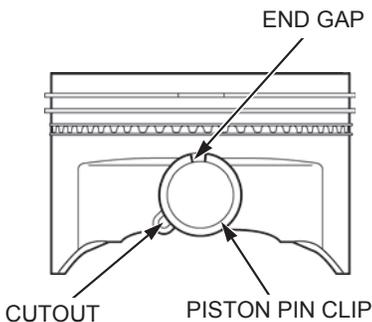


PISTON PIN

### 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.



LONG END

CONNECTING ROD UPPER

#### ASSEMBLY:

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

# CRANKCASE COVER/CYLINDER BARREL/PISTON/CONNECTING ROD/ CRANKSHAFT/CAMSHAFT INSPECTION

## CAM SHAFT HOLDER I.D.: CRANKCASE COVER SIDE

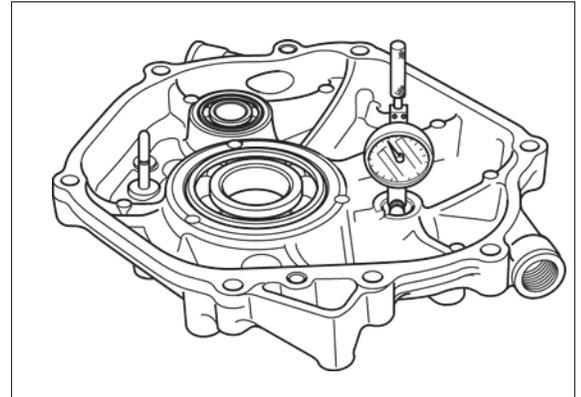
Measure the camshaft holder I.D. of the crankcase cover.

**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](#)).



## CAMSHAFT HOLDER I.D.: CYLINDER BARREL SIDE

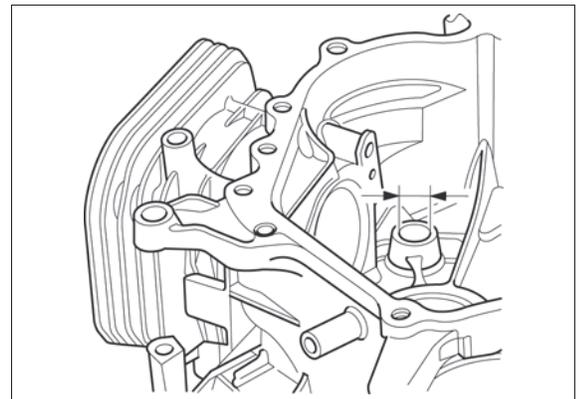
Measure the camshaft holder I.D. of the cylinder barrel assembly.

**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)

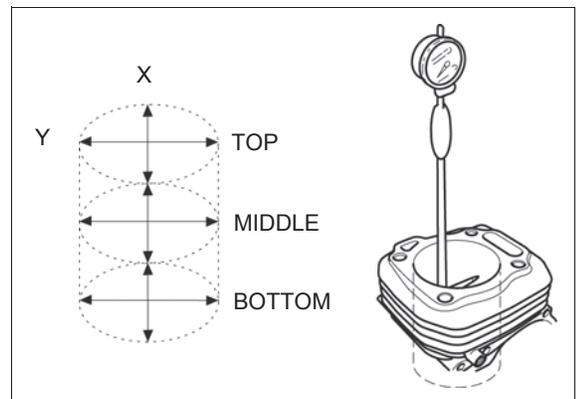
### GX340/GX390

**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)

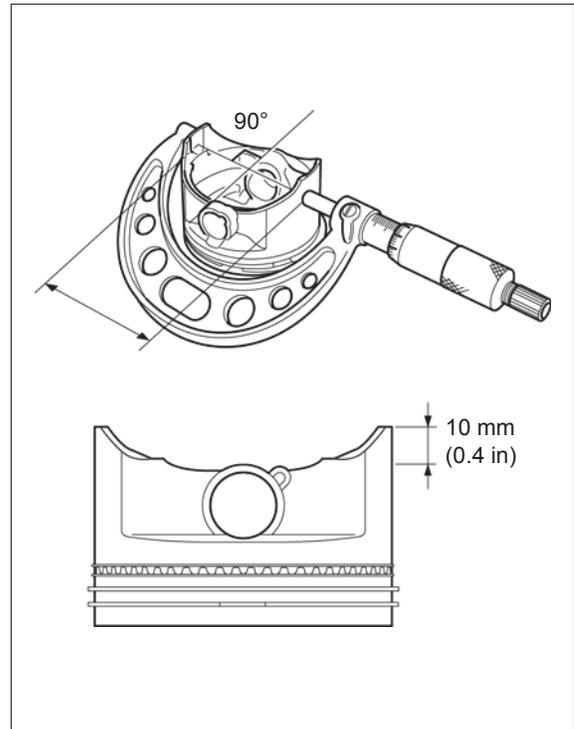
#### GX340/GX390

**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

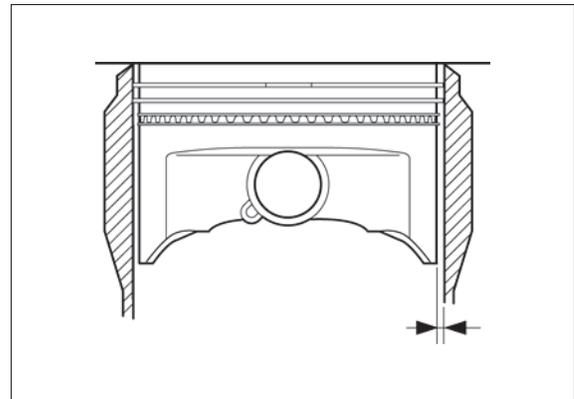
Subtract the piston skirt O.D. from the cylinder sleeve I.D. to obtain the piston-to-cylinder clearance.

**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)

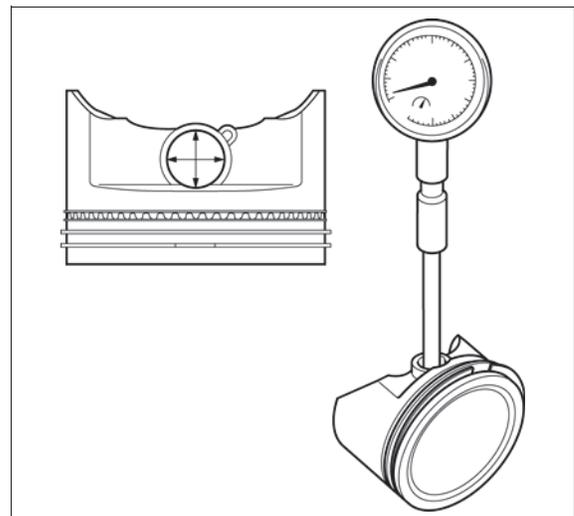
#### GX340/GX390

**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

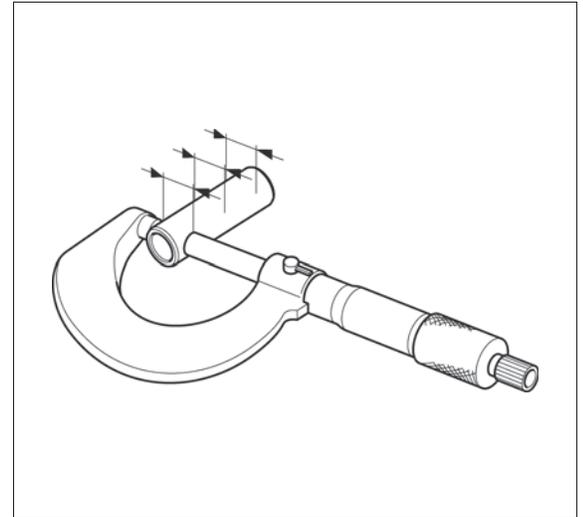
**STANDARD:** 19.994 – 20.000 mm  
(0.7872 – 0.7874 in)

**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:

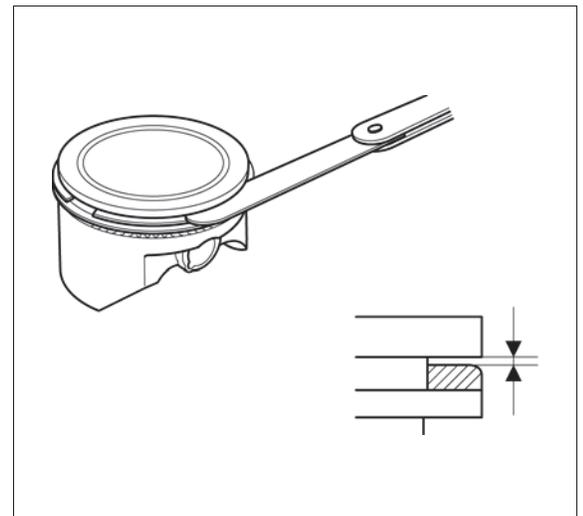
**Top/second:** 0.15 mm (0.006 in)

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)

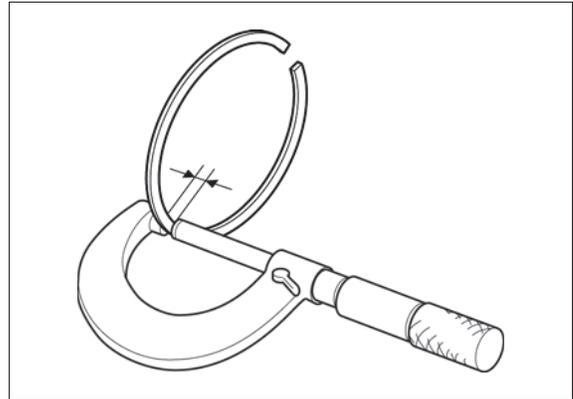
**Second:** 1.160 – 1.175 mm  
(0.0457 – 0.0463 in)

**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:**

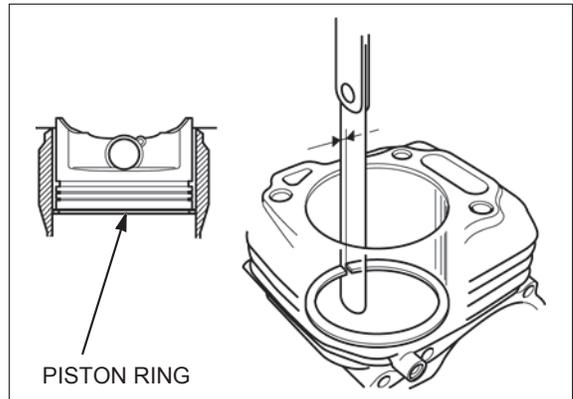
**Top:** 1.0 mm (0.04 in)

**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

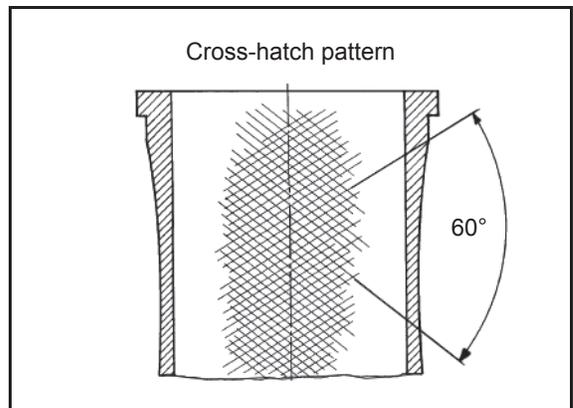
Apply honing oil to the 400-grit flex honing tool and cylinder wall.

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.

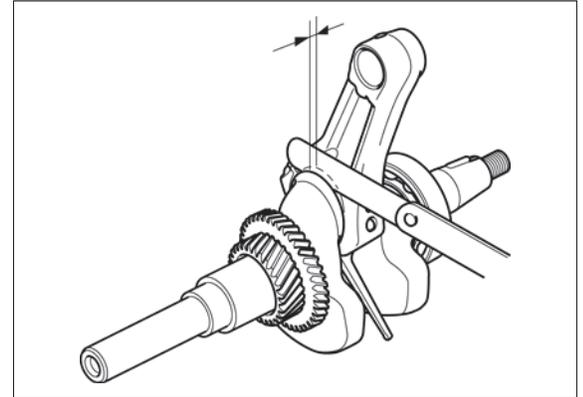
## CONNECTING ROD BIG END SIDE CLEARANCE

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.

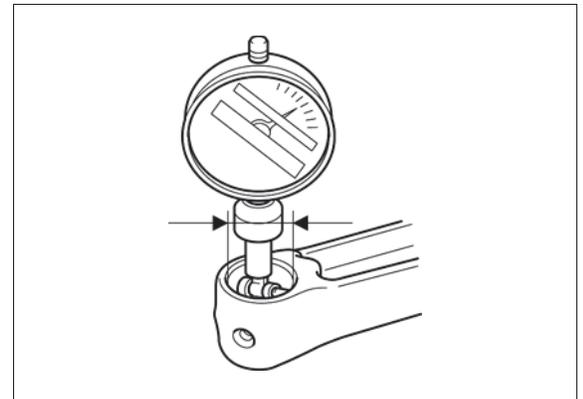
### GX240/GX270

**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.

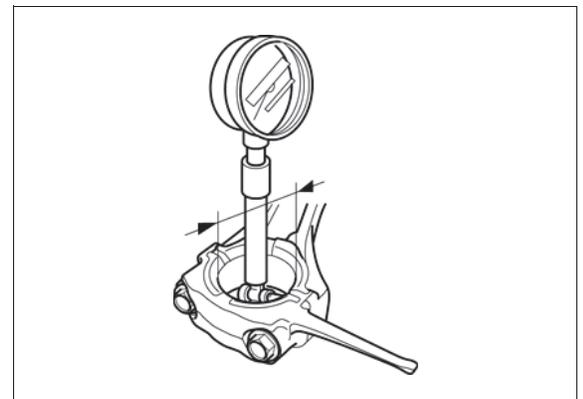
### GX240/GX270

**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)

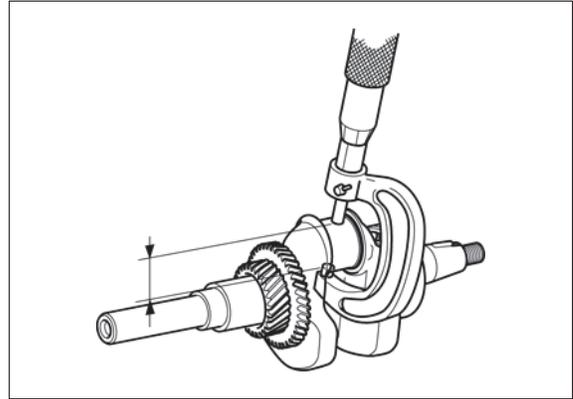
**SERVICE LIMIT:** 32.92 mm (1.296 in)

#### 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

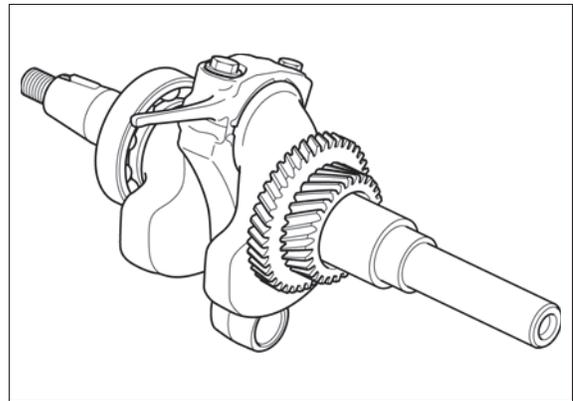
Clean all oil from the crank pin and connecting rod big end surface.

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.



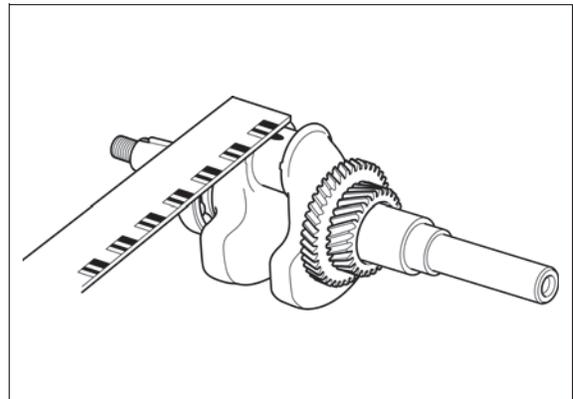
Remove the connecting rod and measure the plastigauge.

**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.

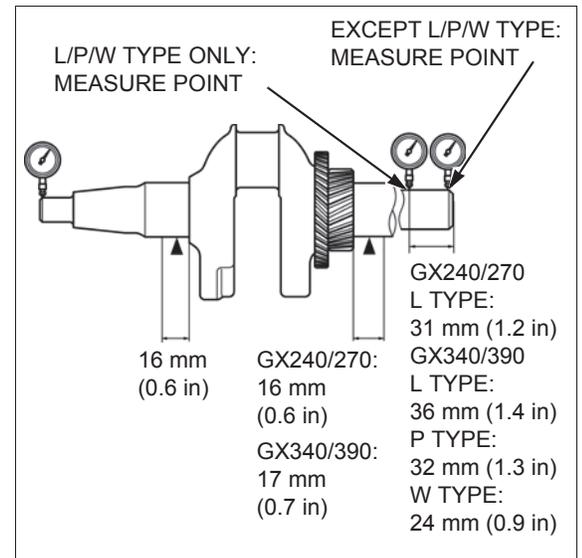


**CRANKSHAFT RUNOUT**

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](#)).



## 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)

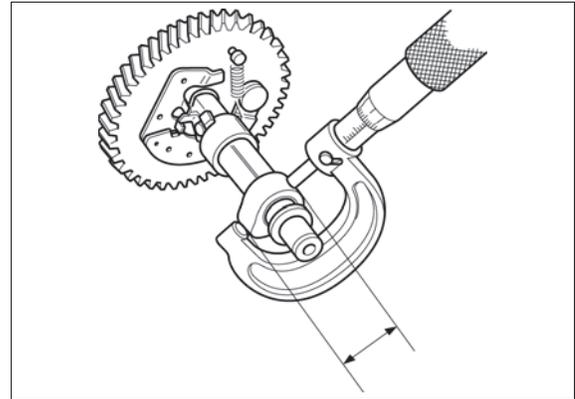
EX: 31.985 – 32.185 mm (1.2592 – 1.2671 in)

##### 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.

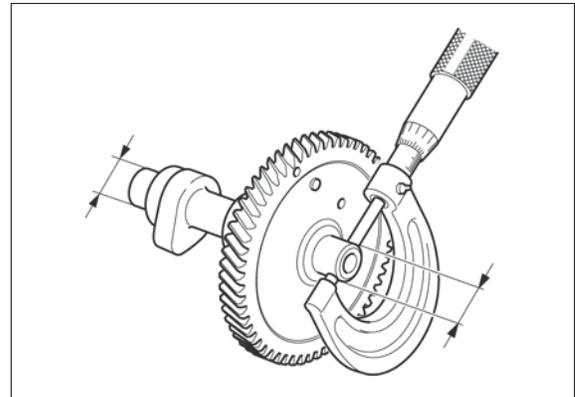
Measure the camshaft O.D. of the camshaft.

**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 [\(page 13-5\)](#).



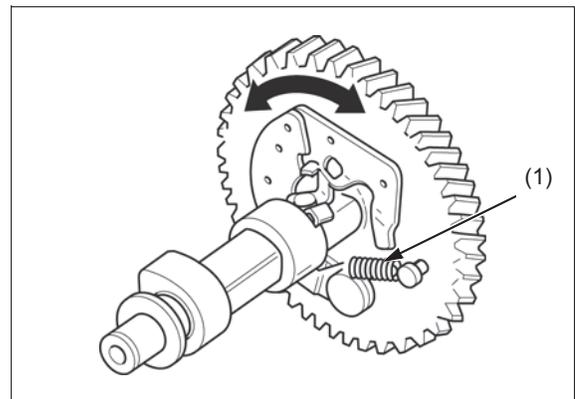
### DECOMPRESSOR WEIGHT

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 [\(page 13-5\)](#).

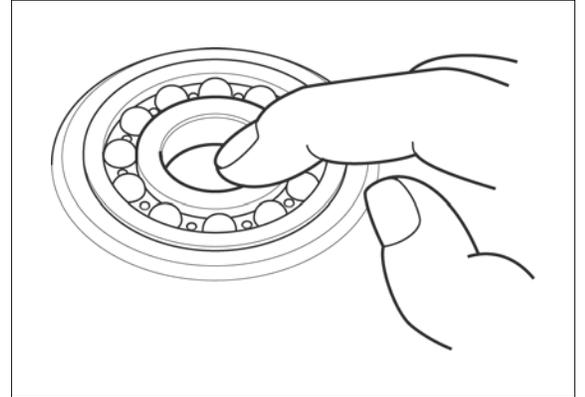


**RADIAL BALL BEARING**

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

---

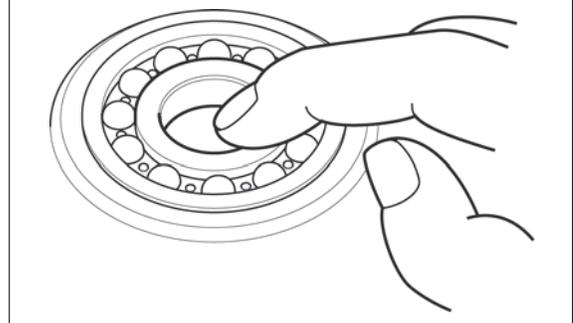
### 1/2 OR 1/6 REDUCTION UNIT INSPECTION

#### 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.

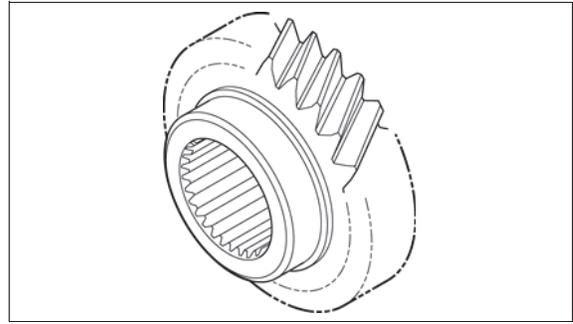
Replace the radial ball bearing if it is noisy or has excessive play.



#### PRIMARY DRIVE GEAR

Check for worn and weakened primary drive gear.

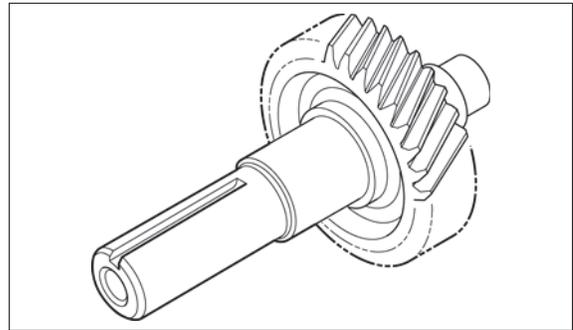
If necessary, replace the primary drive gear ([page 13-7](#)).



#### P.T.O. SHAFT

Check for worn and weakened gear of the P.T.O. shaft.

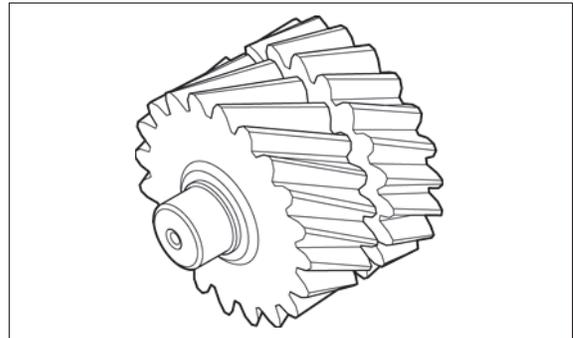
If necessary, replace the P.T.O. shaft ([page 13-7](#)).



#### COUNTER SHAFT

Check for worn and weakened gears of the counter shaft.

If necessary, replace the counter shaft ([page 13-7](#)).



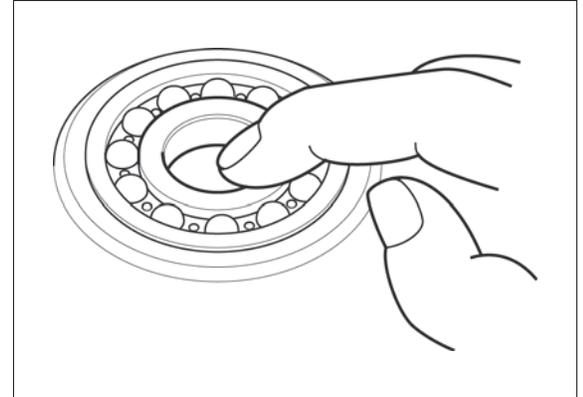
## 1/2 REDUCTION UNIT (CHAIN TYPE) INSPECTION (GX240 ONLY)

### 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.

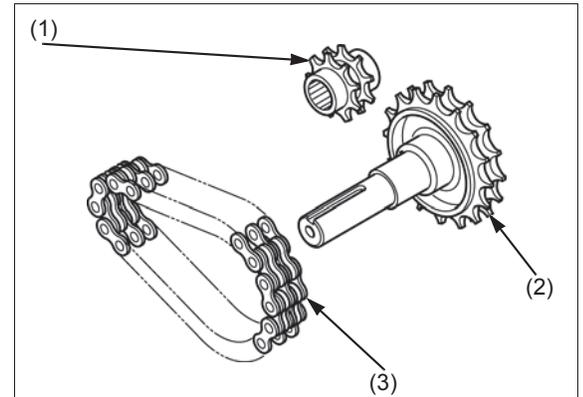


### DRIVE SPROCKET/P.T.O. SHAFT/ DRIVE CHAIN

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

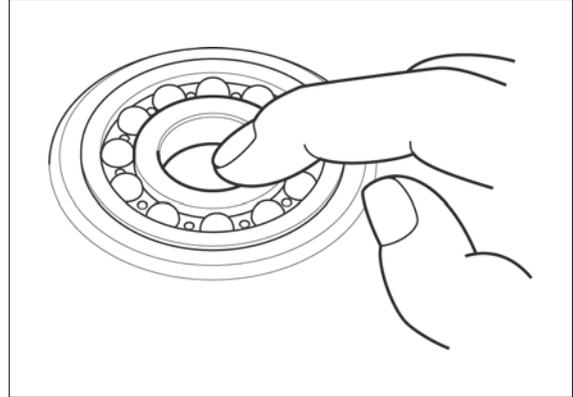
### 1/2 REDUCTION UNIT WITH CLUTCH INSPECTION (GX270 ONLY)

#### 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.

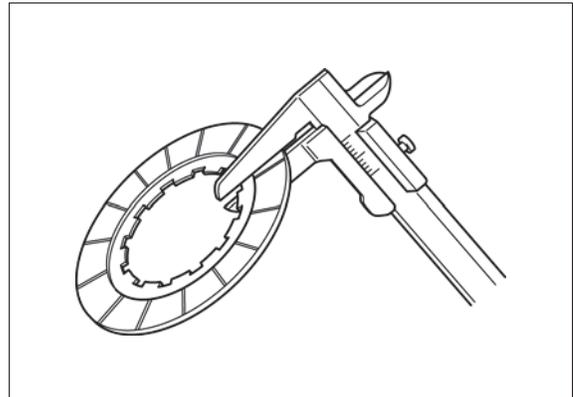


#### CLUTCH FRICTION DISC

Measure the clutch friction disk thickness.

**STANDARD:** 3.5 mm (0.14 in)

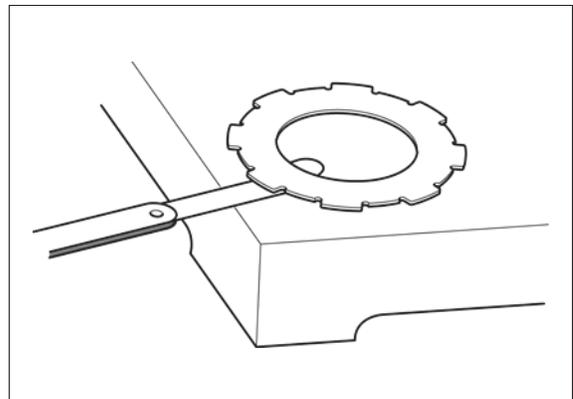
**SERVICE LIMIT:** 3.0 mm (0.12 in)



#### CLUTCH PLATE

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

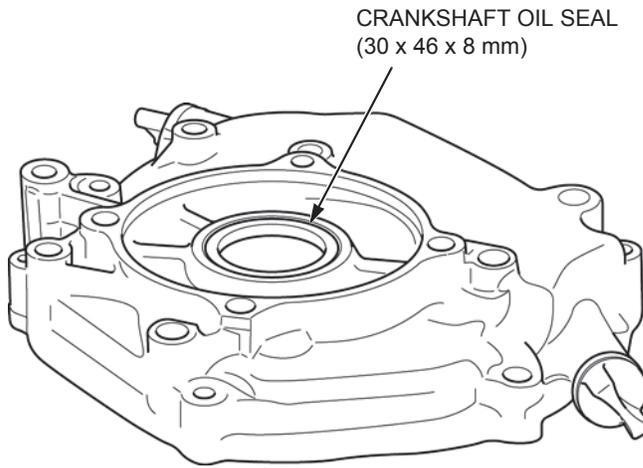
**SERVICE LIMIT:** 0.10 mm (0.004 in)



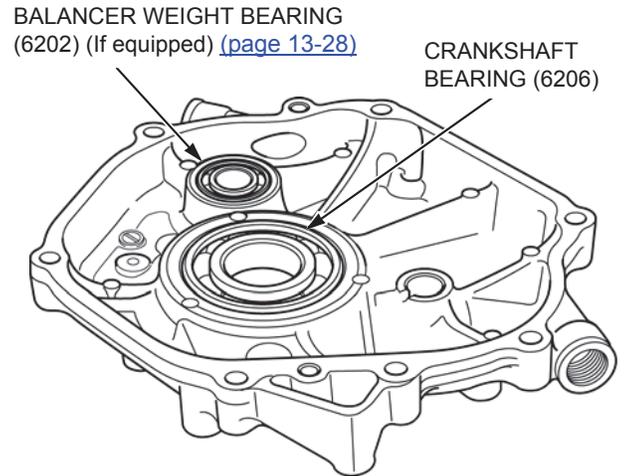
# **GX240/GX270 CRANKSHAFT/BALANCER WEIGHT BEARING/ OIL SEAL REPLACEMENT (CRANKCASE COVER SIDE)**

## **LOCATION**

(OUTSIDE)

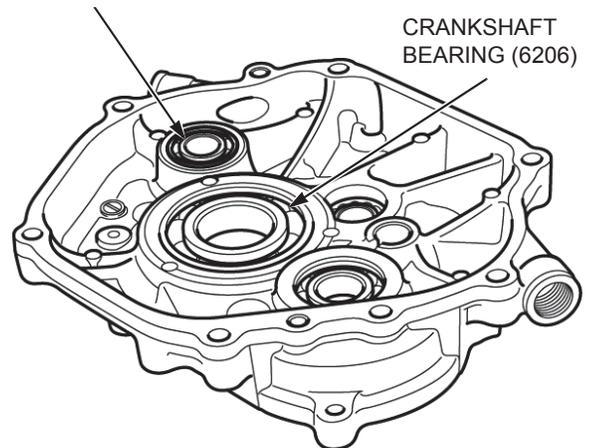


EXCEPT REDUCTION TYPE: (INSIDE)



REDUCTION TYPE: (INSIDE)

BALANCER WEIGHT BEARING  
(6202) (If equipped) [\(page 13-28\)](#)



## CRANKCASE

### CRANKSHAFT BEARING (6206)

Drive out the radial ball bearing (1).

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

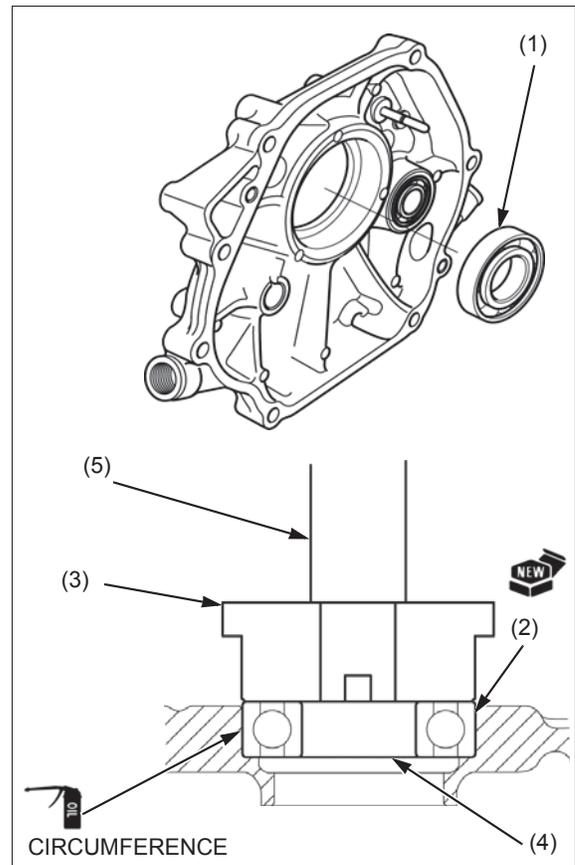
Drive the radial ball bearing until it is fully seated on the end using the special tools.

**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.

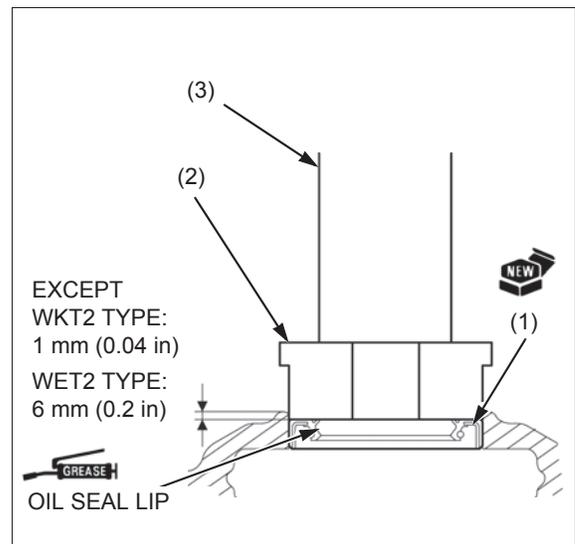
Apply grease to the lip of a new oil seal (1).

Drive the oil seal in the position as shown using the special tools.

**TOOLS:**

**Attachment 45 x 50 mm (2)      07946-6920100**

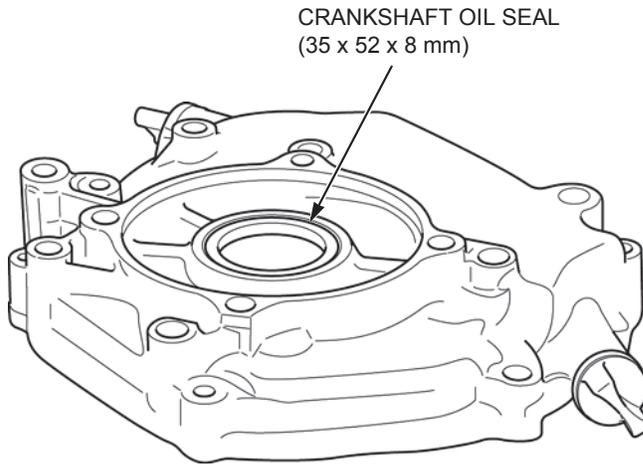
**Driver 15 x 135 mm (3)        07749-0010000**



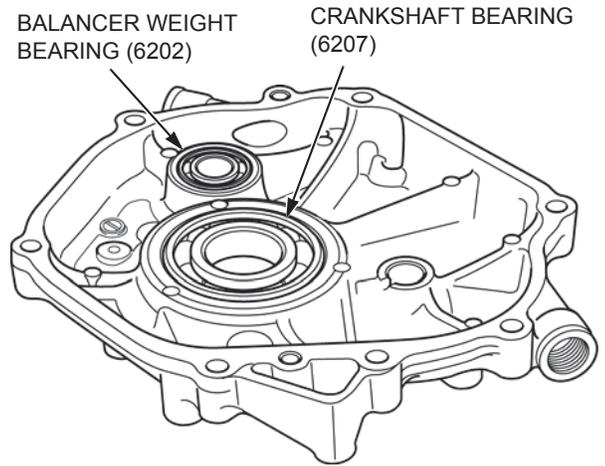
# **GX340/GX390 CRANKSHAFT/BALANCER WEIGHT BEARING/ OIL SEAL REPLACEMENT (CRANKCASE COVER SIDE)**

## **LOCATION**

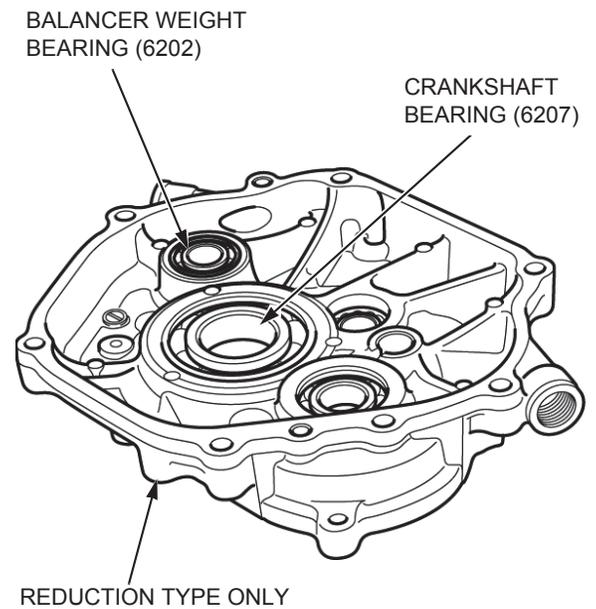
ALL TYPES: (OUTSIDE)



EXCEPT REDUCTION TYPE: (INSIDE)



REDUCTION TYPE: (INSIDE)



**CRANKCASE****BALANCER WEIGHT BEARING (6202)**

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

**TOOLS:**

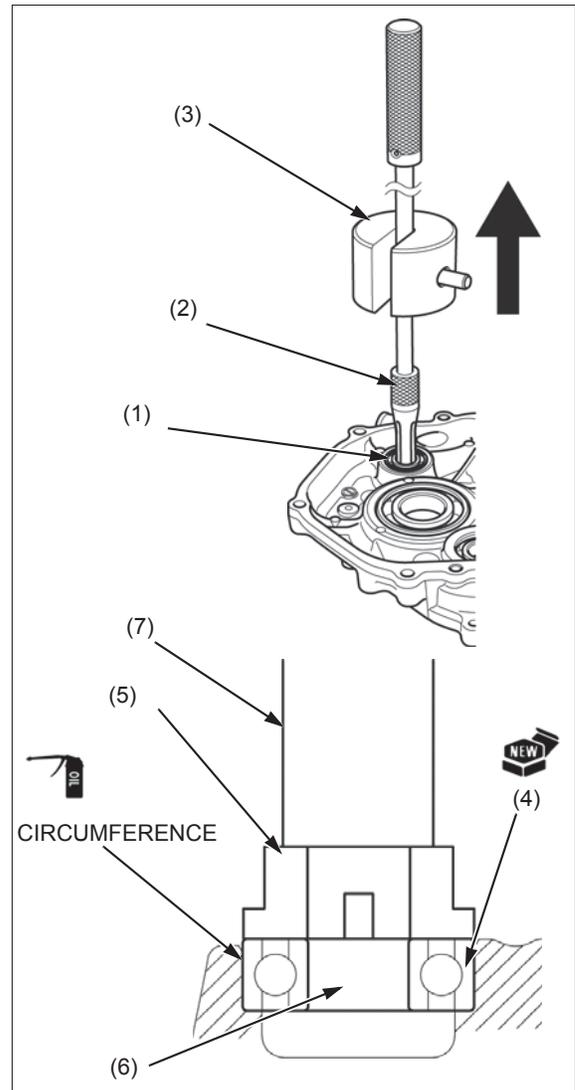
**Bearing remover, 15 mm (2)**      **07936-KC10500**  
**Remover weight (3)**                **07936-371020A**

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**



**CRANKSHAFT BEARING (6207)**

Drive out the radial ball bearing (1).

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

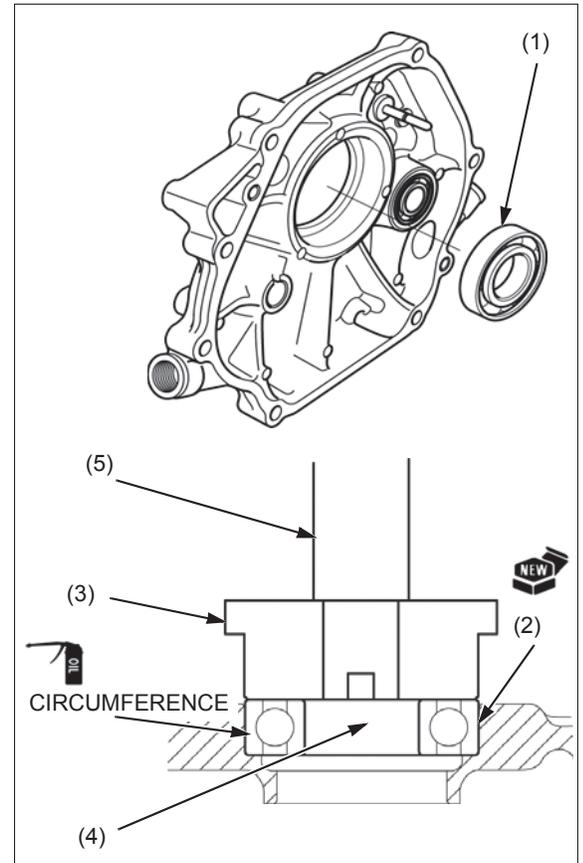
Drive the radial ball bearing until it is fully seated on the end using the special tools.

**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.

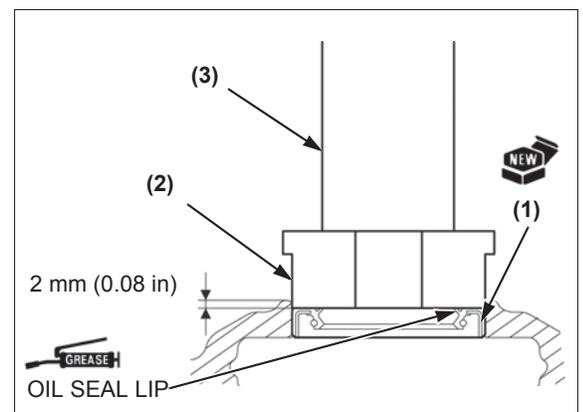
Apply grease to the lip of a new oil seal (1).

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).

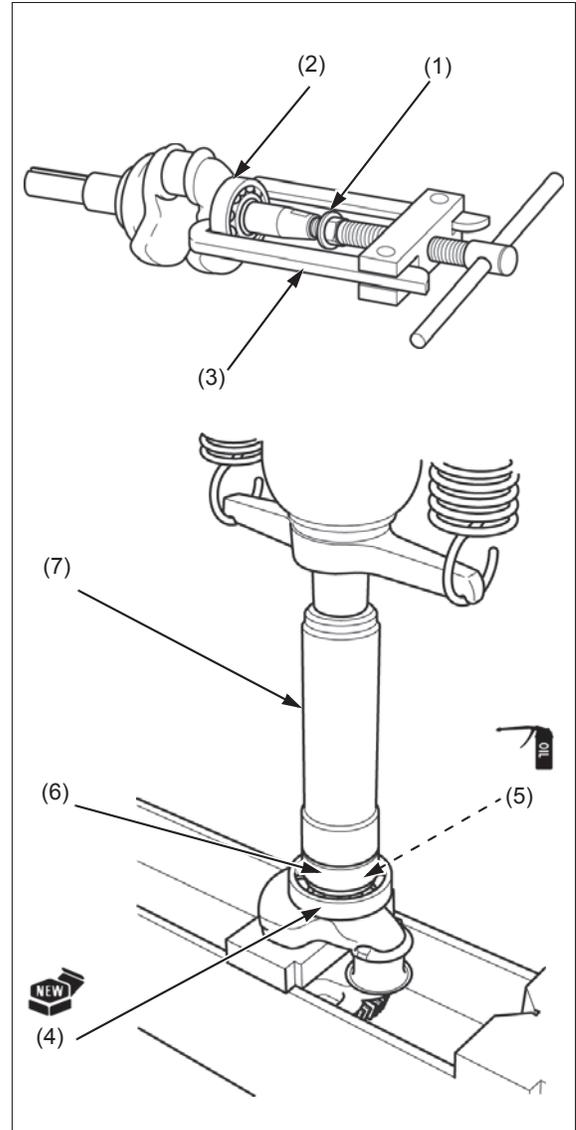
Apply oil to the inner surface of the new bearing (4) inner race (5).

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).

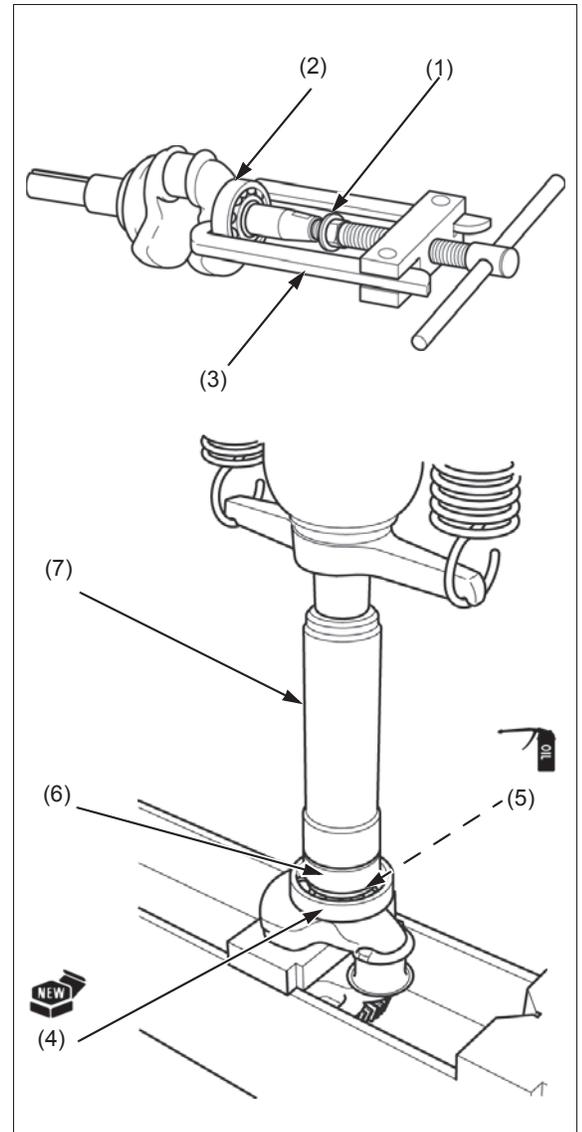
Apply oil to the inner surface of the new bearing (4) inner race (5).

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

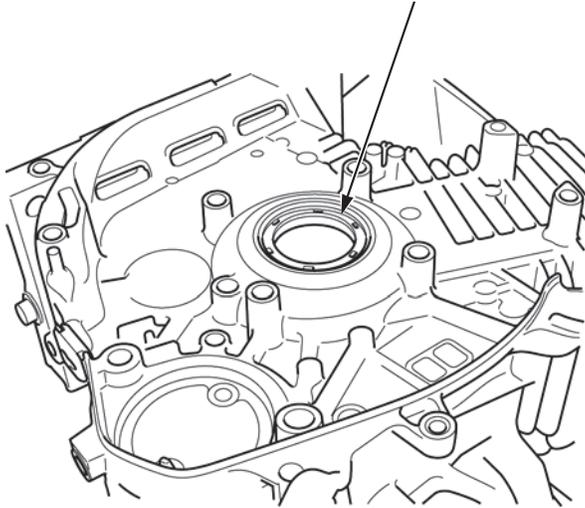


## CRANKCASE

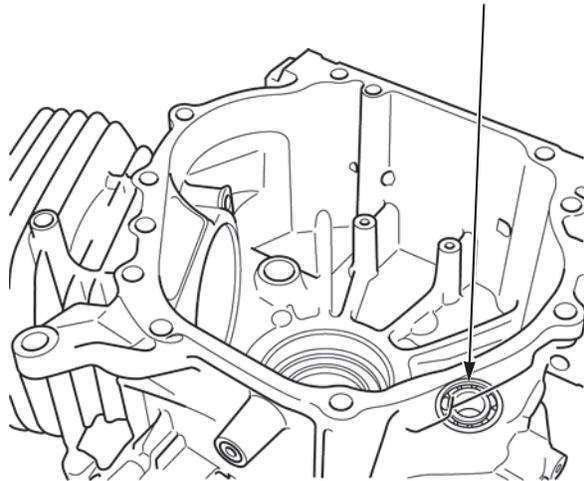
# GX270 CRANKSHAFT/BALANCER WEIGHT BEARING/ OIL SEAL REPLACEMENT (CYLINDER BARREL SIDE)

### LOCATION

CRANKSHAFT OIL SEAL (30 x 46 x 8 mm)



BALANCER WEIGHT BEARING (6202)  
(If equipped) ([page 13-33](#))



### 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.

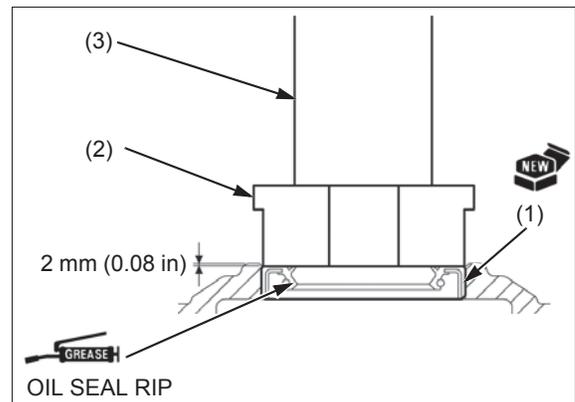
#### TOOLS:

Attachment 45 x 50 mm (2)

07946-6920100

Driver 15 x 135 mm (3)

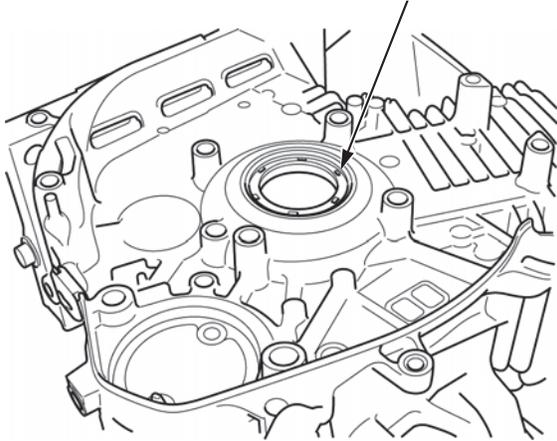
07749-0010000



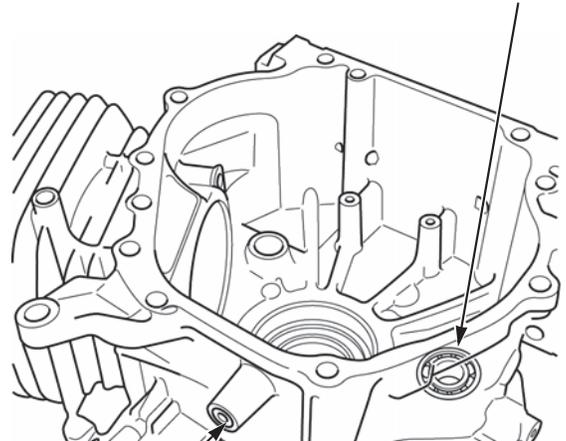
# GX340/GX390 CRANKSHAFT/BALANCER WEIGHT BEARING/ OIL SEAL REPLACEMENT (CYLINDER BARREL SIDE)

## 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:

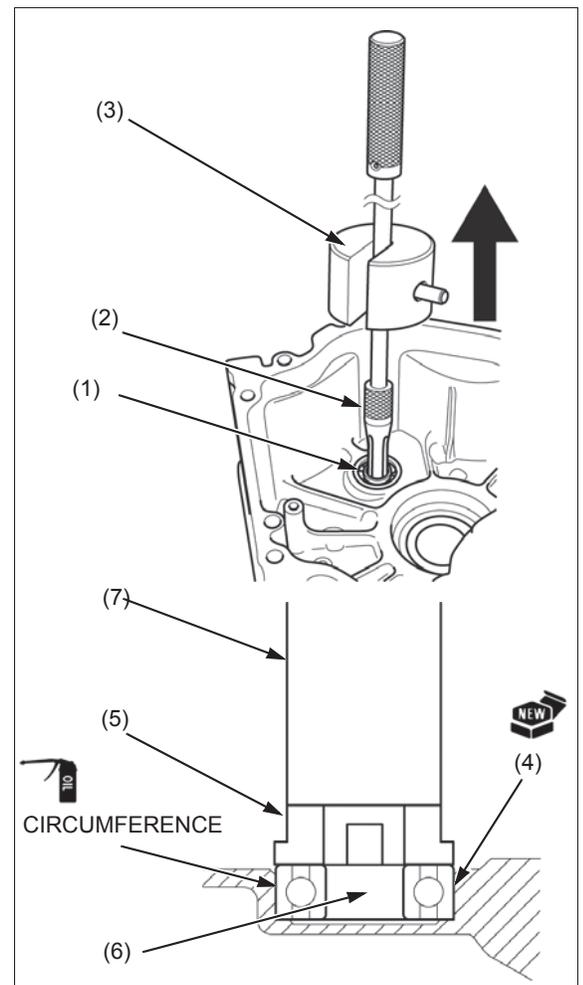
**Bearing remover, 15 mm (2)**      07936-KC10500  
**Remover weight (3)**              07936-371020A

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



## CRANKCASE

### 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.

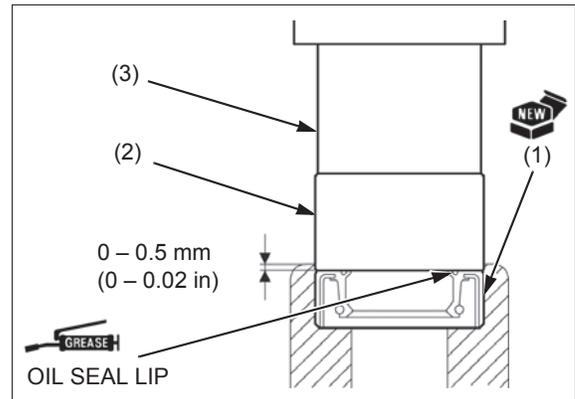
**TOOLS:**

**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.

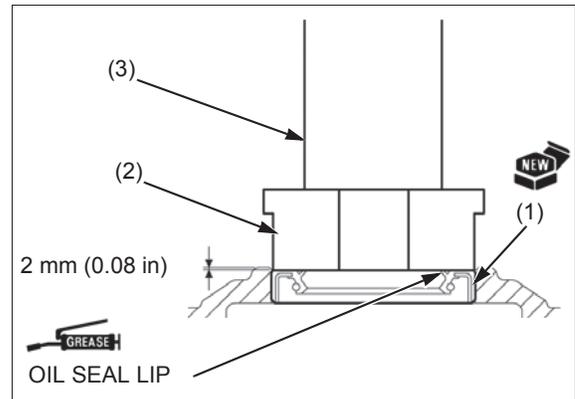
**TOOLS:**

**Attachment, 52 x 55 mm (2)**

**07746-0010400**

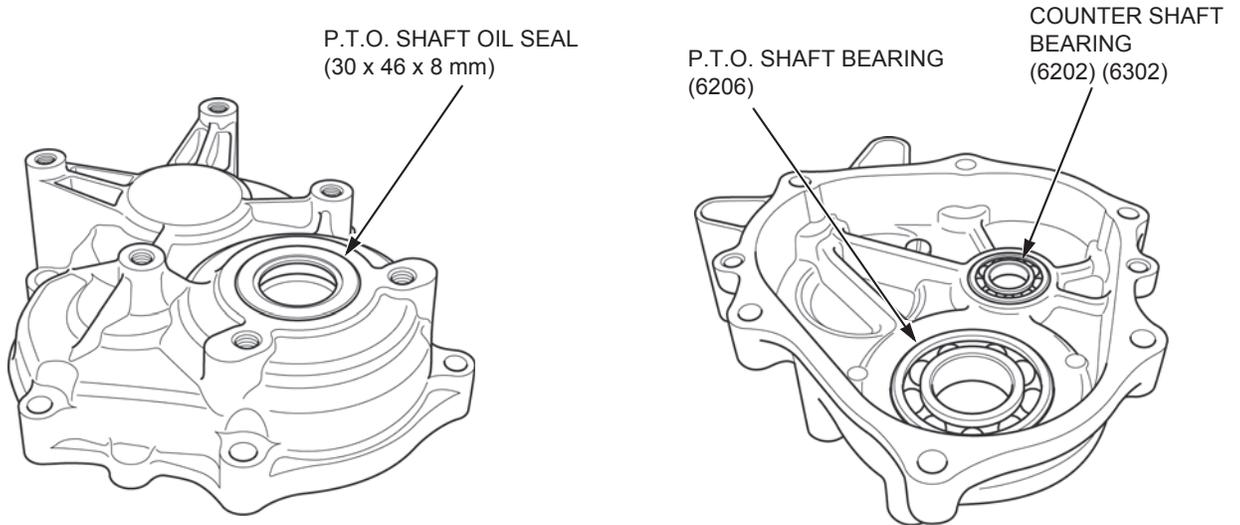
**Driver (3)**

**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:**

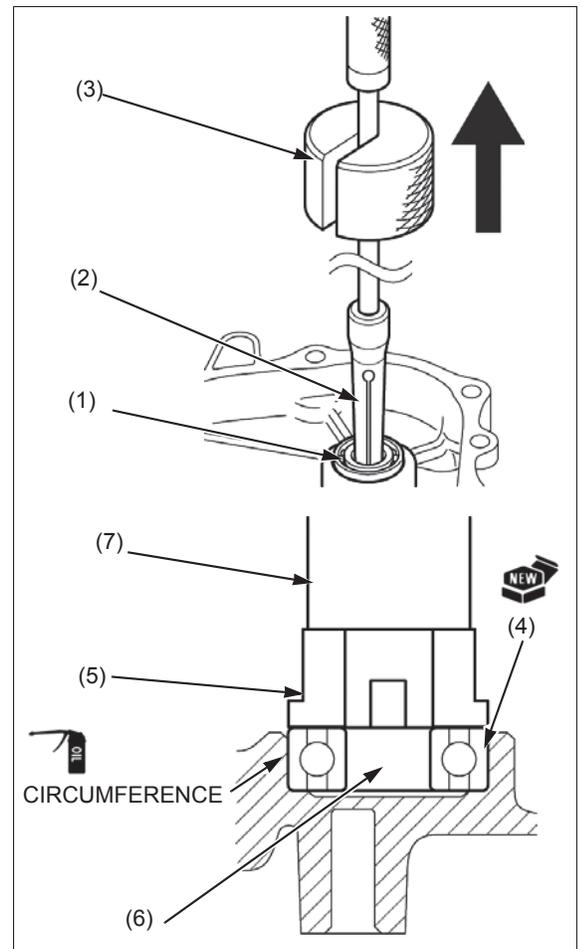
- Bearing remover, 15 mm (2)**      **07936-KC10500**
- Remover weight (3)**              **07936-371020A**

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).

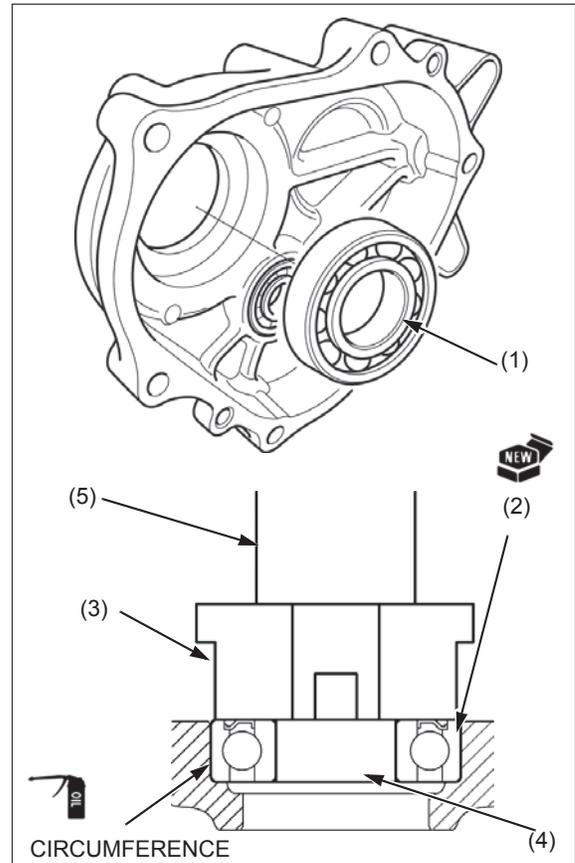
Drive the radial ball bearing until it is fully seated on the end using the special tools.

#### 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).

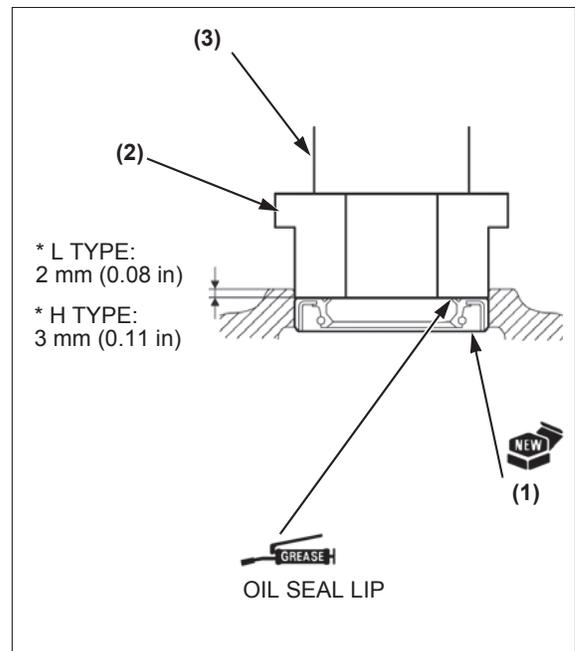
Drive the oil seal in the position as shown using the special tools.

#### TOOLS:

**Attachment, 45 x 50 mm (2)      07946-6920100**

**Driver (3)                                  07749-0010000**

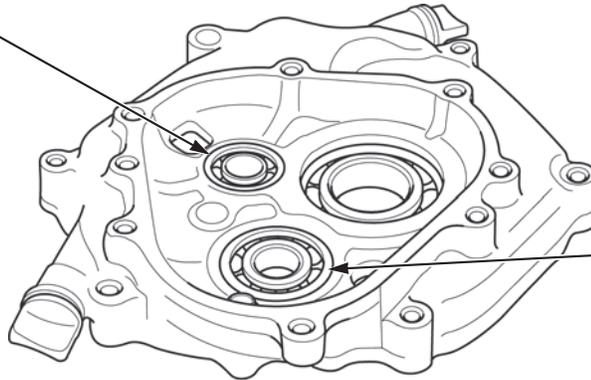
P.T.O type ([page 1-3](#)).



# GX240/GX270 COUNTER SHAFT/P.T.O. SHAFT BEARING REPLACEMENT (CRANKCASE COVER SIDE)

## LOCATION

COUNTER SHAFT BEARING (6302)



P.T.O. SHAFT BEARING (6204) [\(page 13-39\)](#)

## 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).

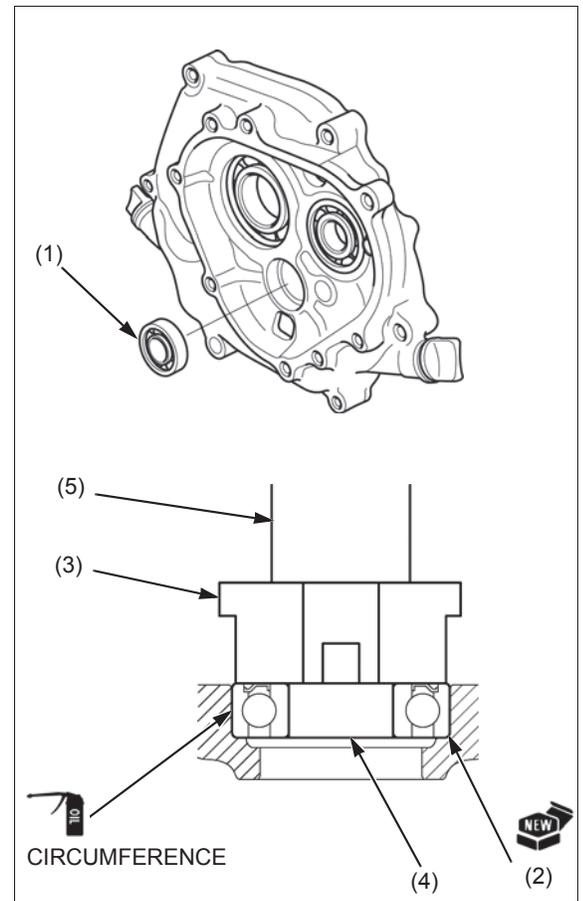
Drive the radial ball bearing until it is fully seated on the end using the special tools.

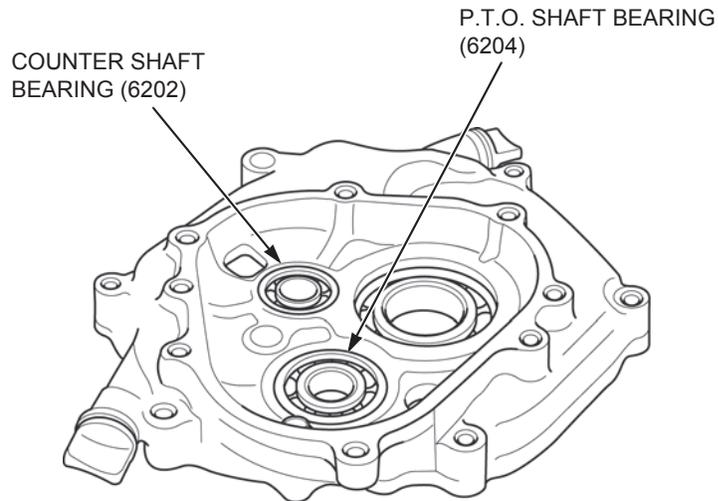
### TOOLS:

Attachment 42 x 47 mm (3)      07746-0010300

Pilot 15 mm (4)                      07746-0040300

Driver 15 x 135 mm (5)            07749-0010000



**CRANKCASE****GX340/GX390 COUNTER SHAFT/P.T.O. SHAFT  
BEARING REPLACEMENT (CRANKCASE COVER SIDE)****LOCATION****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).

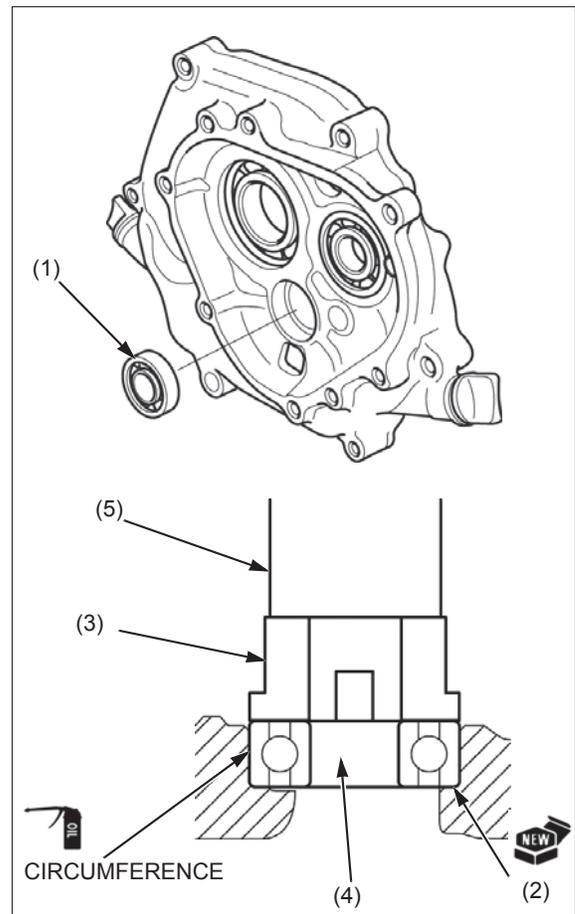
Drive the radial ball bearing until it is fully seated on the end using the special tools.

**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](#)).

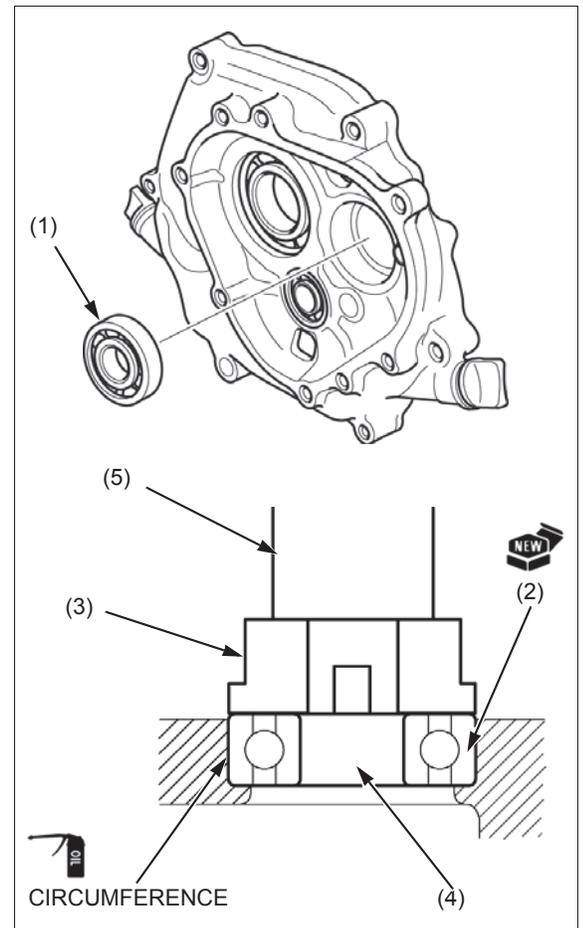
Drive out the radial ball bearing (1).

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:**

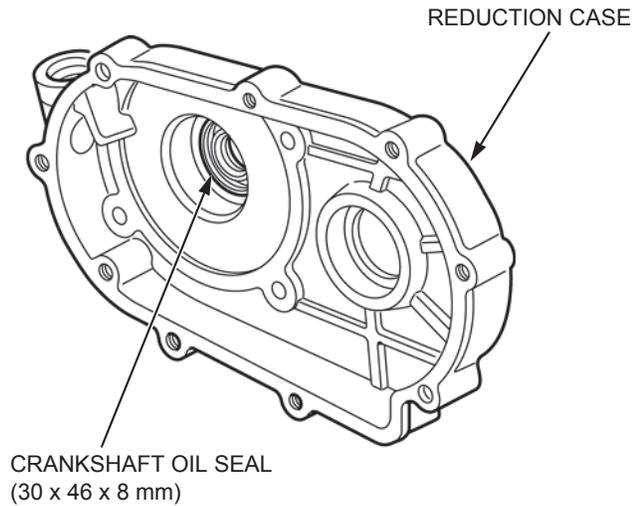
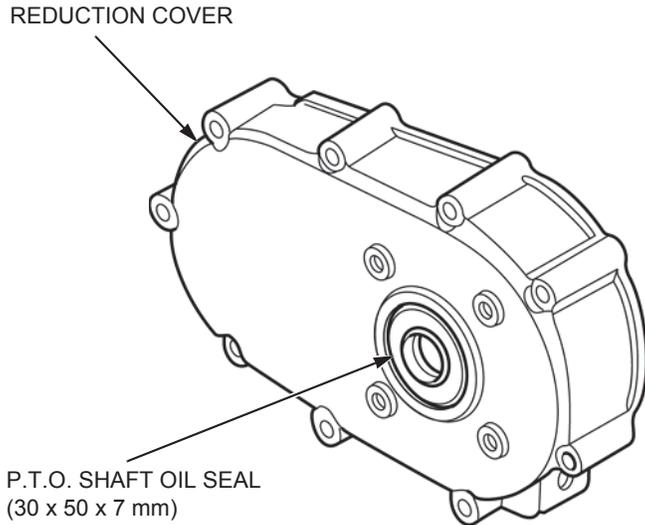
<b>Attachment, 42 x 47 mm (3)</b>	<b>07746-0010300</b>
<b>Pilot, 20 mm (4)</b>	<b>07746-0040500</b>
<b>Driver (5)</b>	<b>07749-0010000</b>



## 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)

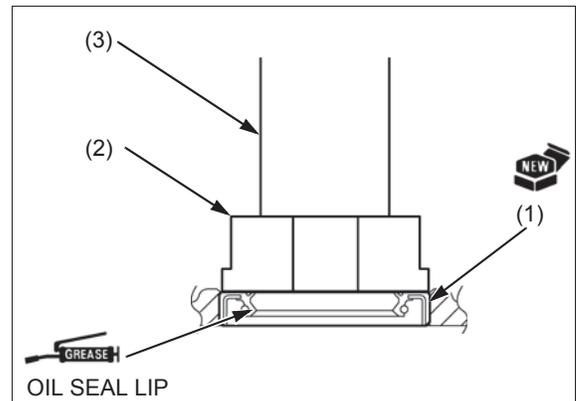
Remove the oil seal from the reduction cover.

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)

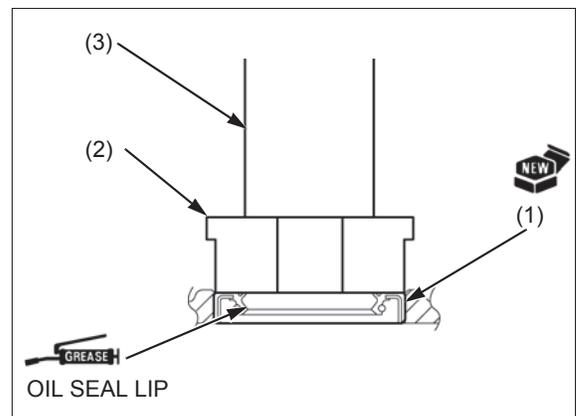
Remove the oil seal from the reduction case.

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 REMOVAL/INSTALLATION . . . 14-2**  
**MUFFLER COVER REMOVAL/INSTALLATION**  
**(IF EQUIPPED) . . . . . 14-4**

**EXHAUST PIPE STUD BOLT**  
**REPLACEMENT . . . . . 14-5**

# MUFFLER

## MUFFLER REMOVAL/INSTALLATION

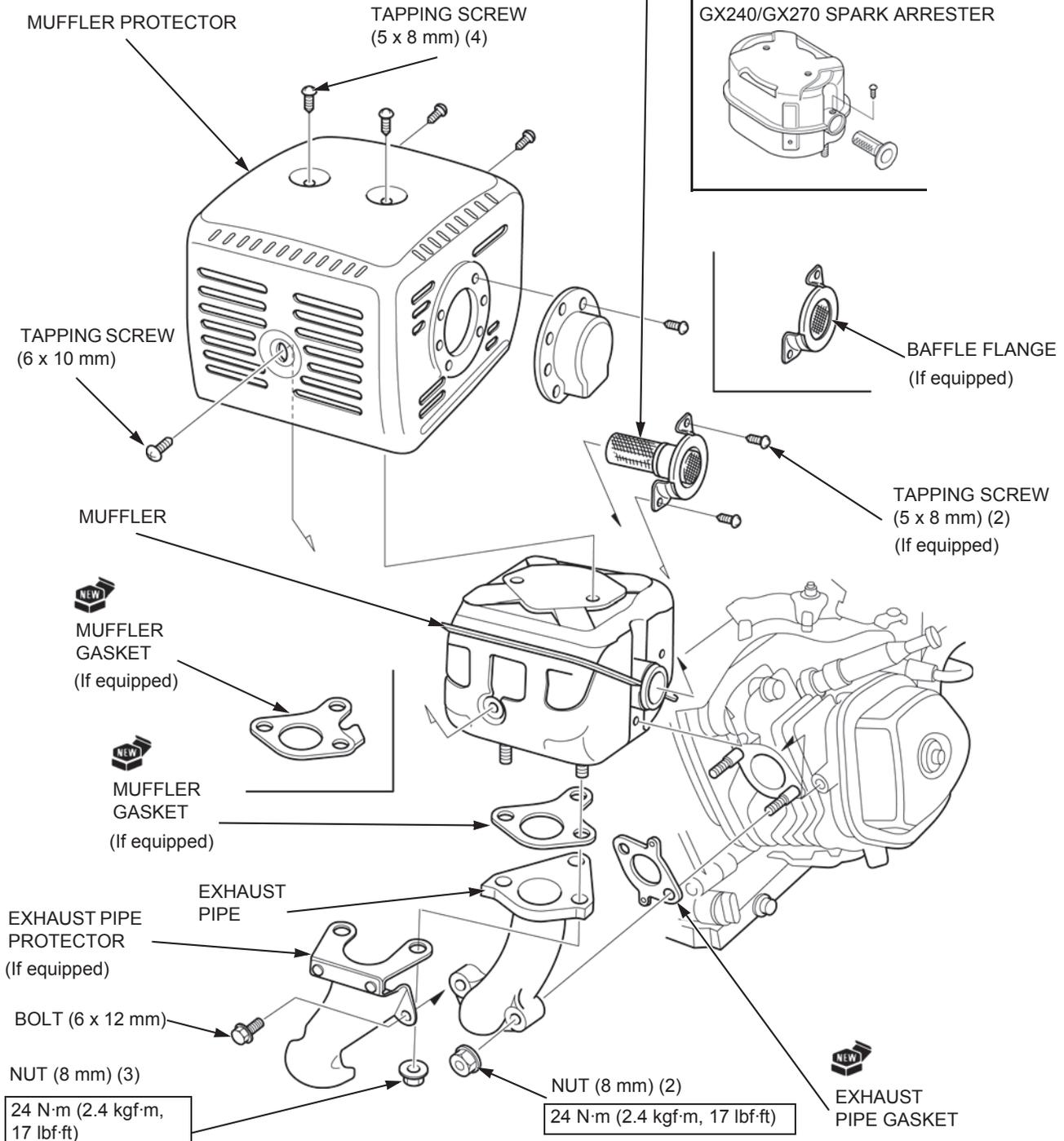
### CAUTION

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.

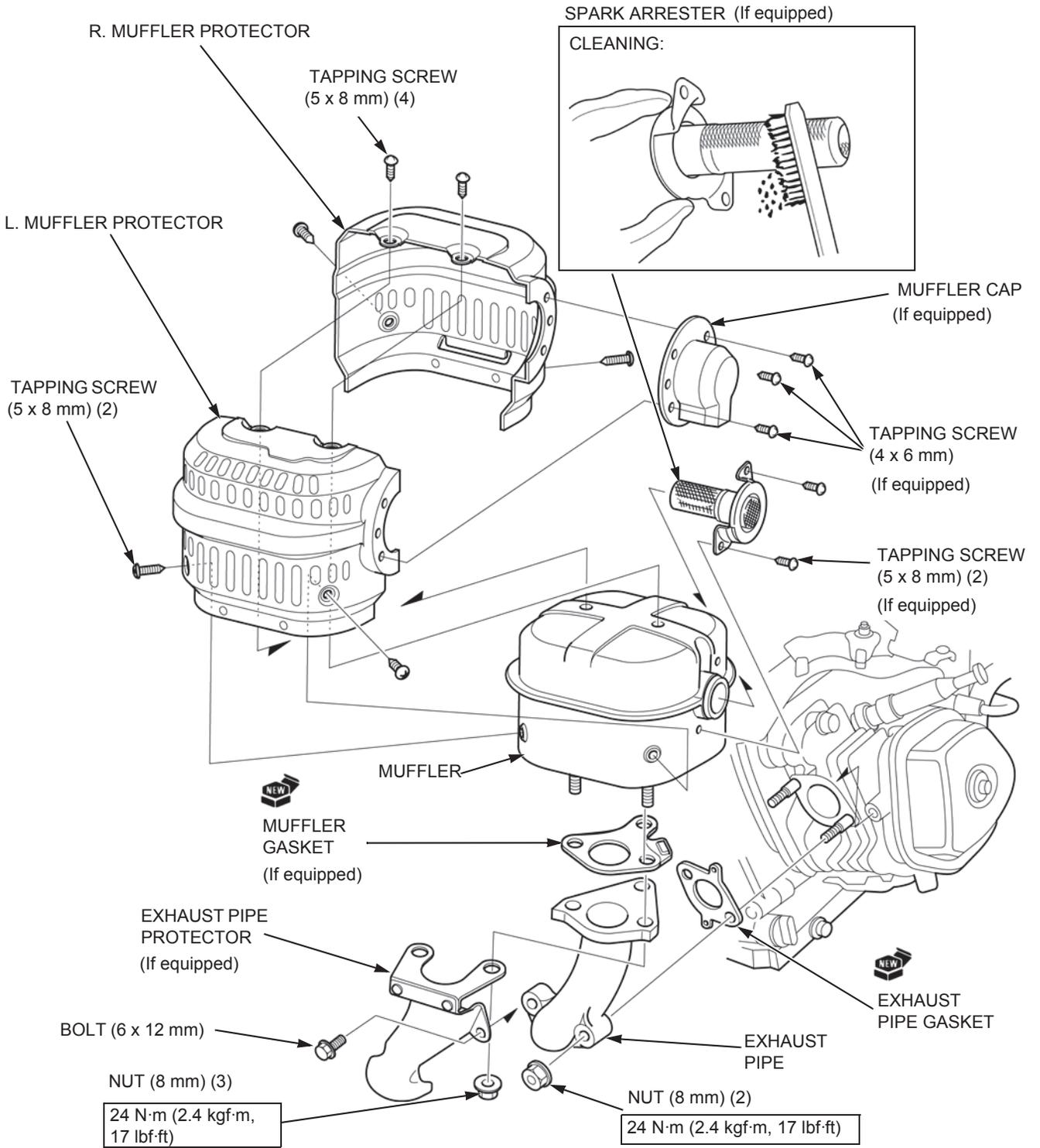
### SOLID PROTECTOR TYPE

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

SPARK ARRESTER (If equipped) (GX340/GX390 shown)  
CLEANING: see [page 3-11](#)



SEPARATED PROTECTOR TYPE

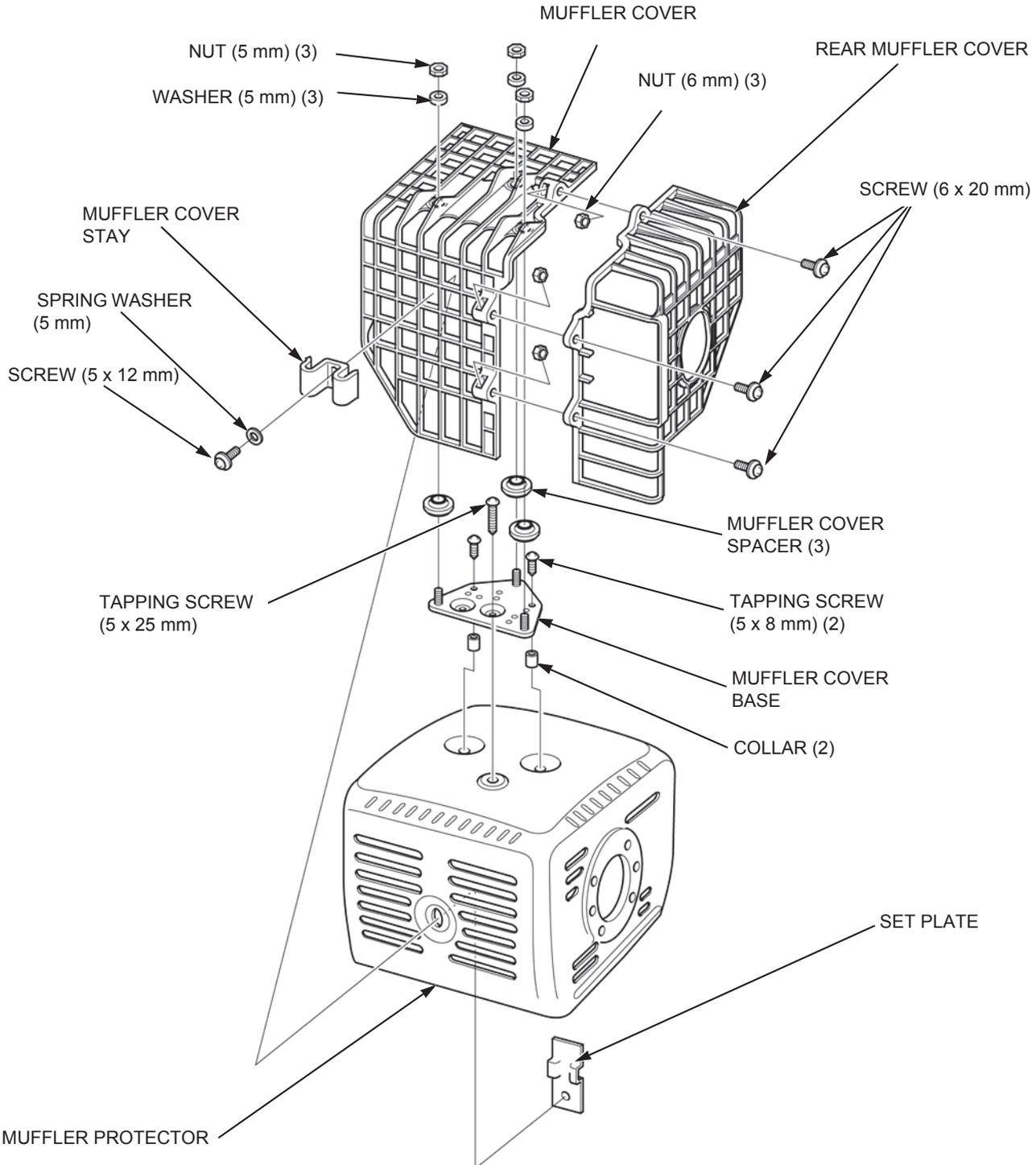


## MUFFLER

# 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

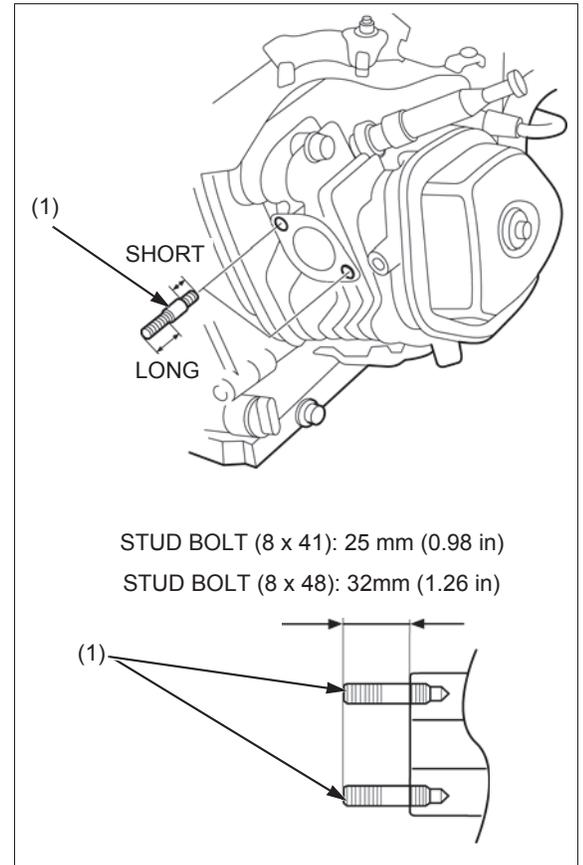
Thread two nuts onto the exhaust pipe stud bolt (1) and tighten them together, and then use a wrench to turn the stud bolt out.

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)**



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# MEMO

# 15. WIRING DIAGRAMS

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**HOW TO READ A WIRING DIAGRAM &  
RELATED INFORMATION..... 15-2**

**NO CHARGE COIL TYPE WIRING  
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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).

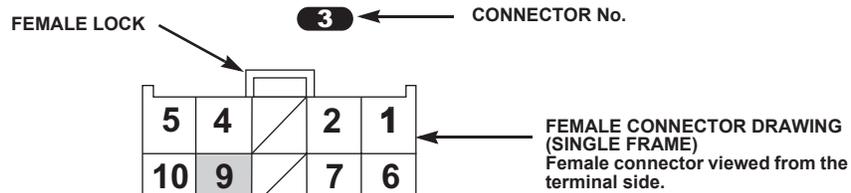
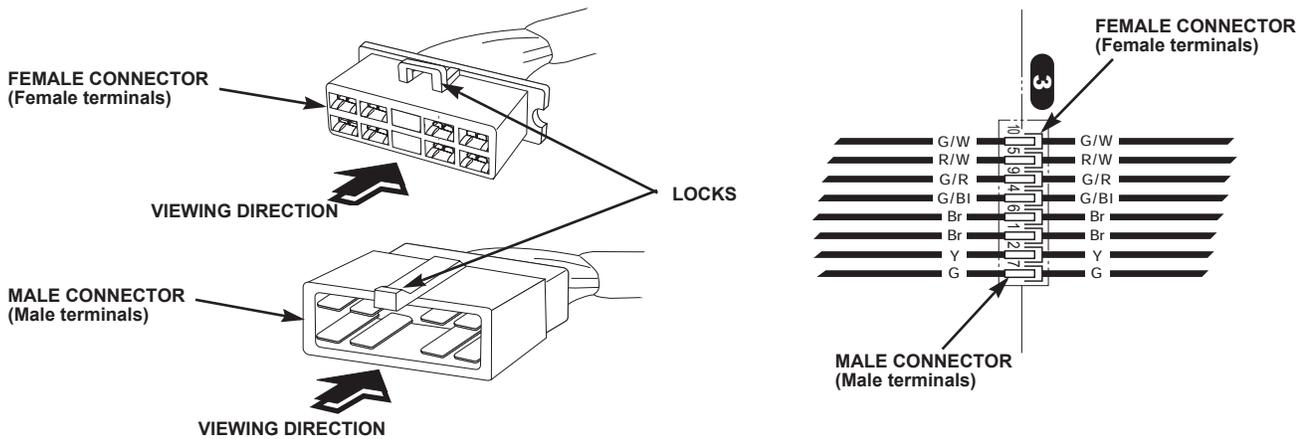
Both the male and female connectors are shown for the common connectors, while only the main wire harness side connectors are shown for the dedicated connectors.

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 shell of a female connector inserts inside the larger plastic shell of a male connector when they are joined.

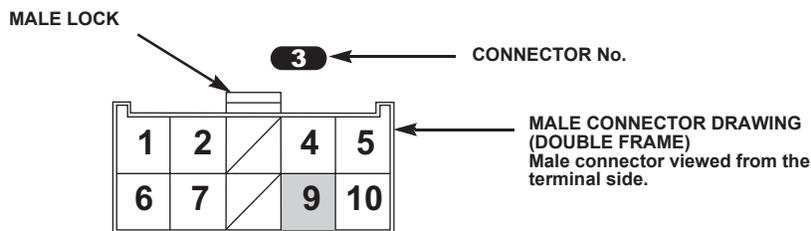
Terminals in a female connector are numbered from left to right, top to bottom looking at the wire side. Terminals in a male connector are numbered from left to right, top to bottom looking at the terminal side.

Both the male and female connectors are shown by viewing them from the terminal side.



### TERMINAL ARRANGEMENT

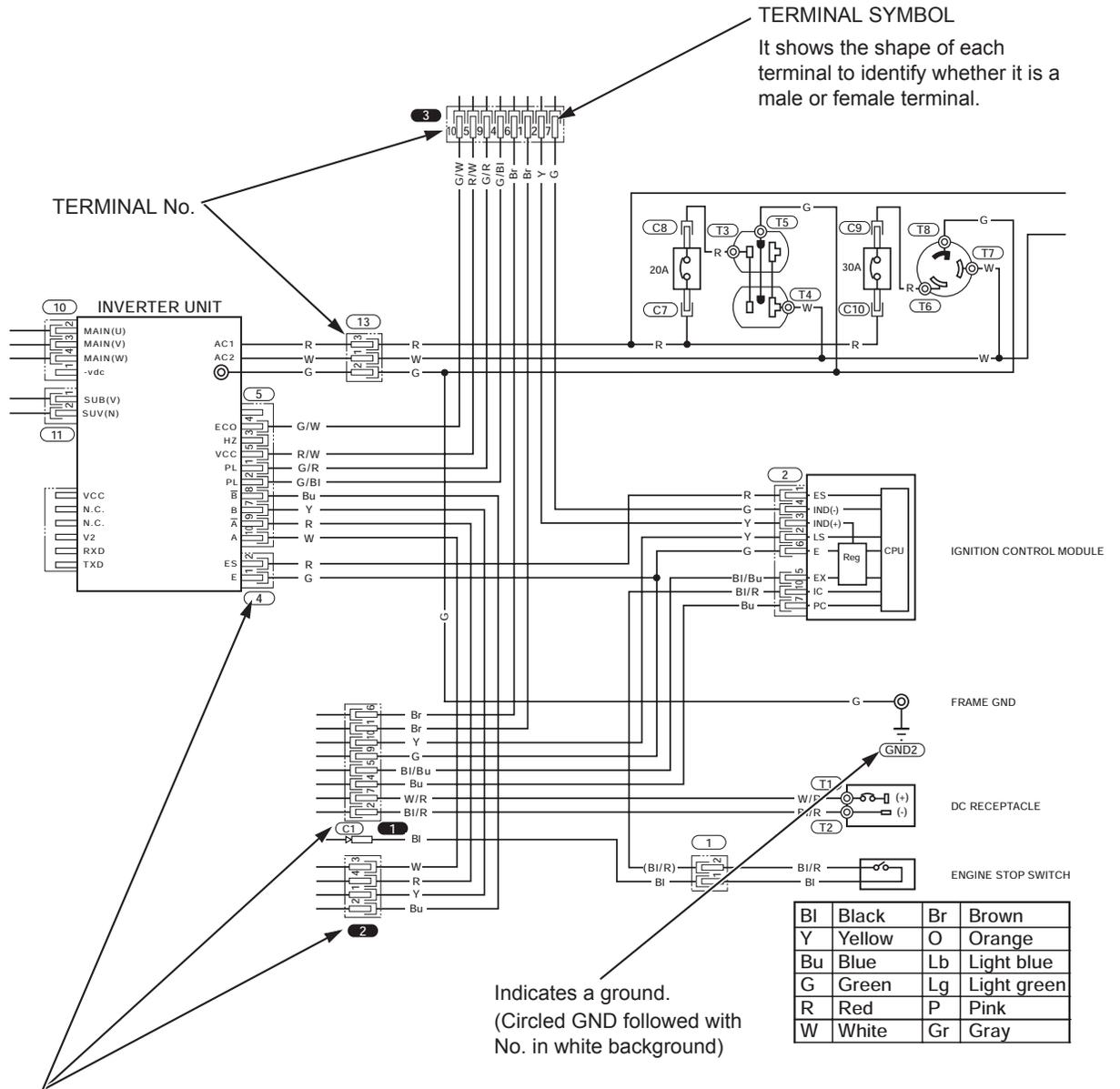
This drawing shows the No. 9 terminal of the **3** female connector with the lock of the connector UP.



### TERMINAL No.

This drawing shows the No. 9 terminal of the **3** male connector with the lock of the connector UP.

HOW TO READ A WIRING DIAGRAM



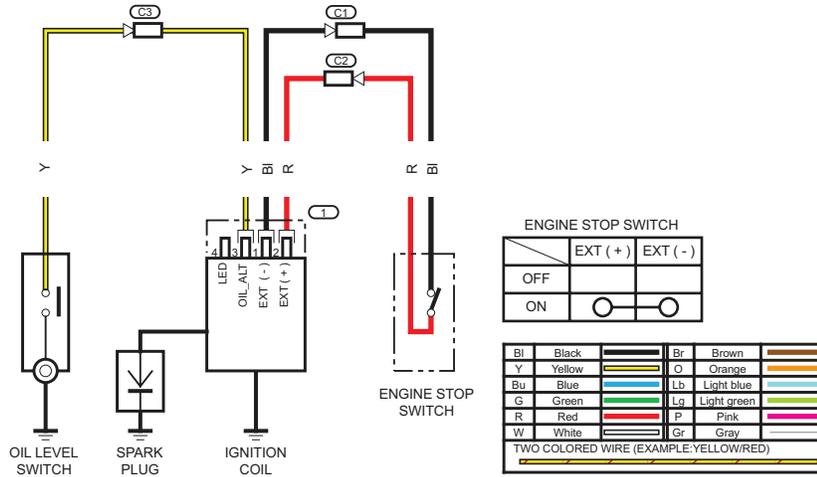
CONNECTOR/TERMINAL No.

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.

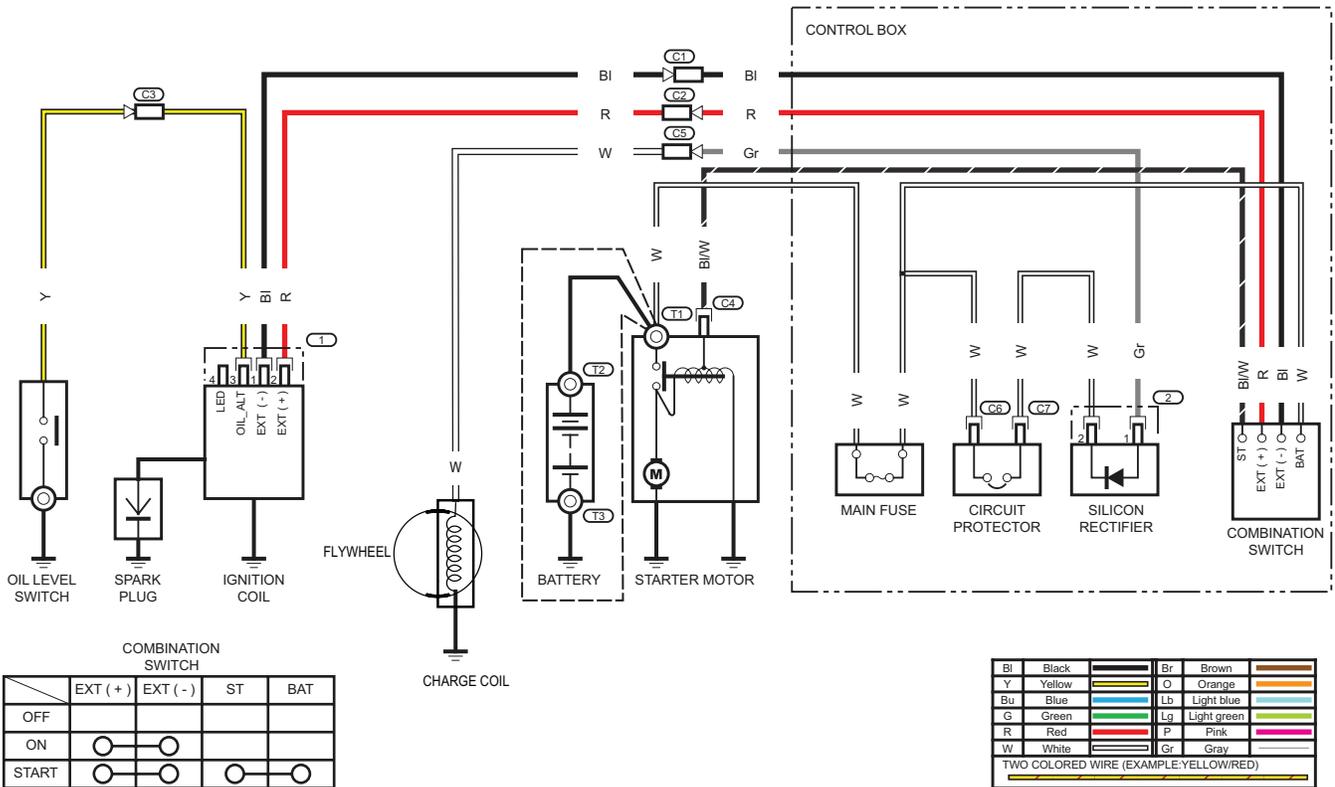
- 1** : Connector that relays from a harness to a harness (Circled No. in black background)
- 1** : Connector that connects to electrical equipment (Circled No. in white background)
- C1** : Connector (Circled C followed with No. in white background)
- T1** : Terminal (Circled T followed with No. in white background)
- GND1** : Ground (Circled GND followed with No. in white background)

## WIRING DIAGRAMS

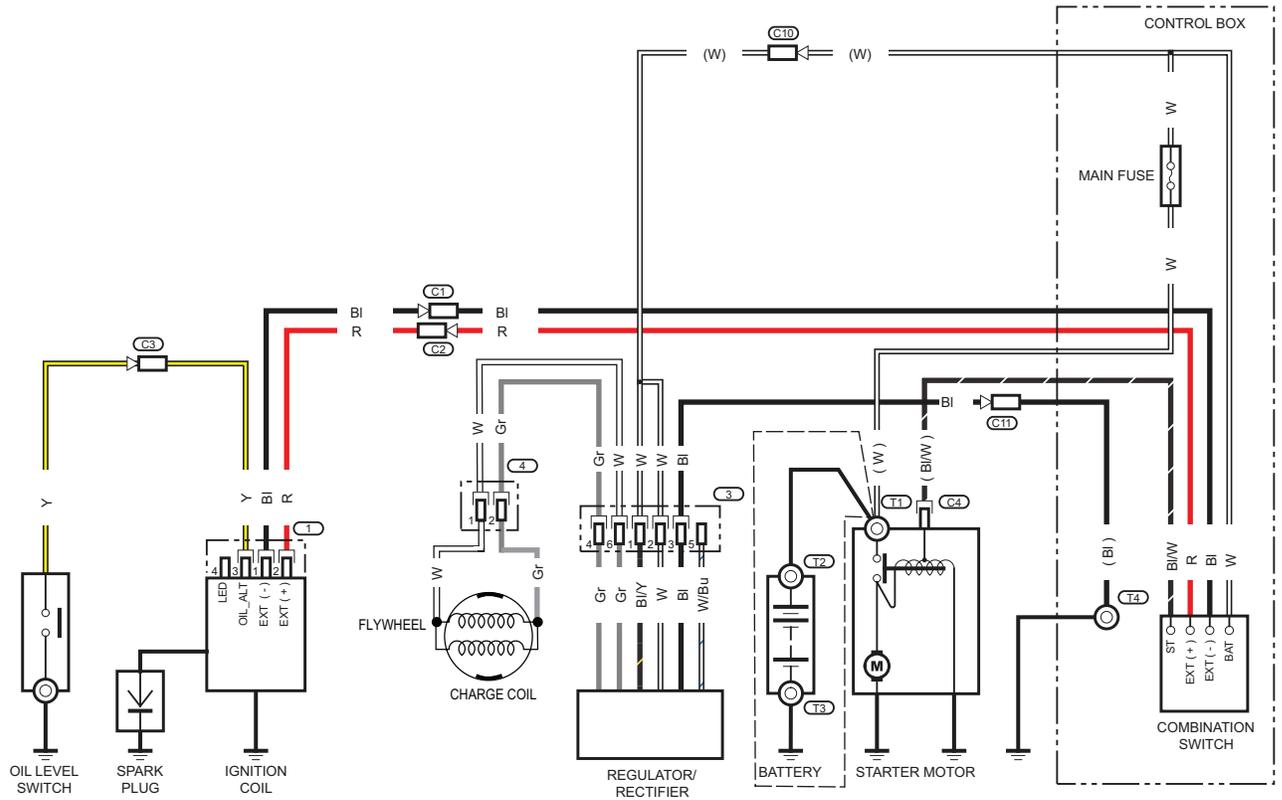
# NO CHARGE COIL TYPE WIRING DIAGRAM



# 1A/3A CHARGE COIL TYPE WIRING DIAGRAM



# 10A CHARGE COIL TYPE WIRING DIAGRAM



COMBINATION SWITCH

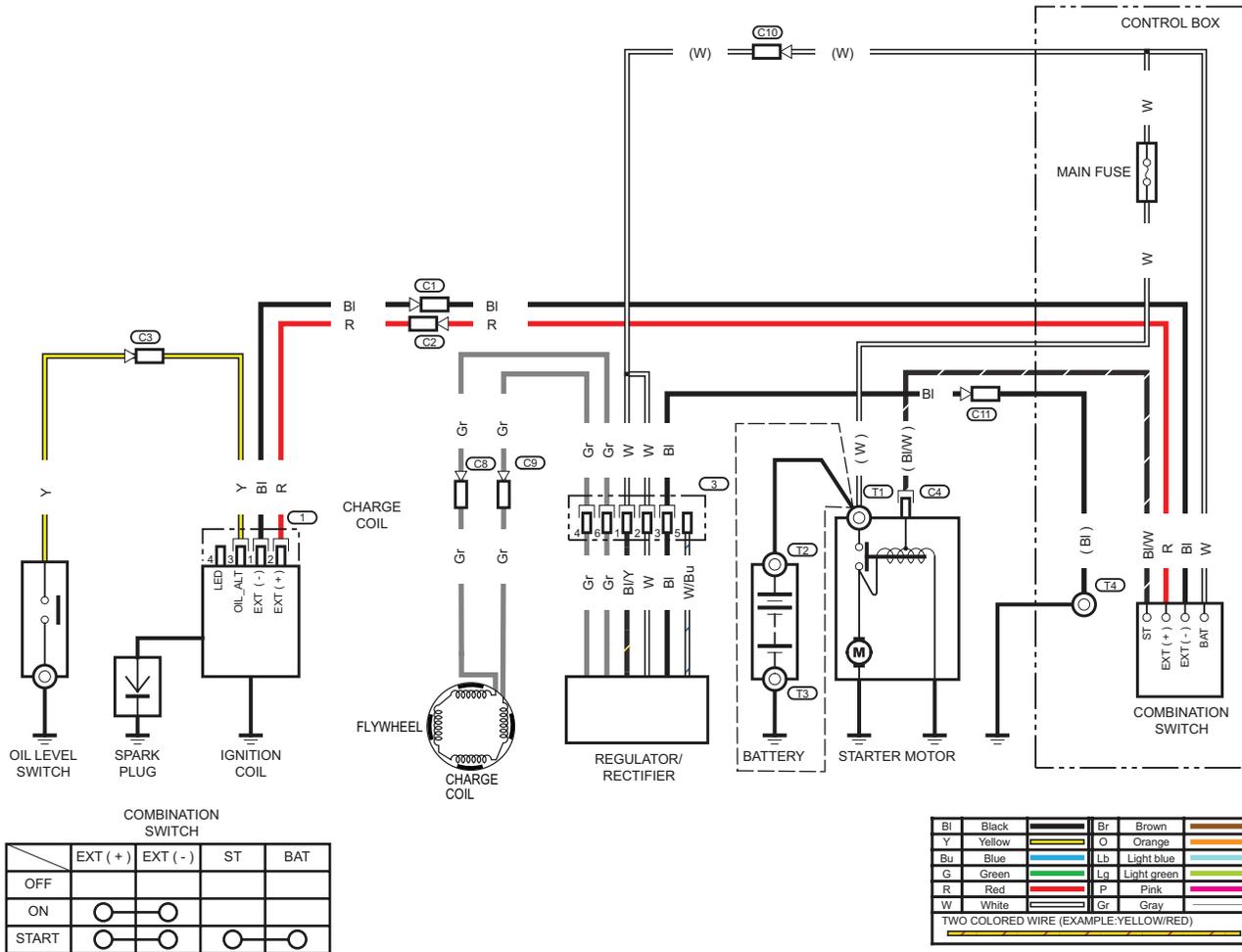
	EXT (+)	EXT (-)	ST	BAT
OFF				
ON	○	○		
START	○	○	○	○

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

TWO COLORED WIRE (EXAMPLE:YELLOW/RED)

## WIRING DIAGRAMS

# 18A CHARGE COIL TYPE WIRING DIAGRAM



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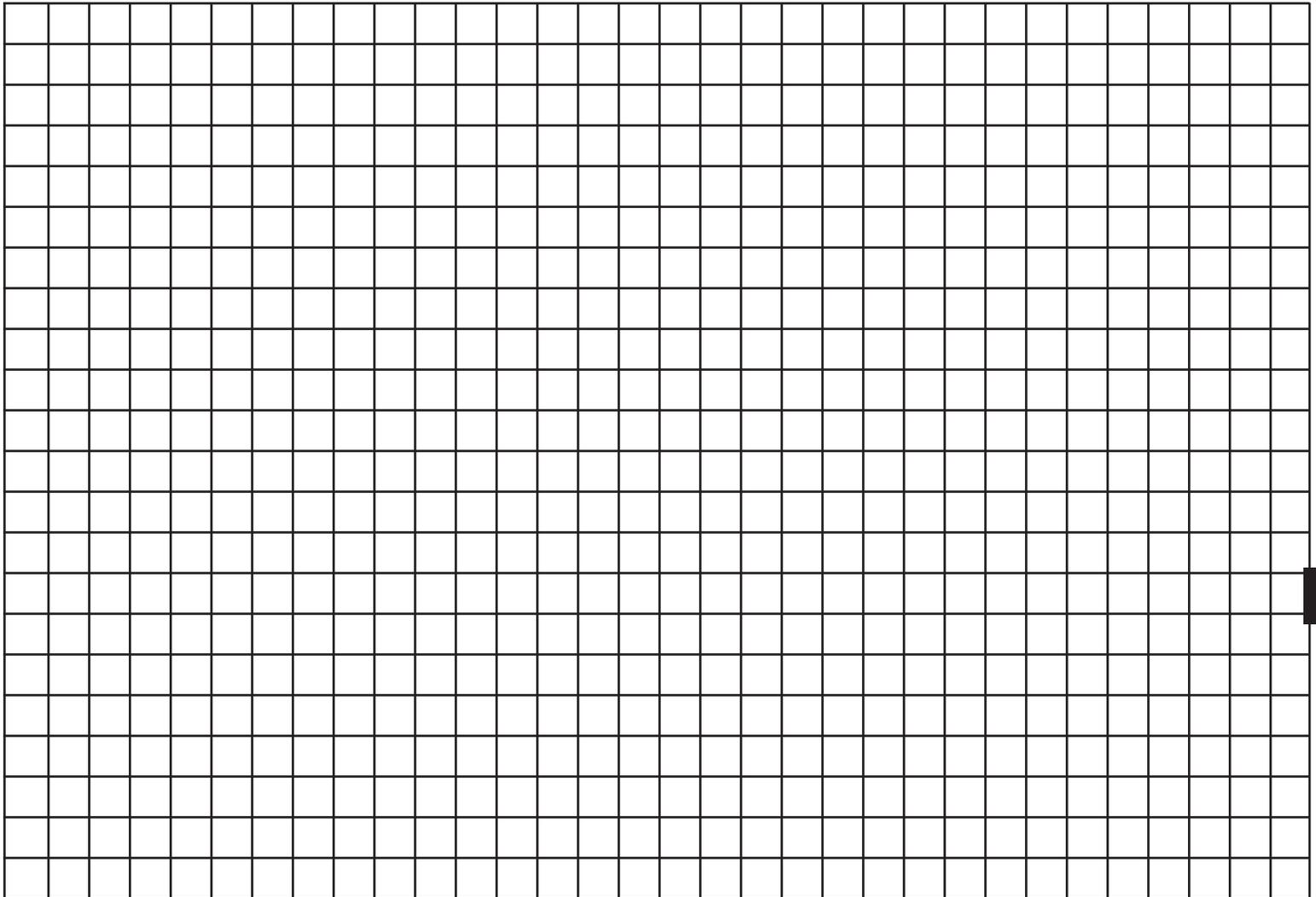
**HONDA**  
**ENGINES**

SUPPLEMENT Y TO: P/N 61Z5F00

• *i*GX SERIES

# SHOP MANUAL

*i*GX270UT2 • *i*GX390T2/UT2



## 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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The marked sections contain no changes. They are not covered in this supplement.

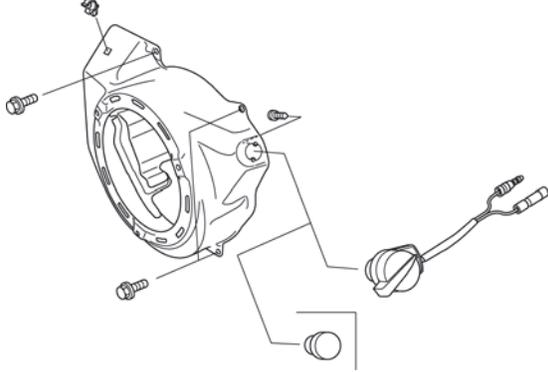
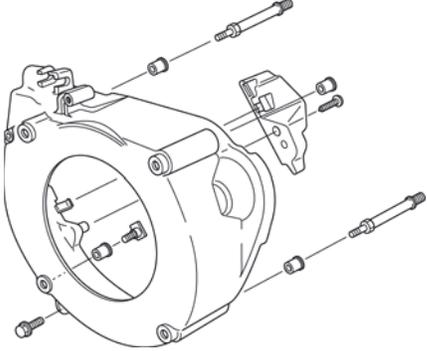
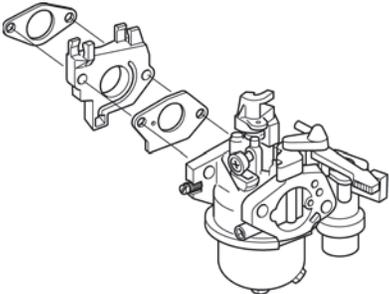
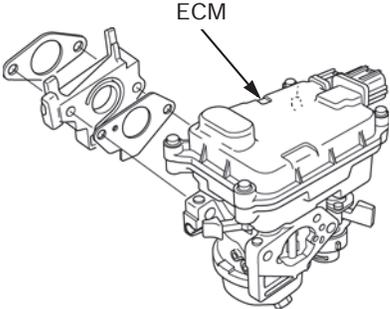
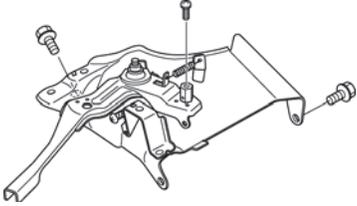
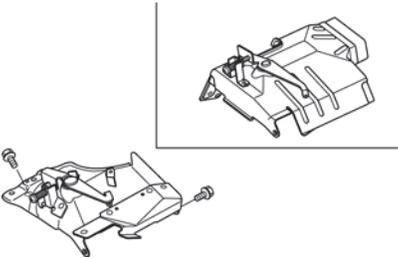
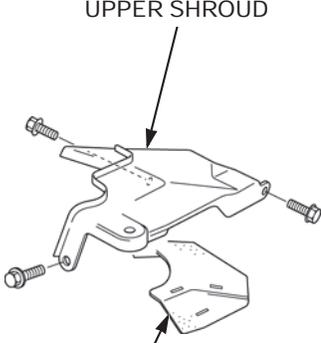
## How to use this manual

# SYMBOLS

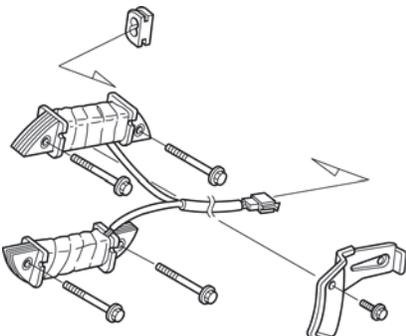
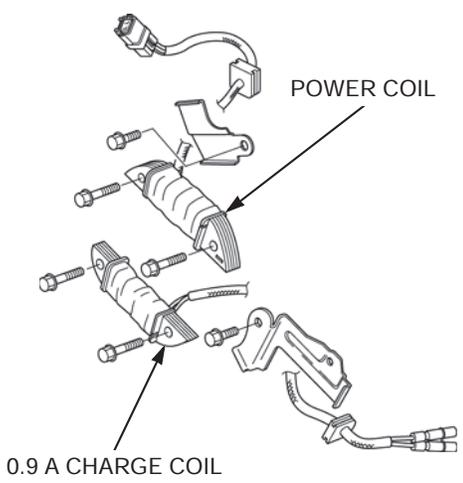
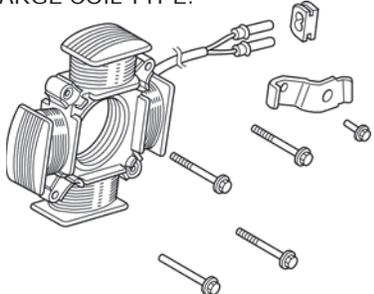
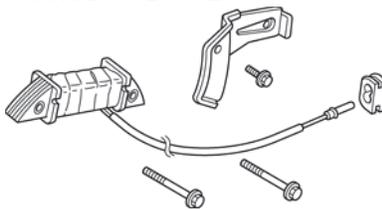
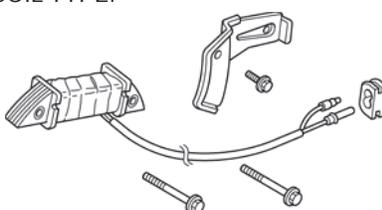
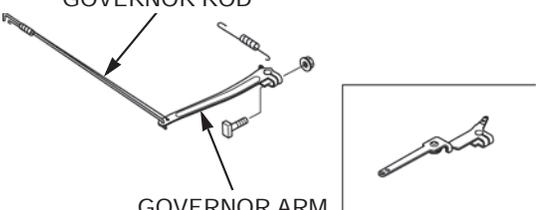
The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it will be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use the recommend engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use automatic transmission fluid.
( $\bigcirc$ x $\bigcirc$ ) ( $\bigcirc$ )	Indicates the diameter, length, and quantity of metric bolts used.
page 1-1	Indicates the reference page.

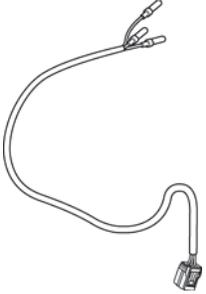
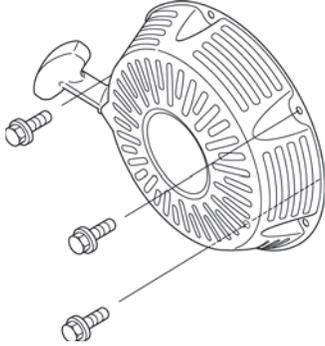
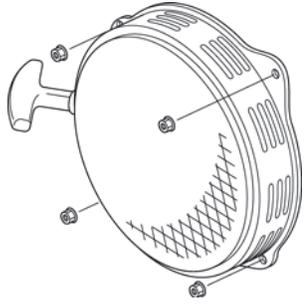
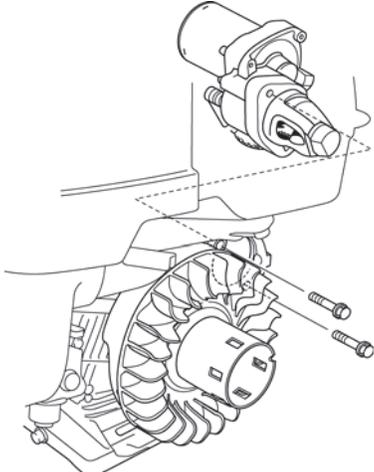
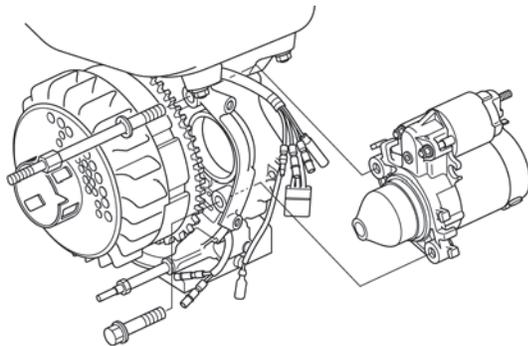
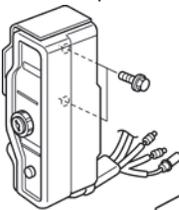
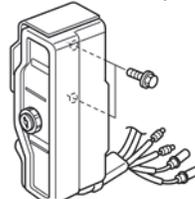
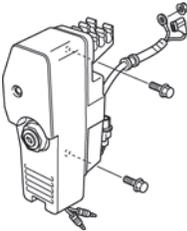
# OUTLINE OF CHANGES

ITEM	MODEL	
	GX270UT2-GX390UT2/T2	iGX270UT2-iGX390UT2/T2
Fan cover		
Carburetor		
Control base Assy.	<p>MANUAL OPERATION TYPE:</p>  <p>EXCEPT MANUAL OPERATION TYPE:</p> 	

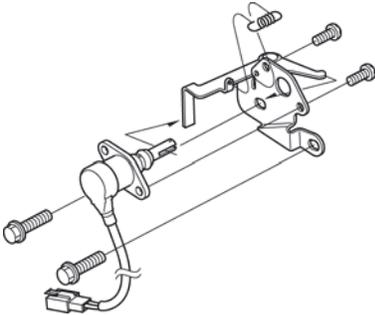
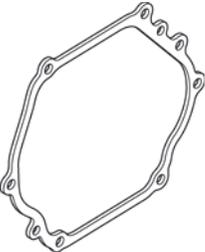
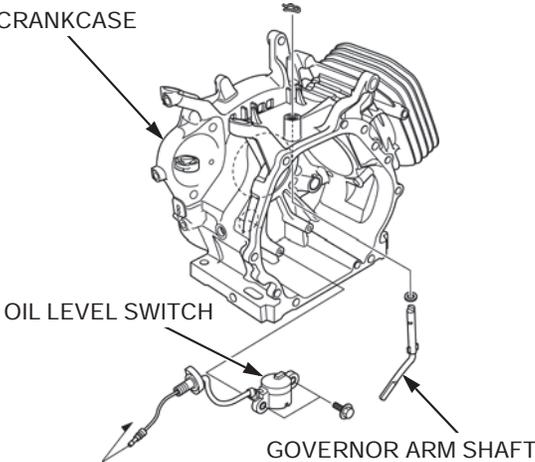
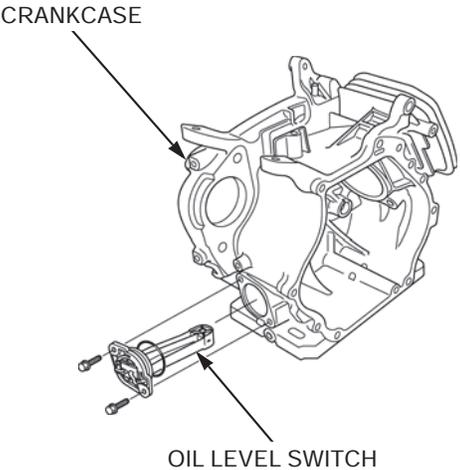
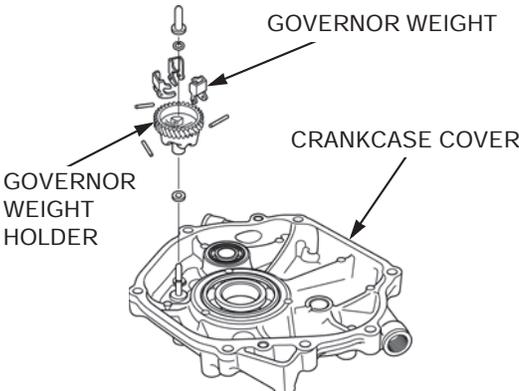
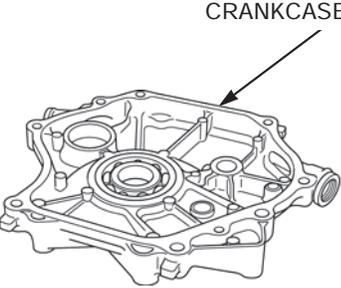
## OUTLINE OF CHANGES

ITEM	MODEL	
	GX270UT2-GX390UT2/T2	iGX270UT2-iGX390UT2/T2
Charge/lamp coil	<p>10 A CHARGE COIL TYPE:</p> 	 <p>POWER COIL</p> <p>0.9 A CHARGE COIL</p>
	<p>18 A CHARGE COIL TYPE:</p> 	
	<p>1 A/3 A CHARGE COIL TYPE:</p> 	
	<p>LAMP COIL TYPE:</p> 	
Governor arm/ governor rod	<p>GOVERNOR ROD</p>  <p>GOVERNOR ARM</p>	

**OUTLINE OF CHANGES**

ITEM	MODEL	
	GX270UT2-GX390UT2/T2	iGX270UT2-iGX390UT2/T2
Engine wire harness		
Recoil starter		
Starter motor		
Control box	<p>With circuit protector type</p>  <p>Without circuit protector type</p> 	

## OUTLINE OF CHANGES

ITEM	MODEL	
	GX270UT2-GX390UT2/T2	iGX270UT2-iGX390UT2/T2
Auto throttle solenoid		/
Case cover packing		/
Crankcase/ oil level switch/ governor arm shaft		
Crankcase cover		

# 1. SPECIFICATIONS

---

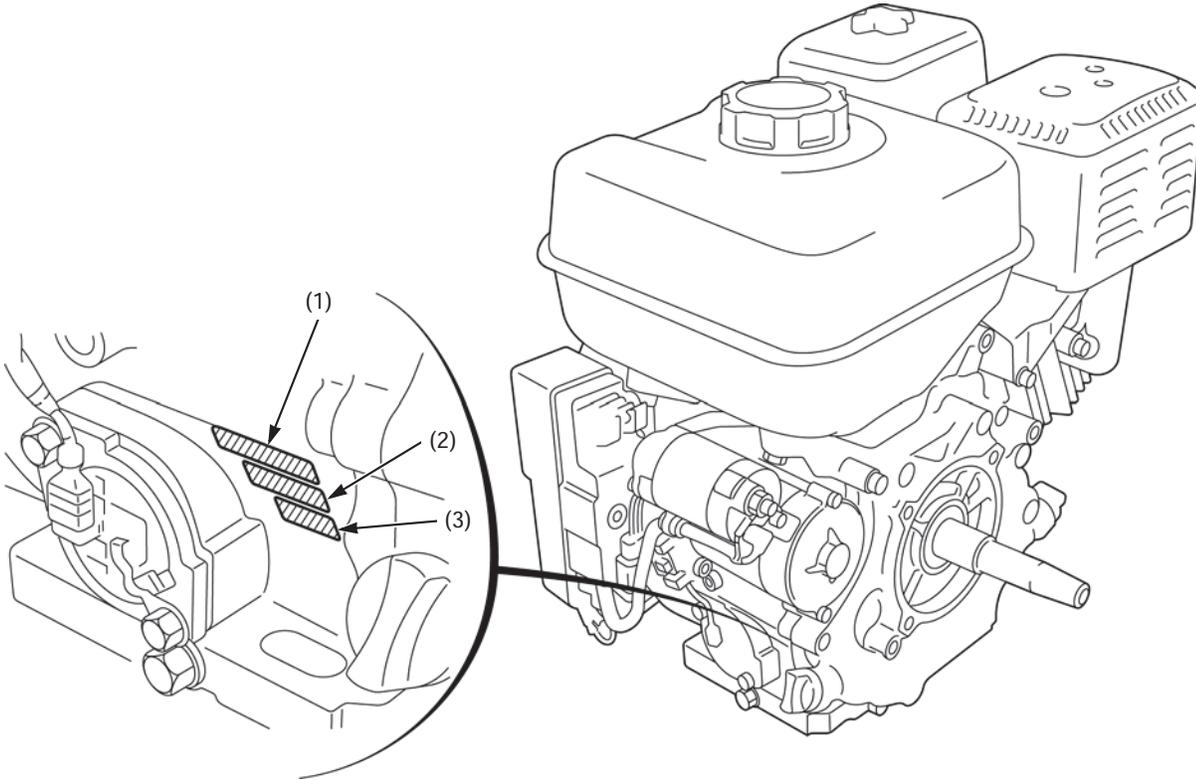
<b>SERIAL NUMBER LOCATION .....</b>	<b>1-2</b>	<b>ENGINE SPECIFICATIONS .....</b>	<b>1-3</b>
<b>TYPE CODE .....</b>	<b>1-2</b>	<b>DIMENSIONAL DRAWINGS .....</b>	<b>1-4</b>
<b>DIMENSIONS AND WEIGHTS SPECIFICATIONS .....</b>	<b>1-3</b>	<b>P.T.O. DIMENSIONAL DRAWINGS .....</b>	<b>1-5</b>

## 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

Model	GX270UT2	
Type	QZX4	VZX7
P. T. O.	Q type	V type

Model	GX390T2	
Type	VZX	
P. T. O.	V type	

Model	GX390UT2	
Type	VZX7	VZX8
P. T. O.	V type	

## DIMENSIONS AND WEIGHTS SPECIFICATIONS

### P.T.O. VARIATION

Model		GX270UT2	GX390UT2·GX390T2
Overall length	Q type*	380 mm (15.0 in)	–
	V type*	400 mm (15.7 in)	425 mm (16.7 in)
Overall width	Q type*	462 mm (18.2 in)	–
	V type*	462 mm (18.2 in)	484 mm (19.1 in)
Overall height	Q type*	422 mm (16.6 in)	–
	V type*	422 mm (16.6 in)	448 mm (17.6 in)
Dry weight	Q type*	29.4 kg (64.8 lbs)	–
	V type*	29.4 kg (64.8 lbs)	36.4 kg (80.2 lbs)
Operating weight	Q type*	34.2 kg (75.4 lbs)	–
	V type*	34.2 kg (75.4 lbs)	41.7 kg (91.9 lbs)

\*: P. T. O. type [\(page 1-2\)](#).

## ENGINE SPECIFICATIONS

Model	GX270UT2	GX390UT2	GX390T2
Description code	GCBGT	GCBCT	GCBDT
Type	4 stroke, overhead valve, single cylinder, inclined by 25°		
Displacement	270 cm <sup>3</sup> (16.5 cu-in)	389 cm <sup>3</sup> (23.7 cu-in)	
Bore x stroke	77.0 x 58.0 mm (3.0 x 2.3 in)	88.0 x 64.0 mm (3.5 x 2.5 in)	
Net power (SAE J1349)*1	6.3 kW (8.4 HP) / 3,600 min <sup>-1</sup> (rpm)	8.7 kW (11.7 HP) / 3,600 min <sup>-1</sup> (rpm)	
Continuous rated power	5.1 kW (6.8 HP) / 3,600 min <sup>-1</sup> (rpm)	7.0 kW (9.4 HP) / 3,600 min <sup>-1</sup> (rpm)	
Maximum net torque (SAE J1349)*1	19.1 N·m (1.95 kgf·m, 14.1 lbf·ft) / 2,500 min <sup>-1</sup> (rpm)	26.5 N·m (2.7 kgf·m, 19.5 lbf·ft) / 2,500 min <sup>-1</sup> (rpm)	
Compression ratio	8.5 : 1	8.2 : 1	
Fuel consumption (at continuous rated power)	2.4 Liters (0.63 US gal, 0.53 Imp gal)/h	3.5 Liters (0.92 US gal, 0.77 Imp gal) / h	
Ignition system	C.D.I.(Capacitor Discharge Ignition) type magneto ignition		
Ignition timing	B.T.D.C. 10° / 1,400 min <sup>-1</sup> (rpm)		
Spark advancer performance	B.T.D.C. 10° – 20°	B.T.D.C. 10° – 22°	
Spark plug	BPR6ES (NGK) / W20EPR-U (DENSO)		
Lubrication system	Forced splash		
Oil capacity	1.1 Liters (1.16 US qt, 0.97 Imp qt)		
Recommended oil	SAE 10W-30 API service classification SJ or later		
Cooling system	Forced air		
Starting system	Recoil and Starter motor		
Stopping system	Ignition primary circuit open		
Carburetor	Horizontal type, butterfly valve		
Air cleaner	Dual element type		
Governor	STR (Self Tuning Regulator) governor		
Breather system	Reed valve type		
Fuel used	Unleaded gasoline with a pump octane rating 86 or higher		

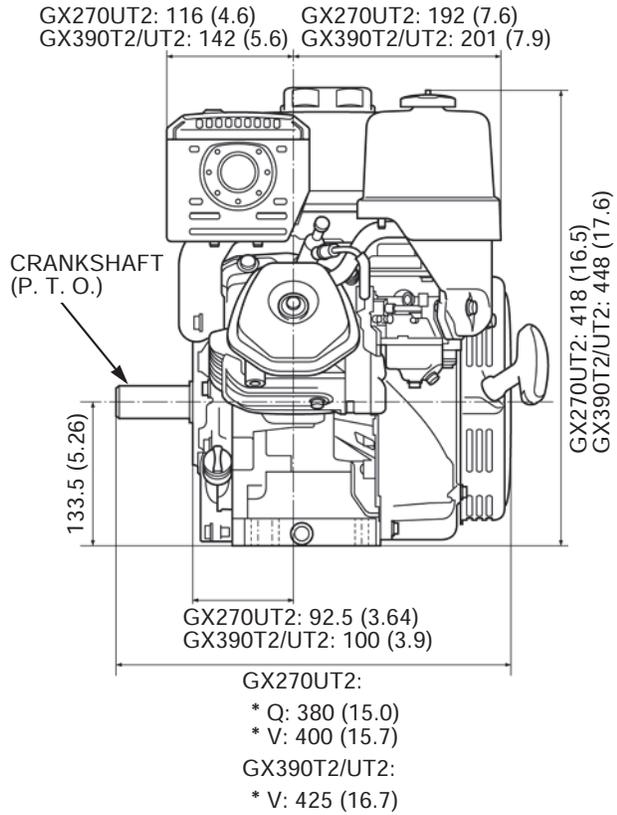
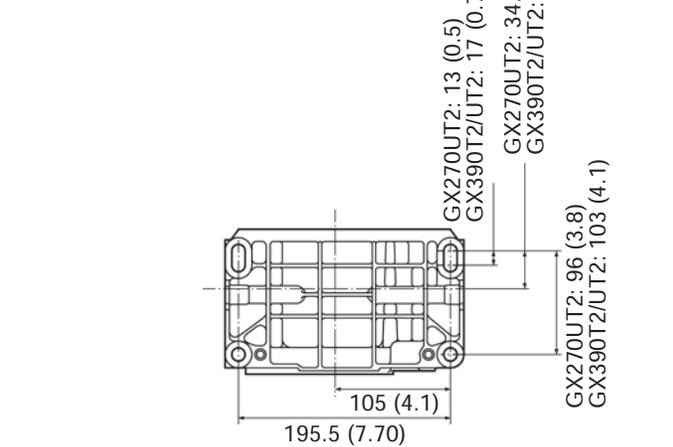
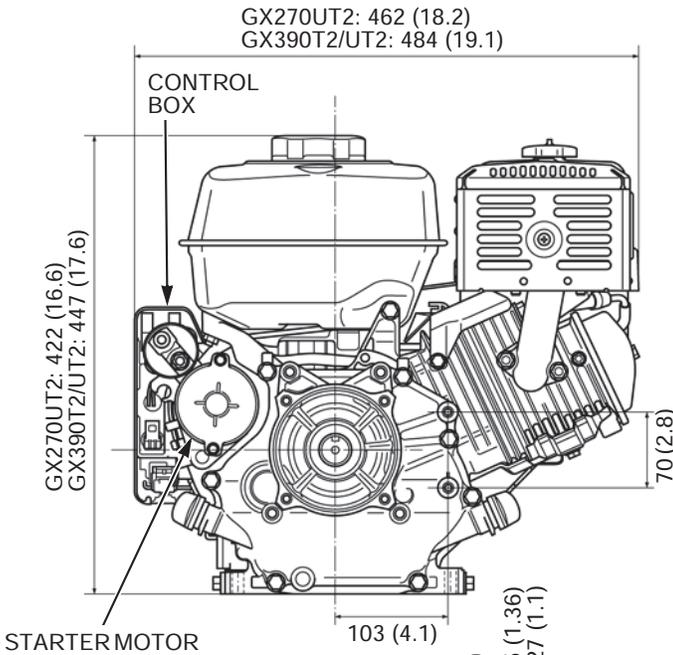
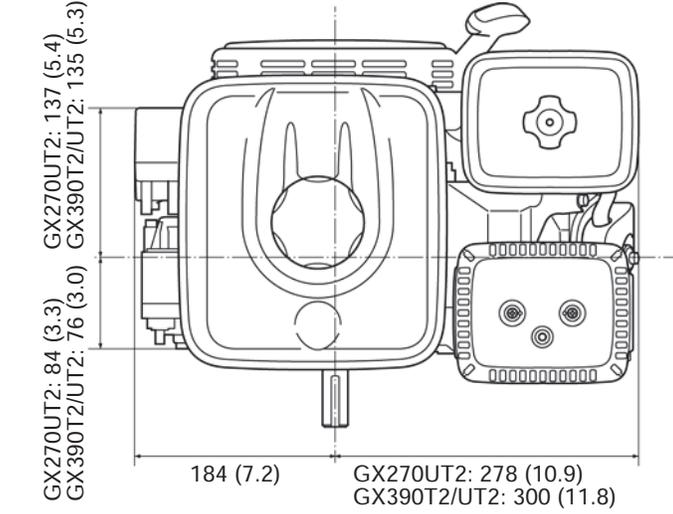
\*1: The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 min<sup>-1</sup> (rpm) (net power) and at 2,500 min<sup>-1</sup> (rpm) (maximum net torque). Mass production engines 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)

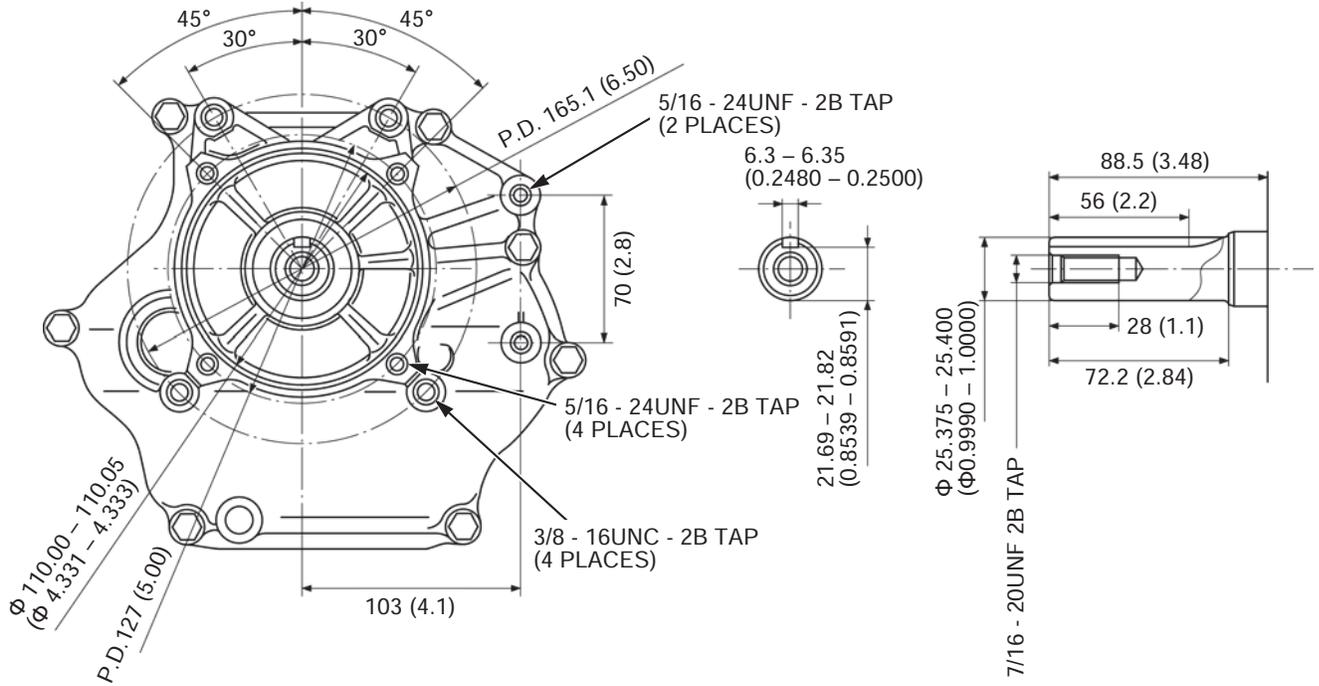


**P.T.O. DIMENSIONAL DRAWINGS**

\*: P. T. O. type [\(page 1-2\)](#).

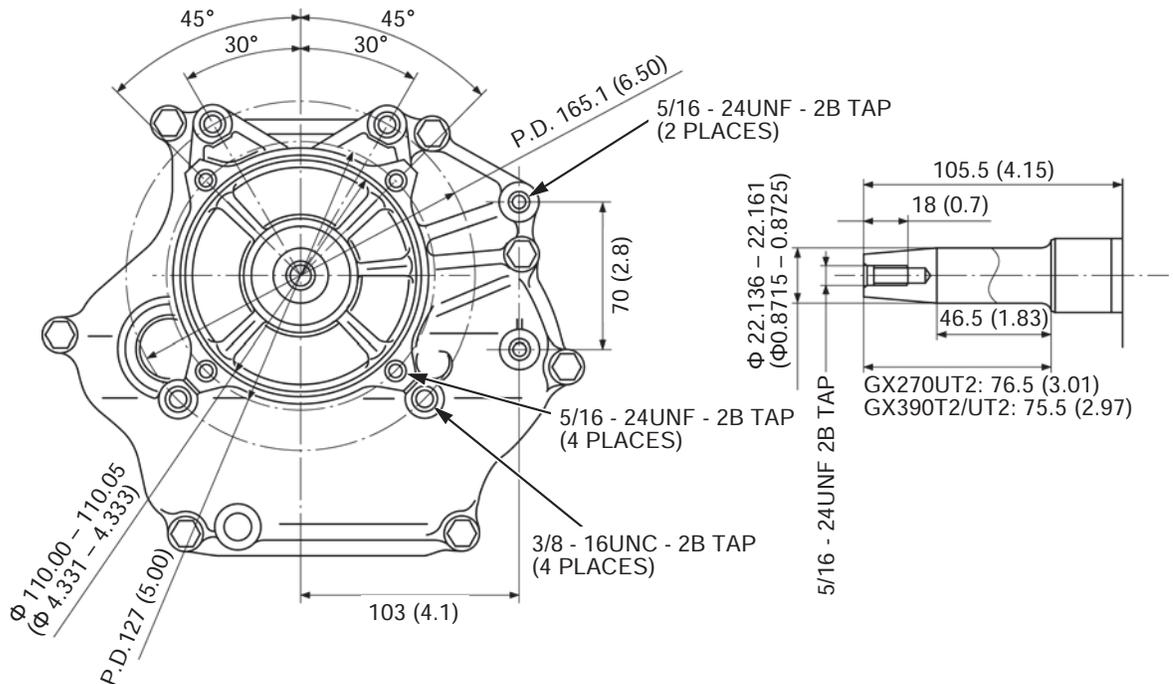
**Q TYPE\* (GX270UT2)**

Unit: mm (in)



**V TYPE\***

Unit: mm (in)



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# MEMO

## 2. SERVICE INFORMATION

---

MAINTENANCE STANDARDS .....	2-2	LUBRICATION & SEAL POINT .....	2-2
TORQUE VALUES .....	2-2	HARNES AND TUBE ROUTING .....	2-3

## SERVICE INFORMATION

### MAINTENANCE STANDARDS

Unit: mm (in)

Part	Item		Standard	Service limit
Engine	Maximum speed (at no load)		3,600 min <sup>-1</sup> (rpm)*	–
	Cylinder compression	GX270UT2	1.31 MPa (13.4 kgf/cm <sup>2</sup> , 190 psi) / 1,400 min <sup>-1</sup> (rpm)	–
GX390T2/UT2		1.29 MPa (13.2 kgf/cm <sup>2</sup> , 187 psi) / 1,400 min <sup>-1</sup> (rpm)	–	
Carburetor	Main jet	GX270UT2	BE90A A: #85	–
		GX390T2/UT2	BE92B A: #100	–
	Pilot screw opening	GX270UT2	BE90A A: 1 - 1/2 turns out	–
		GX390T2/UT2	BE92B A: 3 turns out	–
Starter motor	Brush length		10 (0.4)	6 (0.2)
	Mica depth		–	0.2 (0.01)
Charge coil	Resistance	0.9 A	5.1 - 7.7 Ω	–
Power coil	Resistance		2.9 - 4.5 Ω	–

\*: This figure is caused by basic program in the ECM. The engine speed is different depending on the program in the ECM.

## TORQUE VALUES

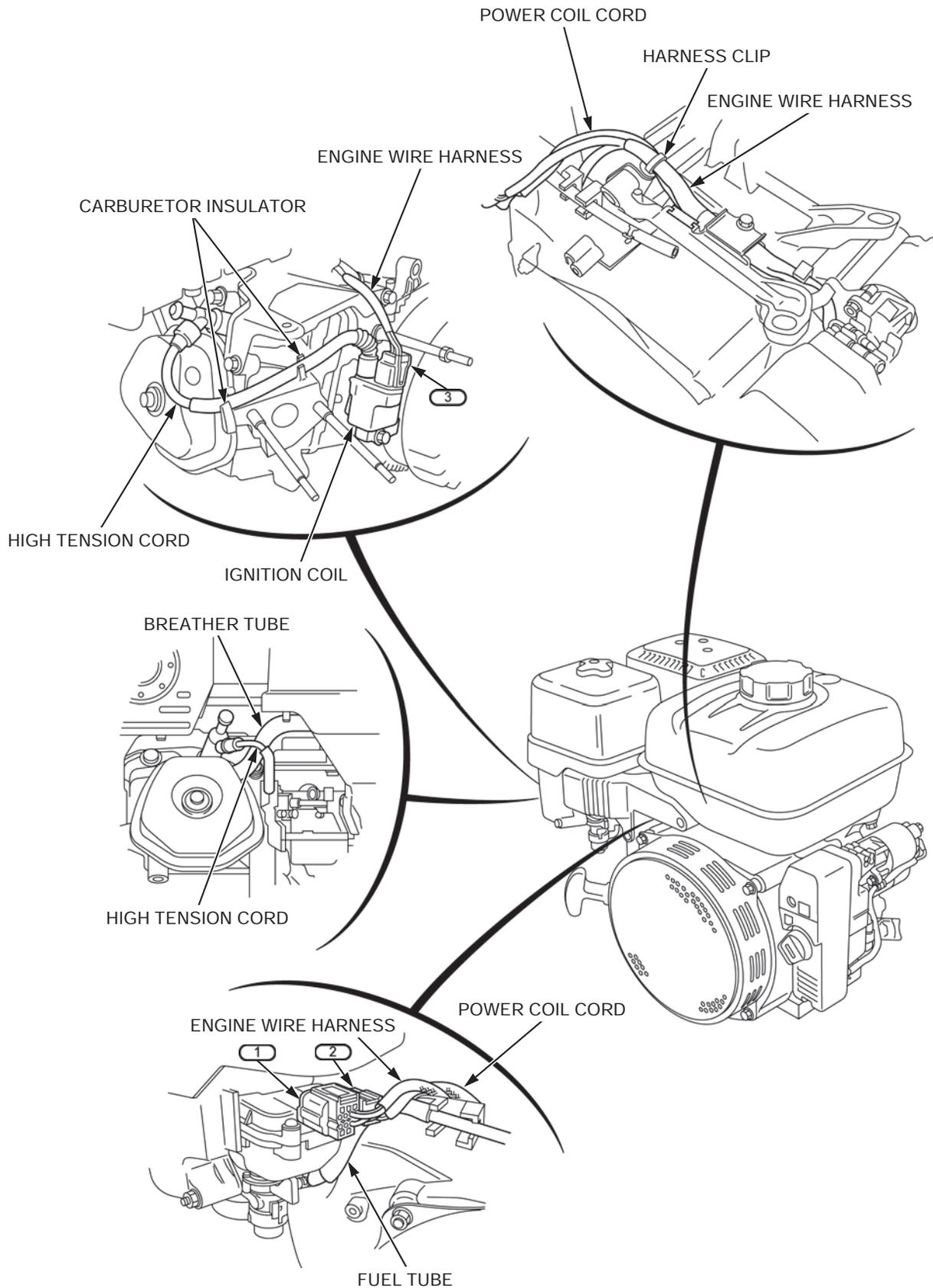
### ENGINE TORQUE VALUES

Item	Tread Dia. (mm)	Torque values		
		N·m	kgf·m	lbf·ft
Starter motor stud bolt	M10 x 1.25	40	4.1	30
Fan cover stud bolt	M8 x 1.25	23	2.3	17
Combination switch nut	M18 x 1.0	4.9	0.50	3.6
ECM screw/washer	M4 x 0.7	2.1	0.21	1.5
Motor case set screw A/B	M4 x 0.7	2.1	0.21	1.5
Starter motor nut	M8 x 1.25	8.8	0.90	6.5
Jet set screw	M5 x 0.8	0.3	0.03	0.22

## LUBRICATION & SEAL POINT

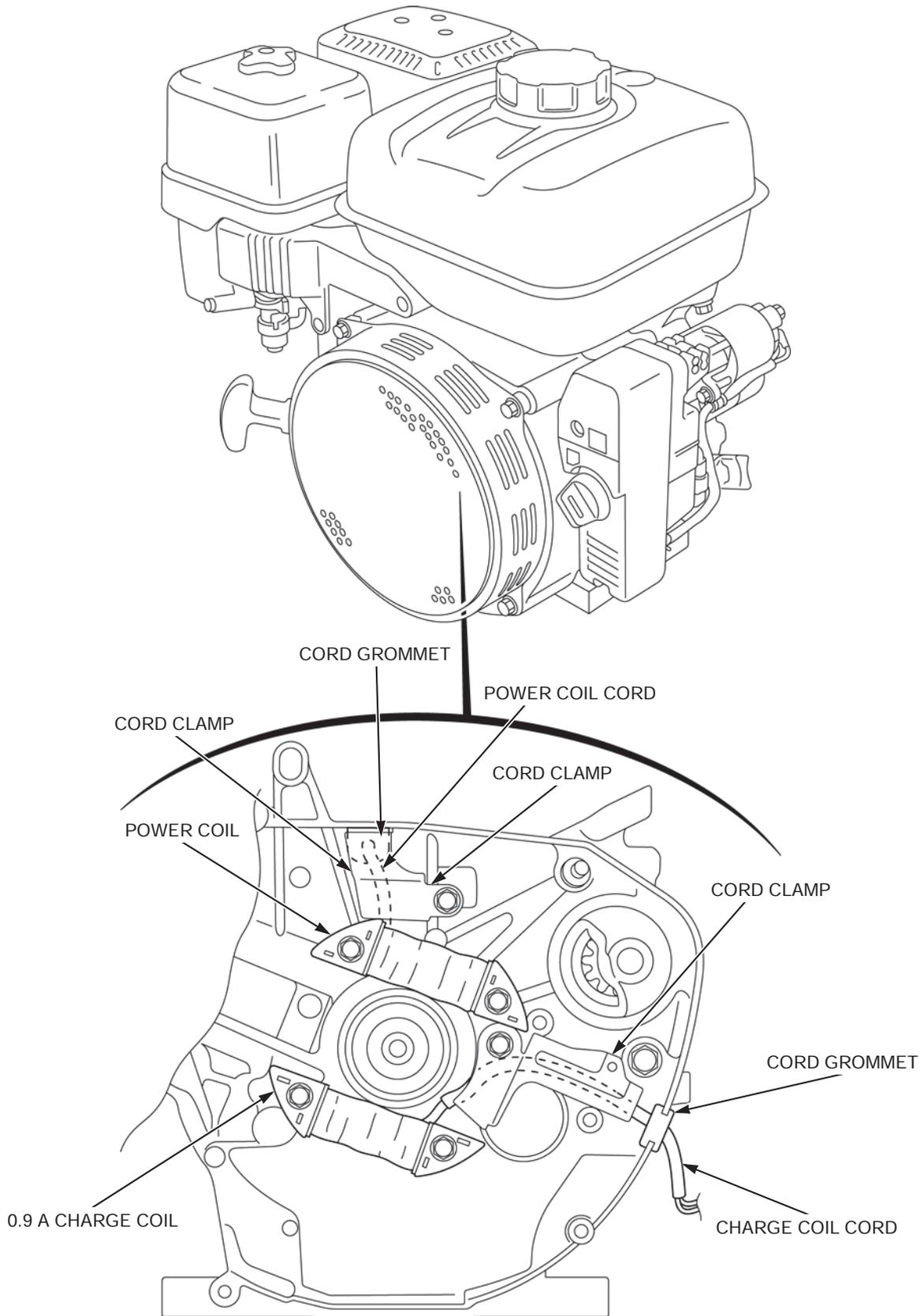
Location	Material	Remarks
Crankcase cover mating surface	Liquid sealant (Hondabond HT, Hondabond 4, or equivalent)	

# HARNESS AND TUBE ROUTING

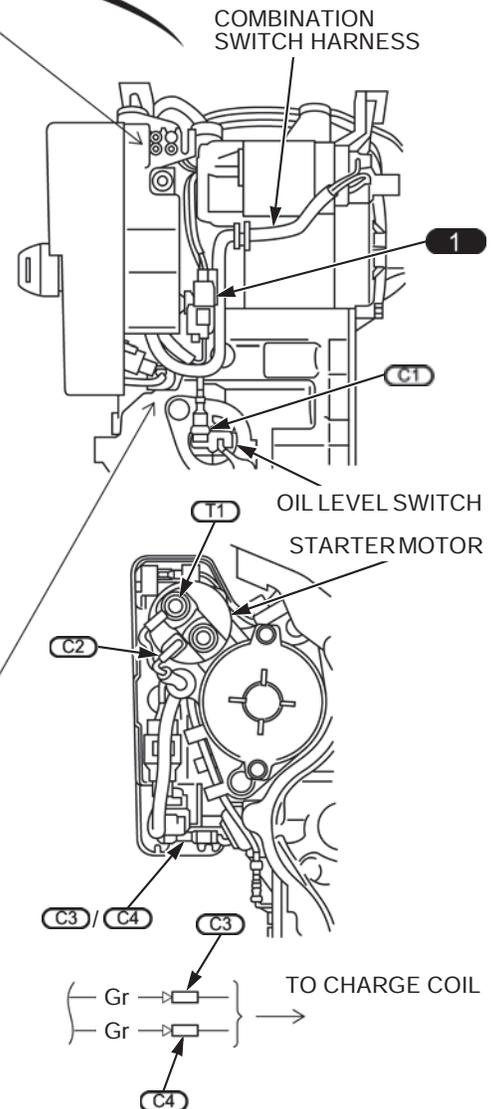
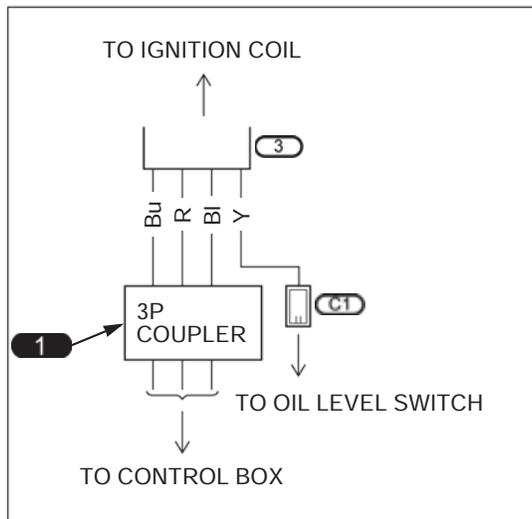
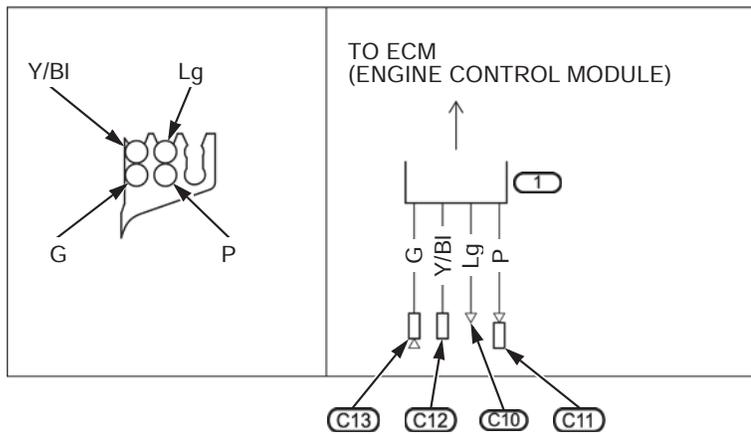
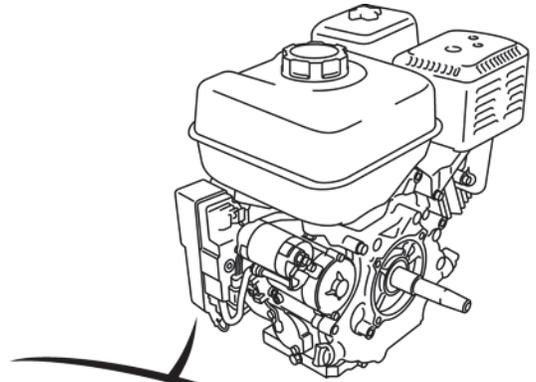


## SERVICE INFORMATION

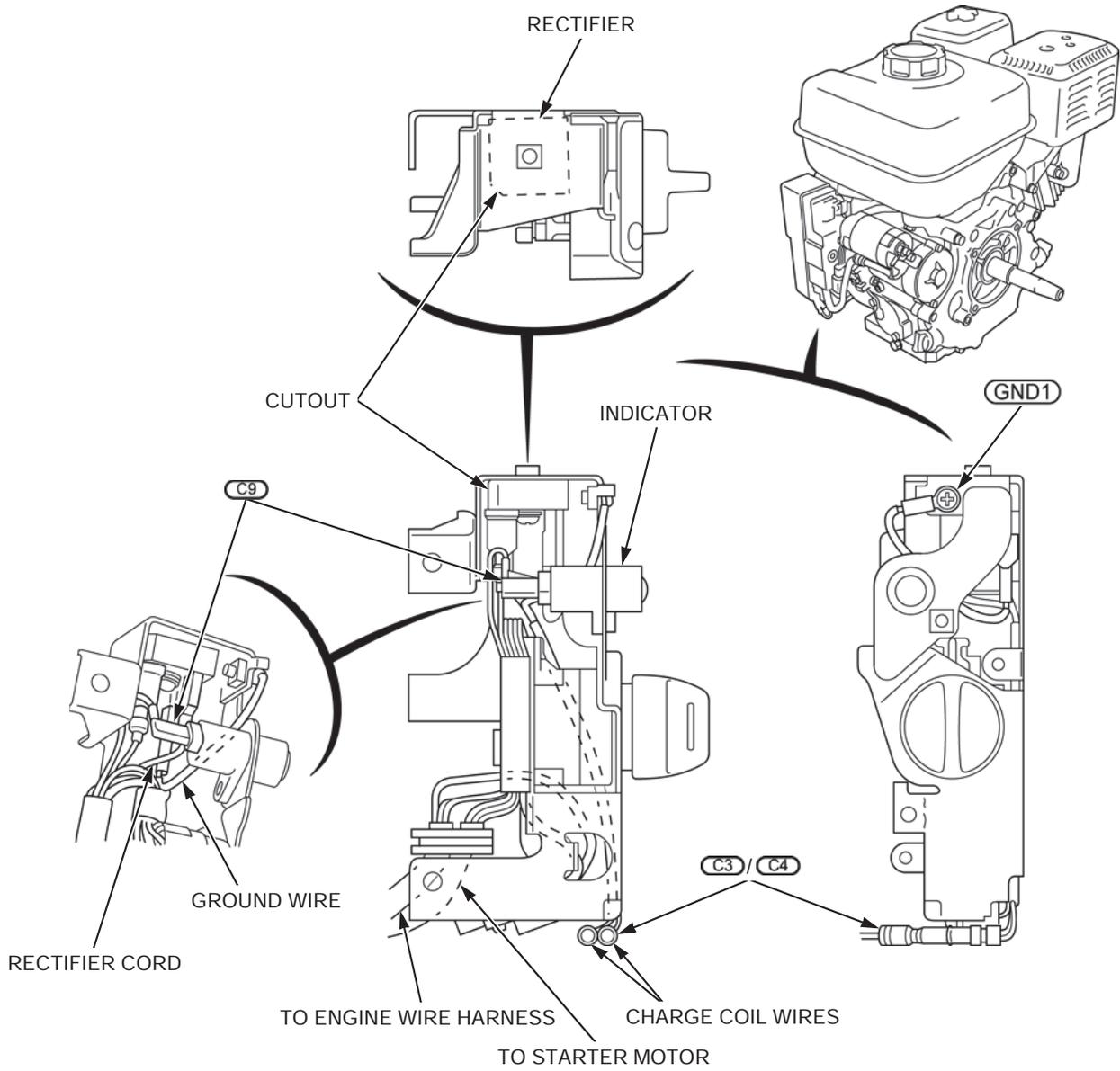
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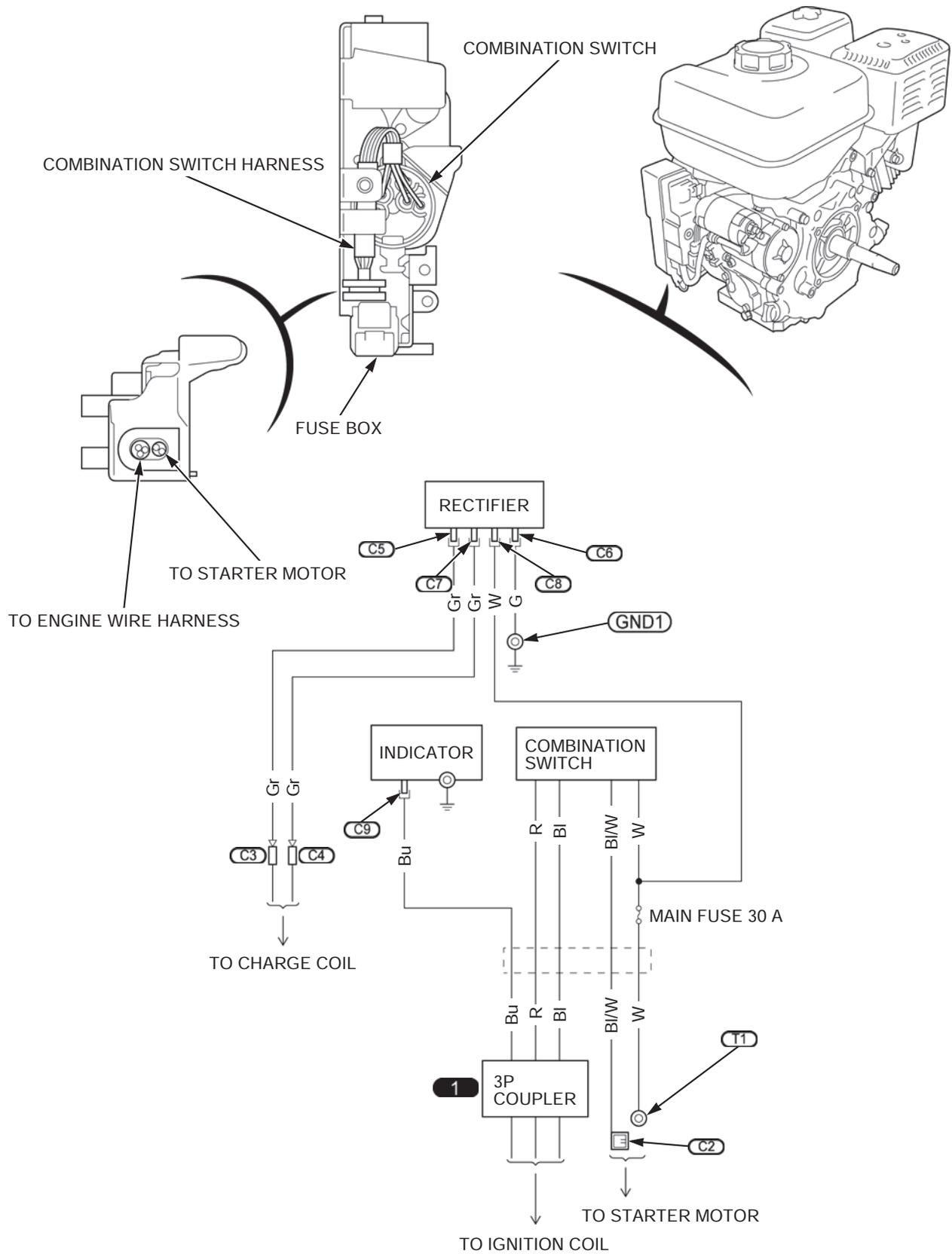
# SERVICE INFORMATION



## SERVICE INFORMATION



# SERVICE INFORMATION



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# MEMO

# 3. MAINTENANCE

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MAINTENANCE SCHEDULE ..... 3-2

COMBUSTION CHAMBER CLEANING ..... 3-4

VALVE CLEARANCE CHECK/  
ADJUSTMENT ..... 3-3

FUEL TUBE CHECK ..... 3-5

## MAINTENANCE SCHEDULE

ITEM Perform at every indicated month or operating hour interval, whichever comes first.	REGULAR SERVICE PERIOD (2)					Refer to page
	Each use	First month or 20 hrs.	Every 3 months or 50 hrs.	Every 6 months or 100 hrs.	Every year or 300 hrs.	
Engine oil	Check level	○				<a href="#">3-3*</a>
	Change		○		○	
Air cleaner	Check	○				<a href="#">3-6*</a>
	Clean			○ (1)		
	Replace				○	
Sediment cup	Clean			○		<a href="#">3-8*</a>
Spark plug	Check-adjust			○		<a href="#">3-9*</a>
	Replace				○	<a href="#">3-10*</a>
Spark arrester (Applicable types)	Check-clean			○		<a href="#">3-10*</a>
Valve clearance	Check-adjust				○	<a href="#">3-3</a>
Fuel tank and filter	Clean			○		<a href="#">3-14*</a>
Fuel tube	Check	Every 2 years (Replace if necessary)				<a href="#">3-5</a>

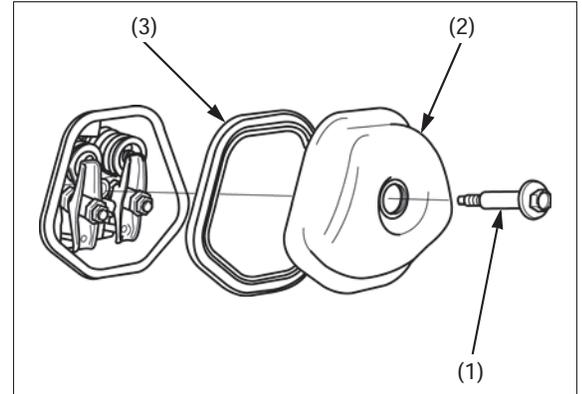
(1) Service more frequently when used in dusty areas.

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

(\*) Refer to page of base shop manual (GX390RT2/T2/UT2: 61Z5F00)

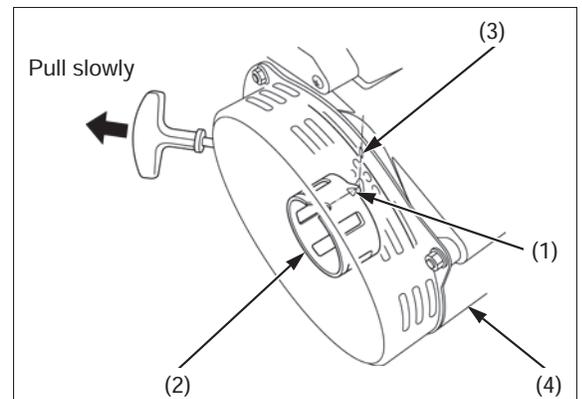
## VALVE CLEARANCE CHECK/ ADJUSTMENT

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.

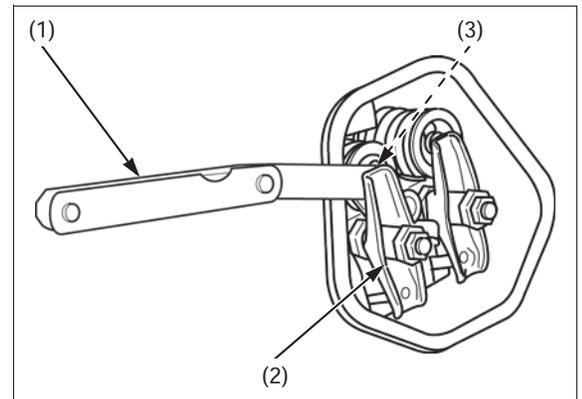
Insert a thickness gauge (1) between the valve rocker arm (2) and valve stem (3) to measure the valve clearance.

### VALVE CLEARANCE:

**IN:  $0.15 \pm 0.02$  mm**

**EX:  $0.20 \pm 0.02$  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:  $0.15 \pm 0.02$  mm**

**EX:  $0.20 \pm 0.02$  mm**

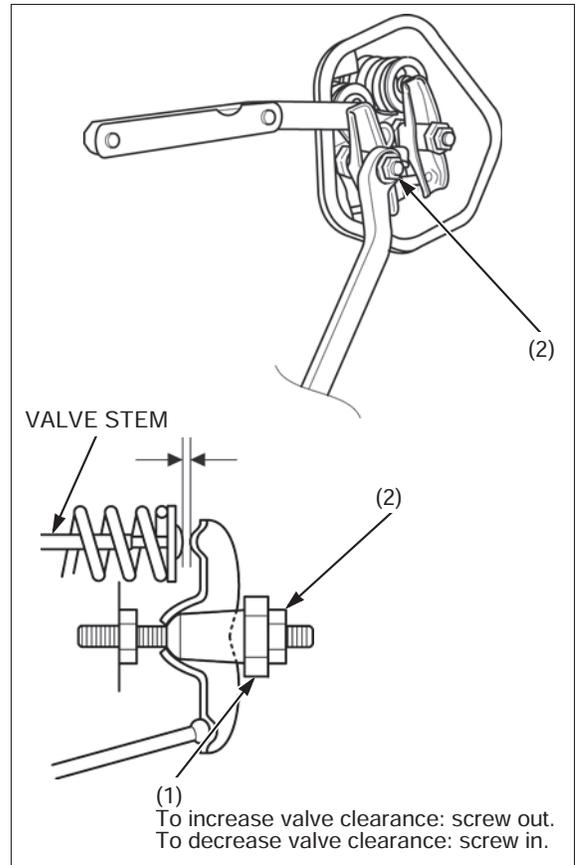
Hold the rocker arm pivot and retighten the pivot adjusting nut to the specified torque.

**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.

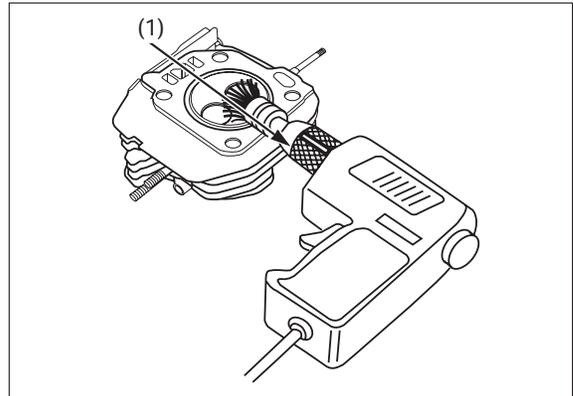
Attach the cylinder head cover to the cylinder head, and tighten the head cover bolt securely.



## COMBUSTION CHAMBER CLEANING

Remove the cylinder head ([page 12-2](#)).

Clean any carbon deposits from the combustion chamber (1).



## FUEL TUBE CHECK

### **⚠ WARNING**

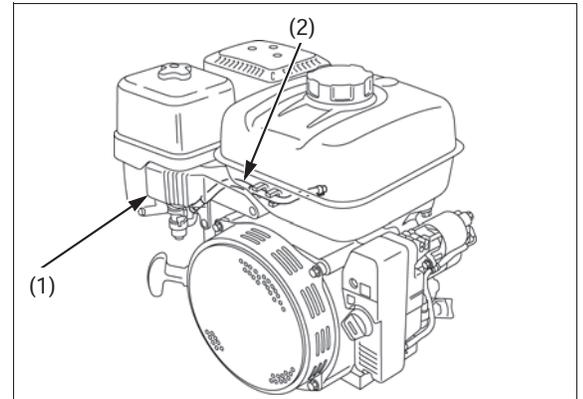
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.

- 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 [\(page 6-2\)](#).



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# MEMO

# 4. TROUBLESHOOTING

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

## TROUBLESHOOTING

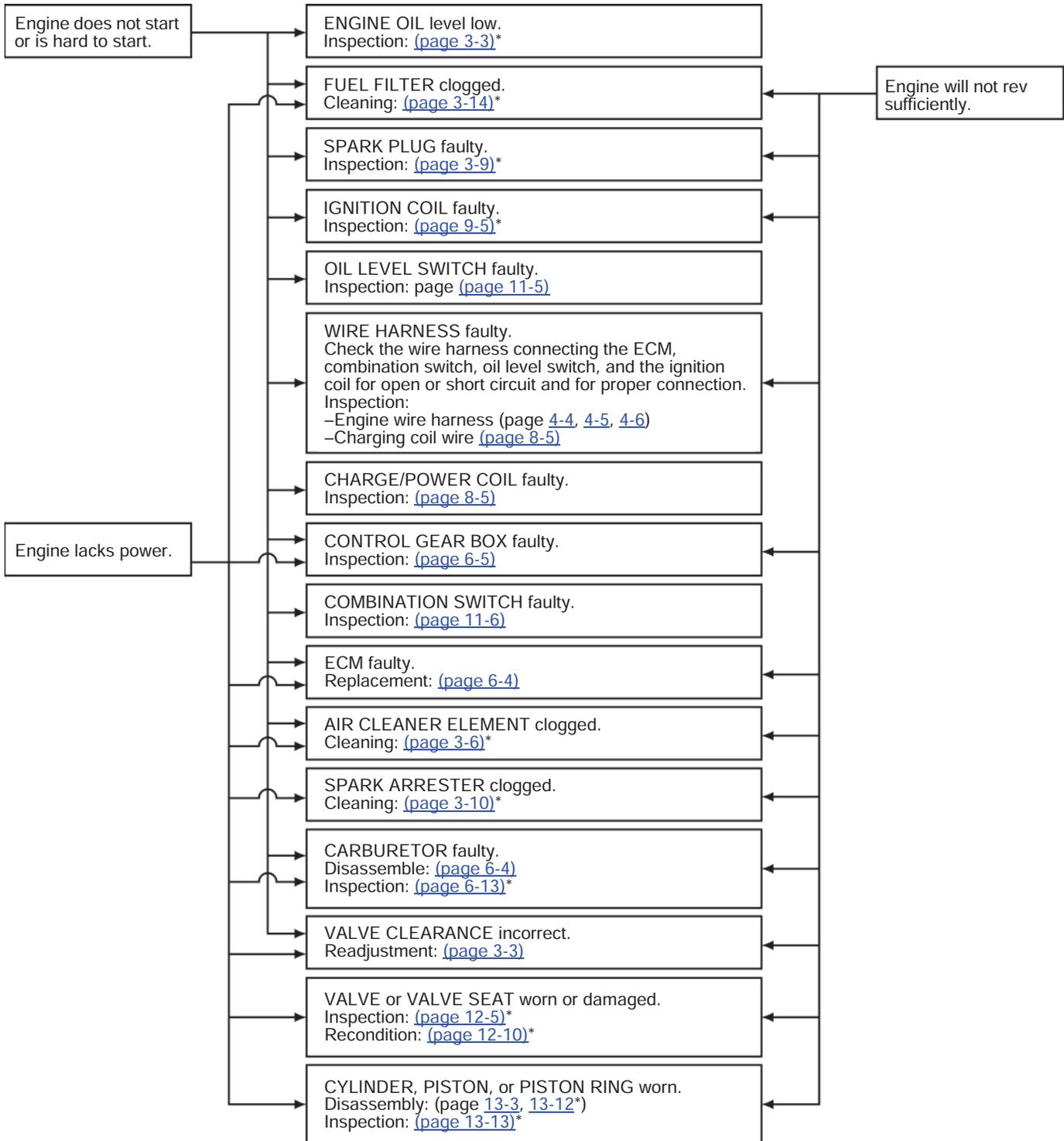
### BEFORE TROUBLESHOOTING

- 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.

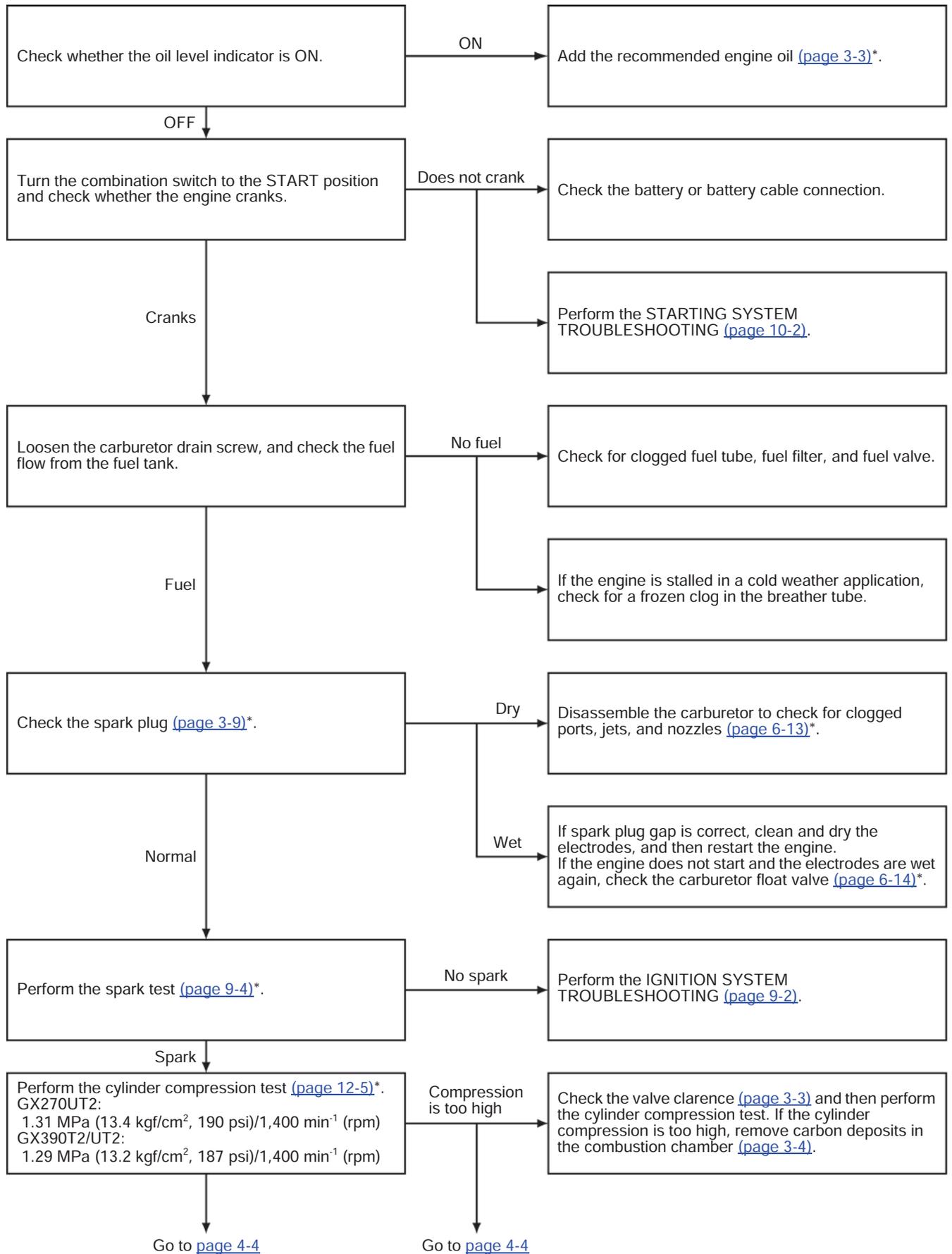
### TROUBLESHOOTING

\* Refer to page of base shop manual (GX390RT2/T2/UT2: 61Z5F00E3)

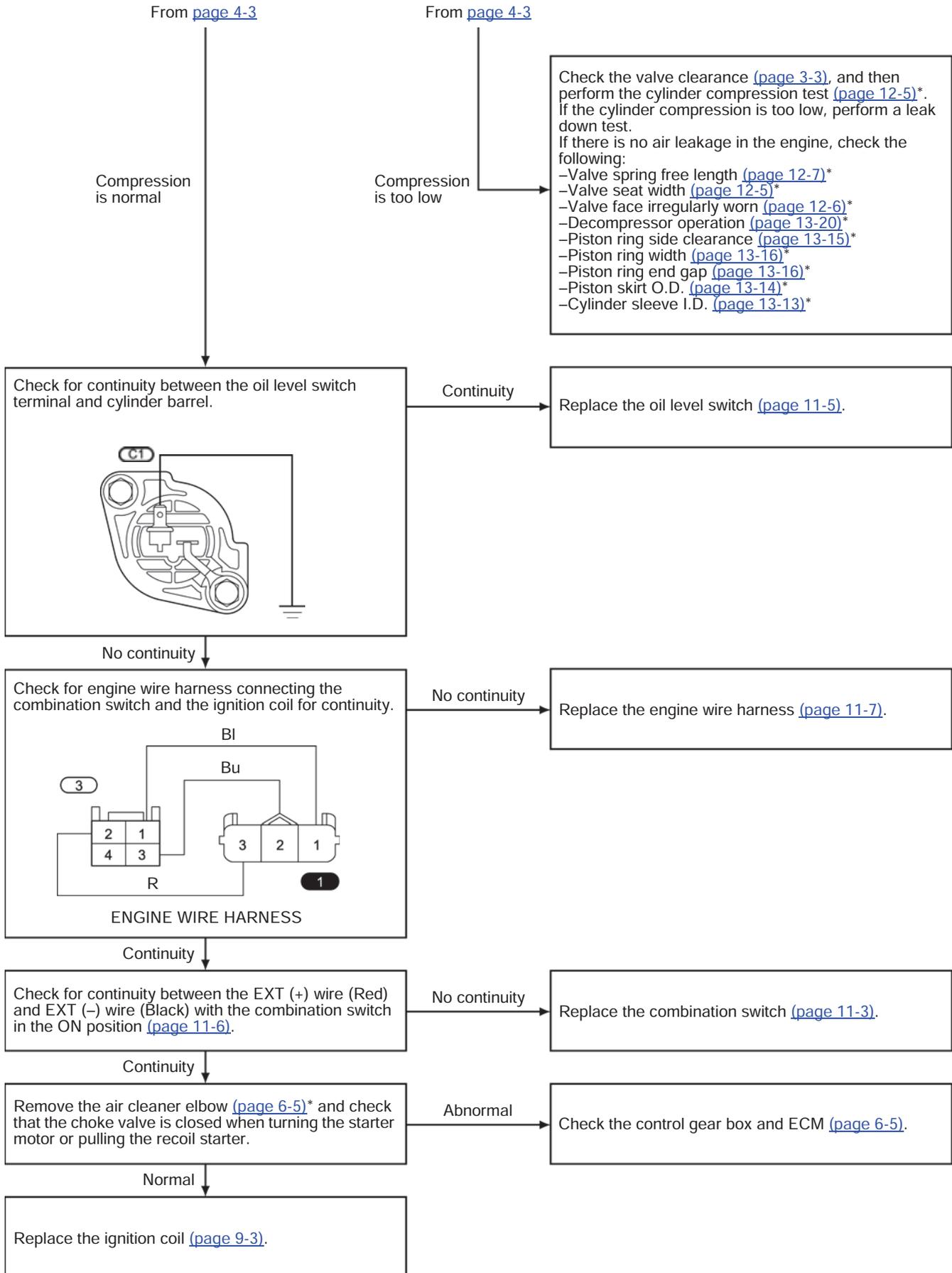
#### GENERAL SYMPTOMS AND POSSIBLE CAUSES



## HARD STARTING

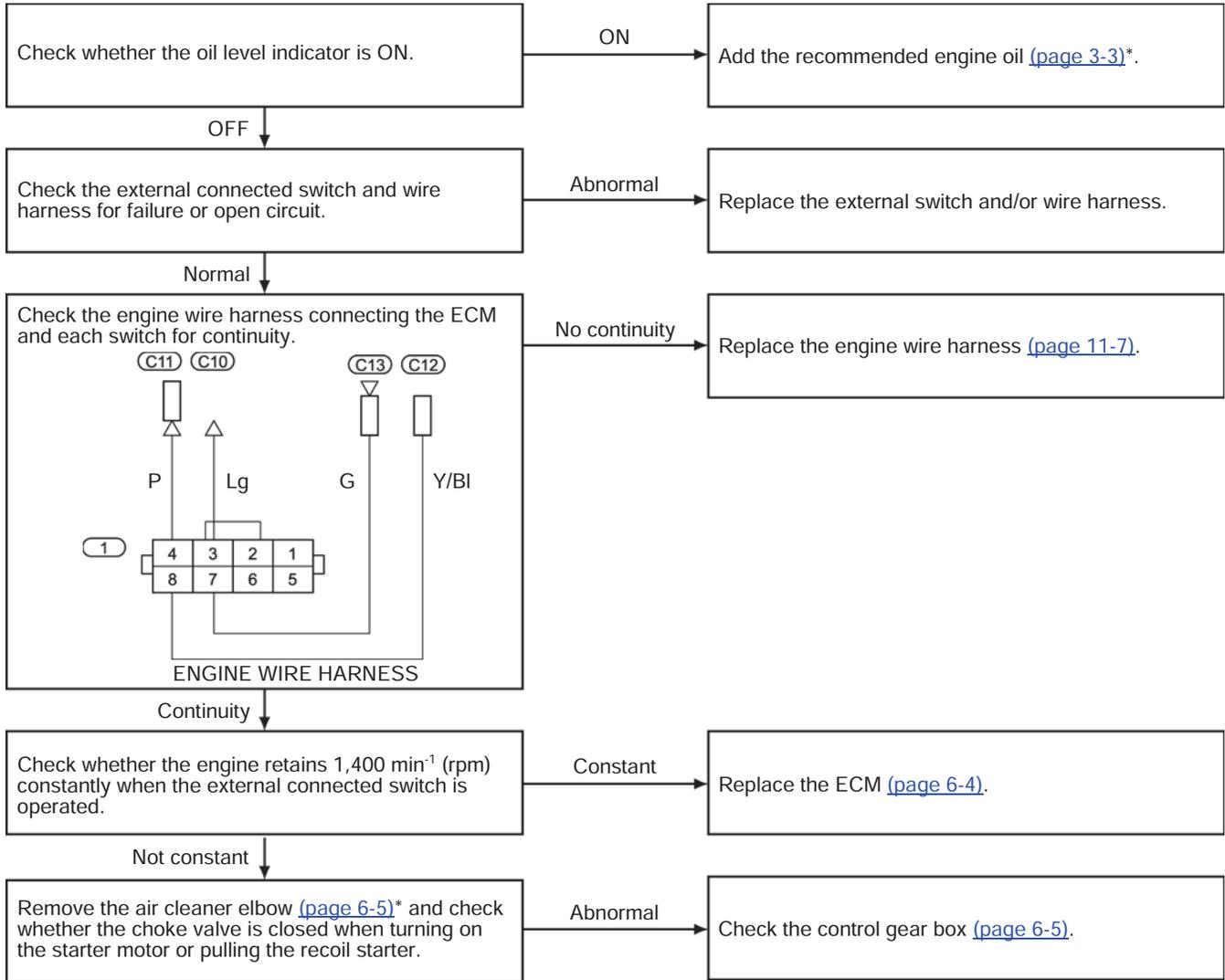


## TROUBLESHOOTING



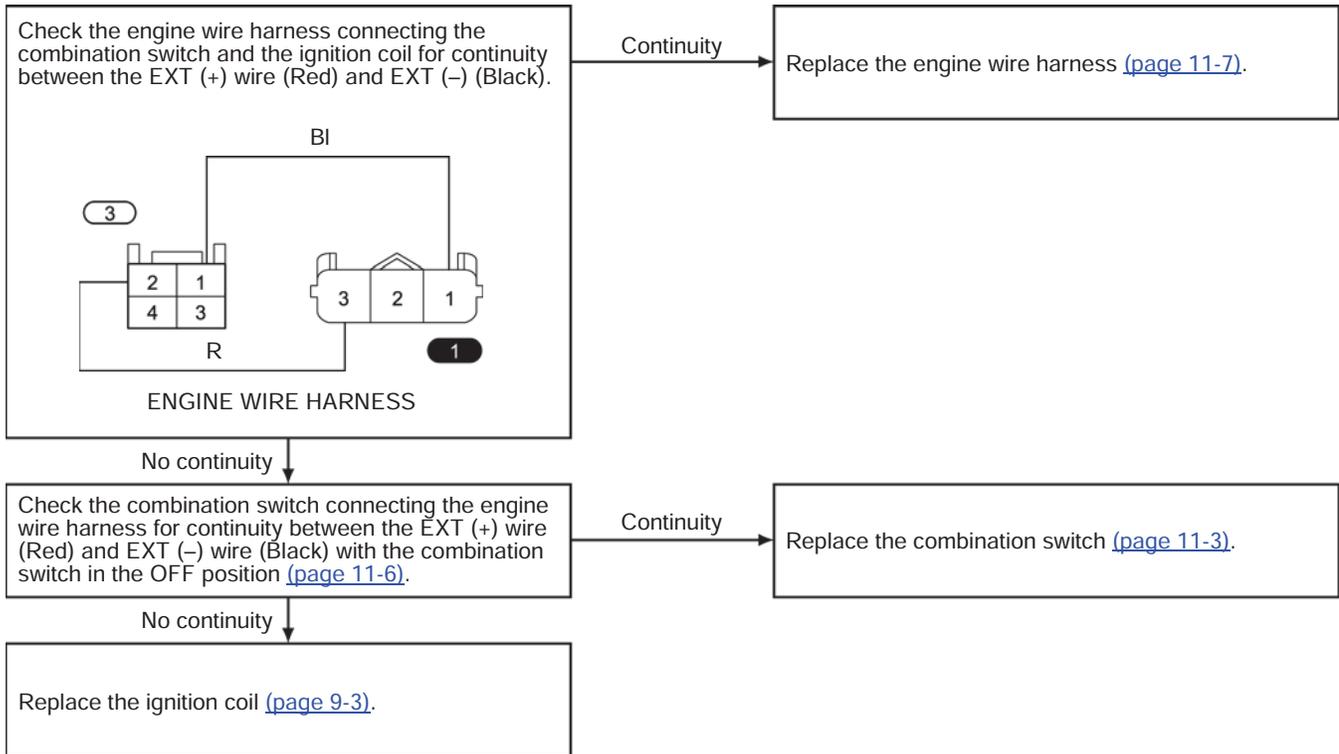
**ENGINE SPEED DOES NOT INCREASE OR STABILIZE**

**SERVICE BULLETIN #47 =>**

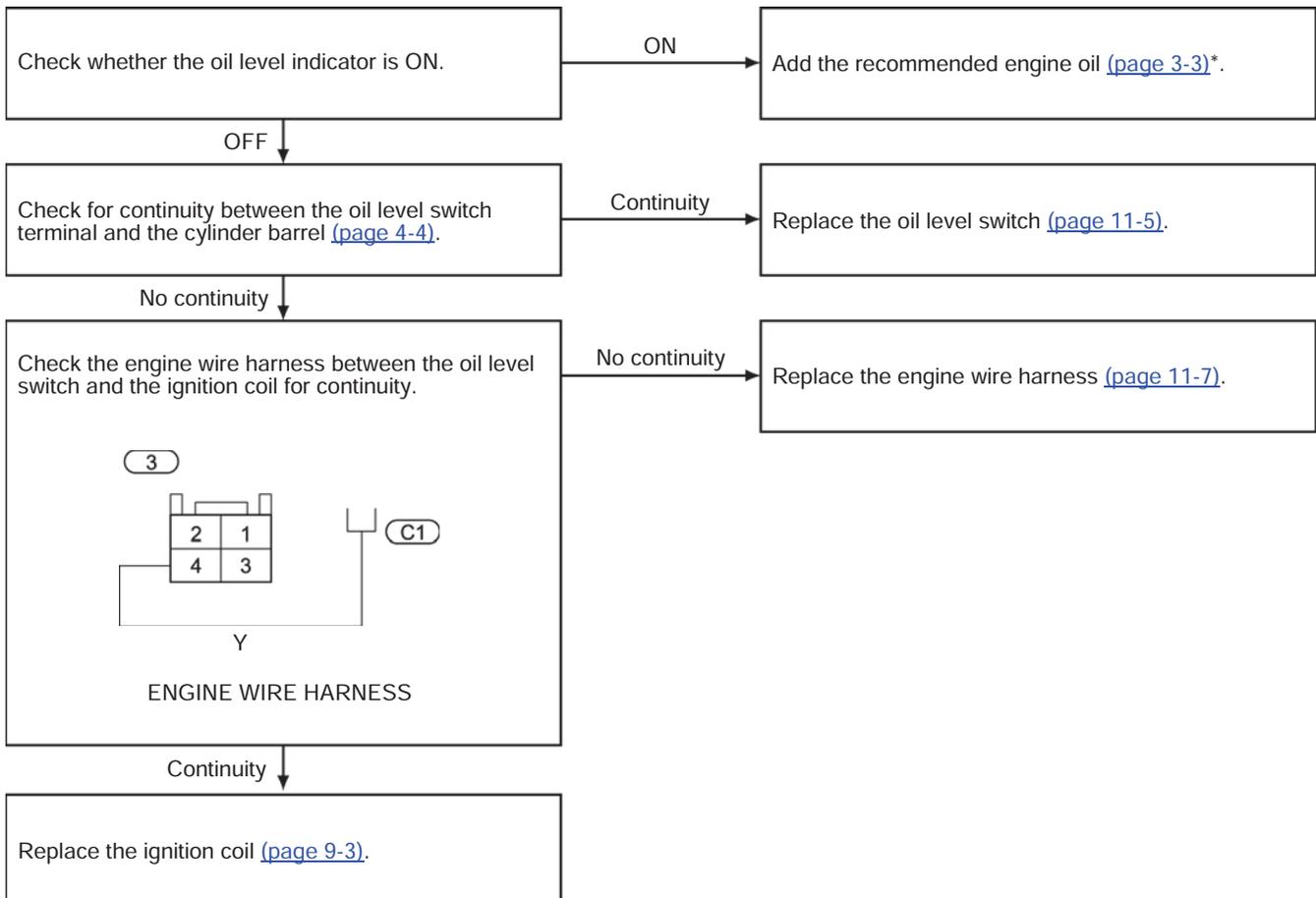


## TROUBLESHOOTING

### ENGINE DOES NOT STOP WHEN COMBINATION SWITCH IS TURNED OFF



### ENGINE DOES NOT STOP WHEN ENGINE OIL LEVEL IS LOW



# 5. FAN COVER

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FAN COVER REMOVAL/INSTALLATION....5-2

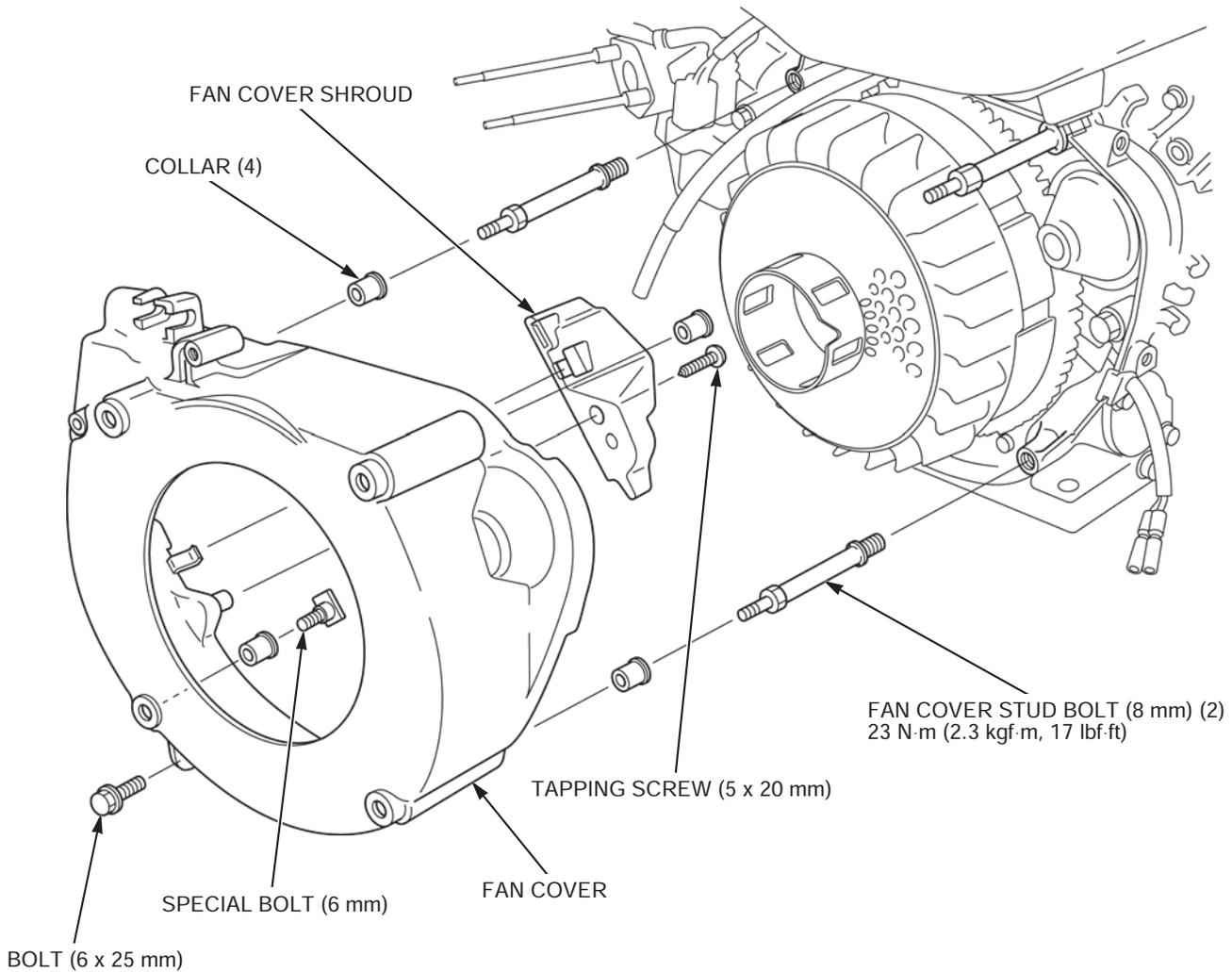
## FAN COVER

# 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 [\(page 2-3\)](#).



# 6. FUEL SYSTEM

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<b>FUEL TANK REMOVAL/INSTALLATION</b> ....6-2	<b>CHOKE SET REPLACEMENT</b> ..... 6-9
<b>CARBURETOR REMOVAL/ INSTALLATION</b> .....6-3	<b>CONTROL MOTOR/WAX HEATER INSPECTION</b> ..... 6-9
<b>CARBURETOR DISASSEMBLY/ ASSEMBLY</b> .....6-4	<b>TECHNICAL FEATURES/STR (Self Tuning Regulator) GOVERNOR</b> ..... 6-10

## FUEL SYSTEM

# FUEL TANK REMOVAL/INSTALLATION

### **⚠ WARNING**

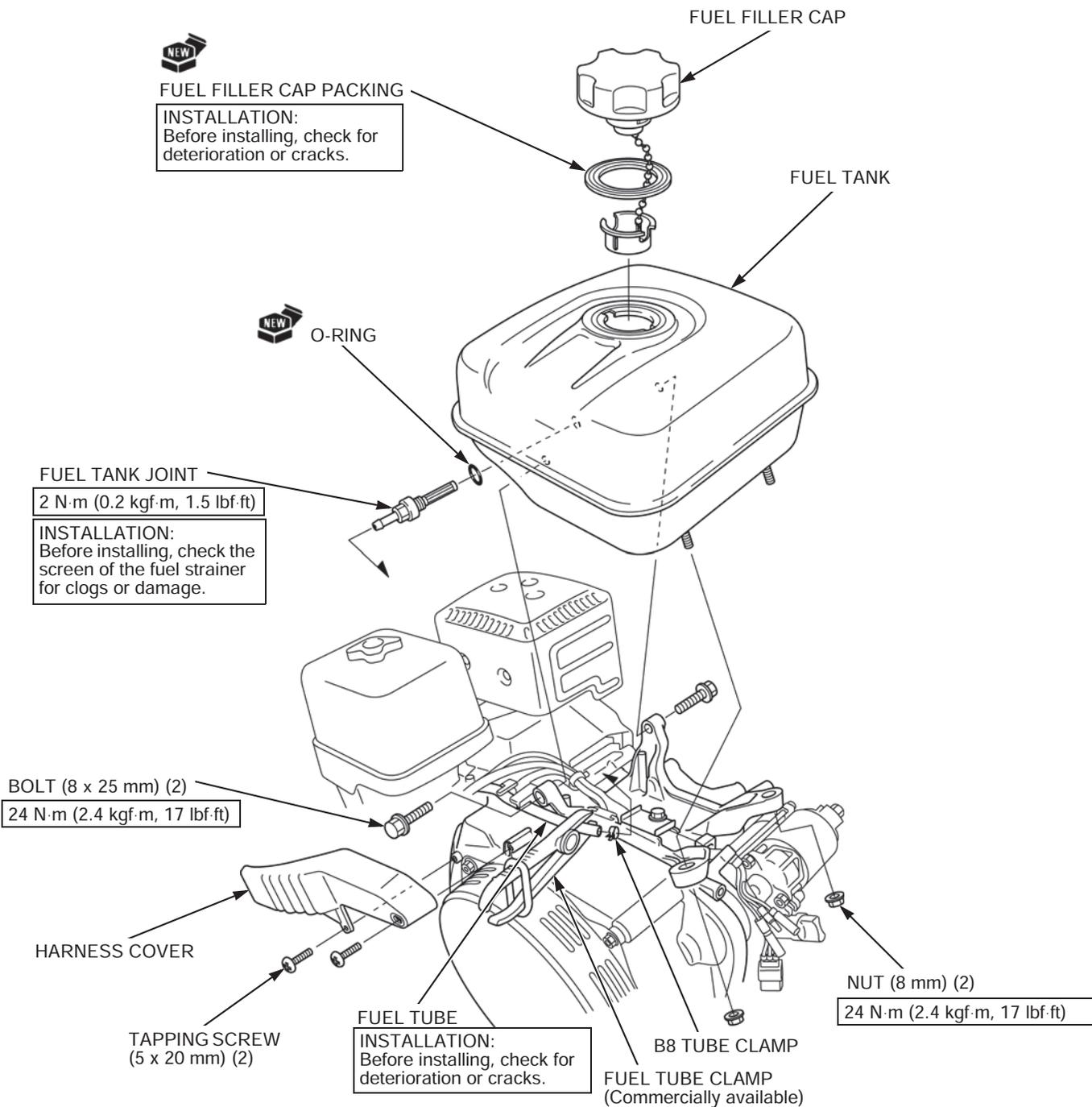
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.

- 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 [\(page 11-3\)](#).



## 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](#)).

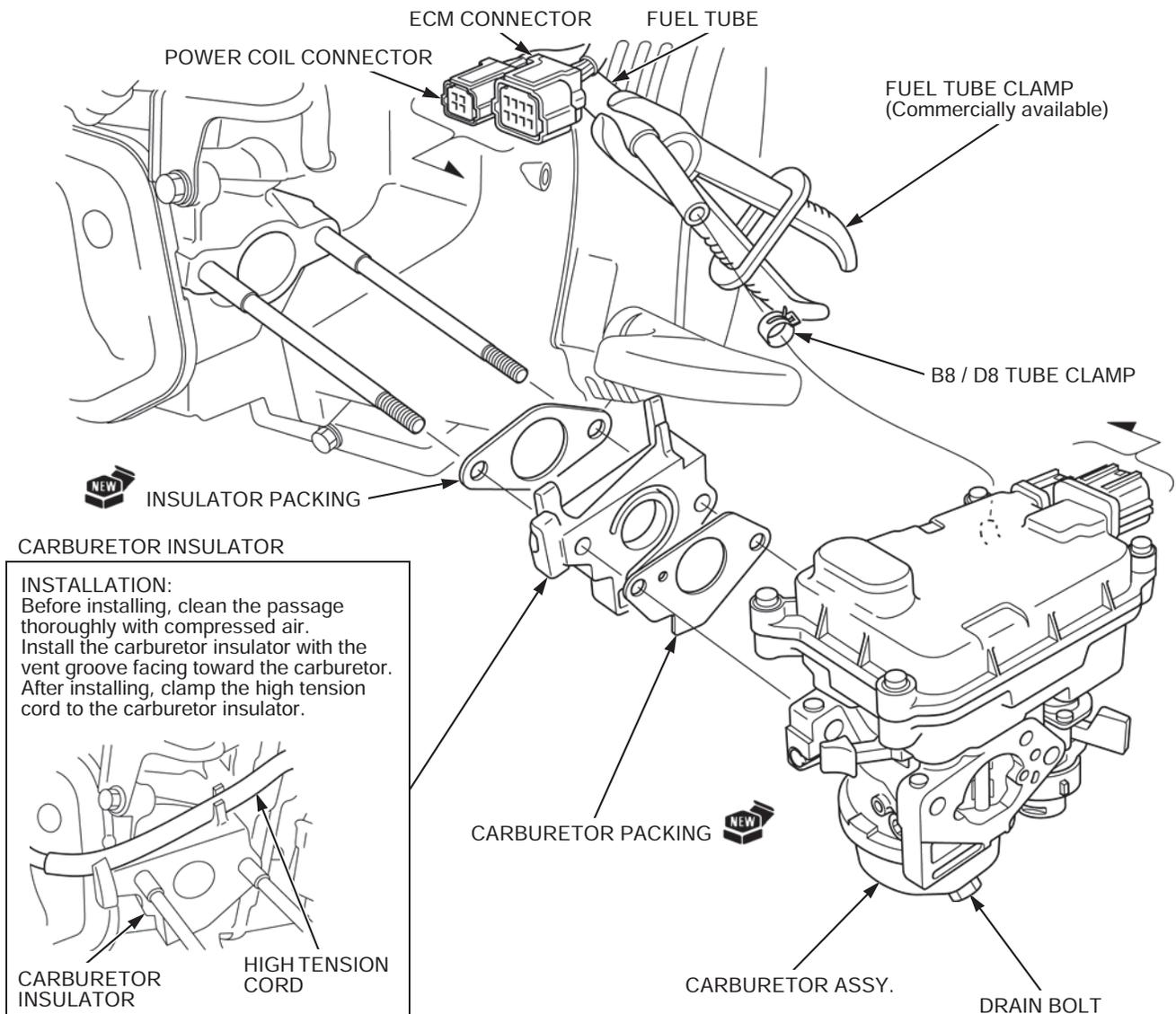
Remove the air cleaner ([page 6-5](#))\*.

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.



## FUEL SYSTEM

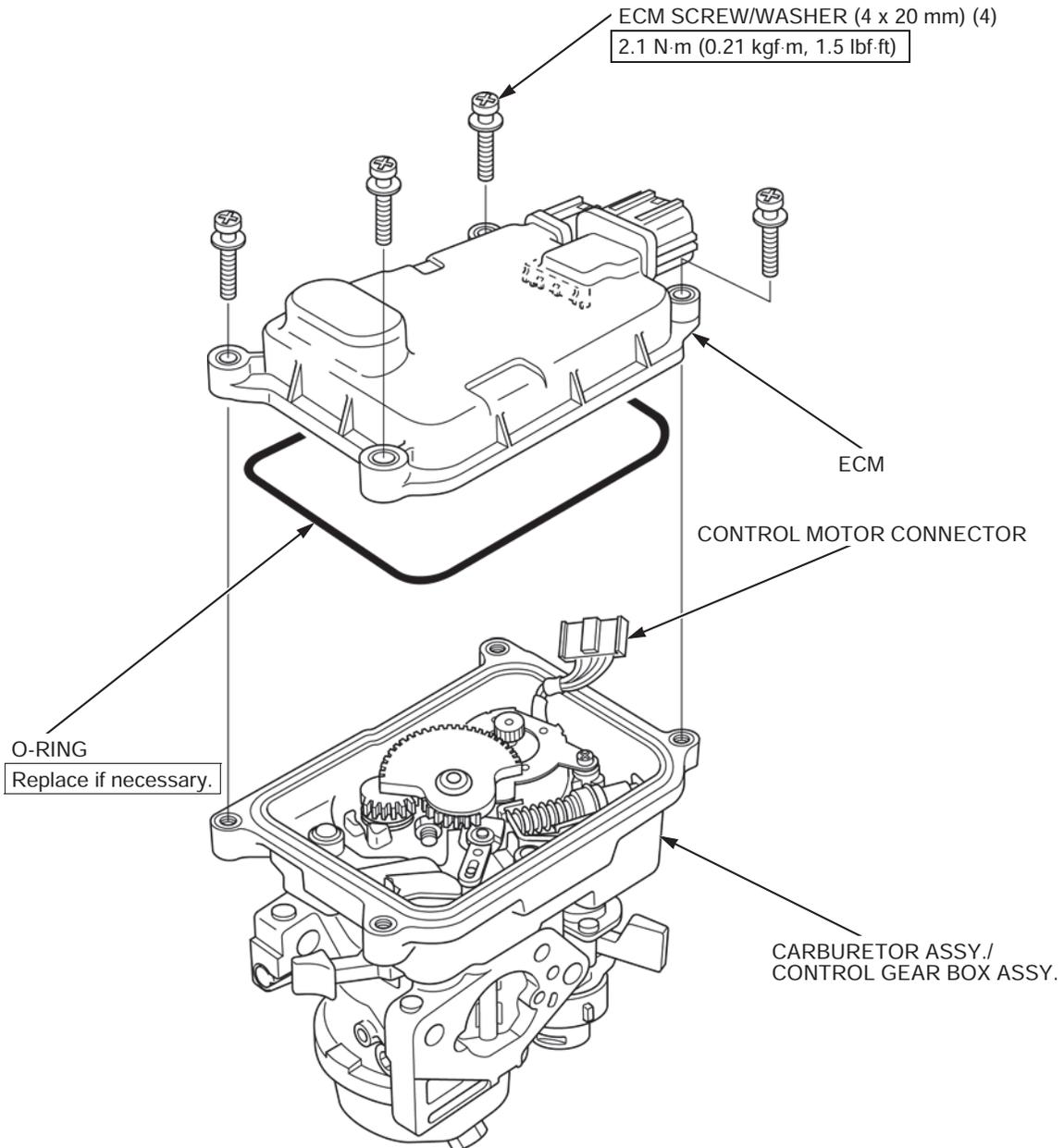
# CARBURETOR DISASSEMBLY/ ASSEMBLY

### 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.

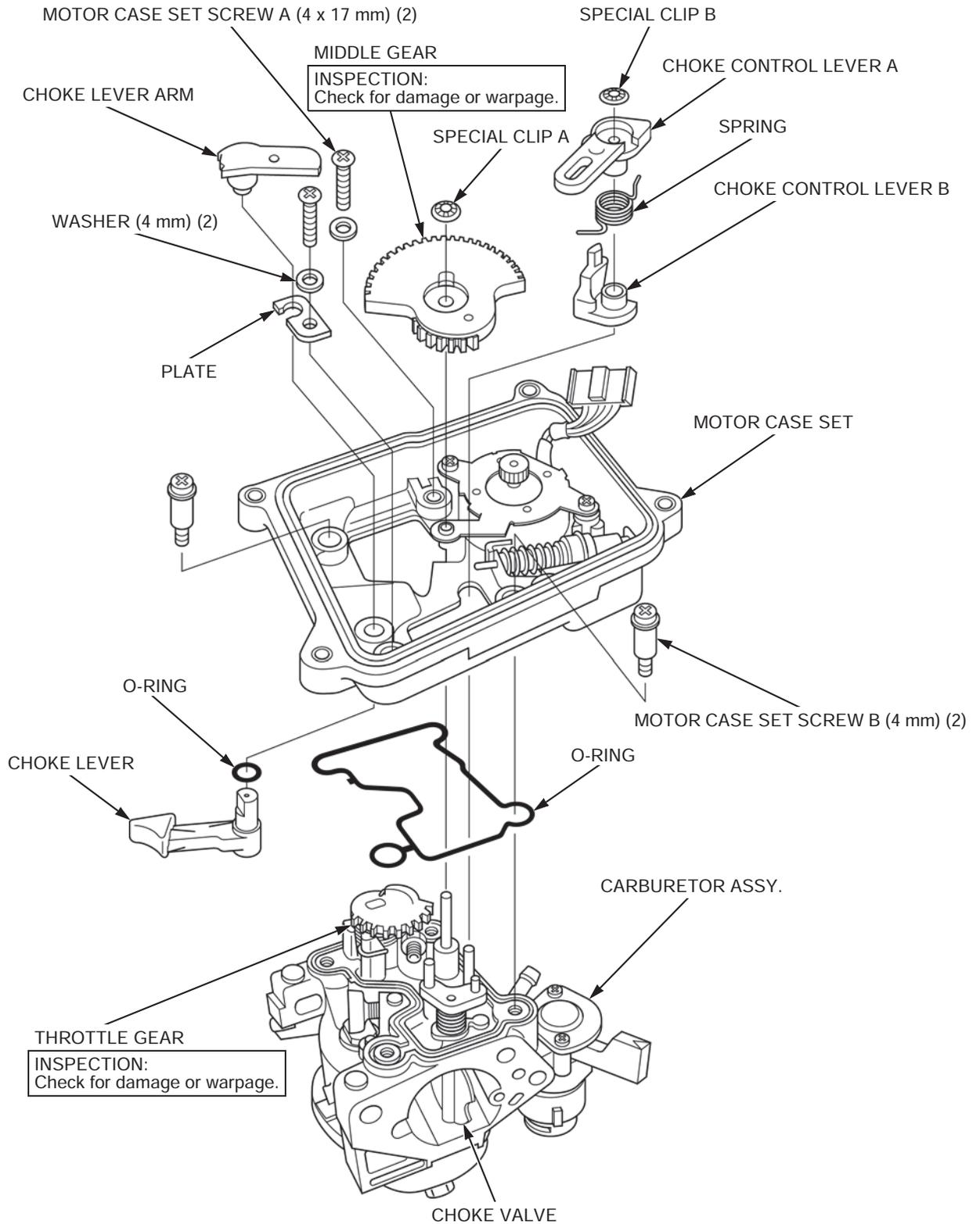


## CONTROL GEAR BOX DISASSEMBLY/ ASSEMBLY

### CONTROL GEAR BOX DISASSEMBLY

Remove the ECM ([page 6-4](#)).

When removing the motor case set, hold the choke valve fully open as shown.



## 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.

*Align the cutouts of choke lever arm and choke lever.*

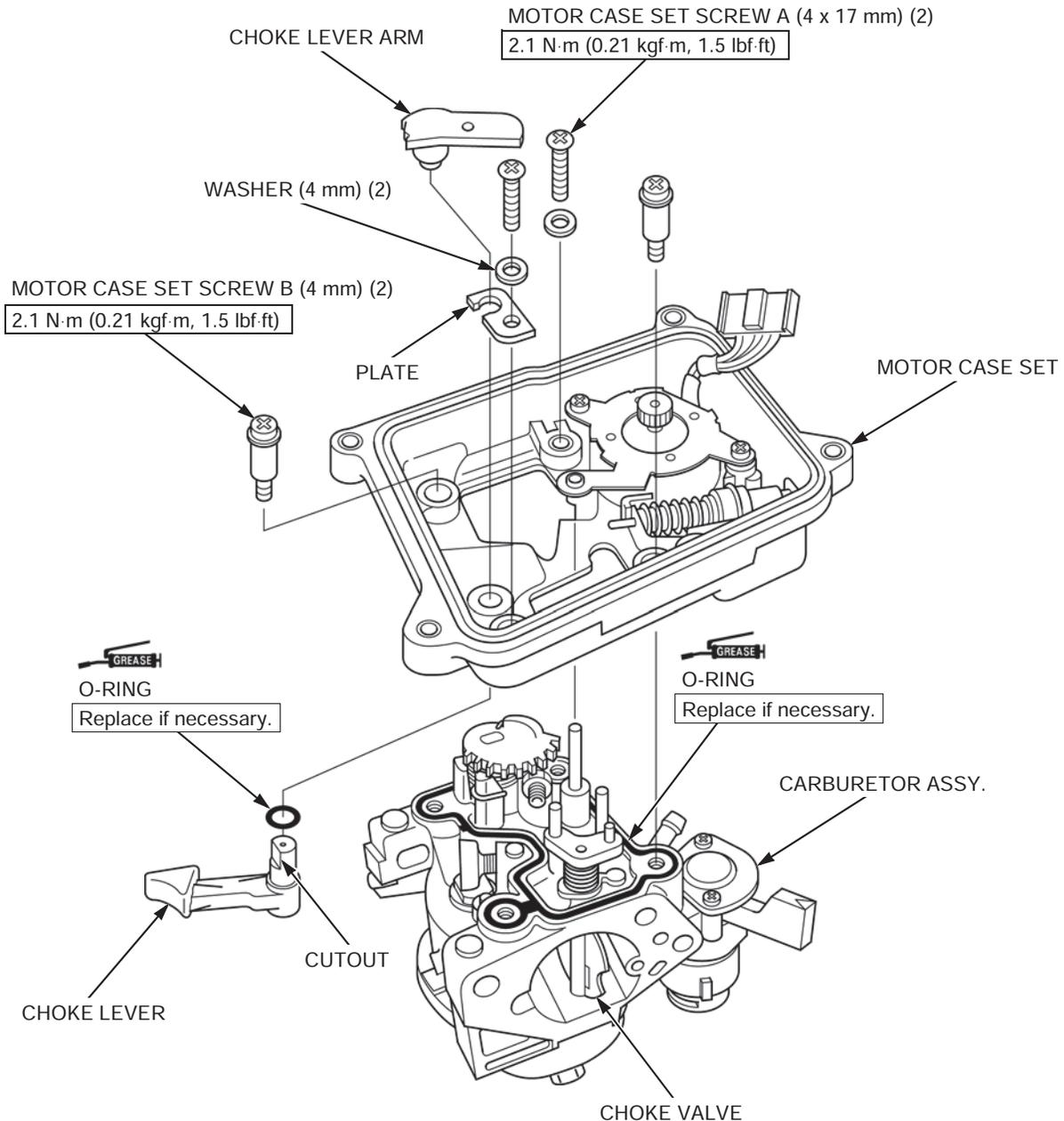
Install the plate to the choke lever arm and install the choke lever arm/plate to the choke lever.

When installing the motor case set, hold the choke valve fully open as shown.

Install the washers and motor case set screws A/B.

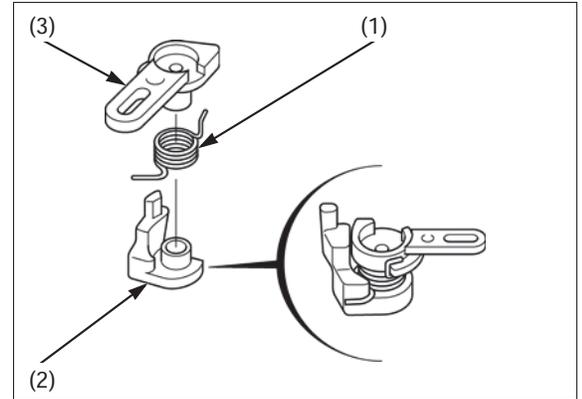
Tighten the motor case set screws A/B to the specified torque.

**TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)**

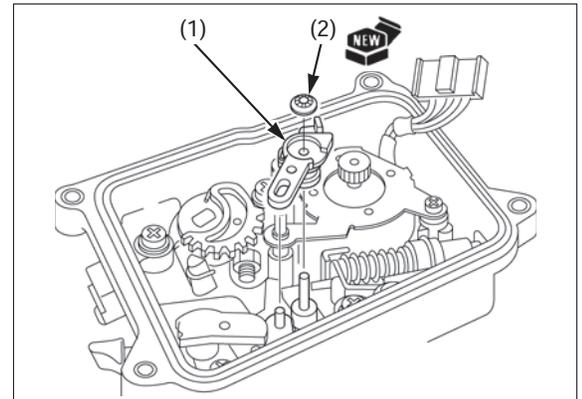


**FUEL SYSTEM**

Hook the spring (1) to the choke control lever B (2) and choke control lever A (3).

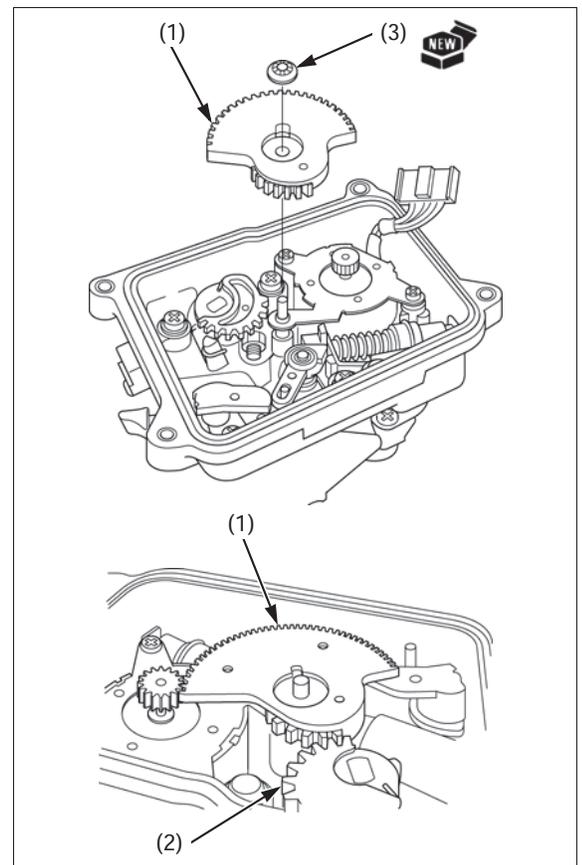


Install the choke control lever (1) and a new special clip B (2) securely.



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

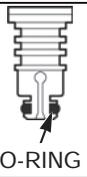
To prevent serious eye injury, always wear safety goggles or other eye protection when using compressed air.

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.



O-RING

#### PILOT SCREW

**REPLACEMENT:** (page 6-15\*)  
**PILOT SCREW OPENING:** (page 2-2)



O-RING

JET SET SCREW (5 mm)

0.3 N·m (0.03 kgf·m, 0.22 lbf·ft)

#### MAIN NOZZLE

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



UPPER SIDE

#### MAIN JET

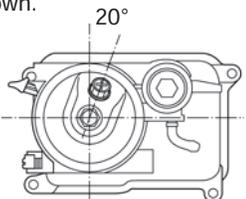
**ASSEMBLY:**  
Before installing, clean thoroughly with low-pressure compressed air.



UPPER SIDE

#### FLOAT CHAMBER

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



20°



O-RING



SET BOLT GASKET

SET BOLT

PAN SCREW (3 x 6 mm) (2)

VALVE LEVER SPRING

LEVER SETTING PLATE

FUEL VALVE LEVER

FUEL VALVE PACKING

CUP FILTER

**REMOVAL/INSTALLATION:**  
(page 3-8)\*

LIMITER CAP

SPRING

FLOAT VALVE

FLOAT VALVE SPRING

O-RING



FLOAT

FLOAT PIN

SEDIMENT CUP

DRAIN BOLT GASKET



SET BOLT

DRAIN BOLT

## CHOKE SET REPLACEMENT

Remove the control gear box ([page 6-5](#)).

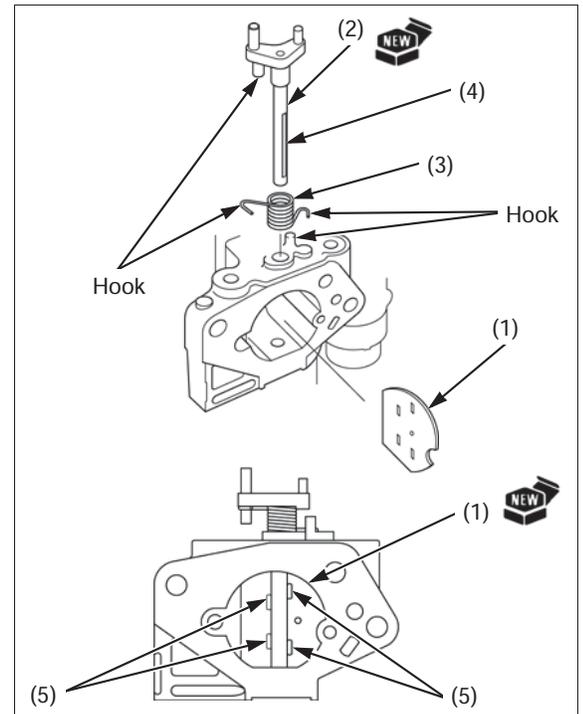
Hold the choke valve fully open and pull out the choke valve plate (1).

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

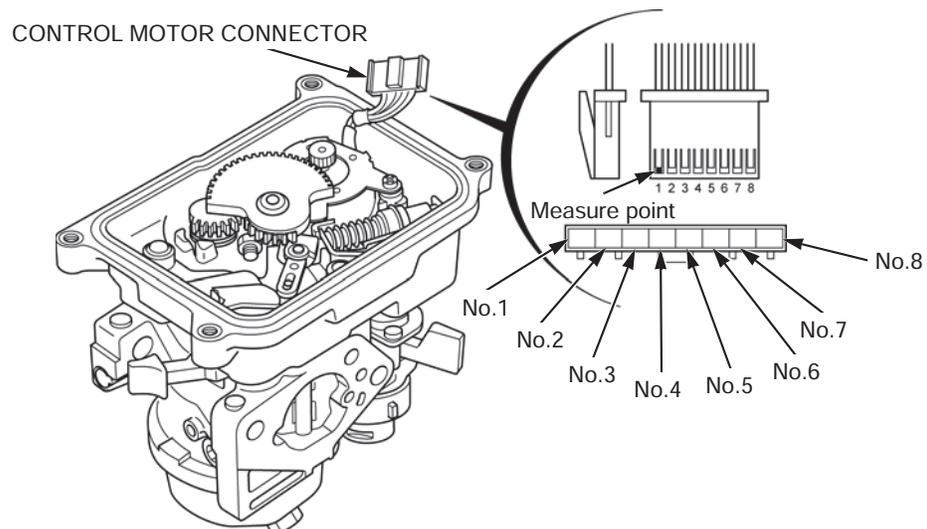
Remove the ECM ([page 6-4](#)).

Measure the resistance between the control motor connector terminals.

Unit:  $\Omega$

	No.5 (R)	No.6 (G)	No.8 (Bu)
No.1 (Y)	52 – 90	–	–
No.2 (O)	52 – 90	–	–
No.3 (Br)	–	52 – 90	–
No.4 (Bl)	–	52 – 90	–
No.7 (W)	–	–	36 – 98

If the measured resistance is out of the specification, replace the motor case set ([page 6-5](#)).



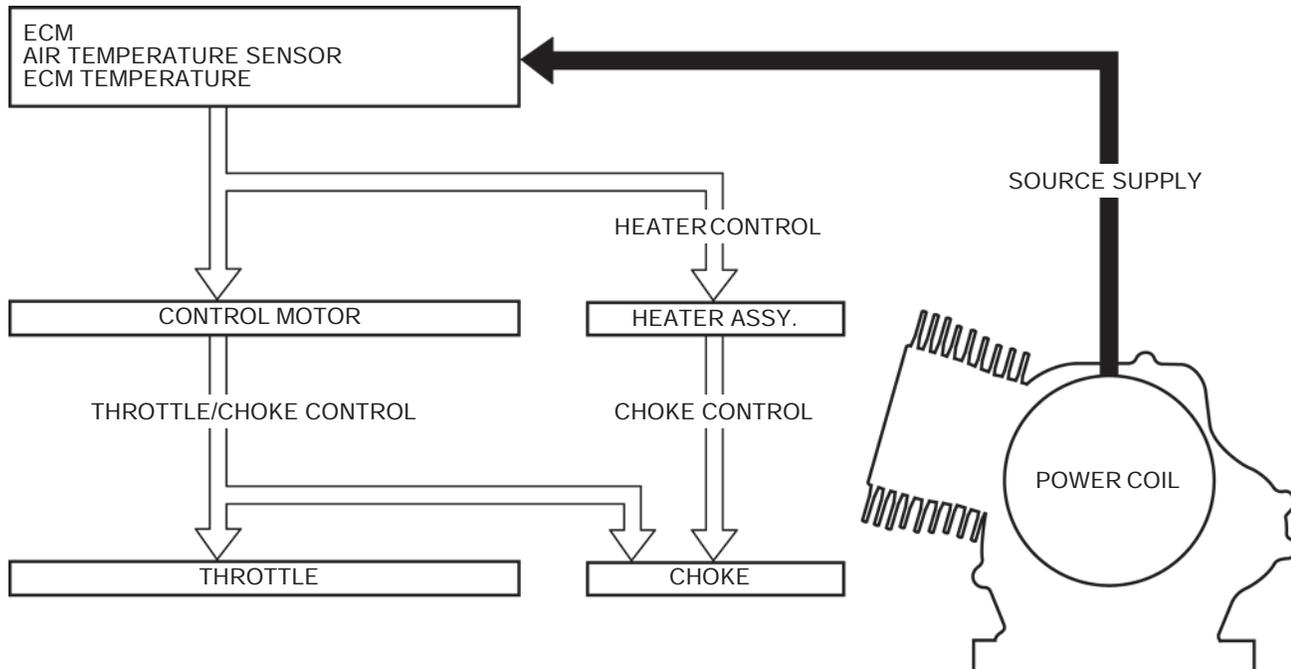
## FUEL SYSTEM

# 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**

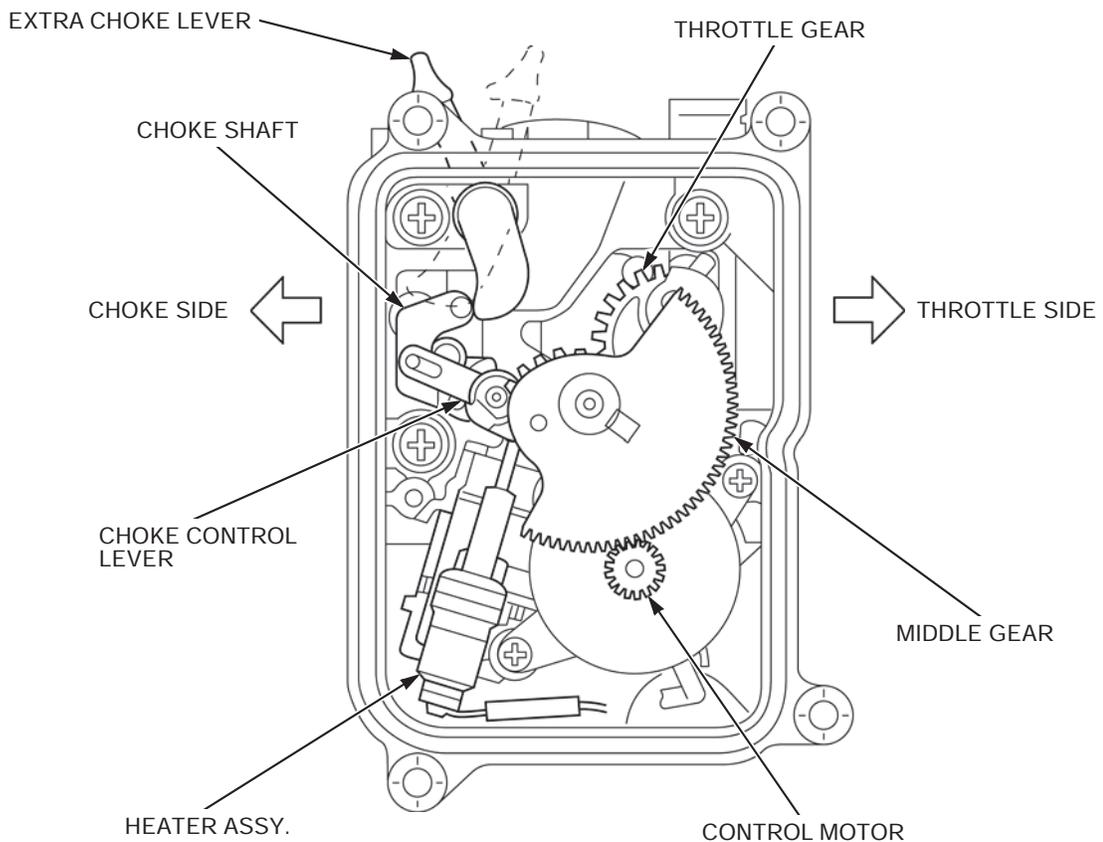
- Transmits the driving power to the throttle gear.
- Adjusts the driving power from the choke control lever to the choke lever with its cam.

**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.

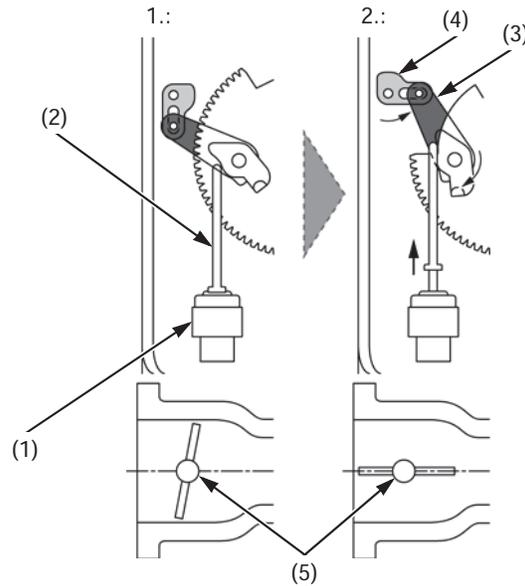


## FUEL SYSTEM

### FUNCTION

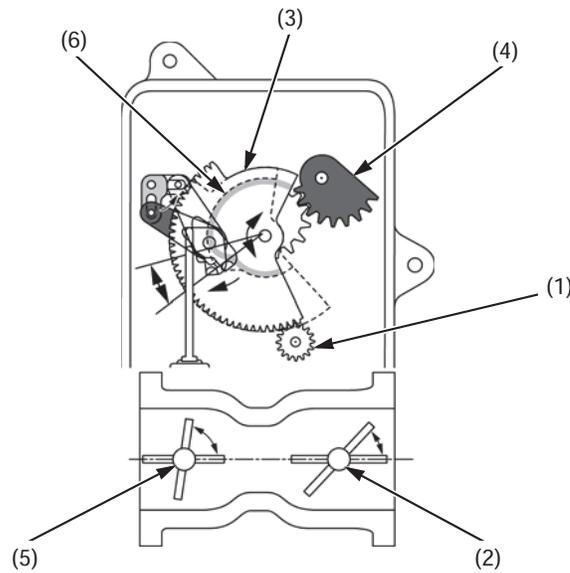
#### When starting:

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.



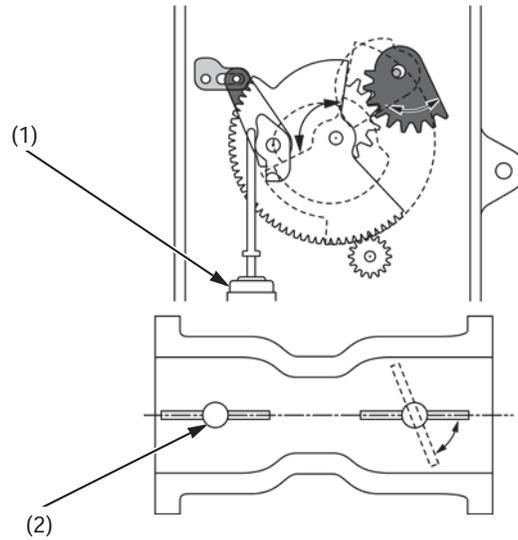
#### After starting – Engine warming up:

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  $3,600 \text{ min}^{-1}$  (rpm) since the choke valve (5) opening is restricted with the choke control cam (6) on the middle gear.

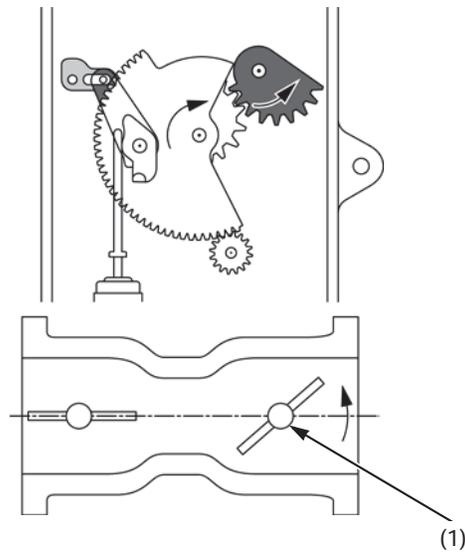


**Engine warming up – Normal running:**

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.



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# MEMO

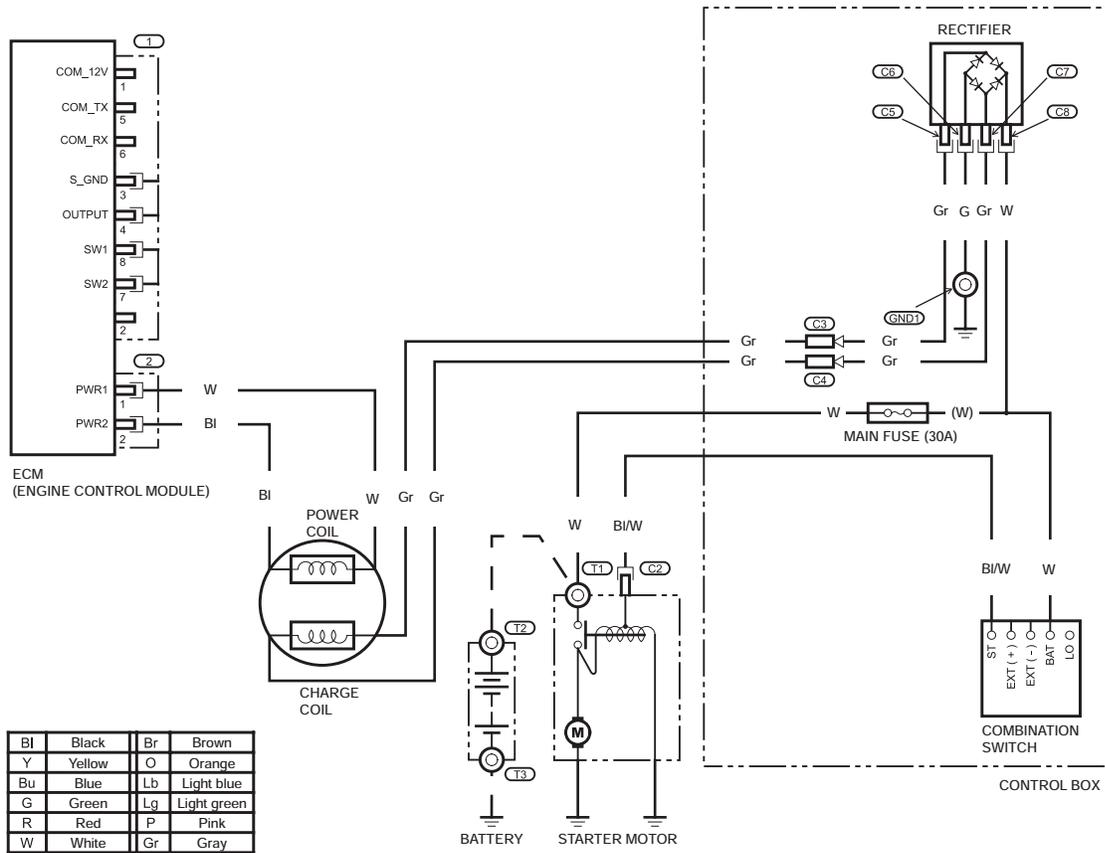
# 8. CHARGING SYSTEM

---

SYSTEM DIAGRAM .....	8-2	CHARGE / POWER COIL REMOVAL/ INSTALLATION .....	8-4
BEFORE TROUBLESHOOTING.....	8-2	CHARGE/POWER COIL INSPECTION .....	8-5
CHARGING SYSTEM TROUBLESHOOTING.....	8-3		

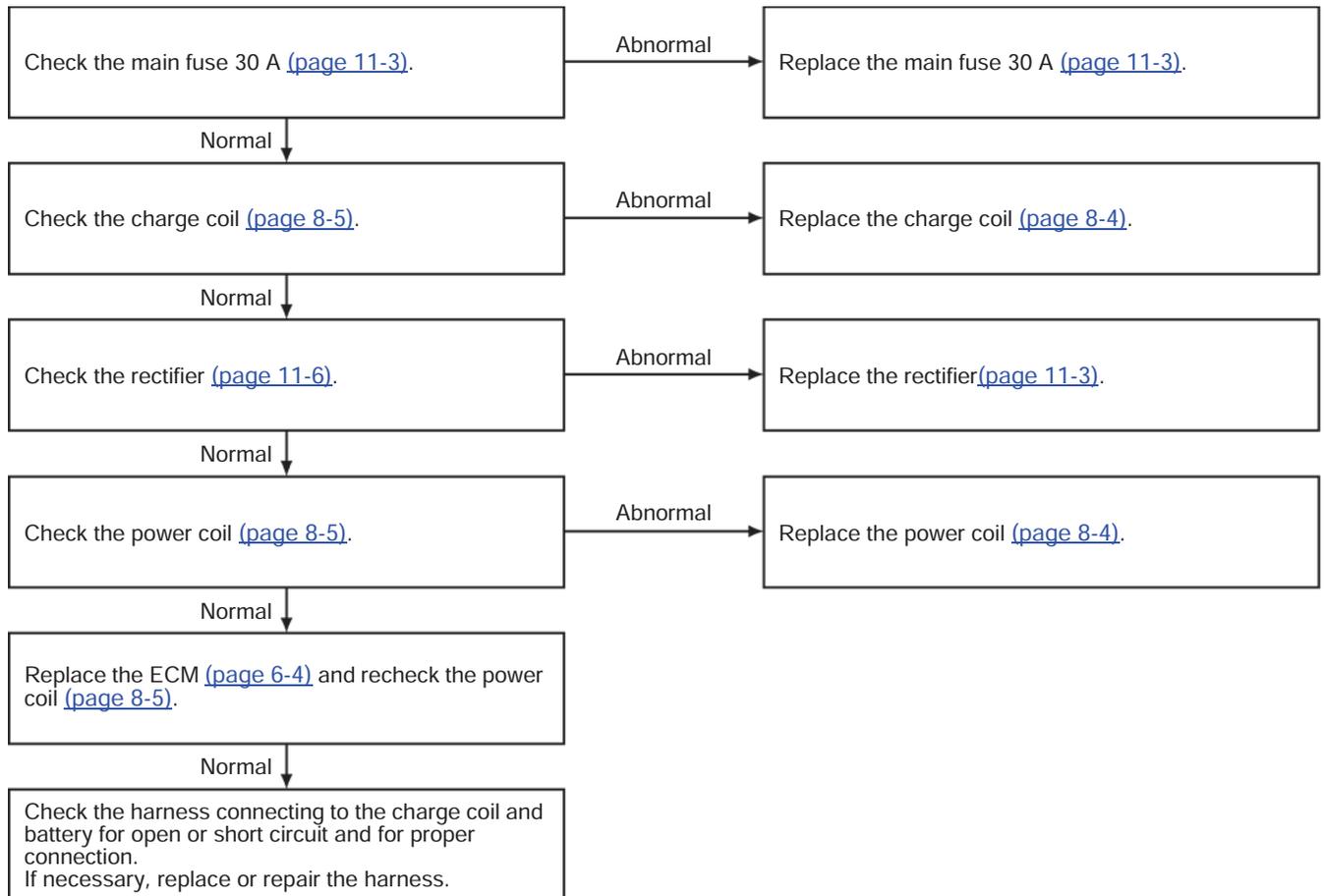
## CHARGING SYSTEM

# SYSTEM DIAGRAM



## 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**

## CHARGING SYSTEM

# CHARGE / POWER COIL REMOVAL/ INSTALLATION

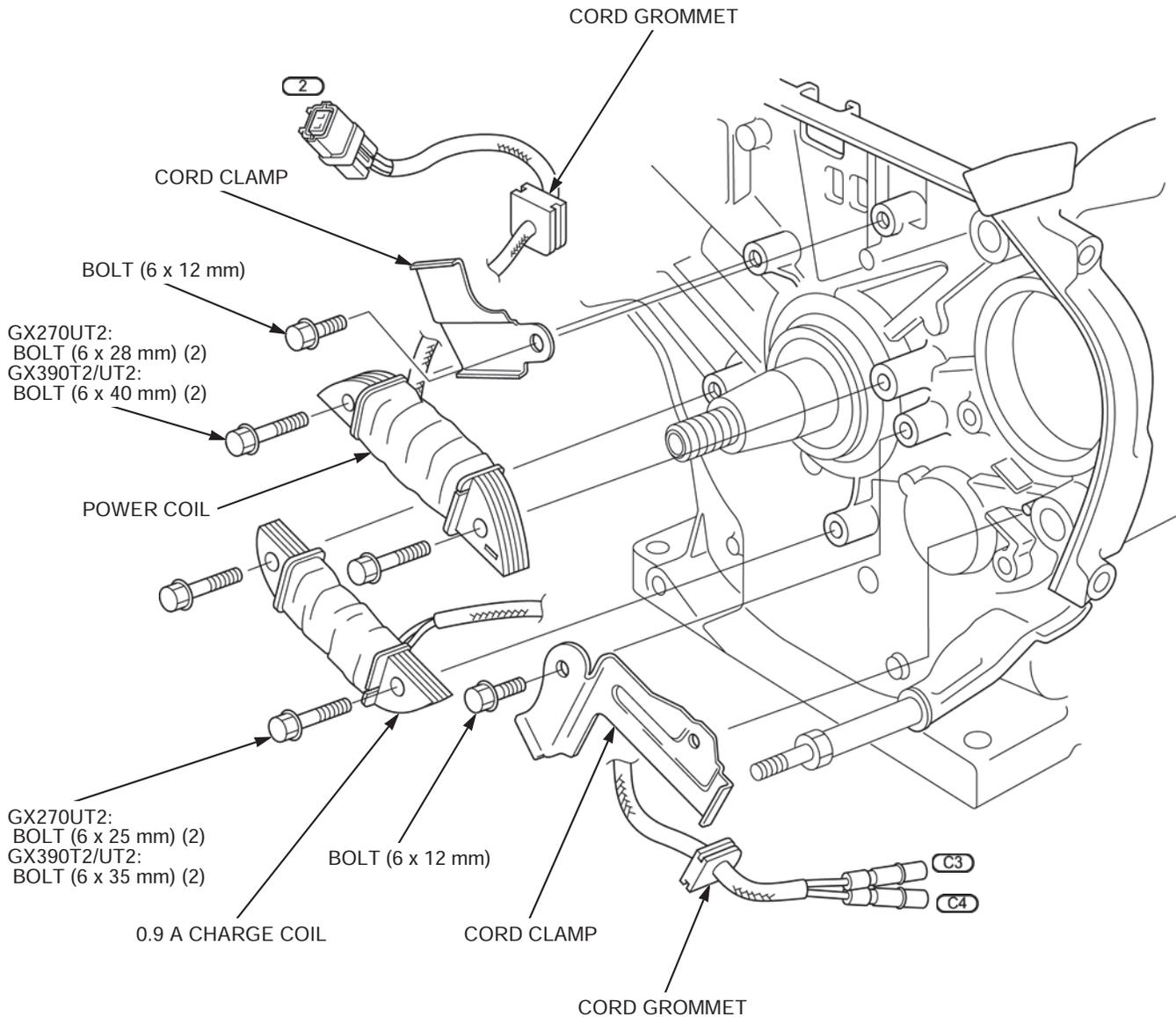
(\*) Refer to page of base shop manual (GX240/GX270/GX340GX390UT2, part number 61Z5F00E3).

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](#)).



## 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.

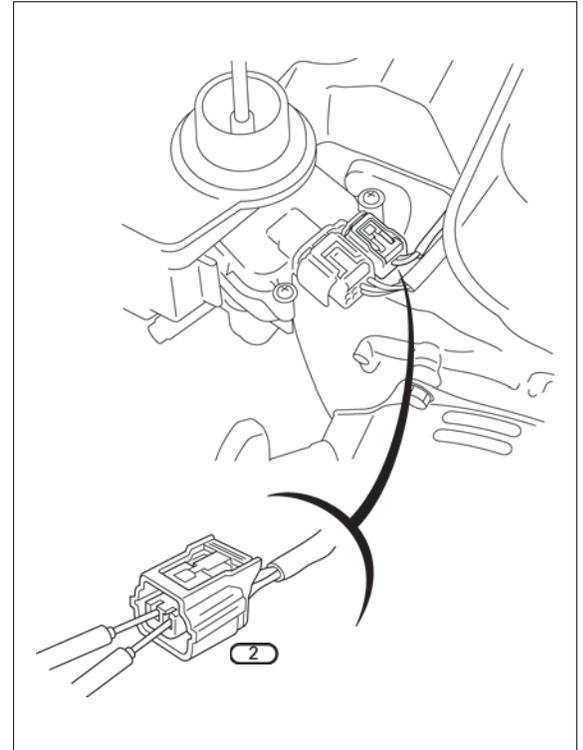
Check for continuity between the terminals of power coil connector. (Engine wire harness side)

**Resistance: 2.9 – 4.5  $\Omega$**

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](#)).

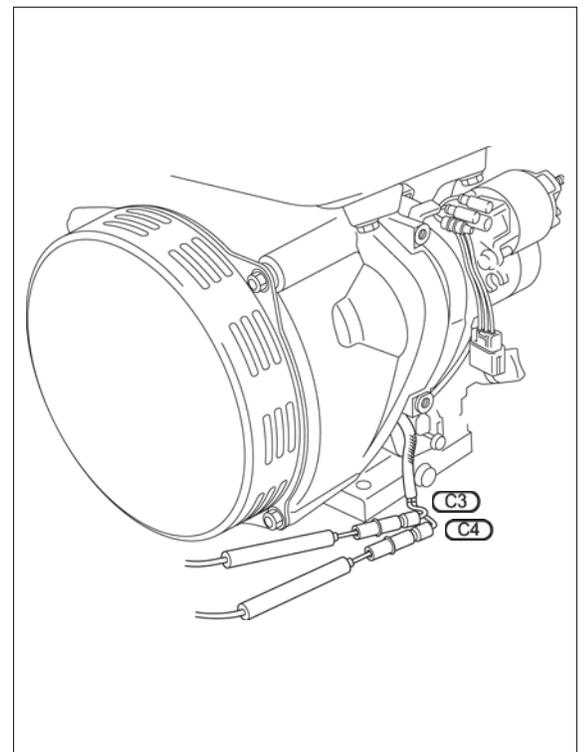
Measure the resistance between the terminals of the charge coil.

**Resistance: 5.1 – 7.7  $\Omega$**

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.



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# MEMO

# 9. IGNITION SYSTEM

---

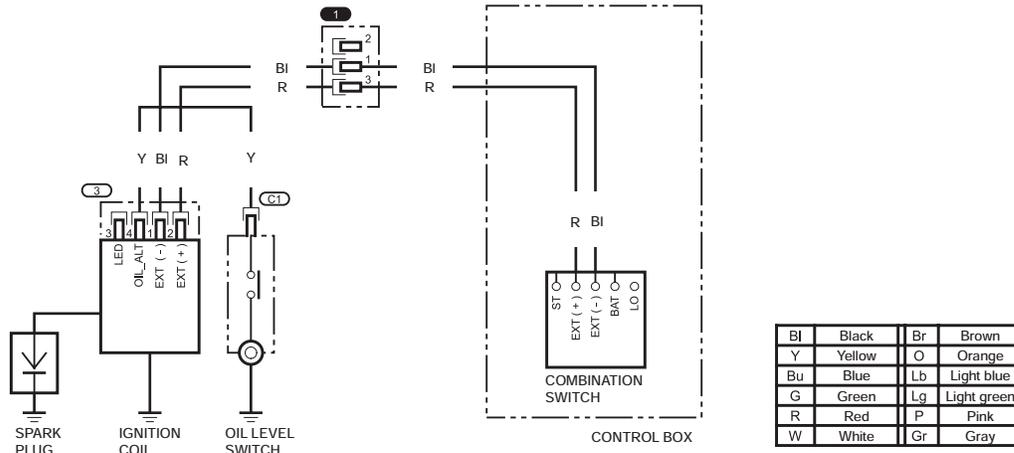
SYSTEM DIAGRAM .....9-2

IGNITION SYSTEM  
TROUBLESHOOTING.....9-2

IGNITION COIL REMOVAL/  
INSTALLATION ..... 9-3

# IGNITION SYSTEM

## SYSTEM DIAGRAM

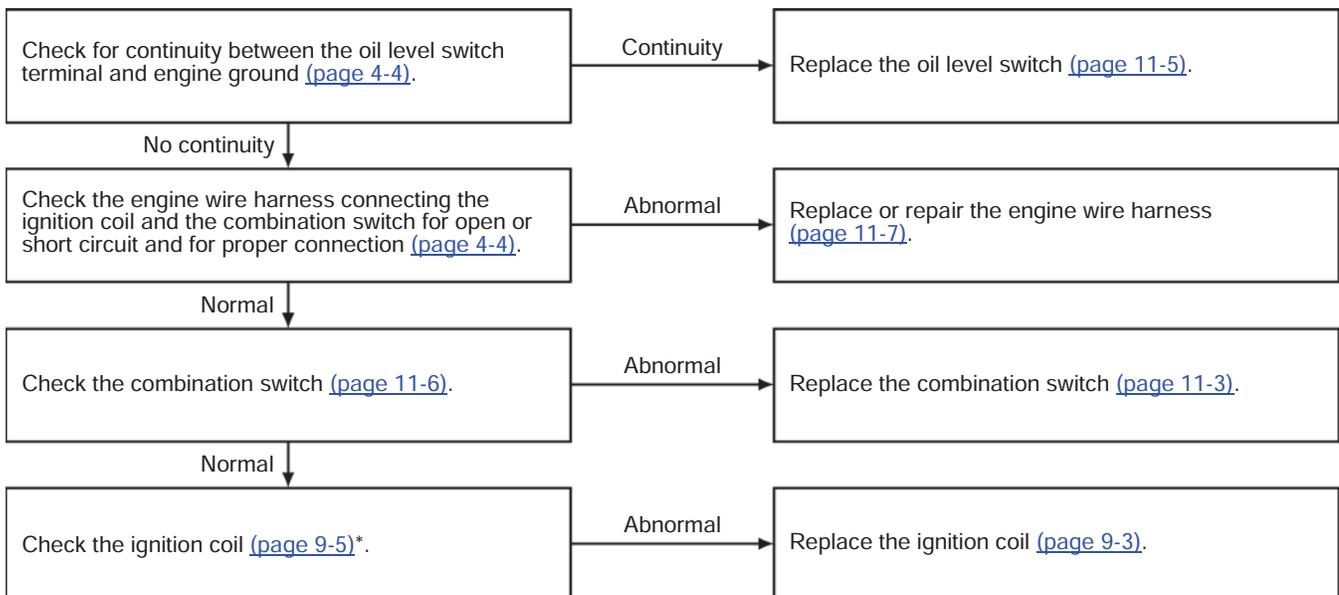


## IGNITION SYSTEM TROUBLESHOOTING

### 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.

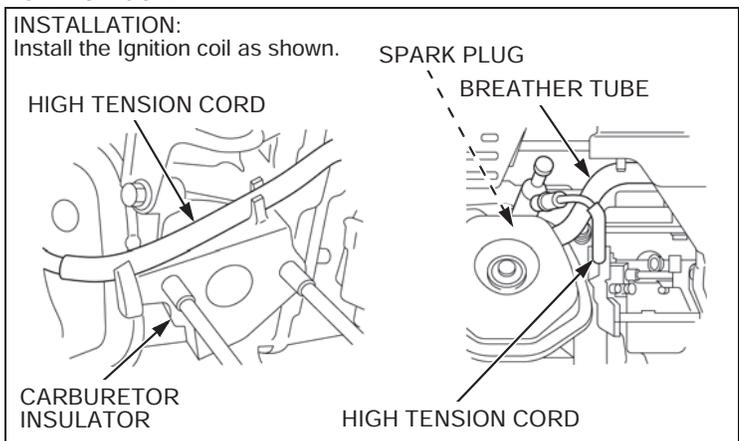
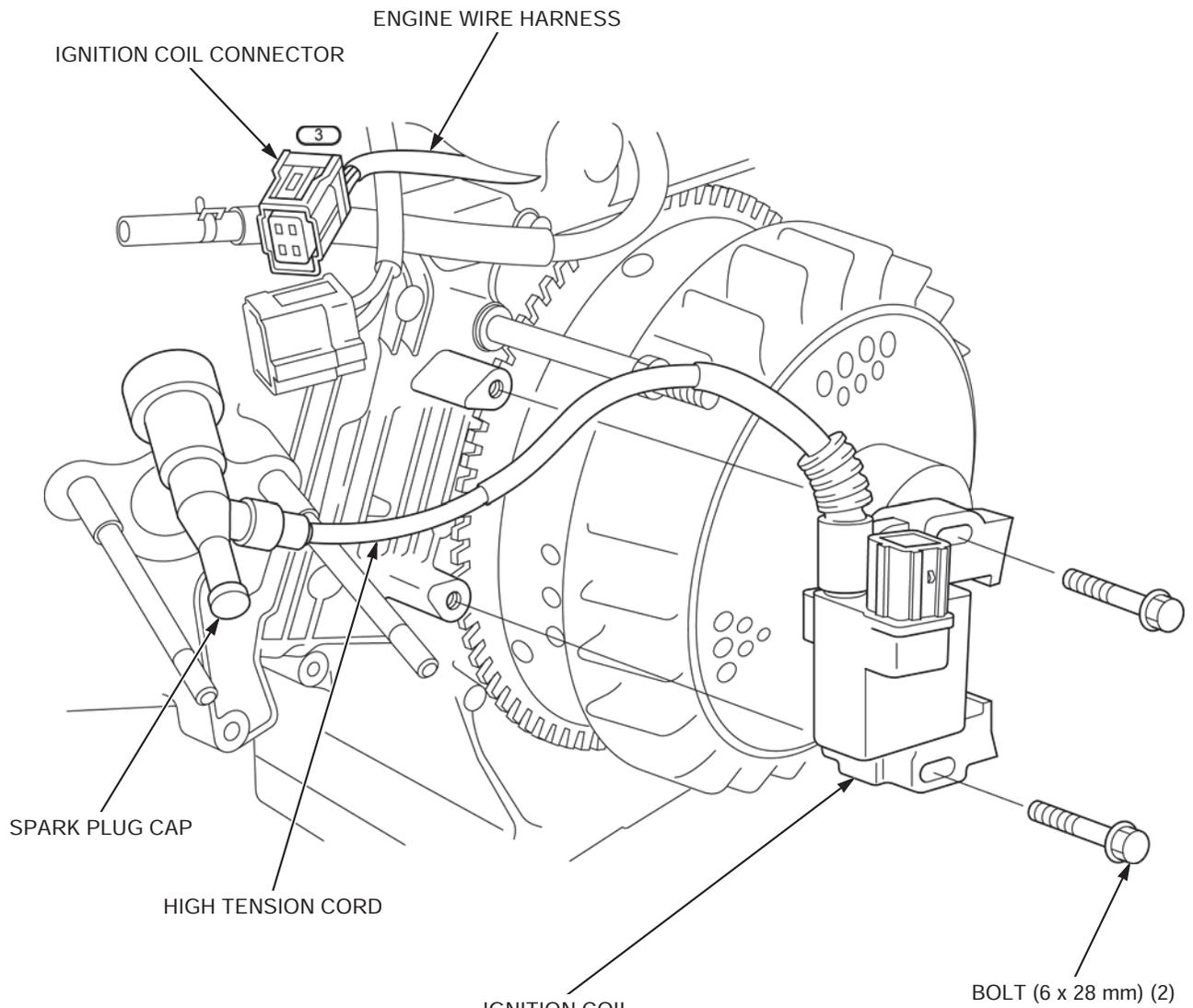


# IGNITION COIL REMOVAL/ INSTALLATION

(\*) 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](#))\*.



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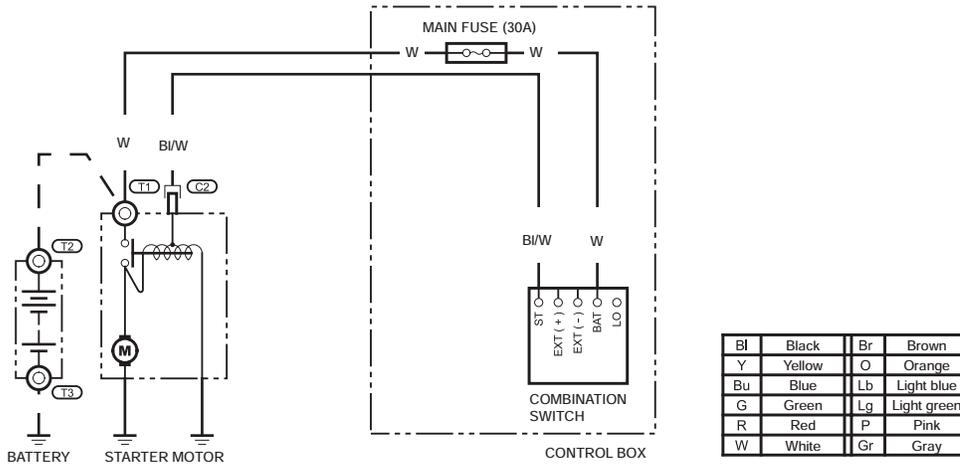
# MEMO

# 10. STARTING SYSTEM

---

SYSTEM DIAGRAM .....	10-2	RECOIL STARTER INSPECTION .....	10-7
STARTING SYSTEM TROUBLESHOOTING.....	10-2	STARTER MOTOR REMOVAL/ INSTALLATION .....	10-8
RECOIL STARTER REMOVAL/ INSTALLATION.....	10-3	STARTER MOTOR DISASSEMBLY/ ASSEMBLY .....	10-9
RECOIL STARTER DISASSEMBLY.....	10-4	INSPECTION.....	10-10
RECOIL STARTER ASSEMBLY.....	10-5	BRUSH REPLACEMENT.....	10-13

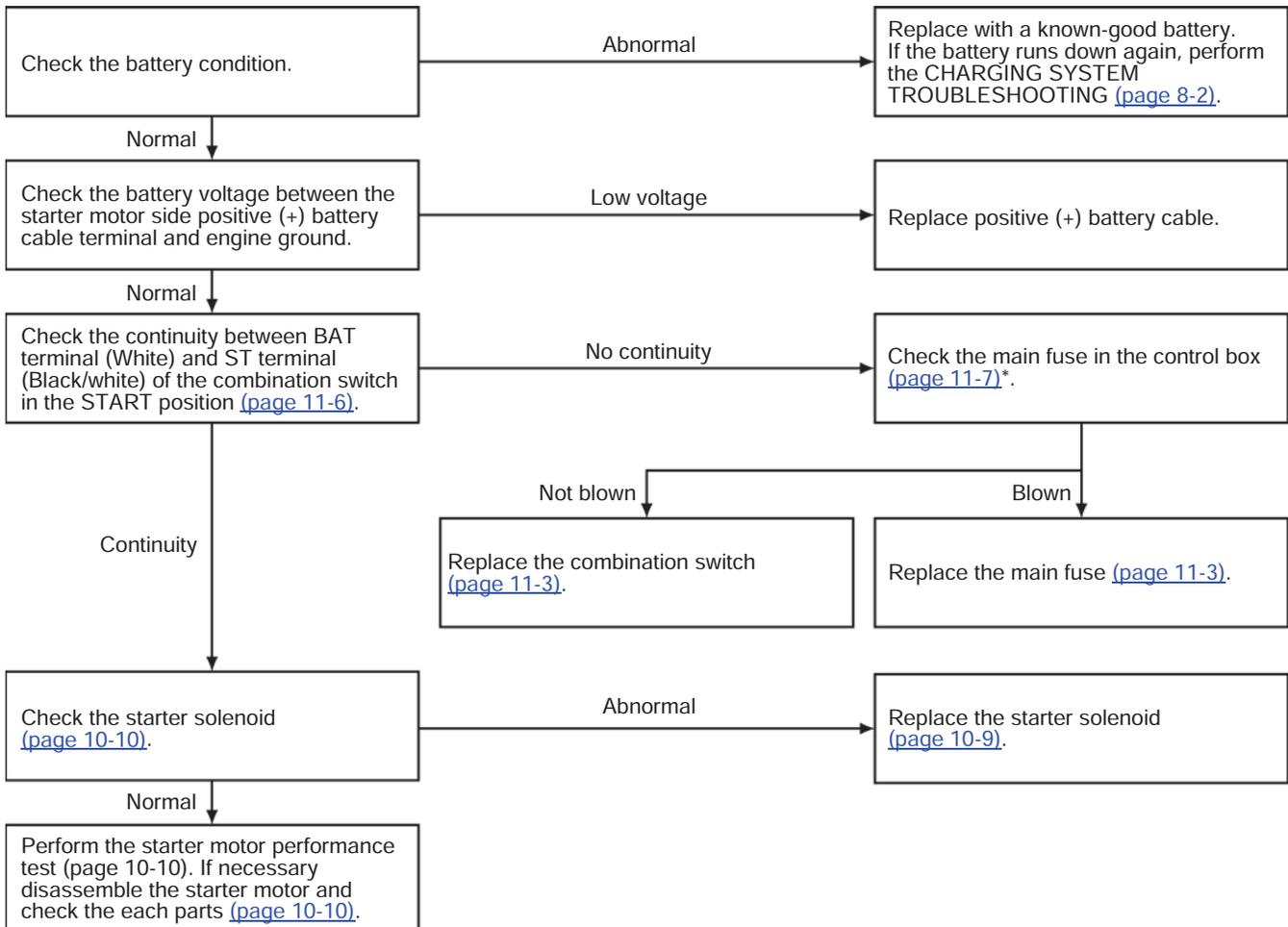
# STARTING SYSTEM SYSTEM DIAGRAM



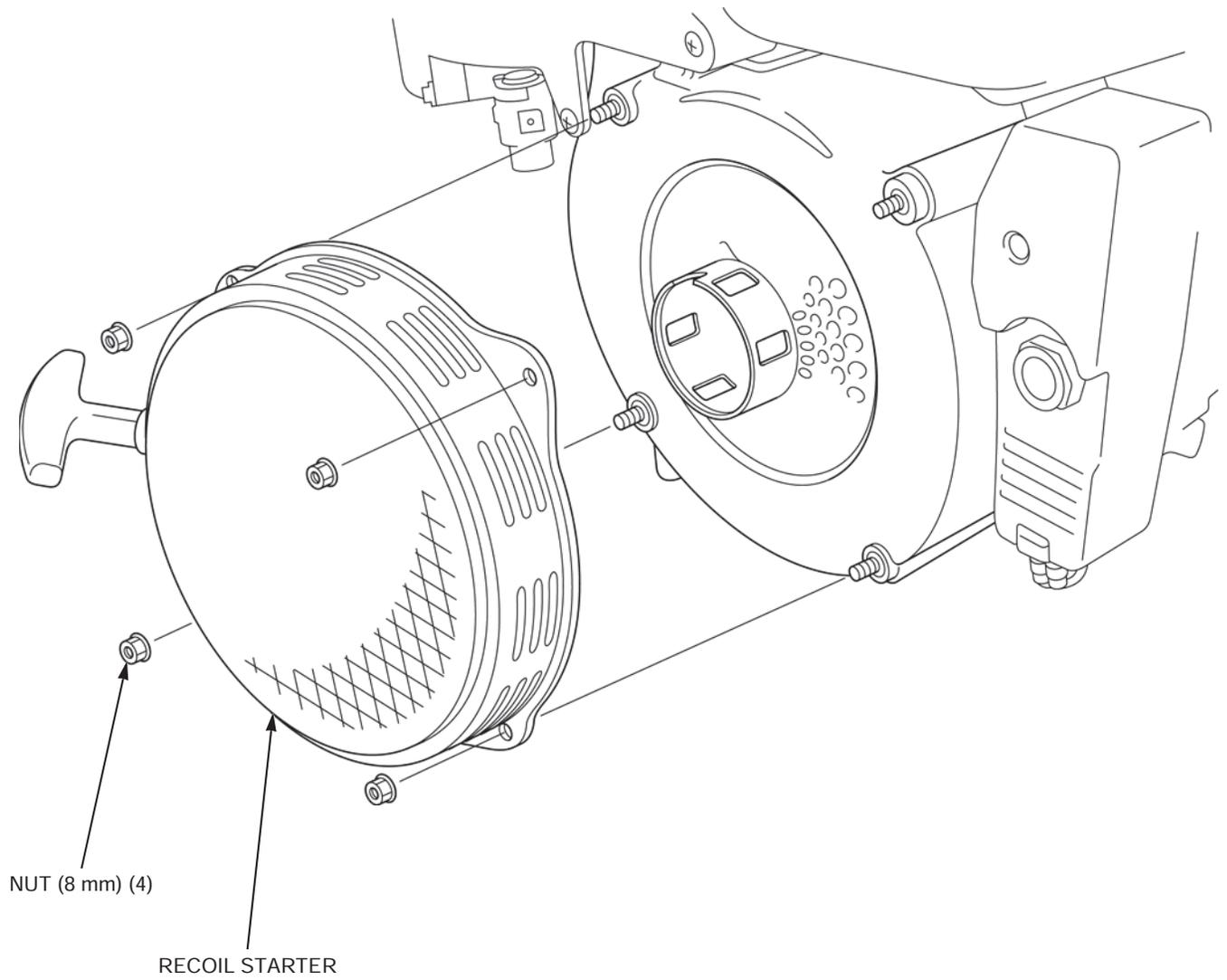
## STARTING SYSTEM TROUBLESHOOTING

(\*) Refer to page of base shop manual (GX240/GX270/GX340/GX390UT2, P/N 61Z5F00E3)

### STARTER MOTOR DOES NOT OPERATE



# RECOIL STARTER REMOVAL/ INSTALLATION



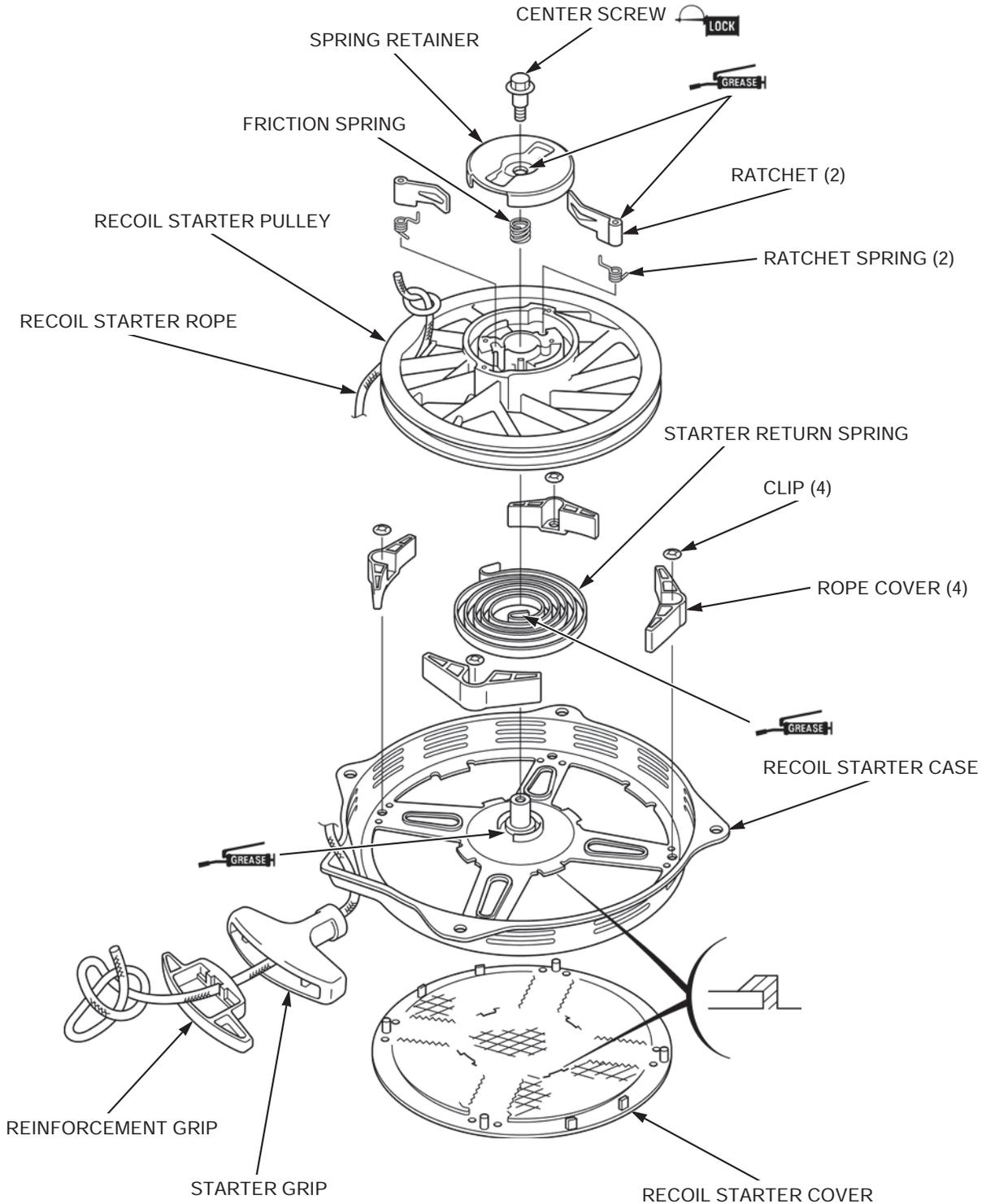
## STARTING SYSTEM

# 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](#)).



## RECOIL STARTER ASSEMBLY

### ⚠ CAUTION

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

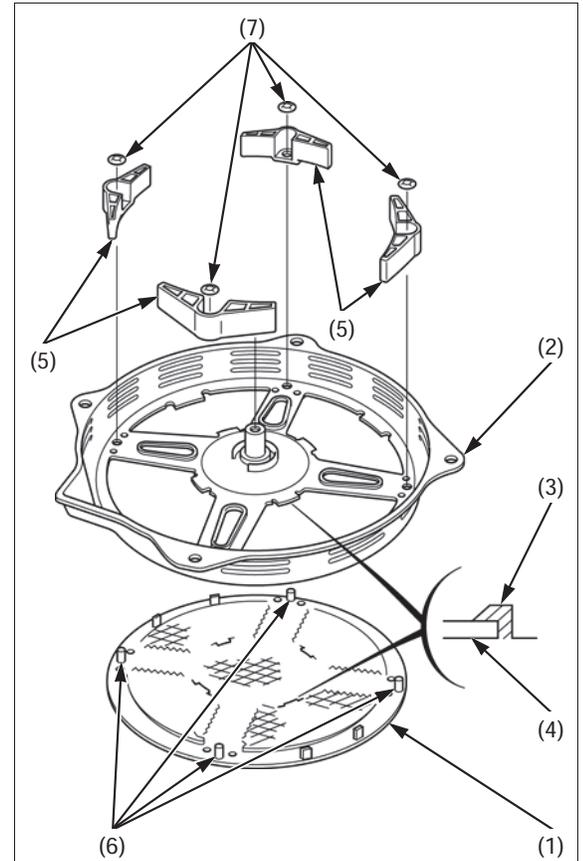
Install the recoil starter cover (1) to the recoil starter case (2).

- 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.

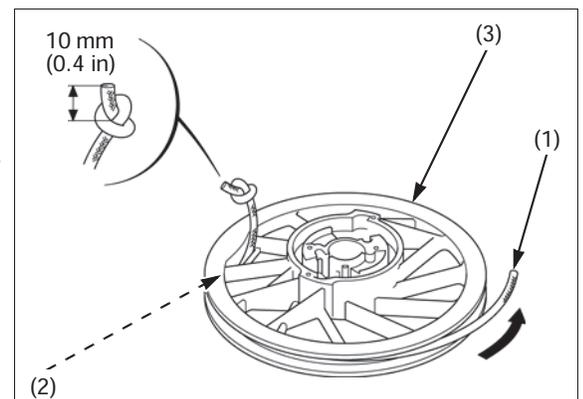


Pass the recoil starter rope (1) through the hole (2) of the recoil starter pulley (3), and then tie the rope as shown.

### NOTICE

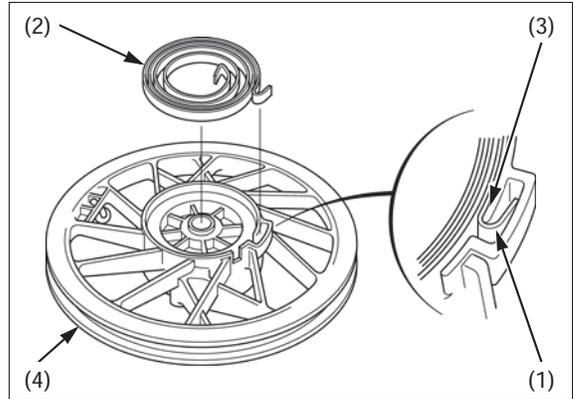
*Before installing the recoil starter rope, check for fray or wear.*

Wind the recoil starter rope onto the recoil starter pulley counterclockwise.



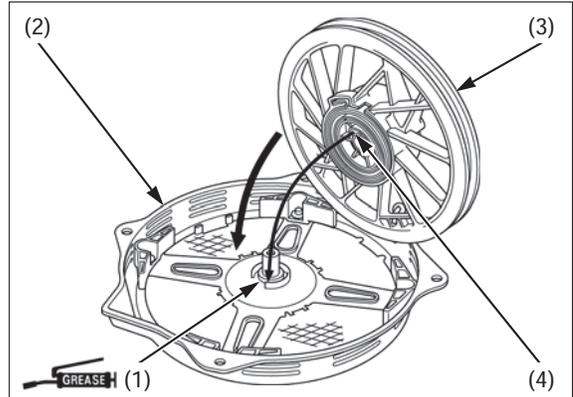
## STARTING SYSTEM

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.



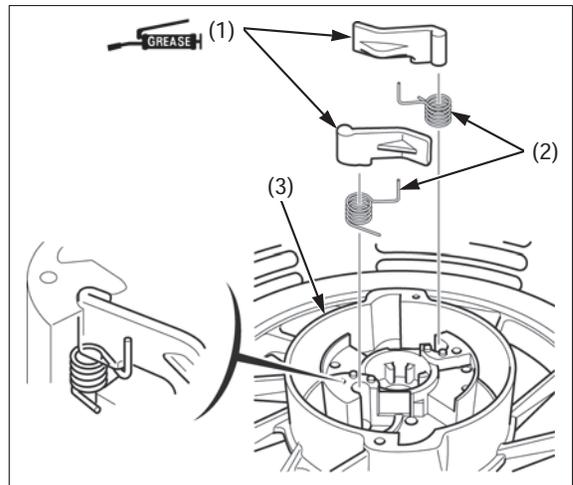
Apply grease to the cutout (1) of the recoil starter case (2).

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.

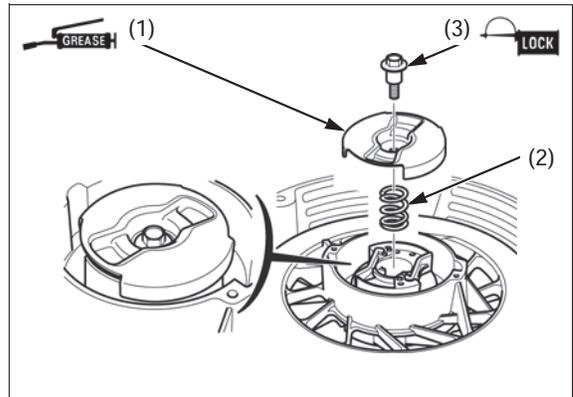


Apply grease to the inside of the spring retainer (1).

Set the friction spring (2) and the spring retainer to the recoil starter pulley in the direction as shown.

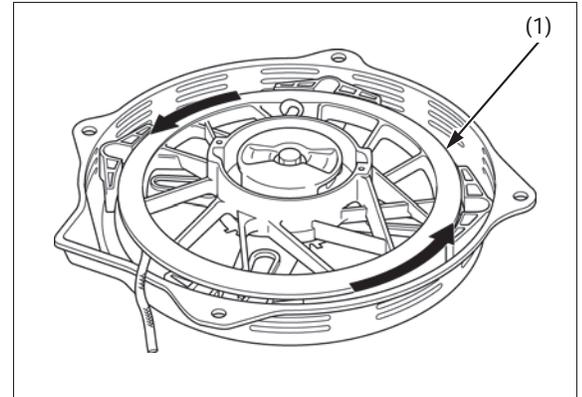
Apply locking agent (Hondalock 1, Threebond® 2430, or equivalent) to the threads of the center screw (3).

Hold the spring retainer and tighten the center screw securely.



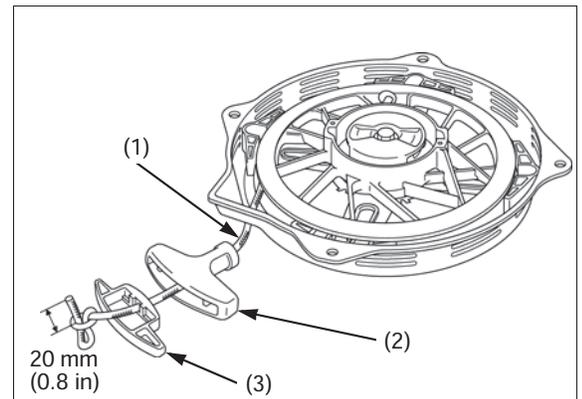
## STARTING SYSTEM

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](#)).

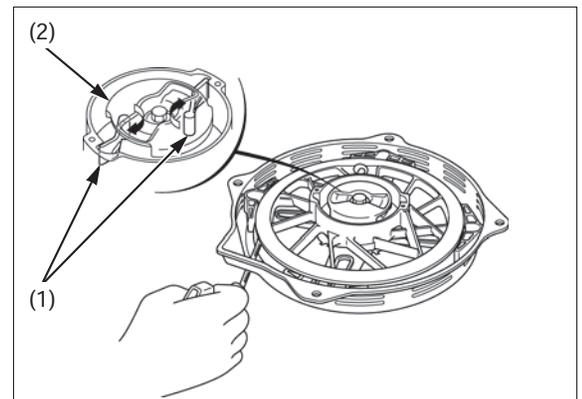


## RECOIL STARTER INSPECTION

### RECOIL STARTER OPERATION

Remove the recoil starter ([page 10-3](#)).

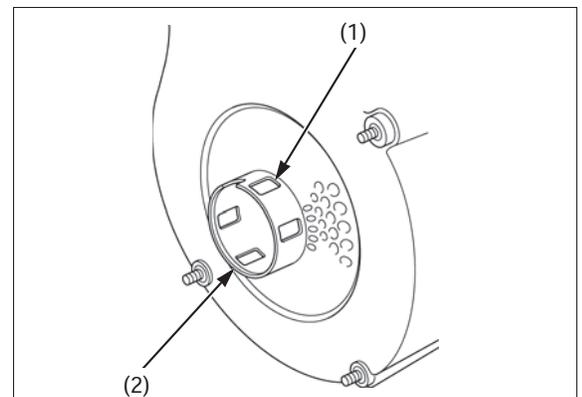
Pull the starter grip several times to inspect that the ratchets (1) are operated properly (the ratchet ends come out from the spring retainer (2)).



### STARTER PULLEY

Remove the recoil starter ([page 10-3](#)).

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



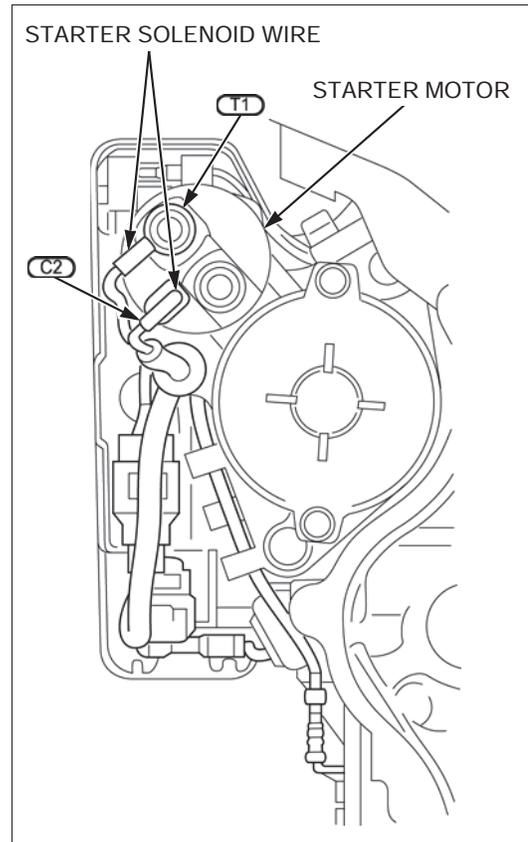
## STARTING SYSTEM

# STARTER MOTOR REMOVAL/ INSTALLATION

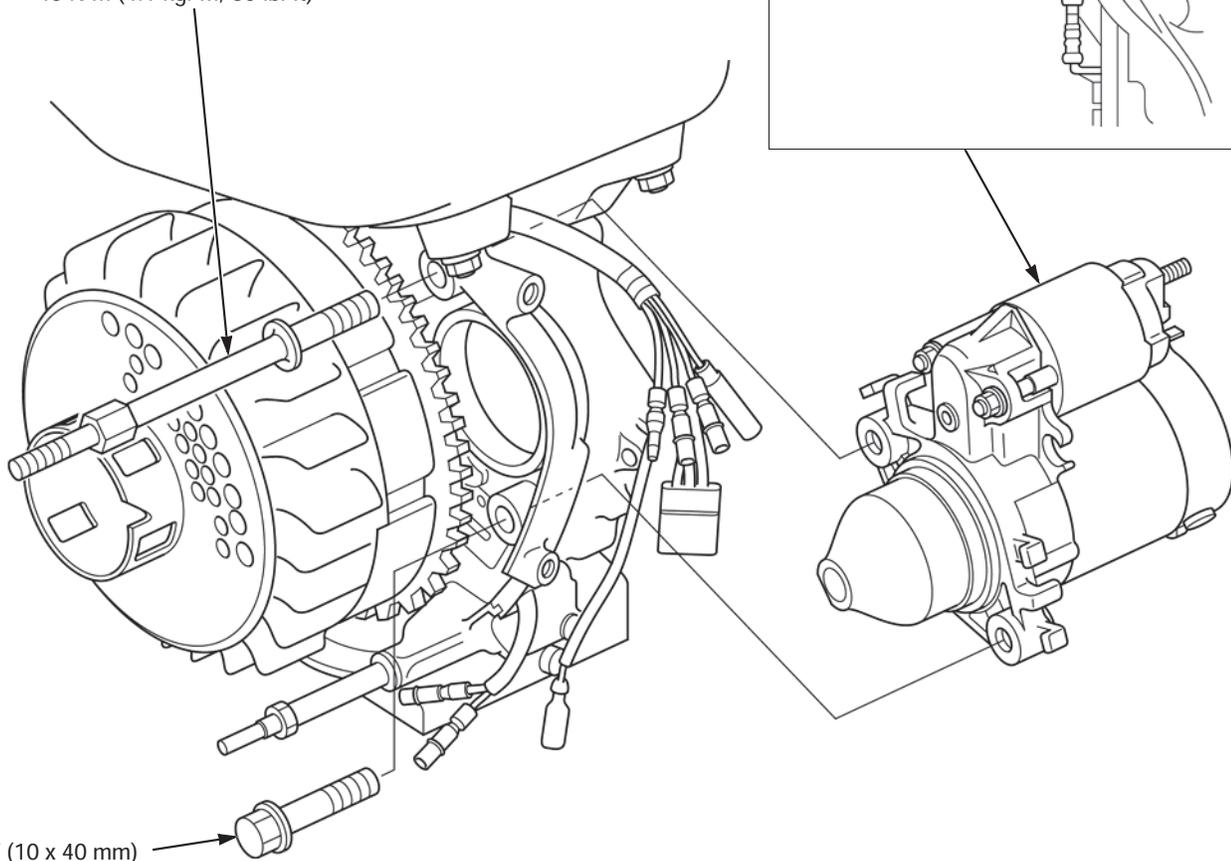
Disconnect the starter solenoid wires from the starter motor.

Remove the fan cover ([page 5-2](#)).

STARTER MOTOR



STARTER MOTOR STUD BOLT (10 mm)  
40 N·m (4.1 kgf·m, 30 lbf·ft)

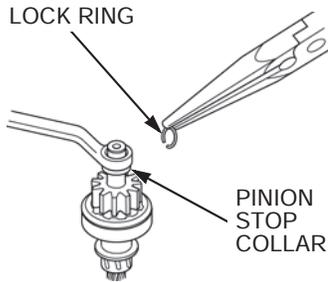


# STARTER MOTOR DISASSEMBLY/ ASSEMBLY

Remove the starter motor ([page 10-8](#)).

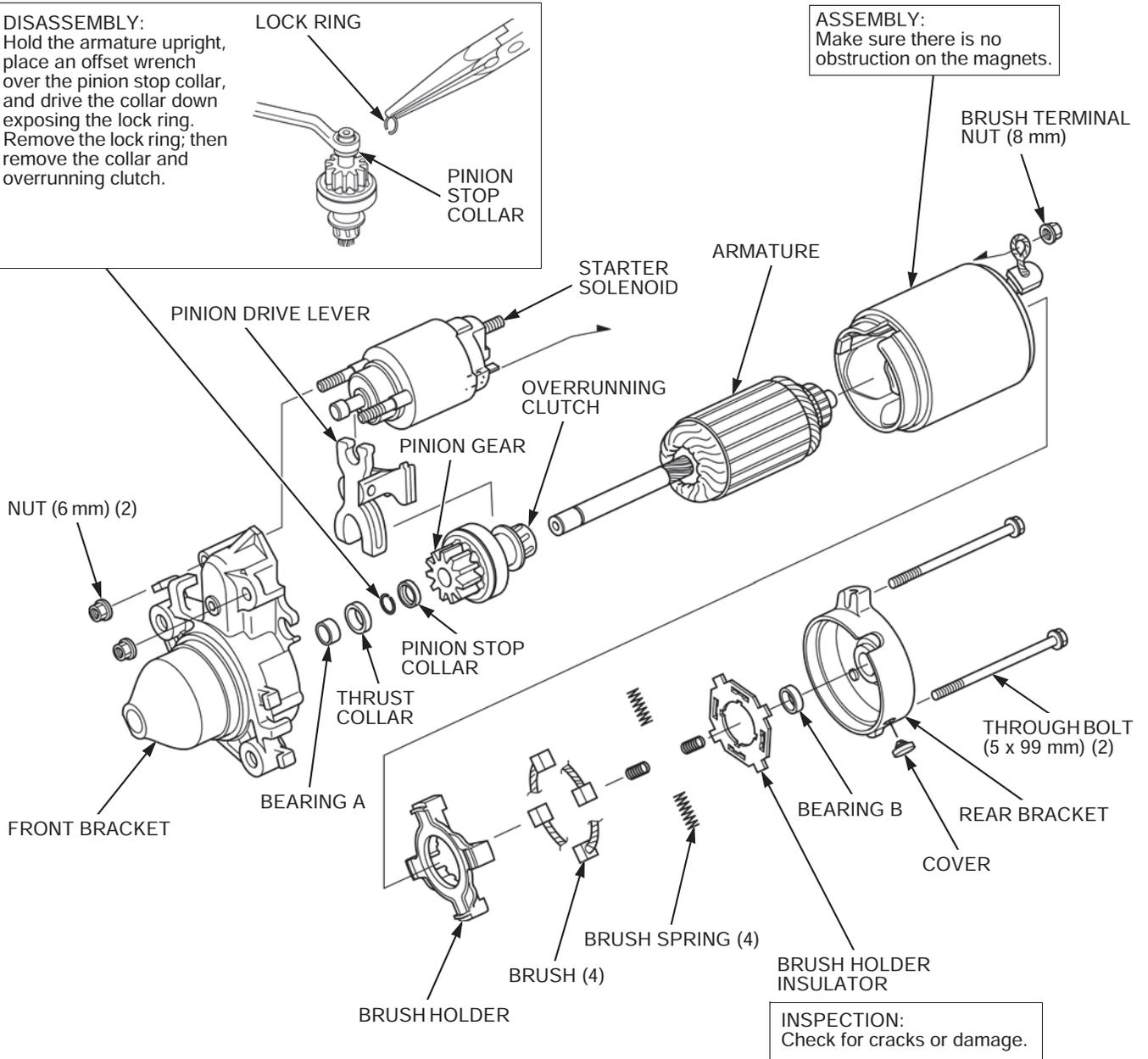
## LOCK RING

**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.



## YOKE

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



## STARTING SYSTEM

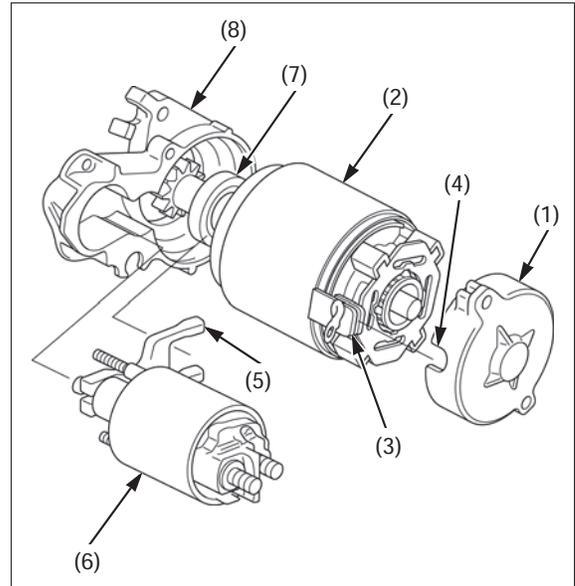
### FRONT BRACKET/REAR BRACKET ASSEMBLY

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<sup>-1</sup> (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.

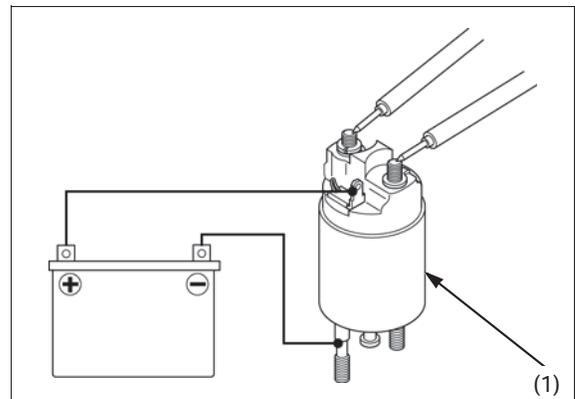
If the measurement is out of specification, disassemble and inspect the starter motor.

### 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.



## STARTING SYSTEM

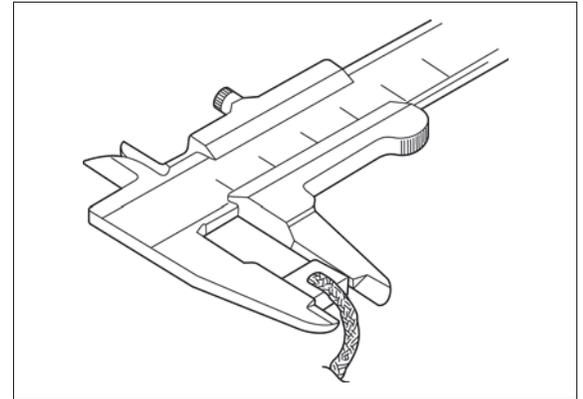
### BRUSH LENGTH

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

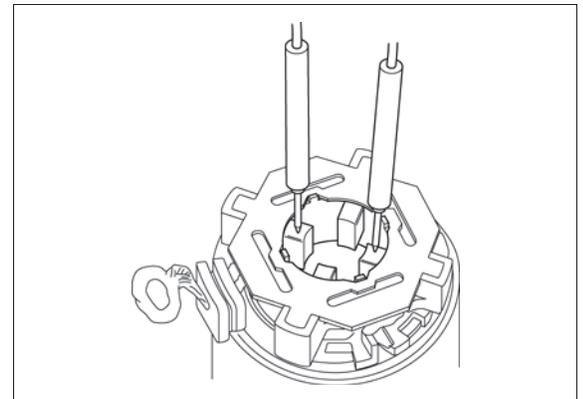
Check for continuity between the brushes.

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](#)).

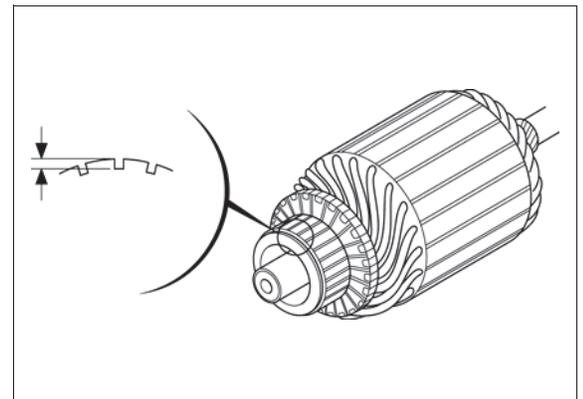


### ARMATURE MICA DEPTH

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.

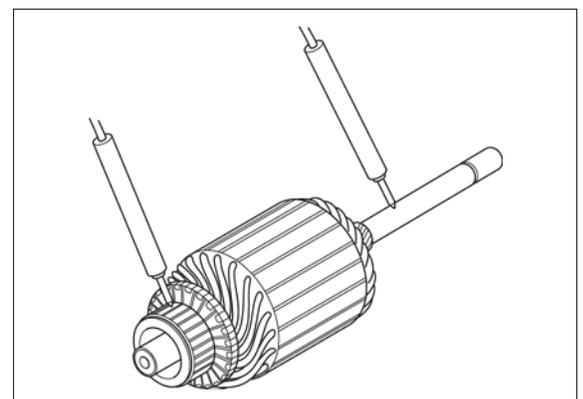
**SERVICE LIMIT:** 0.2 mm (0.01 in)



### ARMATURE CONTINUITY CHECK - COMMUTATOR TO SHAFT

Check for continuity between the commutator and the armature shaft.

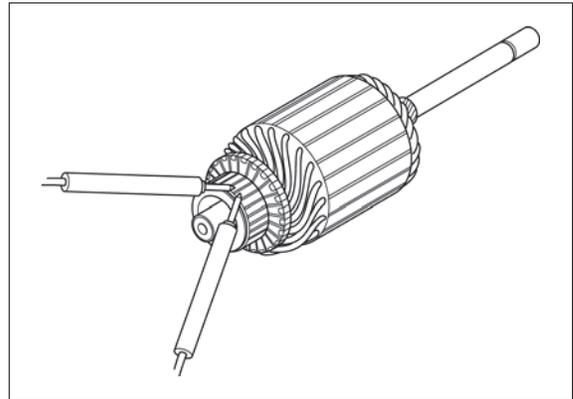
Replace the armature if continuity exists between any of the commutator segments and the armature shaft ([page 10-9](#)).



## STARTING SYSTEM

### ARMATURE CONTINUITY CHECK - COMMUTATOR SEGMENTS

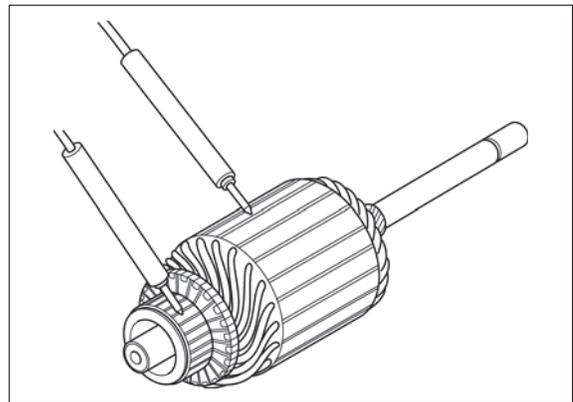
Check for continuity between segments. If an open circuit (no continuity) exists between any two segments, replace the armature ([page 10-9](#)).



### 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](#)).



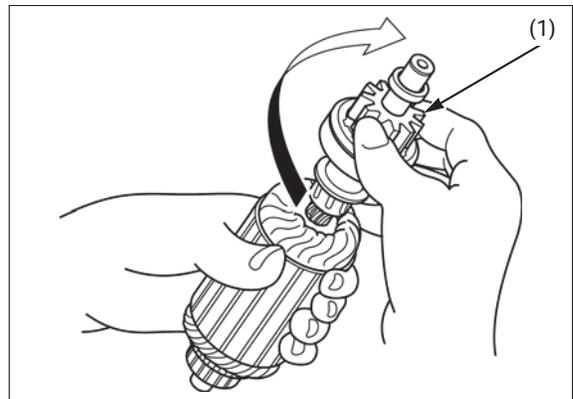
### OVERRUNNING CLUTCH

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.

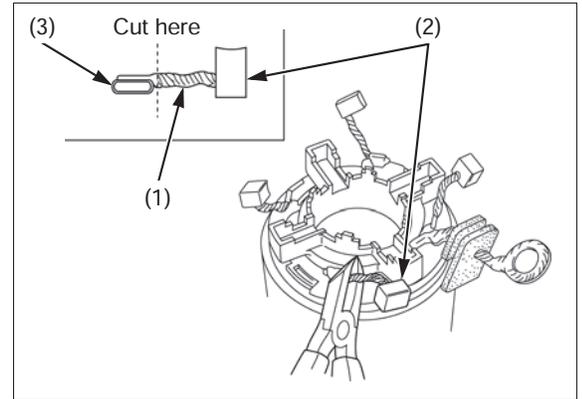
If the pinion gear is worn or damaged, the flywheel ring gear must be inspected.



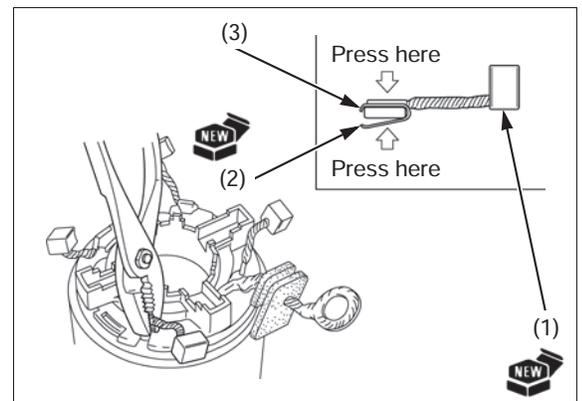
## BRUSH REPLACEMENT

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).

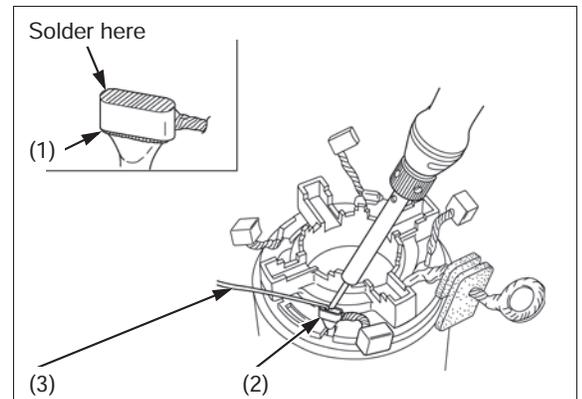


Hold a new brush (1) in the same direction of the removed brush and put a new plate (2) over the new brush and terminal (3), and press it using a pair of pliers as shown.



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.



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# MEMO

# 11. OTHER ELECTRICAL

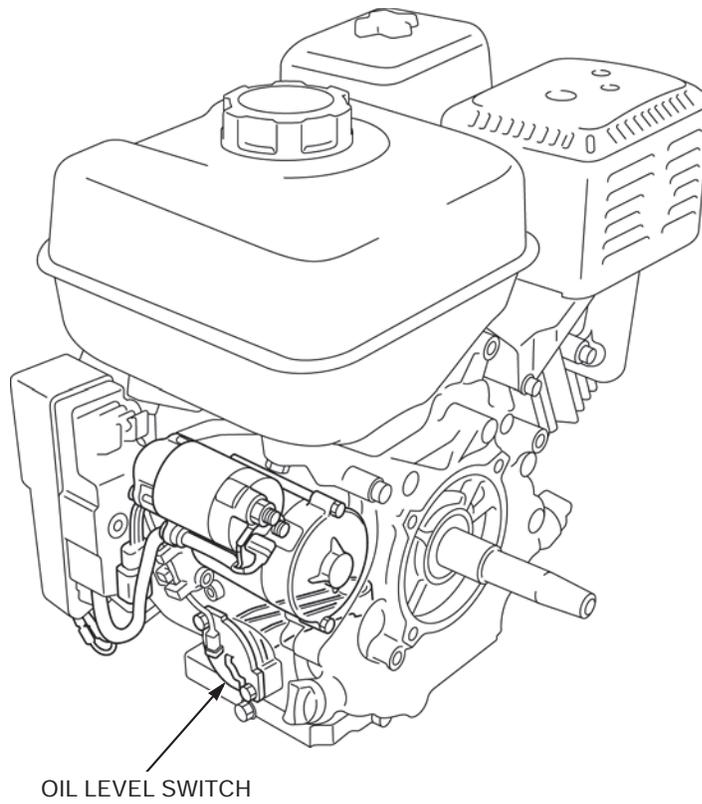
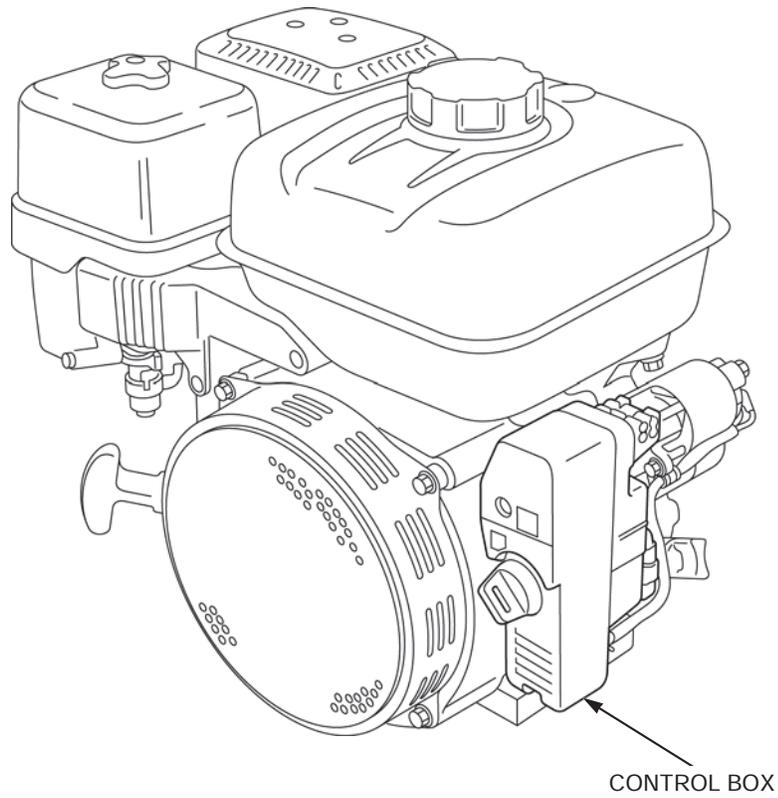
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COMPONENT LOCATION .....	11-2	OIL LEVEL SWITCH INSPECTION .....	11-5
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OIL LEVEL SWITCH REMOVAL/ INSTALLATION .....	11-5	RECTIFIER INSPECTION .....	11-6
		ENGINE WIRE HARNESS REMOVAL/ INSTALLATION .....	11-7

OTHER ELECTRICAL

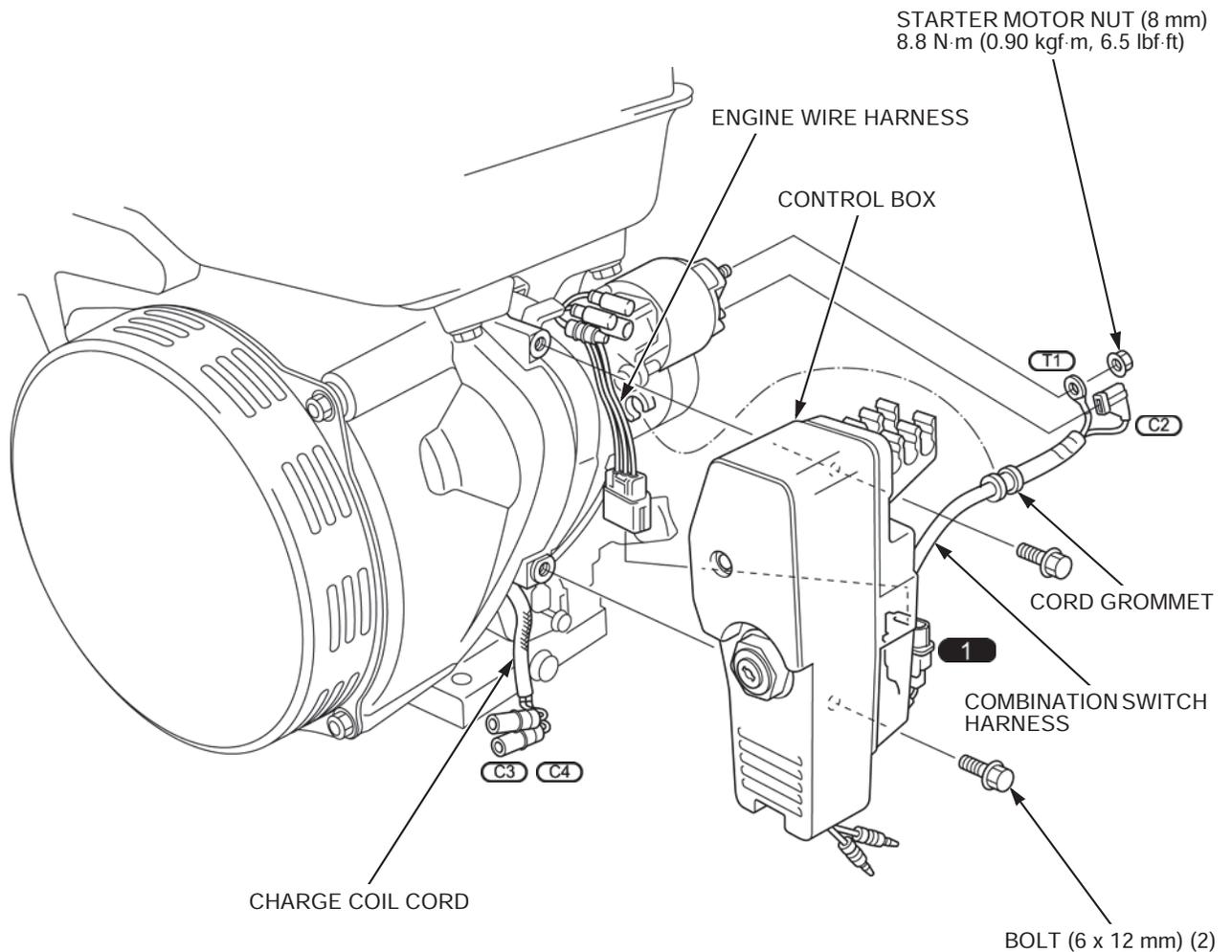
COMPONENT LOCATION

---



## CONTROL BOX REMOVAL/INSTALLATION

When installing the control box, refer to HARNESS AND TUBE ROUTING ([page 2-3](#)).



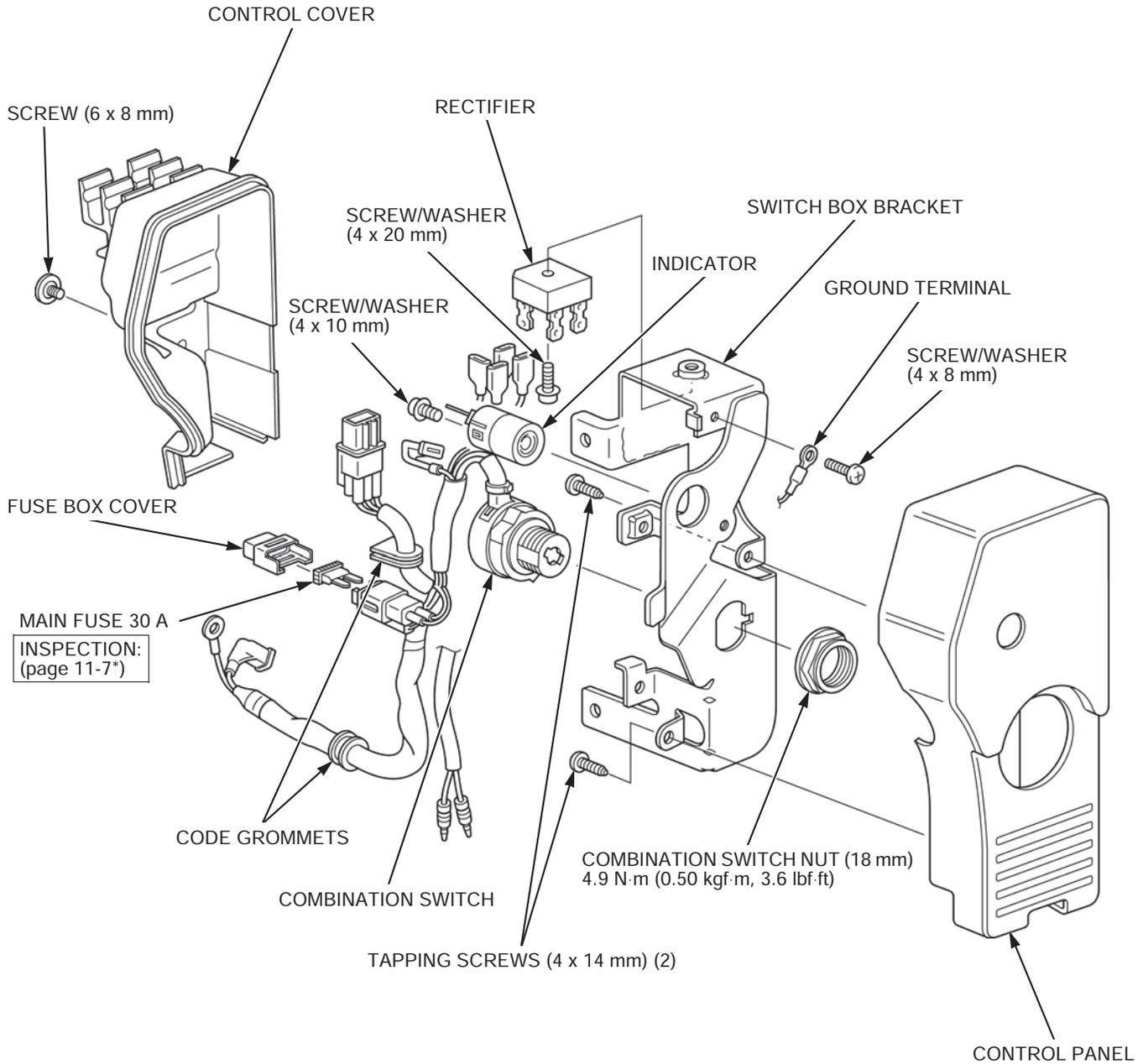
## CONTROL BOX DISASSEMBLY/ASSEMBLY

(\*) 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).

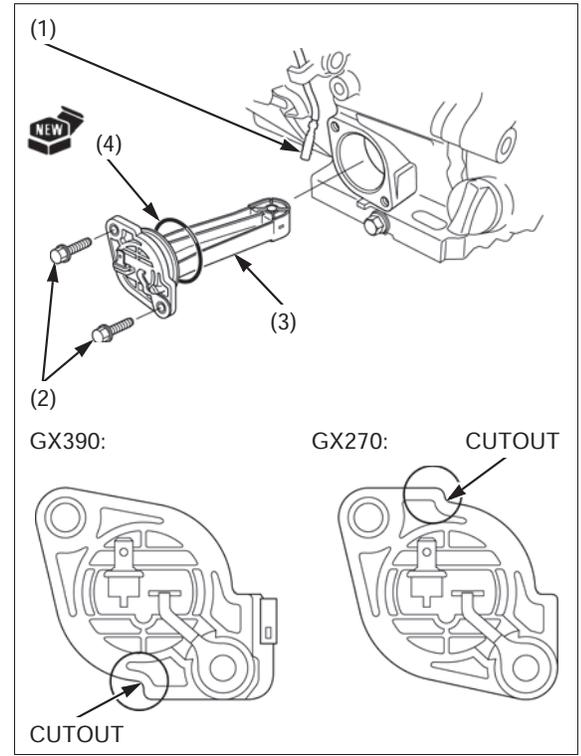
Remove the two 6 x 16 mm flange bolts (2), oil level  
switch (3), and O-ring (4).

Replace the O-ring  
with a new one.

Installation is in the reverse order of removal.

### NOTICE

- Install the oil level switch to the crankcase securely as shown.
- Wrong assembly can cause the engine trouble.



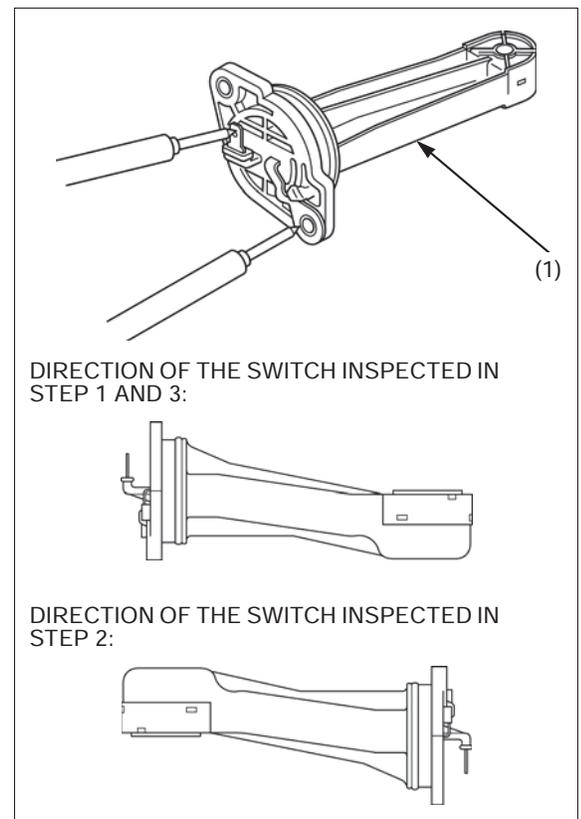
## OIL LEVEL SWITCH INSPECTION

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](#)).



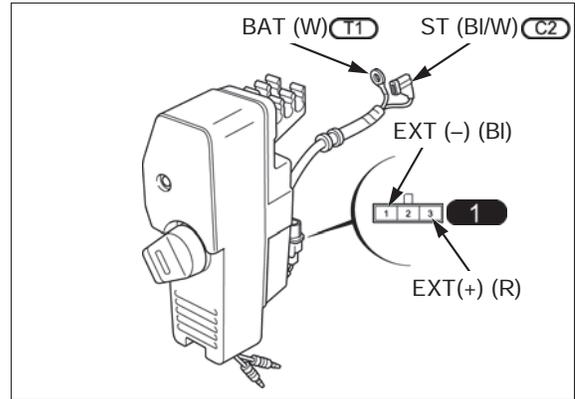
## OTHER ELECTRICAL

### COMBINATION SWITCH INSPECTION

Check for continuity between the terminals at each switch position.

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

	EXT (+) (R)	EXT (-) (Bl)	BAT (W)	ST (Bl/W)
OFF				
ON	○ — ○			
START	○ — ○		○ — ○	



### INDICATOR INSPECTION

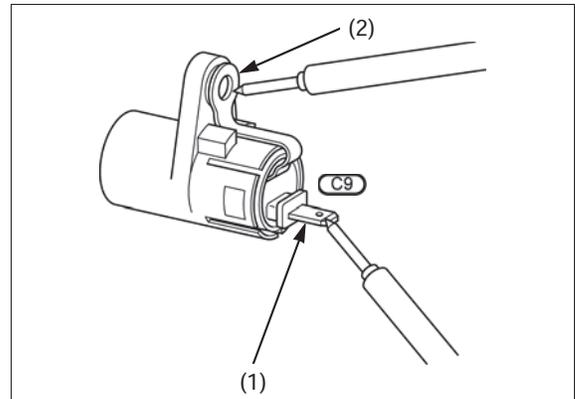
Remove the indicator [\(page 11-3\)](#).

Measure the resistance between the terminal and plate.

- Some testers have reverse polarity.

Unit: kΩ

		(+ Tester probe	
		Terminal (1)	Plate (2)
(-) Tester probe	Terminal (1)	—	200
	Plate (2)	∞	—



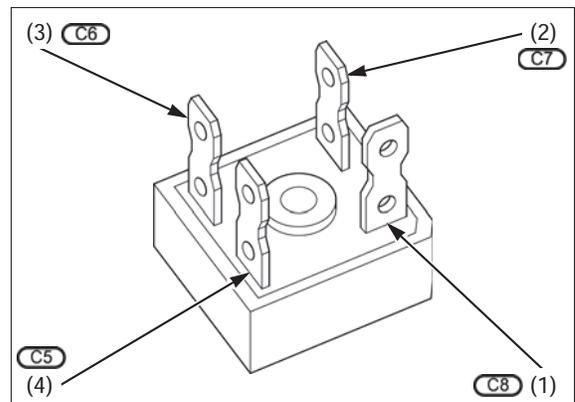
### RECTIFIER INSPECTION

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

		(+ Tester probe			
		W (1)	Gr (2)	G (3)	Gr (4)
(-) Tester probe	W (1)	—	∞	—	∞
	Gr (2)	7	—	∞	—
	G (3)	—	7	—	∞
	Gr (4)	7	—	7	—



## ENGINE WIRE HARNESS REMOVAL/ INSTALLATION

Remove the fan cover ([page 5-2](#)).

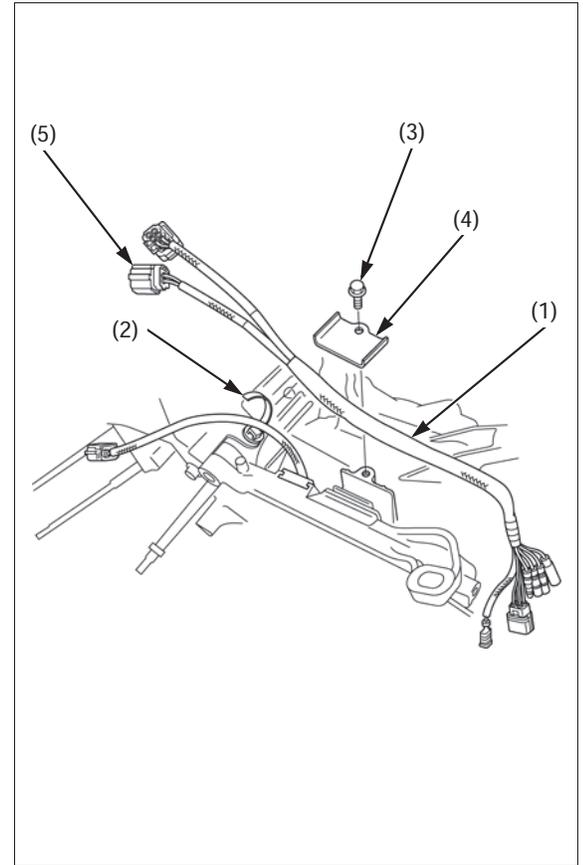
Remove the fuel tank ([page 6-2](#)).

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.



---

# MEMO

# 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).

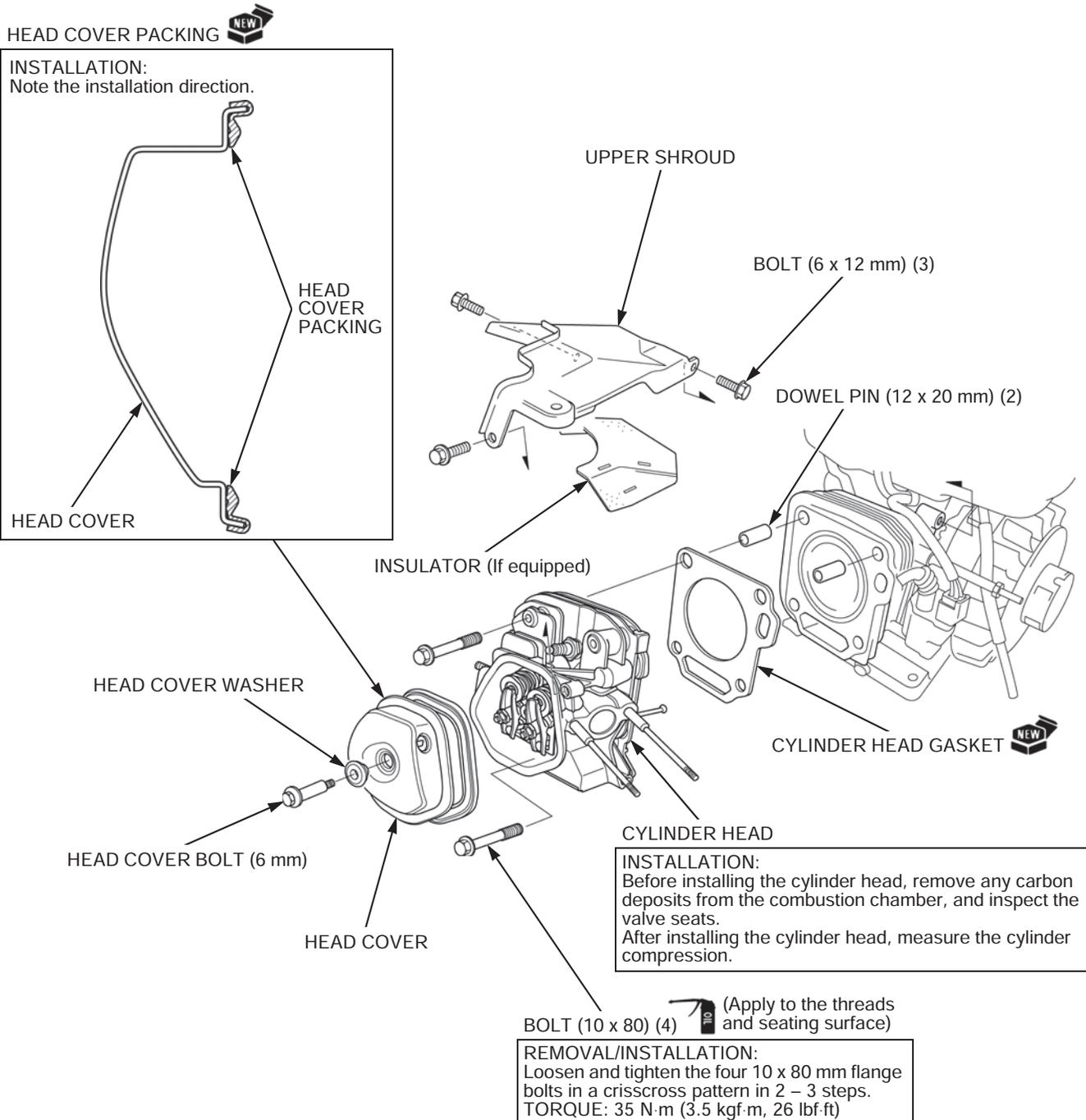
Set the piston at top dead center of the cylinder compression stroke [\(page 3-3\)](#).

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 [\(page 3-3\)](#).



# 13. CRANKCASE

---

**CRANKCASE COVER REMOVAL/  
INSTALLATION..... 13-2**

**CRANKSHAFT/BALANCER/PISTON  
REMOVAL/INSTALLATION ..... 13-3**

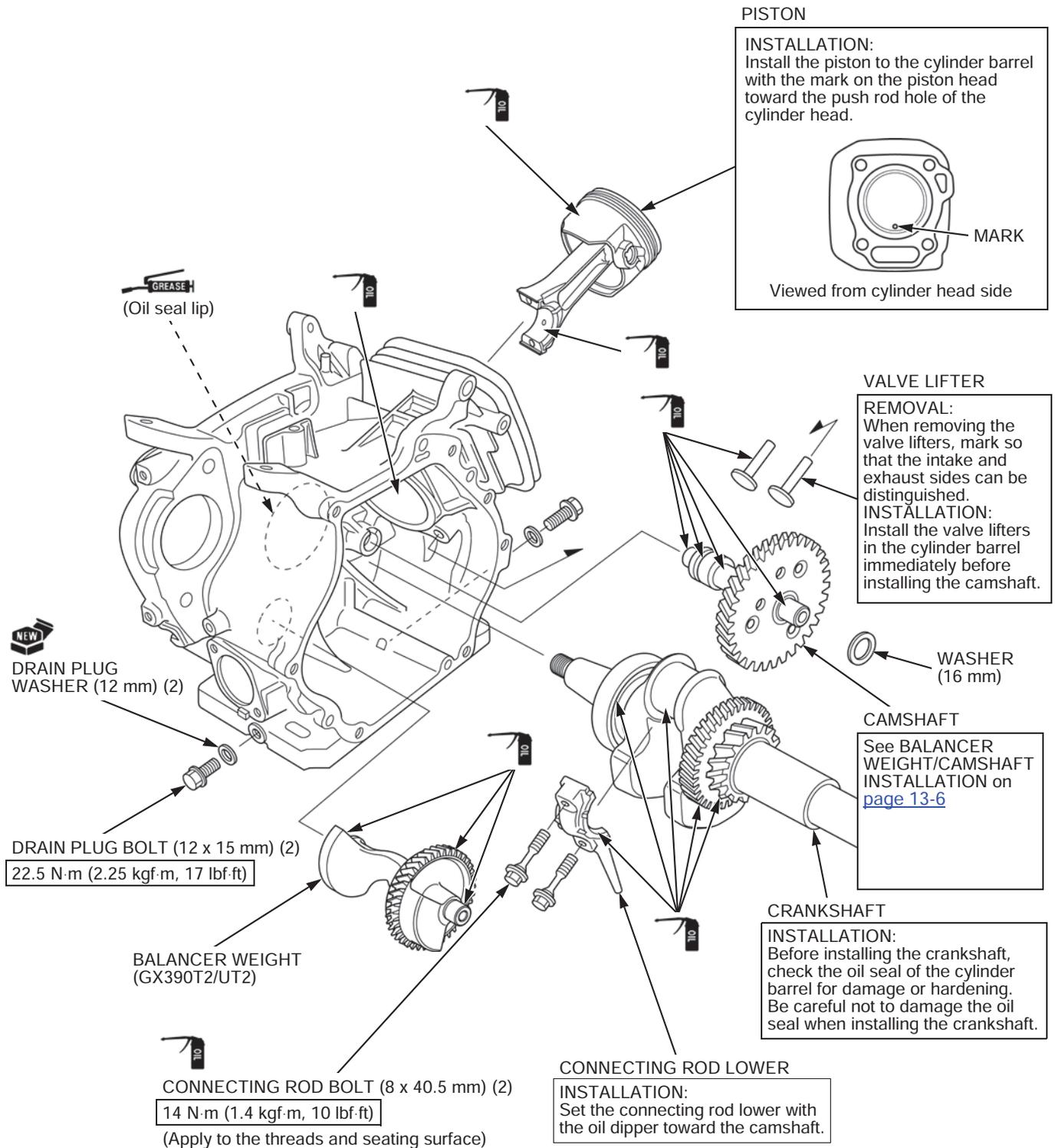


# CRANKSHAFT/BALANCER/PISTON REMOVAL/INSTALLATION

(\*) 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](#))



---

# MEMO

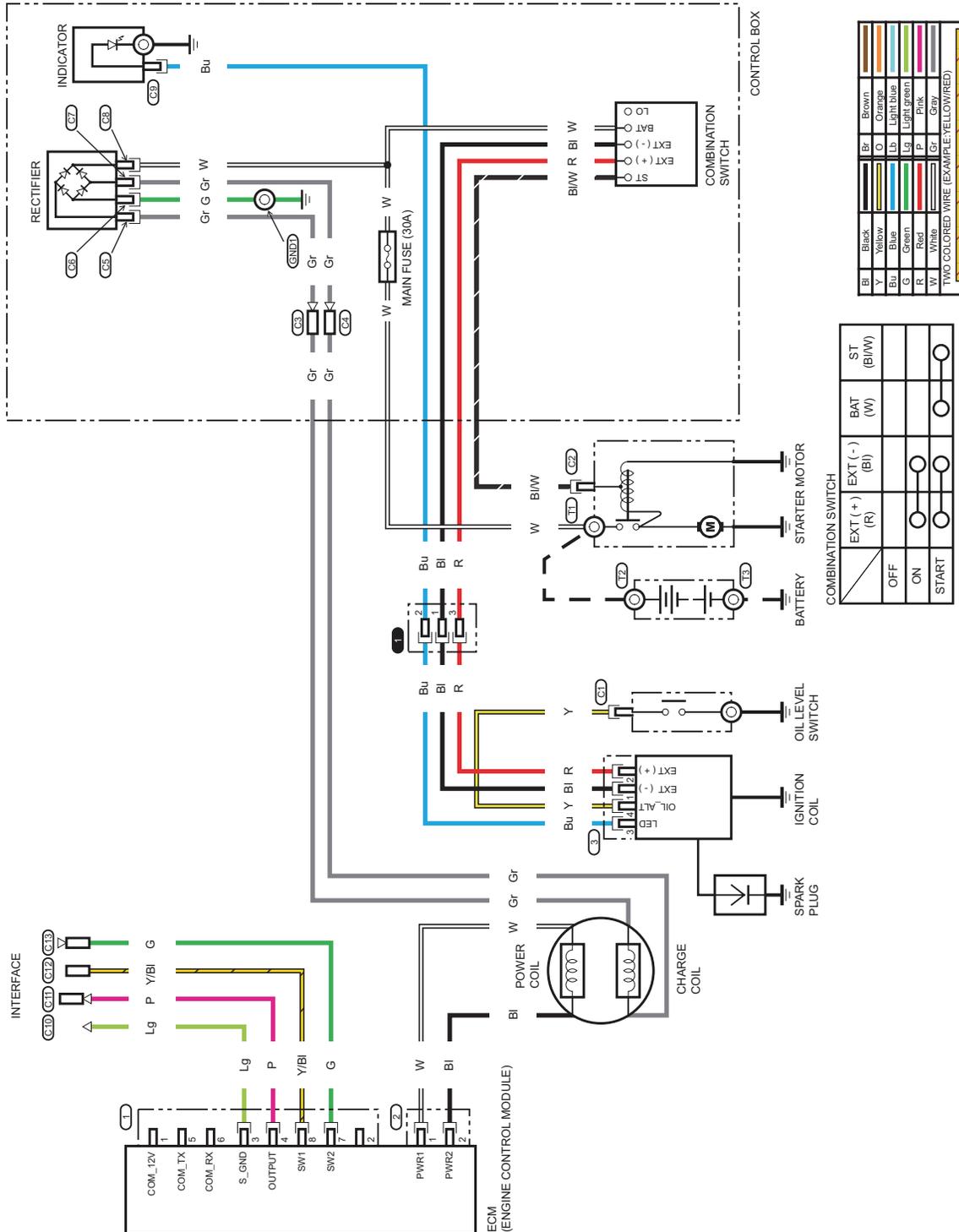
# 15. WIRING DIAGRAMS

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WIRING DIAGRAMS ..... 15-2

WIRING DIAGRAMS

WIRING DIAGRAMS

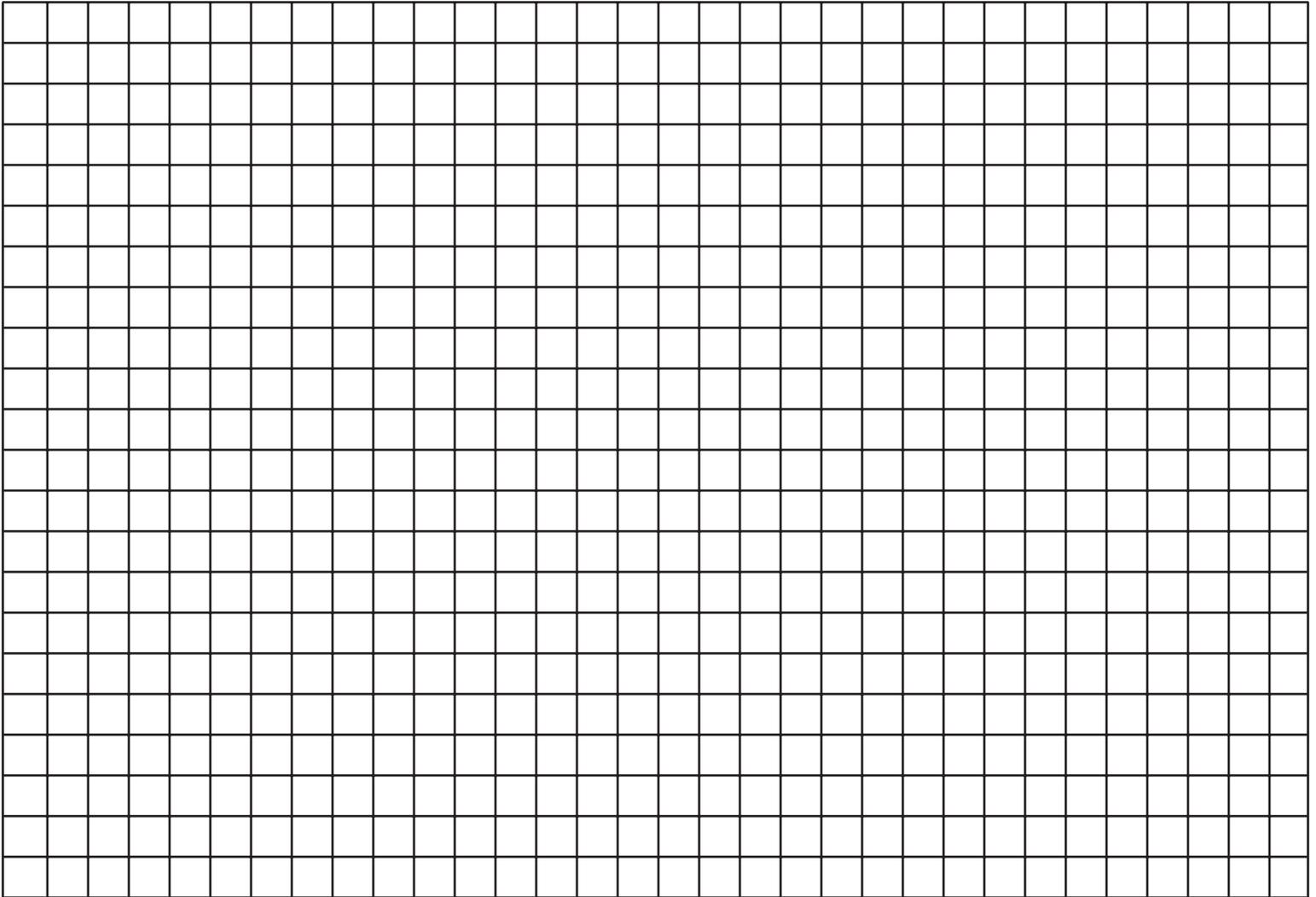


Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray
TWO COLORED WIRE (EXAMPLE:YELLOW/RED)			

	EXT (+) (R)	EXT (-) (Bl)	BAT (W)	ST (Bi/W)
OFF	○	○	○	○
ON	○	○	○	○
START	○	○	○	○

# **HONDA**

The Power of Dreams



**HONDA**  
**ENGINES**

# SUPPLEMENT W

To:

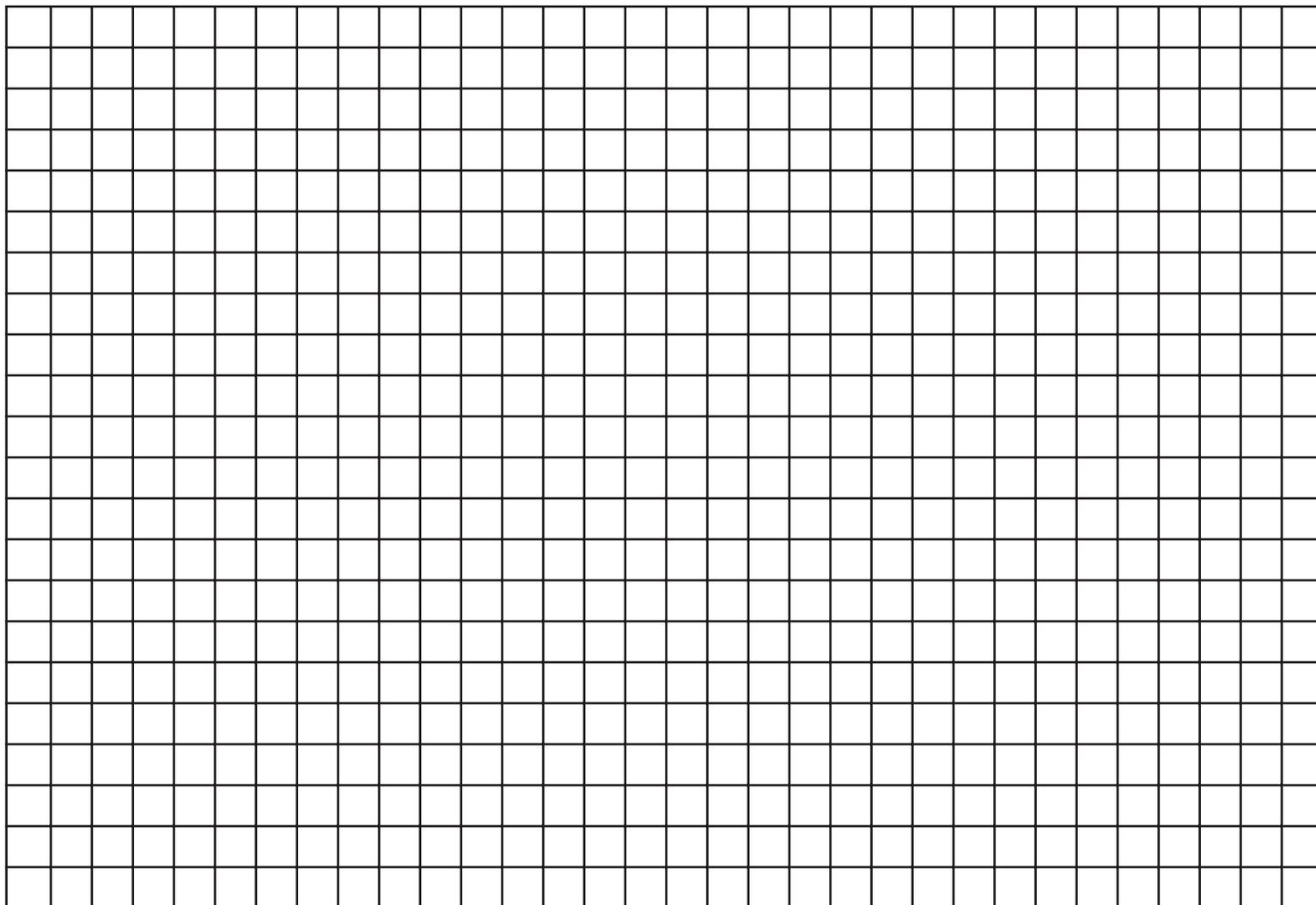
- GX240/270/340/390 SHOP MANUAL
- SUPPLEMENT Y

Includes:

- iGX240/iGX340

# SHOP MANUAL

## iGX240•iGX340



**61Z5F00WE1**  
AHM.25.2012.04  
PRINTED IN U.S.A.

## 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 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

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CRANKCASE	13
MUFFLER	14
WIRING DIAGRAMS	15
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 The marked sections contain no changes. They are not covered in this supplement.

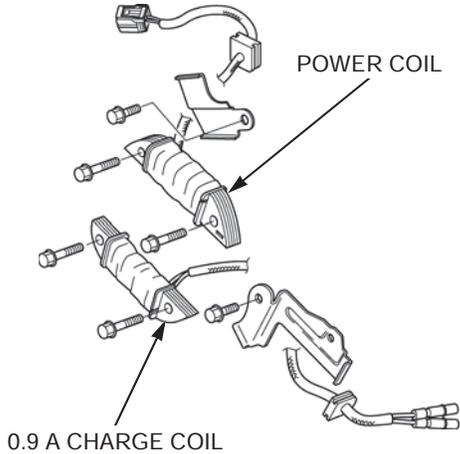
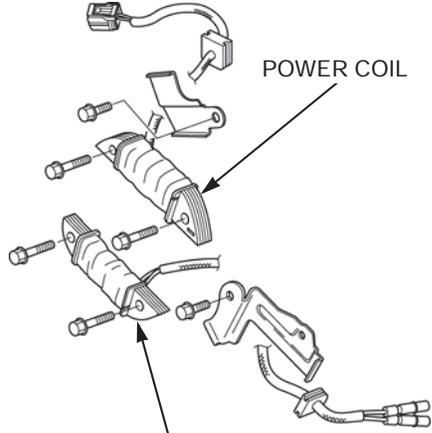
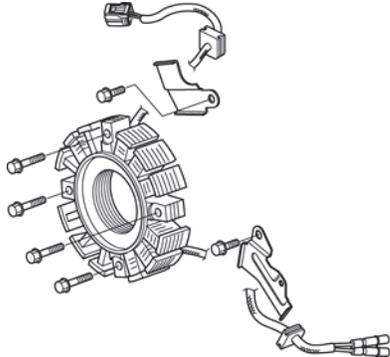
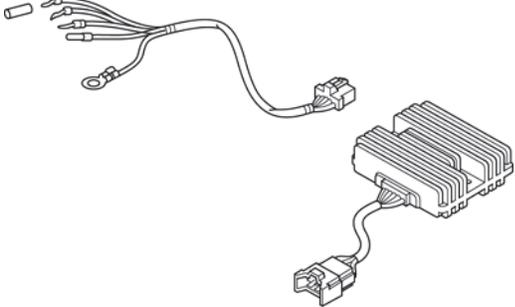
## How to use this manual

# SYMBOLS

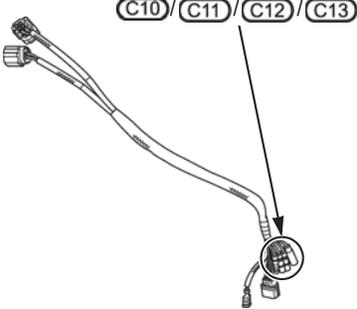
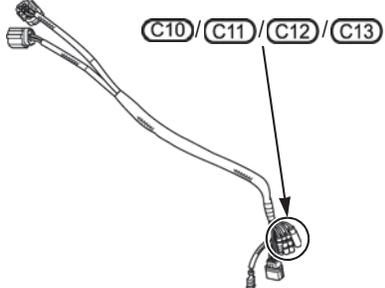
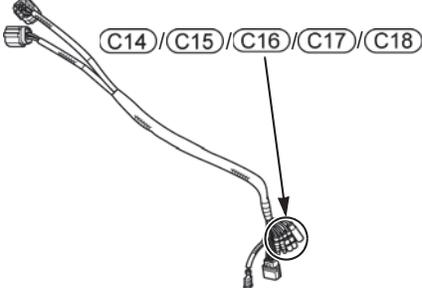
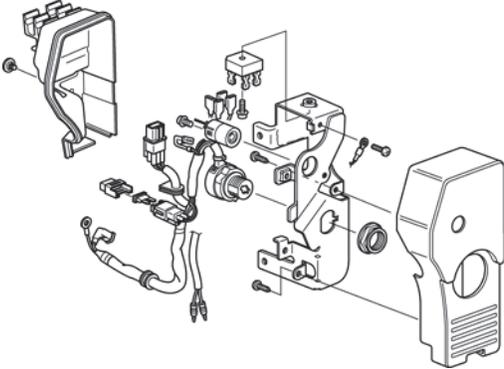
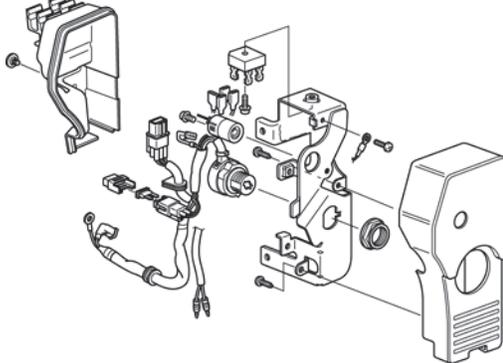
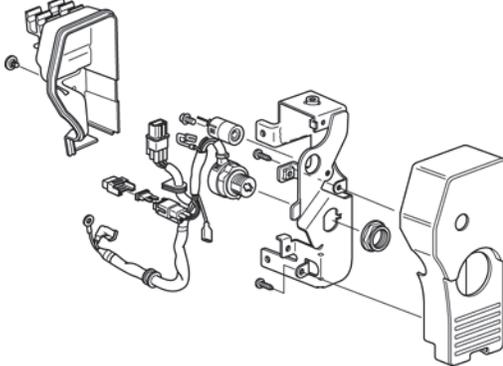
The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it will be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use the recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use marine grease (water resistant urea based grease).
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use automatic transmission fluid.
(O x O) (O)	Indicates the diameter, length, and quantity of metric bolts used.
page 1-1	Indicates the reference page.

# OUTLINE OF CHANGES

ITEM	MODEL	
	iGX270UT2-iGX390UT2/T2	iGX240UT2-iGX340UT2
Charge/power coil	 <p>POWER COIL</p> <p>0.9 A CHARGE COIL</p>	<p>iGX240UT2 QZX4, QZA2, QZAV types/ iGX340UT2 QZX4, QZA2, QZAV types:</p>  <p>POWER COIL</p> <p>iGX240UT2 QZX4 type/iGX340UT2 QZX4 type: 0.9 A CHARGE COIL iGX240UT2 QZA2, QZAV types/iGX340UT2 QZA2, QZAV types: 2.9 A CHARGE COIL</p>
		<p>iGX340UT2 QZN2 type: 12 A CHARGE COIL</p> 
Regulator/rectifier		<p>iGX340UT2 QZN2 type:</p> 

## OUTLINE OF CHANGES

ITEM	MODEL	
	iGX270UT2·iGX390UT2/T2	iGX240UT2·iGX340UT2
Engine wire harness		<p>iGX240UT2 QZX4, QZA2 types/ iGX340UT2 QZX4, QZA2, QZN2 types:</p> 
		<p>iGX240UT2 QZAV type/iGX340UT2 QZAV type:</p> 
Control box		<p>iGX240UT2 QZX4, QZA2, QZAV types/ iGX340UT2 QZX4, QZA2, QZAV types:</p> 
		<p>iGX340UT2 QZN2 type:</p> 

# 1. SPECIFICATIONS

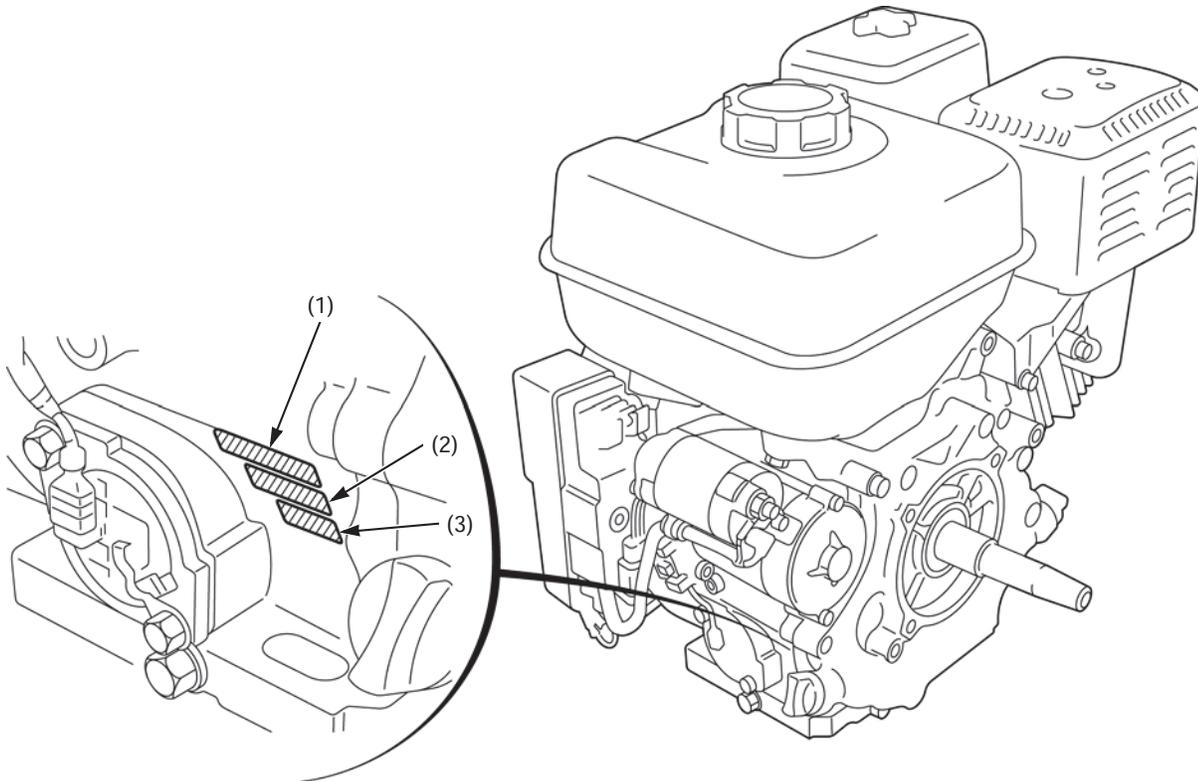
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DIMENSION AND WEIGHT SPECIFICATIONS .....	1-3	P.T.O. DIMENSIONAL DRAWINGS .....	1-5

## SPECIFICATIONS

### SERIAL NUMBER LOCATION

The engine serial number (1), description code (2), and type (3) are stamped on the crankcase.  
Refer to them when ordering parts or making technical inquiries.



### TYPE CODE

Model	iGX240UT2		
Type	QZX4	QZA2	QZAV
P. T. O.	Q type		

Model	iGX340UT2			
Type	QZX4	QZA2	QZAV	QZN2
P. T. O.	Q type			

## DIMENSION AND WEIGHT SPECIFICATIONS

Model	iGX240UT2	iGX340UT2
Overall length	384 mm (15.1 in)	409 mm (16.1 in)
Overall width	462 mm (18.2 in)	484 mm (19.1 in)
Overall height	422 mm (16.6 in)	448 mm (17.6 in)
Dry weight	30.3 kg (66.8 lbs)	36.4 kg (80.2 lbs)
Operating weight	35.1 kg (77.4 lbs)	41.7 kg (91.9 lbs)

## ENGINE SPECIFICATIONS

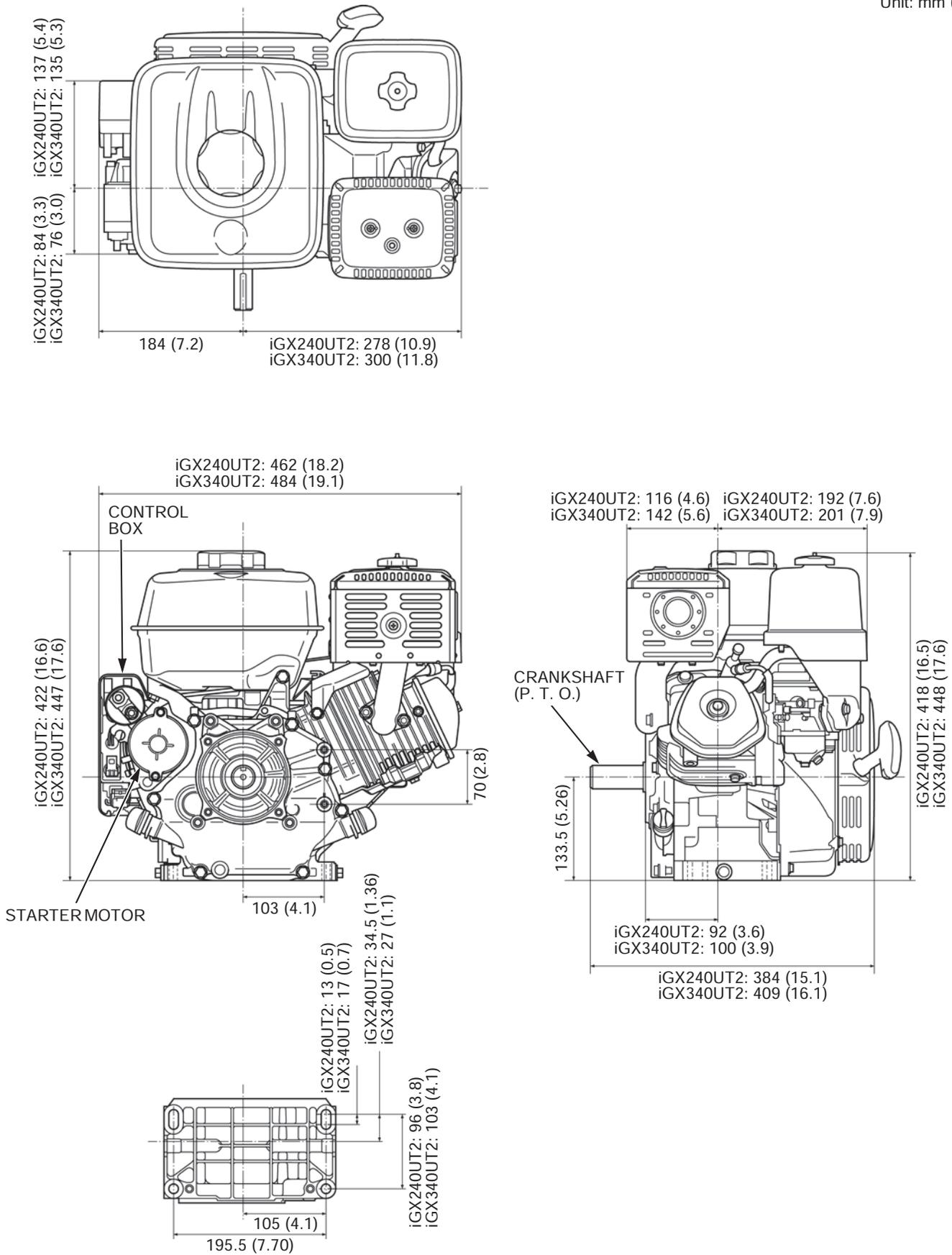
Model	iGX240UT2	iGX340UT2
Description code	GCBJT	GCBET
Type	4 stroke, overhead valve, single cylinder, inclined by 25°	
Displacement	270 cm <sup>3</sup> (16.5 cu-in)	389 cm <sup>3</sup> (23.7 cu-in)
Bore x stroke	77.0 x 58.0 mm (3.0 x 2.3 in)	88.0 x 64.0 mm (3.5 x 2.5 in)
Net power (SAE J1349)*1	5.9 kW (7.9 HP)/3,600 min <sup>-1</sup> (rpm)	8.0 kW (10.7 HP)/3,600 min <sup>-1</sup> (rpm)
Continuous rated power	4.6 kW (6.1 HP)/3,600 min <sup>-1</sup> (rpm)	6.3 kW (8.4 HP)/3,600 min <sup>-1</sup> (rpm)
Maximum net torque (SAE J1349)*1	18.3 N·m (1.86 kgf·m, 13.4 lbf·ft)/ 2,500 min <sup>-1</sup> (rpm)	26.4 N·m (2.6 kgf·m, 19.4 lbf·ft)/ 2,500 min <sup>-1</sup> (rpm)
Compression ratio	8.5 : 1	8.2 : 1
Fuel consumption (at continuous rated power)	2.2 Liters (0.58 US gal, 0.48 Imp gal)/h	3.1 Liters (0.82 US gal, 0.68 Imp gal)/h
Ignition system	C.D.I.(Capacitor Discharge Ignition) type magneto ignition	
Ignition timing	B.T.D.C. 10°/1,400 min <sup>-1</sup> (rpm)	
Spark advancer performance	B.T.D.C. 10° – 17°	B.T.D.C. 10° – 22°
Spark plug	BPR6ES (NGK)/W20EPR-U (DENSO)	
Lubrication system	Forced splash	
Oil capacity	1.1 Liters (1.16 US qt, 0.97 Imp qt)	
Recommended oil	SAE 10W-30, API service classification SJ or later	
Cooling system	Forced air	
Starting system	Recoil starter and Starter motor	
Stopping system	Ignition primary circuit open	
Carburetor	Horizontal type, butterfly valve	
Air cleaner	Dual element type	
Governor	STR (Self Tuning Regulator) governor	
Breather system	Flat valve type	
Fuel used	Unleaded gasoline with a pump octane rating 86 or higher	

\*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<sup>-1</sup> (rpm) (net power) and at 2,500 min<sup>-1</sup> (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

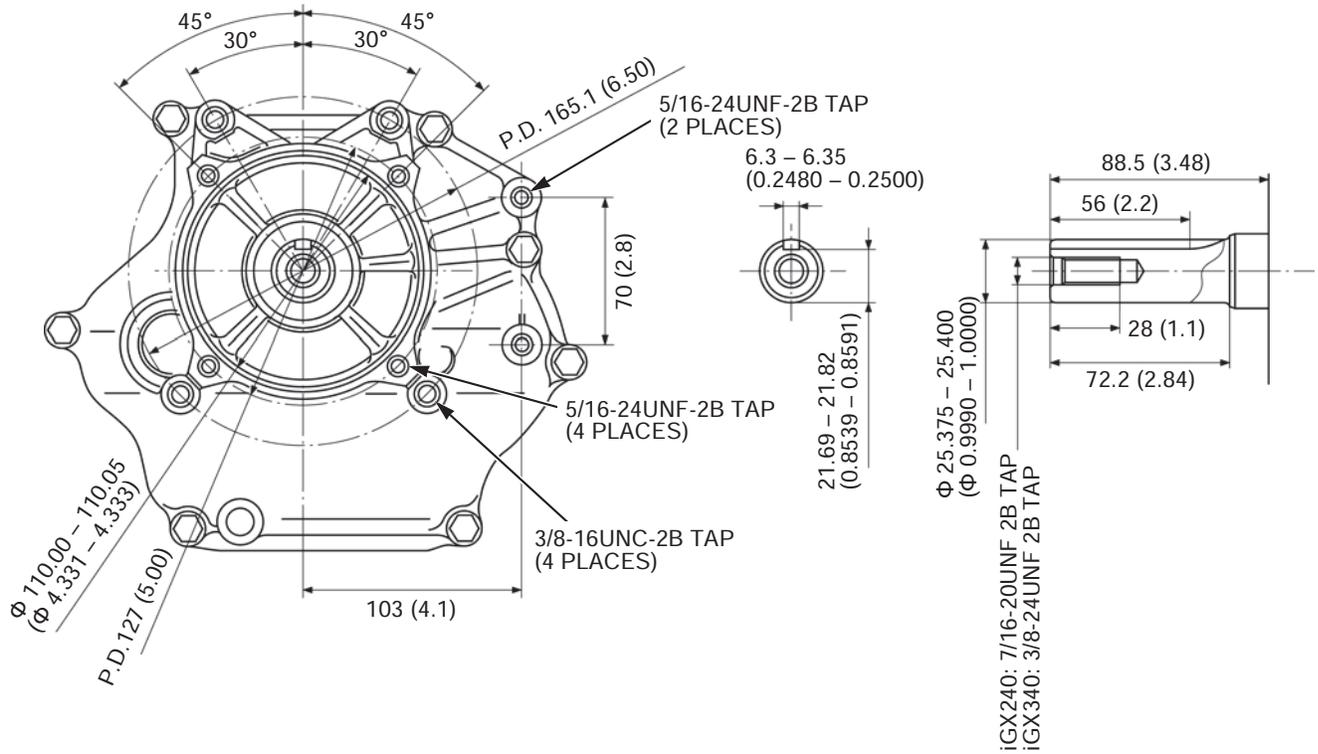
Unit: mm (in)



## P.T.O. DIMENSIONAL DRAWINGS

## Q TYPE

Unit: mm (in)



## 2. SERVICE INFORMATION

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MAINTENANCE STANDARDS .....	2-2	LUBRICATION & SEAL POINTS .....	2-4
TORQUE VALUES .....	2-4	HARNES AND TUBE ROUTING .....	2-5

## SERVICE INFORMATION

## MAINTENANCE STANDARDS

## iGX240UT2

Unit: mm (in)

Part	Item	Standard	Service limit	
Engine	Maximum speed (at no load)	3,600 ± 150 min <sup>-1</sup> (rpm)*	–	
	Idle speed	1,400 ± 150 min <sup>-1</sup> (rpm)	–	
	Cylinder compression	1.31 MPa (13.4 kgf/cm <sup>2</sup> , 190 psi)/ 1,400 min <sup>-1</sup> (rpm)	–	
Cylinder head	Warpage	–	0.10 (0.004)	
Cylinder	Sleeve I.D.	77.000 – 77.017 (3.0315 – 3.0322)	77.17 (3.038)	
Piston	Skirt O.D.	76.975 – 76.985 (3.0305 – 3.0309)	76.85 (3.026)	
	Piston-to-cylinder clearance	0.015 – 0.042 (0.0006 – 0.0016)	0.12 (0.005)	
	Piston pin bore I.D.	18.002 – 18.008 (0.7087 – 0.7090)	18.042 (0.7103)	
Piston pin	Pin O.D.	17.994 – 18.000 (0.7872 – 0.7874)	17.95 (0.707)	
	Piston pin-to-piston pin bore clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)	
Piston rings	Ring side clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
		Second	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
	Ring end gap	Top	0.200 – 0.350 (0.0079 – 0.0138)	1.0 (0.04)
		Second	0.350 – 0.500 (0.0138 – 0.0197)	1.0 (0.04)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Ring width	Top	1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)
Second		1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)	
Connecting rod	Small end I.D.	18.005 – 18.020 (0.7089 – 0.7094)	18.07 (0.711)	
	Big end side clearance	0.1 – 0.4 (0.004 – 0.016)	1.0 (0.04)	
	Big end I.D.	33.025 – 33.039 (1.3002 – 1.3007)	33.07 (1.302)	
	Big end oil clearance	0.040 – 0.064 (0.0016 – 0.0025)	0.12 (0.005)	
Crankshaft	Crankpin O.D.	32.975 – 32.985 (1.2982 – 1.2986)	32.92 (1.296)	
	Crankshaft runout	–	0.1 (0.004)	
Cylinder barrel (Crankcase)	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)	
Crankcase cover	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)	
Valves	Valve clearance	IN	0.15 ± 0.02 (0.006 ± 0.001)	–
		EX	0.20 ± 0.02 (0.008 ± 0.001)	–
	Valve stem O.D.	IN	6.575 – 6.590 (0.2588 – 0.2594)	6.44 (0.254)
		EX	6.535 – 6.550 (0.2572 – 0.2578)	6.40 (0.252)
	Valve guide I.D.	IN/EX	6.600 – 6.615 (0.2598 – 0.2604)	6.66 (0.262)
	Guide-to-stem clearance	IN	0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
		EX	0.050 – 0.080 (0.0020 – 0.0032)	0.12 (0.005)
	Valve seat width		1.0 – 1.2 (0.04 – 0.05)	2.0 (0.08)
Valve spring free length		39.0 (1.54)	37.5 (1.48)	
Valve spring perpendicularity		–	1.5° max.	
Camshaft	Cam height	IN	31.945 – 32.145 (1.2577 – 1.2655)	31.35 (1.234)
		EX	31.666 – 31.866 (1.2467 – 1.2546)	31.35 (1.234)
	Camshaft O.D.		15.966 – 15.984 (0.6286 – 0.6293)	15.92 (0.627)
Carburetor	Main jet	BE93B A: #82	–	
	Pilot screw opening	BE93B A: 1 turn out	–	
	Float height	13.2 (0.52)	–	
Spark plug	Gap	0.7 – 0.8 (0.028 – 0.031)	–	
Ignition coil	Air gap	0.2 – 0.6 (0.01 – 0.02)	–	
Starter motor	Brush length	10 (0.4)	6 (0.2)	
	Mica depth	–	0.2 (0.01)	
Charge coil	Resistance	QZX4 type (0.9 A)	5.1 – 7.7 Ω	–
		QZA2, QZAV types (2.9 A)	0.4 – 0.8 Ω	–
Power coil	Resistance	2.9 – 4.5 Ω	–	

\*: This figure is caused by basic program in the ECM. The engine speed is different depending on the program in the ECM.

## SERVICE INFORMATION

## iGX340UT2

Unit: mm (in)

Part	Item	Standard	Service limit	
Engine	Maximum speed (at no load)	3,600 ± 150 min <sup>-1</sup> (rpm)*	–	
	Idle speed	1,400 ± 150 min <sup>-1</sup> (rpm)	–	
	Cylinder compression	1.29 MPa (13.2 kgf/cm <sup>2</sup> , 187 psi)/ 1,400 min <sup>-1</sup> (rpm)	–	
Cylinder head	Warpage	–	0.10 (0.004)	
Cylinder	Sleeve I.D.	88.000 – 88.017 (3.4646 – 3.4652)	88.17 (3.471)	
Piston	Skirt O.D.	87.975 – 87.985 (3.4635 – 3.4640)	87.85 (3.459)	
	Piston-to-cylinder clearance	0.015 – 0.042 (0.0006 – 0.0016)	0.12 (0.005)	
	Piston pin bore I.D.	20.002 – 20.008 (0.7875 – 0.7877)	20.042 (0.7891)	
Piston pin	Pin O.D.	19.994 – 20.000 (0.7872 – 0.7874)	19.950 (0.7854)	
	Piston pin-to-piston pin bore clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)	
Piston rings	Ring side clearance	Top	0.030 – 0.060 (0.0006 – 0.0024)	0.15 (0.006)
		Second	0.030 – 0.060 (0.0012 – 0.0024)	0.15 (0.006)
	Ring end gap	Top	0.200 – 0.350 (0.0079 – 0.0138)	1.0 (0.04)
		Second	0.350 – 0.500 (0.0138 – 0.0197)	1.0 (0.04)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Ring width	Top	1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)
Second		1.160 – 1.175 (0.0457 – 0.0463)	1.140 (0.0449)	
Connecting rod	Small end I.D.	20.005 – 20.020 (0.7876 – 0.7882)	20.07 (0.790)	
	Big end side clearance	0.1 – 0.4 (0.004 – 0.016)	1.0 (0.04)	
	Big end I.D.	36.025 – 36.039 (1.4183 – 1.4189)	36.07 (1.420)	
	Big end oil clearance	0.040 – 0.064 (0.0016 – 0.0025)	0.12 (0.005)	
Crankshaft	Crankpin O.D.	35.975 – 35.985 (1.4163 – 1.4167)	35.93 (1.415)	
	Crankshaft runout	–	0.1 (0.003)	
Cylinder barrel (Crankcase)	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)	
Crankcase cover	Camshaft bearing I.D.	16.000 – 16.018 (0.6299 – 0.6306)	16.05 (0.632)	
Valves	Valve clearance	IN	0.15 ± 0.02 (0.006 ± 0.001)	–
		EX	0.20 ± 0.02 (0.008 ± 0.001)	–
	Valve stem O.D.	IN	6.575 – 6.590 (0.2588 – 0.2594)	6.44 (0.254)
		EX	6.535 – 6.550 (0.2572 – 0.2578)	6.40 (0.252)
	Valve guide I.D.	IN/EX	6.600 – 6.615 (0.2598 – 0.2604)	6.66 (0.262)
	Guide-to-stem clearance	IN	0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
		EX	0.050 – 0.080 (0.0020 – 0.0032)	0.12 (0.005)
	Valve seat width		1.0 – 1.2 (0.04 – 0.05)	2.0 (0.08)
Valve spring free length		39.0 (1.54)	37.5 (1.48)	
Valve spring perpendicularity		–	1.5° max.	
Camshaft	Cam height	IN	31.945 – 32.145 (1.2577 – 1.2655)	31.35 (1.234)
		EX	31.666 – 31.866 (1.2467 – 1.2546)	31.35 (1.234)
	Camshaft O.D.		15.966 – 15.984 (0.6286 – 0.6293)	15.92 (0.627)
Carburetor	Main jet	BE91A A: #95	–	
	Pilot screw opening	BE91A A: 1 turn out	–	
	Float height	13.2 (0.52)	–	
Spark plug	Gap	0.7 – 0.8 (0.028 – 0.031)	–	
Ignition coil	Air gap	0.2 – 0.6 (0.01 – 0.02)	–	
Starter motor	Brush length	10 (0.4)	6 (0.2)	
	Mica depth	–	0.2 (0.01)	
Charge coil	Resistance	QZX4 type (0.9 A)	5.1 – 7.7 Ω	–
		QZA2, QZAV type (2.9 A)	0.4 – 0.8 Ω	–
		QZN2 type (12 A)	0.22 – 0.34 Ω	–
Power coil	Resistance	QZX4, QZA2, QZAV types	2.9 – 4.5 Ω	–
		QZN2 type	2.8 – 4.4 Ω	–

\*: 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

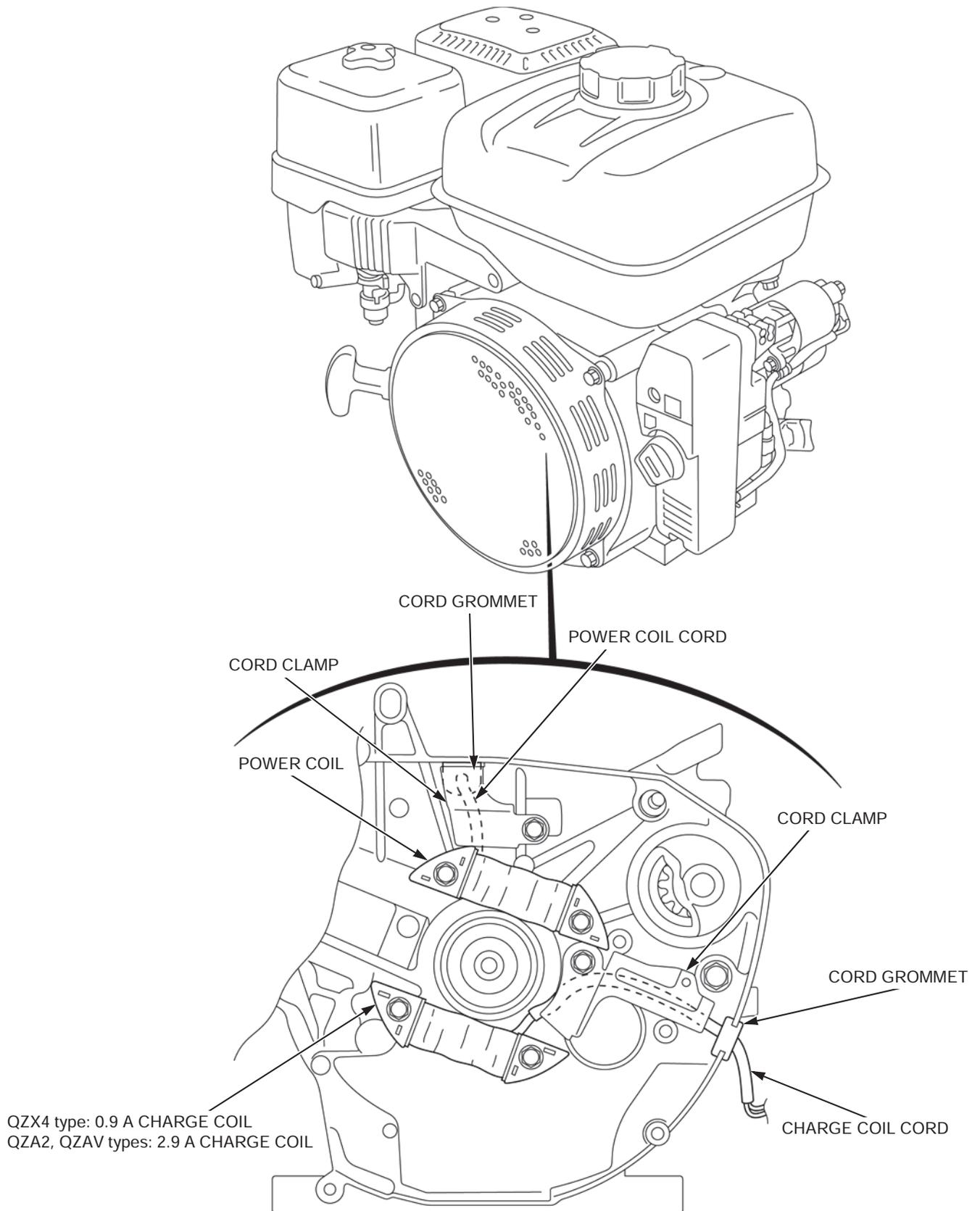
Item	Tread Dia. (mm)	Torque values		
		N·m	kgf·m	lbf·ft
Crankcase cover bolt	M8 x 1.25	24	2.4	17
Cylinder head bolt	M10 x 1.25	35	3.5	26
Oil drain bolt	M12 x 1.5	22.5	2.25	17
Connecting rod bolt	M8 x 1.25 (Special bolt)	14	1.4	10
Rocker arm pivot bolt	M8 x 1.25 (Special bolt)	24	2.4	17
Rocker arm pivot adjusting nut	M6 x 0.5	10	1.0	7
Spark plug	M14 x 1.25	18	1.8	13
Flywheel nut (iGX240UT2)	M16 x 1.5 (Special nut)	128	13.1	94
Flywheel nut (iGX340UT2)	M16 x 1.5 (Special nut)	170	17.3	125
Fuel tank nut/bolt	M8 x 1.25	24	2.4	17
Fuel tank joint	M10 x 1.25	2	0.2	1.5
Air cleaner elbow nut	M6 x 1.0	9	0.9	6.6
Muffler nut	M8 x 1.25	24	2.4	17
Exhaust pipe nut	M8 x 1.25	24	2.4	17
Starter motor stud bolt	M10 x 1.25	40	4.1	30
Fan cover stud bolt	M8 x 1.25	23	2.3	17
Combination switch nut	M18 x 1.0	4.9	0.50	3.6
Fuel strainer cup	M24 x 1.0	3.9	0.40	2.9
ECM screw/washer	M4 x 0.7	2.1	0.21	1.5
Motor case set screw A/B	M4 x 0.7	2.1	0.21	1.5
Starter motor nut	M8 x 1.25	8.8	0.90	6.5
Jet set screw	M5 x 0.8	0.3	0.03	0.22

## LUBRICATION & SEAL POINTS

Location	Material	Remarks
Crankshaft crankpin and gear	Engine oil	
Piston outer surface		
Piston pin outer surface		
Piston rings		
Cylinder inner surface		
Connecting rod big and small end bearings		
Connecting rod bolt threads and seating surface		
Camshaft cam profiles and bearings		
Valve lifter stem and slipper		
Valve stem sliding surface and stem end		
Rocker arm tappet surfaces and pivot		
Rocker arm pivot threads and pivot		
Flywheel nut threads and seating surface		
Cylinder head bolt threads and seating surface		
Balancer shaft bearings and gear		
Each oil seal lip		
Each O-ring		
Recoil starter case cutout		
Recoil starter ratchet sliding surface		
Recoil starter spring retainer inside	Use molybdenum solution (mixture of the engine oil and molybdenum grease with the ratio 100 g grease: 70 cc oil)	When installing a new camshaft
Camshaft cam profile		
Recoil starter center screw threads	Threebond® 2430 or equivalent	
Crankcase cover mating surface	Liquid sealant (Hondabond HT, Hondabond 4, or equivalent)	

# HARNESS AND TUBE ROUTING

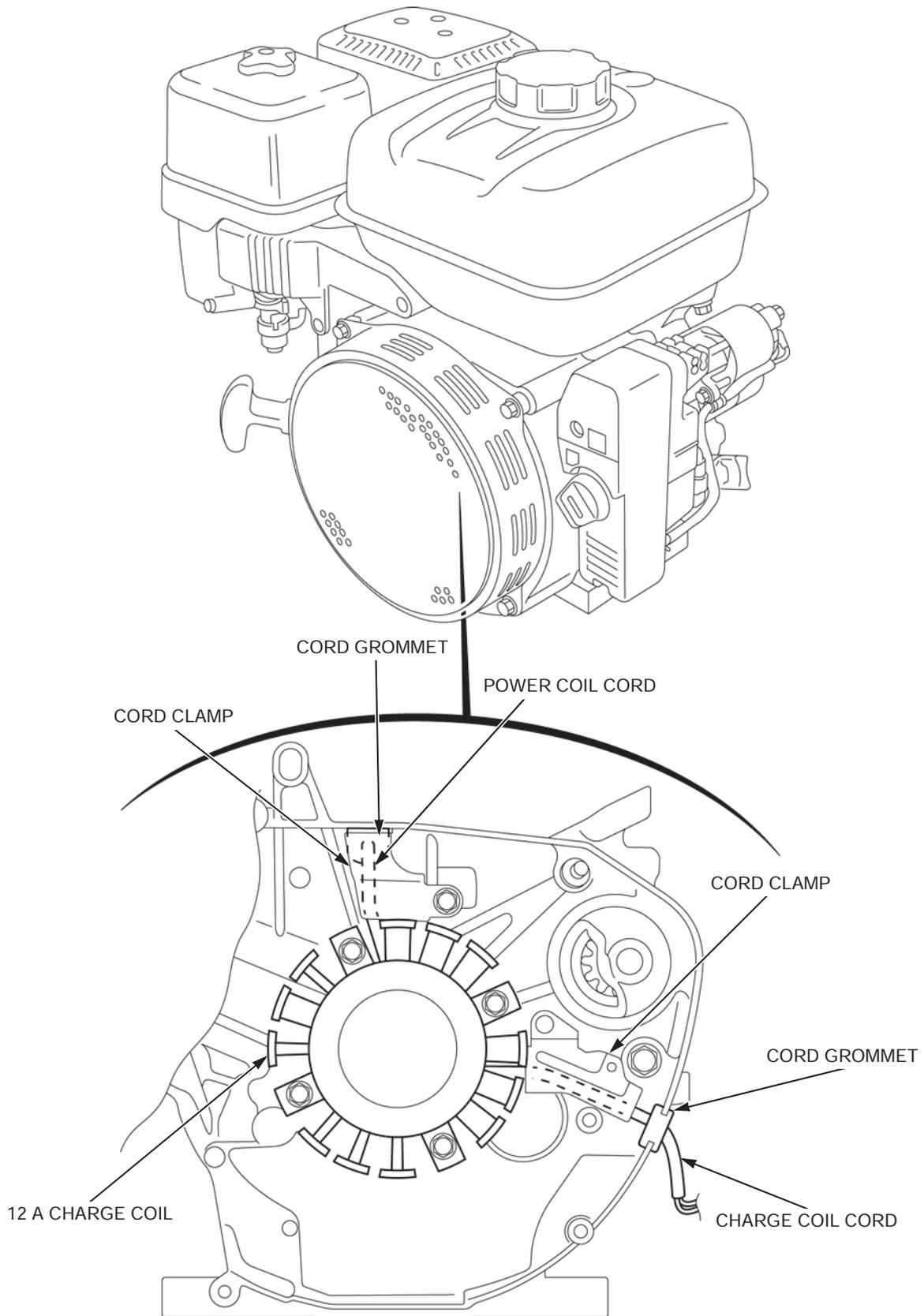
QZX4, QZA2, QZAV types:



## SERVICE INFORMATION

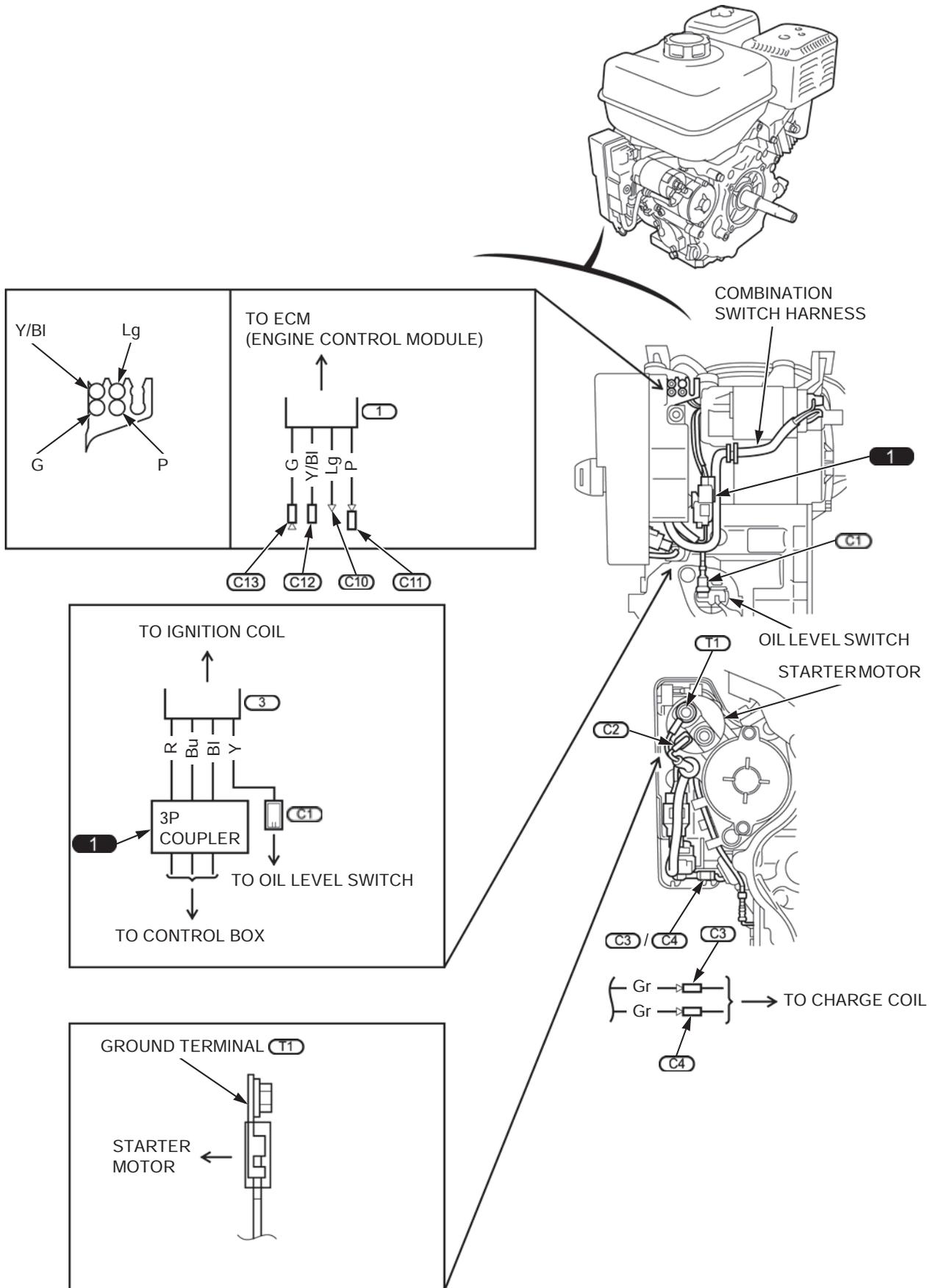
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QZN2 type:



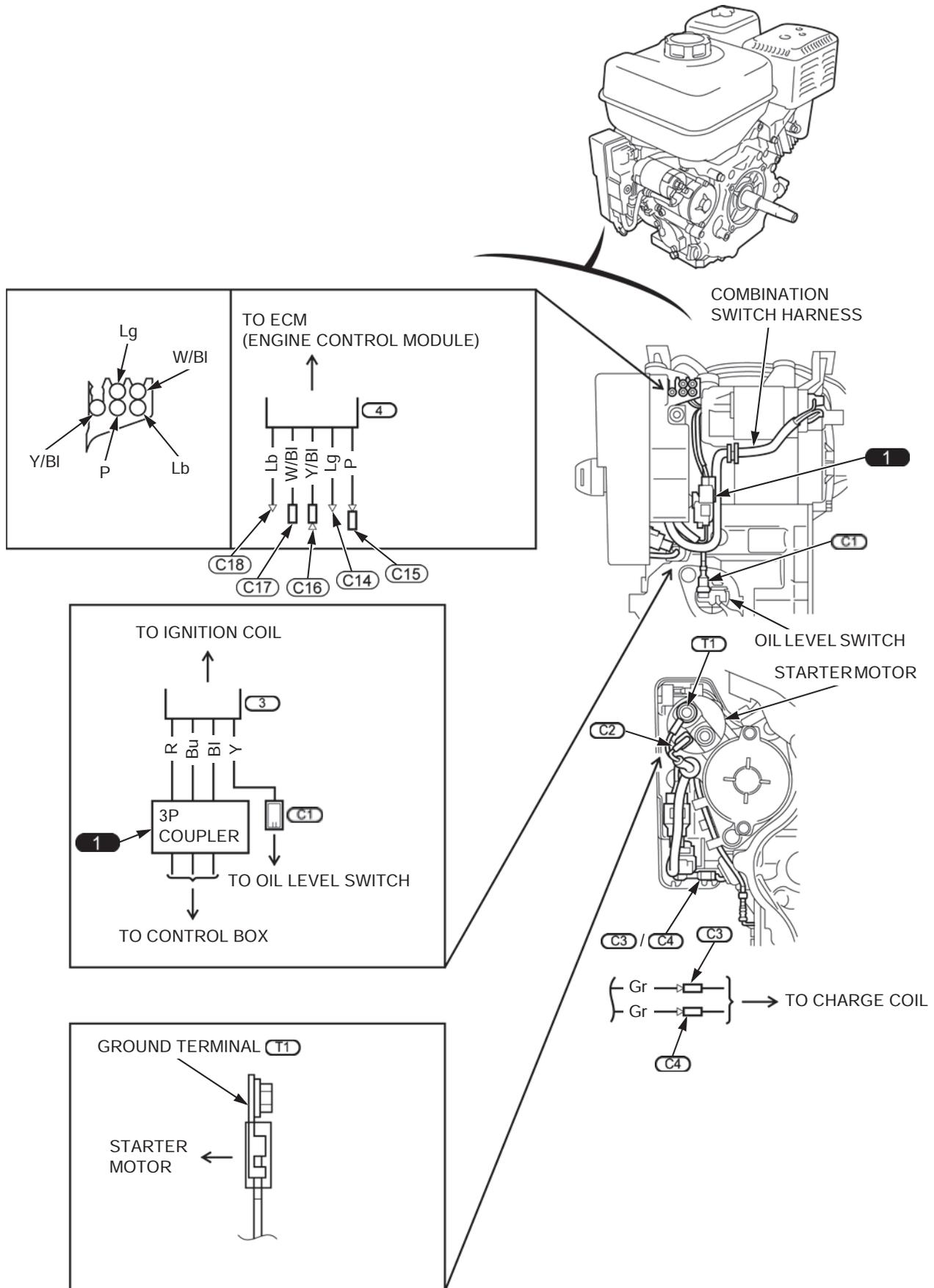
## SERVICE INFORMATION

QXX4, QZA2, QZN2 types:



# SERVICE INFORMATION

QZAV type:



# 4. TROUBLESHOOTING

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

## TROUBLESHOOTING

### BEFORE TROUBLESHOOTING

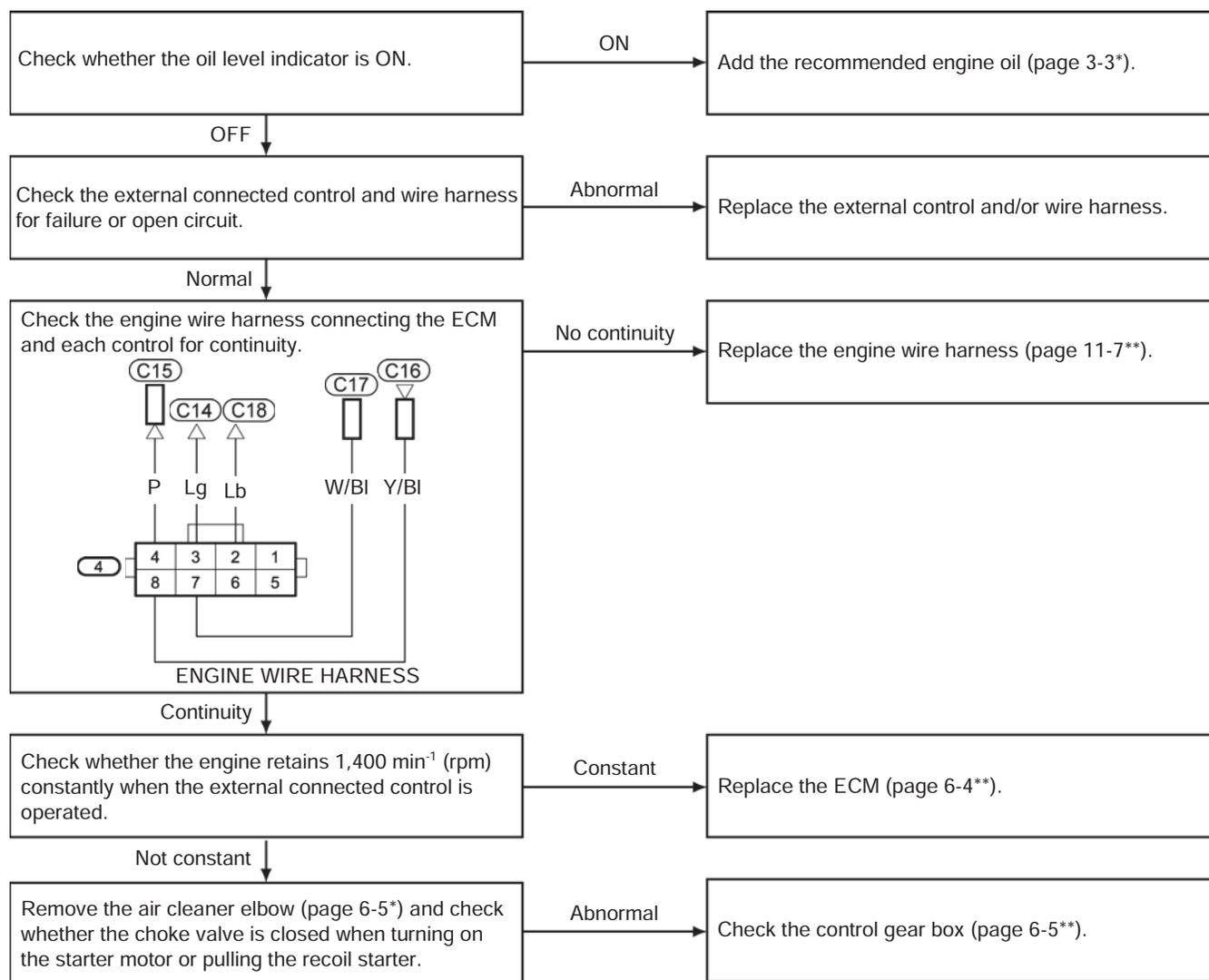
- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Check for sufficient fresh fuel in the fuel tank.
- Read the circuit tester's operation instructions carefully, and observe the instructions during inspection.
- Disconnect the battery cable before continuity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



# 8. CHARGING SYSTEM

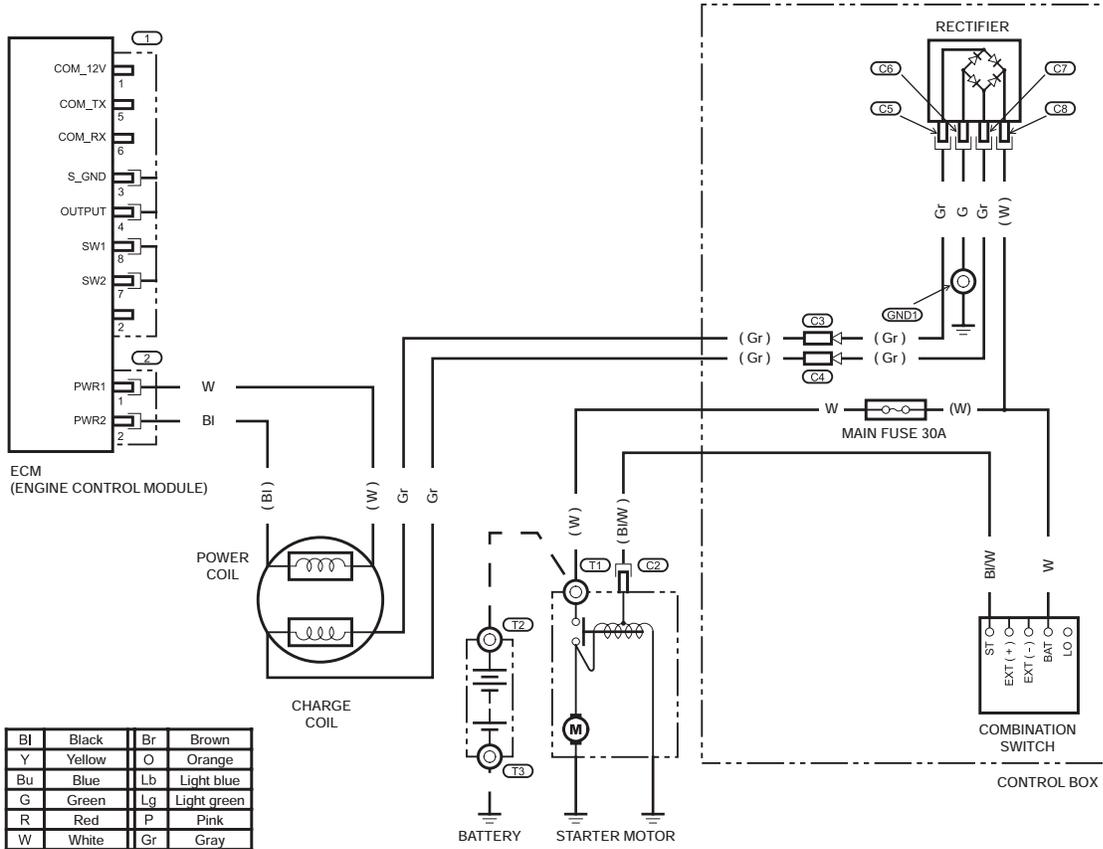
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CHARGING SYSTEM DIAGRAM.....	8-2	CHARGE/POWER COIL REMOVAL/ INSTALLATION .....	8-4
BEFORE TROUBLESHOOTING.....	8-2	CHARGE/POWER COIL INSPECTION .....	8-6
CHARGING SYSTEM TROUBLESHOOTING.....	8-3		

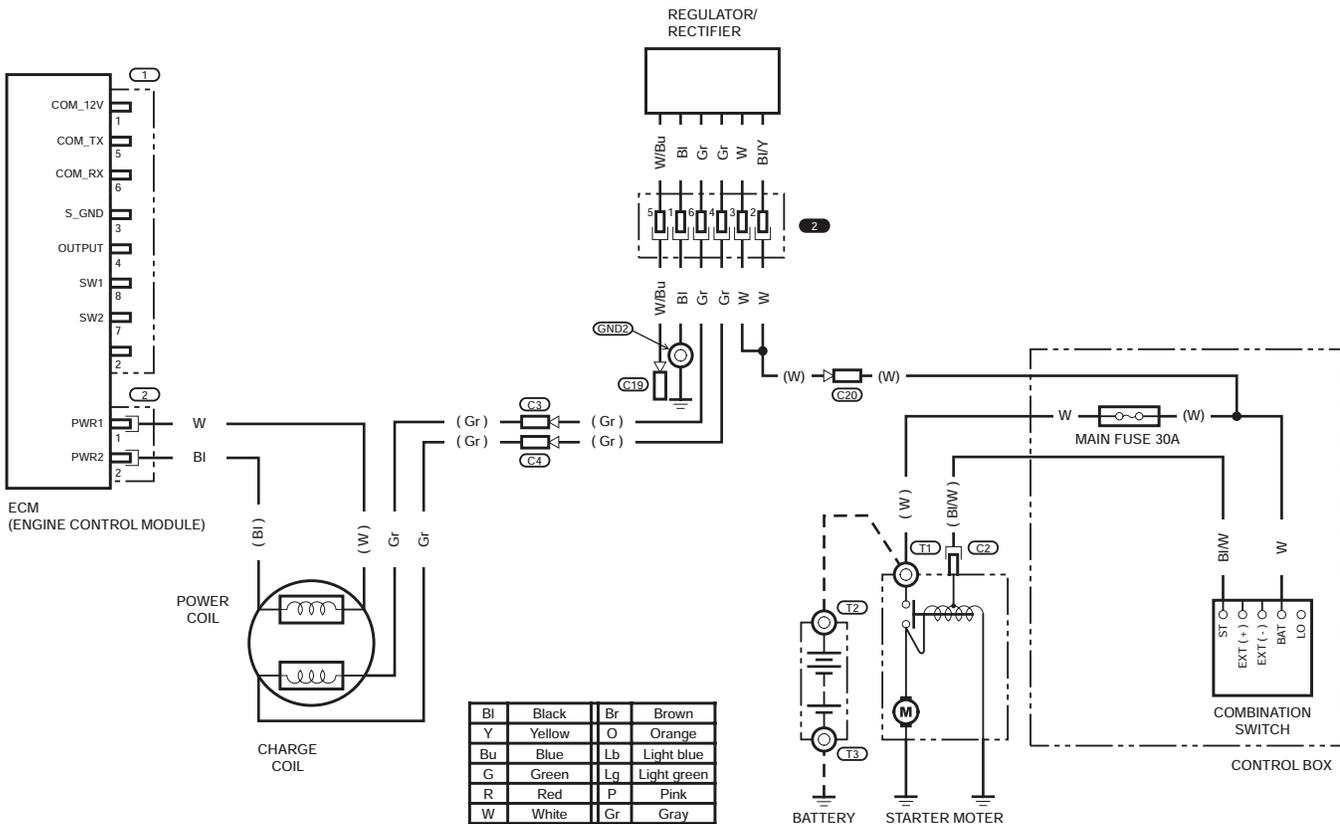
## CHARGING SYSTEM

# CHARGING SYSTEM DIAGRAM

QZX4, QXA2, QZAV types:



QZN2 type:



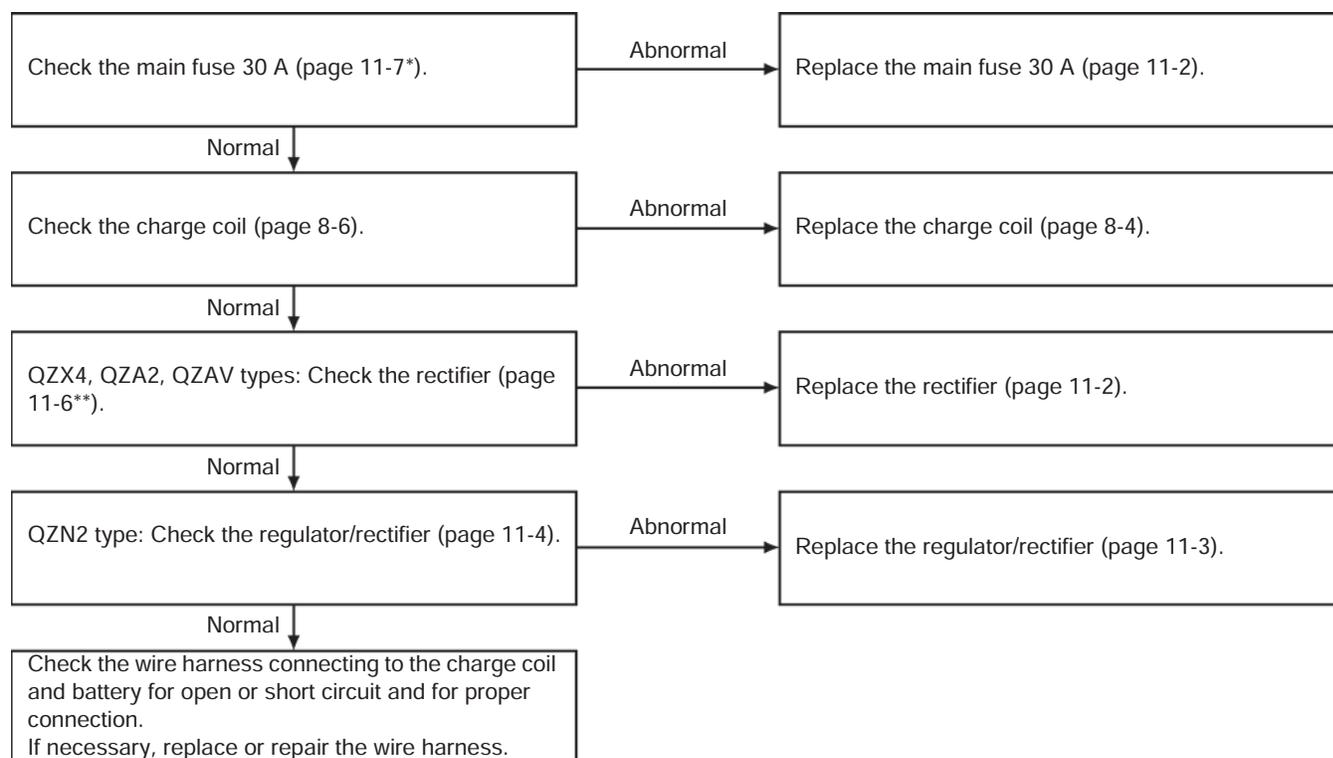
## BEFORE TROUBLESHOOTING

- 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)



**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)

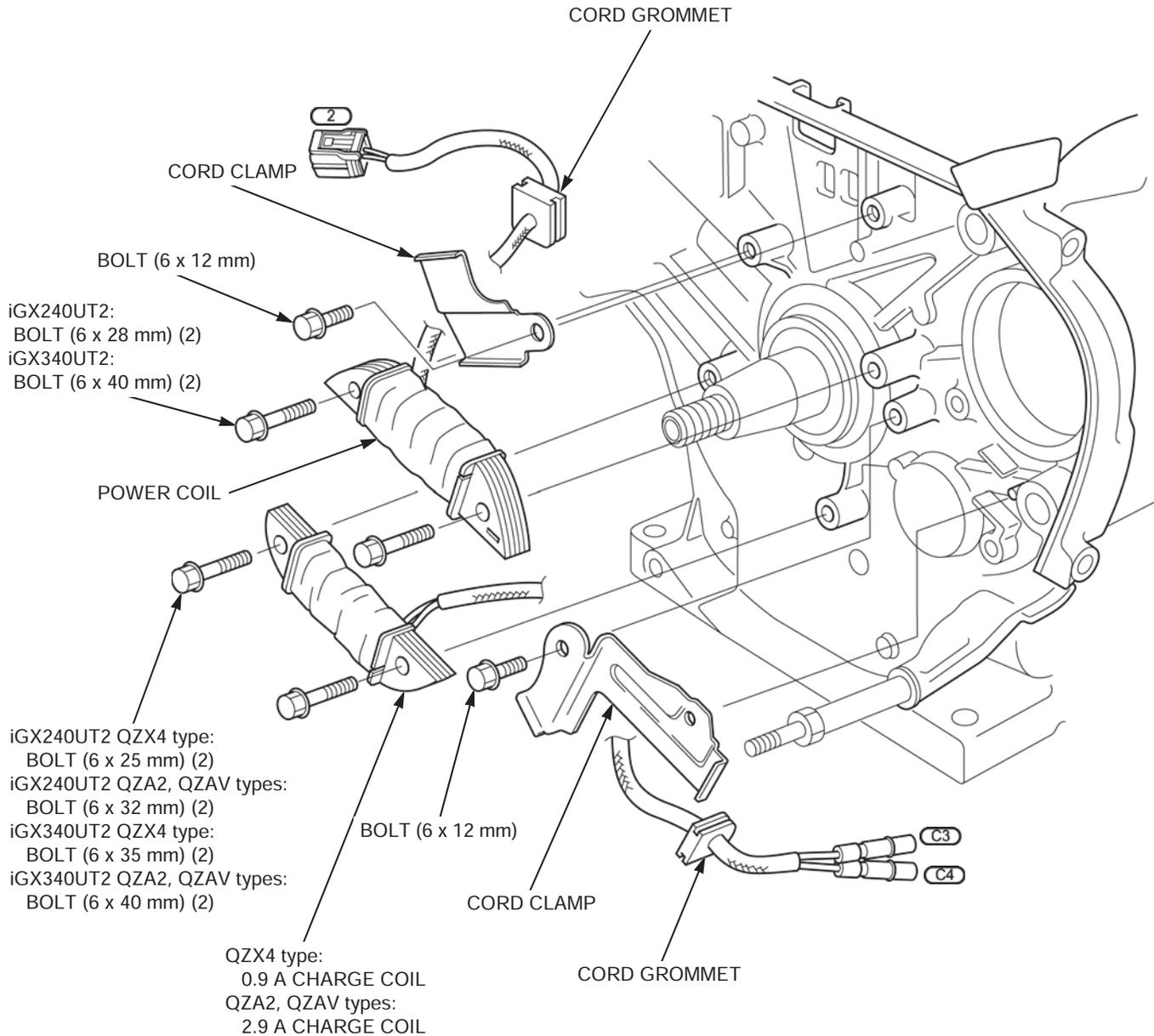
Remove the following:

- Fan cover (page 5-2\*)
- Ignition coil (page 9-3\*)
- Starter motor (page 10-8\*)
- Flywheel (page 8-7\*\*)

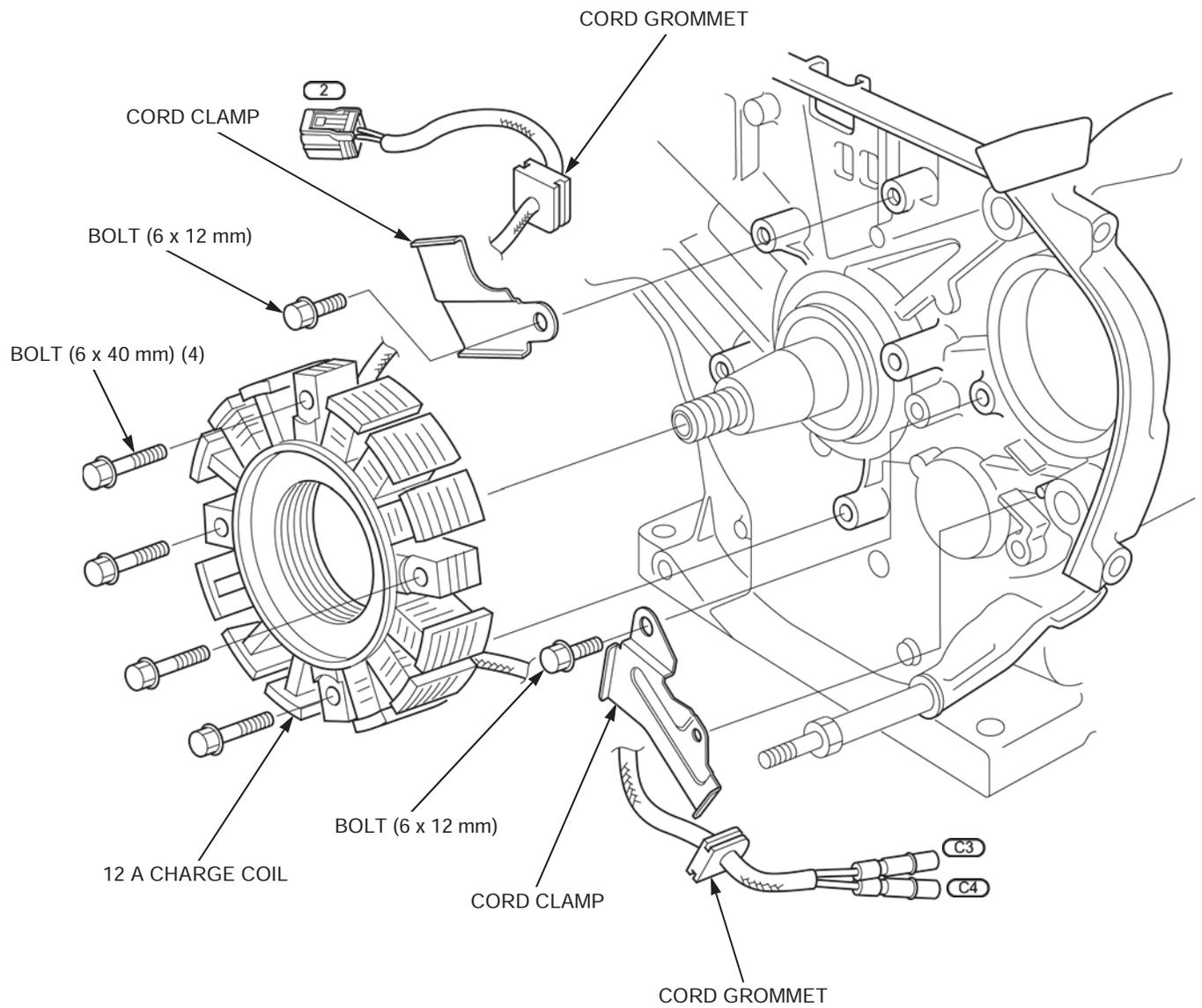
Installation is in the reverse of removal.

When installing the cord clamp, refer to HARNESS AND TUBE ROUTING (page 2-5).

**QZX4, QZA2, QZAV types:**



QZN2 type:



## 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  $\Omega$**

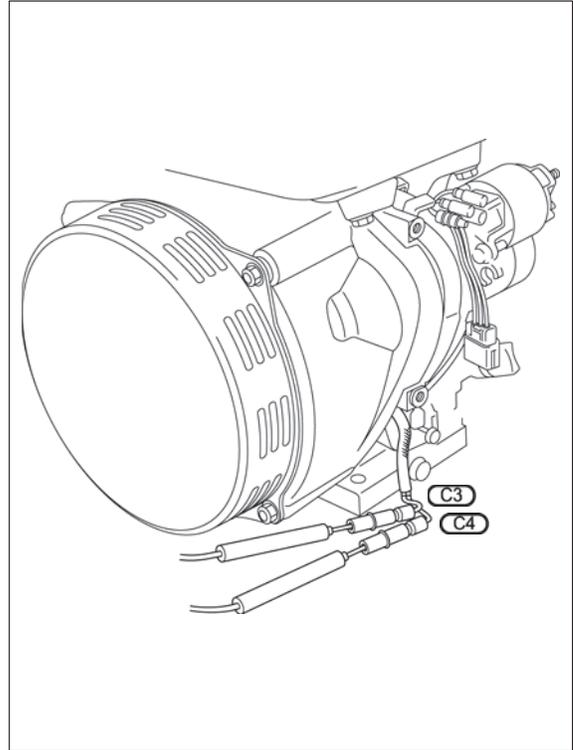
**QZA2, QZAV types (2.9 A): 0.4 – 0.8  $\Omega$**

**QZN2 type (12 A): 0.22 – 0.34  $\Omega$**

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:

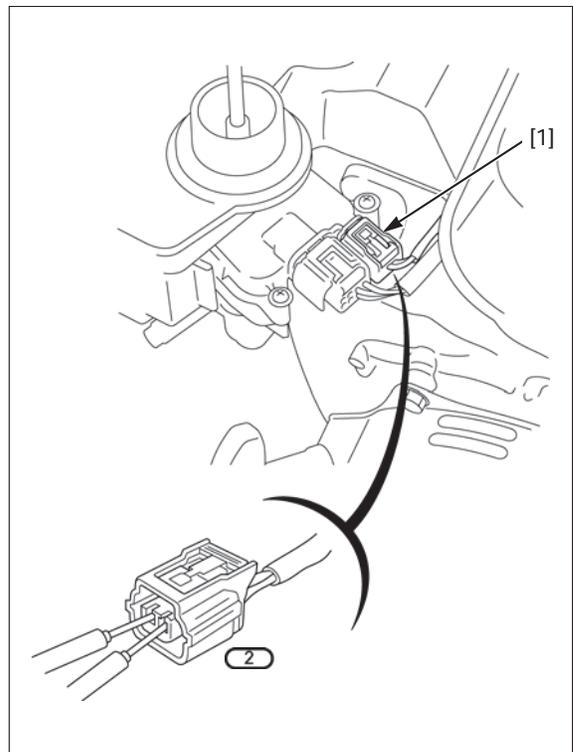
**QZX4, QZA2, QZAV types: 2.9 – 4.5  $\Omega$**

**QZN2 type: 2.8 – 4.4  $\Omega$**

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.



# 11. OTHER ELECTRICAL

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CONTROL BOX DISASSEMBLY/  
ASSEMBLY ..... 11-2

OIL LEVEL SWITCH REMOVAL/  
INSTALLATION ..... 11-4

REGULATOR/RECTIFIER INSPECTION ... 11-4

## OTHER ELECTRICAL

**CONTROL BOX DISASSEMBLY/ASSEMBLY**

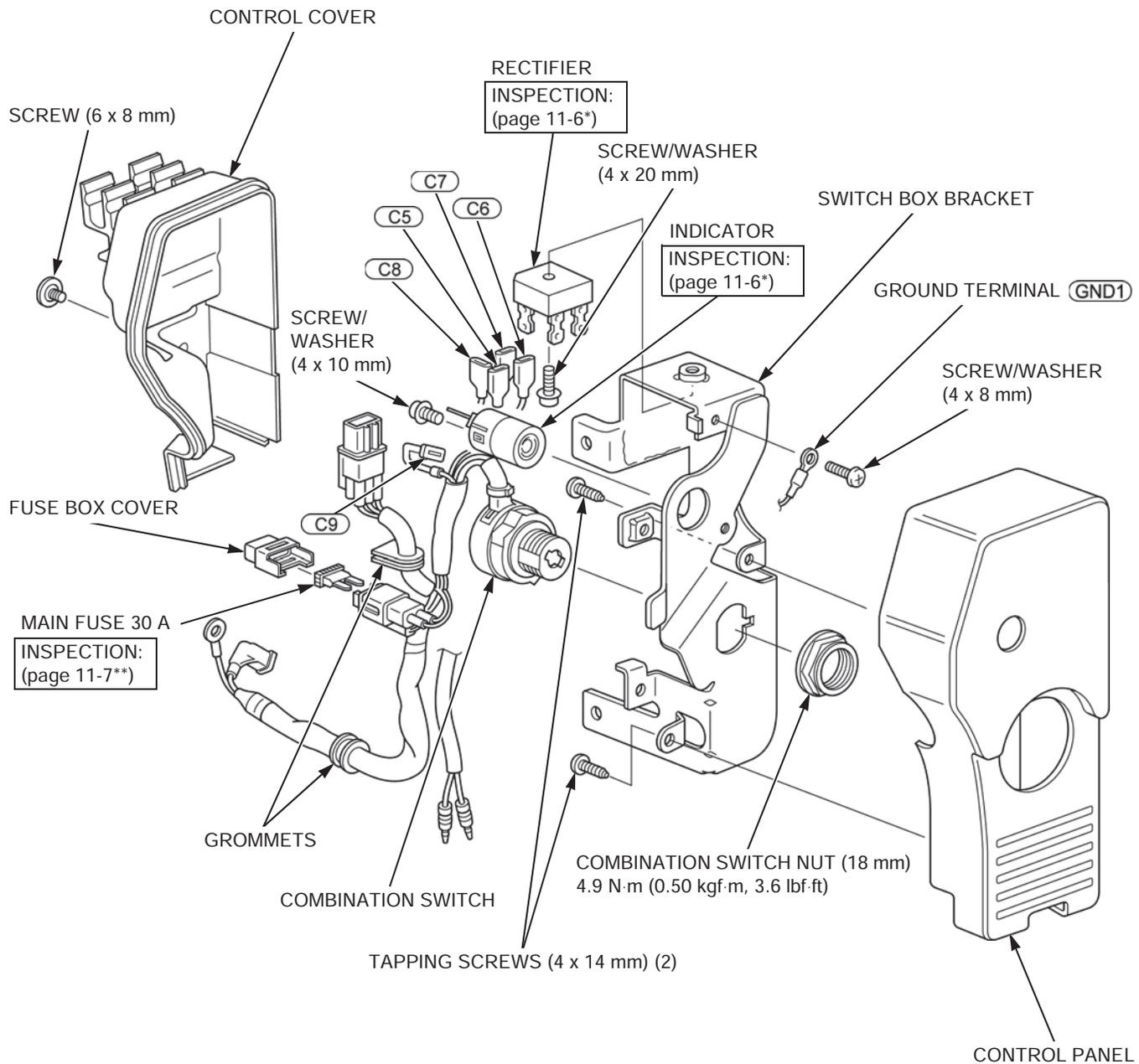
(\*) Refer to page of base shop manual (iGX270UT2-iGX390T2/UT2 Supplement Y)

(\*\*) Refer to page of base shop manual (GX240-GX270-GX340-GX390)

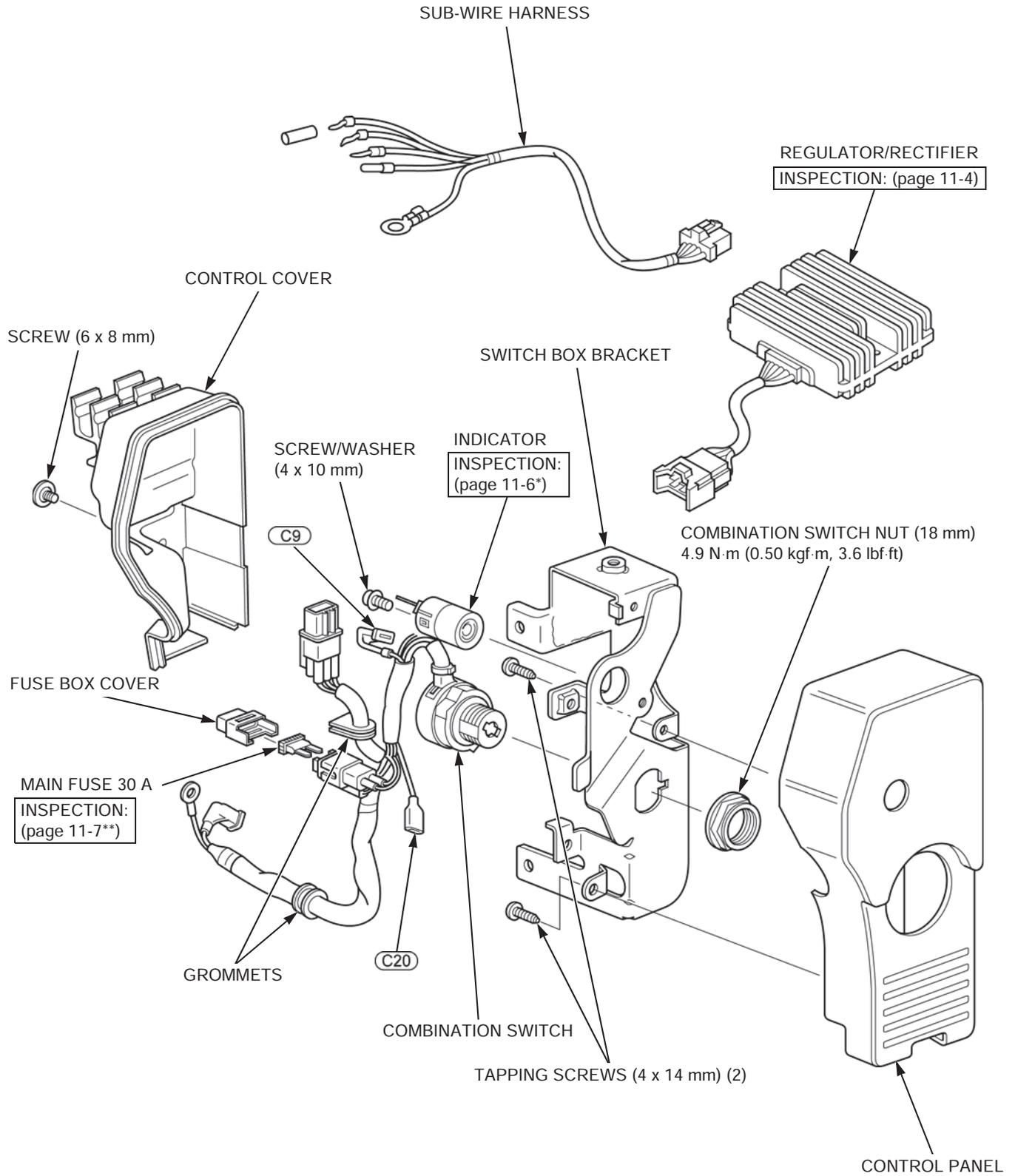
Remove the control box (page 11-3\*).

When assembling the control box, refer to HARNESS AND TUBE ROUTING (page 2-5).

**QZX4, QZA2, QZAV types:**



QZN2 type:



## 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).

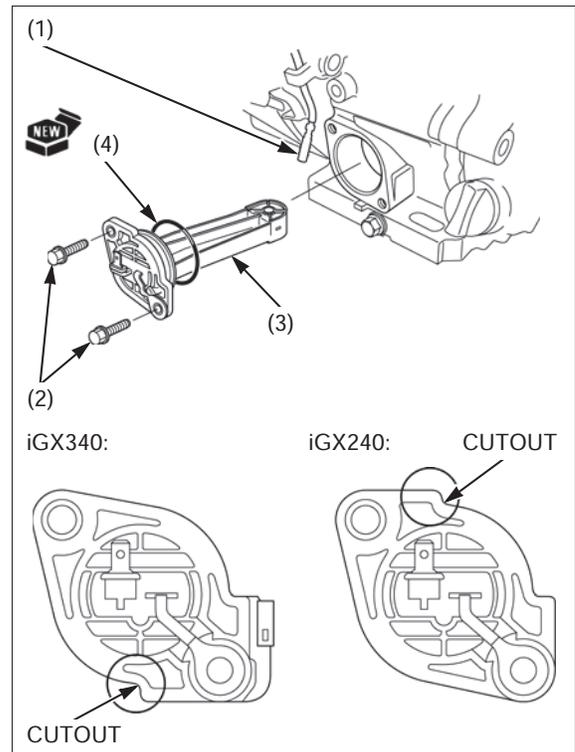
Remove the two 6 x 16 mm flange bolts (2), oil level switch (3), and O-ring (4).

Replace the O-ring with a new one.

Installation is in the reverse order of removal.

#### NOTICE

- Install the oil level switch to the crankcase securely as shown.
- Wrong assembly can cause engine trouble.



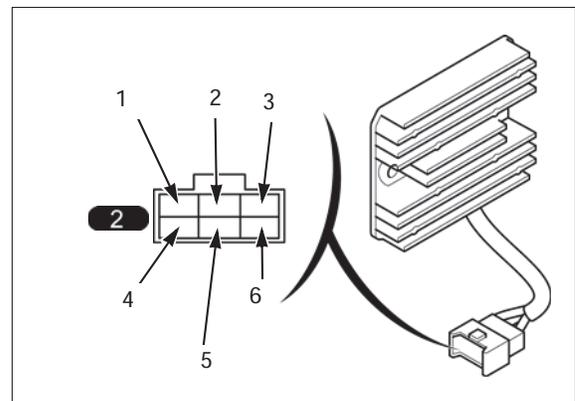
### REGULATOR/RECTIFIER INSPECTION

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 k $\Omega$ /VDC, 9 k $\Omega$ /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.



Unit: k $\Omega$

		Tester (+) probe					
		1	2	3	4	5	6
Tester (-) probe	1	—	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	2	$\infty$	—	1 - 600	2 - 230	2 - 600	2 - 230
	3	$\infty$	$\infty$	—	0.09 - 40	2 - 400	0.09 - 40
	4	$\infty$	$\infty$	2 - 230	—	10 - 1,000	4 - 400
	5	$\infty$	$\infty$	$\infty$	$\infty$	—	$\infty$
	6	$\infty$	$\infty$	2 - 230	4 - 400	10 - 1,000	—

# 15. WIRING DIAGRAMS

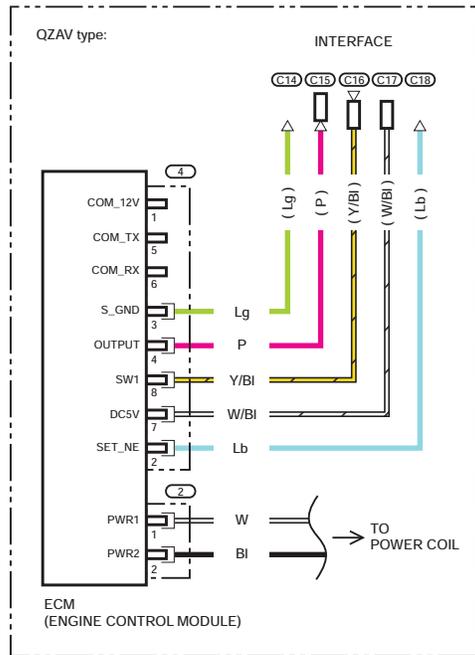
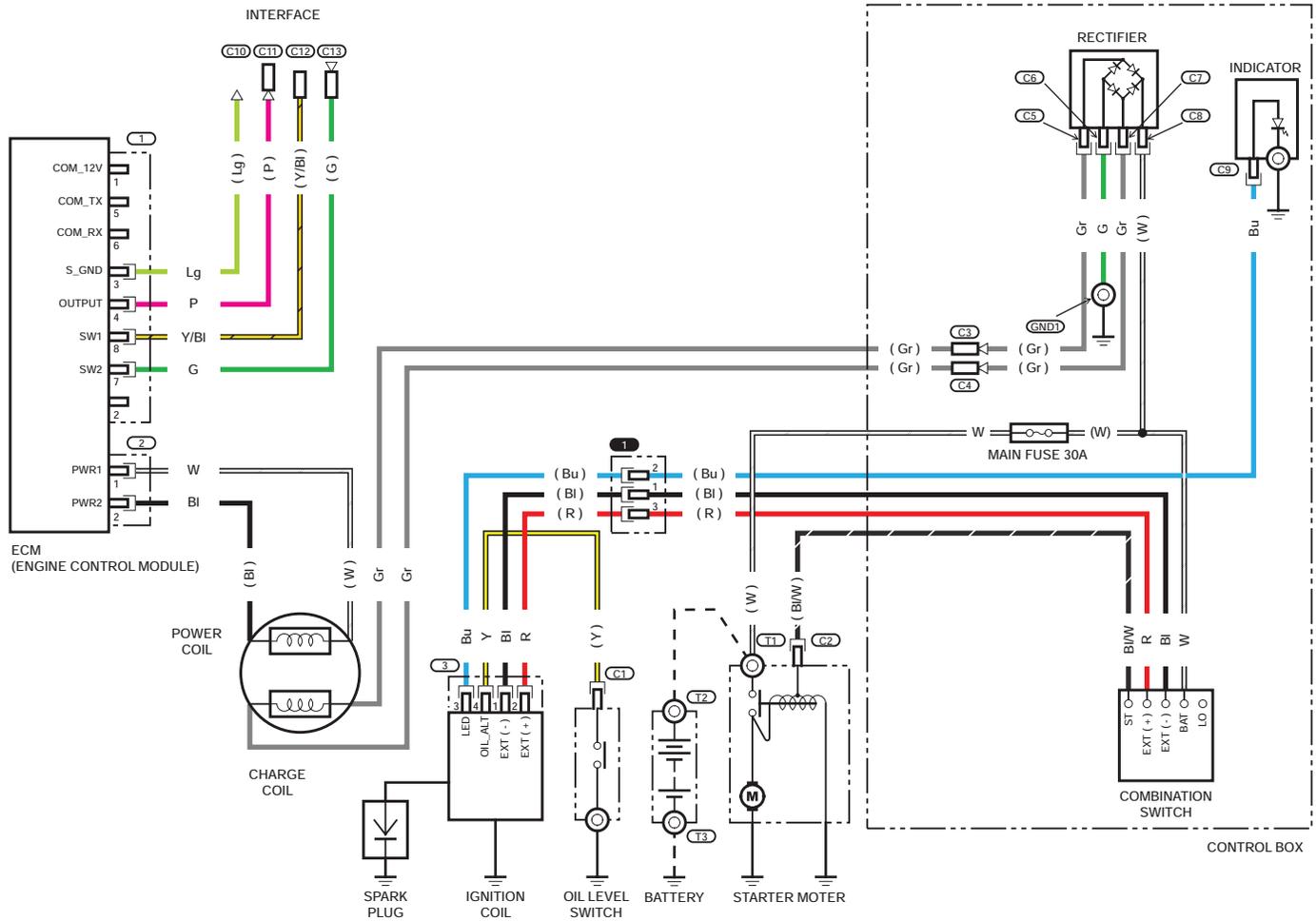
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WIRING DIAGRAMS ..... 15-2

# WIRING DIAGRAMS

## WIRING DIAGRAMS

QZX4, QZA2, QZAV types:



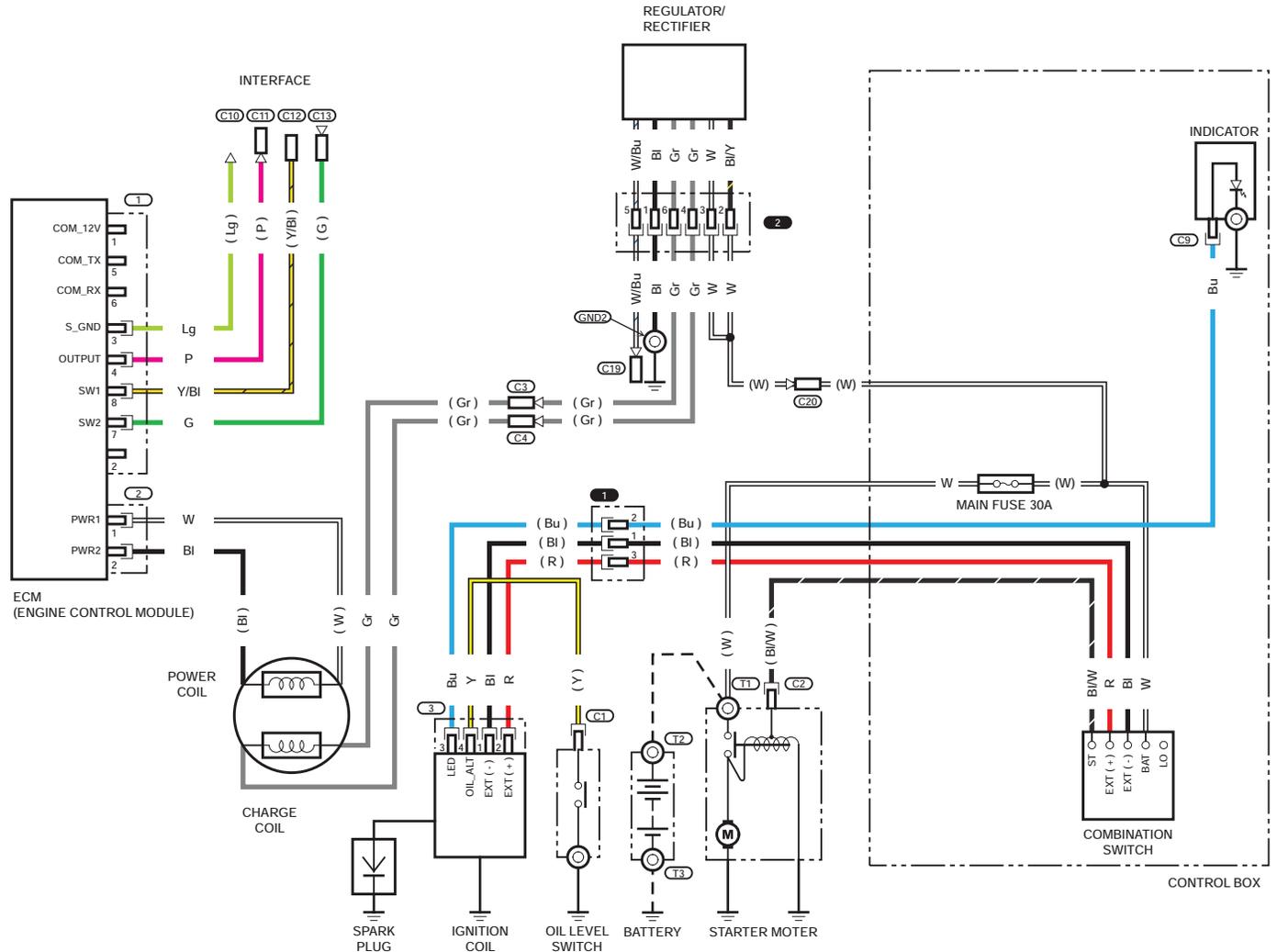
COMBINATION SWITCH

	EXT (+)	EXT (-)	BAT	ST
OFF				
ON	<input type="radio"/>	<input type="radio"/>		
START	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

TWO COLORED WIRE (EXAMPLE:YELLOW/RED)

QZN2 type:



COMBINATION SWITCH

	EXT (+)	EXT (-)	BAT	ST
OFF				
ON	○	○		
START	○	○	○	○

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

TWO COLORED WIRE (EXAMPLE:YELLOW/RED)

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