YAMAHA

EF4000DE
YG4000D
Service Manual

LIT-19616-00-91

FOREWORD

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha generators have a basic understanding of the mechanical precepts and procedures inherent to generator repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit for use and/or unsafe.

Yamaha Motor Company Ltd. is continually striving to further improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

NOTE:
This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.

EF4000DE, YG4000D
SERVICE MANUAL

1st Edition, December 2000

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LIT-19616-00-91

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠
The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:
A CAUTION indicates special precautions that must be taken to avoid damage to the machine.

NOTE:
A NOTE provides key information to make procedures easier or clearer.

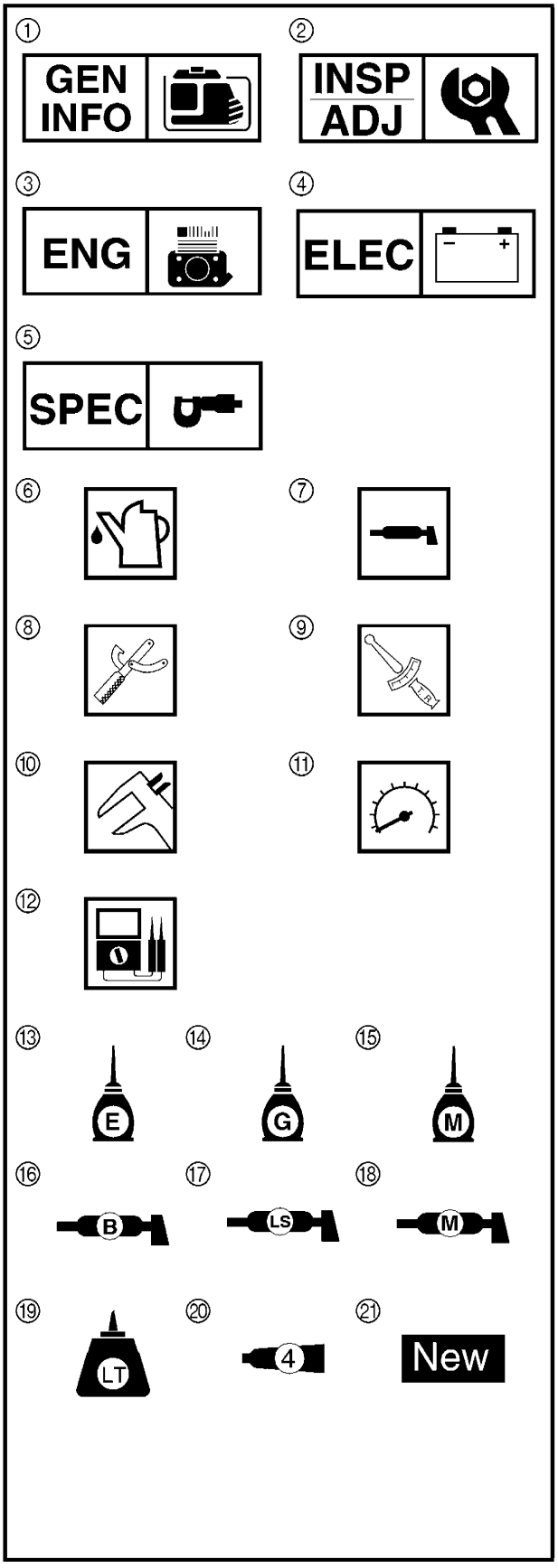
MANUAL FORMAT

The procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.
In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings
  Pitting/damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying the correct disassembly and assembly procedures.



ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① through ⑤ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Periodic inspections and adjustments
③ Engine
④ Electrical
⑤ Specifications

Illustrated symbols ⑥ through ⑫ are used to identify the specific tools and test equipment.

⑥ Filling fluid
⑦ Lubricant
⑧ Special tool
⑨ Tightening
⑩ Wear limit, clearance
⑪ Engine speed
⑫ Ω, V, A

Illustrated symbols ⑬ through ㉑ in the exploded diagram indicate the grades of lubricant and the locations of the lubrication points.

⑬ Apply engine oil
⑭ Apply gear oil
⑮ Apply molybdenum disulfide oil
⑯ Apply wheel bearing grease
⑰ Apply lightweight lithium-soap base grease
⑱ Apply molybdenum disulfide grease
⑲ Apply a locking agent (LOCTITE®)
⑳ Apply Yamaha bond
㉑ Use a new one

INDEX

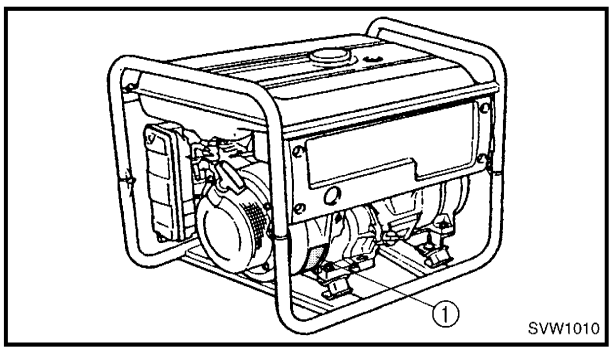
CHAPTER 1. GENERAL INFORMATION

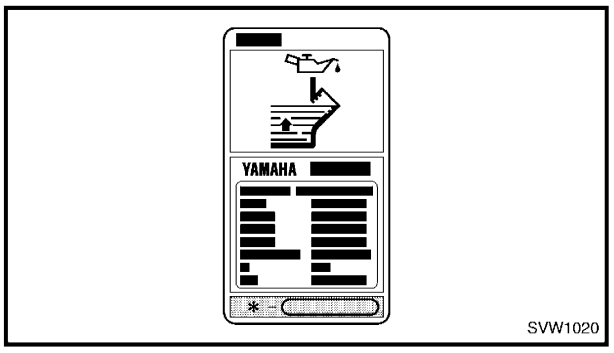
CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS

CHAPTER 3. ENGINE

CHAPTER 4. ELECTRICAL

CHAPTER 5. SPECIFICATIONS





GENERAL INFORMATION

MACHINE IDENTIFICATION

SERIAL NUMBER

The serial number is printed on a label ① which is affixed to the generator as shown.

NOTE:

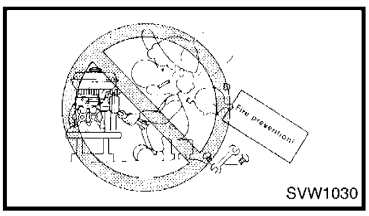
The first three characters of this number are for model identification, the remaining digits are the unit production number.

STARTING SERIAL NUMBER

EF4000DE: 7VW-220101~
YG4000D: 7VW-250101~

NOTE:

Designs and specifications are subject to change without notice.



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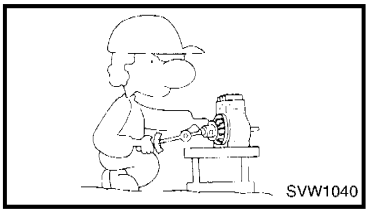
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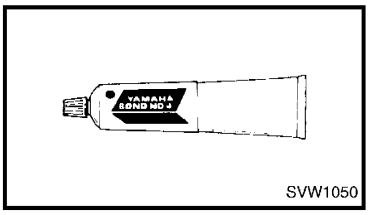

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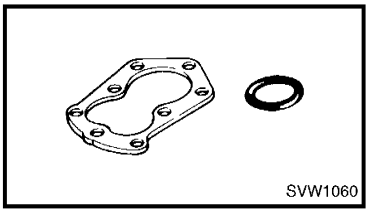
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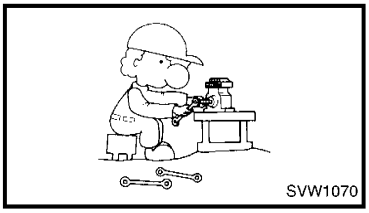
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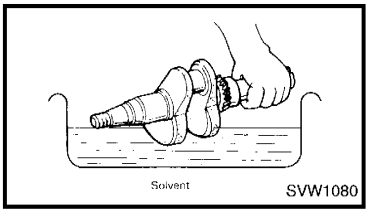

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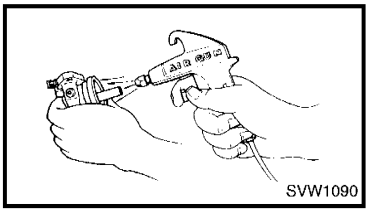
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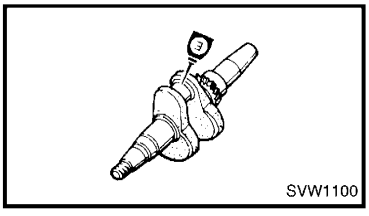

SVW1100

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

CAUTION ON SERVICE

Fire prevention

When servicing the engine, always keep the engine and yourself away from fire.

NOTES ON SERVICE

1. Correct tools
   Be sure to use the correct special tool for the job to guard against damage.

2. Oil, grease and seals
   Be sure to use genuine Yamaha oils, grease and sealers, or the equivalents.

3. Expendable parts
   Always replace the gaskets, O-rings, cotter pins and circlips with new parts when servicing engine.

4. Tightening torque
   Be sure to follow torque specifications. When tightening bolts, nuts or screws, start with the largest-diameter fastener and work from an inner position to an outer position in a crisscross pattern.

5. Notes on disassembly and assembly

a. Parts should be cleaned in solvent and blown dry with compressed air after disassembly.

b. Contact surfaces of moving parts should be oiled when reassembled.

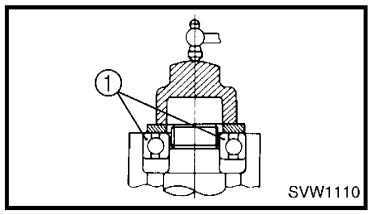
c. Make sure that the parts, move smoothly after each section of the machine is assembled.

ALL REPLACEMENT PARTS

We recommend the use of genuine Yamaha parts for all replacements. Use oil and/or grease, recommended by Yamaha, for assembly and adjustment.

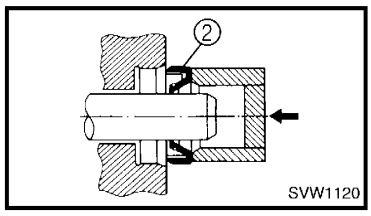
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gaskets surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



BEARINGS AND OIL SEALS

Install the bearing(s) ① and oil seal(s) ② with their manufacture's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

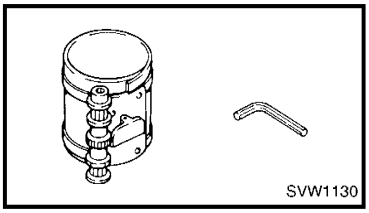


CAUTION:

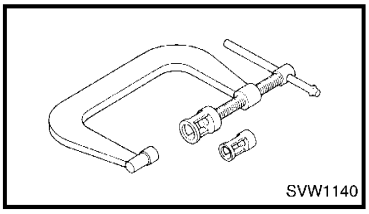
Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.

SPECIAL TOOLS AND TESTERS

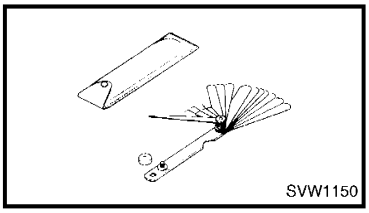
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



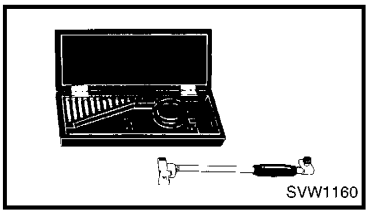
1. Piston ring compressor
   P/N. YU-33294, 90890-05158
   This tool is used to compress the piston rings when installing the piston.



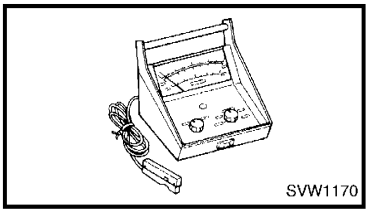
2. Valve spring compressor
   P/N. YM-01253, 90890-01253
   This tool is used to remove the valve springs.



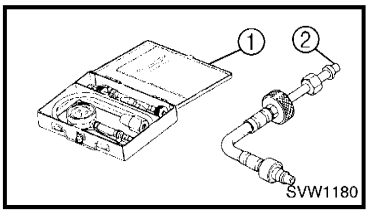
3. Thickness gauge
   P/N. YU-26900-9, 90890-03079
   This gauge is used to adjust valve clearance, piston clearance and piston ring end gap.



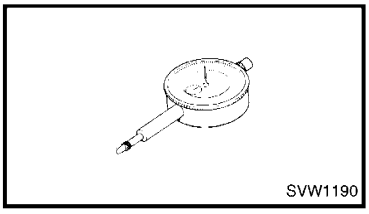
4. Cylinder gauge
   Commercially obtainable
   This instrument is used for checking cylinder bore size and condition.



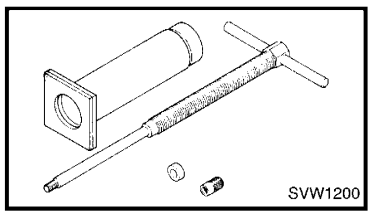
5. Inductive tachometer
   P/N. YU-8036-A
   Engine tachometer
   P/N. 90890-03113
   This instrument is used for reading engine r/min.



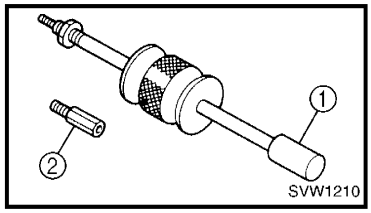
6. Compression gauge ①
   P/N. YU-33223, 90890-03081
   Adapter ②
   P/N. YU-33223-3, 90890-04082
   This gauge is used for checking engine compression.



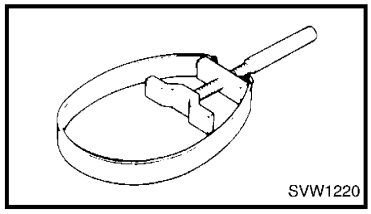
7. Dial gauge
   P/N. YU-03097, 90890-03097
   This instrument is used for checking crankshaft side clearance.



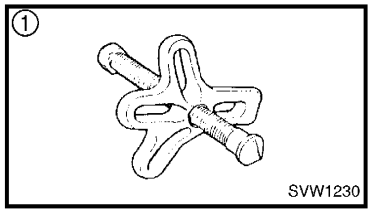
8. Piston pin puller
   P/N. YU-01304, 90890-01304
   This tool is used to remove the piston pin.



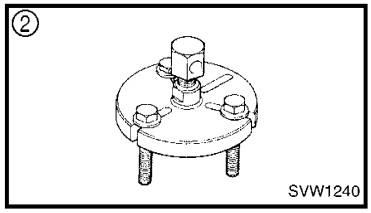
9. Rotor shock puller ①
   P/N. YU-1047, 90890-01259
   Rotor puller attachment (M14 × 1.25) ②
   P/N. YU-1379, 90890-01379
   This tool is used to remove the rotor.

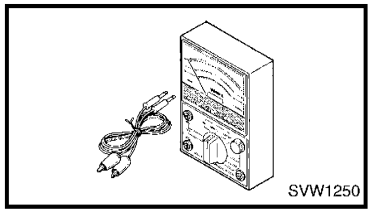


10. Sheave holder
    P/N. YS-01880, 90890-01701
    This tool is necessary for holding the flywheel.

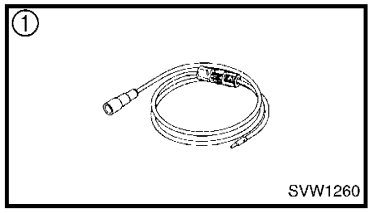


11. Rotor puller
    ① P/N. YU-33270
    ② P/N. 90890-01362
    This tool is necessary for removing the flywheel.

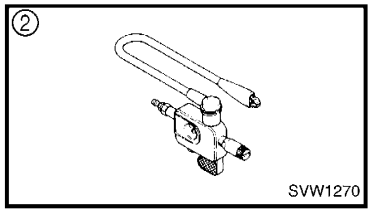




12. Pocket tester
    P/N. YU-03112, 90890-03112
    This instrument is necessary for checking the electrical system.



13. Dynamic spark tester ①
    P/N. YM-34487
    Ignition checker ②
    P/N. 90890-06754
    This instrument is necessary for checking the ignition system components.



PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to machines already in service as well as new machines that are being prepared for sale. All service technicians should be familiar with this entire chapter.

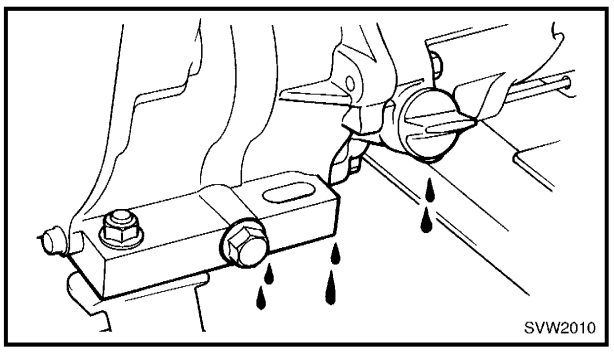
MAINTENANCE INTERVALS CHART

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions control. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are indicated as "*" in the chart.

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

Item	Remarks	Pre-Operation check (daily)	Initial	Every		
			1 month or 20 Hr	3 months or 50 Hr	6 months or 100 Hr	12 months or 300 Hr
*Spark plug	Check condition, adjust gap and clean. Replace if necessary.			●		
*Valve clearance	Check and adjust when engine is cold.					●
*Crankcase breather system	Check breather hose for cracks or damage. Replace if necessary.					●
*Idle speed	Check and adjust engine idle speed.					●
*Exhaust system	Check for leakage. Retighten or replace gasket if necessary.	●				
	Check muffler screen and spark arrester. Clean/replace if necessary.					●
Engine oil	Check oil level.	●				
	Replace.		●		●	
*Air filter	Clean. Replace if necessary.			●		
Fuel filter	Clean fuel cock and fuel tank filter. Replace if necessary.				●	
Fuel line	Check fuel hose for cracks or damage. Replace if necessary.	●				
*Choke lever (for YG4000D)	Check choke operation.	●				
Cooling system	Check for fan damage.					●
Starting system	Check recoil starter operation.	●				
*Decarbonization	More frequently if necessary.					●
Generation	Check the voltage meter indication.	●				
G.F.C.I. socket (for YG4000D)	Check operation. Repair if necessary.	●				
Fittings/fasteners	Check all fittings and fasteners. Correct if necessary.				●	
Battery (for EF4000DE)	Check battery fluid level. Add distilled water.			●		
	Check specific gravity and breather pipe operation. Correct if necessary.					●

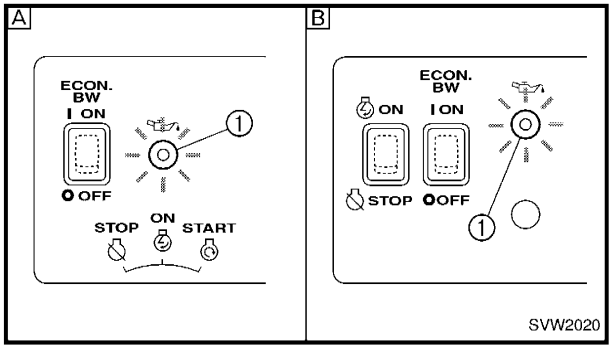
*: Related to emission control system.



ENGINE

ENGINE OIL LEAKAGE CHECKING

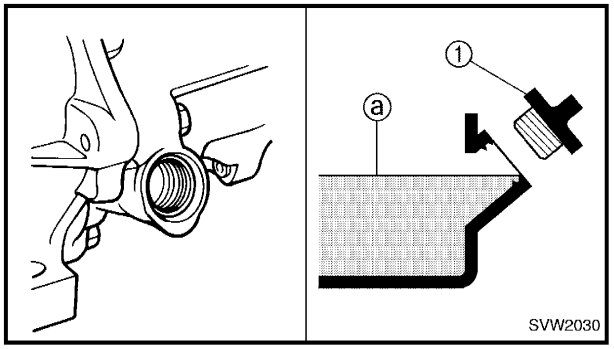
1. Check the areas outside of the engine for oil leakage.
   Oil leakage → Replace the gasket, oil seal, or O-ring.



OIL LEVEL CHECKING

1. Check:
   - Oil level with oil warning light ①
     Check whether the oil warning light flashes by operating the recoil starter.
     Oil warning light flashes → Add oil.
     Oil warning light does not flash → OK

A EF4000DE
B YG4000D

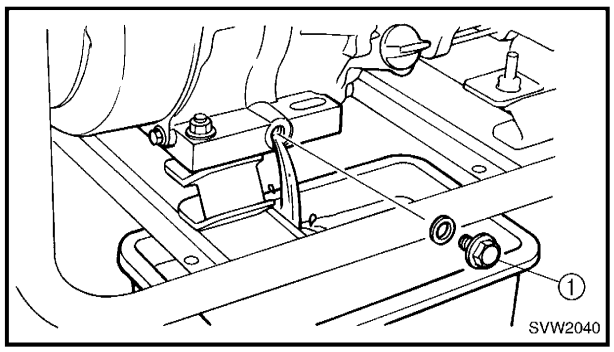


2. Remove:
   - Oil filler cap ①
3. Check:
   - Check that the engine oil is at the specified level ⓐ.

Oil level checking steps:

- Place the engine on a level surface.
- Warm up the engine for several minutes.
- Stop the engine.
- Check that the engine oil is at the specified level ⓐ. Add oil if necessary.

4. Install:
   - Oil filler cap

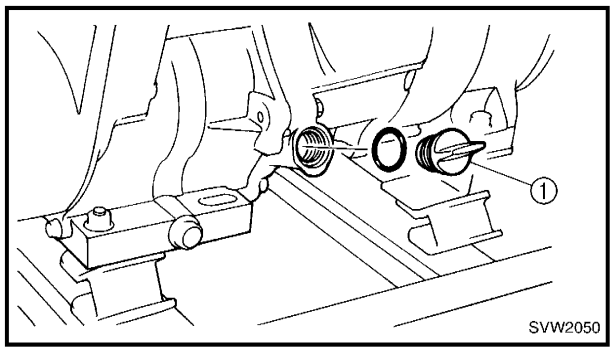


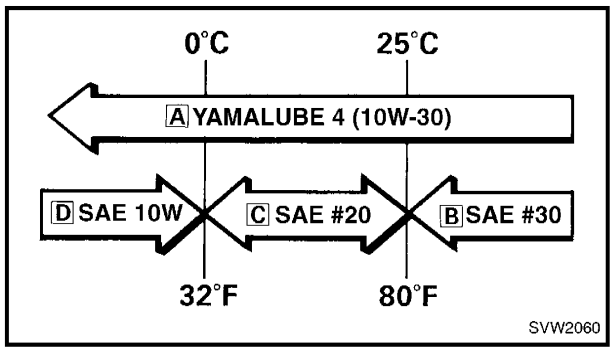
OIL REPLACEMENT

1. Warm up the engine for several minutes.
2. Stop the engine.
3. Place a receptacle under the engine.
4. Remove:
   - Oil drain bolt ①
5. Tilt the engine to drain the oil completely.

6. Tighten:
   - Oil drain bolt

Oil drain bolt:
30 Nm (3.0 m · kg, 22 ft · lb)



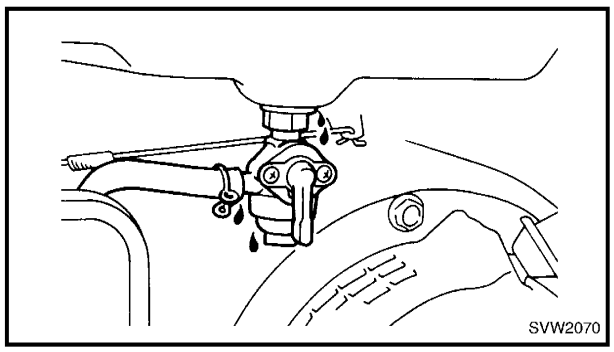


7. Remove:
   - Oil filler cap ①
8. Fill:

Recommended oil:
A YAMALUBE 4 (10W-30) or SAE 10W-30 type SE
B SAE #30
C SAE #20
D SAE 10W
Engine oil quantity:
1.0 L (0.88 Imp qt, 1.06 US qt)

NOTE:
Recommended engine oil classification:
API Service "SE" or "SF", if not available, "SD".

9. Install:
   - Oil filler cap

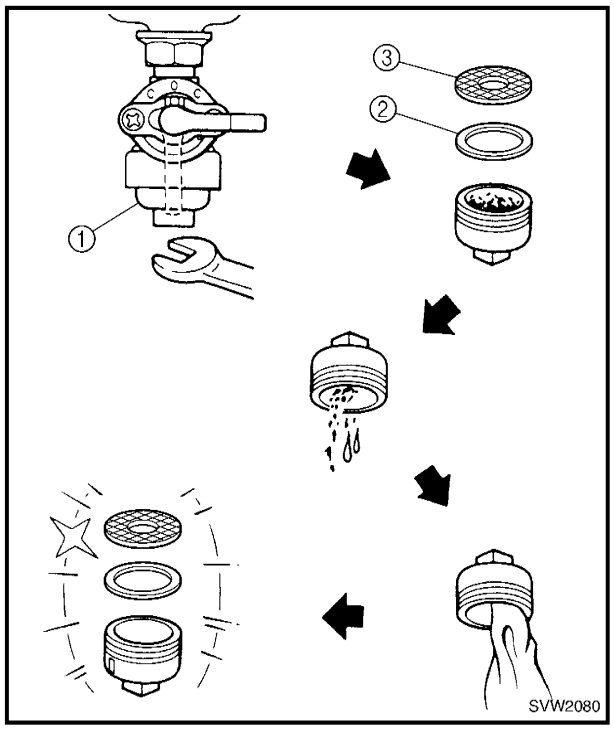


FUEL LEAKAGE

1. Check:
   - Leakage
     Check at fuel tank, fuel cock, fuel hose, and carburetor.

CAUTION:

Replace hose every four years.



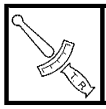
FUEL COCK STRAINER INSPECTION

1. Turn the fuel cock to the "C" position, detach the strainer cup, and then remove the debris from inside the cup.
2. Remove:
   - Fuel cock cup ①
   - Gasket ②
   - Strainer ③
3. Inspect:
   - Fuel cock cup
     Dirt/debris → Clean.
   - Gasket ②
     Damage → Replace.
   - Strainer ③
     Dirt/debris→ Clean.

NOTE:

Clean the cup with solvent, and then dry it thoroughly.

4. Install:
   - Strainer
   - Gasket
   - Fuel cock cup

	**Fuel cock cup:** **1.3 Nm (0.13 m · kg, 0.94 ft · lb)**

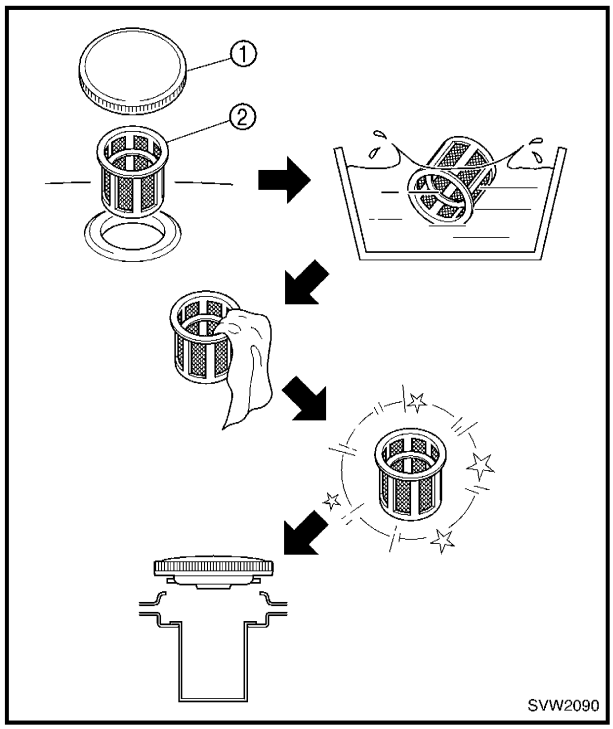
CAUTION:

Securely install the strainer cup to prevent fuel leaks.

FUEL TANK FILTER

⚠ WARNING

Do not smoke, and keep away form open flames, sparks, or any other source of fire when handling or in the vicinity of fuel.



1. Remove:
   - Fuel tank cap ①
   - Fuel tank filter ②
2. Inspect:
   - Fuel tank filter
     Damage → Replace.
3. Clean:
   - Fuel tank filter

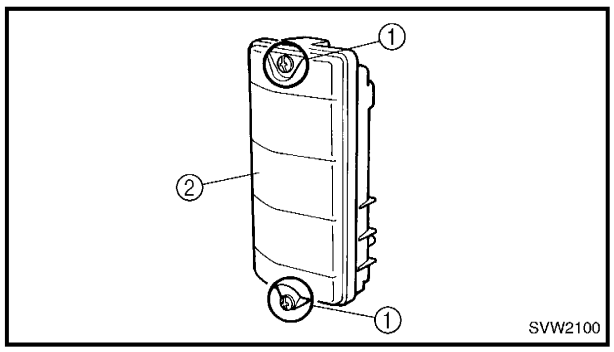
NOTE:

Clean the fuel tank filter with solvent, and then dry it thoroughly.

4. Install:
   - Fuel tank filter
   - Fuel tank cap

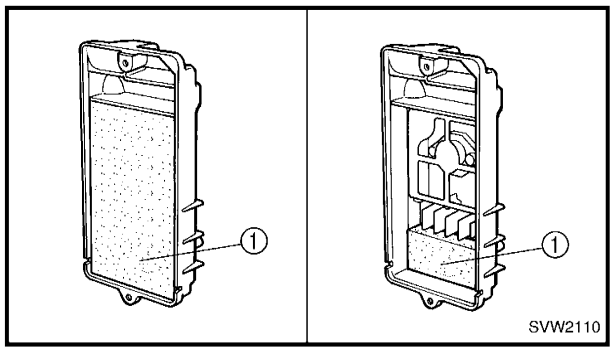
⚠ WARNING

Be sure the tank cap is tightened securely.

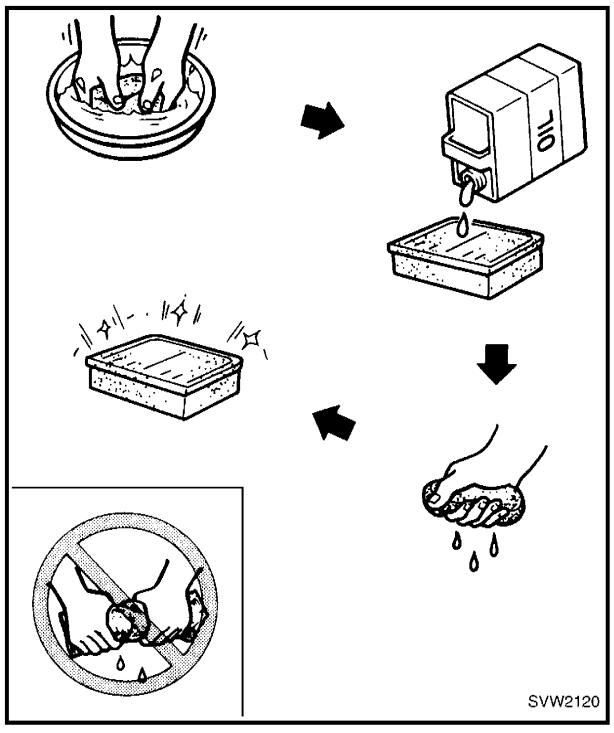


AIR FILTER ELEMENT

1. Remove:
   - Screws ①
   - Air filter case cover ②



2. Remove:
   - Air filter elements ①



3. Inspect:
   - Element
     Damage → Replace.
     Clogging → Wash the element in a solvent, and then dry it thoroughly.
     Oil the element and squeeze out the excess oil.

CAUTION:

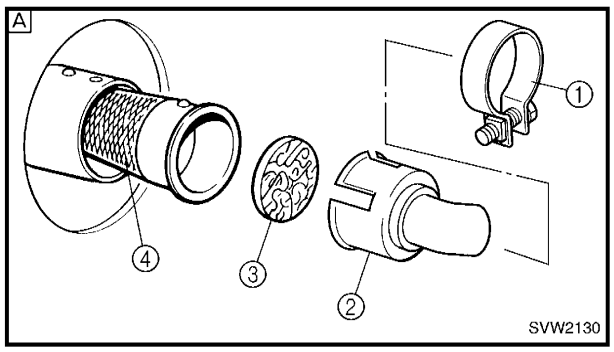
- **Do not wring out the element: this could cause it to tear.**
- **Do not wash the element in gasoline or in acidic, alkalinic, or organic solvents.**

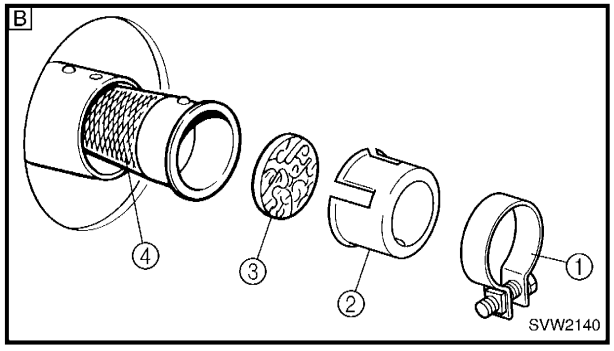
4. Install:
   - Air filter elements
   - Air filter case cover
   - Screws

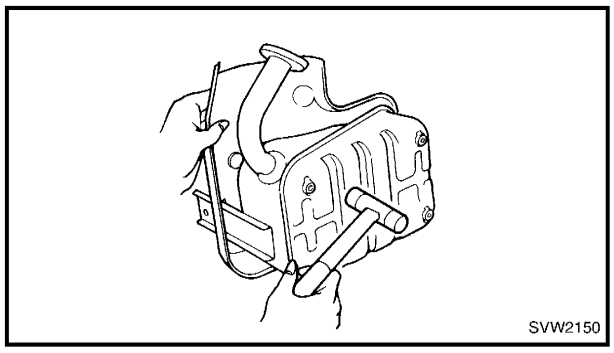
	Screw: **1.6 Nm (0.16 m · kg, 1.2 ft · lb)**

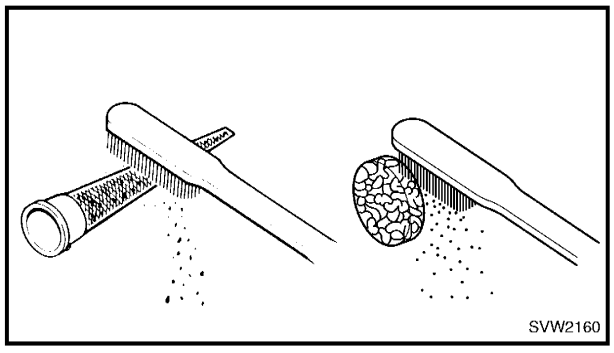
CAUTION:

The engine should never run without the elements, otherwise excessive piston and/or cylinder wear may result.









MUFFLER

1. Remove:
   - Muffler
     Refer to "MUFFLER" in CHAPTER 3.
   - Muffler band ①
   - Muffler cap ②
   - Muffler screen ③
   - Spark arrester ④

A EF4000DE
B YG4000D

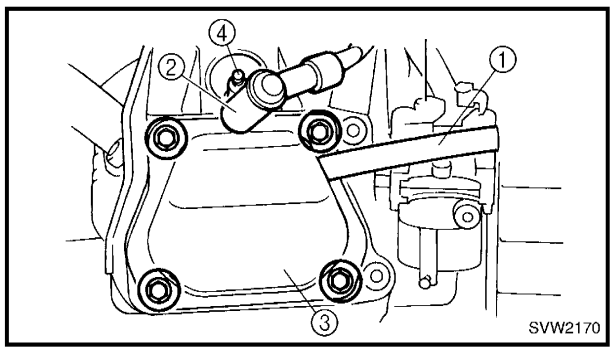
2. Decarbonize:
   - Muffler
     Tap on the muffler in the area shown in the illustration to loosen carbon buildup, and then shake it out of the end of the muffler.

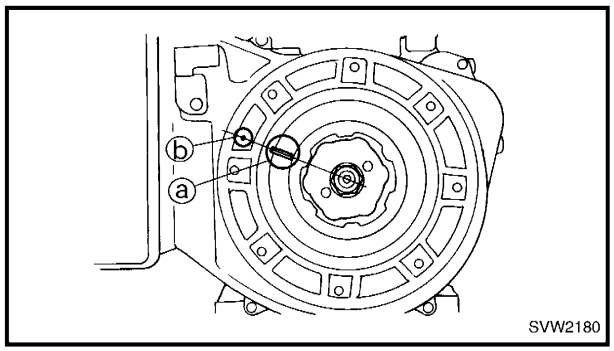
CAUTION:

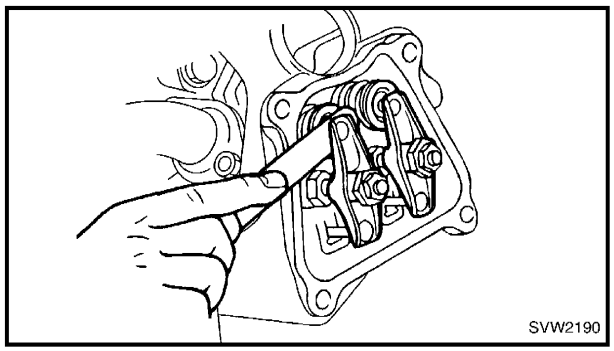
Don't use a wire to clean, otherwise the noise damping material may come out, and the damping effect may be reduced.

3. Decarbonize:
   - Muffler screen
   - Spark arrester
4. Install:
   - Spark arrester
   - Muffler screen
   - Muffler cap
   - Muffler band
   - Muffler
     Refer to "MUFFLER" in CHAPTER 3.

	Muffler band: **4 Nm (0.4 m · kg, 2.9 ft · lb)**







VALVE CLEARANCE ADJUSTMENT

1. Remove:
   - Breather hose ①
   - Spark plug cap ②
   - Cylinder head cover ③
   - Spark plug ④
   - Recoil starter assembly
     Refer to "RECOIL STARTER" in CHAPTER 3.

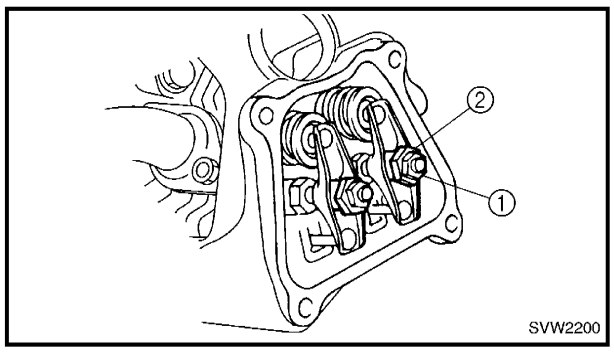
2. Turn the crankshaft clockwise until the mark ⓐ on the fan is parallel with the punch mark ⓑ. The piston is then at top-dead-center of the compression stroke.

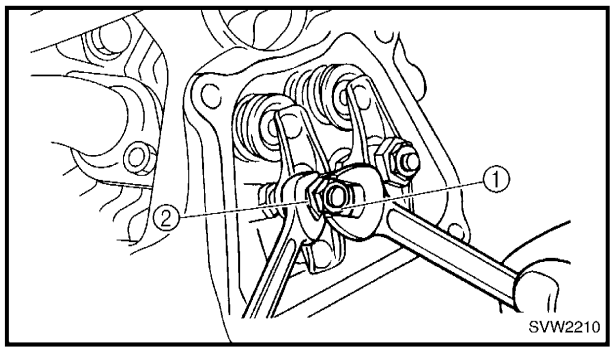
3. Measure:
   - Valve clearance
     Out of specification → Adjust.

NOTE:
Valve clearance must be measured when the engine is cool to the touch.

Intake Valve (cold):
0.07 mm (0.003 in)
Exhaust Valve (cold):
0.07 mm (0.003 in)

Thickness gauge:
YU-26900-9, 90890-03079





4. Adjust:
   - Valve clearance

Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② in or out to obtain the proper clearance.

Adjuster	Valve clearance
Turn in	Decrease
Turn out	Increase

- Tighten the locknut ①.

Locknut:
10 Nm (1.0 m · kg, 7.2 ft · lb)

5. Install:
   - Cylinder head cover
   - Breather hose
   - Spark plug
   - Spark plug cap
   - Recoil starter assembly
     Refer to "RECOIL STARTER" in CHAPTER 3.

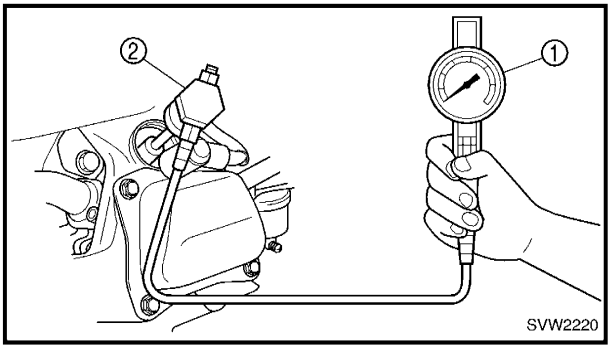
Cylinder head cover bolt:
11 Nm (1.1 m · kg, 8.0 ft · lb)
Spark plug:
20 Nm (2.0 m · kg, 14 ft · lb)

COMPRESSION PRESSURE

NOTE:

Measure the compression after checking and adjusting the valve clearance.

1. Warm up the engine for several minutes.
2. Remove:
   - Spark plug



3. Connect:
   - Compression gauge ①
   - Adapter ②

Compression gauge:
YU-33223, 90890-03081
Adapter:
YU-33223-3, 90890-04082

4. Measure:
   - Compression

   To measure the compression, pull the recoil starter until the needle stops rising on the compression gauge.

Standard compression pressure:
400 ~ 600 kPa
(4 ~ 6 kg/cm², 57 ~ 85 psi)

⚠ WARNING

To prevent sparking when cranking the engine, ground the high-tension cord.

Testing steps (below minimum level):

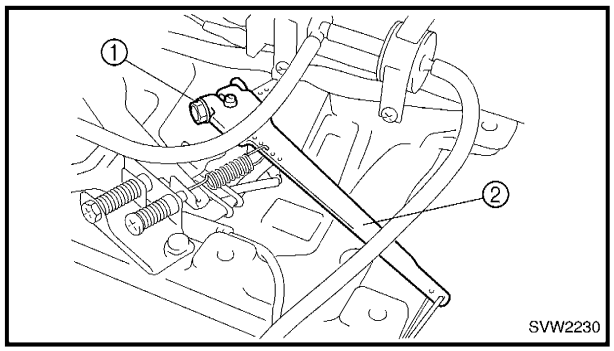
- Squirt a few drops of oil into the cylinder.
- Measure the compression again.

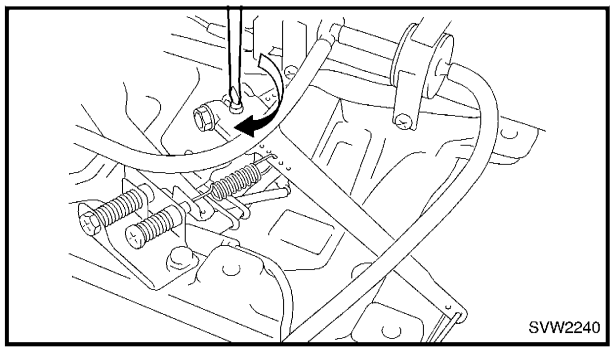
Reading	Diagnosis
If higher than without oil	• Worn cylinder, piston, and piston ring
If the same as without oil	• Defective piston, ring(s), valve(s), and cylinder head gasket • Improper valve timing and valve clearance

Testing steps (above maximum level):
- Check the cylinder head, valve surfaces, and piston crown for carbon deposits.

5. Install:
   - Spark plug

	Spark plug: **20 Nm (2.0 m · kg, 14 ft · lb)**





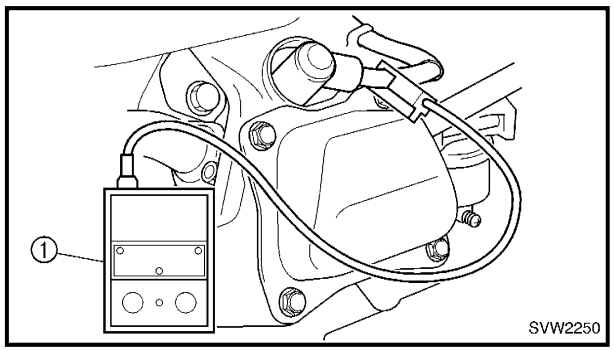
GOVERNOR ADJUSTMENT

1. Remove:
   - Fuel tank assembly
     Refer to "AIR CLEANER AND FUEL TANK" in CHAPTER 3.
2. Adjust:
   - Governor

Adjustment steps:
- Loosen the governor shaft bolt ①.
- Turn the governor arm ② clockwise until it stops.
- Turn the governor shaft clockwise until it stops.
- Tighten the governor shaft bolt ①.

	Governor shaft bolt: **10 Nm (1.0 m · kg, 7.2 ft · lb)**

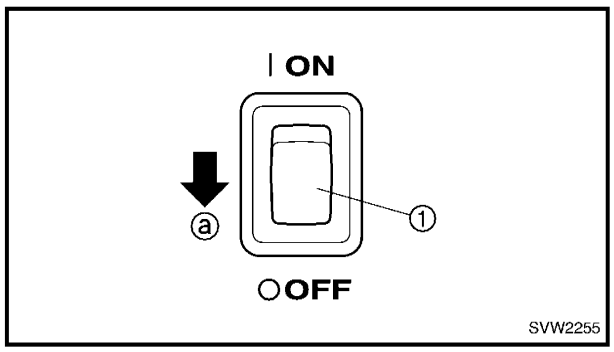
3. Install:
   - Fuel tank assembly
     Refer to "AIR CLEANER AND FUEL TANK" in CHAPTER 3.



RATED ENGINE SPEED INSPECTION

1. Connect:
   - Inductive tachometer ①

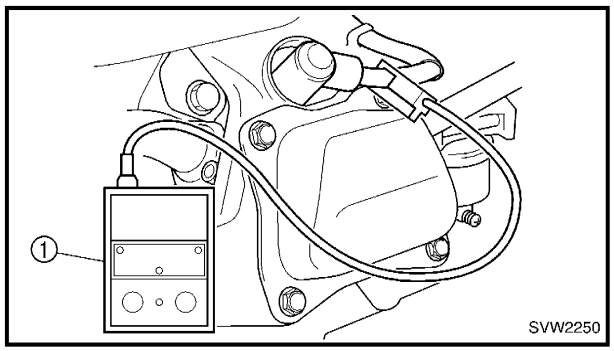
	Inductive tachometer: **YU-8036-A** **Engine tachometer:** **90890-03113**

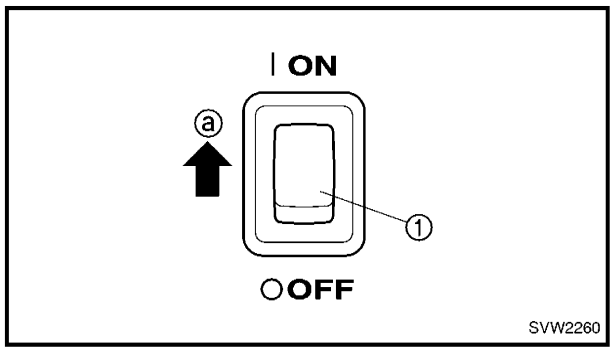


2. Inspect:
   - Rated engine speed
     Specified engine speed → OK
     Out of specification → Rated engine speed adjustment.

Inspection steps:
- Operate the engine (with no load).
- Turn economy switch ① to "OFF" ⓐ.
- Measure the rated engine speed.

Rated engine speed:
3,600 r/min





ECONOMY IDLE ENGINE SPEED INSPECTION

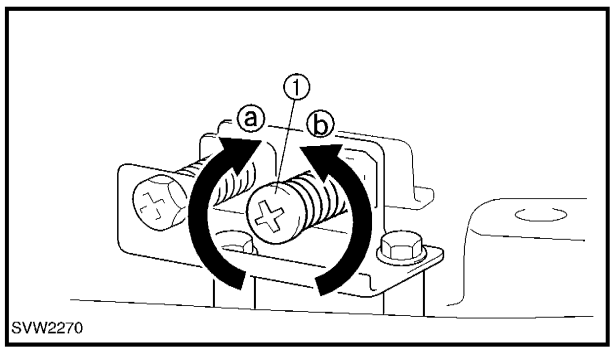
1. Connect:
   - Inductive tachometer ①

Inductive tachometer:
YU-8036-A
Engine tachometer:
90890-03113

2. Inspect:
   - Economy idle engine speed
     Specified engine speed → OK
     Out of specification → Economy idle engine speed adjustment.

Inspection steps:
- Operate the engine (with no load).
- Turn economy switch ① to "ON" ⓐ.
- Measure the economy idle engine speed.

Economy idle engine speed:
2,600 r/min



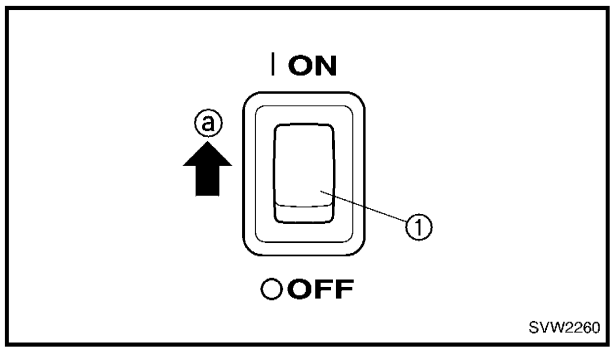
RATED ENGINE SPEED ADJUSTMENT

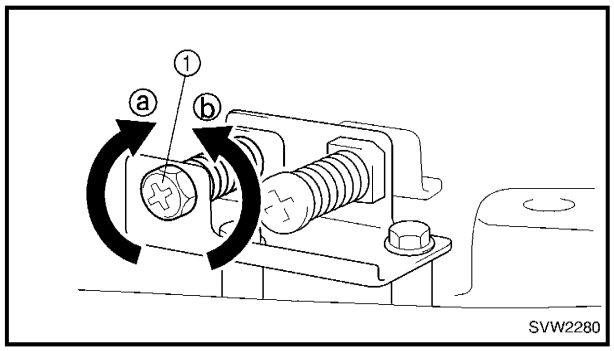
1. Adjust:
   - Rated engine speed

Adjustment steps:
- Operate the engine (with no load).
- Turn the throttle stop screw ① in direction ⓐ or ⓑ until the rated engine speed is obtained.

Direction ⓐ → Rated engine speed is decreased.
Direction ⓑ → Rated engine speed is increased.

Rated engine speed:
3,600 r/min





ECONOMY IDLE ENGINE SPEED ADJUSTMENT

1. Adjust:
   - Economy idle engine speed

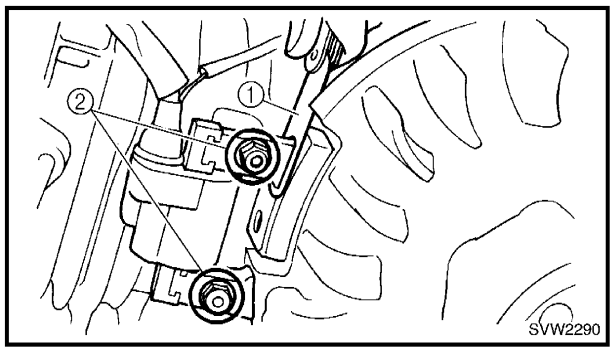
Adjustment steps:
- Operate the engine (with no load).
- Turn economy switch ① to "ON" ⓐ.
- Turn the economy idle screw ① in direction ⓐ or ⓑ until the economy idle engine speed is obtained.

Direction ⓐ → Economy idle engine speed is increased.
Direction ⓑ → Economy idle engine speed is decreased.

Economy idle engine speed:
2,600 r/min

AIR GAP BETWEEN TCI UNIT AND FLYWHEEL

1. Remove:
   - Fuel tank assembly
   - Air cleaner assembly
   Refer to "AIR CLEANER AND FUEL TANK" in CHAPTER 3.
2. Remove:
   - Carburetor assembly
   Refer to "CARBURETOR" in CHAPTER 3.
3. Remove:
   - Recoil starter assembly
   Refer to "RECOIL STARTER" in CHAPTER 3.
4. Remove:
   - Flywheel cover
   Refer to "FLYWHEEL" in CHAPTER 3.



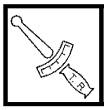
5. Measure:
   - Air gap between TCI unit and flywheel
   Use a thickness gauge ①.
   Out of specification → Adjust.

Thickness gauge:
YU-26900-9, 90890-03079

6. Adjust:
   - Air gap between TCI unit and flywheel

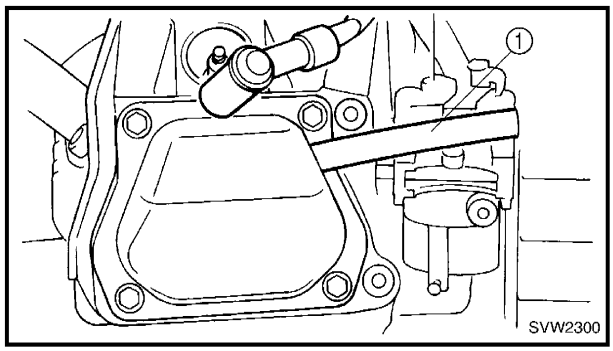
Adjustment steps:
- Loosen the bolts ②.
- Adjust the air gap between TCI unit and flywheel by moving the TCI unit up or down.
- Tighten the bolts ②.

Air gap between TCI unit and flywheel:
0.5 mm (0.02 in)



TCI unit bolt:
10 Nm (1.0 m · kg, 7.2 ft · lb)

7. Install:
   - Flywheel cover
     Refer to “FLYWHEEL” in CHAPTER 3.
8. Install:
   - Recoil starter assembly
     Refer to “RECOIL STARTER” in CHAPTER 3.
9. Install:
   - Carburetor assembly
     Refer to “CARBRETOR” in CHAPTER 3.
10. Install:
    - Air cleaner assembly
    - Fuel tank assembly
      Refer to “AIR CLEANER AND FUEL TANK” in CHAPTER 3.



BREATHER HOSE

1. Inspect:
   - Breather hose ①
     Cracks/damage → Replace.
     Poor connection → Correct.

ELECTRICAL

SPARK PLUG

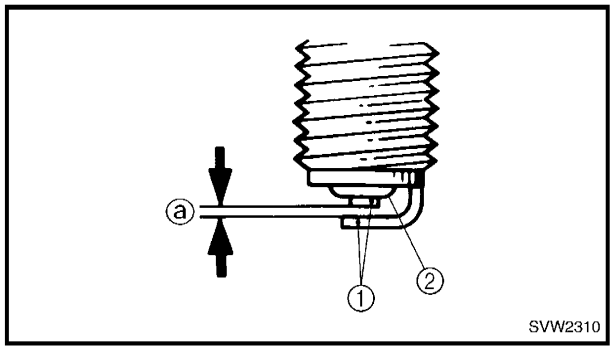
⚠ WARNING

Inspect and adjust the areas around the cylinder head after the engine has cooled down completely.

CAUTION:

Before removing the spark plug, use compressed air to clean the cylinder head cover to prevent dirt from falling into the engine.

1. Remove:
   - Spark plug cap
   - Spark plug

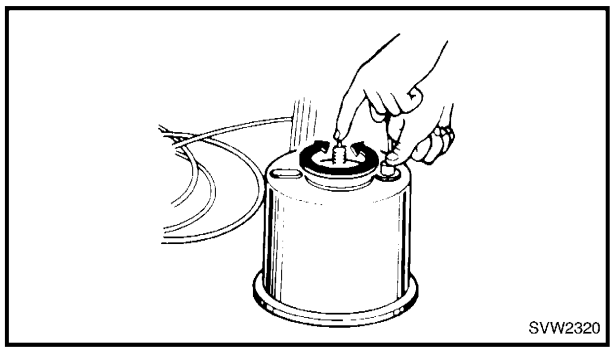


2. Inspect:
   - Electrode ①
     Wear/damage → Replace.
   - Insulator color ②
3. Measure:
   - Spark plug gap ⓐ
     Use a wire gauge or thickness gauge.
     Out of specification → Regap.

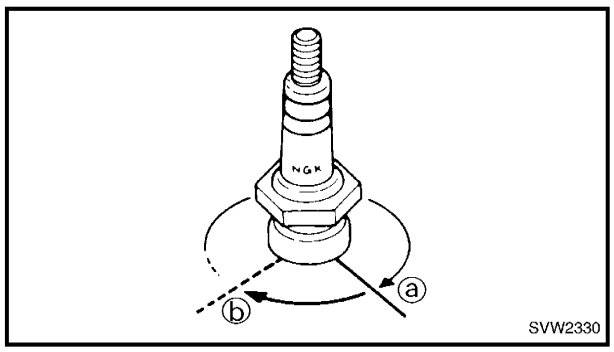
Spark plug gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

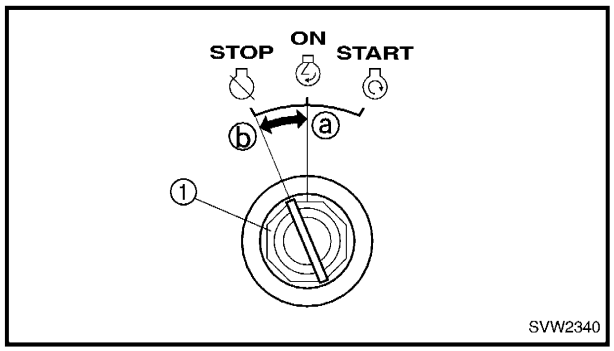
If necessary, clean the spark plug with a spark plug cleaner.

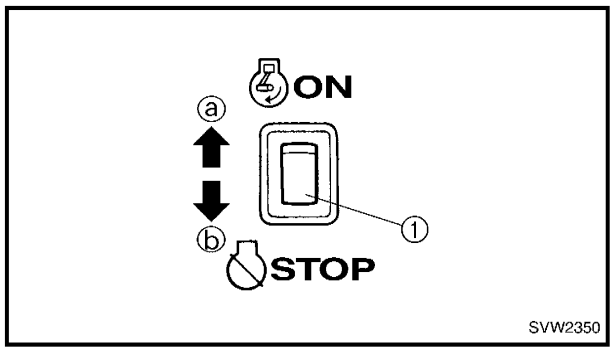
Standard spark plug (with resistor):
BPR4ES (NGK)

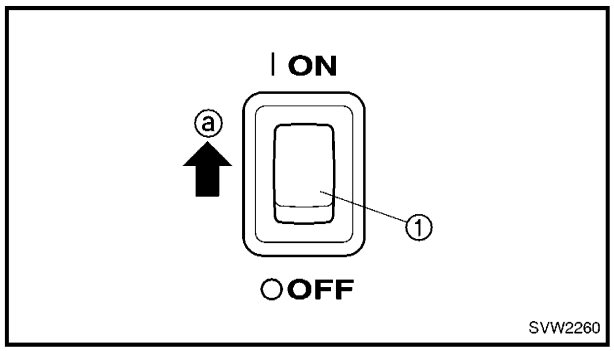


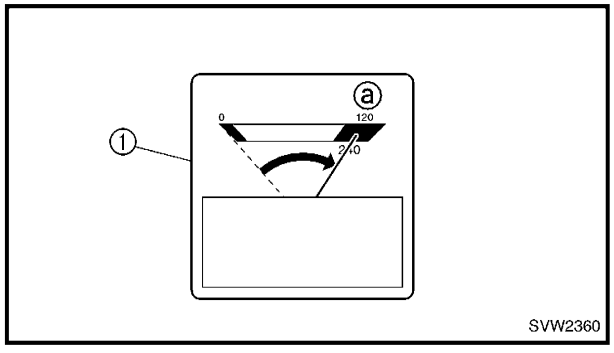
Before installing the spark plug, clean the gasket surface and plug surface.











4. Tighten:
   - Spark plug

	Spark plug: 20 Nm (2.0 m · kg, 14 ft · lb)

NOTE:
To prevent thread damage, finger tighten ⓐ the spark plug before tightening it to the specified torque ⓑ.

MAIN SWITCH (EF4000DE)

1. Check:
   - Main switch ①

Checking steps:
- Set the main switch ① to "ON" ⓐ.
- Start the engine.
- Check that the engine stops when the switch is set to "STOP" ⓑ.

ENGINE SWITCH (YG4000D)

1. Check:
   - Engine switch ①

Checking steps:
- Set the engine switch ① to "ON" ⓐ.
- Start the engine.
- Check that the engine stops when the switch is set to "STOP" ⓑ.

ECONOMY SWITCH

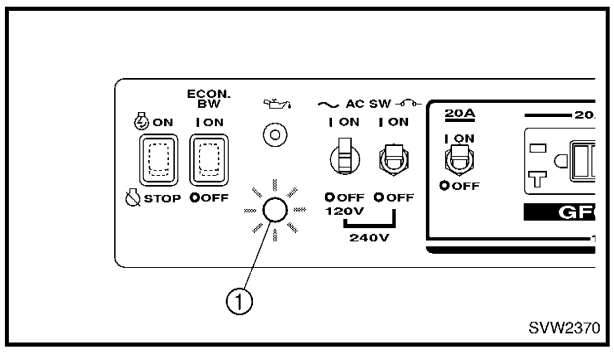
1. Check:
   - Economy switch ①

Checking steps:
- Set the economy switch ① to "ON" ⓐ.
- Start the engine.
- Turn the switch of the electric device connected to the AC outlet "ON" and "OFF" to check whether the engine speed increases and decreases.

VOLTAGE METER (EF4000DE)

1. Check:
   - Voltage meter ①

Checking steps:
- Start the engine.
- Set the economy switch to "OFF".
- Check that the needle indicates 120 V ⓐ.

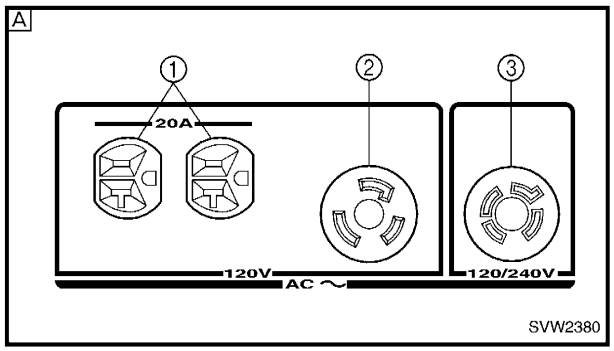


PILOT LIGHT (YG4000D)

1. Check:
   - Pilot light ①

Checking steps:

- Start the engine.
- Make sure that the pilot light ① turns on.

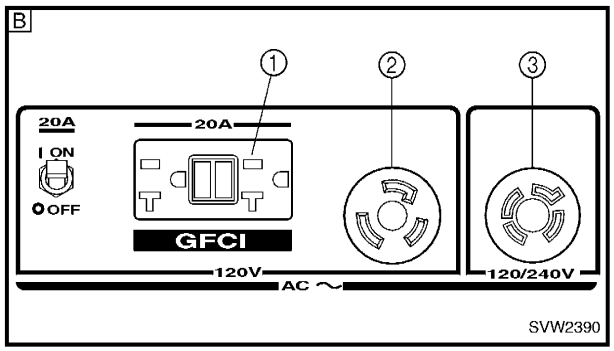


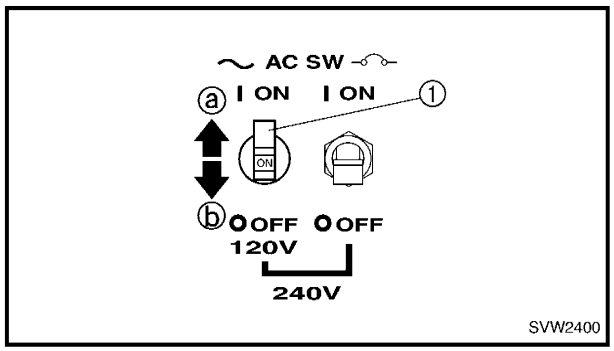
RECEPTACLE

1. Check:
   - AC receptacles (120 V-20 A) ① (EF4000DE)
   - AC receptacle (120 V-20 A, GFCI) ① (YG4000D)
   - AC receptacle (120 V-30 A) ②
   - AC receptacle (120/240 V-20 A) ③

   Cracks/damage → Replace.
   Poor connection → Correct.

A EF4000DE
B YG4000D



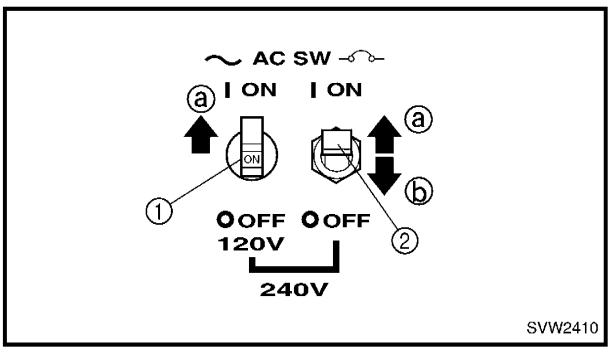


AC SWITCH (NFB) (120 V)

1. Set the AC switch (NFB) ① to the "ON" ⓐ position.
2. Connect the pocket tester (AC 120 V) to the AC receptacle and check the AC switch (NFB) for continuity.
   No continuity → Replace the AC switch (NFB).

	Pocket tester: **YU-03112, 90890-3112**

3. Set the AC switch (NFB) ① to the "OFF" ⓑ position.
4. Connect the pocket tester (AC 120 V) to the AC receptacle and check the AC switch (NFB) for continuity.
   Continuity → Replace the AC switch (NFB).

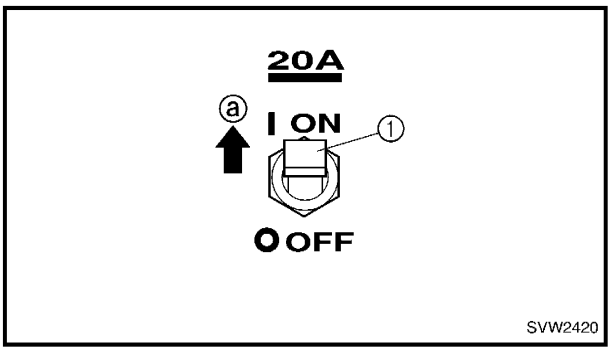


AC SWITCH (NFB) (240 V)

1. Set the AC switches (NFB) ① and ② to the "ON" ⓐ position.
2. Connect the pocket tester (AC 300 V) to the AC receptacle and check the AC switch (NFB) for continuity.
   No continuity → Replace the AC switch (NFB).

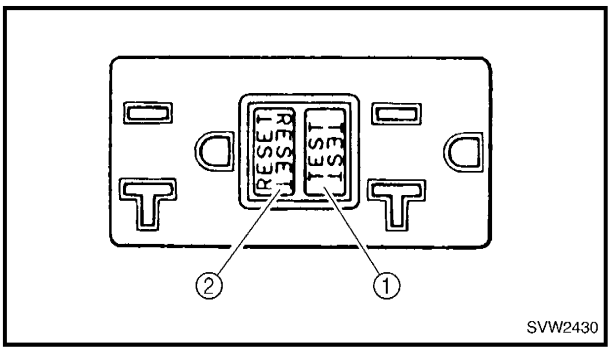
	Pocket tester: YU-03112, 90890-3112

3. Set the AC switch (NFB) ② to the "OFF" ⓑ position.
4. Connect the pocket tester (AC 300 V) to the AC receptacle and check the AC switch (NFB) for continuity.
   Continuity → Replace the AC switch (NFB).



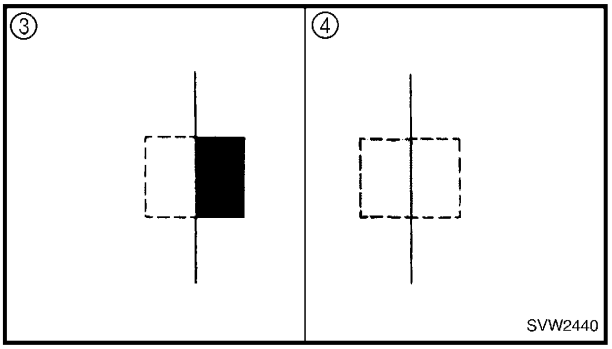
GFCI (YG4000D)

1. Start the engine.
2. Turn the AC switch (NFB) ① to the "ON" ⓐ position.



3. Press the test button ①, then check the position of the reset button ②.

GFCI Reset Button Position after test	GFCI Socket Operation
Pop Out ③	Correct
Stay In ④	Incorrect



4. If GFCI operation is correct, push in the reset button.

⚠ WARNING

Do not operate the generator with a faulty GFCI circuit. Electric shock could occur.

BATTERY INSPECTION (EF4000DE)

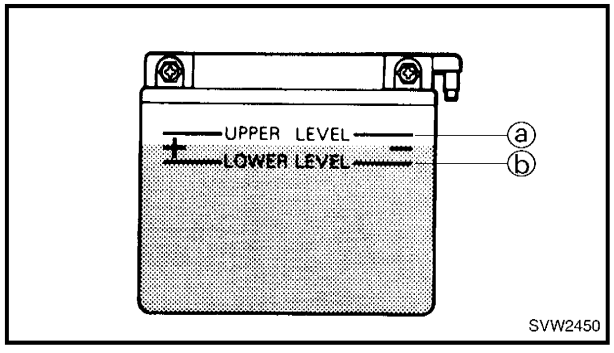
⚠ WARNING

Battery fluid is poisonous and dangerous, causes severe burns, etc. Contains sulfuric acid.
Avoid contact with skin, eyes or clothing.
Antidote:
EXTERNAL – Flush with water.
INTERNAL – Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call a physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention.
Batteries produce explosive gases. Keep sparks, flames, cigarettes, etc. away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

1. Remove:
   - Battery

⚠ WARNING

When removing the battery, disconnect the negative lead first.



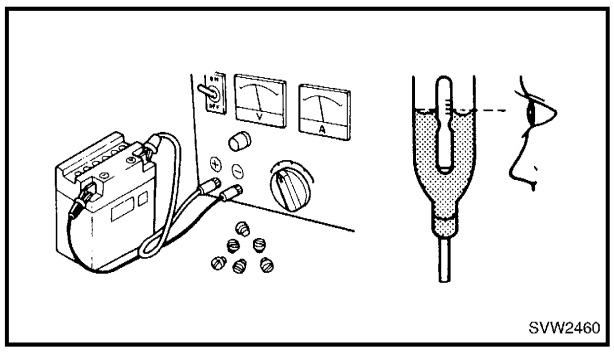
2. Inspect:
   - Fluid level should be between "UPPER LEVEL" ⓐ and "LOWER LEVEL" ⓑ marks.
     Incorrect → Refill.

CAUTION:

Refill with distilled water only; tap water contains minerals harmful to a battery.

3. Check:
   - Specific gravity.
     Less than 1.280 → Recharge battery.

Specific gravity:
1.280 at 20 °C (68 °F)

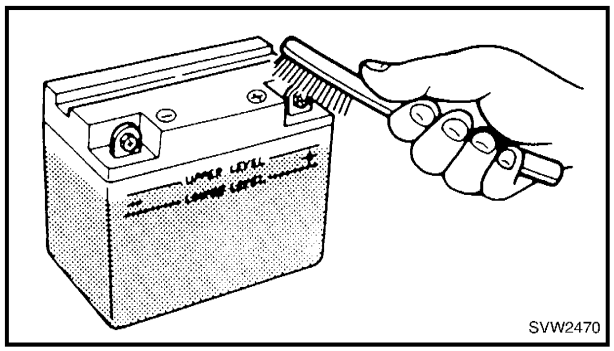

SVW2460

Replace the battery if:

- Battery voltage will not rise to a specific value or bubbles fail to rise even after many hours of charging.
- Sulfation of one or more cells occurs, as indicated by the plates turning white, or an accumulation of material exists in the bottom of the cell.
- Specific gravity readings after a long, slow charge indicate one cell to be lower than the rest.
- Warpage or bucking of plates or insulators is evident.

CAUTION:

Always charge a new battery before using it to ensure maximum performance.


SVW2470

4. Inspect:
   - Battery terminal
     Dirty terminal → Clean with a wire brush.
     Poor connection → Correct.

NOTE:

After cleaning the terminals, apply grease lightly to the terminals.

5. Install:
   - Battery

CAUTION:

- **Connect the positive lead to the battery terminal first.**
- **Make sure the battery leads are connected properly. Reversing the leads can seriously damage the electrical system.**
- **Make sure that the battery breather hose is properly connected and is not obstructed.**

BATTERY CHARGING (EF4000DE)

The battery must be charged properly before using for the first time. This initial charge will prolong the life of the battery.

1. Remove:
   - Battery

⚠ WARNING

When removing the battery, disconnect the negative lead first.

Battery charging step:

- Remove all filler caps from the battery.

NOTE:

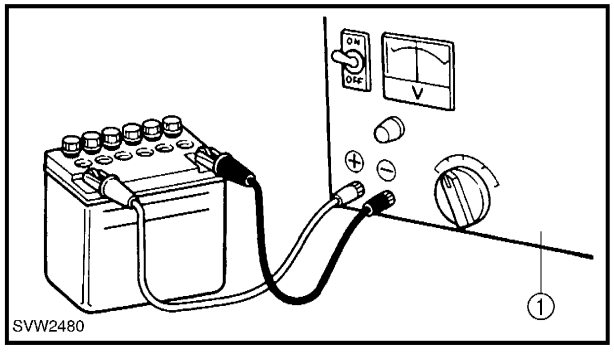
Place the battery on a level place.

- Cool the electrolyte down to below 30 °C (86 °F).
- Pour electrolyte into each cell little by little up to the upper level line, and leave it for a while. When the battery fluid permeates the plates and separators, the fluid level begins to lower. Add electrolyte and bring back to upper level line.

NOTE:

Fill the battery with diluted sulfuric acid (electrolyte).

- Connect the battery to a battery charger ①.
- Set the battery charger rate at 1/10 the battery capacity and charge the battery for 10 hours.



Charging Rate:
1.4 Ah × 10 hours

- Turn the battery charger off then disconnect it from the battery.
- Check the specific gravity of each cell with a hydrometer. If the hydrometer reading is below the specification, additional charging is necessary.
- Install the filler caps, and thoroughly wipe off the fluid around the filler caps.

2. Install:
   • Battery

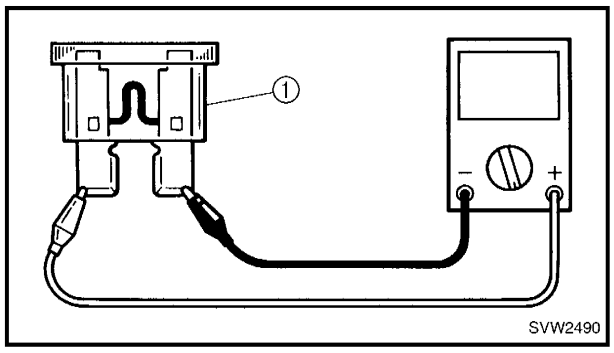
CAUTION:

• Connect the positive lead to the battery terminal first.
• Make sure the battery leads are connected properly. Reversing the leads can seriously damage the electrical system.
• Make sure that the battery breather hose is properly connected and is not obstructed.

FUSE INSPECTION (EF4000DE)

CAUTION:

To avoid a short circuit, always set the main switch to "OFF" when checking or replacing a fuse.



1. Remove
   • Control panel assembly
     Refer to "CONTROL PANEL" in CHAPTER 3.
   • Fuse ①
2. Check:
   • Continuity

Checking steps:

• Connect the pocket tester to the fuse and check the continuity.

NOTE:

Set the pocket tester selector to "Ω × 1".

	Pocket tester: **YU-03112, 90890-03112**

• If the pocket tester indicates "∞", replace the fuse.

3. Replace:
   • Blown fuse

Replacing steps:
- Set the main switch to "OFF".
- Install a new fuse of the correct amperage.
- Set the main switch to "ON" and verify if the electrical circuit is operational.
- If the fuse immediately blows again, check the electrical circuit.

Fuse amperage:
10 A

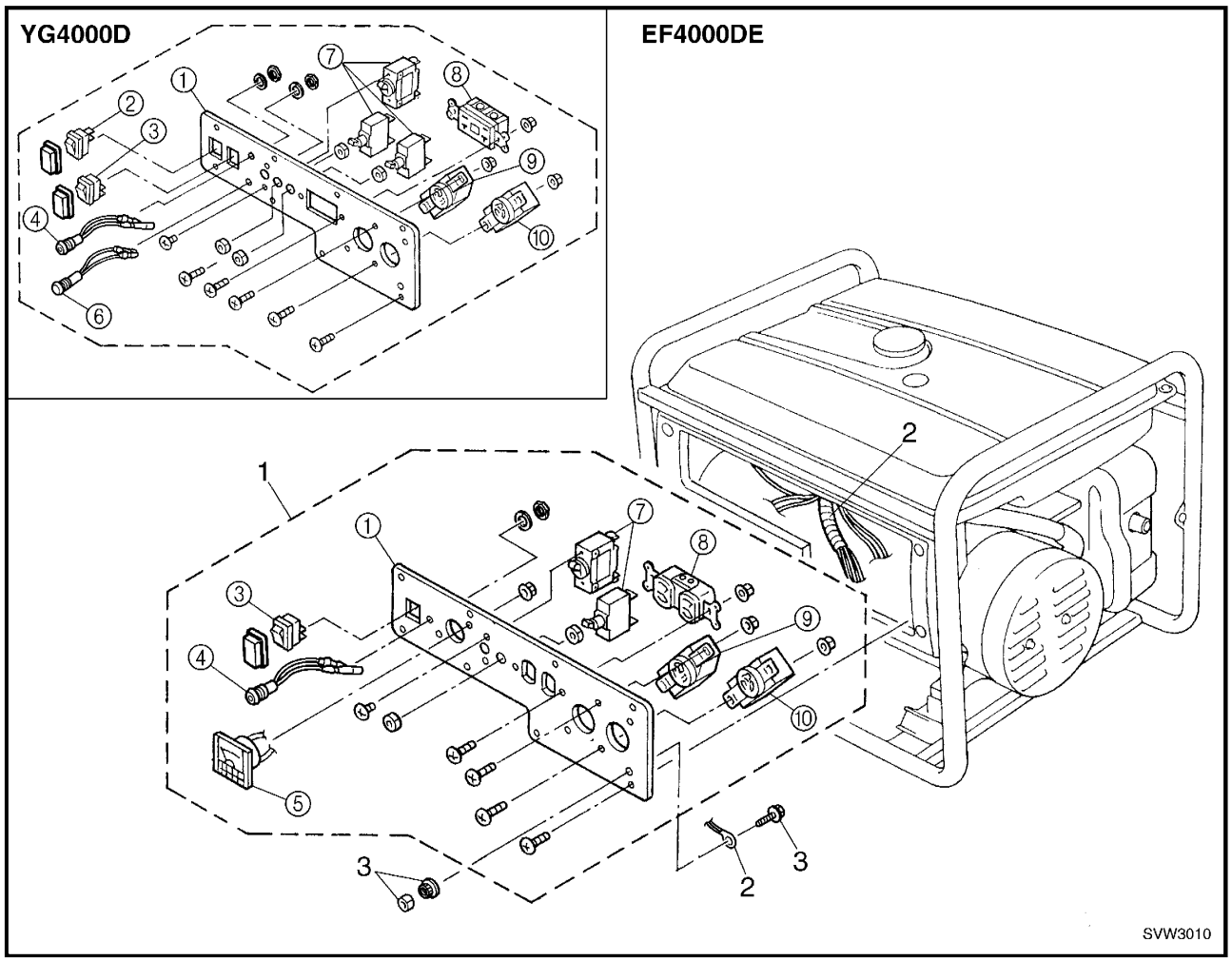
⚠ WARNING

Never use a fuse with an amperage other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system and could possibly cause a fire.

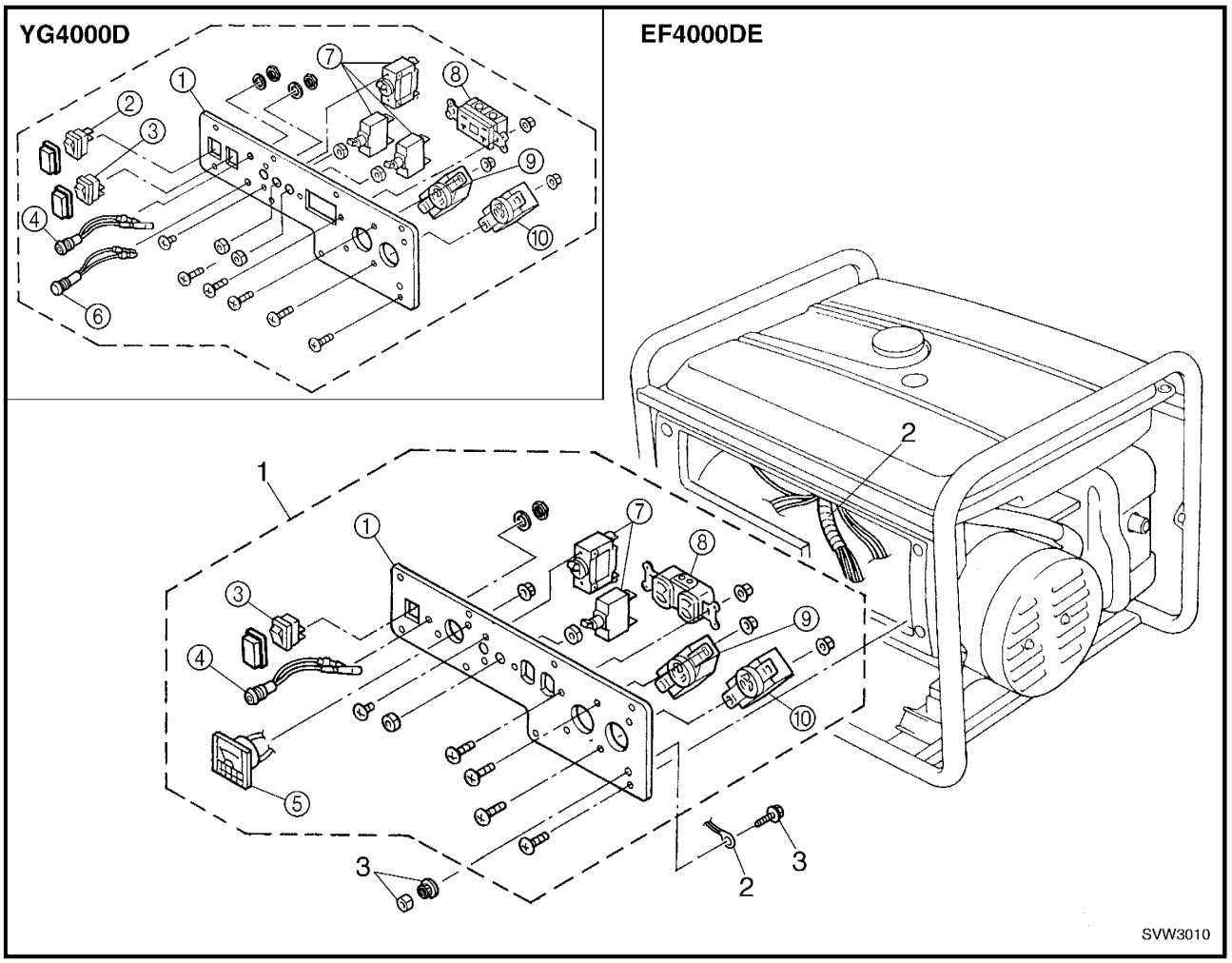
4. Install:
   • Control panel assembly
   Refer to "CONTROL PANEL" in CHAPTER3.

ENGINE

CONTROL PANEL

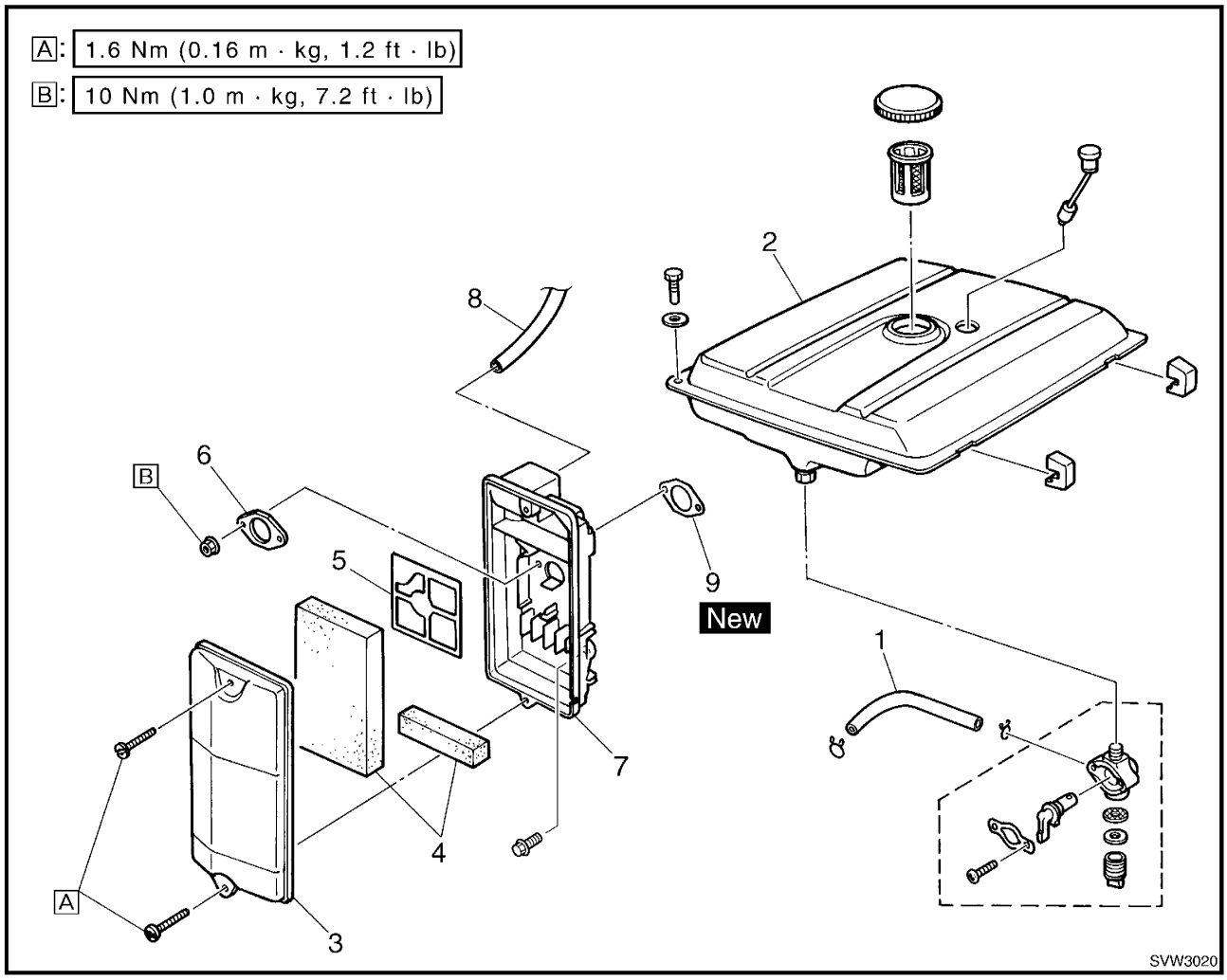


Order	Job name/Part name	Q'ty	Remarks
	Control panel assembly removal		Remove the parts in the order listed below.
1	Control panel assembly	1	
2	Wire harness	1	Disconnect all couplers and lead wires.
3	Ground terminal	1	
			For installation, reverse the removal procedure.

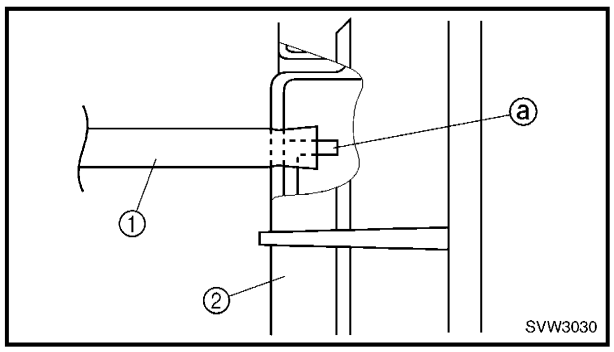


Order	Job name/Part name	Q'ty	Remarks
	Control panel disassembly		Remove the parts in the order listed below.
①	Control panel	1	
②	Engine switch	1	YG4000D
③	Economy switch	1	
④	Oil warning light	1	
⑤	Voltage meter	1	EF4000DE
⑥	Pilot light	1	YG4000D
⑦	AC switch (NFB)	2/3	EF4000DE/YG4000D
⑧	AC receptacle (120 V-20 A)	1	
⑨	AC receptacle (120 V-30 A)	1	
⑩	AC receptacle (120/240 V-20 A)	1	
			For assembly, reverse the disassembly procedure.

AIR CLEANER AND FUEL TANK



Order	Job name/Part name	Q'ty	Remarks
	Air cleaner and fuel tank removal		Remove the parts in the order listed below.
1	Fuel hose	1	Turn the fuel cock to the "C" position.
2	Fuel tank	1	
3	Air filter case cover	1	
4	Air filter element	2	
5	Metal gasket	1	
6	Plate	1	
7	Air filter case	1	
8	Breather hose	1	
9	Gasket	1	
			For installation, reverse the removal procedure.



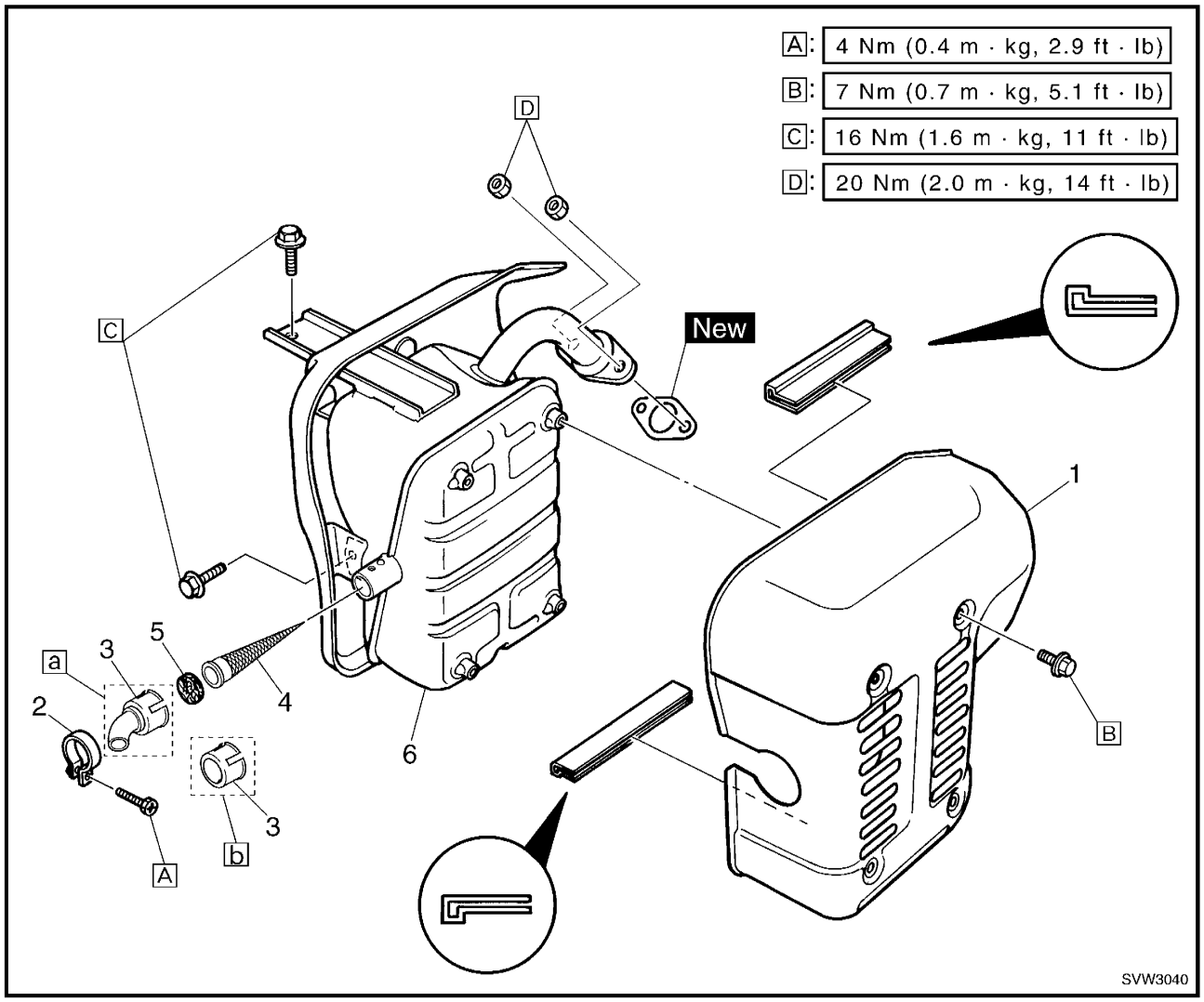
BREATHER HOSE INSTALLATION

1. Install:
   - Breather hose ①
   - Air filter case ②

NOTE:

Contact the end of the breather hose ① to the stopper ⓐ of the air filter case ②.

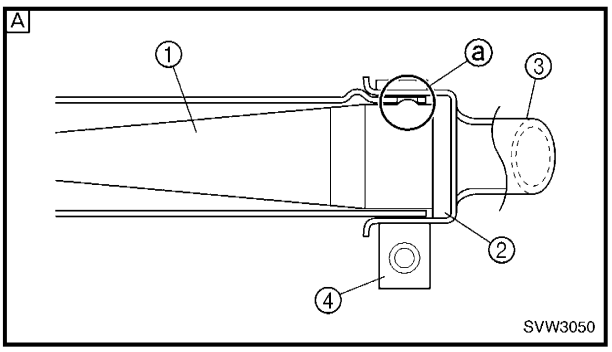
MUFFLER



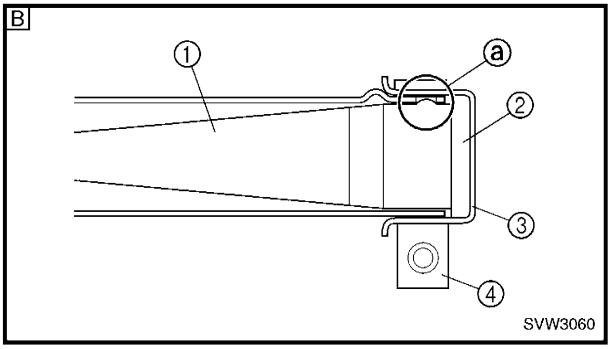
a EF4000DE b YG4000D

Order	Job name/Part name	Q'ty	Remarks
	Muffler removal		Remove the parts in the order listed below.
1	Muffler protector	1	
2	Muffler band	1	
3	Muffler cap	1	
4	Spark arrester	1	
5	Muffler screen	1	
6	Muffler	1	
			For installation, reverse the removal procedure.

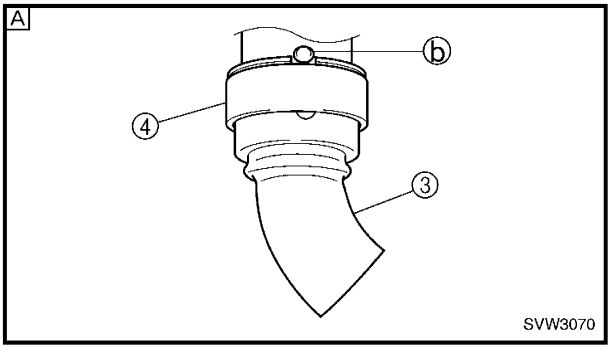
A



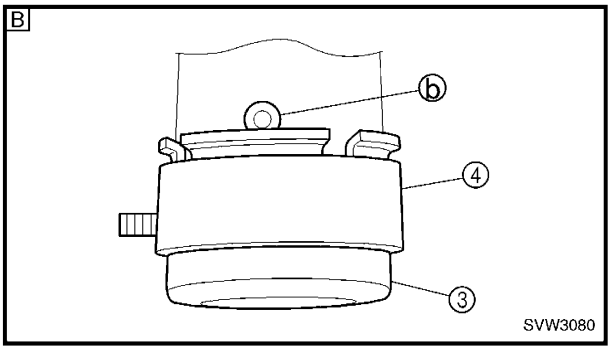
B



A



B



MUFFLER ASSEMBLY

1. Install:
   - Spark arrester ①
   - Muffler screen ②
   - Muffler cap ③
   - Muffler band ④

NOTE:

Align the protrusion ⓐ located outside the spark arrester with the upper hole in the tail pipe.

NOTE:

For EF4000DE:

- Align the slit of the muffler cap ③ with the protrusion ⓑ of the tail pipe.
- Contact the protrusion ⓑ to the slit of the muffler cap ③.

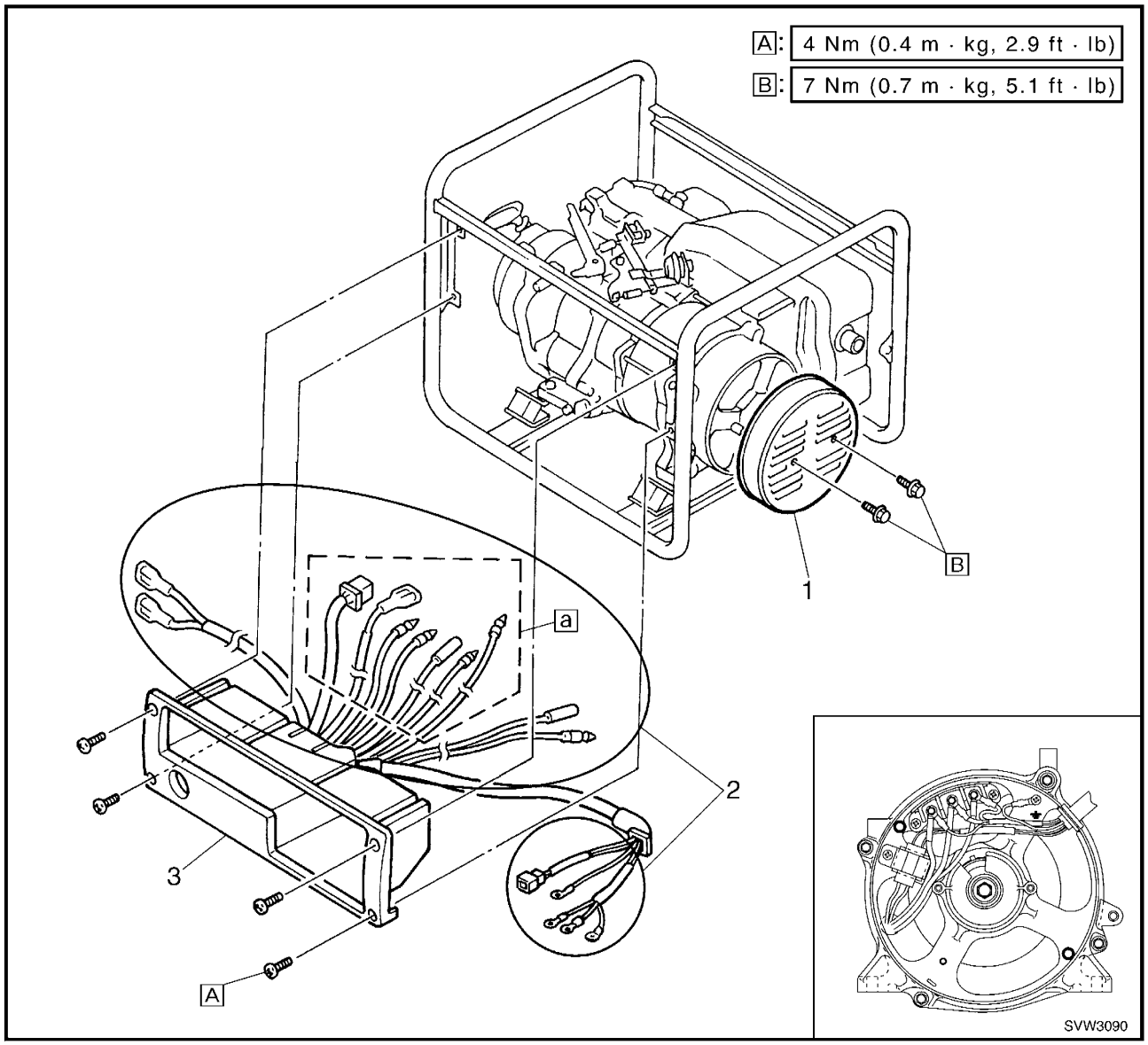
For YG4000D:

- Align the rim of the muffler cap ③ with the protrusion ⓑ of the tail pipe.
- Contact the protrusion ⓑ against the rim of the muffler cap ③, without allowing it to enter the slit.

	Muffler band: **4 Nm (0.4 m · kg, 2.9 ft · lb)**

A EF4000DE
B YG4000D

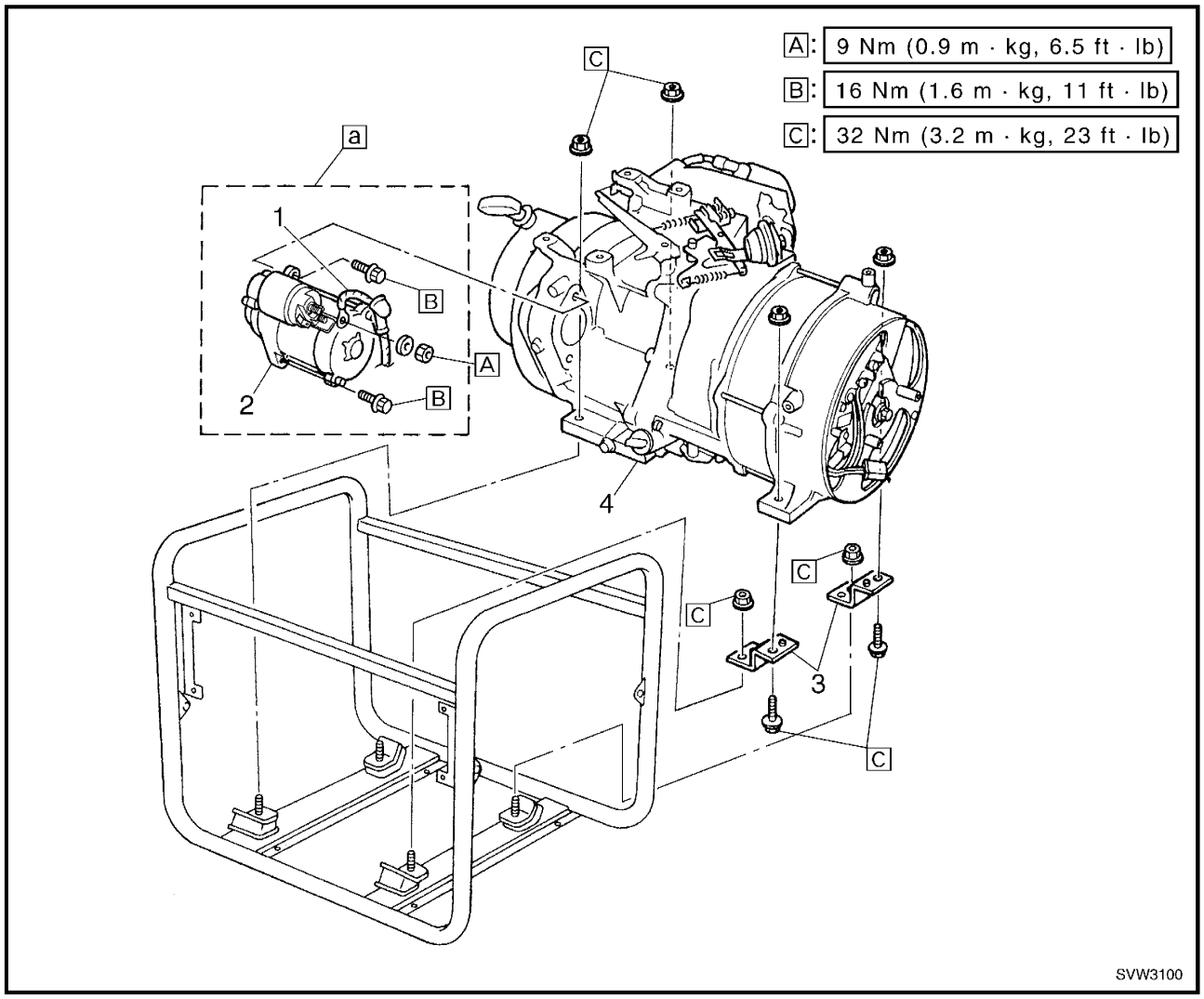
CONTROL BOX



a EF4000DE

Order	Job name/Part name	Q'ty	Remarks
	Control box removal		Remove the parts in the order listed below.
	Fuel tank assembly		Refer to "AIR CLEANER AND FUEL TANK".
1	Generator cover	1	
2	Wire harness	–	Disconnect all couplers, lead wires and connections.
3	Control box assembly	1	
			For installation, reverse the removal procedure.

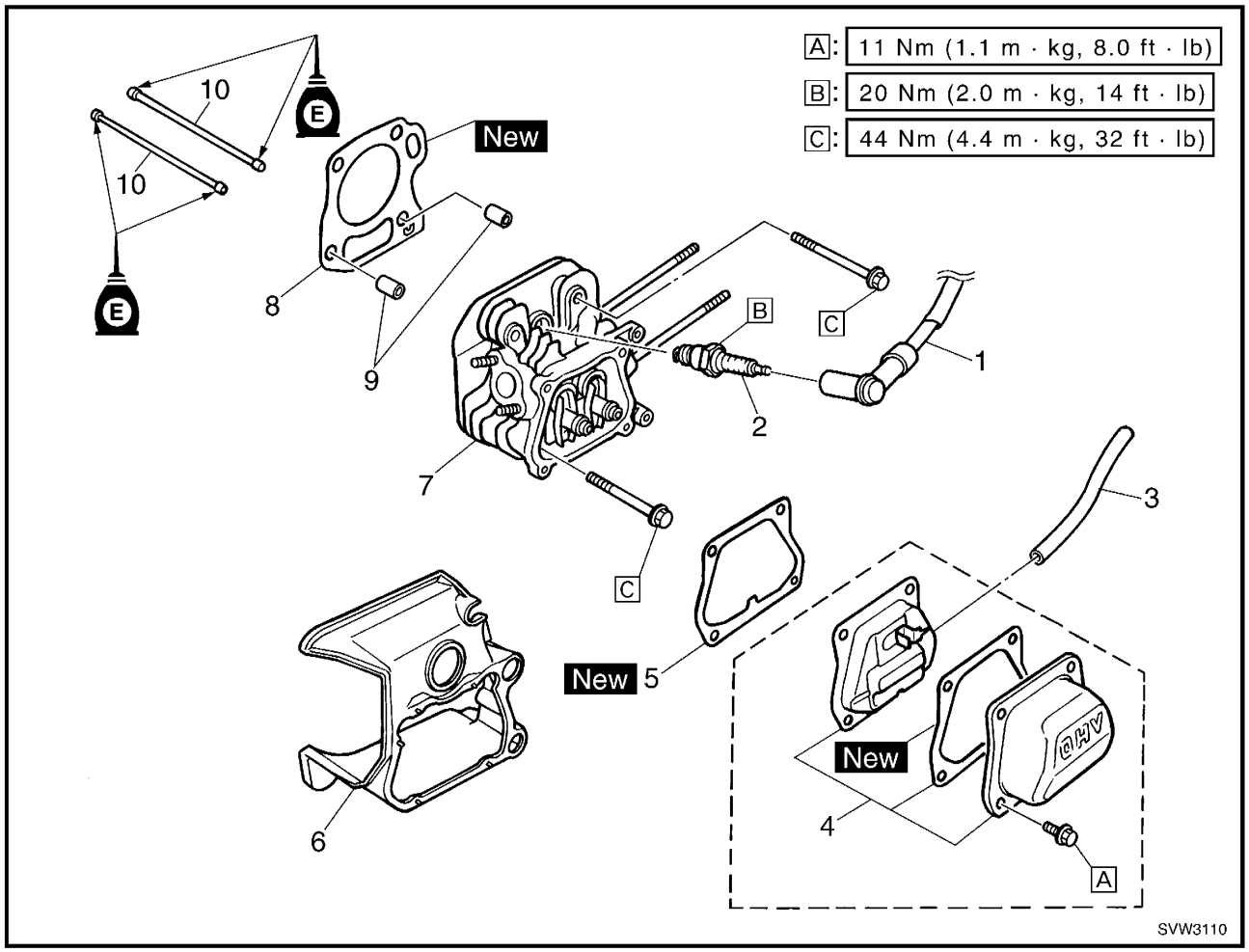
ENGINE



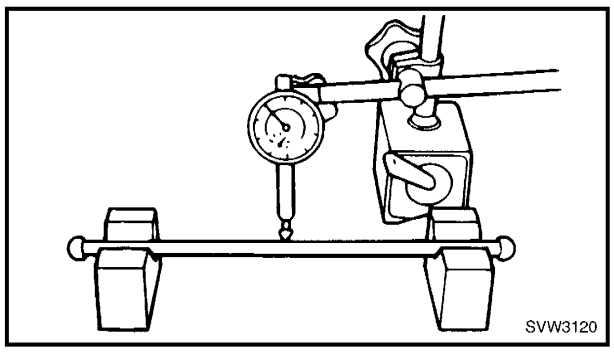
a EF4000DE

Order	Job name/Part name	Q'ty	Remarks
	Engine removal		Remove the parts in the order listed below.
	Engine oil		Refer to "OIL REPLACEMENT" in CHAPTER 2.
	Air cleaner and fuel tank assembly		Refer to "AIR CLEANER AND FUEL TANK".
	Muffler assembly		Refer to "MUFFLER".
	Control box assembly		Refer to "CONTROL BOX".
	Carburetor assembly		Refer to "CARBURETOR".
1	Starter motor lead	1	
2	Starter motor	1	
3	Engine bracket	2	
4	Engine assembly	1	
			For installation, reverse the removal procedure.

CYLINDER HEAD COVER AND CYLINDER HEAD



Order	Job name/Part name	Q'ty	Remarks
	Cylinder head cover and cylinder head removal		Remove the parts in the order listed below.
	Air cleaner and fuel tank assembly		Refer to "AIR CLEANER AND FUEL TANK".
	Muffler assembly		Refer to "MUFFLER".
	Carburetor assembly		Refer to "CARBURETOR".
	Flywheel cover		Refer to "FLYWHEEL".
1	Spark plug cap	1	
2	Spark plug	1	
3	Breather hose	1	
4	Cylinder head cover	1	
5	Gasket	1	
6	Air shroud	1	
7	Cylinder head assembly	1	
8	Cylinder head gasket	1	
9	Dowel pin	2	
10	Push rod	2	
			For installation, reverse the removal procedure.

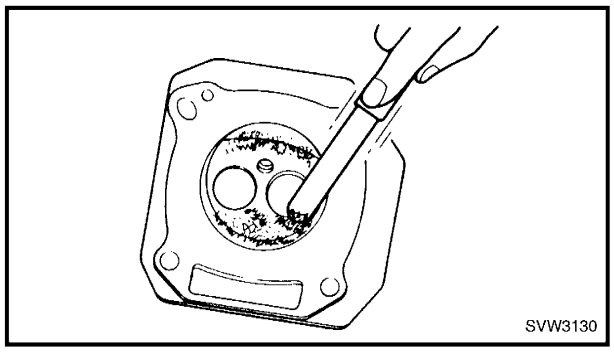

SVW3120

PUSH ROD INSPECTION

1. Measure:
   - Push rod runout

Runout limit:
0.5 mm (0.02 in)

Out of specification → Replace.

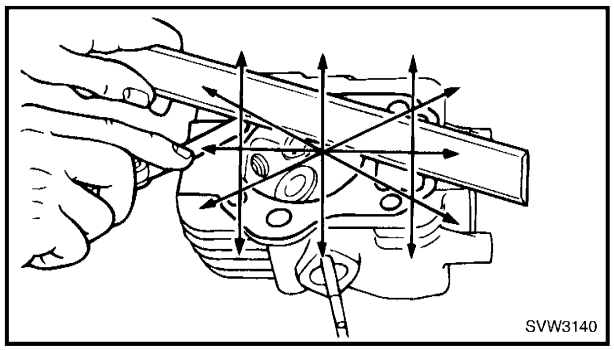

SVW3130

CYLINDER HEAD INSPECTION

1. Inspect:
   - Cylinder head combustion chamber
     Check the combustion chamber for carbon deposits.
     Carbon deposits → Remove.

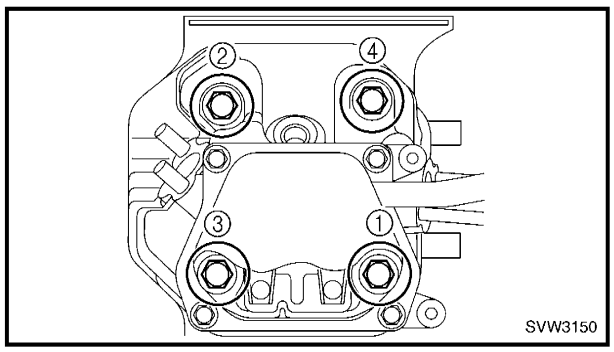
NOTE:
Be sure not to damage the contact surface of the cylinder.

2. Inspect:
   - Cylinder head
     Cracks/damage around the hole of spark plug → Replace.
3. Measure:
   - Cylinder head warpage
     Measure the warpage on the contact surface of the cylinder head at six points using the straight edge and thickness gauge.


SVW3140

Warpage limit:
0.05 mm (0.002 in)

Out of specification → Resurface or replace.



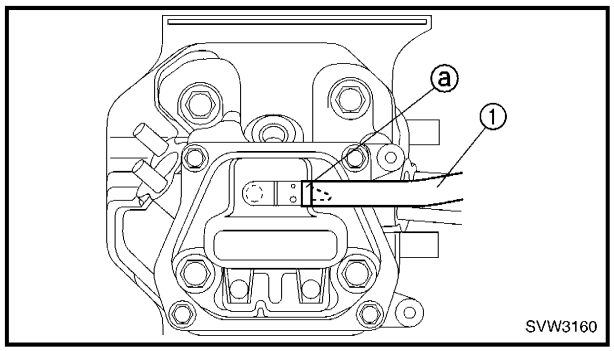
CYLINDER HEAD ASSEMBLY

1. Install:
   - Cylinder head bolts ① to ④.

NOTE:

Tighten the bolts to the specified torque in two steps and in order from ① to ④.

Cylinder head bolts:
44 Nm (4.4 m · kg, 32 ft · lb)



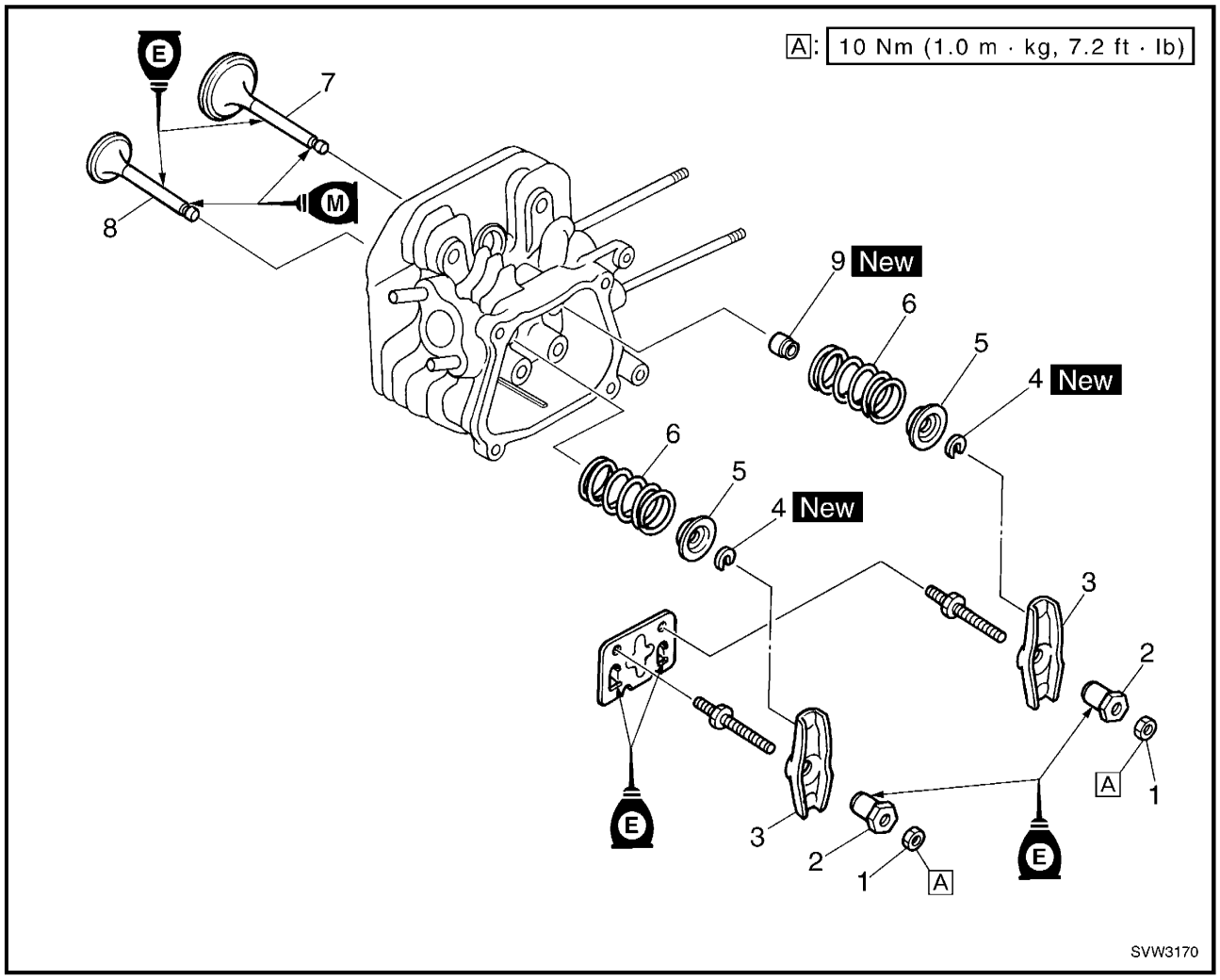
BREATHER HOSE ASSEMBLY

1. Inspect:
   - Breather hose ①

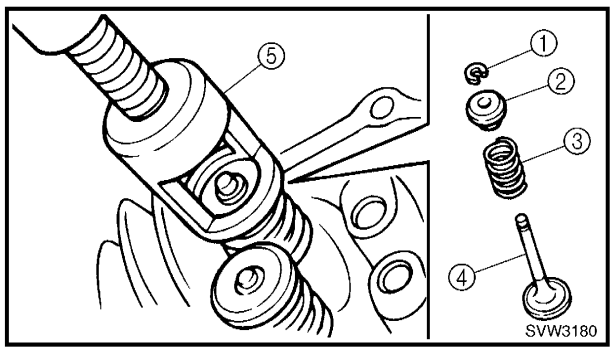
NOTE:

Contact the end of the breather hose to the reed valve stopper ⓐ.

VALVE



Order	Job name/Part name	Q'ty	Remarks
	Valve removal		Remove the parts in the order listed below.
	Cylinder head assembly		Refer to "CYLINDER HEAD COVER AND CYLINDER HEAD".
1	Lock nut	2	
2	Adjuster	2	
3	Rocker arm	2	
4	Valve cotter	2	
5	Valve spring retainer	2	
6	Valve spring	2	
7	Valve (intake)	1	
8	Valve (exhaust)	1	
9	Valve stem seal	1	
			For installation, reverse the removal procedure.



VALVE AND VALVE SPRING REMOVAL

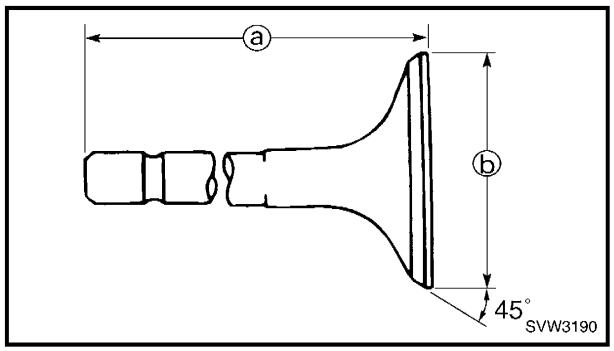
1. Remove:
   - Valve cotter ①
   - Valve spring retainer ②
   - Valve spring ③
   - Valve ④

   Remove the parts using the valve spring compressor ⑤.

NOTE:

Do not compress the spring more than necessary.

	Valve spring compressor: YM-01253, 90890-01253

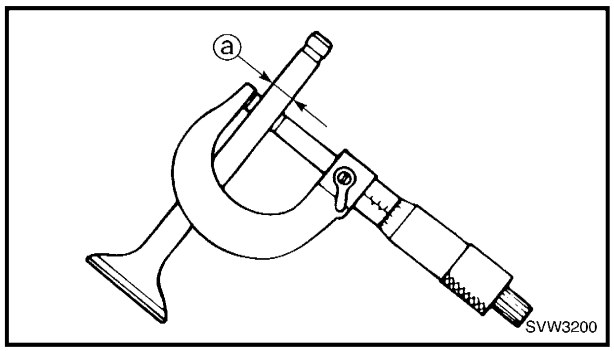


VALVE AND VALVE SPRING INSPECTION

1. Measure:
   - Valve stem length ⓐ
   - Valve face diameter ⓑ

	Valve stem length: **Intake: 85.9 mm (3.38 in)** **Exhaust: 86.1 mm (3.39 in)** **Valve face diameter:** **Intake: 29.0 mm (1.14 in)** **Exhaust: 25.0 mm (0.98 in)**

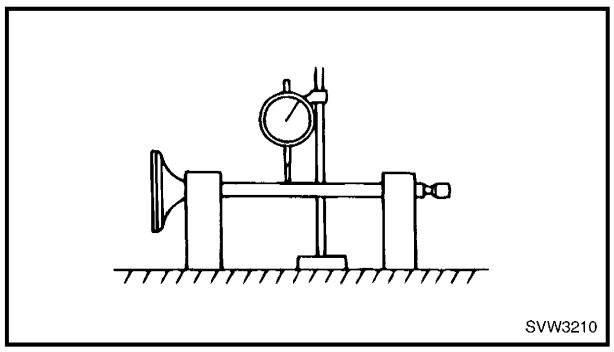
Out of specification → Replace.



2. Measure:
   - Valve stem diameter ⓐ

	Valve stem diameter: **Intake and exhaust: 6.0 mm (0.24 in)** **Wear limit** **Intake: 5.9 mm (0.23 in)** **Exhaust: 5.9 mm (0.23 in)**

Out of specification → Replace.

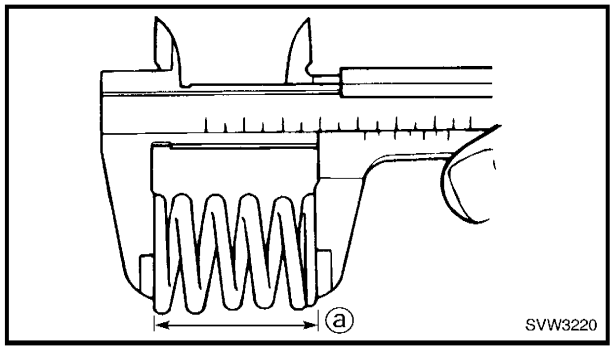

SVW3210

3. Measure:
   • Valve stem runout

Runout limit:
0.01 mm (0.0004 in)

Out of specification → Replace.

NOTE:
The value is half of that indicated on the dial gauge.

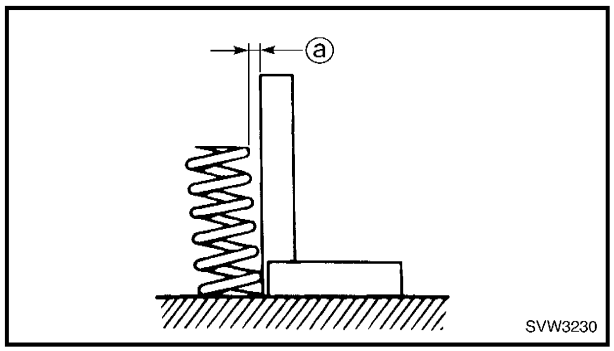


SVW3220

4. Measure:
   • Valve spring free length ⓐ

Valve spring free length:
Intake and exhaust: 37.1 mm (1.46 in)
Limit: 35.0 mm (1.38 in)

Out of specification → Replace.

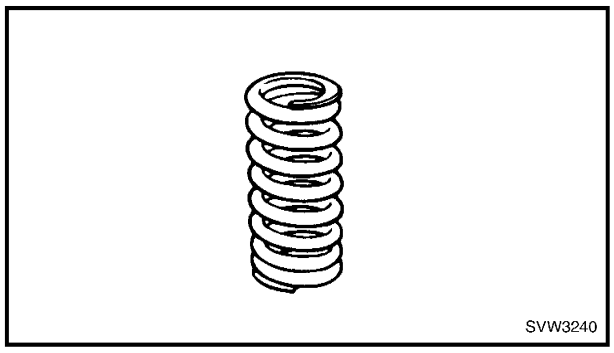


SVW3230

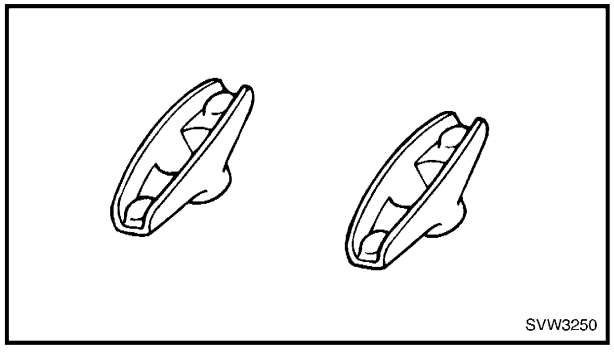
5. Measure:
   • Valve spring tilt ⓐ

Tilt limit:
1.6 mm (0.06 in)

Out of specification → Replace.


SVW3240

6. Inspect:
   • Valve spring contact surface
   More than 2/3 of the contact surface does not contact → Replace.


SVW3250

LOCKER ARM INSPECTION

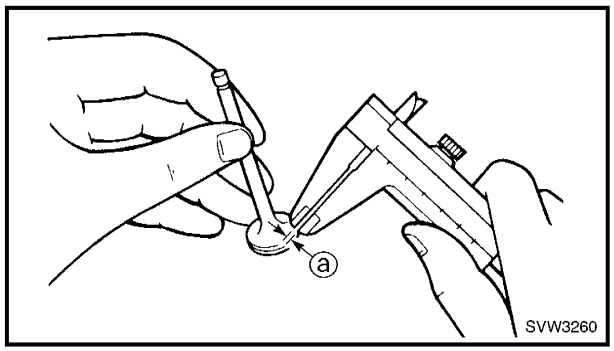
1. Inspect:
   • Rocker arm
   Wear/damage/cracks → Replace.

VALVE SEAT INSPECTION

1. Remove carbon deposits from the valve face and valve seat.
2. Apply a small amount of coarse mechanic's blueing dye (Dykem) to the valve face.
3. Insert the vale into the valve guide and use a valve lapper to contact the valve face with the valve seat.

NOTE:

Do not rotate the valve while the valve face is contacting the valve seat.

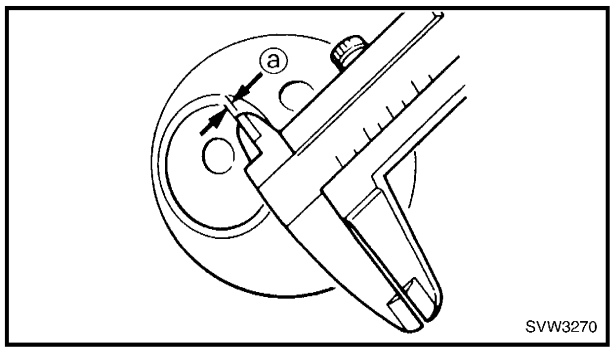


4. Measure:
   - Valve face contact width ⓐ

   Make sure that the contact width along the entire valve face is within specifications.

Valve face contact width (intake and exhaust):
0.8 mm (0.031 in)
Limit: 1.7 mm (0.067 in)

Out of specification/rough/eccentric wear → Replace.

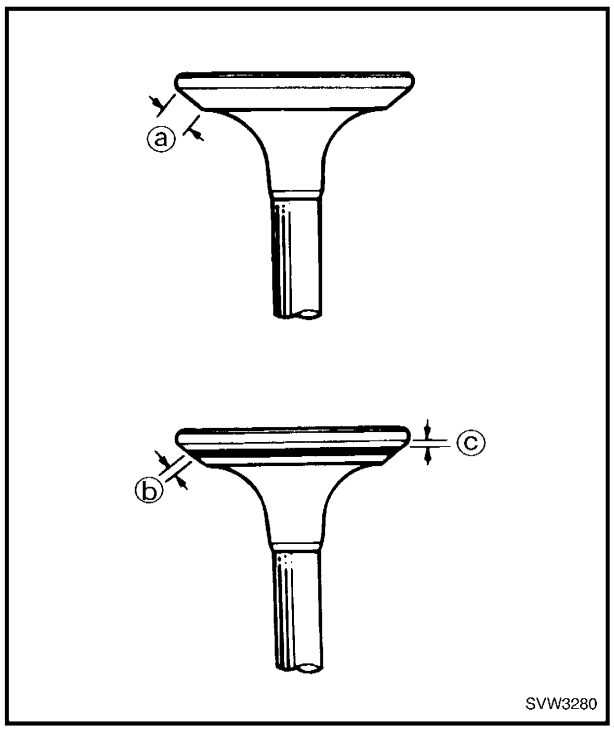


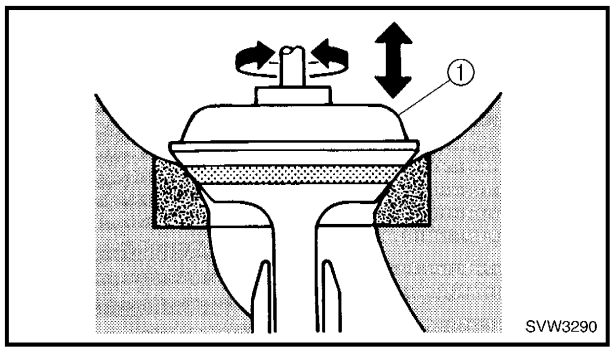
5. Measure:
   - Valve seat contact width ⓐ

   Make sure that the contact width along the entire valve seat is within specifications.

Valve seat contact width (intake and exhaust):
0.8 mm (0.031 in)
Limit: 1.7 mm (0.067 in)

Out of specification/rough/eccentric wear → Replace.





6. Remove the carbon deposits on the valve face ⓐ and valve seat.
   - Valve face contact width ⓑ
   - Valve margin thickness ⓒ

   Apply a small amount of coarse mechanic's blueing dye (Dykem) to the valve seat.

   Press the valve through the valve guide and onto the valve seat to make a clear impression.
   - Valve margin thickness
     Out of specification → Replace.
   - Valve face contact width
     Out of specification → Replace.

Valve face contact width:
0.8 mm (0.031 in)
Valve margin thickness:
0.3 mm (0.012 in)

VALVE LAPPING

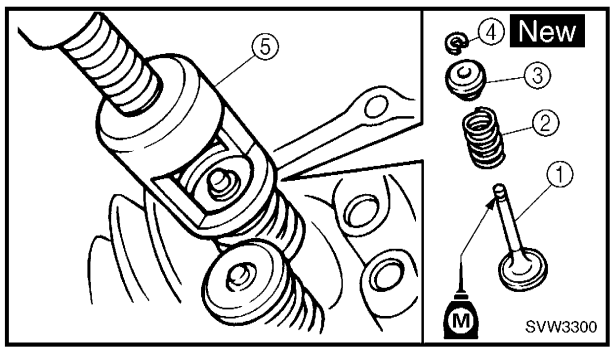
1. Apply a coarse lapping compound evenly on the valve face. Lap the valve by tapping and rotating the valve lapper ① clockwise and counterclockwise.
2. Clean off all of the lapping compound from the valve face and valve seat. Apply fine lapping compound on the valve face and lap the valve as in step 1.
3. If the contact width on the valve face shines white along the entire face, apply mechanic's blueing dye (Dykem) to make sure that there are traces of even contact in the center of the valve face.

CAUTION:

Do not let the lapping compound enter the gap between the valve stem and the valve guide.

NOTE:

After every lapping procedure, clean off the compound from the valve face and valve seat.



VALVE AND VALVE SPRING ASSEMBLY

1. Install:
   - Valve ①
   - Valve spring ②
   - Valve spring retainer ③
   - Valve cotter ④ New

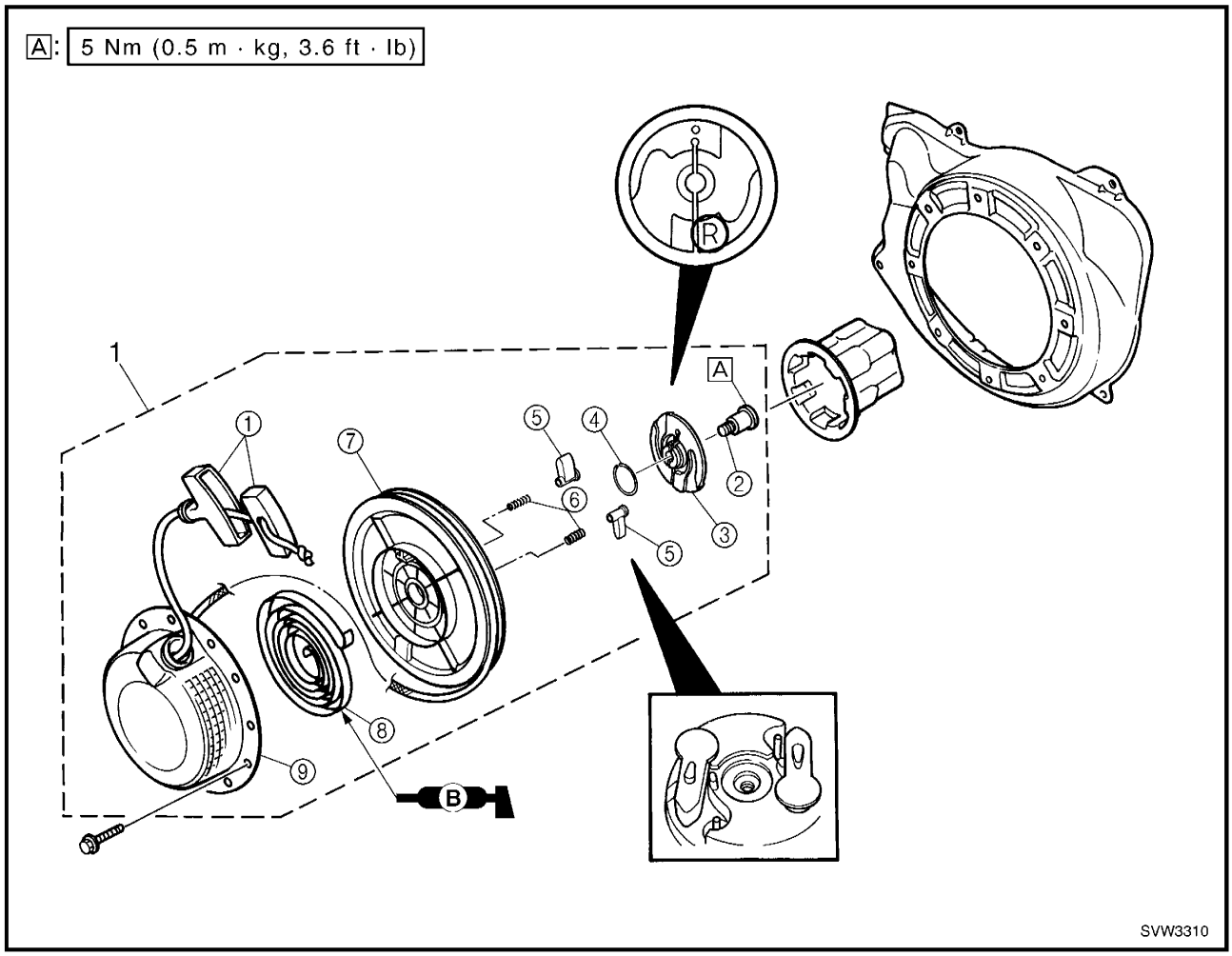
     Apply a small amount of molybdenum disulfide oil to the valve stem and use the valve spring compressor ⑤ to install the parts.

	**Valve spring compressor: YM-01253, 90890-01253**

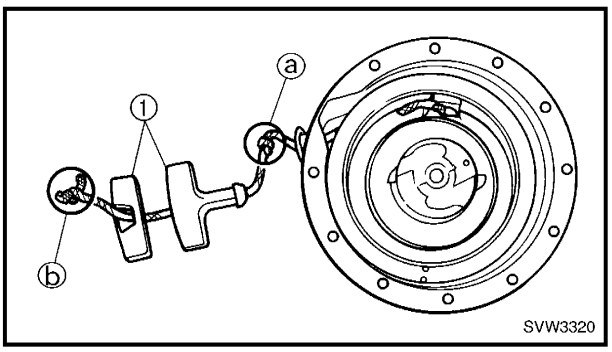
CAUTION:

Do not compress the valve spring more than necessary.

RECOIL STARTER



Order	Job name/Part name	Q'ty	Remarks
	Recoil starter removal		Remove the parts in the order listed below.
1	Recoil starter assembly	1	For installation, reverse the removal procedure.
	Recoil starter disassembly		Remove the parts in the order listed below.
①	Starter handle	1	
②	Bolt	1	
③	Drive plate	1	
④	Clip	1	
⑤	Drive pawl	2	
⑥	Spring	2	
⑦	Sheave drum	1	
⑧	Starter spring	1	
⑨	Starter case	1	For assembly, reverse the disassembly procedure.

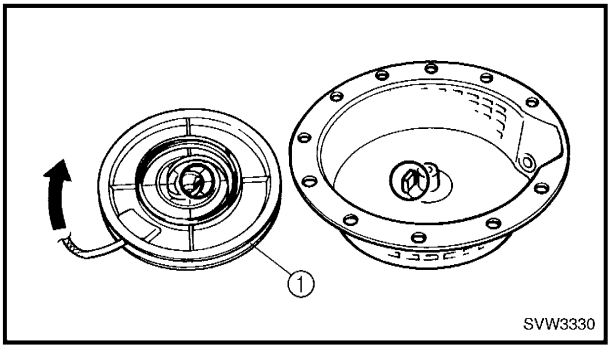


RECOIL STARTER DISASSEMBLY

1. Remove:
   - Starter handle ①

NOTE:

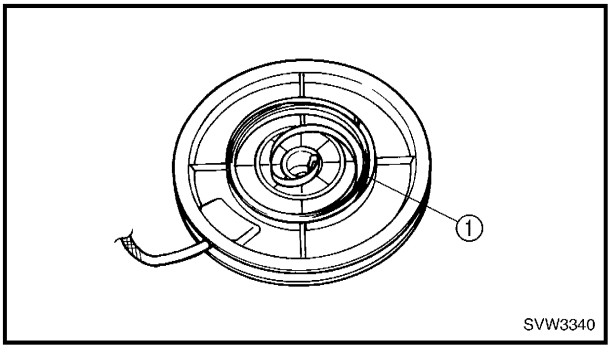
Make a knot ⓐ at the end of the starter rope to prevent the rope from being retracted into the starter case. Then, undo the knot ⓑ at the starter handle to the remove starter handle ①.



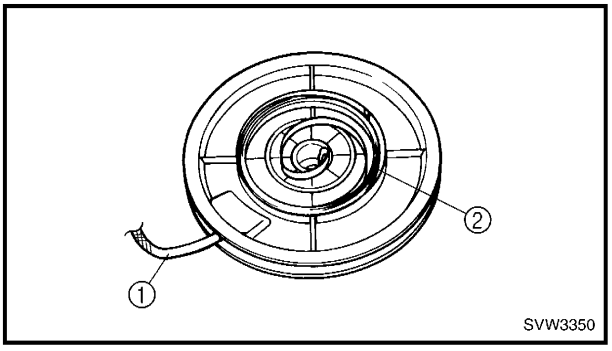
2. Remove:
   - Sheave drum ①

CAUTION:

Be sure to press down on the drum sheave, because the spring will spring out suddenly when it is removed from the sheave drum.

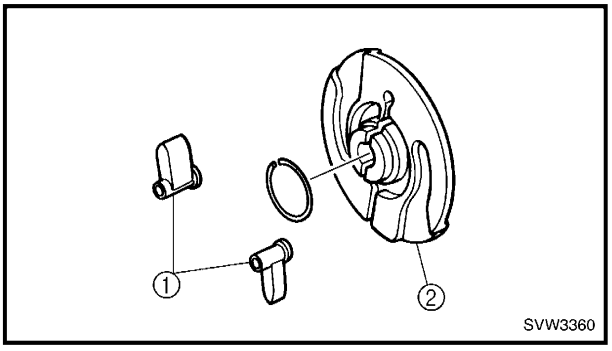


3. Remove:
   - Starter spring ①

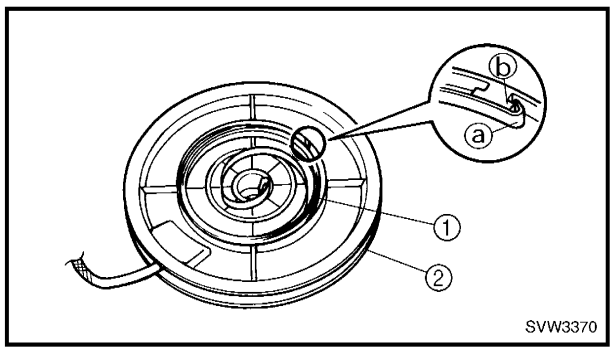


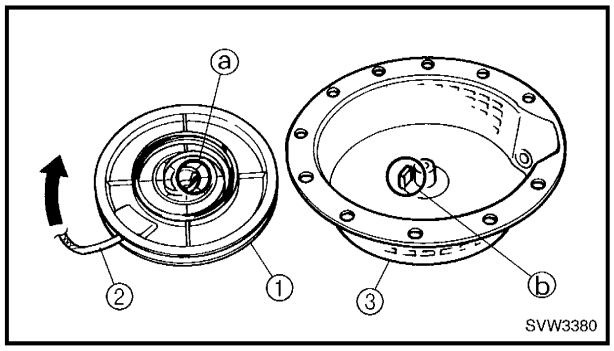
RECOIL STARTER INSPECTION

1. Inspect:
   - Starter rope ①
2. Inspect:
   - Starter spring ②
     Damage/deterioration → Replace.



3. Inspect:
   - Drive pawl ①
   - Drive plate ②
     Wear/damage → Replace.





RECOIL STARTER ASSEMBLY

1. Install:
   - Starter spring ①
   - Sheave drum ②

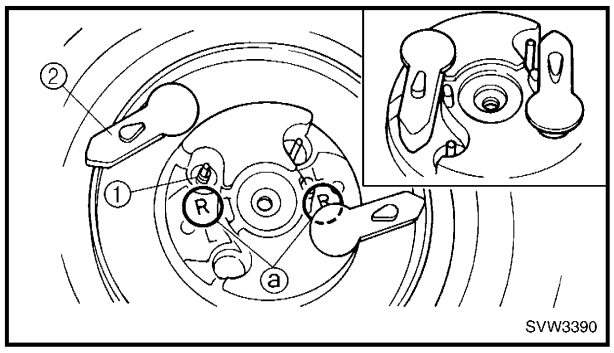
NOTE:

Engage starter spring outer hook ⓐ with groove ⓑ on the sheave drum ②. Carefully wind the spring counterclockwise and place it on the sheave drum ②.

2. Install:
   - Sheave drum ①
   - Starter rope ②
   - Starter case ③

NOTE:

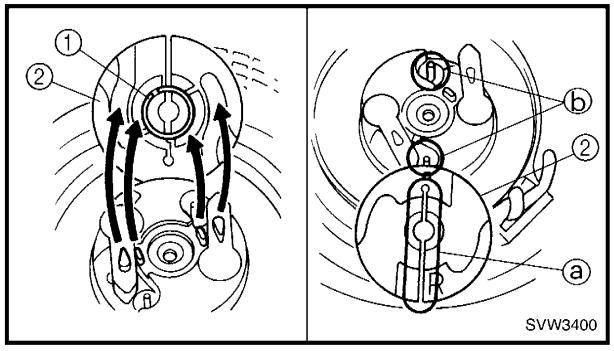
- Wind the starter rope ② clockwise two turns on the sheave drum ①.
- Engage starter spring inner hook ⓐ with the strut ⓑ of the starter case ③ and install the parts.



3. Install:
   - Spring ①
   - Drive pawl ②

NOTE:

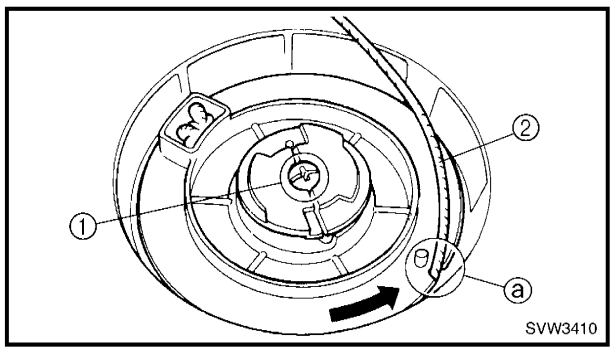
Install the spring ① and drive pawl ② to the "R" mark ⓐ.



4. Install:
   - Clip ①
   - Drive plate ②

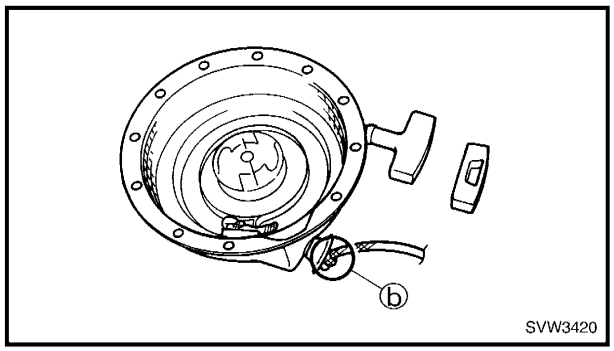
NOTE:

Align the groove ⓐ of the drive plate ② with the sheave drum strut ⓑ, and then install the parts.



5. Install:
   - Bolt ①

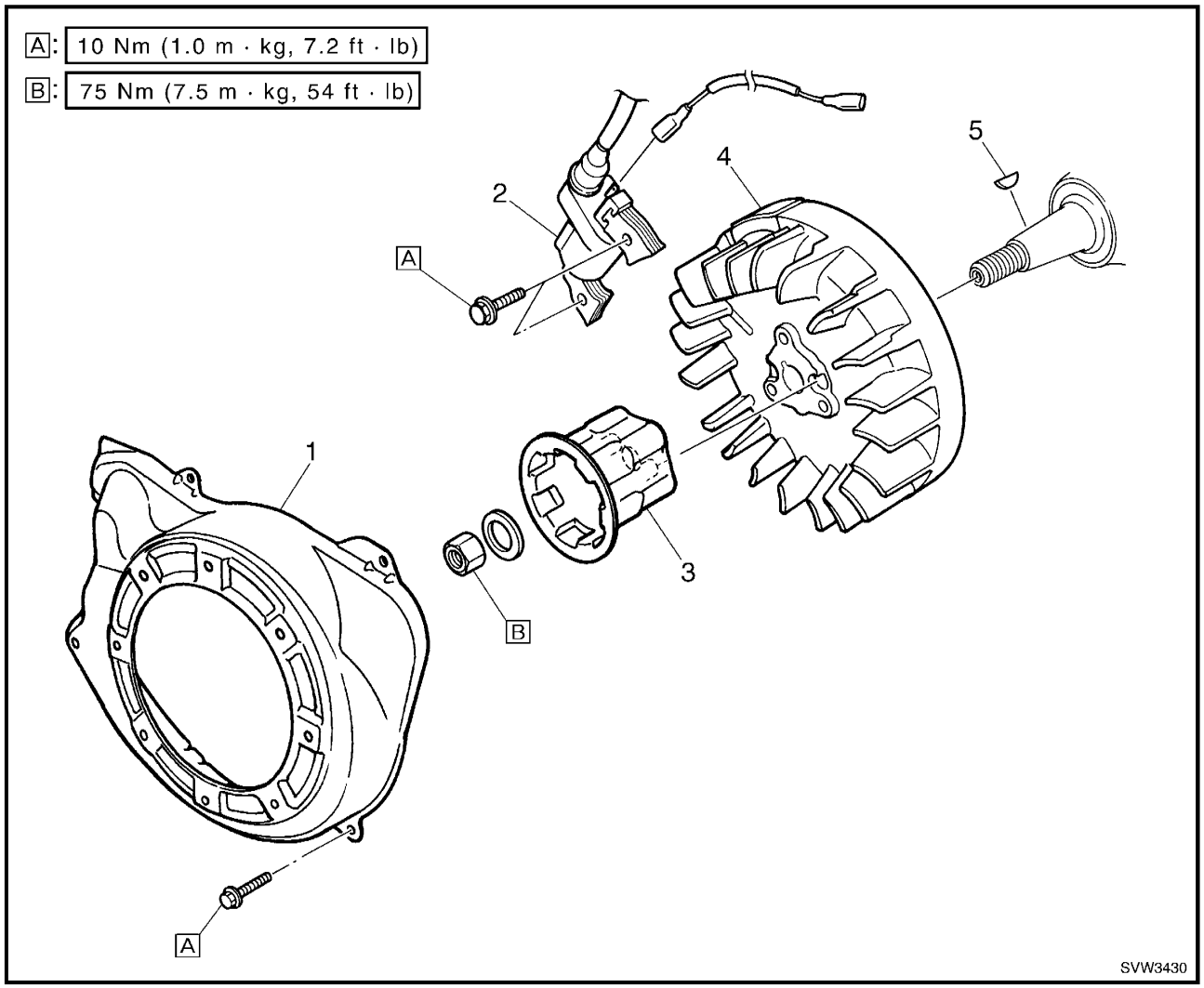
     After tightening the bolt, place starter rope ② in the cutout ⓐ in the sheave drum, and wind it counterclockwise four turns.



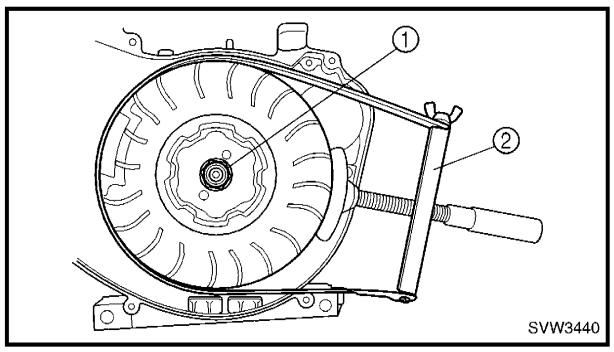
NOTE:

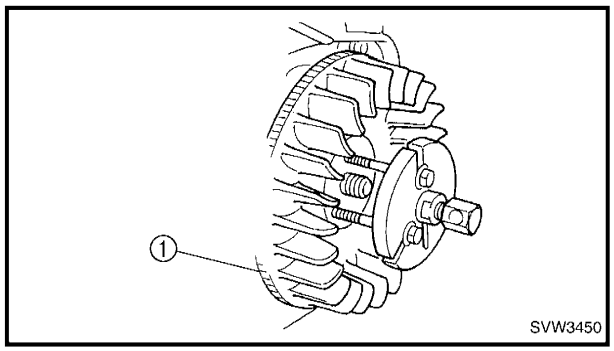
Make a knot ⓑ at the end of the starter rope to prevent the rope from being retracted into the recoil starter case.

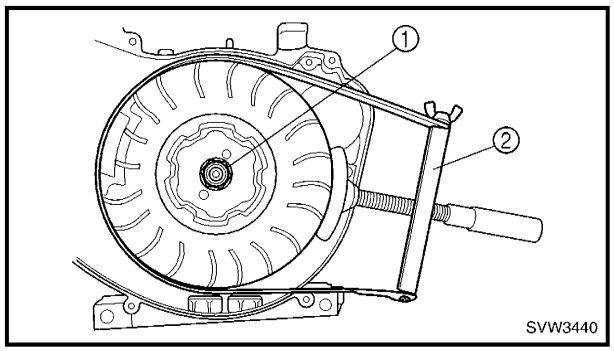
FLYWHEEL

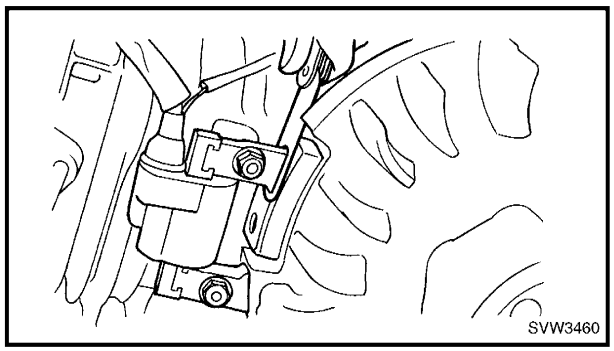


Order	Job name/Part name	Q'ty	Remarks
	Flywheel removal		Remove the parts in the order listed below.
	Air cleaner assembly		Refer to "AIR CLEANER AND FUEL TANK".
	Carburetor assembly		Refer to "CARBURETOR".
	Recoil starter assembly		Refer to "RECOIL STARTER".
1	Flywheel cover	1	
2	TCI unit	1	
3	Starter pulley	1	
4	Flywheel	1	
5	Woodruff key	1	
			For installation, reverse the removal procedure.









FLYWHEEL REMOVAL

1. Remove:
   - Flywheel nut ①
   - Washer

NOTE:

Attach the sheave holder ② to hold the flywheel.

	Sheave holder: **YS-01880, 90890-01701**

2. Remove:
   - Flywheel ①

	Rotor puller: **YU-33270, 90890-01362**

FLYWHEEL INSTALLATION

1. Install:
   - Flywheel
2. Install:
   - Flywheel nut ①
   - Washer

	Flywheel nut: **75 Nm (7.5 m · kg, 54 ft · lb)**

NOTE:

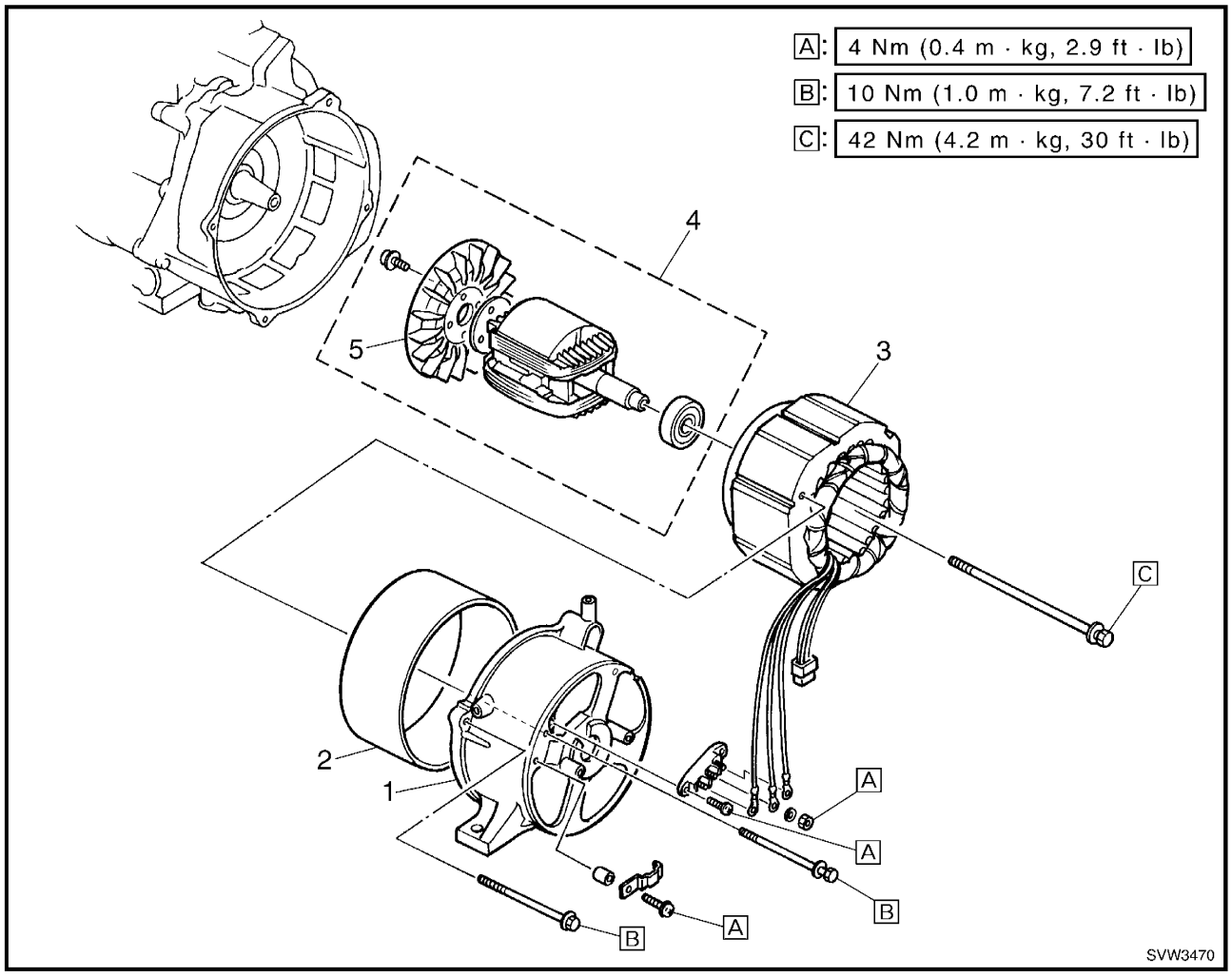
Tighten the flywheel nut ① using the sheave holder ② to hold the flywheel.

	Sheave holder: **YS-01880, 90890-01701**

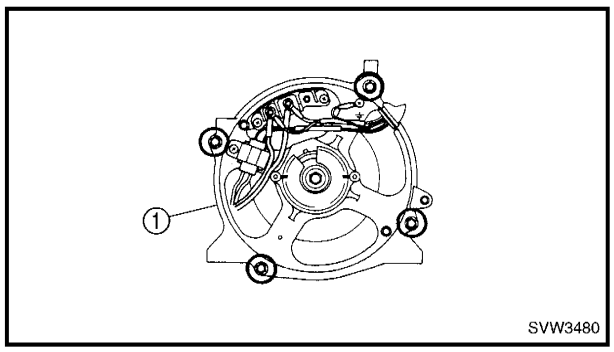
3. Measure:
   - Air gap between TCI unit and flywheel
     Refer to "AIR GAP BETWEEN TCI UNIT AND FLYWHEEL" in CHAPTER 2.

	Air gap between TCI unit and flywheel: **0.5 mm (0.02 in)**

GENERATOR



Order	Job name/Part name	Q'ty	Remarks
	Generator removal		Remove the parts in the order listed below.
	Fuel tank assembly		Refer to "AIR CLEANER AND FUEL TANK".
	Muffler assembly		Refer to "MUFFLER".
	Control box		Refer to "CONTROL BOX".
1	Rear frame	1	
2	Stator cover	1	
3	Stator assembly	1	
4	Rotor assembly	1	
5	Generator fan	1	
			For installation, reverse the removal procedure.

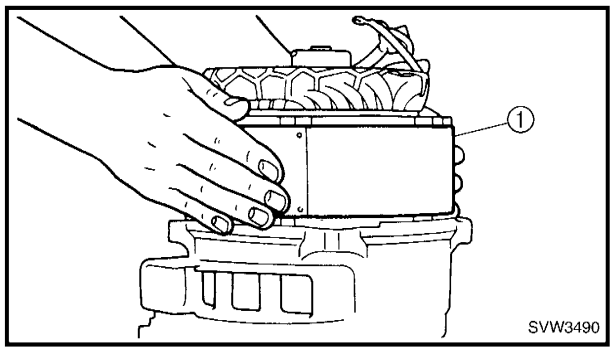


STATOR ASSEMBLY AND ROTOR ASSEMBLY REMOVAL

1. Remove:
   - Rear frame ①

NOTE:

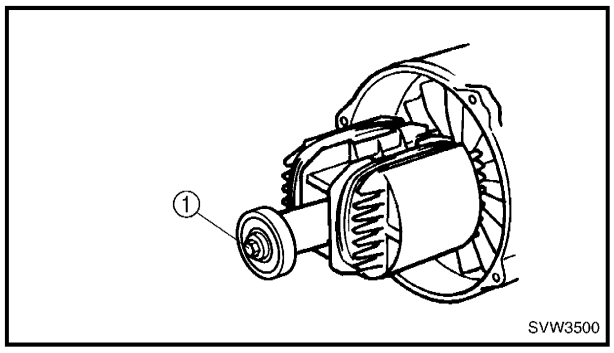
To remove the rear frame ① strike it with a rubber hammer, since the bearing may be stuck in the frame.



2. Remove:
   - Stator assembly ①

CAUTION:

Do not drop damage the stator assembly ①.

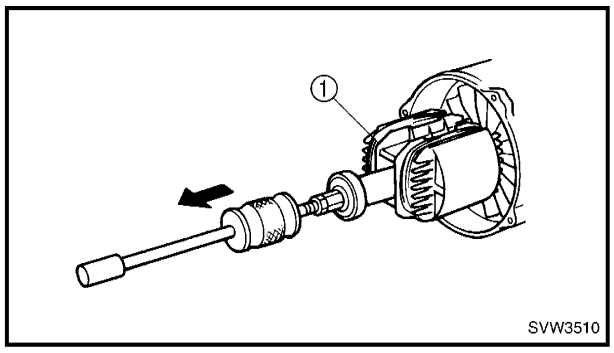


3. Remove:
   - Rotor assembly bolt ①

NOTE:

Attach the sheave holder to hold the flywheel.

Sheave holder:
YS-01880, 90890-01701



4. Remove:
   - Rotor assembly ①

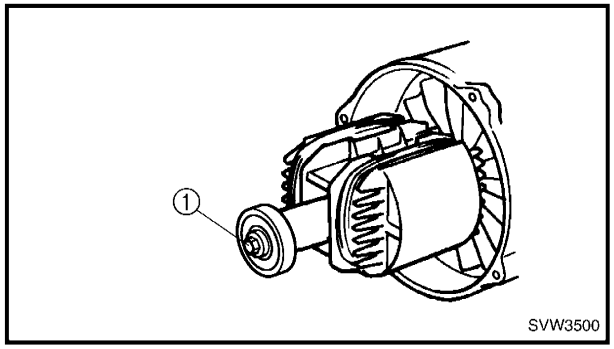
Rotor shock puller:
YU-1047, 90890-01259
Rotor puller attachment (M14 × 1.25):
YU-1379, 90890-01379

CAUTION:

Do not drop or damage the rotor assembly ①.

STATOR ASSEMBLY AND ROTOR ASSEMBLY INSTALLATION

1. Install:
   - Rotor assembly



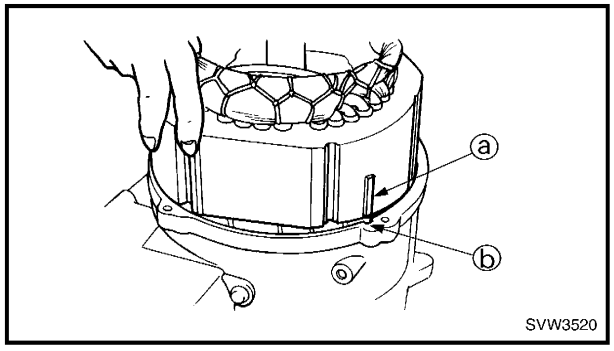
2. Tighten:
   - Rotor assembly bolt ①
   - Washer

	Rotor assembly bolt: 42 Nm (4.2 m · kg, 30 ft · lb)

NOTE:

Tighten the rotor assembly bolt ① attaching the sheave holder to hold the flywheel.

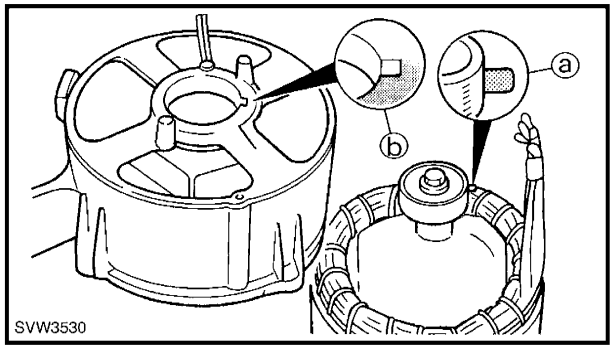
	Sheave holder: YS-01880, 90890-01701



3. Install:
   - Stator assembly

CAUTION:

Align the key ⓐ on the stator assembly with the slot ⓑ on the crankcase cover.

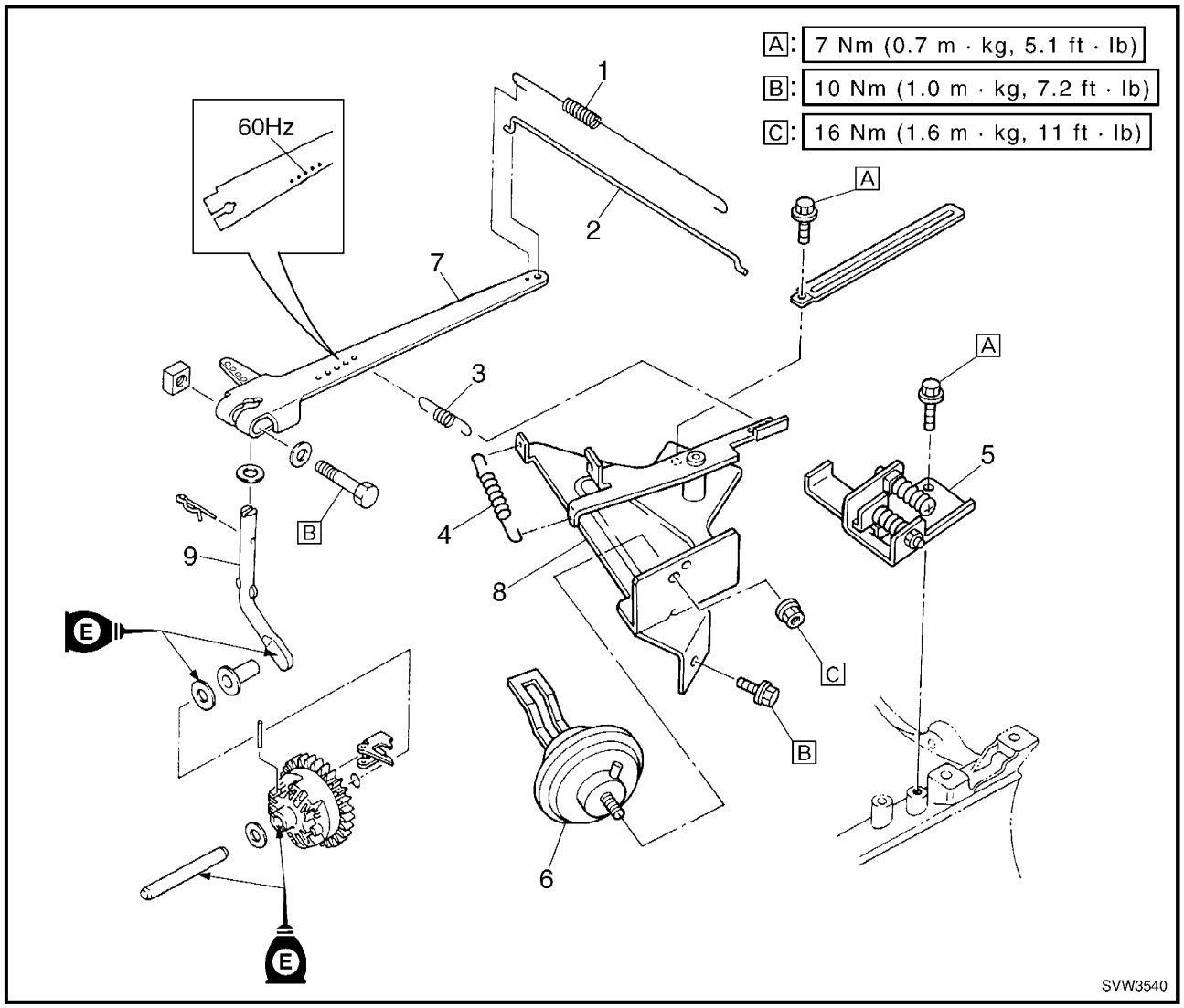


4. Install:
   - Rear frame

CAUTION:

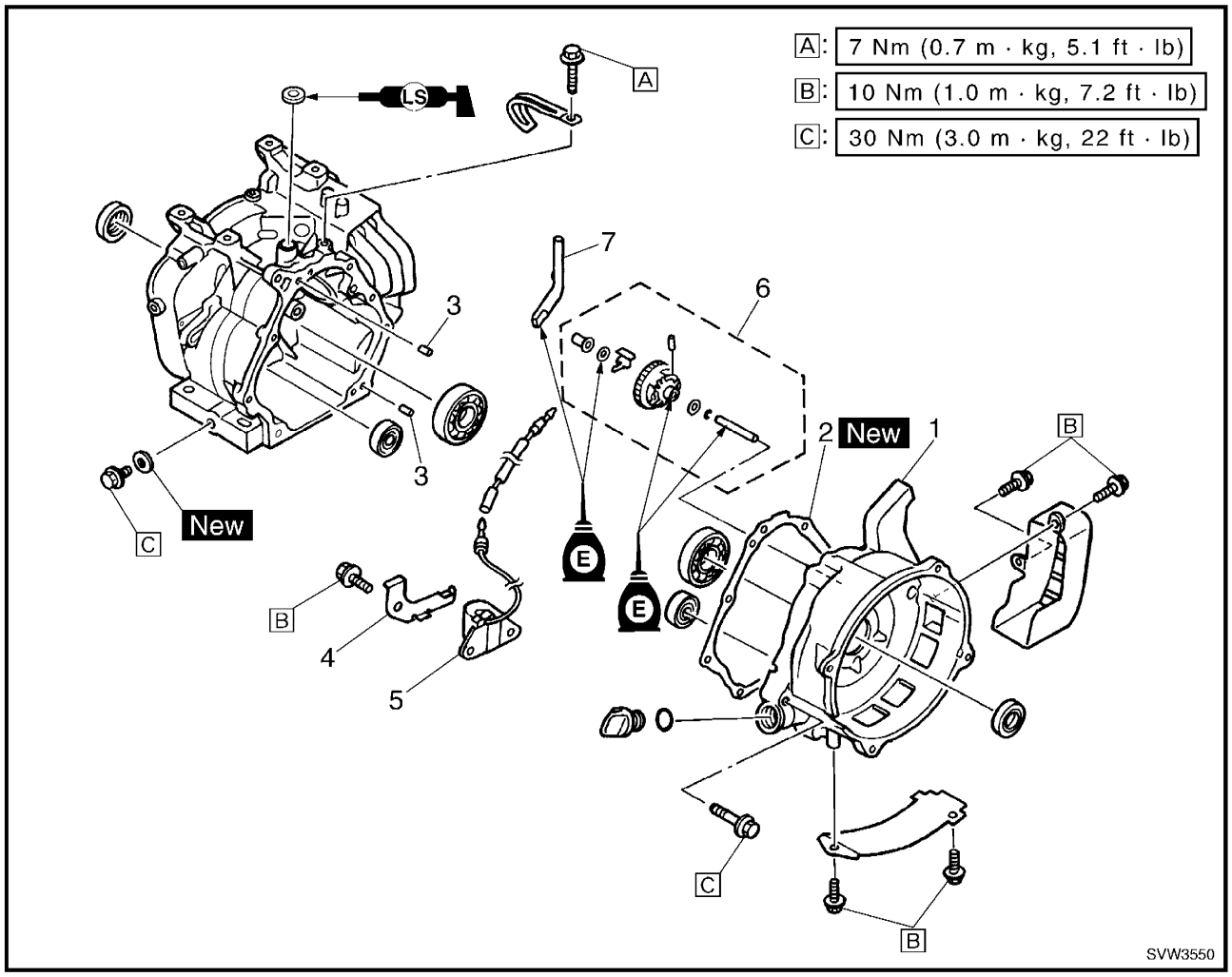
Align the pin ⓐ on the rotor bearing with the slot ⓑ on the rear frame.

GOVERNOR

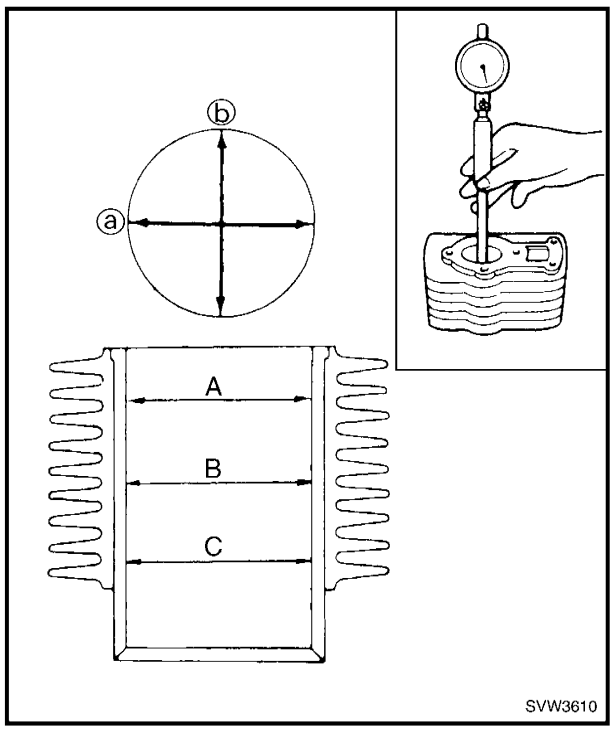


Order	Job name/Part name	Q'ty	Remarks
	Governor removal		Remove the parts in the order listed below.
	Crankshaft assembly		Refer to "PISTON, CONNECTING ROD, CAMSHAFT AND CRANKSHAFT".
1	Spring	1	
2	Link rod	1	
3	Spring	1	
4	Spring	1	
5	Adjust plate assembly	1	
6	Vacuum diaphragm	1	
7	Governor arm	1	
8	Stay assembly	1	
9	Governor shaft	1	
			For installation, reverse the removal procedure.

CRANKCASE COVER AND CRANKCASE



Order	Job name/Part name	Q'ty	Remarks
	Crankcase cover and crankcase removal		Remove the parts in the order listed below.
	Engine assembly		Refer to "ENGINE".
	Generator, rotor assembly		Refer to "GENERATOR".
	Cylinder head assembly		Refer to "CYLINDER HEAD COVER AND CYLINDER HEAD".
	Flywheel		Refer to "FLYWHEEL".
1	Crankcase cover	1	
2	Gasket	1	
3	Dowel pin	2	
4	Bracket	1	
5	Oil level switch	1	
6	Flyweight shaft assembly	1	
7	Governor shaft	1	
			For installation, reverse the removal procedure.



CRANKCASE (CYLINDER) INSPECTION

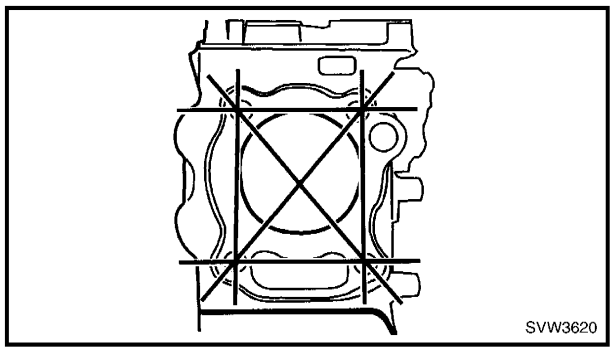
1. Measure:
   - Cylinder inside diameter

NOTE:

Take side to side ⓐ and front to back ⓑ measurements at each of the three locations A, B, C (total of six measurements), and then find the average of the measurements.

Maximum wear = Maximum A, B, C.
Cylinder taper = Maximum A – Minimum C.
Out of specification → Replace.

Cylinder inside diameter:
75.000 ~ 75.020 mm
(2.9528 ~ 2.9535 in)
Cylinder inside diameter wear limit:
75.020 mm (2.9535 in)
Cylinder taper limit:
0.05 mm (0.002 in)



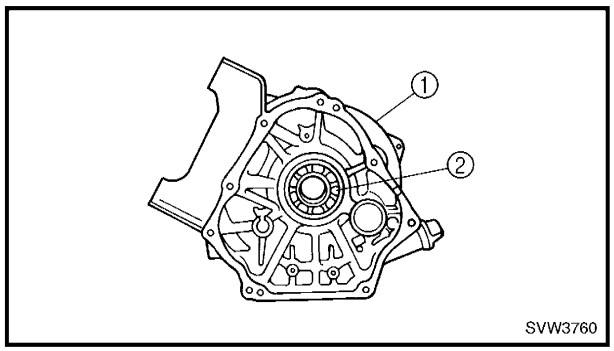
2. Measure:
   - Cylinder warpage

NOTE:

Measure the warpage on the contact surface of the cylinder head at six points using a straight edge and thickness gauge.

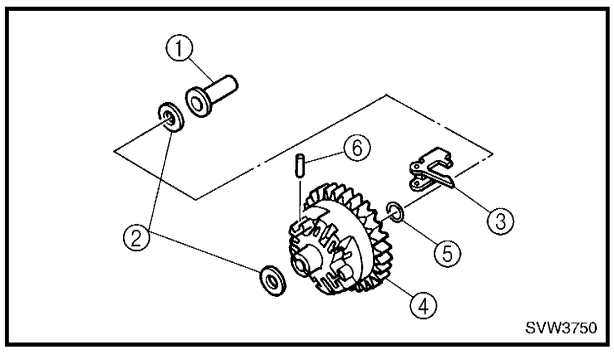
Out of specification → Resurface or replace.

Warpage limit:
0.05 mm (0.002 in)



CRANKCASE COVER INSPECTION

1. Inspect:
   - Crankcase cover ①
     Damage → Replace.
   - Bearing ②
     Noise/wear/rotational failure → Replace.

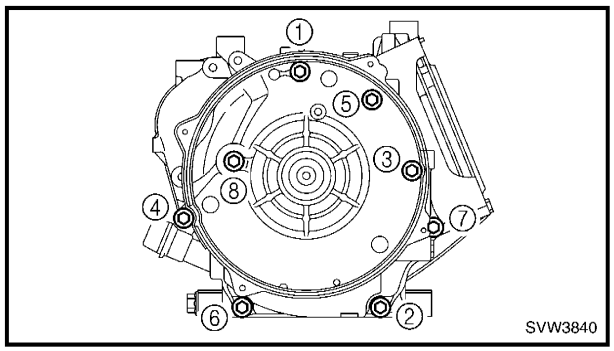


FLYWEIGHT SHAFT GEAR INSPECTION

1. Inspection:
   - Collar ①
   - Washers ②
   - Weight ③
   - Flywheel shaft gear ④
     Wear/damage → Replace.

CAUTION:

Open the end gap of the stopper ⑤, and then remove the stopper ⑤, pin ⑥ and weight ③ in order described.



CRANKCASE COVER INSTALLATION

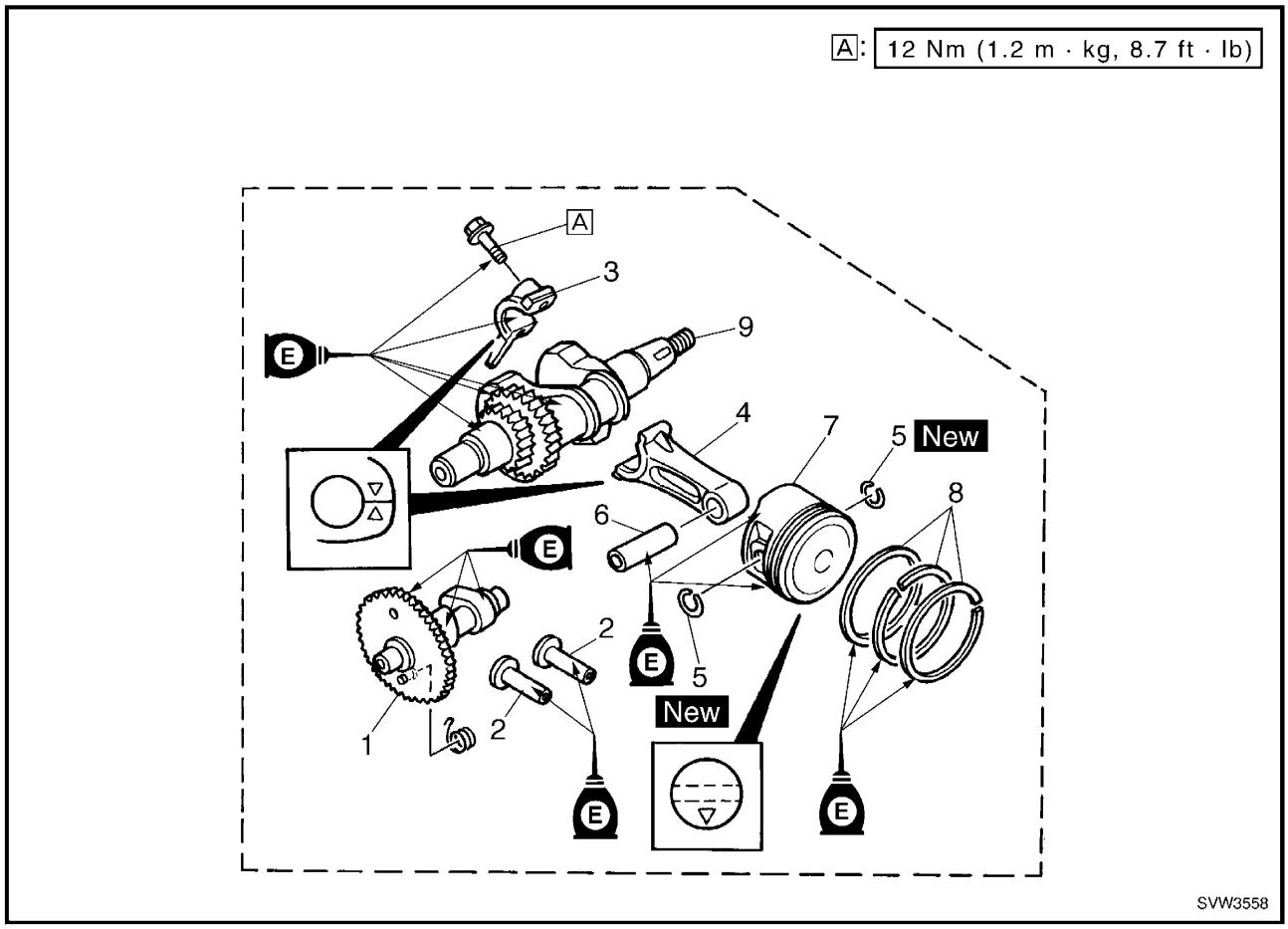
1. Install:
   - Crankcase cover bolts ① to ⑧

NOTE:

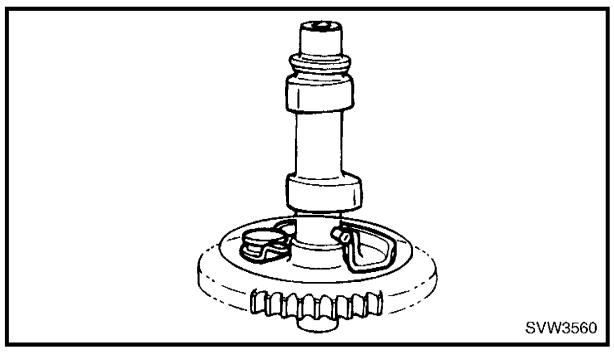
Tighten the bolts to the specified torque in two steps and in order from ① to ⑧.

	Crankcase cover bolts: 30 Nm (3.0 m · kg, 22 ft · lb)

PISTON, CONNECTING ROD, CAMSHAFT AND CRANKSHAFT

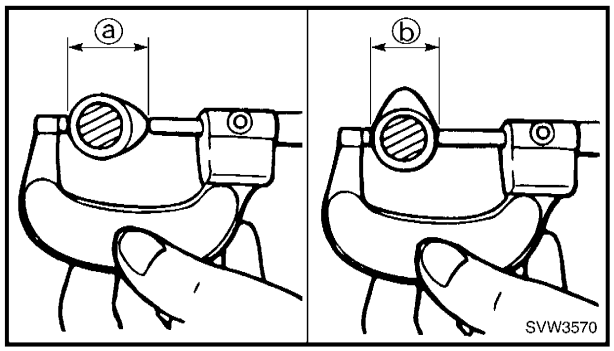


Order	Job name/Part name	Q'ty	Remarks
	Piston, connecting rod, camshaft and crankshaft removal		Remove the parts in the order listed below.
	Engine assembly		Refer to "ENGINE".
	Generator, rotor assembly		Refer to "GENERATOR".
	Cylinder head assembly		Refer to "CYLINDER HEAD COVER AND CYLINDER HEAD".
	Flywheel		Refer to "FLYWHEEL".
	Crankcase cover		Refer to "CRANKCASE COVER AND CRANKCASE".
1	Camshaft	1	
2	Valve lifter	2	
3	Connecting rod cap	1	
4	Connecting rod	1	
5	Piston pin circlip	2	
6	Piston pin	1	
7	Piston	1	
8	Piston ring	3	
9	Crankshaft	1	
			For installation, reverse the removal procedure.



CAMSHAFT INSPECTION

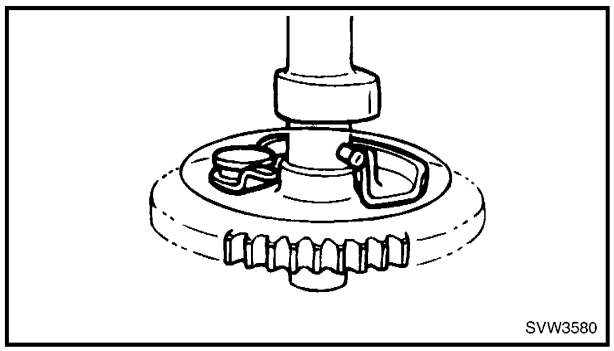
1. Inspect:
   - Camshaft
     Damage → Replace.



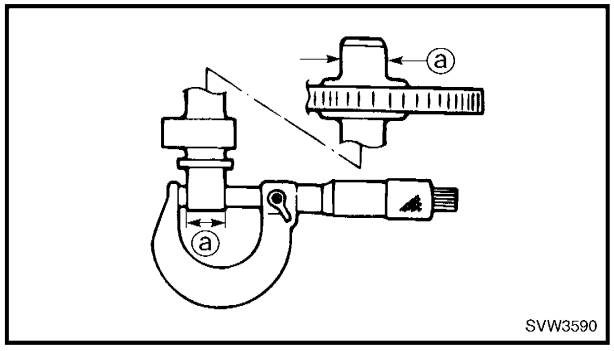
2. Measure:
   - Cam lobes length ⓐ and ⓑ
     Out of specifications → Replace.

Cam lobes length:

Intake	**: 32.55 ± 0.05 mm (1.28 ± 0.002 in)**
Wear limit	**: 32.40 mm (1.276 in)**
	: 26.08 ± 0.05 mm (1.03 ± 0.002 in)
Wear limit	**: 25.93 mm (1.021 in)**
Exhaust	**: 32.55 ± 0.05 mm (1.28 ± 0.002 in)**
Wear limit	**: 32.40 mm (1.276 in)**
	: 26.08 ± 0.05 mm (1.03 ± 0.002 in)
Wear limit	**: 25.93 mm (1.021 in)**

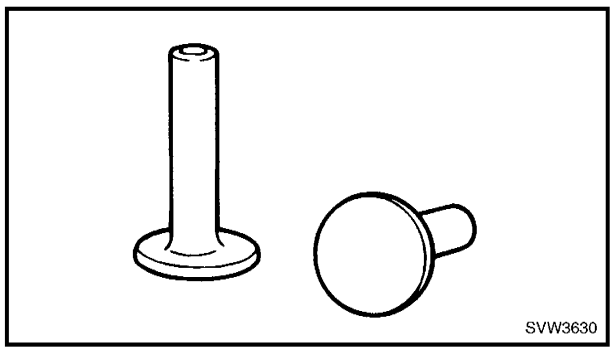


3. Inspect:
   - Surface of camshaft gear teeth
   - Decompressor
     Wear/damage → Replace.



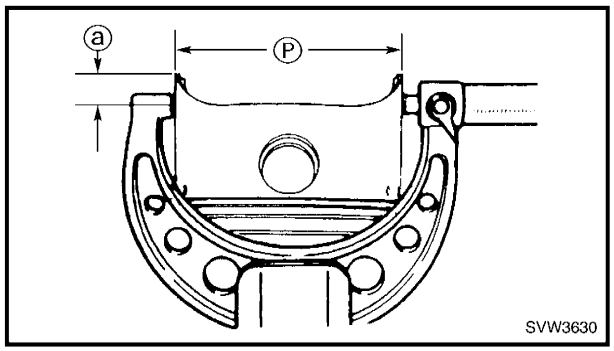
4. Measure:
   - Camshaft diameter ⓐ
     Out of specification → Replace.

Camshaft diameter:
16.000 mm (0.6299 in)
Wear limit: 15.950 mm (0.6280 in)



VALVE LIFTER INSPECTION

1. Inspect:
   - Valve lifter
     Damage → Replace.



PISTON AND PISTON PIN INSPECTION

1. Measure:
   - Piston skirt diameter Ⓟ

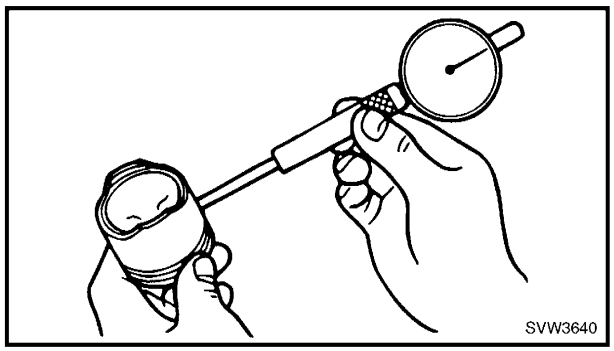
ⓐ = 10 mm (0.4 in) from the piston bottom edge
Out of specification → Replace.

Piston skirt diameter:
75.0 mm (2.953 in)
Wear limit:
74.9 mm (2.949 in)

2. Measure:
   - Piston clearance
     Out of specification → Rebore or replace cylinder and replace piston and piston rings.

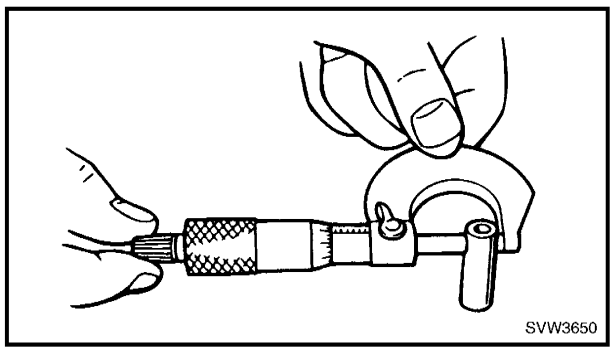
Piston clearance:
0.024 ~ 0.038 mm
(0.00094 ~ 0.00150 in)

Piston clearance =
Cylinder inside diameter –
Piston skirt diameter



3. Measure:
   - Piston pin hole inside diameter
     Out of specification → Replace.

Piston pin hole inside diameter:
18.000 mm (0.7087 in)
Wear limit:
18.020 mm (0.7094 in)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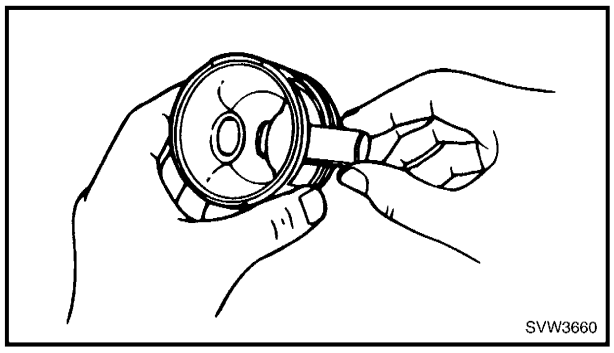
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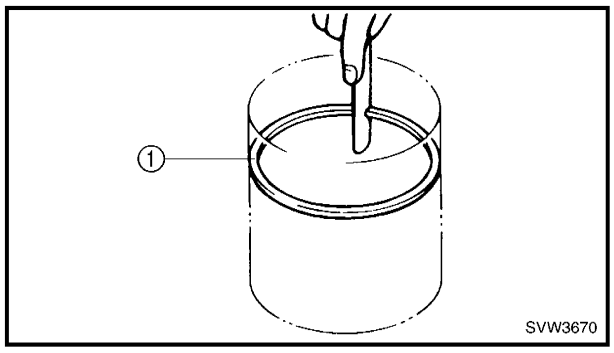


SVW3670

4. Measure:
   • Piston pin diameter
   Out of specification → Replace.

Piston pin diameter:
17.995 ~ 18.000 mm
(0.7085 ~ 0.7086 in)
Wear limit:
17.950 mm (0.7067 in)

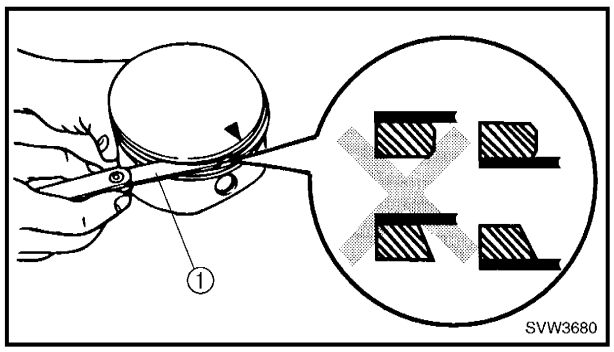
5. Inspect:
   • Check that the piston pin enters smoothly into the piston pin hole.
   If the piston pin fits tightly into the piston, check the piston pin hole. If there is any protrusion, use a knife or scraper to gently remove it so that the piston pin can be pushed in gently with your fingers.

PISTON RING INSPECTION

1. Measure:
   • Piston ring end gap
   Out of specification → Replace.

NOTE:
Insert the piston ring ① into the cylinder, and push it approximately 5 mm (0.2 in) into the cylinder. Push in the ring with the piston crown so that the ring is at right angles to the cylinder bore.

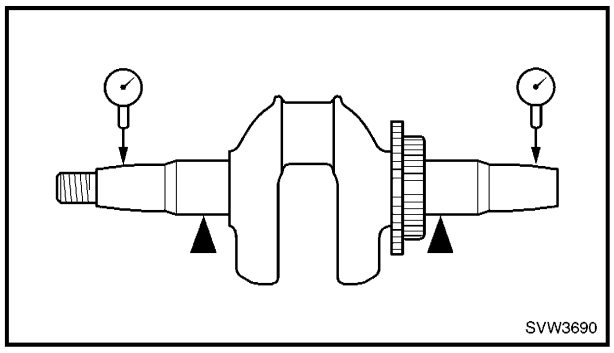
	Ring end gap	Wear limit
Top ring	0.2 ~ 0.4 mm (0.008 ~ 0.016 in)	0.9 mm (0.0354 in)
2nd ring	0.2 ~ 0.4 mm (0.008 ~ 0.016 in)	0.9 mm (0.0354 in)
Oil ring	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)	0.9 mm (0.0354 in)



2. Measure:
   • Piston ring side clearance
   Out of specification → Replace.
   Use a thickness gauge ①.

	Piston ring side clearance	Wear limit
Top ring	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)	0.1 mm (0.0039 in)
2nd ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	

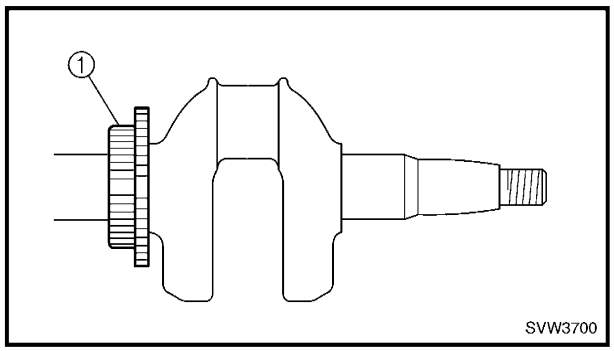
NOTE:
- Clean carbon deposits from the piston ring grooves and rings before measuring the side clearance.
- Measure the side clearance at several portions.



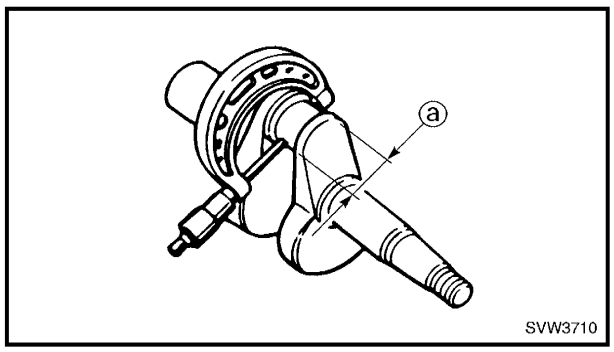
CRANKSHAFT INSPECTION

1. Measure:
   • Crankshaft runout limit
   Use a dial gauge.
   Out of specification → Replace.

	Runout limit: 0.04 mm (0.0016 in)



2. Inspect:
   • Crankshaft gear ①
   Wear/damage → Replace.

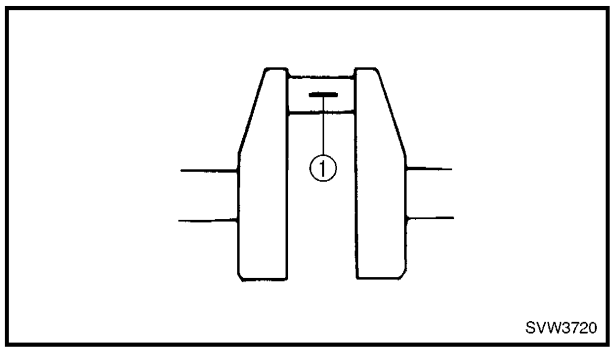


3. Measure:
   - Crank pin outside diameter ⓐ
     Wear/damage → Replace.
     Use a micrometer.
     Out of specification → Replace.

Crank pin outside diameter:
31.969 ~ 31.984 mm
(1.2586 ~ 1.2592 in)
Wear limit:
31.9 mm (1.2559 in)

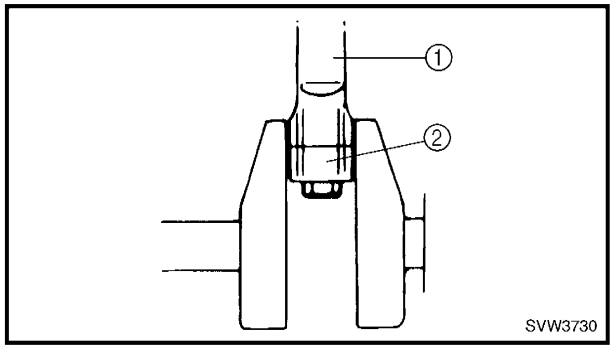
CONNECTING ROD OIL CLEARANCE INSPECTION

NOTE:
Measure the oil clearance if replacing the crankshaft or connecting rod.



1. Place a piece of Plastigauge ① on the crank pin horizontally.

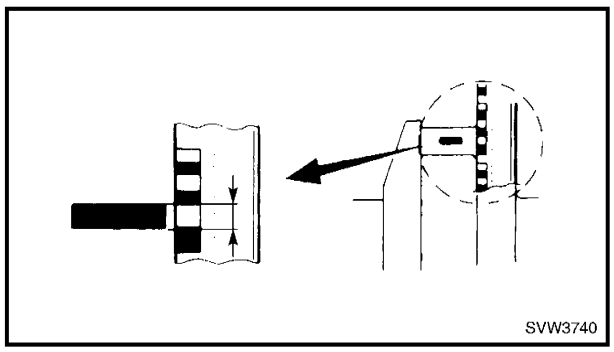
NOTE:
Clean off oil from all parts thoroughly.



2. Install:
   - Connecting rod ①
   - Connecting rod cap ②

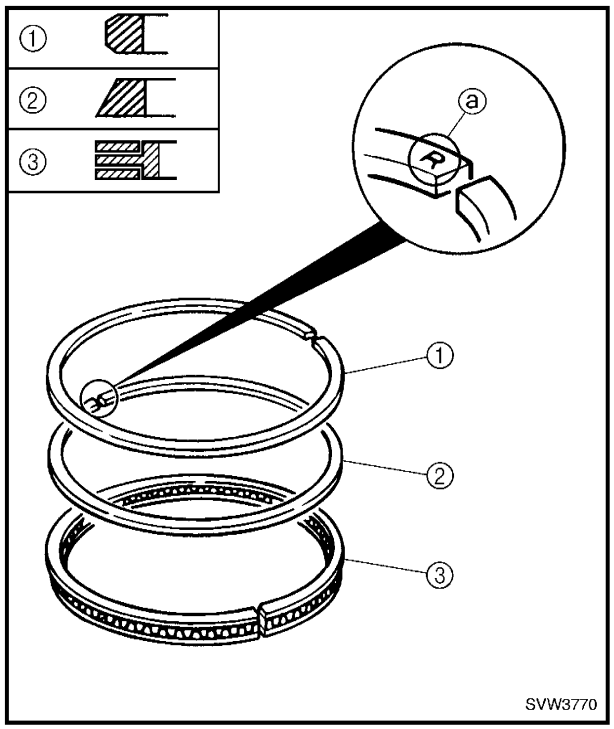
NOTE:
Tighten the cap bolts so that the crankshaft does not move while the oil clearance is being measured.

Connecting rod cap bolt:
12 Nm (1.2 m · kg, 8.7 ft · lb)


SVW3740

3. Remove:
   - Connecting rod cap
   - Connecting rod
4. Measure:
   - Widest portion of the pressed Plastigauge
     Out of specification → Replace crankshaft or connecting rod, and then measure the clearance again.

Connecting rod big end oil clearance:
0.015 ~ 0.045 mm
(0.0006 ~ 0.0018 in)
Wear limit:
0.1 mm (0.004 in)



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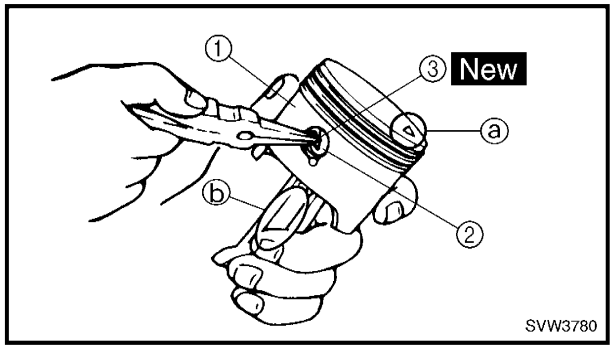


SVW3780

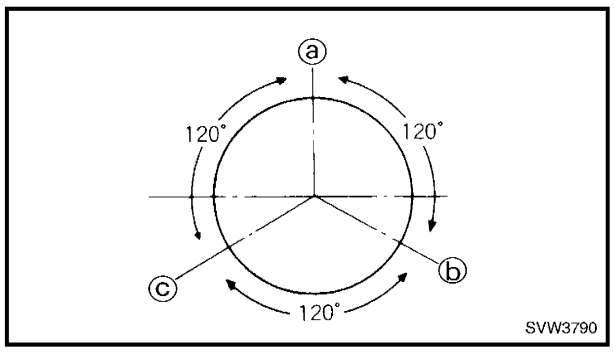
PISTON RING AND PISTON ASSEMBLY

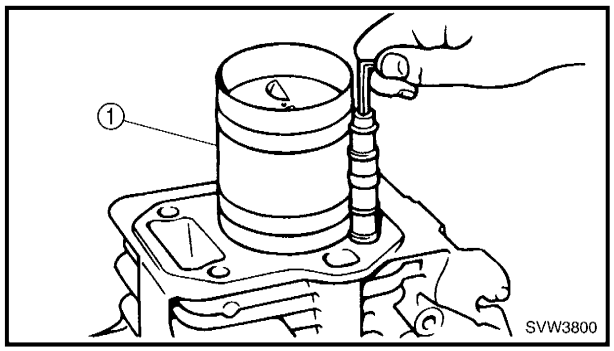
1. Install:
   - Top ring ①
   - 2nd ring ②
   - Oil ring ③

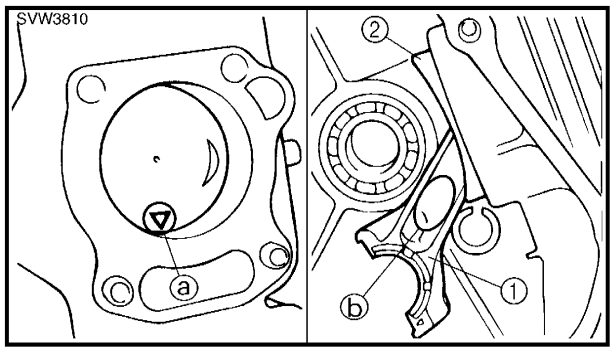
NOTE:
- Be sure to install the second ring so that the manufactures mark ⓐ faces towards the piston head.
- Make sure that the piston rings move smoothly.

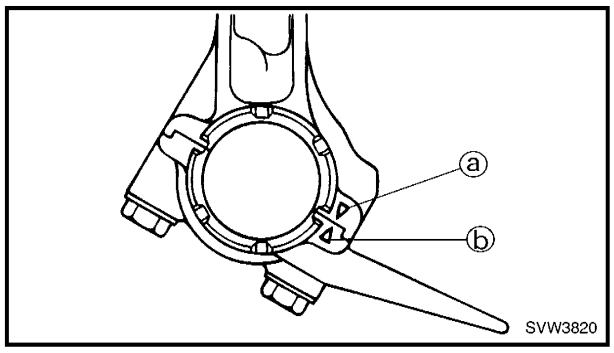
2. Apply 4-stroke engine oil to the inside of the connecting rod small end.
3. Install:
   - Piston ①
   - Piston pin ②
   - Piston pin circlip ③ New

NOTE:
- Make sure that the "▽" mark ⓐ on the piston head faces toward the push rod.
- Make sure that the mark ⓑ on the connecting rod faces toward the crankcase cover.









CONNECTING ROD AND CRANKSHAFT ASSEMBLY

1. Make sure that the end gap of each piston ring is positioned, as shown in the illustration.

Top ring	ⓐ	
2nd ring	ⓑ	
Oil ring	ⓒ	

2. Install:
   - Piston ring compressor ①

Piston ring compressor:
YU-33294, 90890-05158

3. Install:
   - Connecting rod ①
   - Piston ②

NOTE:

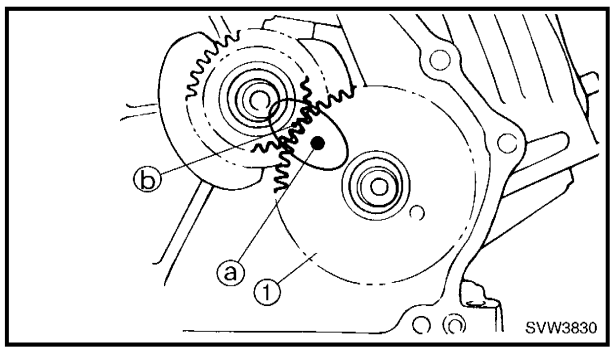
- Make sure that the " ▽ " mark ⓐ on the piston head faces toward the push rod.
- Make sure that the mark ⓑ on the connecting rod faces toward the crankcase cover.

4. Install:
   - Crankshaft
   - Connecting rod cap

NOTE:

Make sure that the " ▽ " mark ⓐ on the connecting rod is aligned with the " ▽ " mark ⓑ on the rod cap.

Connecting rod cap bolt:
12 Nm (1.2 m · kg, 8.7 ft · lb)



CAMSHAFT ASSEMBLY

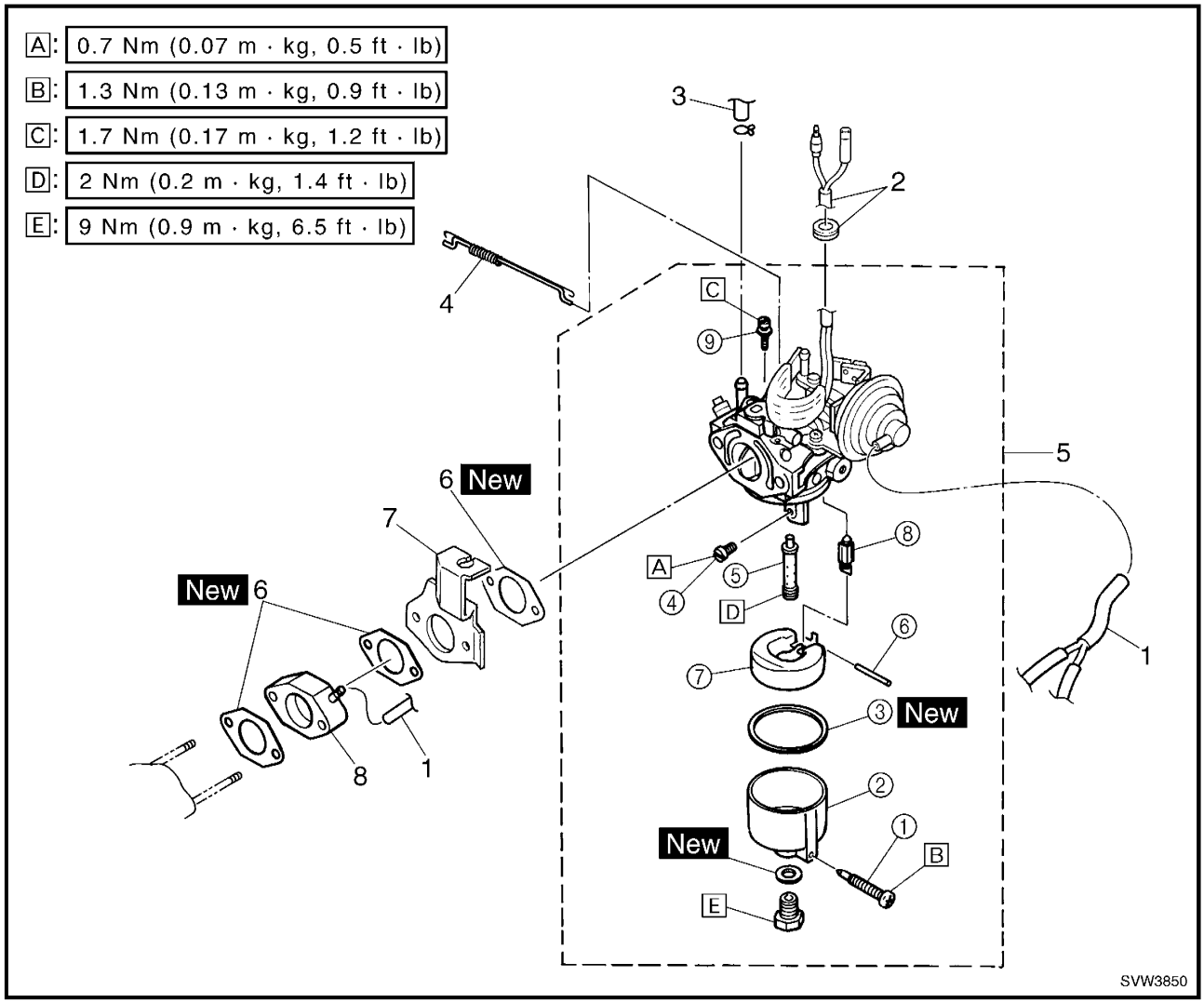
1. Install:
   - Camshaft ①

CAUTION:

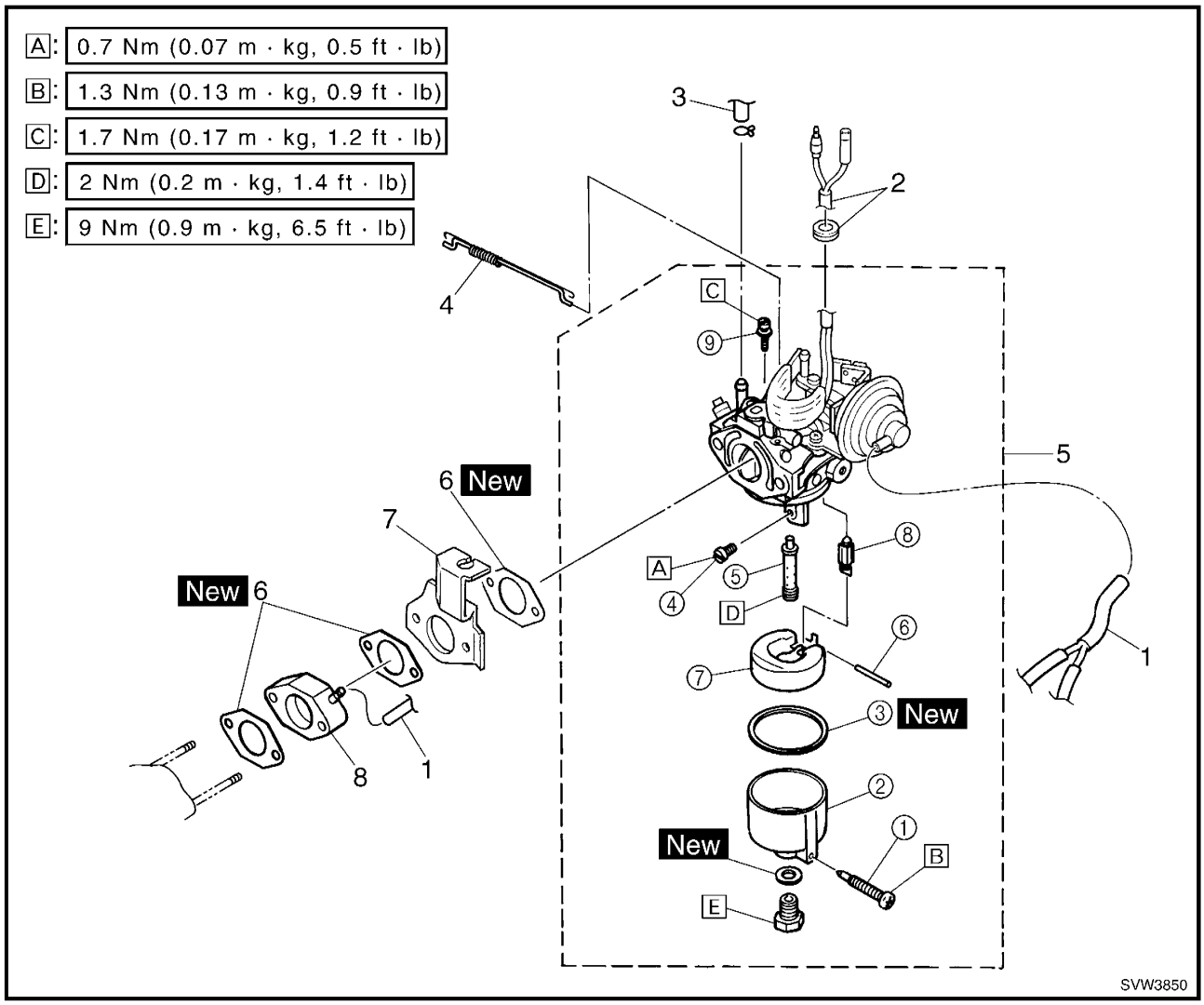
Be sure to align the hole ⓐ of camshaft gear with the crankshaft gear mark ⓑ.

CARBURETOR

EF4000DE

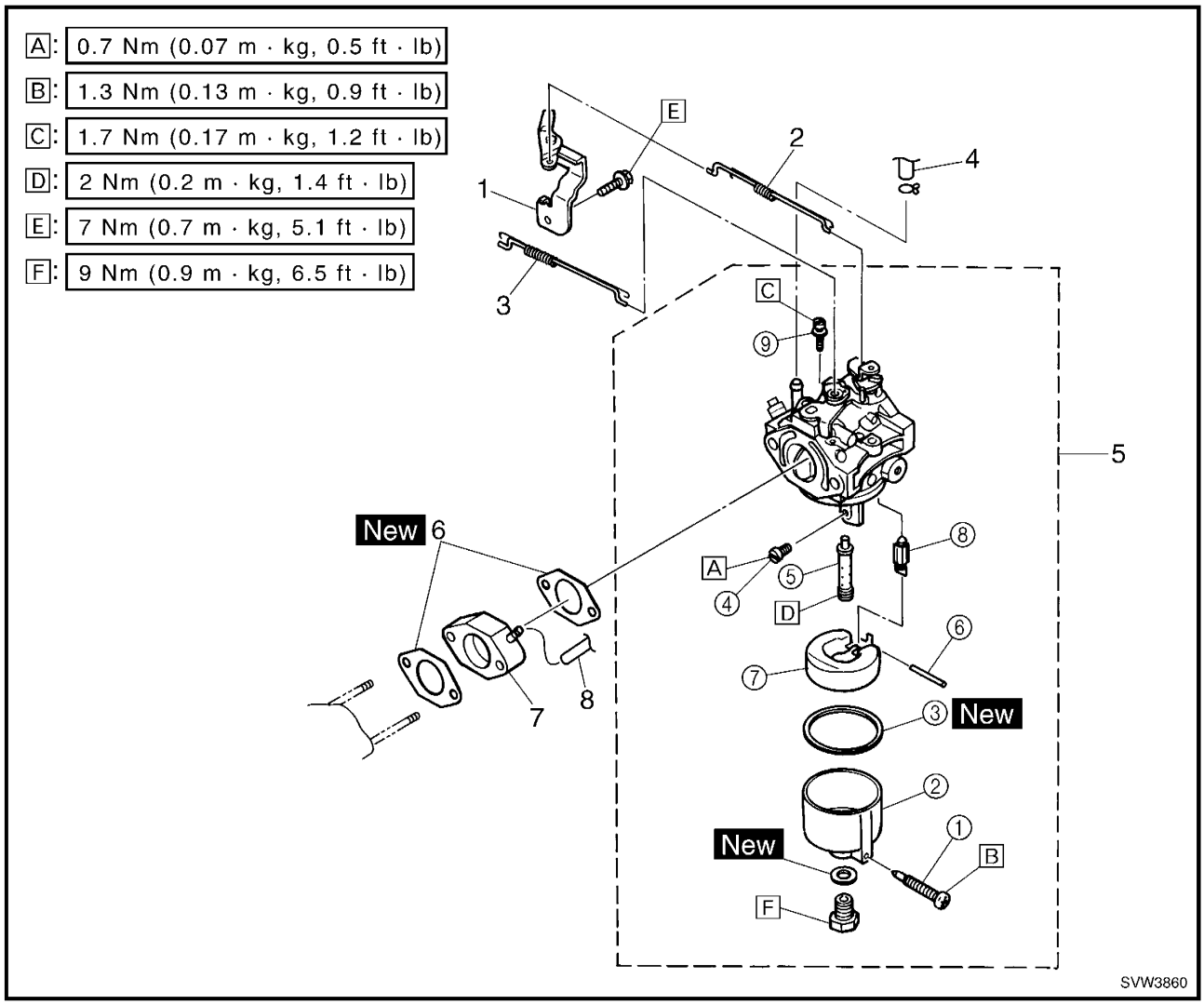


Order	Job name/Part name	Q'ty	Remarks
	Carburetor removal		Remove the parts in the order listed below.
	Air cleaner assembly		Refer to "AIR CLEANER AND FUEL TANK".
1	Vacuum hose	2	
2	Carburetor heater lead/grommet	1/1	
3	Fuel hose	1	
4	Link rod/spring	1/1	
5	Carburetor assembly	1	
6	Gasket	3	
7	Carburetor cover	1	
8	Carburetor joint	1	
			For installation, reverse the removal procedure.

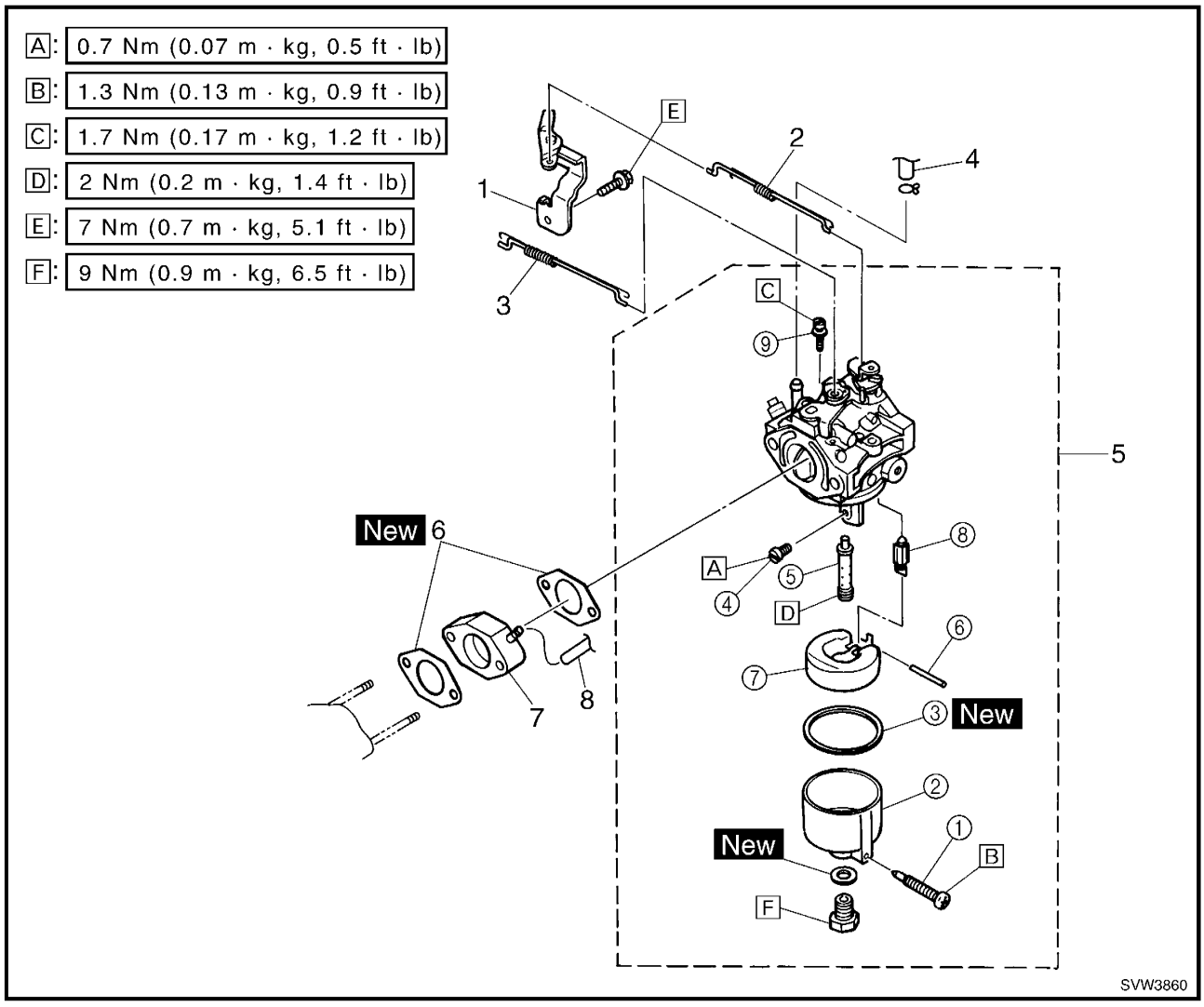


Order	Job name/Part name	Q'ty	Remarks
	Carburetor disassembly		Remove the parts in the order listed below.
①	Drain screw	1	
②	Float chamber	1	
③	Gasket	1	
④	Main jet	1	
⑤	Main nozzle	1	
⑥	Float pin	1	
⑦	Float	1	
⑧	Needle valve	1	
⑨	Pilot jet	1	
			For assembly, reverse the disassembly procedure.

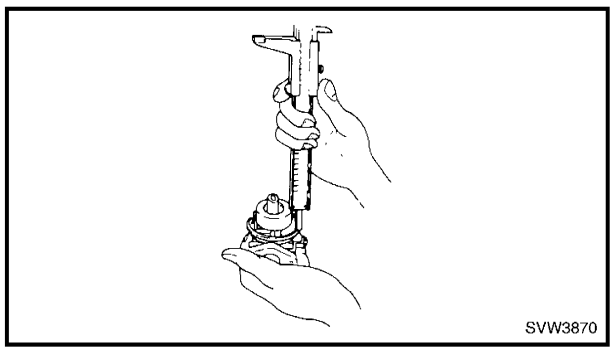
YG4000D



Order	Job name/Part name	Q'ty	Remarks
	Carburetor removal		Remove the parts in the order listed below.
	Air cleaner assembly		Refer to "AIR CLEANER AND FUEL TANK".
1	Choke bracket assembly	1	
2	Link rod/spring	1/1	
3	Link rod/spring	1/1	
4	Fuel hose	1	
5	Carburetor assembly	1	
6	Gasket	2	
7	Carburetor joint	1	
8	Vacuum hose	1	
			For installation, reverse the removal procedure.



Order	Job name/Part name	Q'ty	Remarks
	Carburetor disassembly		Remove the parts in the order listed below.
①	Drain screw	1	
②	Float chamber	1	
③	Gasket	1	
④	Main jet	1	
⑤	Main nozzle	1	
⑥	Float pin	1	
⑦	Float	1	
⑧	Needle valve	1	
⑨	Pilot jet	1	
			For assembly, reverse the disassembly procedure.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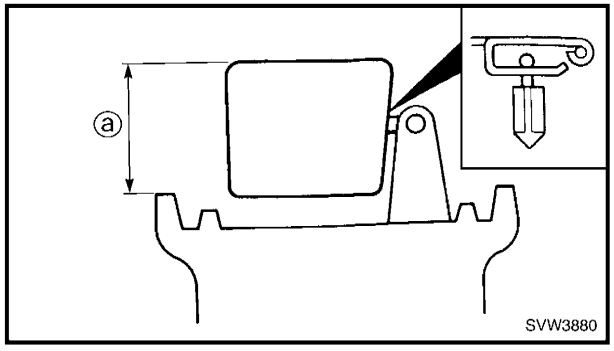

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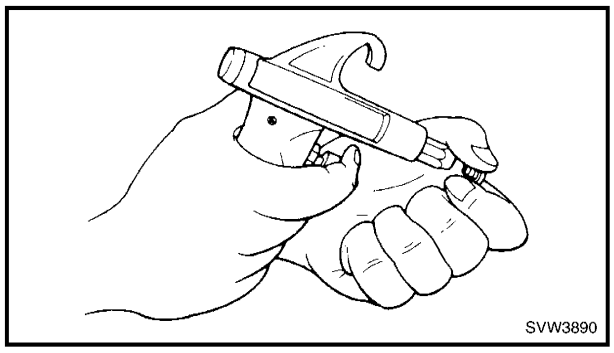
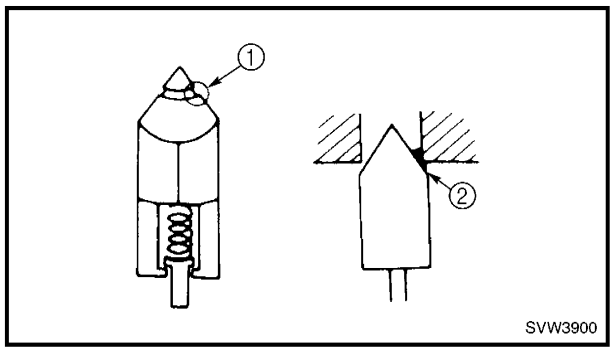

SVW3890



SVW3900

FLOAT HEIGHT INSPECTION

1. Measure:
   - Float height ⓐ
     Out of specification → Replace.

NOTE:

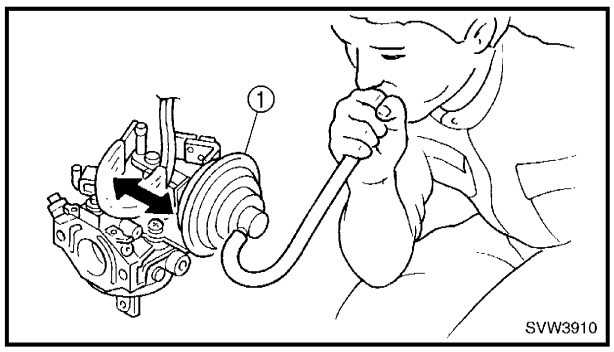
Lift up the float height so that the tip of the float valve lightly contacts the float arm, and then measure the float height ⓐ. (This measurement should be made with the gasket removed.)

Float height:
16.0 mm (0.63 in)

2. Clean:
   - Carburetor body
     Blow out all passages, jets, and carburetor body with compressed air.

3. Inspect:
   - Valve seat
     Wear/damage → Replace.
     Dirt → Clean.

① Wear at groove
② Dirt

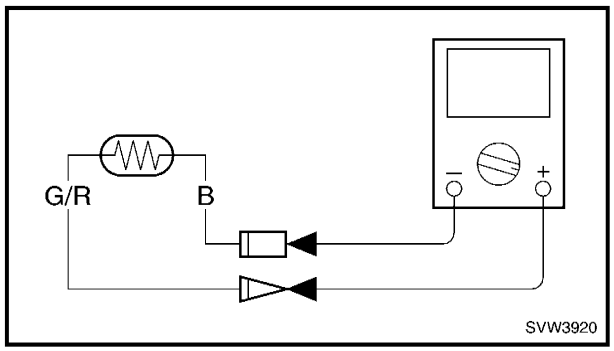


CHOKE DIAPHRAGM INSPECTION (EF4000DE)

1. Inspect:
   - Choke diaphragm ①
     Does not move → Carburetor assembly replace.

Inspection steps:

- Attach a hose to the choke diaphragm.
- Blow into the hose and check that the choke diaphragm operates properly.



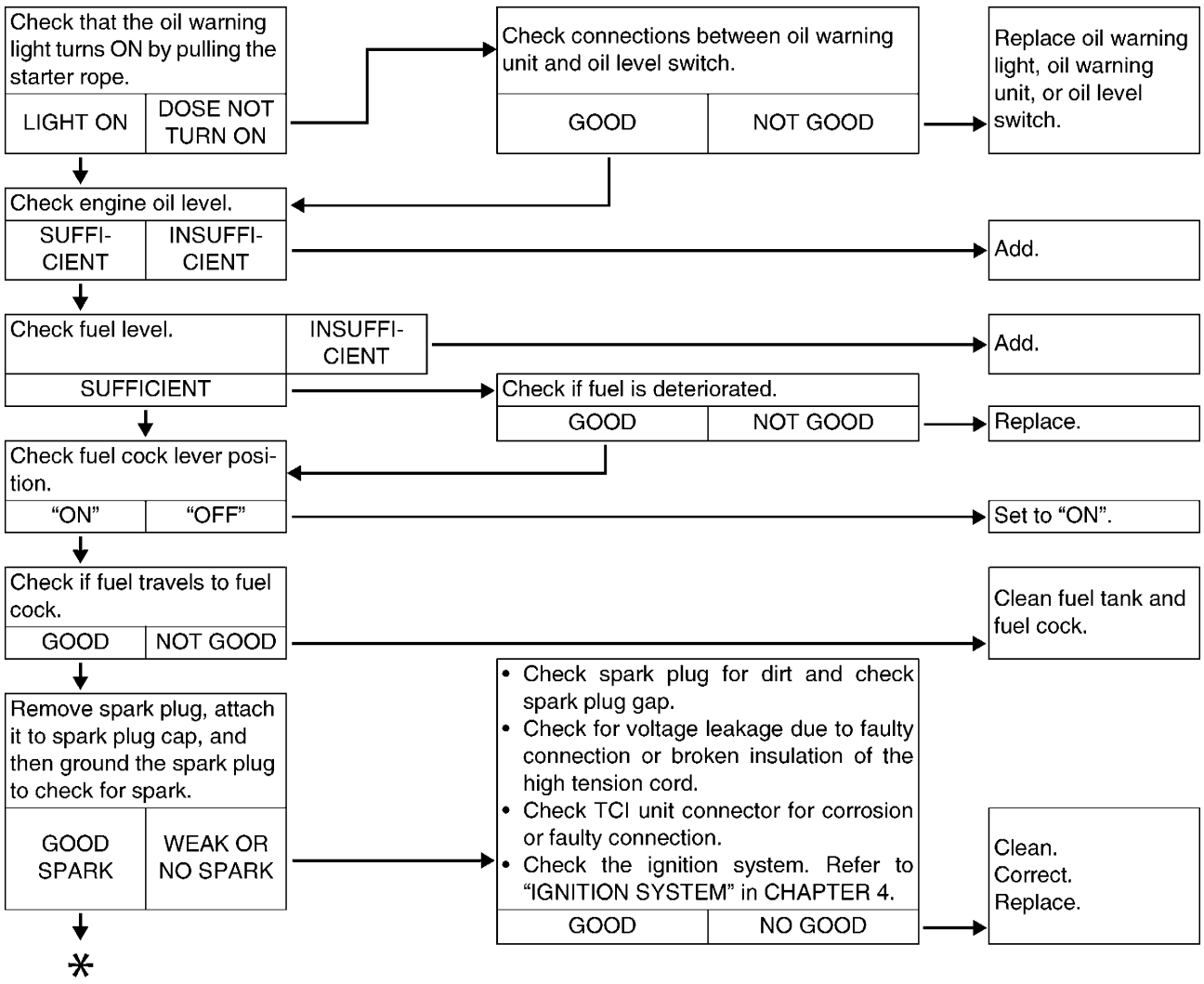
CARBURETOR HEATER INSPECTION (EF4000DE)

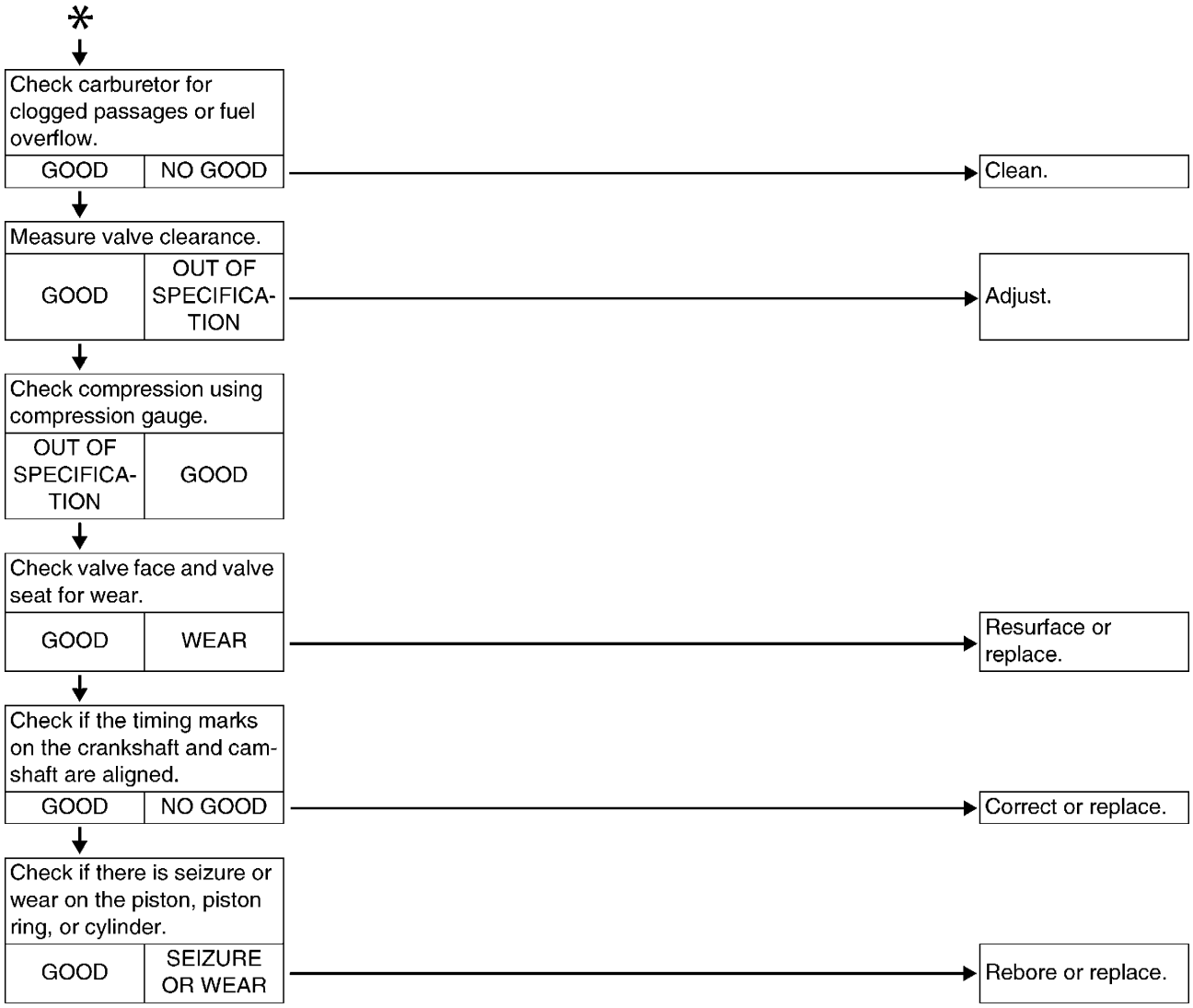
1. Measure:
   - Carburetor heater resistance
     Out of specification → Carburetor assembly replace.

Carburetor heater resistance:
(Green/Red – Black)
13 Ω ± 10% at 23 °C (73 °F)

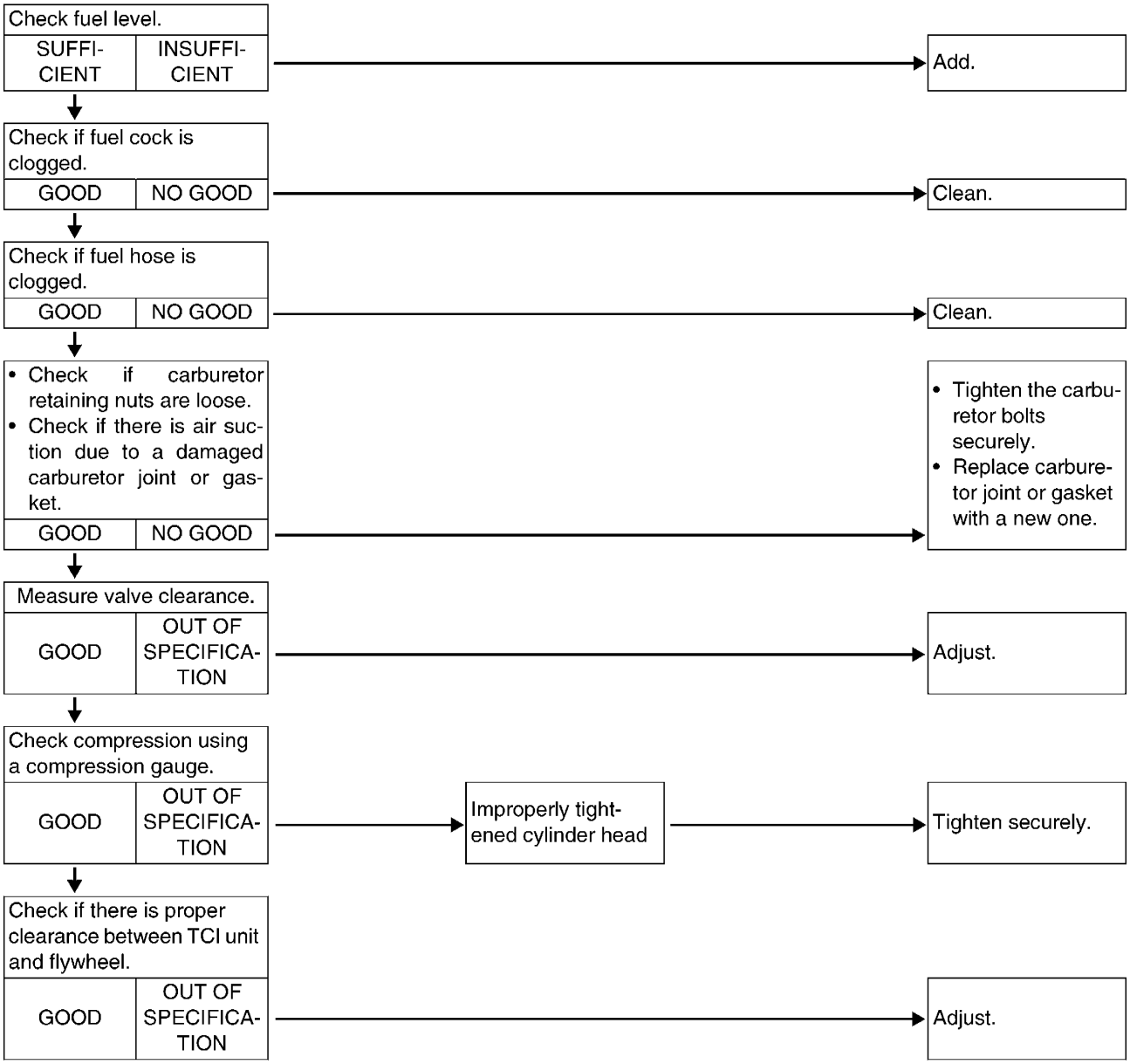
TROUBLESHOOTING

ENGINE DOES NOT START

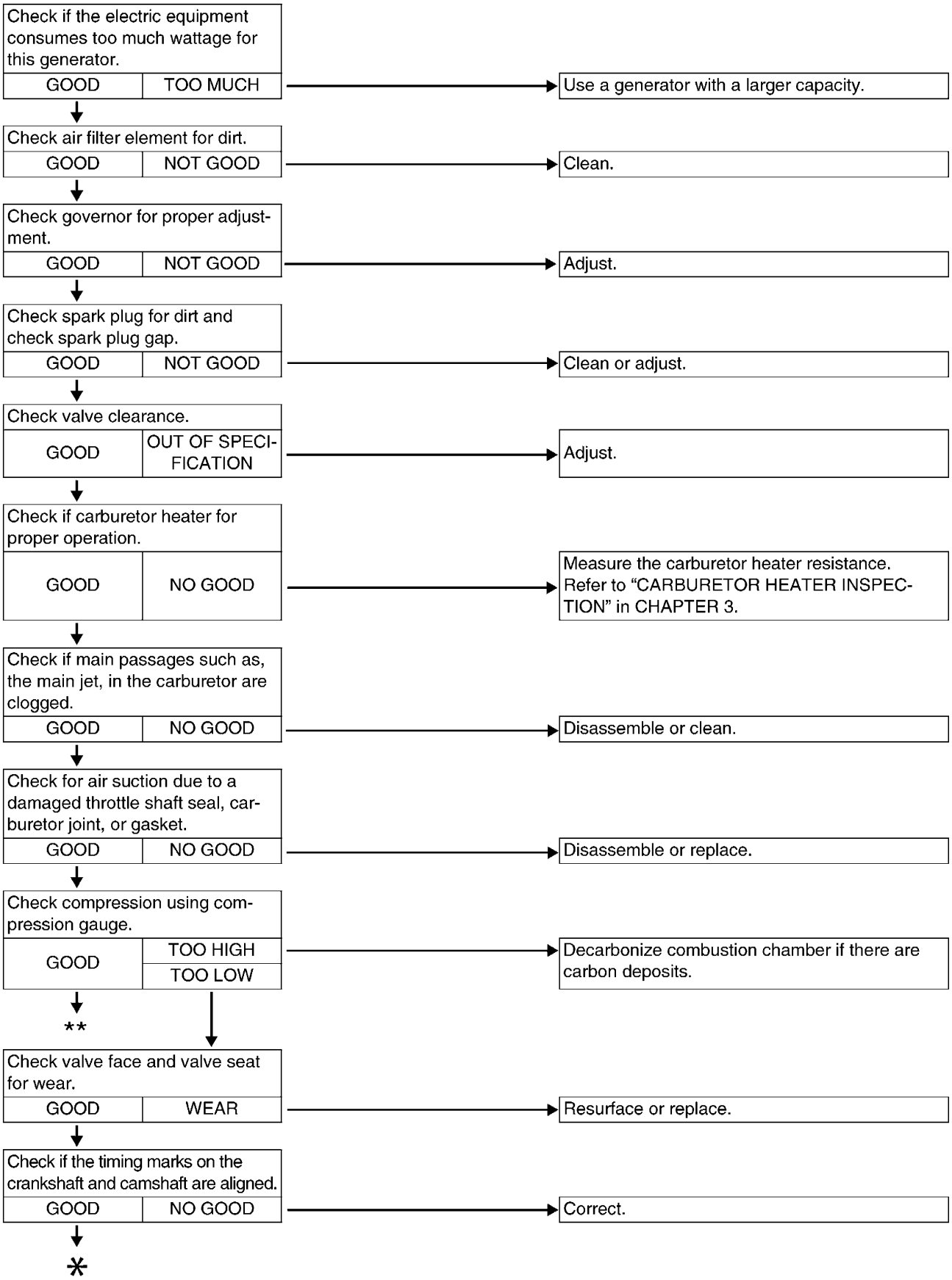


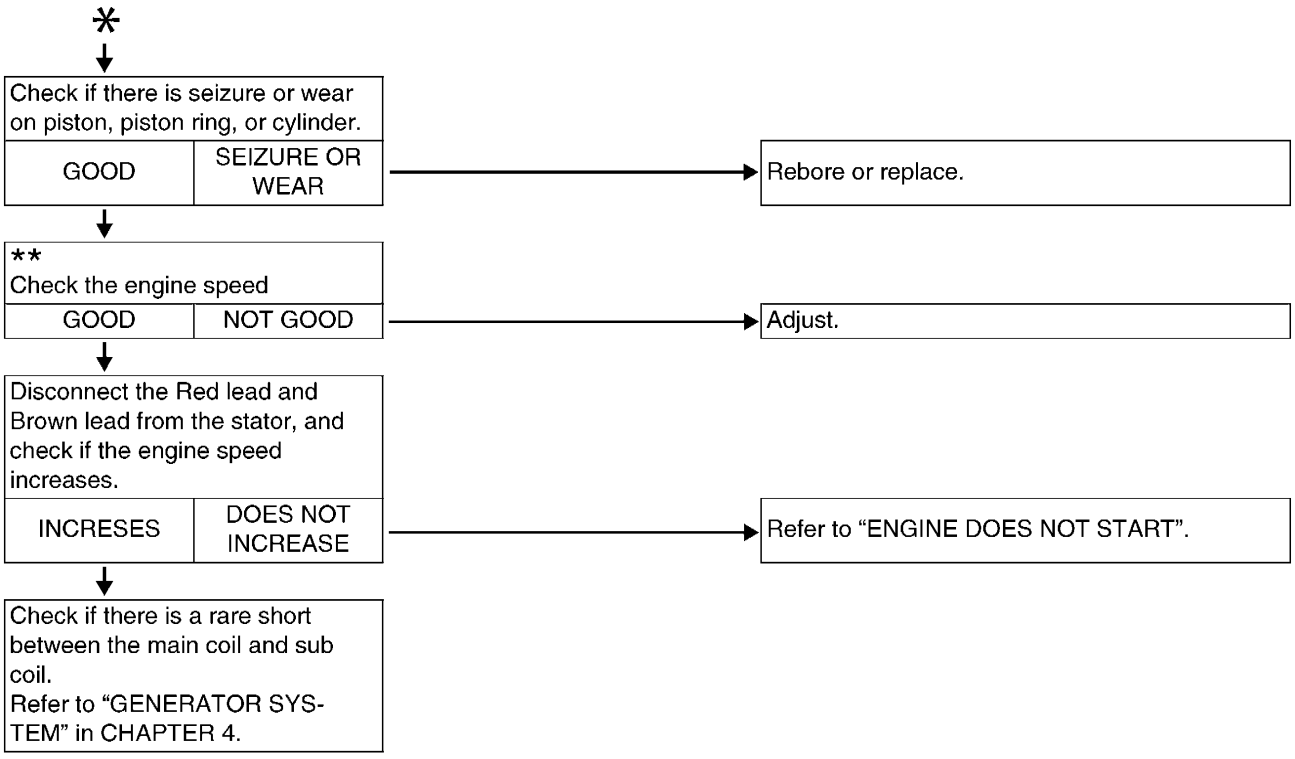

*
Check carburetor for clogged passages or fuel overflow.
GOOD
NO GOOD
Clean.
Measure valve clearance.
GOOD
OUT OF SPECIFICATION
Adjust.
Check compression using compression gauge.
OUT OF SPECIFICATION
GOOD
Check valve face and valve seat for wear.
GOOD
WEAR
Resurface or replace.
Check if the timing marks on the crankshaft and camshaft are aligned.
GOOD
NO GOOD
Correct or replace.
Check if there is seizure or wear on the piston, piston ring, or cylinder.
GOOD
SEIZURE OR WEAR
Rebore or replace.

ENGINE STARTS BUT STALLS

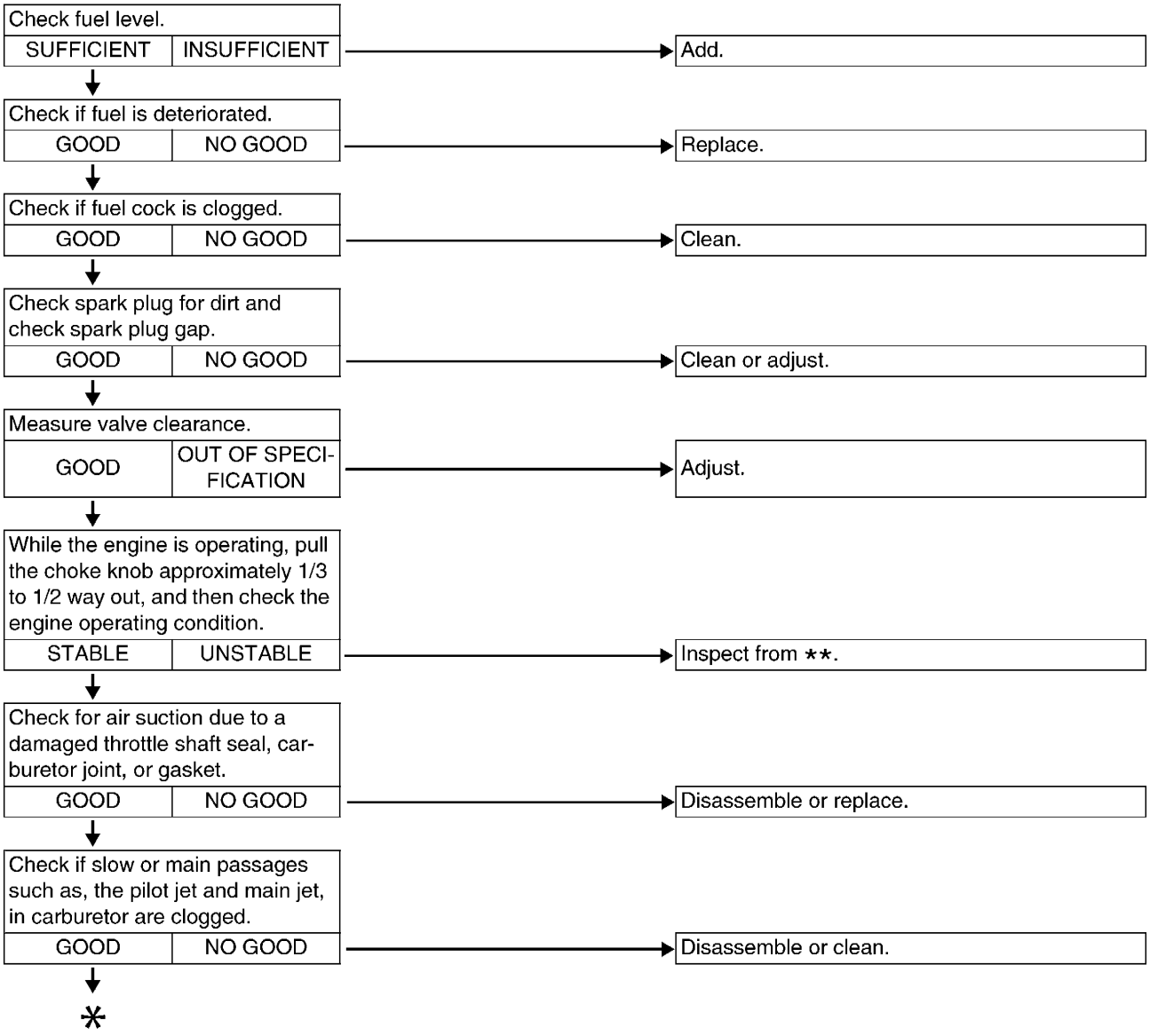


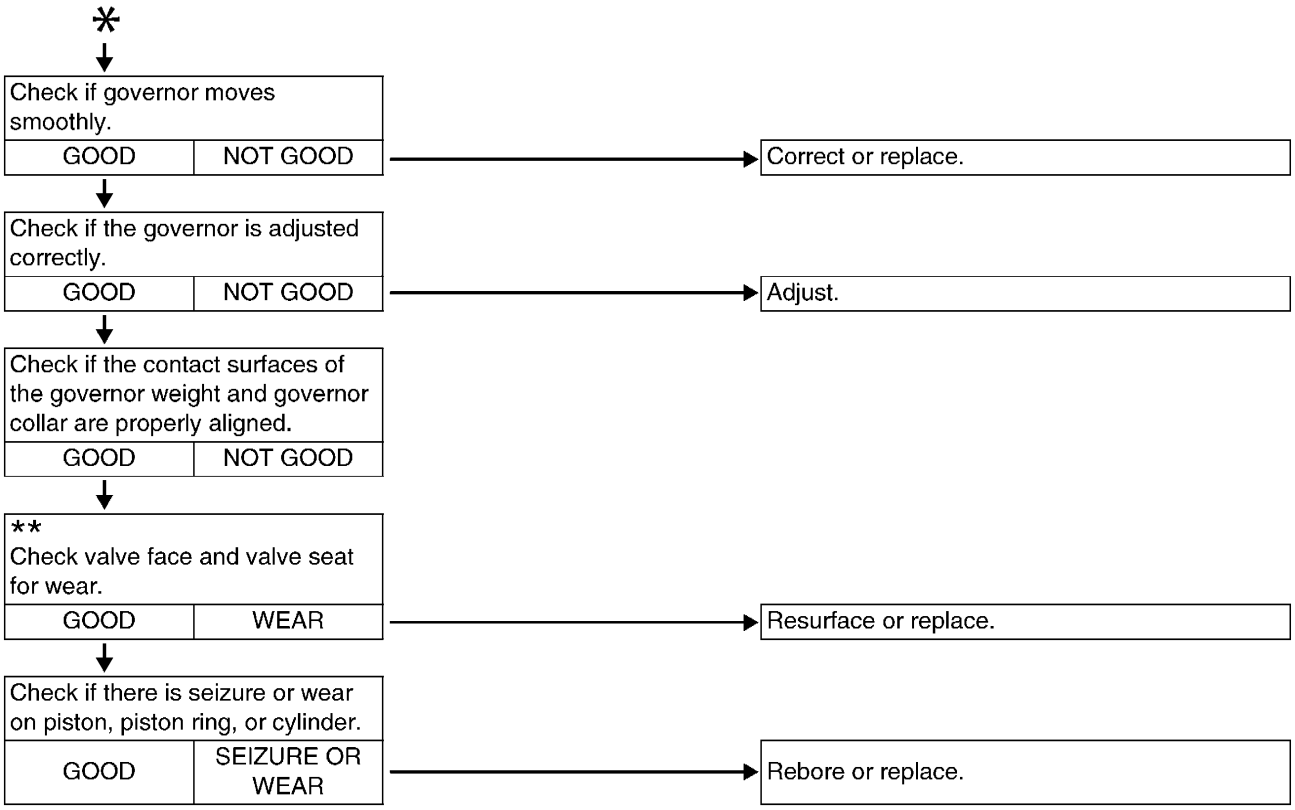
ENGINE SPEED DOES NOT INCREASE




*
Check if there is seizure or wear on piston, piston ring, or cylinder.
GOOD
SEIZURE OR WEAR
Rebore or replace.
**
Check the engine speed
GOOD
NOT GOOD
Adjust.
Disconnect the Red lead and Brown lead from the stator, and check if the engine speed increases.
INCRESES
DOES NOT INCREASE
Refer to “ENGINE DOES NOT START”.
Check if there is a rare short between the main coil and sub coil.
Refer to “GENERATOR SYSTEM” in CHAPTER 4.

ENGINE SPEED IS UNEVEN



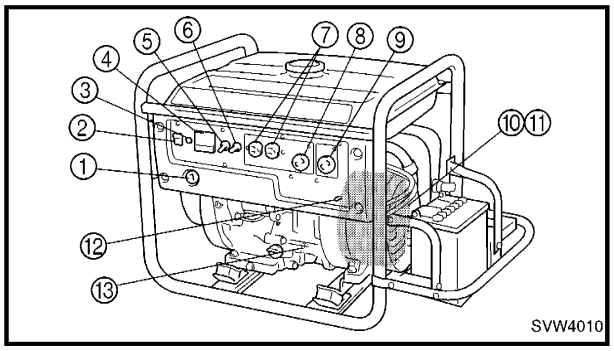

*
Check if governor moves smoothly.
GOOD
NOT GOOD
Correct or replace.
Check if the governor is adjusted correctly.
GOOD
NOT GOOD
Adjust.
Check if the contact surfaces of the governor weight and governor collar are properly aligned.
GOOD
NOT GOOD
**
Check valve face and valve seat for wear.
GOOD
WEAR
Resurface or replace.
Check if there is seizure or wear on piston, piston ring, or cylinder.
GOOD
SEIZURE OR WEAR
Rebore or replace.

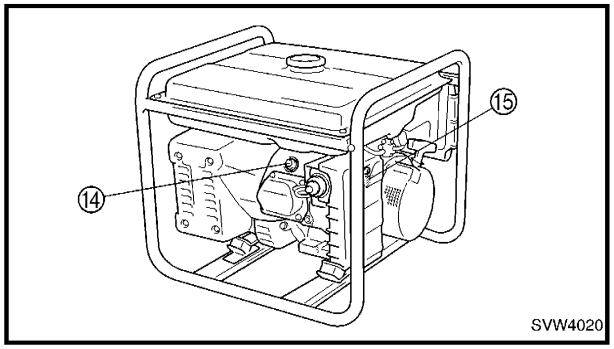
ELECTRICAL

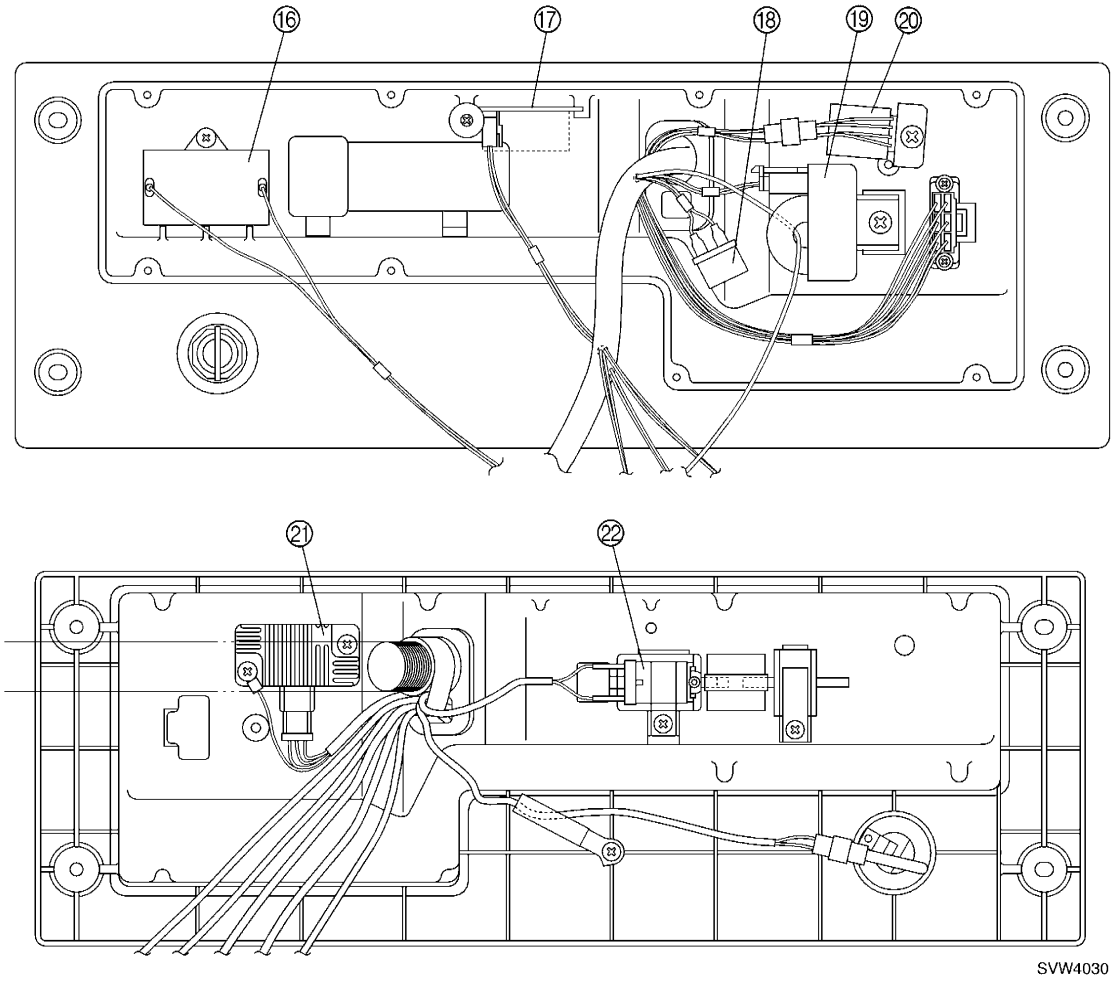
ELECTRICAL COMPONENTS

EF4000DE

① Main switch
② Economy switch
③ Oil warning light
④ Voltage meter
⑤ AC switch (120 V, NFB)
⑥ AC switch (240 V, NFB)
⑦ AC receptacle (120 V-20 A)
⑧ AC receptacle (120 V-30 A)
⑨ AC receptacle (120/240 V-20 A)
⑩ Stator assembly
⑪ Rotor assembly
⑫ Ground terminal
⑬ Oil level switch
⑭ Spark plug
⑮ TCI unit
⑯ Condenser
⑰ Oil warning unit
⑱ Fuse(10 A)
⑲ Economy idle unit
⑳ Rectifier
㉑ Rectifier/regulator
㉒ Solenoid valve

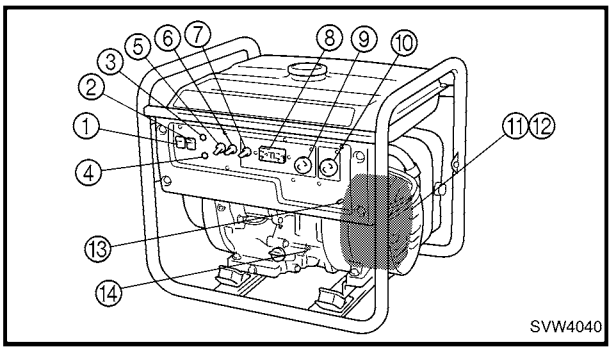




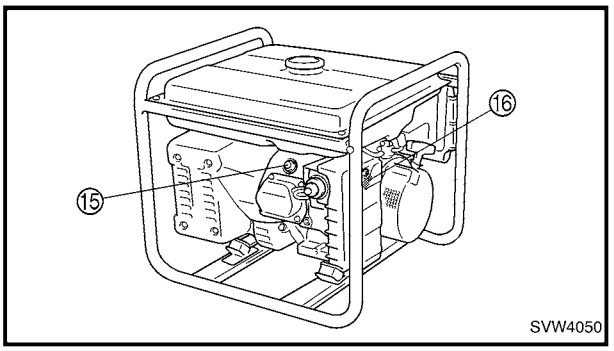


YG4000D

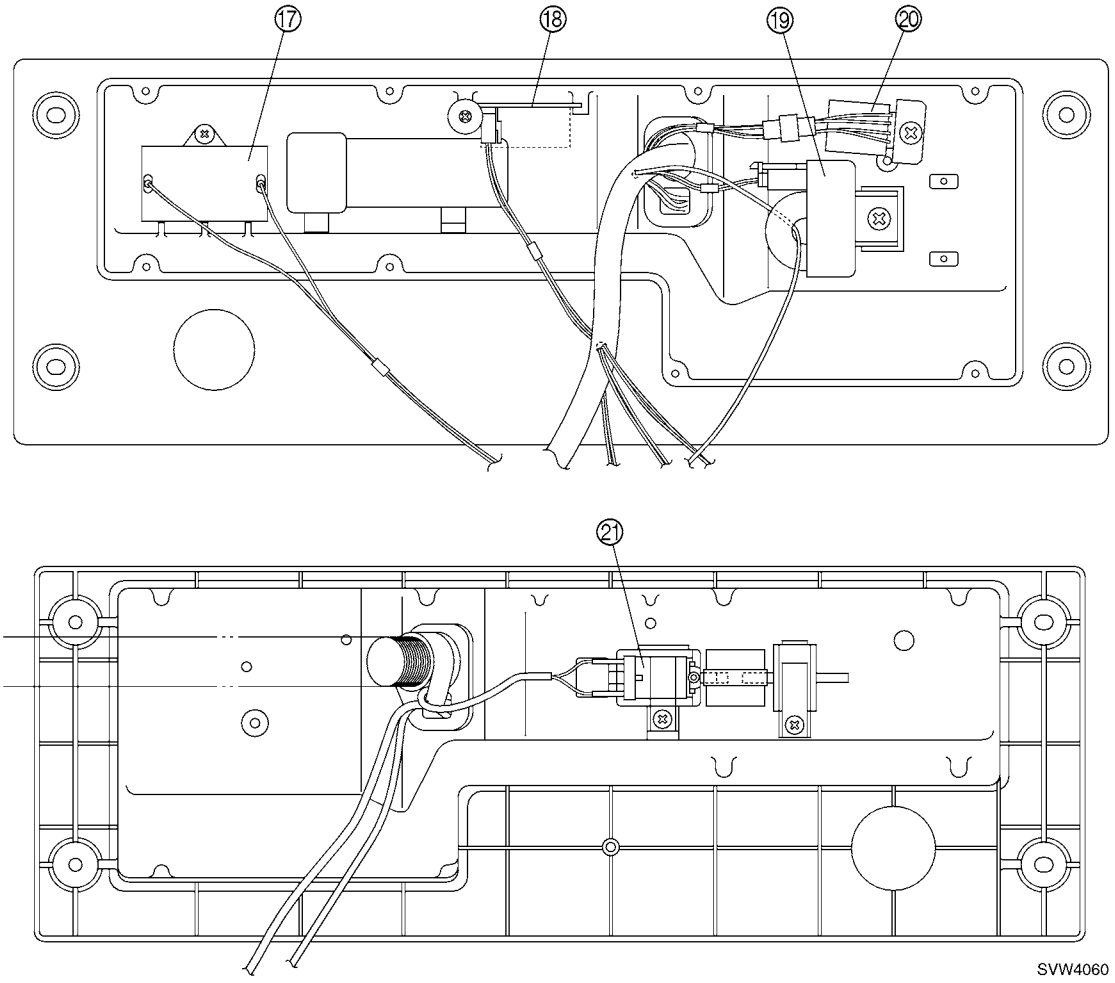
① Engine switch
② Economy switch
③ Oil warning light
④ Pilot light
⑤ AC switch (120 V, NFB)
⑥ AC switch (240 V, NFB)
⑦ AC switch (120 V-20 A, NFB)
⑧ AC receptacle (120 V-20 A, GFCI)
⑨ AC receptacle (120 V-30 A)
⑩ AC receptacle (120/240 V-20 A)
⑪ Stator assembly
⑫ Rotor assembly
⑬ Ground terminal
⑭ Oil level switch
⑮ Spark plug
⑯ TCI unit
⑰ Condenser
⑱ Oil warning unit
⑲ Economy idle unit
⑳ Rectifier
㉑ Solenoid valve



SVW4040



SVW4050

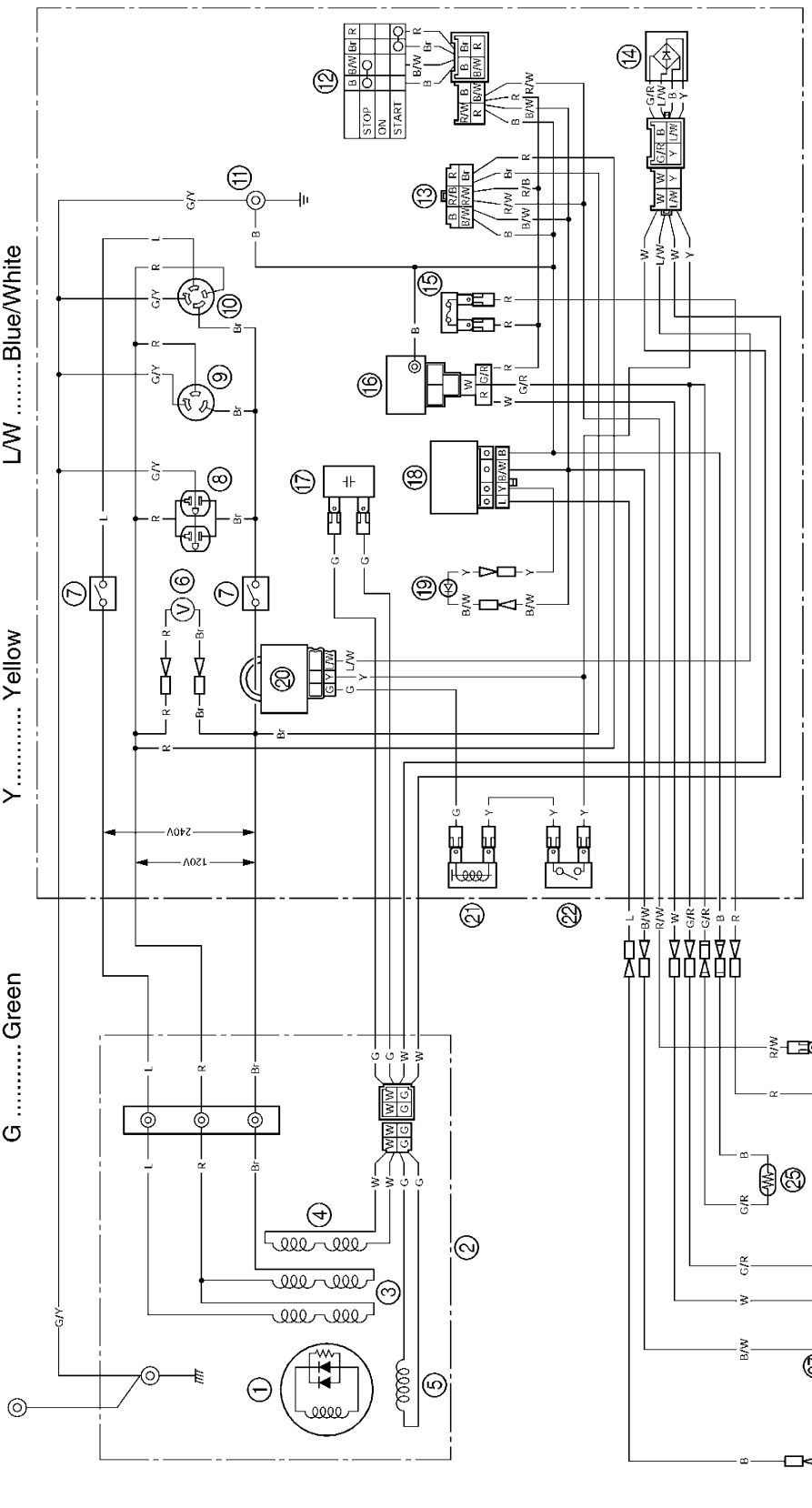


SVW4060

CIRCUIT DIAGRAM
EF4000DE

COLOR CODE

B	Black
Br	Brown
G	Green
L	Blue
R	Red
W	White
Y	Yellow
B/W	Black/White
G/Y	Green/Yellow
G/R	Green/Red
L/W	Blue/White
R/B	Red/Black
R/W	Red/White



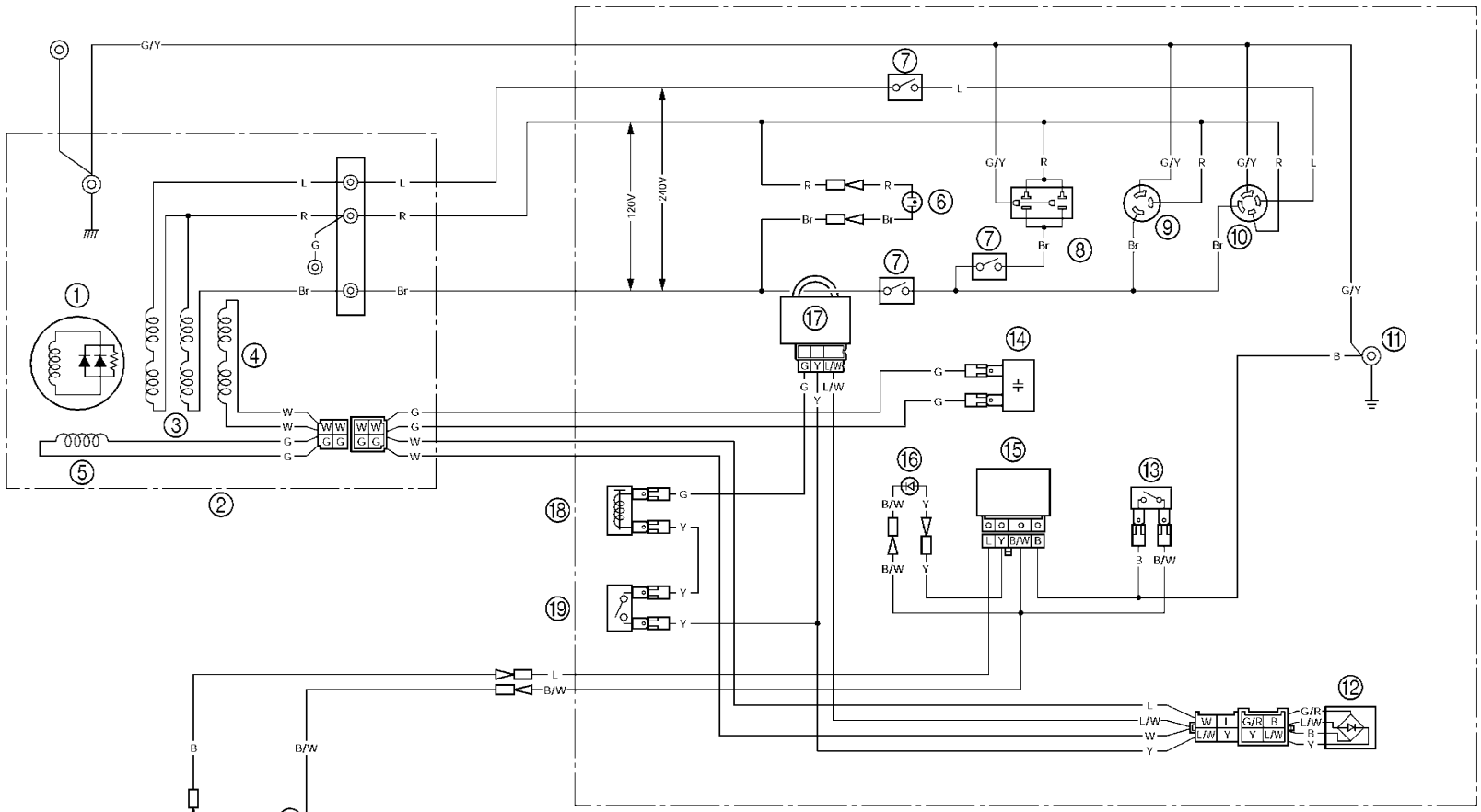
① Rotor assembly
② Stator assembly
③ Main coil
④ DC coil (solenoid valve)
⑤ Sub coil
⑥ Voltage meter
⑦ AC switch (NFB)
⑧ AC receptacle (120 V-20 A)
⑨ AC receptacle (120 V-30 A)
⑩ AC receptacle (120/240 V-20 A)
⑪ Ground terminal
⑫ Main switch
⑬ Remote control terminal
⑭ Rectifier
⑮ Fuse (10 A)
⑯ Rectifier/regulator
⑰ Condenser
⑱ Oil warning unit
⑲ Oil warning light
⑳ Economy idle unit
㉑ Solenoid valve
㉒ Economy switch
㉓ Starter motor
㉔ Battery
㉕ Carburetor heater
㉖ Charging coil
㉗ TCI unit
㉘ Spark plug
㉙ Oil level switch

SVW4070

YG4000D

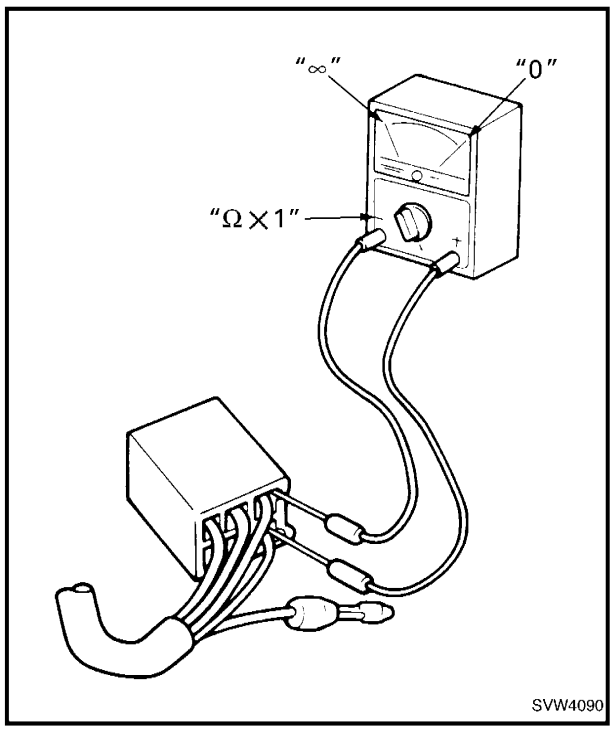
COLOR CODE

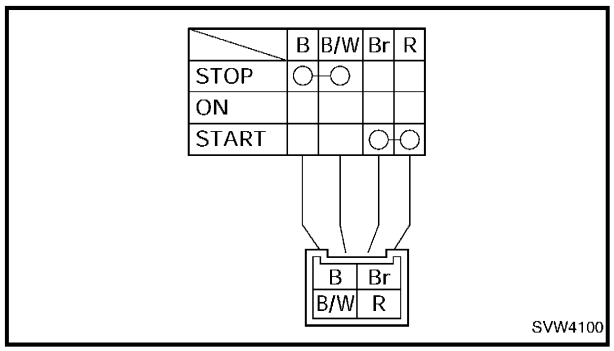
B..... Black	L..... Blue	B/W..... Black/White
Br..... Brown	R ..... Red	G/Y ..... Green/Yellow
G..... Green	W..... White	G/R ..... Green/Red
	Y..... Yellow	L/W ..... Blue/White



① Rotor assembly
② Stator assembly
③ Main coil
④ DC coil (solenoid valve)
⑤ Sub coil
⑥ Pilot light
⑦ AC switch (NFB)
⑧ AC receptacle (120 V-20 A, GFCI)
⑨ AC receptacle (120 V-30 A)
⑩ AC receptacle (120/240 V-20 A)
⑪ Ground terminal
⑫ Rectifier
⑬ Engine switch
⑭ Condenser
⑮ Oil warning unit
⑯ Oil warning light
⑰ Economy idle unit
⑱ Solenoid valve
⑲ Economy switch
⑳ TCI unit
㉑ Spark plug
㉒ Oil level switch

SVW4080





SWITCHES

CHECKING SWITCH CONTINUITY

Use a tester to check the terminals for continuity. If the continuity is faulty at any point, replace the switch.

	Pocket tester: YU-03112, 90890-03112

NOTE:

- Set the pocket tester to "0" before starting a test.
- When testing the switch for continuity the pocket tester should be set to the "× 1" Ω range.
- When checking the switch turn it on and off a few times.

INSPECTING A SWITCH SHOWN IN THE MANUAL (EF4000DE)

The terminal connections for switches are shown in a chart similar to the one on the left. This chart shows the switch positions in the column and the switch lead colors in the top row.

For each switch position, "○——○" indicates the terminals with continuity.

The example chart shows that:

- There is continuity between the "Black and Black/White" leads when the switch is set to "STOP".
- There is continuity between the "Brown and Red" leads when the switch is set to "START".

IGNITION SYSTEM

TROUBLESHOOTING CHART

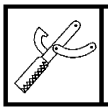
NO SPARK OR WEAK SPARK

Inspection steps:

1. Spark plug
2. Ignition spark gap
3. Spark plug cap
4. TCI unit resistance
5. Main switch (EF4000DE)
6. Engine switch (YG4000D)
7. Oil level switch
8. Air gap between TCI unit and flywheel
9. Wire harness (ignition system)

NOTE:

- Remove the following part(s) before troubleshooting.
  1) Spark plug
- Use the following special tool(s) for troubleshooting.



Pocket tester:
YU-03112, 90890-03112

Dynamic spark tester:
YM-34487
Ignition checker:
90890-06754

1. Spark plug
- Check the spark plug condition.
  Refer to "SPARK PLUG" in CHAPTER 2.

NO GOOD

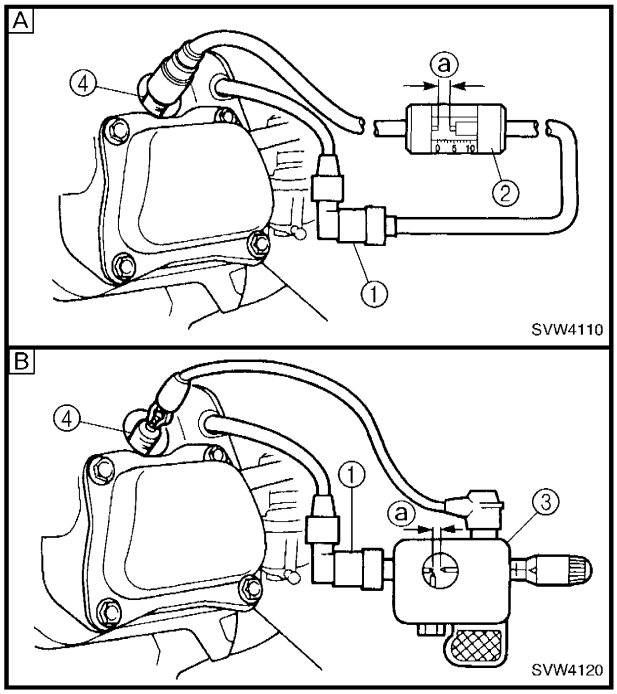
GOOD

Repair or replace the spark plug.

2. Ignition spark gap
- Disconnect the spark plug cap ① from the spark plug.
- Connect the dynamic spark tester ② or ignition checker ③ as shown.

Spark plug cap ① → Dynamic spark tester or ignition checker
Dynamic spark tester lead or ignition checker lead → Spark plug ④

A For USA
B Except for USA



- Crank the engine and measure the ignition spark gap ⓐ.

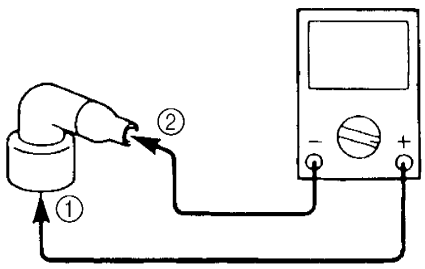
Minimum spark gap:
6 mm (0.24 in)

MEETS SPECIFICATION → The ignition system is good.

OUT OF SPECIFICATION OR NO SPARK

3. Spark plug cap
- Remove the spark plug cap.
- Connect the pocket tester (Ω × 1k) to the spark plug cap.

Tester (+) lead → Spark plug side ①
Tester (–) lead → Spark plug lead side ②



SVW4130

Spark plug cap resistance:
4.0 ~ 6.0 kΩ at 20 °C (68 °F)

OUT OF SPECIFICATION → Replace the spark plug cap.

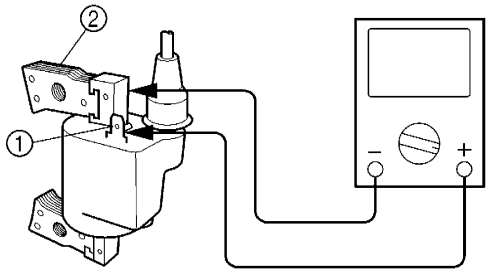
MEETS SPECIFICATION

NOTE:
- Do not pull out the plug cap from the spark plug lead.
- Remove → Turn the plug cap counterclockwise.
- Install → Turn the plug cap clockwise.
- Inspect the spark plug lead for cracks or deterioration, when install the plug cap.
- Cut 5 mm off the end of the spark plug lead, and then connect it to the plug cap.

4. TCI unit resistance
- Remove the TCI unit.

1) Primary coil resistance
- Connect the pocket tester (Ω × 1) to the primary terminal.

Tester (+) lead → Black/White terminal ①
Tester (–) lead → Core ②



SVW4140

Primary coil resistance:
0.5 Ω ± 20% at 20 °C (68 °F)

OUT OF SPECIFICATION → Replace the TCI unit.

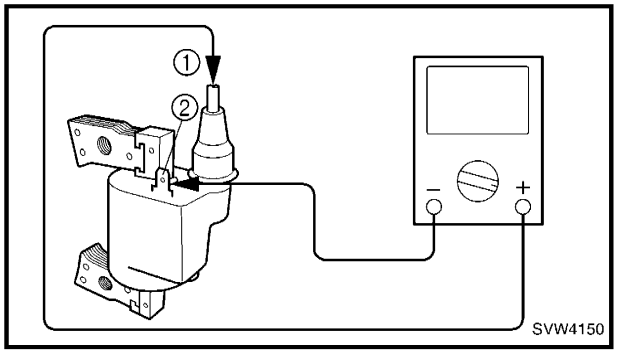
MEETS SPECIFICATION

*

*

2) Secondary coil resistance
- Connect the pocket tester (Ω × 1k) to the secondary terminal.

Tester (+) lead → Spark plug lead ①
Tester (–) lead → Black/White terminal ②

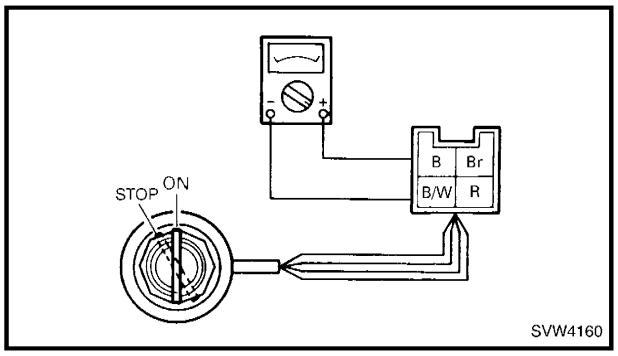


Secondary coil resistance:
11.5 kΩ ± 20% at 20 °C (68 °F)

OUT OF SPECIFICATION → Replace the TCI unit.

MEETS SPECIFICATION

5. Main switch (EF4000DE)
- Disconnect the main switch coupler.
- Connect the pocket tester to the main switch.



- Turn the main switch "ON" and check the main switch for continuity.

CONTINUITY

NO CONTINUITY

- Turn the main switch "STOP" and check the main switch for continuity.

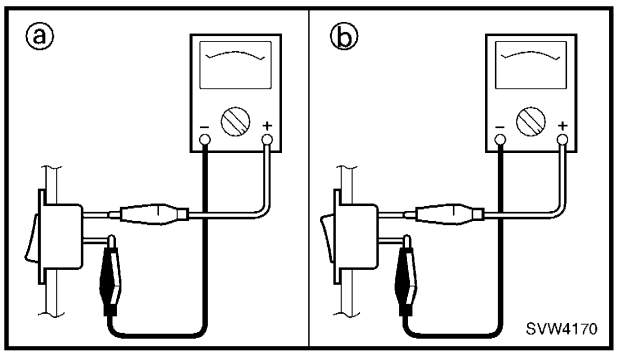
NO CONTINUITY → Replace the main switch.

CONTINUITY

*

*

6. Engine switch (YG4000D)
- Remove the coupler of the engine switch in the control box.
- Turn the engine switch to the "ON" ⓐ position and check the engine switch for continuity.
- Connect the pocket tester to the engine switch terminal.



CONTINUITY

Switch "ON" → No continuity

NO CONTINUITY

NO CONTINUITY

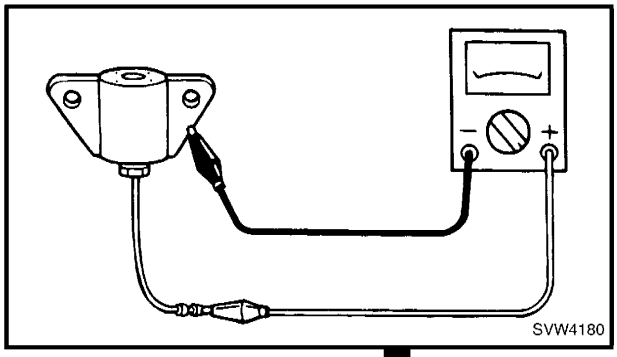
- Turn the engine switch to the "STOP" ⓑ position and check the engine switch for continuity.

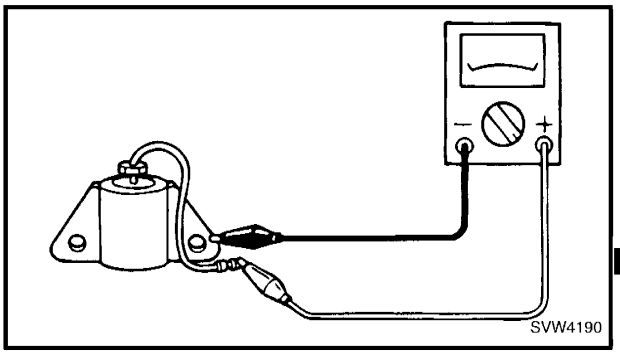
Switch "STOP" → Continuity

CONTINUITY

Replace the engine switch.

7. Oil level switch
- Remove the oil level switch in the bottom of crankcase.
  Refer to "CRANKCASE COVER AND CRANKCASE" in CHAPTER 3.
- Connect the pocket tester to the oil level switch for continuity.





CONTINUITY

NO CONTINUITY

CONTINUITY

Replace the oil level switch.

*

*

8. Air gap between TCI unit and flywheel
- Measure the air gap between the magnet portion of the TCI unit and flywheel.
  Refer to "AIR GAP BETWEEN TCI UNIT AND FLYWHEEL" in CHAPTER 2.

Air gap between TCI unit and flywheel:
0.5 mm (0.02 in)

OUT OF SPECIFICATION

Adjust the air gap between the TCI unit and flywheel.

GOOD

9. Wire harness (ignition system)
- Check the terminal of the connector for contamination, rust or disconnection.

DISCONNECTED

Correct or replace the connector.

GOOD

Replace the flywheel.

GOOD

Replace the TCI unit.

ELECTRIC STARTING SYSTEM (EF4000DE)

TROUBLE SHOOTING CHART

THE STARTER MOTOR DOES NOT OPERATE

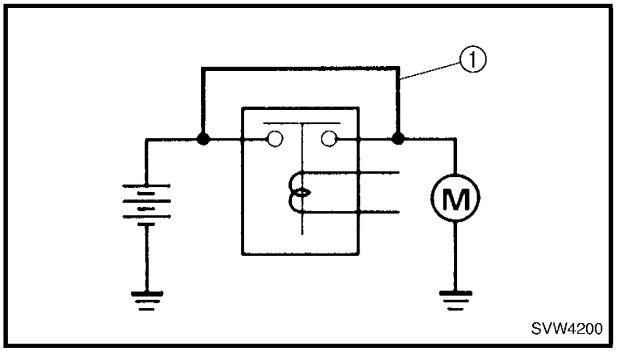
Inspection steps:

1. Starter motor
2. Magnetic switch

NOTE:

- Remove the following part(s) before troubleshooting.
  1) Control box assembly

1. Starter motor
- Connect the jumper lead ① to the magnetic switch terminals on the battery side and the starter motor side.



- Check the starter motor operation.

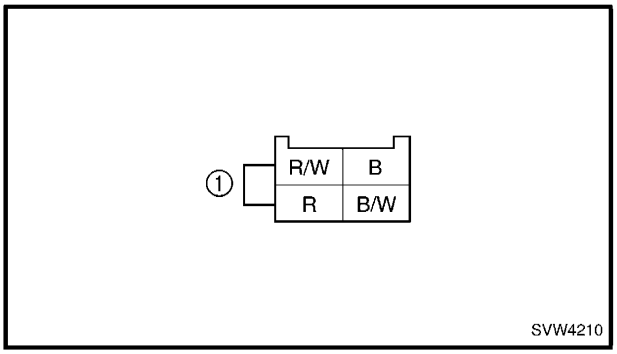
DOES NOT MOVE → Check the battery.

Check the battery. → DOES NOT MOVE → Repair and/or charge the battery.

GOOD → Repair and/or replace the starter motor.

MOVES

2. Magnetic switch
- Disconnect the main switch connector.
- Connect the jumper lead ① to the magnetic switch connector terminals.



- Check the starter motor operation.

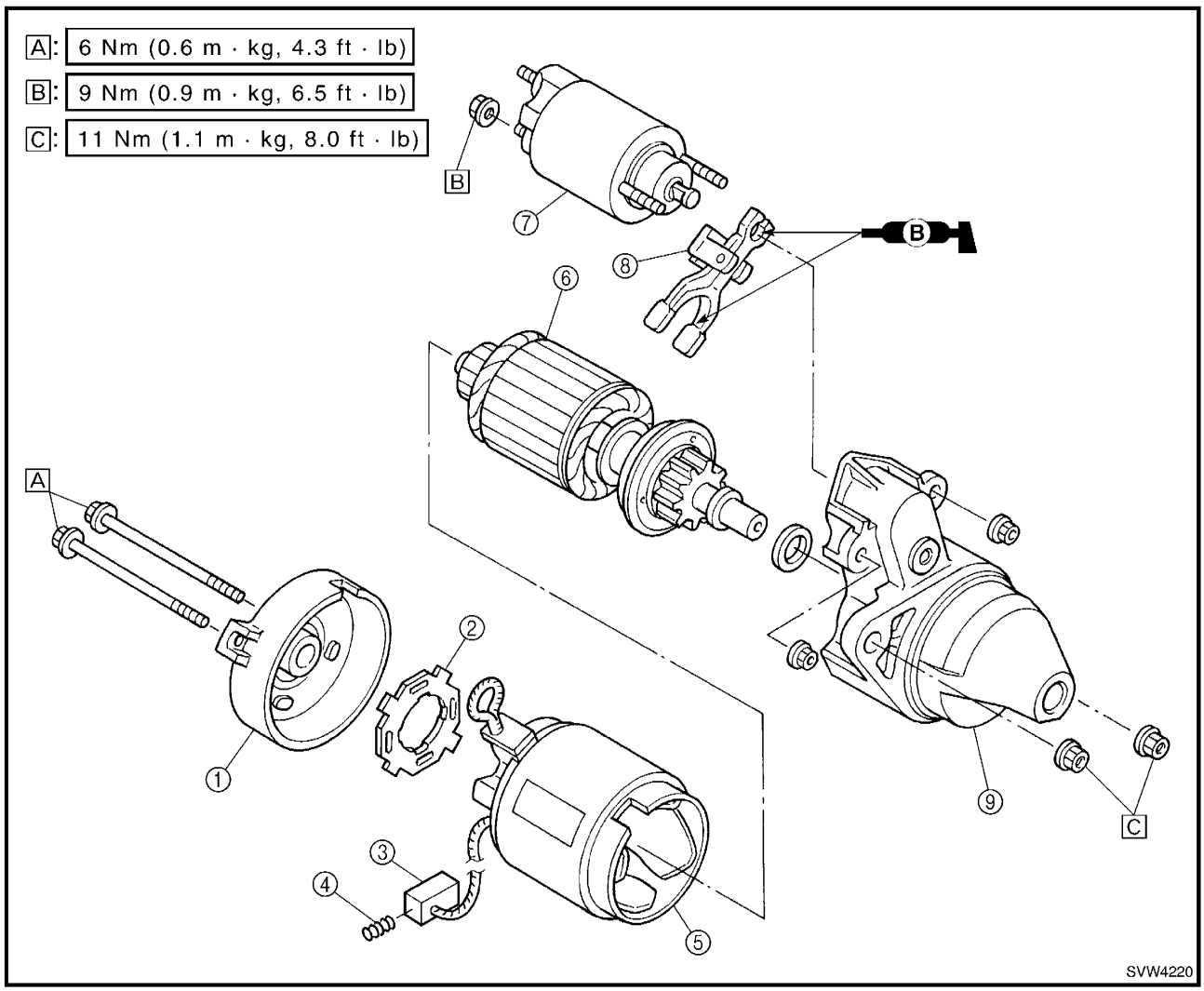
NO CONTINUITY → Replace the magnetic switch.

MOVES → Replace the main switch.

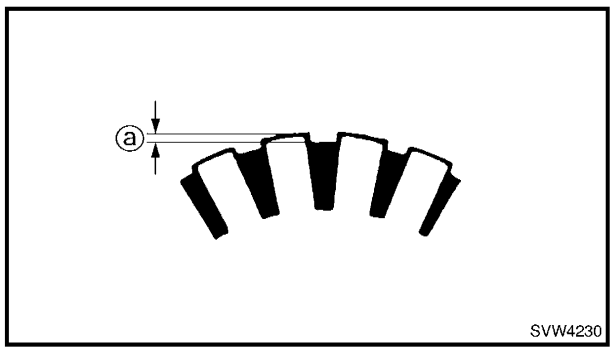
⚠ WARNING

- **A wire that is used as a jumper lead must have the equivalent capacity or more as that of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**

STARTER MOTOR



Order	Job name/Part name	Q'ty	Remarks
	Starter motor disassembly		Remove the parts in the order listed below.
①	Rear bracket	1	
②	Insulator	1	
③	Brush	4	
④	Brush spring	4	
⑤	York	1	
⑥	Armature	1	
⑦	Magnetic switch	1	
⑧	Starter drive lever	1	
⑨	Starter case	1	
			For assembly, reverse the disassembly procedure.

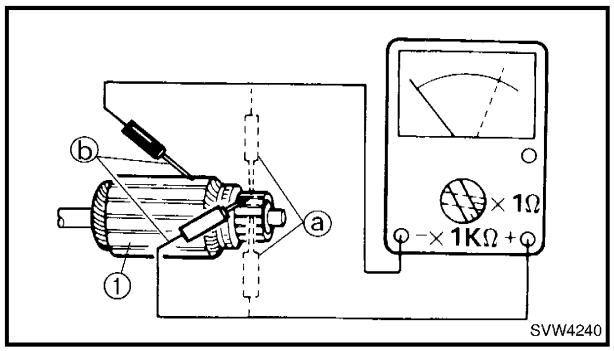


Armature coil inspection

1. Inspect:
   - Commutator (outer surface)
     Dirty → Clean it with #600 grit sandpaper.
2. Measure:
   - Mica (insulation depth between the commutator segments) ⓐ
     Out of specification → Scrape the mica to the proper measurement using a hacksaw blade which has been grounded to fit the commutator.

Depth of insulator:
0.4 ~ 0.8 mm (0.0157 ~ 0.0315 in)

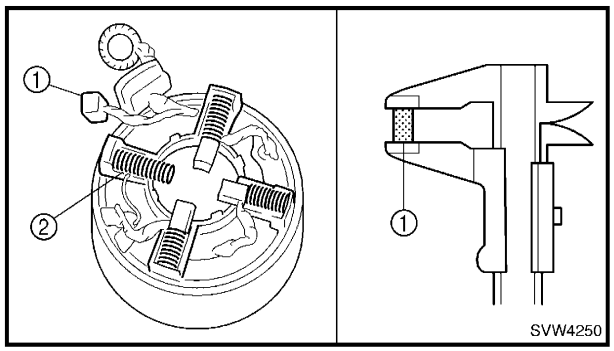
NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of the commutator.



3. Measure:
   - Armature coil (insulation/continuity)
     Defects → Replace the starter motor.

Insulation resistance:
More than 1 MΩ at 20 °C (68 °F)

ⓐ Continuity check
ⓑ Insulation check
① Armature coil

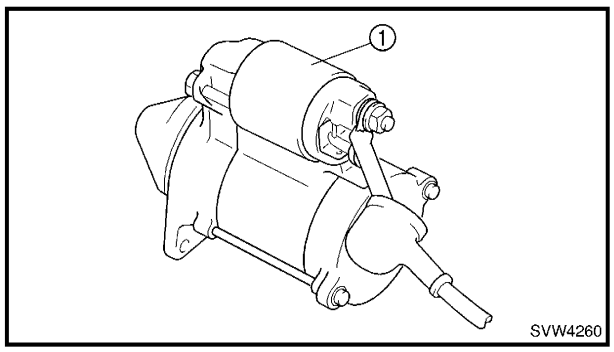


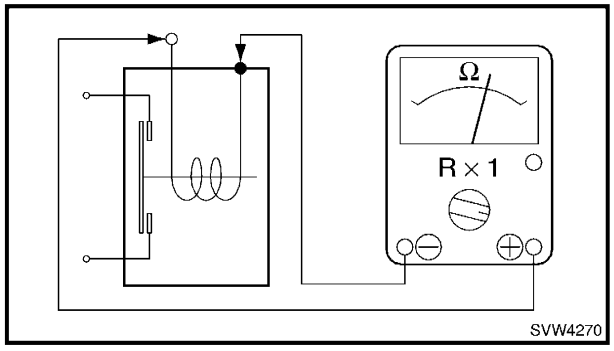
Brush inspection

1. Measure:
   - Brush length (of each brush) ①
     Out of specification → Replace.

Wear limit length:
6 mm (0.24 in)

2. Inspect:
   - Brush spring ②
     Fatigue/damage → Replace.





Magnetic switch inspection

1. Measure:
   - Magnetic switch ① coil resistance

Pocket tester:
YU-03112, 90890-03112

Out of specification → Replace.

Magnetic switch coil resistance:
Red/White-Magnetic switch case 3.4 Ω ± 20% at 20 °C (68 °F)

CHARGING SYSTEM (EF4000DE)

TROUBLESHOOTING CHART

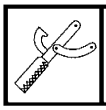
THE BATTERY IS NOT CHARGED

Inspection steps:

1. Fuse
2. Battery voltage
3. Charging voltage
4. Charging coil resistance

NOTE:

- Remove the following part(s) before troubleshooting.
  1) Battery cover
- Use the following special tool(s) for troubleshooting



Pocket tester:
YU-03112, 90890-03112

Inductive tachometer:
YU-8036-A
Engine tachometer:
90890-03113

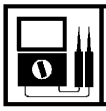
1. Fuse
- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuse for continuity.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

2. Battery voltage
- Connect the pocket tester to the battery terminals.
- Measure battery voltage.

Tester (+) lead → (+) terminal
Tester (–) lead → (–) terminal



Battery voltage:
12 V

OUT OF SPECIFICATION →

- Clean the battery terminals.
- Recharge or replace the battery.

- Measure the specific gravity.

Specific gravity:
1.280

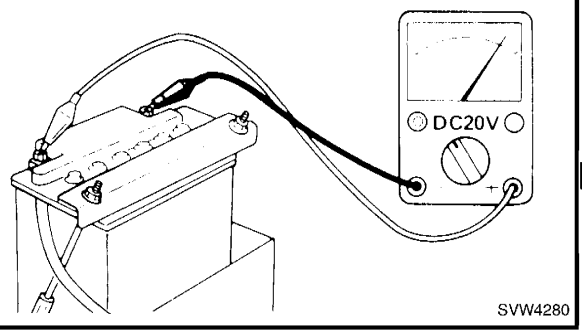
GOOD ↓

*

*

3. Charging voltage
- Start the engine.
- Accelerate to 3,600 r/min.
- Measure the charging voltage.

Charging voltage:
14.5 V

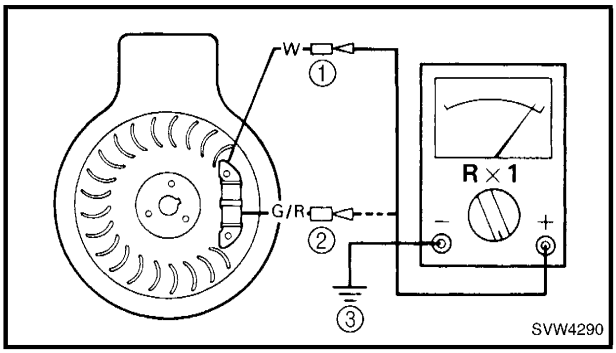


MORE THAN
14.0 V

Properly connect the charging system.

LESS THAN
14.0 V

4. Charging coil resistance
- Disconnect the charging coil leads.
- Connect the pocket tester (Ω × 1) to the charging coil.



Tester (+) lead → White terminal ①
Green/Red terminal ②
Tester (–) lead → Ground ③

Charging coil resistance:
White-Ground:
1.3 Ω ± 20% at 20 °C (68 °F)
Green/Red-Ground:
0.9 Ω ± 20% at 20 °C (68 °F)

GOOD

Replace the rectifier/regulator.

OUT OF
SPECIFICATION

Replace the charging coil.

OIL WARNING SYSTEM

TROUBLESHOOTING CHART

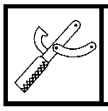
THE ENGINE DOES NOT STOP EVEN THOUGH THE OIL LEVEL HAS DROPPED

Inspection steps:

1. Wire routing
2. Engine operation
3. Oil warning unit ground lead
4. Oil warning unit, oil level switch
5. Engine operation

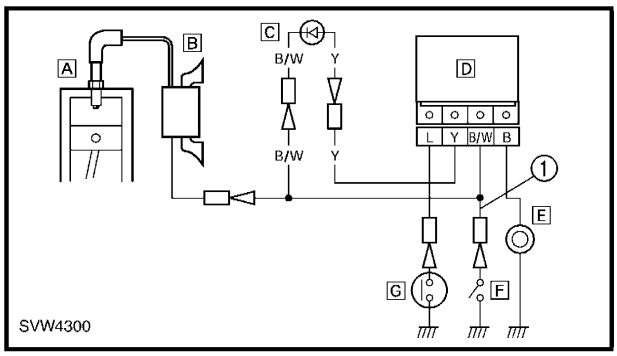
NOTE:

Use the following special tool(s) for troubleshooting.



Pocket tester:
YU-03112, 90890-03112

1. Wire routing
   Connect Black/white lead ① of oil warning unit to the ground. Note that Black/White lead ① must remain attached to the TCI unit and the engine switch during this procedure.



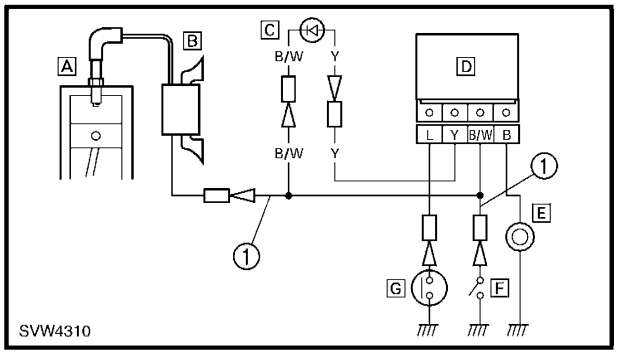
A Engine
B TCI unit
C Oil warning light
D Oil warning unit
E Ground terminal
F Engine switch
G Oil level switch

THE ENGINE DOES NOT STOP

2. Engine operation
   Does the engine stop?

ENGINE STOPS

Check to see if the Black/White lead ① (which is connected to the TCI unit and the engine switch) and the wiring that continues on from the connection are disconnected.



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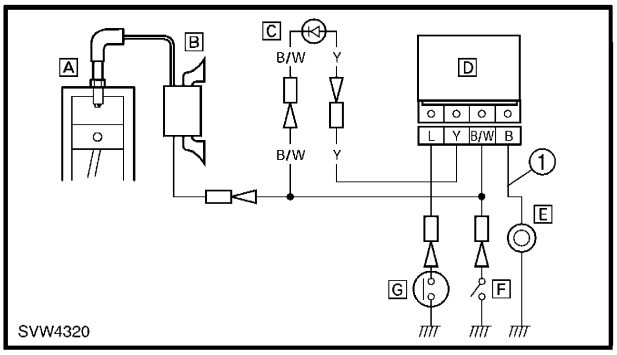
3. Oil warning unit ground lead
   Is black lead ① of the oil warning unit firmly connected to the ground? Is a conduction malfunction occurring due to rust, etc.?

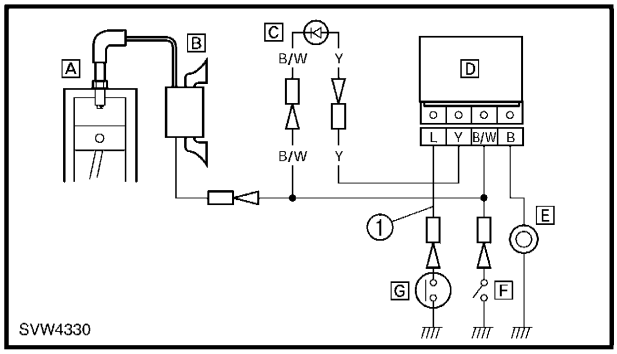
NOT CONNECTED

Firmly connect.



CONNECTED

4. Oil warning unit, oil level switch
   Connect blue lead ① of oil warning unit, which is connected to the oil level switch, to the ground.



5. Engine operation
   Does the engine stop?

ENGINE STOPS

THE ENGINE DOES NOT STOP

The oil warning unit is functioning normally.

Replace the oil warning unit.

Check the connections and operating condition of the oil level switch.

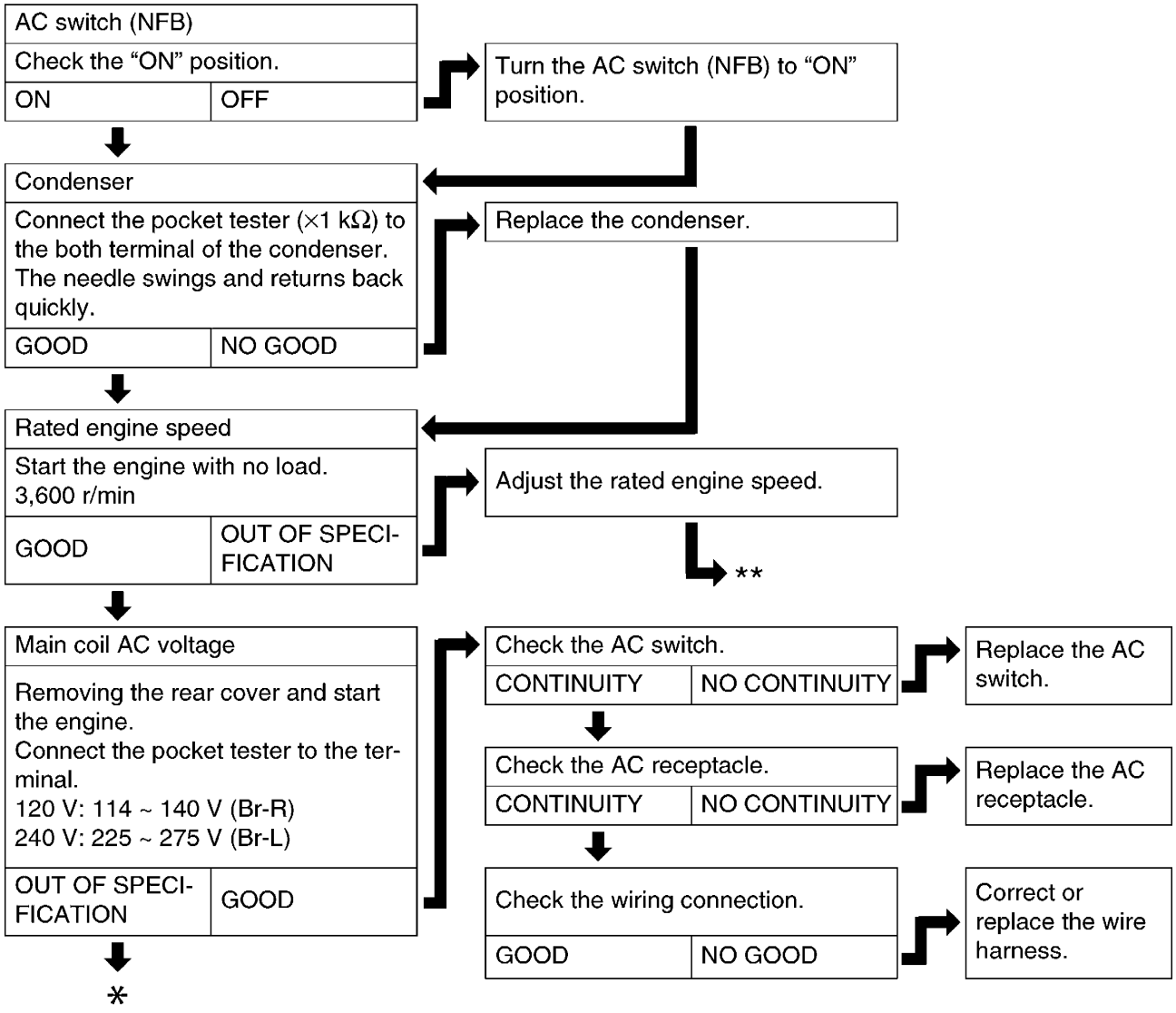
NO GOOD

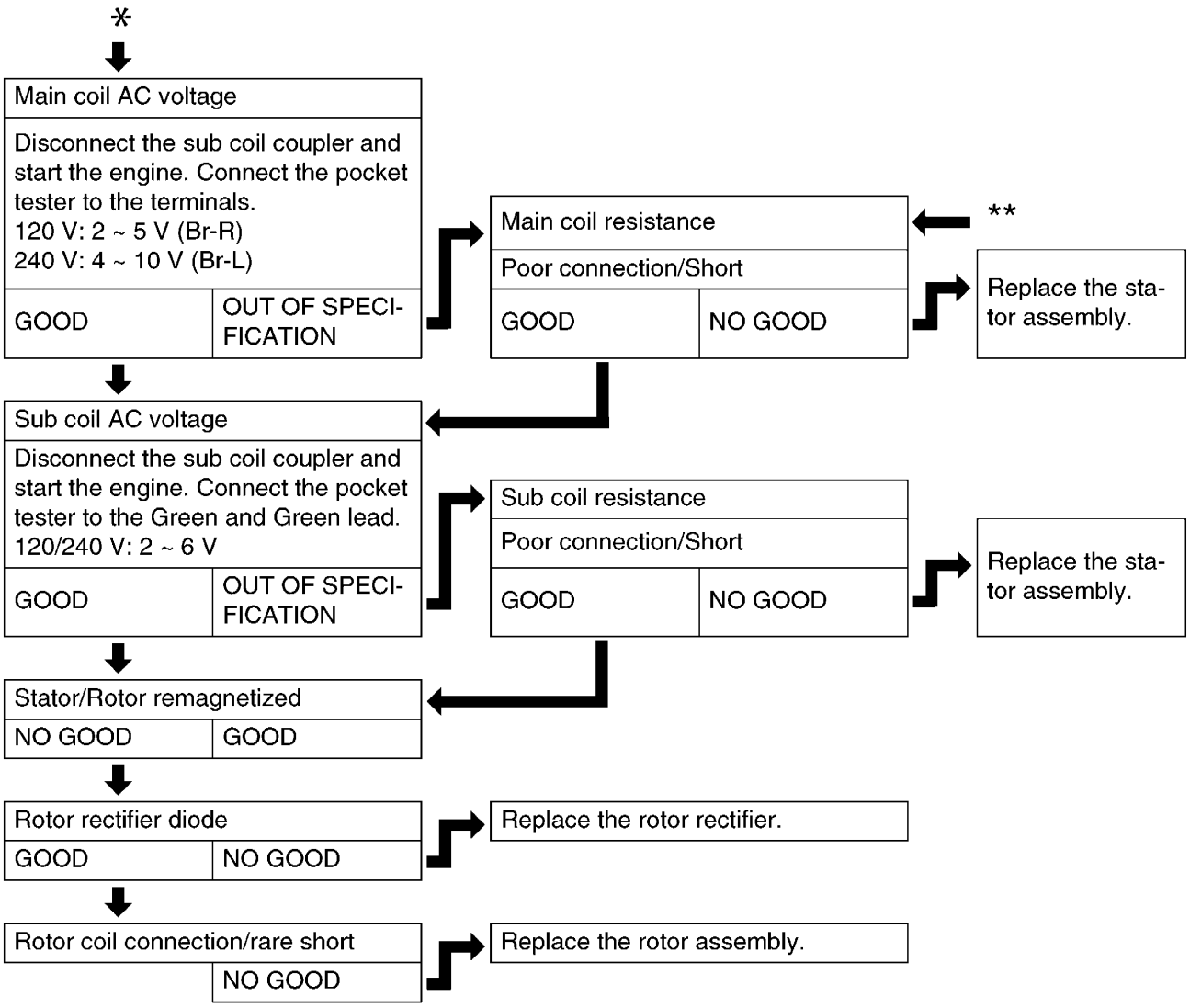
Replace the oil level switch.

GENERATOR SYSTEM

TROUBLESHOOTING CHART

GENERATOR DOES NOT GENERATE




*
Main coil AC voltage
Disconnect the sub coil coupler and start the engine. Connect the pocket tester to the terminals.
120 V: 2 ~ 5 V (Br-R)
240 V: 4 ~ 10 V (Br-L)
GOOD
OUT OF SPECIFICATION
Main coil resistance
**
Poor connection/Short
GOOD
NO GOOD
Replace the stator assembly.
Sub coil AC voltage
Disconnect the sub coil coupler and start the engine. Connect the pocket tester to the Green and Green lead.
120/240 V: 2 ~ 6 V
GOOD
OUT OF SPECIFICATION
Sub coil resistance
Poor connection/Short
GOOD
NO GOOD
Replace the stator assembly.
Stator/Rotor remagnetized
NO GOOD
GOOD
Rotor rectifier diode
GOOD
NO GOOD
Replace the rotor rectifier.
Rotor coil connection/rare short
NO GOOD
Replace the rotor assembly.

ECONOMY IDLE SYSTEM

TROUBLESHOOTING CHART

THE ECONOMY IDLE DOES NOT OPERATE PROPERLY

Inspection steps:

1. Economy idle engine speed
2. Solenoid valve
3. Vacuum diaphragm
4. Economy switch resistance
5. Battery voltage
6. Economy idle voltage
7. Solenoid valve voltage
8. Solenoid valve resistance

NOTE:

- Remove the following part(s) before troubleshooting.
  1) Control panel
  2) Generator cover
- Use the following special tool(s) for troubleshooting.

Inductive tachometer:
YU-8036-A
Engine tachometer:
90890-03113

Pocket tester:
YU-03112, 90890-03112

1. Economy idle engine speed
- Check that the economy switch is on.
- Start the engine (with no load).
- Measure the economy idle engine speed.

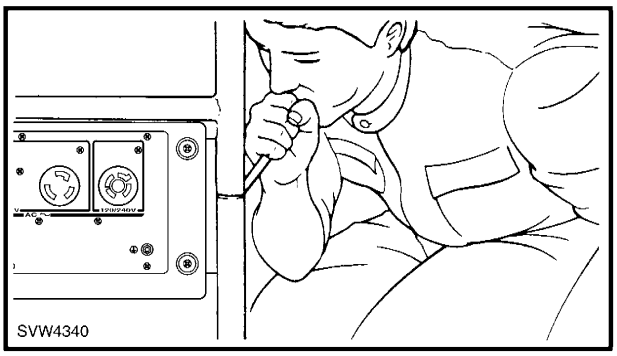
Economy idle engine speed:
2,600 r/min

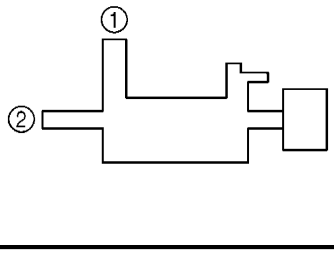
OUT OF SPECIFICATION

Adjust the economy idle engine speed.

GOOD

2. Solenoid valve
- Remove the fuel tank.
- Attach a hose to the solenoid valve.
- Blow into the hose and check the solenoid valve.



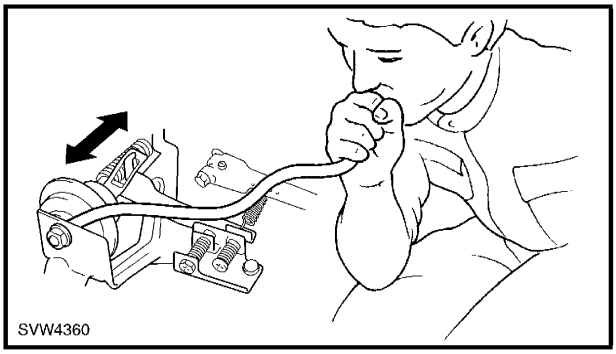


①: OPEN
②: CLOSE

NO GOOD → Replace the solenoid valve.

GOOD ⇩

3. Vacuum diaphragm
- Attach a hose to the vacuum diaphragm.
- Blow into the hose and check that the vacuum diaphragm operates properly.



NO GOOD → Replace the vacuum diaphragm.

GOOD ⇩

4. Economy switch resistance
- Disconnect the economy switch coupler.
- Connect the pocket tester.

Tester (+) lead → Yellow lead
Tester (–) lead → Yellow lead

- Measure the economy switch resistance.

Economy switch is on:
0 Ω
Economy switch is off:
∞ Ω

OUT OF SPECIFICATION → Replace the economy switch.

GOOD ⇩

*

*

5. Battery voltage
- Check the battery voltage.
  Refer to "CHARGING SYSTEM".

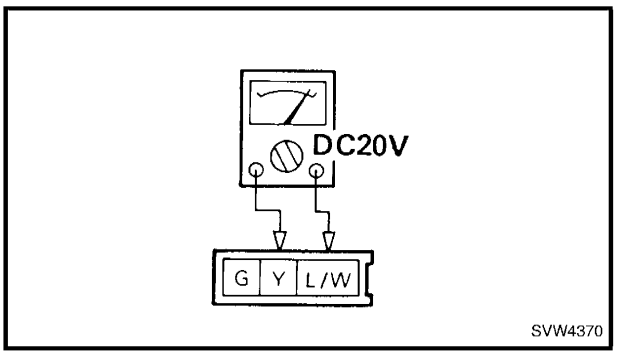
OUT OF SPECIFICATION

GOOD

Check the generator system.

6. Economy idle voltage
- Disconnect the economy idle unit coupler.
- Connect the pocket tester.

Tester (+) lead → Blue/White lead
Tester (–) lead → Yellow lead



- Start the engine.
- Measure the economy idle voltage.

LESS THAN 10 V (DC)

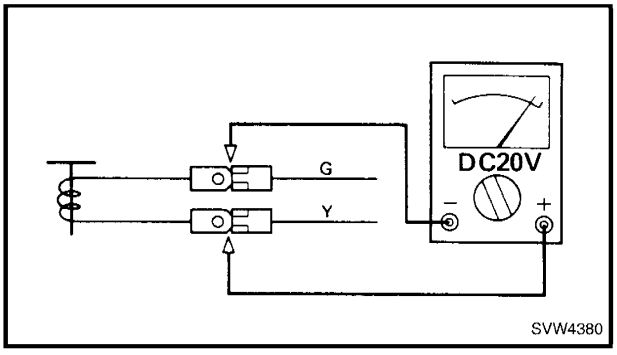
Economy idle voltage:
10 ~ 17 V (DC)

Check the wire harness.

MEETS SPECIFICATION

7. Solenoid valve voltage
- Connect the pocket tester to the solenoid valve coupler.

Tester (+) lead → Yellow lead
Tester (–) lead → Green lead



- Start the engine.
- Measure the solenoid valve voltage.

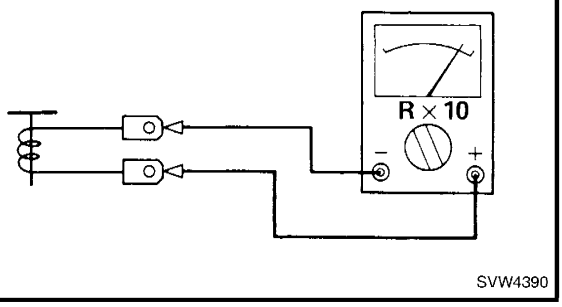
Solenoid valve voltage:
8 ~ 10 V (DC)

OUT OF SPECIFICATION

Replace the solenoid valve.

MEETS SPECIFICATION

8. Solenoid valve resistance
- Disconnect the solenoid valve leads.
- Connect the pocket tester.



OUT OF SPECIFICATION

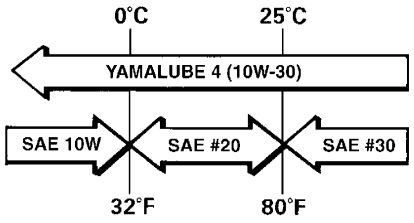
- Measure the solenoid valve resistance.

Solenoid valve resistance:
35.5 Ω ± 10 % at 20 °C (68 °F)

Replace the solenoid valve.

SPECIFICATIONS

GENERAL SPECIFICATIONS

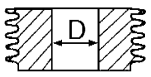
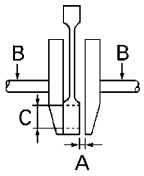
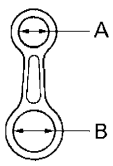
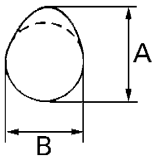
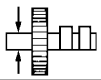
Unit		EF4000DE	YG4000D
Model code number		7VW2	←
Dimensions:			
Overall length	mm (in)	804 (31.7)	580 (22.8)
Overall width	mm (in)	525 (20.7)	525 (20.7)
Overall height	mm (in)	510 (20.1)	560 (22.0)
Dry weight	kg (lb)	66 (145.5)	60 (132.3)
Engine:			
Engine type		4-stroke OHV forced air cooled	←
Cylinder arrangement		1	←
Displacement	L (cm^3)	0.251 (251)	←
Bore × Stroke	mm (in)	75.0 × 57.0 (2.95 × 2.24)	←
Compression ratio		8.3 : 1	←
Rated output	60 Hz · kW (PS)/3,600 r/min	4.5 (6.2)	←
Operating hours	60 Hz · Hrs	8.5	←
Fuel		Unleaded regular gasoline	←
Fuel tank capacity	L (Imp gal, US gal)	18.5 (4.07, 4.89)	←
Engine oil capacity	L (Imp qt, US qt)	1.0 L (0.88, 1.06)	←
Engine oil grade		4-stroke engine oil API service classification SE or SF, if not available, SD 	
Electrical:			
Ignition system		TCI	←
Ignition timing		BTDC 23 ± 3° at 3,600 r/min	←
Spark plug type		BPR4ES (NGK)	←
Gap	mm (in)	0.7 ~ 0.8 (0.028 ~ 0.031)	←

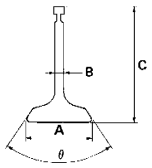
Unit		EF4000DE	YG4000D
Generator:			
Type		Brushless, self-exciting, single-phase, synchronous generator	←
Number of phase		Single phase	←
Number of poles		2	←
Excitation		Self magnetization	←
Initial excitation		Residual magnetization	←
Driving method		Direct connection	←
Rated power factor		1.0	←
Frequency variation		Less than 5%	←
Voltage fluctuation		Less than 10%	←
AC output			
Rated voltage	V	120/240	←
Frequency	Hz	60	←
Rated output	kVA	3.5	←
Rated current	A	29.2/14.6	←
Safety device type		NFB (No fuse breaker)	←
Rated engine speed	r/min	3,600	←
Economy idle engine speed	r/min	2,600	←
Voltage regulation		Condenser	←
Insulation resistance	MΩ	10	←
Insulation type			
Stator		E type	←
Rotor		B type	←
Receptacle			
AC		20 A (125 V) × 1, 30 A (125 V) × 1, 20 A (250/125 V) × 1	←

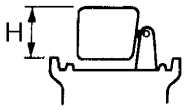
MAINTENANCE SPECIFICATIONS

ENGINE

Unit	EF4000DE	YG4000D
Piston: mm (in)		
Piston clearance	0.024 ~ 0.038 (0.00094 ~ 0.00150)	←
<Limit>	0.100 (0.0039)	←
Piston skirt "D"	75.0 (2.953)	←
<Limit>	74.9 (2.949)	←
Measuring point "H"	10.0 (0.4)	←
Oversize 1st	75.25 (2.9626)	←
2nd	75.50 (2.9724)	←
Piston pin hole inside diameter	18.000 (0.7087)	←
<Limit>	18.020 (0.7094)	←
Piston pin: mm (in)		
Piston pin diameter	17.995 ~ 18.000 (0.7085 ~ 0.7086)	←
<Limit>	17.950 (0.7067)	←
Piston ring: mm (in)		
Top ring		
Type	Barrel face	←
Dimensions "B × T"	1.5 × 3.1 (0.059 × 0.122)	←
End gap	0.2 ~ 0.4 (0.008 ~ 0.016)	←
<Limit>	0.9 (0.0354)	←
Side clearance	0.04 ~ 0.08 (0.0016 ~ 0.0031)	←
<Limit>	0.1 (0.0039)	←
2nd ring		
Type	Taper	←
Dimensions "B × T"	1.5 × 3.1 (0.059 × 0.122)	←
End gap	0.2 ~ 0.4 (0.008 ~ 0.016)	←
<Limit>	0.9 (0.0354)	←
Side clearance	0.03 ~ 0.07 (0.0012 ~ 0.0028)	←
<Limit>	0.1 (0.0039)	←
Oil ring		
Type	3-piece type	←
Dimensions "B × T"	2.5 × 2.5 (0.098 × 0.098)	←
End gap	0.2 ~ 0.7 (0.008 ~ 0.028)	←
<Limit>	0.9 (0.0354)	←

Unit		EF4000DE		YG4000D	
Cylinder head: mm (in)					
Warpage limit		0.05 (0.002)		←	
Cylinder: mm (in)					
Inside diameter "D"		75.000 ~ 75.020 (2.9528 ~ 2.9535)		←	
<Limit>		75.020 (2.9535)		←	
Taper limit		0.05 (0.002)		←	
Warpage limit		0.05 (0.002)		←	
Crankshaft: mm (in)					
Big end side clearance "A"		0.20 ~ 0.65 (0.008 ~ 0.026)		←	
<Limit>		0.8 (0.032)		←	
Runout "B"					
<Limit>		0.04 (0.0016)		←	
Crank pin outside diameter "C"		31.969 ~ 31.984 (1.2586 ~ 1.2592)		←	
<Limit>		31.9 (1.2559)		←	
Connecting rod: mm (in)					
Small end diameter "A"		18.006 ~ 18.020 (0.7089 ~ 0.7094)		←	
Oil clearance		0.006 ~ 0.025 (0.0002 ~ 0.0010)		←	
Big end diameter "B"		32.000 ~ 32.015 (1.2598 ~ 1.2604)		←	
Oil clearance		0.015 ~ 0.045 (0.0006 ~ 0.0018)		←	
<Limit>		0.1 (0.004)		←	
Camshaft: mm (in)					
Camshaft outside diameter					
Cam dimension		IN	EX	IN	EX
"A"		32.55 ± 0.05 (1.28 ± 0.002)	32.55 ± 0.05 (1.28 ± 0.002)	←	←
<Limit>		32.40 (1.276)	32.40 (1.276)	←	←
"B"		26.08 ± 0.05 (1.03 ± 0.002)	26.08 ± 0.05 (1.03 ± 0.002)	←	←
<Limit>		25.93 (1.021)	25.93 (1.021)	←	←
Camshaft journal		16.000 (0.6299)		←	
<Limit>		15.950 (0.6280)		←	

Unit			EF4000DE	YG4000D
Valve:		mm (in)		
Valve				
Face diameter "A"	IN		29.0 (1.14)	←
	EX		25.0 (0.98)	←
Stem diameter "B"	IN		6.0 (0.24)	←
	EX		6.0 (0.24)	←
<Limit>	IN		5.9 (0.23)	←
	EX		5.9 (0.23)	←
Stem length "C"	IN		85.9 (3.38)	←
	EX		86.1 (3.39)	←
Valve face contact width "D"	IN		0.8 (0.031)	←
	EX		0.8 (0.031)	←
<Limit>			1.7 (0.067)	←
Valve stem runout limit			0.01 (0.0004)	←
"θ"			90°	←
Valve guide				←
Guide inside diameter	IN		6.000 ~ 6.012 (0.2362 ~ 0.2367)	←
	EX		6.000 ~ 6.012 (0.2362 ~ 0.2367)	←
Stem to guide clearance	IN		0.037 ~ 0.064 (0.00146 ~ 0.00252)	←
	EX		0.045 ~ 0.072 (0.00177 ~ 0.00283)	←
Valve clearance	IN		0.07 (0.003)	←
	EX		0.07 (0.003)	←
Push rod:		mm (in)		←
Runout limit			0.5 (0.02)	←
Valve spring:		mm (in)		
Free length	IN		37.1 (1.46)	←
	EX		37.1 (1.46)	←
<Limit>	IN		35.0 (1.38)	←
	EX		35.0 (1.38)	←
Set length	IN		29.3 (1.1535)	←
	EX		29.3 (1.1535)	←
Set force	IN		6.9 kg (15.2 lb)	←
	EX		6.9 kg (15.2 lb)	←
Tilt limit			1.6 (0.06)	←

Unit		EF4000DE	YG4000D
Carburetor:	mm (in)		
Type/manufacture		BV22-16/MIKUNI	←
I.D. mark		7VW20	7VW30
Bore size		ø16	←
Main jet		#86.3	←
Main air jet		ø1.4 (0.055)	←
Pilot air jet		ø1.0 (0.039)	←
Pilot outlet		ø0.9 (0.035)	←
Valve seat size		ø1.8 (0.071)	←
Main nozzle		55J	←
Pilot jet		#43.8	←
Throttle valve		#200	←
Float height "H"		16.0 (0.63)	←
Carburetor heater resistance	(Ω ± 10%)	13 at 23°C (73°F)	

TIGHTENING TORQUE

Model / Item	EF4000DE/YG4000D		
	Tread size	Tightening torque Nm (m·kg, ft·lb)	Remarks
Spark plug	M14 × 1.25	20 (2.0, 14)	
Cylinder head cover	M6 × 1.0	11 (1.1, 8.0)	
Cylinder head	M10 × 1.25	44 (4.4, 32)	
Oil drain bolt	M12 × 1.25	30 (3.0, 22)	
Crankcase cover	M8 × 1.25	30 (3.0, 22)	
Cover 1, 2	M6 × 1.0	10 (1.0, 7.2)	
Connecting rod cap	M7 × 1.0	12 (1.2, 8.7)	
Governor and governor shaft	M6 × 1.0	10 (1.0, 7.2)	
Vacuum diaphragm	M8 × 1.25	16 (1.6, 11)	
Stay assembly (bolt)	M6 × 1.0	10 (1.0, 7.2)	
Stay assembly (flange bolt)	M6 × 1.0	7 (0.7, 5.1)	
Valve adjuster locknut	M6 × 0.5	10 (1.0, 7.2)	
Carburetor	M6 × 1.0	10 (1.0, 7.2)	
Air filter case cover	M6 × 1.0	1.6 (0.16, 1.2)	
Muffler (nut)	M8 × 1.25	20 (2.0, 14)	
Muffler (bolt)	M8 × 1.25	16 (1.6, 11)	
Muffler protector	M6 × 1.0	7 (0.7, 5.0)	
Muffler band	M5 × 0.8	4 (0.4, 2.9)	
Engine mount (nut)	M10 × 1.25	32 (3.2, 23)	
Engine mount (bolt)	M10 × 1.25	32 (3.2, 23)	
Drive plate (bolt)	M6 × 1.0	5 (0.5, 3.6)	
Fuel cock cup	—	1.3 (0.13, 0.94)	
Rear frame (flange bolt)	M6 × 1.0	10 (1.0, 7.2)	
Rear frame (bolt)	M6 × 1.0	10 (1.0, 7.2)	
Generator cover	M6 × 1.0	7 (0.7, 5.1)	
Rotor assembly	M10 × 1.25	42 (4.2, 30)	
Flywheel cover	M6 × 1.0	10 (1.0, 7.2)	
Flywheel	M16 × 1.5	75 (7.5, 54)	
TCI unit	M6 × 1.0	10 (1.0, 7.2)	
Oil level switch	M6 × 1.0	10 (1.0, 7.2)	
Control box	M6	4 (0.4, 2.9)	
Starter motor	M8 × 1.25	16 (1.6, 11)	EF4000DE
Starter motor lead	M8 × 1.25	9 (0.9, 6.5)	EF4000DE

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch treads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multifastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specifications call for clean, dry treads. Components should be at room temperature.

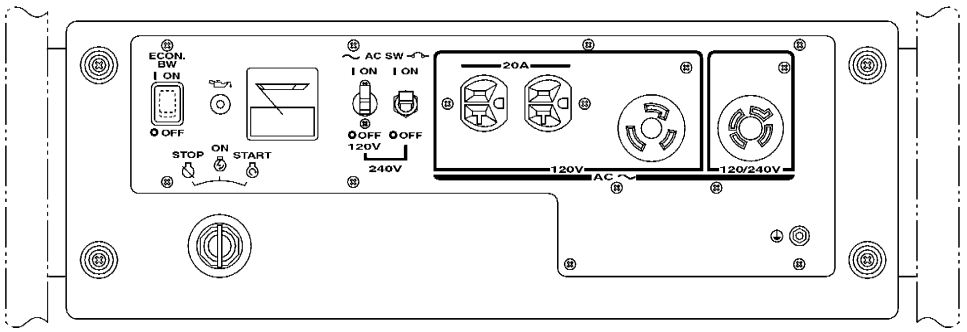
Tread size	Tightening torque		
	Nm	m·kg	ft·lb
M4	2	0.2	1.4
M5	3	0.3	2.2
M6	7	0.7	5.1
M7	10	1.0	7.2
M8	15	1.5	11
M10	30	3.0	22
M12	60	6.0	43

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm	Millimeter	10^{-3} meter	Length
cm	Centimeter	10^{-2} meter	Length
kg	Kilogram	10^{3} gram	Weight
N	Newton	1 kg × m/sec^2	Force
Nm	Newton meter	N × m	Torque
m·kg	Meter kilogram	m × kg	Torque
Pa	Pascal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter	—	Volume or capacity
cm^3	Cubic centimeter		
r/min	Rotation per minute	—	Engine speed

WIRE ROUTING DIAGRAM

CONTROL BOX PANEL AND BEHIND CONTROL BOX (EF4000DE)

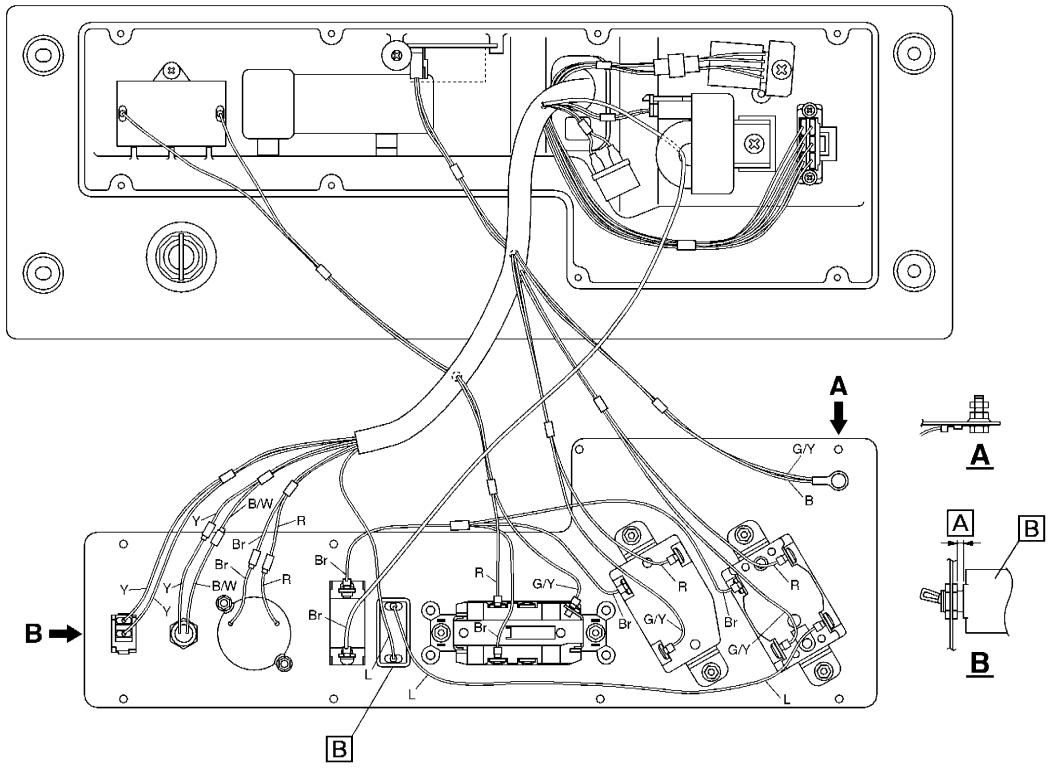


SVW5010

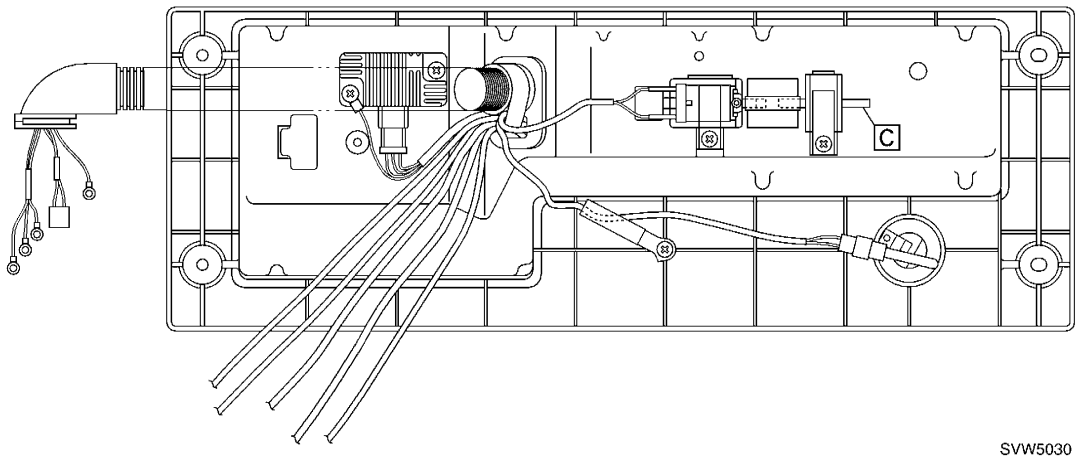
A 3 mm (0.12 in)
B AC switch (NFB)
C Brown

COLOR CODE

B .....Black
Br .....Brown
L.....Blue
R .....Red
Y .....Yellow
B/W .....Black/White
G/Y .....Green/Yellow



SVW5020

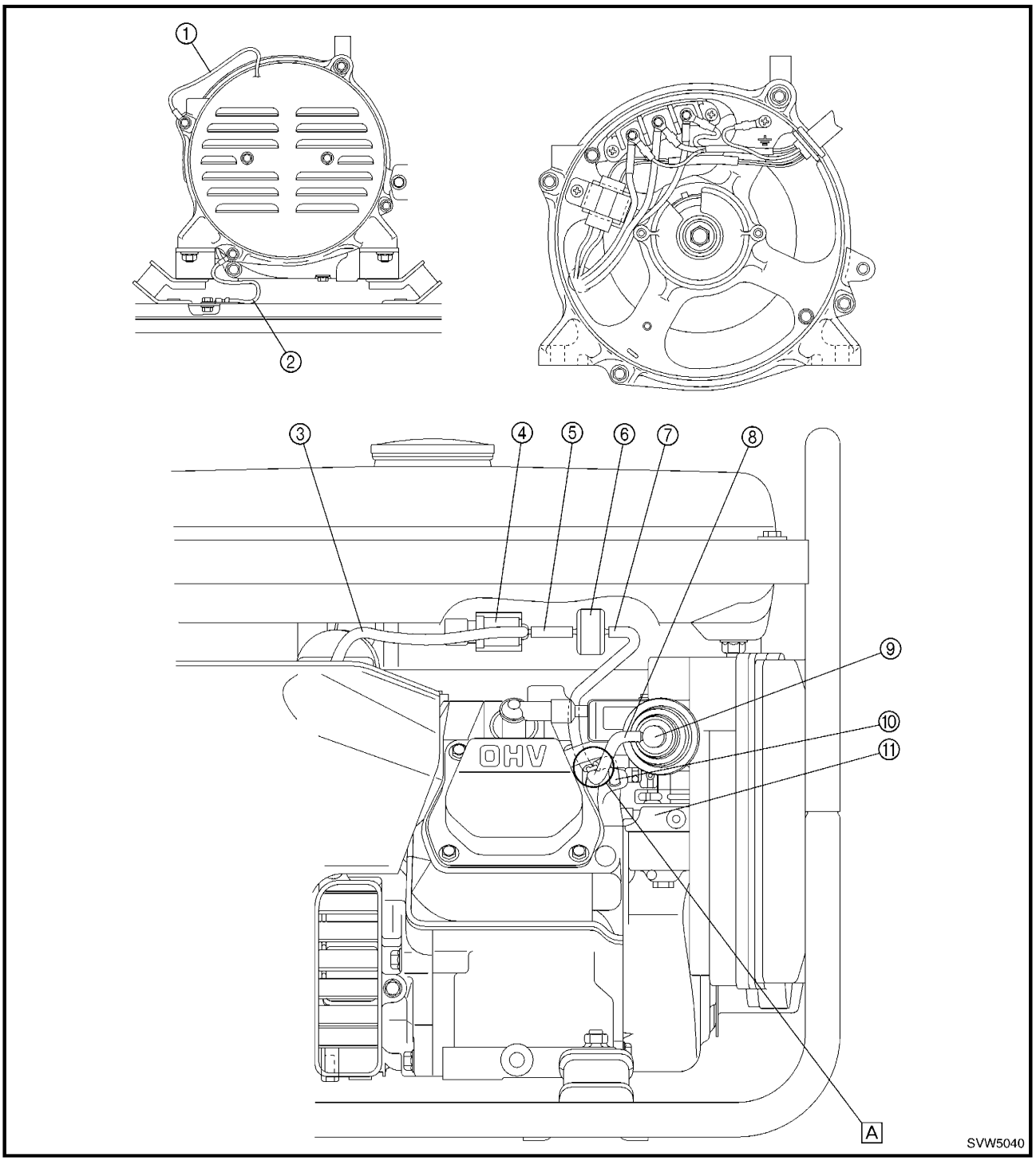


SVW5030

ENGINE AND GENERATOR (EF4000 DE)

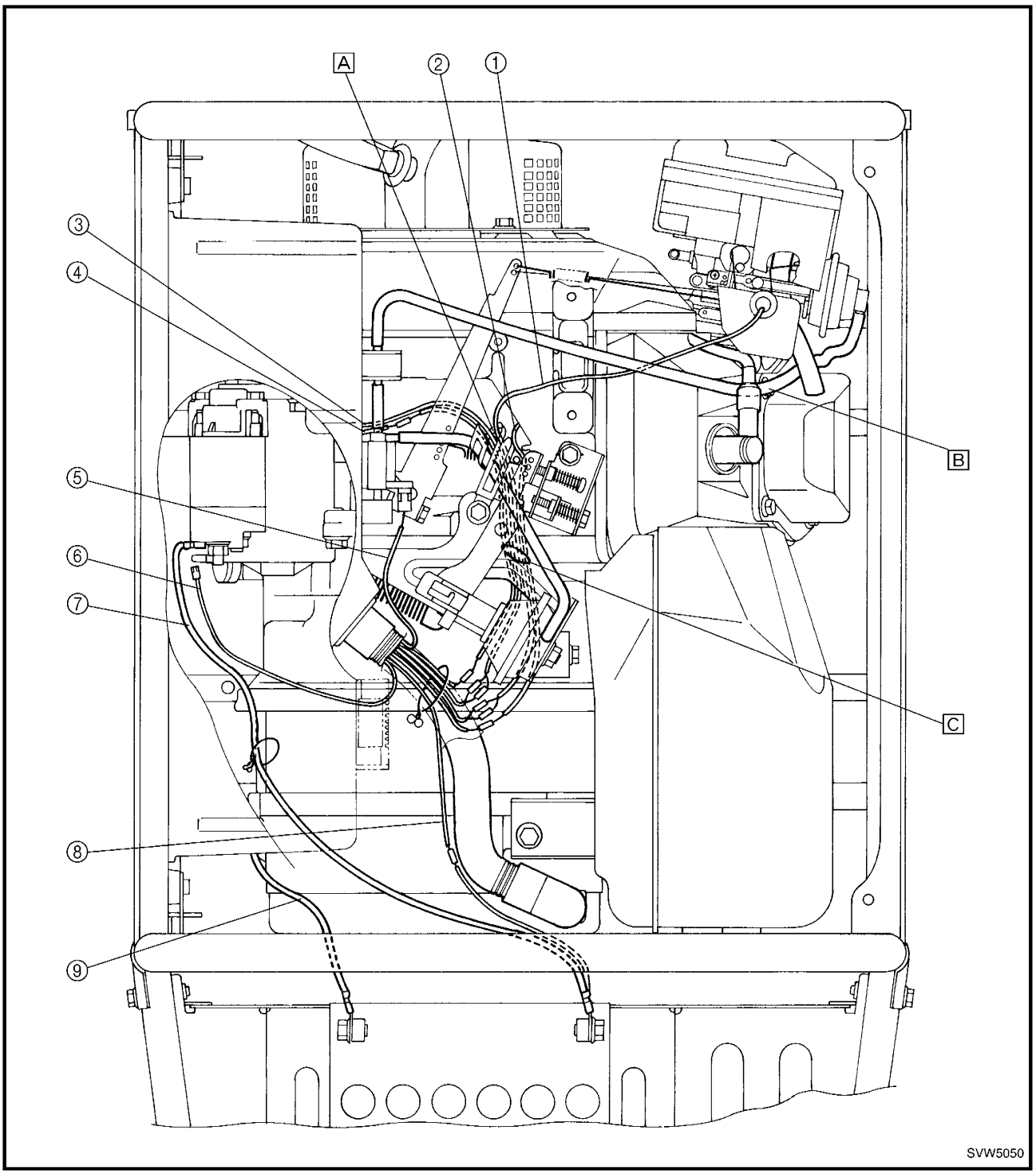
① Battery negative lead
② Ground lead
③ Vacuum hose 1 (solenoid valve to vacuum diaphragm)
④ Solenoid valve
⑤ Vacuum hose 2 (solenoid valve to vacuum control valve)
⑥ Vacuum control valve
⑦ Vacuum hose 3 (vacuum control valve to solenoid valve joint)
⑧ Vacuum hose 4 (solenoid valve joint to choke diaphragm)
⑨ Choke diaphragm
⑩ Vacuum hose 5 (solenoid valve joint to intake manifold)
⑪ Carburetor

[A] Route the vacuum hoses under the breather hose.



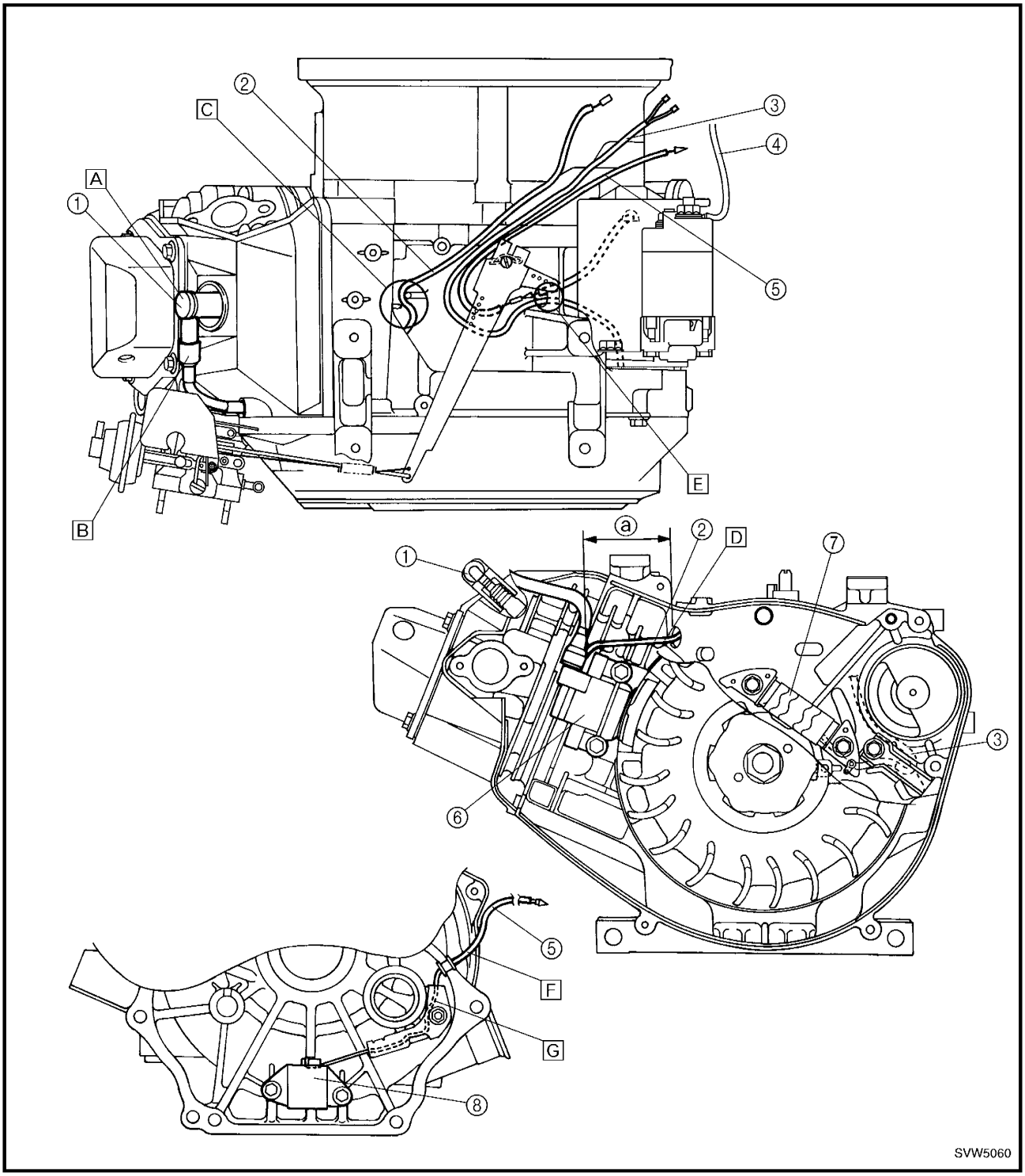
① Carburetor heater lead
② TCI unit lead
③ Charging coil lead
④ Oil level switch lead
⑤ Solenoid valve lead
⑥ Starter relay lead
⑦ Starter motor lead
⑧ Battery positive lead
⑨ Battery negative lead

[A] Fasten the oil level lead, charging coil lead, and carburetor heater lead with the clamp so that they do not contact the adjusting plate and spring.
[B] Route vacuum hose under the spark plug lead.
[C] Pass the TCI lead, oil warning unit lead, charging coil lead and carburetor heater lead under the stay.

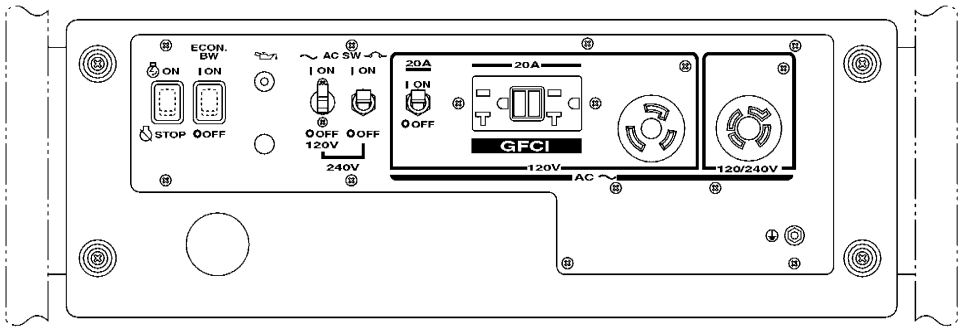


① Spark plug cap
② TCI unit lead
③ Charging coil lead
④ Starter motor lead
⑤ Oil level switch lead
⑥ TCI unit
⑦ Charging coil
⑧ Oil level switch

A Install the spark plug cap, as shown.
B Screw in the spark plug lead until it comes into contact with the spark plug cap.
C Route the TCI unit lead, as shown.
D Pass the TCI unit lead through the hole in the crankcase and be sure to not leave any slack between section ⓐ.
E Pass the oil level switch lead and charging coil lead through the hole of the crankcase.
F Contact the green tube to the grommet.
G Route the oil level switch lead, as shown.



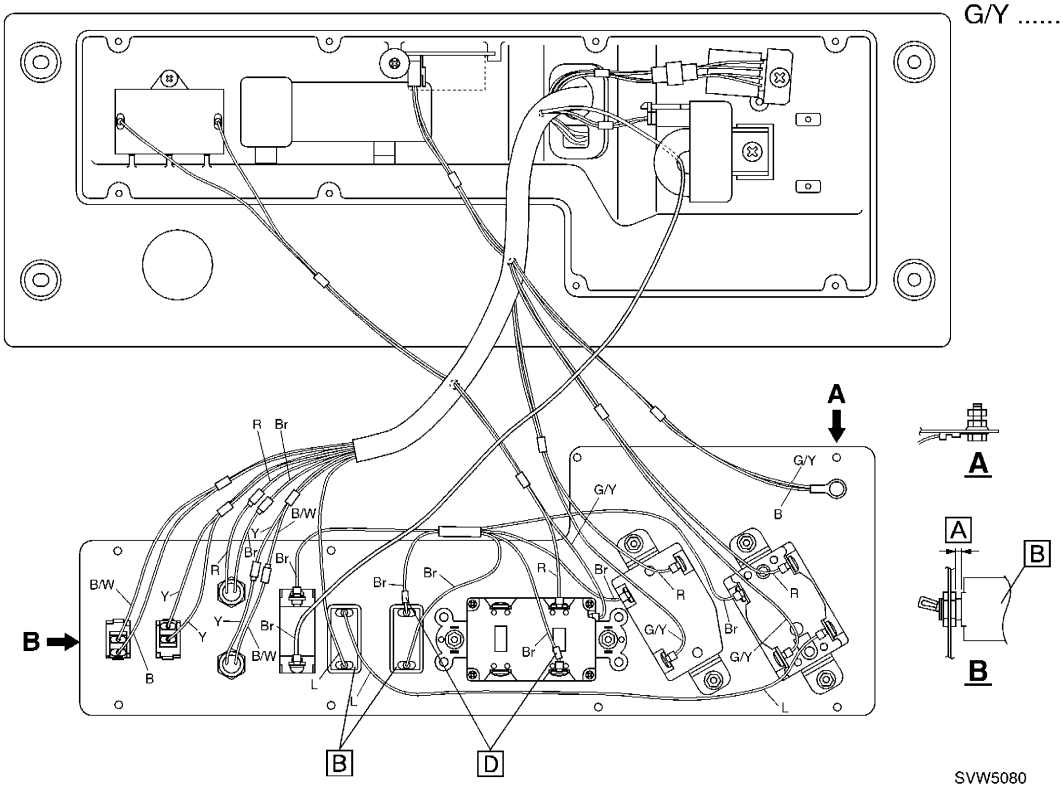
CONTROL BOX PANEL AND BEHIND CONTROL BOX (YG4000D)



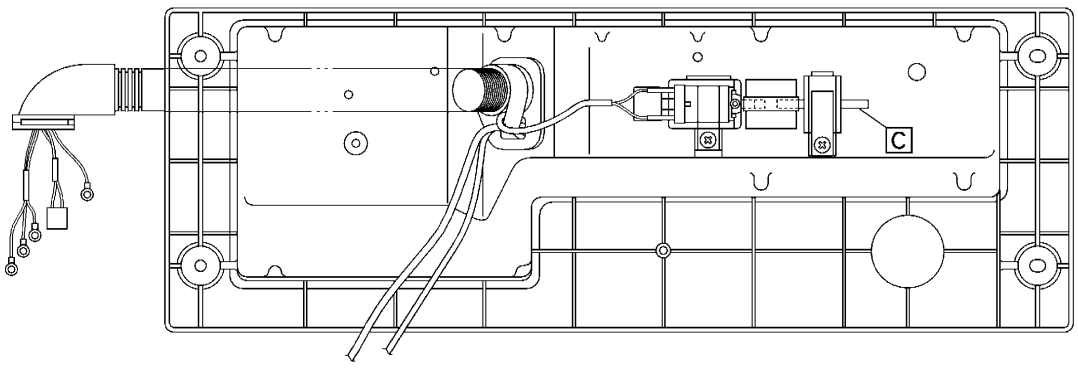
SVW5070

A 3 mm (0.12 in)
B AC switch (NFB)
C Brown
D Brown lead with white tape mark.

COLOR CODE
B .....Black
Br .....Brown
L.....Blue
R .....Red
Y .....Yellow
B/W .....Black/White
G/Y .....Green/Yellow



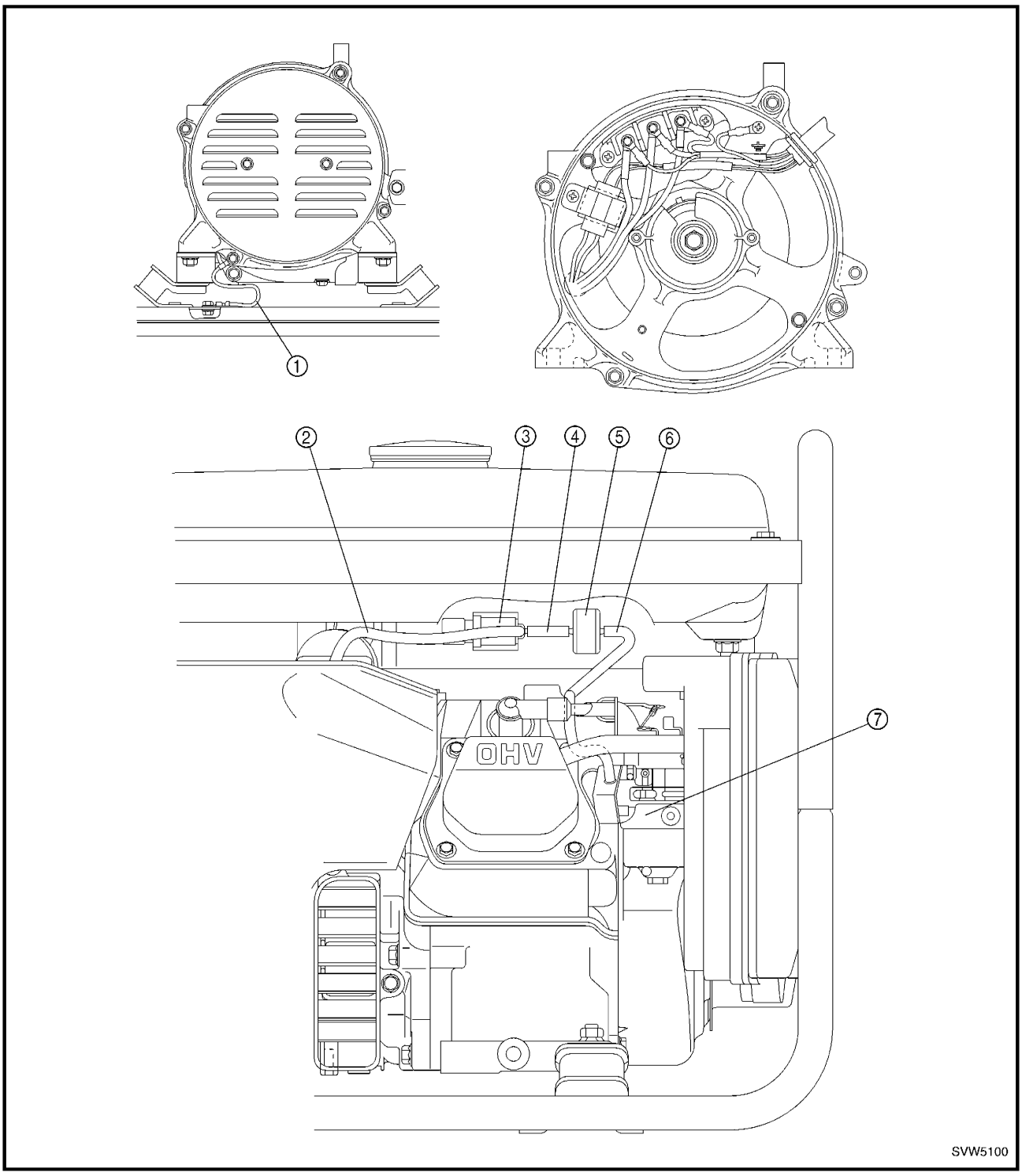
SVW5080



SVW5090

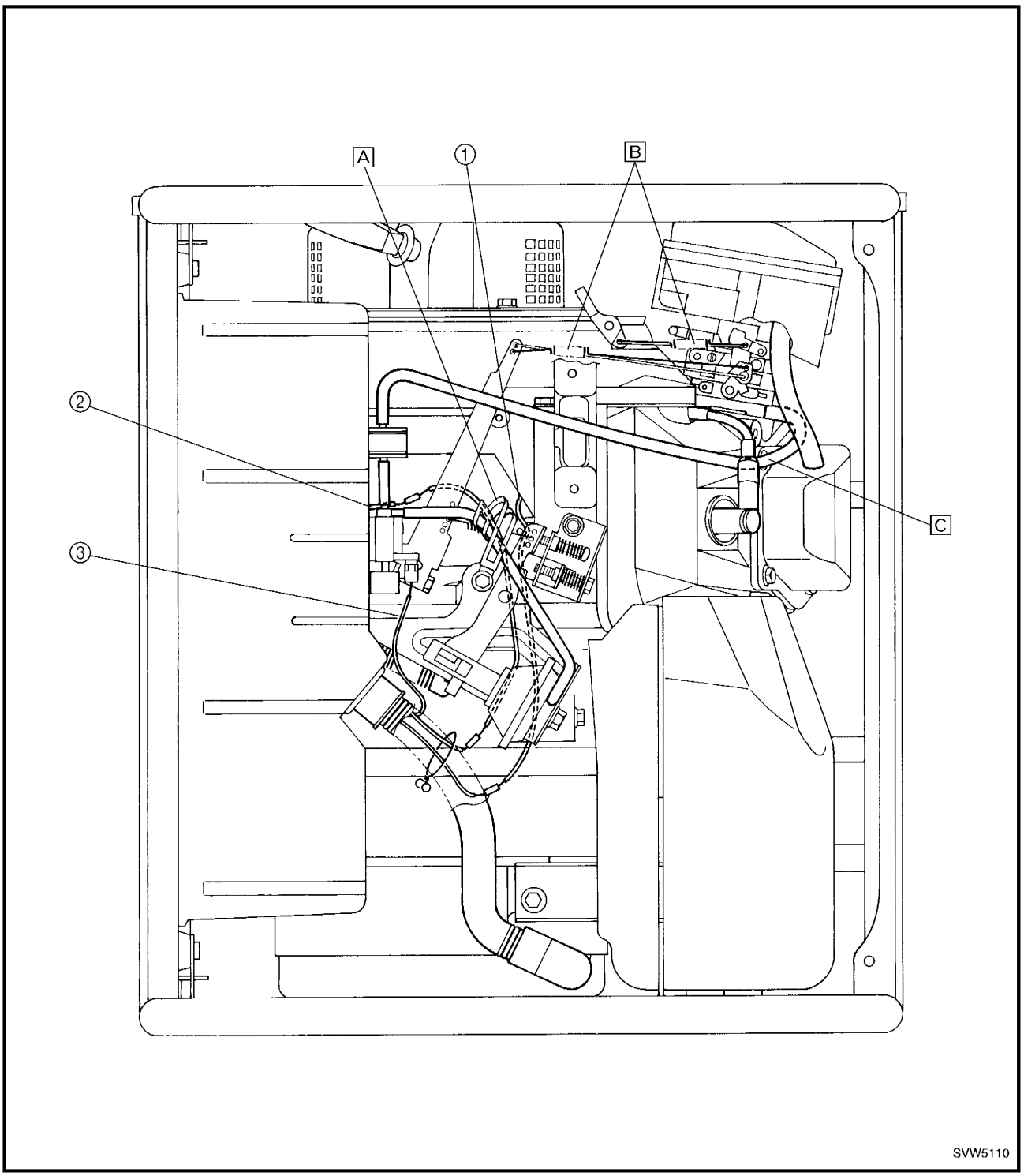
ENGINE AND GENERATOR (YG4000D)

① Ground lead
② Vacuum hose 1 (solenoid valve to vacuum diaphragm)
③ Solenoid valve
④ Vacuum hose 2 (solenoid valve to vacuum control valve)
⑤ Vacuum control valve
⑥ Vacuum hose 3 (vacuum control valve to intake manifold)
⑦ Carburetor



① TCI unit lead
② Oil level switch lead
③ Solenoid valve lead

A Fasten the oil level lead with the clamp so that it does not contact the adjusting plate and spring, so that there is no slack.
B Install the spring, so that it does not twist, as shown in the illustration.
C Route vacuum hose under the spark plug lead.



① Spark plug cap
② TCI unit lead
③ Oil level switch lead
④ TCI unit
⑤ Oil level switch

A Install the spark plug cap, as shown.
B Screw in the spark plug lead until it comes into contact with the spark plug cap.
C Route the TCI unit lead, as shown.
D Pass the TCI unit lead through the hole in the crankcase and be sure to not leave any slack between section ⓐ.
E Pass the oil level switch lead through the hole of the crankcase.
F Contact the green tube to the grommet.
G Route the oil level switch lead, as shown.