



XF50W

SERVICE MANUAL

EAS00000

**XF50W 2006
SERVICE MANUAL
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NOTICE

This manual was produced by the Yamaha Motor Taiwan Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

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

NOTE:

Designs and specifications are subject to change without notice.

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.



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



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



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

NOTE:

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

HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

- ① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter. Refer to "SYMBOLS".
- ② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 ("PERIODIC CHECKS AND ADJUSTMENTS"), where the sub-section title(s) appears.
- ③ Sub-section titles appear in smaller print than the section title.
- ④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.
- ⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.
- ⑥ Symbols indicate parts to be lubricated or replaced. Refer to "SYMBOLS".
- ⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
- ⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.

⑥ ② ①

CYLINDER AND PISTON **ENG**

68190011
CYLINDER AND PISTON

④

⑤

⑦

Order	Job/Part	Qty	Remarks
Removing the cylinder and piston			
	Cylinder head		Remove the parts in the order listed. Refer to "CYLINDER HEAD".
1	Timing chain guide(exhaust side)	1	
2	Cylinder	1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Piston pin clip	2	Refer to "REMOVING THE CYLINDER AND PISTON" and "INSTALLING THE PISTON AND CYLINDER".
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	For installation, reverse the removal procedure.

CYLINDER AND PISTON **ENG**

REMOVING THE CYLINDER AND PISTON

1. Remove:

- piston pin clip ①
- piston pin ②
- piston ③

CAUTION:
Do not use a hammer to drive the piston pin out.

NOTE:

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set ④.

Piston pin puller set
90890-01304(YU-01304)

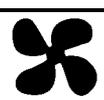
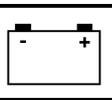
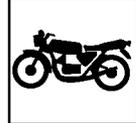
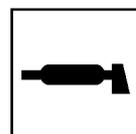
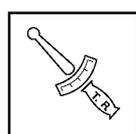
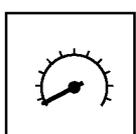
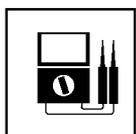
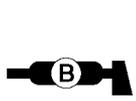
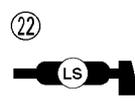
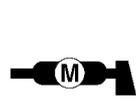
2. Remove:

- top ring
- 2nd ring
- oil ring

NOTE:
When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

5-31

5-32

① GEN INFO 	② SPEC 	
③ CHK ADJ 	④ CHAS 	
⑤ ENG 	⑥ COOL 	
⑦ FI 	⑧ ELEC 	
⑨ TRBL SHTG ?	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	⑰ 
⑱ 	⑲ 	⑳ 
㉑ 	㉒ 	㉓ 
㉔ 	㉕ New	

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SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ Chassis
- ⑤ Engine
- ⑥ Cooling system
- ⑦ Fuel injection system
- ⑧ Electrical system
- ⑨ Troubleshooting

Symbols ⑩ to ⑰ indicate the following.

- ⑩ Serviceable with engine mounted
- ⑪ Filling fluid
- ⑫ Lubricant
- ⑬ Special tool
- ⑭ Tightening torque
- ⑮ Wear limit, clearance
- ⑯ Engine speed
- ⑰ Electrical data

Symbols ⑱ to ㉓ in the exploded diagrams indicate the types of lubricants and lubrication points.

- ⑱ Engine oil
- ⑲ Gear oil
- ⑳ Molybdenum-disulfide oil
- ㉑ Wheel-bearing grease
- ㉒ Lithium-soap-based grease
- ㉓ Molybdenum-disulfide grease

Symbols ㉔ to ㉕ in the exploded diagrams indicate the following.

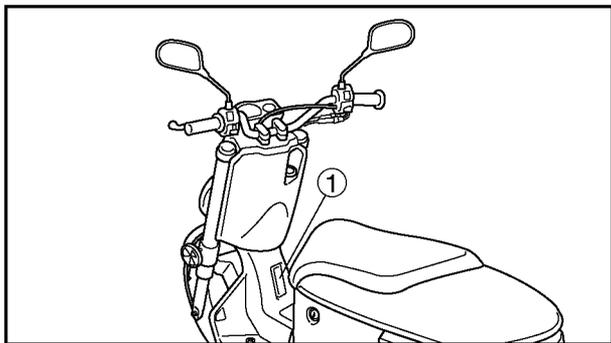
- ㉔ Apply locking agent (LOCTITE®)
- ㉕ Replace the part

TABLE OF CONTENTS

GENERAL INFORMATION		
	GEN INFO	1
SPECIFICATIONS		
	SPEC	2
PERIODIC CHECKS AND ADJUSTMENTS		
	CHK ADJ	3
CHASSIS		
	CHAS	4
ENGINE		
	ENG	5
COOLING SYSTEM		
	COOL	6
FUEL INJECTION SYSTEM		
	FI	7
ELECTRICAL SYSTEM		
	ELEC	8
TROUBLESHOOTING		
	TRBL SHTG	9

**CHAPTER 1
GENERAL INFORMATION**

SCOOTER IDENTIFICATION	1-1
VEHICLE IDENTIFICATION NUMBER	1-1
MODEL LABEL	1-1
FEATURES	1-2
OUTLINE OF THE FI SYSTEM	1-2
FI SYSTEM	1-3
IMPORTANT INFORMATION	1-4
PREPARATION FOR REMOVAL AND DISASSEMBLY	1-4
REPLACEMENT PARTS	1-4
GASKETS, OIL SEALS AND O-RINGS	1-4
LOCK WASHERS/PLATES AND COTTER PINS	1-5
BEARINGS AND OIL SEALS	1-5
CIRCLIPS	1-5
EQUIPMENT PREPARATION	1-6
CHECKING THE CONNECTIONS	1-7
SPECIAL TOOLS	1-8



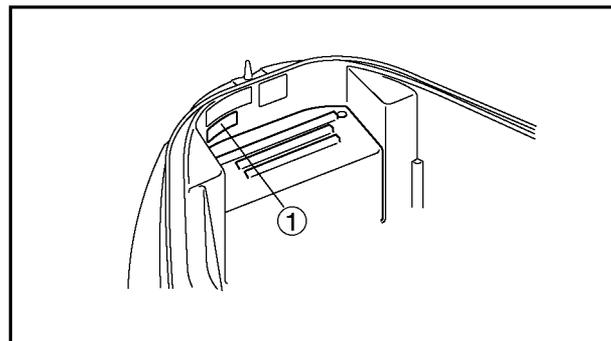
EAS00015

GENERAL INFORMATION SCOOTER IDENTIFICATION

EAS00017

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the frame.



EAS00018

MODEL LABEL

The model label ① is affixed to the frame trunk. This information will be needed to order spare parts.

EAS00896

FEATURES

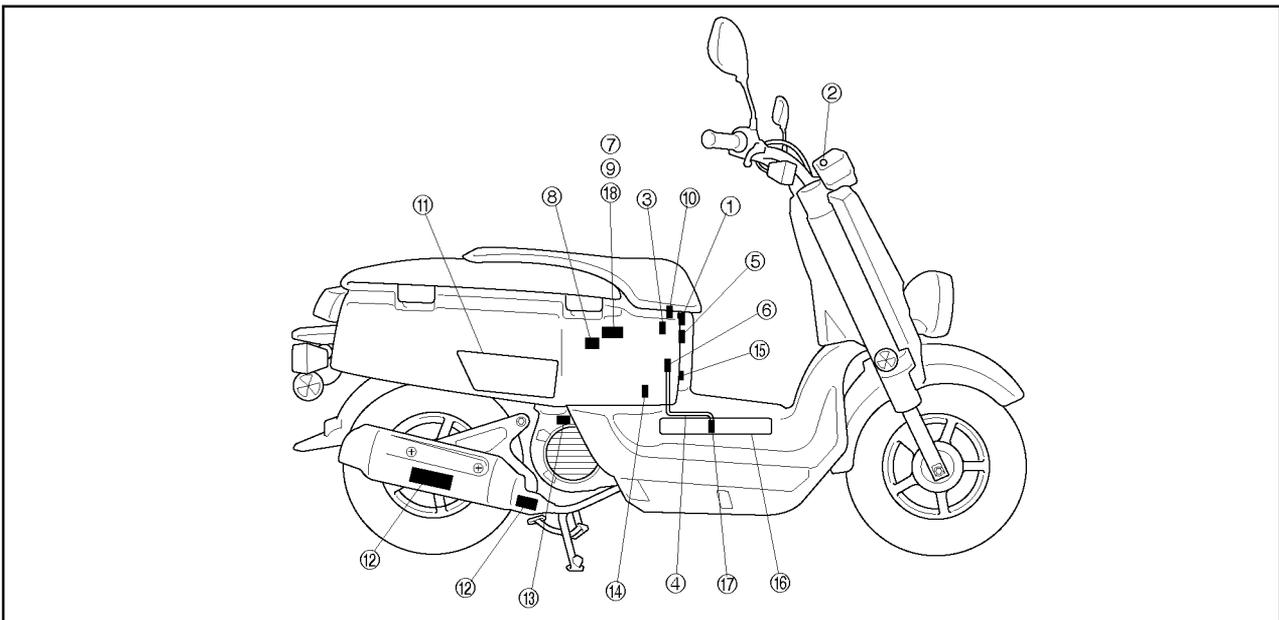
OUTLINE OF THE FI SYSTEM

The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating conditions and the atmospheric temperature. In the conventional carburetor system, the air-fuel ratio of the mixture that is supplied to the combustion chamber is created by the volume of the intake air and the fuel that is metered by the jet used in the respective carburetor.

Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operation under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.

As the requirements for the engine to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection(FI) system, in place of the conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors.

The adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions.



- | | |
|---------------------------------|------------------------------|
| ① ECU | ⑩ Battery |
| ② Engine trouble warning light | ⑪ Air filter case |
| ③ Lean angle cut-off switch | ⑫ Catalytic converter |
| ④ Fuel hose | ⑬ Crankshaft position sensor |
| ⑤ Ignition coil | ⑭ Coolant temperature sensor |
| ⑥ Fuel injector | ⑮ Spark plug |
| ⑦ Intake air pressure sensor | ⑯ Fuel tank |
| ⑧ ISC(idle speed control) valve | ⑰ Fuel pump |
| ⑨ Intake air temperature sensor | ⑱ Throttle position sensor |

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FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at only 250 kPa (2.5 kg/cm², 35.6 psi). Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the crankshaft position sensor, intake air pressure sensor, intake temperature sensor and engine temperature sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

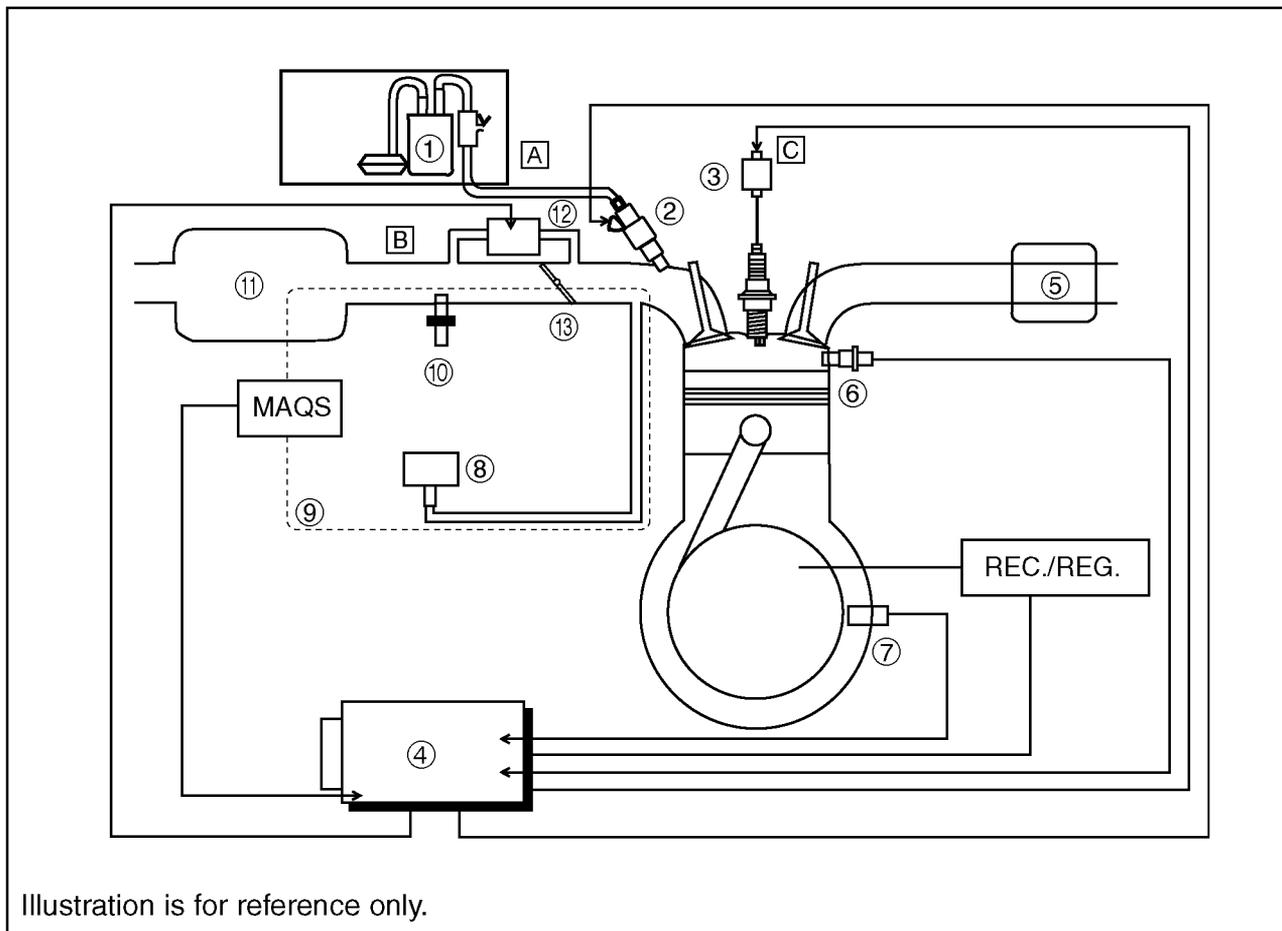
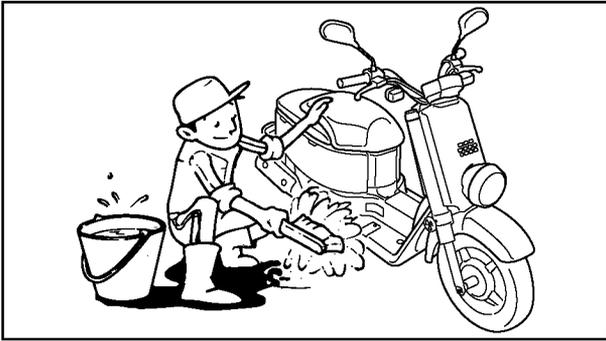


Illustration is for reference only.

- | | |
|---------------------------------|----------------------------------|
| ① Fuel pump | ⑪ Air filter case |
| ② Fuel injector | ⑫ ISC (idle speed control) valve |
| ③ Ignition coil | ⑬ Throttle position sensor |
| ④ ECU | A Fuel system |
| ⑤ Catalytic converter | B Air system |
| ⑥ Coolant temperature sensor | C Control system |
| ⑦ Crankshaft position sensor | |
| ⑧ Intake air pressure sensor | |
| ⑨ Throttle body assembly | |
| ⑩ Intake air temperature sensor | |

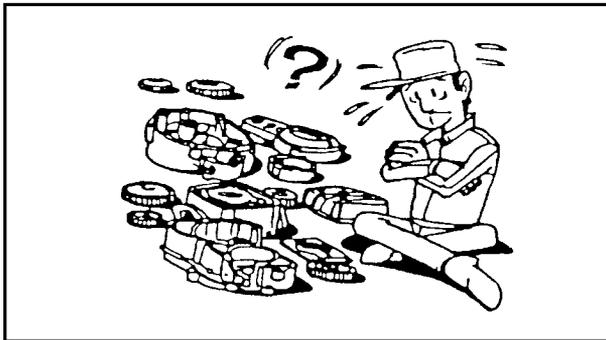


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IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment. Refer to the "SPECIAL TOOLS".
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.



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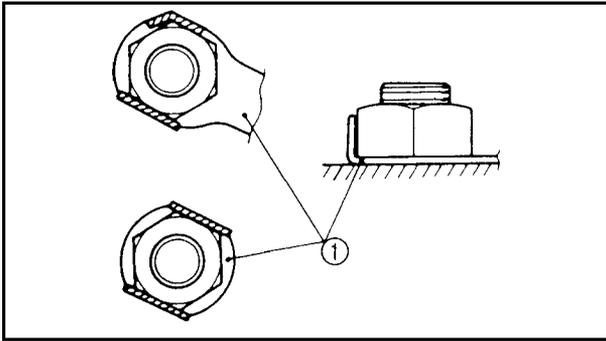
REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

EAS00022

GASKETS, OIL SEALS AND O-RINGS

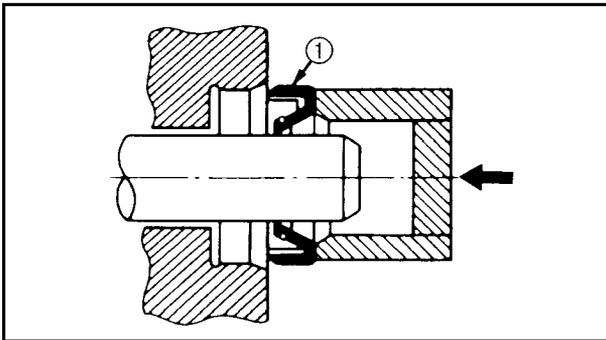
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



EAS00023

LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates ① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.

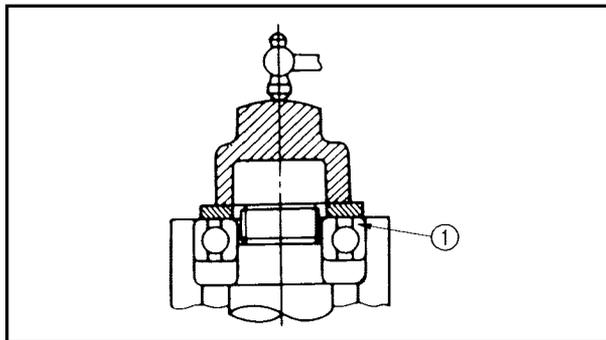


EAS00024

BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

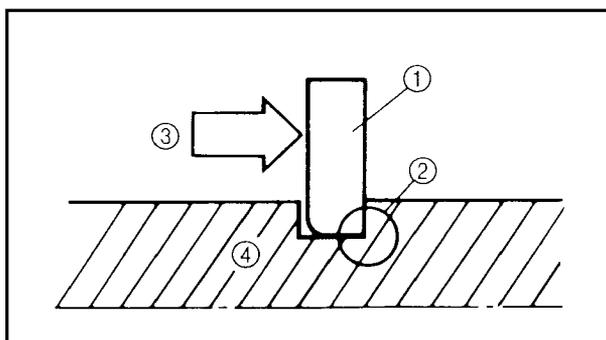
① Oil seal



CAUTION: _____

Do not spin the bearing with compressed air because this will damage the bearing surfaces.

① Bearing

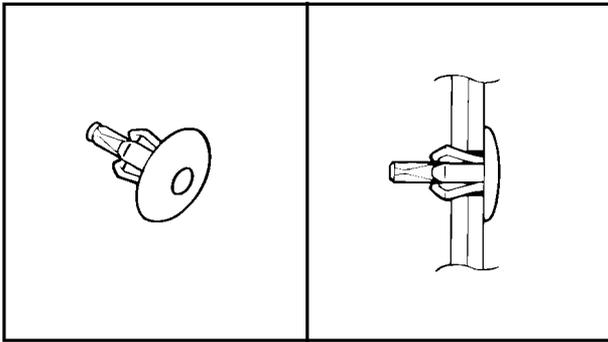


EAS00025

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

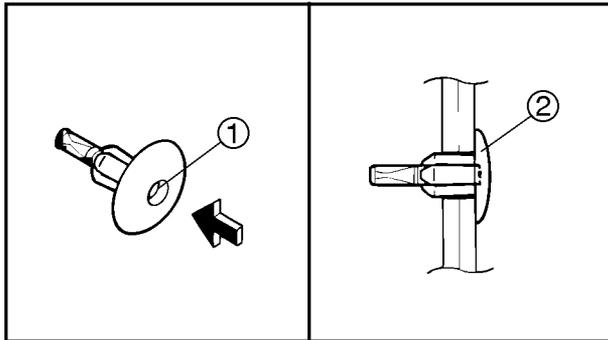


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EQUIPMENT PREPARATION

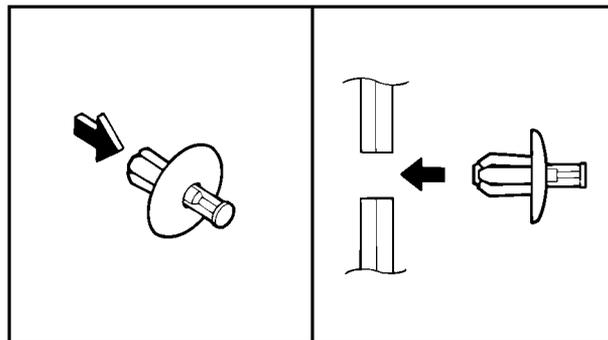
Push Rivet (Push type)

Assembly status of the push rivet(push type).



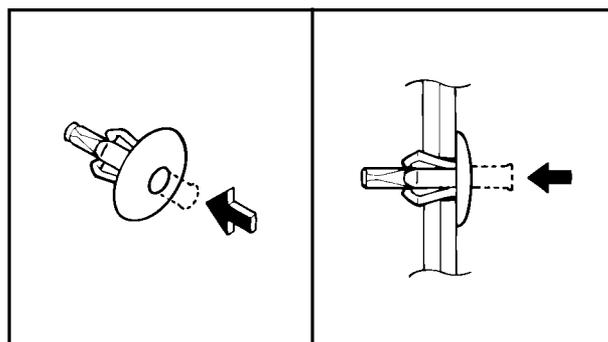
Disassembling

1. Press center pin① inward to release the lock.
2. Remove the push rivet main body②.



Assembling

1. Restore the center pin, replace the push rivet main body.



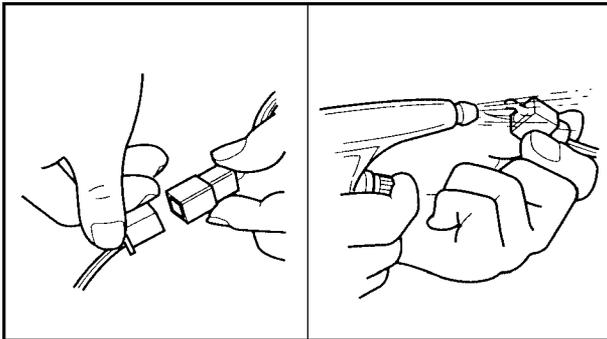
2. Push in the center pin until leveling off with the surface position of the push rivet main body.

EAS00026

CHECKING THE CONNECTIONS

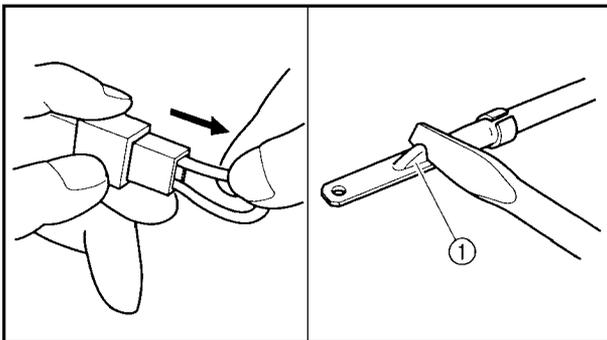
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
 - lead
 - coupler
 - connector



2. Check:
 - lead
 - coupler
 - connector

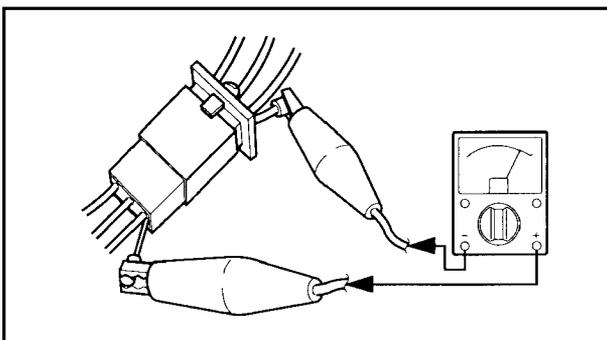
Moisture → Dry with an air blower.
Rust/stains → Connect and disconnect several times.



3. Check:
 - all connections

Loose connection → Connect properly.

NOTE: _____
If the pin ① on the terminal is flattened, bend it up.



4. Connect:
 - lead
 - coupler
 - connector

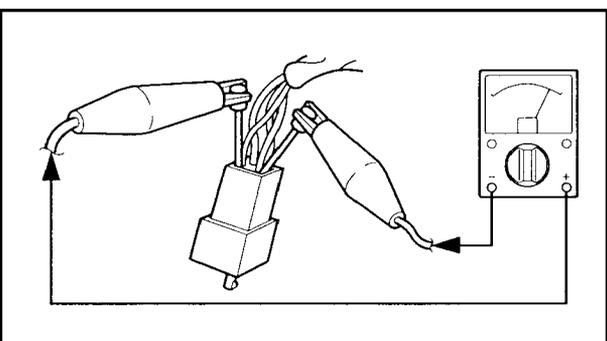
NOTE: _____
Make sure all connections are tight.

5. Check:
 - continuity
(with the pocket tester)

	<p>Pocket tester 90890-03112(YU-03112-C)</p>
---	---

NOTE: _____

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.



EAS00027

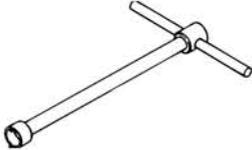
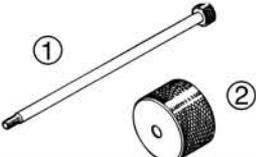
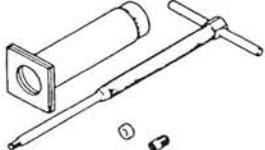
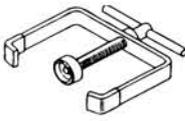
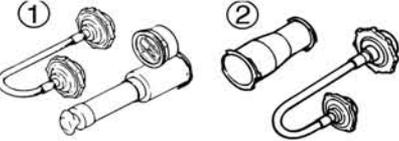
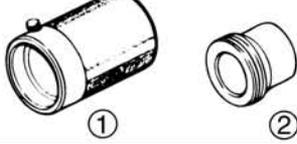
SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.

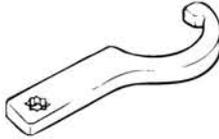
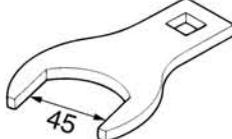
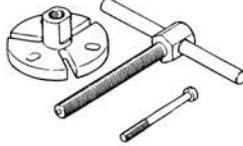
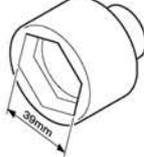
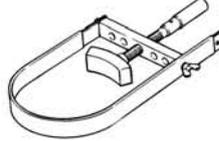
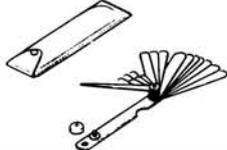
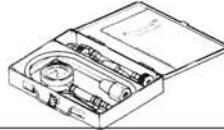
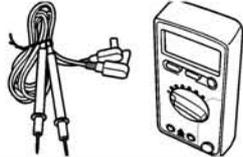
When placing an order, refer to the list provided below to avoid any mistakes.

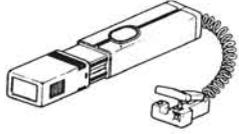
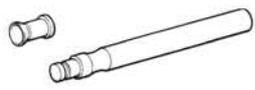
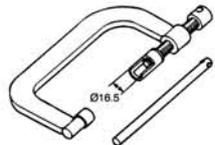
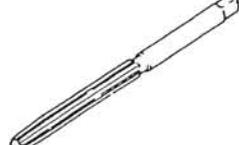
NOTE:

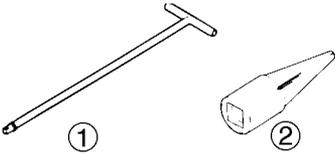
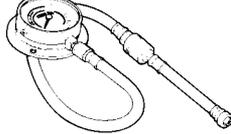
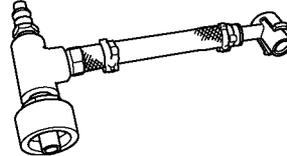
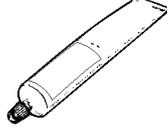
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool NO.	Tool name / Function	Illustration
90890-01052	Meter gear bush tool This tool is used when removing or installing the meter gear.	
90890-01085 YU-01083-2 90890-01084 YU-01083-3	Slide hammer bolt(8mm)① Weight② These tools are needed to remove the camshaft.	
90890-01235 YU-01235	Rotor holding tool This tool is used to hold the primary fixed sheave and secondary sheave assembly.	
90890-01268 YU-01268	Ring nut wrench This tool is used to loosen and tighten the exhaust and steering ring nut.	
90890-01304 YU-01304	Piston pin puller set This tool is used to remove the piston pin.	
90890-01337 YM-33285 YM-33285-6	Clutch spring holder These tool are used for removing the nut with holding the compression spring.	
90890-01325 YU-24460-01 90890-01352 YU-33984	Radiator cap tester① Radiator cap tester adapter② This tester and its adapter are needed for checking the cooling system.	
90890-01367 YM-A9409-7 90890-01400 YM-A9409-3	Fork seal driver weight① Fork seal driver attachment② This tool is used when installing the fork seal.	



Tool NO.	Tool name / Function	Illustration
90890-01384 YM-33299	Oil seal guide This tool is used for protecting the oil seal lip when installing the secondary sliding sheave.	
90890-01403 YU-A9472	Steering nut wrench This tool is used to loosen and tighten the steering ring nut.	
90890-01444 YM-A9409-7	Steering nut wrench(45mm) This tool is used to loosen and tighten the upper bearing inner race.	
90890-01468 YU-33270-B	Flywheel puller set This tool is used to remove the AC magneto rotor.	
90890-01493	Socket wrench(39mm) This tool is used when removing or installing the secondary sheave nut.	
90890-01701 YS-01880-A	Sheave holder This tool is used for holding the secondary sheave.	
90890-03079 YM-34483	Thickness gauge This tool is used to measure the valve clearance.	
90890-03081 YU-33223	Compression gauge This tool is used to measure the engine compression.	
90890-03112 YU-03112-C	Pocket tester This instrument is invaluable for checking the electrical system.	
90890-03174 90890-03141 YU-03141	Digital circuit tester This instrument is invaluable for checking the electrical system.	

Tool NO.	Tool name / Function	Illustration
90890-03141 YU-03141	Timing light This tool is used to check the ignition timing.	
90890-03182 YU-03182	FI diagnostic tool Execute CO adjustment, confirm fault Code, self diagnosis tool	
90890-04101	Valve lapper This tool is needed to remove and install the valve lifters.	
90890-04058 YM-04058 90890-04145	Middle driven shaft bearing driver ^① Mechanical seal installer ^② These tools are used to install the water pump seal.	
90890-04019 YM-04019 90890-04148 YM-04148	Valve spring compressor Compressor adapter(Ø16.5mm) These tools are used when removing or installing the valve and the valve spring.	
90890-06760	Digital tachometer This tool is needed for detecting engine rpm.	
90890-06754 YM-34487	Ignition checker This tool is used to check the ignition system components.	
90890-04111 YM-04111	Valve guide remover(4.0mm) This tool is used to remove or install the valve guides.	
90890-04112 YM-04112	Valve guide installer(4.0mm) This tool is used to install the valve guides.	
90890-04113 YM-04113	Valve guide remover(4.0mm) This tool is used to rebore the new valve guides.	

Tool NO.	Tool name / Function	Illustration
90890-01326 YM-01326 90890-01294 YM-01300-1	T-handle① Damper rod holder② These tools are used to hold the damper rod when removing or installing the damper rod.	
90890-03153 YU-03153	Pressure gauge This tool is used to measure fuel pressure.	
90890-03181	Fuel pressure adapter This tool is used to measure fuel pressure.	
90890-85505 ACC-11001-05-01	Yamaha bond NO.1215 Sealant (Quick Gasket®) This sealant (bond) is used on crankcase mating surfaces(e.g., crankcase mating surfaces).	

**CHAPTER 2
SPECIFICATIONS**

GENERAL SPECIFICATIONS	2-1
ENGINE SPECIFICATIONS	2-2
CHASSIS SPECIFICATIONS	2-12
ELECTRICAL SPECIFICATIONS	2-15
CONVERSION TABLE / GENERAL TIGHTENING TORQUE SPECIFICATIONS	2-18
TIGHTENING TORQUES.....	2-19
ENGINE	2-19
CHASSIS.....	2-21
LUBRICATION POINTS AND LUBRICANT TYPES.....	2-23
ENGINE	2-23
CHASSIS.....	2-25
COOLING SYSTEM DIAGRAMS.....	2-26
CABLE ROUTING	2-29



SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard	Limit
Model code	3B32(USA) 3B33(CAN)
Dimensions		
Overall length	1905mm(75.00in)	...
Overall width	685mm(26.97in)	...
Overall height	1045mm(41.14in)	...
Seat height	735mm(28.94in)	...
Wheelbase	1280mm(50.39in)	...
Minimum ground clearance	115mm(4.53in)	...
Minimum turning radius	2000mm(78.74in)	...
Weight		
Wet(without oil and a full fuel tank)	90kg(198lb)	...
Dry(without oil and fuel)	85kg(187lb)	...
Maximun load(total of cargo, rider, passenger, and accessories)	175kg(386lb)	...



ENGINE SPECIFICATIONS

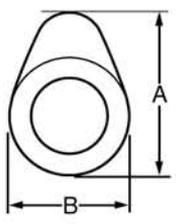
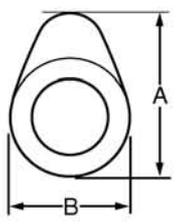
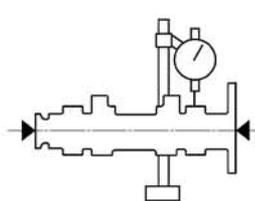
Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 4-stroke, SOHC	...
Displacement	0.049L(49cm ³ , 2.99cu-in)	...
Cylinder arrangement	Forward inclined single cylinder	...
Borexstroke	38.0×43.5mm(1.496×1.713in)	...
Compression ratio	12:1	...
Engine idle speed	2000~2200r/min	...
Vacuum pressure at engine idle speed	34.7kPa(260mmHg, 10.24inHg)	...
Standard compression pressure(at sea level)	1450kPa(14.5kg/cm ²) at 700r/min	...
Fuel		
Recommended fuel	Unleaded gasoline only(USA) Regular unleaded gasoline only(CAN)	...
Fuel tank capacity Total	4.5L(0.98 Imp gal, 1.18 US gal)	...
Engine oil		
Lubrication system	Wet sump	...
Recommended oil	YAMALUBE4, SAE10W30 or SAE20W40 API service SG type or higher JASO stand MA	...
Quantity		
Periodic oil change	0.73~0.83L(0.67~0.76 Imp qt, 0.80~0.90 US qt)	...
Total amount	0.80~0.90L(0.74~0.83 Imp qt, 0.87~0.98 US qt)	...
Final gear oil		
Recommended oil	SAE10W30 hypoid gear oil	...
Periodic oil change	0.09~0.11L(0.08~0.10 Imp qt, 0.10~0.12 US qt)	...
Total amount	0.11~0.13L(0.10~0.12 Imp qt, 0.12~0.14 US qt)	...
Oil filter		
Oil filter type	Wire mesh	...

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Oil pump		
Oil pump type	Trochoid	...
Inner rotor to outer rotor tip clearance	0.15mm(0.006in) or less	0.23mm (0.009in)
Outer rotor to pump housing clearance	0.13~0.18mm(0.005~0.007in)	0.25mm (0.010in)
Oil pump housing to inner rotor and outer rotor clearance	0.07~0.12mm(0.003~0.005in)	0.19mm (0.008in)
Cooling system		
Radiator capacity	0.26L(0.23 Imp gal, 0.28 US gal)	...
Radiator cap opening pressure	107.9~137.3kPa (1.1~1.4kg/cm ² , 15.6~19.9psi)	...
Valve relief pressure	1.1kPa(0.01kg/cm ² , 0.16psi)	...
Radiator core		
Width	127.4mm(5.016in)	...
Height	87mm(3.425in)	...
Depth	16mm(0.630in)	...
Coolant reservoir		
Capacity(up to the maximum level mark)	0.25L(0.22 Imp gal, 0.27 US gal)	...
<From low to full level>	0.15L(0.13 Imp gal, 0.16 US gal)	...
Water pump		
Water pump type	Single-suction centrifugal pump	...
Max. impeller shaft tilt	...	0.15mm (0.0059in)
Starting system type	Electric and kick starter	...
Electric fuel injection		
Type	3B3	...
Manufacturer	AISAN	...
Spark plug		
Model(manufacturer)xquantity	CR7E(NGK)x1	...
Spark plug gap	0.7~0.8mm(0.028~0.031in)	...
Cylinder head		
Volume	3.1~3.5cm ³ (0.19~0.21cu-in)	...
Maximum warpage	...	0.05mm (0.0020in)
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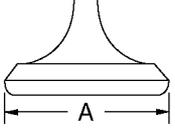
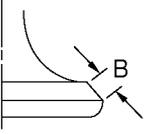
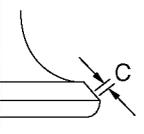
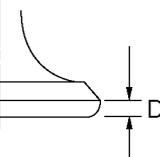
Item	Standard	Limit
Camshaft		
Drive system	Chain drive(left)	...
Intake camshaft lobe dimensions		
		
Measurement A	30.158~30.258mm (1.1873~1.1913in)	30.058mm (1.1834in)
Measurement B	25.082~25.182mm (0.9875~0.9914in)	24.982mm (0.9835in)
Exhaust camshaft lobe dimensions		
		
Measurement A	30.158~30.258mm (1.1873~1.1913in)	30.058mm (1.1834in)
Measurement B	25.020~25.120mm (0.9850~0.9890in)	24.920mm (0.9811in)
Maximum camshaft runout	...	0.03mm (0.0012in)
		

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ENGINE SPECIFICATIONS

SPEC

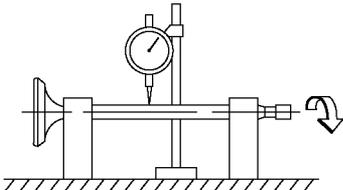


Item	Standard	Limit
Timing chain		
Model/number of links	Morse 92RH2005/82	...
Tensioning system	Automatic	...
Valve, valve seats, valve guides		
Valve clearance(cold)		
Intake	0.10~0.16mm (0.0039~0.0063in)	...
Exhaust	0.18~0.24mm (0.0071~0.0094in)	...
Valve dimensions		
 Head Diameter	 Face Width	 Seat Width
		 Margin Thickness
Valve head diameter A		
Intake	15.4~15.6mm (0.6063~0.6142in)	...
Exhaust	16.4~16.6mm (0.6457~0.6535in)	...
Valve face width B		
Intake	1.48~2.19mm (0.0583~0.0862in)	...
Exhaust	1.48~2.19mm (0.0583~0.0862in)	...
Valve seat width C		
Intake	0.9~1.1mm (0.0354~0.0433in)	1.6mm (0.0630in)
Exhaust	0.9~1.1mm (0.0354~0.0433in)	1.6mm (0.0630in)
Valve margin thickness D		
Intake	0.70mm(0.0276in)	...
Exhaust	0.70mm(0.0276in)	...
Valve stem diameter		
Intake	3.975~3.990mm (0.1565~0.1571in)	3.945mm (0.1553in)
Exhaust	3.975~3.990mm (0.1565~0.1571in)	3.930mm (0.1547in)
Valve guide inside diameter		
Intake	4.000~4.012mm (0.1575~0.1580in)	4.050mm (0.1594in)
Exhaust	4.000~4.012mm (0.1575~0.1580in)	4.050mm (0.1594in)

ENGINE SPECIFICATIONS

SPEC

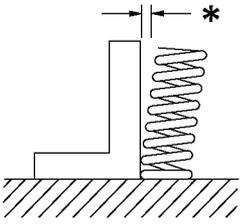


Item	Standard	Limit
Valve stem to valve guide clearance Intake Exhaust	0.010~0.037mm (0.0004~0.0015in) 0.025~0.052mm (0.0010~0.0020in)	0.080mm (0.0031in) 0.100mm (0.0039in)
Valve stem runout 	...	0.010mm (0.0004in)
Valve seat width Intake Exhaust	0.9~1.1mm (0.0354~0.0433in) 0.9~1.1mm (0.0354~0.0433in)	1.6mm (0.0630in) 1.6mm (0.0630in)

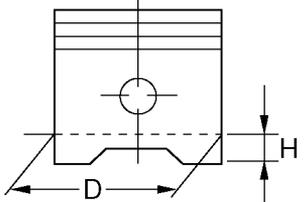
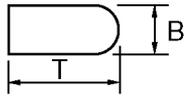
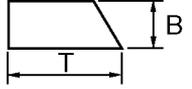
ENGINE SPECIFICATIONS

SPEC



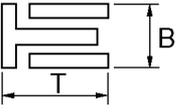
Item	Standard	Limit
Valve springs		
Free length		
Intake	39.35mm(1.5492in)	37.38mm
Exhaust	41.57mm(1.6366in)	(1.4717in)
		39.49mm
		(1.5547in)
Installed length(valve closed)		
Intake	28.0mm(1.1024in)	...
Exhaust	30.0mm(1.1811in)	...
Compressed spring force(installed)		
Intake	91.1~104.9N	...
Exhaust	107.9~124.1N	...
	(9.3~10.7kg, 20.48~23.58lb)	
	(11.0~12.7kg, 24.26~27.90lb)	
Spring tilt		
		
Intake	...	2.5°/1.7mm
Exhaust	...	(2.5°/0.0669in)
		2.5°/1.8mm
		(2.5°/0.0709in)
Winding direction(top view)		
Intake	Clockwise	...
Exhaust	Clockwise	...
		
Valve seat reformed	Yes	...
Cylinder		
Cylinder arrangement	Forward inclined single cylinder	...
Borexstroke	38.0×43.5mm(1.496×1.713in)	...
Compression ratio	12:1	...
Bore	38.000~38.010mm	...
	(1.496~1.497in)	
Maximum taper	...	0.05mm
Maximum out-of-round	...	(0.0020in)
		0.05mm
		(0.0020in)



Item	Standard	Limit
Piston		
Piston-to-cylinder clearance	0.010~0.035mm	0.150mm
(0.0004~0.0014in)	(0.0004~0.0014in)	(0.0059in)
Diameter D	37.975~37.990mm	...
(1.4951~1.4957in)	(1.4951~1.4957in)	...
		
Height H	5.0mm(0.1969in)	...
Piston pin bore(in the piston)		
Diameter	10.002~10.013mm	10.043mm
(0.3938~0.3942in)	(0.3938~0.3942in)	(0.3954in)
Offset	0.35~0.65mm	...
(0.0138~0.0256in)	(0.0138~0.0256in)	...
Offset direction	Intake side	...
Piston pin		
Outside diameter	9.996~10.000mm	9.976mm
(0.3935~0.3937in)	(0.3935~0.3937in)	(0.3928in)
Piston rings		
Top ring		
Ring type	Barrel	...
Dimensions(BxT)	0.8x1.65mm	...
(0.0315x0.0650in)	(0.0315x0.0650in)	...
	0.05~0.15mm	0.40mm
End gap(installed)	(0.0020~0.0059in)	(0.0157in)
Ring side clearance	0.03~0.07mm	0.12mm
(0.0012~0.0028in)	(0.0012~0.0028in)	(0.0047in)
2nd ring		
		
Ring type	Taper	...
Dimensions(BxT)	0.8x1.5mm	...
(0.0315x0.0591in)	(0.0315x0.0591in)	...
End gap(installed)	0.05~0.17mm	0.52mm
(0.0020~0.0067in)	(0.0020~0.0067in)	(0.0205in)
Ring side clearance	0.02~0.06mm	0.12mm
(0.0008~0.0024in)	(0.0008~0.0024in)	(0.0047in)

ENGINE SPECIFICATIONS



Item	Standard	Limit
Oil ring 		
Dimensions(B×T)	1.5×1.6mm (0.0591×0.0630in)	...
End gap(installed)	0.2~0.7mm (0.0079~0.0276in)	...
Ring side clearance	0.03~0.15mm (0.0012~0.0059in)	...

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Rocker arm/rocker arm shaft		
Rocker arm inside diameter	10.000~10.015mm (0.3937~0.3943in)	10.030mm (0.3949in)
Rocker arm shaft outside diameter	9.981~9.991mm (0.3930~0.3933in)	9.950mm (0.3917in)
Arm-to-shaft clearance	0.009~0.034mm (0.0004~0.0013in)	...
Connecting rod		
Connecting rod length	79.95~80.05mm (3.1476~3.1516in)	...
Small end inside diameter	10.015~10.028mm (0.3943~0.3948in)	...
Crankshaft		
Width A	42.45~42.50mm (1.671~1.673in)	...
Maximum runout C	...	0.03mm (0.0012in)
Big end side clearance D	0.15~0.45mm (0.006~0.018in)	1.00mm (0.0394in)
Big end radial clearance E	0~0.010mm (0~0.0004in)	...

ENGINE SPECIFICATIONS

SPEC


Item	Standard	Limit
Clutch		
Clutch type	Automatic centrifugal	...
Clutch shoe thickness	3.7mm(0.146in)	2.0mm (0.079in)
Clutch shoe spring free length	30.1mm(1.185in)	...
Clutch housing inside diameter	107mm(4.213in)	107.5mm (4.232in)
Compression spring free length	76.4mm(3.008in)	...
Weight outside diameter	15.0mm(0.591in)	14.5mm (0.571in)
Clutch-in revolution	3050~3450r/min	...
Clutch-stall revolution	5000~6000r/min	...
V-belt		
V-belt width	17.9mm(0.705in)	16.1mm (0.634in)
Transmission		
Transmission type	V-belt automatic	...
Primary reduction system	Helical gear	...
Primary reduction ratio	50/13(3.846)	...
Secondary reduction system	Helical gear	...
Secondary reduction ratio	43/12(3.583)	...
Single speed automatic	3.087~0.945:1	...
Maximum main axle runout	...	0.04mm (0.002in)
Maximum drive axle runout	...	0.04mm (0.002in)
Air filter type		
	Wet element	...
Fuel pump		
Pump type	Electrical	...
Model(manufacturer)	3B3(AISAN)	...
Output pressure	250kPa(2.5kg/cm ² , 35.6psi)	...
Throttle body		
Throttle cable free play (at the flange of the throttle grip)	1.5~3.5mm(0.06~0.14in)	...
ID mark	3B31 00	...

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Steel tube backbone	...
Caster angle	26°	...
Trail	84mm(3.31in)	...
Front wheel		
Wheel type	Cast wheel	...
Rim		
Size	J10×MT3.00	...
Material	Aluminum	...
Wheel travel	58mm(2.28in)	...
Wheel runout		
Maximum radial wheel runout	...	1.0mm (0.04in)
Maximum lateral wheel runout	...	1.0mm (0.04in)
Wheel axle bending limit	...	0.25mm (0.01in)
Rear wheel		
Wheel type	Cast wheel	...
Rim		
Size	J10×MT3.00	...
Material	Aluminum	...
Wheel travel	56mm(2.20in)	...
Wheel runout		
Maximum radial wheel runout	...	1.0mm (0.04in)
Maximum lateral wheel runout	...	1.0mm (0.04in)
Front tire		
Tire type	Tubeless	...
Size	120/90-10 57J	...
Model(manufacturer)	C-6022(CHENG SHIN)	...
Tire pressure(cold)		
0~175kg(0~386lb)	175kPa(1.75kgf/cm ² , 25psi)	...
Minimum tire tread depth	...	0.8mm (0.03in)

CHASSIS SPECIFICATIONS

SPEC


Item	Standard	Limit
Rear tire		
Tire type	Tubeless	...
Size	120/90-10 57J	...
Model(manufacturer)	C-6022(CHENG SHIN)	...
Tire pressure(cold)		
0~175kg(0~386lb)	175kPa(1.75kgf/cm ² , 25psi)	...
Minimum tire tread depth	...	0.8mm (0.03in)
Front brake		
Brake type	Drum brake	...
Operation	Right-hand operation	...
Brake lever free play(at lever end)	10~20mm(0.39~0.79in)	...
Brake drum inside diameter	110mm(4.33in)	110.5mm (4.35in)
Lining thickness	4.0mm(0.16in)	2.0mm (0.08in)
Rear brake		
Brake type	Drum brake	...
Operation	Left-hand operation	...
Brake lever free play(at lever end)	10~20mm(0.39~0.79in)	...
Brake drum inside diameter	110mm(4.33in)	110.5mm (4.35in)
Lining thickness	4.0mm(0.16in)	2.0mm (0.08in)
Front suspension		
Suspension type	Telescopic fork	...
Front fork type	Coil spring	...
Front fork travel	65mm(2.56in)	...
Spring		
Free length	202.2mm(7.96in)	198.2mm (7.80in)
Installed length	188.2mm(7.41in)	...
Spring rate(K1)	10.1N/mm(1.03kg/mm)	...
Spring stroke(K1)	0~65mm(0~2.56in)	...
Optional spring available	No	...
Fork oil		
Recommended oil	Fork oil 10W or equivalent	...
Quantity(each front fork leg)	0.042L(0.038Imp qt, 0.046 US qt)	...
Inner tube outer diameter	26mm(1.02in)	...
Inner tube bending limit	...	0.2mm (0.01in)

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Steering system		
Steering bearing type	Angular bearing	...
Lock-to-lock angle(left)	46°	...
Lock-to-lock angle(right)	46°	...
Rear suspension		
Suspension type	Unit swing	...
Rear shock absorber assembly type	Coil spring	...
Rear shock absorber assembly travel	45mm(1.77in)	...
Spring		
Free length	176.5mm(6.95in)	...
Installed length	162.5mm(6.40in)	...
Spring rate(K1)	28.03N/mm (2.85kg/mm, 159.59lb/in)	...
Spring rate(K2)	42.18N/mm (4.30kg/mm, 240.79lb/in)	...
Spring stroke(K1)	0~17mm(0~0.67in)	...
Spring stroke(K2)	17~45mm(0.67~1.77in)	...
Optional spring available	No	...



ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12V	...
Ignition system		
Ignition system type	Transistorized coil ignition	...
Ignition timing	5° BTDC at 2000~2200r/min	...
Advancer type	Digita	...
Crankshaft position sensor resistance/color	248~372Ω at 20°C(68°F)/ white/red-white/blue	...
Ignition coil		
Model(manufacturer)	3B3 00(T-MORIC)	...
Minimum ignition spark gap	6mm(0.24in)	...
Primary coil resistance	2.16~2.64Ω at 20°C(68°F)	...
Secondary coil resistance	8.64~12.96kΩ at 20°C(68°F)	...
Spark plug cap		
Material	Resin	...
Resistance	4~6kΩ at 20°C(68°F)	...
Charging system		
System type	AC magneto	...
Model(manufacturer)	F3B3(T-MORIC)	...
Nominal output	14V 130W/5000r/min	...
Stator coil resistance/color	0.28~0.42Ω at 20°C(68°F)/ white-white	...
Rectifier/regulator		
Regulator type	Semiconductor, short circuit	...
Model(manufacturer)	SH745-AA(SHINDENGEN)	...
No load regulated voltage	13.0~14.0V	...
Rectifier capacity	24A	...
Withstand voltage	200V	...
Battery		
Battery type(manufacturer)	GTX5L-BS(GS)	...
Battery voltage/capacity	12V/4AH	...
Specific gravity	1.330	...
Ten hour rate amperage	0.4A	...
Headlight type	Halogen bulb	...
Indicator light(voltage/wattage×quantity)		
Turn signal indicator light	14V 3.0W×1	...
High beam indicator light	12V 1.7W×1	...
Engine trouble warning light	12V 1.7W×1	...
Water temperature indicator light	14V 1.7W×1	...

ELECTRICAL SPECIFICATIONS

SPEC



Item	Standard	Limit
Bulbs(voltage/wattage×quantity)		
Headlight	12V 35/35W×1	...
Tail/brake light	12V 5/21W×1	...
Front turn signal light	12V 10W×2	...
Rear turn signal light	12V 10W×2	...
License plate light	12V 5W×1	...
Speedometer light	12V 1.7W×1	...
Electric starting system		
System type	Constant mesh	...
Starter motor		
Model(manufacturer)	3B3 00(T-MORIC)	...
Suction voltage	12V	...
Power output	0.25kW	...
Brushes		
Overall length	7.0mm(0.28in)	3.5mm (0.14in)
Quantity	2	...
Spring force	3.92~5.88N (400~600gf, 14.11~21.16oz)	...
Commutator diameter	17.6mm(0.69in)	16.6mm (0.65in)
Commutator resistance	0.0378~0.0462Ω at 20°C(68°F)	...
Mica undercut(depth)	1.35mm(0.05in)	...
Starter relay		
Model(manufacturer)	5WC 00(OMRON)	...
Amperage	50A	...
Coil resistance	90-110Ω	...
Suction voltage	More than DC10V	...
Horn		
Horn type	Plane	...
Model(manufacturer)	GF-127(NIKKO)	...
Maximum amperage	1.0A	...
Performance	95~115dB/2m	...
Coil resistance	3.96~4.10W at 20°C(68°F)	...
Turn signal relay		
Relay type	Condenser	...
Model(manufacturer)	FZ222SD(DENSO)	...
Self-cancelling device built-in	NO	...
Turn signal blinking frequency	75~95cycles/minute	...
Wattage	10W×2+3.4W	...

ELECTRICAL SPECIFICATIONS

SPEC


Item	Standard	Limit
Fuse(amperage×quantity) Main fuse	15A×1	...
Fuel gauge Model(manufacturer) Sender unit resistance-full Sender unit resistance-empty	3B3(AISAN) 4~10Ω 90~100Ω
Starting circuit cut-off relay Model(manufacturer) Coil resistance Diode	4HC1(MATSU SHITA) 72~88Ω YES
Radiator fan Model(manufacturer) Running rpm	5ST1(LUNTAI) 10000r/min or less
Thermostat Type(manufacture) Valve opening temperature Valve full open temperature Valve lift-full open	4BA1(NIPPON THERMOSTAT) 83~87°C 100°C 3.5mm
Coolant temperature sensor Model(manufacturer) Coil resistance at 20°C(68°F) Coil resistance at 80°C(176°F)	5YP1(DENSO) 2.32~2.59kΩ 0.310~0.326kΩ
Intake air pressure sensor Output voltage	0.789~4.0V	...
Intake air temperature sensor Coil resistance/color	5.7~6.3kΩ at 20°C(68°F)/ brown-white/black-blue	...
Speed sensor Output voltage When sensor is on When sensor is off	DC 4.8V or more DC 0.6V or less
Throttle position sensor Voltage/color Output voltage(closed position)/color	5V/blue-black/blue 0.63~0.73V/yellow-black/blue
ISC(idle speed control) valve Resistance/color	18~22Ω at 20°C(68°F)/ pink-green/yellow or gray-sky blue	...
Lean angle cut-off switch Voltage Less than 65° More than 65°	0.4~1.4V 3.7~4.4V

CONVERSION TABLE / GENERAL TIGHTENING TORQUE SPECIFICATIONS

SPEC



EAS00028

CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.

Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

METRIC	MULTIPLIER	IMPERIAL
** mm	0.03937	** in
2 mm	0.03937	0.08 in

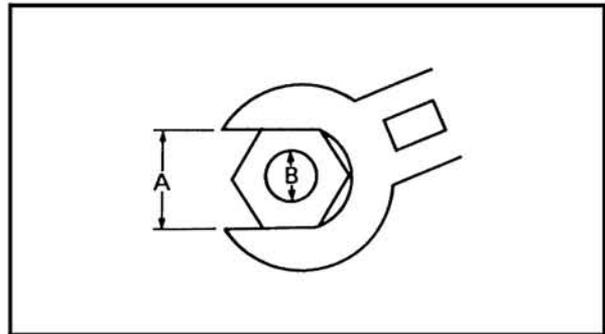
CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Tightening torque	m•kg	7.233	ft•lb
	m•kg	86.794	in•lb
	cm•kg	0.0723	ft•lb
	cm•kg	0.8679	in•lb
Weight	kg	2.205	lb
	g	0.03527	oz
Speed	km/hr	0.6214	mph
Distance	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume/ Capacity	cc (cm ³)	0.03527	oz (IMP liq.)
	cc (cm ³)	0.06102	cu-in
	lt (liter)	0.8799	qt (IMP liq.)
	lt (liter)	0.2199	gal (IMP liq.)
Misc.	kg/mm	55.997	lb/in
	kg/cm ²	14.2234	psi (lb/in ²)
	Centigrade (°C)	9/5+32	Fahrenheit (°F)

EAS00030

GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A: Width across flats

B: Thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



**TIGHTENING TORQUES
ENGINE**

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Exhaust pipe stud bolt	-	M8	2	13	1.3	9.4	
Oil check bolt	-	M6	1	7	0.7	5.1	
Cylinder head cover	Bolt	M6	4	10	1.0	7.2	
Cylinder head and cylinder	Nut	M6	4	10	1.0	7.2	
Cylinder head(timing chain side)	Bolt	M6	2	10	1.0	7.2	
Spark plug	-	M10	1	13	1.3	9.4	
Camshaft sprocket	Bolt	M8	1	30	3.0	21.7	
Timing chain tensioner(body)	Bolt	M6	2	9	0.9	6.5	
Guide stopper2	Bolt	M6	1	7	0.7	5.1	
Timing chain tensioner(plug)	plug	M8	1	8	0.8	5.8	
Water pump assembly	Bolt	M6	3	10	1.0	7.2	
Thermostat cover air bleed bolt	-	M6	1	10	1.0	7.2	
Thermostat cover	Bolt	M6	2	10	1.0	7.2	
Fan case	Bolt	M6	4	10	1.0	7.2	
Fan	Bolt	M6	3	9	0.9	6.5	
Radiator drain bolt	-	M10	1	1	0.1	0.7	
Radiator cover	Screw	6	3	2	0.2	1.5	
Oil pump assembly	Screw	M5	2	4	0.4	2.9	
Engine oil drain plug	-	M35	1	32	3.2	23.1	
Intake manifold	Bolt	M6	2	10	1.0	7.2	
Air filter assembly	Bolt	M6	2	10	1.0	7.2	
Injector	Bolt	M6	1	12	1.2	8.7	
Intake manifold side band	Band	M4	1	3	0.3	2.2	
Air filter assembly side band	Band	M4	1	3	0.3	2.2	
Protector	Screw	M6	2	9	0.9	6.5	When fastened, apply screw retaining compound.
Exhaust pipe	Nut	M8	2	13	1.3	9.4	
Stay fender	Bolt	M8	2	10	1.0	7.2	
Muffler	Bolt	M8	2	31	3.1	22.4	
Reed valve and holder	Bolt	M6	1	14	1.4	10.1	
AI filter case	Bolt	M6	1	7	0.7	5.1	
Oil guide	Nut	M6	2	10	1.0	7.2	
Crankcase(left and right)	Bolt	M6	8	10	1.0	7.2	
Cylinder stud bolt	-	M6	4	13	1.3	9.4	
Drain bolt(transmission oil fill bolt)	-	M8	1	23	2.3	16.6	
V-belt case cover	Bolt	M6	6	10	1.0	7.2	
Drain bolt(transmission oil)	Bolt	M6	1	13	1.3	9.4	
Transmission case	Bolt	M6	6	11	1.1	8.0	
Transmission case	Bolt	M6	2	10	1.0	7.2	
Cover1(starter clutch)	Bolt	M6	7	10	1.0	7.2	
Hold lead plate bolt	-	M6	1	10	1.0	7.2	

TIGHTENING TORQUES

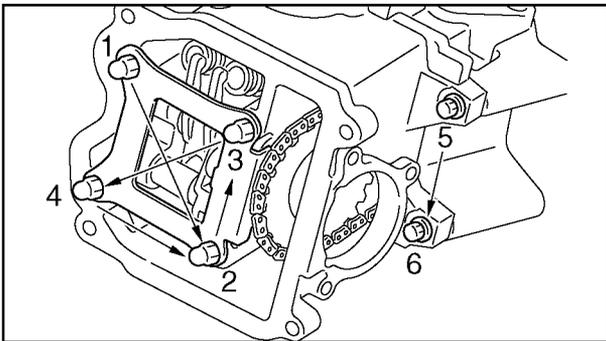
SPEC



Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Drain bolt(engine oil)	-	M8	1	23	2.3	16.6	
Centerstand spring	Hook	M6	1	7	0.7	5.1	
Starter clutch	Nut	M22	1	90	9.0	65.1	Left-hand thread
Kickstarter	Bolt	M6	1	12	1.2	8.7	
Primary fixed sheave	Nut	M10	1	30	3.0	21.7	
Clutch housing	Nut	M10	1	40	4.0	28.9	
Stator coil	Bolt	M5	3	4	0.4	2.9	
Pulser coil	Screw	M6	2	7	0.7	5.1	
AC magneto rotor	Nut	M12	1	43	4.3	31.1	
Starter motor assembly	Bolt	M6	2	13	1.3	9.4	
Ignition coil	Bolt	M6	2	7	0.7	5.1	
Coolant temperature sensor	-	M12	1	22	2.2	15.9	

Cylinder head tightening sequence

(1→2→3→4→2→5→6)



TIGHTENING TORQUES

SPEC



CHASSIS

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m•kg	ft•lb	
Frame and engine bracket3	M10	46	4.6	33.1	See"NOTE" See"NOTE"
Engine bracket3 and engine	M10	58	5.8	42.0	
Handlebar bracket and steering shaft	M10	60	6.0	43.4	
Rear shock absorber and frame	M10	30	3.0	21.7	
Rear shock absorber and engine	M8	16	1.6	11.6	
Steering shaft and upper bearing inner race	BC1	7	0.7	5.1	
Steering shaft and ring nut	BC1	30	3.0	21.7	
Front fork and lower bracket	M10	30	3.0	21.7	
Handlebar bracket and handlebar lower holder	M10	48	4.8	34.7	
Handlebar lower holder and handlebar upper holder	M8	28	2.8	20.3	
Throttle cable and holder lever2	M5	4	0.4	2.9	
Throttle cable and throttle body	M5	5	0.5	3.6	
Front reflector	M5	7	0.7	5.1	
Fuel tank	M6	10	1.0	7.2	
Fuel pump	M5	4	0.4	2.9	
Single seat lock assembly	M6	12	1.2	8.7	
Trunk	M6	12	1.2	8.7	
Bottom plate and single seat lock bracket	M6	7	0.7	5.1	
Bottom plate and frame(single seat)	M6	10	1.0	7.2	
Single seat and frame(single seat)	M6	10	1.0	7.2	
Single seat lock assembly and trunk	M6	7	0.7	5.1	
Resin part and resin cover	About M5	2	0.2	1.5	
Footrest board	M6	7	0.7	5.1	
License bracket	M6	7	0.7	5.1	
Rear turn signal light	M6	4	0.4	2.9	
License light	About M5	2	0.2	1.5	
Front wheel shaft	M10	48	4.8	34.7	
Front brake camshaft lever	M6	8	0.8	5.8	
Rear wheel shaft	M14	120	12.0	86.8	
Rear brake camshaft lever	M6	10	1.0	7.2	
Rear brake pin pivot	M8	16	1.6	11.6	
Speedometer cable	M12	5	0.5	3.6	
Main switch and headlight stay bracket	M6	7	0.7	5.1	
Headlight body and headlight unit	M5	4	0.4	2.9	
Headlight stay bracket and headlight body	M6	10	1.0	7.2	
Lower bracket and headlight stay bracket	M8	23	2.3	16.6	
Handlebar bracket and headlight stay bracket	M8	23	2.3	16.6	
ECU and trunk	M6	7	0.7	5.1	
Rear reflector and license bracket	M5	2	0.2	1.5	
Taillight underside	M6	2	0.2	1.5	

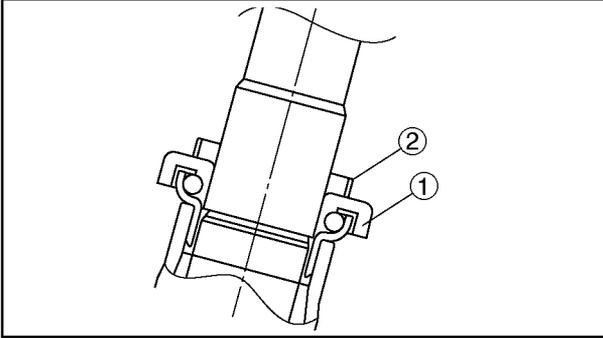
TIGHTENING TORQUES

SPEC



NOTE :

1. First,tighten the upper bearing inner race approximately 7Nm(0.7m•kg, 5.1ft•lb) by using the torque wrench and check turn steering shaft smoothly.
2. Second,hold the upper bearing inner race and tighten the ring nut 30Nm(3.0m•kg, 21.7ft•lb) by using the torque wrench.
3. Final,operate the steering shaft together with the steering stem nut now.



- ① Upper bearing inner race
- ② Ring nut

LUBRICATION POINTS AND LUBRICANT TYPES



EAS00031

LUBRICATION POINTS AND LUBRICANT TYPES ENGINE

Lubrication Point	Lubricant
Oil seal lips	
O-rings(except V-belt drive unit)	
O-ring(fuel injector assembly)	
Cylinder head tightening nut mounting surface	
Cylinder head stud bolt thread	
Cylinder head gasket dowel pin	
Crankshaft pin outside surface	
Connecting rod	
Piston outside and ring groove	
Piston pin outside surface	
surface and bolt thread	
Crankshaft journal	
Piston(balancer) outside surface	
Piston pin(balancer) outside surface	
Camshaft lobe	
Camshaft profile journal	
Valve stems(intake and exhaust)	
Valve stem seals(intake and exhaust)	
Valve pads(intake and exhaust)	
Valve stem ends(intake and exhaust)	
Oil pump assembly inside surface	
Oil pipe union bolt thread and surface	
Starter clutch pin and weight	
Kick pinion gear and kick pinion gear clip thrust surface	
Idle gear 1 thrust surface	
Idle gear2	
Main and drive axle serration(sprocket)	

LUBRICATION POINTS AND LUBRICANT TYPES

SPEC



Lubrication Point	Lubricant
Drive axle taper roller bearing	
Transmission bearings	
Secondary fixed sheave inner surface	BEL-RAY assembly lube®
Secondary sliding sheave torque cam ditch	BEL-RAY assembly lube®
Crankcase mating surfaces	Sealant

LUBRICATION POINTS AND LUBRICANT TYPES



EAS00032

CHASSIS

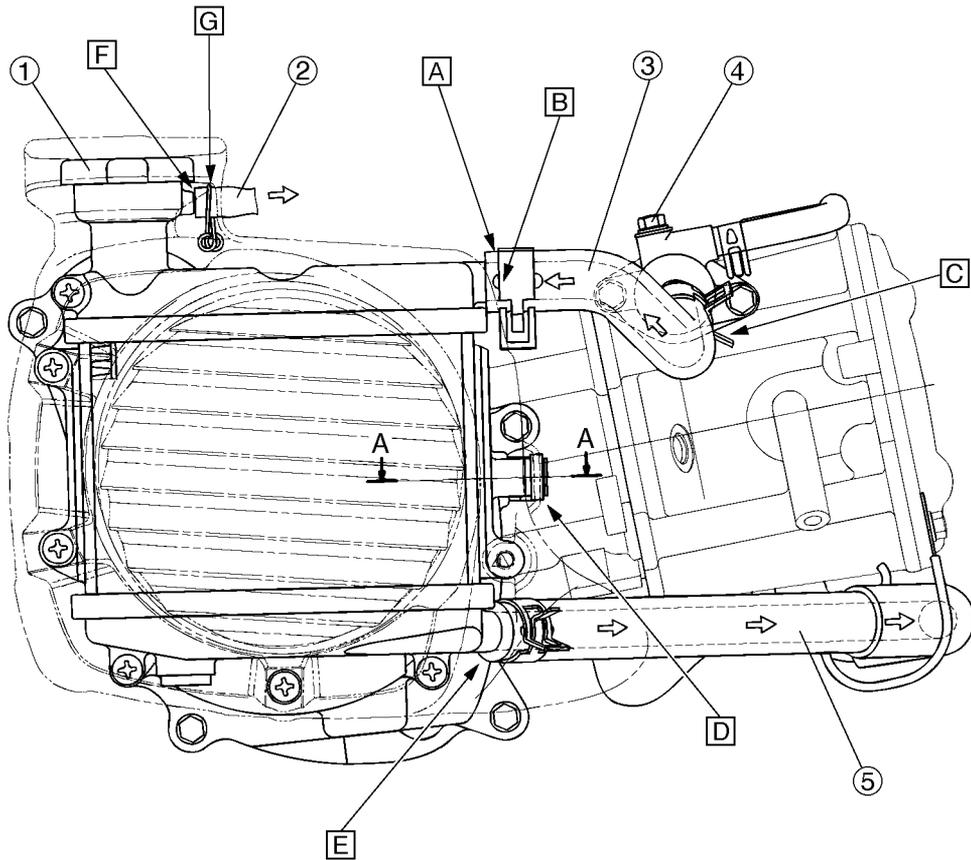
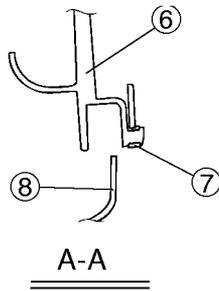
Lubrication Point	Lubricant
Front wheel oil seal lips	
Steering bearing and bearing races(upper and lower)	
Frame head pipe dust seal lips(lower)	
Tube guide(throttle grip) inner surface	
Brake lever and lever holder bolt sliding surface	
Centerstand pivoting point and sliding surface	
Single seat lock cable inner surface	
Engine bracket and engine mound bolt sliding surface	

EAS00033

COOLING SYSTEM DIAGRAMS

- ① Radiator cap
- ② Coolant reservoir hose
- ③ Radiator inlet hose
- ④ Air bleed bolt
- ⑤ Radiator outlet hose
- ⑥ Fan case
- ⑦ Damper
- ⑧ Radiator cover

- [A] Insert until contacting with the latch of radiator tank.
- [B] Install white paint mark of pipe 3 toward the direction of radiator cover.
- [C] Install clip for the turning knob to face forward.
- [D] Hand and fix the claw of fan case 1 on the radiator cover.
- [E] Insert to the bent part of radiator pipe.
- [F] Make sure that hose is inserted to the bottom.
- [G] Install clip for the turning knob to face downward.

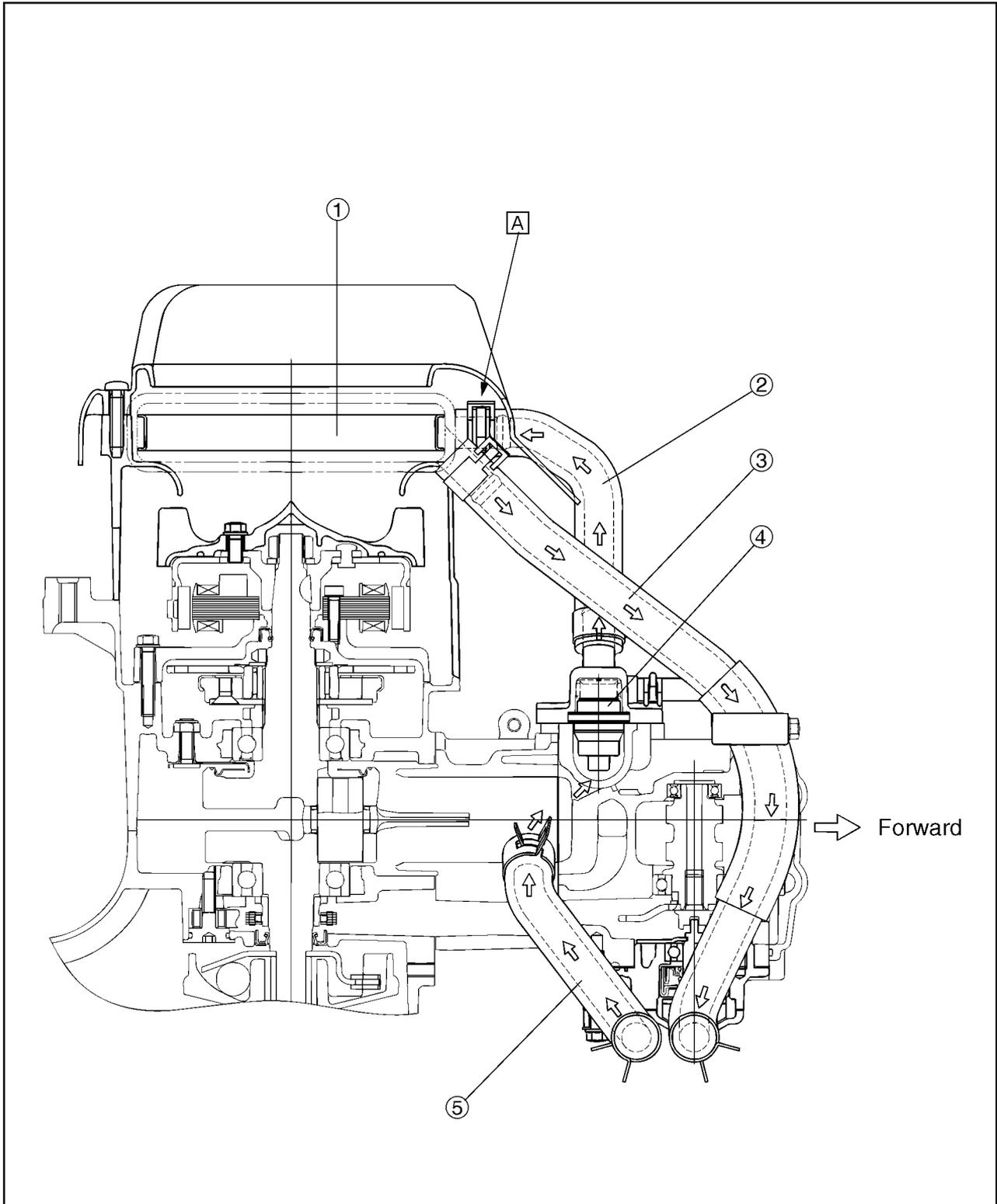


COOLING SYSTEM DIAGRAMS



- ① Radiator
- ② Radiator inlet hose
- ③ Radiator outlet hose
- ④ Thermostat
- ⑤ Water pump outlet hose

[A] Install clip for the turning knob to face downward.



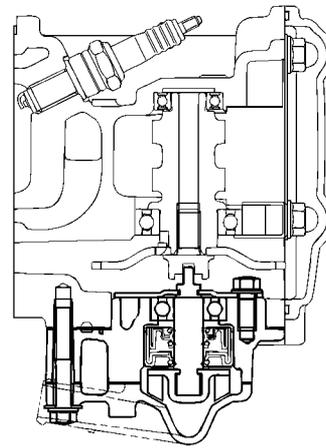
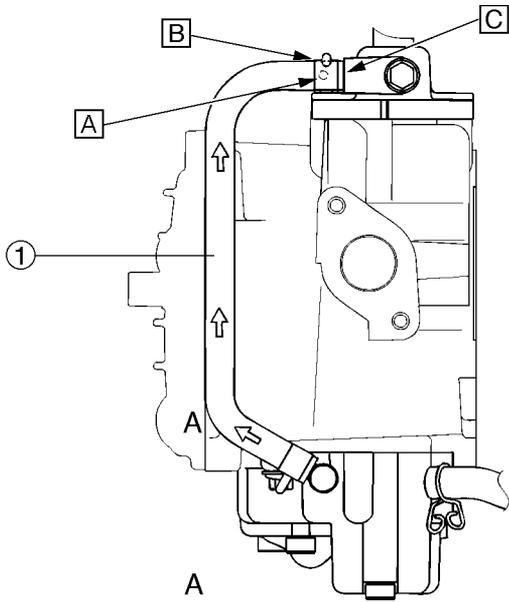
COOLING SYSTEM DIAGRAMS

SPEC

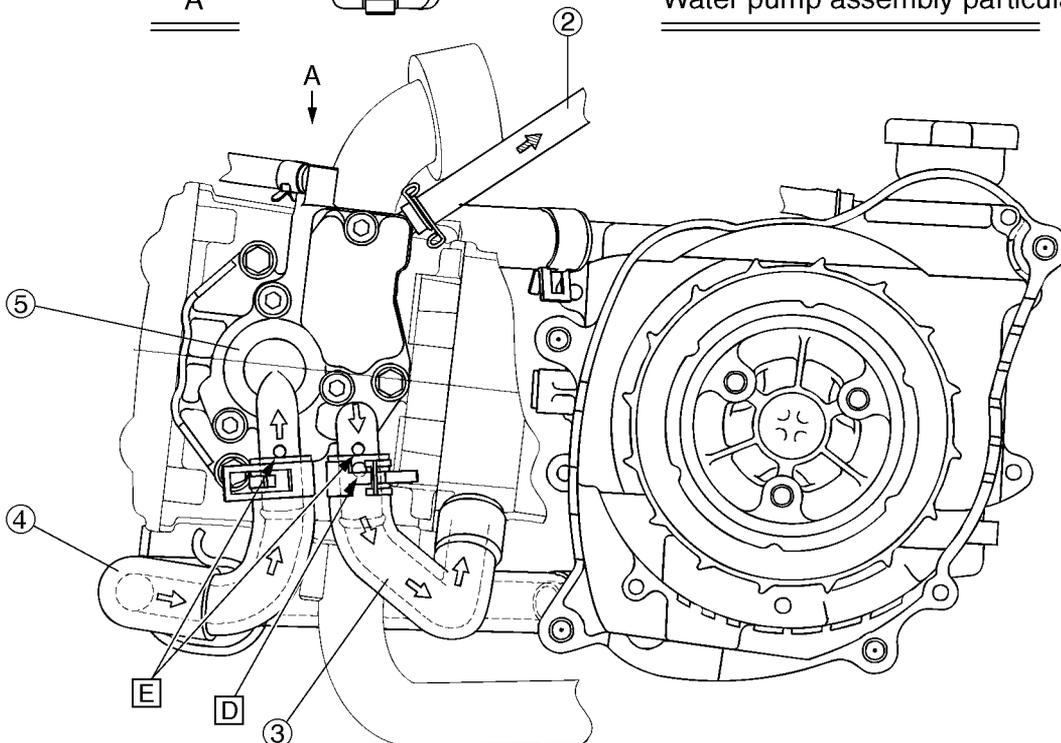


- ① Thermostat assembly inlet breather hose
- ② Breather hose
- ③ Water pump outlet hose
- ④ Radiator outlet hose
- ⑤ Water pump

- [A] Install the paint mark of hose facing up.
- [B] Install clip for the turning knob to face downward.
- [C] Make sure that hose is inserted to the bottom.
- [D] Align the paint mark of pipe 7 to the stopper of water pump Ass'y.
- [E] Insert until contacting with the stopper.



Water pump assembly particular





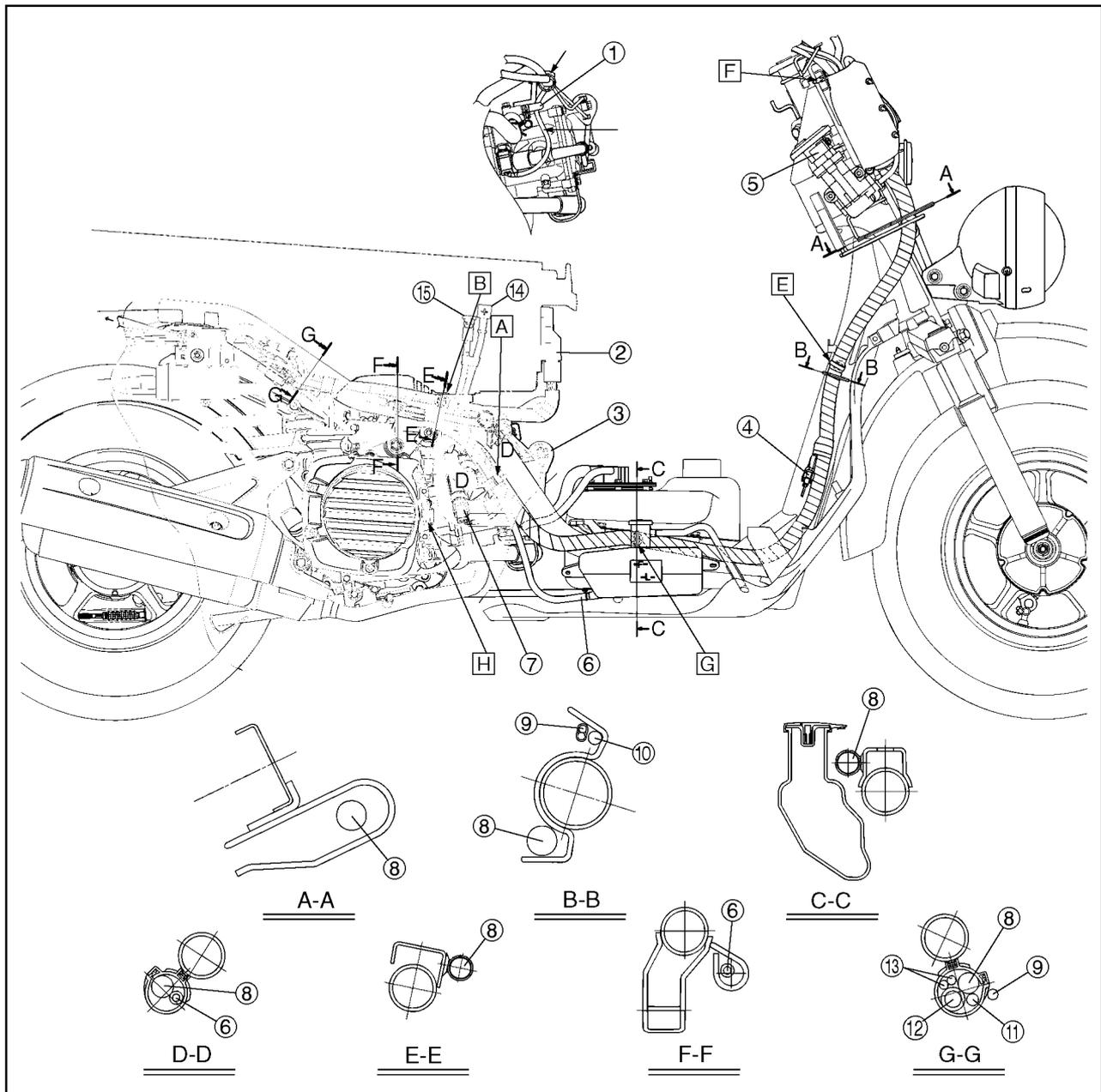
EAS00035

CABLE ROUTING

- ① Hose3
- ② ECU
- ③ Ignition coil
- ④ Sidestand switch lead
- ⑤ Main switch
- ⑥ Hose
- ⑦ Coolant temperature sensor
- ⑧ Wiring harness
- ⑨ Throttle cable kit
- ⑩ Rear brake cable
- ⑪ AC magneto lead
- ⑫ Hose5
- ⑬ Starter motor lead

- ⑭ Battery positive lead
- ⑮ Wire lead cover
- A Assemble cramp on the T-stud at the right of back stay.
- B Install the protruding part of cable strap of electrical wire harness Ass'y on the hole of box bracket 1.
- C Install cramp on the hols of stay 1.
- D Penetrate thermo unit lead through the rear of hose 3.
- E Install the protruding part of cable strap of electrical wire harness Ass'y on the

- hole of down tube 1.
- F Fix connector cover on the head light stay.
- G Install the protruding part of cable strap of electrical wire harness Ass'y on the hole of fuel tank bracket 2.
- H Connect AC magnet lead on the cramp of fan case 1.



CABLE ROUTING

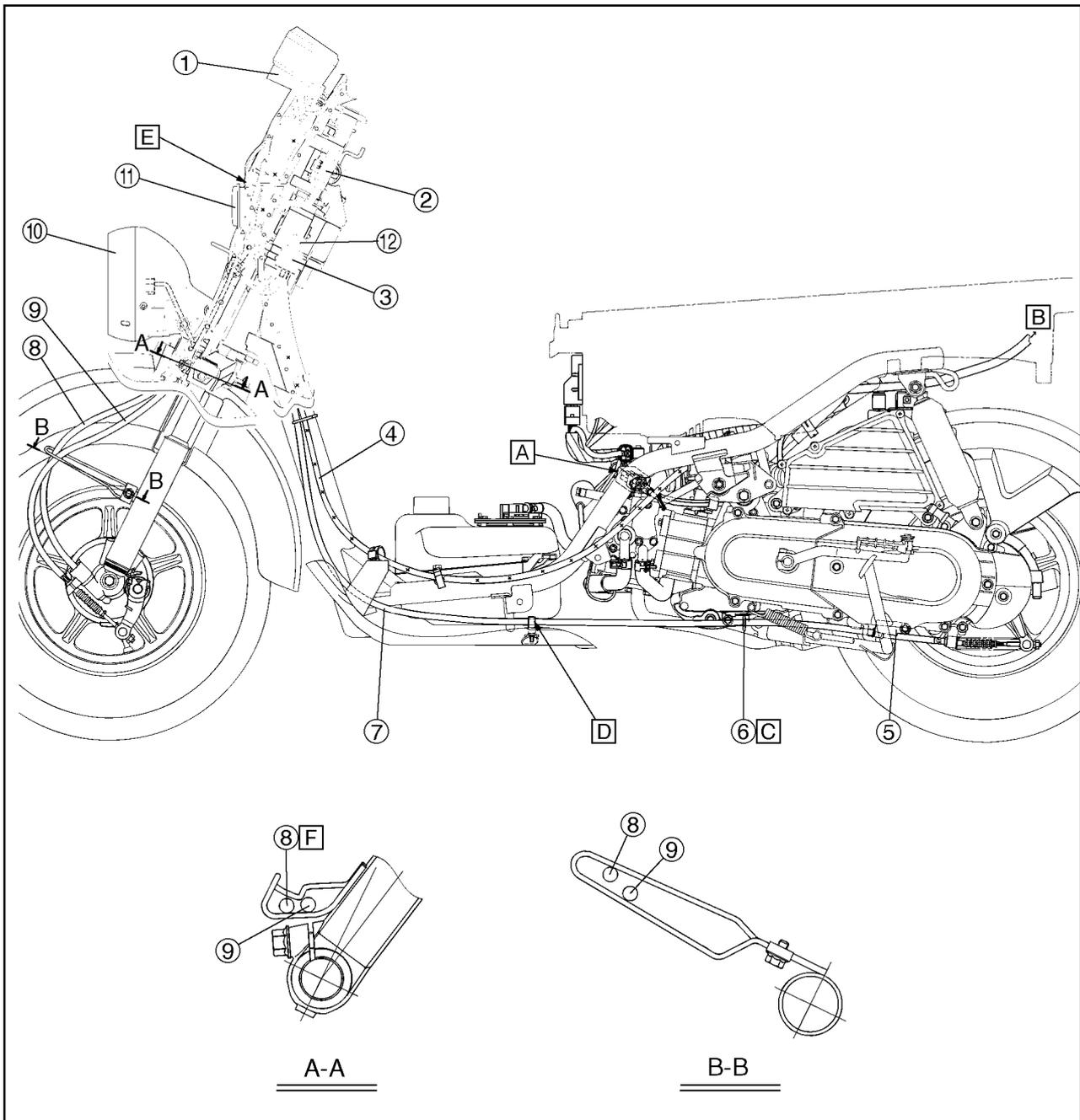
SPEC



- ① Speedometer
- ② Rectifier/Regulator
- ③ Turn signal relay
- ④ Throttle cable Ass'y
- ⑤ Holder
- ⑥ Cable holder
- ⑦ Rear brake cable
- ⑧ Speedometer cable
- ⑨ Front brake cable
- ⑩ Headlight
- ⑪ Horn
- ⑫ Starting circuit cut-off relay

- A After wiring the cover, cover the coupler.
- B Enter tail/brake light.
- C After fixing the rear brake cable, fix crank case 1. When locking, make sure that the stopper at the front of holder touches the position of crank case 1.
- D After fixing the rear brake cable, install the protruding part of cramp on the hole of under cover.

- E Install the horn of coupler according to the direction shown in the drawing, and make sure that it is not loosen easily.
- F Penetrate through the speed meter cable.

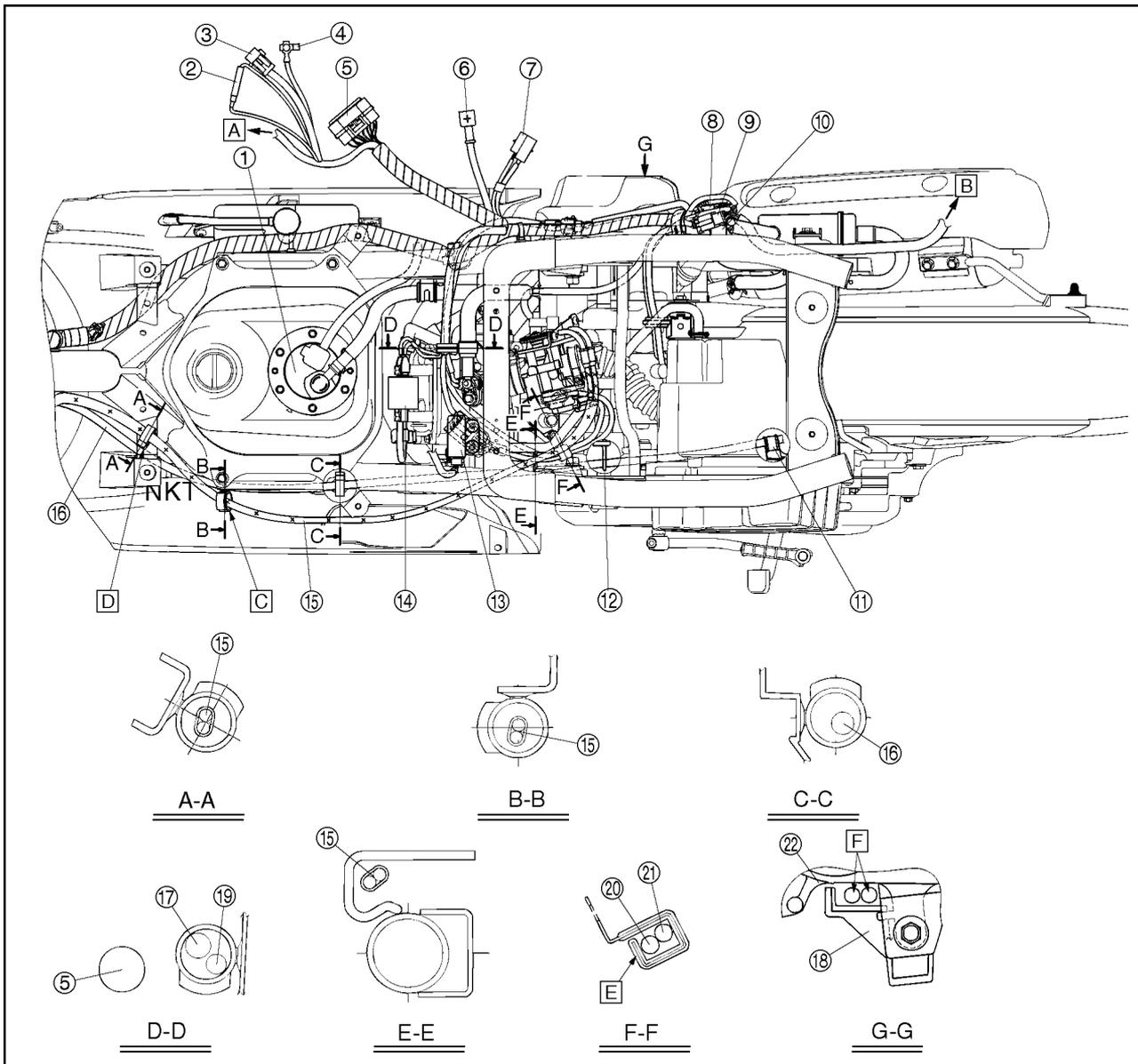




- ① Fuel pump
- ② FI diagnostic tool connector
- ③ Fuse box
- ④ Battery negative lead
- ⑤ ECU lead
- ⑥ Battery positive lead
- ⑦ Starter relay
- ⑧ AC magneto lead
- ⑨ Tail/brake light lead
- ⑩ Starter motor lead
- ⑪ Holder
- ⑫ Cable holder
- ⑬ Lean angle cut-off switch
- ⑭ Ignition coil
- ⑮ Throttle cable Ass'y
- ⑯ Rear brake cable
- ⑰ Wiring harness

- ⑱ Rear fender
- ⑲ Fuel injector lead
- ⑳ Sub-wire harness lead
- ㉑ ISC(idle speed control) valve lead
- ㉒ Crankcase2
- A Enter slant angle of sensor.
- B Enter tail/brake light.
- C Fix throttle cable Ass'y. Install the protruding part of cramp on the hole of fuel tank bracket.
- D Fix throttle cable Ass'y. Install the protruding part of cramp on the hole of foot rest bracket.

- E Put the idle speed control lead and wire sub lead in, and then close the cramp.
- F Wire the starting device of the rear fender of rear motor lead and crank case 2. Do not clip the lead in.



CABLE ROUTING

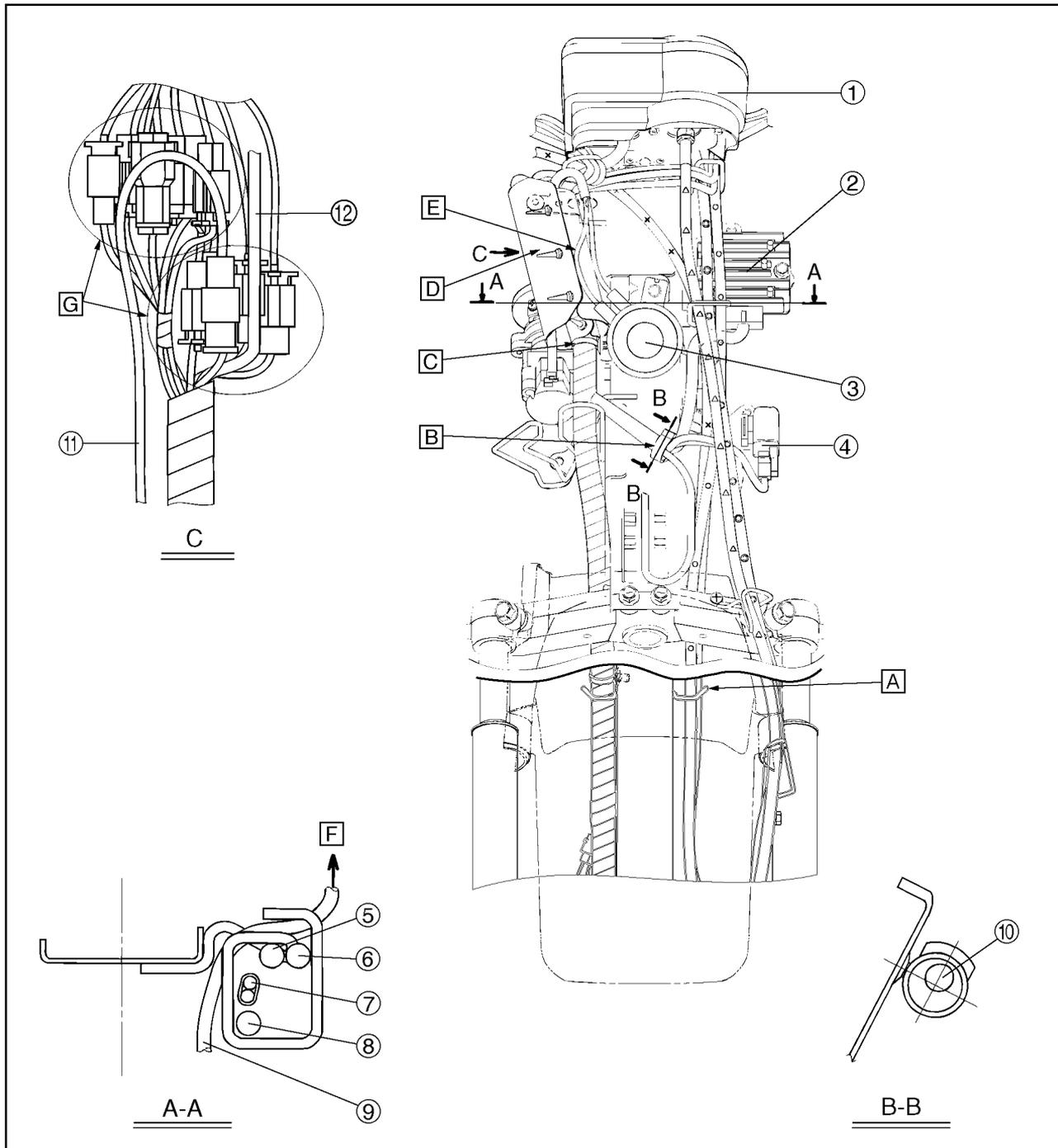
SPEC



- ① Speedometer
- ② Rectifier/Regulator
- ③ Horn
- ④ Turn signal relay
- ⑤ Front brake cable
- ⑥ Rear brake cable
- ⑦ Throttle cable Ass'y
- ⑧ Speedometer cable
- ⑨ Rectifier/Regulator lead
- ⑩ Wiring harness
- ⑪ Main switch lead
- ⑫ Horn lead

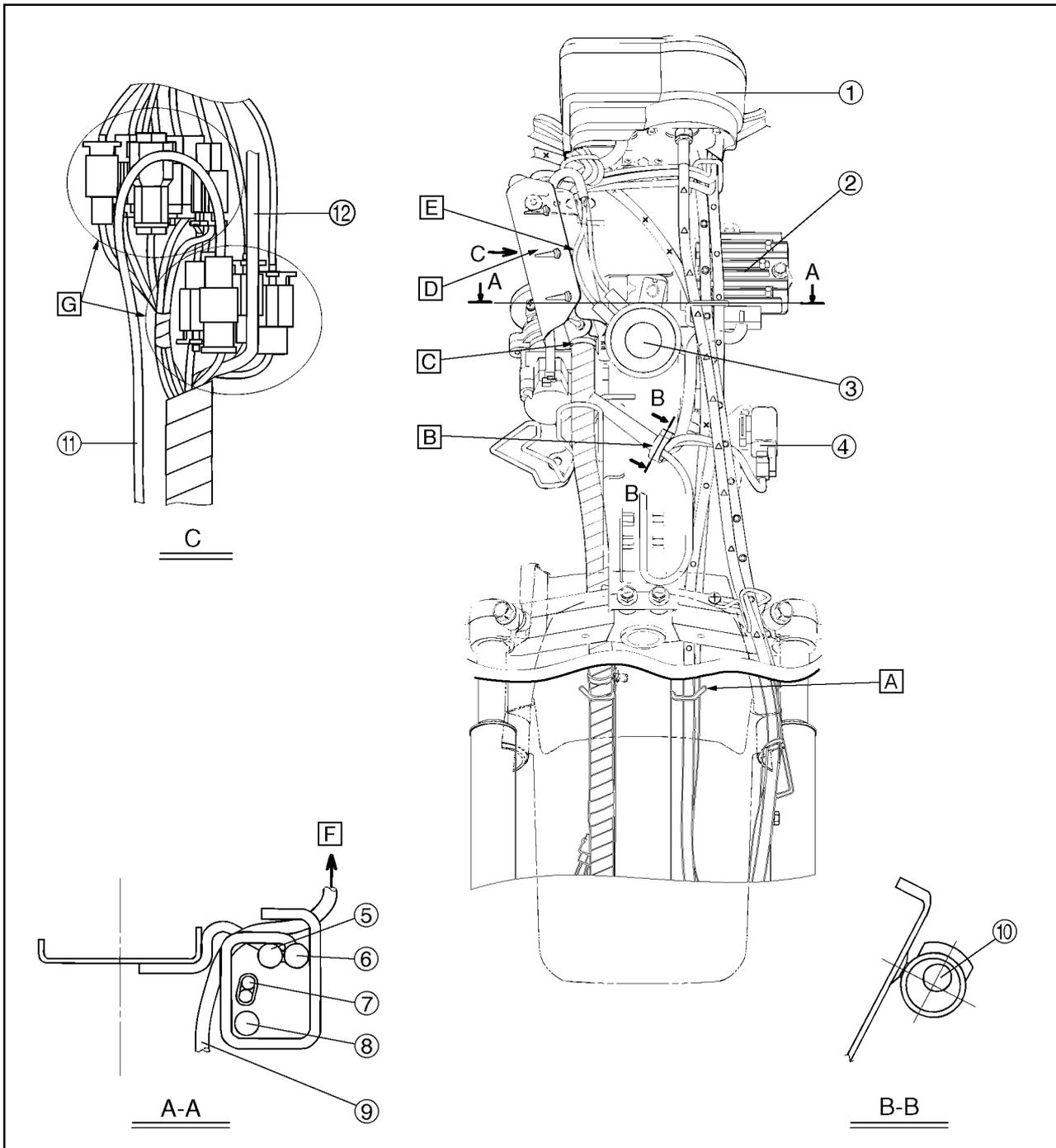
- [A] Penetrate the rear brake cable and throttle cable through the left side of car body.
- [B] Make sure to install the clamp on the head light stay.
- [C] Install the protruding part of cable strap of electrical wire harness Ass'y on the hole of head light stay.

- [D] Penetrate the main switch cable and throttle cable through the left side of car body.
- [E] Penetrate horn cable through the connector cover without sticking out horn cable.
- [F] Enter rectifier and regulator Ass'y.





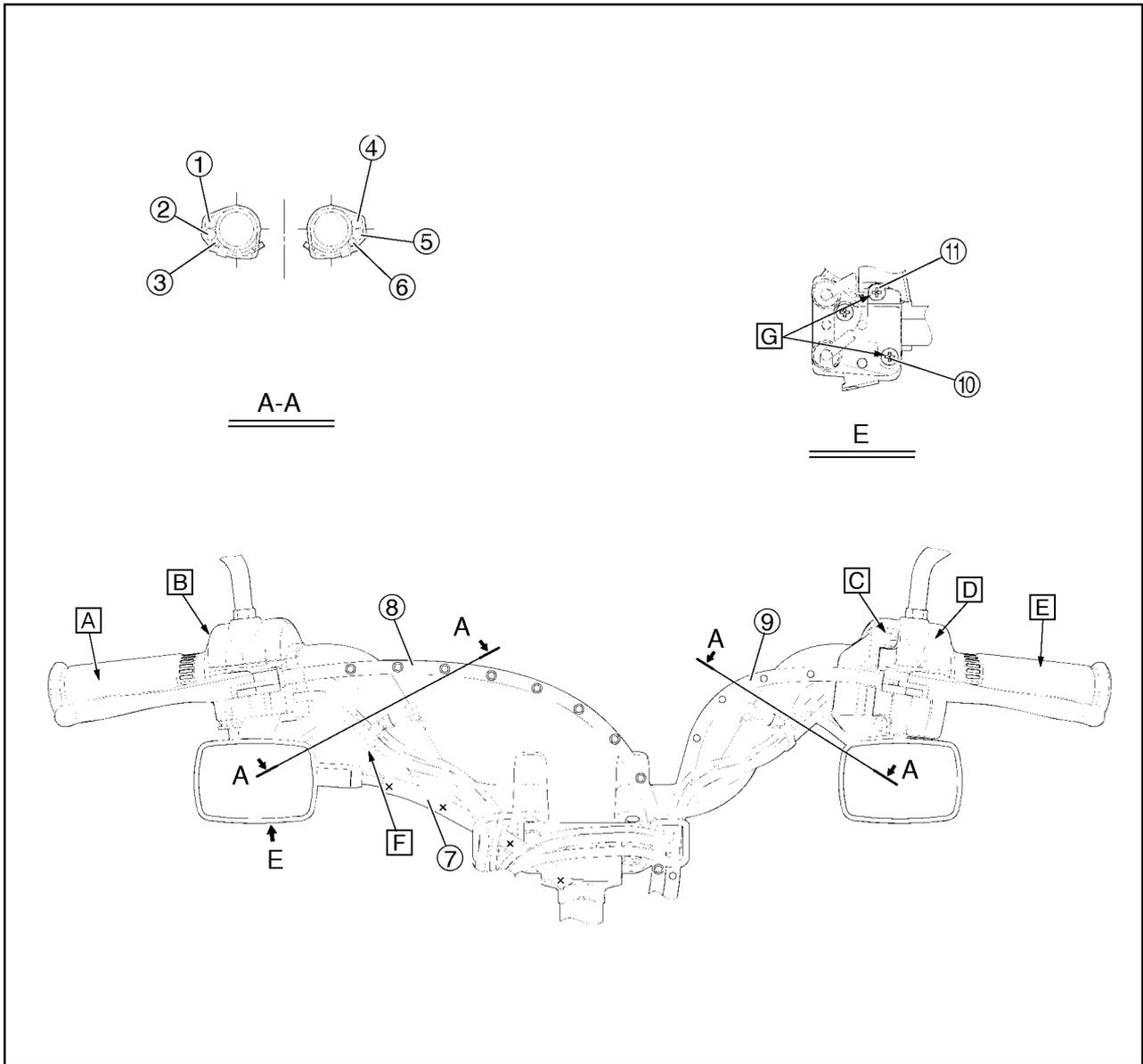
- G Let the left and right flasher lights, meter, and right lead wire of handle bar switch to face upward, let the main switch, front and rear brake switch and left lead wire of handle bar switch to face downward, connect to the coupler, and then store in the connector cover.



CABLE ROUTING



- | | | |
|---------------------------------|---|--|
| ① Turn signal light lead(right) | [A] Penetrate the rear brake cable and throttle cable through the left side of car body. | [F] Enter rectifier and regulator Ass'y. |
| ② Handlebar switch lead(right) | [B] Make sure to install the clamp on the head light stay. | [G] First, tightening the backward screw and tightening the forward screw. |
| ③ Front brake light switch lead | [C] Install the protruding part of cable strap of electrical wire harness Ass'y on the hole of head light stay. | |
| ④ Turn signal light lead(left) | [D] Penetrate the main switch Comp. Lead into the connector cover. | |
| ⑤ Handlebar switch lead(left) | [E] Penetrate horn cable through the connector cover without sticking out horn cable. | |
| ⑥ Rear brake light switch | | |
| ⑦ Throttle cable Ass'y | | |
| ⑧ Front brake cable | | |
| ⑨ Rear brake cable | | |
| ⑩ Backward screw | | |
| ⑪ Forward screw | | |



CHAPTER 3 PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION	3-1
PERIODIC MAINTENANCE AND MINOR REPAIR	3-2
PERIODIC MAINTENANCE CHART FOR THE EMISSION CON- TROL SYSTEM	3-2
GENERAL MAINTENANCE AND LUBRICATION CHART	3-3
COVER AND PANEL	3-5
SIDE COVERS AND TAIL/BRAKE LIGHT	3-5
SINGLE SEAT AND TRUNK	3-7
LEG SHIELD ^{1,2}	3-8
FOOTREST BOARD AND INNER FENDER	3-9
ENGINE	3-10
ADJUSTING THE VALVE CLEARANCE	3-10
CHECKING THE ENGINE IDLING SPEED	3-16
ADJUSTING THE THROTTLE CABLE FREE PLAY	3-17
CHECKING THE SPARK PLUG	3-18
CHECKING THE IGNITION TIMING	3-20
MEASURING THE COMPRESSION PRESSURE	3-22
CHECKING THE ENGINE OIL LEVEL	3-24
CHANGING THE ENGINE OIL	3-25
CHANGING THE TRANSMISSION OIL	3-27
MEASURING THE ENGINE OIL PRESSURE	3-28
REPLACING THE AIR FILTER ELEMENT	3-30
CHECKING THE THROTTLE BODY JOINT AND INTAKE MANIFOLD	3-32
CHECKING THE FUEL HOSE	3-32
CHECKING THE BREATHER HOSES	3-33
CHECKING THE EXHAUST SYSTEM	3-34
CHECKING THE COOLANT LEVEL	3-35
CHECKING THE COOLING SYSTEM	3-36
CHANGING THE COOLANT	3-37
CHASSIS	3-40
ADJUSTING THE FRONT BRAKE	3-40
ADJUSTING THE REAR BRAKE	3-40
CHECKING THE FRONT AND REAR BRAKE SHOES	3-41
CHECKING AND ADJUSTING THE STEERING HEAD	3-42
CHECKING THE FRONT FORK	3-44
CHECKING THE TIRES	3-45

CHECKING THE WHEELS.....	3-48
CHECKING AND LUBRICATING THE CABLES	3-48
LUBRICATING THE LEVERS AND PEDALS.....	3-49
LUBRICATING THE CENTERSTAND	3-49
ELECTRICAL SYSTEM	3-50
CHECKING AND CHARGING THE BATTERY.....	3-50
CHECKING THE FUSE	3-56
REPLACING THE HEADLIGHT BULB	3-58
ADJUSTING THE HEADLIGHT BEAM.....	3-59



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PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

NOTE:

The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.

From 30,000 km, repeat the maintenance intervals starting from 6,000 km.

Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

PERIODIC MAINTENANCE AND MINOR REPAIR



PERIODIC MAINTENANCE AND MINOR REPAIR

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NO.	ITEM	ROUTINE	INITIAL	ODOMETER READING				
			600 mi (1,000 km) or 1 month	2,000 mi (4,000 km) or 6 months	4,000 mi (7,000 km) or 12 months	6,000 mi (10,000 km) or 18 months	8,000 mi (13,000 km) or 24 months	10,000 mi (16,000 km) or 30 months
1	* Fuel line	<ul style="list-style-type: none"> • Check fuel and vacuum hoses for cracks or damage. • Replace if necessary. 		√	√	√	√	√
2	* Spark plug	<ul style="list-style-type: none"> • Check condition. • Adjust gap and clean. • Replace at 4000 mi (7000 km) or 12 months and thereafter every 4000 mi (6000 km) or 12 months. 		√	Replace.	√	Replace.	√
3	* Valve clearance	<ul style="list-style-type: none"> • Check and adjust valve clearance when engine is cold. 	√	Every 6000 mi (10000 km)				
4	* Crankcase breather system	<ul style="list-style-type: none"> • Check breather hose for cracks or damage. • Replace if necessary. 		√	√	√	√	√
5	* Fuel injection	<ul style="list-style-type: none"> • Check engine idle speed. 	√	√	√	√	√	√
6	* Exhaust system	<ul style="list-style-type: none"> • Check for leakage. • Tighten if necessary. • Replace gasket(s) if necessary. 		√	√	√	√	√
7	* Air induction system	<ul style="list-style-type: none"> • Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged parts. 		√	√	√	√	√

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

PERIODIC MAINTENANCE AND MINOR REPAIR



GENERAL MAINTENANCE AND LUBRICATION CHART

NO.	ITEM	ROUTINE	INITIAL	ODOMETER READING					
			600 mi (1,000 km) or 1 month	2,000 mi (4,000 km) or 6 months	4,000 mi (7,000 km) or 12 months	6,000 mi (10,000 km) or 18 months	8,000 mi (13,000 km) or 24 months	10,000 mi (16,000 km) or 30 months	
1	* Air filter element	• Replace.		√	√	√	√	√	√
2	* Front brake	• Check operation. • Adjust cable and replace brake shoes if necessary.	√	√	√	√	√	√	√
3	* Rear brake	• Check operation. • Adjust cable and replace brake shoes if necessary.	√	√	√	√	√	√	√
4	* Wheels	• Check runout and for damage. • Replace if necessary.		√	√	√	√	√	√
5	* Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√	√
6	* Wheel bearings	• Check bearings for smooth operation. • Replace if necessary.		√	√	√	√	√	√
7	* Steering bearings	• Check bearing assemblies for looseness. • Moderately repack with lithium-soap-based grease every 8000 mi (13000 km) or 24 months.	√	√	√	√	√	Repack.	√
8	* Chassis fasteners	• Check all chassis fitting and fasteners. • Correct if necessary.		√	√	√	√	√	√
9	Front and rear brake lever pivot	• Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	√	√	√
10	Centerstand	• Check operation. • Lubricate.		√	√	√	√	√	√
11	* Front fork	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√	√
12	* Shock absorber assembly	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√	√
13	Engine oil	• Change (warm engine before draining). • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√	√
14	Engine oil strainer	• Clean.	√		√		√		√
15	* Cooling system	• Check coolant level and vehicle for coolant leakage. • Change.		√	√	√	√	√	√
16	Final transmission oil	• Check vehicle for oil leakage. • Change.	√		√		√		√
17	* V-belt	• Replace.		Every 6250 mi (10000 km)					
18	* Front and rear brake switches	• Check operation.	√	√	√	√	√	√	√
19	* Control and meter cables	• Apply Yamaha chain and cable lube or engine oil 10W-30 thoroughly.	√	√	√	√	√	√	√
20	* Throttle grip housing and cable	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√	√
21	* Lights, signals and switches	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√	√

PERIODIC MAINTENANCE AND MINOR REPAIR



* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

NOTE: _____

From 12000mi(19000km) or 36 months, repeat the maintenance intervals starting from 4000mi(7000km) or 12 months.

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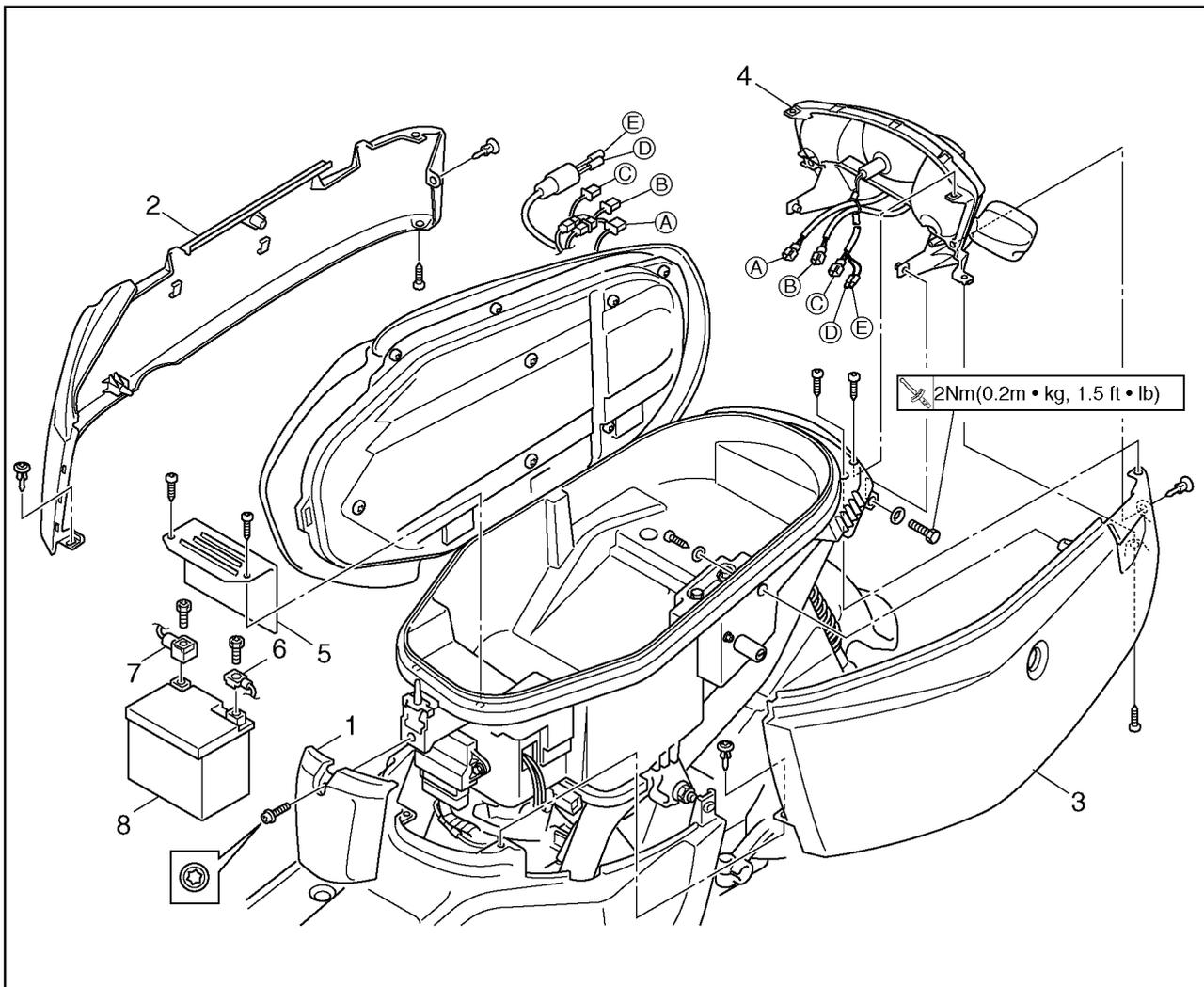
NOTE: _____

The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

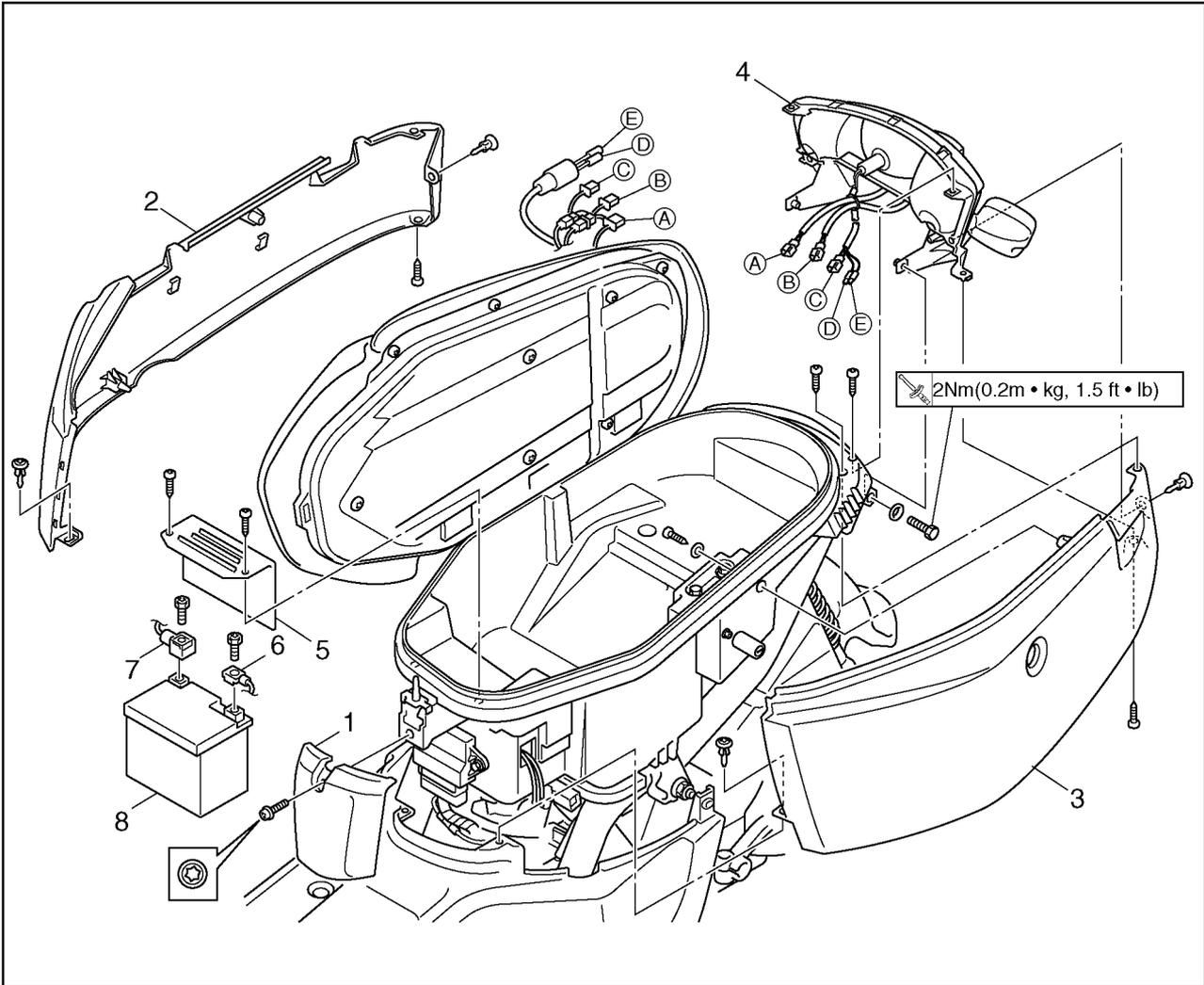


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COVER AND PANEL
SIDE COVERS AND TAIL/BRAKE LIGHT



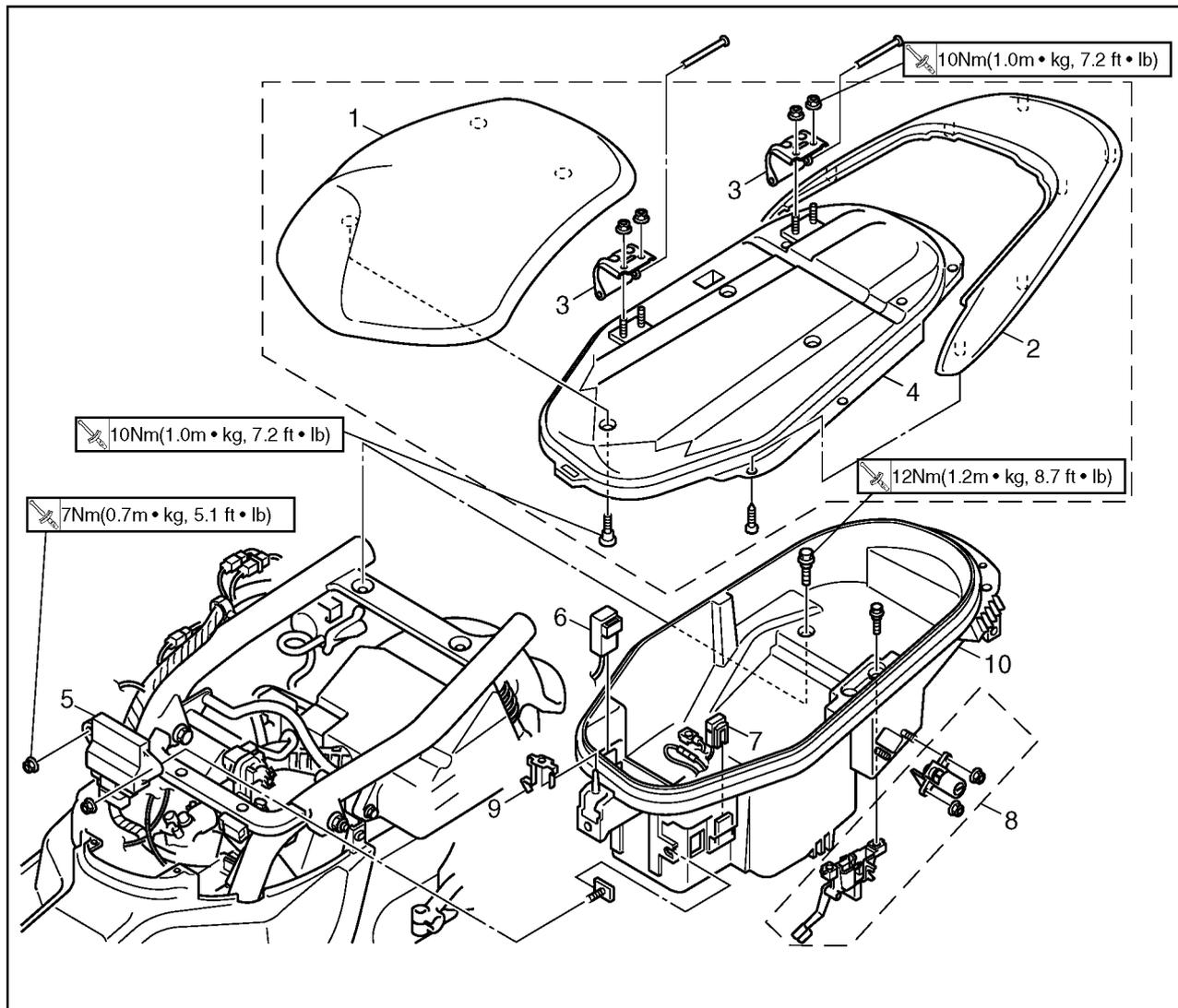
Order	Job/Part	Q'ty	Remarks
	Removing the side covers and tail/brake light		Remove the parts in the order listed.
1	Front cover	1	
2	Side cover(left)	1	
3	Side cover(right)	1	
4	Tail/brake and rear turn signal light(left and right)	1	
5	Battery cover	1	
6	Battery negative lead	1	
7	Battery positive lead	1	
8	Battery	1	
			<p>CAUTION: _____</p> <ul style="list-style-type: none"> ● First, disconnect the negative battery lead, and then the positive battery lead. ● After installing the battery be sure to turn the main switch from "ON" to "OFF" three times in 3 seconds intervals to initialize the idle speed



Order	Job/Part	Q'ty	Remarks
			<p>control system.</p> <hr/> <p>For installation, reverse the removal procedure.</p>



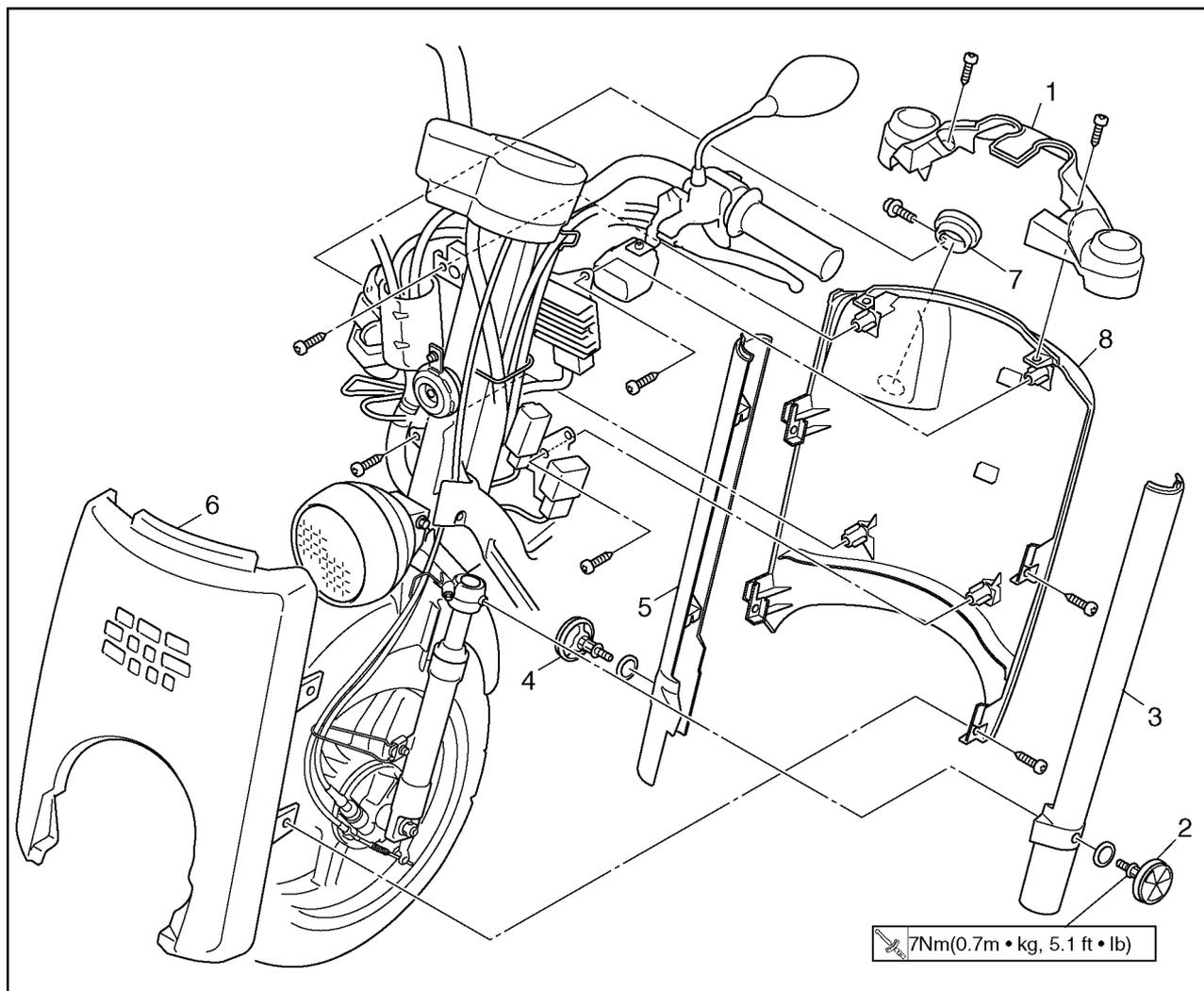
SINGLE SEAT AND TRUNK



Order	Job/Part	Q'ty	Remarks
	Removing the single seat and trunk		
	Side cover(left and right)		Remove the parts in the order listed. Refer to "SIDE COVERS AND TAIL/ BRAKE LIGHT".
1	Single seat	1	
2	Single seat upper cover	1	
3	Bottom plate	2	
4	Frame(single seat)	1	
5	ECU	1	Disconnect.
6	Starter relay	1	Disconnect.
7	Main fuse	1	Disconnect.
8	Single seat lock assembly	1	
9	Helmet holder	1	
10	Trunk	1	
			For installation, reverse the removal procedure.



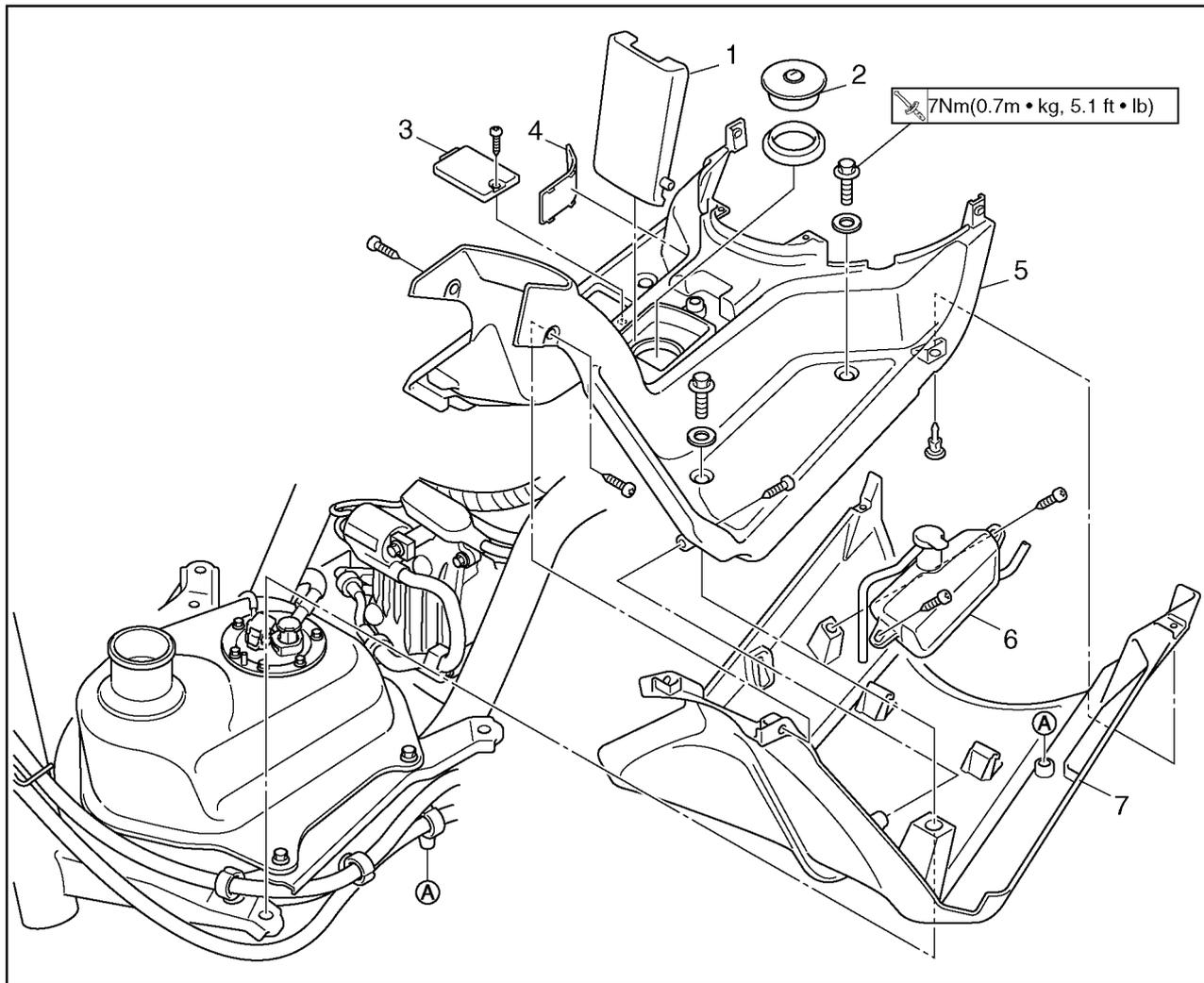
LEG SHIELD1,2



Order	Job/Part	Q'ty	Remarks
	Removing the leg shield1,2		Remove the parts in the order listed.
1	Front fork upper cover	1	NOTE: _____ Caution, do not damage the claw while removing. _____ For installation, reverse the removal procedure.
2	Reflector(left)	1	
3	Front fork cover(left)	1	
4	Reflector(right)	1	
5	Front fork cover(right)	1	
6	Leg shield1	1	
7	Main switch cover	1	
8	Leg shield2	1	



FOOTREST BOARD AND INNER FENDER



Order	Job/Part	Q'ty	Remarks
	Removing the footrest board and inner fender		Remove the parts in the order listed.
	Single seat/trunk		Refer to "SINGLE SEAT AND TRUNK".
1	Fuel tank cap cover	1	NOTE: _____
2	Fuel tank cap	1	
3	Coolant reservoir cap cover	1	When installing the fuel tank cap, align it cap end and the mark on the car body.
4	Panel	1	
5	Footrest board	1	
6	Coolant reservoir	1	Disconnect.
7	Inner fender	1	For installation, reverse the removal procedure.



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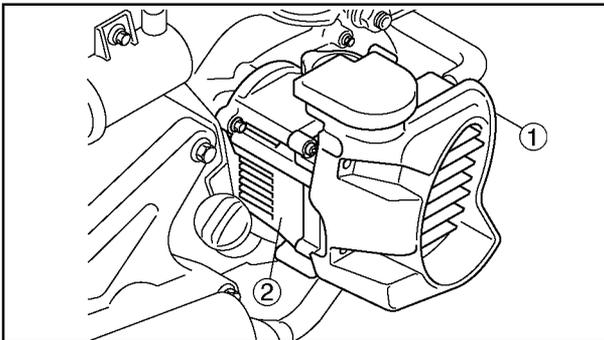
ENGINE

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

NOTE: _____

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.



1. Remove:
 - front cover
 - side cover(left and right)
 - battery /battery cover
 - single seat/trunk
 - footrest board
 - Refer to"COVER AND PANEL".
2. Drain:
 - coolant
(completely from the radiator)
3. Remove:
 - radiator cover①
 - radiator
 - fan case②
Refer to"RADIATOR" in chapter 6.
4. Remove:
 - spark plug cap
 - spark plug
 - ignition coil
 - cylinder head cover
5. Remove:
 - water pump
Refer to"WATER PUMP" in chapter 6.
6. Measure:
 - valve clearance
Out of specification → Adjust.



Valve clearance (cold)

Intake valve

0.10 ~ 0.16mm(0.0039 ~ 0.0063in)

Exhaust valve

0.18 ~ 0.24mm(0.0071 ~ 0.0094in)

ADJUSTING THE VALVE CLEARANCE



Last digit	Rounded value
0 or 2	0
5	5
8	10

EXAMPLE:

Original valve pad number =148(thickness =1.48mm(0.0583in))

Rounded value =150

- g. Locate the rounded number of the original valve pad and the measured valve clearance in the valve pad selection table. The point where the column and row intersect is the new valve pad number.

NOTE:

The new valve pad number is only an approximation. The valve clearance must be measured again and the above steps should be repeated if the measurement is still incorrect.

- h. Install the new valve pad .

NOTE:

- Lubricate the valve pad with molybdenum disulfide oil.
- Install the valve pad in the correct place.

- i. Install the rocker arm, collar and rocker arm shaft.
- j. Install the plate and cylinder head nuts

 10Nm(1.0m • kg, 7.2ft • lb)

- k. Install the cylinder head bolts .

 10Nm(1.0m • kg, 7.2ft • lb)

- l. Install the camshaft sprocket.

 30Nm(3.0m • kg, 21.7ft • lb)

- m. Install the timing chain tensioner and gasket.

 9Nm(0.9m • kg, 6.5ft • lb)

ADJUSTING THE VALVE CLEARANCE



- n. Install the timing chain tensioner spring and cap bolt .

 8Nm(0.8m • kg, 5.8ft • lb)

- o. Measure the valve clearance again.
- p. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.



ADJUSTING THE VALVE CLEARANCE



INTAKE

MEASURED CLEARANCE	ORIGINAL VALVE PAD NUMBER																											
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.00~0.04			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235		
0.05~0.09		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235			
0.10~0.16																												
0.17~0.21	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
→ 0.22~0.26	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.27~0.31	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.32~0.36	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.37~0.41	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.42~0.46	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.47~0.51	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.52~0.56	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.57~0.61	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.62~0.66	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240													
0.67~0.71	175	180	185	190	195	200	205	210	215	220	225	230	235	240														
0.72~0.76	180	185	190	195	200	205	210	215	220	225	230	235	240															
0.77~0.81	185	190	195	200	205	210	215	220	225	230	235	240																
0.82~0.86	190	195	200	205	210	215	220	225	230	235	240																	
0.87~0.91	195	200	205	210	215	220	225	230	235	240																		
0.92~0.96	200	205	210	215	220	225	230	235	240																			
0.97~1.01	205	210	215	220	225	230	235	240																				
1.02~1.06	210	215	220	225	230	235	240																					
1.07~1.11	215	220	225	230	235	240																						
1.12~1.16	220	225	230	235	240																							
1.17~1.21	225	230	235	240																								
1.22~1.26	230	235	240																									
1.27~1.31	235	240																										
1.32~1.36	240																											

VALVE CLEARANCE(cold):
0.10~0.16mm(0.0039~0.0063in)
Example:175 pad is installed
Measured clearance is 0.24mm(0.0094in)
Replace pad 175 with pad 185
Pad number: (example)
Pad No.175=1.75mm(0.0689in)
Pad No.185=1.85mm(0.0728in)

EXHAUST

MEASURED CLEARANCE	ORIGINAL VALVE PAD NUMBER																											
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.00~0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220				
0.03~0.07				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225			
0.08~0.12			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230			
0.13~0.17		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235			
0.18~0.24																												
0.25~0.29	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
→ 0.30~0.34	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.35~0.39	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.40~0.44	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.45~0.49	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.50~0.54	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.55~0.59	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.60~0.64	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.65~0.69	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.70~0.74	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240													
0.75~0.79	175	180	185	190	195	200	205	210	215	220	225	230	235	240														
0.80~0.84	180	185	190	195	200	205	210	215	220	225	230	235	240															
0.85~0.89	185	190	195	200	205	210	215	220	225	230	235	240																
0.90~0.94	190	195	200	205	210	215	220	225	230	235	240																	
0.95~0.99	195	200	205	210	215	220	225	230	235	240																		
1.00~1.04	200	205	210	215	220	225	230	235	240																			
1.05~1.09	205	210	215	220	225	230	235	240																				
1.10~1.14	210	215	220	225	230	235	240																					
1.15~1.19	215	220	225	230	235	240																						
1.20~1.24	220	225	230	235	240																							
1.25~1.29	225	230	235	240																								
1.30~1.34	230	235	240																									
1.35~1.39	235	240																										
1.40~1.44	240																											

VALVE CLEARANCE(cold):
0.18~0.24mm(0.0071~0.0094in)
Example:175 pad is installed
Measured clearance is 0.32mm(0.0126in)
Replace pad 175 with pad 185
Pad number: (example)
Pad No.175=1.75mm(0.0689in)
Pad No.185=1.85mm(0.0728in)

ADJUSTING THE VALVE CLEARANCE



8. Install:
 - all removed parts

NOTE: _____
For installation, reverse the removal procedure.

9. Fill:
 - cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT".

EAS00054

CHECKING THE ENGINE IDLING SPEED

NOTE:

Prior to adjusting the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

1. Start the engine and let it warm up for several minutes.
2. Remove:
 - panel
Refer to "FOOTREST BOARD AND INNER FENDER".
3. Connect:
 - digital circuit tester
(onto the spark plug lead of cylinder)



Digital circuit tester
90890-06760

4. Check:
 - engine idling speed
Out of specification → Replace the throttle body assembly.



Engine idling speed
2000~2200r/min

5. Install:
 - panel
Refer to "FOOTREST BOARD AND INNER FENDER".



EAS00060

CHECKING THE SPARK PLUG

1. Remove:
 - panel
Refer to "FOOTREST BOARD AND INNER FENDER".
2. Disconnect:
 - spark plug cap

⚠ WARNING

Remove the spark plug cap, the engine is extremely hot.

3. Remove:
 - spark plug

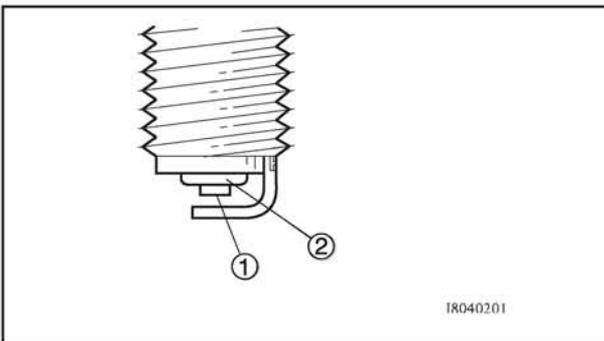
CAUTION:

Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

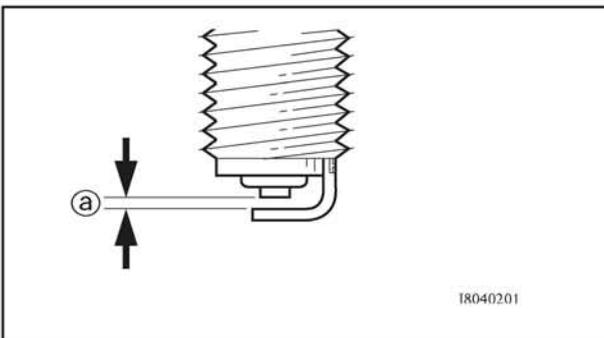
4. Check:
 - spark plug type
Incorrect → Change.



Spark plug type (manufacturer)
CR7E(NGK)



5. Check:
 - electrode ①
Damage/wear → Replace the spark plug.
 - insulator ②
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.
6. Clean:
 - spark plug
(with a spark plug cleaner or wire brush)



7. Measure:
 - spark plug gap ③
(with a wire Thickness gauge)
Out of specification → Regap.



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

CHECKING THE SPARK PLUG



8. Install:
 - spark plug

 13Nm(1.3m • kg, 9.4ft • lb)

NOTE: _____
Before installing the spark plug, clean the spark plug and gasket surface.

9. Connect:
 - spark plug cap
10. Install:
 - panelRefer to "FOOTREST BOARD AND INNER FENDER".



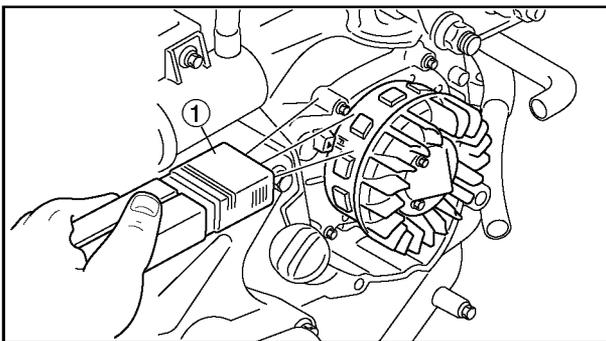
EAS00062

CHECKING THE IGNITION TIMING

NOTE:

Prior to checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

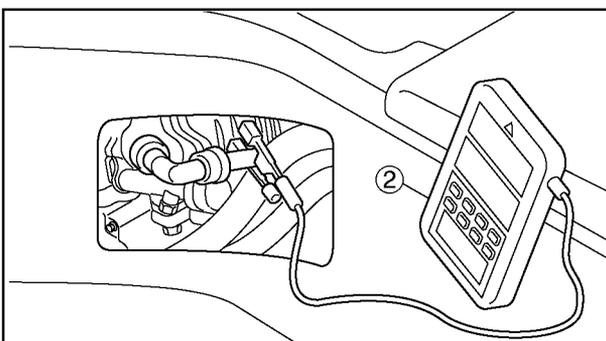
1. Remove:
 - front cover
 - side cover(left and right)
 - battery /battery cover
 - single seat/trunk
 Refer to"COVER AND PANEL".
2. Drain:
 - coolant
 - (completely from the radiator)
3. Remove:
 - radiator cover
 - radiator
 - fan case
 Refer to"RADIATOR" in chapter 6.



4. Attach:
 - timing light ①
 - digital circuit tester②
 (onto the spark plug lead of cylinder)

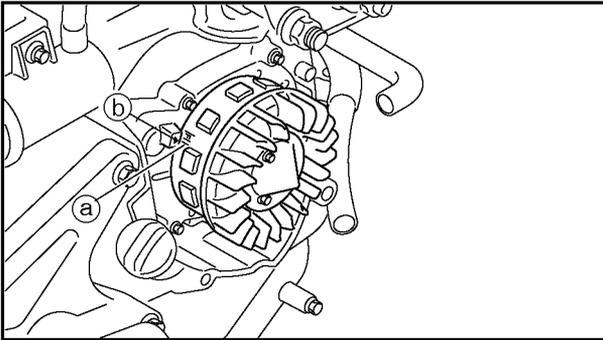


Timing light
90890-03141
YU-03141
Digital circuit tester
90890-06760



CHECKING THE IGNITION TIMING

CHK
ADJ



5. Check:
- ignition timing



- a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.



- b. Check that the mark (a) on the AC magneto rotor is within the firing range (b) on the right crankcase cover.
Incorrect firing range → Check the ignition system.



NOTE: _____

The ignition timing is not adjustable.

6. Remove:
- timing light
 - digital circuit tester
7. Install:
- fan case
 - radiator
 - radiator cover
- Refer to "RADIATOR" in chapter 6.
8. Fill:
- cooling system
(with the specified amount of the recommended coolant)
- Refer to "CHANGING THE COOLANT".
9. Install:
- single seat/trunk
 - battery /battery cover
 - side cover(left and right)
 - front cover
- Refer to "COVER AND PANEL".

EAS00067

MEASURING THE COMPRESSION PRESSURE

NOTE:

Insufficient compression pressure will result in a loss of performance.

1. Measure:
 - valve clearance
Out of specification → Adjust
Refer to "ADJUSTING THE VALVE CLEARANCE".
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
 - panel
Refer to "FOOTREST BOARD AND INNER FENDER".
4. Disconnect:
 - spark plug cap

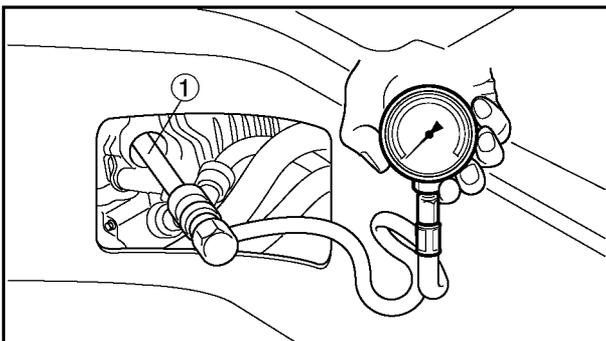
⚠ WARNING

Remove the spark plug cap, the engine is extremely hot.

5. Remove:
 - spark plug

CAUTION:

Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug well to prevent it from falling into the cylinder.



6. Install:
 - compression gauge ①



Compression gauge
90890-03081
YU-33223

7. Measure:
 - compression pressure
Out of specification → Refer to steps (c) and (d).



Compression pressure (at sea level)
Minimum
1262kPa(12.62kg/cm², 179.7psi)
Standard
1450kPa(14.5kg/cm², 206.5psi)
Maximum
1624kPa(16.24kg/cm², 231.3psi)



- a. Set the main switch to "ON".
- b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

⚠ WARNING

To prevent sparking, ground the spark plug lead before cranking the engine.

- c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces, and piston crown for carbon deposits.
Carbon deposits → Eliminate.
- d. If the compression pressure is below the minimum specification, pour a teaspoonful engine oil into the spark plug bore and measure again.
Refer to the following table.

Compression pressure (with oil applied into the cylinder)	
Reading	Diagnosis
Higher than without oil	Piston ring(s) wear or damage → Repair.
Same as without oil	Piston ring(s), valves, cylinder head gasket or piston possibly defective → Repair.

- 8. Remove:
 - compression gauge
- 9. Install:
 - spark plug

 13Nm(1.3m • kg9.4ft • lb)

- 10. Connect:
 - spark plug cap
- 11. Install:
 - panel

Refer to "FOOTREST BOARD AND INNER FENDER".

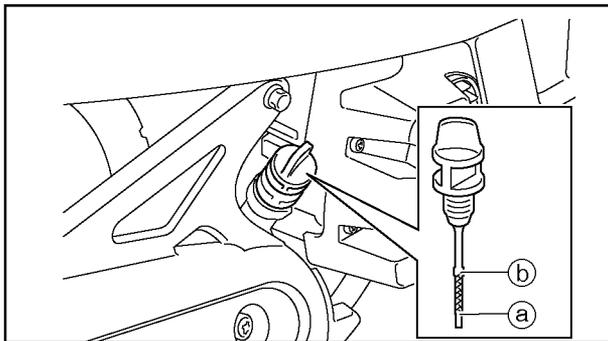
EAS00069

CHECKING THE ENGINE OIL LEVEL

1. Stand the scooter on a level surface.

NOTE:

- Place the scooter on a suitable stand.
- Make sure the scooter is upright.



2. Start the engine, warm it up for several minutes, and then turn it off.

3. Check:

- engine oil level

The engine oil level should be between the minimum level mark (a) and maximum level mark (b).

Below the minimum level mark → Add the recommended engine oil to the proper level.



Recommended engine oil type
YAMALUBE 4, SAE10W30 or
SAE20W40

Recommended engine oil grade
API service SG type or higher
JASO standard MA

CAUTION:

- Do not allow foreign materials to enter the crankcase.

NOTE:

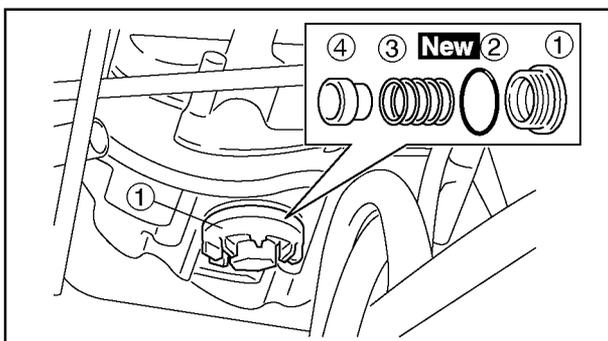
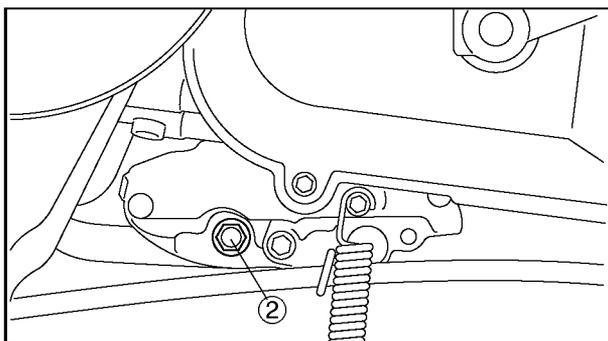
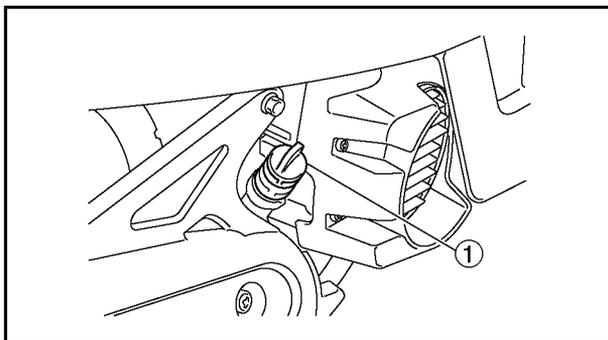
Before checking the engine oil level, wait a few minutes until the oil has settled.

4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

NOTE:

Before checking the engine oil level, wait a few minutes until the oil has settled.

CHANGING THE ENGINE OIL



EAS00076

CHANGING THE ENGINE OIL

1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
 - engine oil filler cap ①
 - engine oil drain bolt ② (along with the gasket)
4. Drain:
 - engine oil (completely from the crankcase)

5. If the oil filter element is also to be replaced or cleaned, perform the following procedure.



- a. Remove the oil strainer cover ①, spring ③ and oil filter element ④.
- b. Replace the O-ring **New** ②
- c. Install the new or clean oil filter element and the oil strainer cover.



Oil strainer cover
32Nm(3.2m • kg, 23.1ft • lb)



6. Install:
 - engine oil drain bolt (along with the gasket)



23Nm(2.3m • kg, 16.6ft • lb)

7. Fill:
 - crankcase (with the specified amount of the recommended engine oil)



Quantity
Total amount
0.8~0.9L(0.74~0.83 Imp qt, 0.87~0.98 US qt)
Periodic oil change
0.73~0.83L(0.67~0.76 Imp qt, 0.80~0.90 US qt)

CHANGING THE TRANSMISSION OIL

CHK
ADJ

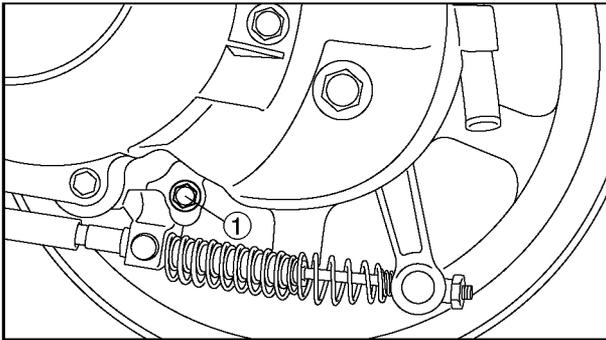


CHANGING THE TRANSMISSION OIL

1. Stand the scooter on a level surface.

NOTE:

- Stand the scooter on a suitable stand.
- Make sure that the scooter is upright.



2. Start the engine, warm it up for several minutes, and then turn it off.
3. Place a container under the transmission oil drain bolt.

4. Remove:

- transmission oil fill bolt (along with the gasket)
- transmission oil drain bolt ①

5. Drain:

- transmission oil (completely from the transmission case)

6. Install:

- transmission oil drain bolt

 13Nm (1.3m • kg, 9.4ft • lb)

7. Fill:

- transmission case (with the specified amount of the recommended transmission oil)



Recommended oil

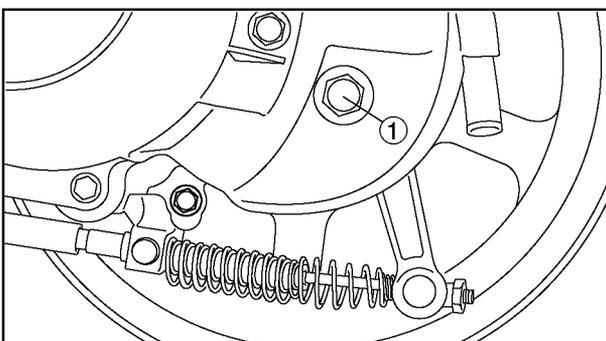
SAE10W30 hypoid gear oil

Total amount

0.11~0.13L (0.10~0.12 Imp qt,
0.12~0.14 US qt)

Periodic oil change

0.09~0.11L (0.08~0.10 Imp qt,
0.10~0.12 US qt)



8. Install:

- transmission oil fill bolt ① (along with the gasket)

 23Nm (2.3m • kg, 16.6ft • lb)

9. Start the engine for several minutes to warm it up and check for the oil leakage.

10. Check:

- transmission case (for transmission oil leaks)

MEASURING THE ENGINE OIL PRESSURE



6. Install:
 - oil gallery bolt

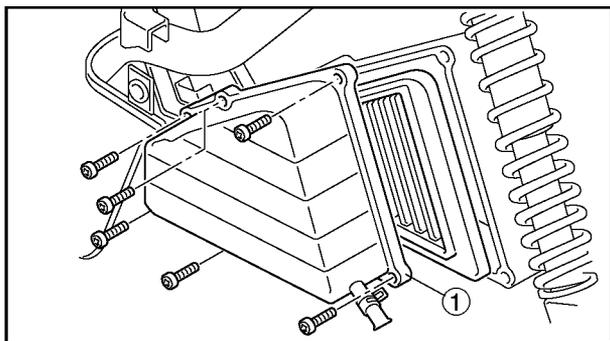
 7Nm(0.7m • kg, 5.1ft • lb)

7. Install:
 - panelRefer to "FOOTREST BOARD AND INNER FENDER".

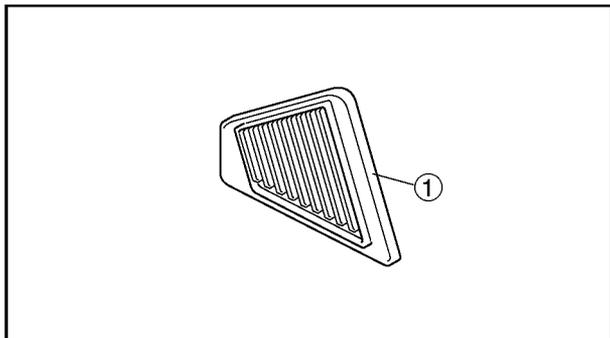
EAS00086

REPLACING THE AIR FILTER ELEMENT

1. Remove:
 - front cover
 - side cover(left)
 Refer to "SIDE COVERS AND TAIL/ BRAKE LIGHT".



2. Remove:
 - air filter case cover (1)
 - air filter element



3. Check:
 - air filter element (1)
 Damage/dirty → Replace.

NOTE:

- Replace the air filter element every 4000km(2000mi) .
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

4. Install:
 - air filter element
 - air filter case cover

 10Nm(1.0m • kg, 7.2ft • lb)

CAUTION:

Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect the throttle body tuning, leading to poor engine performance and possible overheating.

NOTE:

When installing the air filter element into the air filter case cover, make sure their sealing surfaces are aligned to prevent any air leaks.

REPLACING THE AIR FILTER ELEMENT



5. Install:
 - side cover(left)
 - front coverRefer to "SIDE COVERS AND TAIL/
BRAKE LIGHT".

CHECKING THE THROTTLE BODY JOINT AND INTAKE MANIFOLD/CHECKING THE FUEL HOSE

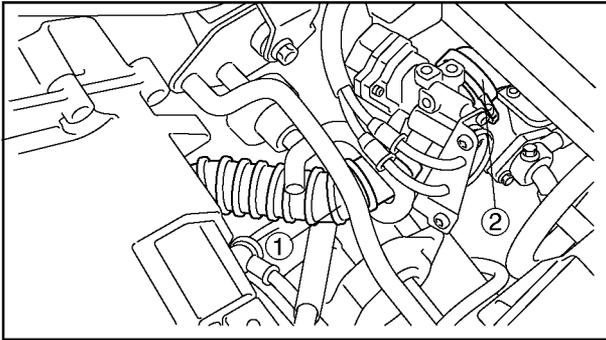
CHK
ADJ



EAS00094

CHECKING THE THROTTLE BODY JOINT AND INTAKE MANIFOLD

1. Remove:
 - front cover
 - side cover(left and right)
 - single seat/trunk
Refer to"COVER AND PANEL".



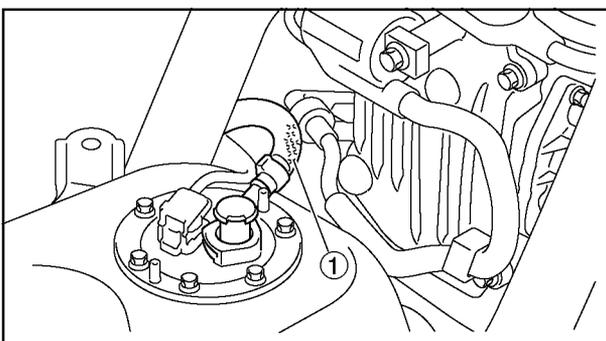
2. Check:
 - throttle body joint ①
 - intake manifold ②
Cracks/damage → Replace.
Refer to "FUEL INJECTION SYSTEM" in chapter 7.
3. Install:
 - single seat/trunk
 - side cover(left and right)
 - front cover
Refer to"COVER AND PANEL".

EAS00096

CHECKING THE FUEL HOSE

The following procedure applies to all of the fuel hose.

1. Remove:
 - front cover
 - side cover(left and right)
 - single seat/trunk
 - footrest board
Refer to"COVER AND PANEL".



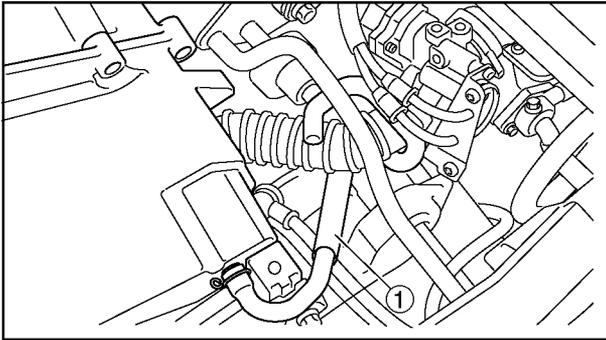
2. Check:
 - fuel hose ①
Cracks/damage → Replace.
Loose connection → Connect properly.
3. Install:
 - footrest board
 - single seat/trunk
 - side cover(left and right)
 - front cover
Refer to"COVER AND PANEL".



EAS00098

CHECKING THE BREATHER HOSES

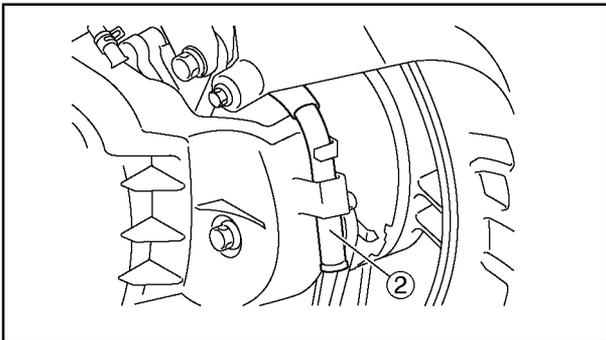
1. Remove:
 - front cover
 - side cover(left and right)
 - single seat/trunk
Refer to"COVER AND PANEL".



2. Check:
 - breather hose ①
 - transmission case breather hose ②
Cracks/damage → Replace.
Loose connection → Connect properly.

CAUTION:

Make sure the breather hoses are routed correctly.



3. Install:
 - single seat/trunk
 - side cover(left and right)
 - front cover
Refer to"COVER AND PANEL".

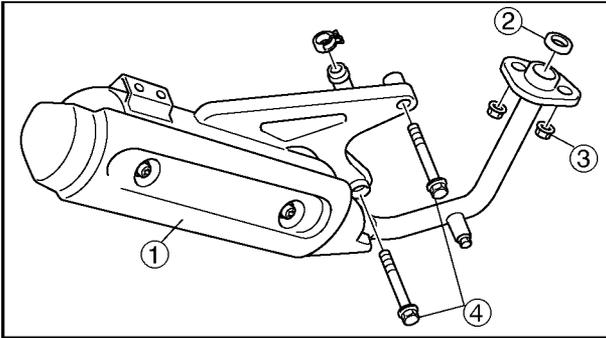


EAS00099

CHECKING THE EXHAUST SYSTEM

The following procedure applies to all of the muffler assembly and gasket.

1. Remove:
 - muffler assembly
Refer to "ENGINE REMOVAL" in chapter 5.



2. Check:
 - muffler assembly ①
Crack/damage → Replace.
 - gasket ②
Exhaust gas leak → Replace.
3. Check:
 - tightening torque



Exhaust pipe nut ③
13Nm(1.3m • kg, 9.4ft • lb)
Muffler and rear arm bolt ④
31Nm(3.1m • kg, 22.4ft • lb)

4. Install:
 - muffler assembly
Refer to "ENGINE REMOVAL" in chapter 5.

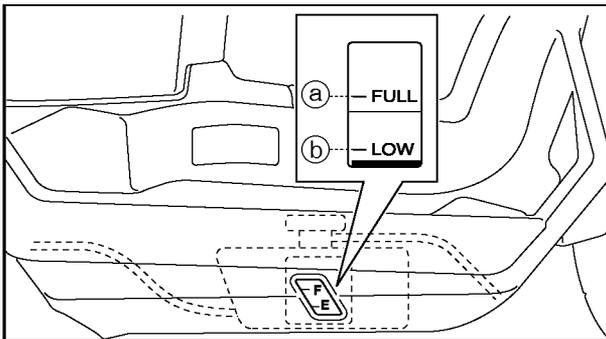
EAS00103

CHECKING THE COOLANT LEVEL

1. Stand the scooter on a level surface.

NOTE:

- Place the scooter on a suitable stand.
- Make sure the scooter is upright.



2. Check:

- coolant level

The coolant level should be between the maximum level mark (a) and minimum level mark (b).

Below the minimum level mark → Add the recommended coolant to the proper level.

CAUTION:

- Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, if distilled water is not available, soft water may be used.

3. Start the engine, warm it up for several minutes, and then turn it off.

4. Check:

- coolant level

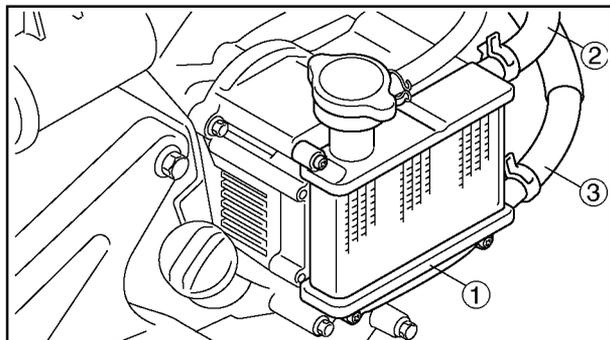
NOTE:

Before checking the coolant level, wait a few minutes until it settles.

EAS00104

CHECKING THE COOLING SYSTEM

1. Remove:
 - front cover
 - side cover(left and right)
 - battery /battery cover
 - single seat/trunk
 - footrest board
Refer to"COVER AND PANEL".
 - radiator cover
Refer to"RADIATOR" in chapter 6.



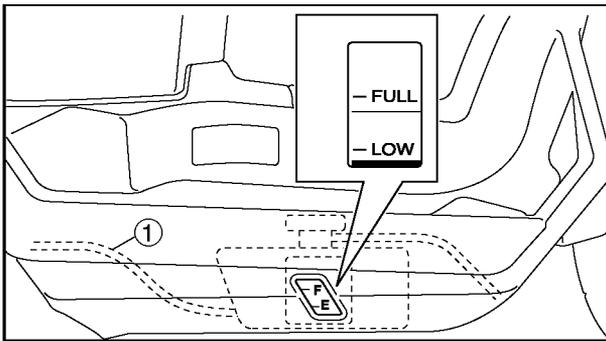
2. Check:
 - radiator ①
 - radiator inlet hose ②
 - radiator outlet hose ③
Cracks/damage → Replace.
Refer to "COOLING SYSTEM" in chapter 6.
3. Install:
 - radiator cover
Refer to"RADIATOR" in chapter 6.
 - footrest board
 - single seat/trunk
 - battery /battery cover
 - side cover(left and right)
 - front cover
Refer to"COVER AND PANEL".



EAS00105

CHANGING THE COOLANT

1. Remove:
 - front cover
 - side cover(right)
 - coolant reservoir cap cover
Refer to "COVER AND PANEL".
 - radiator cover
Refer to "RADIATOR" in chapter 6.



2. Disconnect:
 - coolant reservoir hose ①
3. Drain:
 - coolant
(from the coolant reservoir)
 - coolant
(from the radiator under drain bolt)
4. Remove:
 - radiator cap
 - coolant reservoir cap

⚠ WARNING

A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows: Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.

5. Connect:
 - coolant reservoir hose
6. Install:
 - radiator under drain bolt

 1Nm(0.1m • kg, 0.7ft • lb)

7. Fill:
 - cooling system
(with the specified amount of the recommended coolant)



Recommended antifreeze
 High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
 4:6(antifreeze:water)
Quantity
 Total amount
 0.50L(0.46 Imp qt, 0.53 US qt)
 Coolant reservoir capacity
 0.26L(0.23 Imp qt, 0.28 US qt)
 Up to the maximum level mark

NOTE: _____
 The specified amount of coolant is a standard amount. Fill the cooling system with coolant until coolant comes out of the air bleed bolt hole.

Handling notes for coolant
 Coolant is potentially harmful and should be handled with special care.

⚠ WARNING _____

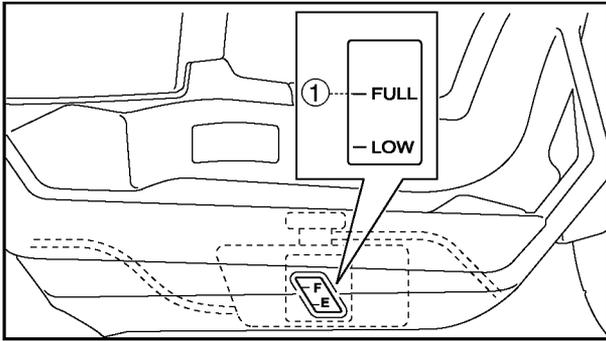
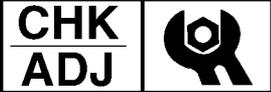
- If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.
- If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.
- If coolant is swallowed, induce vomiting and get immediate medical attention.

CAUTION: _____

- Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, if distilled water is not available, soft water may be used.
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of antifreeze.

8. Install:
 - radiator cap

CHANGING THE COOLANT



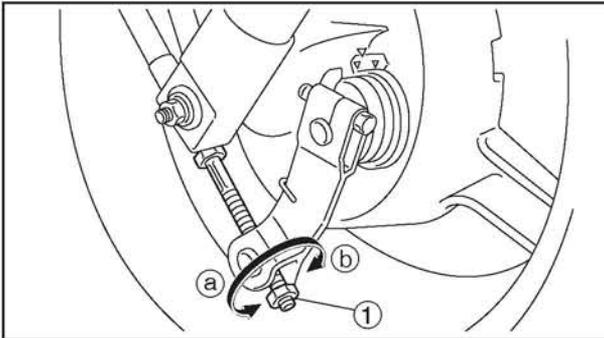
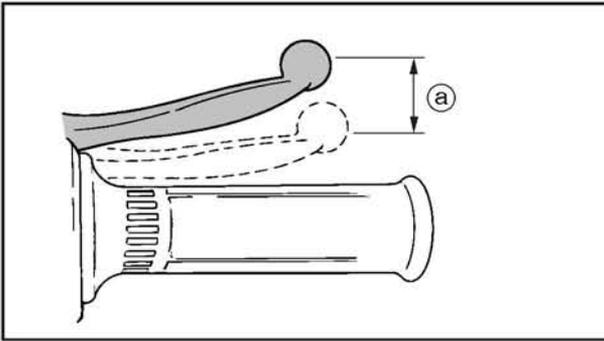
9. Fill:
 - coolant reservoir
(with the recommended coolant to the maximum level mark ①)
10. Install:
 - coolant reservoir cap
11. Start the engine, warm it up for several minutes, and then stop it.
12. Check:
 - coolant level
Refer to "CHECKING THE COOLANT LEVEL".

NOTE: _____
Before checking the coolant level, wait a few minutes until the coolant has settled.

13. Install:
 - radiator cover
Refer to "RADIATOR" in chapter 6.
 - coolant reservoir cap cover
 - side cover (right)
 - front cover
Refer to "COVER AND PANEL".

ADJUSTING THE FRONT BRAKE/ ADJUSTING THE REAR BRAKE

CHK
ADJ



EAS00109

CHASSIS

ADJUSTING THE FRONT BRAKE

1. Check:
 - brake lever free play (a)
 Out of specification → Adjust.



Brake lever free play (at the end of the brake lever)
10~20mm(0.39~0.79in)

2. Adjust:
 - brake lever free play

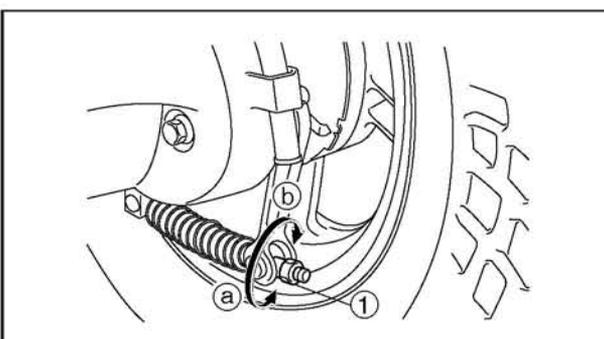
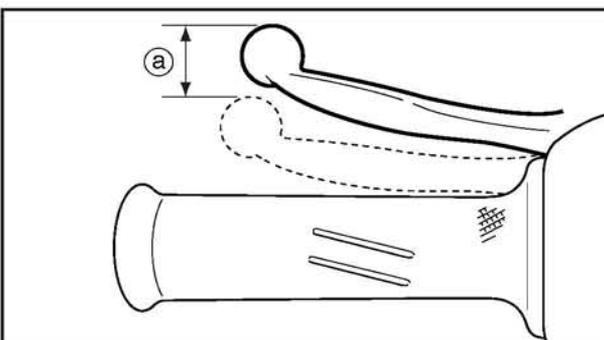


- a. Turn the adjusting nut (1) in direction (a) or (b) until the specified brake lever free play is obtained.

Direction (a)	Brake lever free play is increased.
Direction (b)	Brake lever free play is decreased.

CAUTION:

After adjusting the brake lever free play, make sure there is no brake drag.



EAS00114

ADJUSTING THE REAR BRAKE

1. Check:
 - brake lever free play (a)
 Out of specification → Adjust.



Brake lever free play
10~ 20mm(0.39~ 0.79in)

2. Adjust:
 - brake lever free play



- a. Turn the adjusting nut (1) in direction (a) or (b) until the specified brake lever free play is obtained.

Direction (a)	Brake lever free play is increased.
Direction (b)	Brake lever free play is decreased.

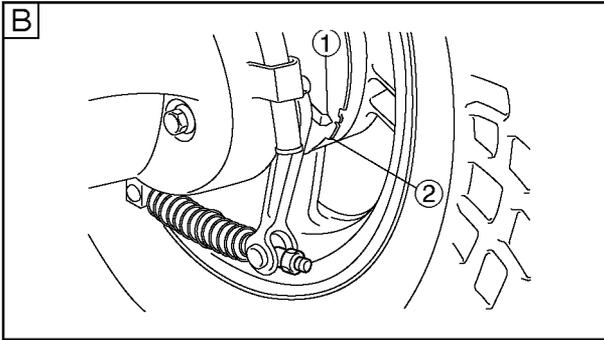
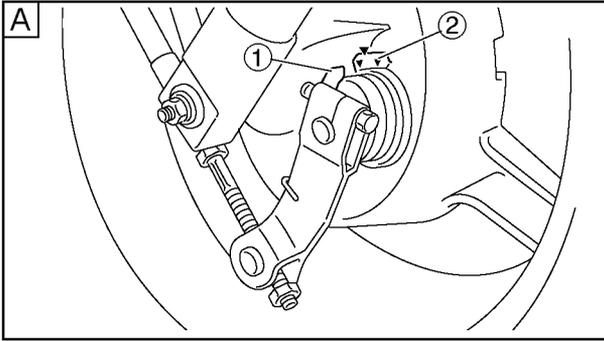
CAUTION:

After adjusting the brake lever free play, make sure there is no brake drag.



CHECKING THE FRONT AND REAR BRAKE SHOES

CHK
ADJ

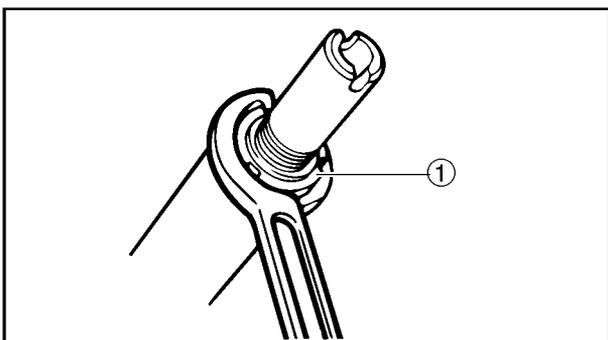
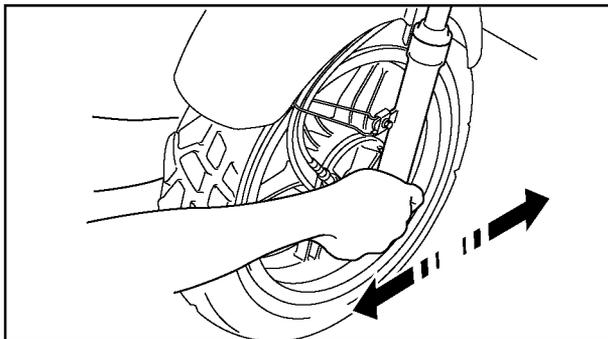
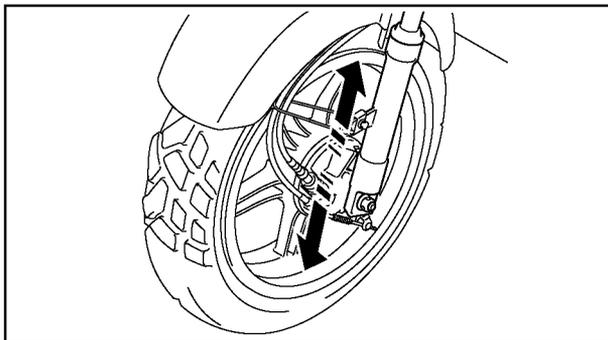


EAS00127

CHECKING THE FRONT AND REAR BRAKE SHOES

1. Operate the brake.
2. Check:
 - wear indicator ①
Reaches the wear limit line ② → Replace the brake shoes as a set.
Refer to “FRONT WHEEL AND BRAKE” and “REAR WHEEL AND BRAKE” in chapter 4.

- A** Front brake
B Rear brake



EAS00148

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the front wheel is elevated.

2. Check:
 - steering head
Grasp the bottom of the front fork legs and gently rock the front fork.
Binding/looseness → Adjust the steering head.
3. Remove:
 - front fork upper cover
 - front fork cover(left, right)
 - leg shield1,2
Refer to"LEG SHIELD1,2".
 - headlight stay bracket
Refer to"HANDLE BRACKET AND HEADLIGHT STAY BRACKET" in chapter 4.

4. Adjust:
 - steering head



- a. Loosen the steering nut ① and then tighten it to specification with the ring nut wrench.

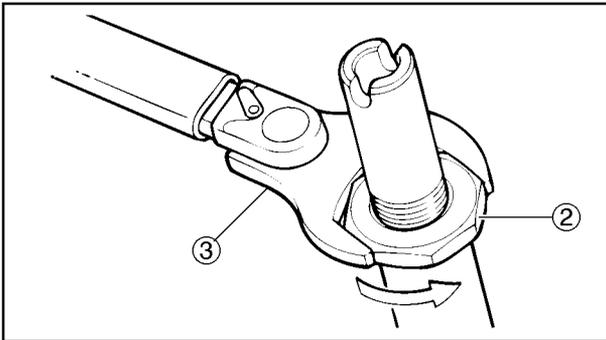
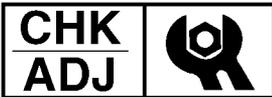
NOTE:

Set the torque wrench at a right angle to the steering nut wrench.



Ring nut wrench
90890-01268
YU-01268

CHECKING AND ADJUSTING THE STEERING HEAD



- b. Loosen the upper bearing inner race^② completely and then tighten it to specification with a steering nut wrench^③.

	Steering nut wrench 90890-01444 YM-A9409-7
---	---

⚠ WARNING

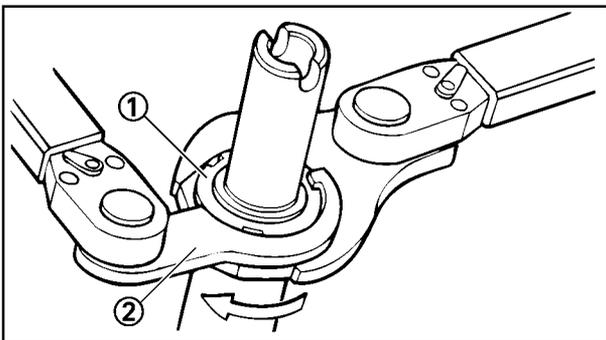
Do not overtighten the upper bearing inner race.

	Upper bearing inner race (final tightening torque) 7Nm (0.7m • kg, 5.1ft • lb)
---	--

- c. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the bearing race.

Refer to "STEERING HEAD" in chapter 4.

- d. Hold the upper bearing inner race with a steering nut wrench and tighten the steering nut^① with a steering nut wrench^②.



	Steering nut wrench 90890-01403 YU-A9472
---	---

	Steering nut 30Nm (3.0m • kg, 21.7ft • lb)
---	--



5. Install:
- headlight stay bracket
Refer to "HANDLE BRACKET AND HEADLIGHT STAY BRACKET" in chapter 4.
 - leg shield 1,2
 - front fork cover (left, right)
 - front fork upper cover
Refer to "LEG SHIELD 1,2".

EAS00151

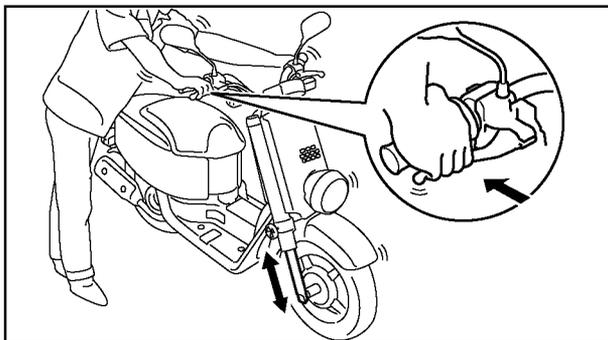
CHECKING THE FRONT FORK

1. Stand the scooter on a level surface.

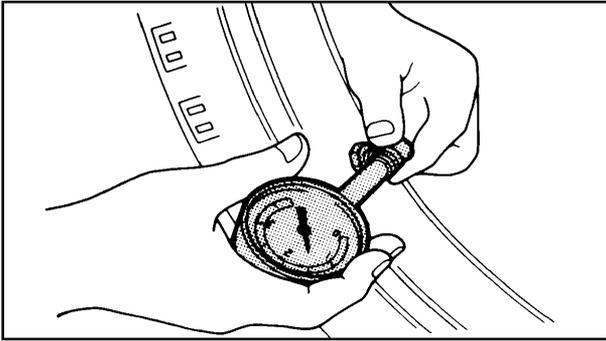
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

2. Check:
 - inner tube
Damage/scratches → Replace.
 - oil seal
Oil leakage → Replace.
3. Hold the scooter upright and apply the front
● brake.



4. Check:
 - front fork operation
Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
Rough movement → Repair.
Refer to "FRONT FORK" in chapter 4.



EAS00163

CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
 - tire pressure
 Out of specification → Regulate.

⚠ WARNING

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded scooter could cause tire damage, an accident or an injury.
- **NEVER OVERLOAD THE SCOOTER.**

Basic weight (with oil and a full fuel tank)	90 kg (198 lb)	
Maximum load*	175 kg (386 lb)	
Cold tire pressure	Front	Rear
Up to 55 kg	175 kPa (1.75 kgf/cm ² , 25 psi)	175 kPa (1.75 kgf/cm ² , 25 psi)
55 kg ~ 175 kg	175 kPa (1.75 kgf/cm ² , 25 psi)	175 kPa (1.75 kgf/cm ² , 25 psi)

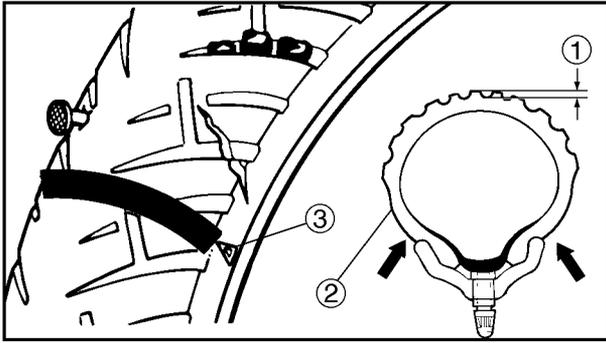
* Total weight of rider, passenger, cargo and accessories

⚠ WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

CHECKING THE TIRES

CHK
ADJ



2. Check:
- tire surfaces
Damage/wear → Replace the tire.

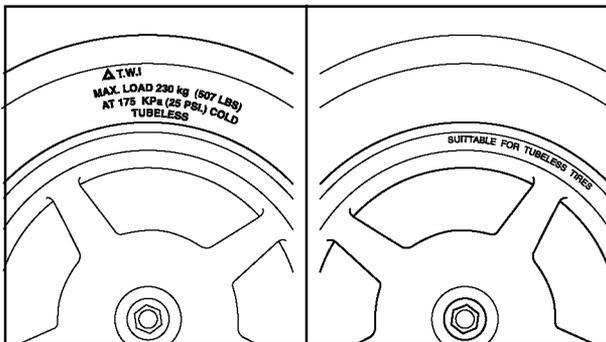


Minimum tire tread depth
0.8mm(0.03in)

- ① Tire tread depth
- ② Sidewall
- ③ Wear indicator

⚠ WARNING

- Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.
- When using tube tires, be sure to install the correct tube.
- Always replace a new tube tire and a new tube as a set.
- To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.



- A Tire
- B Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

- After extensive tests, the tires listed below have been approved by Yamaha Motor Taiwan Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this scooter.

Front tire

Manufacturer	Model	Size
CHENG SHIN	C6022	120/90-10 57J

Rear tire

Manufacturer	Model	Size
CHENG SHIN	C6022	120/90-10 57J

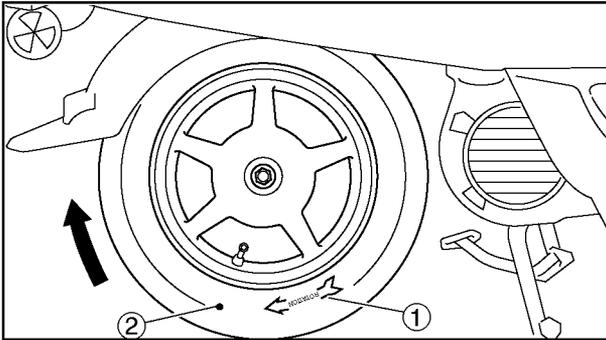
**⚠ WARNING**

New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

NOTE:

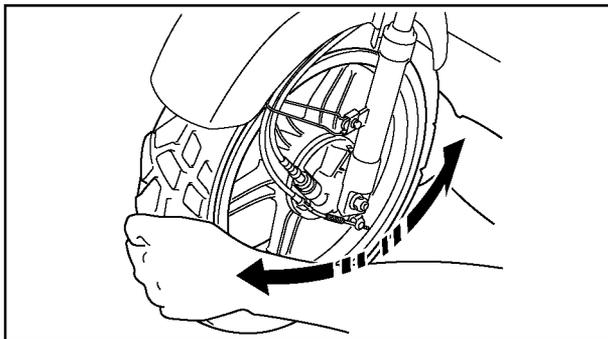
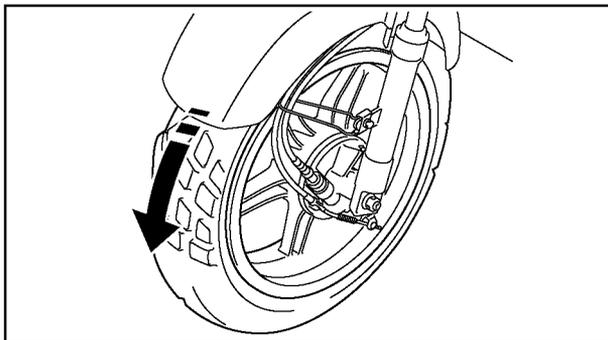
For tires with a direction of rotation mark ①:

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ② with the valve installation point.



CHECKING THE WHEELS/ CHECKING AND LUBRICATING THE CABLES

CHK
ADJ



EAS00168

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
 - wheel
Damage/out-of-round → Replace.

⚠ WARNING

Never attempt to make any repairs to the wheel.

NOTE:

After a tire or wheel has been changed or replaced, always balance the wheel.

EAS00170

CHECKING AND LUBRICATING THE CABLES

The following procedure applies to all of the inner and outer cables.

⚠ WARNING

Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
 - outer cable
Damage → Replace.
2. Check:
 - cable operation
Rough movement → Lubricate.



Recommended lubricant
Engine oil or a suitable cable
lubricant

NOTE:

Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.

LUBRICATING THE LEVERS AND PEDALS/ LUBRICATING THE CENTERSTAND

CHK
ADJ



EAS00171

LUBRICATING THE LEVERS AND PEDALS

Lubricate the pivoting point and metal-to-metal moving parts of the levers and pedals.



Recommended lubricant
Lithium-soap-based grease

EAS00173

LUBRICATING THE CENTERSTAND

Lubricate the pivoting point and metal-to-metal moving parts of the centerstand.



Recommended lubricant
Lithium-soap-based grease

BATTERY INSTRUCTION

This is a sealed type 12 volt battery. No liquid level inspection is ever needed and no refilling water will be required.

IMPORTANT:

- Never interfere with the sealed state of the battery.
- Check the charging condition with a voltmeter (Normal charging voltage should be above 12.8V).
- This battery may be installed in a vehicle only if it replaces a similar sealed type battery.


FLAMMABLES


SHIELD EYES


KEEP OUT OF THE REACH OF CHILDREN


CORROSION OF SULFURIC ACID


READ INSTRUCTION WORKING CAREFULLY


EXPLOSIVE

⚠ DANGER

- Do not use at the places near fire. Hydrogen gas generated from battery may cause fire and explosion.
- This 12V battery is only for starting engine. Do not apply for other uses.
- Keep out of the reach of children or the personnel who do not understand the manual. It may cause blindness or severe burn.
- When using the battery, wear safety glasses and rubber gloves. Sulfuric acid may cause blindness or severe burn.

EAS00179

ELECTRICAL SYSTEM**CHECKING AND CHARGING THE BATTERY****⚠ WARNING**

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

**FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL**

- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL

- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

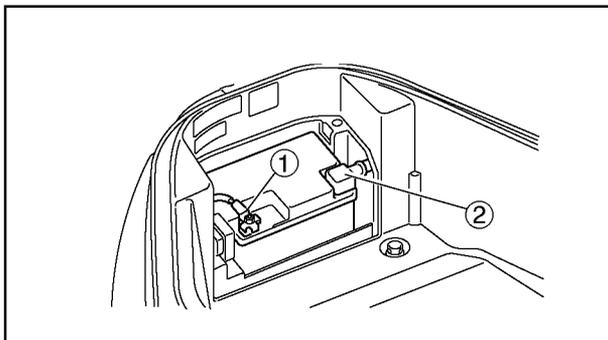
CAUTION:

- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.

NOTE: _____

Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
 - battery cover
Refer to "SIDE COVERS AND TAIL/ BRAKE LIGHT".



2. Disconnect:
 - battery leads
(from the battery terminals)

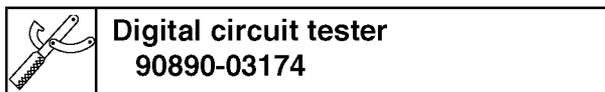
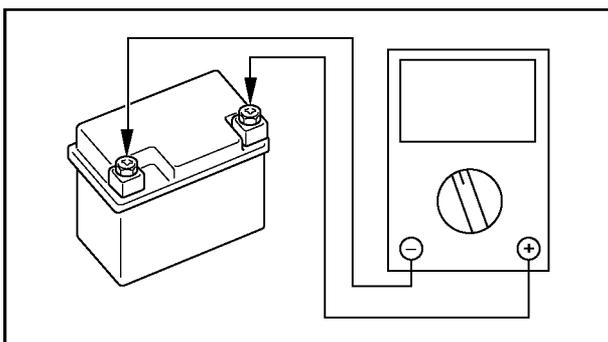
CAUTION: _____

First, disconnect the negative battery lead ①, and then the positive battery lead ②.

3. Remove:
 - battery
4. Check:
 - battery charge



- a. Connect a digital circuit tester to the battery terminals.



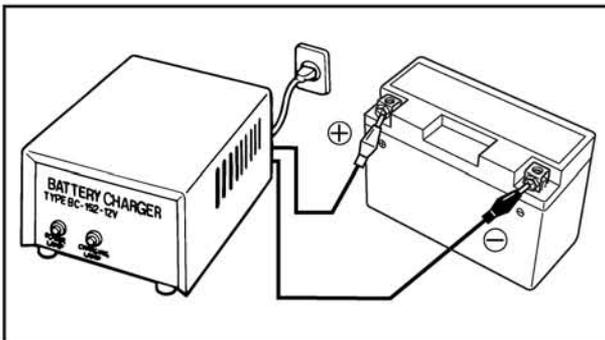
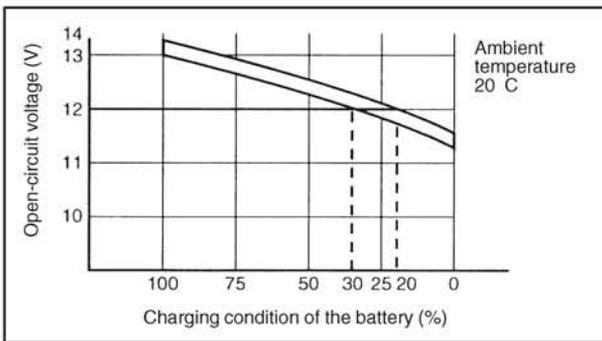
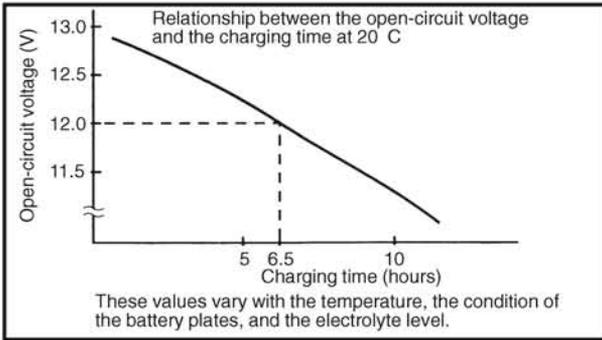
Positive tester probe → positive battery terminal
Negative tester probe → negative battery terminal

NOTE: _____

- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

CHECKING AND CHARGING THE BATTERY

CHK
ADJ



- b. Check the charge of the battery, as shown in the charts and the following example.

Example

- c. Open-circuit voltage = 12.0 V
- d. Charging time = 6.5 hours
- e. Charge of the battery = 20 ~ 30%



5. Charge:
- battery (refer to the appropriate charging method illustration)

⚠ WARNING

Do not quick charge a battery.

CAUTION:

- Never remove the MF battery sealing caps.
- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the scooter. (If charging has to be done with the battery mounted on the scooter, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.

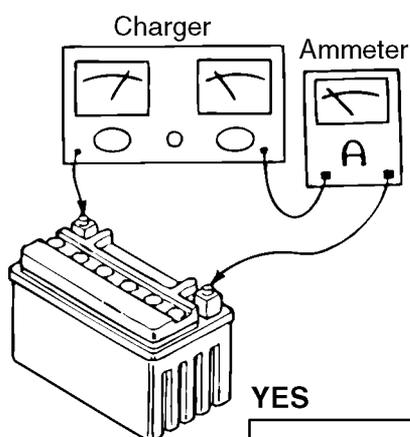


- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
 - If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
 - As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.
-

CHECKING AND CHARGING THE BATTERY



Charging method using a variable-current (voltage) charger



Measure the open-circuit voltage prior to charging.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

NOTE:
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

NOTE:
Set the charging voltage to 16-17 V. (If the charging voltage is lower charging will be insufficient, if it is higher, the battery will be over-charged.)

NO

YES

NO

Adjust the voltage to obtain the standard charging amperage.

Adjust the charging voltage to 20 ~ 25V.

Monitor the amperage for 3 ~ 5 minutes. Is the standard charging amperage exceeded?

YES

NO

Set the timer to the charging time determined by the open-circuit voltage. Refer to "CHECKING AND CHARGING THE BATTERY".

If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.

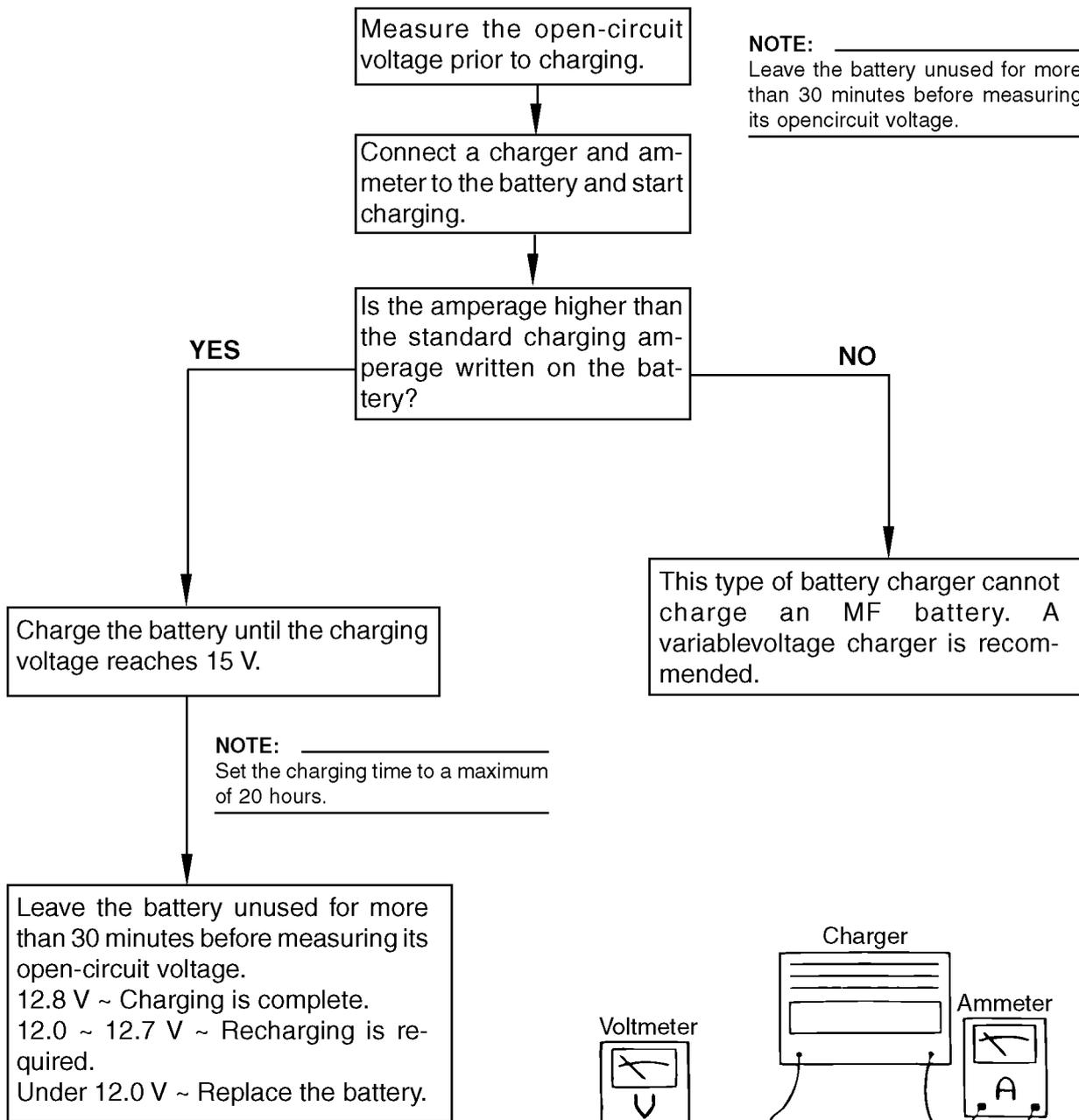
If the required charging time exceeds 5 hours, it is advisable to check the charging amperage after 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging amperage.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.
12.8 V ~ Charging is complete.
12.0 ~ 12.7 V ~ Recharging is required.
Under 12.0 V ~ Replace the battery.

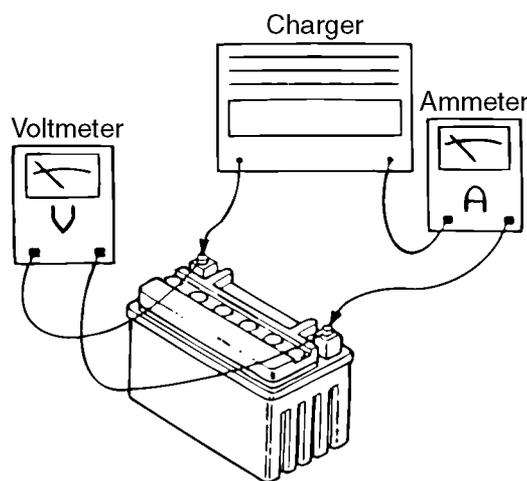
CHECKING AND CHARGING THE BATTERY



Charging method using a constant voltage charger

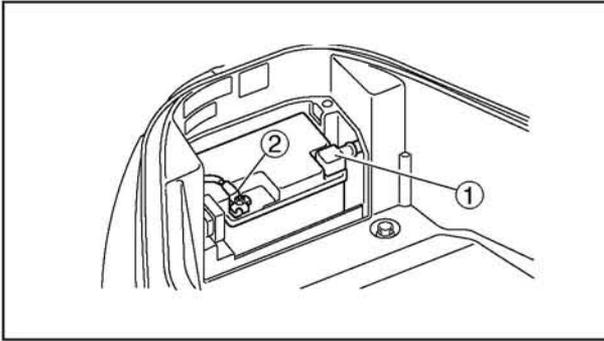


CAUTION: Constant amperage chargers are not suitable for charging MF batteries.



CHECKING AND CHARGING THE BATTERY/ CHECKING THE FUSE

CHK
ADJ



6. Install:
 - battery
7. Connect:
 - battery leads
(to the battery terminals)

CAUTION:

- First, connect the positive battery lead 1, and then the negative battery lead 2.
- After installing the battery, be sure to turn the main switch from "ON" to "OFF" three times in 3 seconds intervals to initialize the idle speed control system.

8. Check:
 - battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.
9. Lubricate:
 - battery terminals



Recommended lubricant
Dielectric grease

10. Install:
 - battery cover
Refer to "SIDE COVERS AND TAIL/
BRAKE LIGHT".

EAS00181

CHECKING THE FUSE

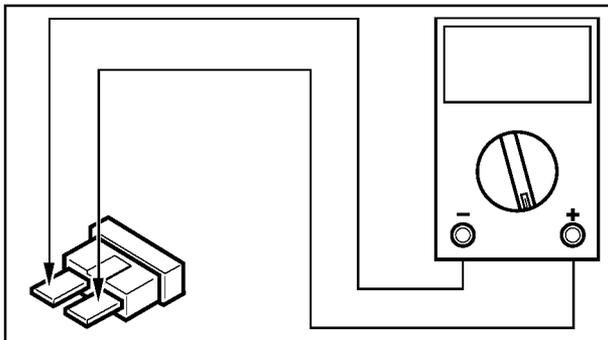
The following procedure applies to all of the fuse.

CAUTION:

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

1. Remove:
 - battery cover
Refer to "SIDE COVERS AND TAIL/
BRAKE LIGHT".

CHECKING THE FUSE



2. Check:

- fuse



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

NOTE:

Set the pocket tester selector to " $\Omega \times 1$ ".



Pocket tester

90890-03112(YU-03112-C)

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



3. Replace:

- blown fuse



- Set the main switch to "OFF".
- Install a new fuse of the correct amperage rating.
- Set on the switches to verify if the electrical circuit is operational.
- If the fuse immediately blows again, check the electrical circuit.

Fuse	Amperage rating	Q'ty
Main	15A	1

! WARNING

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

CAUTION:

After removing and installing the main fuse, be sure to turn the main switch from "ON" to "OFF" three times in 3 seconds intervals to initialize the idle speed control system.



4. Install:

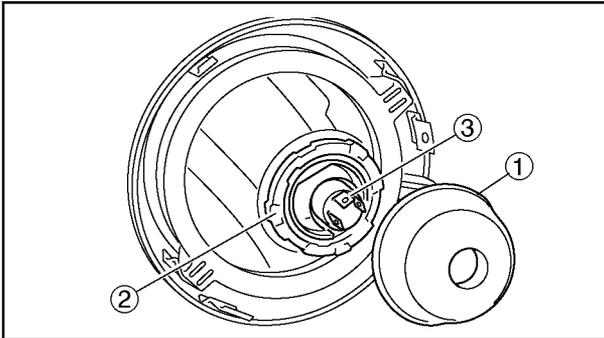
- battery cover

Refer to "SIDE COVERS AND TAIL/ BRAKE LIGHT".

EAS00182

REPLACING THE HEADLIGHT BULB

1. Remove:
 - headlight unit



2. Disconnect:
 - headlight lead coupler
3. Remove:
 - dust boot ①
 - headlight bulb holder ②
 - headlight bulb ③

⚠ WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

4. Install:
 - headlight bulb **New**
 - Secure the new headlight bulb with the headlight bulb holder.

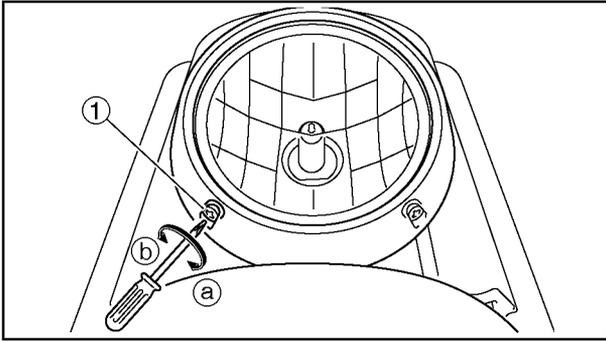
CAUTION:

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

5. Install :
 - headlight bulb holder
6. Install:
 - dust boot
7. Connect:
 - headlight lead coupler
8. Install:
 - headlight unit

ADJUSTING THE HEADLIGHT BEAM

CHK
ADJ



EAS00184

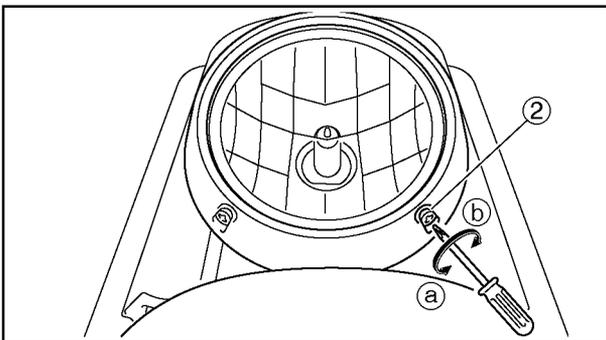
ADJUSTING THE HEADLIGHT BEAM

- Adjust:
headlight beam (vertically)



- Turn the adjusting screw ① in direction ① or ②.

Direction ①	Headlight beam is raised.
Direction ②	Headlight beam is lowered.



- Adjust:
headlight beam (horizontally)



- Turn the adjusting screw ② in direction ① or ②.

Direction ①	Headlight beam moves to the right.
Direction ②	Headlight beam moves to the left.



**CHAPTER 4
CHASSIS**

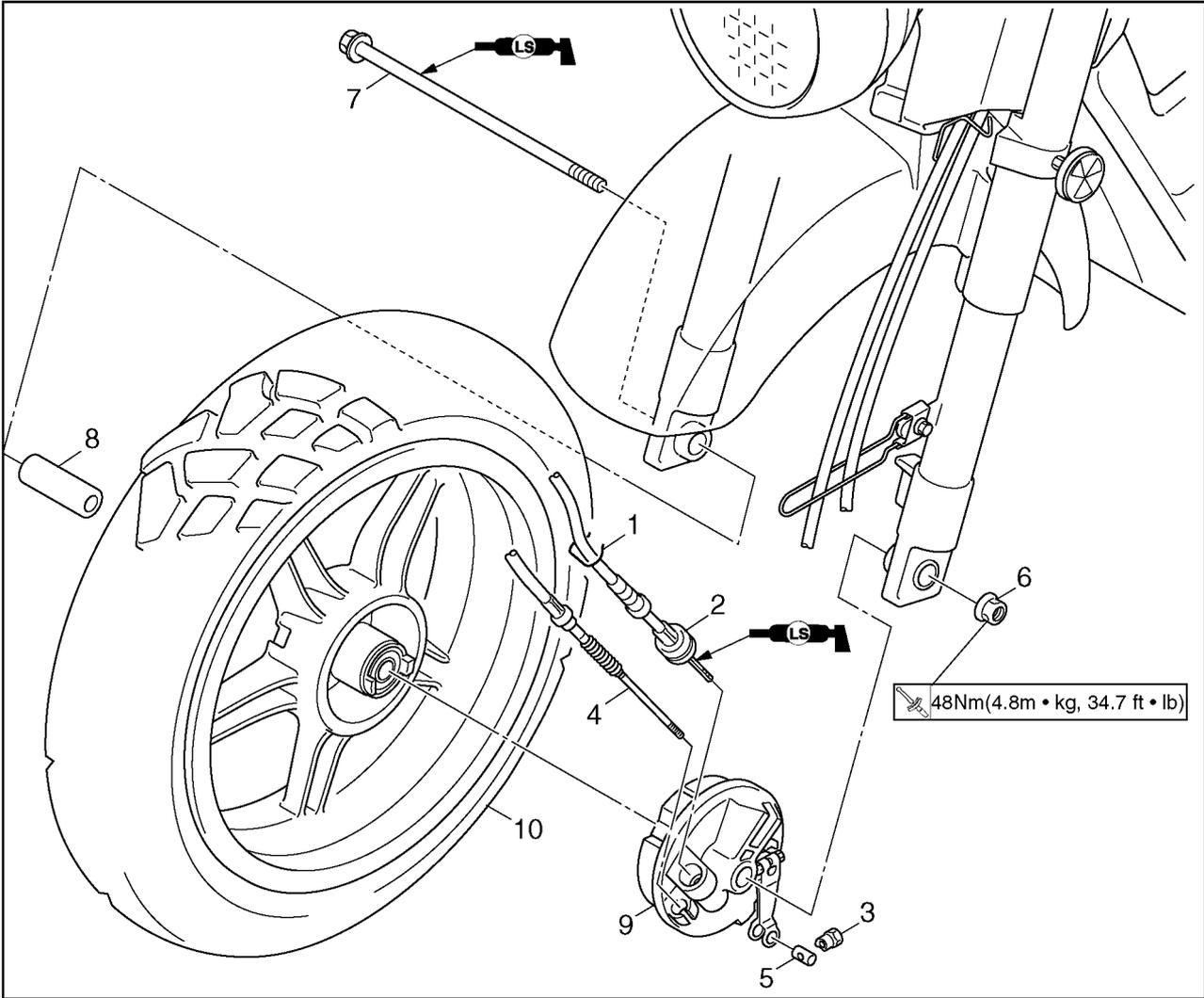
FRONT WHEEL AND BRAKE	4-1
FRONT WHEEL	4-2
FRONT BRAKE SHOE PLATE	4-3
REMOVING THE FRONT WHEEL	4-4
DISASSEMBLING THE BRAKE SHOE PLATE	4-4
CHECKING THE FRONT WHEEL	4-5
CHECKING THE SPEEDOMETER GEAR UNIT	4-6
CHECKING THE BRAKE	4-7
ASSEMBLING THE BRAKE SHOE PLATE	4-8
ASSEMBLING THE FRONT WHEEL	4-9
INSTALLING THE FRONT WHEEL	4-10
ADJUSTING THE FRONT WHEEL STATIC BALANCE	4-11
REAR WHEEL AND BRAKE	4-13
REMOVING THE REAR WHEEL	4-14
CHECKING THE REAR WHEEL	4-14
CHECKING THE REAR WHEEL DRIVE HUB	4-15
CHECKING THE BRAKE	4-15
ASSEMBLING THE BRAKE SHOE PLATE	4-16
INSTALLING THE REAR WHEEL	4-18
ADJUSTING THE REAR WHEEL STATIC BALANCE	4-18
FRONT FORK	4-19
REMOVING THE FRONT FORK LEGS	4-21
DISASSEMBLING THE FRONT FORK LEGS	4-21
CHECKING THE FRONT FORK LEGS	4-23
ASSEMBLING THE FRONT FORK LEGS	4-24
INSTALLING THE FRONT FORK LEGS	4-26
HANDLEBAR	4-27
REMOVING THE HANDLEBAR	4-29
CHECKING THE HANDLEBAR	4-29
INSTALLING THE HANDLEBAR	4-30
STEERING HEAD	4-32
HANDLEBAR BRACKET AND HEADLIGHT STAY BRACKET	4-32
LOWER BRACKET	4-33
REMOVING THE LOWER BRACKET	4-34
CHECKING THE STEERING HEAD	4-35
INSTALLING THE STEERING HEAD	4-36

REAR SHOCK ABSORBER ASSEMBLY	4-37
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY	4-38
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY	4-38
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY	4-39

EAS00517

CHASSIS

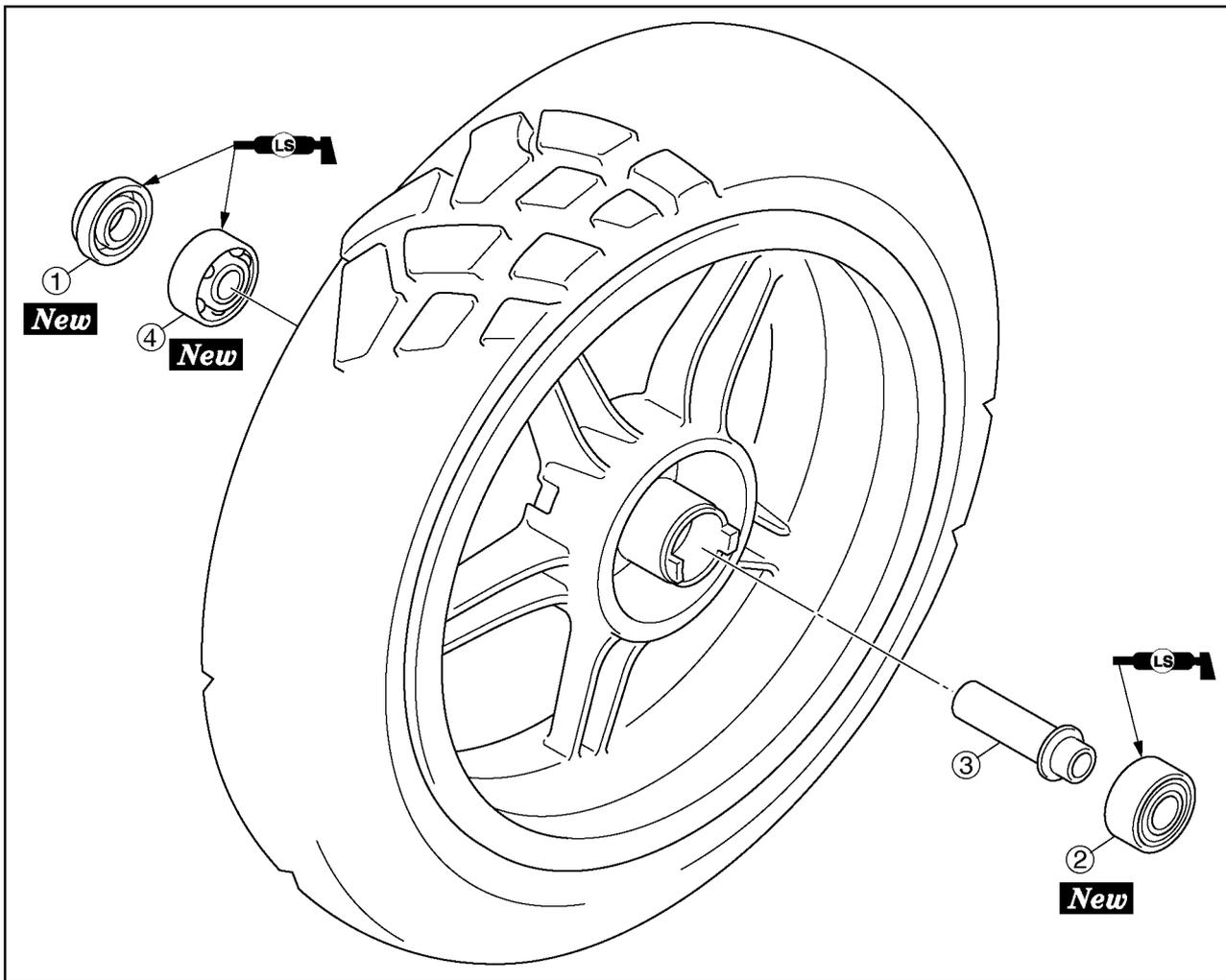
FRONT WHEEL AND BRAKE



Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake		Remove the parts in the order listed. NOTE: _____ Place the scooter on a suitable stand so that the front wheel is elevated.
1	Stop ring	1	Refer to "REMOVING THE FRONT WHEEL and INSTALLING THE FRONT WHEEL".
2	Speedometer cable	1	
3	Brake adjuster	1	
4	Front brake cable	1	
5	Adjusting pin	1	
6	Wheel axle nut	1	
7	Wheel axle	1	
8	Collar	1	
9	Front brake shoe plate	1	
10	Front wheel	1	
			For installation, reverse the removal procedure.

EAS00518

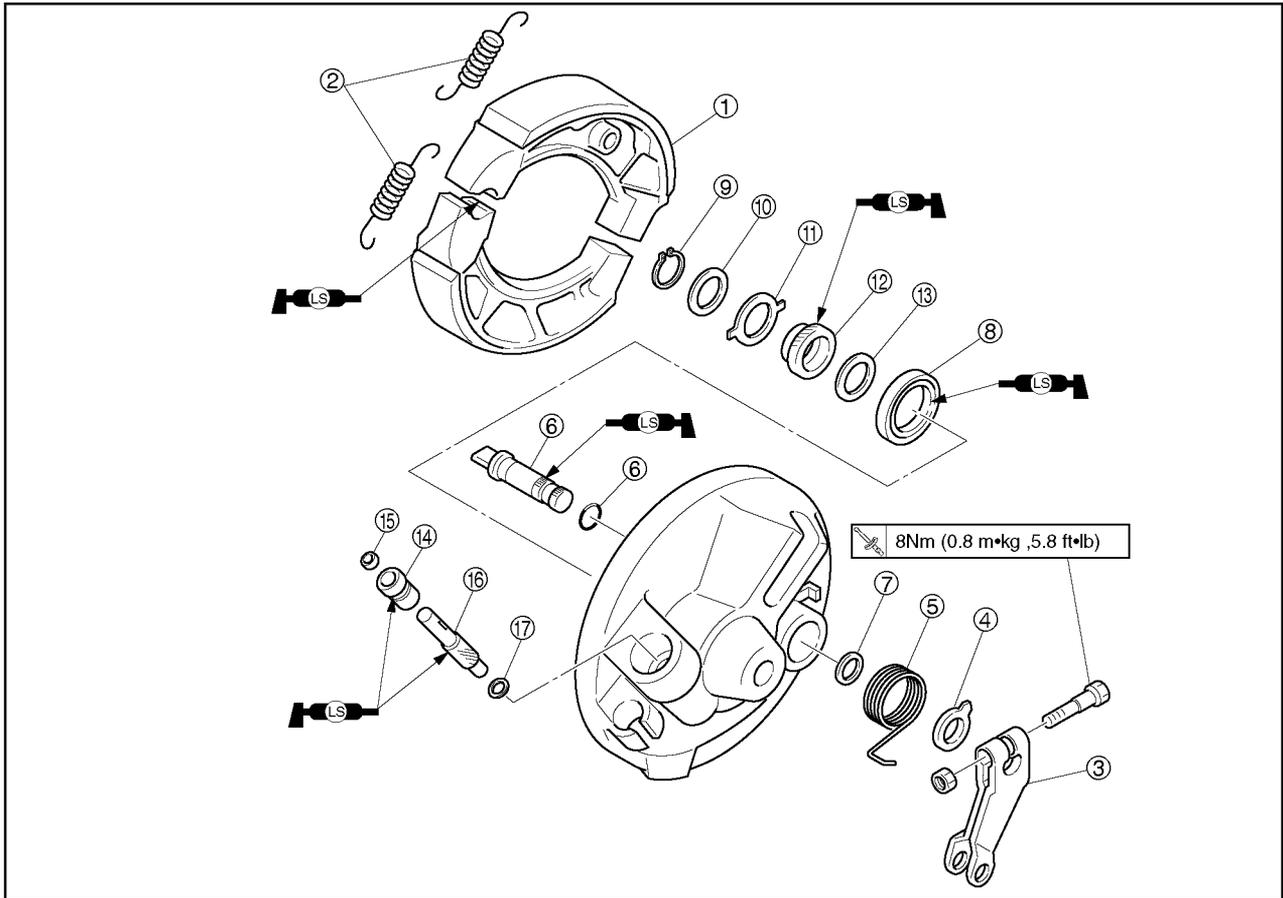
FRONT WHEEL



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Remove the parts in the order listed.
①	Oil seal	1	
②	Bearing	1	
③	Spacer	1	
④	Bearing	1	
			For assembly, reverse the disassembly procedure.



FRONT BRAKE SHOE PLATE



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake shoe plate		Remove the parts in the order listed.
①	Brake shoe kit	1	Refer to "DISASSEMBLING THE BRAKE SHOE PLATE" and "ASSEMBLING THE BRAKE SHOE PLATE".
②	Tension spring	2	
③	Camshaft lever	1	
④	Brake shoe wear indicator	1	
⑤	Return spring	1	
⑥	Brake camshaft/O-ring	1/1	
⑦	Oil seal	1	
⑧	Oil seal	1	
⑨	Circlip	1	
⑩	Plate washer	1	
⑪	Speedometer clutch	1	
⑫	Speedometer drive gear	1	
⑬	Plate washer	1	
⑭	Bushing	1	
⑮	Oil seal	1	
⑯	Speedometer driven gear	1	
⑰	Plate washer	1	
			For assembly, reverse the disassembly procedure.



EAS00520

REMOVING THE FRONT WHEEL

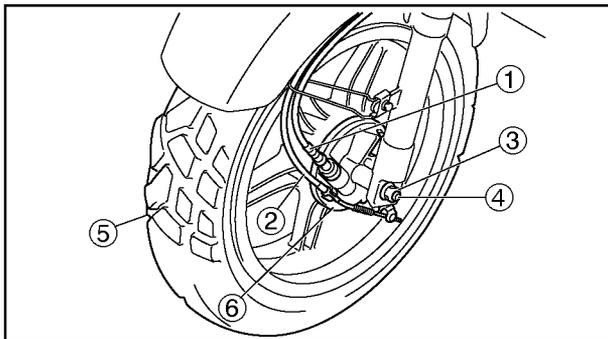
1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the front wheel is elevated.



2. Remove:

- speedometer cable①
- front brake cable②
- front wheel axle nut③
- front wheel axle④
- collar
- front wheel⑤
- front brake shoe plate⑥

EAS00524

DISASSEMBLING THE BRAKE SHOE PLATE

1. Remove:

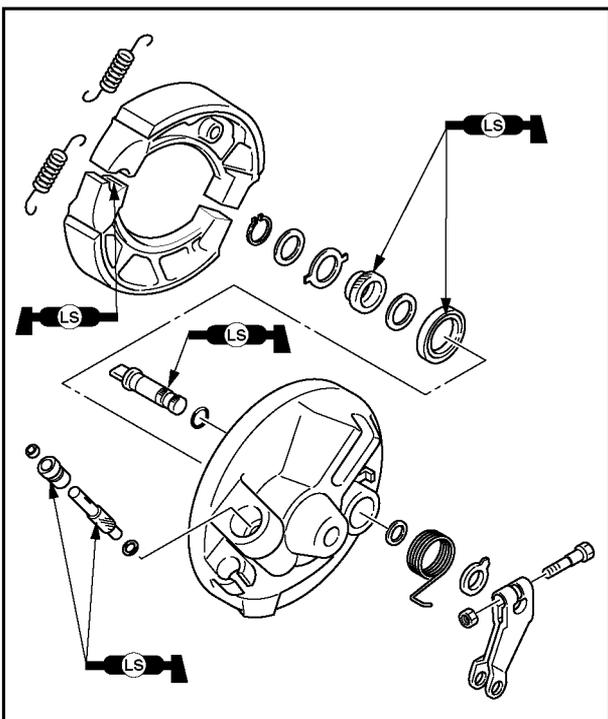
- front brake shoe kit
- camshaft lever
- brake shoe wear indicator
- return spring
- brake camshaft

2. Remove:

- circlip
- plate washer
- speedometer clutch
- speedometer drive gear
- plate washer

3. Remove:

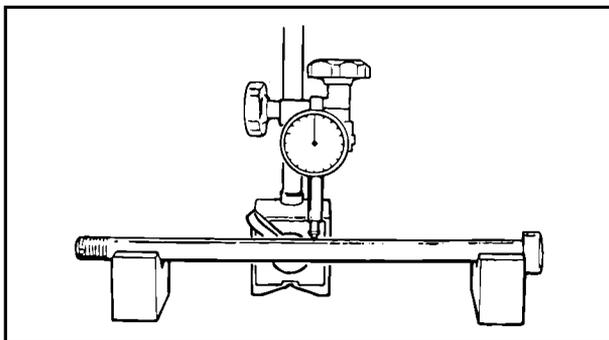
- bushing
(with the special tool)
- speedometer driven gear
- plate washer



Meter gear bush tool
90890-01052

NOTE:

Remove the bushing from the brake shoe plate with the meter gear bush tool.



EAS00525

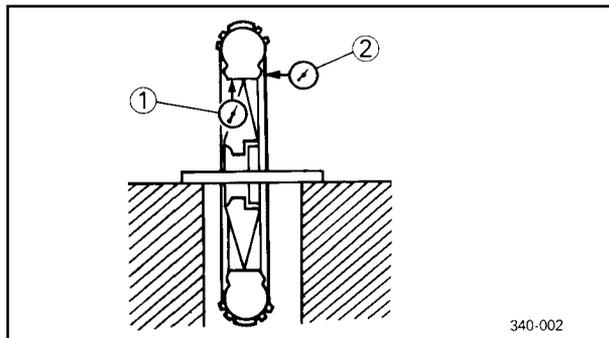
CHECKING THE FRONT WHEEL

1. Check:
 - wheel axle
 Roll the wheel axle on a flat surface.
 Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent wheel axle.

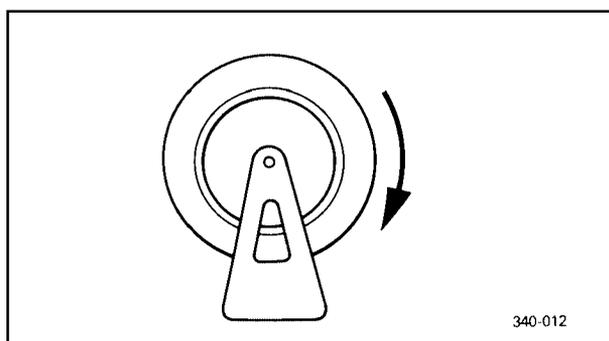
2. Check:
 - tire
 - front wheel
 Damage/wear → Replace.
 Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.



340-002

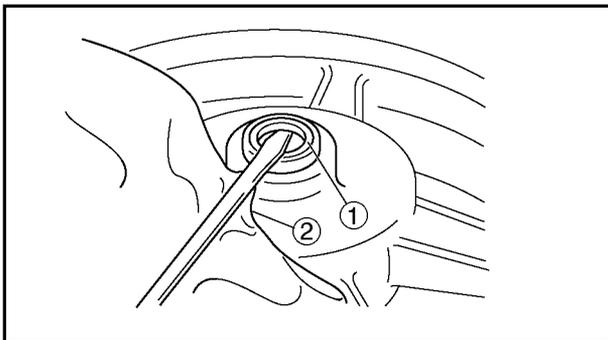
3. Measure:
 - radial wheel runout ①
 - lateral wheel runout ②
 Over the specified limits → Replace.

	Radial wheel runout limit
	1.0 mm (0.04 in)
	Lateral wheel runout limit
	1.0 mm(0.04 in)



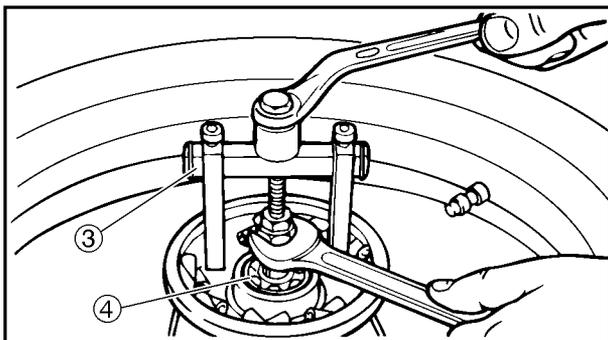
340-012

4. Check:
 - wheel bearings
 Front wheel turns roughly or is loose → Replace the wheel bearings.
 - oil seal
 Damage/wear → Replace.
5. Replace:
 - wheel bearings **New**
 - oil seal **New**



- a. Clean the outside of the front wheel hub.
- b. Remove the oil seal ① with a flat-head screwdriver.

NOTE: _____
 To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.

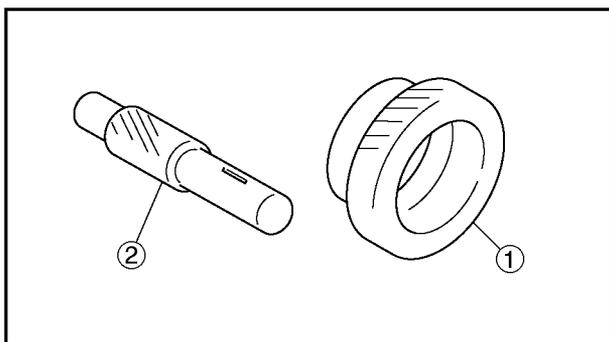


- c. Remove the wheel bearings ④ with a general bearing puller ③.
- d. Install the new wheel bearings and oil seal in the reverse order of disassembly.

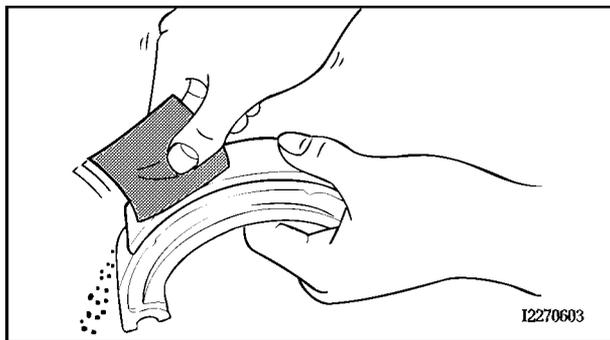
EAS00535

CHECKING THE SPEEDOMETER GEAR UNIT

1. Check:
 - speedometer clutch
 - Bends/damage/wear → Replace.



2. Check:
 - speedometer drive gear ①
 - speedometer driven gear ②
 - Damage/wear → Replace.



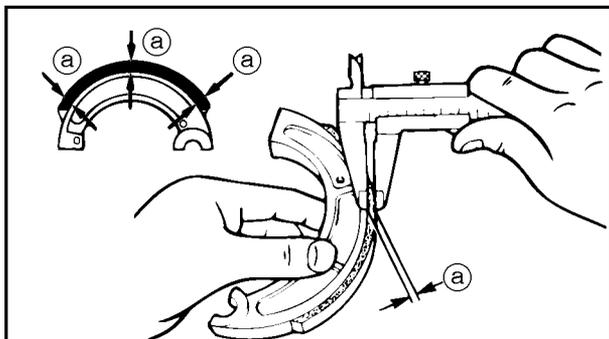
EAS00536

CHECKING THE BRAKE

The following procedure applies to all of the brake shoes.

1. Check:
 - brake shoe lining
 - Glazed areas → Repair.
 - Sand the glazed areas with course sand-paper.

NOTE: _____
 After sanding the glazed areas, clean the brake shoe with a cloth.

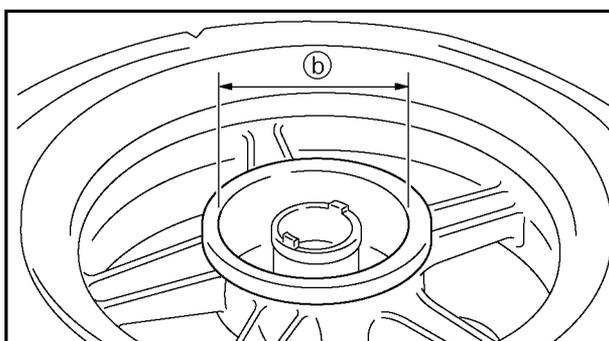


2. Measure:
 - brake shoe lining thickness (a)
 - Out of specification → Replace.

	Brake shoe lining thickness limit (minimum) 2.0 mm (0.08 in)
--	--

⚠ WARNING _____
 Do not allow oil or grease to contact the brake shoes.

NOTE: _____
 Replace the brake shoes as a set, if either is worn to the wear limit.



3. Measure:
 - brake drum inside diameter (b)
 - Out of specification → Replace the wheel.

	Brake drum inside diameter limit (maximum) 110.5 mm (4.35 in)
--	---



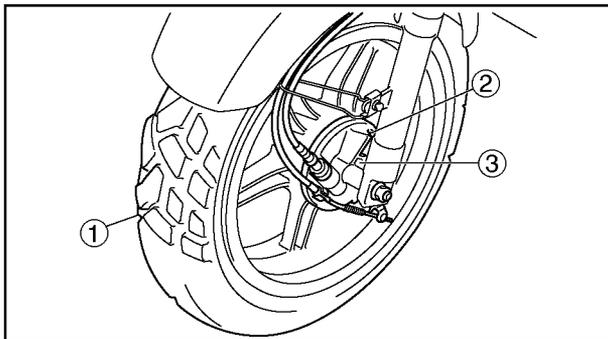
EAS00540

INSTALLING THE FRONT WHEEL

1. Lubricate:
 - wheel axle
 - wheel bearings
 - oil seal lips
 - speedometer drive gear
 - speedometer driven gear



Recommended lubricant
Lithium-soap-based grease



2. Install:
 - front wheel ①

NOTE: _____

Make sure the slot ② in the brake shoe plate fits over the stopper ③ on the outer tube.

3. Tighten:
 - wheel axle nut



48 Nm (4.8 m • kg, 34.7 ft • lb)

⚠ WARNING _____

Make sure the brake cable is routed properly.

CAUTION: _____

Before tightening the wheel axle nut, push down hard on the handlebar several times and check if the front fork rebounds smoothly.

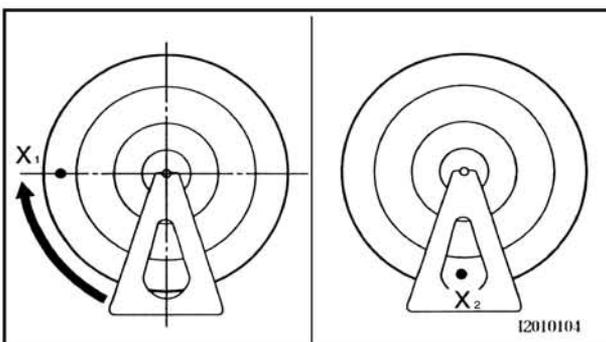
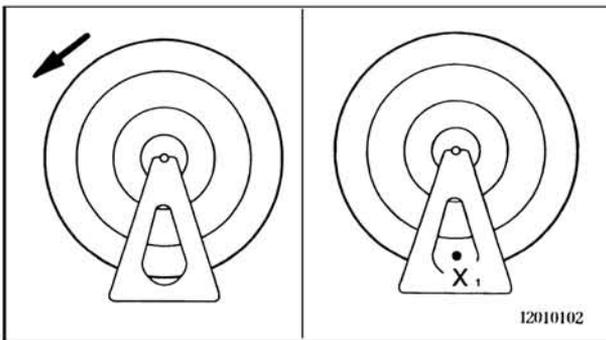
EAS00548

ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:

- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

1. Remove:
 - balancing weight(s)

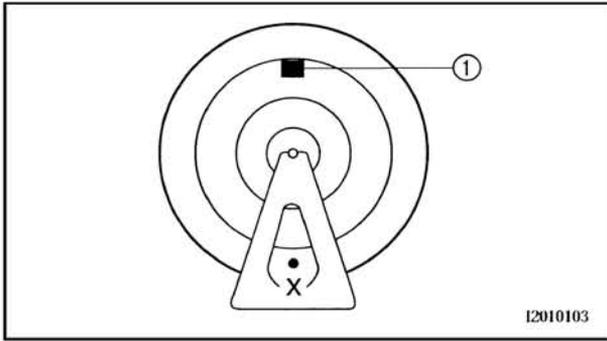


2. Find:
 - front wheel's heavy spot

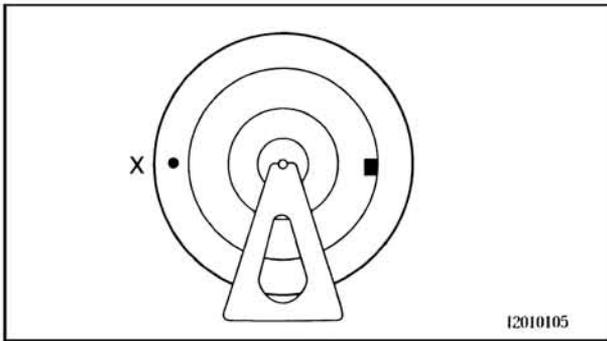
NOTE:

Place the front wheel on a suitable balancing stand.

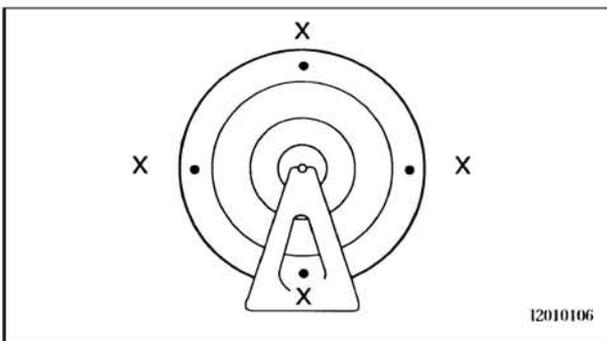
- a. Spin the front wheel.
- b. When the front wheel stops, put an "X₁" mark at the bottom of the wheel.
- c. Turn the front wheel 90° so that the "X₁" mark is positioned as shown.
- d. Release the front wheel.
- e. When the wheel stops, put an "X₂" mark at the bottom of the wheel.
- f. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".



12010103



12010105



12010106

3. Adjust:
- front wheel static balance



- a. Install a balancing weight ① onto the rim exactly opposite the heavy spot "X".

NOTE: _____
Start with the lightest weight.

- b. Turn the front wheel 90° so that the heavy spot is positioned as shown.
c. If the heavy spot does not stay in that position, install a heavier weight.
d. Repeat steps (b) and (c) until the front wheel is balanced.



4. Check:
- front wheel static balance

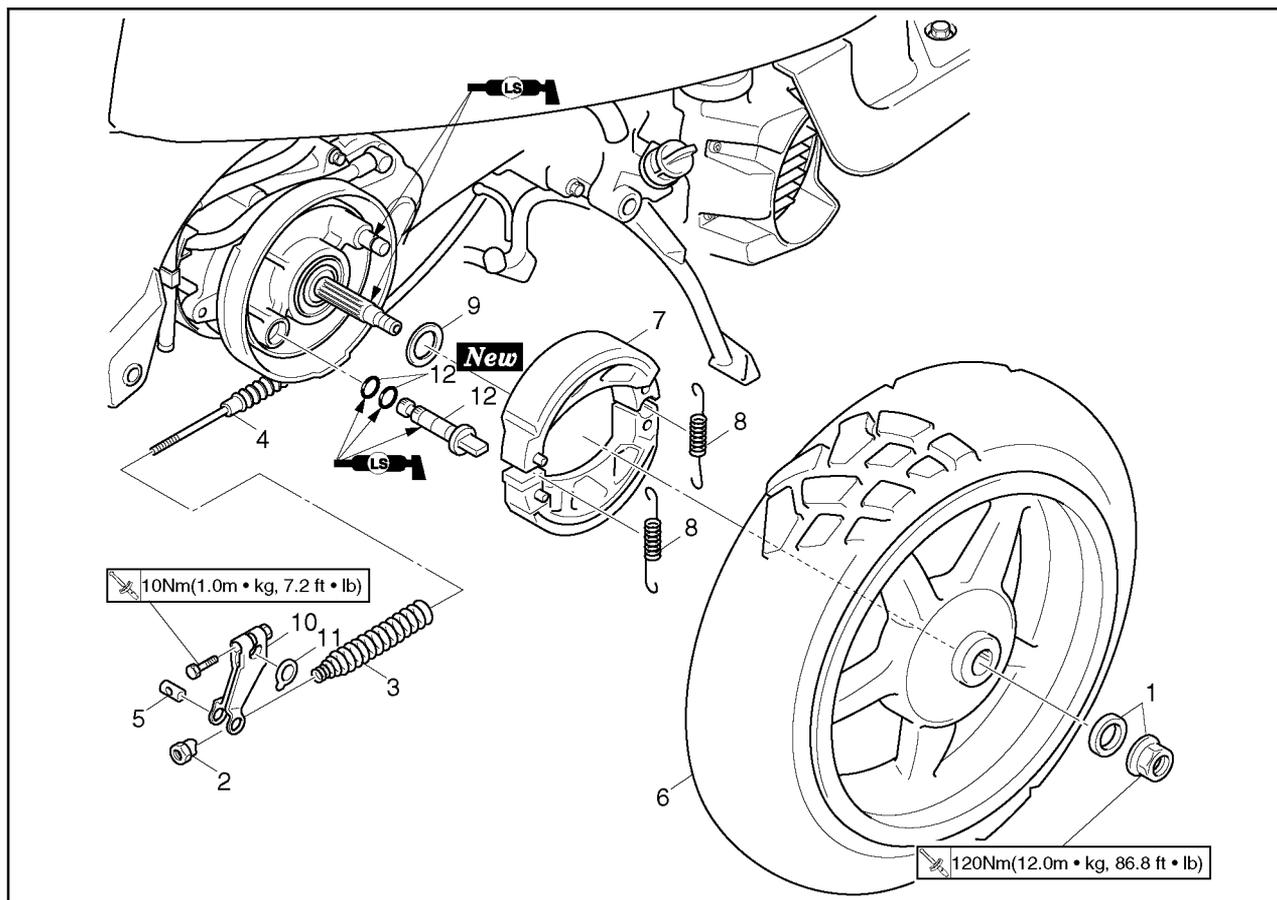


- a. Turn the front wheel and make sure it stays at each position shown.
b. If the front wheel does not remain stationary at all of the positions, rebalance it.



EAS00555

REAR WHEEL AND BRAKE



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel and brake		Remove the parts in the order listed. NOTE: _____ Place the scooter on a suitable stand so that the front wheel is elevated. _____
	Muffler		Refer to "ENGINE REMOVAL" in chapter 5.
1	Self lock nut/Plate washer	1/1	
2	Brake adjuster	1	
3	Spring	1	
4	Rear brake cable	1	Disconnect.
5	Adjusting pin	1	
6	Rear wheel	1	
7	Brake shoe kit	1	
8	Tension spring	2	
9	Plate washer	1	
10	Camshaft lever	1	
11	Indicator plate	1	
12	Brake camshaft/O-ring	1/2	For installation, reverse the removal procedure.



EAS00564

REMOVING THE REAR WHEEL

1. Stand the scooter on a level surface.

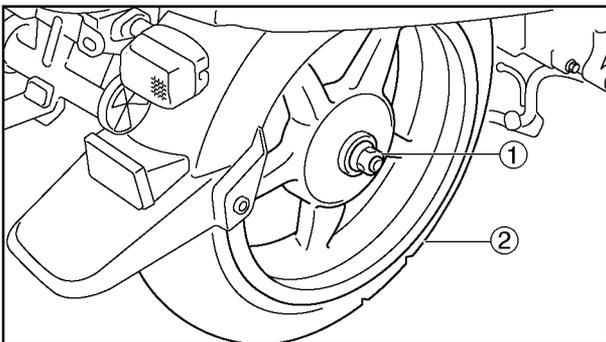
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the rear wheel is elevated.

2. Remove:
 - muffler
Refer to "ENGINE REMOVAL" in chapter 5.
3. Loosen:
 - brake adjuster



4. Remove:
 - wheel axle nut ①
 - plate washer
 - rear wheel ②

EAS00565

CHECKING THE REAR WHEEL

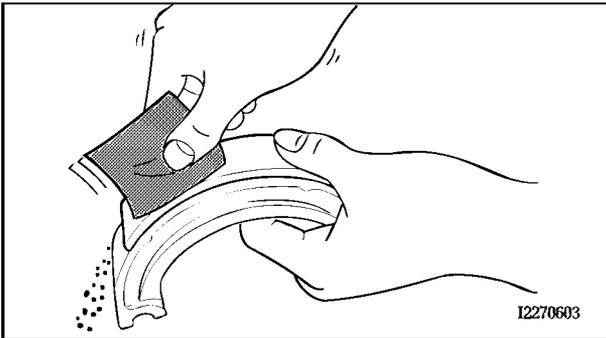
1. Check:
 - tire
 - rear wheel
Damage/wear → Replace.
Refer to "CHECKING THE TIRES "and" CHECKING THE WHEELS" in chapter 3.
2. Measure:
 - radial wheel runout
 - lateral wheel runout
Refer to "CHECKING THE FRONT WHEEL".



EAS00567

CHECKING THE REAR WHEEL DRIVE HUB

1. Check:
 - rear wheel drive hub
Cracks/damage → Replace.



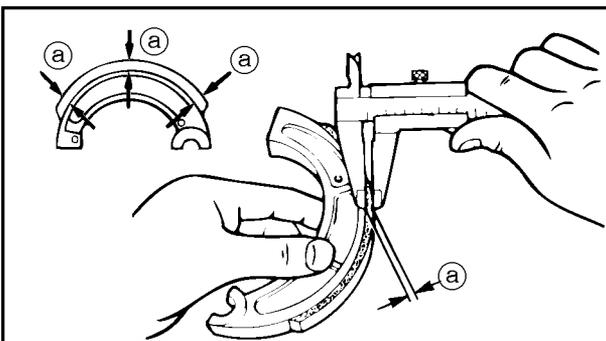
EAS00569

CHECKING THE BRAKE

The following procedure applies to all of the brake shoes.

1. Check:
 - brake shoe lining
Glazed areas → Repair.
Sand the glazed areas with course sand-paper.

NOTE: _____
After sanding the glazed areas, clean the brake shoe with a cloth.

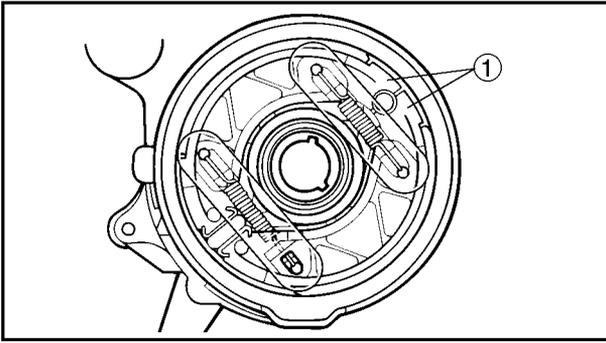


2. Measure:
 - brake shoe lining thickness (a)
Out of specification → Replace.

	Brake shoe lining thickness limit (minimum) 2.0 mm(0.08 in)
--	---

! WARNING _____
Do not allow oil or grease to contact the brake shoes.

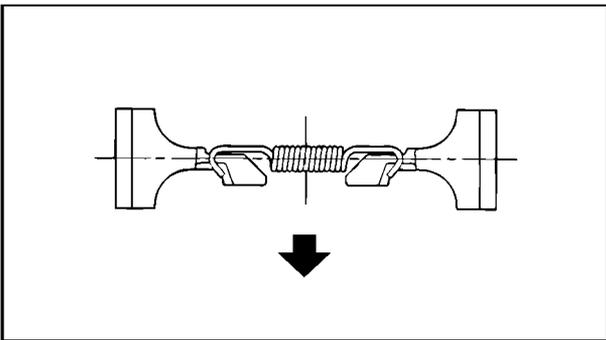
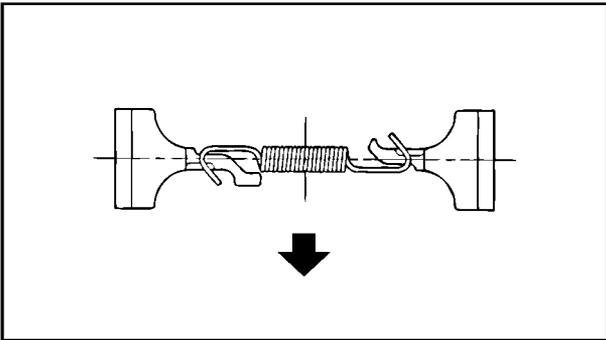
NOTE: _____
Replace the brake shoes as a set, if either is worn to the wear limit.



3. Install:
- brake shoe kit①
 - tension springs

CAUTION: _____

- Do not put lubricating oil on the brake lining.
- Change the tension spring at the same time of changing the brake shoe.
- Refer to the direction in the illustration when assembling the brake shoe and spring.
- Refer to the illustration with regards to the assembly direction of tension spring, and do not let the spring hook and coil to be damaged by the pliers.





EAS00574

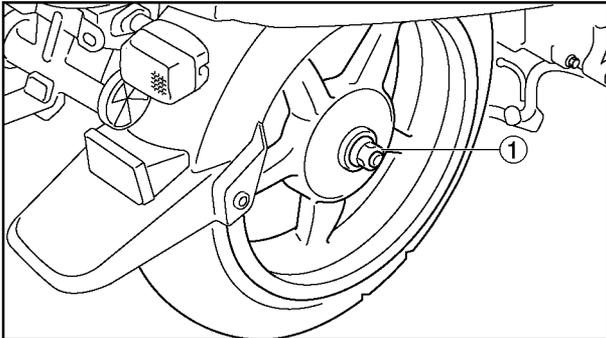
INSTALLING THE REAR WHEEL

1. Lubricate:
 - wheel axle

	Recommended lubricant Lithium-soap-based grease
--	---

2. Install:
 - rear wheel
3. Tighten:
 - plate washer
 - wheel axle nut①

	120Nm(12.0m • kg, 86.8ft • lb)
--	---------------------------------------



4. Install:
 - muffler
 Refer to "ENGINE REMOVAL" in chapter 5.
5. Adjust:
 - brake lever free play
 Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.

EAS00575

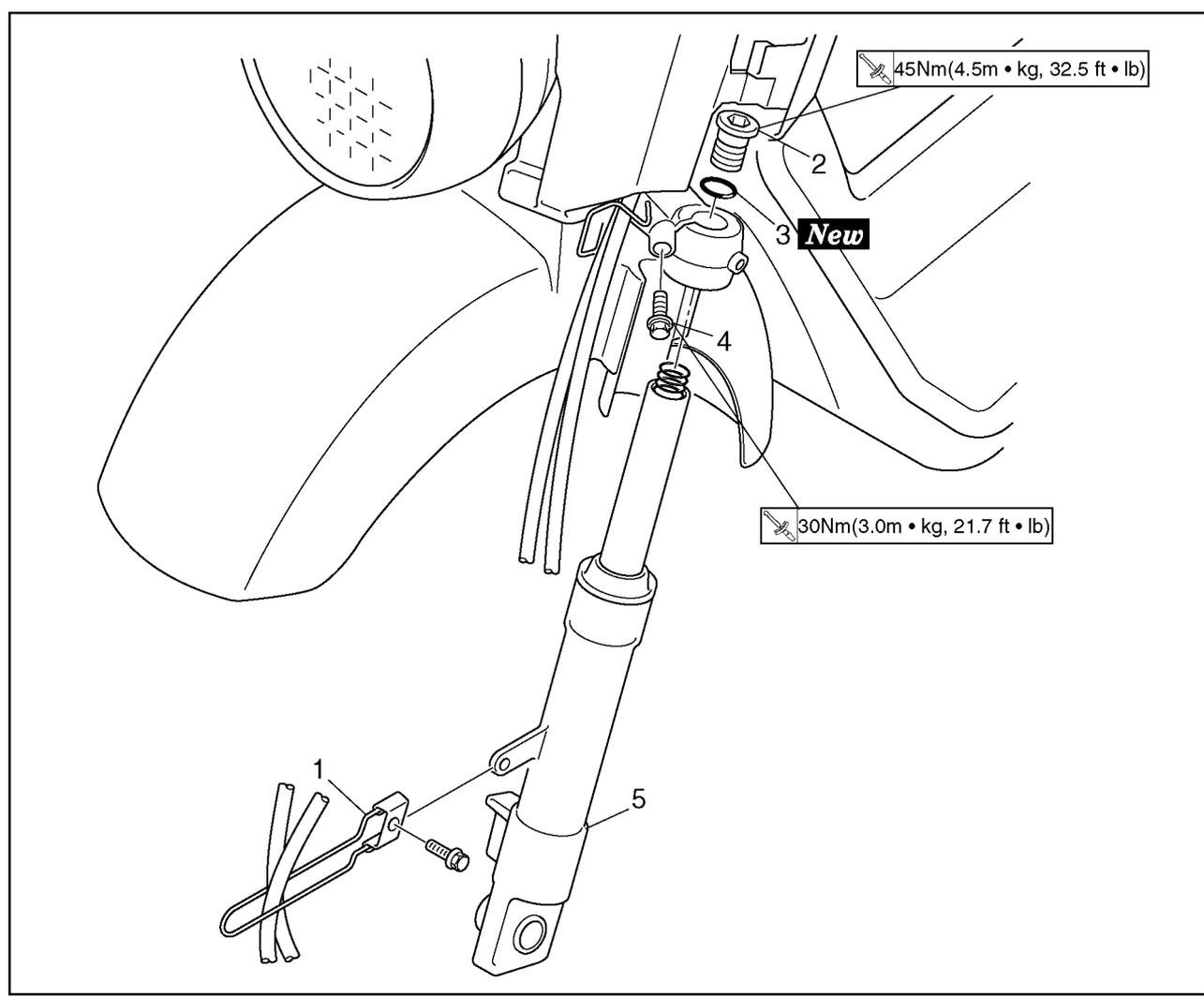
ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE: _____

- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the rear wheel drive hub installed.

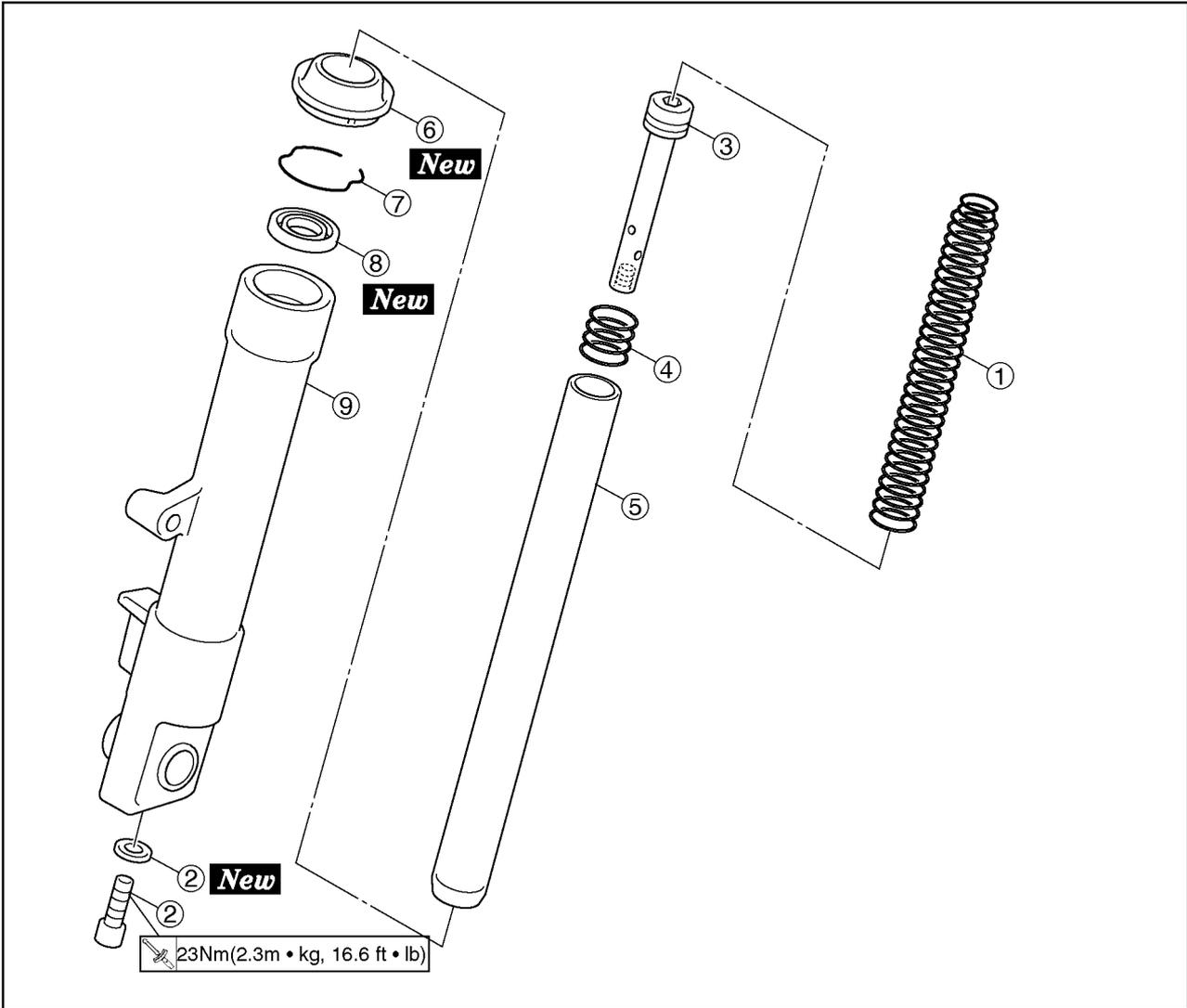
1. Adjust:
 - rear wheel static balance
 Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE".

EAS00646
FRONT FORK



Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed.
	Front fork upper cover		Refer to "LEG SHIELD1,2 " in chapter 3.
	Reflector		
	Front fork cover(left and right)		
	Front wheel		Refer to "FRONT WHEEL AND BRAKE".
1	Cable guide	1	Refer to "REMOVING THE FRONT FORK LEGS" and "INSTALLING THE FRONT FORK LEGS"
2	Cap bolt	1	
3	O-ring	1	
4	Lower bracket pinch bolt	1	
5	Front fork leg	1	
			For installation, reverse the removal procedure.

EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork legs		Remove the parts in the order listed. Drain.
①	Fork oil		
①	Fork spring	1	
②	Damper rod bolt/Copper washer	1/1	
③	Damper rod	1	
④	Rebound spring	1	
⑤	Inner tube	1	Refer to "DISASSEMBLING THE FRONT FORK LEGS" and "ASSEMBLING THE FRONT FORK LEGS"
⑥	Dust seal	1	
⑦	Oil seal clip	1	
⑧	Oil seal	1	
⑨	Outer tube	1	
			For assembly, reverse the disassembly procedure.



EAS00651

REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Stand the scooter on a level surface.

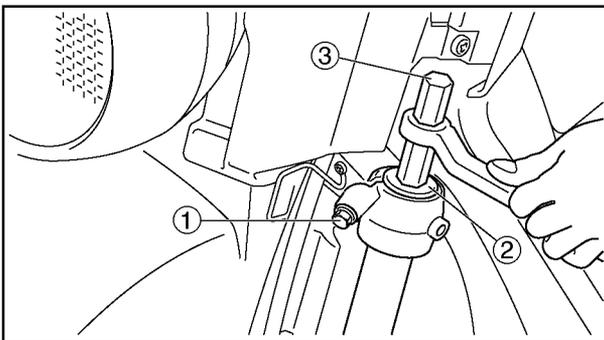
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the front wheel is elevated.

2. Remove:
 - front fork upper cover
 - front fork cover (left and right)
Refer to "LEG SHIELD1,2" in chapter 3.
 - front wheel
Refer to "FRONT WHEEL AND BRAKE".

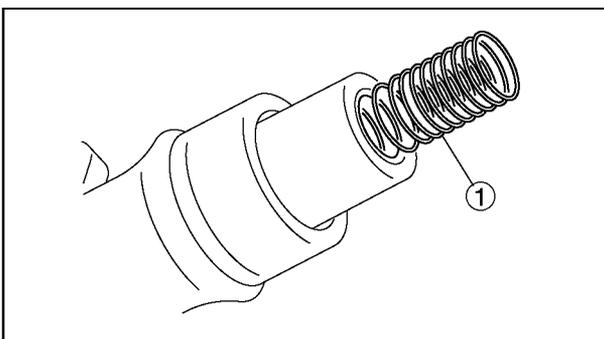


3. Loosen:
 - lower bracket pinch bolt ①
4. Remove:
 - cap bolt ②
(with a 10 -mm hexagonal wrench ③)

⚠ WARNING

Before loosening the lower bracket pinch bolt, support the front fork leg.

5. Remove:
 - front fork leg

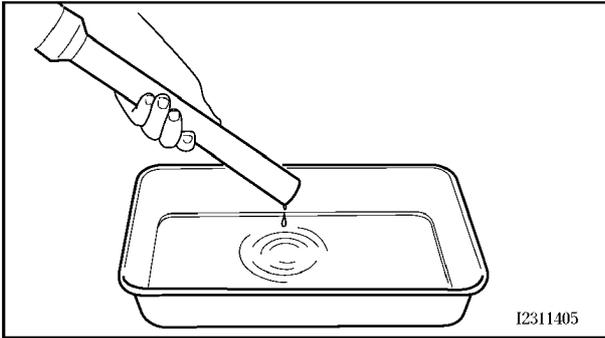


EAS00653

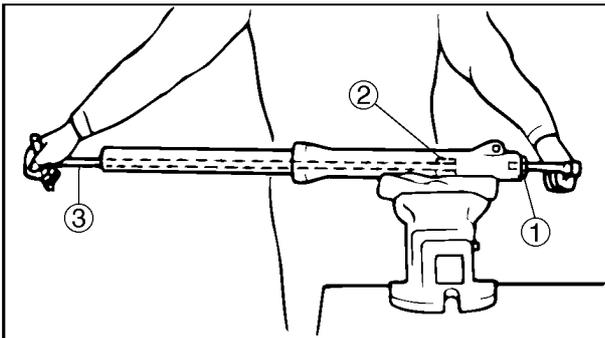
DISASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Remove:
 - fork spring ①



2. Drain:
 - fork oil



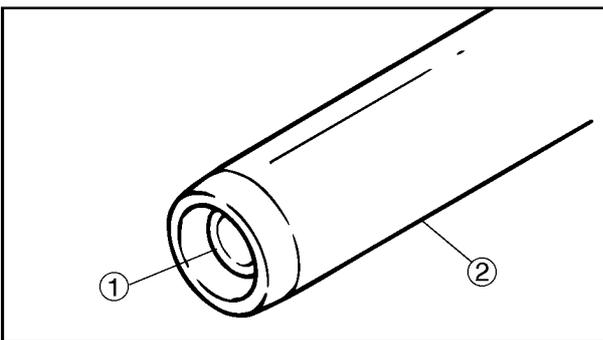
3. Remove:
 - damper rod assembly bolt①

NOTE:

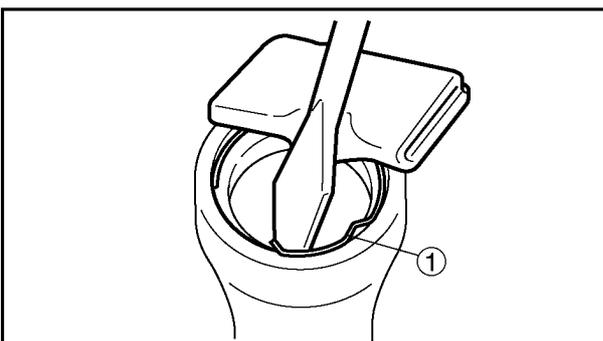
While holding the damper rod with the damper rod holder ② and T-handle③, loosen the damper rod assembly bolt.



Damper rod holder
90890-01294(YM-01300-1)
T-handle
90890-01326(YM-01326)



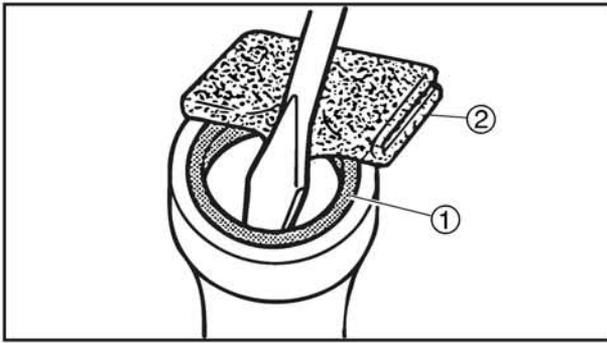
4. Remove:
 - damper rod①
 - spring
 - inner tube②



5. Remove:
 - dust seal
 - oil seal clip ①
(with a flat-head screwdriver)

CAUTION:

Do not scratch the inner tube.

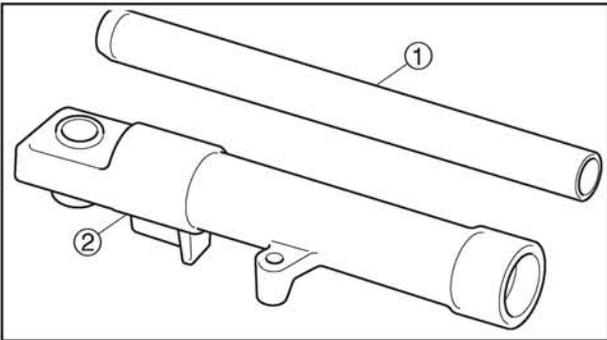


6. Remove:
- oil seal ①

CAUTION:

Never reuse the oil seal.

- Rag ②



EAS00656

CHECKING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

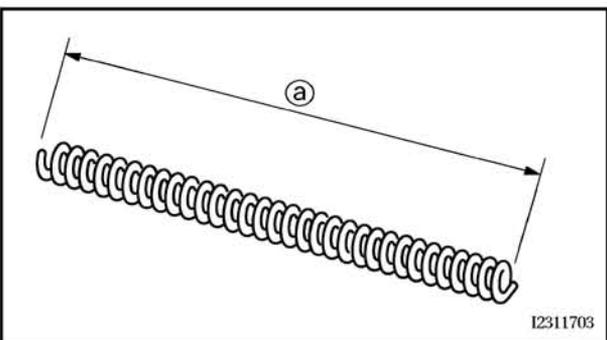
1. Check:

- inner tube ①
- outer tube ②

Bends/damage/scratches → Replace.

⚠ WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.



2. Measure:

- spring free length ①

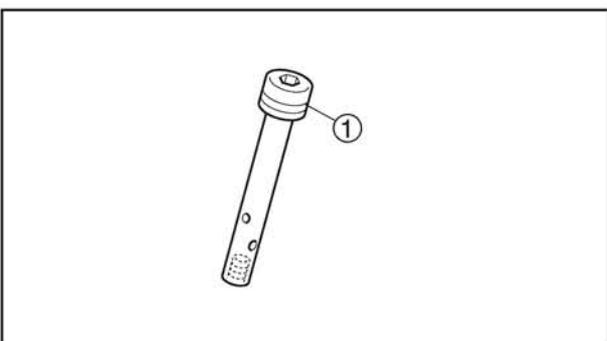
Out of specification → Replace.



Spring free length

202.2mm(7.96in)

<Limit> :198.2mm(7.80in)



3. Check:

- damper rod ①

Damage/wear → Replace.

Obstruction → Blow out all of the oil passages with compressed air.



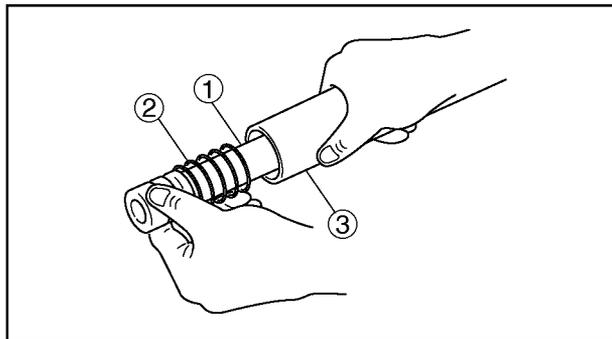
EAS00658

ASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

NOTE:

- When assembling the front fork leg, be sure to replace the following parts:
 - oil seal
 - dust seal
- Before assembling the front fork leg, make sure all of the components are clean.



1. Install:

- damper rod assembly ①
- rebound spring ②

CAUTION:

Allow the damper rod assembly to slide slowly down the inner tube ③ until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

2. Lubricate:

- inner tube's outer surface

 **Recommended lubricant**
Fork oil 10W or equivalent

3. Tighten:

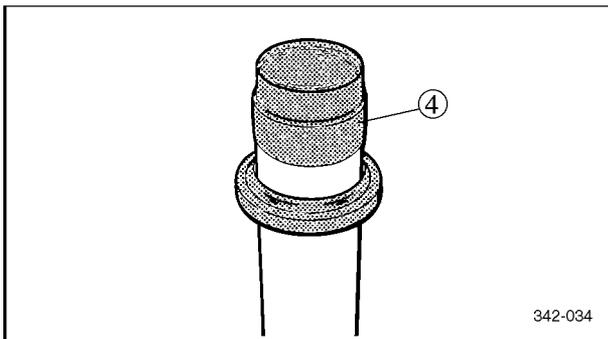
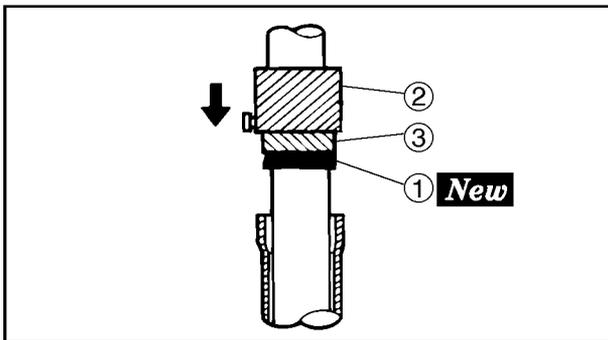
- Copper washer **New**
- damper rod assembly bolt ①

 23 Nm (2.3 m • kg, 16.6 ft • lb)

NOTE:

While holding the damper rod assembly with the damper rod holder ② and T-handle ③, tighten the damper rod assembly bolt.

 **Damper rod holder**
90890-01294(YM-01300-1)
T-handle
90890-01326(YM-01326)



342-034

4. Install:

- oil seal ① **New**
(with the fork seal driver weight ② and adapter ③)



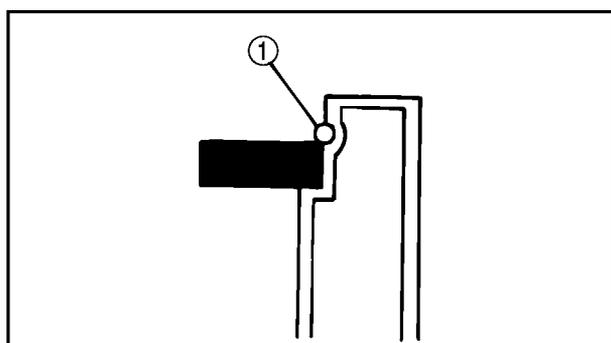
Fork seal driver weight
90890-01367(YM-A9409-7)
Adapter
90890-01400(YM-A9409-3)

CAUTION: _____

Make sure the numbered side of the oil seal faces up.

NOTE: _____

- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag ④ to protect the oil seal during installation.

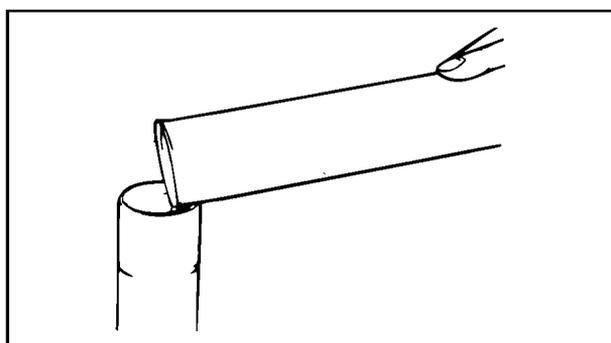


5. Install:

- oil seal clip ①

NOTE: _____

Adjust the oil seal clip so that it fits into the outer tube's groove.



6. Fill:

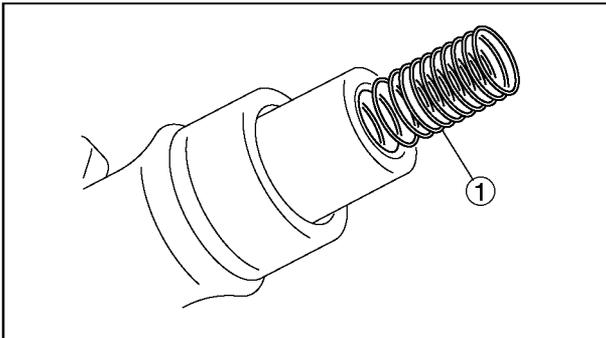
- front fork leg
(with the specified amount of the recommended fork oil)



Quantity (each front fork leg)
0.042 L (0.038 Imp qt, 0.046 US qt)
Recommended oil
Fork oil 10W or equivalent

**NOTE:**

- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.

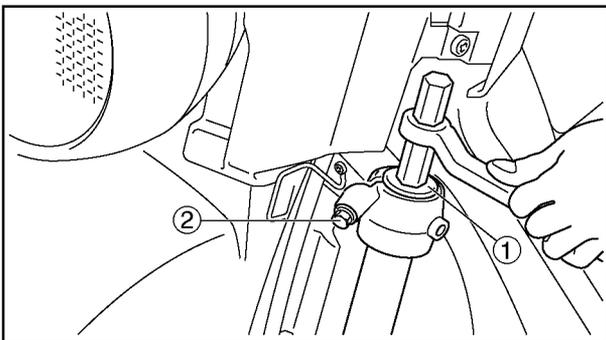


7. Install:

- fork spring ①

NOTE:

- Install the spring with the smaller pitch facing down .



EAS00663

INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Install:

- front fork leg
- o-ring **New**
- cap bolt

NOTE:

Pull up the inner tube until it stops, then install the cap bolt .

2. Tighten:

- cap bolt ①

45 Nm (4.5 m • kg, 32.5 ft • lb)

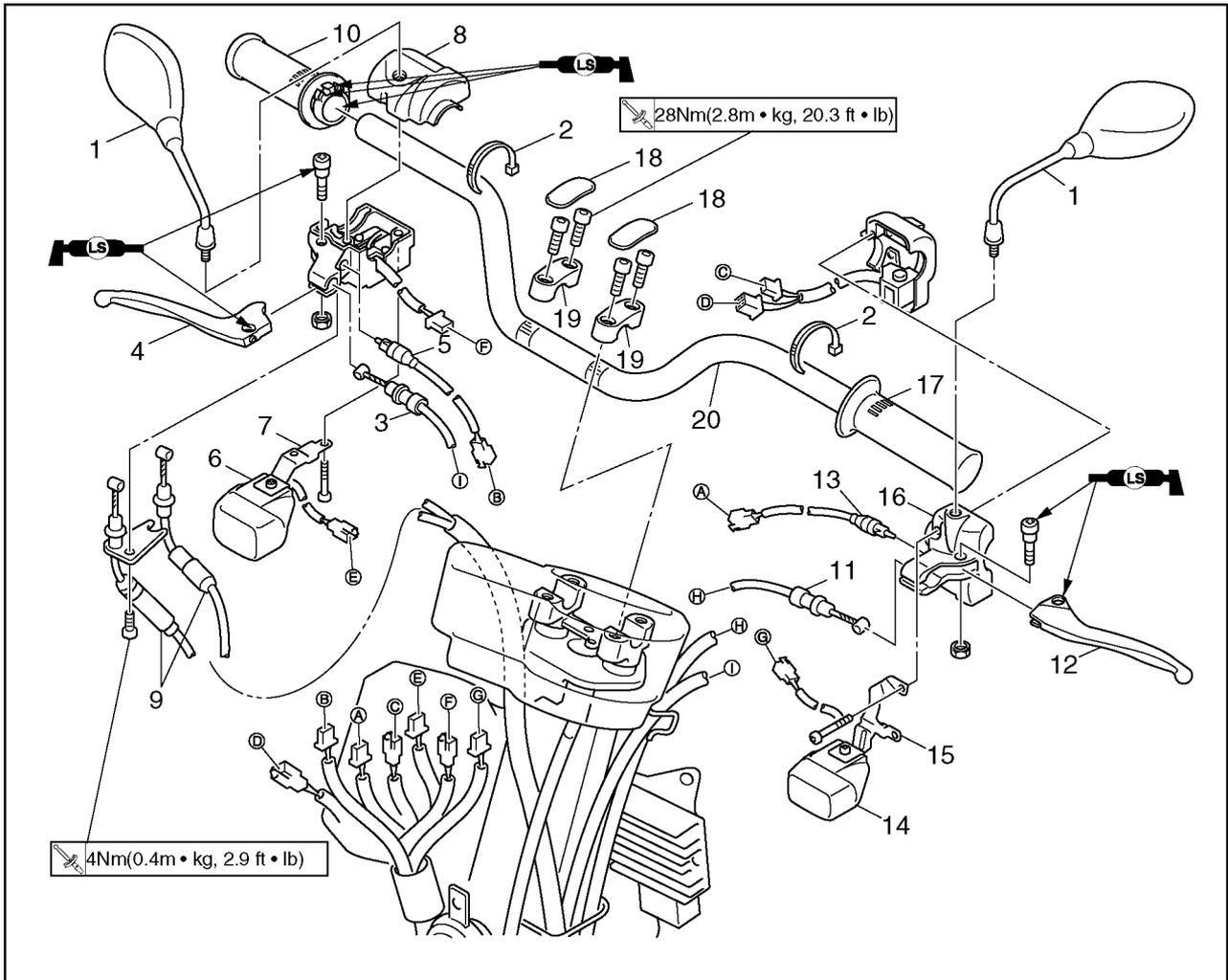
- lower bracket pinch bolt ②

30Nm(3.0m • kg, 21.7ft • lb)

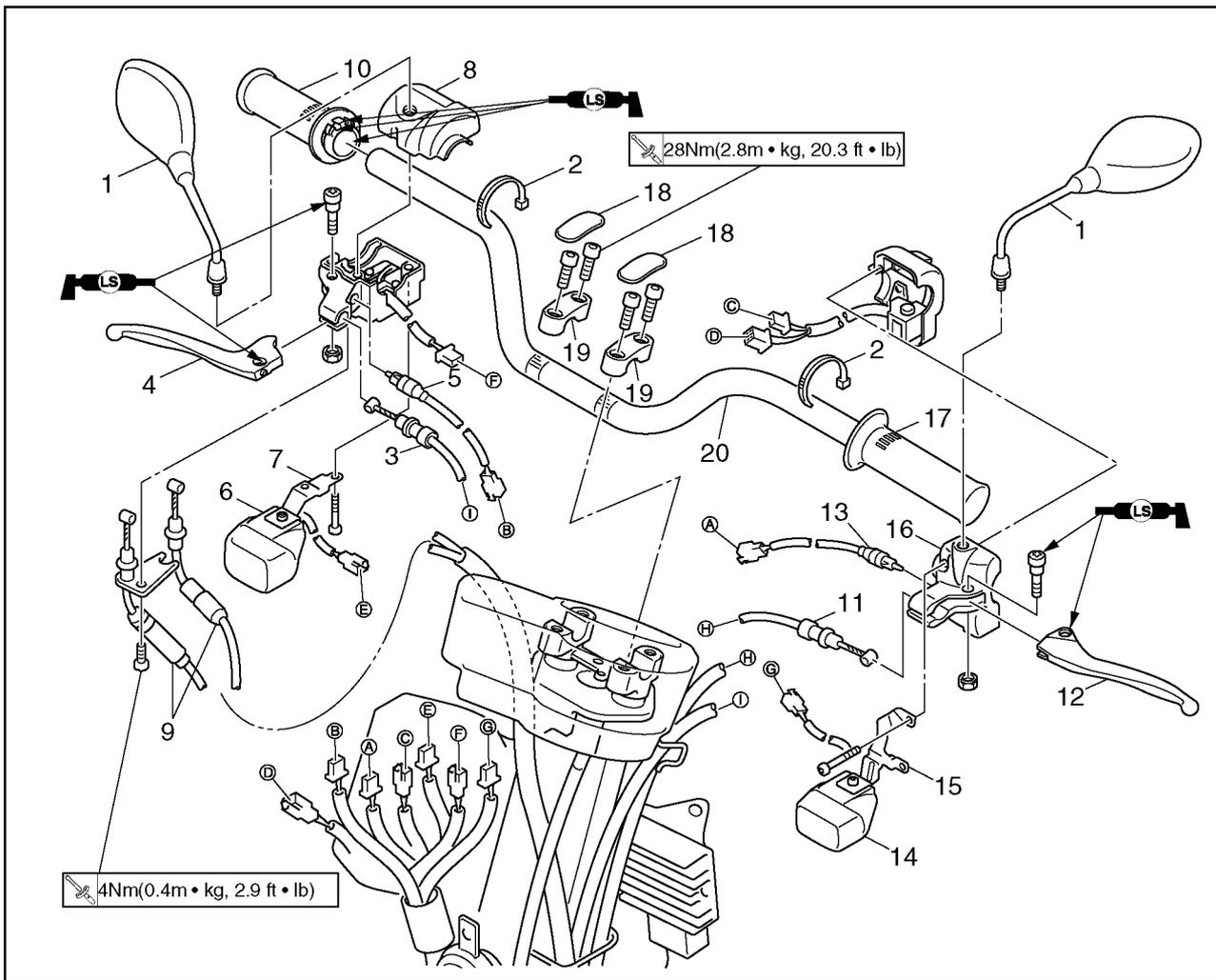


EAS00664

HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
	Front fork upper cover		Refer to "LEG SHIELD1,2" in chapter 3.
	Front fork cover(left and right)		
	Leg shield1,2		
1	Rear view mirror(left and right)	1/1	
2	Band	2	
3	Front brake cable	1	Disconnect.
4	Brake lever(right)	1	
5	Front brake switch	1	
6	Front turn signal light(right)	1	
7	Front turn signal light bracket(right)	1	
8	Handlebar switch(right)	1	
9	Throttle cable	2	Disconnect.
10	Throttle grip assembly	1	
11	Rear brake cable	1	Disconnect.
12	Brake lever(left)	1	
13	Rear brake switch	1	



Order	Job/Part	Q'ty	Remarks
14	Front turn signal light(left)	1	For installation, reverse the removal procedure.
15	Front turn signal light bracket(left)	1	
16	Handlebar switch(left)	1	
17	Handlebar grip	1	
18	Cap	2	
19	Handlebar upper holder	2	
20	Handlebar assembly	1	



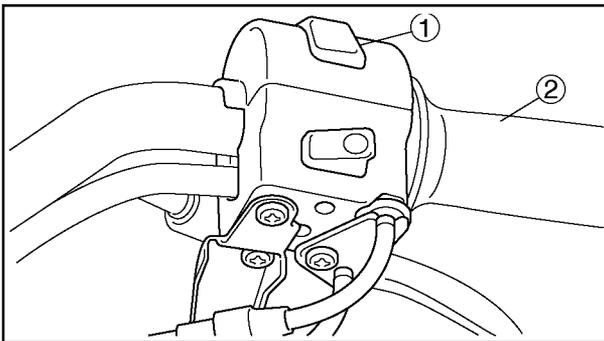
EAS00666

REMOVING THE HANDLEBAR

1. Stand the scooter on a level surface.

⚠ WARNING

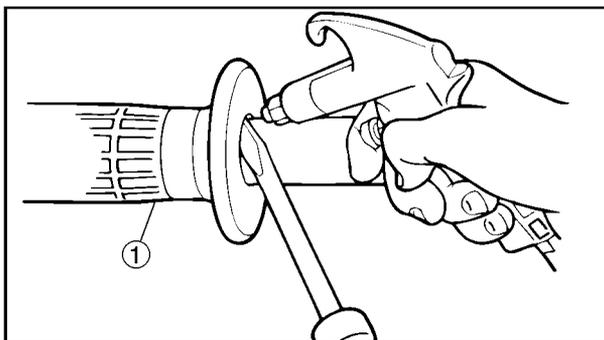
Securely support the scooter so that there is no danger of it falling over.



2. Remove:
 - handlebar switch(right) ①
 - throttle grip assembly ②

NOTE:

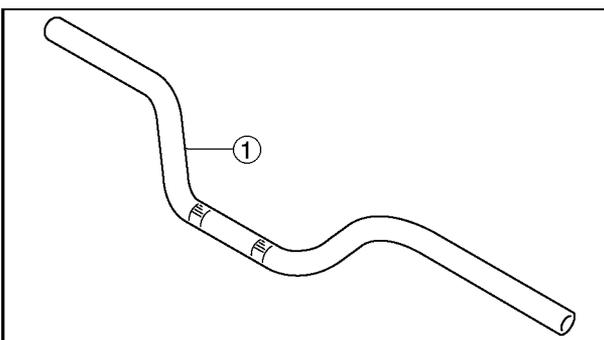
While removing the handlebar holder assembly (right), pull back the rubber cover.



3. Remove:
 - handlebar switch(left)
 - handlebar grip ①
 - handlebar upper holder

NOTE:

Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.



EAS00668

CHECKING THE HANDLEBAR

1. Check:
 - handlebar ①

Bends/cracks/damage → Replace.

⚠ WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken it.



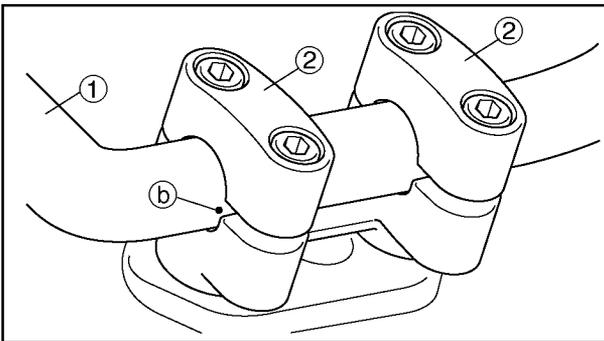
EAS00673

INSTALLING THE HANDLEBAR

1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.



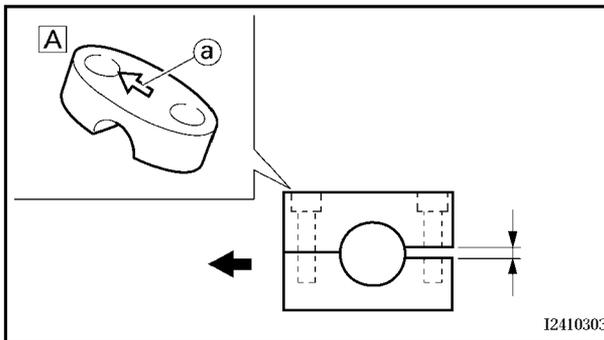
2. Install:

- handlebar ①
- handlebar upper holders ②

28Nm (2.8m • kg, 20.3ft • lb)

CAUTION:

First, tighten the bolts on the front side of the handlebar holders, and then on the rear side.

**NOTE:**

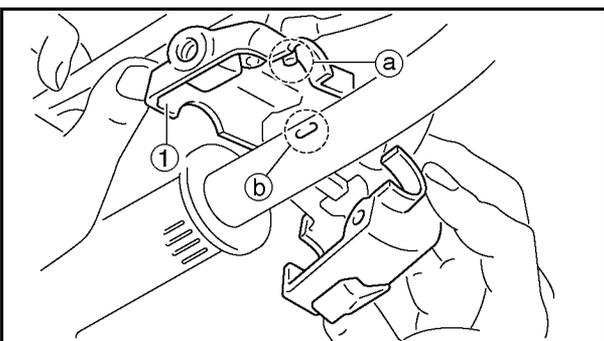
- The upper handlebar holders should be installed with the arrow marks (a) facing forward [A]
- Align the match marks (b) on the handlebar with the upper surface of the handlebar lower holder.

3. Install:

- handlebar grip

NOTE:

Before installing the handlebar grip, apply the bond.

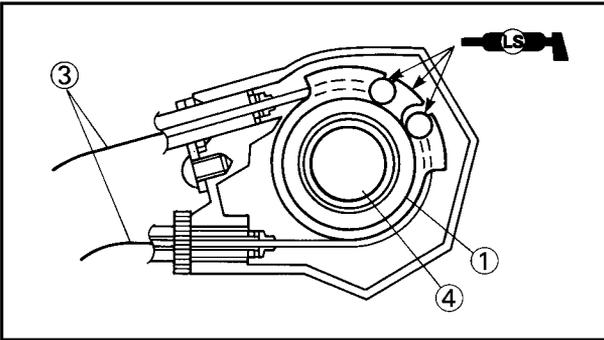
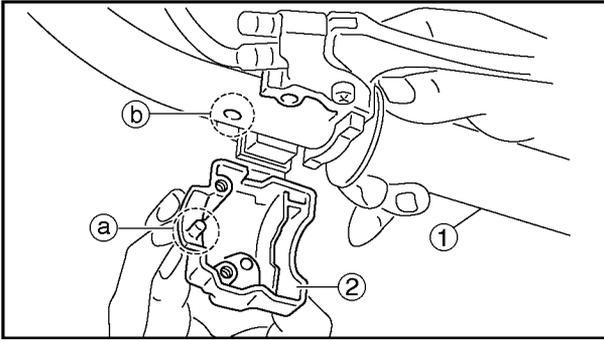


4. Install:

- left handlebar switch ①

NOTE:

Align the projection (a) on the left handlebar switch with the hole (b) on the handlebar.



5. Install:

- throttle grip assembly ①
- right handlebar switch ②
- throttle cables ③

NOTE:

- Align the projection ① on the right handlebar switch with the hole ② on the handlebar.
- Lubricate the inside of the throttle grip with a thin coat of lithium-soap-based grease and install it onto the handlebar ④.

⚠ WARNING

Make sure the throttle grip operates smoothly.

6. Adjust:

- throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.



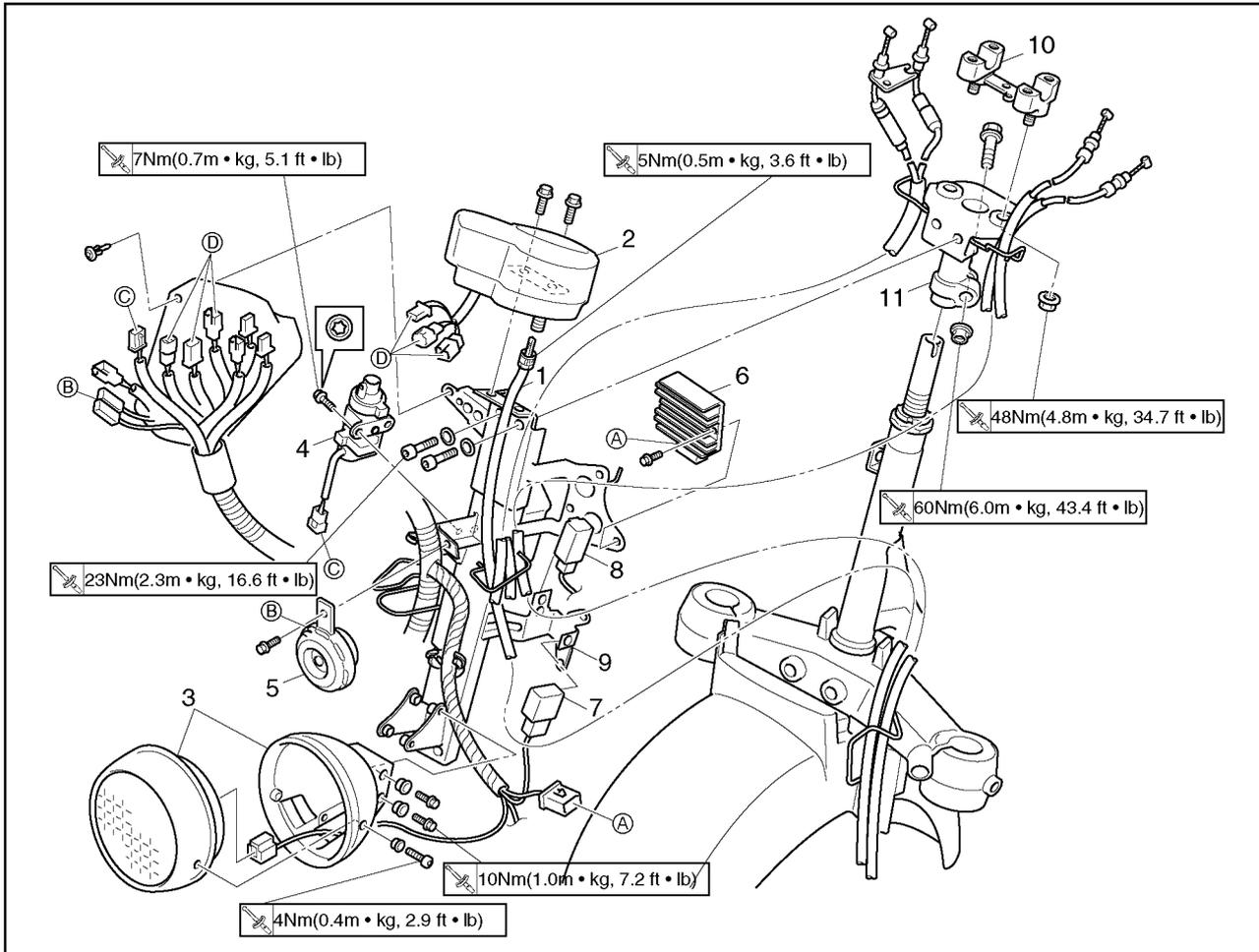
Throttle cable free play (at the flange of the throttle grip)
1.5~3.5mm(0.06~0.14in)



EAS00675

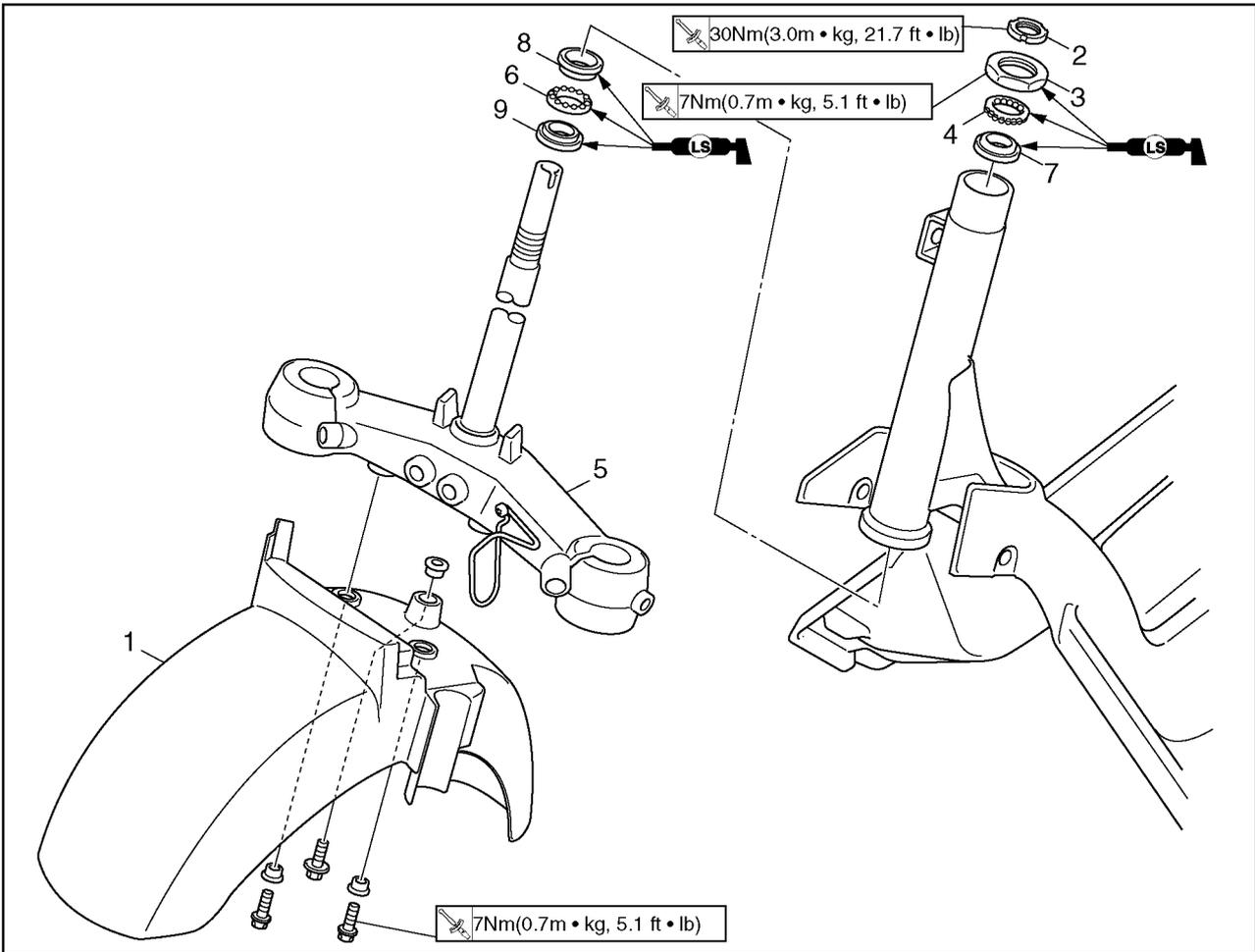
STEERING HEAD

HANDLEBAR BRACKET AND HEADLIGHT STAY BRACKET

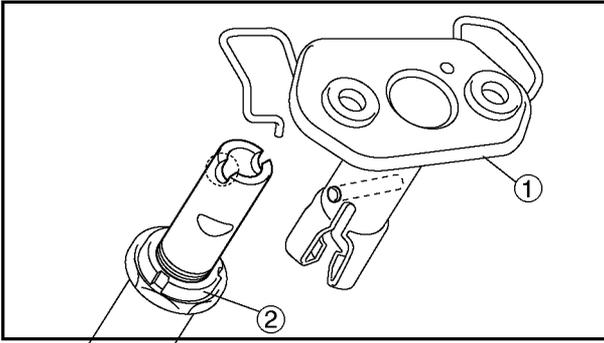


Order	Job/Part	Q'ty	Remarks
	Removing the handlebar bracket and headlight stay bracket		Remove the parts in the order listed.
	Front fork upper cover		Refer to "LEG SHIELD1,2" in chapter 3.
	Front fork cover(left and right)		
	Leg shield1,2		
	Handlebar assembly		Refer to "HANDLEBAR".
1	Speedometer cable	1	
2	Speedometer	1	
3	Headlight unit/Headlight body	1/1	
4	Main switch	1	
5	Horn	1	
6	Rectifier/regulator	1	
7	Turn signal relay	1	Disconnect.
8	Starting circuit cut-off relay	1	Disconnect.
9	Headlight stay bracket	1	
10	Handlebar lower holder	1	
11	Handlebar bracket	1	
			For installation, reverse the removal procedure.

LOWER BRACKET



Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket		Remove the parts in the order listed.
	Front fork upper cover		Refer to "LEG SHIELD1,2" in chapter 3.
	Front fork cover(left and right)		
	Leg shield1,2		Refer to "FRONT WHEEL AND BRAKE". Refer to "FRONT FORK"
	Front wheel		
	Front fork legs		Refer to "HANDLEBAR".
	Handlebar assembly		Refer to "HANDLEBAR BRACKET AND HEADLIGHT STAY BRACKET"
	Headlight stay bracket		
	Handlebar bracket		
1	Front fender	1	Refer to "REMOVING THE LOWER BRACKET" and "INSTALLING THE STEERING HEAD".
2	Ring nut	1	
3	Upper bearing inner race	1	
4	Upper bearing	1	
5	Lower bracket	1	
6	Lower bearing	1	
7	Upper bearing outer race	1	
8	Lower bearing outer race	1	
9	Lower bearing inner race	1	
			For installation, reverse the removal procedure.



EAS00678

REMOVING THE LOWER BRACKET

1. Stand the scooter on a level surface.

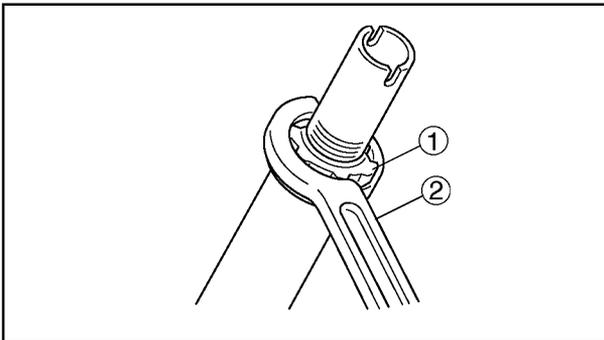
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

2. Remove:
 - handlebar bracket (1)

NOTE:

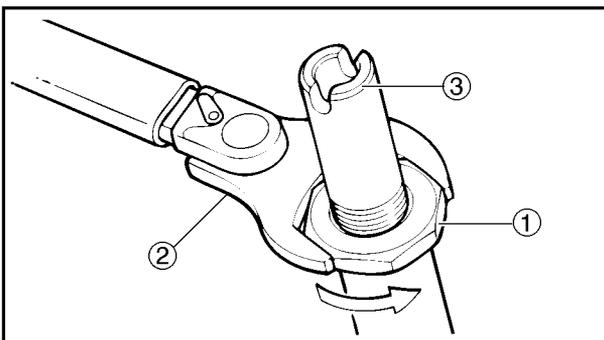
Remove the handlebar bracket by loosening the ring nut (2) gradually.



3. Remove:
 - ring nut (1)
(with the ring nut wrench (2))



Ring nut wrench
90890-01268
YU-01268



4. Remove:
 - upper bearing inner race (1)
(with the steering nut wrench (2))



Steering nut wrench
90890-01444
YM-A9409-7

⚠ WARNING

Securely support the lower bracket (3) so that there is no danger of it falling.

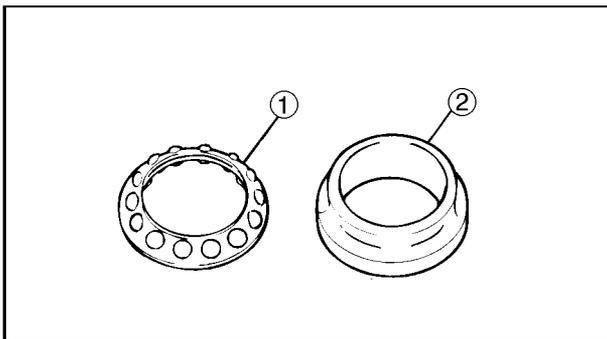


EAS00682

CHECKING THE STEERING HEAD

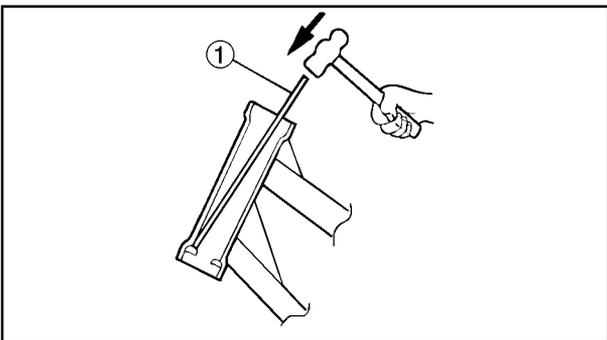
1. Wash:
 - bearing balls
 - bearing races

	<p>Recommended cleaning solvent Kerosene</p>
--	---



2. Check:
 - bearing balls ①
 - bearing races ②

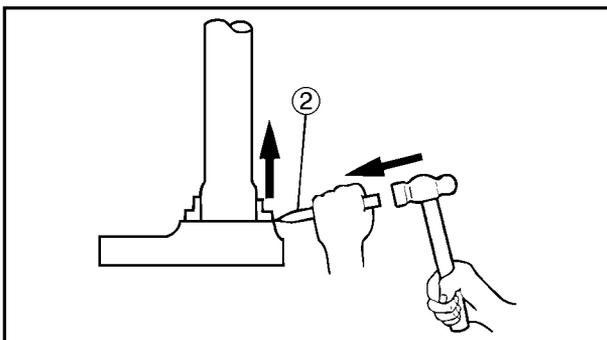
Damage/pitting → Replace.



3. Replace:
 - bearing balls
 - bearing races



- a. Remove the bearing races from the steering head pipe with a long rod ① and hammer.
- b. Remove the bearing race from the front fork assembly with a floor chisel ② and hammer.
- c. Install a new bearing races.



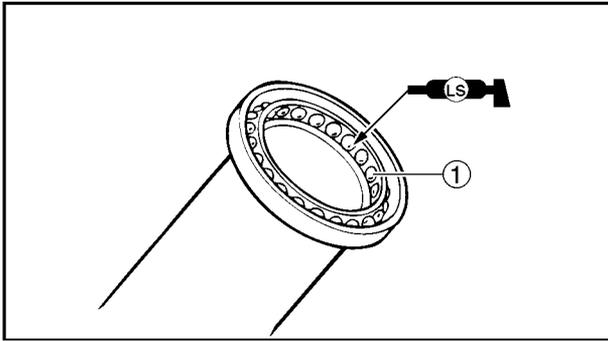
CAUTION: _____
If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE: _____
 Always replace the balls and bearing races as a set.



4. Check:
 - lower bracket
(along with the steering stem)

Bends/cracks/damage → Replace.

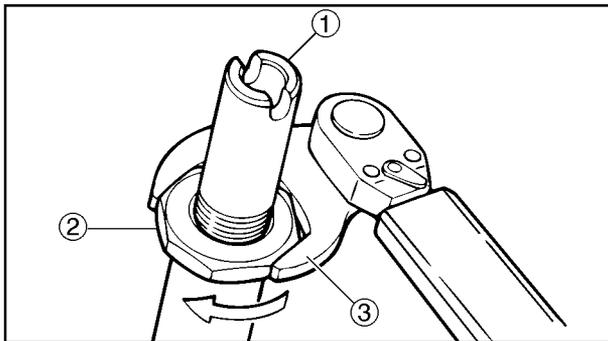


EAS00684

INSTALLING THE STEERING HEAD

1. Lubricate:
 - bearing balls ①
 - bearing races

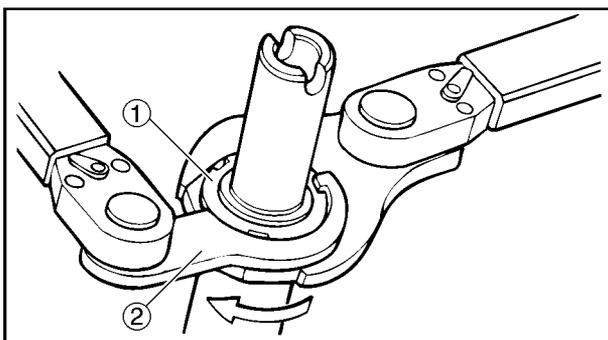
	Recommended lubricant Lithium-soap-based grease
---	---



2. Install:
 - lower bracket ①
 - upper bearing inner race ②
(with the steering nut wrench ③)

	Upper bearing inner race 7Nm(0.7m • kg, 5.1ft • lb)
---	---

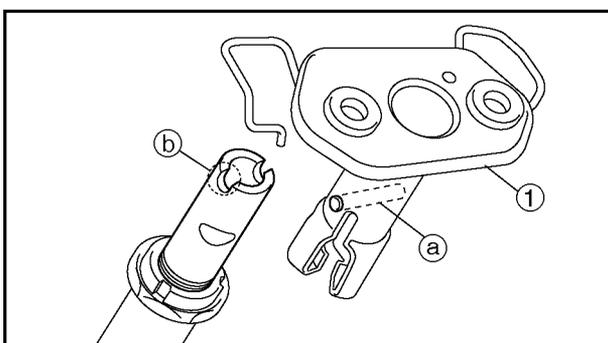
	Steering nut wrench 90890-01444 YM-A9409-7
--	---



3. Install:
 - ring nut ①
(with the steering nut wrench ②)

	Ring nut 30Nm(3.0m • kg, 21.7ft • lb)
---	---

	Steering nut wrench 90890-01403 YU-A9472
---	---



4. Install:
 - handlebar bracket ①

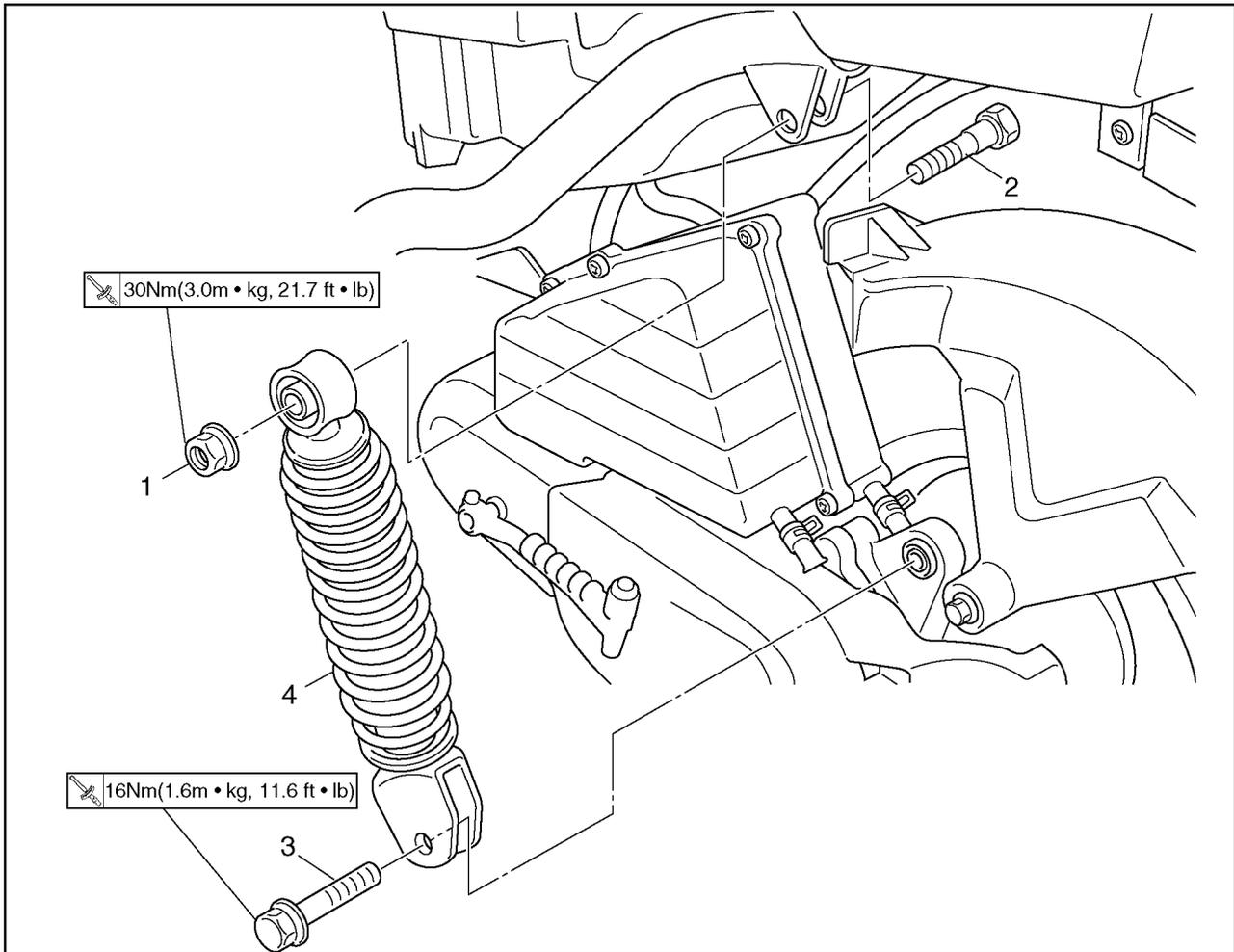
NOTE: _____
Align the handlebar bracket across rod (a) on the lower bracket concave (b) .

5. Tighten:
 - handlebar bracket nut

	60Nm(6.0m • kg, 43.4ft • lb)
---	------------------------------

EAS00685

REAR SHOCK ABSORBER ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assembly		Remove the parts in the order listed.
	Front cover		Refer to "SIDE COVERS AND TAIL/BRAKE LIGHT" in chapter 3.
	Side cover(left)		
1	Rear shock absorber assembly upper nut	1	
2	Rear shock absorber assembly upper bolt	1	
3	Rear shock absorber assembly lower bolt	1	
4	Rear shock absorber assembly	1	For installation, reverse the removal procedure.



EAS00692

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the rear wheel is elevated.

2. Remove:
 - front cover
 - side cover(left)
Refer to "SIDE COVERS AND TAIL/ BRAKE LIGHT" in chapter 3.
3. Remove:
 - rear shock absorber nut(upper)
 - rear shock absorber bolt(upper)
 - rear shock absorber bolt(lower)

EAS00695

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
 - rear shock absorber rod
Bend/damage → Replace the rear shock absorber assembly.
 - rear shock absorber
Oil leak → Replace the rear shock absorber assembly.
 - spring
Damage/wear → Replace the rear shock absorber assembly.
 - bushing
Damage/wear → Replace.
 - dust seal
Damage/wear → Replace.
 - bolts
Bends/damage/wear → Replace.



EAS00698

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Install:
 - rear shock absorber assembly
2. Tighten:
 - rear shock absorber assembly upper nut

 30Nm(3.0m • kg, 21.7ft • lb)

- rear shock absorber assembly lower bolt

 16Nm(1.6m • kg, 11.6ft • lb)

3. Install:
 - side cover(left)
 - front coverRefer to "SIDE COVERS AND TAIL/ BRAKE LIGHT" in chapter 3.

CHAPTER 5
ENGINE

ENGINE REMOVAL	5-1
LEADS, HOSES AND MUFFLER	5-1
ENGINE	5-3
INSTALLING THE ENGINE	5-4
CYLINDER HEAD	5-5
REMOVING THE CYLINDER HEAD	5-7
CHECKING THE CYLINDER HEAD	5-9
INSTALLING THE CYLINDER HEAD	5-10
THE ROCKER ARMS AND CAMSHAFT	5-13
REMOVING THE ROCKER ARMS AND CAMSHAFT	5-14
CHECKING THE CAMSHAFT	5-15
CHECKING THE ROCKER ARMS AND ROCKER ARM	
SHAFTS	5-16
CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKET, AND	
TIMING CHAIN GUIDES	5-17
CHECKING THE TIMING CHAIN TENSIONER	5-18
INSTALLING THE CAMSHAFT AND ROCKER ARMS	5-19
VALVES AND VALVE SPRINGS	5-20
REMOVING THE VALVES	5-22
CHECKING THE VALVES AND VALVE GUIDES	5-24
CHECKING THE VALVE SEATS	5-26
CHECKING THE VALVE SPRINGS	5-28
INSTALLING THE VALVES	5-29
CYLINDER AND PISTON	5-31
REMOVING THE CYLINDER AND PISTON	5-32
CHECKING THE CYLINDER AND PISTON	5-33
CHECKING THE PISTON RINGS	5-35
CHECKING THE PISTON PIN	5-36
CHECKING THE TIMING CHAIN GUIDE	5-37
INSTALLING THE PISTON AND CYLINDER	5-37
BELT DRIVE	5-39
V-BELT CASE COVER	5-39
KICKSTARTER	5-40
INSTALLING THE KICKSTARTER	5-41
V-BELT AND PRIMARY/SECONDARY SHEAVE	5-42
SECONDARY SHEAVE	5-43
REMOVING THE PRIMARY SHEAVE	5-44

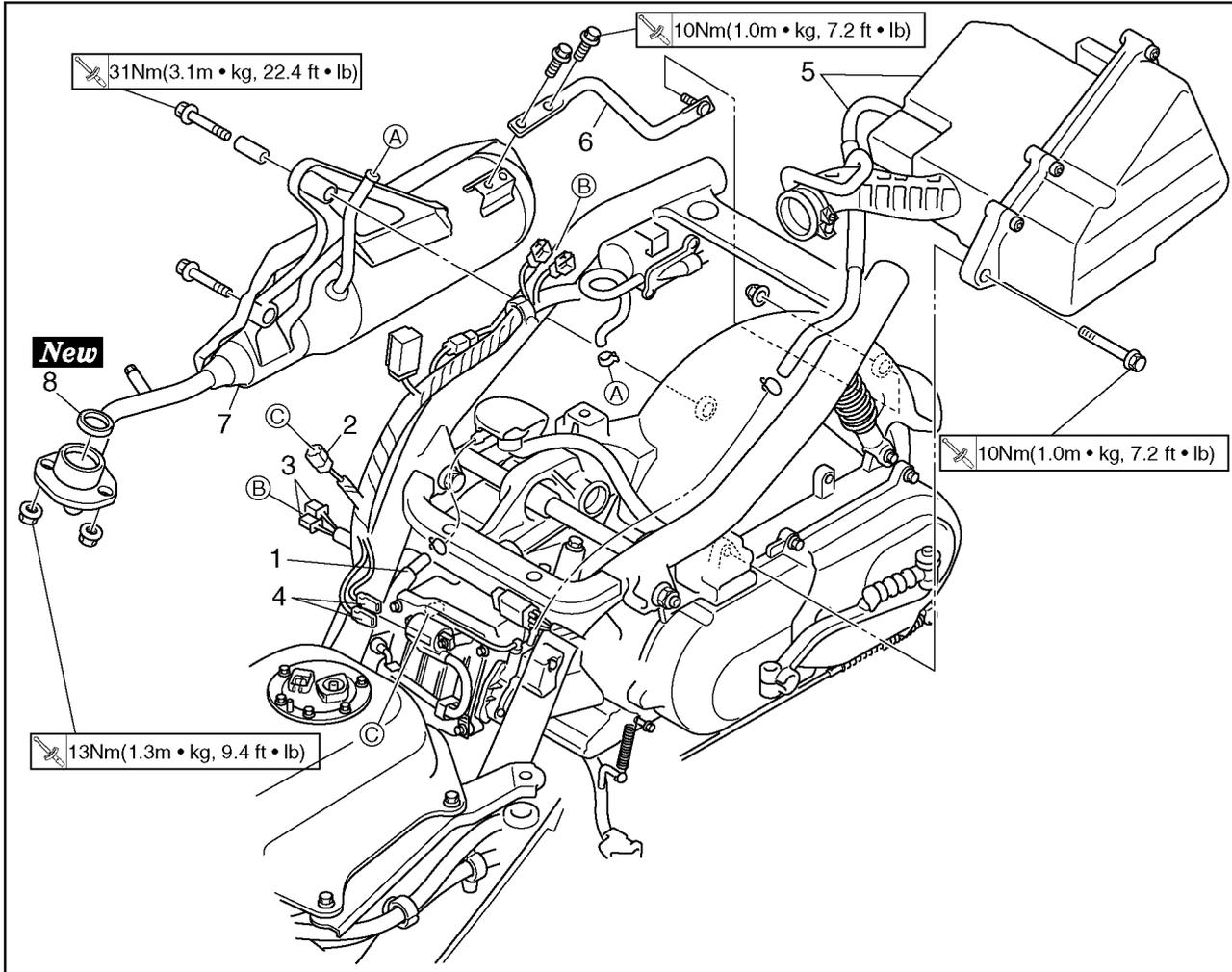
REMOVING THE SECONDARY SHEAVE AND V-BELT	5-44
DISASSEMBLING THE SECONDARY SHEAVE	5-45
CHECKING THE CLUTCH SHOES	5-45
CHECKING THE V-BELT	5-46
CHECKING THE PRIMARY SHEAVE	5-46
CHECKING THE PRIMARY SHEAVE WEIGHTS	5-47
CHECKING THE SLIDER.....	5-47
CHECKING THE SECONDARY SHEAVE	5-47
ASSEMBLING THE PRIMARY SHEAVE	5-48
ASSEMBLING THE SECONDARY SHEAVE	5-49
INSTALLING THE SECONDARY SHEAVE, V-BELT AND PRIMARY SHEAVE	5-50
STARTER CLUTCH AND AC MAGNETO	5-53
STATOR COIL ASSEMBLY.....	5-53
STARTER CLUTCH	5-55
REMOVING THE AC MAGNETO	5-56
REMOVING THE STARTER CLUTCH.....	5-57
CHECKING THE STARTER CLUTCH	5-58
INSTALLING THE STARTER CLUTCH	5-59
INSTALLING THE AC MAGNETO	5-59
OIL PUMP	5-61
CHECKING THE OIL PUMP	5-62
ASSEMBLING THE OIL PUMP	5-63
INSTALLING THE OIL PUMP	5-63
TRANSMISSION	5-64
CHECKING THE TRANSMISSION	5-65
CRANKSHAFT	5-66
CRANKSHAFT ASSEMBLY	5-66
DISASSEMBLING THE CRANKCASE	5-68
REMOVING THE CRANKSHAFT ASSEMBLY	5-69
CHECKING THE CRANKSHAFT AND CONNECTING ROD	5-69
CHECKING THE CRANKCASE	5-70
CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE(INTAKE SIDE).....	5-71
CHECKING THE BEARINGS AND OIL SEALS	5-71
CHECKING THE CIRCLIPS AND WASHERS	5-71
INSTALLING THE CRANKSHAFT	5-72
ASSEMBLING THE CRANKCASE	5-72



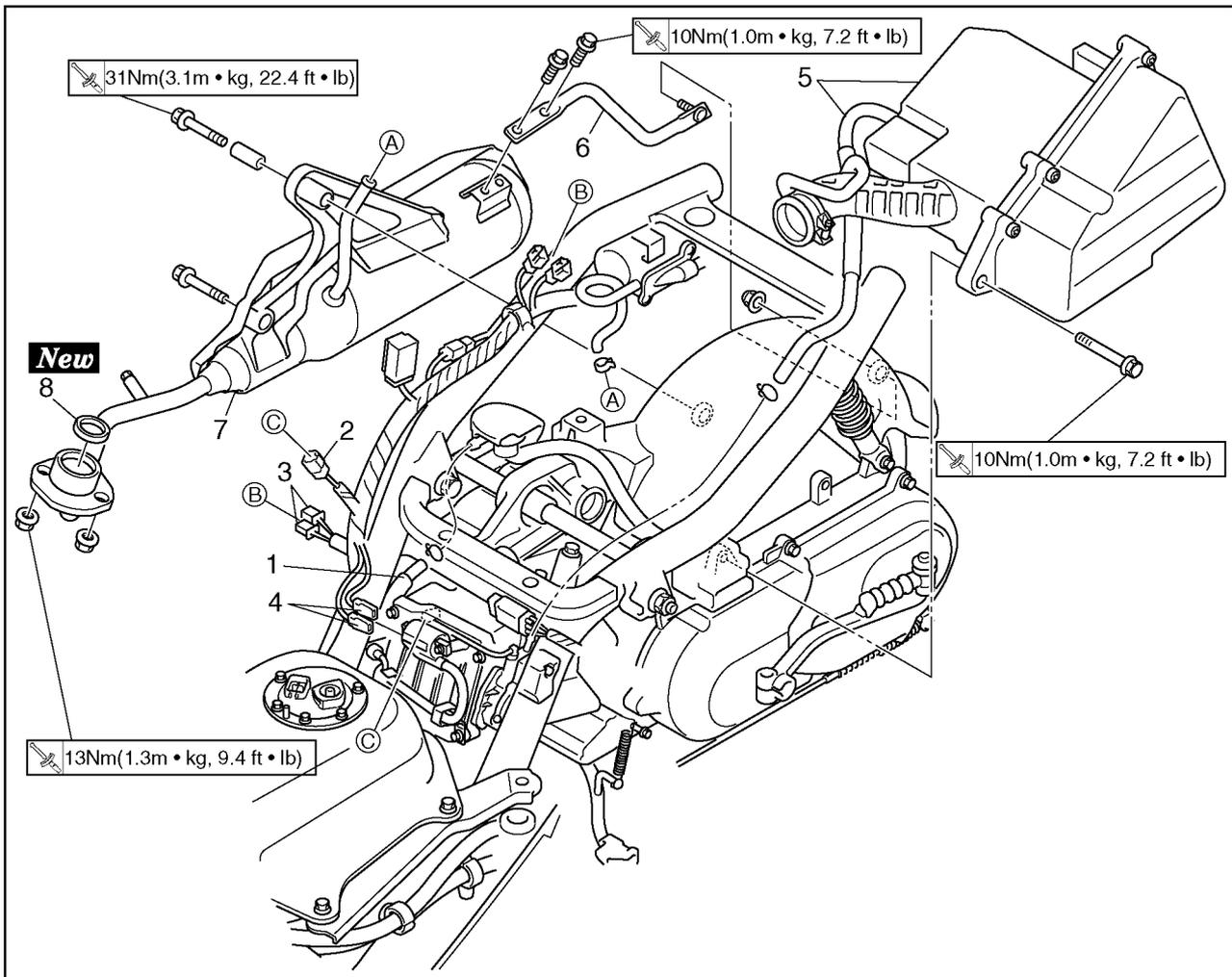
EAS00188

ENGINE

ENGINE REMOVAL
LEADS, HOSES AND MUFFLER



Order	Job/Part	Q'ty	Remarks
	Removing the leads, hoses and muffler		Remove the parts in the order listed.
	Front cover/Single seat/Trunk		Refer to "COVER AND PANEL" in chapter 3.
	Battery cover/Battery		
	Side cover(left and right)		
	Footrest board		
	Coolant		
	Rear brake cable/Adjuster/Pin		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Throttle body and fuel injector		Refer to "REAR WHEEL AND BRAKE" in chapter 4.
	Starter motor		Refer to "THROTTLE BODY AND FUEL INJECTOR" in chapter 7.
			Refer to "STARTER MOTOR" in chapter 8.
1	Conduit hose	1	Disconnect.
2	Coolant temperature sensor coupler	1	Disconnect.

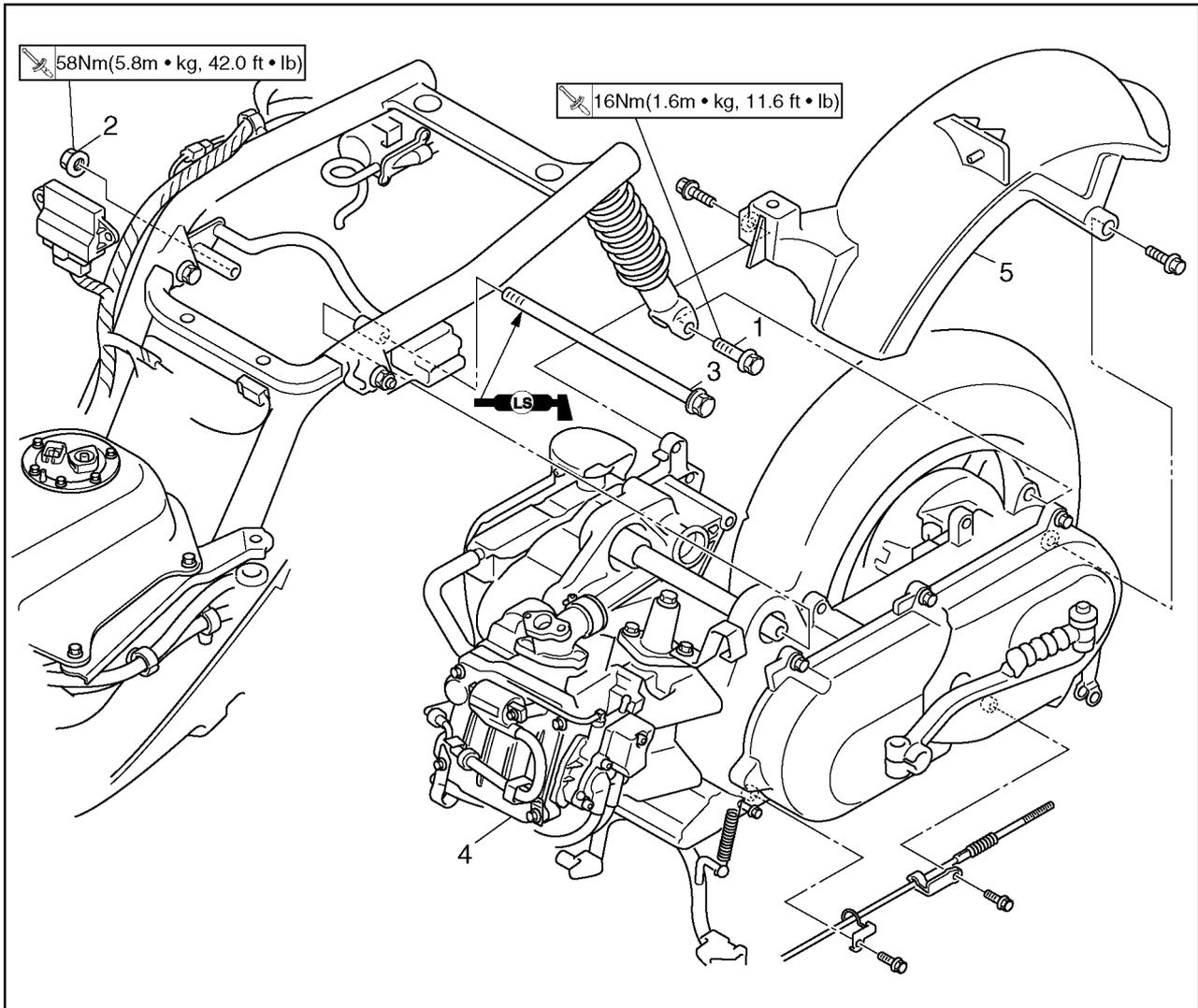


Order	Job/Part	Q'ty	Remarks
3	Crankshaft position sensor/Stator assembly coupler	1/1	Disconnect.
4	Ignition primary coil coupler	1	Disconnect.
5	Air filter assembly/Breather hose	1/1	
6	Bracket	1	
7	Muffler	1	
8	Gasket	1	
			For installation, reverse the removal procedure.

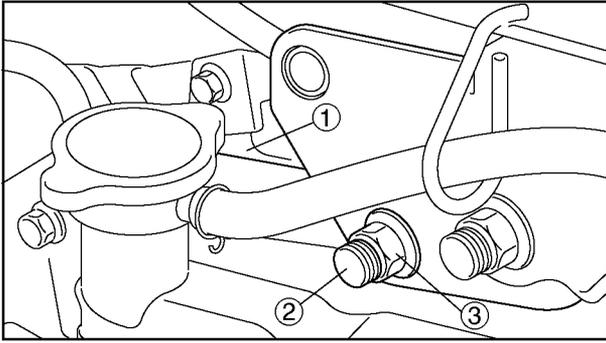


EAS00191

ENGINE



Order	Job/Part	Q'ty	Remarks
	Removing the engine		Remove the parts in the order listed. NOTE: Place a suitable stand under the frame and engine.
1	Rear shock absorber assembly lower bolt	1	Refer to "INSTALLING THE ENGINE". For installation, reverse the removal procedure.
2	Engine mounting nut	1	
3	Engine mounting bolt	1	
4	Engine	1	
5	Rear fender	1	



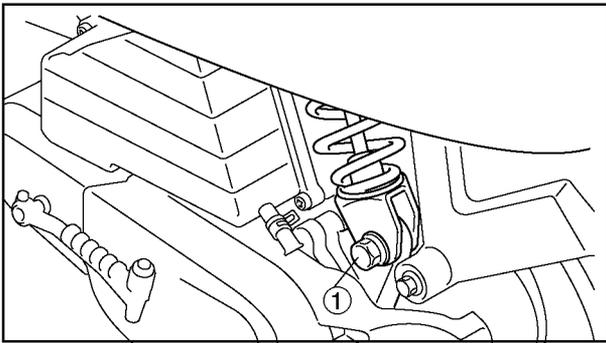
EAS00192

INSTALLING THE ENGINE

1. Install:
 - engine①
 - engine mounting bolt②
 - engine mounting nut③

NOTE:

- Apply lithium-soap-based grease to the unthreaded portion of the engine mounting bolt shaft.
- Do not fully tighten the engine mounting bolt..



2. Install:
 - rear shock absorber assembly lower bolt①

NOTE:

Do not fully tighten the bolt.

3. Tighten:
 - engine mounting bolt

58Nm(5.8m • kg, 42.0ft • lb)

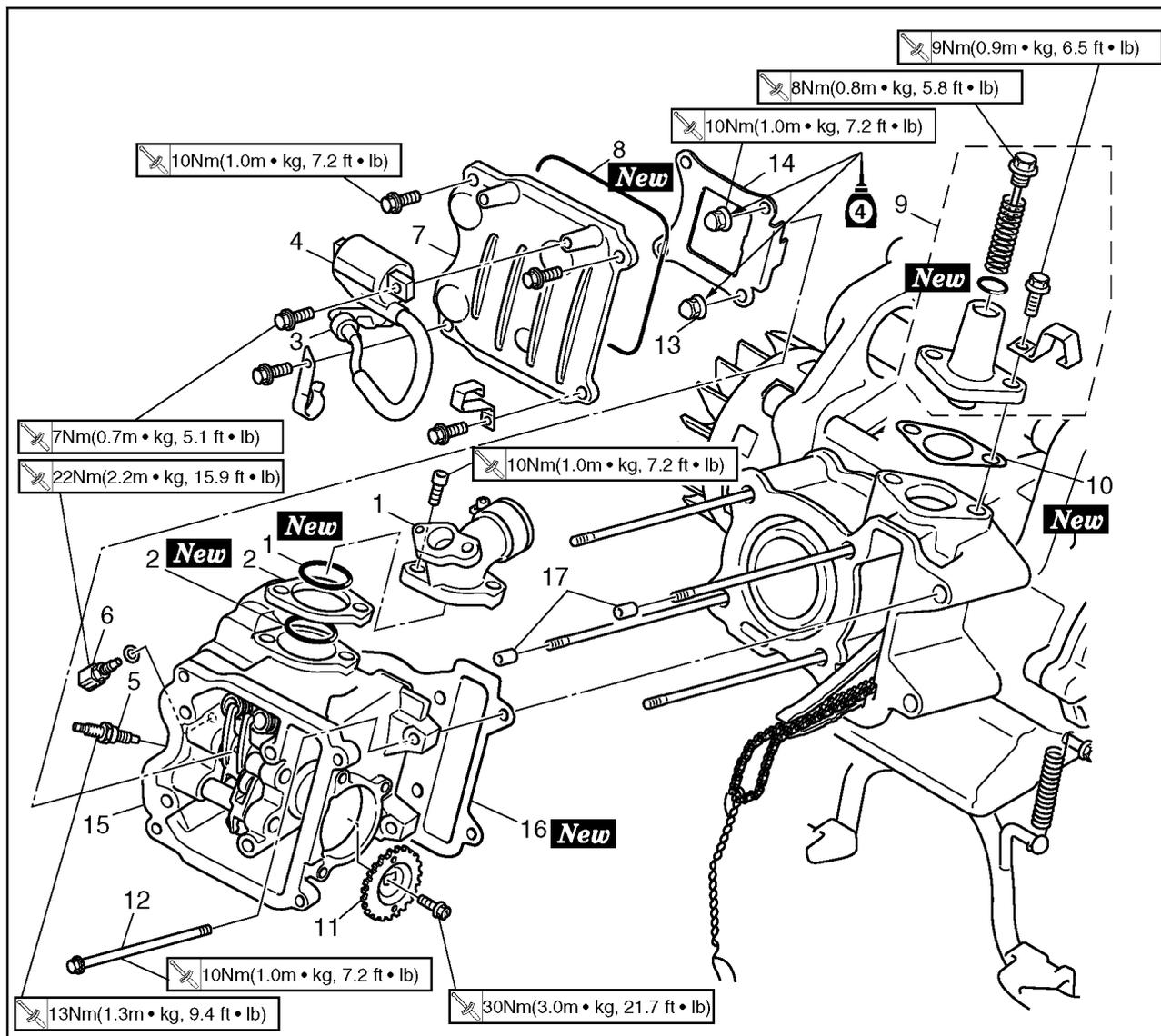
- rear shock absorber assembly lower bolt

16Nm(1.6m • kg, 11.6ft • lb)

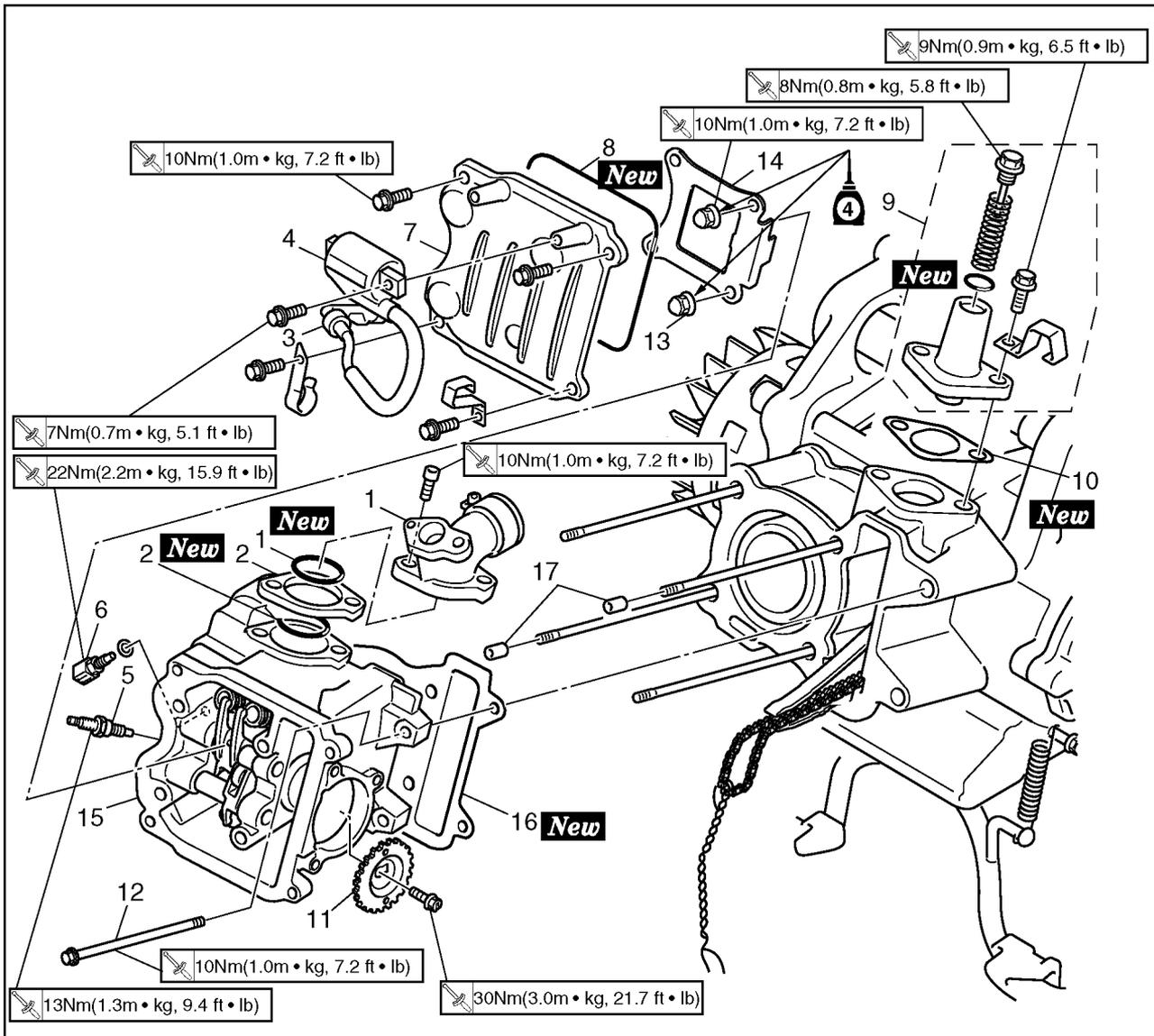


EAS00221

CYLINDER HEAD



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head		Remove the parts in the order listed.
	Radiator		Refer to "COOLING SYSTEM" in chapter 6.
	Thermostat		
	Water pump		Refer to "ENGINE REMOVAL".
	Muffler/Bracket		
1	Intake manifold/O-ring	1/1	
2	Joint/O-ring	1/1	
3	Spark plug cap	1	
4	Ignition coil	1	
5	Spark plug	1	
6	Coolant temperature sensor	1	
7	Cylinder head cover	1	
8	O-ring	1	
9	Timing chain tensioner	1	



Order	Job/Part	Q'ty	Remarks
10	Timing chain tensioner gasket	1	Refer to "REMOVING THE CYLINDER HEAD" and "INSTALLING THE CYLINDER HEAD".
11	Camshaft sprocket	1	
12	Bolt	2	
13	Nut	4	
14	Plate	1	
15	Cylinder head	1	
16	Cylinder head gasket	1	
17	Dowel pin	2	For installation, reverse the removal procedure.

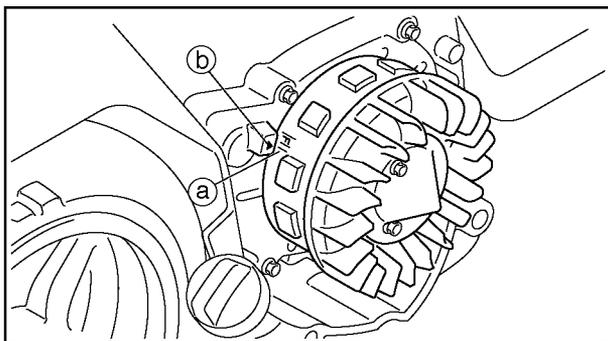


EAS00225

REMOVING THE CYLINDER HEAD

1. Remove :

- V-belt case cover
- Refer to "BELT DRIVE".
- cylinder head cover

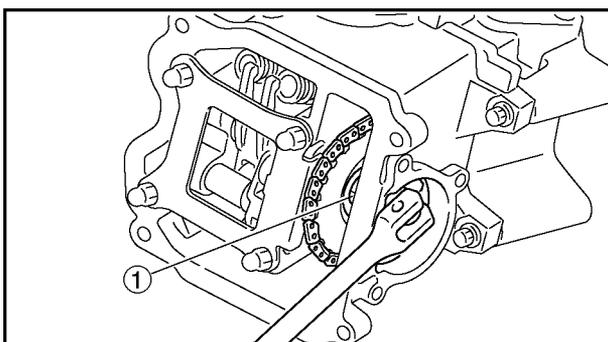
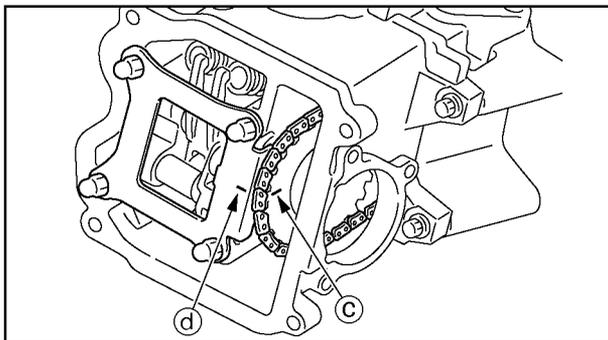


2. Align:

- "1" mark (a) on the AC magneto rotor
(with the stationary pointer (b) on the crankcase cover)

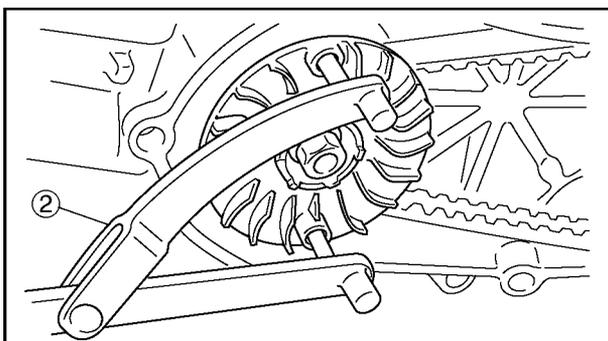


- a. Turn the primary fixed sheave counterclockwise.
- b. When the piston is at TDC on the compression stroke, align the "1" mark (c) on the camshaft sprocket with the mark (d) on the plate.

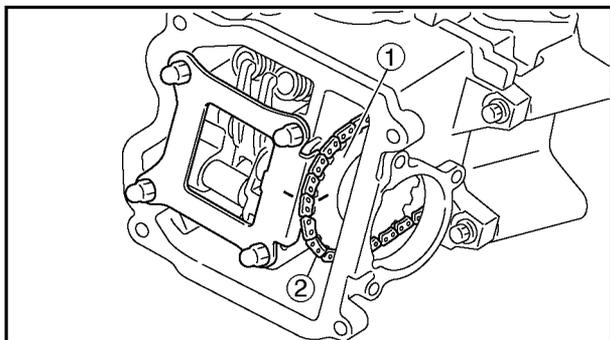


3. Loosen:

- timing chain tensioner cap bolt
 - camshaft sprocket bolt (1)
- While holding the crank bolt with a wrench (2), remove the camshaft sprocket bolt.



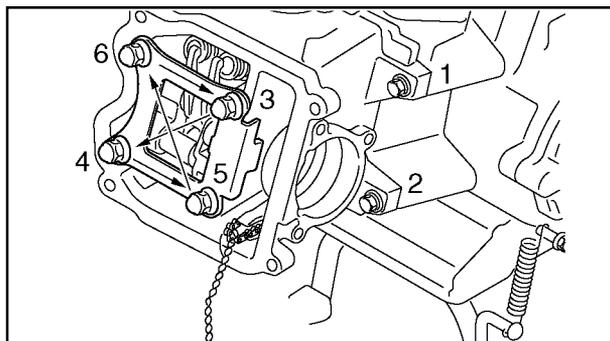
Rotor holding tool
90890-01235
YU-01235



4. Remove:
- timing chain tensioner (along with the gasket)
 - camshaft sprocket ①
 - timing chain ②

NOTE: _____

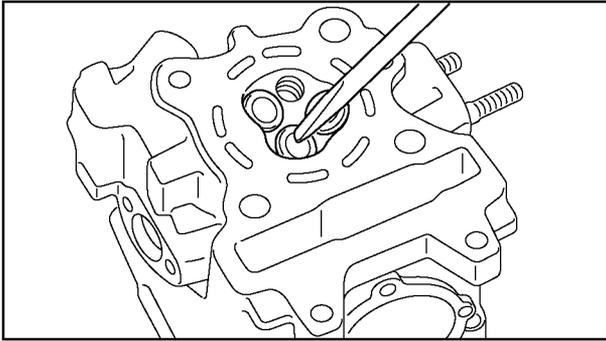
- To prevent the timing chain from falling into the crankcase, fasten it with a wire.



5. Remove:
- cylinder head

NOTE: _____

- Loosen the nuts in the proper sequence as shown.
- Loosen each nut 1/2 of a turn at a time. After all of the nuts are fully loosened, remove them.



EAS00227

CHECKING THE CYLINDER HEAD

1. Eliminate:
 - combustion chamber carbon deposits (with a rounded scraper)

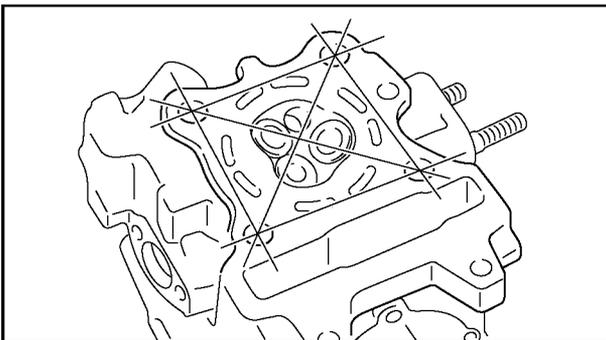
NOTE: _____

Do not use a sharp instrument to avoid damaging or scratching:

- spark plug bore thread
- valve seats

2. Check:

- cylinder head
Damage/scratches → Replace.

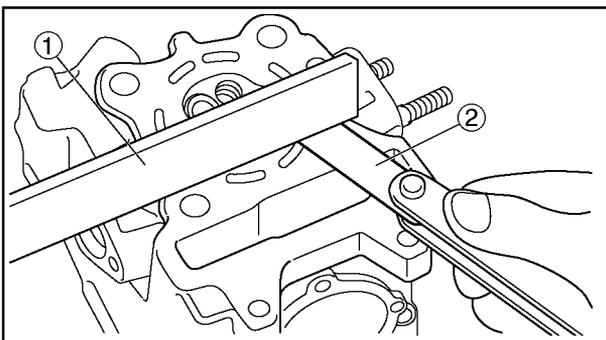


3. Measure:

- cylinder head warpage
Out of specification → Resurface the cylinder head.



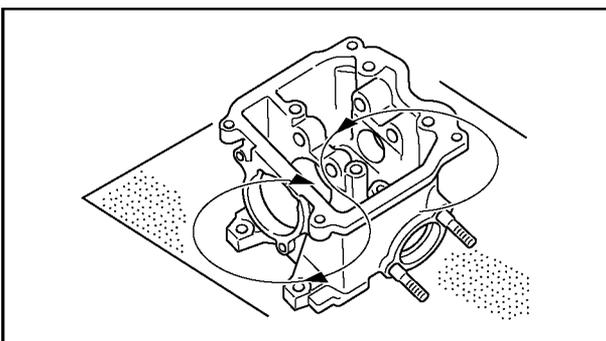
**Maximum cylinder head warpage
0.05 mm (0.0020 in)**



- a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
- b. Measure the warpage.
- c. If the limit is exceeded, resurface the cylinder head as follows.
- d. Place a 400 ~ 600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE: _____

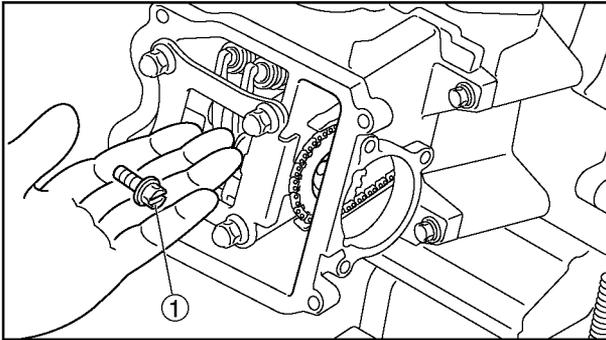
To ensure an even surface, rotate the cylinder head several times.



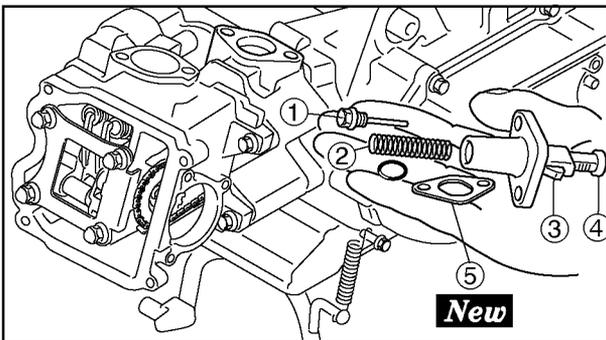
**CAUTION:**

Do not turn the crankshaft when installing the camshaft to avoid damage or improper valve timing.

- e. While holding the camshaft, temporarily tighten the camshaft sprocket bolt.
- f. Remove the wire from the timing chain.



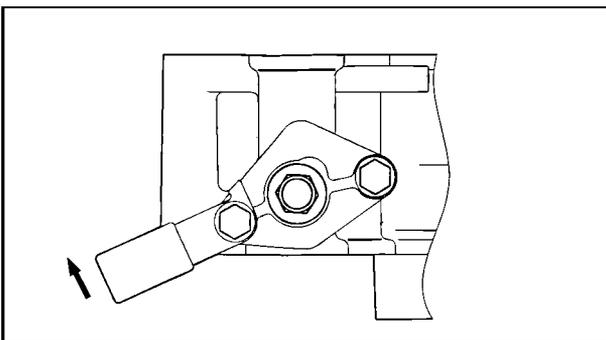
5. Install
 - camshaft sprocket bolt ①



6. Install:
 - timing chain tensioner gasket **New**
 - timing chain tensioner



- a. Remove the cap bolt ① and spring ②.
- b. Release the timing chain tensioner one-way cam ③ and push the timing chain tensioner rod ④ all the way into the timing chain tensioner housing.
- c. Install the timing chain tensioner and gasket ⑤ onto the cylinder.



Timing chain tensioner bolt
9 Nm (0.9 m • kg, 6.5 ft • lb)

- d. Install the springs ② and cap bolt ①.

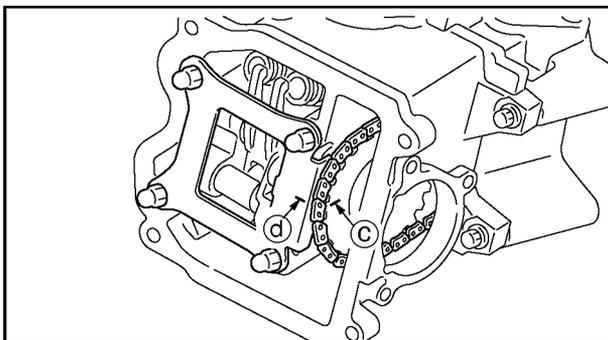
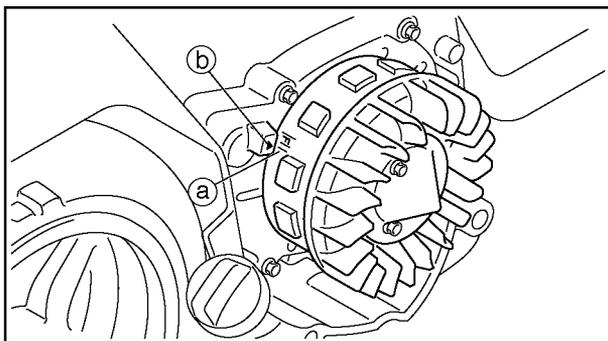


Cap bolt
8 Nm (0.8 m • kg, 5.8 ft • lb)





7. Turn:
- crankshaft
(several turns counterclockwise)



8. Check:
- “I” mark (a)
Align the “I” mark on the AC magneto rotor with the stationary pointer (b) on the crankcase cover.
 - “I” mark (c)
Align the “I” mark on the camshaft sprocket with the stationary pointer (d) on the plate.
Out of alignment → Correct.
Refer to the installation steps above.

9. Tighten:
- camshaft sprocket bolt

 30 Nm (3.0 m • kg, 21.7 ft • lb)

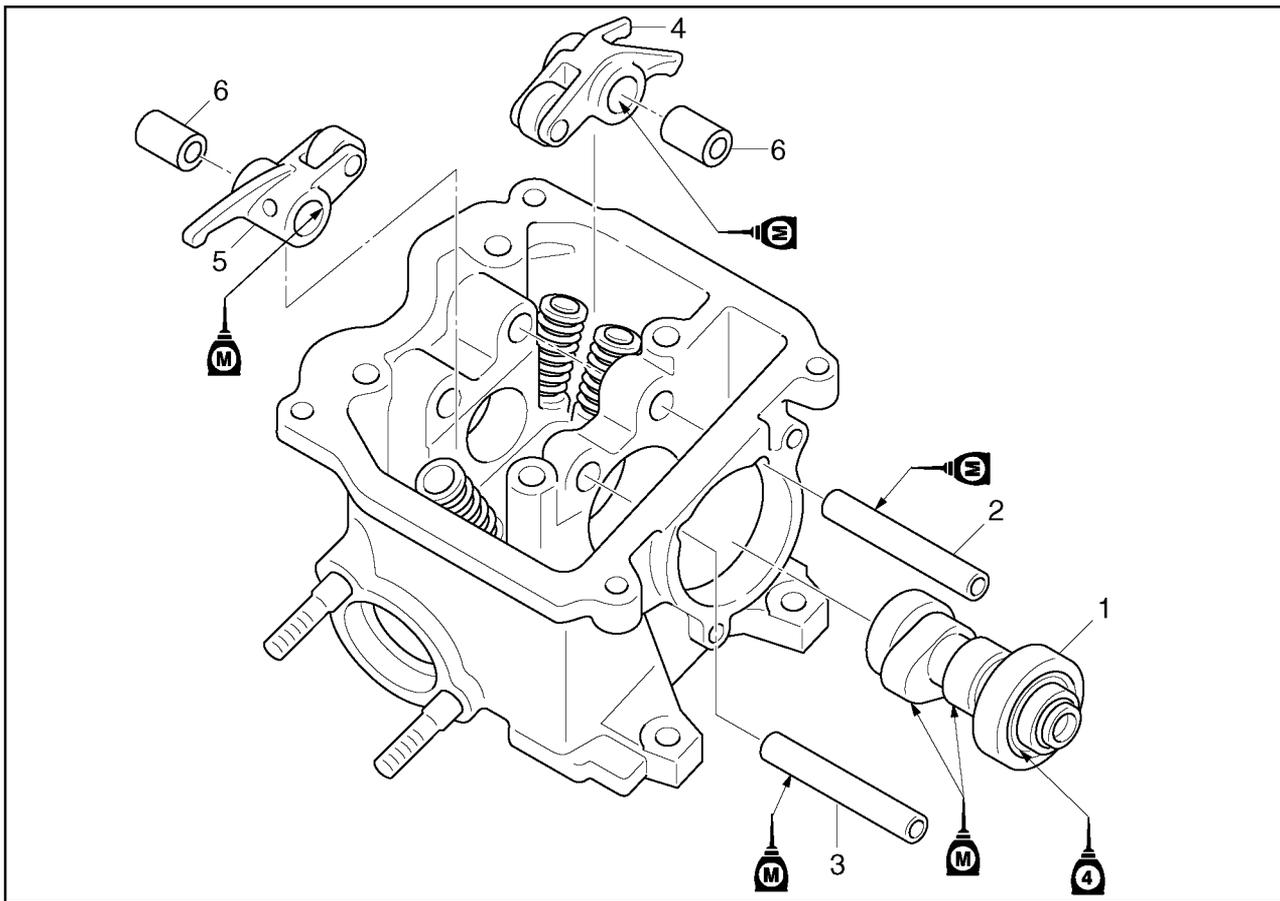
CAUTION: _____

Be sure to tighten the camshaft sprocket bolt to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

10. Measure:
- valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEARANCE” in chapter 3.



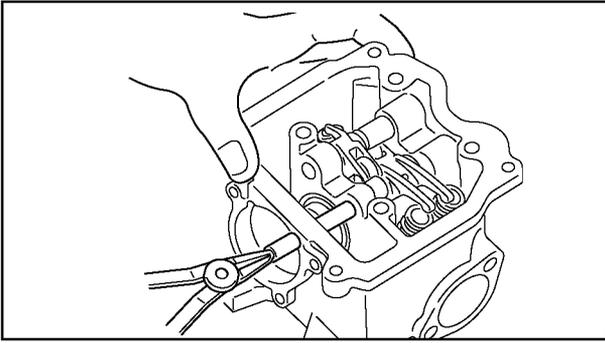
THE ROCKER ARMS AND CAMSHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the rocker arms and camshaft		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Camshaft	1	
2	Rocker arm shaft(intake)	1	
3	Rocker arm shaft(exhaust)	1	
4	Rocker arm(intake)	1	
5	Rocker arm(exhaust)	1	
6	Collar	2	For installation, reverse the removal procedure.

THE ROCKER ARMS AND CAMSHAFT

ENG

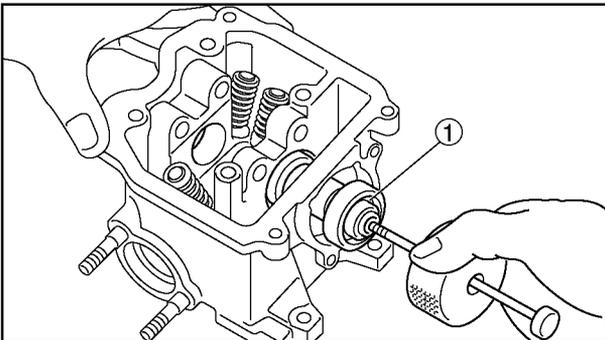


EAS00202

REMOVING THE ROCKER ARMS AND CAMSHAFT

1. Remove:
 - intake rocker arm shaft
 - exhaust rocker arm shaft
 - intake rocker arm
 - exhaust rocker arm
 - collar

NOTE: _____
Remove the rocker arm shafts with the clip plier.



2. Remove:
 - camshaft ①

NOTE: _____
Remove the camshaft with the slide hammer bolt.



Slide hammer bolt

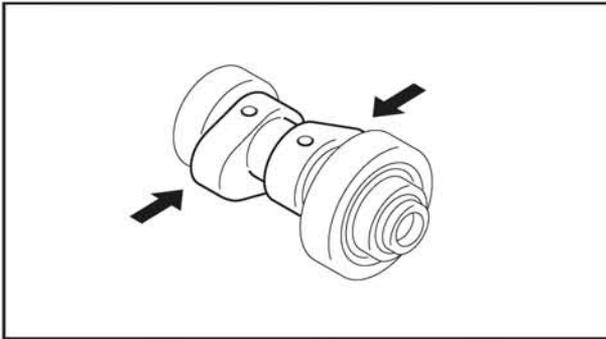
90890-01085

YU-01083-2

Weight

90890-01084

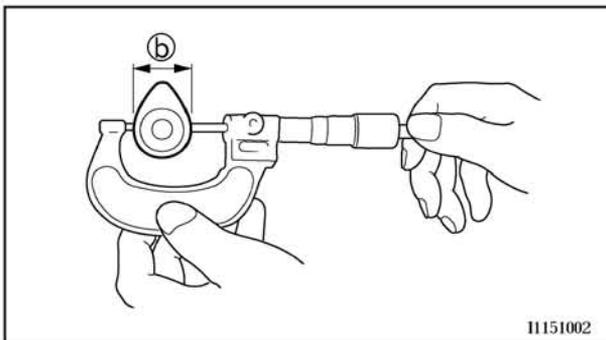
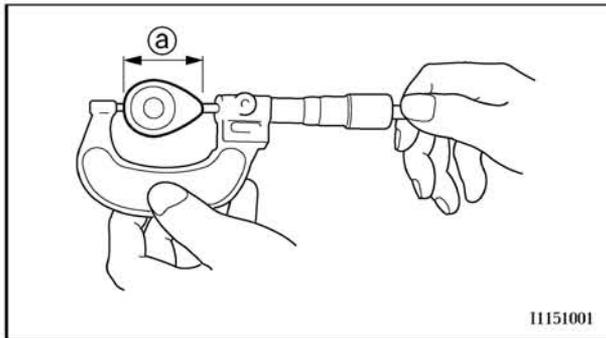
YU-01083-3



EAS00205

CHECKING THE CAMSHAFT

1. Check:
 - camshaft bushings
Damage/wear → Replace.
2. Check:
 - camshaft lobes
Blue discoloration/pitting/scratches → Replace the camshaft.
3. Measure:
 - camshaft lobe dimensions (a) and (b)
Out of specification → Replace the camshaft.



Camshaft lobe dimension limit

Intake

Ⓐ 30.158~30.258mm

(1.1873~1.1913 in)

<Limit>: 30.058mm (1.1834 in)

Ⓑ 25.082~25.182mm

(0.9875~0.9914 in)

<Limit>: 24.982mm (0.9835 in)

Exhaust

Ⓐ 30.158~30.258mm

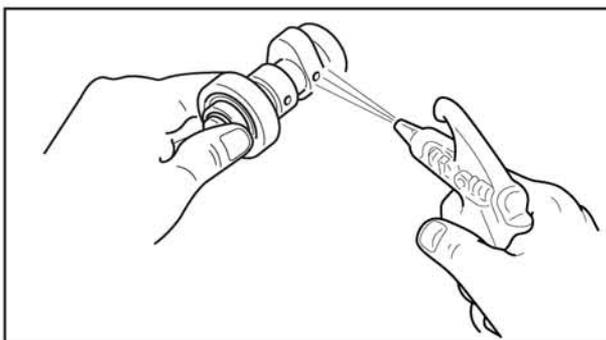
(1.1873~1.1913 in)

<Limit>: 30.058mm (1.1834 in)

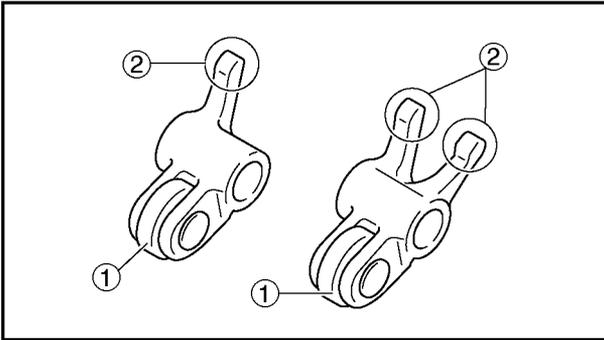
Ⓑ 25.020~25.120mm

(0.9850~0.9890 in)

<Limit>: 24.920mm (0.9811 in)



4. Check:
 - camshaft oil passage
Obstruction → Blow out with compressed air.

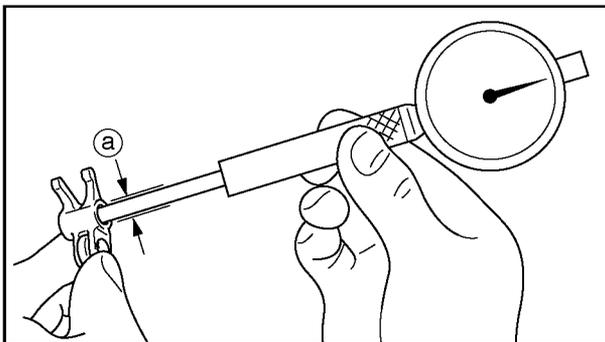


EAS00206

CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

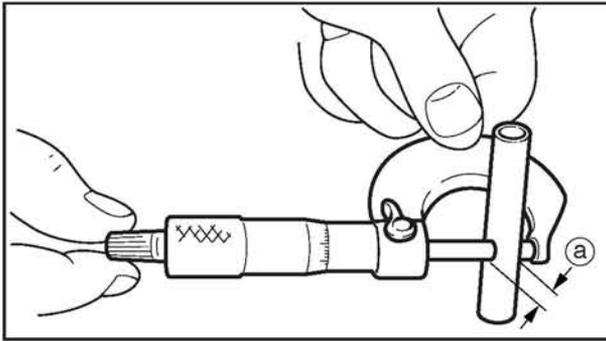
1. Check:
 - rocker arm (camshaft touch surface①)
 - rocker arm (valve touch surface②)
Damage/wear → Replace.
2. Check:
 - rocker arm shaft
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.
3. Check:
 - camshaft lobe
Excessive wear → Replace the camshaft.



4. Measure:
 - rocker arm inside diameter (a)
Out of specification → Replace.



Rocker arm inside diameter
 10 ~ 10.015 mm (0.3937 ~ 0.3943 in)
 <Limit>: 10.030mm (0.3949 in)



5. Measure:
 - rocker arm shaft outside diameter (a)
Out of specification → Replace.

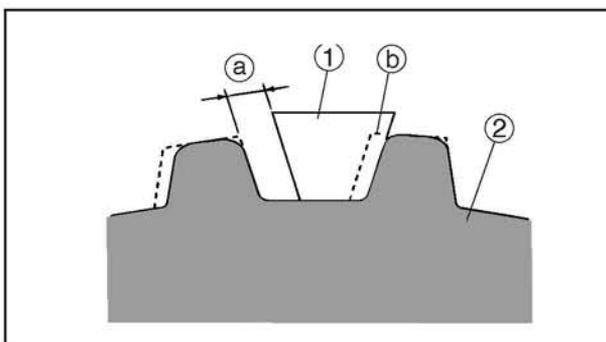
	Rocker arm shaft outside diameter 9.981 ~ 9.991 mm (0.3930 ~ 0.3933 in) <Limit>: 9.950mm (0.3917 in)
--	---

6. Calculate:
 - rocker-arm-to-rocker-arm-shaft clearance

NOTE: _____
 Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Above 0.034 mm (0.0013 in) → Replace the defective part(s).

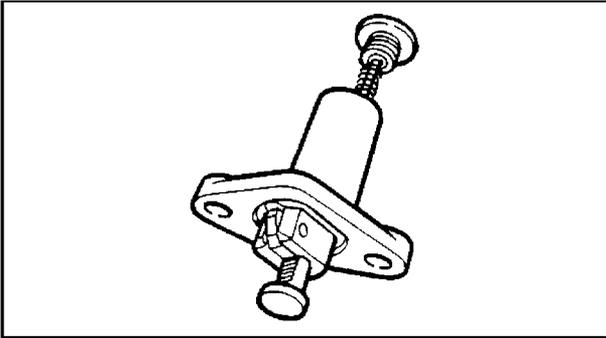
	Rocker-arm-to-rocker-arm-shaft clearance 0.009 ~ 0.034 mm (0.0004 ~ 0.0013 in)
--	--



EAS00207

CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKET, AND TIMING CHAIN GUIDES

1. Check:
 - timing chain
Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.
 2. Check:
 - camshaft sprocket
More than 1/4 tooth wear (a) → Replace the camshaft sprocket and the timing chain as a set.
- (a) 1/4 tooth
 (b) Correct
 ① Timing chain roller
 ② Camshaft sprocket
3. Check:
 - timing chain guide (exhaust side)
 - timing chain guide (intake side)
Damage/wear → Replace the defective part(s).



EAS00210

CHECKING THE TIMING CHAIN TENSIONER

1. Check:
 - timing chain tensioner
Cracks/damage → Replace.
2. Check:
 - one-way cam operation
Rough movement → Replace the timing chain tensioner.
3. Check:
 - cap bolt
 - o-ring **New**
 - spring
 - one-way cam
 - gasket **New**
 - timing chain tensioner rod
Damage/wear → Replace the defective part(s).



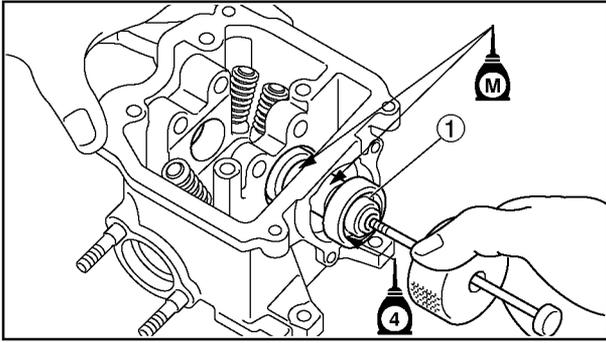
- a. Removing the spring and cap bolt.
- b. Return cam chain tensioner one way cam.
Press tensioner rod to the cam chain tensioner housing.
- c. Installing the spring and cap bolt.
- d. Loosen the front end of cam chain tensioner slowly.
- e. Make sure to return to the front end of cam chain tensioner.



Rough movement → Replace the timing chain tensioner.

THE ROCKER ARMS AND CAMSHAFT

ENG



EAS00220

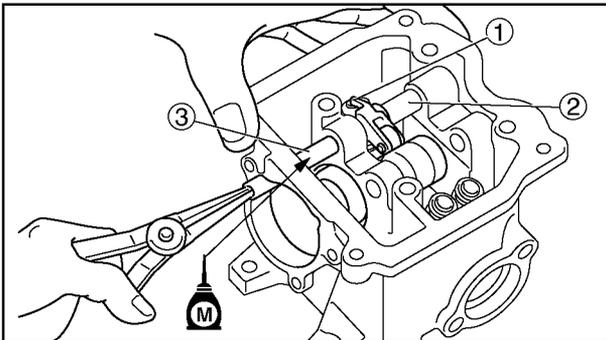
INSTALLING THE CAMSHAFT AND ROCKER ARMS

- Lubricate:
 - camshaft ①

	Recommended lubricant Camshaft Molybdenum disulfide oil Camshaft bearing Engine oil
---	--

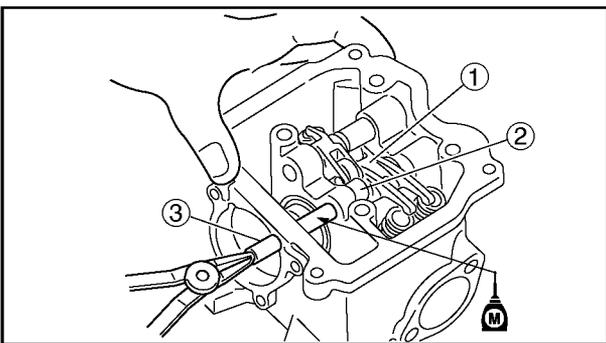
- Lubricate:
 - rocker arm shafts

	Recommended lubricant Molybdenum disulfide oil
---	--



- Install:
 - exhaust rocker arm ①
 - collar ②
 - exhaust rocker arm shaft ③

NOTE: _____
 Make sure the exhaust rocker arm shaft is completely pushed into the cylinder head.



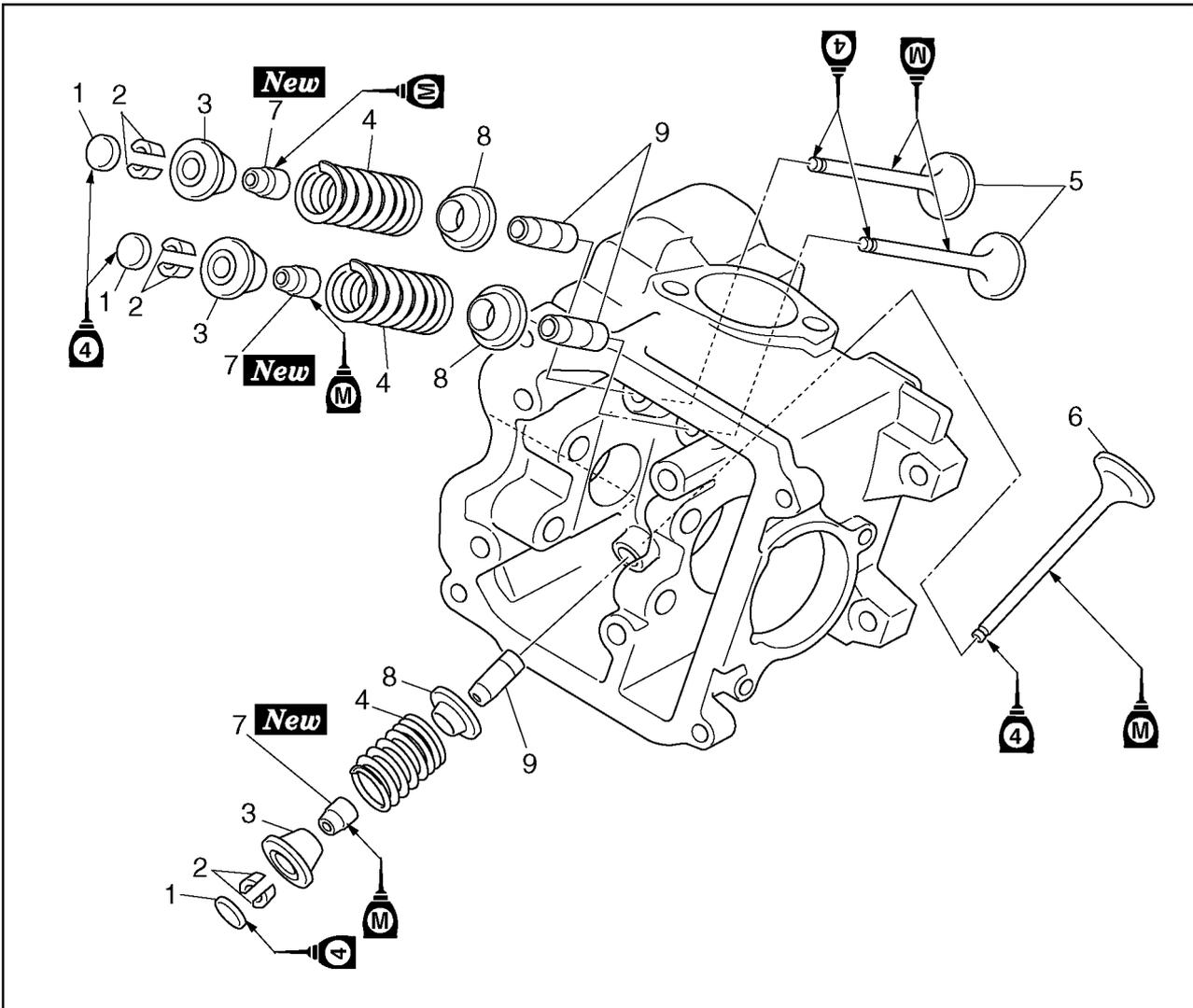
- Install:
 - intake rocker arm ①
 - collar ②
 - intake rocker arm shaft ③

NOTE: _____
 Make sure the intake rocker arm shaft is completely pushed into the cylinder head.



EAS00236

VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
	Rocker arms		Refer to "REMOVING THE ROCKER ARMS AND CAMSHAFT" and "INSTALLING THE CAMSHAFT AND ROCKER ARMS".
	Rocker arm shafts		
	Camshaft		
1	Valve pad	3	
2	Valve cotter	6	
3	Valve spring retainer	3	
4	Valve spring	3	
5	Valve(intake)	2	Refer to "REMOVING THE VALVES" and "INSTALLING THE VALVES".
6	Valve(exhaust)	1	
7	Valve stem seal	3	
8	Valve stem seat	3	
9	Valve guide	3	



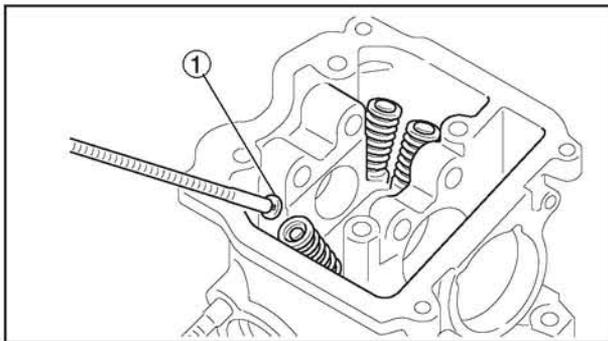
EAS00237

REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

NOTE:

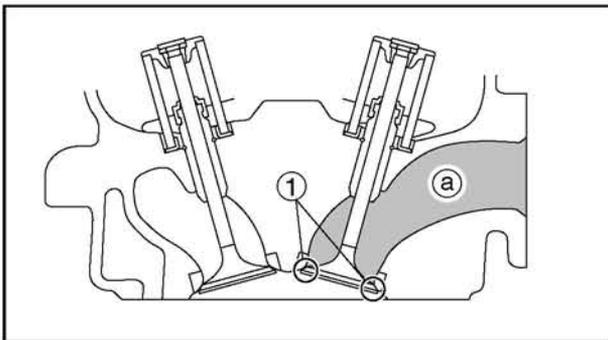
Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.



- Remove:
 - valve pad ①

NOTE:

Make a note of the position of each valve pad so that they can be reinstalled in their original place.



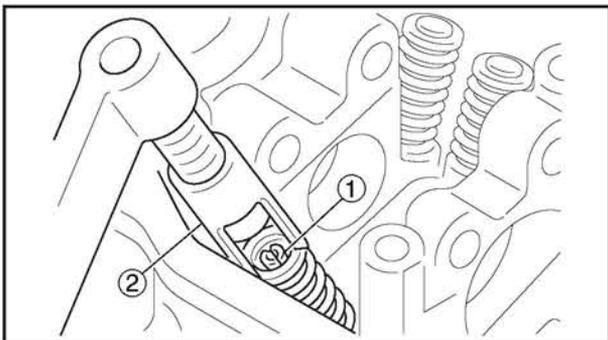
- Check:
 - valve sealing
Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
Refer to “CHECKING THE VALVE SEATS”.



- Pour a clean solvent (a) into the intake and exhaust ports.
- Check that the valves properly seal.

NOTE:

There should be no leakage at the valve seat ①.



- Remove:
 - valve cotters ①

NOTE:

Remove the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment ②.



Valve spring compressor

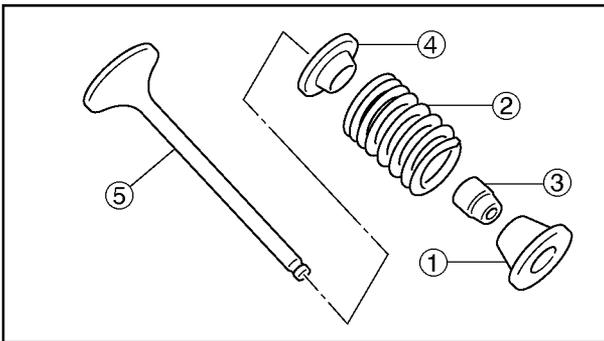
90890-04019

YM-04019

Valve spring compressor attachment

90890-04148

YM-04148

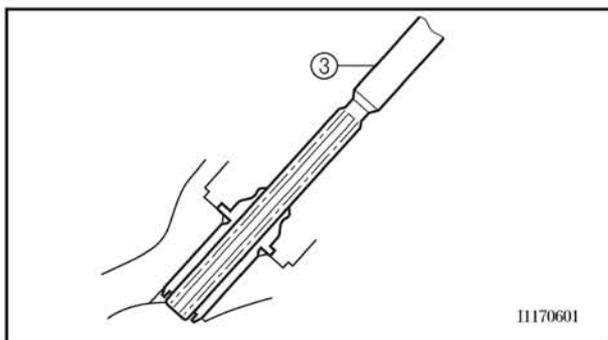
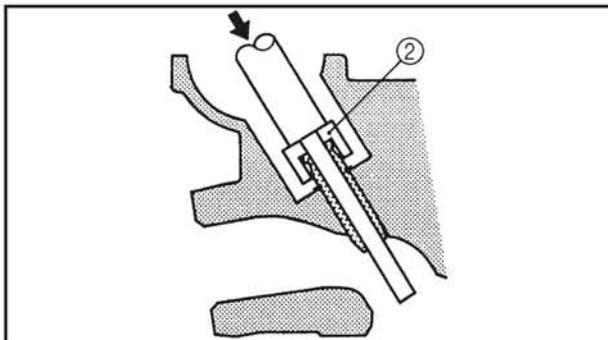
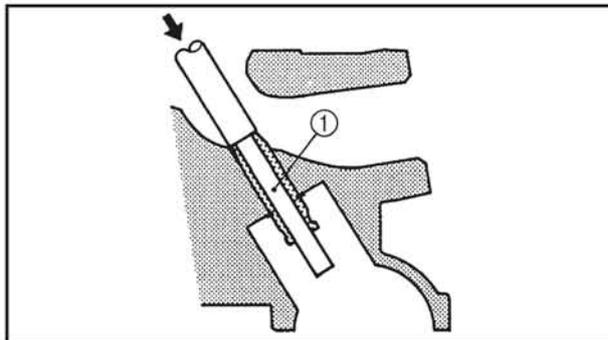
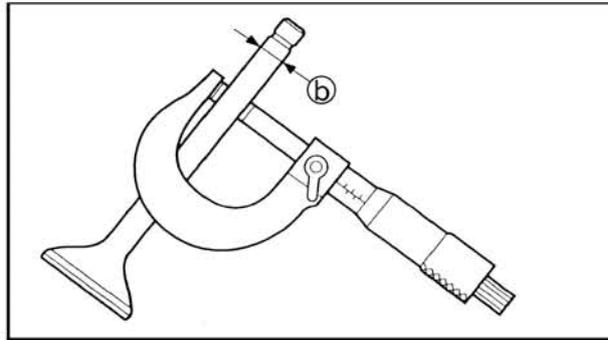
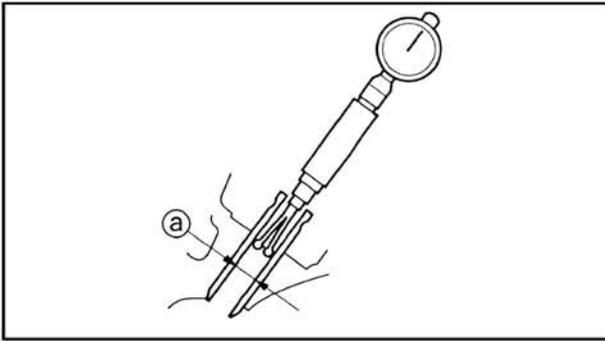


4. Remove:

- valve spring retainer ①
- valve spring ②
- valve stem seal ③
- valve spring seat ④
- valve ⑤

NOTE: _____

Identify the position of each part very carefully so that it can be reinstalled in its original place.



11170601

EAS00239

CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

1. Measure:

- valve-stem-to-valve-guide clearance

$$\text{Valve-stem-to-valve-guide clearance} = \text{Valve guide inside diameter (a)} - \text{Valve stem diameter (b)}$$

Out of specification → Replace the valve guide.



Valve-stem-to-valve-guide clearance

Intake

0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
 <Limit>: 0.08 mm (0.0031 in)

Exhaust

0.025 ~ 0.052 mm (0.001 ~ 0.002 in)
 <Limit>: 0.10 mm (0.0039 in)

2. Replace:

- valve guide

NOTE:

To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C (212°F) in an oven.



- Remove the valve guide with the valve guide remover ①.
- Install the new valve guide with the valve guide installer ② and valve guide remover ①.
- After installing the valve guide, bore the valve guide with the valve guide reamer ③ to obtain the proper valve-stem-to-valve-guide clearance.

NOTE:

After replacing the valve guide, reface the valve seat.



Valve guide remover (4.0 mm)
 90890-04111(YM-04111)

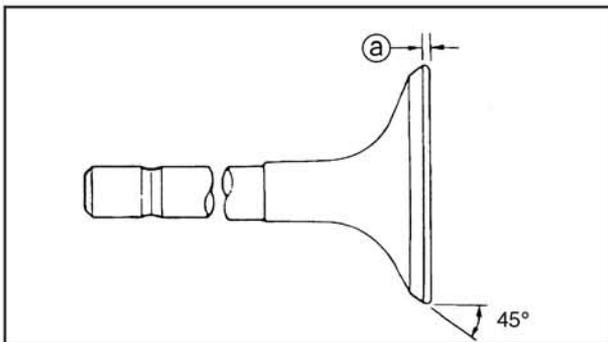
Valve guide installer (4.0 mm)
 90890-04112(YM-04112)

Valve guide reamer (4.0 mm)
 90890-04113(YM-04113)





3. Eliminate:
 - carbon deposits
(from the valve face and valve seat)
4. Check:
 - valve face
Pitting/wear → Grind the valve face.
 - valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.



5. Measure:
 - valve margin thickness (a)
Out of specification → Replace the valve.

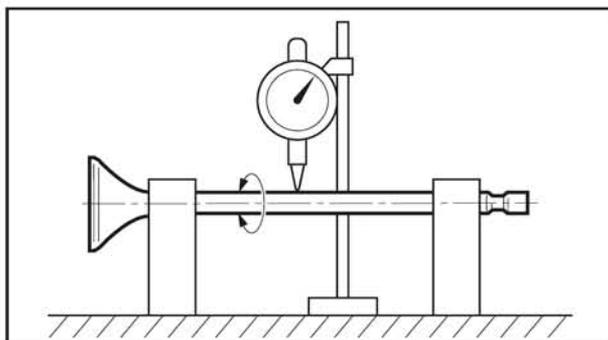


Valve margin thickness
0.9~1.1mm(0.0354~0.0433in)

6. Measure:
 - valve stem runout
Out of specification → Replace the valve.

NOTE: _____

- If the valve is removed or replaced, always replace the oil seal.



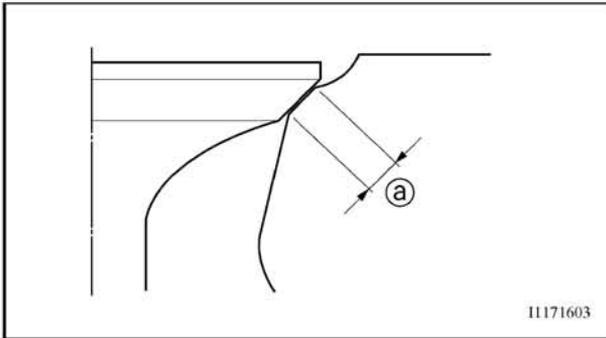
Valve stem runout
0.01 mm(0.0004 in)

EAS00240

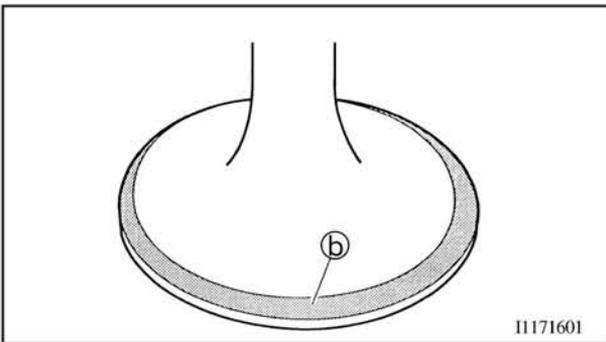
CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

1. Eliminate:
 - carbon deposits (from the valve face and valve seat)
2. Check:
 - valve seat
Pitting/wear → Replace the cylinder head.
3. Measure:
 - valve seat width ①
Out of specification → Replace the cylinder head.



11171603



11171601

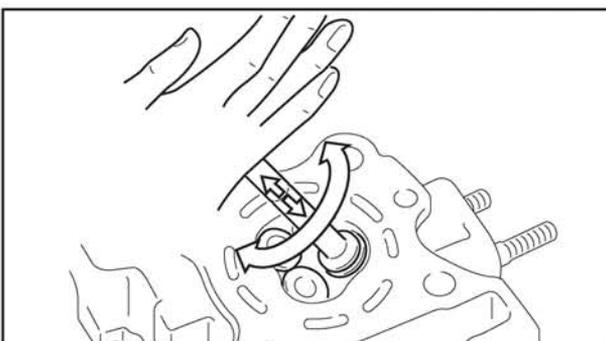
	Valve seat width Intake: 0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in) <Limit>: 1.6 mm(0.063 in) Exhaust: 0.9 ~1.1 mm (0.0354~0.0433 in) <Limit>: 1.6 mm(0.063 in)
---	---



- a. Apply Mechanic’s blueing dye (Dykem) ② onto the valve face.
- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- d. Measure the valve seat width.

NOTE: _____

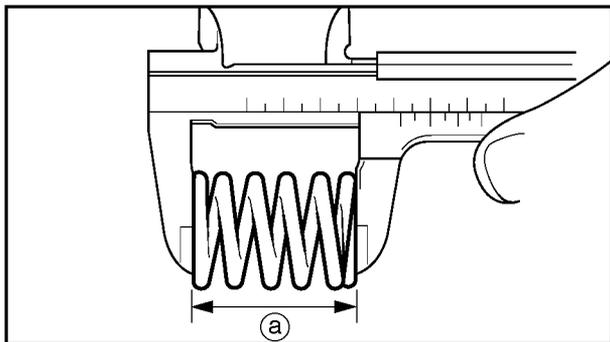
Where the valve seat and valve face contacted one another, the blueing will have been removed.



4. Lap:
 - valve face
 - valve seat

NOTE: _____

After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.



EAS00241

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

1. Measure:

- valve spring free length (a)
Out of specification → Replace the valve spring.



Valve spring free length

Intake valve spring

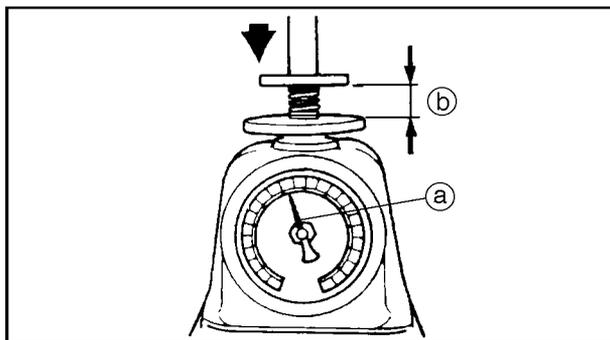
39.35 mm (1.5492 in)

<Limit>: 37.38 mm (1.4717 in)

Exhaust valve spring

41.57 mm (1.6366 in)

<Limit>: 39.49 mm (1.5547 in)



2. Measure:

- compressed valve spring force (a)
Out of specification → Replace the valve spring.

(b) Installed length



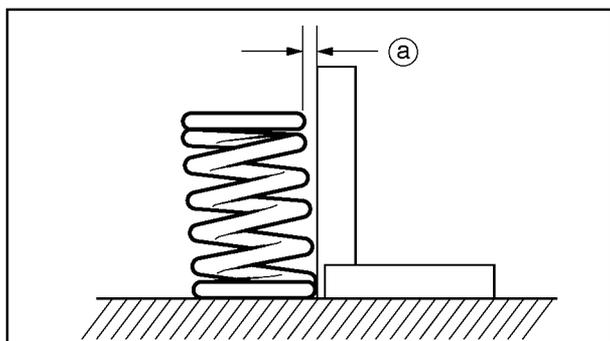
Compressed valve spring force (installed)

Intake valve spring

91.1 ~ 104.9 N (9.3 ~ 10.7 kg, 20.48 ~ 23.58 lb) at 28mm (1.1024 in)

Exhaust valve spring

107.9 ~ 124.1 N (11.0 ~ 12.7 kg, 24.26 ~ 27.90 lb) at 30mm (1.1811 in)



3. Measure:

- valve spring tilt (a)
Out of specification → Replace the valve spring.



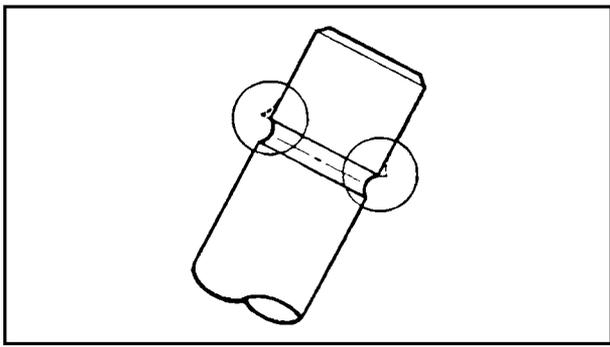
Spring tilt limit

Intake valve spring

1.7 mm (0.0669 in) (2.5°)

Exhaust valve spring

1.8 mm (0.0709 in) (2.5°)

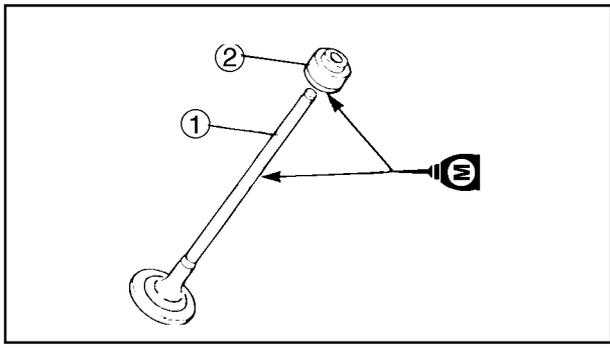


EAS00245

INSTALLING THE VALVES

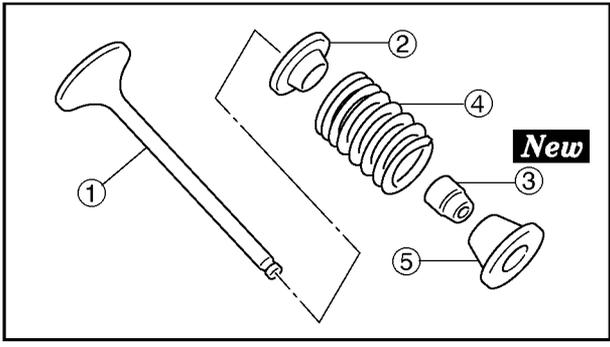
The following procedure applies to all of the valves and related components.

1. Deburr:
 - valve stem end (with an oil stone)



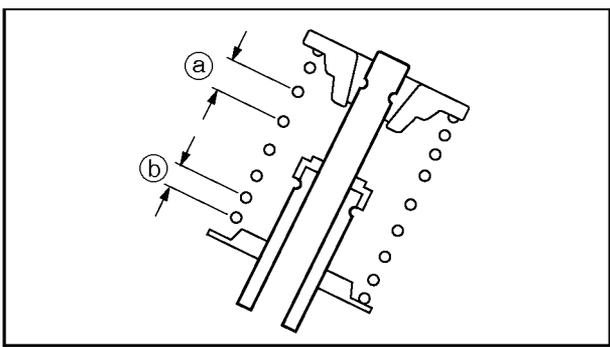
2. Lubricate:
 - valve stem ①
 - valve stem seal ② (with the recommended lubricant)

	<p>Recommended lubricant Molybdenum disulfide oil</p>
--	--

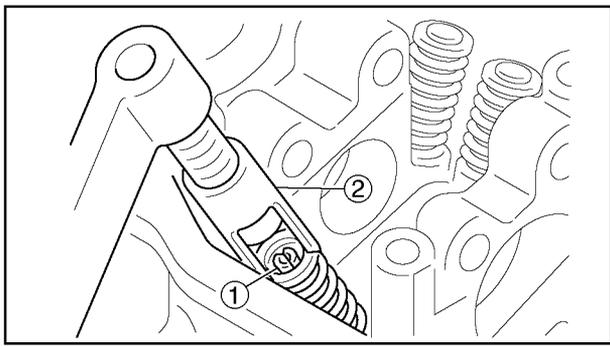


3. Install:
 - valve ①
 - valve spring seat ②
 - valve stem seal ③ **New**
 - valve spring ④
 - valve spring retainer ⑤ (into the cylinder head)

NOTE: _____
Install the valve spring with the larger pitch (a) facing up.



(b) Smaller pitch



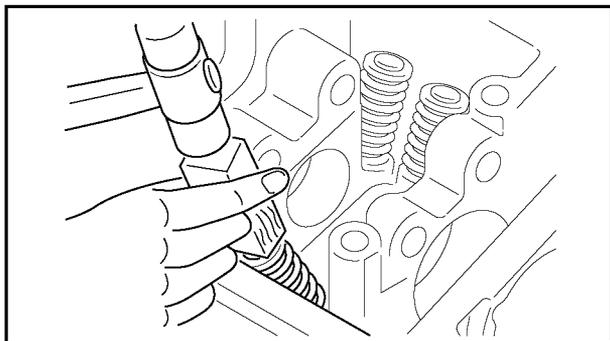
4. Install:
 - valve cotten ①

NOTE: _____
Install the valve cotten by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment ②.



Valve spring compressor
90890-04019(YM-04019)

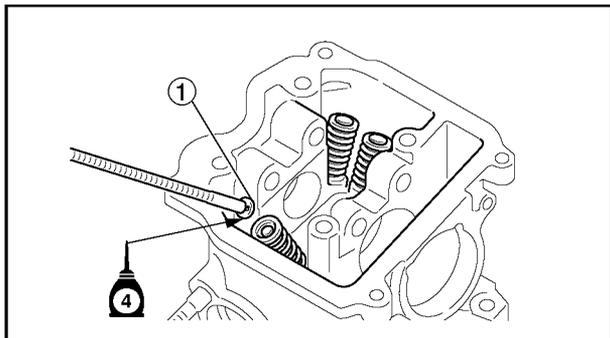
Valve spring compressor attachment
90890-04148(YM-04148)



5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

CAUTION:

Hitting the valve tip with excessive force could damage the valve.



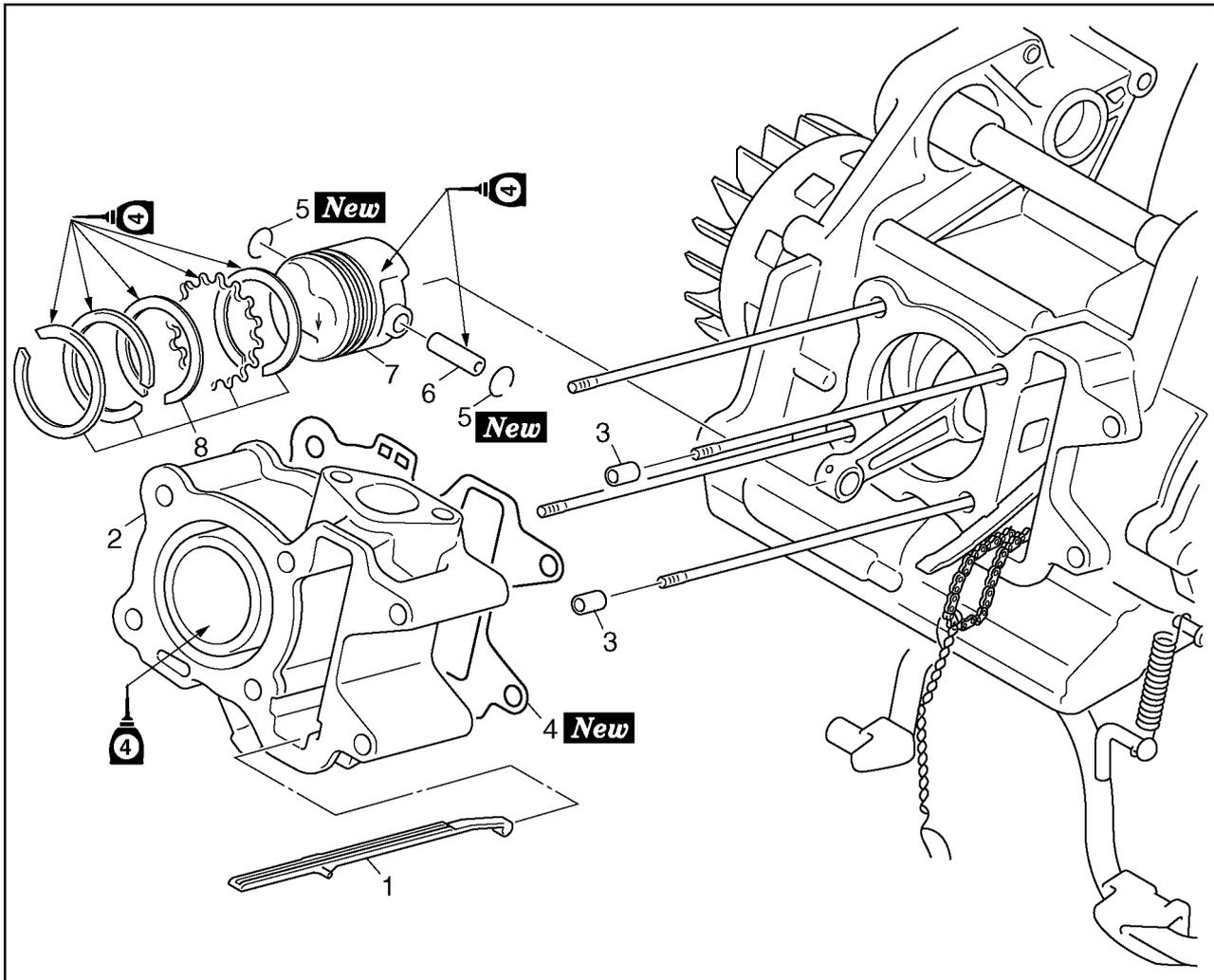
6. Install:
valve pad ①

NOTE:

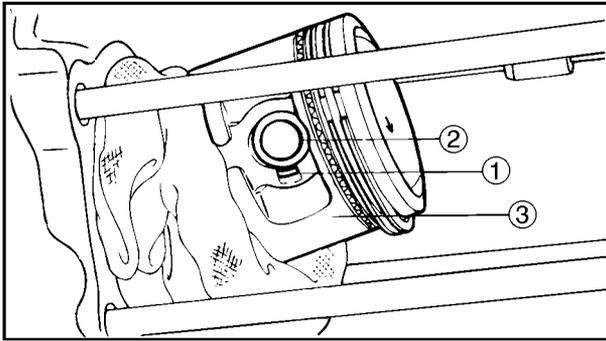
- Lubricate the valve pad with engine oil.
- Valve pad must be reinstalled in its original position.

EAS00251

CYLINDER AND PISTON



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder and piston		
	Cylinder head		Remove the parts in the order listed. Refer to "CYLINDER HEAD".
1	Timing chain guide(exhaust side)	1	
2	Cylinder	1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Piston pin clip	2	Refer to "REMOVING THE CYLINDER AND PISTON" and "INSTALLING THE PISTON AND CYLINDER".
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	
			For installation, reverse the removal procedure.



EAS00253

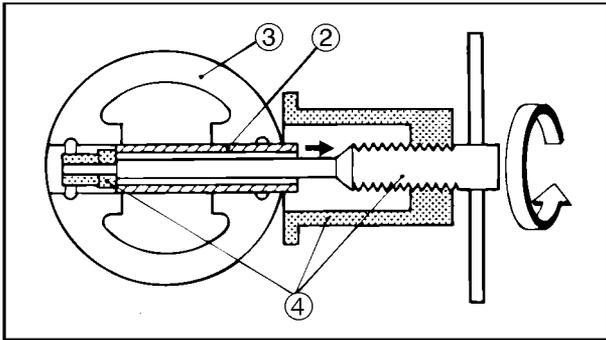
REMOVING THE CYLINDER AND PISTON

1. Remove:

- piston pin clip ①
- piston pin ②
- piston ③

CAUTION:

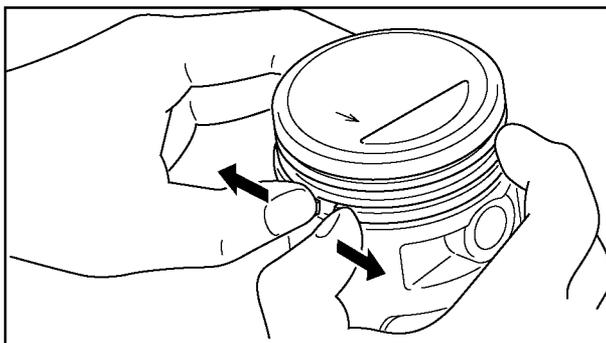
Do not use a hammer to drive the piston pin out.

**NOTE:**

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set ④.



Piston pin puller set
90890-01304(YU-01304)



2. Remove:

- top ring
- 2nd ring
- oil ring

NOTE:

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



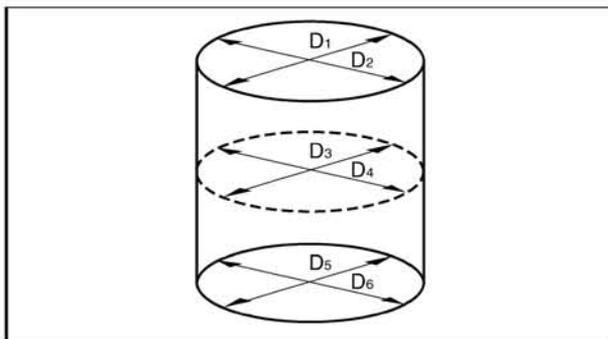
EAS00255

CHECKING THE CYLINDER AND PISTON

1. Check:

- piston wall
- cylinder wall

Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.



2. Measure:

piston-to-cylinder clearance



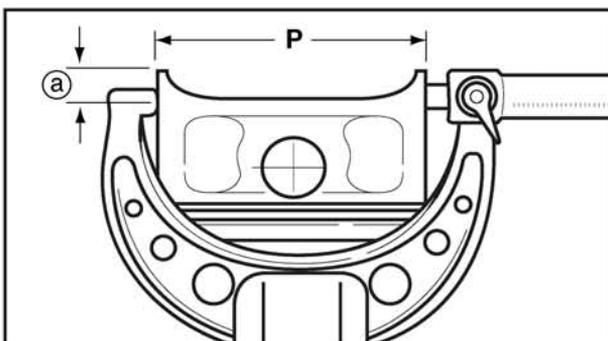
- a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE:

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

Cylinder bore "C"	38.000 ~ 38.010mm (1.4961 ~ 1.4965in)
Taper limit "T"	0.05mm (0.0020in)
Out-of-round "R"	0.05mm (0.0020in)
"C" = maximum of D ₁ ~ D ₂	
"T" = maximum of D ₁ or D ₂ - maximum of D ₅ or D ₆	
"R" = maximum of D ₁ , D ₃ or D ₅ - minimum of D ₂ , D ₄ or D ₆	

- b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure piston skirt diameter "P" with the micrometer.



- (a) 5mm(0.1969in) from the bottom edge of the piston

	Piston size "P"
Standard	37.975 ~ 37.990mm (1.4951 ~ 1.4957in)

- d. If out of specification, replace the piston and piston rings as a set.



- e. Calculate the piston-to-cylinder clearance with the following formula.

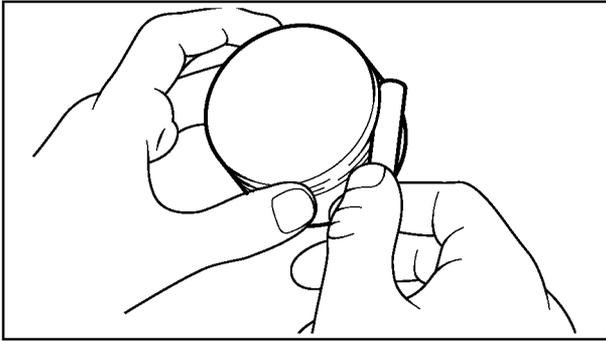
Piston-to-cylinder clearance =
Cylinder bore "C" -
Piston skirt diameter "P"



Piston-to-cylinder clearance
0.010 ~ 0.035mm(0.0004 ~
0.0014in)
<Limit>:0.15mm(0.0059in)

- f. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.





EAS00263

CHECKING THE PISTON RINGS

1. Measure:

- piston ring side clearance
Out of specification → Replace the piston and piston rings as a set.

NOTE:

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

**Piston ring side clearance****Top ring**

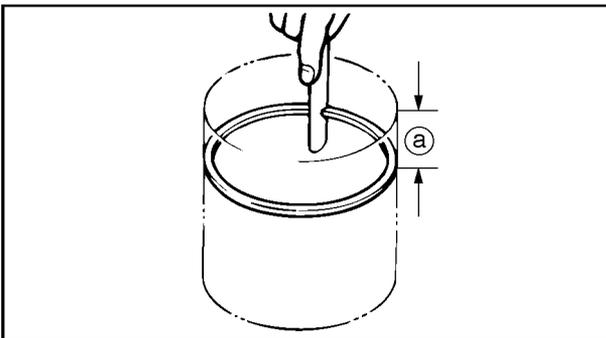
0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)

<Limit>: 0.12 mm (0.0047 in)

2nd ring

0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)

<Limit>: 0.12 mm (0.0047 in)



2. Install:

- piston ring
(into the cylinder)

NOTE:

Level the piston ring into the cylinder with the piston crown.

Ⓐ 10 mm (0.3937 in)

3. Measure:

- piston ring end gap
Out of specification → Replace the piston ring.

NOTE:

The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

**Piston ring end gap****Top ring**

0.05 ~ 0.15 mm (0.0020 ~ 0.0059 in)

<Limit>: 0.40 mm (0.0157 in)

2nd ring

0.05 ~ 0.17 mm (0.0020 ~ 0.0067 in)

<Limit>: 0.52 mm (0.0205 in)

Oil ring

0.20 ~ 0.70 mm (0.0079 ~ 0.0276 in)



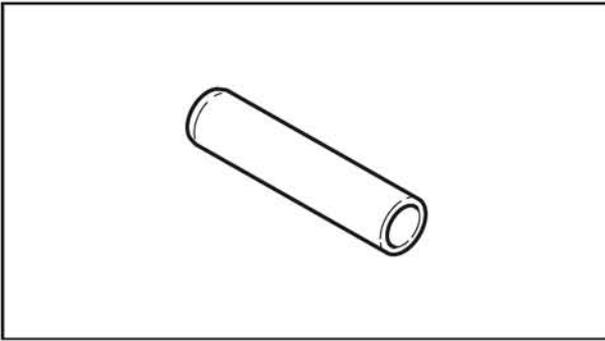
EAS00265

CHECKING THE PISTON PIN

1. Check:

- piston pin

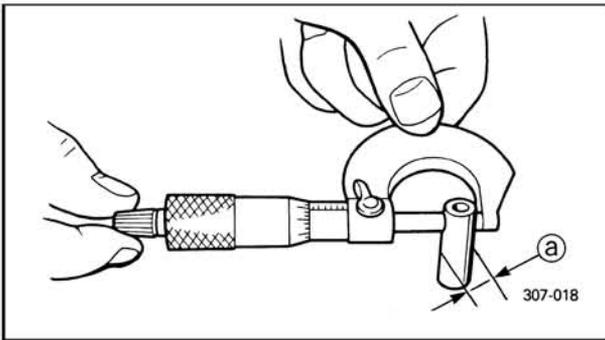
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.



2. Measure:

- piston pin outside diameter (a)

Out of specification → Replace the piston pin.



Piston pin outside diameter

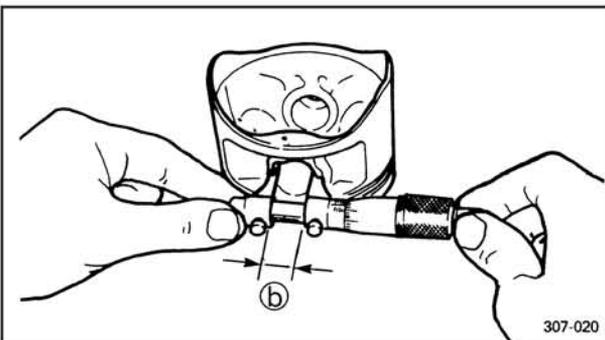
9.996 ~ 10.000 mm (0.3935 ~ 0.3937 in)

<Limit>: 9.976 mm (0.3928 in)

3. Measure:

- piston pin bore diameter (b)

Out of specification → Replace the piston.



Piston pin bore diameter

10.002 ~ 10.013 mm (0.3938 ~ 0.3942 in)

<Limit>: 10.043 mm (0.3954 in)

4. Calculate:

- piston-pin-to-piston-pin-bore clearance

Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston-pin-bore clearance =

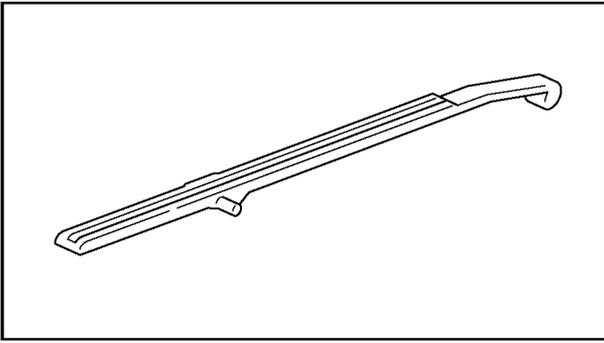
Piston pin bore diameter (b) -

Piston pin outside diameter (a)



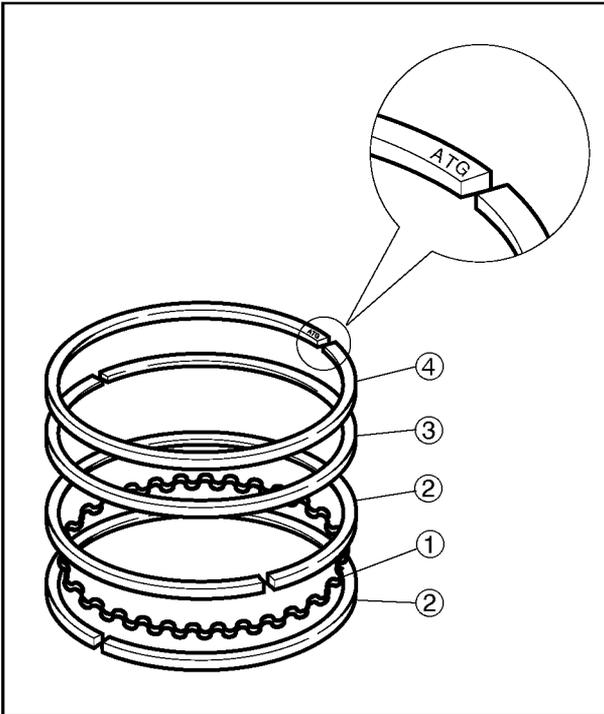
Piston-pin-to-piston clearance

0.002 ~ 0.017 mm (0.0001 ~ 0.0007 in)



CHECKING THE TIMING CHAIN GUIDE

1. Check:
 - timing chain guide (exhaust side)
 - Damage/wear → Replace



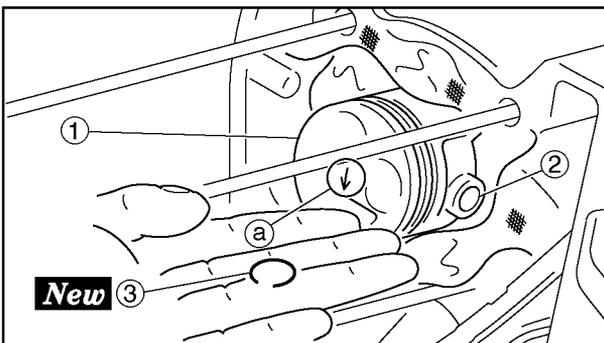
EAS00267

INSTALLING THE PISTON AND CYLINDER

1. Install:
 - oil ring expander ①
 - oil ring rail ②
 - 2nd ring ③
 - top ring ④

NOTE:

Be sure to install the piston rings so that the manufacturer's marks or numbers face up.



2. Install:

- piston ①
- piston pin ②
- piston pin clip **New** ③

NOTE:

- Apply engineoil the piston pin.
- Make sure the arrow mark (a) on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.



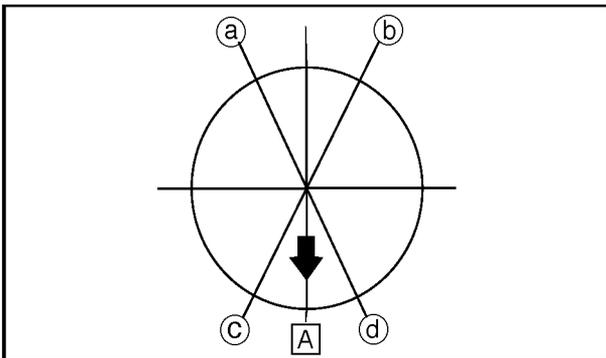
3. Install:

- gasket **New**
- dowel pins

4. Lubricate:

- piston
- piston rings
- cylinder
(with the recommended lubricant)

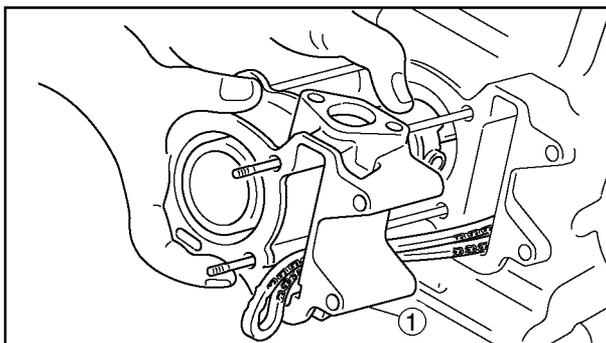
	Recommended lubricant Engine oil
---	--



5. Offset:

- piston ring end gaps

- (a) Top ring
- (b) Lower oil ring rail
- (c) Upper oil ring rail
- (d) 2nd ring
- (A) Exhaust side



6. Install:

- cylinder ①
- timing chain guide(exhaust side)

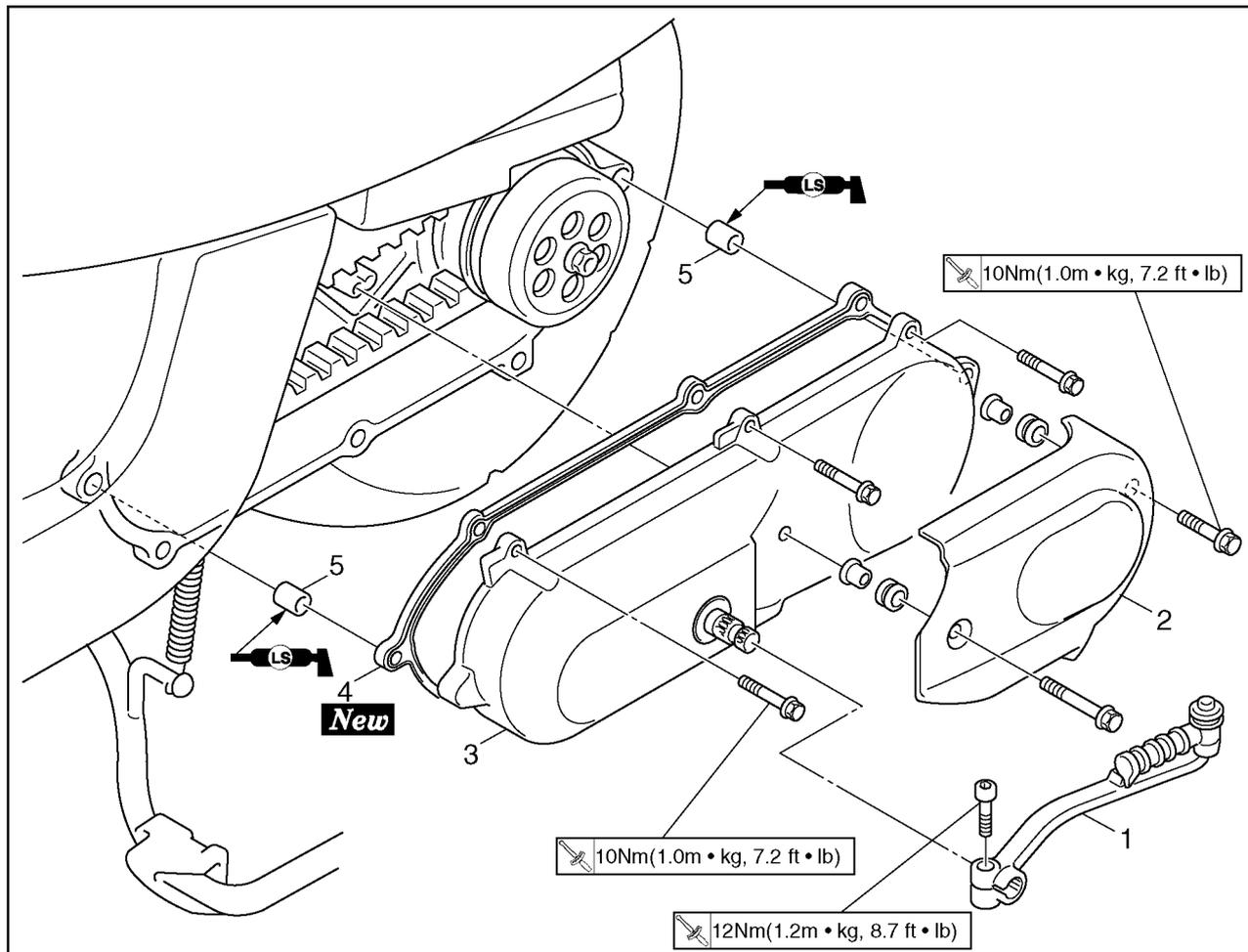
NOTE:

- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.



EAS00316

BELT DRIVE
V-BELT CASE COVER

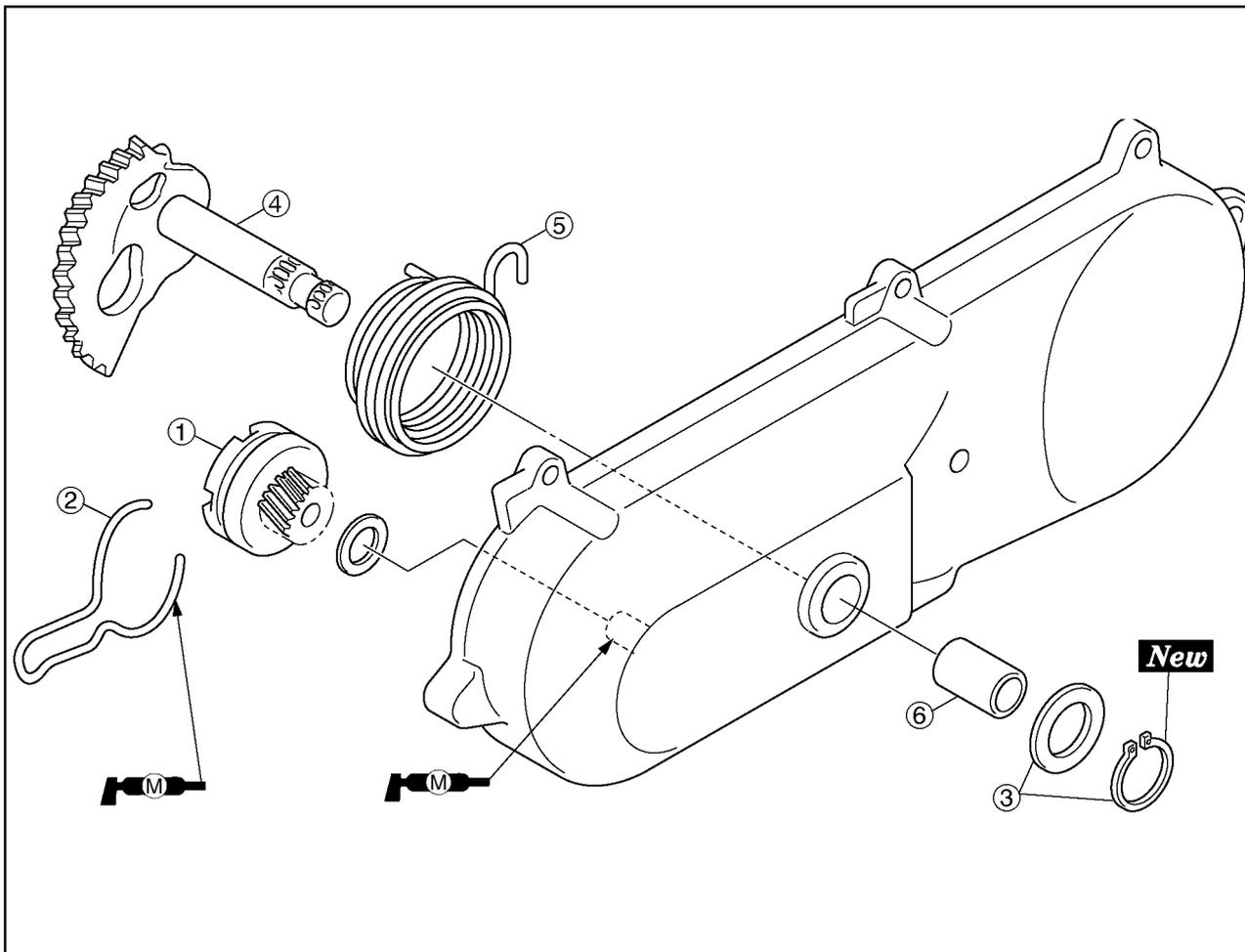


Order	Job/Part	Q'ty	Remarks
	Removing the V-belt case cover		
1	Kickstarter	1	Remove the parts in the order listed.
2	Cover	1	
3	V-belt case cover	1	
4	V-belt case cover gasket	1	
5	Dowel pin	2	
			For installation, reverse the removal procedure.

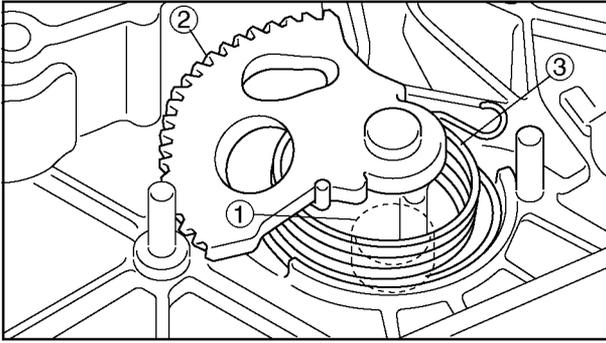


EAS00338

KICKSTARTER



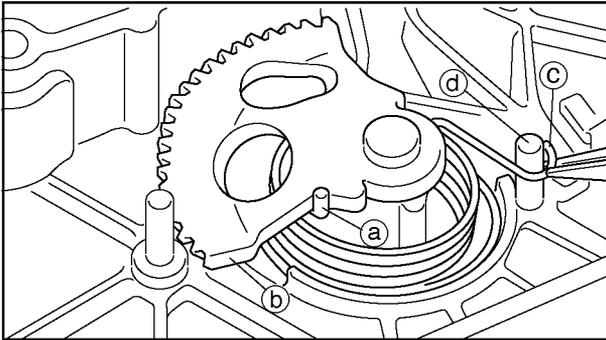
Order	Job/Part	Q'ty	Remarks
	Disassembling the kickstarter		
	V-belt case cover		Remove the parts in the order listed. Refer to "V-BELT CASE COVER".
①	Kick pinion gear	1	Refer to "INSTALLING THE KICKSTARTER".
②	Kick pinion gear clip	1	
③	Circlip/Plate washer	1/1	
④	Kickstarter shaft	1	
⑤	Torsion spring	1	
⑥	Solid bush	1	
			For assembly, reverse the disassembly procedure.



EAS00340

INSTALLING THE KICKSTARTER

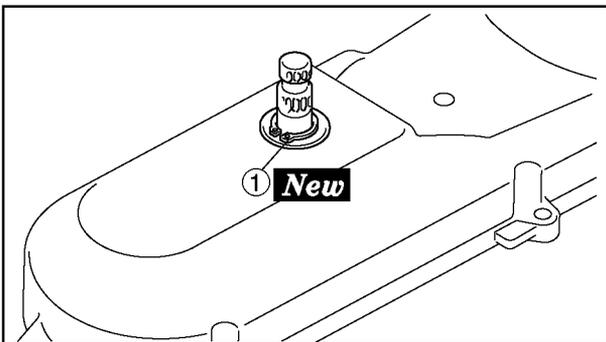
1. Install:
 - solid bush①
 - kick shaft assembly②
 - torsion spring③



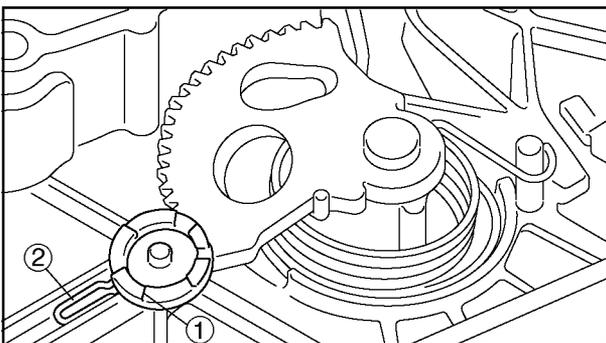
2. Hook:
 - torsion spring

NOTE: _____

Hook the spring end (a) on the kickstarter shaft (b) as shown, and hook the other end (c) on the projection (d) .



3. Install:
 - plain washer
 - circlip① **New**



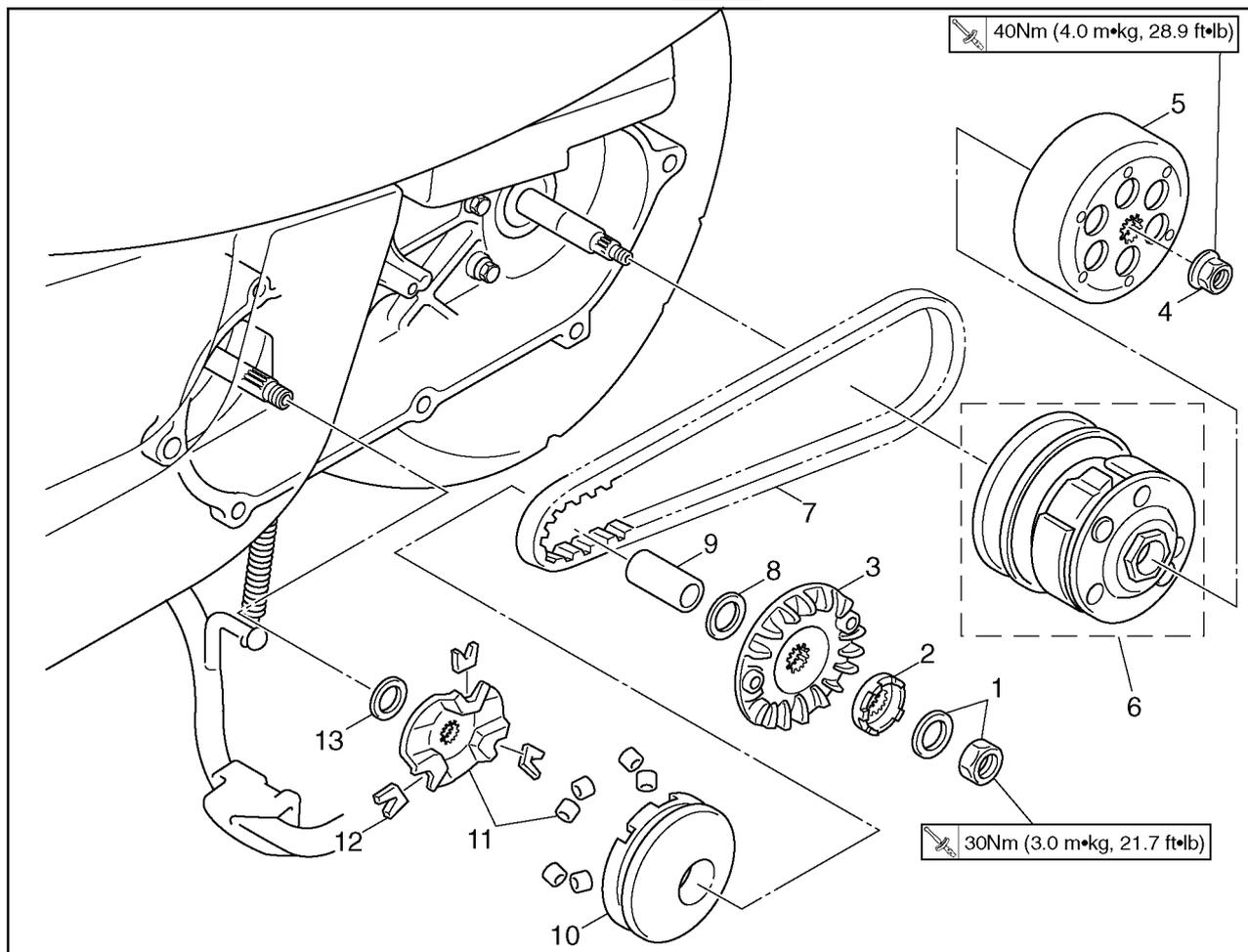
4. Install:
 - kick pinion gear①
 - kick pinion gear clip②

NOTE: _____

- Lubricate the kick pinion gear clip and shaft with molybdenum disulfide oil.
- Install the kick pinion gear clip at the position shown.



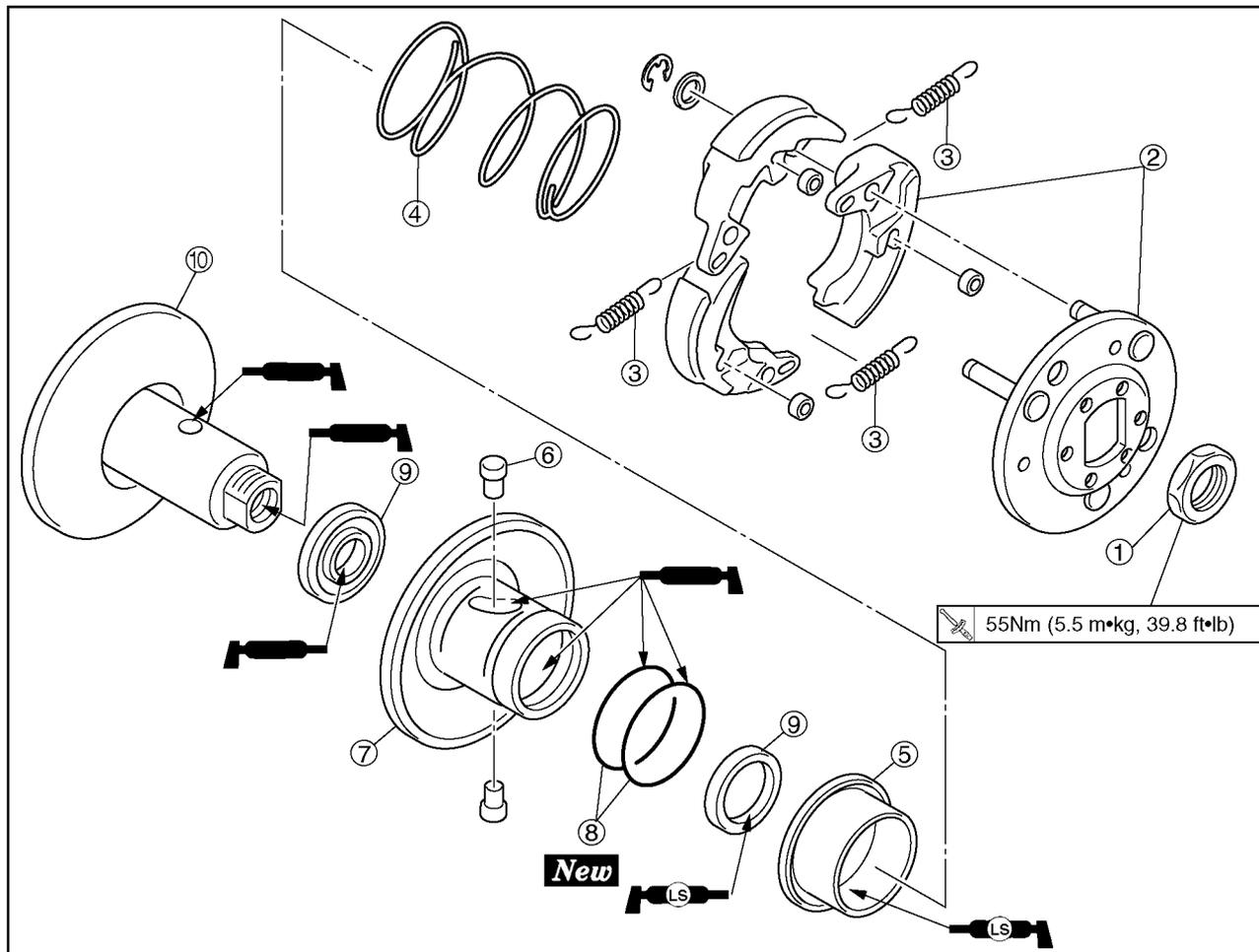
V-BELT AND PRIMARY/SECONDARY SHEAVE



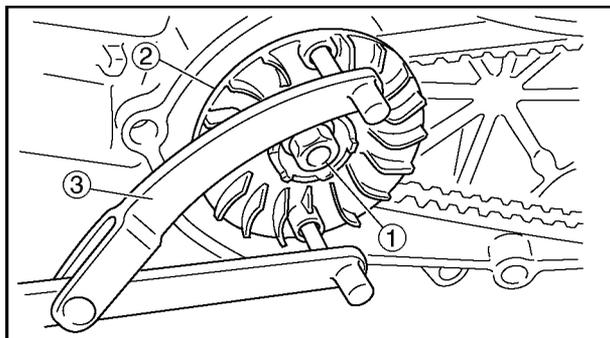
Order	Job/Part	Q'ty	Remarks
	Removing the V-belt and primary/secondary sheave		Remove the parts in the order listed.
1	Primary sheave nut/Plate washer	1/1	Refer to "REMOVING THE PRIMARY SHEAVE" and "INSTALLING THE SECONDARY SHEAVE, V-BELT AND PRIMARY SHEAVE".
2	Oneway clutch	1	
3	Primary fixed sheave	1	
4	Secondary sheave nut	1	
5	Clutch housing	1	
6	Secondary sheave	1	
7	V-belt	1	
8	Plate washer	1	
9	Collar	1	
10	Primary sliding sheave	1	
11	Cam/Weight	1/6	
12	Slider	3	
13	Plate washer	1	
			For installation, reverse the removal procedure.



SECONDARY SHEAVE



Order	Job/Part	Q'ty	Remarks
	Disassembling the secondary sheave		Disassemble the parts in the order listed.
①	Clutch carrier nut	1	Refer to "DISASSEMBLING THE SECONDARY SHEAVE" and "ASSEMBLING THE SECONDARY SHEAVE".
②	Clutch carrier	1	
③	Clutch shoe spring	3	
④	Compression spring	1	Refer to "ASSEMBLING THE SECONDARY SHEAVE".
⑤	Secondary spring seat	1	
⑥	Guide pin	2	
⑦	Secondary sliding sheave	1	
⑧	O-ring	2	
⑨	Oil seal	2	For assembly, reverse the disassembly procedure.
⑩	Secondary fixed sheave	1	



EAS00317

REMOVING THE PRIMARY SHEAVE

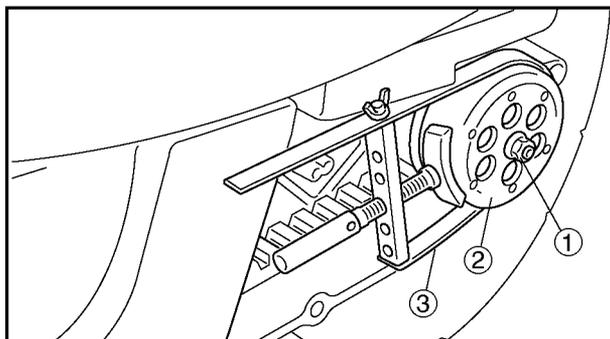
1. Remove:
 - primary sheave nut ①
 - plate washer
 - oneway clutch
 - primary fixed sheave ②

NOTE: _____

While holding the primary fixed sheave with the rotor holding tool ③, loosen the primary fixed sheave nut.



Rotor holding tool
90890-01235 (YU-01235)



EAS00318

REMOVING THE SECONDARY SHEAVE AND V-BELT

1. Remove:
 - secondary sheave nut ①
 - clutch housing ②

NOTE: _____

While holding the clutch housing with the sheave holder ③, loosen the secondary sheave nut.



Sheave holder
90890-01701 (YS-01880-A)

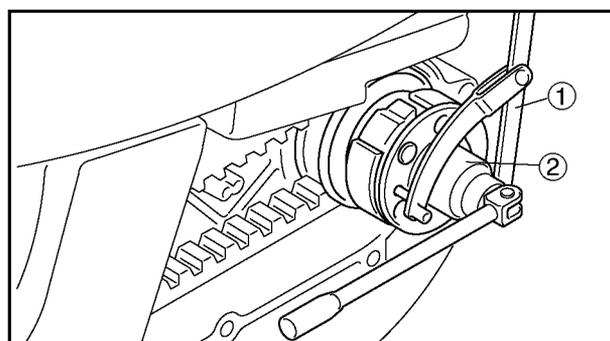
2. Loosen:
 - clutch carrier nut

CAUTION: _____

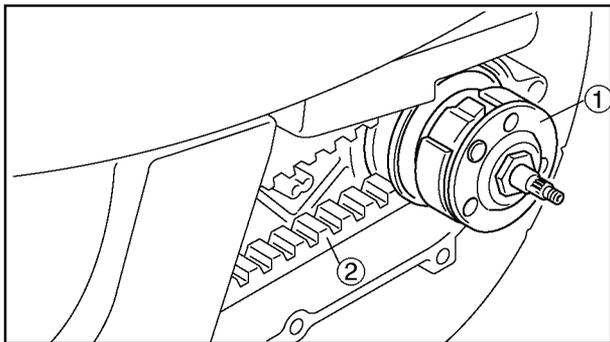
Do not remove the clutch carrier nut at this stage.

NOTE: _____

While holding the clutch carrier with the rotor holding tool ①, loosen the clutch carrier nut one full turn with the socket wrench ②.

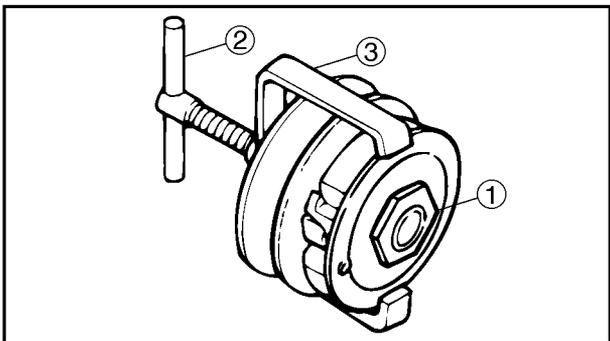


Rotor holding tool
90890-01235
YU-01235
Socket wrench(39mm)
90890-01493



3. Remove:
 - secondary sheave ①
 - V-belt ②

NOTE: _____
 Remove the V-belt and secondary sheave from the primary sheave side.



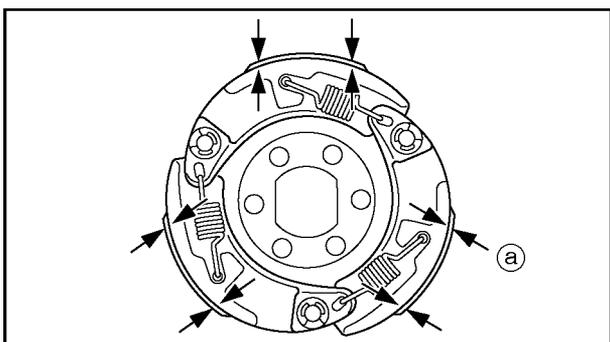
EAS00319

DISASSEMBLING THE SECONDARY SHEAVE

1. Remove:
 - clutch carrier nut ①

NOTE: _____
 Install the clutch spring holder ② and clutch spring holder arm ③ onto the secondary sheave as shown. Then, compress the spring, and remove the clutch carrier nut ①.

	<p>Clutch spring holder 90890-01337 YM-33285 YM-33285-6</p>
--	---



CHECKING THE CLUTCH SHOES

The following procedure applies to all of the clutch shoes.

1. Check:
 - clutch shoe
 Damage/wear → Replace the clutch shoes and springs as a set.
 Glazed areas → Sand with coarse sandpaper.

NOTE: _____
 After sanding the glazed areas, clean the clutch with a cloth.

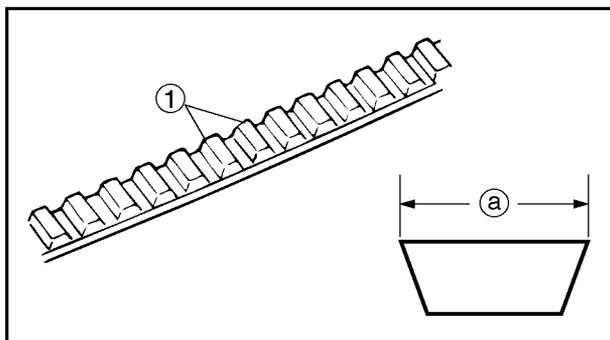
2. Measure:
 - clutch shoe thickness
 Out of specification → Replace the clutch shoes and springs as a set.



Clutch shoe thickness
 3.7mm(0.146in)
 <Limit>:2.0mm(0.079in)

NOTE:

- Inspect clutch shoes①.
- After removing the clutch shoe spring, do not use them again.
- Replace the all three as a set.



EAS00320

CHECKING THE V-BELT

1. Check:

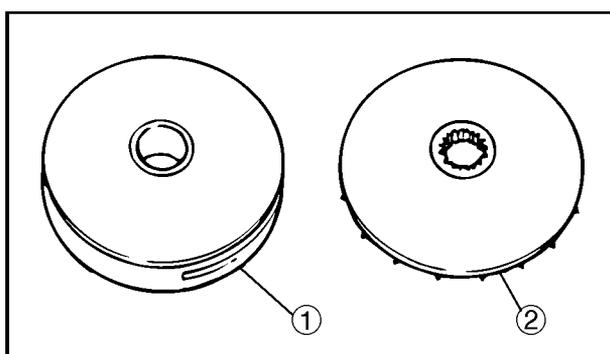
- V-belt ①
 Cracks/damage/wear → Replace.
 Grease/oil → Clean the primary and secondary sheave.

2. Measure:

- V-belt width ②
 Out of specification → Replace.



V-belt width
 17.9 mm (0.705 in)
 <Limit>: 16.1 mm (0.634 in)



CHECKING THE PRIMARY SHEAVE

1. Check:

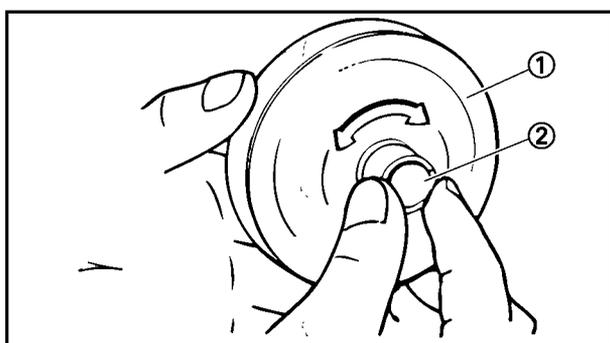
- primary sliding sheave①
- primary fixed sheave②
 Cracks/damage/wear → Replace the primary sliding sheave, primary fixed sheave and V-belt.

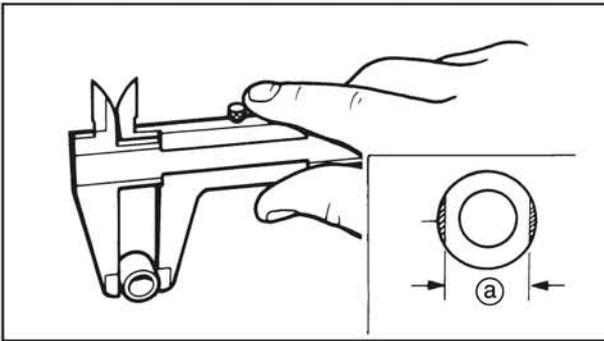
2. Check:

- free movement
 Stick or excessive play → Replace the primary sliding sheave or collar.

NOTE:

Insert the collar② into the primary sliding sheave①, and check for free movement.





EAS00321

CHECKING THE PRIMARY SHEAVE WEIGHTS

The following procedure applies to all of the primary sheave weights.

1. Check:
 - primary sheave weight
 - Cracks/damage/wear → Replace.

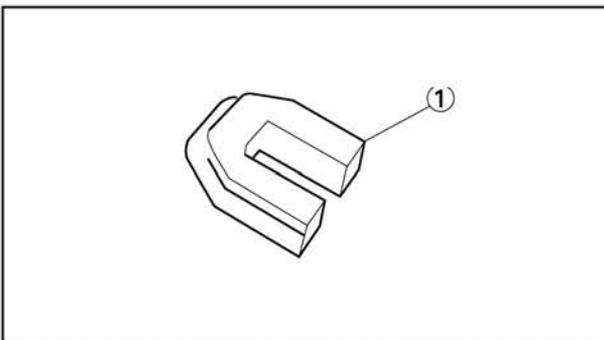
2. Measure:
 - primary sheave weight outside diameter [Ⓐ]
 - Out of specification → Replace.



Primary sheave weight outside diameter

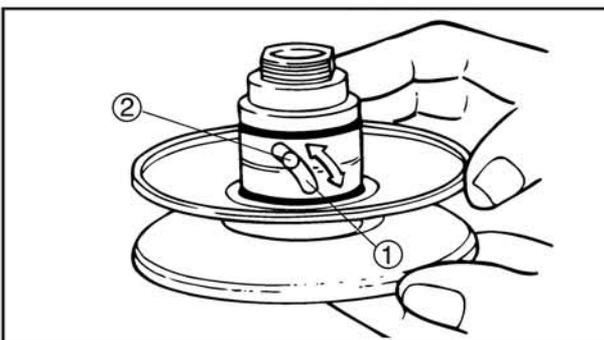
15 mm (0.591 in)

<Limit>: 14.5 mm (0.571 in)



CHECKING THE SLIDER

1. Check:
 - slider [Ⓛ]
 - Damage/wear → Replace



EAS00322

CHECKING THE SECONDARY SHEAVE

1. Check:
 - secondary fixed sheave
 - secondary sliding sheave
 - Cracks/damage/wear → Replace the secondary fixed and sliding sheaves as a set.

2. Check:
 - torque cam groove [Ⓛ]
 - Damage/wear → Replace the secondary fixed and sliding sheaves as a set.

3. Check:
 - guide pin [Ⓜ]
 - Damage/wear → Replace the secondary fixed and sliding sheaves as a set.



EAS00323

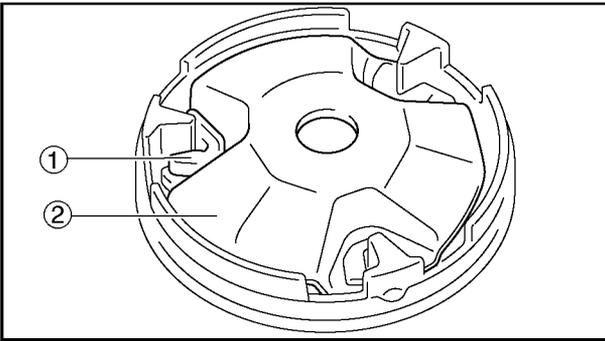
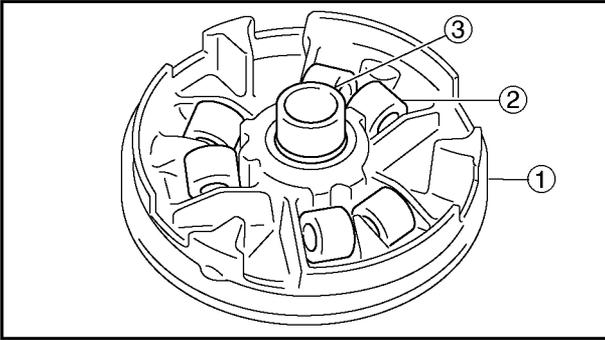
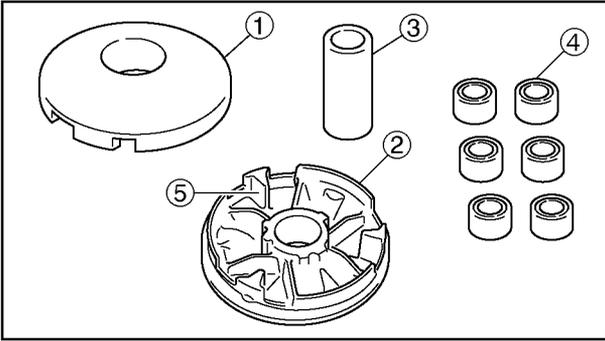
ASSEMBLING THE PRIMARY SHEAVE

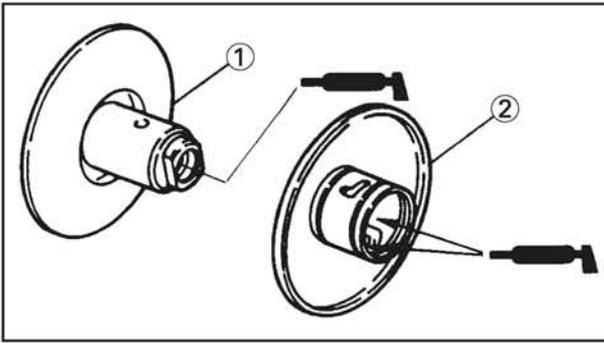
1. Clean:
 - primary fixed sheave ①
 - primary sliding sheave ②
 - collar ③
 - primary sheave weights ④

NOTE: _____
 Use thinner to clean up grease, dirt on the primary sliding sheave cam side ⑤.

2. Install:
 - primary sliding sheave ①
 - primary sheave weights ②
 - collar ③

3. Install:
 - sliders ①
 - cam ②



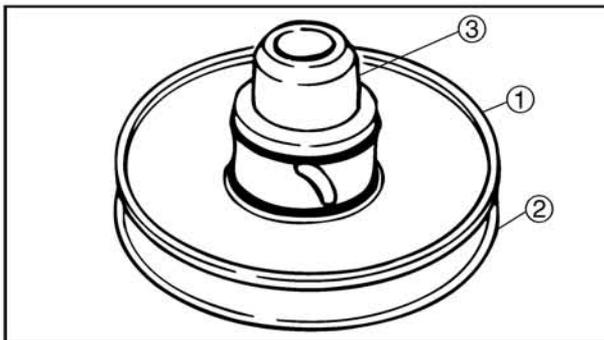


EAS00324

ASSEMBLING THE SECONDARY SHEAVE

1. Lubricate:
 - secondary fixed sheave's inner surface ①
 - secondary sliding sheave's inner surface ②
 - oil seals
 - bearings (with the recommended lubricant)

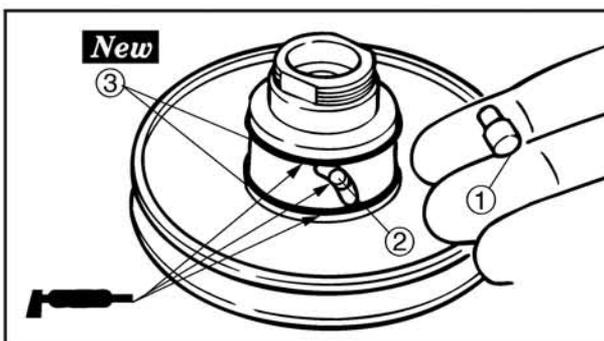
	<p>Recommended lubricant BEL-RAY assembly lube®</p>
---	--



2. Install:
 - secondary sliding sheave ①

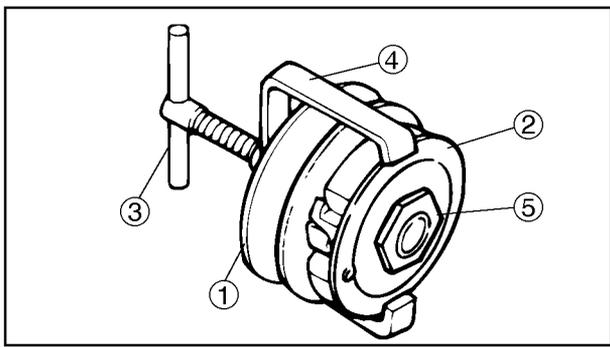
NOTE: _____
 Install the secondary sliding sheave onto the secondary fixed sheave ② with the oil seal guide ③.

	<p>Oil seal guide 90890-01384 (YM-33299)</p>
---	---



3. Install:
 - guide pin ①
4. Lubricate:
 - guide pin groove ②
 - o-ring **New** ③ (with the recommended lubricant)

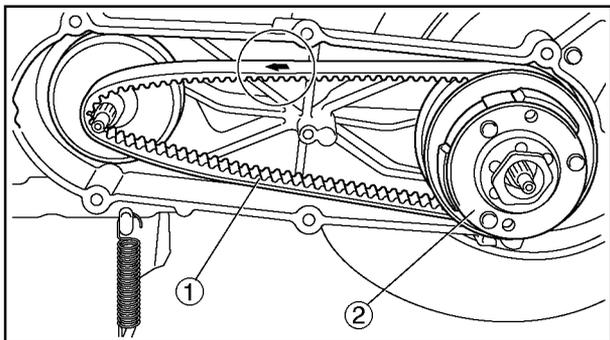
	<p>Recommended lubricant BEL-RAY assembly lube®</p>
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5. Install:
 - secondary sheave ①
 - spring
 - clutch carrier ②

NOTE: Attach the clutch spring holder ③ and clutch spring holder arm ④ onto the secondary sheave as shown. Then, compress the spring, and tighten the clutch carrier nut ⑤.

Clutch spring holder
90890-01337 (YM-33285)
(YM-33285-6)

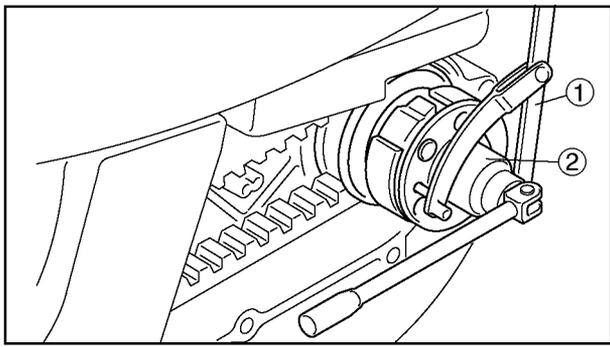


EAS00325
INSTALLING THE SECONDARY SHEAVE, V-BELT AND PRIMARY SHEAVE

1. Install:
 - V-belt ①
 - secondary sheave ②

CAUTION: Do not allow grease to contact the V-belt, secondary sheave assembly.

- NOTE:**
- Install the V-belt onto the primary sheave side.
 - Install the V-belt with printed arrow mark on the V-belt facing in the direction shown in the illustration.



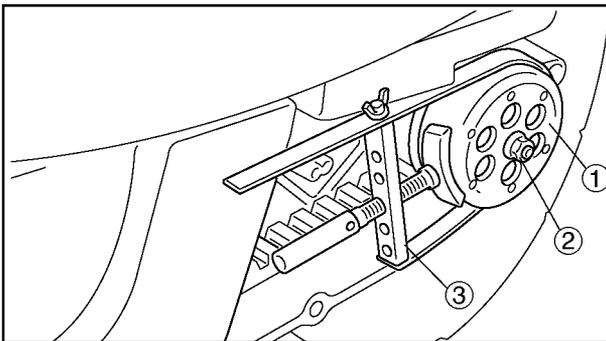
2. Tighten:
 - clutch carrier nut

55Nm (5.5m • kg, 39.8ft • lb)

NOTE: While holding the clutch carrier with the rotor holding tool ①, tighten the clutch carrier nut with the socket wrench ②.



Rotor holding tool
 90890-01235
 YU-01235
Socket wrench(39mm)
 90890-01493



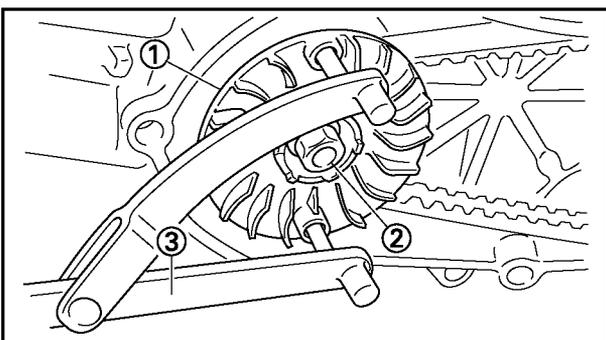
3. Install:
- clutch housing ①
 - secondary sheave nut②

 40Nm(4.0m • kg, 28.9ft • lb)

NOTE: _____
 Tighten the secondary sheave nut with the sheave holder ③.



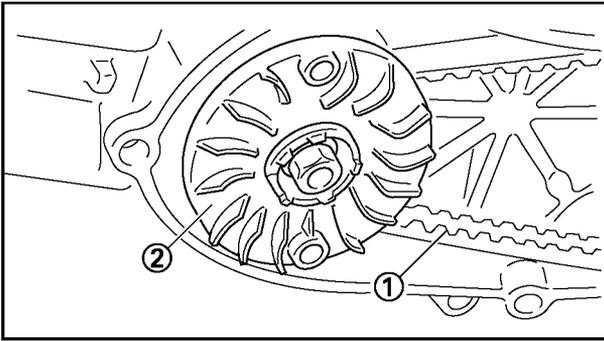
Sheave holder
 90890-01701
 YS-01880-A



4. Install:
- primary fixed sheave①
 - oneway clutch
 - plate washer
 - primary sheave nut②

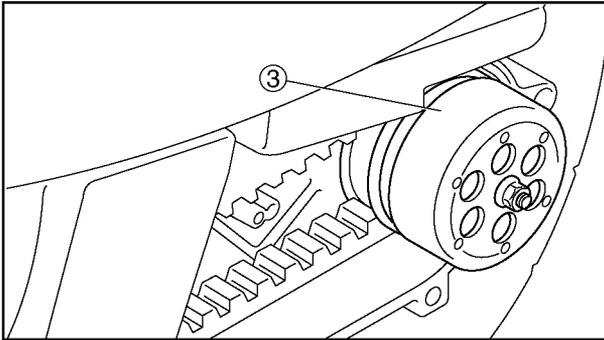
 30Nm(3.0m • kg, 21.7ft • lb)

NOTE: _____
 While holding the primary fixed sheave with the rotor holding tool③, tighten the primary fixed sheave nut.



5. Position:
● V-belt ①

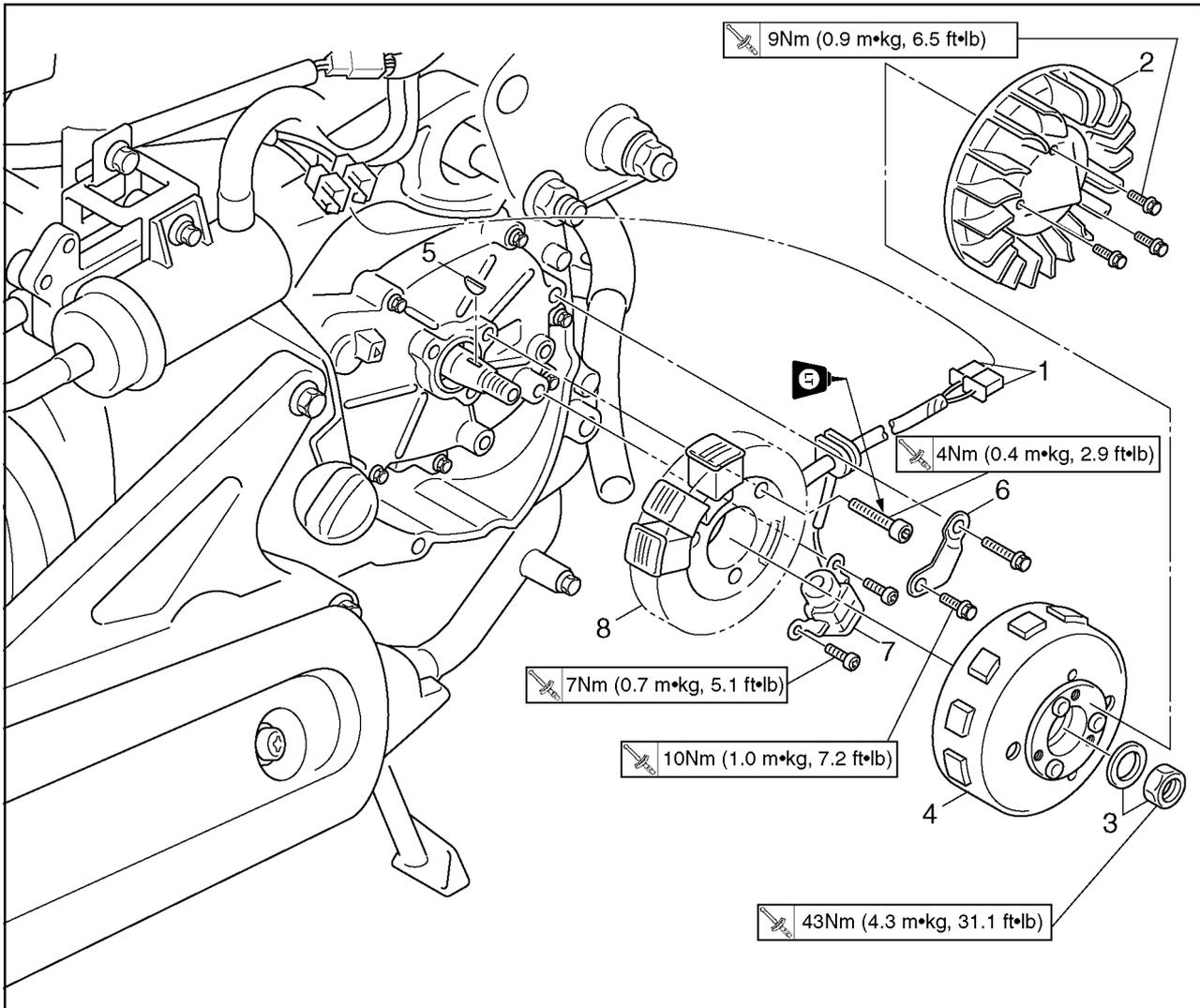
NOTE: _____
Position the V-belt in the primary sheave ② (when the pulley is at its widest position) and in the secondary sheave ③ (when the pulley is at its narrowest position), and make sure the V-belt is tight.





EAS00341

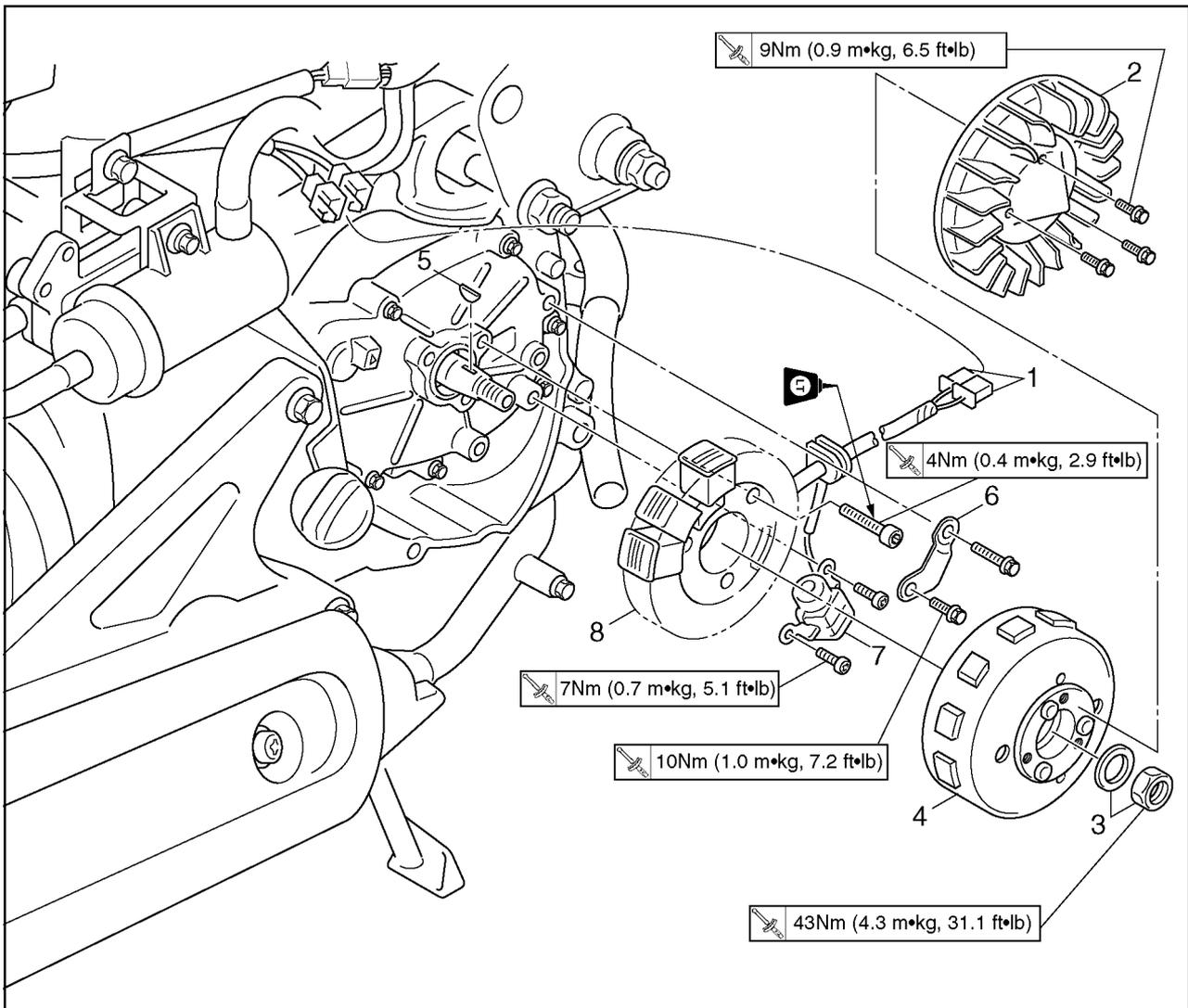
**STARTER CLUTCH AND AC MAGNETO
STATOR COIL ASSEMBLY**



Order	Job/Part	Q'ty	Remarks
	Removing the stator coil assembly		Remove the parts in the order listed.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Single seat/Trunk		
	Front cover		
	Side cover(left and right)		Refer to "COVER AND PANEL" in chapter 3.
	Battery cover/Battery		
	Footrest board		
	Radiator		Refer to "RADIATOR" in chapter 6.
1	Crankshaft position sensor coupler/Stator coil assembly coupler	1/1	Disconnect.
2	Fan	1	
3	Nut/Plate washer	1/1	
4	AC magneto rotor	1	
5	Woodruff key	1	

STARTER CLUTCH AND AC MAGNETO

ENG

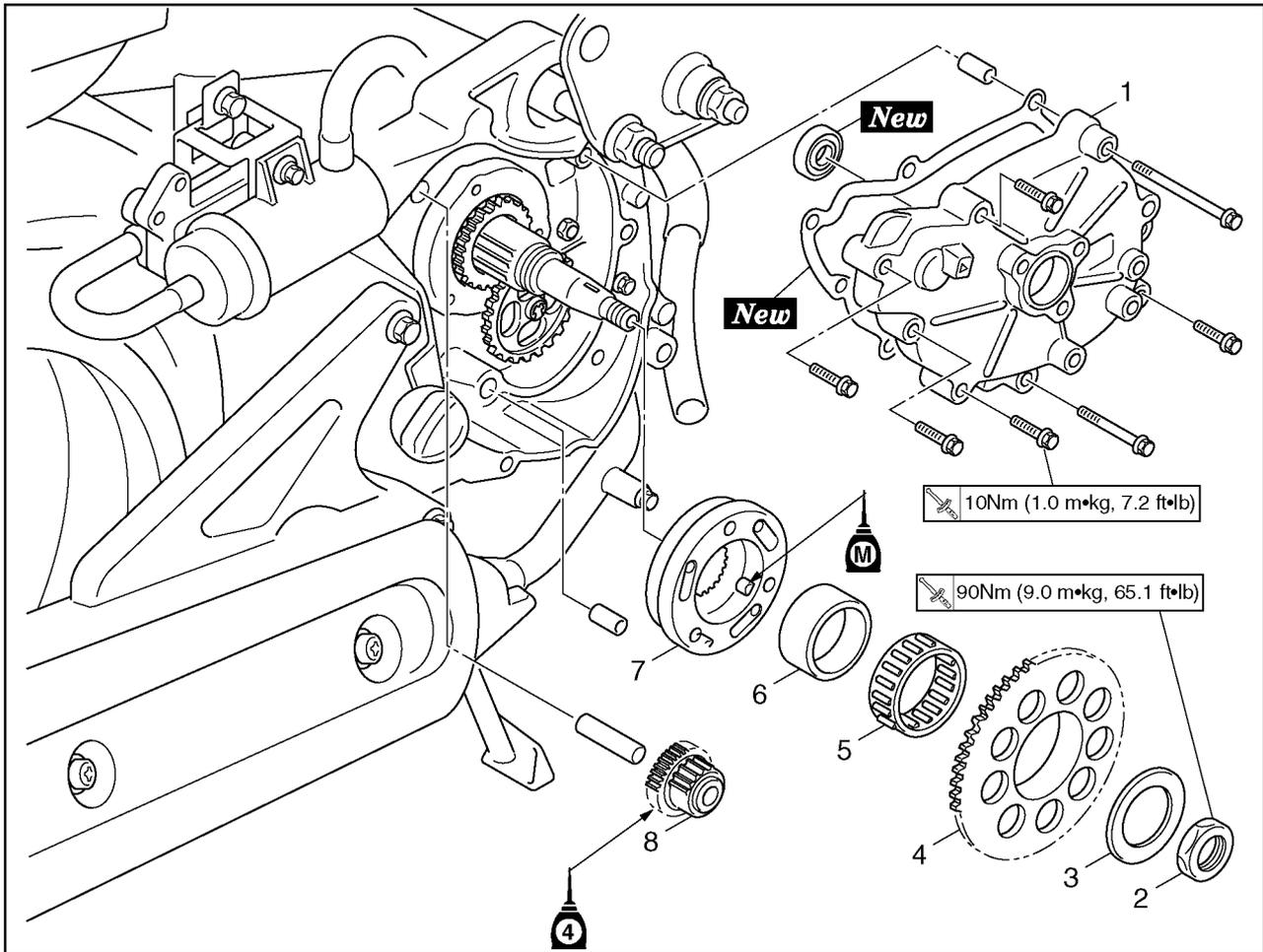


Order	Job/Part	Q'ty	Remarks
6	Lock plate	1	For installation, reverse the removal procedure.
7	Crankshaft position sensor	1	
8	Stator coil assembly	1	

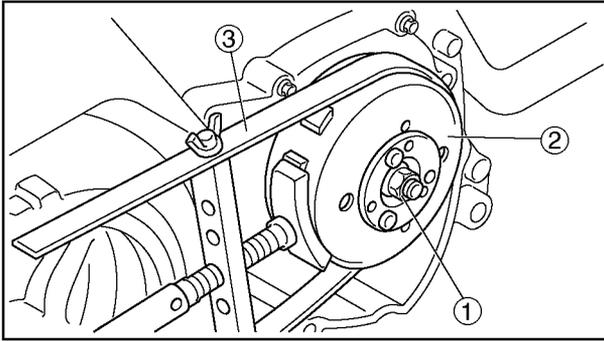


EAS00342

STARTER CLUTCH



Order	Job/Part	Q'ty	Remarks
	Removing the starter clutch		
	Engine oil		Remove the parts in the order listed. Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	AC magneto rotor		Refer to "REMOVING THE AC MAGNETO" and "INSTALLING THE AC MAGNETO".
	Stator coil assembly		
1	Crankcase cover(right)	1	
2	Starter clutch nut	1	CAUTION: The starter clutch nut is left-hand thread.
3	Washer	1	
4	Starter wheel gear	1	
5	Roller	1	
6	Collar	1	
7	Starter clutch	1	Refer to "REMOVING THE STARTER CLUTCH" and "INSTALLING THE STARTER CLUTCH".
8	Idle gear	1	For installation, reverse the removal procedure.



EAS00347

REMOVING THE AC MAGNETO

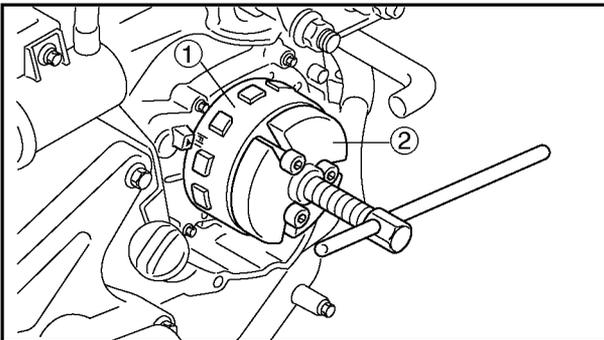
1. Remove:
 - AC magneto rotor nut (1)
 - washer

NOTE:

- While holding the AC magneto rotor (2) with the sheave holder (3), loosen the AC magneto rotor nut.
- Do not allow the sheave holder to touch the projection on the AC magneto rotor.



Sheave holder
 90890-01701
 YS-01880-A



2. Remove:
 - AC magneto rotor (1)
 (with the flywheel puller set (2))
 - woodruff key

CAUTION:

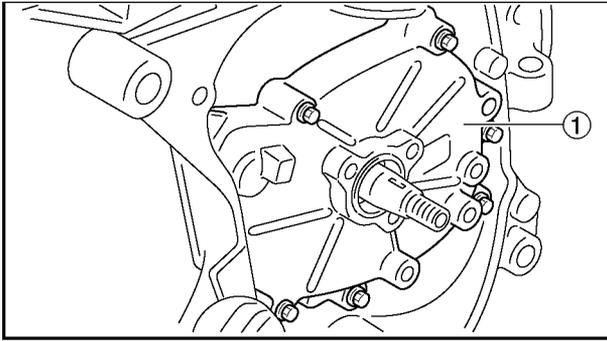
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set's center bolt and the crankshaft.

NOTE:

Make sure the flywheel puller is centered over the AC magneto rotor.



Flywheel puller set
 90890-01468
 YU-33270-B



EAS00344

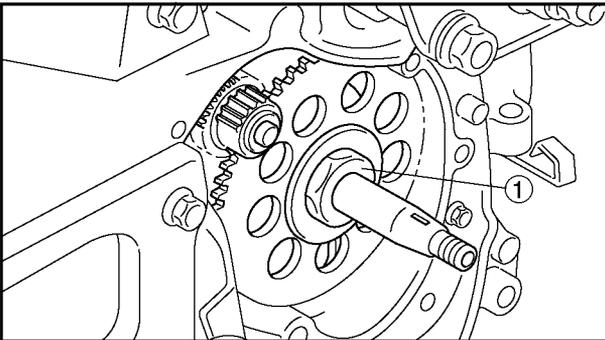
REMOVING THE STARTER CLUTCH

1. Remove:

- crankcase cover (right)①

NOTE:

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

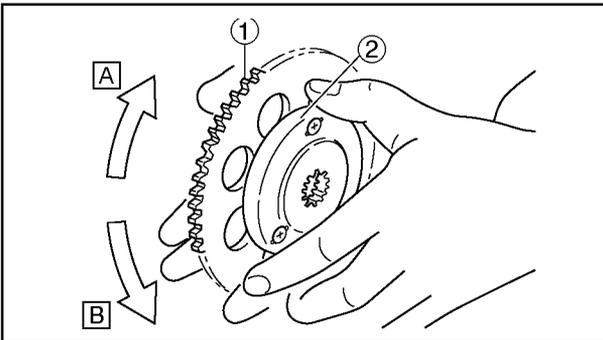
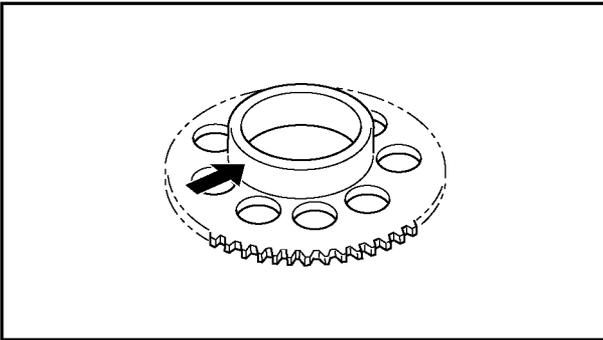
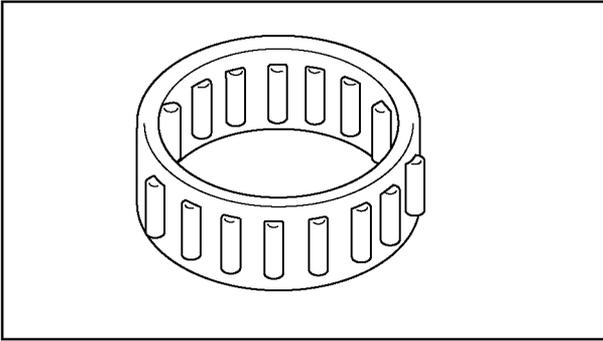


2. Remove:

- starter clutch nut①
- washer
- starter wheel gear
- roller
- collar
- starter clutch
- idle gear

NOTE:

The starter clutch nut is left-hand thread.



EAS00351

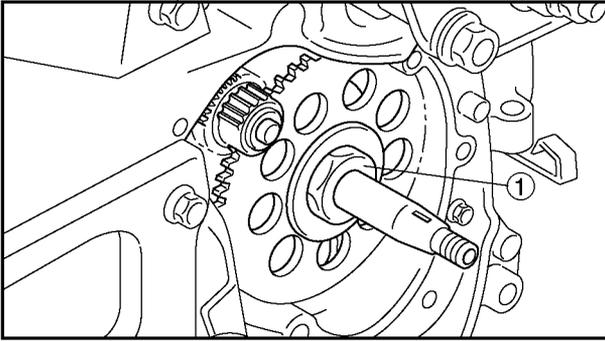
CHECKING THE STARTER CLUTCH

1. Check:
 - starter clutch roller
Damage/wear → Replace.
2. Check:
 - starter clutch idle gear
 - starter wheel gear
Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
 - starter wheel gear's contacting surfaces
Damage/pitting/wear → Replace the starter clutch gear.
4. Check:
 - starter clutch operation



- a. Install the starter wheel gear ① onto the starter clutch ② and hold the starter clutch.
- b. When turning the starter wheel gear clockwise [A], the starter clutch and the starter wheel gear should engage, otherwise the starter clutch is faulty and must be replaced.
- c. When turning the starter wheel gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.





EAS00355

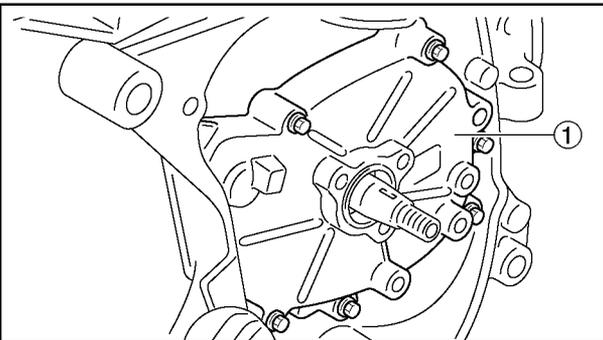
INSTALLING THE STARTER CLUTCH

1. Install:
 - idle gear
 - starter clutch
 - collar
 - roller
 - starter wheel gear
 - washer
 - starter clutch nut^①

90 Nm (9.0 m • kg, 65.1 ft • lb)

NOTE:

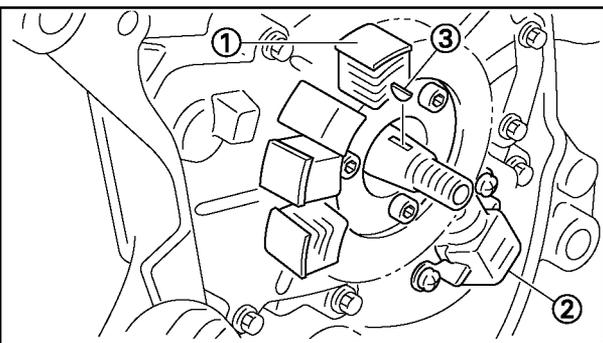
The starter clutch nut is left-hand thread.



2. Install:

- gasket **New**
- crankcase cover (right)^①

10 Nm (1.0 m • kg, 7.2 ft • lb)



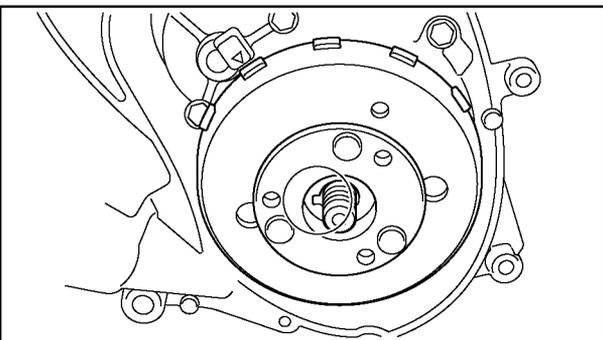
EAS00354

INSTALLING THE AC MAGNETO

1. Install:
 - stator coil assembly^①
 - crankshaft position sensor^②
 - woodruff key^③
 - AC magneto rotor
 - washer
 - AC magneto rotor nut

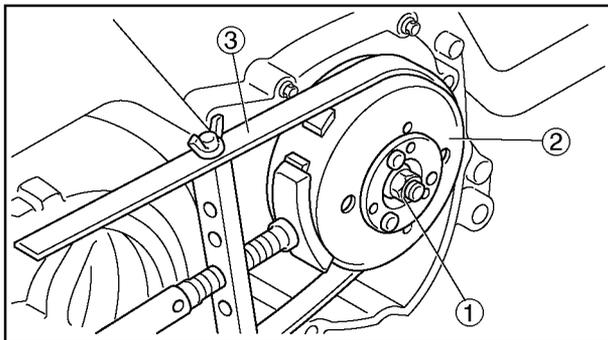
NOTE:

- Clean the tapered portion of the crankshaft and the AC magneto rotor hub.
- When installing the AC magneto rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.



STARTER CLUTCH AND AC MAGNETO

ENG



2. Tighten:
- AC magneto rotor nut ①

 43 Nm (4.3 m • kg, 31.1 ft • lb)

NOTE:

- While holding the AC magneto rotor ② with the sheave holder ③, tighten the AC magneto rotor nut.
- Do not allow the sheave holder to touch the projection on the AC magneto rotor.

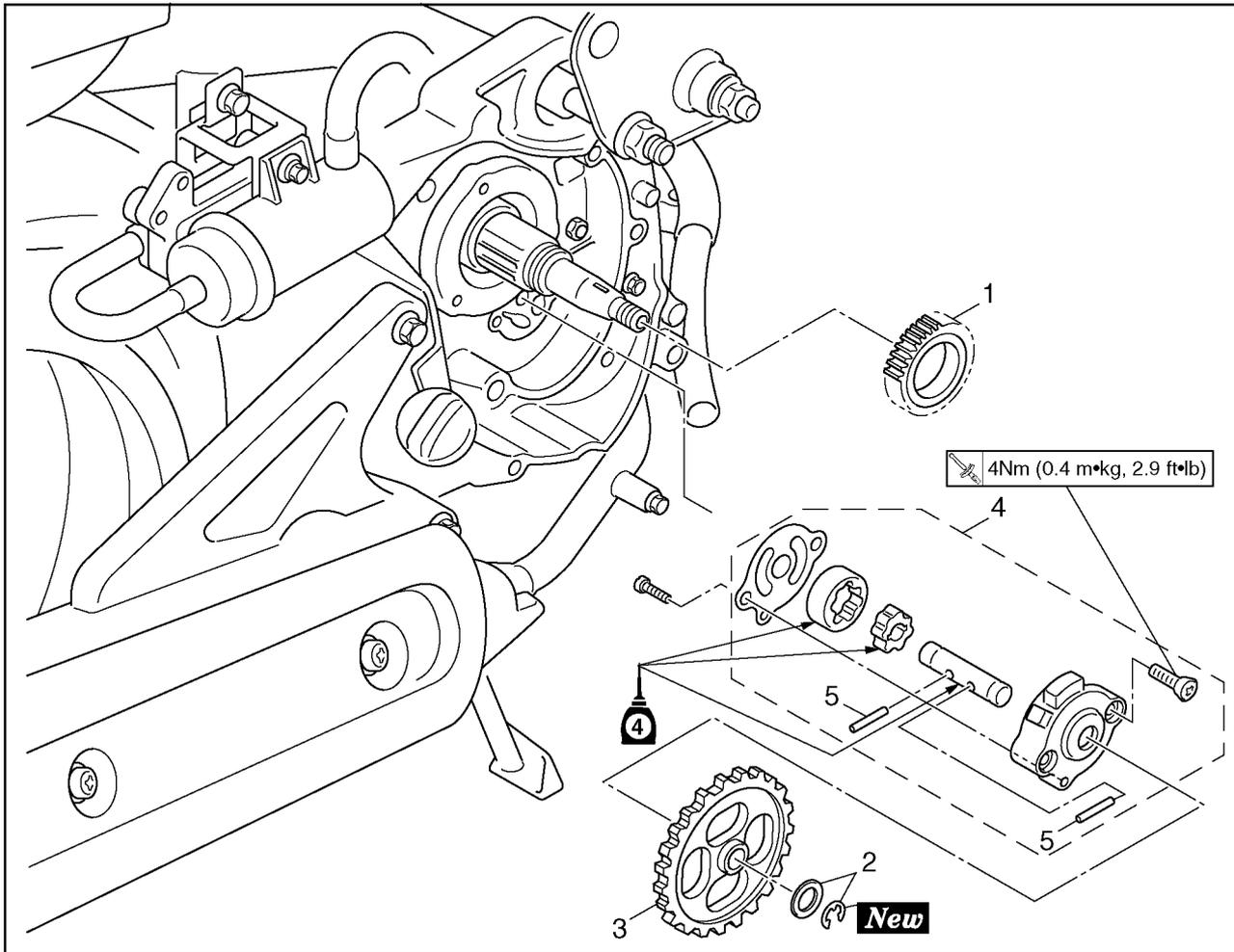


Sheave holder
90890-01701
YS-01880-A

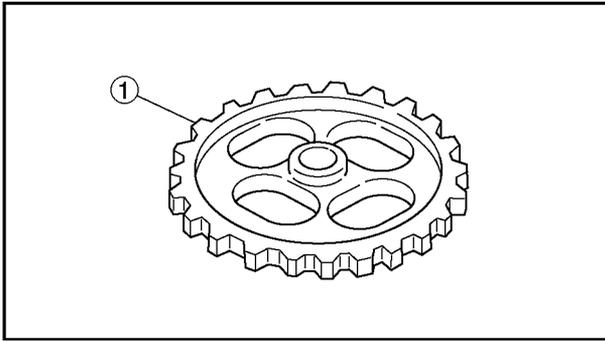


EAS00360

OIL PUMP



Order	Job/Part	Q'ty	Remarks
	Removing the oil pump		
	Radiator		Remove the parts in the order listed.
	AC magneto		Refer to "RADIATOR" in chapter 6.
	Starter clutch		Refer to "STARTER CLUTCH AND AC MAGNETO".
1	Drive gear	1	
2	Circlip/Plate washer	1/1	
3	Oil pump driven gear	1	
4	Dowel pin	2	
5	Oil pump	1	
			For installation, reverse the removal procedure.

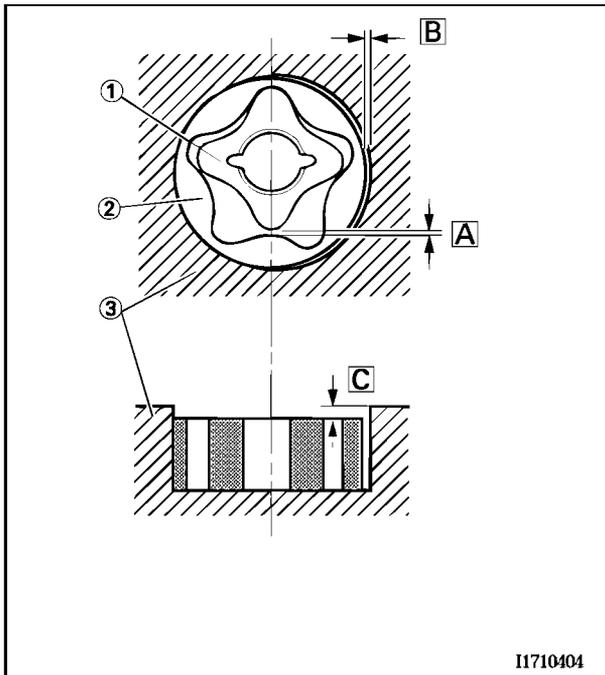


EAS00364

CHECKING THE OIL PUMP

1. Check:

- oil pump drive gear
 - oil pump driven gear ①
 - oil pump housing
 - oil pump housing cover
- Cracks/damage/wear → Replace the defective part(s).



2. Measure:

- inner-rotor-to-outer-rotor-tip clearance **A**
 - outer-rotor-to-oil-pump-housing clearance **B**
 - oil-pump-housing-to-inner-rotor-and-outer-rotor clearance **C**
- Out of specification → Replace the oil pump.

- ① Inner rotor
- ② Outer rotor
- ③ Oil pump housing

**Inner-rotor-to-outer-rotor-tip clearance**

0.15 mm (0.006 in) or less
 <Limit>: 0.23 mm (0.009 in)

Outer-rotor-to-oil-pump-housing clearance

0.13 ~ 0.18 mm (0.005 ~ 0.007 in)
 <Limit>: 0.25mm (0.010 in)

Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance

0.07 ~ 0.12 mm (0.003 ~ 0.005 in)
 <Limit>: 0.19 mm (0.008 in)

3. Check:

- oil pump operation
- Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



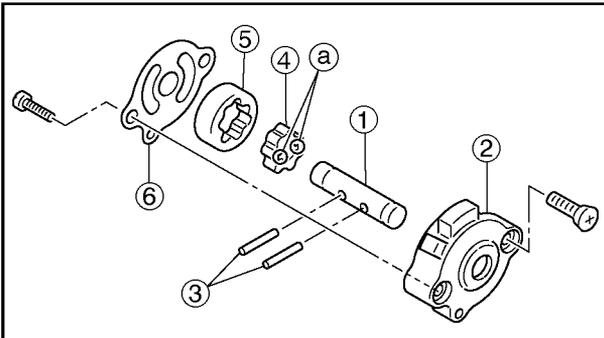
EAS00375

ASSEMBLING THE OIL PUMP

- Lubricate:
 - inner rotor
 - outer rotor
 - oil pump shaft
(with the recommended lubricant)



Recommended lubricant
Engine oil



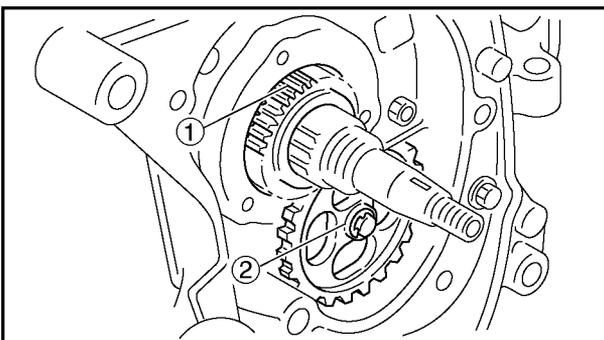
- Install:
 - oil pump shaft ①
(to the oil pump housing②)
 - pin ③
 - inner rotor ④
 - outer rotor⑤
 - oil pump housing cover⑥
 - oil pump housing screw

4 Nm (0.4 m • kg, 2.9 ft • lb)

NOTE:

When installing the inner rotor, align the pin ③ in the oil pump shaft with the groove ③ in the inner rotor ④.

- Check:
 - oil pump operation
Refer to "CHECKING THE OIL PUMP".



EAS00376

INSTALLING THE OIL PUMP

- Install:
 - oil pump drive gear ①
 - gasket **New**
 - oil pump②
 - oil pump bolt

4 Nm (0.4 m • kg, 2.9 ft • lb)

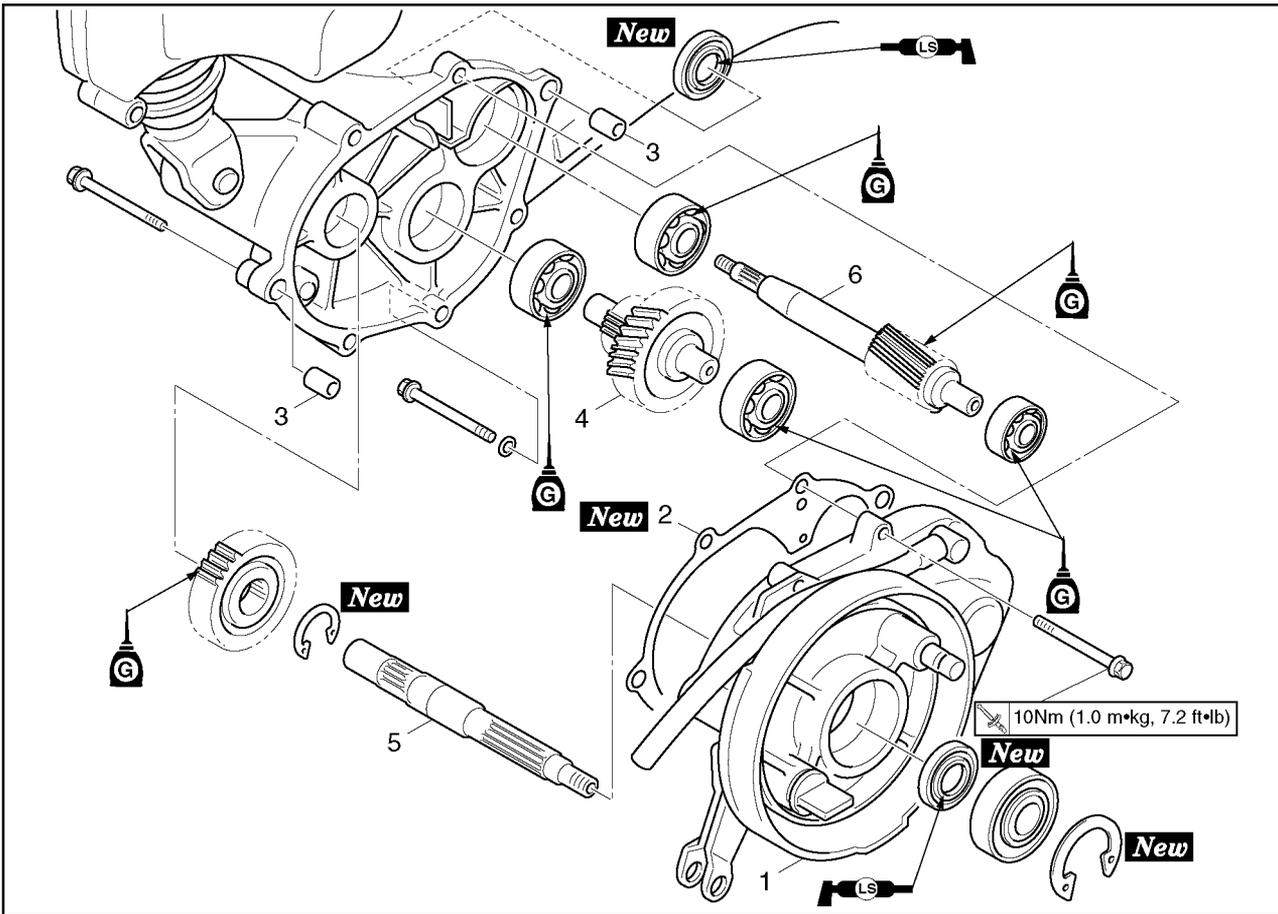
CAUTION:

After tightening the bolts, make sure the oil pump turns smoothly.

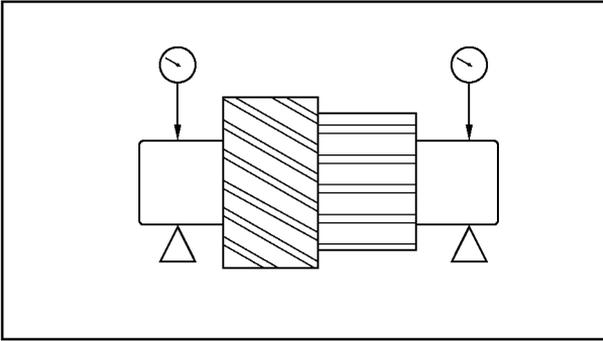


EAS00419

TRANSMISSION



Order	Job/Part	Q'ty	Remarks
	Removing the transmission		Remove the parts in the order listed.
	Transmission oil		Drain.
	Muffler/Bracket		Refer to "CHANGING THE TRANSMISSION OIL" in chapter 3.
	Rear wheel		Refer to "ENGINE REMOVAL".
	V-belt case cover		Refer to "REAR WHEEL AND BRAKE" in chapter 4.
	Secondary sheave		Refer to "BELT DRIVE".
1	Transmission cover	1	
2	Transmission cover gasket	1	
3	Dowel pin	2	
4	Main axle	1	
5	Drive axle	1	
6	Primary drive gear	1	
			For installation, reverse the removal procedure.



EAS00425

CHECKING THE TRANSMISSION

1. Measure:

- main axle runout

(with a centering device and dial gauge)

Out of specification → Replace the main axle.



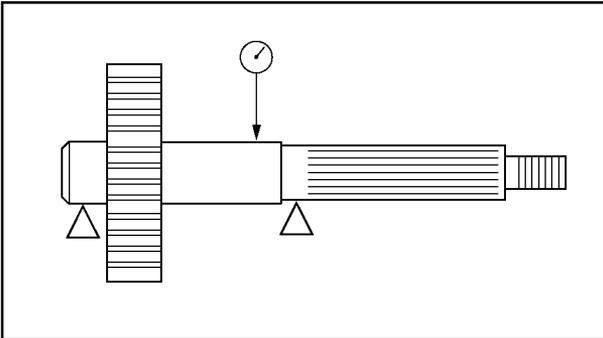
Main axle runout limit
0.04 mm (0.002 in)

2. Measure:

- drive axle runout

(with a centering device and dial gauge)

Out of specification → Replace the drive axle.



Primary drive gear shaft runout limit
0.04 mm (0.002 in)

3. Check:

- transmission gears

Blue discoloration/pitting/wear → Replace the defective gear(s).

- transmission gear dogs

Cracks/damage/rounded edges → Replace the defective gear(s).

4. Check:

- transmission gear engagement

(each pinion gear to its respective wheel gear)

Incorrect → Reassemble the transmission axle assemblies.

5. Check:

- transmission gear movement

Rough movement → Replace the defective part(s).

6. Check:

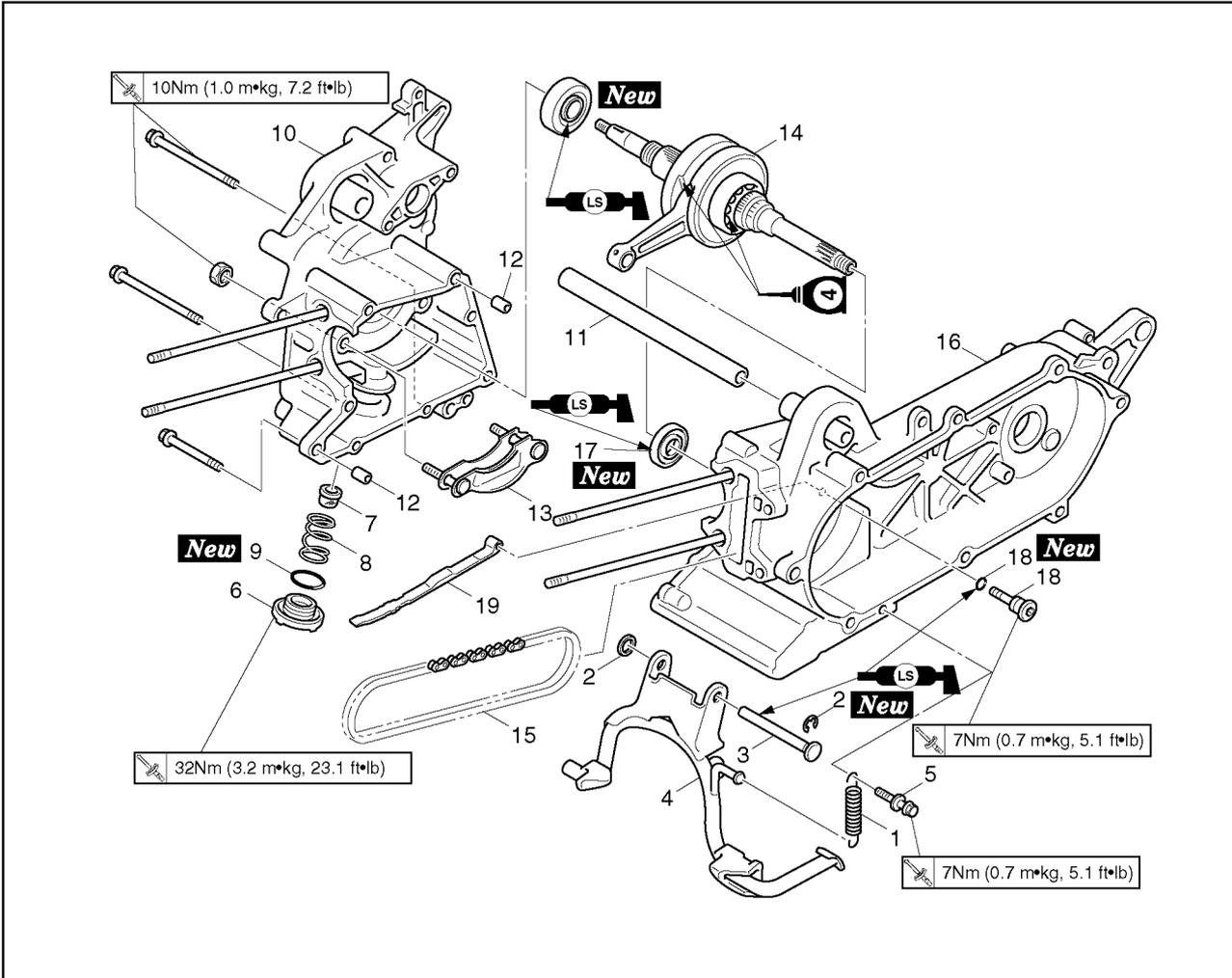
- circlip

Bends/damage/looseness → Replace.

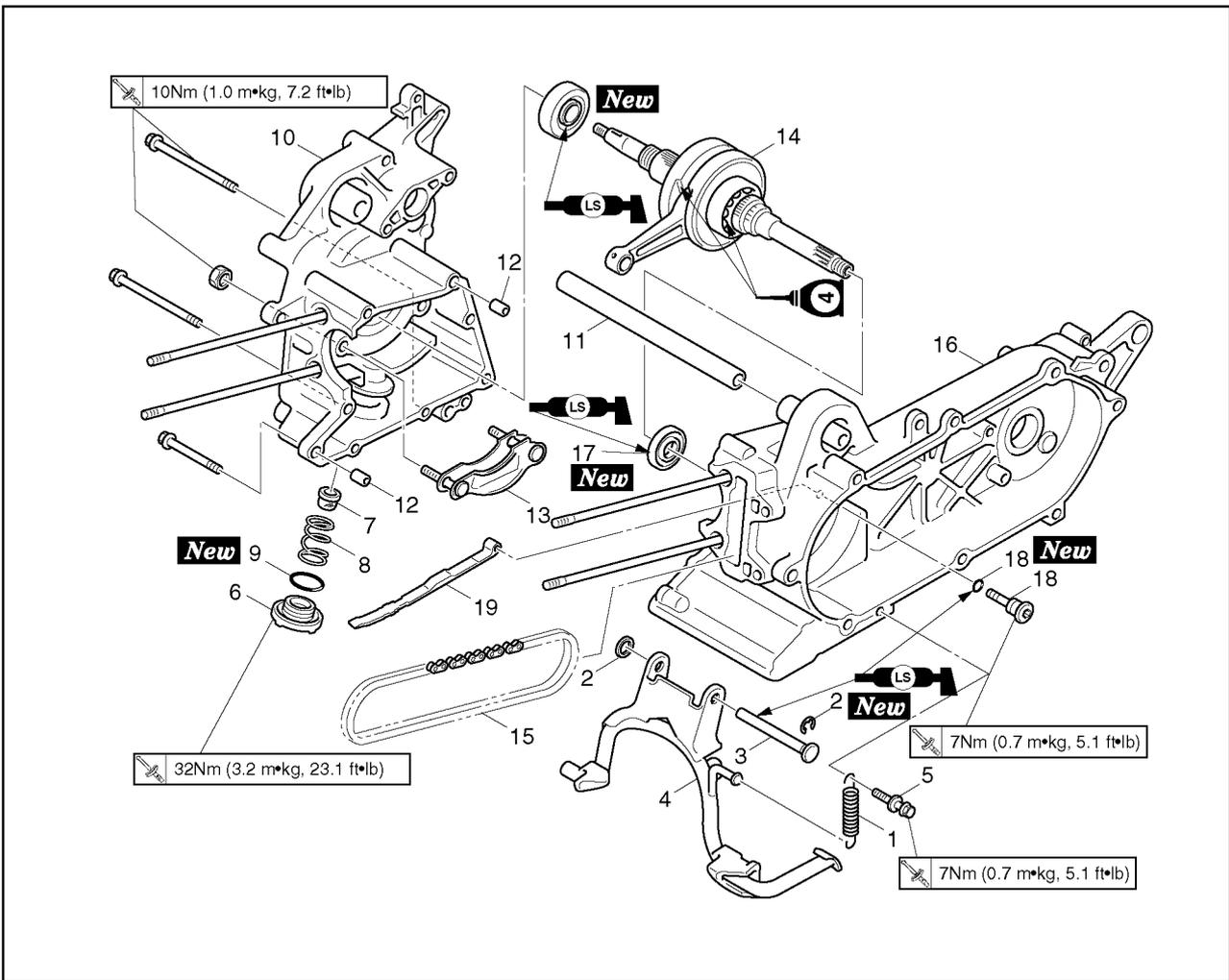


EAS00381

CRANKSHAFT
CRANKSHAFT ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft assembly		
	Engine		Remove the parts in the order listed. Refer to "ENGINE REMOVAL".
	Cylinder head		Refer to "CYLINDER HEAD".
	Cylinder and piston		Refer to "CYLINDER AND PISTON".
	V-belt case cover		Refer to "BELT DRIVE".
	V-belt and primary/secondary sheave		
	Radiator		Refer to "COOLING SYSTEM" in chapter 6.
	Water pump		
	Starter clutch		Refer to "STARTER CLUTCH AND AC MAGNETO".
	AC magneto		
	Oil pump		Refer to "OIL PUMP".
	Transmission		Refer to "TRANSMISSION".
	Rear wheel		Refer to "REAR WHEEL AND BRAKE" in chapter 4.
1	Tension spring	1	
2	Circlip/Plate washer	1/1	
3	Pin	1	
4	Centerstand	1	



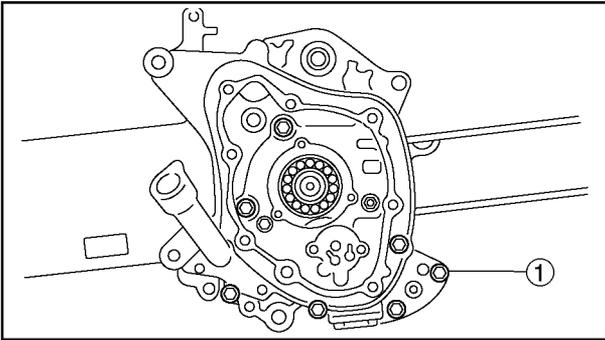
Order	Job/Part	Q'ty	Remarks
5	Hook	1	
6	Drain plug	1	
7	Oil strainer	1	
8	Compression spring	1	
9	O-ring	1	
10	Crankcase(right)	1	Refer to "DISASSEMBLING THE CRANKCASE" and "ASSEMBLING THE CRANKCASE".
11	Spacer	1	
12	Dowel pin	2	
13	Guide	1	
14	Crankshaft	1	Refer to "REMOVING THE CRANKSHAFT ASSEMBLY" and "INSTALLING THE CRANKSHAFT ASSEMBLY".
15	Timing chain	1	
16	Crankcase(left)	1	
17	Oil seal	1	
18	Bolt/O-ring	1/1	
19	Timing chain guide (intake side)	1	
			For installation, reverse the removal procedure.



EAS00385

DISASSEMBLING THE CRANKCASE

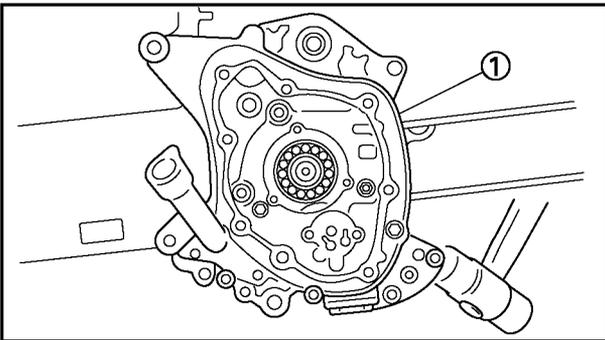
1. Remove:
 - centerstand assembly



2. Remove:
 - crankcase bolts①

NOTE: _____

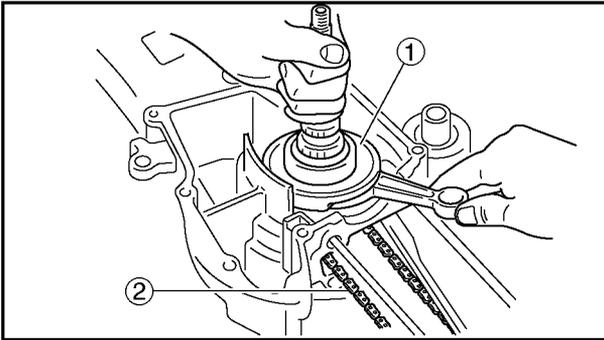
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



3. Remove:
 - right crankcase①
 - spacer

CAUTION: _____

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.



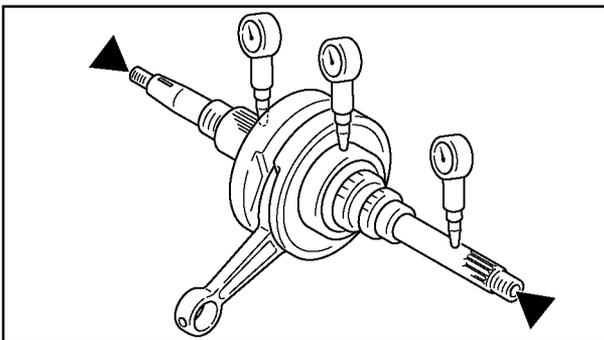
EAS00389

REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
 - crankshaft assembly①
 - timing chain②
 - timing chain guide(intake side)

NOTE:

- Before removing the crankshaft assembly, remove the timing chain from the crankshaft sprocket.
- The crankshaft assembly cannot be removed if the timing chain is attached onto the crankshaft sprocket.



EAS00394

CHECKING THE CRANKSHAFT AND CONNECTING ROD

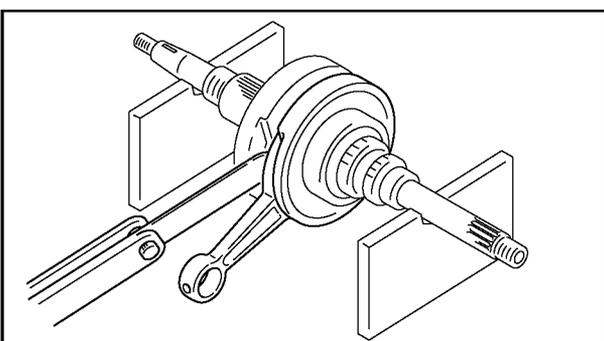
1. Measure:
 - crankshaft runout
 Out of specification → Replace the crankshaft, bearing or both.

NOTE:

Turn the crankshaft slowly.



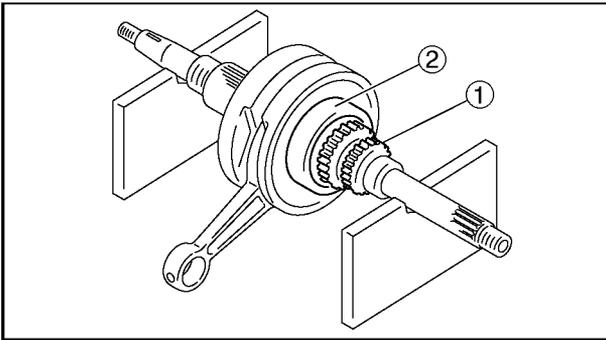
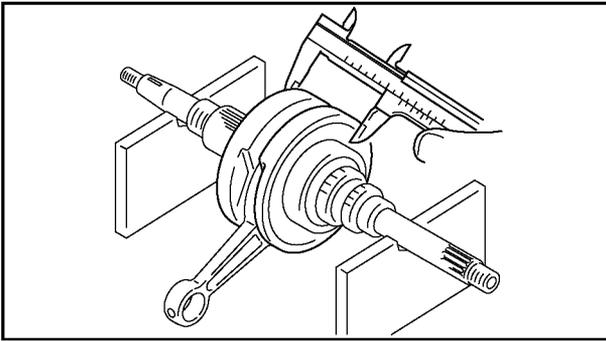
Maximum crankshaft runout
0.03mm(0.0012in)



2. Measure:
 - big end side clearance
 Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.



Big end side clearance
0.15~0.45mm(0.006~0.018in)



3. Measure:
 - crankshaft width
 - Out of specification → Replace the crankshaft.



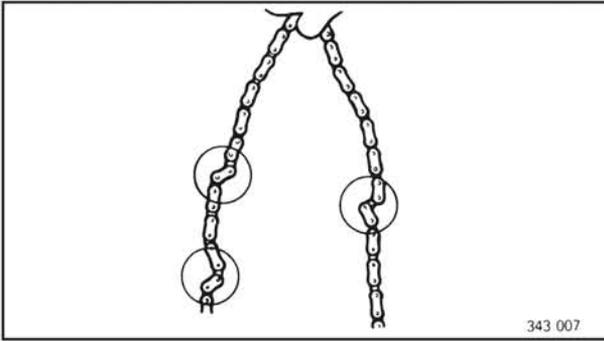
Crankshaft width
42.45~42.50mm(1.671~1.673in)

4. Check:
 - crankshaft sprocket ①
 - Damage/wear → Replace the crankshaft.
 - bearing ②
 - Cracks/damage/wear → Replace the crankshaft.
 - oil pump drive gear
 - Damage/wear → Replace the crankshaft.
5. Check:
 - crankshaft journal
 - Scratches/wear → Replace the crankshaft.
 - crankshaft journal oil passage
 - Obstruction → Blow out with compressed air.

EAS00399

CHECKING THE CRANKCASE

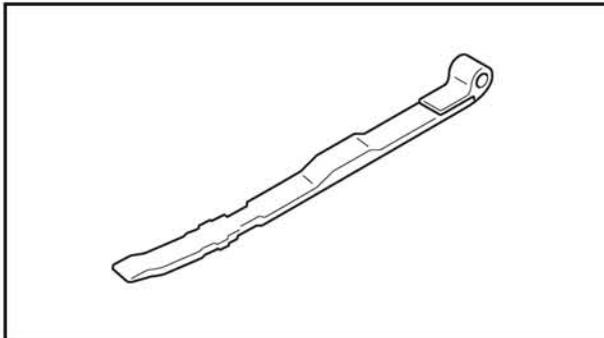
1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
 - crankcase
 - Cracks/damage → Replace.
 - oil delivery passages
 - Obstruction → Blow out with compressed air.



EAS00207

CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE (INTAKE SIDE)

1. Check:
 - timing chain
Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.
2. Check:
 - timing chain guide (intake side)
Damage/wear → Replace.



EAS00401

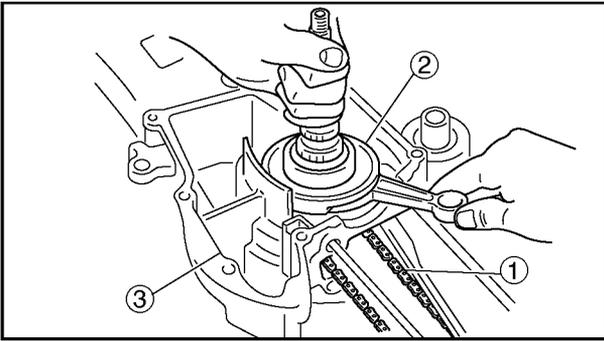
CHECKING THE BEARINGS AND OIL SEALS

1. Check:
 - bearings
Clean and lubricate the bearings, then rotate the inner race with your finger.
Rough movement → Replace.
2. Check:
 - oil seals
Damage/wear → Replace.

EAS00402

CHECKING THE CIRCLIPS AND WASHERS

1. Check:
 - circlips
Bends/damage/looseness → Replace.
 - washers
Bends/damage → Replace.



EAS00408

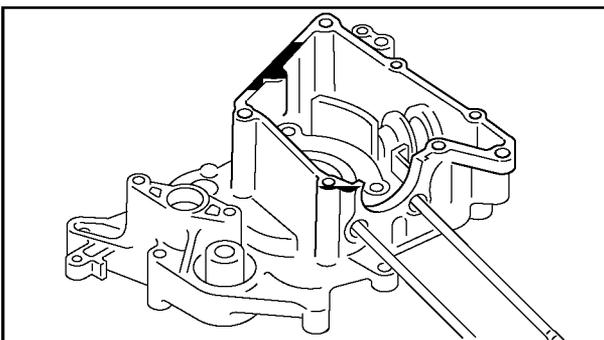
INSTALLING THE CRANKSHAFT

1. Install:
 - timing chain guide (intake side)
 - timing chain ①
 - crankshaft assembly ②

NOTE: _____
Install the timing chain so it is not visible through the opening in the left crankcase ③.

CAUTION: _____
To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

NOTE: _____
Put the timing chain in parallel into the crankcase, then use hands to place the crankshaft assembly into the crankcase. Manually rotate the crankshaft to check whether it is tightly engaged with the timing chain. (if not, install again)



EAS00418

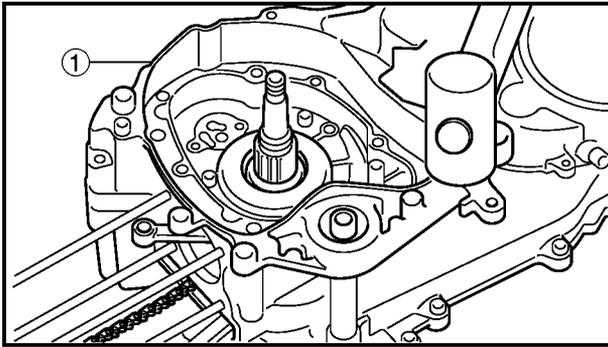
ASSEMBLING THE CRANKCASE

1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
 - sealant
(onto the crankcase mating surfaces)



Yamaha bond No. 1215
90890-85505
Sealant (Quick Gasket®)
ACC-11001-05-01

NOTE: _____
Do not allow any sealant to come into contact with the oil gallery.



3. Install:
 - dowel pins
 - spacer
 - right crankcase①

NOTE: _____

Tap lightly on the right crankcase with a soft-face hammer.

4. Tighten:
 - crankcase bolts

 10Nm(1.0m • kg, 7.2ft • lb)

NOTE: _____

Tighten the crankcase bolts in stages and in a crisscross pattern.

5. Apply:
 - engine oil
(onto the crankshaft pin, bearing and oil delivery hole)
6. Check:
 - crankshaft operation
Rough movement → Repair.

**CHAPTER 6
COOLING SYSTEM**

RADIATOR	6-1
CHECKING THE RADIATOR	6-2
INSTALLING THE RADIATOR	6-3
THERMOSTAT	6-4
CHECKING THE THERMOSTAT	6-5
INSTALLING THE THERMOSTAT	6-6
WATER PUMP	6-7
DISASSEMBLING THE WATER PUMP	6-9
CHECKING THE WATER PUMP	6-9
ASSEMBLING THE WATER PUMP	6-10
INSTALLING THE WATER PUMP	6-11

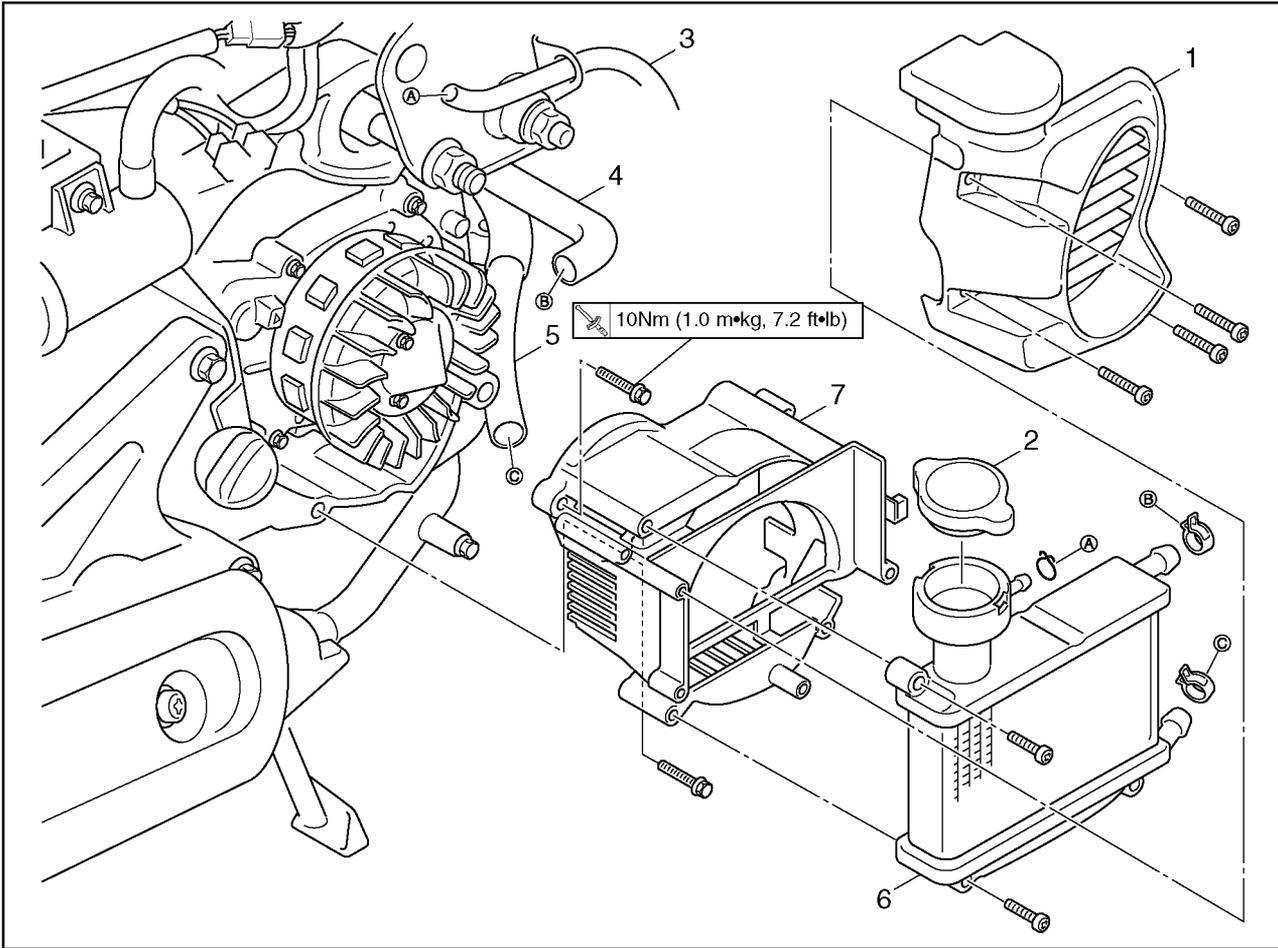


EAS00454



COOLING SYSTEM

RADIATOR



Order	Job/Part	Q'ty	Remarks
	Removing the radiator		Remove the parts in the order listed.
	Front cover		Refer to "COVER AND PANEL" in chapter 3.
	Side cover(left and right)		
	Single seat/Trunk		
	Footrest board		
	Coolant		
			Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator cover	1	
2	Radiator cap	1	
3	Conduit hose	1	Disconnect.
4	Radiator inlet hose	1	Disconnect.
5	Radiator outlet hose	1	Disconnect.
6	Radiator	1	
7	Fan case	1	
			For installation, reverse the removal procedure.

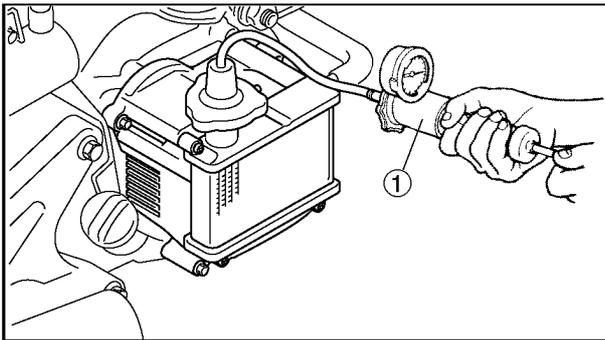


EAS00456

INSTALLING THE RADIATOR

1. Fill:

- cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" in chapter 3.



2. Check:

- cooling system
Leaks → Repair or replace any faulty part.



- a. Attach the radiator cap tester ① to the radiator.

	Radiator cap tester 90890-01325, YU-24460-01 Radiator cap tester adapter 90890-01352, YU-33984
--	---

- b. Apply 100 kPa (1.0 kg/cm², 14.22 psi) of pressure.
c. Measure the indicated pressure with the gauge.



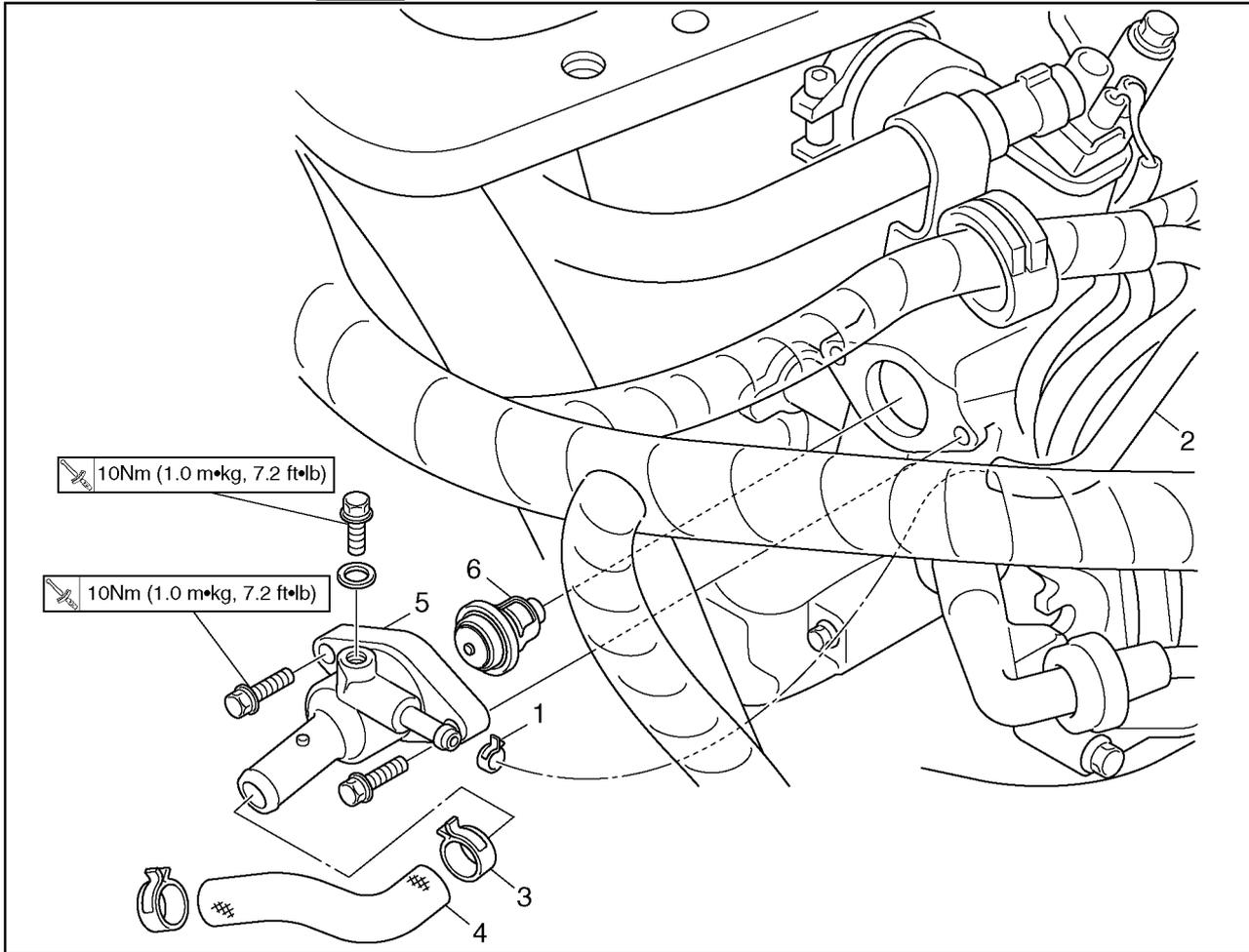
3. Measure:

- radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to "CHECKING THE RADIATOR".

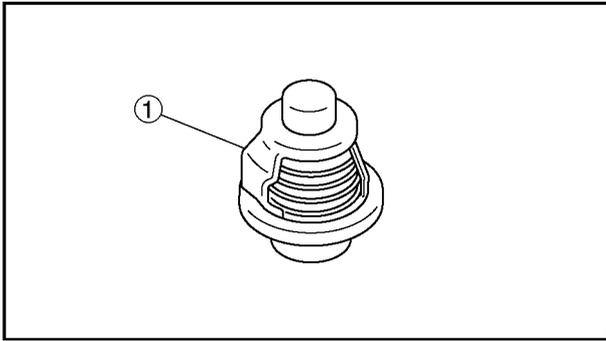


EAS00460

THERMOSTAT



Order	Job/Part	Q'ty	Remarks
	Removing the thermostat		Remove the parts in the order listed.
	Front cover		Refer to "COVER AND PANEL" in chapter 3.
	Side cover(left and right)		
	Single seat/Trunk		
	Footrest board		
	Coolant		
			Drain.
			Refer to "CHANGING THE COOLANT" in chapter 3.
1	Clip	1	
2	Thermostat inlet hose	1	Disconnect.
3	Clip	1	
4	Thermostat outlet hose	1	Disconnect.
5	Thermostat cover	1	
6	Thermostat	1	
			For installation, reverse the removal procedure.



EAS00462

CHECKING THE THERMOSTAT

1. Check:

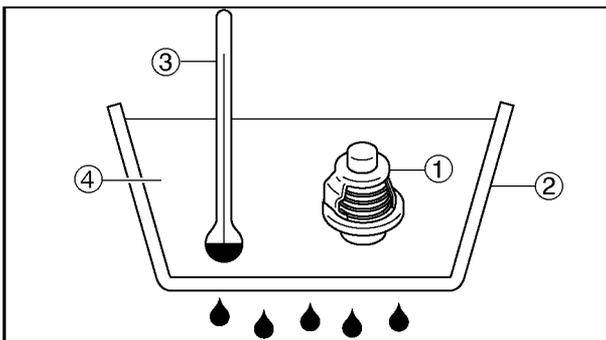
- thermostat ①

Does not open at $85 \sim 100^{\circ}\text{C}$ ($185 \sim 212^{\circ}\text{F}$)

→ Replace.



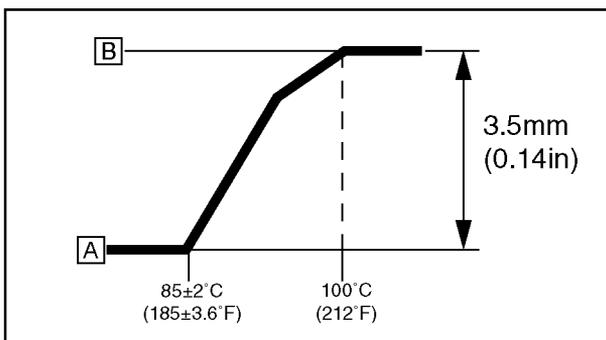
- Suspend the thermostat in a container filled with water.
- Slowly heat the water.
- Place a thermometer in the water.
- While stirring the water, observe the thermostat and thermometer's indicated temperature.



- ① Thermostat
- ② Container
- ③ Thermometer
- ④ Water
- A Fully closed
- B Fully open

NOTE: _____

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.



2. Check:

- thermostat cover

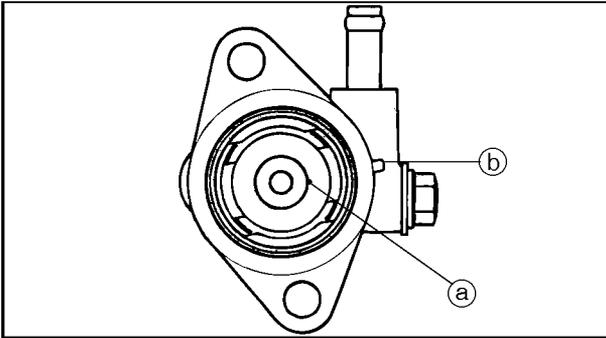
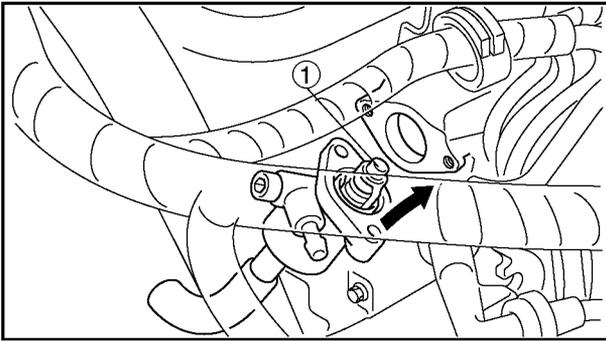
Cracks/damage → Replace.

3. Check:

- thermostat inlet hose

- thermostat outlet hose

Cracks/damage → Replace.



EAS00466

INSTALLING THE THERMOSTAT

1. Install:

- thermostat ①
- thermostat cover

	10Nm (1.0m • kg, 7.2ft • lb)
---	------------------------------

NOTE:

Align the breather (a) of thermostat to mark (b) of thermostat before installation.

2. Fill:

- cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" in chapter 3.

3. Check:

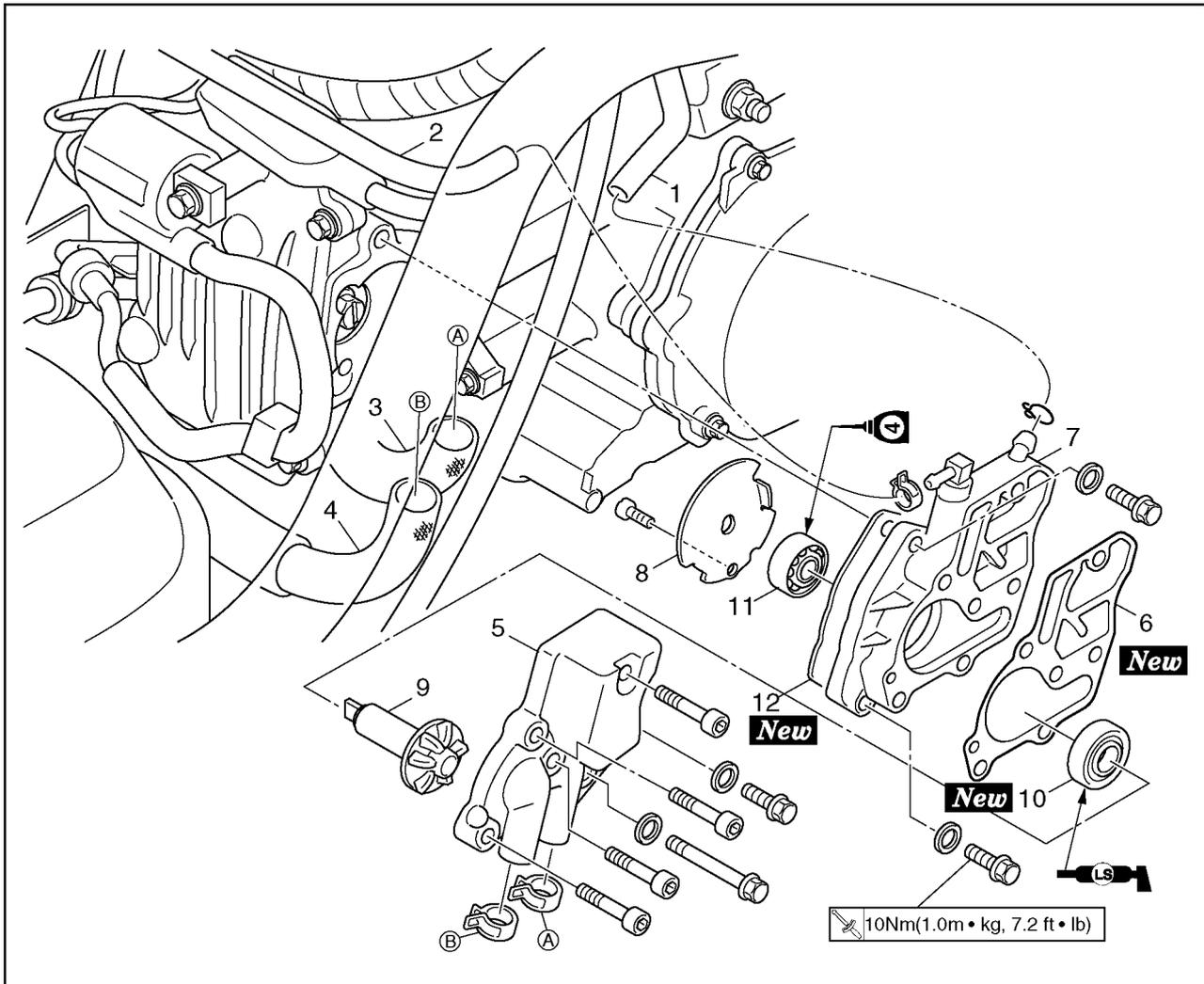
- cooling system
Leaks → Repair or replace any faulty part.

4. Measure:

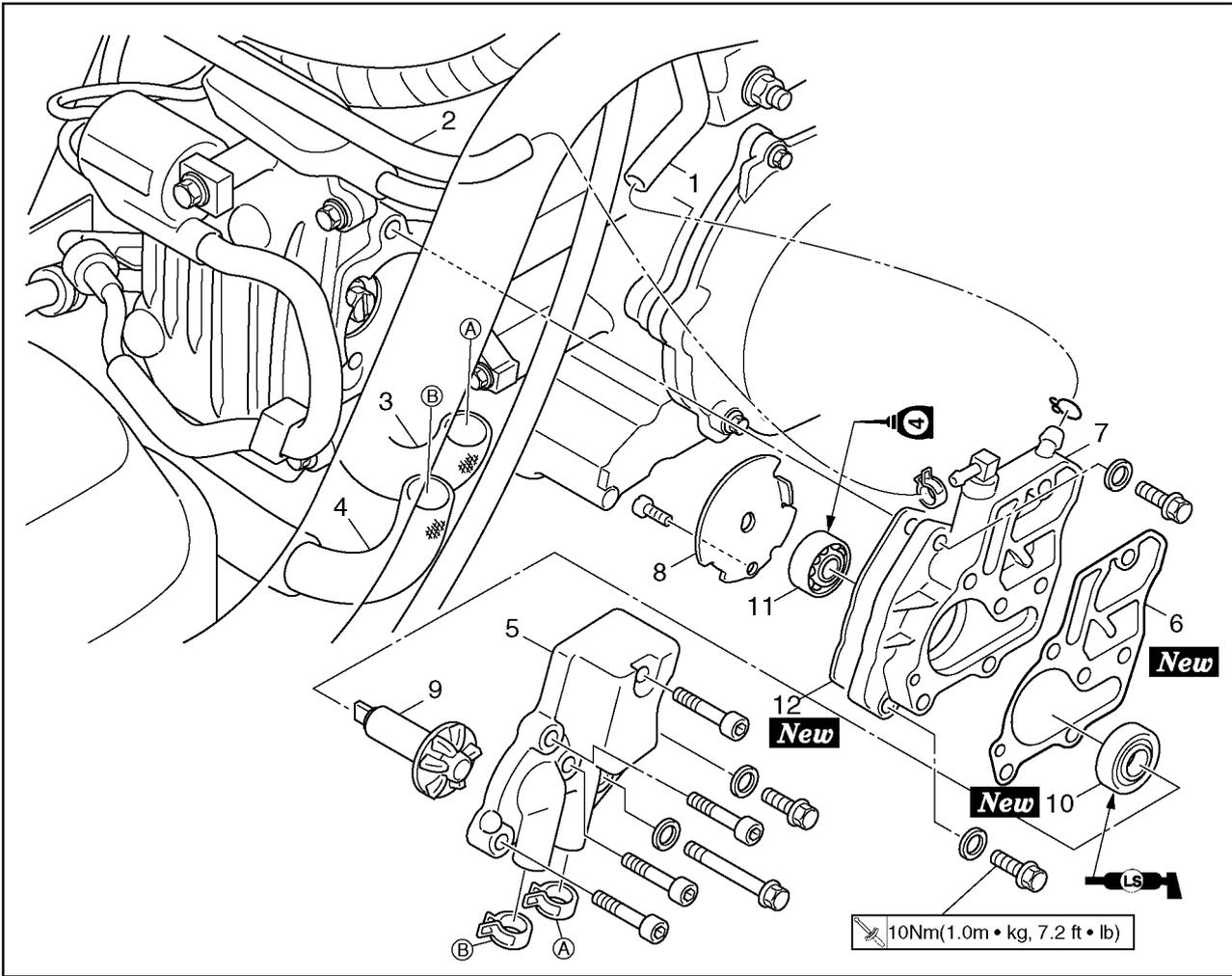
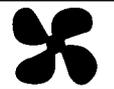
- radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to "CHECKING THE RADIATOR".

EAS00468

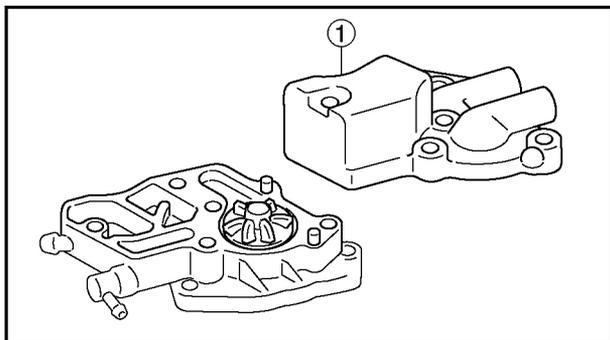
WATER PUMP



Order	Job/Part	Q'ty	Remarks
	Removing the water pump		Remove the parts in the order listed.
	Front cover		Refer to "COVER AND PANEL" in chapter 3.
	Side cover(left and right)		
	Single seat/Trunk		
	Footrest board		
	Coolant		
			Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Breather hose	1	Disconnect.
2	Thermostat inlet hose	1	Disconnect.
3	Water pump outlet hose	1	Disconnect.
4	Radiator outlet hose	1	Disconnect.
5	Water pump housing cover	1	
6	Gasket	1	
7	Water pump housing	1	
8	Plate	1	
9	Impeller shaft	1	



Order	Job/Part	Q'ty	Remarks
10	Oil seal	1	For installation, reverse the removal procedure.
11	Bearing	1	
12	Gasket	1	

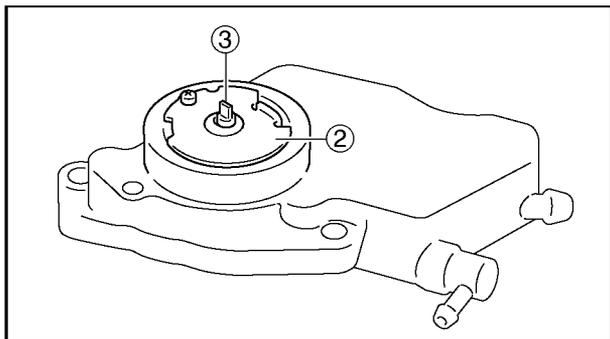


EAS00471

DISASSEMBLING THE WATER PUMP

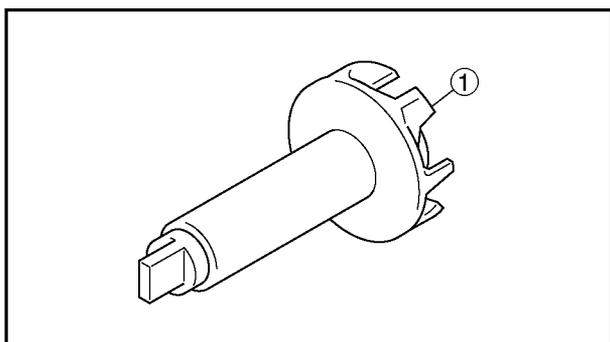
1. Remove:
 - water pump housing cover ①
 - dowel pin
 - gasket

2. Remove:
 - plate ②
 - impeller shaft ③
 - gasket
 - oil seal
(with a thin, flat-head screwdriver)
 - bearing



NOTE:

- Remove the oil seal from the inside of the water pump housing.
- Remove the bearing from the inside of the water pump housing.

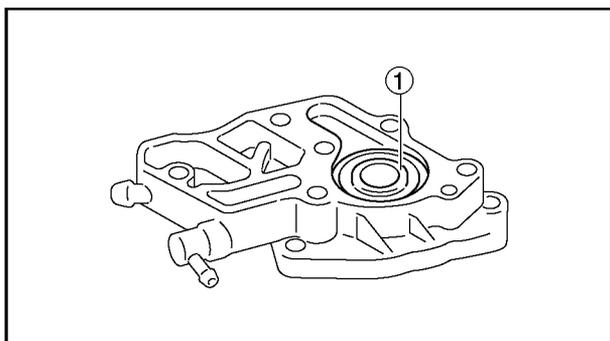


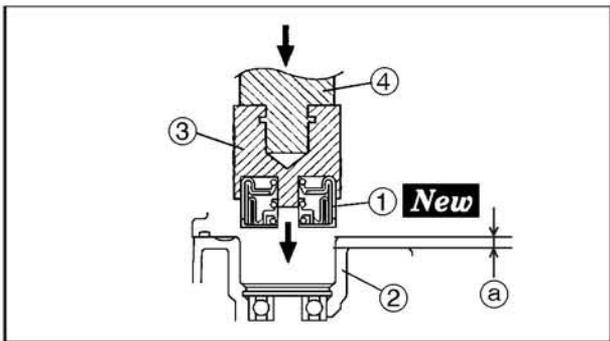
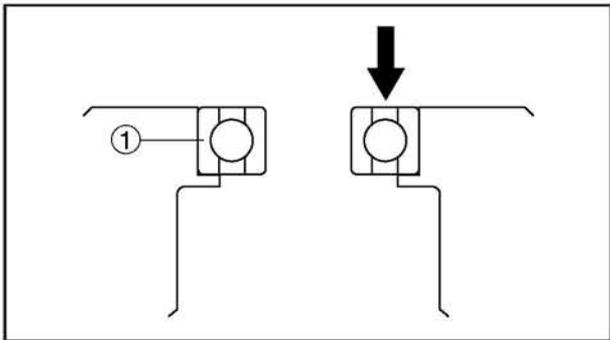
EAS00474

CHECKING THE WATER PUMP

1. Check:
 - water pump housing cover
 - water pump housing
 - impeller ①
Cracks/damage/wear → Replace.

2. Check:
 - water pump seal ①
Cracks/damage/wear → Replace.
3. Check:
 - bearing
Rough movement → Replace.
4. Check:
 - radiator outlet hose
Cracks/damage/wear → Replace.





EAS00475

ASSEMBLING THE WATER PUMP

1. Install:
 - bearing①

NOTE: _____

- Before installing the oil seal, apply tap water or coolant onto its out surface.
- Install the oil seal with a socket that matches its outside diameter.

2. Install:

- water pump seal **New** ①
(into the water pump housing ②)

CAUTION: _____

Never lubricate the water pump seal surface with oil or grease.

NOTE: _____

- Install the water pump seal with the special tools.
- Press in depth of water pump and oil seal is 5.5~6.0mm ①.



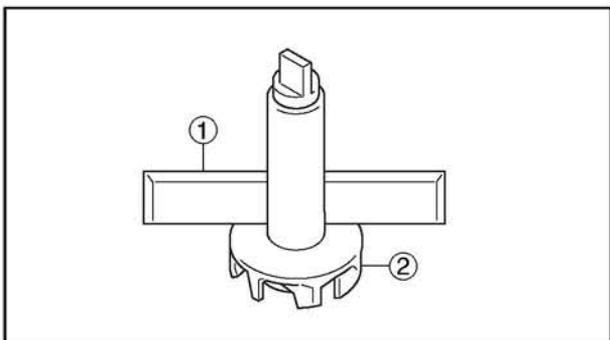
Mechanical seal installer

90890-04145 ③

Middle driven shaft bearing driver

90890-04058 ④

YM-04058



3. Measure:

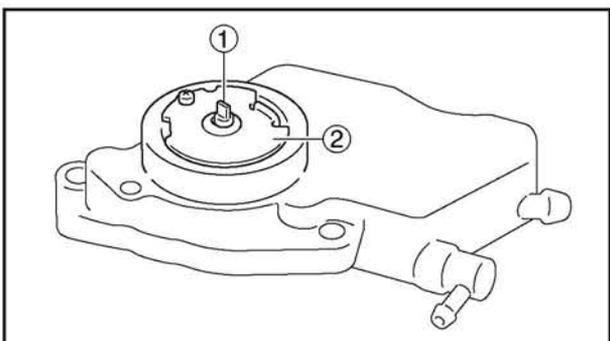
- impeller shaft tilt
Out of specification → Replace the impeller shaft .



Impeller shaft tilt limit

0.15mm(0.0059in)

- ① Straightedge
- ② Impeller

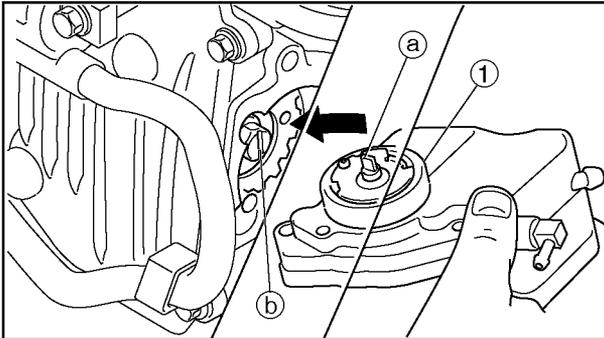
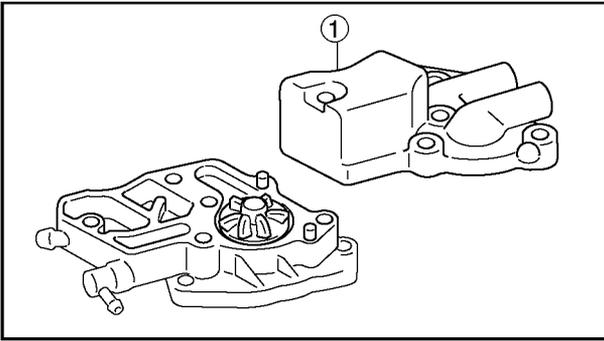


4. Install:

- impeller shaft①
- plate②

CAUTION: _____

After installation, check that the impeller shaft rotates smoothly.



5. Install:
 - gasket **New**
 - water pump housing cover ①

EAS00478

INSTALLING THE WATER PUMP

1. Install:
 - water pump assembly ①

	10Nm (1.0m • kg, 7.2ft • lb)
---	-------------------------------------

NOTE:

Align the slit (a) on the impeller shaft with the projection (b) on the camshaft sprocket bolt.

2. Install:
 - breather hose
 - thermostat inlet hose
 - water pump outlet hose
 - radiator outlet hose
3. Fill:
 - cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" in chapter 3.
4. Check:
 - cooling system
Leaks → Repair or replace the faulty part.
5. Measure:
 - radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to "CHECKING THE RADIATOR".



CHAPTER 7 FUEL INJECTION SYSTEM

FUEL INJECTION SYSTEM	7-1
WIRING DIAGRAM	7-2
ECU'S SELF-DIAGNOSTIC FUNCTION	7-4
CHECKING FOR A DEFECTIVE ENGINE TROUBLE WARNING LIGHT BULB.....	7-5
SELF-DIAGNOSTIC FUNCTION TABLE.....	7-5
Self-diagnostic function table.....	7-5
TROUBLESHOOTING CHART	7-7
DIAGNOSTIC MODE	7-8
TROUBLESHOOTING DETAILS.....	7-12
THROTTLE BODY AND FUEL INJECTOR	7-26
THROTTLE BODY	7-26
FUEL INJECTOR AND FUEL HOSE	7-27
FUEL TANK.....	7-28
REMOVING THE FUEL HOSE.....	7-29
REMOVING THE FUEL PUMP	7-29
CHECKING THE THROTTLE BODY.....	7-30
INSTALLING THE FUEL PUMP	7-31
INSTALLING THE FUEL HOSE	7-31
CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OP- ERATION	7-32
CHECKING THE THROTTLE POSITION SENSOR	7-32
CHECKING THE ISC (IDLE SPEED CONTROL) VALVE	7-34
AIR INDUCTION SYSTEM	7-35
AIR INJECTION	7-35
AIR CUT-OFF VALVE	7-35
AIR INDUCTION SYSTEM DIAGRAMS	7-36
AIR CUT-OFF VALVE AND AIR FILTER CASE	7-37
CHECKING THE AIR INDUCTION SYSTEM	7-38

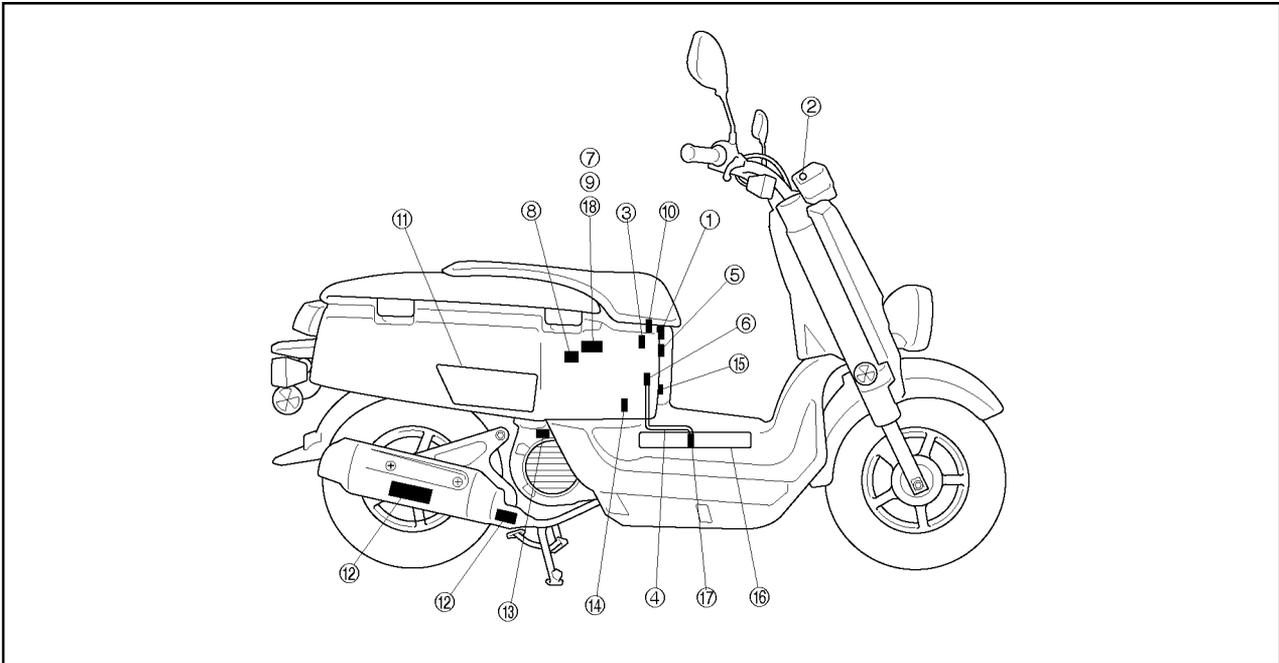


EAS00894

FUEL INJECTION SYSTEM

FUEL INJECTION SYSTEM

- | | |
|---------------------------------|------------------------------|
| ① ECU | ⑪ Air filter case |
| ② Engine trouble warning light | ⑫ Catalytic converter |
| ③ Lean angle cut-off switch | ⑬ Crankshaft position sensor |
| ④ Fuel hose | ⑭ Coolant temperature sensor |
| ⑤ Ignition coil | ⑮ Spark plug |
| ⑥ Fuel injector | ⑯ Fuel tank |
| ⑦ Intake air pressure sensor | ⑰ Fuel pump |
| ⑧ ISC(idle speed control) valve | ⑱ Throttle position sensor |
| ⑨ Intake air temperature sensor | |
| ⑩ Battery | |

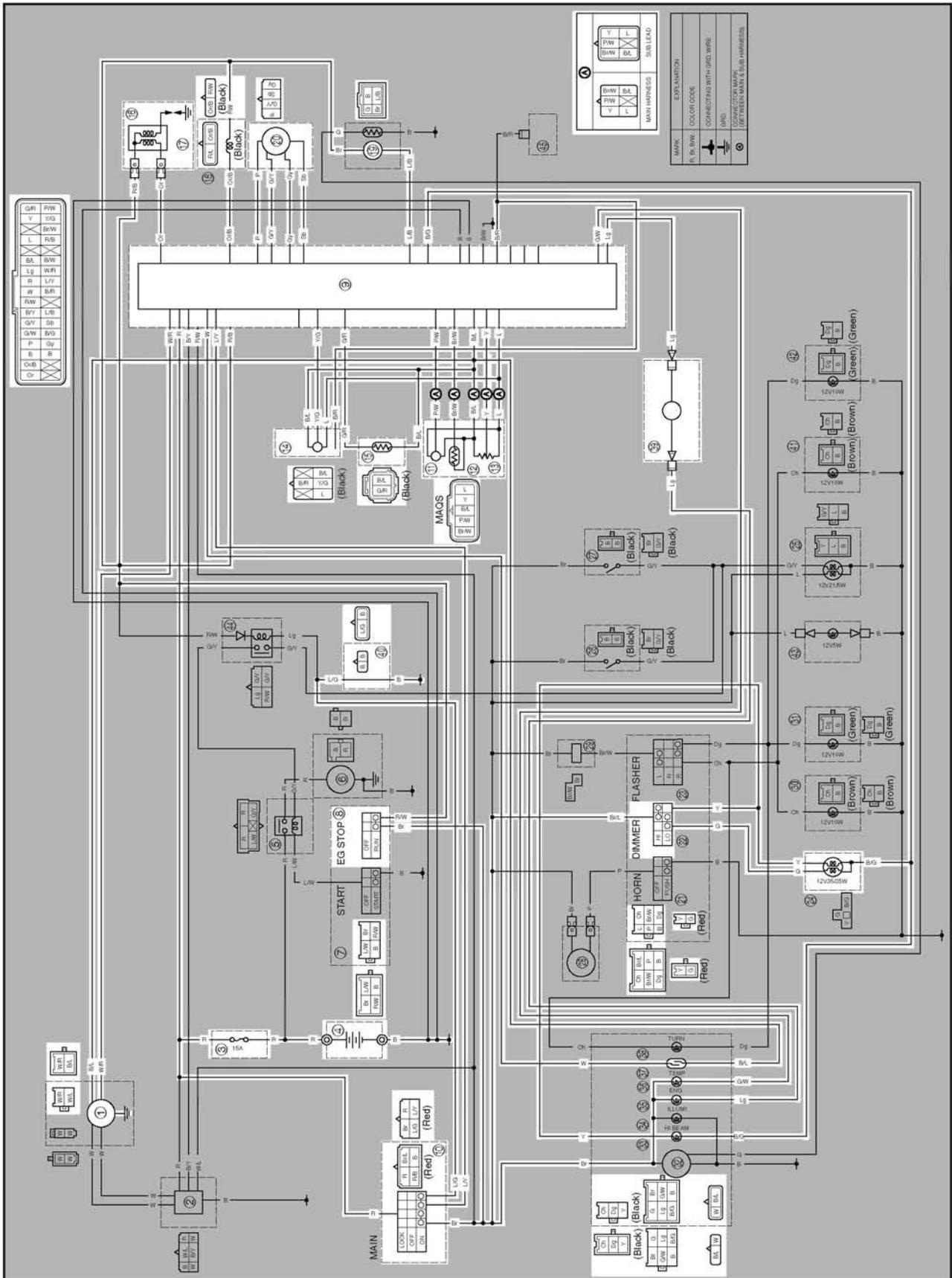


FUEL INJECTION SYSTEM

FI



WIRING DIAGRAM



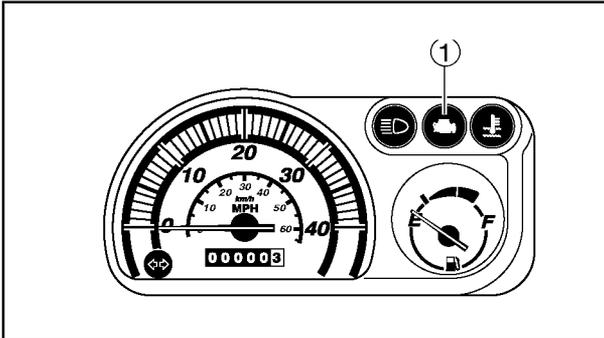


- ① AC magneto
- ③ Main fuse
- ④ Battery
- ⑧ Engine stop switch
- ⑨ ECU
- ⑩ Main switch
- ⑪ Intake air pressure sensor
- ⑫ Intake air temperature sensor
- ⑬ Throttle position sensor
- ⑭ Lean angle cut-off switch
- ⑮ Coolant temperature sensor
- ⑯ Ignition coil
- ⑰ Spark plug
- ⑱ Fuel injector
- ⑲ Fuel pump
- ⑳ ISC (idle speed control) valve
- ㉒ Dimmer switch
- ㉔ Headlight
- ㉓ High beam indicator light
- ㉕ Engine trouble warning light
- ㉖ Coolant temperature indicator light
- ㉗ Speed sensor
- ㉙ FI diagnostic tool (optional)
- ㉚ Sidestand switch (optional)



ECU'S SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the engine control system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.



① Engine trouble warning light

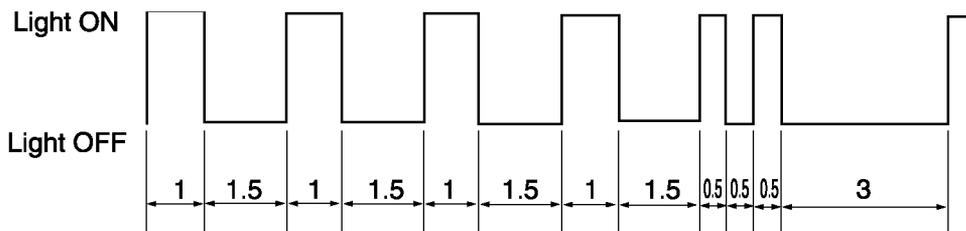
- To inform the rider that the fuel injection system is not functioning correctly, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, this mode provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the engine trouble warning light (or displayed on the FI diagnostic tool). It remains stored in the memory of the ECU until it is deleted.

Engine trouble warning light fault code indication

Digit of 10: Cycles of 1 sec. ON and 1.5 sec. OFF.

Digit of 1: Cycles of 0.5 sec, ON and 0.5 sec. OFF.

<Example> 42



EAS00900

Engine trouble warning light indication and FI system operating condition

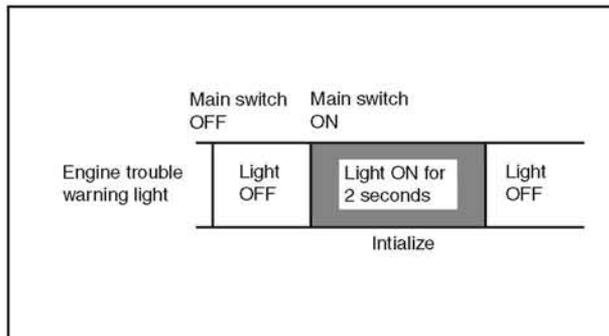
Engine condition	Warning light indication	FI operation	Vehicle operation
Operate (cranking with electric starter)	Flashing	Operation stopped	Unable
	Remains ON	Operated with substitute characteristics in accordance with the description of the malfunction	Able
Stop	Flashing (indicate the fault code)	—	—



EAS00901

CHECKING FOR A DEFECTIVE ENGINE TROUBLE WARNING LIGHT BULB

The engine trouble warning light comes on for 2 seconds after the main switch has been turned “ON” and when the start switch is being pushed. If the warning light does not come on under these conditions, the warning light bulb may be defective.



EAS00902

SELF-DIAGNOSTIC FANCTION TABLE

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.

Self-diagnostic fansion table

Fault code No.	Item	Symptom	Engine startability	Vehicle driveability
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	Unable	Unable
13 14	Intake air pressure sensor (open or short circuit) (pipe system)	Intake air pressure sensor-open or short circuit detected. Faulty intake air pressure sensor pipe system.	Able	Able
15 16	Throttle position sensor (open or short circuit)(stuck)	Throttle position sensor-open or short circuit detected. A stuck throttle position sensor is detected.	Able	Able
19	Broken or disconnected blue/yellow lead of the ECU	Open circuit in the input line (blue/yellow lead) of the ECU is detected.	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor-open or short circuit is detected.	Able	Able
22	Intake temperature sensor	Intake temperature sensor-open or short circuit is detected.	Able	Able
33	Faulty ignition	Open circuit detected in the primary lead of the ignition coil.	Unable	Unable
37	ISC (idle speed control) valve (stuck fully open)	Engine speed is high when the engine is idling.	Able	Able

FUEL INJECTION SYSTEM

FI

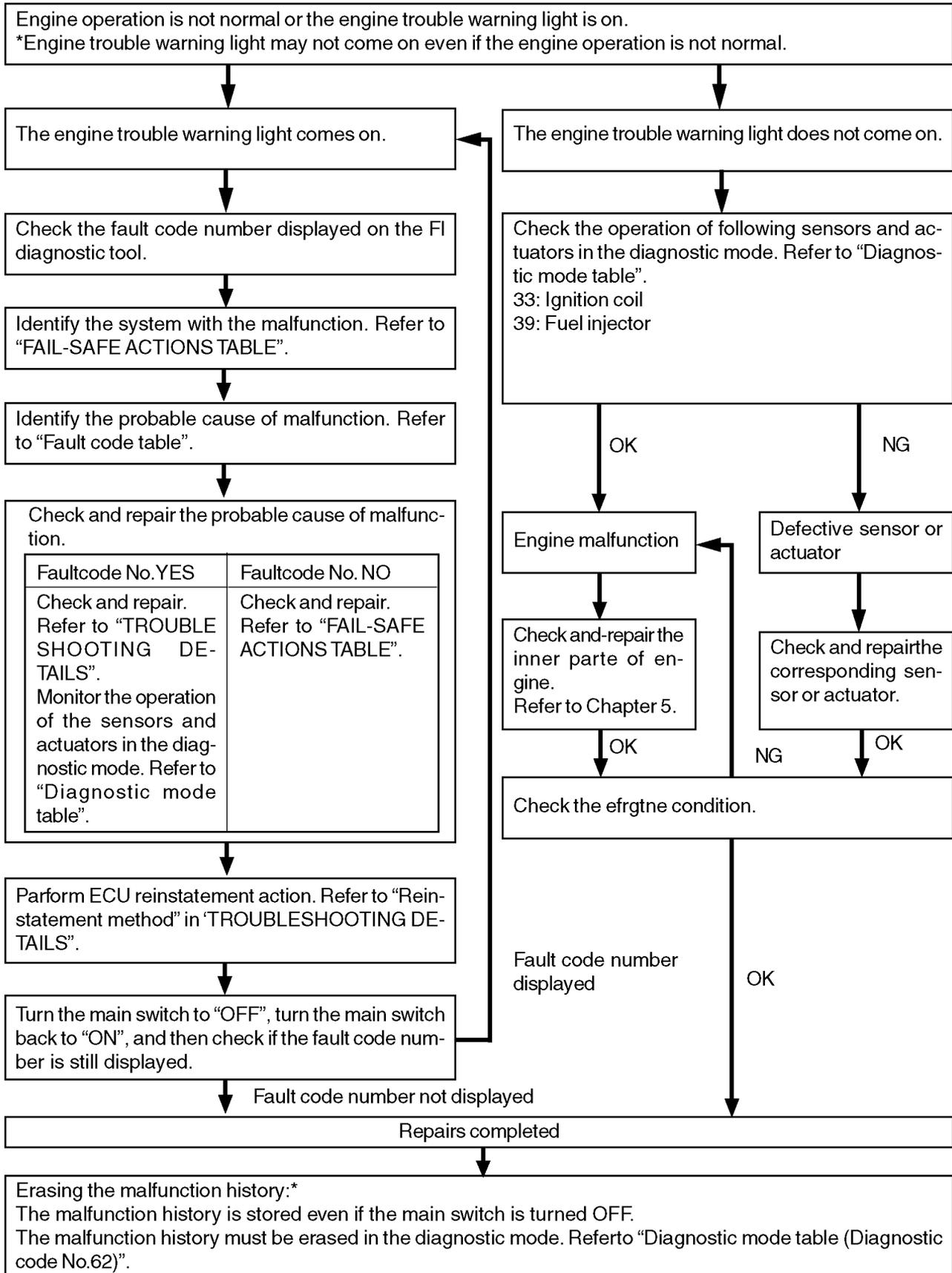


Fault code No.	Item	Symptom	Engine startability	Vehicle driveability
39	Fuel injector	Fuel injector open or short circuit is detected.	Unable	Unable
30 41	Lean angle cut-off switch (latch up detected) (open or short circuit)	The vehicle has overturned. Lean angle cut-off switch-open or short circuit is detected.	Unable	Unable
42	Speed sensor	No normal signals are received from the speed sensor.	Able	Able
43	Fuel system voltage (monitoring voltage)	Power supply to the fuel injector, fuel pump and ignition coil are not normal.	Able	Able
44	Error in reading from or writing on E2PROM	An error is detected while reading from or writing on E2PROM (CO adjustment value).	Able	Able
46	Vehicle system power supply (monitoring voltage)	Power supply to FI system is not normal. (red lead)	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the engine trouble warning light or displayed on FI diagnostic tool.	Unable	Unable
61	ISC (idle speed control) valve unit (open or short circuit)	ISC (idle speed control) valve unit-open or short circuit detected.	Able	Able
—	Start unable warning Engine trouble warning light flashes when the start switch is turned ON.	Relay is not activated even if the crank signal is input while the start switch is pushed.	Unable	Unable



EAS00904

TROUBLESHOOTING CHART



* Operated when the engine trouble warning light is on.



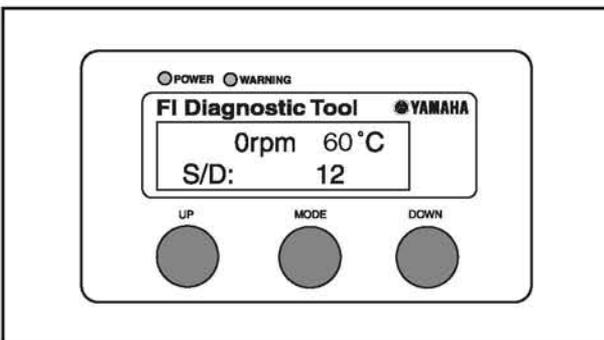
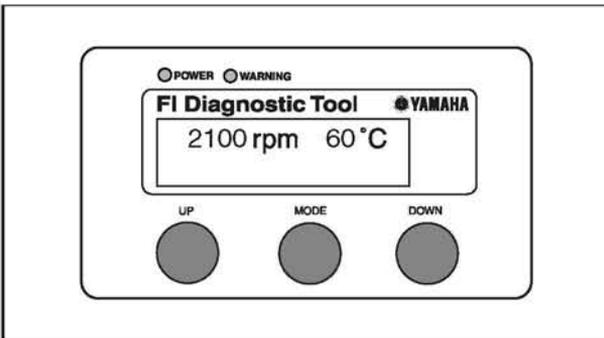
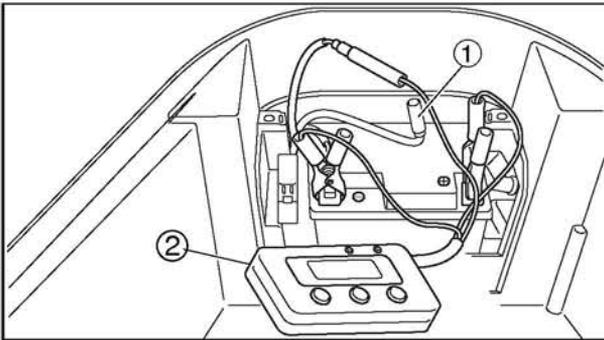
EAS00905

DIAGNOSTIC MODE

It is possible to monitor the sensor output data or check the activation of actuators with connecting the FI diagnostic tool to the normal mode or the diagnostic monitoring mode.



FI diagnostic tool
90890-03182
YU-03182



Setting the normal mode

NOTE:

The engine speed, engine temperature, and fault code, if detected, can be displayed on the LCD of the FI diagnostic tool when the tool is connected to the vehicle and is set to the normal mode.

1. Turn the main switch to "OFF" and the engine stop switch to "RUN".
2. Disconnect the self diag signal connector ①, and then connect the FI diagnostic tool ② as shown.
3. Turn the main switch to "ON" and start the engine.

NOTE:

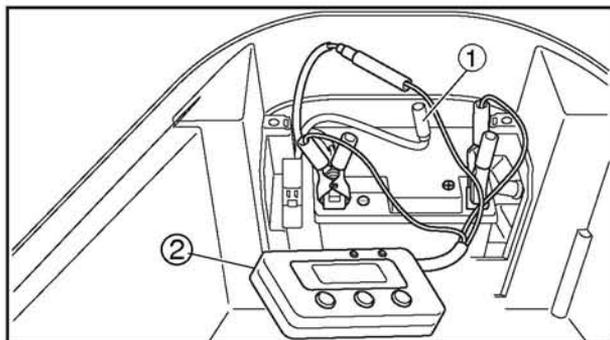
- Engine temperature and engine revolution appears on the LCD of the FI diagnostic tool.
- "POWER" LED (Green) comes on.
- If a malfunction is detected in the system, "WARNING" LED (Orange) comes on. However the fault code is not appears on the LCD of FI diagnostic tool.

4. Stop the engine.

NOTE:

If a malfunction is detected in the system, the fault code appears on the LCD of the FI diagnostic tool. And also, "WARNING" LED (Orange) comes on.

5. Turn the main switch to "OFF" to cancel the normal mode.
6. Disconnect the FI diagnostic tool and connect the self diag signal connector.



Setting the diagnostic mode

1. Turn the main switch to "OFF" and the engine stop switch to "RUN"..
2. Disconnect the self diag signal connector ①, and then connect the FI diagnostic-tool ② as shown.
3. While press the "MODE" button, turn the main switch to "ON".

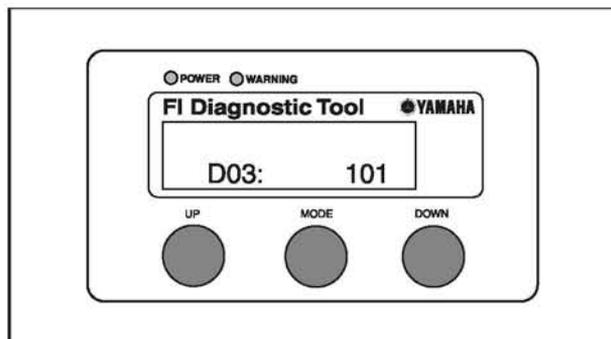
NOTE:

- "DIAG" appears on the LCD of the FI diagnostic tool.
- "POWER" LED (Green) comes on.

4. Press the "UP" button to select the CO adjustment mode "CO" or the diagnostic mode "DIAG".
5. After selecting "DIAG", press the "MODE" button.
6. Select the diagnostic code number that applies to the item that was verified with the fault code number by pressing the "UP" and "DOWN" buttons.

NOTE:

- The diagnostic code number appears on the LCD (D01-D70).
- To decrease the selected diagnostic code number, press the "DOWN" button. Press the "DOWN" button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the "UP" button. Press the "UP" button for 1 second or longer to automatically increase the diagnostic code numbers.



7. Verify the operation of the sensor or actuator.
 - Sensor operation
The data representing the operating conditions of the sensor appears on the LCD.
 - Actuator operation
Press the "MODE" button to operate the actuator.
8. Turn the main switch to "OFF" to cancel the diagnostic mode.
9. Disconnect the FI diagnostic tool and connect the self diag signal connector.


Fault code table

Fault codeNo.	Symptom	Probable cause of malfunction	Diagnostic code
12	No normal signals are received from the crankshaft position sensor.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. • Defective crankshaft position sensor. • Malfunction in pickup rotor. • Improperly installed sensor lead connector in the coupler. 	-
13	Intake air pressure sensor-open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective intake air pressure sensor. • Improperly installed sensor lead connector in the coupler. 	D03
14	Faulty intake air pressure sensor pipe system	<ul style="list-style-type: none"> • Intake air pressure sensor is disconnected or clogged. 	D03
15	Throttle position sensor-open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective throttle position sensor. • Improperly installed throttle position sensor lead connector in the coupler. 	D01
16	A stuck throttle position sensor is detected.	<ul style="list-style-type: none"> • Stuck throttle position sensor. • Defective throttle position sensor. 	D01
19	Open circuit in the input line (blue/yellow lead) of ECU is detected when the start switch is pressed.	<ul style="list-style-type: none"> • Open circuit in wiring harness (ECU coupler). 	D20
21	Coolant temperature sensor-open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. • Defective coolant temperature sensor. • Improperly installed sensor lead connector in the coupler. 	D06
22	Intake air temperature sensor-open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire sub lead. • Open or short circuit in wiring harness. • Defective intake temperature sensor. • Improperly installed sensor lead connector in the coupler. 	D06
30	The vehicle has overturned.	<ul style="list-style-type: none"> • Overturned condition. 	D08
33	Open circuit is detected in the primary lead of the ignition coil.	<ul style="list-style-type: none"> • Open circuit in wiring harness. • Malfunction in ignition coil. • Improperly installed primary lead connector in the coupler. 	D30
37	The ISC (idle speed control) valve is stuck fully open.	<ul style="list-style-type: none"> • Malfunction in throttle body. • Malfunction in throttle cables. • ISC (idle speed control) valve is stuck fully open. 	D54
39	Fuel injector open or short circuit is detected.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. • Defective fuel injector. • Improperly installed lead connector in the coupler. 	D36
41	Lean angle cut-off switch-open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. • Defective lean angle cut-off switch. • Improperly installed lead connector in the coupler. 	D08
42	No normal signals are received from the speed sensor.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. • Defective speed sensor. • Improperly installed lead connector in the coupler. 	D07
43	Power supply to the fuel injector, fuel pump and ignition coil are not normal.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. 	D09
44	An error is detected while reading or writing on E2PROM.	<ul style="list-style-type: none"> • Malfunction in ECU. (The CO adjustment value, code reregistering key code, and throttle valve fully closed notification value are not properly written on or read from the internal memory.) 	D60
46	Power supply to FI system is not normal.(red lead)	<ul style="list-style-type: none"> • Malfunction in charging system. 	-
50	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	<ul style="list-style-type: none"> • Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.) 	-
61	ISC (idle speed control) valve open or short circuit is detected.	<ul style="list-style-type: none"> • Open or short circuit in wiring harness. • Improperly installed lead connector in the coupler. 	D54



EAS00907

Diagnostic mode table

NOTE:

- Check the intake air temperature and coolant temperature as close as possible to the intake air temperature sensor and the coolant temperature sensor respectively.
- If it is not possible to check the intake air temperature, use the ambient temperature as reference.

Diagnostic code	Item	Description of action	Data displayed on FI diagnostic tool (reference value)
D01	Throttle angle	Displays the throttle angle. <ul style="list-style-type: none"> • Check with throttle fully closed. • Check with throttle fully open. 	0-125 degrees <ul style="list-style-type: none"> • Fully closed position (14-20) • Fully open position (97-107)
D03	Intake air pressure	Displays the intake air pressure. <ul style="list-style-type: none"> • Check the pressure in the intake manifold. 	Compare it to the value displayed on the FI diagnostic tool.
D05	Intake air temperature	Displays the intake air temperature. <ul style="list-style-type: none"> • Check the temperature in the intake manifold. 	Compare it to the value displayed on the FI diagnostic tool.
D06	Coolant temperature	Displays the coolant temperature. <ul style="list-style-type: none"> • Check the temperature of the coolant. 	Compare it to the value displayed on the FI diagnostic tool.
D07	Vehicle speed pulse	Displays the accumulation of the vehicle pulses that are generated when the tire is spun.	(0-999; resets to 0 after 999) OK if the numbers appear on the FI diagnostic tool.
D08	Lean angle cut-off switch	Displays the lean angle cut-off switch values.	Upright: 0.4-1.4 V Overturned: 3.7-4.4 V
D09	Fuel system voltage (battery voltage)	Displays the fuel system voltage (battery voltage).	0-18.7 V Normally, approximately 12.0 V
D20	Sidestand switch (Option)	Displays that the switch is ON or OFF.	Stand retracted: ON Stand extended: OFF
D30	Ignition coil	When the "MODE" button is pressed, the ignition coil is actuated five times per second and the "WARNING" LED (orange) comes on. <ul style="list-style-type: none"> • Connect an ignition checker. 	Check that spark is generated, 5 times with the "MODE" button press.
D36	Fuel injector	When the "MODE"-button is pressed, the fuel injector is actuated five times per second and the "WARNING" LED (orange) comes on.	Check the operating sound of the fuel injector five times with "MODE" button press.
D52	Headlight	When the "MODE" button is pressed, the headlight is actuated five times every 5 seconds and the engine trouble warning light comes on. (ON 2 seconds, OFF 3 seconds)	Check the headlight operating 5 times with the "MODE" button is pressed.
D54	ISC (idle speed control) valve	When the the "MODE" button is pressed, the ISC (idle speed control) valve fully closes, and then it opens until it is at the standby opening position when the engine is started. This operation takes approximately 3 seconds until it is completed.	The ISC (idle speed control) valve unit vibrates when the ISC (idle speed control) valve operates.
D60	E2PROM fault code display.	<ul style="list-style-type: none"> • Transmits the abnormal portion of the data in the E2PROM that has been detected as a fault code 44. • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated. 	01 CO adjustment value is detected. (00) Displays when there is no malfunction.
D61	Malfunction history code display	<ul style="list-style-type: none"> • Displays the codes of the history of the self-diagnosis malfunctions (i.e., a code of a malfunction that occurred once and which has been corrected). • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated. 	12-61 (00) Displays when there is no malfunction.
D62	Malfunction history code erasure	<ul style="list-style-type: none"> • Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history. • Erases only the history codes when the "MODE" button is pressed. 	00-18 (00) Displays when there is no malfunction.
D70	Control number	Displays the program control number.	00-254



Communication error with the FI diagnostic tool

LCD Display	Sympton	Probable cause of malfunction
Waiting for connection...	No signals are received from the ECU.	<ul style="list-style-type: none"> • Improper installed lead connector in the coupler. • The main switch is OFF position. • Malfunction in FI diagnostic tool. • Malfunction in ECU.
ERROR 4	Commands from the FI diagnostic tool are not accepted by the ECU.	<ul style="list-style-type: none"> • Turn the main switch to "OFF" once, and then turn it back to CO adjustment mode or diagnostic mode. • Vehicle battery is insufficiently charged. • Malfunction in FI diagnostic tool. • Malfunction in ECU.

EAS00908

TROUBLESHOOTING DETAILS

This section describes the countermeasures per fault code number displayed on the FI diagnostic tool. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioned part has been completed, reset the FI diagnostic tool display according to the "Reinstatement method".

Fault code No.:

Fault code number displayed on the FI diagnostic tool when the engine failed to work normally.

Refer to "Fault code table".

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "DIAGNOSTIC MODE".

FUEL INJECTION SYSTEM

FI



Fault code No. | 12 | Symptom | No normal signals are received from the crankshaft position sensor.

Used diagnostic code No. --

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor.	Check the installed area for looseness or pinching.	Reinstated by cranking the engine.
2	Connected condition of connector. Inspect the coupler for any pins that may have pulled out. Check that the coupler is connected securely. NOTE: Set the main switch to OFF before connecting or disconnecting the connector.	If there is a malfunction, repair it and connect it securely. Crankshaft position sensor coupler Main wiring harness ECU coupler	
3	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit between the main wiring harnesses. Between sensor coupler and ECU coupler. white/red black/blue	
4	Defective crankshaft position sensor.	Replace if defective. Refer to "IGNITION SYSTEM" in chapter 8.	

FUEL INJECTION SYSTEM

FI



Fault code No. 13 Symptom Intake air pressure sensor-open or short circuit detected.

Used diagnostic code No. D03 (intake air pressure sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	<p>Connected condition of connector</p> <p>Inspect the coupler for any pins that may have pulled out.</p> <p>Check the locking condition of the coupler.</p> <p>NOTE: _____</p> <p>Set the main switch to OFF before connecting or disconnecting the connector.</p>	<p>If there is a malfunction, re-per it and connect it securely.</p> <p>Intake air pressure sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler</p>	<p>Reinstated by turning the main switch ON.</p>
2	<p>Open or short circuit in wiring harness and /or sub lead.</p>	<p>Repair or replace if there is an open or short circuit.</p> <p>Between sensor coupler and ECU coupler black/blue - black/blue pink/white - pink/white blue- blue</p>	
3	<p>Defective intake air pressure sensor.</p>	<p>Execute the diagnostic mode (code No. D03)</p> <p>Replace the throttle body.</p> <p>NOTE: _____</p> <p>Do not remove the sensor assembly (MAQS).</p> <p>1. Connect the digital circuit tester to the intake air pressure sensor coupler as shown.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Positive tester probe → pink/white ①</p> <p>Negative tester probe → black/blue ②</p> </div> <p>2. Set the main switch to "ON".</p> <p>3. Measure the intake air pressure sensor output voltage.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Intake air pressure sensor output voltage 3.9-4.1V</p> </div> <p>4. Is the intake air pressure sensor OK?</p>	

FUEL INJECTION SYSTEM

FI



Fault code No.	14	Symptom	Intake air pressure sensor-hose system malfunction (clogged or detached hose).	
Used diagnostic code No. D03 (intake air pressure sensor)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected state of connector Intake air pressure sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler		Check the coupler for any pins that may have pulled out. Check that the coupler is connected securely. If there is a malfunction, repair it and connect it securely.	Reinstated by starting the engine and operating it at idle.
2	Defective intake air pressure sensor.		Execute the diagnostic mode (code No. D03) Replace the throttle body. NOTE: Do not remove the sensor assembly (MAQS). Refer to "Fault code No. 13".	

Fault code No.	15	Symptom	Throttle position sensor-open or short circuit detected.	
Used diagnostic code No. D01 (throttle position sensor)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Installed condition of throttle position sensor.		Check the installed area for looseness or pinching. Check that it is installed in the specified position. Refer to "THROTTLE BODY AND FUEL INJECTOR".	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Throttle position sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue - black/blue yellow - yellow blue -blue	
4	Defective throttle position sensor.		Execute the diagnostic mode (code No. D01) Replace the throttle body. NOTE: Do not remove the sensor assembly (MAQS). Refer to "THROTTLE BODY AND FUEL INJECTOR".	

FUEL INJECTION SYSTEM

FI



Fault code No. 16 Symptom		Stuck throttle position sensor detected.	
Used diagnostic code No. D01 (throttle position sensor)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of throttle position sensor.	Check the installed area for looseness or pinching. Check that it is installed in the specified position. Refer to "THROTTLE BODY AND FUEL INJECTOR".	Reinstated by starting the engine, operating it at idle, and then racing it.
2	Defective throttle position sensor	Execute the diagnostic mode (code No. 01) Replace the throttle body. NOTE: Do not remove the sensor assembly (MAQS). Refer to "THROTTLE BODY AND FUEL INJECTOR".	
3	When fault code No.15 has been detected	Refer to "Fault code No.15".	Refer to "Fault code No.15".

Fault code No. 19 Symptom		Open circuit in the input line of ECU (blue/yellow lead) detected.	
Used diagnostic code No. D20 (sidestand switch :option)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected state of connector Main wiring harness ECU coupler (blue/yellow connector)	Execute the diagnostic mode (code No. D20) Check the coupler for any pins that may have pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect it securely.	Reinstated by reconnecting the wiring and retracting the sidestand.
2	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open circuit. Between main switch coupler and ECU coupler. blue/yellow - blue/yellow Sidestand switch signal input line of main switch coupler. blue/green - blue/green	

FUEL INJECTION SYSTEM

FI

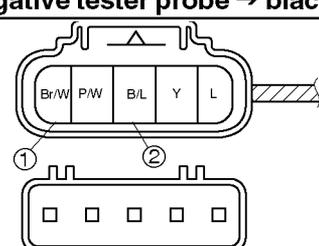


Fault code No. 21 Symptom		Coolant temperature sensor open or short circuit is detected.	
Used diagnostic code No. D06 (coolant temperature sensor)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Coolant temperature sensor coupler Main wiring harness ECU coupler	
3	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue-black/blue green/red - green/red	
4	Defective coolant temperature sensor.	Execute the diagnostic mode (code No.D06) Replace if defective. Refer to "COOLING SYSTEM" in chapter 8.	



Fault code No. 22 | **Symptom** Intake temperature sensor open or short circuit is detected.

Used diagnostic code No. D05 (intake air temperature sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Intake air temperature sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue - black/blue brown/white - brown/white	
4	Defective intake air temperature sensor.	<p>Execute the diagnostic mode (code No. D05) Replace the throttle body. NOTE: _____ Do not remove the sensor assembly (MAQS).</p> <p>1. Connect the digital circuit tester to the intake air temperature sensor terminal as shown.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="margin: 0;">Positive tester probe → brown/white ①</p> <p style="margin: 0;">Negative tester probe → black/blue ②</p>  </div> <p>2. Measure the intake air temperature sensor resistance.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">  <p style="margin: 0;">Intake air temperature sensor resistance 2.4~2.9kΩ at 20°C (68°F)</p> </div> <p>⚠ WARNING _____</p> <ul style="list-style-type: none"> ● Handle the intake air temperature sensor with special care. ● Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it. <hr/> <p>3. Is the intake air temperature sensor OK?</p>	

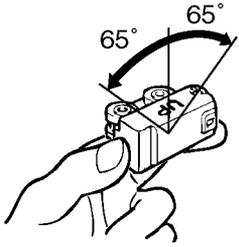
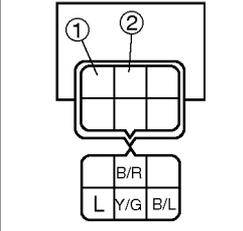
FUEL INJECTION SYSTEM

FI



Fault code No. 30 Symptom The vehicle has overturned.

Used diagnostic code No. D08 (lean angle cut-off switch)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	The vehicle has overturned.	Raise the vehicle upright.	Reinstated by turning the main switch ON (however, the engine cannot be restarted unless the main switch is first turned OFF).
2	Installed condition of the lean angle cut-off switch	Check the installed area for looseness or pinching.	
3	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Lean angle cut-off switch coupler Main wiring harness ECU coupler	
4	Defective lean angle cut-off switch	Execute the diagnostic mode (code No. D08) Replace if defective. 1. Remove the lean angle cut-off switch from the vehicle. 2. Connect the lean angle cut-off switch coupler to the wire harness. 3. Connect the digital circuit tester to the lean angle cut-off switch terminals as shown. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Positive tester probe → bleu ① Negative tester probe → yellow/green ②</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> 4. When turning the lean angle cut-off switch approximately 65°, the voltage reading change from 0.4 V to 4.4 V. 5. Is the lean angle cut-off switch OK?	

FUEL INJECTION SYSTEM

FI



Fault codeNo. 33 Symptom		Open circuit detected in the primary lead of the ignition coil.	
Used diagnostic code No. D30			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Ignition coil primary side coupler - orange Main wiring harness ECU coupler	Reinstated by starting the engine and operating it at idle.
2	Open or short circuit in lead.	Repair or replace if there is an open or short circuit. Between ignition coil coupler and ECU coupler/main harness orange - orange	
3	Defective ignition coil (test the primary and secondary coils for continuity).	Execute the diagnostic mode (code No. D30) Replace if defective. Refer to "IGNITION SYSTEM" in chapter 8.	

Fault code No. 37 Symptom		Engine speed is high when the engine is idling.	
Used diagnostic code No. D54 (ISC (idle speed control) valve)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Incorrect speed sensor signal	Check the speed sensor. Check the speed sensor leads. Check the speed sensor coupler.	Reinstated if the engine idle speed is within specification after starting the engine.
2	Throttle valve does not fully close	Check the throttle body. Refer to "THROTTLE BODY ASSEMBLY AND FUEL INJECTOR ASSEMBLY". Check the throttle cables. Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.	
3	ISC (idle speed control) valve stuck fully open	The ISC (idle speed control) valve is stuck fully open if it does not operate when the main switch is set to OFF. (Touch the ISC (idle speed control) valve unit with your hand and check if it is vibrating to confirm if the ISC (idle speed control) valve is operating.) NOTE: Do not remove the ISC (idle speed control) valve unit.	
4	ISC (idle speed control) valve not moving correctly	Execute the diagnostic mode (code No. D54) After the ISC (idle speed control) valve is fully closed, it opens until it is at the standby opening position when the engine is started. This operation takes approximately 3 seconds until it is completed. Start the engine. If the error recurs, replace the throttle body assembly.	

FUEL INJECTION SYSTEM

FI



Fault code No. 39 Symptom		Fuel injector open or short circuit is detected.	
Used diagnostic code No. D36 (fuel injector)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Fuel injector coupler - orange/black Main wiring harness ECU coupler	Reinstated by starting the engine.
2	Open or short circuit in lead wire.	Repair or replace if there is an open or short circuit. Between fuel injector coupler and ECU coupler/main harness orange/black - orange/black	
3	Defective fuel injector	Execute the diagnostic mode (code No. D36) Replace if defective.	

Fault code No. 41 Symptom		Lean angle cut-off switch open or short circuit is detected.	
Used diagnostic code No. D08 (lean angle cut-off switch)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Lean angle cut-off switch coupler Main wiring harness ECU coupler	Reinstated by turning the main switch ON.
2	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit. Between switch coupler and ECU coupler black/blue - black/blue yellow/green - yellow/green blue- blue	
3	Defective lean angle cut-off switch	Execute the diagnostic mode (code No. D08) Replace if defective. Refer to Fault code No. 30.	

FUEL INJECTION SYSTEM

FI



Fault code No. 42 Symptom No normal signals are received from the speed sensor.

Used diagnostic code No. D07 (speed sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of speedometer connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Speedometer coupler Main wiring harness ECU coupler	Reinstated by inputting the vehicle speed signals by turning the front wheel.
2	Open or short circuit in speedometer lead.	Repair or replace if there is an open or short circuit. Between speedometer coupler and ECU coupler white - white black/blue - black/blue	
3	Breakage speedometer cable or speedometer gear unit.	Execute the diagnostic mode (code No.D07) Checking the speedometer cable breakage and loose connection. Checking the movement of the speedometer gear unit ①. Checking the breakage of the speedometer clutch projections ①a and speedometer gear unit slots ①b.	
4	Defective speed sensor.	Execute the diagnostic mode (code No. D07) Replace the meter assembly.	

FUEL INJECTION SYSTEM

FI



Fault code No.	43	Symptom	Power supply to the fuel injector, fuel pump and ignition coil are not normal.	
Used diagnostic code No. D09 (fuel system voltage)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. ECU coupler	Reinstated by starting the engine and operating it at idle.
2	Faulty battery		Replace or charge the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.	
3	Open or short circuit in wiring harness.		Execute the diagnostic mode (code No. D09) NOTE: When the leads are disconnected, the voltage check by the code No. D09 is impossible. Repair or replace if there is an open or short circuit. <ul style="list-style-type: none"> ● Between battery and main switch red-red ● Between main switch and handlebar switch (engine stop switch) brown-brown ● Between handlebar switch (engine stop switch) and ECU red/white-red/black 	

Fault code No.	44	Symptom	Error is detected while reading from or writing on EEROM (code registering key code and throttle valve fully closed notification valve).	
Used diagnostic code No. D60 (EEPROM improper cylinder indication)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Malfunction in ECU		Execute the diagnostic mode (code No. D60) <ul style="list-style-type: none"> ● 01 is displayed on meter. Readjust the CO of the displayed cylinder. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" in chapter 3. Replace ECU if defective.	Reinstated by turning the main switch ON.

FUEL INJECTION SYSTEM

FI



Fault code No.		46		Symptom	Power supply to FI system is not normal. (red lead)	
Used diagnostic code No. --						
Order	Inspection operation item and probable cause			Operation item and countermeasure		Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.			If there is a malfunction, repair it and connect it securely. ECU coupler		Reinstated by starting the engine and operating it at idle.
2	Faulty battery			Replace or charge the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.		
3	Malfunction in rectifier/ regulator			Replace if defective. Refer to "CHARGING SYSTEM" in chapter 8.		
4	Open or short circuit in wiring harness.			Repair or replace if there is an open or short circuit. Between battery and ECU red-red		

Fault code No.		50		Symptom	Faulty ECU memory. (when this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	
Used diagnostic code No. --						
Order	Inspection operation item and probable cause			Operation item and countermeasure		Reinstatement method
1	Malfunction in ECU			Replace the ECU.		Reinstated by turning the main switch ON.

FUEL INJECTION SYSTEM

FI



Fault code No. | 61 | Symptom | ISC (idle speed control) valve open or short circuit is detected.

Used diagnostic code No. --

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. ISC (idle speed control) valve coupler Main wiring harness ECU coupler	Reinstated by setting the main switch to ON, The ISC (idle speed control) valve fully closes, and then it opens until it is at the standby opening position when the engine is started.
2	Open or short circuit in lead.	Repair or replace if there is an open or short circuit. Between ISC (idle speed control) valve and ECU coupler/main harness pink- pink green/yellow-green/yellow gray - gray sky blue-sky blue	
3	Detective ISC (idle speed control) valve	Execute diagnostic mode (code No.D54) Replace the throttle body. NOTE: _____ Do not remove the ISC (idle speed control) valve. _____ Refer to "THROTTLE BODY AND FUEL INJECTOR".	

THROTTLE BODY AND FUEL INJECTOR

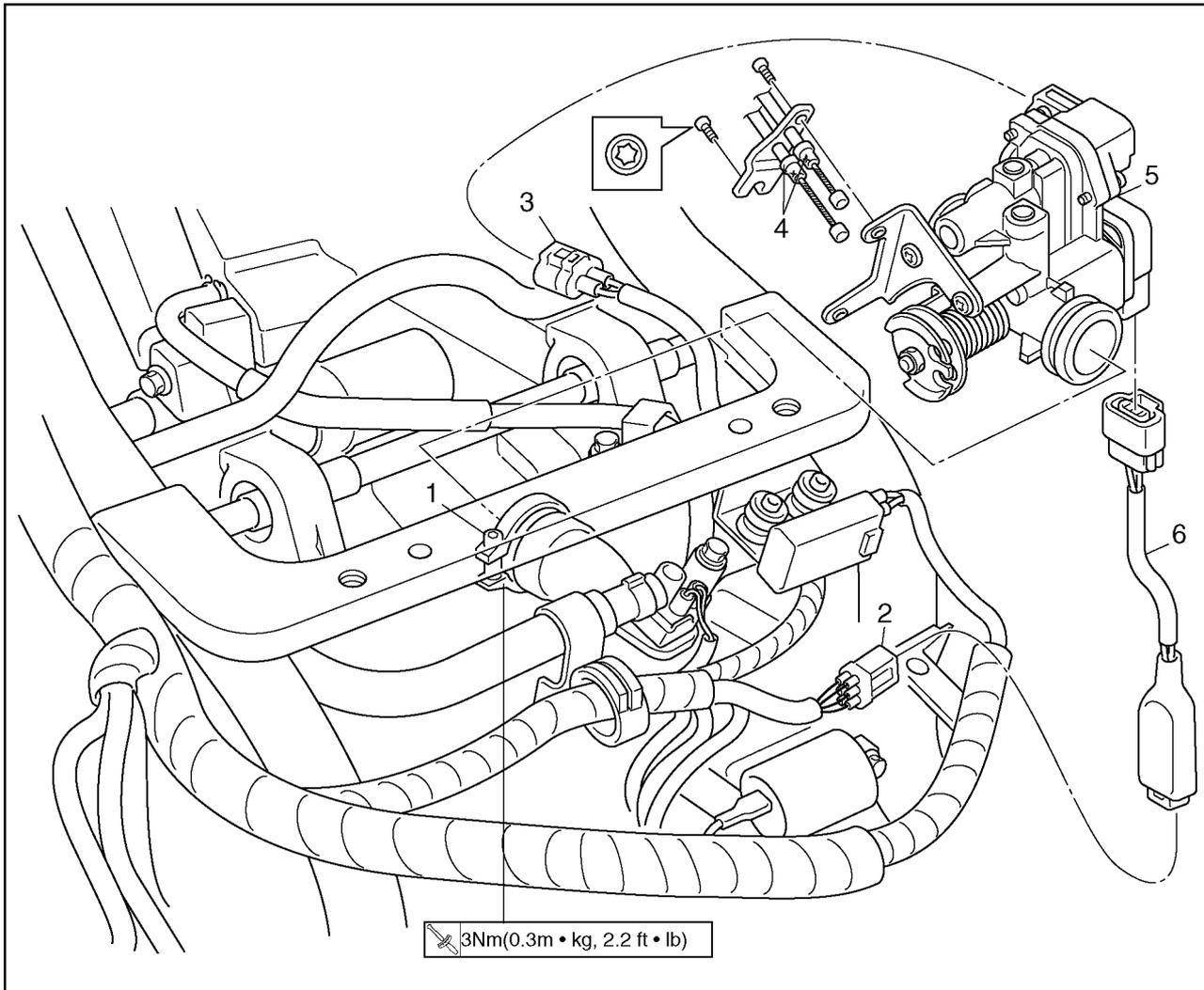
FI



EAS00909

THROTTLE BODY AND FUEL INJECTOR

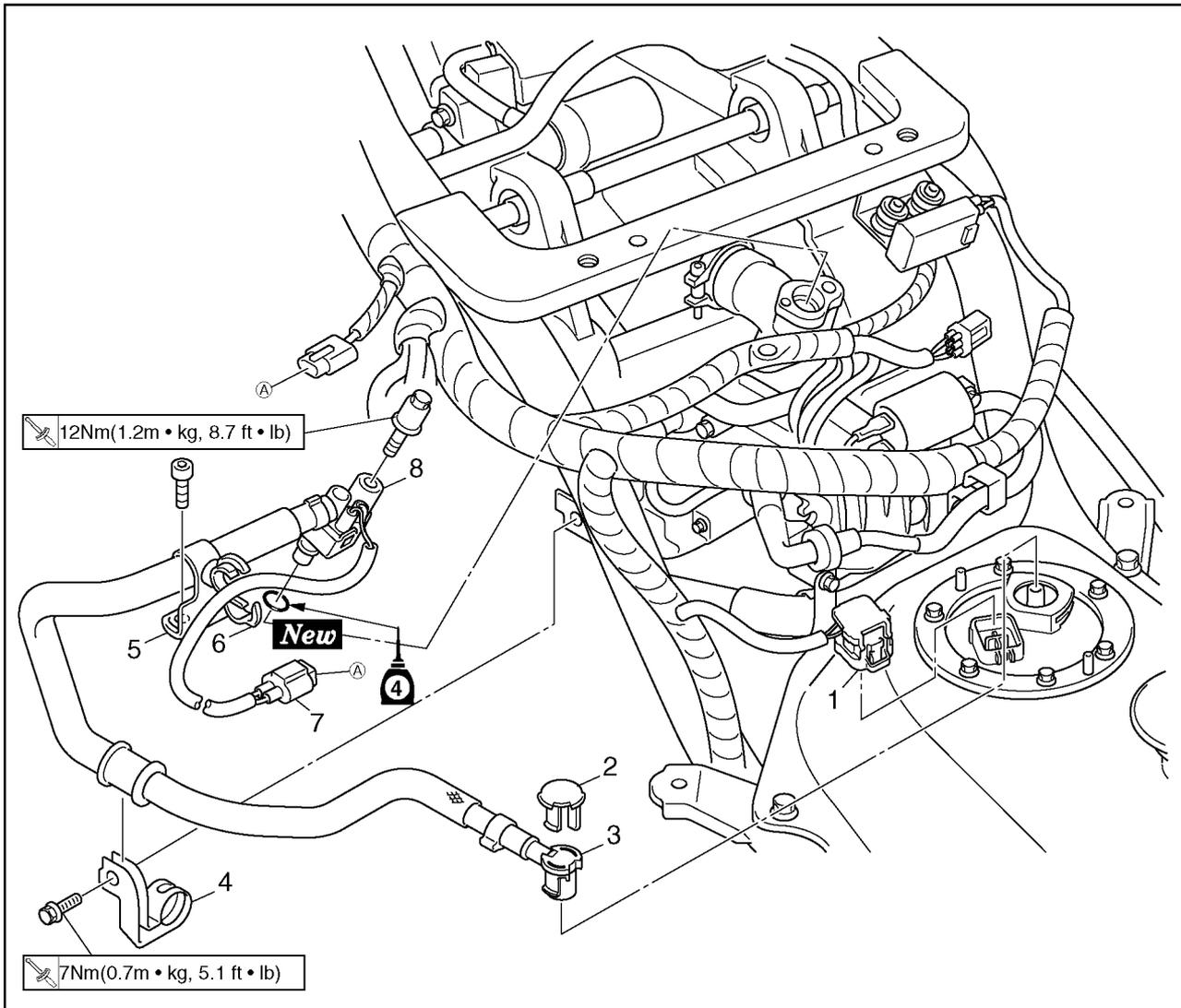
THROTTLE BODY



Order	Job/Part	Q'ty	Remarks
	Removing the throttle body		Remove the parts in the order listed.
	Side cover(left and right)		Refer to "COVER AND PANEL" in chapter 3.
	Single seat/Trunk		Refer to "ENGINE REMOVAL" in chapter 5.
	Air filter assembly		
1	Throttle body clamp screw	1	Loosen.
2	MAQS(modulated air quantity sensor) coupler	1	Disconnect.
3	ISC (idle speed control) valve coupler	1	Disconnect.
4	Throttle cable	2	Disconnect.
5	Throttle body	1	
6	Sub-wire harness	1	
			For installation, reverse the removal procedure.



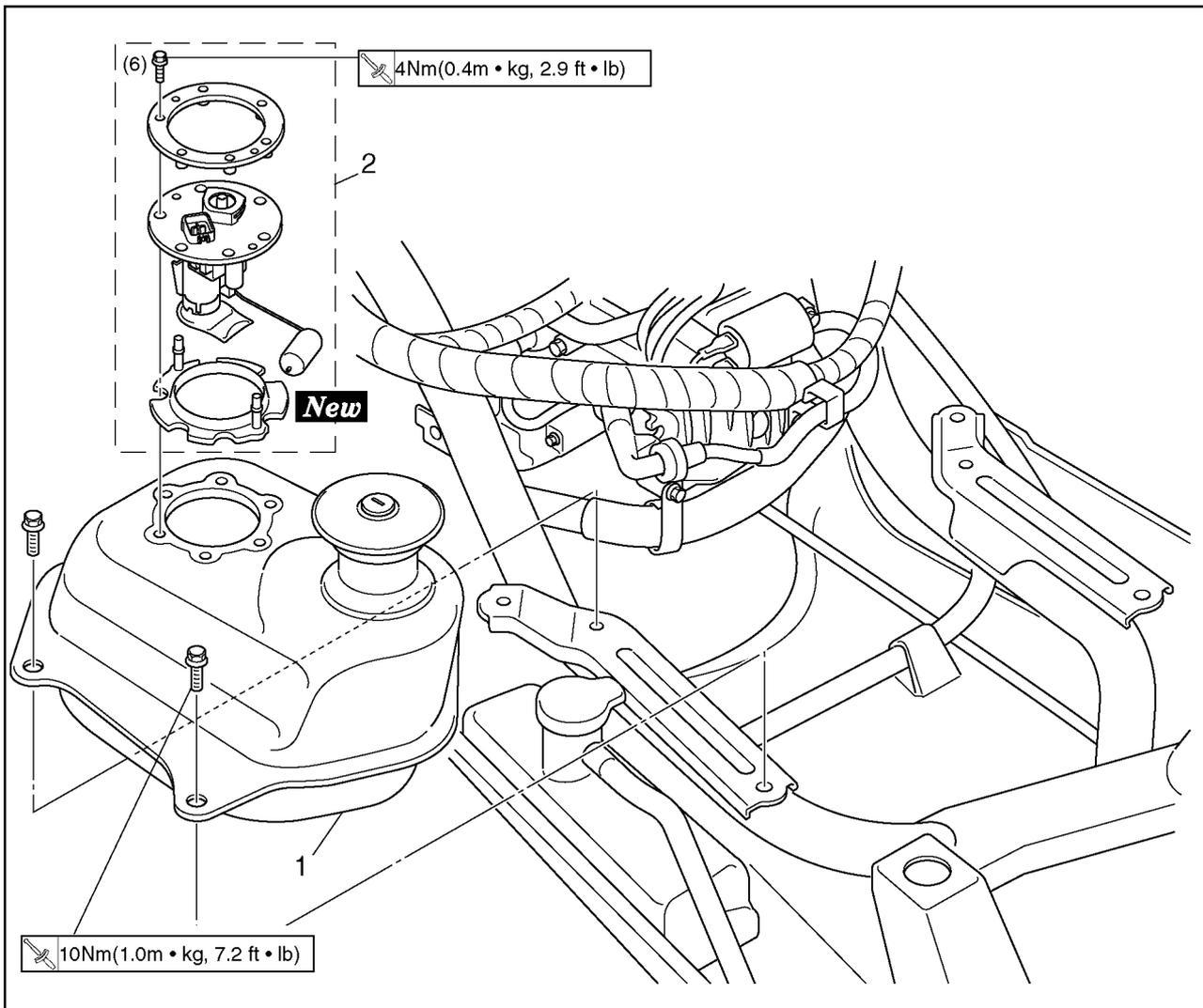
FUEL INJECTOR AND FUEL HOSE



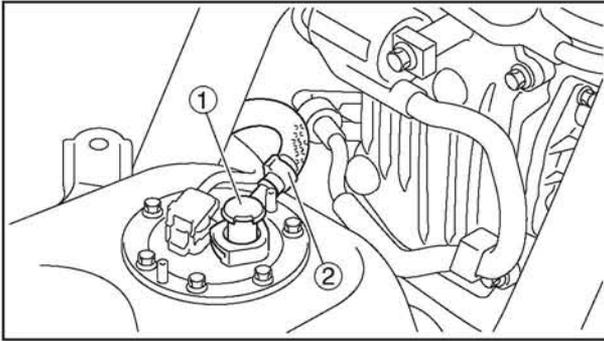
Order	Job/Part	Q'ty	Remarks
	Removing the fuel injector and fuel hose		Remove the parts in the order listed.
	Footrest board		Refer to "COVER AND PANEL" in chapter 3.
1	Fuel pump coupler	1	Disconnect.
2	Fuel hose connector cover	1	
3	Fuel hose connector	1	
4	Fuel hose holder(to frame)	1	
5	Fuel hose holder(to intake manifold)	1	
6	Clamp	1	Open lock.
7	Fuel injector coupler	1	Disconnect.
8	Fuel injector	1	
			For installation, reverse the removal procedure.



FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		Remove the parts in the order listed. NOTE _____ Place the scooter on a suitable stand.
	Fuel hose		Refer to "FUEL INJECTOR AND FUEL HOSE".
1	Fuel tank	1	Refer to "REMOVING THE FUEL HOSE".
2	Fuel pump	1	Refer to "REMOVING THE FUEL PUMP" and "INSTALLING THE FUEL PUMP". For installation, reverse the removal procedure.



REMOVING THE FUEL HOSE

1. Extract the fuel in the fuel tank through the fuel tank filler hole with a pump.
2. Remove:
 - fuel hose connector cover ①
3. Disconnect:
 - fuel hose ②

CAUTION:

- Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.
- Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.
- Do not disconnect the fuel hose from the fuel hose connector. Disconnect the connector from the fuel pump.

NOTE:

Before removing the hose, place a few rags in the area under where it will be removed.

3. Remove:
 - fuel tank

REMOVING THE FUEL PUMP

1. Disconnect:
 - fuel pump coupler
 - fuel hose
2. Remove:
 - fuel pump

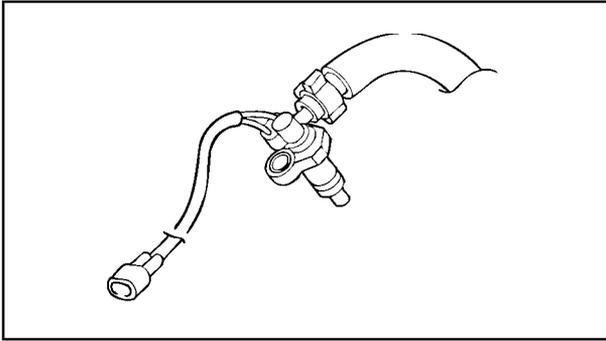
CAUTION:

- Do not drop the fuel pump or give it a strong shock.
- Do not touch the base section of the fuel sender.

EAS00911

CAUTION:

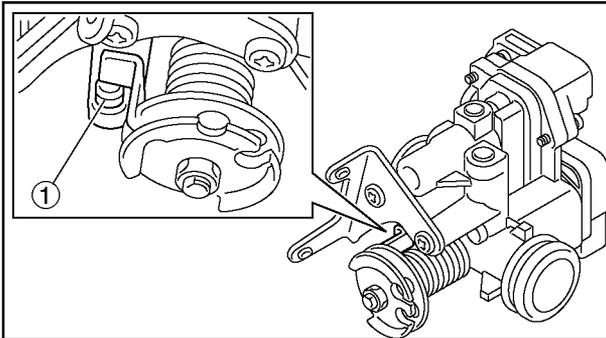
The fuel pump should not be disassembled.



EAS00912

CHECKING THE FUEL INJECTOR

1. Check:
 - fuel injector
Damage → Replace.



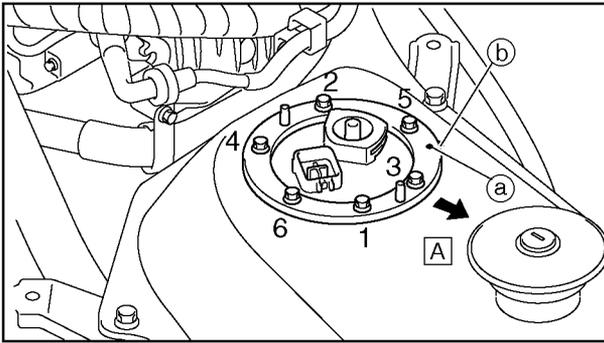
EAS00913

CHECKING THE THROTTLE BODY

1. Check:
 - throttle body
Cracks/damage → Replace the throttle body.
2. Check:
 - butterfly valve
Damage/scratches/wear → Replace.

CAUTION:

- Do not adjust the stop screw ①
- Do not clean the throttle body using carburetor cleaner or compressed air.
- When replace the throttle body, the main switch is operated three times turn ON and OFF position.
(ON position : 3 seconds more, OFF position : 3seconds more). And then, start the engine and keep idling at 10 minutes more.



INSTALLING THE FUEL PUMP

1. Install:

- fuel pump

4Nm(0.4m•kg, 2.9ft•lb)

NOTE:

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Align the projection (a) on the fuel pump with the alignment mark (b) on the fuel tank.
- Tighten the fuel pump bolts in the proper tightening sequence as shown and torque them in two stages.

A Forward

INSTALLING THE FUEL HOSE

1. Install:

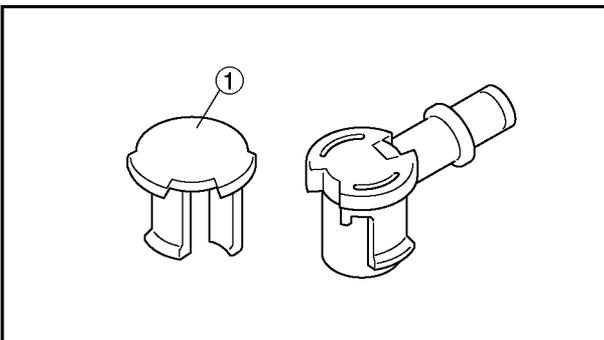
- fuel hose
- fuel hose connector cover

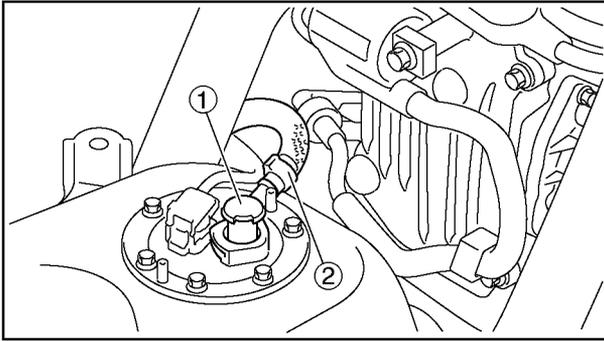
CAUTION:

Be sure to connect the fuel hose securely and install the fuel hose connector cover in the correct position, otherwise the fuel hose will not be properly installed.

NOTE:

- Install the fuel hose connector securely onto the fuel tank until a distinct “click” is heard, and then make sure that it does not come loose.
- After installing the fuel hose connector cover (1), make sure that it is installed securely.





EAS00915

CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OPERATION

1. Check:
 - pressure regulator operation



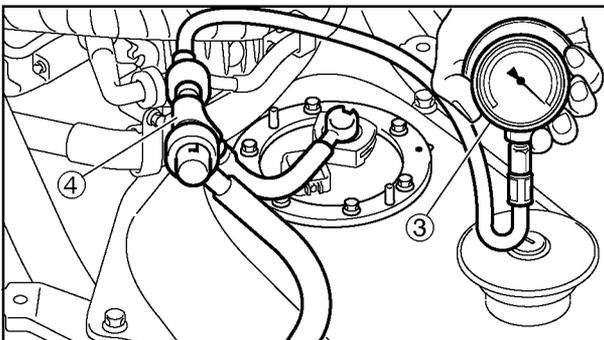
- a. Remove the footrest board.
Refer to "COVER AND PANEL" in chapter 3.
- b. Remove the fuel hose connector cover ① and disconnect the fuel hose ② from the fuel pump.

CAUTION:

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

NOTE:

Before removing the hose, place a few rags in the area under where it will be removed.



- c. Connect the pressure gauge ③ and adapter ④ onto the fuel hose.



Pressure gauge
90890-03153
YU-03153
Adapter
90890-03181

- d. Start the engine.
- e. Measure the fuel pressure.



Fuel pressure
246 ~ 254 kPa
(2.46 ~ 2.54 kg/cm², 35.0 ~ 36.1 psi)

Faulty → Replace the fuel pump.



EAS00916

CHECKING THE THROTTLE POSITION SENSOR

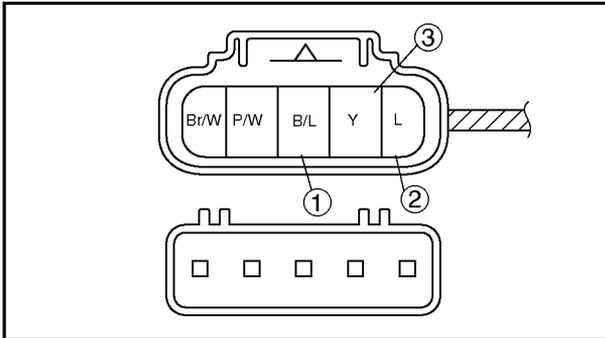
1. Check:
 - throttle position sensor



- a. Connect the digital circuit tester to the terminals of the throttle position sensor.

THROTTLE BODY AND FUEL INJECTOR

FI



Positive tester probe → blue terminal ①
Negative tester probe → black/blue terminal ②



Digital circuit tester
90890-03174

- b. Measure the throttle position sensor voltage.
Out of specification → Replace or repair the wire harness.



Throttle position sensor voltage
5V
(blue-black/blue)

- c. Connect the digital circuit tester to the terminals of the throttle position sensor.

Positive tester probed →
yellow terminal ③
Negative tester probe →
black/blue terminal ②

- d. While slowly opening the throttle, check that the throttle position sensor voltage is increased.
Voltage does not change or it changes abruptly → Replace the throttle body.
Out of specification (closed position) → Replace the throttle body.



Throttle position sensor voltage
(closed position)
0.63 ~ 0.73 V
(yellow-black/blue)





EAS00916

CHECKING THE ISC (IDLE SPEED CONTROL) VALVE

NOTE:

Do not remove the ISC (idle speed control) valve unit completely from the throttle body assembly.

1. Check:
 - ISC (idle speed control) valve



- a. Disconnect the ISC (idle speed control) valve coupler from the ISC (idle speed control) valve.
- b. Connect the digital circuit tester to the terminals of the ISC (idle speed control) valve.

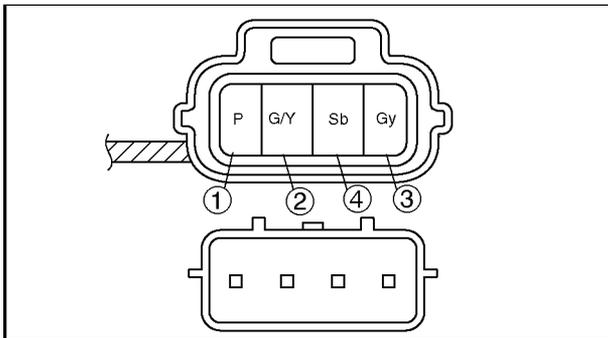
Positive tester probe → pink terminal ①
 Negative tester probe → green/yellow terminal ②

Positive tester probe → gray terminal ③
 Negative tester probe → sky blue terminal ④

 **Digital circuit tester**
 90890-03174

- c. Measure the ISC (idle speed control) valve resistance.
 Out of specification → Replace the throttle body.

 **ISC (idle speed control) valve resistance**
 18 ~ 22 Ω at 20°C(68°F)





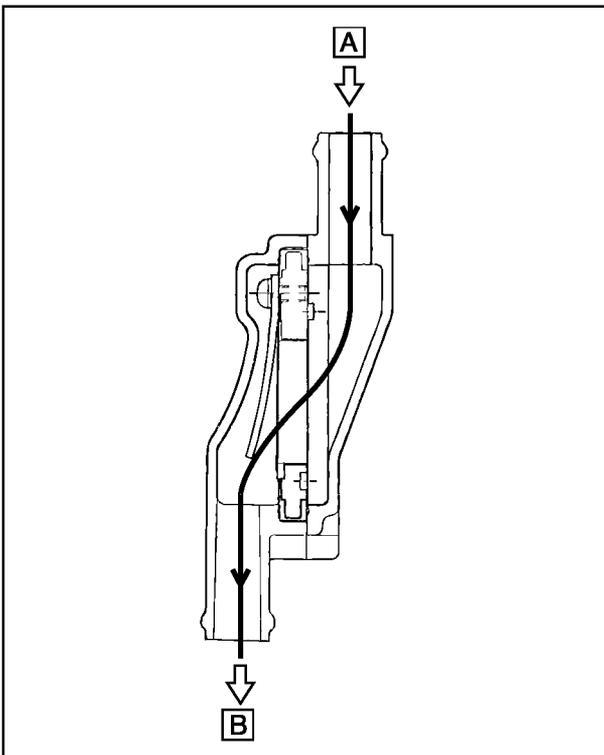
EAS00507

AIR INDUCTION SYSTEM

AIR INJECTION

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust pipe reducing the emission of hydrocarbons.

When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700 °C (1,112 to 1,292 °F)



EAS00917

AIR CUT-OFF VALVE

The air cut-off valve prevents air backflow from the exhaust pipe to the air filter.

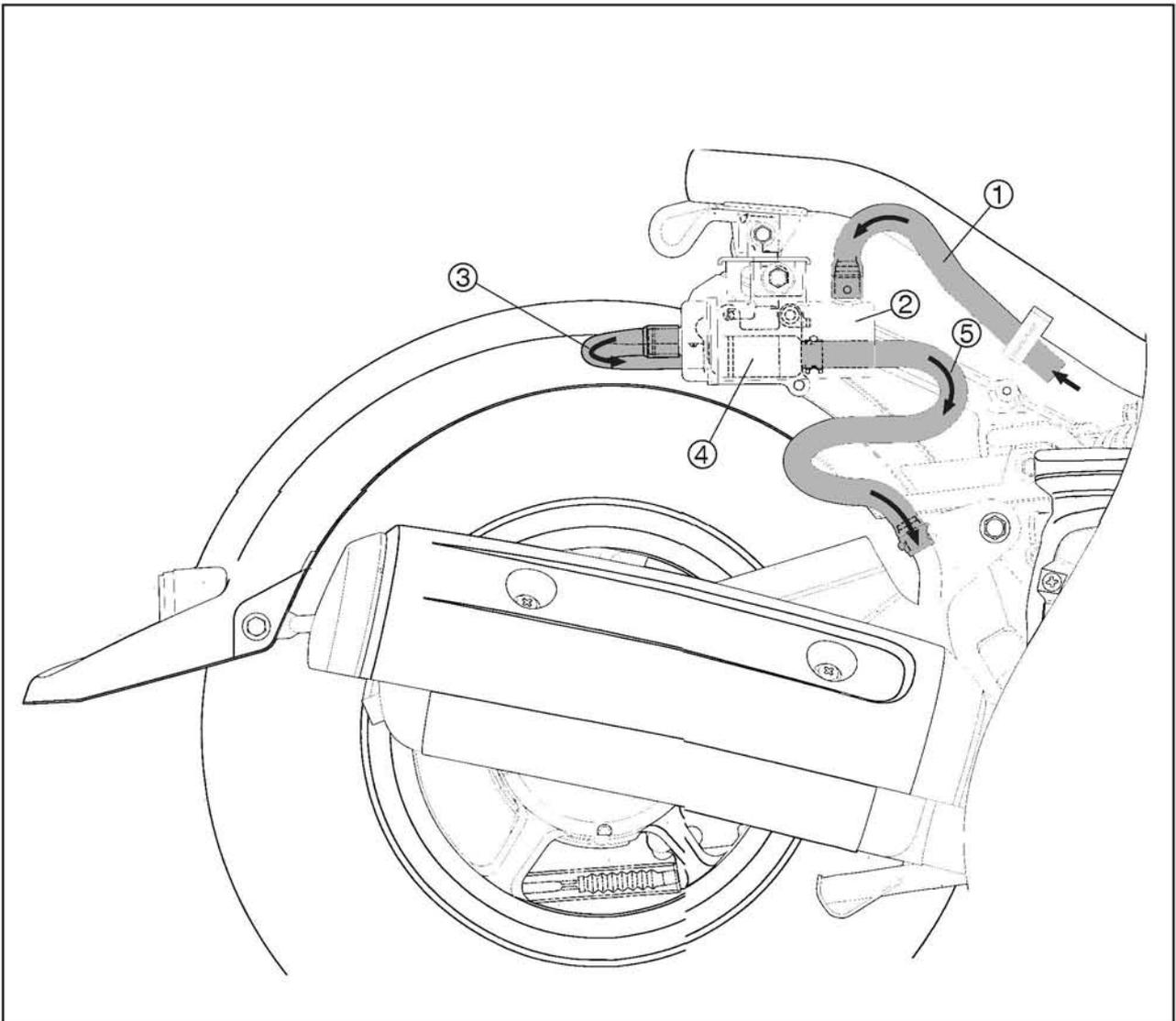
- A** From the air filter
- B** To the exhaust pipe assembly



EAS00509

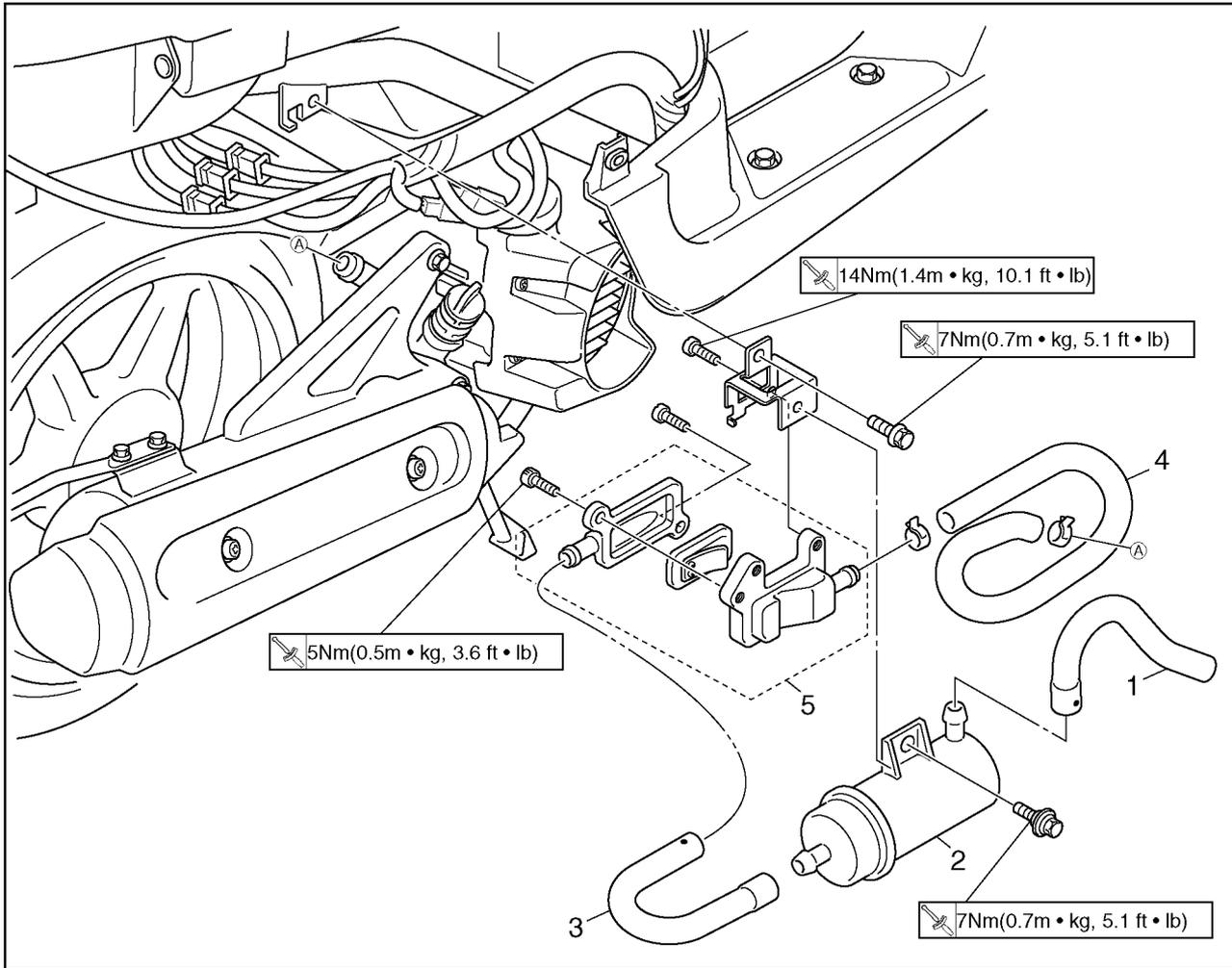
AIR INDUCTION SYSTEM DIAGRAMS

- ① Air induction system hose
- ② Air filter case
- ③ Air induction system hose (air filter case to air cut-off valve)
- ④ Air cut-off valve
- ⑤ Air induction system hose (air cut-off valve to exhaust pipe)





AIR CUT-OFF VALVE AND AIR FILTER CASE



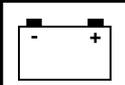
Order	Job/Part	Q'ty	Remarks
	Removing the air cut-off valve and air filter case		Remove the parts in the order listed.
	Front cover		Refer to "COVER AND PANEL" in chapter 3.
	Side cover(right)		
1	Hose(to air filter case)	1	
2	Air filter case	1	
3	Hose(air cut-off valve to air filter case)	1	
4	Hose(air cut-off valve assembly to exhaust pipe)	1	
5	Air cut-off valve	1	For installation, reverse the removal procedure.



EAS00918

CHECKING THE AIR INDUCTION SYSTEM

1. Check:
 - hoses
 - Loose connection → Connect properly.
 - Cracks/damage → Replace.
2. Check:
 - reed valve
 - reed valve stopper
 - reed valve seat
 - Cracks/damage → Replace the reed valve.
3. Check:
 - air cut-off valve
 - Cracks/damage → Replace.



CHAPTER 8 ELECTORICAL

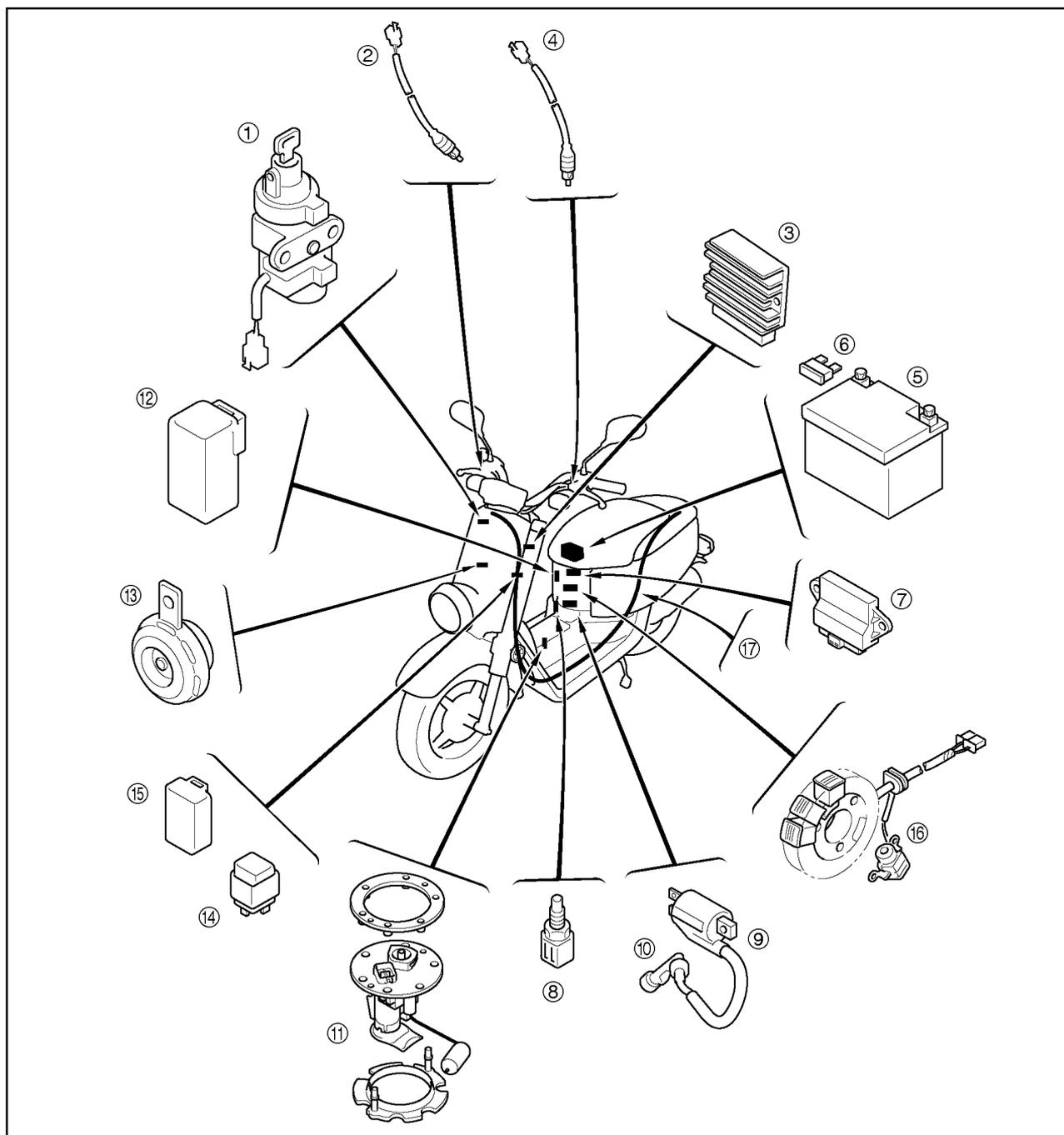
ELECTRICAL COMPONENTS	8-1
WIRING DIAGRAM	8-2
CHECKING SWITCH CONTINUITY	8-4
CHECKING THE SWITCHES	8-5
CHECKING THE BULBS AND BULB SOCKETS	8-6
TYPES OF BULBS	8-6
CHECKING THE CONDITION OF THE BULBS	8-7
CHECKING THE CONDITION OF THE BULB SOCKETS	8-8
IGNITION SYSTEM	8-9
CIRCUIT DIAGRAM	8-9
TROUBLESHOOTING	8-10
ELECTRIC STARTING SYSTEM	8-14
CIRCUIT DIAGRAM	8-14
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION	8-15
TROUBLESHOOTING	8-16
STARTER MOTOR	8-20
CHECKING THE STARTER MOTOR	8-21
ASSEMBLING THE STARTER MOTOR	8-23
CHARGING SYSTEM	8-24
CIRCUIT DIAGRAM	8-24
TROUBLESHOOTING	8-25
LIGHTING SYSTEM	8-27
CIRCUIT DIAGRAM	8-27
TROUBLESHOOTING	8-28
CHECKING THE LIGHTING SYSTEM	8-30
SIGNALING SYSTEM	8-34
CIRCUIT DIAGRAM	8-34
TROUBLESHOOTING	8-35
CHECKING THE SIGNALING SYSTEM	8-36
COOLING SYSTEM	8-42
TROUBLESHOOTING	8-43
CHECKING THE COOLING SYSTEM	8-45

EAS00729

ELECTRICAL

ELECTRICAL COMPONENTS

- | | |
|------------------------------|----------------------------------|
| ① Main switch | ⑩ Spark plug cap |
| ② Front brake light switch | ⑪ Fuel pump |
| ③ Rectifier/regulator | ⑫ Starter relay |
| ④ Rear brake light switch | ⑬ Horn |
| ⑤ Battery | ⑭ Turn signal relay |
| ⑥ Main fuse | ⑮ Starting circuit cut-off relay |
| ⑦ ECU | ⑯ Stator coil |
| ⑧ Coolant temperature sensor | ⑰ Wire harness |
| ⑨ Ignition coil | |

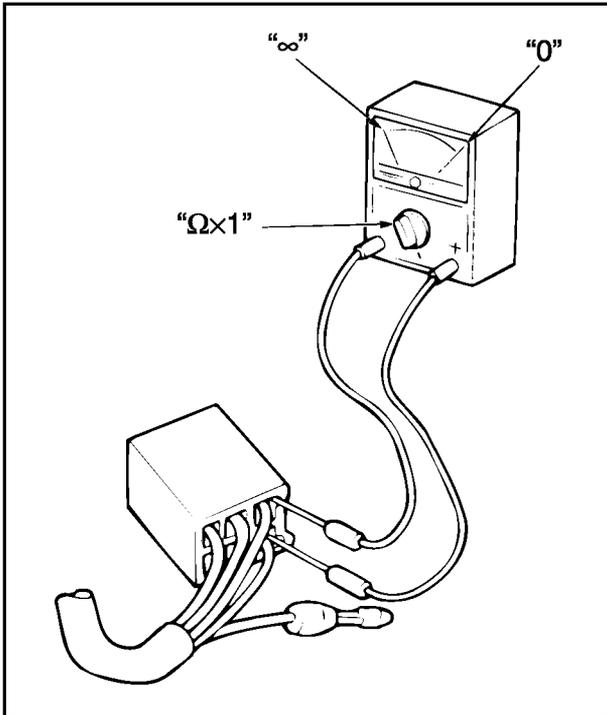
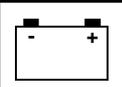




- ① AC magneto
- ② Rectifier/regulator
- ③ Main fuse
- ④ Battery
- ⑤ Starter relay
- ⑥ Starter motor
- ⑦ Start switch
- ⑧ Engine stop switch
- ⑨ ECU
- ⑩ Main switch
- ⑪ Intake air pressure sensor
- ⑫ Intake air temperature sensor
- ⑬ Throttle position sensor
- ⑭ Lean angle cut-off switch
- ⑮ Coolant temperature sensor
- ⑯ Ignition coil
- ⑰ Spark plug
- ⑱ Fuel injector
- ⑲ Fuel pump
- ⑳ ISC(idle speed control) valve
- ㉑ Horn switch
- ㉒ Dimmer switch
- ㉓ Turn signal switch
- ㉔ Headlight
- ㉕ Tail/brake light
- ㉖ Front brake light switch
- ㉗ Rear brake light switch
- ㉘ Horn
- ㉙ Turn signal relay
- ㉚ Front turn signal light(left)
- ㉛ Front turn signal light(right)
- ㉜ Fuel level meter
- ㉝ High beam indicator light
- ㉞ Speedometer light
- ㉟ Engine trouble warning light
- ㊱ Coolant temperature indicator light
- ㊲ Speed sensor
- ㊳ Turn signal indicator light
- ㊴ FI diagnostic tool(optional)
- ㊵ Sidestand switch (optional)
- ㊶ Rear turn signal light(left)
- ㊷ Rear turn signal light(right)
- ㊸ License plate light
- ㊹ Starting circuit cut-off relay
- ㊺ Connector

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
Or	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/L	Black/Blue
B/G	Black/Green
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
G/R	Green/Red
G/Y	Green/Yellow
G/W	Green/White
L/B	Blue/Black
L/G	Blue/Green
L/W	Blue/White
L/Y	Blue/Yellow
Or/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/L	Red/Blue
R/W	Red/White
W/L	White/Blue
W/R	White/Red
Y/G	Yellow/Green
Br/W	Brown/White
Br/L	Brown/Blue



EAS00730

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

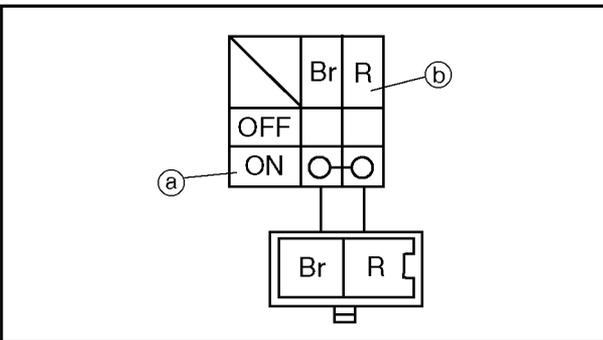
Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester
90890-03132 (YU-03112-C)

NOTE:

- Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.
- When checking for continuity, switch back and forth between the switch positions a few times.



The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.

The switch positions (a) are shown in the far left column and the switch lead colors (b) are shown in the top row in the switch illustration.

NOTE:

“○-○” indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:

There is continuity between black and black/white when the switch is set to “OFF”.
There is continuity between red and brown when the switch is set to “ON”.

EAS00731

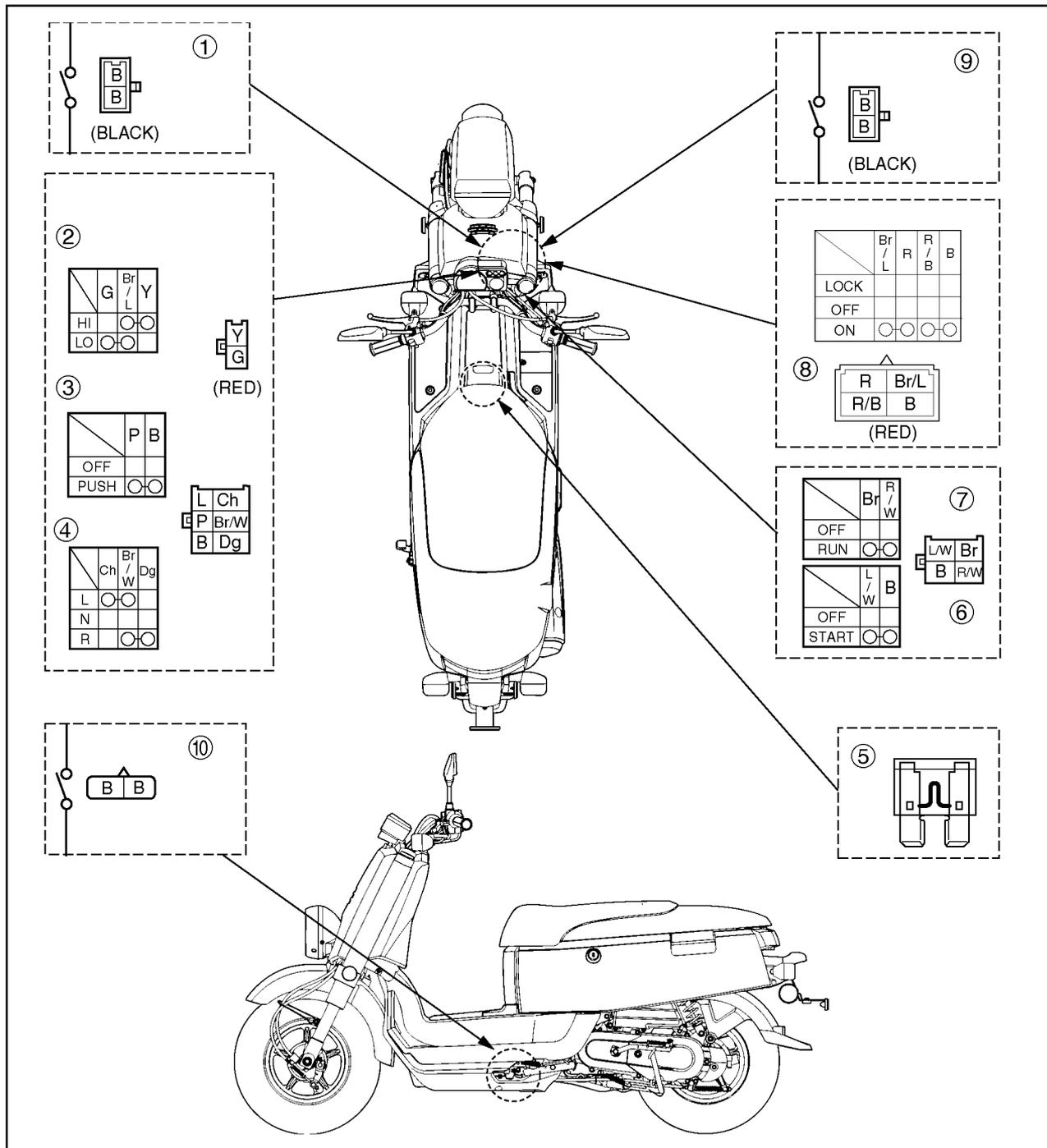
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to "CHECKING SWITCH CONTINUITY".

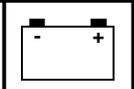
Damage/wear → Repair or replace.

Improperly connected → Properly connect.

Incorrect continuity reading → Replace the switch.



- | | | |
|---------------------------|----------------------|-------------------------------|
| ① Rear brake light switch | ⑤ Main fuse | ⑨ Front brake light switch |
| ② Dimmer switch | ⑥ Start switch | ⑩ Sidestand switch (optional) |
| ③ Horn switch | ⑦ Engine stop switch | |
| ④ Turn signal switch | ⑧ Main switch | |



EAS00733

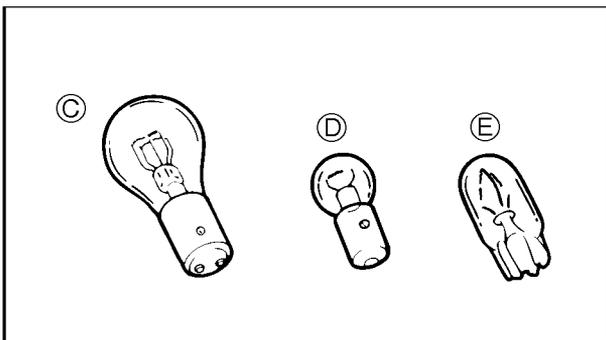
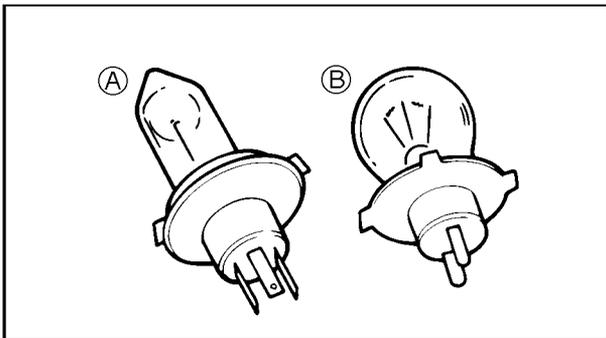
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

Improperly connected → Properly connect.

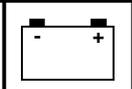
No continuity → Repair or replace the bulb, bulb socket or both.



TYPES OF BULBS

The bulbs used on this scooter are shown in the illustration on the left.

- Bulbs (A) and (B) are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulbs (C) is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs (D) and (E) are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.



CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

1. Check:
 - bulb socket (for continuity)
(with the pocket tester)
No continuity → Replace.



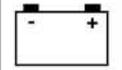
Pocket tester
90890-03112 (YU-03112-C)

NOTE: _____
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.



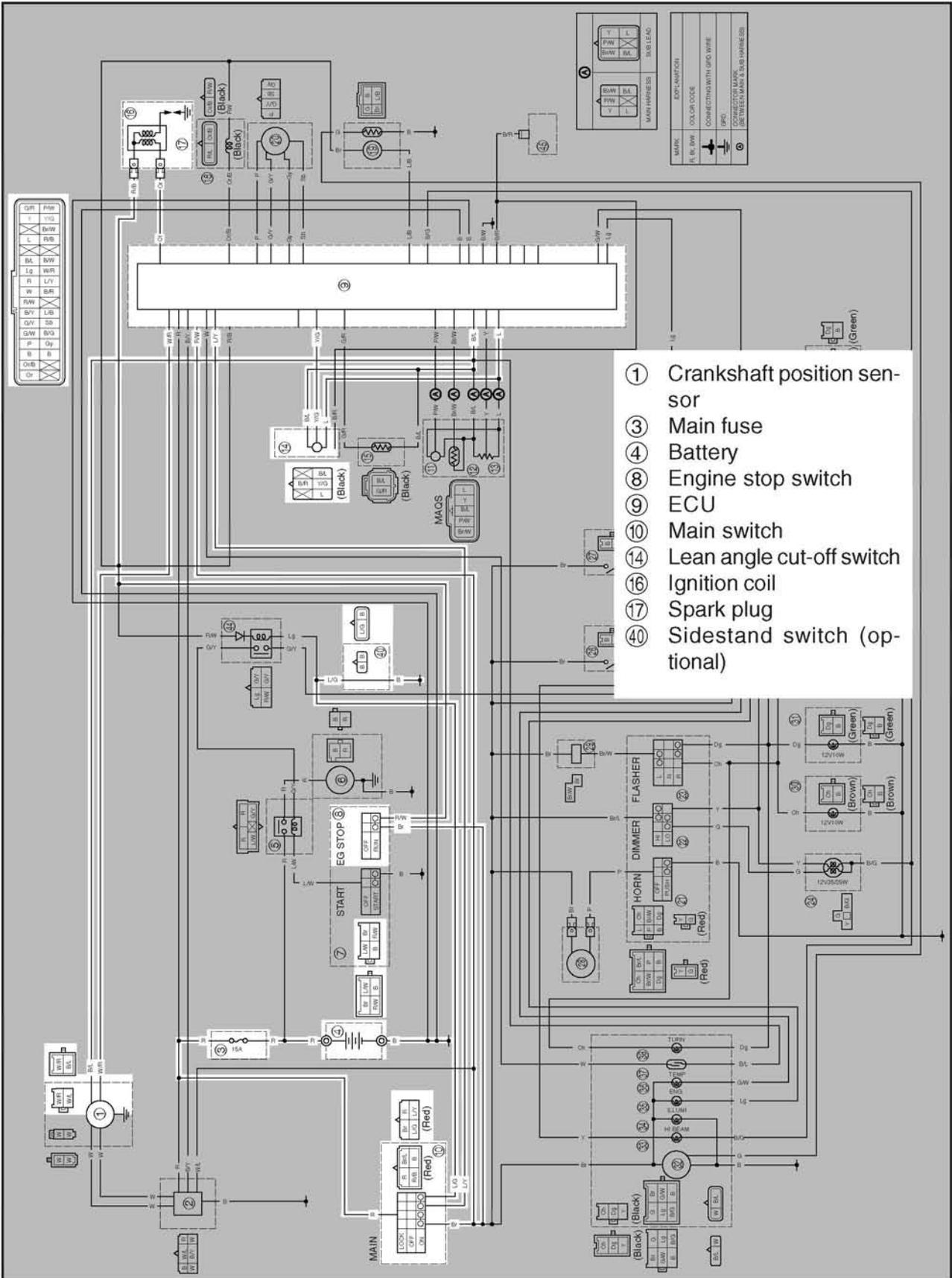
- a. Install a good bulb into the bulb socket.
- b. Connect the pocket tester probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

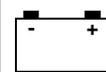




EAS00734

**IGNITION SYSTEM
CIRCUIT DIAGRAM**





EAS00736

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:

1. main fuse
2. battery
3. spark plug
4. ignition spark gap
5. spark plug cap resistance
6. ignition coil resistance
7. crankshaft position sensor resistance
8. main switch
9. engine stop switch
10. sidestand switch(optional)
11. lean angle cut-off switch
12. wiring connections (of the entire ignition system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. Battery cover
 2. Front cover
 3. Side cover (right)
- Troubleshoot with the following special tool(s).



Ignition checker
90890-06754
YM-34487
Pocket tester
90890-03112
YU-03112-C

EAS00738

1. Main Fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



YES



NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?



YES



NO

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

EAS00740

3. Spark plug

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap. Refer to "CHECKING THE SPARK PLUG" in chapter 3.



Standard spark plug
CR7E (NGK)
Spark plug gap
0.7 ~ 0.8 mm(0.028 ~ 0.031 in)

- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?



YES



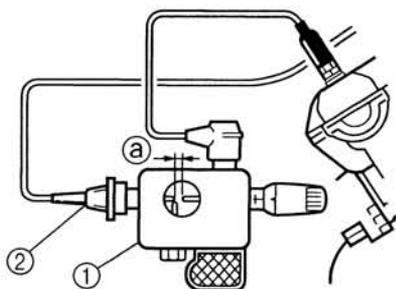
NO

Re-gap or replace the spark plug.

EAS00742

4. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
- ② Spark plug cap
- Set the main switch to "ON".
- Measure the ignition spark gap ③.
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.



Minimum ignition spark gap
6 mm (0.24 in)

- Is there a spark and is the spark gap within specification?



NO



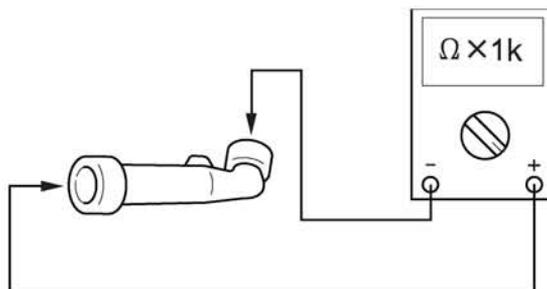
YES

The ignition system is OK.

EAS00744

5. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ($\Omega \times 1k$ range) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
4~6 k Ω at 20°C (68°F)

- Is the spark plug cap OK?



YES



NO

Replace the spark plug cap.

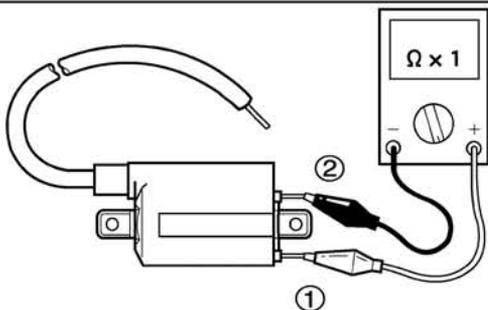
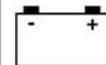
EAS00746

6. Ignition coil resistance

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.

Positive tester probe → orange ①

Negative tester probe → red/black ②



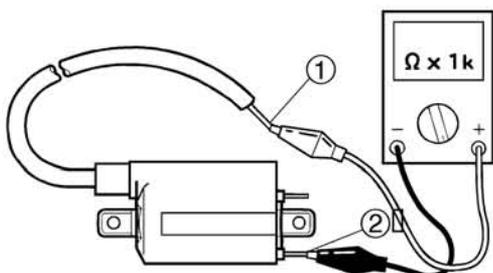
- Measure the primary coil resistance.



Primary coil resistance
2.16 ~ 2.64 Ω at 20°C(68°F)

- Connect the pocket tester (Ω ×1k) to the ignition coil as shown.

Negative tester probe g orange ②
Positive tester probe g spark plug lead ①



- Measure the secondary coil resistance.



Secondary coil resistance
8.64 ~ 12.96 kΩ at 20°C(68°F)

- Is the ignition coil OK?



YES



NO

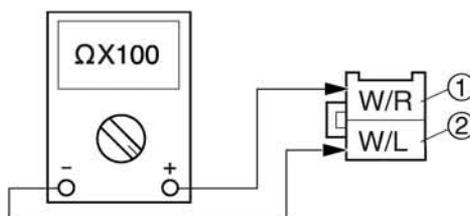
Replace the ignition coil.

EAS00748

7. Crankshaft position sensor resistance

- Disconnect the crankshaft position sensor coupler from the wire harness.
- Connect the pocket tester (Ω ×100) to the crankshaft position sensor coupler as shown.

Positive tester probe g white/red ①
Negative tester probe g white/blue ②



- Measure the crankshaft position sensor resistance.



Crankshaft position sensor resistance
248 ~ 372Ω at 20°C(68°F)
(between white/red and white/blue)

- Is the crankshaft position sensor OK?



YES



NO

Replace the crankshaft position sensor/stator assembly.

EAS00749

8. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?



YES



NO

Replace the main switch.

EAS00750

9. Engine stop switch

- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?



YES



NO

Replace the right handlebar switch.

EAS00752

10. Sidestand switch(optional)

- Check the sidestand switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?



YES



NO

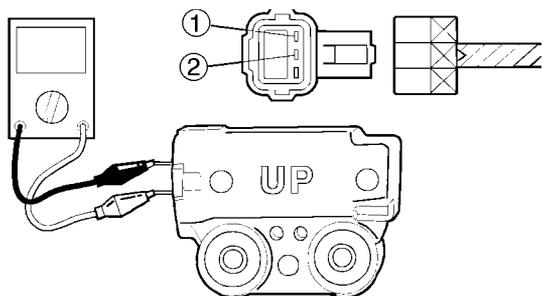
Replace the sidestand switch.

11. Lean angle cut-off switch

- Remove the lean angle cut-off switch.
- Connect the pocket tester($\Omega \times 1$) to the lean angle cut-off switch terminals as shown.

Positive tester probe → blue ①

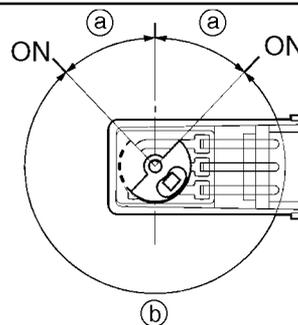
Negative tester probe → yellow/green②



Lean angle cut-off switch voltage

Less than 65° **Ⓐ** → 0.4~1.4V

More than 65° **Ⓑ** → 3.7~4.4V



- Is the lean angle cut-off switch OK?



YES



NO

Replace the lean angle cut-off switch.

EAS00754

12. Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?



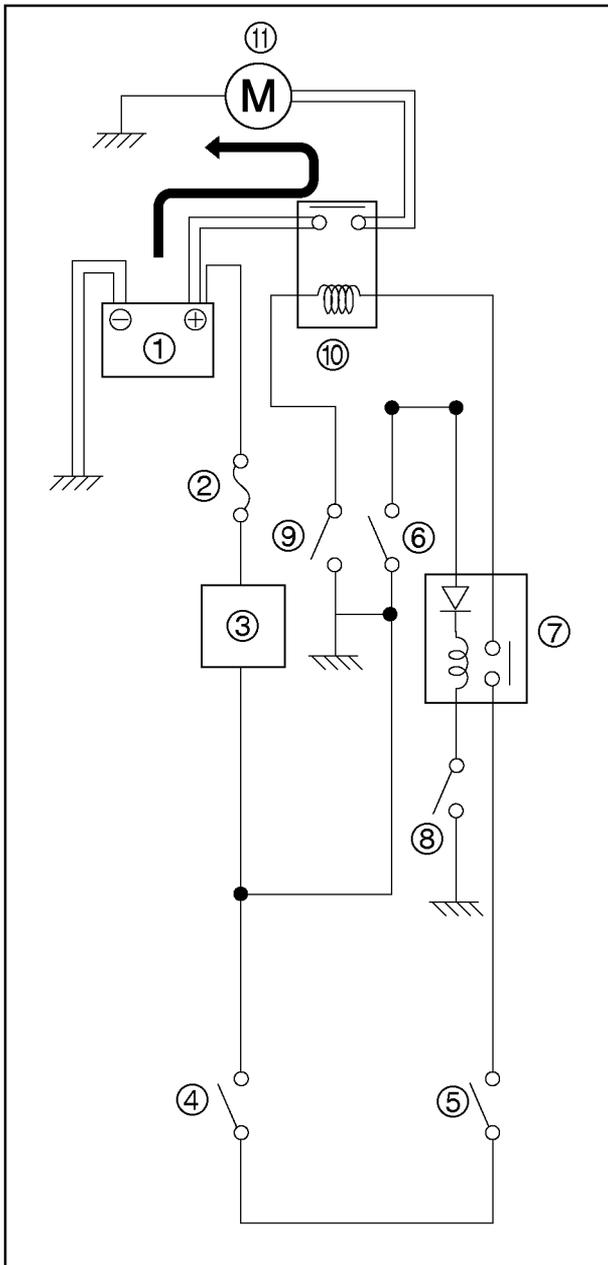
YES



NO

Replace the ECU.

Properly connect or repair the ignition system's wiring.



EAS00756

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to “O” and the main switch is set to “ON” (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The brake lever(front or rear) is pulled to the handlebar(the brake light switch is closed) and the sidestand(optional) is up(the sidestand switch(optional) is closed).

- ① Battery
- ② Main fuse
- ③ Main switch
- ④ Front brake light switch
- ⑤ Rear brake light switch
- ⑥ Engine stop switch
- ⑦ Starting circuit cut-off relay
- ⑧ Sidestand switch(optional)
- ⑨ Start switch
- ⑩ Starter relay
- ⑪ Starter motor



EAS00757

TROUBLESHOOTING

The starter motor fails to turn.

Check:

1. main fuse
2. battery
3. starter motor
4. starting circuit cut-off relay
5. starter relay
6. main switch
7. brake light switch(front and rear)
8. engine stop switch
9. sidestand switch(optional)
- 10.start switch
- 11.wiring connections
(of the entire starting system)

NOTE: _____

- Before troubleshooting, remove the following part(s):
 1. battery cover/front cover
 2. side cover(left and right)
 3. front fork upper cover
 4. front fork cover(left and right)
 5. leg shield1
 6. air filter assembly
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112 (YU-03112-C)

EAS00738

1. Main Fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



YES



NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?



YES



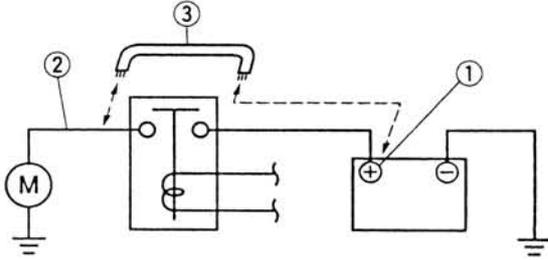
NO

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

EAS00758

3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



⚠ WARNING

- A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.

- Does the starter motor turn?

↓ YES

↓ NO

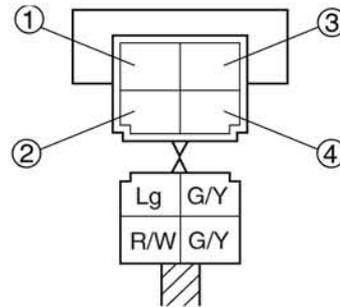
Repair or replace the starter motor.

EAS00759

4. Starting circuit cut-off relay

- Remove the starting circuit cut-off relay.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starting circuit cut-off relay coupler as shown.

Positive battery terminal → red/white ①
 Negative battery terminal → light green ②
 Positive tester probe → green/yellow ③
 Negative tester probe → green/yellow ④



- Does the starting circuit cut-off relay have continuity between green/yellow and green/yellow?

↓ YES

↓ NO

Replace the starting circuit cut-off relay

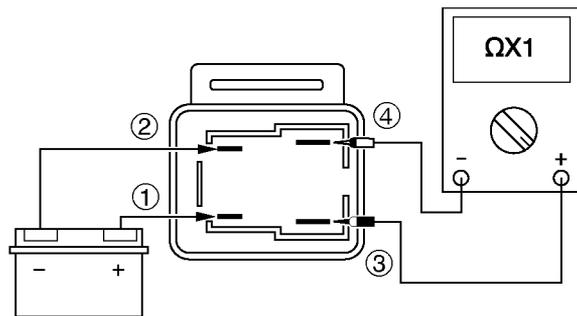


EAS00761

5. Starter relay

- Remove the starter relay .
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starter relay coupler as shown.

Positive battery terminal → green/yellow ①
 Negative battery terminal → blue/white ②
 Positive tester probe → red ③
 Negative tester probe → red ④



- Does the starter relay have continuity between red ③ and red ④?

↓ YES

↓ NO

Replace the starter relay.

EAS00749

6. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.

EAS00751

7. Brake light switch(front and rear)

- Check the brake light switches for continuity. Refer to "CHECKING THE SWITCHES".
- Is each brake light switch OK?

↓ YES

↓ NO

Replace the brake light switch(es).

EAS00750

8. Engine stop switch

- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

↓ YES

↓ NO

Replace the right handlebar switch.

EAS00752

9. Sidestand switch(optional)

- Check the sidestand switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?

↓ YES

↓ NO

Replace the sidestand switch.

EAS00764

10. Start switch

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?

↓ YES

↓ NO

Replace the right handlebar switch.



EAS00766

11. Wiring

- Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the starting system's wiring properly connected and without defects?



YES



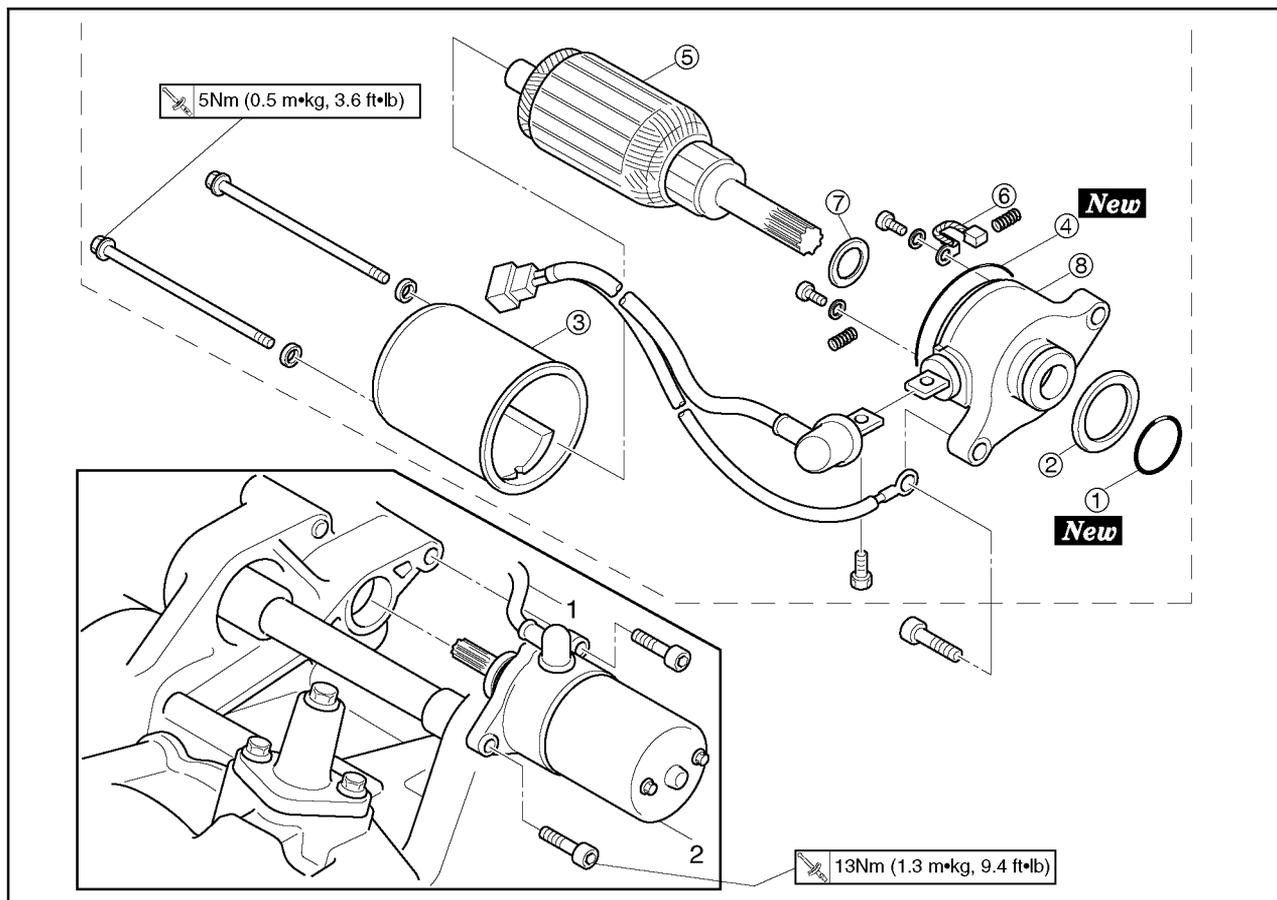
NO

The starting system circuit is OK.

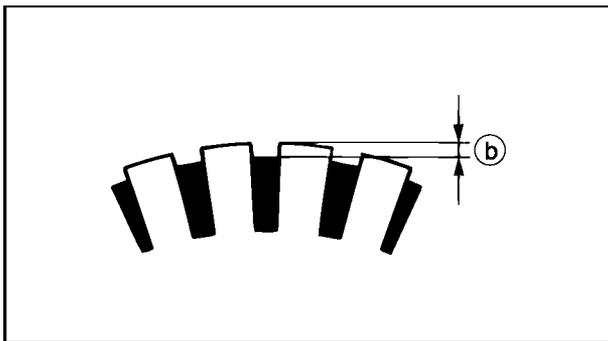
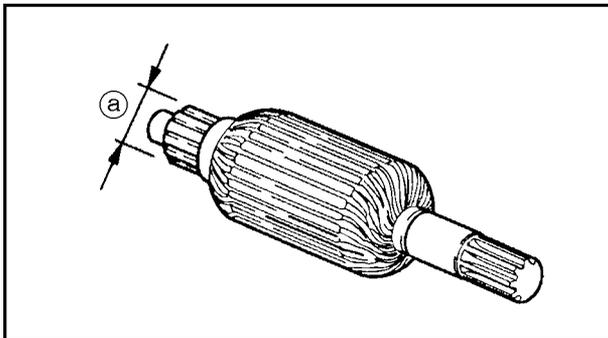
Properly connect or repair the starting system's wiring.

EAS00767

STARTER MOTOR



Order	Job/Part	Q'ty	Remarks
1	Removing the starter motor Front cover Single seat/Trunk Air filter assembly		Remove the parts in the order listed. Refer to "COVER AND PANEL" in chapter 3. Refer to "ENGINE REMOVAL" in chapter 5.
2	Starter motor lead coupler	1	Disconnect.
	Starter motor	1	For installation, reverse the removal procedure.
①	Disassembling the starter motor O-ring	1	Disassemble the parts in the order listed.
②	Gasket	1	
③	Stator assembly	1	Refer to "ASSEMBLING THE STARTER MOTOR".
④	O-ring	1	
⑤	Armature coil	1	
⑥	Brush	2	
⑦	Plate washer	1	
⑧	Bracket	1	
			For assembly, reverse the disassembly procedure.



EAS00769

CHECKING THE STARTER MOTOR

1. Check:
 - commutator
Dirt → Clean with 600-grit sandpaper.
2. Measure:
 - commutator diameter (a)
Out of specification → Replace the starter motor.



Commutator wear limit
16.6 mm (0.65 in)

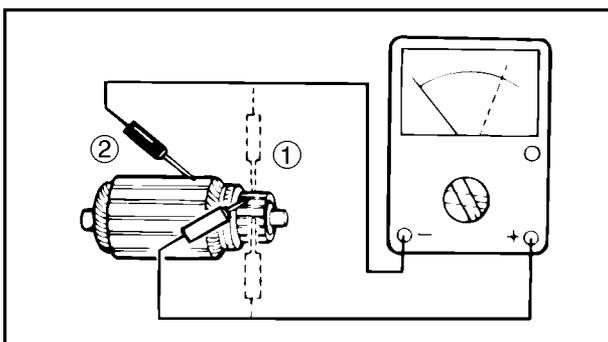
3. Measure:
 - mica undercut (b)
Out of specification → Scrape the mica to the proper measurement with a hack-saw blade that has been grounded to fit the commutator.



Mica undercut
1.35 mm (0.05 in)

NOTE:

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



4. Measure:
 - armature assembly resistances (commutator and insulation)
Out of specification → Replace the starter motor.



- a. Measure the armature assembly resistances with the pocket tester.

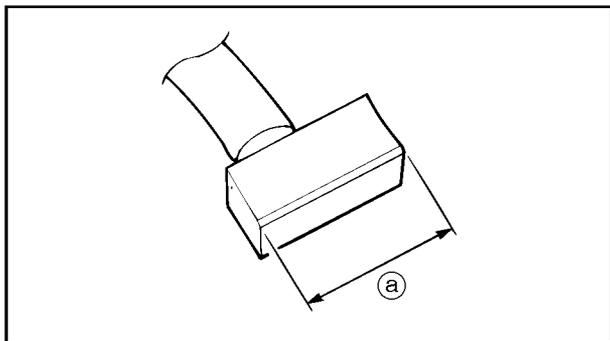


Pocket tester
90890-03112 (YU-03112-C)



Armature coil
Commutator resistance ①
0.0378 ~ 0.0462 Ω at 20°C (68°F)
Insulation resistance ②
Above 1 MΩ at 20°C(68°F)

- b. If any resistance is out of specification, replace the starter motor.

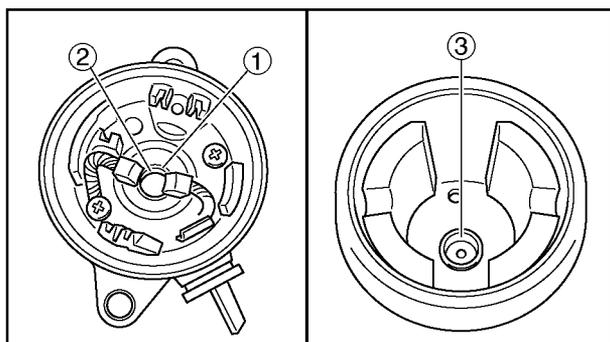


- 5. Measure:
 - brush length (a)
 - Out of specification → Replace the brushes as a set.

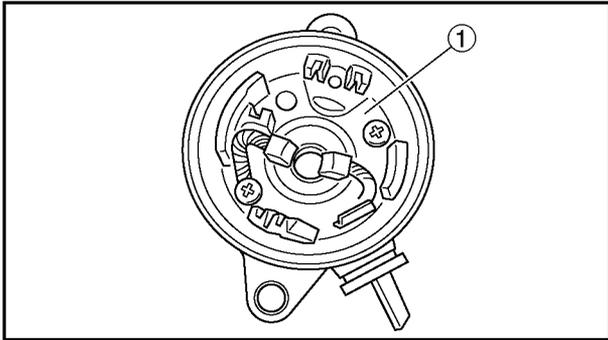
	Brush length wear limit 3.5 mm (0.14 in)
---	---

- 6. Measure:
 - brush spring force
 - Out of specification → Replace the brush springs as a set.

	Brush spring force 3.92 ~ 5.88N(400 ~ 600gf, 14.11 ~ 21.16oz)
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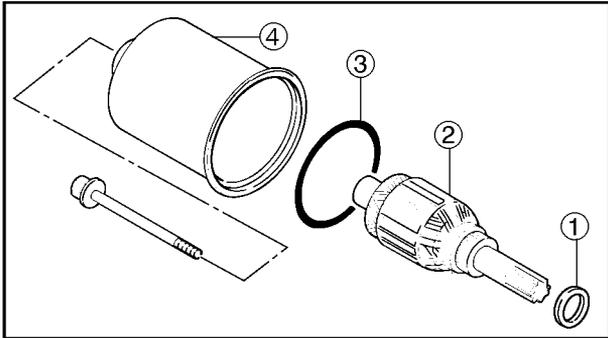
- 7. Check:
 - gear teeth
 - Damage/wear → Replace the gear.
- 8. Check:
 - bearing①
 - oil seal②
 - bush③
 - Damage/wear → Replace.



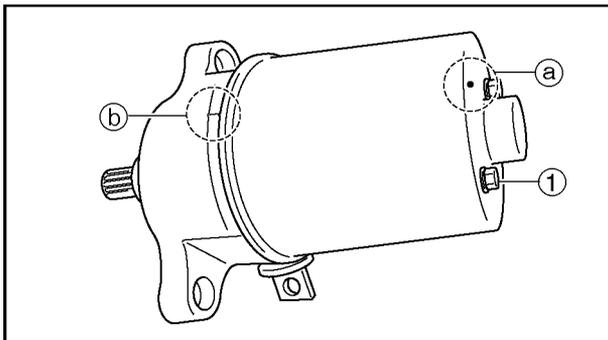
EAS00772

ASSEMBLING THE STARTER MOTOR

1. Install:
 - brush seat ①



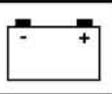
2. Install:
 - washer ①
 - armature coil ②
 - o-ring **New** ③
 - stator assembly ④



3. Install:
 - bracket
 - bolts ①

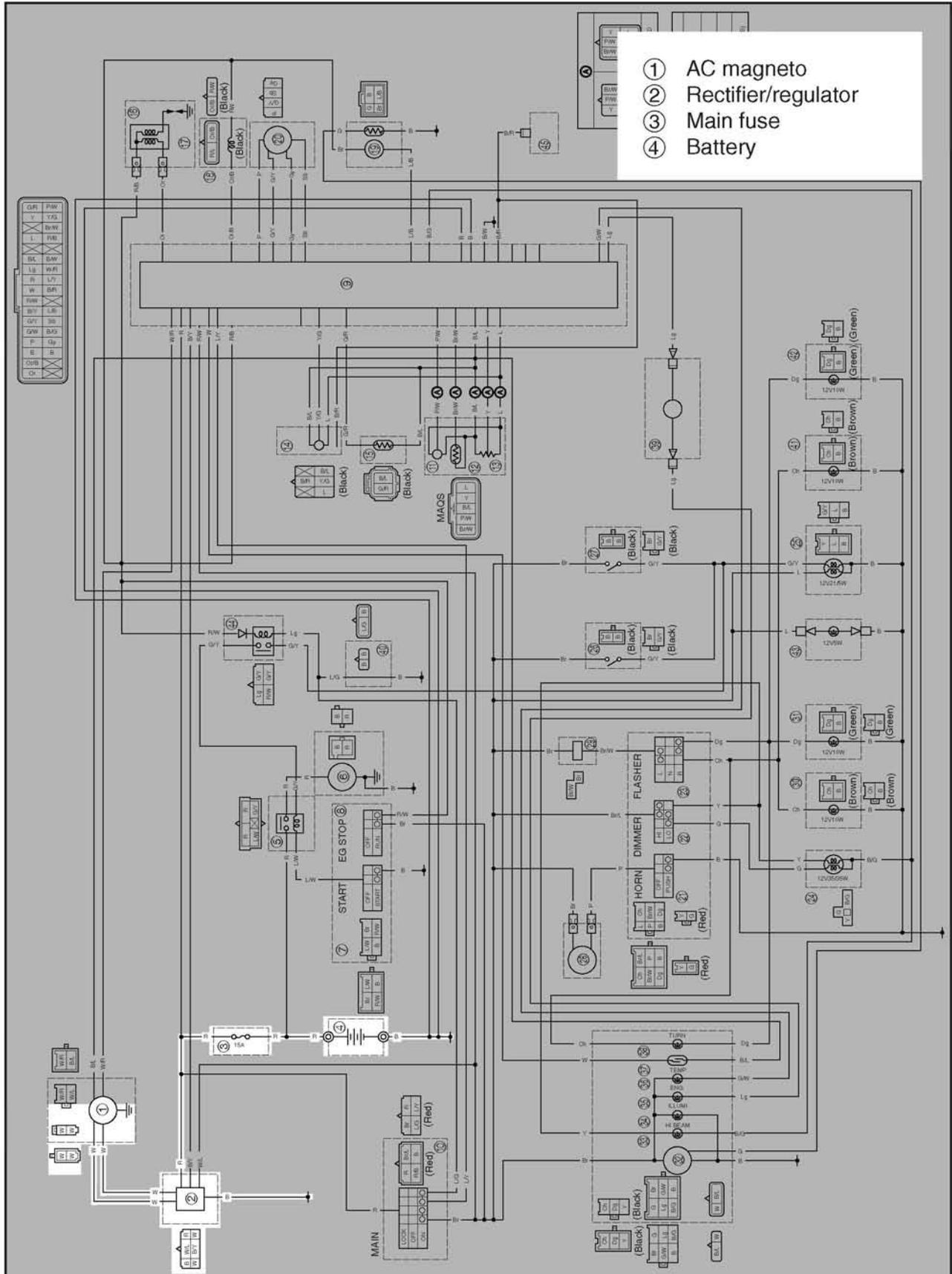
 5 Nm (0.5 m • kg, 3.6 ft • lb)

NOTE: _____
Align the match marks (a) on the starter motor yoke with the match marks (b) on the bracket.



EAS00773

CHARGING SYSTEM CIRCUIT DIAGRAM





EAS00774

TROUBLESHOOTING

The battery is not being charged.

Check:

1. main fuse
2. battery
3. charging voltage
4. stator coil resistance
5. wiring connections
(of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. battery cover/front cover
 2. side cover(right)
 3. front fork upper cover
 4. front fork cover(left and right)
 5. leg shield1
- Troubleshoot with the following special tool(s).



Digital tachometer
90890-06760
Pocket tester
90890-03112
YU-03112-C

EAS00738

1. Main fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



YES



NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?



YES



NO

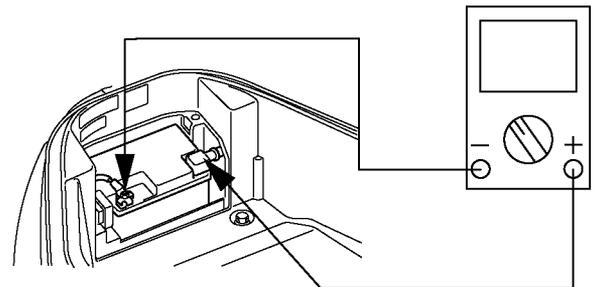
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00775

3. Charging voltage

- Connect the digital tachometer to the spark plug lead of cylinder.
- Connect the pocket tester (DC 20 V) to the battery as shown.

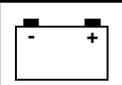
Positive tester probe → positive battery terminal
Negative tester probe → negative battery terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.



Charging voltage
14 V at 5000r/min



NOTE:

Make sure the battery is fully charged.

- Is the charging voltage within specification?

NO

YES

The charging circuit is OK.

EAS00779

5. Wiring

- Check the wiring connections of the entire charging system. Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

YES

NO

Replace the rectifier/regulator.

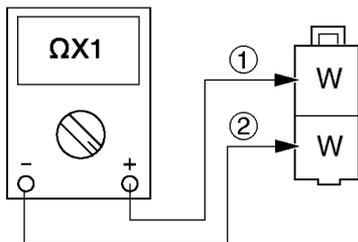
Properly connect or repair the charging system's wiring.

EAS00776

4. Stator coil resistance

- Disconnect the starter coil coupler from wireharness.
- Connect the pocket tester ($\Omega \times 1$) to the stator coil as shown.

Positive tester probe → white ①
 Negative tester probe → white ②



- Measure the stator coil resistances.



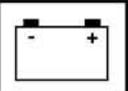
Stator coil resistance
 0.28 ~ 0.42 Ω at 20°C (68°F)

- Is the stator coil OK?

YES

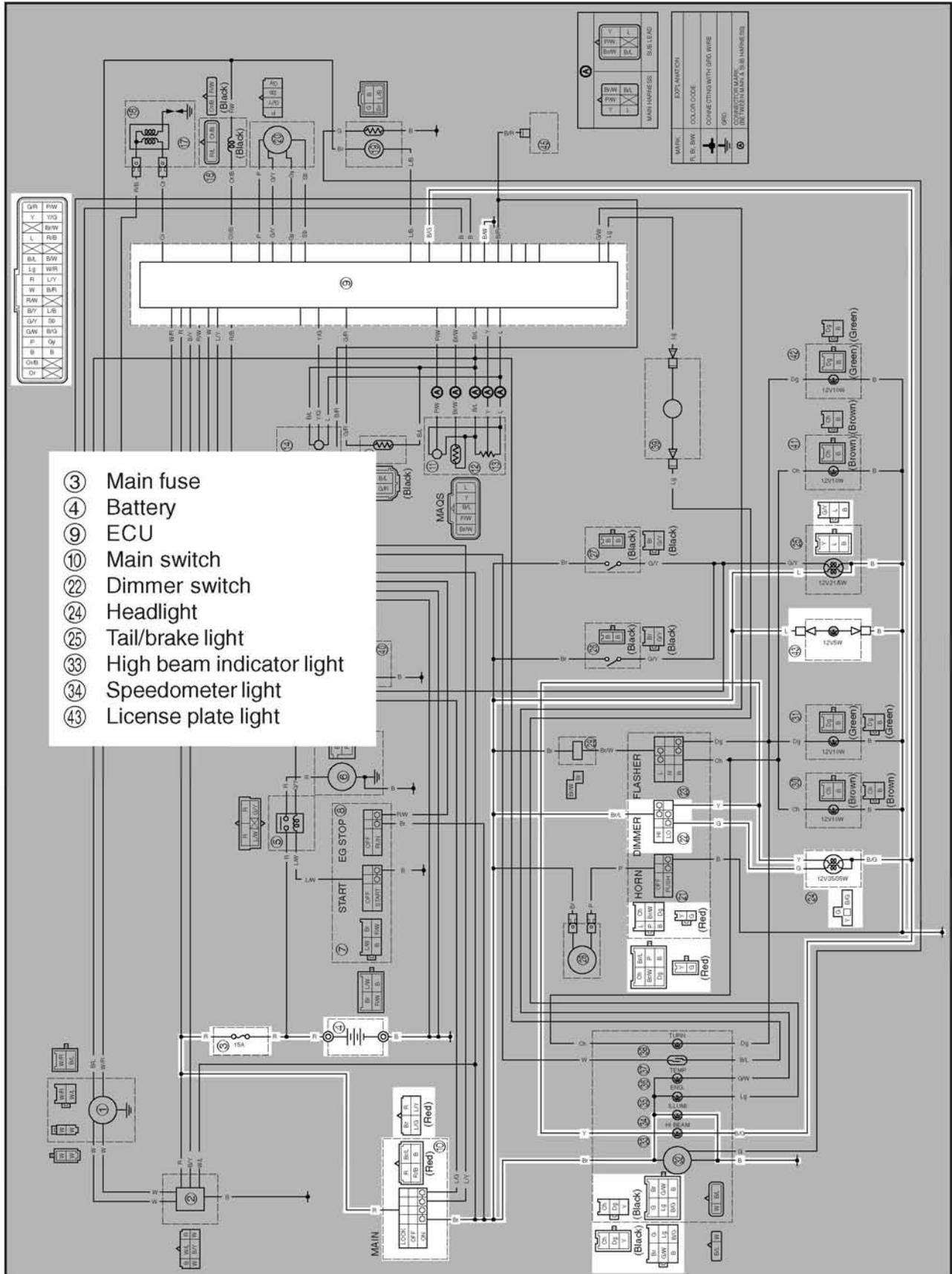
NO

Replace the crankshaft position sensor/stator coil assembly.



EAS00780

LIGHTING SYSTEM
CIRCUIT DIAGRAM



- ③ Main fuse
- ④ Battery
- ⑨ ECU
- ⑩ Main switch
- ⑫ Dimmer switch
- ⑭ Headlight
- ⑮ Tail/brake light
- ⑰ High beam indicator light
- ⑱ Speedometer light
- ⑳ License plate light



EAS00781

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, license plate light or meter light.

Check:

1. main fuse
2. battery
3. main switch
4. dimmer switch
5. wiring connections
(of the entire lighting system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. battery cover/front cover
 2. side cover(right)
 3. front fork upper cover
 4. front fork cover(left and right)
 5. leg shield1
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112
YU-03112-C

EAS00738

1. Main fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



YES



NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?



YES



NO

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

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?



YES



NO

Replace the main switch.

EAS00784

4. Dimmer switch

- Check the dimmer switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?



YES



NO

The dimmer switch is faulty. Replace the left handlebar switch.



EAS00787

5. Wiring

- Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?



YES



NO

Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".

Properly connect or repair the lighting system's wiring.



EAS00788

CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to come on.

1. Headlight bulb and socket

- Check the headlight bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the headlight bulb and socket OK?



YES



NO

Replace the headlight bulb, socket or both.

2. High beam indicator light bulb and socket

- Check the high beam indicator light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the high beam indicator light bulb and socket OK?



YES



NO

Replace the high beam indicator light bulb , socket or both.

3. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

A When the dimmer switch is set to “ ”

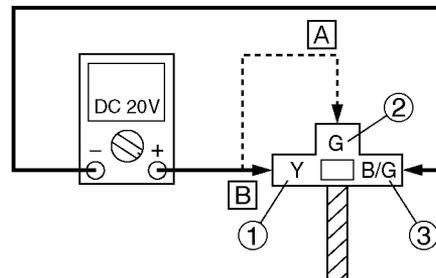
B When the dimmer switch is set to “ ”

Headlight

Positive tester probe → yellow ① or green ②

Negative tester probe → black/green ③

Headlight coupler

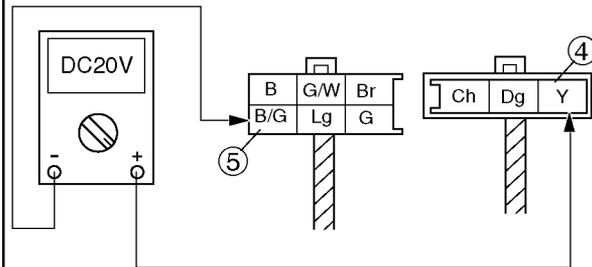


High beam indicator light

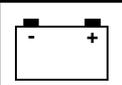
Positive tester probe → yellow ④

Negative tester probe → black/green ⑤

Meter assembly coupler



- Set the main switch to “ON”.
- Start the engine.
- Set the dimmer switch to “ ” or “ ”.
- Measure the voltage (DC 12 V) of yellow①(green ②) on the headlight coupler and yellow④ on the meter assembly coupler(wire harness side).
- Is the voltage within specification?



YES

This circuit is OK.



NO

The wiring circuit from the main switch to the headlight coupler or meter assembly coupler is faulty and must be repaired. Refer to "CIRCUIT DIAGRAM".

EAS00789

2. The meter light fails to come on.

1. Meter light bulb and socket

- Check the meter light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the meter light bulb and socket OK?



YES



NO

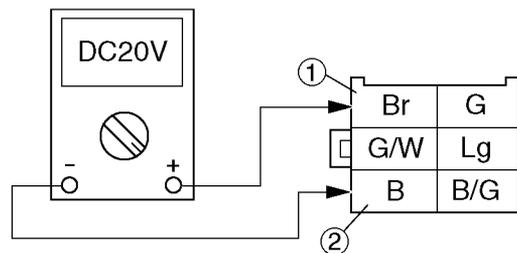
Replace the meter light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

Positive tester probe → brown ①

Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown ① on the meter light coupler (wire harness side).
- Is the voltage within specification?



YES



NO

This circuit is OK.

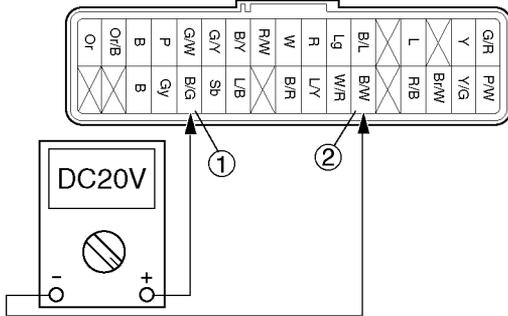
The wiring circuit from the main switch to the meter light coupler is faulty and must be repaired. Refer to "CIRCUIT DIAGRAM".



3. Voltage

- Connect the pocket tester (DC 20 V) to the ECU coupler (wire harness side) as shown.

Positive tester probe → black/green ①
 Negative tester probe → black/white ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of black/green ① on the ECU coupler (wire harness side).
- Is the voltage within specification?

YES NO

This circuit is OK.

The wiring circuit from the main switch to the ECU coupler is faulty and must be repaired. Refer to "CIRCUIT DIAGRAM".

EAS00790

3. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the tail/brake light bulb and socket OK?

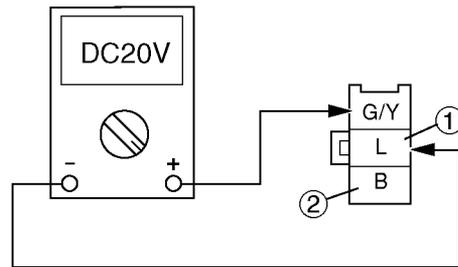
YES NO

Replace the tail/brake light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → blue ①
 Negative tester probe → black ②

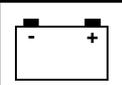


- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ① on the tail/brake light coupler (tail/brake light side).
- Is the voltage within specification?

YES NO

This circuit is OK.

wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired. Refer to "CIRCUIT DIAGRAM".



EAS00792

4. The license plate light fails to come on.

1. License plate light bulb and socket

- Check the license plate light bulb and socket for continuity.
Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the license plate light bulb and socket OK?



YES



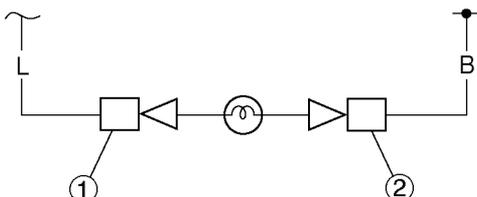
NO

Replace the license plate light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the license plate light coupler (license plate light side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of blue ① on the license plate light coupler (license plate light side).
- Is the voltage within specification?



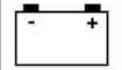
YES



NO

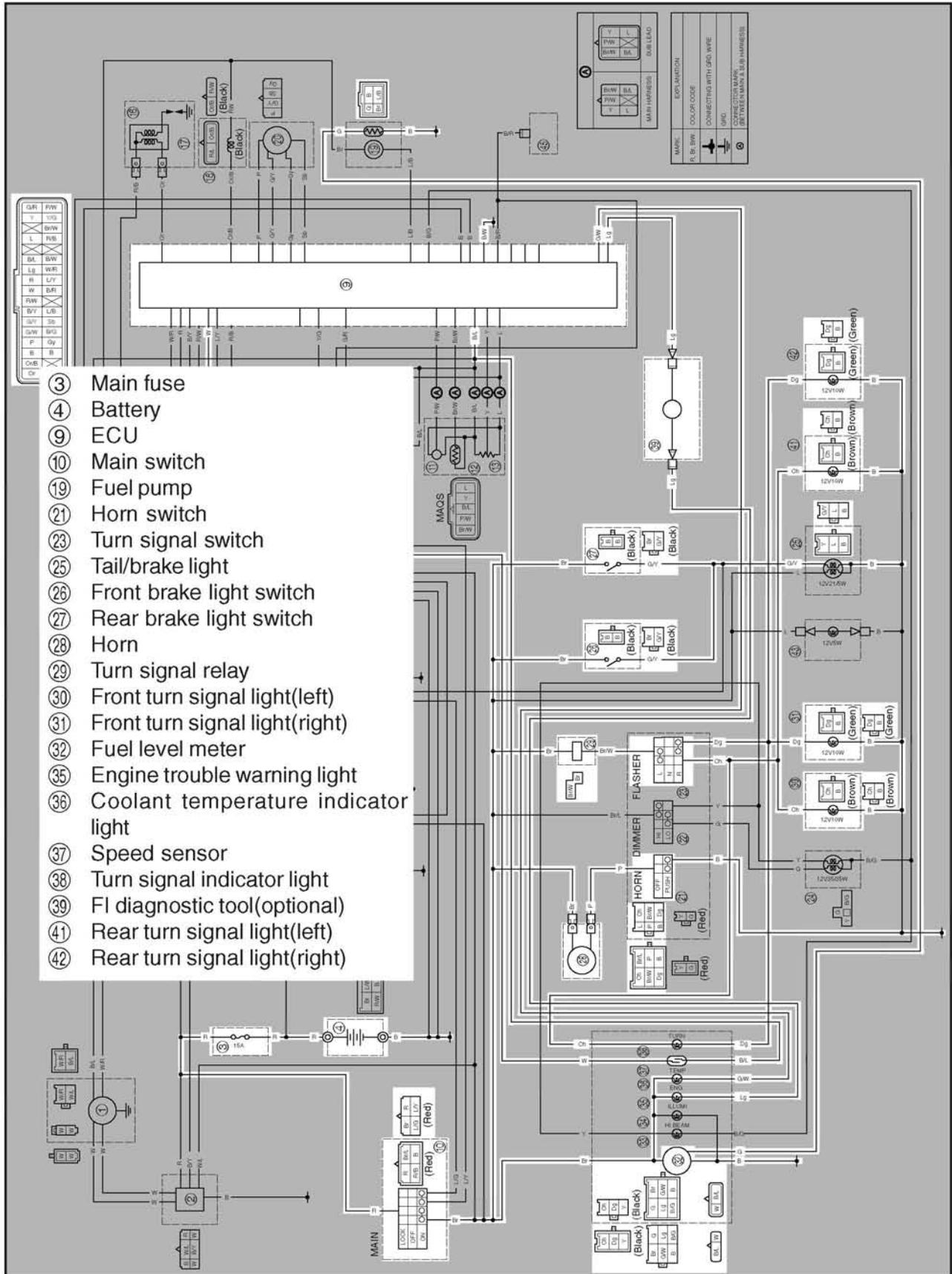
This circuit is OK.

The wiring circuit from the main switch to the license plate light coupler is faulty and must be repaired.
Refer to “CIRCUIT DIAGRAM”.



EAS00793

SIGNALING SYSTEM
CIRCUIT DIAGRAM



- ③ Main fuse
- ④ Battery
- ⑨ ECU
- ⑩ Main switch
- ⑱ Fuel pump
- ⑳ Horn switch
- ㉓ Turn signal switch
- ㉕ Tail/brake light
- ㉖ Front brake light switch
- ㉗ Rear brake light switch
- ㉘ Horn
- ㉙ Turn signal relay
- ㉚ Front turn signal light(left)
- ㉛ Front turn signal light(right)
- ㉜ Fuel level meter
- ㉝ Engine trouble warning light
- ㉞ Coolant temperature indicator light
- ㉟ Speed sensor
- ㊱ Turn signal indicator light
- ㊲ FI diagnostic tool(optional)
- ㊳ Rear turn signal light(left)
- ㊴ Rear turn signal light(right)



EAS00794

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.

Check:

1. main fuse
2. battery
3. main switch
4. wiring connections
(of the entire signaling system)

NOTE:

- Before troubleshooting, remove the following part(s):
1. battery cover/front cover
 2. side cover(left and right)
 3. front fork upper cover
 4. front fork cover(left and right)
 5. leg shield1,2
 6. footrest board
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112
YU-03112-C

EAS00739

2. Battery

- Check the condition of the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?



YES



NO

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

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?



YES



NO

Replace the main switch.

EAS00738

1. Main fuse

- Check the main fuse for continuity. Refer to “CHECKING THE FUSE” in chapter 3.
- Is the fuse OK?



YES



NO

Replace the fuse.

EAS00795

4. Wiring

- Check the entire signal system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the signaling system’s wiring properly connected and without defects?



YES



NO

Check the condition of each of the signaling system’s circuits. Refer to “CHECKING THE SIGNALING SYSTEM”.

Properly connect or repair the signaling system’s wiring.

EAS00796

CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

1. Horn switch

- Check the horn switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the horn switch OK?



YES



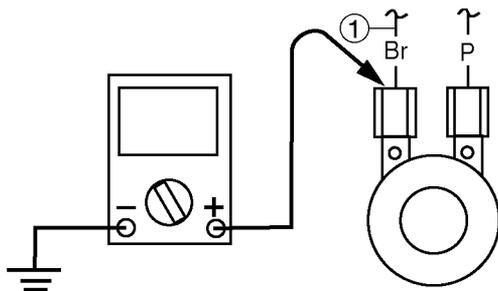
NO

Replace the left handlebar switch.

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

Positive tester probe → brown ①
Negative tester probe → ground



- Set the main switch to “ON”.
- Push the horn switch.
- Measure the voltage (DC 12 V) of brown at the horn terminal.
- Is the voltage within specification?



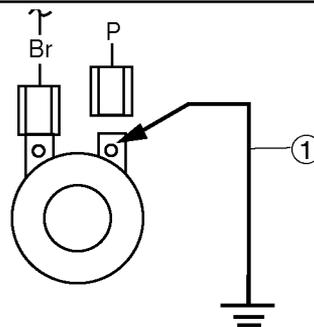
YES



NO

The wiring circuit from the main switch to the horn connector is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.

- 3. Horn**
- Disconnect the pink connector at the horn terminal.
 - Connect a jumper lead ① to the horn terminal and ground the jumper lead.
 - Set the main switch to “ON”.
 - Push the horn switch.
 - Does the horn sound?



NO

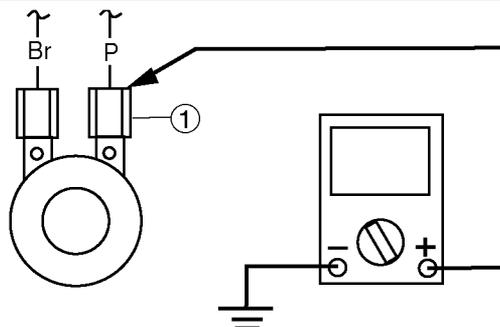


YES

The horn is OK.

- 4. Voltage**
- Connect the pocket tester (DC 20 V) to the horn connector at the pink terminal as shown.

Positive tester probe → pink ①
Negative tester probe → ground



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of pink ① at the horn terminal.
- Is the voltage within specification?



YES



NO

Repair or replace the horn.

Replace the horn.

EAS00798

2. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the tail/brake light bulb and socket OK?

↓ YES

↓ NO

Replace the tail/brake light bulb, socket or both.

2. Brake light switches

- Check the brake light switches for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the brake light switch OK?

↓ YES

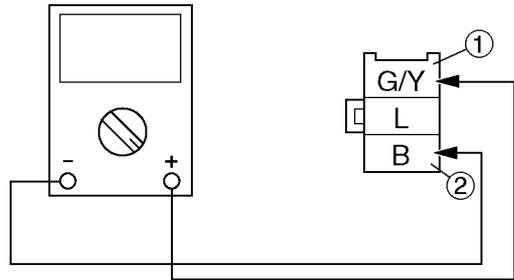
↓ NO

Replace the brake light switch(es).

3. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → green/ yellow ①
Negative tester probe → black ②



- Set the main switch to “ON”.
- Pull in the brake levers.
- Measure the voltage (DC 12 V) of green/ yellow ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be re-paired. Refer to “CIRCUIT DIAGRAM”.



EAS00799

3. The turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal indicator light bulb and socket

- Check the turn signal indicator light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the turn signal indicator light bulb and socket OK?



YES



NO

Replace the turn signal indicator light bulb, socket or both.

2. Turn signal light bulb and socket

- Check the turn signal light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the turn signal light bulb and socket OK?



YES



NO

Replace the turn signal light bulb, socket or both.

3. Turn signal switch

- Check the turn signal switch for continuity. Refer to “CHECKING THE SWITCHES”
- Is the turn signal switch OK?



YES



NO

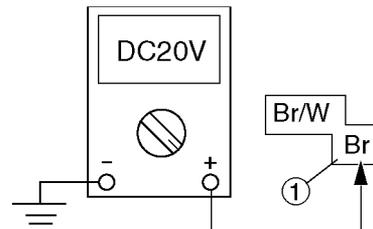
Replace the left handle-bar switch.

4. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown ①

Negative tester probe → ground



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?



YES



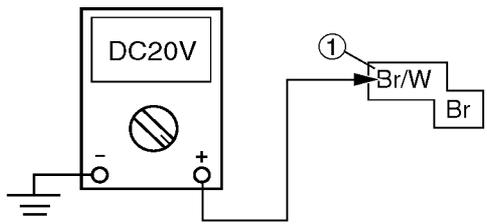
NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.

5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown/white ①
Negative tester probe → ground



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

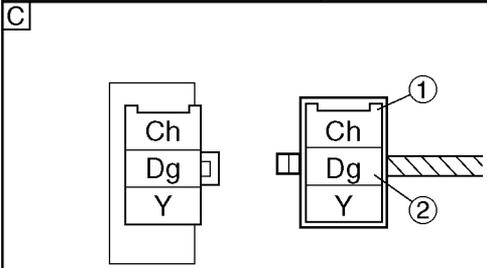
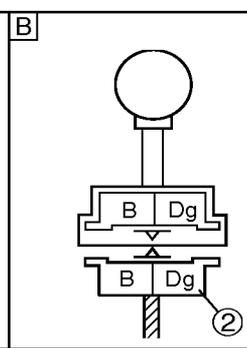
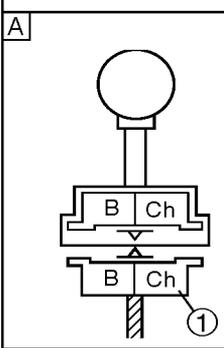
The turn signal relay is faulty and must be replaced.

6. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connector or meter assembly coupler (wire harness side) as shown.

- A** Left turn signal light(front and rear)
- B** Right turn signal light(front and rear)
- C** Turn signal indicator light

Left turn signal light
Positive tester probe → chocolate ①
Negative tester probe → ground
Right turn signal light
Positive tester probe → dark green ②
Negative tester probe → ground



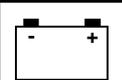
- Set the main switch to “ON”.
- Set the turn signal switch to “←” or “→”.
- Measure the voltage (DC 12 V) of the chocolate ① or dark green ② at the turn signal light connector (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

This circuit is OK.

The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.



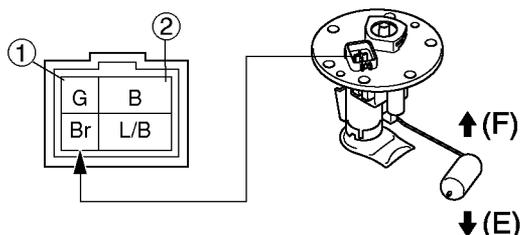
EAS00804

4. The fuel level meter fails to operate.

1. Fuel sender

- Remove the fuel pump from the fuel tank.
- Connect the pocket tester ($\Omega \times 1$) to the fuel sender coupler (wire harness side) as shown.

Positive tester probe → green ①
 Negative tester probe → black ②



- Measure the fuel sender resistances.



Fuel sender resistance (up position "F") ($\Omega \times 1$)

4~10 Ω at 20°C (68°F)

Fuel sender resistance (down position "E") ($\Omega \times 10$)

90~100 Ω at 20°C (68°F)

- Is the fuel sender OK?

↓ YES

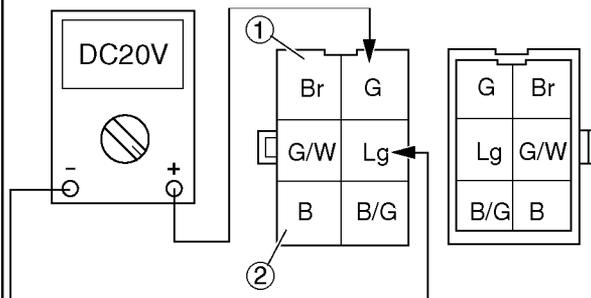
↓ NO

Replace the fuel pump.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

Positive tester probe → brown ①
 Negative tester probe → black ②

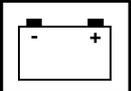


- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown ① on the meter light coupler (wire harness side).
- Is the voltage within specification?

↓ YES

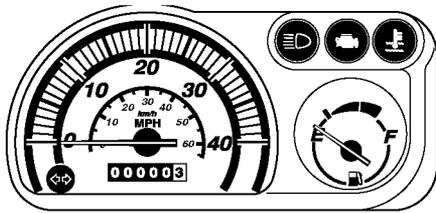
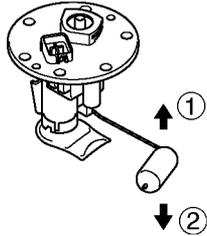
↓ NO

Check the wiring connections of the entire signaling system. Refer to "CIRCUIT DIAGRAM".



3. Fuel level meter

- Set the main switch to “ON”.
- Move the float up ① or down ②.



- Check that the fuel level meter needle moves to “F” or “E”.

NOTE:

Before reading the fuel level meter, leave the float in one position (either up or down) for at least three minutes.

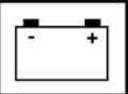
- Does the fuel level meter needle move appropriately?

↓ YES

↓ NO

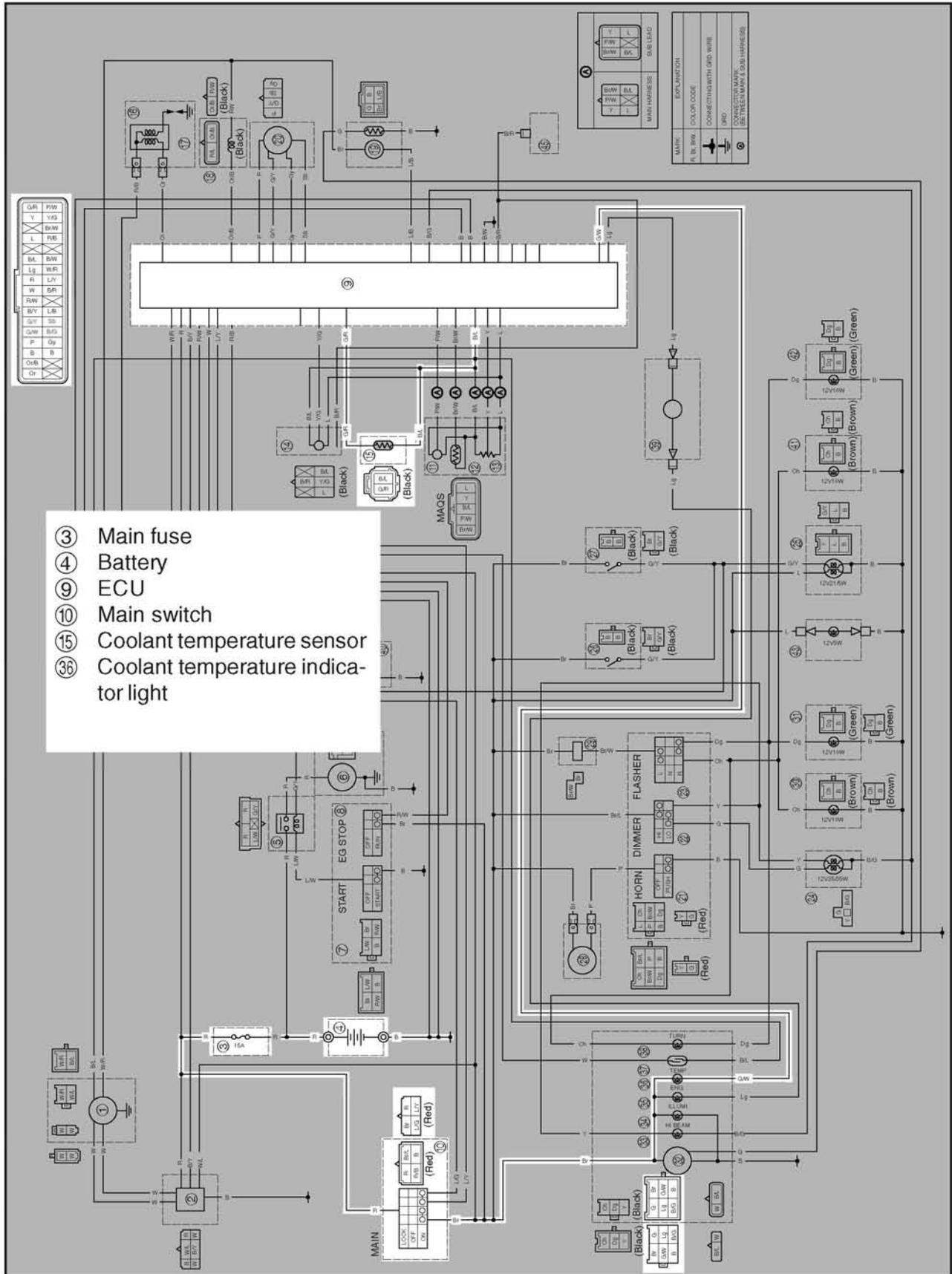
This circuit is OK.

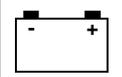
Replace the speedo meter.



EAS00807

COOLING SYSTEM
CIRCUIT DIAGRAM





EAS00808

TROUBLESHOOTING

- The coolant temperature indicator light fails to indicate.
- The coolant temperature indicator light fails to indicate when the engine is warm.

Check:

1. main fuse
2. battery
3. main switch
4. coolant temperature sensor
5. wiring connections
(the entire cooling system)

NOTE:

- Before troubleshooting, remove the following part(s):
1. battery cover/front cover
 2. side cover(right)
 3. front fork upper cover
 4. front fork cover(left and right)
 5. leg shield1,2
 6. footrest board
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112
YU-03112-C

EAS00738

1. Main fuse
- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
 - Is the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

↓ YES

↓ NO

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

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.



EAS00812

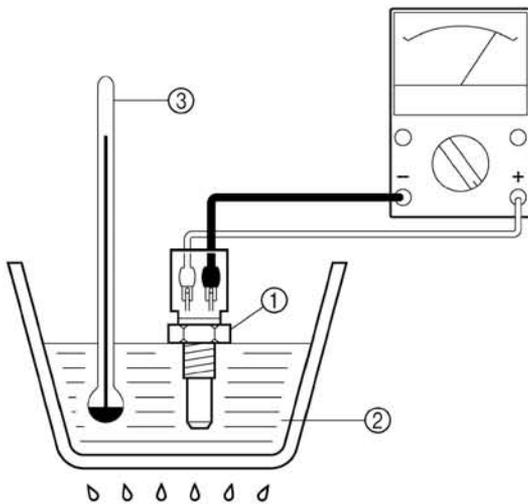
4. Coolant temperature sensor

- Remove the coolant temperature sensor from the cylinder head.
- Connect the pocket tester ($\Omega \times 1k$) to the coolant temperature sensor① as shown.
- Immerse the coolant temperature sensor in a container filled with coolant②.

NOTE:

Make sure the coolant temperature sensor terminals do not get wet.

- Place a thermometer③ in the coolant.
- Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.
- Check the thermo switch for continuity at the temperatures indicated below.



Coolant temperature sensor resistance

20°C (68°F): 2.32 ~2.59k Ω

80°C (176°F): 0.310 ~0.326k Ω

⚠ WARNING

- Handle the coolant temperature sensor with special care.
- Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.



Coolant temperature sensor
22 Nm (2.2 m • kg, 15.9 ft • lb)

- Does the coolant temperature sensor operate properly?



YES



NO

Replace the coolant temperature sensor.

EAS00813

5. Wiring

- Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the cooling system's wiring properly connected and without defects?



YES



NO

Replace the ECU.

Properly connect or repair the cooling system's wiring.



CHECKING THE COOLING SYSTEM

1. The coolant temperature indicator light fails to come on.

1. Coolant temperature indicator light bulb and socket

- Check the coolant temperature indicator light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the coolant temperature indicator light bulb and socket OK?



YES



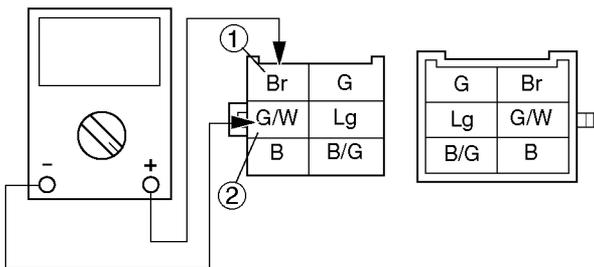
NO

Replace the coolant temperature indicator light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → green/white ②



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of brown 1 on the meter light coupler (wire harness side).
- Is the voltage within specification?



YES



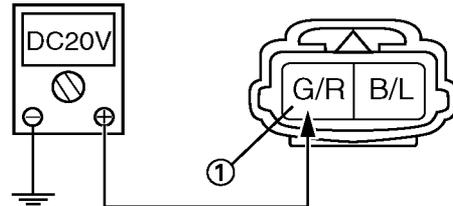
NO

The wiring circuit from the main switch to the meter light coupler is faulty and must be repaired.

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

Positive tester probe → green/red ①
Negative tester probe → ground



- Set the main switch to “ON”.
- Measure the voltage (DC 12V) of green/red ① on the coolant temperature sensor coupler (wire harness side).
- Is the voltage within specification?

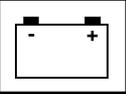


YES



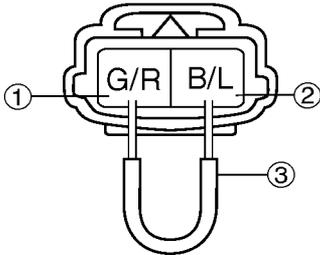
NO

The wiring circuit from the main switch to the coolant temperature sensor coupler is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.



4. Coolant temperature indicator light

- Disconnect the coolant temperature sensor coupler at the coolant temperature sensor.
- Connect the green/red① and black/blue② with a jumper lead③.
- Set the main switch to "ON".



- Is the coolant temperature indicator light OK?

↓ YES

This circuit is OK.

↓ NO

Replace the coolant temperature indicator light.

**CHAPTER 9
TROUBLE SHOOTING**

STARTING FAILURE/HARD STARTING.....	9-1
ENGINE	9-1
FUEL SYSTEM	9-1
ELECTRICAL SYSTEMS	9-1
STARTING FAILURES/HARD STARTING/ INCORRECT ENGINE IDLING	
SPEED	9-2
ENGINE	9-2
FUEL SYSTEM	9-2
ELECTRICAL SYSTEMS	9-2
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE/FAULTY	
CLUTCH	9-3
ENGINE	9-3
FUEL SYSTEM	9-3
FAULTY CLUTCH	9-3
ENGINE OPERATES BUT SCOOTER WILL NOT MOVE	9-3
CLUTCH SLIPS	9-3
POOR STARTING PERFORMANCE	9-3
POOR SPEED PERFORMANCE	9-4
OVERHEATING.....	9-4
ENGINE	9-4
COOLING SYSTEM.....	9-4
FUEL SYSTEM	9-4
CHASSIS.....	9-4
ELECTRICAL SYSTEMS	9-4
COOLING SYSTEM.....	9-4
POOR BRAKING PERFORMANCE/FAULTY FRONT FORK LEGS/UN-	
STABLE HANDLING	9-5
FAULTY FRONT FORK LEGS	9-5
LEAKING OIL	9-5
MALFUNCTION	9-5
UNSTABLE HANDLING.....	9-5
FAULTY LIGHTING OR SIGNALING SYSTEM	9-6
HEADLIGHT DOES NOT COME ON.....	9-6
HEADLIGHT BULB BURNT OUT	9-6
TAIL/BRAKE LIGHT DOES NOT COME ON	9-6
TAIL/BRAKE LIGHT BULB BURNT OUT	9-6

TURN SIGNAL DOES NOT COME ON	9-6
TURN SIGNAL BLINKS SLOWLY	9-6
TURN SIGNAL REMAINS LIT	9-6
TURN SIGNAL BLINKS QUICKLY	9-6
HORN DOES NOT SOUND	9-6

TROUBLESHOOTING

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING FAILURE/HARD STARTING

ENGINE

Cylinder and cylinder head

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Piston and piston ring

- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter

- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft

- Improperly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank

- Empty fuel tank
- Clogged fuel tank cap breather hole
- Deteriorated or contaminated fuel
- Clogged or damaged fuel hose

Fuel pump

- Faulty fuel pump
- Improperly routed hose

Throttle body

- Deteriorated or contaminated fuel
- Sucked-in air

ELECTRICAL SYSTEMS

Battery

- Discharged battery
- Faulty battery

Fuse

- Blown, damaged or incorrect fuse
- Improperly installed fuse

Spark plug

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil

- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coil
- Faulty spark plug lead

Ignition system

- Faulty ECU
- Faulty crankshaft position sensor
- Broken AC magneto rotor woodruff key

Switches and wiring

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty front, rear or both brake light switches
- Faulty start switch
- Faulty sidestand switch(optional)
- Improperly grounded circuit
- Loose connections

STARTING FAILURES/HARD STARTING/ INCORRECT ENGINE IDLING SPEED

TRBL
SHTG



Starting system

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

EAS00847

INCORRECT ENGINE IDLING SPEED

ENGINE

Cylinder and cylinder head

- Incorrect valve clearance
- Damaged valve train components

Air filter

- Clogged air filter element

FUEL SYSTEM

Throttle body

- Damaged or loose throttle body joint
- Improperly ISC(idle speed control) valve
- Improper throttle cable free play
- Flooded throttle body
- Faulty air induction system

ELECTRICAL SYSTEMS

Battery

- Discharged battery
- Faulty battery

Spark plug

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil

- Faulty spark plug lead

Ignition system

- Faulty ECU
- Faulty crankshaft position sensor

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE/ FAULTY CLUTCH

TRBL
SHTG



EAS00848

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURE/HARD STARTING".

ENGINE

Air filter

- Clogged air filter element

FUEL SYSTEM

Throttle body

- Faulty diaphragm

Fuel pump

- Faulty fuel pump

EAS00853

FAULTY CLUTCH

ENGINE OPERATES BUT SCOOTER WILL NOT MOVE

V-belt

- Bent, damaged or worn V-belt
- Slipping V-belt

Primary pulley cam and primary pulley slider

- Damaged or worn primary pulley cam
- Damaged or worn primary pulley slider

Clutch spring(s)

- Damaged clutch spring

Transmission gears

- Damaged transmission gear

CLUTCH SLIPS

Clutch shoe springs

- Damaged, loose or worn clutch shoe spring

Clutch shoes

- Damaged or worn clutch shoe

Primary sliding sheave

- Seized primary sliding sheave

POOR STARTING PERFORMANCE

V-belt

- V-belt slips
- Oil or grease on the V-belt

Primary sliding sheave

- Faulty operation
- Worn pin groove
- Worn pin

Clutch shoes

- Bent, damaged or worn clutch shoe

FAULTY CLUTCH/OVERHEATING/OVERCOOLING



POOR SPEED PERFORMANCE

V-belt

- Worn V-belt
- Oil or grease on the V-belt

Primary pulley weight(s)

- Faulty operation
- Worn primary pulley weight

Primary fixed sheave

- Worn primary fixed sheave

Primary sliding sheave

- Worn primary sliding sheave

Secondary fixed sheave

- Worn secondary fixed sheave

Secondary sliding sheave

- Worn secondary sliding sheave

EAS00855

OVERHEATING

ENGINE

Clogged coolant passages

- Heavy carbon buildup

Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

COOLING SYSTEM

Coolant

- Low coolant level

Radiator

- Damaged or leaking radiator
- Faulty radiator cap
- Bent or damaged radiator fan

Water pump

- Damaged or faulty water pump

Thermostat

- Thermostat stays closed

Oil cooler

- Clogged or damaged oil cooler

Hose(s) and pipe(s)

- Damaged hose
- Improperly connected hose
- Damaged pipe
- Improperly connected pipe

FUEL SYSTEM

Throttle body

- Damaged or loose throttle body joint

Air filter

- Clogged air filter element

CHASSIS

Brake(s)

- Dragging brake

ELECTRICAL SYSTEMS

Spark plug

- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system

- Faulty coolant temperature sensor
- Faulty ECU

EAS00856

OVERCOOLING

COOLING SYSTEM

Thermostat

- Thermostat stays open

POOR BRAKING PERFORMANCE/FAULTY FRONT FORK LEGS/UNSTABLE HANDLING

TRBL
SHTG



EAS00859

POOR BRAKING PERFORMANCE

Drum brake

- Worn brake shoe
- Worn or rusty brake drum
- Incorrect brake lever position
- Incorrect brake lever free play
- Incorrect brake camshaft lever position
- Incorrect brake shoe position
- Damaged or fatigued brake shoe spring
- Oil or grease on the brake shoe
- Oil or grease on the brake drum

EAS00861

FAULTY FRONT FORK LEGS

LEAKING OIL

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

MALFUNCTION

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS00862

UNSTABLE HANDLING

Handlebar

- Bent or improperly installed handlebar

Steering head components

- Improperly installed handlebar bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)

- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Rear shock absorber assembly

- Faulty rear shock absorber spring
- Leaking oil

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

EAS00866

FAULTY LIGHTING OR SIGNALING SYSTEM**HEADLIGHT DOES NOT COME ON**

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT COME ON

- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

TAIL/BRAKE LIGHT BULB BURNT OUT

- Wrong tail/brake light bulb
- Faulty battery
- Tail/brake light bulb life expired

TURN SIGNAL DOES NOT COME ON

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

TURN SIGNAL BLINKS SLOWLY

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb
- Faulty battery

TURN SIGNAL REMAINS LIT

- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY

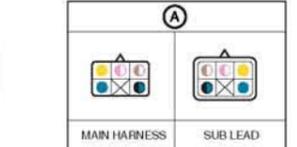
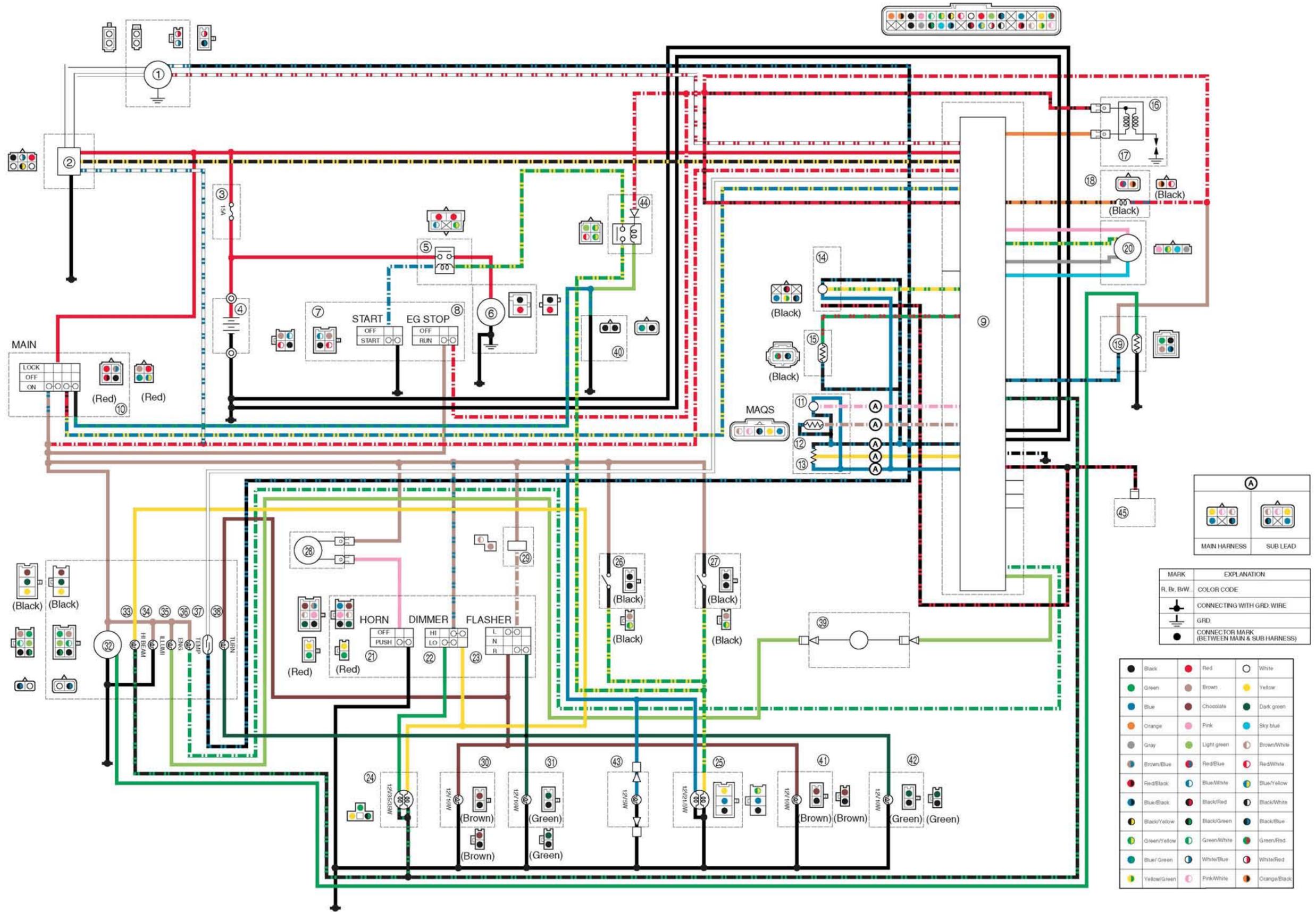
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND

- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness



XF50W WIRING DIAGRAM



MARK	EXPLANATION
R, Br, B/W	COLOR CODE
	CONNECTING WITH GRD. WIRE
	GRD.
	CONNECTOR MARK (BETWEEN MAIN & SUB HARNESS)

	Black		Red		White
	Green		Brown		Yellow
	Blue		Chocolat		Dark green
	Orange		Pink		Sky blue
	Gray		Light green		Brown/White
	Brown/Blue		Red/Blue		Red/White
	Red/Black		Blue/White		Blue/Yellow
	Blue/Black		Black/Red		Black/White
	Black/Yellow		Black/Green		Black/Blue
	Green/Yellow		Green/White		Green/Red
	Blue/Green		White/Blue		White/Red
	Yellow/Green		Pink/White		Orange/Black