

2009

MOTORCYCLE TIME TELL

SERVICE MANUAL

Model: YW125Y\_

Downloaded from white Scoter line het

EAS00000

YW125Y 2009
SERVICE MANUAL
©2008 by Yamaha Motor Taiwan Co., Ltd.
First edition, July 2008
All rights reserved.
Any reproduction or unauthorized use without the written permission of Yamaha Motor Taiwan Co., Ltd. is expressly prohibited.

FAS20070

#### **IMPORTANT**

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.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.

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.

#### TIP.

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

EAS20080

#### IMPORTANT MANUAL INFORMATION

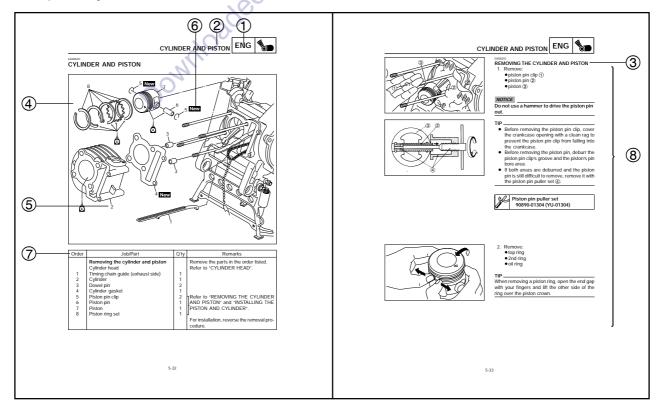
Particularly important information is distinguished in this manual by the following notations.

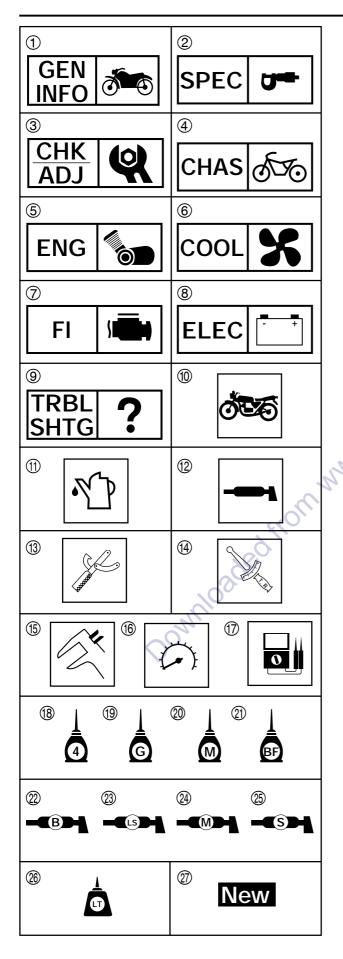
$\triangle$	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
<b>⚠</b> WARNING	A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.	
TIP	A TIP 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.

- 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.
  - 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.
  - Symbols indicate parts to be lubricated or replaced Refer to "SYMBOLS".
  - A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
  - Solution (Such as special tools and technical data) are described sequentially.





#### **SYMBOLS**

The following symbols are not relevant to every vehicle.

Symbols ① to ② indicate the subject of each chapter.

- (1) General information
- ② Specifications
- 3 Periodic checks and adjustments
- 4 Chassis
- ⑤ Engine
- 6 Cooling system
- Tuel injection system
- 8 Electrical system
- Troubleshooting

Symbols 10 to 17 indicate the following.

- Serviceable with engine mounted
- 1 Filling fluid
- ② Lubricant
- Special tool
- (4) Tightening torque
- (15) Wear limit, clearance
- (6) Engine speed
- (17) Electrical data

Symbols (8) to (25) in the exploded diagrams indicate the types of lubricants and lubrication points.

- 18 Engine oil
- (19) Gear oil
- 20 Molybdenum-disulfide oil
- ② Brake fluid
- Wheel-bearing grease
- ② Lithium-soap- based grease
- Molybdenum-disulfide grease
- (25) Silicone grease

Symbols (26) to (27) in the exploded diagrams indicate the following.

- 26 Apply locking agent (LOCTITE®)
- ② Replace the part

## **TABLE OF CONTENTS**

GENERAL INFORMATION	GEN 1
SPECIFICATIONS	SPEC 2
PERIODIC CHECKS AND ADJUSTMENTS	CHK ADJ 3
CHASSIS	CHAS 4
ENGINE WAR	ENG 5
FUEL INJECTION SYSTEM	FI 6
ELECTRICAL SYSTEM	ELEC 7

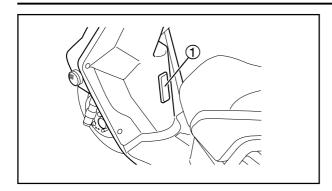


## CHAPTER 1 GENERAL INFORMATION

SCOOTER IDENTIFICATION	1-1
VEHICLE IDENTIFICATION NUMBER	1-1
MODEL LABEL	1-1
FEATURES	
OUTLINE OF THE FI SYSTEM	
FI SYSTEM	
O <sub>2</sub> sensor	1-4
IMPORTANT INFORMATION	1-5
PREPARATION FOR REMOVAL AND DISASSEMBLY	1-5
REPLACEMENT PARTS	1-5
REPLACEMENT PARTSGASKETS, OIL SEALS AND O-RINGS	1-5
LOCK WASHERS/PLATES AND COTTER PINS	1-6
BEARINGS AND OIL SEALS	1-6
BEARINGS AND OIL SEALS  CIRCLIPS  EQUIPMENT PREPARATION  CHECKING THE CONNECTIONS	1-6
FOLIPMENT PREPARATION	1 - 7
CHECKING THE CONNECTIONS	 1₋8
SDECIAL TOOLS	1-0 1₋0
SPECIAL TOOLS	

### **SCOOTER IDENTIFICATION**



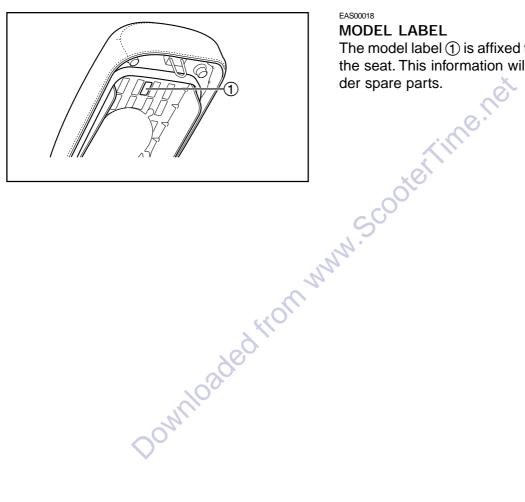


EAS00015

### **GENERAL INFORMATION** SCOOTER IDENTIFICATION

#### **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 under the seat. This information will be needed to orEASUUSOS

#### **FEATURES**

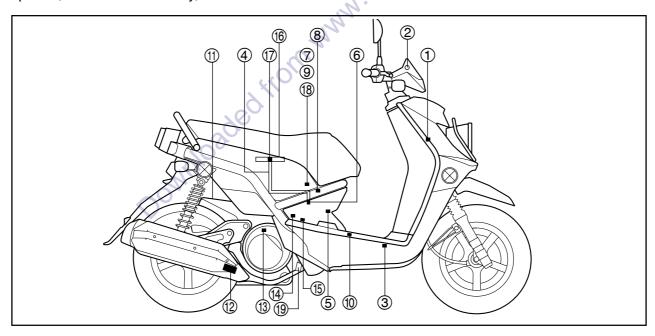
#### **OUTLINE OF THE FI SYSTEM**

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.



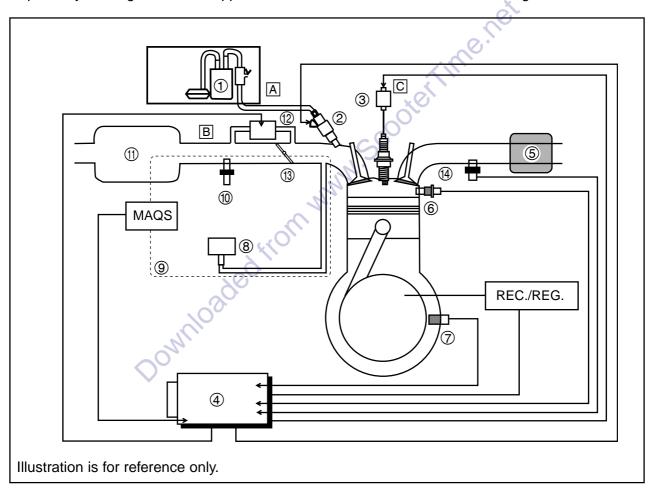
- ① ECU
- 2 Engine trouble warning light
- 3 Lean angle cut-off switch
- 4 Fuel hose
- (5) Ignition coil
- 6 Fuel injector
- (7) Intake air pressure sensor
- (8) ISC(idle speed control) valve
- (9) Intake air temperature sensor

- ① Battery
- ① Air filter case
- ② Catalytic converter
- (13) Crankshaft position sensor
- (4) Engine temperature sensor
- ⑤ Spark plug
- (16) Fuel tank
- (7) Fuel pump
- (18) Throttle position sensor
- 19 O<sub>2</sub> sensor

#### **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 kgf/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.

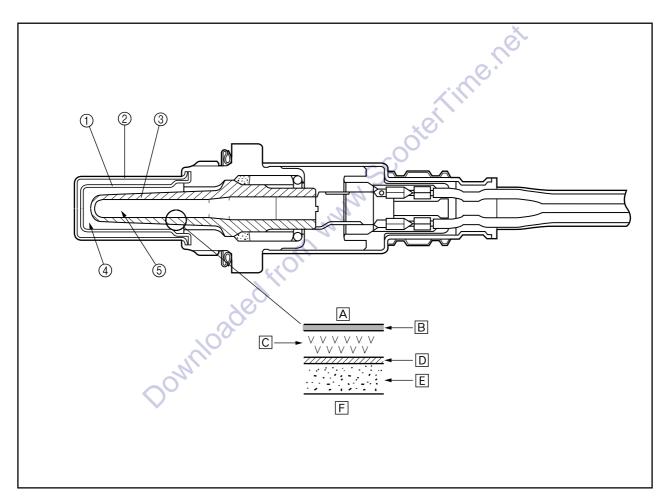


- Fuel pump
- ② Fuel injector
- ③ Ignition coil
- 4 ECU
- ⑤ Catalytic converter
- 6 Engine temperature sensor
- (7) Crankshaft position sensor
- (8) Intake air pressure sensor
- (9) Throttle body assembly
- ① Intake air temperature sensor

- Air filter case
- 12 ISC (idle speed control) valve
- Throttle position sensor
- (4) O<sub>2</sub> sensor
- A Fuel system
- B Air system
- C Control system

#### O, sensor

The O<sub>2</sub> sensor has been adopted to enable the catalyst to function at a high degree of efficiency by maintaining the air-fuel mixture near the stoichiometric ratio (14.7:1). This sensor, which is a zirconia type, utilizes the oxygen ion conductivity of the solid electrolyte for detecting the oxygen concentration levels. In actual operation, a zirconia tube made of solid electrolyte is exposed in the exhaust gas, so that the exterior of the zirconia tube is in contact with the exhaust gas and the interior is in contact with the atmosphere whose oxygen concentration level is known. When a difference in the oxygen concentration level is created between the outside and the inside of the zirconia tube, the oxygen ion passes through the zirconia element and generates an electromotive force. The electromotive force increases when the oxygen concentration level is low (rich air-fuel ratio) and the electromotive force decreases when the oxygen concentration level is high (lean air-fuel ratio). As electromotive force is generated in accordance with the concentration of the exhaust gas, the resultant voltage is input into the ECU in order to correct the duration of the injection of fuel.

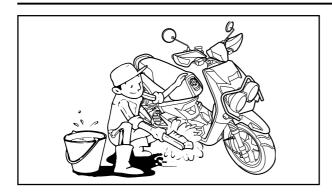


- Inner cover
- ② Outer cover
- ③ Zirconia tube
- (4) Exhaust gas
- (5) Atmosphere

- Atmosphere
- B Inner electrode
- C Zirconia element
- D Outer electrode
- E Porous ceramic layer
- F Exhaust gas

#### IMPORTANT INFORMATION



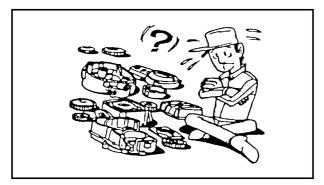


EAS00020

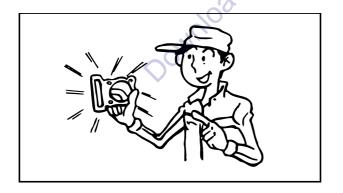
#### IMPORTANT INFORMATION

#### PREPARATION FOR REMOVAL AND DISAS-SEMBLY

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".
- 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.



EAS00021

#### 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.

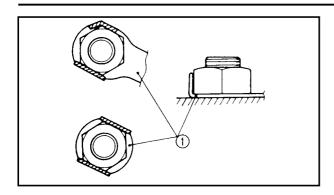
EAS00022

#### GASKETS, OIL SEALS AND O-RINGS

- 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.

#### IMPORTANT INFORMATION

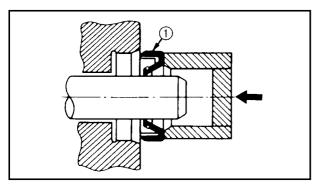




EAS00023

### 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.

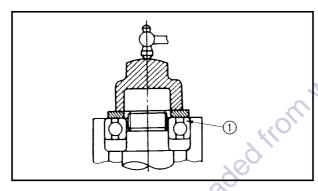


EAS00024

#### **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.

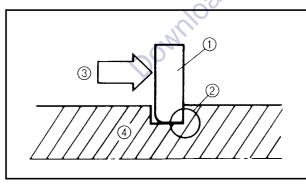
1 Oil seal



NOTICE

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

Bearing



EAS00025

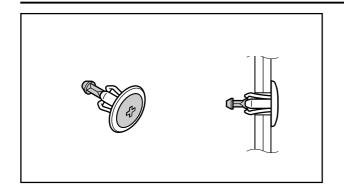
#### **CIRCLIPS**

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

### IMPORTANT INFORMATION

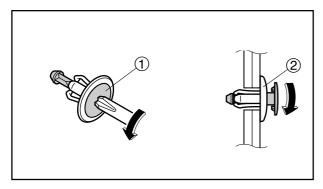




EAS00021

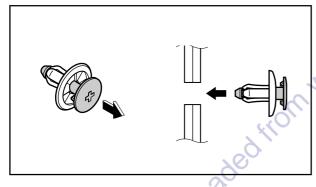
## EQUIPMENT PREPARATION Turn Rivet (Turn type)

Assembly status of the turn rivet(turn type).



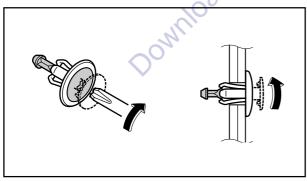
#### Dissembling

- 1. Press center pin(1) inward to release the lock.
- 2. Remove the push rivet main body 2.



#### **Assembling**

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



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

### CHECKING THE CONNECTIONS

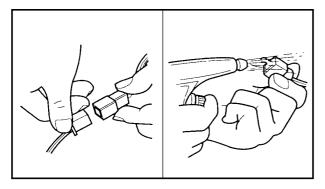


EAS00026

#### CHECKING THE CONNECTIONS

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

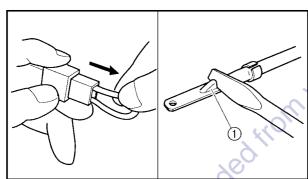
- 1. Disconnect:
  - lead
  - coupler
  - connector



- 2. Check:
  - lead
  - coupler
  - connector
     Moisture → Dry with an air blower.

    Rust/stains → Connect and disconnect

Rust/stains → Connect and disconnect several times.

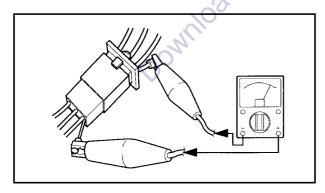


#### 3. Check:

all connections
 Loose connection → Connect properly.

TID

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



- 4. Connect:
  - lead
  - coupler
  - connector

TIP

Make sure all connections are tight.

5. Check:

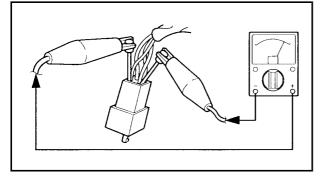
continuity (with the pocket tester)



Pocket tester 90890-03112 (YU-03112-C)

#### TIP

- 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.



#### 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.

#### TIP

- 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
90890-01085 (M8) YU-01083-2 90890-01084	Slide hammer bolt (8mm) ① Weight ②	1
YU-01083-3	These tools are needed to remove the camshaft.	© 2
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.	60
90890-01337 YM-33285	Clutch spring holder	
	These tool are used for removing the nut with holding the compression spring.	
90890-01311 YM-08035-A	Valve adjusting tool	
	This tool is necessary for adjusting valve clearance.	
90890-01326 YM-01326 90890-01294	T-handle ① Damper rod holder ②	
YM-01300-1	These tools are used to hold the damper rod when removing or installing the damper rod.	1 2
90890-01348 YM-01348	Lock nut wrench	41
	This tool is used when removing or installing the secondary sheave nut.	46

### SPECIAL TOOLS



Tool NO.	Tool name / Function	Illustration
90890-01189 YM-01189	Flywheel puller	
	This tool is used for removing the AC magneto rotor.	
90890-01367 YM-A9409-7 90890-01368 YM-A9409-4	Fork seal driver weight ① Fork seal driver attachment (Ø33mm) ②	
	These tools are used when installing the fork seal.	1 2
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	Zillie.
	This tool is used to loosen and tighten the steering ring 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	
90890-03081	cleanance.	<b>6</b>
YU-33223	Compression gauge  This tool is used to measure the engine com-	
90890-03112	pression. Pocket tester	
YU-03112-C		
	This instrument is invaluable for checking the electrical system.	8
90890-03174	Digital circuit tester	
	This instrument is invaluable for checking the electrical system.	
90890-06760	Digital tachometer  This tool is needed for detecting engine rpm.	

Tool NO.	Tool name / Function	Illustration
90890-03141 YU-03141	Timing light	
	This tool is used to check the ignition timing.	
90890-04101	Valve lapper	
	This tool is needed to remove and install the valve lifters.	
90890-04019 YM-04019 90890-04108	Valve spring compressor Compressor adapter (Ø19mm)	
YM-04108	These tools are used when removing or installing the valve and the valve spring.	and a second
90890-04116 YM-04116	Valve guide remover (4.5mm)	· Me · Ne
	This tool is used to remove or install the valve guides.	
90890-04117 YM-04117	Valve guide installer (4.5mm)  This tool is used to install the valve guides.	
90890-04118	Valve guide reamer (4.5mm)	/3
YM-04118	This tool is used to rebore the new valve guides.	
90890-06754 YM-34487	Ignition checker  This tool is used to check the ignition sys-	
	tem components.	
90890-03182 YU-03182	FI diagnostic tool	
	Execute CO adjustment, confirm fault code, self diagnosis tool.	
90890-03153 YU-03153	Pressure gauge	
	This tool is used to measure fuel pressure.	<b>V</b>
90890-03186	Fuel pressure adapter	
	This tool is used to measure fuel pressure.	





Tool NO.	Tool name / Function	Illustration
90890-85505 ACC-11001-05-01	Yamaha bond NO.1215 Sealant (Quick Gasket®)	
	This sealant (bond) is used to apply on crankcase mating surfaces.	

Downloaded from www. Scooter Finne. Net.

SPEC U

## CHAPTER 2 SPECIFICATIONS

GENERAL SPECIFICATIONS	2-1
ENGINE SPECIFICATIONS	2-2
CHASSIS SPECIFICATIONS	2-12
ELECTRICAL SPECIFICATIONS	2-15
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
CABLE ROUTING	2-26
GENERAL SPECIFICATIONS ENGINE SPECIFICATIONS CHASSIS SPECIFICATIONS ELECTRICAL SPECIFICATIONS GENERAL TIGHTENING TORQUE SPECIFICATIONS TIGHTENING TORQUES ENGINE CHASSIS LUBRICATION POINTS AND LUBRICANT TYPES ENGINE CHASSIS CABLE ROUTING	





### **SPECIFICATIONS**

### **GENERAL SPECIFICATIONS**

Item	Standard	Limit	
Model			
Code	32S1 (USA)		
	32S2 (CAN)		
Dimensions			
Overall length	1910mm (75.2in)		
Overall width	765mm (30.1in)		
Overall height	1110mm (43.7in)		
Seat height	780mm (30.7in)		
Wheelbase	1290mm (50.8in)		
Minimum ground clearance	125mm (4.9in)		
Minimum turning radius	1290mm (50.8in) 125mm (4.9in) 1900mm (74.8in)		
Weight			
Wet (with oil and a full fuel tank)	122kg (269lb)		
Dry (without oil and fuel)	116kg (256lb)		
Maximum load (total of cargo, rider,	09		
passenger, and accessories)			
Maximum load (total of cargo, rider, passenger, and accessories)  155kg (342lb)			





### **ENGINE SPECIFICATIONS**

Item	Standard	Limit
Engine		
Engine type	Air-cooled, 4-stroke, SOHC	
Displacement	0.125L (125cm <sup>3</sup> , 7.63cu-in)	
Cylinder arrangement	Forward inclined	
	single cylinder	
Bore × stroke	52.4 × 57.9mm (2.06 × 2.28in)	
Compression ratio	10:1	
Engine idle speed	1700 ~ 1900r/min	
Vacuum pressure at engine idle speed	37 ~ 47kPa	
	(281 ~ 357mmHg,	
	11.06 ~ 14.05inHg)	
	at 1800r/min	
Standard compression pressure	1350kPa	
(at sea level)	(13.5kgf/cm², 192psi)	
	at 1800r/min	
Fuel		
Recommended fuel	Regular unleaded	
	gasoline only	
Fuel tank capacity	34.	
Total	6.0L	
4	(1.59 US gal, 1.32 lmp. gal)	
Engine oil Lubrication system Recommended oil  Quantity		
Lubrication system	Wet sump	
Recommended oil	SAE20W-40 or SAE10W-30	
	API service SG type or higher	
	JASO standard MA	
Quantity		
Periodic oil change	0.80 ~ 0.90L	
	(0.87 ~ 0.98 US qt,	
	0.74 ~ 0.83 Imp. qt)	
Total amount	0.85 ~ 0.95L	
	(0.9 ~ 1.0 US qt,	
	0.75 ~ 0.84 Imp. qt)	
Final gear oil		
Recommended oil	SAE10W-30 type SE motor oil	
Periodic oil change	0.12 ~ 0.14L	
•	(0.13 ~ 0.15 US qt,	
	0.11 ~ 0.12 Imp. qt)	
Total amount	0.14 ~ 0.16L	
	(0.15 ~ 0.17 US qt,	
	0.12 ~ 0.14 Imp. qt)	





Item	Standard	Limit
Oil filter		
Oil filter type	Wire mesh	
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	0.07 ~ 0.12mm	0.19mm
	(0.003 ~ 0.005in)	(0.008in)
Starting system type	Electric starter	
Spark plug		
Model (manufacturer) × quantity	U22ESR-N (DENSO) × 1	
Spark plug gap	0.7 ~ 0.8mm (0.028 ~ 0.031in)	
Cylinder head		
Volume	11.4 ~ 12.0cm <sup>3</sup>	
	(0.70 ~ 0.73cu-in)	
Maximum warpage		0.05mm
		(0.002in)
	13.	
	3	
	(0.70 ~ 0.73cu-in)	
1 2 4 4 4 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		
1(110304		



Item	Standard	Limit
Camshaft Drive system Intake camshaft lobe dimensions	Chain drive (left)	
Measurement A  Measurement B  Exhaust camshaft lobe dimensions	25.267 ~ 25.367mm (0.995 ~ 0.999in) 21.069 ~ 21.169mm (0.829 ~ 0.833in)	25.167mm (0.991in) 20.969mm (0.826in)
Measurement A  Measurement B  Maximum camshaft runout	25.275 ~ 25.375mm (0.995 ~ 0.999in) 21.069 ~ 21.169mm (0.829 ~ 0.833in) 	25.175mm (0.991in) 20.969mm (0.826in) 0.03mm (0.0012in)



Item	Standard	Limit
Timing chain		
Model/number of links	Morse 92RH2005/94	
Tensioning system	Automatic	• • •
Valve, valve seats, valve guide	s	
Valve clearance (cold)		
Intake	0.10 ~ 0.14mm	
	(0.004 ~ 0.006in)	
Exhaust	0.16 ~ 0.20mm	
	(0.006 ~ 0.008in)	
Valve dimensions		
		(
	A C	
		$\rightarrow$ D
A ——		<u> </u>
Head Diameter F	ace Width Seat Width Mar	gin Thickness
Valve head diameter A		
Intake	18.9 ~ 19.1mm	
	(0.744 ~ 0.752in)	
Exhaust	16.9 ~ 17.1mm	
	(0.665 ~ 0.673in)	
Valve face width B		
Intake	1.48 ~ 2.18mm	
	(0.058 ~ 0.086in)	
Exhaust	1.91 ~ 2.61mm	
	(0.058 ~ 0.086in) 1.91 ~ 2.61mm (0.075 ~ 0.103in)	
Valve seat width C		
Intake	0.9 ~ 1.1mm (0.035 ~ 0.043in)	• • •
Exhaust	0.9 ~ 1.1mm (0.035 ~ 0.043in)	• • •
Valve margin thickness D	0.7mm (0.030in)	
Intake Exhaust	0.7mm (0.028in) 1.0mm (0.039in)	•••
Valve stem diameter	1.011111 (0.037111)	•••
Intake	4.970 ~ 4.985mm	4.940mm
ano	(0.1956 ~ 0.1963in)	(0.1945in)
Exhaust	4.955 ~ 4.970mm	4.925mm
	(0.1951 ~ 0.1957in)	(0.1939in)
Valve guide inside diameter	,	,
Intake	5.000 ~ 5.012mm	5.050mm
	(0.1969 ~ 0.1973in)	(0.1988in)
Exhaust	5.000 ~ 5.012mm	5.050mm
	(0.1969 ~ 0.1973in)	(0.1988in)



Item	Standard	Limit	
Valve stem to valve guide clearance			
Intake	0.015 ~ 0.042mm	0.08mm	
	(0.0006 ~ 0.0017in)	(0.0031in)	
Exhaust	0.030 ~ 0.057mm (0.0012 ~ 0.0022in)	0.1mm (0.0039in)	
Valve stem runout	(0.0012 ~ 0.0022111)	0.01mm	
Taive stein raineat		(0.0004 in)	
		,	
Valve seat width	76		
Intake	0.9 ~ 1.1mm (0.035 ~ 0.043in)	1.6mm	
	Z.III	(0.063in)	
Exhaust	0.9 ~ 1.1mm (0.035 ~ 0.043in)	1.6mm (0.063in)	



Item	Standard	Limit
Valve springs Free length		
Intake	41.88mm (1.649in)	39.786mm (1.566in)
Exhaust	41.88mm (1.649in)	39.786mm (1.566in)
Installed length (valve closed)		
Intake	30mm (1.18in)	
Exhaust	30mm (1.18in)	
Compressed spring force (installed)	127 1570//202	
Intake	137 ~ 157N/mm	•••
	(13.97 ~ 16.01kgf/mm, 30.83 ~ 35.33lbf/in)	
Exhaust	137 ~ 157N/mm	
Exilaust	(13.97 ~ 16.01kgf/mm,	•••
	30.83 ~ 35.33lbf/in)	
Spring tilt	00.00 00.00121111	
—————————————————————————————————————	a die	
Intake  Exhaust	MM-SCOO	
Intake		2.5°/1.8mm
(0)		(2.5°/0.07in)
Exhaust		2.5°/1.8mm
200		(2.5°/0.07in)
Winding direction (top view)		
Intake	Clockwise	
Exhaust	Clockwise	
004		
Valvo coat reformed	Voc	
Valve seat reformed	Yes	•••
Cylinder	Command in allia and	
Cylinder arrangement	Forward inclined	•••
Para v stroka	single cylinder	
Bore × stroke Compression ratio	52.4 × 57.9mm (2.06 × 2.28in) 10:1	•••
Bore	52.40 ~ 52.41mm	•••
Doic	(2.0630 ~ 2.0634in)	•••
Maximum taper	(2.0030 - 2.0034111)	0.05mm
Maximum tapor		(0.002in)
Maximum out-of-round		0.05mm
		(0.002in)



Item	Standard	Limit
Piston		
Piston-to-cylinder clearance	0.010 ~ 0.035mm	0.15mm
1 Islon-to-cyllinder clearance	(0.0004 ~ 0.0014in)	(0.0059in)
Diameter D	52.375 ~ 52.390mm	
		•••
	(2.0620 ~ 2.0626in)	
→ <del>-</del>		
\ <u>\</u>		
/ <del>-</del> D/	7 Omers (0.20in)	
Height H	7.0mm (0.28in)	•••
Piston pin bore (in the piston)	15.002 15.012	15.042
Diameter	15.002 ~ 15.013mm	15.043mm
05.	(0.5906 ~ 0.5911in)	(0.5922in)
Offset	0.35 ~ 0.65mm	•••
05	(0.0138 ~ 0.0256in)	
Offset direction	Intake side	
Piston pin	0	
Outside diameter	14.995 ~ 15.000mm	14.975mm
	(0.5904 ~ 0.5906in)	(0.5896in)
Piston rings	13.	
Top ring	3	
Ping type		
Diam to make	Damal	
King type	Barrel	•••
Dimensions (B × T)	1.0 × 2.1mm	•••
End gon (installed)	(0.0394 × 0.0827in)	0.50000
End gap (installed)	0.10 ~ 0.25mm	0.50mm
Ping side clearance	(0.0039 ~ 0.0098in)	(0.0197in)
Ring side clearance	0.02 ~ 0.08mm	0.13mm
2 and size as	(0.0008 ~ 0.0031in)	(0.0051in)
2nd ring		
В		
T		
Ring type	Taper	
Dimensions (B × T)	1.0 × 2.1mm	•••
Dimonsions (D × 1)	(0.0394 × 0.0827in)	•••
End gap (installed)	0.25 ~ 0.40mm	0.75mm
Life gap (installed)	(0.0098 ~ 0.0157in)	(0.0295in)
Ring side clearance	0.02 ~ 0.06mm	0.0295iii) 0.12mm
Taing side clearance	(0.0008 ~ 0.0024in)	(0.0047in)
	(0.0000 ~ 0.0024111)	(0.0047111)



Item	Standard	Limit
Oil ring		
B		
Dimensions (B × T)	2.0 × 2.5mm (0.0787 × 0.0984in)	
End gap (installed)	0.2 ~ 0.7mm	
Ring side clearance	(0.0079 ~ 0.0276in) 0.04 ~ 0.12mm (0.0016 ~ 0.0047in)	



Item	Standard	Limit
Rocker arm/rocker arm shaft		
Rocker arm inside diameter	10.000 ~ 10.015mm	
	(0.3937 ~ 0.3943in)	
Rocker arm shaft outside diameter	9.981 ~ 9.991mm	
Arm-to-shaft clearance	(0.3930 ~ 0.3933in) 0.009 ~ 0.034mm	
Anni-to-shall clearance	(0.009 ~ 0.03411111 (0.0004 ~ 0.0013in)	
Connecting rod	·	
Connecting rod length	93.45 ~ 93.55mm	
	(36.791 ~ 36.831in)	
Small end inside diameter	15.015 ~ 15.028mm	
	(0.591 ~ 0.592in)	
Crankshaft		
C C	in the same	
	ש	
	000	
A D	500	
Width A	45.45 ~ 45.50mm	
in the second se	(1.789 ~ 1.791in)	
Maximum runout C		0.03mm
		(0.0012in)
Big end side clearance D	0.15 ~ 0.45mm	
Pig and radial clearance E	(0.006 ~ 0.018in) 0 ~ 0.01mm (0 ~ 0.0014in)	
Big end radial clearance E	0 ~ 0.0111111 (0 ~ 0.0014111)	•••
Clutch Clutch type	Automatic centrifugal	
Clutch type  Clutch shoe thickness	3.2mm ~ 3.5mm (0.13~0.14in)	2.0mm
Cidion sinds unistings	9.2	(0.079in)
Clutch shoe spring free length	28.5mm (1.12in)	
Clutch housing inside diameter	120mm (4.72in)	120.5mm
		(4.74in)
Compression spring free length	108mm (4.25in)	10 5
Weight outside diameter	20mm (0.79in)	19.5mm (0.77in)
Clutch-in revolution	2700 ~ 3300r/min	(0.77111)
Clutch-stall revolution	5150 ~ 6150r/min	
V-belt		
V-belt width	22mm (0.87in)	19.8mm
		(0.78in)



Item	Standard	Limit
Transmission		
Transmission type	V-belt automatic	
Primary reduction system	Helical gear	
Primary reduction ratio	40/15 (2.667)	
Secondary reduction system	Spur gear	
Secondary reduction ratio	44/11 (4.0)	
Single speed automatic	2.398 ~ 0.823:1	
Maximum main axle runout	l	0.04mm
		(0.002in)
Maximum drive axle runout		0.04mm
		(0.002in)
Air filter	*	
Туре	Wet element	
Fuel pump	0.	
Pump type	Electrical	
Model (manufacturer)	5S9 (AISAN)	
Maximum consumption amperage	1.9A	
Output pressure	250kPa (2.5kgf/cm², 35.6psi)	
Throttle body	60	
Model (manufacturer) × quantity	AC24-7 (AISAN) × 1	
Throttle cable free play	3 ~ 5mm (0.12 ~ 0.20in)	
(at the flange of the throttle grip)		
ID mark	5S91 00	
Engine idling speed	1700 ~ 1900r/min	
Carbon monoxide density (exhaust pipe)	1.0% or less	
Carbon monoxide density (tail pipe)	1.0% or less	
Oil temperature	70 ~ 110°C (158 ~ 230°F)	

## CHASSIS SPECIFICATIONS SPEC



### **CHASSIS SPECIFICATIONS**

Frame         Steel tu           Frame type         Steel tu           Caster angle         27°           Trail         90mm (           Front wheel         Cast wheel           Wheel type         Cast wheel           Rim         Size           Material         Aluming	heel MT2.75	
Caster angle       27°         Trail       90mm (         Front wheel       Wheel type         Rim       Cast wheel         Size       J12 × M	(3.54in) heel MT2.75	
Trail 90mm (  Front wheel Wheel type Rim Size J12 × N	heel MT2.75	
Front wheel Wheel type Rim Size  J12 × N	heel MT2.75	
Wheel type Rim Size  Cast with the state of	ИТ2.75	
Rim Size J12 × N	ИТ2.75	
Size J12 × N		•••
		•••
Material Aluminu	um (3.07in)	
	(3.07in)	• • •
Wheel travel 78mm (		
Wheel runout		
Maximum radial wheel runout	O.	1.0mm
	X.III.	(0.04in)
Maximum lateral wheel runout		1.0mm
	XO.	(0.04in)
Wheel axle bending limit	.00	0.25mm
6		(0.01in)
Rear wheel		
Wheel type Cast w	heel	
Rim		
Size J12 × N	ЛТ3.00	
Material Aluminu	um	
Wheel travel 71mm (	(2.80in)	
Wheel type Rim Size Material Wheel travel Wheel runout  Cast with the content of	` ,	
Maximum radial wheel runout		1.0mm
		(0.04in)
Maximum lateral wheel runout		1.0mm
207		(0.04in)
Front tire		·
Tire type Tubeles	SS	• • •
Size 120/70-		
	KENDA)	
Tire pressure (cold)	,	
· · · · · · · · · · · · · · · · · · ·	a (1.75kgf/cm², 25psi)	
	a (2.0kgf/cm², 29psi)	
Minimum tiro troad donth	(=.ong//on/ / 2/po//	0.8mm
iviiriiindin tire tread deptir		(0.03in)



Itom	Standard	Limit
Item	Standard	LIIIII
Rear tire		
Tire type	Tubeless	
Size	130/70-12 56L	
Model (manufacturer)	K761 (KENDA)	
Tire pressure (cold)		
0 ~ 90kg (0 ~ 198lb)	200kPa (2.0kgf/cm², 29psi)	
90kg (198lb)~ maximum load	225kPa (2.25kgf/cm², 33psi)	
Minimum tire tread depth		0.8mm
		(0.03in)
Front brake		
Brake type	Single-disc brake	
Operation	Right-hand operation	
Recommended fluid	DOT 4	
Brake disc		
Diameter × thickness	220 × 4.0mm (8.66 × 0.16in)	220 × 3.5mm
		(8.66 × 0.14in)
Minimum thickness		3.5mm
	O.L.	(0.14in)
Maximum deflection		0.15mm
	5	(0.006in)
Brake pad lining thickness-inner	5.8mm (0.23in)	0.8mm
	3	(0.03in)
Brake pad lining thickness-outer	5.8mm (0.23in)	0.8mm
	,	(0.03in)
Master cylinder inside diameter	11mm (0.43in)	
Caliper cylinder inside diameter	35mm (1.38in)	
Rear brake	(2,	
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	150mm (5.91in)	151mm
Diake ululii liiside dialiletei	130(1)(1)	(5.94in)
Lining thicknose	4.0mm (0.16in)	1.0mm
Lining thickness	4.011111 (0.1011)	(0.04in)
		(0.04111)
Steering system		
Steering bearing type	Angular bearing	
Lock to lock angle (left)	48°	
Lock to lock angle (right)	48°	



		•
Item	Standard	Limit
Front suspension		
Suspension type	Telescopic	
Front fork type	Coil spring/oil damper	
Front fork travel	90mm (3.54in)	
Spring		
Free length	252.1mm (9.93in)	247mm
		(9.72in)
Installed length	230.9mm (9.09in)	
Spring rate (K1)	7.1N/mm (0.72kgf/mm,	
	1.60lbf/in)	
Spring rate (K2)	15.4N/mm (1.57kgf/mm,	
	3.47lbf/in)	
Spring stroke (K1)	0 ~ 66.7mm (0 ~ 2.63in)	
Spring stroke (K2)	66.7 ~ 90mm (2.63 ~ 3.54in)	
Optional spring available	No	
Fork oil	Z.III.	
Recommended oil	Fork oil 10W or equivalent	
Quantity (each front fork leg)	0.104L (0.11 US qt,	
<b>3</b> .	0.09 Imp. qt)	
Inner tube outer diameter	33mm (1.30in)	
Inner tube bending limit	4.	0.2mm
Ğ	and the same of th	(0.008in)
Rear suspension		
Suspension type	Unit swing	
Rear shock absorber assembly type	Coil spring/oil damper	
Rear shock absorber assembly travel	70mm (2.76in)	
Spring		
Free length	235mm (9.25in)	
Installed length	224mm (8.82in)	
Installed length Spring rate (K1)	9.3N/mm (0.95kgf/mm,	
004	2.09lbf/in)	
Spring rate (K2)	13.15N/mm (1.34kgf/mm,	
	2.96lbf/in)	
Spring rate (K3)	19.23N/mm (1.96kgf/mm,	
	4.33lbf/in)	
Spring stroke (K1)	0 ~ 24mm (0 ~ 0.94in)	
Spring stroke (K2)	24 ~ 54mm (0.94 ~ 2.13in)	
Spring stroke (K3)	54 ~ 70mm (2.13 ~ 2.76in)	
Optional spring available	No	

# ELECTRICAL SPECIFICATIONS SPEC





### **ELECTRICAL SPECIFICATIONS**

Item	Standard	Limit
System voltage	12V	
Ignition system Ignition system type Ignition timing Advancer type Pickup coil resistance/color	Transistorized coil ignition 5° BTDC at 1800r/min Digital 248 ~ 372Ω at 20°C (68°F) /white/red - white/blue	
Ignition coil  Model (manufacturer)  Minimum ignition spark gap  Primary coil resistance  Secondary coil resistance  Spark plug cap  Material	2JN (T-MORIC) 6mm (0.24in) 2.16 ~ 2.64Ω at 20°C (68°F) 8.64~12.96Ω at 20°C (68°F)	
Resistance	8 ~ 12kΩ at 20°C (68°F)	
Charging system System type Model (manufacturer) Nominal output Stator coil resistance/color	AC magneto 5S9 (T-MORIC) 14V 170W/5000r/min 0.56 ~ 0.84Ω at 20°C (68°F) /white - white	
Rectifier/regulator  Model (manufacturer)  No load regulated voltage  Rectifier capacity	SH640E-11 (TAIGENE) 14.1 ~ 14.9V 25A	
Battery Battery type (manufacturer) Battery voltage capacity Specific gravity Ten hour rate amperage	YT7B-BS (YUASA) 12V 6.5AH 1.340 6.5AH	
Headlight type	Halogen bulb	
Indicator light (voltage/wattage × quantity) Turn signal indicator light High beam indicator light Engine trouble warning light	12V 1.7W × 1 12V 1.7W × 1 12V 1.7W × 1	
Bulbs (voltage/wattage × quantity) Headlight Tail/brake light Front turn signal light Rear turn signal light Speedometer light	12V 60W/55W × 2 12V 5W/21W × 1 12V 10W × 2 12V 10W × 2 12V 1.7W × 2	

# ELECTRICAL SPECIFICATIONS SPEC U



Itom	Standard	Limit
Item	Statiualu	LIIIIII
Electric starting system		
System type	Constant mesh	
Starter motor		
Model (manufacturer)	5S9 00 (T-MORIC)	
Suction voltage	12V	
Power output	0.35kW	
Brushes		
Overall length	10.0mm (0.39in)	3.5mm
		(0.14in)
Quantity	2	
Spring force	5.52 ~ 8.28N/mm	
	(0.56 ~ 0.84kgf/mm,	
	1.24 ~ 1.86lbf/in)	
Commutator diameter	22mm (0.87in)	21mm
		(0.83in)
Commutator resistance	$0.0252 \sim 0.0308\Omega$	
	at 20°C (68°F)	
Mica undercut (depth)	1.5mm (0.06in)	
Starter relay		
Model (manufacturer)	5S9 00 (SHIHLIN)	
Amperage	100A	
Coil resistance	$3.6 \sim 4.4\Omega$	
Suction voltage	DC8V	
Horn Horn type Model (manufacturer) Maximum amperage		
Horn type	Plane	
Model (manufacturer)	YF-12 (NIKKO)	
Maximum amperage	3A	
Performance	105 ~ 120dB/2m	
Coil resistance	1.15 ~ 1.25Ω	
Turn signal relay		
Relay type	Condenser	
Model (manufacturer)	5XN4 (OMRON)	
Self-cancelling device built-in	NO	
Turn signal blinking frequency	70 ~ 100cycles/min	
Wattage	10W × 2 + 3.4W	
Fuse (amperage × quantity)		
Main fuse	20A × 1	
Ignition fuse	10A × 1	
Signaling system fuse	15A × 1	
Fuel injection system fuse	10A × 1	
Headlight fuse	10A × 1	
Spare fuse	20A, 15A, 10A × 1	

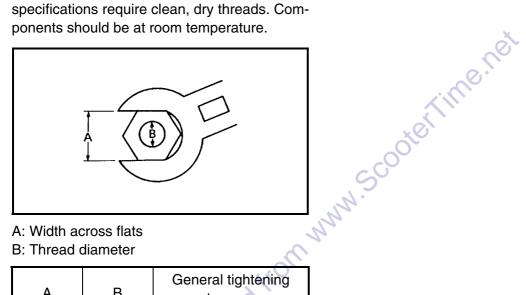
# ELECTRICAL SPECIFICATIONS SPEC



Item	Standard	Limit
Fuel sender  Model (manufacturer)  Sender unit resistance-full  Sender unit resistance-empty	5S9 (AISAN) 4 ~ 10Ω 90 ~ 100Ω	
Fuel level gauge Gauge type (manufacture)	Analog (CHAOLONG)	
Starting circuit cut-off relay Model (manufacturer) Coil resistance Diode	4HC1 (MATSU SHITA) 72 ~ 88Ω YES	
Headlight relay Model (manufacturer) Coil resistance Diode	4HM-20 (OMRON) 90 ~ 110Ω YES	
Engine temperature sensor  Model (manufacturer)  Coil resistance at 100°C (212°F)	4P91 (PANASONIC) 0.210 ~ 0.221kΩ	
Intake air pressure sensor Output voltage	0.789 ~ 4.0V	
Intake air temperature sensor Coil resistance/color	6kΩ at 0°C (32°F)/ brown-white/black-blue	
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	20Ω at 20°C (68°F)/ pink-green/yellow or gray-sky blue	
Lean angle cut-off switch Voltage Less than 45° More than 45°	0.4V 1.4V	
O <sub>2</sub> sensor Model (manufacturer) Coil resistance	1B91(DENSO) 11.7 ~ 15.5Ω at 20°C (68°F)	 

#### **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)	Gene	eral tighte torques	_
(Hat)	(BOIL)	Nm	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 SPEC U





#### **TIGHTENING TORQUES ENGINE**

Part to be tightened	Part name	t name Thread size		Tightening torque			Remarks	
-		Size		Nm	m•kgf	ft•lbf		
Cylinder head and cylinder	Nut	M8	4	22	2.2	15.9	<b>4</b>	
Spark plug	-	M10	1	13	1.3	9.4	<u> </u>	
Cylinder head (timing chain side)	Bolt	M6	2	12	1.2	8.7		
Exhaust pipe stud bolt	-	M8	2	13	1.3	9.4		
Breather	Bolt	M6	2	7	0.7	5.1		
Valve cover	Bolt	M6	6	7	0.7	5.1		
Stopper plate (camshaft)	Bolt	M6	1	12	1.2	8.7		
Guide stopper 2	Bolt	M6	1	7	0.7	5.1		
Valve clearance adjusting screw lock nu	t -	M5	4	7	0.7	5.1		
Camshaft sprocket	Bolt	M8	1	30	3.0	21.7		
Timing chain tensioner (body)	Bolt	M6	2	9	0.9	6.5		
Timing chain tensioner (plug)	Plug	M8	1	8	0.8	5.8		
Air shroud cylinder 1 and 2	Screw	6.0	05	2	0.2	1.4		
Air shroud cylinder 2 and 3	Screw	6.0	1	2	0.2	1.4		
Air shroud cylinder 3	Screw	M6	3	7	0.7	5.1		
Fan	Bolt	M <sub>6</sub>	4	9	0.9	6.5		
Guide	Screw	6.0	3	2	0.2	1.4		
Oil pump	Screw	M5	2	4	0.4	2.9		
Engine oil drain plug	0	M30	1	20	2.0	14.5		
Intake manifold	Bolt	M6	2	10	1.0	7.2		
Intake manifold Air filter Fuel injector Intake manifold side band Air filter side band Protector Exhaust pipe Muffler	Screw	M6	2	7	0.7	5.1		
Fuel injector	Bolt	M6	1	12	1.2	8.7		
Intake manifold side band	Band	M4	1	3	0.3	2.2	Touching collar stop.	
Air filter side band	Band	M4	1	3	0.3	2.2		
Protector	Bolt	M6	4	10	1.0	7.2	<b>-</b> [LT]	
Exhaust pipe	Nut	M8	2	13	1.3	9.4	7	
Muffler	Bolt	M10	1	53	5.3	38.3		
Muffler	Bolt	M8	2	31	3.1	22.4		
Crankcase (left and right)	Bolt	M6	8	13	1.3	9.4		
Crankcase (left and right)	Bolt	M6	1	13	1.3	9.4		
V-belt case	Bolt	M6	8	11	1.1	8.0		
Crankcase cover (right)	Bolt	M6	6	10	1.0	7.2		
Cover 1 (magneto base)	Bolt	M6	2	13	1.3	9.4	Crankcase (left and	
Cover 1 (magneto base)	Bolt	M6	1	13	1.3	9.4	right) together tightening.	
V-belt case cover	Screw	M6	3	7	0.7	5.1		
V-belt case cover	Bolt	M6	2	7	0.7	5.1		
Cylinder stud bolt	-	M8	4	13	1.3	9.4		
Drain bolt (transmission oil)	_	M8	1	23	2.3	16.6		
Drain bolt (transmission oil)	_	M12	1	20	2.0	14.5		
Guide element	Screw	M6	1	7	0.7	5.1		

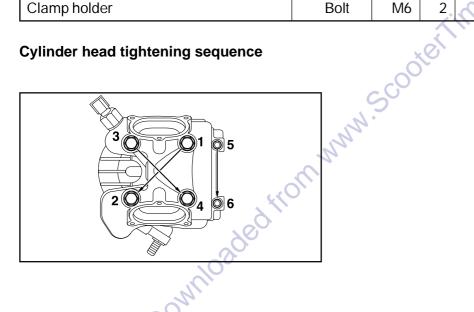
## TIGHTENING TORQUES SPEC





Part to be tightened	Part name Thread size		Qʻty	Tightening torque			Remarks
				Nm	m•kgf	ft•lbf	
Plate (V-belt guide)	Bolt	M6	4	10	1.0	7.2	
Idle gear plate	Bolt	M6	2	10	1.0	7.2	
Plate	Bolt	M6	1	10	1.0	7.2	
Clutch housing	Nut	M14	1	60	6.0	43.4	
Primary fixed sheave	Nut	M12	1	45	4.5	32.5	
Starter motor	Bolt	M6	2	7	0.7	5.1	
AC magneto rotor	Nut	M12	1	70	7.0	50.6	
Stator coil	Screw	M6	3	7	0.7	5.1	<b>-</b>
Crankshaft position sensor	Screw	M6	2	7	0.7	5.1	_
Ignition coil	Screw	M6	2	7	0.7	5.1	
O <sub>2</sub> sensor	-	M18	1	44	4.4	31.8	
Engine temperature sensor	-	M10	1	18	1.8	13.0	Do not use the air impact wrench to tight.
Clamp holder	Bolt	M6	2	10	1.0	7.2	. •

### Cylinder head tightening sequence



# TIGHTENING TORQUES SPEC U





#### **CHASSIS**

Part to be tightened		1	ghtenin orque	g	Remarks
	size	Nm	m•kgf	ft•lbf	
Frame and engine bracket 2	M10	32	3.2	23.1	
Engine bracket 2, compression rod and engine	M10	32	3.2	23.1	
Compression rod and frame	M10	32	3.2	23.1	
Sidestand (bolt and stand)	M10	9	0.9	6.5	
Sidestand (bolt and nut)	M10	40	4.0	28.9	
Centerstand	M8	23	2.3	16.6	
Swingarm	M8	31	3.1	22.4	
Rear shock absorber and frame	M10	30	3.0	21.7	
Rear shock absorber and engine	M8	18	1.8	13.0	
Steering ring shaft	M25				See"TIP"
Handlebar and steering shaft	M10	60	6.0	43.4	
Brake hose and master cylinder	M10	26	2.6	18.8	
Speedometer and speedometer cable	M12	4	0.4	2.9	
Speedometer gear and speedometer cable	M12	4	0.4	2.9	
Handlebar bracket and handlebar holder	M10	48	4.8	34.7	
Upper handlebar holder		28	2.8	20.3	
Handlebar bracket	M10	60	6.0	43.4	
Master cylinder holder	M6	9	0.9	6.5	
Fuel tank	№ M6	10	1.0	7.2	
Trunk	M6	7	0.7	5.1	
Seat hinge	M6	7	0.7	5.1	
Seat lock assembly	M6	7	0.7	5.1	
Fuel pump bracket	M5	4	0.4	2.9	
Resin part and resin cover	About M5	1.5	0.15	1.1	
Fuel tank Trunk Seat hinge Seat lock assembly Fuel pump bracket Resin part and resin cover Front fender Leg shield assembly	M6	5	0.5	3.6	
		7	0.7	5.1	
Footrest board	M6	7	0.7	5.1	
Front wheel shaft	M12	70	7.0	50.6	
Rear wheel shaft	M14	105	10.5	75.9	
Rear brake camshaft lever	M6	10	1.0	7.2	
Rear brake pin pivot	M10	32	3.2	23.1	
Front brake caliper	M10	49	4.9	35.4	
Front brake disc rotor	M8	23	2.3	16.6	
Brake hose and front brake caliper	M10	26	2.6	18.8	
Front brake caliper and bleed screw	M7	6	0.6	4.3	

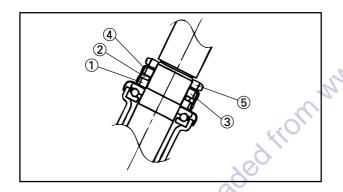
### TIGHTENING TORQUES





#### TIP\_

- 1. First, tighten the ring nut (lower) approximately 38Nm (3.8m kgf, 27.5ft lbf) by using the torque wrench, then loosen the ring nut 1/4 turn.
- 2. Second, tighten the ring nut (lower) approximately 14Nm (1.4m kgf, 10.1ft lbf) by using the torque wrench.
- 3. Installing the rubber washer.
- 4. Then finger tighten the center ring nut and touch rubber washer. Align the slots both ring nut and install the lock washer.
- 5. Final, hold the ring nuts (lower and center) and tighten the ring nut (upper) 75Nm (7.5m kgf, 54.2ft lbf) by using the torque wrench.
- 6. Confirm, adjust the direction handlebar to the right direction, front wheel suspend. Push direction handlebar lightly with the finger approxomately 0.15Nm (0.015m kgf, 0.11ft lbf) , direction handlebar should turn slowly without interfrence or hindrance.



- ① Lower ring nut
- (2) Rubber washer
- 3 Center ring nut
- 4 Lock washer
- ⑤ Upper ring nut

# LUBRICATION POINTS AND LUBRICANT TYPES SPEC





#### **LUBRICATION POINTS AND LUBRICANT TYPES ENGINE**

Lubrication Point	Lubricant
Oil seal lips	LS
Bearings	-4
O-rings (except V-belt drive unit)	
O-rings (fuel injector)	-4
Cylinder head tightening nut mounting surface	-4
Cylinder head stud bolt thread	-4
Cylinder head nut	-4
Cylinder head gasket dowel pin	-4
Crankshaft pin outside surface	-4
Crankshaft journals	-4
Connecting rod big end thrust surface	-4
Piston and piston rings	-4
Piston pin and connecting rod small end	-4
surface and bolt thread	<b>4</b>
Piston (balancer) outside surface	-4
Piston pin (balancer) outside surface	<b>4</b>
Rocker arm shaft outside surface (intake and exhaust)	
Rocker arm shaft and rockor arm	
Camshaft lobes	<b>4</b>
Camshaft journals	<b>4</b>
Valve stems (intake and exhaust)	
Valve stem seals (intake and exhaust)	
Valve stem ends (intake and exhaust)	<b>4</b>
Oil pump inside surface	-4
Oil pump shaft	<b>—4</b>
V-belt case dowel pin	LS
Starter clutch pin and weight	
Idle gear 1 thrust surface	-4
Idle gear 2	<b>4</b>

## LUBRICATION POINTS AND LUBRICANT TYPES SPEC



Lubrication Point	Lubricant
Main and drive axle serration (sprocket)	<b>–©</b>
Drive axle taper rollor bearing	
Transmission bearing	<b>⊸</b> (G
Secondary fixed sheave inner surface	BEL-RAY asembly lube®
Secondary sliding sheave torque cam ditch	BEL-RAY asembly lube®
Crankcase mating surfaces	Yamaha bond NO.1215

Downloaded from www. Scooter lime. Ret

### LUBRICATION POINTS AND LUBRICANT TYPES



EAS00032

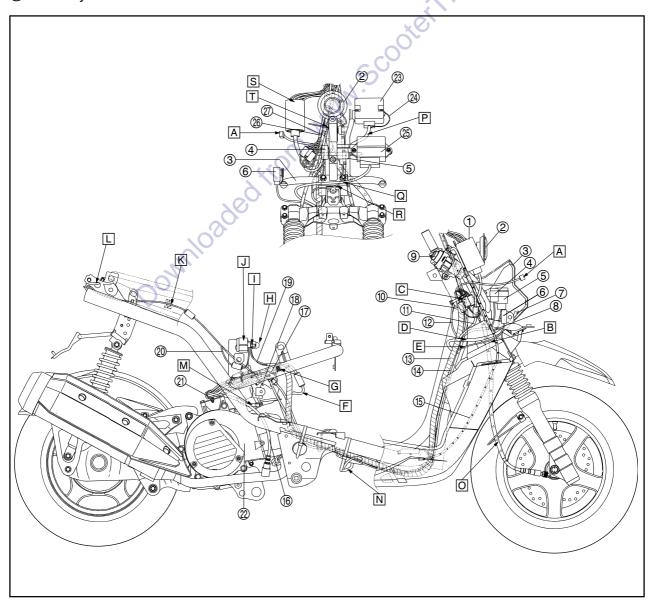
#### **CHASSIS**

Lubrication Point	Lubricant
Engine mounting bolt	
Steering bearing and bearing races (upper and lower)	LS
Throttle grip inner surface and throttle cables	LS
Rear brake lever pivoting point and metal-to-metal moving parts	LS
Rear brake cable and brake lock lever (cable connection area)	Ls
Front wheel oil seal	LS
Front wheel axle	LSD
Speedometer gear unit	LS
Rear wheel axle	LS
Sidestand pivoting point and sliding surface metal-to-metal moving parts and	S
bolt outer surface	
Centerstand shaft pivoting point and metal-to-metal moving parts	LS
Centerstand stopper pivoting point	LS
Centerstand and sidestand spring hook metal-to-metal moving parts	LS
Caliper piston seal	
Rubber parts inside the master cylinder	
Caliper piston dust seal	<b>S</b>
Front brake lever retaining bolt	
Sliding area between brake lever and master cylinder	
Caliper bracket slide pins and/or retaining bolt	

EAS00035

- Connector cover
- ② Horn
- 3 Front bracket
- A Starting circuit cut-off relay
- 5 Turn signal relay
- 6 Headlight relay
- 7 ECU lead
- Turn signal relay lead
- Main switch
- (10) Horn lead
- (1) Main switch lead
- Rectifier/regulator lead
- Wire harness
- (4) Throttle cable assembly
- (5) Seat lock cable
- 16 O<sub>2</sub> sensor lead
- Tuel injector lead

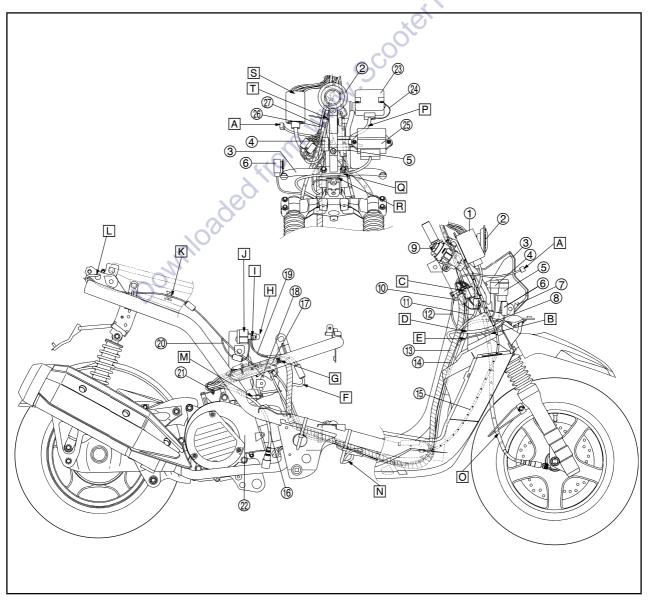
- ® Engine temperature sensor lead
- (9) Positive wire lead
- Starter relay lead
- ② Clamp (90464-25803)
- Air shroud cylinder 2
- ② Rectifier/regulator
- (24) Body earth lead
- 25 ECU
- Speedometer lead
- ② Left lever holder lead
- After connect the headlight coupler, lead do not touch horn.
- B Speedometer cable passes through the right hole of inner fender.
- © Five couplers of speedometer lead and lever holder.
- D ECU lead passes by the right side of the inner fender rib.





- E Headlight relay lead passes by the right side of inner fender rib.
- F Start relay sub lead to forward.
- G Orientation: white tape.
- H Totally cover the terminal after locking.
- Torque: 4Nm (0.4m kgf, 2.9ft lbf).
- J Starter relay inserts into holder certainly.
- K After connecting, press lead of tail/brake light into the holder on side cover.
- Seat lock cable passes through the hole of seat bracket 1.
- M Pipe 11 passes by the open hole of air shroud cylinder 2.
- N Fuse box passes under the wire harness.
- Speedometer cable passes through the wire holder.
- P Rectifier/regulator lead passes by the back of the head pipe.
- Q ECU lead passes under of the front bracket.

- R Turn signal relay lead passes under of the front bracket.
- S After connecting, put the front signal light coupler (left and right), brake light switch coupler (front and rear) and right handlebar switch lead coupler in the connector cover. Connector cover hold to leg shield 2 rib.
- Band the speedometer cable stopper in the top and white tape range of left lever holder lead.

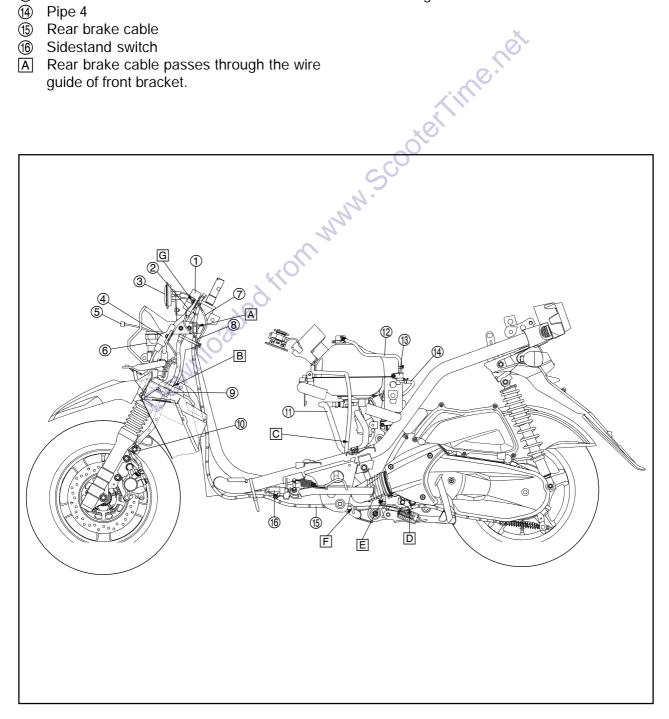


## CABLE ROUTING SPEC



- Rectifier/regulator
- Body earth lead
- 3 Horn
- ECU
- Headlight lead
- Turn signal relay
- Horn lead
- Rectifier/regulator lead
- Brake hose holder 3
- Brake hose holder 1
- Fuel hose (11)
- (12) Pipe 3
- Roll over valve
- Pipe 4
- Rear brake cable
- Sidestand switch
- A Rear brake cable passes through the wire guide of front bracket.

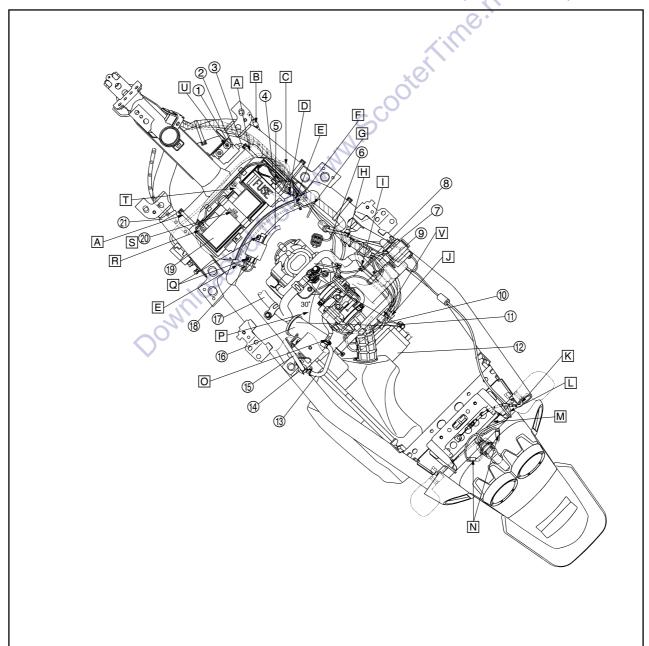
- Brake hose passes through the left hole of inner fender.
- C Locate the end of gasoline overflow pipe at between frame and air duct.
- D Rear brake holder 2 holds the rear brake cable and covers the ultrasonic weld mark at the PVC protector.
- **E** Locate at between compression rod and air
- F Rear brake cable passes through the wire quide.
- G Tightening the body earth terminal and rectifier/regulator.





- 1) Plain washer
- ② Lean angle cut-off switch
- 3 Lean angle cut-off switch lead
- 4 FI diagnostic tool
- ⑤ Hight tension cord
- 6 Fuel pump lead
- (7) Engine temperature sensor lead
- 8 Fuel injector lead
- 9 Clamp (90464-13800)
- Starter motor positive lead
- (1) Starter motor negative lead
- Starter motor
- (13) Pipe 4
- (4) Roll over valve
- (15) Pipe 3
- (16) Canister

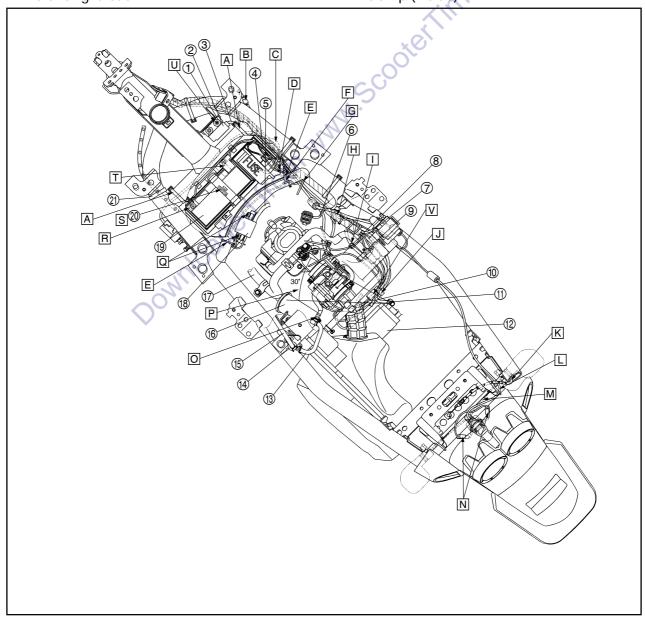
- 17) Fuel hose
- (8) Ignition coil
- Battery
- ② Battery band
- ② Clamp (90464-12812)
- Fasten the sidestand switch lead to the frame with a plastic locking tie, point the band tip to down of car body.
- B Seat lock cable inserts into the right hole of frame, and the protector must be at the hole.
- C Fuse box lead passes under the wire harness.
- D Pass the positive and negative battery leads through the slot in the footrest board, leads and wire harness do not twine.
- E Do not cut off, point the band tip to down.





- F Ignition coil lead passes under the cross tube.
- G Pass the throttle cable assembly through wire guide.
- H Locate the white tape of wire harness in the holder.
- $\square$  Clamp (90464-10800) the O<sub>2</sub> sensor lead.
- Clamp (90464-25803) the starter motor lead, AC magneto lead, ISC (idle speed control) valve lead, sensor module (MAQS) lead, fuel injector lead and O<sub>2</sub> sensor lead.
- K Seat lock cable passes through the hole of seat bracket.
- Tail/brake light lead pass under the seat lock cable.
- M Turn signal light lead pass through the hole at license bracket and combine with tail/ brake light lead.

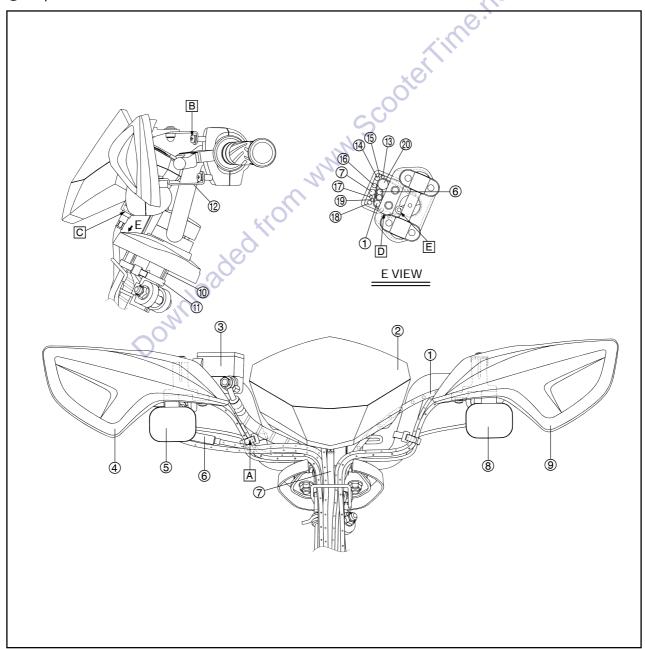
- N After combining the couplers, insert them into the sockets at tail/brake light.
- O Yellow mark to up of pipe 11.
- Assembly range of starter motor negative lead terminal.
- Q Torque: 7Nm (0.7m kgf, 5.1ft lbf).
- R The terminal of battery negative pole (black lead) shall tough the left surface of battery box at least.
- S Battery band buckles the rear side and then front.
- The terminal of battery positive pole (red lead) shall be aimed at the center of mark "(+)" at footrest board.
- U Torque: 5Nm (0.5m ⋅ kgf, 3.6ft ⋅ lbf).
- After combining the fuel injector coupler, align the coupler (forward side) with the clamp (inside).





- Rear brake cable
- ② Speedometer
- 3 Front master cylinder
- ④ Brush guard (right)
- ⑤ Turn signal light (right)
- 6 Throttle cable assembly
- (7) Speedometer cable
- Turn signal light (left)
- Brush guard (left)
- ① Handlebar bracket
- ① Clamp (90464-12812)
- ② Bracket
- Turn signal light lead (right)
- (4) Right handlebar switch lead
- (f) Front brake light switch lead
- Speedometer lead

- Rear brake light switch lead
- (8) Left lever holder lead
- Turn signal light lead (left)
- ② Brake hose
- A Fasten the right handlebar switch lead, front brake light switch lead and right turn signal light lead to the handlebar.
- **B** Upper screw tighten first.
- C Torque: 4Nm (0.4m kgf, 2.9ft lbf).
- D Band holds the wires and hoses with finger clearance, and cut off the surplus until 5mm left. Band is above the pin of handlebar bracket.
- E When assemble the lower handlebar holder, the position point is in the front.





## CHAPTER 3 PERIODIC CHECKS AND ADJUSTMENTS

PERIODIC MAINTENANCE AND ADJUSTMENT  Periodic maintenance chart for the emission control system 3-1 Genela maintenance and lublication chart 3-2 COVER AND PANEL 3-4 SEAT AND TRUNK 3-4 FOOTREST BOARD 3-5 LEG SHIELD 1 ASSEMBLY AND LEG SHIELD 2 3-7 ENGINE 3-9 ADJUSTING THE VALVE CLEARANCE 3-9 CHECKING THE ENGINE IDLING SPEED 3-12 ADJUSTING THE THROTTLE CABLE FREE PLAY 3-13 ADJUSTING THE SEAT SPRING FORCE 3-14 CHECKING THE SPARK PLUG 3-15
Genela maintenance and lublication chart
COVER AND PANEL  SEAT AND TRUNK  FOOTREST BOARD  LEG SHIELD 1 ASSEMBLY AND LEG SHIELD 2  ADJUSTING THE VALVE CLEARANCE  CHECKING THE ENGINE IDLING SPEED  ADJUSTING THE THROTTLE CABLE FREE PLAY  ADJUSTING THE SEAT SPRING FORCE  CHECKING THE SPARK PLUG  3-4  3-4  3-4  3-7  3-7  3-7  3-7  3-7
SEAT AND TRUNK 3-4 FOOTREST BOARD 3-5 LEG SHIELD 1 ASSEMBLY AND LEG SHIELD 2 3-7 ENGINE 3-9 ADJUSTING THE VALVE CLEARANCE 3-9 CHECKING THE ENGINE IDLING SPEED 3-12 ADJUSTING THE THROTTLE CABLE FREE PLAY 3-13 ADJUSTING THE SEAT SPRING FORCE 3-14 CHECKING THE SPARK PLUG 3-15
FOOTREST BOARD
LEG SHIELD 1 ASSEMBLY AND LEG SHIELD 2
ADJUSTING THE VALVE CLEARANCE
CHECKING THE ENGINE IDLING SPEED
CHECKING THE ENGINE IDLING SPEED
CHECKING THE ENGINE IDLING SPEED
ADJUSTING THE SEAT SPRING FORCE
CHECKING THE SPARK PLUG3-15
CHECKING THE SPARK PLUG
CHECKING THE IGNITION TIMING
MEASURING THE COMPRESSION PRESSURE 3-19
CHECKING THE ENGINE OIL LEVEL3-22
CHANGING THE ENGINE OIL
CHANGING THE TRANSMISSION OIL
MEASURING THE ENGINE OIL PRESSURE3-26
CLEANING THE AIR FILTER ELEMENT 3-28
CLEANING THE V-BELT CASE AIR FILTER ELEMENT 3-29
CHECKING THE THROTTLE BODY JOINT AND INTAKE
MANIFOLD
CHECKING THE FUEL HOSE3-30
CHECKING THE BREATHER HOSES 3-31
CHECKING THE EXHAUST SYSTEM3-32
CHECKING THE CANISTER AND ROLL OVER VALVE 3-33
CHASSIS3-35
CHECKING THE FRONT BRAKE3-35
ADJUSTING THE REAR BRAKE3-35
CHECKING THE BRAKE FLUID LEVEL 3-36
CHECKING THE FRONT BRAKE PADS 3-37
CHECKING THE REAR BRAKE SHOES 3-37
CHECKING THE FRONT BRAKE HOSE 3-37
BLEEDING THE HYDRAULIC BRAKE SYSTEM3-38
CHECKING AND ADJUSTING THE STEERING HEAD 3-40
CHECKING THE FRONT FORK3-42

CHK	40)
ADJ	M

CHECKING THE TIRES	
CHECKING THE WHEELS	
CHECKING AND LUBRICATING THE CABLES	
LUBRICATING THE LEVERS	3-47
LUBRICATING THE SIDESTAND	3-47
LUBRICATING THE CENTERSTAND	3-47
LUBRICATING THE REAR SUSPENSION	3-47
ELECTRICAL SYSTEM	
CHECKING AND CHARGING THE BATTERY	3-48
CHECKING THE FUSES	3-55
REPLACING THE HEADLIGHT BULBS	3-57
ADJUSTING THE HEADLIGHT BEAMS	3-58
REPLACING THE HEADLIGHT BULBSADJUSTING THE HEADLIGHT BEAMS	

EAS00036

#### 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.

#### PERIODIC MAINTENANCE AND ADJUSTMENT

EAU17570

Periodic maintenance chart for the emission control system

				INITIAL		ODO	METER REA	DING	
N	IO.	ITEM	ROUTINE	1000 km (600 mi) or 1 month	4000 km (2000 mi) or 6 months	7000 km (4000 mi) or 12 months	10000 km (6000 mi) or 18 months	13000 km (8000 mi) or 24 months	16000 km (10000 mi) or 30 months
1	*	Fuel line	Check fuel hoses for cracks or damage.     Replace if necessary.		<b>√</b>	7	<b>V</b>	V	<b>√</b>
2		Spark plug	Check condition. Adjust gap and clean. Replace at 7000 km (4000 mi) or 12 months and thereafter every 6000 km (4000 mi) or 12 months.		S O O	Replace.	V	Replace.	<b>√</b>
3	*	Valve clearance	Check and adjust valve clearance when engine is cold.	1	1	√	√	√	<b>√</b>
4	*	Crankcase breather system	Check breather hose for cracks or damage.     Replace if necessary.	NA	√	√	√	√	√
5	*	Fuel injection	Check engine idle speed.	1	√	√	√	√	<b>√</b>
6	*	Exhaust system	Check for leakage.     Tighten if necessary.     Replace gasket(s) if necessary.	<b>V</b>	V	<b>V</b>	<b>V</b>	V	V

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

### PERIODIC MAINTENANCE AND ADJUSTMENT



E A I 12211E

#### Genela maintenance and lublication chart

				INITIAL		ODO	METER REAL	DING	
NO.		ITEM	ROUTINE	1000 km (600 mi) or 1 month	4000 km (2000 mi) or 6 months	7000 km (4000 mi) or 12 months	10000 km (6000 mi) or 18 months	13000 km (8000 mi) or 24 months	16,000 km (10,000 mi) or 30 months
1		Air filter element • Replace.			<b>V</b>		<b>V</b>		<b>√</b>
2		V-belt case air filter element	• Clean		V	√	V	√	√
3	*	Front brake	Check operation, fluid level, and for fluid leakage.     Replace brake pads if necessary.	<b>√</b>	√	<b>V</b>	<b>√</b>	<b>V</b>	<b>√</b>
4	*	Rear brake	Check operation.     Adjust cable and replace brake shoes if necessary.	V	V	V	V	<b>V</b>	<b>V</b>
5	*	Brake hose	Check for cracks or damage.		√	√	√	√	V
			Replace.  Chapter was at and for domain.			Every 4	4 years		
6	*	Wheels	Check runout and for damage.     Replace if necessary.		√	√		√	√
7	*	Tires	Check tread depth and for damage.     Replace if necessary.     Check air pressure.     Correct if necessary.		1 1 8 1		√	<b>√</b>	
8	*	Wheel bearings	Check bearings for smooth operation.     Replace if necessary.		1	e v	$\sqrt{}$	$\checkmark$	√
9	*	Steering bearings	Check bearing assemblies for looseness. Moderately repack with lithium-soap-based grease every 13000 km (8000 mi) or 24 months.	1	Sapo	<b>V</b>	V	Repack.	<b>V</b>
10	*	Chassis fasteners	Check all chassis fitting and fasteners.     Correct if necessary.	NAN	1	<b>√</b>	<b>V</b>	<b>V</b>	<b>√</b>
11		Front brake lever pivot shaft	Apply silicone grease lightly.		√	√	√	√	√
12		Rear brake lever pivot shaft	Apply lithium-soap-based grease lightly.		<b>√</b>	√	√	<b>V</b>	√
13	*	Centerstand and sidestand pivots	Check operation.     Apply lithium-soap-based grease lightly.		<b>√</b>	V	V	<b>√</b>	<b>V</b>
14	*	Sidestand switch	Check operation and replace if necessary.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	√
15	*	Front fork	Check operation and for oil leakage.     Replace if necessary.		$\checkmark$	√	V	<b>√</b>	√
16	*	Shock absorber assemblies	Check operation and for oil leakage.     Replace if necessary.		<b>√</b>	<b>V</b>	<b>√</b>	<b>V</b>	<b>√</b>
17		Engine oil	Change (warm engine before draining).     Check oil level and vehicle for oil leakage.	<b>√</b>	<b>√</b>	<b>V</b>	<b>V</b>	<b>V</b>	√
18	*	Engine oil strainer	Clean.	V		√		√	
19		Final transmission oil	Check vehicle for oil leakage.     Change.	<b>V</b>		<b>V</b>		<b>V</b>	
20	*	V-belt	Replace.			Every 18000 l	km (12000 mi)		
21	*	Front and rear brake switches	Check operation.	V	V	<b>V</b>	V	<b>V</b>	√
22	*	Control and meter cables	Apply Yamaha chain and cable lube or engine oil thoroughly.	V	V	<b>V</b>	V	<b>V</b>	√
23	*	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.		<b>√</b>	<b>V</b>	V	1	<b>V</b>
24	*	Lights, signals and switches	Check operation.     Adjust headlight beam.	√	√	√	√	√	√

#### PERIODIC MAINTENANCE AND ADJUSTMENT



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

#### TIP.

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

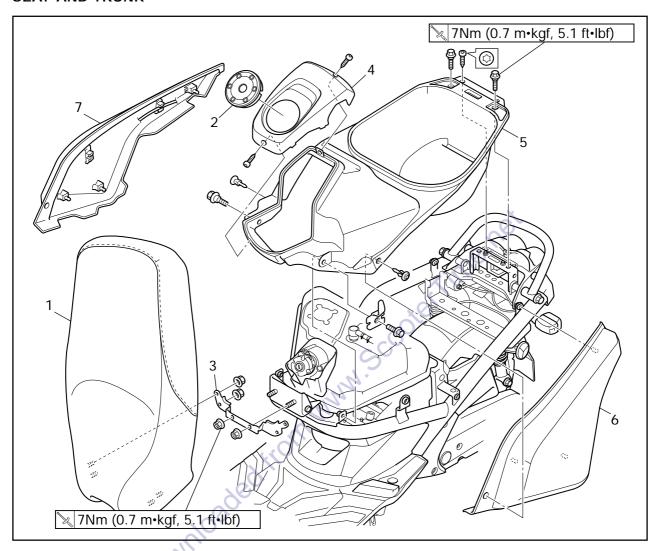
#### EAUT2710

#### TIP.

- Air filter and V-belt filter
  - This model's air filter is equipped with a disposable oil-coated paper element, which must not be cleaned with compressed air to avoid damaging it.
  - The air filter element needs to be replaced and V-belt filter needs to be serviced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
  - After disassembling the brake master cylinder and caliper, always change the fluid. Regularly check the brake fluid level and fill the reservoir as required.
  - Every two years replace the internal components of the brake master cylinder and caliper, and change the brake fluid.
    - Replace the brake hose every four years and if cracked or damaged.

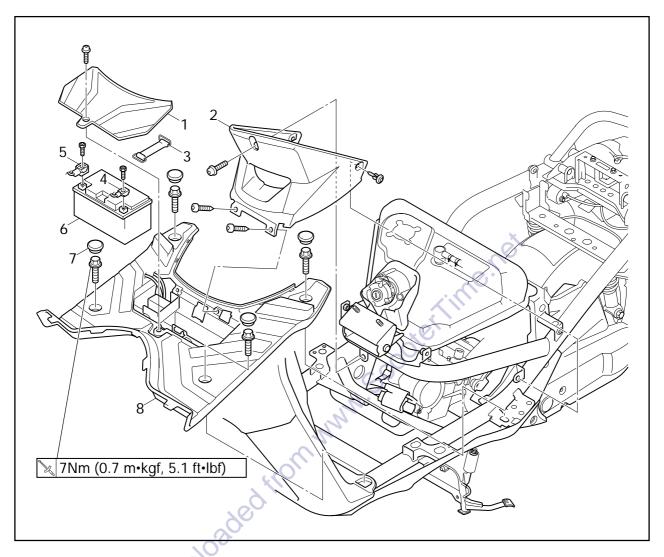
EAS00038

## COVER AND PANEL SEAT AND TRUNK

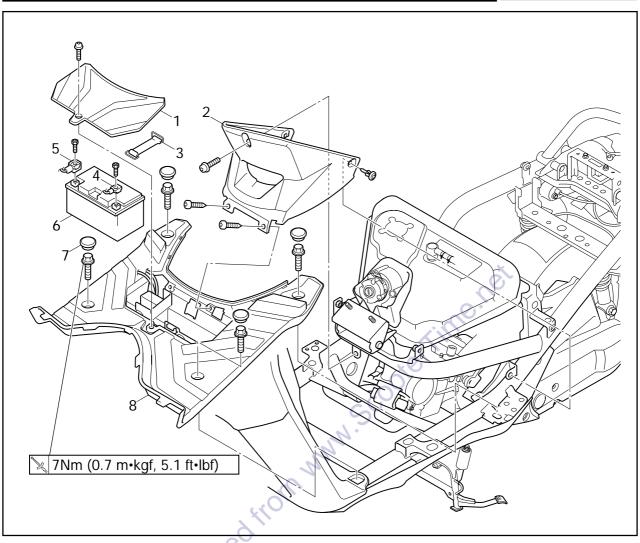


Order	Job/Part	Q′ty	Remarks
	Removing the seat and trunk		Remove the parts in the order listed.
1	Seat	1	·
2	Fuel tank cap cover	1	
3	Seat hinge	1	
4	Upper cover	1	
5	Trunk	1	
6	Side cover (left)	1	
7	Side cover (right)	1	
			For installation, reverse the removal procedure.

#### FOOTREST BOARD

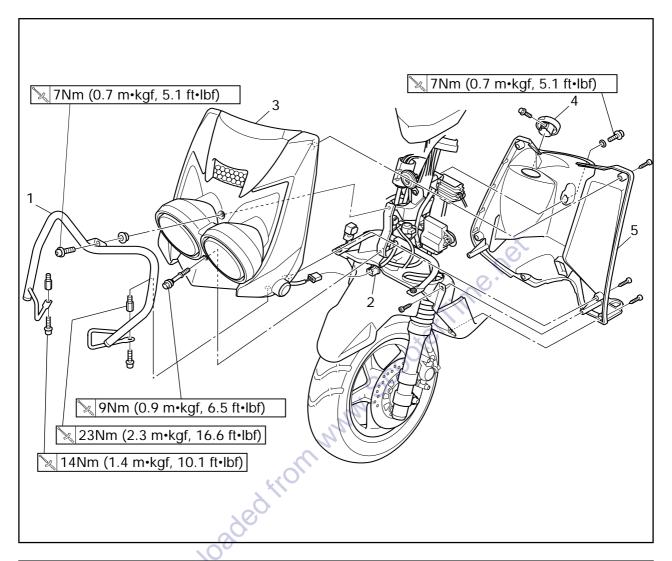


Order	Job/Part	Q′ty	Remarks
1 2 3 4 5 6	Removing the footrest board Battery box cover Front cover Band Battery negative lead Battery positive lead Battery	1 1 1 1 1	NOTICE  First, disconnect the negative battery lead, and then the positive battery lead.  After installing the battery be sure to turn the main switch from "ON" to "OFF" three times in 3 seconds intervals to initialize the idle speed control system.
7	Сар	4	

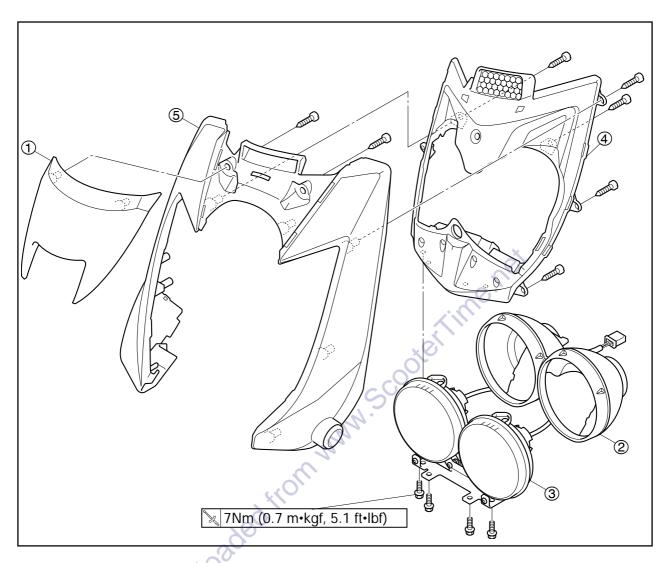


Order	er Job/Part		Remarks	
8	Footrest board		TIP	
	OOM.		While installing, the fuse box should be installed to the correct position.	
			For installation, reverse the removal procedure.	

#### **LEG SHIELD 1 ASSEMBLY AND LEG SHIELD 2**



Order	Job/Part	Q′ty	Remarks
	Removing the leg shield 1 assembly and leg shield 2		Remove the parts in the order listed. Refer to "FOOTREST BOARD".
1	Footrest board	_	
1	Safeguard		
2	Headlight coupler	1	Disconnect.
3	Leg shield 1 assembly	1	
4	Main switch cover	1	
5	Leg shield 2	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q′ty	Remarks
1 2 3 4 5	Disassembling the leg shield 1 assembly Panel Headlight cover Headlight assembly Panel (leg shield 1) Leg shield 1	1 1 1 1 1	Remove the parts in the order listed.  For assembly, reverse the disassembly procedure.

#### ADJUSTING THE VALVE CLEARANCE



EAS00049

#### **ENGINE**

#### ADJUSTING THE VALVE CLEARANCE

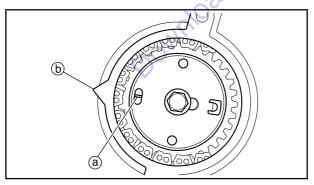
The following procedure applies to all of the valves.

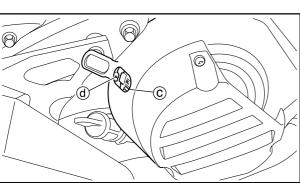
#### TIP\_

- 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:
  - battery box cover
  - •front cover Refer to "COVER AND PANEL".

#### 2. Remove:

- spark plug cap
- spark plug
- ignition coil
- valve cover (intake and exhaust)
- breather





#### Measure:

• valve clearance Out of specification → Adjust.



redironmi

Valve clearance (cold) Intake valve

0.10 ~ 0.14mm (0.004 ~ 0.006in) **Exhaust valve** 

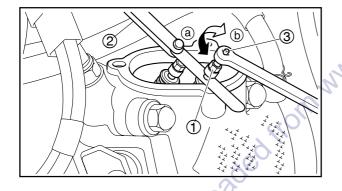
0.16 ~ 0.20mm (0.006 ~ 0.008in)

- a. Turn the crankshaft counterclockwise.
- b. When the piston is at TDC on the compression stroke, align the punch mark (a) in the camshaft sprocket with the stationary (b) on the cylinder head.

#### ADJUSTING THE VALVE CLEARANCE



- c. Align the TDC mark © on the AC magneto rotor with the stationary pointer @ on the crankcase.
- d. Measure the valve clearance with a thickness gauge.
   Out of specification → Adjust.



- 4. Adjust:
  - valve clearance
- a Loosen the locknut ①.
- b. Insert a thickness gauge ② between the end of the adjusting screw and the valve tip.
- c. Turn the adjusting screw ③ in direction ⓐ or ⓑ until the specified valve clearance is obtained.

Direction (a)	Valve clearance is increased.	
Direction (b)	Valve clearance is decreased.	



#### y Valve adjusting tool 90890-01311 (YM-08035-A)

d. Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.



Locknut

7Nm (0.7m • kgf, 5.1ft • lbf)

#### ADJUSTING THE VALVE CLEARANCE



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

- 5. Install:
  - breather

7Nm (0.7m • kgf, 5.1ft • lbf)

valve cover (intake and exhaust)

7Nm (0.7m • kgf, 5.1ft • lbf)

•ignition coil

7Nm (0.7m • kgf, 5.1ft • lbf)

spark plug

13Nm (1.3m • kgf, 9.4ft • lbf)

- - front cover
- 13Nm.
  6. Install:

   front of

   be? battery box cover Refer to "COVER AND PANEL".

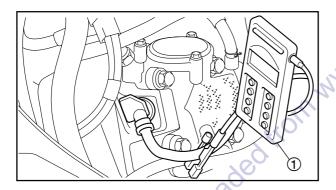
FASOOOF

#### CHECKING THE ENGINE IDLING SPEED

TIP

Prior to checking 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:
  - battery box cover
  - front cover Refer to "COVER AND PANEL".



- 3. Connect:
  - digital tachometer ①(onto the spark plug lead of cylinder)



Digital tachometer 90890-06760

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

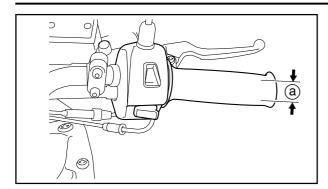


Engine idling speed 1700 ~ 1900r/min

- 5. Install:
  - front cover
  - battery box cover
     Refer to "COVER AND PANEL".

#### ADJUSTING THE THROTTLE CABLE FREE PLAY





EASONO5

### ADJUSTING THE THROTTLE CABLE FREE PLAY

TIP

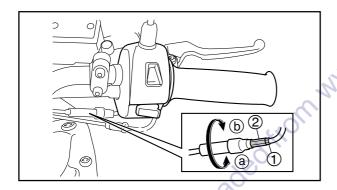
Prior to adjusting the throttle cable free play, the engine idling speed should be checked properly.

- 1. Check:
  - throttle cable free play ⓐ
     Out of specification →Adjust.



Throttle cable free play (at the flange of the throttle grip)

3 ~5mm (0.12 ~ 0.20in)



- 2. Adjust:
  - throttle cable free play
- a. Loosen the locknut (1).
- b. Turn the adjusting nut ② in direction ③ or
  ⑤ until the specified throttle cable free play is obtained.

Direction (a)	Throttle cable free play is increased		
Direction (b)	Throttle cable free play is de-		
	creased.		

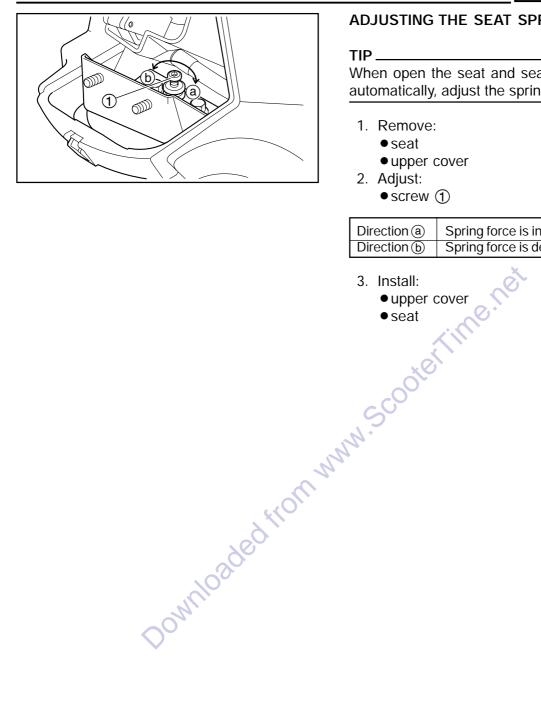
c. Tighten the locknut.

#### **⚠** WARNING

After adjusting the throttle cable free play, start the engine and turn the handlebar to the right and to the left to ensure that this does not cause the engine idling speed to change.

### ADJUSTING THE SEAT SPRING FORCE





#### ADJUSTING THE SEAT SPRING FORCE

TIP \_\_\_

When open the seat and seat will not fold up automatically, adjust the spring force.

- 1. Remove:
  - seat
  - upper cover

	Spring force is increased.
Direction (b)	Spring force is decreased.

EAS00060

#### CHECKING THE SPARK PLUG

- 1. Remove:
  - battery box cover
  - front cover Refer to "COVER AND PANEL".
- 2. Disconnect:
  - spark plug cap

#### **⚠** WARNING

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

- 3. Remove:
  - spark plug

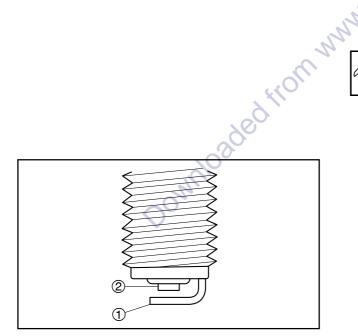
#### NOTICE

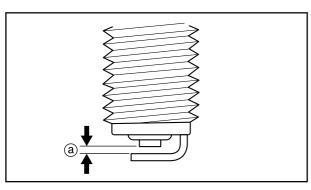
Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

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



Spark plug type (manufacturer) U22ESR-N (DENSO)





- 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 ⓐ
     (with a wire Thickness gauge)
     Out of specification → Regap.



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



- 8. Install:
  - spark plug

13Nm(1.3m • kgf, 9.4ft • lbf)

TIP\_

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

- 9. Connect:
  - spark plug cap
- 10. Install:
  - front cover
- Downloaded from www. battery box cover Refer to "COVER AND PANEL".

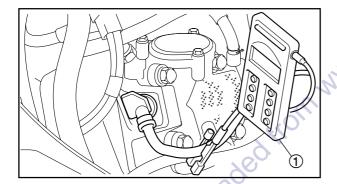
EAS0006

#### CHECKING THE IGNITION TIMING

#### TIP\_

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:
  - battery box cover
  - front cover Refer to "COVER AND PANEL".

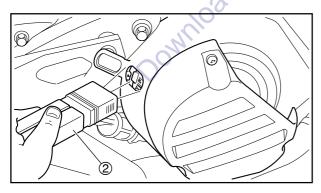




- digital tachometer ①
  (onto the spark plug lead of cylinder)
- timing light ②



Timing light 90890-03141 (YU-03141) Digital tachometer 90890-06760



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



### Engine idling speed 1700 ~ 1900r/min

b. Check that the mark (a) on the AC magneto rotor is within the firing range (b) on the crankcase.

Incorrect firing range → Check the ignition system.

TIP.

The ignition timing is not adjustable.

- 4. Remove:
  - timing light
  - digital tachometer
- 5. Install:
  - front cover
- battery box cover Refer to "COVER AND PANEL".

#### MEASURING THE COMPRESSION PRESSURE



EAS00067

MEASURING THE COMPRESSION PRES-**SURE** 

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:
  - battery box cover
  - front cover \_ ? Refer to "COVER AND PANEL".
- 4. Disconnect:
  - spark plug cap

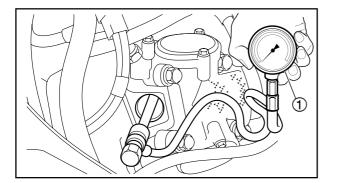
#### **WARNING**

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

- 5. Remove:
  - spark plug

#### NOTICE

Donulogged thou m 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)

# MEASURING THE COMPRESSION PRESSURE

Domilos ded trom w



### 7. Measure:

compression pressure
 Out of specification → Refer to steps (c)
 and (d).



Compression pressure (at sea level) Minimum

1175kPa(11.8kgf/cm², 167psi) at 1800r/min

Standard

1350kPa(13.5kgf/cm², 192psi) at 1800r/min

Maximum

1512kPa(15.1kgf/cm², 215psi) at 1800r/min

- 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 of 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, valves, cylinder head gasket or piston possibly defective → Repair.		



# MEASURING THE COMPRESSION PRESSURE



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

# 13Nm(1.3m • kgf, 9.4ft • lbf)

- 10. Connect:
  - spark plug cap
- 11. Install:
  - front cover
  - battery box cover Refer to "COVER AND PANEL".

Downloaded from www.scooter line. Ret



EAS00069

### CHECKING THE ENGINE OIL LEVEL

1. Stand the scooter on a level surface.

#### TIP\_

- 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.



• 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 SAE20W-40 or SAE10W-30 Recommended engine oil grade API service SG type or higher JASO standard MA



### NOTICE

Do not allow foreign materials to enter the crankcase.

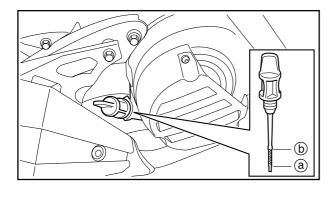
#### TIP

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.

-	Г	ı	D

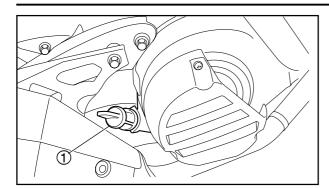
Before checking the engine oil level, wait a few minutes until the oil has settled.



Donulog ded from

# CHANGING THE ENGINE OIL

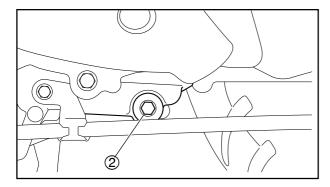




EAS00076

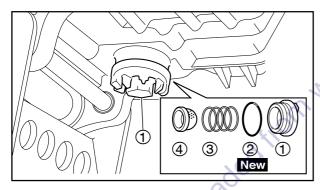
### CHANGING THE ENGINE OIL

- 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 new O-ring 2.

c. Install the new or clean oil filter element and the oil strainer cover.



Oil strainer cover 20Nm(2.0m • kgf, 14.5ft • lbf)

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

20Nm(2.0m • kgf, 14.5ft • lbf)

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

# CHANGING THE ENGINE OIL





Quantity Total amount

0.85 ~ 0.95L (0.9 ~ 1.0 US qt, 0.75 ~ 0.84 Imp. qt)

Periodic oil change

0.80 ~ 0.90L (0.87 ~ 0.98 US qt, 0.74

~ 0.83 lmp. qt)

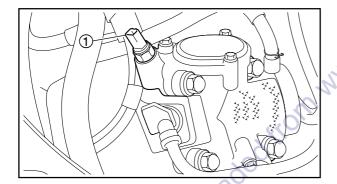
- 8. Install:
  - engine oil filler cap
- 9. Start the engine, warm it up for several minutes, and then turn it off.

### 10.Check:

engine (for engine oil leaks)

### 11.Check:

 engine oil level Refer to "CHECKING THE ENGINE OIL LEVEL".



### 12. Check:

engine oil pressure

- a. Disconnect the engine temperature sensor coupler.
- b. Slightly loosen the engine temperature sensor (1).
- c. Start the engine and keep it idling until engine oil starts to seep from the engine temperature sensor. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- d. Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to "OIL PUMP" in chapter 5.
- e. Start the engine after solving the problem(s) and check the engine oil pressure again.
- f. Tighten the engine temperature sensor to specification.



Engine temperature sensor 18Nm (1.8m • kgf, 13.0ft • lbf)

g. Connect the engine temperature sensor coupler.



# CHANGING THE TRANSMISSION OIL

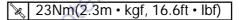


### CHANGING THE TRANSMISSION OIL

1. Stand the scooter on a level surface.

#### TIP

- Stand the scooter on a suitable stand.
- Make sure that the scooter 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 cap
  - transmission oil drain bolt 1
- 5. Drain:
  - transmission oil (completely from the transmission case)
- 6. Install:
  - transmission oil drain bolt



# 7. Fill:

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



Recommended oil SAE10W-30 type SE motor oil Total amount

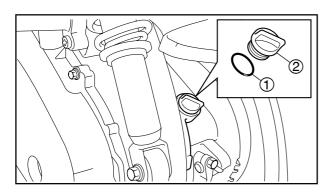
0.14 ~ 0.16L (0.15 ~ 0.17 US qt, 0.12

~ 0.14 Imp. qt)

Periodic oil change

0.12 ~ 0.14L (0.13 ~ 0.15 US qt, 0.11

~ 0.12 lmp. qt)



- 8. Install:
  - O-ring 1
  - transmission oil fill cap 2
- 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)

EAS00077

### MEASURING THE ENGINE OIL PRESSURE

- 1. Check:
  - engine oil level

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

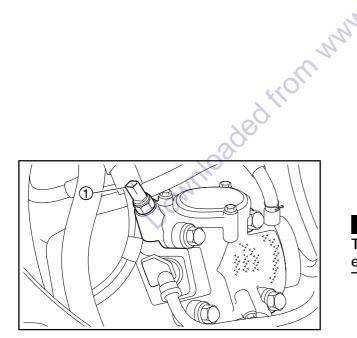
Refer to "CHECKING THE ENGINE OIL LEVEL".

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

### NOTICE

When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

- 3. Remove:
  - battery box cover
  - front coverRefer to "COVER AND PANEL".
- 4. Disconnect:
  - engine temperature sensor coupler



- 5. Lossen:
  - engine temperature sensor (1)

### **⚠** WARNING

The engine, muffler and engine oil are extremely hot.

- 6. Check:
  - engine oil pressure

- a. Start the engine and keep it idling until engine oil starts to seep from the engine temperature sensor. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- b. Check the engine oil passages, the oil filter and oil pump for damage or leakage. Refer to "OIL PUMP" in chapter 5.

# MEASURING THE ENGINE OIL PRESSURE



c. Start the engine after solving the problem(s) and check the engine oil pressure again.

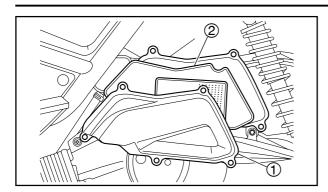
- 7. Tighten:
  - engine temperature sensor

18Nm(1.8m • kgf, 13.0ft • lbf)

- 8. Connect:
  - engine temperature sensor coupler
- 9. Install:
  - front cover
- JOHN LOAD ON THE SCOOL OF THE S battery box cover Refer to "COVER AND PANEL".

# CLEANING THE AIR FILTER ELEMENT

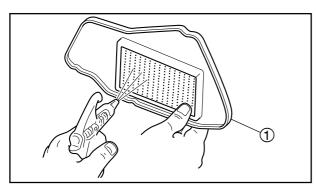




EAS00086

### CLEANING THE AIR FILTER ELEMENT

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



Donuloaded trouming

### 2. Clean:

- air filter element ①
   Apply compressed air to the outer surface of the air filter element.
- 3. Check:
  - air filter element
     Damage → Replace.

### TIP

- Replace the air filter element every 6000km (3500mi).
- 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

### NOTICE

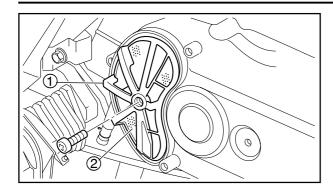
Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect the carburetor tuning, leading to poor engine performance and possible overheating.

### TIP\_

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

# **CLEANING THE V-BELT CASE AIR FILTER ELEMENT**





EAS00090

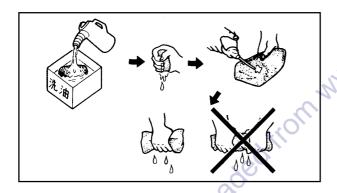
# CLEANING THE V-BELT CASE AIR FILTER ELEMENT

- 1. Remove:
  - V-belt case cover
  - V-belt case air filter guide (1)
  - V-belt case air filter element ②
- 2. Clean:
  - V-belt case air filter element (with solvent)

#### TIP

After cleaning, carefully pat the V-belt case air filter element on a clean cloth to remove the excess solvent.

- 3. Check:
  - V-belt case air filter element Damage → Replace.



4. Apply the recommended oil to the entire surface of the V-belt case air filter element and then carefully pat the V-belt case air filter element on a clean cloth to remove the excess oil. The V-belt case air filter element should be wet but not dripping.



### Recommended oil Engine oil

- 5. Install:
  - V-belt case air filter element
  - V-belt case air filter guide

7Nm (0.7m ⋅ kgf, 5.1ft ⋅ lbf)

V-belt case cover

7Nm (0.7m • kgf, 5.1ft • lbf)

CHK ADJ

EAS00094

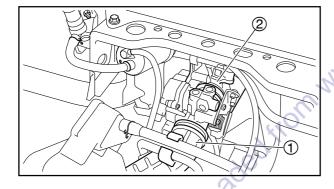
# CHECKING THE THROTTLE BODY JOINT AND INTAKE MANIFOLD

- 1. Remove:
  - seat
  - trunk
  - battery box cover
  - front cover

Refer to "COVER AND PANEL".

### 2. Remove:

fuel tank
 Refer to "REMOVING THE FUEL TANK"
 in chapter 6.



### 3. Check:

- throttle body joint 1
- intake manifold ②
   Cracks/damage → Replace.
   Refer to "CYLINDER HEAD" in chapter
   5.
- 4. Install:
  - fuel tank
     Refer to "INSTALLING THE FUEL TANK
     AND FUEL HOSE" in chapter 6.
- 5. Install:
  - front cover
  - battery box cover
  - trunk
  - seat

Refer to "COVER AND PANEL".

#### EAS00096

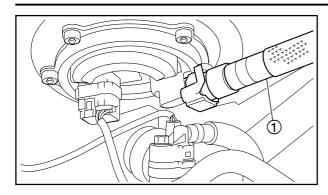
### CHECKING THE FUEL HOSE

The following procedure applies to all of the fuel and impulse hoses.

- 1. Remove:
  - seat
  - trunk
  - battery box cover
  - front cover Refer to "COVER AND PANEL".

# CHECKING THE FUEL HOSE/CHECKING THE CHK BREATHER HOSES AD J





- 2. Check:
  - fuel hose ①
     Cracks/damage → Replace.
     Loose connection → Connect properly.
- 3. Install:
  - front cover
  - battery box cover
  - trunk
  - seat

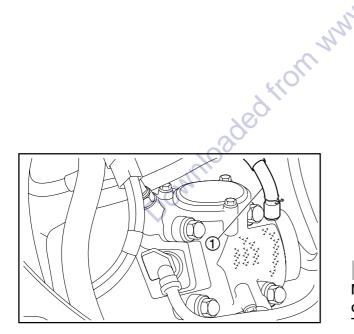
Refer to "COVER AND PANEL".

EAS00098

### CHECKING THE BREATHER HOSES

- 1. Remove:
  - seat
  - trunk
  - battery box cover
  - front cover

Refer to "COVER AND PANEL".



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

### NOTICE

Make sure the breather hoses are routed correctly.

- 3. Install:
  - front cover
  - battery box cover
  - trunk
  - seat

Refer to "COVER AND PANEL".

# CHECKING THE EXHAUST SYSTEM

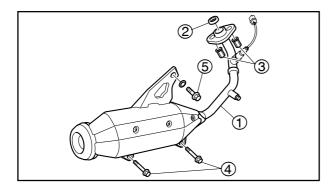


EAS00099

### CHECKING THE EXHAUST SYSTEM

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

- 1. Remove:
  - O<sub>2</sub> sensor coupler
  - muffler
     Refer to "REAR SHOCK ABSORBER
     ASSEMBLIES AND SWINGARM" in
     chapter 4.



Donuloaded troin in

### 2. Check:

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



## Exhaust pipe nut 3

13Nm (1.3m • kgf, 9.4ft • lbf)

Muffler and swingarm bolt 4

31Nm (3.1m • kgf, 22.4ft • lbf)

Muffler and swingarm bolt (5)

53Nm (5.3m • kgf, 38.3ft • lbf)

### 4. Install:

- muffler
- O<sub>2</sub> sensor coupler Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" in chapter 4.

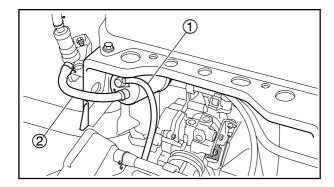


# CHECKING THE CANISTER AND ROLL OVER VALVE

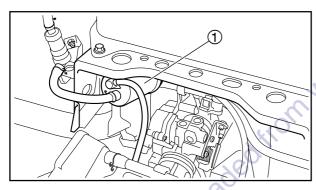
The following procedure applies to all of the canister and roll over valve.

- 1. Remove:
  - seat
  - trunk

Refer to "COVER AND PANEL".



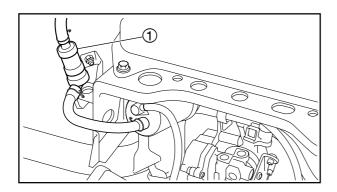
- 2. Check:
  - hose (to throttle body) ①
  - hose (to roll over valve) ②
     Cracks/damage → Replace.
     Loose connection → Connect properly.



- 3. Remove:
  - canister (1)
- 4. Check:
  - canister
     Cracks/damage → Replace.
     Obstruction → Blow out with compressed air.
- 5. Install:
  - canister

TIP

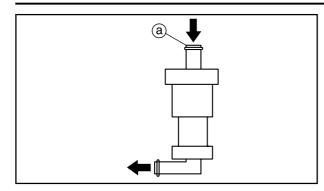
While installing, make sure the canister is routed correctly.

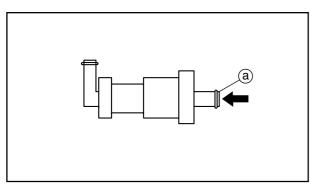


- 6. Remove:
  - roll over valve ①

# CHECKING THE CANISTER AND ROLL OVER VALVE







- 7. Check:
  - roll over valve

# \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- a. Remove the roll over valve.
- b. Put roll over valve with the vertical angle.
- c. Connect the hose to direction (a) and blow air in the hose.

Unobstructed → Normal.

Obstruction → Replace.

- d. Put roll over valve with the horizontal angle.
- e. Connect the hose to direction (a) and blow air in the hose.

Unobstructed → Replace.

Obstruction → Normal.

### \_\_\_\_

- 8. Install:
  - roll over valve

### TIP

Roll over valve should be installed on the frame with the vertical angle. If roll over valve to slope or the horizontal (more than about 45 degrees) installation, will make the scooter unable to start.

- 9. Install:
  - trunk
  - seat

Refer to "COVER AND PANEL".

# CHECKING THE FRONT BRAKE/ADJUSTING THE REAR BRAKE



EAS00108

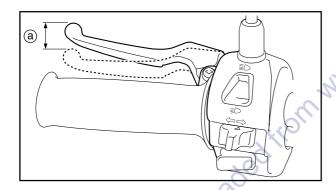
# CHASSIS CHECKING THE FRONT BRAKE

TIP\_

The brake lever free play is not adjustable.

### **⚠** WARNING

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.



EAC00114

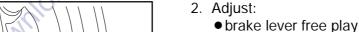
### ADJUSTING THE REAR BRAKE

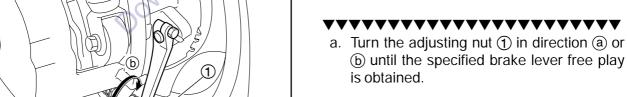
- 1. Check:
  - brake lever free play ⓐ
     Out of specification → Adjust.



Brake lever free play

10 ~ 20mm (0.39 ~ 0.79in)





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

### NOTICE

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





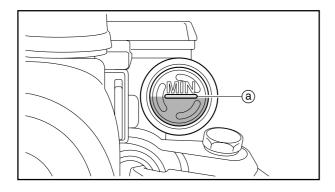
EAS00116

### CHECKING THE BRAKE FLUID LEVEL

1. Stand the scooter on a level surface.

#### TIP\_

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



Donuloaded thou M

### 2. Check:

brake fluid level
 Below the minimum level mark (a) → Add
 the recommended brake fluid to the proper
 level.



Recommended brake fluid DOT 4

### **⚠** WARNING

- Use only the designated brake fluid.
   Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

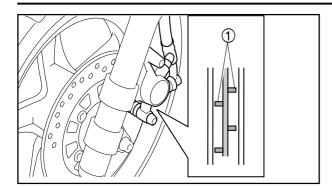
### NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

# CHECKING THE FRONT BRAKE PADS/CHECKING THE REAR BRAKE SHOES/CHECKING THE FRONT BRAKE HOSE





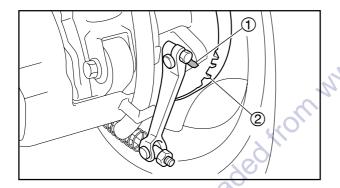
FAS0011

### CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

- 1. Operate the brake.
- 2. Check:
  - front brake pad

Wear indicators ① almost touch the brake disc → Replace the brake pads as a set. Refer to "REPLACING THE FRONT BRAKE PADS" in chapter 4.



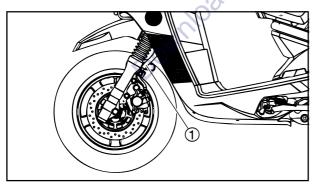
EAC00124

### CHECKING THE REAR BRAKE SHOES

- 1. Operate the brake.
- 2. Check:
  - wear indicator (1)

Reaches the wear limit line  $② \rightarrow \text{Replace}$  the brake shoes as a set.

Refer to "REAR WHEEL AND REAR BRAKE" in chapter 4.



FAS00130

### CHECKING THE FRONT BRAKE HOSE

- 1. Check:
  - brake hose ①
     Cracks/damage/wear → Replace.
- 2. Check:
  - brake hose holder
     Loose connection → Tighten the holder bolt.
- 3. Hold the scooter upright and apply the front brake several times.
- 4. Check:
  - brake hose

Brake fluid leakage → Replace the damaged hose.

Refer to "FRONT BRAKE" in chapter 4.



EAS00133

# BLEEDING THE HYDRAULIC BRAKE SYSTEM

## **⚠** WARNING

Bleed the hydraulic brake system whenever:

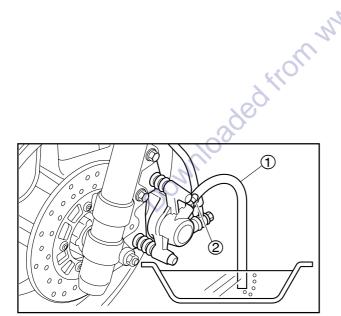
- the system is disassembled.
- a brake hose is loosened, disconnected or replaced.
- the brake fluid level is very low.
- brake operation is faulty.

### 1. Remove:

brake master cylinder reservoir cap

#### TIP

- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours.
   Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.



### 2. Bleed:

hydraulic brake system

# a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.

\*\*\*\*\*\*\*

- b. Install the brake master cylinder reservoir diaphragm.
- c. Connect a clear plastic hose ① tightly to the bleed screw ②.
- d. Place the other end of the hose into a container.
- e. Slowly apply the brake lever several times.
- f. Fully pull the brake lever without releasing it
- g. Loosen the bleed screw.

# **BLEEDING THE HYDRAULIC BRAKE SYSTEM**



TIP\_

Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip.

- h. Tighten the bleed screw and then release the brake lever.
- i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
- j. Tighten the bleed screw to specification.



Bleed screw 6Nm (0.6m • kgf, 4.3ft • lbf)

k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.

Refer to "CHECKING THE BRAKE FLUID LEVEL".

# **WARNING**

After bleeding the hydraulic brake system, check the brake operation.

\*\*\*\*

3. Install:

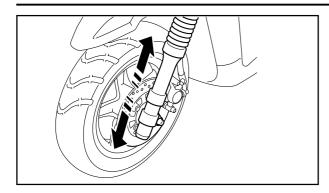
Donnloaded from m

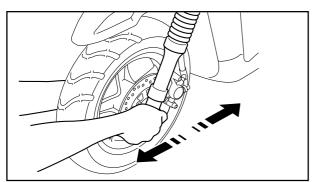
• brake master cylinder reservoir cap

1.6Nm (0.16m • kgf, 1.5ft • lbf)

# CHECKING AND ADJUSTING THE STEERING HEAD







EAS00148

# CHECKING AND ADJUSTING THE STEER-ING HEAD

1. Stand the scooter on a level surface.

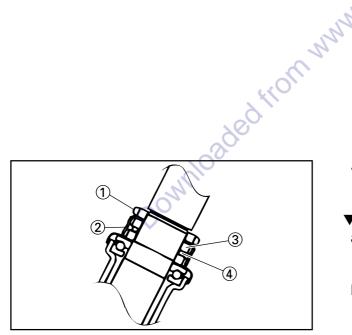
## **WARNING**

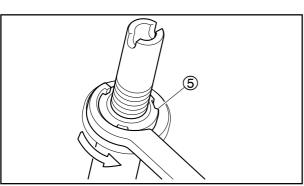
Securely support the scooter so that there is no danger of it falling over.

TIP\_

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:
  - leg shield 1 Refer to "COVER AND PANEL".





- 4. Adjust:
  - steering head
- a. Remove the upper ring nut ①, lock washer
  ②, the center ring nut ③ and the rubber washer ④.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

b. Loosen the lower ring nut (5) and then tighten it to specification with the ring nut wrench (6).

TIE

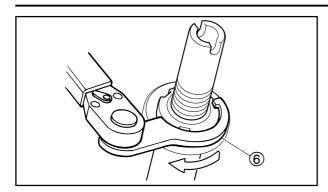
Set the torque wrench at a right angle to the ring nut wrench.

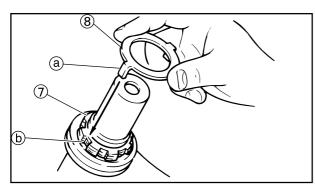


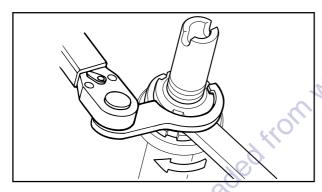
Ring nut wrench 90890-01403 (YU-A9472)

# CHECKING AND ADJUSTING THE STEERING HEAD











Lower ring nut (initial tightening torque)

38Nm (3.8m • kgf, 27.5ft • lbf)

c. Losen the lower ring nut completely and then tighten it to specification with a steering nut wrench.

### **♠** WARNING

Do not over tighten the lower ring nut.



Lower ring nut (final tightening torque)

14Nm (1.4m • kgf, 10.1ft • lbf)

- d. 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 upper and lower bearings.
  - Refer to "STEERING HEAD" in chapter 4.
- e. Install the rubber washer.
- f. Install the center ring nut ⑦.
- g. Finger tighten the center ring nut, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the center ring nut until their slots are aligned.
- h. Install the lock washer (8).

### TIP\_

Make sure the lock washer tabs a sit correctly in the ring nut slots b.

i. Hold the lower and center ring nuts with a ring nut wrench and tighten the upper ring nut with a steering nut wrench.



Steering nut wrench 90890-01403 (YU-A9472)



Ring nut wrench 90890-01268 (YU-01268)



Upper ring nut 75Nm (7.5m • kgf, 54.2ft • lbf)

- \*\*\*\*\*
- 5. Install:
  - leg shield 1 Refer to "COVER AND PANEL".

EAS00151

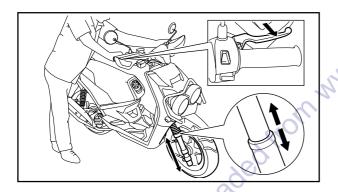
### CHECKING THE FRONT FORK

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 tubeDamage/scratches → Replace.
  - oil sealOil leakage → Replace.
- 3. Hold the scooter upright and apply the front brake



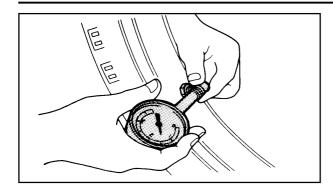
### 4. Check:

front fork operation

Push down hard on the handlebar several times and check if the front fork rebounds smoothly.

Rough movement  $\rightarrow$  Repair.

Refer to "FRONT FORK" in chapter 4.



ΕΔS0016

### **CHECKING THE TIRES**

The following procedure applies to both of the tires.

- 1. Check:
  - tire pressureOut 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.

	60		
M	Basic weight (with oil and a full fuel tank)	122 kg(269lb)	
non	Maximum load*	155 kg(342lb)	
ded !!	cold tire pres- sure	Front	Rear
Carlo adec	Up to 90kg (198lb)	175 kPa (1.75 kgf/cm², 25 psi)	200 kPa (2.00 kgf/cm², 25 psi)
Oom	90kg(198lb)~ m a x i m u m load*	200 kPa (2.00 kgf/cm², 29 psi)	225 kPa (2.25 kgf/cm², 33 psi)

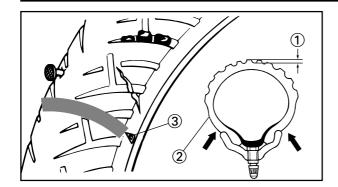
<sup>\*</sup> Total weight of rider, passenger, cargo and accessories

### **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**







tire surfacesDamage/wear → Replace the tire.

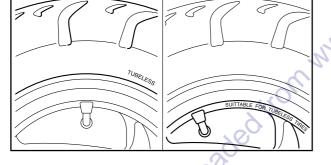


Minimum tire tread depth 0.8mm (0.03in)

- 1 Tire tread depth
- 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.



В

A Tire

**B** Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

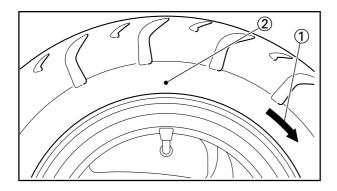
• After extensive tests, the tires listed below have been approved by Yamaha Motor Taiwan Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than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

### Front tire

Manufacturer	Model	Size
KENDA	K761	120/70-12 51L

### Rear tire

Manufacturer	Model	Size
KENDA	K761	130/70-12 56L



# **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.

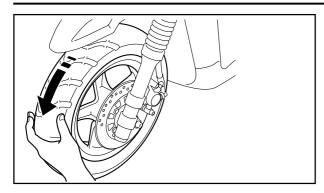
### TIP\_

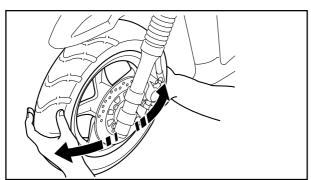
For tires with a direction of rotation mark ①:

- 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







Dominio aded from

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.

TIP \_\_\_\_

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

FAS00170

# 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 cableDamage → Replace.
- 2. Check:
  - cable operation
     Rough movement → Lubricate.



Recommended lubricant
Engine oil or a suitable cable
lubricant

TIP\_

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/LUBRICATING THE SIDESTAND/ LUBRICATING THE CENTERSTAND/LUBRICATING THE REAR SUSPENSION



EAS00171

### **LUBRICATING THE LEVERS**

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



**Recommended Iubricant** Lithium-soap-based grease

EAS00172

### LUBRICATING THE SIDESTAND

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



Recommended lubricant Lithium-soap-based grease

### LUBRICATING THE CENTERSTAND

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



**Recommended Iubricant** Lithium-soap-based grease

### LUBRICATING THE REAR SUSPENSION

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



**Recommended Iubricant** Lithium-soap-based grease



# This is a sealed type 12 volt battery. No figuid level inspection is ever needed and no refilling water will be required. IMPORTANT: - Check with the sealed state of the battery. - Check the charging condition with a voltmeter (Normal charging vottage should be above 12.8V). - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery. - This battery may be installed in an vehicle only if it replaces a similar sealed type battery.

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**

Donuloaded trom m

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

### NOTICE

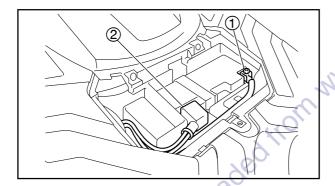
- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should 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.

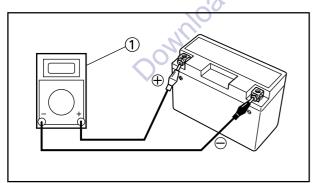


TIP\_

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 box cover
     Refer to "COVER AND PANEL".





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

### NOTICE

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

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

a. Connect a digital circuit tester ① to the battery terminals.



Digital circuit tester 90890-03174

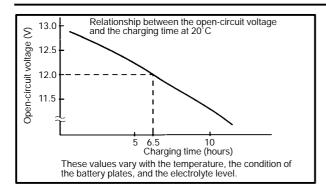
Positive tester probe → positive battery terminal

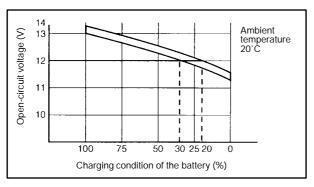
Negative tester probe → negative battery terminal

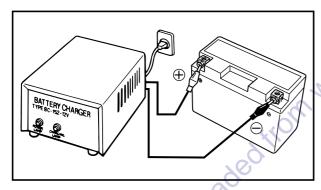
### TIP\_

 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 opencircuit voltage equals or exceeds 12.8 V.
- 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.

### NOTICE

- 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.

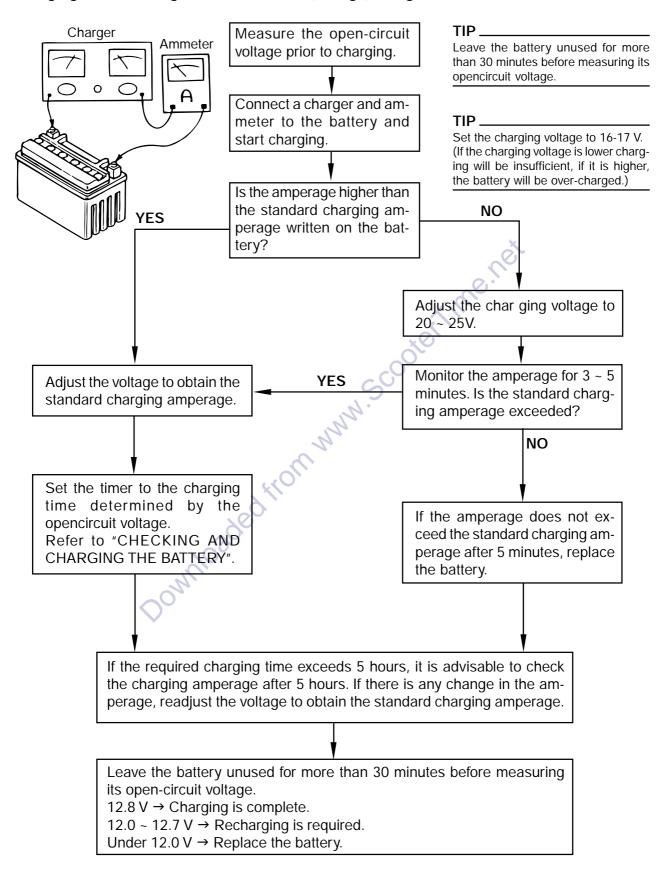


- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact 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.

  | As shown in the following illustration, the open-circuit voltage in the open-circuit voltage.

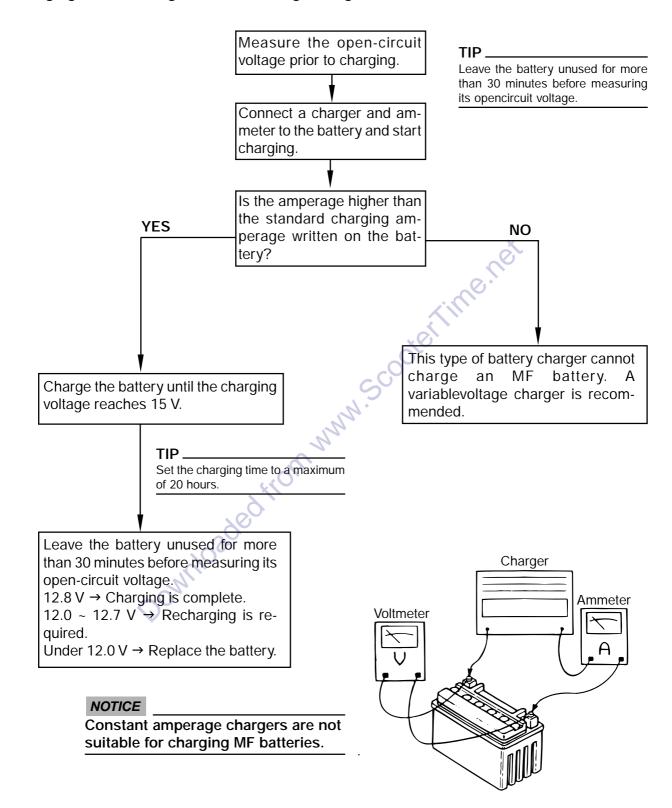


### Charging method using a variable-current (voltage) charger

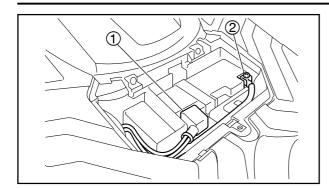




### Charging method using a constant voltage charger







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

### NOTICE

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

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



Recommended lubricant Dielectric grease

- 10. Install:

   batte
  Refe
  - battery box cover

    Refer to "COVER AND PANEL".



FASO018

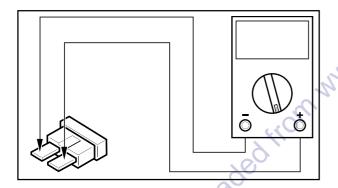
### **CHECKING THE FUSES**

The following procedure applies to all of the fuses.

### NOTICE

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

- 1. Remove:
  - battery box cover
     Refer to "COVER AND PANEL".



2. Check:

fuse

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

TIP

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



Pocket tester 90890-03112 (YU-03112-C)

b. If the pocket tester indicates " $\infty$ ", replace the fuse.

3. Replace:

blown fuse

\*\*\*\*\*\*\*

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

### **CHECKING THE FUSES**



Fuses	Amperage rating	Q′ty
Main	20A	1
Headlight	10A	1
Signaling system	15A	1
Ignition	10A	1
Fuel injection sys-	10A	1
tem		
Reserve	20A	1
	15A	1
	10A	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.

- **\*\*\***
- 4. Install:

   batte
  Refe
  - battery box cover Refer to "COVER AND PANEL".

### REPLACING THE HEADLIGHT BULBS



EAS00183

### REPLACING THE HEADLIGHT BULBS

The following procedure applies to both of the headlight bulbs.

- 1. Remove:
  - safeguard
  - leg shield 1 Refer to "COVER AND PANEL".
- 2. Disconnect:
  - headlight coupler



- dust boot
- headlight bulb holder (1)
- headlight bulb ②



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

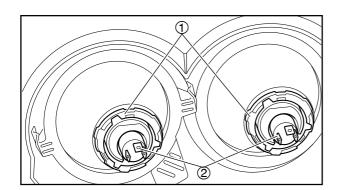
- 4. Install:
  - headlight bulb New
    Secure the new headlight bulb with the headlight bulb holder.

### NOTICE

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
  - dust boot
- 6. Connect:
  - headlight coupler
- 7. Install:
  - leg shield 1
  - safeguard

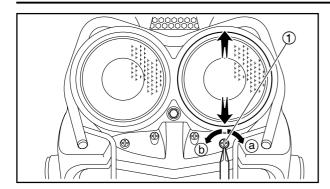
Refer to "COVER AND PANEL".

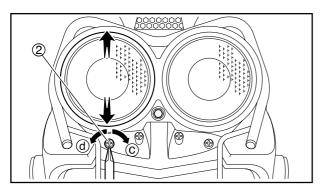


Donulog ged thown my

### ADJUSTING THE HEADLIGHT BEAMS







EAS00185

### ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

- 1. Adjust:
  - headlight beam (vertically)

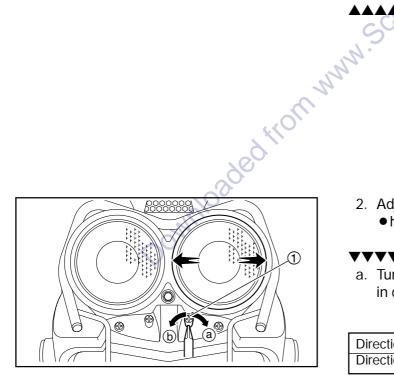
a. Turn the low beam light adjusting screw ① in direction (a) or (b).

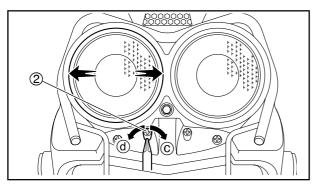
Direction (a)	Headlight beam is raised.
Direction (b)	Headlight beam is lowered.

b. Turn the high beam light adjusting screw ② in direction (c) or (d).

	Headlight beam is raised.	
Direction (d)	Headlight beam is lowered.	







- 2. Adjust:
  - headlight beam (horizontally)

a. Turn the low beam light adjusting screw ① in direction (a) or (b).

	Headlight beam moves to the right.
Direction (b)	Headlight beam moves to the left.

b. Turn the high beam light adjusting screw ② in direction (c) or (d).

	Headlight beam moves to the left.
Direction (d)	Headlight beam moves to the right.

# CHAPTER 4 CHASSIS

FRONT WHEEL AND BRAKE DISC	4-1
FRONT WHEEL	
REMOVING THE FRONT WHEEL	4-3
CHECKING THE FRONT WHEEL	4-4
CHECKING THE BRAKE DISC	4-6
CHECKING THE SPEEDOMETER GEAR UNIT	4-7
ASSEMBLING THE FRONT WHEEL	
INSTALLING THE FRONT WHEEL	
ADJUSTING THE FRONT WHEEL STATIC BALANCE	4-9
REAR WHEEL AND REAR BRAKE  REMOVING THE REAR WHEEL  CHECKING THE REAR WHEEL  CHECKING THE REAR WHEEL DRIVE HUB	4-11
REMOVING THE REAR WHEEL	4-13
CHECKING THE REAR WHEEL	4-14
CHECKING THE REAR WHEEL DRIVE HUB	4-14
CHECKING THE BRAKEASSEMBLING THE BRAKE SHOES	4-14
ASSEMBLING THE BRAKE SHOES	4-15
INSTALLING THE REAR WHEEL	4-17
ADJUSTING THE REAR WHEEL STATIC BALANCE	
FRONT BRAKE	4-19
FRONT BRAKE PADS	
REPLACING THE FRONT BRAKE PADS	
FRONT BRAKE MASTER CYLINDER	
DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER .	
CHECKING THE FRONT BRAKE MASTER CYLINDER	
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTE	
CYLINDER	
FRONT BRAKE CALIPER	
DISASSEMBLING THE FRONT BRAKE CALIPER	
CHECKING THE FRONT BRAKE CALIPER	4-33
ASSEMBLING AND INSTALLING THE FRONT BRAKE	
CALIPER	
FRONT FORK	
REMOVING THE FRONT FORK LEGS	
DISASSEMBLING THE FRONT FORK LEGS	
CHECKING THE FRONT FORK LEGS	
ASSEMBLING THE FRONT FORK LEGS	
INSTALLING THE FRONT FORK LEGS	4-48

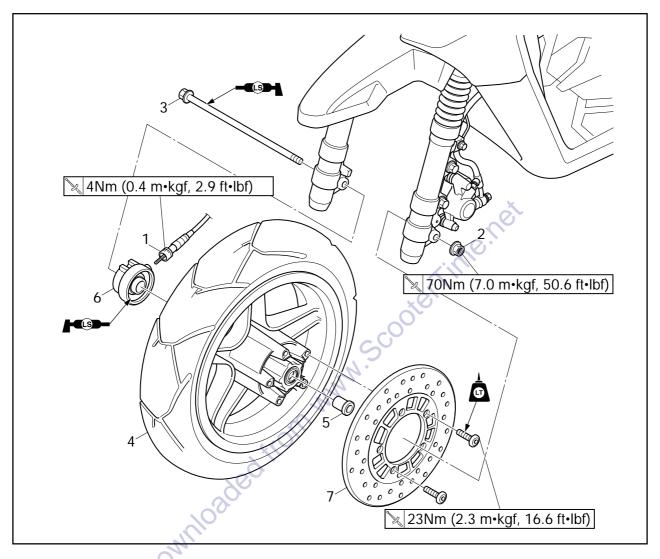
CHAS	d 50
------	------

HANDLEBAR4-	-49
REMOVING THE HANDLEBAR4-	-51
CHECKING THE HANDLEBAR4-	-52
INSTALLING THE HANDLEBAR4-	-53
STEERING HEAD4-	-55
HANDLEBAR BRACKET AND FRONT BRACKET 4-	-55
LOWER BRACKET 4-	-56
REMOVING THE LOWER BRACKET4-	-58
CHECKING THE STEERING HEAD4-	-59
INSTALLING THE STEERING HEAD 4-	-60
REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM 4-	-61
REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES 4-	-62
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY 4-	-62
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES 4-	-63
REMOVING THE SWINGARM4-	-63
CITE CIZINIC TITE CINTINIC VIDA	-64
INSTALLING THE SWINGARM4-	-64
Kio.	
8	
INSTALLING THE SWINGARM 4-	



# **CHASSIS**

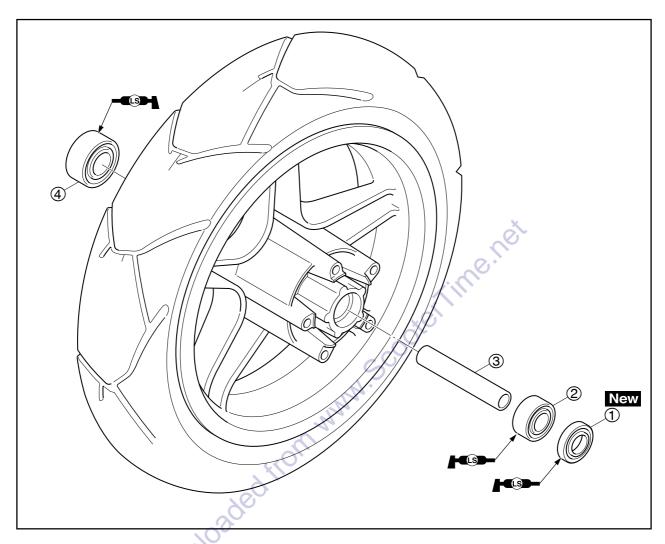
# FRONT WHEEL AND BRAKE DISC



Order	Job/Part	Q′ty	Remarks
	Removing the front wheel and brake disc		Remove the parts in the order listed.
			TIP
			Place the scooter on a suitable stand so that the front wheel is elevated.
1	Speedometer cable	1	Disconnect. 7
2	Wheel axle nut	1	Refer to "REMOVING
3	Wheel axle	1	THE FRONT WHEEL"
4	Front wheel	1	rand "INSTALLING THE
5	Collar	1	FRONT WHEEL".
6	Speedometer gear unit	1	
7	Front brake disc	1	
			For installation, reverse the removal pro-
			cedure.



### FRONT WHEEL



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



EAS00520

### REMOVING THE FRONT WHEEL

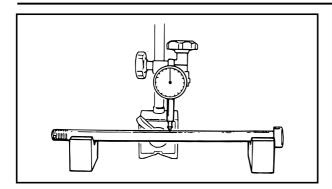
1. Stand the scooter on a level surface.

# Securely support the scooter so that there is no danger of it falling over. TIP Place the scooter on a suitable stand so that the front wheel is elevated.

- 2. Remove:
  - speedometer cable
  - front wheel axle nut
  - front wheel axle
  - front wheel
  - collar
  - speedometer gear unit

Do not apply the brake lever when removing the front wheel .





EAS00525

### CHECKING THE FRONT WHEEL

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



Wheel axle bending limit 0.25mm (0.01in)

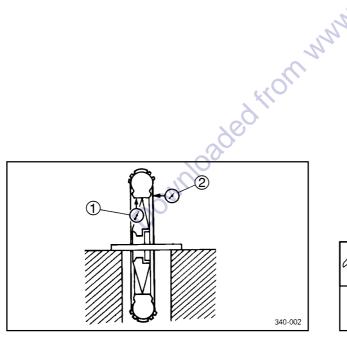
### **⚠** WARNING

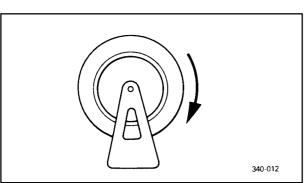
Do not attempt to straighten a bent wheel axle.

### 2. Check:

- tire
  - front wheel
     Damage/wear → Replace.

     Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter
     3





### 3. Measure:

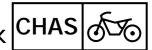
- radial wheel runout (1)
- lateral wheel runout ②
   Over the specified limits → Replace.

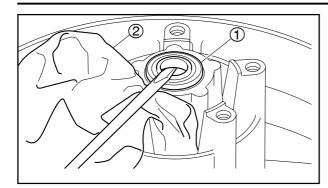


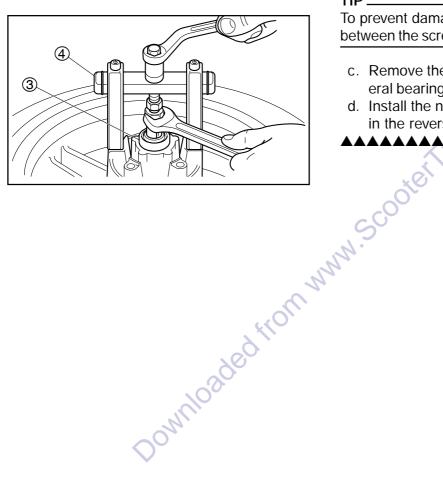
Radial wheel runout limit 1.0mm (0.04in) Lateral wheel runout limit 1.0mm (0.04in)

### 4. Check:

- wheel bearings
   Front wheel turns roughly or is loose →
   Replace the wheel bearings.
- oil sealDamage/wear → Replace.







- 5. Replace:
  - wheel bearings New
  - oil seal New

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

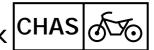
- a. Clean the outside of the front wheel hub.
- b. Remove the oil seal ① with a flat-head screwdriver.

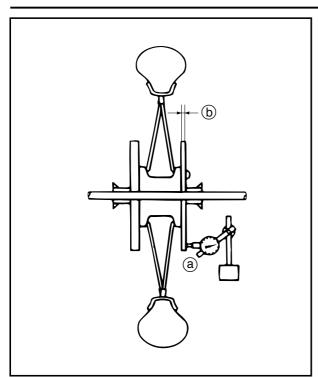
### TIP\_

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

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







EAS00528

### CHECKING THE BRAKE DISC

- 1. Check:
  - brake disc Damage/galling → Replace.
- 2. Measure:
  - brake disc deflection (a) Out of specification → Correct the brake disc deflection or replace the brake disc.

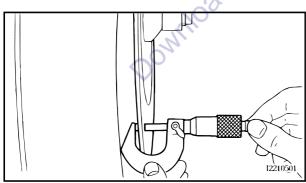


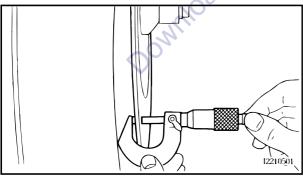
Brake disc deflection limit (maximum)

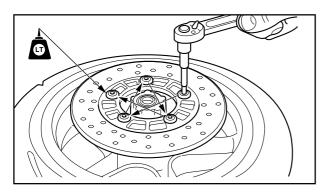
0.15mm (0.006in)



- a. Place the scooter on a suitable stand so that the front wheel is elevated.
- b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Hold the dial gauge at a right angle against the brake disc surface.
- e. Measure the deflection 2 ~ 3mm (0.08 ~ 0.12in) below the edge of the brake disc.







- 3. Measure:
  - brake disc thickness (b) Measure the brake disc thickness at a few different locations.
    - Out of specification → Replace.



Brake disc thickness limit (minimum)

3.5mm (0.14in)

- 4. Adjust:
  - brake disc deflection
- a. Remove the brake disc.
- b. Rotate the brake disc by one bolt hole.
- c. Install the brake disc.



TIP\_

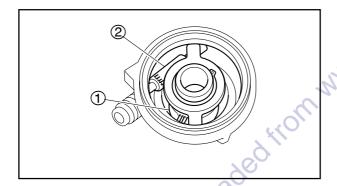
Tighten the brake disc bolts in stages and in a crisscross pattern.



Brake disc bolt 23Nm (2.3m • kgf, 16.6ft • lbf) LOCTITE®

- d. Measure the brake disc deflection.
- e. If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.
- f. If the brake disc deflection cannot be brought within specification, replace the brake disc.





FAS00535

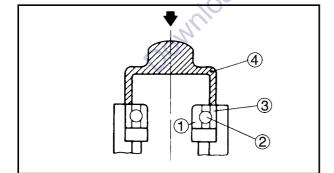
# CHECKING THE SPEEDOMETER GEAR UNIT

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

FAS00539

### ASSEMBLING THE FRONT WHEEL

- 1. Install:
  - wheel bearing
  - spacer
  - oil seal New



a. Install the new wheel bearings and oil seal in the reverse order of disassembly.

	 _	_
NO	 7	_

Do not contact the wheel bearing inner race ① or balls ②. Contact should be made only with the outer race ③.

TIP

Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

\_\_\_\_



### INSTALLING THE FRONT WHEEL

- 1. Lubricate:
  - wheel axle
  - wheel bearings
  - oil seal lip
  - speedometer gear unit



Recommended lubricant Lithium-soap-based grease

2. Install:

• speedometer gear unit ①

TIP

Make sure the speedometer gear unit and the wheel hub are installed with the two projections ② meshed into the speedmeter clutch ③ respectively.



front wheel

TIP

Make sure the slot ① in the speedometer gear unit fits over the stopper ② on the outer tube.

- 4. Tighten:
  - wheel axle

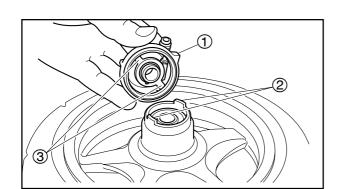
70Nm (7.0m • kgf, 50.6ft • lbf)

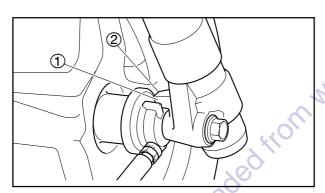
### NOTICE

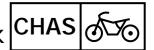
Before tightening the wheel axle nut, push down hard on the handlebar several times and check if the front fork rebounds smoothly.

- 5. Install:
  - speedometer cable

4Nm (0.4m • kgf, 2.9ft • lbf)







EAS00548

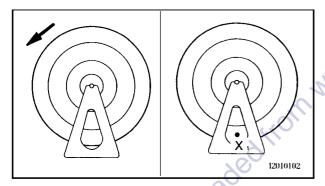
# ADJUSTING THE FRONT WHEEL STATIC BALANCE

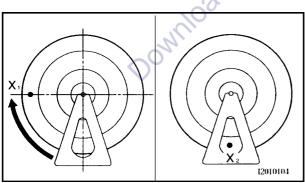
### TIP \_\_\_\_\_

- 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

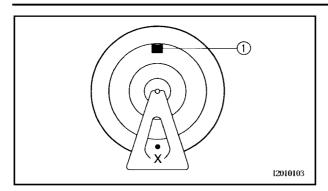
### TIP\_

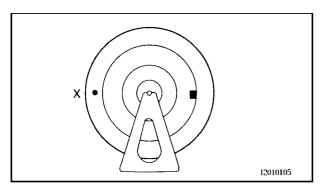
Place the front wheel on a suitable balancing stand.

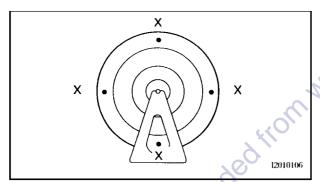
### \*\*\*\*\*\*\*\*\*\*\*\*\*\*

- a. Spin the front wheel.
- b. When the front wheel stops, put an "X<sub>1</sub>" mark at the bottom of the wheel.
- c. Turn the front wheel 90° so that the "X<sub>1</sub>" mark is positioned as shown.
- d. Release the front wheel.
- e. When the wheel stops, put an "X<sub>2</sub>" 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".









3. Adjust:

• front wheel static balance

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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

TIP\_

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.

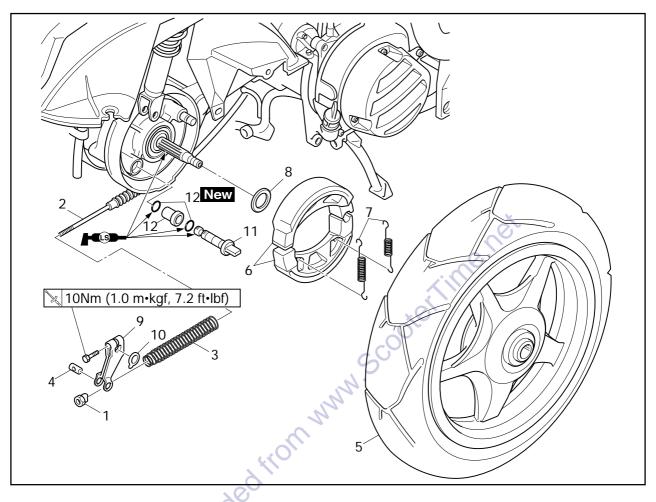
4. Check:

• front wheel static balance

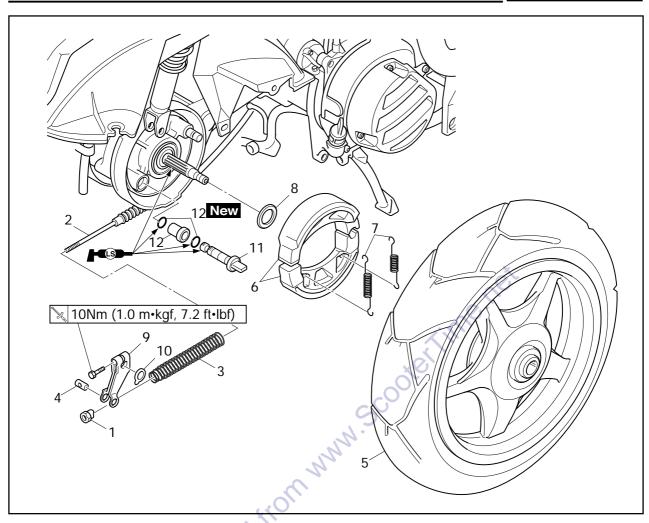
a. Turn the front wheel and make sure it stays at each position shown.

b. If the front wheel does not remain stationary at all of the positions, rebalance it.





Order	Job/Part	Q′ty	Remarks
	Removing the rear wheel and rear		Remove the parts in the order listed.
	brake		
			TIP
			Place the scooter on a suitable stand so that the front wheel is elevated.
	$O_2$ sensor coupler Muffler		Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM".
			ASSEMBLIES AND SWINGARM.
4	Swingarm	_	
1	Brake adjuster	1	
2	Brake cable	1	
3	Compression spring	1	
4	Pin	1	
5	Rear wheel	1	h
6	Brake shoe kit	1	
7	Tension spring	2	Refer to "ASSEMBLING THE BRAKE
8	Plate washer	1	SHOES".
9	Camshaft lever	1	3NOE3 . 
10	Brake shoe wear indicator	1	Ц
11	Brake camshaft/O-ring	1/2	



Order	Job/Part	Q′ty	Remarks
12	Collar	1	For installation, reverse the removal procedure.



EAS00564

### **REMOVING THE REAR WHEEL**

1. Stand the scooter on a level surface.

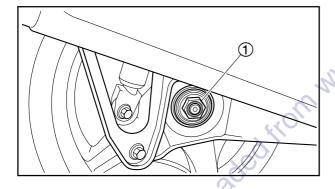
### **♠** WARNING

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

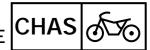
TIP\_

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

- 2. Disconnect:
  - ●O₂ sensor coupler



- 3. Remove:
  - muffler
    - •wheel axle nut ①
  - •swingarm
    Refer to "REAR SHOCK ABSORBER
    ASSEMBLIES AND SWINGARM".
- 4. Loosen:
  - brake adjuster
- 5. Remove:
  - •rear wheel
- 6. Remove:
  - brake shoe kit
  - •brake camshaft lever



EAS00565

### CHECKING THE REAR WHEEL

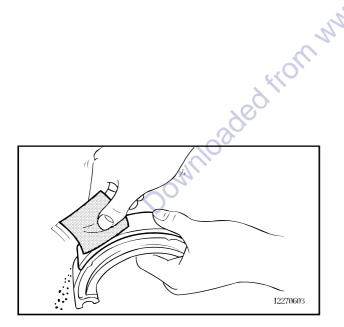
- 1. Check:
  - •tire
  - •rear wheel
     Damage/wear → Replace.

     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".

EAS0056

### CHECKING THE REAR WHEEL DRIVE HUB

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



FAS00569

### **CHECKING THE BRAKE**

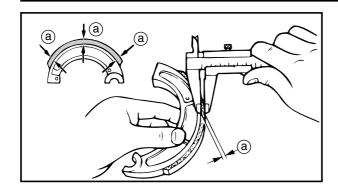
The following procedure applies to all of the brake shoes.

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

### TID

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





### 2. Measure:

brake shoe lining thickness ⓐ
 Out of specification → Replace.



Brake shoe lining thickness limit (minimum)

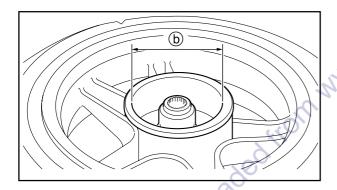
1.0mm (0.04in)

### **⚠** WARNING

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

TIP.

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)

151mm (5.94in)

### 4. Check:

• brake drum inner surface

Oil deposits → Clean.

Remove the oil with a rag soaked in lacquer thinner or solvent.

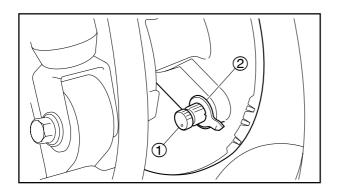
Scratches → Repair.

Lightly and evenly polish the scratches with an emery cloth.

### 5. Check:

• brake camshaft

Damage/wear → Replace.

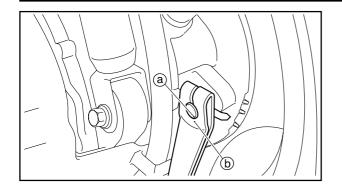


#### EAS00570

### ASSEMBLING THE BRAKE SHOES

- 1. Install:
  - O-rings New
  - brake camshaft (1)
  - brake shoe wear indicator (2)





### TIP\_

Lubricate the brake camshaft and O-rings with lithium-soap-based grease.

### **WARNING**

After installing the brake camshaft and Orings, remove any excess grease.

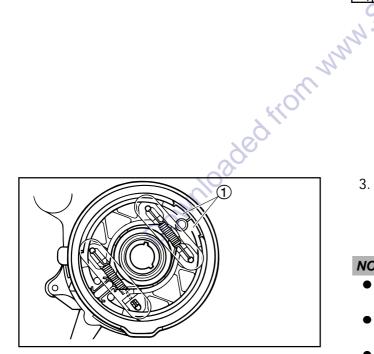
### \*\*\*\*\*\*\*\*\*\*\*\*\*\*

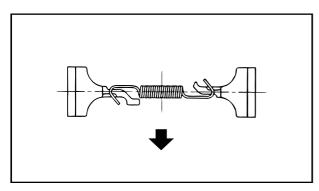
- a. Install the brake camshaft so its punch marka) is positioned as shown.
- b. Align the projection **(b)** on the brake camshaft lever with the notch in the brake shoe camshaft.
- c. Check that the brake shoes are properly positioned.

### \_\_\_\_

- 2. Tighten:
  - brake camshaft lever

🔌 10Nm(1.0m • kgf, 7.2ft • lbf)



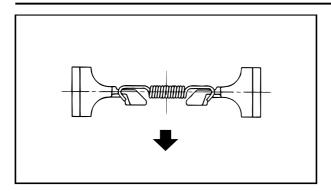


- 3. Install:
  - brake shoe kit (1)
  - tension springs

### NOTICE

- 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

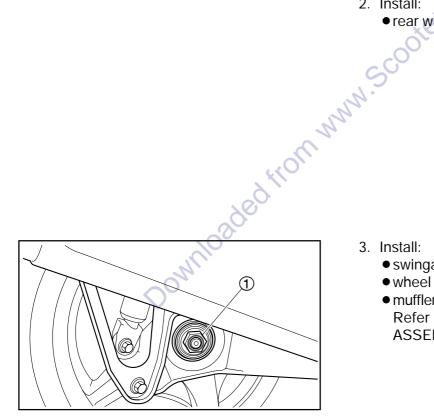
### INSTALLING THE REAR WHEEL

- 1. Lubricate:
  - wheel axle



Recommended lubricant Lithium-soap-based grease

- 2. Install:
  - rear wheel



- 3. Install:
  - swingarm
  - wheel axle nut (1)
  - muffler Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM".
- 4. Connect:
  - O<sub>2</sub> sensor coupler
- 5. Adjust:
  - brake lever free play Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.

# ADJUSTING THE REAR WHEEL STATIC BALANCE

### TIP \_\_\_\_

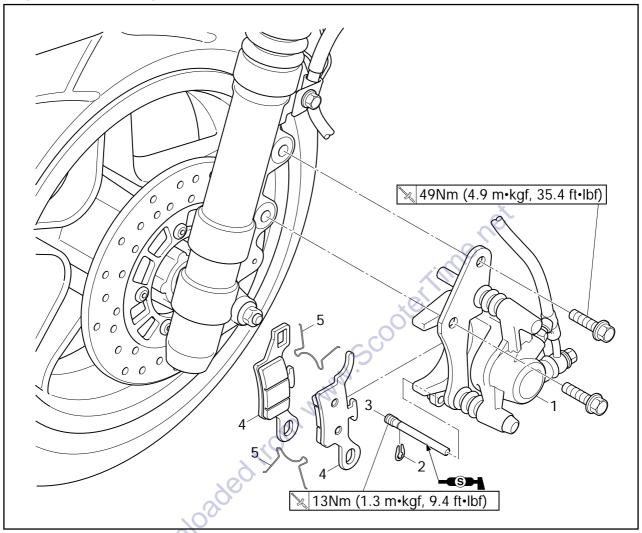
- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the rear wheel drive hub installed.

### 1. Adjust:

• rear wheel static balance
Refer to "ADJUSTING THE FRONT
WHEEL STATIC BALANCE".

### FRONT BRAKE

### FRONT BRAKE PADS



er listed. EPLACING T BRAKE

### NOTICE

Disc brake components rarely require disassembly.

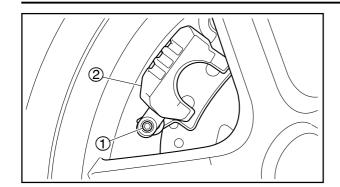
Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.

FIRST AID FOR BRAKE FLUID ENTERING THE EYES:

 Flush with water for 15 minutes and get immediate medical attention.

Downloaded from w



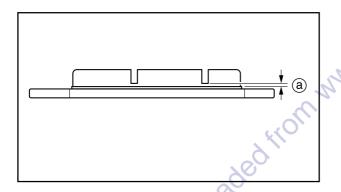
FAS0058

### REPLACING THE FRONT BRAKE PADS

TIP

When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

- 1. Loosen:
  - brake pad retaining bolt 1
- 2. Remove:
  - brake caliper ②
- 3. Remove:
  - circlip
  - brake pad retaining bolt
  - brake pads
  - brake pad springs



- 4. Measure:
  - brake pad wear limit (a)
     Out of specification → Replace the brake pads as a set.



Brake pad wear limit 0.8mm (0.03in)

- 5. Install:
  - brake pad springs
  - brake pads

TIP

Always install new brake pads and a new brake pad springs as a set.

TIP

Make sure the brake pad springs is installed correctly as shown.

- 6. Lubricate:
  - brake pad retaining bolt



**Recommended lubricant** Silicone grease

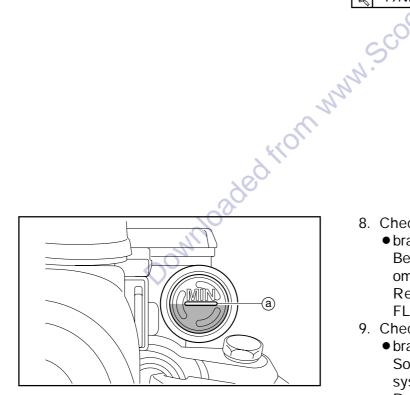
### NOTICE

- Do not allow grease to contact the brake pads.
- Remove any excess grease.
- 7. Install:
  - brake pad retaining bolt

13Nm (1.3m • kgf, 9.4ft • lbf)

- circlip
- brake caliper

49Nm (4.9m • kgf, 35.4ft • lbf)

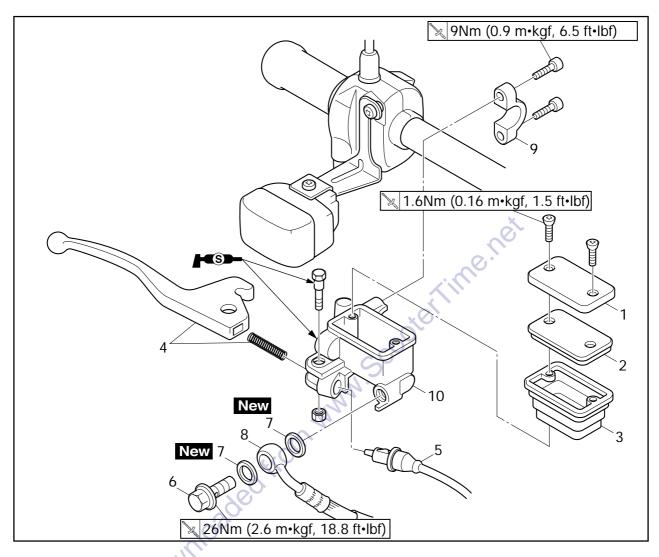


- 8. Check:
  - brake fluid level Below the level mark (a) → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
- 9. Check:
  - brake lever operation Soft or spongy feeling → Bleed the brake Refer to "BLEEDING THE HYDRAULIC

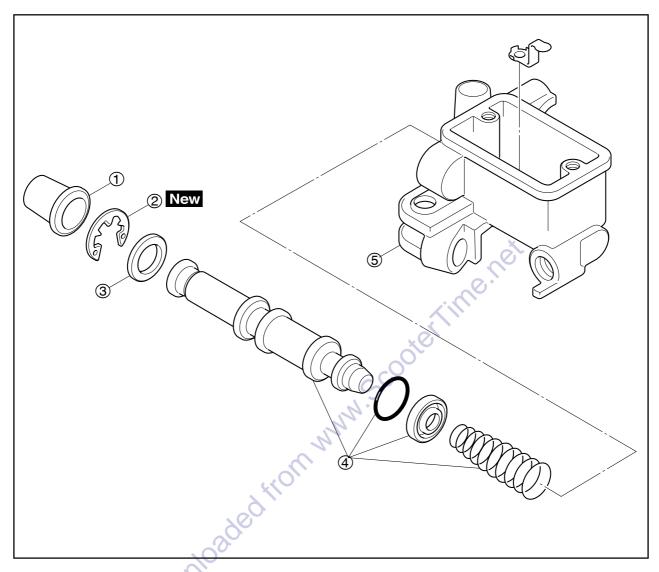
BRAKE SYSTEM" in chapter 3.

FAS0058

### FRONT BRAKE MASTER CYLINDER



Order	Job/Part	Q′ty	Remarks
	Removing the front brake master cyl-		Remove the parts in the order listed.
	inder		
	Brush guard (right)		Refer to "HANDLEBAR".
	Brake fluid		Drain.
1	Brake master reservoir cap	1	
2	Brake master reservoir holder	1	
3	Brake master reservoir diaphragm	1	
4	Brake lever/compress spring	1/1	Refer to "DISASSEM-
5	Front brake light switch	1	BLING THE FRONT
6	Union bolt	1	BRAKE MASTER CYLIN-
7	Copper washer	2	DER" and "ASSEMBLING
8	Brake hose	1	Disconnect. AND INSTALLING THE
9	Brake master cylinder holder	1	FRONT BRAKE MASTER
10	Brake master cylinder	1	│ │ │ │ │ │ │ │ │ │ │ │ │
			For installation, reverse the removal pro-
			cedure.



_ ·		I	
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Remove the parts in the order listed.
1	Dust boot	1	
2	Circlip	1	
3	Washer	1	
4	Brake master cylinder kit	1	
(5)	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

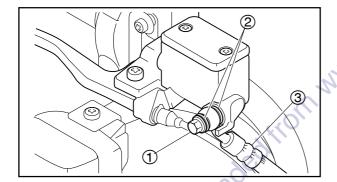
EASON58

# DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

TIP\_

Before disassembling the front brake master cylinder, drain the brake fluid from the entire brake system.

- 1. Remove:
  - brush guard (right)Refer to "HANDLEBAR".



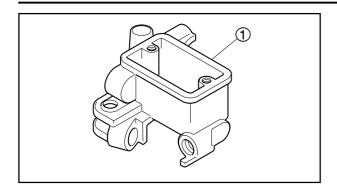
2. Remove:

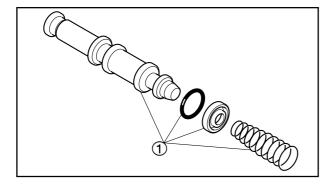
- brake lever/compress spring
  - front brake light switch
  - union bolt ①
  - copper washers ②
  - brake hose ③

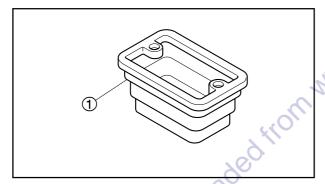
TIP

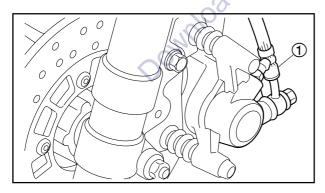
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

- 3. Remove:
  - brake master cylinder holder
  - brake master cylinder
- 4. Remove:
  - dust boot
  - circlip
  - washer
  - brake master cylinder kit









FAS00590

# CHECKING THE FRONT BRAKE MASTER CYLINDER

- 1. Check:
  - brake master cylinder ①
     Damage/scratches/wear → Replace.
  - brake fluid delivery passages (brake master cylinder body)
     Obstruction → Blow out with compressed air.
- 2. Check:
  - brake master cylinder kit ①
     Damage/scratches/wear → Replace.

3. Check:

 brake master cylinder reservoir Cracks/damage → Replace.
 brake master cylinder reservoir diaphragm ①
 Damage/wear → Replace.

4. Check: brake hose ①

Cracks/damage/wear → Replace.

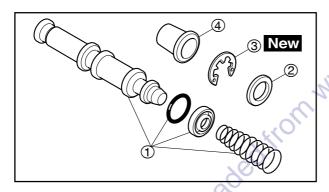
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

### **WARNING**

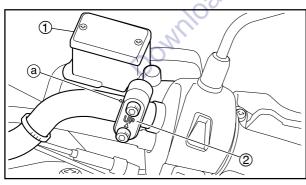
- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components.



Recommended brake fluid DOT 4



- 1. Install:
  - brake master cylinder kit (1)
  - washer ②
  - circlip ③ New
  - dust boot (4)



- 2. Install:
  - brake master cylinder (1)
  - brake master cylinder holder (2)

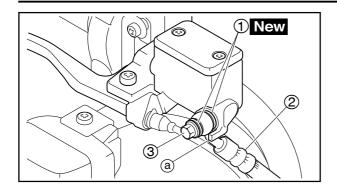
9Nm (0.9m • kgf, 6.5ft • lbf)

### TIP\_

- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark (a) in the handle-
- First, tighten the upper bolt, then the lower bolt.

# FRONT BRAKE





- 3. Install:
  - copper washers ① New
  - brake hose ②
  - union bolt ③

26Nm (2.6m • kgf, 18.8ft • lbf)

### NOTICE

When installing the brake hose onto the brake master cylinder, make sure the brake hose touch the projection (a) on the brake master cylinder.

### **⚠** WARNING

Proper brake hose routing is essential to insure safe scooter operation. Refer to "CABLE ROUTING" in chapter 2.

### TIP\_

- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.
- 4. Fill:
  - brake fluid reservoir (with the specified amount of the recommended brake fluid)



Downloaded from w

Recommended brake fluid DOT 4

### **WARNING**

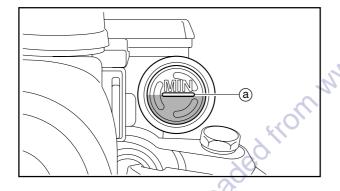
- Use only the designated brake fluid.
   Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

### NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

### 5. Bleed:

brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



### 6. Check:

brake fluid level

Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper

Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

### 7. Check:

• brake lever operation

Soft or spongy feeling → Bleed the brake

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

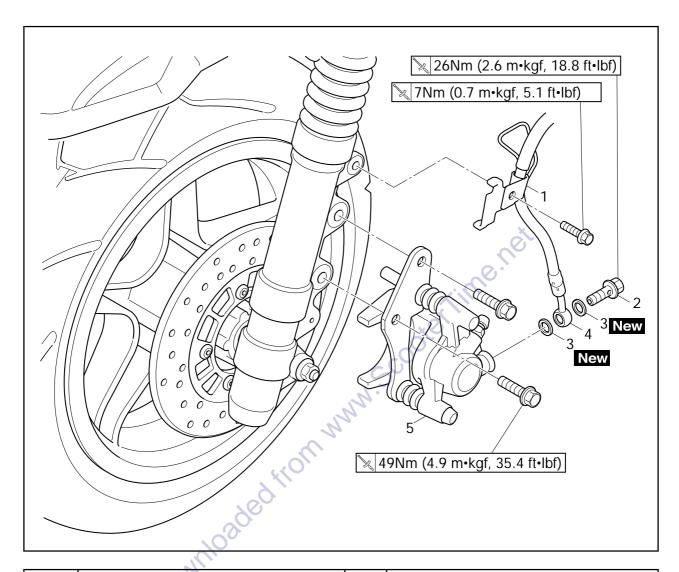
### 8. Install:

brush guard (right)

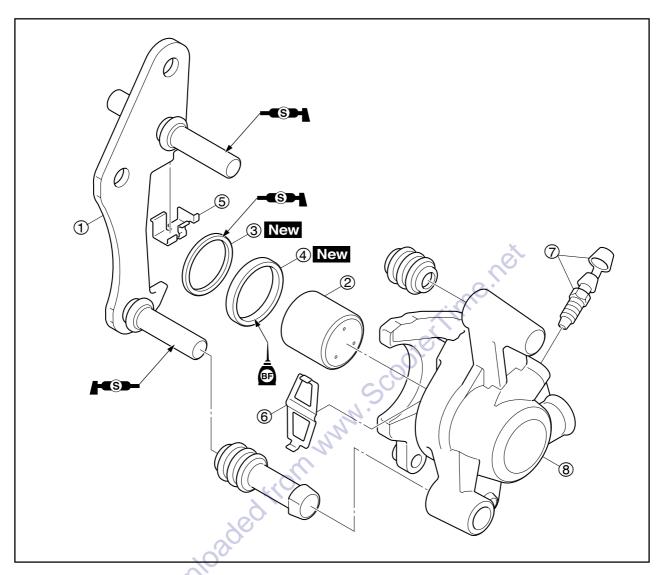
Refer to "HANDLEBAR".

FAS00612

### FRONT BRAKE CALIPER



Order	Job/Part	Q′ty	Remarks
	Removing the front brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake hose holder 1	1	
2	Union bolt	1	
3	Copper washer	2	
4	Brake hose	1	Disconnect.
5	Brake caliper	1	
			For installation, reverse the removal pro-
			cedure.



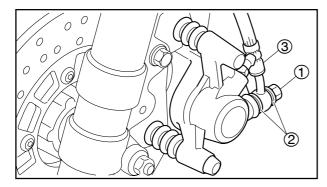
Order	Job/Part	Q′ty	Remarks
1) 2 3	Disassembling the front brake caliper Brake pad Brake pad spring Brake caliper bracket Brake caliper piston Brake caliper dust seal Brake caliper piston seal Spring	1 1 1 1	Remove the parts in the order listed.  Refer to "REPLACING THE FRONT BRAKE PADS".  Refer to "DISASSEMBLING THE FRONT BRAKE CALIPER" and "ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER".
(4) (5) (6) (7) (8)	Spring Sp	1 1/1 1/1	For assembly, reverse the disassembly procedure.

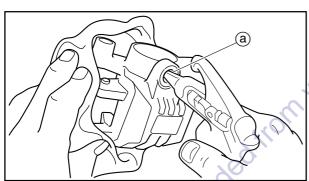
FΔS00619

# DISASSEMBLING THE FRONT BRAKE CALIPER

TIP\_

Before disassembling the brake caliper, drain the brake fluid from the entire brake system.





1. Remove:

- union bolt (1)
- copper washers (2)
- brake hose ③

TIP\_

Put the end of the brake hose into a container and pump out the brake fluid carefully.

2. Remove:

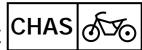
- brake caliper piston
  - brake caliper dust seal
  - brake caliper piston seal
  - spring
  - spring seat

a. Blow compressed air into the brake hose joint opening (a) to force out the pistons from the brake caliper.

\*\*\*\*\*\*\*\*

# **⚠** WARNING

- Cover the brake caliper piston with a rag.
   Be careful not to get injured when the piston are expelled from the brake caliper.
- Never try to pry out the brake caliper piston.
- b. Remove the brake caliper piston seal and dust seal.



#### CHECKING THE FRONT BRAKE CALIPER

Recommended brake component replacement		
schedule		
Brake pads	If necessary	
Piston seal	Every two years	
Brake hose	Every four years	
Brake fluid	Every two years and whenever the brake is disassembled	



# 1. Check:

- ◆brake caliper piston ①
   Rust/scratches/wear → Replace the brake caliper piston.
- brake caliper cylinder ②
   Scratches/wear → Replace the brake caliper assembly.
- brake caliper body ③
   Cracks/damage → Replace the brake caliper assembly.
- brake fluid delivery passages (brake caliper body)
   Obstruction → Blow out with compressed air.

## **WARNING**

Whenever a brake caliper is disassembled, replace the piston seal and dust seal.

#### 2. Check:

brake caliper bracket
 Cracks/damage → Replace.



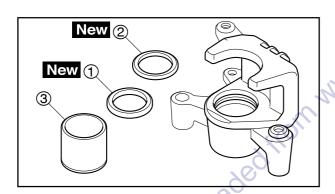
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER

# **WARNING**

- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the piston seal to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston seal and dust seal.



Recommended brake fluid DOT 4



- 1. Install:
  - brake caliper piston seal ① New
  - brake caliper dust seal ② New
  - brake caliper piston ③
- 2. Lubricate:
  - brake caliper piston seal
  - brake caliper dust seal



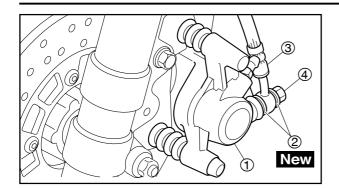
**Recommended lubricant** Brake caliper piston seal Brake fluid Brake caliper dust seal Silicone grease

- 3. Install:
  - brake caliper bracket
- 4. Lubricate:
  - brake caliper guide bar



Recommended lubricant Silicone grease





- 5. Install:
  - brake caliper (1) (temporarily)
  - copper washers ② New
  - brake hose ③
  - union bolt (4)

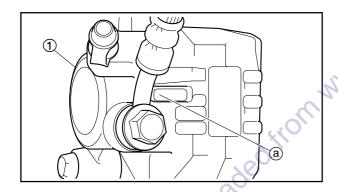
26Nm (2.6m • kgf, 18.8ft • lbf)

brake hose holder 1

7Nm (0.7m • kgf, 5.1ft • lbf)

# **⚠** WARNING

Proper brake hose routing is essential to insure safe scooter operation. Refer to "CABLE ROUTING" in chapter 2.



#### NOTICE

When installing the brake hose onto the brake caliper 1, make sure the brake pipe touch the projection (a) on the brake caliper.

- 6. Remove:
  - brake caliper
- 7. Install:
  - spring seat
  - spring
  - brake pads
  - brake pad springs
  - brake caliper retaining bolt

13Nm (1.3m • kgf, 9.4ft • lbf)

- circlip
- brake caliper

49Nm (4.9m • kgf, 35.4ft • lbf)

Refer to "REPLACING THE BRAKE PADS".

- 8. Fill:
  - brake fluid reservoir (with the specified amount of the recommended brake fluid)



Recommended brake fluid DOT 4

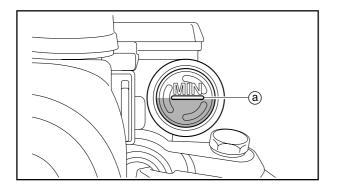
# **⚠** WARNING

- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

#### NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

- 9. Bleed:
  - brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



#### 10. Check:

brake fluid level Below the level mark (a) → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.



# 11. Check:

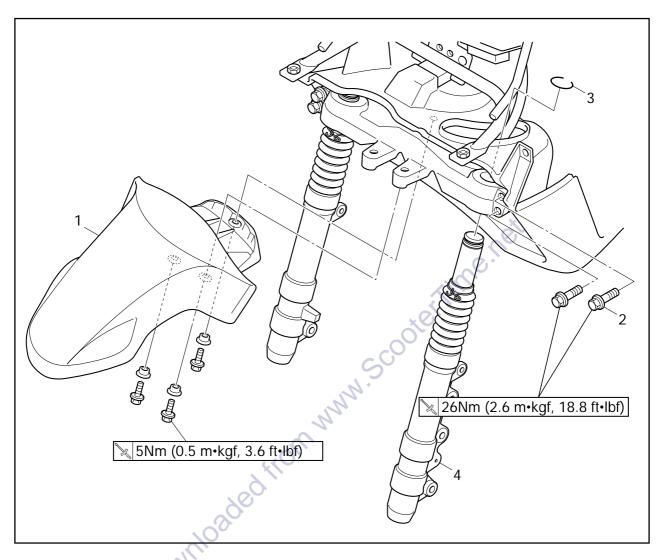
• brake lever operation Soft or spongy feeling → Bleed the brake Refer to "BLEEDING THE HYDRAULIC

BRAKE SYSTEM" in chapter 3.

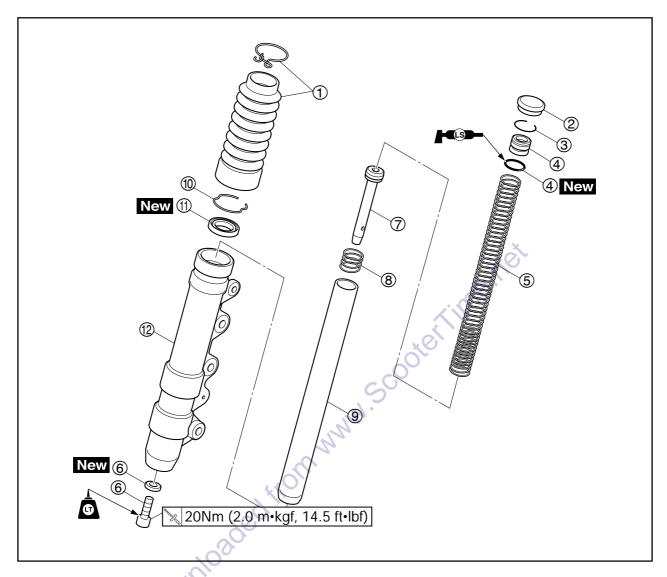
Downloaded from white Scoter line het

FAS00646

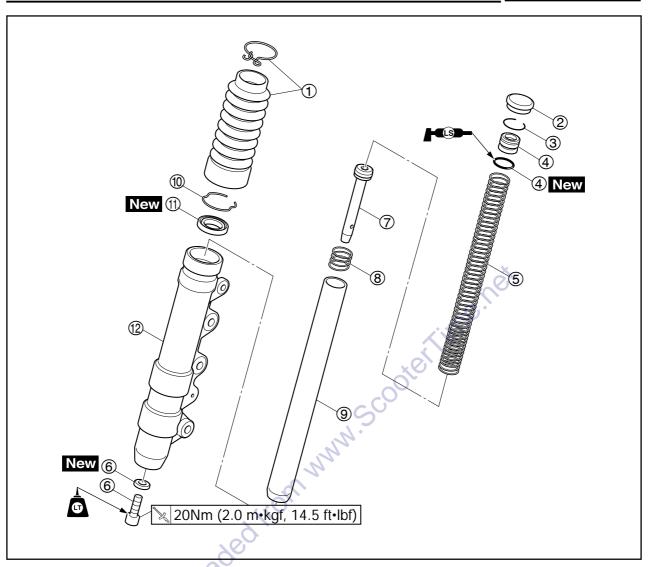
# **FRONT FORK**



Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
	Leg shield 1		Refer to "COVER AND PANEL" in chapter 3.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
	Brake hose holder 1 Brake caliper		Refer to "FRONT BRAKE".
1 2 3 4	Front fender Lower bracket pinch bolt Stopper ring Front fork leg	1 2 1 1	Loosen Refer to "REMOVING THE -FRONT FORK LEGS" and - "INSTALLING THE FRONT FORK LEGS".  For installation, reverse the removal procedure.



Order	Job/Part	Q′ty	Remarks
	Disassembling the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
-0004667899999	Clamp/boot Cap Stopper ring Collar/O-ring Fork spring Damper rod bolt/copper washer Damper rod Rebound spring Inner tube Oil seal clip Outer tube	1/1 1 1/1 1/1 1 1/1 1 1 1	Refer to "DISASSEMBLING THE FRONT FORK LEGS" and "ASSEM-BLING THE FRONT FORK LEGS".



Order	Job/Part	Q′ty	Remarks
	OOM,		For assembly, reverse the disassembly procedure.

EASON65

#### REMOVING THE FRONT FORK LEGS

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

1. Stand the scooter on a level surface.

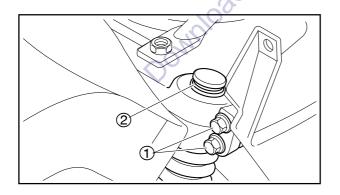
### **WARNING**

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

TIP

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

- 2. Remove:
  - leg shield 1
     Refer to "COVER AND PANEL" in chapter 3.
  - brake hose holder 1
  - brake caliper
     Refer to "FRONT BRAKE".
  - front wheel
     Refer to "FRONT WHEEL AND BRAKE DISC".



- 3. Loosen:
  - lower bracket pinch bolt (1)
- 4. Remove:
  - stopper ring ②

# **WARNING**

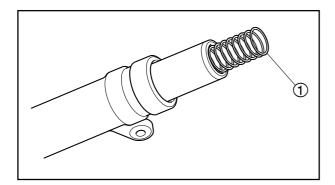
Before loosening the lower bracket pinch bolts, support the front fork leg.

- 5. Remove:
  - •front fork leg

#### DISASSEMBLING THE FRONT FORK LEGS

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

- 1. Remove:
  - clamp/boot

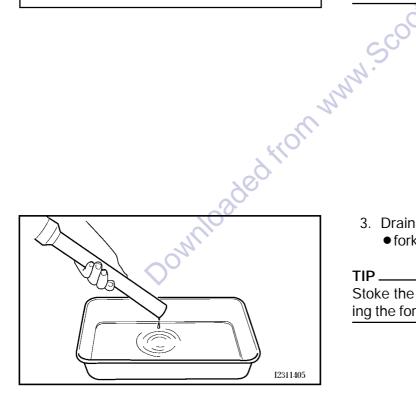


#### 2. Remove:

- cap
- stopper ring
- •collar/O-ring
- ●fork spring ①

#### NOTICE

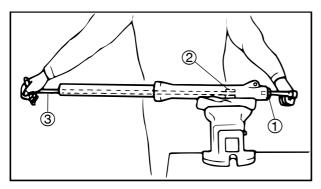
The collar/O-ring and fork spring jump out after removing stopper ring.



#### 3. Drain:

• fork oil

Stoke the outer tube several times while draining the fork oil.



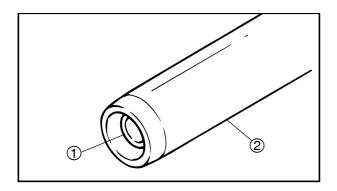
# 4. Remove:

- damper rod assembly bolt (1)
- copper washer

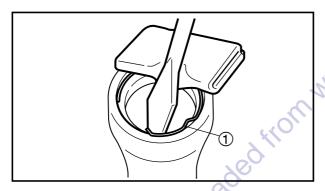
While holding the damper rod with the damper rod holder (2) and T- handle(3), loosen the damper rod assembly bolt.



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



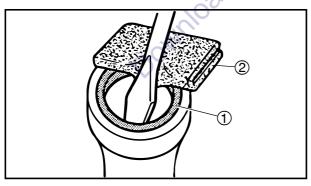
- 5. Remove:
  - damper rod ①
  - rebound spring
  - inner tube ②



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

NOTICE

Do not scratch the inner tube.

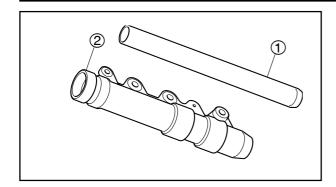


- 7. Remove:
  - oil seal 1

NOTICE

Never reuse the oil seal.

• Rag ②



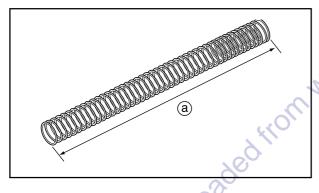
#### CHECKING THE FRONT FORK LEGS

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.

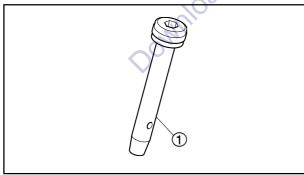


#### 2. Measure:

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

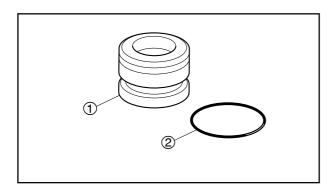


Spring free length 252.1mm (9.93in) <Limit>:247mm (9.72in)



#### 3. Check:

• damper rod (1) Damage/wear → Replace. Obstruction → Blow out all of the oil passages with compressed air.



#### 4. Check:

- collar (1)
- O-ring ② Damage/wear → Replace.

#### ASSEMBLING THE FRONT FORK LEGS

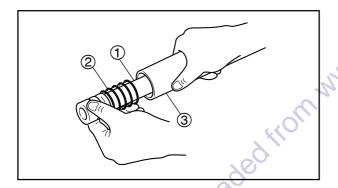
The following procedure applies to both of the front fork legs.

# **M** WARNING

- Make sure the oil levels in both front fork legs are equal.
- Uneven oil levels can result in poor handling and a loss of stability.

#### TIP\_

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



- 1. Install:
  - damper rod assembly ①
  - rebound spring ②

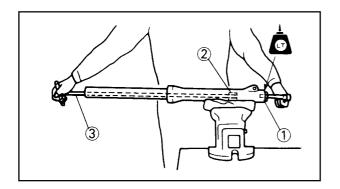
#### NOTICE

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



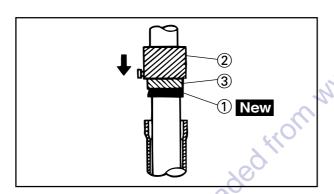
20Nm (2.0m • kgf, 14.5ft • lbf) LOCTITE®

#### TIP\_

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)





# 4. Install:

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



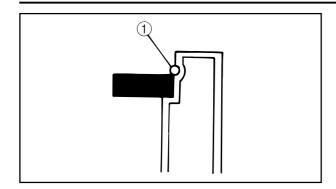
Fork seal driver weight 90890-01367 (YM-A9409-7) Adapter 90890-01368 (YM-A9409-4)

### NOTICE

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

- 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.



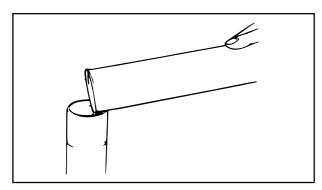


5. Install:

• oil seal clip ①

#### TIP

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



Dominoaded trom m

6. Fill:

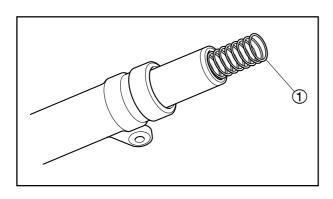
front fork leg
 (with the specified amount of the recommended fork oil)



Quantity (each front fork leg) 0.104L (0.11 US qt, 0.09 lmp. qt) Recommended oil Fork oil 10W or equivalent

#### TID

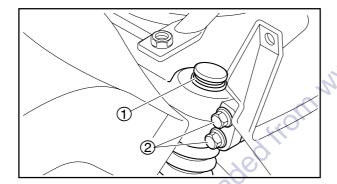
- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.



- 7. Install:
  - fork spring ①
  - collar
  - O-ring New
  - stopper ring
  - •cap

#### TIP\_

- Install the spring with the smaller pitch facing down.
- Before installing the collar, lubricate its Oring with grease.
- Press down the collar/O-ring, adjust the stopper ring so that it fits into the inner tube's groove.
- 8. Install:
  - clamp/boot



FAS00663

#### INSTALLING THE FRONT FORK LEGS

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

- 1. Install:
  - front fork leg
  - stopper ring ①

#### TIP

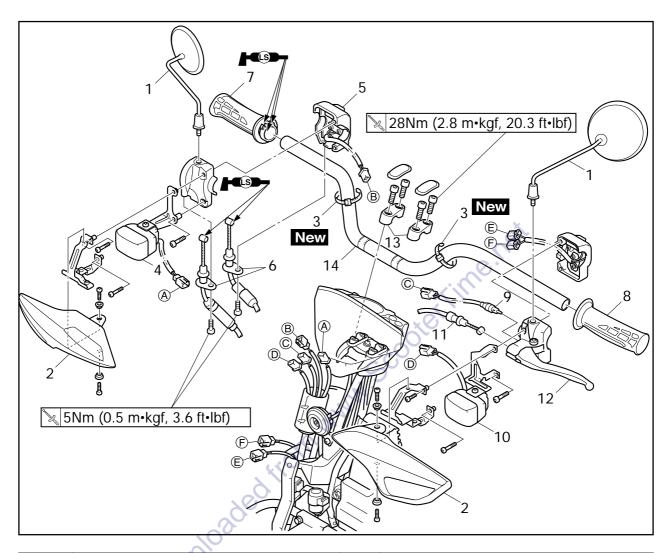
Pull up the inner tube until it stops, then install the stopper ring.

- 2. Tighten:
  - lower bracket pinch bolt (2)

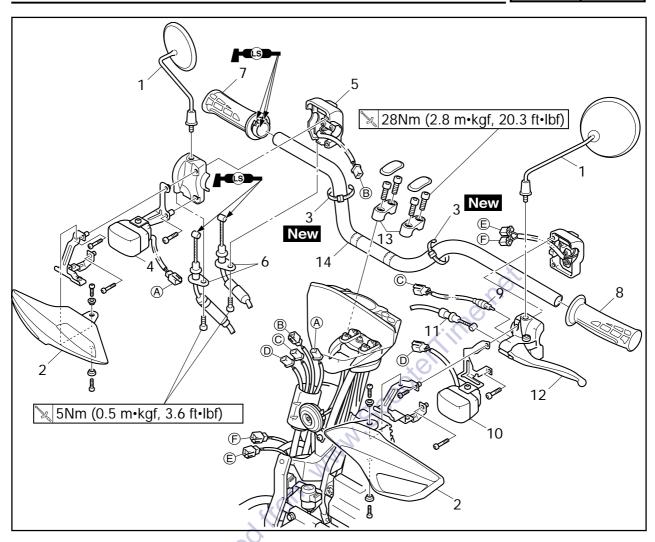
# 26Nm (2.6m • kgf, 18.8ft • lbf)

- 3. Install:
  - front wheel Refer to "FRONT WHEEL AND BRAKE DISC".
  - brake caliper
  - brake hose holder 1 Refer to "FRONT BRAKE".
  - leg shield 1
     Refer to "COVER AND PANEL" in chapter 3.

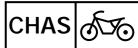
# **HANDLEBAR**



Order	Job/Part	Q′ty	Remarks		
1	Removing the handlebar Leg shield 1 Leg shield 2 Brake master cylinder  Rear view mirror (left and right)	1/1	Remove the parts in the order listed Refer to "COVER AND PANEL" in charge ter 3.  Disconnect.  Refer to "FRONT BRAKE".		
2 3 4 5 6 7 8	Brush guard (left and right) Band Front turn signal light (right) Right handlebar switch Throttle cable assembly Throttle grip assembly Handlebar grip Brake light switch (rear)	1/1 2 1 1 1 1 1	Cut.  Disconnect.	Refer to "REMOVING THE HANDLEBAR" and -"INSTALLING THE HANDLEBAR".	
10 11 12	Front turn signal light (left) Rear brake cable Left lever holder	1 1 1	Disconnect.		



Order	Job/Part	Q′ty	Remarks	
13 14	Upper handlebar holder Handlebar	2		
	Don,	·	For installation, reverse the removal procedure.	



EASON66

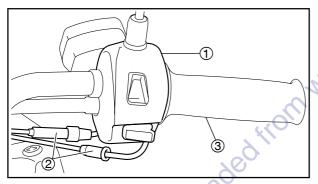
#### REMOVING THE HANDLEBAR

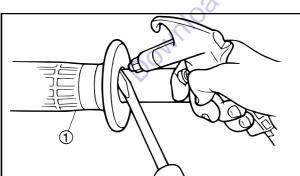
1. Stand the scooter on a level surface.

# **⚠** WARNING

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

- 2. Remove:
  - leg shield 1
  - leg shield 2
     Refer to "COVER AND PANEL" in chapter 3.
  - rear view mirror (left and right)
  - brush guard (left and right)
  - ●band
- 3. Disconnect:
  - brake master cylinder Refer to "FRONT BRAKE".





- 4. Remove:
  - front turn signal light (right)
    - right handlebar switch ①
    - throttle cable assembly 2
    - throttle grip assembly ③

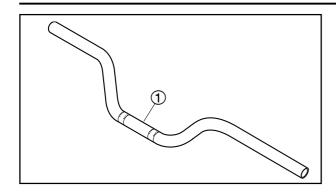
TIP.

While removing the right handlebar switch, pull back the rubber cover.

- 5. Remove:
  - rear brake cable
  - brake light switch (rear)
  - front turn signal light (left)
  - left lever holder
  - handlebar grip ①
  - upper handlebar holder
  - handlebar

TIP \_\_\_\_

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



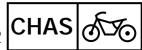
## CHECKING THE HANDLEBAR

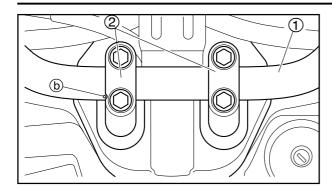
- 1. Check:
  - handlebar ①
     Bends/cracks/damage → Replace.

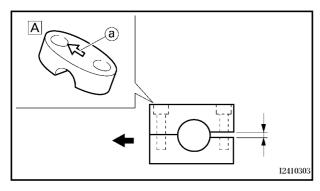
# **MARNING**

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

Downloaded from www. Scooter lime. Ret







#### 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)
  - upper handlebar holders ②

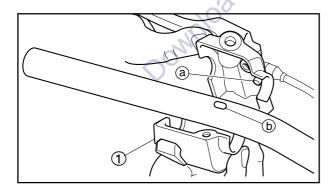
28Nm(2.8m • kgf, 20.3ft • lbf)

## NOTICE

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

TIP.

- 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:
  - left lever holder (1)

TIP

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

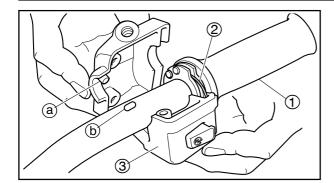
- 4. Install:
  - handlebar grip

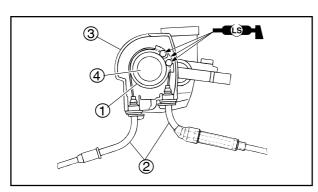
TIP

Before installing the handlebar grip, apply the bond.

# **HANDLEBAR**







- 5. Install:
  - throttle grip assembly (1)
  - throttle cable assembly 2
  - right handlebar switch ③

#### TIP\_

- Lubricate the inside of the throttle grip assembly with a thin coat of lithium-soapbased grease and install it onto the handlebar (4).
- Align the projection (a) on the right handlebar switch with the hole (b) in the handlebar.

# **⚠** WARNING

Make sure the throttle grip operates smoothly.

- 6. Install:
  - brake master cylinder Refer to "FRONT BRAKE".
- Dominoaged thou man 7. Install:
  - band New
  - brush guard (left and right)
  - rear view mirror (left and right)
  - 8. Install:
    - leg shield 2
    - leg shield 1 Refer to "COVER AND PANEL" in chapter 3.
  - 9. Adjust:
    - throttle cable free play Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

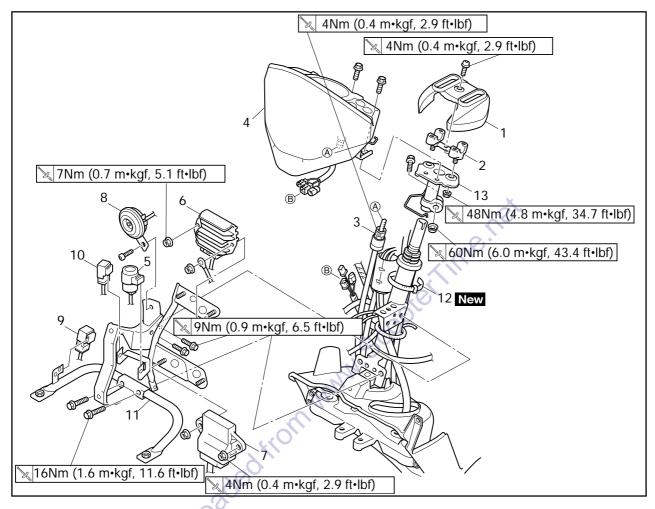


Throttle cable free play (at the flange of the throttle grip)

3 ~5mm (0.12 ~ 0.20in)

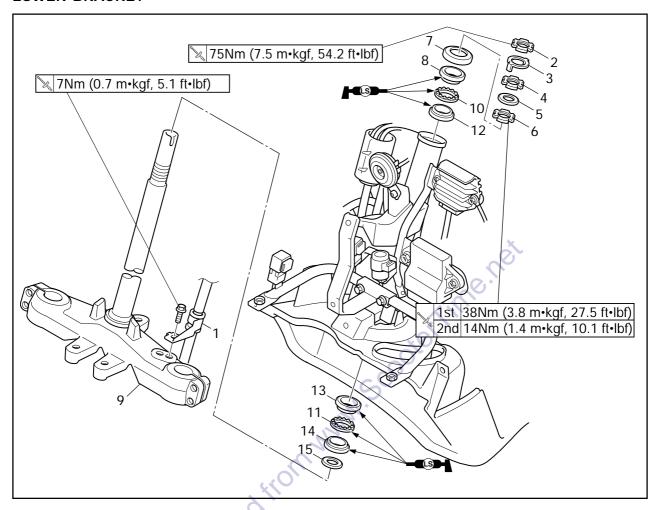
# STEERING HEAD

## HANDLEBAR BRACKET AND FRONT BRACKET

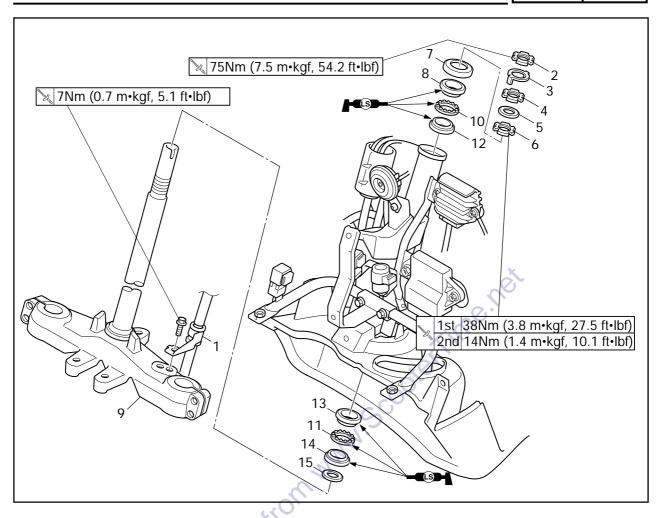


Order	Job/Part	Q′ty	Remarks
	Removing the handlebar bracket and		Remove the parts in the order listed.
	front bracket		·
	Handlebar		Refer to "HANDLEBAR".
1	Handlebar cover	1	
2	Lower handlebar holder	1	
3	Speedometer cable	1	Disconnect.
4	Speedometer	1	
5	Turn signal relay	1	Disconnect.
6	Rectifier/regulator	1	Disconnect.
7	ECU	1	Disconnect.
8	Horn	1	Disconnect.
9	Headlight relay	1	Disconnect.
10	Starting circuit cut-off relay	1	Disconnect.
11	Front bracket	1	
12	Band	1	Cut.
13	Handlebar bracket	1	
			For installation, reverse the removal procedure.

## LOWER BRACKET



Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket Leg shield 1 Leg shield 2 Front wheel  Brake caliper Front fork legs Handlebar Handlebar bracket		Remove the parts in the order listed. Refer to "COVER AND PANEL" in chapter 3. Refer to "FRONT WHEEL AND BRAKE DISC". Refer to "FRONT BRAKE". Refer to "FRONT FORK". Refer to "HANDLEBAR". Refer to "HANDLEBAR BRACKET AND FRONT BRACKET".
1 2 3 4 5	Brake hose holder 2 Upper ring nut Lock washer Center ring nut Rubber washer	1 1 1 1 1 1	
6 7 8 9 10	Lower ring nut Bearing race cover Upper bearing inner race Lower bracket Upper bearing	1 1 1 1 1	Refer to "REMOVING THE LOWER BRACKET" and "INSTALLING THE STEERING HEAD".



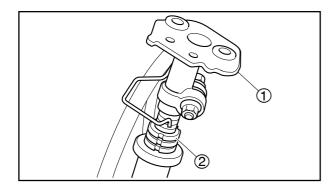
Order	Job/Part	Q′ty	Remarks
11	Lower bearing	1	
12	Upper bearing outer race	1	
13	Lower bearing outer race	1	
14	Lower bearing inner race	1	
15	Dust seal	1	Ц
			For installation, reverse the removal procedure.

#### REMOVING THE LOWER BRACKET

1. Stand the scooter on a level surface.

# **MARNING**

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

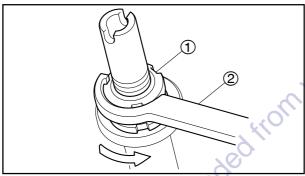


#### 2. Remove:

- •brake hose holder 2
- •handlebar bracket (1)

#### TIP

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



#### 3. Remove:

- upper ring nut ①(with the ring nut wrench ②)
- lock washer
- center ring nut
- rubber washer



Ring nut wrench 90890-01268 (YU-01268)



# 4 . Remove:

•lower ring nut ①
(with the ring nut wrench ②)



Ring nut wrench 90890-01268 (YU-01268)

# **WARNING**

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



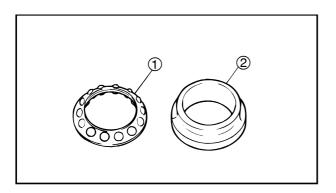
FASON68

#### **CHECKING THE STEERING HEAD**

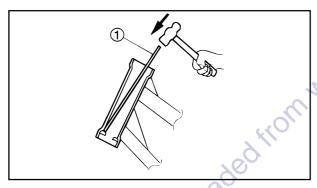
- 1. Wash:
  - bearings
  - bearing races



Recommended cleaning solvent Kerosene



- 2. Check:
  - •bearings (1)
  - bearing races ②
     Damage/pitting → Replace.
- 3. Replace:
  - bearings
  - bearing races
  - •dust seal



- Remove the bearing races from the steering head pipe with a long rod ① and hammer.
- b. Remove the bearing race from the lower bracket with a floor chisel ② and hammer.
- c. Install a new dust seal, bearings and bearing races.



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

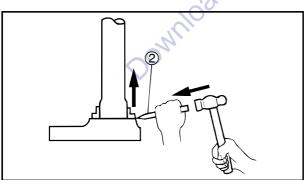
TIP.

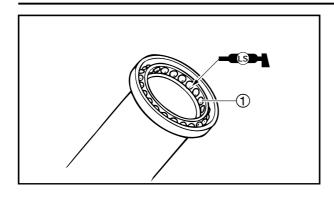
- Always replace the bearings and bearing races as a set.
- Whenever the steering head is disassembled, replace the dust seal.



- 4. Check:
  - •handlebar bracket
  - lower bracket

     (along with the steering stem)
     Bends/cracks/damage → Replace.



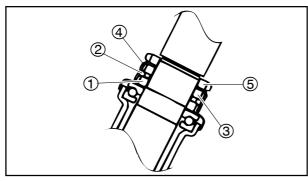


#### INSTALLING THE STEERING HEAD

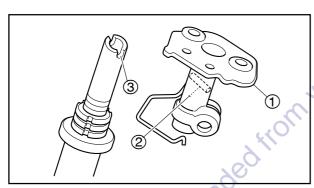
- 1. Lubricate:
  - bearings ①
  - bearing races



Recommended lubricant Lithium-soap-based grease



- 2. Install:
  - lower ring nut ①
  - rubber washer ②
  - center ring nut ③
  - lock washer 4
  - upper ring nut (5)
     Refer to "CHECKING THE STEERING HEAD" in chapter 3.



- 3. Install:
  - handlebar bracket ①

60Nm(6.0m • kgf, 43.4ft • lbf)

TIP.

Align the handlebar bracket across rod  $\ 2$  on the lower bracket concave  $\ 3$  .

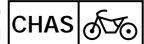
- 4. Tighten:
  - brake hose holder 2

7Nm (0.7m • kgf, 5.1ft • lbf)

• lower handlebar holder

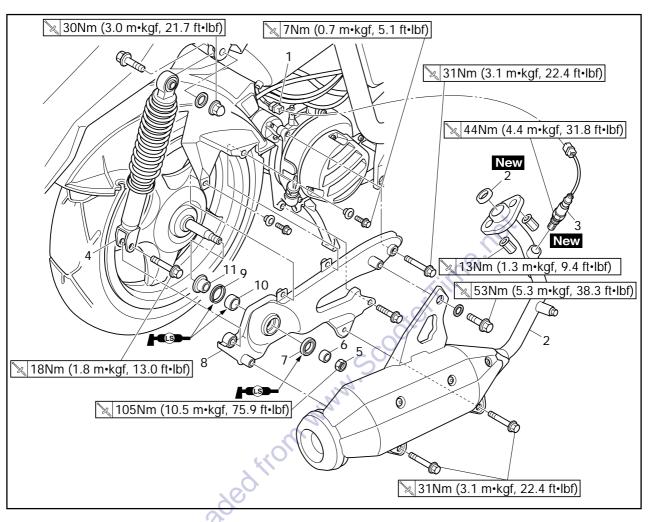
48Nm (4.8m • kgf, 34.7ft • lbf)

# REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



FAS0068!

# REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assemblies and swingarm		Remove the parts in the order listed.
1	O <sub>2</sub> sensor coupler	1	Disconnect.
2	Muffler/gasket	1/1	
2 3	O, sensor	1	
4	Rear shock absorber assembly (left and right)	1/1	
5	Rear wheel axle nut	1	
6	Spacer	1	
7	Oil seal	1	
8	Swingarm	1	
9	Oil seal	1	
10	Bearing	1	
11	Collar	1	
			For installation, reverse the removal procedure.

# REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



EAS00693

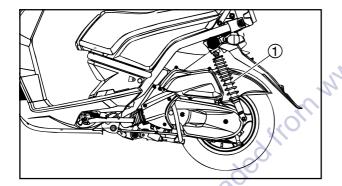
# REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES

1. Stand the scooter on a level surface.

## **№** WARNING

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

TIP					
Place the scooter	on a	suitable	stand	so	that
he rear wheel is el	evate	.d			



#### 2. Remove:

• rear shock absorber assemblies (1)

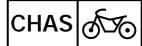
FAS0069!

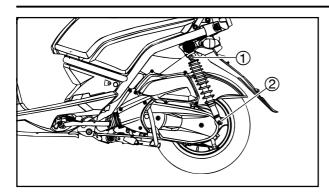
# CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

The following procedure applies to both of the rear shock absorber assemblies.

- 1. Check:
  - •rear shock absorber rod
     Bends/damage → Replace the rear shock
     absorber assembly.
  - •rear shock absorber
     Oil leaks → Replace the rear shock absorber assembly.
  - spring
     Damage/wear → Replace the rear shock absorber assembly.
  - bushingsDamage/wear → Replace.
  - dust sealsDamage/wear → Replace.
  - boltsBends/damage/wear → Replace.

# REAR SHOCK ABSORBER ASSEMBLIES AND **SWINGARM**





## INSTALLING THE REAR SHOCK AB-**SORBER ASSEMBLIES**

- 1. Install:
  - rear shock absorber assembly upper nuts

30Nm (3.0m • kgf, 21.7ft • lbf)

• rear shock absorber assembly lower bolts

18Nm (1.8m • kgf, 13.0ft • lbf)

## REMOVING THE SWINGARM

1. Stand the scooter on a level surface.

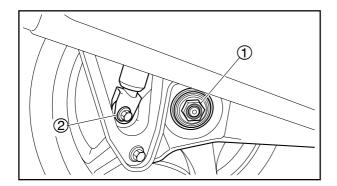
## WARNING

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

TIP\_

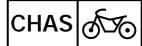
Place the scooter on a suitable stand so that the rear wheel is elevated.

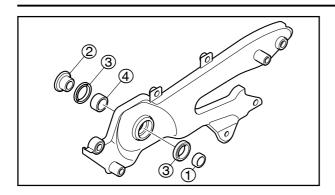
- 2. Disconnect:
  - O<sub>2</sub> sensor coupler
- 3. Remove:
  - muffler



- 4. Remove:
  - rear wheel axle nut (1)
  - rear shock absorber assembly lower bolt (right) ②
- 5. Remove:
  - swingarm

# REAR SHOCK ABSORBER ASSEMBLIES AND **SWINGARM**





EAS00708

# **CHECKING THE SWINGARM**

- 1. Check:
  - swingarm Bends/cracks/damage → Replace.
- 2. Check:
  - spacer (1)
  - collar (2)
  - oil seals ③
  - bearing (4)

Damage/wear → Replace.

# INSTALLING THE SWINGARM

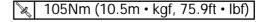
- 1. Lubricate:
  - bearing
  - oil seal lips
  - rear wheel axle splines



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



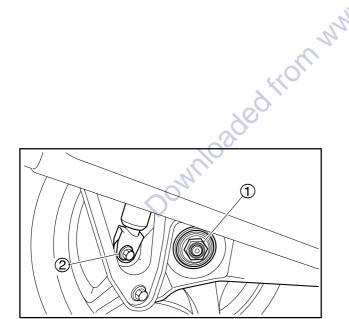
- swingarm
- 31Nm (3.1m kgf, 22.4ft lbf)
  - rear wheel axle nut ①



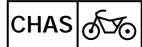
rear shock absorber assembly lower bolt (right) ②

18Nm (1.8m • kgf, 13.0ft • lbf)

- 3. Install:
  - muffler



# REAR SHOCK ABSORBER ASSEMBLIES AND **SWINGARM**



- 4. Tighten:
  - exhaust pipe nut

13Nm (1.3m • kgf, 9.4ft • lbf)

muffler and swingarm bolt

er and swir

3Nm (5.3m • kgf, 5

5. Connect:

• O<sub>2</sub> sensor coupler 31Nm (3.1m • kgf, 22.4ft • lbf)

muffler and swingarm bolt

53Nm (5.3m • kgf, 38.3ft • lbf)

# CHAPTER 5 ENGINE

ENGINE REMOVAL	5-1
LEADS AND HOSES	5-1
ENGINE	
INSTALLING THE ENGINE	5-4
CYLINDER HEAD	
REMOVING THE CYLINDER HEAD	5-7
CHECKING THE CYLINDER HEAD	5-9
INSTALLING THE CYLINDER HEAD	5-10
THE ROCKER ARMS AND CAMSHAFT	
REMOVING THE ROCKER ARMS AND CAMSHAFT	
CHECKING THE CAMSHAFT	5-15
CHECKING THE ROCKER ARMS AND ROCKER ARM	
SHAFTS	5-16
CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKET AN	ID
TIMING CHAIN GUIDES	
CHECKING THE TIMING CHAIN TENSIONER	5-18
INSTALLING THE CAMSHAFT AND ROCKER ARMS	
VALVES AND VALVE SPRINGS	5-21
REMOVING THE VALVES	
CHECKING THE VALVES AND VALVE GUIDES	5-24
CHECKING THE VALVE SEATS	5-27
CHECKING THE VALVE SPRINGS	5-29
INSTALLING THE VALVES	5-30
CYLINDER AND PISTON	
REMOVING THE CYLINDER AND PISTON	5-33
CHECKING THE CYLINDER AND PISTON	5-34
CHECKING THE PISTON RINGS	5-36
CHECKING THE PISTON PIN	5-37
CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)	5-38
INSTALLING THE PISTON AND CYLINDER	5-38
BELT DRIVE	5-40
V-BELT CASE	
V-BELT AND PRIMARY/SECONDARY SHEAVE	5-41
SECONDARY SHEAVE	
REMOVING THE PRIMARY SHEAVE	5-43
REMOVING THE SECONDARY SHEAVE AND V-BELT	5-43
DISASSEMBLING THE SECONDARY SHEAVE	5-44
CHECKING THE CLUTCH SHOES	5-44

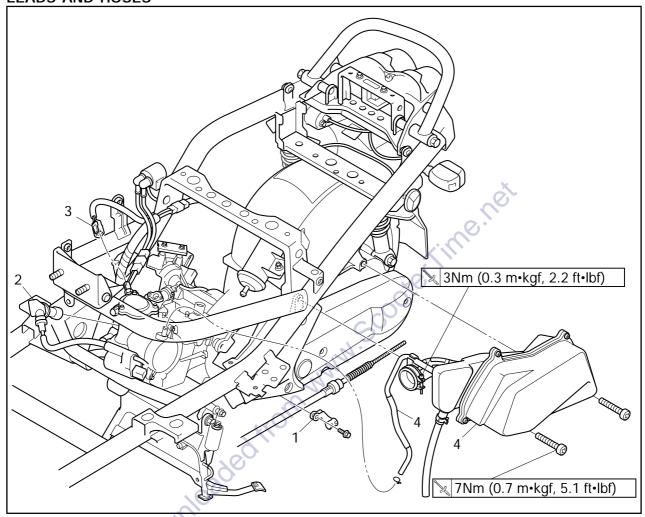
# ENG 🔊

CHECKING THE V-BELT	5-45
CHECKING THE PRIMARY SHEAVE	5-46
CHECKING THE PRIMARY SHEAVE WEIGHTS	5-46
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 PRIM	IARY
SHEAVE	5-50
STARTER CLUTCH AND AC MAGNETO	5-53
STATOR COIL ASSEMBLY	5-53
STARTER CLUTCH	5-54
STARTER CLUTCHREMOVING THE AC MAGNETO	5-55
CHECKING THE STARTER CLUTCHINSTALLING THE AC MAGNETO	5-56
INSTALLING THE AC MAGNETO	5-57
OIL PUMP	5-58
OIL PUMP	5-59
ASSEMBLING THE OIL PUMP	5-60
INSTALLING THE OIL PUMP	5-60
TRANSMISSION	5-61
CHECKING THE TRANSMISSION	5-62
CRANKSHAFT	
CRANKSHAFT ASSEMBLY	
DISASSEMBLING THE CRANKCASE	
REMOVING THE CRANKSHAFT ASSEMBLY	5-66
CHECKING THE CRANKSHAFT AND CONNECTING ROD	5-66
CHECKING THE CRANKCASE	5-67
CHECKING THE TIMING CHAIN AND TIMING CHAIN	
GUIDE(INTAKE SIDE)	
CHECKING THE BEARINGS AND OIL SEALS	5-68
INSTALLING THE CRANKSHAFT ASSEMBLY	5-69
ASSEMBLING THE CRANKCASE	5-69

EAS00188

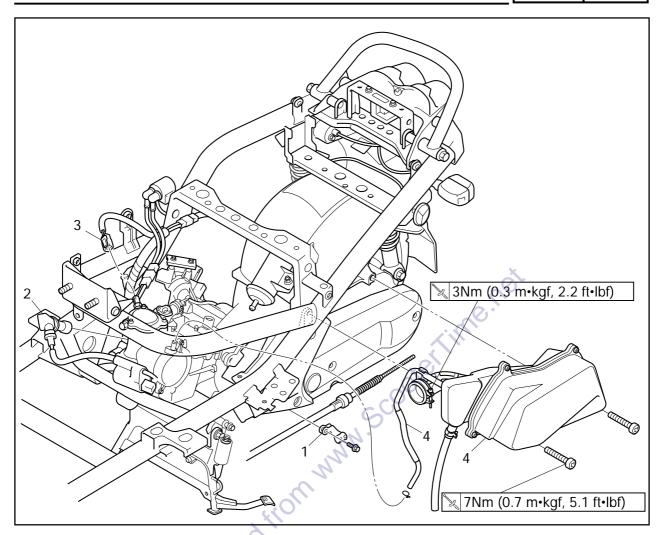
# **ENGINE**

# ENGINE REMOVAL LEADS AND HOSES



Order	Job/Part	Q′ty	Remarks
	Removing the leads and hoses		Remove the parts in the order listed.
	Seat/trunk		h l
	Battery box cover/front cover		Refer to "COVER AND PANEL" in chap-
	Side cover (left and right)		ter 3.
	Battery/footrest board		
	Rear brake cable/adjuster/spring/pin		Refer to "REAR WHEEL AND REAR
			BRAKE" in chapter 4.
	O <sub>2</sub> sensor coupler		Refer to "REAR SHOCK ABSORBER
	Muffler		ASSEMBLIES AND SWINGARM" in
			Chapter 4.
	Air duct		Refer to "BELT DRIVE".
	Crankshaft position sensor/stator coil		Refer to "STARTER CLUTCH AND AC
	assembly coupler		MAGNETO".
	Throttle body and fuel injector		Refer to "THROTTLE BODY AND FUEL
			INJECTOR " in chapter 6.
	Starter motor		Refer to "ELECTRIC STARTING SYS-

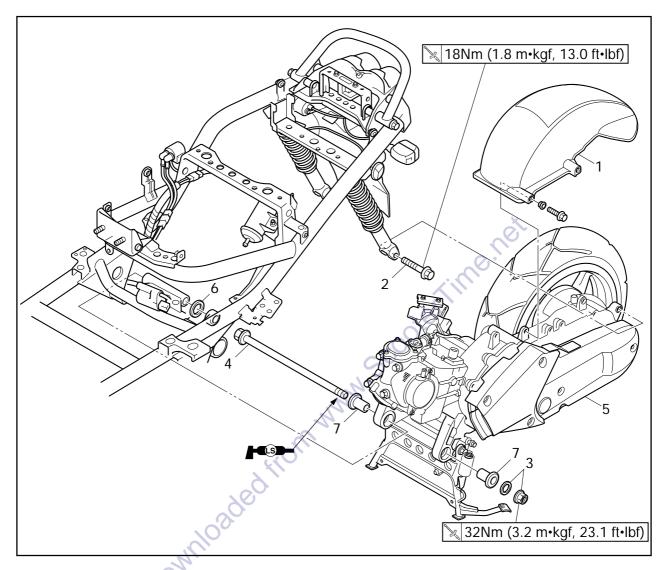




Order	Job/Part	Q'ty	Remarks
			TEM" in chapter 7.
1	Rear brake cable holder	1	·
2	Spark plug cap	1	Disconnect.
3	Engine temperature sensor coupler	1	Disconnect.
4	Air filter/breather hose	1/1	
			For installation, reverse the removal procedure.

EAS00191

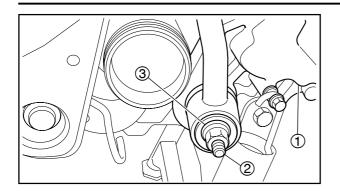
### **ENGINE**



Order	Job/Part	Q′ty	Remarks
	Removing the engine		Remove the parts in the order listed.
			Place a suitable stand under the frame and engine.
1 2	Rear fender Rear shock absorber assembly lower	1 2	T
3 4 5	bolt Engine mounting nut/washer Engine mounting bolt Engine	1/1 1 1	Refer to "INSTALLING THE ENGINE".
6 7	Washer Collar	1 2	
			For installation, reverse the removal procedure.

# **ENGINE REMOVAL**





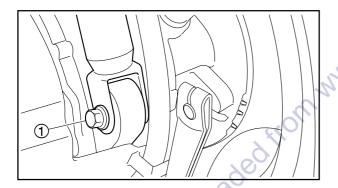
FΔS0010

## **INSTALLING THE ENGINE**

- 1. Install:
  - engine (1)
  - engine mounting bolt 2
  - engine mounting nut ③

TIP\_

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



2. Install:

• rear shock absorber assembly lower bolts

①

TIP

Do not fully tighten the bolts.

3. Tighten:

• engine mounting bolt

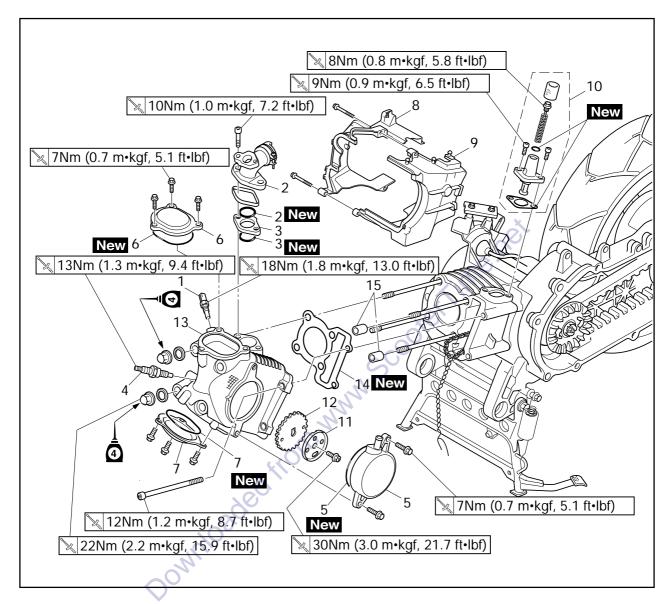
32Nm(3.2m • kgf, 23.1ft • lbf)

• rear shock absorber assembly lower bolts

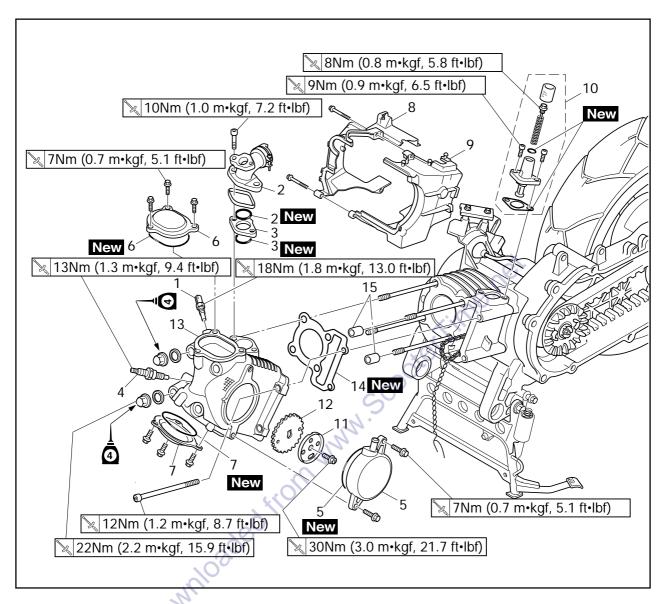
18Nm(1.8m • kgf, 13.0ft • lbf)

EAS0022

### CYLINDER HEAD



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head Air guide Air shroud cylinder 3 V-belt case Muffler		Remove the parts in the order listed. Refer to "STARTER CLUTCH AND AC MAGNETO". Refer to "BELT DRIVE". Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" in chapter 4.
1	Engine temperature sensor	1	· ·
2	Intake manifold/O-ring	1/1	
3	Joint/O-ring	1/1	
4	Spark plug	1	
5	Breather/O-ring	1/1	۱
6	Valve cover (intake)/O-ring	1/1	Refer to "REMOVING THE CYLINDER
7	Valve cover (exhaust)/O-ring	1/1	HEAD" and "INSTALLING THE CYLIN-
8	Air shroud cylinder 2	1	DER HEAD".

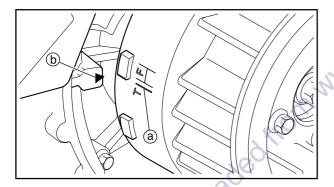


Order	Job/Part	Q'ty	Remarks
9	Air shroud cylinder 1	1	
10	Timing chain tensioner	1	
11	Camshaft sprocket plate	1	
12	Camshaft sprocket	1	
13	Cylinder head	1	
14	Cylinder head gasket	1	
15	Dowel pin	2	Ц
			For installation, reverse the removal pro-
			cedure.

EASO022

#### REMOVING THE CYLINDER HEAD

- 1. Remove:
  - air guide
  - air shroud cylinder 3
     Refer to "STARTER CLUTCH AND AC MAGNETO".
  - V-belt case Refer to "BELT DRIVE".
  - muffler Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" in chapter 4.
- 2. Remove:
  - breather/O-ring
  - valve cover (intake)/O-ring
  - valve cover (exhaust)/O-ring



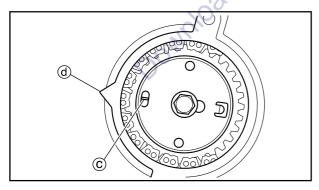


 "I" mark (a) on the AC magneto rotor (with the stationary pointer (b) on the crankcase)

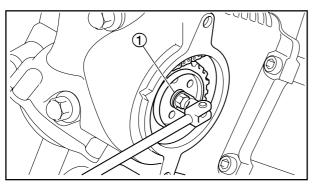


b. When the piston is at TDC on the compression stroke, align the "I" mark © on the camshaft sprocket with the mark @ on the cylinder head.





- 4. Remove:
  - air shroud cylinder 2
  - air shroud cylinder 1

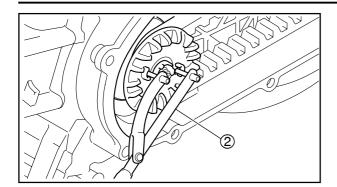


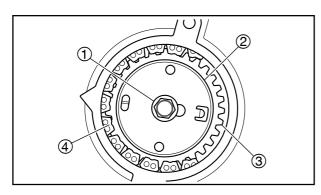
- 5. Loosen:
  - timing chain tensioner cap bolt
  - camshaft sprocket bolt ①
     While holding the primary fixed sheave with a rotor holding tool ②, remove the camshaft sprocket bolt.



Rotor holding tool 90890-01235(YU-01235)



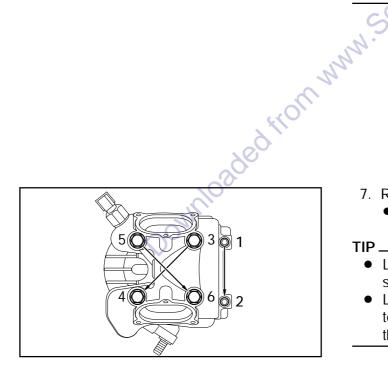




#### 6. Remove:

- timing chain tensioner (along with the gasket)
- camshaft sprocket bolt 1
- camshaft sprocket plate ②
- camshaft sprocket ③
- timing chain 4

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

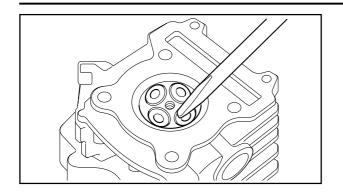


#### 7. Remove:

cylinder head

- 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.





EVSUUSS

#### CHECKING THE CYLINDER HEAD

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

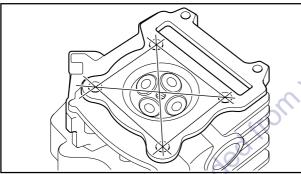
#### TIP\_

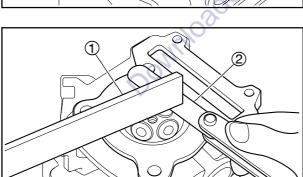
Do not use a sharp instrument to avoid damaging or scratching:

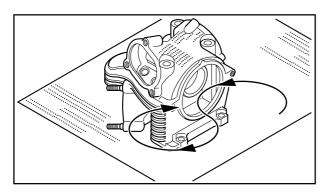
- spark plug bore thread
- valve seats

#### 2. Check:

cylinder headDamage/scratches → Replace.







#### 3. Measure:

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



Maximum cylinder head warpage Less than 0.05mm (0.002in)

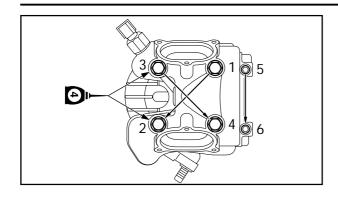
- a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
- b. Measure the warpage.
- c. If the limit is exceeded, resurface the cylinder head as follows.
- d. Place a 400 ~ 600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

#### TIP

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







#### INSTALLING THE CYLINDER HEAD

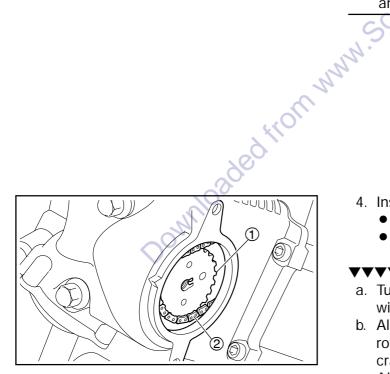
- 1. Install:
  - gasket New
  - dowel pins
- 2. Install:
  - cylinder head
- 3. Tighten:
  - cylinder head nuts

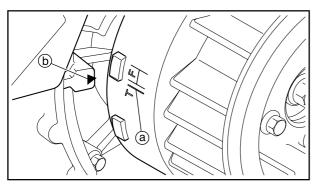
22 Nm (2.2 m • kgf, 15.9 ft • lbf)

cylinder head bolts

12 Nm (1.2 m • kgf, 8.7 ft • lbf)

- Lubricate the cylinder head nuts with engine oil.
- Tighten the cylinder head nuts and bolts in the proper tightening sequence as shown and torque them in two stages.





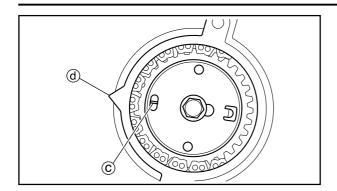
- 4. Install:
  - camshaft sprocket (1)
  - timing chain (2)
- a. Turn the primary fixed sheave counterclock-

~~~~~~~~~~~~~~~~

- b. Align the "I" mark (a) on the AC magneto rotor with the stationary pointer (b) on the crankcase.
- c. Align the "I" mark © on the camshaft sprocket with the stationary pointer (d) on the cylinder head.
- d. Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft.







TIE

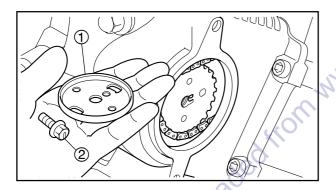
- When installing the camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.
- Align the slot on the camshaft with the tab in the camshaft sprocket.

#### NOTICE

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

e. Remove the wire from the timing chain.





5. Install

- camshaft sprocket plate 1
  - camshaft sprocket bolt ②

### TIP.

While holding the camshaft and install the camshaft sprocket plate, temporarily tighten the camshaft sprocket bolt.



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

#### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- a. Remove the cap bolt 1 and spring 2.
- 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 • kgf, 6.5 ft • lbf)

d. Install the spring 2 and cap bolt 1.

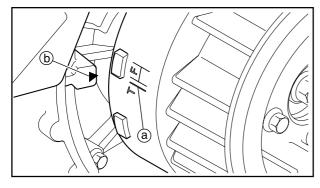


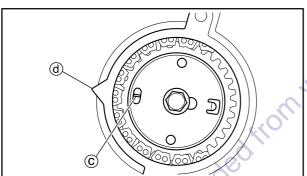


Cap bolt 8 Nm (0.8 m • kgf, 5.8 ft • lbf)

#### 7. Turn:

•crankshaft (several turns counterclockwise)





#### 8. Check:

●"I" mark ⓐ

Align the "I" mark on the AC magneto rotor with the stationary pointer **(b)** on the crankcase.

●"I" mark ©

Align the "I" mark on the camshaft sprocket with the stationary pointer (d) on the cylinder head.

Out of alignment → Correct.

Refer to the installation steps above.

9. Tighten:

camshaft sprocket bolt

30 Nm (3.0 m • kgf, 21.7 ft • lbf)

#### NOTICE

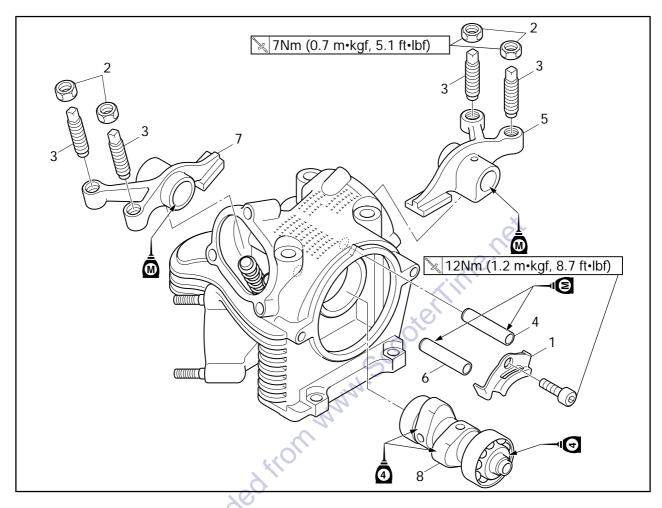
Be sure to tighten the camshaft sprocket bolt to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

#### 10.Measure:

valve clearance
 Out of specification → Adjust.
 Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3.

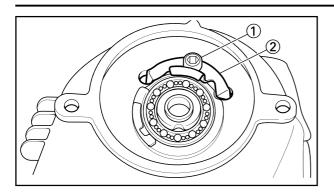






| Order | Job/Part                          | Q′ty | Remarks                                          |
|-------|-----------------------------------|------|--------------------------------------------------|
|       | Removing the rocker arms and cam- |      | Remove the parts in the order listed.            |
|       | shaft                             |      |                                                  |
|       | Cylinder head                     |      | Refer to "CYLINDER HEAD".                        |
| 1     | Stopper plate                     | 1    | h                                                |
| 2     | Locknut                           | 4    | Refer to "REMOVING THE ROCKER                    |
| 3     | Adjusting screw                   | 4    | ARMS AND CAMSHAFT" and "INSTALL-                 |
| 4     | Rocker arm shaft (intake)         | 1    | ING THE CAMSHAFT AND ROCKER                      |
| 5     | Rocker arm (intake)               | 1    | ARMS".                                           |
| 6     | Rocker arm shaft (exhaust)        | 1    |                                                  |
| 7     | Rocker arm (exhaust)              | 1    |                                                  |
| 8     | Camshaft                          | 1    | J                                                |
|       |                                   |      | For installation, reverse the removal procedure. |

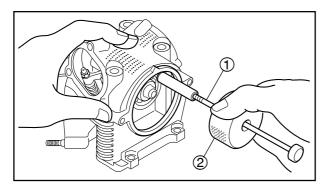




EAS00202

# REMOVING THE ROCKER ARMS AND CAMSHAFT

- 1. Remove:
  - locknut ①
  - stopper plate ②



#### 2. Remove:

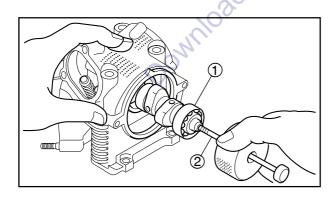
- intake rocker arm shaft
- exhaust rocker arm shaft
- intake rocker arm
- exhaust rocker arm

#### TIP

Remove the rocker arm shafts with the slide hammer bolt 1 and weight 2.



Slide hammer bolt 90890-01085 (YU-01083-2) Weight 90890-01084 (YU-01083-3)



#### 3. Remove:

• camshaft (1)

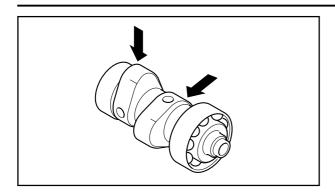
#### TIP

Slide hammer bolt ② into the threaded end of the camshaft and then pull out the camshaft.



Slide hammer bolt 90890-01085 (YU-01083-2) Weight 90890-01084 (YU-01083-3)

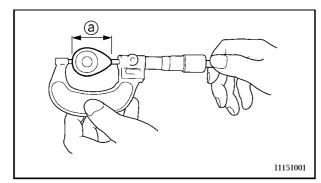


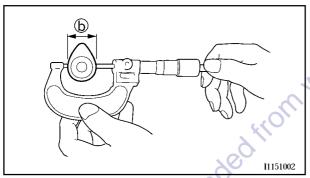


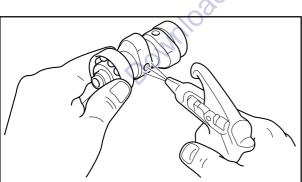
EAS00205

## **CHECKING THE CAMSHAFT**

- 1. Check:
  - Camshaft lobes
     Blue discoloration/pitting/scratches →
     Replace the camshaft.

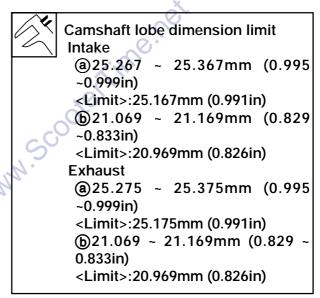






#### 2. Measure:

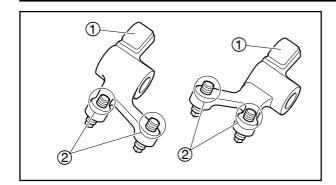
camshaft lobe dimensions (a) and (b)
 Out of specification → Replace the camshaft.



### 3. Check:

camshaft oil passage
 Obstruction → Blow out with compressed air.



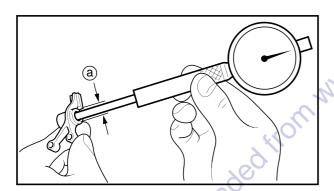


EAS00206

# 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 surface) 1
  - rocker arm (valve touch surface)②
     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.

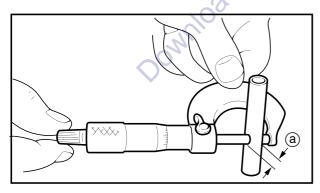


#### 4. Measure:

rocker arm inside diameter (a)
 Out of specification → Replace.



Rocker arm inside diameter 10.000 ~ 10.015mm (0.3937 ~ 0.3943in)



#### 5. Measure:

•rocker arm shaft outside diameter (a)
 Out of specification → Replace.



Rocker arm shaft outside diameter 9.981 ~ 9.991mm (0.3930 ~ 0.3933in)

#### 6. Calculate:

•rocker-arm-to-rocker-arm-shaft clearance

#### TIE

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

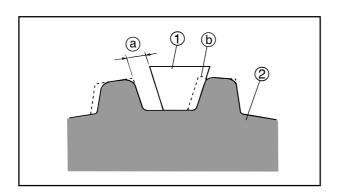


Above 0.034mm (0.0013in)  $\rightarrow$  Replace the defective part(s).



Rocker-arm-to-rocker-arm-shaft clearance

0.009 ~ 0.034mm (0.0004 ~ 0.0013in)



Downloaded from

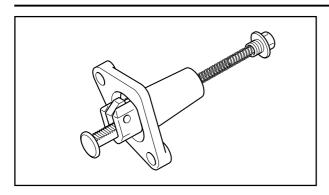
FAS00207

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

The following procedure applies to all of the 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 ⓐ → 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).





Downloaded from m

EAS00210

#### CHECKING THE TIMING CHAIN TENSIONER

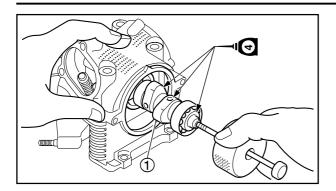
- 1. Check:
  - timing chain tensioner
     Cracks/damage → Replace.
- 2. Check:
  - one-way cam operation
     Rough movement → Replace the timing chain tensioner.
- 3. Check:
  - cap bolt
  - O-ring New
  - spring
  - one-way cam
  - gasket New
  - timing chain tensioner rod
     Damage/wear → Replace 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.





EAS00220

# INSTALLING THE CAMSHAFT AND ROCKER ARMS

- 1. Lubricate:
  - camshaft 1

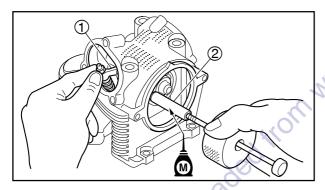


Recommended lubricant Camshaft Engine oil Camshaft bearing Engine oil

- 2. Lubricate:
  - rocker arms
  - rocker arm shafts



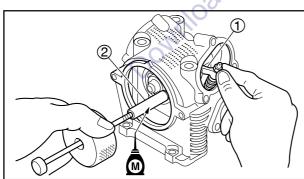
Recommended lubricant Molybdenum disulfide oil



- 3. Install:
  - exhaust rocker arm (1)
    - exhaust rocker arm shaft ②

TIP\_

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



- 4. Install:
  - intake rocker arm (1)
  - intake rocker arm shaft ②

TIF

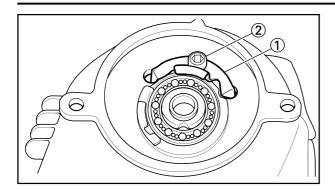
Make sure the intake rocker arm shaft is completely pushed into the cylinder head.

NOTICE

Make sure the threaded part of the rocker arm shaft faces out.







- 5. Install:
  - stopper plate ①
  - locknut ②

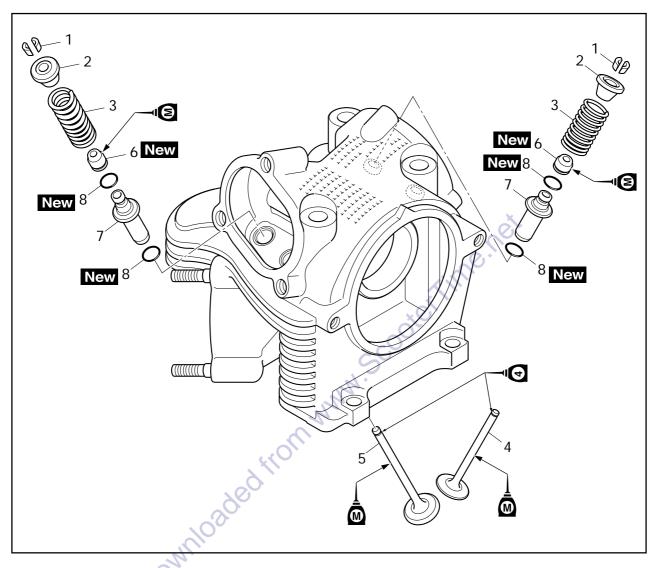
🔪 12Nm (1.2m • kgf, 8.7ft • lbf)

Downloaded from www. Scooter line net

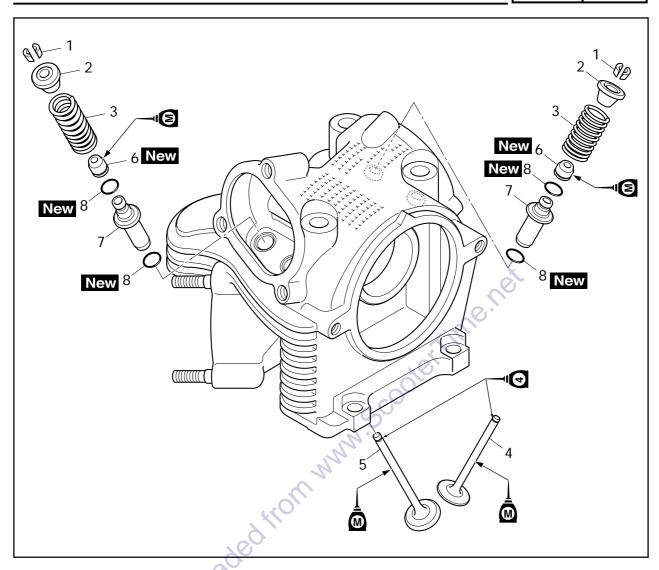


EAS00236

# **VALVES AND VALVE SPRINGS**



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



| Order | Job/Part | Q′ty | Remarks                                          |
|-------|----------|------|--------------------------------------------------|
|       | Don!     |      | For installation, reverse the removal procedure. |

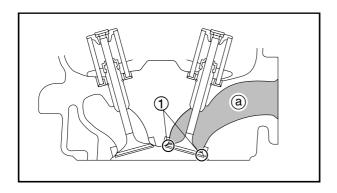
EAS00237

#### **REMOVING THE VALVES**

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



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



#### 1. Check:

valve sealing

Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.

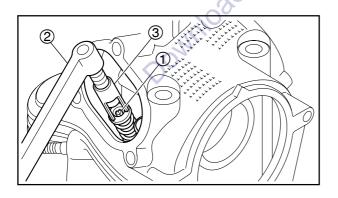
Refer to "CHECKING THE VALVE SEATS".

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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

### TIP

There should be no leakage at the valve seat ①.



#### 2 . Remove:

• valve cotters (1)

#### TIP

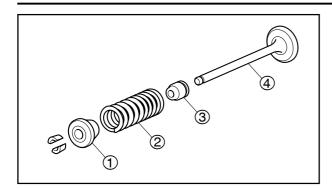
Remove the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.



Valve spring compressor 90890-04019 (YM-04019) Valve spring compressor attachment 90890-04108 (YM-04108)





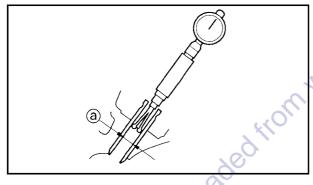


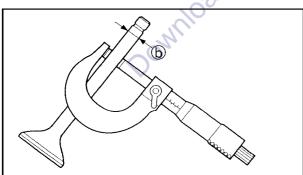
#### 3. Remove:

- valve spring retainer 1
- valve spring ②
- valve stem seal 3
- valve (4)

#### TIP\_

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





FAS00239

# 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

Valve-stem-to-valve-guide clearance = Valve guide inside diameter (a) - Valve stem diameter (b)

Out of specification → Replace the valve guide.



Valve-stem-to-valve-guide clearance Intake

0.015 ~ 0.042mm (0.0006 ~ 0.0017in)

<Limit>: 0.08mm (0.0031in)

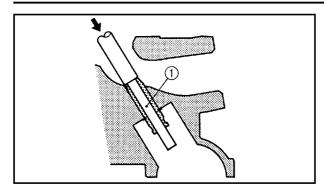
**Exhaust** 

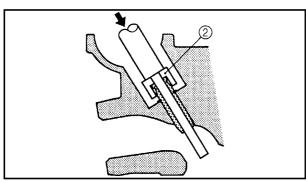
 $0.030 \sim 0.057$ mm ( $0.0012 \sim 0.0022$ in)

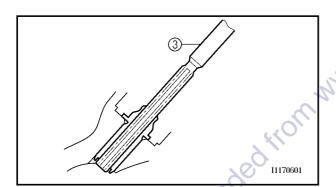
<Limit>: 0.10mm (0.0039in)











2. Replace:

• valve guide

TIP

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.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- a. Remove the valve guide with the valve guide remover (1).
- b. Install the new valve guide with the valve guide installer ② and valve guide remover ①.
- c. 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.

TIP

After replacing the valve guide, reface the valve seat.

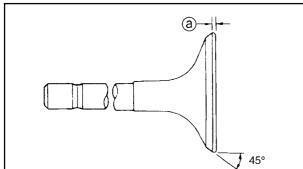


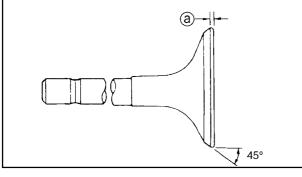
Valve guide remover (4.5mm) 90890-04116 (YM-04116) Valve guide installer (4.5mm) 90890-04117 (YM-04117) Valve guide reamer (4.5mm) 90890-04118 (YM-04118)

- 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 (intake) 0.7mm (0.028in) Valve margin thickness (exhaust) 1.0mm (0.039in)

#### 6. Measure:

valve stem runout Out of specification → Replace the valve.

#### TIP\_

- When installing a new valve, always replace the valve guide
- If the valve is removed or replaced, always replace the oil seal...



Valve stem runout 0.01mm (0.0004in)



EAS00240

#### **CHECKING THE VALVE SEATS**

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

- 1. Fliminate:
  - carbon deposits (from the valve face and valve seat)
- 2. Check:
  - valve seat
     Pitting/wear → Replace the cylinder head.



valve seat width (a)
 Out of specification → Replace the cylinder head.



Valve seat width

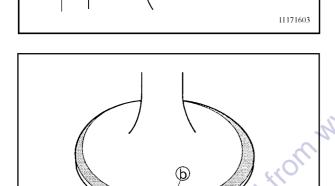
Intake: 0.9 ~ 1.1mm (0.035 ~

0.043in)

<Limit>: 1.6mm (0.063in) Exhaust: 0.9 ~1.1mm (0.035 ~

0.043in)

<Limit>: 1.6mm (0.063in)

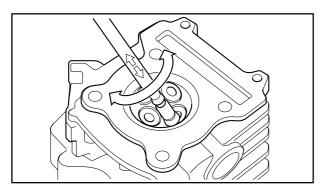


- a. Apply Mechanic's blueing dye (Dykem) (b) onto the valve face.
- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- d. Measure the valve seat width.

#### TIP\_

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



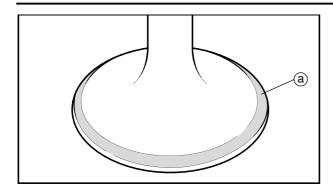


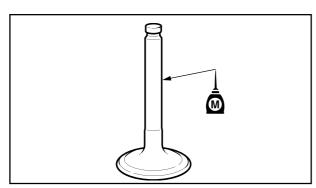
- 4. Lap:
  - valve face
  - valve seat

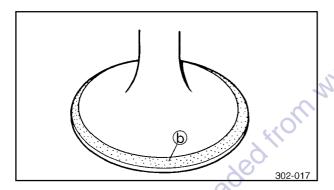
#### TIP

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









a. Apply a coarse lapping compound (a) to the valve face.

#### NOTICE

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

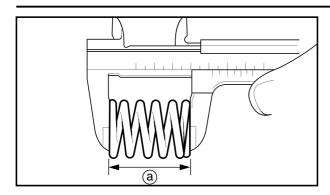
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

#### TID

For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply Mechanic's blueing dye (Dykem) **(b)** onto the valve face.
- h. Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear impression.
- j. Measure the valve seat width again. If the valve seat width is out of specification, reface and lap the valve seat.





EAS00241

#### **CHECKING THE VALVE SPRINGS**

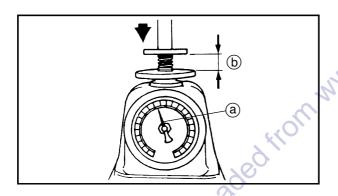
The following procedure applies to all of the valve springs.

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



Valve spring free length 41.88mm (1.649in)

<Limit>: 39.786mm (1.566in)



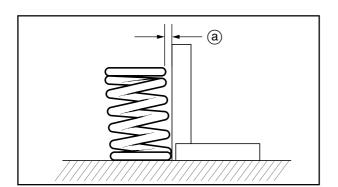
2. Measure:

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



Compressed valve spring force (installed)

137 ~ 157N/mm (13.97 ~ 16.01kgf/mm, 30.83 ~ 35.33lbf/in) at 30mm (1.18in)



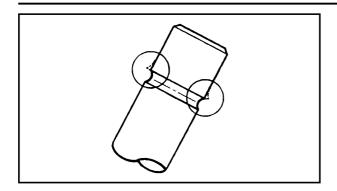
- 3. Measure:
  - valve spring tilt (a)
     Out of specification → Replace the valve spring.



Spring tilt limit

2.5°/1.8mm (2.5°/0.07in)



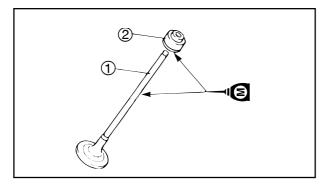


EAS00245

#### **INSTALLING THE VALVES**

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

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

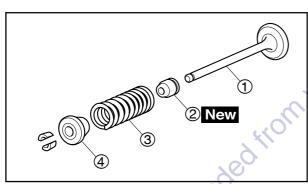


2. Lubricate:

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



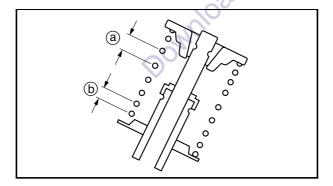
Recommended lubricant Molybdenum disulfide oil



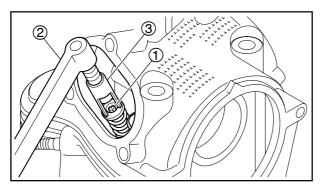
- 3. Install:
  - valve (1)
    - valve stem seal ②New
    - valve spring ③
    - valve spring retainer 4 (into the cylinder head)

TIP

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



**b** Smaller pitch



- 4. Install:
  - valve cotters (1)

TIP

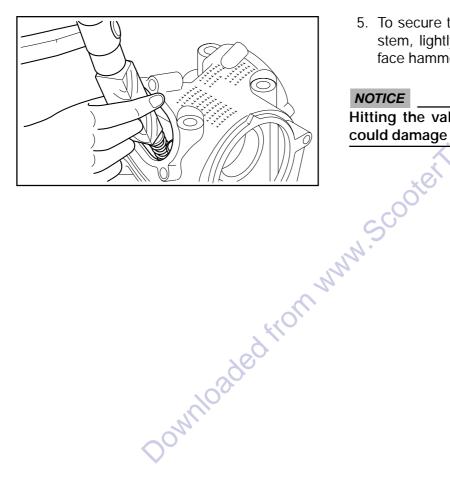
Install the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.







Valve spring compressor 90890-04019 (YM-04019) Valve spring compressor attachment 90890-04108 (YM-04108)



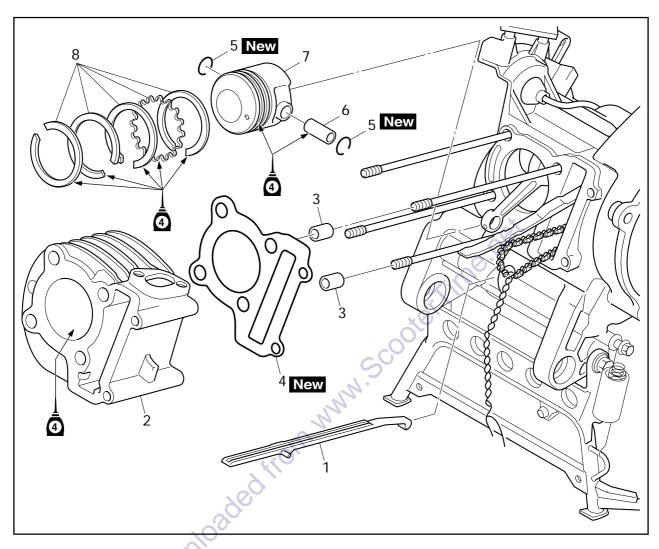
5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a softface hammer.

### NOTICE

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

EAS0025

# CYLINDER AND PISTON

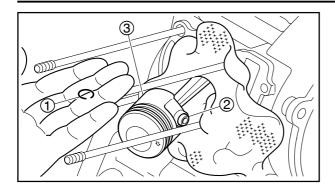


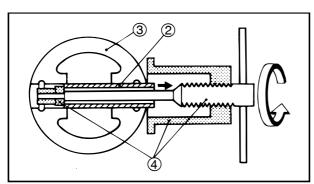
| Order                                | Job/Part                                                                                                                                                              | Q′ty             | Remarks                                                                 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

# **CYLINDER AND PISTON**









EAS0025

#### REMOVING THE CYLINDER AND PISTON

- 1. Remove:
  - piston pin clip (1)
  - piston pin ②
  - piston ③

NOTICE

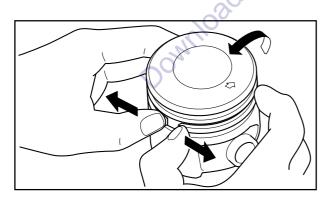
Do not use a hammer to drive the piston pin out

#### TIP\_

- 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

TIP

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

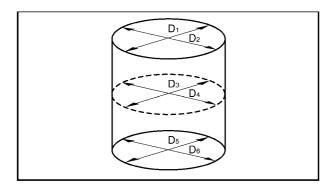


EAS00255

#### 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

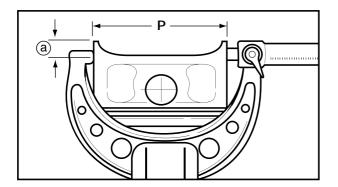
a. Measure cylinder bore "C" with the cylinder bore gauge.

#### TIP\_

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"                   | 52.40 ~ 52.41mm<br>(2.0630~2.0634in)                                                 |
|----------|-------------------------------------|--------------------------------------------------------------------------------------|
|          | Taper limit "T"                     | 0.05mm (0.002in)                                                                     |
| 7        | Out-of-round "R"                    | 0.05mm (0.002in)                                                                     |
|          | "C" = maximum of D <sub>1</sub>     |                                                                                      |
|          | "T" = maximum of $D_1$              | or D <sub>2</sub> - maximum of D <sub>5</sub> or D <sub>6</sub>                      |
| 6        |                                     | $D_3$ or $D_5$ - minimum of $D_2$ , $D_4$                                            |
| 700      | or D <sub>6</sub>                   |                                                                                      |
| Donuloge | cylinder, and re<br>rings as a set. | ation, rebore or replace the place the piston and piston skirt diameter "P" with the |

- 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) 7mm (0.28in) from the bottom edge of the piston

|          | Piston size "P"     |
|----------|---------------------|
| Standard | 52.375 ~ 52.390mm   |
|          | (2.0620 ~ 2.0626in) |

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

# **CYLINDER AND PISTON**



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)

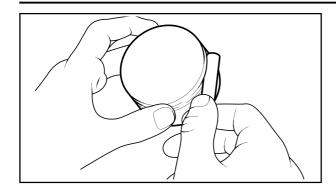
<Limit>: 0.15mm (0.0059in)

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

## **CYLINDER AND PISTON**







EASO026

#### **CHECKING THE PISTON RINGS**

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

#### TIP\_

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

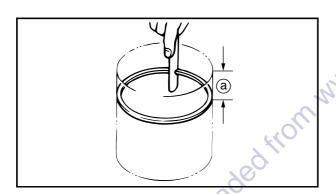


Piston ring side clearance Top ring

0.02 ~ 0.08mm (0.0008 ~ 0.0031in) <Limit>: 0.13mm (0.0051in)

2nd ring \_(

0.02 ~ 0.06mm (0.0008 ~ 0.0024in) <Limit>:0.12mm (0.0047in)



- 2. Install:
  - piston ring (into the cylinder)

#### TIP

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

- (a) 20mm (0.79in)
  - 3. Measure:
    - piston ring end gap
       Out of specification → Replace the piston ring.

#### TIP\_

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

0.10 ~ 0.25mm (0.0039 ~ 0.0098in)

<Limit>: 0.50mm (0.0197in)

2nd ring

0.25 ~ 0.40mm (0.0098 ~ 0.0157in)

<Limit>: 0.75mm (0.0295in)

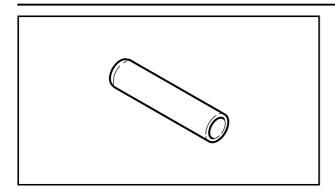
Oil ring

0.20 ~ 0.70mm (0.0079 ~ 0.0276in)

#### **CYLINDER AND PISTON**



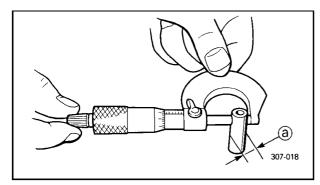




EAS00265

#### **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 14.995 ~ 15.000mm (0.5904 ~0.5906in)

<Limit>:14.975mm (0.5896in)



piston pin bore diameter (b)
 Out of specification → Replace the piston.



Piston pin bore diameter 15.002 ~ 15.013mm (0.5906 ~ 0.5911in)

<Limit>:15.043mm (0.5922in)

#### 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)

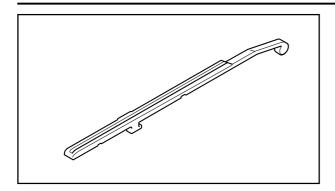


Piston-pin-to-piston clearance 0.002 ~ 0.018mm (0.00008 ~ 0.0007in)



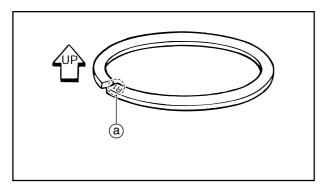
#### **CYLINDER AND PISTON**





#### CHECKING THE TIMING CHAIN GUIDE (EX-**HAUST SIDE)**

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

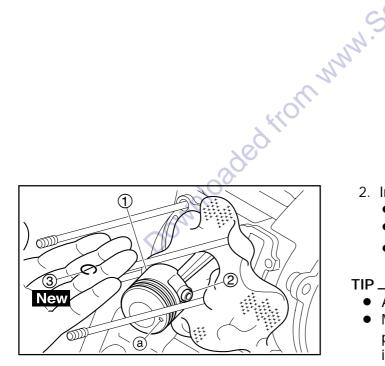


#### EAS00267

#### INSTALLING THE PISTON AND CYLINDER

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

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



#### 2. Install:

- piston (1)
- piston pin ②
- piston pin clip ③ New

#### TIP\_

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

#### **CYLINDER AND PISTON**



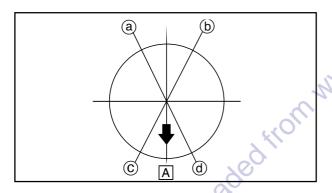


- 3. Install:
  - gasket New
  - dowel pins

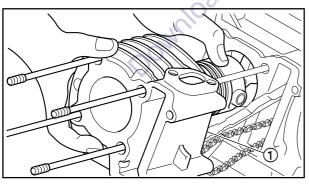
- 4. Lubricate:
  - piston
  - piston rings
  - cylinder (with the recommended lubricant)



#### Recommended lubricant Engine oil



- 5. Offset:
  - piston ring end gaps
- a Top ring
- **b** Lower oil ring rail
- © Upper oil ring rail
- (d) 2nd ring
- A Exhaust side

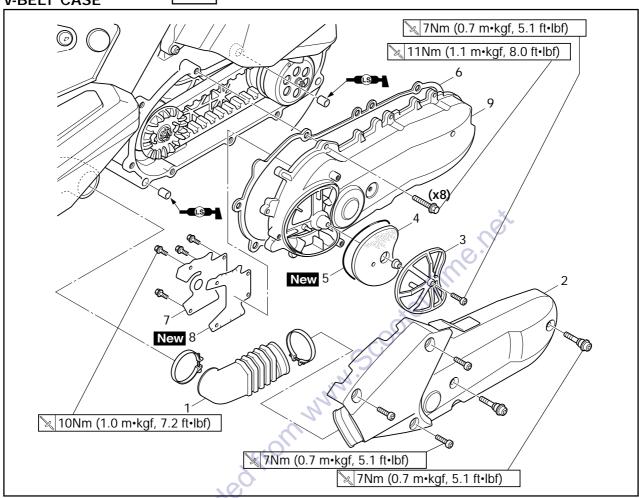


- 6. Install:
  - cylinder (1)

#### TIP

- 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.

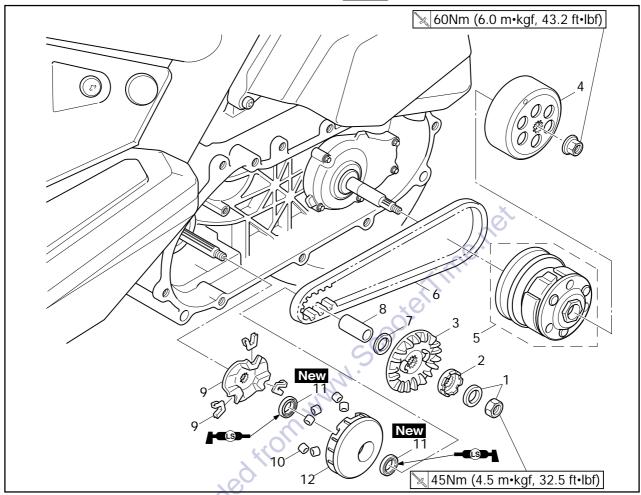
BELT DRIVE V-BELT CASE



| Order | Job/Part                   | Q′ty | Remarks                                          |
|-------|----------------------------|------|--------------------------------------------------|
|       | Removing the V-belt case   |      | Remove the parts in the order listed.            |
| 1     | Air duct                   | 1    | ·                                                |
| 2     | V-belt case cover          | 1    |                                                  |
| 3     | V-belt case filter guide   | 1    |                                                  |
| 4     | V-belt case filter element | 1    |                                                  |
| 5     | O-ring                     | 1    |                                                  |
| 6     | Gasket (V-belt case)       | 1    |                                                  |
| 7     | Plate                      | 1    |                                                  |
| 8     | Gasket (plate)             | 1    |                                                  |
| 9     | V-belt case                | 1    |                                                  |
|       |                            |      | For installation, reverse the removal procedure. |

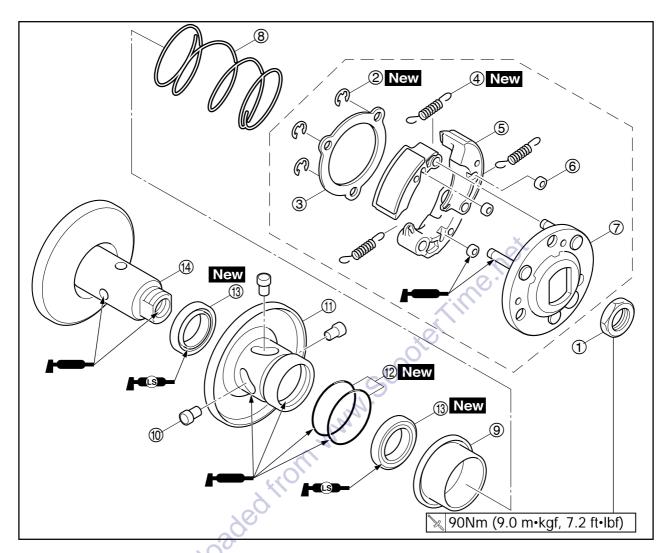
#### V-BELT AND PRIMARY/SECONDARY SHEAVE



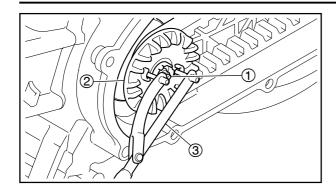


| Order | Job/Part                                         | Q′ty | Remarks                                          |
|-------|--------------------------------------------------|------|--------------------------------------------------|
|       | Removing the V-belt and primary/secondary sheave |      | Remove the parts in the order listed.            |
|       | V-belt case                                      |      | Refer to "V-BELT CASE".                          |
| 1     | Primary fixed sheave nut/plate washer            | 1/1  | Refer to "REMOVING THE PRIMARY                   |
| 2     | Oneway clutch                                    | 1    | SHEAVE" and "INSTALLING THE SEC-                 |
| 3     | Primary fixed sheave                             | 1    | ONDARY SHEAVE, V-BELT AND PRI-                   |
|       |                                                  |      | MARY SHEAVE".                                    |
| 4     | Clutch housing                                   | 1    | h                                                |
| 5     | Secondary sheave                                 | 1    |                                                  |
| 6     | V-belt                                           | 1    | Refer to "REMOVING THE SECOND-                   |
| 7     | Plate washer                                     | 1    | ARY SHEAVE AND V-BELT" and "IN-                  |
| 8     | Collar                                           | 1    | STALLING THE SECONDARY                           |
| 9     | Cam/slider                                       | 1/3  | SHEAVE, V-BELT AND PRIMARY                       |
| 10    | Primary sheave weight                            | 6    | SHEAVE".                                         |
| 11    | Oil seal                                         | 2    |                                                  |
| 12    | Primary sliding sheave                           | 1    | Ц                                                |
|       |                                                  |      | For installation, reverse the removal procedure. |

#### **SECONDARY SHEAVE**



| Order          | Job/Part                                                                                                                                                                                                                       | Q'ty                                           | Remarks                                                                                      |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------|
| 10346678991934 | Disassembling the secondary sheave Clutch carrier nut Clip Plate Clutch shoe spring Clutch shoe Damper Clutch carrier Compression spring Spring seat Guide pin Secondary sliding sheave O-ring Oil seal Secondary fixed sheave | 1<br>3<br>1<br>3<br>3<br>1<br>1<br>1<br>2<br>2 | Disassemble the parts in the order listed.  For assembly, reverse the disassembly procedure. |



- ΔS00317

#### REMOVING THE PRIMARY SHEAVE

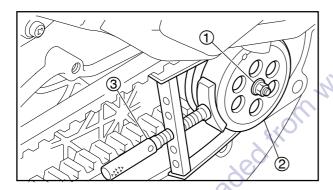
- 1. Remove:
  - V-belt case
    - Refer to "V-BELT CASE".
- 2. Remove:
  - primary fixed sheave nut ①
  - plate washer
  - oneway clutch
  - primary fixed sheave ②

#### TIP\_

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)



FAS00318

## REMOVING THE SECONDARY SHEAVE AND V-BELT

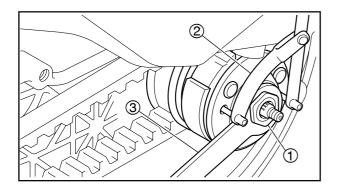
- 1. Remove:
  - secondary sheave nut 1
  - clutch housing ②

#### TID

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 (1)

#### NOTICE

Do not remove the clutch carrier nut at this stage.



#### TIP\_

While holding the clutch carrier with the rotor holding tool 2, loosen the clutch carrier nut one full turn with the locknut wrench 3.



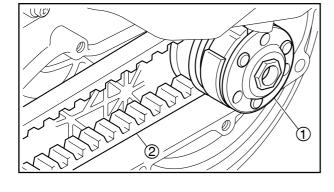
Rotor holding tool 90890-01235 (YU-01235) Locknut wrench 90890-01348 (YM-01348)



- secondary sheave 1
- V-belt ②



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



EAS00319\_

#### DISASSEMBLING THE **SECONDARY** SHEAVE

- 1. Remove:
  - clutch carrier nut (1)

#### TIP\_

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.



Clutch spring holder 90890-01337 (YM-33285)



#### CHECKING THE CLUTCH SHOES

The following procedure applies to all of the clutch shoes.

- 1. Check:
  - clutch shoe

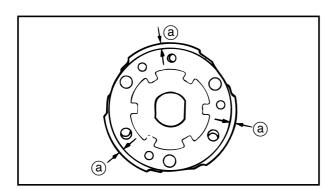
Damage/wear → Replace the clutch shoes and springs as a set.

Glazed areas →Sand with coarse sandpaper.



#### TIP\_

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



#### 2. Measure:

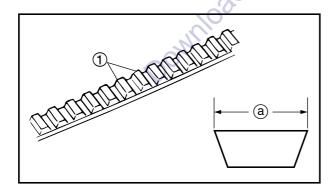
 clutch shoe thickness
 Out of specification → Replace the clutch shoes and springs as a set.



Clutch shoe thickness 3.2 ~ 3.5mm (0.13 ~ 0.14in) <Limit>: 2.0mm (0.079in)

#### TIP.

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



#### FAS00320

#### **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 ⓐ
     Out of specification → Replace.



V-belt width 22mm (0.87in)

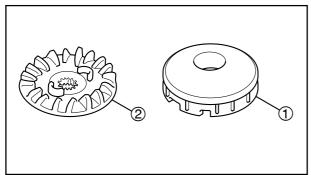
<Limit>: 19.8mm (0.78in)

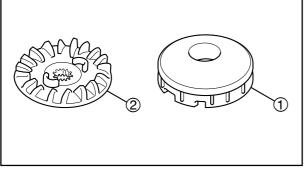
Cracks/damage/wear → Replace the primary sliding sheave, primary fixed

CHECKING THE PRIMARY SHEAVE

• primary sliding sheave 1 primary fixed sheave ②

sheave and V-belt.

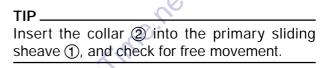




## 2. Check:

1. Check:

•free movement Stick or excessive play → Replace the primary sliding sheave, collar or both.





#### CHECKINGTHE 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

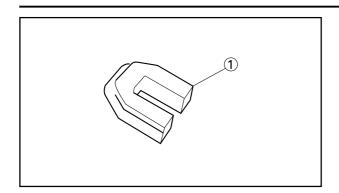
Out of specification → Replace.



Primary sheave weight outside diameter

20mm (0.79in)

<Limit>: 19.5mm (0.77in)



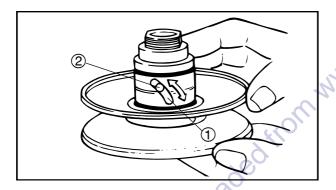
#### **CHECKING THE SLIDER**

- 1. Check:
  - slider ①
    Damage/wear→ Replace

EAS00322

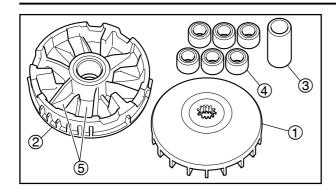
#### **CHECKING THE SECONDARY SHEAVE**

- 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 ①
   Damage/wear → Replace the secondary fixed and sliding sheaves as a set.
- 3. Check:
  - •guide pin ②
     Damage/wear → Replace the secondary fixed and sliding sheaves as a set.

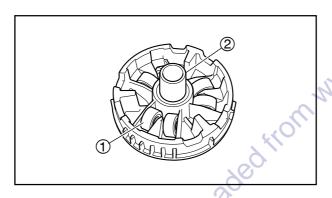


#### ASSEMBLING THE PRIMARY SHEAVE

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

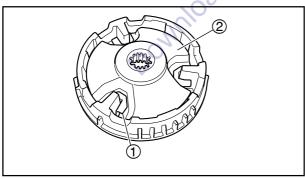
TIP\_

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

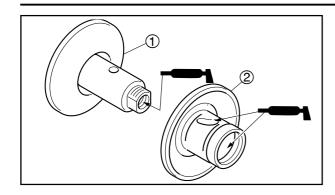


2. Install:

- •primary sheave weights ①
- •collar ②



- 3. Install:
  - sliders (1)
  - cam ②



EVSUUSS

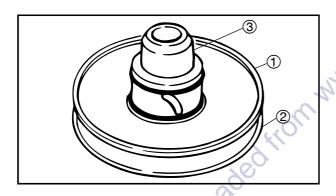
#### ASSEMBLING THE SECONDARY SHEAVE

- 1. Lubricate:
  - secondary fixed sheave's inner surface

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



Recommended lubricant BEL-RAY assembly lube®



2 Install

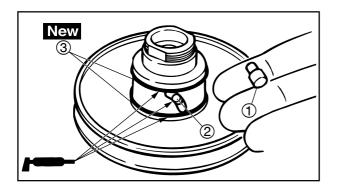
• secondary sliding sheave 1

TIP\_

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



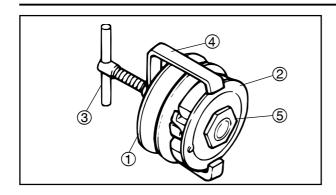
Oil seal guide 90890-01384 (YM-33299)



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



Recommended lubricant BEL-RAY assembly lube®



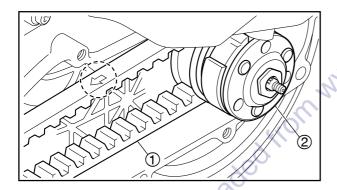
- 5. Install:
  - secondary sheave 1
  - spring
  - clutch carrier (2)

#### TIP

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)



FAS00325

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

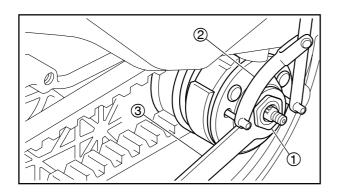
- 1. Install:
  - V-belt (1)
  - secondary sheave ②

#### NOTICE

Do not allow grease to contact the V-belt and secondary sheave.

#### TIP\_

- 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. Install:
  - clutch carrier nut (1)

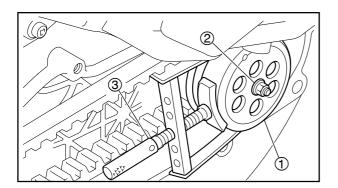
90Nm(9.0m • kgf, 65.1ft • lbf)

#### TIP \_\_\_\_\_

While holding the clutch carrier with the rotor holding tool ②, tighten the clutch carrier nut with the locknut wrench ③.



Rotor holding tool 90890-01235 (YU-01235) Locknut wrench 90890-01348 (YM-01348)



- 3. Install:
  - clutch housing ①
  - secondary sheave nut 2

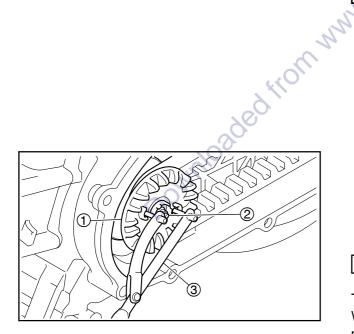
60Nm(6.0m • kgf, 43.4ft • lbf)

#### TIP

Tighten the secondary sheave nut with the sheave holder ③.



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



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

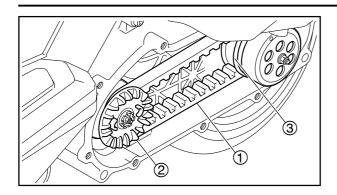
45Nm(4.5m ⋅ kgf, 32.5ft ⋅ lbf)

#### TIP

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



Rotor holding tool 90890-01235 (YU-01235)



- 5. Position:
  - V-belt (1)

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 Vbelt is tight.

- 6. Install:
  - V-belt case Refer to "V-BELT CASE".

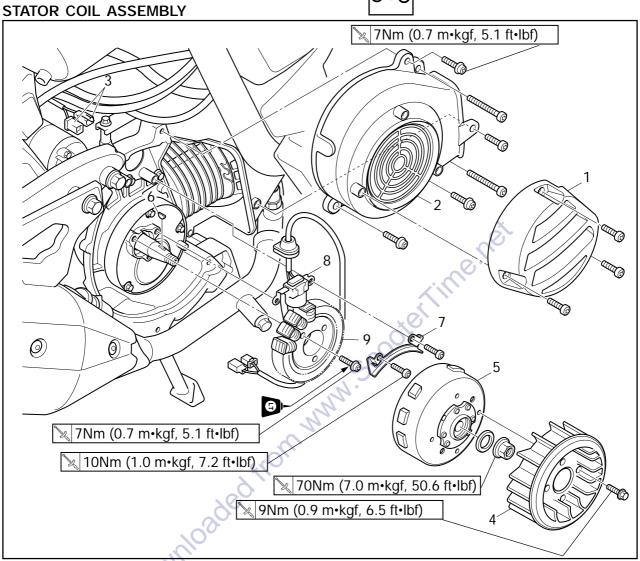
ENG



EAS00341

## STARTER CLUTCH AND AC MAGNETO





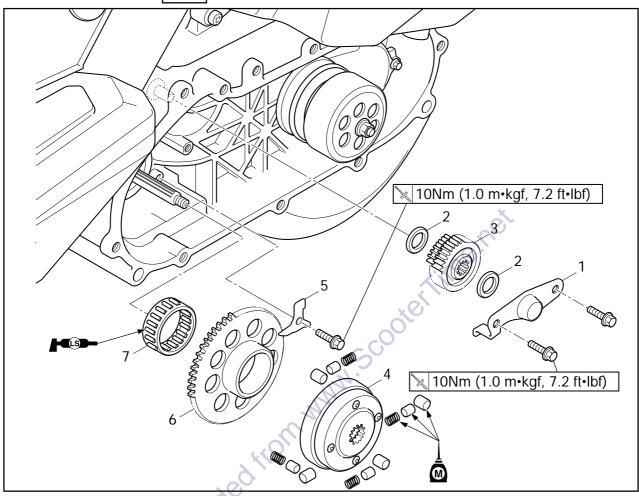
| Order | Job/Part                                 | Q'ty | Remarks                                          |
|-------|------------------------------------------|------|--------------------------------------------------|
|       | Removing the stator coil assembly        |      | Remove the parts in the order listed.            |
| 1     | Air guide                                | 1    |                                                  |
| 2     | Air shroud cylinder 3                    | 1    |                                                  |
| 3     | Pickup coil/stator coil assembly coupler | 1/1  | Disconnect.                                      |
| 4     | Fan                                      | 1    |                                                  |
| 5     | AC magneto rotor                         | 1    |                                                  |
| 6     | Woodruff key                             | 1    |                                                  |
| 7     | Lock plate                               | 1    |                                                  |
| 8     | Pickup coil                              | 1    |                                                  |
| 9     | Stator coil assembly                     | 1    |                                                  |
|       |                                          |      | For installation, reverse the removal procedure. |





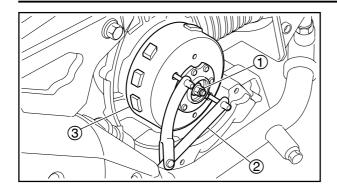
EAS00342 **STARTER CLUTCH** 





| Order                           | Job/Part                                                                                                                                                                                      | Q′ty | Remarks                                                                                                                                                    |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6<br>7 | Removing the starter clutch V-belt case Primary fixed sheave Primary sliding sheave Idle gear plate Plate washer Idle gear Starter clutch Starter wheel gear holder Starter wheel gear Roller |      | Remove the parts in the order listed. Refer to "V-BELT CASE". Refer to "V-BELT AND PRIMARY/SEC-ONDARY SHEAVE".  For installation, reverse the removal pro- |
|                                 |                                                                                                                                                                                               |      | cedure.                                                                                                                                                    |





EAS00347

#### **REMOVING THE AC MAGNETO**

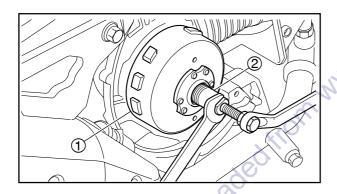
- 1. Remove:
  - air guide
    - air shroud cylinder 3
- 2. Remove:
  - fan
  - AC magneto rotor nut ①
  - washer

#### TIP\_

While holding the AC magneto rotor ③ with the rotor holding tool ②, loosen the AC magneto rotor nut.



Rotor holding tool 90890-01235 (YU-01235)



- 3. Remove:
  - AC magneto rotor ①
    (with the flywheel puller ②)
    - woodruff key
  - stator coil assembly

#### NOTICE

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

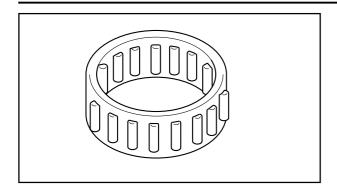
#### TIP

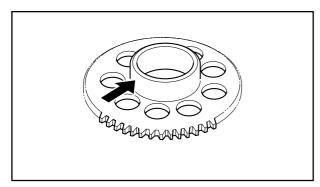
Make sure the flywheel puller set is centered over the AC magneto rotor.

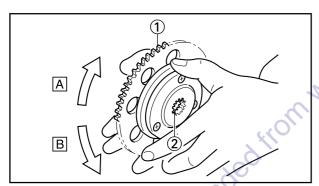


Flywheel puller 90890-01189 (YM-01189)









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 wheel 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.



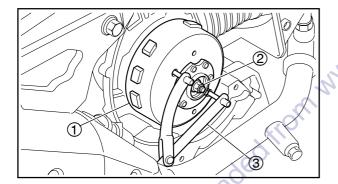
EAS00354

#### **INSTALLING THE AC MAGNETO**

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

#### TIP\_

- 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.



2. Tighten:

• AC magneto rotor nut ②

70 Nm (7.0 m • kgf, 50.6 ft • lbf)

TIP.

While holding the AC magneto rotor ① with the rotor holding tool ③, tighten the AC magneto rotor nut



Rotor holding tool 90890-01235 (YU-01235)

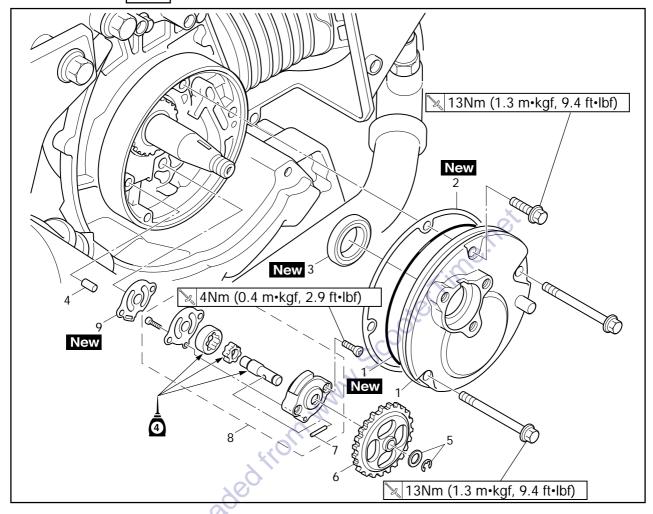
- 3. Install:
  - fan

🗽 9Nm (0.9m • kgf, 6.5ft • lbf)

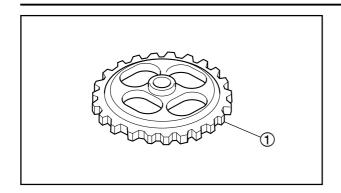
- 4. Install:
  - air shroud cylinder 3
  - air guide

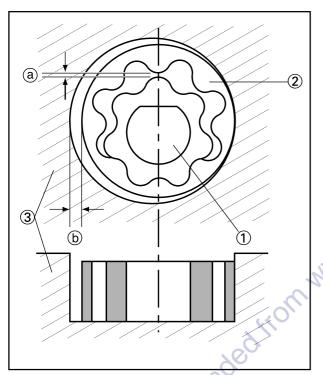






| Order                                | Job/Part                                                                                                                                                               | Q′ty                                  | Remarks                                                                         |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8 | Removing the oil pump AC magneto rotor Stator coil assembly Cover/O-ring Gasket Oil seal Dowel pin Circlip/plate washer Oil pump driven gear Dowel pin Oil pump Gasket | 1/1<br>1<br>1<br>1/1<br>1/1<br>1<br>1 | Remove the parts in the order listed. Refer to "STARTER CLUTCH AND AC MAGNETO". |
|                                      |                                                                                                                                                                        |                                       | For installation, reverse the removal procedure.                                |





#### 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)**.

Out of specification  $\rightarrow$  Replace the oil pump.

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



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

0.15mm (0.006in) or less

<Limit>: 0.23mm (0.009in)

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

0.07 ~ 0.12mm (0.003 ~ 0.005in)

<Limit>: 0.19mm (0.008in)

#### 3. Check:

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

#### ASSEMBLING THE OIL PUMP

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



#### Recommended lubricant Engine oil



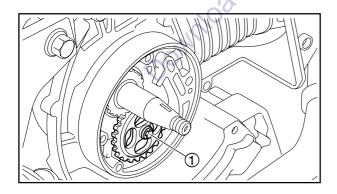
- oil pump shaft ① (to the oil pump housing ②)
- pin (3)
- inner rotor ④
- outer rotor (5)
- oil pump housing cover (6)
- oil pump housing screw



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

3. Check:

oil pump operation
 Refer to "CHECKING THE OIL PUMP".



**(6)** 

EAS00376

#### INSTALLING THE OIL PUMP

- 1. Install:
  - gasket New
  - oil pump ①

4 Nm (0.4 m • kgf, 2.9 ft • lbf)

NOTICE

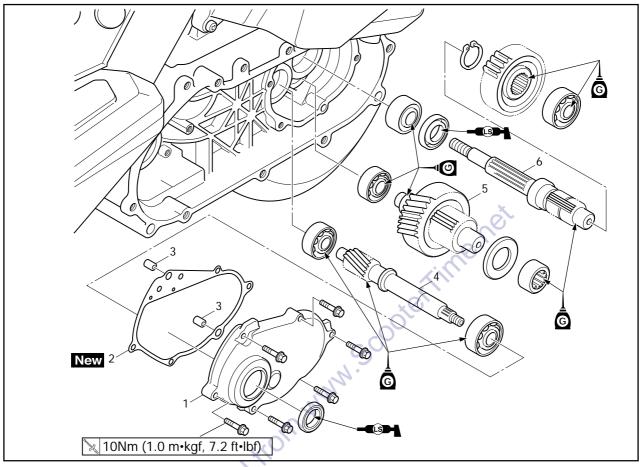
After tightening the bolts, make sure the oil pump turns smoothly.

- 2. Install:
  - O-ring New
  - cover

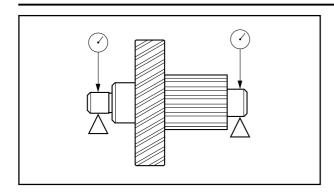
13 Nm (1.3 m • kgf, 9.4 ft • lbf)

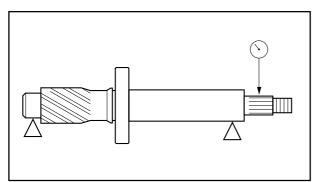
## **TRANSMISSION**





| Order                      | Job/Part                                                                                                                                                                                                               | Q′ty                  | Remarks                                                                                                                                                                                                                                        |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6 | Removing the transmission Transmission oil Muffler Swingarm Rear wheel  V-belt case V-belt Secondary sheave Right crankcase cover Right crankcase cover gasket Dowel pin Primary drive gear shaft Main axle Drive axle | 1<br>1<br>2<br>1<br>1 | Remove the parts in the order listed. Drain. Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" in chapter 4. Refer to "REAR WHEEL AND REAR BRAKE" in chapter 4.  Refer to "BELT DRIVE".  For installation, reverse the removal procedure. |





Dominloaded troin my

EVZUUVA

#### **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 0.04mm (0.002in)

#### 2. Measure:

drive axle runout
 (with a centering device and dial gauge)
 Out of specification → Replace the drive axle.



Drive axle runout limit 0.04mm (0.002in)

#### 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.

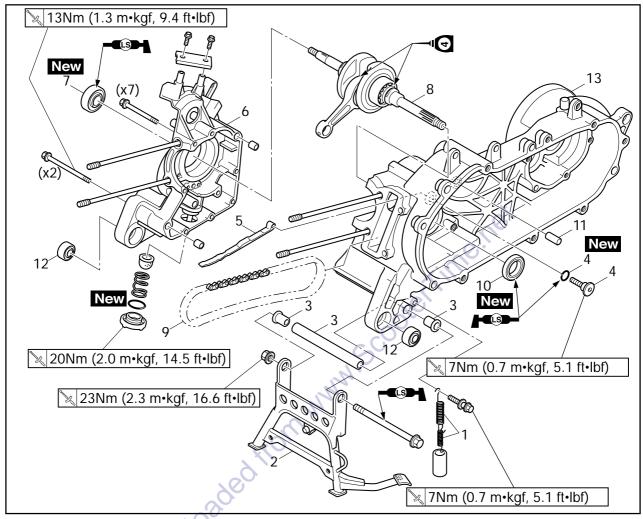
#### 5. Check:

- ◆transmission gear movement
   Rough movement → Replace the defective part(s).
- 6. Check:
  - circlip

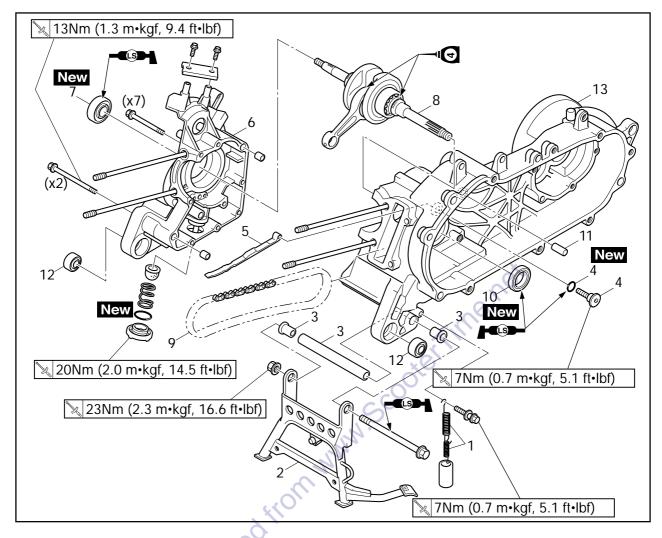
Bends/damage/looseness → Replace.

#### **CRANKSHAFT**

#### **CRANKSHAFT ASSEMBLY**



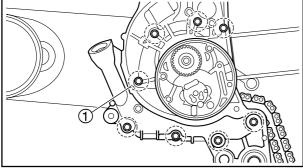
| Order | Job/Part                                                                                | Q′ty | Remarks                                                                                                                                           |
|-------|-----------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|       | Removing the crankshaft assembly Engine Cylinder head Cylinder and piston V-belt case   |      | Remove the parts in the order listed. Refer to "ENGINE REMOVEL". Refer to "CYLINDER HEAD". Refer to "CYLINDER AND PISTON". Refer to "BELT DRIVE". |
|       | V-belt and primary/secondary sheave Starter clutch AC magneto Oil pump Muffler Swingarm |      | Refer to "STARTER CLUTCH AND AC MAGNETO". Refer to "OIL PUMP". Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" in                          |
|       | Rear wheel                                                                              |      | chapter 4. Refer to "REAR WHEEL AND REAR BRAKE" in chapter 4.".                                                                                   |
| 1     | Tension spring                                                                          | 2    |                                                                                                                                                   |
| 2     | Centerstand                                                                             | 1    |                                                                                                                                                   |
| 3     | Spacer/collar                                                                           | 1/2  |                                                                                                                                                   |
| 4     | Bolt/O-ring                                                                             | 1/1  |                                                                                                                                                   |

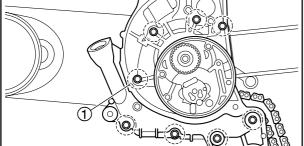


| Order | Job/Part                         | Q'ty | Remarks                                    |
|-------|----------------------------------|------|--------------------------------------------|
| 5     | Timing chain guide (intake side) | 1    |                                            |
| 6     | Crankcase (right)                | 1    |                                            |
| 7     | Oil seal                         | 1    |                                            |
| 8     | Crankshaft assembly              | 1    |                                            |
| 9     | Timing chain                     | 1    |                                            |
| 10    | Oil seal                         | 1    |                                            |
| 11    | Shaft                            | 1    |                                            |
| 12    | Bearing                          | 2    |                                            |
| 13    | Crankcase (left)                 | 1    |                                            |
|       |                                  |      | For installation, reverse the removal pro- |
|       |                                  |      | cedure.                                    |

#### DISASSEMBLING THE CRANKCASE

- 1. Remove:
  - centerstand





#### 2. Remove:

• crankcase bolts (1)

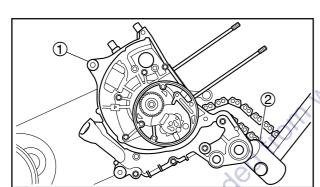
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

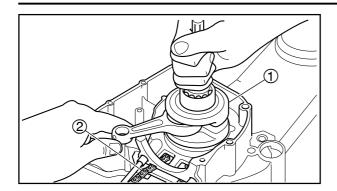


right crankcase (1)



Tap on one side of the crankcase with a softface hammer 2. 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.





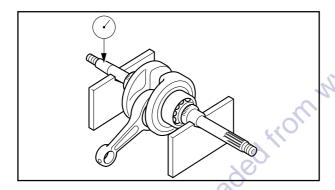
FAS00389

#### REMOVING THE CRANKSHAFT ASSEMBLY

- 1. Remove:
  - crankshaft assembly (1)
  - timing chain ②

#### TIP\_

- 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.



FAS0039

## CHECKING THE CRANKSHAFT AND CONNECTING ROD

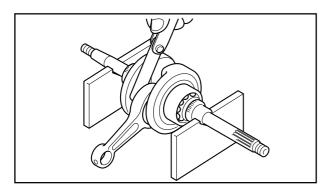
- 1. Measure:
  - crankshaft runout
     Out of specification → Replace the crankshaft, bearing or both.

TIP\_

Turn the crankshaft slowly.



Maximum crankshaft runout 0.03mm (0.0012in)

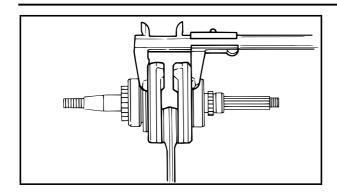


- 2. Measure:
  - big end side clearance
     Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.



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





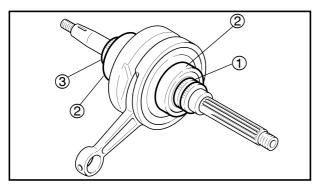
#### 3. Measure:

crankshaft width
 Out of specification → Replace the crankshaft.



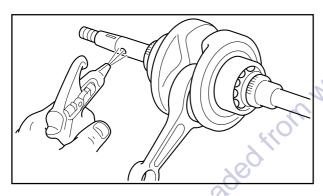
#### Crankshaft width

45.45 ~ 45.50mm (1.789 ~ 1.791in)



#### 4. Check:

- crankshaft sprocket ①
   Damage/wear → Replace the crankshaft.
- bearing ②
   Cracks/damage/wear → Replace the crankshaft.
- oil pump drive gear ③
   Damage/wear → Replace the crankshaft.



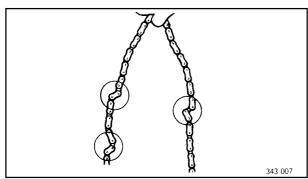
#### 5. Check:

- ◆crankshaft journal
   Scratches/wear → Replace the crankshaft.
- ◆crankshaft journal oil passage
   Obstruction → Blow out with compressed air.

EAS00399

#### CHECKING THE CRANKCASE

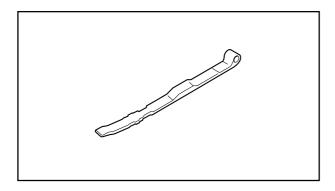
- 1. Thoroughly wash the crankcase halves in a mild solvent.
- 2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- 3. Check:
  - crankcaseCracks/damage → Replace.
  - oil delivery passages
     Obstruction → Blow out with compressed
     air.





#### 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.

# CHECKING THE BEARINGS AND OIL **SEALS** Downloaded from w

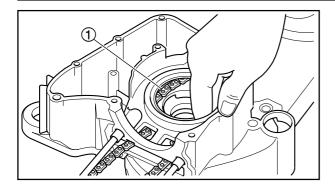
- 1. Check:
  - bearings

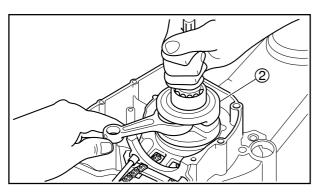
Clean and lubricate the bearings, then rotate the inner race with your finger. Rough movement → Replace.

- 2. Check:
  - •oil seals

Damage/wear → Replace.







EASON/O

## INSTALLING THE CRANKSHAFT ASSEMBLY

- 1. Install:
  - timing chain ①
  - crankshaft assembly ②

TIP

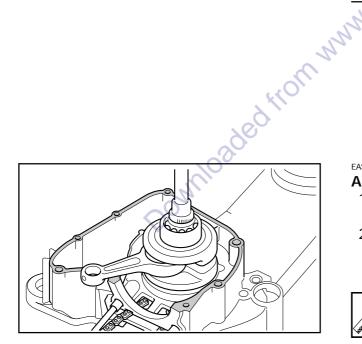
Install the timing chain so it is not visible through the opening in the left crankcase.

#### NOTICE

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.

TIP

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)



FAS00418

#### 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 (ACC-11001-05-01)

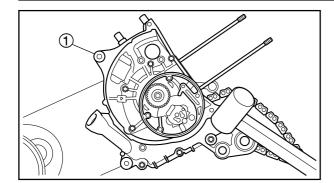
TIP\_

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

## **CRANKSHAFT**







- 3. Install:
  - dowel pins
  - right crankcase ①

#### TIP\_

Tap lightly on the right crankcase with a softface hammer.

- 4. Tighten:
  - •crankcase bolts

13Nm(1.3m • kgf, 9.4ft • lbf)

#### TIP \_\_\_\_

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

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



# CHAPTER 6 FUEL INJECTION SYSTEM

| FUEL INJECTION SYSTEM                           | 6-1    |
|-------------------------------------------------|--------|
| WIRING DIAGRAM                                  | 6-2    |
| ECU'S SELF-DIAGNOSTIC FUNCTION                  | 6-4    |
| CHECKING FOR A DEFECTIVE ENGINE TROUBLE WARNING |        |
| LIGHT BULB                                      | 6-5    |
| SELF-DIAGNOSTIC FANCTION TABLE                  |        |
| TROUBLESHOOTING CHART                           | 6-7    |
| DIAGNOSTIC MODE                                 | 6-8    |
| TROUBLESHOOTING DETAILS                         | . 6-12 |
| THROTTLE BODY AND FUEL INJECTOR                 | . 6-26 |
| FUEL TANKFUEL INJECTOR AND FUEL HOSE            | . 6-26 |
| FUEL INJECTOR AND FUEL HOSE                     | . 6-28 |
| THROTTLE BODY                                   | . 6-29 |
| REMOVING THE FUEL TANKREMOVING THE FUEL PUMP    | . 6-30 |
| REMOVING THE FUEL PUMP                          | . 6-31 |
| CHECKING THE FUEL INJECTOR                      | . 6-32 |
| CHECKING THE THROTTLE BODY                      |        |
| INSTALLING THE FUEL PUMP                        | . 6-33 |
| INSTALLING THE FUEL TANK AND FUEL HOSE          | . 6-33 |
| CHECKING THE FUEL PUMP AND PRESSURE REGULATOR   |        |
| OPERATION                                       | . 6-34 |
| CHECKING THE THROTTLE POSITION SENSOR           | . 6-35 |
| CHECKING THE ISC (IDLE SPEED CONTROL) VALVE     | . 6-36 |

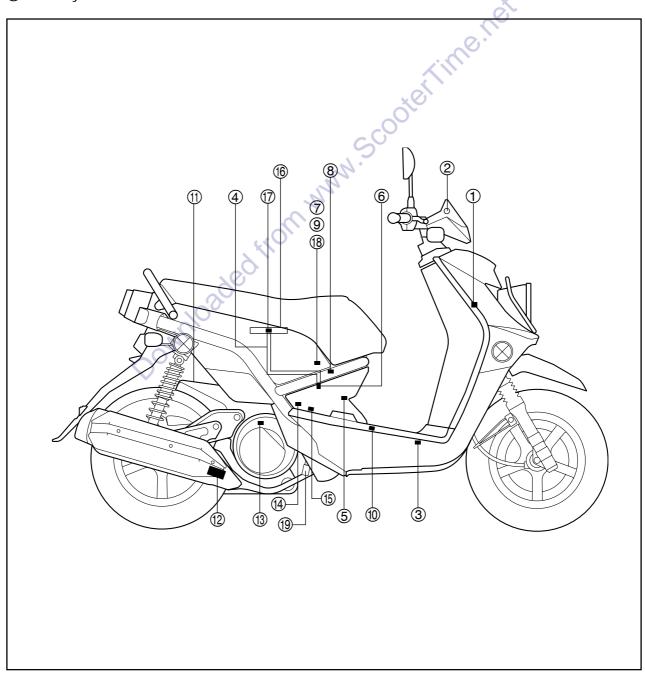


#### **FUEL INJECTION SYSTEM**

#### **FUEL INJECTION SYSTEM**

- ① ECU
- 2 Engine trouble warning light
- 3 Lean angle cut-off switch
- 4) Fuel hose
- ⑤ Ignition coil
- 6 Fuel injector
- 7 Intake air pressure sensor
- (8) ISC (idle speed control) valve
- 9 Intake air temperature sensor
- Battery

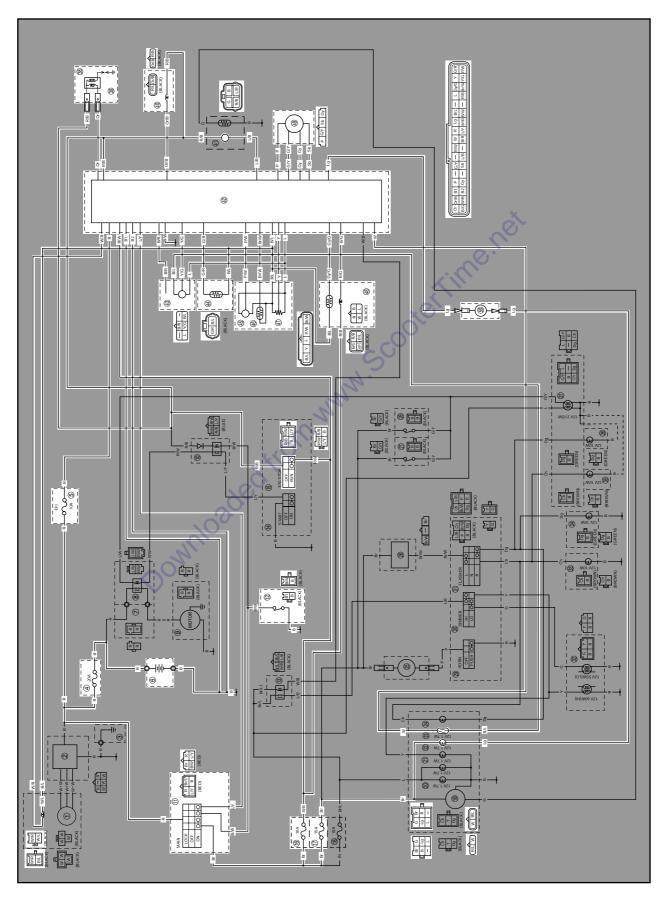
- ① Air filter case
- ② Catalytic converter
- (13) Crankshaft position sensor
- 4 Engine temperature sensor
- (15) Spark plug
- (6) Fuel tank
- Tuel pump
- Throttle position sensor
- 19 O<sub>2</sub> sensor







### WIRING DIAGRAM







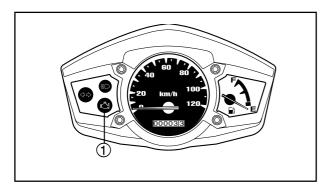
- ① Crankshaft position sensor
- 4 Main fuse
- ⑤ Fuel injection system fuse
- 6 Battery
- (1) Main switch
- Sidestand switch
- (5) Engine stop switch
- (f) Ignition fuse
- 17) Signaling system fuse
- ② Engine trouble warning light
- Speed sensor
- Ignition coil
- 39 Spark plug
- 40 Fuel injector
- Fuel pump
- **42** ECU
- 43 Lean angle cut-off switch
- Engine temperature sensor
- 45 Intake air pressure sensor
- (6) Intake air temperature sensor
- Throttle position sensor **47**)
- (48) O<sub>2</sub> sensor
- Downloaded from white Scooter lime het (4) ISC (idle speed control) valve
- (50) FI diagnostic tool





### 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.

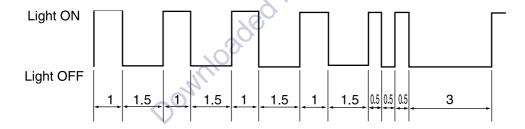


① Engine trouble warning light

- 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 see. 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 |
|------------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------|-------------------|
|                                          | Flashing                              | Operation stopped                                                                              | Unable            |
| Operate (cranking with electric starter) | Remains ON                            | Operated with substitute characteristics in accordance with the description of the malfunction | Able              |
| Stop                                     | Flashing<br>(indicate the fault code) | _                                                                                              | _                 |

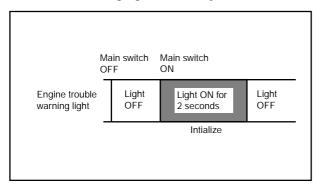
FI



EASONON'

### 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.



FASOOO02

### **SELF-DIAGNOSTIC FANCTION TABLE**

If the ECU detects an abnormal signal from a sensorwhile 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.

The ECU takes fail-safe actions in two ways: one in which the sensor output is set to a prescribed value, and the other in which the ECU directly operates an actuator. Details on the fail-safe actions are aiven in the table below.

### Self-diagnostic fanction table

| Fault<br>code No. | ltem                                                      | Symptom                                                                                                | Engine<br>startability | Vehicle<br>driveability |
|-------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------|-------------------------|
| 12                | Crankshaft position sensor                                | No normal signals are received from the crankshaft position sensor.                                    | Unable                 | Unable                  |
| 13<br>14          | Intake air pressure sensor (open or short circuit system) | Intake air pressure sensor-open or short circuit detected. Faulty intake air pressure sensor system.   | Able                   | Able                    |
| 15<br>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 sidestand lead of the ECU          | Open circuit in the input line (sidestand) of the ECU is detected.                                     | Unable                 | Unable                  |
| 22                | Intake air temperature sensor                             | Intake air temperature sensor-open or short circuit is detected.                                       | Able                   | Able                    |
| 24                | O <sub>2</sub> sensor                                     | No normal signal is received from the O <sub>2</sub> sensor.                                           | Able                   | Able                    |
| 28                | Engine temperature sensor                                 | Engine temperature sensor-open or short circuit 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                    |





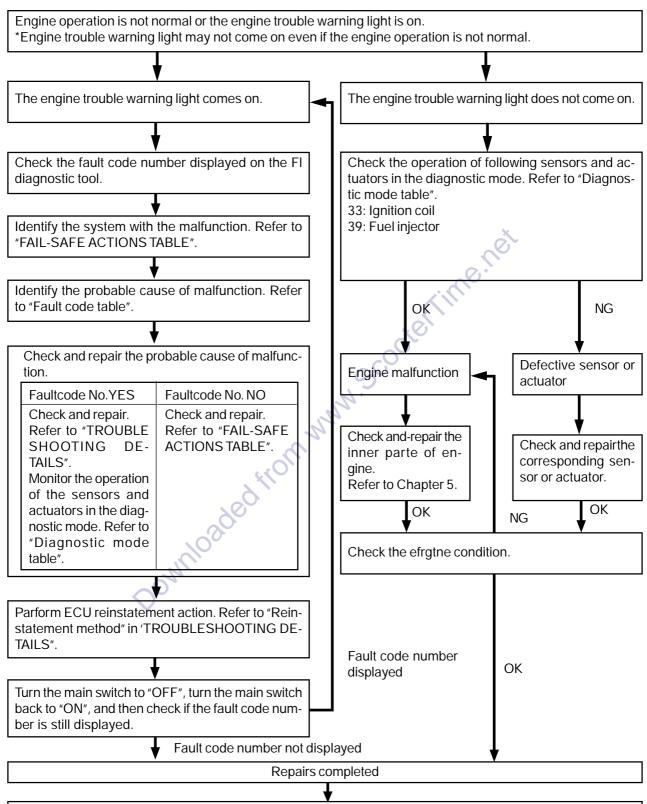
| Fault<br>code No. | Item                                                                                                   | Symptom                                                                                                                                                               | Engine<br>startability | Vehicle<br>driveability |
|-------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------|
| 39                | Fuel injector                                                                                          | Fuel injector open or short circuit is detected.                                                                                                                      | Unable                 | Unable                  |
| 30<br>41          | Lean angle cut-off switch (latch up detected) (open or short circuit)                                  | The vehicle has overturned.<br>Lean angle cut-off switch-open or short cir-<br>cuit 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 fuel injector, fuel pump and ignition coil are not normal.                                                                                            | Able                   | Able                    |
| 44                | Error in reading from or writing on EEPROM                                                             | An error is delected while reading from or writing on EEPROM (CO adjustment value, code re-registering key code, and throttle valve fully closed notification 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<br>Engine trouble warning light<br>flashes when the start<br>switch is turned ON. | Relay is not activated even if the crank signal is input while the start switch is pushed.                                                                            | Unable                 | Unable                  |

FΙ



EASOOO

### TROUBLESHOOTING CHART



Erasing the malfunction history:\*

The malfunction history is stored even if the main switch is turned OFF.

The malfunction history must be erased in the diagnostic mode. Referto "Diagnostic mode table (Diagnostic code No.62)".

<sup>\*</sup> Operated when the engine trouble warning light is on.





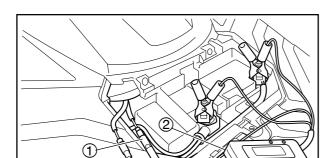
EAS00905

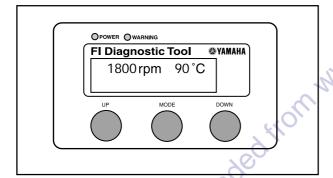
#### DIAGNOSTIC MODE

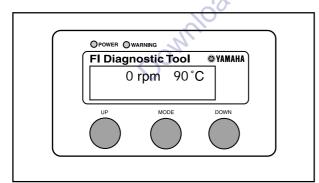
It is possible to monitor the sensor output data or check the activation of actuators with connecting the FI diagnostic tool to the normal mode or the diagnostic monitoring mode.



FI diagnostic tool 90890-03182 (YU-03182)







### Setting the normal mode

#### TIP\_

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 vhicle and is set to the normal mode.

- 1. Turn the main switch to "OFF".
- 2. Disconnect the self diag signal connector①, and then connect the FI diagnostic tool② as shown.
- 3. Turn the main switch to "ON" and start the engine.

#### TIP

- 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. How ever the fault code is not appears on the LCD of FI diagnostic tool.
- 4. Stop the engine.

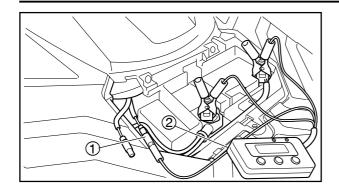
#### TIP\_

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

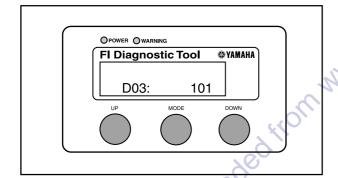
- 1. Turn the main switch to "OFF".
- 2. Disconnect the self diag signal connector①, and then connect the FI diagnostic-tool② as shown.
- 3. While press the "MODE" button, turn the main switch to "ON".

#### TIP.

- "DIAG" appears on the LCD of the FI diagnostic tool.
- "POWER" LED (Green) comes on.
- Press the "UP" button to select the CO adjustment mode "CO" or the diagnostic mode "DIAG".
- 5. After selecting "DIAG", press the "MODE" button.
- 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.

### TIP

- 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<br>codeNo. | Symptom                                                                                                                                                        | Probable cause of malfunction                                                                                                                                                                                                                      | Diagnostic code |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 12               | No normal signals are received from the crankshaft position sensor.                                                                                            | 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.                                                                                                     | Open or short circuit in wiring sub lead. Open orshort circuit in wiring harness. Defective intake air pressure sensor. Improperly installed sendor lead connector in the coupler.                                                                 | D03             |
| 14               | Faulty intake air pressure sensor system                                                                                                                       | Intake air pressure sensor is disconnected, or clogged.                                                                                                                                                                                            | D03             |
| 15               | Throttle position sensor-open or short circuit detected.                                                                                                       | <ul> <li>Open or short circuit in wiring sub lead.</li> <li>Open or short circuit in wiring harness.</li> <li>Defective throttle position sensor.</li> <li>Improperly installed throttle'position sensor lead connector in the coupler.</li> </ul> | D01             |
| 16               | A stuck throttle position sensor is detected.                                                                                                                  | Stuck throttle position sensor.     Defective throttle position sensor.                                                                                                                                                                            | D01             |
| 19               | Open circuit in the input line (sidestand lead) of ECU is detected when the start switch is pressed.                                                           | Open circuit in wiring harness (ECU coupler).                                                                                                                                                                                                      | D20             |
| 22               | Intake air temperature sensor-open or short circuit detected.                                                                                                  | <ul> <li>Open or short circuit in wire sub lead.</li> <li>Open or short circuit in wiring harness.</li> <li>Defective intake temperature sensor.</li> <li>Improperly installed sensor lead connector in the coupler.</li> </ul>                    | D05             |
| 24               | No normal signal is received from the ${\rm O_2}$ sensor.                                                                                                      | <ul> <li>Open or short circuit in wiring harness.</li> <li>Defective O<sub>2</sub> sensor.</li> <li>Improperly installed sensor.</li> </ul>                                                                                                        | -               |
| 28               | Engine temperature sensor-open or short circuit detected.                                                                                                      | Open or short circuit in wiring harness. Defective engine temperature sensor. Improperly installed lead connector in the coupler.                                                                                                                  | D11             |
| 30               | The vehicle has overturned.                                                                                                                                    | Overturned condition.                                                                                                                                                                                                                              | D08             |
| 33               | Open circuit is detected in the primary lead of the ignition coil.                                                                                             | 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.                                                                                                        | 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> <li>Open or short circuit in wiring harness.</li> <li>Defective fuel injector.</li> <li>Improperly installed lead connector in the coupler.</li> </ul>                                                                                        | D36             |
| 41               | Lean angle cut-off switch-open or short circuit detected.                                                                                                      | <ul> <li>Open or short circuit in wiring harness.</li> <li>Defective lean angle cut-off switch.</li> <li>Improperly installed lead connector in the coupler.</li> </ul>                                                                            | D08             |
| 42               | No normal signals are received from the speed sensor.                                                                                                          | <ul> <li>Open or short circuit in wiring harness.</li> <li>Defective speed sensor.</li> <li>Improperly installead lead connector in the coupler.</li> </ul>                                                                                        | D07             |
| 43               | Power supply to the fuel injector, fuel pump and ignition coil are not normal.                                                                                 | Open or short circuit in wiring harness.                                                                                                                                                                                                           | D09             |
| 44               | An error is detected while reading or writing on EEPROM.                                                                                                       | <ul> <li>Malfunction in ECU. (The CO adjustment value, code<br/>reregistering key code, and throttle valve fully closed<br/>notification value are not properly written on or read<br/>from the internal memory.)</li> </ul>                       | D60             |
| 46               | Power supply to FI system is not normal (red lead)                                                                                                             | Malfunction in charging system.                                                                                                                                                                                                                    | -               |
| 50               | 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. | Malfunction in ECU. (The program and data are not<br>properly written on or read from the internal memory.)                                                                                                                                        | _               |
| 61               | ISC (idle speed control) valve open or short circuit is detected.                                                                                              | <ul><li>Open or short circuit in wiring harness.</li><li>Improperly installed lead connector in the coupler.</li></ul>                                                                                                                             | D54             |

FI



FASOOO7

### Diagnostic mode table

#### TIP

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

| Diag-<br>nostic<br>code | Item                                  | Description of action                                                                                                                                                                                                                                                                                              | Data displayed on FI diagnostic tool (reference value)                                             |
|-------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| D01                     | Throttle angle                        | Displays the throttle angle.  • Check with throttle fully closed.                                                                                                                                                                                                                                                  | 0-125 degrees • Fully closed position (14-20)                                                      |
| D03                     | Intake air pressure                   | <ul> <li>Check with throttle fully open.</li> <li>Displays the intake air pressure.</li> <li>Check the pressure in the intake manifold.</li> </ul>                                                                                                                                                                 | Fully open position (97-107)     Compare it to the value displayed on the FI diagnostic tool.      |
| D05                     | Intake air temperature                | Displays the intake air temperature.  • Check the temperature in the intake manifold.                                                                                                                                                                                                                              | 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)<br>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 V<br>Overturned: 1.4V                                                                 |
| D09                     | Fuel system voltage (battery voltage) | Displays the fuel system voltage (battery voltage).                                                                                                                                                                                                                                                                | 0-18.7 V<br>Normally, approximately 12.0 V                                                         |
| D11                     | Engine temperature sensor             | Displays the engine temperature sensor.  Check the engine temperature sensor in the cylinder head.                                                                                                                                                                                                                 | Compare it to the value displayed on the FI diagnostic tool.                                       |
| D20                     | Sidestand switch                      | Displays that the switch is ON or OFF.                                                                                                                                                                                                                                                                             | Stand retracted: ON<br>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.  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 relay                       | When the "MODE" button is pressed, the head-<br>light relay is actuated five times every 5 seconds<br>and the engine trouble warning light comes on.<br>(ON 2 seconds, OFF 3 seconds)                                                                                                                              | Check the headlight relay 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                     | EEPROM fault code display.            | <ul> <li>Transmits the abnormal portion of the data in the E2PROM that has been detected as a fault code 44.</li> <li>If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.</li> </ul>                                                   | 01 CO adjustment value is detected. (00) Displays when there is no malfunction.                    |
| D61                     | Malfunction history code display      | <ul> <li>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).</li> <li>If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.</li> </ul> | 12-61<br>(00) Displays when there is no malfunction.                                               |
| D62                     | Malfunction history code erasure      | <ul> <li>Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history.</li> <li>Erases only the history codes when the "MODE" button is pressed.</li> </ul>                                                                                           | 00-18<br>(00) Dispiays when there is no malfunction.                                               |
| D70                     | Control number                        | Displays the program control number.                                                                                                                                                                                                                                                                               | 00-254                                                                                             |
| 1                       |                                       |                                                                                                                                                                                                                                                                                                                    |                                                                                                    |





### 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> <li>Improper installed lead connector in the coupler.</li> <li>The main switch is OFF position.</li> <li>Malfunction in FI diagnostic tool.</li> <li>Malfunction in ECU.</li> </ul>                                                             |
| ERROR 4                | Commands from the FI diagnostic tool are not accepted by the ECU. | <ul> <li>Turn the main switch to "OFF" once, and then turn it back to CO adjustment mode or diagnostic mode.</li> <li>Vehicle battery is insufficiently charged.</li> <li>Malfunction in FI diagnostic tool.</li> <li>Malfunction in ECU.</li> </ul> |

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".





| Fault c | ode No.   12   Symptom   N                                                                                                                                                                                       | lo normal signals are received from the cranksh                                                                                                         | naft 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 crank-<br>ing 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.  TIP  Set the main switch to OFF before connecting or disconnector. | If there is a malfunction, repair it and connect it securely.  Crankshaft position sensor coupler Main wiring harness ECU coupler                       |                                         |
|         | necting the connector.                                                                                                                                                                                           | Kilme                                                                                                                                                   |                                         |
| 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.                                                                                                                                   |                                         |

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     | 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, reper it and connect it securely. Intake air pressure sensor coupler Main wiring harness ECU coupler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Reinstated by turning the main switch ON. |
|       | Set the main switch to OFF before connecting or disconnecting the connector.                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ·                                         |
| 2     | Open or short circuit in wiring harnes.                                                                                                 | Repair or replace if there is an open or short circuit.  Between sensor coupler and ECU coupler black/blue - black/blue pink/white - pink/whte blue- blue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |
| 3     | Defective intake air pressure sensor.                                                                                                   | Execute the diagnostic mode (code No. D03) Replace the throttle body.  TIP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                           |
|       | Oomuloac                                                                                                                                | Positive tester probe → pink/white ① Negative tester prove → black/blue ②    Description   Descript |                                           |
|       |                                                                                                                                         | <ul> <li>2. Set the main switch to "ON".</li> <li>3. Measure the intake air pressure sensor output voltage.</li> </ul> Intake air pressure sensor output voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |
|       |                                                                                                                                         | 0.789~4.0V  4. Is the intake air pressure sensor OK?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                           |





| Fault c | ode No.   14   Symptom                                                                                           | Intake air pressure sensor system ma (clogged or detached).                                                                                                          | Ifunction                                                   |
|---------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Used    | diagnostic code No. D03 (intake a                                                                                | nir pressure sensor)                                                                                                                                                 |                                                             |
| Order   | Inspection operation item and probable cause                                                                     | Operation item and countermeasure                                                                                                                                    | Reinstatement method                                        |
| 1       | Connected state of connector<br>Intake air pressure sensor cou-<br>pler<br>Main wirring harness ECU cou-<br>pler | 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.  TIP                                                                                           | er e                    |

| Fault c | ode No.   15   Symptom                                                                                                                  | Throttle position sensor-open or short circ                                                                                                           | cuit detected.                            |  |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--|--|
| Used    | Used diagnostic code No. D01 (throttle position sensor)                                                                                 |                                                                                                                                                       |                                           |  |  |
| Order   | Inspection operation item and probable cause                                                                                            | Operation item and countermeasure                                                                                                                     | Reinstatement<br>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                      |                                           |  |  |
| 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 yellow - yellow blue -blue    |                                           |  |  |
| 4       | Defective throttle position sensor.                                                                                                     | Execute the diagnostic mode (code No. D01) Replace the throttle body.  TIP                                                                            |                                           |  |  |





| Fault c | ode No. 16 Symptom                               | Stuck throttle position sensor dete                                                                                                                   | ected.                                                                                    |
|---------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 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 start-<br>ing the engine, oper-<br>ating it at idle, and<br>then racing it. |
| 2       | Defective throttle position sensor               | Execute the diagnostic mode (code No. 01) Replace the throttle body.  TIP                                                                             |                                                                                           |
| 3       | When fault code No.15 has been detected          | Refer to "Fault code No.15".                                                                                                                          | Refer to "Fault code<br>No. 15".                                                          |

| Fault c | ode No.   19   Symptom                                                                        | Open circuit in the input line of ECU (sidestan                                                                                                                                                               | d lead) detected.                                                   |
|---------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Used    | diagnostic code No. D20 (sidesta                                                              | nd switch)                                                                                                                                                                                                    |                                                                     |
| Order   | Inspection operation item and probable cause                                                  | Operation item and countermeasure                                                                                                                                                                             | Reinstatement method                                                |
| 1       | Connected state of connector<br>Main wiring harness ECU cou-<br>pler<br>(sidestand 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.                                                      | Between main switch coupler and ECU coupler.  black/yellow - blue/yellow Sidestand switch and main switch coupler.  black/white - black/white                                                                 |                                                                     |

FΙ



|       |                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | , , , , , , , , , , , , , , , , , , ,      |  |  |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--|--|
|       | Fault code No.   22   Symptom   Intake air temperature sensor open or short circuit is detected.                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                            |  |  |
| Used  | Used diagnostic code No. D05 (intake air temperature sensor)                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                            |  |  |
| Order | Inspection operation item and probable cause                                                                                            | Operation item and countermeasure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Reinstatement<br>method                    |  |  |
| 1     | Installed condition of sensor                                                                                                           | Check the installed area for looseness or pinching.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Reinstated by turn-<br>ing the main switch |  |  |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ON.                                        |  |  |
| 3     | Open or short circuit in wireing harness.                                                                                               | 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.                                                                                                | Execute the diagnostic mode (code No. D05) Replace the throttle body.  TIP  Do not remove the sensor module.  1. Connect the digital circuit tester to the intake air temperature sensor terminal as shown.  Positive tester probe → brown/white ① Negative tester probe → black/blue ②  2. Measure the intake air temperature sensor resistance.  Intake air temperature sensor resistance 6kΩ at 20°C (68°F)  AWARNING  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.  3. Is the intake air temperature sensor OK? |                                            |  |  |





| Fault c | ode No. 24 Symptom                                                                                                                  | No normal signal is received from the C                                                                                               | O <sub>2</sub> sensor.                                                           |
|---------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Used    | diagnostic code No                                                                                                                  |                                                                                                                                       |                                                                                  |
| Order   | Inspection operation item and probable cause                                                                                        | Operation item and countermeasure                                                                                                     | Reinstatement method                                                             |
| 1       | Defective O <sub>2</sub> sensor.                                                                                                    | Replace if defective.                                                                                                                 | Reinstated by start-                                                             |
| 2       | Open or short circuit in wiring harness.                                                                                            | Repair or replace if there is there is an open or short circuit.  Main wiring harness black/blue – gray/green red/black – black/green | ing the engine, operating it at idle, and then racing it after it has warmed up. |
| 3       | Installed state of O <sub>2</sub> sensor.                                                                                           | Check the installed area for losseness or pinching.                                                                                   |                                                                                  |
| 4       | Connected state 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 and connect it securely.  O <sub>2</sub> sensor coupler  Main wiring ECU harness coupler            | •                                                                                |
| 5       | Check fuel pressure                                                                                                                 | Refer to "CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OPERATION.                                                                    |                                                                                  |

| Fault c | ode No. 28 Symptom                                                                                                                      | Engine temperature sensor open or short circ                                                                                                | cuit is detected.                          |  |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--|--|
| Used    | Used diagnostic code No. D11 (engine temperature sensor)                                                                                |                                                                                                                                             |                                            |  |  |
| Order   | Inspection operation item and probable cause                                                                                            | Operation item and countermeasure                                                                                                           | Reinstatement<br>method                    |  |  |
| 1       | Installed condition of sensor                                                                                                           | Check the installed area for looseness or pinching.                                                                                         | Reinstated by turn-<br>ing the main switch |  |  |
| 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.  Engine temperature sensor coupler Main wiring harness ECU coupler            | OŇ.                                        |  |  |
| 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 engine temperature sensor.                                                                                                    | Execute the diagnostic mode (code No.D11) Replace if defective.                                                                             |                                            |  |  |

FΙ



| Fault c | ode No. 30 Symptom                                                                                                                      | The vehicle has overturned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--|
| Used    | 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 turn-                                                     |  |
| 2       | Installed condition of the lean angle cut-off switch                                                                                    | Check the installed area for looseness or pinching.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ing the main switch ON (however, the                                    |  |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                     | engine cannot be restarted unless the main switch is first turned OFF). |  |
| 4       | Defective lean angle cut-off switch                                                                                                     | <ol> <li>Execute the diagnostic mode (code No. D08) Replace if defective.</li> <li>Remove the lean angle cut-off switch from the vehicle.</li> <li>Connect the lean angle cut-off switch coupler to the wire harness.</li> <li>Connect the digital circuit tester to the lean angle cut-off switch terminals as shown.</li> </ol> Positive tester probe → blue ① Negative tester probe → yellow/green ② 45° 45° 45° 45° 45° 1 ② When turning the lean angle cut-off switch approximately 45°, the voltage reading change from 0.4 V to 1.4 V. 5. Is the lean angle cut-off switch OK? |                                                                         |  |





| Fault | odeNo. 33 Symptom                                                                                                                       | Open circuit detected in the primary lead of t                                                                                      | he ignition coil.                                           |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Used  | diagnostic code No. D30                                                                                                                 |                                                                                                                                     |                                                             |
| Order | Inspection operation item and probable cause                                                                                            | Operation item and countermeasure                                                                                                   | Reinstatement<br>method                                     |
| 1     | Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler. | 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 | v                                                           |
| 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 7.                           |                                                             |

| Fault c | ode No. 37 Symptom                                            | Engine speed is high when the engine                                                                                                                                                                                                                                                                                                 | e is idling.                                                                           |  |
|---------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--|
| Used    | Used diagnostic code No. D54 (ISC (idle speed control) valve) |                                                                                                                                                                                                                                                                                                                                      |                                                                                        |  |
| Order   | Inspection operation item and probable cause                  | Operation item and countermeasure                                                                                                                                                                                                                                                                                                    | Reinstatement<br>method                                                                |  |
| 1       | Throttle valve does not fully close                           | Check the throttle body. Refer to "THROTTLE BODY AND FUEL INJECTOR". Check the throttle cable assembly. Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.                                                                                                                                                              | Reinstated if the engine idle speed is within specification after starting the engine. |  |
| 2       | 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.)                                                         |                                                                                        |  |
|         |                                                               | TIP                                                                                                                                                                                                                                                                                                                                  |                                                                                        |  |
| 3       | 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. |                                                                                        |  |





| Fault c | ode No. 39 Symptom                                                                                                                      | Fuel injector open or short circuit is d                                                                                                        | etected.                           |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Used    | diagnostic code No. D36 (fuel inje                                                                                                      | ector)                                                                                                                                          |                                    |
| 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 c | ode No. 41 Symptom                                                                                                                      | Lean angle cut-off switch open or short circ                                                                                                                   | uit is detected.                          |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Used    | diagnostic code No. D08 (lean an                                                                                                        | gle 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.                                                                   |                                           |





|         |                                                                                                                                                                   |                                                                                                                                                                                                                                              | •                                                                                        |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Fault c | ode No.   42   Symptom                                                                                                                                            | No normal signals are received from the s                                                                                                                                                                                                    | peed sensor.                                                                             |
| Used    | diagnostic code No. D07 (speed s                                                                                                                                  | ensor)                                                                                                                                                                                                                                       |                                                                                          |
| Order   | Inspection operation item and probable cause                                                                                                                      | Operation item and countermeasure                                                                                                                                                                                                            | Reinstatement<br>method                                                                  |
| 1       | Connected condition of speed-<br>ometer connector Inspect the coupler for any<br>pins that may have pulled<br>out. Check the locking condition<br>of the coupler. | If there is a malfunction, repair it and connect it securely.  Speedometer coupler  Main wiring harness ECU coupler                                                                                                                          | Reinstated by input-<br>ting the vehicle speed<br>signals by turning the<br>front wheel. |
| 2       | Open or short circuit in speed-<br>ometer 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 wheel hub projections ⓐ and speedometer clutch ⓑ. |                                                                                          |
| 4       | Defective speed sensor                                                                                                                                            | Execute the diagnostic mode (code No. D07) Replace the meter assembly.                                                                                                                                                                       |                                                                                          |





| Fault c | Fault code No. 43 Symptom Power supply to the fuel injector, fuel pump and ignistion coil are not normal.                               |                                                                                           |                                                             |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------|--|
| Used    | diagnostic code No. D09 (fuel sys                                                                                                       | stem 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.                                                                                                | TIP                                                                                       |                                                             |  |

| Fault c | Fault code No. 44 Symptom An error is delected while reading from or writing on EEPROM (CO adjustment value, code re-registering key code, and throttle valve fully closed notification value). |                                                                                                                                                                                          |                                           |  |  |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--|--|
| Used    | diagnostic code No. D60 (EEPRC                                                                                                                                                                  | M improper cylinder indication)                                                                                                                                                          |                                           |  |  |
| Order   | Inspection operation item and probable cause                                                                                                                                                    | Operation item and countermeasure                                                                                                                                                        | Reinstatement method                      |  |  |
| 1       | Malfunction in ECU                                                                                                                                                                              | <ul> <li>Execute the diagnostic mode (code No. D60)</li> <li>01 is displayed on meter.</li> <li>Readjust the CO of the displayed cylinder.</li> <li>Replace ECU if defective.</li> </ul> | Reinstated by turning the main switch ON. |  |  |





| Fault c | ode 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 7.                            |                                                             |
| 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 c | ode No.   | 50       | Symptom                      | Fau | ulty ECU memory. (when this malfunction is det<br>fault code number might not appear on t |                                           |
|---------|-----------|----------|------------------------------|-----|-------------------------------------------------------------------------------------------|-------------------------------------------|
| Used    | diagnosti | c code   | e No                         |     |                                                                                           |                                           |
| Order   |           |          | peration item a<br>ble cause | and | Operation item and countermeasure                                                         | Reinstatement method                      |
| 1       | Malfund   | ction ir | n ECU                        | 96  | Replace the ECU.                                                                          | Reinstated by turning the main switch ON. |





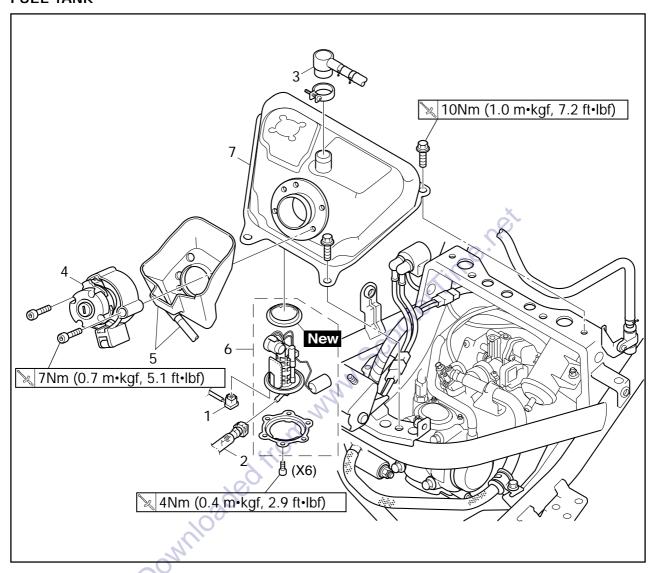
| Fault c | ode No. 61 Symptom                                                                                                                      | ISC (idle speed control) valve open or short ci                                                                                                                                                 | ircuit is detected.                                                                                                                                                                     |  |  |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Used    | Used diagnostic code No. D54 (ISC (idle speed control)valve)                                                                            |                                                                                                                                                                                                 |                                                                                                                                                                                         |  |  |  |
| 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.  TIP Do not remove the ISC (idle speed control) valve.  Refer to "THROTTLE BODY AND FUEL IN- JECTOR".                          |                                                                                                                                                                                         |  |  |  |





EAS00909

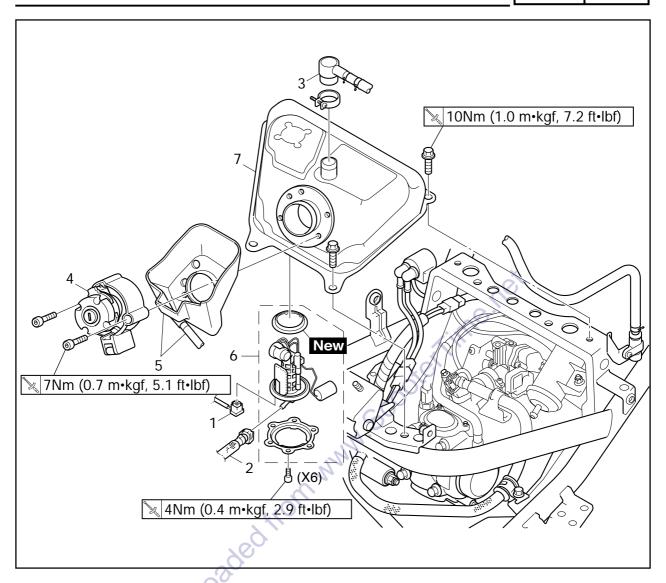
# THROTTLE BODY AND FUEL INJECTOR FUEL TANK



| Order | Job/Part                                                                  | Q′ty | Remarks                                          |
|-------|---------------------------------------------------------------------------|------|--------------------------------------------------|
|       | Removing the fuel tank                                                    |      | Remove the parts in the order listed.            |
|       |                                                                           |      | TIP<br>Place the scooter on a suitable stand.    |
|       | Seat/trunk Battery box cover/front cover Side cover (left and right) Fuel |      | Refer to "COVER AND PANEL" in chapter 3.  Drain. |
| 1     | Fuel pump coupler                                                         | 1    | Disconnect.                                      |
| 2     | Fuel hose                                                                 | 1    | Disconnect.                                      |
| 3     | Fuel return hose                                                          | 1    | Disconnect.                                      |
| 4     | Fuel tank cap                                                             | 1    |                                                  |
| 5     | Filler cover/overflow pipe                                                | 1/1  |                                                  |





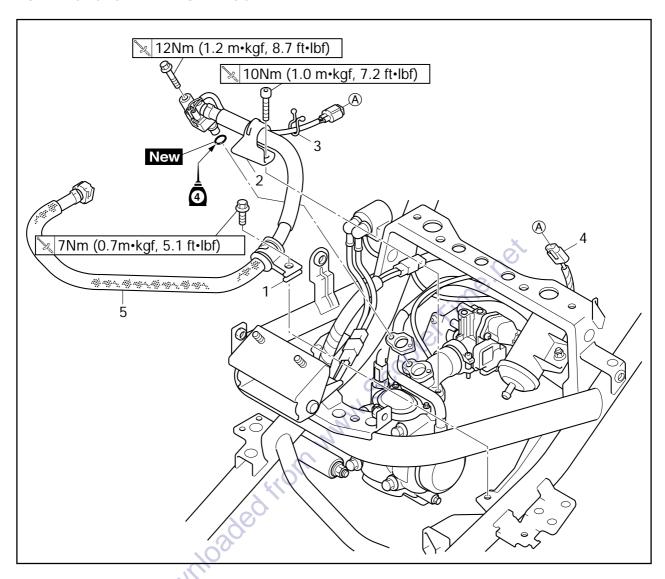


| Order | Job/Part  | Q'ty | Remarks                                                                                                                          |
|-------|-----------|------|----------------------------------------------------------------------------------------------------------------------------------|
| 6     | Fuel pump | 1    | Refer to "REMOVING THE FUEL PUMP" and "INSTALLING THE FUEL PUMP".                                                                |
| 7     | Fuel tank | 1    | Refer to "REMOVING THE FUEL TANK" and "INSTALLING THE FUEL TANK AND FUEL HOSE". For installation, reverse the removal procedure. |





### **FUEL INJECTOR AND FUEL HOSE**

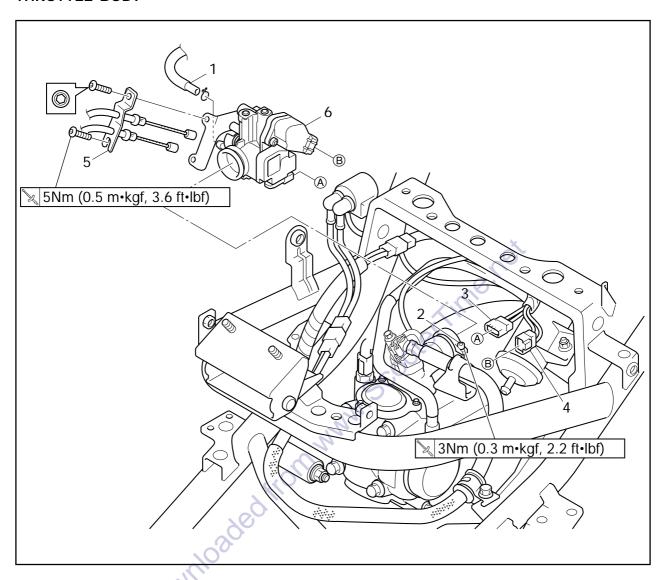


| Order | Job/Part                              | Q′ty | Remarks                                          |
|-------|---------------------------------------|------|--------------------------------------------------|
|       | Removing the fuel injector and fuel   |      | Remove the parts in the order listed.            |
|       | hose                                  |      | ·                                                |
|       | Fuel tank                             |      | Refer to "REMOVING THE FUEL TANK".               |
| 1     | Fuel hose holder (to frame)           | 1    |                                                  |
| 2     | Fuel hose holder (to intake manifold) | 1    |                                                  |
| 3     | Clamp                                 | 1    |                                                  |
| 4     | Fuel injector coupler                 | 1    | Disconnect.                                      |
| 5     | Fuel injector and fuel hose           | 1    |                                                  |
|       |                                       |      | For installation, reverse the removal procedure. |





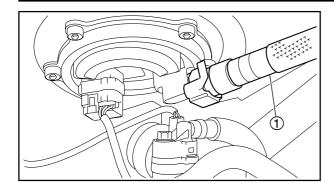
### THROTTLE BODY



| Order                      | Job/Part                                                                                                                                                                                                                 | Q′ty                  | Remarks                                                                                                                                                                                                |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6 | Removing the throttle body Air filter/breather hose  Fuel tank Fuel pipe (to throttle body) Throttle body clamp screw Sensor module coupler ISC (idle speed control) valve coupler Throttle cable assembly Throttle body | 1<br>1<br>1<br>1<br>1 | Remove the parts in the order listed. Refer to "ENGINE REMOVAL" in chapter 5. Refer to "FUEL TANK". Disconnect. Lossen. Disconnect. Disconnect. Disconnect. For installation, reverse the removal pro- |
|                            |                                                                                                                                                                                                                          |                       | cedure.                                                                                                                                                                                                |





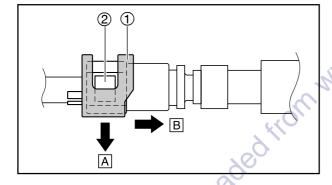


### REMOVING THE FUEL TANK

- 1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
- 2. Remove:
  - fuel return hose
  - fuel hose (1)

### NOTICE

- 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.



### TIP

- Before removing the hose, place a few rags in the area under where it will be removed.
- Hold fuel hose connector ① draw down, press tenon ② draw backward and then, can remove the fuel hose.
- A Draw down
- **B** Draw backward
- 3. Disconnect:
  - •fuel pump coupler
- 4. Remove:
  - •fuel tank

#### TIP

Do not set the fuel tank down so that the installation surface of the fuel pump is directly under the tank. Be sure to lean the fuel tank in an upright position.





### **REMOVING THE FUEL PUMP**

- 1. Remove:
  - fuel tank Refer to "REMOVING THE FUEL TANK".
- 2. Remove:
  - •fuel pump

### NOTICE

- Do not drop the fuel pump or give it a strong shock.
- Do not touch the base section of the fuel sender.

EAS00911

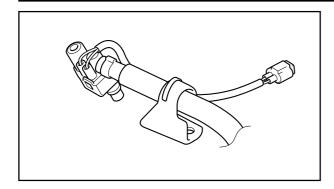
Downloaded from www. Scooter

NOTICE

The fuel pump should not be disassembled.



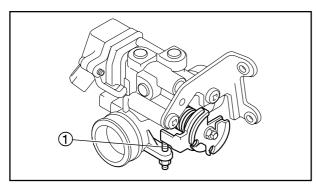




EAS00912

### CHECKING THE FUEL INJECTOR

- 1. Check:
  - fuel injector
     Damage → Replace.



Domiloaded trom m

FAS00913

### CHECKING THE THROTTLE BODY

- 1. Check:
  - ◆ throttle body
     Cracks/damage → Replace the throttle body.
- 2. Check:
  - butterfly valve
     Damage/scratches/wear → Replace.

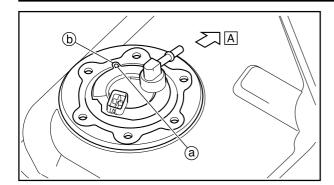
### NOTICE

- Do not adjust the stop screw ①.
- Do not clean the throttle body ass'y 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: 3 seconds more). And then, start the engine and keep idling at 10 minutes more.







### INSTALLING THE FUEL PUMP

- 1. Install:
  - fuel pump

4Nm (0.4m • kgf, 2.9ft • lbf)

#### TIP.

- Do not damage the installion surface 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.



### INSTALLING THE FUEL TANK AND FUEL HOSE

- 1. Install :
  - fuel tank

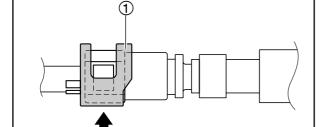
10Nm (1.0m • kgf, 7.2ft • lbf)

- led trown my Connect:
  - fuel pump coupler
  - 3. Install:
    - fuel hose (1)
    - fuel return hose



When installing the fuel hose, make sure that it is securely connected, and that the fuel hose holders are in the correct position, otherwise the fuel hose will not be properly installed.





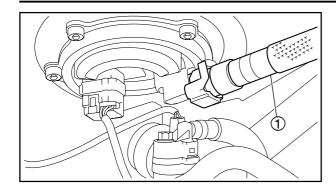
#### TIP\_

(1)

- 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
- After instslling the fuel hose, hold fuel hose connector (1) push to the bottom up and make sure that it is installed securely.







EAS00915

### CHECKING THE FUEL PUMP AND PRES-SURE REGULATOR OPERATION

- 1. Check:
  - pressure regulator operation



- a. Remove the battery box cover and front cover
  - Refer to "COVER AND PANEL" in chapter 3.
- b. Remove the fuel hose 1 from the fuel pump.



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.



Before removing the hose, place a few rags in the area under where it will be removed.

c. Connect the pressure gauge ② and adapter③ onto the fuel hose.



Pressure gauge 90890-03153 (YU-03153) Adapter 90890-03186

- d. Start the engine.
- e. Measure the fuel pressure.



Fuel pressure 250kPa (2.5kgf/cm², 35.6psi)

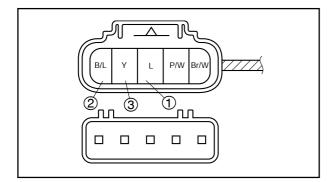
Faulty → Replace the fuel pump.

\_\_\_\_









Downloaded from

EAS00916

### CHECKING THE THROTTLE POSITION SEN-SOR

- 1. Check:
  - throttle position sensor

a. Connect the digital circuit tester to the ter-

minals of the throttle position sensor.

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.

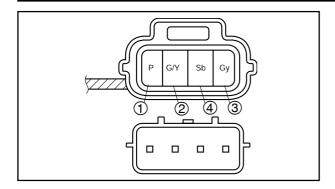


Throttle position sensor voltage (closed position)

0.63 ~ 0.73 V
(yellow-black/blue)







EAS00916

CHECKING THE ISC (IDLE SPEED CON-TROL) VALVE

### TIP\_

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

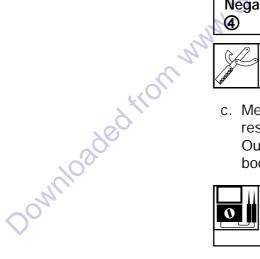
Positive tester probe → gray terminal ③ Negative tester probe → sky blue terminal



Digital circuit tester 90890-03174

c. Measure the ISC (idle speed control) valve resistance.

Out of specification → Replace the throttle



ISC (idle speed control) valve resistance

\_\_\_\_

20 Ω at 20°C(68°F)

# CHAPTER 7 ELECTRICAL SYSTEM

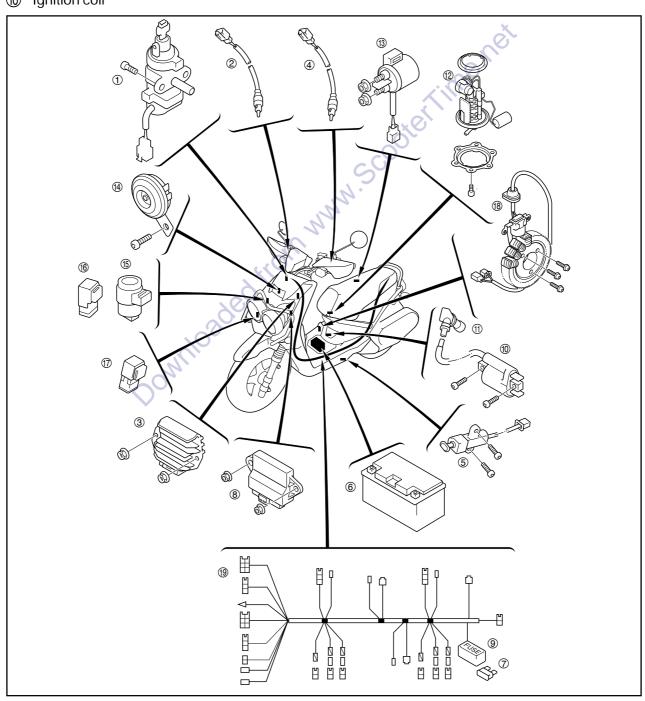
| ELECTRICAL COMPONENTS                                                 | 7-1  |
|-----------------------------------------------------------------------|------|
| WIRING DIAGRAM                                                        | 7-2  |
| CHECKING SWITCH CONTINUITY                                            | 7-4  |
| CHECKING THE SWITCHES                                                 | 7-5  |
| CHECKING THE BULBS AND BULB SOCKETS                                   | 7-6  |
| TYPES OF BULBS                                                        |      |
| CHECKING THE CONDITION OF THE BULBS                                   | 7-6  |
| CHECKING THE CONDITION OF THE BULB SOCKETS                            | 7-7  |
| IGNITION SYSTEM                                                       | 7-9  |
| CIRCUIT DIAGRAM                                                       | 7-9  |
| TROUBLESHOOTING                                                       | 7-10 |
| IGNITION SYSTEMCIRCUIT DIAGRAMTROUBLESHOOTINGELECTRIC STARTING SYSTEM | 7-15 |
| CIRCUIT DIAGRAM                                                       | 7-15 |
| STARTING CIRCUIT CUT-OFF SYSTEM OPERATION                             |      |
| TROUBLESHOOTING                                                       | 7-17 |
| STARTER MOTOR                                                         |      |
| CHECKING THE STARTER MOTOR                                            |      |
| ASSEMBLING THE STARTER MOTOR                                          | 7-25 |
| CHARGING SYSTEMCIRCUIT DIAGRAM                                        | 7-26 |
| CIRCUIT DIAGRAM                                                       | 7-26 |
| TROUBLESHOOTING                                                       | 7-27 |
| LIGHTING SYSTEM                                                       |      |
| CIRCUIT DIAGRAM                                                       |      |
| TROUBLESHOOTING                                                       |      |
| CHECKING THE LIGHTING SYSTEM                                          |      |
| SIGNALING SYSTEM                                                      |      |
| CIRCUIT DIAGRAM                                                       |      |
| TROUBLESHOOTING                                                       |      |
| CHECKING THE SIGNALING SYSTEM                                         | 7-37 |

### **ELECTRICAL SYSTEM**

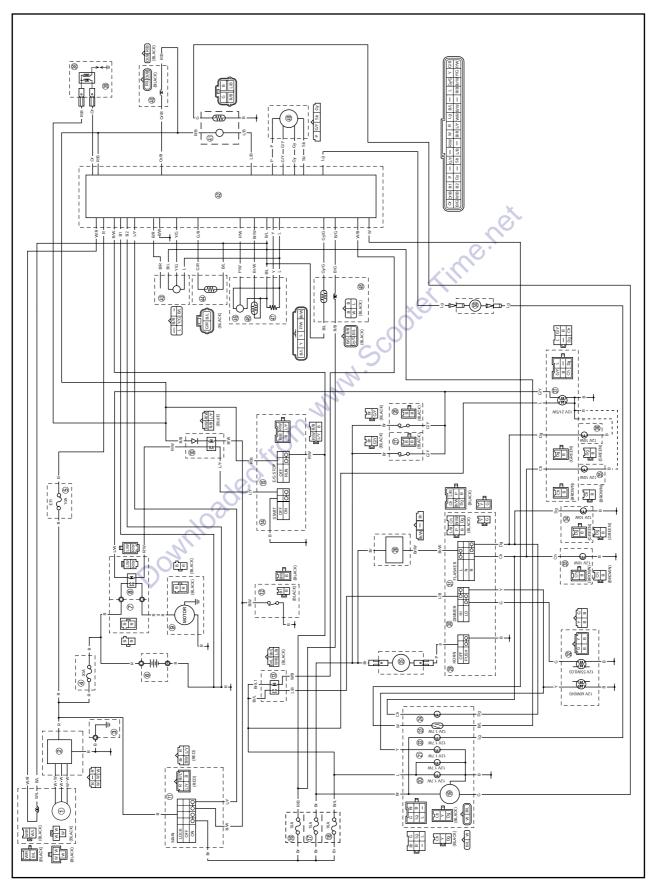
#### **ELECTRICAL COMPONENTS**

- 1 Main switch
- ② Front brake light switch
- 3 Rectifier/regulator
- A Rear brake light switch
- Sidestand switch
- 6 Battery
- Main fuse
- 8 ECU
- 9 Fuse box
- 10 Ignition coil

- ① Spark plug cap
- Fuel pump
- (13) Starter relay
- (14) Horn
- (5) Turn signal relay
- 6 Starting circuit cut-off relay
- (f) Headlight relay
- Stator coil
- (19) Wire harness



#### WIRING DIAGRAM



# WIRING DIAGRAM ELEC

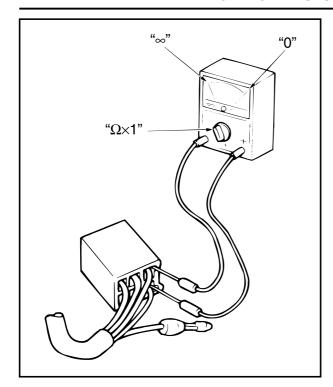
ELEC -

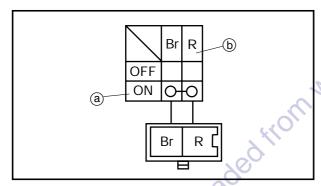
| 1           | AC magneto                                                                                          |
|-------------|-----------------------------------------------------------------------------------------------------|
| (2)         | Rectifier/regulator Body earth Main fuse Fuel injection system fuse Battery Wire lead Starter relay |
| 3           | Body earth                                                                                          |
| <u>4</u>    | Main fuse                                                                                           |
| <u>(5)</u>  | Fuel injection system fuse                                                                          |
| 6           | Battery                                                                                             |
| <u>(7)</u>  | Wire lead                                                                                           |
| 8           | Starter relay                                                                                       |
| 9           | Starter motor                                                                                       |
| 10          | Starting circuit cut-off relay                                                                      |
|             | Main switch                                                                                         |
| 12          | Sidestand switch                                                                                    |
|             | Headlight relay                                                                                     |
|             | Start switch                                                                                        |
|             | Engine stop switch                                                                                  |
| <b>16</b>   | Ignition fuse                                                                                       |
| 17          | Signaling system fuse                                                                               |
| 18          |                                                                                                     |
| 19          | Fuel level gauge                                                                                    |
| <b>(20)</b> | Speedometer light                                                                                   |
| (1)<br>(20) | High beam indicator light                                                                           |
| 22          | Engine trouble warning light                                                                        |
| 23<br>24    | Speed sensor Turn signal indicator light                                                            |
| 25          | Horn                                                                                                |
| 26          | Turn signal relay                                                                                   |
| 27          | Front brake light switch                                                                            |
|             | Rear brake light switch                                                                             |
| 29          | Horn switch                                                                                         |
| 30          | Dimmer switch                                                                                       |
| 31          | Turn signal switch                                                                                  |
| 32          | Headlight                                                                                           |
| 33          | Front turn signal light (left)                                                                      |
| 34)         | Front turn signal light (right)                                                                     |
| 35)         | Rear turn signal light (left)                                                                       |
| 36          | Rear turn signal light (right)                                                                      |
| 37)         | Tail/brake light                                                                                    |
| 38)         | Ignition coil                                                                                       |
| 39          | Spark plug                                                                                          |
| 40          | Fuel injector                                                                                       |
| <b>41</b>   | Fuel pump                                                                                           |
| <b>42</b>   | ECU                                                                                                 |
| <b>43</b>   | Lean angle cut-off switch                                                                           |
| 44          | Engine temperature sensor                                                                           |
| <b>45</b>   | Intake air pressure sensor                                                                          |
| <b>46</b>   | Intake air temperature sensor                                                                       |
| 47          | Throttle position sensor                                                                            |
| <b>48</b>   | O <sub>2</sub> sensor<br>ISC (idle speed control) valve                                             |
| 49<br>50    | FI diagnostic tool                                                                                  |
| w           | i i diagnostic tool                                                                                 |
|             |                                                                                                     |

| Color Code |              |
|------------|--------------|
| В          | Black        |
| Br         | Brown        |
| Ch         | Chocolate    |
| Dg         | Dark green   |
| Ğ          |              |
| Gy         |              |
| L          |              |
| Lg         |              |
| Or         | 0 0          |
| P          | •            |
| R          | Red          |
| Sb         | Sky blue     |
|            |              |
| W<br>Y     | Yellow (     |
| B/L        |              |
| B/G        | Black/Green  |
| B/R        | Black/Red    |
| B/W        | Black/White  |
| G/R        | Green/Red    |
| G/Y        | Green/Yellow |
| L/B        | Blue/Black   |
| 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/B        |              |
| W/L        |              |
| W/R        |              |
|            | Yellow/Green |
| Br/L       |              |
| Br/W       |              |
| Gy/G       | Gray/Green   |
|            |              |

## **CHECKING SWITCH CONTINUITY**







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.

#### NOTICE

Never insert the tester probes into the coupler terminal slots (a). Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester 90890-03112 (YU-03112-C)

#### TIP

- Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " 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.

#### TIP\_

"O-O" 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 red and brown when the switch is set to "ON".

FΔS00731

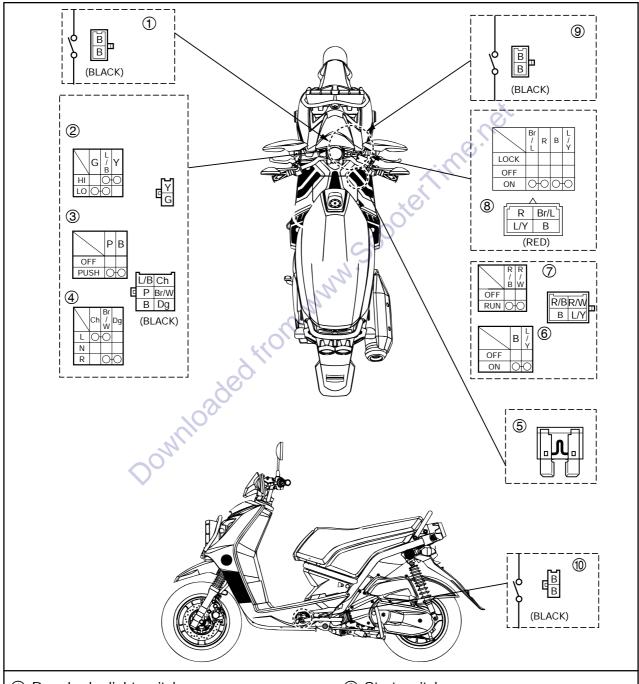
#### **CHECKING THE SWITCHES**

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
- 2 Dimmer switch
- (3) Horn switch
- 4 Turn signal switch
- ⑤ Main fuse

- 6 Start switch
- Tengine stop switch
- (8) Main switch
- Front brake light switch
- 10 Sidestand switch

## 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.



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 © is used for turn signal and tail/ brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.

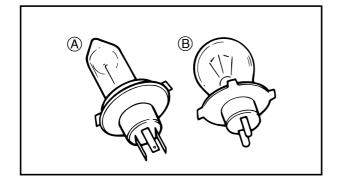
#### **CHECKING THE CONDITION OF THE BULBS**

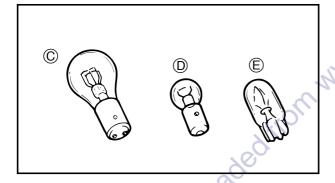
The following procedure applies to all of the bulbs.

- 1. Remove:
  - bulb

#### **⚠** WARNING

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





### CHECKING THE BULBS AND BULB SOCKETS



#### NOTICE

- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- 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.

#### 2. Check:

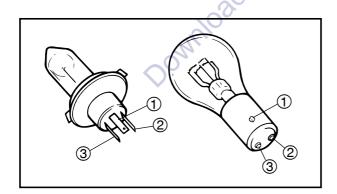
bulb (for continuity)
 (with the pocket tester)
 No continuity → Replace.



Pocket tester 90890-03112 (YU-03112-C)

#### TIP

Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times$  1" range.



# a. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ②, and check the continuity.

- b. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ③, and check the continuity.
- c. If either of the readings indicate no continuity, replace the bulb.

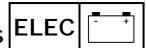
## CHECKING THE CONDITION OF THE BULB SOCKETS

\_\_\_\_\_

The following procedure applies to all of the bulb sockets.

- 1. Check:
  - bulb socket (for continuity) (with the pocket tester)
     No continuity → Replace.

## CHECKING THE BULBS AND BULB SOCKETS





Pocket tester 90890-03112 (YU-03112-C)

#### TIP\_

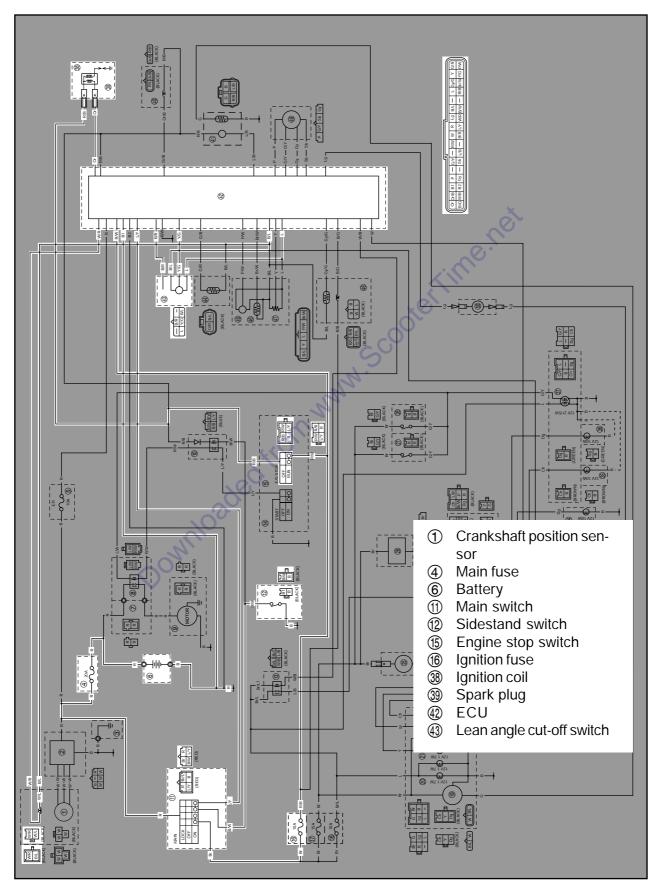
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

#### \*\*\*\*\*\*\*\*

- 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.

Downloaded from www.scooterlime.

## IGNITION SYSTEM CIRCUIT DIAGRAM





FAS00736

#### **TROUBLESHOOTING**

The ignition system fails to operate (no spark or intermittent spark).

#### Check:

- 1. main and ignition fuses
- 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
- 11. lean angle cut-off switch
- 12. wiring connections (of the entire ignition system)

#### TIP\_

- Before troubleshooting, remove the following part(s):
- 1. battery box cover
- 2. front cover
- 3. leg shield 1
- 4. footrest board
- Troubleshoot with the following special tool(s).



Ignition checker 90890-06754 (YM-34487) Pocket tester 90890-03112(YU-03112-C) FASO073

#### 1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
   Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and ignition fuses OK?





NO

Replace the fuse(s)

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?





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 U22ESR-N (DENSO) Spark plug gap 0.7 ~ 0.8 mm (0.028 ~ 0.031in)

 Is the spark plug in good condition, is it of the correct type, and is its gap within specification?



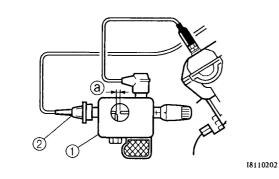


NO

Re-gap or replace the spark plug.

#### 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 (a).
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.





Minimum ignition spark gap 6 mm (0.24in)

Is there a spark and is the spark gap within specification?



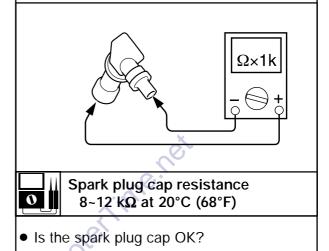


The ignition system is

EAS0074

#### 5. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ("Ω × 1k" range) to the spark plug cap as shown.
- Measure the spark plug cap resistance.







Replace the spark plug cap.

EAS00746

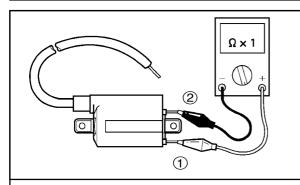
#### 6. Ignition coil resistance

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Positive tester probe → orange ①
Negative tester probe → red/black ②

## **IGNITION SYSTEM**





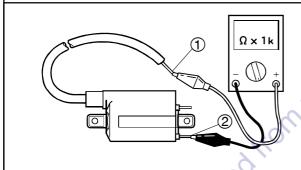
Measure the primary coil resistance.



Primary coil resistance 2.16 ~ 2.64 Ω at 20°C (68°F)

• Connect the pocket tester ( $\Omega \times 1k$ ) to the ignition coil as shown.

Negative tester probe → orange ②
Positive tester probe → 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?



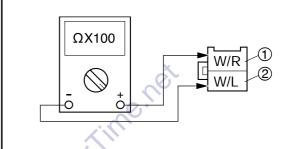


Replace the ignition coil.

EASO0749

- 7. Crankshaft position sensor resistance
- Disconnect the crankshaft position sensor coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 100$ ) to the crankshaft position sensor coupler as shown.

Positive tester probe → white/red ①
Negative tester probe → 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.

## **IGNITION SYSTEM**

AS00749

#### 8. Main switch

- Check the main switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?





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?





Replace the right handlebar switch.

#### EAS00752

#### 10. Sidestand switch

- Check the sidestand switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?



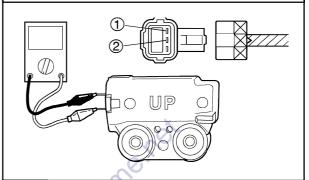


Replace the sidestand switch.

#### 11. Lean angle cut-off switch

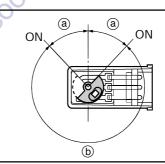
- Remove the lean angle cut-off switch.
- Connect the pocket tester ( $\Omega \times 1$ ) to the lean angle cut-off switch terminals as shown.

Positive tester probe → blue ①
Negative tester probe → yellow/green ②



0

Lean angle cut-off switch voltage Less than 45° (a) → 0.4V More than 45° (b) → 1.4V



Is the lean angle cut-off switch OK?



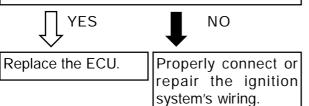
YES



Replace the lean angle cut-off switch.

#### 12. Wiring

- Check the entire ignition system's wiring.
   Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

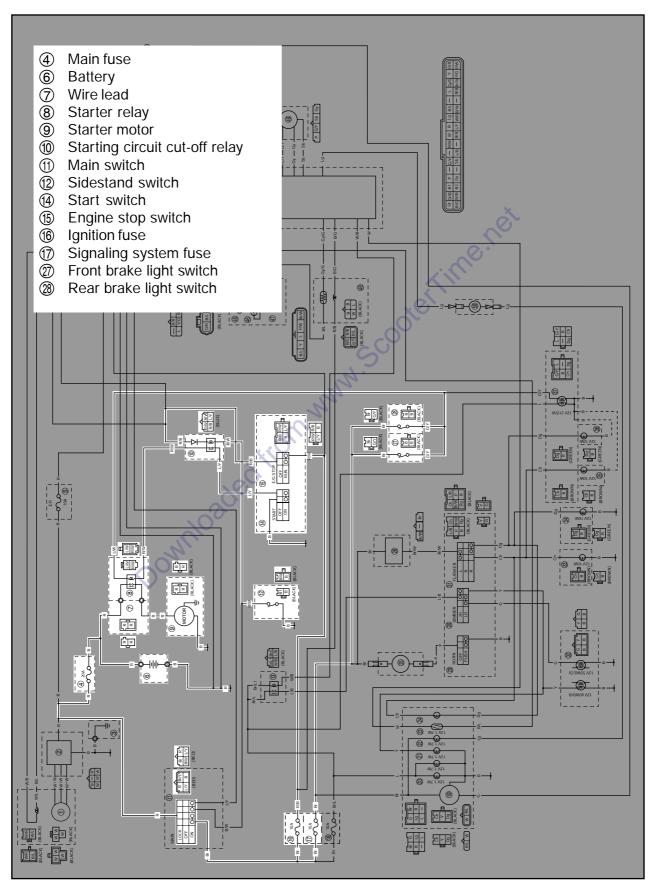


Downloaded from www. Scooter line. Ret

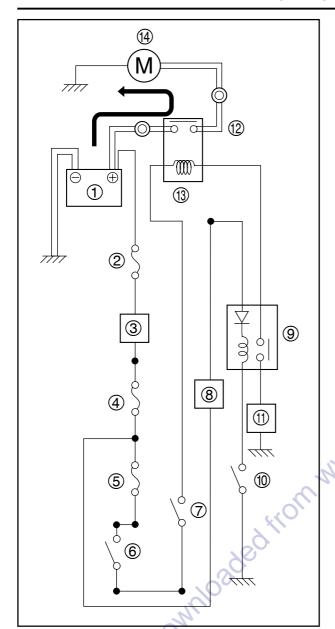


EASO075

## ELECTRIC STARTING SYSTEM CIRCUIT DIAGRAM







EAS00756

#### STARTING CIRCUIT CUT-OFF SYSTEM OP-ERATION

If the engine stop switch is set to " $\bigcap$ " and the main switch is set to " $\bigcap$ " (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 is up (the sidestand switch is closed).
- Battery
- ② Main fuse
- 3 Main switch
- 4 Ignition fuse
- Signaling system fuse
- 6 Front brake light switch
- Rear brake light switch
- 8 Engine stop switch
- Starting circuit cut-off relay
- Sidestand switch
- 11) Start switch
- Wire lead
- Starter relay
- (4) Starter motor



EΔS0075

#### **TROUBLESHOOTING**

#### The starter motor fails to turn.

#### Check:

- 1. main, signal and ignition fuses
- 2. battery
- 3. starter motor
- 4. starting circuit cut-off relay
- 5. starter relay
- 6. main switch
- 7. engine stop switch
- 8. brake light switch (front and rear)
- 9. sidestand switch
- 10. start switch
- wiring connections
   (of the entire starting system)

#### TIP.

- Before troubleshooting, remove the following part(s):
- 1. battery box cover/front cover
- 2. seat/trunk
- 3. side cover (right)
- 4. leg shield 1
  - Troubleshoot with the following special tool(s).



Pocket tester 90890-03112 (YU-03112-C) FASO073

#### 1.Main, signal and ignition fuses

- Check the main, signal and ignition fuses for continuity.
   Refer to "CHECKING THE FUSES" in chap-
- Are the main, signal and ignition fuses OK?





NO

Replace the fuse(s).

#### 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?





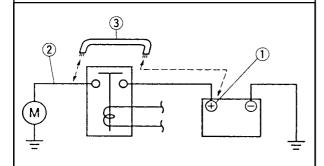
NO

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

ΔS00758

#### 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?





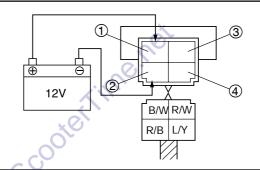
Repair or replace the starter motor.

EASON750

- 4. Starting circuit cut-off relay
- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cut-off relay coupler as shown.

Positive battery terminal → red/blcak ①
Negative battery terminal → black/white ②

Positive tester probe → blue/yellow ③ Negative tester probe → red/white ④



 Does the starting circuit cut-off relay have continuity between blue/yellow and red/ white?





NO

Replace the starting circuit cut-off relay.

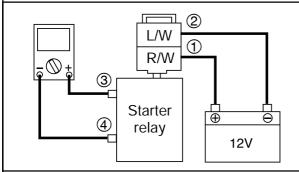
EAS0076

#### 5. Starter relay

- Disconnect the starter relay coupler from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starter relay coupler as shown.

Positive battery terminal → red/white 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?





Replace the starter relay.

EAS00749

#### 6. Main switch

- Check the main switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?





Replace the main switch.

-ΔS00750

#### 7. Engine stop switch

- Check the engine stop switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?





Replace the right handlebar switch.

EAS00751

#### 8. Brake light switch (front and rear)

- Check the brake light switches for continuity.
  - Refer to "CHECKING THE SWITCHES".
- Is each brake light switch OK?





NO

Replace the brake light switch(es).

EAS00752

#### 9. Sidestand switch

- Check the sidestand switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?





NO

Replace the sidestand switch.

#### 10. Start switch

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?





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?





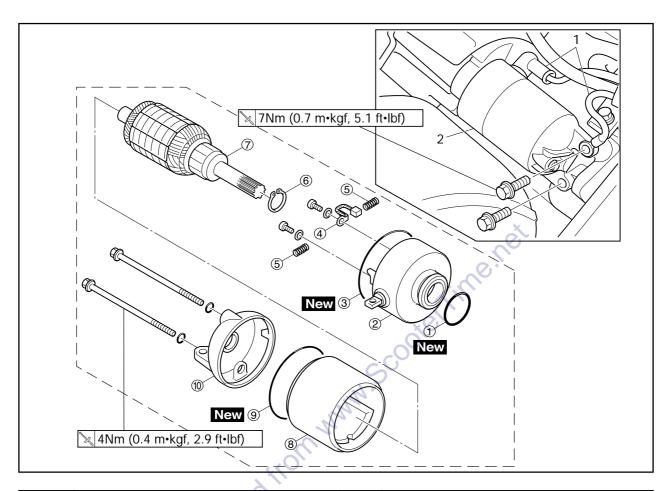
The starting system circuit is ok.

Journa ded from white sooter line het



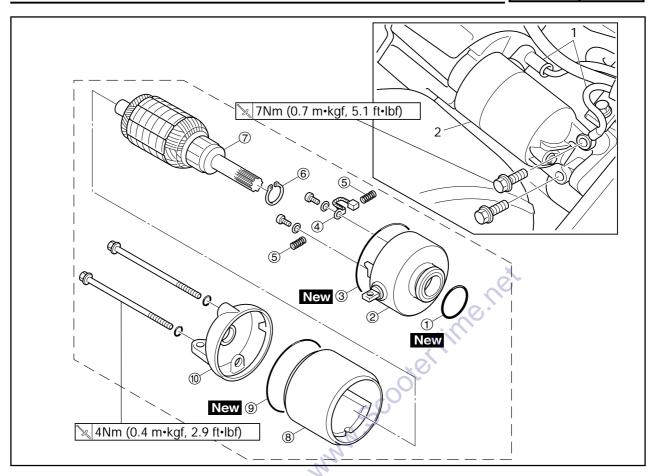
FAS00767

#### STARTER MOTOR



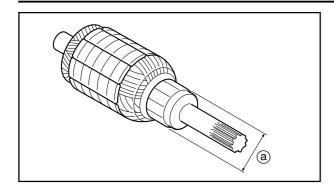
| Order      | Job/Part                                                       | Q′ty | Remarks                                                                                                           |
|------------|----------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------|
|            | Removing the starter motor Seat/trunk Air filter/breather hose |      | Remove the parts in the order listed. Refer to "COVER AND PANEL" in chapter 3. Refer to "ENGINE REMOVEL" in chap- |
|            | 7 til Tiller/Steat et 11636                                    |      | ter 5.                                                                                                            |
| 1          | Starter motor lead/earth lead                                  | 1/1  | Disconnect.                                                                                                       |
| 2          | Starter motor                                                  | 1    |                                                                                                                   |
|            |                                                                |      | For installation, reverse the removal pro-                                                                        |
|            |                                                                |      | cedure.                                                                                                           |
|            | Disassembling the starter motor                                |      | Disassemble the parts in the order listed.                                                                        |
| 1          | O-ring                                                         | 1    | h                                                                                                                 |
| 2          | Starter motor front cover                                      | 1    |                                                                                                                   |
| 3          | O-ring                                                         | 1    |                                                                                                                   |
| 4          | Brush                                                          | 2    |                                                                                                                   |
| (5)        | Brush Spring                                                   | 2    | Refer to "ASSEMBLING THE STARTER                                                                                  |
| 6          | Circlip                                                        | 1    | MOTOR".                                                                                                           |
| 7          | Armature                                                       | 1    |                                                                                                                   |
| 1034567899 | Stator                                                         | 1    |                                                                                                                   |
| 9          | O-ring                                                         | 1    |                                                                                                                   |
| 100        | Starter motor rear cover                                       | 1    | μ                                                                                                                 |

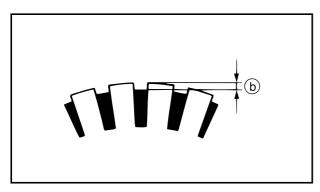




| Order | Job/Part | Q′ty | Remarks                                          |
|-------|----------|------|--------------------------------------------------|
|       | 100/110  |      | For assembly, reverse the disassembly procedure. |







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 21 mm (0.83in)

- 3. Measure:
  - mica undercut (b)
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit



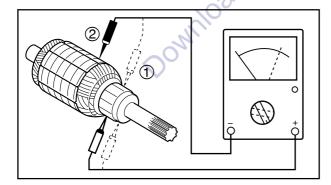
Mica undercut 1.5 mm (0.06in)

the commutator.

#### TIP

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 resis-

tances with the pocket tester.



Pocket tester 90890-03112 (YU-03112-C)

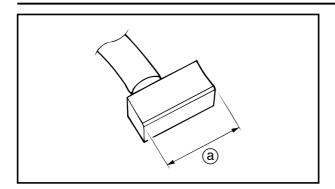


Armature coil Commutator resistance (1)  $0.0252 \sim 0.0308 \ \Omega$  at  $20^{\circ}\text{C}$  (68°F) Insulation resistance (2) Above 1 M $\Omega$  at  $20^{\circ}\text{C}$  (68°F)

b. If any resistance is out of specification, replace the starter motor.







- 5. Measure:
  - brush length ⓐ
     Out of specification → Replace the
     brushes as a set.



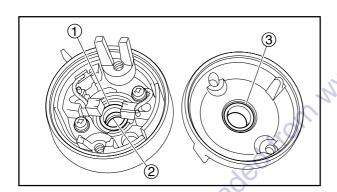
Brush length wear limit 3.5 mm (0.14in)

- 6. Measure:
  - brush spring force
     Out of specification → Replace the brush
     springs as a set.

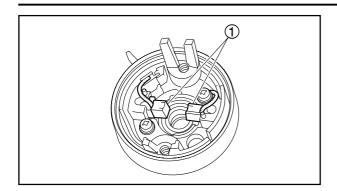


Brush spring force 5.52 ~ 8.28 N/mm (0.56 ~ 0.84kgf/ mm, 1.24 ~ 1.86lbf/in)

- 7. Check:
  - gear teeth
     Damage/wear → Replace the gear.



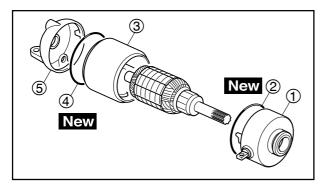
- 8. Check:
  - bearing (1)
    - oil seal 2
    - bush ③Damage/wear → Replace.



EAS00772

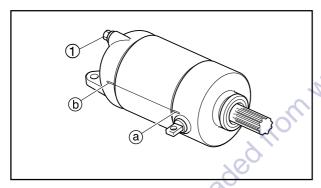
#### ASSEMBLING THE STARTER MOTOR

- 1. Install:
  - brush spring
  - brush ①



2. Install:

- armature
- starter motor front cover 1
- O-ing ② New
- stator ③
- O-ing ④ New
- starter motor rear cover ⑤



3. Install:

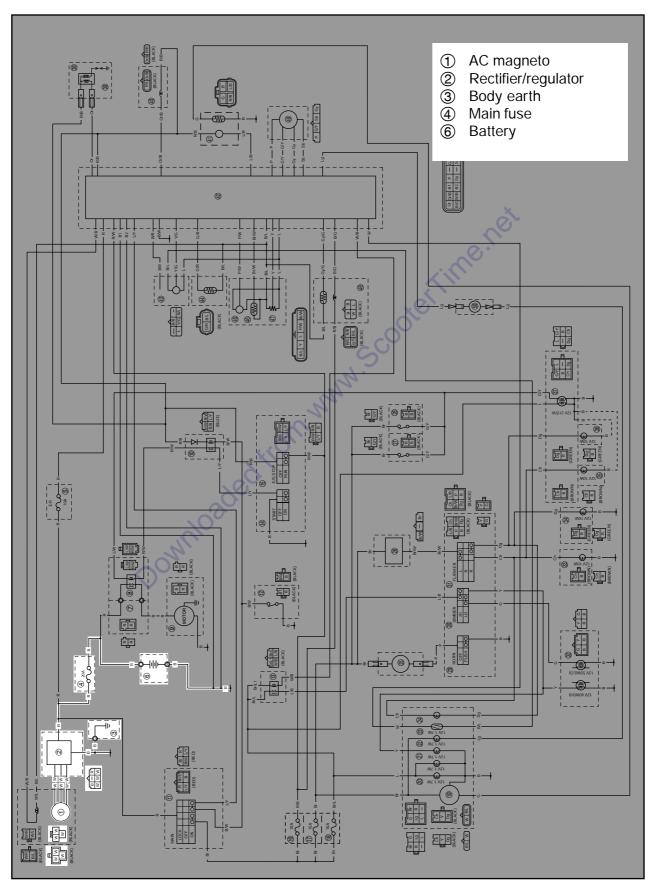
- O-rings New
  - bolts 1

4Nm (0.4m • kgf, 2.9ft • lbf)

TIP\_

Align the match marks (a) on the stator with the match marks (b) on the front and starter motor rear covers.

## CHARGING SYSTEM CIRCUIT DIAGRAM



## **CHARGING SYSTEM**



EAS00774

#### **TROUBLESHOOTING**

#### The battery is not being charged.

#### Check:

- 1. main fuse
- 2. battery
- 3. charging voltage
- 4. stator coil resistance
- wiring connections (of the entire charging system)

#### TIP -

- Before troubleshooting, remove the following part(s):
- 1. battery box cover
- 2. front cover
- 3. leg shield 1
- Troubleshoot with the following special tool(s).



Digital tachometer 90890-06760 Pocket tester 90890-03112 (YU-03112-C)

#### FΔS00738

- 1. Main fuse
- Check the main fuse for continuity.
   Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?





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?





NO

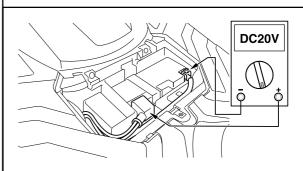
- Clean the battery terminals.
- Recharge or replace the battery.

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

## **CHARGING SYSTEM**

TIP.

Make sure the battery is fully charged.

•Is the charging voltage within specification?





The charging circuit is OK.

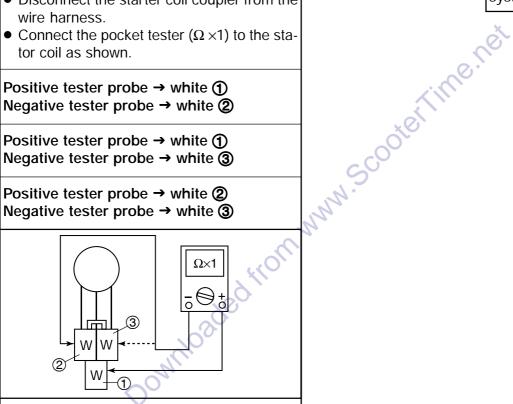
EAS00776

- 4. Stator coil resistance
- Disconnect the starter coil coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) to the stator coil as shown.

Positive tester probe → white (1) Negative tester probe → white ②

Positive tester probe → white (1) Negative tester probe → white ③

Positive tester probe → white ② Negative tester probe → white ③



Measure the stator coil resistances.



Stator coil resistance  $0.28 \sim 0.42 \Omega$  at 20°C (68°F)

Is the stator coil OK?





NO

Replace the crankshaft position sensor/ stator coil assembly.

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?



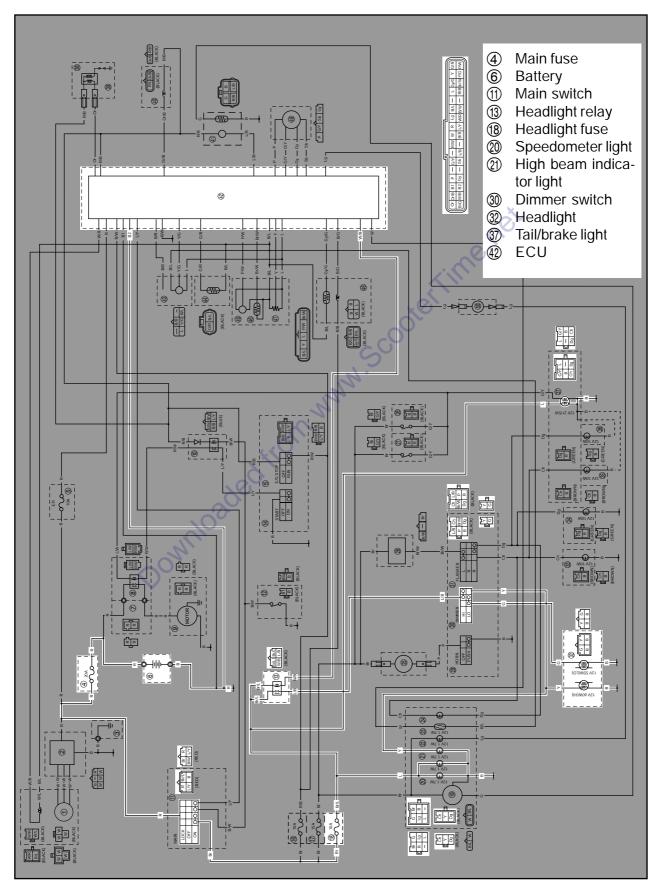


NO

Replace the rectifier/ regulator.

Properly connect or repair the charging system's wiring.

## LIGHTING SYSTEM CIRCUIT DIAGRAM



FAS00781

#### **TROUBLESHOOTING**

Any of the following fail to light: headlight, high beam indicator light, taillight or meter light.

#### Check:

- 1. main and headlight fuses
- 2. battery
- 3. main switch
- 4. dimmer switch
- 5 headlight relay
- 6 wiring connections (of the entire lighting system)

#### TIP\_

- Before troubleshooting, remove the following part(s):
- 1. battery box cover
- 2. front cover
- 3. leg shield 1
- Troubleshoot with the following special tool(s).



Pocket tester 90890-03112 (YU-03112-C)

#### noot with the following special

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?





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?





NO

Replace the main switch.

#### FAS00738

- 1. Main and headlight fuses
- Check the main and headlight fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3.

Are the fuses OK?





Replace the fuse(s).

EAS00784

- 4. Dimmer switch
- Check the dimmer switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?





NO

The dimmer switch is faulty. Replace the left handlebar switch.

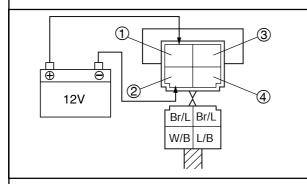


#### 5. Headlight relay

- Disconnect the headlight relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the headlight relay coupler as shown.

Positive battery terminal → white/black ①
Negative battery terminal → brown/blue ②

Positive tester probe → blue/black ③
Negative tester probe → brown/blue ④



 Does the headlight relay have continuity between blue/black and brown/blue?





NO

Replace the headlight relay.

FASOO78

#### 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?



Replace the headlight bulb, socket or both.

NO

- 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?





NO

Replace the high beam indicator light bulb, socket or both.

#### EAS00787

#### 6. Wiring

- Check the entire lighting system's wiring.
   Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?





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.

### LIGHTING SYSTEM



#### 3. Voltage

 Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

AWhen the dimmer switch is set to "

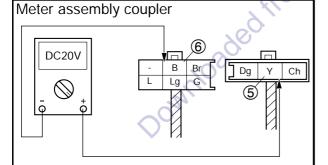
BWhen the dimmer switch is set to "

C"

#### Headlight

Positive tester probe → yellow ①
Negative tester probe → black ②
Positive tester probe → green ③
Negative tester probe → black ④

High beam indicator light
Positive tester probe → yellow ⑤
Negative tester probe → black ⑥



- Set the main switch to "ON".
- Set the engine stop switch to "\(\Omega"\).
- Start the engine.
- Set the dimmer switch to "\( \subseteq \si
- Measure the voltage (DC 12 V) of yellow ①
  or green ③ on the headlight coupler (wire
  harness side) and yellow ⑤ on the meter
  assembly coupler (wire harness side).
- Is the voltage within specification?





NO

This circuit is OK.

www.scooterlime.net

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".

AS00789

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?





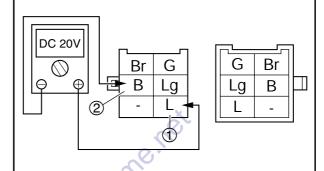
Replace the meter light bulb, socket or both.

Donulogded trom my

#### 2. Voltage

 Connect the pocket tester (DC 20 V) to the meter 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 meter light coupler (wire harness side).
- Is the voltage within specification?





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. 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?



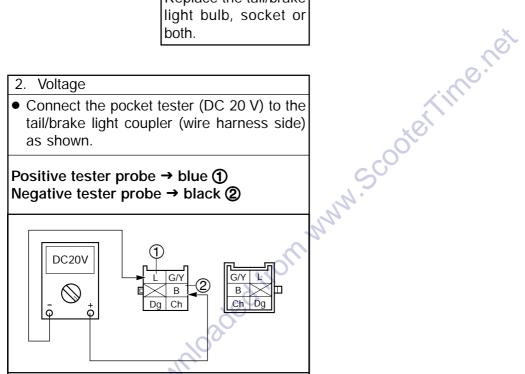


Replace the tail/brake light bulb, socket or both.

#### 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 meter light coupler (wire harness side).
- Is the voltage within specification?





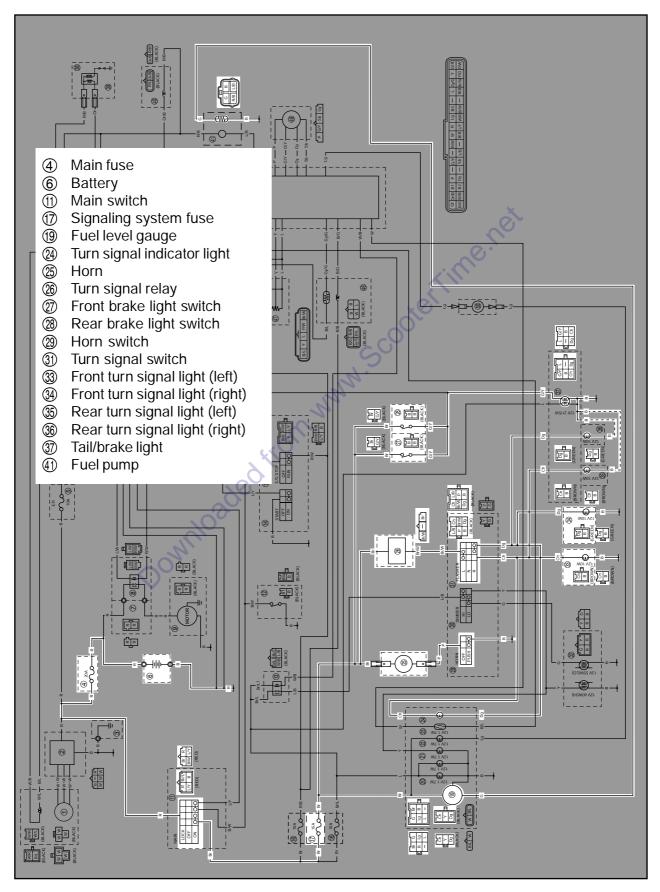
NO

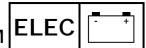
This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

Refer to "CIRCUIT DIAGRAM".

## SIGNALING SYSTEM CIRCUIT DIAGRAM





FAS0070/

#### **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 and signaling fuses
- 2. battery
- 3. main switch
- wiring connections
   (of the entire signaling system)

#### TIP.

- Before troubleshooting, remove the following part(s):
- 1. battery box cover
- 2. front cover
- 3. leg shield 1
- 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

- Main switch
- Check the main switch for continuity.
   Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?





NO

Replace the main switch.

#### EAS00738

#### 1.Main and signaling fuses

Check the main and signaling fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3.

Are the main and signaling fuses OK?





NO

ded from

Replace the fuse(s).

#### EAS00795

- 4. Wiring
- Check the entire signal system's wiring.
   Refer to "CIRCUIT DIAGRAM".
- Is the signal system's wiring properly connected and without defects?





NO

Check the condition of each of the signaling system's circuits.
Refer to "CHECKING

Refer to "CHECKING THE SIGNALING SYSTEM". Properly connect or repair the signaling system's wiring.

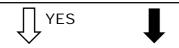
## SIGNALING SYSTEM

#### 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?



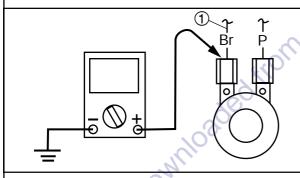
Replace the left handlebar switch.

NO

#### 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?





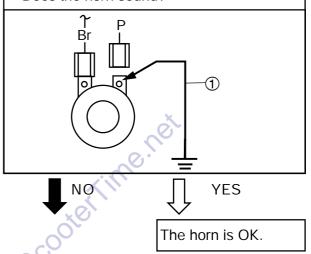
NO

The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

Refer to "CIRCUIT DIAGRAM".

#### 3. Horn

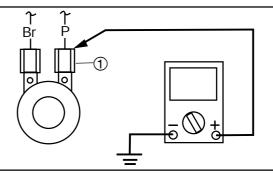
- Disconnect the pink connector at the horn terminal.
- Connect a jumper lead (1) to the horn terminal and ground the jumper lead.
- Set the main switch to "ON".
- Push the horn switch.
- Does the horn sound?



#### 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?





Repair or replace the horn.

Replace the horn.

- 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?





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?





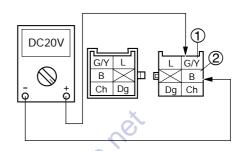
NO

Replace the brake light switch.

#### 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?





NO

This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

Refer to "CIRCUIT DIAGRAM".

- 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?





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?





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?



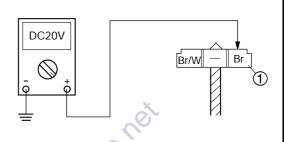


NO

Replace the left handlebar 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?





NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

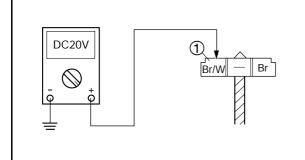
Refer to "CIRCUIT DIAGRAM".

## SIGNALING SYSTEM



- 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?





The turn signal relay is faulty and must be replaced.

- 6. Voltage
- Connect the pocket tester (DC 20 V) to the turn signal light coupler 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

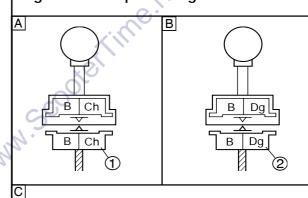
Left turn signal light

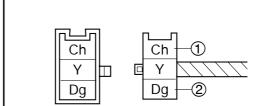
Positive tester probe → chocolate ①

Negative tester probe → ground

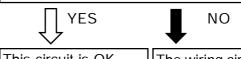
Right turn signal light

Positive tester probe → dark green ②
Negative tester probe → ground





- Set the main switch to "ON".
- Set the turn signal switch to "\( \sqrt{}\sqrt{}\)" or "\( \sqrt{}\)".
- Measure the voltage (DC 12 V) of the chocolate ① or dark green ② at the turn signal light coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

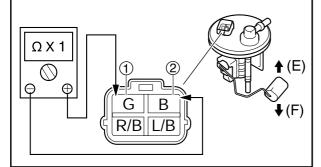
The wiring circuit from the turn signal switch to the turn signal light coupler is faulty and must be repaired.

4. The fuel level gauge fails to operate.

#### 1. Fuel sender

- Remove the fuel pump from the fuel tank.
- Connect the pocket tester (Ω × 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")( $\Omega \times 1$ )

4~10Ω at 20°C (68°F)

Fuel sender resistance (down position "E") ( $\Omega \times 10$ ) 90~100  $\Omega$  at 20°C (68°F)

Is the fuel sender OK?



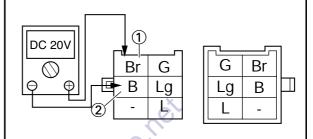


Replace the fuel pump.

#### 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?



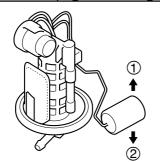


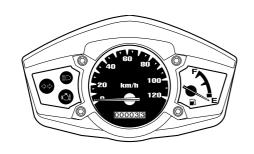
NO

Check the wiring coupler of the entire signaling system.

Refer to "CIRCUIT DIAGRAM".

- 3. Fuel level gauge
- Set the main switch to "ON".
- Move the float up 1 or down 2.





www.scoterfime.net • Check that the fuel level gauge needle moves to "F" or "E".

#### TIP\_

Before reading the fuel level gauge, leave the float in one position (either up or down) for at least three minutes.

• Does the fuel level gauge needle move appropriately?





NO

This circuit is OK.

Replace the speedometer.

#### 4. Wiring

Check the entire signaling system's wiring.

# CHAPTER 8 TROUBLE SHOOTING

| STARTING FAILURE/HARD STARTING            | 8-1 |
|-------------------------------------------|-----|
| ENGINE                                    | 8-1 |
| FUEL SYSTEM                               | 8-1 |
| ELECTRICAL SYSTEMS                        | 8-1 |
| INCORRECT ENGINE IDLING SPEED             | 8-2 |
| ENGINE                                    | 8-2 |
| FUEL SYSTEM                               |     |
| ELECTRICAL SYSTEMS                        |     |
| POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE    | 8-2 |
| FAULTY CLUTCH                             | 8-2 |
| FUEL SYSTEM                               | 8-2 |
| FAULTY CLUTCH                             | 8-3 |
| ENGINE OPERATES BUT SCOOTER WILL NOT MOVE | 8-3 |
| CLUTCH SLIPSPOOR STARTING PERFORMANCE     | 8-3 |
| POOR STARTING PERFORMANCE                 | 8-3 |
| POOR SPEED PERFORMANCE                    | 8-3 |
| OVERHEATING                               | 8-3 |
| ENGINE                                    | 8-3 |
| FUEL SYSTEM                               | 8-3 |
| CHASSIS                                   | 8-3 |
| ELECTRICAL SYSTEMS                        | 8-3 |
| POOR BRAKING PERFORMANCE                  | 8-4 |
| FAULTY FRONT FORK LEGS                    | 8-4 |
| LEAKING OIL                               | 8-4 |
| MALFUNCTION                               | 8-4 |
| UNSTABLE HANDLING                         | 8-4 |
| FAULTY LIGHTING OR SIGNALING SYSTEM       | 8-5 |
| HEADLIGHT DOES NOT COME ON                |     |
| HEADLIGHT BULB BURNT OUT                  |     |
| TAIL/BRAKE LIGHT DOES NOT COME ON         | 8-5 |
| TAIL/BRAKE LIGHT BULB BURNT OUT           | 8-5 |
| TURN SIGNAL DOES NOT COME ON              | 8-5 |
| TURN SIGNAL BLINKS SLOWLY                 | 8-5 |
| TURN SIGNAL REMAINS LIT                   | 8-5 |
| TURN SIGNAL BLINKS QUICKLY                | 8-5 |
| HORN DOES NOT SOUND                       | 8-5 |

## STARTING FAILURE/HARD STARTING

-AS00844

### TROUBLESHOOTING

TIP

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(s)

- 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
- Improperly grounded circuit
- Loose connections

#### Starting system

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

## INCORRECT ENGINE IDLING SPEED/POOR MEDIUM- TRB AND-HIGH-SPEED PERFORMANCE SHTG

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
- برب heat range
  برا amaged electrode
  الله r damaged insulator
  الله spark plug cap

  ition coil

  Faulty spark plug lead

  ion system
  Faulty ECU
  Faulty cranks • Improper throttle cable free play

#### **ELECTRICAL SYSTEMS**

#### **Battery**

#### Spark plug

#### Ignition coil

#### Ignition system

EAS00848

#### POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURE/HARD START-ING".

#### **ENGINE**

#### Air filter

Clogged air filter element

#### **FUEL SYSTEM**

#### Throttle body

Faulty diaphragm

#### Fuel pump

• Faulty fuel pump

#### **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

#### 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 in cylinder head and piston

#### Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

#### **FUEL SYSTEM**

#### Throttle body

- Faulty 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 ECU
- Faulty engine temperature sensor

# POOR BRAKING PERFORMANCE/FAULTY FRONT FORK LEGS/UNSTABLE HANDLING

TRBL ?

EVZUUSE

#### POOR BRAKING PERFORMANCE

#### Disc brake

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

#### 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

#### Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

#### Rear shock absorber assemblies

- 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

## FAULTY LIGHTING OR SIGNALING SYSTEM

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 switch)
- Burnt-out headlight bulb
- Faulty headlight relay

#### HEADLIGHT BULB BURNT OUT

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty headlight relay
- 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
- Faulty front or rear brake light switch
- 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

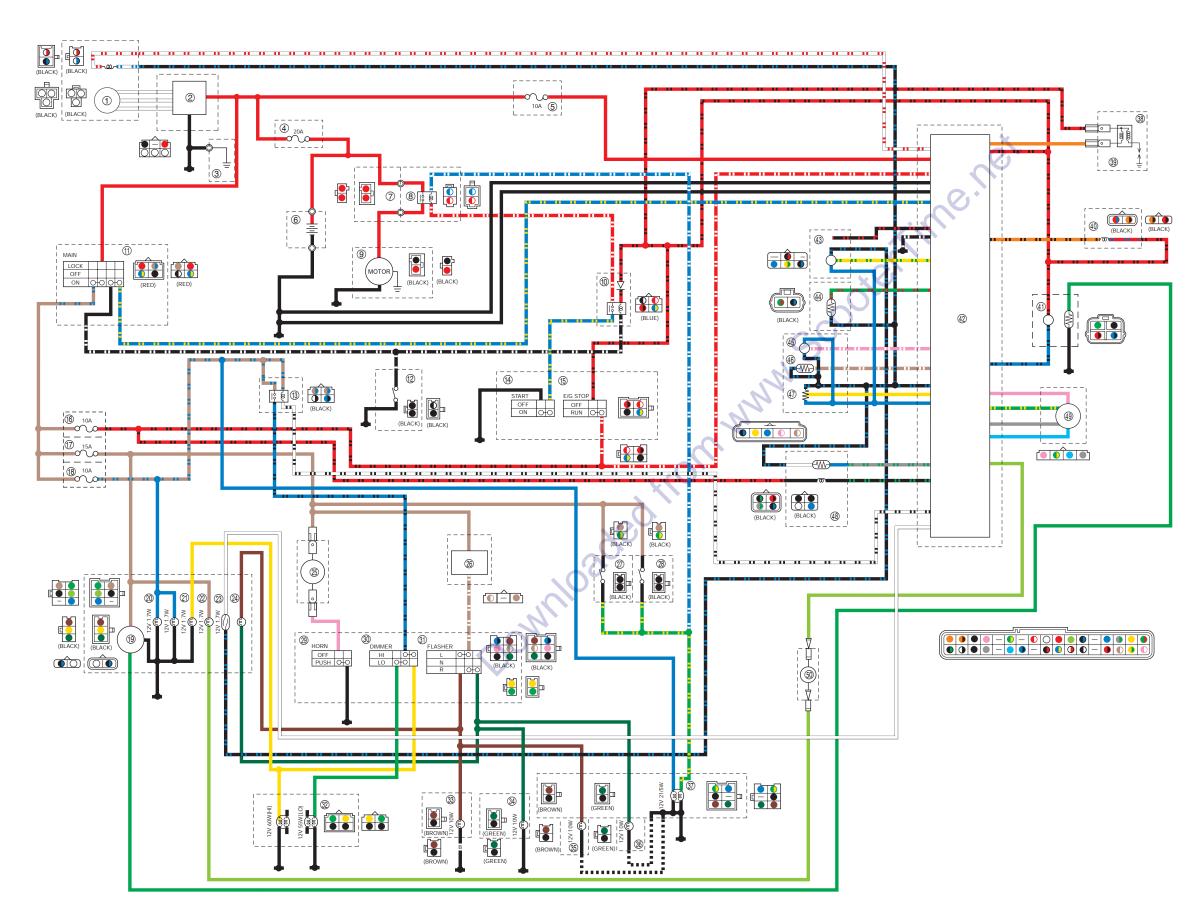
#### TURN SIGNAL BLINKS QUICKLY

- 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

# **YW125Y WIRING DIAGRAM**



- AC magneto
- ② Rectifier/regulator
- 3 Body earth
- 4 Main fuse
- § Fuel injection system fuse
- 6 Battery
- Wire lead
- Starter relay
- Starter motor
  Starting circuit cut-off relay
  Main switch
- Sidestand switch
- (13) Headlight relay (4) Start switch
- ⑤ Engine stop switch
- (f) Ignition fuse

- ignition luse
   Signaling system fuse
   Headlight fuse
   Fuel level gauge
   Speedometer light
   High beam indicator light
   Engine trouble warning light
- Speed sensor
- Turn signal indicator light
- ②5 Horn
- Turn signal relayFront brake light switchRear brake light switch
- ② Horn switch
- 3 Dimmer switch
- Turn signal switch

- 3 Ignition coil
- Spark plugFuel injector
- 4) Fuel pump 42 ECU
- ECULean angle cut-off switch
- Engine temperature sensor
  Intake air pressure sensor
- 46 Intake air temperature sensor Throttle position sensor
- 48 O. sensor
- 49 ISC (idle speed control) valve
- 50 FI diagnostic tool

| MA               | RK       |                  |        | EXPLANA     | TION |            |   |  |
|------------------|----------|------------------|--------|-------------|------|------------|---|--|
| •                | •        | COLOR            | CORD   | )           |      |            |   |  |
| 7                | <b>-</b> | CONNE            | ECTING | WITH GND. W | IRE  |            |   |  |
| ا <del>ر</del> _ | _        | GND.             |        |             |      |            |   |  |
|                  |          | CONNECTOR SYMBOL |        |             |      |            |   |  |
| •                | Blac     | k                | •      | Red         | •    | Yellow     |   |  |
| •                | Gree     | n                | •      | Brown       | •    | Dark green |   |  |
| •                | Blue     |                  | •      | Chocolate   | •    | Sky blue   |   |  |
|                  |          |                  |        |             |      |            | 1 |  |

| • | Black        | • | Red         | • | Yellow       |
|---|--------------|---|-------------|---|--------------|
| • | Green        |   | Brown       | • | Dark green   |
| • | Blue         | • | Chocolate   | • | Sky blue     |
| • | Orange       | • | Pink        | • | Brown/White  |
| • | Gray         | • | Light green | • | Red/White    |
| • | Brown/Blue   | • | White/Blue  | • | Blue/Yellow  |
| • | Red/Black    | • | Blue/White  | • | Black/White  |
| • | Blue/Black   | • | Black/Red   | • | Black/Blue   |
| • | Gray/Green   | • | Black/Green | • | Green/Red    |
| • | Green/Yellow | • | White/Black | • | White/Red    |
| • | Red/Blue     | • | Pink/White  | • | Orange/Black |
| • | Yellow/Green | 0 | White       |   |              |

Downloaded from white Scoter line net