YAMAHA

2005 - 2007

MOTORCYCLE

SERVICE MANUAL

Model : YP400T, YP400V, YP400W

5RU281972000

EAS00000

YP400T
SERVICE MANUAL

EAS00002

NOTICE

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

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

NOTE:

Designs and specifications are subject to change without notice.

EAS00005

IMPORTANT MANUAL INFORMATION

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

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

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

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

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

EAS00007

HOW TO USE THIS MANUAL

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

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to “SYMBOLS”.

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 (“PERIODIC CHECKS AND ADJUSTMENTS”), where the sub-section title(s) appears.

③ Sub-section titles appear in smaller print than the section title.

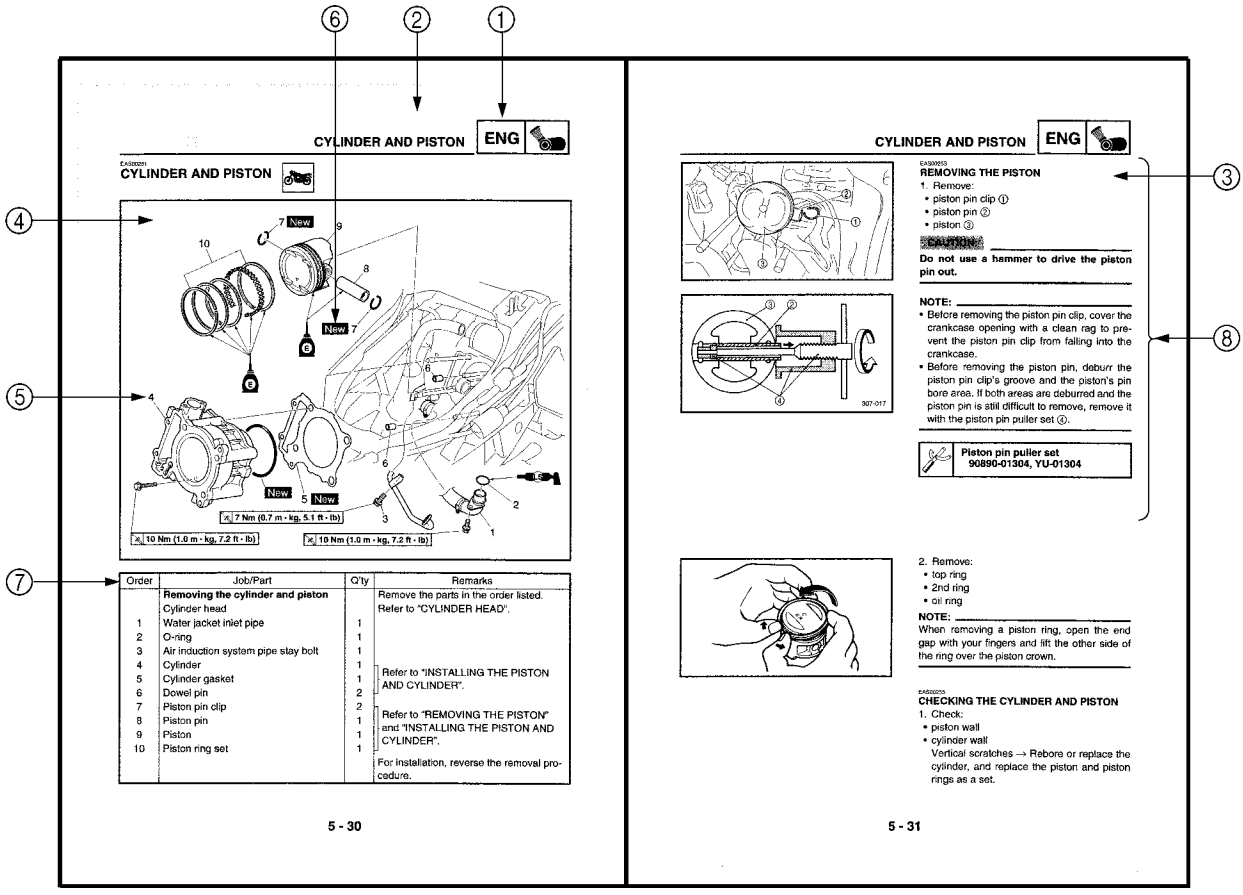
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

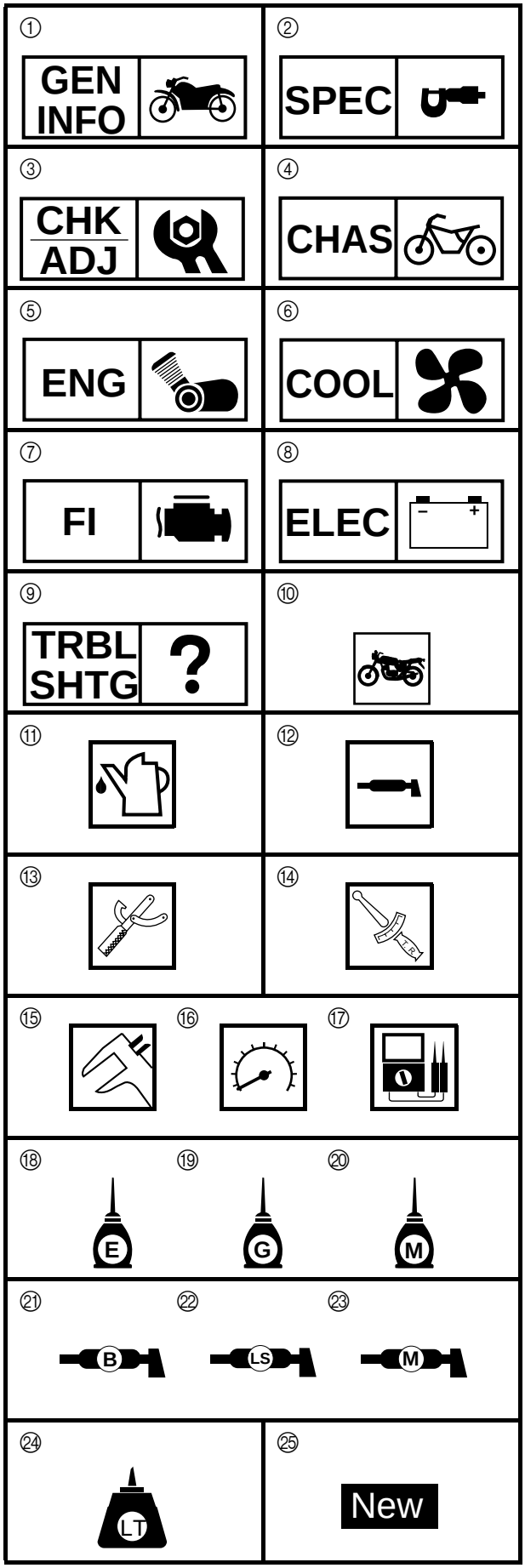
⑥ Symbols indicate parts to be lubricated or replaced.
Refer to “SYMBOLS”.

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder and piston		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Water jacket inlet pipe	1	
2	O-ring	1	
3	Air induction system pipe stay bolt	1	
4	Cylinder	1	
5	Cylinder gasket	1	Refer to "INSTALLING THE PISTON AND CYLINDER".
6	Dowel pin	2	
7	Piston pin clip	2	
8	Piston pin	1	Refer to "REMOVING THE PISTON" and "INSTALLING THE PISTON AND CYLINDER".
9	Piston	1	
10	Piston ring set	1	
			For installation, reverse the removal procedure.



EAS00008

SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

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

Symbols ⑩ to ⑰ indicate the following.

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

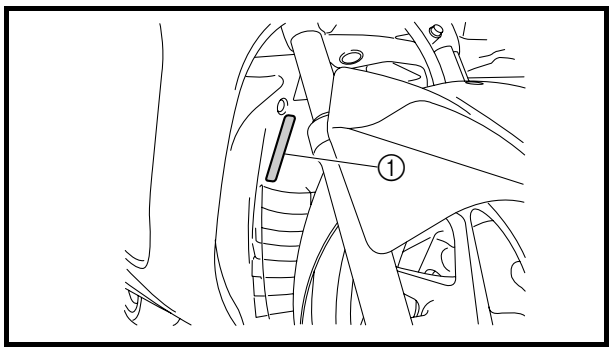
Symbols ⑱ to ㉓ in the exploded diagrams indicate the types of lubricants and lubrication points.

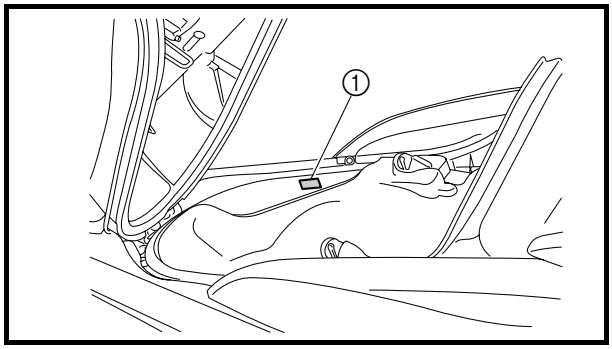
⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum-disulfide oil
㉑ Wheel-bearing grease
㉒ Lithium-soap-based grease
㉓ Molybdenum-disulfide grease

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

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

CHAPTER 1
GENERAL INFORMATION





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GENERAL INFORMATION

SCOOTER IDENTIFICATION

EAS00017

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the frame.

EAS00018

MODEL LABEL

The model label ① is affixed inside the storage box. Record the information on this label in the space provided. This information will be needed when ordering spare parts.

EAS00896
FEATURES

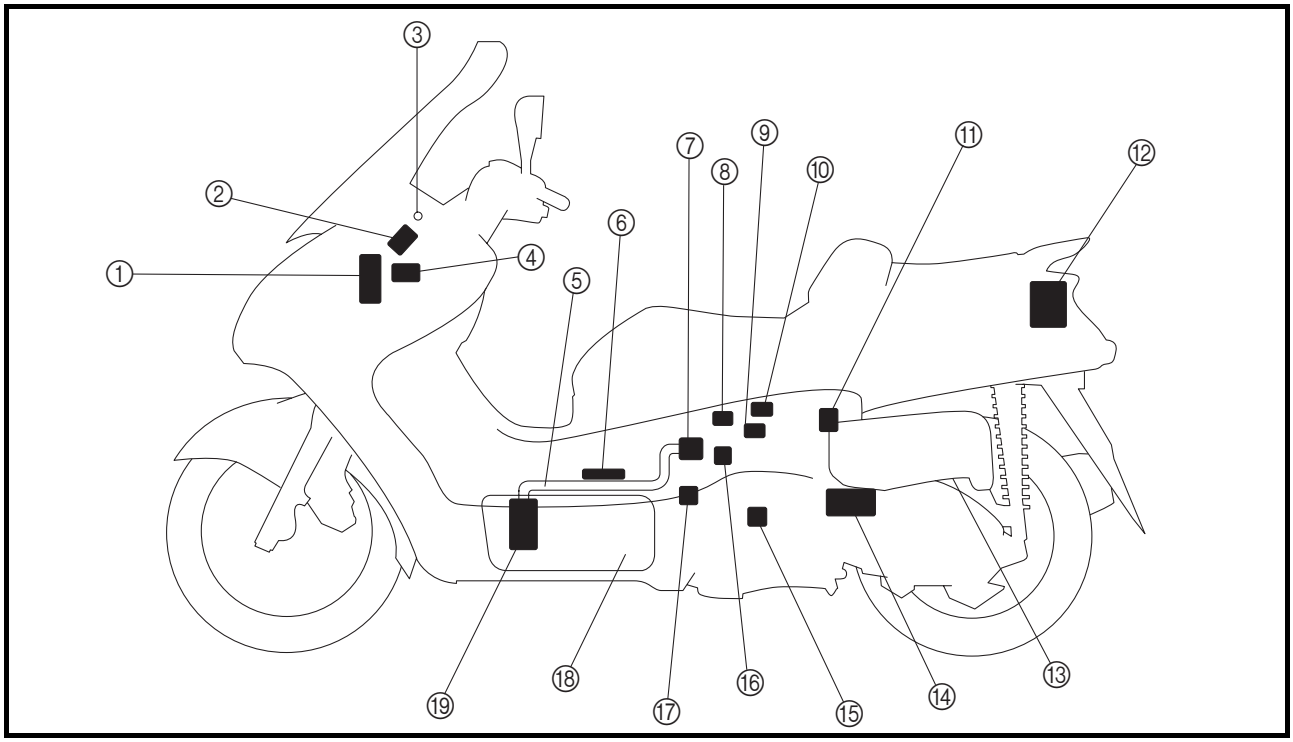
OUTLINE OF THE FI SYSTEM

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

Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating 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 Fuel injection system relay
③ Engine trouble warning light
④ Lean angle cut-off switch
⑤ Fuel hose
⑥ Ignition coil
⑦ Fuel injector
⑧ Intake air pressure sensor
⑨ Throttle position sensor
⑩ ISC (idle speed control) valve
⑪ Intake air temperature sensor
⑫ Battery
⑬ Air filter case
⑭ Catalytic converter
⑮ Crankshaft position sensor
⑯ Coolant temperature sensor
⑰ Spark plug
⑱ Fuel tank
⑲ Fuel pump

EAS00897
FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at only 250 kPa (2.5 kg/cm^2, 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 throttle position sensor, crankshaft position sensor, intake air pressure sensor, intake temperature sensor and coolant temperature sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

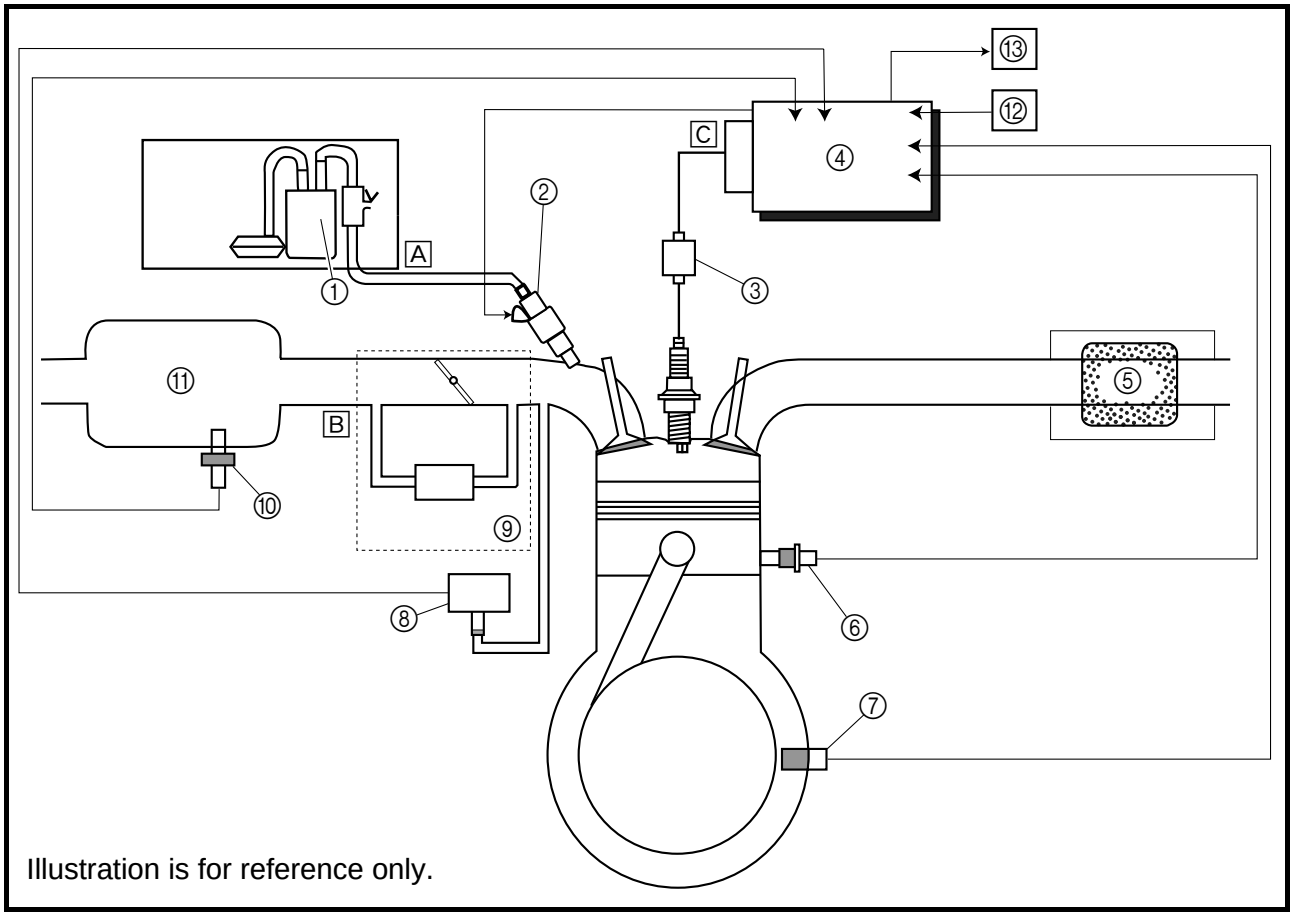
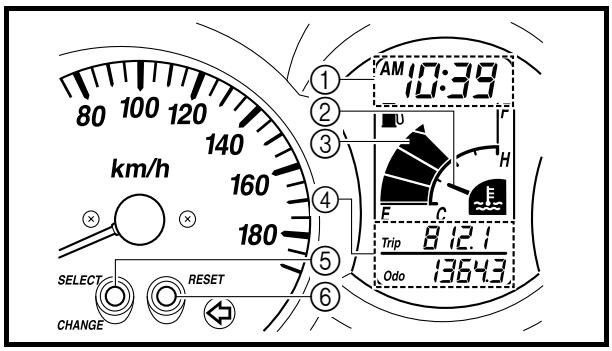
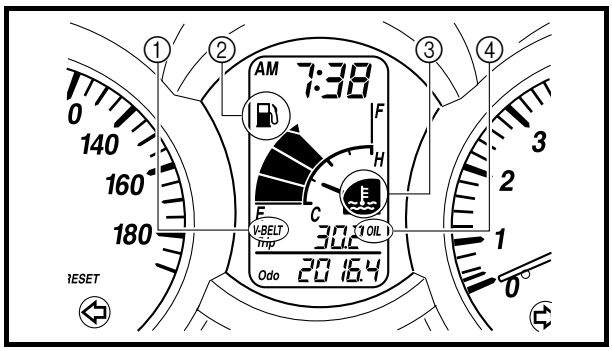
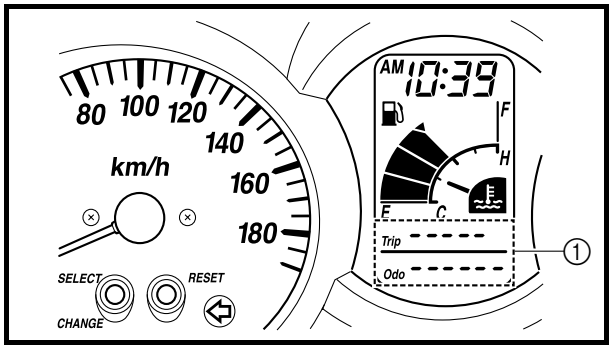


Illustration is for reference only.

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







INSTRUMENT FUNCTIONS

Multifunction display

⚠ WARNING

Be sure to stop the vehicle before making any setting changes to the multifunction display.

① Clock/ambient temperature display
② Coolant temperature meter
③ Fuel meter
④ Odometer/tripmeters
⑤ "SELECT" button
⑥ "RESET" button

① V-belt replacement indicator "V-BELT"
② Fuel level warning symbol " ⛽ "
③ Coolant temperature symbol " 🌡 "
④ Oil change indicator "OIL"

The multifunction display is equipped with the following:

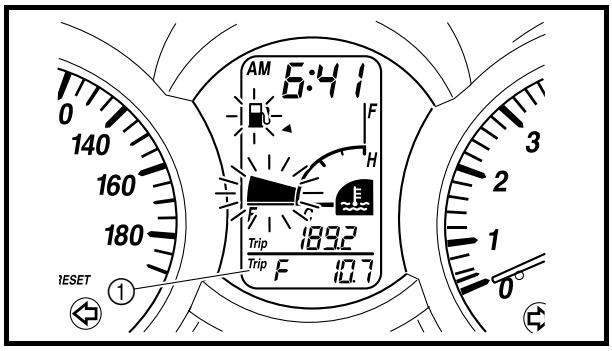
- a fuel meter
- a coolant temperature meter
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the bottom segment of the fuel meter and fuel level warning symbol started flashing)
- a self-diagnosis device
- a clock
- an ambient temperature display
- an oil change indicator
- a V-belt replacement indicator

NOTE:

- Be sure to turn the key to "ON" before using the "SELECT" and "RESET" buttons.
- When the key is turned to "ON", all of the display segments of the multifunction display will appear one after the other and then disappear, in order to test the electrical circuit.

CAUTION:

If bars ① appear where the odometer and tripmeters are normally displayed, the multi-function display is malfunctioning. Replace the entire multi-function display.



Odometer and tripmeter modes

Pushing the "SELECT" button switches the display between the odometer mode "ODO" and the tripmeter modes "TRIP" in the following order:

ODO → TRIP (top) → TRIP (bottom) → ODO

When approximately 2.8 L (0.62 Imp gal, 0.74 US gal) of fuel remains in the fuel tank, the bottom segment of the fuel meter and fuel level warning symbol will start flashing, and the display will automatically change to the fuel reserve tripmeter mode "TRIP F" and start counting the distance traveled from that point. In that case, pushing the "SELECT" button switches the display between the various tripmeter and odometer modes in the following order:

TRIP F → TRIP (top) → TRIP (bottom) → ODO → TRIP F

① Fuel reserve tripmeter

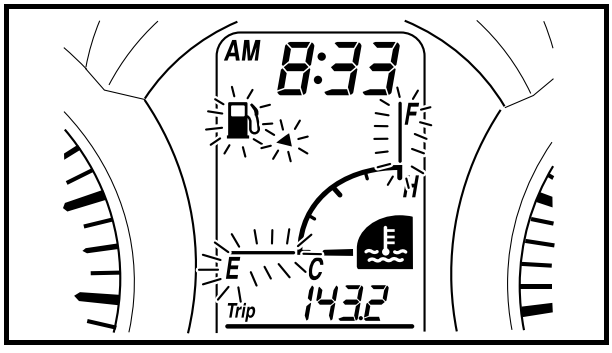
To reset a tripmeter, select it by pushing the "SELECT" button, until "TRIP" or "TRIP F" begins flashing ("TRIP" or "TRIP F" will only flash for five seconds). While "TRIP" or "TRIP F" is flashing, push the "RESET" button for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

NOTE:

The display cannot be changed back to "TRIP F" after pushing the "RESET" button.

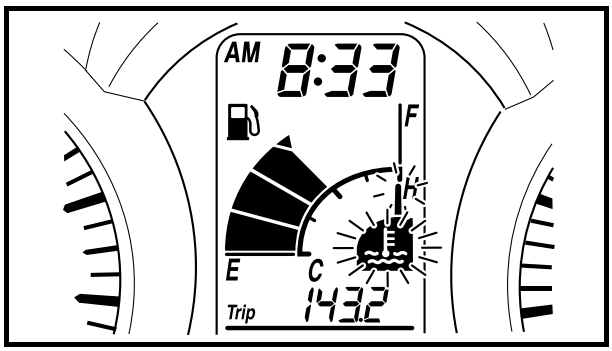
Fuel meter

With the key in the "ON" position, the fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear towards "E" (Empty) as the fuel level decreases. When the fuel level reaches the bottom segment near "E", the fuel level warning symbol and the bottom segment will flash. Refuel as soon as possible.



CAUTION:

If the fuel level is not displayed and the fuel level warning symbol, triangular mark, "E" line, and "F" line flash in the fuel meter, the fuel level monitoring system is malfunctioning. Check the fuel sender and the electrical circuit.



Coolant temperature meter

With the key in the "ON" position, the coolant temperature meter indicates the temperature of the coolant. The coolant temperature varies with changes in the weather and engine load. If the top segment and coolant temperature symbol flash, stop the vehicle and let the engine cool.

CAUTION:

Do not operate the engine if it is overheated.

Oil change indicator "OIL"

This indicator flashes at the initial 1,000 km (600 mi), then at 5,000 km (3,000 mi) and every 5,000 km (3,000 mi) thereafter to indicate that the engine oil should be changed.

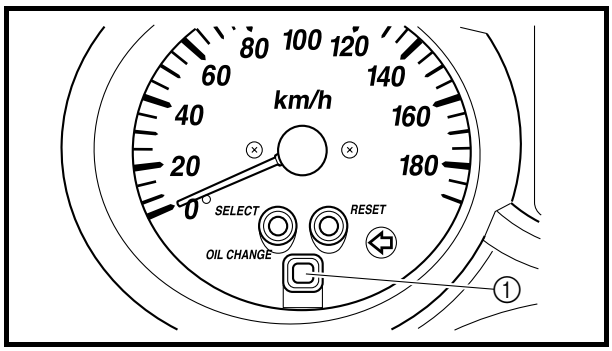
After changing the engine oil, reset the oil change indicator. Refer to "To reset the oil change indicator". If the engine oil is changed before the oil change indicator comes on (i.e. before the periodic oil change interval has been reached), the indicator must be reset after the oil change for the next periodic oil change to be indicated at the correct time.

The electrical circuit of the indicator can be checked according to the following procedure.

1. Set the engine stop switch to "○" and turn the key to "ON".
2. Check that the indicator comes on for a few seconds and then goes off.
3. If the indicator does not come on, check the electrical circuit. Refer to "SIGNALING SYSTEM" in chapter 8.

NOTE:

The oil change indicator may flash when the engine is revved with the scooter on the centerstand, but this does not indicate a malfunction.



To reset the oil change indicator

1. Turn the key to "ON".
2. Hold the reset button pushed for two to eight seconds.

① Reset button "OIL CHANGE"

3. Release the reset button, and the oil change indicator will go off.

NOTE:

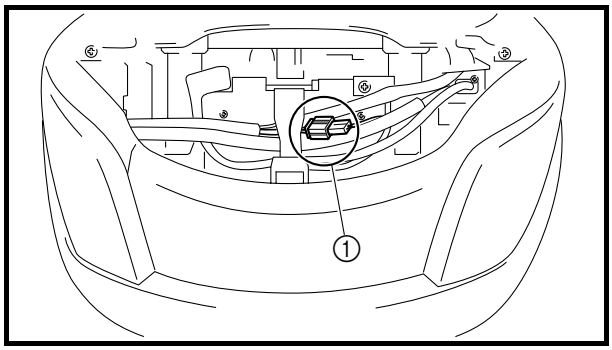
If the engine oil is changed before the oil change indicator comes on (i.e. before the periodic oil change interval has been reached), the indicator must be reset after the oil change for the next periodic oil change to be indicated at the correct time. To reset the oil change indicator before the periodic oil change interval has been reached, follow the above procedure, but note that the indicator will come on for 1.4 seconds after releasing the reset button, otherwise repeat the procedure.

V-belt replacement indicator "V-BELT"

This indicator flashes every 20,000 km (12,500 mi) when the V-belt needs to be replaced.

The electrical circuit of the indicator can be checked according to the following procedure.

1. Turn the key to "ON" and make sure that the engine stop switch is set to "".
2. If the indicator does not come on, check the electrical circuit. Refer to "SIGNALING SYSTEM" in chapter 8.



To reset the V-belt replacement indicator

1. Turn the key to "ON" and make sure that the engine stop switch is set to "ON".
2. Disconnect the V-belt replacement reset coupler ① for two to ten seconds.
3. And then, connect the V-belt replacement reset coupler, the V-belt replacement indicator will come on for 1.4 seconds.
   And the V-belt replacement indicator will go off.

NOTE:

If the V-belt is replaced before the V-belt replacement indicator comes on (i.e. before the V-belt replacement interval has been reached), the indicator must be reset after the V-belt replacement for the next periodic V-belt replacement to be indicated at the correct time.

Self-diagnosis device

This model is equipped with a self-diagnosis device for various electrical circuits.

If any of those circuits are defective, the multifunction display will indicate a two-digit error code (e.g., 12, 13, 14).

If the multifunction display indicates an error code, note the code number, and then check the vehicle. Refer to “FUEL INJECTION SYSTEM” in chapter 7.

CAUTION:

If the multifunction display indicates an error code, the vehicle should be checked as soon as possible in order to avoid engine damage.

Clock mode

To set the clock:

1. Push the “SELECT” button and “RESET” button together for at least two seconds.
2. When the hour digits start flashing, push the “RESET” button to set the hours.
3. Push the “SELECT” button, and the minute digits will start flashing.
4. Push the “RESET” button to set the minutes.
5. Push the “SELECT” button and then release it to start the clock. Pushing the “RESET” button for at least two seconds switches the clock display to the ambient temperature display.

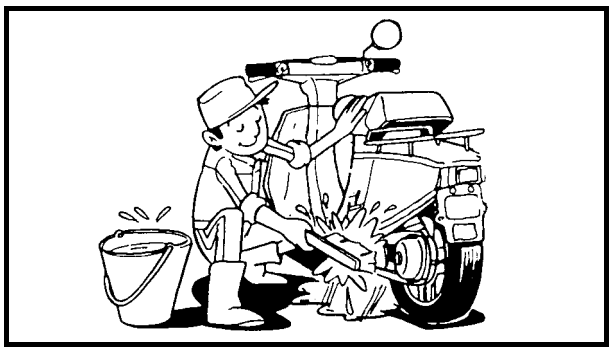
Ambient temperature display

This display shows the ambient temperature from –10 °C to 50 °C in 1 °C increments. The temperature displayed may vary from the ambient temperature. Pushing the “RESET” button for at least two seconds switches the ambient temperature display to the clock display.

- When the ambient temperature falls below –10.0 °C, “–10.0 °C” is displayed.
- When the ambient temperature climbs above 50.0 °C, “50.0” is displayed.

NOTE:

- If “– – °C” is displayed or “50.0” flashes while the ambient temperature is between –10.0 °C and 50.0 °C, there is a problem with the electrical circuit. Check or repair the electric circuit or replace the thermistor.
- The accuracy of the temperature reading may be affected when riding slowly (approximately under 20 km/h) or when stopped at traffic signals, railroad crossings, etc.

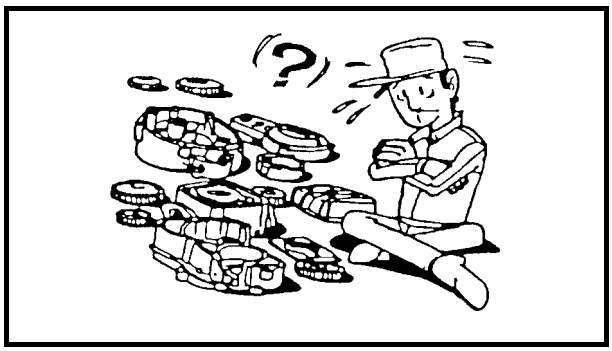


EAS00020

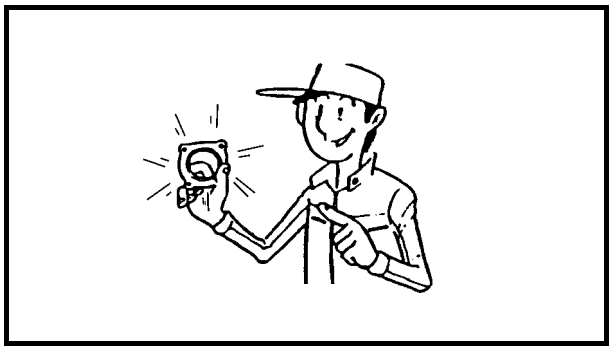
IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



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



EAS00021

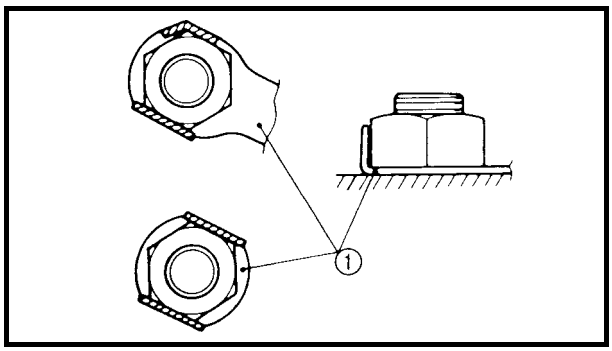
REPLACEMENT PARTS

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

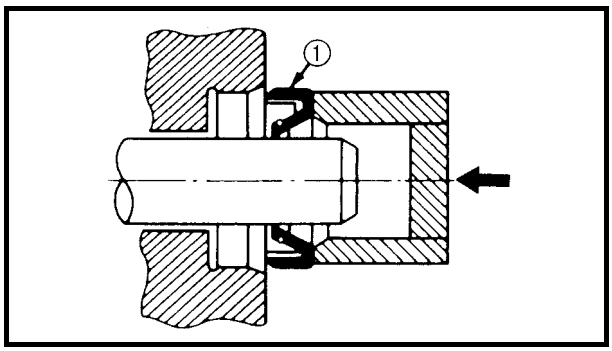
GASKETS, OIL SEALS AND O-RINGS

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



EAS00023
LOCK WASHERS/PLATES AND COTTER PINS

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



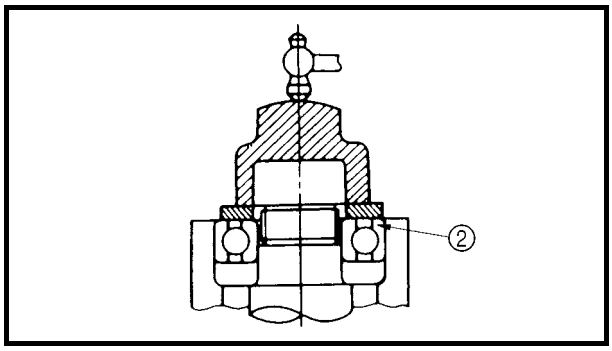
EAS00024
BEARINGS AND OIL SEALS

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

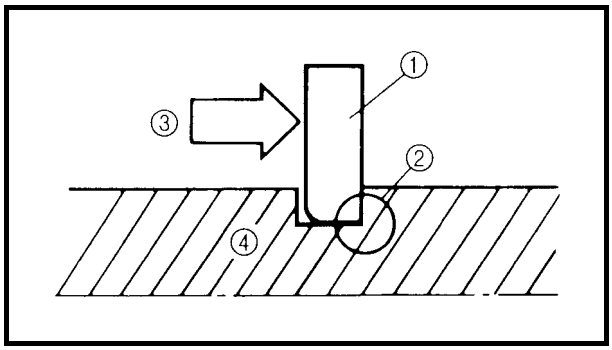
① Oil seal

CAUTION:

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



② Bearing



EAS00025
CIRCLIPS

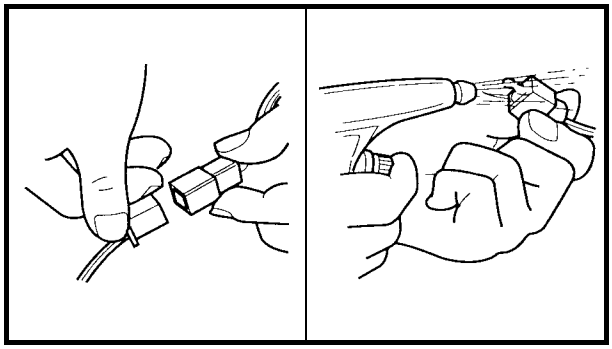
Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

EAS00026
CHECKING THE CONNECTIONS

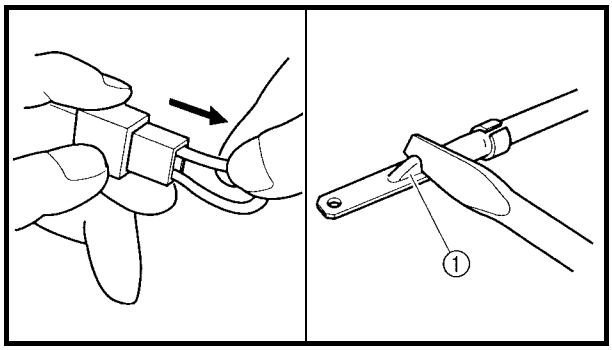
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - lead
   - coupler
   - connector



2. Check:
   - lead
   - coupler
   - connector

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



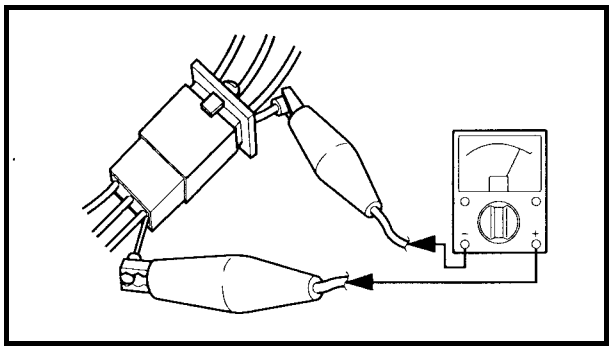
3. Check:
   - all connections

   Loose connection → Connect properly.

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

4. Connect:
   - lead
   - coupler
   - connector

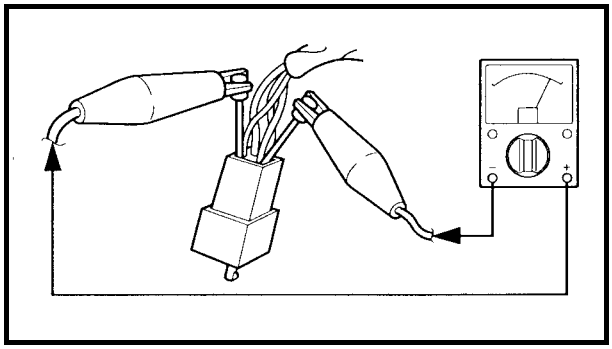
NOTE:
Make sure all connections are tight.



5. Check:
   - continuity

   (with the pocket tester)

Pocket tester
90890-03112, YU-03112-C

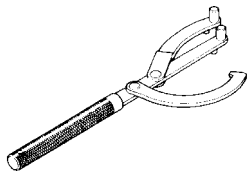
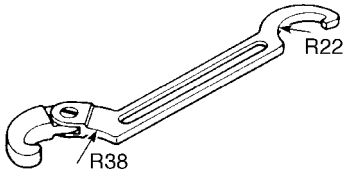
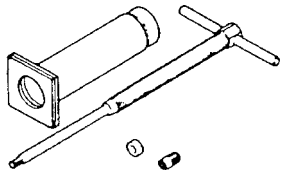
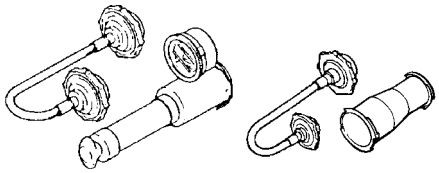
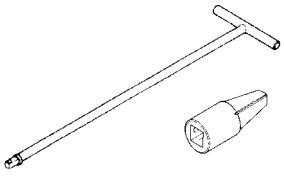
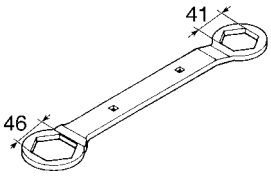


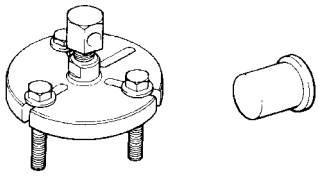
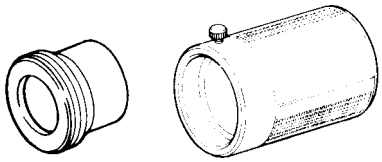
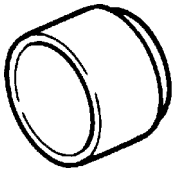
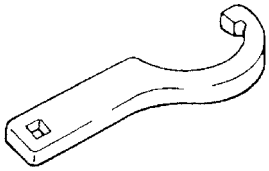
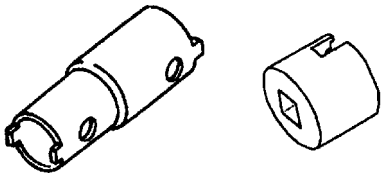
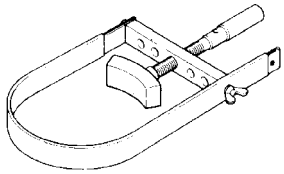
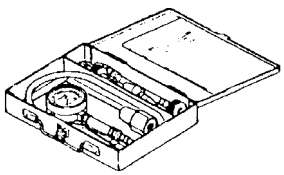
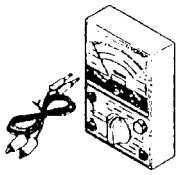
NOTE:
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.

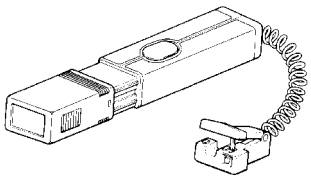
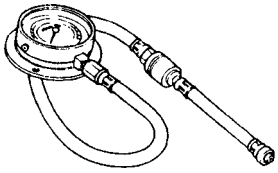
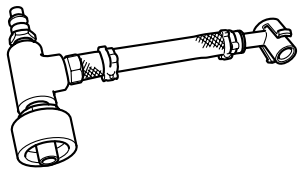
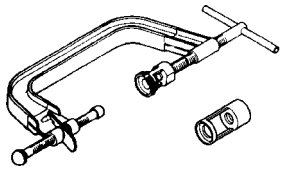
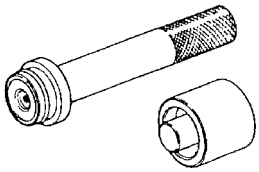
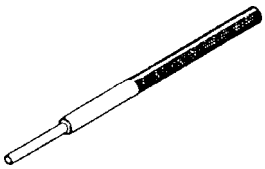
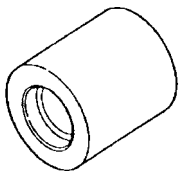
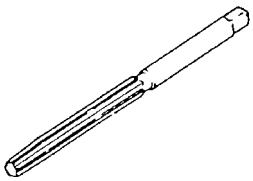
EAS00027
SPECIAL TOOLS

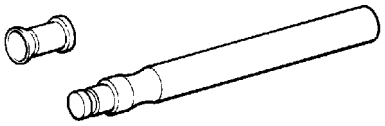
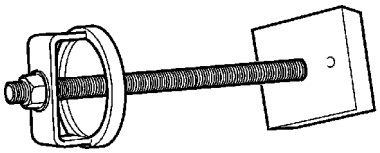
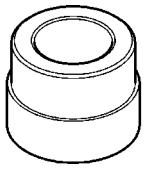
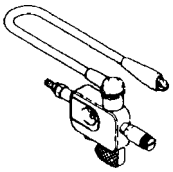
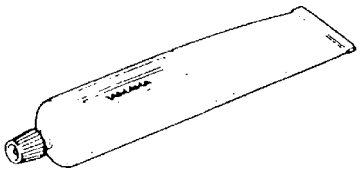
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.
When placing an order, refer to the list provided below to avoid any mistakes.

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

Tool No.	Tool name/Function	Illustration
90890-01235 YU-01235	Rotor holding tool This tool is used to hold the primary fixed sheave and clutch shoe assembly.	
90890-01268 YU-01268	Ring nut wrench This tool is used to loosen or tighten the steering ring nuts.	
90890-01304 YU-01304	Piston pin puller set This tool is used to remove the piston pins.	
Radiator cap tester 90890-01325 YU-24460-01 Radiator cap tester adapter 90890-01352 YU-33984	Radiator cap tester Radiator cap tester adapter These tools are used to check the cooling system.	
T-handle 90890-01326 Damper rod holder 90890-01460	T-handle Damper rod holder These tools are used to hold the damper rod when removing or installing the damper rod.	
90890-01348 YM-01348	Locknut wrench This tool is used to remove or install the clutch shoe assembly nut.	

Tool No.	Tool name/Function	Illustration
Flywheel puller 90890-01362 Flywheel puller attachment 90890-04089 YM-33282	Flywheel puller Flywheel puller attachment This tool is used to remove the generator rotor.	
Fork seal driver weight 90890-01367 YM-A9409-7 Fork seal driver attachment 90890-01381 YM-A5142-2	Fork seal driver weight Fork seal driver attachment (41 mm) These tools are used to install the oil seal, dust seal, and the outer tube bushing of a front fork leg.	
90890-01396	Oil seal guide This tool is used for protecting the oil seal lip when installing the secondary sliding sheave.	
90890-01403 YU-A9472	Steering nut wrench This tool is used to loosen or tighten the steering ring nuts.	
Pivot shaft wrench 90890-01471 YM-01471 Pivot shaft wrench adapter 90890-01476	Pivot shaft wrench Pivot shaft wrench adapter These tools are used to tighten the subframe adjusting bolt.	
90890-01701 YS-01880-A	Sheave holder This tool is used to hold the generator rotor and clutch housing.	
Compression gauge 90890-03081 YU-33223 Adapter (compression gauge) 90890-04082	Compression gauge Adapter (compression gauge) These tools are used to measure engine compression.	
90890-03112 YU-03112-C	Pocket tester This tool is used to check the electrical system.	

Tool No.	Tool name/Function	Illustration
90890-03141 YU-03141	Timing light This tool is used to check the ignition timing.	
90890-03153 YU-03153	Pressure gauge This tool is used to measure fuel pressure.	
90890-03181 YM-03181	Adapter This tool is used to measure fuel pressure.	
Valve spring compressor 90890-04019 YM-04019 Valve spring compressor attachment 90890-01243 YM-01253-1	Valve spring compressor Valve spring compressor attachment These tools are used to remove or install the valve assemblies.	
Middle driven shaft bearing driver 90890-04058 YM-04058 Mechanical seal installer 90890-04145 YM-04145	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
90890-04097 YM-04097	Valve guide remover (5 mm) This tool is used to remove or install the valve guides.	
90890-04098 YM-04098	Valve guide installer (5 mm) This tool is used to install the valve guides.	
90890-04099 YM-04099	Valve guide reamer (5 mm) This tool is used to rebore the new valve guides.	

Tool No.	Tool name/Function	Illustration
90890-04101	Valve lapper This tool is needed to remove and install the valve lifters.	
Sheave spring compressor 90890-04134 YM-04134 Sheave fixed block 90890-04135 YM-04135	Sheave spring compressor Sheave fixed block This tool is used to hold the compression spring when removing or installing the clutch shoe assembly nut.	
90890-04146 YM-04146	Plane bearing installer/remover This tool is used to install or remove the crankshaft journal bearings.	
90890-06754 YM-34487	Ignition checker This tool is used to check the ignition system components.	
Bond 90890-85505 Sealant ACC-11001-05-01	Yamaha bond No. 1215 Sealant (Quick Gasket®) This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	

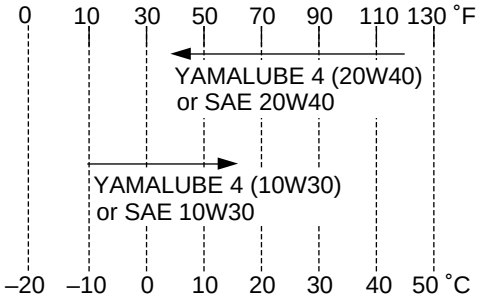
CHAPTER 2
SPECIFICATIONS

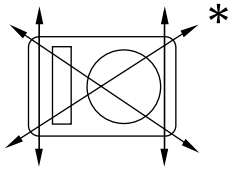
SPECIFICATIONS

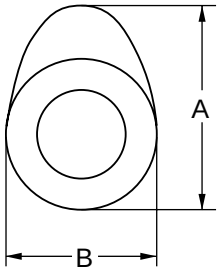
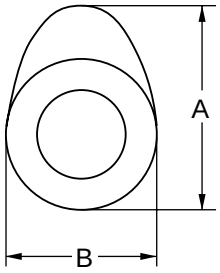
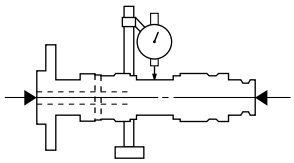
GENERAL SPECIFICATIONS

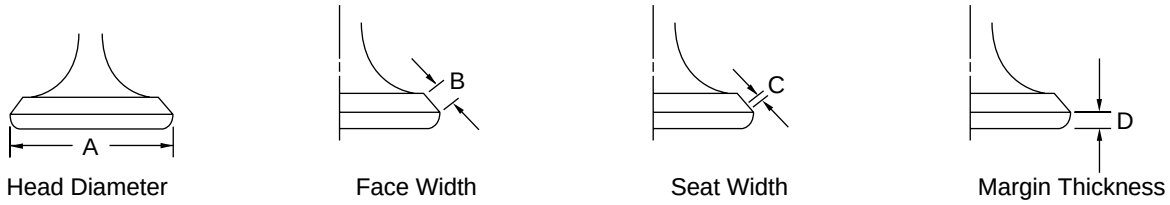
Item	Standard	Limit
Model code	5RU4 (USA) 5RUC (CDN)	---- ----
Dimensions		
Overall length	2,230 mm (87.8 in)	----
Overall width	780 mm (30.7 in)	----
Overall height	1,380 mm (54.3 in)	----
Seat height	750 mm (29.5 in)	----
Wheelbase	1,565 mm (61.6 in)	----
Minimum ground clearance	120 mm (4.72 in)	----
Minimum turning radius	2,600 mm (102.4 in)	----
Weight		
Wet (with oil and a full fuel tank)	212 kg (467 lb)	----
Maximum load (total of cargo, rider, passenger, and accessories)	196 kg (432 lb)	----

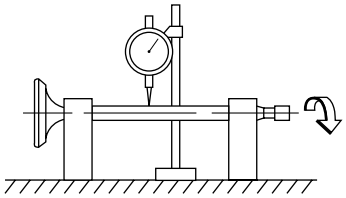
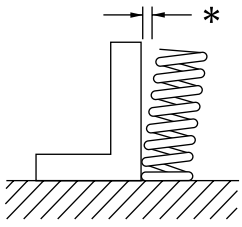
ENGINE SPECIFICATIONS

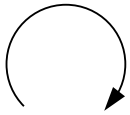
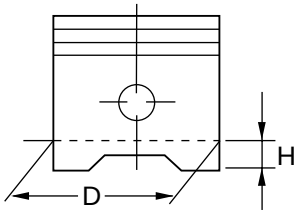
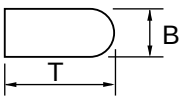
Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 4-stroke, DOHC	----
Displacement	394.9 cm^3 (24.10 cu.in)	----
Cylinder arrangement	Forward-inclined single cylinder	----
Bore × stroke	83.0 × 73.0 mm (3.27 × 2.87 in)	----
Compression ratio	10.6 : 1	----
Engine idling speed	1,300 ~ 1,500 r/min	----
Vacuum pressure at engine idling speed	35.0 ~ 41.0 kPa (263 ~ 308 mmHg, 10.4 ~ 12.1 inHg)	----
Compression pressure (at sea level)		----
Standard	1,400 kPa (14.0 kg/cm^2, 199.1 psi) at 500 r/min	----
Minimum	1,100 kPa (11.0 kg/cm^2, 156.5 psi)	----
Maximum	1,650 kPa (16.5 kg/cm^2, 234.7 psi)	----
Fuel		
Recommended fuel	Unleaded gasoline only (USA) Regular unleaded gasoline only (CDN)	---- ----
Fuel tank capacity		
Total	14.0 L (3.08 Imp gal, 3.70 US gal)	----
Engine oil		
Lubrication system	Wet sump	----
Recommended oil		Refer to the chart for the engine oil grade.	----
Recommended engine oil grade	API service SE, SF, SG type or higher	----
Quantity		
Total amount	1.70 L (1.50 Imp qt, 1.80 US qt)	----
Without oil filter element replacement	1.50 L (1.32 Imp qt, 1.59 US qt)	----
With oil filter element replacement	1.70 L (1.50 Imp qt, 1.80 US qt)	----
Engine oil temperature	70 ~ 80 °C (158 ~ 176 °F)	----
Final transmission oil		
Type	SAE10W-30 type SE motor oil	----
Quantity	0.25 L (0.22 Imp qt, 0.26 US qt)	----

Item	Standard	Limit
Oil pump		
Oil pump type	Trochoid	----
Inner-rotor-to-outer-rotor-tip clearance	0.07 mm (0.0028 in)	0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance	0.013 ~ 0.036 mm (0.0005 ~ 0.0014 in)	0.106 mm (0.0042 in)
Oil-pump-housing-to-inner-and-outer rotor clearance	0.040 ~ 0.096 mm (0.0016 ~ 0.0038 in)	0.166 mm (0.0065 in)
Cooling system		
Radiator capacity	1.57 L (1.38 Imp qt, 1.66 US qt)	----
Radiator cap opening pressure	110.0 ~ 140.0 kPa (1.10 ~ 1.40 kg/cm^2, 15.6 ~ 19.9 psi)	----
Radiator core		
Width	260 mm (10.24 in)	----
Height	148 mm (5.83 in)	----
Depth	24 mm (0.94 in)	----
Coolant reservoir		
Capacity	0.32 L (0.28 Imp qt, 0.34 US qt)	----
Water pump		
Water pump type	Single-suction centrifugal pump	----
Reduction ratio	37/22 × 25/37 (1.136)	----
Coolant temperature	80 ~ 90 °C (176 ~ 194 °F)	----
Starting system type	Electric starter	----
Electric fuel injection		
Type	1100-87C00-A	----
Manufacturer	AISAN	----
Spark plug		
Model (manufacturer) × quantity	CR7E (NGK) × 1	----
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)	----
Cylinder head		
Volume	30.3 ~ 31.1 cm^3 (1.85 ~ 1.90 cu.in)	----
Maximum warpage ∗	----	0.05 mm (0.002 in)
		

Item	Standard	Limit
Camshafts		
Drive system	Chain drive (right)	----
Camshaft cap inside diameter	24.500 ~ 24.521 mm (0.9646 ~ 0.9654 in)	----
Camshaft journal diameter	24.459 ~ 24.472 mm (0.9630 ~ 0.9635 in)	----
Camshaft-journal-to-camshaft-cap clearance	0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	0.08 mm (0.0031 in)
Intake camshaft lobe dimensions 		
Measurement A	34.350 ~ 34.450 mm (1.352 ~ 1.356 in)	34.250 mm (1.3484 in)
Measurement B	24.950 ~ 25.050 mm (0.982 ~ 0.986 in)	24.850 mm (0.9783 in)
Exhaust camshaft lobe dimensions 		
Measurement A	33.450 ~ 33.550 mm (1.317 ~ 1.321 in)	33.350 mm (1.3130 in)
Measurement B	24.956 ~ 25.056 mm (0.983 ~ 0.986 in)	24.856 mm (0.9786 in)
Maximum camshaft runout 	----	0.03 mm (0.0012 in)

Item	Standard	Limit
Timing chain		
Model/number of links	DID SCR-0409 SV/136LE	----
Tensioning system	Automatic	----
Valves, valve seats, valve guides		
Valve clearance (cold)		
Intake	0.15 ~ 0.20 mm (0.0059 ~ 0.0079 in)	----
Exhaust	0.25 ~ 0.30 mm (0.0098 ~ 0.0118 in)	----
Valve dimensions		
 Head Diameter Face Width Seat Width Margin Thickness		
Valve head diameter A		
Intake	30.9 ~ 31.1 mm (1.2165 ~ 1.2244 in)	----
Exhaust	27.9 ~ 28.1 mm (1.0984 ~ 1.1063 in)	----
Valve face width B		
Intake	1.838 ~ 2.687 mm (0.0724 ~ 0.1058 in)	----
Exhaust	1.697 ~ 2.828 mm (0.0668 ~ 0.1113 in)	----
Valve seat width C		
Intake	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Exhaust	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Valve margin thickness D		
Intake	0.85 ~ 1.15 mm (0.0335 ~ 0.0453 in)	----
Exhaust	0.85 ~ 1.15 mm (0.0335 ~ 0.0453 in)	----
Valve stem diameter		
Intake	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)	4.945 mm (0.1947 in)
Exhaust	4.960 ~ 4.975 mm (0.1953 ~ 0.1959 in)	4.930 mm (0.1941 in)
Valve guide inside diameter		
Intake	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.050 mm (0.1988 in)
Exhaust	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.050 mm (0.1988 in)
Valve-stem-to-valve-guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.080 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.100 mm (0.0039 in)

Item	Standard	Limit
Valve stem runout 	----	0.01 mm (0.0004 in)
Valve seat width		
Intake	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Exhaust	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Valve springs		
Free length		
Intake	46.45 mm (1.83 in)	44.13 mm (1.74 in)
Exhaust	46.45 mm (1.83 in)	44.13 mm (1.74 in)
Installed length (valve closed)		
Intake	35.10 mm (1.38 in)	----
Exhaust	35.10 mm (1.38 in)	----
Spring rate (K1)		
Intake	15.21 N/mm (1.55 kg/mm, 86.77 lb/in)	----
Exhaust	15.21 N/mm (1.55 kg/mm, 86.77 lb/in)	----
Spring rate (K2)		
Intake	19.84 N/mm (2.02 kg/mm, 113.28 lb/in)	----
Exhaust	19.84 N/mm (2.02 kg/mm, 113.28 lb/in)	----
Compressed spring force (installed)		
Intake	160.5 ~ 184.7 N at 35.10 mm (16.37 ~ 18.83 kg at 35.10 mm, 36.08 ~ 41.52 lb at 1.38 in)	----
Exhaust	160.5 ~ 184.7 N at 35.10 mm (16.37 ~ 18.83 kg at 35.10 mm, 36.08 ~ 41.52 lb at 1.38 in)	----
Spring tilt * 		
Intake	----	2.0 mm (0.08 in)
Exhaust	----	2.0 mm (0.08 in)

Item	Standard	Limit
Winding direction (top view)		
Intake	Clockwise	----
Exhaust	Clockwise	----
		
Cylinder		
Cylinder arrangement	Forward-inclined single cylinder	----
Bore × stroke	83.0 × 73.0 mm (3.27 × 2.87 in)	----
Compression ratio	10.6 : 1	----
Bore	83.000 ~ 83.010 mm (3.2677 ~ 3.2681 in)	----
Maximum taper	----	0.05 mm (0.002 in)
Piston		
Piston-to-cylinder clearance	0.060 ~ 0.075 mm (0.0024 ~ 0.0030 in)	0.15 mm (0.0059 in)
Diameter D	82.930 ~ 82.945 mm (3.2650 ~ 3.2656 in)	----
		
Height H	5.0 mm (0.20 in)	----
Piston pin bore (in the piston)		
Diameter	20.004 ~ 20.015 mm (0.7876 ~ 0.7880 in)	20.045 mm (0.7892 in)
Offset	1.0 mm (0.0394 in)	----
Offset direction	Intake side	----
Piston pin		
Outside diameter	19.991 ~ 20.000 mm (0.7870 ~ 0.7874 in)	19.971 mm (0.7863 in)
Piston-pin-to-piston-pin-bore clearance	0.004 ~ 0.024 mm (0.0002 ~ 0.0009 in)	0.074 mm (0.0029 in)
Piston rings		
Top ring		
		
Ring type	Barrel	----
Dimensions (B × T)	1.00 × 2.70 mm (0.04 × 0.11 in)	----
End gap (installed)	0.20 ~ 0.35 mm (0.0079 ~ 0.0138 in)	0.50 mm (0.0197 in)
Ring side clearance	0.030 ~ 0.070 mm (0.0012 ~ 0.0028 in)	0.100 mm (0.0039 in)