YAMAHA

2009

MOTORCYCLE

SERVICE MANUAL

Model : YW125Y_

32SF819770E0

EAS00000

YW125Y 2009
SERVICE MANUAL

EAS20070

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.

⚠	**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.**
⚠ WARNING	**A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**
NOTICE	**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.

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.

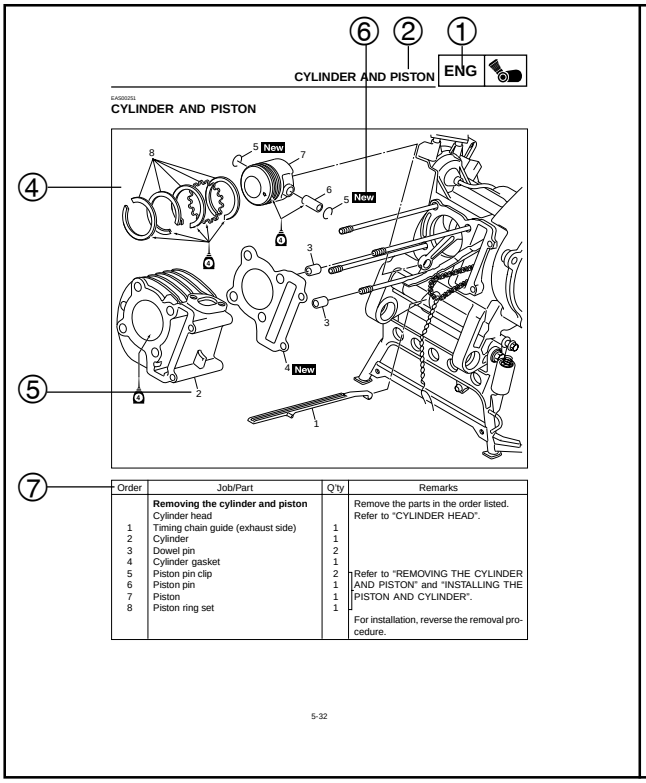
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

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

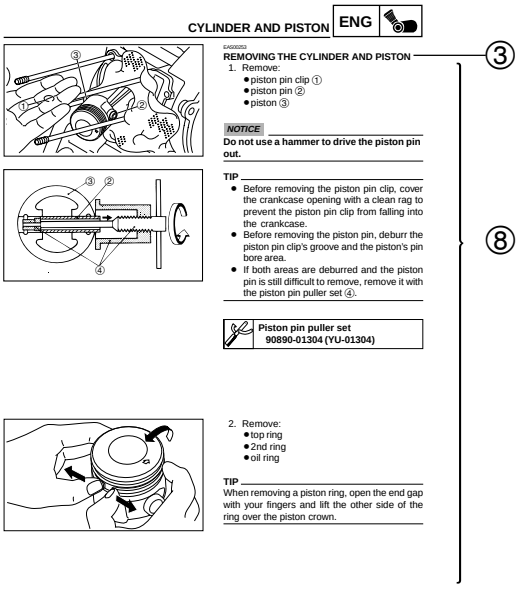
⑥ Symbols indicate parts to be lubricated or replaced.
Refer to “SYMBOLS”.

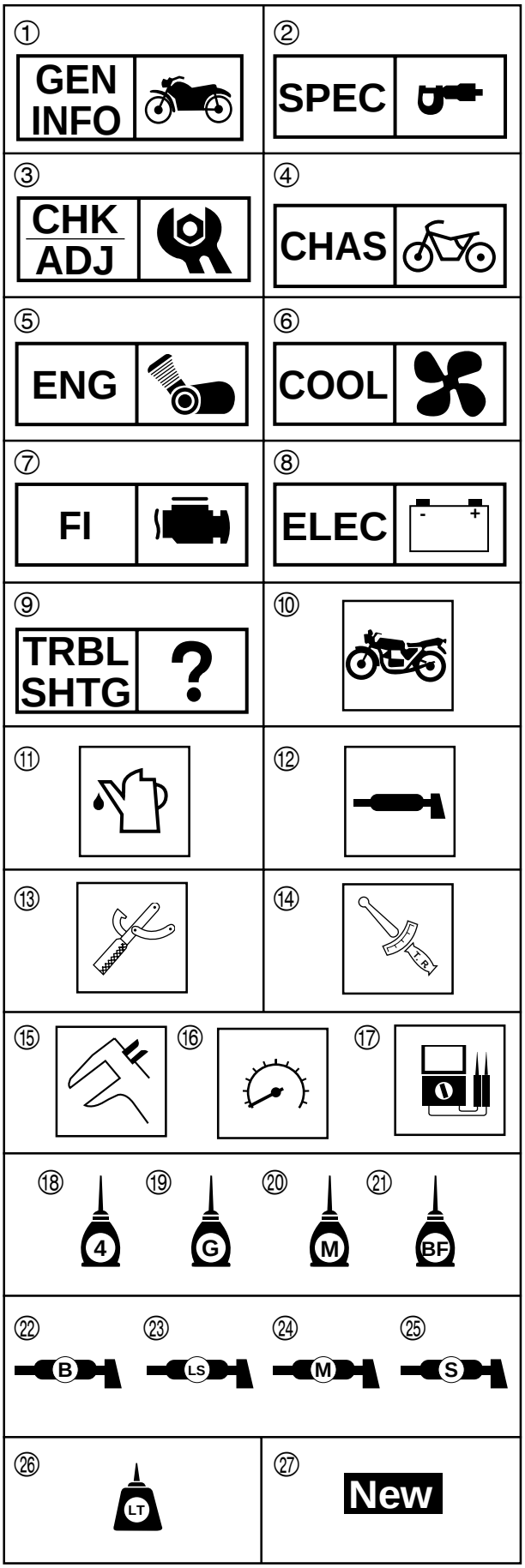
⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

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	Timing chain guide (exhaust side)	1	
2	Cylinder	1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Piston pin clip	2	Refer to “REMOVING THE CYLINDER AND PISTON” and “INSTALLING THE PISTON AND CYLINDER”.
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	
			For installation, reverse the removal procedure.





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 ㉕ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum-disulfide oil
㉑ Brake fluid
㉒ Wheel-bearing grease
㉓ Lithium-soap- based grease
㉔ Molybdenum-disulfide grease
㉕ Silicone grease

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

㉖ Apply locking agent (LOCTITE®)
㉗ Replace the part

EAS00011

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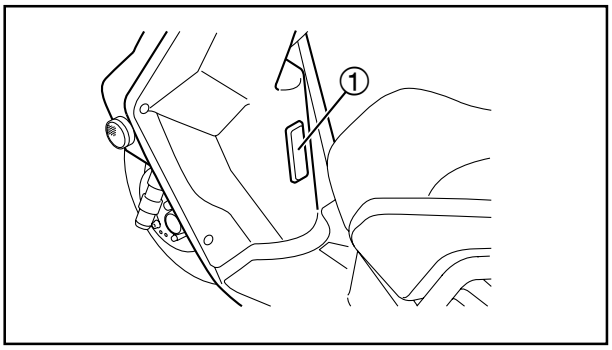
CHAPTER 1
GENERAL INFORMATION



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GENERAL INFORMATION

SCOOTER IDENTIFICATION

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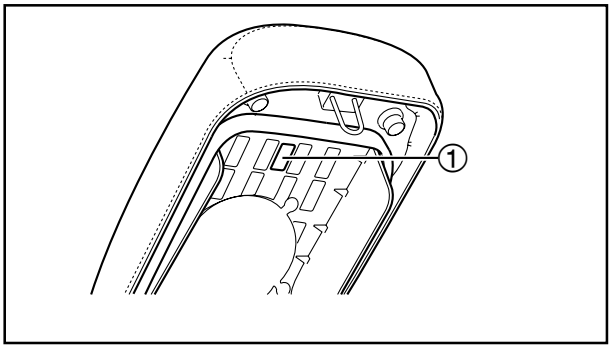
VEHICLE IDENTIFICATION NUMBER

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 order spare parts.

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FEATURES

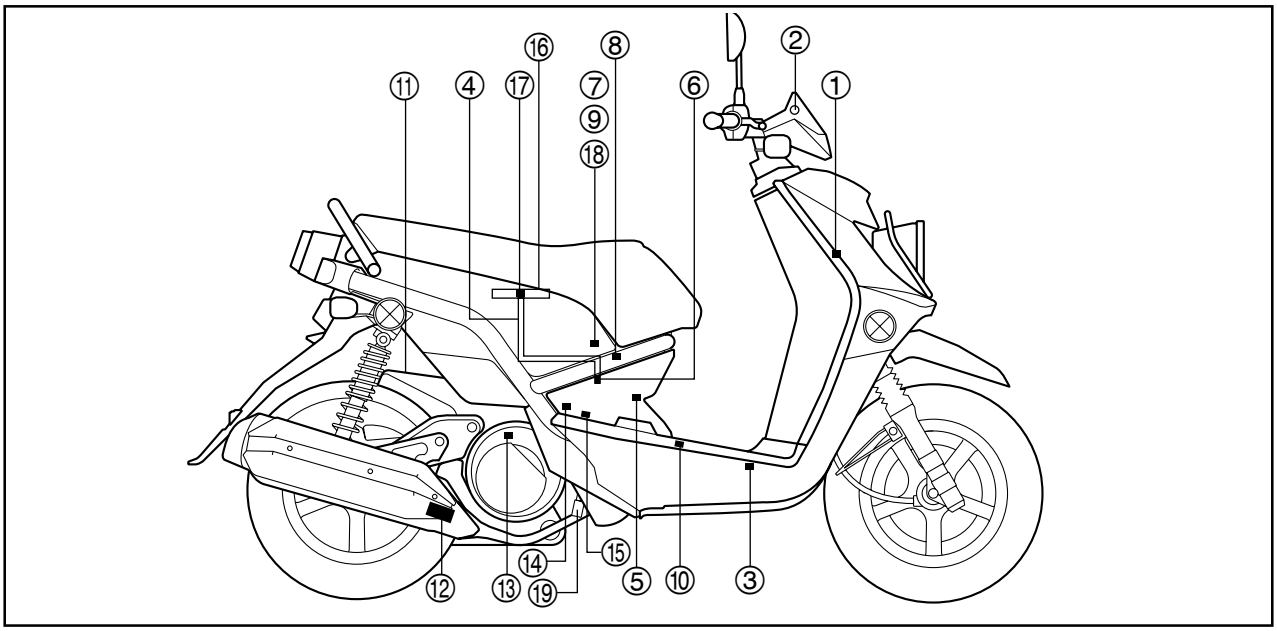
OUTLINE OF THE FI SYSTEM

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
⑩ Battery
⑪ Air filter case
⑫ Catalytic converter
⑬ Crankshaft position sensor
⑭ Engine temperature sensor
⑮ Spark plug
⑯ Fuel tank
⑰ Fuel pump
⑱ Throttle position sensor
⑲ O_2 sensor

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

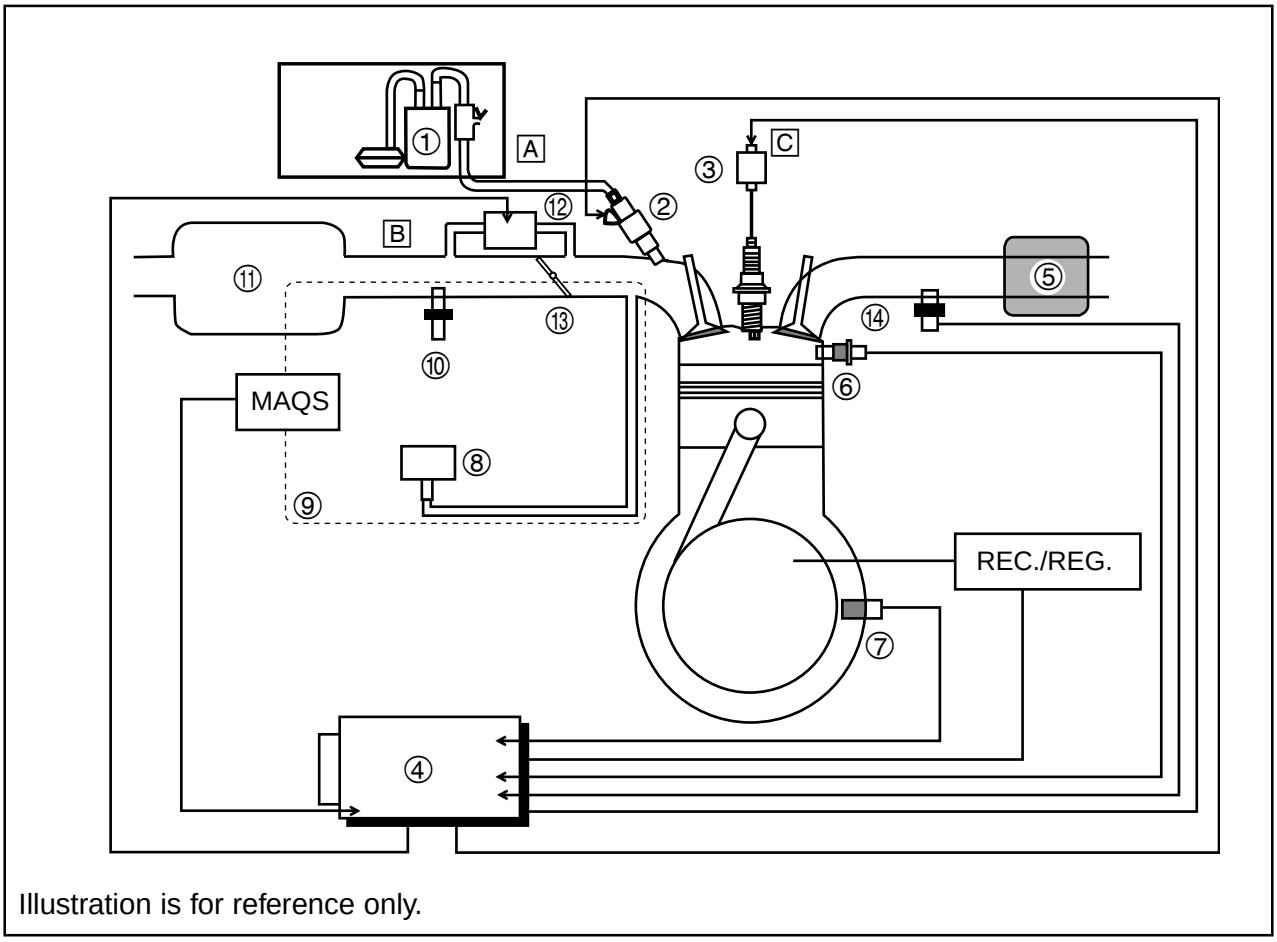
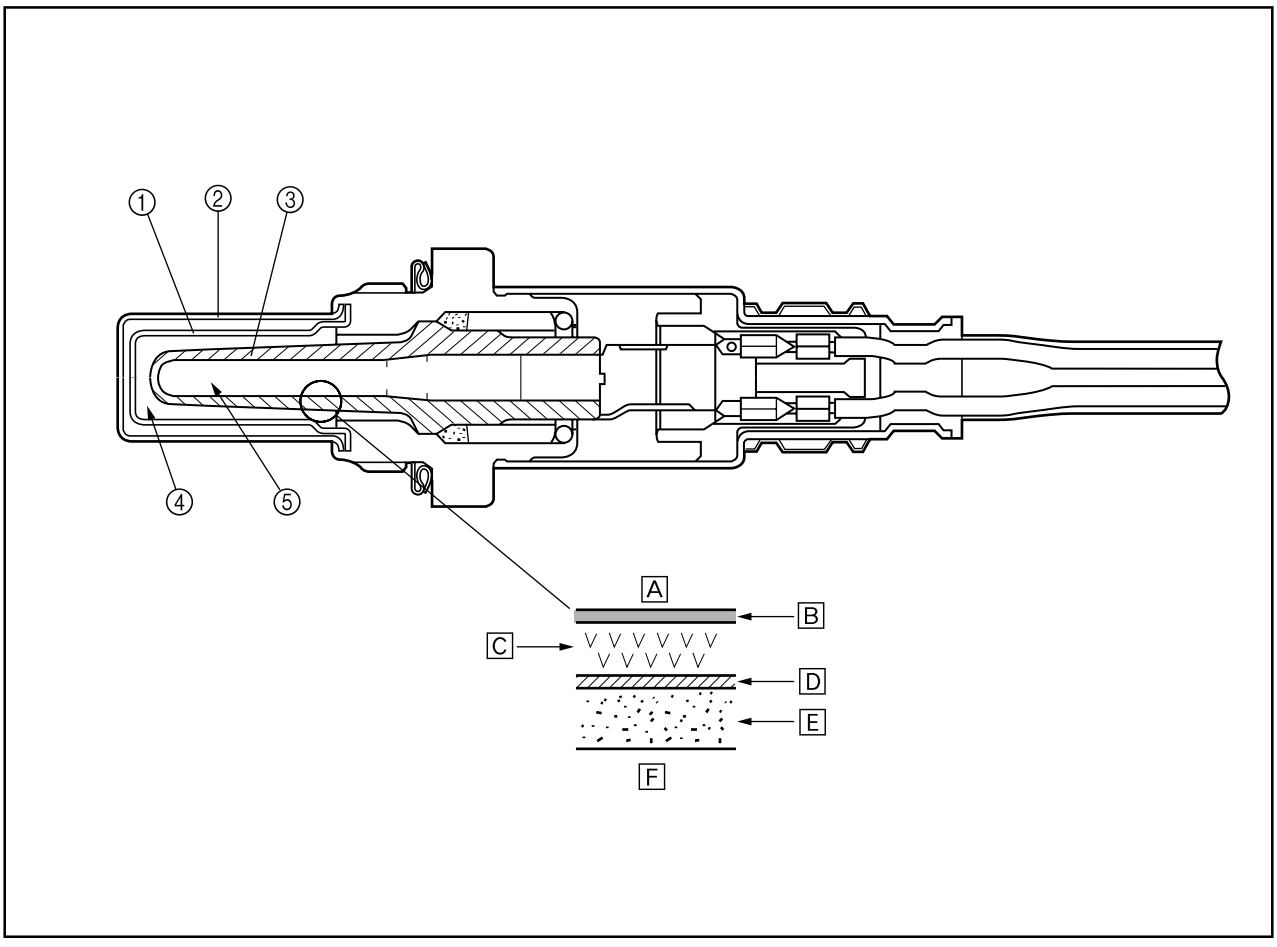


Illustration is for reference only.

① Fuel pump
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
⑩ Intake air temperature sensor
⑪ Air filter case
⑫ ISC (idle speed control) valve
⑬ Throttle position sensor
⑭ O_2 sensor
[A] Fuel system
[B] Air system
[C] Control system

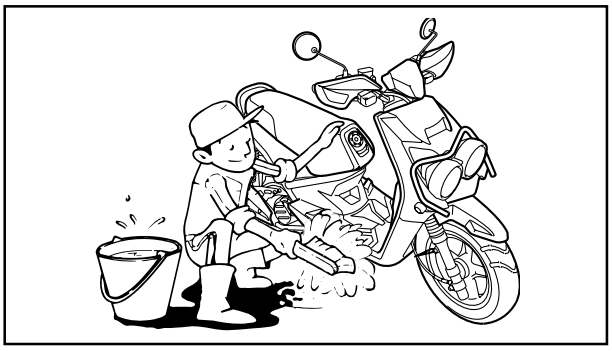
O_2 sensor

The O_2 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.



① Inner cover
② Outer cover
③ Zirconia tube
④ Exhaust gas
⑤ Atmosphere

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

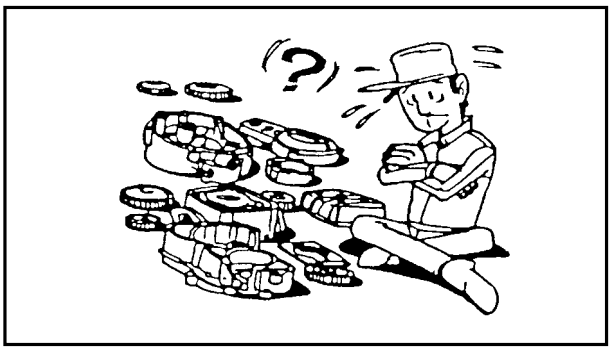


EAS00020

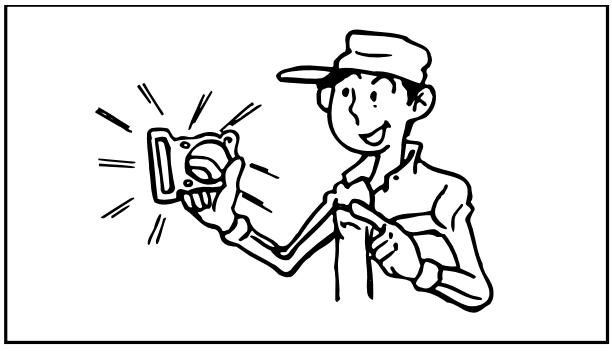
IMPORTANT INFORMATION

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



EAS00021

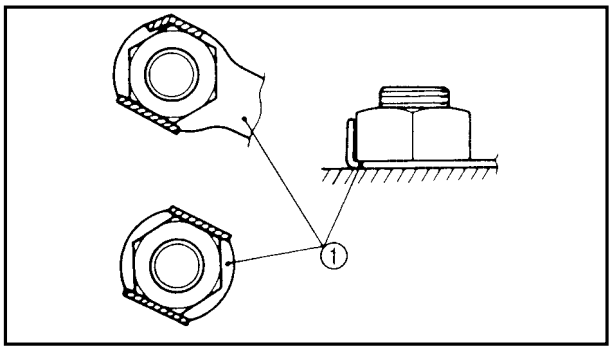
REPLACEMENT PARTS

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.

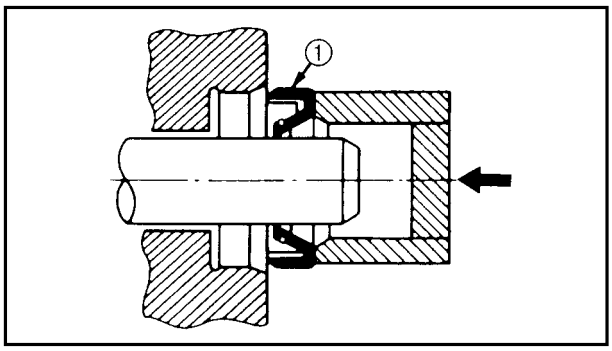
EAS00022

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.

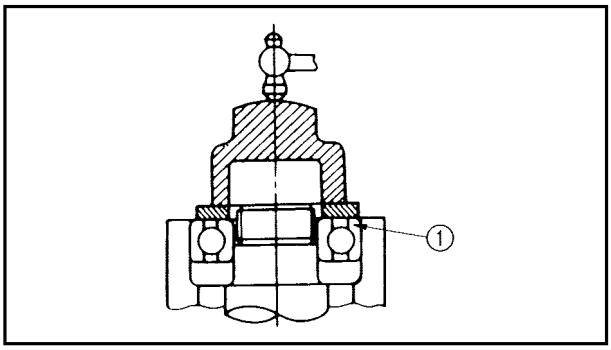


EAS00023
LOCK WASHERS/PLATES AND COTTER PINS
After removal, replace all lock washers/plates ① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



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.

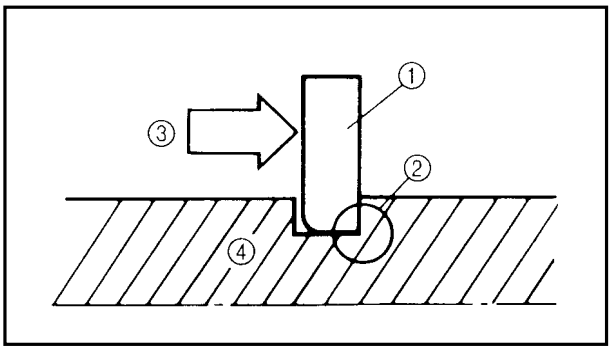
① Oil seal



NOTICE

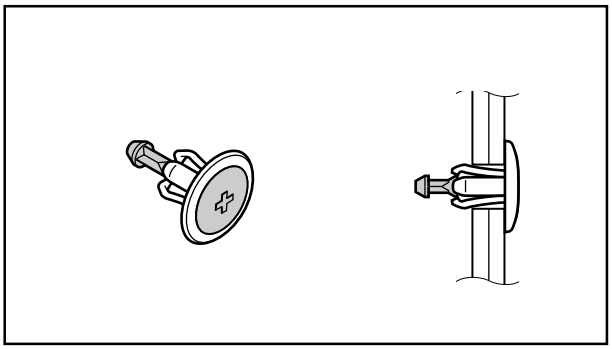
Do not spin the bearing with compressed air because this will damage the bearing surfaces.

① Bearing



EAS00025
CIRCLIPS
Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

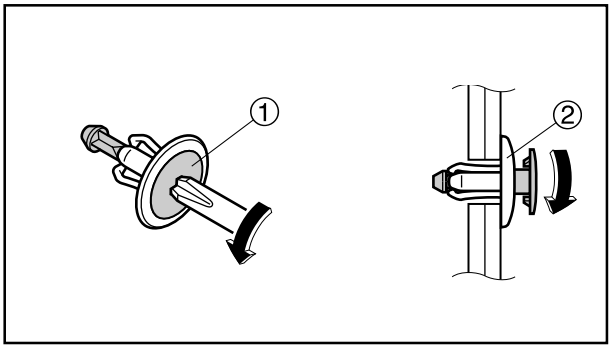


EAS00021

EQUIPMENT PREPARATION

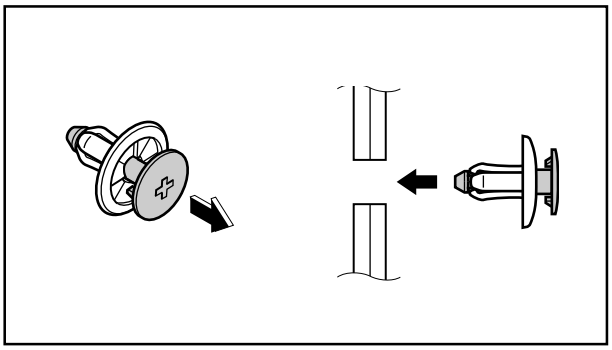
Turn Rivet (Turn type)

Assembly status of the turn rivet(turn type).



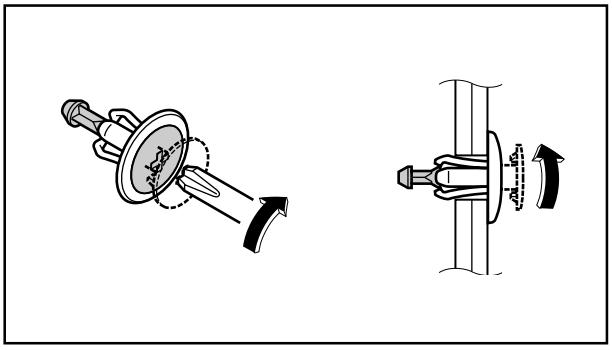
Dissembling

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



Assembling

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



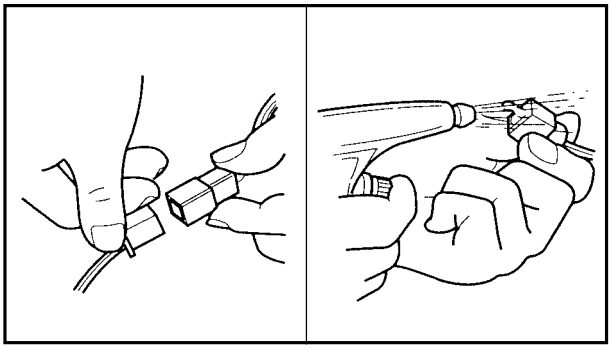
2. Turn in the center pin until leveling off with the surface position of the turn rivet main body.

EAS00026

CHECKING THE CONNECTIONS

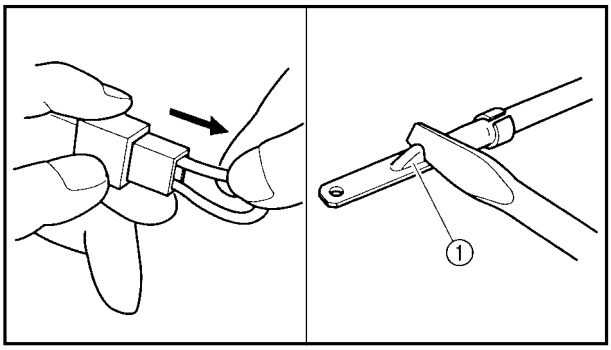
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - lead
   - coupler
   - connector



2. Check:
   - lead
   - coupler
   - connector

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

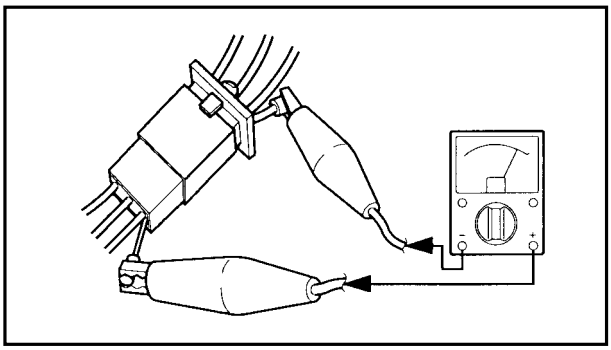


3. Check:
   - all connections

   Loose connection → Connect properly.

TIP

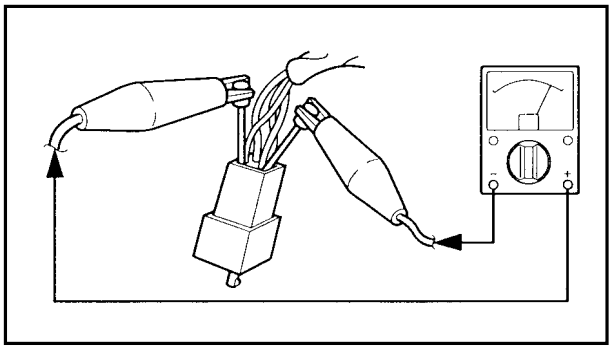
If the pin ① on the terminal is flattened, bend it up.



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.

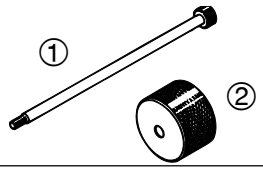
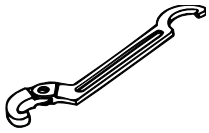
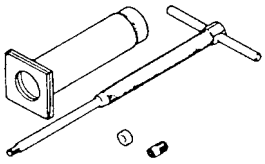
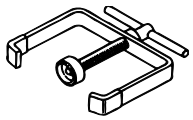
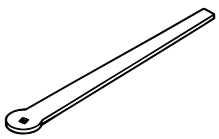
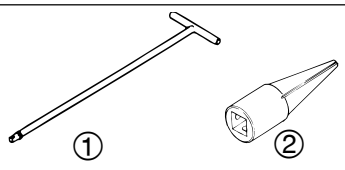
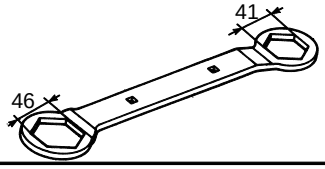
EAS00027

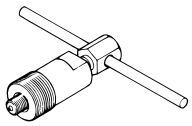
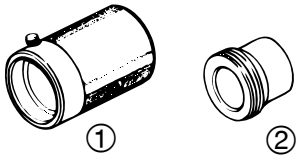
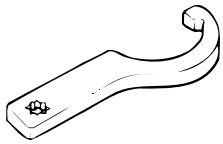
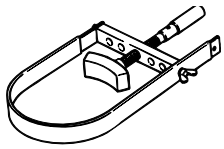
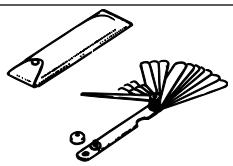
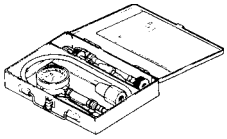
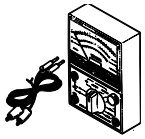
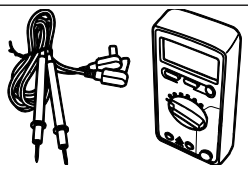
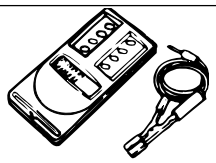
SPECIAL TOOLS

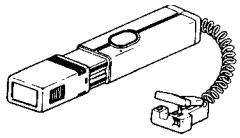
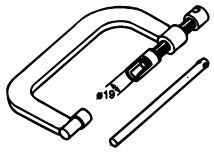
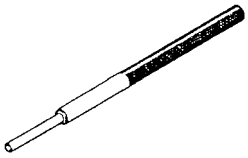
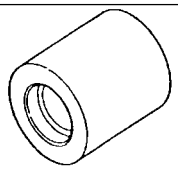
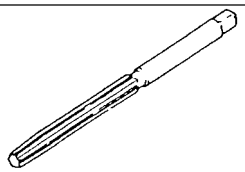
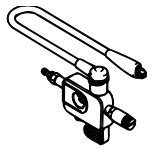
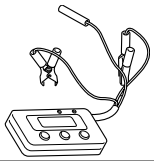
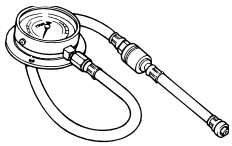
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

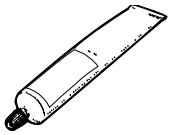
TIP

- 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 YU-01083-3	Slide hammer bolt (8mm) ① Weight ② These tools are needed to remove the camshaft.	
90890-01235 YU-01235	Rotor holding tool This tool is used to hold the primary fixed sheave and secondary sheave assembly.	
90890-01268 YU-01268	Ring nut wrench This tool is used to loosen and tighten the exhaust and steering ring nut.	
90890-01304 YU-01304	Piston pin puller set This tool is used to remove the piston pin.	
90890-01337 YM-33285	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 YM-01300-1	T-handle ① Damper rod holder ② These tools are used to hold the damper rod when removing or installing the damper rod.	
90890-01348 YM-01348	Lock nut wrench This tool is used when removing or installing the secondary sheave nut.	

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.	
90890-01384 YM-33299	Oil seal guide This tool is used for protecting the oil seal lip when installing the secondary sliding sheave.	
90890-01403 YU-A9472	Steering nut wrench This tool is used to loosen and tighten the steering ring nut.	
90890-01701 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 cleanance.	
90890-03081 YU-33223	Compression gauge This tool is used to measure the engine compression.	
90890-03112 YU-03112-C	Pocket tester This instrument is invaluable for checking the electrical system.	
90890-03174	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 YM-04108	Valve spring compressor Compressor adapter (Ø19mm) These tools are used when removing or installing the valve and the valve spring.	
90890-04116 YM-04116	Valve guide remover (4.5mm) 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 YM-04118	Valve guide reamer (4.5mm) This tool is used to rebore the new valve guides.	
90890-06754 YM-34487	Ignition checker This tool is used to check the ignition system 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.	
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.	

CHAPTER 2
SPECIFICATIONS

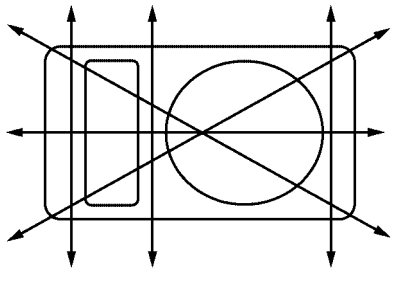
SPECIFICATIONS

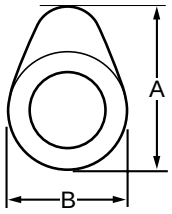
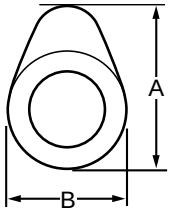
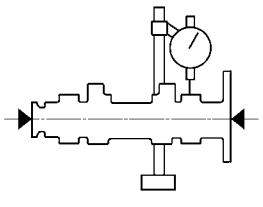
GENERAL SPECIFICATIONS

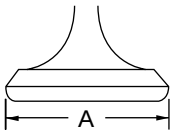
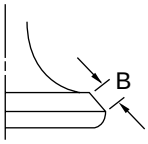
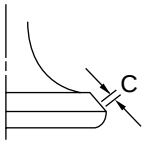
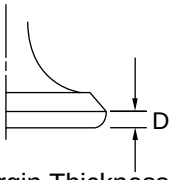
Item	Standard	Limit
Model		
Code	32S1 (USA) 32S2 (CAN)	… …
Dimensions		
Overall length	1910mm (75.2in)	…
Overall width	765mm (30.1in)	…
Overall height	1110mm (43.7in)	…
Seat height	780mm (30.7in)	…
Wheelbase	1290mm (50.8in)	…
Minimum ground clearance	125mm (4.9in)	…
Minimum turning radius	1900mm (74.8in)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

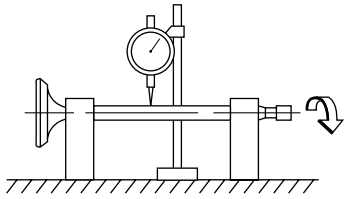
ENGINE SPECIFICATIONS

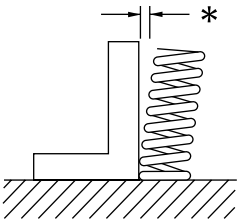
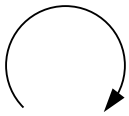
Item	Standard	Limit
Engine		
Engine type	Air-cooled, 4-stroke, SOHC	…
Displacement	0.125L (125cm^3, 7.63cu-in)	…
Cylinder arrangement	Forward inclined single cylinder	…
Bore × stroke	52.4 × 57.9mm (2.06 × 2.28in)	…
Compression ratio	10:1	…
Engine idle speed	1700 ~ 1900r/min	…
Vacuum pressure at engine idle speed	37 ~ 47kPa (281 ~ 357mmHg, 11.06 ~ 14.05inHg) at 1800r/min	…
Standard compression pressure (at sea level)	1350kPa (13.5kgf/cm^2, 192psi) at 1800r/min	…
Fuel		
Recommended fuel	Regular unleaded gasoline only	…
Fuel tank capacity		
Total	6.0L (1.59 US gal, 1.32 Imp. gal)	…
Engine oil		
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)	…

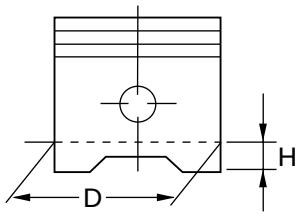
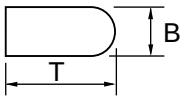
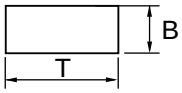
Item	Standard	Limit
Oil filter		
Oil filter type	Wire mesh	…
Oil pump		
Oil pump type	Trochoid	…
Inner rotor to outer rotor tip clearance	0.15mm (0.006in) or less	0.23mm (0.009in)
Outer rotor to pump housing clearance	0.07 ~ 0.12mm (0.003 ~ 0.005in)	0.19mm (0.008in)
Starting system type	Electric starter	…
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 ~ 12.0cm³ (0.70 ~ 0.73cu-in)	…
Maximum warpage  I1110304	…	0.05mm (0.002in)

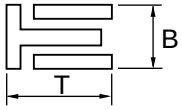
Item	Standard	Limit
Camshaft		
Drive system	Chain drive (left)	…
Intake camshaft lobe dimensions		
		
Measurement A	25.267 ~ 25.367mm (0.995 ~ 0.999in)	25.167mm (0.991in)
Measurement B	21.069 ~ 21.169mm (0.829 ~ 0.833in)	20.969mm (0.826in)
Exhaust camshaft lobe dimensions		
		
Measurement A	25.275 ~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

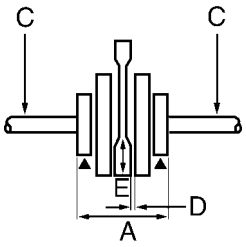
Item	Standard	Limit
Timing chain		
Model/number of links	Morse 92RH2005/94	…
Tensioning system	Automatic	…
Valve, valve seats, valve guides		
Valve clearance (cold)		
Intake	0.10 ~ 0.14mm (0.004 ~ 0.006in)	…
Exhaust	0.16 ~ 0.20mm (0.006 ~ 0.008in)	…
Valve dimensions		
 Head Diameter	 Face Width	 Seat Width	 Margin 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 (0.075 ~ 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		
Intake	0.7mm (0.028in)	…
Exhaust	1.0mm (0.039in)	…
Valve stem diameter		
Intake	4.970 ~ 4.985mm (0.1956 ~ 0.1963in)	4.940mm (0.1945in)
Exhaust	4.955 ~ 4.970mm (0.1951 ~ 0.1957in)	4.925mm (0.1939in)
Valve guide inside diameter		
Intake	5.000 ~ 5.012mm (0.1969 ~ 0.1973in)	5.050mm (0.1988in)
Exhaust	5.000 ~ 5.012mm (0.1969 ~ 0.1973in)	5.050mm (0.1988in)

Item	Standard	Limit
Valve stem to valve guide clearance		
Intake	0.015 ~ 0.042mm (0.0006 ~ 0.0017in)	0.08mm (0.0031in)
Exhaust	0.030 ~ 0.057mm (0.0012 ~ 0.0022in)	0.1mm (0.0039in)
Valve stem runout	…	0.01mm (0.0004 in)
		
Valve seat width		
Intake	0.9 ~ 1.1mm (0.035 ~ 0.043in)	1.6mm (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)		
Intake	137 ~ 157N/mm (13.97 ~ 16.01kgf/mm, 30.83 ~ 35.33lbf/in)	…
Exhaust	137 ~ 157N/mm (13.97 ~ 16.01kgf/mm, 30.83 ~ 35.33lbf/in)	…
Spring tilt 		
Intake	…	2.5°/1.8mm (2.5°/0.07in)
Exhaust	…	2.5°/1.8mm (2.5°/0.07in)
Winding direction (top view)		
Intake	Clockwise	…
Exhaust	Clockwise 	…
Valve seat reformed	Yes	…
Cylinder		
Cylinder arrangement	Forward inclined single cylinder	…
Bore × stroke	52.4 × 57.9mm (2.06 × 2.28in)	…
Compression ratio	10:1	…
Bore	52.40 ~ 52.41mm (2.0630 ~ 2.0634in)	…
Maximum taper	…	0.05mm (0.002in)
Maximum out-of-round	…	0.05mm (0.002in)

Item	Standard	Limit
Piston		
Piston-to-cylinder clearance	0.010 ~ 0.035mm (0.0004 ~ 0.0014in)	0.15mm (0.0059in)
Diameter D	52.375 ~ 52.390mm (2.0620 ~ 2.0626in)	…
		
Height H	7.0mm (0.28in)	…
Piston pin bore (in the piston)		
Diameter	15.002 ~ 15.013mm (0.5906 ~ 0.5911in)	15.043mm (0.5922in)
Offset	0.35 ~ 0.65mm (0.0138 ~ 0.0256in)	…
Offset direction	Intake side	…
Piston pin		
Outside diameter	14.995 ~ 15.000mm (0.5904 ~ 0.5906in)	14.975mm (0.5896in)
Piston rings		
Top ring		
		
Ring type	Barrel	…
Dimensions (B × T)	1.0 × 2.1mm (0.0394 × 0.0827in)	…
End gap (installed)	0.10 ~ 0.25mm (0.0039 ~ 0.0098in)	0.50mm (0.0197in)
Ring side clearance	0.02 ~ 0.08mm (0.0008 ~ 0.0031in)	0.13mm (0.0051in)
2nd ring		
		
Ring type	Taper	…
Dimensions (B × T)	1.0 × 2.1mm (0.0394 × 0.0827in)	…
End gap (installed)	0.25 ~ 0.40mm (0.0098 ~ 0.0157in)	0.75mm (0.0295in)
Ring side clearance	0.02 ~ 0.06mm (0.0008 ~ 0.0024in)	0.12mm (0.0047in)

Item	Standard	Limit
Oil ring  		
Dimensions (B × T)	2.0 × 2.5mm (0.0787 × 0.0984in)	…
End gap (installed)	0.2 ~ 0.7mm (0.0079 ~ 0.0276in)	…
Ring side clearance	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 (0.3930 ~ 0.3933in)	…
Arm-to-shaft clearance	0.009 ~ 0.034mm (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		
		
Width A	45.45 ~ 45.50mm (1.789 ~ 1.791in)	…
Maximum runout C	…	0.03mm (0.0012in)
Big end side clearance D	0.15 ~ 0.45mm (0.006 ~ 0.018in)	
Big end radial clearance E	0 ~ 0.01mm (0 ~ 0.0014in)	…
Clutch		
Clutch type	Automatic centrifugal	…
Clutch shoe thickness	3.2mm ~ 3.5mm (0.13~0.14in)	2.0mm (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)	…
Weight outside diameter	20mm (0.79in)	19.5mm (0.77in)
Clutch-in revolution	2700 ~ 3300r/min	…
Clutch-stall revolution	5150 ~ 6150r/min	…
V-belt		
V-belt width	22mm (0.87in)	19.8mm (0.78in)