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YAMAHA

YZF-R1 '98

4XV1-AE1

SERVICE MANUAL

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EB000000

YZF - R1
SERVICE MANUAL
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First edition, October 1997
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EB001000

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.

EB002000

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 motorcycle operator, a bystander or a person checking or repairing the motorcycle.

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

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

EB003000

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.

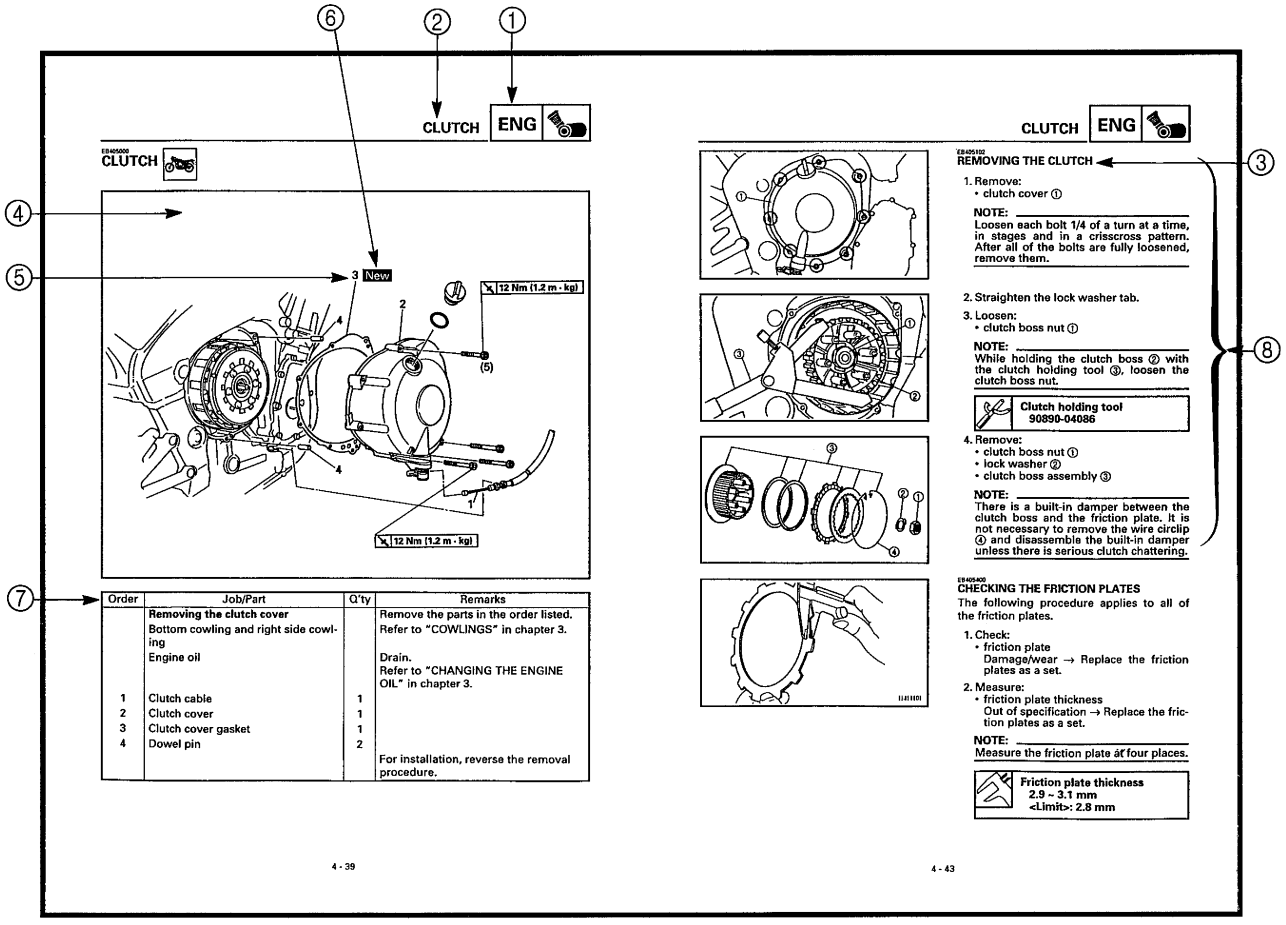
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

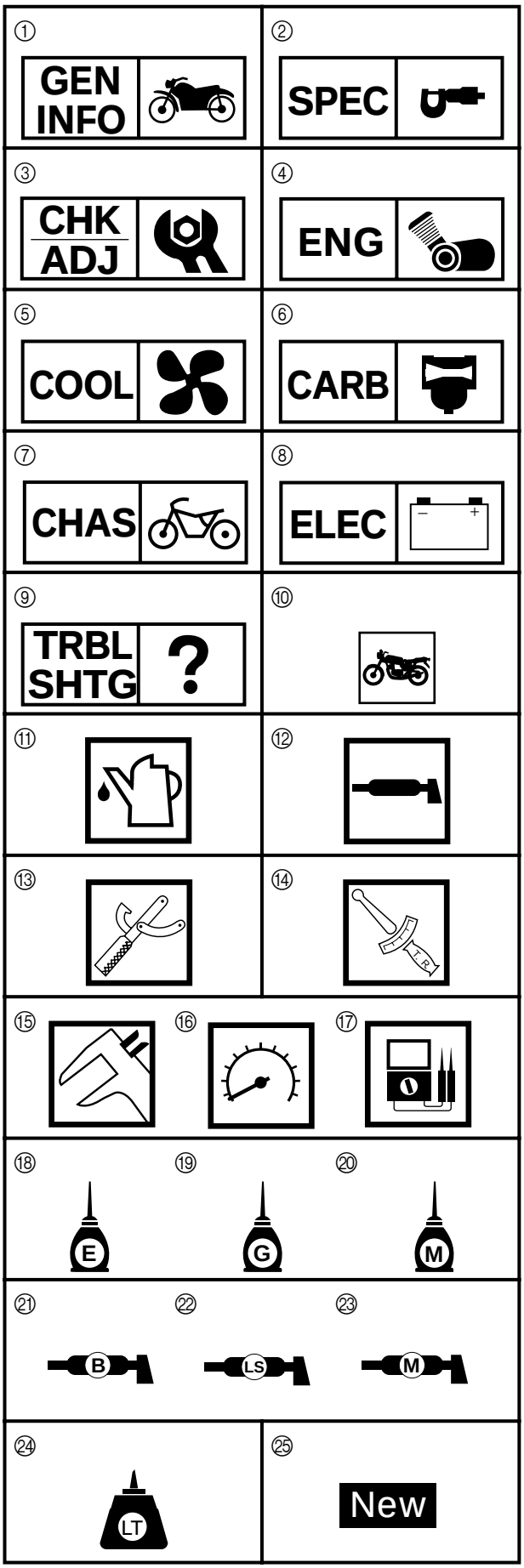
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

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.





EB004000

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 Engine
⑤ Cooling system
⑥ Carburetor(-s)
⑦ Chassis
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.

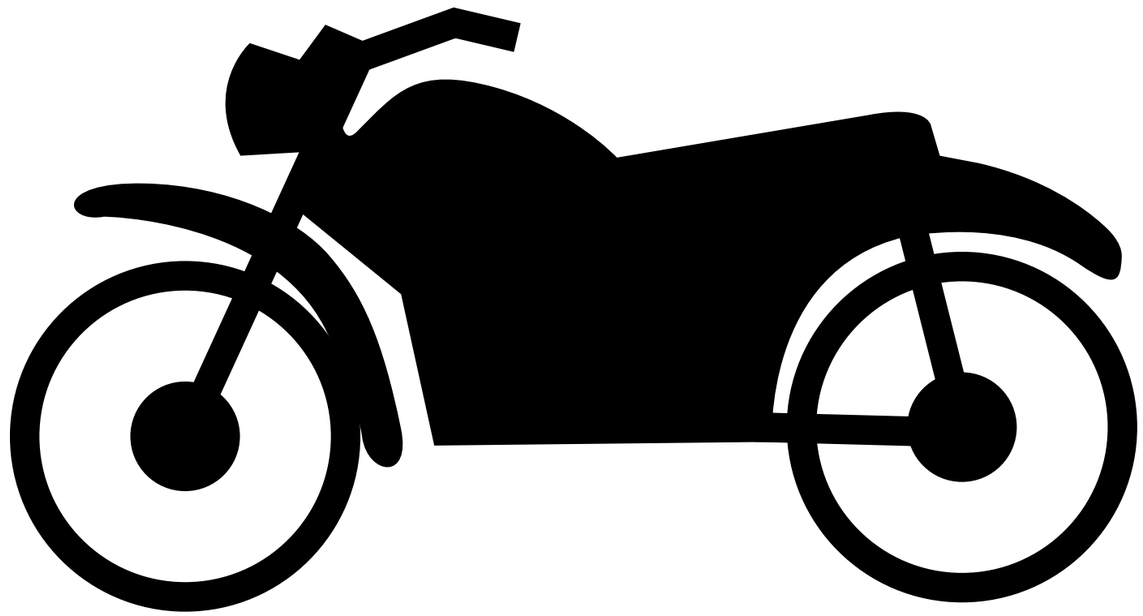
⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum disulfide oil
㉑ Wheel bearing grease
㉒ Lithium soap base grease
㉓ Molybdenum disulfide grease

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

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

CHAPTER TITLES

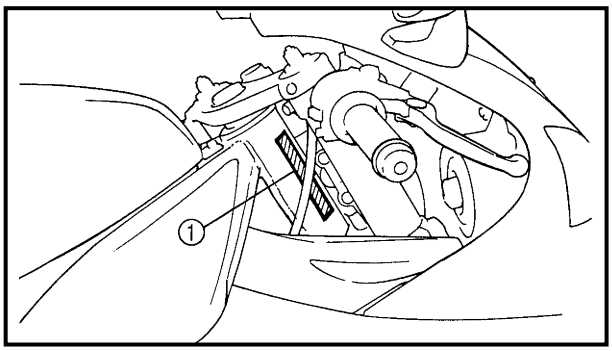
GENERAL INFORMATION	 GEN INFO 1
SPECIFICATIONS	 SPEC 2
PERIODIC CHECKS AND ADJUSTMENTS	 CHK / ADJ 3
ENGINE	 ENG 4
COOLING	 COOL 5
CARBURETION	 CARB 6
CHASSIS	 CHAS 7
ELECTRICAL	 ELEC 8
TROUBLESHOOTING	? TRBL SHTG 9

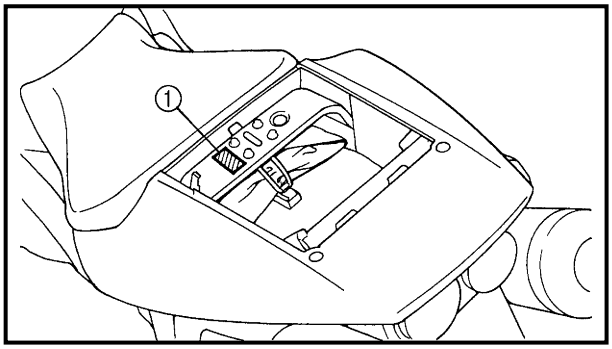


GEN INFO

1

CHAPTER 1.
GENERAL INFORMATION





EB100000

GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

EB100010

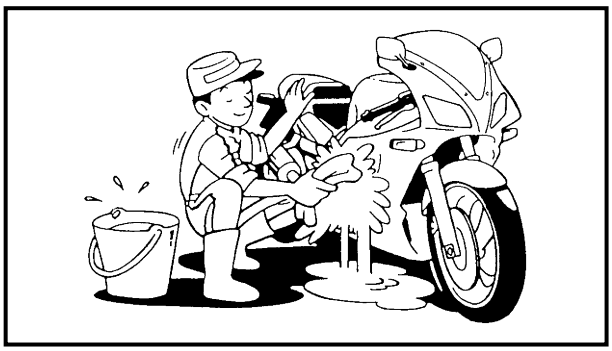
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the right side of the steering head pipe.

EB100020

MODEL CODE

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

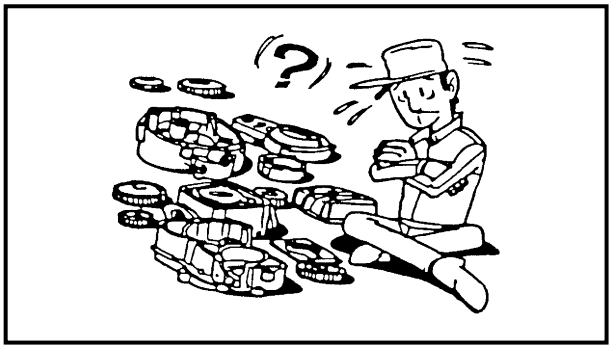


EB102000

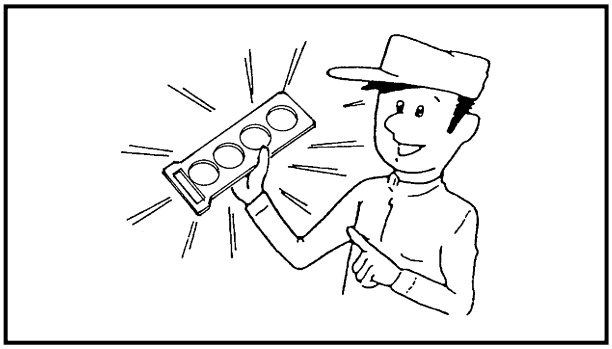
IMPORTANT INFORMATION

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.



EB102010

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.

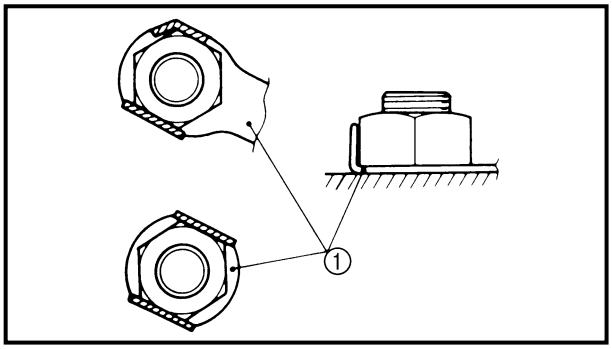
EB102020

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.

USING A DYNAMOMETER

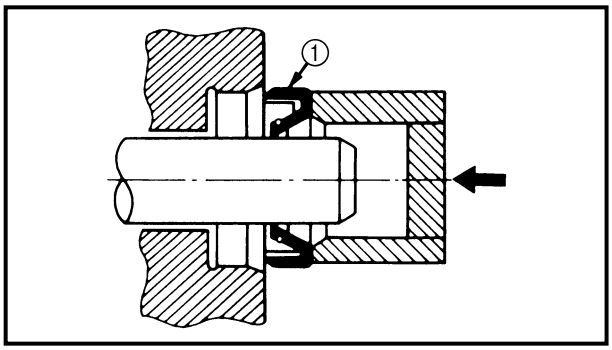
The YZF-R1 has a carbon muffler that may change color when exposed to high temperatures. Therefore, when using a dynamometer always use a fan to cool the muffler.



EB102030

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 washer tabs and the cotter pin ends along a flat of the bolt or nut.



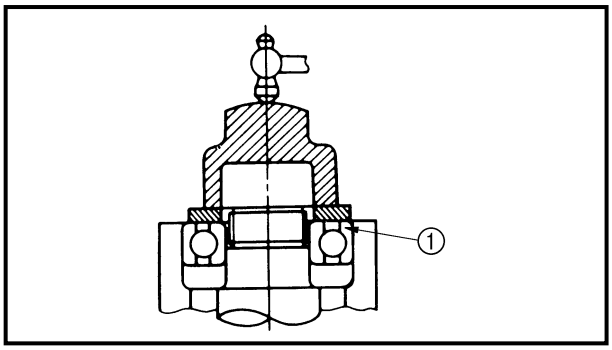
EB102040

BEARINGS AND OIL SEALS

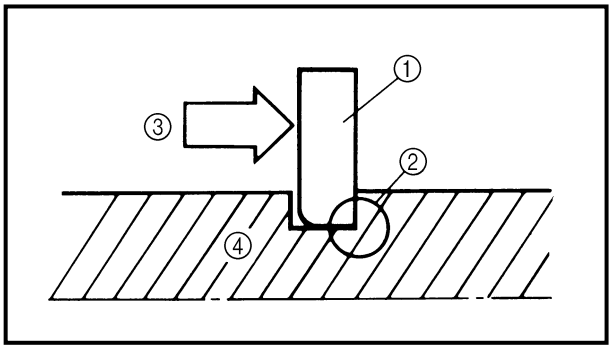
1. Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium soap base grease. Oil bearings liberally when installing, if appropriate.
   ① Oil seal

CAUTION:

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



① Bearing



EB102050

CIRCLIPS

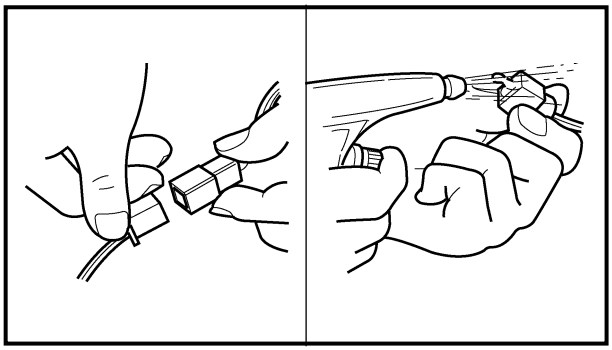
Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

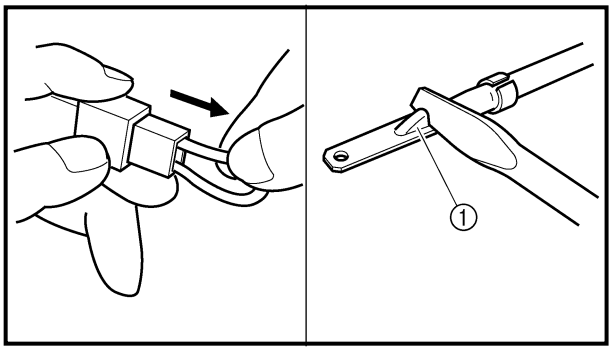
EB103000
CHECKING THE CONNECTIONS

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

1. Disconnect:
   • lead
   • coupler
   • connector

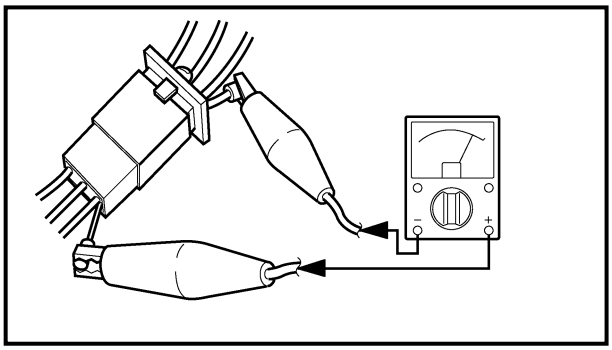


2. Check:
   • lead
   • coupler
   • connector
   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.



3. Check:
   • all connections
   Loose connection → Connect properly.

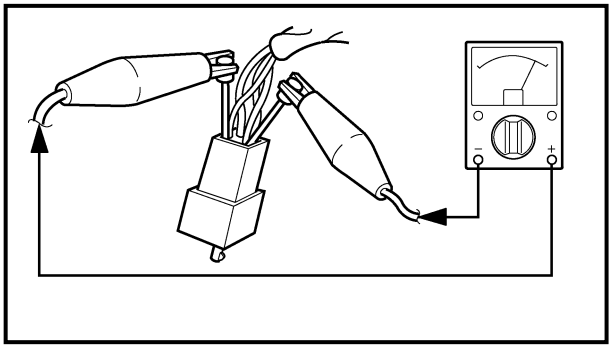
NOTE:
If the pin ① on the terminal is flattened, bend it up.



4. Connect:
   • lead
   • coupler
   • connector

NOTE:
Make sure that all connections are tight.

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

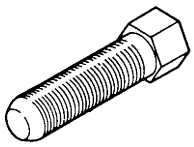
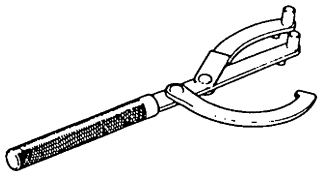
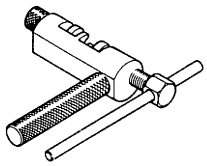
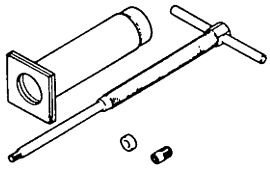
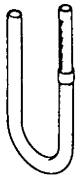
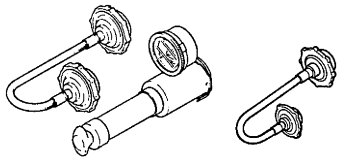
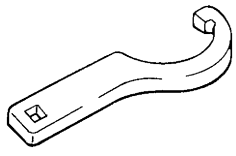
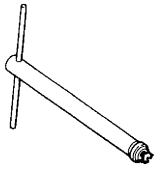


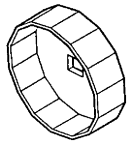
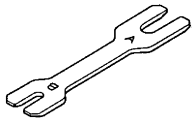
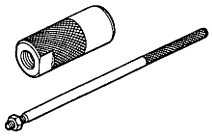
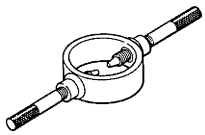
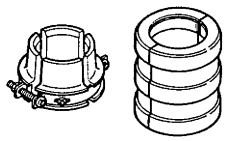
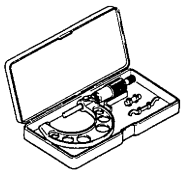
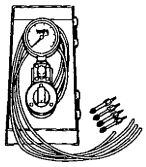
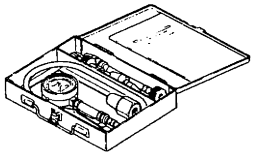
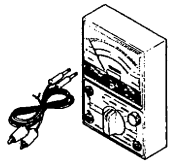
	**Pocket tester** **90890-03112**

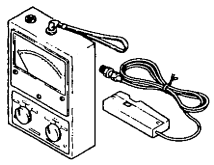
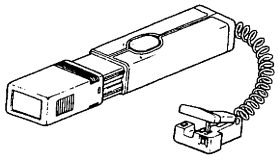
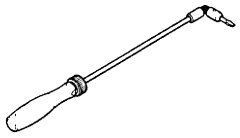
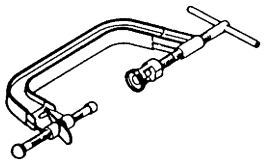
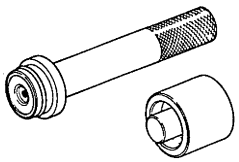
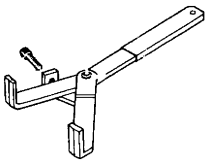
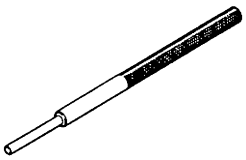
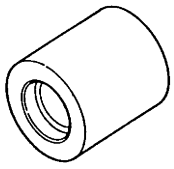
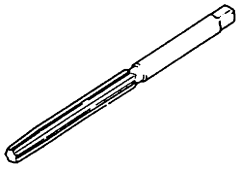
NOTE:
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.

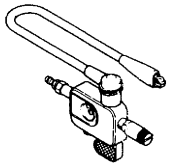
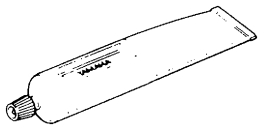
EB104000
SPECIAL TOOLS

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

Tool No.	Tool name/Function	Illustration
90890-01080	Flywheel puller This tool is used to remove the generator rotor.	
90890-01235	Rotor holding tool This tool is used to hold the generator rotor when removing or installing the generator rotor bolt or pickup coil rotor bolt.	
90890-01286	Drive chain cutter This tool is used to remove the drive chain.	
90890-01304	Piston pin puller This tool is used to remove the piston pins.	
90890-01312	Fuel level gauge This tool is used to measure the fuel level in the float chamber.	
Radiator cap tester 90890-01325 Adapter 90890-01352	Radiator cap tester Adapter These tools are used to check the cooling system.	
90890-01403	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
90890-01423	Damper rod holder This tool is used to hold the damper rod assembly when loosening or tightening the damper rod assembly bolt.	

Tool No.	Tool name/Function	Illustration
90890-01426	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
90890-01434	Rod holder This tool is used to support the damper adjusting rod.	
Rod puller 90890-01437 Rod puller attachment 90890-01436	Rod puller Rod puller attachment These tools are used to pull up the front fork damper rod.	
90890-01441	Fork spring compressor This tool is used to disassemble or assemble the front fork legs.	
90890-01442	Fork seal driver This tool is used to install the front fork's oil seal and dust seal.	
90890-03008	Micrometer This tool is used to measure the piston skirt diameter.	
Vacuum gauge 90890-03094 Vacuum gauge attachment 90890-03060	Vacuum gauge Vacuum gauge attachment This gauge is used to synchronize the carburetors.	
Compression gauge 90890-03081 Adapter 90890-04136	Compression gauge Adapter These tools are used to measure engine compression.	
90890-03112	Pocket tester This tool is used to check the electrical system.	

Tool No.	Tool name/Function	Illustration
90890-03113	Engine tachometer This tool is used to check engine speed.	
90890-03141	Timing light This tool is used to check the ignition timing.	
90890-03158	Carburetor angle driver This tool is used to turn the pilot screw when adjusting the engine idling speed.	
Valve spring compressor 90890-04019 Attachment 90890-04108 90890-04114	Valve spring compressor Attachment These tools are used to remove or install the valve assemblies.	
Middle driven shaft bearing driver 90890-04058 Mechanical seal installer 90890-04078	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
90890-04086	Clutch holding tool This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
90890-04111 90890-04116	Valve guide remover This tool is used to remove or install the valve guides.	
90890-04112 90890-04117	Valve guide installer This tool is used to install the valve guides.	
90890-04113 90890-04118	Valve guide reamer This tool is used to rebore the new valve guides.	

Tool No.	Tool name/Function	Illustration
90890-06754	Ignition checker This tool is used to check the ignition system components.	
90890-85505	Yamaha bond No. 1215 This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	

SPEC 2

CHAPTER 2.
SPECIFICATIONS

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