



**YAMAHA**

**XV16AL/XV16ALC**  
**XV16ATL/XV16ATLC**

**SERVICE MANUAL**

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EAS00001

**XV16AL/XV16ALC  
XV16ATL/XV16ATLC  
SERVICE MANUAL**

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## 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.

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 with federal environmental quality objectives.

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.

This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.

**NOTE:**

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Designs and specifications are subject to change without notice.

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## IMPORTANT MANUAL INFORMATION

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



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



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



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.

# 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.

②

CLUTCH

①

ENG

④

⑤

⑥

⑦

Order	Job/Part	Q'ty	Remarks
<b>Removing the clutch cover</b>			
	Left side cover		Remove the parts in the order listed. Refer to "SEATS AND SIDE COVERS" in chapter 3.
	Engine left side cover		Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
	Engine oil		Drain.
1	Clutch cable	1	Disconnect.
2	Pull lever	1	
3	Pull lever spring	1	
4	Pickup coil coupler	1	Disconnect.
5	Shift arm	1	
6	Clutch cable holder	1	
7	Clutch cover	1	

CLUTCH ENG

③

**REMOVING THE CLUTCH**

1. Remove:

- clutch cable holder ①
- clutch cover ②

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

2. Straighten the lock washer tab.

3. Loosen:

- clutch boss nut ①

**NOTE:**  
While holding the clutch boss ② with the universal clutch holder ③, loosen the clutch boss nut.

**Universal clutch holder YM-91042**

4. Remove:

- clutch boss nut ①
- lock washer ②
- clutch boss assembly ③







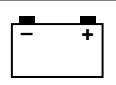


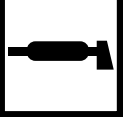












**NOTE:**  
There is a built-in damper between the clutch boss and the clutch plate. It is not necessary to remove the wire circlip ④ and disassemble the built-in damper unless there is serious clutch chattering.

⑧

**REMOVING THE PRIMARY DRIVE GEAR**

1. Remove:

- pickup coil rotor bolt ①

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

\*\*\*\*\*  
**SYMBOLS**

The following symbols are not relevant to every vehicle.

Symbols ① to ⑧ indicate the subject of each chapter.

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

Symbols ⑨ to ⑯ indicate the following.

- ⑨ Serviceable with engine mounted
- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Tightening torque
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Electrical data

Symbols ⑰ to ㉒ in the exploded diagrams indicate the types of lubricants and lubrication points.









- ⑰ Engine oil
- ⑱ Gear oil
- ⑲ Molybdenum disulfide oil
- ⑳ Wheel bearing grease
- ㉑ Lithium soap base grease
- ㉒ Molybdenum disulfide grease

Symbols ㉓ to ㉔ in the exploded diagrams indicate the following.

- ㉓ Apply locking agent (LOCTITE®).
- ㉔ Replace the part.

\*\*\*\*\*

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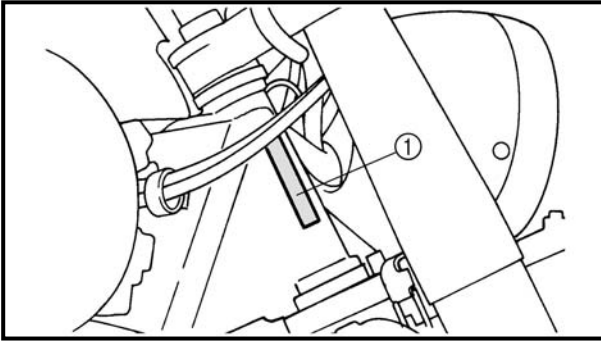
<b>GENERAL INFORMATION</b>	
	<b>GEN INFO 1</b>
<b>SPECIFICATIONS</b>	
	<b>SPEC 2</b>
<b>PERIODIC CHECKS AND ADJUSTMENTS</b>	
	<b>CHK ADJ 3</b>
<b>CHASSIS</b>	
	<b>CHAS 4</b>
<b>ENGINE</b>	
	<b>ENG 5</b>
<b>CARBURETION</b>	
	<b>CARB 6</b>
<b>ELECTRICAL SYSTEM</b>	
	<b>ELEC 7</b>
<b>TROUBLESHOOTING</b>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

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## GENERAL INFORMATION

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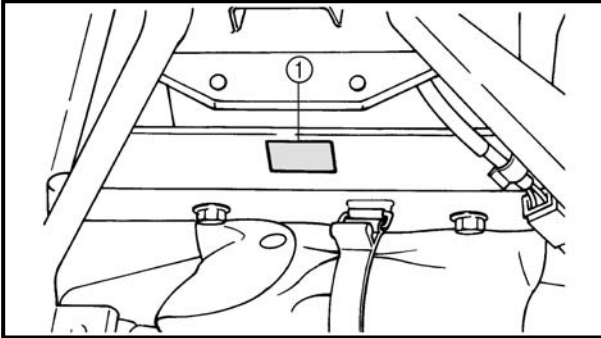
EAS00014

## GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

EAS00017

### VEHICLE IDENTIFICATION NUMBER

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



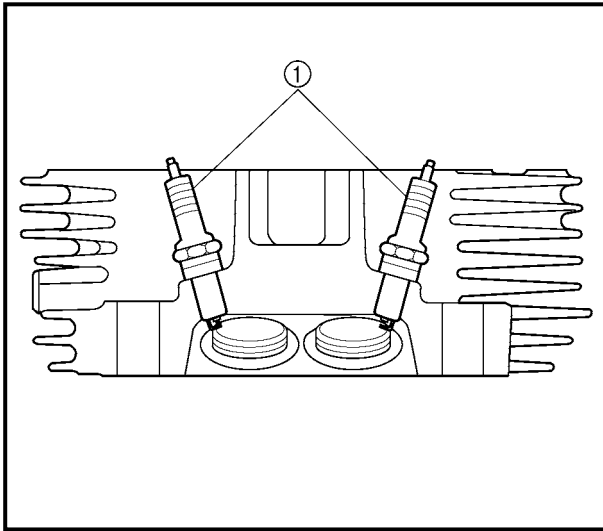
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### MODEL CODE

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

1



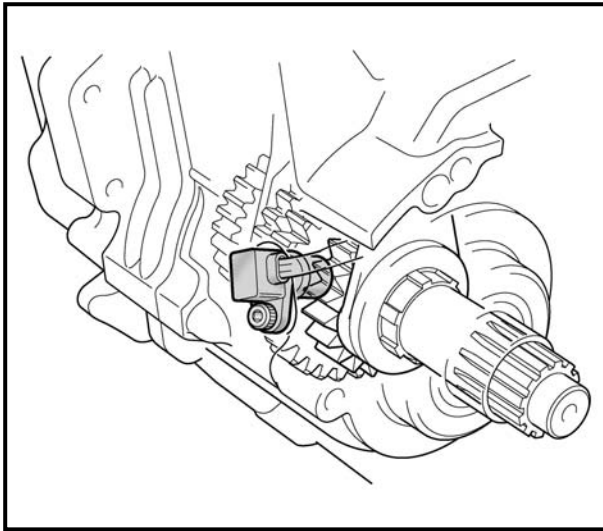


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**FEATURES**

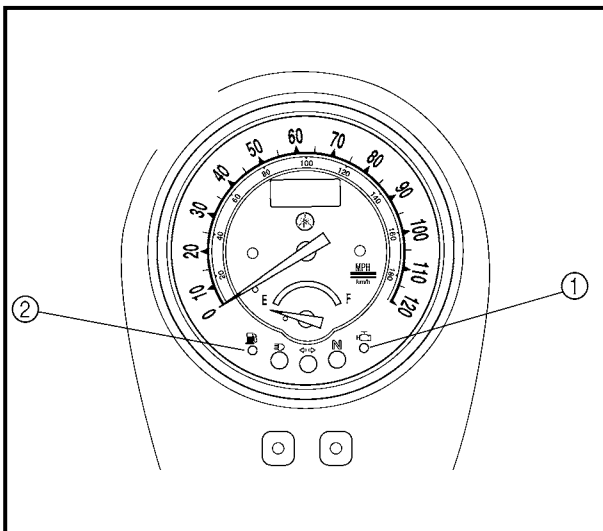
**Twin spark plugs**

For this model, two spark plugs are incorporated in each cylinder. By using two spark plugs, the combustion time in the combustion chamber is shortened in an attempt to improve torque.



**Speed sensor**

The speed sensor is installed to the crankcase and it detects the number of passing gears while the vehicle is running in 5th gear and sends the information out as an electrical signal to the ignitor unit.



**Self-diagnosis device**

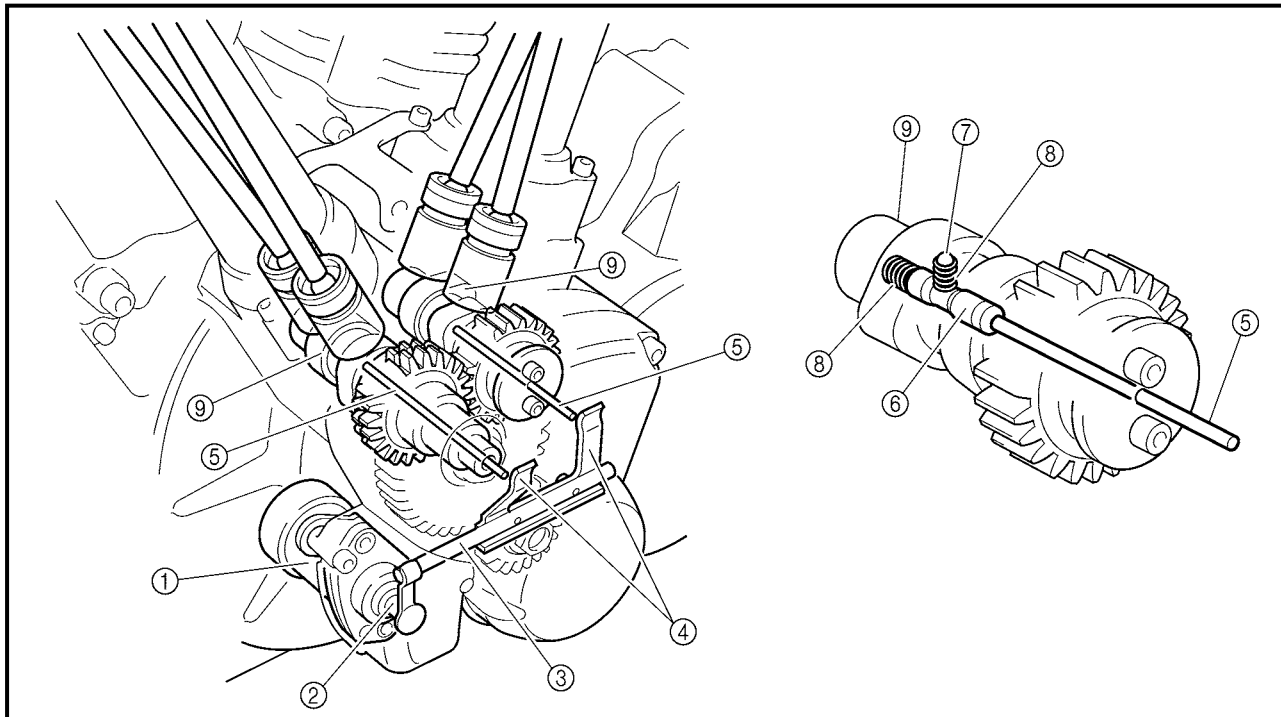
This model is equipped with a self-diagnosis device that has four functions. The engine trouble indicator light will come on or flash if trouble occurs in an engine monitoring circuit.

Circuit	Indicator lights	Number of flashes
Throttle position sensor	Engine trouble indicator light ①	3
Speed sensor	Engine trouble indicator light ①	4
Solenoid	Engine trouble indicator light ①	6
Fuel level meter	Fuel level indicator light ②	8

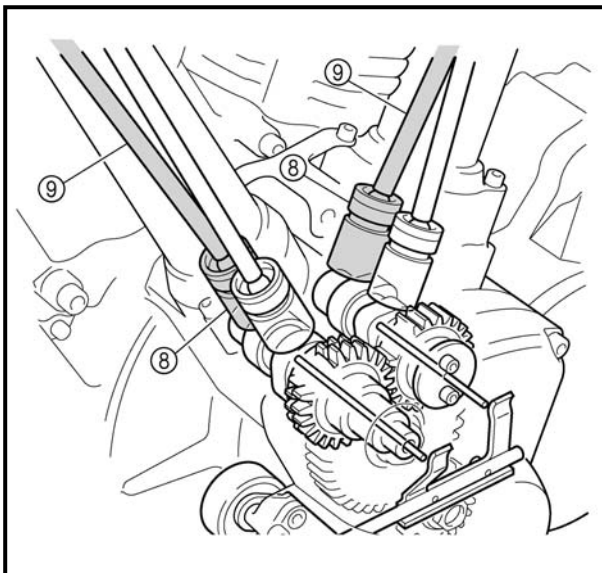
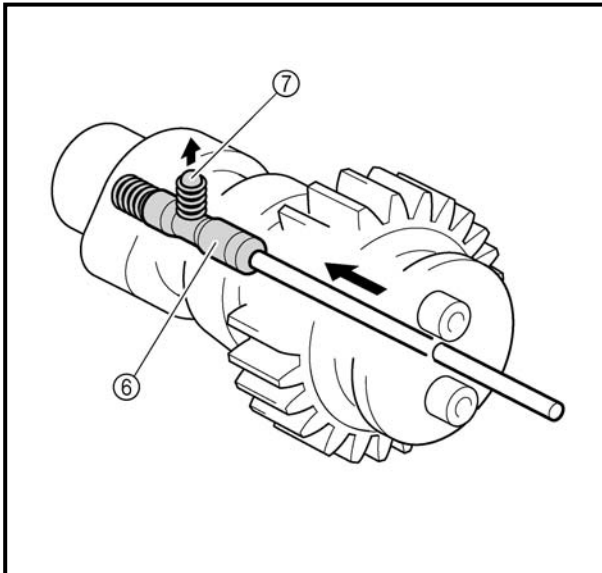
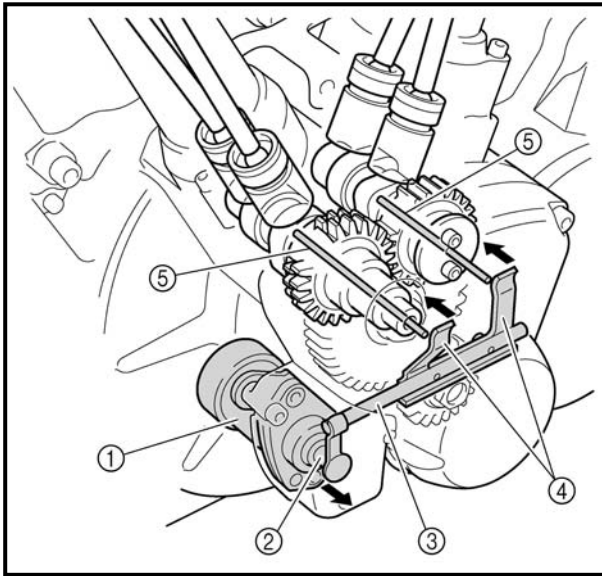
**Auto decompression mechanism**

The auto decompression mechanism occurs when the engine is started. When the engine is started, the decompression cam and pin raise the exhaust valve lifters, push the push rods, move the rocker arms, and lower the exhaust valves which compress the cylinder. When the cylinder is compressed, pressure is released immediately, resulting in smoother engine starting capabilities and smoother crankshaft revolutions.

1



- ① Decompression solenoid
- ② Decompression solenoid rod
- ③ Decompression connector
- ④ Decompression lever
- ⑤ Decompression push rod
- ⑥ Decompression cam
- ⑦ Pin
- ⑧ Spring
- ⑨ Camshaft



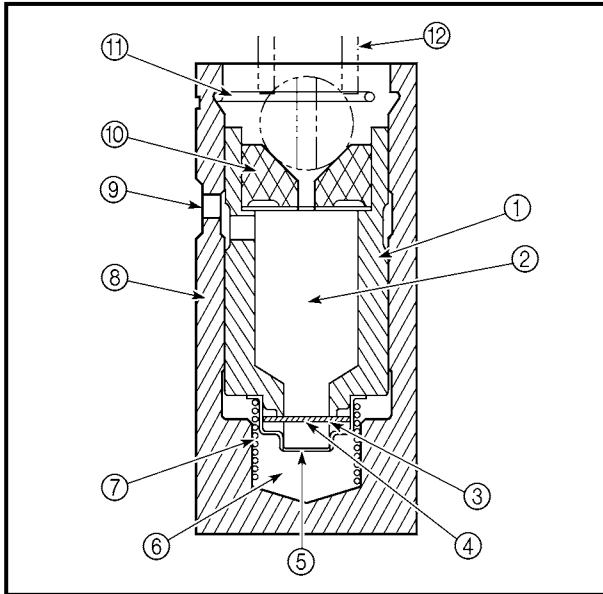
### Operation

1. When the starter switch is pushed, electricity is run to the decompression solenoid ① causing it to push out the decompression solenoid rod ②.
2. When the decompression solenoid rod is pushed out, the decompression connector ③ moves the decompression levers ④ in the direction indicated by the arrows, and then the levers push the decompression rods ⑤ toward the camshaft side.
3. The decompression cam ⑥ is pushed in the direction indicated by the arrow, and then the pin ⑦ raises the projection of the decompression cam.
4. When the camshaft is rotated by the self-timing motor, the exhaust valve lifters ⑧ are lifted by the pin just before top dead center (TDC) and the exhaust valve push rod ⑨ and valve rocker arms are operated. Thus, opening the exhaust valve becomes easy.
5. When the engine starts and reaches a specific engine speed the decompression solenoid is turned off and the decompression system stops operating.

## Hydraulic valve lifters

Since the hydraulic valve-lifting mechanism maintains a valve clearance of zero, periodic valve clearance adjustments are unnecessary.

The advantages of this system as compared to conventional techniques include the following: mechanical noise is reduced, the camshaft action on the valves remains unaffected by engine speed or temperature, and the valve timing is kept stable.



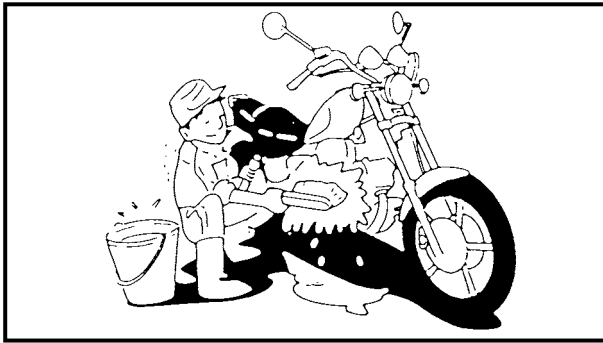
- ① Plunger
- ② Oil reservoir
- ③ Check valve spring
- ④ Check valve
- ⑤ Spring retainer
- ⑥ High-pressure chamber
- ⑦ Plunger spring
- ⑧ Valve lifter body
- ⑨ Oil supply inlet
- ⑩ Push rod cup
- ⑪ Plunger retaining clip
- ⑫ Valve push rod

The hydraulic valve-lifting system functions as follows:

1. As the camshaft rotates, the valve lifter is pushed up by the passing cam lobe.
2. Since the check valve ④ prevents the engine oil contained inside the high-pressure chamber from escaping, the plunger ① moves up along with the valve lifter body ⑧ and pushes up the push rod, causing the valve to be lifted.
3. As the camshaft continues to rotate, the valve lifter moves back down to its original position, where it remains while the cam heel passes.

When a positive valve clearance is caused by either heat expansion of the cylinder head or engine oil leaking from the valve lifter during stage 2, the plunger, which no longer receives pressure from the push rod, is pushed up by the plunger spring ⑦. As a result, the valve clearance is zeroed and engine oil is allowed to return to the high-pressure chamber from the reservoir ② through the check valve ④.

When, on the contrary, a negative valve clearance occurs (this is the case when the cam heel is passing the valve lifter, but the rocker arm, pushed by the push rod, is lifting the valve), the plunger ① continues to receive pressure from the valve push rod. As engine oil contained inside the high-pressure chamber leaks from the gaps between the valve lifter body ⑧ and the plunger ① as well as between the valve lifter body ⑧ and the check valve ④, the plunger ① moves down and the valve clearance is zeroed.



EAS00020

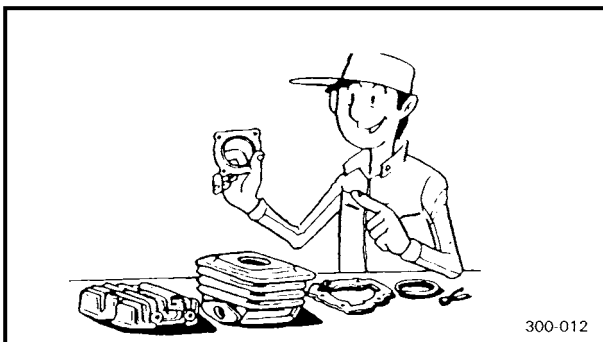
**IMPORTANT INFORMATION**

**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.



300 008



300-012

EAS00021

**REPLACEMENT PARTS**

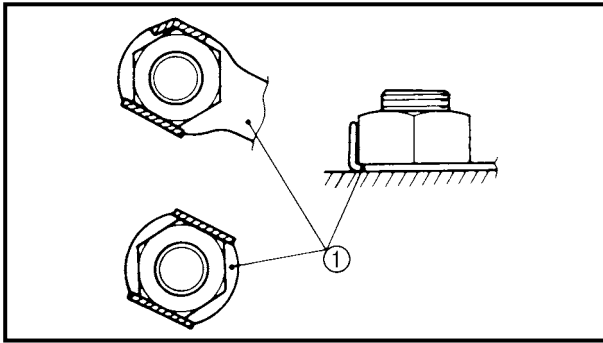
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

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.

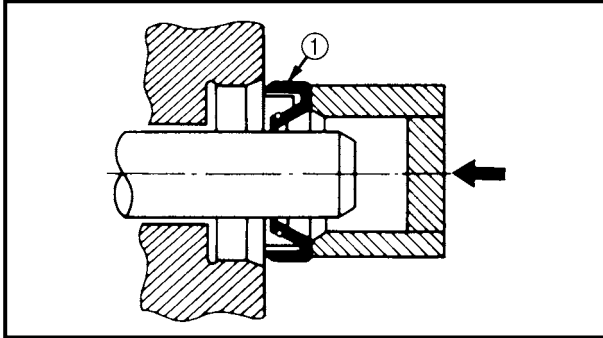
1



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

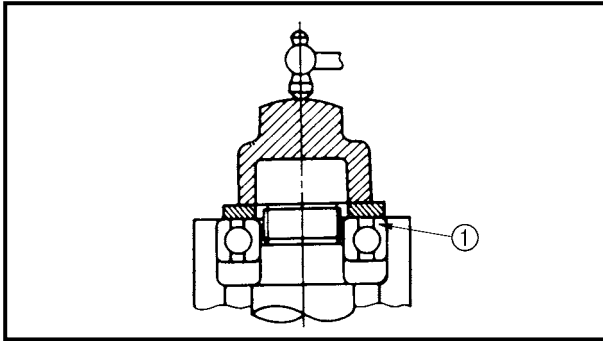


EAS00024

**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.

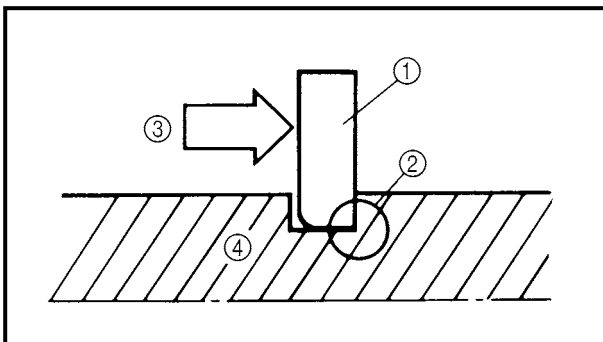
① Oil seal



**CAUTION:**

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

① Bearing



EAS00025

**CIRCLIPS**

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

④ Shaft

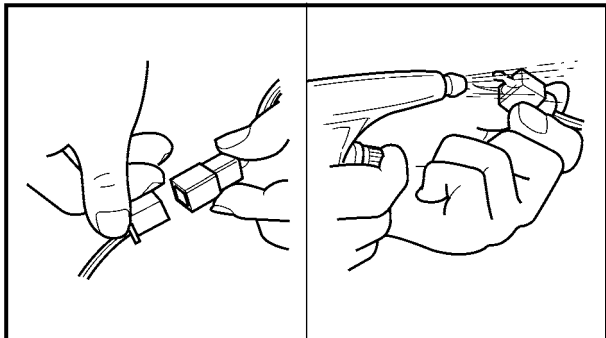
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**CHECKING THE CONNECTIONS**

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

1. Disconnect:

- lead
- coupler
- connector

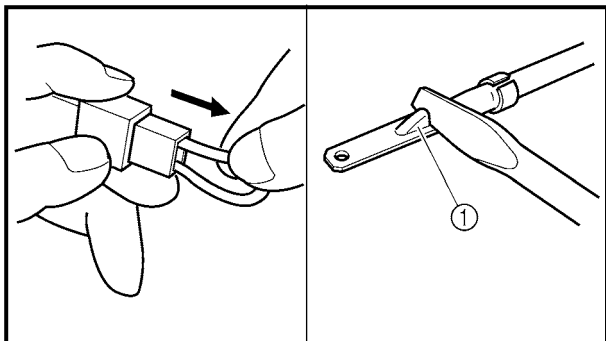


2. Check:

- lead
- coupler
- connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



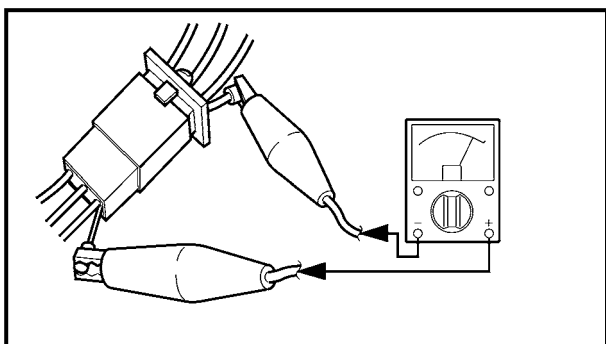
3. Check:

- all connections

Loose connection → Connect properly.

**NOTE:** \_\_\_\_\_

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



4. Connect:

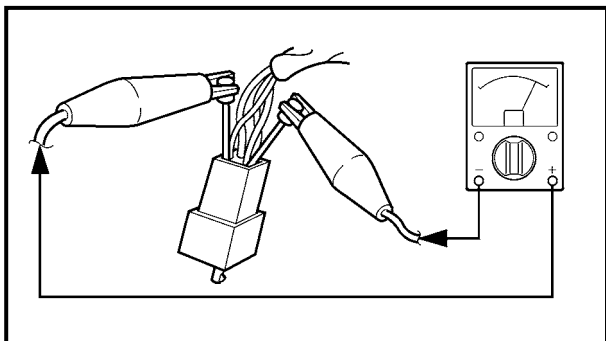
- lead
- coupler
- connector

**NOTE:** \_\_\_\_\_

Make sure all connections are tight.

5. Check:

- continuity  
(with the pocket tester)



	<b>Pocket tester YU-03112</b>
---	-----------------------------------

**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.

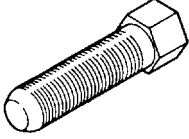
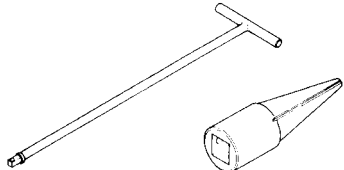
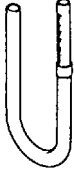
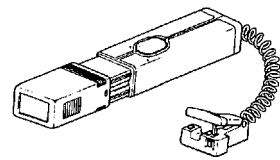
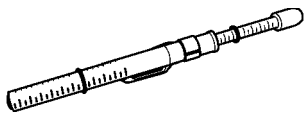
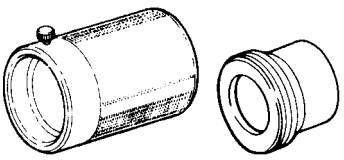
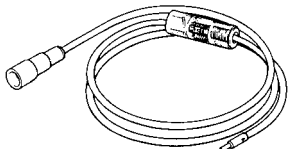
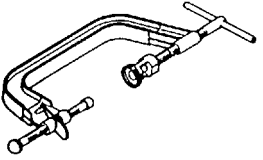


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## SPECIAL TOOLS

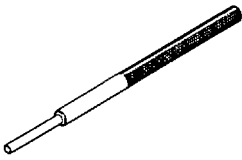
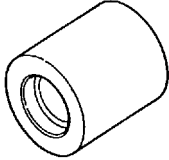
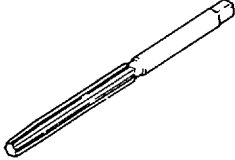
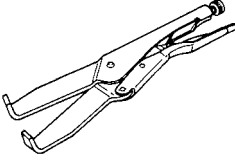
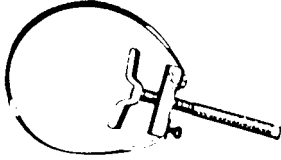
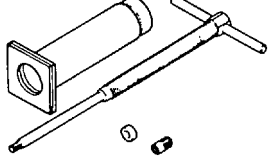

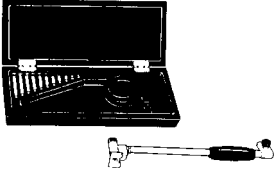
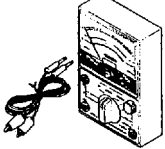
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers, or both may differ depending on the country.

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

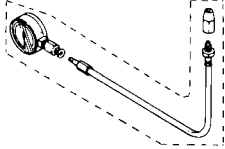
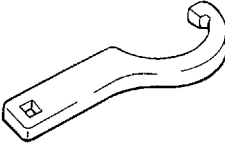
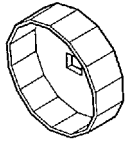
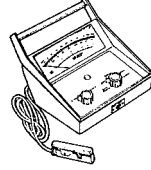
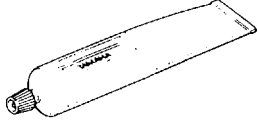
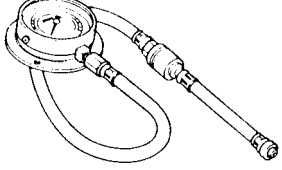
Tool No.	Tool name/Function	Illustration
YM-01080-A	Flywheel puller  This tool is used to remove the generator rotor.	
T-handle YM-01326 Damper rod holder YM-1300-1	T-handle Damper rod holder These tools are used to hold the cartridge cylinder when loosening or tightening the cartridge cylinder bolt.	
YM-01312-A	Fuel level gauge  This tool is used to measure the fuel level in the float chamber.	
YM-33277-A	Timing light  This tool is used to check the ignition timing.	
YM-03170	Belt tension gauge  This tool is used to measure the drive belt slack.	
Fork seal driver weight YM-33963 Adapter YM-8020	Fork seal driver weight Adapter These tools are used to install the front fork's oil seal and dust seal.	
YM-34487	Dynamic spark tester  This tool is used to check the ignition system components.	
YM-04019	Valve spring compressor  This tool is used to remove or install the valve assemblies.	





Tool No.	Tool name/Function	Illustration
YM-4064-A	Valve guide remover (6 mm) This tool is used to remove or install the valve guides.	
YM-4065-A	Valve guide installer This tool is used to install the valve guides.	
YM-4066	Valve guide reamer This tool is used to rebores the new valve guides.	
YM-91042	Universal clutch holder This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
YS-01880	Sheave holder This tool is used to hold the generator rotor when removing or installing the generator rotor bolt, generator shaft bolt or pickup coil rotor bolt.	
YU-01304	Piston pin puller This tool is used to remove the piston pins.	
YU-03009	Micrometer (75 ~ 100 mm) This tool is used to measure the piston skirt diameter.	
YU-03017	Cylinder bore gauge (50 ~ 100 mm) This tool is used to measure the cylinder bore.	
YU-03112	Pocket tester This tool is used to check the electrical system.	



Tool No.	Tool name/Function	Illustration
Compression gauge YU-33223 Compression gauge adapter YU-33223-3	Compression gauge  These tools are used to measure engine compression.	
YU-33975	Steering nut wrench  This tool is used to loosen or tighten the steering stem ring nuts.	
YU-38411	Oil filter wrench  This tool is needed to loosen or tighten the oil filter cartridge.	
YU-8036-A	Inductive tachometer  This tool is used to check engine speed.	
ACC-11001-05-01	Quick Gasket®  This sealant is used to seal two mating surfaces (e. g., crankcase mating surfaces).	
90890-03153	Oil pressure gauge  This tool is used to measure the engine oil pressure.	



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## SPECIFICATIONS

## GENERAL SPECIFICATIONS

Item	Standard	Limit
<b>Dimensions</b>		
Overall length	2,500 mm (98.4 in)	----
Overall width	980 mm (38.6 in)	----
Overall height	1,140 mm (44.9 in): XV16A	----
	1,500 mm (59.1 in): XV16AT	----
Seat height	710 mm (28.0 in)	----
Wheelbase	1,685 mm (66.3 in)	----
Minimum ground clearance	145 mm (5.71 in)	----
Minimum turning radius	3,200 mm (126 in)	----
<b>Weight</b>		
Wet (with oil and a full fuel tank)	332 kg (732 lb): XV16A	----
	347 kg (765 lb): XV16AT	----
Dry (without oil and fuel)	307 kg (678 lb): XV16A	----
	322 kg (710 lb): XV16AT	----
Maximum load (total of cargo, rider, passenger, and accessories)	196 kg (432 lb): XV16A	----
	181 kg (399 lb): XV16AT	----

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