

Tech-CD

Service & Repair Manual



V-Star 950
Service Manual
2009-2012

SYMBOLS

The following symbols are used in this manual for easier understanding.

TIP

The following symbols are not relevant to every vehicle.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Serviceable with engine mounted		Gear oil
	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
	Special tool		Wheel bearing grease
	Tightening torque		Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone grease
	Electrical data		Apply locking agent (LOCTITE®).
	Engine oil		Replace the part with a new one.

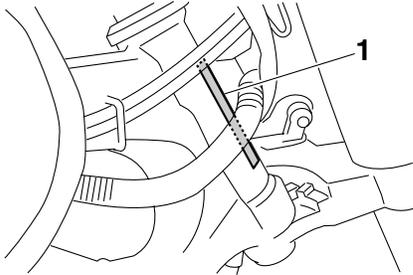
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IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

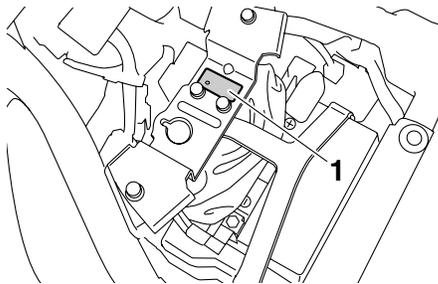
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



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MODEL LABEL

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



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FEATURES

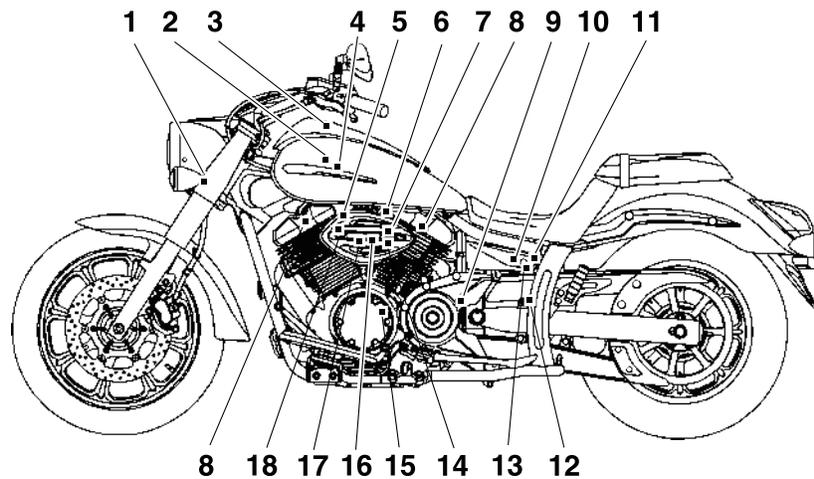
EAS5S71022

OUTLINE OF THE FI SYSTEM

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

Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.

As the requirements for the engine to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection (FI) system, in place of the conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors. The adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions.



- | | |
|-----------------------------------|----------------------------------|
| 1. Air temperature sensor | 17. Front cylinder ignition coil |
| 2. Intake air pressure sensor | 18. Engine temperature sensor |
| 3. Engine trouble warning light | |
| 4. Fuel pump | |
| 5. Front cylinder injector | |
| 6. Rear cylinder injector | |
| 7. Throttle position sensor | |
| 8. Spark plug | |
| 9. Speed sensor | |
| 10. Relay unit (fuel pump relay) | |
| 11. ECU (engine control unit) | |
| 12. O ₂ sensor | |
| 13. Lean angle sensor | |
| 14. ISC (idle speed control) unit | |
| 15. Crankshaft position sensor | |
| 16. Rear cylinder ignition coil | |

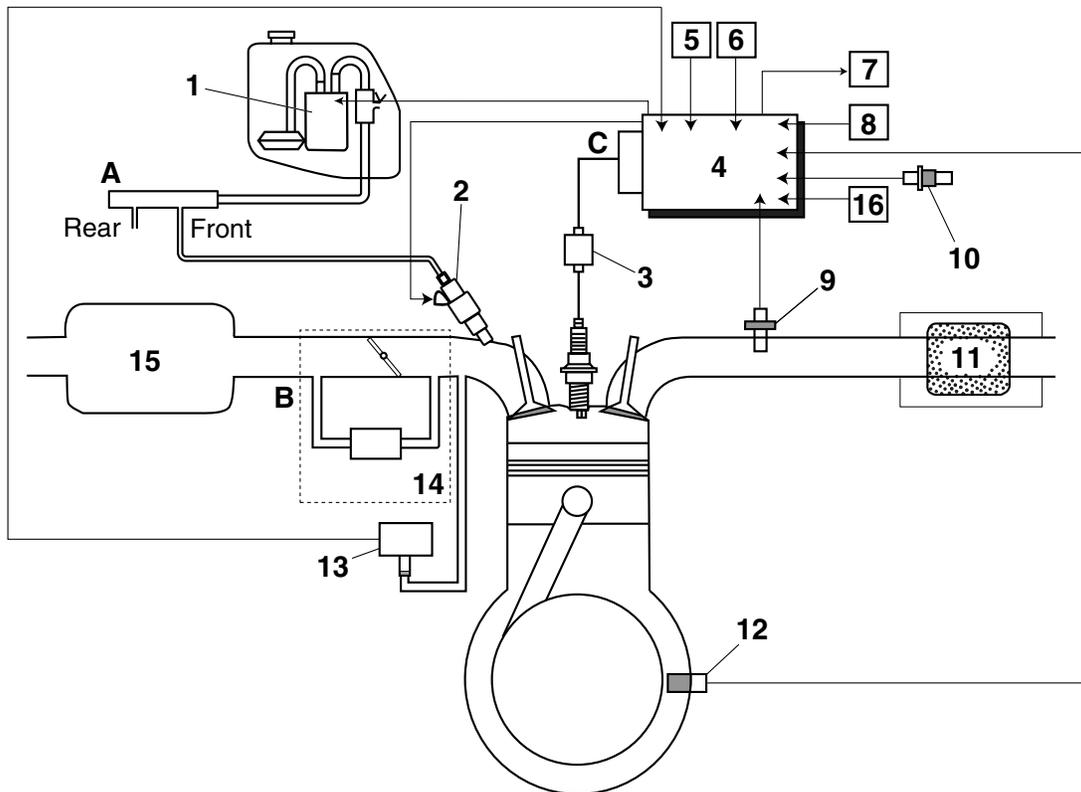
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FI SYSTEM

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 392 kPa (3.92 kg/cm², 56.9 psi). Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, air temperature sensor, engine temperature sensor, lean angle sensor, speed sensor and O₂ 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 | 14. Throttle body |
| 2. Fuel injector | 15. Air filter case |
| 3. Ignition coil | 16. Speed sensor |
| 4. ECU (engine control unit) | A. Fuel system |
| 5. Air temperature sensor | B. Air system |
| 6. Lean angle sensor | C. Control system |
| 7. ISC (idle speed control) unit | |
| 8. Throttle position sensor | |
| 9. O ₂ sensor | |
| 10. Engine temperature sensor | |
| 11. Catalytic converter | |
| 12. Crankshaft position sensor | |
| 13. Intake air pressure sensor | |

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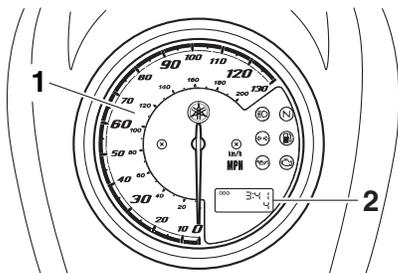
INSTRUMENT FUNCTIONS

Multi-function meter unit

EWA5S71001



Be sure to stop the vehicle before making any setting changes to the multi-function meter unit.



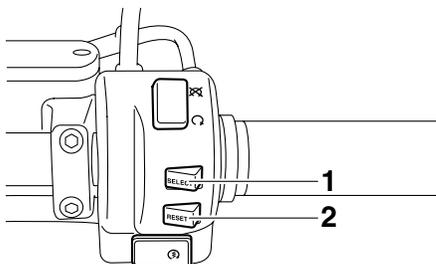
1. Speedometer
2. Odometer/tripmeter/fuel reserve tripmeter/clock

The multi-function meter unit is equipped with the following:

- a speedometer (which shows the riding speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled on the fuel reserve)
- a clock
- a self-diagnosis device
- a brightness control mode

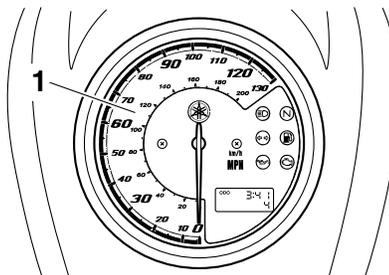
TIP

Be sure to turn the key to “ON” before using the “SELECT” switch and “RESET” switch, except for setting the brightness control mode.



1. “SELECT” switch
2. “RESET” switch

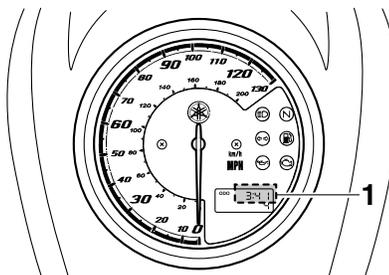
Speedometer



1. Speedometer

The speedometer shows the riding speed. When the key is turned to “ON”, the speedometer needle will sweep once across the speed range and then return to zero in order to test the electrical circuit.

Clock

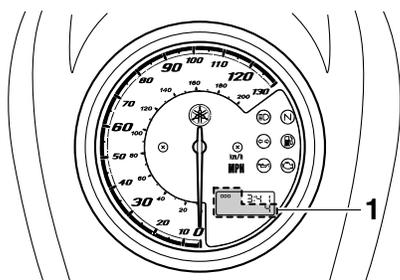


1. Clock

To set the clock:

1. Push the “SELECT” switch and the “RESET” switch together for at least three seconds.
2. When the hour digits start flashing, push the “RESET” switch to set the hours.
3. Push the “SELECT” switch, and the minute digits will start flashing.
4. Push the “RESET” switch to set the minutes.
5. Push the “SELECT” switch and then release it to start the clock.

Odometer, tripmeter, and fuel reserve trip-meter modes



1. Odometer/tripmeter/fuel reserve tripmeter

Push the “SELECT” switch to change the display between the odometer mode “ODO”, the tripmeter modes “TRIP A” and “TRIP B” in the following order:

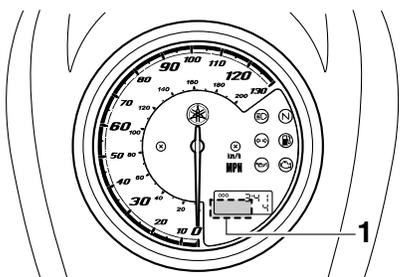
ODO → TRIP A → TRIP B → ODO

If the fuel level warning light comes on, the odometer display will automatically change to the fuel reserve tripmeter mode “TRIP F” and start counting the distance traveled from that point. In that case, push the “SELECT” switch to change the display between the various tripmeter and odometer modes in the following order:

TRIP F → TRIP A → TRIP B → ODO → TRIP F

To reset a tripmeter, select it by pushing the “SELECT” switch, and then push the “RESET” switch for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically, and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

Self-diagnosis device



1. Error code display

This model is equipped with a self-diagnosis device for various electrical circuits. If any of those circuits are defective, the engine trouble warning light will come on, and then the

odometer/tripmeter/clock display will indicate a two-digit error code (e.g., 12, 13, 14).

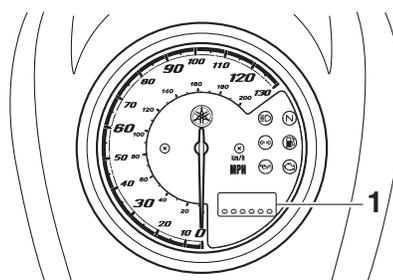
If the odometer/tripmeter/clock display indicates any error codes, note the code number, and then check the vehicle. Refer to “FUEL INJECTION SYSTEM” on page 7-27.

ECA5S71001

NOTICE

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

Brightness control mode



1. Brightness level

This function allows you to adjust the brightness of the multi-function meter unit panel to suit the outside lighting conditions.

To set the brightness:

1. Turn the key to “OFF”.
2. Push and hold the “SELECT” switch.
3. Turn the key to “ON”, and then release the “SELECT” switch after five seconds.
4. Adjust the multi-function meter unit panel brightness level by pushing the “SELECT” switch.
5. Push the “RESET” switch.

The odometer/tripmeter/clock display will return to the prior mode.

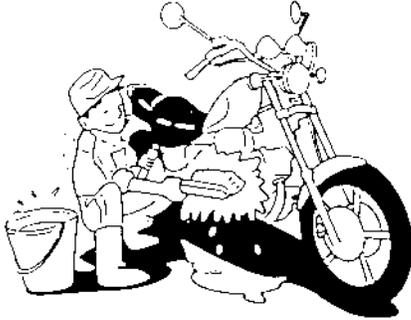
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IMPORTANT INFORMATION

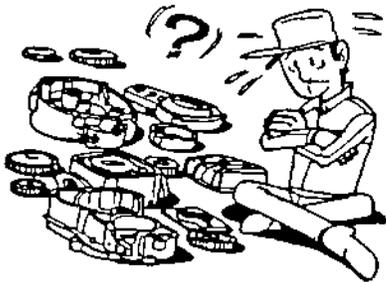
EAS20190

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" on page 1-9.
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.

EAS20200

REPLACEMENT PARTS

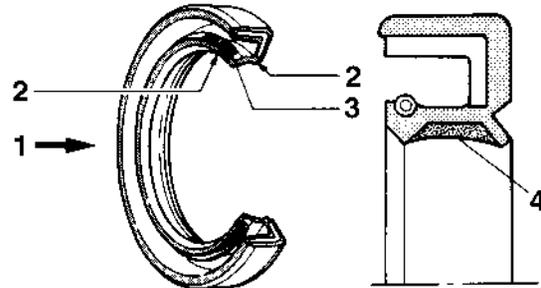
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS20210

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.

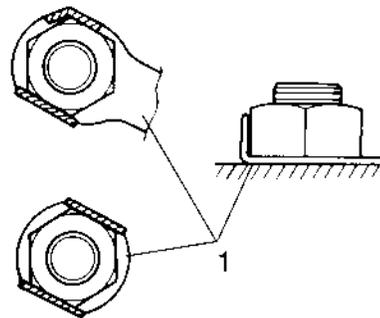


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

LOCK WASHERS/PLATES AND COTTER PINS

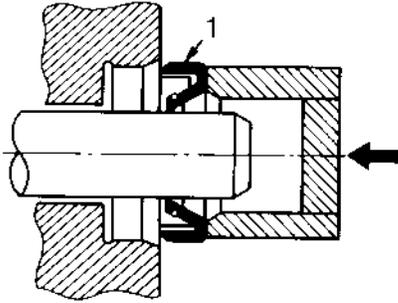
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

BEARINGS AND OIL SEALS

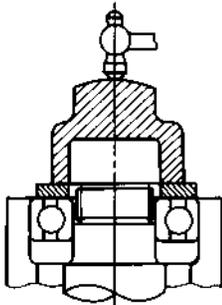
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

NOTICE

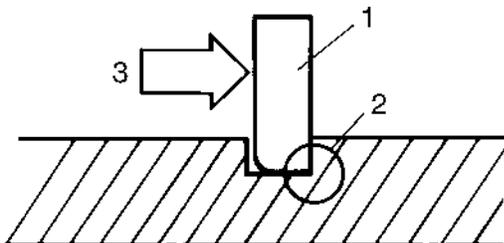
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



EAS20240

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.



CHECKING THE CONNECTIONS

EAS20250

CHECKING THE CONNECTIONS

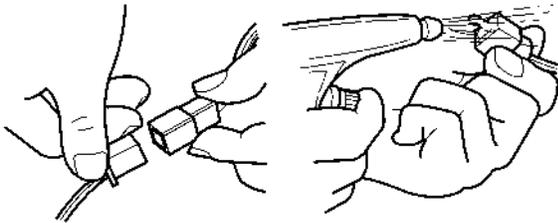
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
 - Lead
 - Coupler
 - Connector

2. Check:
 - Lead
 - Coupler
 - Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.

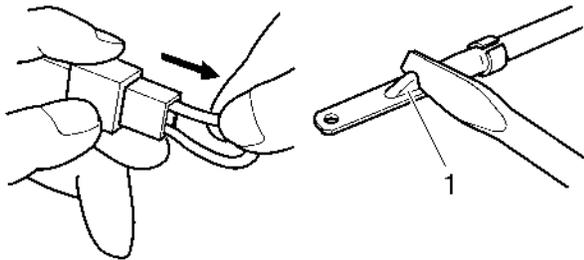


3. Check:
 - All connections

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.

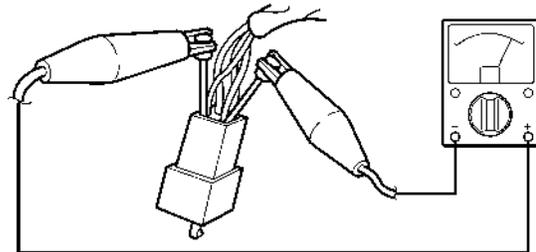
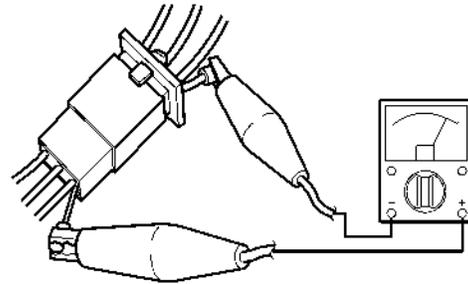
5. Check:
 - Continuity
(with the pocket tester)



Pocket tester
90890-03112
Analog pocket tester
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.



EAS20260

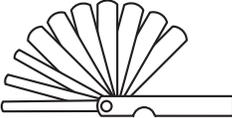
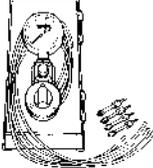
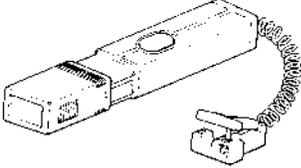
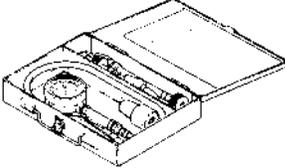
SPECIAL TOOLS

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 numbers starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part numbers starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-8, 7-79, 7-80, 7-81, 7-85, 7- 86, 7-87, 7-88, 7-89, 7-90, 7- 91, 7-92, 7-93, 7-94, 7-95
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-7
Vacuum gauge 90890-03094 Carburetor synchronizer YU-44456	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 20px;"> 90890-03094  </div> <div style="display: flex; align-items: center;"> YU-44456  </div> </div>	3-9
Timing light 90890-03141 Inductive clamp timing light YU-03141		3-5
Compression gauge 90890-03081 Engine compression tester YU-33223		5-22