



**SERVICE MANUAL  
MANUEL D'ATELIER  
INSTRUKTIONSBOK**

**RS90K  
RS90RK  
RSG90K  
RS90MK  
RST90K  
RST90TFK**

**8FJ-28197-J0**

**981097**

## NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha snowmobiles have a basic understanding of the mechanical concepts and procedures inherent in snowmobile repair. Without such knowledge, attempted repairs or service to this model may render it unfit and/or unsafe to use. Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

## HOW TO USE THIS MANUAL

Particularly important information is distinguished in this manual by the following notations:



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

### **WARNING**

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

### **CAUTION:**

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

### **NOTE:**

A NOTE provides key information that can make procedures easier or clearer.

### **MANUAL FORMAT**

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all inspection, repair, assembly, and disassembly operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required to correct the problem will follow the symbol, e.g.,

- Bearings  
Pitting/damage → Replace.

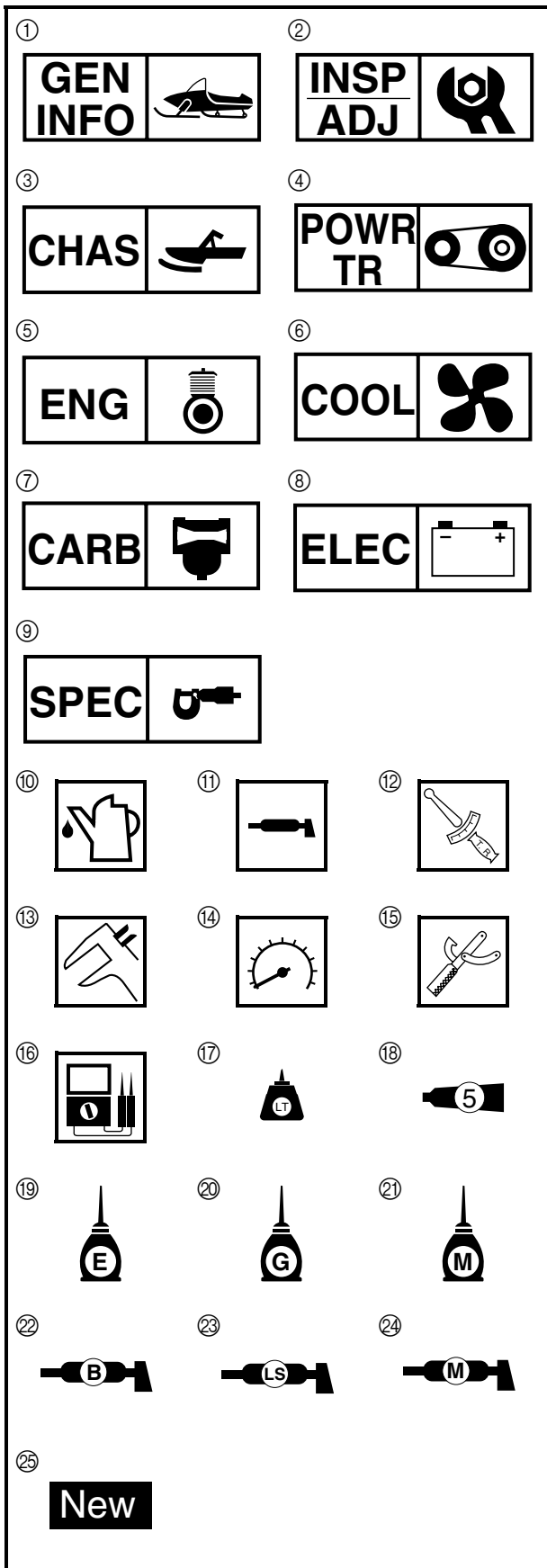
### **EXPLODED DIAGRAM**

Each chapter provides exploded diagrams before each disassembly section to facilitate correct disassembly and assembly procedures.

**RS90K, RS90RK, RSG90K,  
RS90MK, RST90K, RST90TFK  
SERVICE MANUAL**

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## ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

- ① General information
- ② Periodic inspection and adjustment
- ③ Chassis
- ④ Power train
- ⑤ Engine
- ⑥ Cooling system
- ⑦ Carburetion
- ⑧ Electrical
- ⑨ Specifications










Illustrated symbols ⑩ to ⑯ are used to identify the specifications which appear.

- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Tightening
- ⑬ Wear limit, clearance
- ⑭ Engine speed
- ⑮ Special tool
- ⑯ Ω, V, A

Illustrated symbols ⑰ to ⑳ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑰ Apply locking agent (LOCTITE®)
- ⑱ Apply Yamabond No.5®
- ⑲ Apply engine oil
- ⑳ Apply gear oil
- ㉑ Apply molybdenum disulfide oil
- ㉒ Apply wheel bearing grease
- ㉓ Apply low-temperature lithium-soap base grease
- ㉔ Apply molybdenum disulfide grease
- ㉕ Use new one

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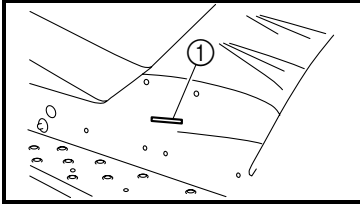
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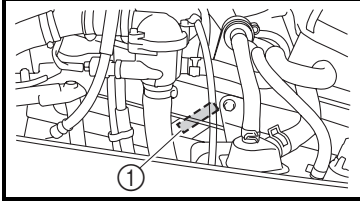


**GENERAL INFORMATION****MACHINE IDENTIFICATION****FRAME SERIAL NUMBER**

The frame serial number ① is located on the right-hand side of the frame (just below the front of the seat).

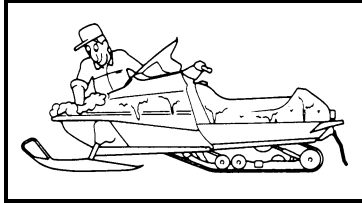
**ENGINE SERIAL NUMBER**

The engine serial number ① is located on the right-hand side of the crankcase.

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

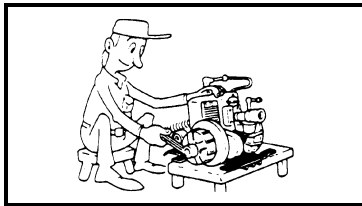
Designs and specifications are subject to change without notice.

**IMPORTANT INFORMATION**  
**PREPARATION FOR REMOVAL AND DISASSEMBLY**



1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.

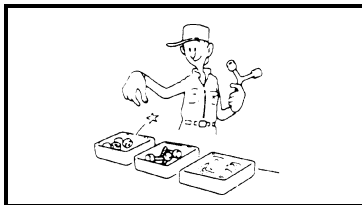
While cleaning, take care to protect the electrical parts, such as relays, switches, motor, resistors, controllers, etc., from high pressure water splashes.



2. Use proper tools and cleaning equipment.  
Refer to "SPECIAL TOOLS".

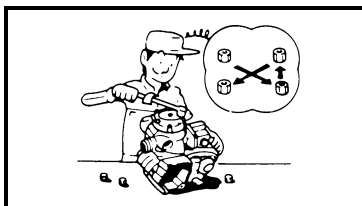


3. When disassembling the machine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must be reused or replaced as an assembly.

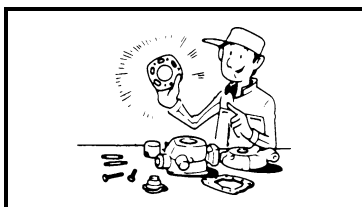


4. During disassembly of the machine, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help ensure that all parts are reinstalled correctly.

5. Keep all parts away from any source of fire.



6. Be sure to keep to the tightening torque specifications. When tightening bolts, nuts, and screws, start with those that have larger diameters, and proceed from the inside to the outside in a crisscross pattern.

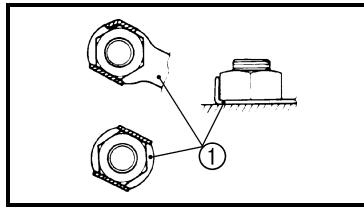


**ALL REPLACEMENT PARTS**

We recommend using genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for assembly and adjustments.

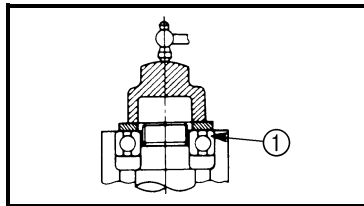
**GASKETS, OIL SEALS, AND O-RINGS**

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



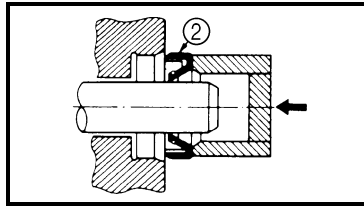
**LOCK WASHERS/PLATES AND COTTER PINS**

All lock washers/plates ① and cotter pins must be replaced if they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



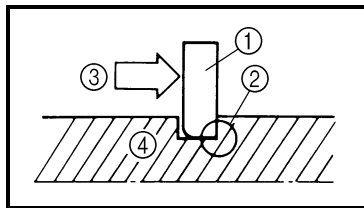
**BEARINGS AND OIL SEALS**

Install the bearings ① and oil seals ② with their manufacturer's marks or numbers facing outwards. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil the bearings liberally when installing.



**CAUTION:**

**Do not use compressed air to spin the bearings dry. This causes damage to the surface of the bearings.**



**CIRCLIPS**

All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace misshapen circlips. When installing a circlip ①, make sure that the sharp edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

**LOCTITE®**

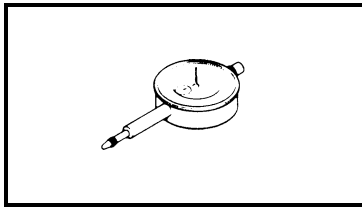
After installing fasteners that have LOCTITE® applied, wait 24 hours before using the machine. This will give the LOCTITE® time to dry properly.

## SPECIAL TOOLS

Some special tools are necessary for a completely accurate tune-up and assembly. Using the correct special tool will help prevent damage that can be caused by the use of improper tools or improvised techniques.

### NOTE:

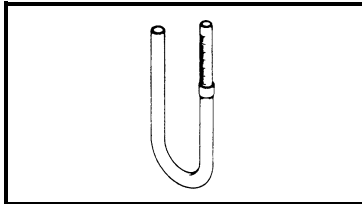
- Be sure to use the correct part number when ordering the tool, since the part number may differ according to country.
- For USA and Canada, use part number starting with “YB-”, “YM-”, “YU-”, “YS-” or “ACC-”.
- For others, use part number starting with “90890-”.



### FOR TUNE UP

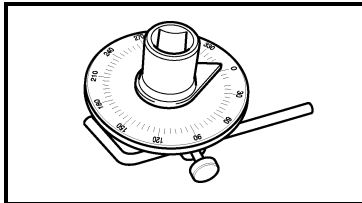
- Dial gauge  
P/N: YU-03097  
90890-03097

This gauge is used for run out measurement.



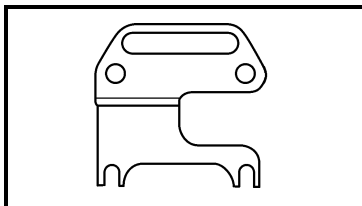
- Fuel level gauge  
P/N: YM-01312-A  
90890-01312

This gauge is used to measure the fuel level in the float chamber.



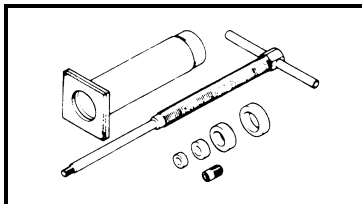
- Angle gauge  
Use goods on the market.

This tool is used to tightening the torque.



- Steering linkage alignment plate  
P/N: YS-01487  
90890-01487

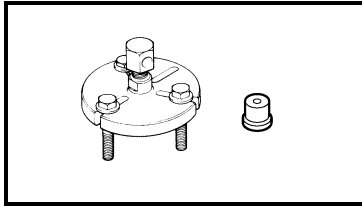
Locks steering relay arms in place while adjusting the steering linkage for front-end alignment.



### FOR ENGINE SERVICE

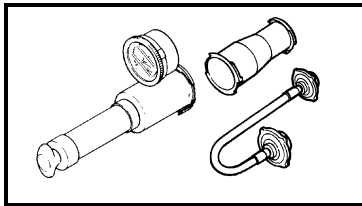
- Piston pin puller  
P/N: YU-01304  
90890-01304

This tool is used to remove the piston pin.



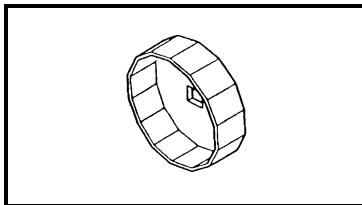
- Rotor holding puller  
P/N: YU-33270-B  
90890-01362
- Flywheel puller attachment  
P/N: YM-33282  
90890-04089

These tools are used to remove the magneto rotor.



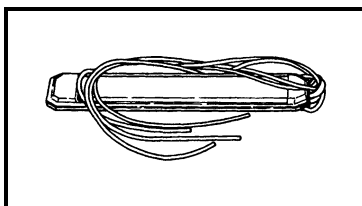
- Cooling system tester  
P/N: YU-24460-01  
90890-01325
- Adapter  
P/N: YU-33984  
90890-01352

This tester and its adapter are used for checking the cooling system.



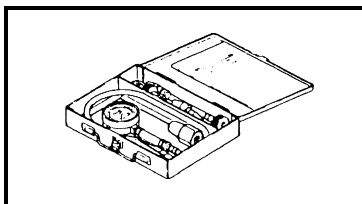
- Oil filter wrench  
P/N: YM-01469  
90890-01469

This tool is needed to loosen or tighten the oil filter cartridge.



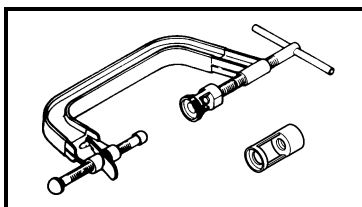
- Vacuum gauge  
P/N: YU-44456  
90890-03094

This guide is used to synchronize the carburetors.



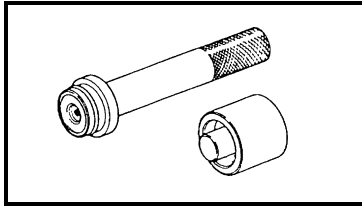
- Compression gauge set  
P/N: YU-33223 (compression gage)  
90890-03081
- P/N: YU-33223-4 (adapter)  
90890-04136

These tools are used to measure engine compression.



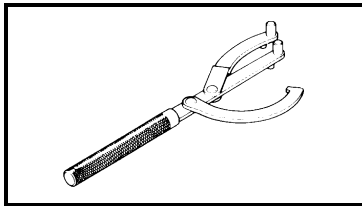
- Valve spring compressor set  
P/N: YM-04019 (valve spring compressor)  
90890-04019
- P/N: YM-04108 (attachment)  
90890-04108

These tools are used to remove or install the valve assemblies.



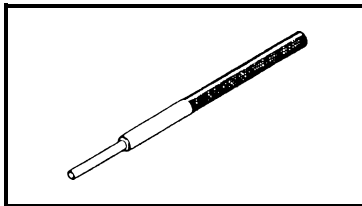
- 40 and 50 mm bearing driver  
P/N: YM-04058  
90890-04058
- Mechanical seal installer  
P/N: YM-04145  
90890-04145

These tools are used to install the water pump seal.



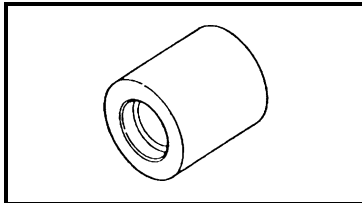
- Rotor holding tool  
P/N: YU-01235  
90890-01235

This tool is used to hold the camshaft sprocket.



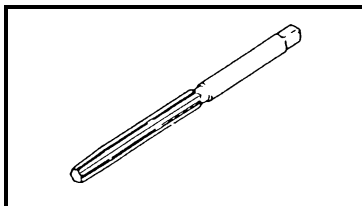
- Valve guide remover (ø5)  
P/N: YM-04097  
90890-04097

This tool is used to remove or install the valve guides.



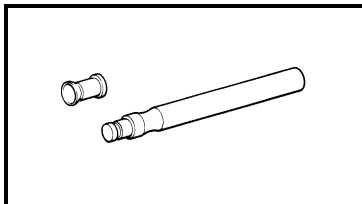
- Valve guide installer (ø5)  
P/N: YM-04098  
90890-04098

This tool is used to install the valve guides.



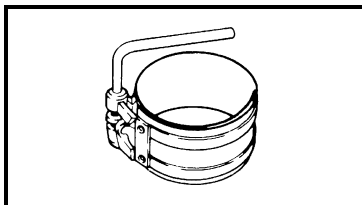
- Valve guide reamer (ø5)  
P/N: YM-04099  
90890-04099

This tool is used to rebores the new valve guides.



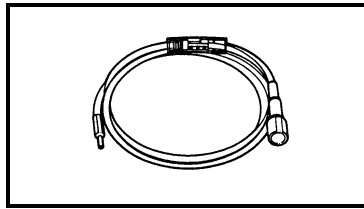
- Valve lapper  
P/N: 90890-04101

This tool is needed to remove and install the valve lifters.



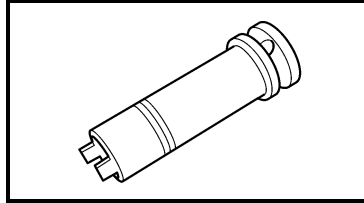
- Piston ring compressor  
P/N: YM-08037  
90890-05158

This tool is used to compress the piston rings when installing the piston into the cylinder.



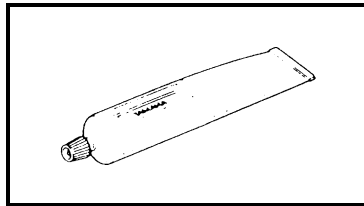
- Dynamic spark tester  
P/N: YM-34487
- Ignition checker  
P/N: 90890-06754

This tool is used to check the ignition system component.



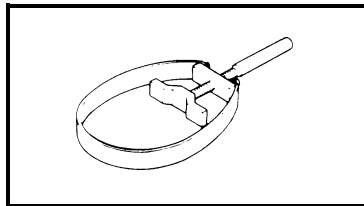
- Engine mount spacer wrench  
P/N: YS-01489  
90890-01489

Used to turn the engine mounting bolts when removing/installing engine.



- Quick gasket®  
P/N: ACC-QUICK-GS-KT
- Yamaha bond No. 1215  
P/N: 90890-85505

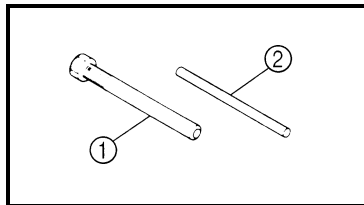
This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces.)



#### FOR POWER TRAIN SERVICE

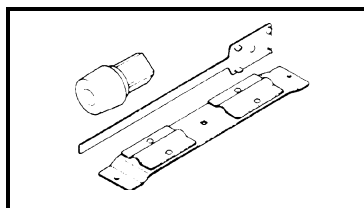
- Sheave holder  
P/N: YS-01880-A  
90890-01701

This tool is used to hold the primary sheave and A.C. magneto rotor.



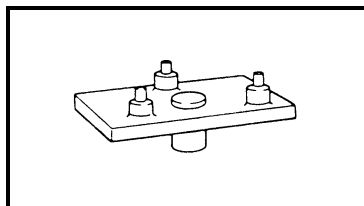
- Primary sheave puller (18 mm)  
P/N: YS-01881-A ①, YS-01881-1 ②  
90890-01898

This tool is used for removing the primary sheave.



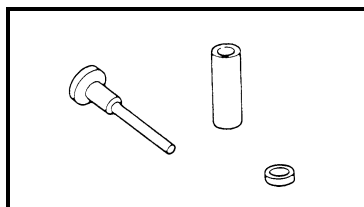
- Clutch spider separator  
P/N: YS-28890-C  
90890-01711

This tool is used when disassembling and assembling the primary sheave.



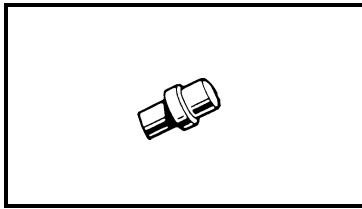
- Clutch separator adapter  
P/N: YS-34480  
90890-01740

This tool is used when disassembling and assembling the primary sheave.



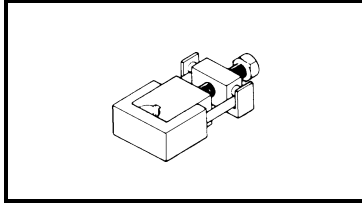
- YXR clutch bushing jig kit  
P/N: YS-39752

This tool is used for removal and installation of primary clutch weight and roller bushings.



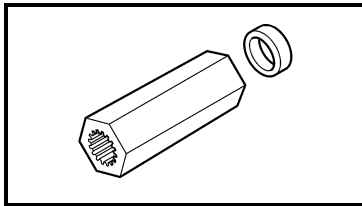
- Clutch bushing press  
P/N: YS-42424

This tool is used for removing and installing the post bushings (primary sheave cap bush, sliding sheave bush and torque cam bush).



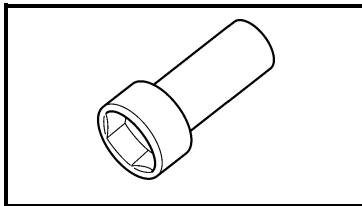
- Track clip installer  
P/N: YS-91045-C  
90890-01721

This tool is used for installing the track clip.



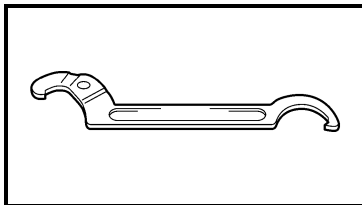
- Secondary shaft slide & holder  
P/N: YS-01492  
90890-01492

Remove and install secondary shaft bearing tapered collar. Also used to hold the secondary shaft when used with the drive gear socket (YS-01490/90890-01490).



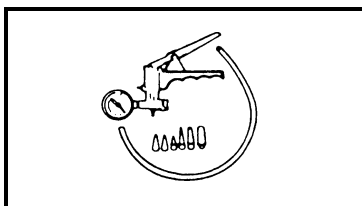
- Drive gear socket  
P/N: YS-01490  
90890-01490

Remove and install drive chain sprocket nut (36 × 100 mm (1.4 × 4 in) deep well socket).



- Ring nut wrench  
P/N: YU-01268  
90890-01268

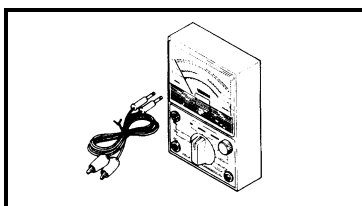
Remove and install secondary shaft bearing nut.



**FOR CARBURETION SERVICE**

- Mity vac  
P/N: YS-42423  
90890-06756

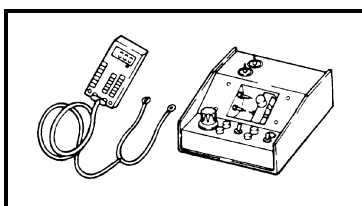
This tool is used to check the fuel pump.



**FOR ELECTRICAL SERVICE**

- Pocket tester  
P/N: YU-03112-C  
90890-03112

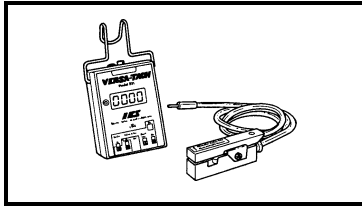
This instrument is necessary for checking the electrical components.



- Electro tester  
P/N: YU-33260-A  
90890-03021

This instrument is invaluable for checking the electrical system.





- Engine tachometer  
P/N: YU-08036-C  
90793-80009
- This tool is used to check engine speed.

## PERIODIC INSPECTION AND ADJUSTMENT

### INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. In addition, the need for costly overhaul work will be greatly reduced. This information applies to machines already in service as well as new machines that are being prepared for sale. All service technicians should be familiar with this entire chapter.

### PERIODIC MAINTENANCE CHART

Regular maintenance is most important for best performance and safe operation.

| Item                                | Remarks   | Pre-operation check (Daily)                                      | Initial 1 month or 800 km (500 mi) (40 hr) | Every Seasonally or 3,200 km (2,000 mi) (160 hr) |
|-------------------------------------|---|--|--|--|
| Spark plugs                         | Check condition.<br>Adjust gap and clean.<br>Replace if necessary.                |  |  | ●  |
| Valve clearance                     | Check clearance.<br>Adjust clearance when engine is cold.                         | Every 40,000 km (25,000 mi)                                      |  |  |
| Engine oil                          | Check oil level.  | ●  |  |  |
|                                     | Replace.  |  | ●  | ●  |
| Engine oil filter cartridge         | Replace.  |  | ●  | Every 20,000 km (12,000 mi)                      |
| Fuel                                | Check fuel level.   | ●  |  |  |
| Fuel filter                         | Check condition.<br>Replace if necessary.   |  |  | ●  |
| Fuel line                           | Check fuel hose for cracks or damage.<br>Replace if necessary.                    |  |  | ●  |
| Engine coolant                      | Check coolant level.  | ●  |  |  |
|                                     | Air bleed the cooling system if necessary.  |  |  | ●  |
|                                     | The coolant should be changed at least every season.                              |  |  | ●  |
| Carburetor                          | Check throttle lever operation.   | ●  |  |  |
|                                     | Adjust the jets.  | Whenever operating condition (elevation/temperature) is changed. |  |  |
| Engine stop switch                  | Check operation.<br>Repair if necessary.  | ●  |  |  |
| Throttle override system (T.O.R.S.) | Check operation.<br>Repair if necessary.  | ●  |  |  |
| Throttle lever                      | Check operation.<br>Repair if necessary.  | ●  |  |  |
| Exhaust system                      | Check for leakage.<br>Tighten or replace gasket if necessary.                     |  |  | ●  |
| Drive guard                         | Check for cracks, bends or damage.<br>Replace if necessary.                       | ●  |  |  |
| V-belt                              | Check for wear and damage.<br>Replace if necessary.                               | ●  |  |  |
| Drive track and idler wheels        | Check deflection, and for wear and damage.<br>Adjust/replace if necessary.        | ●  |  |  |
| Slide runners                       | Check for wear and damage.  | ●  |  |  |
|                                     | Replace if necessary.   |  |  | ●  |
| Brake and parking brake             | Check operation and fluid leakage.  | ●  |  |  |
|                                     | Adjust free play and/or replace pads if necessary.                                |  |  | ●  |
|                                     | Replace brake fluid.  | See NOTE on page 2-2.  |  |  |
| Disc brake installation             | Check for slight free play.<br>Lubricate shaft with specified grease as required. |  |  | Every 1,600 km (1,000 mi)                        |

# PERIODIC MAINTENANCE CHART



| Item   | Remarks  | Pre-operation check (Daily)                                      | Initial 1 month or 800 km (500 mi) (40 hr) | Every                                      |
|--|--|--|--|--|
|  |  |  |  | Seasonally or 3,200 km (2,000 mi) (160 hr) |
| Drive chain oil  | Check oil level.   |  | ●  |  |
|  | Replace.   |  |  | ●  |
| Drive chain  | Check deflection.<br>Adjust if necessary.  | Initial at 500 km (300 mi) and every 800 km (500 mi) thereafter. |  |  |
| Skis and ski runners                                     | Check for wear and damage.   | ●  |  |  |
|  | Replace if necessary.  |  |  | ●  |
| Steering system  | Check operation.   | ●  |  |  |
|  | Adjust toe-out if necessary.   |  |  | ●  |
| Strap (RS90M)  | Check for damage.<br>Replace if necessary.   | ●  |  |  |
| Lights   | Check operation.<br>Replace bulbs if necessary.  | ●  |  |  |
| Battery  | Check condition.<br>Charge if necessary.   |  |  | ●  |
| Primary and secondary clutches                           | Check engagement and shift speed.<br>Adjust if necessary.  |  |  | ●  |
|  | Whenever operating elevation is changed.   |  |  |  |
|  | Inspect sheaves for wear/damage.<br>Inspect weights/rollers and bushings for wear-for primary.<br>Inspect ramp shoes/bushings for wear-for secondary.<br>Replace if necessary. |  |  | ●  |
|  | Lubricate with specified grease.   |  |  | ●  |
| Steering column bearing                                  | Lubricate with specified grease.   |  |  | ●  |
| Ski and front suspension                                 | Lubricate with specified grease.   |  |  | ●  |
| Suspension component                                     | Lubricate with specified grease.   |  |  | ●  |
| Parking brake cable end and lever end/throttle cable end | Lubricate with specified grease.   |  |  | ●  |
|  | Check cable damage.<br>Replace if necessary.   |  |  | ●  |
| Shroud latches   | Make sure that the shroud latches are hooked.  | ●  |  |  |
| Fittings and fasteners                                   | Check tightness.<br>Repair if necessary.   | ●  |  |  |
| Tool kit and recommended equipment                       | Check for proper placement.  | ●  |  |  |

**NOTE:**

Brake fluid replacement:

1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hose every four years, or if cracked or damaged.

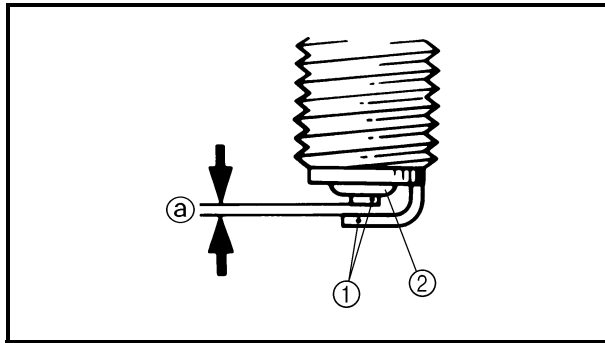
2

**Thank you very much  
for your reading.**

**Please click here and go  
back to the website.**


**Then, you can  
download the complete  
manual instantly.**

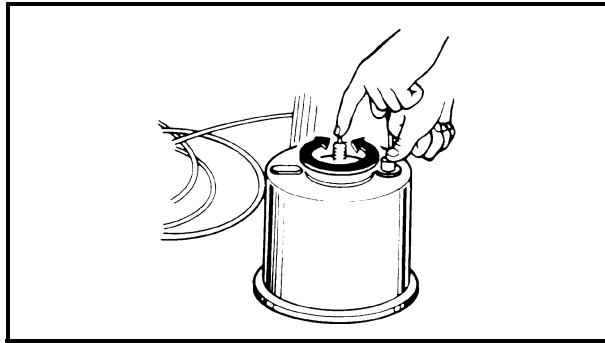
**No waiting.**



## ENGINE SPARK PLUGS

1. Remove:
  - Spark plug caps
  - Spark plugs
2. Inspect:
  - Electrodes ①
  - Damage/wear → Replace the spark plug.
  - Insulator color ②
3. Measure:
  - Spark plug gap ③
  - Out of specification → Regap.
  - Use a wire thickness gauge.

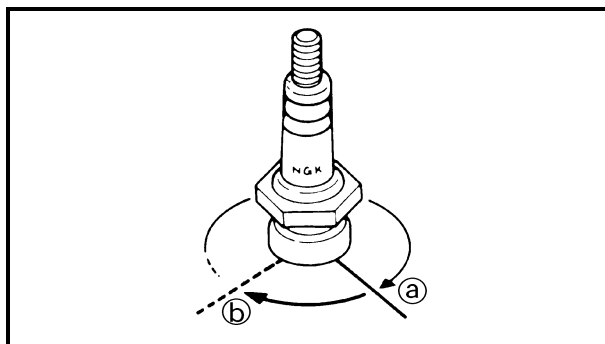
|   |   |
|---|---|
|  | <b>Spark plug gap:</b><br>0.7 ~ 0.8 mm (0.028 ~ 0.031 in) |
|---|---|




If necessary, clean the spark plugs with a spark plug cleaner.

### Standard spark plug: NGK R CR8E (NGK)

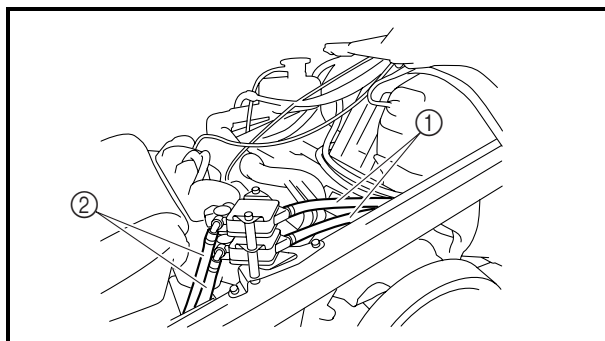
Before installing a spark plug, clean the gasket surface and spark plug surface.



4. Install:
  - Spark plugs

|   |   |
|---|---|
|  | <b>Spark plug:</b><br>13 Nm (1.3 m · kg, 9.4 ft · lb) |
|---|---|

**NOTE:** \_\_\_\_\_  
 Finger-tighten ③ the spark plug before torquing ④ it to specification.  
 \_\_\_\_\_



## FUEL LINE INSPECTION

1. Inspect:
  - Fuel hoses ①
  - Fuel delivery hoses ②
  - Cracks/damage → Replace.

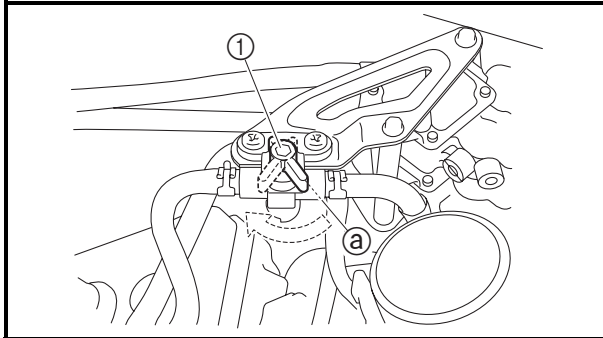
## COOLING SYSTEM

## Coolant replacement

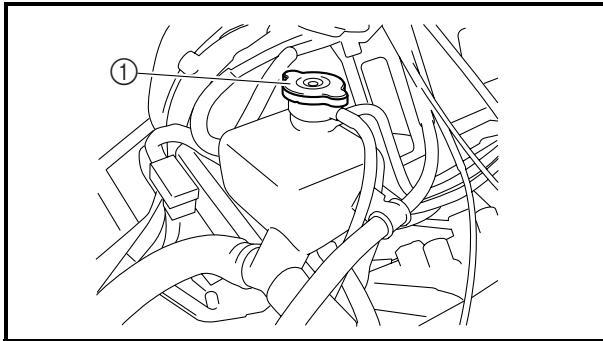
**NOTE:** \_\_\_\_\_

The coolant should be changed at least every season.

1. Place the machine on a level surface.



2. Make sure that the carburetor coolant shut-off lever (1) is turned to "ON" (a).  
(for RS90M)

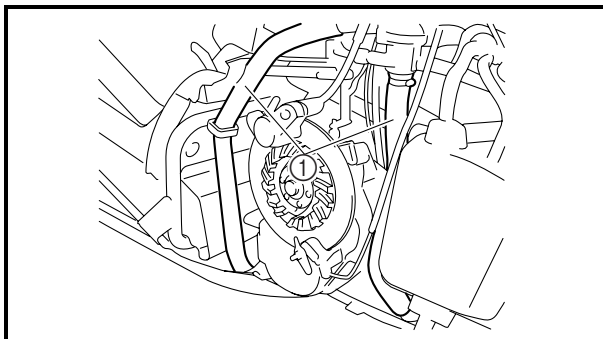


3. Remove:

- Coolant filler cap (1)

**⚠ WARNING** \_\_\_\_\_

Do not remove the coolant filler cap (1) when the engine is hot. Pressurized scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, place a thick rag or a towel over the coolant filler cap. Slowly turn the cap counterclockwise until it stop. This allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning it counterclockwise to remove it.



4. Place an open container under the coolant hoses.

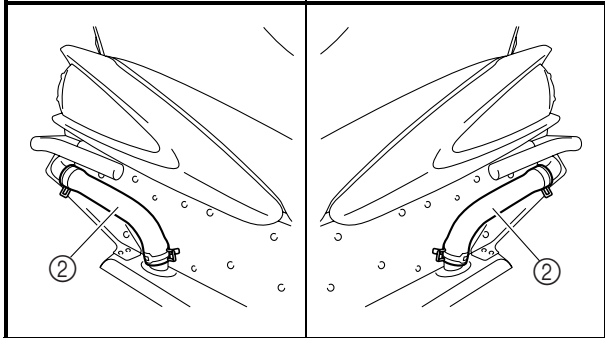
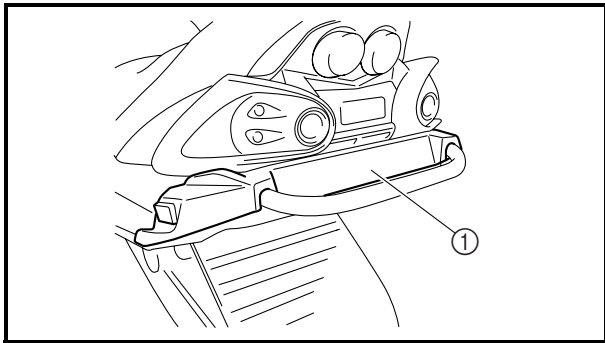
5. Disconnect:

- Coolant hoses (1)

6. Drain the coolant.

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

Lift up the tail of the machine to drain the coolant.



7. Remove:
  - Rear bumper cover ①
8. Disconnect:
  - Coolant hoses ②
9. Drain the coolant.

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

Lift up the front of the machine to drain the coolant completely.

**⚠ WARNING** \_\_\_\_\_

Coolant is poisonous. It is harmful or fatal if swallowed.

- If coolant is swallowed, induce vomiting immediately and get immediate medical attention.
- If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.
- If coolant splashes on your skin or clothes, quickly wash it away with soap and water.

10. Connect:
  - Front coolant hoses
11. Connect:
  - Rear coolant hoses
12. Fill:
  - Cooling system



**Recommended coolant:**

High quality silicate-free ethylene glycol antifreeze containing corrosion inhibitors

Coolant mixing ratio (coolant:water):  
3:2 (60%:40%)

**Total amount:**

RS90/RS90R/RSG90  
4.8 L (4.22 Imp qt, 5.07 US qt)

RS90M  
6.3 L (5.55 Imp qt, 6.66 US qt)

RST90 "USA/Canada"/RST90TF  
"Canada"

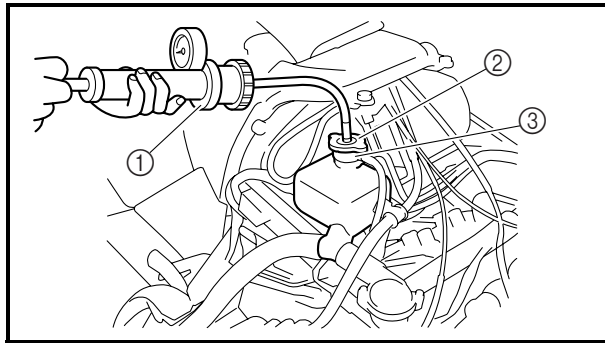
5.2 L (4.58 Imp qt, 5.50 US qt)  
RST90 "Europe"/RST90TF

"Europe"  
5.4 L (4.75 Imp qt, 5.71 US qt)

**CAUTION:** \_\_\_\_\_

- Hard water or salt water is harmful to engine parts. If soft water is not available, use boiled or distilled water.
- Do not use water containing impurities or oil.

13. Bleed the air from the cooling system.



### 14. Inspect:

- Cooling system  
Decrease of pressure (leaks) → Repair as required.

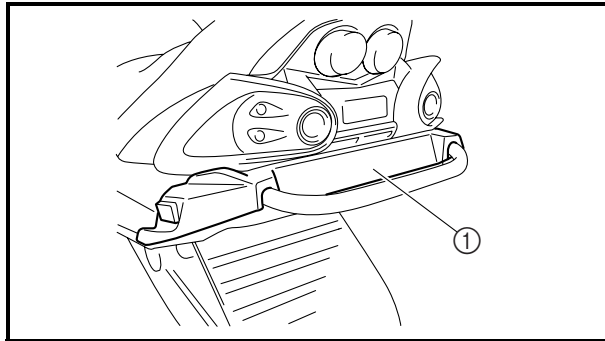
### Inspection steps:

- Attach the cooling system tester ① and adapter ② to the coolant filler ③.



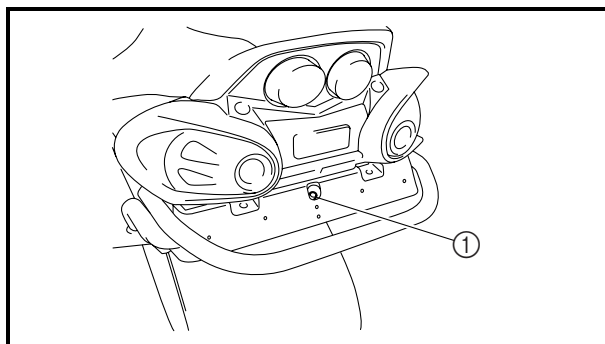
**Cooling system tester:**  
90890-01325, YU-24460-01  
**Adapter:**  
90890-01352, YU-33984

- Apply 100 kPa (1.0 kg/cm<sup>2</sup>, 14 psi).
- Measure the pressure with the gauge.



### Air bleeding

1. Remove:
  - Rear bumper cover ①
2. Bleed air from the cooling system.



### Air bleeding steps:

- Lift up the tail of the machine.
- Remove the bleed bolt ① on the heat exchanger.
- While slowly adding coolant to the coolant filler, drain the coolant until no more air bubbles appear.
- Tighten the bleed bolt ①.



**Bleed bolt:**  
13 Nm (1.3 m · kg, 9.4 ft · lb)

- Add coolant to the coolant cold level ②.

