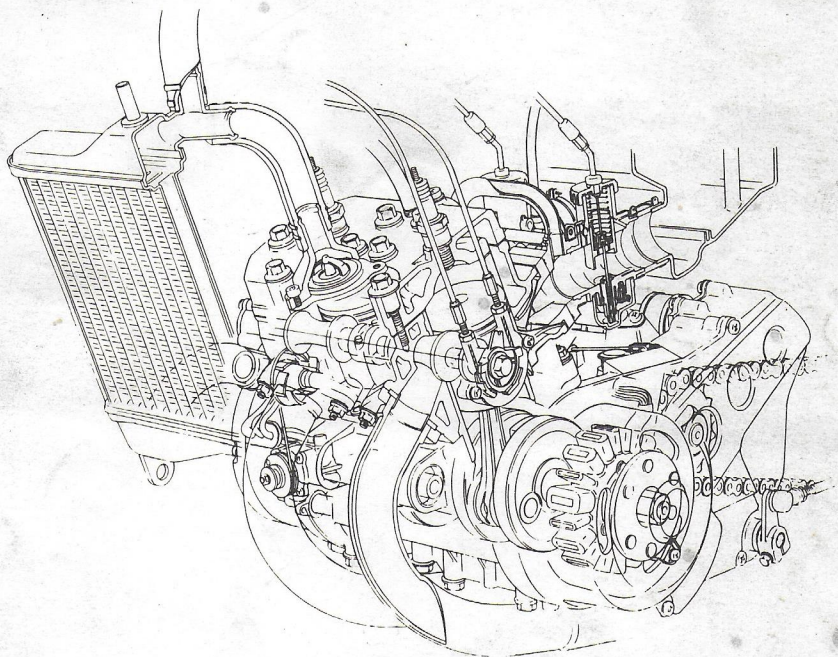


# **YAMAHA**

## **SERVICE GUIDE**



# **RD350/250**

# **RZ350/250**



**YAMAHA**

90894-29209



3430

RICK SUMNER  
MOTORCYCLE LITERATURE  
BOUGHT AND SOLD  
01663 734580

RD350/250

RZ350/250

**SERVICE GUIDE**

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## FOREWORD

This service guide provides technical information on new mechanisms of the new RD350/250 (RZ350/250). Although these models are completely new unlike the previous RD series, the construction is based on the previous RD series. Therefore, this service guide describes mainly the new YPVS system, new cooling system and rear suspension.

For detailed procedures, you can refer to the respective service manual. As this guide describes pre-delivery as well as periodic inspection, it also serves as a guide for initial inspection steps.

It is our sincere hope and belief that this guide will help enhance the technical knowledge and servicing ability of all of you who are engaged in selling these models and bring you a prosperous business reflecting customer satisfaction and reliance.

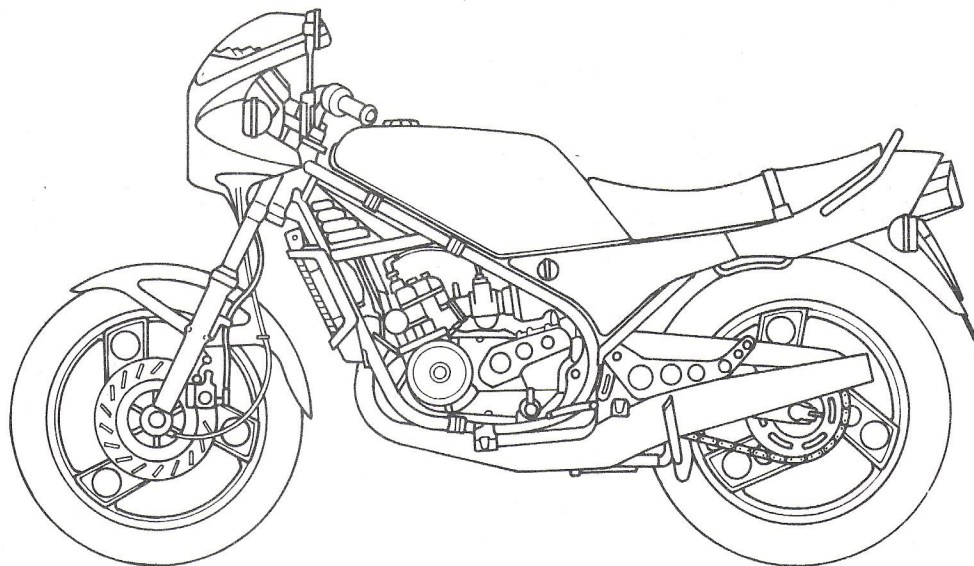
SERVICE DEPT.  
INTERNATIONAL DIVISION  
YAMAHA MOTOR CO., LTD.

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## 1. OUTLINE OF RD350/250 (RZ350/250)



### ENGINE

- \* 2-stroke, Parallel twin, Liquid cooling.
- \* Servo motor driven YPVS. (Yamaha Power Valve System)
- \* New liquid cooling system. (Single row radiator and thermostat equipped)
- \* Orthogonal engine mount.
- \* Narrow engine width.
- \* O-ring chain for drive chain.

### CHASSIS

- \* Hitenion steel tubelar frame.
- \* New type link suspension system.
- \* Front and rear disc brakes.
- \* Tilt type sports fairing.
- \* Wider tires.
- \* Large capacity fuel tank. (20 litter)
- \* New cast wheels.
- \* Air assisted front fork with variable damper.

### ELECTRICAL

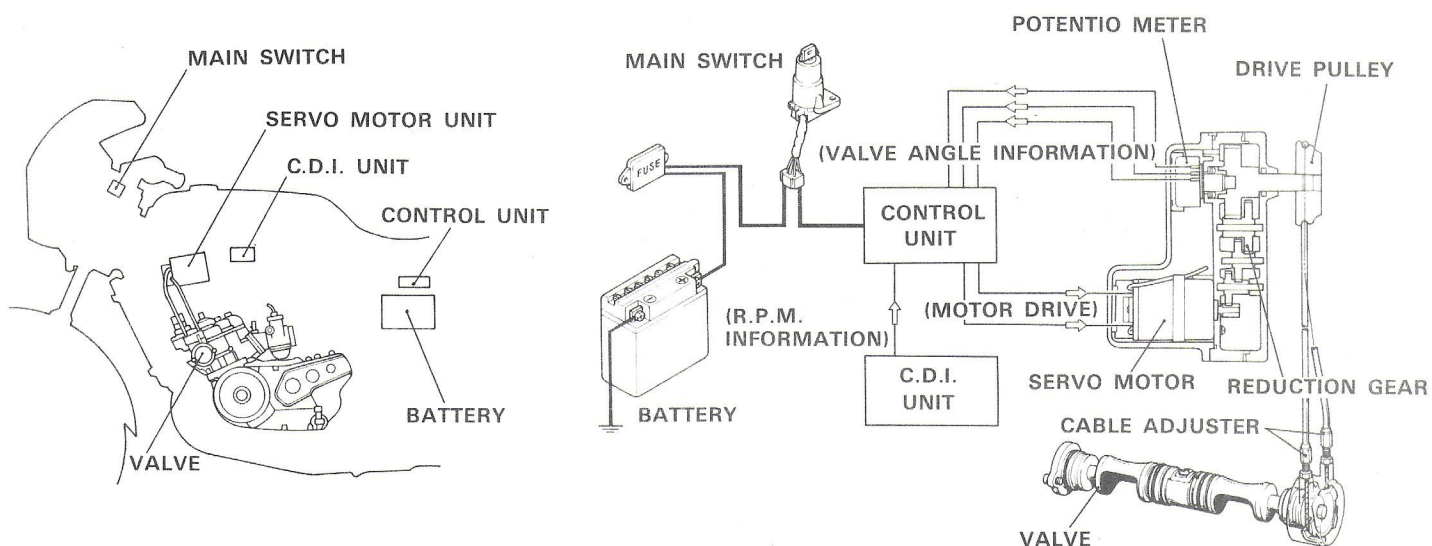
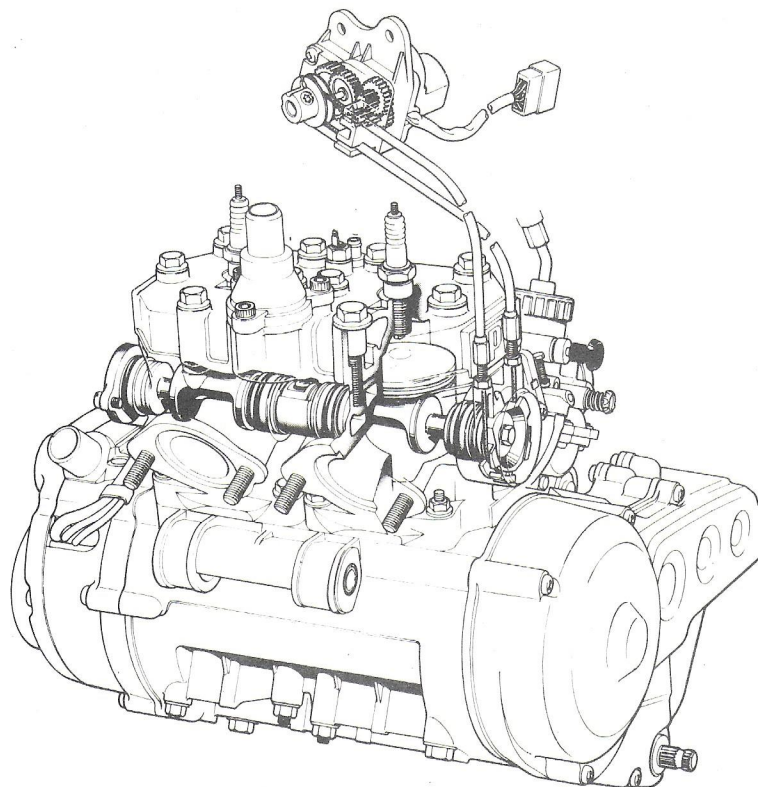
- \* New capacitor discharge ignition system. (Electronic advance)
- \* Quartz halogen head lamp.
- \* Dual bulb tail light.
- \* New instullment design.

## 2. NEW MECHANISM AND MAINTENANCE [ENGINE]

### 2-1. NEW YPVS SYSTEM

#### Outline of new YPVS (Yamaha power valve system)

Newly designed YPVS is equipped on these models in order to obtain better engine performance all the way from the bottom end to the top. An electronic servo motor drives the YPVS valves fitted in the exhaust port in the cylinder. The electronic servo motor operates according to the engine rpm using the micro computer and it provides greater torque for rotating the valves. Thus, accurate operation can be ensured.



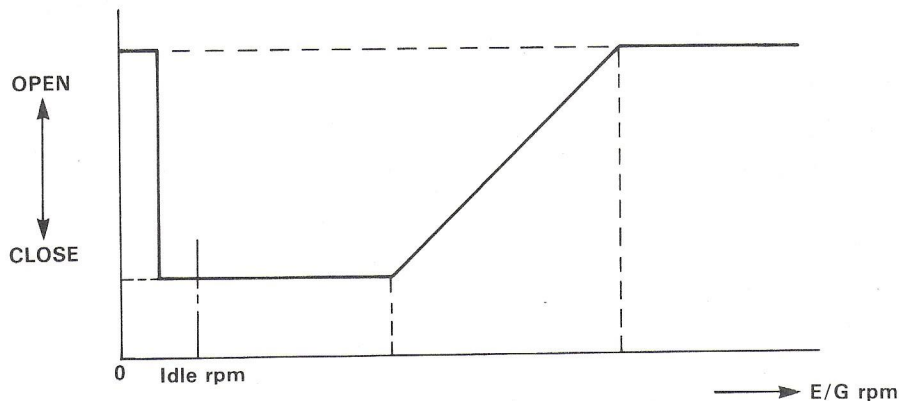


### Operation

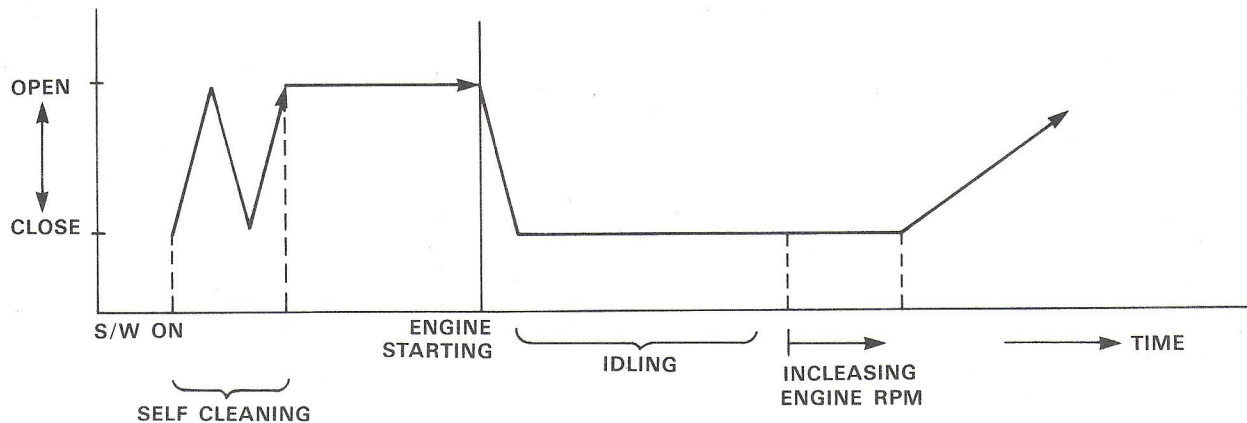
YPVS valves are driven by the DC servo motor which is controlled by the micro computer (control unit).

Control unit senses the engine rpm by the ignition pulses from the C.D.I. unit and also senses the YPVS valve angle by the position of the potentiometer equipped in the servo motor unit. The control unit is so programmed that it compares the two signals and drives the servo motor to cause the YPVS valves to form appropriate angles for any engine rpm.

### Basic operation (engine rpm vs. valve opening rate)



### YPVS operation (time vs. valve opening rate)



### (Self cleaning mechanism)

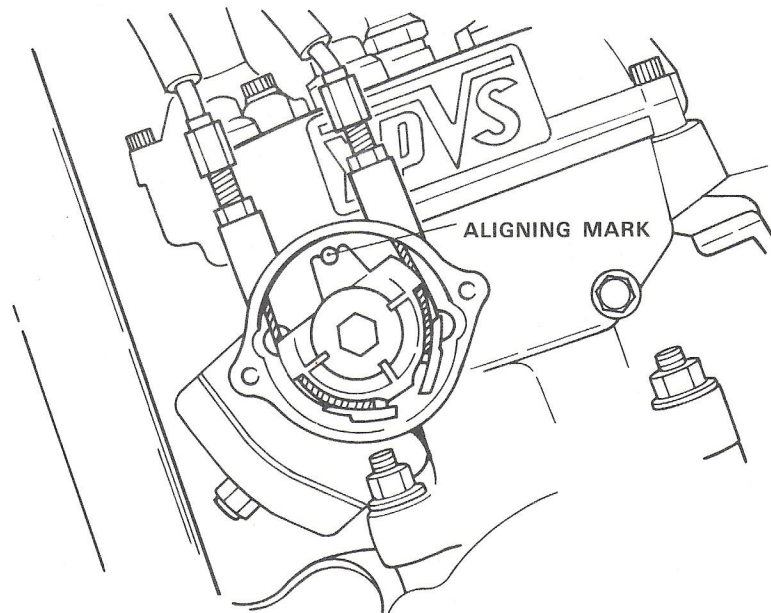
In order to make sure of smooth valve operation, the valves are rotated one cycle whenever the main switch is turned on. This operation is programmed in the micro computer.

### NOTE:

1. If the main switch is turned off to stop the engine, the valves will remain at the closed position.
2. If the engine stalls while the main switch is on, the valves will return to the open position because the servo motor is kept operating even after the engine is stopped.
3. If the main switch is turned on and off without the engine being started, the valves will remain at the open position because the power supply to the servo motor is cut off while the valves are at the open position.

## Adjustment

Drive cables must be adjusted properly by the following procedure.

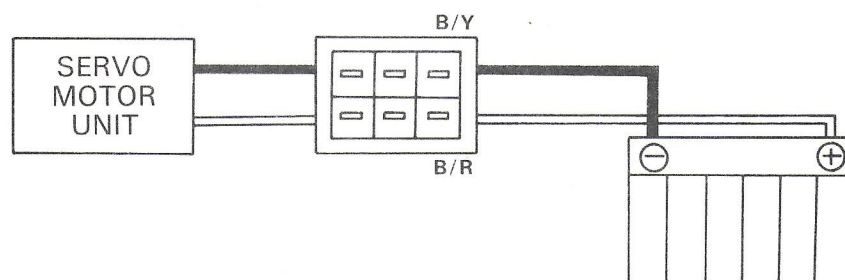


## Procedure

1. Remove the valve cover on the left side cylinder.
2. Turn on the main switch so that the valves are fully opened. Make sure the battery is fully charged and the servo motor is operating properly.
3. Loosen the lock nuts for the cable adjusters and adjust them with finger so that the aligning marks on the cylinder and the pulley align.
4. Turn both adjusters clockwise  $1/4$  turn from the finger tight position so that the proper cable free play can be provided.
5. Tighten the lock nut.

## Inspection

The servo motor unit can be inspected by connecting 12 volt battery to the wiring coupler on the servo motor unit.

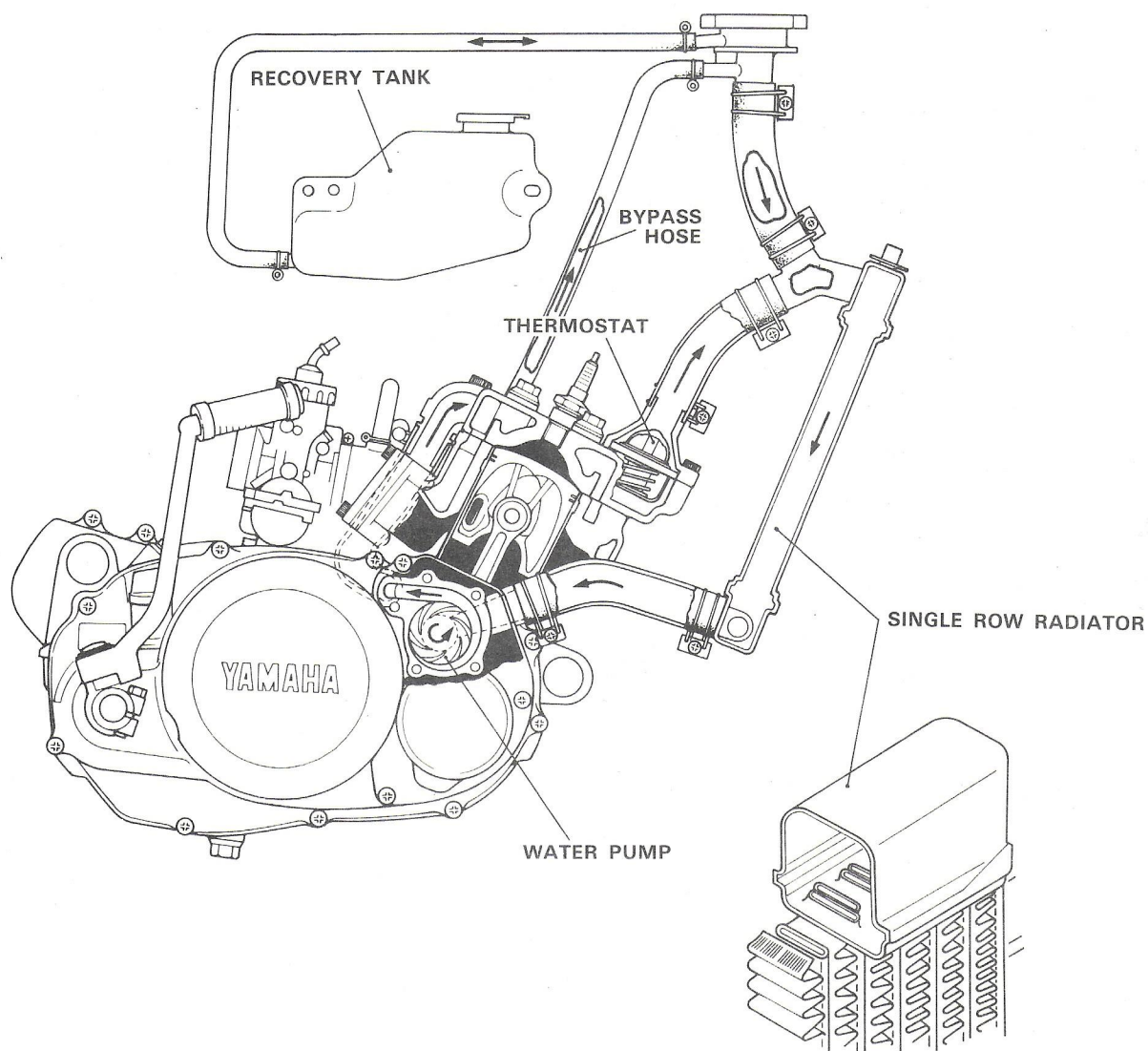


The servo motor is in good condition if the motor operates when the battery is connected as shown above.

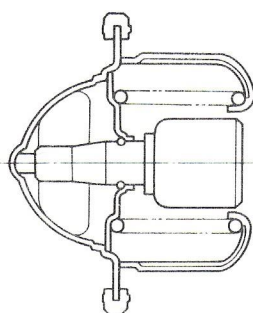


## 2-2. COOLING SYSTEM

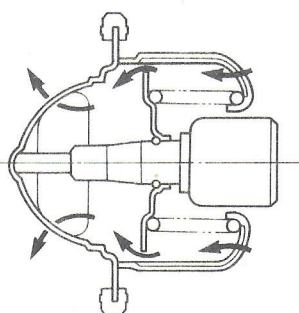
Thermostat is equipped in the cylinder head for quicker warming up. When the thermostat is closed, the small amount of water flows through the bypass hose which is connected to the cylinder head and water filling hose. The recovery tank is located in front of the fuel tank. The radiator is a compact single row type for lighter weight.



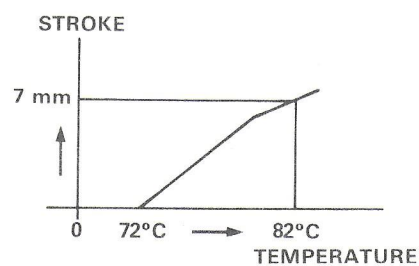
### THERMOSTAT



COLD



WARM



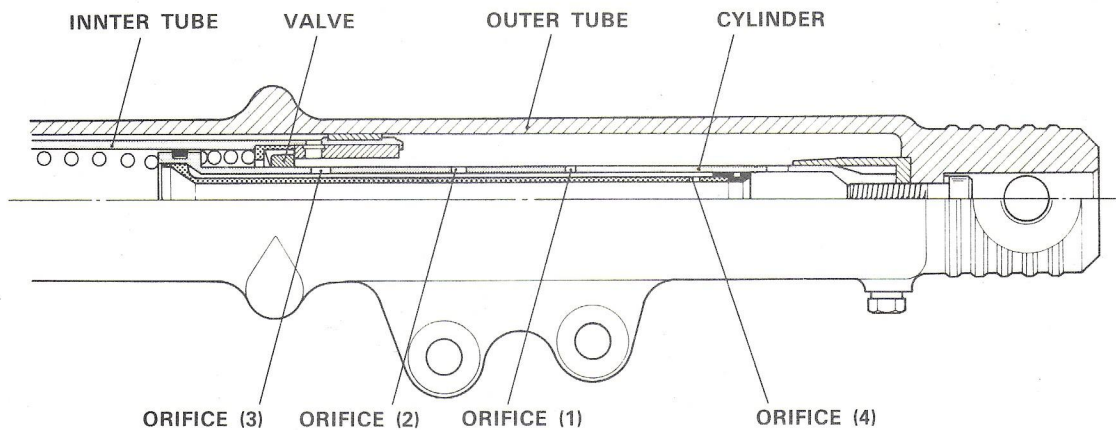
## [CHASSIS]

### 2-3. FRONT FORK (air adjusted fork with variable damper)

#### Description

A soft spring and damper are required of the suspension for comfortable riding, while a harder spring and damper are required for high speed stability.

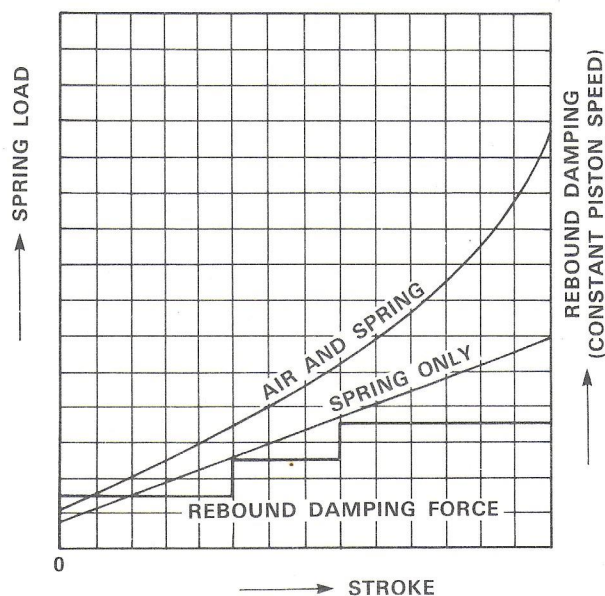
In order to satisfy both high speed stability and riding comfort, the RD250/350 (RZ350/250) are equipped with the variable damper in combination with the air assisted front fork which has a progressive spring characteristic.



#### Operation of variable damper

Variable damper is effective on a rebound stroke of the front fork. Oil in the oil chamber (A) is pushed out through the small orifice during the rebound stroke; thus, the damping force is created due to the restriction of oil flow.

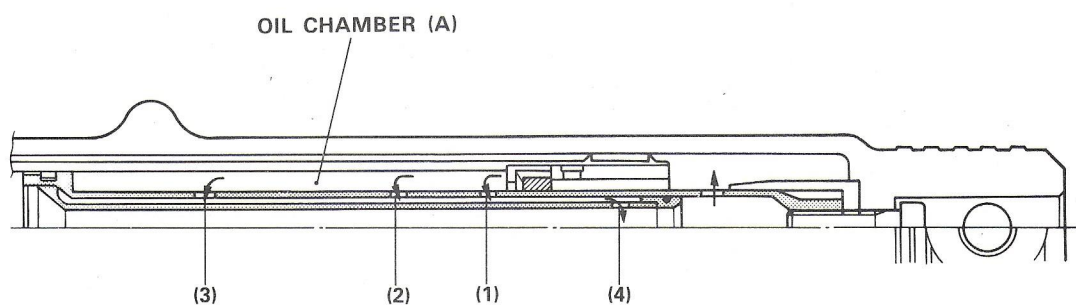
On these models, the cylinder is of double tubing construction and the oil flows out through the space between two tubes. There are four orifices provided in the complete cylinder and the number of orifices which restricts the oil flow is changed according to the wheel travel.





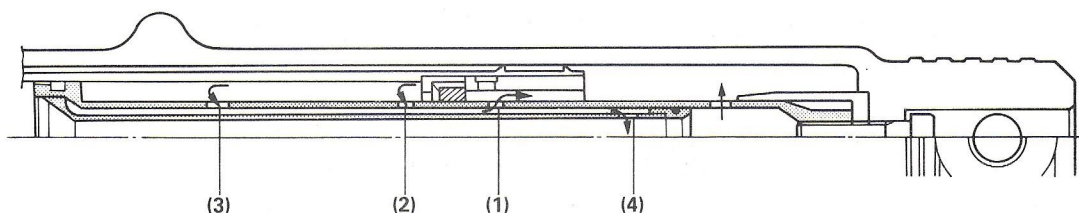
1. The first stage of the rebound stroke.

While the valve travels from the front fork bottom position to the orifice (1), oil flow is restricted by the orifice (4); thus, the damping force is greatest at this stage.



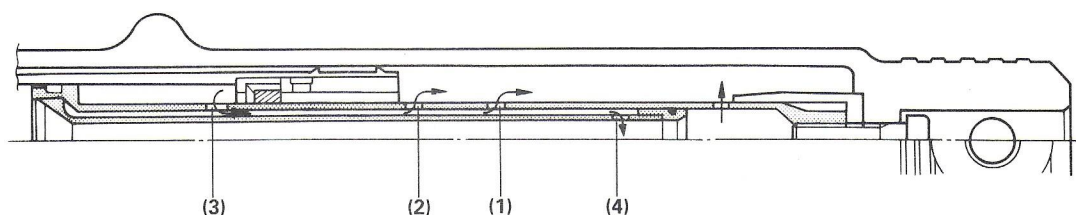
2. The second stage of the rebound stroke.

While the valve travels from the orifice (1) to the orifice (2), oil flow is restricted by the orifice (4) and (1); thus, the damping force is smaller than the first stage.



3. The last stage of the rebound stroke.

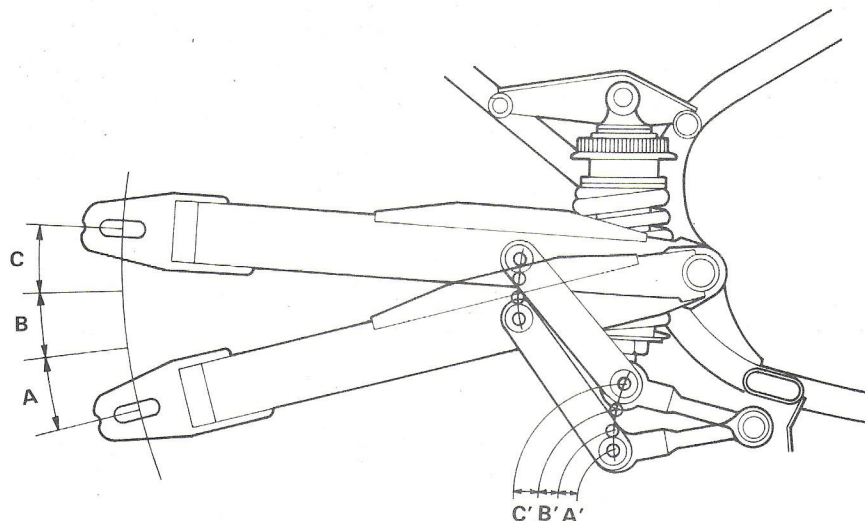
While the valve travels from the orifice (2) to the orifice (3), oil flow is restricted by the orifice (4), (1) and (2); thus, the damping force is smaller than the second stage.



## 2-4. REAR SUSPENSION

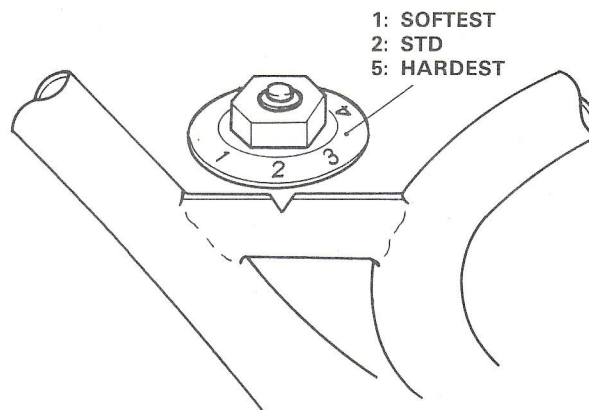
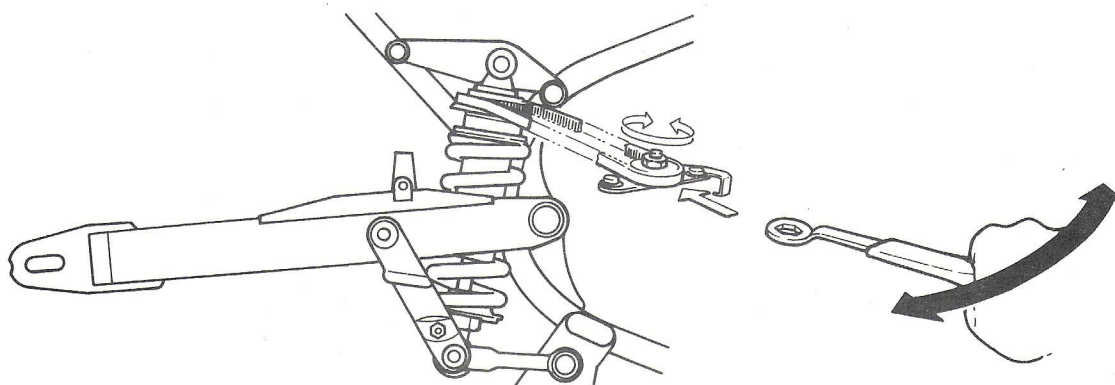
### Description

New link suspension is employed and the rear shock unit is mounted in the center of the frame providing a lower center of gravity of the machine. The remote control spring preload adjuster provides easy adjustment.



### Spring preload adjustment

Spring preload can be adjusted using a ring spanner and extension handle in the tool kit equipped on the machine. The adjuster is located inside the right-hand side cover. The spring preload adjuster ring is driven by the cogged belt. The standard preload set position is 2nd from the softest position at the factory.





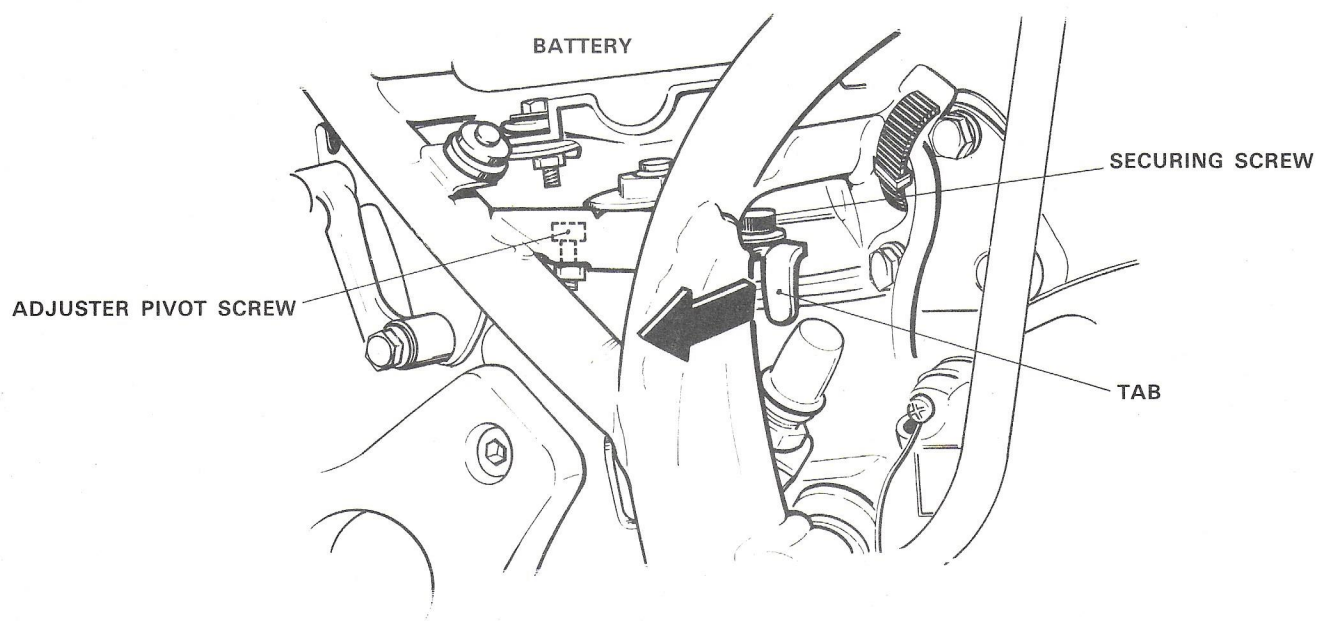
## Rear shock unit removal and installation

### REMOVAL

1. The spring preload position must be noted before removing the shock unit for the convenience of reinstallation.
2. Loosen the belt tensioner so that the belt is free from the adjuster.
3. Remove the exhaust pipes, battery, oil tank.
4. Remove the pivot bolts on both top and bottom of the shock unit so that the shock unit can be removed from the frame.

### INSTALLATION

1. Install the shock unit in the frame and put the belt around the shock unit.
2. Make sure the adjuster is at the same position as where the belt was removed.  
If the preload position of the shock unit is unknown, temporarily set the belt and the adjuster. Rotate the adjuster counterclockwise until the adjuster stops so that the shock unit is set at the softest position which is position "1" on the shock unit. Reset the adjuster to position "1". Do not rotate the adjuster in order to avoid damage to the belt.
3. Tighten the adjuster securing screw while pulling the adjuster tab with your finger (approximately 10 kg). Tighten the adjuster pivot securing screw.

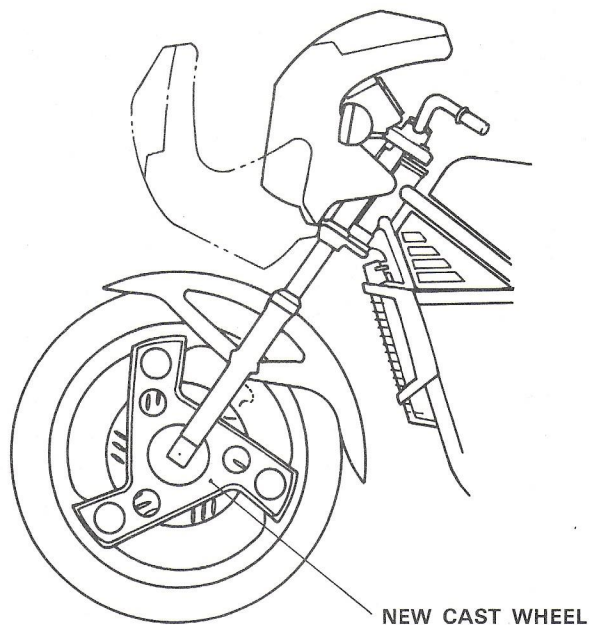
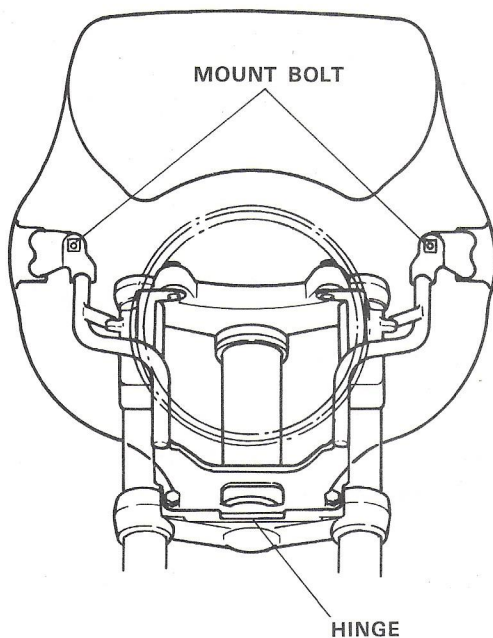


### NOTE:

A small hole is provided at the bottom of the battery case for use of hexagon wrench.

## 2-5. FAIRING

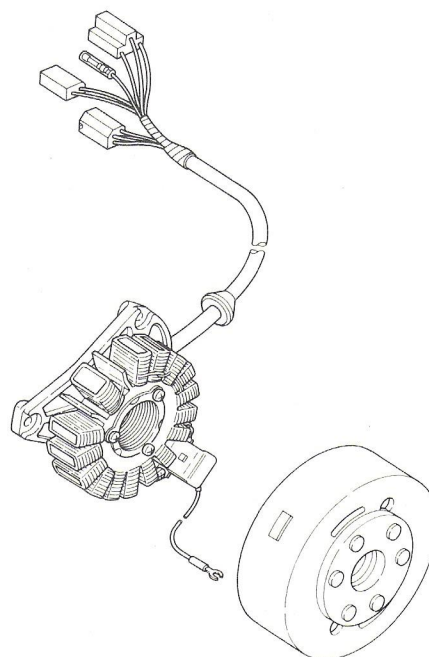
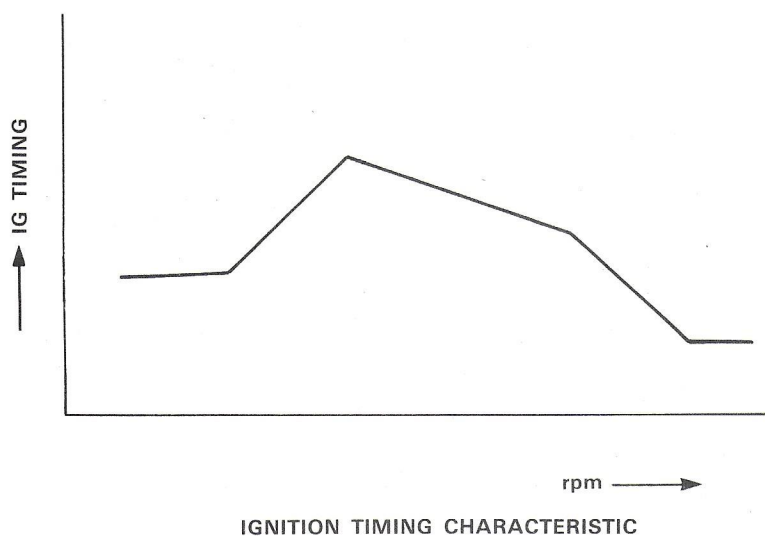
The fairing can be tilted down by unscrewing the two securing bolts for easy maintenance on the headlight and meters, as shown below.



## [ELECTRICAL]

### 2-6. CAPACITOR DISCHARGE IGNITION

Electronic advance system in the C.D.I. system provides a new advance characteristic in order to obtain maximum performance in combination with the YPVS system.





### 3. INSPECTION AND MAINTENANCE

#### 3-1. PRE-DELIVERY INSPECTION

Following items must be checked thoroughly before deliver the machine to a customer.

#### PRE-DELIVERY CHECK LIST

ITEM	REMARKS
1. All nuts and bolts	Check torque and tightness, especially; Engine mounting bolts and/or nuts Steering head Rear swingarm pivot shaft Axles
2. Hydraulic disc brakes	Check master cylinder fluid level, bleed systems, check and adjust free play, and check operation.
3. Twin front disc brake	Check clearance between caliper brackets and disc.
4. Clutch	Check and adjust free play.
5. Air forks	Adjust pressure.
6. Fuel filter screen and fuel line	Clean and check for connection tightness.
7. Carburetor	Drain stale fuel from line and float bowl. Tighten cap and mounting bolts. Adjust starter cable freeplay. Adjust throttle cable freeplay.
8. Tires	Adjust pressure.
9. Engine/transmission oil	Fill.
10. Battery	Charge at specified 10 hour rate.
11. Drive chain	Check and adjust.
12. Electrical components	Check for proper operation of; Head lamp Turn signals Stoplight Taillight Indicator lights Instrument lights Horn
13. Air filter	Service.
14. Autolube tank	Fill tank, check breather tube routing.
15. Autolube pump	Bleed air from pump and all lines. Adjust cable and check minimum stroke. Check oil delivery to cylinder and for leaks.
16. Idle speed	Check.
17. Test ride	

### 3-2. PERIODIC INSPECTION AND ADJUSTMENT

This table includes all items necessary to perform recommend inspection and adjustments. These preventative maintenance items, if followed, will insure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced.

#### PERIODIC INSPECTION/ADJUSTMENT TABLE

Unit: km (miles)

ITEM	REMARKS	BREAK-IN 1,000 (600)	EVERY	
			6,000 (4,000) or 6 months	12,000 (8,000) or 12 months
Spark plug(s)	Check/ Clean or replace.	○	○	REPLACE
Air filter	Clean. Replace every 24,000 (16,000).		○	○
Carburetor*	Check/ Adjust/ idle speed, synchronization, starter operation.	○	○	○
Fuel line*	Check fuel hose and vaccum pipe for cracks or damage.		○	○
Transmission oil	Replace every 24,000 (16,000) or 24 months (Warm engine before draining).	○	CHECK	CHECK
Autolube pump*	Check/ Adjust/ Air bleeding	○	○	○
Brake*	Check operation/ fluid leakage/ See NOTE.		○	○
Clutch*	Check operation.		○	○
Rear arm pivot shaft*	Check rear arm assembly for looseness. Moderately repack every 12,000 (8,000) or 12 months. **			○
Wheels*	Check balance/ damage/ runout.		○	○
Wheel bearings*	Check bearings assembly for looseness/ damage. Replace if damaged.		○	○
Steering bearing*	Check bearings assembly for looseness. Moderately repack every 24,000 (16,000) or 24 months. **			CHECK
Front forks*	Check operation/ oil leakage.		○	○
Rear shock absorber*	Check operation/ oil leakage.		○	○
Cooling system*	Check/ Repair as required/ Replace coolant every 24,000 (16,000) or 24 months.		CHECK	CHECK
Drive chain	Check tension/ alignment/ clean	EVERY 500 (300)		
Fittings/ Fasteners	Check all chassis fittings and fasteners.	○	○	○
Battery*	Check specific gravity. Check breather pipe for proper operation.		○	○

\*: It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

#### NOTE:

The air filter should be cleaned more often than specified intervals if the machine is operated in the extremely dusty condition.

The control cables must be checked for proper free play and operation each time the machine is used.

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 (clutch) hoses every four years, or if cracked or damaged.





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