



YAMAHA

XVZ13DS(C)~DE(C) VENTURE ROYALE (‘86~’93) Service Manual



YAMAHA

**XVZ13DS
XVZ13DSC**

Service Manual

**XVZ13DS/DSC
SERVICE MANUAL**

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1st Edition, November 1985**

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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 motorcycles have a basic understanding of the mechanical concepts and procedures inherent in motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

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 motorcycle 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 motorcycle and to conform with federal environmental quality objectives.

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.

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the XVZ13DS/DSC. Please read this material carefully.

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLES OPERATIONS
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

CAUTION:

A **CAUTION** indicates special procedures that must be followed to avoid damage to the motorcycle.

WARNING:

A **WARNING** indicates special procedures that must be followed to avoid injury to a motorcycle operator or person inspecting or repairing the motorcycle.

MANUAL FORMAT














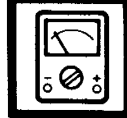







All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

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

- Bearings
Pitting/Damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.

① GEN INFO 	② INSP ADJ 	
③ ENG 	④ COOL 	
⑤ CARB 	⑥ CHAS 	
⑦ ELEC 	⑧ APPX 	
⑨ 	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	⑰ 
⑱ 	⑲ 	⑳ 
㉑ 		

ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

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









Illustrated symbols ⑨ to ⑭ are used to identify the specifications appearing in the text.

- ⑨ Filling fluid
- ⑩ Lubricant
- ⑪ Tightening
- ⑫ Wear limit, clearance
- ⑬ Engine speed
- ⑭ Ω , V, A

Illustrated symbols ⑮ to ㉑ in the exploded diagram indicate grade of lubricant and location of lubrication point.

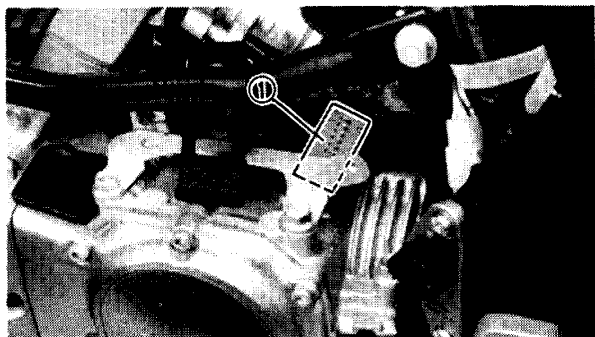
- ⑮ Apply engine oil
- ⑯ Apply gear oil
- ⑰ Apply molybdenum disulfide oil
- ⑱ Apply wheel bearing grease
- ⑲ Apply lightweight lithium-soap base grease
- ⑳ Apply molybdenum disulfide grease
- ㉑ Apply locking agent (LOCTITE®)

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CHAPTER 1. GENERAL INFORMATION

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GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

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

NOTE: _____

The vehicle identification number is used to identify your motorcycle and may be used to register your motorcycle with the licensing authority in your state.

Starting Serial Number:

XVZ13DS...JYA1NL00 * GA000101
XVZ13DSC...JYA1UN00 * GA000101

ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the left side of the engine.

NOTE: _____

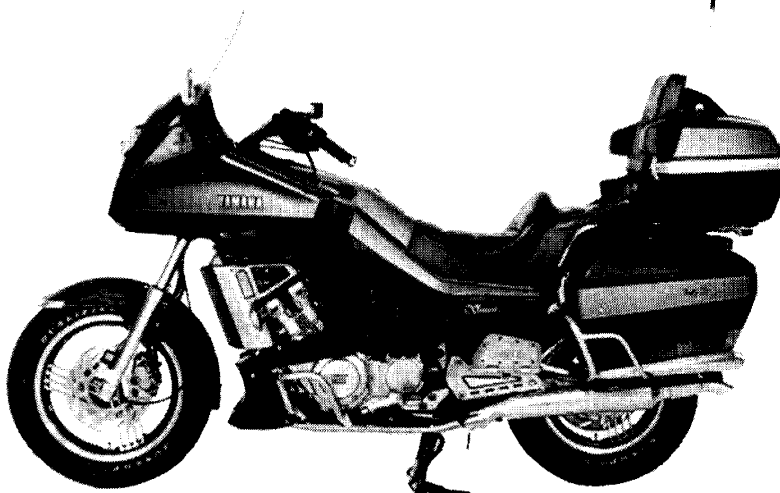
The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:

XVZ13DS.....1NL-000101
XVZ13DSC.....1UN-000101

NOTE: _____

Designs and specifications are subject to change without notice.



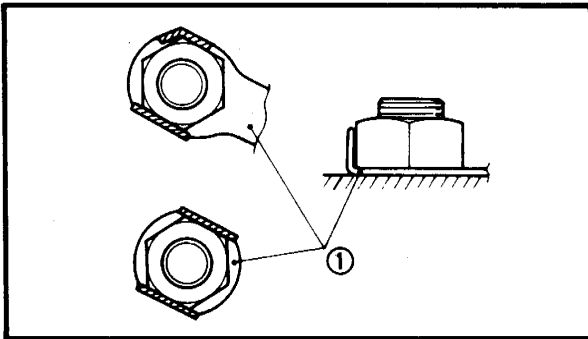
IMPORTANT INFORMATION

ALL REPLACEMENT PARTS

1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

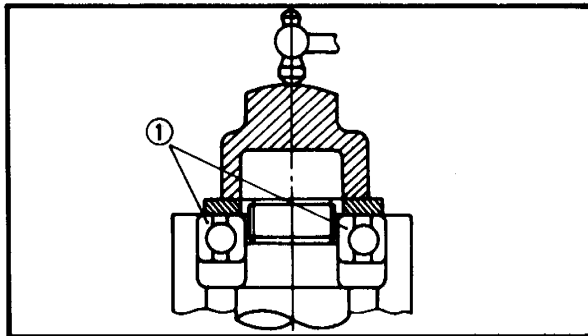
GASKETS, OIL SEALS, AND O-RINGS

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

1. All lock washers/plates ① and cotter pins must be replaced when 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.

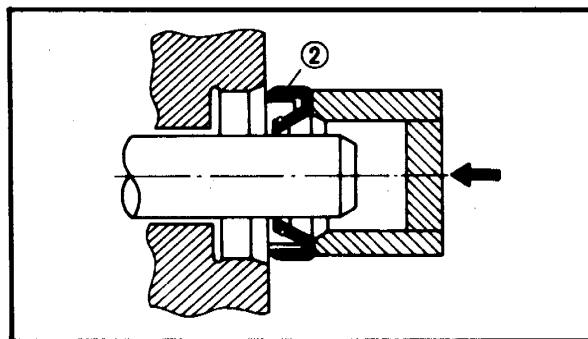


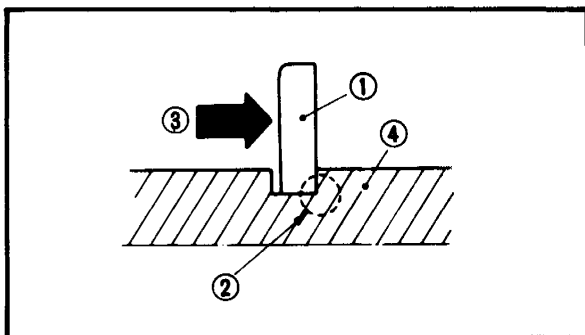
BEARINGS AND OIL SEALS

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

CAUTION

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.





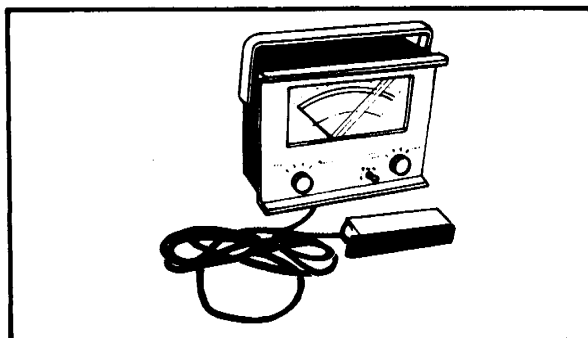
CIRCLIPS

1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted 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

SPECIAL TOOLS

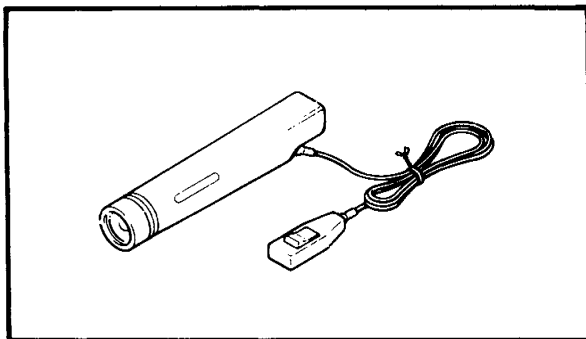
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

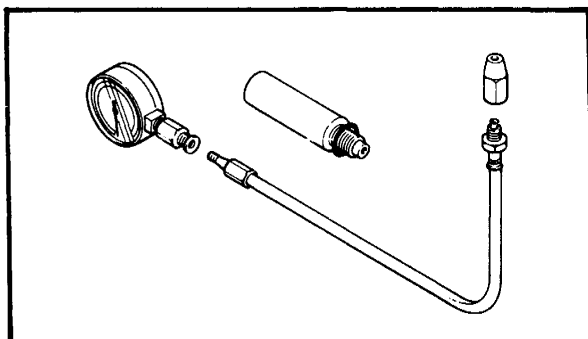
1. Inductive Tachometer
P/N YU-08036

This tool is needed for detecting engine rpm.



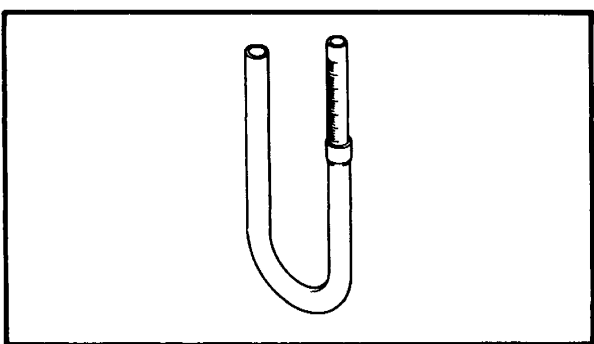
2. Inductive Timing Light
P/N YU-33277

This tool is necessary for checking ignition timing.



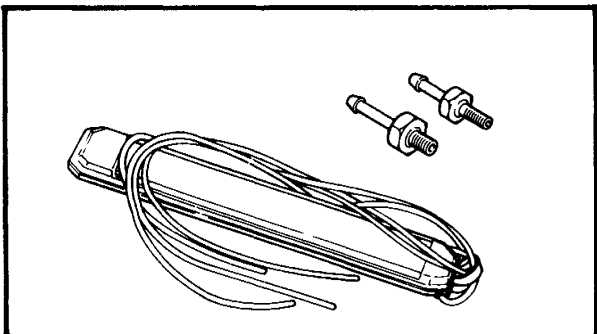
3. Compression Gauge
P/N YU-33223

This gauge is used to measure the engine compression.



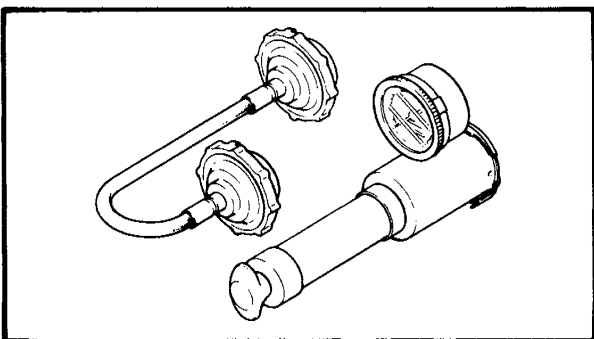
4. Fuel Level Gauge
P/N YM-01312-A

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



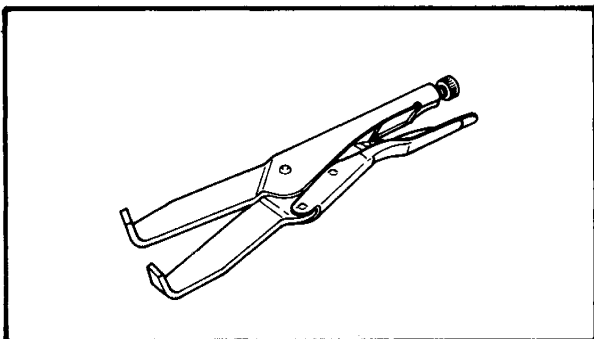
5. Vacuum Gauge
P/N YU-08030-A

This gauge is needed for carburetor synchronization.



6. Radiator Cap Tester
P/N YU-24460-01

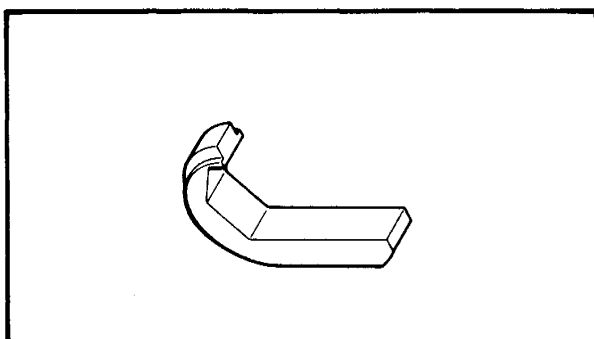
This tester is needed for checking the cooling system.



FOR ENGINE SERVICE

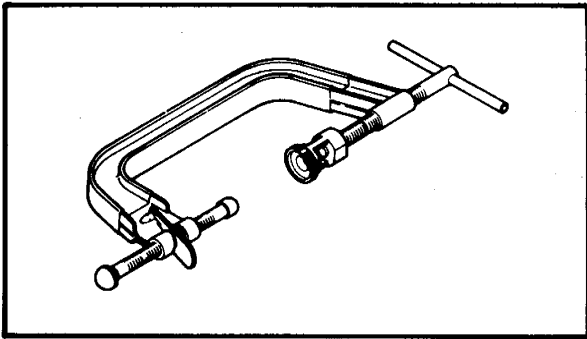
1. Clutch Holder
P/N YM-91042

This tool is used to hold the clutch when removing or installing the clutch boss locknut.

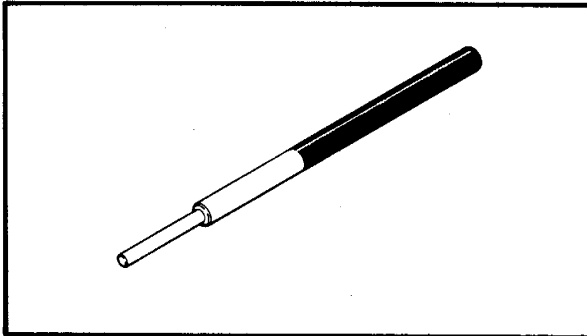


2. Tappet Adjusting Tool
P/N YM-33961

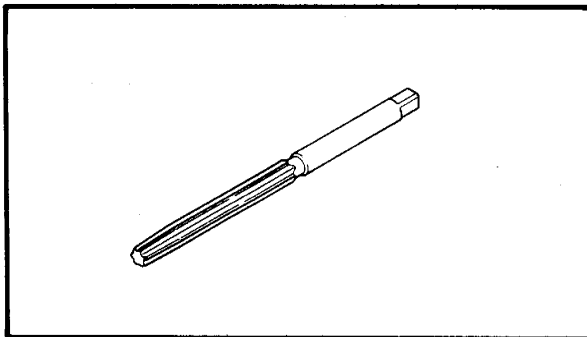
This tool is necessary to replace valve adjusting pads.

**3. Valve Spring Compressor****P/N YM-04019**

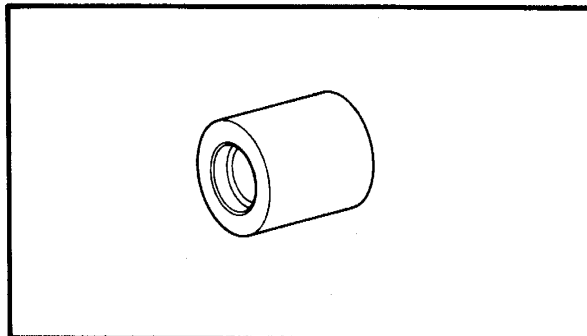
This tool is needed to remove and install the valve assemblies.

**4. Valve Guide Remover (6.0 mm)****P/N YM-04064-A**

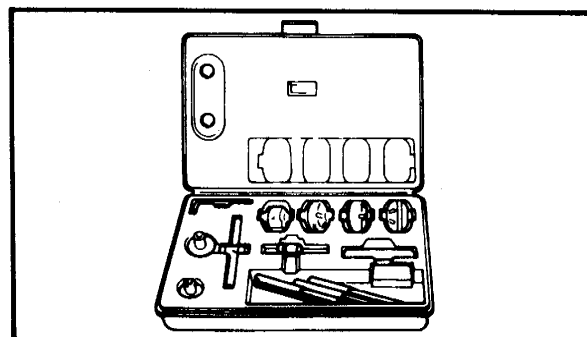
This tool is used to remove the valve guides.

**5. Valve Guide Reamer (6.0 mm)****P/N YM-04066**

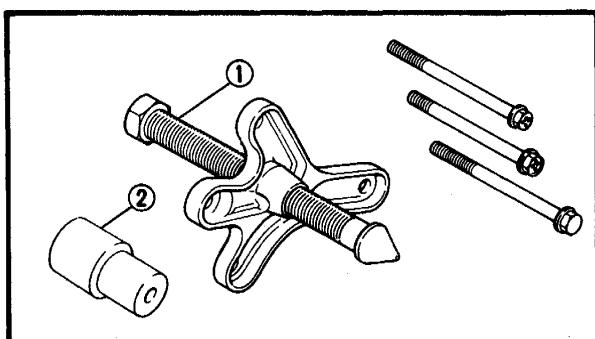
This tool is used to re-bore the new valve guide.

**6. Valve Guide Installer (6.0 mm)****P/N YM-04065-A**

This tool is needed to install the valve guides properly.

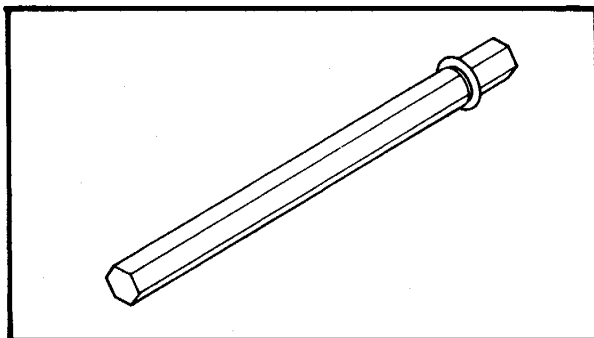
**7. Valve Seat Cutter Set****P/N YM-91043**

This tool is needed to resurface the valve seat.



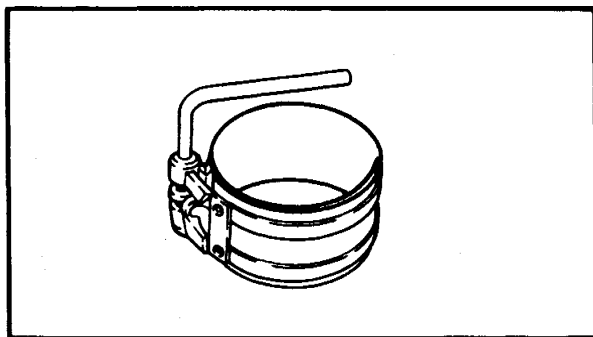
8. Flywheel Puller
P/N YU-33270 – ①
Adapter
P/N YM-33282 – ②

These tools are used to remove the flywheel.



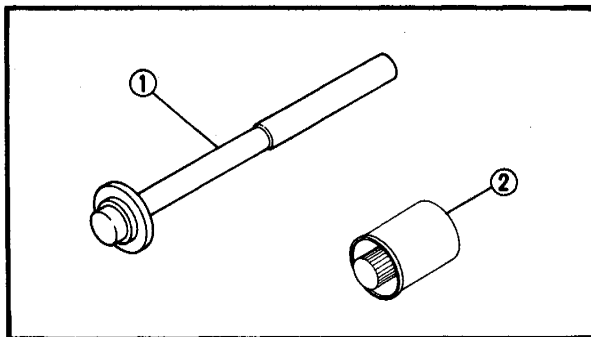
9. 8 mm Wrench Adapter
P/N YM-28897

This tool is used to loosen or tighten the cylinder head securing nut.



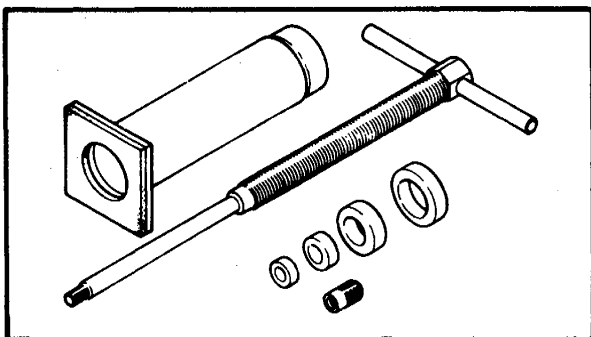
10. Piston Ring Compressor
P/N YM-8037

This tool is used when installing the piston into the cylinder.



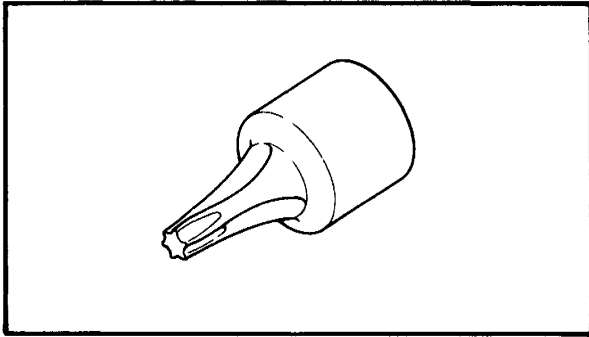
11. Water Pump Seal Installer
Handle
P/N YM-04058-1 – ①
Adapter
P/N YM-33221 – ②

These tools are needed for proper installation of the water pump seal.



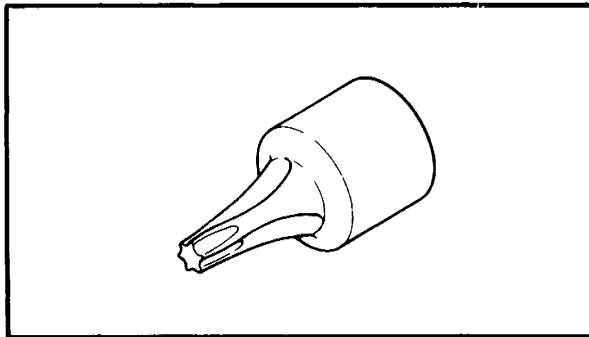
12. Piston Pin Puller
P/N YU-01304

This tool is used to remove the piston pin.



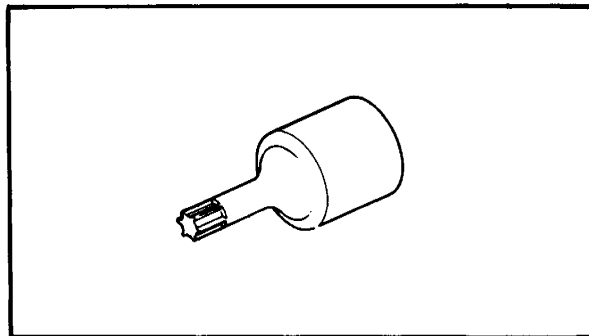
13. #40 Torx Driver
P/N YU-29843-7

This tool is used to loosen or tighten the middle gear bearing retainer bolt.



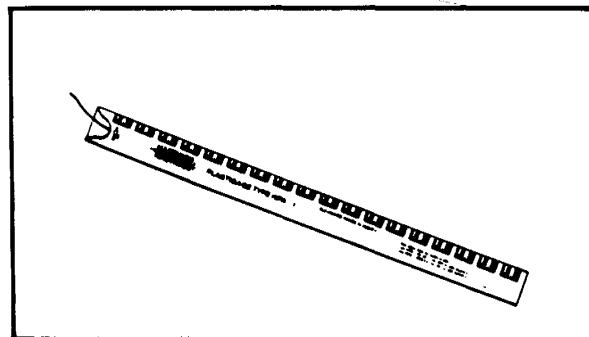
14. #30 Torx Driver
P/N YU-29843-6

This tool is used to loosen or tighten the drive axle bearing retainer bolt.



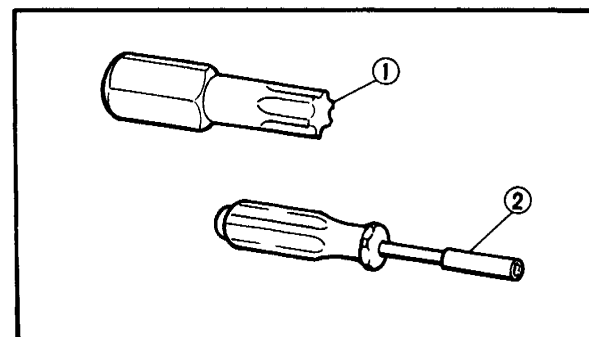
15. #25 Torx Driver
P/N YU-29843-4

This tool is used to loosen or tighten the shift cam segment securing bolt.



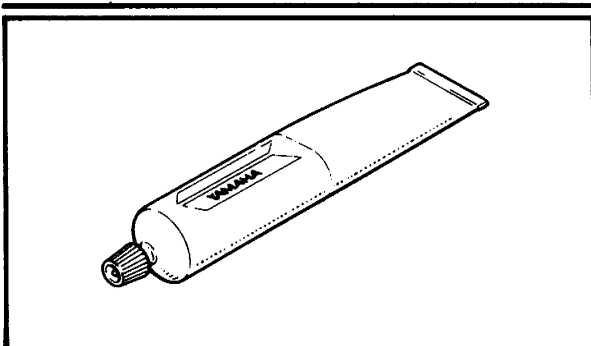
16. Plastigage® Set "Green"
P/N YU-33210

This gauge is needed to measure the clearance for the connecting rod bearing.



17. Special Torx Bit
P/N YU-25359-2 – ①
Torx Screwdriver Holder
P/N YU-25359-26 – ②

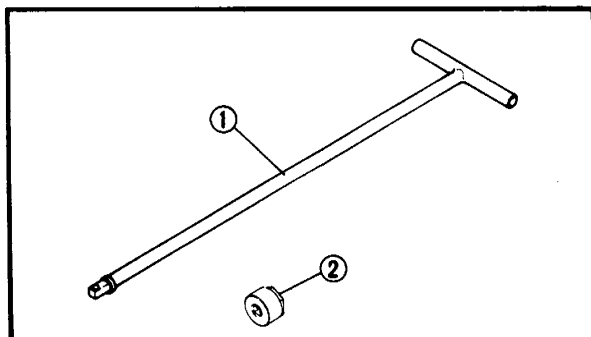
These tools are used when overhauling the carburetors.



18. Sealant (Quick Gasket®)

P/N ACC-11001-05-01

This sealant (bond) is used for crankcase mating surfaces, etc.

**FOR CHASSIS SERVICE**

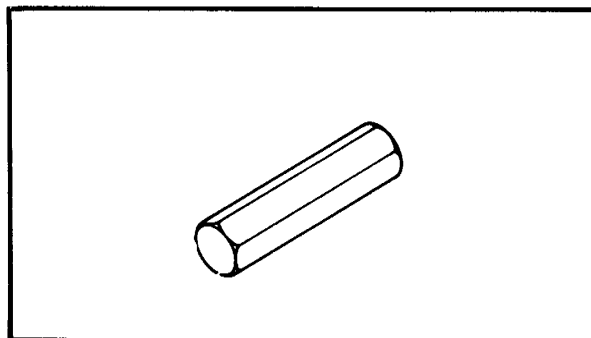
1. T-Handle

P/N YM-01326 – ①

Damper Rod Holder (24 mm)

P/N YM-01328 – ②

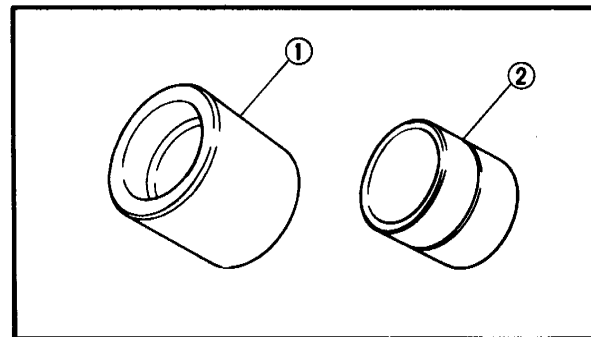
These tools are used to loosen and tighten the front fork cylinder holding bolt.



2. Front Fork Cap Socket (17 mm)

P/N YM-01104

This tool is needed when loosening and tightening the front fork cap bolt.



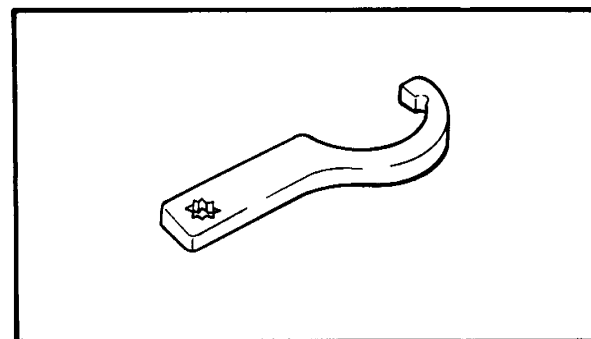
3. Front Fork Seal Driver Weight

P/N YM-33963 – ①

Adapter (40 mm)

P/N YM-33964 – ②

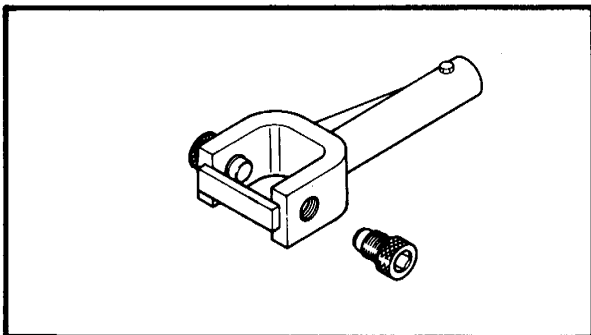
These tools are used when installing the fork seal.



4. Ring Nut Wrench

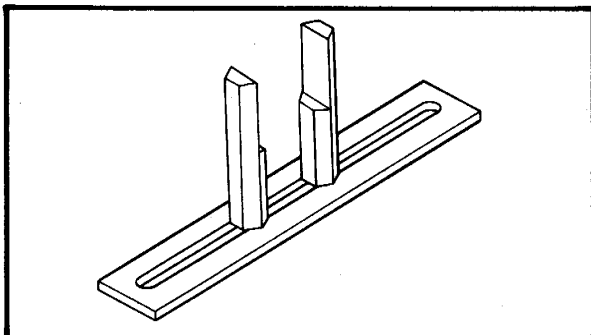
P/N YU-01268

This tool is used to loosen and tighten the steering ring nut.

**FOR MIDDLE GEAR SERVICE****1. Universal Joint Holder**

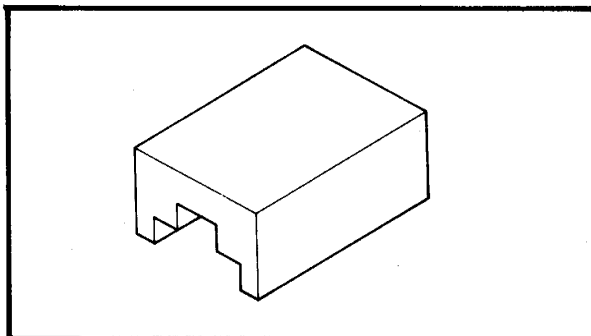
P/N YM-04062

This tool is used when adjusting the gear lash in the middle gear.

**2. Middle Drive Gear Holder**

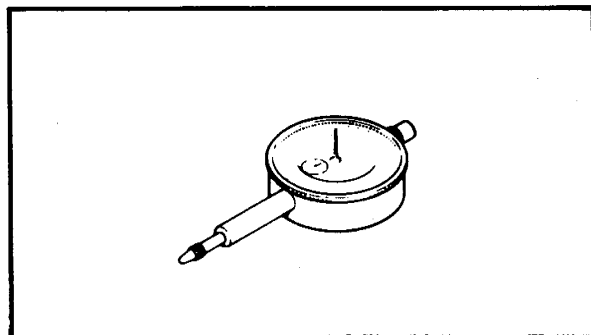
P/N YM-33222

This tool is needed when measuring the middle gear lash.

**3. Damper Spring Plate**

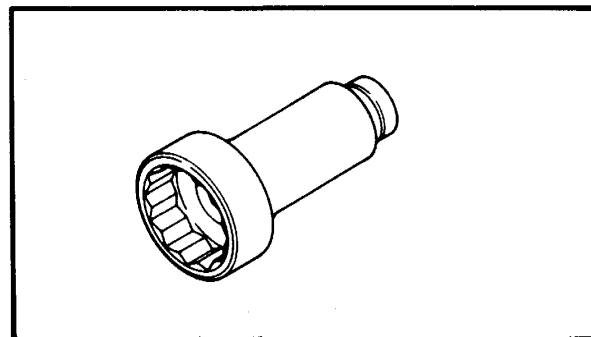
P/N YM-33286

This tool is used to disassemble and reassemble the middle gear damper.

**4. Dial Gauge**

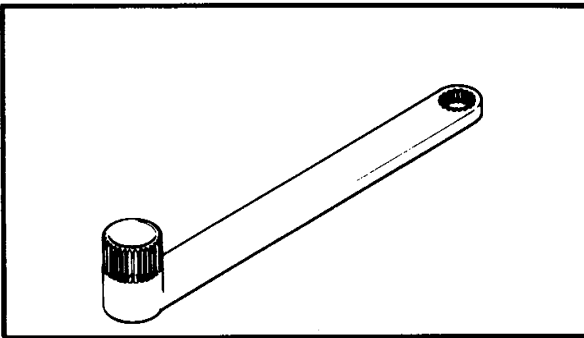
P/N YU-03097

This tool is used to measure the gear lash for the middle gear and final gear.

**5. 55 mm Offset Wrench**

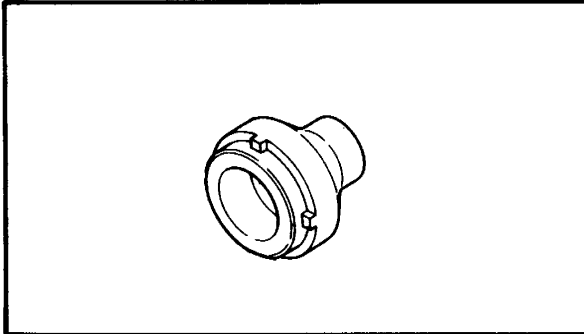
P/N YM-04054

This tool is used to loosen and tighten the drive shaft nut.



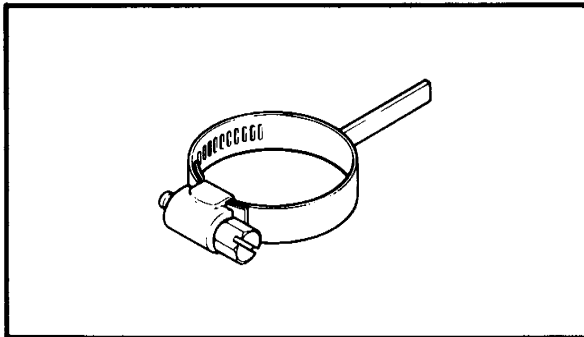
6. Final Drive Shaft Holder
P/N YM-01229

This tool is used when adjusting the gear lash for the final gear.



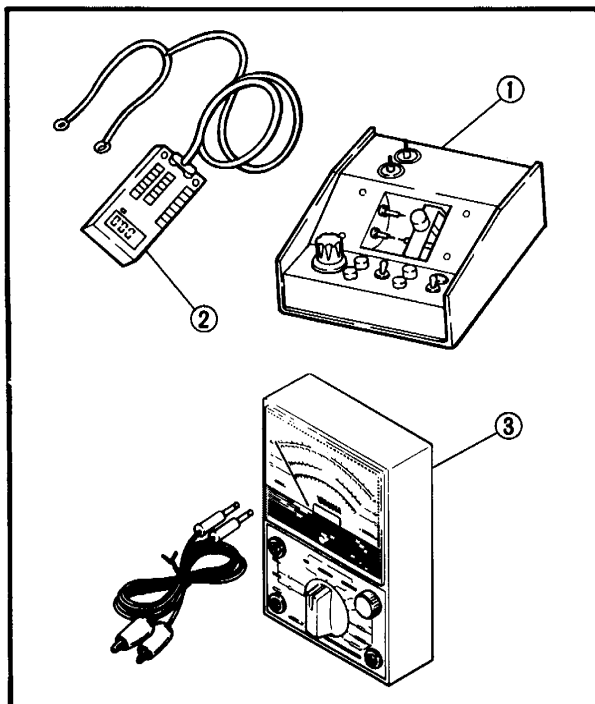
7. Final Drive Shaft Bearing Retainer Wrench
P/N YM-04050

This tool is used to remove and install the bearing retainer.



8. Gear Lash Measurement Tool
P/N YM-01230

This tool is used to measure gear lash.



FOR ELECTRICAL COMPONENTS

1. Electro Tester
P/N YU-33260 – ①

This instrument is necessary for checking the ignition system components.

2. Pocket Tester
P/N YU-33263 – ② or
P/N YU-03112 – ③

This instrument is invaluable for checking the electrical system.

CHAPTER 2.

PERIODIC INSPECTIONS AND ADJUSTMENTS

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PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

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

MAINTENANCE INTERVALS CHARTS

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions control. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are grouped separately.

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

No.	Item	Remarks	Initial	Odometer readings				
			1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	25,000 km or 25 months (15,800 mi)	**3 31,000 km or 31 months (19,600 mi)
1*	Valve clearance	Check and adjust valve clearance when engine is cold.	Every 42,000 km (26,600 mi)					
2	Spark plug	Check condition. Adjust gap and clean. Replace at 13,000 km (or 13 months) and thereafter every 12,000 km (or 12 months).		○	Replace	○	Replace	○
3*	Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		○	○	○	○	○
4*	Fuel line	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary.		○	○	○	○	○
5*	Fuel filter	Replace initial 31,000 km (19,600 mi) and thereafter every 30,000 km (19,000 mi).						Replace
6*	Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	○	○	○
7*	Carburetor synchronization	Adjust synchronization of carburetors.	○	○	○	○	○	○
8*	Idle speed	Check and adjust engine idle speed. Adjust cable free play.		○	○	○	○	○

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

NOTE:

For farther odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi) and **3: Every 30,000 km (19,000 mi) intervals.

MAINTENANCE INTERVALS CHARTS



GENERAL MAINTENANCE/LUBRICATION

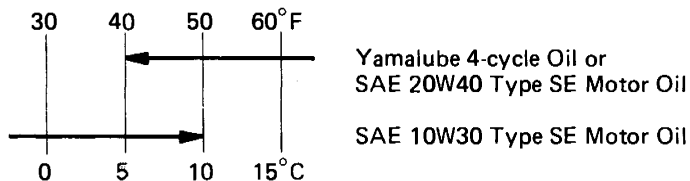
No.	Item	Remarks	Type	Initial	Odometer reading					
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)	
1	Engine oil	Warm-up engine before draining.	See NOTE.	○		○		○		
2	Oil filter	Replace.	—	○		○		○		
3*	Air filter	Clean with compressed air. Replace if necessary.	—		○	○	○	○	○	
4*	Cooling system	Check hoses for cracks or damage, replace if necessary.	—		○	○	○	○	○	
		Replace coolant 24 months.	Ethylene glycol anti-freeze coolant					Replace		
5*	Brake system	Adjust free play Replace pads if necessary.	—	○	○	○	○	○	○	
6	Final gear oil	Check oil level and leakage. Replace every 24,000 km or 24 months.	SAE 80 API "GL-4" hypoid gear oil	Replace		Check		○		
7	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W30 motor oil	○	○	○	○	○	○	
8*	Rear arm pivot bearing	Check bearing assembly for looseness. Moderately repack every 18,000 km (11,400 mi).	Medium weight wheel bearing grease				Replace			
9	Brake/Clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○	○	○	○	
10	Brake pedal and change pedal shaft	Lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○	○	○	○	
11*	Center/Side stand pivots	Check operation and lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○	○	○	○	
12*	Front fork oil	Check operation and leakage.	—		○	○	○	○	○	

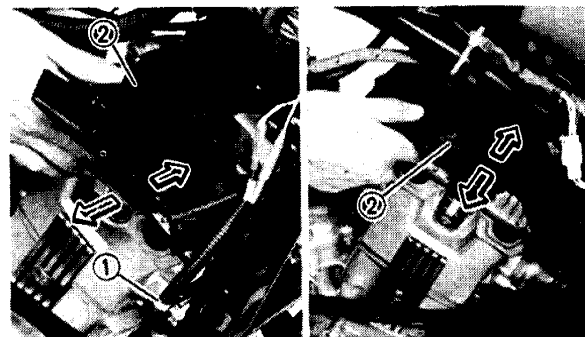
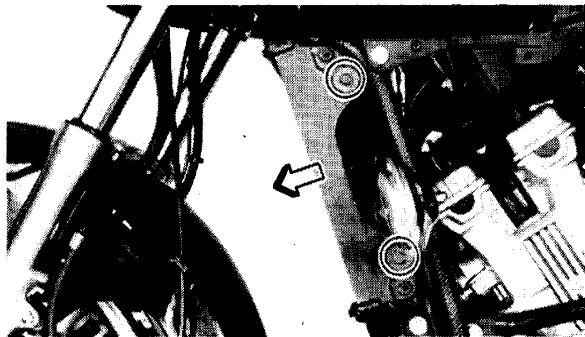
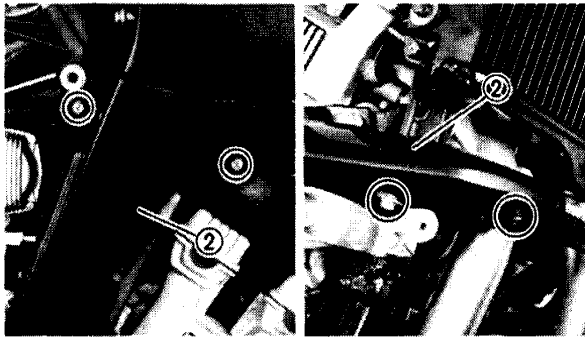
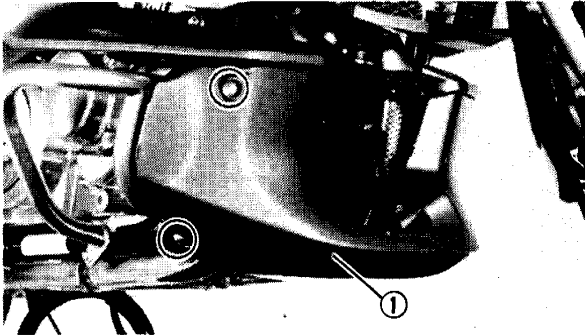
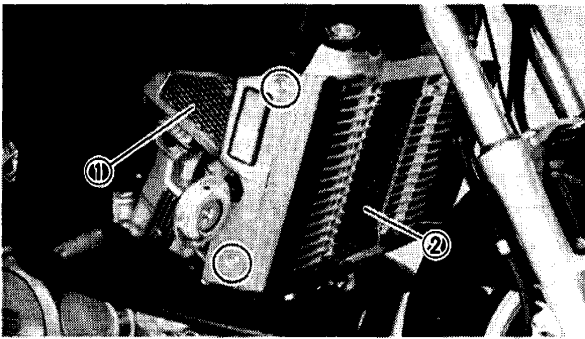
No.	Item	Remarks	Type	Initial	Odometer reading					
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)	
13*	Steering bearings	Check bearings assembly for looseness. Moderately repack every 24,000 km (15,200 mi).	Medium weight wheel bearing grease		○	○	○		Repack	○
14*	Wheel bearings	Check bearings for smooth rotation.	—		○	○	○	○		○
15*	Rear suspension link pivots	Apply grease lightly.	Molybdenum disulfide grease				○			
16*	Air drier	Replace desiccant every 24 months.	—					○		
17*	Suction filter	Clean filter every 12 months.	—			○		○		
18*	Battery	Check specific gravity and breather pipe for proper operation.	—		○	○	○	○		○
19*	Sidestand switch	Check and clean or replace if necessary.	—	○	○	○	○	○		○

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

NOTE:

- For farther odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi), and **3: Every 24,000 km (15,200 mi) intervals.
- Brake fluid replacement (brake and clutch):
 - 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 it cracked or damaged.
- Engine oil:





ENGINE

VALVE CLEARANCE ADJUSTMENT

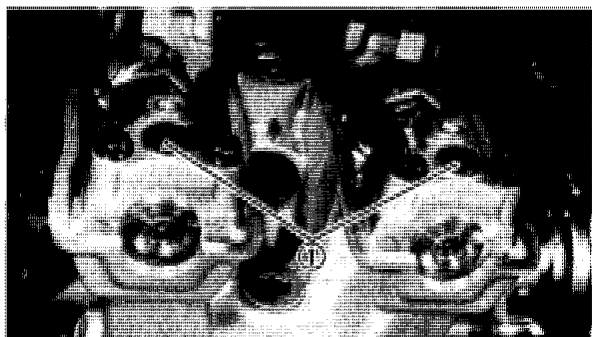
Removal

1. Remove:
 - Top cover
 - Side panels (Left and right)
Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.
 - Radiator side covers ①
 - Radiator cover ②
2. Remove:
 - Lower cowl ①
 - Lower panels ②
Separate the panel halves.

3. Remove:
 - Bolts (Radiator)

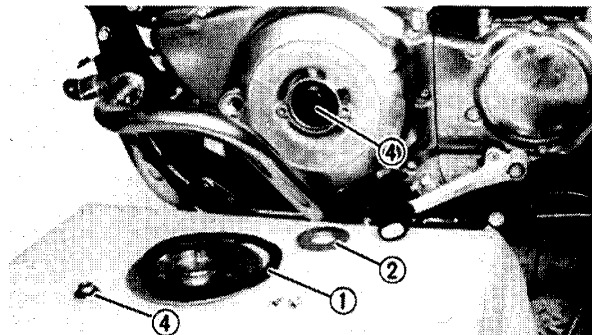
NOTE: _____
It is not necessary to remove the radiator completely from the motorcycle.

4. Disconnect:
 - Spark plug caps ①
5. Remove:
 - Air baffle plates (Front and rear) ②
Pull up the baffle plates, and pull the plate toward right-side (Front) or left-side (Rear).



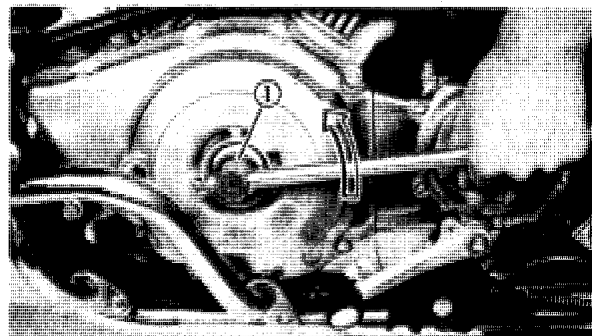
6. Remove:
- Cylinder head covers

NOTE: _____
Be sure you do not lose the oil plugs ① on the camshaft caps.



7. Remove:
- Crankcase cover plate ①
 - Special washer ②
 - Timing plug ③

NOTE: _____
Check for clog of oil passage ④ in the bolt. If any, clean the oil passage.

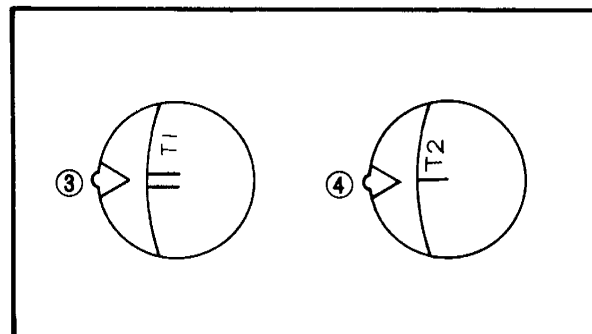
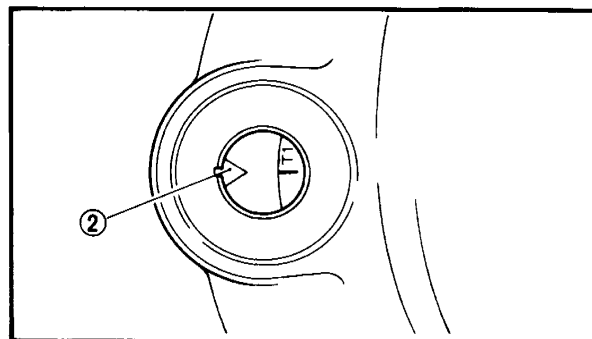


Inspection and Adjustment

1. Measure:
- Valve clearance

NOTE: _____
Be sure piston is at Top Dead Center (TDC) when measuring clearance.

By the following measurement steps.



Valve clearance measurement steps:

- Turn the crankshaft counterclockwise with a 32 mm (1.26 in) socket wrench ①.

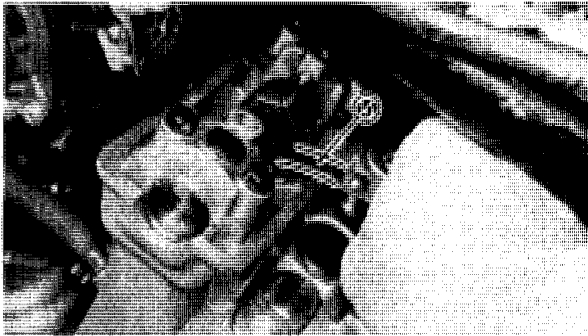
NOTE: _____
Valve clearance must be measured when the engine is cool to the touch.

- Align the "T₁" mark (for the No. 1 cylinder) on the flywheel with the stationary pointer ② on the crankcase cover. When the "T₁" mark is aligned with the stationary pointer ②, the piston is at top dead center (TDC).

- Note marks on flywheel to obtain correct valve clearance measurements.

- ③ TDC for No. 1 cylinder
- ④ TDC for No. 2 cylinder

VALVE CLEARANCE ADJUSTMENT



- Measure the valve clearance using a Feeler Gauge ⑤.
- Record the measured amount if the clearance is incorrect.



Intake Valve (Cold):
0.11 ~ 0.15 mm
(0.004 ~ 0.006 in)

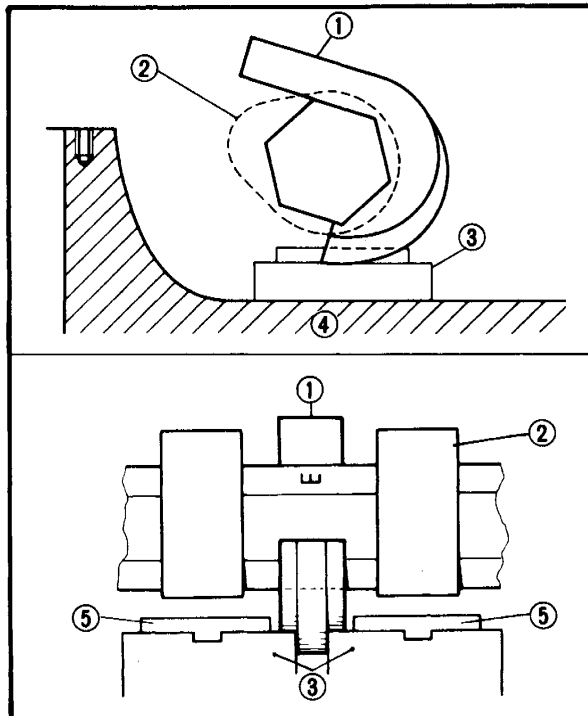
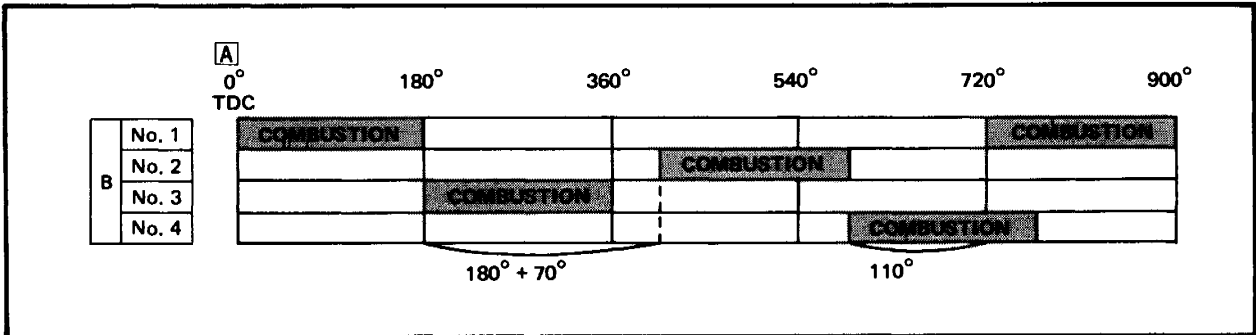
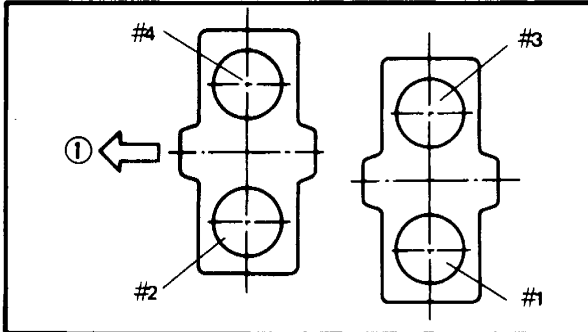
Exhaust Valve (Cold):
0.16 ~ 0.20 mm
(0.006 ~ 0.008 in)

- Measure the valve clearance, in sequence, for No. 3, 4, and No. 2 cylinders.
- Out of specification → Adjust clearance.

① Front

Firing Sequence:
1 - 3 - 4 - 2

- A** Crankshaft degree
- B** Cylinder



2. Adjust:

- Valve clearance
- By the following adjustment steps.

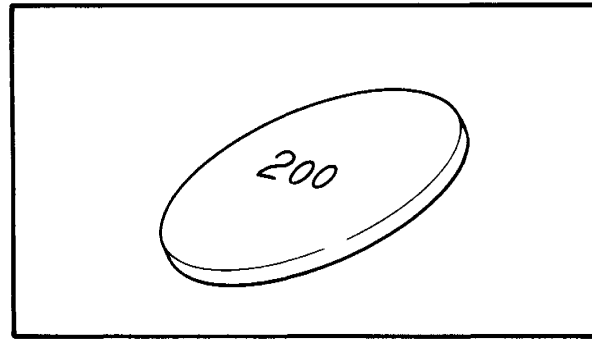
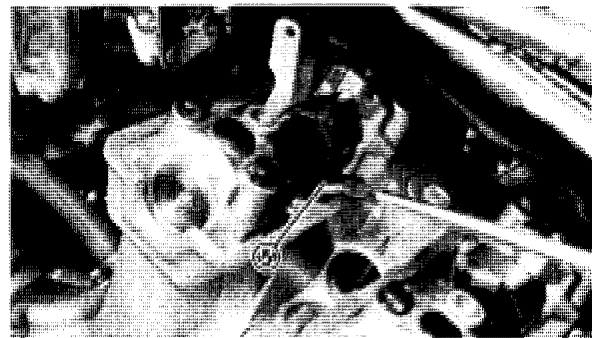
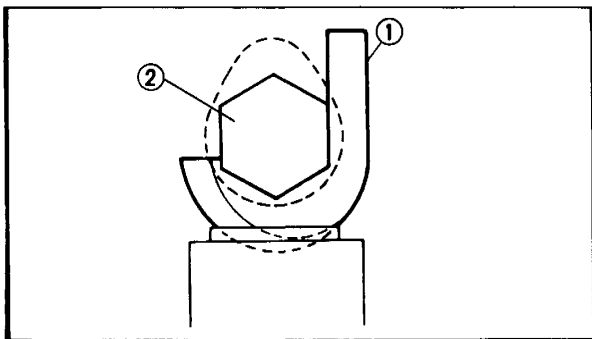
Valve clearance adjustment steps:

- Position the valve lifter slots (intake and exhaust side) opposite each other.
- Install the Tappet Adjusting Tool ① (YM-33961) onto the camshaft ②.

- ④ Cylinder head
- ⑤ Pad



VALVE CLEARANCE ADJUSTMENT



• Turn the crankshaft until the lobe of the tool ① depresses the valve lifters ③ .

• Remove the pads ⑤ from the lifters. Use a small screwdriver and a magnetic rod for removal.

• Note pad numbers.

• Select the proper valve adjusting pad from the chart below:

Pad range		Pad Availability: 25 increments
No. 200 ~ No. 320	200 mm (0.079 in) ~ 320 mm (0.130 in)	Pads stepped in 0.05 mm (0.002 in) increments

NOTE: _____
The thickness of each pads is marked on the pad face that contacts the valve lifter (not the cam).

• Round off the hundredths digit of the original pad number to the nearest 0.05 mm increment.

Hundredths digit	Rounded valve
0 or 2.	0
5	(NOT ROUNDED OFF)
8	10

EXAMPLE:
Original pad number = 258 (2.58 mm)
Rounded off digit = 260

NOTE: _____
Pads can only be selected in 0.05 mm (0.002 in) increments.

• Locate the "Installed Pad Number" on the chart, and then find the measured valve clearance. The point where these coordinates intersect is the new pad number.

NOTE: _____
Use the new pad number as a guide only as the number must be verified.

VALVE CLEARANCE ADJUSTMENT



Pad number verification steps:

- Install the new pad with the number down.
- Remove the adjusting tool.
- Recheck the valve clearance.
- If the clearance is incorrect, repeat all of the clearance adjustment steps until the proper clearance is obtained.

INTAKE

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.00 ~ 0.05			200	205	210	215	220	225	230	235															
0.06 ~ 0.10		200	205	210	215	220	225	230	235	240															
0.11 ~ 0.15																									
0.16 ~ 0.20	205	210	215	220	225	230	235	240	245	250															
0.21 ~ 0.25	210	215	220	225	230	235	240	245	250	255															
0.26 ~ 0.30	215	220	225	230	235	240	245	250	255	260															
0.36 ~ 0.40	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.41 ~ 0.45	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.46 ~ 0.50	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.51 ~ 0.55	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.56 ~ 0.60	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.61 ~ 0.65	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.66 ~ 0.70	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.71 ~ 0.75	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.76 ~ 0.80	265	270	275	280	285	290	295	300	305	310	315	320													
0.81 ~ 0.85	270	275	280	285	290	295	300	305	310	315	320														
0.86 ~ 0.90	275	280	285	290	295	300	305	310	315	320															
0.91 ~ 0.95	280	285	290	295	300	305	310	315	320																
0.96 ~ 1.00	285	290	295	300	305	310	315	320																	
1.10 ~ 1.05	290	295	300	305	310	315	320																		
1.06 ~ 1.10	295	300	305	310	315	320																			
1.11 ~ 1.15	300	305	310	315	320																				
1.16 ~ 1.20	305	310	315	320																					
1.21 ~ 1.25	310	315	320																						
1.26 ~ 1.30	315	320																							
1.31 ~ 1.35	320																								

VALVE CLEARANCE (cold):

0.11 ~ 0.15 mm (0.004 ~ 0.006 in)

Example: Installed is 250

Measured clearance is 0.32 mm (0.013 in)

Replace 250 pad with 270 pad

*Pad number: (example)

Pad No. 250 = 2.50 mm (0.098 in)

Pad No. 255 = 2.55 mm (0.100 in)

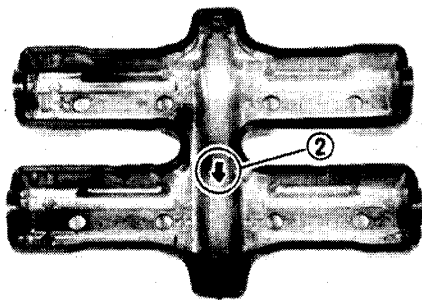
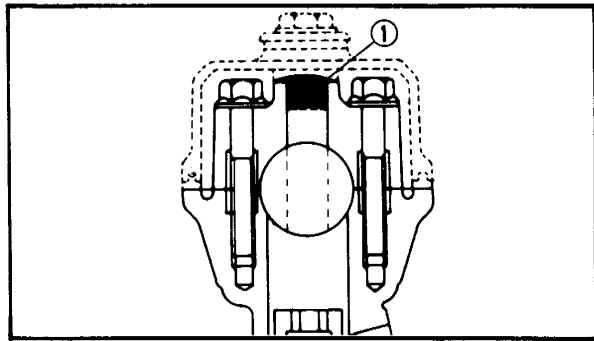
Always install pad with number down.



EXHAUST

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																																
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350		
0.00~0.05				200	205	210	215	220	225	230																							
0.06~0.10			200	205	210	215	220	225	230	235																							
0.11~0.15		200	205	210	215	220	225	230	235	240																							
0.16~0.20																																	
0.21~0.25		205	210	215	220	225	230	235	240	245	250																						
0.26~0.30		210	215	220	225	230	235	240	245	250	255																						
0.36~0.40		220	225	230	235	240	245	250	255	260	265	270																					
0.41~0.45		225	230	235	240	245	250	255	260	265	270	275																					
0.46~0.50		230	235	240	245	250	255	260	265	270	275	280																					
0.51~0.55		235	240	245	250	255	260	265	270	275	280	285																					
0.56~0.60		240	245	250	255	260	265	270	275	280	285	290																					
0.61~0.65		245	250	255	260	265	270	275	280	285	290	295																					
0.66~0.70		250	255	260	265	270	275	280	285	290	295	300																					
0.71~0.75		255	260	265	270	275	280	285	290	295	300	305																					
0.76~0.80		260	265	270	275	280	285	290	295	300	305	310																					
0.81~0.85		265	270	275	280	285	290	295	300	305	310	315																					
0.86~0.90		270	275	280	285	290	295	300	305	310	315	320																					
0.91~0.95		275	280	285	290	295	300	305	310	315	320																						
0.96~1.00		280	285	290	295	300	305	310	315	320																							
1.10~1.05		285	290	295	300	305	310	315	320																								
1.06~1.10		290	295	300	305	310	315	320																									
1.11~1.15		295	300	305	310	315	320																										
1.16~1.20		300	305	310	315	320																											
1.21~1.25		305	310	315	320																												
1.26~1.30		310	315	320																													
1.31~1.35		315	320																														
1.36~1.40		320																															

VALVE CLEARANCE (cold):
 0.16 ~ 0.20 mm (0.006 ~ 0.008 in)
Example: Installed is 250
 Measured clearance is 0.32 mm (0.013 in)
 Replace 250 pad with 265 pad
***Pad number: (example)**
 Pad No. 250 = 2.50 mm (0.098 in)
 Pad No. 255 = 2.55 mm (0.100 in)
Always install pad with number down.



Assembly

When installing the side panels, reverse the removal procedure. Note the following points.

- 1. Install:
 - Cylinder head covers

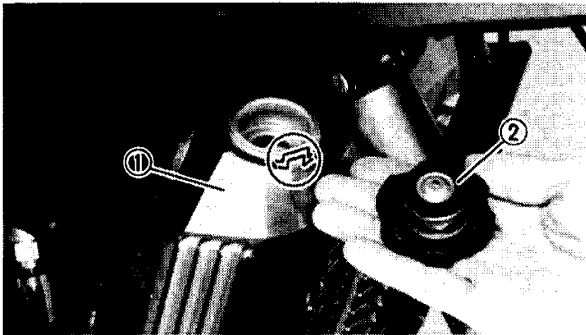
NOTE: _____

- Be sure all cam caps are covered with oil plug ①.
- Arrow mark ② on the cover should face toward the exhaust side.
- Inspect the head cover gasket and replace it if damaged.

- 2. Tighten:
 - Bolts (Cylinder head cover)

Bolts (Cylinder Head Cover):
 10 Nm (1.0 m·kg, 7.2 ft·lb)

CRANKCASE VENTILATION SYSTEM INSPECTION/ FUEL LINE INSPECTION/FUEL FILTER REPLACEMENT



3. Tighten:
 - Bolts (Radiator)

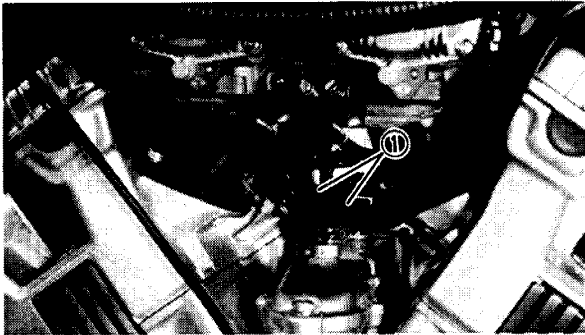


Bolts (Radiator):
7 Nm (0.7 m·kg, 5.1 ft·lb)

4. Install:
 - Radiator cover ①

NOTE: _____
Before installing the radiator cover, remove the radiator cap ② .

5. Install:
 - Side panels (Left and right)
 - Top coverRefer to "SIDE PANEL REMOVAL AND INSTALLATION" section.

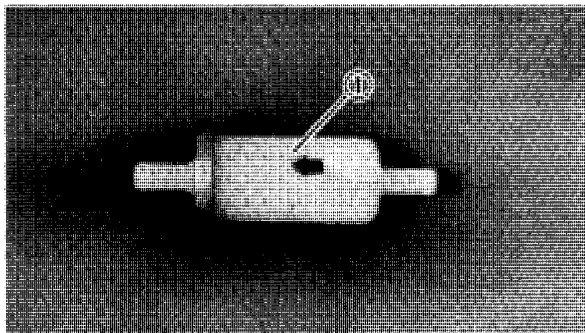


CRANKCASE VENTILATION SYSTEM INSPECTION

1. Inspect:
 - Crankcase ventilation hose ①Cracks/Damage → Replace.

FUEL LINE INSPECTION

1. Inspect:
 - Fuel hoses
 - Vacuum linesCracks/Damage → Replace.



FUEL FILTER REPLACEMENT

1. Remove:
 - Side panel (Left)
 - Fuel filter ①
2. Inspect:
 - Fuel filterDirty/Damage → Replace.
3. Install:
 - Components in above list (step "1")



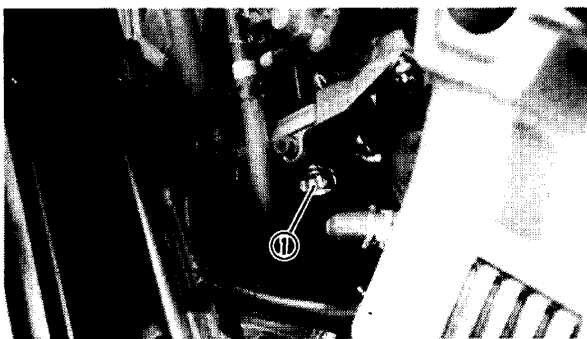
INTAKE MANIFOLD INSPECTION

1. Tighten:
 - Carburetor clamps
 - Carburetor joint bolts
 - Carburetor joint nuts
2. Inspect:
 - Carburetor joint
 - Gaskets
 Cracks/Damage → Replace.

EXHAUST SYSTEM INSPECTION

1. Inspect:
 - Exhaust pipe
 - Muffler clamp gasket(s)
 Damage → Replace.
2. Tighten:
 - Exhaust pipe bolts
 - Muffler bolts

	Exhaust Pipe Joint: 7 Nm (0.7 m·kg, 5.1 ft·lb)
	Exhaust Pipe Flange: 20 Nm (2.0 m·kg, 14 ft·lb)
	Muffler Clamp: 20 Nm (2.0 m·kg, 14 ft·lb)



IDLE SPEED ADJUSTMENT

1. Remove:
 - Top cover
 - Side panel (Left)
 Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.
2. Adjust:
 - Idle speed
 Warm up the engine and turn the throttle stop screw ① to adjust.

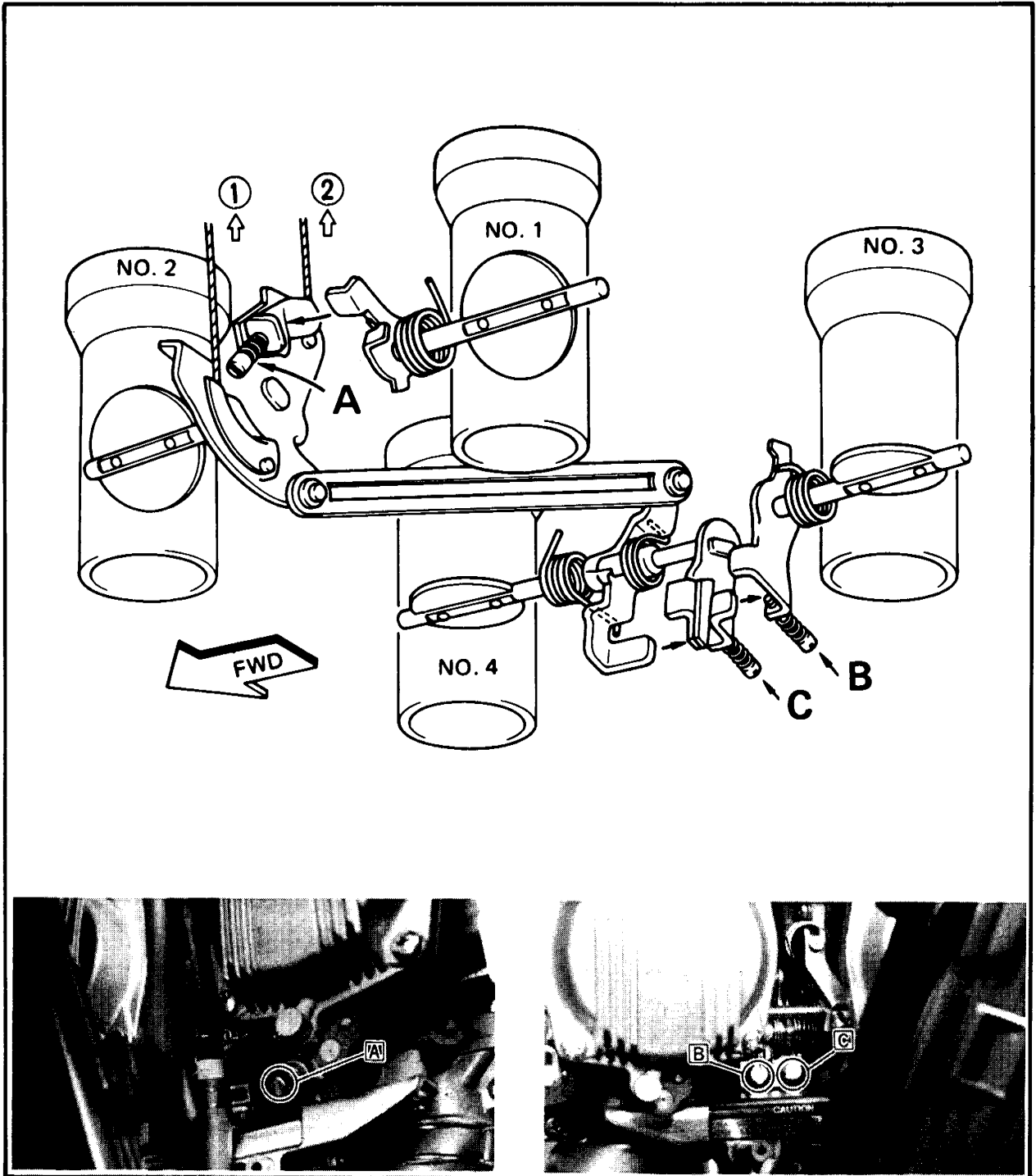
	Idle Speed: 950 ~ 1,050 r/min
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3. Install:
 - Side panel (Left)
 - Top cover
 Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.

CARBURETOR SYNCHRONIZATION

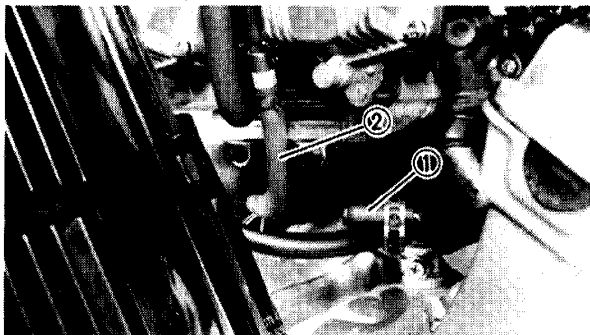
NOTE: _____
Valve clearance must be set properly before synchronizing the carburetors.

- ① OPEN
- ② CLOSE

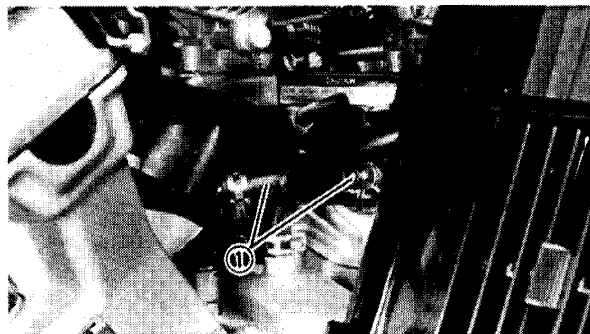




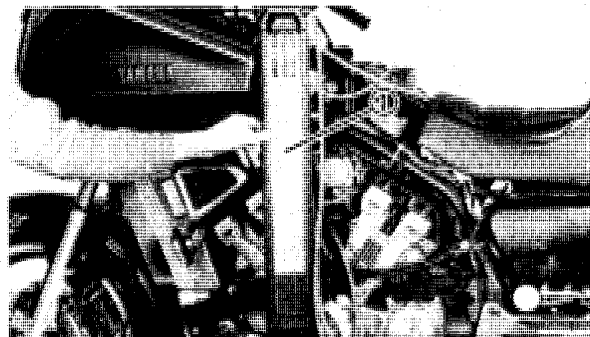
CARBURETOR SYNCHRONIZATION



1. Remove:
 - Top cover
 - Side panels (Left and right)
Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.
 - Vacuum plugs (Left and right) ①
 - Vacuum hose ②

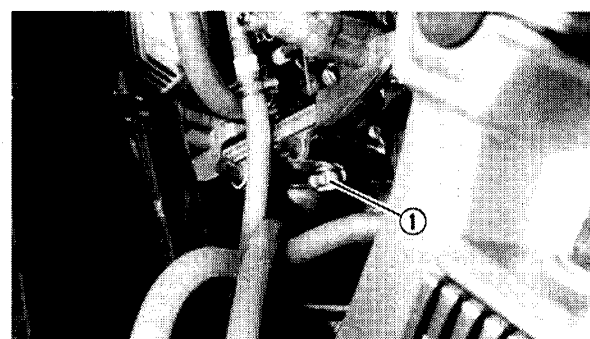


2. Attach:
 - Vacuum Gauge ① (YU-08030-A)
To the vacuum plugs.
3. Start the engine and let it warm up.



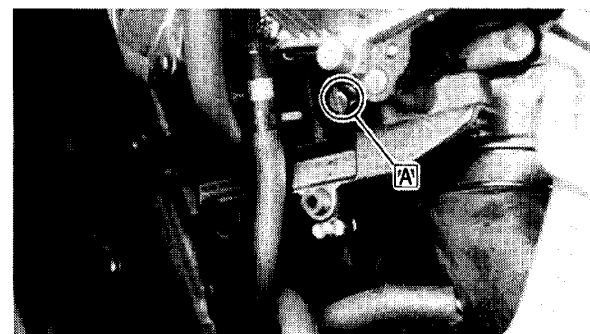
4. Adjust:
 - Idle speed
Out of specification →
Turn the throttle stop screw ① to adjust.

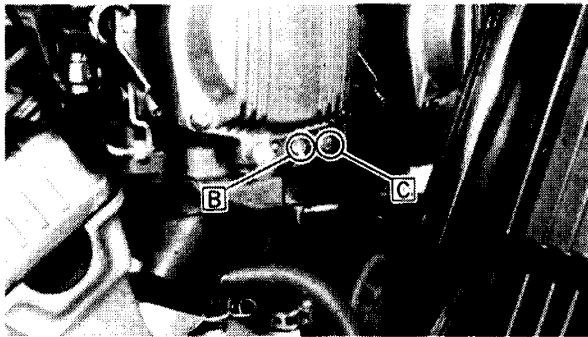
	<p>Idle Speed: 950 ~ 1,050 r/min</p>
--	---



5. Adjust:
 - Carburetor synchronization
By the following adjustment steps.

<p>Carburetor synchronization adjustment steps:</p> <ul style="list-style-type: none"> • Synchronize carburetor No. 1 to carburetor No. 2 by turning synchronizing screw "A" until both gauges read the same. • Rev the engine for a fraction of a second, two or three times, and check the synchronization again.
--





Vacuum Pressure at Idle Speed:
 33.3 kPa (250 mm Hg, 9.84 in Hg)
Vacuum Synchronous Difference:
 1.33 kPa (10 mm Hg, 0.40 in Hg)

- Repeat the above steps to synchronize carburetor No. 3 to carburetor No. 4 by turning synchronizing screw "B" until both gauges read the same.
- Repeat the same steps to synchronize No. 4 carburetor to No. 2 carburetor, then turn synchronizing screw "C" until both gauges read the same.

6. Install:


- Components in above list (Step "1")
 Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.

THROTTLE CABLE ADJUSTMENT

NOTE: _____
 Before adjusting the throttle cable free play, the engine idling speed should be adjusted.

1. Check:

- Throttle cable 3 free play (a)
 Out of specification → Adjust.

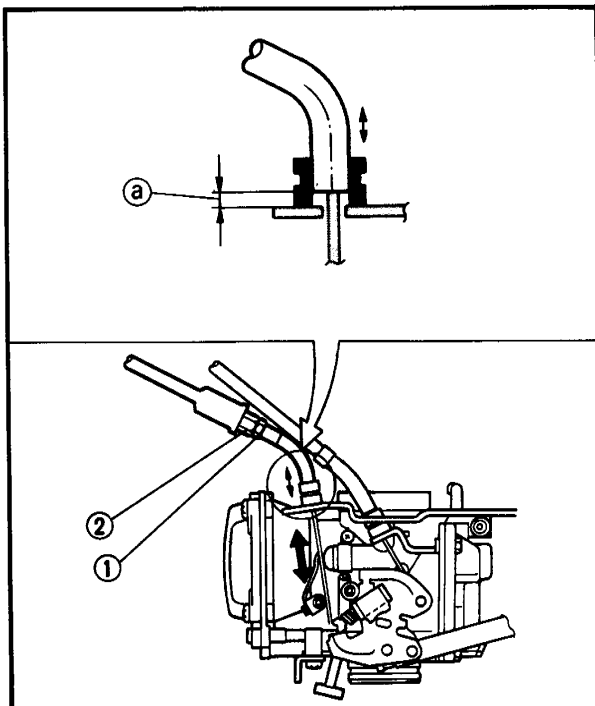
 **Throttle Cable 3 Free Play (a) :**
 1 ~ 2 mm (0.04 ~ 0.08 in)

2. Adjust:

- Throttle cable 3 free play
 By the following adjustment steps.

Throttle cable 3 free play adjustment steps:

- Loosen the locknut (Throttle cable 3) ① .
- Turn the adjuster (Throttle cable 3) ② clockwise or counterclockwise until proper free play is attained.
- Tighten the locknut.





3. Check:

- Throttle cable 1 free play (a)
Out of specification → Adjust.



Throttle Cable 1 Free Play (a) :
4 ~ 7 mm (0.16 ~ 0.28 in)

4. Adjust:

- Throttle cable 1 free play
By the following adjustment steps.

Throttle cable 1 free play adjustment steps:

- Loosen the locknut (Throttle cable 1) ①.
- Turn the adjuster (Throttle cable 1) ② clockwise or counterclockwise until proper free play is attained.
- Tighten the locknut.

5. Check:

- Actuator cable free play (a)
Out of specification → Adjust.
Put the actuator.



Actuator Cable Free Play (a) :
1 ~ 2 mm (0.04 ~ 0.08 in)

6. Check:

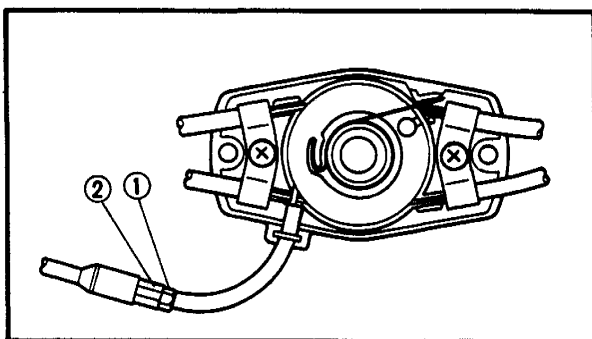
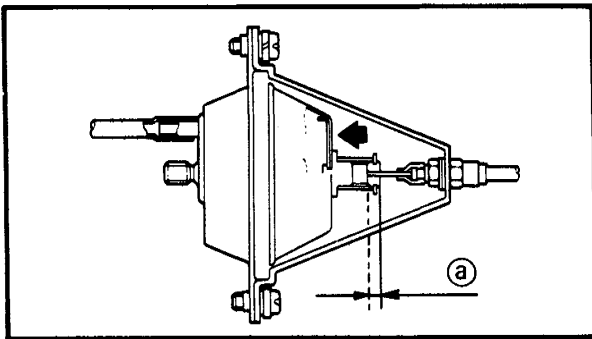
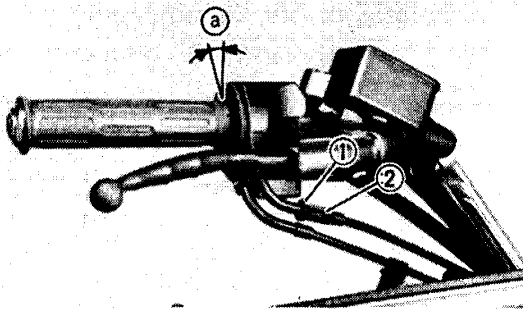
- Throttle grip operation
Throttle grip fails to operate → Adjust.
Further push the actuator to eliminate the free play.

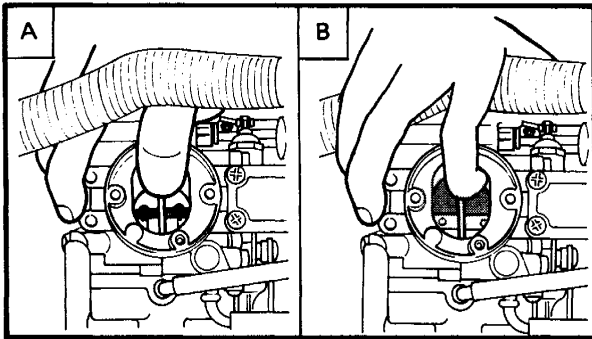
7. Adjust:

- Actuator cable free play
By the following adjustment steps.

Actuator cable free play adjustment:

- Loosen the locknut (Actuator cable) ①.
- Turn the adjuster (Actuator cable) ② clockwise or counterclockwise until proper free play is attained.
- Tighten the locknut.
- Repeat step "6".





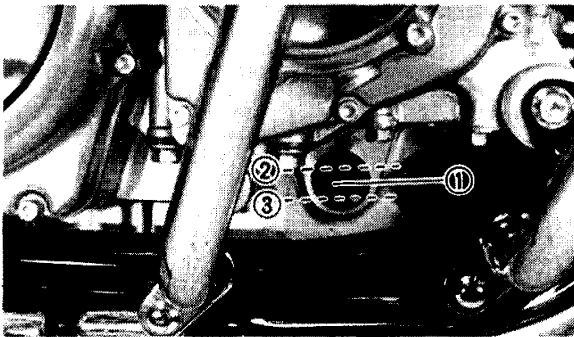
8. Check:

- No. 2 carburetor throttle valve operation
By the following checking steps.

No. 2 carburetor throttle valve operation checking steps:

- Turn throttle grip back and forth.
- Check No. 2 carburetor to see if the throttle valve operates at full open and full closed.
Throttle valve fails to operate at full closed
→ Repeat steps "1 ~ 7".

- A** THROTTLE VALVE FULLY OPEN
B THROTTLE VALVE FULLY CLOSED



ENGINE OIL LEVEL INSPECTION

1. Inspect:

- Oil level
Oil level low → Add sufficient oil.
By the following inspection steps.

Engine oil level visual inspection steps:

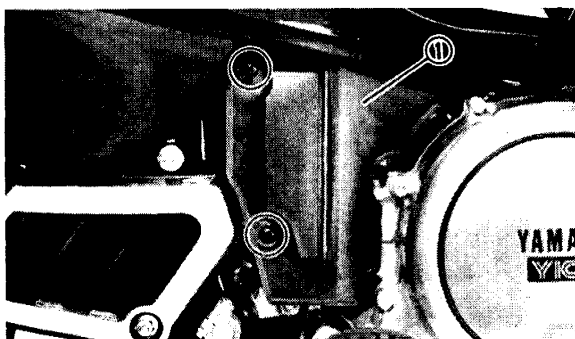
- Place the motorcycle on its centerstand and warm up the engine for several minutes.

NOTE:

Position motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.

- Stop the engine and visually check the oil level through the level window ①.

- ② Maximum
③ Minimum



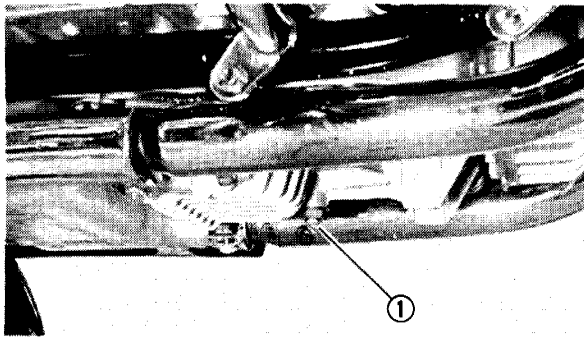
ENGINE OIL REPLACEMENT

Engine Oil Replacement (Without Oil Filter)

1. Warm up the engine for several minutes, then place a receptacle under the engine.
2. Remove:
 - Lower side cover (Right) ①
 - Oil filler cap



ENGINE OIL REPLACEMENT

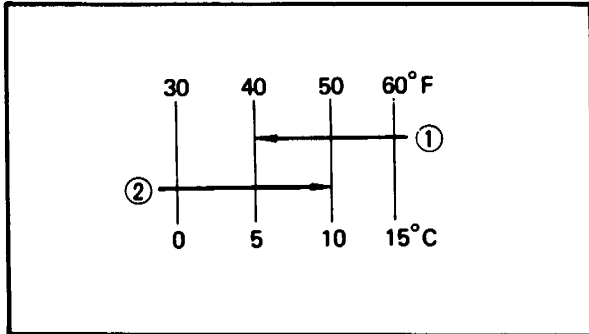


3. Remove:
 - Drain plug ①
 - Drain the engine oil.
4. Tighten:
 - Drain plug ①

Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)

5. Fill:
 - Crankcase

Recommended Oil:
 At 5°C (40°F) or Higher ① :
 Yamalube 4-cycle Oil or
 SAE 20W40 Type SE Motor Oil
 At 15°C (60°F) or Lower ② :
 SAE 10W30 Type SE Motor Oil
Periodic Oil Change:
 3.5 L (3.1 Imp qt, 3.7 US qt)



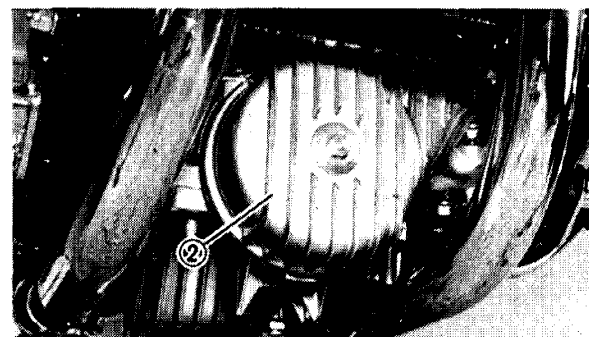
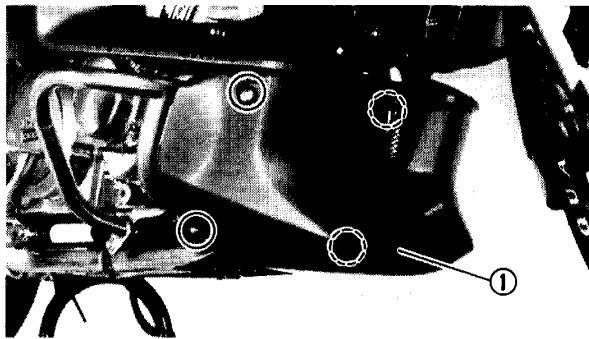
CAUTION:

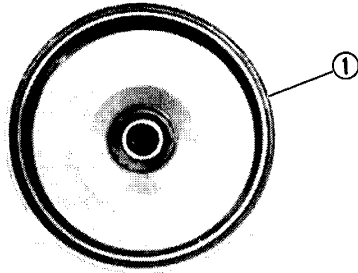
Do not allow foreign material to enter the crankcase.

6. Install:
 - Filler cap
 - Lower side cover (Right)
7. Inspect:
 - Oil leaks
 - Oil level


Engine Oil Replacement (With Oil Filter)

1. Warm up the engine and place a receptacle under the engine.
2. Remove:
 - Lower side cover (Right)
 - Oil filler cap
 - Drain plug
 - Drain the engine oil.
3. Remove:
 - Lower cowl ①
 - Oil filter cover ②






4. Install:
- Drain plug

 **Drain Plug:**
43 Nm (4.3 m·kg, 31 ft·lb)


- Oil filter (New)
- O-ring (New)
- Oil filter cover

NOTE: _____
Be sure the O-ring ① is positioned properly.

5. Tighten:
- Bolt (Oil filter)

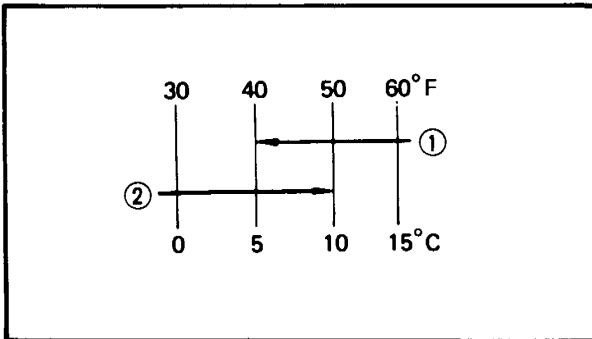
 **Bolt (Oil Filter):**
32 Nm (3.2 m·kg, 23 ft·lb)

6. Fill:
- Crankcase

 **Recommended Oil:**
At 5° C (40° F) or Higher ① :
Yamalube 4-cycle Oil or
SAE 20W40 Type SE Motor Oil
At 15° C (60° F) or Lower ② :
SAE 10W30 Type SE Motor Oil
With Oil Filter Replacement:
3.8 L (3.3 Imp qt, 4.0 US qt)

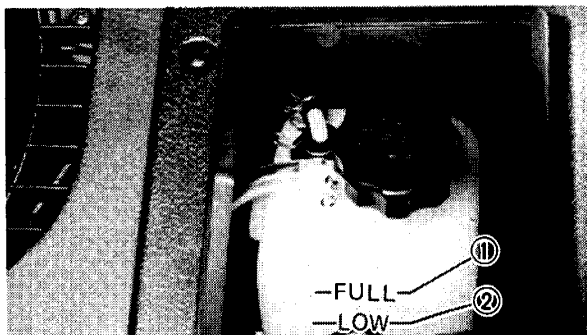
CAUTION: _____

Do not allow foreign material to enter the crankcase.



7. Install:
- Lower side cover (Right)
 - Oil filter cap

8. Inspect:
- Oil leaks
 - Oil level



COOLANT LEVEL INSPECTION

1. Open:
- Reservoir tank cover
2. Inspect:
- Coolant level (Reservoir tank)
Level low → Add tap water (Soft water).
Change the Coolant every two years.
Refer to Chapter 4 "COOLING SYSTEM"
for more detail.

- ① "FULL" level
- ② "LOW" level



WARNING:

Do not remove the radiator cap when the engine is hot.

CAUTION:

Hard water or salt water is harmful to the engine parts; use boiled or distilled water if you can't get soft water.



Total Amount:
2.8 L (2.46 Imp qt, 2.96 US qt)
Reservoir Tank Capacity:
0.39 L (0.34 Imp qt, 0.41 US qt)
From LOW to FULL Level:
0.25 L (0.22 Imp qt, 0.26 US qt)

COOLING SYSTEM INSPECTION

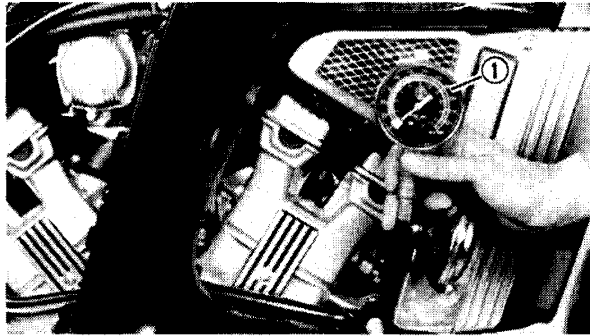
1. Inspect:
 - Hoses
 - Cranks/Damage → Replace.

COMPRESSION PRESSURE MEASUREMENT

NOTE:

Insufficient compression pressure will result in performance loss.

1. Measure:
 - Valve clearance
 - Out of specification → Adjust.
2. Warm up the engine.
3. Remove:
 - Top cover
 - Side panels (Left and right)
 - Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.
 - Spark plugs
4. Measure:
 - Compression pressure
 - By the following measurement steps.



Compression pressure measurement steps:

- Install the Compression Gauge ① (YU-33223) using an adapter.
- Crank over the engine with the electric starter (be sure the battery is fully charged) with the throttle wide open until the compression reading on the gauge stabilizes.
- Check readings with specified levels (See chart)

Compression Pressure (at sea level):

- Standard:**
1,177 kPa (12 kg/cm², 171 psi)
- Minimum:**
981 kPa (10 kg/cm², 142 psi)
- Maximum:**
1,373 kPa (14 kg/cm², 199 psi)

WARNING:

When cranking the engine, ground all of the spark plug leads to prevent sparking.

- Repeat the previous steps for the other cylinders.
- If pressure falls below the minimum level:
 - 1) Squirt a few drops of oil into the affected cylinder.
 - 2) Measure the compression again.

**Compression Pressure
(with oil introduced into cylinder)**

Reading	Diagnosis
Higher than without oil	Worn or damaged pistons
Same as without oil	Defective ring(s), valves, cylinder head gasket or piston is possible.
Above maximum level	Inspect cylinder head, valve surfaces, or piston crown for carbon deposits.

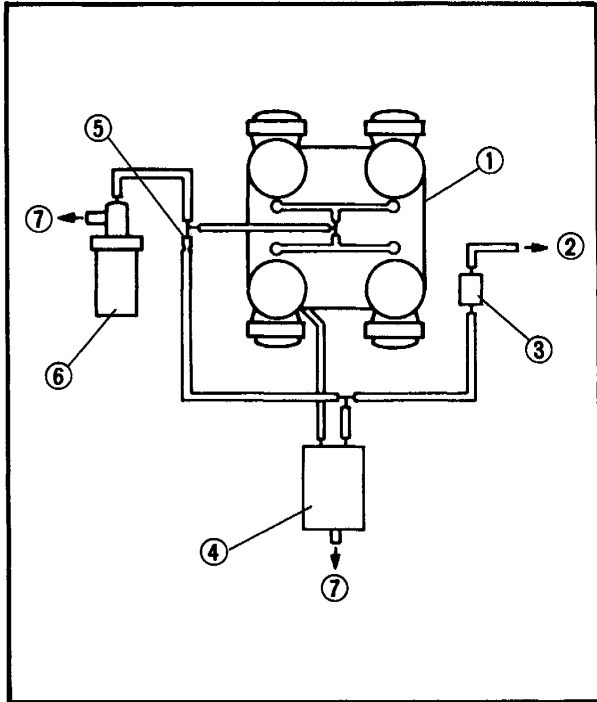
NOTE:

The difference between the highest and lowest cylinder compression readings must not vary more than the specified value.



**Difference Between Each Cylinder:
Less than 98 kPa (1 kg/cm², 14 psi)**

5. Install:
- Components in above list (Step "3")



CANISTER INSPECTION (XVZ13DSC ONLY)

1. Inspect:
- Hose connection
Poor condition → Correct.
 - Hoses
 - Canister
Cracks/Damage → Replace.
Clogs → Clean.

- ① Carburetor
- ② To carburetor
- ③ Roll over valve
- ④ Canister
- ⑤ Nozzle
- ⑥ Air vent control valve
- ⑦ To atmosphere



CHASSIS

FAIRING REMOVAL AND INSTALLATION

CAUTION:

- Avoid impact or damage in the removal and installation of the fairing.
- Avoid using any alkaline or strong acid cleaner, gasoline, brake fluid, or any other solvent.

WARNING:

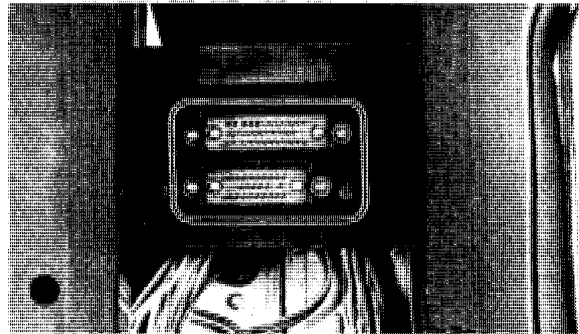
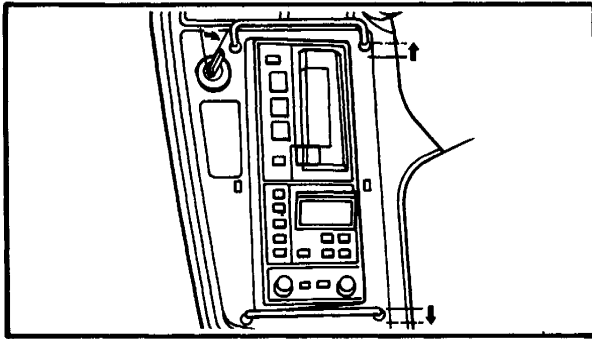
- Do not use a haircracked windscreen because it blurs visibility.
- Do not put a thing between the fairing and frame because it adversely affects steering.

Cleaning

Clean the fairing with a cloth or sponge damped with a neutral detergent, and after cleaning, thoroughly wash out with water. Some cleaning compounds for plastics may leave scratches on surfaces of the fairing. Before using, make a test by polishing an area which does not affect your visibility.

Removal

1. Remove:
 - Side panels (Left and right)
 - Lower cowl
 - Side covers (Radiator)



2. Remove:

- Lower side covers (Left and right) ①
 - Headlight mole
 - Headlight lens cover ②
 - Headlight lens unit
 - Windscreen ③
 - Rear view mirrors (Left and right) ④
 - Audio complete ⑤
- Unlock the lock and unhook the hooks.

CAUTION:

Before removing the control unit, turn off the main switch and "ON-VOL"/"INT.VOL" control knobs.

When removing the control unit, protect it, as well as the connectors, from water and mud. Do not bend or strain the connector terminals.

- Hoods (Left and right) ⑥
- Upper cover (Left) ⑦
Before removing the cover, remove the knob (Headlight beam adjuster). Disconnect all leads.
- Fairing (Left) ⑧
Disconnect all leads.
- Amplifier ⑨ /Tuner ⑩
Remove the amplifier/Tuner together bracket.
Disconnect all leads.
- Upper cover (Right) ⑪
Disconnect all leads.
- Fairing (Right) ⑫
Disconnect all leads.

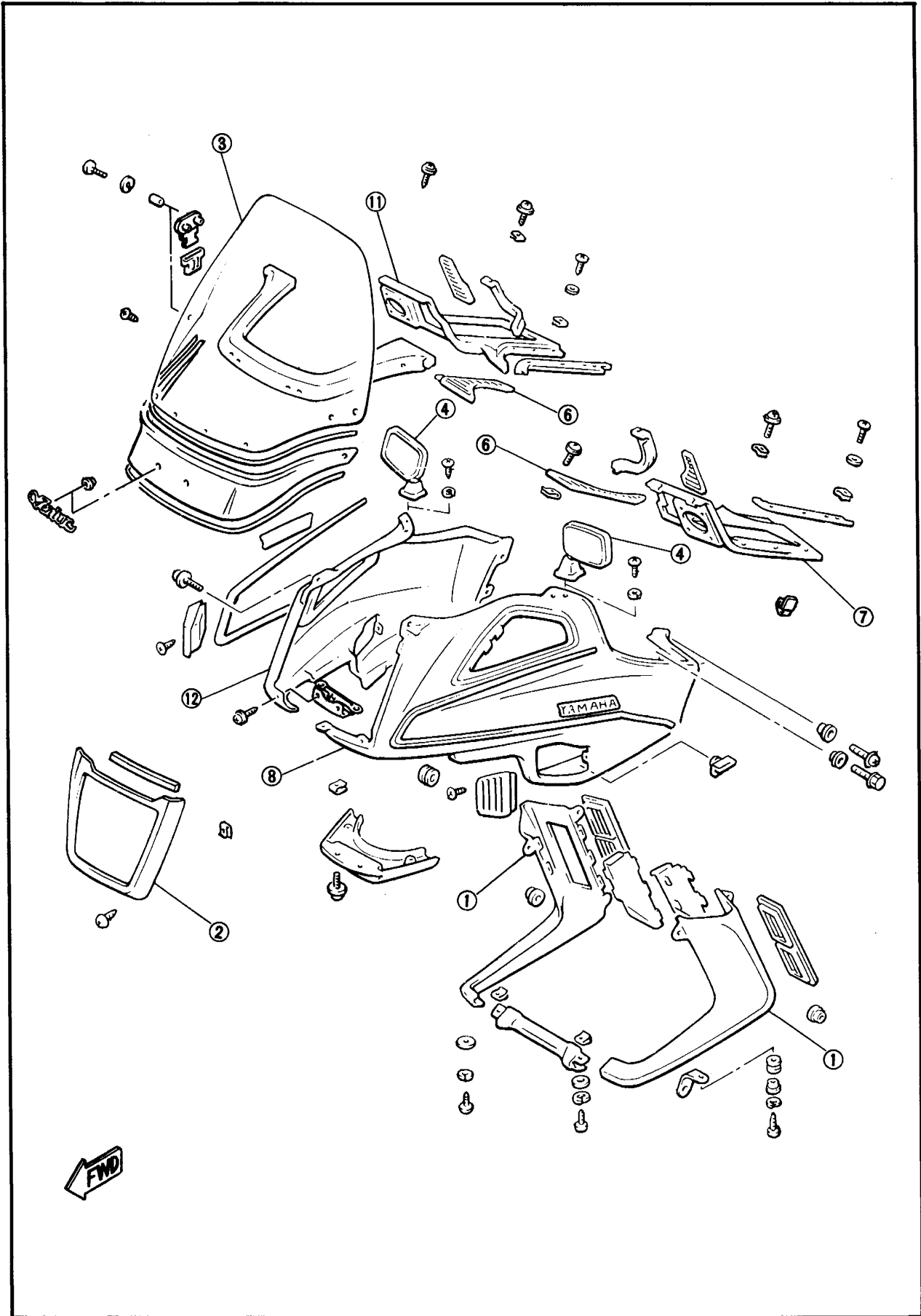
Removal

When installing the fairing, reverse the removal procedure.

NOTE:

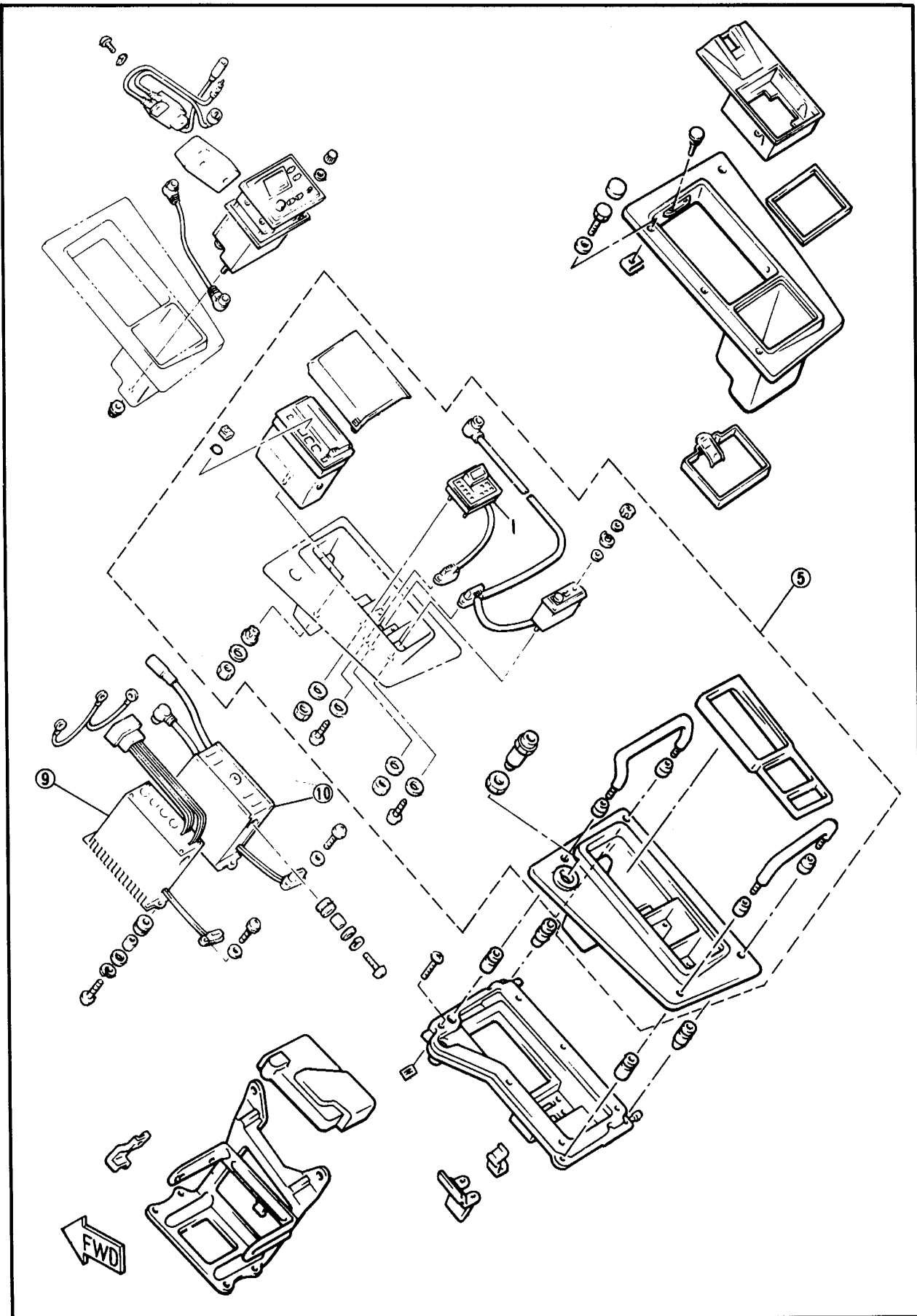
Make sure that leads are routed properly.

FAIRING REMOVAL AND INSTALLATION

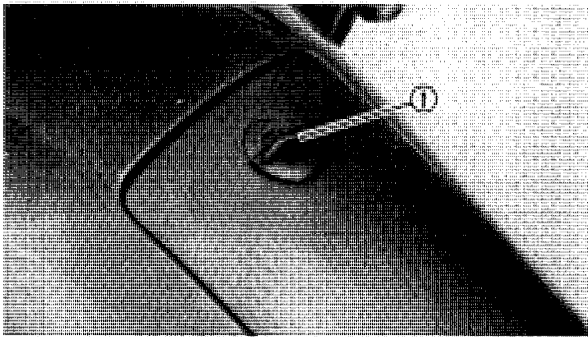




FAIRING REMOVAL AND INSTALLATION



SIDE PANEL REMOVAL AND INSTALLATION



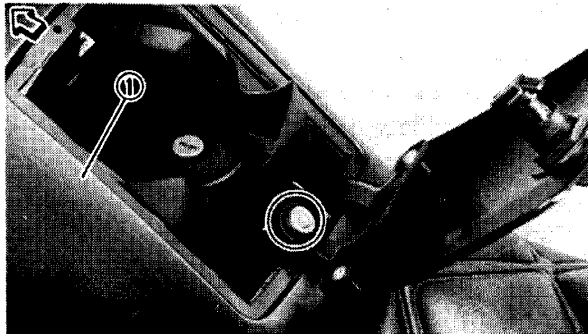
SIDE PANEL REMOVAL AND INSTALLATION

Removal

1. Open:

- Lid (Top cover) ①

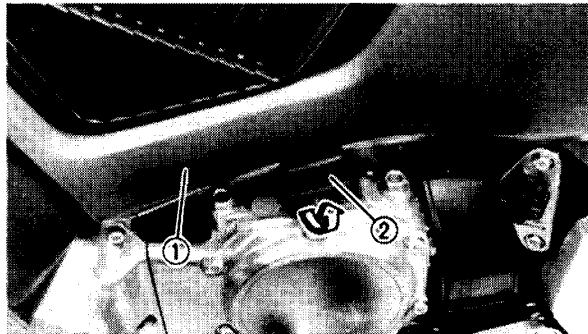
Rise the screw piece and turn it clockwise.



2. Remove:

- Top cover ①

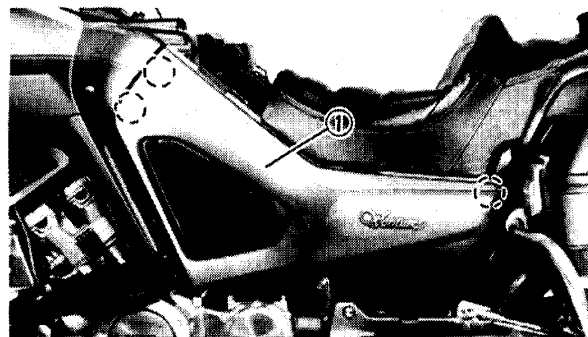
Push the top cover forward.



3. Remove:

- Side panels (Left and right) ①

Pull out the rubber band ② and pull the knobs out.

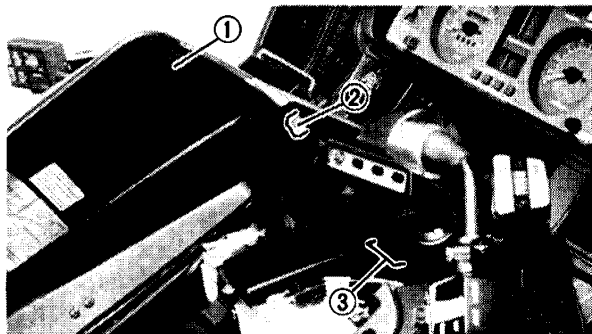


Installation

1. Install:

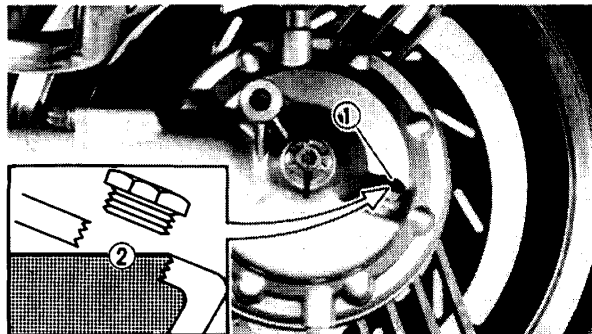
- Side panels (Left and right) ①

Place the side panel pawl ② beneath the seat and push the knobs in, then fit the rubber band.



2. Install:
 - Top cover ①

NOTE: _____
Make sure the hook ② on the top cover is inserted into the receptacle ③ on the frame.



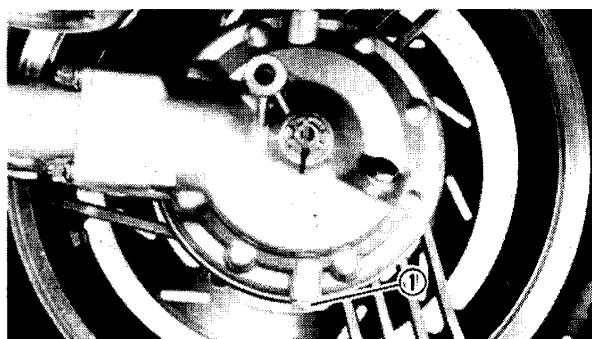
FINAL GEAR OIL LEVEL INSPECTION

1. Inspect:
 - Final gear oil level
 - Oil level low → Add sufficient oil.
 - By the following inspection steps.

Final gear oil level visual inspection steps:

- Position the motorcycle on a level area and place on its centerstand.
- Remove the oil filler cap ① .
- Visually check the oil level. Correct oil level ② should be at the brim of the hole.
- If the oil level is low, add sufficient oil.
- Tighten the oil filler cap to specification.

Oil Filler Cap (Final Gear):
23 Nm (2.3 m·kg, 17 ft·lb)



FINAL GEAR OIL REPLACEMENT

1. Place a receptacle under the final gear case.
2. Remove:
 - Oil filler cap
 - Drain plug ①
 - Drain the oil.
3. Install:
 - Drain plug

Drain Plug (Final Gear):
23 Nm (2.3 m·kg, 17 ft·lb)

4. Fill:
 - Final gear case

WARNING: _____
Do not allow the gear oil to contact the tire or wheel.



Oil Capacity:
0.2 L (0.18 Imp qt, 0.21 US qt)

Final Gear Oil:
SAE 80 API "GL-4" Hypoid
Gear Oil

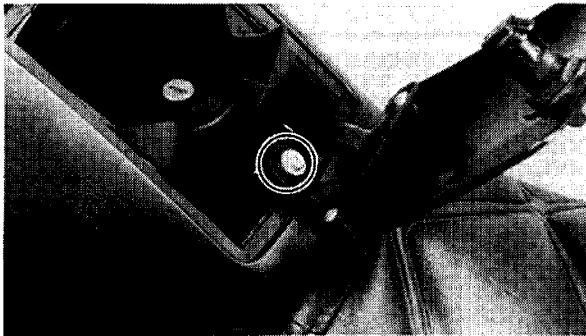
If desired, an SAE 80W90 Hypoid gear oil may be used for all conditions.

5. Install:

- Oil filler cap



Oil Filler Cap (Final Gear):
23 Nm (2.3 m·kg, 17 ft·lb)

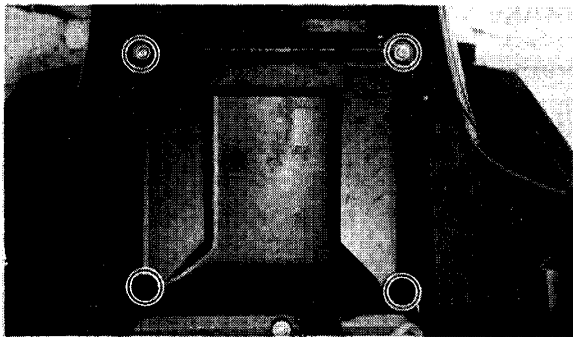


AIR FILTER CLEANING

1. Remove:

- Top cover

Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.

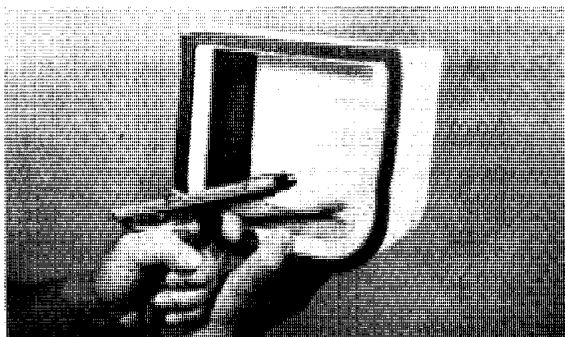


2. Remove:

- Air filter case cover
- Air filter element

CAUTION:

The engine should never be run without the air filter element installed; excessive piston and/or cylinder wear may result.



3. Eliminate:

- Dust

Use the compressed air.

Blow out dust in the element from the inner surface.

4. Inspect:

- Element

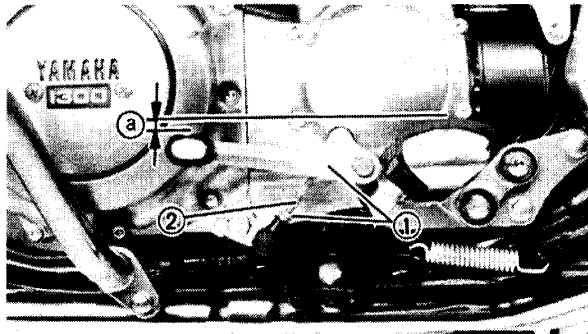
Damage → Replace.



5. Install:

- Element
- Air filter case cover
- Top cover

Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.



CHANGE PEDAL ADJUSTMENT

1. Loosen:

- Locknuts ①

2. Adjust:

- Change pedal height ②

Turn the adjuster ② until the change pedal position is at the specified height.



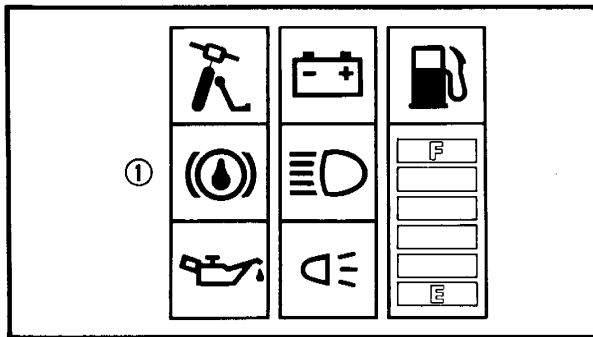
Change Pedal Height ② :

0 mm (0 in)

Flush with the Top of the Footrest

3. Tighten:

- Locknuts



BRAKE FLUID LEVEL INSPECTION

Brake Inspection

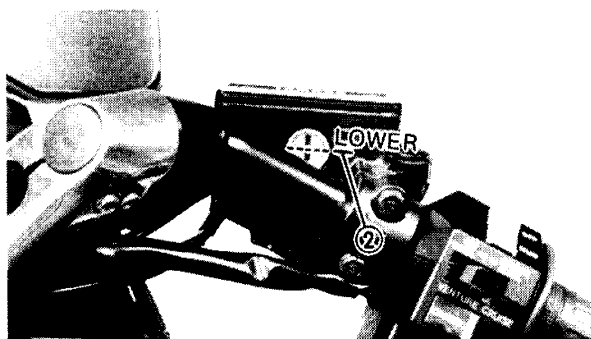
1. Inspect:

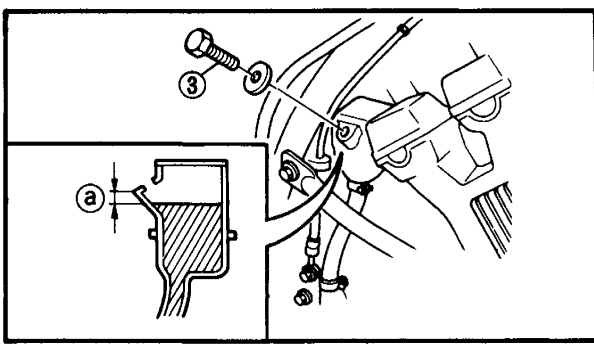
- Brake fluid level (Front and rear brake master cylinder)

By the following inspection steps.

Brake fluid level inspection steps:

- Place the motorcycle on its centerstand and turn the handlebars until the front master cylinder top is horizontal.
- Turn the main switch on, and inspect the computerized monitor.
- If the "BRK" indicator ① comes on, visually check the brake fluid level.
- Visually check the front brake fluid level. Correct brake fluid level should be over the "LOWER" level ②.
- If the fluid level is low, add sufficient fluid.





- Remove the top cover, side panel (Right) and blind plug ③ . Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.
- Visually check the rear brake fluid level. Correct brake fluid level ④ should be at 2 ~ 5 mm (0.08 ~ 0.20 in) below the plug hole brim.
- If the fluid level is low, add sufficient fluid.
- Tighten the blind plug and install the side panel (Right) and top cover. Refer to "SIDE PANEL REMOVAL AND INSTALLATION" section.

	Brake Fluid: DOT #3
---	-------------------------------

NOTE: _____

Be sure that:

- Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.

WARNING: _____

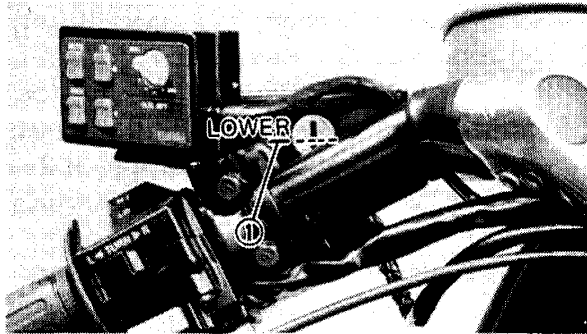
- Use only the designated quality brake fluid, otherwise poor brake performance will result.
- Water does not enter the master cylinder when refilling, otherwise poor brake performance.

Clutch Inspection

This motorcycle has a hydraulic clutch. There are no adjustments to perform, but the clutch system must be inspected periodically for fluid level and leakage.

1. Inspect:

- Brake fluid level (Clutch master cylinder)
By the following inspection steps.



Brake (Clutch) fluid level inspection steps:

- Place the motorcycle on its centerstand and turn the handlebars until the clutch master cylinder top is horizontal.
- Visually check the brake (clutch) fluid level. Correct brake (clutch) fluid level should be over the "LOWER" level ①.
- If the fluid level is low, add sufficient fluid.

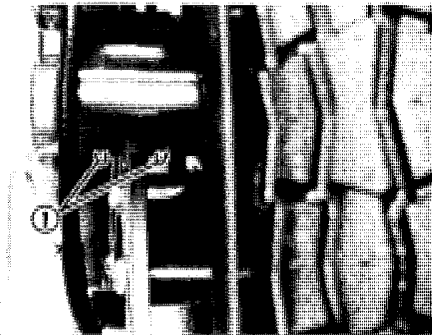


**Brake Fluid:
DOT #3**

NOTE:

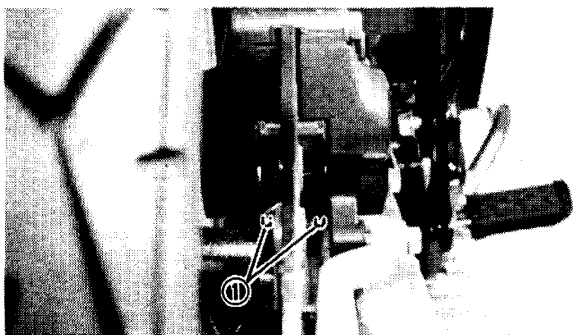
Be sure that:

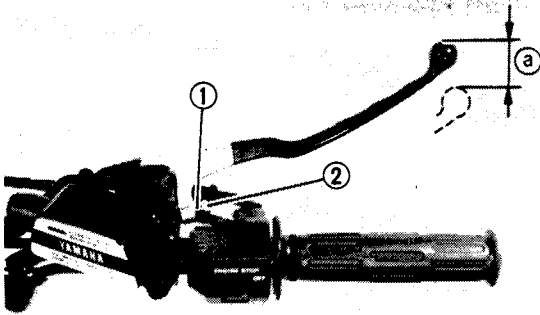
- Use only the designated quality brake fluid.
- Water does not enter the master cylinder when refilling.
- Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.



FRONT AND REAR BRAKE PAD INSPECTION

1. Activate the brake lever or brake pedal.
2. Inspect:
 - Wear indicator ①
Indicator almost contacts disc → Replace pads.
Refer to "Chapter 5 CHASSIS" section.






FRONT BRAKE ADJUSTMENT

1. Loosen:
 - Locknut ①
2. Adjust:
 - Free play ②

Turn the adjuster ② until the free play ② is within the specified limits.

 Free play ② :
2 ~ 5 mm (0.08 ~ 0.20 in)

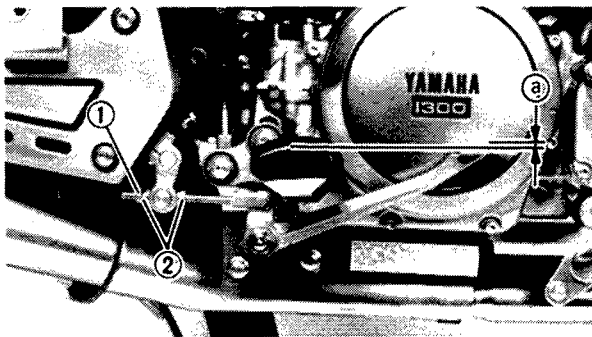
CAUTION:

Proper lever free play is essential to avoid excessive brake drag.

WARNING:

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.


3. Tighten:
 - Locknut



REAR BRAKE ADJUSTMENT Brake Pedal Height Adjustment

1. Remove:
 - Lower side cover (Right)
2. Loosen:
 - Locknut ①
3. Adjust:
 - Brake pedal height ②

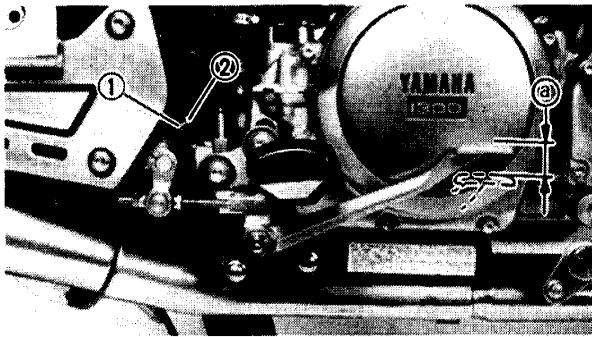
Turn the adjusters ② until the brake pedal position is at the specified height.

 Brake Pedal Height ② :
10 mm (0.4 in)
Above the Top of the Footrest

4. Tighten:
 - Locknut

WARNING:

After adjusting the pedal height, adjust the brake pedal free play.

**Brake Pedal Free Play Adjustment**

1. Loosen:
 - Locknut ①
2. Adjust:
 - Free play ③
 - Turn the adjuster ② until the free play ③ is within the specified limits.



Free play ③ :
13 ~ 15 mm (0.5 ~ 0.6 in)

CAUTION:

Proper pedal free play is essential to avoid excessive brake drag.

WARNING:

- A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.
- Check the operation of the brake light after adjusting the rear brake.

3. Tighten:
 - Locknut

CABLE INSPECTION AND LUBRICATION**Cable inspection and lubrication steps:**

- Remove the screws that secure throttle housing to handlebar.
- Hold cable end high and apply several drops of lubricant to cable.

**BRAKE AND CHANGE PEDALS/BRAKE AND CLUTCH
LEVERS LUBRICATION/CENTERSTAND AND
SIDE STAND LUBRICATION/SWINGARM LUBRICATION/
REAR SUSPENSION LINK LUBRICATION**



- Coas metal surface of disassembled throttle twist grip with suitable all-purpose grease to minimize friction.
- Check for damage to cable insulation. Replace any corroded or obstructed cables.
- Lubricate any cables that do not operate smoothly.



**Yamaha Chain and Cable Lube or
SAE 10W30 Motor Oil**

**BRAKE AND CHANGE PEDALS/BRAKE
AND CLUTCH LEVERS LUBRICATION**

Lubricate pivoting parts of each lever and pedal.



**Yamaha Chain and Cable Lube or
SAE 10W30 Motor Oil**

**CENTERSTAND AND SIDE STAND
LUBRICATION**

Lubricate the centerstand and sidestand at their pivot points.



**Yamaha Chain and Cable Lube or
SAE 10W30 Motor Oil**

SWINGARM LUBRICATION

Lubricate the swingarm bearing.



**Medium Weight Wheel
Bearing Grease**

REAR SUSPENSION LINK LUBRICATION

Lubricate pivoting parts of suspension link.



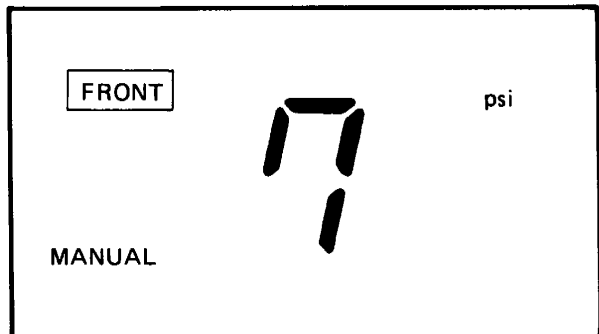
Molybdenum Disulfide Grease



FRONT FORK OIL CHANGE

WARNING:

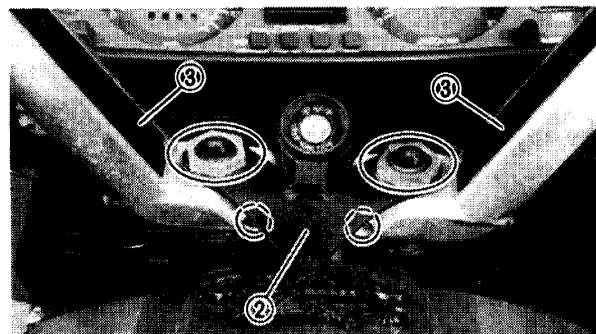
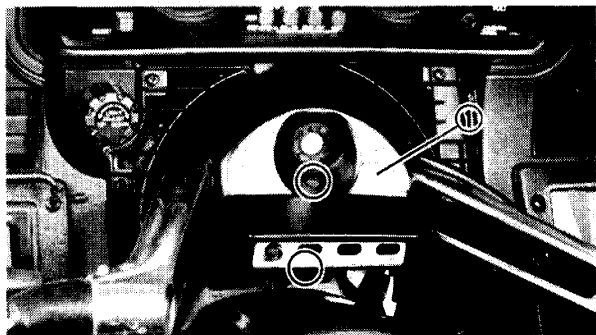
- Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the motorcycle.
- Securely support the motorcycle so there is no danger of it falling over.



1. Elevate the front wheel by placing a suitable stand under the engine.
2. Adjust:
 - Front fork air pressure
Decrease the air pressure to the minimum level (0.5 kg/cm² or 7 psi) by operating the air suspension controller.

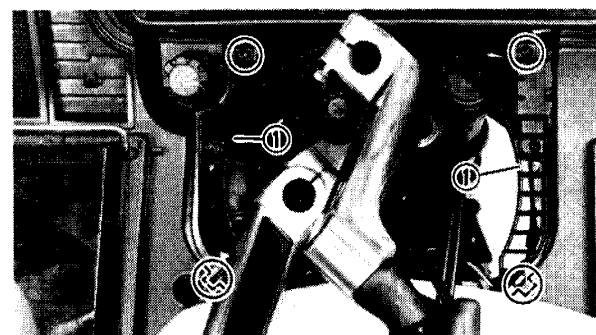
3. Remove:

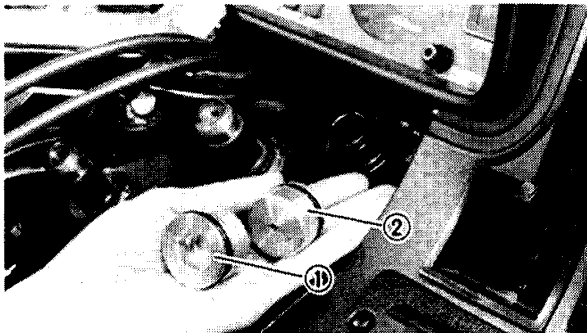
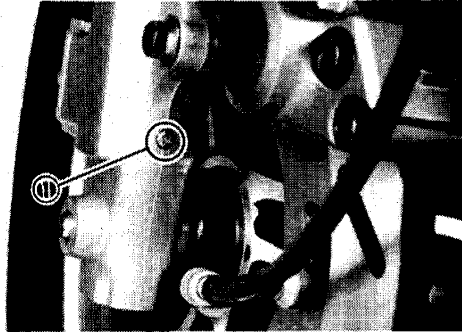
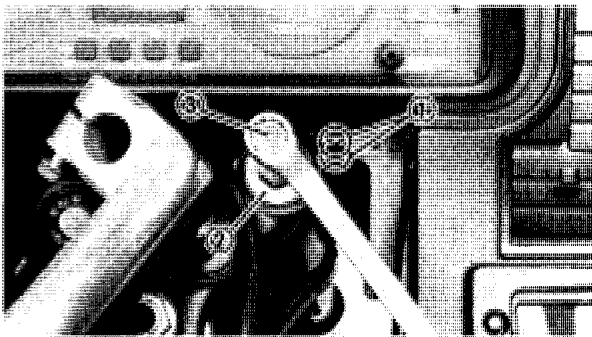
- Handlebar cover ①
- Bracket ②
- Handlebars ③



4. Remove:

- Hoods (Left and right) ①






5. Loosen:
 - Pinch bolts (Steering crown) ①
6. Remove:
 - Fork caps
 - Cap bolts ②
 - Use the Front Fork Cap Socket ③ (YM-01104).
 - Caps
 - Guides
7. Place a receptacles under the drain screws.
8. Remove:
 - Drain screws ①
 - Drain the fork oil.

WARNING:

Do not allow any oil to contact the disc brake components. If oil is discovered, be sure to remove it, otherwise diminished braking capacity and damage to the rubber components of the brake assembly will occur.


9. Inspect:
 - O-rings (Cap bolt) ①
 - O-rings (Cap) ②
 - Gaskets (Drain screw)
 - Wear/Damage → Replace.
10. Install:
 - Drain screws
 - Guides
11. Fill:
 - Front forks



Each Fork:
 409 cm³ (14.4 Imp oz, 13.8 US oz)
 Yamaha Fork Oil 10 wt or
 or Equivalent

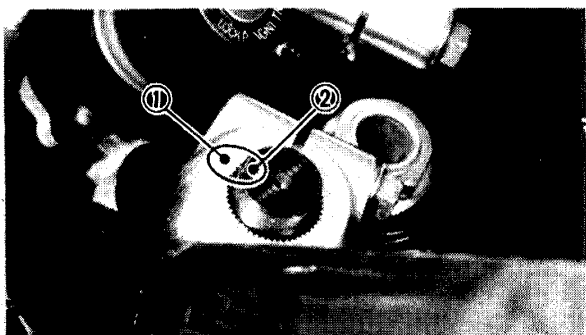
After filling, pump the forks slowly up and down to distribute the oil.

12. Install:
 - Caps
 - Cap bolts
 - Use the Front Fork Cap Socket (YM-01104).
 - Pinch bolts (Steering crown)
 - Hoods (Left and right)



Cap Bolt:
 25 Nm (2.5 m·kg, 18 ft·lb)

Pinch Bolts (Steering Crown):
 20 Nm (2.0 m·kg, 14 ft·lb)



13. Install:

- Handlebars
 - Bracket
- Select either of the handlebars position.

NOTE:

Standard Position:

Be sure the match mark ① on the handlebars is aligned with the match mark ② on the handlebar boss.

Backward Position:

The handlebars can be adjusted backward, one notch only, from the standard position.

WARNING:

Never tamper with this adjustment device in an attempt at further adjustment. Otherwise, it may cause:

The handlebar to contact the top cover or cables to be pulled tense, and the rider to assume an inappropriate riding position. Always adjust the handlebars on each side to the same position. Uneven adjustment will cause an improper riding position.

14. Tighten:

- Handlebars

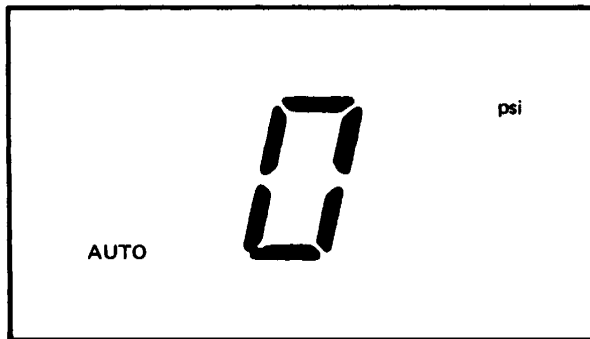
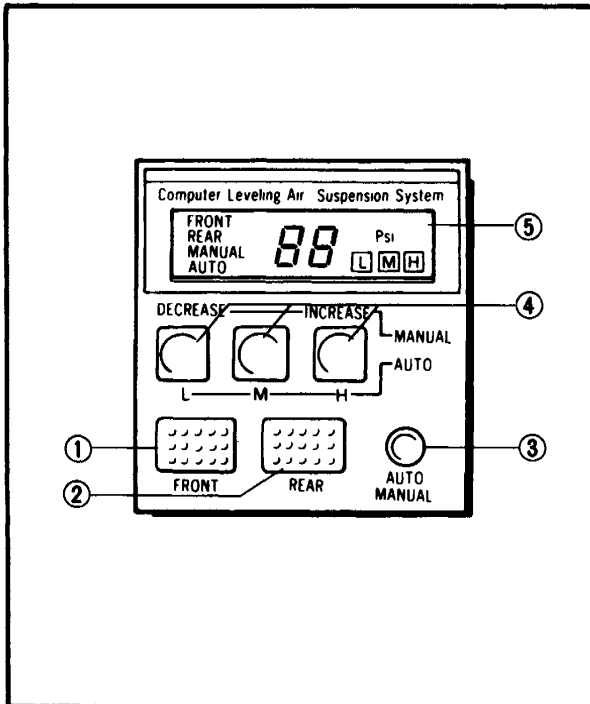
<p>Stopper Nut (Handlebars): 125 Nm (12.5 m·kg, 90 ft·lb)</p> <p>Pinch Bolt (Handlebars): 30 Nm (3.0 m·kg, 22 ft·lb)</p>
--

15. Install:

- Handlebar cover

16. Adjust:

- Front fork air pressure
- Refer to "FRONT FORK AND REAR SHOCK ABSORBER ADJUSTMENT" section.



FRONT FORK AND REAR SHOCK ABSORBER ADJUSTMENT

Air Pressure Adjustment (Front and Rear)

CAUTION:

Do not damage the air hose. It will result in an air leakage.

1. Elevate the wheel by placing the motorcycle on the centerstand.

NOTE:

When checking and adjusting the air pressure, there should be no weight on the motorcycle.

- ① "FRONT" switch
- ② "REAR" switch
- ③ "AUTO/MANUAL" switch
- ④ Pressure adjusting switch
- ⑤ Display panel

2. Turn the main switch to "ACC". All indicators on the display panel will light for about three seconds.

NOTE:

No adjustment is impossible with the main switch set to any position other than "ACC".

3. When the main switch is turned to "ACC", the display will appear.
4. Push the "FRONT" switch or the "REAR" switch. The front fork or the rear shock air pressure will be indicated on the display panel.
5. Adjust:
 - Air pressure

NOTE:

The air pressure of the front forks and rear shock absorber can be adjusted to suit rider's preference, weight, and the course condition.

By the following adjustment steps.

Air pressure adjustment steps:

NOTE:

If the display panel shows the error sign or if the system does not operate normally, refer to "CHAPTER 7. ELECTRICAL" section.

“AUTO” adjustment:

- Select “AUTO” by operating the “AUTO/MANUAL” switch.
- Using the pressure adjusting switch, push your desired switch (L, M, or H), and the air pressure is automatically adjusted to the preset pressure.

AIR PRESSURE		L	M	H
FRONT	kPa	78.5	98.1	118
	kg/cm ²	0.8	1.0	1.2
	psi	11	14	17
REAR	kPa	98.1	294	490
	kg/cm ²	1.0	3.0	5.0
	psi	14	43	71

NOTE: _____

Refer to “RECOMMENDED COMBINATION OF THE FRONT FORK AND REAR SHOCK ABSORBER SETTINGS” section.

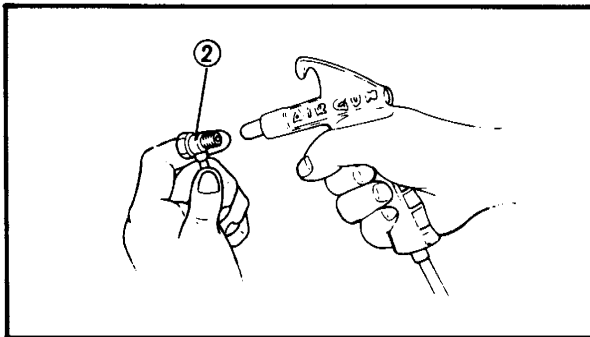
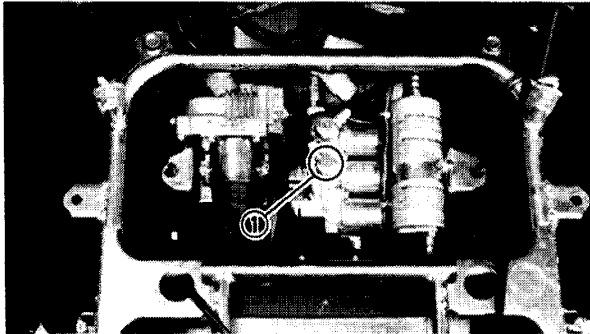
“MANUAL” adjustment:

- Using the “AUTO/MANUAL” switch, select “MANUAL”.
- By pushing “DECREASE” or “INCREASE” on the pressure adjusting switch, the air pressure can be adjusted.

AIR PRESSURE		MINIMUM ~ MAXIMUM
FRONT	kPa	49.0 ~ 147
	kg/cm ²	0.5 ~ 1.5
	psi	7 ~ 21
REAR	kPa	49.0 ~ 588
	kg/cm ²	0.5 ~ 6.0
	psi	7 ~ 85

NOTE: _____

- When making a manual adjustment, adjust the front fork air pressure first and then the rear shock. If the procedure is reversed, the residual high-pressure air in the circuit will flow into the front forks.
- Refer to “RECOMMENDED COMBINATION OF THE FRONT FORK AND REAR SHOCK ABSORBER SETTINGS” section.



If the motorcycle should turn over, proceed as follows:

- Place the motorcycle on the centerstand, and readjust the front fork air pressure.
- Check the air pressure again a few seconds after the readjustment.
- If there is a difference of 3 psi from the specified pressure, it is considered that the front fork oil may have entered the air pipe.
- Remove the front fork cap bolt (Left).
- Disconnect the air hose (Front fork) ① .
- Use compressed air to force the fork oil completely into the front fork.
- ② Air joint bolt
- Reverse the removal procedure.



Fork Cap Bolt:
25 Nm (2.5 m·kg, 18 ft·lb)

Air Hose:
10 Nm (1.0 m·kg, 7.2 ft·lb)

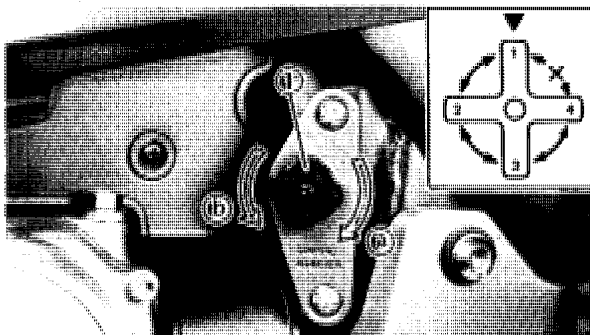
Damping Adjustment (Rear)

1. Adjust:
 - Damping

NOTE: _____

The damping of the rear shock absorber can be adjusted to suit rider's preference, weight, and the course condition.

By the following adjustment steps.



Damping adjustment steps:

- Adjust the damping with the damping adjuster ① .

- Stiffer ②** → Increase the damping.
(Turn the adjuster ① clockwise.)
- Softer ③** → Decrease the damping
(Turn the adjuster ① counter-clockwise.)



RECOMMENDED COMBINATIONS OF THE FRONT FORK AND THE REAR SHOCK ABSORBER SETTINGS

Standard Position (Minimum Position):

1

Maximum Position:

4

CAUTION:

Turn the damping adjuster from 1 to 4 or 4 to 1 in progressive steps. Never turn the adjuster directly 1 to 4 or 4 to 1.

RECOMMENDED COMBINATIONS OF THE FRONT FORK AND THE REAR SHOCK ABSORBER SETTINGS

Use this table as guidance to meet specific riding conditions and motorcycle load.

Loading condition	Solo rider			With passenger or accessory equipments			With accessory equipments and passenger			
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	
Air Pressure	Front	78.5	0.8	11	78.5 ~ 98.1	0.8 ~ 1.0	11 ~ 14	78.5 ~ 118	0.8 ~ 1.2	11 ~ 17
	Rear	98.1	1.0	14	196 ~ 294	2.0 ~ 3.0	28 ~ 43	294 ~ 490	3.0 ~ 5.0	43 ~ 71
Damping adjuster	1 or 2			2 or 3			3 or 4			

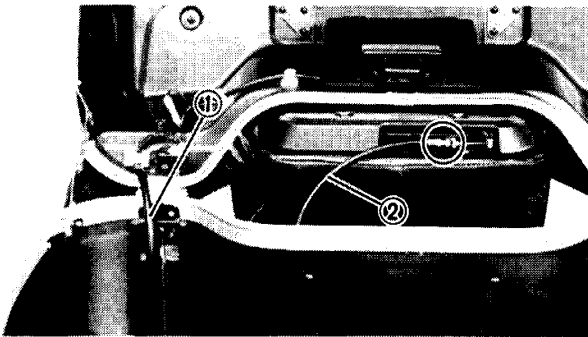
DESICCANT REPLACEMENT

The air drier contains 60 grams of silicagel as an absorbant. The absorbing power of the desiccant (silicagel) decreases as it absorbs moisture, so it must be replaced periodically. The desiccant (silicagel) is colorless when it is new but turns to pink after absorbing moisture.

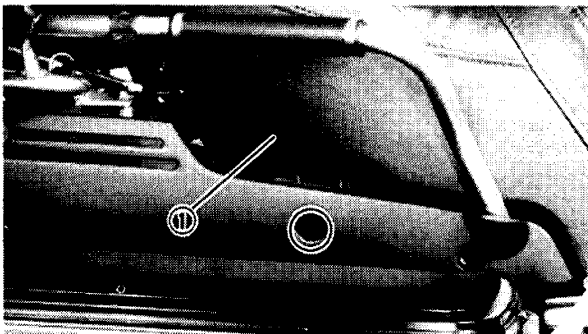
Replacement interval: 2 years

NOTE:

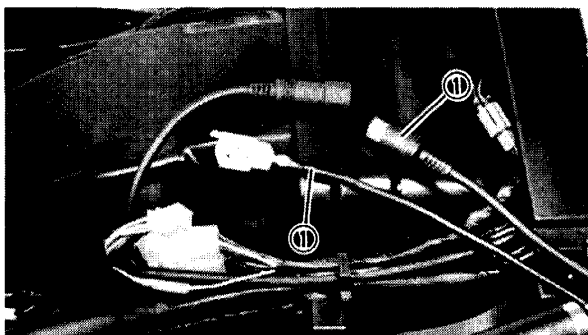
When used frequently or in humid areas, replacement interval should be shortened.

**Removal**

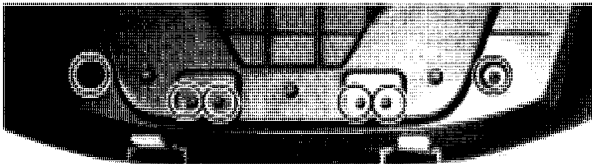
1. Decrease the air pressure to the minimum level (0.5 kg/cm² or 7 psi) by operating the air suspension controller.
2. Open the travel trunk.
3. Disconnect:
 - Trunk light lead ①
 - Back rest cable ②



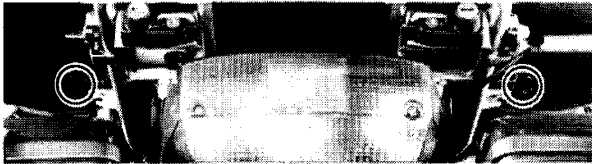
4. Remove:
 - Saddlebag lids (Left and right)
 - Seat ①



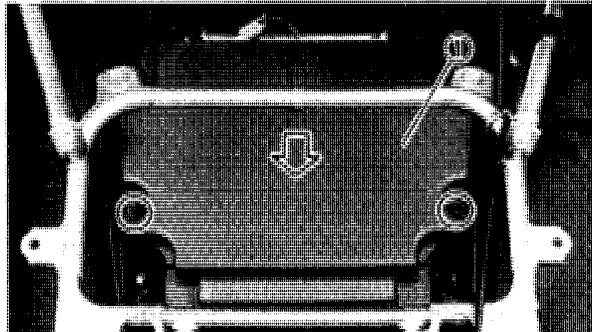
5. Disconnect:
 - Remote controller leads ①



6. Remove:
- Travel trunk

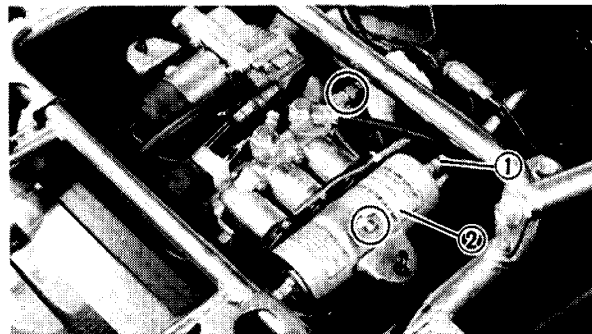


7. Remove:
- Cover ①

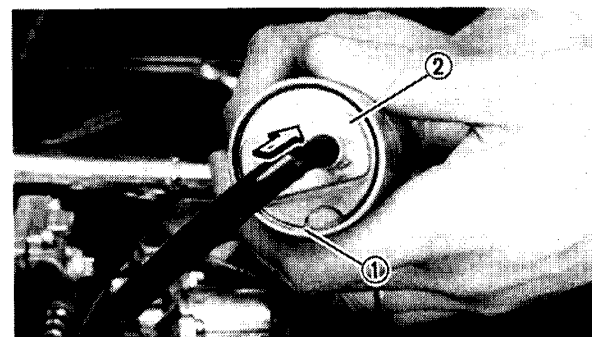


8. Disconnect:
- Drier hose ①

9. Remove:
- Drier ②

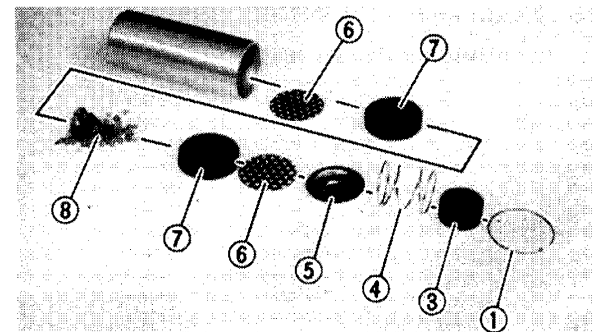


10. Remove:
- Circlip ①
 - Push the cap.
 - Cap ②



CAUTION:

- Avoid pulling the hose.
- Keep the opening of the chamber upright so that inner parts do not fall off.



- Filter ③
- Spring ④
- Buckle plates ⑤
- Filter plates ⑥
- Filters ⑦
- Desiccant ⑧

Cleaning

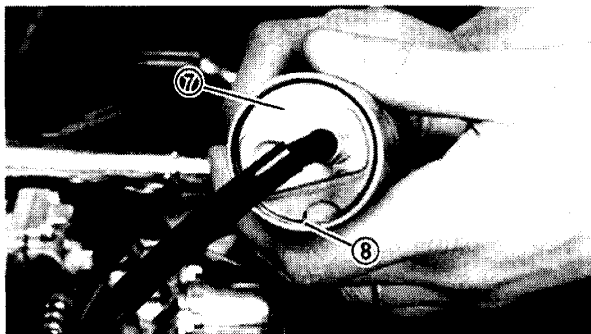
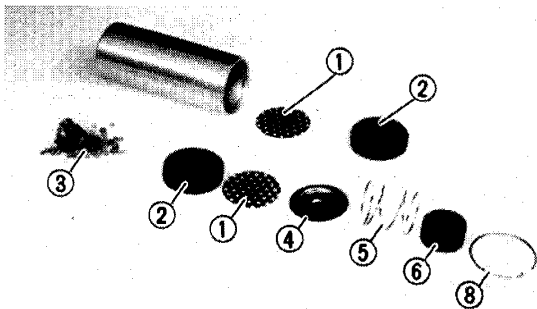
1. Clean:

- Drier
- Filters

By the following steps.

Cleaning steps:

- Thoroughly wipe off the inner surface of the drier, and let it dry.
- Wash the filters in the water, and dry it.



Installation

When installing the trunk light lead, reverse the removal procedure. Note the following points.

1. Install:

- Filter plates ①
- Filters ②
- Desiccant-SILICAGEL® (New) ③
Put 60g of specified desiccant into the drier case.
- Buckle plate ④
- Spring ⑤
- Filter ⑥
- Cap ⑦
- Circlip ⑧
Fit the circlip in its place and pull the cap.

CAUTION:

- There must be no particle of dust beyond the filters. These may cause damage or air leaks to the valve.
- Use this desiccant as soon as the bag is opened.
- Do not press or crush this desiccant in any way.
- Any pulverized desiccant should be excluded.



WARNING:

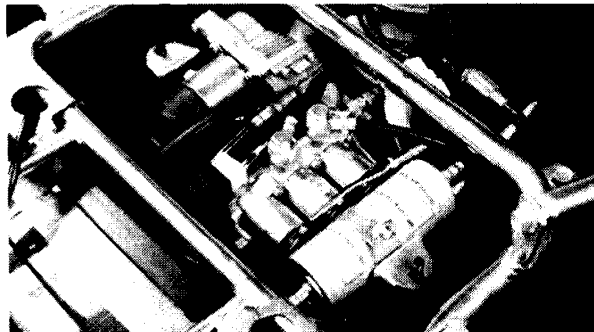
- This desiccant cannot be eaten. Should you swallow any, go to a doctor at once.
- Keep out of reach of children.
- Discard desiccant immediately after use.

2. Install:

- Drier

NOTE:

Make sure that pipes and leads are routed properly.



CAUTION:

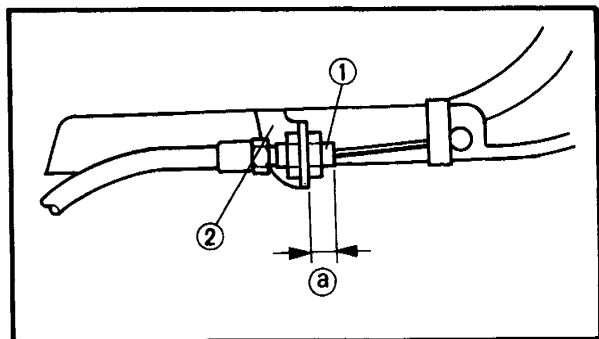
When installing the drier, care should be used so that the pipes and leads are not pinched.

3. Disconnect:

- Back rest cable

4. Adjust:

- Back rest cable distance (a)
Between the threaded end of the back rest cable guide (1) and the bracket (2).



Distance (a) :
7 mm (0.28 in)

5. Adjust:

- Front fork air pressure
 - Rear shock absorber air pressure
- Refer to "FRONT FORK AND REAR SHOCK ABSORBER ADJUSTMENT" section.

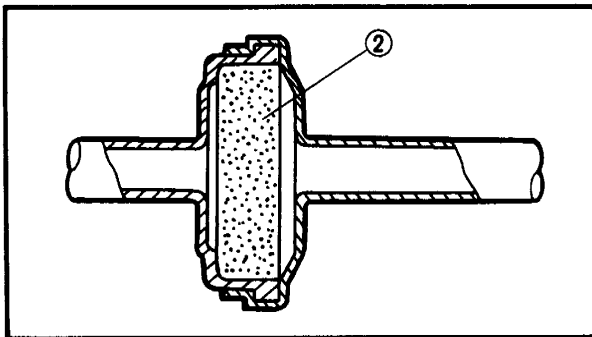
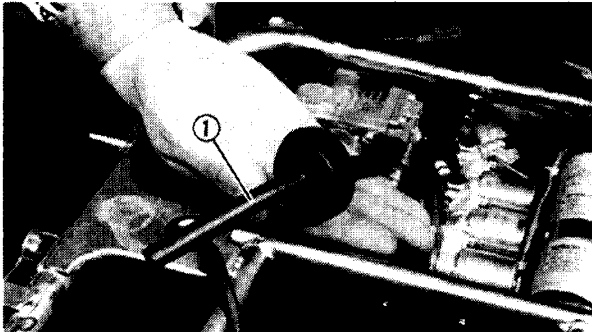
SUCTION FILTER CLEANING

The air compressor suction port is fitted with a filter which must be cleaned periodically.

Cleaning interval: One year

Removal

1. Open the travel trunk.
2. Remove:
 - Saddlebag lids (Left and right)
 - Seat
 - Travel trunkRefer to "DESICCANT REPLACEMENT" section.
3. Remove:
 - Suction hose ①
 - Suction filter ②Separate the suction pipe, and pull the filter.



Cleaning

1. Clean:
 - Suction filterWash the filter in the solvent and dry it.

Installation

When installing the trunk light lead, reverse the removal procedure. Note the following points.

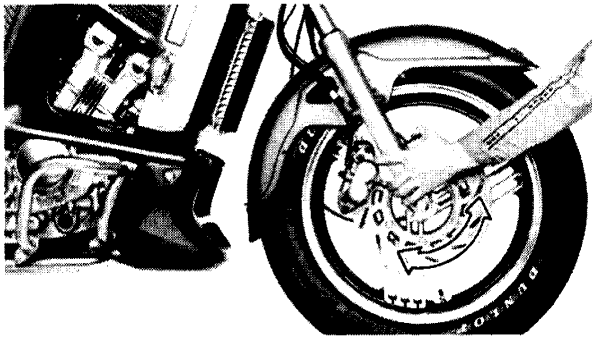
1. Install:
 - Suction filter
 - Suction hose

**NOTE:** _____

- Connect the hose to the filter housing while taking care not to bend it.
 - The open end of the hose should face downward.
 - The filter housing halves should be put together so that no water enters through the mating surfaces.
-

2. Install:

- Components in above list (Steps "Removal 1 ~ 2")
Refer to "DESICCANT REPLACEMENT" section.

**STEERING HEAD INSPECTION****WARNING:** _____

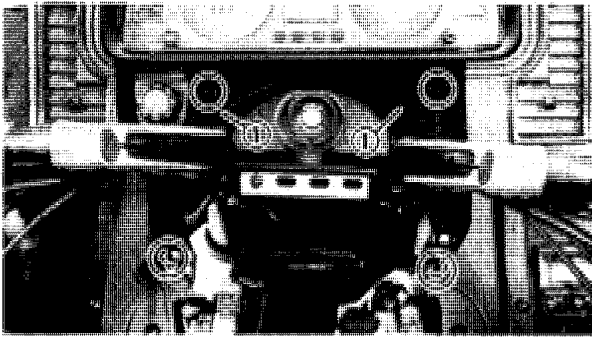
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on its centerstand, then elevate the front wheel.
2. Check:
 - Steering assembly bearings
Grasp the bottom of the forks and gently rock the fork assembly back and forth.
Looseness → Adjust steering head.

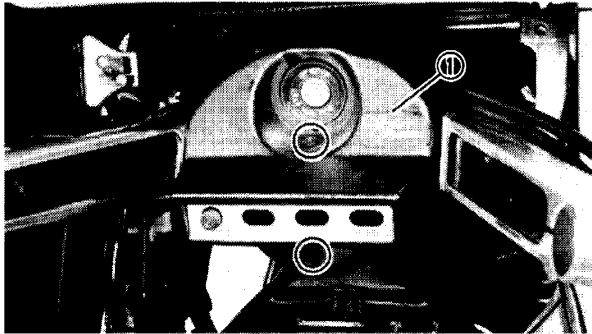
STEERING HEAD ADJUSTMENT**WARNING:** _____

Securely support the motorcycle so there is no danger of it falling over.

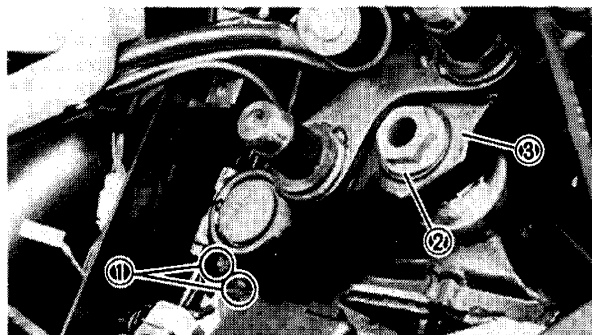
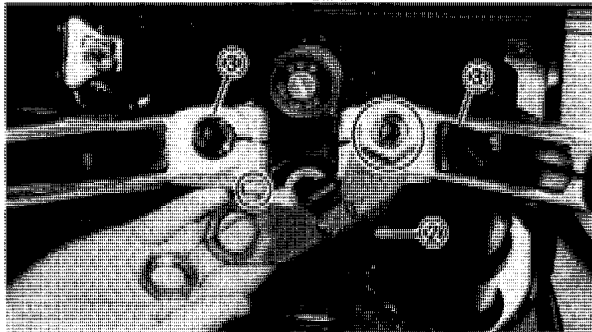
1. Elevate the front wheel by placing a suitable stand under the engine.



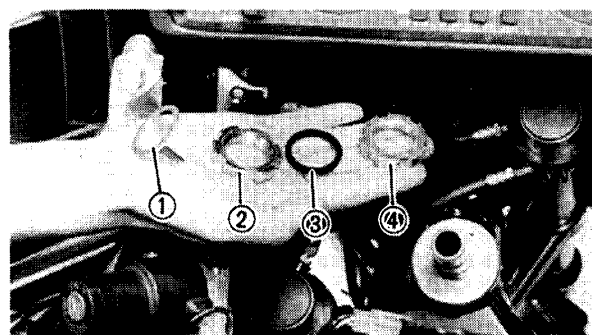
2. Remove:
- Top cover
 - Fairing (Left upper panel)
Refer to "FAIRING REMOVAL AND INSTALLATION" section.
 - Hoods (Left and right) ①



3. Remove:
- Handlebar cover ①
 - Bracket ②
 - Handlebars ③



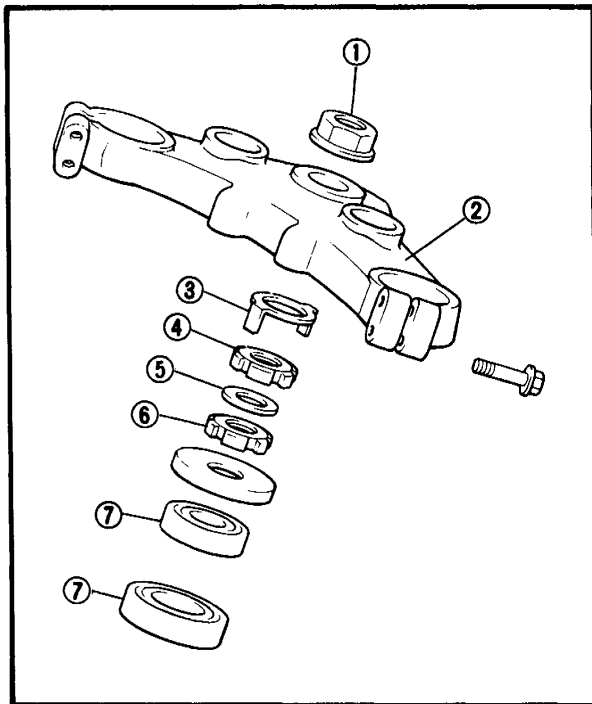
4. Loosen:
- Pinch bolts (Steering crown) ①
5. Remove:
- Nut (Steering stem) ②
 - Steering crown ③



6. Remove:
- Lock washer (Ring nut) ①
 - Ring nut (Upper) ②
 - Washer ③
 - Ring nut (Lower) ④

WARNING:

Support the under bracket so that it may not fall down.



7. Tighten:

- Ring nuts (Lower and upper)
By the following tightening steps.

Ring nuts tightening steps:

NOTE:

Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

- Install the ring nut (Lower) ⑥ .

NOTE:

The tapered side of ring nut must face downward.

- Tighten the ring nut ⑥ using the Ring Nut Wrench (YU-01268).



Ring Nut ⑥ (Initial Tightening):
50 Nm (5.0 m·kg, 36 ft·lb)

- Loosen the ring nut ⑥ completely and retighten it to specification.

WARNING:

Do not over-tightening.



Ring Nut ⑥ (Final Tightening):
3 Nm (0.3 m·kg, 2.2 ft·lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearing ⑦ .

Refer to "CHAPTER 6. STEERING HEAD" for more details.

- Install the washer ⑤ .
- Install the ring nut (Upper) ④ .



NOTE:

The tapered side of ring nut must face downward.


- Finger tighten the ring nut ④ , then align the slots of both ring nuts. If not aligned, hold the lower ring nut ⑥ and tighten the other until they are aligned.
- Install the lock washer ③ .

NOTE:

Make sure the lock washer tab is placed in the slots.

- Install the steering crown ② and tighten the steering stem nut ① to specification.
- | | |
|---|---|
|  | Nut (Steering Stem):
110 Nm (11.0 m·kg, 80 ft·lb) |
| • Tighten the pinch bolts to specification. | |
|  | Pinch Bolt (Steering Crown):
20 Nm (2.0 m·kg, 14 ft·lb) |

8. Install:
- Hoods (Left and right)
 - Handlebars
 - Bracket
- Refer to "FRONT FORK OIL CHANGE" section.
9. Tighten:
- Handlebars

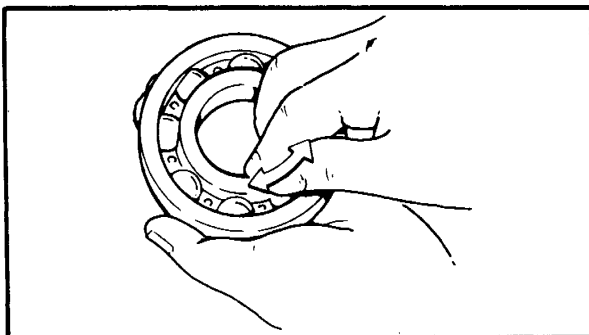
- | | |
|---|--|
|  | Stopper Nut (Handlebars):
125 Nm (12.5 m·kg, 90 ft·lb) |
| | Pinch Bolt (Handlebars):
30 Nm (3.0 m·kg, 22 ft·lb) |

10. Install:
- Handlebar cover
 - Fairing

WHEEL BEARINGS CHECK

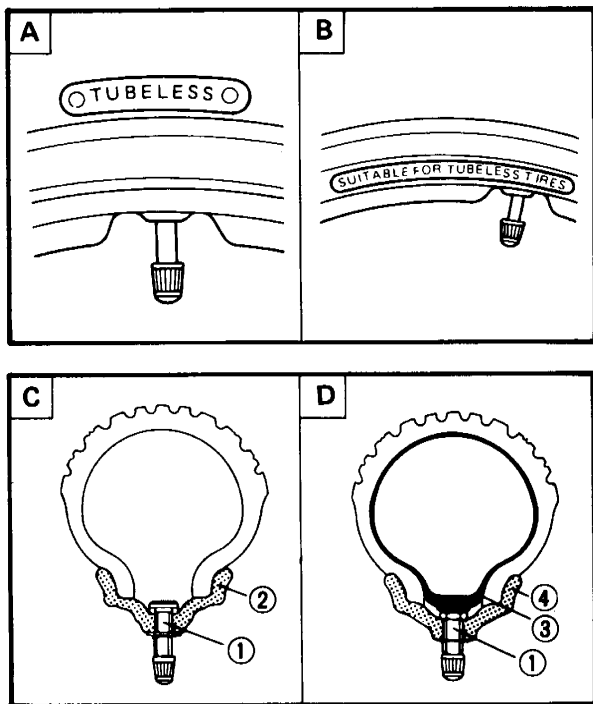
Front Wheel

1. Check:
- Front wheel bearings
- Raise the front end of the motorcycle, and spin the wheel by hand. Touch the axle or front fender while spinning the wheel.
- Excessive vibration → Replace bearings.



Rear Wheel

1. Remove:
- Rear wheel
2. Check:
- Bearing movement
- With the fingers.
- Roughness/Wear → Replace.



TIRES CHECK

WARNING:

Do not attempt to use tubeless tires on a wheel designed for tube type tires only. Tire failure and personal injury may result from sudden deflation.

Wheel	Tire
Tube type	Tube type only
Tubeless type	Tube type or tubeless type

Be sure to install the correct tube when using tube type tires.

- A** Tire
- B** Wheel
- C** Tubeless tire
- D** Tube type tire
- ①** Air valve
- ②** Aluminum wheel (tubeless type)
- ③** Tube
- ④** Aluminum wheel (tube type)

1. Measure:
 - Tire pressure
 - Out of specification → Adjust.

Basic weight: With oil and full fuel tank	XVZ13DS: 355 kg (783 lb) XVZ13DSC: 356 kg (785 lb)	
Maximum load *	XVZ13DS: 175 kg (386 lb) XVZ13DSC: 174 kg (384 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load *	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)
90 kg (198 lb) ~ Maximum load *	225 kPa (2.3 kg/cm ² , 32 psi)	275 kPa (2.8 kg/cm ² , 40 psi)
High speed riding	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)

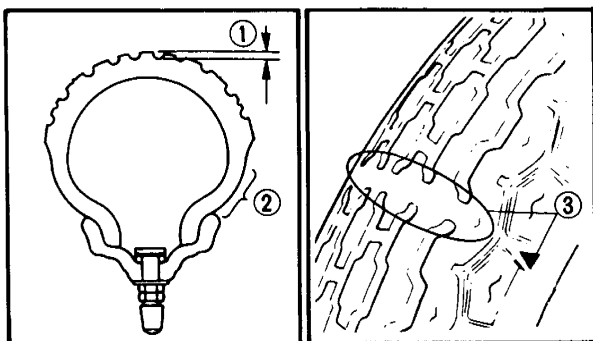
* Load is the total weight of cargo, rider, passenger, and accessories.

WARNING:

- Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature.

Tire inflation pressure must be adjusted according to total weight of cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.

- Proper loading of your motorcycle is important for the handling, braking, and other performance and safety characteristics of your motorcycle. Do not carry loosely packed items that can shift. Securely pack your heaviest items close to the center of the motorcycle, and distribute the weight evenly from side to side. Properly adjust the suspension for your load, and check the condition and pressure of your tires. **NEVER OVERLOAD YOUR MOTORCYCLE.** Make sure the total weight of the cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model) does not exceed the maximum load of the motorcycle. Operation of an overloaded motorcycle could cause tire damage, an accident, or even injury.



2. Inspect:

- Tire surfaces
Wear/Damage → Replace.



**Minimum Tire Tread Depth:
(Front and Rear)
1.0 mm (0.04 in)**

- ① Tread depth
- ② Side wall
- ③ Wear indicator

WARNING:

- It is dangerous to ride with a wornout tire. When a tire tread begins to show lines, replace the tire immediately.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.

WHEELS CHECK

1. Inspect:

- Aluminum wheels

Damage/Bends → Replace.

NOTE: _____


Always balance the wheel when a tire or wheel has been changed or replaced.

WARNING: _____

Never attempt even small repairs to the wheel.

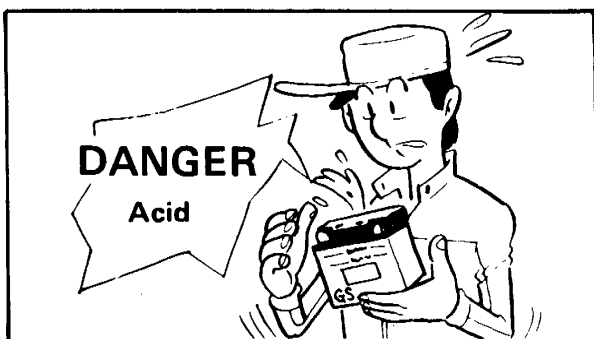
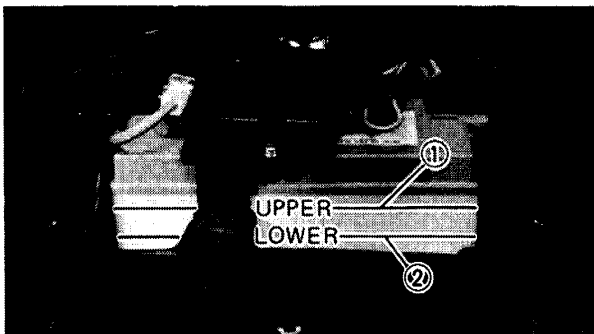
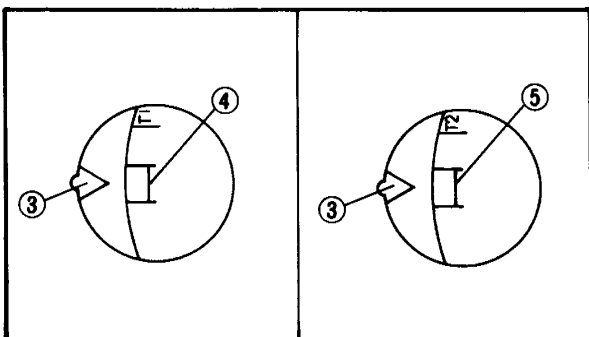
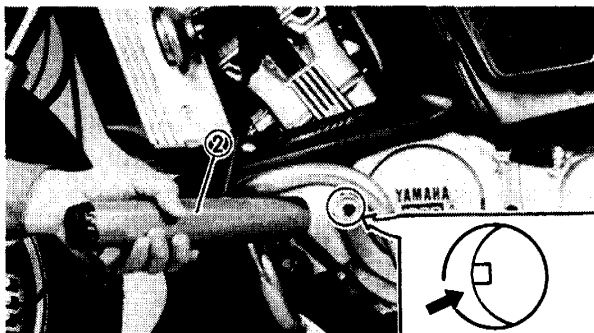
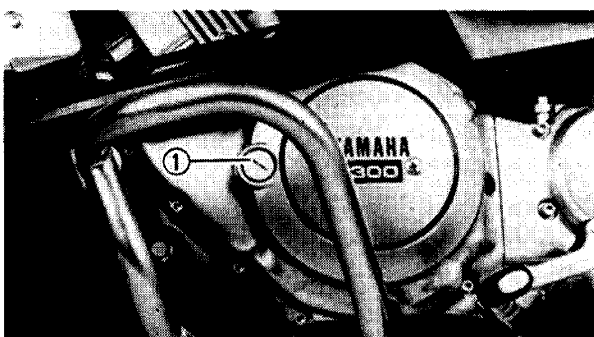
2. Tighten:

- Valve stem locknut

	Valve Stem Locknut: 1.5 Nm (0.15 m·kg, 1.1 ft·lb)
---	---

WARNING: _____

Ride conservatively after installing a tire to allow it to seat itself properly on the rim.



ELECTRICAL

IGNITION TIMING CHECK

1. Check:
 - Ignition timing
 By the following steps.

Ignition timing check steps:

- Remove the timing plug ①.
- Connect the Timing Light ② (YU-33277) to No. 1 or No. 2 cylinder spark plug lead.
- Warm up the engine and let it idle at the specified idle speed of 1,000 r/min.
- Visually check the stationary pointer ③ in the timing window to verify it is within the required firing range indicated on the flywheel.

Incorrect firing range → Check flywheel and/or pickup assembly (tightness damage).
Refer to "CHAPTER 7, ELECTRICAL" for further information.

IGNITION

- ④ Firing range for the No. 1 cylinder
- ⑤ Firing range for the No. 2 cylinder

BATTERY INSPECTION

1. Inspect:
 - Battery fluid level
 Battery fluid level low → Fill.
Fluid level should be between upper and lower level marks.

- ① Upper level
- ② Lower level

CAUTION:

Refill with distilled water only; tap water contains minerals harmful to a battery.

WARNING:

Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.



Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

- SKIN – Flush with water.
- EYES – Flush with water for 15 minutes and get immediate medical attention.

Antidote (INTERNAL):

- Drink large quantities of water or milk follow with milk of magnesia beaten egg, or vegetable oil. Get immediate medical attention.

Batteries also generate explosive hydrogen gas, therefore you should always follow these preventive measures:

- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)
- DO NOT SMOKE when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

2. Remove:

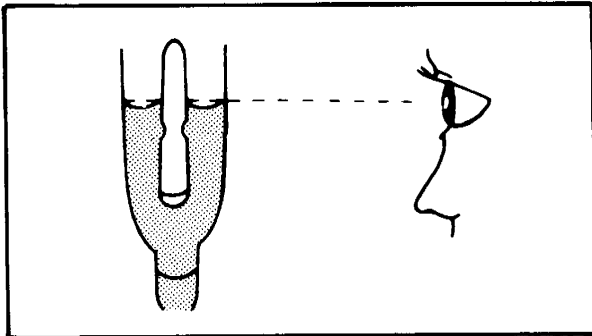
- Battery

3. Inspect:

- Battery fluid specific gravity
Out of specification → Charge.

CAUTION: _____

Always charge a new battery before using it to ensure maximum performance.

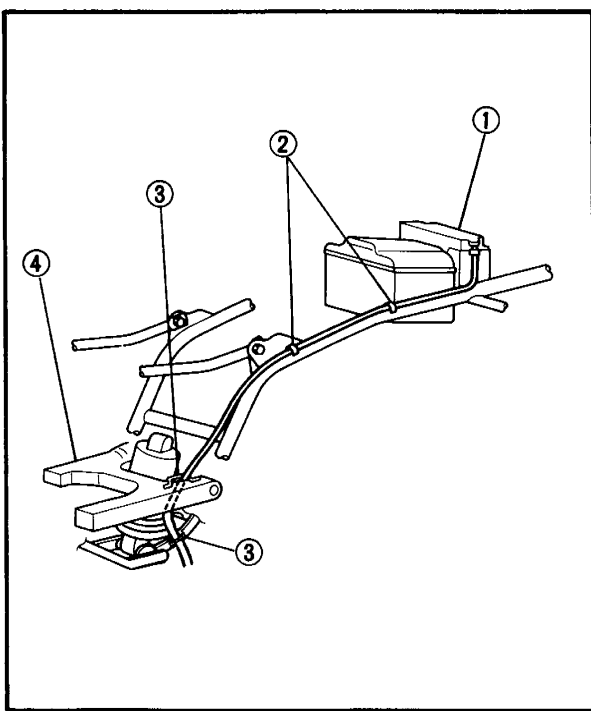


<p>Charging Current 2.0 amps/10 hrs</p> <p>Specific Gravity: 1.280 at 20° C (68° F)</p>

4. Install:

- Battery

BRAKE LIGHT SWITCH ADJUSTMENT/ SPARK PLUG INSPECTION



5. Connect:

- Breather hose
Be sure the hose is properly attached and routed.

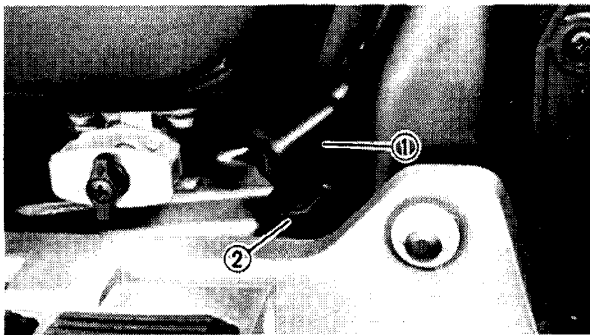
CAUTION:

When inspecting the battery, be sure the breather hose is routed correctly. If the breather hose touches the frame or exits in such a way as to cause battery electrolyte or gas to exit onto the frame, structural and cosmetic damage to the motorcycle can occur.

- | | |
|----------------|--------------------------|
| ① Battery | ② Pass through the clamp |
| ③ Cable holder | ④ Swingarm |

6. Inspect:

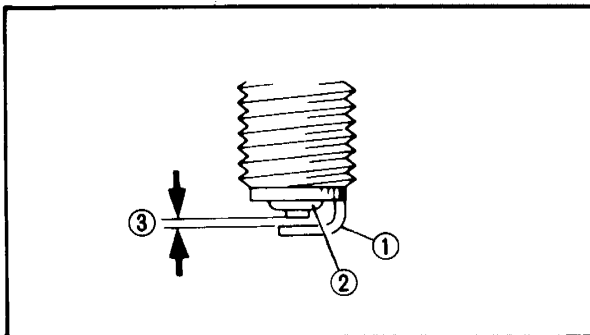
- Breather hose
Obstruction → Remove.
Damage → Replace.



BRAKE LIGHT SWITCH ADJUSTMENT

1. Adjust:

- Brake light operating timing
Hold the main body ① of the switch with your hand so it does not rotate, and turn the adjuster ② until the operating timing is correct.



SPARK PLUG INSPECTION

1. Inspect:

- Electrode ①
Wear/Damage → Replace.
- Insulator color ②
Normal condition is a medium to light tan color.
Distinctly different color → Check the engine condition.

- ③ Spark plug gap




2. Clean:
- Spark plug
Clean the spark plug with a spark plug cleaner or wire brush.

3. Inspect:
- Spark plug type
Incorrect → Replace


Standard Spark Plug:
DPR8EA-9 (NGK)
X24EPR-U9 (N.D.)

4. Measure:
- Spark plug gap
Out of specification → Regap.
Use a wire gauge.

 **Spark Plug Gap:**
0.8 ~ 0.9 mm (0.031 ~ 0.035 in)

5. Tighten:
- Spark Plug

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

 **Spark Plug:**
17.5 Nm (1.75 m·kg, 12.5 ft·lb)

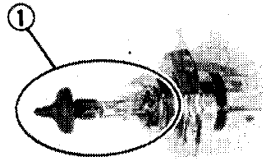
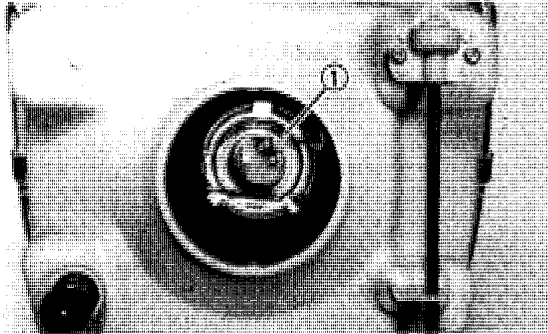
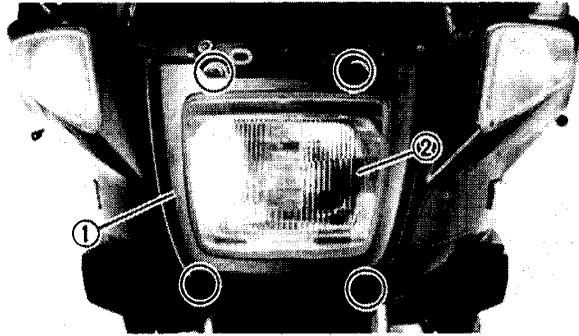
NOTE: _____
If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/4 to 1/2 turns part finger tight. Have the spark plug torqued to the correct value as soon as possible with a torque wrench.

HEADLIGHT BULB REPLACEMENT

1. Remove:
- Windscreen mole ①



HEADLIGHT BULB REPLACEMENT



2. Remove:
 - Headlight cover ①
 - Headlight lens unit ②
3. Disconnect:
 - Headlight lens unit leads

4. Remove:
 - Bulb
 - Unhook the bulb spring ① .

WARNING:

Do not touch headlight bulb when it is on as the bulb generates enormous heat; keep flammable objects away.

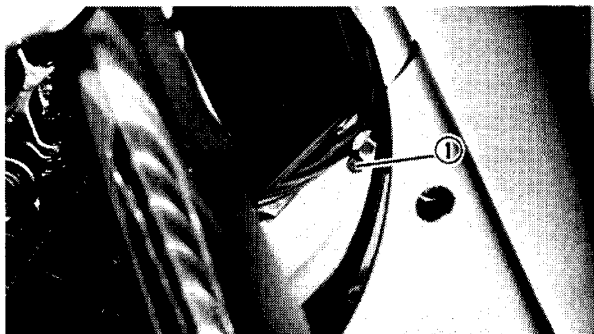
5. Install:
 - Bulb (New)
 - Secure the new bulb with the bulb spring.

CAUTION:

Avoid touching glass part of bulb. Also keep it free from oil otherwise, transparency of glass, bulb life and illuminous flux will be adversely affected. If oil gets on bulb, clean it with a cloth moistened thoroughly with alcohol or lacquer thinner.

- ① Don't touch

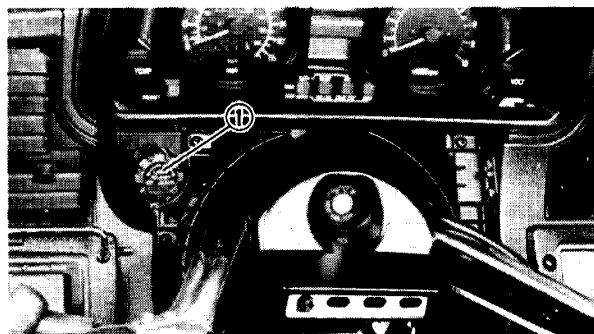
6. Install:
 - Components in above list (Steps "3 ~ 1")
7. Adjust:
 - Headlight beam
 - Refer to "HEADLIGHT BEAM ADJUSTMENT" section.



HEADLIGHT BEAM ADJUSTMENT

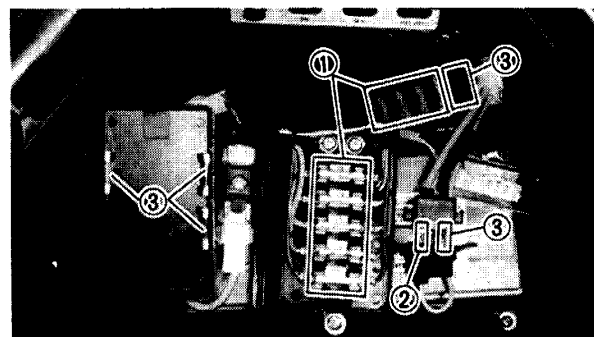
1. Adjust:
 - Headlight beam (Horizontally)

Horizontal Adjustment	
Right	Turn adjusting screw ① counter-clockwise.
Left	Turn adjusting screw ① clockwise.



2. Adjust:
 - Headlight beam (Vertically)

Vertical Adjustment	
Higher	Turn the adjusting knob ① counter-clockwise.
Lower	Turn the adjusting knob ① clockwise.



FUSE INSPECTION

The fuse panel is located under the top cover.

1. Inspect:
 - Fuses ①
 - Main fuse ②
- Defective → Replace.
Blown fuse (New) → Inspect circuit.

CAUTION:

Do not use fuses of higher amperage rating than those recommended.
Substitution of a fuse of improper rating can cause extensive electrical system damage and possibly a fire.

③ Spare fuses

FUSE INSPECTION

Description	Amperage	Quantity
MAIN	40A	1
ACC	10A	1
HEAD	15A	1
TAIL	10A	1
SIGNAL	20A	1
IGNITION	15A	1
RESERVE	10A	1
	15A	1
	20A	1
CLASS	20A	1
BACK UP	5A	1
AUDIO CB	5A	1
FAN	10A	1
HAZARD	15A	1
RESERVE	5A	1
	10A	1
	15A	1



CHAPTER 3. ENGINE OVERHAUL

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ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

It is not necessary to remove the engine in order to remove the following components:

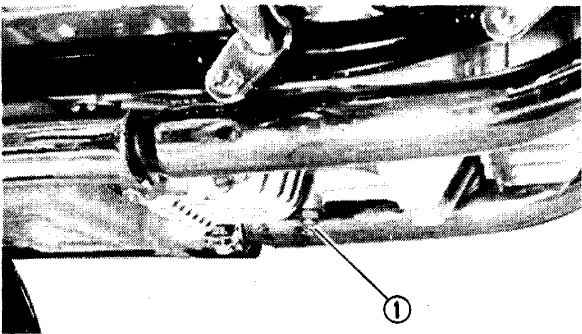
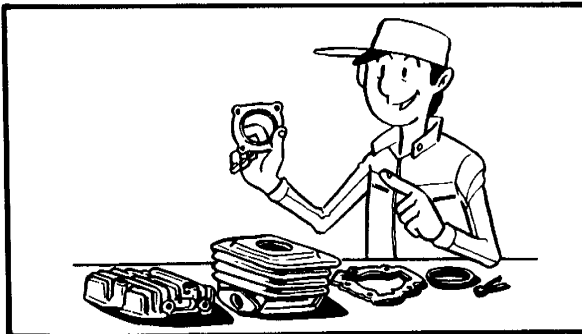
- Clutch
- Carburetor
- Water pump
- AC magneto

PREPARATION FOR REMOVAL

1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to "CHAPTER 1. SPECIAL TOOL" section.

NOTE:

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



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

4. Remove:

- Lower side cover (Right)
- Drain plug (Crankcase) ①
Drain engine oil completely.
Refer to "CHAPTER 2. ENGINE OIL REPLACEMENT" section.

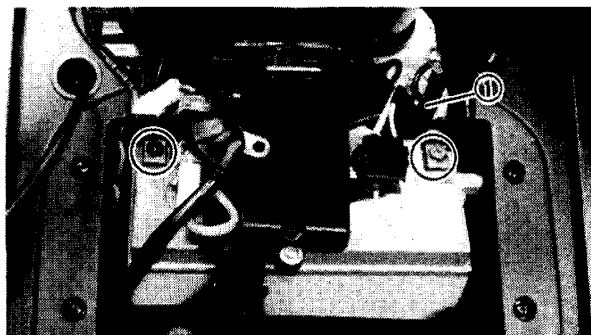
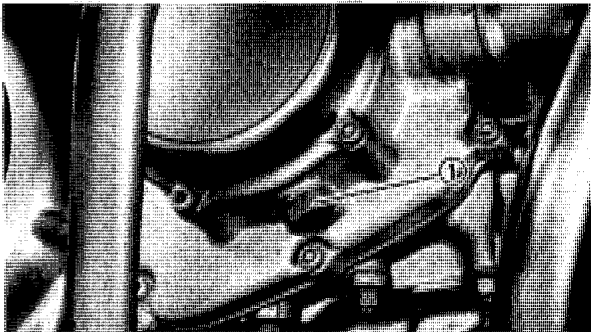


5. Remove:

- Top cover
- Side panels (Left and right)
- Radiator side covers (Left and right)
- Radiator cover
- Radiator cap
- Lower cowl
- Lower panels (Left and right)
- Drain bolt (Water pump) ①

Drain the coolant completely.

Refer to "CHAPTER 4. COOLANT REPLACEMENT" section.



6. Disconnect:

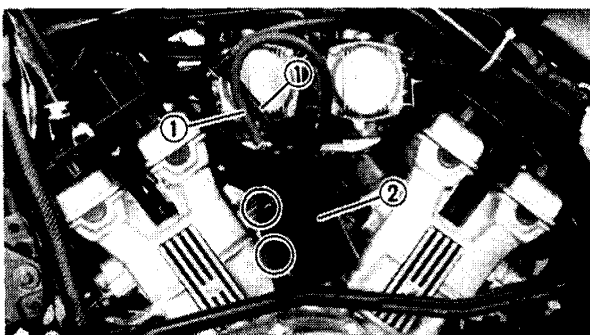
- Battery leads

NOTE:

Disconnect the negative lead ① first.

7. Remove:

- Fairing assembly (Left and right)
- Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.

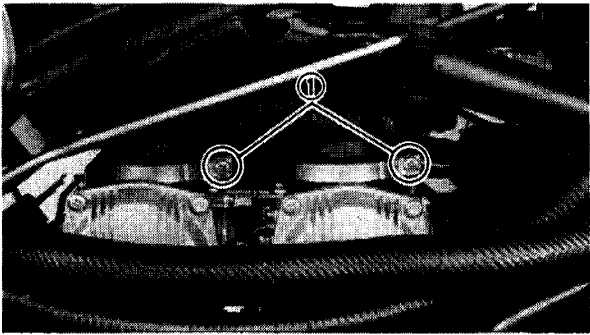
**CANISTER (XVZ13DSC ONLY)**

1. Disconnect:

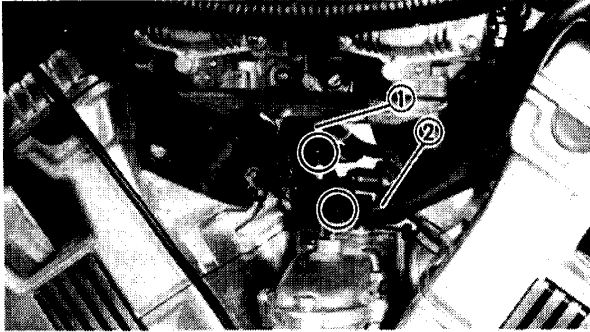
- Hoses (Canister) ①

2. Remove:

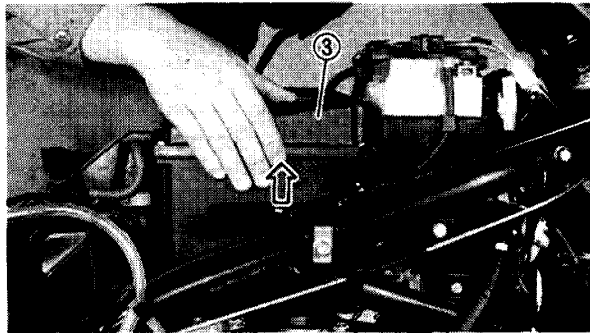
- Canister ②

**CARBURETOR****1. Loosen:**

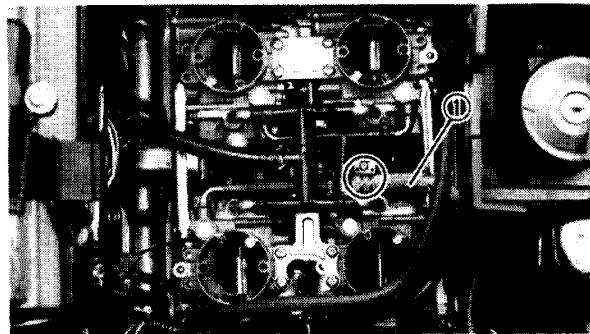
- Screws (Air cleaner joint) ①

**2. Remove:**

- Ventilation hose (Crankcase) ①, ②
- Air cleaner assembly ③

**3. Disconnect:**

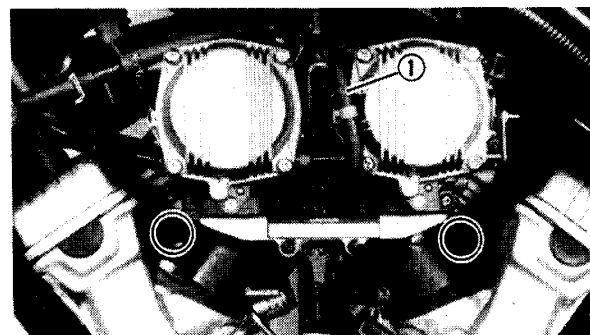
- Fuel hose ①
- Hose (Air bent control valve – For XVZ13DSC only)

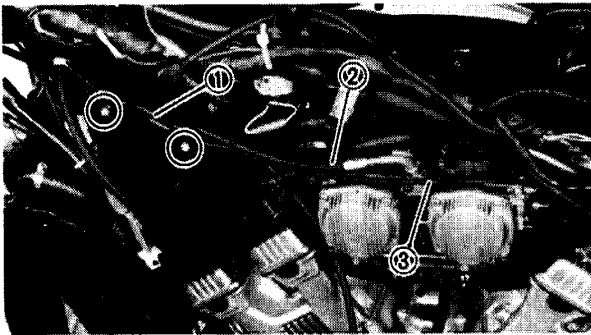
**4. Disconnect:**

- Vacuum hose (Ignition advance) ①

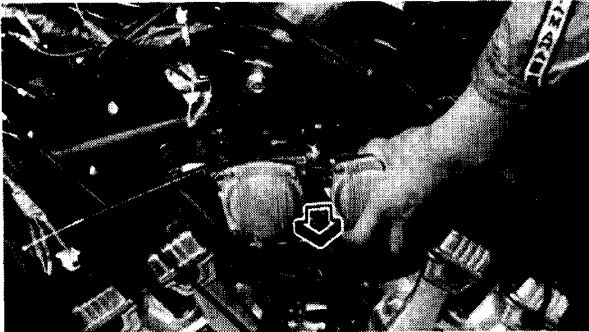
5. Loosen:

- Screws (Carburetor joint)



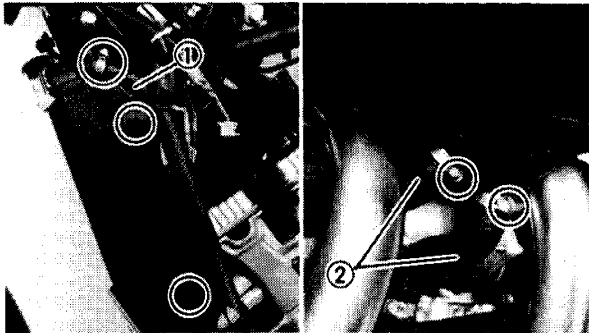


6. Remove:
 - Throttle cable housing ①
7. Disconnect:
 - Throttle cables ②
 - Choke cable ③



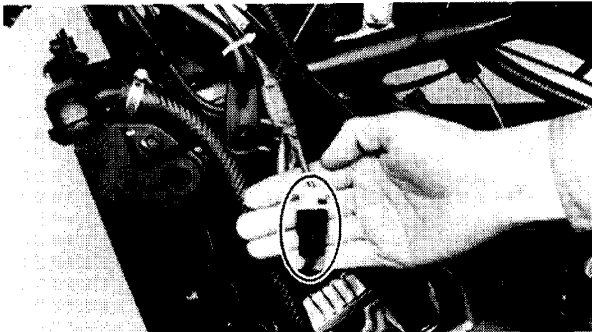
8. Remove:
 - Carburetor assembly

NOTE: _____
 Cover the carburetor with a clean rag to prevent dirt or foreign matter into the carburetor.

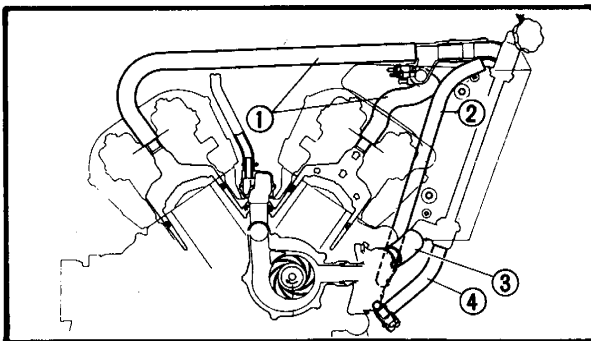


RADIATOR

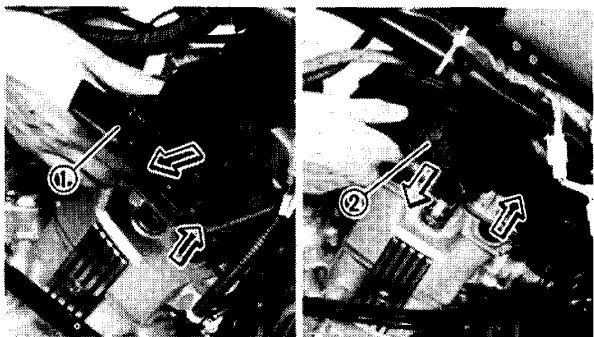
1. Remove:
 - Horns (Left and right)
 - Bolts (Radiator)
2. Disconnect:
 - Horn leads
 - Upper hose ①
 - Lower hoses ②



3. Disconnect:
 - Fan motor coupler
4. Remove:
 - Radiator assembly

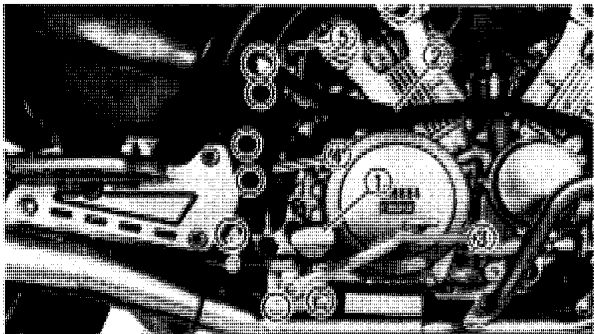


5. Disconnect:
 - All hoses (Coolant) ① , ② , ③ , ④



6. Remove:

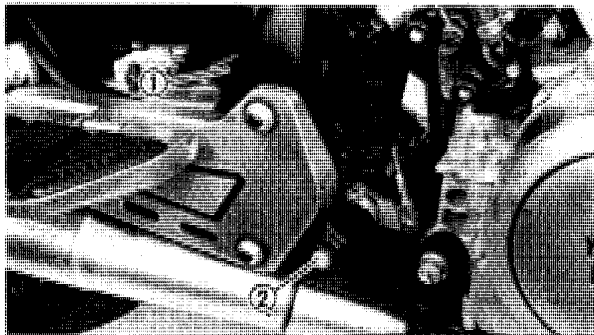
- Air baffle plate (Front) ①
- Air baffle plate (Rear) ②



FOOTREST (RIGHT) AND BRAKE PEDAL

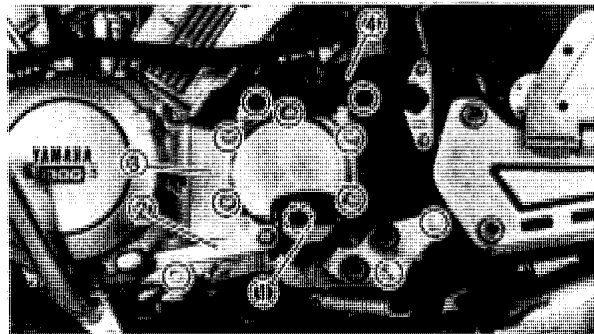
1. Remove:

- Footrest (Right) ①
- Side frame (Right) ②
- Brake pedal assembly ③
- Brake master cylinder ④
- Brake fluid reservoir ⑤



2. Remove:

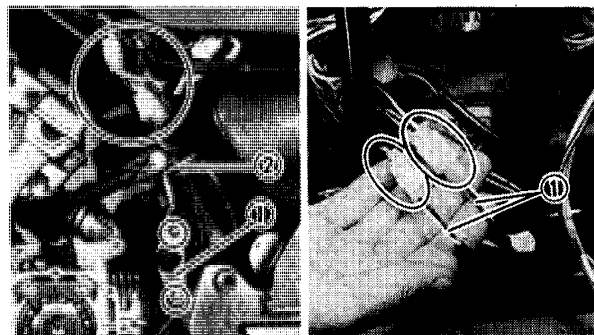
- Rear brake switch ①
- Brake pedal shaft ②



FOOTREST (LEFT) AND CLUTCH RELEASE CYLINDER

1. Remove:

- Footrest (Left) ①
- Change pedal assembly ②
- Middle gear case cover ③
- Engine side cover ④



2. Remove:

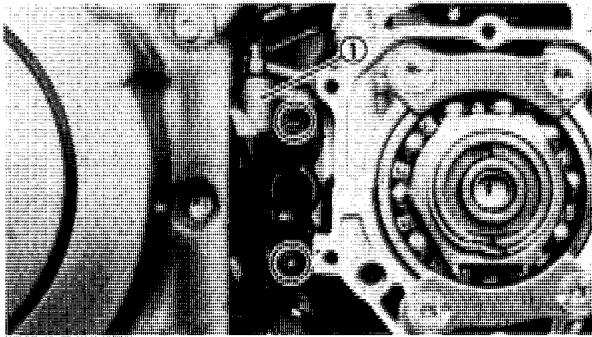
- Damping adjuster knob holder (Rear shock absorber) ①

3. Disconnect:

- All leads (Engine)

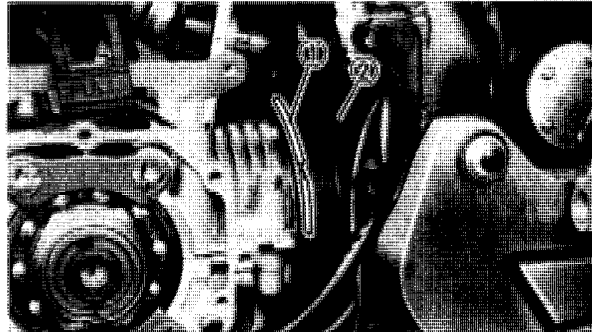
4. Remove:

- Band ②



5. Remove:

- Clutch release cylinder ①

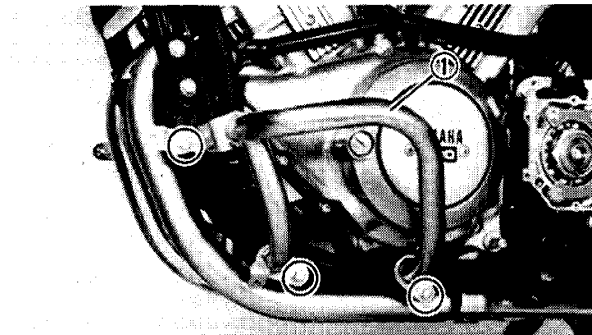


6. Remove:

- Spring ①

7. Disconnect:

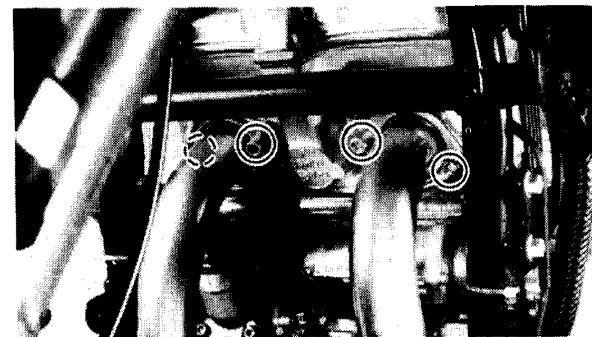
- Rubber boot ②



ENGINE GUARD

1. Remove:

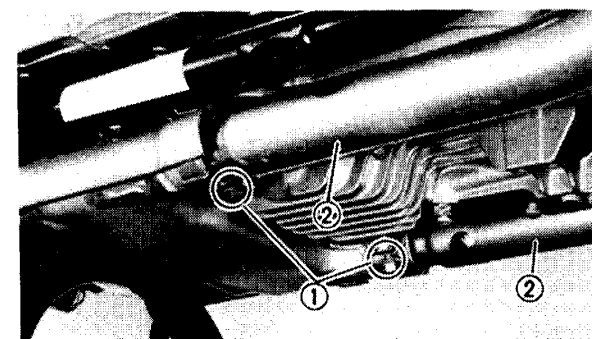
- Engine guards (Left and right) ①



EXHAUST PIPE AND MUFFLER

1. Remove:

- Flange bolts (Front exhaust pipe)

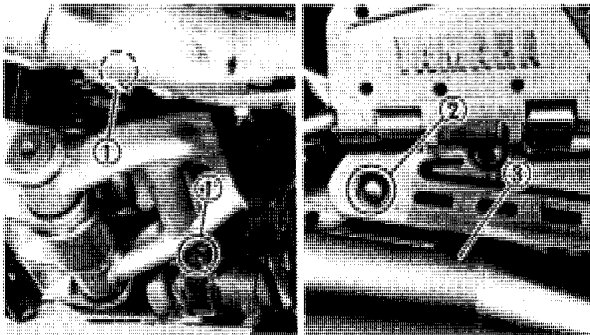


2. Loosen:

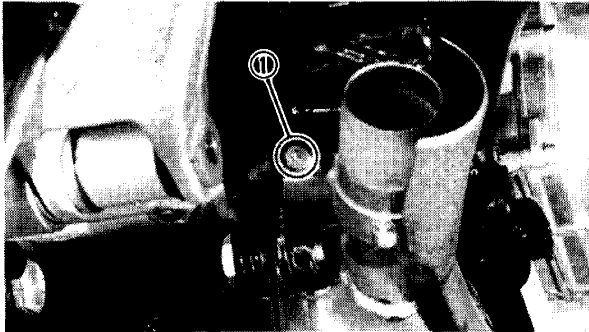
- Bolts (Front exhaust pipe – Clamp) ①

3. Remove:

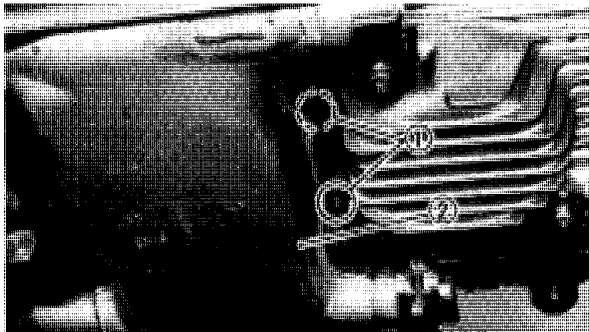
- Front exhaust pipes ②



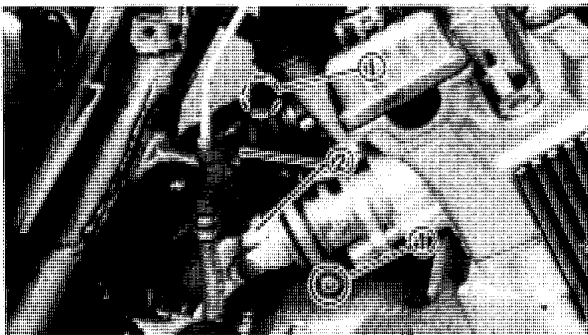
4. Loosen:
 - Bolts (Muffler – Clamp) ①
5. Remove:
 - Bolts (Muffler bracket) ②
 - Mufflers ③



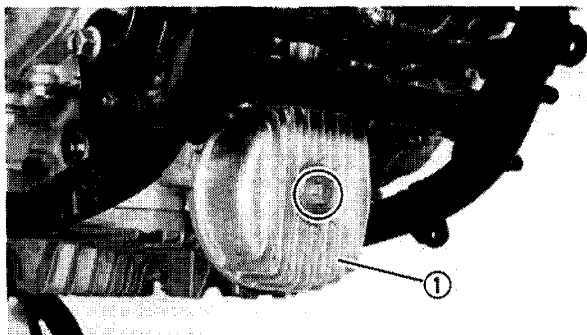
6. Loosen:
 - Bolts (Rear exhaust pipe – Clamp) ①



7. Remove:
 - Bolts (Exhaust chamber) ①
 - Exhaust chamber ②

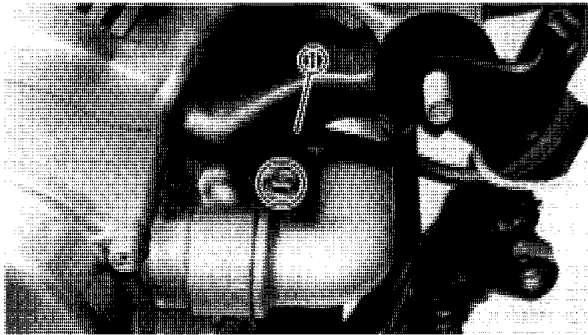


8. Loosen:
 - Bolts (Rear exhaust pipe – Clamp) ①
9. Remove:
 - Rear exhaust pipe ②

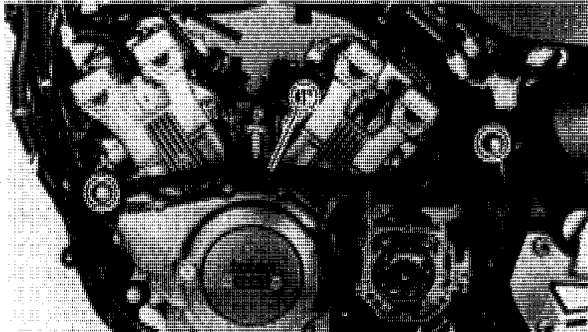


OIL FILTER

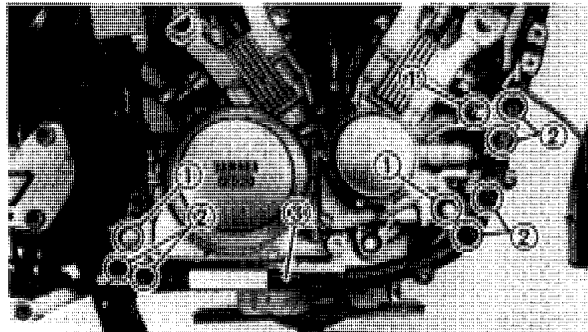
1. Remove:
 - Oil filter cover ①

**GROUND LEAD**

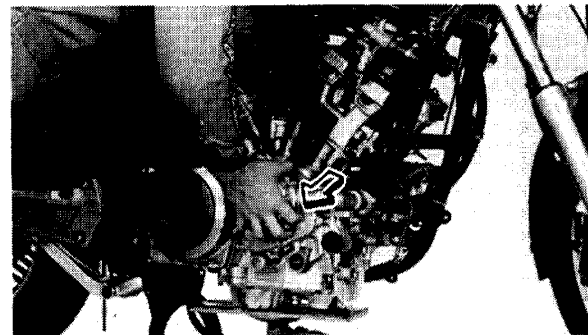
1. Remove:
 - Ground lead ①

**ENGINE REMOVAL**

1. Place a suitable stand under the engine.
2. Remove:
 - Side frame (Left) ①

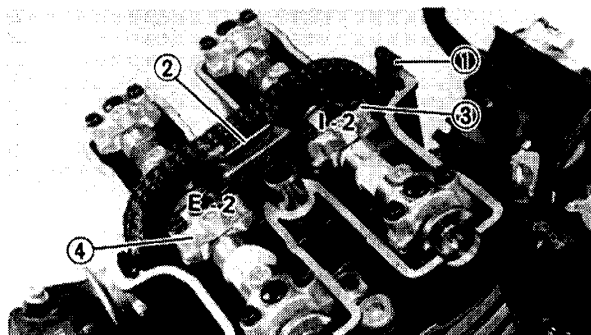
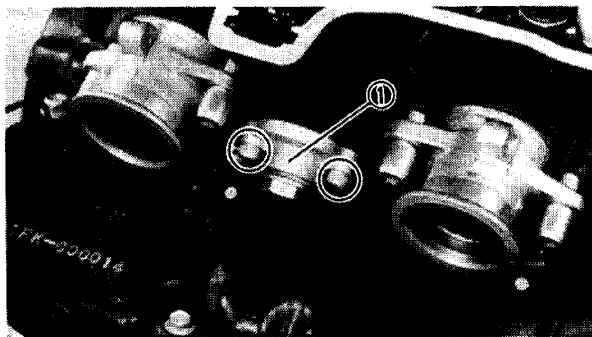
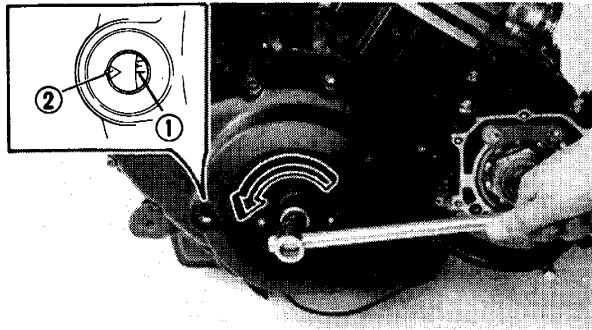
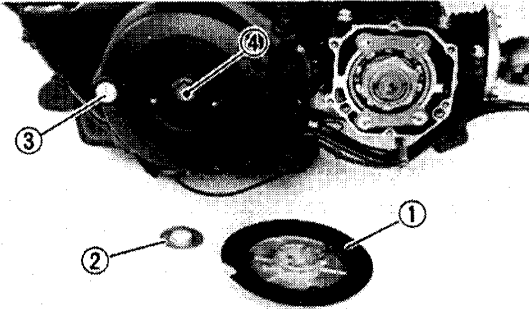
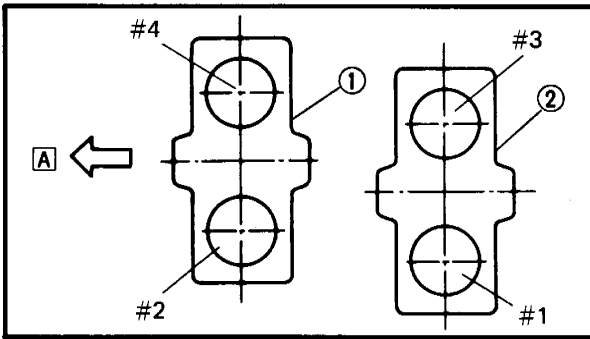


3. Remove:
 - Bolt (Engine) ①
 - Bolts (Down tube) ②
 - Down tube frame (Right) ③



4. Remove:
 - Engine assembly
 From right side.

NOTE: _____
 Remove the rear cylinder head cover if difficulties are encountered with any of the previous steps.



**ENGINE DISASSEMBLY
CYLINDER HEAD AND CAMSHAFT
Rear Cylinder Head**

1. Remove:

- Cylinder head covers (Rear and front)
- Gaskets
- Spark plugs

① Front cylinder

② Rear cylinder

A FRONT

2. Remove:

- Crankcase cover plate ①
- Special washer ②
- Timing plug ③

NOTE:

Check for clog of oil passage ④ in the bolt.
If any, clean the oil passage.

3. Align:

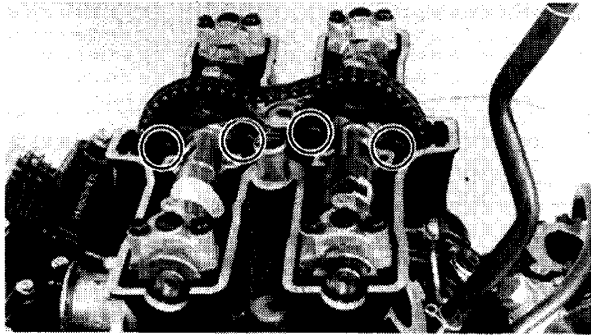
- Flywheel "T-1" mark ① with stationary pointer ② on crankcase cover

4. Remove:

- Cam chain tensioner (Rear) ①

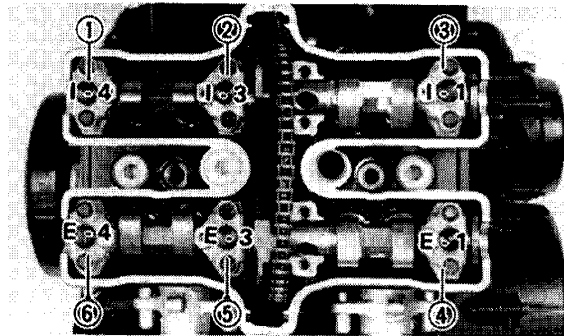
5. Remove:

- Chain guides ① , ②
 - Camshaft caps ③ , ④
- They was marked "1-2" ③ and "E-2" ④.



6. Remove:

- Bolts (Cam chain sprocket)
- Use 32 mm Wrench to hold camshaft.

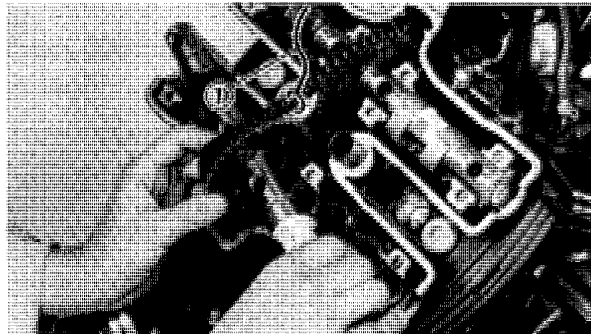


7. Remove:

- Camshaft caps ① , ② , ③ , ④ , ⑤ , ⑥

NOTE: _____

When loosening camshaft cap bolts, be sure camshaft cam lobes do not touching valve lifters.

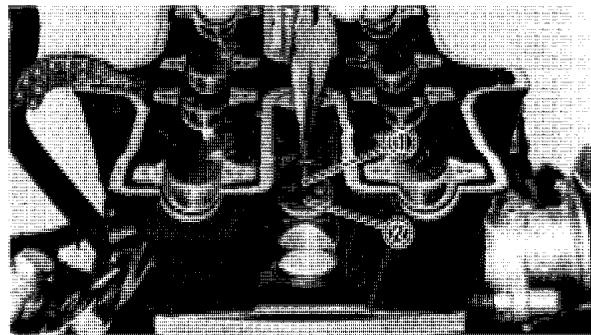


8. Remove:

- Camshafts
- Sprockets
- Slip the sprockets from mounting boss on camshaft.

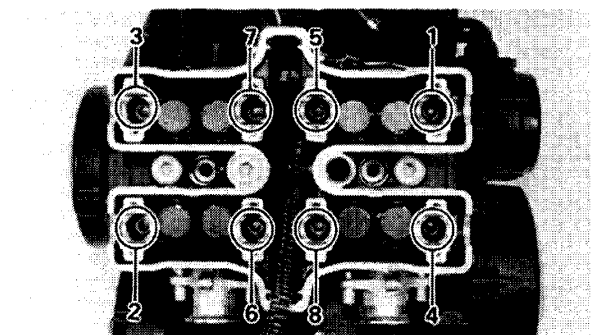
NOTE: _____

Fasten a safety wire ① to the cam chain.



9. Remove:

- Lock pin ①
- Water jacket joint ②

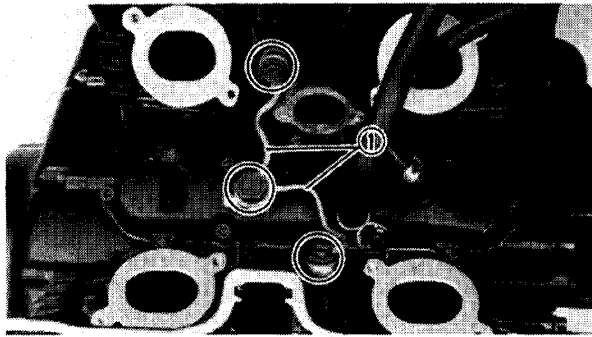


10. Remove:

- Nuts (Cylinder head)
- Use 8 mm Wrench Adapter (YM-28897).

NOTE: _____

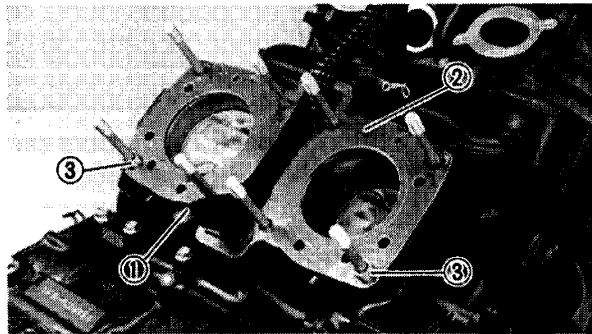
Follow numerical order shown in photo. Start by loosening each nut 1/2 turn until all are loose.



11. Remove:
- Oil delivery pipe ①

NOTE: _____
 When removing the pipe, be sure not to lose the washers that may fall out.

- Cylinder head



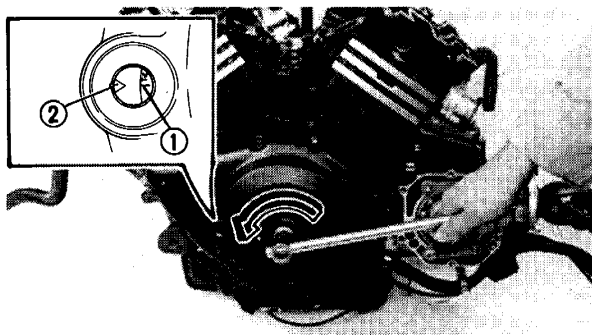
12. Remove:
- Cam chain guide (Rear) ①
 - Gasket ②
 - Dowel pins ③

Front Cylinder Head

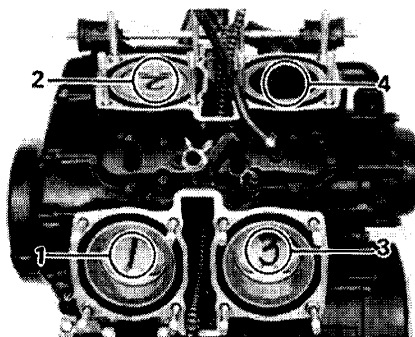
When removing the front cylinder head, repeat the rear cylinder head removal procedure. However, note the following points.

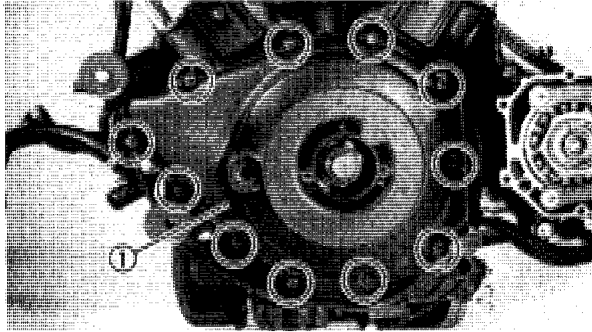
1. Rotate:
- Crankshaft
 Counterclockwise 360° plus an added 70° (430° total) from the "T-1" mark.

2. Align:
- Flywheel "T-2" mark ① with stationary pointer ② on crankcase cover



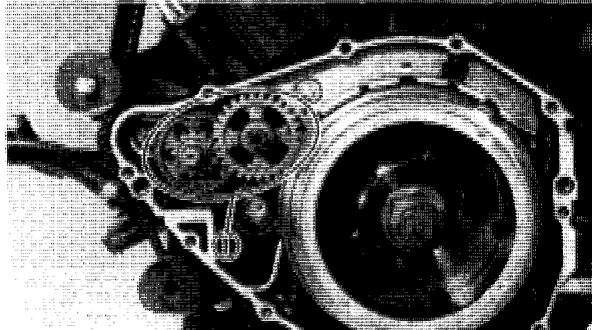
3. Mark:
- Pistons
 With piston number designations as shown.



**STARTER IDLE GEARS AND FLYWHEEL**

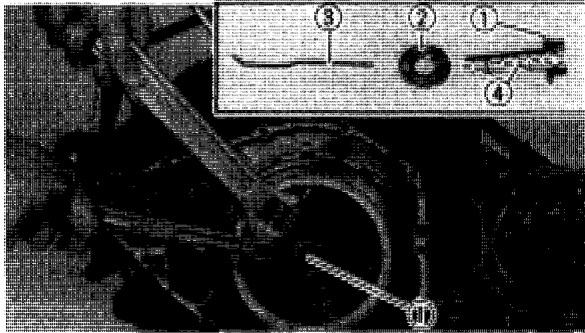
1. Remove:

- Crankcase cover (Left) ①
- Gasket
- Dowel pins



2. Remove:

- Starter idle gears ①

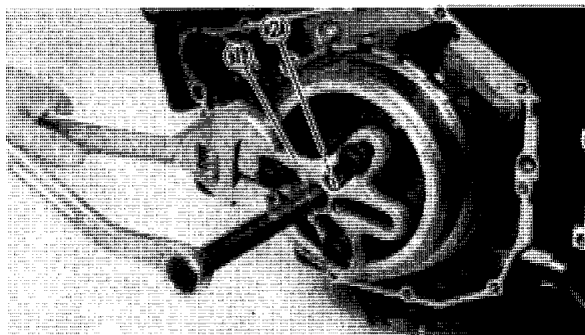


3. Remove:

- Bolt (Flywheel) ①
- Plain washer ②
- Pin ③

NOTE:

Check for clog of oil passage ④ in the bolt.
If any, clean the oil passage.

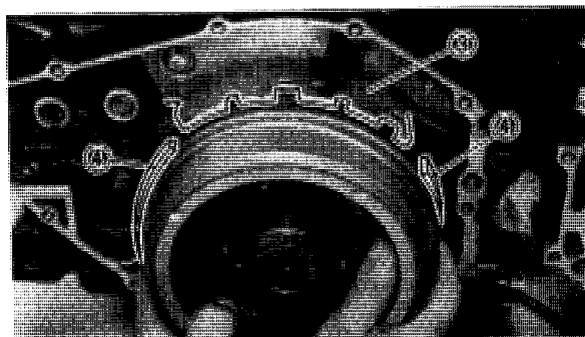


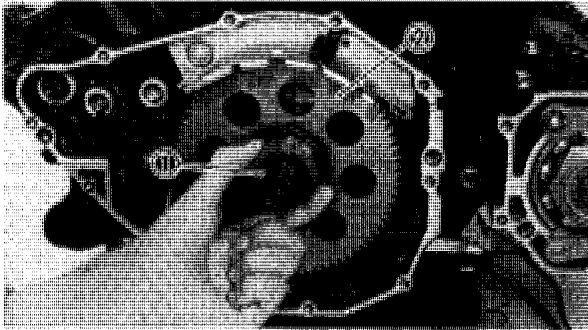
4. Remove:

- Flywheel
- Use the Flywheel Puller (YU-33270) ①
with the Puller Adapter (YM-33282) ② .

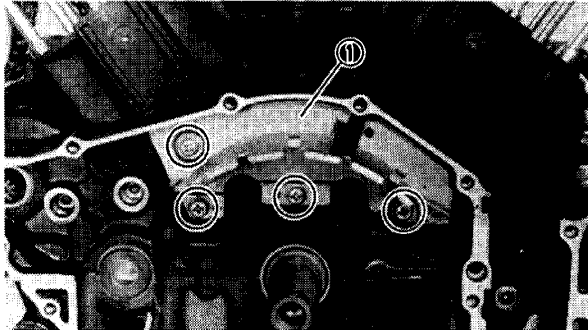
NOTE:

When removing the flywheel, do not allow the
oil baffle plate ③ to touch the projections ④
on the flywheel.

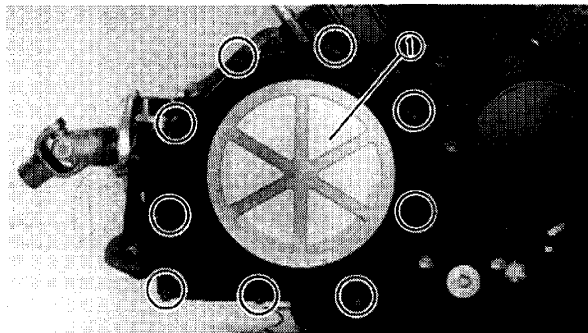




5. Remove:
- Woodruff key ①
 - Starter clutch gear ②



6. Remove:
- Oil baffle plate ①



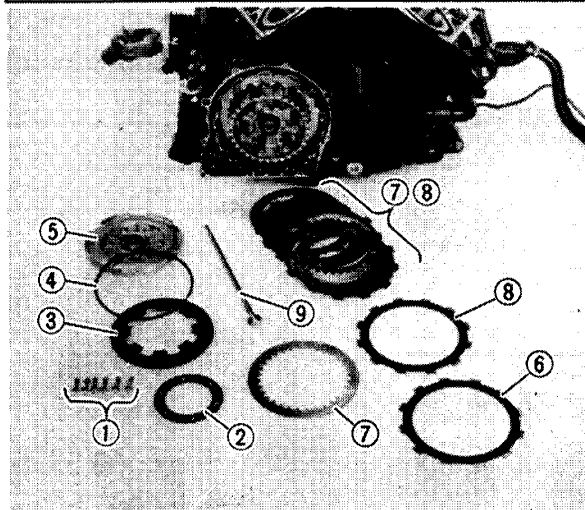
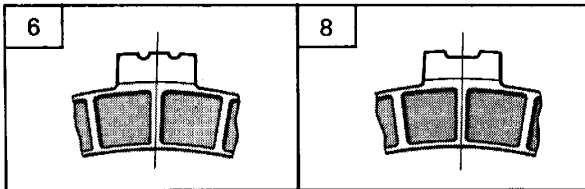
CLUTCH AND OIL PUMP DRIVE GEAR

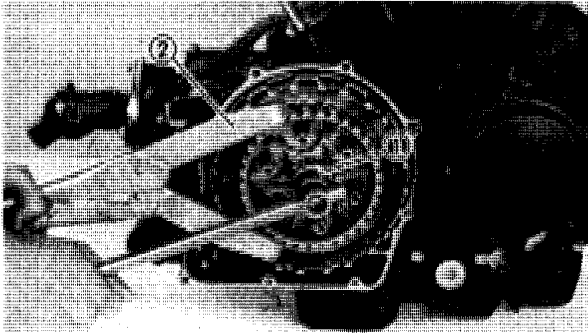
1. Remove:
- Crankcase cover (Right) ①

NOTE: Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.

- Gasket
- Dowel pins

2. Remove:
- Bolts (Clutch spring) ①
 - Plate washer ②
 - Clutch spring ③
 - Spring seat ④
 - Pressure plate ⑤
 - Friction plate ⑥
 - Clutch plates ⑦
 - Friction plates ⑧
 - Push rod ⑨

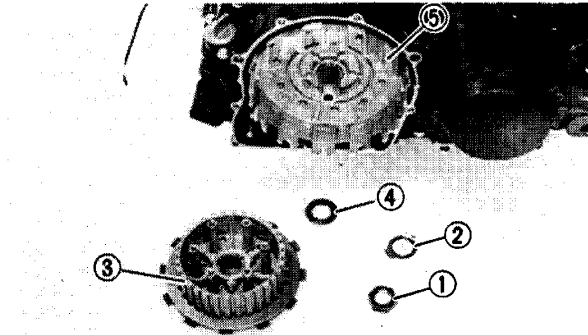




3. Straighten the lock washer tabs.

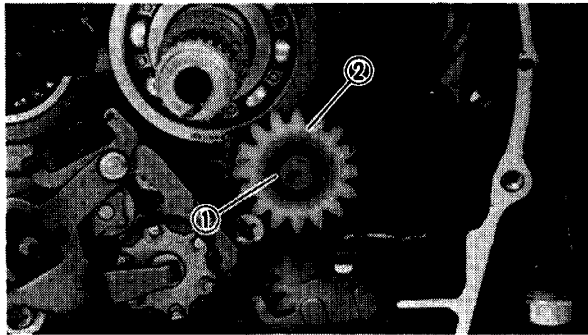
4. Loosen:

- Nut (Clutch boss) ①
- Use the Clutch Holder (YM-91042) ② to hold the clutch boss.



5. Remove:

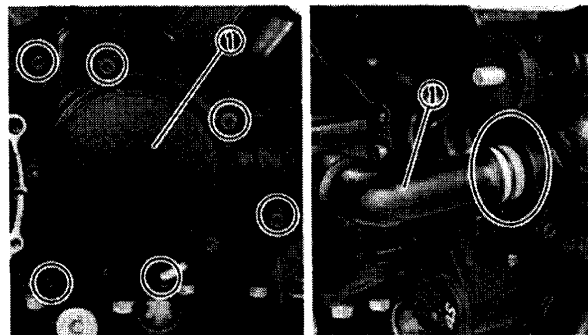
- Nut (Clutch boss) ①
- Lock washer ②
- Clutch boss ③
- Thrust washer ④
- Clutch housing ⑤



6. Remove:

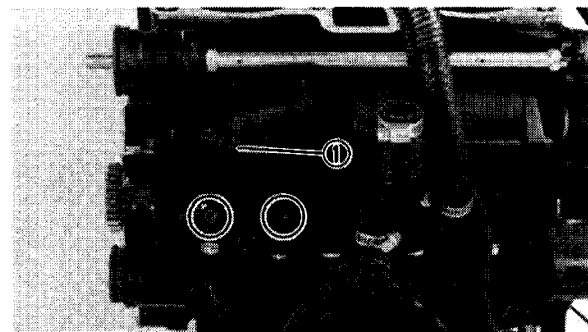
- Circlip ①
- Oil pump drive gear ②

WATER PUMP AND THERMOSTATIC VALVE



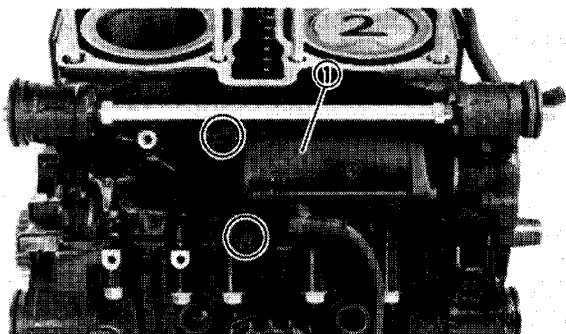
1. Remove:

- Water pump cover/Water pump case ①
- Gasket
- Dowel pins

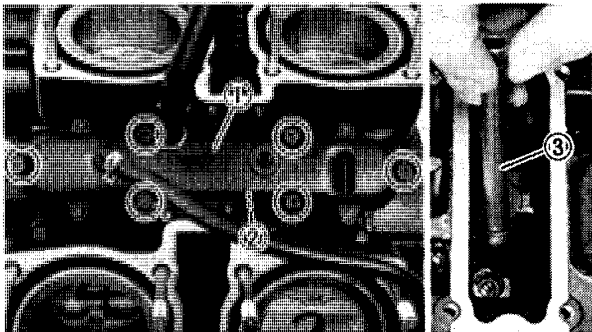


2. Remove:

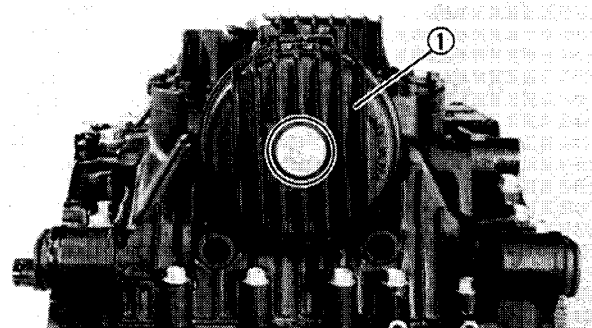
- Thermostat assembly ①

**STARTER MOTOR AND BREATHER COVER**

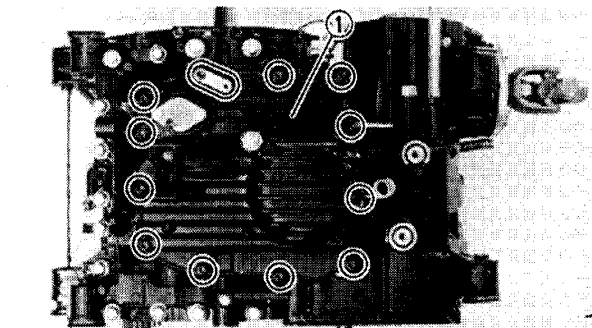
1. Remove:
 - Starter motor ①



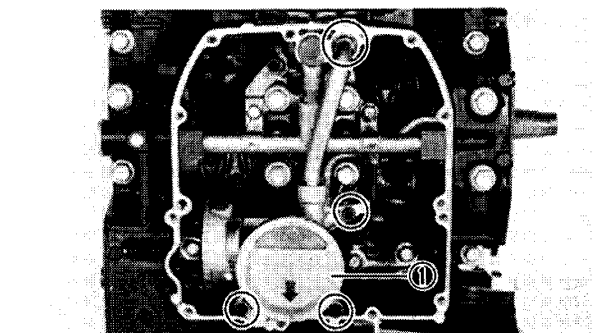
2. Remove:
 - Breather cover ①
 - Breather cover spacer ②
 - Oil pipe ③

**OIL PAN AND OIL PUMP**

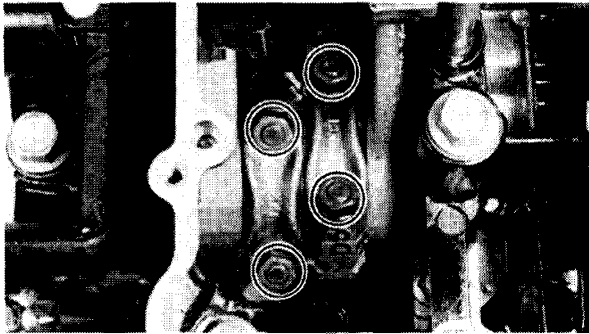
1. Remove:
 - Oil filter cover ①



2. Remove:
 - Oil pan ①
 - Gasket
 - Dowel pins

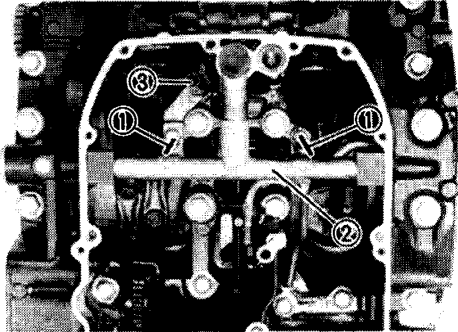


3. Remove:
 - Oil pump assembly ①
 - Dowel pins



NOTE:

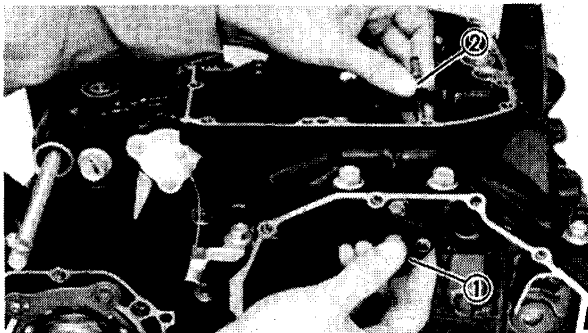
At this stage it is possible to replace the piston, connecting rod, and big-end bearing by simply removing the connecting rod nut. None of the steps below are necessary to replace the above components.



4. Straighten the bracket tabs ① .

5. Remove:

- Oil pipe ②
- Main oil gallery pipe ③



6. Remove:

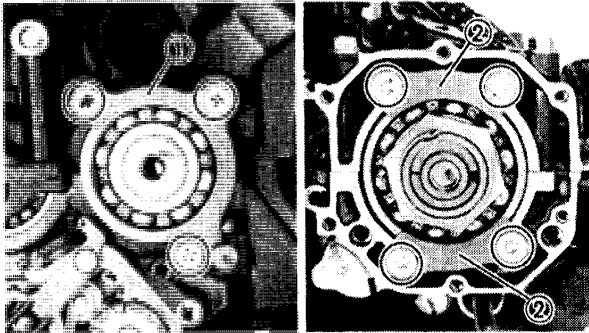
- Damper (Oil pump pipe) ①
- Oil pump pipe ②

CRANKCASE DISASSEMBLY

1. Remove:

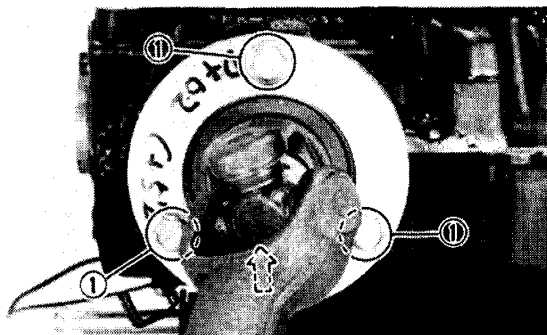
- Retainer (Main axle bearing) ①
- Retainers (Middle gear bearing) ②

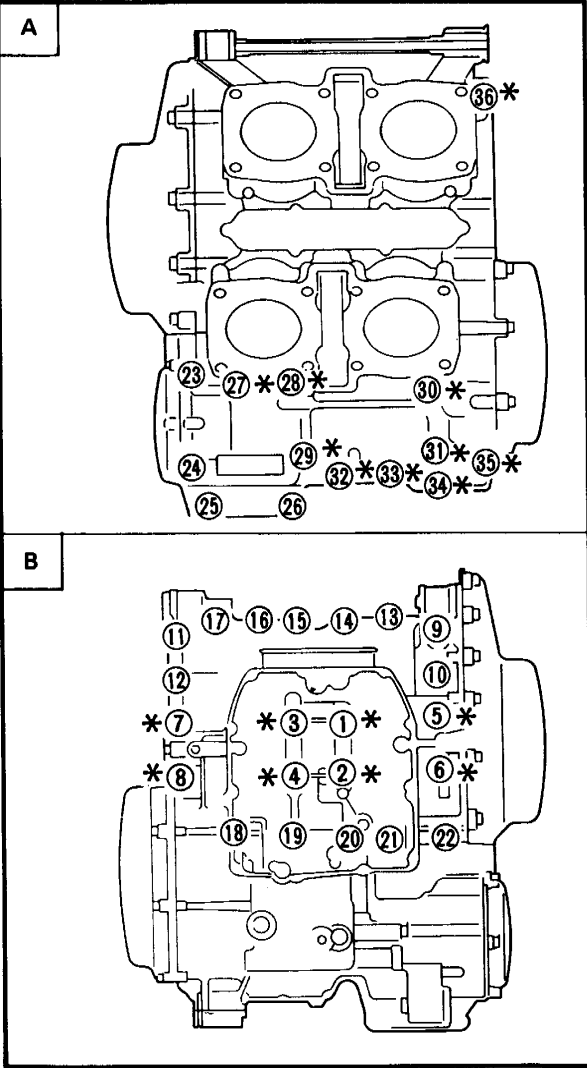
Use the #40 Torx Driver (YU-29843-7).



2. Remove:

- Bolts (Middle driven gear housing) ①



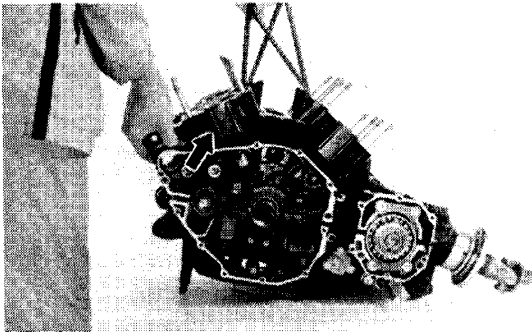


3. Remove:
- Bolts (Crankcase)

NOTE:

- Remove the bolts starting with the highest numbered one.
- The embossed numbers in the crankcase designate the crankcase tightening sequence.

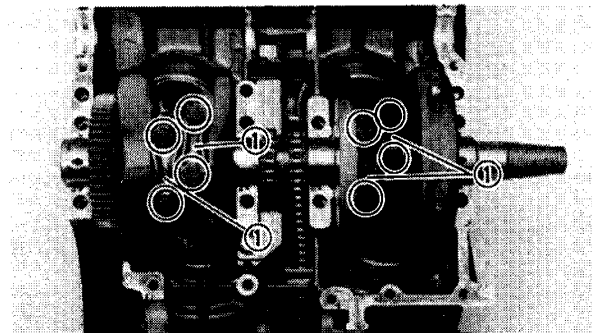
* With washer
 [A] UPPER CASE
 [B] LOWER CASE



4. Remove:
- Crankcase (Upper)
 Use a soft hammer.

NOTE:
 Pull out the crankcase (Upper) while pulling up the cam chain.

- Dowel pins



UPPER CRANKCASE

1. Remove:
- Connecting rod caps ①
 - Connecting rod/Piston assembly

CAUTION:
 Do not hammer out the connecting bolts to remove the connecting rod assembly.

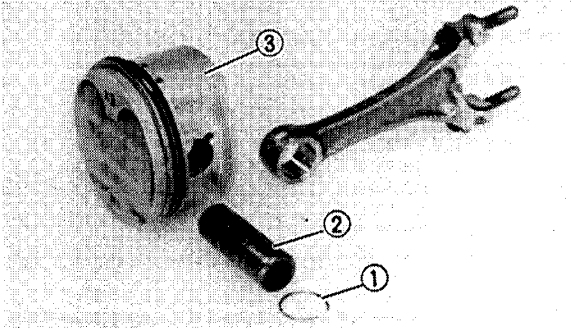


2. Remove:

- Crankshaft
- Plane bearings (Crankshaft/Connecting rods/Balancer shaft)

NOTE: _____

Identify each plane bearing position very carefully so that it can be reinstalled in its original place.



3. Remove:

- Piston pin clip ①
- Piston pin ②
- Piston ③

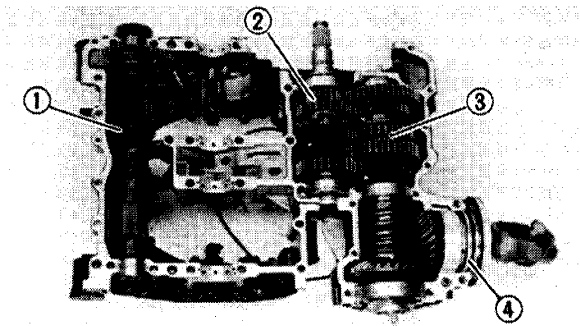
TRANSMISSION

1. Remove:

- Balancer shaft ①
- Main axle assembly ②
- Drive axle assembly ③
- Middle driven gear assembly ④
- Plane bearings (Crankshaft/Balancer shaft)

NOTE: _____

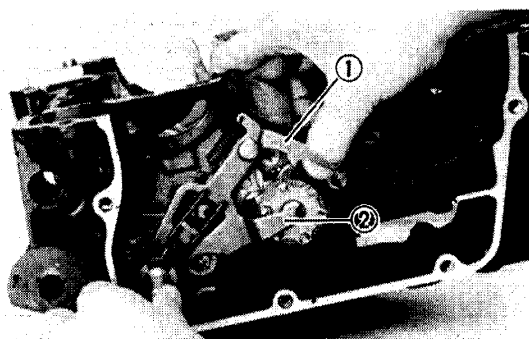
Identify each plane bearing position very carefully so that it can be reinstalled in its original place.



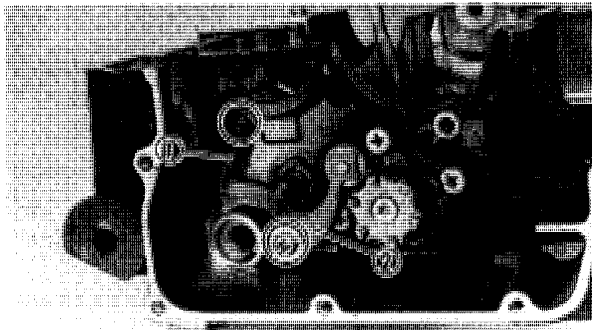
LOWER CRANKCASE

1. Remove:

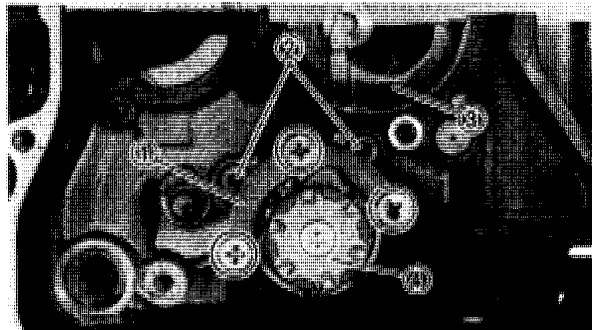
- Shift shaft assembly



- ① Shift lever 1
- ② Shift lever 2



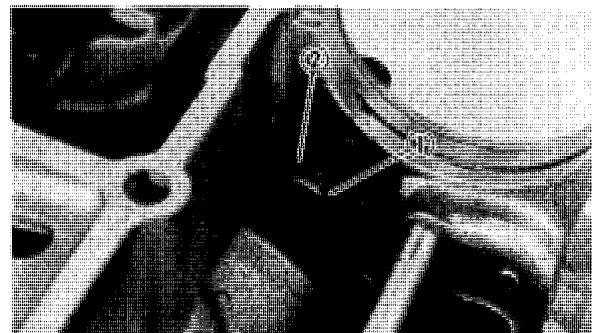
2. Unhook:
 - Tension spring ①
3. Remove:
 - Shift cam stopper lever ②



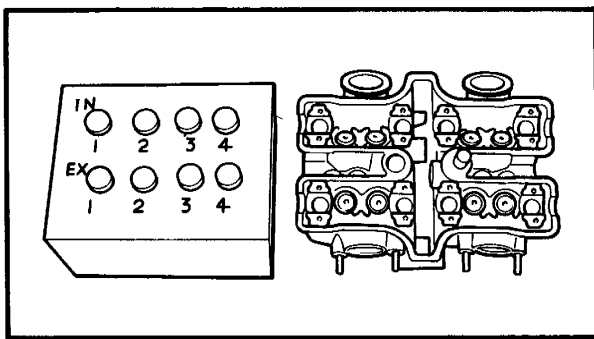
4. Remove:
 - Bearing retainer (Shift cam) ①
 - Guide bars ②
 - Shift forks ③
 - Shift cam ④

NOTE:

Note the position of each part. Pay particular attention to the location and direction of shift forks.



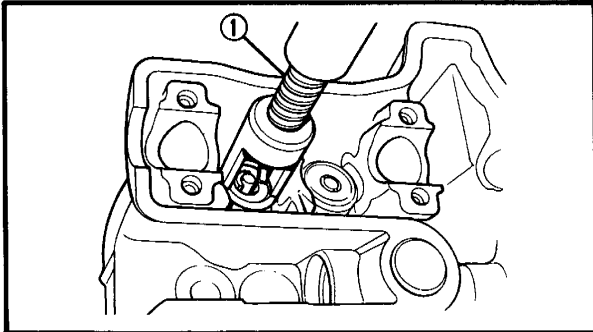
5. Remove:
 - Circlip ①
 - Oil pump idle gear ②



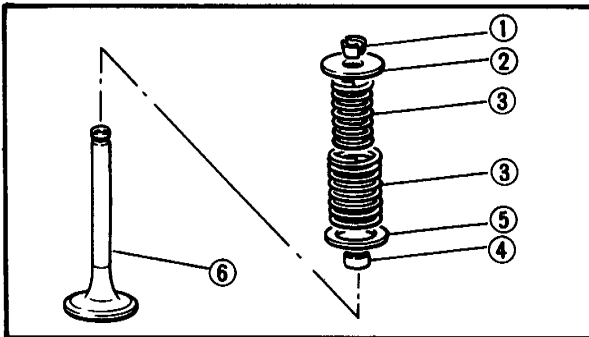
**INSPECTION AND REPAIR
CYLINDER HEAD**

1. Remove:
 - Valve pads
 - Lifters
 - Spark plugs

NOTE: _____
Identify each lifter and pad position very carefully so that it can be reinstalled in its original place.

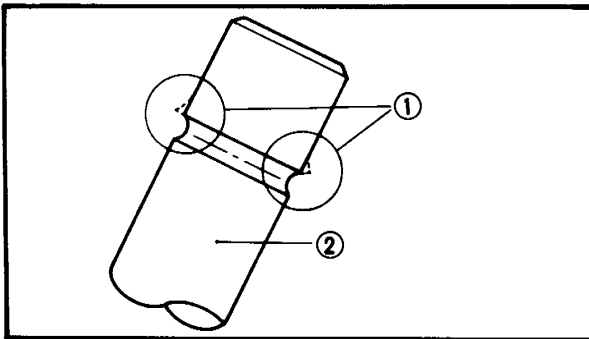


2. Attach:
 - Valve Spring Compressor (YM-04019) ①



3. Remove:
 - Valve retainers ①
 - Valve spring seat ②
 - Valve springs ③
 - Oil seal ④
 - Valve spring seat ⑤
 - Valve ⑥

NOTE: _____
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.

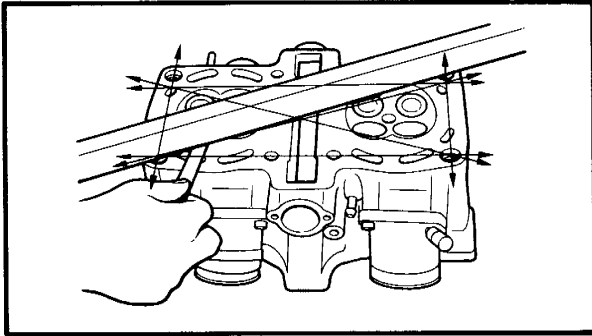


- ① Deburr
- ② Valve stem

4. Eliminate:
 - Carbon deposit
 Use rounded scraper.

NOTE: _____
Do not use a sharp instrument and avoid damaging or scratching.

- Spark plug threads
- Valve seat
- Cylinder head

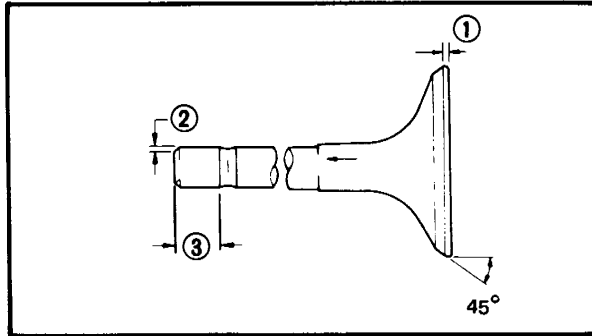


5. Measure:

- Cylinder head warpage
Under specification → Resurface.
Over specification → Replace.



Cylinder Head Warp Limit:
Less than 0.03 mm (0.0012 in)



VALVE, VALVE GUIDE, AND VALVE SEAT

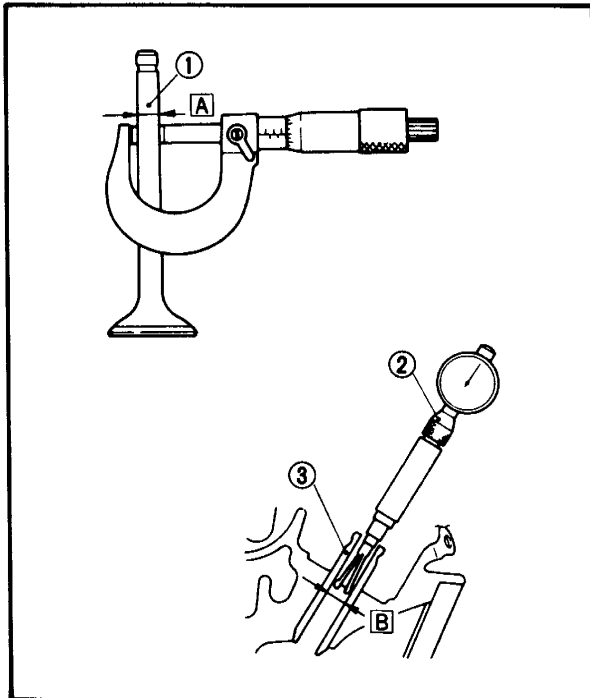
Intake and Exhaust Valve

1. Inspect:

- Valve face
 - Stem end
- Wear/Pitting/Out of specification → Replace.



Minimum Thickness (Service limit) ① :
0.7 mm (0.028 in)
Beveled ② : 0.5 mm (0.020 in)
Minimum Length (Service limit) ③ :
4.0 mm (0.16 in)



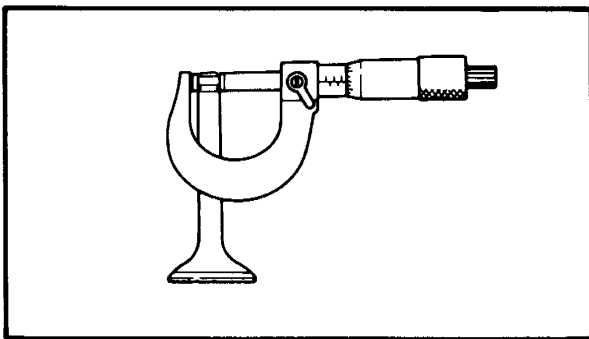
2. Measure:

- Valve stem clearance
Out of specification → Replace either valve and/or guide.
Use the Micrometer and Bore Gauge.



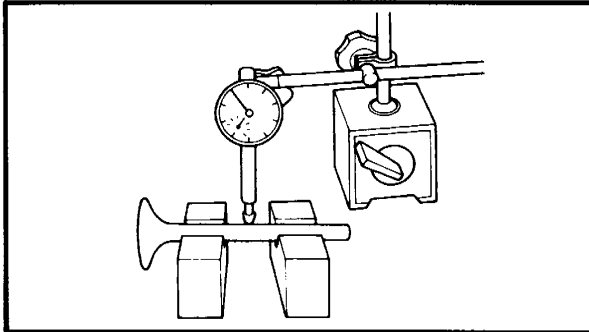
	Valve Stem Clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)

- ① Valve
- ② Bore Gauge
- ③ Valve guide
- A** Valve stem outside diameter
- B** Valve guide inside diameter



3. Inspect:

- Valve stem end
Mushroom shape/Larger diameter than rest of stem → Replace valve, valve guide, and oil seal.



4. Measure:

- Valve stem runout
Out of specification → Replace.



Maximum Runout:
0.01 mm (0.0004 in)

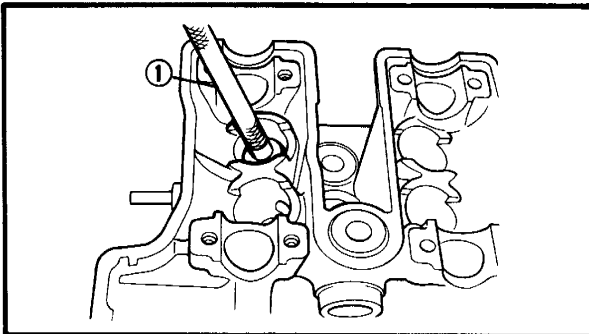
Valve Guide

NOTE:

- Always replace valve guide if valve is replaced.
- Always replace oil seal if valve is removed.

1. Inspect:

- Valve guide
Wear/Oil leakage into cylinder → Replace.

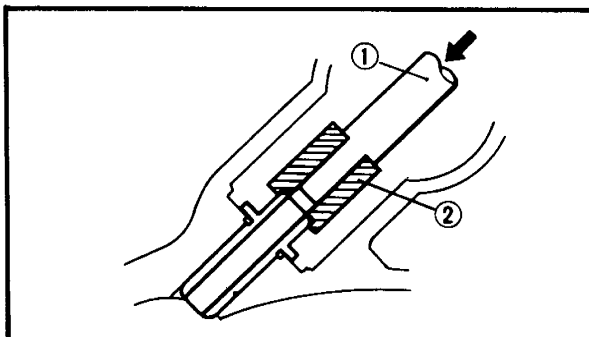


2. Remove:

- Valve guide
Use the Valve Guide Remover (YM-04064-A) ①.

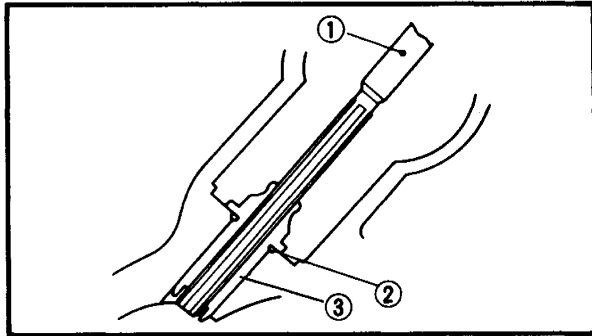
NOTE:

Heat the head in an oven to 100°C (212°F) to ease guide removal and installation and to maintain correct interference fit.



3. Install:

- Circlip (New)
- Valve guide (Oversize)
Use the Valve Guide Remover (YM-04064-A) ① with the Valve Guide Installer (YM-04065-A) ②.

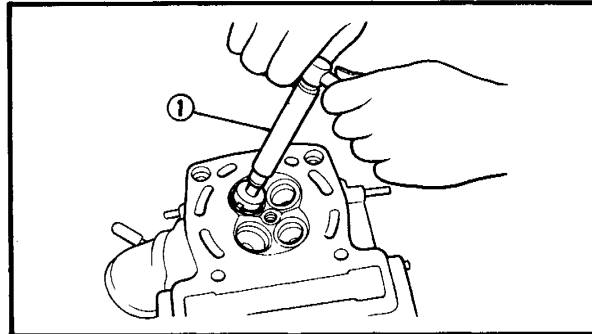


NOTE:

After installing valve guide:

- Use the 6.0 mm Valve Guide Reamer (YM-04066) ① to obtain proper valve guide/valve stem clearance.
- Recut the valve seat.

- ② Circlip
- ③ Valve guide



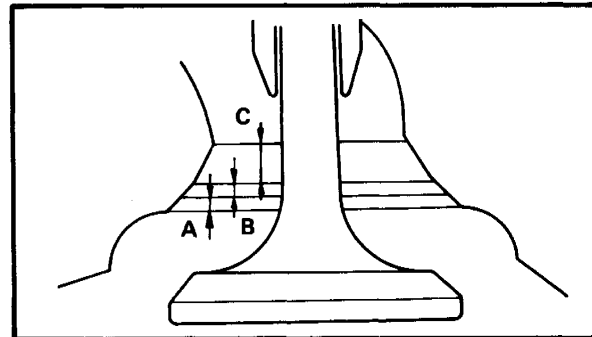
Valve Seat

1. Inspect:

- Valve seat
Wear/Pitting/Valve replacement →
Resurface seat at 45° angle.

CAUTION:

Clean valve seat if pitted or worn using a 45° Valve Seat Cutter (YM-91043) ①. When twisting cutter, keep an even downward pressure to prevent chatter marks.



Cut sections as follows	
Section	Cutter
A	30°
B	45°
C	60°

2. Measure:

- Valve seat width

3. Apply:

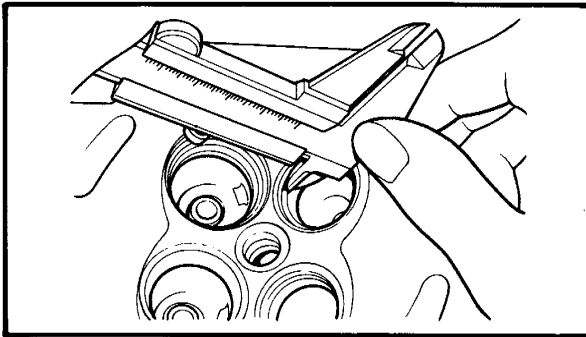
- Mechanics bluing dye (Dykem)
To valve and seat.
- Fine grinding compound (Small amount)
Ground surface of valve face.

4. Position:

- Valves
Into cylinderhead.
Spin it rapidly back and forth, then lift valve and clean off all grinding compound.

5. Inspect:

- Valve seat surface
Wherever valve seat and valve face made contact, bluing will have been removed.



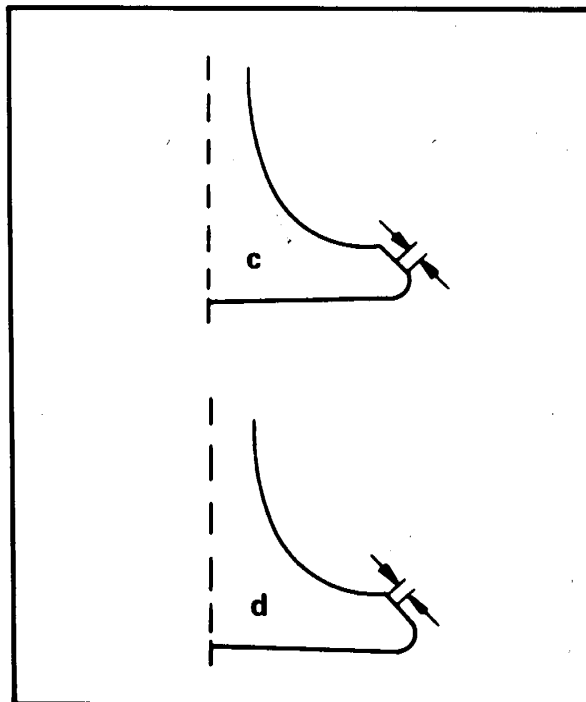
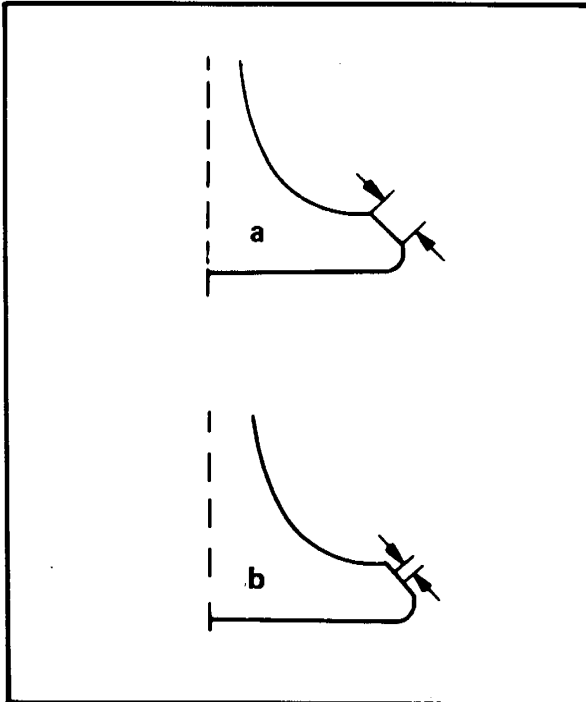
6. Measure:


- Valve seat width

Out of specification/Remaining pitting/
Variation of valve seat width → Cut valve
further.

CAUTION:

Remove just enough material to achieve satisfac-
tory seat.



 **Seat Width:**
Standard: 0.9 ~ 1.1 mm
(0.035 ~ 0.043 in)
Wear limit: 1.4 mm (0.055 in)

Valve seat recutting steps are necessary if:

- Valve seat is uniform around perimeter of valve face but too wide or not centered on valve face.

Valve Seat Cutter Set		Desired result
Use either	30° cutter	To center the seat or to reduce its width
	45° cutter	
	60° cutter	

- Valve face indicates that valve seat is centered on valve face but is too wide (see "a" diagram).

Valve Seat Cutter Set		Desired result
Use lightly	30° cutter	To reduce valve seat width to 1.0 mm (0.039 in)
	60° cutter	

- Valve seat is in the middle of the valve face but too narrow (see "b" diagram).

Valve Seat Cutter Set		Desired Result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.039 in)

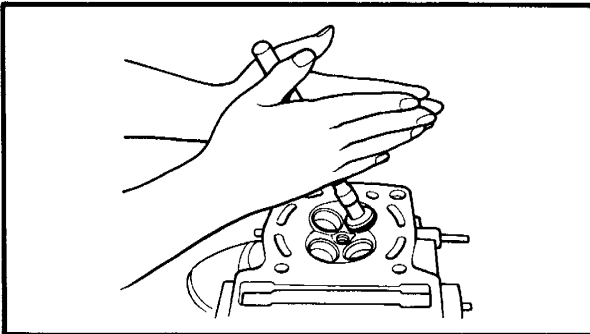
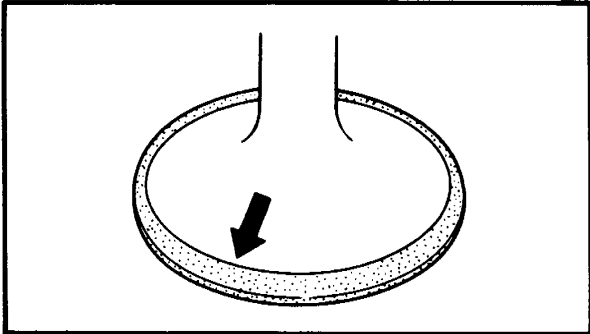
- Valve seat is too narrow and right up near valve margin (see "c" diagram).

Valve Seat Cutter Set		Desired Result
Use	30° cutter, first	To center the seat and to increase its width
	45° cutter	



● Valve seat is too narrow and is located down near the bottom edge of the valve face (see diagram "d").

Valve Seat Cutter Set		Desired Result
Use	60° cutter, first	To center the seat and to increase its width
	45° cutter	



Valve/Valve Seat Assembly Lapping

1. Apply:
 - Coarse lapping compound (Small amount)
To valve face.
 - Molybdenum disulfide oil
To valve stem.
2. Position:
 - Valves
In cylinder head.
3. Rotate:
 - Valve
Turn until valve and valve seat are evenly polished, then clean off all compound.
4. Apply:
 - Fine lapping compound (Small amount)
To valve face.
5. Repeat steps 2 and 3.

NOTE: _____

Be sure to clean off all compound from valve face after every lapping operation.

6. Inspect:
 - Valve face
Not yet uniformly smooth → Repeat procedure from step 1.
7. Apply:
 - Mechanics bluing dye (Dykem)
To valve face and seat.
8. Rotate:
 - Valve
9. Inspect:
 - Valve face
Valve must make full seat contact indicated by grey surface all around. The valve face where bluing was removed.
Faulty contact → Replace.
(See procedure below)



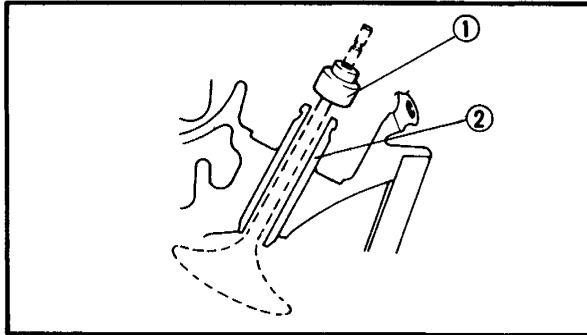
10. Apply:

- Solvent

Into each intake and exhaust port.

NOTE:

Pour solvent into intake and exhaust ports only after completion of all valve work and assembly of all head parts.



11. Check:

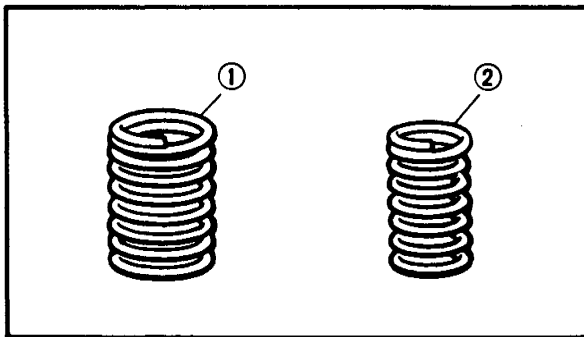
- Valve seals ①

Leakage past valve seat → Replace valve.
(See procedure below)

② Valve guide

Relapping steps:

- Disassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to effect a satisfactory seal.

**Valve Spring**

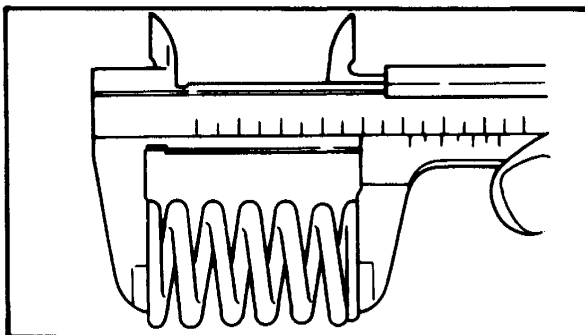
This engine uses two springs of different sizes to prevent valve float or surging. Valve spring specifications show the basic valve characteristics.

- ① Outer spring
- ② Inner spring

1. Measure:

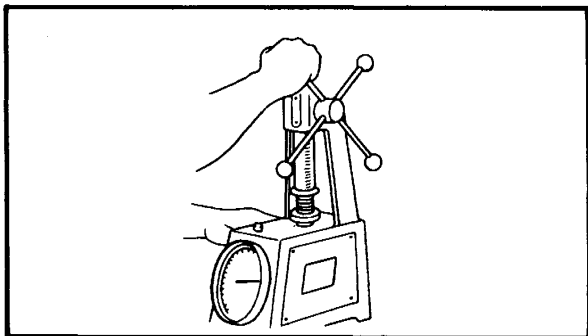
- Spring free length

Out of specification → Replace.

**Minimum Free Length:**

Outer: 37.25 mm (1.467 in)

Inner: 35.30 mm (1.390 in)

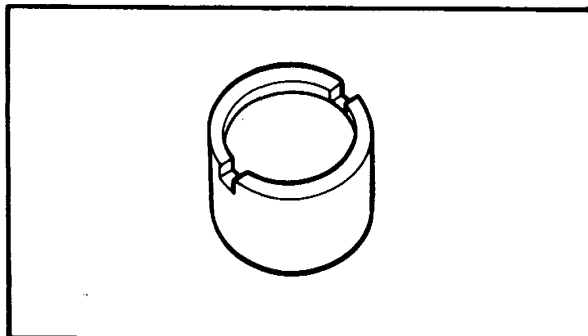


2. Measure:

- Spring force (installed length)
Out of specification → Replace.

Valve Compressed Force:

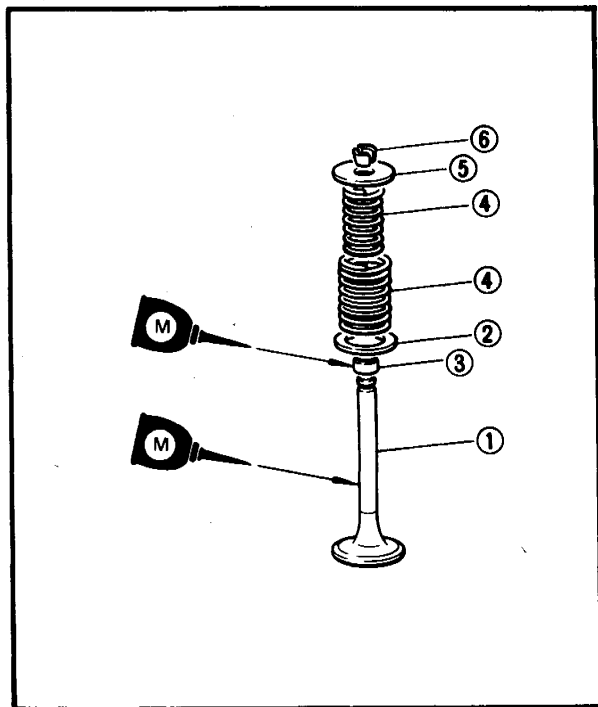
- Outer: 10.1 ~ 11.9 kg (22.3 ~ 26.2 lb)
at 33.8 mm (1.331 in)
- Inner: 4.57 ~ 5.37 kg (10.1 ~ 11.8 lb)
at 31.8 mm (1.75 in)



Valve Lifter

1. Inspect:

- Valve lifter wall
Scratches/Damage → Replace both lifter and cylinder head.



Valve Installation

1. Lubricate:

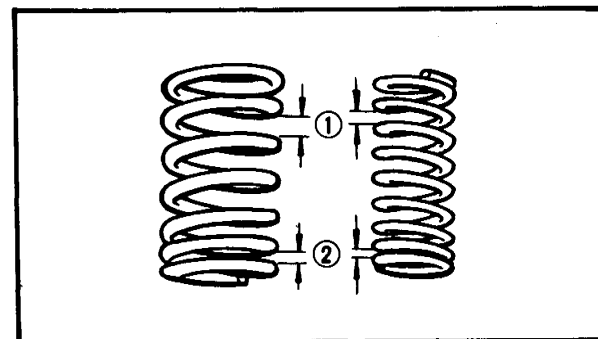
- Valve stem
- Oil seal



High-Quality Molybdenum Disulfide Motor Oil or Molybdenum Disulfide Grease

2. Install:

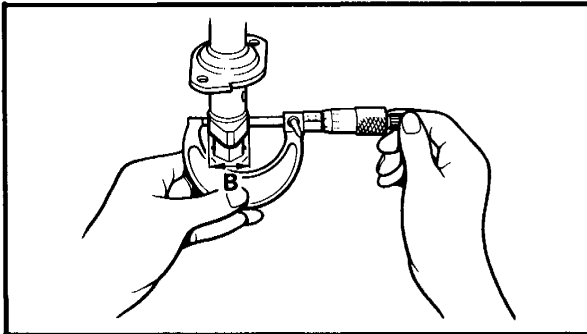
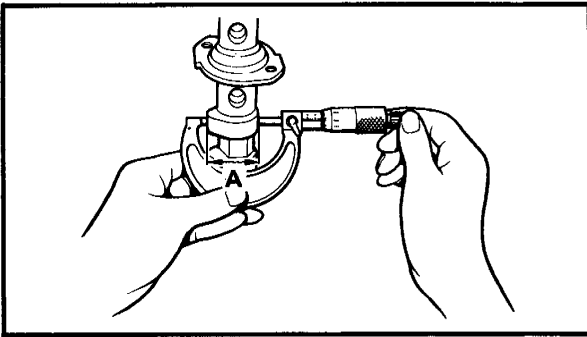
- Valve ①
- Valve spring seat ②
- Oil seal ③
- Valve springs ④
- Valve spring seat ⑤
- Valve retainers ⑥



NOTE:

Install springs with wider-gapped coils facing upwards, as shown.

- ① Larger pitch
- ② Smaller pitch



CAMSHAFT, CAM CHAIN, AND CAM SPROCKET

Camshaft

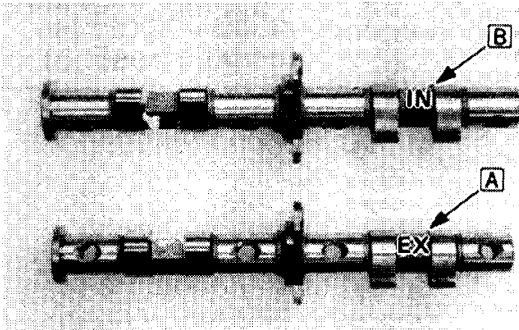
1. Inspect:

- Cam lobes
Pitting/Scratches/Blue discoloration → Replace.

2. Measure:

- Cam lobes
Use the Micrometer.
Out of specification → Replace.

	Cam Lobe "A" (Limit)	Cam Lobe "B" (Limit)
Intake	35.65 mm (1.404 in)	27.85 mm (1.096 in)
Exhaust	35.65 mm (1.404 in)	27.85 mm (1.096 in)



Camshaft/Cap Clearance Measurement

1. Install:

- Camshaft

2. Attach:

- Plastigage® (YU-33210)
Onto camshaft.

A For Exhaust

B For Intake

3. Attach:

- Camshaft cap ("I-3" or "E-3")

4. Install:

- Camshaft caps (others)

5. Tighten:

- Camshaft cap bolts

CAUTION:

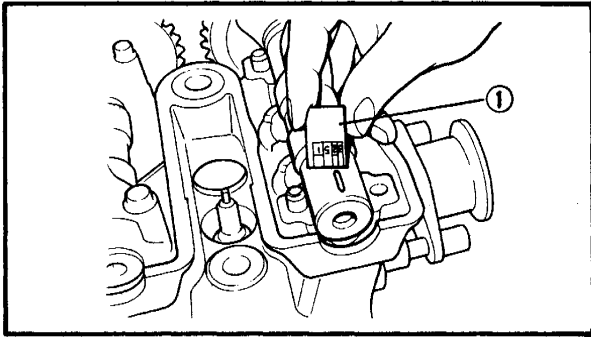
First Tighten the Nos. 2, 4, and 1 cap bolts in that order, then the No. 3 cap bolts; otherwise, the No. 3 caps may be damaged or bent.



Camshaft Cap:
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:

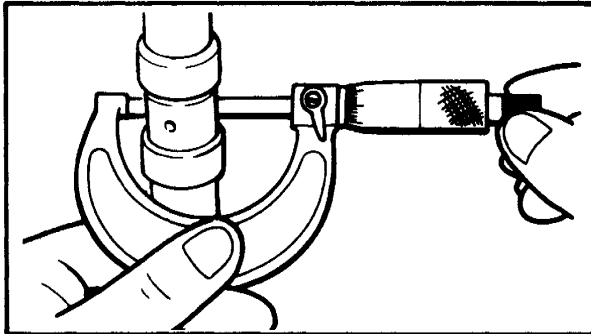
Do not turn the camshaft when measuring clearance with Plastigage®.



6. Remove:
 - Camshaft caps
7. Measure:
 - Width of Plastigage® ①
 Out of specification → Follow step 8.



Camshaft-to-cap Clearance:
 Standard: 0.020 ~ 0.054 mm
 (0.0008 ~ 0.0021 in)
 Maximum: 0.160 mm (0.006 in)



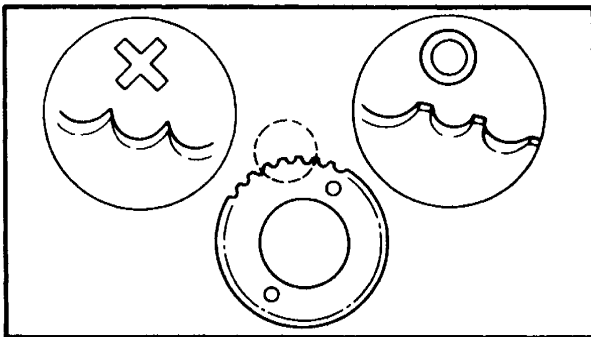
8. Measure:
 - Camshaft outside diameter
 Use a micrometer.
 Out of specification → Replace camshaft.
 Within specification → Replace cylinder head.



Camshaft Outside Diameter:
 Standard: 24.967 ~ 24.980 mm
 (0.9830 ~ 0.9835 in)
Cam Cap Inside Diameter:
 Standard: 25.000 ~ 25.021 mm
 (0.9843 ~ 0.9851 in)

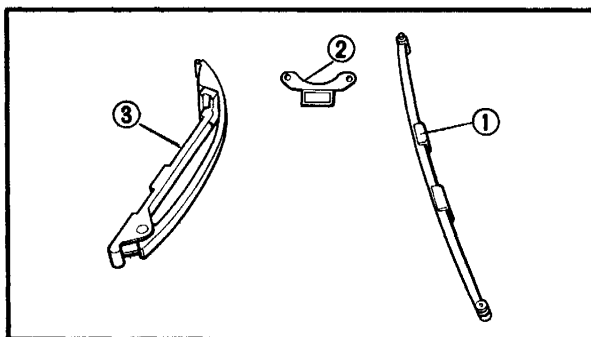
Cam Chains

1. Inspect:
 - Cam chains
 Chain stretch/Cracks → Replace.



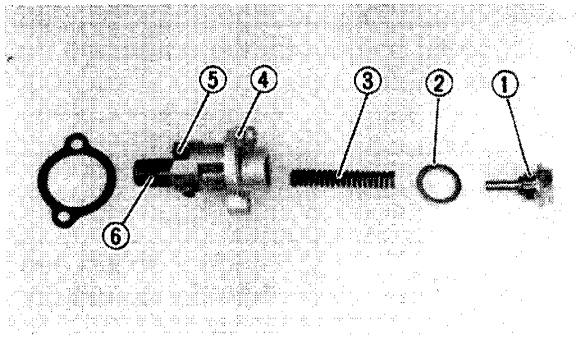
Cam Sprockets

1. Inspect:
 - Cam sprockets
 Wear/Damage → Replace.



Chain Dampers

1. Inspect:
 - Upper damper ①
 - Front damper ②
 - Rear damper ③
 Wear → Replace.



Cam Chain Tensioner

1. Check:
 - One-way cam operation
Unsmooth operation → Replace.

2. Inspect:
 - All parts
Damage/Wear → Replace.

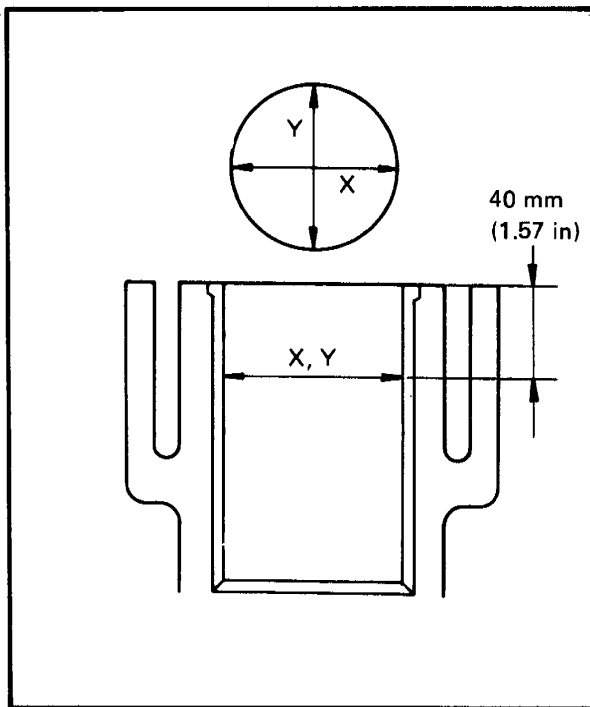
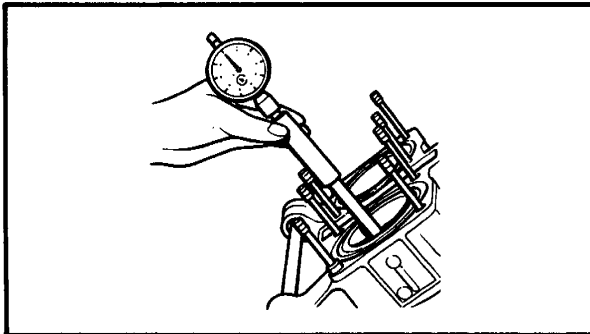
- | | |
|------------|------------------|
| ① End plug | ④ Tensioner body |
| ② Washer | ⑤ One way cam |
| ③ Spring | ⑥ Tensioner rod |

CYLINDER

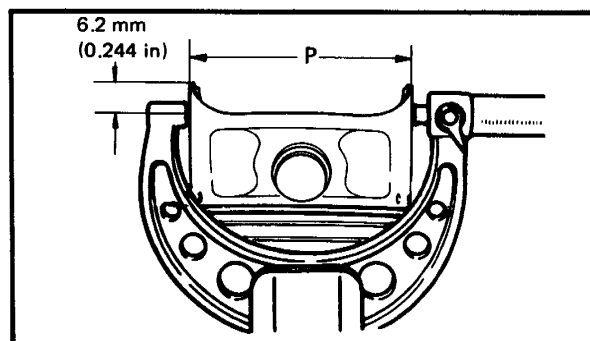
1. Inspect:
 - Cylinder wall
Wear/Scratches → Rebore or replace.

2. Measure:
 - Cylinder bore "C"
Use the Cylinder Bore Gauge.
Measure the cylinder bore "C" horizontally and laterally at 40 mm (1.57 in) from cylinder top. Then find the coverage of the measurements.

Out of specification → Rebore.



	Standard	Wear Limit
Cylinder Bore "C":	78.967 ~ 79.016 mm (2.991 ~ 2.993 in)	79.1 mm (3.114 in)
$C = \frac{X + Y}{2}$		



PISTON, PISTON RING, AND PISTON PIN

Piston

1. Inspect:
 - Piston wall
Wear/Scratches/Damage → Replace.

2. Measure:
 - Piston outside diameter "P"
Use a Micrometer.
Out of specification → Replace.



NOTE:
Measurement should be made at a point 6.2 mm (0.244 in) above the bottom edge of the piston.

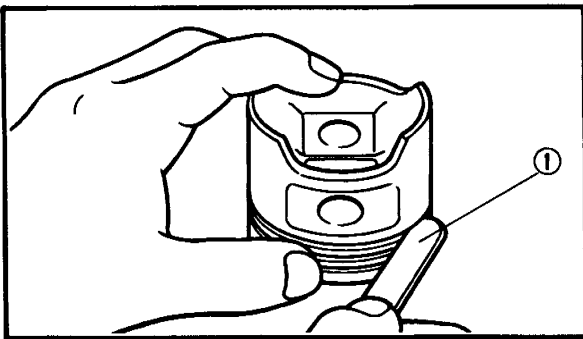
	Size "P"
Standard	78.926 ~ 78.933 mm (3.1073 ~ 3.1076 in)
Overize 1	79.25 mm (3.120 in)
Overize 2	79.50 mm (3.130 in)

3. Measure:

- Piston clearance

Out of specification → Rebore cylinder or replace piston.

	Piston Clearance = C – P: 0.055 ~ 0.069 mm (0.0022 ~ 0.0027 in)
	C: Cylinder bore P: Piston outside diameter



Piston Ring

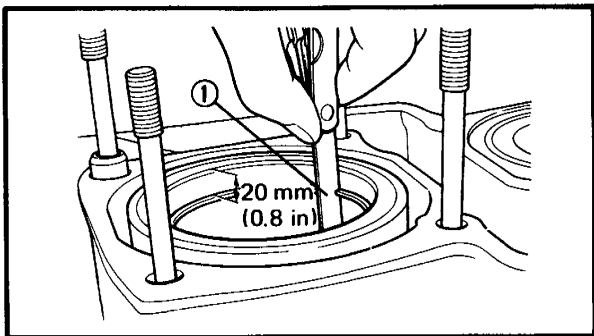
1. Measure:

- Side clearance

Use the Feeler Gauge ① .

Out of specification → Replace piston and/or rings.

	Side Clearance	
	Standard	Limit
Top Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.12 mm (0.0047 in)
2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)	0.12 mm (0.0047 in)



2. Position:

- Piston ring
Into cylinder.
Push the ring with the piston crown.

3. Measure:

- End gap
Use the Feeler Gauge ① .
Out of specification → Replace rings as set.

	End Gap	
	Standard	Limit
Top Ring	0.35 ~ 0.50 mm (0.0138 ~ 0.0197 in)	0.70 mm (0.0276 in)
2nd Ring	0.35 ~ 0.50 mm (0.0138 ~ 0.0197 in)	0.80 mm (0.0315 in)
Oil Ring	0.3 ~ 0.9 mm (0.0118 ~ 0.0354 in)	—

Overize Piston Rings

- The overize top and middle ring sizes are stamped on top of the ring.

Overize 1	0.25 mm (0.0098 in)
Overize 2	0.50 mm (0.0197 in)

- The expander spacer of the bottom ring (oil control ring) is color-coded to identify sizes. The color mark is painted on the expander spacer.

Size	Color
Overize 1	Blue (Two)
Overize 2	Red (One)

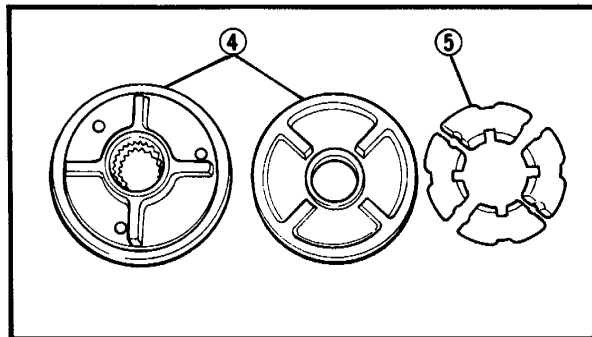
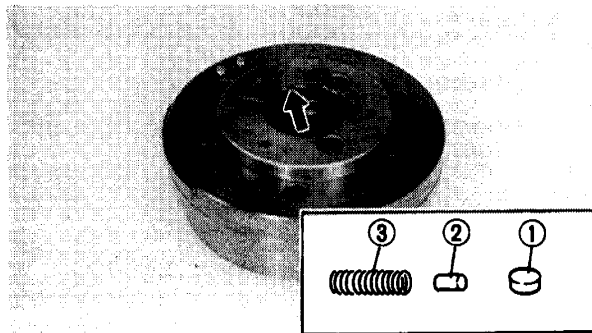
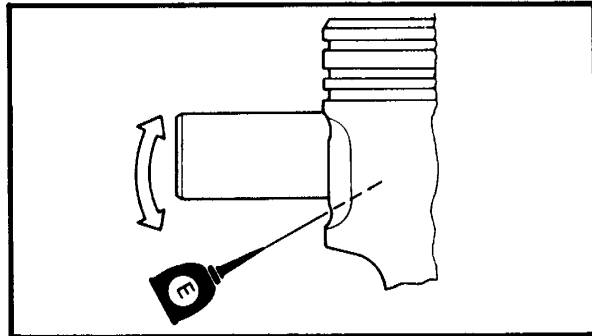
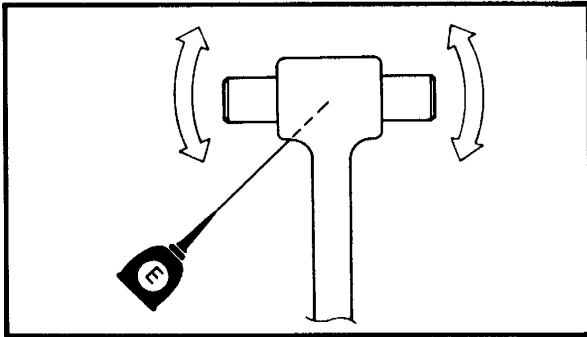
Piston Pin

1. Lubricate:

- Piston pin (Lightly)

2. Install:

- Piston pin
Into small end of connecting rod.



3. Check:

- Free play
Free play → Inspect connecting rod for wear.
- Wear → Inspect connecting rod and piston pin.

4. Position:

- Piston pin
Into piston.

5. Check:

- Free play
When pin is in place in piston.
Free play → Replace piston pin and/or piston.

STARTER DRIVES

Electric Starter Clutch

1. Check:

- Ball ① operation
- Spring cap ② operation
- Spring ③ operation
- Unsmooth operation → Replace one-way clutch.

2. Check:

- Damper housing ④
- Rubber dampers ⑤
- Cracks/Wear/Damage → Replace.

3. Install:

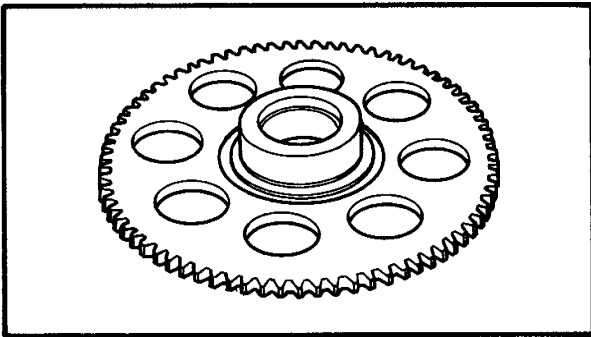
- Rubber damper
- Damper housing
- One-way clutch

4. Tighten:

- Bolts (One-way clutch)

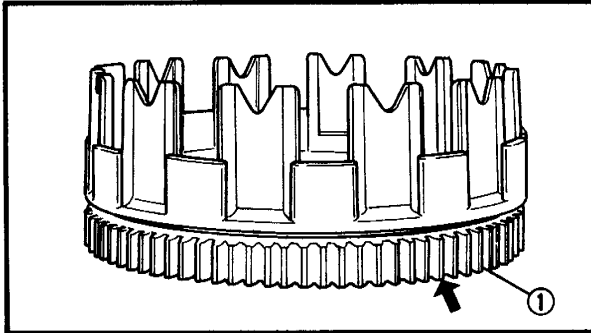


Bolts (Starter One-way Clutch):
 24 Nm (2.4 m.kg, 17 ft.lb)
LOCTITE®
 Stake Over the End of the Bolt



Starter Gears

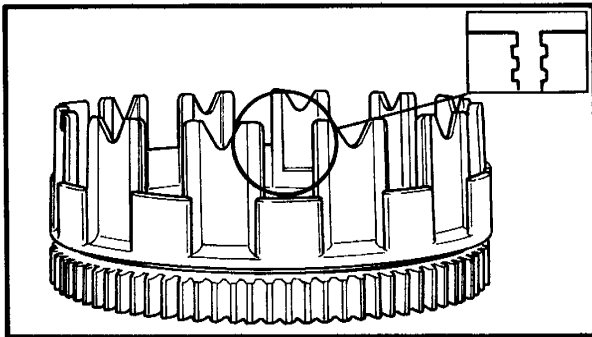
1. Inspect:
 - Idle gear surfaces
 - Pitting/Wear/Damage → Replace.



PRIMARY GEARS

The drive gear is mounted on the crankshaft; the driven gear is mounted on the transmission and is intergrated with the clutch assembly.

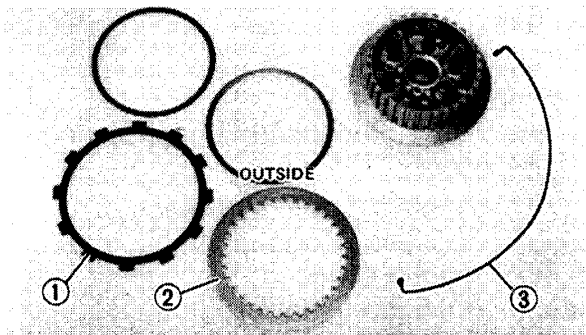
1. Inspect:
 - Drive gear
 - Scratches/Wear/Damage → Replace crankshaft.
 - Driven gear ①
 - Scratches/Wear/Damage → Replace clutch housing assembly.



CLUTCH

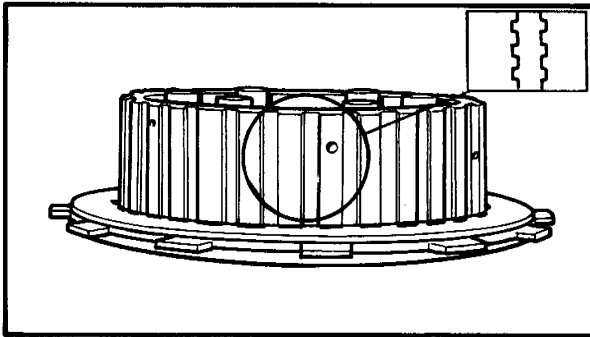
Clutch Housing

1. Inspect:
 - Dogs on the housing
 - Cracks/Wear/Damage → Deburr or replace.
 - Clutch housing bearing
 - Chafing/Wear/Damage → Replace.



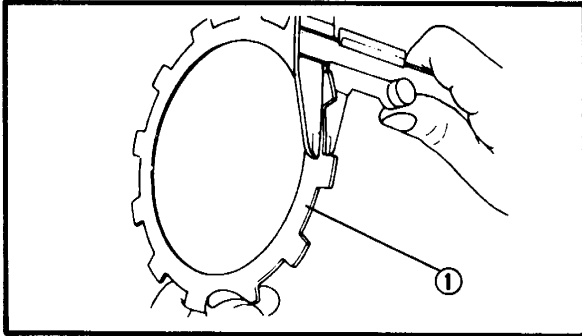
Clutch Boss

The clutch boss contains a built-in damper beneath the friction plate ① and clutch plate ② . It is not necessary to remove the wire circlip ③ and disassemble the built-in damper unless there is serious clutch chattering.



1. Inspect:
 - Clutch boss splines
 - Scoring/Wear/Damage → Replace clutch boss assembly.

NOTE: _____
 Scoring on the clutch plate splines will cause erratic operation.

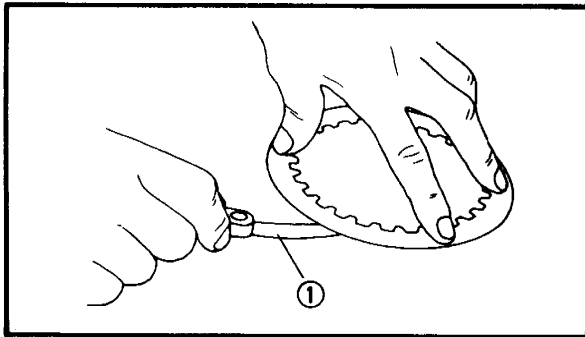


Friction Plates

1. Inspect:
 - Friction plate ①
 - Damage/Wear → Replace friction plate as a set.
2. Measure:
 - Friction plate thickness
 - Measure at all four points.
 - Out of specification → Replace friction plate as a set.



Wear Limit:
 2.8 mm (0.11 in)

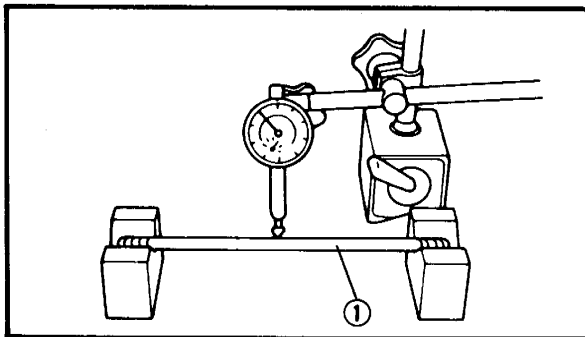


Clutch Plates

1. Measure:
 - Clutch plate warpage
 - Use the surface plate and the Feeler Gauge ①.
 - Out of specification → Replace.



Warp Limit:
 0.2 mm (0.008 in)



Push Rod

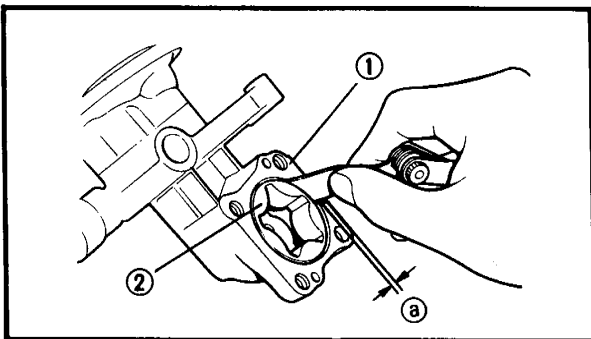
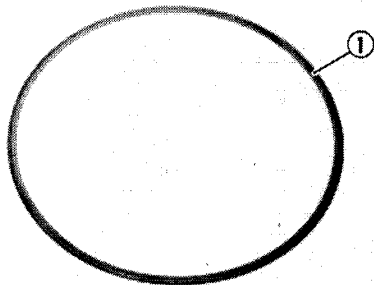
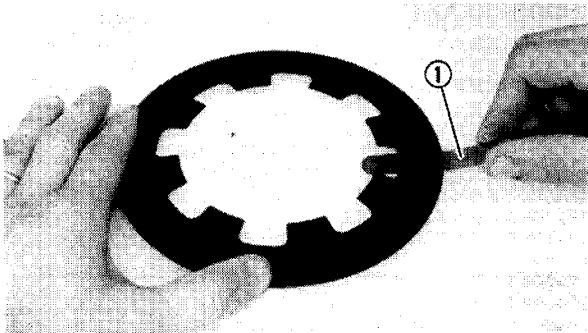
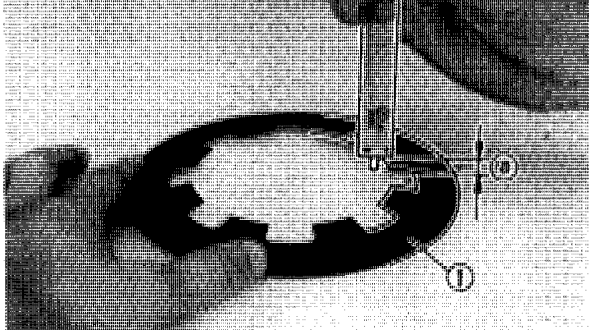
1. Measure:
 - Push rod runout ①
 - Use V-Blocks and the Dial Gauge (YU-03097).
 - Out of specification → Replace.



Bending Limit:
 0.5 mm (0.02 in)

Clutch Bearing

1. Inspect:
 - Bearing
 - Pitting/Damage → Replace.



Clutch Spring

1. Inspect:
 - Clutch spring ①
 - Wear/Bends/Cracks → Replace.
2. Measure:
 - Clutch spring free height (a)
 - Out of specification → Replace.

 **Clutch Spring Minimum Height:**
6.5 mm (0.26 in)

3. Measure:
 - Clutch spring warpage
 - Use a surface plate and the Feeler Gauge ①.
 - Out of specification → Replace.


 **Warp Limit:**
0.1 mm (0.004 in)

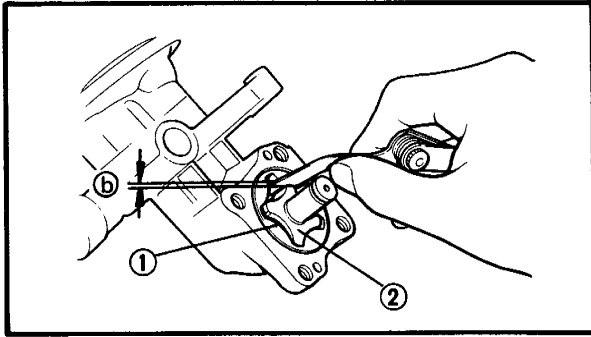
Clutch Spring Seat

1. Inspect:
 - Clutch spring seat ①
 - Wear/Bends/Damage → Replace.

OIL PUMP

1. Measure:
 - Housing ① /Outer rotor ② clearance (a)
 - Use the Feeler Gauge.
 - Out of specification → Replace oil pump assembly.

 **Side Clearance Limit:**
0.08 mm (0.0031 in)

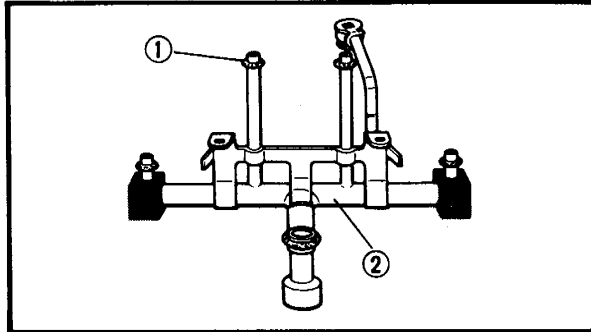


2. Measure:

- Outer rotor ① / Inner rotor ② clearance ③
- Use the Feeler Gauge.
- Out of specification → Replace oil pump assembly.



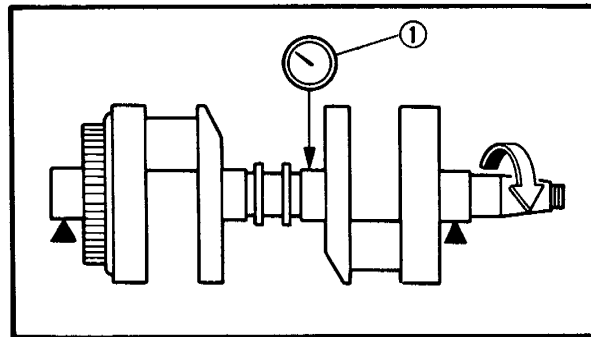
Tip Clearance Limit:
0.17 mm (0.0067 in)



OIL GALLERY PIPE

1. Inspect:

- O-rings ①
Wear/Cracks/Damage → Replace.
- Gallery pipe ②
Cracks/Damage → Replace.



CRANKSHAFT

Crankshaft

1. Measure:

- Runout
Use the V-Blocks and Dial Gauge ① (YU-03097).
- Out of specification → Replace.



Runout Limit:
0.03 mm (0.0012 in)

2. Inspect:

- Crankshaft bearing surfaces
Wear/Scratches → Replace.

Crankshaft Main Bearing Clearance Measurement

1. Clean all parts.

2. Position:

- Crankcase half (Upper)
Place on a bench in an upside down position.

3. Install:

- Bearings
Into the upper crankcase.
- Crankshaft

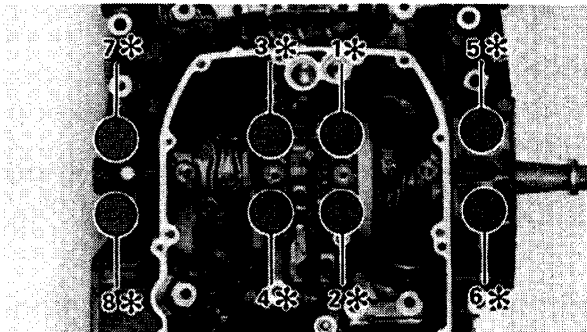


4. Attach:

- Plastigage® (YU-33210)
Onto the crankshaft journal surface.

NOTE:

Do not turn the crankshaft until clearance measurement has been completed.



5. Install:

- Bearings
Into lower crankcase.

6. Tighten:

- Bolts

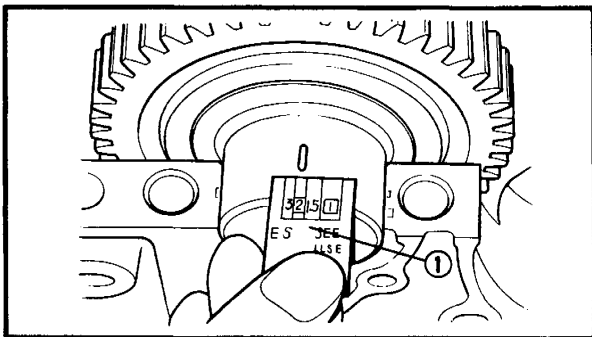
CAUTION:

Tighten to full torque in torque sequence as shown.



10 mm Bolts (Crankcase):
40 Nm (4.0 m·kg, 29 ft·lb)

* With a washer



7. Remove:

- Bolts
Reverse assembly order.
- Crankcase (Lower)
Use care in removing.

8. Measure:

- Width of Plastigage® ①
Out of specification → Replace bearings;
replace crankshaft if necessary.

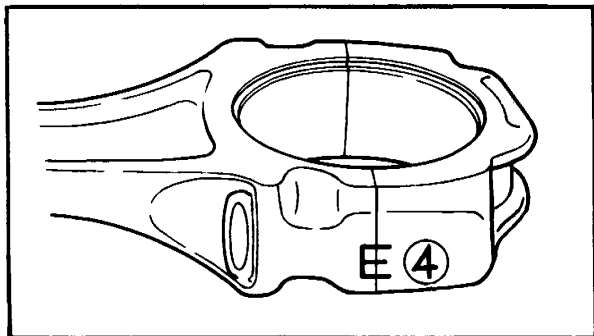


Main Bearing Oil Clearance:
0.020 ~ 0.038 mm
(0.0008 ~ 0.0015 in)



Connecting Rod Bearing Clearance Measurement

1. Clean all parts.
2. Install:
 - Connecting rod bearings
Into connecting rod and cap.
3. Attach:
 - Plastigage® (YU-33210)
Onto the crank pin.
4. Install:
 - Connecting rod
 - Connecting rod cap



NOTE:

Be sure the letter on both components align to form perfect character.

5. Lubricate:
 - Bolt threads (Connecting rod)



Molybdenum Disulfide Grease

6. Tighten:
 - Nuts (Connecting rod cap)

NOTE:

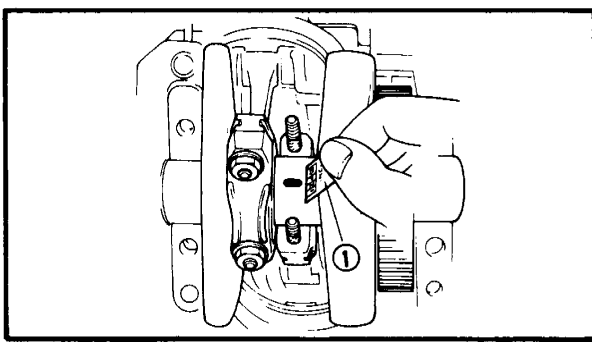
Do not turn connecting rod until clearance measurement has been completed.

CAUTION:

Tighten to full torque specification without pausing. Apply continuous torque between 3.0 and 3.8 m·kg. Once you reach 3.0 m·kg, **DO NOT STOP TIGHTENING** until final torque is reached. If tightening is interrupted between 3.0 and 3.8 m·kg, loosen nut to less than 3.0 m·kg and start again.




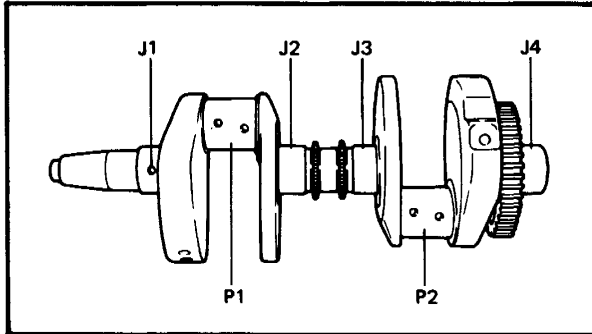
Connecting Rod Cap:
36 Nm (3.6 m·kg, 25 ft·lb)



7. Remove:
- Connecting rod cap
Use care in removing.

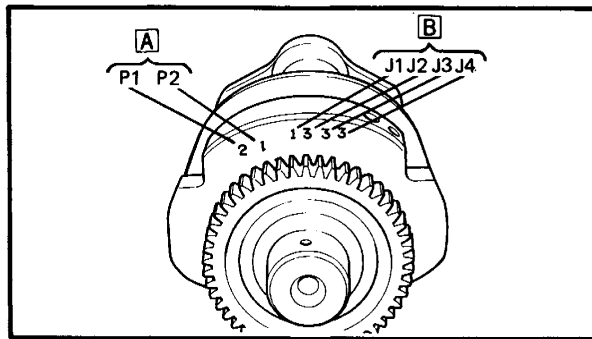
8. Measure:
- Width of Plastigage® ①
Out of specification → Replace bearings and/or replace crankshaft if necessary.

 **Connecting Rod Bearing Clearance:**
0.021 ~ 0.039 mm
(0.0008 ~ 0.0015 in)

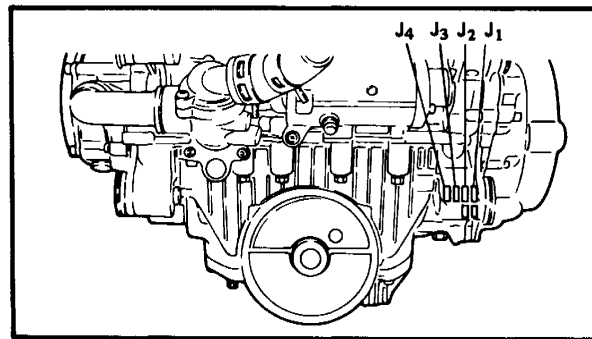


Crankshaft Main and Connecting Rod Bearing Selection

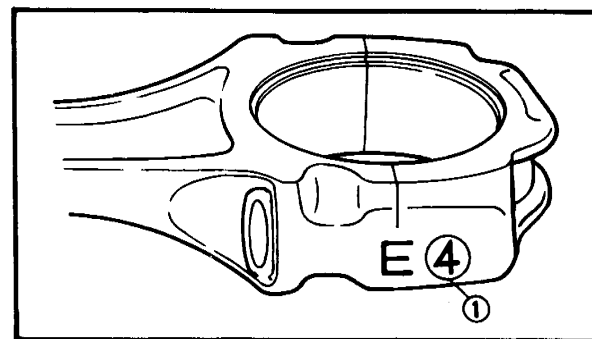
- Numbers used to indicate crankshaft journal sizes are stamped on the crankweb. The first two (2) **A** are rod bearing journal numbers, starting with the left journal. The four (4) **B** main bearing journal numbers follow in the same sequence.



- The lower crankcase half is numbered J1, J2, J3, and J4 on the front left boss as shown.



- The numbers ① are stamped in ink on the rod.





Example 1: Selection of the crankshaft main bearings;

- If the crankcase J1 and crankshaft J1 sizes are No. 4 and No. 1, respectively, the bearing size No. is:

Bearing Size No. =
Crankcase No. – Crankshaft No. =
4 – 1 = 3 (Brown)

BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow
No. 6	Pink

Example 2: Selection of the connecting rod bearing;

- If the connecting rod P1 and crankshaft P1 sizes are No. 5 and No. 1, respectively, the bearing size No. is:

Bearing Size No. =
Connecting rod No. – Crankshaft No. =
5 – 1 = 4 (Green)

BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow
No. 6	Pink
No. 7	Red

BALANCER SHAFT

Balancer Shaft Bearing Clearance Measurement

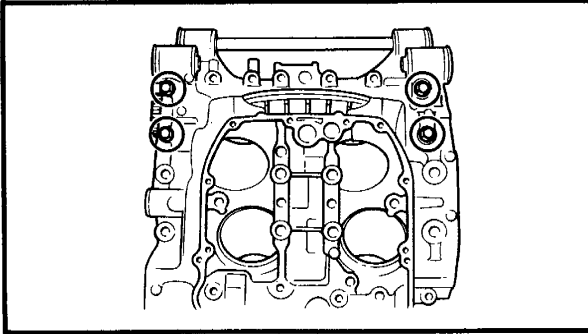
1. Clean surfaces of balancer shaft and crankcase journal.
2. Position:
 - Crankcase half (Upper)
Place on a bench in an upside down position.



3. Install:
 - Bearings
Into the upper crankcase.
4. Install:
 - Balancer shaft
Into the upper crankcase.
5. Attach:
 - Plastigage® (YU-33210)
Onto the balancer shaft journal surface.

NOTE:

Do not move balancer shaft until clearance measurement has been completed.



6. Install:
 - Bearings
Into lower crankcase.
7. Tighten:
 - Bolts (Crankcase)

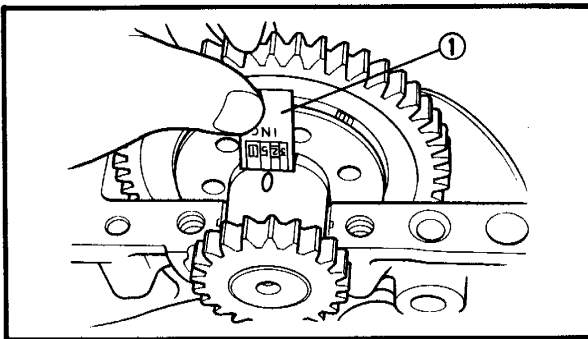
CAUTION:

Tighten to full torque in torque sequence cast on the crankcase.

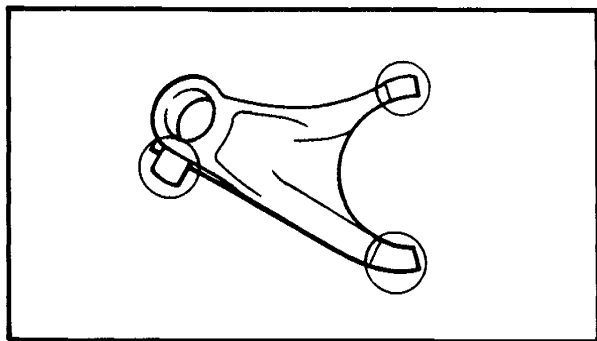
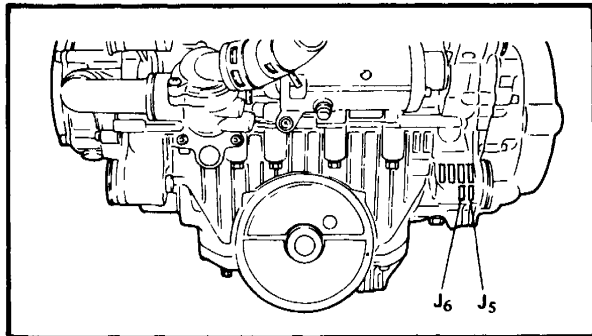
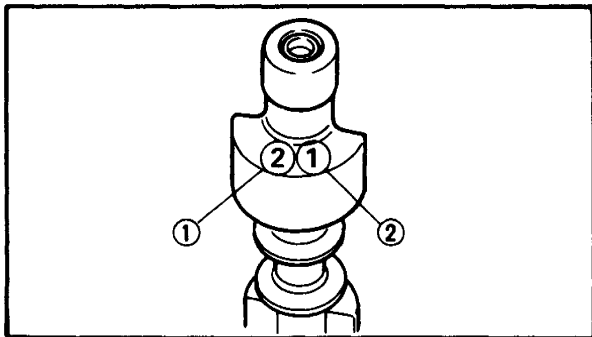


8 mm Bolt (Crankcase):
24 Nm (2.4 m·kg, 17 ft·lb)

8. Remove:
 - Bolts
Reverse assembly order.
 - Crankcase (Lower)
Use care in removing.
9. Measure:
 - Plastigage® ① width
Out of specification → Replace bearings;
replace balancer shaft in necessary.



Balancer Shaft Bearing Oil Clearance:
0.020 ~ 0.048 mm
(0.0008 ~ 0.002 in)



Balancer Shaft Bearing Selection

- Numbers used to indicate balancer shaft journal sizes are stamped on the RH balancer web corner, starting with the left journal.

- ① Left balancer shaft journal size number
- ② Right balancer shaft journal size number

- The lower crankcase half is numbered J5, and J6 as shown.

Example: Selection of the balancer shaft bearings;

- If the crankcase J5 and left balancer shaft sizes are No. 4 and No. 1, respectively, the left balancer bearing size No. is:

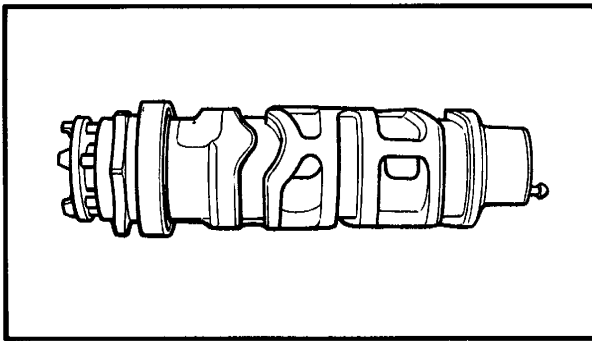
Bearing Size No. =
Crankcase No. – Balancer Shaft No. =
4 – 1 = 3 (Brown)

BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow
No. 6	Pink

TRANSMISSION

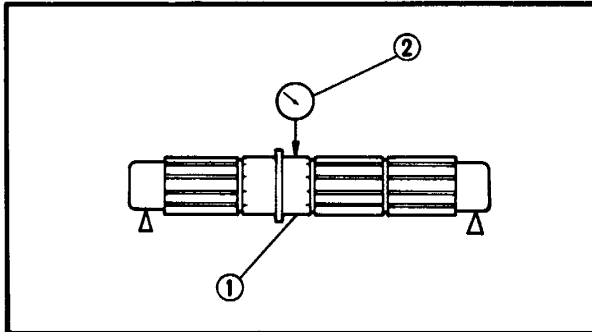
Shift Fork

1. Inspect:
 - Shift forks
 - On the gear and shift cam contact surfaces.
 - Wear/Chafing/Bends/Damage → Replace.
2. Check:
 - Shift fork movement
 - On its guide bar.
 - Unsmooth operation → Replace fork and/or guide bar.

**Shift Cam**

1. Inspect:

- Shift cam grooves
Wear/Damage/Scratches → Replace.
- Shift cam segment
Damage/Wear → Replace.
- Shift cam bearing
Pitting/Damage → Replace.

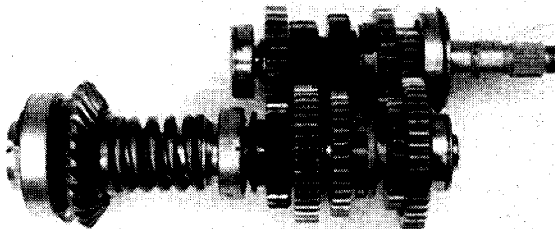
**Main and Drive Axles**

1. Measure:

- Axle runout ①
Use the centering device and Dial Gauge (YU-03097) ② .
Out of specification → Replace.



Runout Limit: 0.08 mm (0.0031 in)

**Gears**

1. Inspect:

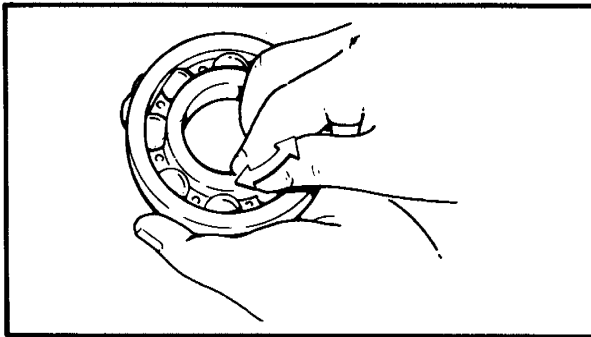
- Gears
Damage/Wear → Replace.

2. Check:

- Gear movement
Unsmooth operation → Replace.

3. Inspect:

- Mating dogs
Cracks/Wear/Damage → Replace.

**BEARINGS**

1. Inspect:

- Axle bearings
- Shift cam bearing
Pitting/Damage → Replace.

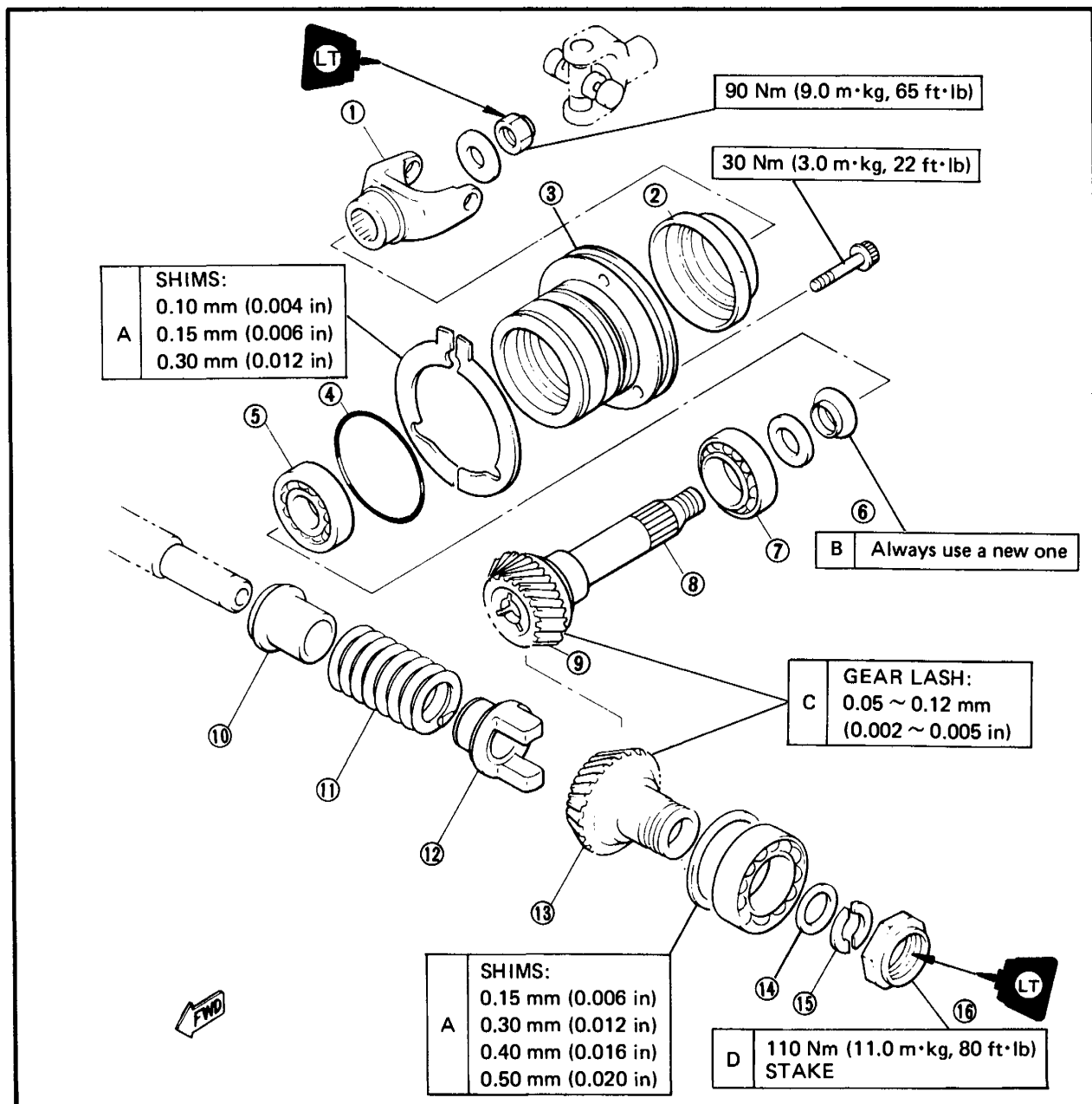
CIRCLIPS AND WASHERS

1. Inspect:

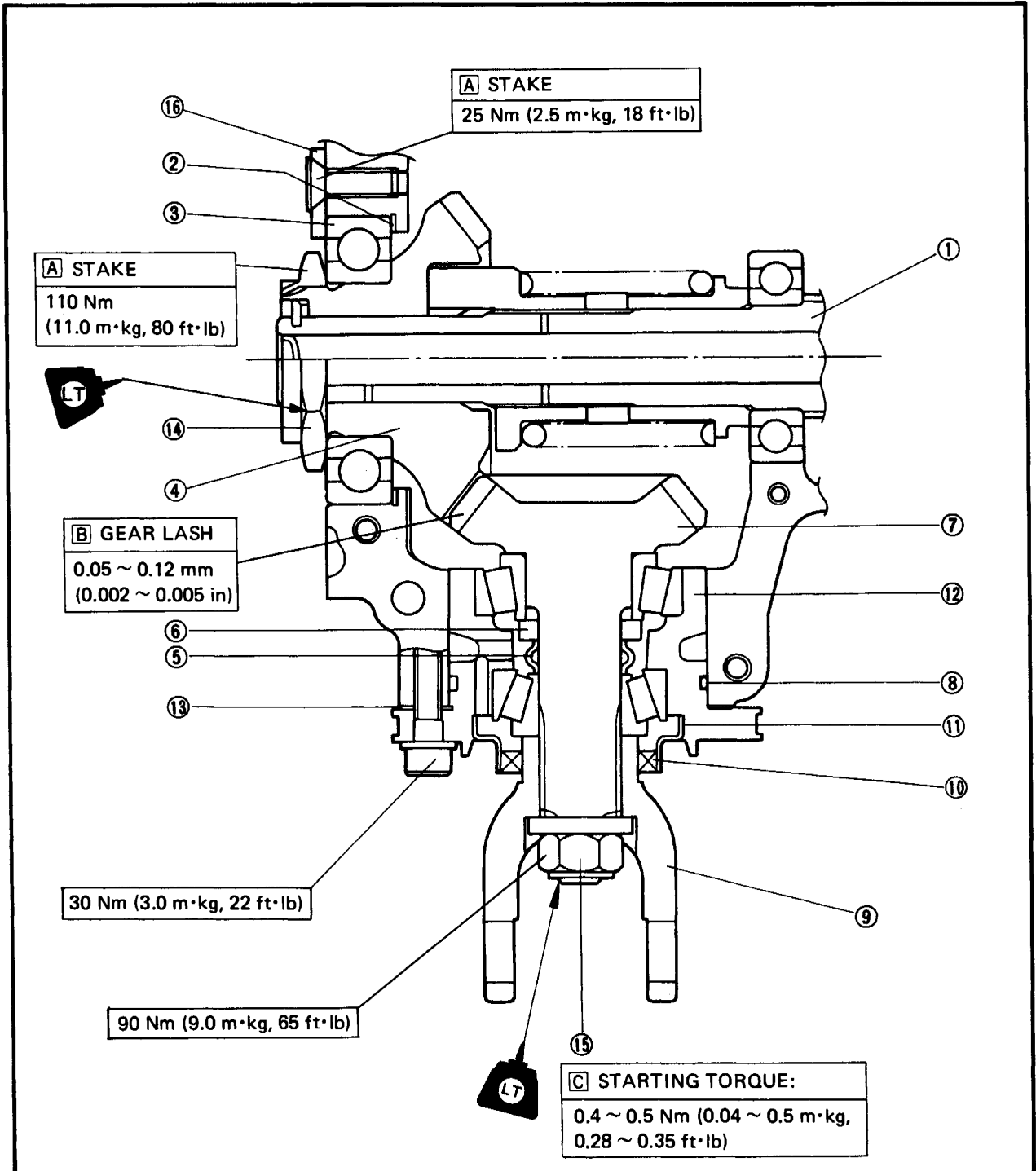
- Circlips
- Washers
Damage/Looseness/Bends → Replace.

MIDDLE GEAR SERVICE

- ① Universal joint
- ② Dust seal
- ③ Housing
- ④ O-ring
- ⑤ Bearing
- ⑥ Collapsible collar
- ⑦ Bearing
- ⑧ Middle drive shaft
- ⑨ Middle driven pinion gear
- ⑩ Spring seat
- ⑪ Damper spring
- ⑫ Damper cam
- ⑬ Middle drive pinion gear
- ⑭ Thrust washer
- ⑮ Retainer



- ① Drive axle
- ② Drive pinion gear shim
- ③ Bearing
- ④ Middle drive pinion gear
- ⑤ Collapsible collar
(Always use a new one)
- ⑥ Spacer
- ⑦ Middle driven pinion gear
- ⑧ O-ring
- ⑨ Universal joint
- ⑩ Oil seal
- ⑪ Bearing retainer
- ⑫ Bearing housing
- ⑬ Driven pinion gear shim
- ⑭ Nut (drive pinion gear)
- ⑮ Nut (driven pinion gear)
- ⑯ Bearing stopper



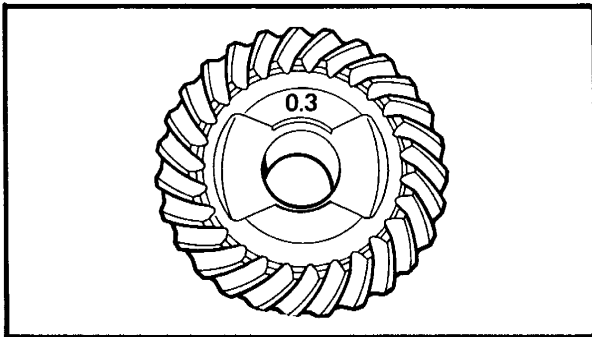
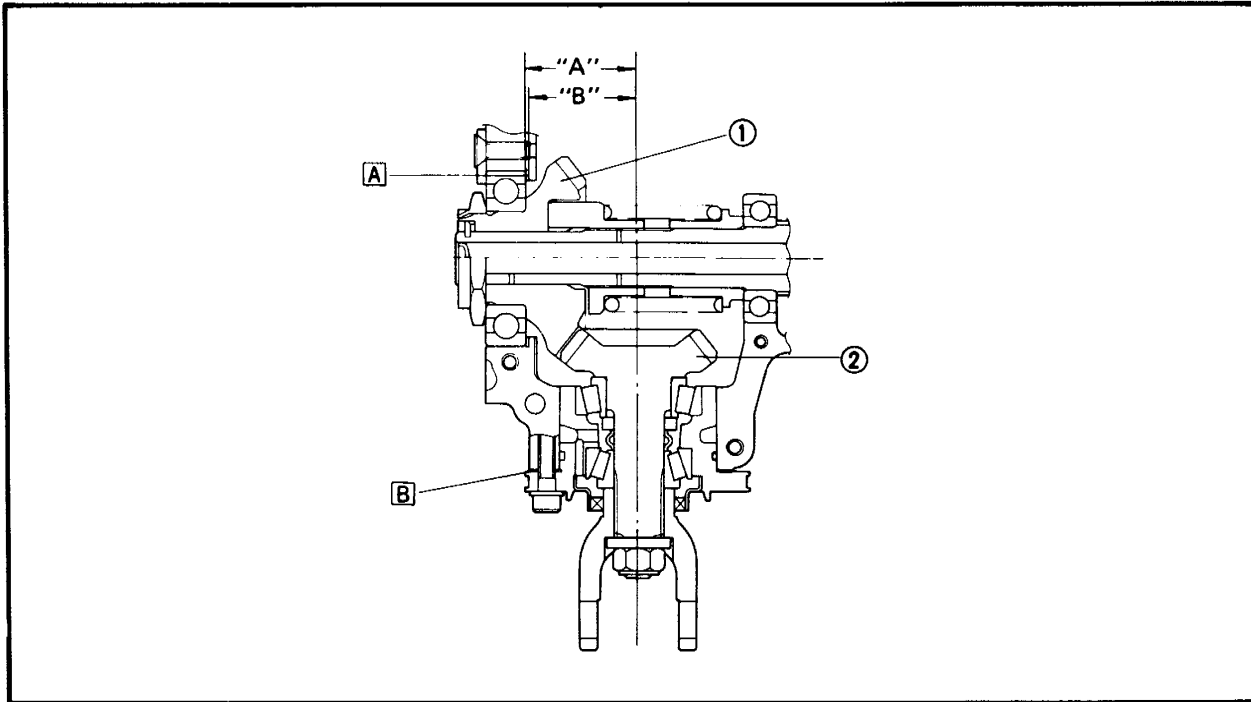


DRIVE AXLE POSITIONING

When the crankcase assembly and/or the drive axle are replaced, you must position the drive axle in place.

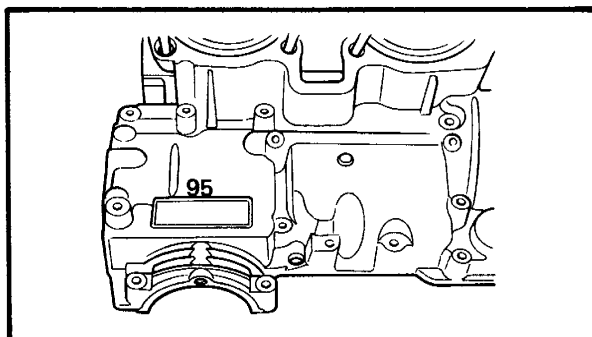
Refer to "Drive Pinion Gear Shim Selection and Middle Gear Lash Adjustment" section.

- ① Drive pinion gear
- ② Driven pinion gear
- A Drive pinion gear shim
- B Driven pinion gear shim



Drive Pinion Gear Shim Selection

- "A" = 54.5 plus or minus the number stamped on the drive pinion gear.



- "B" = 53 plus the number stamped on the left-side rear of the upper crankcase.



Example: Selection of the drive pinion gear shim;

**Shim Thickness =
Distance "A" – Distance "B"**

- If the drive pinion gear is stamped "03" (plus (+ 03) is implied here since only the minus (-) designations are stamped alongside the numbers), then:

$$\text{"A"} = 54.5 + 0.03$$

$$= 54.53$$

NOTE: _____
 All stamped numbers are in hundredths of a mm.

- If the left-side-rear of the upper crankcase is stamped "95", then:

$$\text{"B"} = 53 + 0.95$$

$$= 53.95$$

Therefore:

$$T = A - B$$


$$= 54.53 - 53.95$$

$$= 0.58 \text{ mm}$$

- The calculated shim thickness is 0.58 mm. Because shim can only be selected in 0.05 mm increments, use the following chart to round off the hundredths digit of the calculated thickness and select the appropriate shim.

Hundredths Digit	Rounded Value
0, 1, 2	0
3, 4, 5, 6	5
7, 8, 9	10

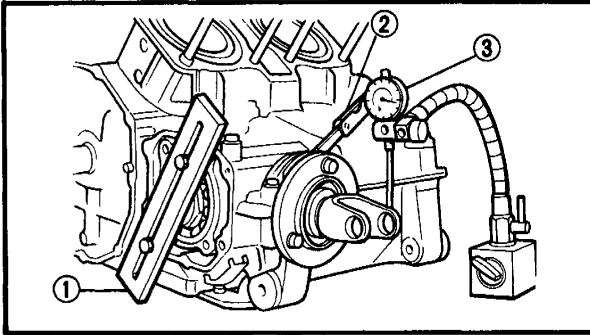
- Using the above example, the calculated shim thickness of 0.58 mm is rounded off to 0.60 mm. Therefore, you may choose either 4 – 0.15 mm shims, 2 – 0.30 mm shims, or 1 – 0.30 mm and 2 – 0.15 mm shims as selected from the shim thickness chart below. Shim size are supplied in the following thicknesses:

 Drive Pinion Gear Shim		
Thickness (mm)	0.15	0.30
	0.40	0.50



Middle Gear Lash Adjustment

1. Attach:
 - Middle Drive Gear Holder ① (YM-33222)
This tool will prevent the drive axle from turning.
2. Install:
 - Bolts (Three)
On driven bearing housing.
Finger-tighten the bolts.



NOTE:

Clearance between the crankcase and driven bearing housing should be about 2 mm (0.08 in). Measure gap with Feeler Gauge ②.

3. Position:
 - Dial Gauge ③ (YU-03097)
On the outside edge of U-joint.

NOTE:

Be sure the gauge is positioned over the center-line of the yoke bearing hole.

4. Rotate:
 - U-joint
Move it gently back and forth.
5. Measure:
 - Gear lash
Over specification → Follow next steps.
Under or same specification → Incorrect; check for faulty parts and/or reassemble bearing housing.



Middle Gear Lash:
0.05 ~ 0.12 mm (0.002 ~ 0.005 in)

CAUTION:

Do not hammer the U-joint or the collapsible collar of the driven pinion gear may be distorted. This will result in a change in the standard starting torque, requiring replacement of the collapsible collar and reassembly of the driven gear assembly.

NOTE:

Check the gear lash at four positions. Rotate the U-joint 90 degrees each time and repeat the gear lash check.



6. Tighten:

- Bolt (Three)

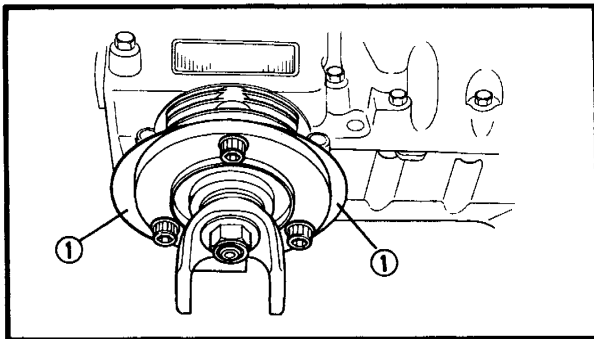
Tighten carefully one-thread turn only. Push in bearing housing and hold in position while tightening bearing housing bolts.

CAUTION:

Do not overtighten bearing housing bolts or you may obtain too little gear lash and cause damage to gears. If over tightened, loosen the 3 bolts so that crankcase/bearing housing clearance is about 2 mm (0.08 in) and repeat all previous steps.

7. Repeat steps 4 and 5 until correct gear lash is achieved.

Middle Gear Lash:
0.05 ~ 0.12 mm (0.002 ~ 0.005 in)



8. Measure:

- Crankcase/bearing housing clearance
Use a Feeler Gauge.

9. Select:

- Shim(s) ①
By the following steps.

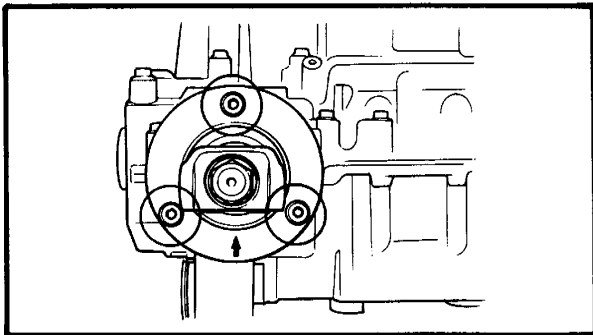
Example: Selection of the driven pinion gear shim;

- If the clearance is 0.46 mm.
- The shim can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

Hundredths	Round Value
0, 1, 2	0
3, 4, 5, 6	5
7, 8, 9	10

- In the example above, the measured shim thickness is 0.46 mm. The chart instructs you, however, to round off the 6 to 5. Thus you should use 0.15 mm and 0.30 mm shims.
- Shim sizes are supplied in the following thickness.

Thickness (mm)	Driven Pinion Gear Shim		
	0.10	0.15	0.30
	0.40	0.50	0.60



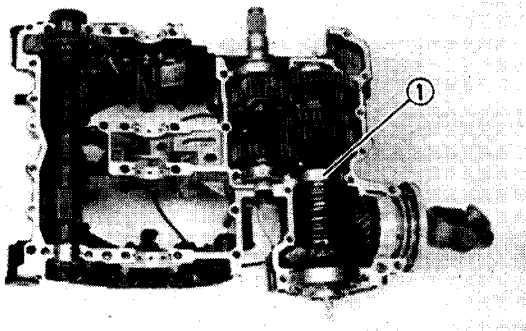
10. Tighten:
- Bolts (Bearing housing)



Bolts (Bearing Housing):
30 Nm (3.0 m·kg, 22 ft·lb)

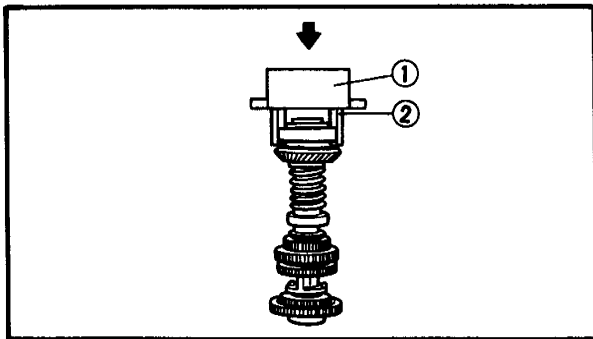
NOTE: _____
Before tightening the bolts, make sure that the arrow on the bearing housing points to the upper crankcase.

11. Measure:
- Gear lash



REMOVAL

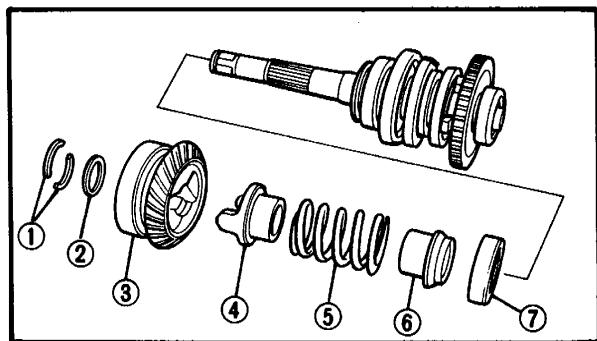
1. Remove:
- Drive axle assembly ①



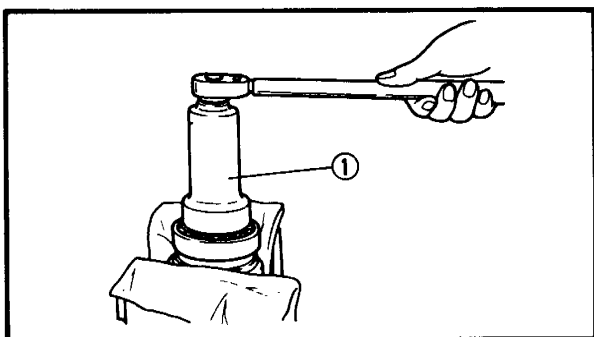
2. Attach:
- Damper Spring Plate (YM-33286) ①
 - Middle Drive Gear Holder (YM-33222) ②
- Onto drive pinion.

3. Position:
- Drive axle shaft assembly
- Onto a Hydraulic Press.

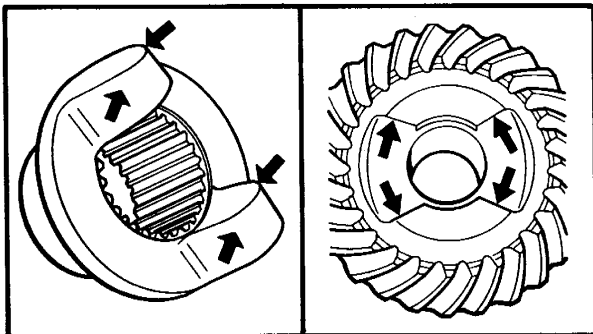
4. Compress the damper spring on the drive axle shaft assembly.



5. Remove:
- Retainers ①
 - Washer ②
 - Drive pinion gear ③
 - Damper cam ④
 - Damper spring ⑤
 - Spring seat ⑥
 - Bearing ⑦

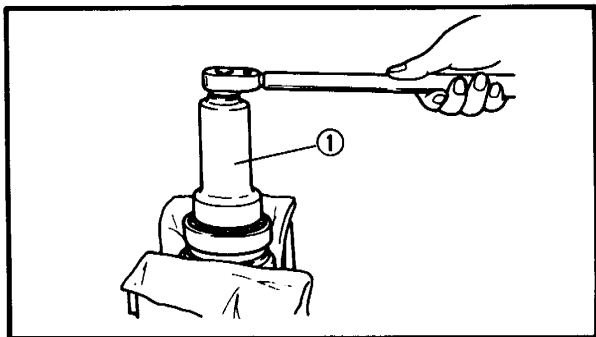


6. Remove:
- Nut (Drive gear)
Use the Offset Wrench ① (YM-04054).
 - Bearing
 - Shim(s)



INSPECTION

1. Inspect:
 - Damper cam surfaces
Wear/Scratches → Replace damper and drive pinion gear as a set.
2. Inspect:
 - Damper spring
Damage/Cracks → Replace.



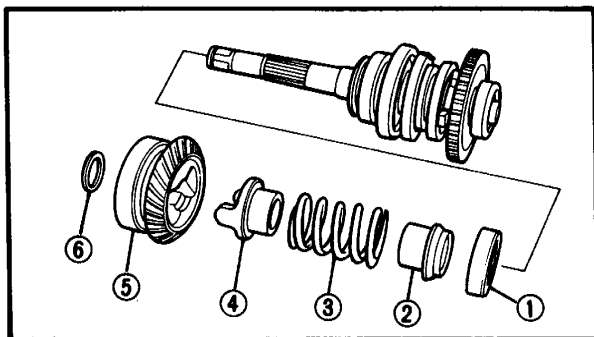
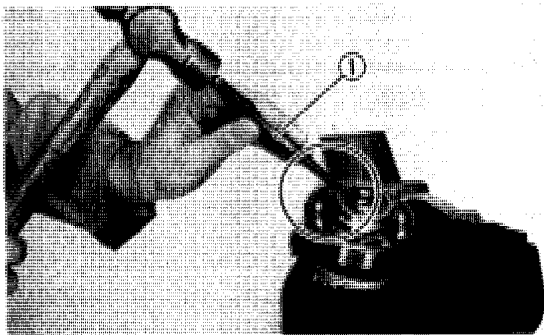
ASSEMBLY

1. Install:
 - Shim(s)
 - Bearing
 - Nut (Drive gear)
Use the Offset Wrench ① (YM-04054).

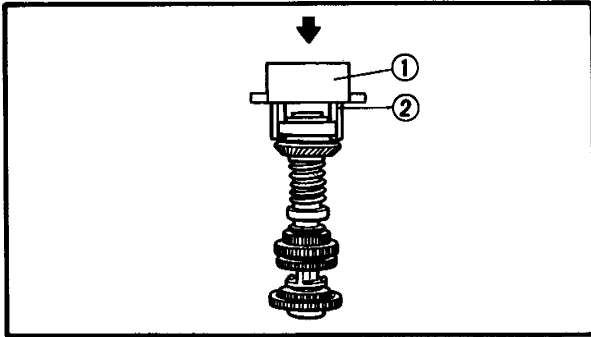


Nut (Drive Gear):
110 Nm (11.0 m·kg, 80 ft·lb)
LOCTITE®

2. Lock the threads with center punch ① as shown.



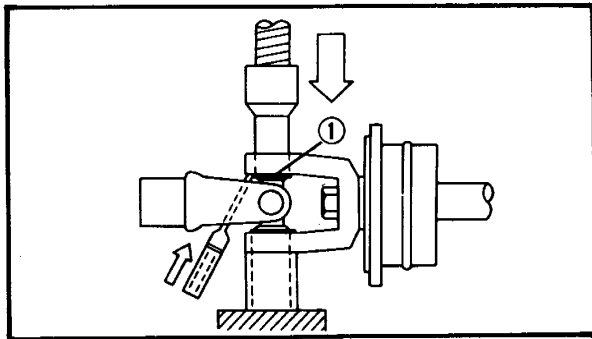
3. Install:
 - Bearing ①
 - Spring seat ②
 - Damper spring ③
 - Damper cam ④
 - Drive gear assembly ⑤
 - Washer ⑥



4. Attach:
 - Damper Spring Plate (YM-33286) ①
 - Middle Drive Gear Holder (YM-33222) ②
5. Position:
 - Drive axle shaft assembly
Onto a Hydraulic Press.
6. Compress the damper spring on the drive axle assembly.
7. Install:
 - Retainers
Into drive axle shaft groove.
 - Drive axle shaft assembly
Onto the crankcase.

MIDDLE DRIVEN GEAR BEARINGS

The following procedures should be performed only if the middle driven gear or middle drive shaft bearing(s) must be replaced.



Universal Joint Removal

1. Remove:
 - Universal joint
By the following.

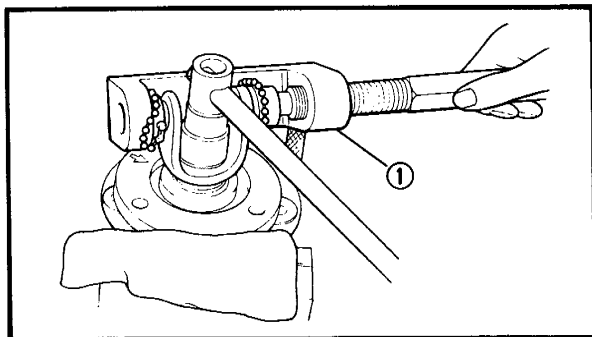
Universal joint removal steps:

- Remove the circlips ①.
- Place the U-joint in a press.
- With a suitable diameter pipe beneath the yoke, press the bearing into the pipe as shown.

NOTE: _____
It may be necessary to lightly tap the yoke with a punch.

- Repeat the steps for the opposite bearing.
- Remove the yoke.

NOTE: _____
It may be necessary to lightly tap the yoke with a punch.



2. Attach:
 - Universal Joint Holder ① (YM-04062)
Onto the universal joint yoke.



3. Remove:

- Nut (Driven pinion gear)
- Washer
- Yoke
- Bearing
- Bearing housing
- Collapsible collar
- Spacer

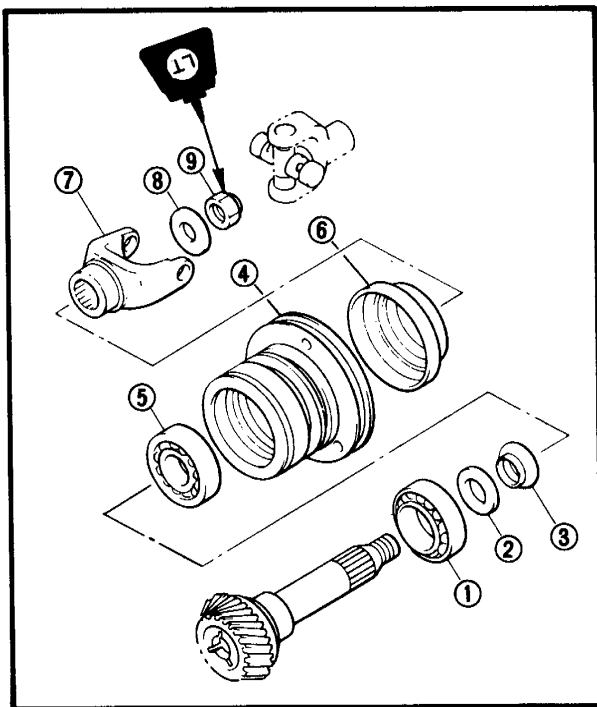
Inspection

1. Inspect:

- Gear teeth
Pitting/Galling/Wear → Replace middle gear as a set.
- Bearings
Pitting/Damage → Replace.

2. Check:

- U-joint movement
Roughness → Replace U-joint.



Assembly

1. Install:

- Bearing outer race
Into the bearing housing.

CAUTION:

Do not press the bearing outer race. Always press the inner race with care when installing.

2. Install:

- Inner bearing ①
- Spacer ②
- Collapsible collar ③ (New)
- Bearing housing ④
- Outer bearing ⑤
- Dust seal ⑥
- Yoke ⑦
- Washer ⑧
- Nut (Driven pinion gear) ⑨

3. Attach:

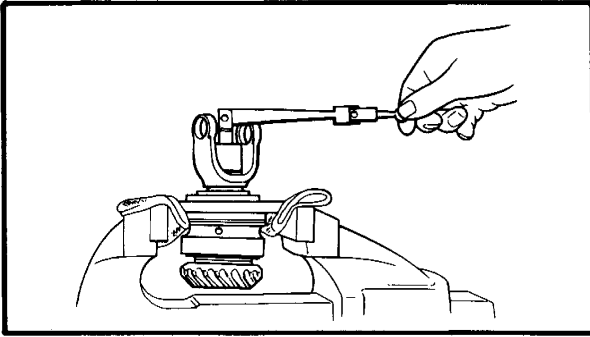
- Universal Joint Holder (YM-04062)
Onto the universal joint yoke.

4. Tighten:

- Nut (Driven pinion gear)
Torque nut carefully, little by little.



Nut (Driven Pinion Gear):
90 Nm (9.0 m·kg, 65 ft·lb)
LOCTITE®



5. Measure:

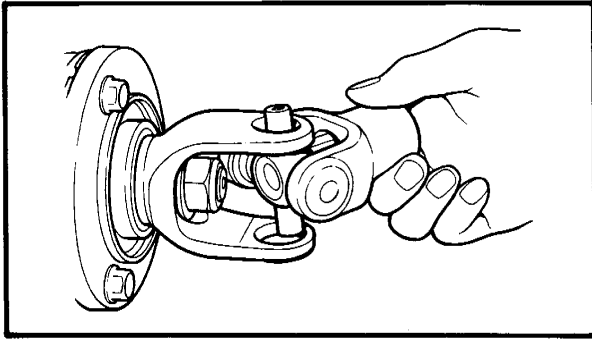
- Starting torque (Driven pinion gear)
Under specification → Repeat steps from 4.



Starting Torque (Driven Pinion Gear):
0.4 ~ 0.5 Nm (0.04 ~ 0.05 m·kg,
0.29 ~ 0.36 ft·lb)

CAUTION:

- Never exceed the standard starting torque.
- Be sure to tighten the driven pinion gear nut slowly, carefully checking measurements each time. Exceeding the standard starting torque may depress the collapsible collar, requiring reassembly.
- To reassemble, you must replace the collapsible collar and repeat the steps in 4 and 5 to obtain the standard starting torque.



6. Position:

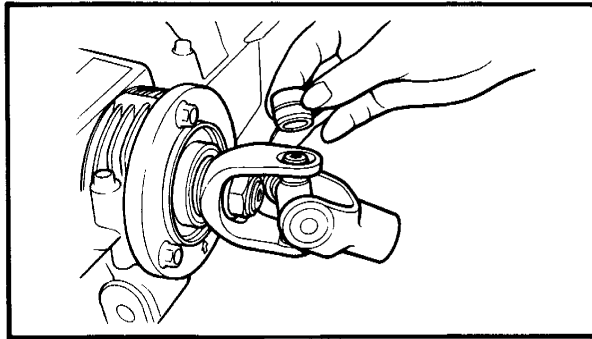
- Yoke
Into the U-joint.

7. Lubricate:

- Bearings



Wheel Bearing Grease

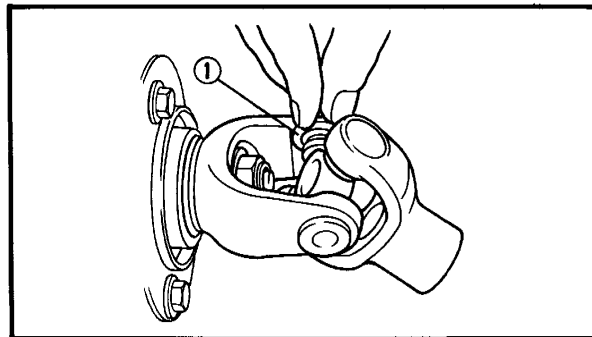


8. Install:

- Bearings
Onto the yoke.

CAUTION:

Check each bearing. The needles can easily fall out of their races. Slide the yoke back and forth on the bearings; the yoke will not go all the way onto a bearing if a needle is out of place.



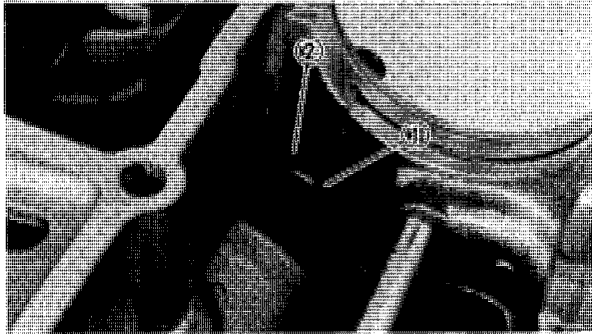
9. Press each bearing into U-joint using a suitable socket.

NOTE:

Bearing must be inserted far enough into U-joint so that circlip can be installed.

10. Install:

- Circlips ①
Into groove of each bearing.

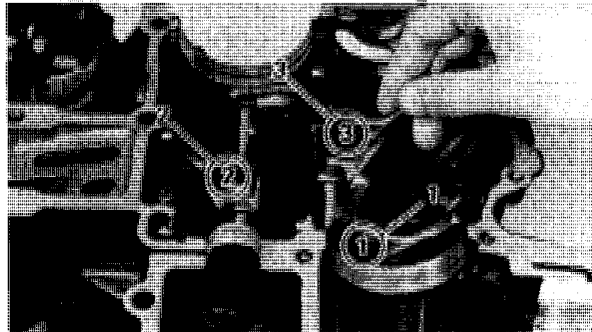


ENGINE ASSEMBLY AND ADJUSTMENT

LOWER CRANKCASE

1. Install:

- Oil pump idle gear ②
- Circlip ①



2. Install:

- Shift cam
- Shift forks (No. 1, 2, 3)
- Guide bars

NOTE:

All numbers should face the left side and be in sequence (1, 2, 3), beginning from the left.

3. Install:

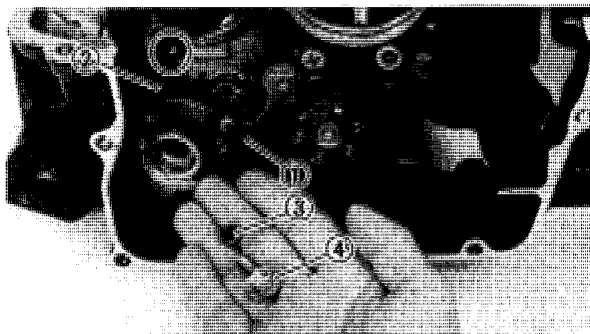
- Bearing retainer (Shift cam)

4. Tighten:

- Screws (Bearing retainer)



Screws (Bearing Retainer):
LOCTITE®
 7 Nm (0.7 m·kg, 5.1 ft·lb)



5. Rotate the shift cam to neutral position.

6. Install:

- Shift cam stopper lever ①
- Tension spring ②
- Washer ③
- Bolt (Shift cam stopper lever) ④

7. Tighten:

- Bolt (Shift cam stopper lever)



Bolt (Shift Cam Stopper Lever):
8 Nm (0.8 m·kg, 5.8 ft·lb)
LOCTITE®

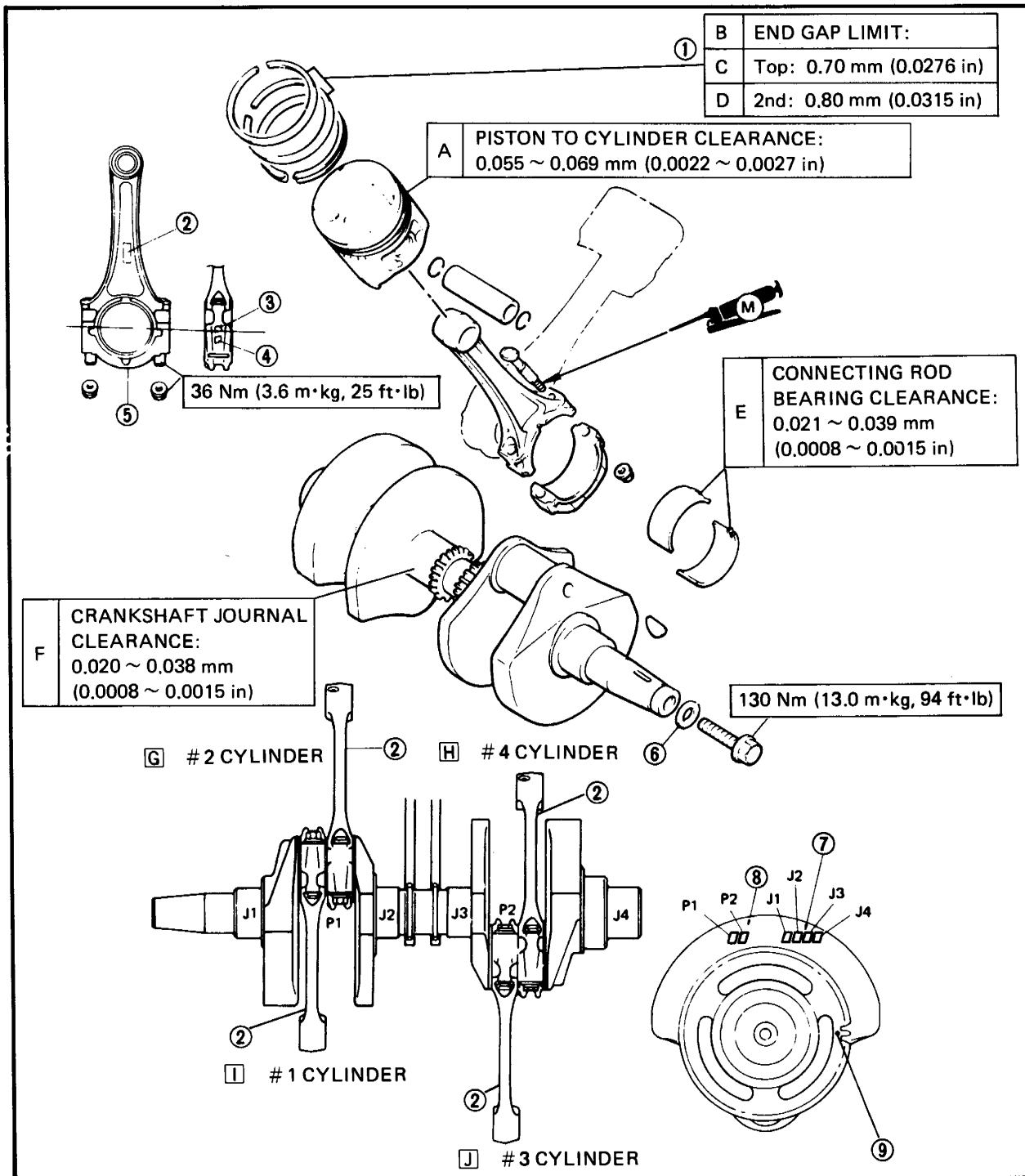
NOTE:

Check for smooth operation after tightening the stopper lever.



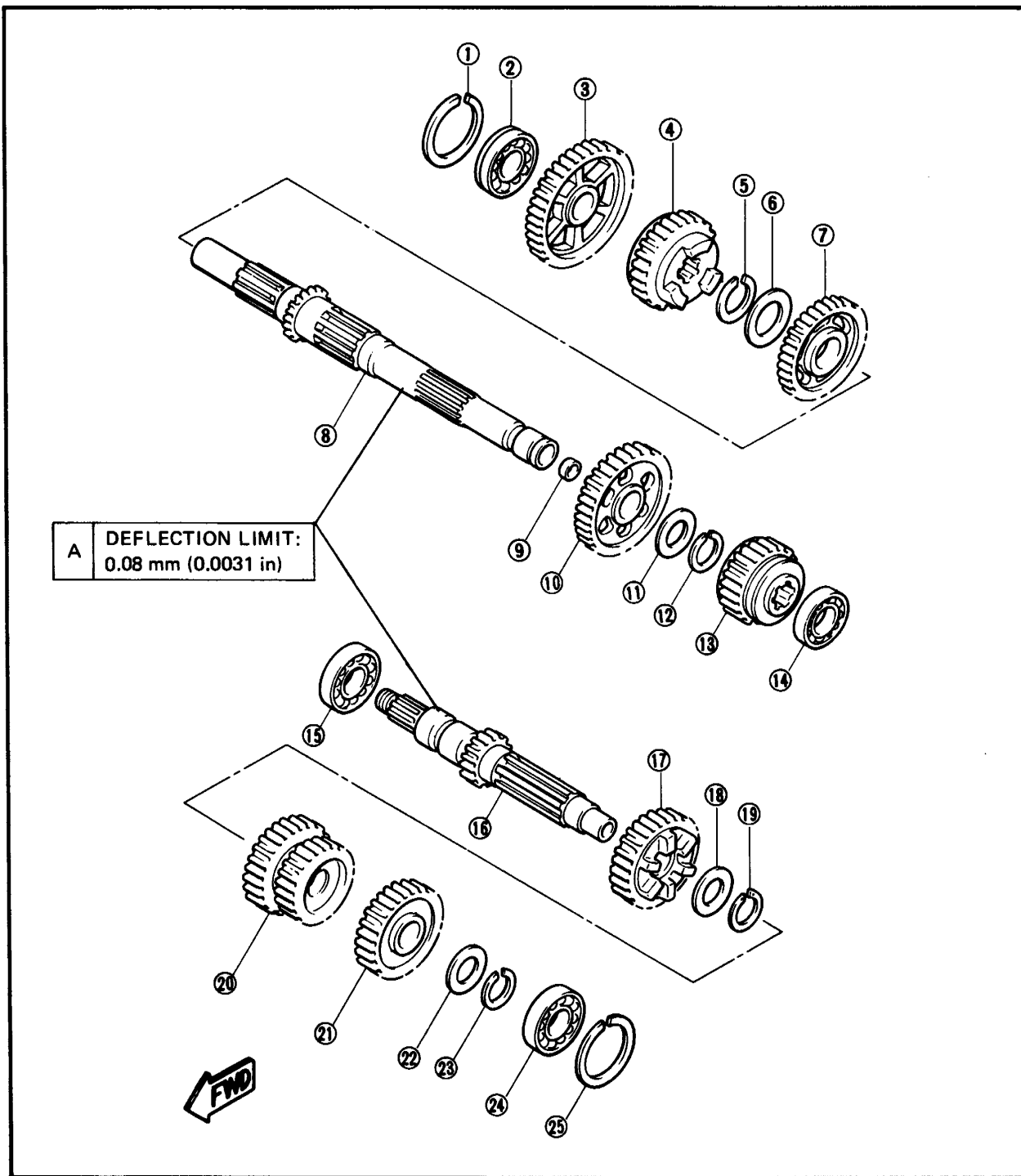
CRANKSHAFT/CONNECTING ROD/PISTON

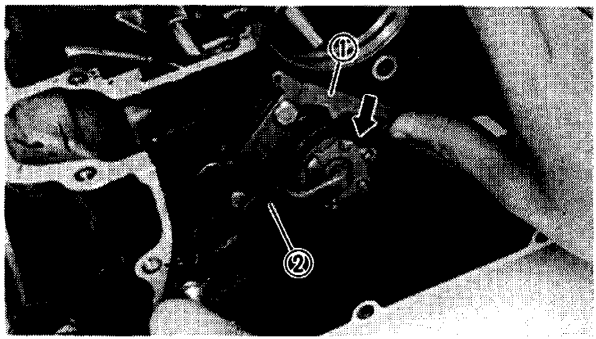
- ① Piston ring
- ② "Y" mark
- ③ Matching mark
- ④ Connecting rod bearing size
- ⑤ Projection
- ⑥ Washer
- ⑦ Journal bearing size
- ⑧ Crank pin size
- ⑨ Balancer matching mark



TRANSMISSION

- | | | |
|------------------------|-------------------------|---------------------------------|
| ① Circlip | ⑩ 2nd wheel gear (39T) | ⑲ Circlip |
| ② Bearing | ⑪ Washer | ⑳ 2nd, 3rd pinion gear (22/23T) |
| ③ 1st wheel gear (39T) | ⑫ Circlip | ㉑ 5th pinion gear (32T) |
| ④ 4th wheel gear (31T) | ⑬ 5th wheel gear (29T) | ㉒ Washer |
| ⑤ Circlip | ⑭ Bearing | ㉓ Circlip |
| ⑥ Washer | ⑮ Bearing | ㉔ Bearing |
| ⑦ 3rd wheel gear (31T) | ⑯ Main axle | ㉕ Circlip |
| ⑧ Drive axle | ⑰ 4th pinion gear (29T) | |
| ⑨ Plug | ⑱ Washer | |





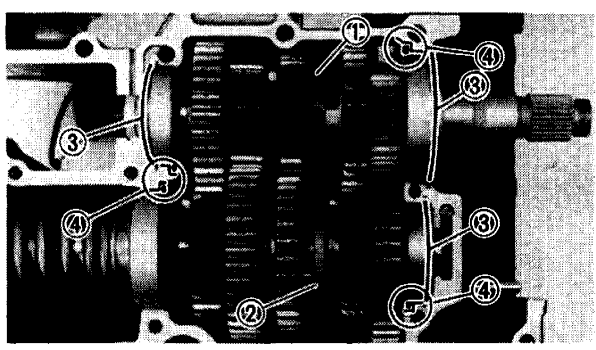
8. Install:
- Shift shaft assembly

- ① Shift lever 1
- ② Shift lever 2

TRANSMISSION

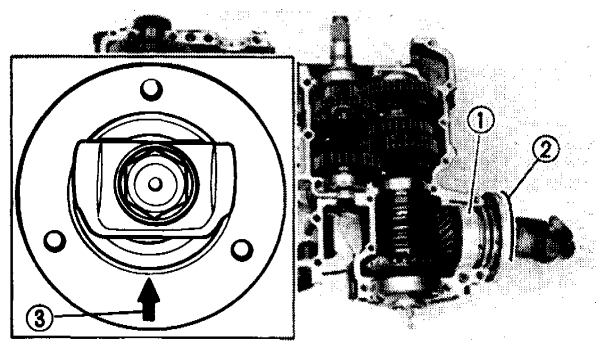
1. Install:
- Plane bearings (Crankshaft/Balancer shaft)

NOTE: _____
 Identify each plane bearing position very carefully so that it can be reinstalled in its original palce.



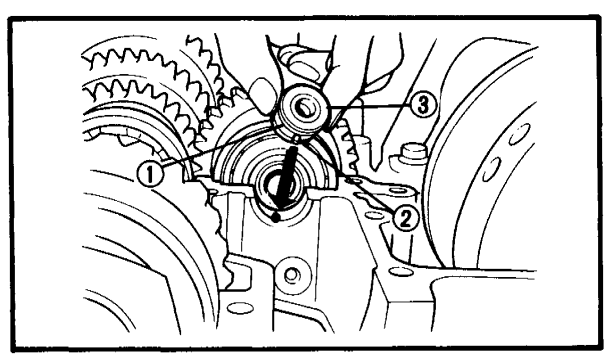
2. Install:
- Main axle assembly ①
 - Drive axle assembly ②

NOTE: _____
 • Insert the bearing circlips ③ completely into lower crankcase positioning grooves.
 • Position the bearing pin ④ as shown.



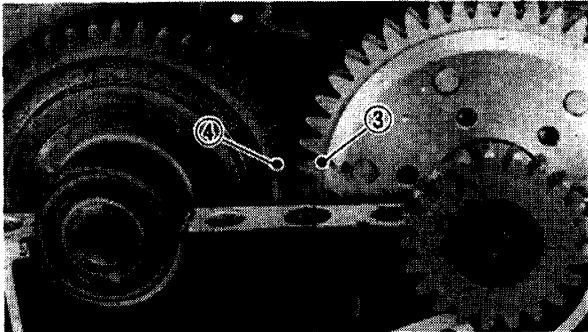
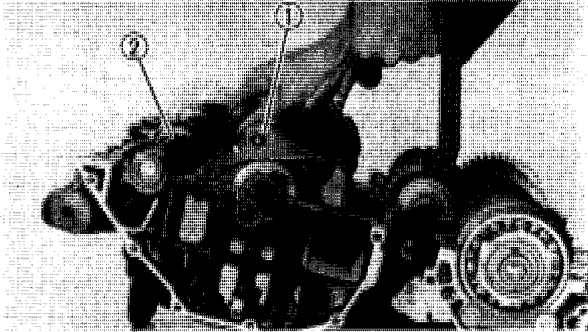
3. Install:
- Middle driven pinion gear assembly ①

NOTE: _____
 • Be careful not to damage the O-ring ② during installation.
 • The arrow mark ③ on the bearing housing points to the upper crankcase.



4. Install:
- Push rod support bearing ①

NOTE: _____
 • Insert the bearing pin ② into the crankcase hole.
 • Position the oil seal ③ snugly against the bearing.
 • Lightly apply grease to the oil seal lips.



5. Check:
- Transmission and shifter operation
Unsmooth operation → Repair.

NOTE: _____
Oil each gear and bearing thoroughly.

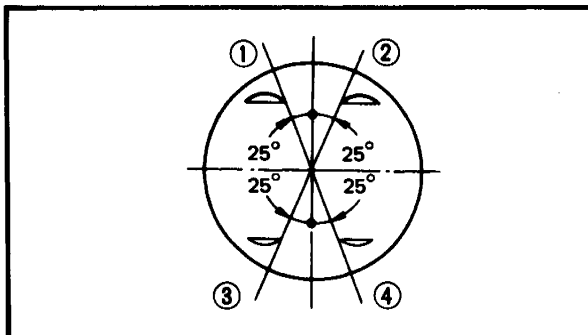
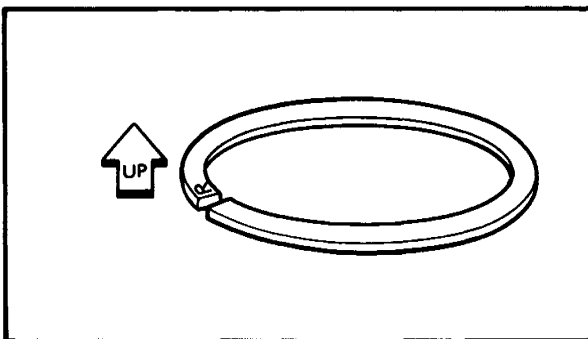
6. Install:
- Crankshaft with cam chains ①
 - Balancer shaft ②

NOTE: _____
Align the mark ③ on the balancer shaft gear with the mark ④ on the crankshaft gear.

UPPER CRANKCASE

1. Install:
- Plane bearings (Crankshaft/Balancer gear)

NOTE: _____
Identify each plane bearing position very carefully so that it can be reinstalled in its original place.



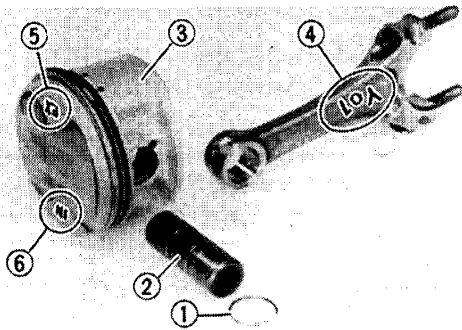
2. Install:
- Piston rings

NOTE: _____
Be sure to install rings so that Manufacturer's marks or numbers are located on the top side of the rings.

3. Oil liberally:
- Pistons
 - Rings
 - Cylinders
4. Set:
- Piston ring ends

CAUTION: _____
Make sure the ends of the oil ring expanders do not overlap.

- ① TOP ② OIL RING (LOWER RAIL)
- ③ OIL RING (UPPER RAIL) ④ 2ND

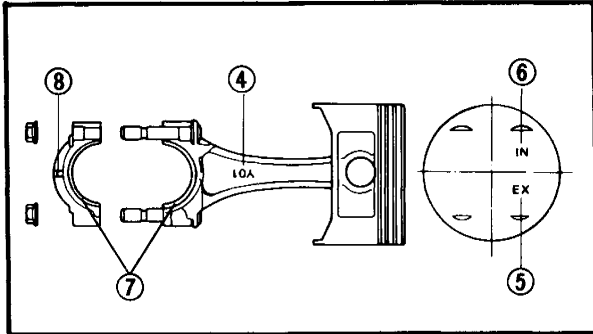


5. Install:

- Piston ③
- Piston pin ②
- Piston pin clip ①

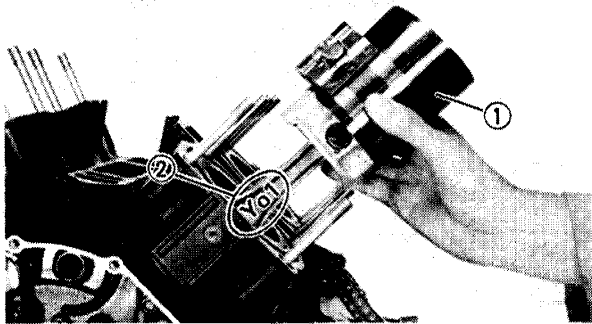
NOTE:

- Be sure the piston is positioned correctly as shown.
- Always install new piston pin clips.



- Plane bearings (Connecting rods) ⑦
- Onto the connecting rod and cap.

- ④ "Y" Mark
- ⑤ "EX" Exhaust side
- ⑥ "IN" Intake side
- ⑧ Projection



6. Install:

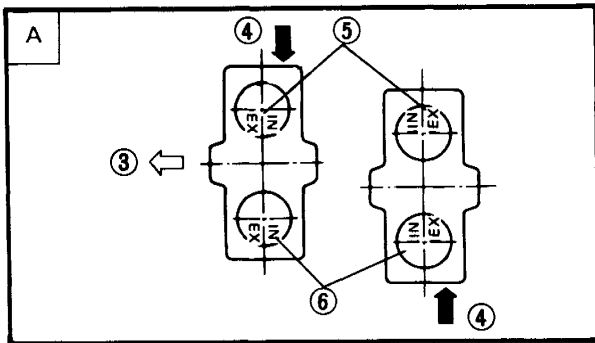
- Piston/Connecting rod assembly (#1 ~ #4)
- Into the upper crankcase.
- By the following steps.

Piston/Connecting rod assembly installation steps:

- Attach the Piston Ring Compressor ① (YM-8037) to the piston.
- Install the piston to the cylinder.

NOTE:

- The stamped "Y" mark ② on the No. 2 and No. 4 connecting rods should face towards the RIGHT side of the crankcase.
- The stamped "Y" mark ② on the No. 1 and No. 3 connecting rods should face towards the LEFT side of the crankcase.



- A Top view
- ③ Front
- ④ "Y"-mark facing direction
- ⑤ Piston exhaust mark
- ⑥ Piston intake mark



CRANKCASE ASSEMBLY

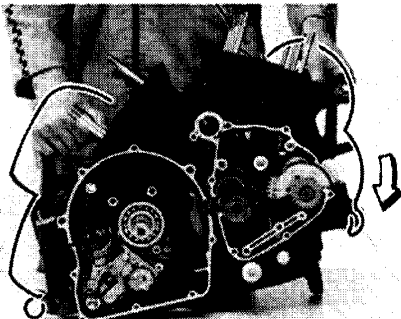
1. Apply:

- Sealant (Quick Gasket®)
(ACC-11001-05-01)

To the mating surfaces of both case halves.

NOTE:

DO NOT ALLOW any sealant to come in contact with the oil gallery O-ring, or crankshaft bearings. Do not apply sealant to within 2 ~ 3 mm (0.08 ~ 0.12 in) of the bearings.



2. Set shift cam and transmission gears in NEUTRAL position.

3. Install:

- Upper crankcase
- Dowel pins
To the lower crankcase.

NOTE:

Attach a length of wire to each cam chain and place cam chains on timing gear sprockets.

CAUTION:

Before tightening the crankcase bolts, check the following points:

- Be sure the gear shifts correctly while hand-turning the shift cam.
- Be sure the balancer shaft gear is aligned so that the dot mark lines up between the triangular timing marks on the upper crankcase when the No. 1 piston is at TDC.

- ① Balancer shaft mark
- ② Triangular timing marks

4. Finger-tighten the several crankcase bolts, preferably wide apart. Then, turn the crankcase assembly upside down.

NOTE:

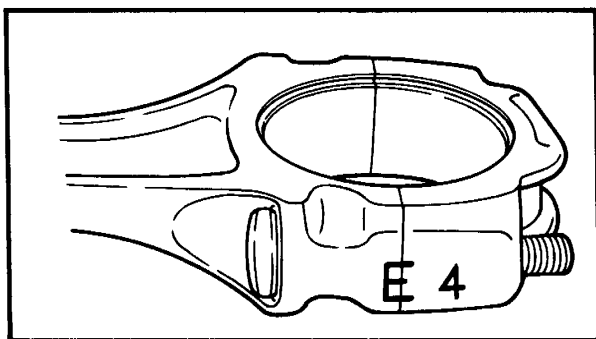
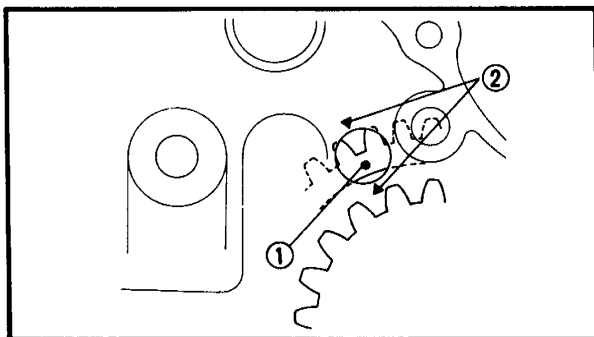
Be careful not to let pistons fall out of the cylinders.

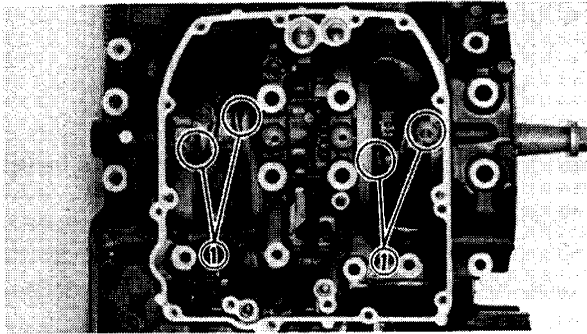
5. Install:

- Rod caps

NOTE:

Be sure the letters on both components align to form a perfect character.





6. Tighten:
- Nuts (Connecting rod cap)



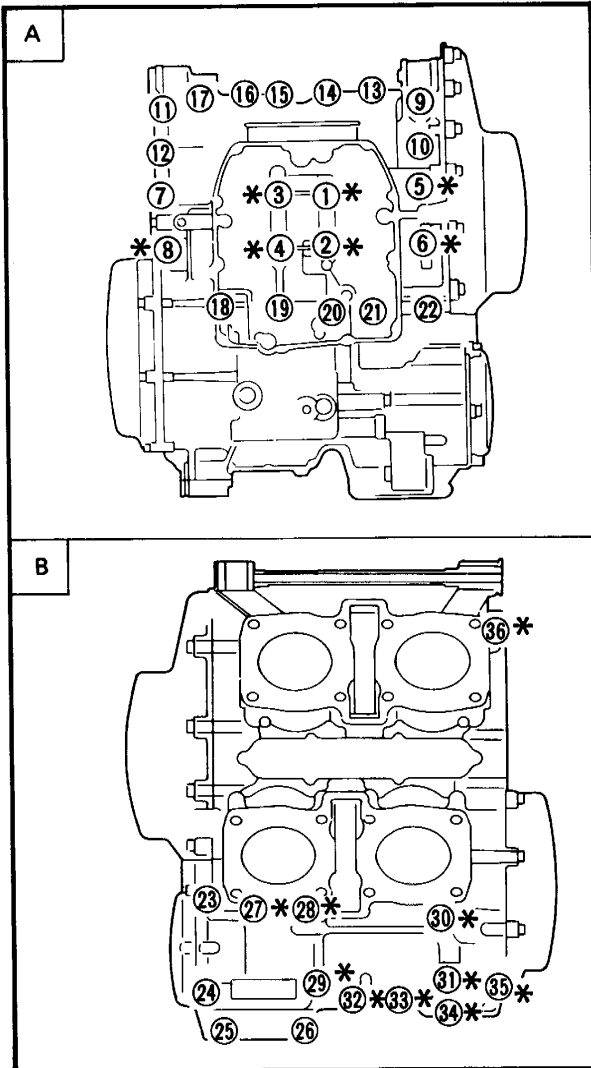
Nut (Connecting Rod):
36 Nm (3.6 m·kg, 25 ft·lb)

NOTE:

- Apply Molybdenum disulfide grease to the rod cap bolt threads and nut surfaces.
- The projection ① on the connecting rod cap should face the crankshaft web.

CAUTION:

When tightening the rod cap, apply continuous torque between 3.0 and 3.8 m·kg. Once you reach 3.0 m·kg of torque, **DO NOT STOP TIGHTENING** until final torque is reached. If tightening is interrupted between 3.0 and 3.8 m·kg, loosen the nut to less than 3.0 m·kg, and start again. Tighten to full-torque specification without pausing.



7. Tighten:
- Bolts (Crankcase)

NOTE:

Tighten the bolts starting with the lowest numbered one.

* With washer

- A** LOWER CASE
- B** UPPER CASE



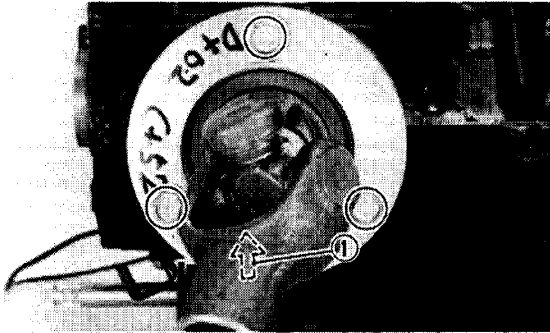
6 mm Bolt:
12 Nm (1.2 m·kg, 8.7 ft·lb)

8 mm Bolt:
24 Nm (2.4 m·kg, 17 ft·lb)

10 mm Bolt:
40 Nm (4.0 m·kg, 29 ft·lb)

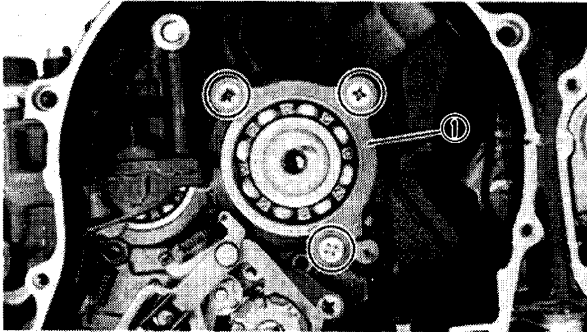
NOTE:

- Install the oil pipe bracket on Bolt Nos. 1 and 3.
- Install the lead wire bracket on Bolt No. 22.
- Install the battery ground lead on Bolt No. 36.
- Install the copper washers on Bolt Nos. 28 and 30.
- Apply engine oil to the 10 mm bolt threads.



8. Check:
 - Crankshaft operation
Unsmooth operation → Repair.
9. Install:
 - Bolts (Middle driven gear housing)

NOTE: _____
The arrow mark ① on the bearing housing points to the upper crankcase.

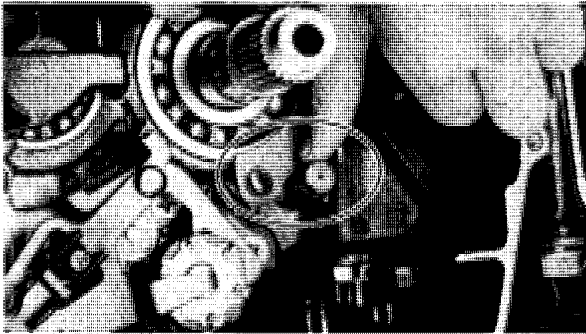


10. Install:
 - Retainer (Main axle bearing) ①

NOTE: _____
Be sure that the groove in the shaft mesh with the slot in the retainer.



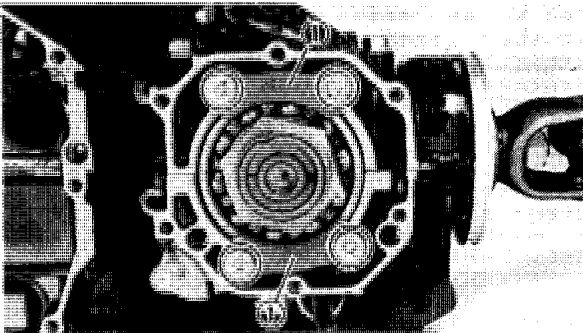
Retainer (Main Axle Bearing):
7 Nm (0.7 m·kg, 5.1 ft·lb)
LOCTITE®



11. Install:
 - Retainers (Middle gear bearing) ①
Use the #40 Torx Drive (YU-29843-7).
Stake screw head with center punch to lock.

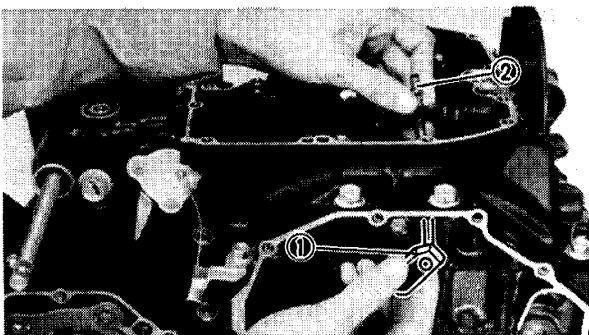


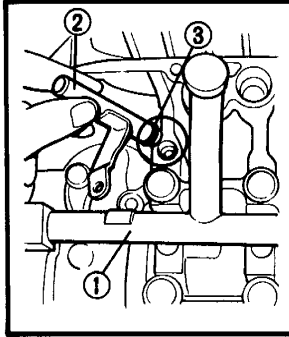
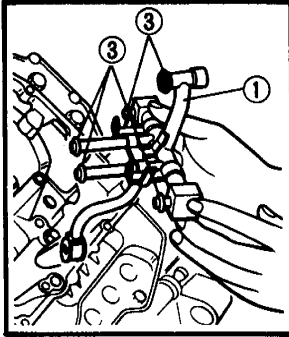
Retainers (Middle Gear Bearing):
25 Nm (2.5 m·kg, 18 ft·lb)



OIL PUMP AND OIL PAN

1. Install:
 - Damper (Oil pump pipe) ①
 - Oil pump pipe ②





2. Install:

- Main oil gallery pipe ①
- Oil pipe ②

NOTE:

Make sure the correct O-rings ③ are installed on gallery pipe.

3. Tighten:

- Bolts (Main oil gallery pipe) ① , ②



6 mm Flange Bolt ① :
 12 Nm (1.2 m·kg, 8.7 ft·lb)
8 mm Union Bolt ② :
 18 Nm (1.8 m·kg, 14 ft·lb)

4. Bend the bracket tabs ③ .

5. Install:

- Dowel pins
- Oil pump assembly

NOTE:

- Make sure the correct O-ring ① is installed on oil pump pipe.
- The arrow mark ② on the oil pump should face toward the rear.



Oil Pump:
 10 Nm (1.0 m·kg, 7.2 ft·lb)

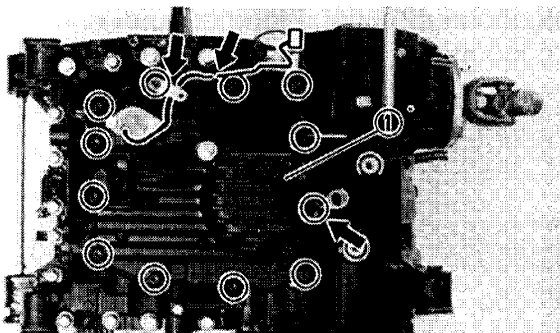
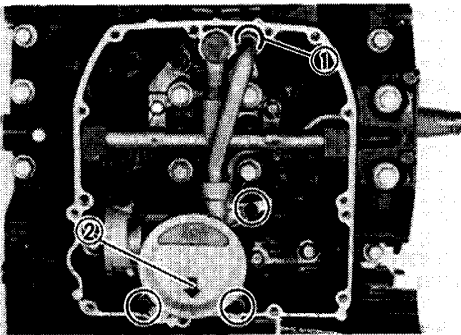
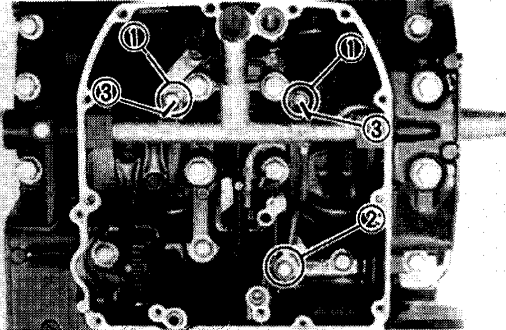
6. Install:

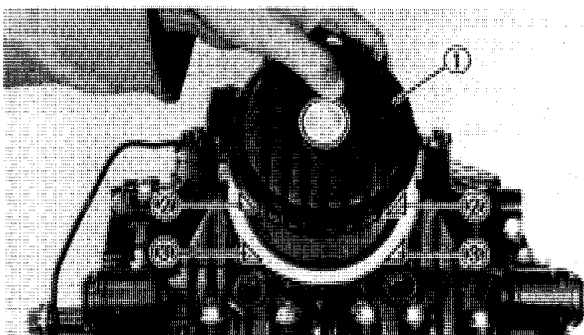
- Gasket
- Dowel pins
- Oil pan ①



Oil Pan:
 10 Nm (1.0 m·kg, 7.2 ft·lb)

7. Clamp the oil level gauge lead.





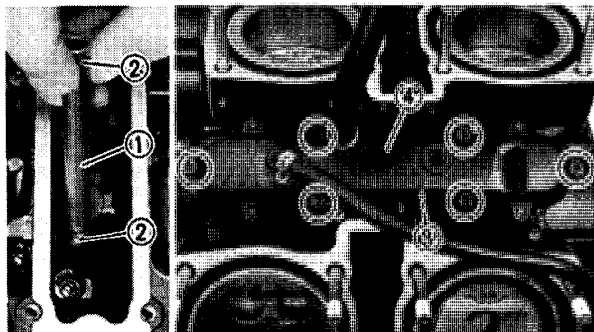
8. Install:
- Oil filter cover ①

NOTE: Be sure that the projections ② on the filter cover mesh with the slots ③ on the crankcase.



Oil Filter Cover:
32 Nm (3.2 m·kg, 23 ft·lb)

BREATHER COVER AND STARTER MOTOR



1. Install:
- Oil pipe ①
 - Breather cover spacer ③
 - Breather cover ④



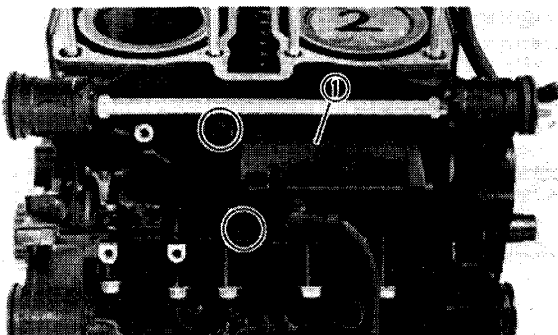
Bolt (Breather Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)

② O-ring

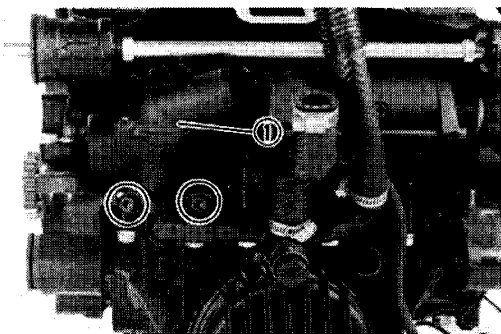
2. Install:
- Starter motor ①



Bolts (Starter Motor):
10 Nm (1.0 m·kg, 7.2 ft·lb)



WATER PUMP AND THERMOSTATIC VALVE

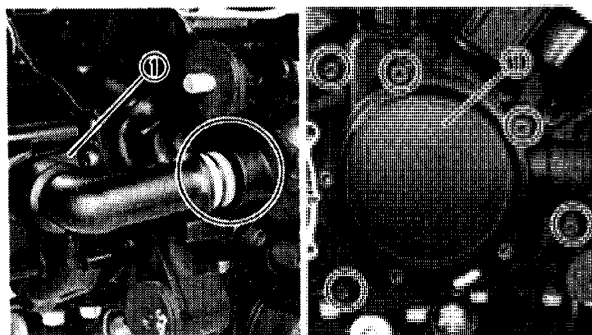


1. Install:
- Thermostat assembly ①

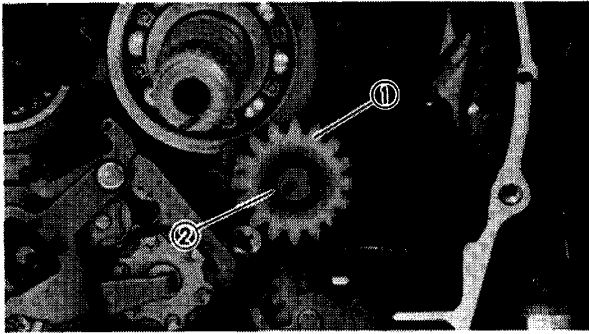


Thermostatic Valve Housing:
10 Nm (1.0 m·kg, 7.2 ft·lb)

2. Install:
- Dowel pins
 - Gasket
 - Water pump case/Water pump cover ①



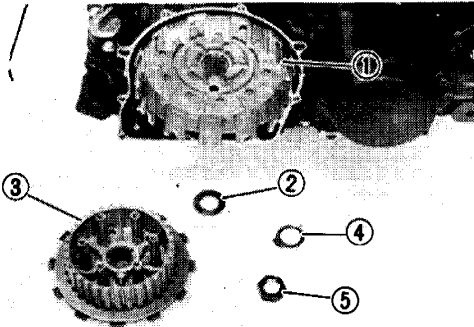
Water Pump Case and Housing:
10 Nm (1.0 m·kg, 7.2 ft·lb)



CLUTCH AND OIL PUMP DRIVE GEAR

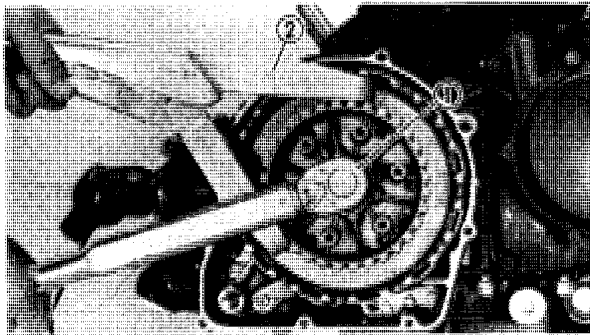
1. Install:

- Oil pump drive gear ①
- Circlip ②



2. Install:

- Clutch housing ①
- Thrust washer ②
- Clutch boss ③
- Lock washer (New) ④
- Nut (Clutch boss) ⑤

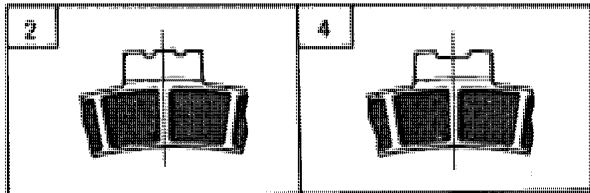


3. Tighten:

- Nut (Clutch boss) ①
- Use the Clutch Holder (YM-91042) ② to hold the clutch boss.



Nut (Clutch Boss):
70 Nm (7.0 m·kg, 50 ft·lb)



4. Bend the lock washer tabs along the nut flat.

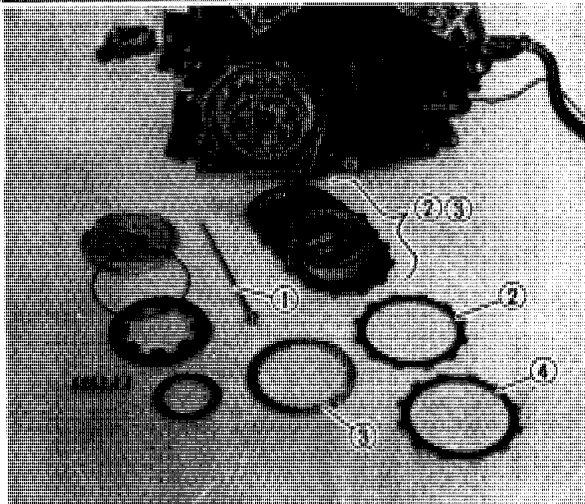
5. Install:

- Push rod ①
- Friction plates ②, ④
- Clutch plates ③

NOTE:

Install the friction plates and clutch plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.

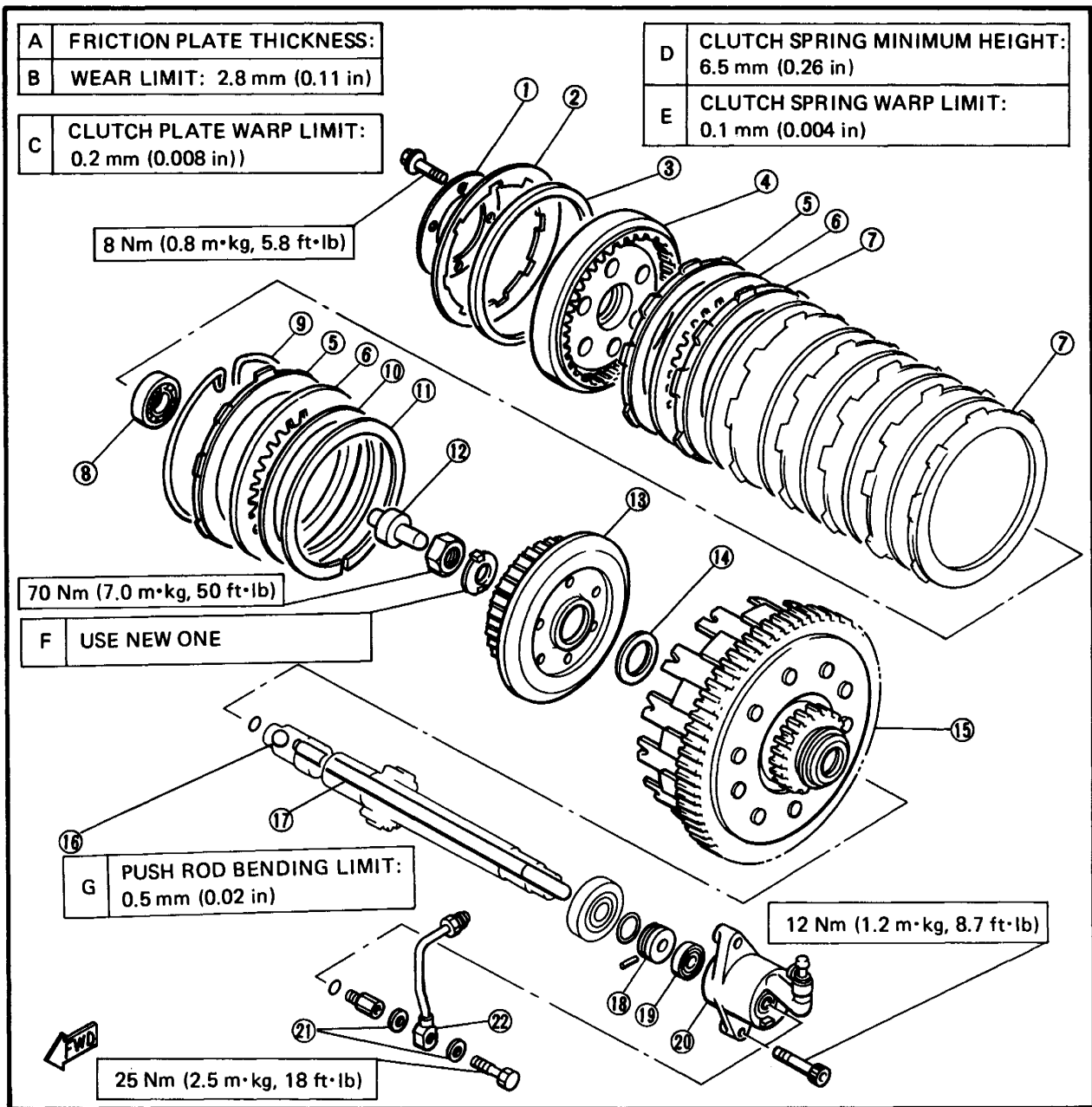
By the following installation steps.

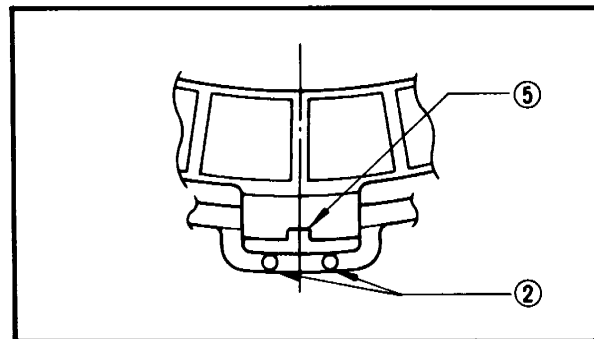
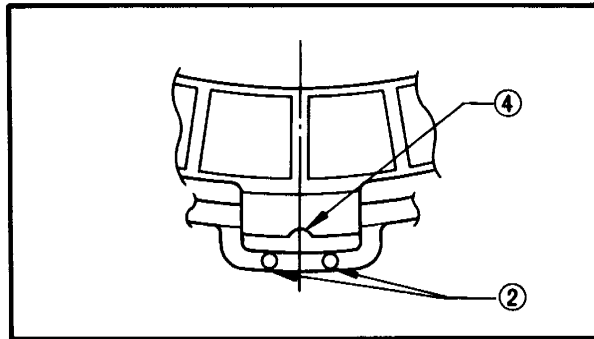
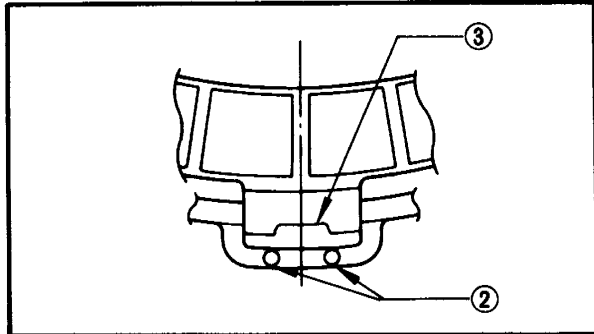
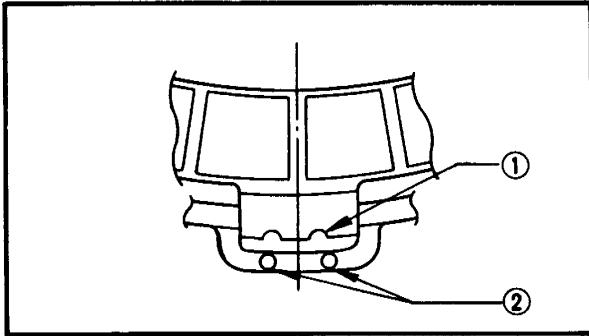




CLUTCH AND OIL PUMP DRIVE GEAR

- | | | |
|--------------------------|-----------------------------|------------------------------|
| ① Washer | ⑪ Ball | ⑳ O-ring |
| ② Clutch spring | ⑫ Push rod (No. 2) | ㉑ Dowel pin |
| ③ Spring seat | ⑬ Circlip | ㉒ Oil pump |
| ④ Pressure plate | ⑭ Spring washer | ㉓ Oil pump driven gear (32T) |
| ⑤ Friction plate (2 pcs) | ⑮ Clutch boss | |
| ⑥ Clutch plate (7 pcs) | ⑯ Thrust washer | |
| ⑦ Friction plate (6 pcs) | ⑰ Clutch housing | |
| ⑧ Bearing | ⑱ Collar | |
| ⑨ Push rod (No. 1) | ㉔ Oil pump drive gear (36T) | |
| ⑩ O-ring | ㉕ Main axle | |





Friction plates and clutch plates installation steps:

- Install the six friction plates (with the double semi-circular slots) and the six clutch plates.

NOTE:

Be sure the double semi-circular slots ① on the friction plate is aligned with the clutch housing embossed match marks ② .

- Install the clutch plate and the friction plate (with the wide square slot).

NOTE:

Be sure the wide square slot ③ on the friction plate is aligned with the clutch housing embossed match marks ② .

- If the clutch does not release due to hard meshing between the friction plates and the clutch housing, check to see if any of the friction plates fit too snugly into the clutch housing. Any tight-fitting friction plates must be repositioned as follows.

- 1) Remove the friction plates and the clutch plates.
- 2) Install the six friction plate (with the double semi-circular slots) and the six clutch plates.

NOTE:

- Invert the friction plates.

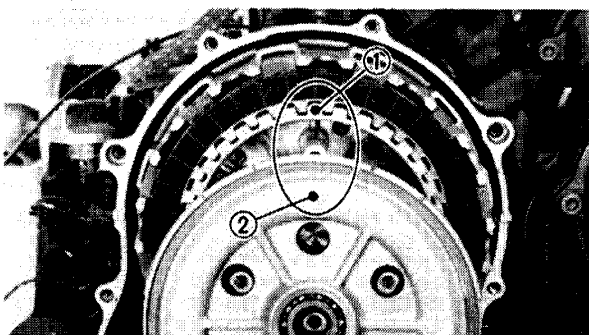
- Be sure the single semi-circular slot ④ on the friction plate is aligned with the clutch housing embossed match marks ② .

- 3) Install the clutch plate and the friction plate (with the wide square slot).

NOTE:

- Invert the friction plates.

- Be sure the narrow square slot ⑤ on the friction plate is aligned with the clutch housing embossed match marks ② .



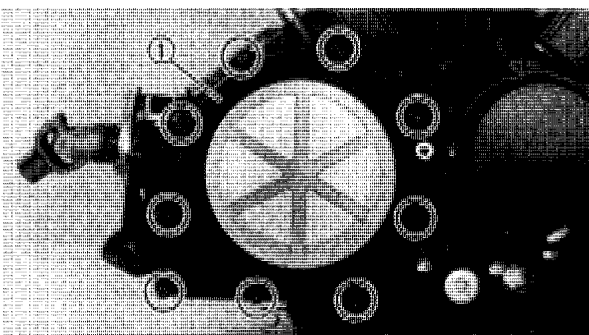
6. Install:
- Pressure plate

NOTE: _____
 Be sure the match mark ① on the clutch boss is aligned with the match mark ② on the pressure plate.

7. Install:
- Spring seat
 - Clutch spring
 - Plate washer
 - Bolts (Clutch spring)



Bolt (Clutch Spring):
 8 Nm (0.8 m·kg, 5.8 ft·lb)

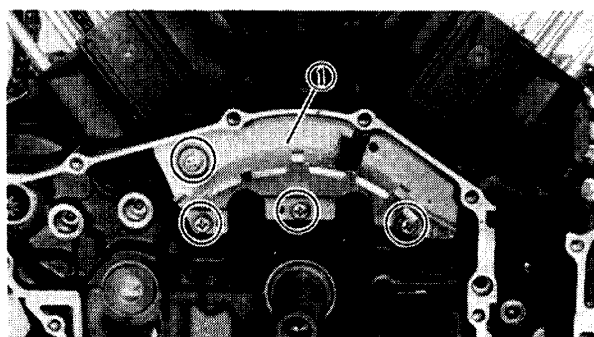


8. Install:
- Dowel pins
 - Gasket
 - Crankcase cover (Right) ①

NOTE: _____
 Tighten the bolts in a crisscross pattern.



Crankcase Cover (Right):
 10 Nm (1.0 m·kg, 7.2 ft·lb)

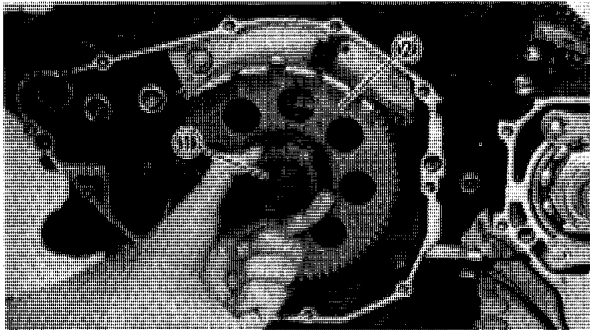


FLYWHEEL AND STARTER IDLE GEAR

1. Install:
- Oil baffle plate ①



Oil Baffle Plate:
 7 Nm (0.7 m·kg, 5.1 ft·lb)

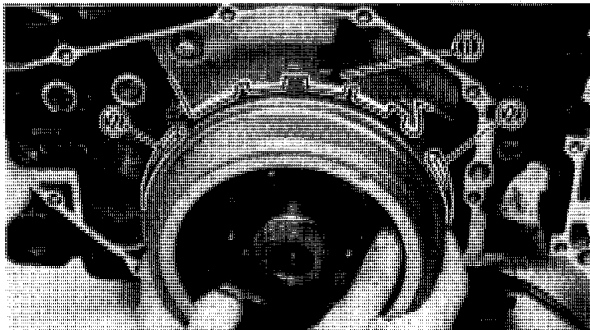


2. Install:

- Starter clutch gear ②
- Woodruff key ①

CAUTION:

Be sure to remove any oil and or grease from the tapered portion of the crankshaft and rotor with a thinner.

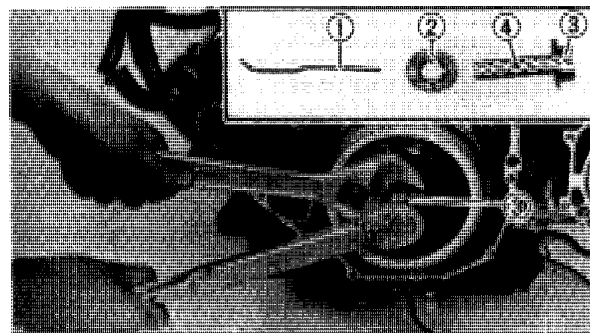


3. Install:

- Flywheel

NOTE:

When installing the flywheel, do not allow the oil baffle plate ① to touch the projections ② on the flywheel.



4. Install:

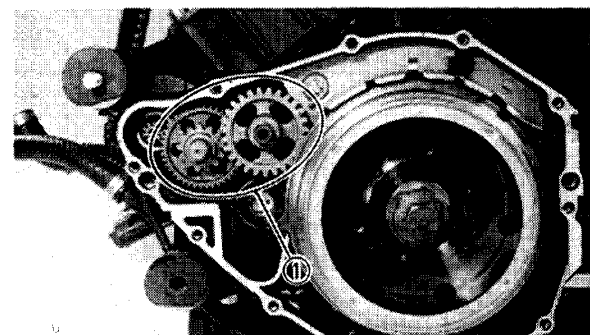
- Pin ①
- Plain washer ②
- Bolt (Flywheel) ③

NOTE:

Check for clot of oil passage ④ in the bolt. If any, clean the oil passage.

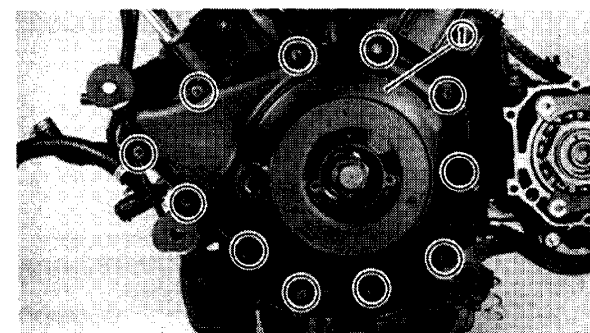


Bolt (Flywheel):
130 Nm (13.0 m·kg, 94 ft·lb)



5. Install:

- Starter idle gears ①



6. Install:

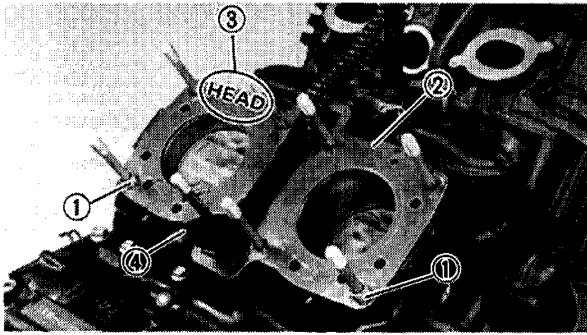
- Dowel pins
- Gasket
- Crankcase cover (Left) ①

NOTE:

Tighten the bolts in a crisscross pattern.



Crankcase Cover (Left):
10 Nm (1.0 m·kg, 7.2 ft·lb)



CYLINDER HEAD AND CAMSHAFT

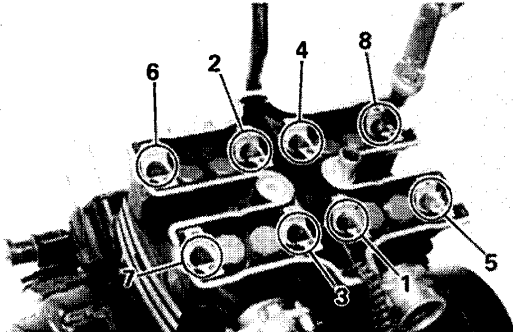
Rear Cylinder Head

1. Install:

- Dowel pins ①
- Gasket ②
- Rear cam chain guide ④

NOTE: _____

- The gasket "HEAD" mark ③ should be upward.
- The lower end of chain guide must rest in the cam chain guide slot in the crankcase.



- Cylinder head
Pass cam chain through cam chain cavity.

2. Install:

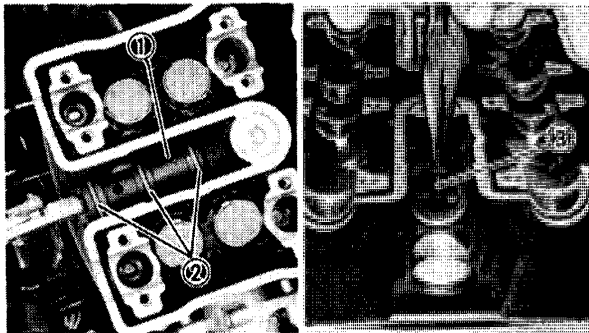
- Nuts (Cylinder head)
Use 8 mm Wrench Adapter (YM-8037).

NOTE: _____

- In sequence as shown and torque nuts in two stages.
- Never lubricate the bolt threads with engine oil.



Nuts (Cylinder Head):
43 Nm (4.3 m·kg, 31 ft·lb)



3. Install:

- Water jacket joints ①

NOTE: _____

Be sure each joint passes through its corresponding cam chain.

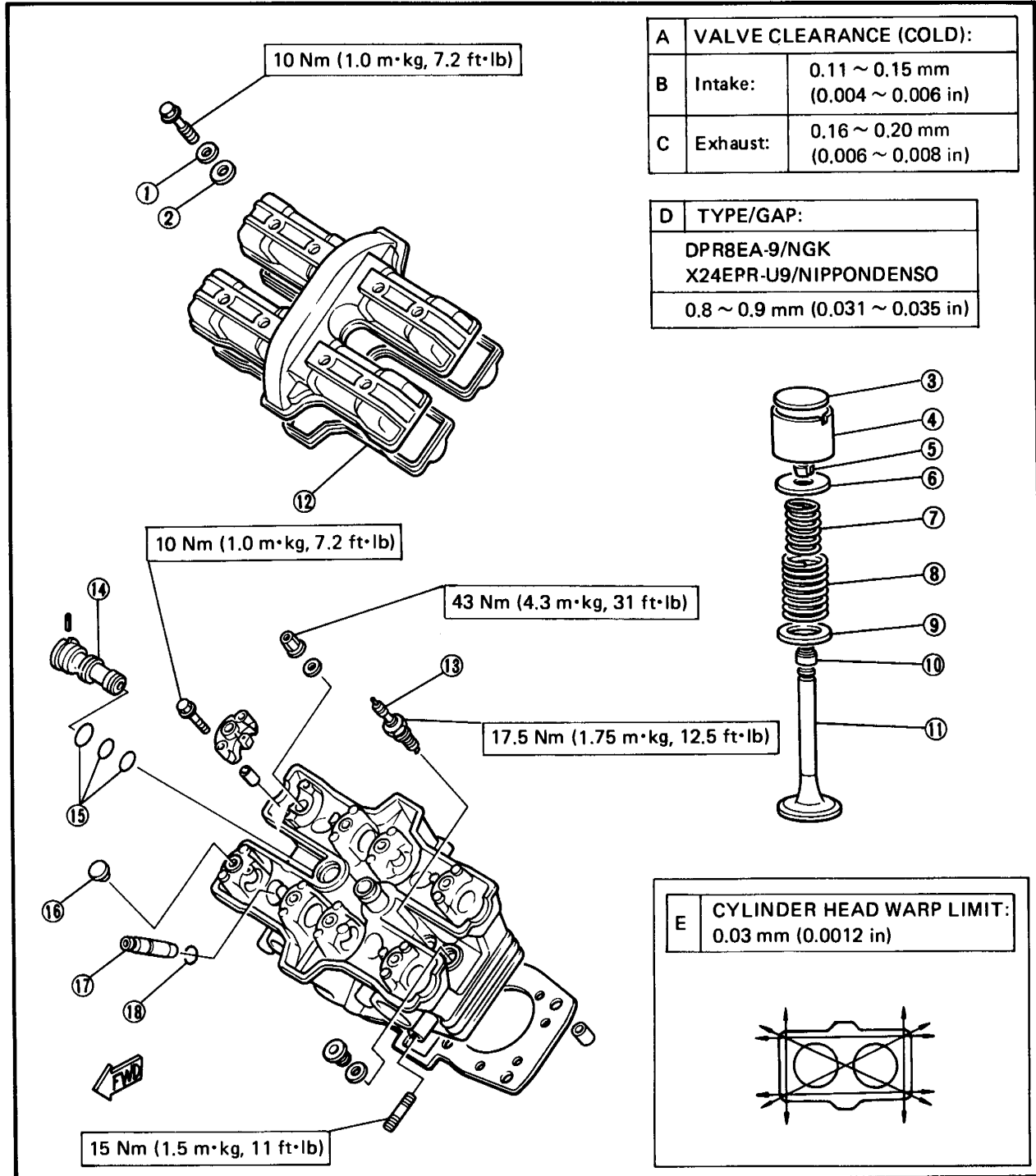
- Lock pin ③

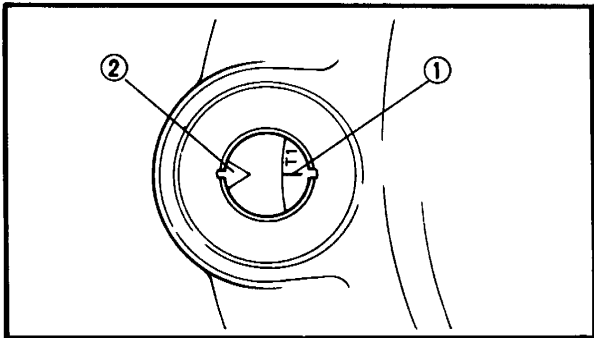
② O-ring



CYLINDER HEAD AND CAMSHAFT

- ① Washer
- ② Rubber washer
- ③ Pad
- ④ Valve lifter
- ⑤ Valve retainer
- ⑥ Spring seat
- ⑦ Inner spring
- ⑧ Outer spring
- ⑨ Spring seat
- ⑩ Oil seal
- ⑪ Valve
- ⑫ Gasket
- ⑬ Sprak plug
- ⑭ Joint
- ⑮ O-ring
- ⑯ Oil plug
- ⑰ Valve guide
- ⑱ Circlip





4. Install:

- Camshafts

By the following installation steps.

Camshaft installation steps:

- Align the "T-1" mark ① on the flywheel with the stationary pointer ② on the crankcase cover use 32 mm wrench.

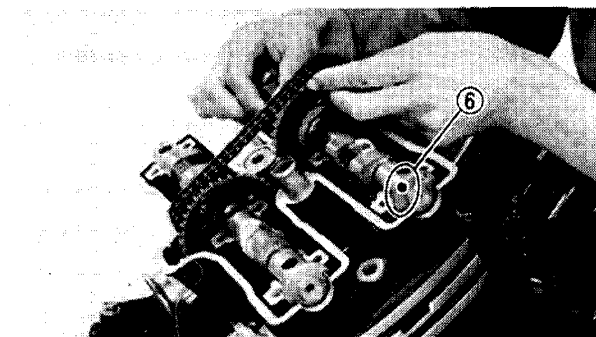
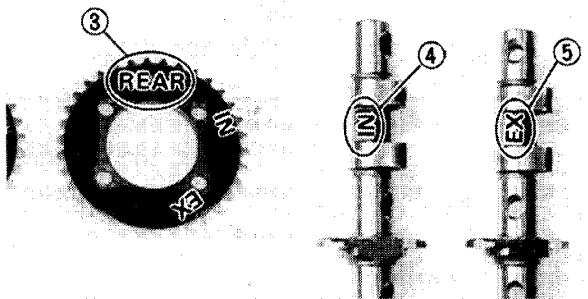
CAUTION:

- Never turn the flywheel installing bolt. Rotating the bolt may loosen it, causing the rotor to fall out.
- Do not turn the crankshaft during the camshafts installation.

- Install the cam chain sprockets onto the camshafts.

NOTE:

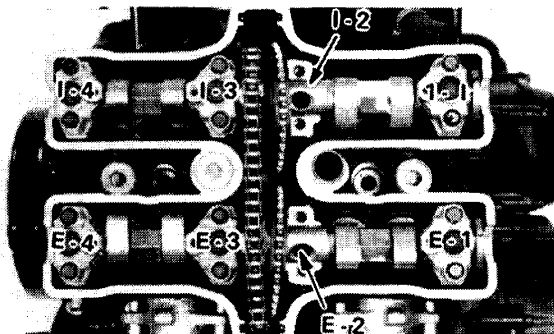
Make sure the "REAR" mark ③ on the cam chain sprockets face away from the "IN" mark ④ and "EX" mark ⑤ on the camshafts.



- Apply engine oil to the camshaft bearing surfaces.
- Install the "IN" marked camshaft onto the intake side and "EX" marked camshaft onto the exhaust side.
- Turn the camshafts by hand so that the timing marks ⑥ (○: small hole) on the camshaft face upward.
- Install the dowel pins into the cam caps.
- Install the cam caps (Nos. 3,1 and 4) onto the camshaft.

NOTE:

- Do not install No. 2 intake and No. 2 exhaust cam caps at this stage.
- The numbers are punched on the camshaft caps in increments from right to left.





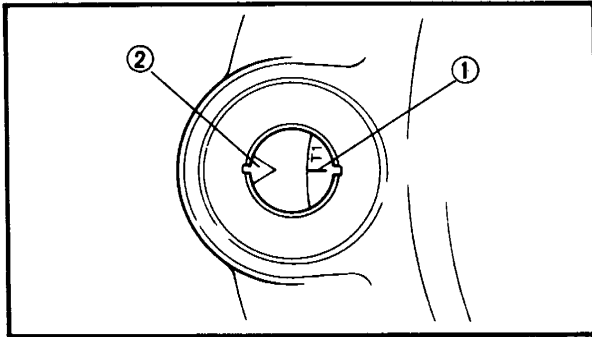
- Tighten the cap bolts.

NOTE:

First tighten the No. 3, 1 and 4 cap bolts in that order, then the No. 2 cap bolts.

**Camshaft Cap:**

10 Nm (1.0 m·kg, 7.2 ft·lb)



5. Install:

- Cam chain sprockets

By the following installation steps.

Cam chain sprockets installation steps:

- Align the "T-1" mark ① on the flywheel with the stationary pointer ② on the crankcase cover use 32 mm wrench.

CAUTION:

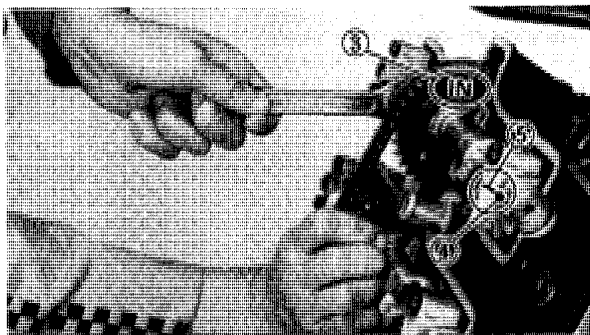
- Never turn the flywheel installing bolt. Rotating the bolt may loosen it, causing the rotor to fall out.
- Do not turn the crankshaft during the sprocket installation.

- Place the cam chain onto the intake sprocket.
- Install the sprocket with the punched mark "REAR" facing outward and finger-tighten the sprocket bolts.

NOTE:

Align the "IN" mark ③ hole on the sprocket with the thread hole on the camshaft.

- Rotate the intake camshaft to align the timing mark ④ (○: small hole) on the camshaft with the embossed match mark ⑤ on the camshaft cap (1-4).



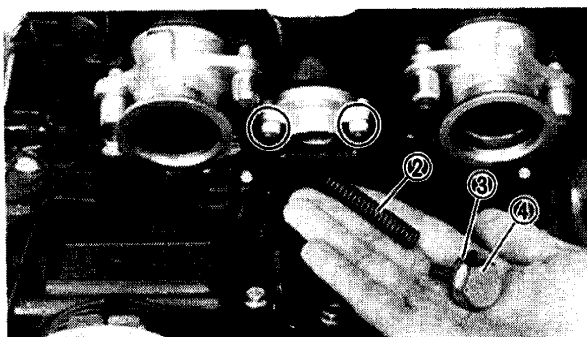
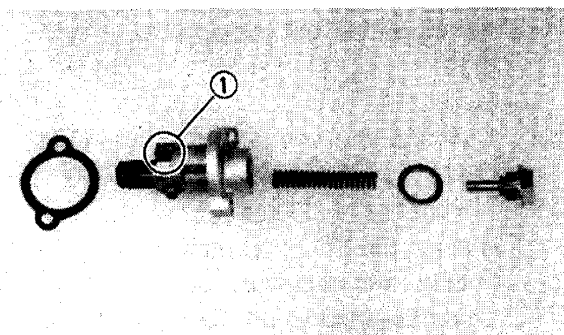


- Force the intake camshaft counterclockwise to remove the cam chain slack.
- Place the cam chain onto the exhaust sprocket.
- Install the sprocket with the punched mark "REAR" facing outward and finger-tighten the sprocket bolt.

NOTE: _____

Align the "EX" mark hole on the sprocket with the thread hole on the camshaft.

- Rotate the exhaust camshaft to align the timing mark (○: small hole) on the camshaft with the embossed match mark on the camshaft cap (E-4).
- Force the exhaust camshaft clockwise to remove all the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain guide inward.
- While pushing the cam chain guide, be sure camshaft embossed match marks align with the timing marks on the camshaft.
- If marks do not align, change the meshing position of sprocket and cam chain.



6. Install:

- Cam chain tensioner

By the following installation steps.

Cam chain tensioner installation steps:

- Remove the tensioner end cap bolt and spring.
- Release the cam chain tensioner one-way cam ①.
- Install the tensioner with a new gasket into the cylinder.



Cam Chain Tensioner Body:
12 Nm (1.2 m·kg, 8.7 ft·lb)

- Install the tensioner spring ② copper washer ③ and end cap bolt ④.



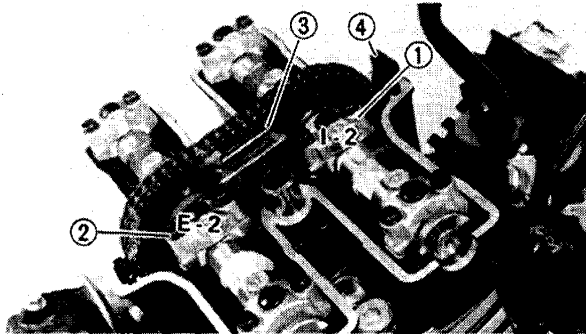
End Bolt (Cam Chain Tensioner):
20 Nm (2.0 m·kg, 14 ft·lb)

7. Turn the crankshaft and tighten the cam sprocket bolts.

	Camshaft Sprocket:
	24 Nm (2.4 m·kg, 17 ft·lb)

CAUTION:

Be sure to attain the specified torque value to avoid the possibility of these bolts coming loose and causing damage to the engine.



8. Install:

- Cam caps ("I-2" and "E-2") ① , ②

	Camshaft Cap:
	10 Nm (1.0 m·kg, 7.2 ft·lb)

- Cam chain guides ③ , ④

9. Apply:

- Engine oil

To the cam chain, sprockets, camshaft and valves.

Front Cylinder Head

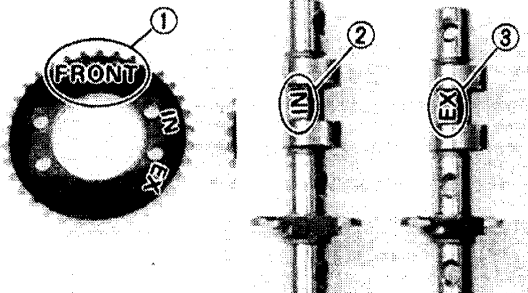
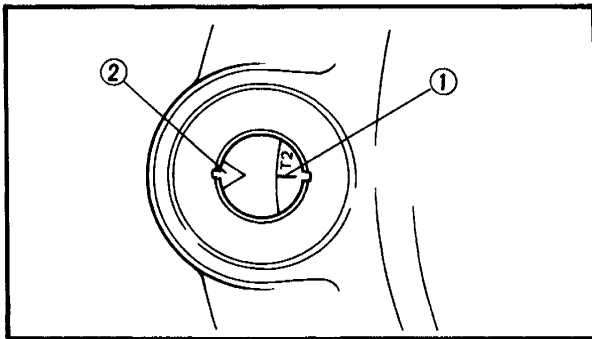
When installing the front cylinder head, repeat the rear cylinder head installation procedure. However, note the following points.

1. Install:
 - Camshafts
 - 1) Rotate the crankshaft counterclockwise 360° plus and added 70° (430° total) from the "T-1" mark.
 - 2) Align the "T-2" ① mark on the flywheel with the stationary pointer ② on the crankcase cover use 32 mm wrench.
 - 3) Install the cam chain sprockets onto the camshafts.

NOTE:

Make sure the "FRONT" mark ① on the cam chain sprockets face away from the "IN" mark ② and "EX" mark ③ on the camshaft.

4) Turn the camshafts by hand so that the timing marks (○: big hole) on the camshaft face upward.

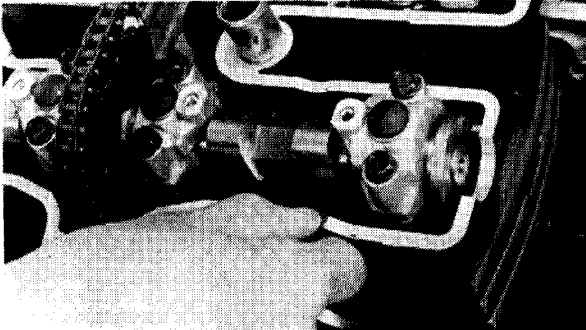




2. Install:

- Cam chain sprocket

- 1) Align the "T-2" mark on the flywheel with the stationary pointer on the crankcase cover use 32 mm wrench.
- 2) Install the sprocket with the punched mark "FRONT" facing outward and finger-tighten the sprocket bolts.
- 3) Rotate the intake and exhaust camshafts to align the timing mark (○: big hole) on the camshaft with the embossed match marks on the camshaft caps (I-4 and E-4).



3. Measure:

- Valve clearance

Out of specification → Adjust.

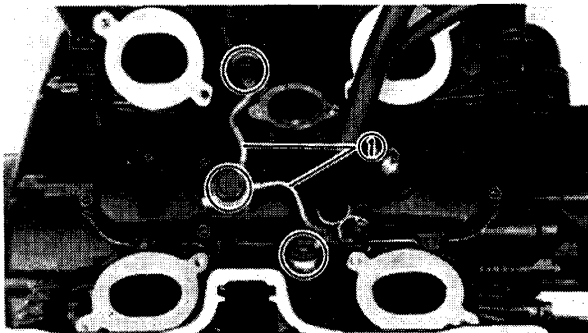
Refer to "CHAPTER 2. VALVE CLEARANCE ADJUSTMENT" section.



Valve Clearance (Cold):

Intake: 0.11 ~ 0.15 mm
(0.004 ~ 0.006 in)

Exhaust: 0.16 ~ 0.20 mm
(0.006 ~ 0.008 in)



OIL DELIVERY PIPE AND CYLINDER HEAD COVER

1. Install:

- Oil delivery pipe ①

NOTE:

Tighten the three union bolts evenly, then torque them to specification.



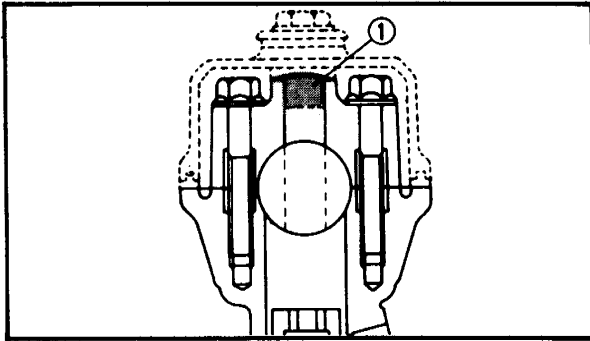
Oil Delivery Pipe:

8 mm Bolt:
18 Nm (1.8 m·kg, 13 ft·lb)

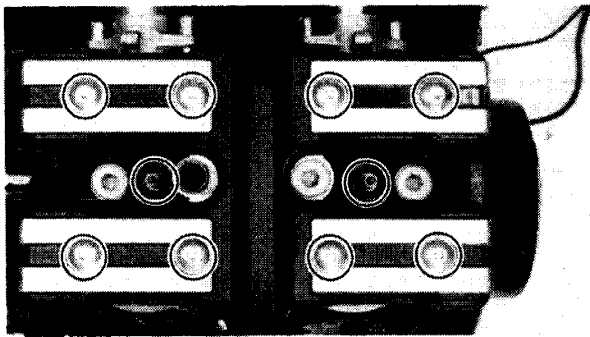
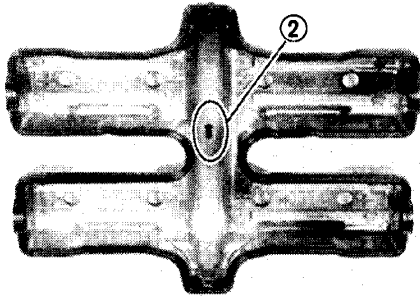
10 mm Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)

2. Install:

- Gasket
- Cylinder head covers (Rear and front)

**NOTE:**

- Be sure all cam caps are covered with oil plugs ①.
- Arrow mark ② on the cover should face toward the exhaust side.
- Inspect the head cover gasket and replace it if damaged.

**3. Tighten:**

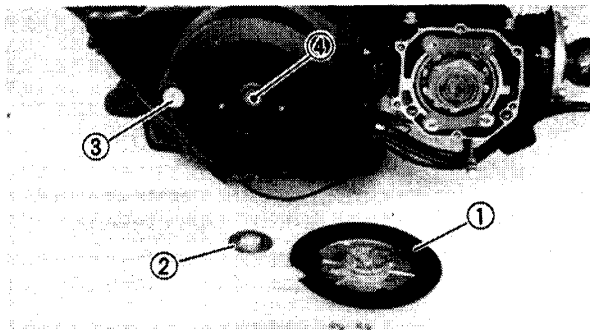
- Bolts (Cylinder head cover)
- Spark plugs

**Cylinder Head Cover:**

10 Nm (1.0 m·kg, 7.2 ft·lb)

Spark Plug:

17.5 Nm (1.75 m·kg, 12.5 ft·lb)

**4. Install:**

- Timing plug ③
- Special washer ②
- Crankcase cover plate ①

NOTE:

Check for clog of oil passage ④ in the bolt. If any, clean the oil passage.



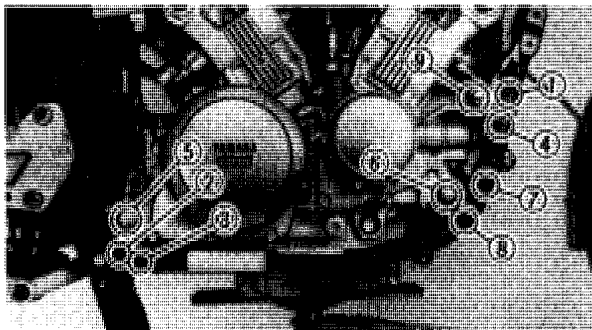
REMountING ENGINE

When remounting the engine, reverse the removal procedure. Note the following points.

1. Install:
 - Engine assembly

NOTE: _____

Be sure to position the rear exhaust pipe assembly between the engine and chassis before installing the engine.



2. Install:
 - Down tube frame (right)
 - Bolts (down tube) ①, ②, ③, ④, ⑦, ⑧
 - Bolts (engine) ⑤, ⑥, ⑨

NOTE: _____

Tighten the bolts (#1 ~ #9) in that order.

	Engine Mounting: Bolts (Down Tube) ①, ②, ③, ④ : 42 Nm (4.2 m·kg, 30 ft·lb) Bolts (Engine) ⑤ : 70 Nm (7.0 m·kg, 50 ft·lb) Bolts (Engine) ⑥, ⑨ : 42 Nm (4.2 m·kg, 30 ft·lb) Bolts (Down Tube) ⑦, ⑧ : 16 Nm (1.6 m·kg, 11 ft·lb)
--	--

3. Install:
 - Side frames (Left and right)
 - Oil filter cover

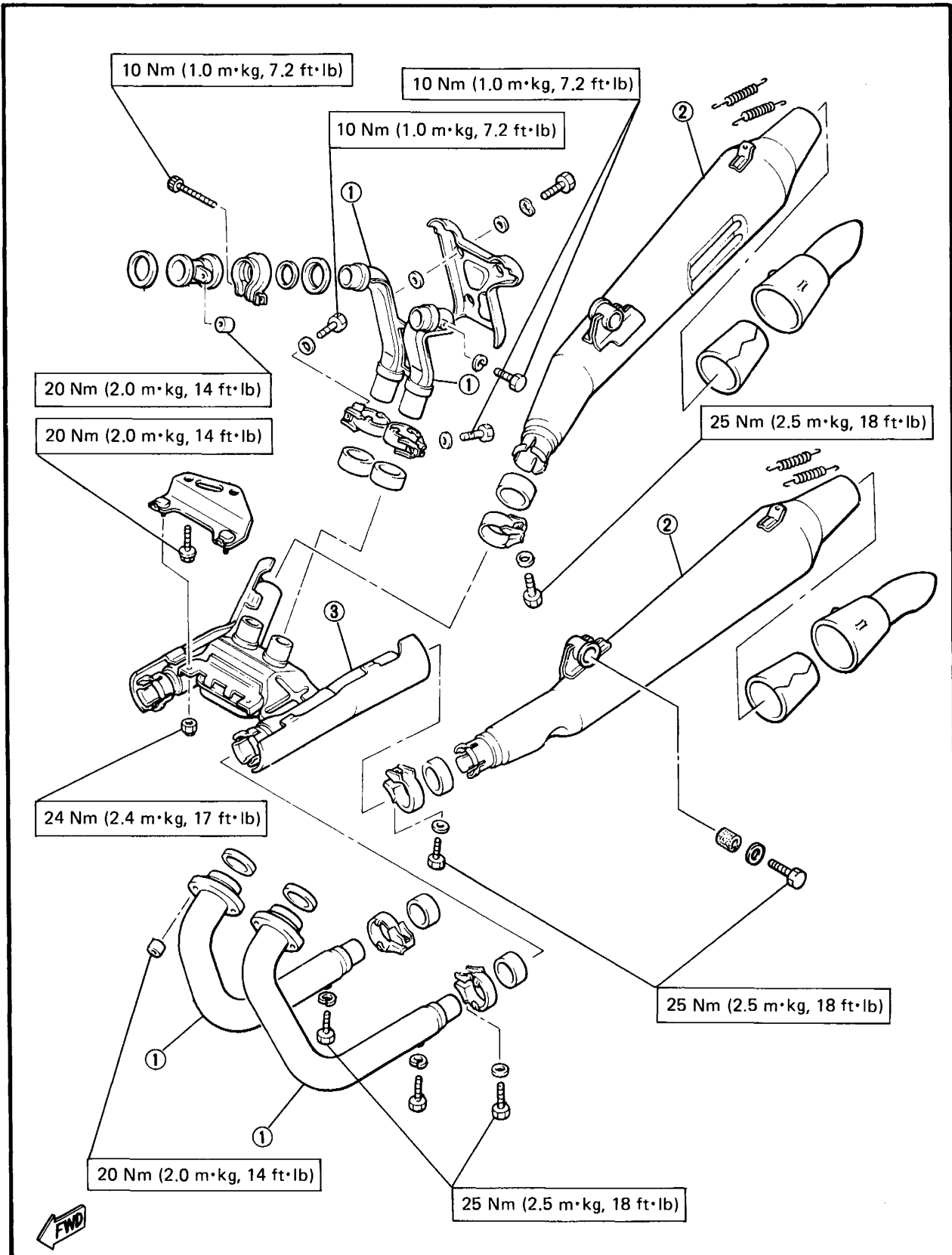
	Side Frame: 15 Nm (1.5 m·kg, 11 ft·lb) Oil Filter Cover: 32 Nm (3.2 m·kg, 23 ft·lb)
--	--

4. Install:
 - Exhaust pipes
 - Mufflers

Refer to illustration.



- ① Exhaust pipe
- ② Muffler
- ③ Chamber



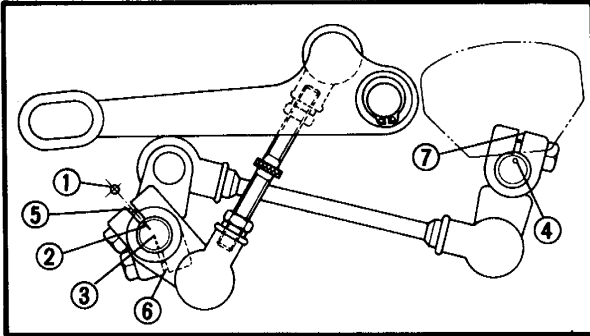


5. Install:

- Clutch release cylinder
- Middle gear case cover



Clutch Release Cylinder:
12 Nm (1.2 m·kg, 8.7 ft·lb)
Middle Gear Case Cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)



6. Install:

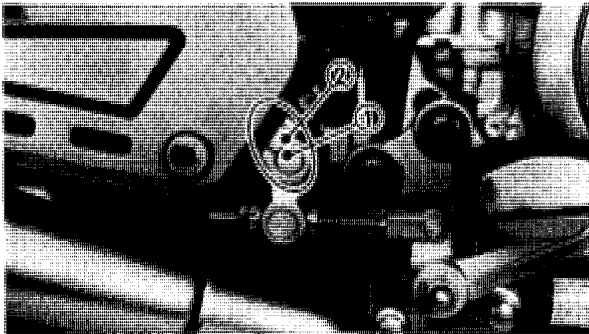
- Change pedal assembly

NOTE:

Align the match marks ①, ②, ③, ④ with the slits ⑤, ⑥, ⑦.



Change Pedal:
10 Nm (1.0 m·kg, 7.2 ft·lb)



7. Adjust:

- Change pedal height
Refer to "CHAPTER 2. CHANGE PEDAL ADJUSTMENT" section.

8. Install:

- Brake pedal assembly

NOTE:

Align the match mark ① on the brake shaft with the match mark ② in the brake pedal.

9. Adjust:

- Rear brake switch operation
Refer to "CHAPTER 2. REAR BRAKE SWITCH ADJUSTMENT" section.

10. Install:

- Footrests (Left and right)
- Radiator



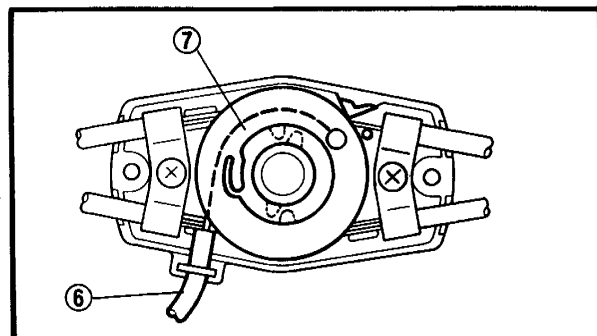
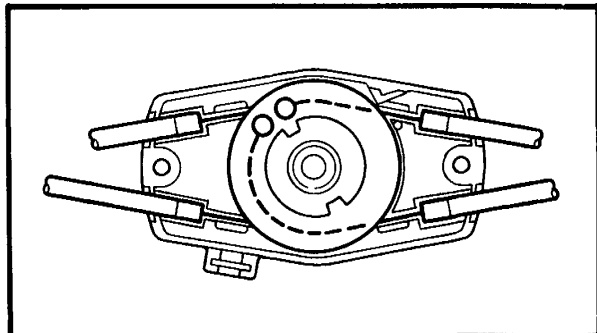
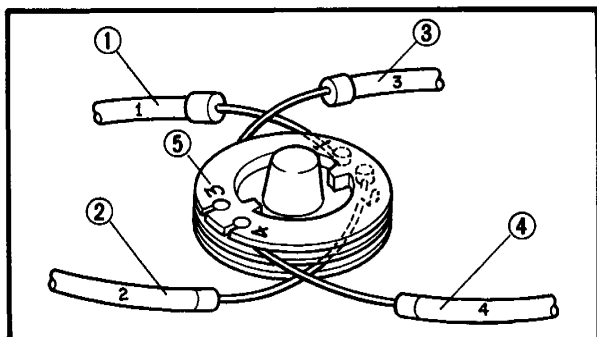
Footrests:
28 Nm (2.8 m·kg, 20 ft·lb)
Radiator:
7 Nm (0.7 m·kg, 5.1 ft·lb)

11. Install:

- Carburetor



Carburetor Joint:
10 Nm (1.0 m·kg, 7.2 ft·lb)



12. Install:

- Throttle cable housing

By the following installation steps.

Throttle cable housing installation steps:

- Install the throttle cable 1, 2, 3 and 4 ① ② ③ ④ onto the rotor 1 ⑤.

NOTE:

When installing the throttle cables, correspond the painted number on the throttle cable to the embossed number on rotor.

- Install the rotor 1 ⑤ to housing.
- Secure the throttle cable 1, 2, 3 and 4 ① ② ③ ④ using the clamps.

NOTE:

Make sure that outer cable end is properly seated in the groove.

- Install the actuator cable ⑥ onto the rotor 2 ⑦.
- Install the rotor 2 ⑦ to the rotor 1 ⑤

NOTE:

Be sure that the two projections inside the rotor 2 mesh with the two slots in the rotor 1.

- Hang one end of torsion spring on rotor 2 and the other on projection of housing.
- Fit the cover over the housing and secure it with screws.
- Adjust the throttle cable free plays.
Refer to "CHAPTER 2. THROTTLE CABLE ADJUSTMENT" section.



13. Install:
 - Fairing assembly
Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.
14. Add:
 - Engine oil
Refer to "CHAPTER 2. ENGINE OIL REPLACEMENT" section.
15. Add:
 - Coolant
Refer to "CHAPTER 4. COOLING SYSTEM, COOLANT" section.

CHAPTER 4. COOLING SYSTEM

COOLANT	4-1
COOLANT FLOW	4-1
COOLANT REPLACEMENT	4-2
WATER PUMP	4-6
DISASSEMBLY	4-6
INSPECTION	4-6
BEARING AND SEAL REPLACEMENT	4-6
ASSEMBLY	4-8
THERMOSTATIC VALVE	4-9
REMOVAL	4-9
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DISASSEMBLY	4-10
INSPECTION	4-10
ASSEMBLY	4-10
CYLINDER HEAD WATER JACKET JOINT	4-11
REMOVAL	4-11
INSPECTION	4-11
ASSEMBLY	4-11
RADIATOR	4-11
DISASSEMBLY	4-11
INSPECTION	4-12
ASSEMBLY	4-13



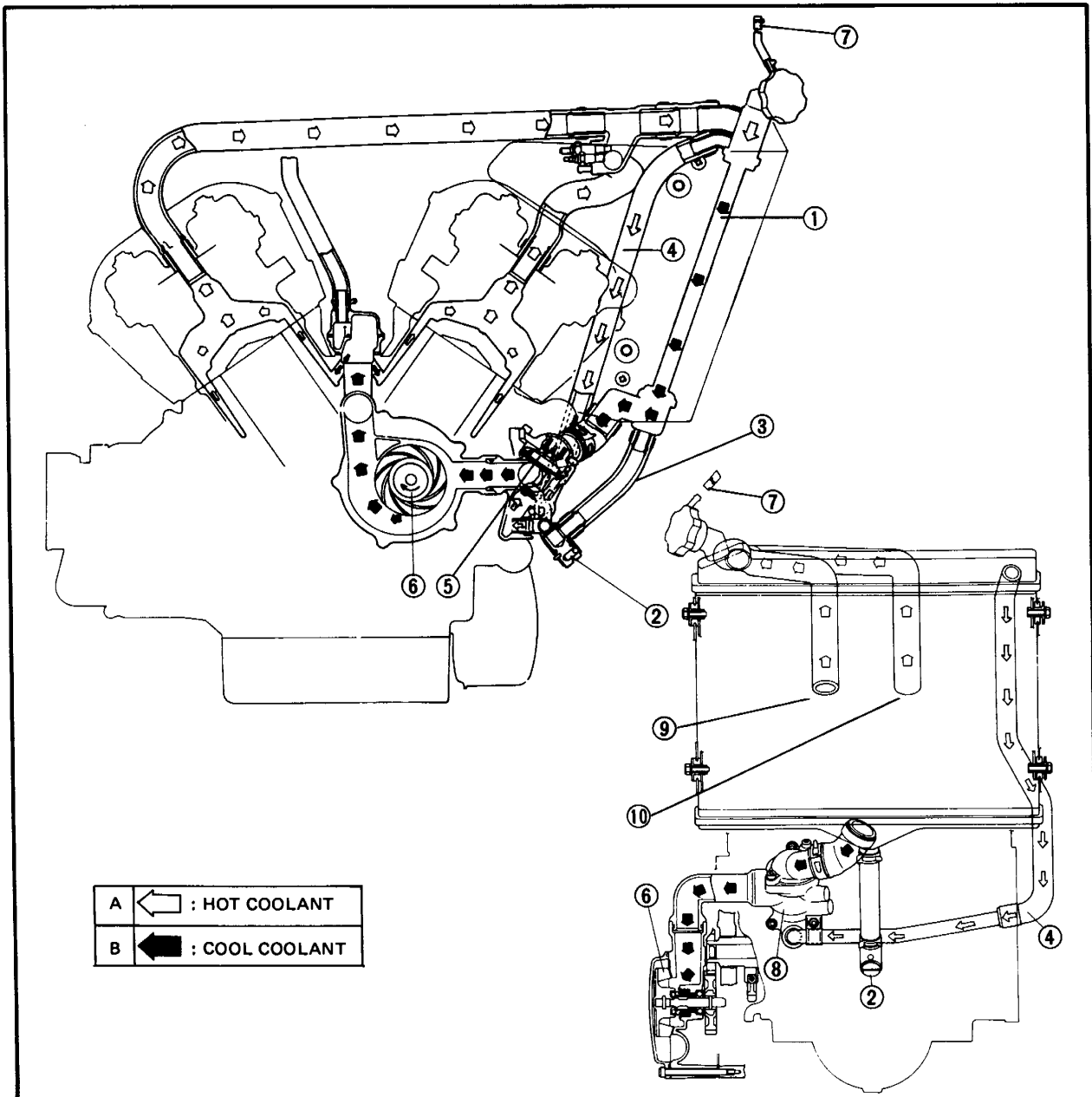
COOLANT

COOLING SYSTEM

COOLANT

COOLANT FLOW

- ① Radiator
- ② Coolant drain valve
- ③ Bypass pipe to the coolant drain valve
- ④ Bypass pipe to the thermostatic valve
- ⑤ Thermostatic valve
- ⑥ Water pump
- ⑦ To the reservoir tank
- ⑧ Thermostat housing
- ⑨ Rear cylinder head
- ⑩ Front cylinder head



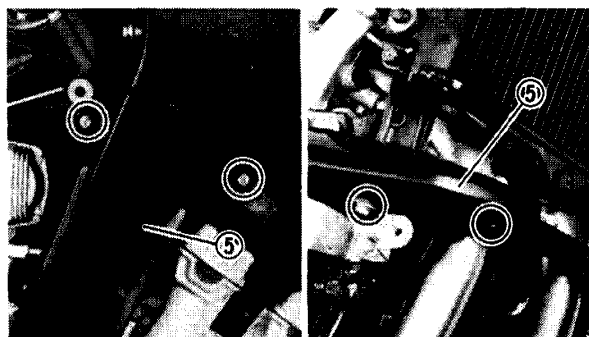
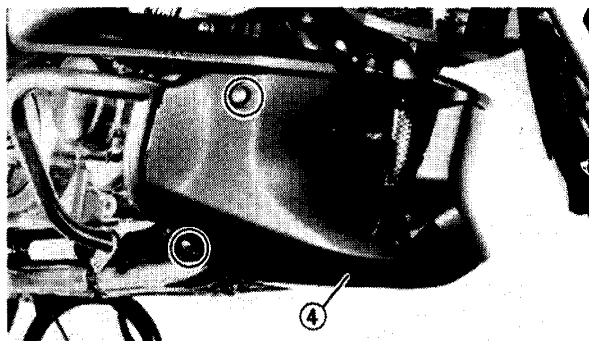
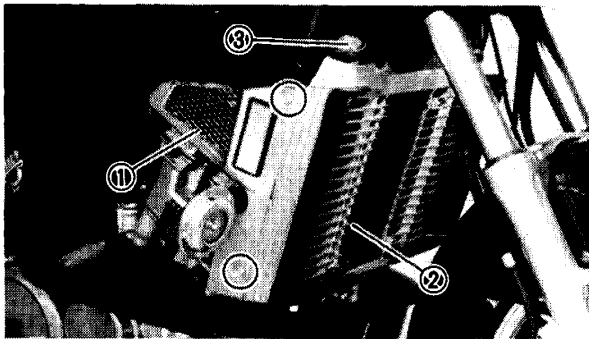
COOLANT REPLACEMENT

WARNING:

Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap by the following procedure:

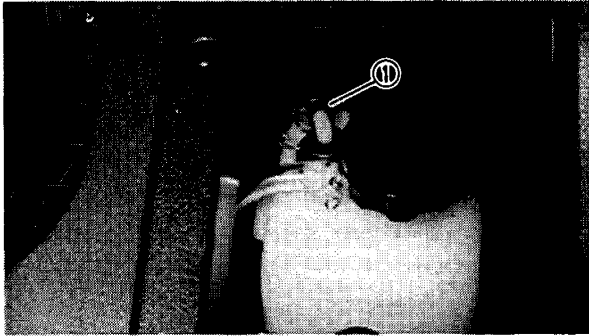
Place a thick rag, like a towel, over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

1. Place a receptacle under the coolant drain bolt.



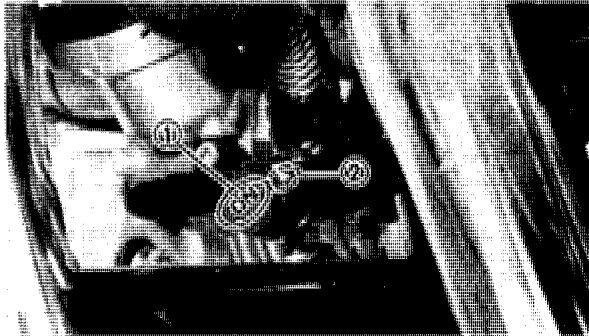
2. Remove:

- Top cover
 - Side panels (Left and right)
Refer to "CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENT – SIDE PANEL REMOVAL AND INSTALLATION" section.
 - Radiator side cover ①
 - Radiator cover ②
 - Radiator cap ③
 - Lower cowl ④
 - Lower panels ⑤
- Separate the panel halves.

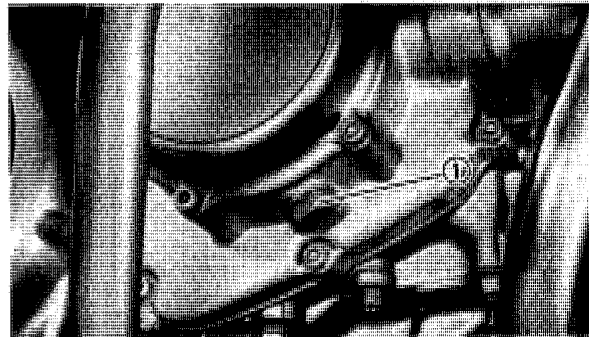


3. Open:
- Reservoir tank cover

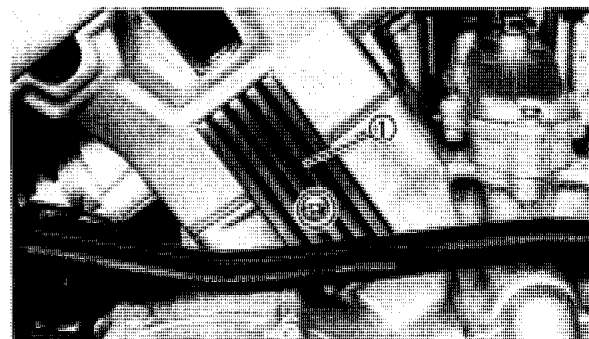
4. Disconnect:
- Feed hose (Reservoir tank) ①



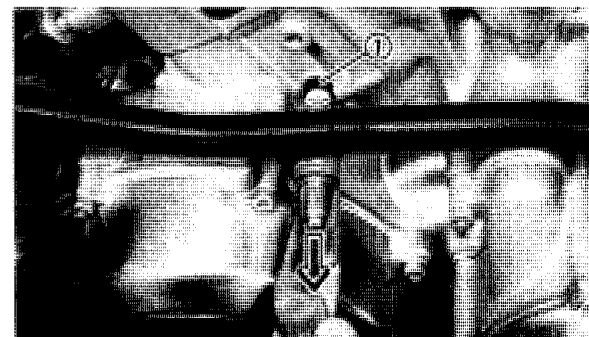
5. Align:
- Coolant drain valve "ON" ① mark with match mark ② on drain valve housing



6. Remove:
- Drain bolt ①
Drain the coolant.



7. Remove:
- Side covers (Cylinder) ①



8. Remove:
- Rubber plugs ①
Drain the coolant.

NOTE: _____
To facilitate removal of the rubber plug's, screw a spark plug into the threaded hole and hand-pull the spark plug firmly.



9. Drain:
- Coolant (Completely)

NOTE:

Thoroughly flush the cooling system with clean tap water.

10. Inspect:
- Rubber plugs
Damage → Replace.
11. Tighten:
- Drain bolt
 - Rubber plugs



Drain Bolt:
43 Nm (4.3 m·kg, 31 ft·lb)

12. Fill:
- Cooling system
By the following steps.



Recommended Coolant:
High Quality Ethylene Glycol
Anti-Freeze Containing Anti-
Corrosion for Aluminum Engine
Inhibitors

Coolant and Water Mixed Ratio:
50%/50%

Total Amount:
2.8 L (2.46 Imp qt, 2.96 US qt)

Reservoir Tank Capacity:
0.39 L (0.34 Imp qt, 0.41 US qt)

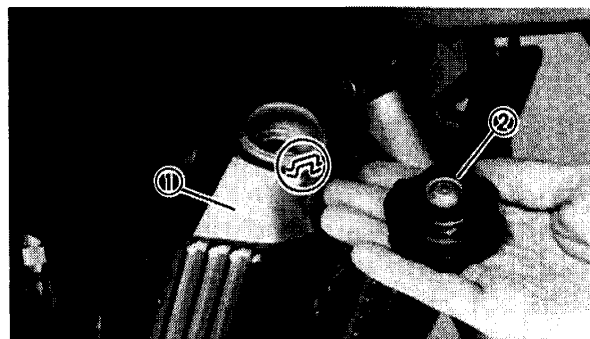
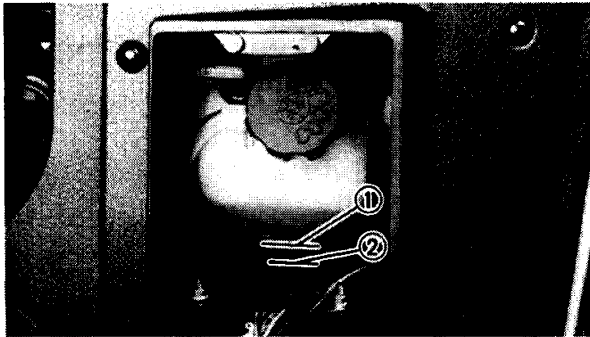
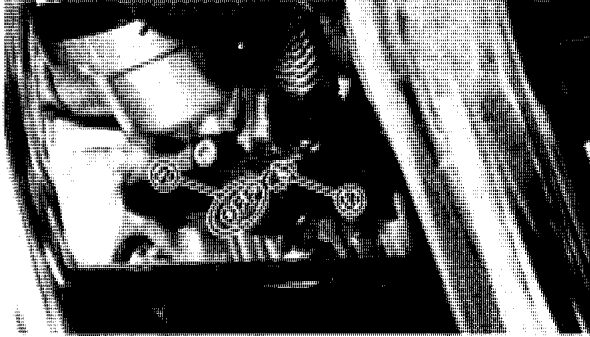
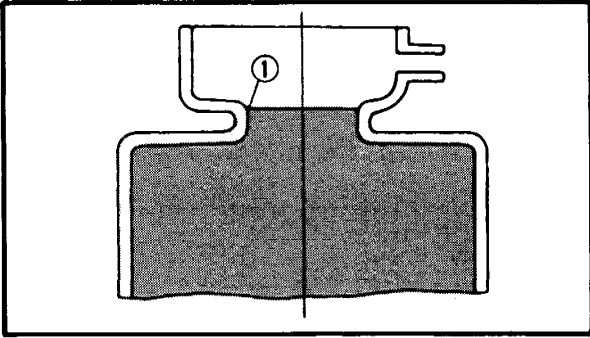
From "LOW" to "FULL" Level:
0.25 L (0.22 Imp qt, 0.26 US qt)

CAUTION:

- Hard water or salt water is harmful to the engine. You may use distilled water if you can't get soft water.
- Do not mix more than one type of ethlen glycol antifreeze containing corrosion for aluminum engine inhibitors.

Coolant filling steps:

- Fill the coolant into the radiator until the radiator is full.
- Start the engine (Coolant level decreases.)



CAUTION:

Always check coolant level, and check for coolant leakage before starting engine.

- Add the coolant while engine is running.
- Stop the engine when coolant level stabilizes.
- Add the coolant again to specified level ① .
- Install the radiator cap.
- Align the coolant drain valve "OFF" mark ② with the match mark ③ on drain valve housing.

13. Connect:

- Feed hose (Reservoir tank)

14. Fill:

- Reservoir tank
Add the coolant until liquid reaches "FULL" level mark.

① "FULL" level

② "LOW" level

15. Install:

- Components in above list (Step "2")

NOTE:

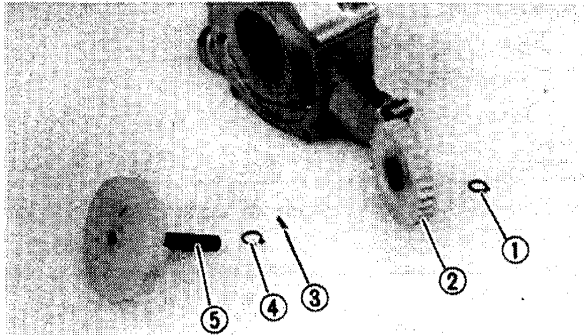
- Before installing the radiator cover ① , remove the radiator cap ② .
- Refer to "CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS – SIDE PANEL REMOVAL AND INSTALLATION" section.

WATER PUMP

DISASSEMBLY

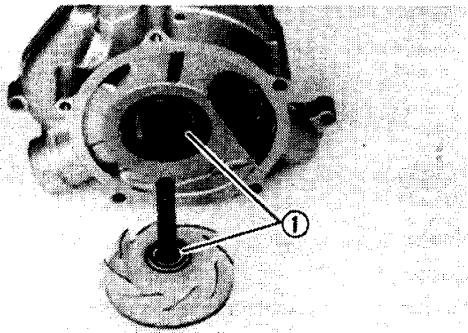
NOTE:

- Be sure to drain the coolant before disassembly of the cooling system components.
- Refer to Engine Disassembly for water pump disassembly.



1. Remove:
 - Circlip ①
 - Drive gear ②
 - Gear stopper pin ③
 - Circlip ④
 - Impeller shaft ⑤
2. Eliminate:
 - Deposits

From the impeller and water pump housing.



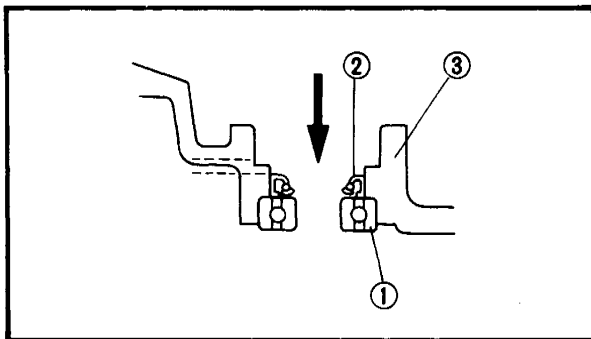
INSPECTION

1. Inspect:
 - Bearing
Wear/Damage → Replace.
 - Oil seal
Wear/Damage → Replace.
 - Impeller
Cracks/Wear/Damage → Replace.
 - Water pump seal set ①
Wear/Damage → Replace.

BEARING AND SEAL REPLACEMENT

1. Remove:
 - Bearing ①
 - Oil seal ②

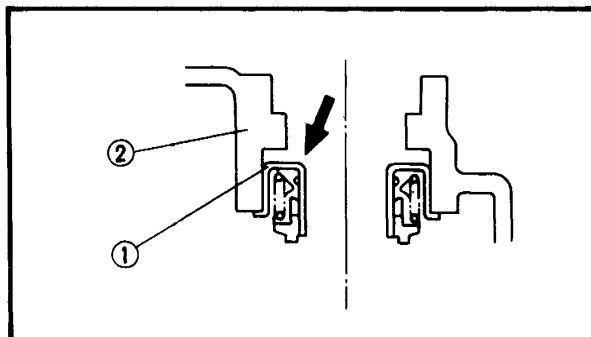
Tap off both components from water pump seal side.

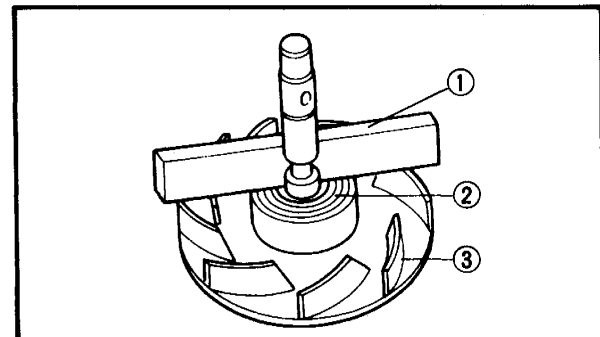
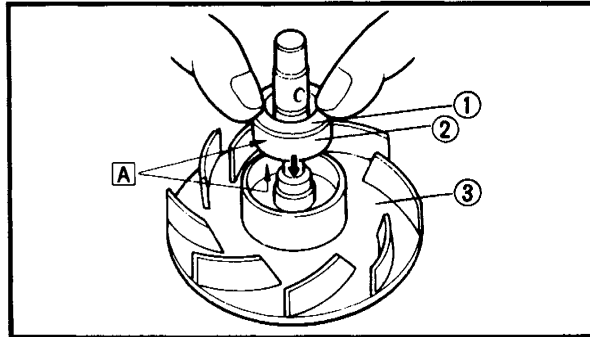
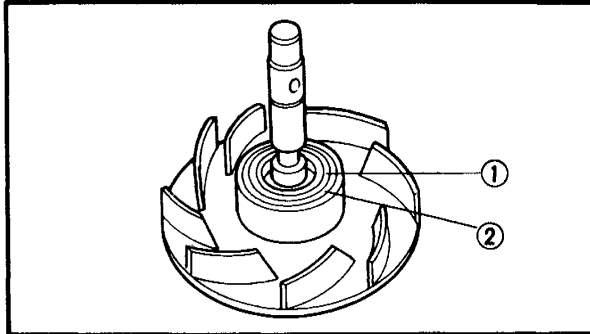
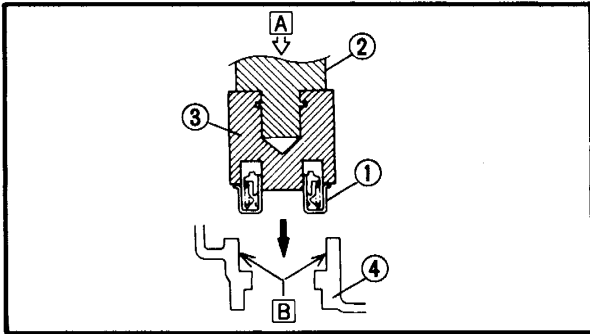


③ Crankcase cover

2. Remove:
 - Water pump seal (Crankcase side) ①

Tap it off from the cover ②.





3. Install:

- Water pump seal ①
- Use Water Pump Seal Installer (YM-04058-1 ②, YM-33221 ③).
- Apply Sealant (Quick Gasket®) to crankcase cover ④ before installing seal.

- A** PRESS
- B** APPLY Sealant (Quick Gasket®)

4. Remove:

- Seal No. 2 ①
- From impeller.
- Pry out with a small screwdriver.

NOTE: _____
Be careful not to scratch or bend the impeller shaft.

② Damper rubber

5. Apply:

- Water or coolant
- To outer surface of damper rubber ② and impeller hub.

CAUTION: _____
Never apply oil or grease to water pump seal surfaces.

6. Assemble:


- Seal No. 2/Damper rubber ②
- To impeller hub.

- ① Slip ring
- ③ Impeller
- A** APPLICATION OF WATER OR COOLANT

7. Measure:

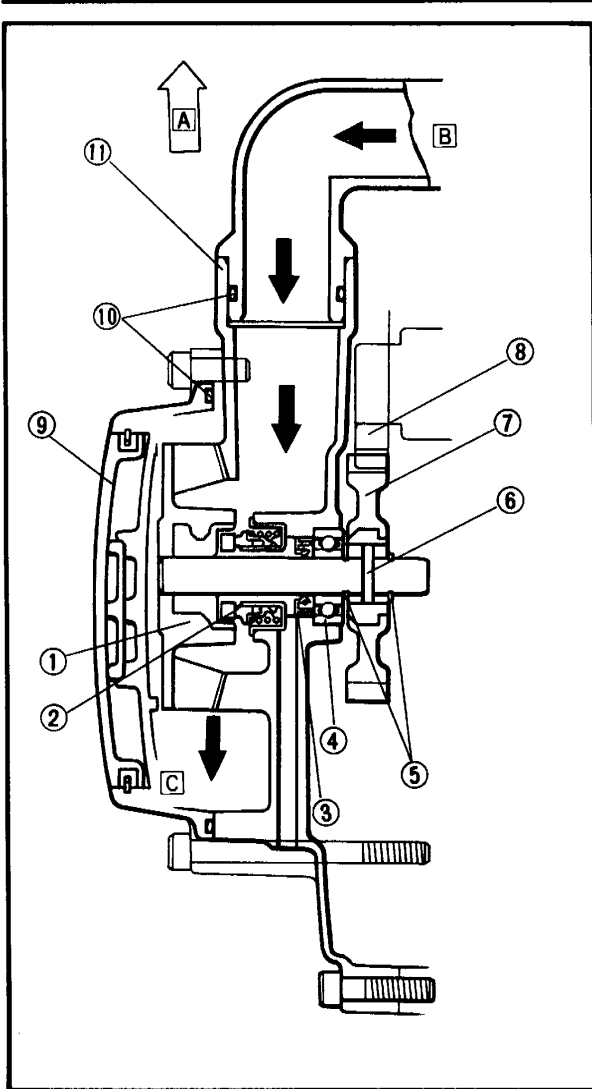
- Tilt
- Out of specification → Repeat the above steps "4 ~ 6".

NOTE: _____
Be sure seal No. 2 fits squarely.

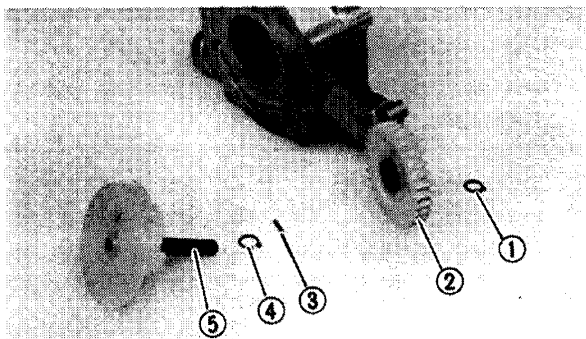
 **Tilt Limit: 0.15 mm (0.006 in)**

- ① Straight edge
- ② Seal No. 2
- ③ Impeller

ASSEMBLY



- ① Impeller
- ② Mechanical seal
- ③ Oil seal
- ④ Bearing
- ⑤ Circlip
- ⑥ Gear stopper pin
- ⑦ Driven gear
- ⑧ Drive gear
- ⑨ Water pump cover
- ⑩ O-ring
- ⑪ Crankcase cover
- A FRONT
- B FROM RADIATOR
- C TO CYLINDER

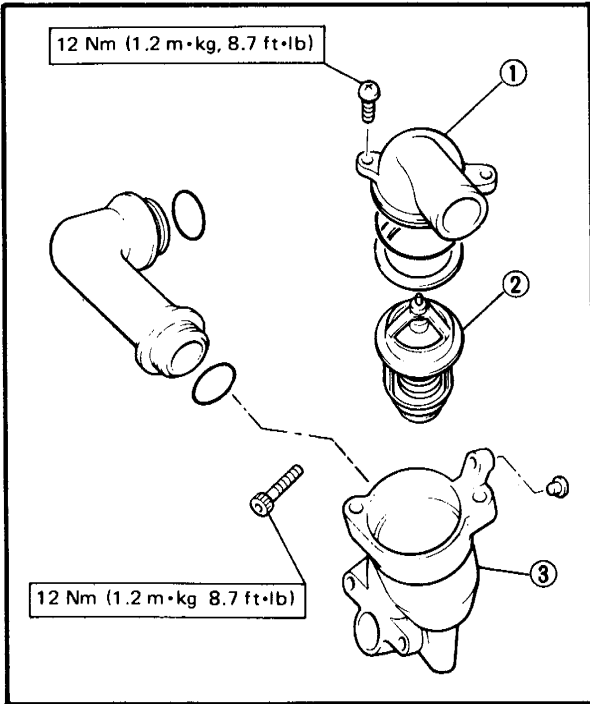


1. Install:

- Impeller shaft ⑤
- Circlip ④
- Gear stopper pin ③
- Drive gear ②
- Circlip ①

CAUTION:

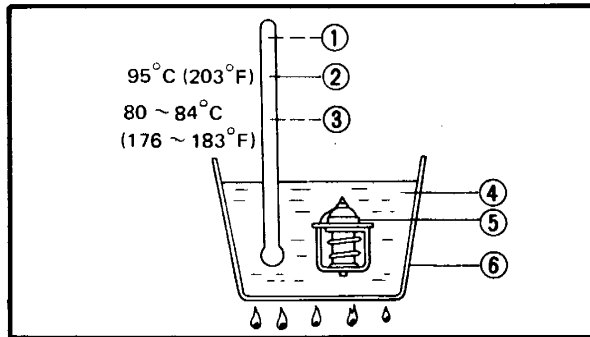
- Be sure not to scratch the water pump mechanical seal while installing.
- Replace any scratched seal.



THERMOSTATIC VALVE

REMOVAL

- Remove:
 - Thermostat cover ①
 - Thermostatic valve ②



INSPECTION AND ASSEMBLY

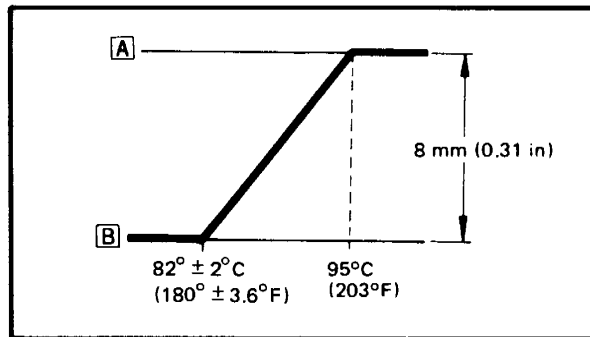
- Inspect:
 - Thermostatic valve

Valve does not open at 80 ~ 84°C (176 ~ 183°F) → Replace.

By the following inspection steps.

Thermostatic valve inspection steps:

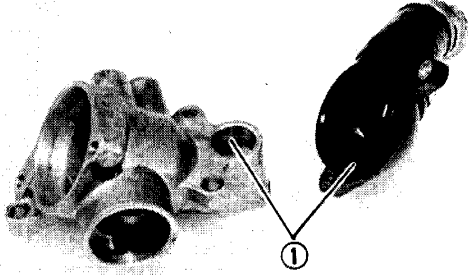
- Suspend thermostatic valve in a vessel or water.
- Place reliable thermometer in water.
- Heat water slowly.
- Observe thermometer, while stirring water continually



- | | |
|---------------------------|----------------------|
| ① Thermometer | ④ Water |
| ② Full open | ⑤ Thermostatic valve |
| ③ Opening sequence begins | ⑥ Vessel |
| A OPEN | B CLOSE |

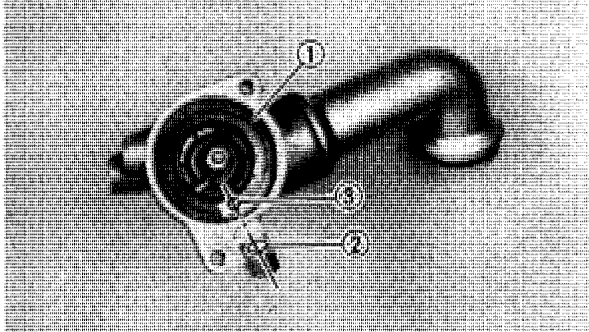
NOTE:

Thermostat is sealed and its setting is specialized work. If its accuracy is in doubt, always replace it. A faulty unit could cause serious overheating or overcooling.



2. Inspect:

- O-ring ①
Wear/Damage → Replace.



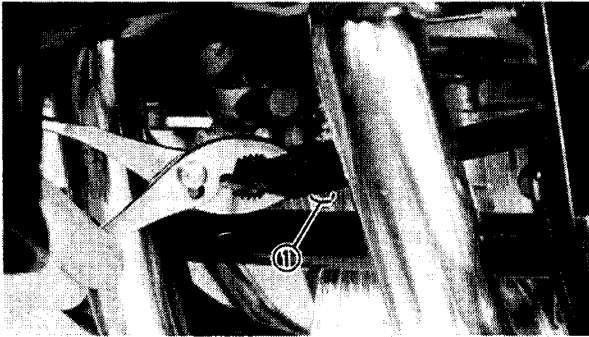
3. Install:

- Thermostatic valve ①

NOTE:

Line up the valve breather hole ② with the housing projection ③ .

- Thermostat cover
- Thermostat housing

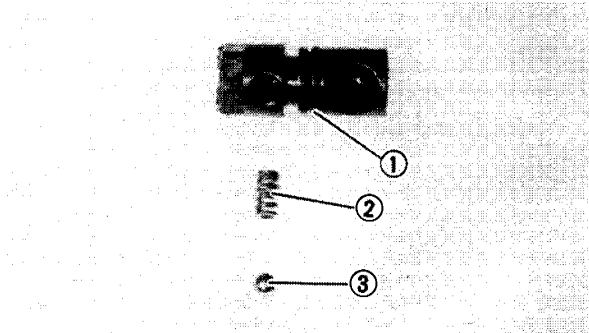


COOLANT DRAIN VALVE

DISASSEMBLY

1. Remove:

- Retaining screw ①
- Valve assembly



INSPECTION

1. Inspect:

- O-ring ①
Wear/Damage → Replace.
- Spring ②
Damage → Replace.
- Stopper ball ③
Wear/Damage → Replace.

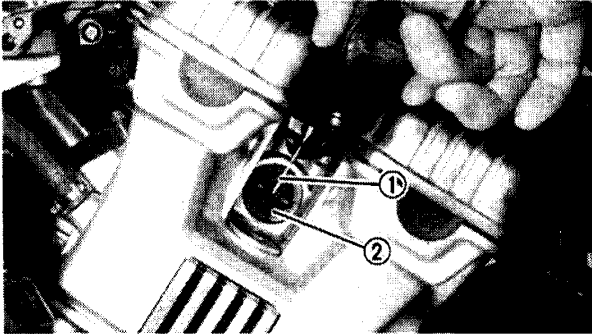
ASSEMBLY

1. Install:

- Valve assembly
Be sure stopper ball falls into body cavity.
2. Secure valve assembly with retaining screw.


**CYLINDER HEAD WATER JACKET
JOINT**
CAUTION:

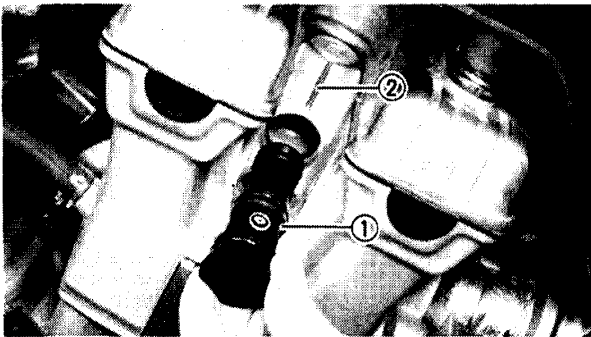
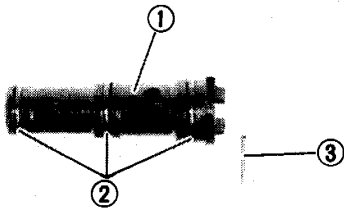
- Be sure to drain the coolant before you disassemble the water jacket joints otherwise the coolant will flow into the crankcase.
- Do not remove the water jacket joints unless absolutely essential; e.g., when overhauling the engine.


REMOVAL

1. Remove:
 - Stopper pins ①
 - Water jacket joints ②

INSPECTION

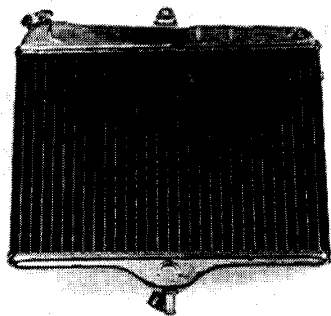
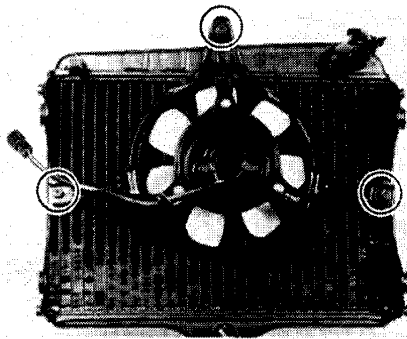
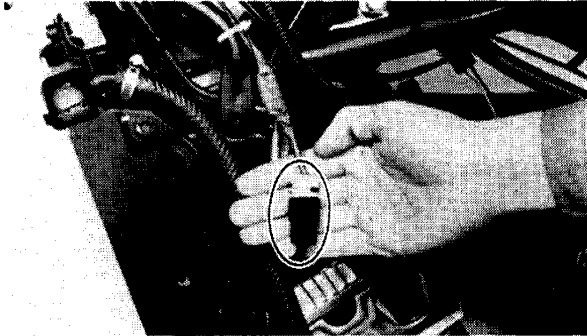
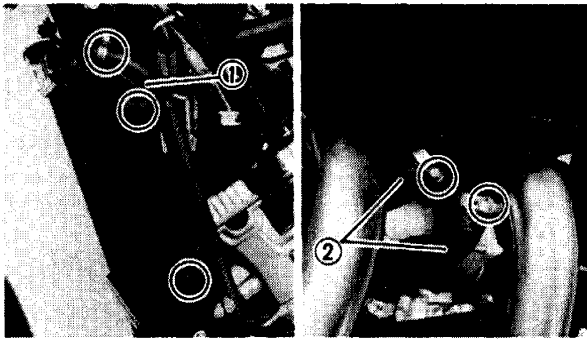
1. Inspect:
 - Water jacket joint ①
Clogging → Clean.
 - O-rings ②
Wear/Damage → Replace.
 - Stopper pin ③
Wear/Bends → Replace.


ASSEMBLY

1. Install:
 - Water jacket joints ①
 - Stopper pins ②

RADIATOR
DISASSEMBLY

1. Drain:
 - Coolant (Completely)
Refer to "COOLANT REPLACEMENT"
section.



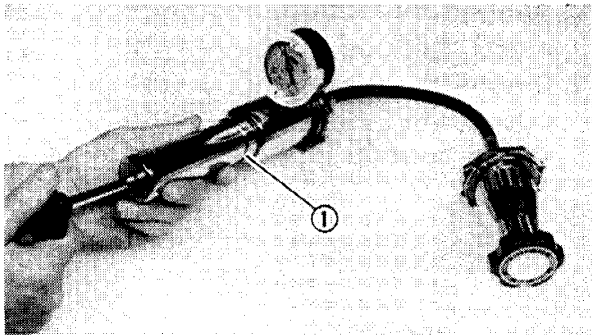
2. Remove:
 - Bolts (Radiator)
3. Disconnect:
 - Upper hose ①
 - Lower hoses ②

4. Disconnect:
 - Fan motor coupler
5. Remove:
 - Radiator assembly

6. Remove:
 - Fan motor assembly

INSPECTION

1. Inspect:
 - Radiator
 - Obstruction → Blow out with compressed air through rear of radiator.
 - Flattened fins → Repair.
 - Coolant hoses
 - Cracks/Damage → Replace.
2. Inspect:
 - Vacuum valve spring
 - Fatigue → Replace.
 - Vacuum valve seating condition
 - Poor condition → Replace.
3. Measure:
 - Valve opening pressure
 - By the following measurement steps.



Valve opening pressure measurement steps:


- Measure the radiator cap pressure using the Radiator Cap Tester ① (YU-24460-01). Valve opens at pressure below specified valve or defective → Replace.

Valve Opening Pressure:
 73.6 ~ 103.0 kPa (0.75 ~ 1.05 kg/cm² ,
 10.7 ~ 14.9 lb/in²)

ASSEMBLY

When installing the radiator and conduit, reverse the removal procedure. Note the following points.

1. Install:
 - Radiator assembly

 **Bolts (Radiator):**
 7 Nm (0.7 m·kg, 5.1 ft·lb)

2. Fill:
 - Cooling system
 Refer to "COOLANT REPLACEMENT" section.
3. Inspect:
 - Cooling system
 By the following inspection steps.

Cooling system inspection steps:

- Connect Radiator Cap Tester (YU-24460-01) ① .
- Apply 1.0 kg/cm² (14 lb/in²) pressure.
- Measure pressure with gauge.

Decrease of pressure (leaks) → Repair at required.



**CHAPTER 5.
CARBURETION**

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REMOVAL 5-3
DISASSEMBLY 5-3
INSPECTION 5-6
ASSEMBLY 5-7
INSTALLATION 5-8
ADJUSTMENT 5-9

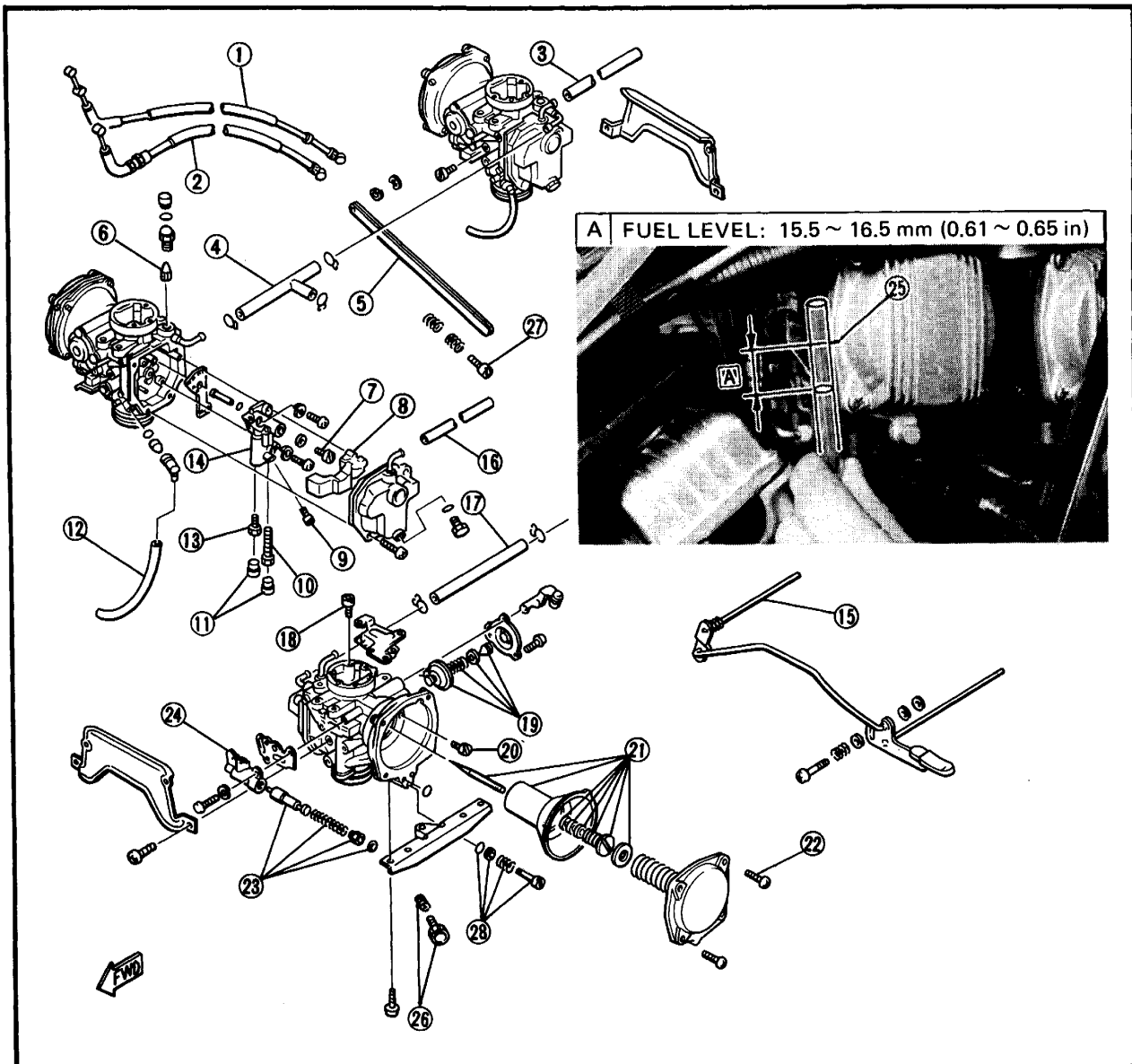
AIR CLEANER AND CRANKCASE VENTILATION SYSTEM 5-10

CARBURETION

CARBURETOR

- ① Throttle cable (Close side)
- ② Throttle cable (Open side)
- ③ Fuel overflow hose
- ④ Fuel feed hose
- ⑤ Synchronization rod
- ⑥ Float needle valve
- ⑦ Needle jet screw
- ⑧ Float
- ⑨ Main jet
- ⑩ Main bleed pipe
- ⑪ Rubber plug
- ⑫ Fuel drain hose
- ⑬ Pilot jet
- ⑭ Jet block
- ⑮ Starter lever shaft
- ⑯ Fuel overflow hose
- ⑰ Fuel feed hose
- ⑱ Pilot air jet No. 1
- ⑲ Coasting enrichment valve assembly
- ⑳ Pilot air jet No. 2
- ㉑ Piston valve assembly
- ㉒ Tamper proof screw
- ㉓ Starter plunger assembly
- ㉔ Starter body
- ㉕ Piston valve center mark
- ㉖ Throttle stop screw set
- ㉗ Synchronization screw
- ㉘ Pilot screw set

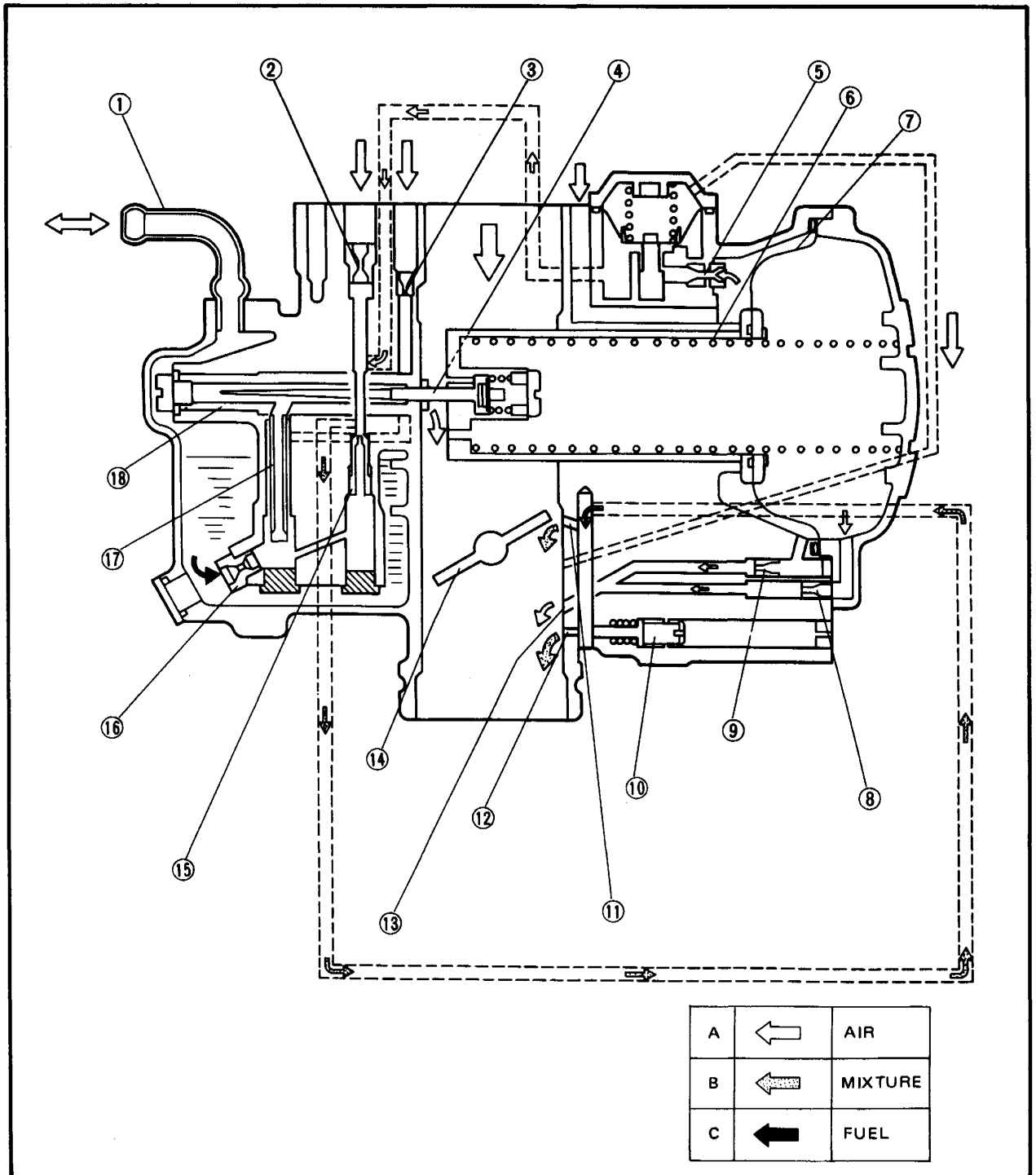
SPECIFICATIONS	
Main jet	#125
Main air jet	φ2.0
Jet needle	5DZ3-1
Needle jet	Y-0
Pilot jet	#37.5
Fuel level	15.5 ~ 16.5 mm (0.61 ~ 0.65 in)
Pilot screw	Preset
Float valve seat	1.5
Engine idle speed	950 ~ 1,050 r/min





SECTION VIEW

- ① Air vent
- ② Pilot air jet No. 1
- ③ Main air jet
- ④ Jet needle
- ⑤ Pilot air jet No. 2
- ⑥ Piston valve
- ⑦ Diaphragm
- ⑧ Purge jet No. 2
- ⑨ Purge jet No. 1
- ⑩ Pilot screw
- ⑪ Bypass hole
- ⑫ Pilot outlet
- ⑬ Purge hole
- ⑭ Throttle valve
- ⑮ Pilot jet
- ⑯ Main jet
- ⑰ Main bleed pipe
- ⑱ Needle jet





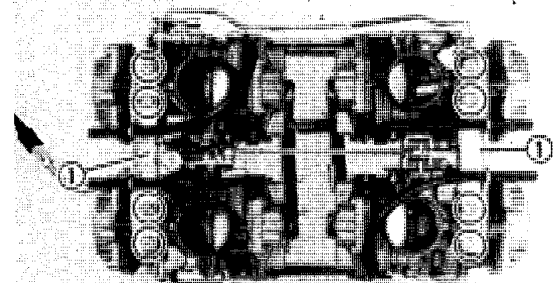
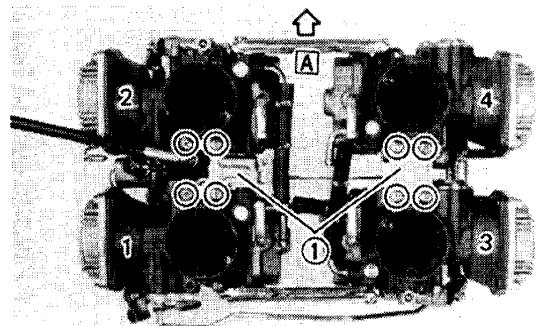
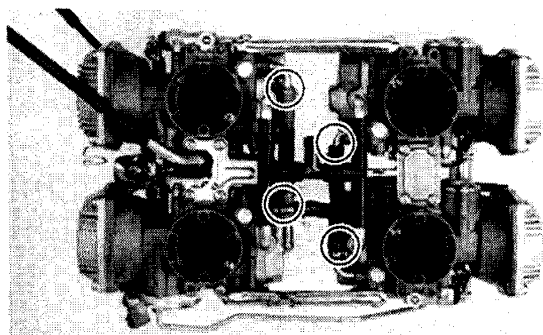
REMOVAL

1. Remove:
 - Carburetor assembly
 Refer to engine removal section.

NOTE: _____

The following parts can be cleaned and inspected without disassembly.

- Piston valve
- Starter plunger
- Coasting enrichment valve



DISASSEMBLY

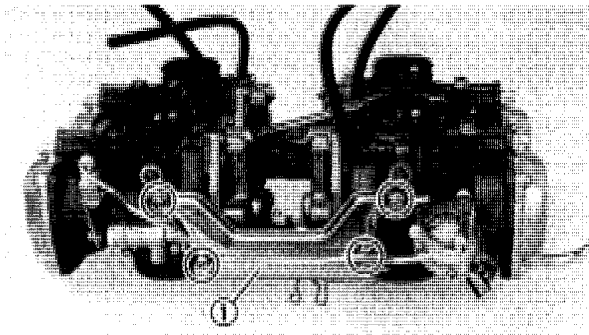
CAUTION: _____

The plastic piston valve is fragile and highly susceptible to damage. Be sure to handle with extreme care. Do not drop the valve or subject it to undue abuse as this can cause cracks that could severely weaken the piston valve.

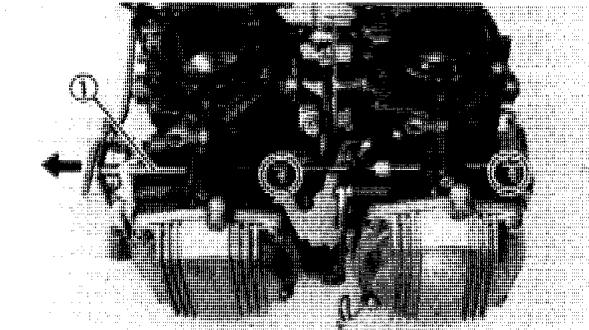
1. Remove:
 - Fuel lines
2. Number each carburetor before removing it from carburetor bracket.
3. Remove:
 - Upper brackets ①

A FRONT

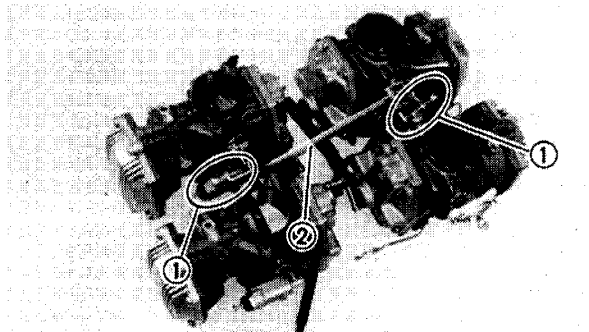
4. Remove:
 - Lower brackets ①



5. Remove:
- Side brackets ①

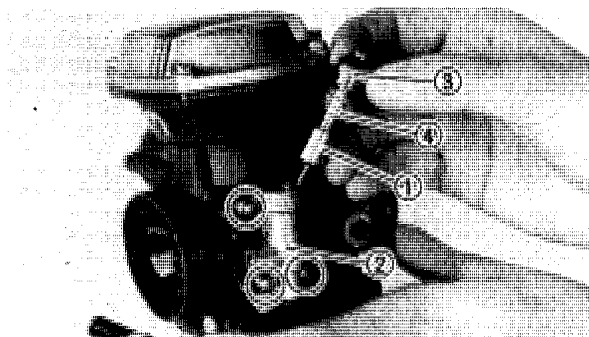


6. Remove:
- Starter lever shafts ①



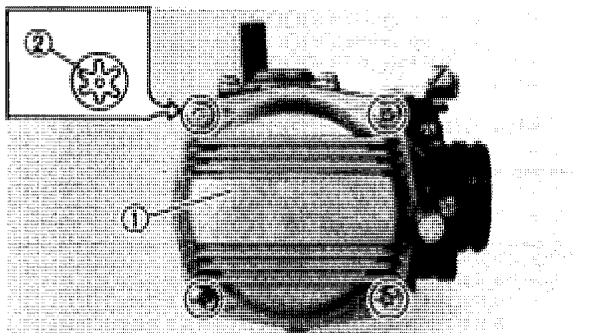
7. Remove:
- Synchronization screws ①
 - Synchronization rod ②

NOTE: _____
 When separating the carburetors be sure not to lose the small spring that may fall out. This spring connects the throttle levers.



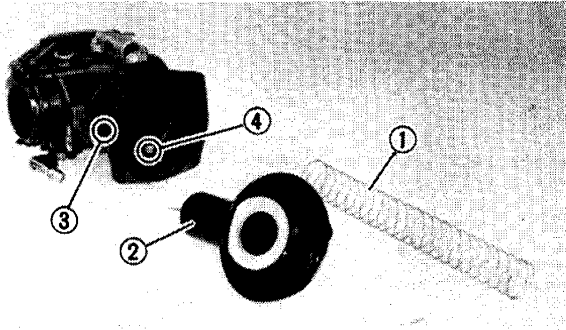
8. Remove:
- Starter plunger ①
 - Starter plunger body ②

- ③ Nut
- ④ Spring

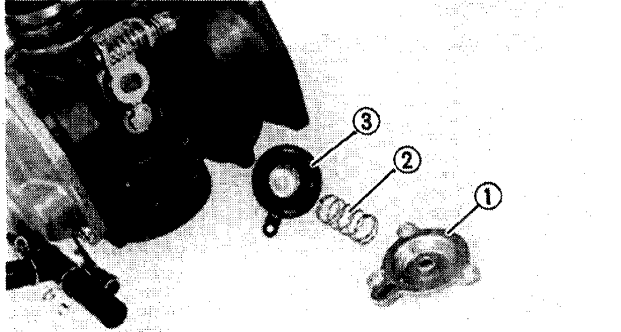


9. Remove:
- Vacuum chamber cover ①
- Use the Special Torx Driver (YU-25359-2, YU-25359-26).

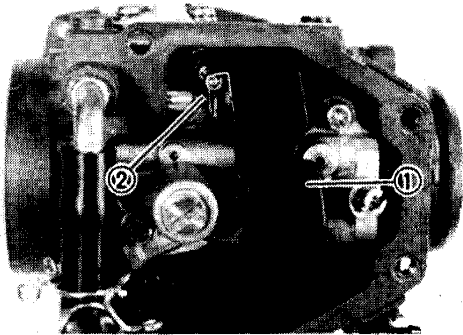
- ② Tamperproof screw



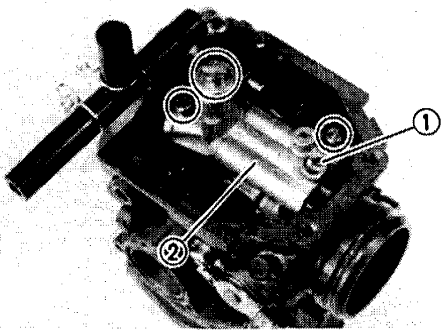
10. Remove:
- Spring ①
 - Vacuum piston ②
 - O-ring ③
 - Pilot air jet No. 2 ④



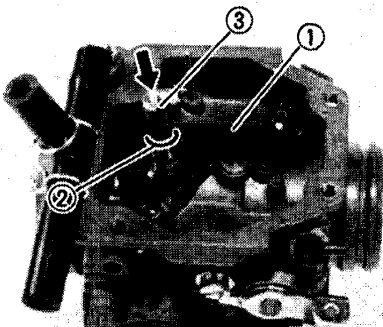
11. Remove:
- Coasting enrichment cover ①
 - Spring ②
 - Diaphragm ③



12. Remove:
- Float chamber cover ①
 - Float ②
 - Needle valve ③

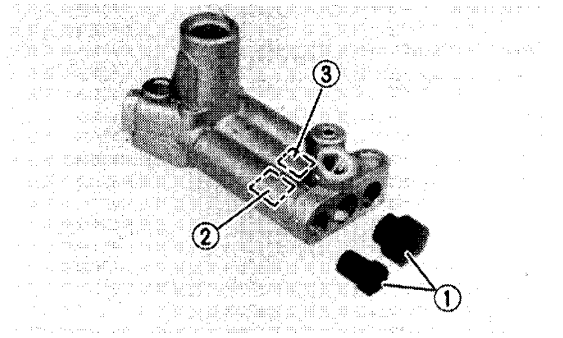


13. Remove:
- Main jet ①
 - Jet block ②

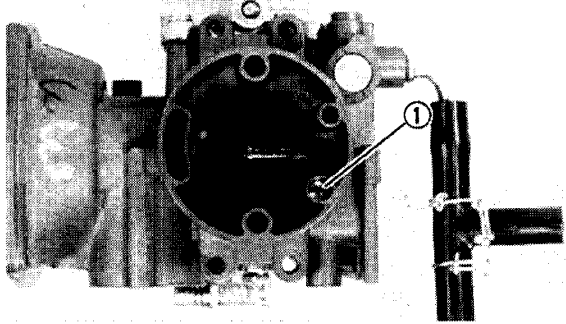


14. Remove:
- Gasket ①
 - O-ring ②
 - Needle jet ③

NOTE: _____
 Move the needle jet toward the vacuum piston.



15. Remove:
- Rubber caps ①
 - Pilot jet ②
 - Main bleed pipe ③

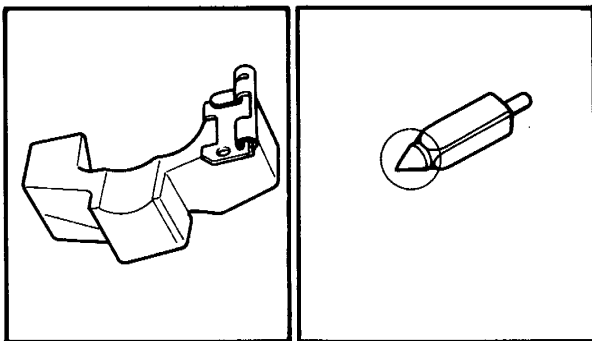


16. Remove:
- Pilot air jet No. 1 ①

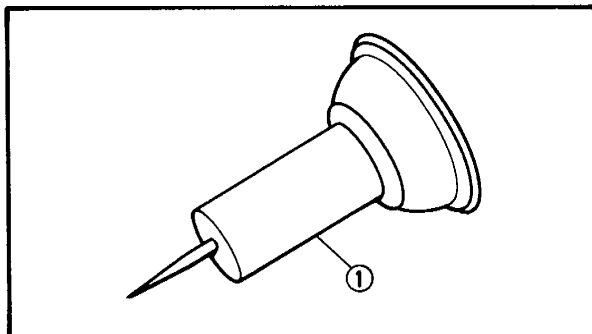
INSPECTION

1. Inspect:
- Carburetor body
Contamination → Clean.

NOTE: _____
Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.

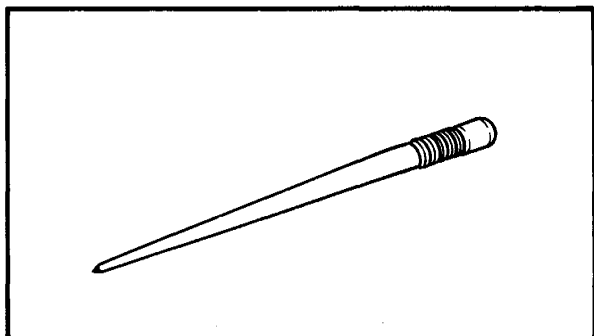


2. Inspect:
- Float
Damage → Replace.
 - Needle valve
Wear/Contamination → Replace.

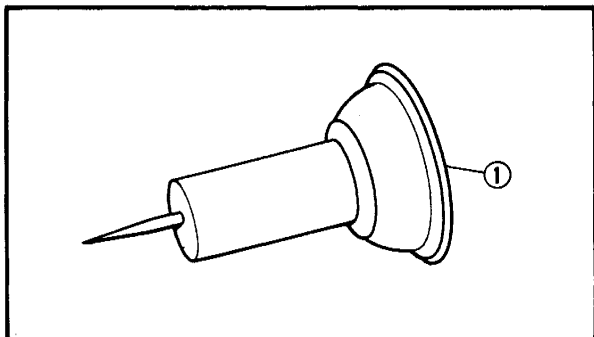


3. Inspect:
- Vacuum piston ①
Cracks → Replace.

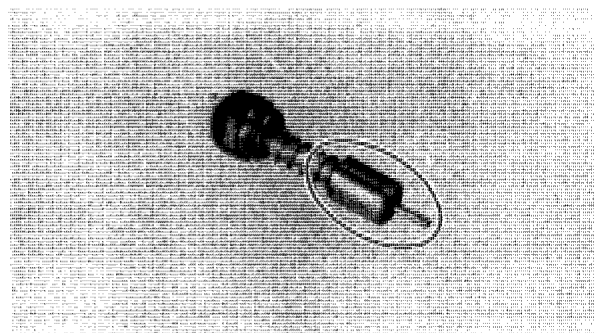
NOTE: _____
If you suspect the piston valve has been damaged, check the component for cracks by pouring gasoline into the valve. If it leaks, replace with a new piston valve.



4. Inspect:
- Jet needle
 - Bends/Wear → Replace.



5. Inspect:
- Diaphragm ①
 - Tears → Replace.



6. Inspect:
- Starter plunger
 - Damage/Wear → Replace.

7. Inspect
- O-ring
 - Gasket
 - Damage → Replace.

ASSEMBLY

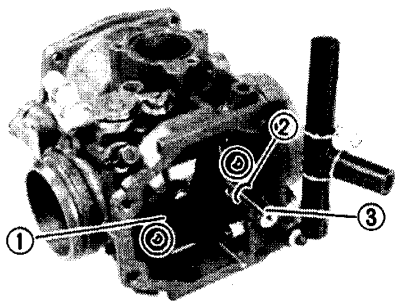
To assemble the carburetors, reverse the disassembly procedures. Note the following points.

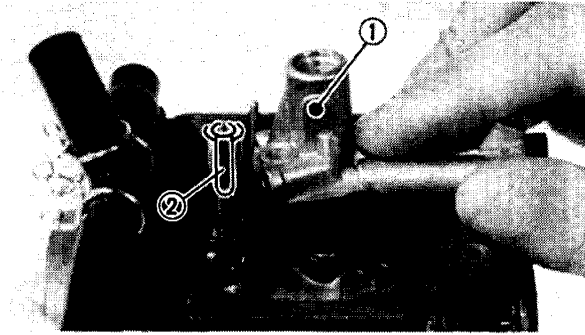
CAUTION:

- Before reassembling, wash all parts in clean gasoline.
- Always use a new gasket.

1. Install:
- Needle jet ③
 - O-ring ②
 - Gasket ①

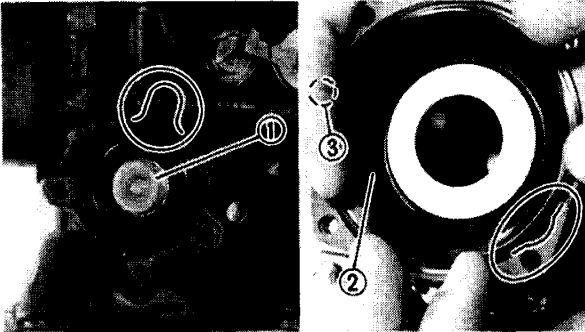
NOTE: Make sure the projections on the carburetor body are meshed with the holes on the gasket.





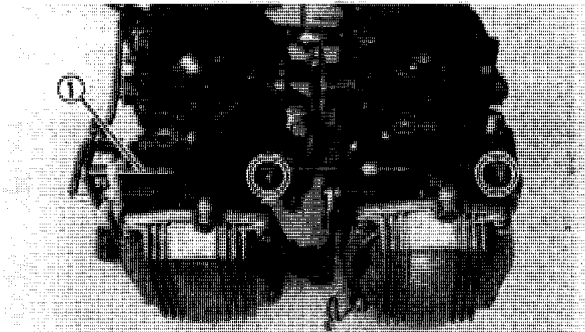
2. Install:
- Jet block

NOTE:
Make sure the projection ① on the jet block is meshed with the groove ② on the needle jet.

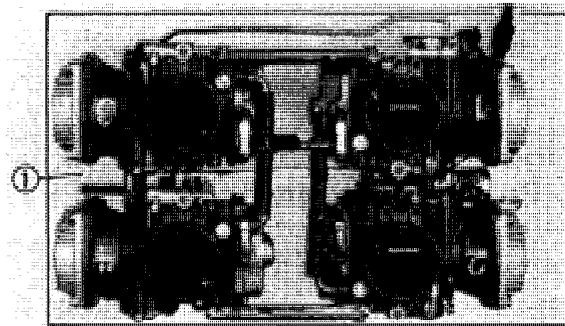


3. Install:
- Coasting enricher ①
 - Vacuum piston ②
 - O-ring ③

NOTE:
There is a tab on the rubber diaphragm and a matching recess in the carburetor body to accept the diaphragm tab.




4. Install:
- Starter lever shafts ①
- Apply LOCTITE® to the starter plunger lever securing screws.



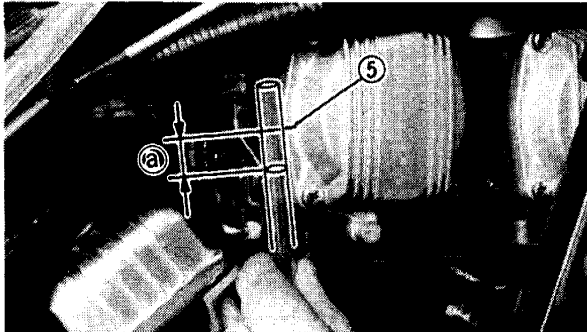
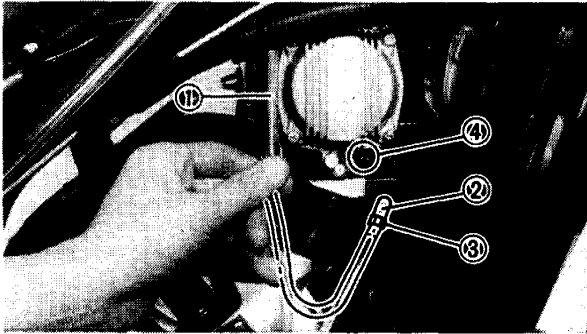
5. Install:
- Mounting brackets:
- Apply LOCTITE® to the bracket securing screws.

NOTE:
When reassembling, the surface plate ① should be used for proper carburetor alignment.

 Screws (Mounting Brackets):
5 Nm (0.5 m·kg, 3.6 ft·lb)

INSTALLATION

1. Install:
- Carburetors
- Reverse the removal steps



ADJUSTMENT

1. Measure:

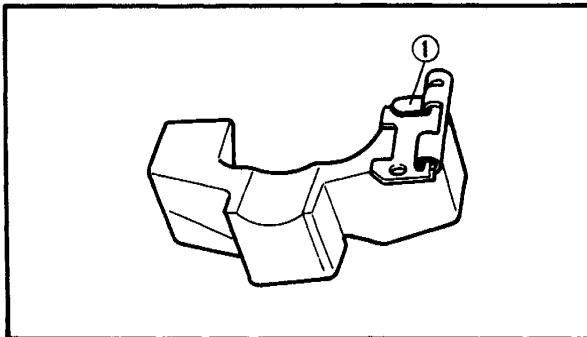
- Fuel level
- Out of specification → Adjust.
- By the following measurement steps.



Fuel Level (a) :
 15.5 ~ 16.5 mm (0.61 ~ 0.65 in)
 Below the Carburetor Piston
 Valve Center

Fuel level measurement steps:

- Place the motorcycle on a level surface.
- Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
- Connect the Fuel Level Gauge ① (YM-01312-A) to the drain pipe ② using a level gauge adapter ③ .
- Loosen the drain screw ④ and warm up the engine for several minutes.
- Measure the fuel level (a) with the gauge.
- ⑤ Piston valve center mark
- Repeat the above procedure for other carburetors.
- If the fuel level(s) is incorrect, adjust the fuel level(s).



2. Adjust:

- Fuel level
- By the following adjustment steps.

Fuel level adjustment steps:

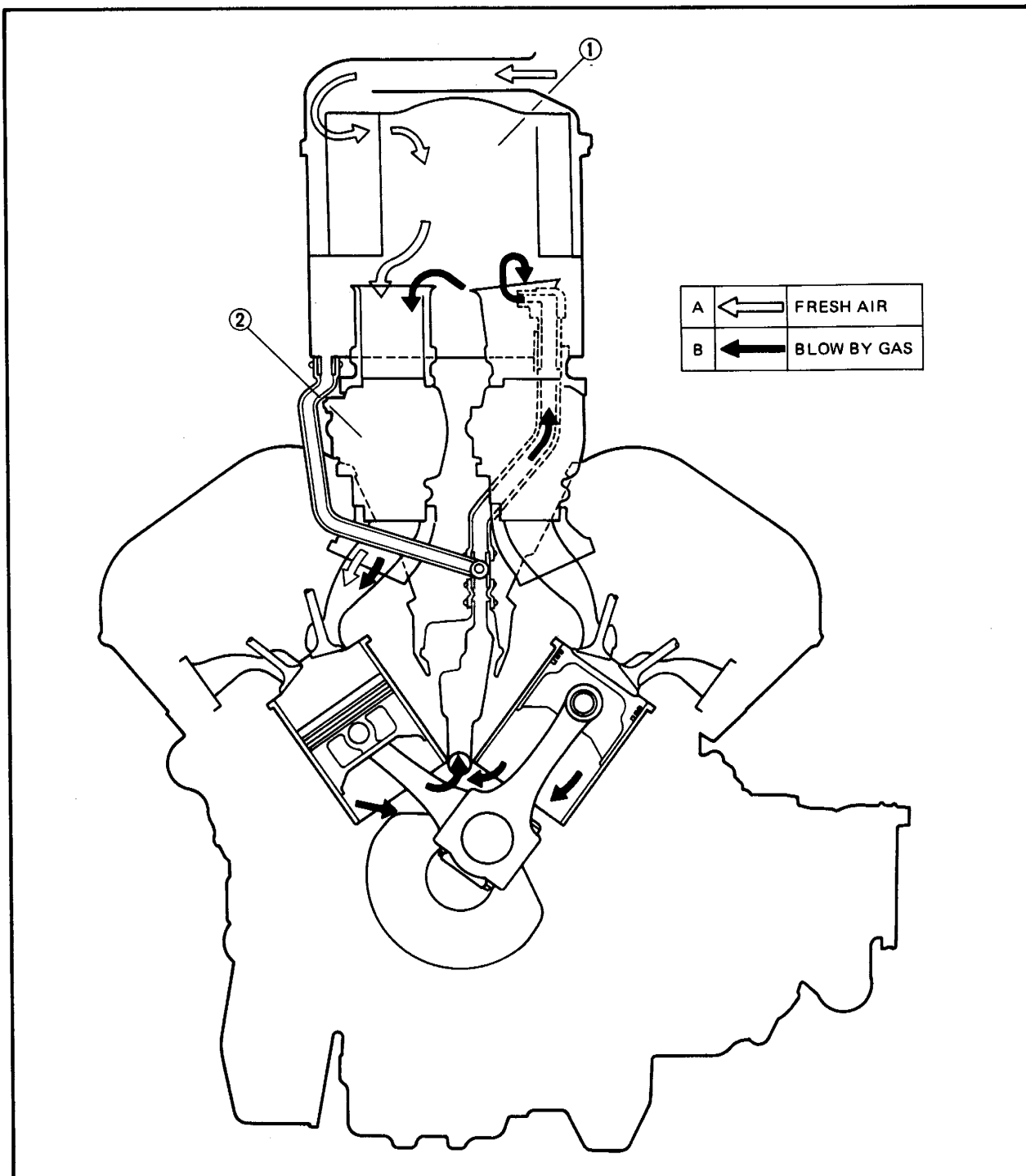
- Remove the carburetors.
- Inspect the needle valve.
- If it is worn, replace it.
- If it is fine, adjust float level by bending the float tang ① slightly.
- Repeat the procedure for the other carburetors.



AIR CLEANER AND CRANKCASE VENTILATION SYSTEM

Refer to "CHAPTER 2" for the air cleaner maintenance.

- ① Air cleaner
- ② Carburetor



CHAPTER 6. CHASSIS

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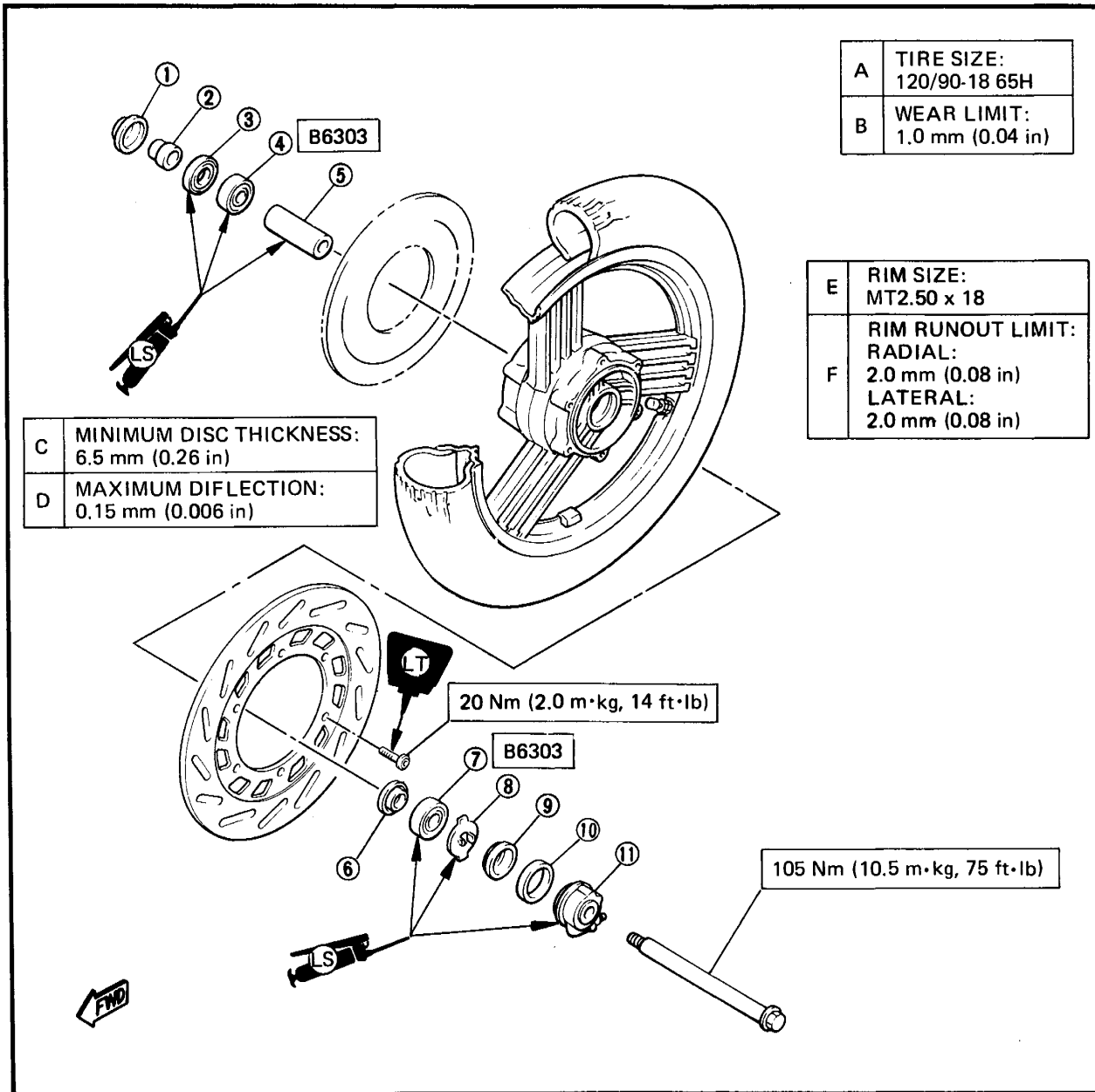
CHASSIS

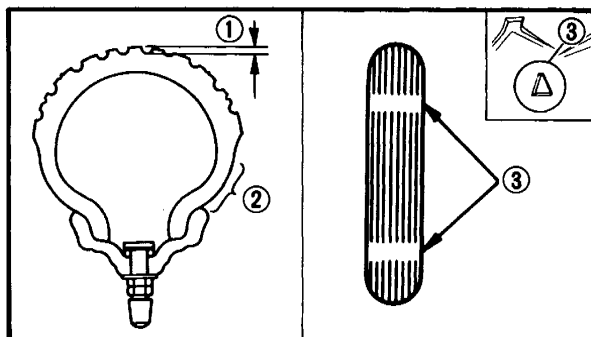
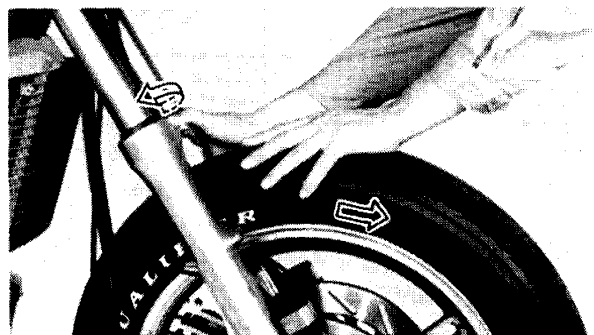
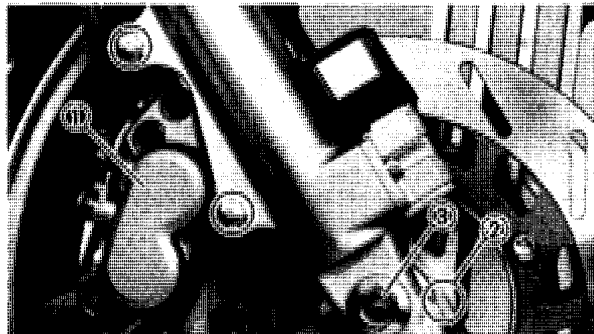
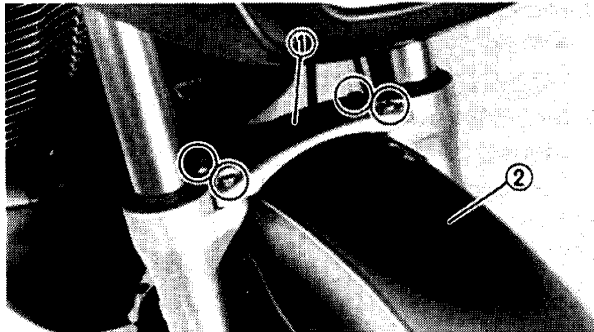
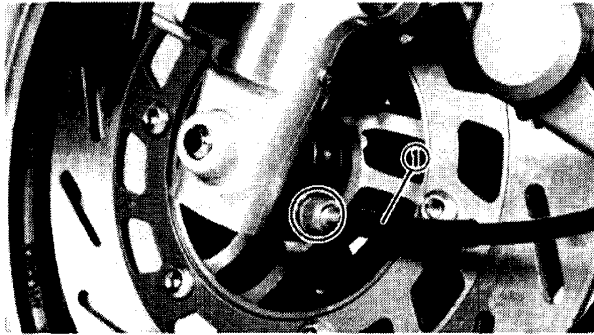
FRONT WHEEL

- ① Dust cover
- ② Collar
- ③ Oil seal
- ④ Bearing
- ⑤ Spacer
- ⑥ Spacer flange
- ⑦ Bearing
- ⑧ Meter clutch
- ⑨ Clutch retainer
- ⑩ Oil seal
- ⑪ Gear unit assembly

TIRE AIR PRESSURE		
Cold Tire Pressure	Front	Rear
Up to 90 kg (198 lb) Load*	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)
90 kg (198 lb)* ~ Maximum Load*	225 kPa (2.3 kg/cm ² , 32 psi)	275 kPa (2.8 kg/cm ² , 40 psi)
High Speed Riding	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)
Maximum Load	XVZ13DS: 175 kg (386 lb)	XVZ13DSC: 174 kg (384 lb)

*Load is the total weight of cargo, rider, passenger, and accessories.



**REMOVAL****WARNING:**

Securely support the motorcycle so it won't fall over when the front wheel is removed.

1. Place the motorcycle on its centerstand.
2. Remove:
 - Speedometer cable ①
3. Remove:
 - Fork brace ①
 - Front fender ②
 - Brake hose holders (Left and right) ③
4. Remove:
 - Brake caliper (Right) ①
5. Loosen:
 - Pinch bolt (Front axle) ②
 - Front axle ③
6. Elevate the front wheel by placing a suitable stand under the engine.
7. Remove:
 - Front axle
 - Front wheel

Lower the wheel until the brake discs come off the calipers. Turn the brake calipers outward so they do not obstruct the wheel.

NOTE:

Do not squeeze the brake lever while the wheel is off the motorcycle.

INSPECTION

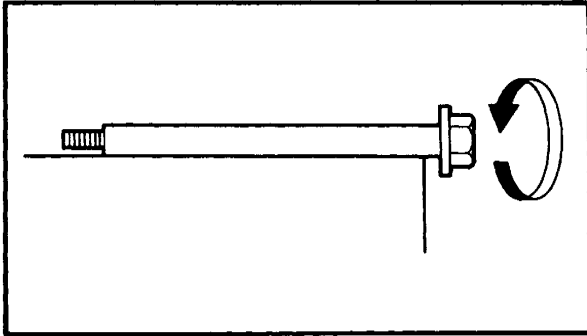
1. Inspect:
 - Tire

Tire tread shows crosswise lines (minimum tread depth)/Cracks → Replace.



Minimum Tire Tread Depth:
1.0 mm (0.04 in)

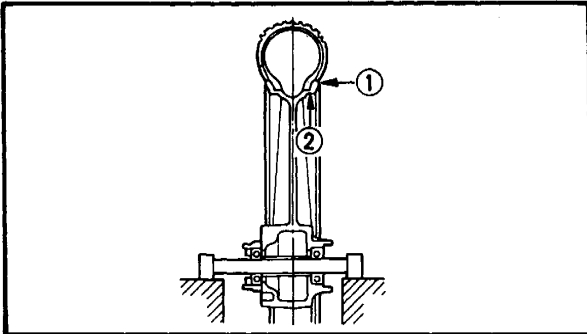
- ① Tread depth ② Side wall ③ Wear indicator



2. Inspect:
- Front axle
Bends → Replace.
Roll the axle on a flat surface.

WARNING: _____

Do not attempt to straighten a dent axle.



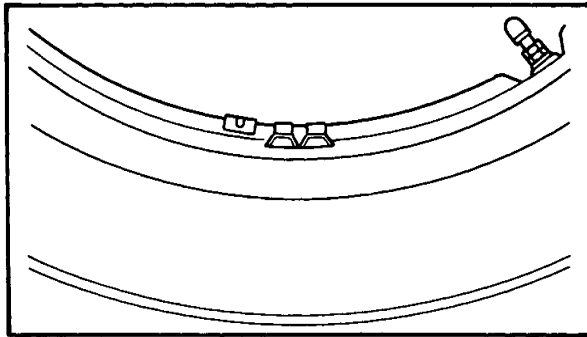
3. Inspect:
- Wheel
Cracks/Bends/Warpage → Replace.

4. Measure:
- Wheel runout
Over specified limit → Replace.



Rim Runout Limits:

Radial ①: 2.0 mm (0.08 in)
Lateral ②: 2.0 mm (0.08 in)



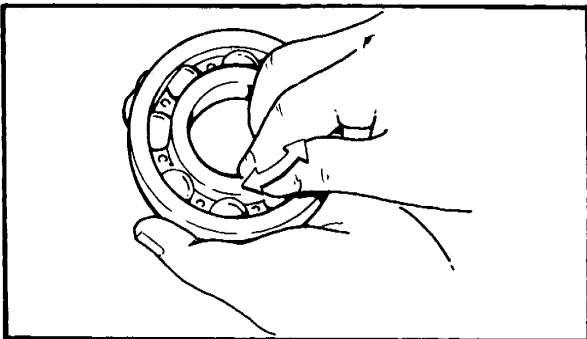
5. Check:
- Wheel balance
Out of balance → Adjust.

NOTE: _____

Balance wheels with the brake discs installed.

CAUTION: _____

Be sure the valve stem locknut is tightened securely after repairing or replacing a tire and/or wheel.



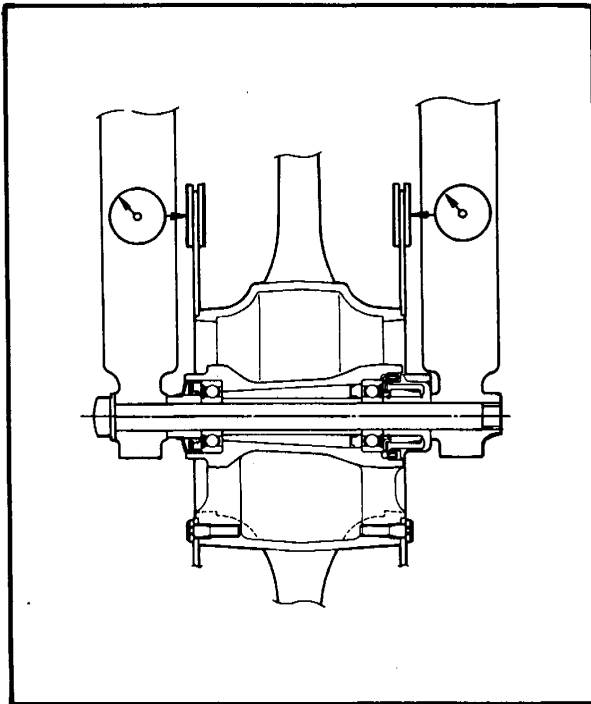
WARNING: _____

Ride conservatively after installing a tire to allow the tire to seat itself correctly on the rim.

6. Inspect:
- Wheel bearings
Bearings allow play in the wheel hub or wheel turns roughly → Replace.
By the following replacement steps.

Wheel bearing replacement steps:

- Clean the outside of the wheel hub.
- Drive out the bearing.

**WARNING:**

Eye protection is recommended when using striking tools.

- Install the new bearing by reversing the previous steps.

NOTE:

Use a socket that matches the outside diameter of the race of the bearing.

CAUTION:

Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

7. Inspect:

- Brake disc

Wear/Over specified limit → Replace.



**Maximum Deflection
(Front and Rear):**
0.15 mm (0.006 in)

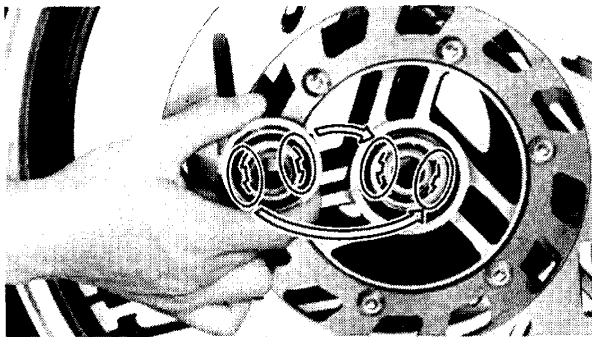
Minimum Disc Thickness

Front:

6.5 mm (0.26 in)

Rear:

4.5 mm (0.18 in)

**INSTALLATION**

When installing the front wheel, reverse the removal procedure. Note the following points.

1. Apply:

- Lithium base grease

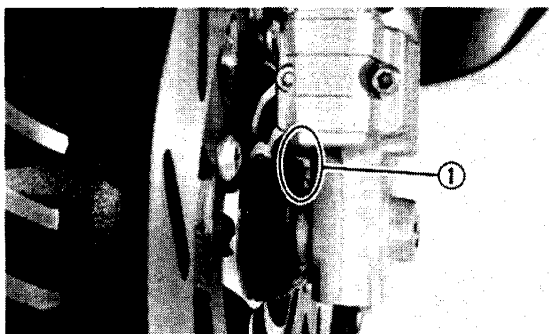
Lightly grease to the oil seal and gear unit.

2. Install:

- Gear unit assembly

NOTE:

Be sure that the two projections inside the wheel hub mesh with the two slots in the gear unit assembly.

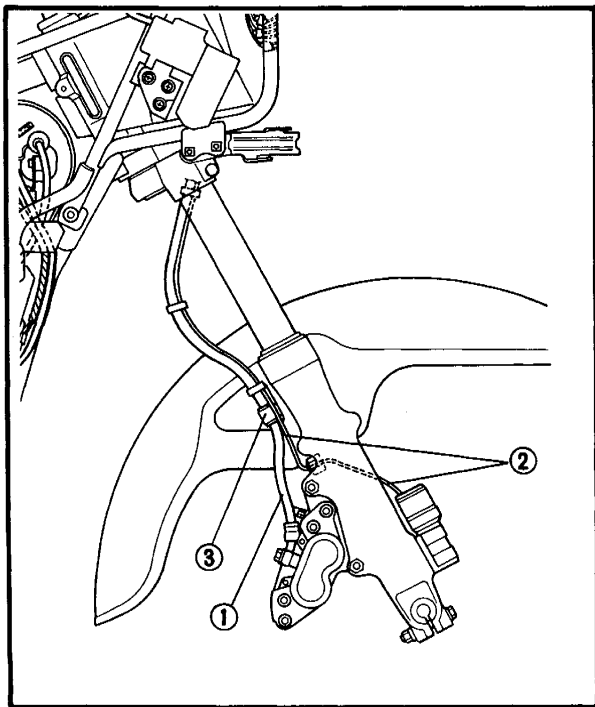


3. Install:
- Front wheel

NOTE: _____
 Be sure that the projecting portion (torque stopper) ① of the gear unit housing is positioned correctly.

4. Tighten:
- Front axle
 - Brake caliper (Right)
 - Pinch bolt (Front axle)

	Front Axle:
	105 Nm (10.5 m·kg, 72 ft·lb)
	Brake Caliper (Right):
	45 Nm (4.5 m·kg, 32 ft·lb)
	Pinch Bolt (Front Axle):
	20 Nm (2.0 m·kg, 14 ft·lb)



5. Install:
- Brake hose holders (Left and right)
 - Front fender
 - Fork brace

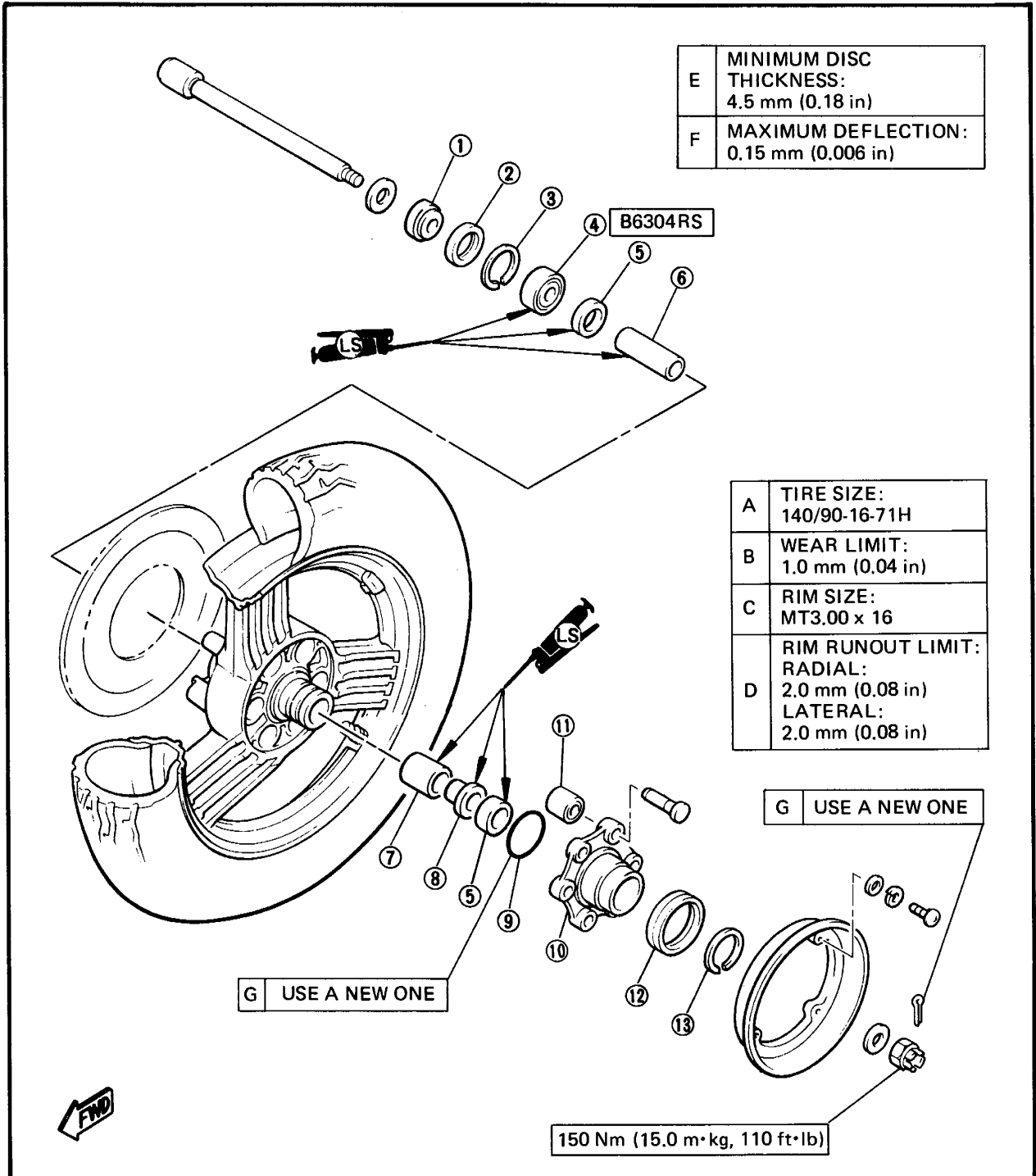
	Front Fender:
	20 Nm (2.0 m·kg, 14 ft·lb)

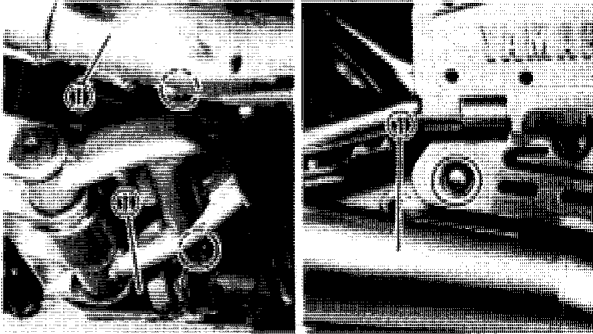
WARNING: _____
 Make sure that pipes and leads are routed properly.

- ① Brake hose
- ② EAND leads
- ③ Brake hose holder

REAR WHEEL

- ① Dust cover
- ② Oil seal
- ③ Circlip
- ④ Bearing
- ⑤ Spacer flange
- ⑥ Spacer
- ⑦ Collar
- ⑧ Cylindrical bearing
- ⑨ O-ring
- ⑩ Clutch hub
- ⑪ Damper
- ⑫ Hub dust seal
- ⑬ Circlip



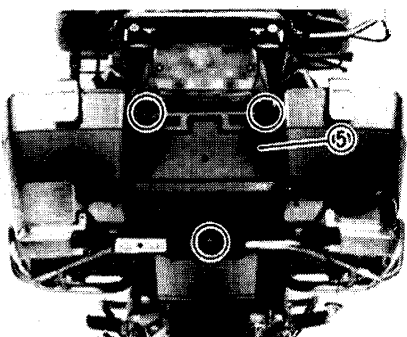
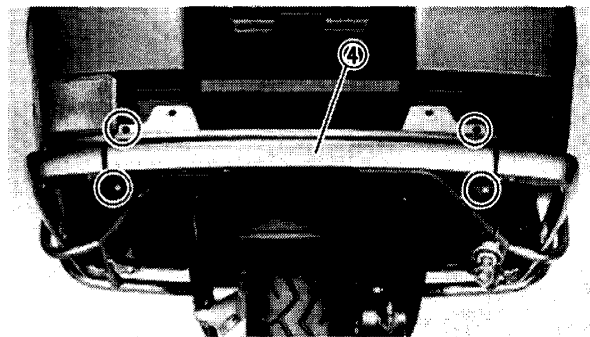
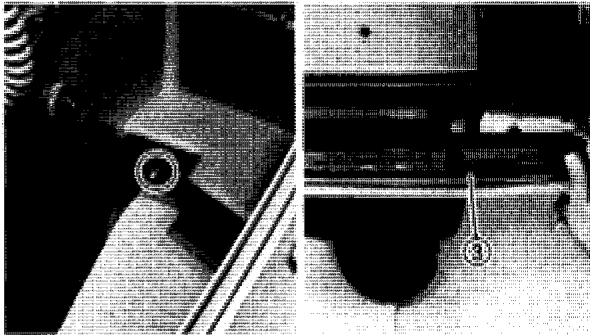
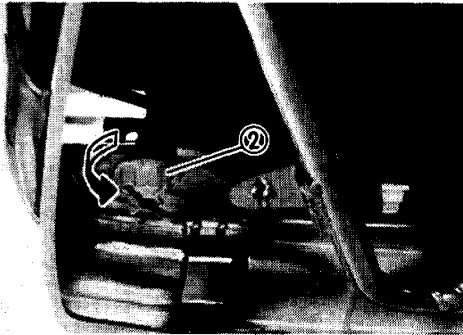


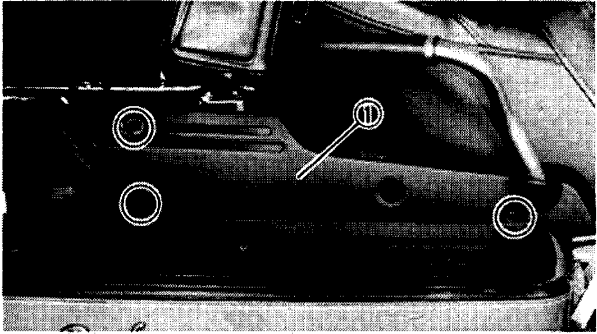
REMOVAL

1. Place the motorcycle on its centerstand.

2. Remove:

- Mufflers (Left and right) ①
- Saddlebag lid (Right)
- Flasher light bulb (Right) ②
- Reflector (Rear-Center) ③
- Ornamental band (Rear-Center) ④
- Rear fender cover ⑤



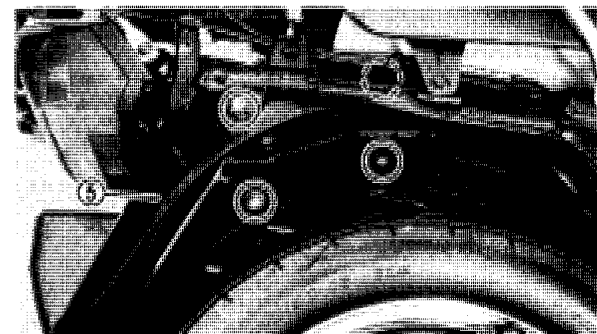
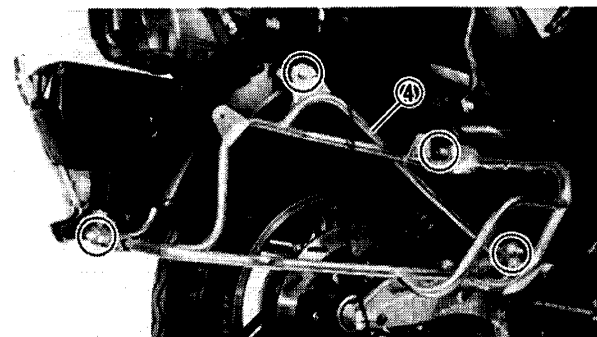
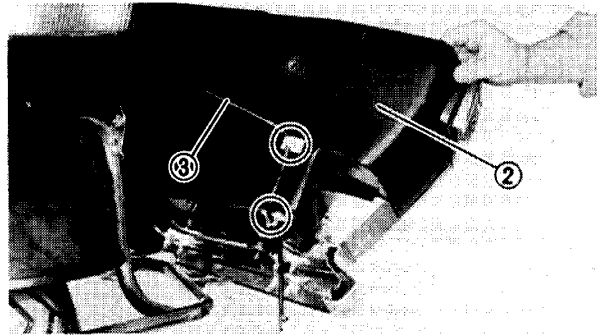
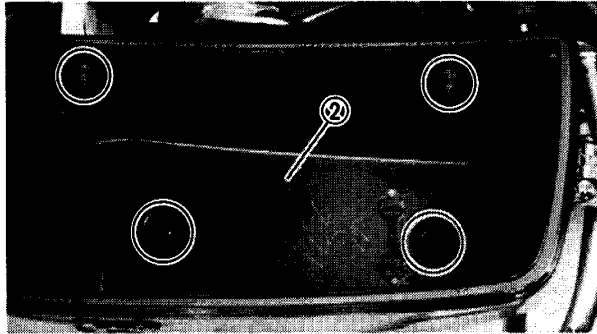


3. Remove:

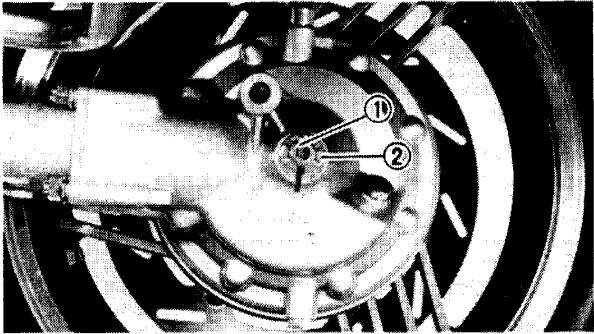
- Cover (Rear-Right) ①
- Saddlebag assembly (Right) ②

NOTE:

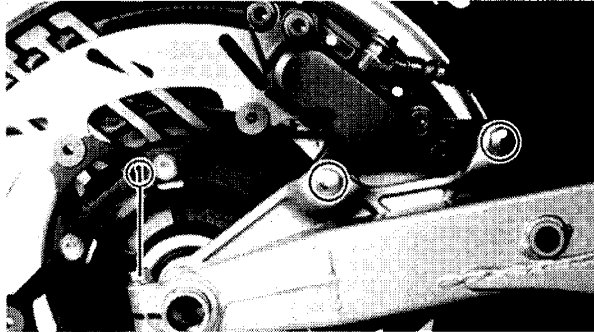
Before removing the saddlebag, unhook the flasher light lead ③ from the clamps.



- Saddlebag stay ④
- Rear fender ⑤

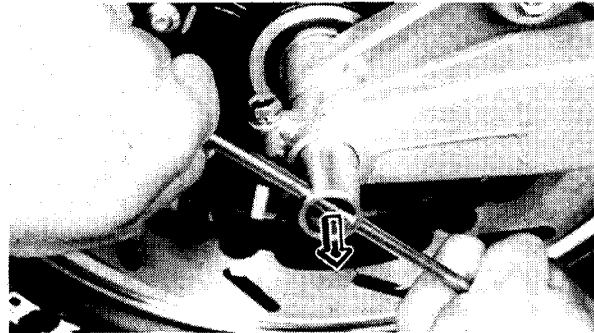


4. Remove:
- Cotter pin ①
 - Axle nut ②
 - Washer



5. Remove:
- Rear caliper

NOTE: _____
Do not depress the brake pedal when the wheel is off the motorcycle as the brake pads will be forced.

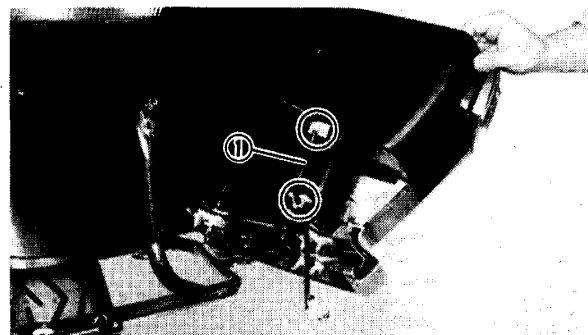
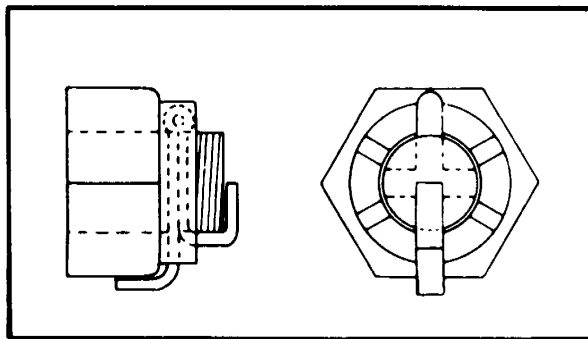
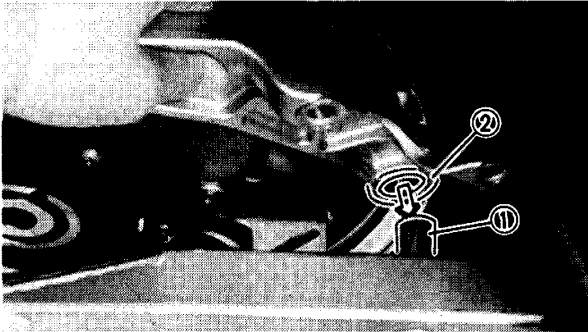
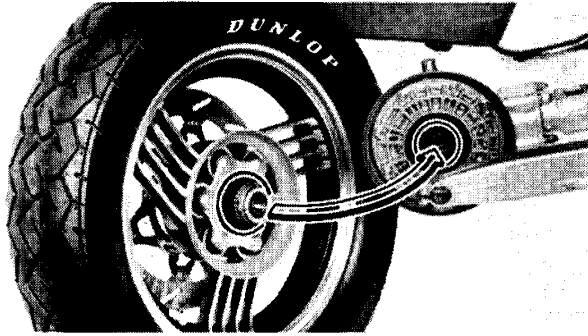


6. Loosen:
- Pinch bolt (Rear axle) ①

7. Remove:
- Rear axle
 - Tension bar
 - Washer
 - Rear wheel
- Move the wheel to the right side to separate it from the final gear case.

INSPECTION

1. Inspect:
- Tire
 - Rear axle
 - Wheel
 - Wheel bearings
 - Brake disc
- Refer to "FRONT WHEEL – INSPECTION" section.
2. Measure:
- Wheel runout
- Refer to "FRONT WHEEL – INSPECTION" section.
3. Check:
- Wheel balance
- Refer to "FRONT WHEEL – INSPECTION" section.



INSTALLATION

When installing the rear wheel, reverse the removal procedure. Note the following points.

1. Apply:
 - Lithium base grease
Lightly grease to the final gear case splines.
2. Install:
 - Rear wheel assembly

NOTE: _____


Be sure the splines on the wheel hub fit into final gear case.

3. Install:
 - Tension bar
 - Washer
 - Rear axle
 - Brake caliper (Right)

NOTE: _____

Make sure the swingarm projection ① is placed in the hole ② of the tension bar.

4. Tighten:
 - Rear axle
 - Pinch bolt (Rear axle)
 - Brake caliper (Right)
 - Mufflers (Left and right)

	Axle Nut: 150 Nm (15.0 m·kg, 110 ft·lb)
	Pinch Bolt (Rear Axle): 20 Nm (2.0 m·kg, 14 ft·lb)
	Brake Caliper (Right): 45 Nm (4.5 m·kg, 32 ft·lb)
	Mufflers: 25 Nm (2.5 m·kg, 18 ft·lb)

CAUTION: _____

Always use a new cotter pin on the rear axle nut.

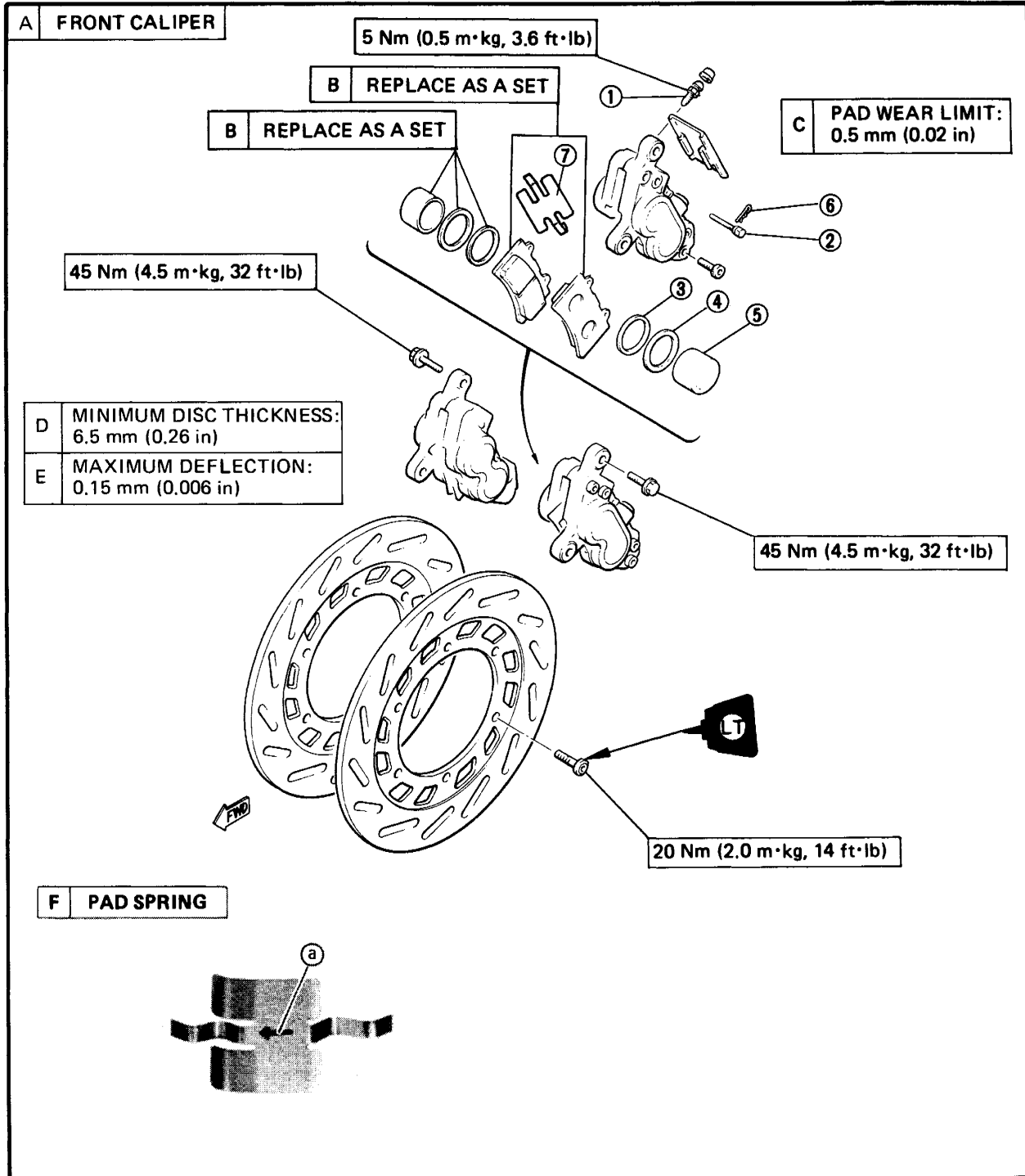
5. Install:
 - Saddlebag assembly (Right)

NOTE: _____

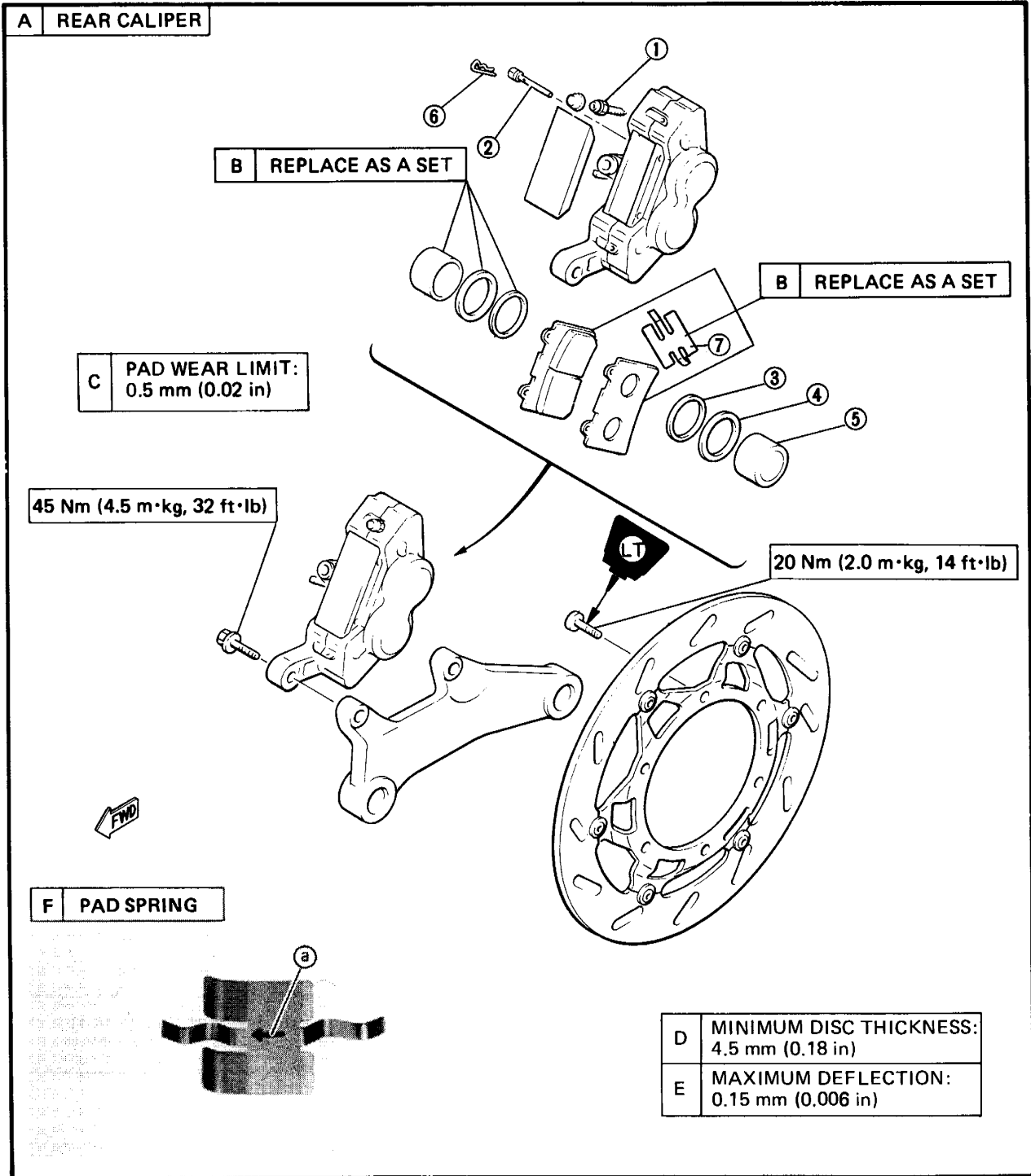
Before installing the saddlebag, route the flasher light lead ① and then clamp it.

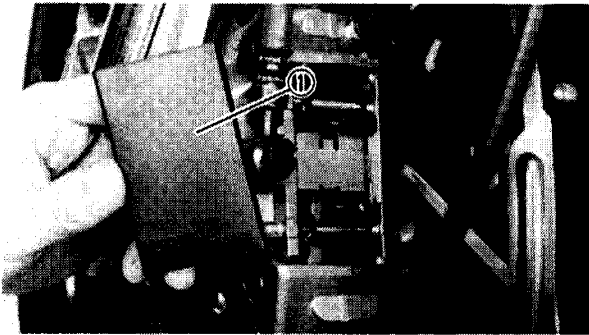
FRONT AND REAR BRAKE

- ① Air bleed screw
 - ② Retaining pin
 - ③ Dust seal
 - ④ Piston seal
 - ⑤ Piston
 - ⑥ Circlip
 - ⑦ Pad spring
- F** The arrow mark **(a)** on the pad spring must point in the disc rotating direction.



- ① Air bleed screw
 - ② Retaining pin
 - ③ Dust seal
 - ④ Piston seal
 - ⑤ Piston
 - ⑥ Clirlip
 - ⑦ Pad spring
- [F] The arrow mark (a) on the pad spring must point in the disc rotating direction.



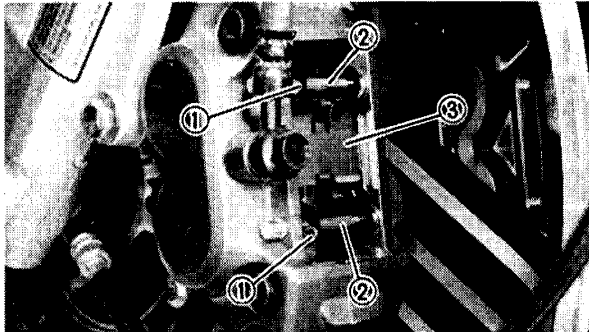


CALIPER PAD REPLACEMENT

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

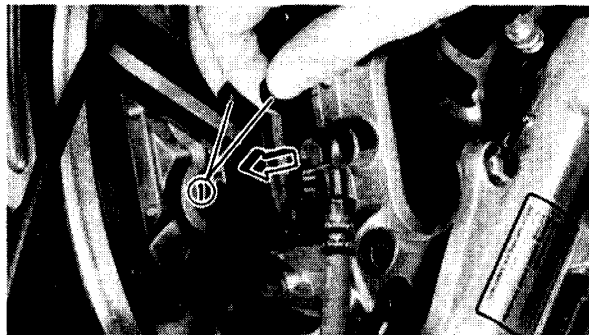
1. Remove:

- Cover ①



2. Remove:

- Retaining clips ①
- Retaining pins ②
- Pad spring ③



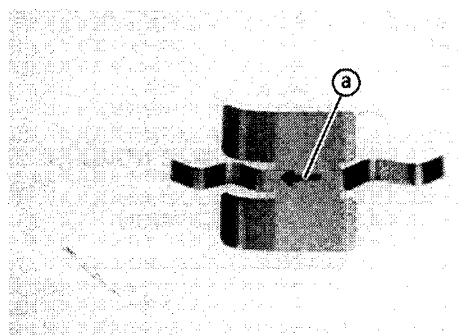
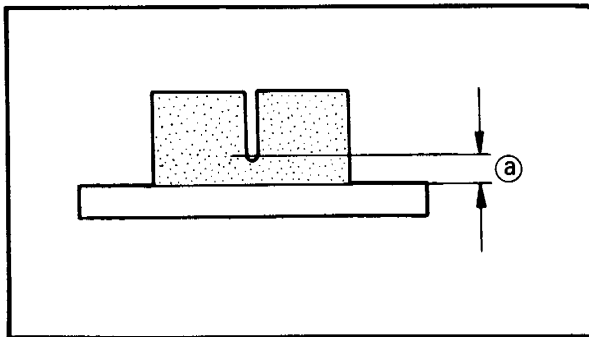
3. Remove:

- Pads ①

NOTE:

- Replace the pad spring if pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.

	<p>Wear Limit (a): 0.5 mm (0.02 in)</p>
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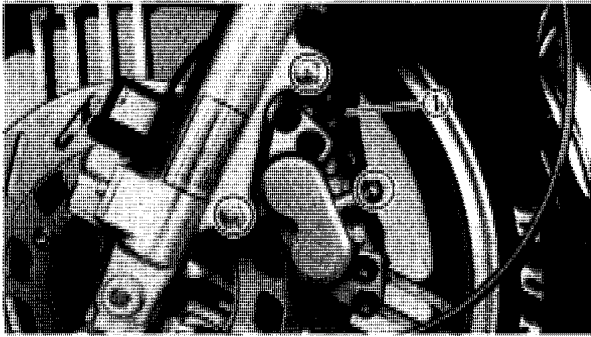


4. Install:

- Components in above list (steps "3 ~ 1")

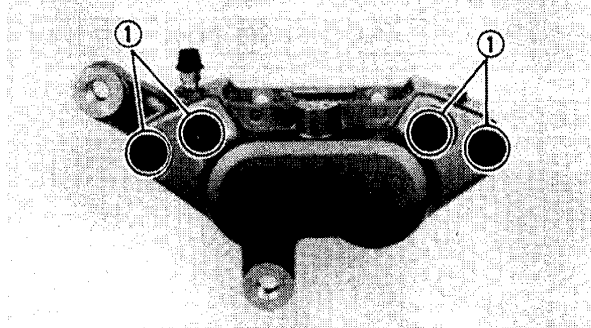
NOTE:

The arrow mark (a) on the pad spring must point in the disc rotating direction.



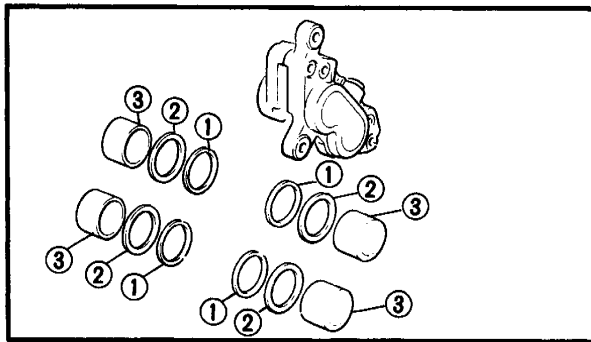
CALIPER DISASSEMBLY

1. Remove:
 - Pads
Refer to "CALIPER PAD REPLACEMENT" section.
2. Remove:
 - Brake hose ①
Place the open hose end into a container and pump the old fluid out carefully.
3. Remove:
 - Caliper



CAUTION:

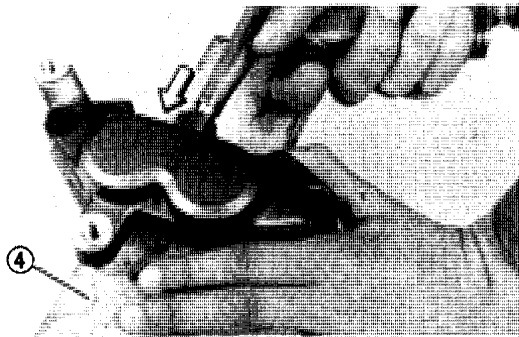
Never loosen the bridge bolts ① on either side of the caliper.



4. Remove:
 - Dust seals ①
 - Piston seals ②
 - Pistons ③
 By the following removal steps.

Caliper piston removal steps:

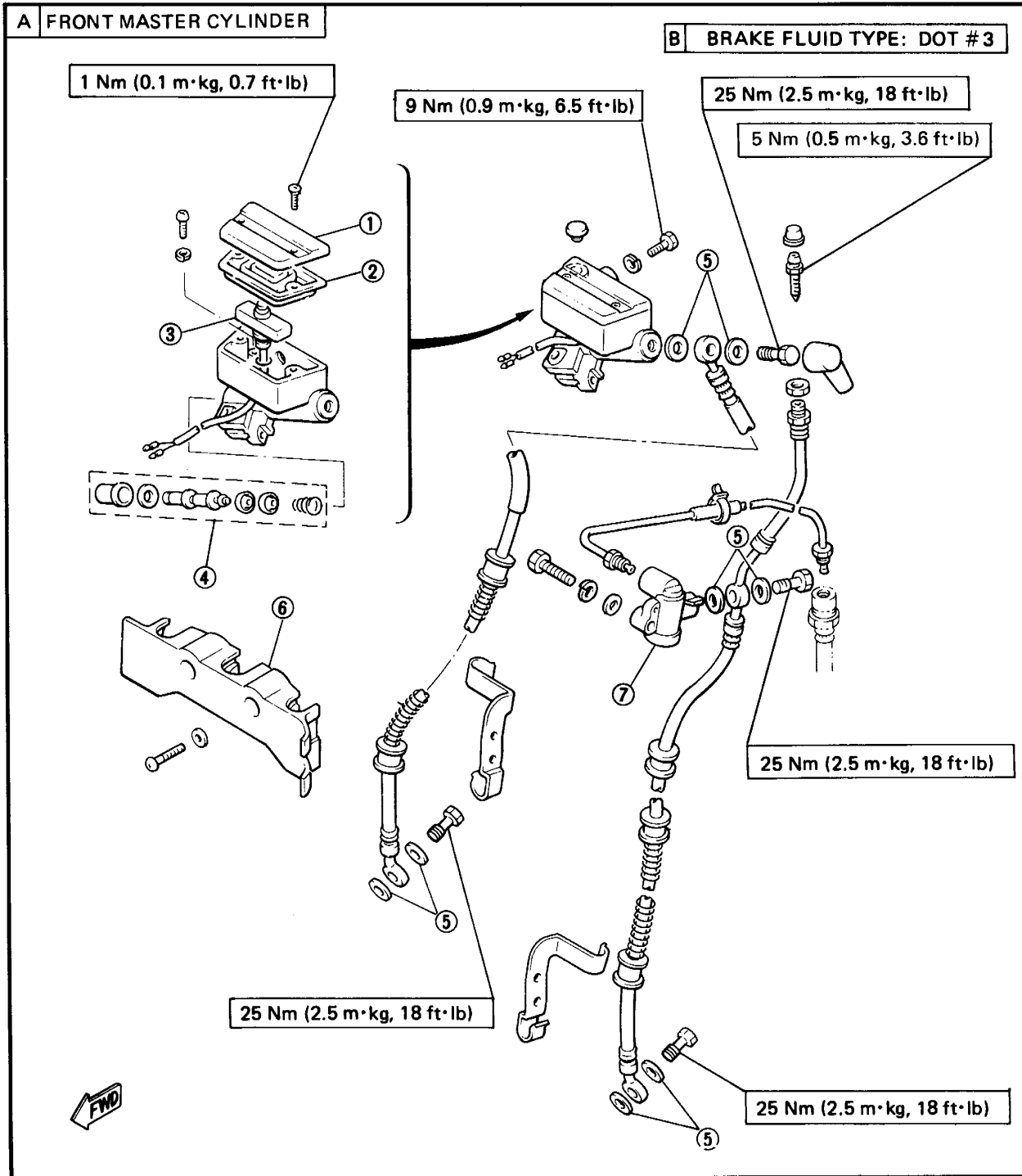
- Insert a piece of wooden board ④ into the caliper to lock the right side piston.
- Blow compressed air into the tube joint opening to force out the left side pistons from the caliper body.
- Repeat previous step to force out the right side pistons from the caliper body.





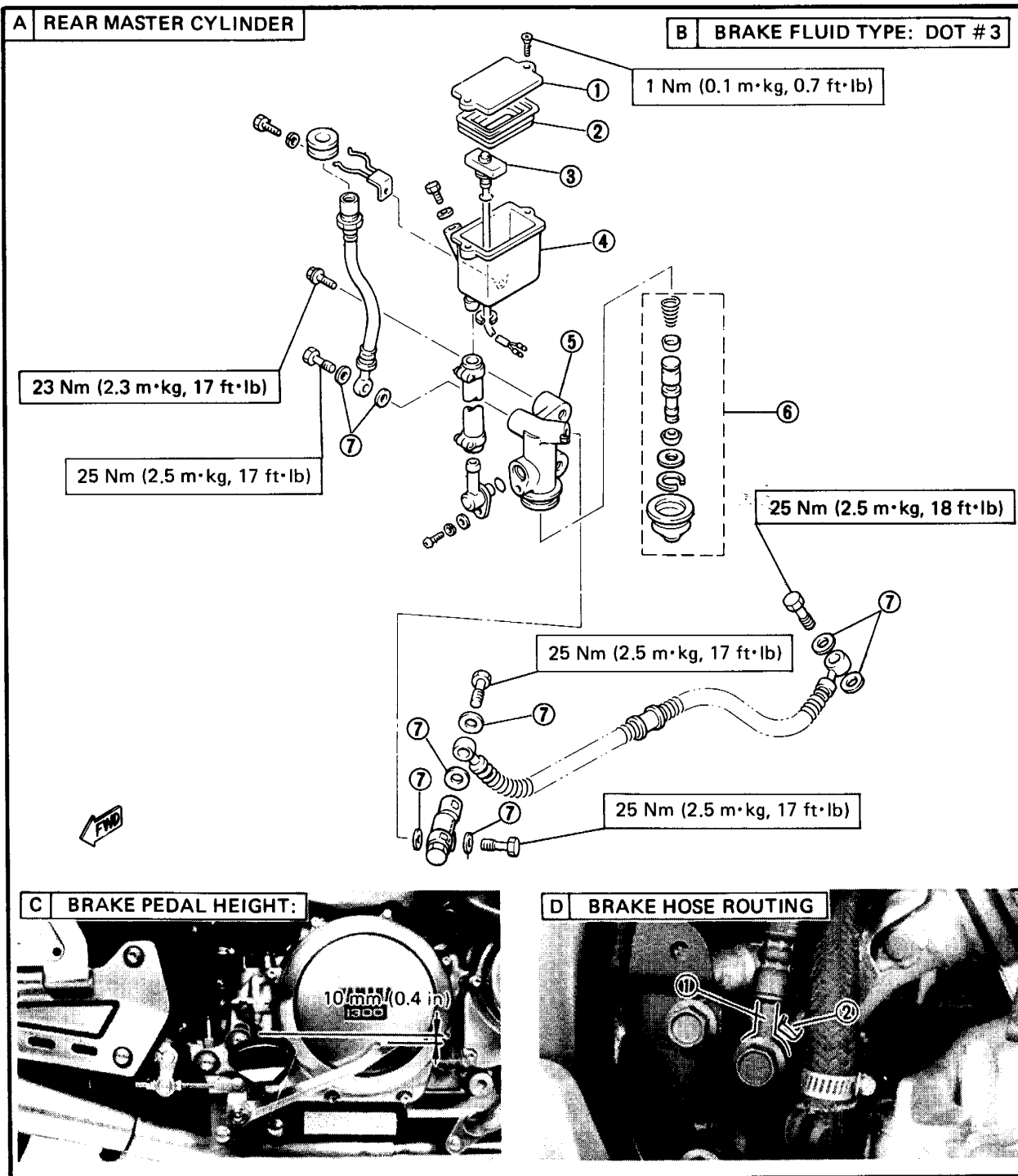
MASTER CYLINDER DISASSEMBLY

- ① Master cylinder cap
- ② Rubber seal
- ③ Brake fluid level sensor
- ④ Master cylinder kit
- ⑤ Copper washer
- ⑥ Brake hose holder
- ⑦ Metering valve



- ① Master cylinder cap
- ② Rubber seal
- ③ Brake fluid level sensor
- ④ Reservoir tank
- ⑤ Master cylinder
- ⑥ Master cylinder kit
- ⑦ Copper washer

D BRAKE HOSE ROUTING:
When installing the rear brake hose, lightly touch the brake pipe ① with the projection ② on the master cylinder.

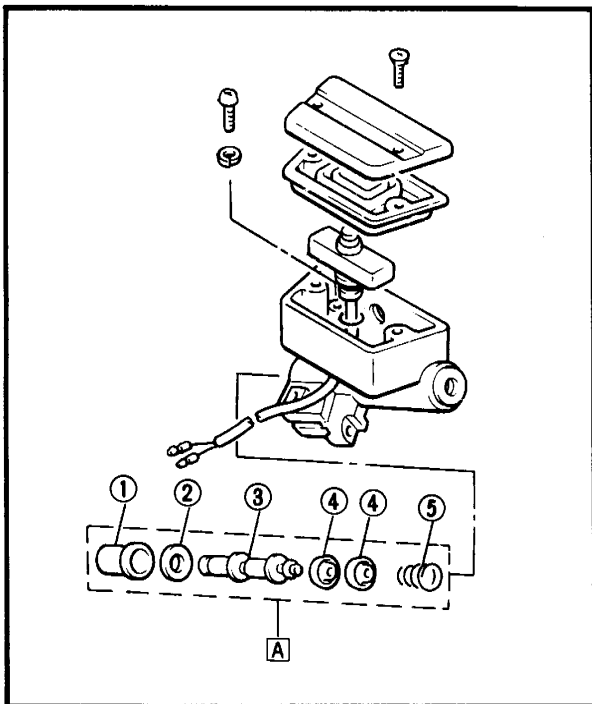




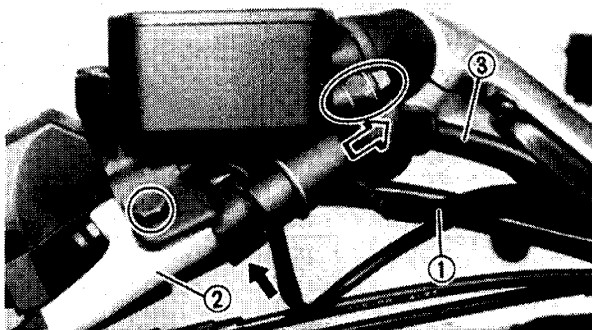
Front Brake Master Cylinder Disassembly

NOTE:

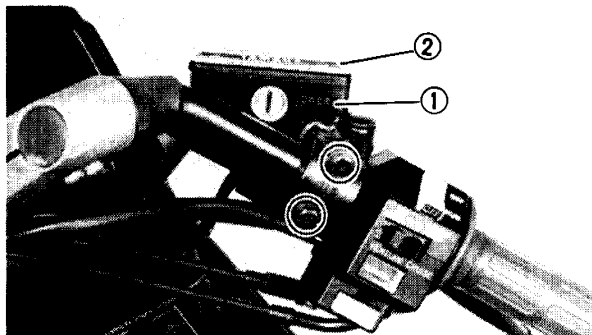
Drain the brake fluid before removing master cylinder.



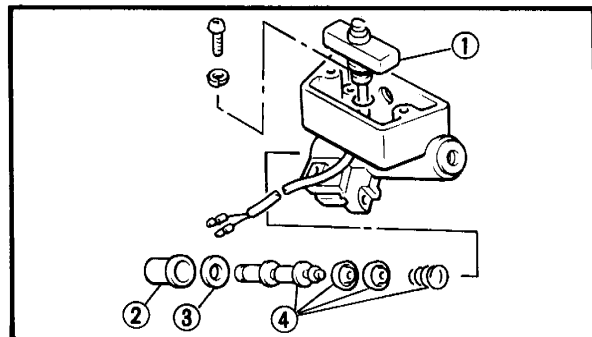
- ① Dust boot
- ② Circlip
- ③ Piston
- ④ Piston cups
- ⑤ Return spring
- A MASTER CYLINDER KIT (Replace as a set)



1. Remove:
 - Cover (Brake lever)
 - Brake light switch leads ①
 - Brake lever ②
 - Lever spring
2. Disconnect:
 - Brake hose ③
 - Drain the fluid.



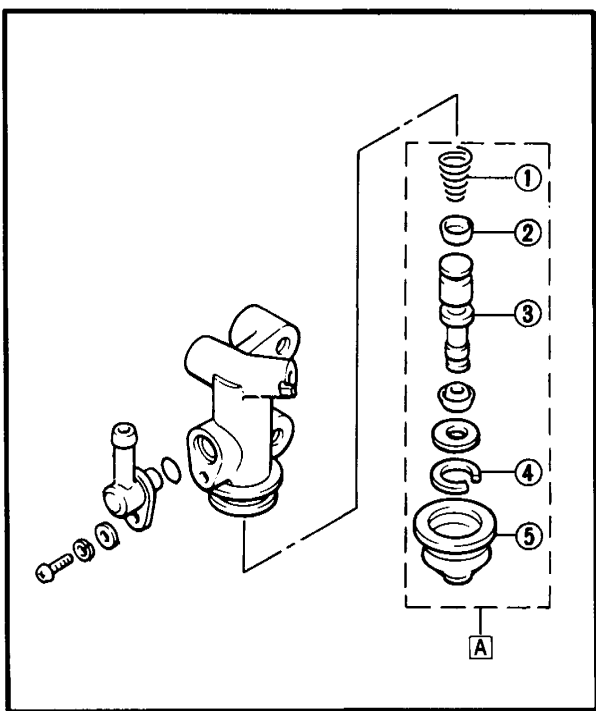
3. Remove:
 - Master cylinder ①
 - Master cylinder cap ②



4. Remove:
 - Brake fluid level sensor ①
 - Dust boot ②
 - Circlip ③
 - Master cylinder kit ④

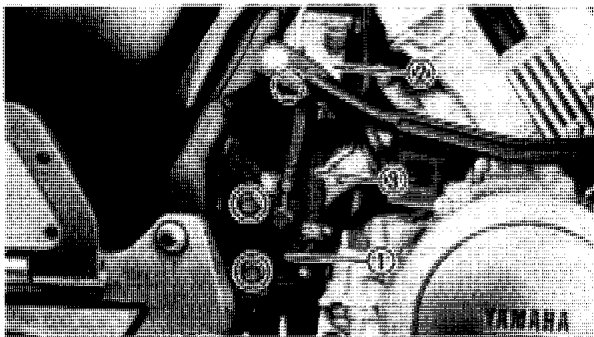
Rear Brake Master Cylinder Disassembly

NOTE: _____
 Drain the brake fluid before removing master cylinder.

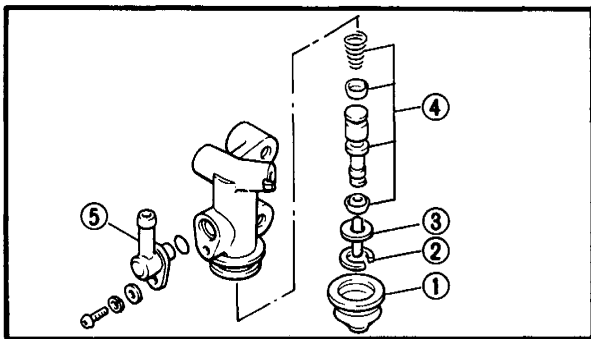


1. Remove:
 - Lower side cover (Right)
2. Disconnect:
 - Brake hose

- ① Spring
- ② Piston cup
- ③ Piston
- ④ Circlip
- ⑤ Dust boot
- A** MASTER CYLINDER KIT (Replace as a set)



3. Remove:
 - Master cylinder ①
 - Fluid reservoir tank ②
 Drain the fluid.
4. Disconnect:
 - Tank hose ③



5. Remove:
 - Dust boot ①
 - Circlip ②
 - Adjusting rod ③
 - Master cylinder kit ④
 Drain the excess fluid.
 - Proportioning valve ⑤

BRAKE INSPECTION AND REPAIR

Recommended Brake Component Replacement Schedule:	
Brake pads	As required
Piston seal, dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Replace only when brakes are disassembled



WARNING:

All internal parts should be cleaned in new brake fluid only. Do not use solvents will cause seals to swell and distort.

1. Inspect:

- Brake pads
Over specified limit → Replace.



Wear Limit (a):
0.5 mm (0.02 in)

2. Inspect:

- Caliper piston
Rust/Wear/Damage → Replace.
- Dust seal/Piston seal
Damage → Replace.

WARNING:

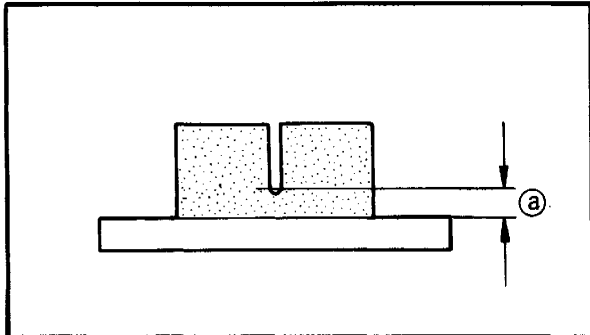
Replace the piston and dust seals whenever a caliper is disassembled.

- Master cylinder kit
- Master cylinder body
Scratches/Wear → Replace.

NOTE:

Clean all passages with new brake fluid.

- Brake hose
Cracks/Wear/Damage → Replace.



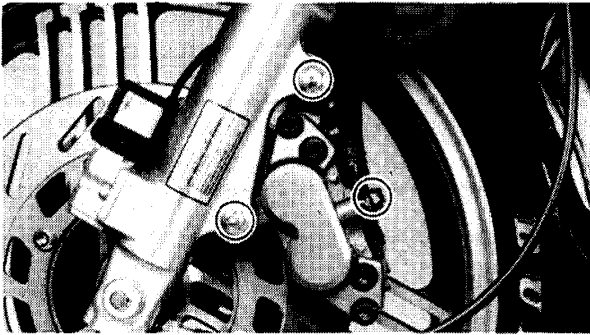
BRAKE REASSEMBLY

WARNING:

- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with brake fluid when installed.



Brake Fluid:
DOT #3



Caliper Reassembly

When assembling the caliper, reverse the disassembly procedure. Note the following points.

1. Install:
 - Brake calipers
 - Brake hoses



Brake Caliper:
45 Nm (4.5 m·kg, 32 ft·lb)

Brake Hose:
25 Nm (2.5 m·kg, 18 ft·lb)

2. Bleed the air completely from the brake system.

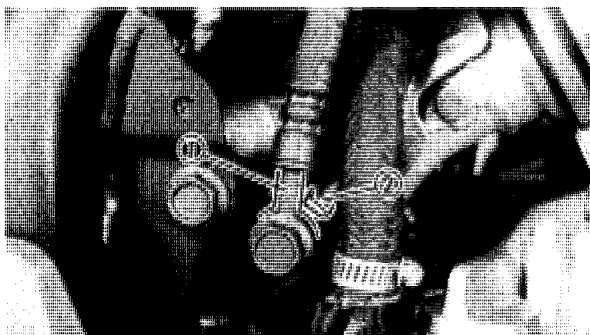
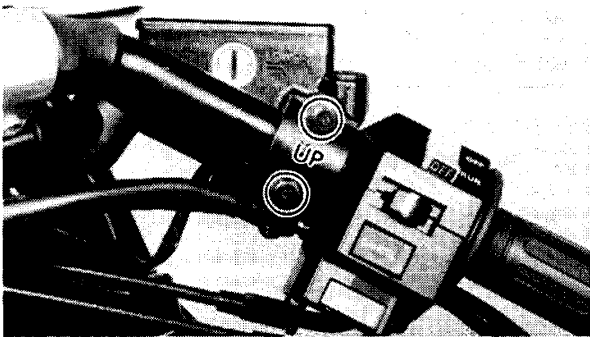
Master Cylinder Reassembly

When assembling the master cylinder, reverse the disassembly procedure. Note the following points.

1. Install:
 - Master cylinder kit

WARNING:

Internal parts should be lubricated with brake fluid when installed.



2. Install:
 - Proportioning valve
 - Master cylinders (Front and rear)
 - Brake hoses



Proportioning Valve:
26 Nm (2.6 m·kg, 19 ft·lb)

Front Master Cylinder:
9 Nm (0.9 m·kg, 6.5 ft·lb)

Rear Master Cylinder:
23 Nm (2.3 m·kg, 17 ft·lb)

Brake Hose:
25 Nm (2.5 m·kg, 18 ft·lb)

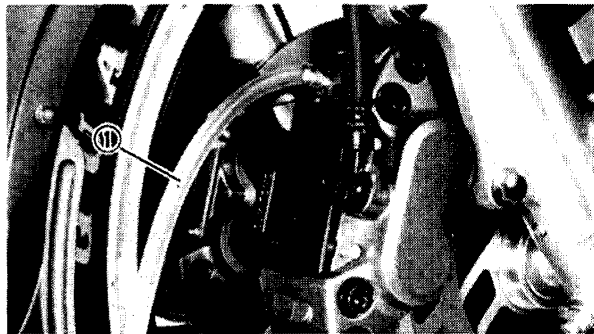
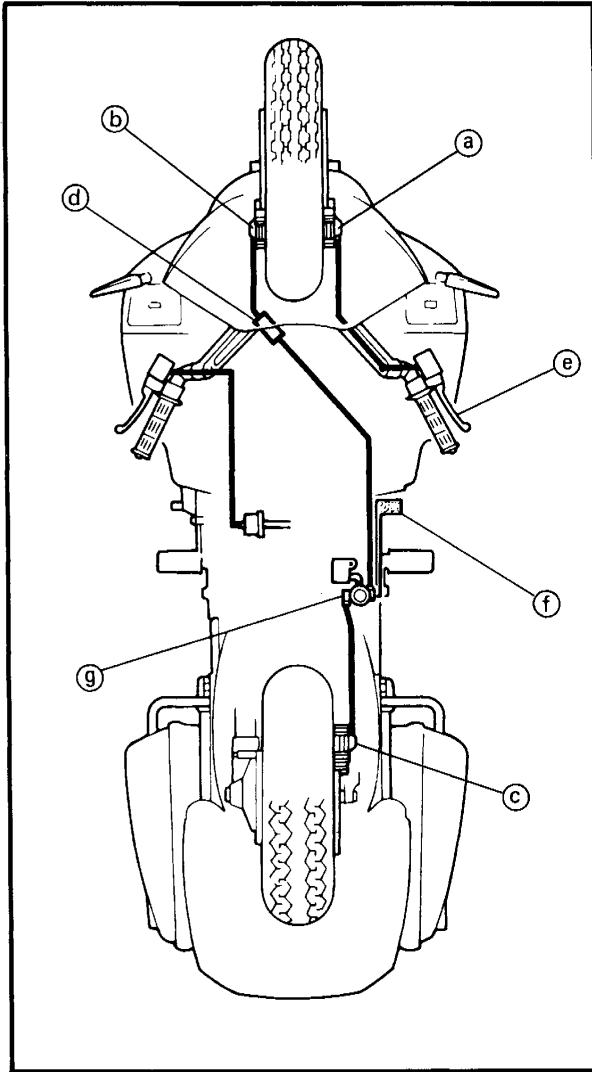
CAUTION:

When installing the rear brake hose, lightly touch the brake pipe ① with the projection ② on the master cylinder.

3. Fill:
 - Master cylinders

	Brake Fluid: DOT #3
---	-------------------------------

4. Bleed the air completely from the brake system.



AIR BLEEDING

WARNING: _____

Bleed the brake system if:

- The system has been disassembled.
- A brake hose has been loosened or removed.
- The brake fluid is very low.
- The brake operation is faulty.

A dangerous loss of braking performance may occur if the brake system is not properly bled.

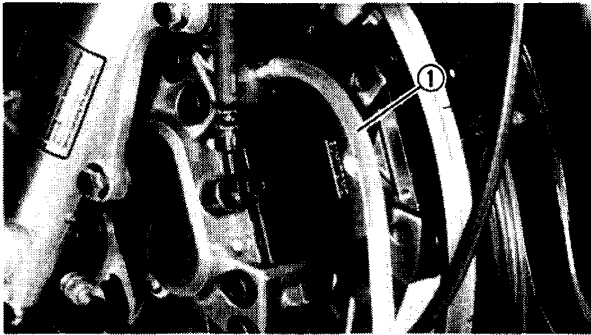
1. Bleed:
 - Brake fluid
 By the following steps.

Air bleeding steps:	
NOTE: _____	
Bleed the brake system in the following order.	
① First step – Front brake caliper (Right)	
② Second step – Front brake caliper (Left)	
③ Third step – Rear brake caliper	
④ Final step – Metering valve	

- ⑤ Brake lever ⑥ Brake pedal
- ⑦ Proportioning valve

First step – Front brake caliper (Right):

- a. Add proper brake fluid to the reservoir.
- b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
- c. Connect the clear plastic tube ① tightly to the caliper bleed screw.
- d. Place the other end of the tube into a container.
- e. Slowly apply the brake lever several times.
- f. Pull the lever in. Hold the lever in position.



- g. Loosen the bleed screw and allow the lever to travel towards its limit.
- h. Tighten the bleed screw when the lever limit has been reached; then release the lever.



Bleed Screw:
6 Nm (0.6 m·kg, 4.3 ft·lb)

- i. Repeat steps (e) to (h) until of the air bubbles have been removed from the system.

NOTE:

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

- j. Add brake fluid to the level line on the reservoir.

WARNING:

Check the operation of the brake after bleeding the brake system.

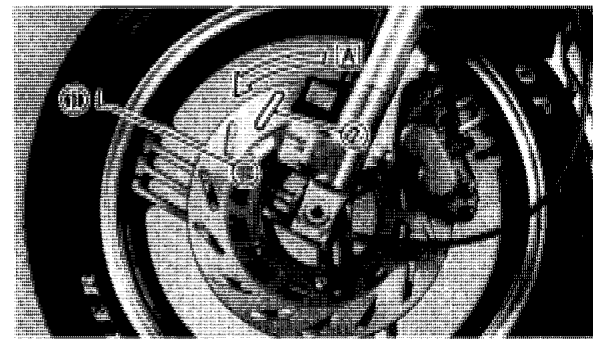
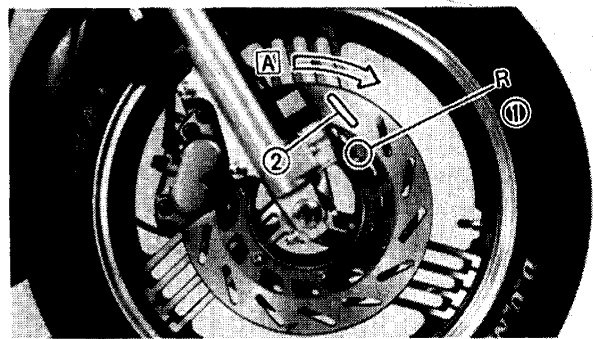
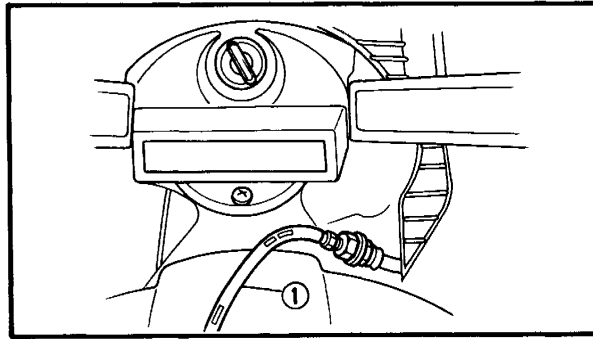
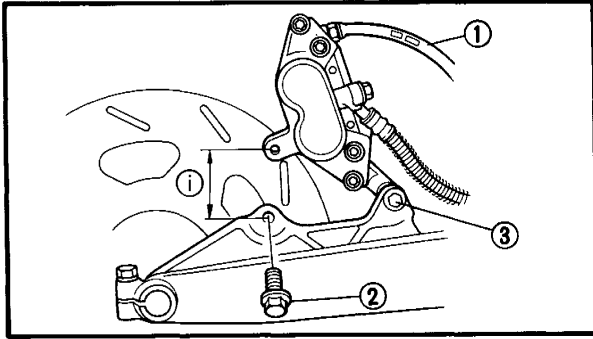
Second step – Front brake caliper (Left):

- a. Add proper brake fluid to the reservoir.
- b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
- c. Connect the clear plastic tube ① tightly to the caliper bleed screw.
- d. Place the other end of the tube into a container.
- e. Slowly apply the brake pedal several times.
- f. Push down on the pedal. Hold the pedal in position.
- g. Loosen the bleed screw and allow the pedal to travel towards its limit.
- h. Tighten the bleed screw when the pedal limit has been reached; then release the pedal.



Bleed Screw.
6 Nm (0.6 m·kg, 4.3 ft·lb)

- i. Repeat steps (e) to (h) until of the air bubbles have been removed from the system.




NOTE: _____

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

j. Add brake fluid to the level line on the reservoir.

Third step – Rear brake caliper:

- a. Remove the bolt (Rear caliper – Rear side) ② .
- b. Loosen the bolt (Rear caliper – Front side) ③ .
- c. Lift the caliper at the specified distance ① .

 **Distance ① :**
30 mm (1.2 in) or more

- d. Repeat steps "Second steps (a) to (j)".
- e. Install the caliper.

 **Brake Caliper:**
45 Nm (4.5 m·kg, 32 ft·lb)

Final step – Metering valve:

- a. Repeat steps "Second steps (a) to (j)".
- ① Plastic tube

WARNING: _____

Check the operation of the brake after bleeding the brake system.


BRAKE DISC INSTALLATION

- 1. Install:
 - Brake disc(s)

NOTE: _____

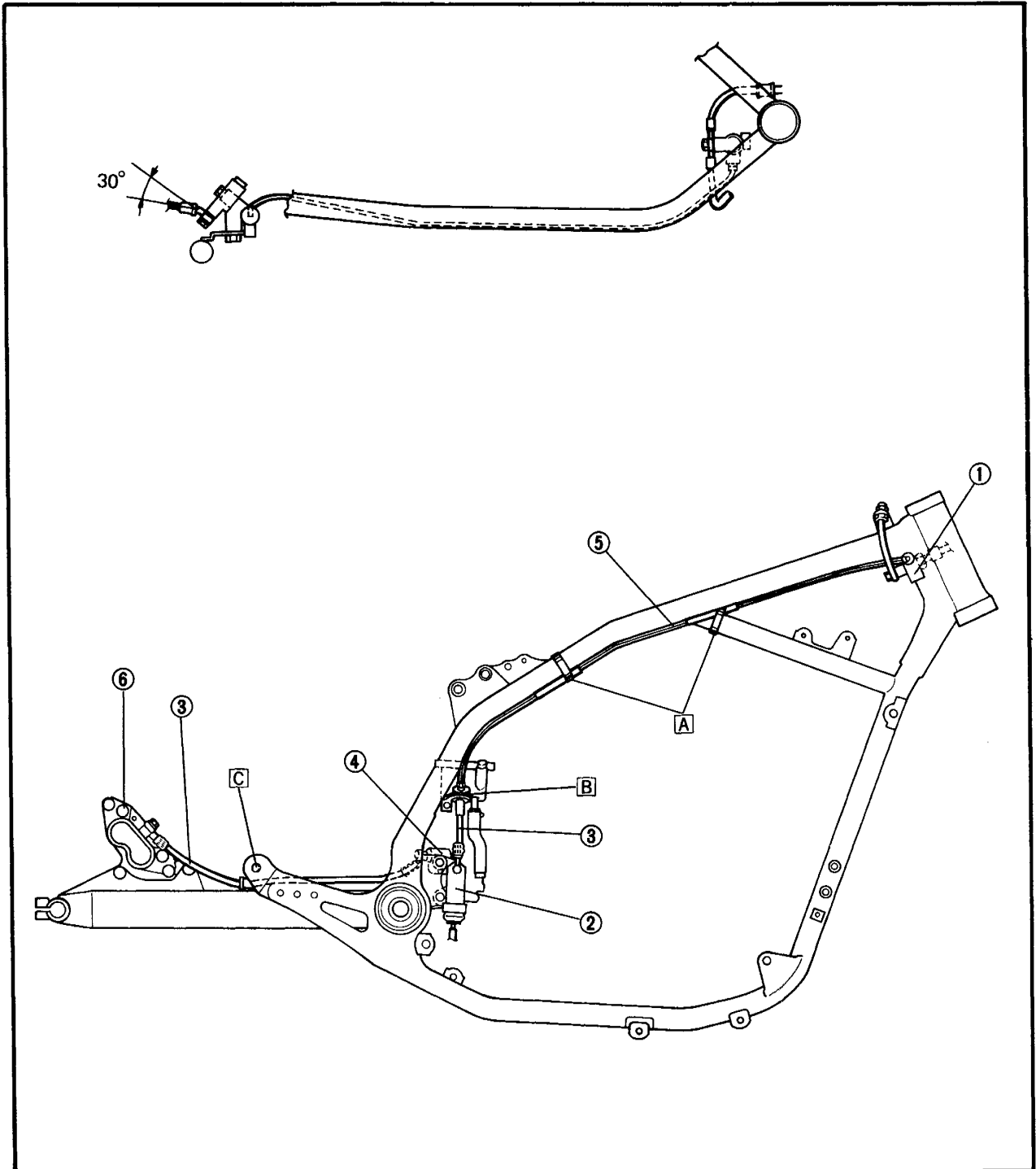
- The brake disc should be installed with the identified mark (L or R) ① face outward.
- The slots ② in the disc must point in the rotating direction **A** of the wheel.

- 2. Tighten:
 - Bolts (Disc)

 **Bolts (Brake Disc):**
20 Nm (2.0 m·kg, 14 ft·lb)
LOCTITE®

BRAKE SYSTEM PIPING DIAGRAM

- | | |
|------------------------|-----------------------------------|
| ① Metering valve | A Secured with band. |
| ② Rear master cylinder | B Secured with brake hose holder. |
| ③ Brake hose | C Secured with clamp. |
| ④ Proportioning valve | |
| ⑤ Brake pipe | |
| ⑥ Rear brake caliper | |

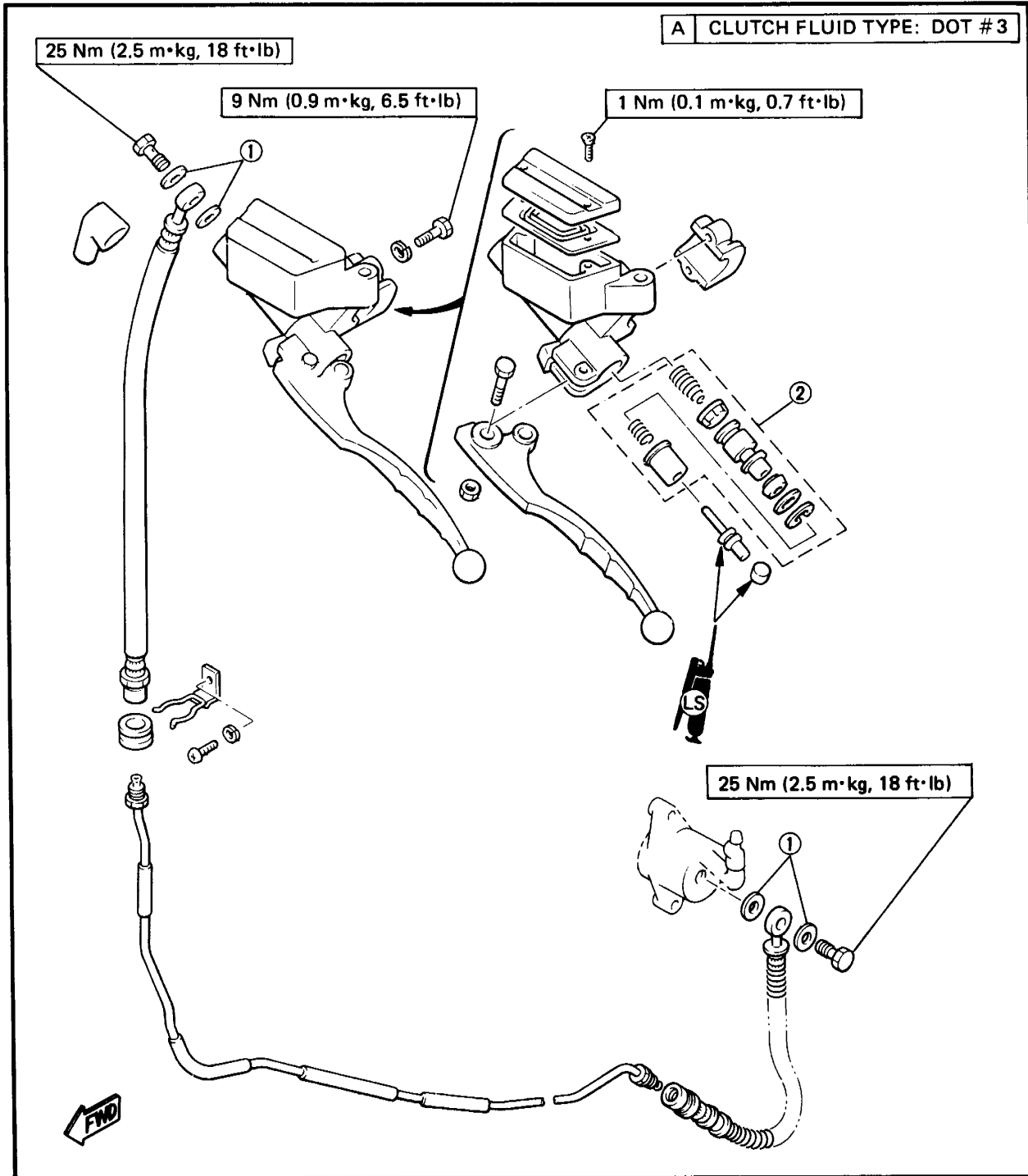


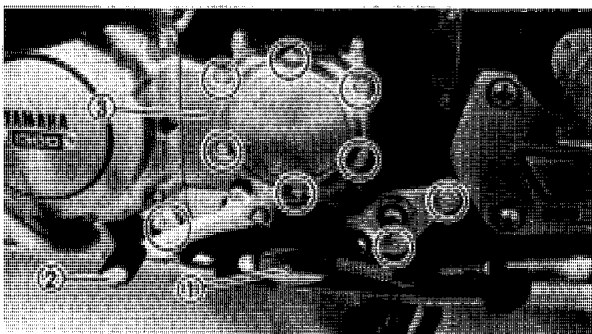


HYDRAULIC CLUTCH

HYDRAULIC CLUTCH

- ① Copper washer
- ② Master cylinder kit
(Replace as a set)

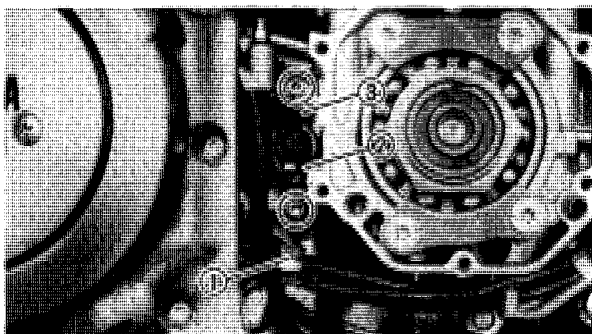




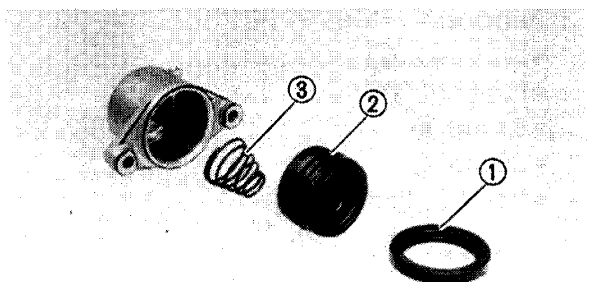
CLUTCH RELEASE DISASSEMBLY

1. Remove:
 - Side panel (Left)
 - Footrest ①
 - Change pedal ②
 - Middle gear case cover ③

NOTE: _____
 When removing the middle gear case cover, be sure oil does not leak out of the case.



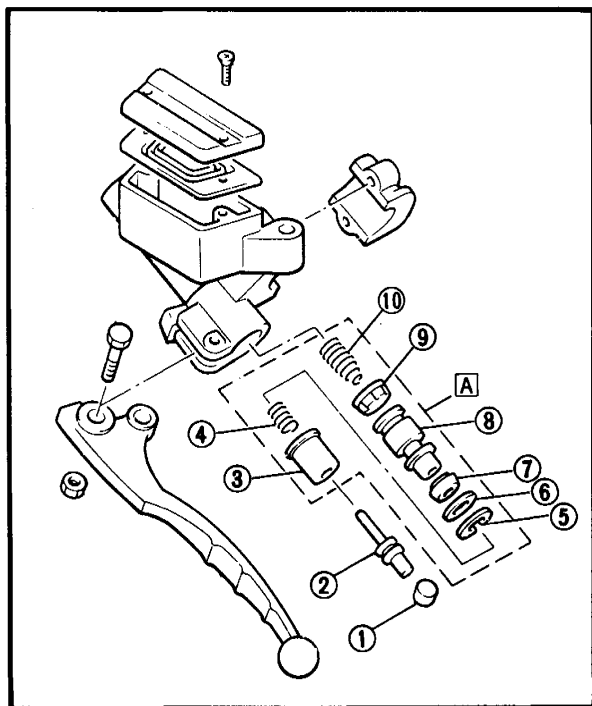
2. Remove:
 - Clamp ①
 - Clutch hose ②
 - Drain the fluid.
 - Clutch release assembly ③



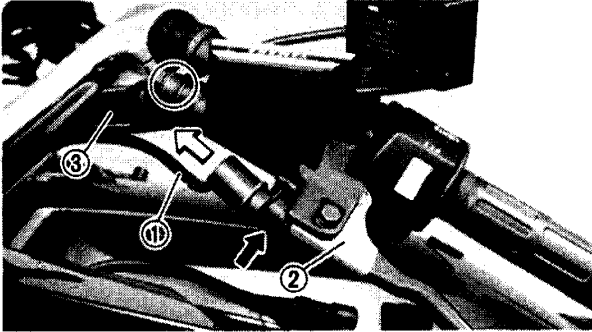
3. Remove:
 - Dust seal ①
 - Piston assembly ②
 - Spring ③

MASTER CYLINDER DISASSEMBLY

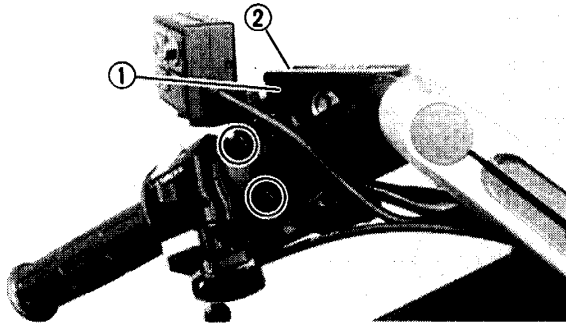
NOTE: _____
 Drain the clutch fluid before removing master cylinder.



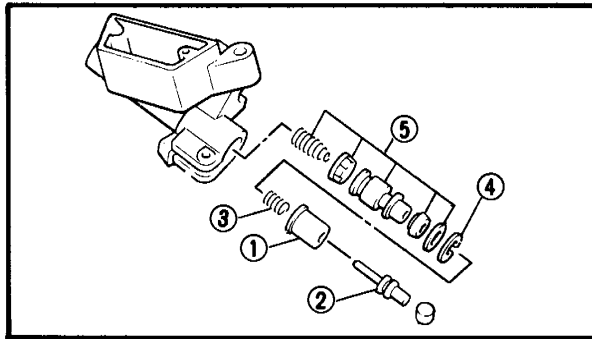
- ① Bush
- ② Push rod
- ③ Dust boot
- ④ Spring
- ⑤ Circlip
- ⑥ Washer
- ⑦ Piston cup
- ⑧ Piston
- ⑨ Seat
- ⑩ Return spring
- A Master cylinder kit (Replace as a set)



1. Remove:
 - Cover
 - Clutch switch leads ①
 - Clutch lever ②
 - Clutch hose ③
 Drain the fluid.



2. Remove:
 - Master cylinder ①
 - Cap ②
 Drain the excess fluid.



3. Remove:
 - Dust boot ①
 - Push rod ②
 - Spring ③
 - Circlip ④
 - Master cylinder kit ⑤

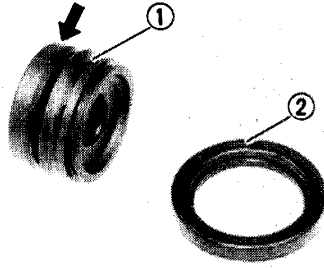
CLUTCH INSPECTION AND REPAIR

Recommended Clutch Component Replacement Schedule:	
Piston seal, dust sel	Every two years
Clutch hoses	Every four years
Clutch fluid	Replace only when clutch is disassembled

1. Inspect:
 - Cylinder body
 Scratches/Wear → Replace.

NOTE: _____
 Clean all passages with new brake fluid.

- Clutch hoses
- Cracks/Wear/Damage → Replace.



2. Inspect:

- Piston ①
Scratches/Wear → Replace.
- Piston seal ②
Wear → Replace.

CLUTCH REASSEMBLY

WARNING:

- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with brake fluid when installed.



Brake Fluid:
DOT #3

Clutch Release Reassembly

When assembling the clutch release, reverse the disassembly procedure. Note the following points.

1. Install:

- Clutch release assembly
- Clutch hose



Clutch Release Assembly:
12 Nm (1.2 m·kg, 8.7 ft·lb)

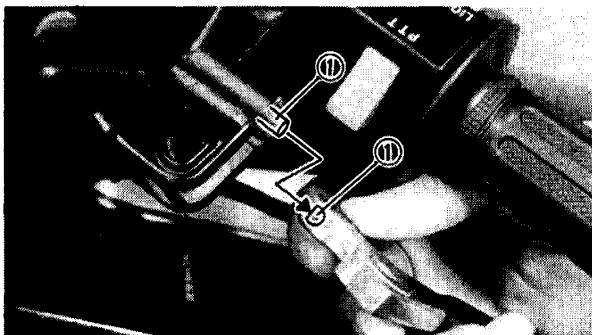
Clutch Hose:
25 Nm (2.5 m·kg, 18 ft·lb)

Master Cylinder Reassembly

When assembling the master cylinder, reverse the disassembly procedure. Note the following points.

1. Install:

- Master cylinder
- Clutch hose



Master Cylinder:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Clutch Hose:
25 Nm (2.5 m·kg, 18 ft·lb)

2. Install:

- Push rod
- Lever

NOTE:

Grease the pivot point ①.

3. Fill:

- Master cylinder



Brake Fluid:
DOT #3

- 4. Bleed the air completely from the clutch system.**

AIR BLEEDING

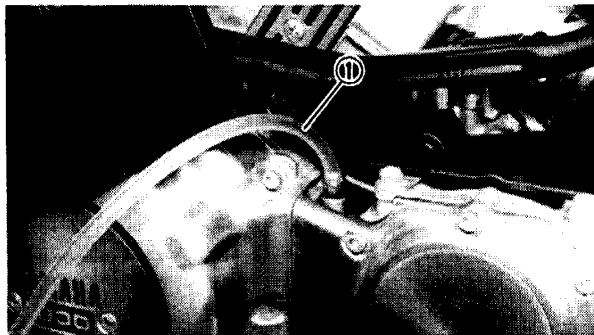
WARNING:

Bleed the clutch system if:

- The system has been disassembled.
- A clutch hose has been loosened or removed.
- The clutch fluid is very low.
- The clutch operation is faulty.

1. Bleed:

- Clutch fluid (Brake fluid)
- By the following steps.



Air bleeding steps:

- a. Add proper brake fluid to the reservoir.
- b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
- c. Connect the clear plastic hose ① to the bleed screw.
- d. Place the other end of the tube into a container.
- e. Slowly apply the clutch lever several times.
- f. Pull in the lever and hold it in position.
- g. Loosen the bleed screw and allow the lever to travel slowly toward its limit.
- h. Tighten the bleed screw when the lever has reached its limit, then release the lever.



Bleed Screw:
6 Nm (0.6 m·kg, 4.3 ft·lb)

- i. Repeat steps (e) to (h) until all of the air bubbles have been removed from the system.

NOTE:

If bleeding is difficult, it may be necessary to let the clutch fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

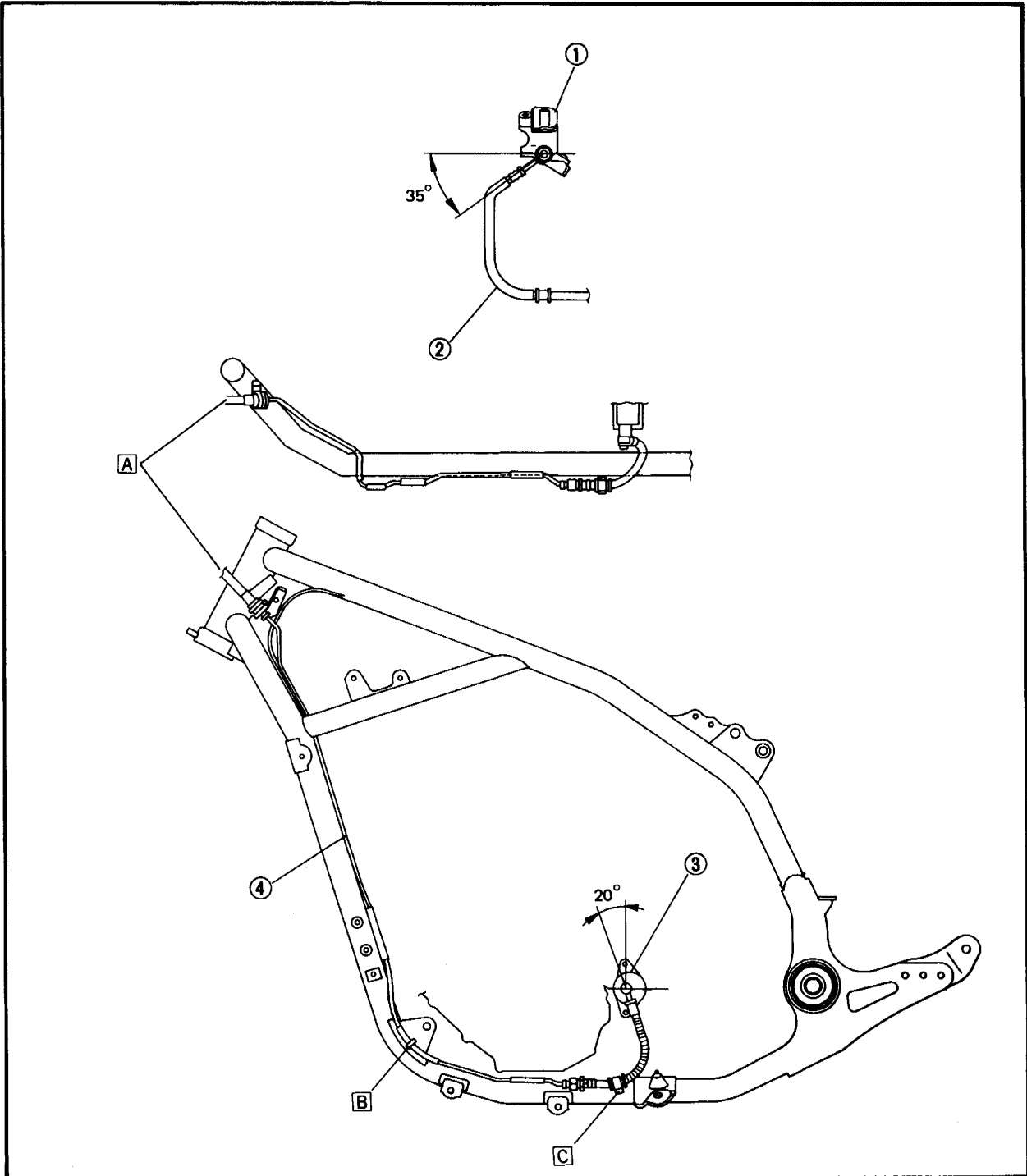
- j. Add brake fluid to the level line on the reservoir.

WARNING:

Check the operation of the clutch after bleeding the clutch system.

CLUTCH SYSTEM PIPING DIAGRAM

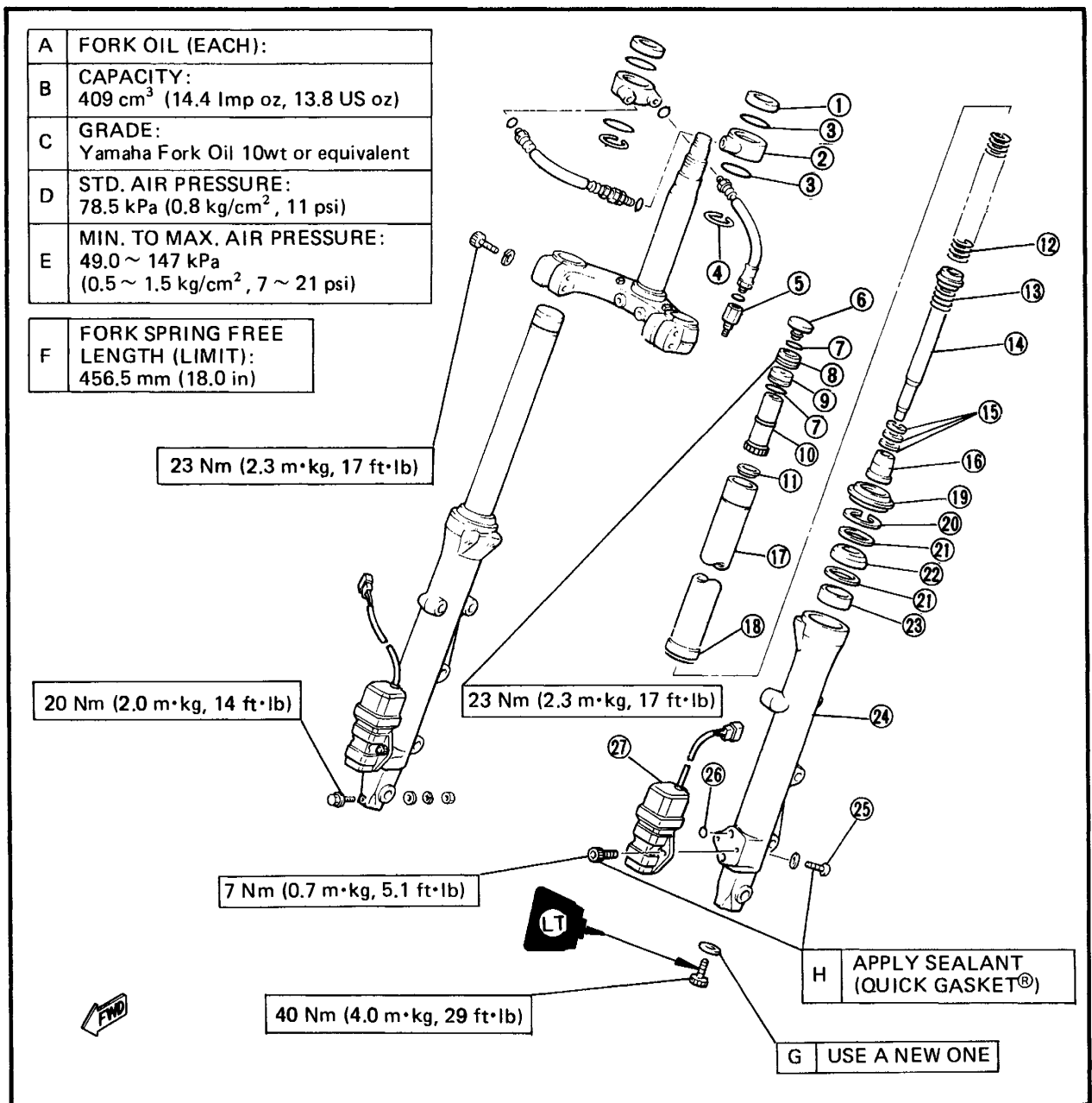
- | | |
|---------------------------|-------------------------------|
| ① Master cylinder | A From clutch master cylinder |
| ② Clutch hose | B Secured with a clamp |
| ③ Clutch release assembly | C Secured with a clamp |
| ④ Clutch pipe | |



FRONT FORK

- ① Damper
- ② Air joint
- ③ O-ring
- ④ Circlip
- ⑤ Air valve
- ⑥ Fork cap
- ⑦ O-ring
- ⑧ Cap bolt
- ⑨ Cap
- ⑩ Guide
- ⑪ Spring seat
- ⑫ Fork spring
- ⑬ Rebound spring
- ⑭ Cylinder complete
- ⑮ Special washers
- ⑯ Oil lock piece
- ⑰ Inner fork tube
- ⑱ Guide bush
- ⑲ Dust cover
- ⑳ Retaining clip
- ㉑ Seal spacer
- ㉒ Oil seal
- ㉓ Slide bush
- ㉔ Outer fork tube
- ㉕ Drain screw
- ㉖ O-ring
- ㉗ EAND unit

A	FORK OIL (EACH):
B	CAPACITY: 409 cm ³ (14.4 Imp oz, 13.8 US oz)
C	GRADE: Yamaha Fork Oil 10wt or equivalent
D	STD. AIR PRESSURE: 78.5 kPa (0.8 kg/cm ² , 11 psi)
E	MIN. TO MAX. AIR PRESSURE: 49.0 ~ 147 kPa (0.5 ~ 1.5 kg/cm ² , 7 ~ 21 psi)
F	FORK SPRING FREE LENGTH (LIMIT): 456.5 mm (18.0 in)

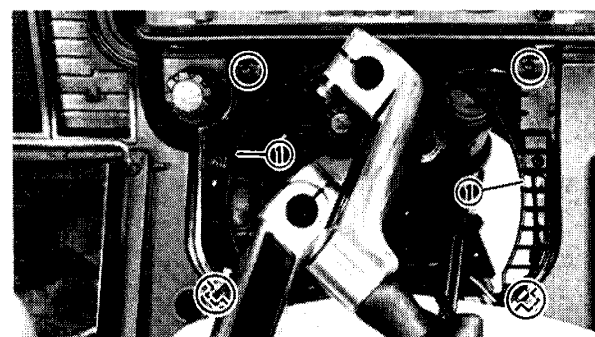
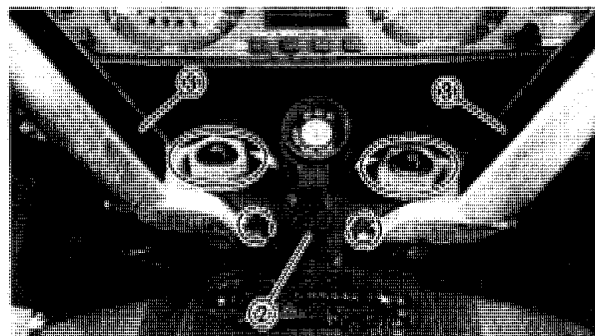
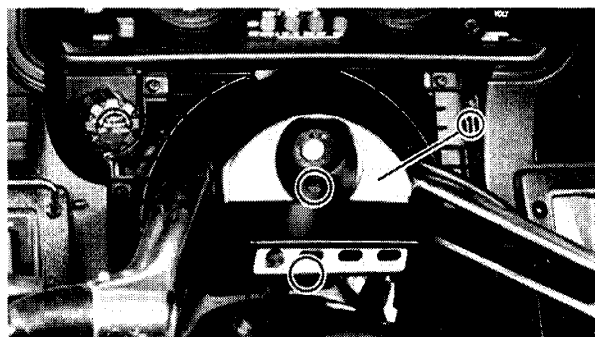
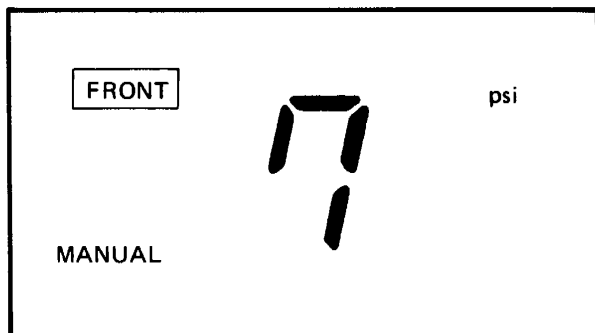




REMOVAL

WARNING:

Securely support the motorcycle so it won't fall over when the front wheel and front forks are removed.



1. Remove:

- Fork brace
- Front fender
- Brake caliper (Right)
- Front wheel

Refer to "FRONT WHEEL" section.

- Brake caliper (Left)

2. Adjust:

- Front fork air pressure

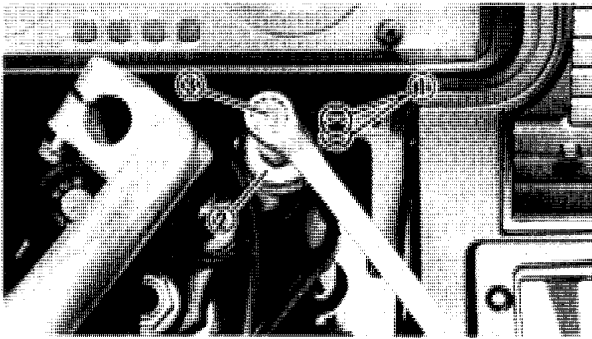
Decrease the air pressure to the minimum level (0.5 kg/cm² or 7 psi) by operating the air suspension controller.

3. Remove:

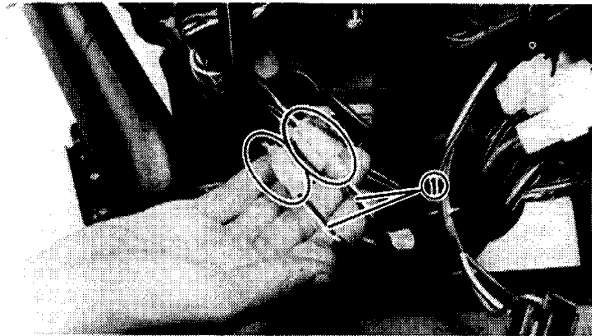
- Handlebar cover ①
- Bracket ②
- Handlebars ③

4. Remove:

- Hoods (Left and right) ④



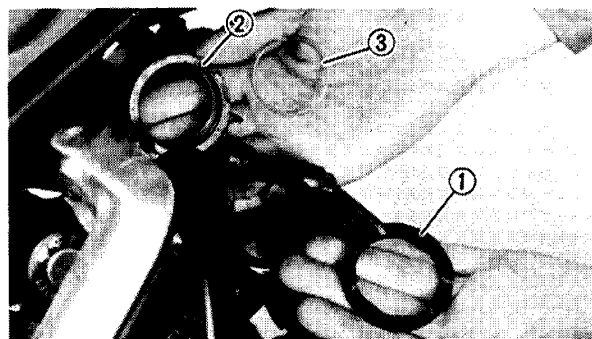
5. Remove:
 - Fork caps
6. Loosen:
 - Pinch bolts (Steering crown) ①
 - Cap bolts ②
 Use the Front Fork Cap Socket ③ (YM-01104).



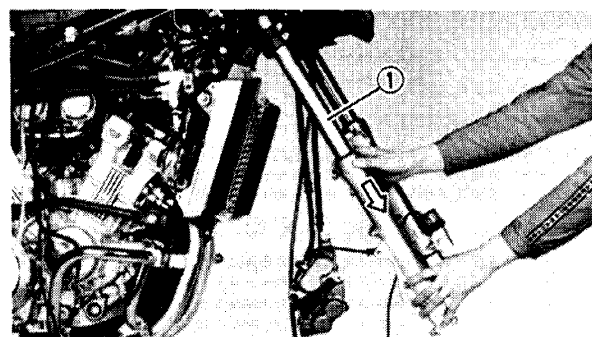
7. Remove:
 - Fairing
 Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.
8. Disconnect:
 - EAND leads (Black - White) ①



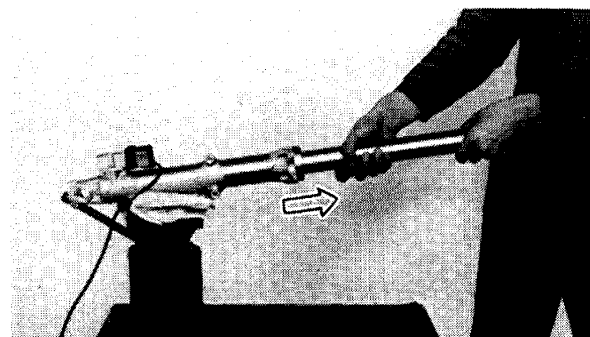
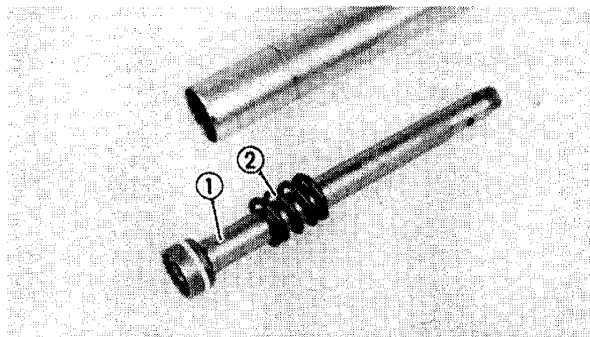
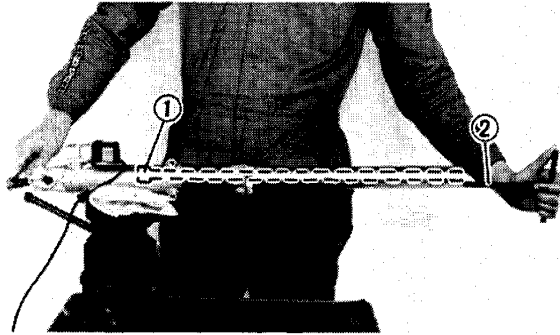
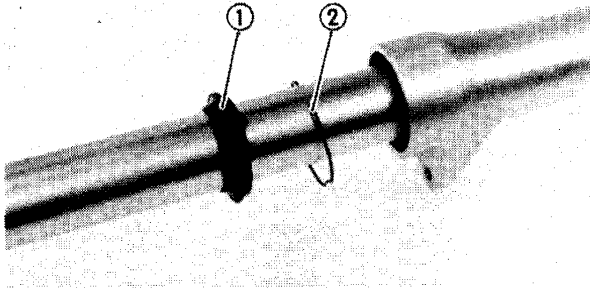
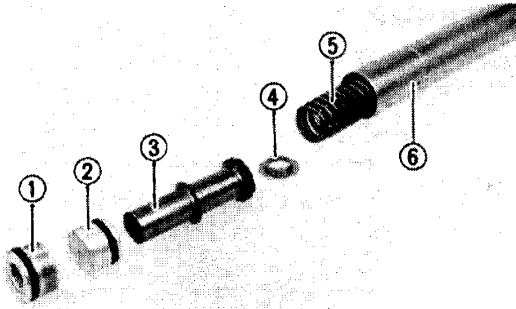
9. Loosen:
 - Pinch bolts (Under bracket) ①
 Pull out the fork leg from the steering crown.



10. Remove:
 - Rubber damper ①
 - Air joint bracket ②
 - Circlip ③



11. Remove:
 - Front fork(s) ①



DISASSEMBLY

1. Remove:
 - Cap bolt ①
Use the Front Fork Cap Socket (YM-01104).
 - Cap ②
 - Guide ③
 - Spring seat ④
 - Fork spring ⑤
Drain the fork oil.

⑥ Inner fork tube

2. Remove:
 - Dust cover ①
 - Retaining clip ②
Use a thin screwdriver, and be careful not to scratch the inner fork tube.
 - Seal spacer

3. Remove:
 - Bolt (Cylinder complete)
Use the Damper Rod Holder ① (YM-01328) and the T-Handle ② (YM-01326) to lock the damper rod.

4. Remove:
 - Damper rod (Cylinder complete) ①
 - Rebound spring ②

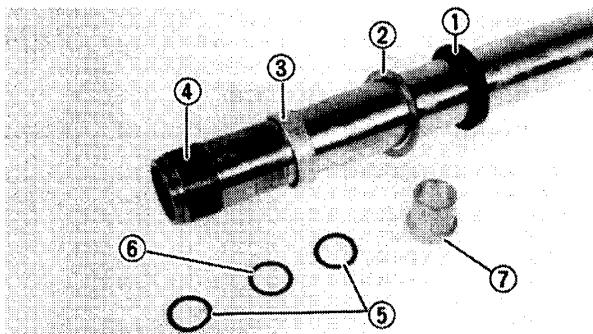
5. Remove:
 - Inner fork tube
By the following removal steps.

Inner fork tube removal steps:

- Hold fork leg horizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

NOTE:

- Excessive force will damage the oil seal and/or the bushes. Damaged oil seal and bushing must be replaced.
- Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.

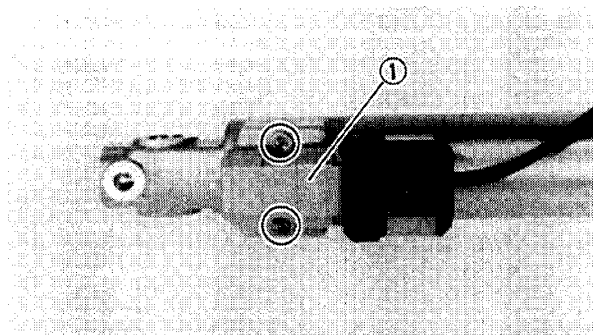


6. Remove:

- Oil seal ①
- Seal spacer ②
- Slide bush ③
- Guide bush ④
- Special washers (Top and bottom) ⑤
- Special washer (Center) ⑥
- Oil lock piece ⑦

NOTE:

When removing the special washers ⑤, ⑥ will fall off. Take care not to lose these parts.



7. Remove:

- EAND unit ①

INSPECTION

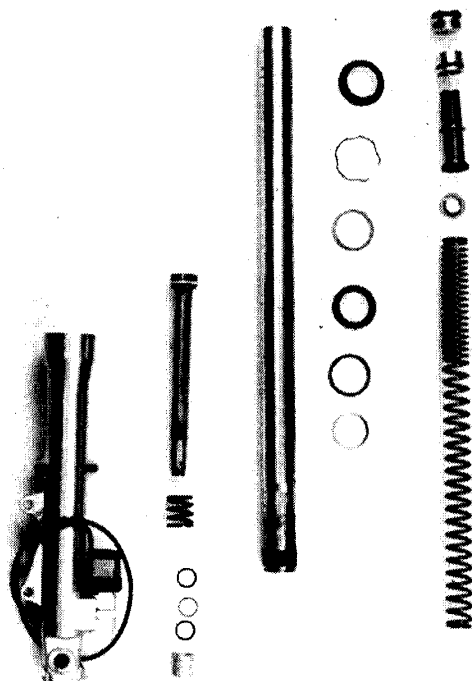
1. Inspect:

- Inner fork tube
Scratches/Bends → Replace.

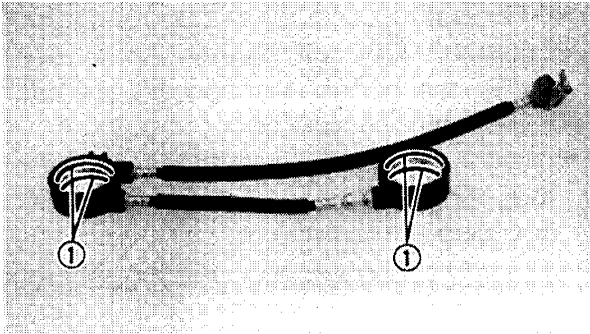
WARNING:

Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.

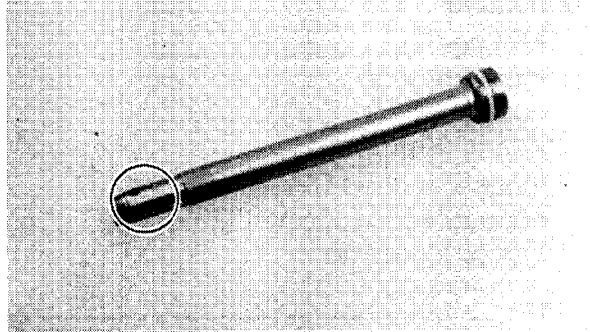
- Outer fork tube
Scratches/Bends/Damage → Replace.
- Fork spring
Over specified limit → Replace.



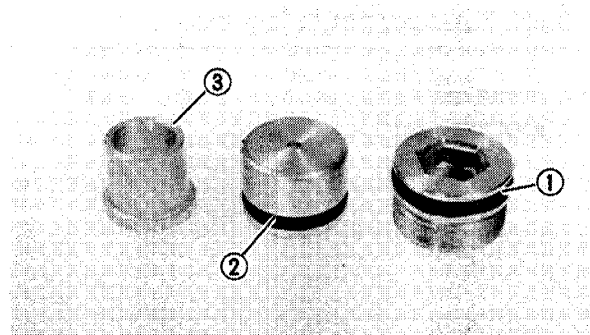
Fork Spring Free Length (Limit):
456.5 mm (18.0 in)



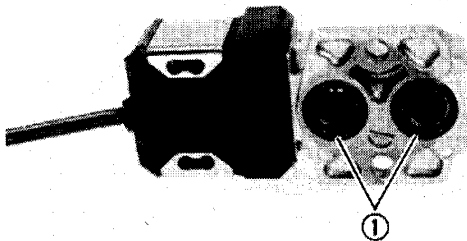
2. Inspect:
- Air joint bracket
 - Air hose
Cracks/Damage → Replace.
 - O-ring ①
Damage → Replace.



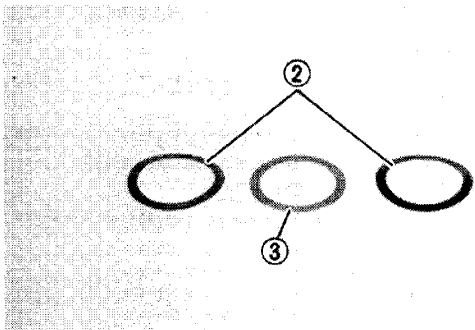
3. Inspect:
- Damper rod
Wear/Damage → Replace.
Contamination → Blow out all oil passages with compressed air.



4. Inspect:
- O-ring (Cap bolt) ①
 - O-ring (Cap) ②
 - Oil lock piece ③
Damage → Replace.
 - Seals
Wear/Damage → Replace.



5. Inspect:
- O-rings (EAND unit) ①
 - Special washers (Oil lock piece) ② , ③
Damage → Replace.



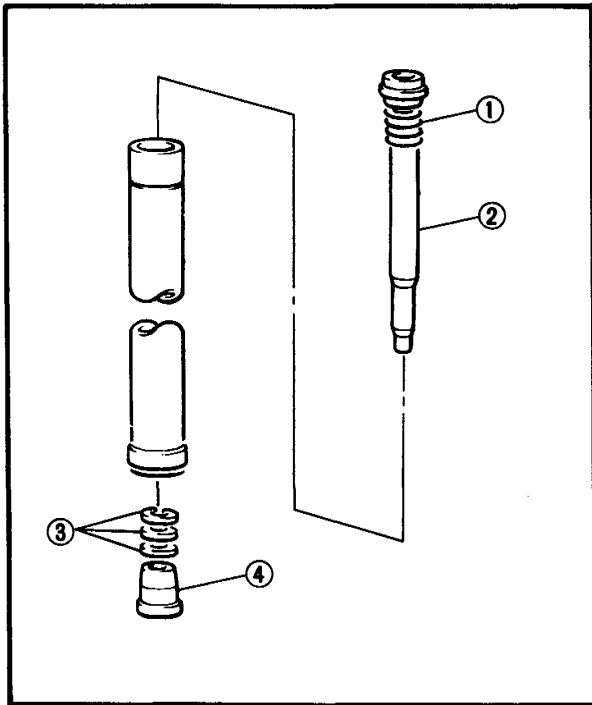
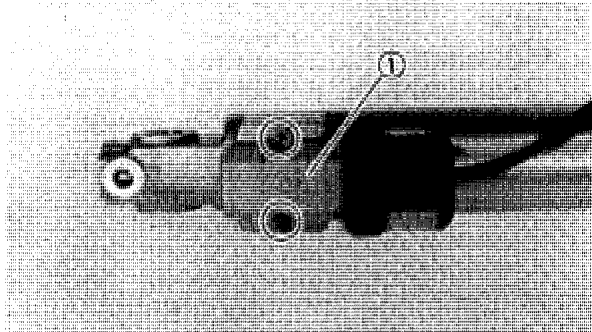
ASSEMBLY

Before assembling, clean and inspect all parts and replace when necessary.

NOTE:

In front fork assembly, be sure to use following new parts. Do not reuse them.

- Slide bush
- Guide bush
- Oil seal
- Dust seal



1. Apply:

- Sealant (Quick Gasket®) (ACC-11001-05-01)

To the mating surfaces of the outer tube and EAND unit.

2. Install:

- EAND unit ①

Apply Sealant (Quick Gasket®) to the thread portion of the bolts.

**EAND Unit:**

7 Nm (0.7 m·kg, 5.1 ft·lb)

3. Install:

- Rebound spring ①
- Damper rod ②

Allow the rod to slide slowly down the tube until the it protrudes from the bottom.

- Oil lock piece ④

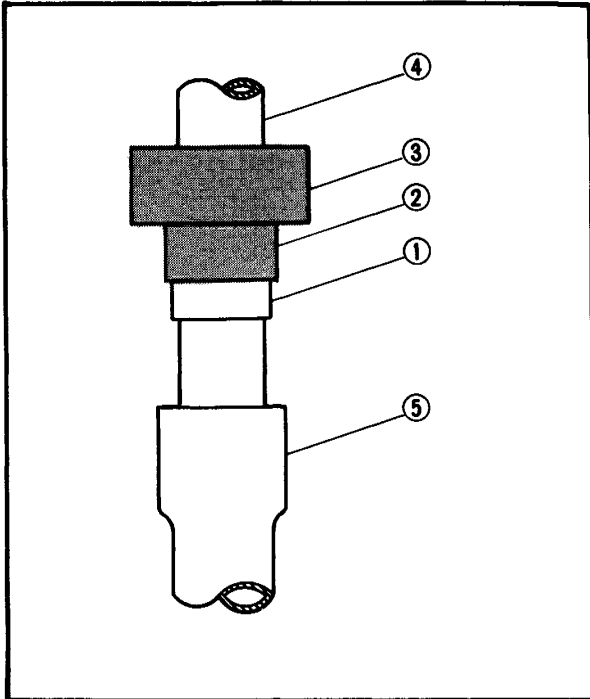
Fit oil lock piece over damper rod sticking out of the inner fork tube.

NOTE:

Before reinstalling the oil lock piece, do not forget to fit the special washers ③ .

4. Install:

- Inner fork tube
Into outer tube.



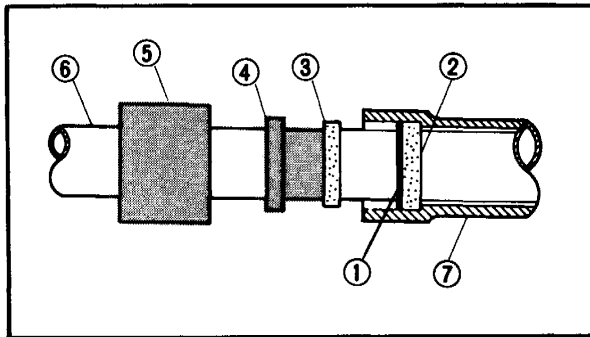
5. Tighten:
- Bolt (Cylinder complete)
Use the Damper Rod Holder (YM-01328) and the T-Handle (YM-01326).



Bolt (Cylinder Complete):
40 Nm (4.0 m·kg, 29 ft·lb)
LOCTITE®

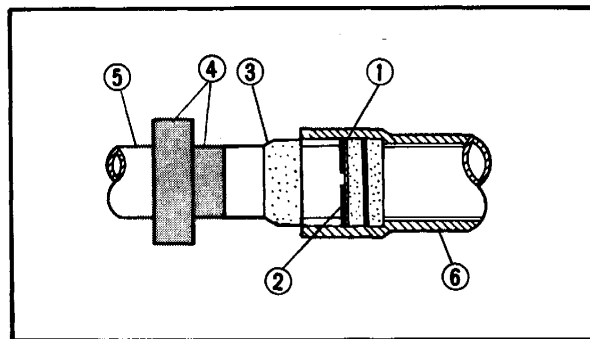
6. Install:
- Slide bush (1)
Into outer tube.
Use the Fork Seal Driver Weight (3) (YM-33963) and the Adapter (2) (YM-33964).

- ④ Inner tube
- ⑤ Outer tube



7. Install:
- Seal spacer (1)
On top of the slide bush (2).
 - Oil seal (3)
Use the Fork Seal Driver Weight (5) (YM-33963) and the Adapter (4) (YM-33964), and install with numbered side up.

- ⑥ Inner tube
- ⑦ Outer tube



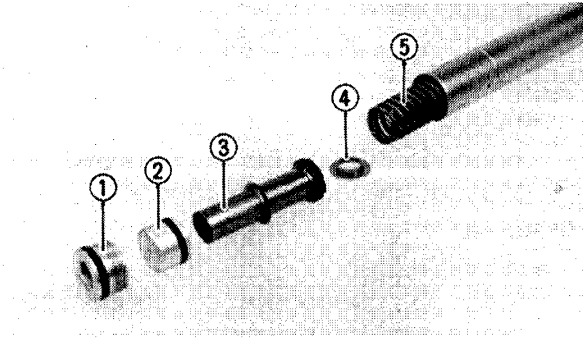
8. Install:
- Seal spacer (1)
 - Retaining clip (2)
 - Dust seal (3)
Use the Special Tools (4) (YM-33963, YM-33964)

- ⑤ Inner tube
- ⑥ Outer tube

9. Fill:
- Front fork



Each Fork:
409 cm³ (14.4 Imp oz, 13.8 US oz)
Yamaha Fork Oil 10wt or equivalent
After filling, slowly pump the fork up and down to distribute oil.



10. Install:
- Fork spring ⑤
With smaller pitch side up.
 - Spring seat ④
 - Guide ③
 - Cap ②
 - Cap bolt ①
Temporarily tighten the cap bolt.

INSTALLATION

1. Install:
- Front fork(s)
Into underbracket.
 - Circlip
Onto inner tube.

NOTE: _____
Apply a light coat of lithium base grease to the O-rings in the air joint bracket.

- Air joint bracket


NOTE: _____
Make sure that position the projecting portion (Stopper) ① of the air joint bracket correctly.

- Rubber damper
Over inner fork tube.

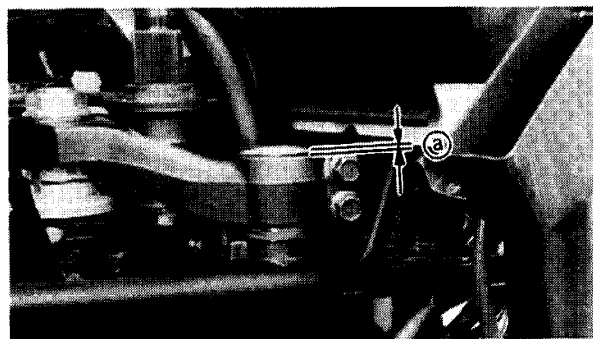
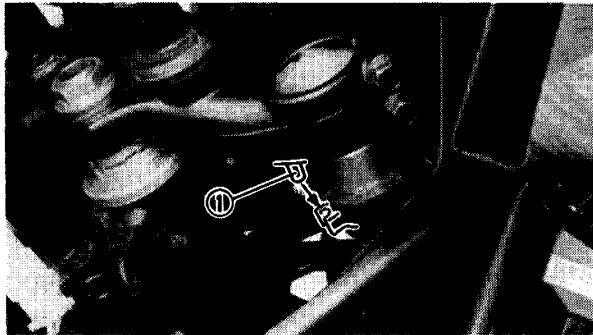
2. Tighten:
- Pinch bolts (Under bracket)
Temporarily tighten the pinch bolts.

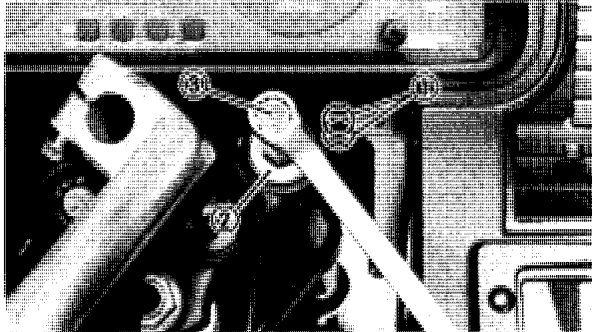
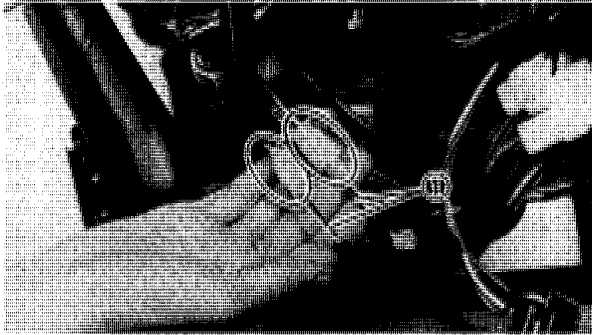
NOTE: _____
Position the inner tube end so that it is flush ② with the top of the steering crown.

3. Tighten:
- Pinch bolts (Under bracket)

	Pinch Bolts (Under Bracket): 23 Nm (2.3 m·kg, 17 ft·lb)
---	---

NOTE: _____
Do not tighten the pinch bolt (Steering crown) in this stage.





4. Connect:
 - EAND leads (Black – White) ①
5. Install:
 - Fairing
Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.
6. Adjust:
 - Headlight beam
Refer to "CHAPTER 2. HEADLIGHT BEAM ADJUSTMENT" section.
7. Tighten:
 - Cap bolt ②
Use the Front Fork Cap Socket ③ (YM-01104).
 - Pinch bolt (Steering crown) ①

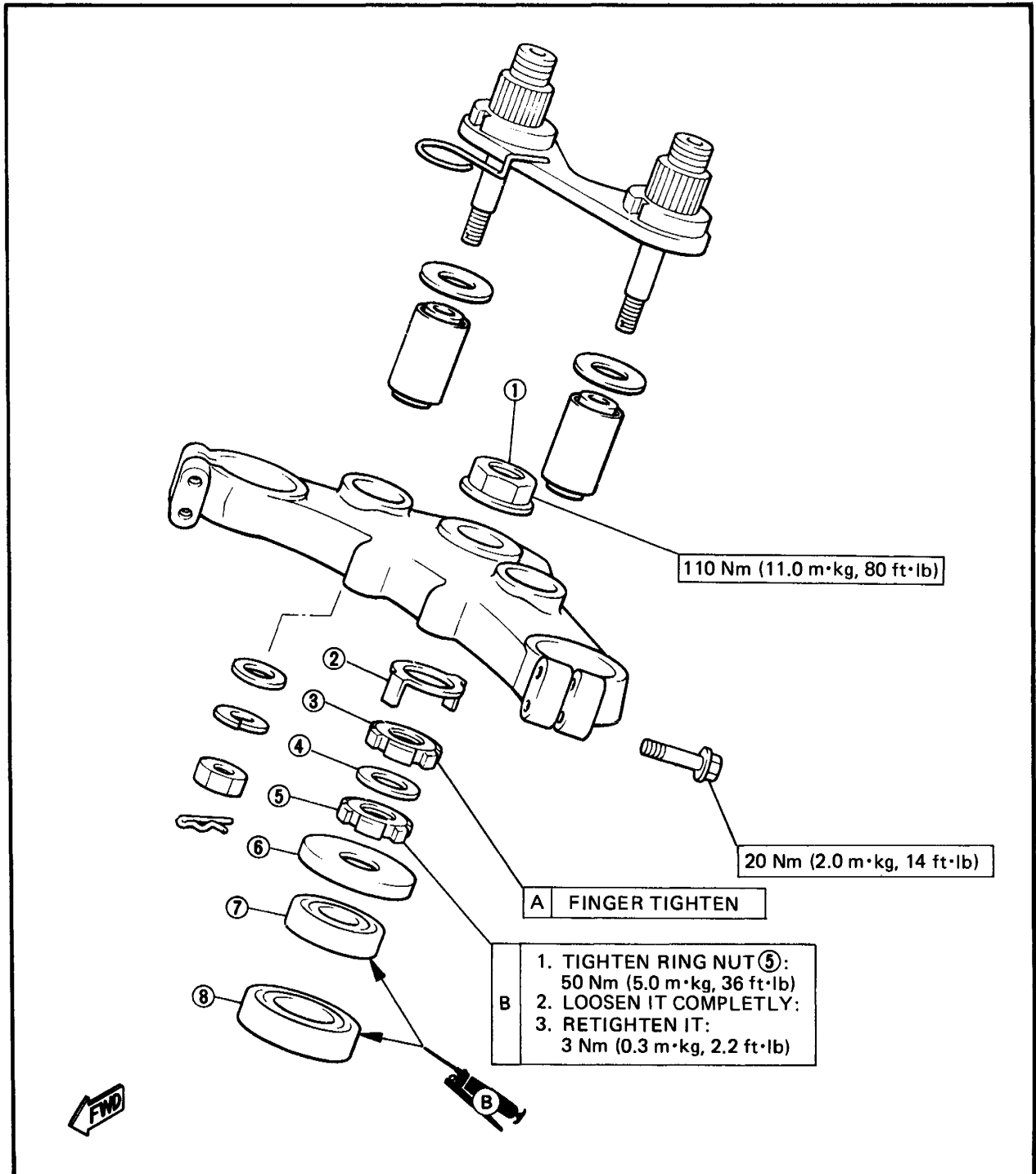


Cap Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)
Pinch Bolts (Steering Crown):
20 Nm (2.0 m·kg, 14 ft·lb)

8. Install:
 - Components in aforementioned list (Steps "REMOVAL 5 ~ 3")
Refer to "CHAPTER 2. FRONT FORK OIL CHANGE" section.
9. Adjust:
 - Front fork air pressure
Refer to "CHAPTER 2. FRONT FORK AND REAR SHOCK ABSORBER ADJUSTMENT" section.
10. Install:
 - Front wheel
 - Brake calipers (Left and right)
 - Front fender
 - Fork brace
Refer to "FRONT WHEEL" section.
11. Inspect:
 - EAND system
Oil leaks → Replace O-rings.

STEERING HEAD

- ① Steering stem nut
- ② Lock washer
- ③ Ring nut (Upper)
- ④ Washer
- ⑤ Ring nut (Lower)
- ⑥ Bearing cover
- ⑦ Bearing (Upper)
- ⑧ Bearing (Lower)



REMOVAL

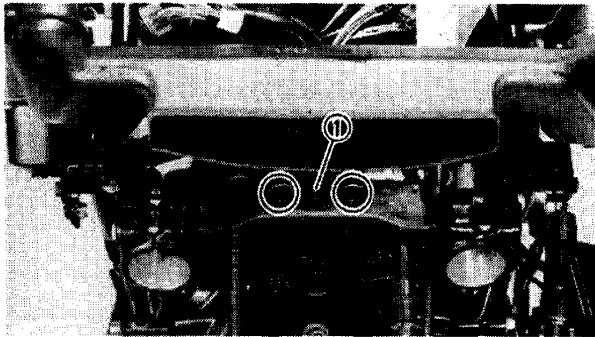
WARNING:

Securely support the motorcycle so there is no danger of it falling over.

1. Remove:

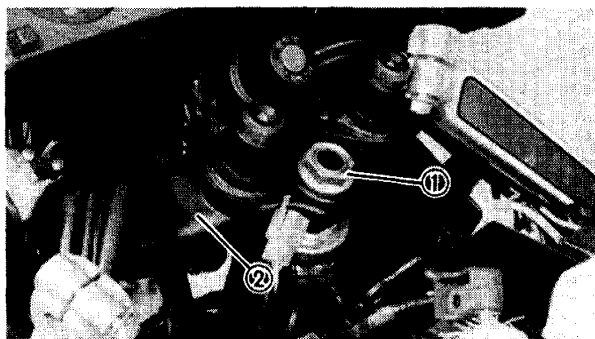
- Front wheel
- Handlebars
- Front forks
- Fairing

Refer to "FRONT WHEEL", "FRONT FORK" and "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.



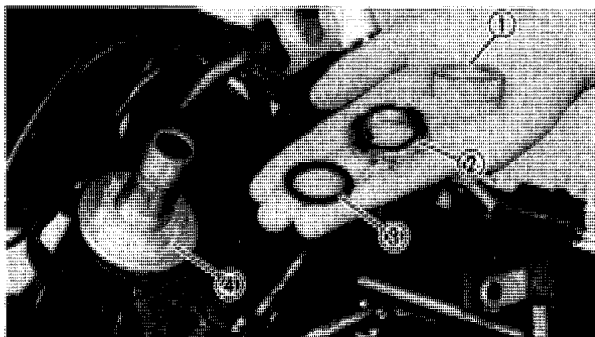
2. Remove:

- Brake hose holder ①



3. Remove:

- Nut (Steering crown) ①
- Steering crown ②

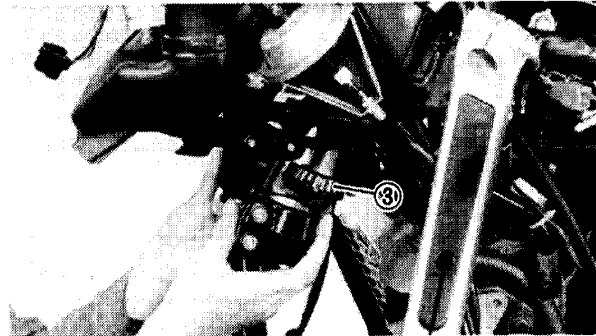
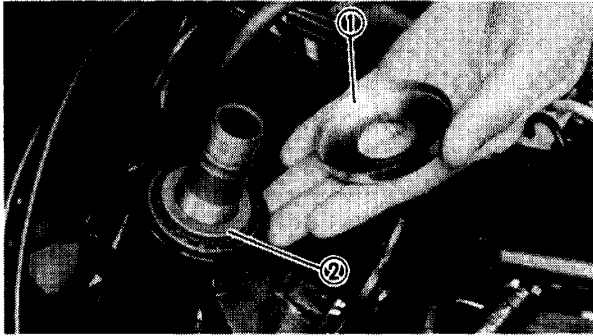


4. Remove:

- Lock washer (Ring nut) ①
- Ring nut (Upper) ②
- Washer ③
- Ring nut (Lower) ④

WARNING:

Support the under bracket so that it may not fall down.



5. Remove:

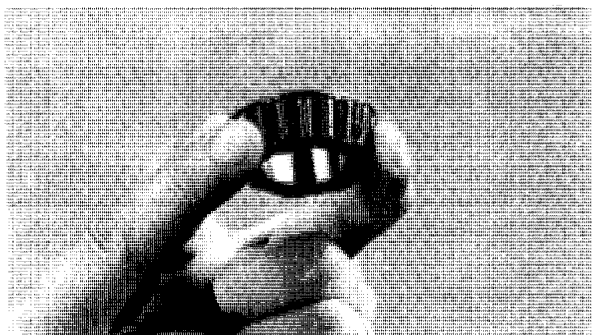
- Steering stem
- Bearing cover ①
- Bearing (Upper) ②
- Bearing (Lower) ③

INSPECTION

1. Wash the bearing in a solvent.
2. Inspect:
 - Bearings
 - Bearing race
 - Pitting/Damage → Replace.

NOTE: _____

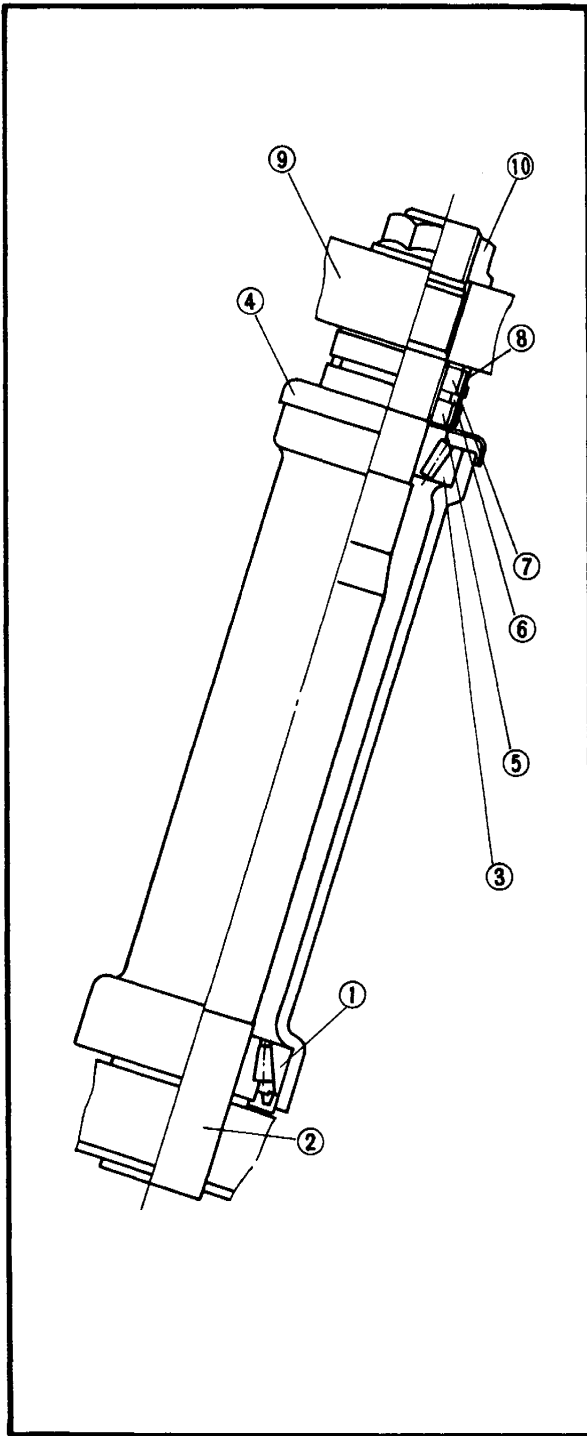
Always replace bearing and race as a set.



INSTALLATION

1. Lubricate:
 - Bearing and races

 Wheel bearing grease



2. Install:
- Bearing (Lower) ①
 - Onto steering stem.
 - Steering stem ②

CAUTION: _____

Hold the steering stem until it is secured.

- Bearing (Upper) ③
 - Ball race cover ④
 - Ring nut (Lower) ⑤
3. Tighten:
- Ring nuts (Lower and upper)
 - By the following tightening steps.

Ring nuts tightening steps:

NOTE: _____
Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

- Install the ring nut (Lower) ⑤ .

NOTE: _____
The tapered side of ring nut must face downward.

- Tighten the ring nut ⑤ using the Ring Nut Wrench (YU-01268).



Ring Nut ⑤ (Initial Tightening):
50 Nm (5.0 m·kg, 36 ft·lb)

- Loosen the ring nut ⑤ completely and retighten it to specification.

WARNING: _____

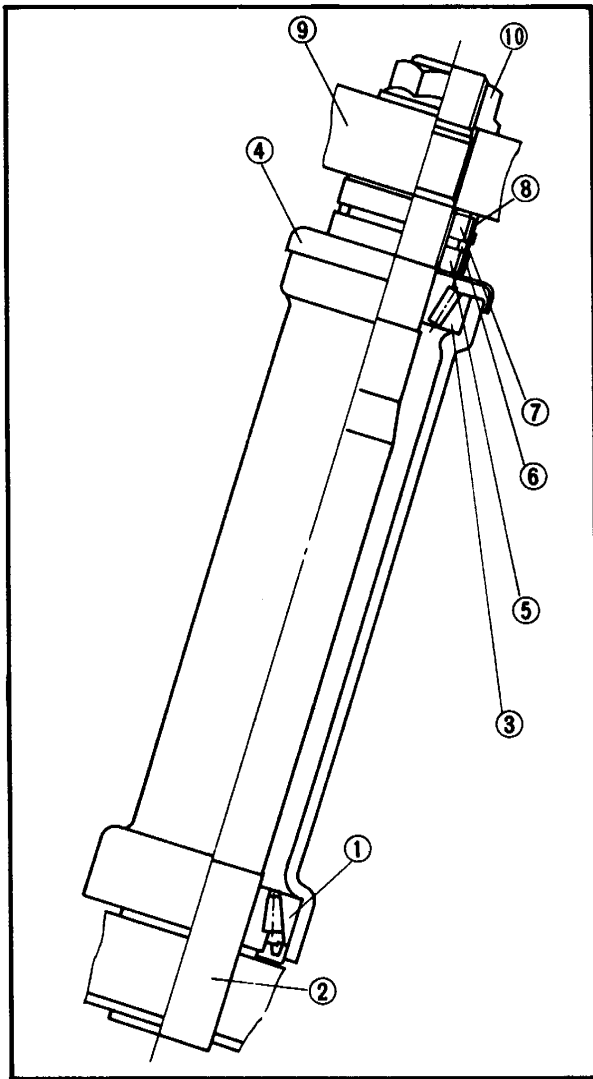
Do not over-tightening.



Ring Nut ⑤ (Final Tightening):
3 Nm (0.3 m·kg, 2.2 ft·lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ①, ③.
- Install the washer ⑥ .
- Install the ring nut (Upper) ⑦ .

NOTE: _____
The tapered side of ring nut must face downward.



- Finger tighten the ring nut ⑦, then align the slots of both ring nuts. If not aligned, hold the lower ring nut ⑤ and tighten the other until they are aligned.
- Install the lock washer ⑧.

NOTE: _____
 Make sure the lock washer tab is placed in the slots.

- Install the steering crown ⑨ and tighten the steering stem nut ⑩ to specification.



Nut (Steering Stem):
 110 Nm (11.0 m·kg, 80 ft·lb)

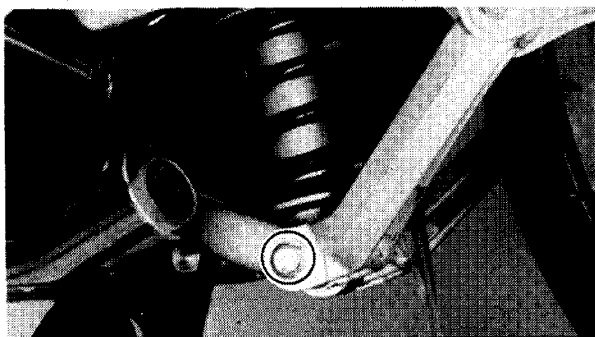
- Tighten the pinch bolts to specification.



Pinch Bolt (Steering Crown):
 20 Nm (2.0 m·kg, 14 ft·lb)

4. Install:

- Components in aforementioned list (Steps "REMOVAL 2 ~ 1")
 Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION", "FRONT FORK" and "FRONT WHEEL" section.

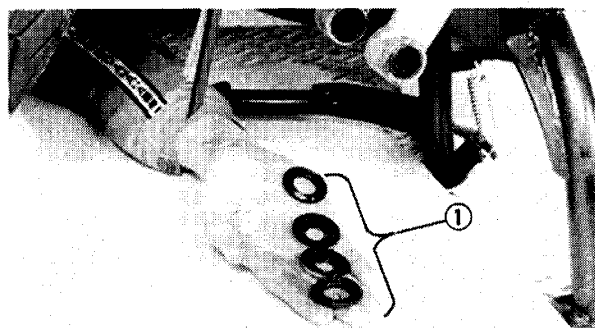


REMOVAL

1. Remove:
 - Side panels (Left and right)
 - Mufflers (Left and right)
2. Remove:
 - Bolt (Rear shock absorber – Bottom)



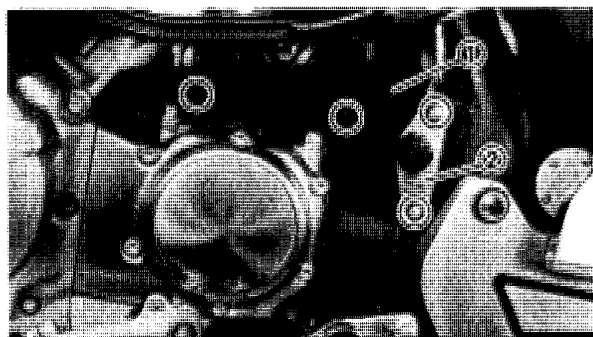
3. Remove:
 - Pivot shaft (Rear shock absorber) ①
 - Bushing (Rear shock absorber – Bottom) ②



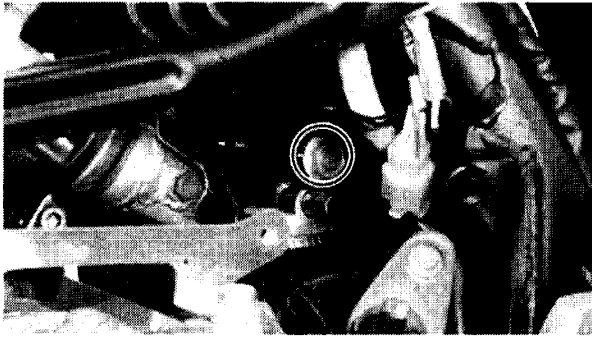
4. Remove:
 - Dust covers ①



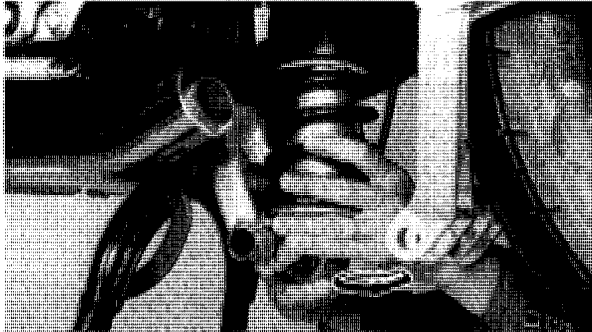
5. Remove:
 - Saddlebag lids (Left and right)
 - Seat
6. Disconnect:
 - Air hose (Rear shock absorber) ①



7. Remove:
 - Lower side cover (Left) ①
 - Damping Adjuster bracket ②



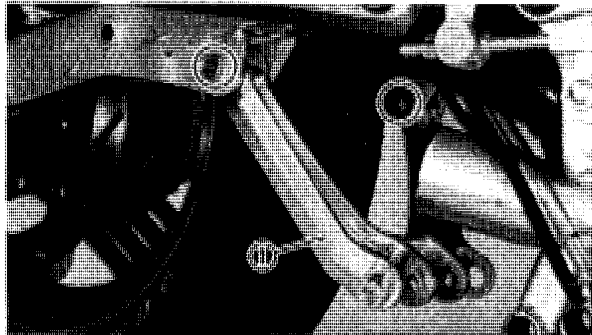
8. Remove:
- Bolt (Rear shock absorber – Top)



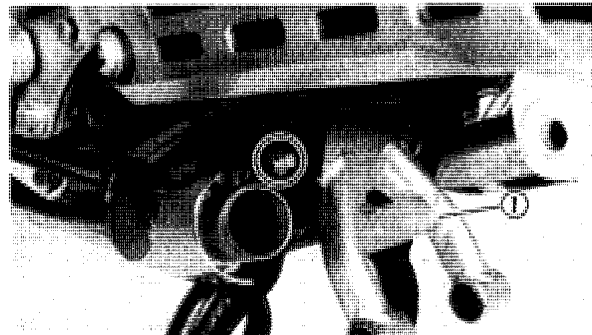
9. Remove:
- Shock Absorber assembly

CAUTION: _____

Be sure the rear shock absorber hose does not contact the frame.



10. Remove:
- Arm ①



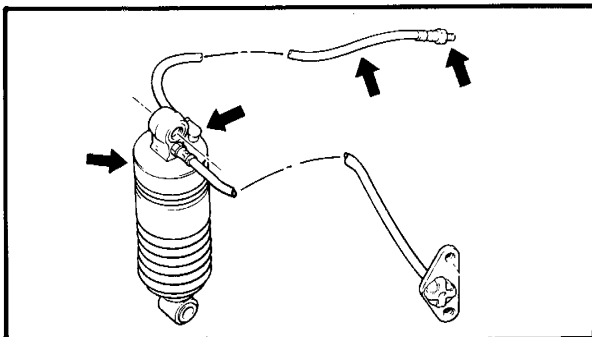
11. Remove:
- Relay arm ①

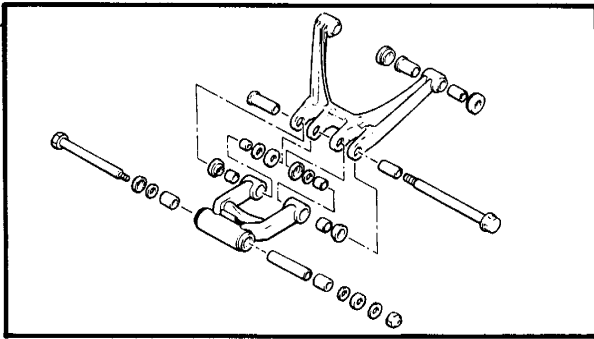
NOTE: _____

When removing the relay arm, loosen the bolt holding the expansion chamber, and move the chamber downward. Then remove the relay arm bolt.

INSPECTION

1. Inspect:
- Rear shock absorber
Air and/or oil leaks/Damage → Replace.
 - Air valve, hose
Air leak/Damage → Replace.



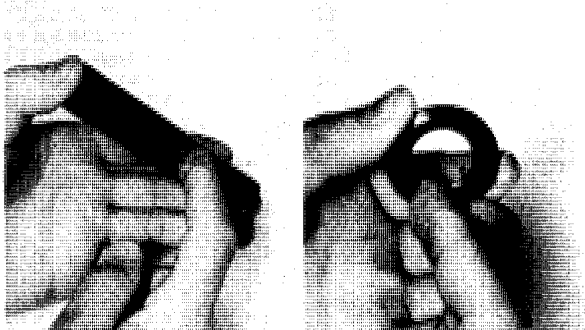


2. Replace:
- Bushings
 - Dust seals

INSTALLATION


Reverse removal steps.

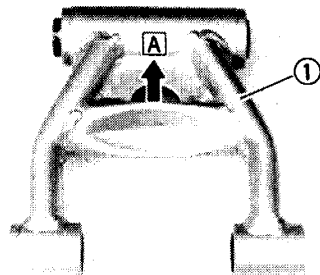
1. Grease the bushing and dust seals.



 **Molybdenum Grease**

2. Install:
- Relay arm
 - Arm ①


 **Relay Arm and Frame:**
60 Nm (6.0 m·kg, 43 ft·lb)
Swingarm and Arm:
30 Nm (3.0 m·kg, 22 ft·lb)



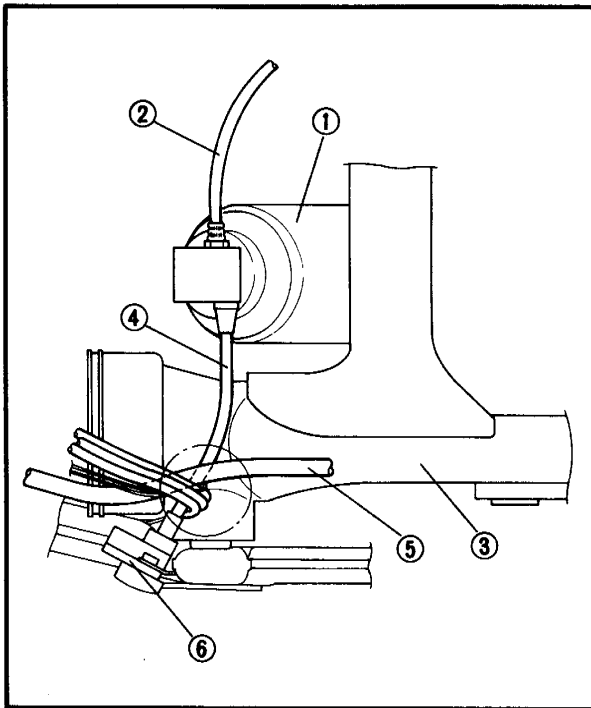
NOTE: _____
The relay arm should be installed so that the recess in the arm faces upward.

A UP

3. Install:
- Rear shock absorber assembly

 **Rear Shock Absorber:**
Top:
30 Nm (3.0 m·kg, 22 ft·lb)
Bottom:
60 Nm (6.0 m·kg, 43 ft·lb)

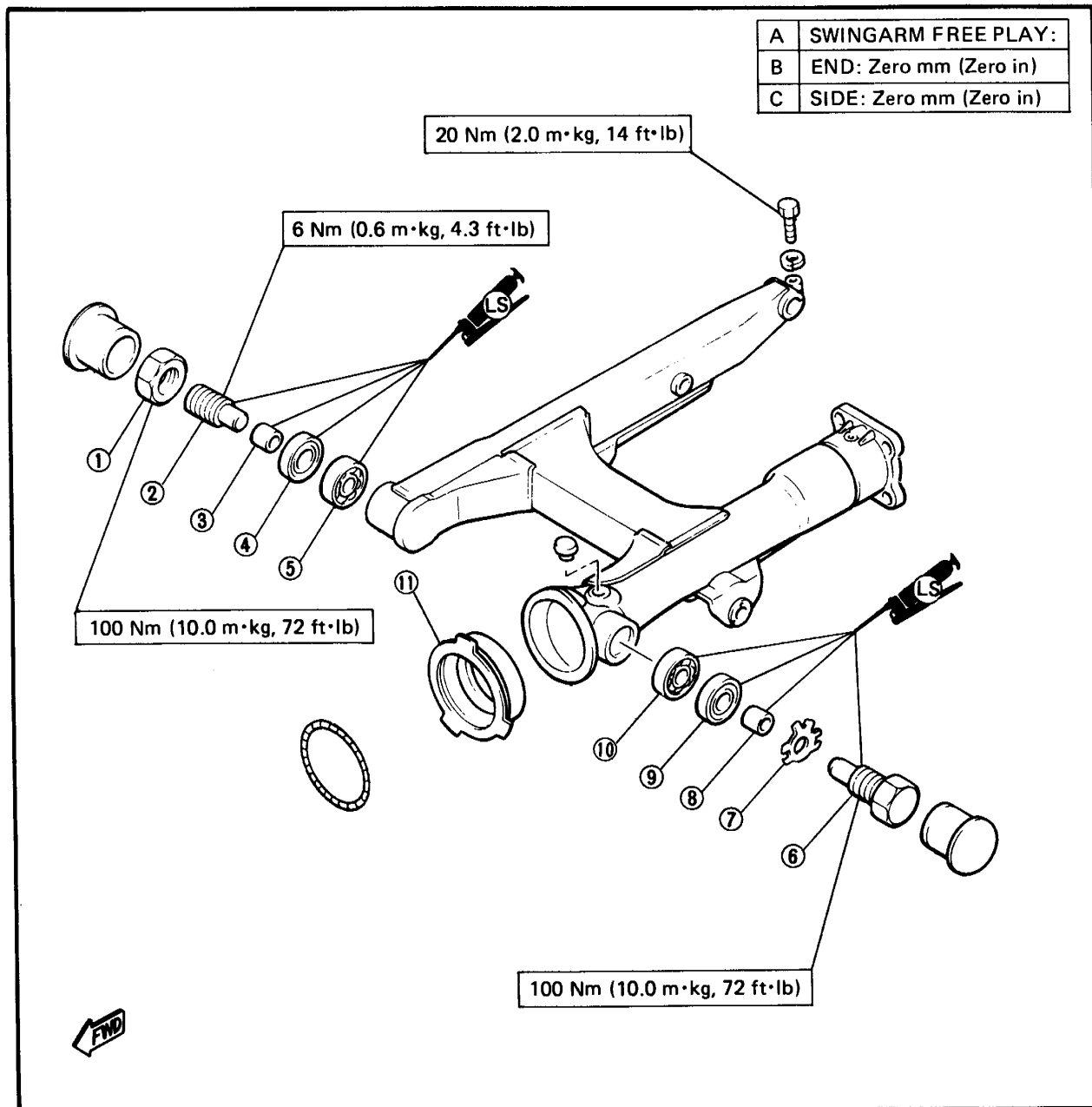
CAUTION: _____
Make sure that pipes and leads are routed properly.

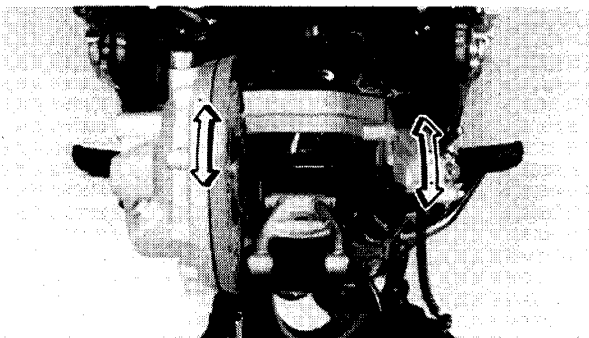
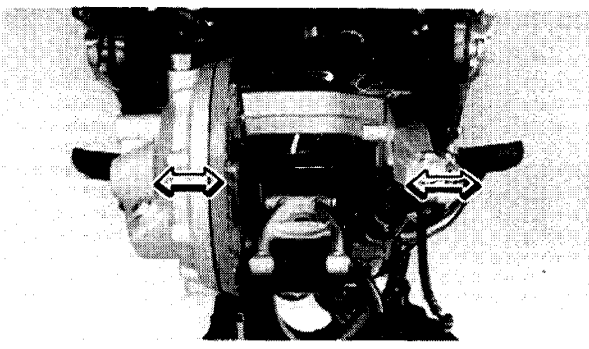


- ① Rear shock absorber
- ② Air hose
- ③ Swingarm
- ④ Damper adjusting cable
- ⑤ Fuel hose
- ⑥ Damping adjuster

SWINGARM

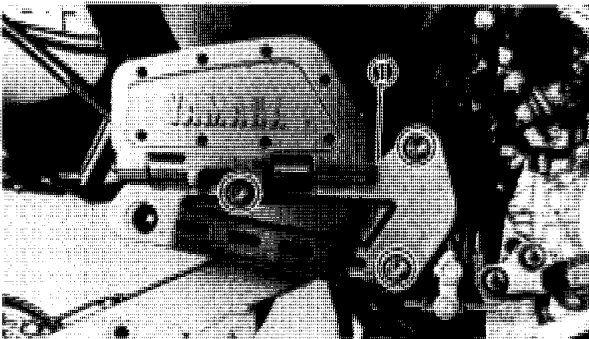
- ① Locknut
- ② Pivot shaft (right)
- ③ Collar
- ④ Oil seal
- ⑤ Taper roller bearing
- ⑥ Pivot shaft (left)
- ⑦ Lock washer
- ⑧ Collar
- ⑨ Oil seal
- ⑩ Taper roller bearing
- ⑪ Rubber boot





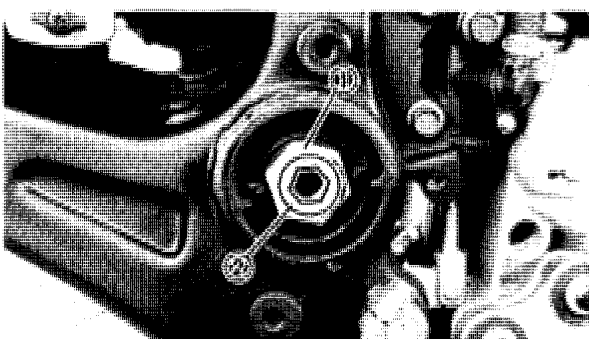
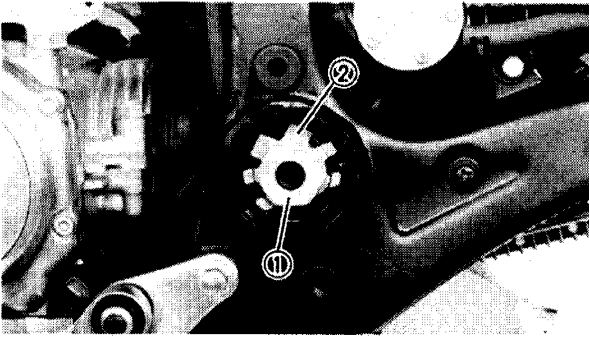
FREE PLAY INSPECTION

1. Remove:
 - Rear wheel
 - Rear shock absorber
2. Check:
 - Swingarm (Side play)
 - Side play → Replace taper roller bearings and collars.
 - Move the swingarm from side to side.
 - There should be no noticeable side play.
3. Check:
 - Swingarm (Vertical movement)
 - Tightness/Binding/Rough spots → Replace bearings.
 - Move the swingarm up and down.

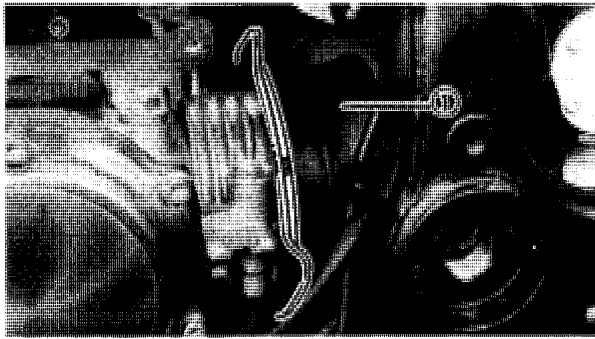


REMOVAL

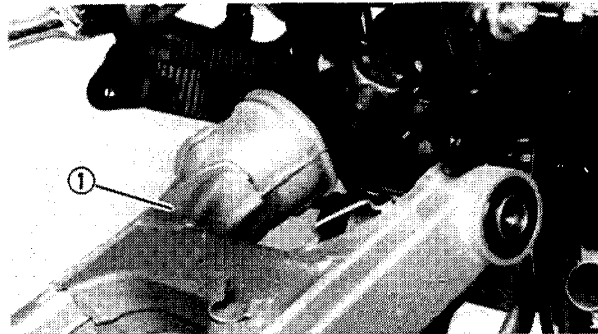
1. Remove:
 - Rear wheel
 - Rear shock absorber
 - Passenger footrest (Left and right) ①
2. Flatten:
 - Lock washer tab
 - Use a blunt chisel.
3. Remove:
 - Pivot shaft cap
 - Pivot shaft (Left) ①
 - Lock washer ②



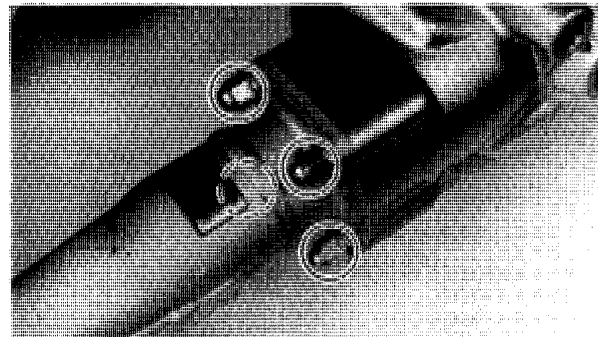
4. Remove:
 - Pivot shaft cap
 - Nut ①
 - Pivot shaft (Right) ②



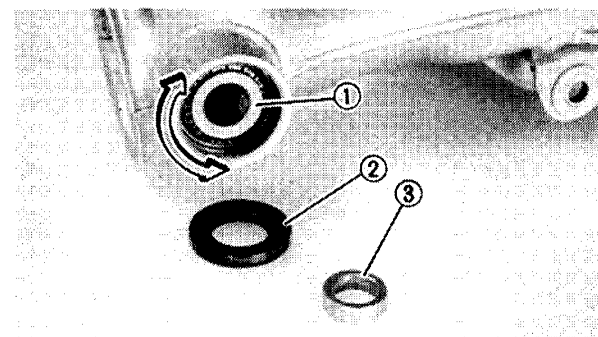
5. Remove:
- Rubber boot ①



6. Remove:
- Swingarm ①



7. Remove:
- Final gear assembly




INSPECTION

1. Wash the bearings in a solvent.
2. Inspect:
 - Bearings (Race/Rollers) ①
Pitting/Damage → Replace.
 - Oil seals ②
 - Collars ③
Damage → Replace.
3. Inspect:
 - Rubber boot
Damage → Replace.

INSTALLATION


When installing the swingarm, reverse the removal steps. Note the following points.


1. Lubricate:
 - Bearing
 - Oil seals


	Lithium Base Waterproof Wheel Bearing Grease
---	---


2. Install:
 - Swingarm
 - Pivot shafts
3. Tighten:
 - Pivot shafts


By the following tightening steps.


Pivot shaft tightening steps:	
	• Tighten the pivot shaft (Left) ① to specification.


	Pivot Shaft (Left): 100 Nm (10.0 m·kg, 72 ft·lb)
---	--

	• Tighten the pivot shaft (Right) ③ until it contacts the collar ⑤.
--	---

	Pivot Shaft (Right): 6 Nm (0.6 m·kg, 4.3 ft·lb)
---	---


	• Tighten nut (Right pivot shaft) ④ to specification.
---	---

	Nut (Right Pivot Shaft): 100 Nm (10.0 m·kg, 72 ft·lb)
---	---

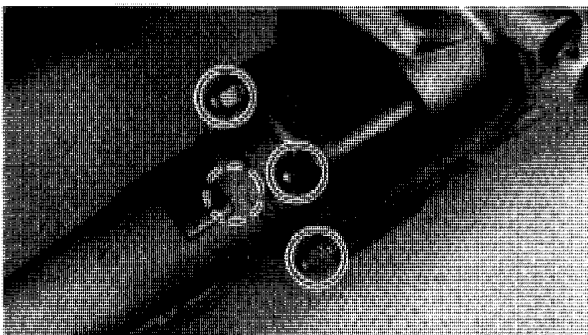
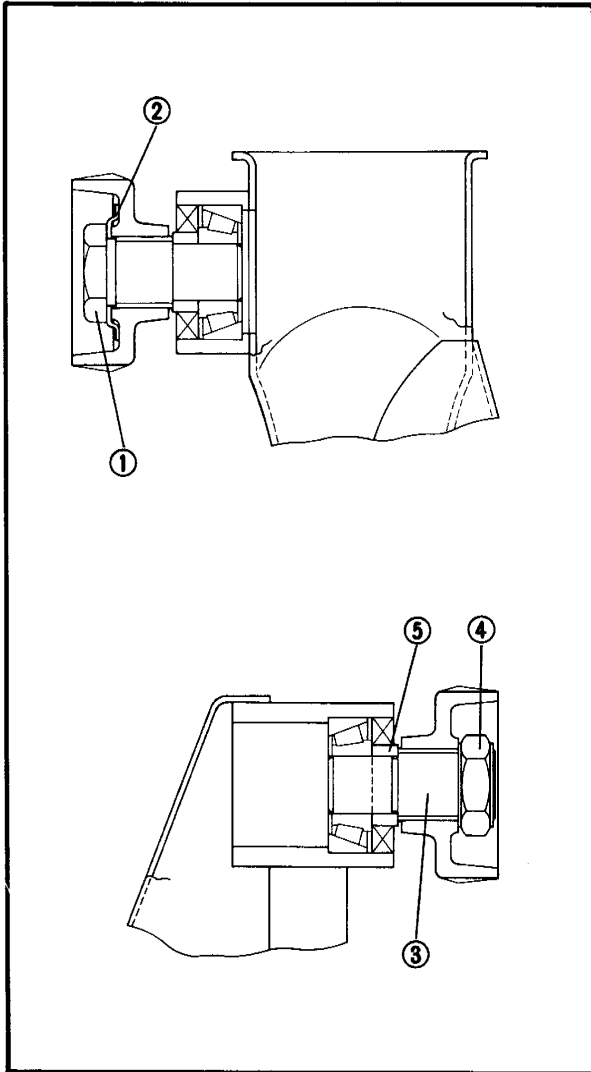
	• Bend the lock washer tab ② along the nut flat.
---	--

4. Apply:
 - Sealant (Quick Gasket®)
(ACC-11001-05-01)
To the mating surfaces of both case halves.

5. Install:
 - Final gear assembly

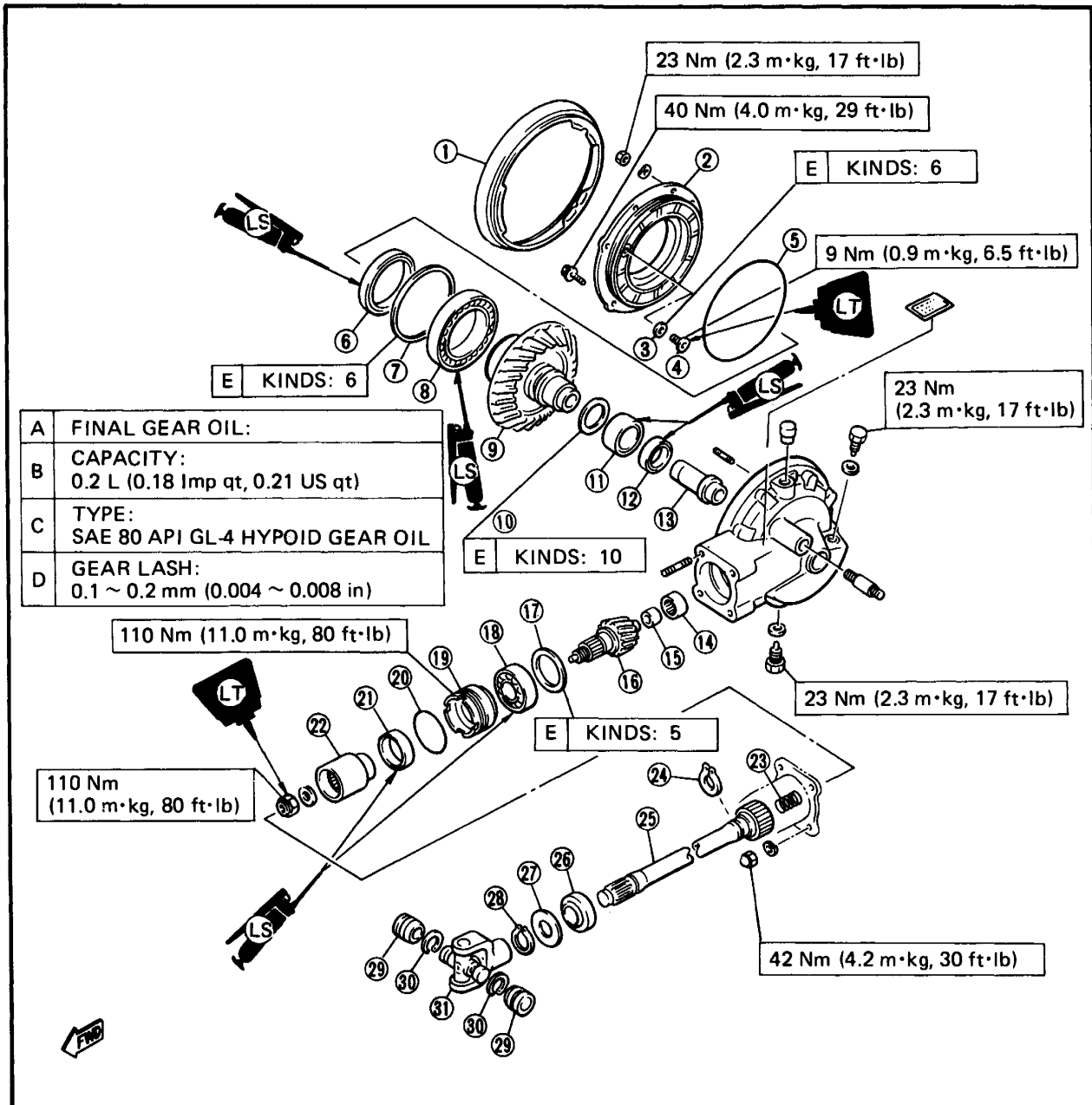
	Nuts (Final Gear Case): 42 Nm (4.2 m·kg, 30 ft·lb)
---	--

6. Check:
 - Swingarm (Side play)
 - Swingarm (Vertical movement)
Refer to "FREE PLAY INSPECTION" section.



SHAFT DRIVE

- | | | |
|--------------------------|-------------------------|-------------------|
| ① Dust cover | ⑮ Bearing | ⑳ Bearing |
| ② Bearing housing | ⑯ Drive pinion gear | ㉑ Circlip |
| ③ Ring gear stopper shim | ⑰ Final drive gear shim | ㉒ Universal joint |
| ④ Ring gear stopper | ⑱ Bearing | |
| ⑤ O-ring | ⑲ Bearing retainer | |
| ⑥ Oil seal | ⑳ O-ring | |
| ⑦ Ring gear shim | ㉑ Oil seal | |
| ⑧ Bearing | ㉒ Coupling gear | |
| ⑨ Ring gear | ㉓ Spring | |
| ⑩ Thrust washer | ㉔ Circlip | |
| ⑪ Bearing | ㉕ Drive shaft | |
| ⑫ Oil seal | ㉖ Oil seal | |
| ⑬ Collar | ㉗ Washer | |
| ⑭ Bearing | ㉘ Circlip | |



TROUBLESHOOTING

The following conditions may indicate damaged shaft drive components:

A	Symptoms	B	Possible Causes
	<ol style="list-style-type: none"> 1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (This must not be confuse with engine surging or tansmission characteristics.) 2. A "rolling rumble" noticeable at low speed; a high-piched whine; a "clunk" from a shaft drive component or area. 3. A locked-up condition of the shaft drive mechanism; no power transmitted from engine to rear wheel. 		<ol style="list-style-type: none"> A. Bearing damage. B. Improper gear lash. C. Gear tooth damage. D. Broken drive shaft. E. Broken gear teeth. F. Seizure due to lack of lubrication. G. Small foreign object lodged between moving parts.

NOTE: _____

Areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal motorcycle operating noise. If there is reason to believe these components are damaged, remove the components for specific inspection.

Inspection Notes

1. Investigate any unusual noises

The following "Noises" may indicate a mechanical defect:

a. A "rolling rumble" noise during coasting, acceleration, or deceleration. The noise increases with rear wheel speed, but it does not increase with higher engine or transmission speeds.

Diagnosis: Possible wheel bearing damage.

b. A "whining" noise that varies with acceleration and deceleration.

Diagnosis: Possible incorrect reassembly, too-little gear lash.

CAUTION:

Too-little gear lash is extremely destructive to the gear teeth. If a test ride following reassembly indicates this condition, stop riding immediately to minimize gear damage.

c. A slight "thunk" evident at low speed operation. This noise must be distinguished from normal motorcycle operation.

Diagnosis: Possible broken gear teeth.

WARNING:

Stop riding immediately if broken gear teeth are suspected. This condition could result in a locking-up of the shaft drive assembly, causing loss of control of the bike and possible injury to the rider.

2. Inspect:

- Drained oil

Drain plug shows large amount of metal.

Particles → Check bearing for seizure.

NOTE:

A small amount of metal particles in the oil is normal.

3. Inspect:

- Oil leakage

By the following inspection steps.

Oil leakage inspection steps:

- Clean the entire motorcycle thoroughly, then dry it.
- Apply a leak-localizing compound or dry powder spray to the shaft drive.
- Road test the motorcycle for the distance necessary to locate the leak.

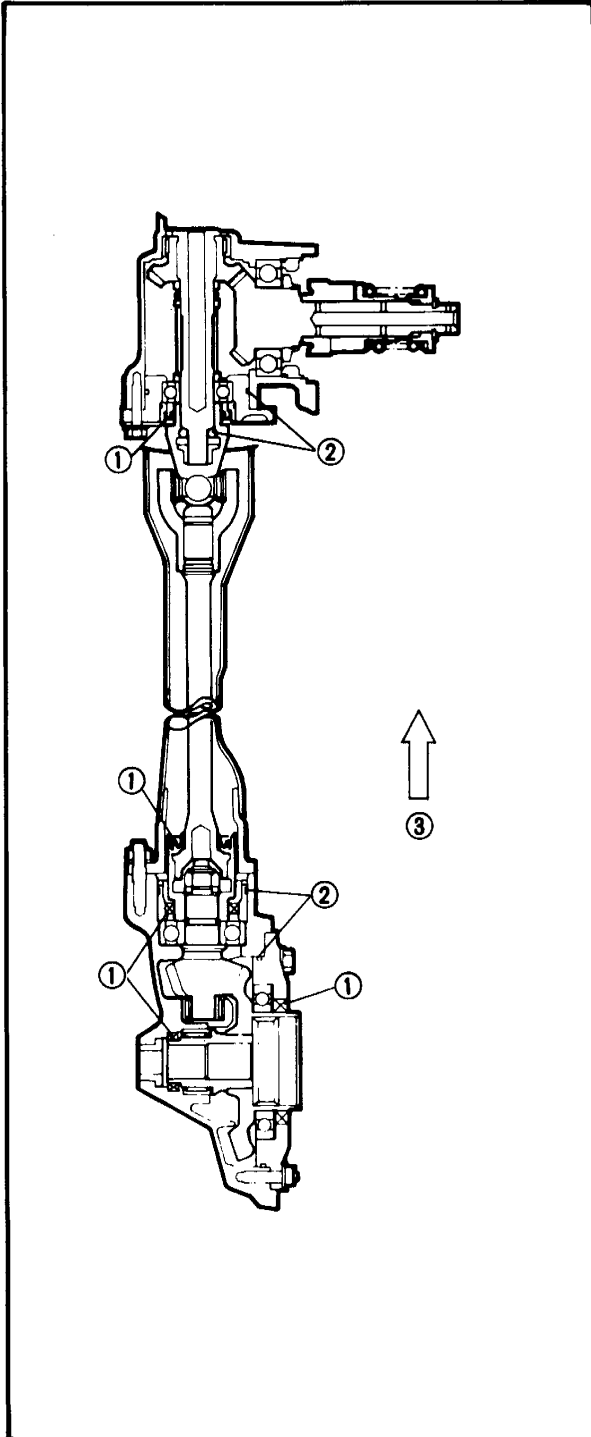
Leakage → Inspect component housing, gasket, and/or seal for damage.

Damage → Replace component.

- ① Oil seal
- ② O-ring
- ③ Forward

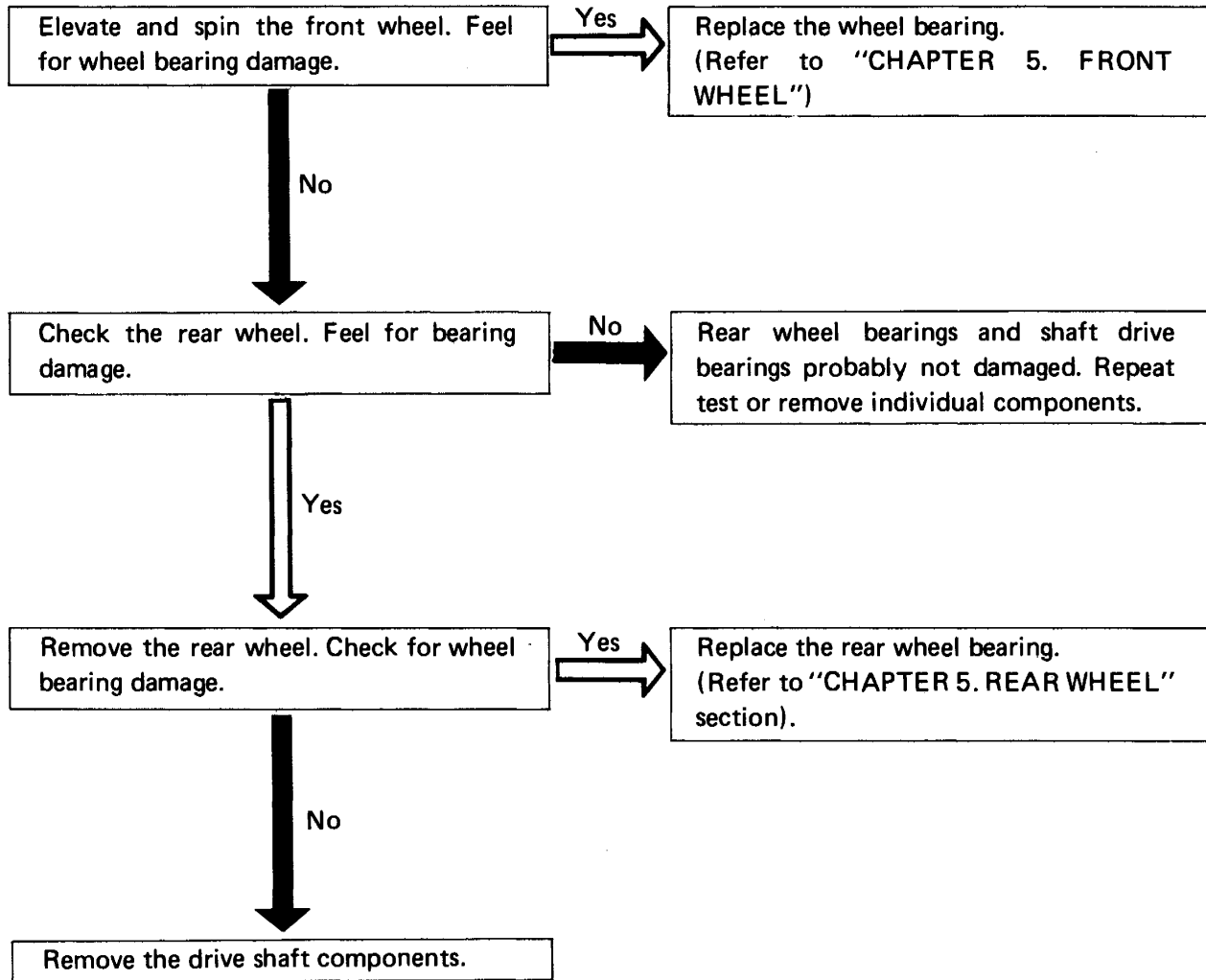
NOTE:

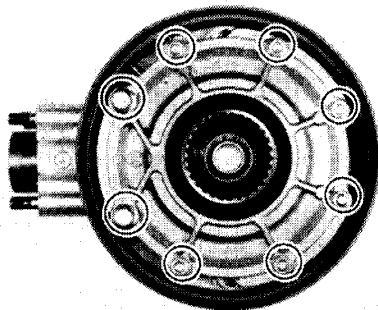
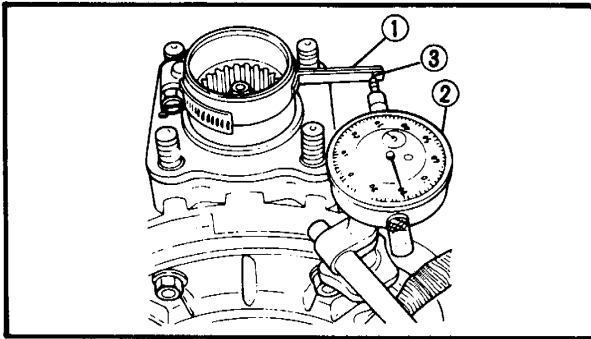
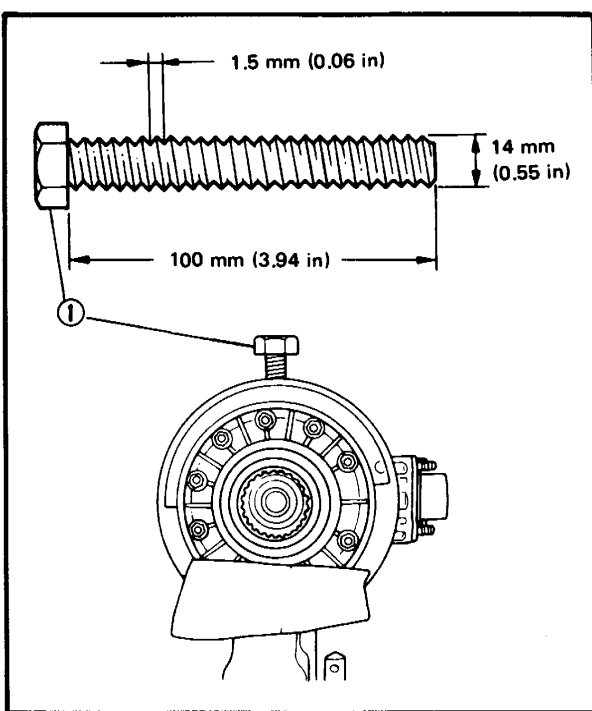
- An apparent oil leak on a new or nearly new motorcycle may be the result of a rest-preventative coating or excessive seal lubrication.
- Always clean the motorcycle and recheck the suspected location of an apparent leakage.



Troubleshooting Chart

When basic conditions "a" and "b" above exist, check the following points:





FINAL DRIVE GEAR

Gear Lash Measurement

1. Secure the gear case in a vise or other support.
2. Remove:
 - Drain plug
 - Drain the oil.
3. Install:
 - A specified bolt ①
 - Into the drain plug hole.
4. Finger tighten the bolt until it holds the ring gear.

NOTE:

Do not over tighten the bolt; finger-tight is sufficient.

5. Attach:

- Gear Lash Measurement Tool ① (YM-01230)
- Dial Gauge ② (YU-03097)

③ Position mark

6. Measure:

- Gear lash

Gently rotate the gear coupling from engagement to engagement.

Over specified limit → Adjust.



Final Gear Lash:

0.10 ~ 0.20 mm (0.004 ~ 0.008 in)

NOTE:

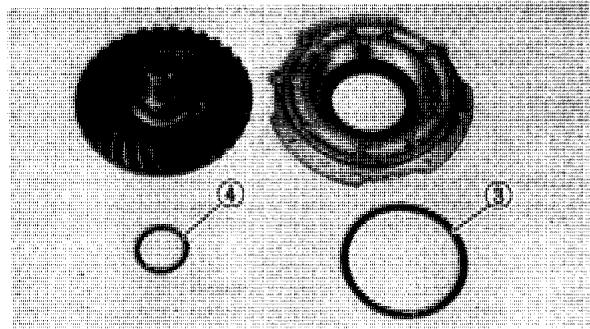
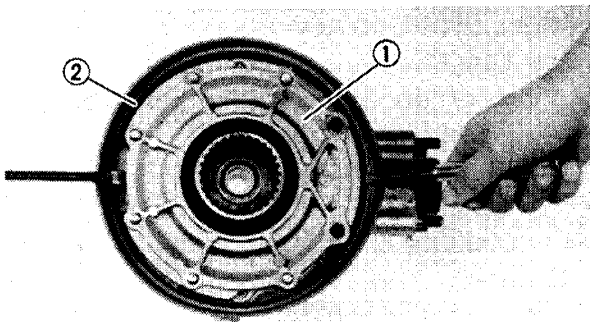
Measure the gear lash at 4 positions. Rotate the shaft 90° each time.

Gear Lash Adjustment

1. Remove:
 - Nuts (Bearing housing)
 - Bolts (Bearing housing)

NOTE:

Working in a crisscross pattern, loosen nut 1/4 turn each. Remove them after all are loosened.



2. Remove:
- Bearing housing ①
 - Dust cover ②
 - Ring gear
 - Shim(s) ③
 - Thrust washer ④

3. Adjust:
- Gear lash
- By the following adjustment steps.

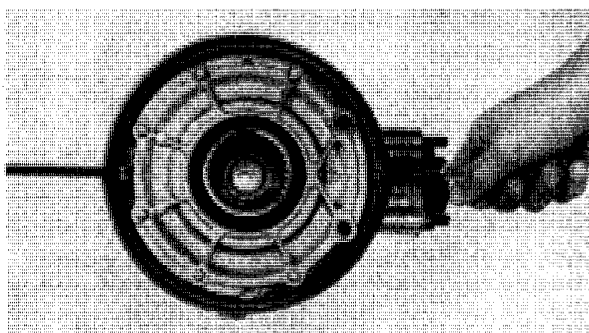
Gear lash adjustment steps:

- Select the suitable shims and thrust washer by the following chart.

<p>Too-little gear lash → Reduce shim thickness.</p> <p>Too-large gear lash → Increase shim thickness.</p>	
<p>To Add or Reduce Ring Gear Shim Thickness</p>	
<p>Increase by more than 0.1 mm (0.004 in)</p>	<p>Reduce by more than 0.1 mm (0.004 in)</p>
<p>Reduce thrust washer thickness by 0.1 mm (0.004 in) for every 0.1 mm of ring gear shim increase.</p>	<p>Reverse procedure</p>

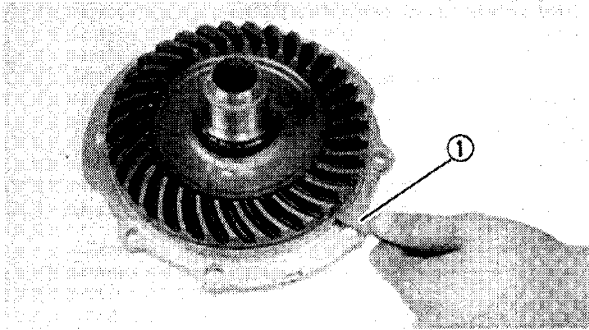
Ring Gear Shim				
Thickness (mm)	0.25 0.40	0.30 0.45	0.35 0.50	

Thrust Washer			
Thickness (mm)	1.4 1.7 2.0 2.3	1.5 1.8 2.1	1.6 1.9 2.2




Ring Gear Stopper Clearance Measurement

1. Remove:
- Bearing housing with ring gear
- Refer to "Gear Lash Adjustment" section.



2. Measure:

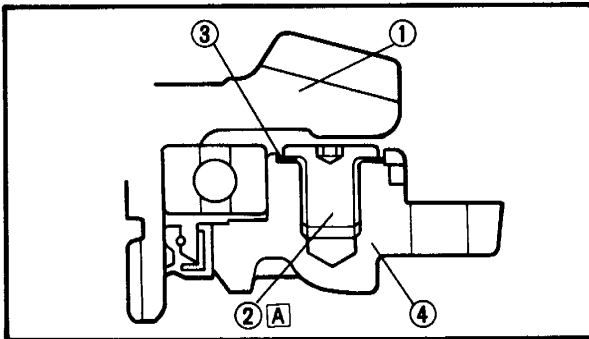
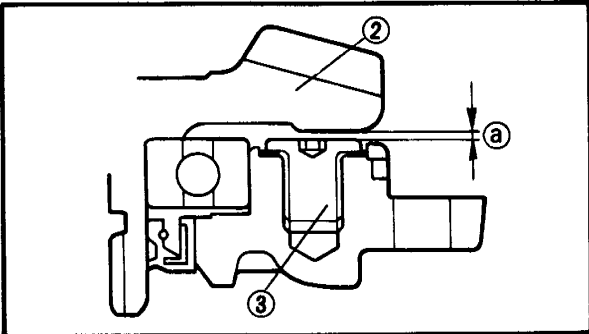
- Ring gear stopper clearance (a)
- Use the Feeler Gauge (1).
- Out of specification → Adjust.

 **Ring Gear Stopper Clearance (a) :**
0.30 ~ 0.60 mm (0.012 ~ 0.024 in)

- ② Ring gear stopper
- ③ Ring gear

3. Install:

- Bearing housing with ring gear




Ring Gear Stopper Clearance Adjustment

1. Remove:

- Ring gear (1)
- Ring gear stopper (2)
- Shim(s) (3)
- ④ Bearing housing
- A Left-hand-threads


2. Select:

- Suitable shim(s)
- By the following chart.

	Shim	
	Thickness (mm)	0.10 0.20 0.40

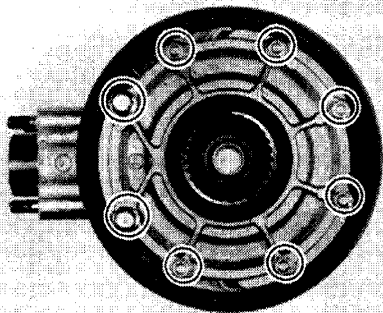
3. Install:

- Components in above list (step "1")

 **Ring Gear Stopper:**
9 Nm (0.9 m·kg, 6.5 ft·lb)
LOCTITE®

4. Measure:

- Ring gear stopper clearance



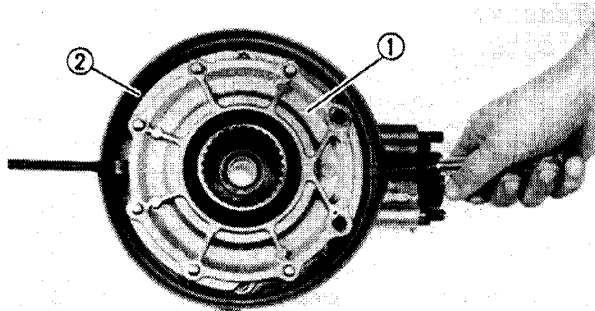
Final Drive Gear Disassembly

1. Remove:

- Nuts (Bearing housing)
- Bolts (Bearing housing)

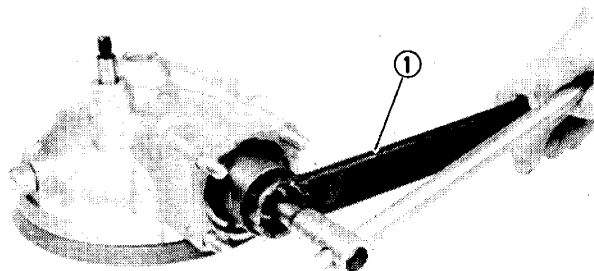
NOTE:

Working in a crisscross pattern, loosen nut 1/4 turn each. Remove them after all loosened.



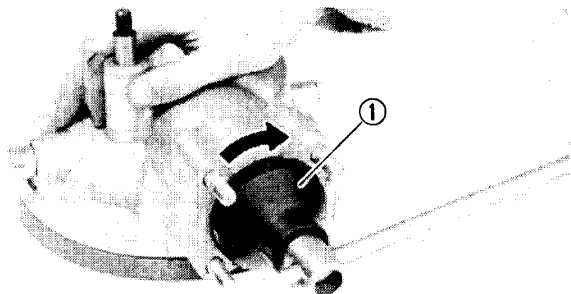
2. Remove:

- Bearing housing ①
- Dust cover ②
- Shim(s)
- Thrust washer



3. Remove:

- Self-locking nut (Coupling gear)
Use a Final Drive Shaft Holder ① (YM-01229).
- Coupling gear



4. Remove:

- Bearing retainer (Final drive shaft)
Use a Final Drive Shaft Bearing Retainer ① (YM-04050).

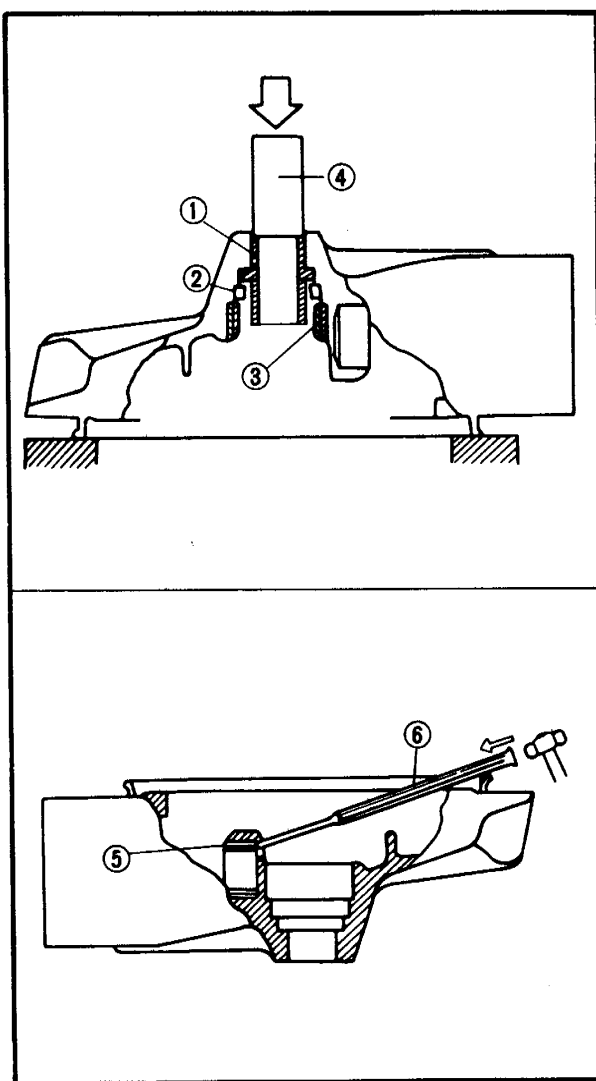
CAUTION:

Final-drive-shaft-bearing-retainer has left-hand threads. Turn retainer clockwise to loosen it.

- Final drive shaft assembly
Tap lightly on the final drive shaft end with a soft hammer.

CAUTION:

Final drive shaft removal should be performed only if gearing replacement is necessary. Do not reuse bearings or races after removal.

**Bearing Removal and Reassembly****1. Remove:**

- Guide collar ①
- Oil seal ②
- Roller bearing ③

Use a suitable press tool ④ and an appropriate support for the main housing.

2. Inspect:

- Roller bearing
- Damage → Replace.

NOTE:

Reuse of roller bearing OK, but Yamaha recommends installation of new bearing. Do not reuse the oil seal.

3. Remove:

- Final drive shaft roller bearing ⑤
- By the following removal steps.

Final drive shaft roller bearing removal steps:

- Heat the bare housing to 150°C (302°F)
- Remove the roller bearing outer race with an appropriately shaped punch ⑥.
- Remove the inner race from the final drive shaft.

NOTE:

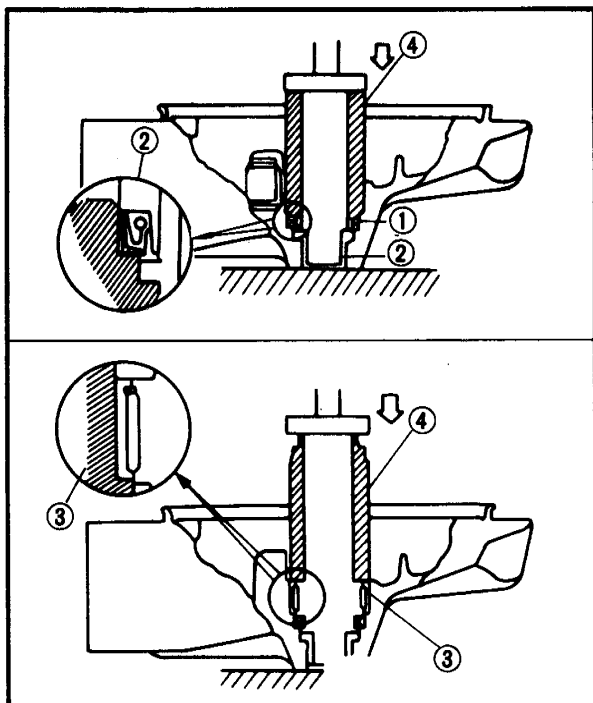
The removal of the final drive shaft roller bearing is difficult and seldom necessary.

4. Install:

- Rear final drive shaft roller bearing (New)
- By the following installation steps.

Final drive shaft roller bearing installation steps:

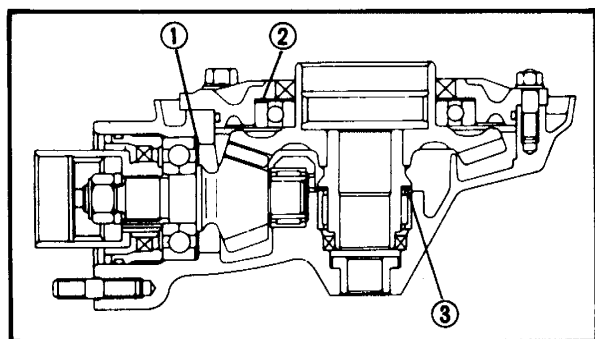
- Heat the bare bearing to 150°C (302°F)
- Install the roller bearing outer race using the proper adapted.
- Install the inner race onto the drive shaft.



5. Install:

- Guide collar ①
- Oil seal (New) ②
- Roller bearing (Outer race) ③

Use a suitable press tool ④ and a press to install the above components into the main housing.



Final Drive/Ring Gear Positioning

NOTE:

Gear positioning is necessary when any of the following parts are replaced:

- Final gear case
- Ring gear bearing housing
- Bearing(s)

1. Select:

- Final drive gear shim ①
- Ring gear shim ②

By the following selection steps.

Final drive/ring gear shim selection steps:

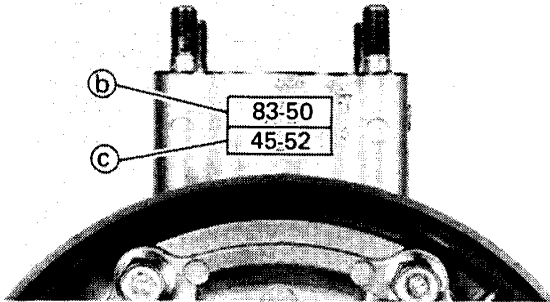
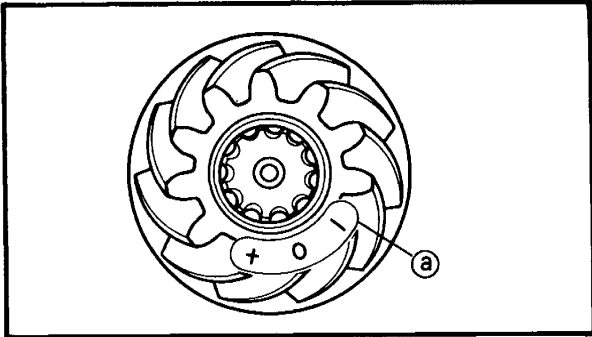
- Position final drive shaft gear and ring gear by using shims ① and ② with their respective thicknesses calculated from information marked on final gear case and drive gear end.

- ① Shim thickness "A"
- ② Shim thickness "B"
- ③ Thrust washer

- To find shim thickness "A" use following formula:

Final Drive Gear Shim Thickness:

$$A = a - b$$



Where:

a = a numeral (usually a decimal number) on the gear is either added to or subtracted from "84".

b = a numeral on the gear case (i.e. 83.50)

Example:


1) If final drive shaft gear is marked "+01" ... "a" is 84.01.

2) If the gear case is marked "83.50" ... "b" is 83.50.

$$A = 84.01 - 83.50 = 0.51$$

3) Therefore, shim thickness is 0.51 mm.

Shim sizes are supplied in following thicknesses:

 Final Drive Gear Shim		
Thickness (mm)	0.15	0.30
	0.40	0.50
	0.60	

Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

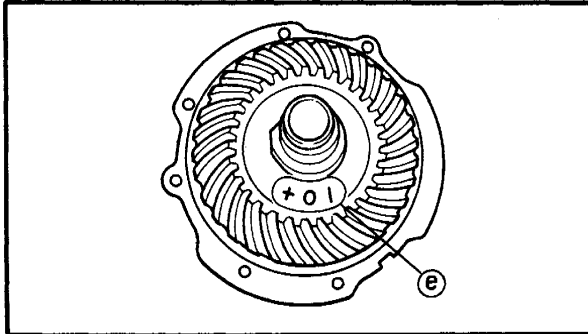
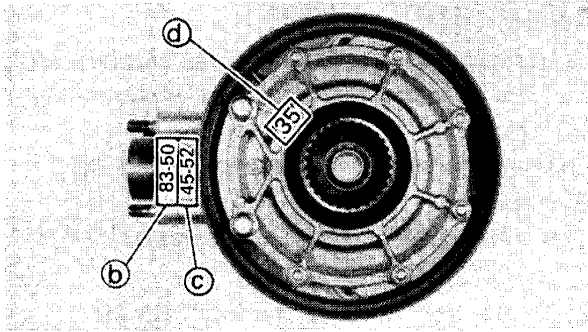
Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

In the example above, the calculated shim thickness is 0.51 mm. The chart instructs you, however, to round off the 1 to 0. Thus you should use a 0.50 mm shim.

- To find shim thickness "B", use following formula:

Ring Gear Shim Thickness:

$$B = c + d - (e + f)$$



Where:

- c = numeral on gear case (i.e. 45.52)
- d = numeral (usually a decimal number) on outside of ring gear bearing housing and added to 3.
- e = numeral (usually a decimal number) on inside of ring gear either added to or subtracted from 35.40.
- f = bearing thickness (considered constant).



Bearing Thickness "f" = 13.00 mm

Example:

- 1) If gear case is marked "45.52" ... "c" is 45.52.
- 2) If ring gear bearing housing is marked "35" ... "d" is $0.35 + 3 = 3.35$.
- 3) If ring gear is marked "+01" ... "e" is $35.40 + 0.01 = 35.41$.
- 4) "f" is 13.00.

$$= c + d - (e + f)$$

$$= 45.52 + 3.35 - (35.41 + 13.00)$$

$$= 48.87 - (48.41)$$

$$= 0.46$$
- 5) Therefore, shim thickness is 0.46 mm. Shim sizes are supplied in following thickness:



Ring Gear Shim

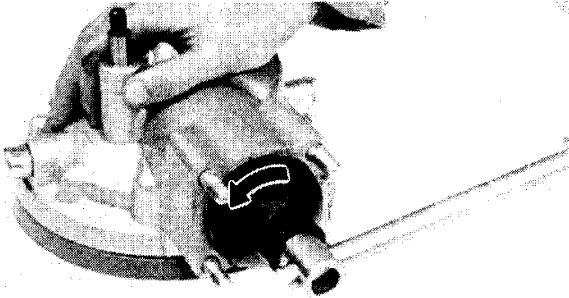
Thickness (mm)	0.25	0.30	0.35
	0.40	0.45	0.50

Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).



Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

In the example above, the calculated shim thickness is 0.46 mm. The chart instructs you, however, to round off the 6 to 5. Thus you should use a 0.45mm shims.



2. Install:

- Shims (Proper size as calculated)
- Final drive shaft assembly
- Bearing retainer (Final drive shaft)
Use a Final Drive Shaft Bearing Retainer Wrench (YM-04050).

NOTE:

The bearing retainer has left-hand threads; turn retainer counterclockwise to tighten it.



Bearing Retainer:
110 Nm (11.0 m·kg, 80 ft·lb)

3. Install:

- Coupling gear
- Self-locking nut (Coupling gear)
Use a Final Drive Shaft Holder (YM-01229).



Self-locking Nut (Coupling Gear)
110 Nm (11.0 m·kg, 80 ft·lb)
LOCTITE®

4. Install:

- Ring gear assembly (Without thrust washer)

5. Adjust:

- Gear lash
Refer to "Gear Lash Measurement and Adjustment" section.

6. Measure/Select:

- Ring gear thrust clearance
By the following measurement and selection steps.



Thrust clearance measurement steps:

- Remove the ring gear assembly.
- Place four pieces of Plastigage® between originally fitted thrust washer and ring gear.
- Install the ring gear assembly and tighten the bolts and nuts to specification.



Bolts (Bearing Housing):
40 Nm (4.0 m·kg, 29 ft·lb)

Nuts (Bearing Housing):
23 Nm (2.3 m·kg, 17 ft·lb)

NOTE:

Do not turn the shaft drive and ring gear when measuring clearance with Plastigage®.

- Remove the ring gear assembly.
- Measure the thrust clearance. Calculate width of flattened Plastigage® ① .



Ring Gear Thrust Clearance:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

- If the correct clearance, install the ring gear assembly.
- If the out of specification, select the correct washer.

Thrust washer selection steps:

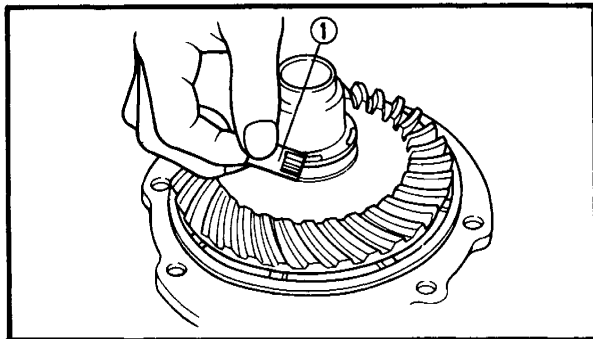
- Select the suitable thrust washer by the following chart.

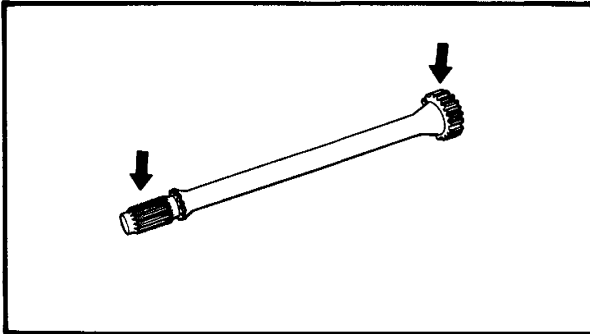
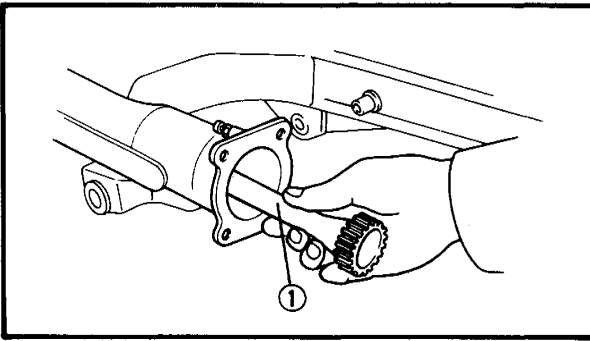
Thrust Washer			
	1.4	1.5	1.6
Thickness (mm)	1.7	1.8	1.9
	2.0	2.1	2.2
	2.3		

- Repeat measurement steps until the ring gear thrust clearance is within the specified limits.



Ring Gear Thrust Clearance:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)



**DRIVE SHAFT****Removal**

1. Remove:
 - Rear wheel
 - Final gear assembly
 - Drive shaft ①

Inspection

1. Inspect:
 - Drive shaft splines
 - Wear/Damage → Replace.

Installation

When installing the drive shaft, reverse the removal procedure. Note the following points.

1. Lubricate:
 - Shaft splines



Molybdenum Disulfide Grease

2. Install:
 - Drive shaft

NOTE:

Before installing, first set the universal joint in place on the middle case side.

3. Apply:
 - Sealant (Quick Gasket®)
(ACC-11001-05-01)
To the mating surfaces of both case halves.
4. Tighten:
 - Nuts (Final gear case)



Nuts (Final Gear Case):
42 Nm (4.2 m·kg, 30 ft·lb)

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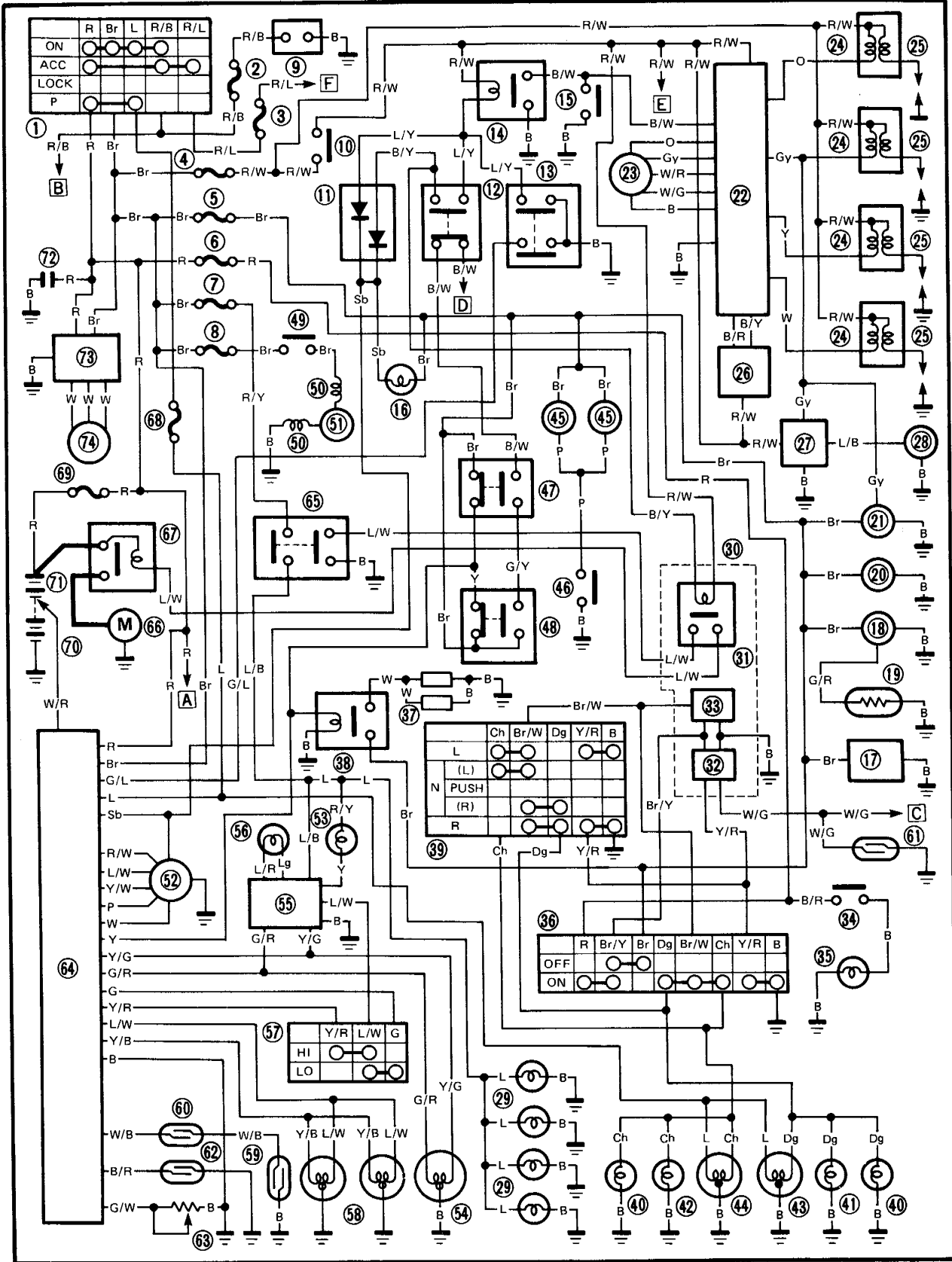
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ELECTRICAL

XVZ13DS/DSC CIRCUIT DIAGRAM (1)





- ① Main switch
- ② Fuse
- ③ Fuse (CLASS)
- ④ Fuse (IGNITION)
- ⑤ Fuse (SIGNAL)
- ⑥ Fuse (HAZARD)
- ⑦ Fuse (HEAD)
- ⑧ Fuse (FAN)
- ⑨ Auxiliary D.C. terminal
- ⑩ "ENGINE STOP" switch
- ⑪ Diode assembly
- ⑫ Clutch switch
- ⑬ Sidestand switch
- ⑭ Sidestand relay
- ⑮ Emergency stop switch
- ⑯ "NEUTRAL" indicator light
- ⑰ Air vent control valve
(For California)
- ⑱ Engine temperature gauge
- ⑲ Thermo unit
- ⑳ Voltmeter
- ㉑ Tachometer
- ㉒ Ignitor unit
- ㉓ Pick up coil
- ㉔ Ignition coil (#1 ~ #4)
- ㉕ Spark plug (#1 ~ #4)
- ㉖ Pressure sensor (Ignition)
- ㉗ Fuel pump control relay
- ㉘ Fuel pump
- ㉙ Meter light
- ㉚ Relay assembly
- ㉛ Starting circuit cut-off relay
- ㉜ Cancelling unit
- ㉝ Flasher relay
- ㉞ Trunk light switch
- ㉟ Trunk light
- ㊱ "HAZARD" switch
- ㊲ Solenoid valve (EAND)

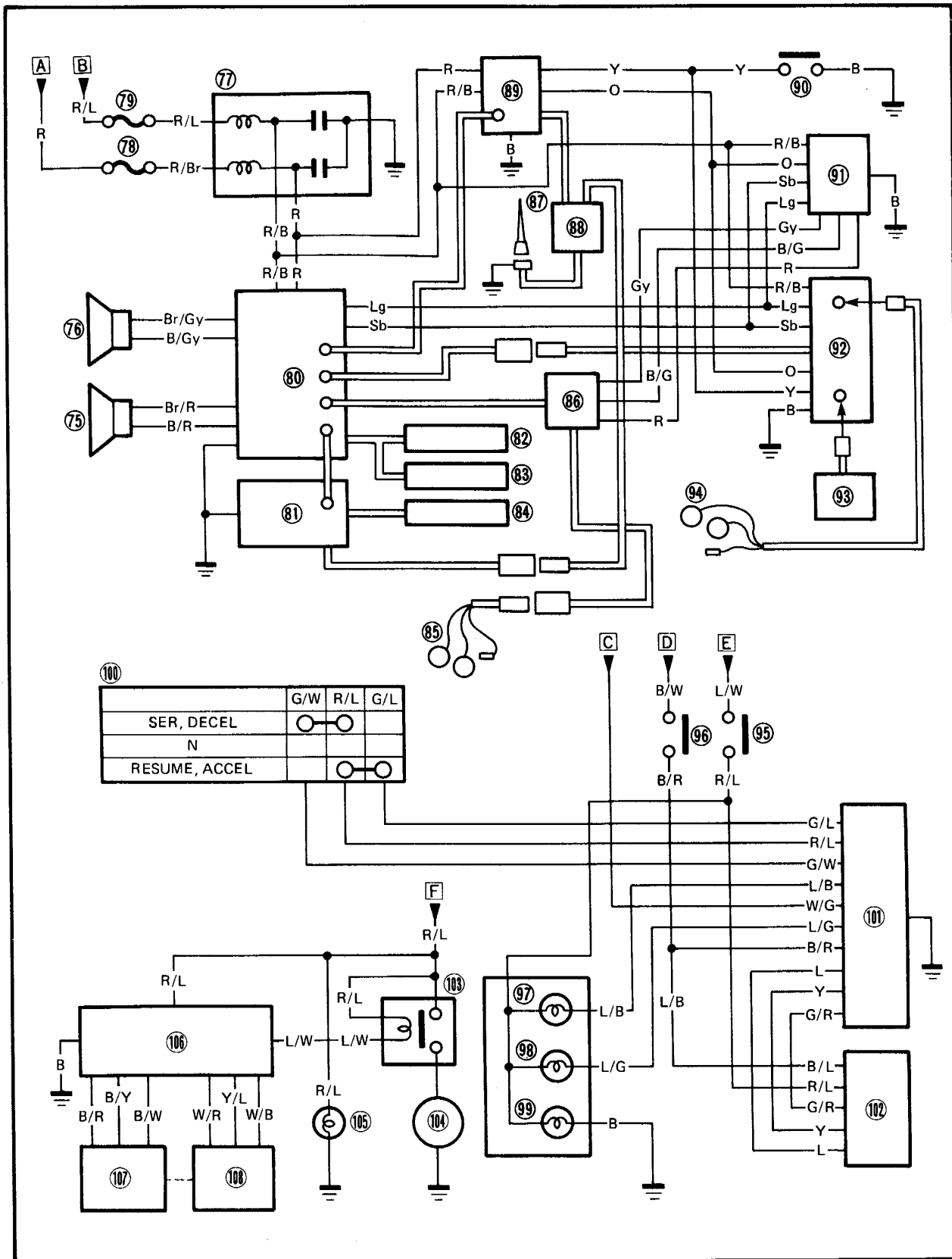
- ㊳ EAND relay
- ㊴ "TURN" switch
- ㊵ "TURN" indicator light
- ㊶ Rear flasher light (Right)
- ㊷ Rear flasher light (Left)
- ㊸ Front flasher light (Right)/
Parking and running light
- ㊹ Front flasher light (Left)/
Parking and running light
- ㊺ Horn
- ㊻ "HORN" switch
- ㊼ Front brake switch
- ㊽ Rear brake switch
- ㊾ Thermo switch
- ㊿ Noise filter (Fan motor)
- 1 Fan motor
- 2 Shift position switch
- 3 "HIGH BEAM" indicator light
- 4 Headlight
- 5 Reserve lighting unit
- 6 "HEAD LAMP" indicator light
- 7 "LIGHTS" (Dimmer) switch
- 8 Tail/brake light
- 9 Rear brake fluid level sensor
- 0 Front brake fluid level sensor
- 1 Speedometer sensor
- 2 Oil level sender
- 3 Fuel sender
- 4 Computer monitor
- 5 "START" switch
- 6 Starter motor
- 7 Starter relay
- 8 Fuse (TAIL)
- 9 Fuse (MAIN)
- 0 Battery sensor
- 1 Battery
- 2 Condensator
- 3 Rectifier with regulator
- 4 A.C. Generator

COLOR CODE

B	Black
L	Blue
O	Orange
G	Green
R	Red
P	Pink
Y	Yellow
W	White
Br	Brown
Dg	Dark green
Ch	Chocolate
Sb	Sky blue
Gy	Gray
Lg	Light green
G/R	Green/Red
G/Y	Green/Yellow
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
L/Y	Blue/Yellow
L/B	Blue/Black
L/W	Blue/White
R/W	Red/White
R/B	Red/Black
R/Y	Red/Yellow
W/R	White/Red
W/G	White/Green
W/B	White/Black
Y/R	Yellow/Red
Y/L	Yellow/Blue
Br/W	Brown/White
B/L	Black/Blue
B/G	Black/Green
B/Gy	Black/Gray
L/R	Blue/Red
L/G	Blue/Green
R/L	Red/Blue
Y/G	Yellow/Green
Y/B	Yellow/Black
Y/W	Yellow/White
G/L	Green/Blue
G/W	Green/White
Br/Y	Brown/Yellow
Br/Gy	Brown/Gray
Br/R	Brown/Red



CIRCUIT DIAGRAM (2)





- ⑦⑤ Speaker (Right)
- ⑦⑥ Speaker (Left)
- ⑦⑦ Noise filter (Wire harness)
- ⑦⑧ Fuse (BACK UP)
- ⑦⑨ Fuse (AUDIO/C.B.)
- ⑧① Amplifier
- ⑧① Tuner
- ⑧② Amplifier controller
- ⑧③ Cassette deck
- ⑧④ Tuner controller
- ⑧⑤ Head set (For rider-Option)
- ⑧⑥ Head set lead
- ⑧⑦ Antenna
- ⑧⑧ Matching box
- ⑧⑨ C.B. radio
- ⑨① "PTT" (Push-to-talk) switch
- ⑨① Remote controller unit (For rider)
- ⑨② Remote controller box
- ⑨③ Remote controller unit
(For passenger)
- ⑨④ Head set (For passenger-Option)
- ⑨⑤ "POWER" (Cruise) switch
- ⑨⑥ "CANCEL" (Cruise) switch
- ⑨⑦ "SET" (Cruise) indicator light
- ⑨⑧ "RESUME" (Cruise) indicator light
- ⑨⑨ "ON" (Cruise) indicator light
- ⑩① Cruise control switch
- ⑩① Cruise control unit
- ⑩② Vacuum pump
- ⑩③ CLASS relay
- ⑩④ Compressor
- ⑩⑤ Illumination (CLASS)
- ⑩⑥ CLASS control unit
- ⑩⑦ Solenoid valve (CLASS)
- ⑩⑧ Pressure sensor (CLASS)

COLOR CODE

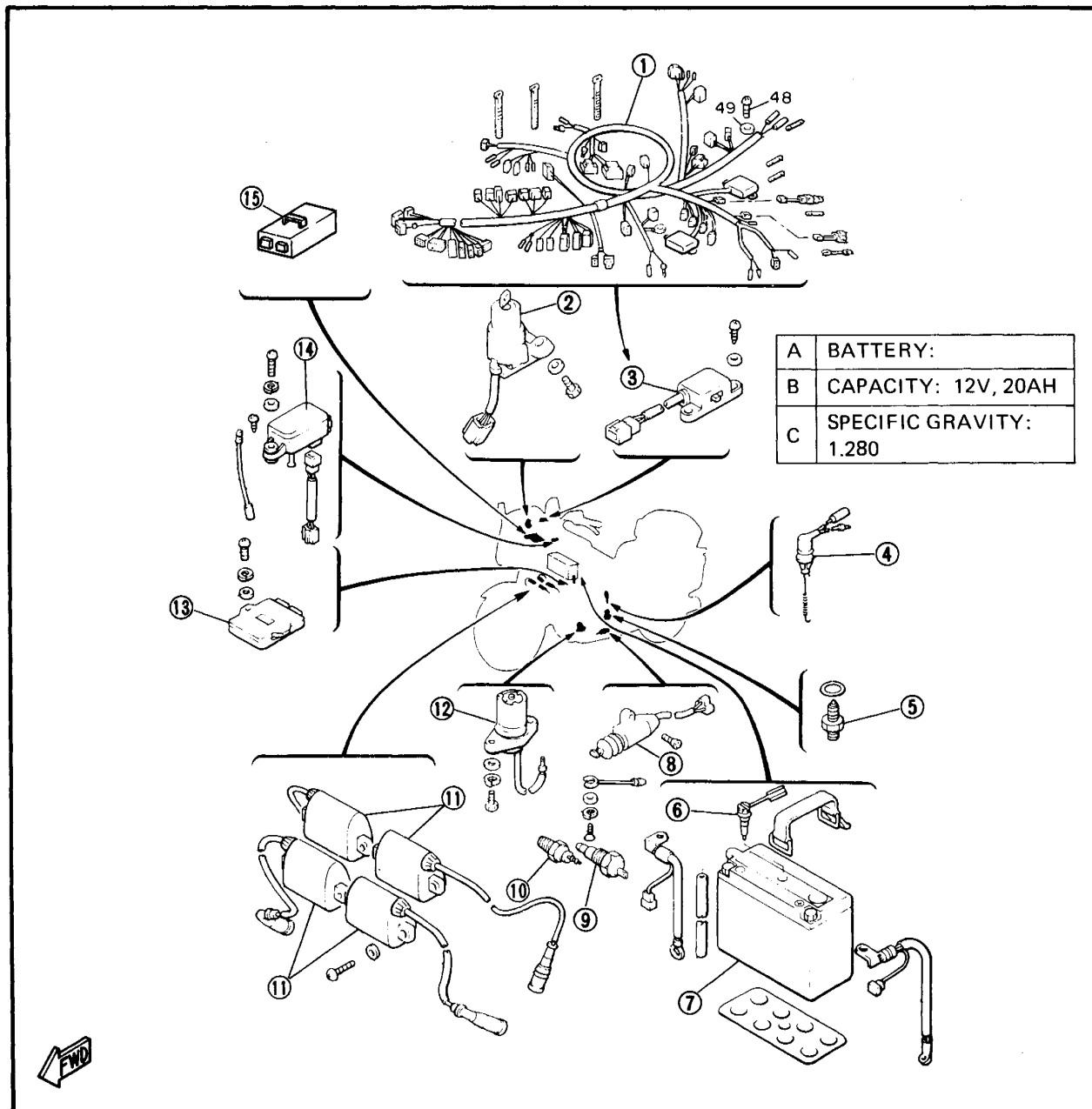
B	Black
L	Blue
O	Orange
G	Green
R	Red
P	Pink
Y	Yellow
W	White
Br.	Brown
Dg	Dark green
Ch	Chocolate
Sb	Sky blue
Gy	Gray
Lg	Light green
G/R	Green/Red
G/Y	Green/Yellow
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
L/Y	Blue/Yellow
L/B	Blue/Black
L/W	Blue/White
R/W	Red/White
R/B	Red/Black
R/Y	Red/Yellow
W/R	White/Red
W/G	White/Green
W/B	White/Black
Y/R	Yellow/Red
Y/L	Yellow/Blue
Br/W	Brown/White
B/L	Black/Blue
B/G	Black/Green
B/Gy	Black/Gray
L/R	Blue/Red
L/G	Blue/Green
R/L	Red/Blue
Y/G	Yellow/Green
Y/B	Yellow/Black
Y/W	Yellow/White
G/L	Green/Blue
G/W	Green/White
Br/Y	Brown/Yellow
Br/Gy	Brown/Gray
Br/R	Brown/Red



ELECTRICAL COMPONENTS (1)

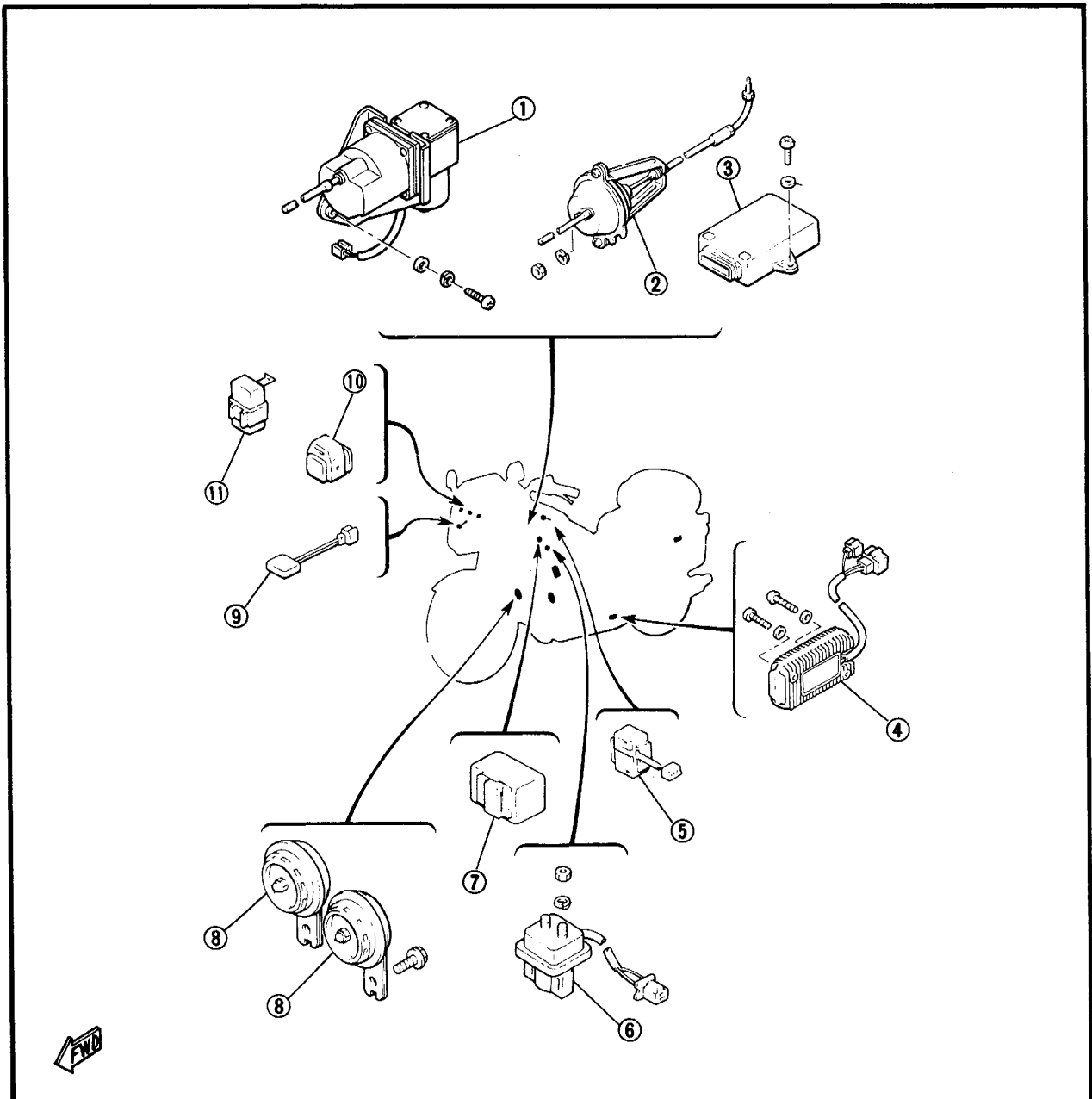
- ① Wire harness
- ② Main switch
- ③ Hazard switch
- ④ Rear brake switch
- ⑤ Shift position switch
- ⑥ Battery fluid level sensor
- ⑦ Battery
- ⑧ Sidestand switch
- ⑨ Thermo switch
- ⑩ Thermo unit
- ⑪ Ignition coil
- ⑫ Oil level sender
- ⑬ Ignitor unit
- ⑭ Pressure sensor (Ignition)
- ⑮ Reserve lighting unit

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY	2.4 ~ 3.0Ω
SECONDARY	10.6 ~ 15.8kΩ
PICK-UP COIL:	93.5 ~ 126.5Ω



ELECTRICAL COMPONENTS (2)

- ① Vacuum pump (Venture cruise)
- ② Vacuum autuator (Venture cruise)
- ③ Cruise control unit
- ④ Rectifier with regulator
- ⑤ Emergency stop switch
- ⑥ Starter relay
- ⑦ Relay assembly
- ⑧ Horn
- ⑨ Diode
- ⑩ Sidestand relay
- ⑪ Fuel pump control relay

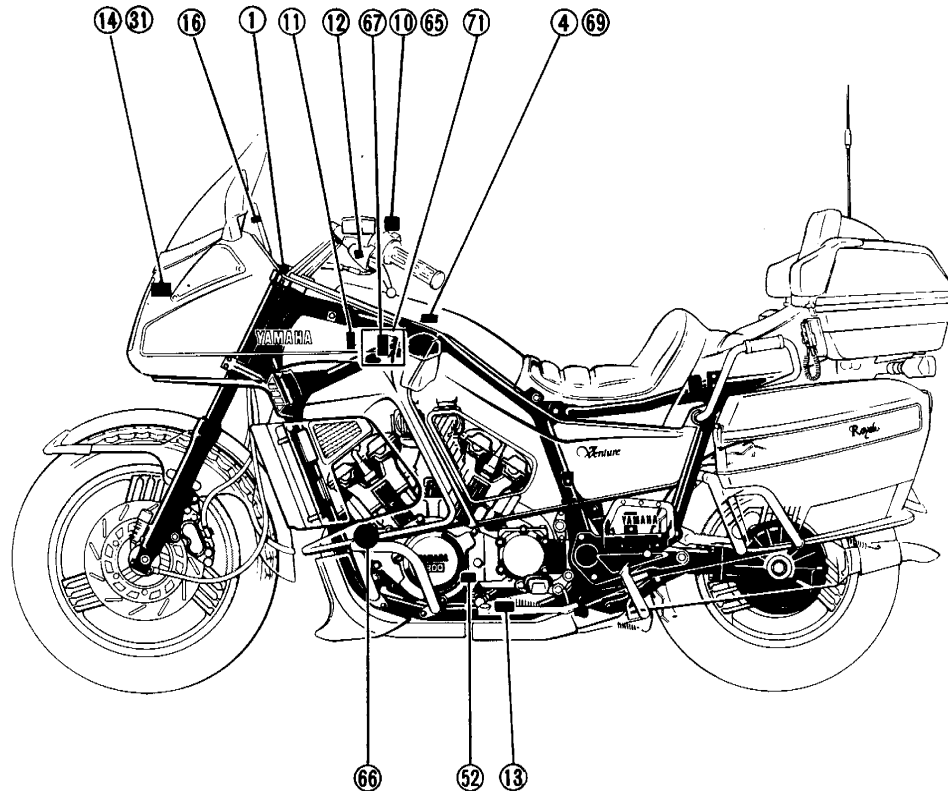


Aforementioned circuit diagram shows electrical starting circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

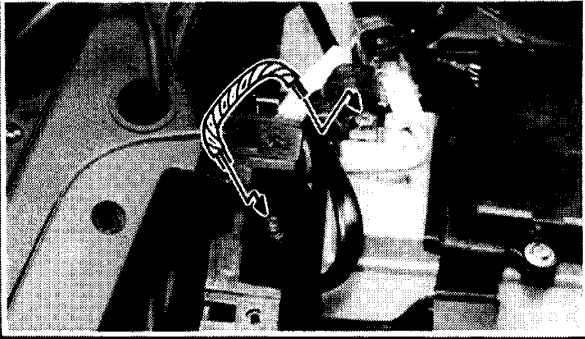
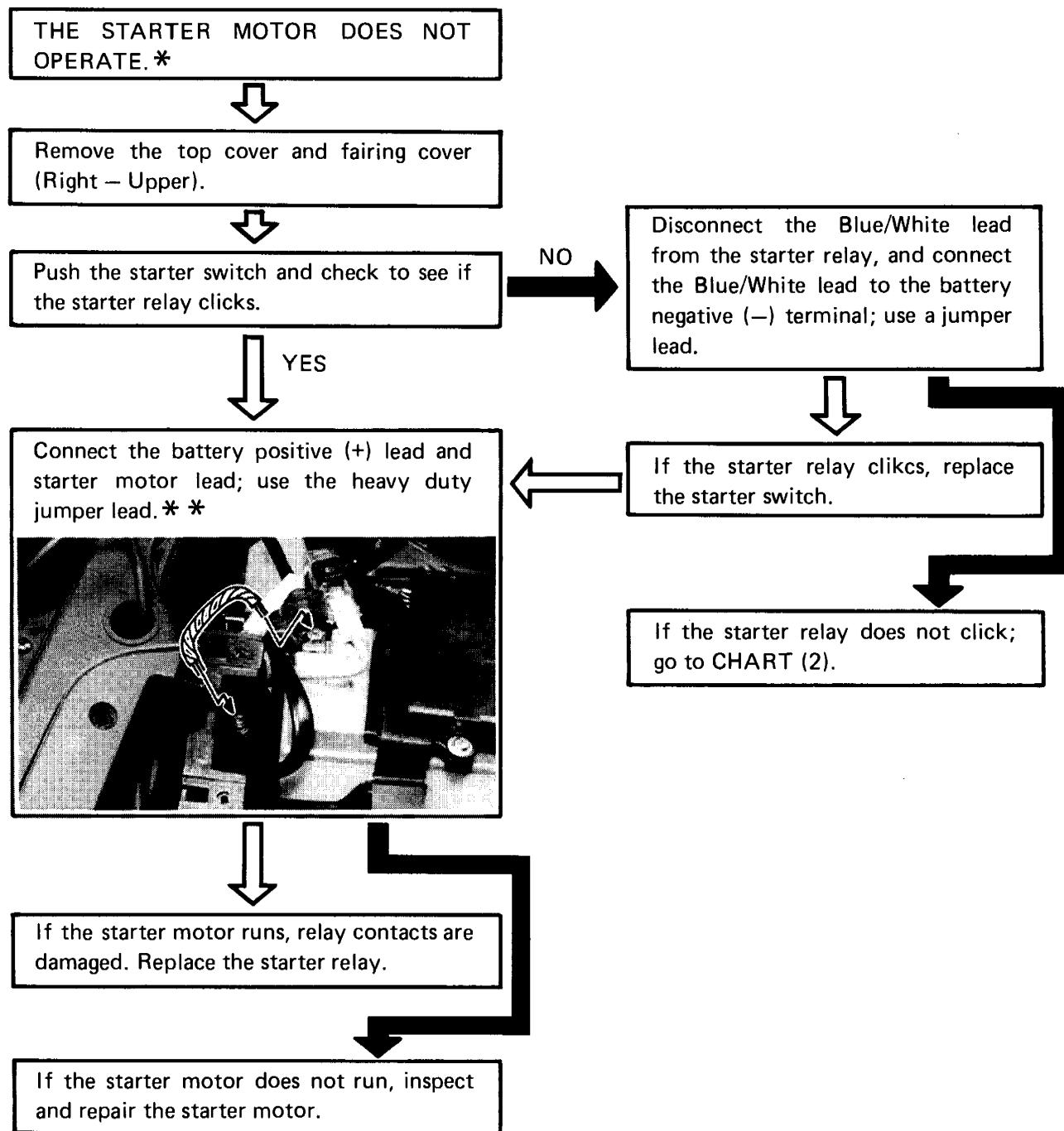
- ① Main switch
- ④ Fuse (IGNITION)
- ⑩ "ENGINE STOP" switch
- ⑪ Diode assembly
- ⑫ Clutch switch
- ⑬ Sidestand switch
- ⑭ Sidestand relay
- ⑯ "NEUTRAL" indicator light
- ⑳ Starting circuit cut-off relay
- ㉓ Shift position switch
- ㉖ "START" switch
- ㉗ Starter motor
- ㉘ Starter relay
- ㉙ Fuse (MAIN)
- ㉚ Battery





TROUBLESHOOTING

Troubleshooting Chart (1)



*** NOTE:** _____
 Make sure that the battery should be fully charged.

**** WARNING:** _____
 This test should be performed within a few seconds to prevent further damage. Also, there should be no flammables close to the starter relay.

Troubleshooting Chart (2)

THE STARTER MOTOR DOES NOT OPERATE.



Check the starter relay and starter motor; refer to CHART (1).




Remove the fairing and disconnect the relay assembly connector.



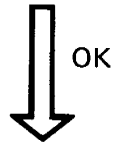
Check the battery voltage (12V) on the Red/White lead.

L/W	L/W	X	Br/W	Br/Y
R/W	B/Y	B	Y/R	W/G



NO →

Check for an open or poor connection between the main switch and relay assembly.



Connect the relay assembly connector.



Connect the Black/Yellow lead to "ground" on the frame; use a jumper lead.

→

If the relay does not click, replace the relay assembly.



If the relay clicks, check the sidestand relay, diode and the starter, clutch, sidestand and shift position switches. Replace switch(es) if necessary.



STARTING CIRCUIT CUT-OFF SYSTEM

A starting circuit cut-off system is employed, and operates as follows:

Starting Circuit Operation

The starting circuit on this model consist of the starter motor, starter relay, and the relay assembly (starting circuit cut-off relay). If the engine stop switch and the main switch are both on, the starter motor can operate only if:

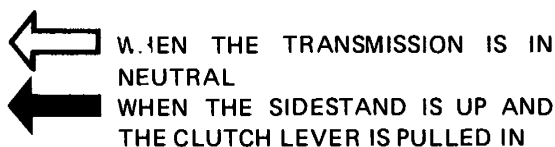
The transmission is in neutral (the neutral switch is on).

or if

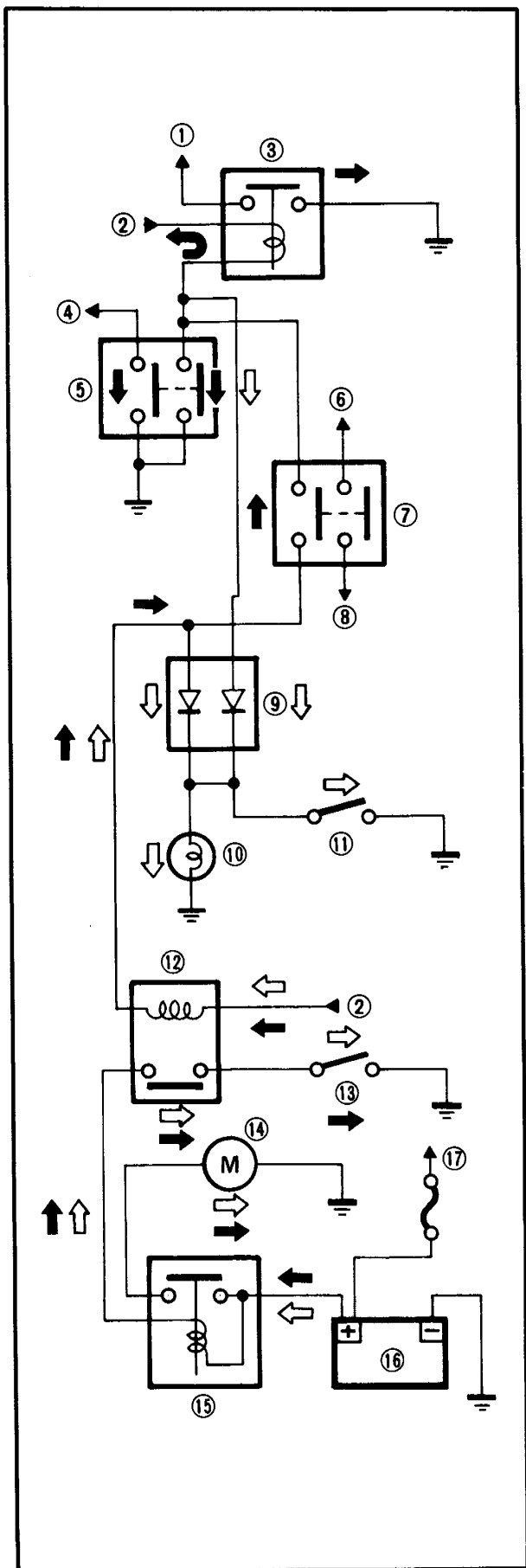
The clutch lever is pulled to the handlebar (the clutch switch is on) and the sidestand is up (the sidestand switch is on.)

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is off so current cannot reach the starter motor.

When one of both of the above conditons have been met, however, the starting circuit cut-off relay is on, and the engine can be started by pressing the starter switch.

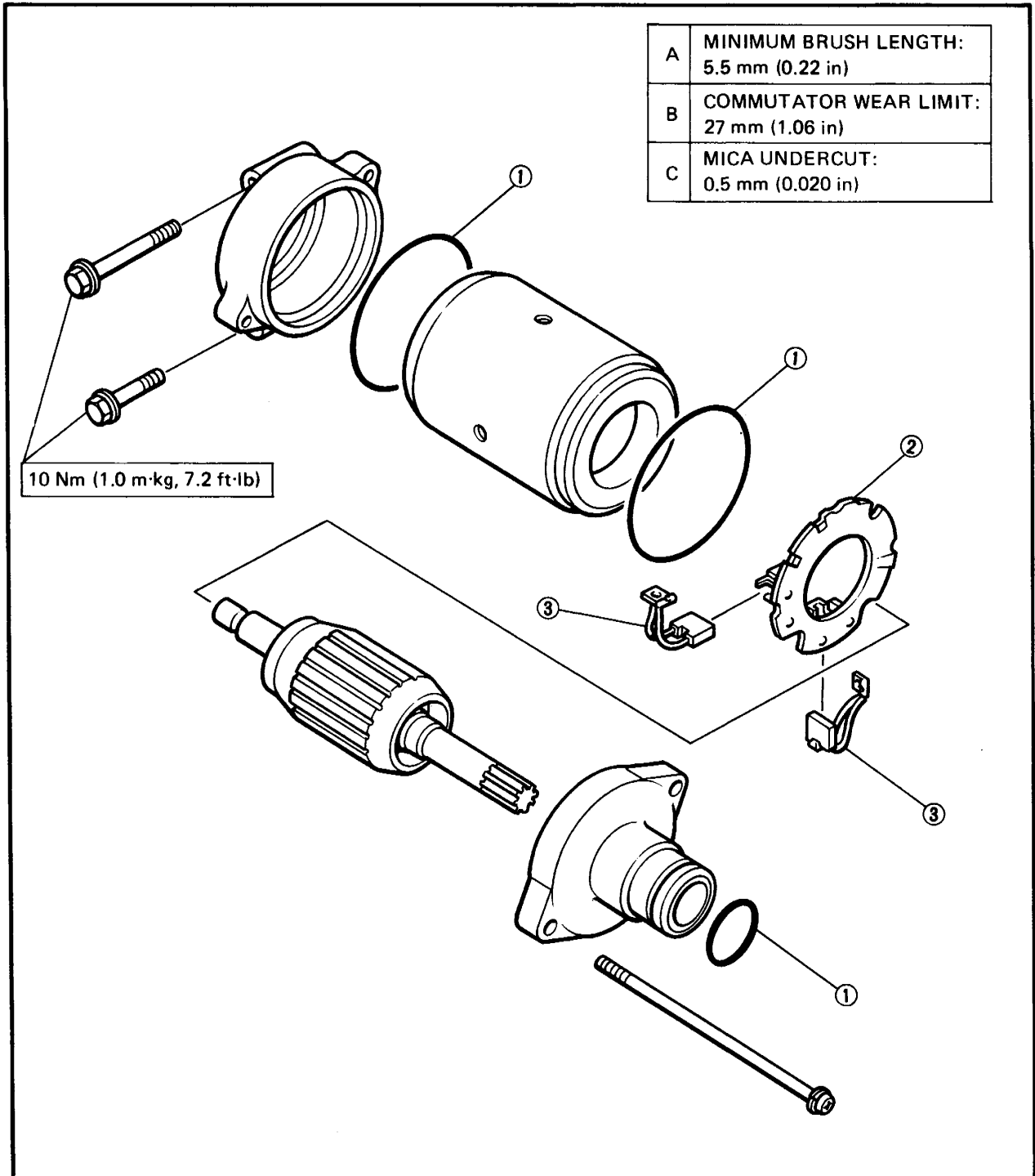


- ① To ignitor unit
- ② From engine stop switch
- ③ Sidestand relay
- ④ To computer monitor
- ⑤ Sidestand switch
- ⑥ To cruise control unit
- ⑦ Clutch switch
- ⑧ To front brake switch
- ⑨ Diode
- ⑩ "NEUTRAL" indicator light
- ⑪ Shift position switch
- ⑫ Starting circuit cut-off relay
- ⑬ Starter switch
- ⑭ Starter motor
- ⑮ Starter relay
- ⑯ Battery
- ⑰ To main switch



STARTER MOTOR TEST

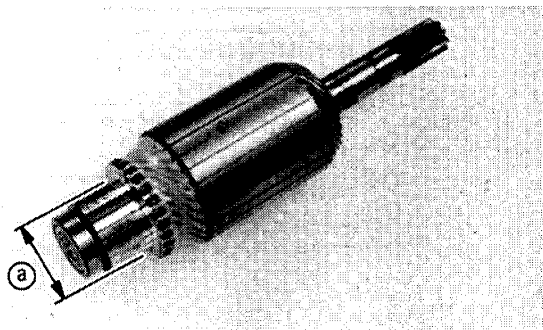
- ① O-ring
- ② Brush holder assembly
- ③ Brush





Removal

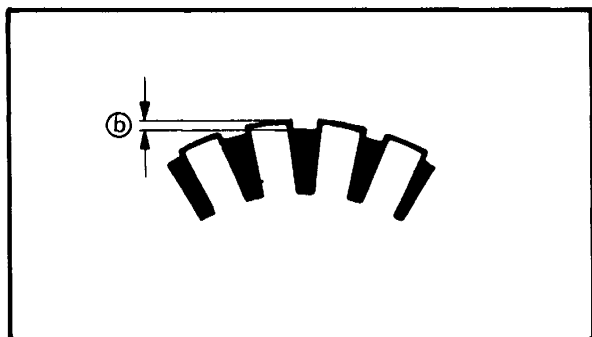
1. Remove:
 - Starter motor
 Refer to "CHAPTER 3. ENGINE DIS-ASSEMBLY" section.



Inspection and Repair

1. Inspect:
 - Commutator
 - Dirty → Clean with #600 grit sandpaper.
2. Measure:
 - Commutator diameter (a)
 - Out of specification → Replace starter motor.

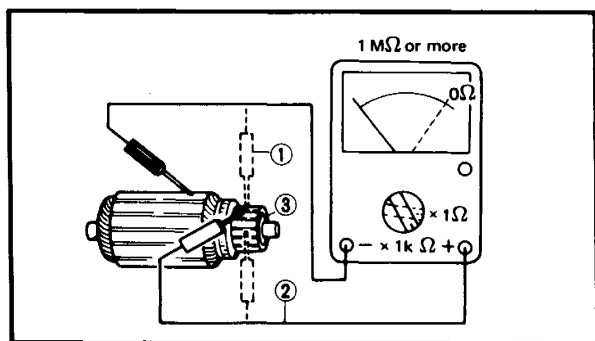
Commutator Wear Limit:
27 mm (1.06 in)



3. Measure:
 - Mica undercut (b)
 - (between commutator segments)
 - Out of specification → Scrape mica to proper value.
 - Use a hacksaw blade that is ground to fit.

Mica Undercut:
0.5 mm (0.020 in)

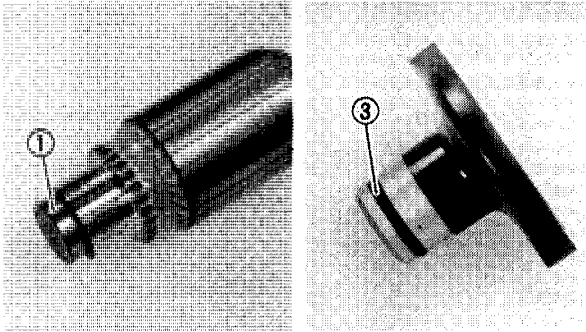
NOTE: _____
 The mica insulation of the commutator must be undercut to ensure proper operation of the commutator.



4. Measure:
 - Armature coil insulation/continuity
 - Defect(s) → Replace starter motor.

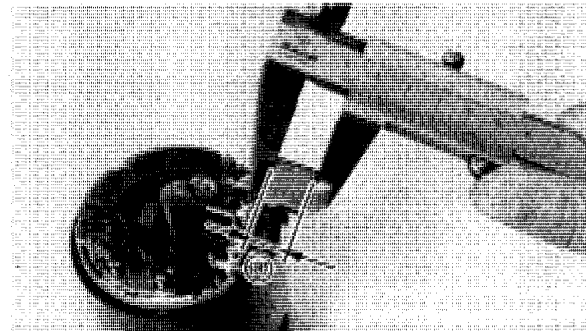
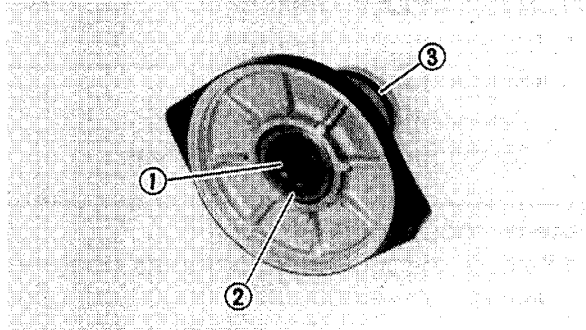
Insulation Resistance:
1 MΩ or more at 20°C (68° F)

- ① Continuity check
- ② Insulation check
- ③ Armature coil



5. Inspect:

- Bearings ①
 - Oil seal ②
 - O-ring ③
- Wear/Damage → Replace.



6. Inspect:

- Commutator brushes
- Damage → Replace.

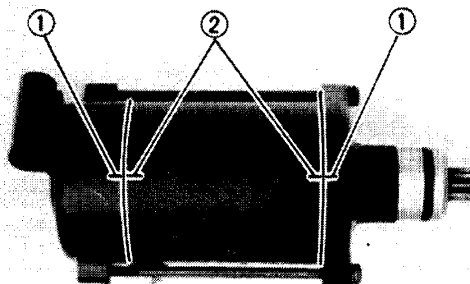
7. Measure:

- Brush length ①
- Out of specification → Replace.

	<p>Minimum Brush Length: 5.5 mm (0.22 in)</p>
--	--

8. Inspect:

- Brush springs
- Compare with new spring.
Wear/Damage → Replace.



Installation

1. Install:

- Starter motor

NOTE:

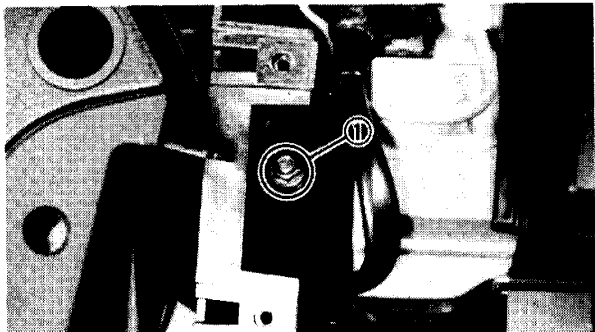
Align the match marks ① on the brackets with the match marks ② on the housing.



BATTERY INSPECTION

1. Inspect:

- Battery
Refer to "CHAPTER 2 BATTERY INSPECTION" section.



STARTER RELAY TEST

1. Inspect:

- Starter relay
Poor condition → Replace.
By the following inspection steps.

Starter relay inspection steps:

- Remove the top cover and fairing (Right – Upper).
- Turn ignition switch to "ON", engine stop switch to "RUN" and shift pedal to "NEUTRAL".
- Disconnect the starter motor lead ① from the starter motor.
- Push the starter switch and check to see if the starter relay clicks.
Starter relay clicking → Starter relay OK.
Starter relay not clicking → Measure coil resistance.

2. Measure:

- Starter relay resistance
Out of specification → Replace.
By the following measurement steps.

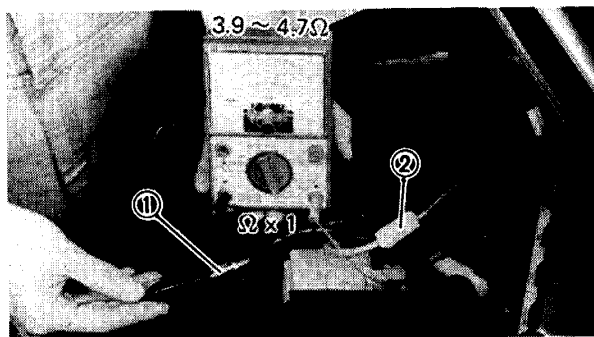
Starter relay resistance measurement steps:

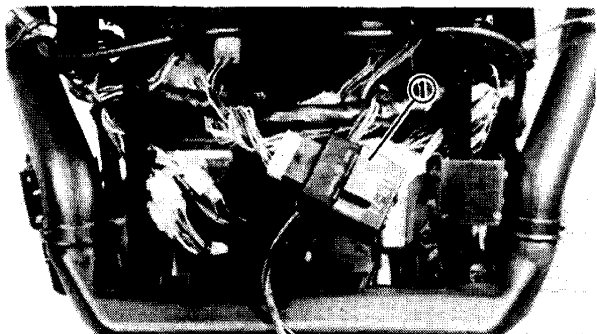
- Disconnect the Blue/White lead and the battery positive lead.
- Connect the Pocket Tester (YU-33263) leads to the starter relay.
 - ① Blue/White
 - ② Red
- Measure the coil resistance.



Starter Relay Resistance:
3.9 ~ 4.7Ω at 20°C (68°F)

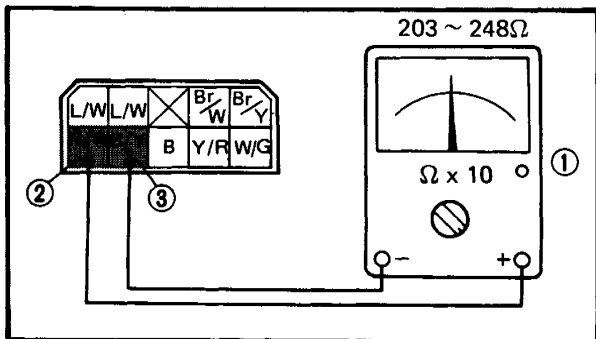
- If the resistance is not within specification, replace the starter relay.






STARTING CIRCUIT CUT-OFF RELAY TEST

1. Remove:
 - Top cover
 - Fairing (Left and right)
 - Relay assembly ①
2. Disconnect:
 - Relay assembly connector

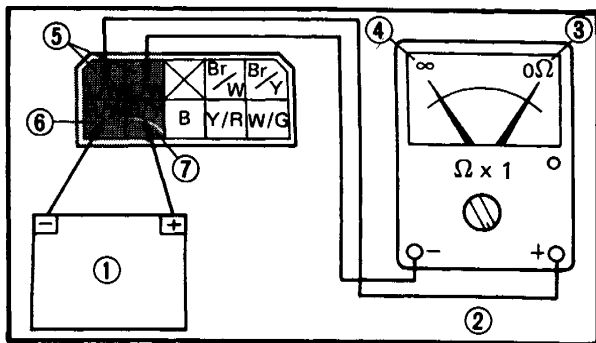


3. Measure:
 - Starting circuit out-off relay resistance
 - Use the Pocket Tester ① (YU-33263).
 - Out of specification → Replace.



Starting Circuit Cut-off Relay Resistance:
203 ~ 248Ω at 20°C (68°F)

- ② Red/White
- ③ Black/Yellow

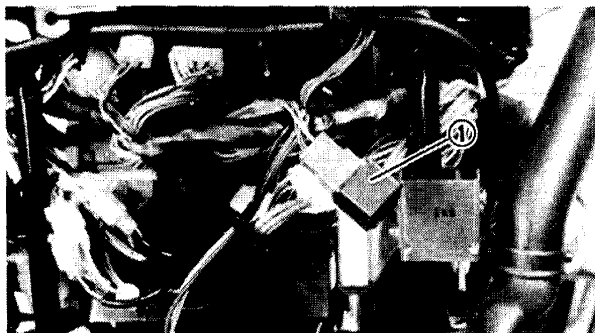


4. Check:
 - Starting circuit cut-off relay contacts
 - Use 12V battery ① and the Pocket Tester ② (YU-33263).
 - Out of specification → Replace.



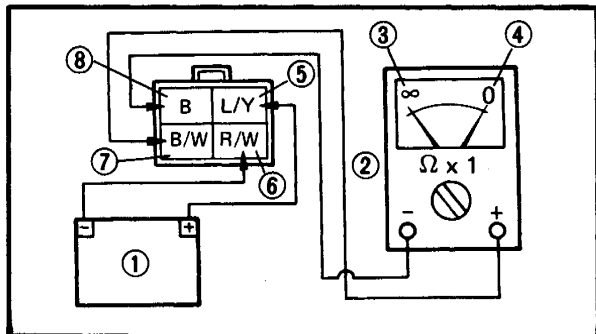
Battery Connected ③ : 0Ω
Battery Disconnected ④ : ∞

- ⑤ Blue/White
- ⑥ Red/White
- ⑦ Black/Yellow



SIDESTAND RELAY TEST

1. Remove:
 - Fairing assembly
 - Sidestand relay ①



2. Check:

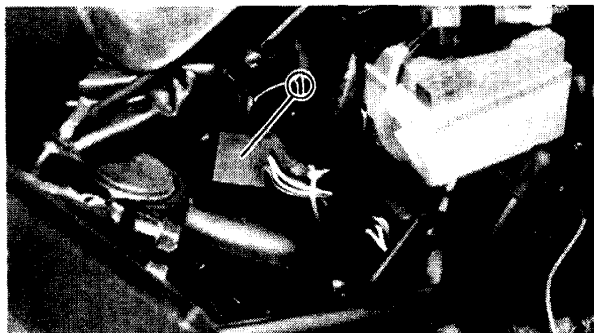
- Sidestand relay contacts

Use 12V battery ① and the Pocket Tester ② (YU-33263).

Out of specification → Replace relay.

Battery Connected ③ : ∞
Battery Disconnected ④ : 0Ω

- ⑤ Blue/Yellow
- ⑥ Red/White
- ⑦ Black/White
- ⑧ Black



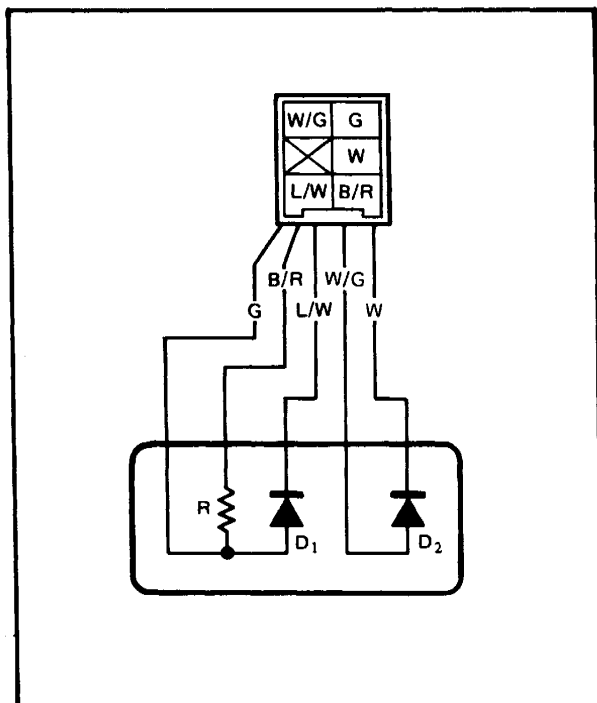
DIODE TEST

1. Remove:

- Top cover
- Diode ①

2. Check:

- Diode continuity/discontinuity
- Defective element(s) → Replace diode.



Checking element	Pocket tester connecting point		Good
	(+) (Red)	(-) (Black)	
D ₁	G	L/W	○
	L/W	G	X
D ₂	W/G	W	○
	W	W/G	X
R	G	B/R	8.2Ω

○: Continuity (0Ω) (Scale Ω x 1K)

X: Discontinuity (∞) (Scale Ω x 1)

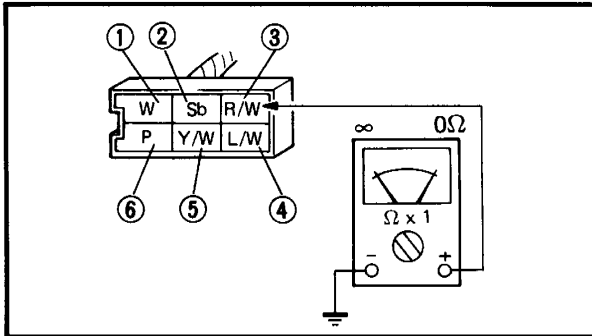
NOTE:

The results "○" or "X" should be reversed according to the Pocket Tester polarity.

SHIFT POSITION SWITCH TEST

1. Remove:
 - Top cover
 - Side panel (Left)
 - Seat
2. Disconnect:
 - Shift position switch connector (White, Sky blue, Red/White, Pink, Yellow/White and Blue/White)
3. Check:
 - Shift position switch contact

Out of specification → Replace switch.



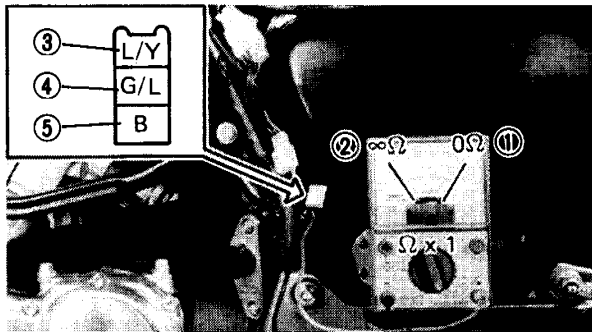
Checking shift position	Shift position	Good
NEUTRAL (② Sky blue)	Neutral	○
	Other	X
1ST (① White)	1st	○
	Other	X
2ND (⑥ Pink)	2nd	○
	Other	X
3RD (⑤ Yellow/White)	3rd	○
	Other	X
4TH (④ Blue/White)	4th	○
	Other	X
5TH (③ Red/White)	5th	○
	Other	X


○: Continuity (0Ω)
X: Discontinuity (∞)

SIDESTAND SWITCH TEST

1. Remove:
 - Side panel (Left)
2. Disconnect:
 - 3-pin connector (Blue/Yellow, Green/Blue and Black)
3. Check:
 - Sidestand switch contacts

Out of specification → Replace switch.



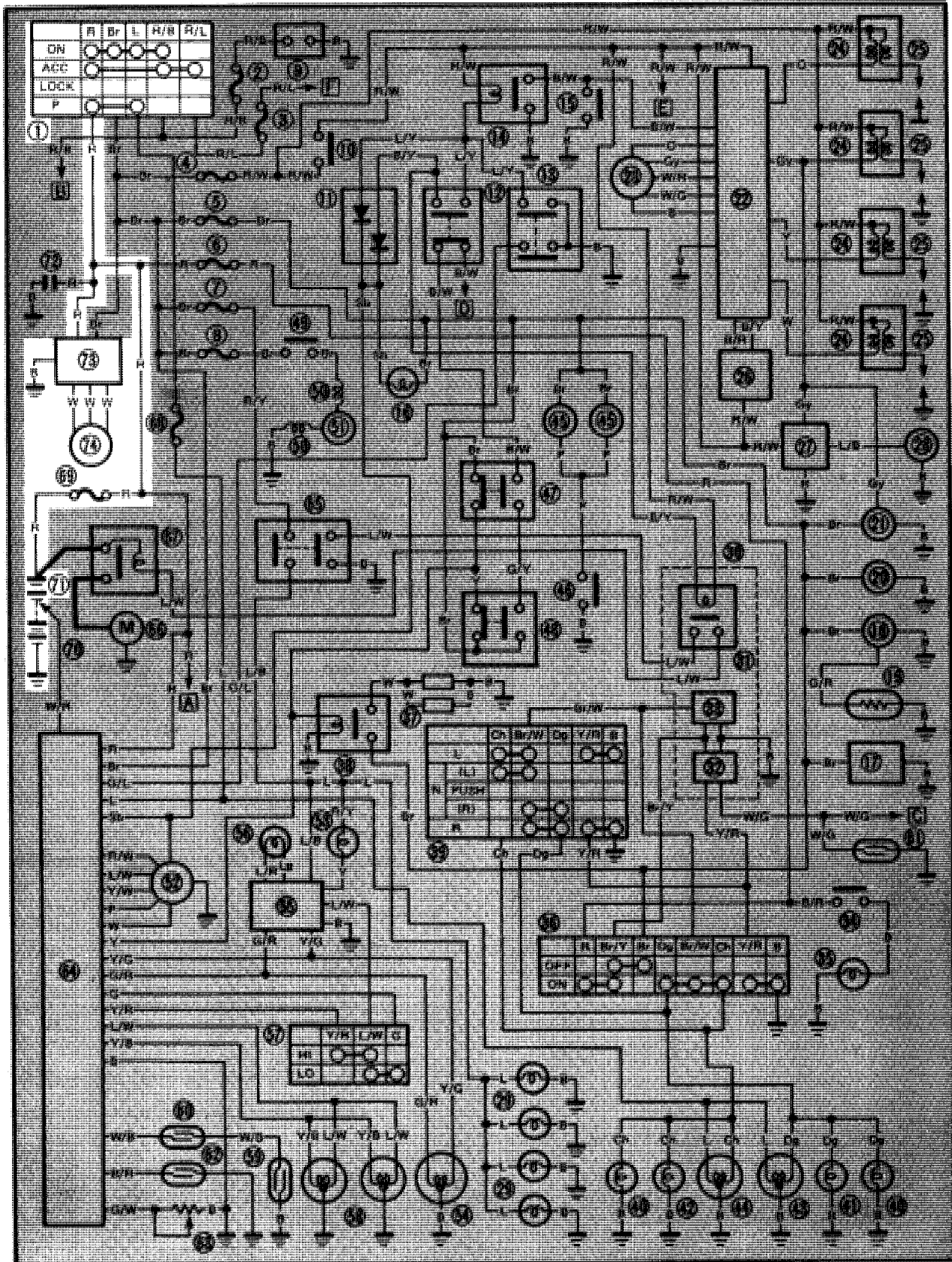
	Sidestand Up (③ – ⑤ , ④ – ⑤): 0Ω ①
	Sidestand Down (③ – ⑤ , ④ – ⑤): ∞ ②

- ③ Blue/Yellow
- ④ Green/Blue
- ⑤ Black



CHARGING SYSTEM

CIRCUIT DIAGRAM

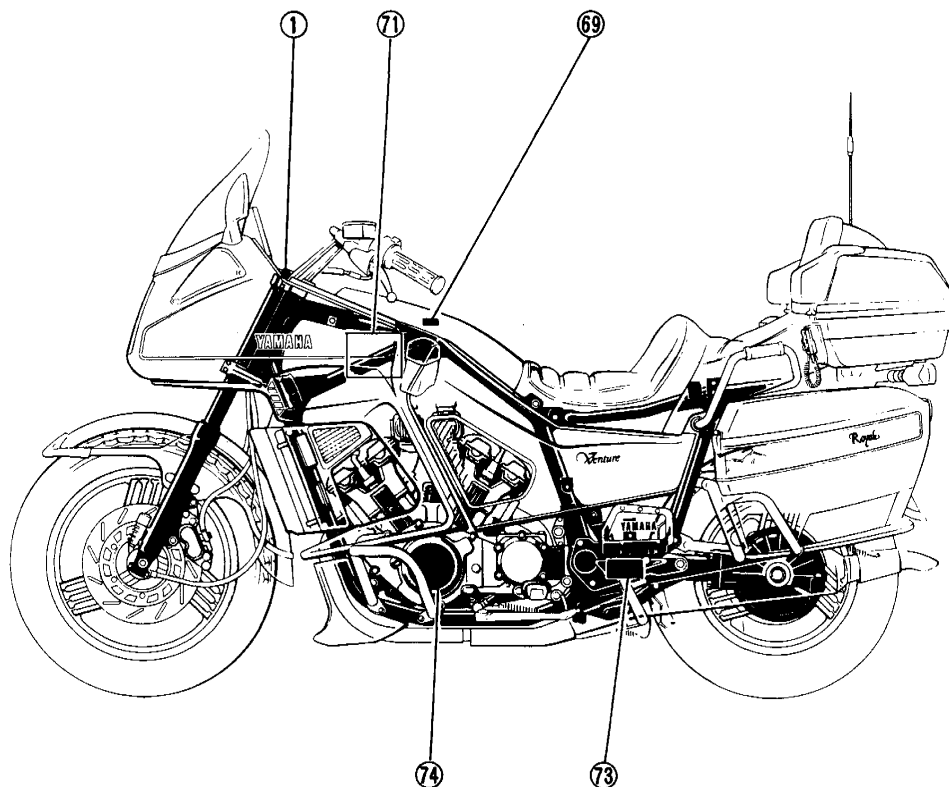


Aforementioned circuit diagram shows charging circuit in wiring diagram.

NOTE:

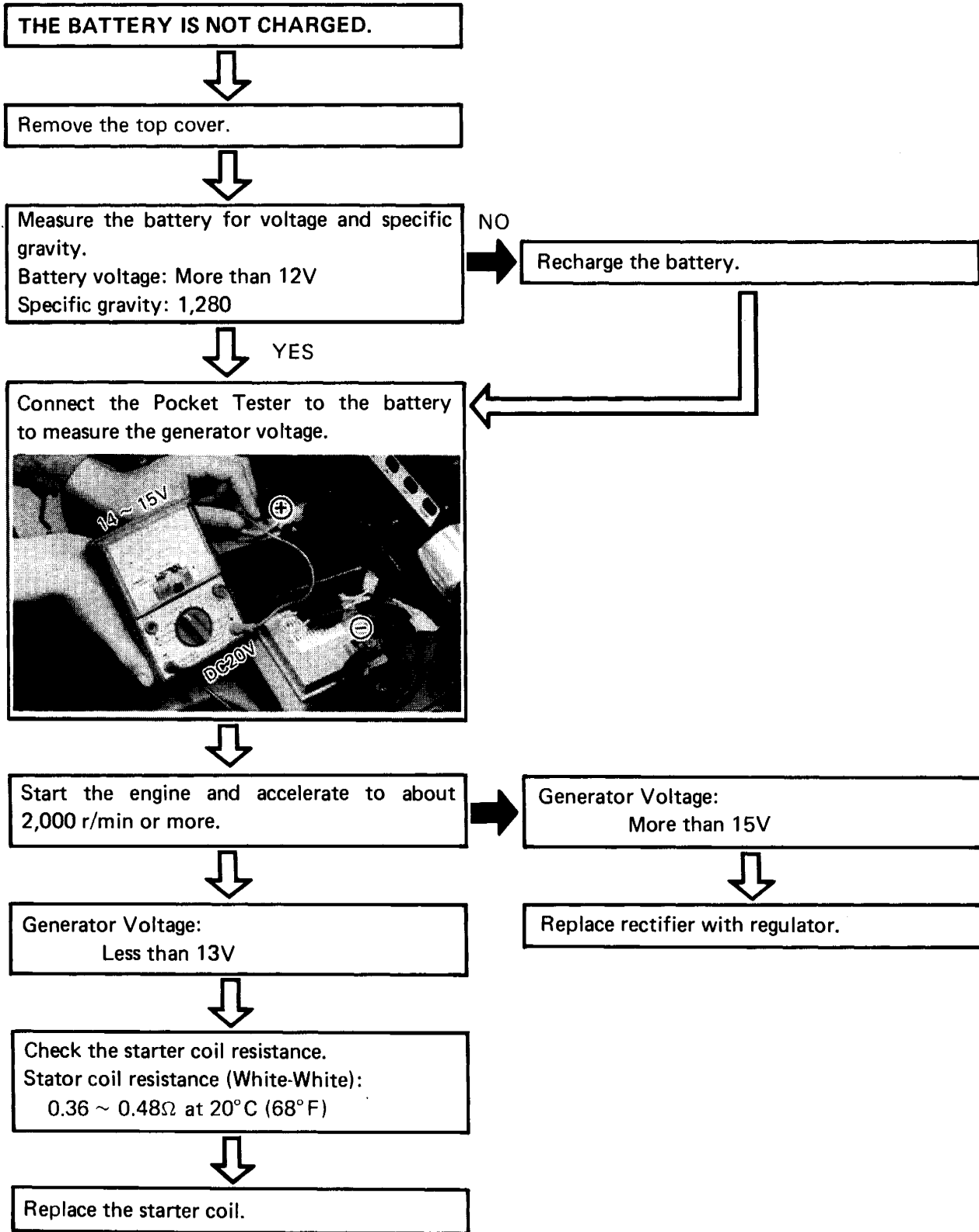
For the encircled numbers and color codes, see page 7-2.

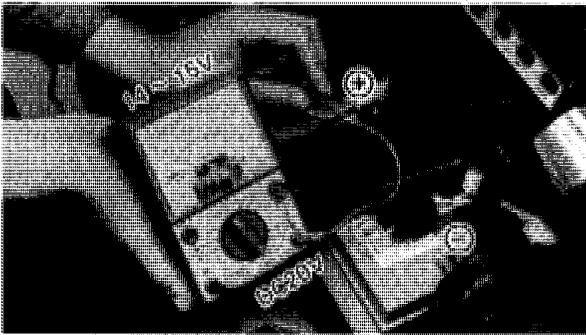
- ① Main switch
- ⑥9 Fuse (MAIN)
- ⑦1 Battery
- ⑦3 Rectifier with regulator
- ⑦4 AC Magneto





TROUBLESHOOTING



**CHARGING VOLTAGE TEST**

1. Remove:
 - Top cover
2. Connect:
 - Pocket Tester (YU-33263)
To battery terminals.
3. Start the engine and accelerate to about 2,000 r/min or more.
4. Measure:
 - Generator voltage
Out of specification → Check battery, stator coil, and rectifier/regulator.

**Generator Voltage: 14 ~ 15V****CAUTION:**

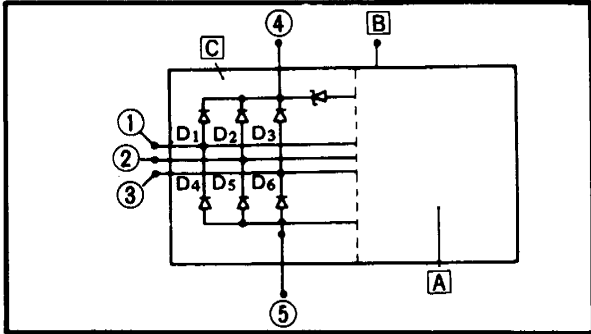
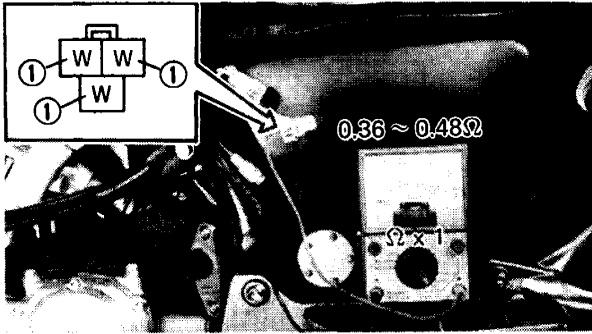
Never disconnect the wires from the battery while the generator is operating, otherwise the voltage across the generator terminals will increase and damage the semiconductors.

BATTERY INSPECTION

Refer to "CHAPTER 2 BATTERY INSPECTION" section.

STATOR COIL RESISTANCE TEST

1. Remove:
 - Side panel (Left)
2. Disconnect:
 - 3-pin connector (White, White and White)
From rectifier/regulator.
3. Connect:
 - Pocket Tester (YU-33263)



4. Measure:

- Stator coil resistance
- Out of specification → Replace stator coils.



Stator Coil Resistance:
 0.36 ~ 0.48Ω at 20°C (68°F)
 (White – White)

- ① White

RECTIFIER TEST

1. Check:

- Defective element → Replace rectifier.

- ① White
- ② White
- ③ White
- ④ Red
- ⑤ Black
- A IC Regulator
- B Brown
- C Rectifier

Checking Element	Pocket Tester Connecting Point		Good	Replace (Element shorted)	Replace (Element opened)
	(+) (Red)	(-) (Black)			
D ₁	d	a	○	○	×
	a	d	×	○	×
D ₂	d	b	○	○	×
	b	d	×	○	×
D ₃	d	c	○	○	×
	c	d	×	○	×
D ₄	a	e	○	○	×
	e	a	×	○	×
D ₅	b	e	○	○	×
	e	b	×	○	×
D ₆	c	e	○	○	×
	e	c	×	○	×

○: Continuity X: Discontinuity (∞)

NOTE:

The results "○" or "X" should be reversed according to the Pocket Tester polarity.

CAUTION:

Do not overcharge rectifier or damage may result.

Avoid:

- A short circuit.
- Inverting + and – battery leads.
- Direct connection of rectifier to battery.

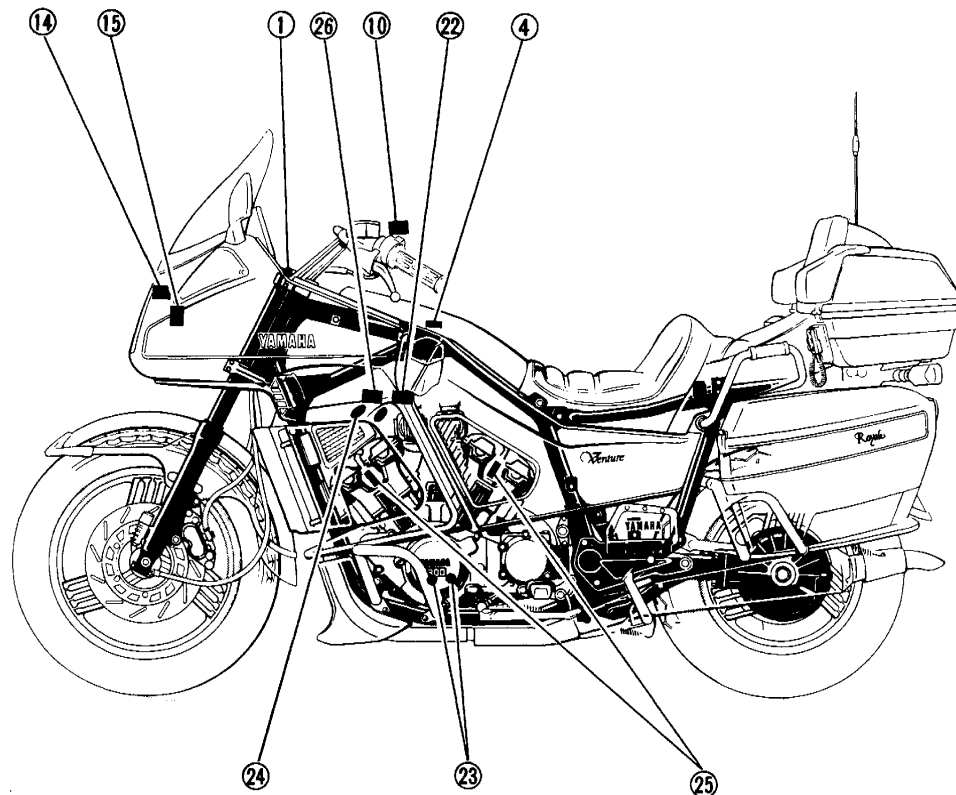


Aforementioned circuit diagram shows ignition circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ④ Fuse (IGNITION)
- ⑩ "ENGINE STOP" switch
- ⑭ Sidestand relay
- ⑮ Emergency stop switch
- ⑳ Ignitor unit
- ㉓ Pick-up coil
- ㉔ Ignition coil (#1 ~ #4)
- ㉕ Spark plug (#1 ~ #4)
- ㉖ Pressure sensor

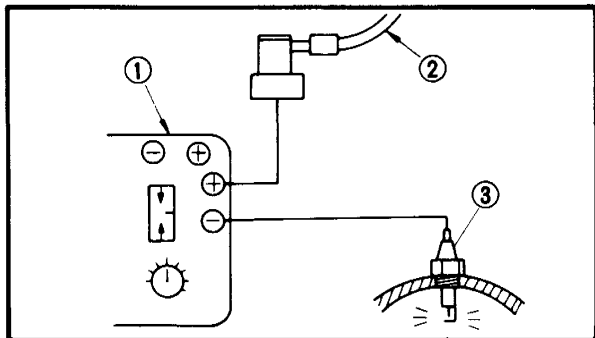




TROUBLESHOOTING

The entire ignition system can be checked for misfire and weak spark by using the Electro Tester.

1. Warm up the engine so that all of the electrical components are at operating temperature.



2. Connect:
 - Electro Tester (YU-33260) ①
3. Start the engine, and increase the spark gap until misfire occurs. (Test at various r/min between idle and red line.)

- ② Spark plug lead
③ Spark plug

CAUTION:

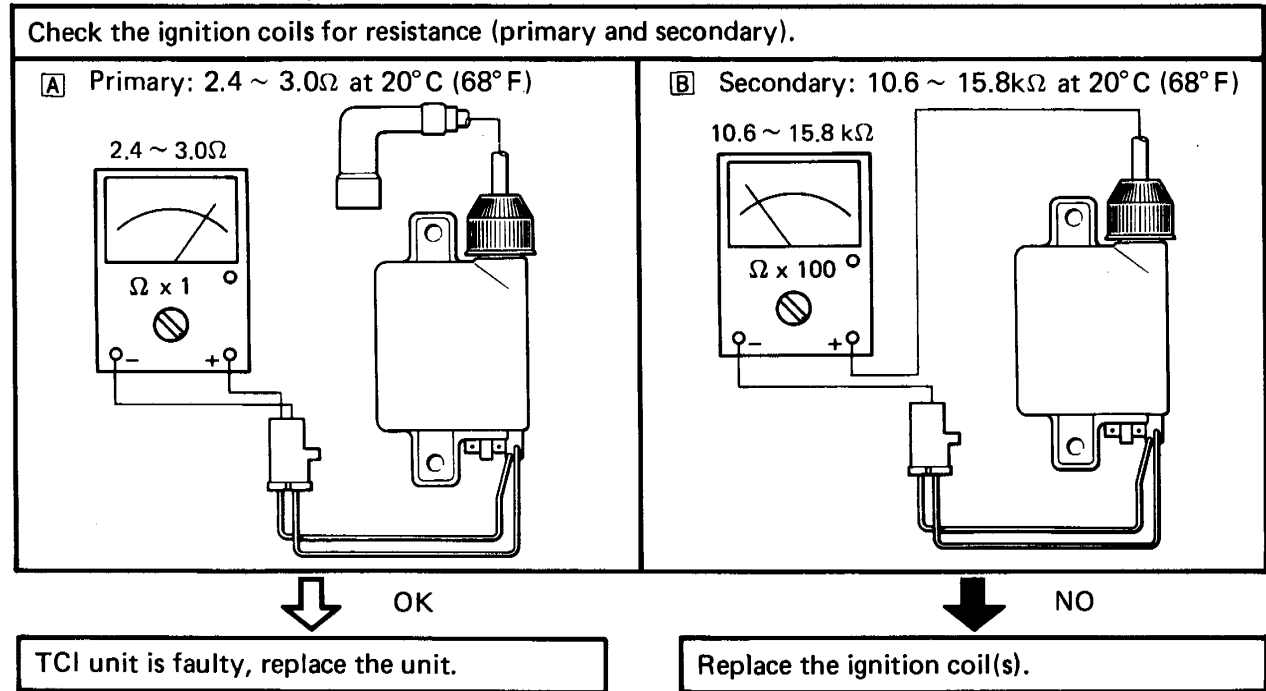
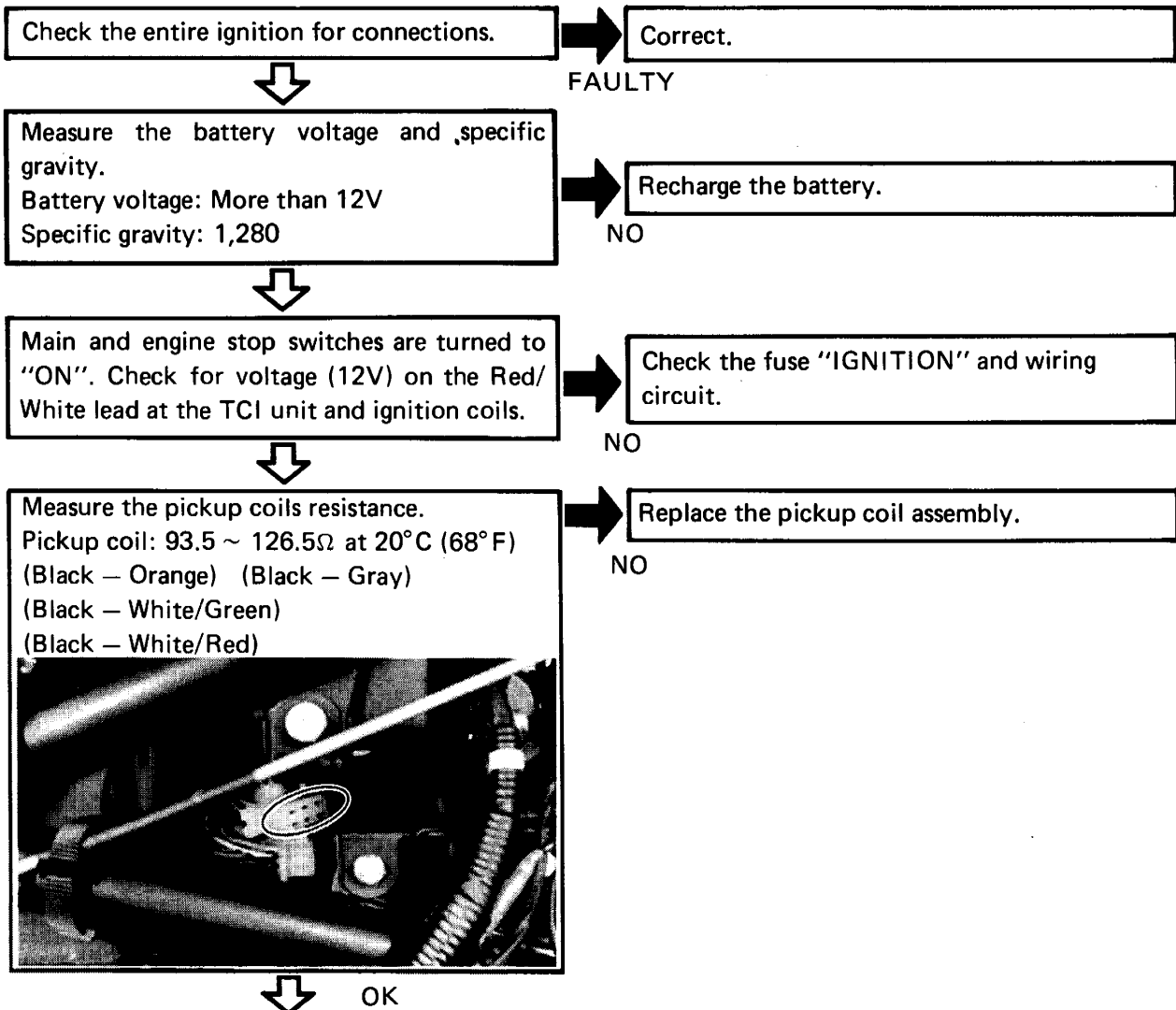
Do not run the engine in neutral above 6,000 r/min for more than 1 or 2 seconds.

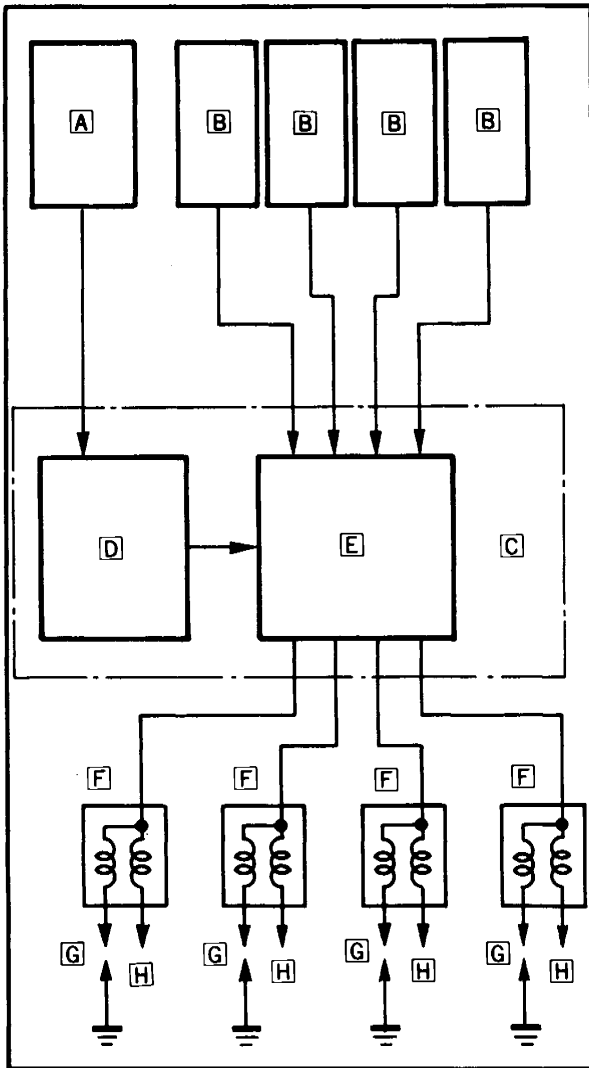


Minimum Spark Gap: 6 mm (0.24 in)

Faulty ignition system operation (at the minimum spark gap or smaller) → Follow the troubleshooting chart until the source of the problem is located.

Troubleshooting Chart





DESCRIPTION

This model is equipped with a battery operated, fully transistorized, breakerless ignition system. By using magnetic pickup coils, the need for contact breaker points is eliminated. This adds to the dependability of the system by eliminating frequent cleaning and adjustment of points and ignition timing. The TCI (Transistor Control Ignition) unit incorporates an automatic advance circuit controlled by signals generated by the pickup coil. This adds to the dependability of the system by eliminating the mechanical advancer. This TCI system consists of two units; a pickup unit and an ignitor unit.

- A Pressure sensor
- B Pickup coil
- C Ignitor unit
- D Advance control
- E Electronic advance circuit
- F Ignition coil x 4
- G Spark plug x 4
- H Battery

OPERATION

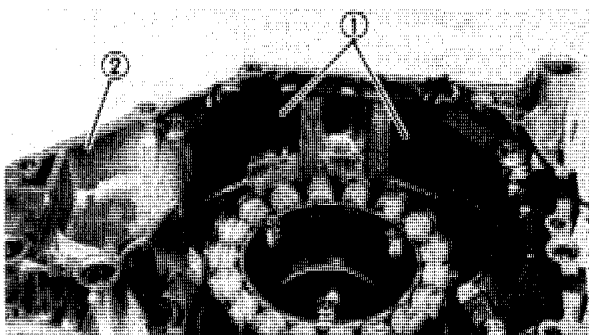
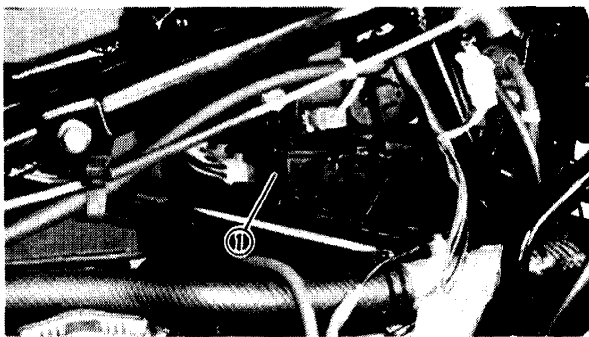
TCI Unit

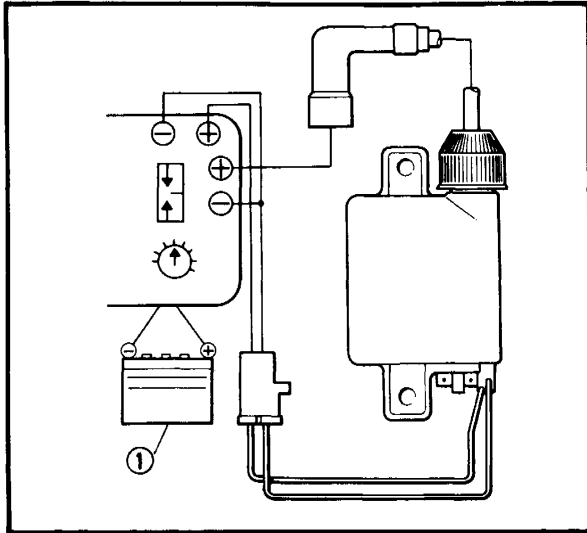
The TCI functions on the same principle as a conventional DC ignition system with the exception of using magnetic pickup coils and a transistor control box (TCI) in place of contact breaker points.

- ① TCI unit

Pickup Unit

The pickup unit consists of two pickup coils ① and a flywheel mounted onto the crankshaft. When the projection on the flywheel passes a pickup coil, a signal is generated and transmitted to the ignitor unit. The width of the projection on the flywheel determines the ignition advance. The pickup coils are located in the right crank-case cover ②.





IGNITION SPARK GAP TEST

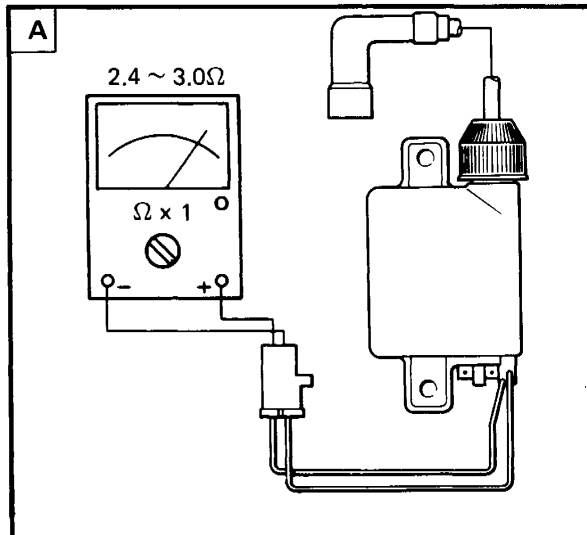
1. Remove:
 - Top cover
 - Fairing
2. Disconnect:
 - Ignition coil leads
 - Spark plug leads
3. Connect:
 - Electro Tester (YU-33260)

NOTE: _____
 Be sure to use a fully charge 12V battery ① .

4. Turn the spark plug gap adjuster and increase the gap to the maximum limit unless misfire occurs first.

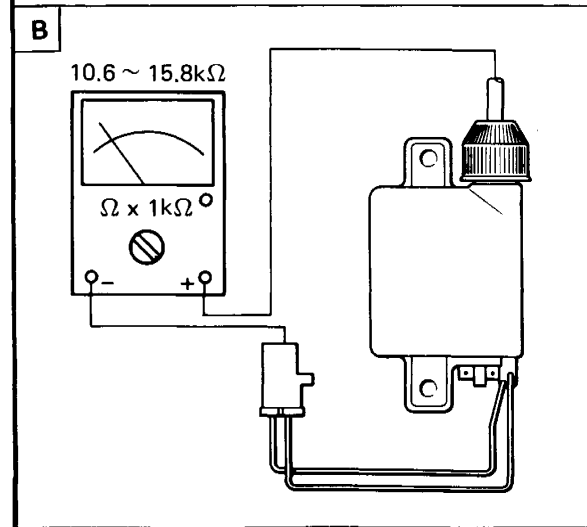



Minimum Spark Gap: 6 mm (0.24 in)



IGNITION COIL RESISTANCE TEST

1. Connect:
 - Pocket Tester (YU-33263)
2. Measure:
 - Primary coil resistance **A**
 - Secondary coil resistance **B**
 Out of specification → Replace.

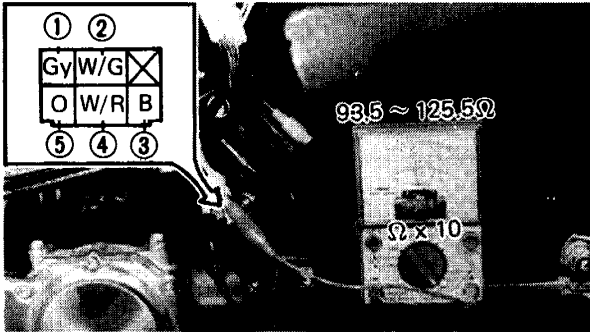




Primary Coil Resistance:
 2.4 ~ 3.0Ω at 20°C (68° F)

Secondary Coil Resistance:
 10.6 ~ 15.8kΩ at 20°C (68° F)

Spark Plug Cap:
 10kΩ ± 10%



PICKUP COIL RESISTANCE TEST

1. Remove:
 - Top cover
 - Side panels
 - Seat
2. Disconnect:
 - 5-pin connector (Black, White/Red, Orange, White/Green and Gray)
3. Measure:
 - Pickup coil resistance

Use a Pocket Tester (YU-33263).

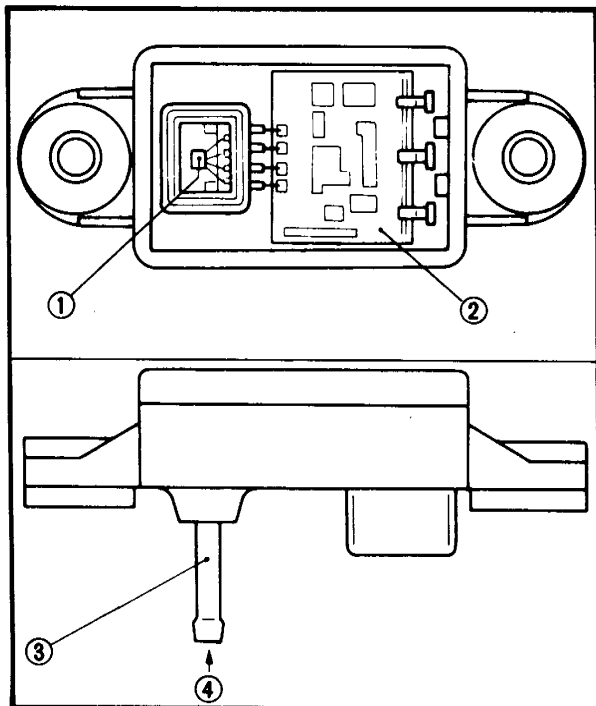
Out of specification → Replace.

Pickup Coil Resistance:
 93.5 ~ 126.5Ω at 20°C (68°F)
 (B – O), (B – Gy), (B – W/G),
 (B – W/R)

- ① Gray
- ② White/Green
- ③ Black
- ④ White/Red
- ⑤ Orange

SPARK PLUG INSPECTION

Refer to "CHAPTER 2 SPARK PLUG INSPECTION" section.

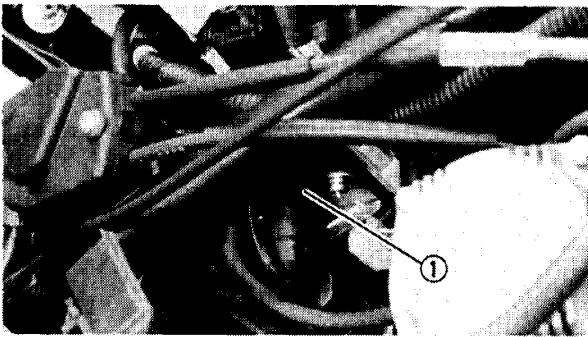


PRESSURE SENSOR

Operation

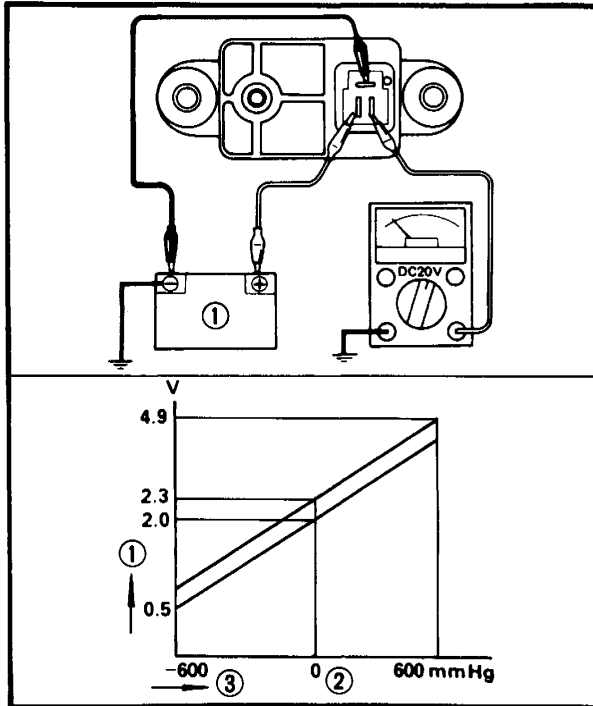
This pressure sensor unit consists of a semiconductor strain gauge and an amplifying circuit. Pressure to the carburetor joint (venturi portion) is sensed by the strain gauge and amplified in the circuit connected with this gauge. The amplified pressure signals are then transmitted to the ignition system for the control of ignition timing advance.

- ① Strain gauge
- ② Amplifying circuit
- ③ Pressure intake tube
- ④ From carburetor joint



Removal

1. Remove:
 - Top cover
 - Side panels
 - Fairing
2. Disconnect:
 - Sensor connector
 - Vacuum hose
3. Remove:
 - Pressure sensor ①



Inspection

1. Connect:
 - Pocket Tester (YU-33263)
 - Battery (12V) ①
2. Measure:
 - Output voltage

Out of specification → Replace.



Output Voltage: About 2.0 DC Volt

- ① Output voltage
- ② Atmospheric pressure
- ③ Pressure

Installation

1. Install:
 - Pressure sensor

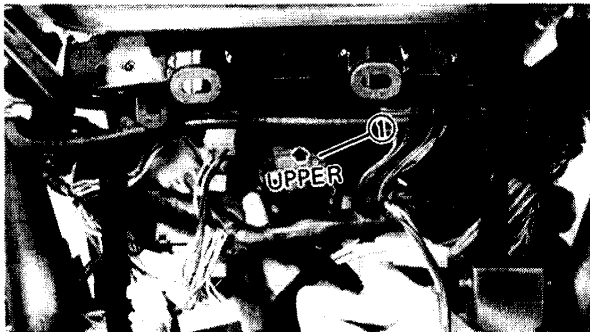
Reverse the removal procedure.

EMERGENCY STOP SWITCH

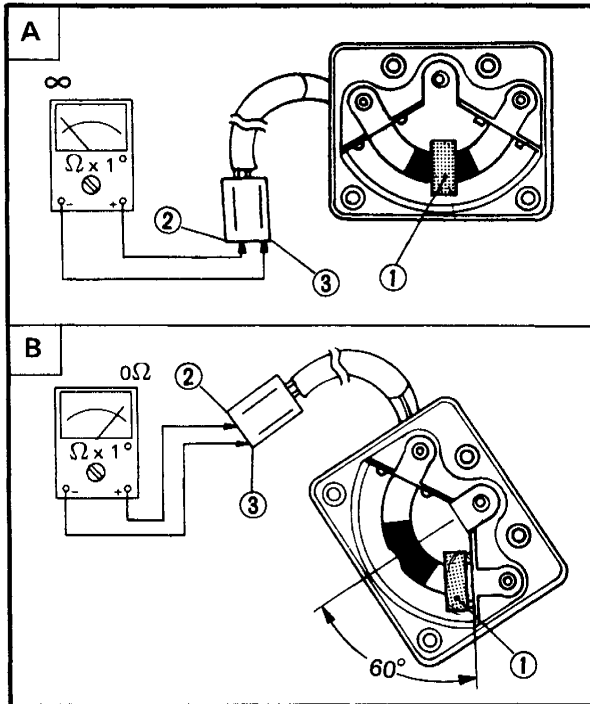
The emergency stop switch is a mechanical switch that is mounted behind the headlight. This switch will cut-off the ignition system if for any reason the motorcycle reaches a lean angle of 60 degrees or more from vertical.

Removal

1. Remove:
 - Fairing



2. Disconnect:
 - Switch connector (Blue/White and Black)
3. Remove:
 - Emergency stop switch ①

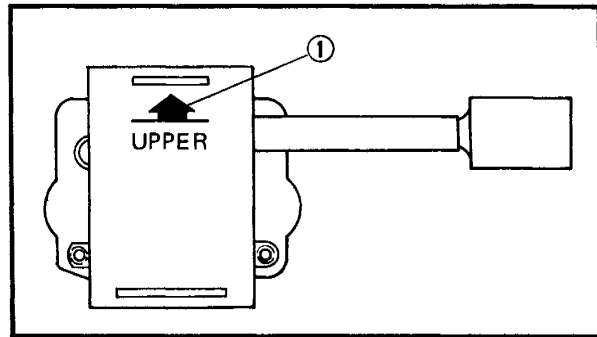


Inspection

1. Connect:
 - Pocket Tester (YU-33263)
2. Measure:
 - Resistance
 - Out of specification → Replace.

	Switch Vertical A : ∞
	Switch Tilted (60° or more to left and right) B : 0Ω

- ① Contact weight
- ② Black/White
- ③ Black



Installation

CAUTION: _____
 Install the emergency stop switch with the arrow ① pointing up or the switch will not operate correctly.

1. Install:
 - Emergency stop switch
 - Fairing



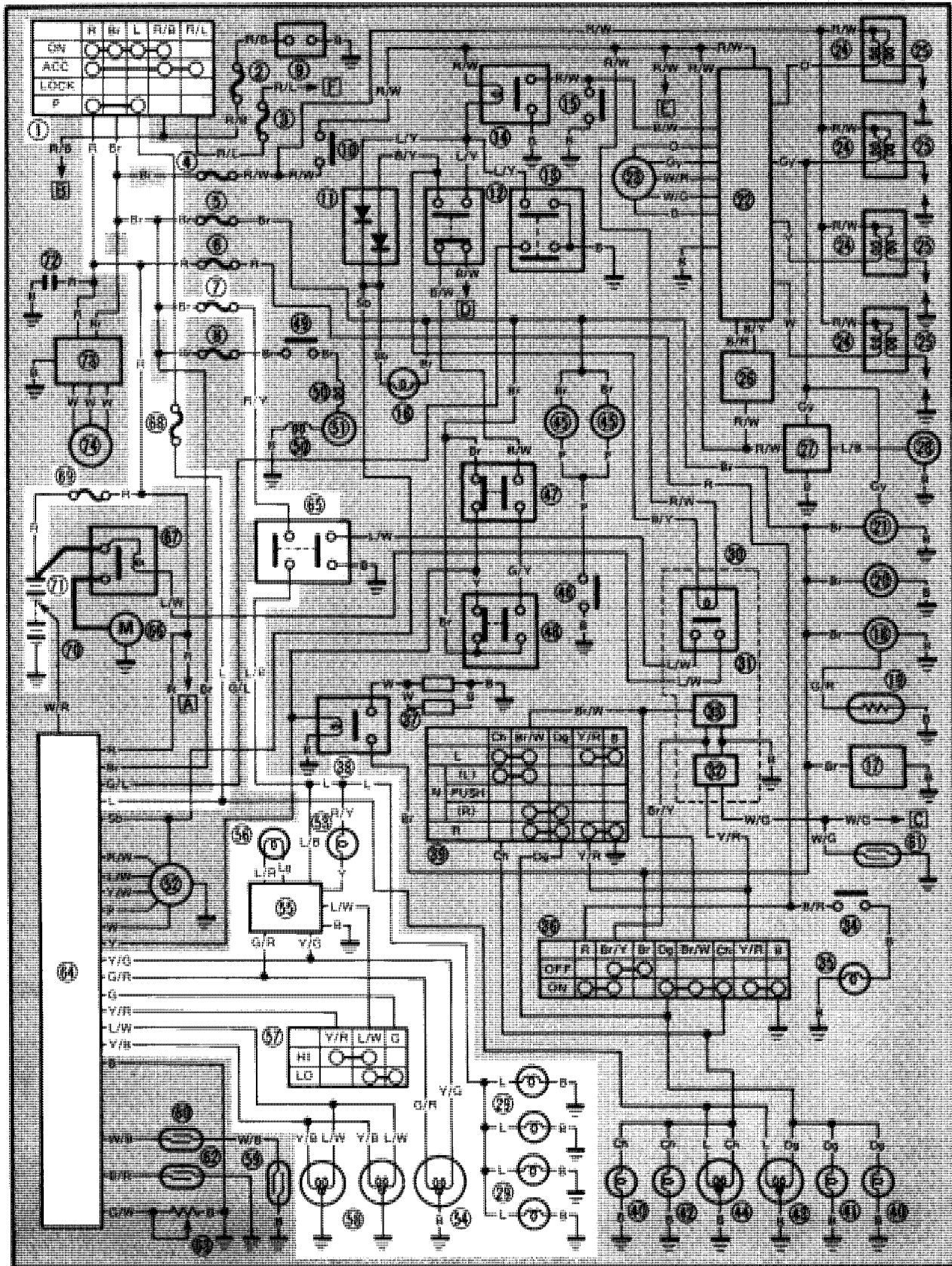
— MEMO —

A series of horizontal dotted lines spanning the width of the page, intended for handwritten notes or a memo.



LIGHTING SYSTEM

CIRCUIT DIAGRAM

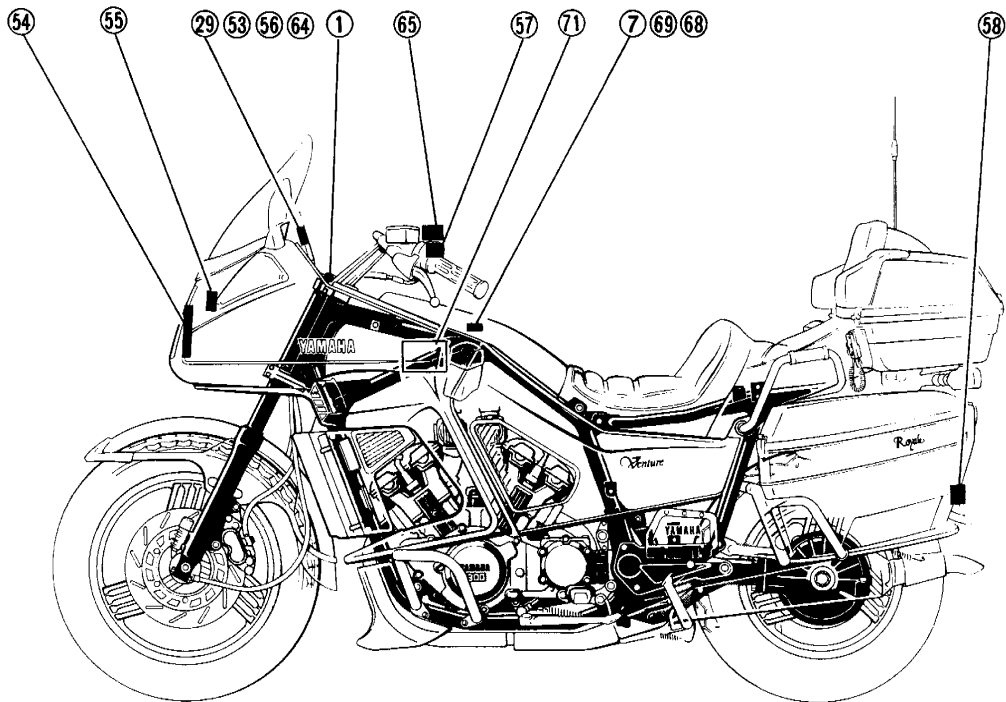


Aforementioned circuit diagram shows lighting circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ⑦ Fuse (HEAD)
- ②⑨ Meter lights
- ⑤③ "HIGH BEAM" indicator light
- ⑤④ Headlight
- ⑤⑤ Reserve lighting unit
- ⑤⑥ "HEAD LAMP" indicator light
- ⑤⑦ "LIGHTS" (Dimmer) switch
- ⑤⑧ Tail/brake light
- ⑥④ Computer monitor
- ⑥⑤ "START" switch
- ⑥⑧ Fuse (TAIL)
- ⑥⑨ Fuse (MAIN)
- ⑦① Battery



**LIGHTING TESTS AND CHECKS**

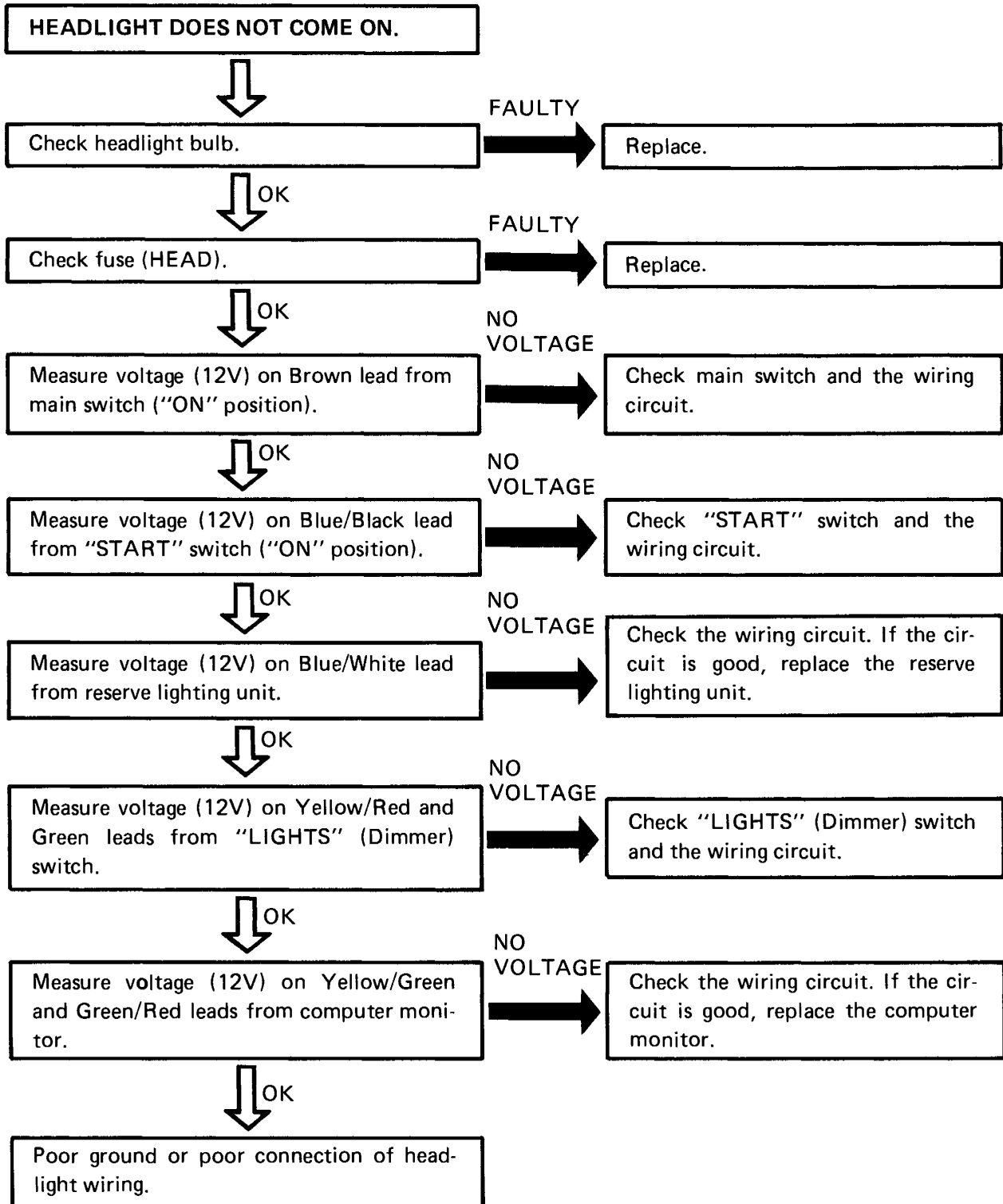
The battery provides power for operation of the headlight, taillight, and meter lights. If none of the above fail to operate proceed further. Low battery voltage indicates either a faulty battery, low battery fluid level, or a defective charging system.

Also check fuse condition. Replace any "open" fuses. There are individual fuses for various circuits (see complete Circuit Diagram).

NOTE: _____

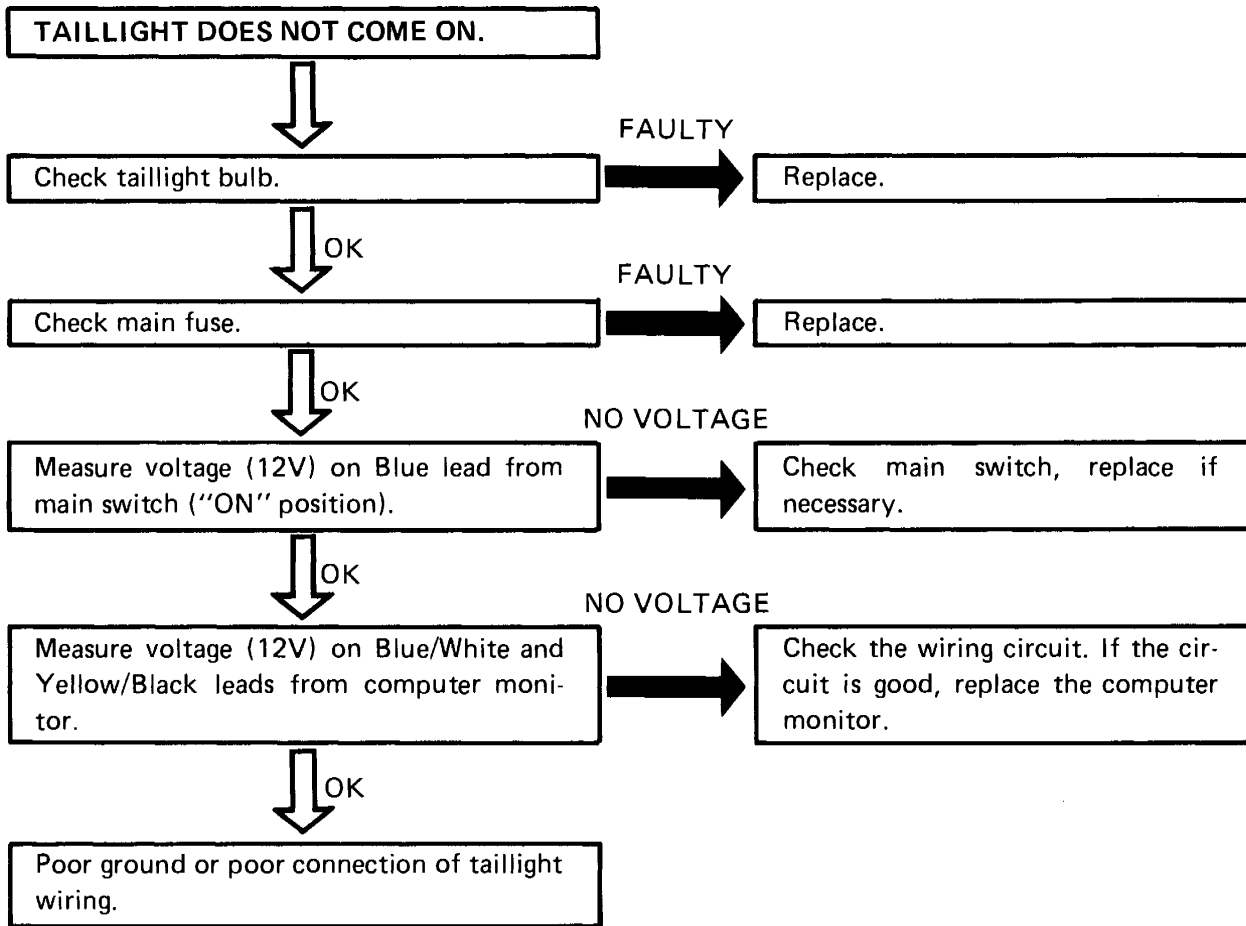
Check each bulb first before performing the following check.

Headlight Troubleshooting





Taillight Troubleshooting

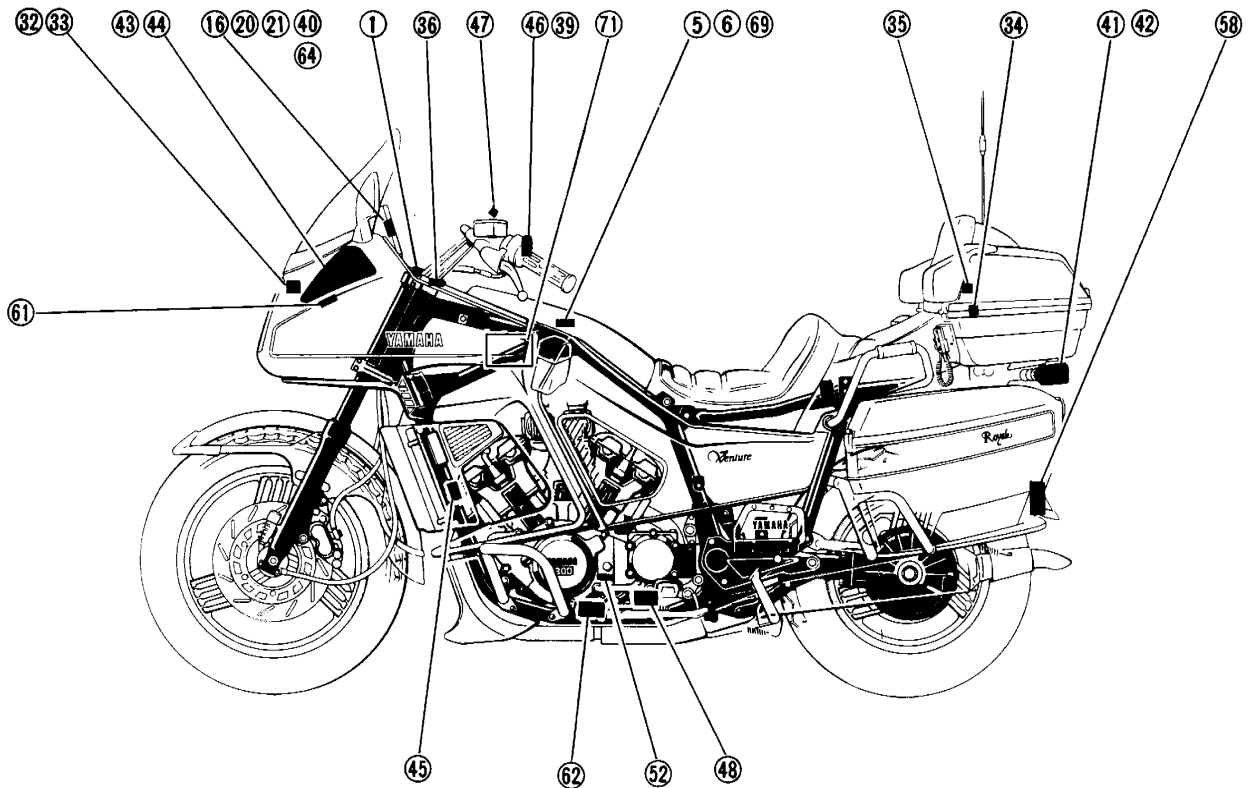


Aforementioned circuit diagram shows signal circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

- | | |
|-------------------------------|--|
| ① Main switch | ④③ Front flasher light (Right)/
Parking and running light |
| ⑤ Fuse (SIGNAL) | ④④ Front flasher light (Left)/
Parking and running light |
| ⑥ Fuse (HAZARD) | ④⑤ Horn |
| ⑬ "NEUTRAL" indicator light | ④⑥ "HORN" switch |
| ⑳ Voltmeter | ④⑦ Front brake switch |
| ㉑ Tachometer | ④⑧ Rear brake switch |
| ㉒ Cancelling unit | ⑤② Shift position switch |
| ㉓ Flasher relay | ⑤⑧ Tail/brake light |
| ⑳ Trunk light switch | ⑥① Speedometer sensor |
| ㉔ Trunk light | ⑥② Oil level sender |
| ⑳ "HAZARD" switch | ⑥④ Computer monitor |
| ㉕ "TURN" switch | ⑥⑨ Fuse (MAIN) |
| ④① "TURN" indicator light | ⑦① Battery |
| ④① Rear flasher light (Right) | |
| ④② Rear flasher light (Left) | |





SIGNAL SYSTEM TESTS AND CHECKS

The battery provides power for operation of the horn, brakelight, indicator lights and flasher lights. If none of the above operates, always check battery voltage before proceeding further.

Battery

1. Check:

- Battery voltage
Defective components → Replace.

Check for:	Faulty battery
	Low battery fluid level
	Defective charging system
	Faulty fuse(s)

Horn

1. Check:

- Horn operation
Defective components → Replace.

Check for:	12V on Brown lead to horn
	Good grounding of horn (Pink lead) when horn button is pressed
	Faulty fuse

Brake Light

1. Check:

- Brake light operation
Defective components → Replace.

Check for:	Defective bulb
	12V on Yellow lead to brake light
	12V on Brown lead to each brake light switch (Front and rear brake switch)

“NEUTRAL” Indicator Light

1. Check:

- Indicator light operation
Defective components → Replace.

Check for:	Defective bulb
	12V on Sky Blue lead to shift position switch
	12V on Brown lead to indicator light

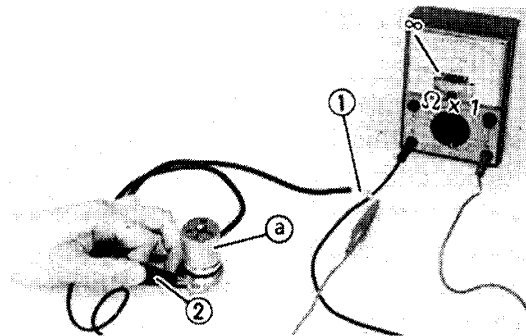
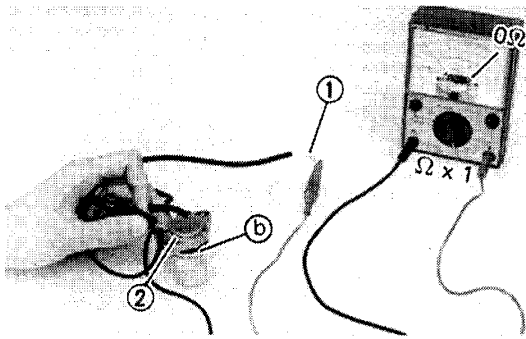
“TURN” Indicator Light

1. Check:
 - Indicator light operation
 - Defective components → Replace.

Check for:	Defective bulb
	12V on Blue lead to indicator light
	12V on Chocolate and Dark green leads to indicator light


Flasher Light

1. Check:
 - Flasher light operation
 - Refer to “SELF-CANCELLING FLASHER SYSTEM” section.



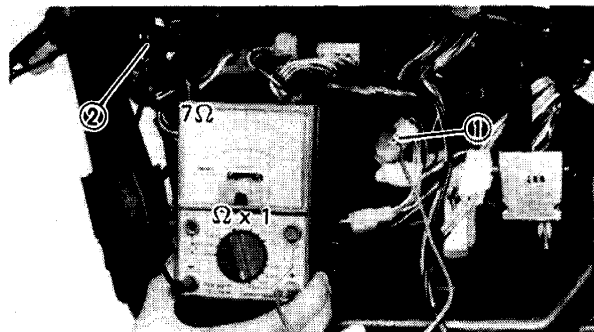
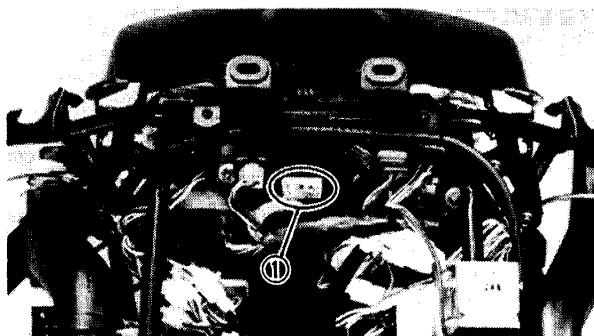
OIL LEVEL SENDER TEST

1. Drain:
 - Engine oil
2. Remove:
 - Oil level sender
3. Measure:
 - Oil level sender resistance
 - Use the Pocket Tester (YU-33263).
 - Out of specification → Replace.

	<p>Oil Level Gauge Resistance: Float is down (a) → ∞ Float is up (b) → Zero Ω</p>
--	--

- ① Black/Red
- ② Ground

4. Install:
 - Oil level sender
5. Connect:
 - Leads
6. Fill:
 - Crankcase
 - Refer to “CHAPTER 2 ENGINE OIL REPLACEMENT” section.



SPEEDOMETER SENSOR TEST

1. Remove:
 - Headlight lens unit
 - Top cover
 - Fairing
2. Disconnect:
 - Relay assembly coupler ①
3. Measure:
 - Speedometer sensor resistance
 Use the Pocket Tester (YU-33263).
 Out of specification → Replace.
 Lift the front wheel and rotate the wheel by hand.



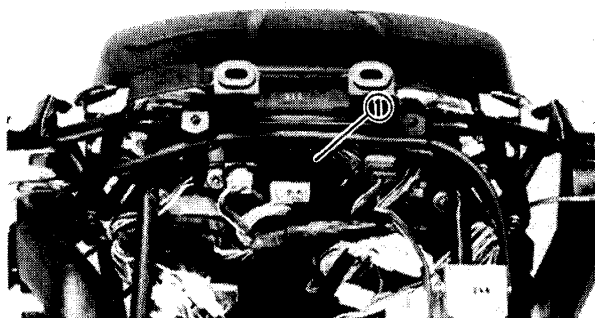
Speedometer Sensor Resistance:
About 7Ω
 Then return back 0Ω or $\infty\Omega$
 when wheel is stopped

- ① White/Green
 ② Ground

SELF-CANCELLING FLASHER SYSTEM TEST

Description

The self-cancelling flasher system turns off the turn signal after a period of time or distance involved in turning or changing lanes. Generally, the signal will cancel after either 10 seconds, or 150 meters (490 feet), whichever is greater. At very low speed, the function is determined by distance; at high speed, especially when changing speeds the cancelling determination is a combination of both times and distance. The self-cancelling determination is a mechanism only operates when the motorcycle is moving; thus the signal will not self-cancel while you are stopped at an intersection.

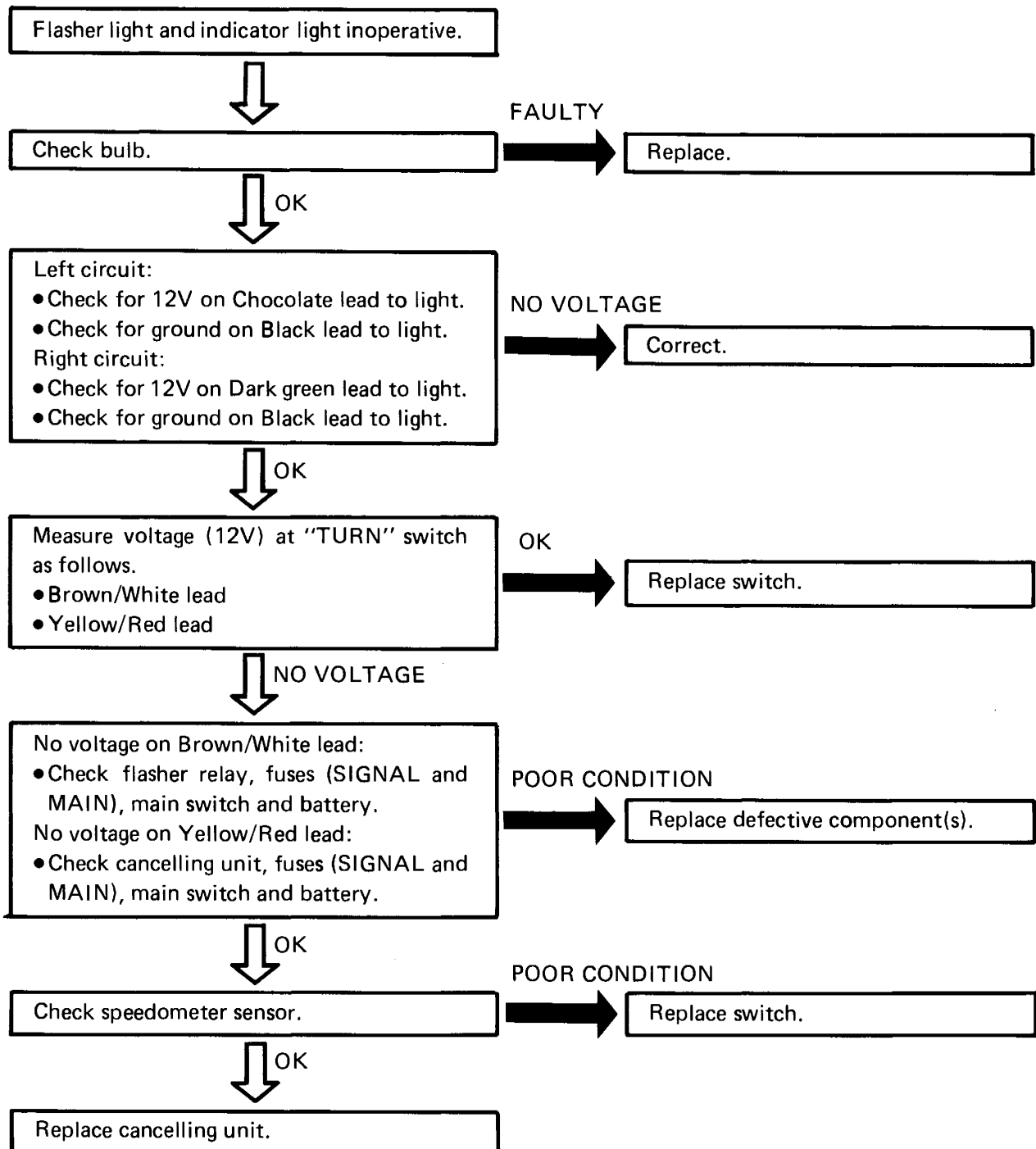


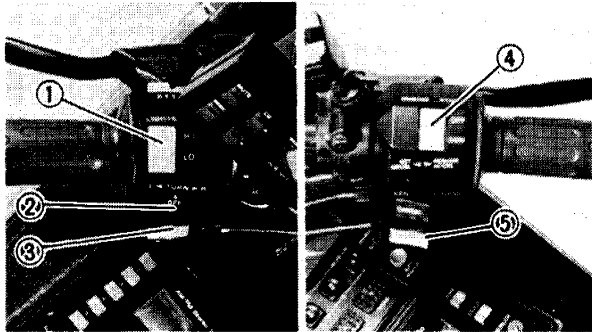
- ① Cancelling unit (Relay assembly)

Operation

The handlebar switch has three positions: L (left), OFF, and R (right). The switch lever will return to the "OFF" position after being pushed to L or R, but the signal will function. By pushing the lever in, the signal may be cancelled manually. If the flasher self-cancelling system should become inoperative, replace relay unit.

Troubleshooting





SWITCHES TEST

Switches may be checked for continuity with a Pocket Tester (YU-33263) on the "Ohm x 1" position.

- ① "LIGHTS" (Dimmer) switch
- ② "TURN" switch
- ③ "HORN" switch
- ④ "ENGINE STOP" switch
- ⑤ "START" switch

Main Switch

Switch Position	Lead Color				
	R	Br	L	R/B	R/L
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ACC	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
OFF					
LOCK					
PARKING	<input type="checkbox"/>		<input type="checkbox"/>		

"LIGHTS" (Dimmer) Switch

Switch Position	Lead Color		
	Y/R	L/B	G
HI	<input type="checkbox"/>	<input type="checkbox"/>	
LO		<input type="checkbox"/>	<input type="checkbox"/>

"TURN" Switch

Switch Position	Lead Color				
	Dg	Br/W	Ch	Y/R	B
R	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
N	R	<input type="checkbox"/>			
	N				
	L		<input type="checkbox"/>	<input type="checkbox"/>	
L		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

"HORN" Switch

Switch Position	Lead Color	
	P	B
OFF		
ON	<input type="checkbox"/>	<input type="checkbox"/>



"ENGINE STOP" Switch

Switch Position	Lead Color	
	R/W	R/W
OFF		
ON		

"START" Switch

Switch Position	Color Code			
	R/Y	L/B	L/W	B
OFF				
ON				

Clutch Switch

Switch Position	Color Code			
	B/Y	L/Y	B/W	B/W
PUSH				
FREE				

Front Brake Switch

Switch Position	Color Code			
	Br	Y	B/W	G/Y
PUSH				
FREE				

Rear Brake Switch

Switch Position	Color Code		
	G/Y	Br	Y
FREE			
PULL			

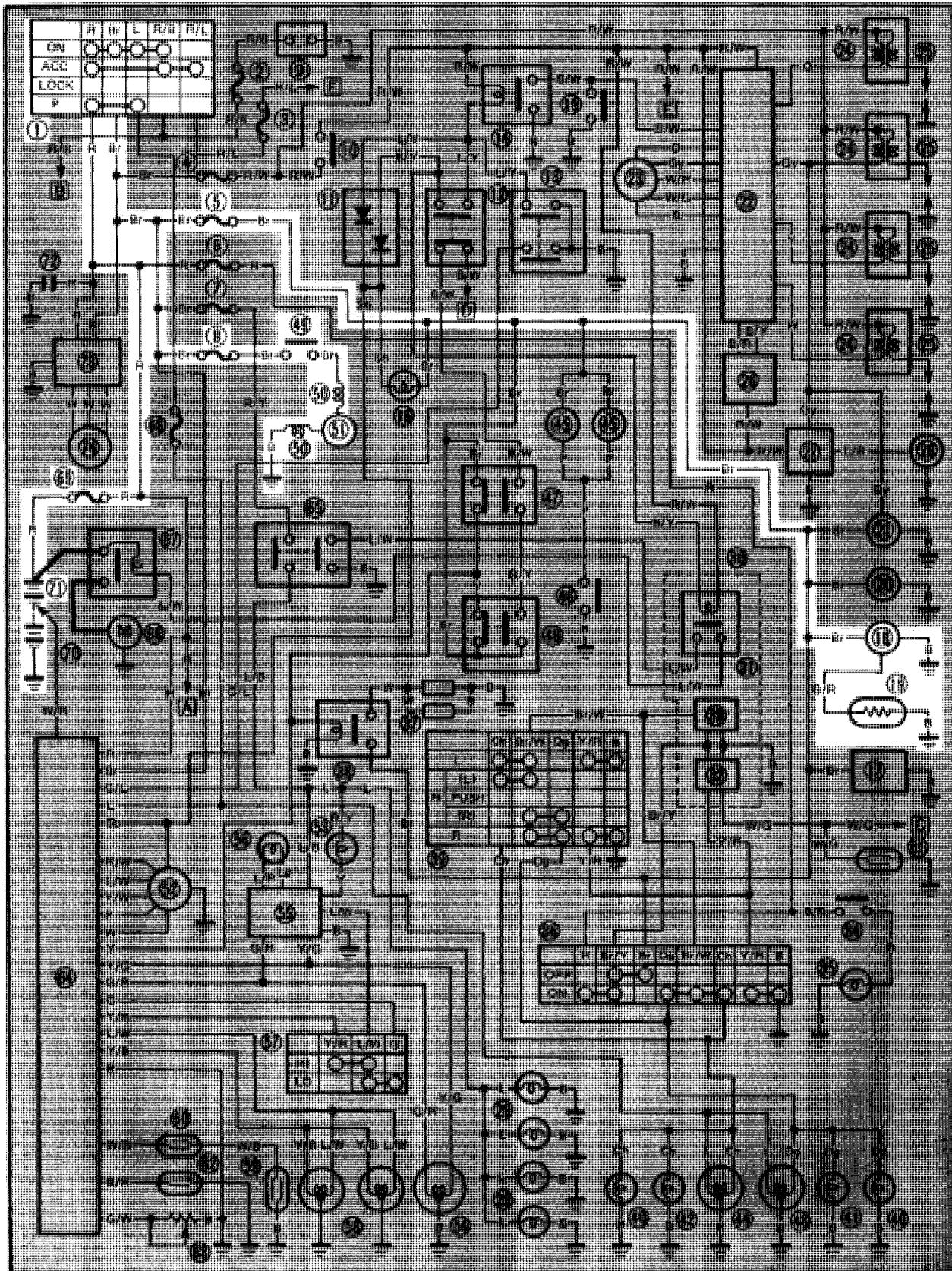
Sidestand Switch

Switch Position	Color Code		
	L/Y	G/L	B
FREE			
PUSH			

Trunk Light Switch

Switch Position	Color Code	
	B/R	B
OFF		
ON		

**COOLING SYSTEM
CIRCUIT DIAGRAM**

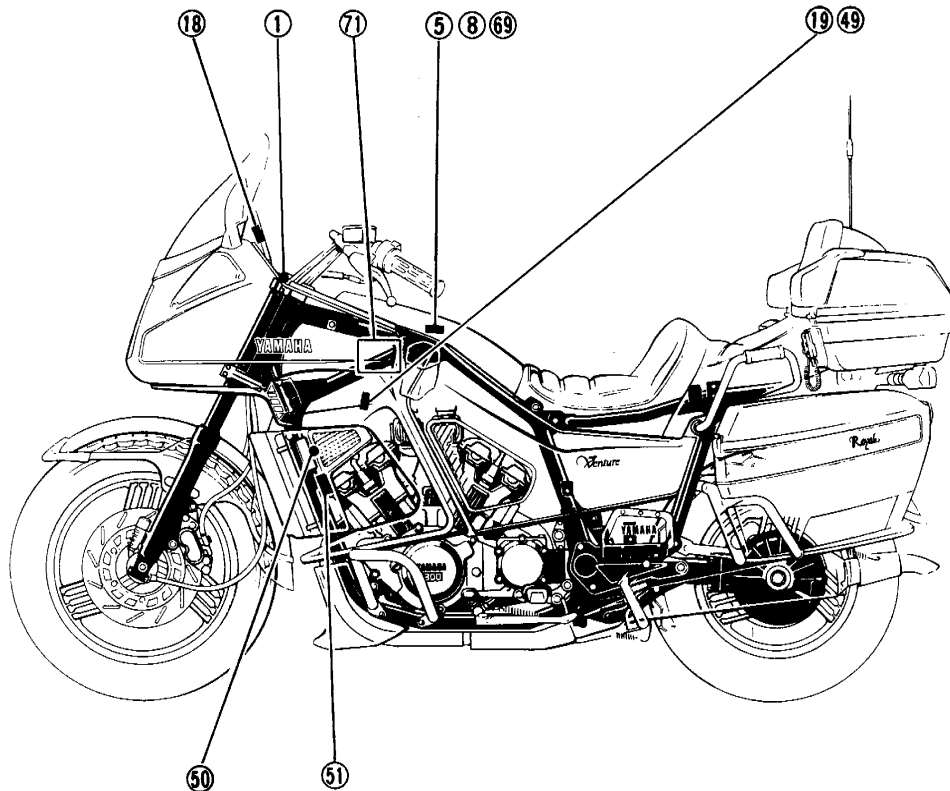


Aforementioned circuit diagram shows cooling circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ⑤ Fuse (SIGNAL)
- ⑧ Fuse (FAN)
- ⑱ Engine temperature gauge
- ⑲ Thermo unit
- ④⑨ Thermo switch
- ⑤⑩ Noise filter (Fan motor)
- ⑤① Fan motor
- ⑥⑨ Fuse (MAIN)
- ⑦① Battery





TROUBLESHOOTING

The electric fan will not turn at coolant temperatures of $105 \pm 3^{\circ}\text{C}$ ($221.0 \pm 5.4^{\circ}\text{F}$) or more:



Check the connectors.

DEFECTIVE



Correct.



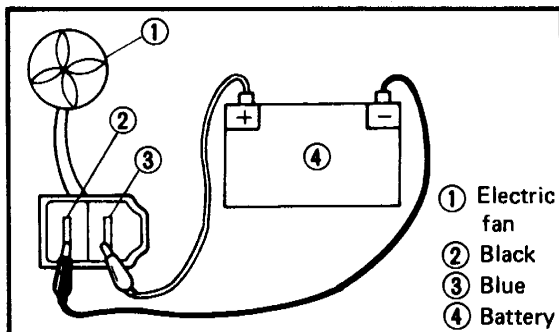
OK

Disconnect fan motor connector and connect battery as shown.

FAN
INOPERATIVE



Replace fan motor assembly.



FAN OPERATIVE

NO
VOLTAGE

Check battery voltage (12V) on Blue lead.



Check wiring circuit, and correct defective component(s).



OK

Disconnect the lead of the thermo switch and ground it to the motor body.

FAN
OPERATIVE

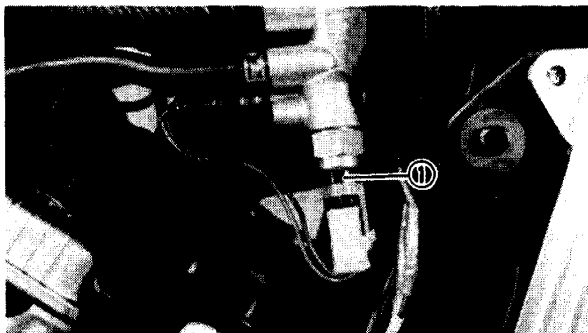
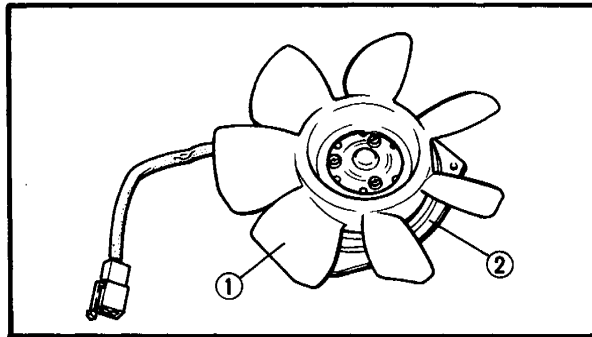
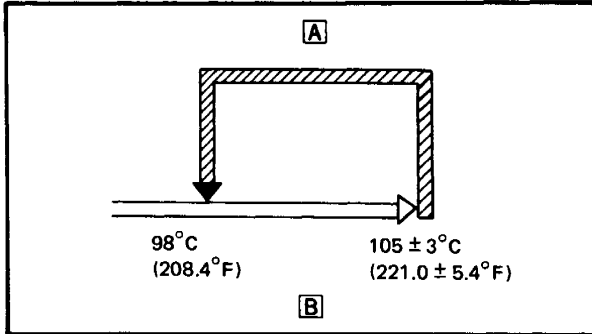
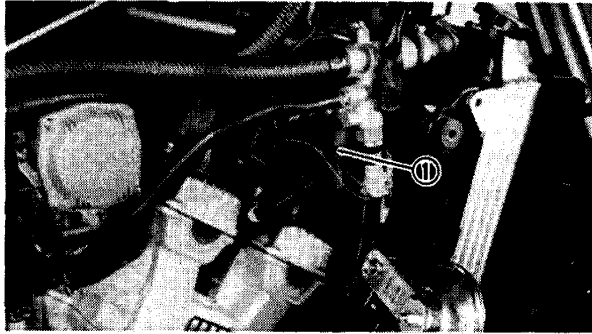


Replace the thermo switch.



FAN INOPERATIVE

Replace the fan motor assembly.



ELECTRIC FAN AND THERMO SWITCH

Operation

The electric fan will be switched ON or OFF according to the coolant temperature in the radiator.

① Electric fan

NOTE:

The electric fan is controlled by the thermo switch when the main switch is "ON". Thus, under certain operating conditions, this fan may continue to run until the engine temperature has cooled down to about 91°C (195.8°F).

- A** THERMO SWITCH "ON"
- B** COOLANT TEMPERATURE

Electric Fan Inspection

The following problems may require repair or replacement of components	
Component	Condition
Fan motor	Unsmooth operation
Fan motor	Excessive vibration
Fan motor bracket	Cracks
Fan blades	Cracks
Securing bolts	Looseness

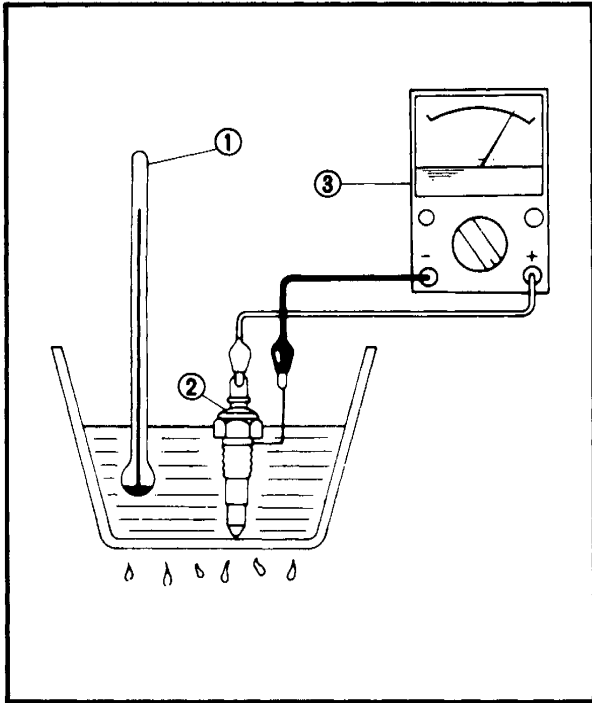
- ① Fan
- ② Electric fan motor

Thermo Switch Inspection

1. Remove:
 - Top cover
 - Fairing (Right)
 - Thermo switch ①

WARNING:

Handle the thermostatic valve very carefully. Never subject it to strong shock or allow it to be dropped. Should it be dropped, it must be replaced.



2. Inspect:
- Thermo switch operation
- By the following inspection steps.

Thermo switch inspection steps:

- Immerse thermo switch in water.

- ① Thermometer
- ② Thermo switch
- ③ Pocket Tester

- Check continuity as indicated.
- Note temperatures while heating the water.
Malfunction → Replace switch.

Test Step	Water Temperature	Pocket Tester (Ω x 1)
1	0 ~ 98°C (32 ~ 208.4°F)	Discontinuity
2	More than 105 ± 3°C (221.0 ± 5.4°F)	Continuity
3*	105 to 98°C (221.0 to 208.4°F)	Continuity
4*	Less than 98°C (208.4°F)	Discontinuity

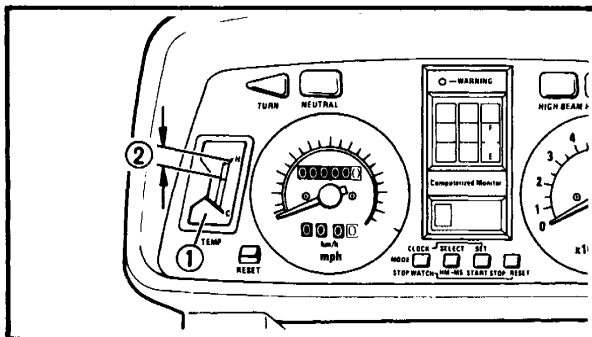
Test 1 & 2; Heat-up tests
Test 3* & 4*; Cool-down tests

3. Install:
- Thermo switch

Thermo Switch:
8 Nm (0.8 m·kg, 5.8 ft·lb)
Three Bond Sealock® # 10

CAUTION:

After replacing the thermo switch, check the coolant level in the radiator and also check for any leakage.

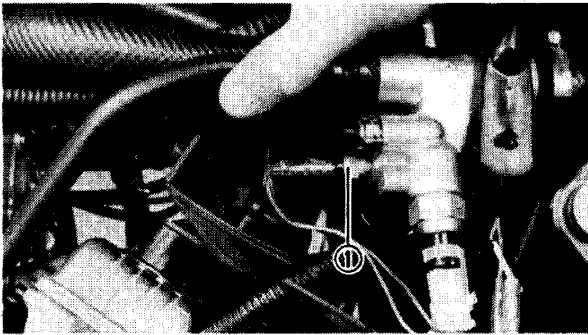


THERMO-UNIT AND THERMOMETER

Operation

The thermo unit has less resistance at higher temperatures and thus allows more current to pass through. When more current flows to the coil in the thermometer, the armature to which the needle is attached by the increased magnetic field. In this way, the needle indicates the temperature.

- ① Engine temperature gauge
- ② Red zone

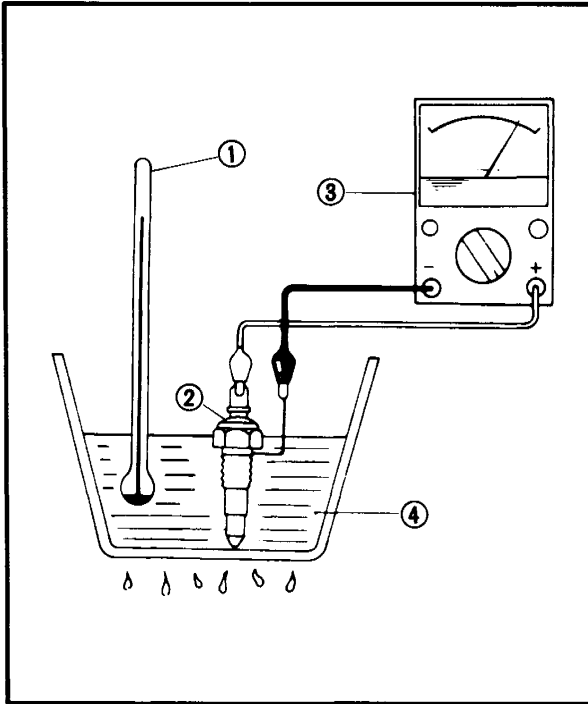


Thermo-unit Inspection

1. Remove:
 - Top cover
 - Fairing (Right)
 - Thermo-unit ①

WARNING:

Handle the thermo-unit with special care. Never subject it to strong shock or allow it to be dropped. Should it be dropped, it must be replaced.



2. Inspect:
 - Thermo-unit operation

By the following inspection steps.

Thermo-unit inspection steps:


- Immerse thermo-unit in water.

- ① Temperature gauge
- ② Thermo-unit
- ③ Pocket Tester
- ④ Water

- Check continuity at indicated
- Note temperatures while heating the water.
Malfunction → Replace switch.

Water Temperature	50°C (122°F)	80°C (176°F)	100°C (212°F)
Resistance	153.9Ω	47.5 ~ 56.8Ω	26.2 ~ 29.3Ω

3. Install:
 - Thermo-unit



Thermo-unit:
15 Nm (1.5 m·kg, 11 ft·lb)
Three Bond Sealock® #10

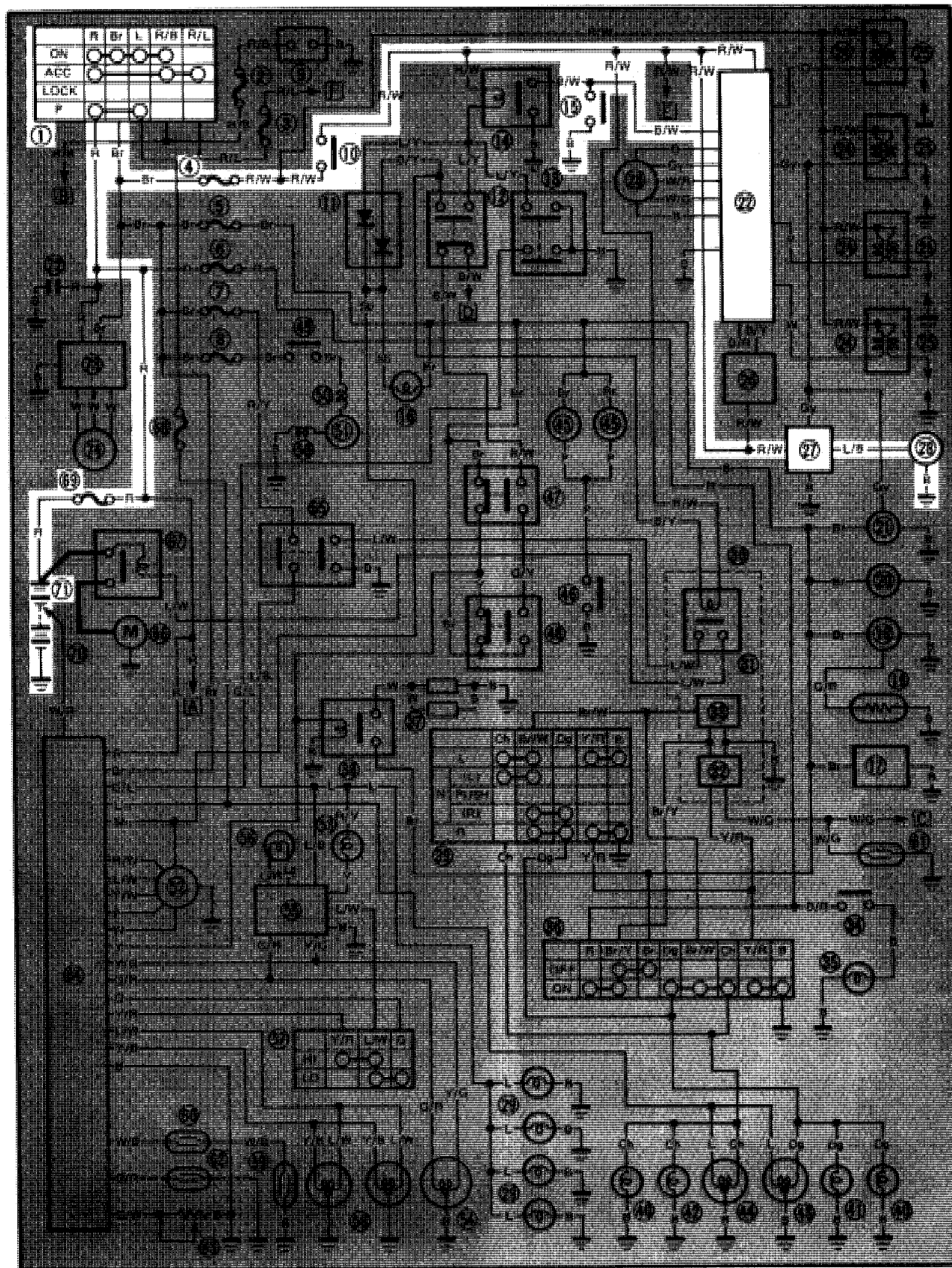
CAUTION:

After replacing the thermo-unit, check the coolant level in the radiator and also check for any leakage.



FUEL PUMP SYSTEM

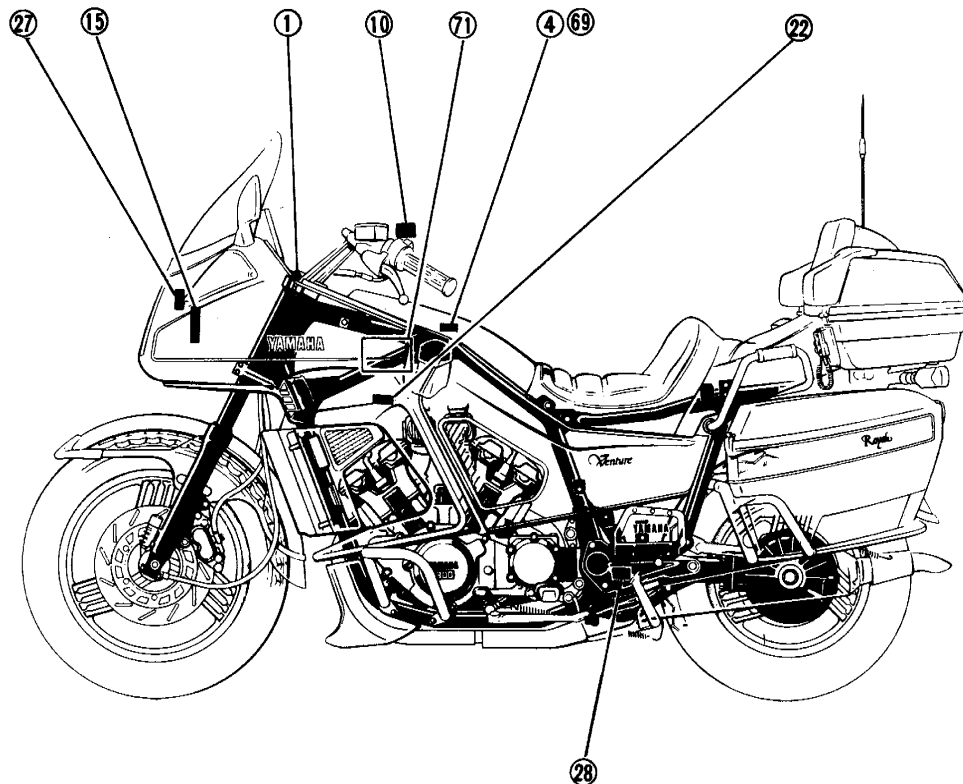
CIRCUIT DIAGRAM



Aforementioned circuit diagram shows fuel pump circuit in wiring diagram.

NOTE: _____
 For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ④ Fuse (IGNITION)
- ⑩ "ENGINE STOP" switch
- ⑮ Emergency stop switch
- ⑳ Ignitor unit
- ㉓ Fuel pump control relay
- ㉔ Fuel pump
- ㉖ Fuse (MAIN)
- ㉗ Battery



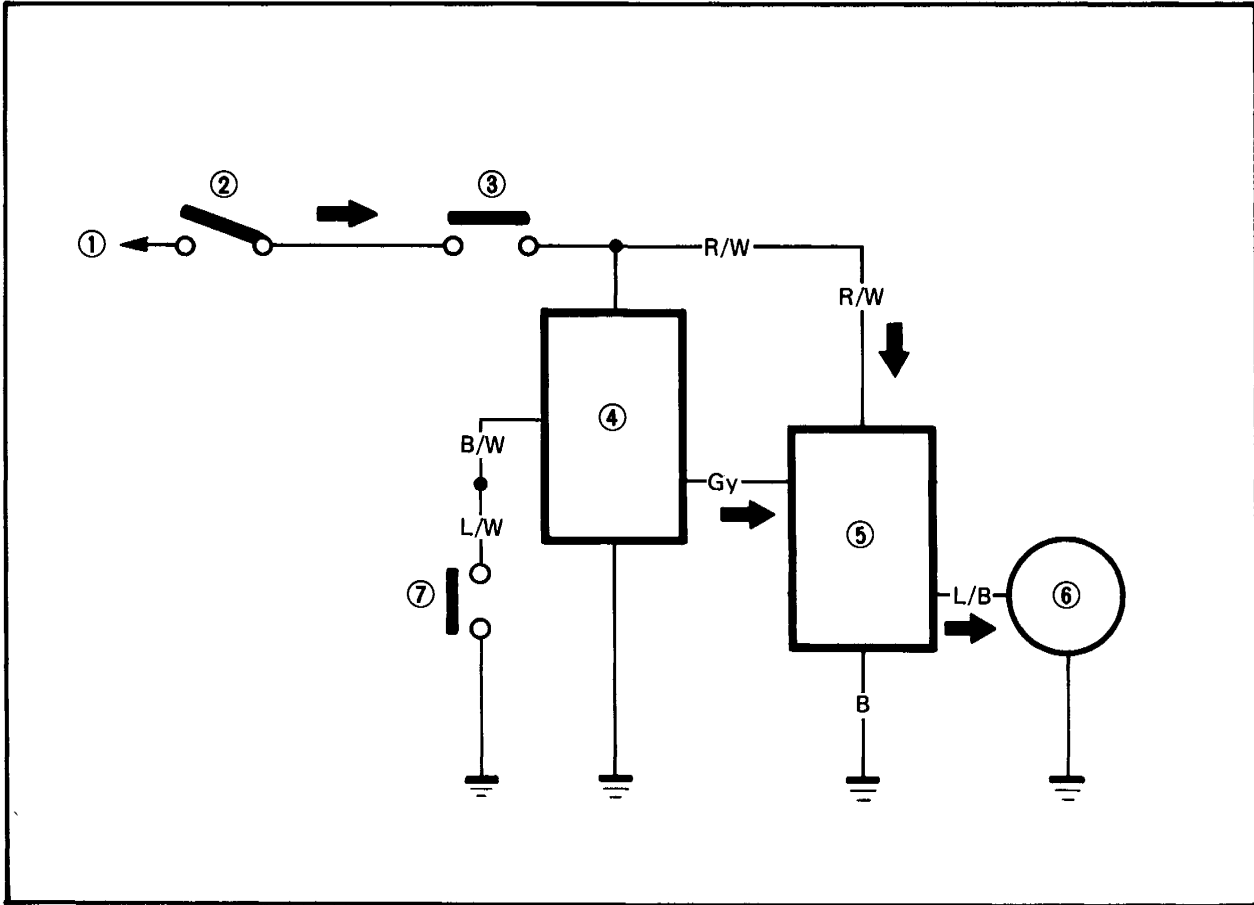


FUEL PUMP CIRCUIT OPERATION

The fuel pump circuit consists of the fuel control relay, fuel pump, emergency stop switch etc.

The fuel pump starts and stops as indicated in the chart below.

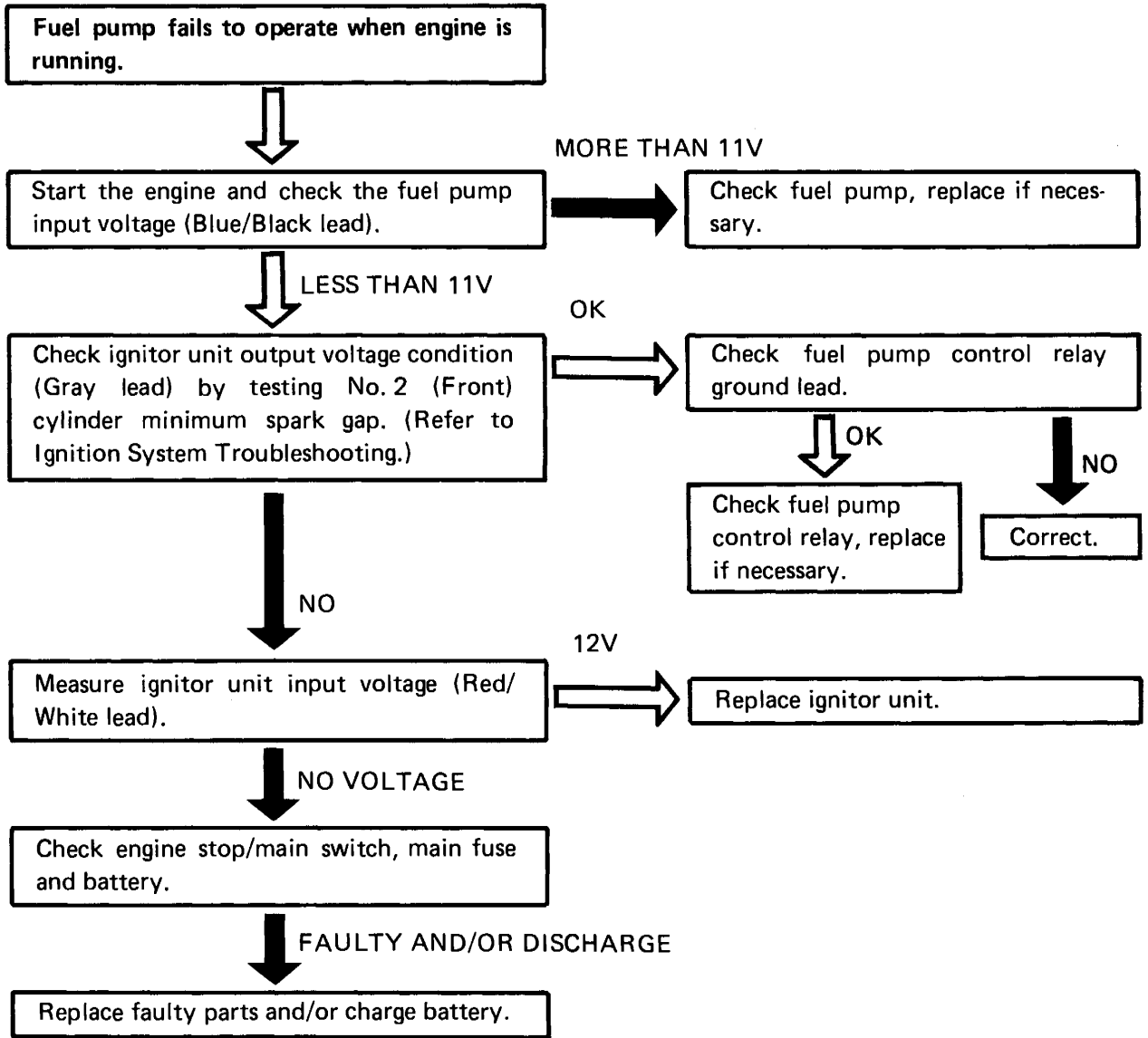
- ① To main fuse and battery
- ② Main switch
- ③ Engine stop switch
- ④ Ignitor unit
- ⑤ Fuel pump control relay
- ⑥ Fuel pump
- ⑦ Emergency stop switch



FUEL PUMP		
START		STOP
• Main/Engine stop switch turned to "ON"	• Engine turned on	• Engine turned off
For about 5 seconds when carburetor fuel level is low	After about 0.1 second	After about 5 seconds

TROUBLESHOOTING

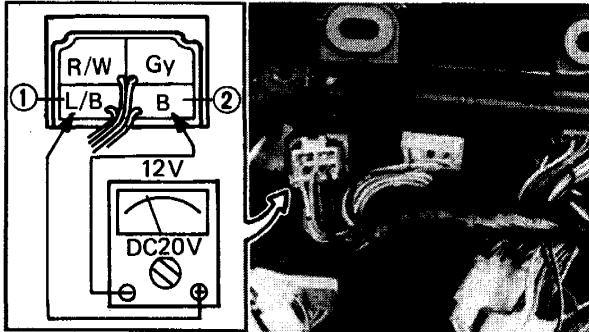
Troubleshooting Chart (1)





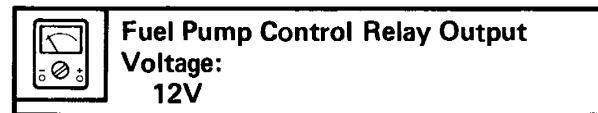
FUEL PUMP CONTROL RELAY TEST

1. Remove:
 - Top cover
 - Fairing
2. Check:
 - Fuel pump operation
Refer to "FUEL PUMP TEST" section.
3. Measure:
 - Battery voltage
Use the Pocket Tester (YU-33263).
Out of specification → Replace relay.
Main and engine stop switches are "ON" position.

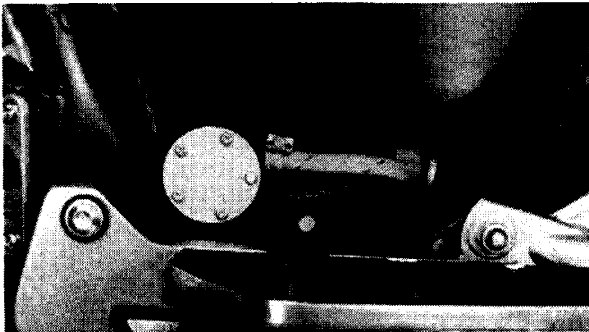


NOTE:

When the main and engine stop switches are ON, the fuel pump control relay is activated for five (5) seconds at which time the fuel pump operates.



- ① Blue/Black
- ② Black



FUEL PUMP TEST

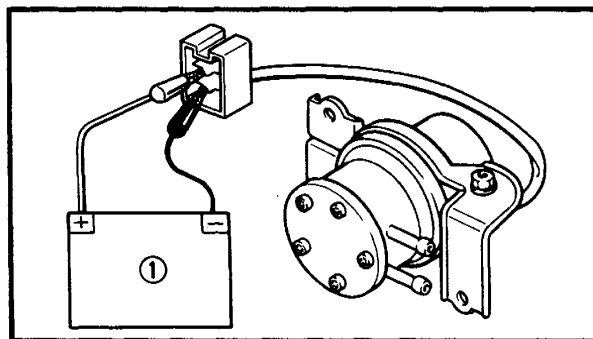
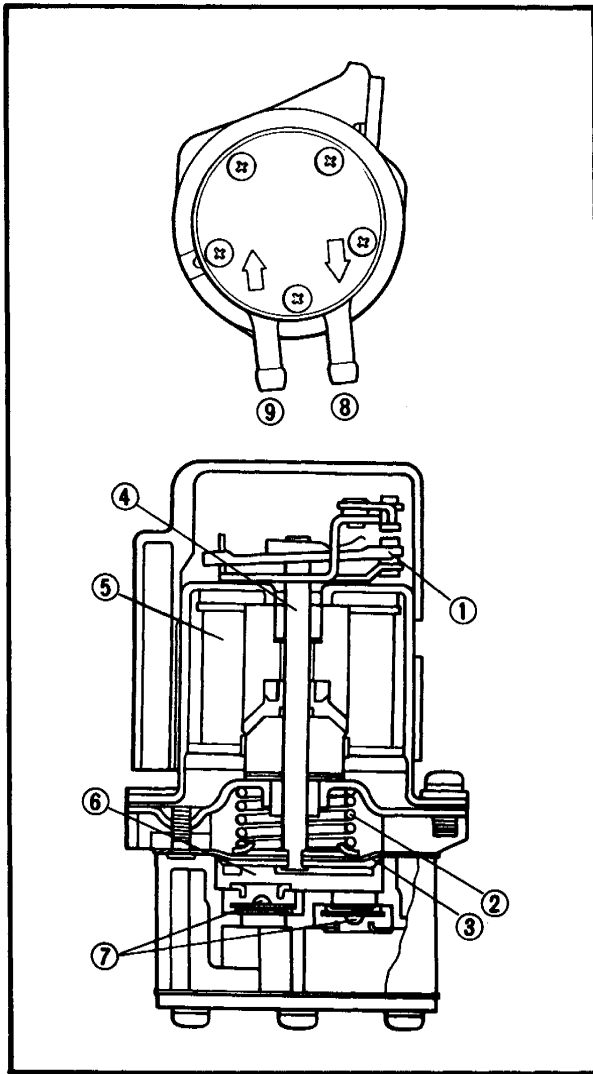
Operation

The diaphragm is pulled left by the plunger allowing fuel to be sucked into the fuel chamber. Fuel is pushed out from the pump until carb float chamber is filled with fuel, and then the cut-off switch cuts off the circuit.

When the spring pushes the diaphragm further to the end, the cut-off switch turns on and the solenoid coil pulls the plunger with the diaphragm forcing fuel into the fuel chamber.

NOTE:

When the main and engine stop switches are ON, the fuel pump relay is activated for five (5) seconds at which time the fuel pump operates.



- ① Cut-out switch
- ② Spring
- ③ Diaphragm
- ④ Plunger
- ⑤ Solenoid coil
- ⑥ Fuel chamber
- ⑦ Valve
- ⑧ Outlet
- ⑨ Inlet

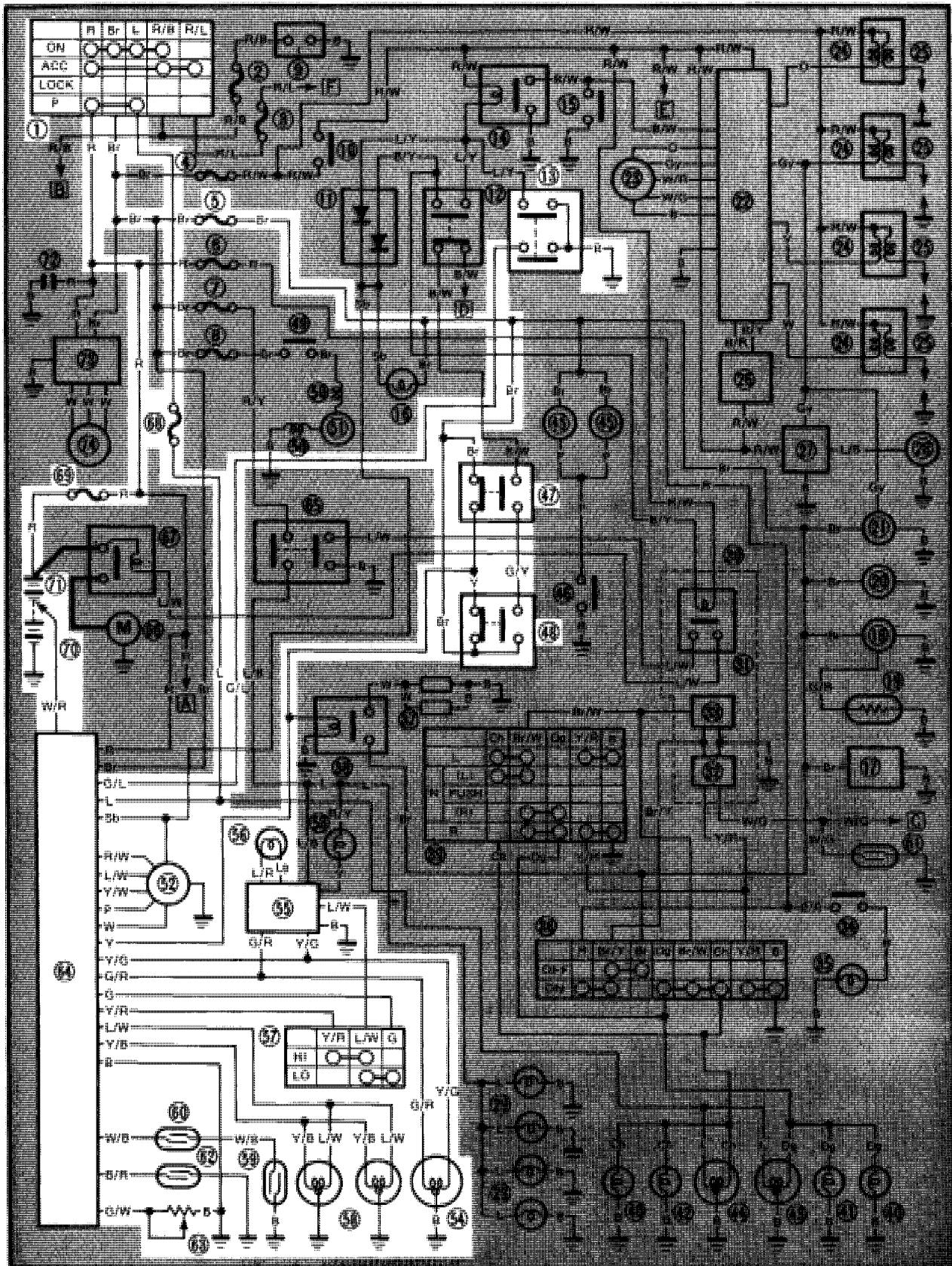
Inspection

1. Connect:
 - Battery (12V) ①
2. Check:
 - Fuel pump operation
 - Faulty operation → Replace.
3. Inspect:
 - Fuel pump
 - Cracks/Damage → Replace.



COMPUTERIZED MONITOR SYSTEM

CIRCUIT DIAGRAM

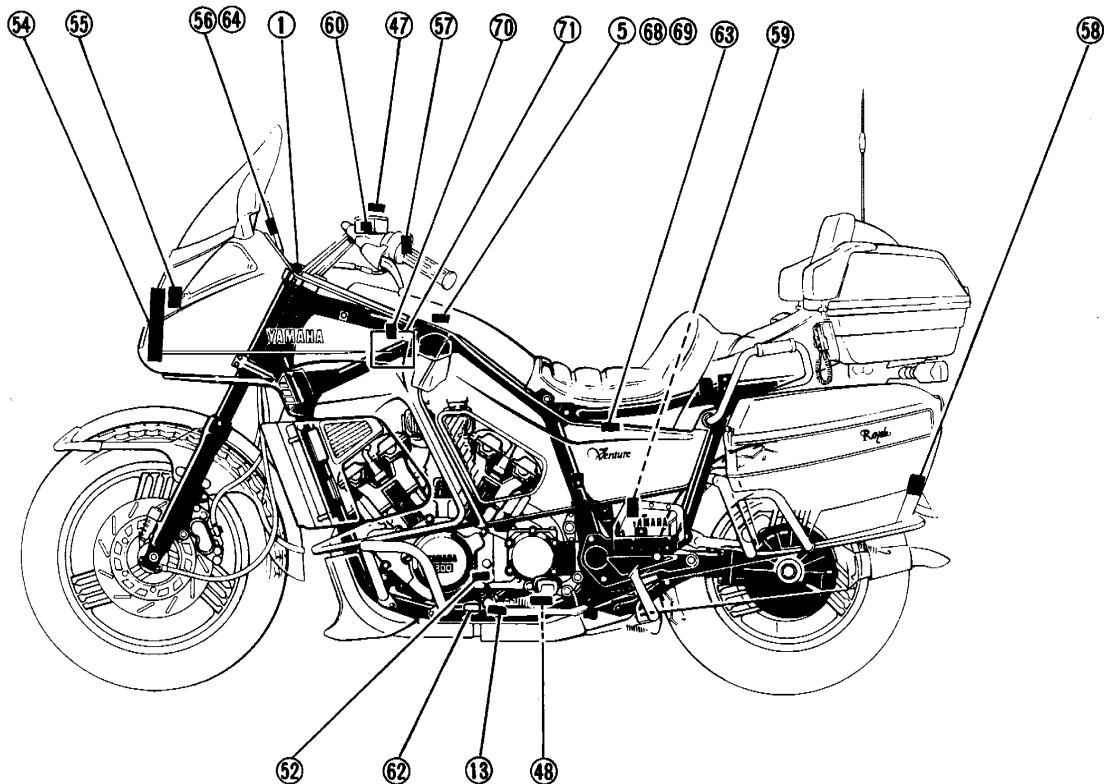


Aforementioned circuit diagram shows computerized monitor circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

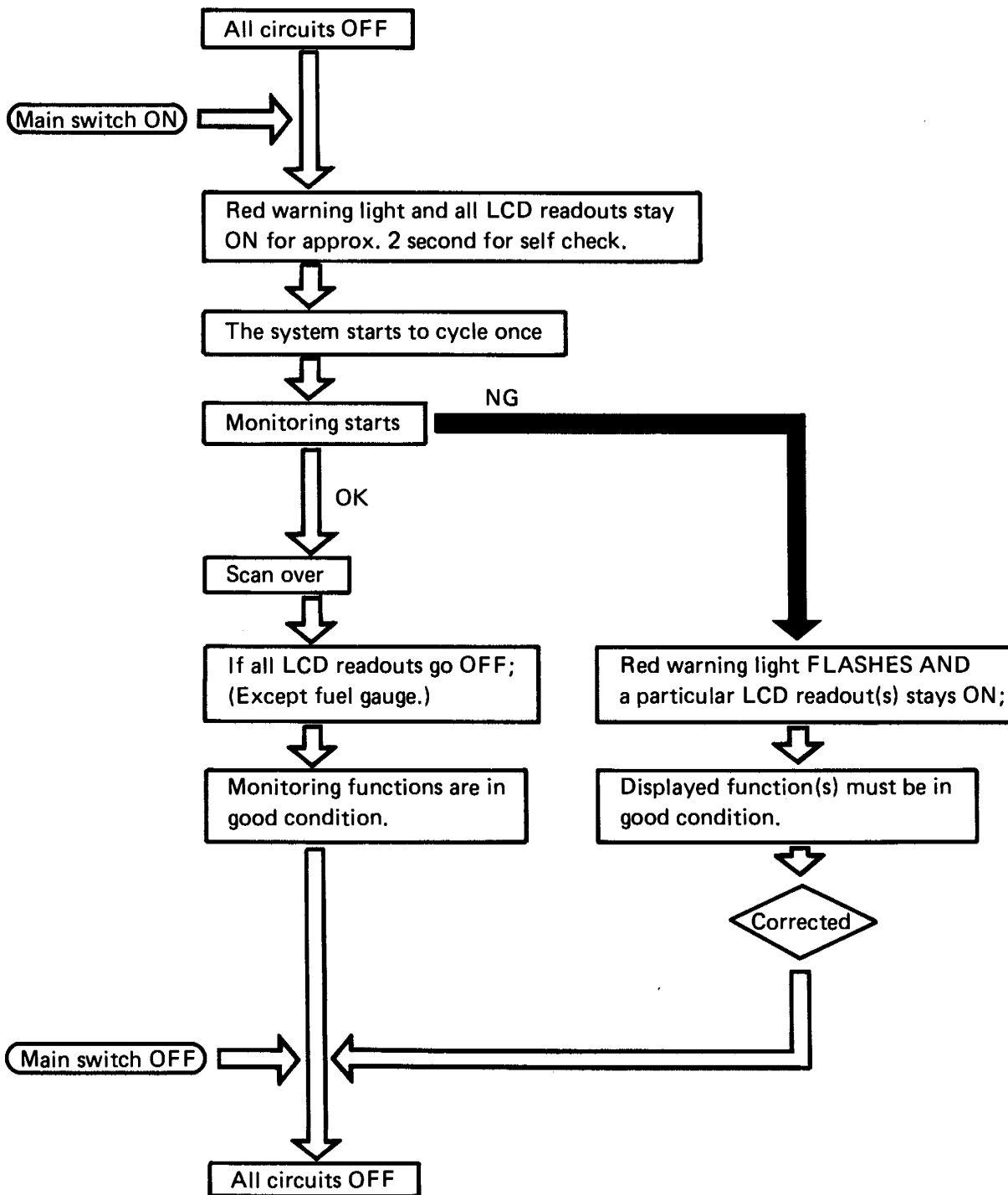
- ① Main switch
- ⑤ Fuse (SIGNAL)
- ⑬ Sidestand switch
- ④⑦ Front brake switch
- ④⑧ Rear brake switch
- ⑤② Shift position switch
- ⑤④ Headlight
- ⑤⑤ Reserve lighting unit
- ⑤⑥ "HEAD LAMP" indicator light
- ⑤⑦ "LIGHTS" (Dimmer) switch
- ⑤⑧ Tail/brake light
- ⑤⑨ Rear brake fluid level sensor
- ⑥⑩ Front brake fluid level sensor
- ⑥② Oil level sender
- ⑥③ Fuel sender
- ⑥④ Computer monitor
- ⑥⑧ Fuse (TAIL)
- ⑥⑨ Fuse (MAIN)
- ⑦⑩ Battery sensor
- ⑦① Battery





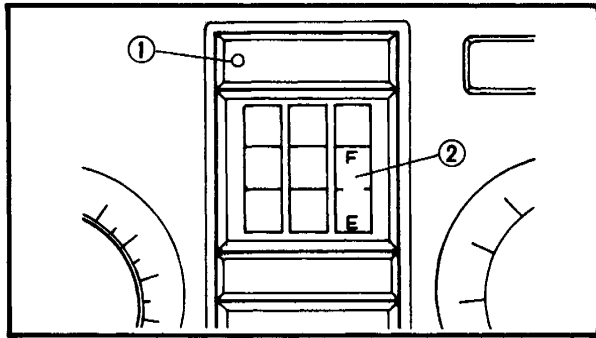
COMPUTER MONITOR SYSTEM

Operation Flow Chart



NOTE:

- Fuel level display:
CMS displays real fuel level reading about 2 seconds after the main switch is turned on; After about 2 seconds, CMS displays the fuel level for an average of approx. 5 seconds.
- Brake fluid, Engine oil, and Battery fluid level display:
CMS displays when the fluid level becomes insufficient for more than about 8 seconds.



Description

This system monitors seven separate functions and will warn you of any malfunction until it is fixed. In addition, the fuel gauge in this system indicates the amount of fuel in the tank.

- ① "WARNING" light (Red)
- ② Display panel

Operation

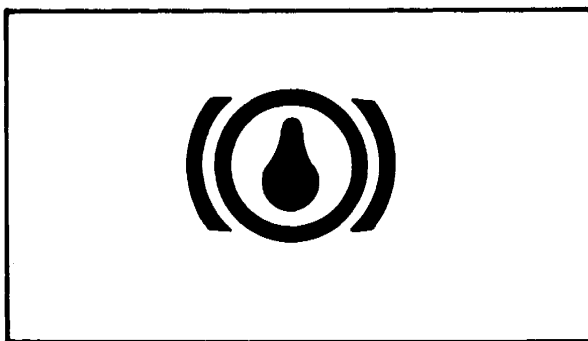
When the main switch is turned on:

- All seven liquid crystal displays (LCDs) come on, with the bottom fuel display (■■■■■■) indicating the amount of fuel in the tank.
- The system begins its scan of the motorcycle conditions. From top to bottom, all the LCDs flash on and then off in sequence.

The red warning light will begin flashing if any one condition is found improper or inadequate, and the LCD for the area will remain displayed.

WARNING: _____

If any LCD remains displayed or the warning light flashes on, correct the problem immediately.



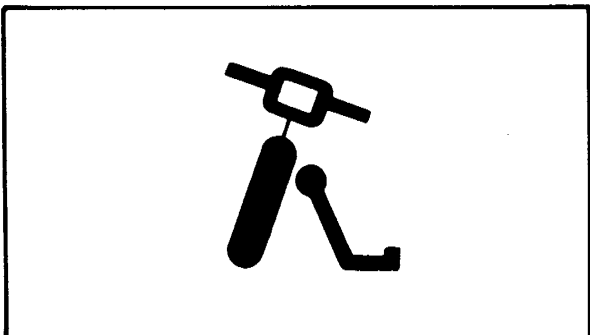
Display Panel

Brake fluid level:

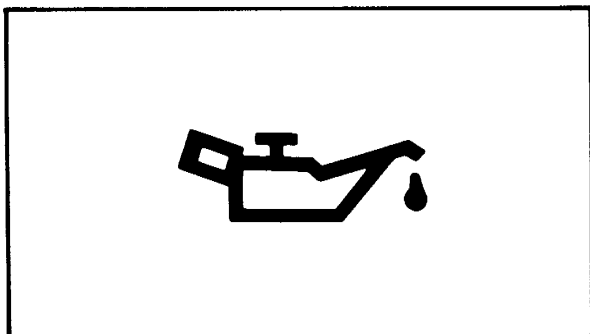
This indicator is displayed when the brake fluid level is below specification in the front and rear brake master cylinder. Add the brake fluid immediately.

WARNING: _____

Do not run the motorcycle with a low brake fluid level for a long time or at high speeds.

**Sidestand:**

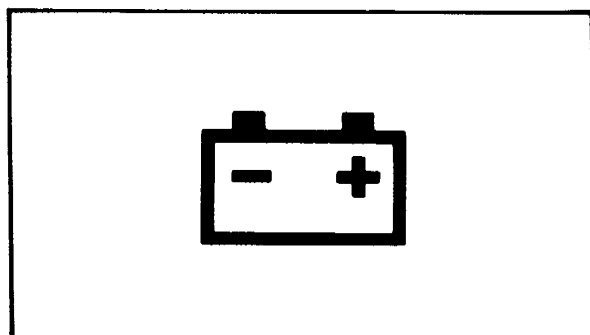
This indicator is displayed when the sidestand is down. Be sure to retract it before starting out on the road.

**Engine oil level:**

This indicator is displayed when the engine oil level is low. If it remains displayed or keeps flickering while riding, add engine oil at the first opportunity.

WARNING:

Do not run the motorcycle with a low engine oil level for a long time or at high speeds.

**Battery fluid level:**

This indicator is displayed when the battery fluid level is low. If it remains displayed, add distilled water at the first opportunity.

CAUTION:

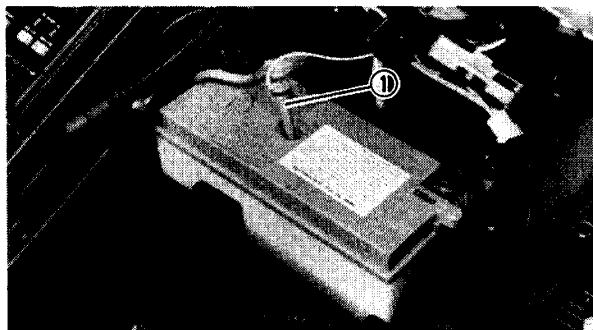
Continuous riding with a low battery fluid level will damage the battery.

NOTE:

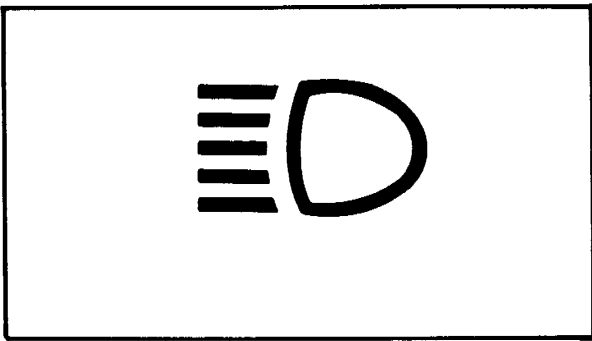
The battery sensor terminal must be cleaned approximately every 5,000 km (3,000 mi). The terminal is constructed of lead, and its surface may become corroded causing a system malfunction.

CAUTION:

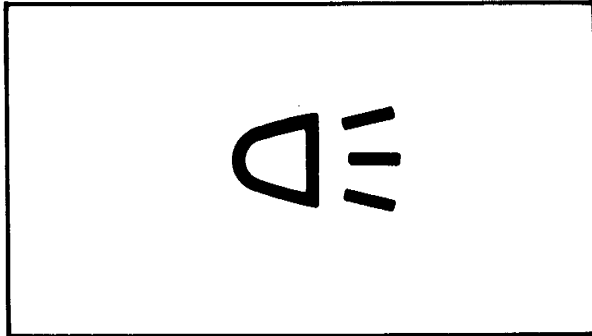
Make sure that the connection to the battery is correct, otherwise, damage to the microcomputer may occur.



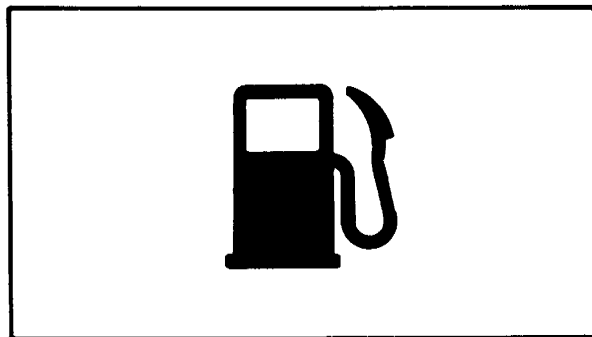
① Battery sensor

**Headlight bulb:**

This indicator is displayed when the headlight bulb is burned out. If it remains displayed, have the bulb replaced and correctly adjusted at the first opportunity.

**Tail/Brake light bulbs:**

This indicator is displayed when the taillight and/or brake light bulbs are burned out. If it remains displayed, have the bulb(s) replaced at the first opportunity.

**Fuel amount:**

This indicator is displayed when the fuel level is low. If it remains displayed or keeps flickering while riding, add fuel at the first opportunity.

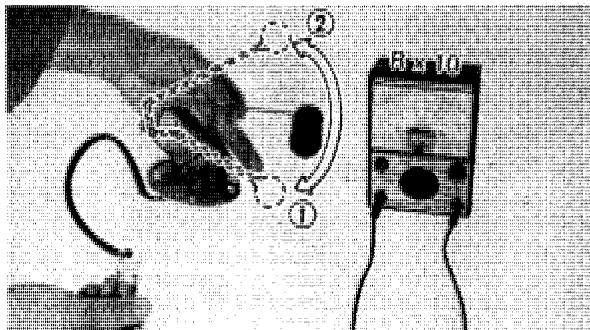
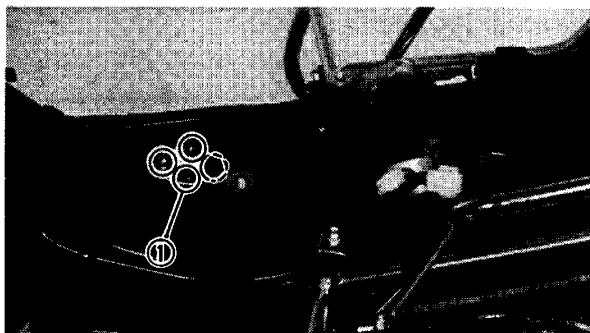
NOTE: _____

When this indicator is displayed, the remaining fuel is 4.0 L (0.9 Imp gal, 1.1 US gal).

CAUTION: _____

Failure to observe any of the following "don'ts" may result in malfunction of the microcomputer or damage to the electrical circuit:

- Don't use a taillight, brake light, or any other bulb that is not of the specified wattage.
 - Don't connect extra electrical accessories to the Computerized Monitor System circuit (taillight, headlight, etc.).
 - Don't allow any water or steam to come in contact with the instrument panel.
 - Don't exert undue pressure on the display panel or subject it to strong shock.
 - Don't place a magnet or any magnetized objects close to the display panel.
-




COMPUTERIZED MONITOR SYSTEM SENSOR TEST

Fuel Level Sensor

1. Remove:
 - Side panels
 - Seat
 - Fuel sensor ①

2. Measure:
 - Fuel sensor resistance
 Use the Pocket Tester (YU-33263).
 Out of specification → Replace.

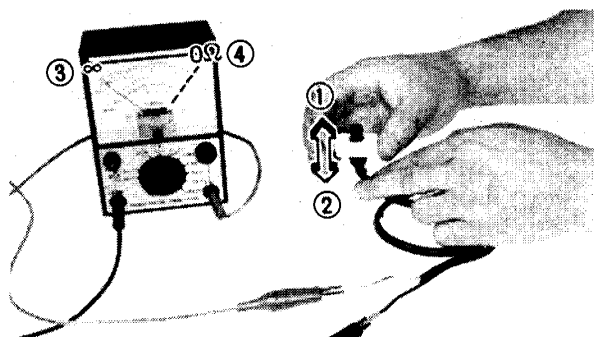
	Fuel sensor resistance	
Full ①		44Ω or less
1/2		160 ~ 180Ω
Empty ②		273Ω or more


Oil Level Sender Test

Refer to "SIGNAL SYSTEM – OIL LEVEL SENDER TEST" section.

Brake Fluid Sensor (Front and Rear) Test

1. Remove:
 - Master cylinders
2. Drain:
 - Brake master cylinders
3. Remove:
 - Brake fluid sensors
4. Measure:
 - Brake fluid sensor resistance
 Use the Pocket Tester (YU-33263).
 Out of specification → Replace.



	Brake Fluid Sensor Resistance:	
	Float is down ①	→ ∞ ③
	Float is up ②	→ Zero Ω ④

5. Install:
 - Brake fluid sensors
 - Master cylinders



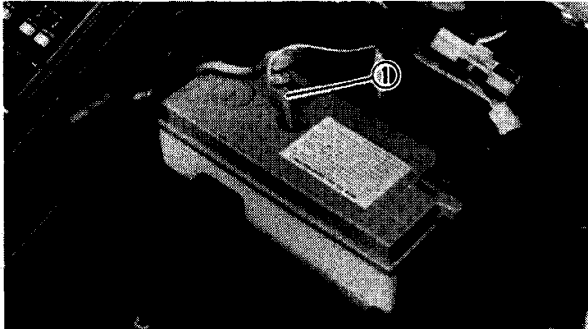
6. Fill:
- Brake reservoir tank



Brake Fluid:
DOT #3

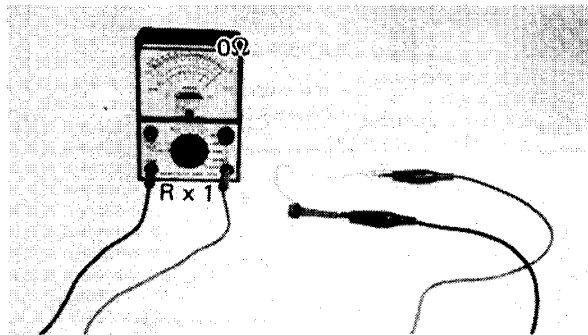
WARNING:

The brake system must be bled to remove air from the brake fluid.



Battery Fluid Sensor

1. Remove:
- Top cover
 - Battery sensor ①



2. Measure:
- Battery sensor resistance.
Use the Pocket Tester (YU-33263).
Out of specification → Replace.



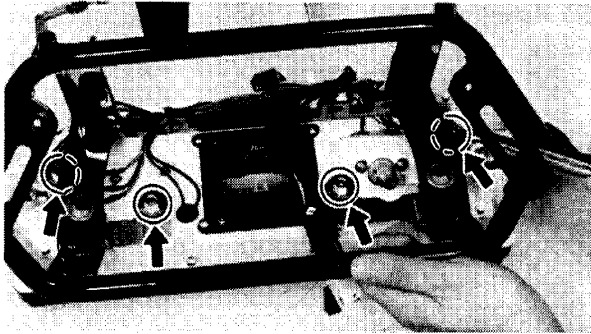
Battery Sensor Resistance:
0Ω

3. Install:
- Battery sensor
 - Top cover

**LCD PANEL****Troubleshooting**

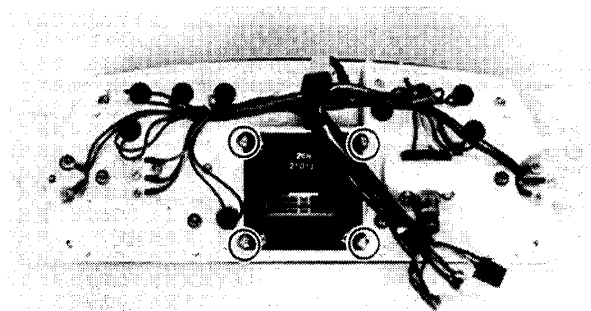
After the main switch is turned on:

PROBLEM	CAUSE	SOLUTION
Warning light doesn't come on.	LCD is broken. Low battery charge. Faulty coupler connection. Broken lead. CMS control unit failed.	Replace LCD panel. Recharge battery. Clean coupler contacts. Replace wiring. Replace CMS control unit.
Liquid crystal display (LCD) flashes on and off.	CMS control unit failed.	Replace CMS control unit.
LCD does not function.	LCD connectors incorrectly installed. Broken lead. Faulty contact between LCD panel and LCD holder. LCD panel failed. CMS control unit failed.	Reinstall connectors. Replace wiring. Clean contacts. Replace LCD panel. Replace CMS control unit.
LCD only partially displays.	LCD panel failed.	Replace LCD panel.
LCD does not cycle.	Faulty coupler connection. Broken lead. CMS control unit failed.	Clean coupler contacts. Replace wiring. Replace CMS control unit.

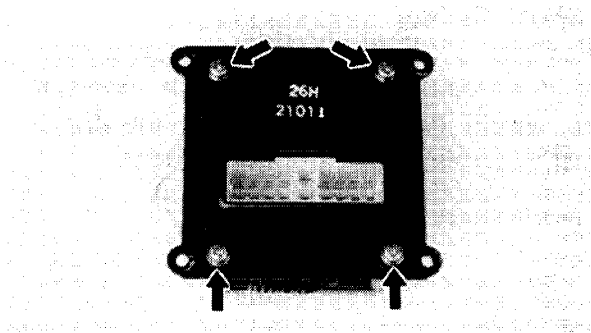


LCD Removal

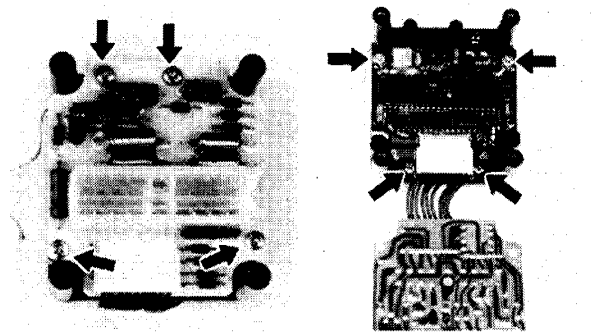
1. Remove:
 - Meter assembly



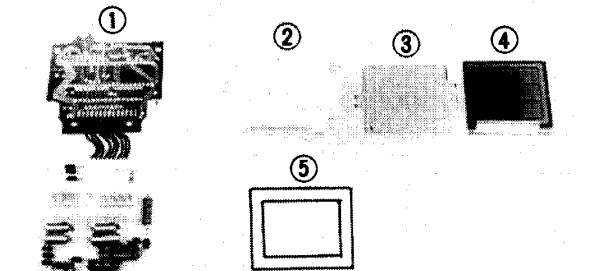
2. Remove:
 - Microcomputer unit



3. Remove:
 - Unit cover

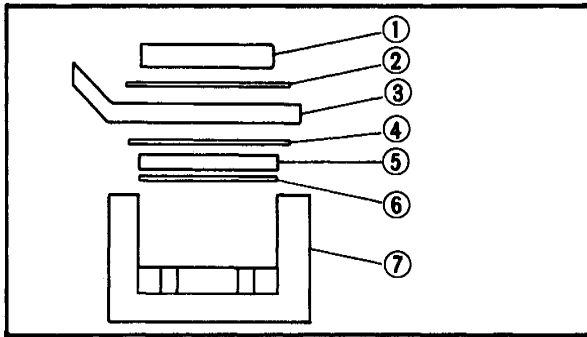


4. Remove:
 - Circuit board assembly



5. Remove:
 - Components

- ① Circuit board assembly
- ② Display plate
- ③ Reflector
- ④ LCD unit
- ⑤ Holder spacer



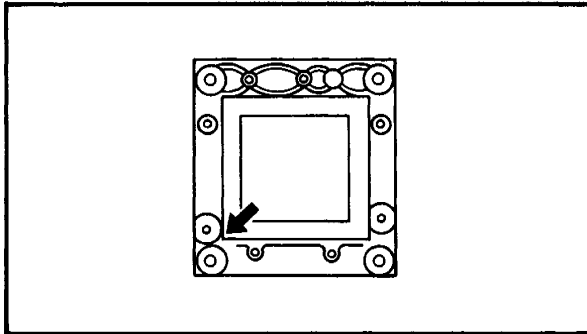
LCD Assembly

Reverse the removal procedure.

- ① LCD connector
- ② Reflector
- ③ Display plate
- ④ LCD reflector
- ⑤ LCD unit
- ⑥ Holder spacer
- ⑦ Display holder

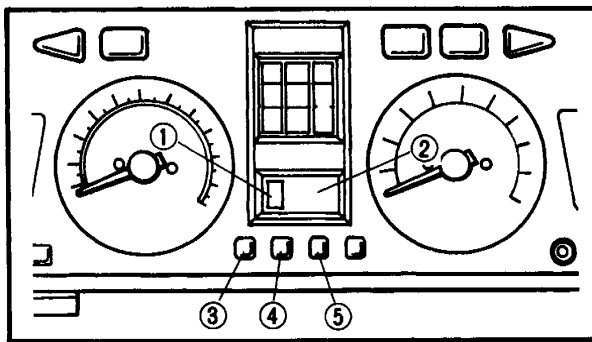
NOTE:

LCD unit should be installed in the direction of the arrow.



Screw (M3):
0.8 Nm (0.08 m·kg, 0.6 ft·lb)

Screw (M4):
1.2 Nm (0.12 m·kg, 0.9 ft·lb)



DIGITAL CLOCK

This digital clock ② functions both as a watch and as a stop watch. A clock mode (watch or stop watch) can be displayed on the display panel by turning "ON" the main switch.

- ① Gear indicator panel

Clock Adjustment

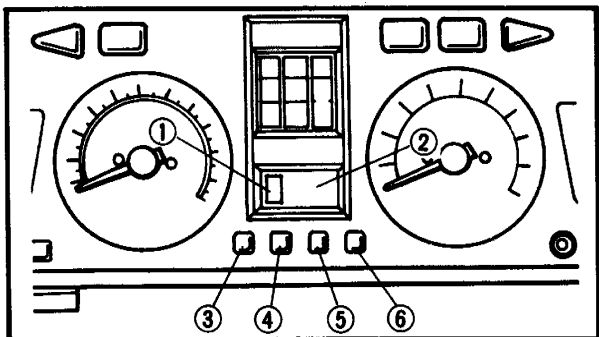
1. Adjust:

- Clock

By the following adjustment steps.

Clock adjustment steps:

- Turn the main switch to ON.
- Place the clock in the clock mode by pressing the "CLOCK/STOP WATCH" switch ③.
- Press the "SELECT/HM-MS" switch ④ and select the clock model (hour or minute) you want to adjust. The flashing digit can be adjusted.
- By pressing the "SET/START-STOP" switch ⑤ the flashing digit can be adjusted.



Stop Watch Operation

1. Operate:

- Stop Watch

By the following operating steps:

- ① Gear indicator panel
- ② Digital clock

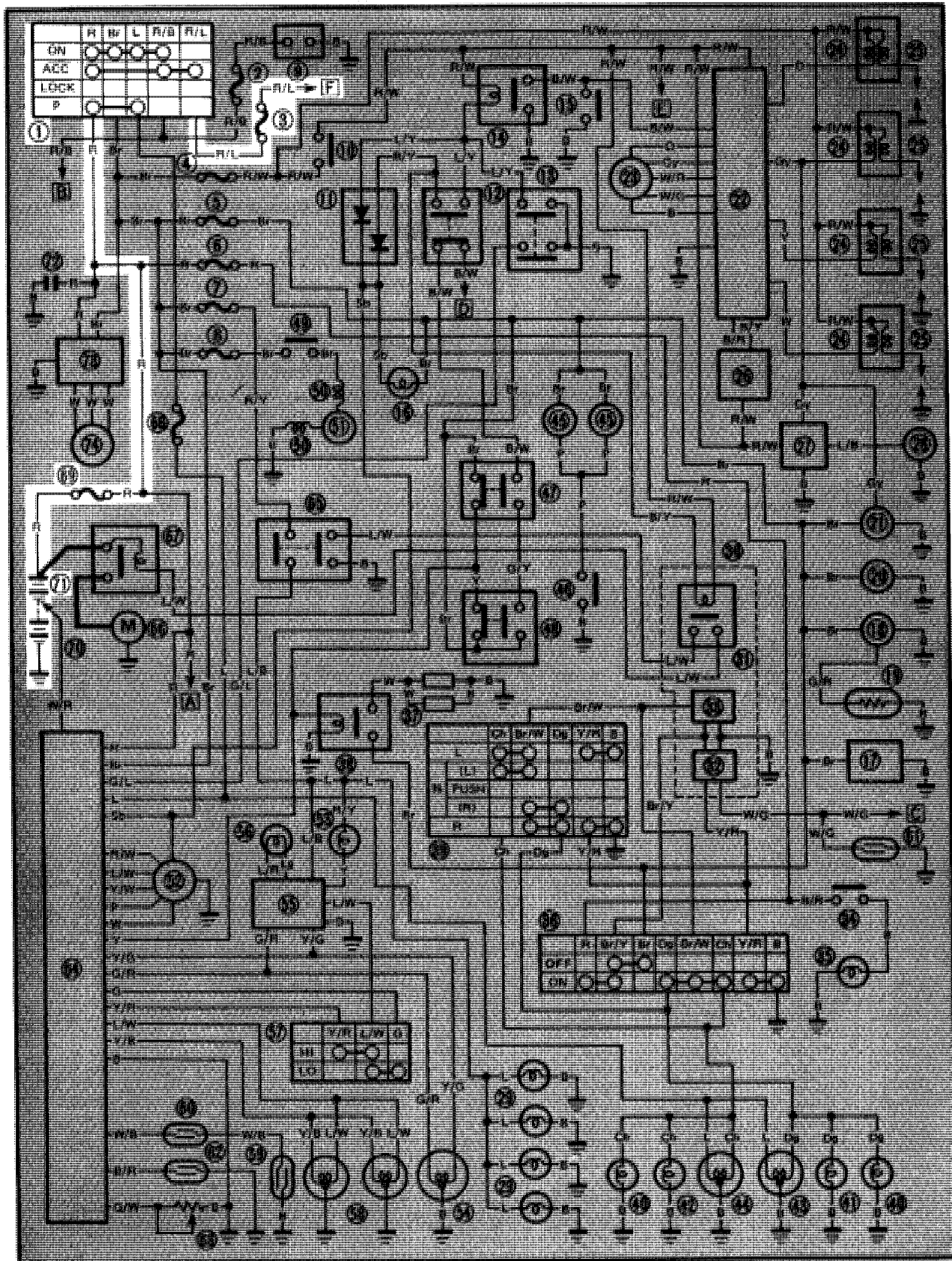
Stop watch operating steps:

- Turn the main switch to ON.
- By pressing the "CLOCK/STOP WATCH" switch ③ , place the clock in the stop watch mode.
- Select the display of the hour and minutes or the minutes and seconds by pressing the "SELECT/HM-MS" switch ④ .
- By pressing the "SET/START-STOP" switch ⑤ , the watch can be started or stopped.
- The watch can be reset by pressing the "RESET" switch ⑥ .



CLASS (Computer Leveling Air Suspension System) SYSTEM

CIRCUIT DIAGRAM (1)



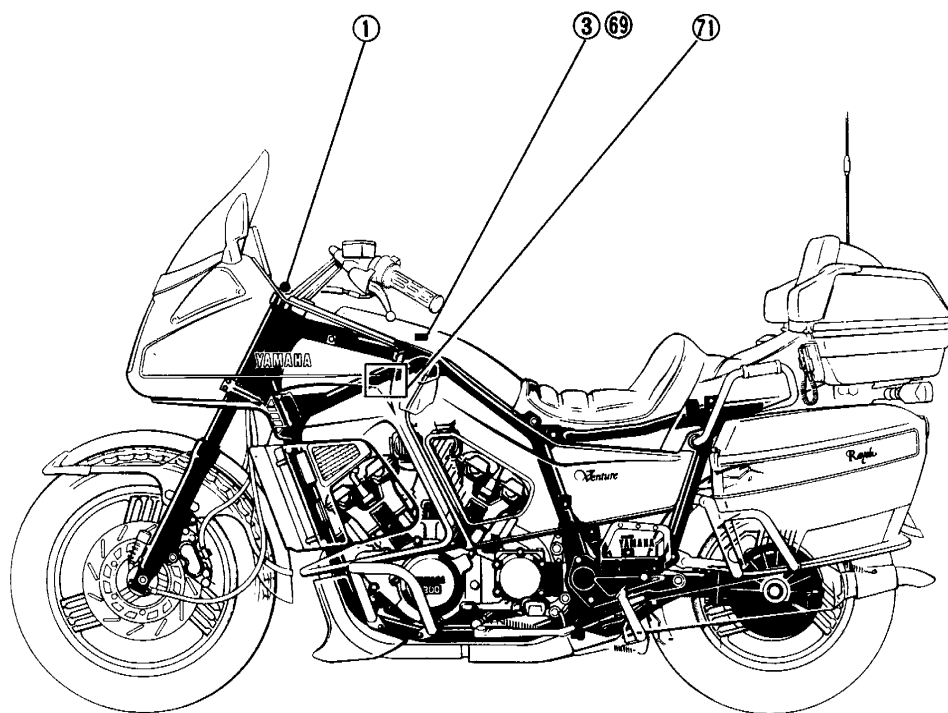


Aforementioned circuit diagram shown CLASS circuit in wiring diagram.

NOTE:

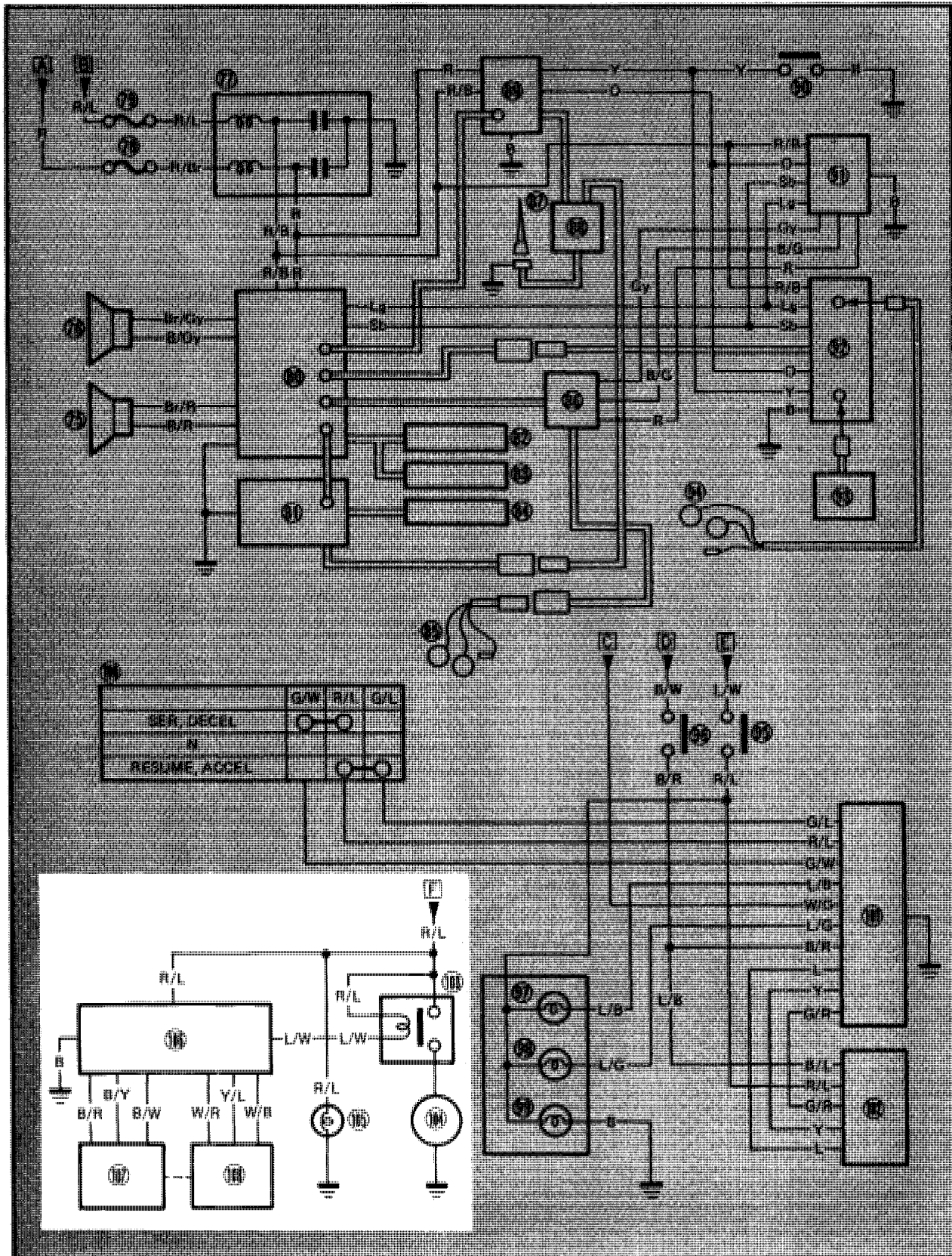
For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ③ Fuse (CLASS)
- ⑥⑨ Fuse (MAIN)
- ⑦① Battery





CIRCUIT DIAGRAM (2)



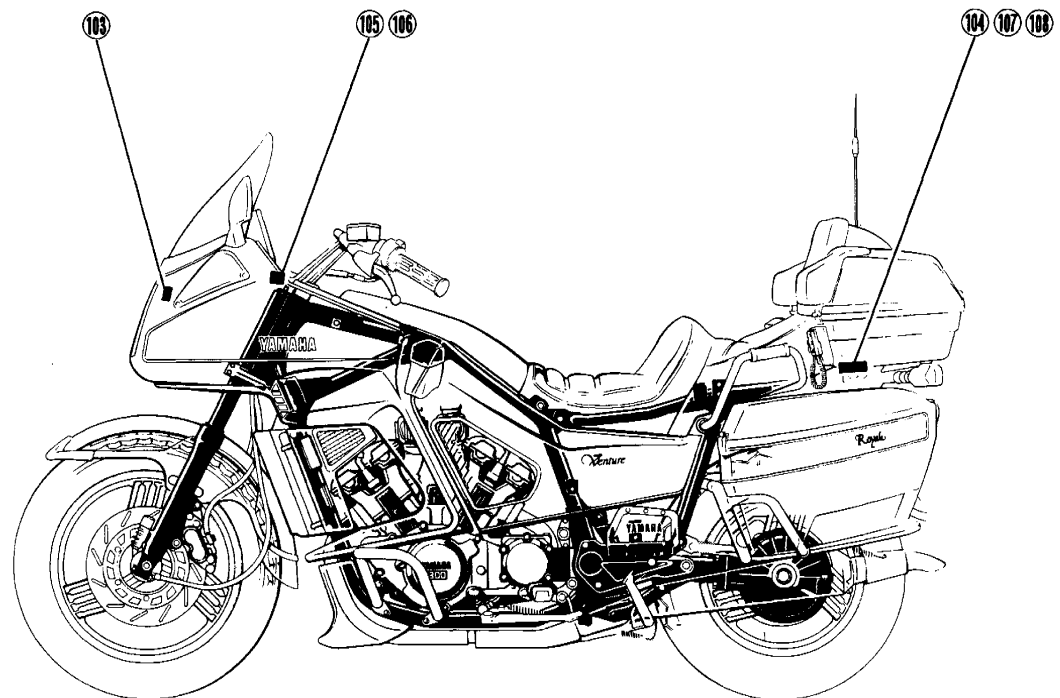


Aforementioned circuit diagram shown CLASS circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

- ⑩③ CLASS relay
- ⑩④ Compressor
- ⑩⑤ Illumination (CLASS)
- ⑩⑥ CLASS control unit
- ⑩⑦ Solenoid valve (CLASS)
- ⑩⑧ Pressure sensor (CLASS)



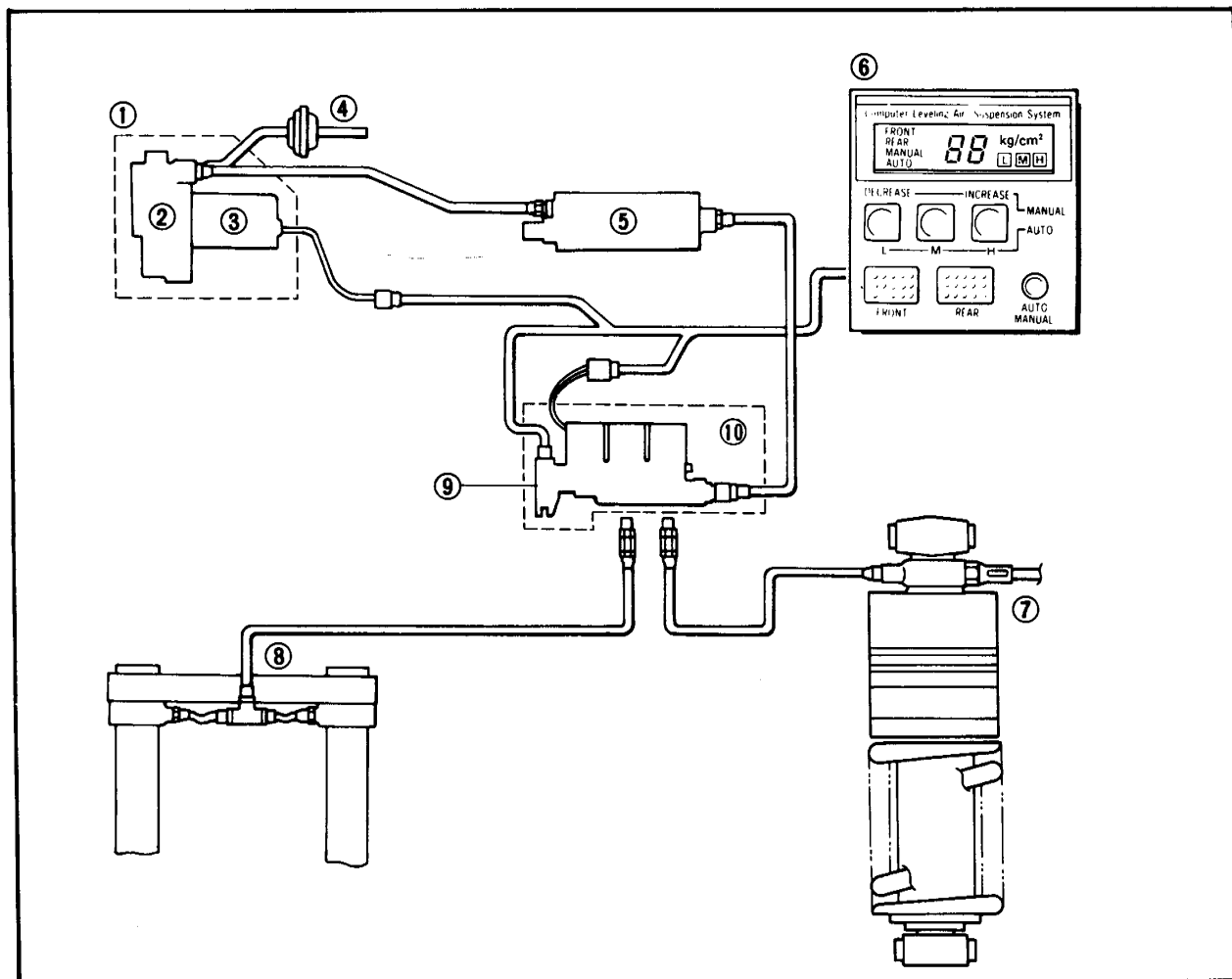


DESCRIPTION OF THE SYSTEM

The operation of buttons on the controller unit enables the semiconductor pressure sensor and micro-computer to measure both front and rear suspension air pressures and automatically adjust the pressures in three stages. On the MANUAL mode, it is possible to set the pressures at any desired level. The controller has a built-in microcomputer that controls the solenoid valves and air compressor motor. Simultaneously the controller also indicates the constantly changing air pressure on the liquid crystal display (LCD) during pressure adjustment. In case of trouble, the self-diagnosis function indicates an "error" sign (E1 to E6) on the display to aid in troubleshooting.

The air suspension controller controls the air compressor and three solenoid valves. It also feeds air to and draws air from the front and rear suspension systems. The semiconductor pressure sensor constantly measures the air pressure during pressure adjustment and transmits it to the controller. By operating the switch, the front and rear suspension air chambers and the pressure sensor chamber can be closed, and the compressor operates when air is required. If air has to be drawn out, the discharge valve opens. In this way, the suspension air pressures are controlled.

- | | |
|------------------|-------------------------|
| ① Air compressor | ⑥ CLASS controller unit |
| ② Compressor | ⑦ Rear suspension |
| ③ Electric motor | ⑧ Front suspension |
| ④ Air cleaner | ⑨ Pressure sensor |
| ⑤ Air dryer | ⑩ Valve assembly |



**Operation Notes**

1. Pressure adjustment should be made with the mainstand extended. The pressure levels for automatic adjustment are preset with the mainstand extended.
2. Avoid pushing two switches at close intervals, or they will not work. Push one by one at full intervals. (For instance, to measure the suspension air pressure, you must wait until the pressure has stabilized. Otherwise, the adjustment switch cannot be operated.)
3. When two switches are pushed at once, the one pushed first has preference.
4. If three switches are pushed at one time, CLASS may stop functioning.
5. Switches may sometimes not work during operation; this does not necessarily mean trouble. Refer to the switch acceptance chart below;
6. In the MANUAL mode, the front suspension air pressure should be first adjusted. If the order is reversed, the residual high pressure air in the circuit will flow into the front suspension. (In this case, use the DECREASE switch for pressure adjustment.)
7. Avoid operating the CB unit when operating CLASS.
8. Air will be discharged in a small amount each time the air pressure is measured. So when air pressure measurement is repeated, the air pressure will show a decrease.
9. Automatic adjustment is possible with an accuracy of $\pm 0.1 \text{ kg/cm}^2$ ($\pm 1.4 \text{ psi}$). A slight difference may be shown when the air pressure is checked after automatic adjustment is made, but it does not necessarily represent air leakage.
10. Do not operate this system while the motorcycle is running.



Functions

NOTE:

Refer to "RECOMMENDED COMBINATION OF THE FRONT FORK AND REAR SHOCK ABSORBER SETTINGS" section.

1. Air pressure measurement of the front and rear suspensions.
2. Air pressure adjustment of the front and rear suspensions.
 - a) Automatic adjustment

Both front and rear suspension air pressures can be set in three stages.

AIR PRESSURE		L	M	H
FRONT	kPa	78.5	98.1	118
	kg/cm ²	0.8	1.0	1.2
	psi	11	14	17
REAR	kPa	98.1	294	490
	kg/cm ²	1.0	3.0	5.0
	psi	14	43	71

b) Manual adjustment

Both front and rear suspension air pressures can be set at any desired level within the adjustable range.

AIR PRESSURE		MINIMUM ~ MAXIMUM
FRONT	kPa	49.0 ~ 147
	kg/cm ²	0.5 ~ 1.5
	psi	7 ~ 21
REAR	kPa	49.0 ~ 588
	kg/cm ²	0.5 ~ 6.0
	psi	7 ~ 85

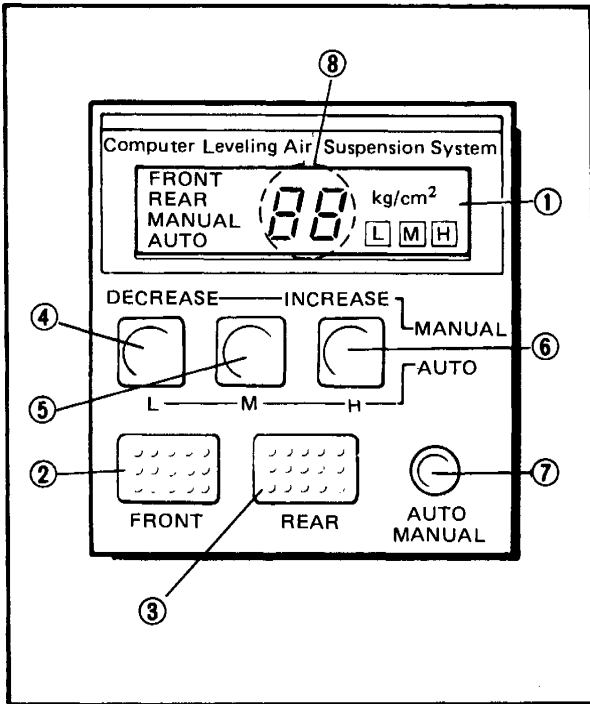
3. LCD (Liquid crystal display) of air pressure and mode

LCD indicates the selection of the front or rear suspension, the present suspension air pressure, the adjusted air pressure, AUTO/MANUAL mode, and error sign.
4. Error diagnosis

LCD shows six different error signs depending on trouble diagnosis. Refer to "TROUBLESHOOTING" section.

**Switch Acceptance Chart**

No.	Condition	Front, Rear Switch	L, M, H, INCREASE, DECREASE Switch	AUTO/MANUAL Switch
1	All characters on LCD are shown.	No	No	No
2	Atmospheric pressure is being read.	No	No	No
3	Suspension air pressure is being measured.	No	No	Yes
4	After suspension air pressure is measured.	Yes	Yes	Yes
5	During automatic adjustment.	No	Yes	No
6	After automatic adjustment.	Yes	Yes	Yes
7	During manual adjustment.	No	No	No
8	After manual adjustment.	Yes	Yes	Yes
9	Error sign is on.	No	No	No

**TROUBLESHOOTING****When an "Error" Sign Appears**

To show trouble by self-check functions, the following six signs are used: E1 to E6.

E1

Shows trouble on the system. (If detected by self-check when power is turned on.)

E2

Air pressure does not rise when the air compressor is operated.

E3

The air compressor has been operated continuously for about one minute.

E4

The pressure sensor has no output voltage.

E5

Control unit has trouble.

E6

Air pressure does not drop with the discharge valve opened.

- | | |
|------------------|------------------------|
| ① Display panel | ⑤ "MEDIUM" switch |
| ② "FRONT" switch | ⑥ "HIGH" switch |
| ③ "REAR" switch | ⑦ "AUTO/MANUAL" switch |
| ④ "LOW" switch | ⑧ "ERROR" sign |

Troubles are shown in the above six categories, but if more than one trouble arises, the error sign displayed may be erroneous. In this case, refer to "How to locate the cause of trouble". (For example, if a connector has a poor contact, one of the six error signs may incorrectly appear at random.)

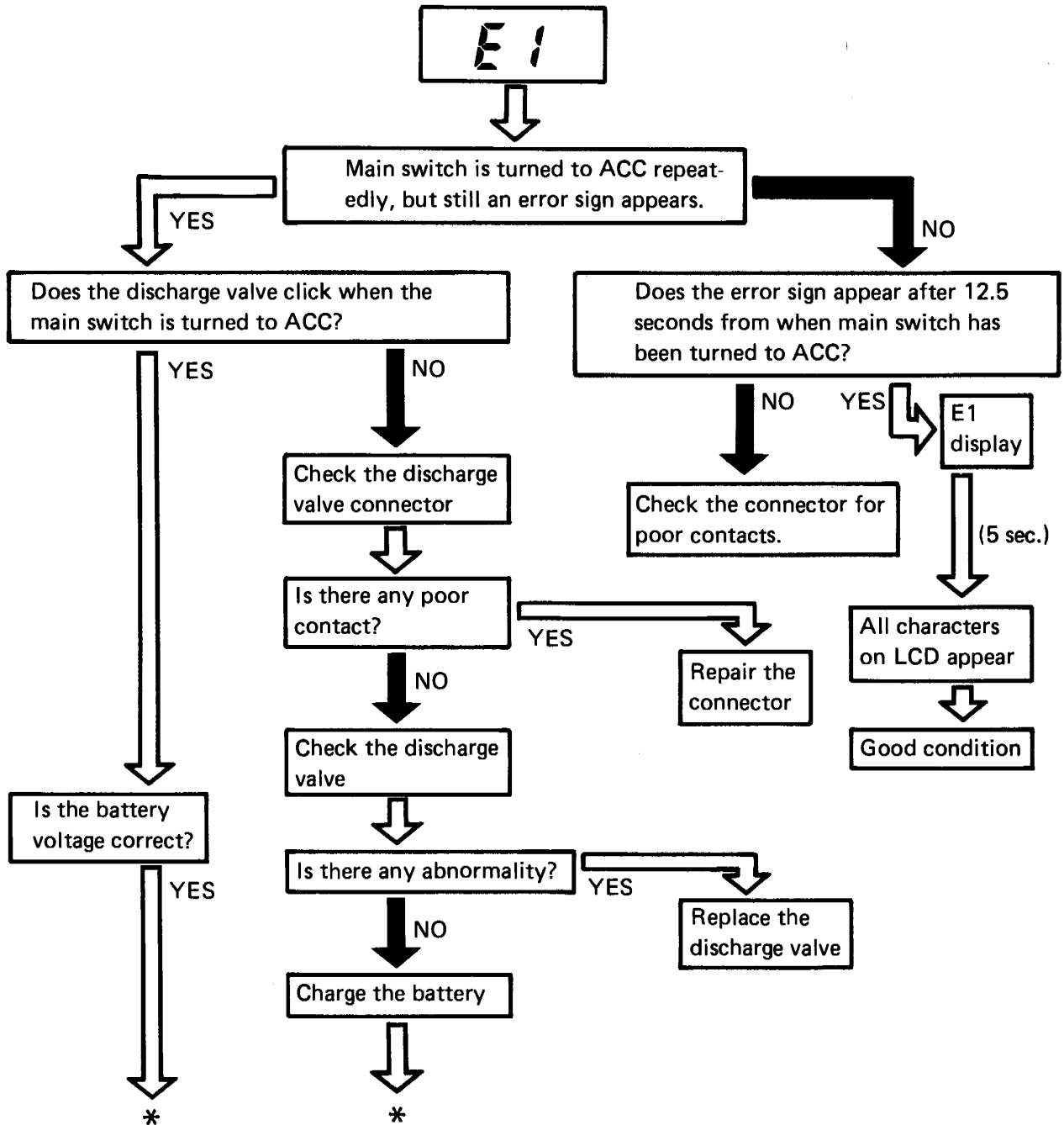
NOTE:

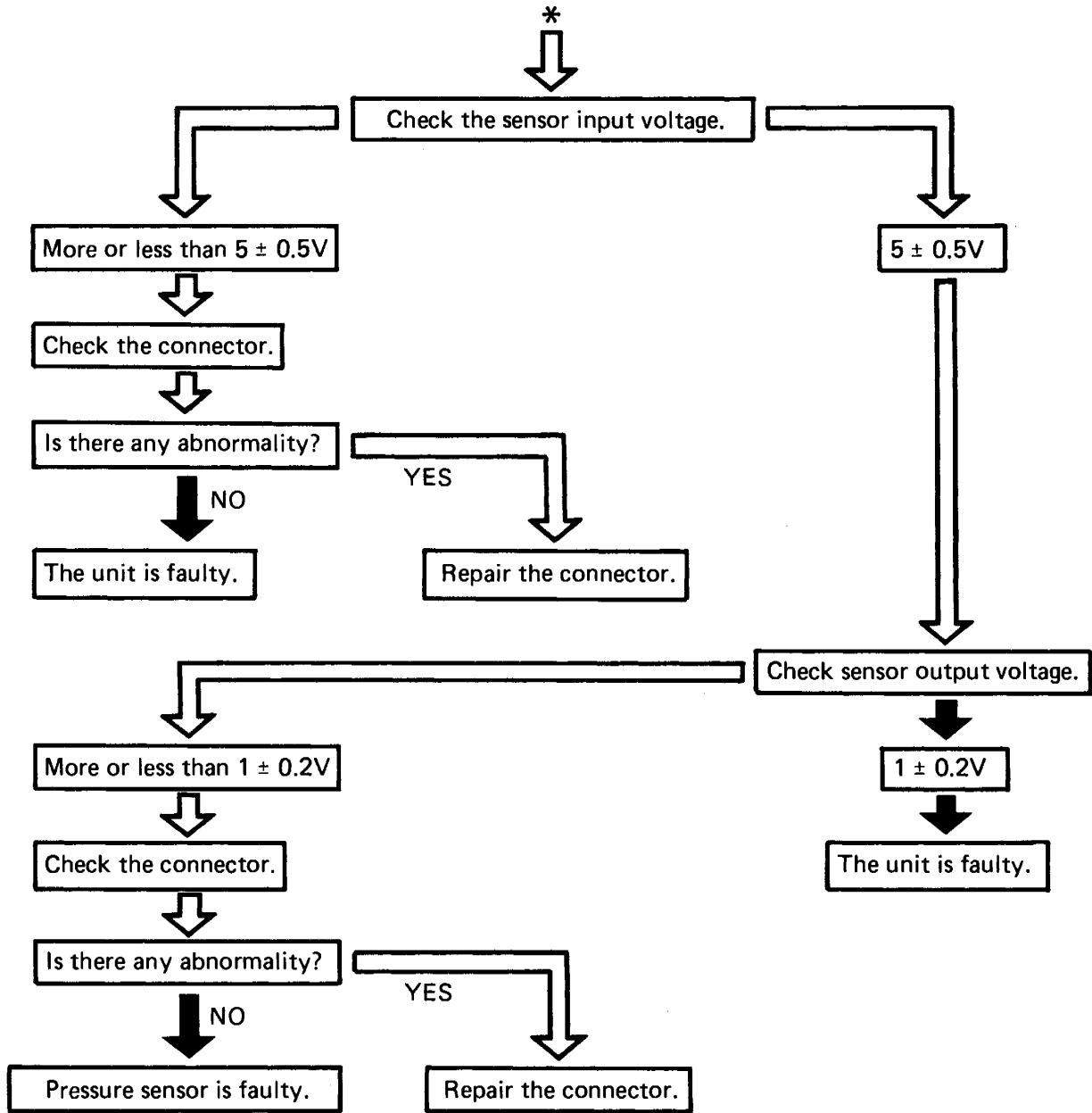
Should any error sign appear, the system will be reset after 5 seconds.

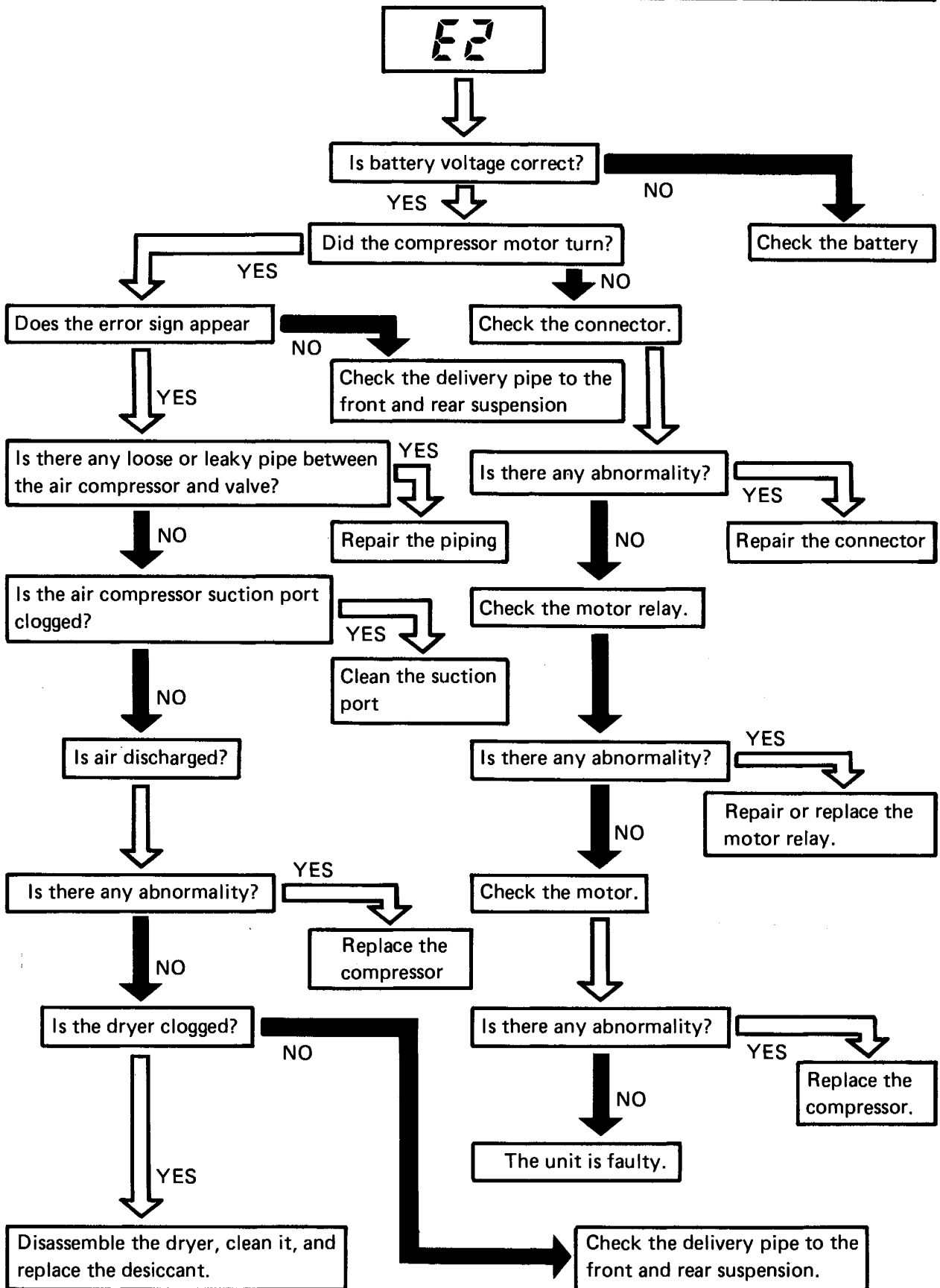
How to Locate the Cause of Trouble

The causes of the possible troubles are classified by an error sign as shown in the following troubleshooting flow chart to assist you in trouble diagnosis.

If the unit is found faulty, check for the cause of trouble by referring to the Unit Check Flow Chart.

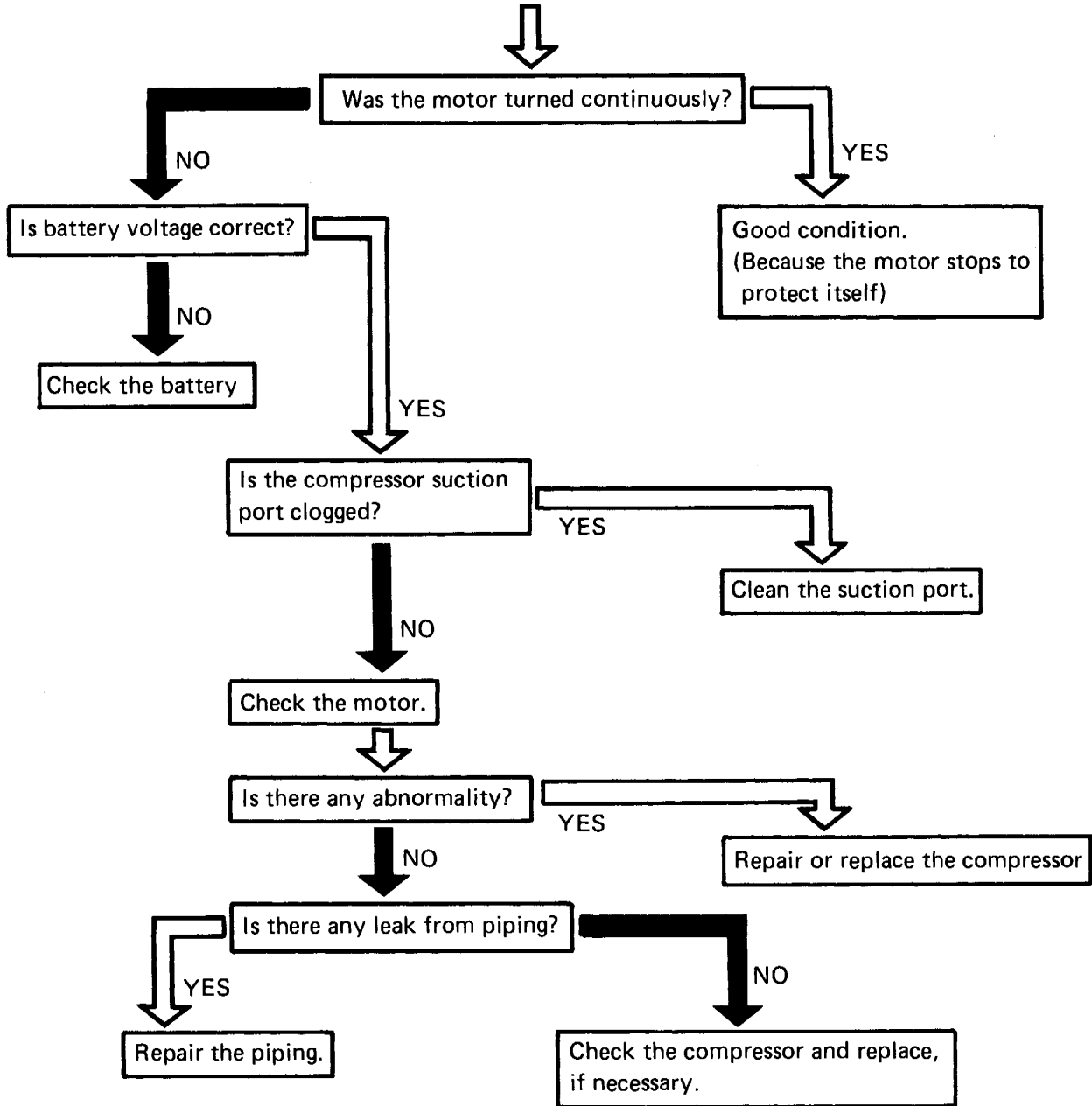


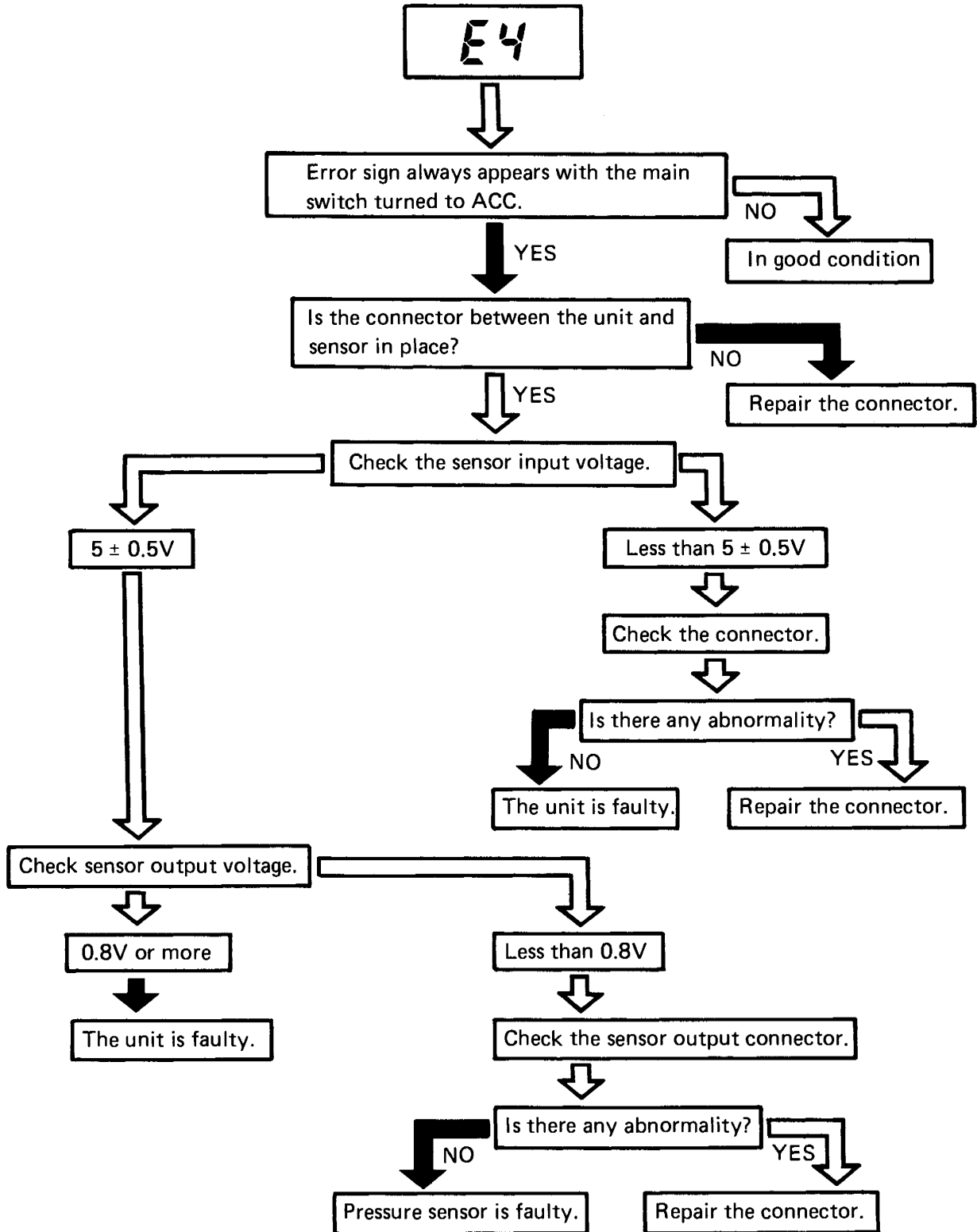




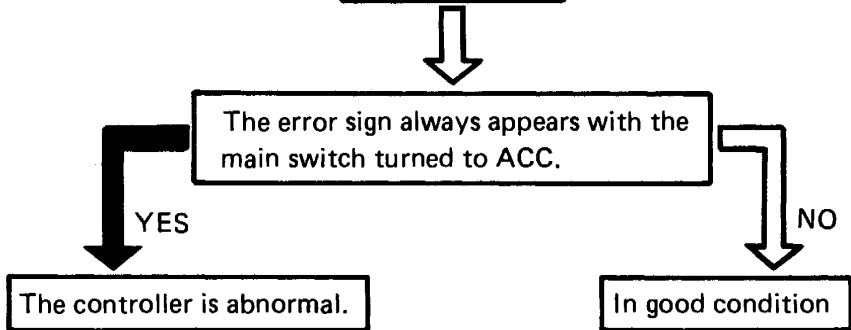


E3

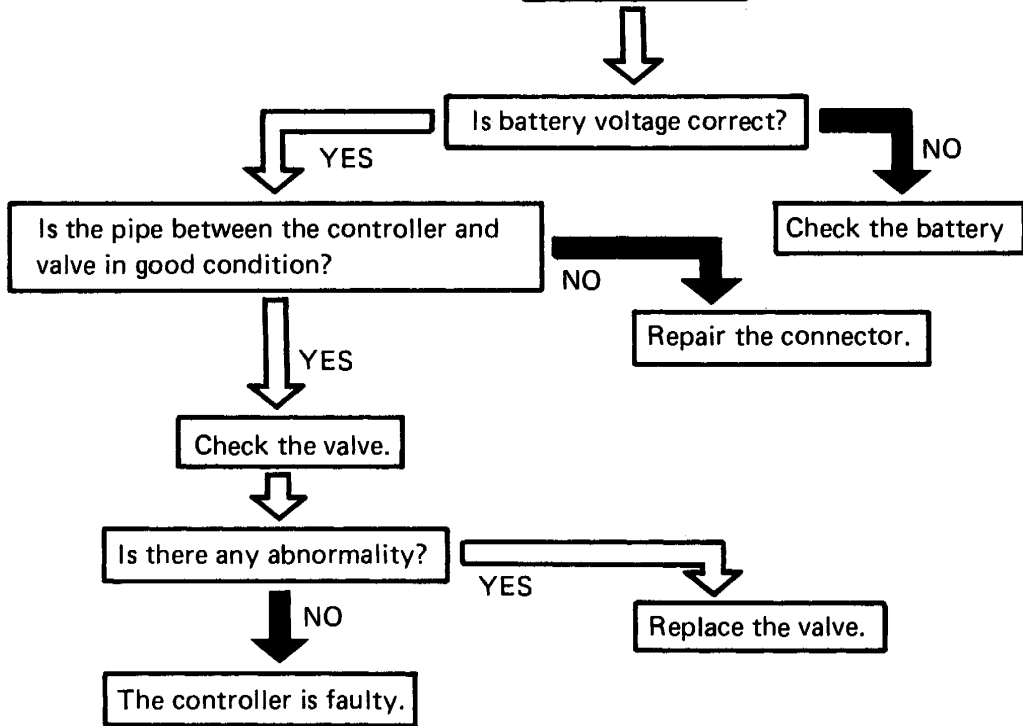




E5



E6





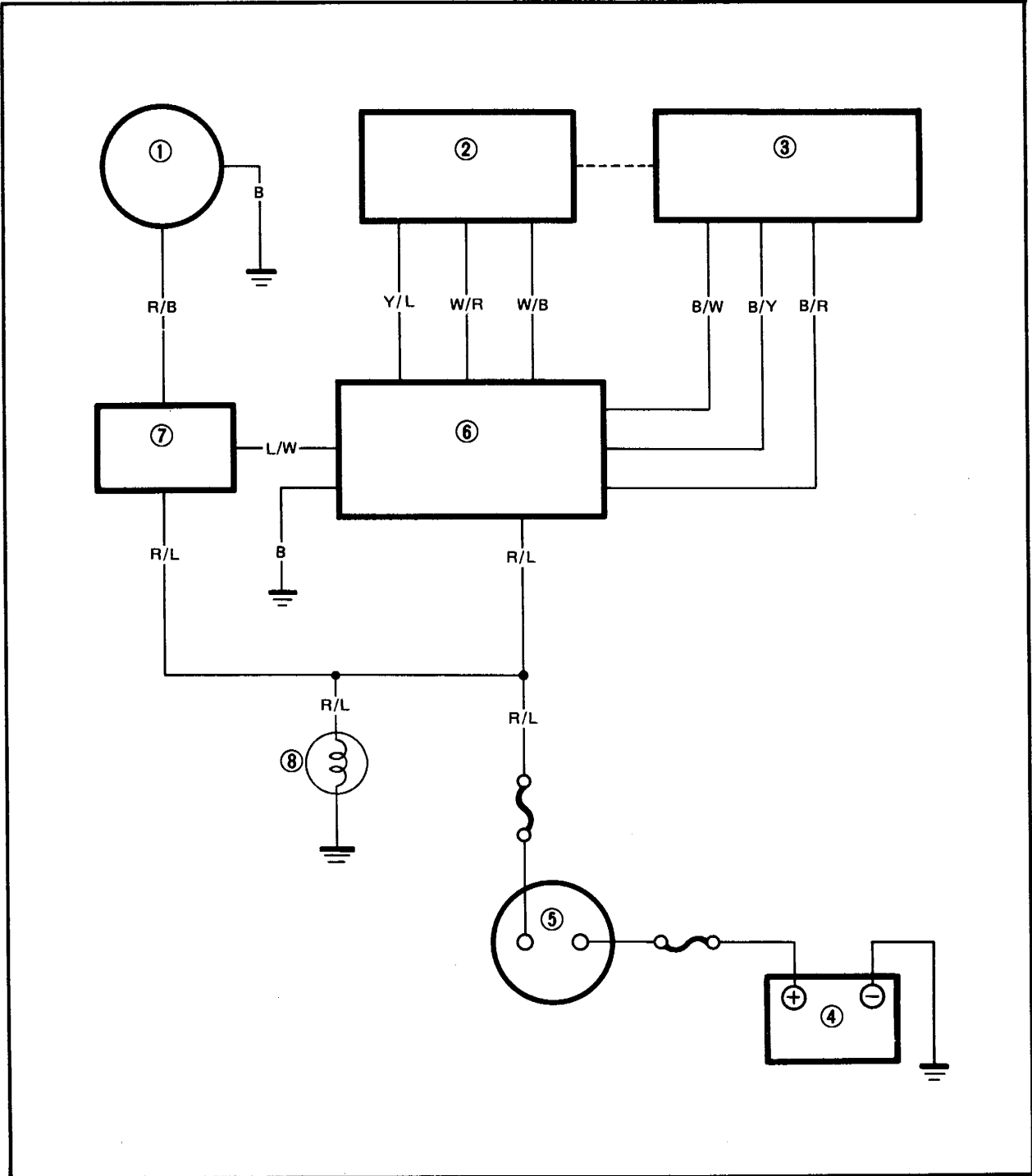
CLASS INSPECTION

Block Diagram

- ① Motor
- ② Pressure sensor
- ③ Valve assembly
- ④ Battery
- ⑤ Main switch
- ⑥ CLASS controller unit
- ⑦ CLASS relay
- ⑧ Illumination (CLASS)

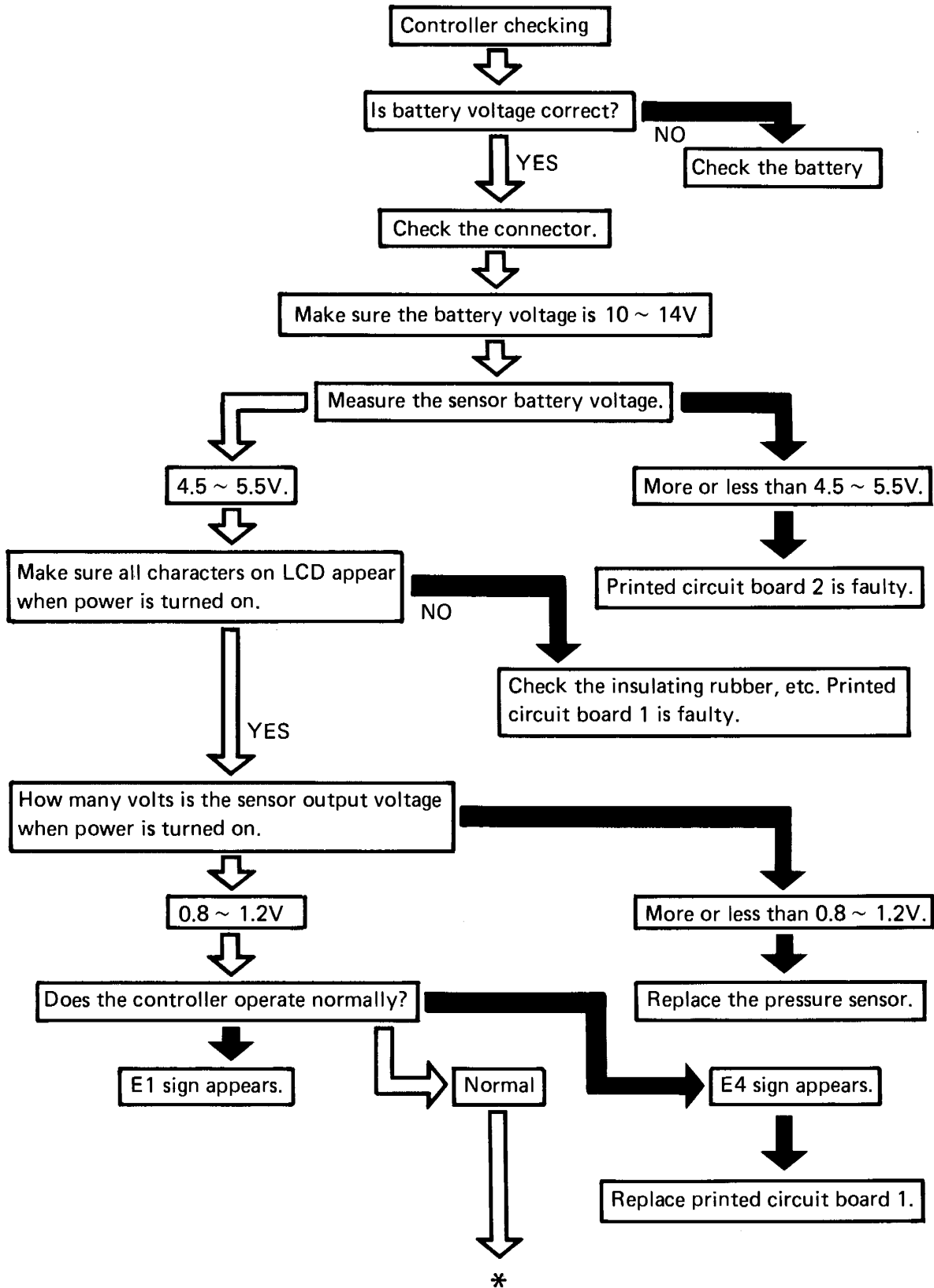
Color code

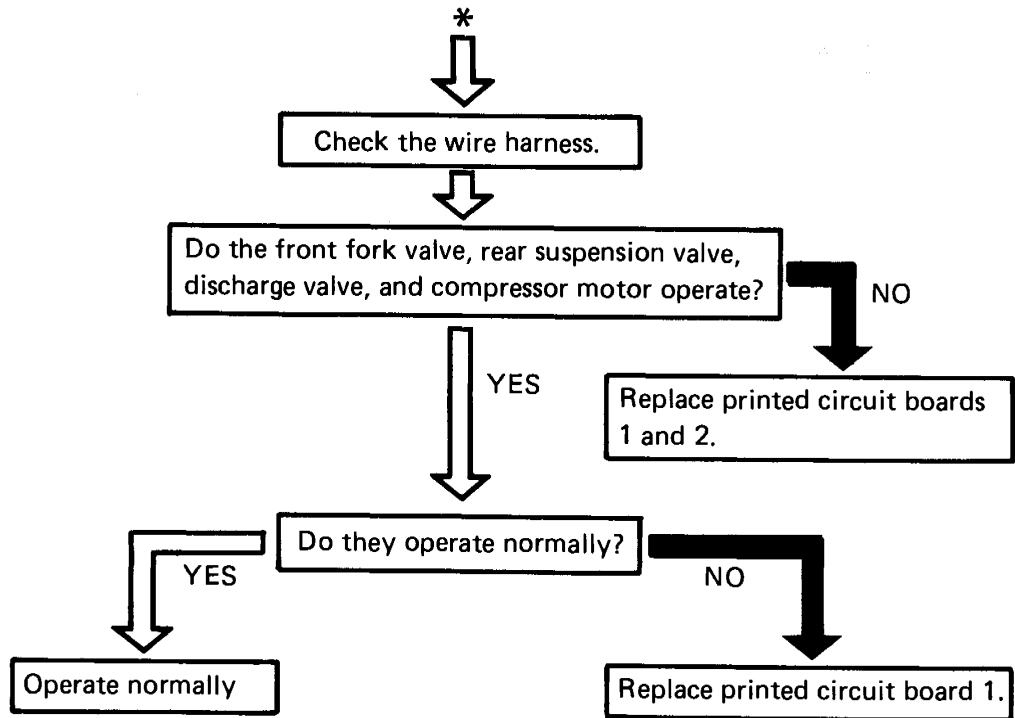
- | | | | |
|---------------|-------------|---------------|--------------|
| B | Black | B/W | Black/White |
| R/B | Red/Black | B/Y | Black/Yellow |
| Y/L | Yellow/Blue | B/R | Black/Red |
| W/R | White/Red | R/L | Red/Blue |
| W/B | White/Black | | |





CLASS Controller Unit Check Flow Chart

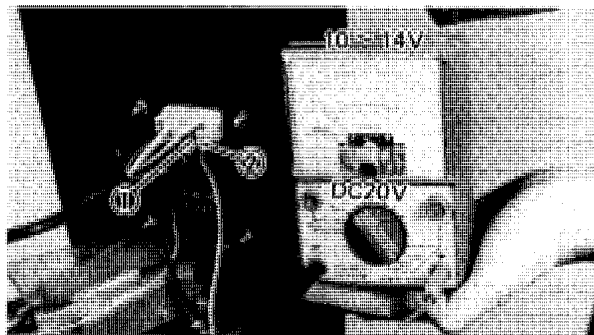




Other Irregularities

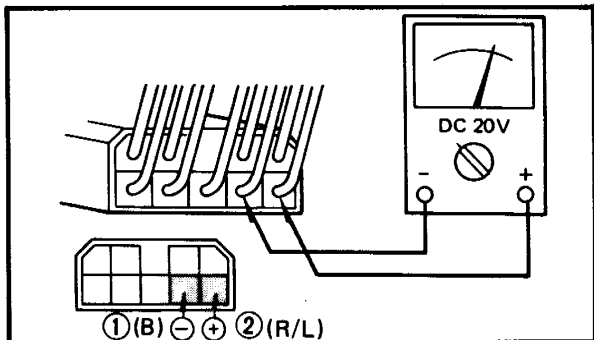
	Trouble	Possible cause
1	Unit does not operate at all. (No light comes on.)	Fuse broken
2	All characters on LCD remain lit.	Control unit is faulty. (Mainly printed circuit board 2)
3*	Pressure adjustment can be completed rapidly, but measurement shows different values each time it is rechecked.	<ul style="list-style-type: none"> • Fork oil may clog the air hose. (Return the oil into the front fork.) • Valve is faulty. (It does not operate.)


* Refer to "CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS – FRONT FORK AND REAR SHOCK ABSORBER ADJUSTMENT" section.

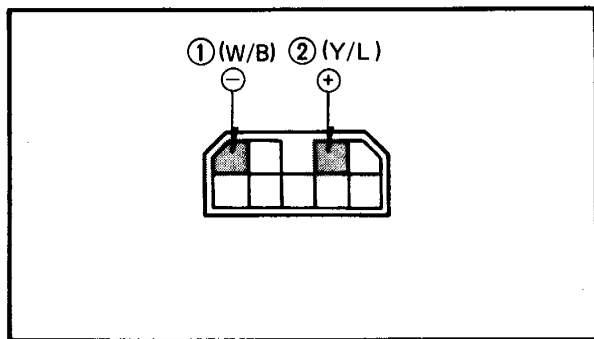


Class Controller Unit Test


1. Remove:
 - Fairing (Right)
2. Check:
 - Battery voltage
Use the Pocket Tester (YU-33263).
Turn the main switch to ACC.
Out of specification → Check fuses, main switch, and wiring circuit/Replace if necessary.

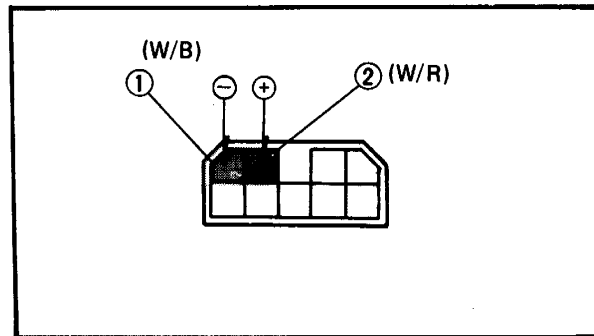


 **Black ① – Red/Blue ② :
10 ~ 14V**




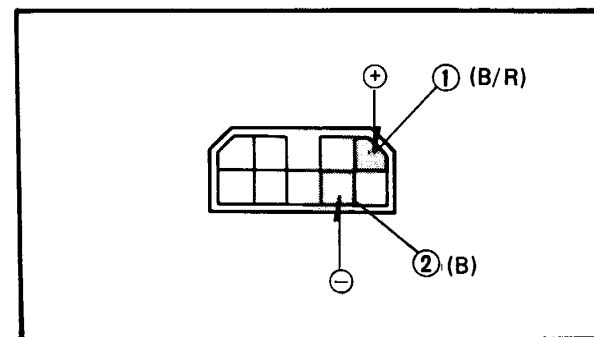
3. Measure:
 - Sensor power voltage
Use the Pocket Tester (YU-33263).
Turn the main switch to ACC.
Out of specification → Replace.

 **Yellow/Blue ② – White/Black ① :
4.5 ~ 5.5V**



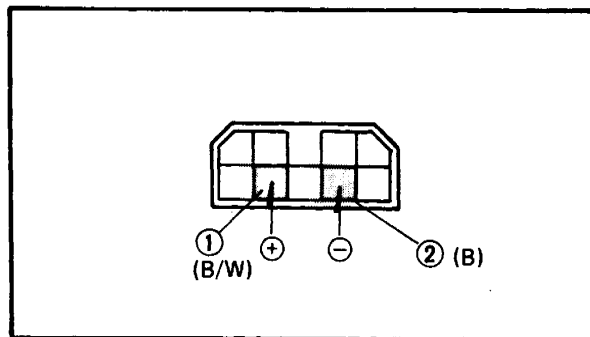
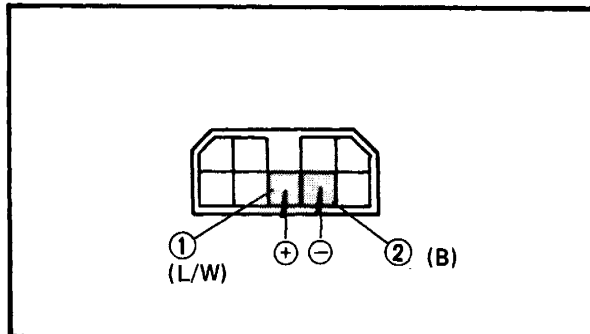
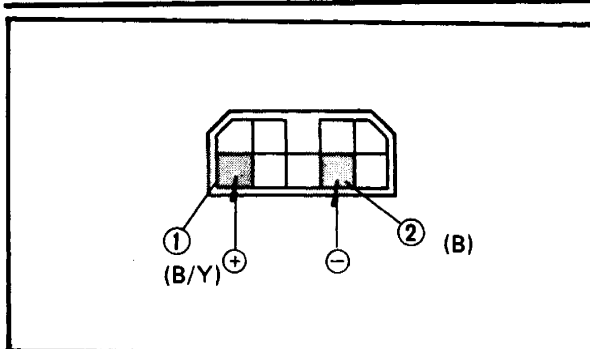
4. Measure:
 - Sensor output voltage
Use the Pocket Tester (YU-33263).
Turn the main switch to ON and wait for ten (10) seconds.
Out of specification → Replace.

 **White/Red ② – White/Black ① :
0.8 ~ 1.2V**



5. Check:
 - Controller valve operation
Use the Pocket Tester (YU-33263).
Turn the main switch to ACC.
Push the FRONT button.
No Tester readings variation (12V – 0V) when FRONT button is pushed → Replace.

- ① Black/Red
- ② Black



6. Check:

- Controller valve operation
Use the Pocket Tester (YU-33263).
Turn the main switch to ACC.
Connect Pocket Tester as shown and push REAR button.
No Tester reading variation (12V – 0V) when REAR button is pushed → Replace.

- ① Black/Yellow
- ② Black

7. Check:

- Controller valve operation
Use the Pocket Tester (YU-33263).
Turn the main switch to ACC.
No Tester reading variation (12V – 0V) when the required button is pushed → Replace.

- ① Blue/White
- ② Black

8. Check:

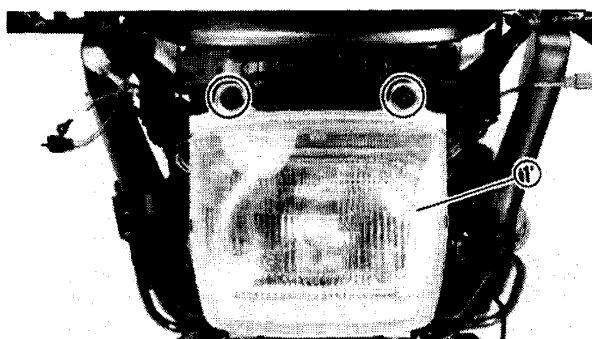
- Controller valve operation
Use the Pocket Tester (YU-33263).
Turn the main switch to ACC.
No Tester reading variation (12V – 0V) when the required button is pushed → Replace.

- ① Black/White
- ② Black

CLASS Relay Test

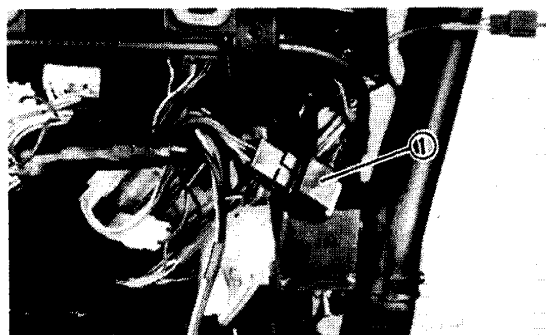
1. Remove:

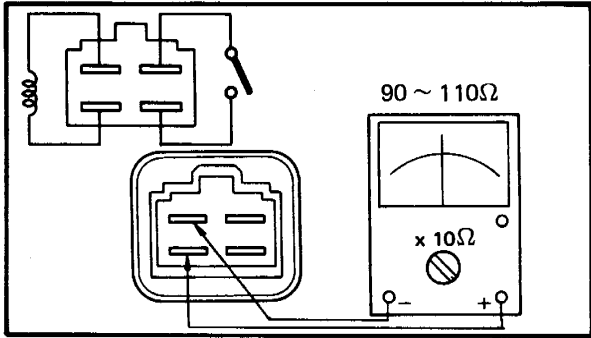
- Fairing
Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.
- Headlight unit ①



2. Remove:

- CLASS relay ①

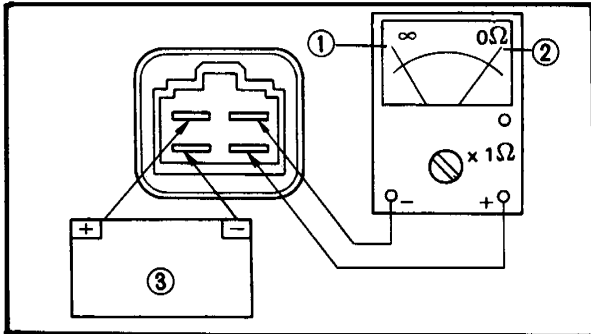




3. Measure:

- Relay coil resistance.
- Use the Pocket Tester (YU-33263).
Out of specification → Replace.

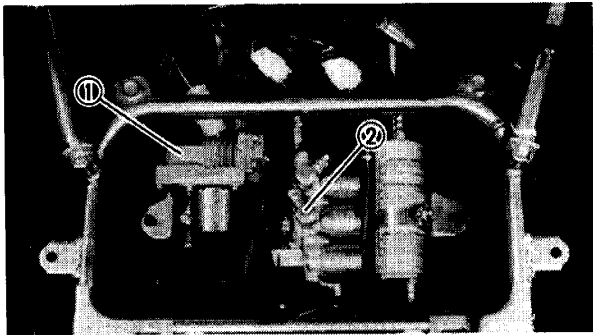
	<p>Relay Coil Resistance: 90 ~ 110Ω at 20°C (68°F)</p>
--	---



2. Check:

- Relay function
- Use the Pocket Tester (YU-33263) and 12V battery ③ .
Malfunction → Replace.

	<p>Battery Connected ② : 0Ω Battery Disconnected ① : ∞Ω</p>
--	---



Compressor Test

1. Remove:

- Seat
- Travel trunk
- Cover

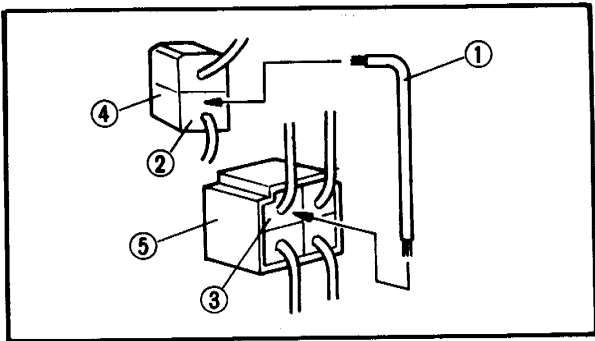
- ① Compressor
- ② Solenoid valve

2. Check:

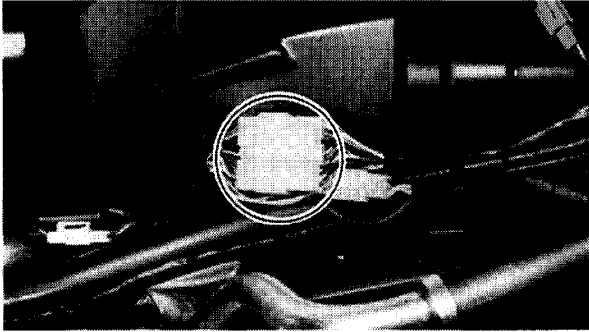
- Compressor operation
- Use jumper lead ① (15 cm/6.0 in).
Turn the main switch to ACC.
Connect jumper lead as shown.
Inoperative → Replace.

CAUTION:

A bad connection of a jumper lead may cause damage to the controller's micro-computer.

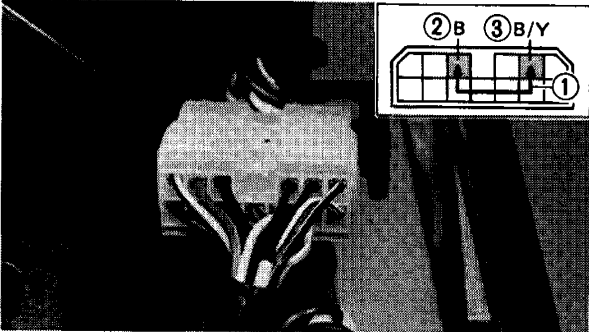


- ② Red/Black
- ③ Red/Blue
- ④ Compressor connector
- ⑤ Solenoid valve connector



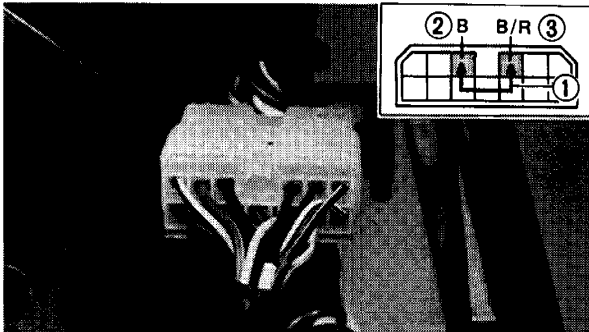
Solenoid Valve Test

1. Remove:
 - Seat
2. Locate 13-pin connector.



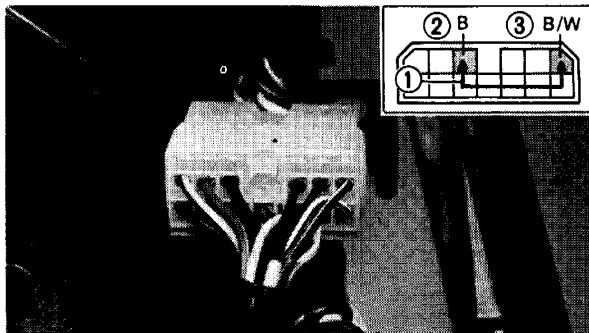
3. Check:
 - Front valve operation
Use jumper lead ① (15 cm/6.0 in).
Turn the main switch to ACC.
Connect jumper lead as shown.
No clicks → Measure valve coil resistance.

- ② Black
- ③ Black/Yellow



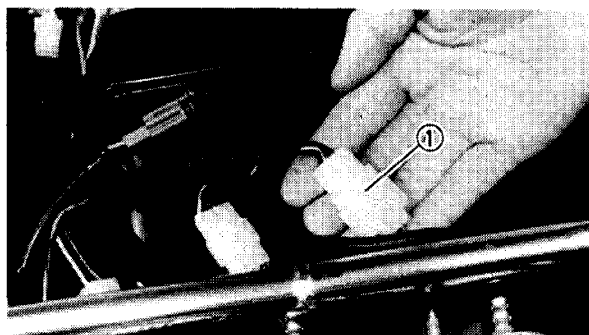
4. Check:
 - Rear valve operation
Use jumper lead ① (15 cm/6.0 in).
Turn the main switch to ACC.
Connect jumper lead as shown.
No clicks → Measure valve coil resistance.

- ② Black
- ③ Black/Red

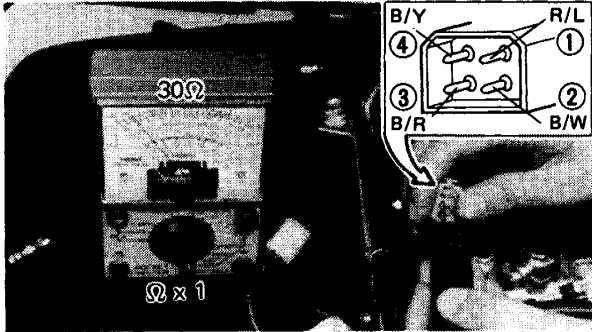


5. Check:
 - Discharge valve operation
Use jumper lead ① (15 cm/6.0 in).
Turn the main switch to ACC.
Connect jumper lead as shown.
No clicks → Measure valve coil resistance.

- ② Black
- ③ Black/White



6. Remove:
 - Travel trunk
 - Cover
7. Disconnect:
 - Connector (Solenoid valve) ①



8. Measure:

- Coil resistance

Use the Pocket Tester (YU-33263).

Out of specification → Replace.



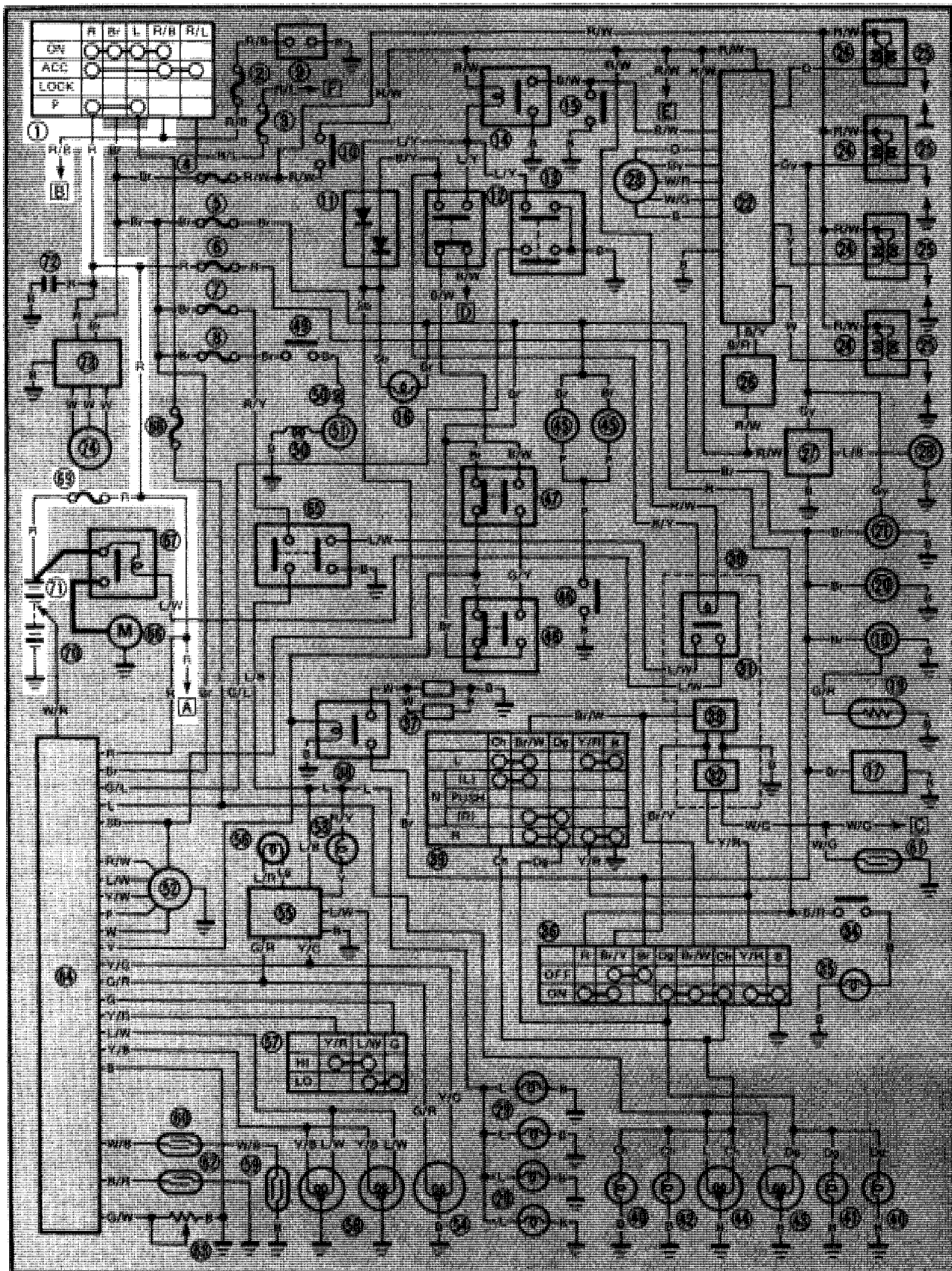
Coil Resistance:
Approx. 30Ω

Valve	Pocket Tester Leads
Front Valve	Red/Blue ① – Black/Red ③
Rear valve	Red/Blue ① – Black/Yellow ④
Discharge valve	Red/Blue ① – Black/White ②



AUDIO/C.B. RADIO SYSTEM

CIRCUIT DIAGRAM (1)



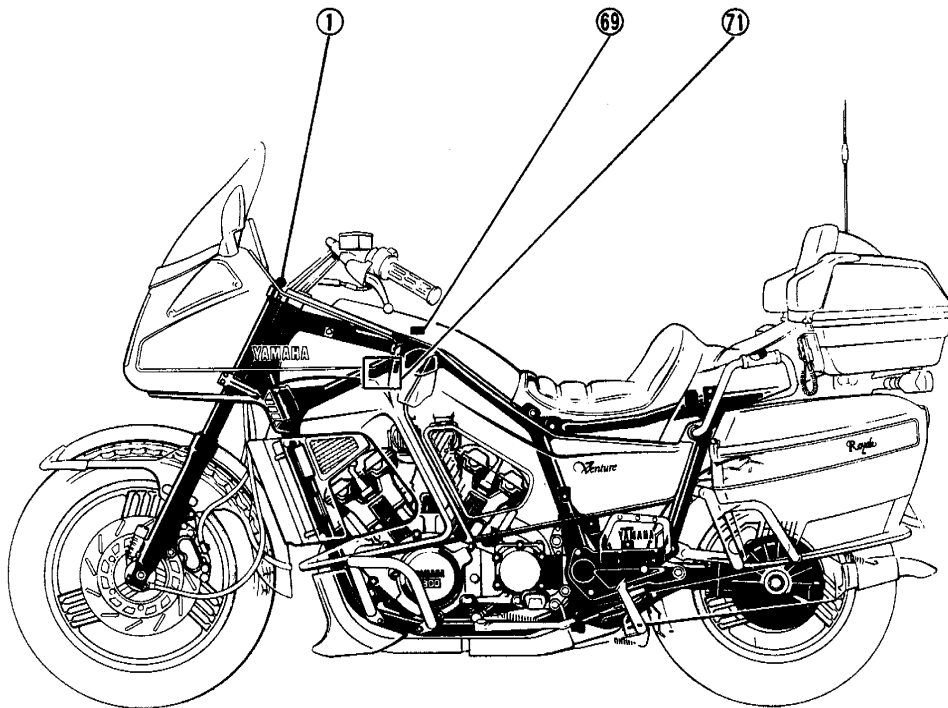


Aforementioned circuit diagram shown audio/C.B. radio circuit in wiring diagram.

NOTE:

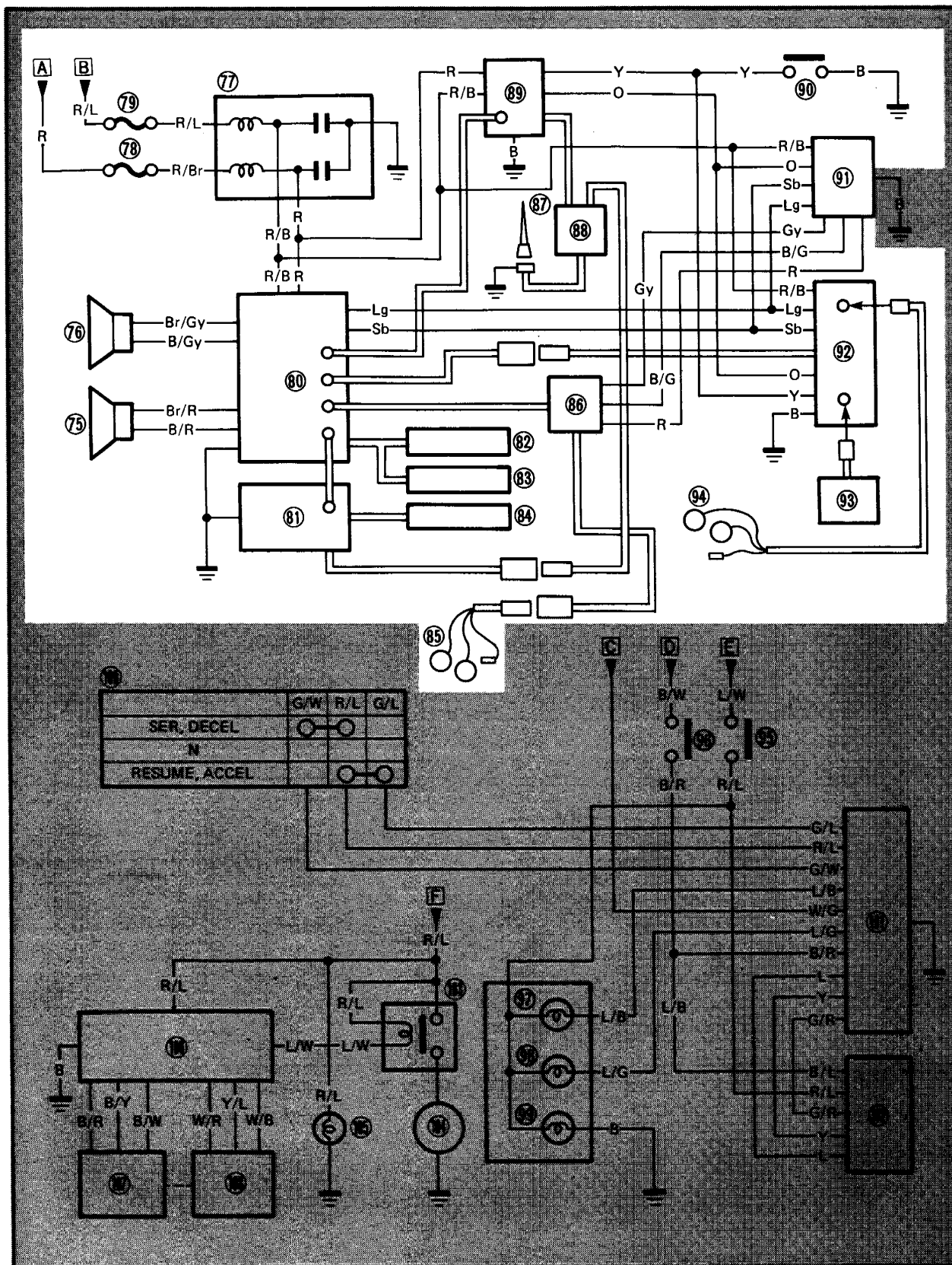
For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ⑥9 Fuse (MAIN)
- ⑦1 Battery





CIRCUIT DIAGRAM (2)

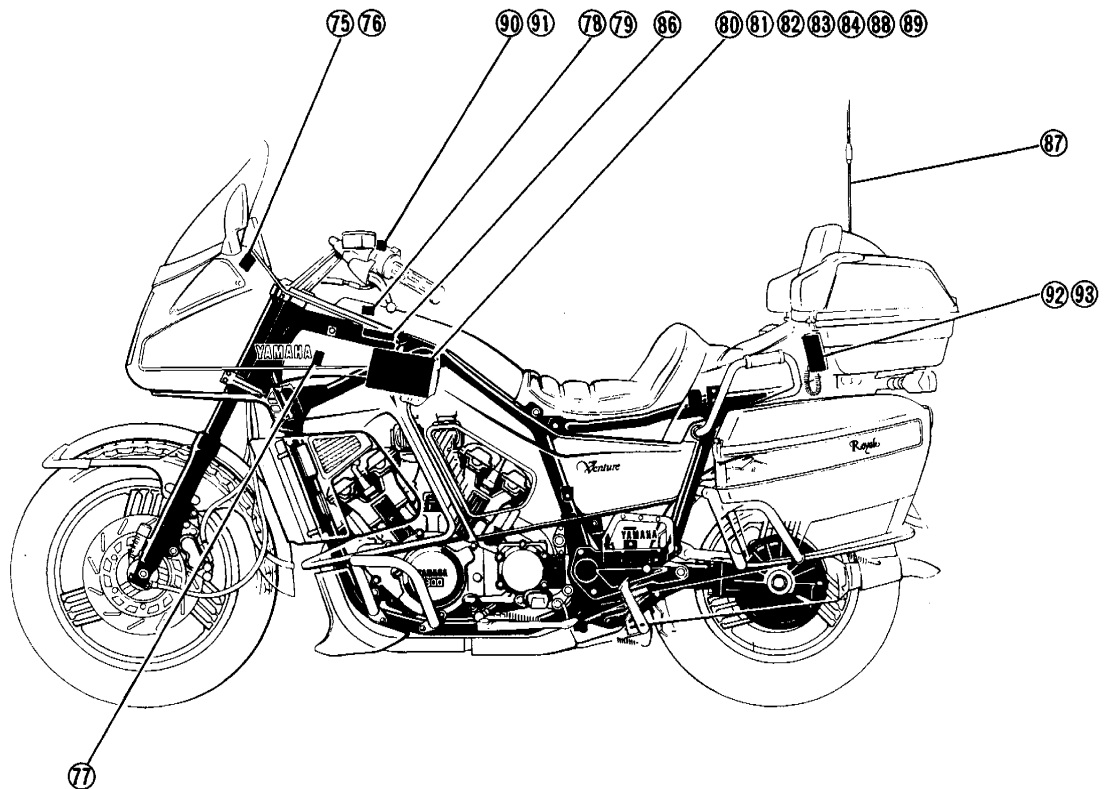


Aforementioned circuit diagram shown audio/C.B. radio circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

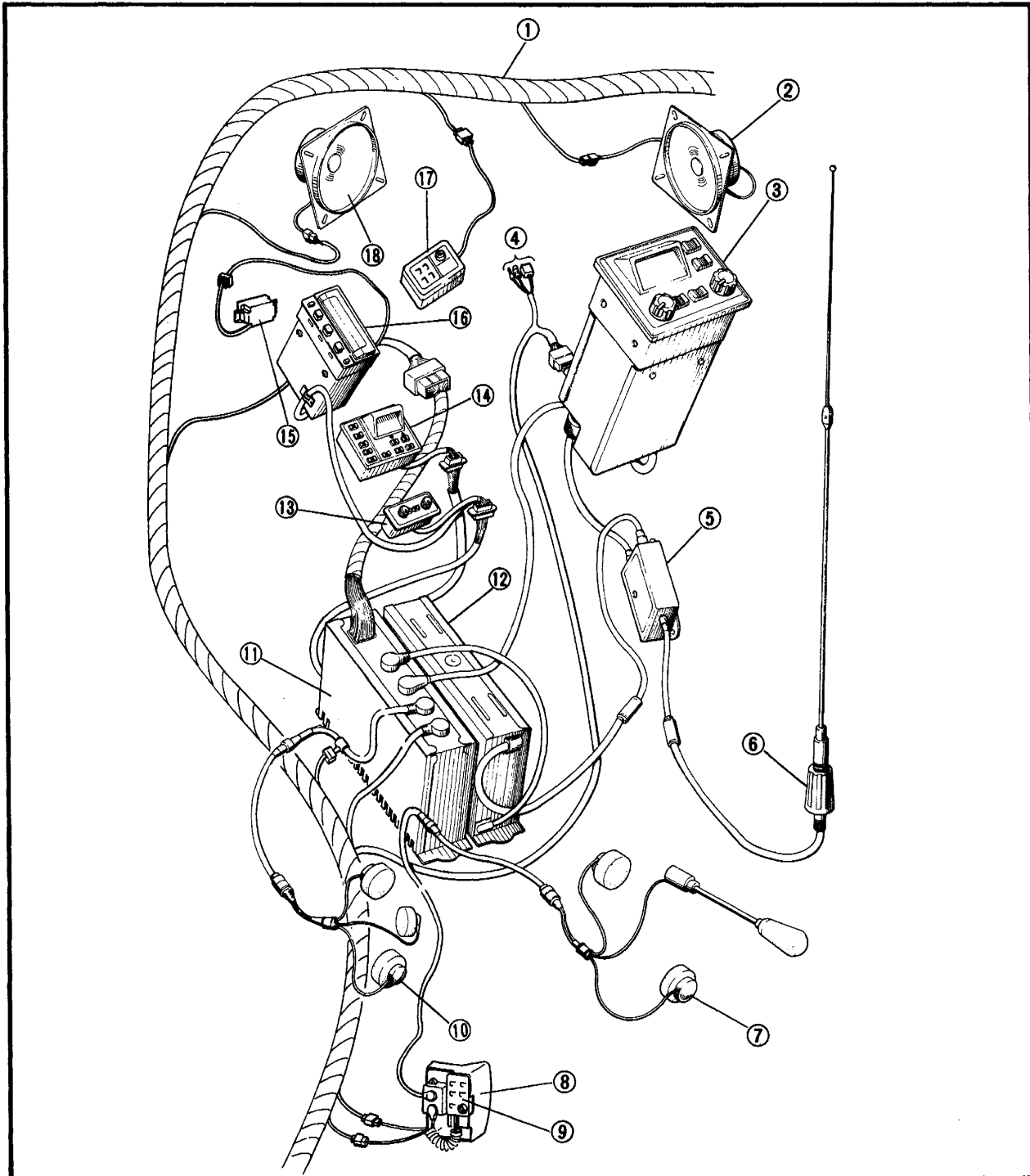
- | | |
|-------------------------------|---|
| ⑦5 Speaker (Right) | ⑧5 Head set (For rider- Option) |
| ⑦6 Speaker (Left) | ⑧6 Head set lead |
| ⑦7 Noise filter (Wireharness) | ⑧7 Antenna |
| ⑦8 Fuse (BACK UP) | ⑧8 Matching box |
| ⑦9 Fuse (AUDIO/C.B.) | ⑧9 C.B. radio |
| ⑧0 Amplifier | ⑨0 "PTT" (Push-to-talk) switch |
| ⑧1 Tuner | ⑨1 Remote controller unit (For rider) |
| ⑧2 Amplifier controller | ⑨2 Remote controller box |
| ⑧3 Cassette deck | ⑨3 Remote controller unit (For passenger) |
| ⑧4 Tuner controller | ⑨4 Head set (For passenger- Option) |





ELECTRICAL COMPONENTS

- | | | |
|-------------------------------------|---|--------------------------|
| ① Wireharness | ⑧ Remote controller box | ⑭ Tuner controller |
| ② Speaker (Right) | ⑨ Remote controller unit
(For passenger) | ⑮ Noise filter |
| ③ C.B. radio | ⑩ Head set (For rider - Option) | ⑯ Cassette deck |
| ④ To CLASS unit | ⑪ Amplifier | ⑰ Remote controller unit |
| ⑤ Matching box | ⑫ Tuner | ⑱ Speaker (Left) |
| ⑥ Antenna | ⑬ Amplifier controller | |
| ⑦ Head set (For passenger - Option) | | |





HANDLING NOTES**CAUTION:**

- Do not use the radio for long when the engine is off: battery energy might be used up.
 - Remove the control unit when you wash the motorcycle.
 - When removing the control unit, protect it, as well as the connectors, from water and mud. Do not bend or strain the connector terminals.
 - Although the control unit has a water-resistant construction, avoid pouring water on it and brushing.
 - Before removing the control unit, turn off the main switch and the "ON-VOL" and "INT.VOL" control knob.
 - If the control unit panel surface gets stained, wipe it off with soft cloth soaked with neutral detergent solution. Never use thinner, benzine, and gasoline.
-

WARNING:

- It is very dangerous to operate radio controls except remote controls during travel: do not leave your hands from the handlebars.
 - To drive safely, keep a moderate sound level.
-

C.B. RADIO NOTES

This C.B. radio represents the most advanced mobile station type radio ever designed for use in the Citizens Band Radio Service. It will operate on any of the 40 frequencies designated as Citizens band channels by the Federal Communications Commission (F.C.C.).

This model features a frequency synthesizing circuit with PHASE LOCK LOOP techniques to assure ultraprecise frequency control.

This radio has been Type Accepted and Type Certified by the F.C.C.

WARNING:

The Citizens Band Radio Service is under the jurisdiction of the Federal Communications Commission (F.C.C.).

Any adjustments or alterations which would alter the performance of the transceiver's

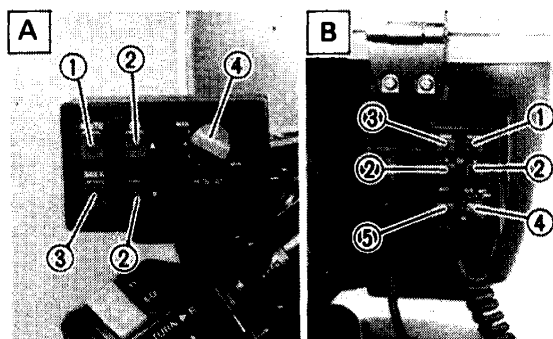


original F.C.C. Type Acceptance or which would change the frequency determining method are strictly prohibited.

Replacement or substitution of Crystals, Transistors, IC, Regulator Diodes or any other part of a unique nature, with parts other than those recommended by us, may cause violation of the technical regulations of Part 95 of the F.C.C. Rules or Violation of Type Acceptance requirements of Part 2 of the Rules.

Elimination of licensing

The Federal Communications Commission (F.C.C.) has rules that Citizens Band Radio Service Operators no longer are required to obtain an F.C.C. license to operate their C.B. equipment. In doing so, the F.C.C. also decided to permit C.B. station operation without station identification. Elimination of individual station licenses results in no lessening of the operating privileges or responsibilities of C.B. users. An operator of a C.B. radio station is still required to comply with the Communications Act and with the rules of C.B. Radio Service.



REMOTE CONTROL SWITCH FUNCTIONS

- A** OPERATOR
 - B** PASSENGER
 - ① "MUTE" switch
 - ② "CB Δ ∇ " switch
 - ③ "SEEK" switch
 - ④ "H.PH ATT" knob
 - ⑤ "PTT" switch
- For rider → Handlebar switch (Left)
 For passenger → Remote controller unit

**"SEEK" switch**

This permits tuning in to a broadcast automatically.

"MUTE" switch

The sound level immediately drops to about 20dB when this switch is turned on.

"H.PH. ATT" knob

This knob enables the sound volume to be individually adjusted in the head set of each of the rider and the passenger. Generally, set it at the position as shown (one position below Max). Turn the knob in the "MIN" direction to decrease the volume.

"CB $\Delta \nabla$ " switch

This switch selects the desired channel for transmission and reception.

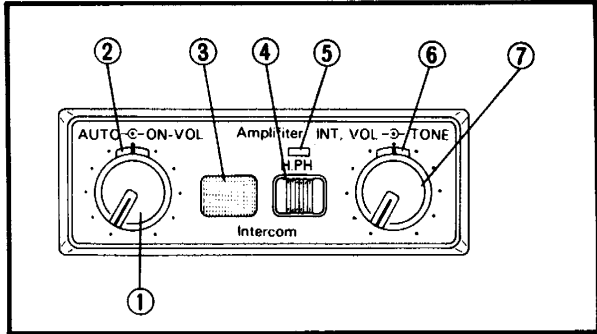
Each time the switch is pressed, the channel changes one step (∇) downward or (Δ) upward. Keeping the switch pressed changes the channels consecutively downward or upward. All channels, except channel 9, may be used for communications between stations operating under different license. Channel 9 has been reserved by the F.C.C. for emergency communications involving the immediate safety to individuals or immediate protection of property. Channel 9 may also be used to render assistance to a motorist.

This is an F.C.C. rule and applies to all operators of Citizens band radios.



“PTT (PUSH-TO-TALK)” switch

The receiver and transmitter are controlled by the “PTT” switch. Press the switch and the transmitter is activated. Release the switch to receive.



AMPLIFIER CONTROLLER FUNCTIONS

CAUTION:

Do not press the external noise sensing microphone strongly because its surface is made of a special waterproof cloth.

- ① “ON-VOL” control knob
- ② “AUTO” control knob
- ③ External noise sensing microphone
- ④ “H.PH” switch
- ⑤ Headphone indicator light
- ⑥ “TONE” control knob
- ⑦ “INT.VOL” control knob

“ON-VOL” control knob

This not only turns on and off power supplied to the tuner controller and tape deck but also varies sound level. Turn it counterclockwise to reduce sound level. Rotate it all the way counterclockwise to turn power off. Turn it clockwise to raise sound level.

“AUTO” control knob

During travel, external noises will disturb you from listening to radio, tape (or voice). Our motorcycle audio system incorporates an automatic volume control which operates according to the level of external noise. Turn the “AUTO” control knob clockwise and the rate of volume compensation will rise. Turn it counterclockwise to reduce the level compensation rate.

NOTE:

You may set the “ON-VOL” and “AUTO” control knobs so appropriately that the sound level remains unchanged during travel and while stopped in traffic.

**External noise sensing microphone**

This detects external noises for the automatic volume control.

CAUTION:

Do not permit things like dust to clog the microphone covering nor give damage to it.

"H.PH" switch

Depress this switch to switch output from speakers to headphones or from headphones to speakers alternately.

Headphones indicator light

This lights when the "H.PH" switch selects headphones output.

"TONE" control knob

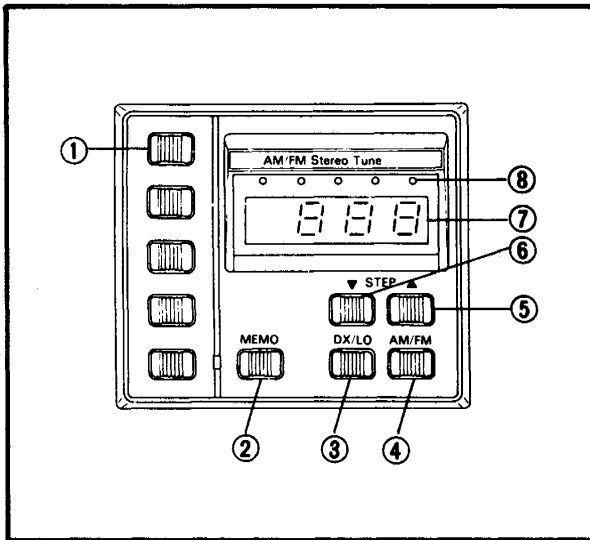
This controls tone of radio and tape sounds. Turn it counterclockwise to enhance bass and clockwise to enhance treble.

"INT.VOL" control knob

This is the volume control-combined power switch of the Intercom. Turn it counterclockwise to reduce sound level. Rotate it fully counterclockwise to turn power off. Turn it clockwise to raise sound level.

NOTE:

If you raise sound level too much with the Intercom, the noise sensing microphone is likely to pick up noises, making it harder for you to listen to radio or tape sounds.



TUNER CONTROLLER FUNCTIONS

CAUTION:

This motorcycle requires use of anti-noise type spark plugs (a resistor is incorporated in this type of spark plug). When replacing spark plugs, be sure to use the designated type.

- ① Preset switch
- ② "MEMO" (Memory) switch
- ③ "DX/LO" switch
- ④ "AM/FM" switch
- ⑤ Step up switch ▲
- ⑥ Step down switch ▼
- ⑦ Frequency display
- ⑧ Indicator lights

Preset switches

Each of the five preset switches provided permits to instantly tune in to a specific broadcast station preselected with the switch. Up to five AM/FM stations may be preselected.

"MEMO" (Memory) switch

Use this switch to preselect broadcast stations.

"DX/LO" switch

DX and LO alternate on every depression of this switch.

This provides the following effects when the handlebar-mounted "TUNE" switch is on.

DX:

Automatic "TUNE" works for radio waves of strong and weak field intensities inclusively.

LO:

Automatic "TUNE" works for radio waves of strong field intensities only.

**"AM/FM" switch**

AM and FM alternate on every depression of this switch.

Step up▲/down▼ switches

On every depression of either of the switches, AM or FM turned frequency scans up or down wave band. Keep one depressed to let tuned frequency scan up or down rapidly.

Frequency display

This displays the tuned frequency.

Indicator lights

MEMO – remains lit for 5 seconds on depression of the memory switch.

AM – lights when "AM" is selected with the "AM/FM" switch.

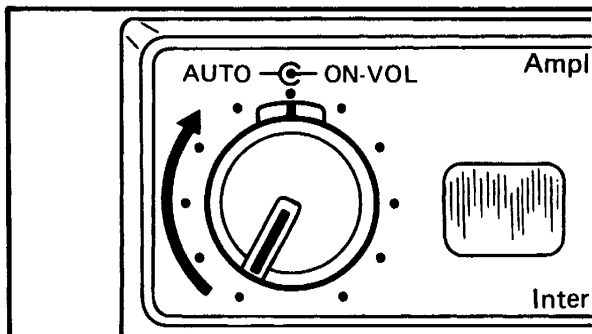
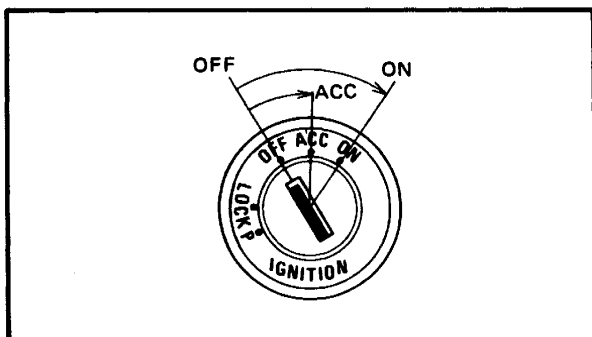
FM – lights when "FM" is selected with the "AM/FM" switch.

ST – lights when "FM" is selected with the "AM/FM" switch and a stereo "FM" broadcast is tuned into.

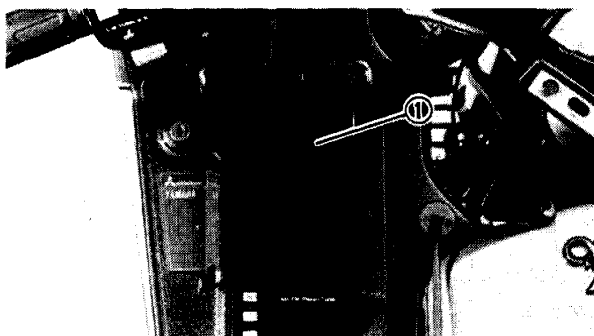
LO – lights when "LO" is selected with the "DX/LO" switch.

HOW TO LISTEN TO RADIO**Radio listening steps:**

- Turn off both the "ON-VOL" and "INT.VOL" control knobs of the amplifier controller.
- Turn off the "ON-VOL" control knob of the C.B. radio.



- Turn off the "MUTE" switch of operator and passenger remote control switch.
- Remove the cassette tape from the deck, if loaded.
- Set the main switch at "ACC" or "ON".
- Select speakers or headphones output with the "H.PH" switch of the amplifier controller.
- Turn on power with the "ON-VOL" control knob and adjust sound level appropriately.
- Select "AM" or "FM" with the "AM/FM" switch.
- Tune in to a broadcast by using the handlebar-mounted "TUNE" switch or the Step Up/Down switches.
- Put the frequency of a desired station in memory.
 - 1) Let the frequency display read the frequency of the desired station.
 - 2) Depress the "MEMO" (Memory) switch. The "MEMO" indicator remains lit for 5 seconds.
 - 3) Depress a preset switch while the "MEMO" light is lit. Then the station's frequency is assigned to the preset switch and memorized.
- Tuning in to a memorized station
Depress a preset switch, and the station assigned to the preset switch is tuned in to with its frequency read on the frequency display.



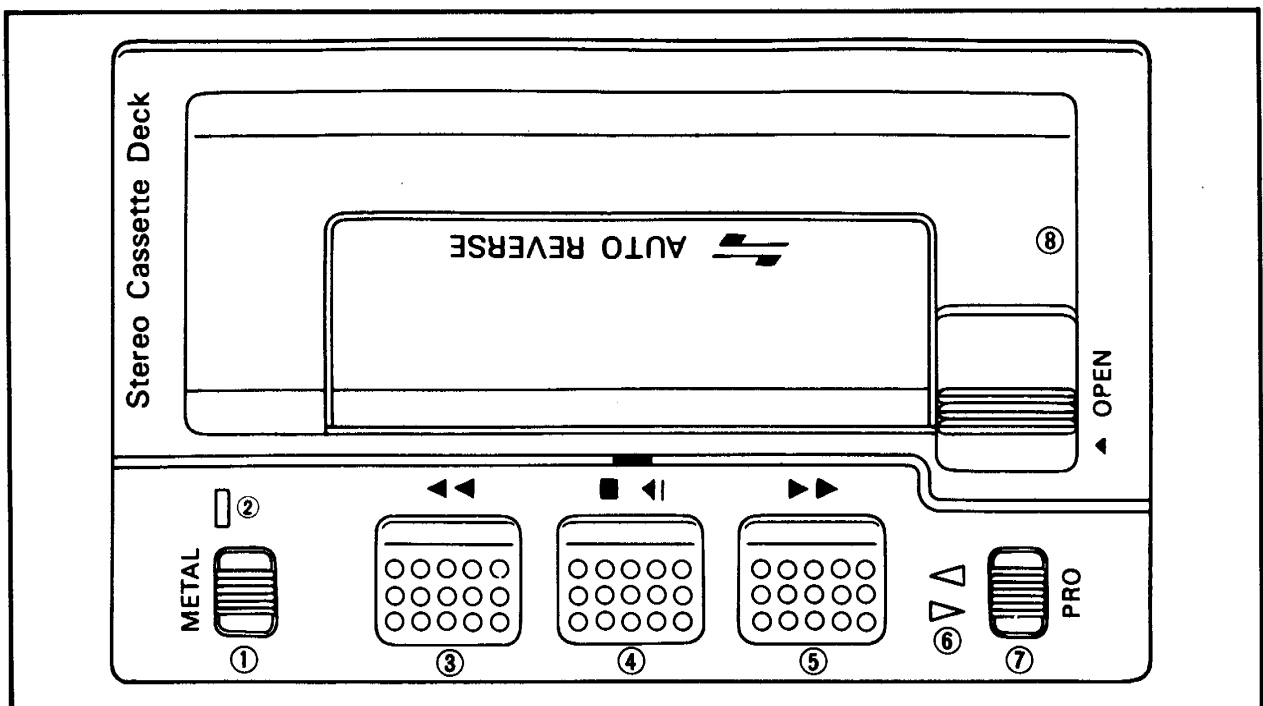
CASSETTE DECK FUNCTIONS

CAUTION

- Cover the unit with a waterproof awning ① in rainy days.
- Keep the cassette compartment lid closed during use.
- Store the cassette half in the cassette case. It permits to keep the tape without sag.

- If the tape is loose, it could be snagged by the tape transport mechanism. Be sure to remove sag before use.
- Do not lead the cassette half in direct sunlight for long.
- If the inside of the cassette tape deck has got wet, dry it up in the shade with the cassette compartment lid kept open.
- To clean the magnetic head, wipe it with something like the medical applicator soaked with alcohol. (Never use thinner, benzine, and gasoline.)

- ① "METAL" switch
- ② "METAL" indicator light
- ③ ◀◀ (Fast-forward) switch
- ④ ■◀| (Eject/stop) switch
- ⑤ ▶▶ (Fast-reverse) switch
- ⑥ Program indicator light
- ⑦ "PRO" (Program) switch
- ⑧ Cassette compartment lid



**"METAL" switch**

"METAL" and "NORMAL" modes alternate on every depression of this switch.

NOTE: _____

Select "NORMAL" mode for normal tape and "METAL" mode for metal tape.

"METAL" indicator light

This lights during "METAL" mode.

" ◀◀, ▶▶" (Fast-forward/reverse) switch

Depress the " ◀◀ " (Fast-forward) switch to fast-forward and the " ▶▶ " (Fast-reverse) switch to fast-reverse the tape.

" ■ ◀ | " (Eject/stop) switch

Depress this switch strongly to eject the cassette tape. Depress it lightly to stop fast-forwarding or reversing.

Program indicator light

These indicate tape running direction.

"PRO" (Program) switch

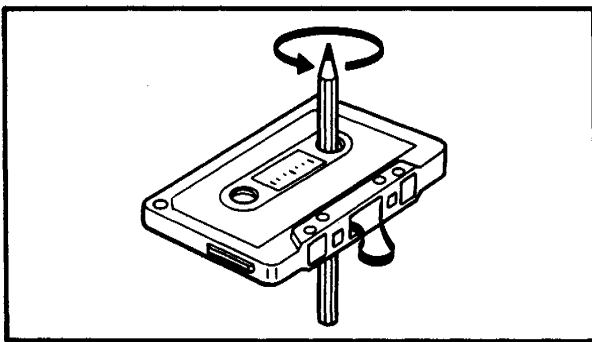
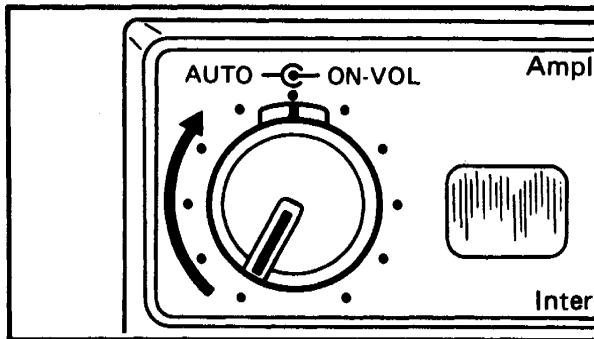
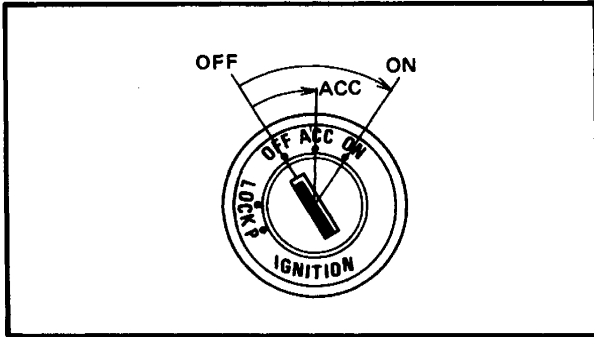
Tape running direction reverses on every depression of this switch.

Cassette compartment lid

This is made to waterproof construction. Keep it closed except when installing or removing a tape.



HOW TO LISTEN TO TAPE



Tape listening steps:

- Turn off both the "ON-VOL" and "INT. VOL" control knobs of the amplifier controller.
- Turn off the "ON-VOL" control knob of the C.B. radio.
- Turn off the "MUTE" switch of operator and passenger remote control switch.
- Remove the cassette tape from the deck, if loaded.
- Set the main switch at "ACC" or "ON".
- Select speakers or headphones output with the "H.PH" switch of the amplifier controller.
- Turn on power with the "ON-VOL" control knob and adjust sound level appropriately.
- Open the cassette compartment lid and insert a tape. (Close the lid after loading the tape.)
Then the system automatically switches from radio to tape.

NOTE:

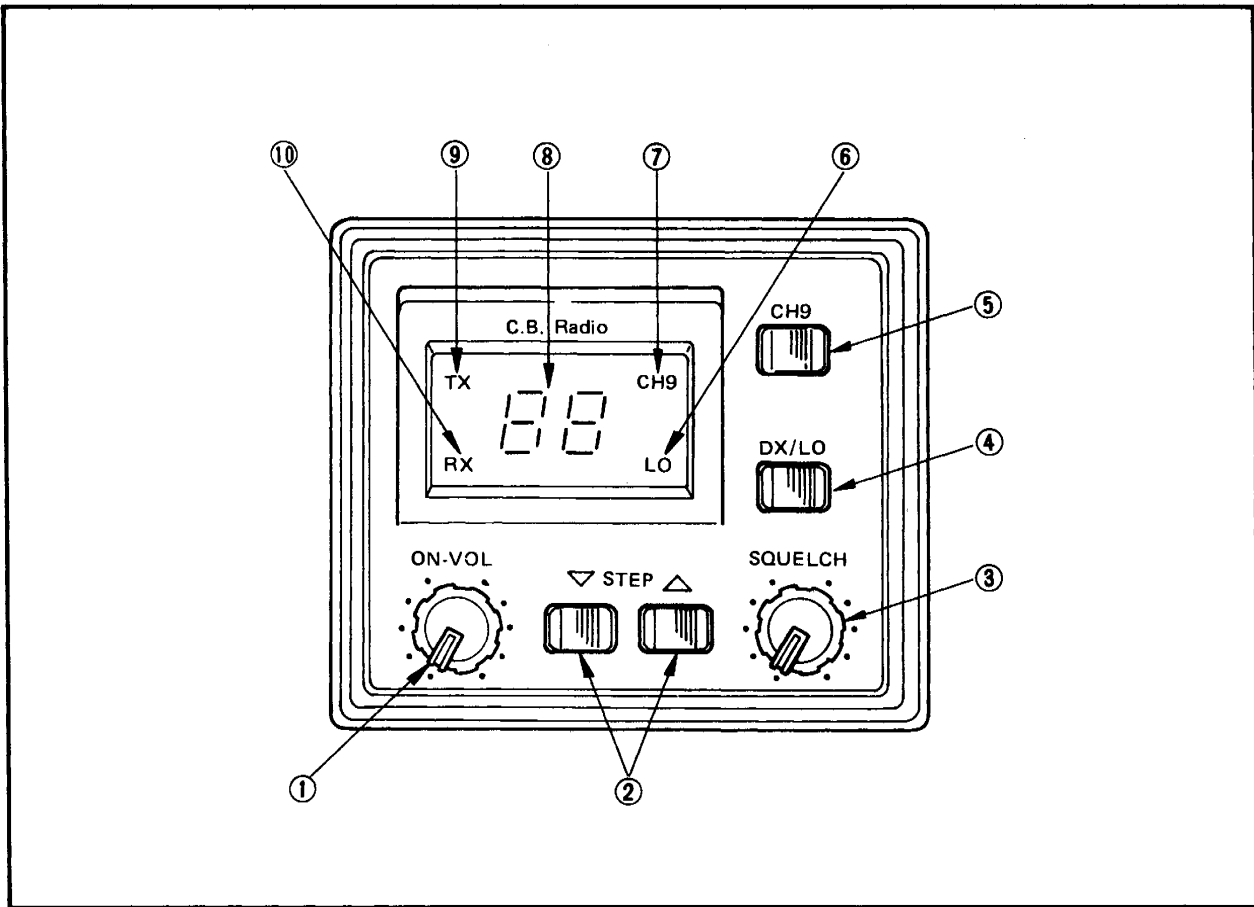
If the tape is loose, wind it properly by a pencil or the like as illustrated to remove the sag.

- Select "METAL" mode if metal tape is loaded.
- Reverse or fast-forward the tape as necessary.



C.B. RADIO FUNCTIONS

- ① "ON-VOL" control knob
- ② "▼ STEP ▲" switch
- ③ "SQUELCH" control knob
- ④ "DX/LO" switch
- ⑤ "CH9" switch
- ⑥ "LO" indicator
- ⑦ "CH9" indicator
- ⑧ Channel indicator
- ⑨ "TX" indicator
- ⑩ "RX" indicator



"ON-VOL" control knob

Turn clockwise to apply power to the radio and to set the audio volume to the desired listening level.

Turn fully counterclockwise to turn off the radio.

**" ▼ STEP ▲ " switch**

These buttons select the desired channel for transmission and reception.

Each time this switch is pressed, the channels changes one step (▼) downward or (▲) upward. Keeping the switch pressed changes the channels consecutively downward or upward. All channels, except channel 9, may be used for communications between stations operating under different license. Channel 9 has been reserved by the F.C.C. for emergency communications involving the immediate safety of individuals or immediate protection of property. Channel 9 also may be used to render assistance to a motorist.

"SQUELCH" control knob

This squelch control is rotated to cut off or eliminate received background noise in the absence of an incoming signal. For maximum receive sensitivity, it is desired that the control be rotated only to this point where the receive background noise or ambient background noise is eliminated. Turn the control fully counter-clockwise, then slowly rotate clockwise until the receive noise disappears. In order to be heard, any signal must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at the maximum clockwise setting.

"DX/LO" switch

For normal reception, set the switch to "DX". For a short-range communication or when signal is so strong as to produce a jarring note, set the switch to "LO".

**"CH9" switch**

Depress this switch for instant access to emergency channel 9. Depress again to return to the original channel.

"LO" indicator

This indicator is displayed when the "DX/LO" selector switch is depressed.

"CH9" indicator

This indicator is displayed when the "CH9" switch is depressed.

Channel indicator

Liquid Crystal Display (LCD) indicates the channel number in use.

"TX" indicator

This indicator is displayed when the transmitter is in operation.

"RX" indicator

This indicator is displayed when an incoming signal is received.



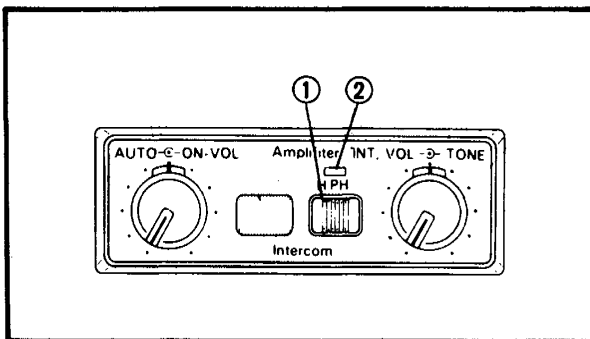
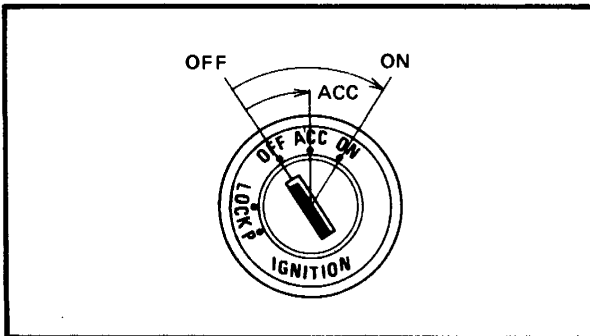
HOW TO OPERATE THE C.B. RADIO

CAUTION:

- Do not use the C.B. radio for long time when the engine is off: battery energy might be used up.

WARNING:

- It is very dangerous to operate C.B. radio controls except remote controls while riding: do not remove your hands from the handle-bars.
- To ride safely, keep a moderate audio level.

**C.B. radio operating steps:**

- Connect the head set (option parts) correctly.
 - Turn off both the "ON-VOL" and "INT. VOL" control knobs of the amplifier controller.
 - Turn off the "ON-VOL" control knob of the C.B. radio.
 - Turn off the "MUTE" switch of operator and passenger remote control switch.
 - Turn the main switch to "ACC" or "ON".
 - Select speakers or headphones output with the "H. PH" switch ① of the amplifier controller.
- ② Headphone indicator light

To Receive:

- 1) Turn the "ON-VOL" control knob clockwise.
- 2) Set the desired channel.
- 3) Set the "ON-VOL" control knob to a comfortable listening audio level.
- 4) Listen to the background noise from the speakers or headphones. Turn the squelch control slowly clockwise until the noise just disappears (no signal should be present). Leave the control at this setting.

The squelch is now properly adjusted. The receiver will remain quiet until a signal is actually received. Do not advance the control too far, or some of the weaker signals will not be heard.

**To Transmit:**

- 1) Be sure the operator has read and understands part 95, F.C.C. Rules and Regulations prior to operating the transmitter.
- 2) Select the desired channel.
- 3) If the channel is clear, press the "P.T.T." switch on the C.B. radio remote controller and speak in a normal voice.

Simultaneous use of audio system (radio or tape) and C.B. radio

Adjustment of the "Squelch" control knob automatically enables you to listen to the audio system (radio or tape) when no electric waves are received on the C.B. radio or when no electric waves are transmitted.

NOTE:

None of the following cases mean the failure of the audio system (radio or tape) even if no sound is produced on the system.

- When a remote control switch for either operator or passenger is turned on for "MUTE".
- When the "SQUELCH" control switch is turned to the farthest left with the "ON-VOL" switch is on for the C.B. radio.
- When the C.B. radio is receiving non-modulated signals (when the other party is not speaking).
- When signals are transmitted or received on the C.B. radio.

**CHANNEL INFORMATION**

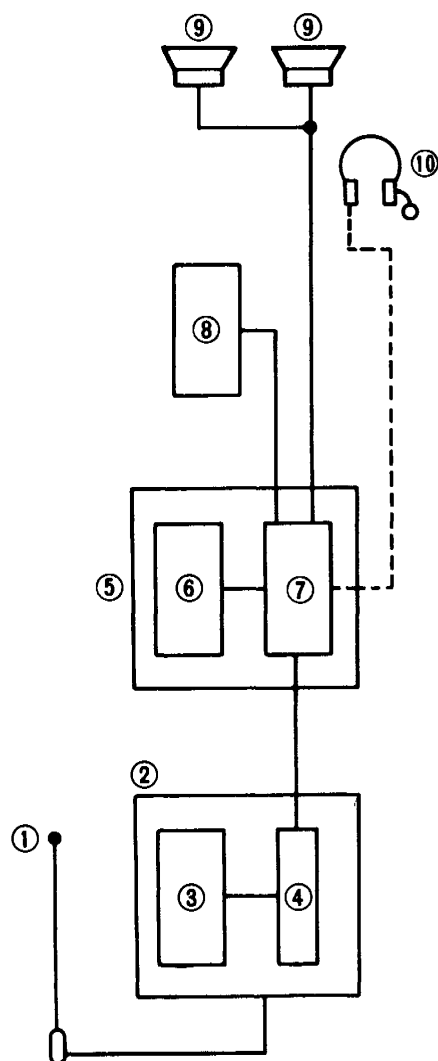
Channel	Channel Frequency in MHz	Channel	Channel Frequency in MHz
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.235
4	27.005	24	27.245
5	27.015	25	27.255
6	27.025	26	27.266
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

NOTE:

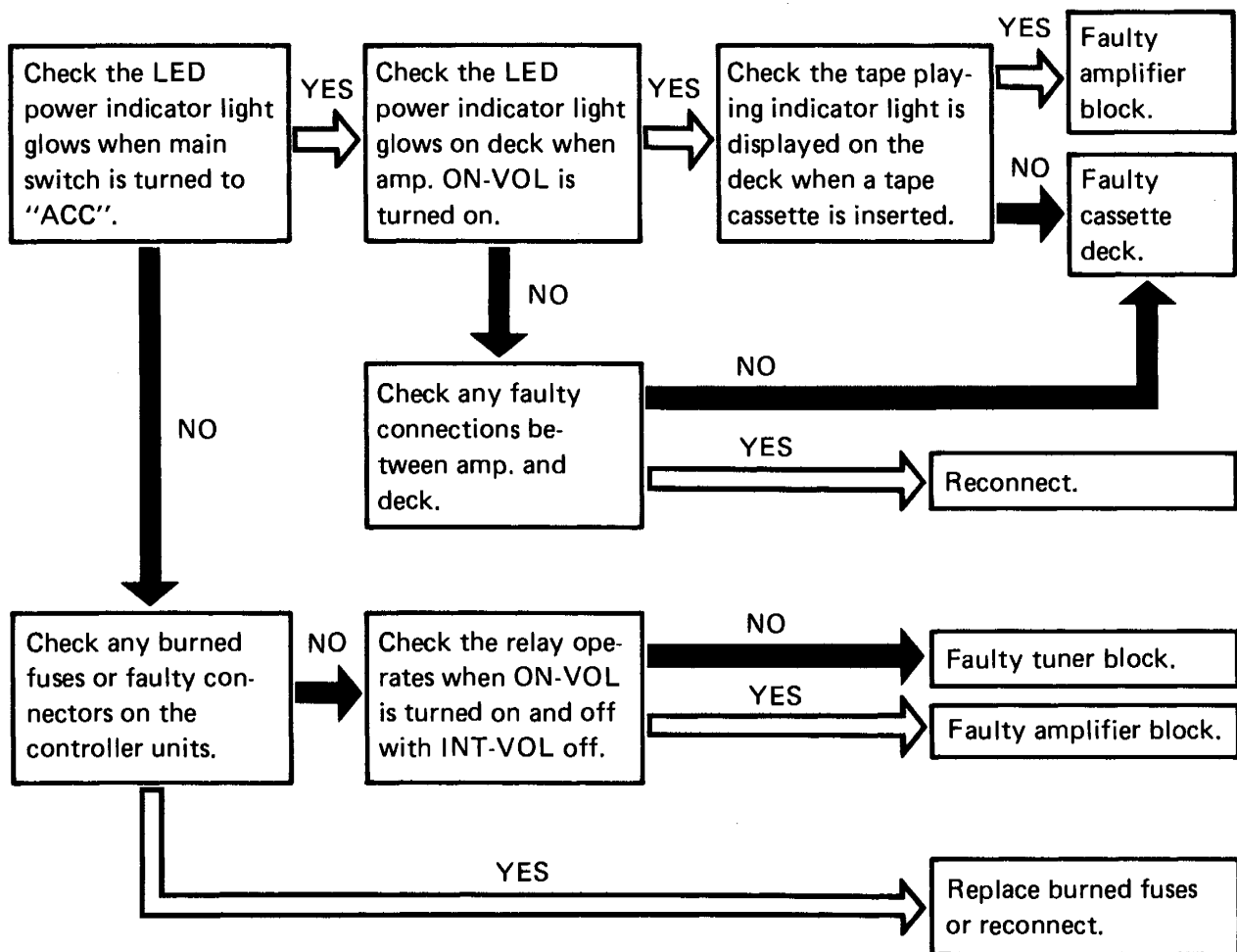
This radio has been designed for operation in the 11 meter Citizens Radio Service. It uses a frequency synthesizing circuit with Phase Locked Loop (PLL) techniques to provide crystal controlled transmit and receive operation on all 40 channels. The PLL circuitry assures ultraprecise frequency control. It is designed to meet the Federal Communications Commission requirements applicable to equipment operating in the Citizens Radio Service, and is not to be used for any other purpose.

**AUDIO TROUBLESHOOTING**

- ① Antenna
- ② Tuner block
- ③ Tuner controller
- ④ Tuner
- ⑤ Amplifier block
- ⑥ Amplifier controller
- ⑦ Amplifier
- ⑧ Cassette deck
- ⑨ Speaker
- ⑩ Head set (Option)



No power from the battery

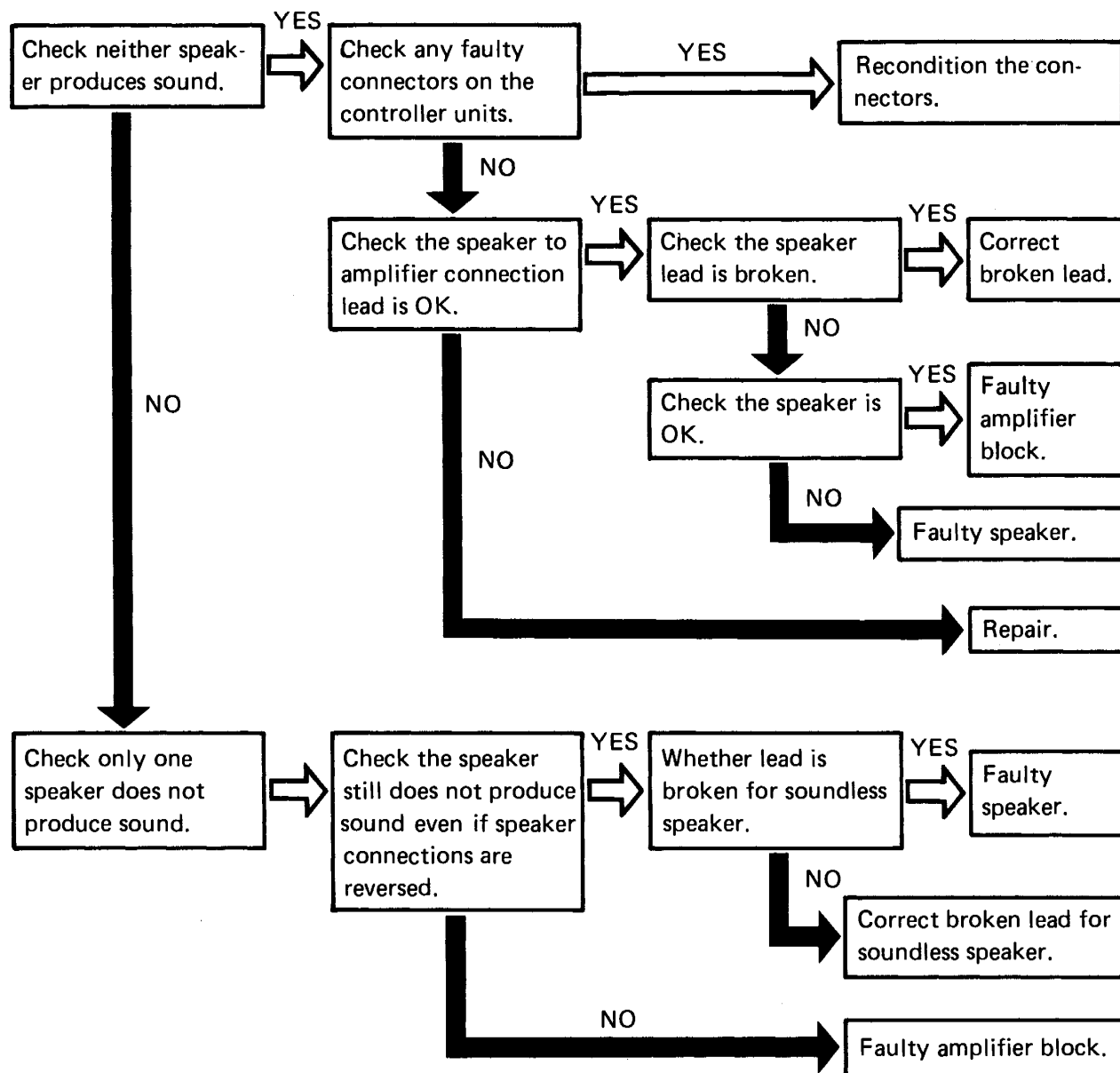




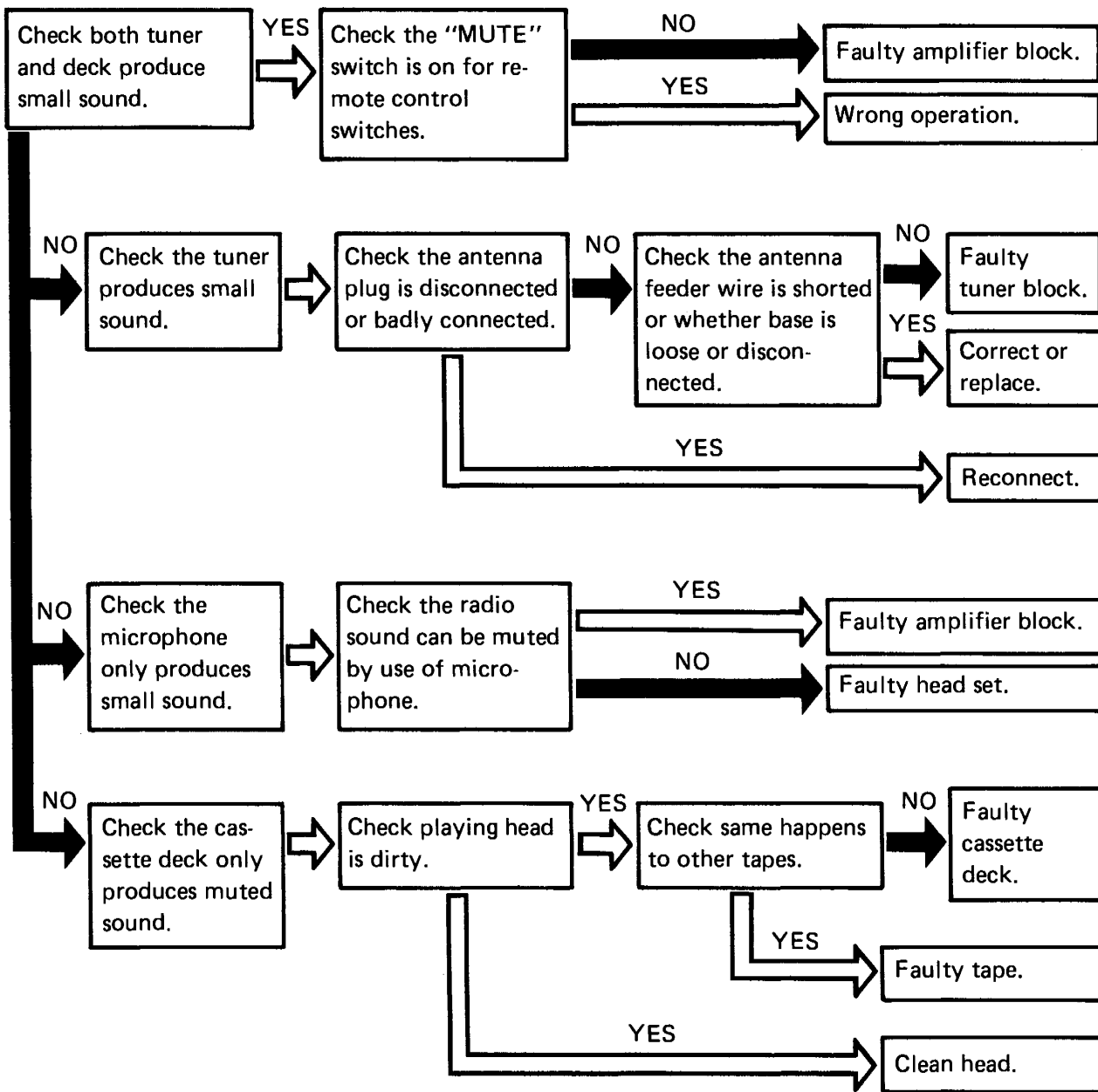
No sound from speaker only

NOTE:

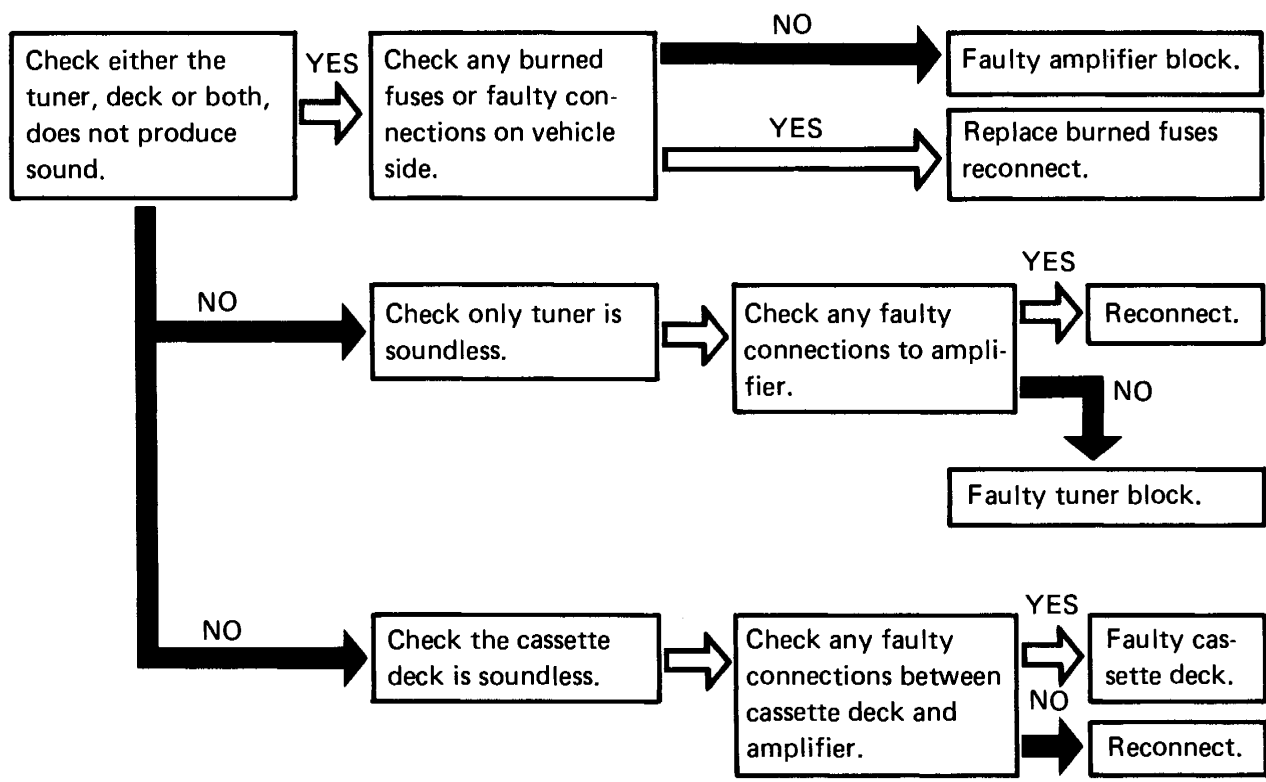
Before checking the following chart, be sure that the HEADPHONE switch on the amplifier controller is turned to "OFF".



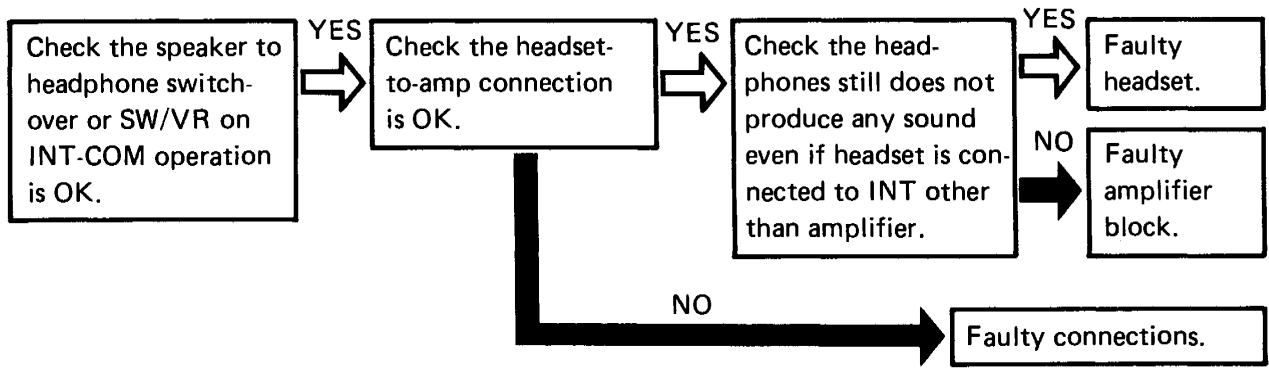
Sound is muted



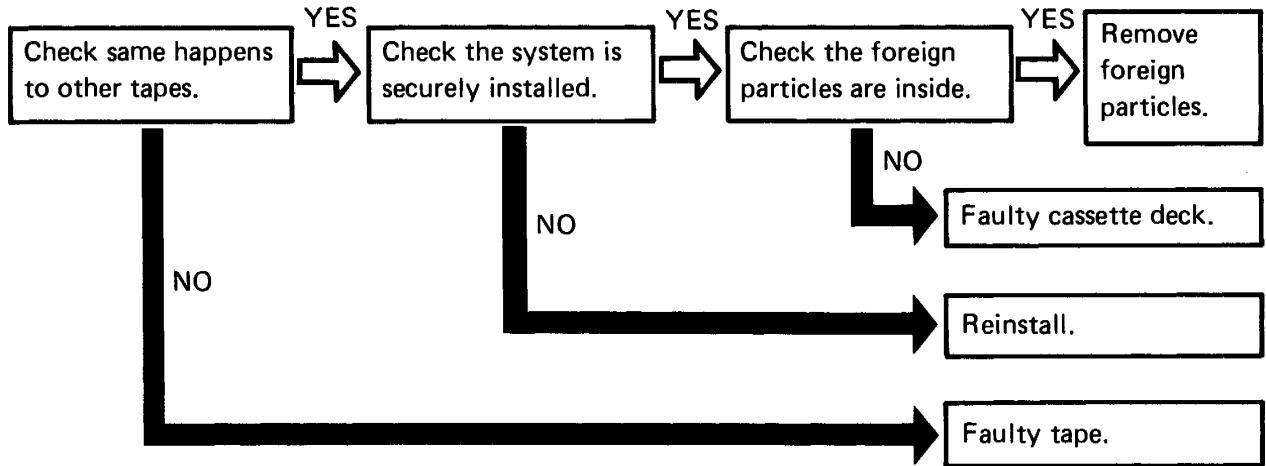
No sound from the speakers and headphones



No sound from the headphones only



System is subjected to wowing and fluttering

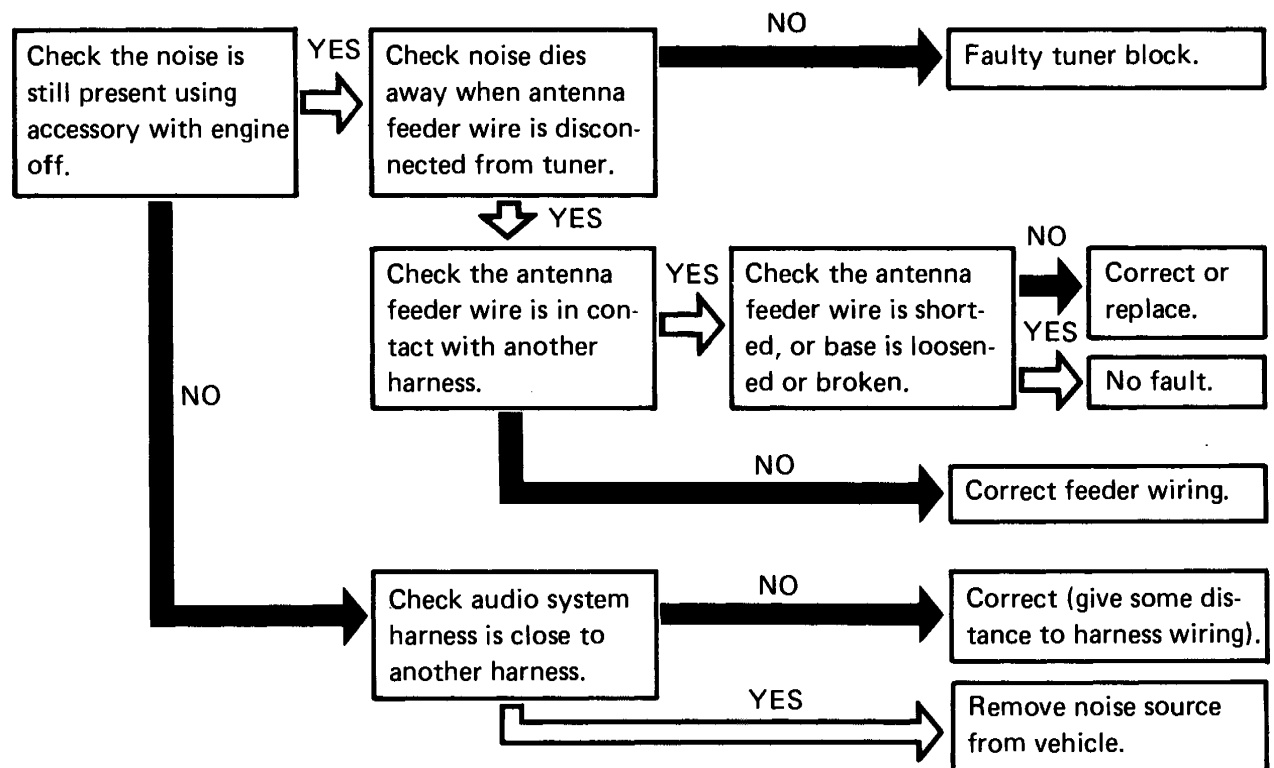


There are many noises

NOTE:

Before checking the following chart:

- Check the high tension code for binding and connection from ignition coils to spark plug caps.
- Check the ground lead from the amplifier and tuner to chassis. (Inside of the left fairing panel)

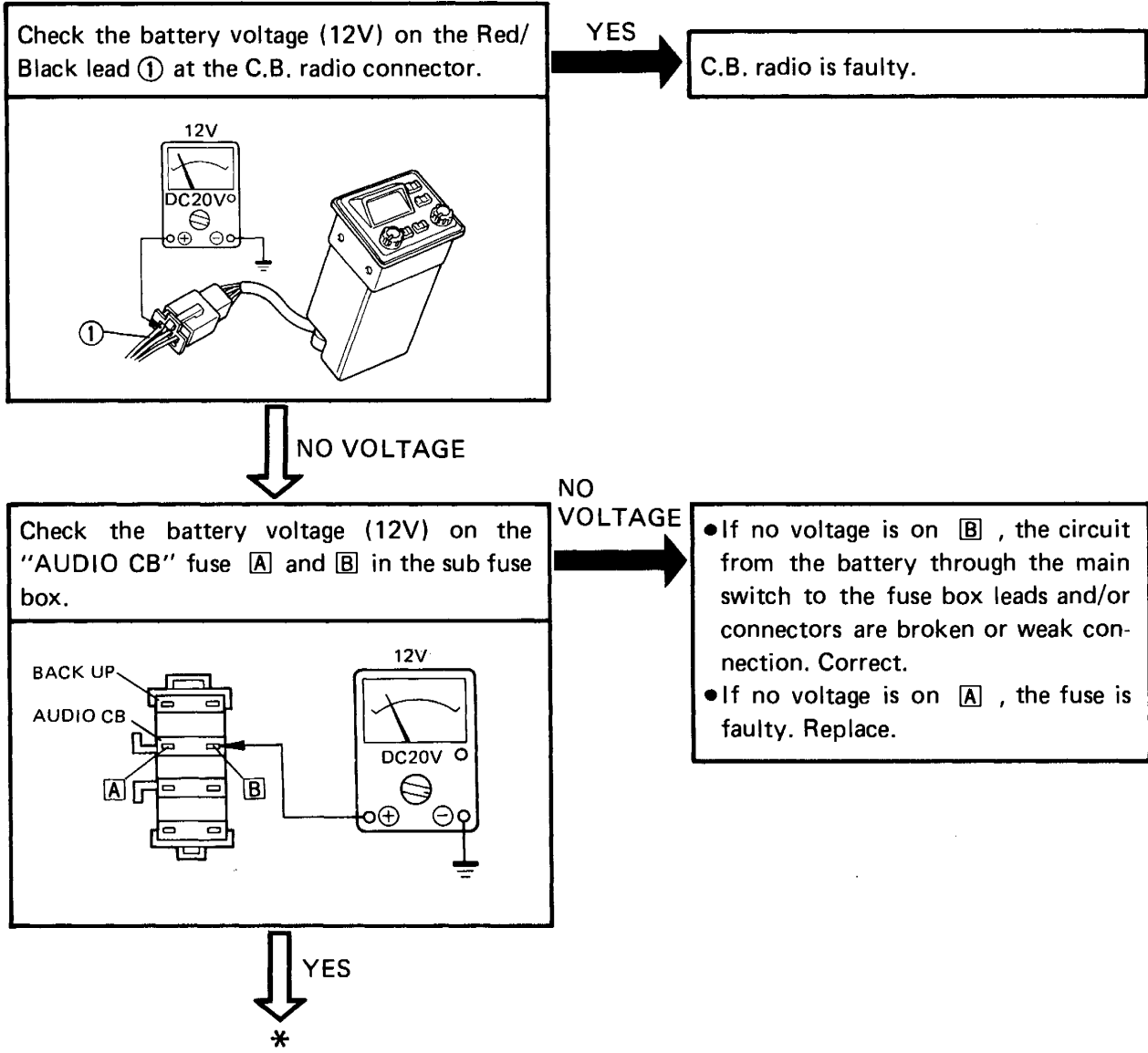


C.B. RADIO TROUBLESHOOTING

NOTE:

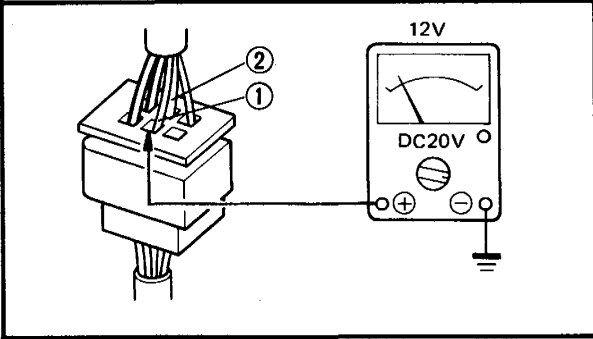
Prior to troubleshooting, make sure the tuner, cassette deck, headphones and inter communication are in good working condition. Also, check that all leads between the C.B. radio and the antenna are correctly connected.

C.B. radio does not come on with the "ON-VOL" control knob





Check the battery voltage (12V) on the Red/Blue ① and Red/Black ② leads at the noise filter connector.

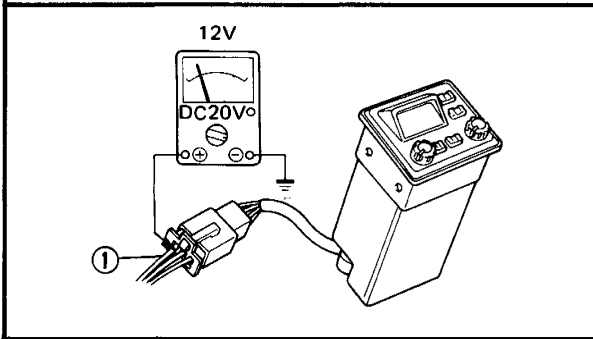


NO VOLTAGE

- If no voltage is on Red/Blue lead, the circuit from the fuse box to noise filter is broken or weak connection. Correct.
- If no voltage is on Red/Black lead, the noise filter is faulty. Replace.



Check the battery voltage (12V) on the Red/Black lead ① at the C.B. radio connector.



NO VOLTAGE

The circuit from the noise filter to C.B. radio connector is faulty. Correct.

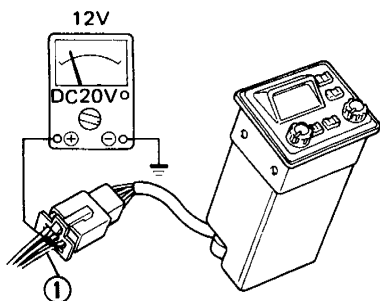
**Back up system does not operate****NOTE:**

When the main switch and "ON-VOL" control knob has been set back to ON after being once turned to OFF, the channel does not revert to the original.

Check the battery voltage (12V) on the Red lead ① at the C.B. radio connector.

YES

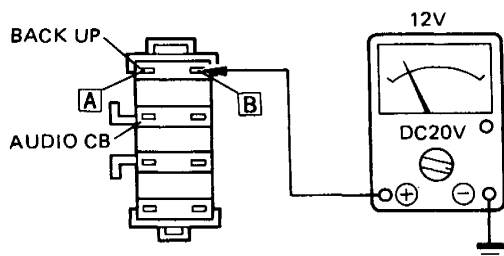
C.B. radio is faulty.

**NO VOLTAGE**

Check the battery voltage (12V) on the "BACK UP" fuse **A** and **B** in the sub fuse box.

NO VOLTAGE

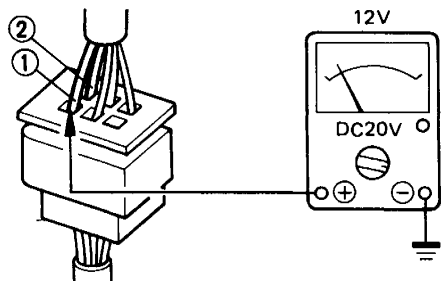
- If no voltage is on **B**, the circuit from the battery through the main switch to the fuse box leads and/or connectors are broken or weak connection. Correct.
- If no voltage is on **A**, the fuse is faulty. Replace.

**YES**

Check the battery voltage (12V) on the Red/Brown ① and Red ② leads at the noise filter connector.

NO VOLTAGE

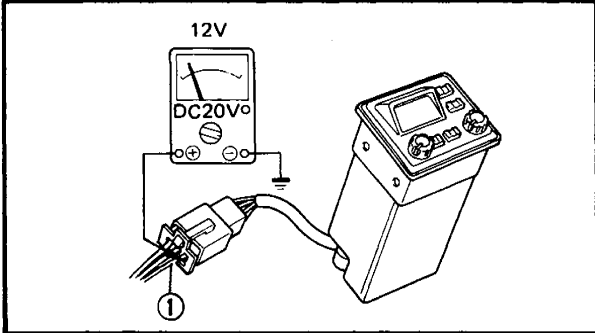
- If no voltage is on Red/Brown lead, the circuit from the fuse box to noise filter is broken or in weak connection. Correct.
- If no voltage is on Red lead, the noise filter is faulty. Replace.

**YES**

*



Check the battery voltage (12V) on the Red lead ① at the C.B. radio connector.



NO VOLTAGE



The circuit from the noise filter to C.B. radio connector is faulty. Correct.

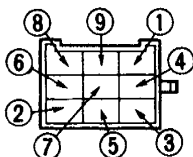


Remote controller (Rider's or passenger's) does not operate

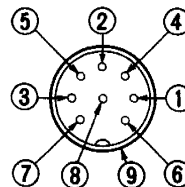
Check the remote controller functions according to the following check list. If any one (or more) function does not meet the following, replace the controller assembly.

Function	Tester Check Points	Resistance						
CB CH · ▲	② and ⑨	0Ω when pushed/∞Ω when released						
CB CH · ▼	② and ⑧	1kΩ when pushed/∞Ω when released						
PTT	⑤ and ⑨	0Ω when pushed/∞Ω when released						
SEEK	⑥ and ⑨	0Ω when pushed/∞Ω when released						
MUTE	⑦ and ⑨	0Ω ↔ ∞Ω for each push						
ATT (Left)	① and ④	Step	1 (Maximum)	2	3	4	5	6 (Minimum)
(Right)	③ and ④	Resistance	∞Ω	12 ~ 18Ω	5.4 ~ 8.2Ω	2.6 ~ 4.0Ω	1.3 ~ 2.0Ω	0Ω

For rider



For passenger



YES

NO
CONTINUITY

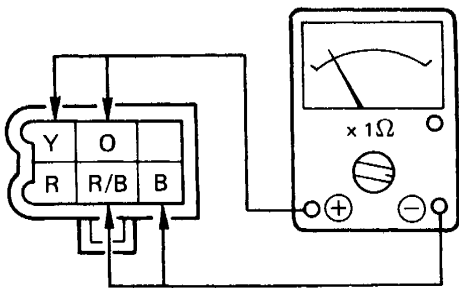
Remove the C.B. radio leads at the C.B. radio connector and check the following.

Switch	Color	Free	Push
PTT	Y ↔ B	∞	0Ω
▲	O ↔ B	∞	0Ω
▼	O ↔ R/B	∞	Approx. 1KΩ

The circuit from the remote controller to the C.B. radio leads and/or connectors are broken or in weak connection. Correct.

YES

C.B. radio is faulty.





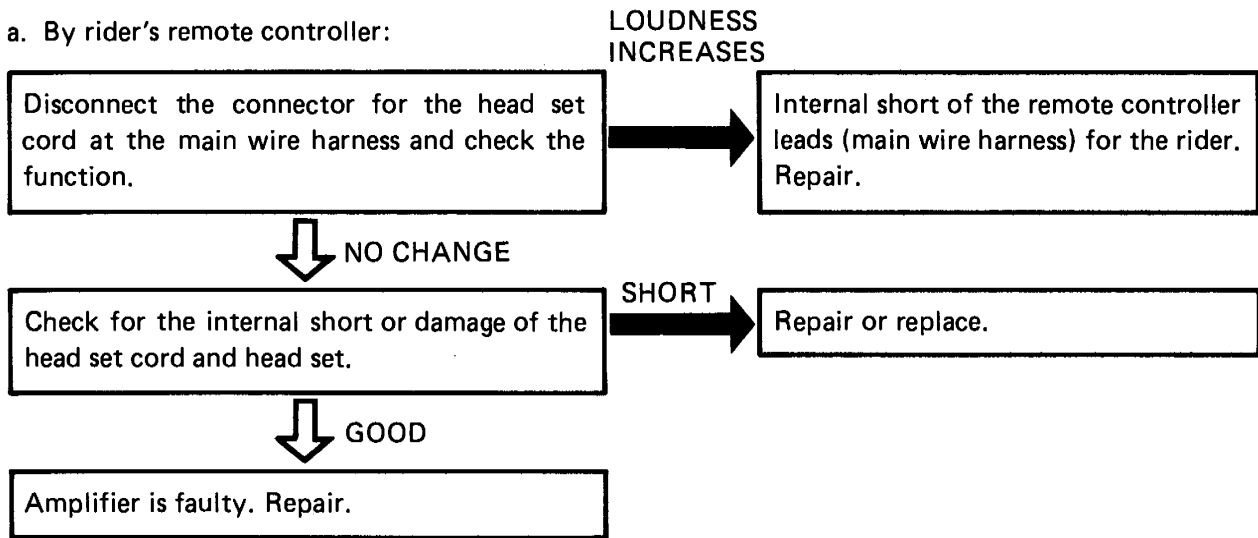
Loudness can not be controlled by ATT knob

1. Loudness can not be reduced
 - Disconnection or open circuit of the connection cable between the remote controller and the head set.
2. Loudness can not be increases

CAUTION:

Do not use the Pocket Tester for measuring the direct current resistance of the microphone. It may damage the microphone's voice coil.

a. By rider's remote controller:



b. By passenger's remote controller:

Internal short of the remote controller box or damage of the head set. Repair or replace.

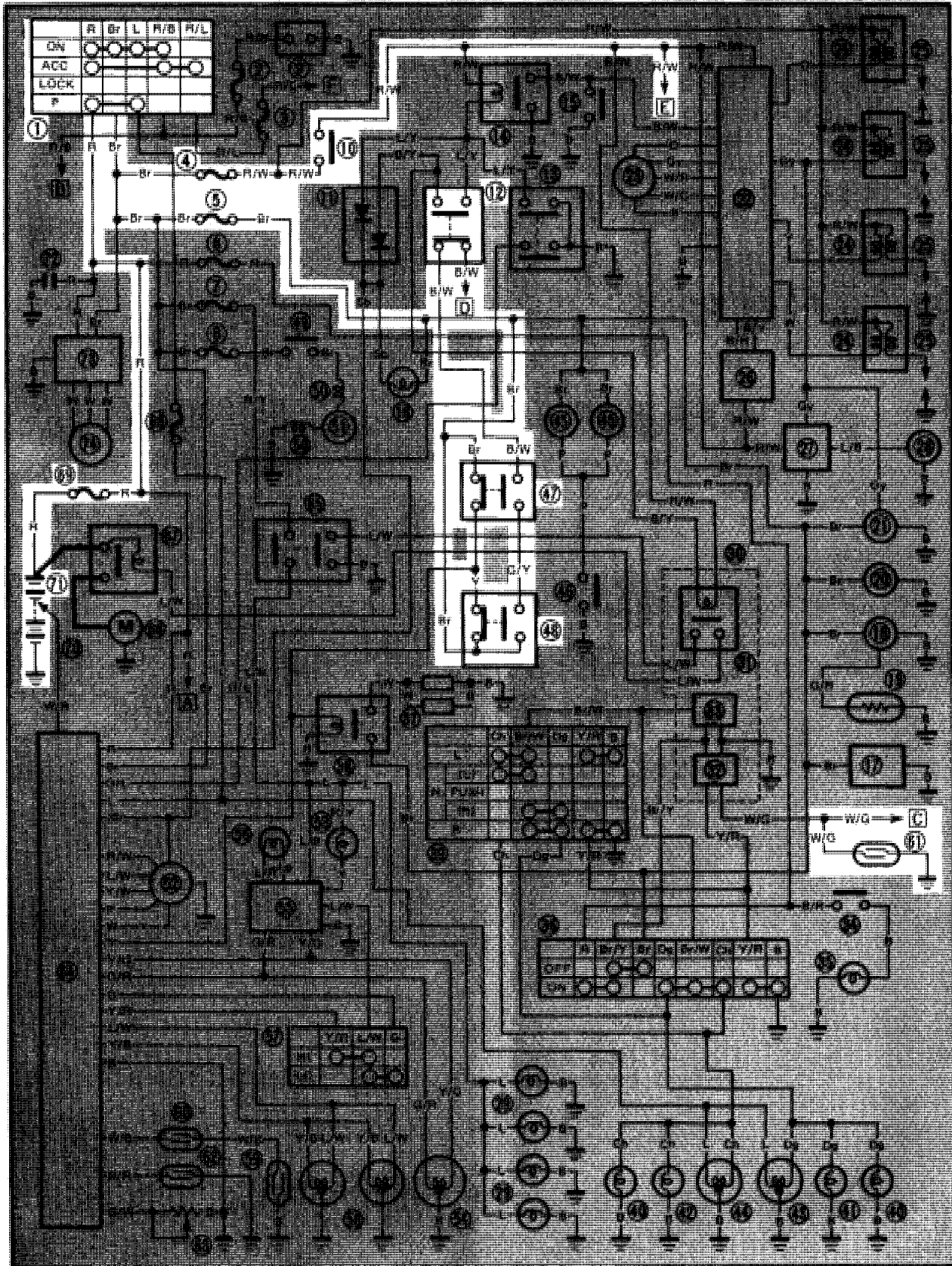
**AUDIO/C.B. RADIO REMOVAL AND INSTALLATION**

Refer to "CHAPTER 2. FAIRING REMOVAL AND INSTALLATION" section.



VENTURE CRUISE CONTROL SYSTEM

CIRCUIT DIAGRAM



VENTURE CRUISE CONTROL SYSTEM

ELEC

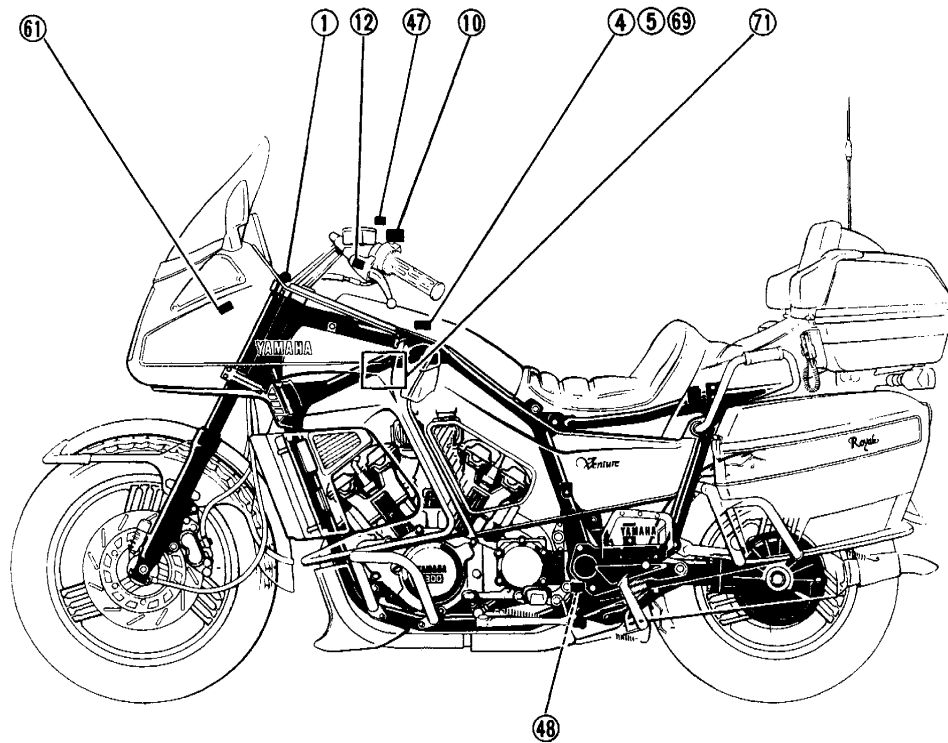


Aforementioned circuit diagram shows venture cruise control circuit in wiring diagram.

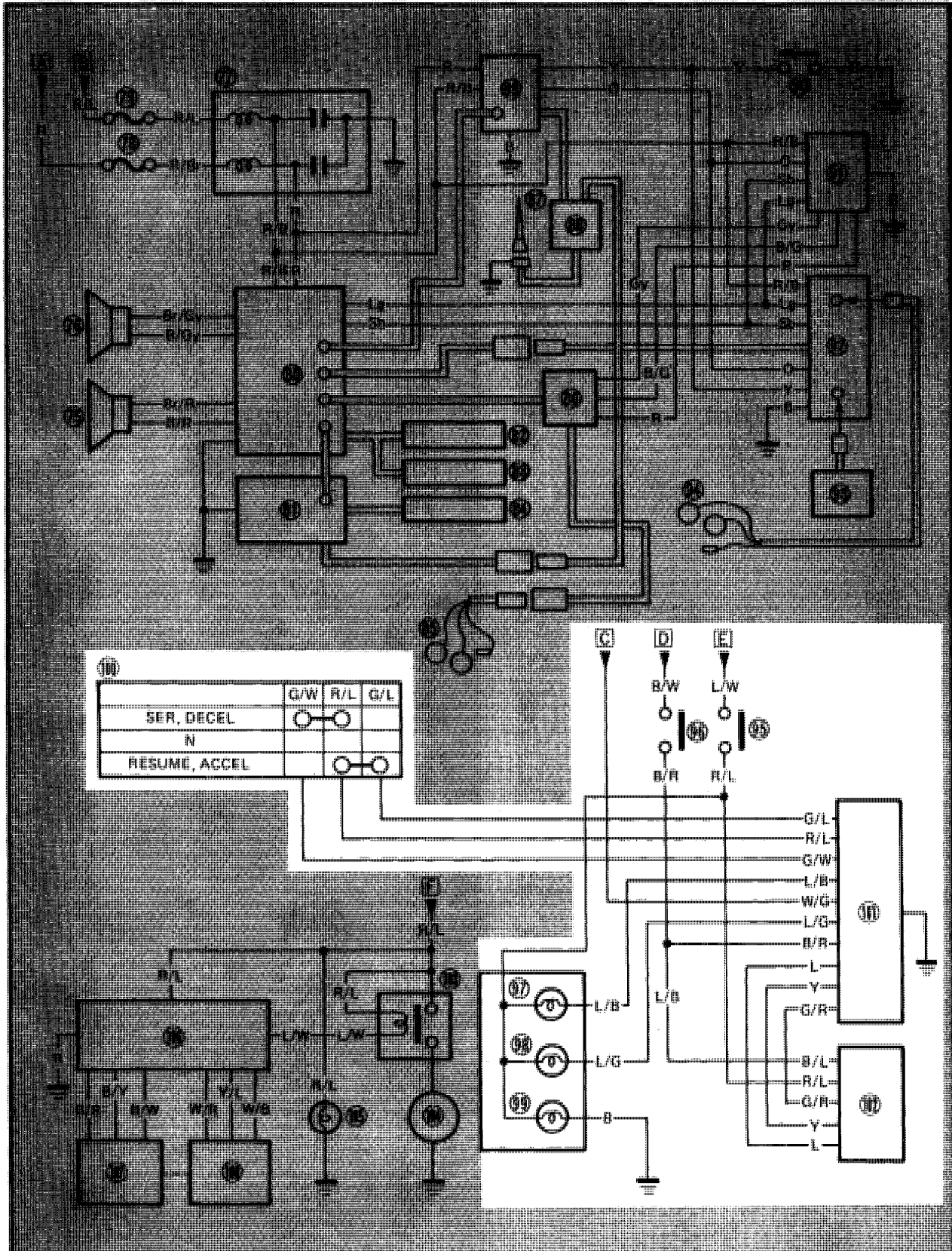
NOTE:

For the encircled numbers and color codes, see page 7-2.

- | | |
|------------------------|-----------------------|
| ① Main switch | ④⑦ Front brake switch |
| ④ Fuse (IGNITION) | ④⑧ Rear brake switch |
| ⑤ Fuse (SIGNAL) | ⑥① Speedometer sensor |
| ⑩ "ENGINE STOP" switch | ⑥⑨ Fuse (MAIN) |
| ⑫ Clutch switch | ⑦① Battery |



CIRCUIT DIAGRAM (2)

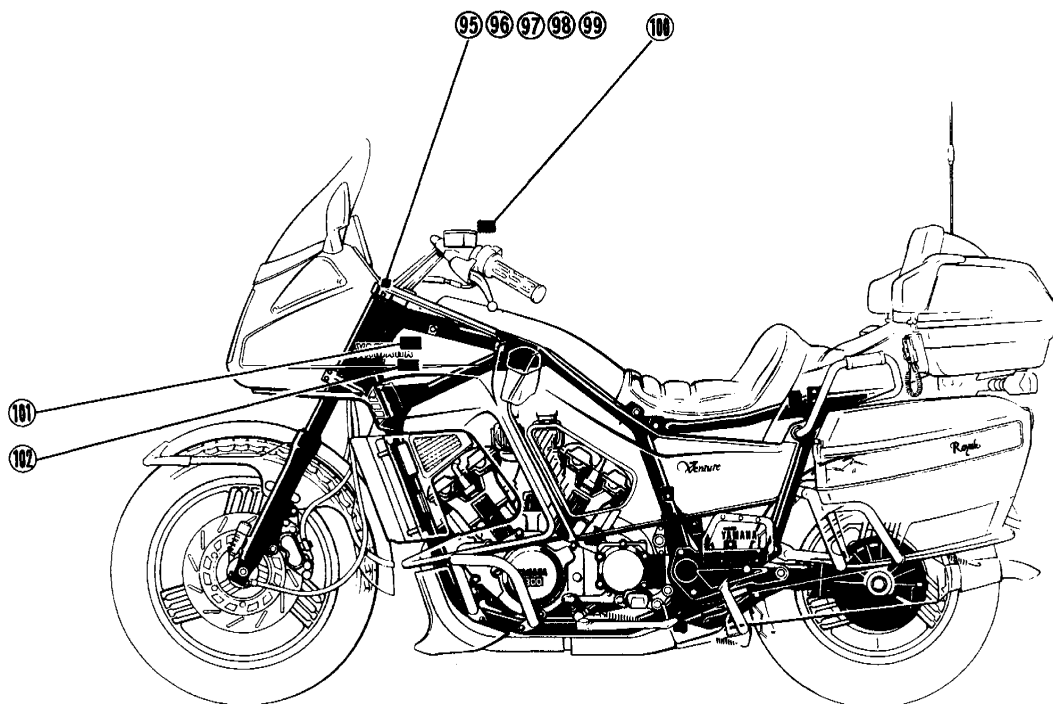


Aforementioned circuit diagram shows venture cruise control circuit in wiring diagram.

NOTE: _____

For the encircled numbers and color codes, see page 7-2.

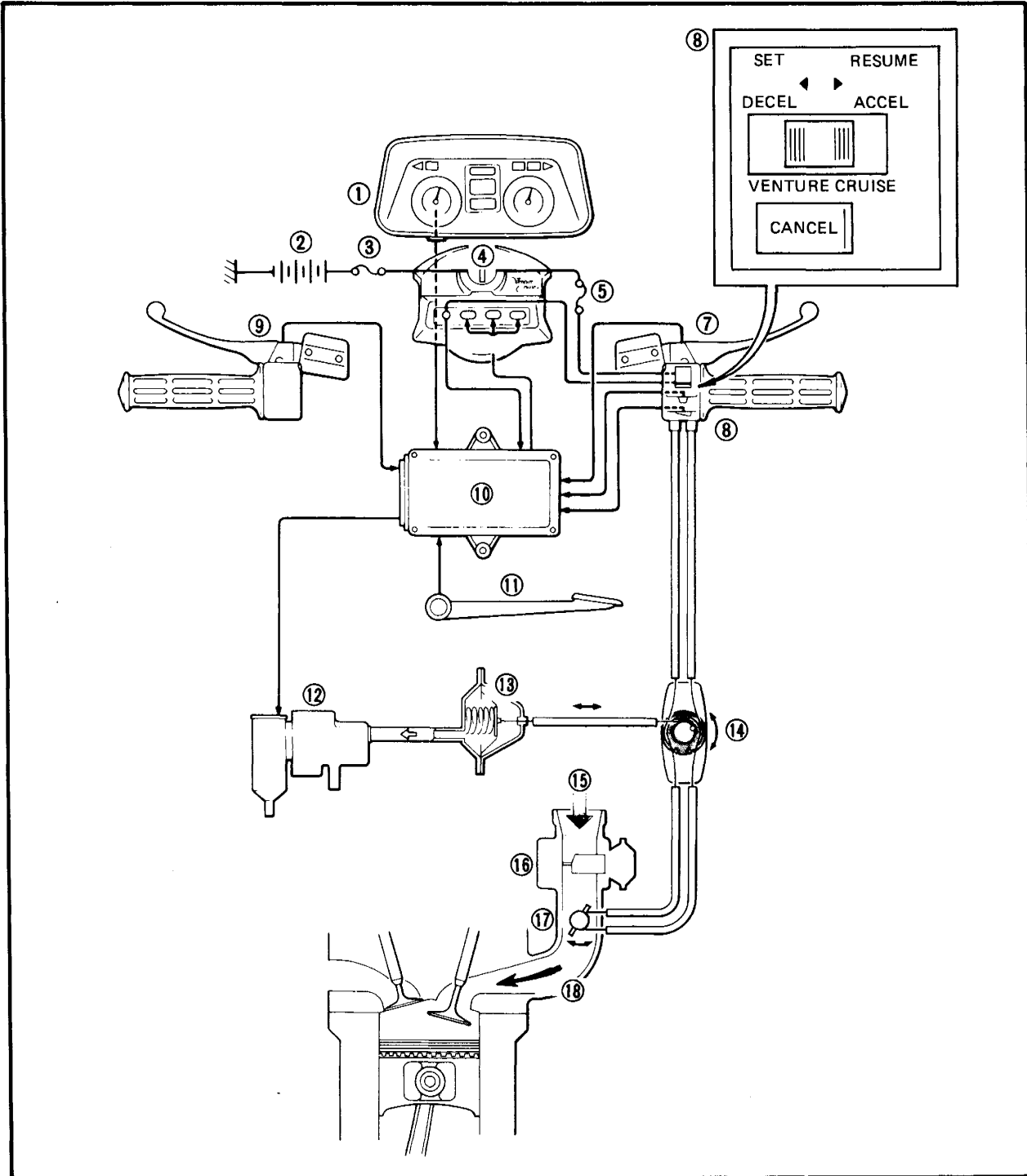
- | | |
|--------------------------------------|----------------------------------|
| ⑨5 "POWER" (Cruise) switch | ⑨9 "ON" (Cruise) indicator light |
| ⑨6 "CANCEL" (Cruise) switch | ⑩0 Cruise control switch |
| ⑨7 "SET" (Cruise) indicator light | ⑩1 Cruise control unit |
| ⑨8 "RESUME" (Cruise) indicator light | ⑩2 Vacuum pump |





ELECTRICAL COMPONENTS

- | | | |
|----------------------|-------------------------|--------------------|
| ① Speedometer sensor | ⑧ Cruise control switch | ⑮ Air |
| ② Battery | ⑨ Clutch switch | ⑯ Carburetor(s) |
| ③ Fuse | ⑩ Cruise control unit | ⑰ Throttle valve |
| ④ Main switch | ⑪ Rear brake switch | ⑱ Air/Fuel mixture |
| ⑤ Fuse | ⑫ Vacuum pump | |
| ⑥ Indicators | ⑬ Vacuum actuator | |
| ⑦ Front brake switch | ⑭ Throttle cable joint | |





DESCRIPTION

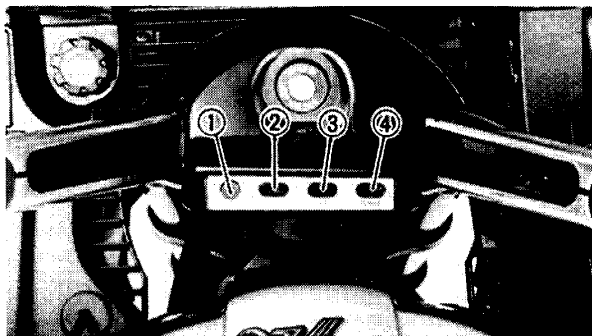
This motorcycle is equipped with the Venture Cruise Control System which is designed to maintain a set speed. Use this control system on the open road when you are in 5th gear.

NOTE:

A set speed can be maintained only when you are riding in the speed range of approx. 50 ~ 130 km/h (approx. 30 ~ 80 mi/h).

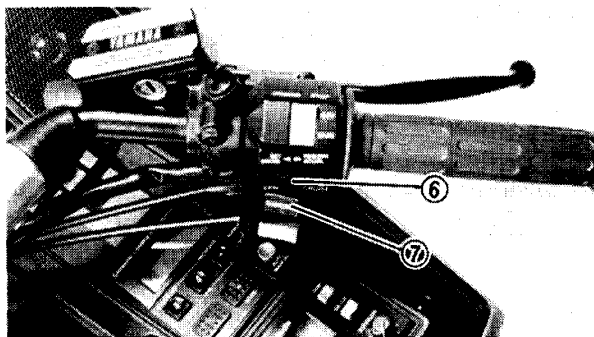
WARNING:

Don't use the Venture Cruise Control System in road conditions requiring frequent speed changes such as in heavy traffic or going a hill.



VENTURE CRUISE CONTROL SWITCH FUNCTIONS

- ① "POWER" (Cruise) switch
- ② "ON" (Cruise) indicator light
- ③ "SET" (Cruise) indicator light
- ④ "RESUME" (Cruise) indicator light



- ⑤ Cruise control switch
- ⑥ "CANCEL" (Cruise) switch

"POWER" (Cruise) switch

This switch, with an ON-OFF feature, presets the Venture Cruise Control System.

**“ON” (Cruise) indicator light**

This light comes on when the Venture Cruise Control System is preset (when “ON” is selected by the power switch).

“SET” (Cruise) indicator light

This light comes on when the motorcycle is running at a set speed.

“RESUME” (Cruise) indicator light

This light comes on when the set speed, which is cancelled by any of the steps in “OPERATION ③”, is memorized and when the vehicle speed is in the range of approx. 50 ~ 130 km/h (approx. 30 ~ 80 mi/h). If the resume system is operated while this light is on, it continues flashing until the speed returns to that memorized.

Cruise Control Switch

This switch is capable of the following controls. Refer to the “OPERATION” section for details.

- Set-speed ride
- Minute adjustment of set speed
- Consecutive adjustment of set speed
- “RESUME” system

“CANCEL” (Cruise) switch

Push this switch to cancel the set speed ride in the Venture Cruise Control System.



OPERATION

NOTE:

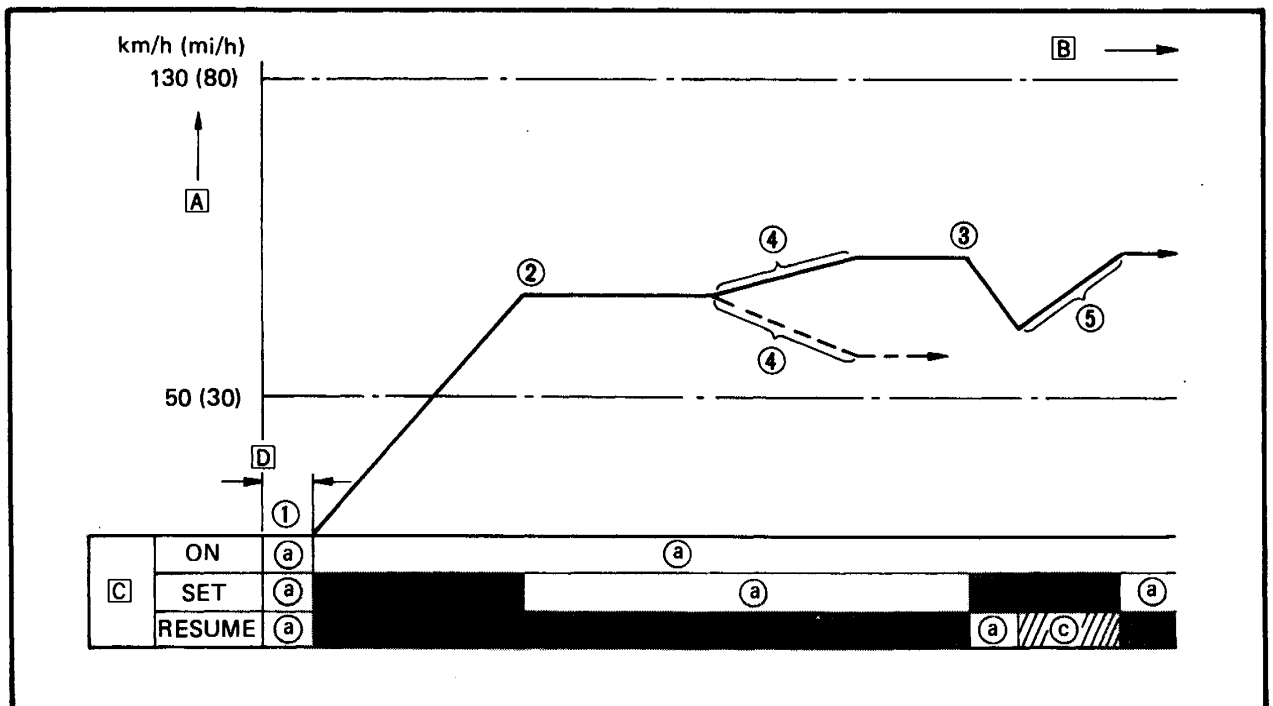
The system can be automatically cancelled in the following cases where:

- There is something wrong with the system.
- There is a speed drop of approx. 8 km/h (5 mi/h) or more than set.

WARNING:

- If you close the throttle with the cruise control activated, the motorcycle may accelerate upon release of the throttle grip if the deceleration is less than 8 km/h (5 mi/h).
- For safety, always keep both hands on the handlebar grips to avoid loss of vehicle stability. If the "SET" indicator light flashes, the system is out of order. Do not use the system if the "SET" indicator flashes.

- [A] SPEED
- [B] TIME
- [C] INDICATOR LIGHTS
- [D] APPROXIMATELY 1 SECOND
- [a] ON
- [b] OFF
- [c] FLASH





- ① Before starting, push the power switch to preset the Venture Cruise Control System. This turns the "POWER", "SET", and "RESUME" indicator lights on. The "SET" and "RESUME" indicator lights go out after approximately one second (to check for a burned bulb). The "POWER" indicator light stays on.
- ② Push the control switch to the "SET" position when you are at the desired speed. The "SET" indicator will come on and the speed at that moment will be memorized.
- ③ The set speed can be cancelled by any one of the following:
 - Pull the brake lever.
 - Pull the clutch lever.
 - Step on the brake pedal.
 - Give one push to the cancel switch.
 - Turn the engine stop switch to off. The Resume function will not work in this case.
- ④ Minute/connective adjustment of the set speed. By pushing the control switch in the direction of either "ACCEL" or "DECEL" during a set speed ride, the set speed can be changed in an increment or decrement of approximately one mile per hour. If the control switch is held in the "ACCEL" or "DECEL" position, the speed can be successively increased or decreased slowly. The speed at the moment when the control switch is released is memorized as the new set speed in the Venture Cruise Control System.

NOTE:

The upper limit of the speed increase is 130 km/h (80 mi/h), at which speed control switch operation for a high speed is overridden, thereby maintaining a constant 130 km/h (80 mi/h).

The lower limit of the speed reduction is 50 km/h (30 mi/h), at which speed control switch operation for a lower speed is overridden, thereby maintaining a constant 50 km/h (30 mi/h).



⑤ "RESUME" System

If after using a cancellation function, the "RESUME" indicator light is on you may resume a previously set speed by pushing the control switch once in the "RESUME" direction.

The "RESUME" indicator light will flash while the speed is returned to the one used before the cancellation. The "RESUME" indicator light will then go out and the "SET" indicator light will come on.

NOTE:

If during a set speed ride the vehicle speed is increased by turning the throttle grip and then the grip is turned back, the vehicle speed is brought back to the set speed.

If the vehicle speed is increased by 8 km/h (5 mi/h) within 130 km/h (80 mi/h), one push at the control switch for speed setting allows the speed of that moment to be memorized, thereby causing the motorcycle to run at that set speed.

**TROUBLESHOOTING****DETECTING AN ABNORMALITY WITH THE MOTORCYCLE STOPPED****NOTE:**

The cruise control "SET" indicator light will show any abnormality of the cruise control system.

Main switch: ON
"ENGINE STOP" switch: RUN
"POWER" (Cruise) switch: ON

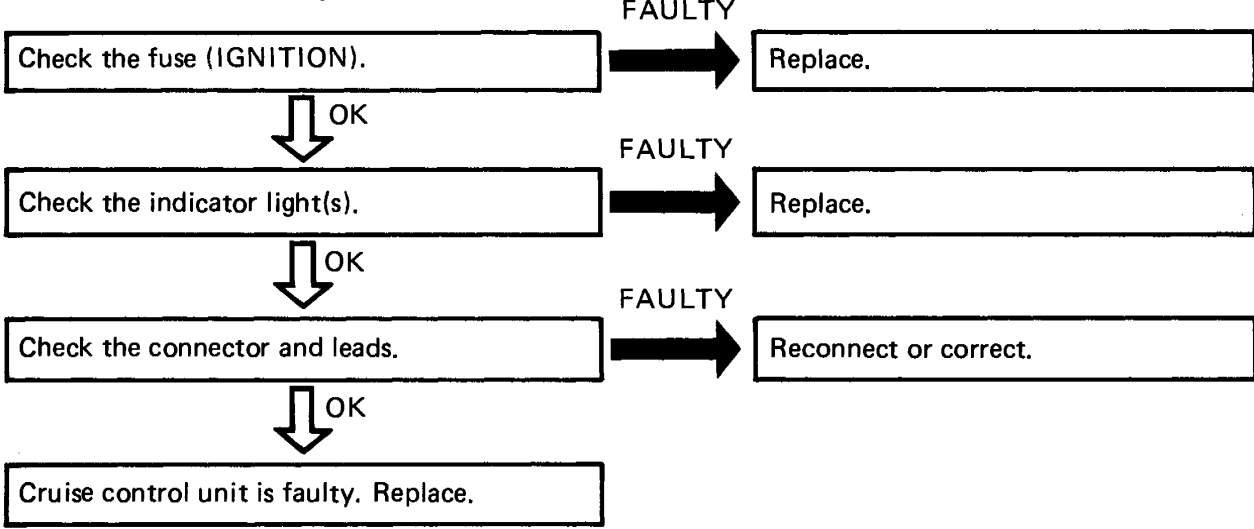


"POWER", "SET" and "RESUME" indicator lights come on. The "SET" and "RESUME" indicator lights go out after approximately one second (to check for a burned bulb). The "POWER" indicator light stays on.



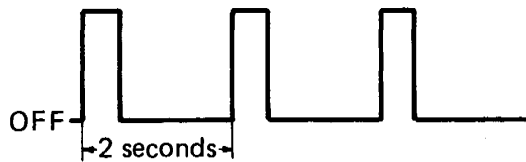
- If one (or more) indicator light does not come on:
Indicator light(s) or related parts are faulty.
- If the "SET" indicator light flashes every two seconds:
Vacuum pump or related parts are faulty.
- If the "SET" indicator light flashes three times every two seconds:
Cruise control unit is faulty.

Cruise control indicator light(s) does not come on



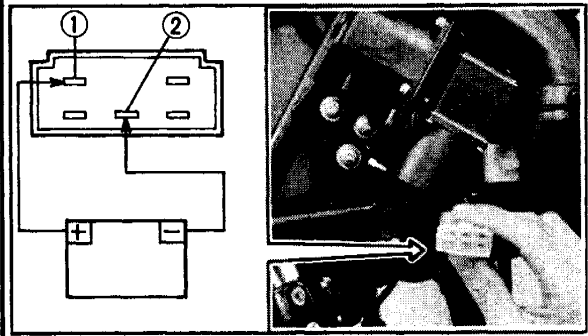


"SET" indicator light flashes every two seconds



FAULTY

Connect the battery to the Red/Blue lead ① and Green/Red lead ② at the vacuum pump connector, and check the sound of the rotating vacuum pump.



Vacuum pump is faulty. Replace.

OK

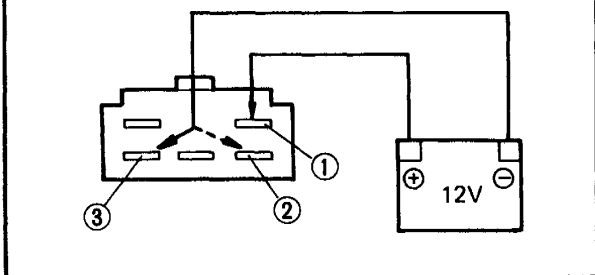
Connect the battery to the Black/Blue lead ① and the Yellow lead ② for "AIR" valve or Blue lead ③ for "RELEASE" valve. While repeating connection and disconnection, check the sound of each valve operation.

FAULTY

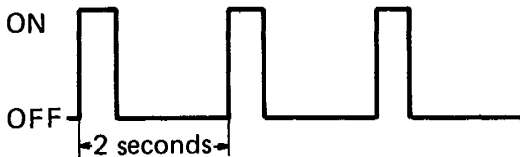
Vacuum pump valve(s) is faulty. Replace the vacuum pump assembly.

OK

Check the condition of connector and leads. Reconnect or correct as necessary.



"SET" indicator light flashes three times every two seconds

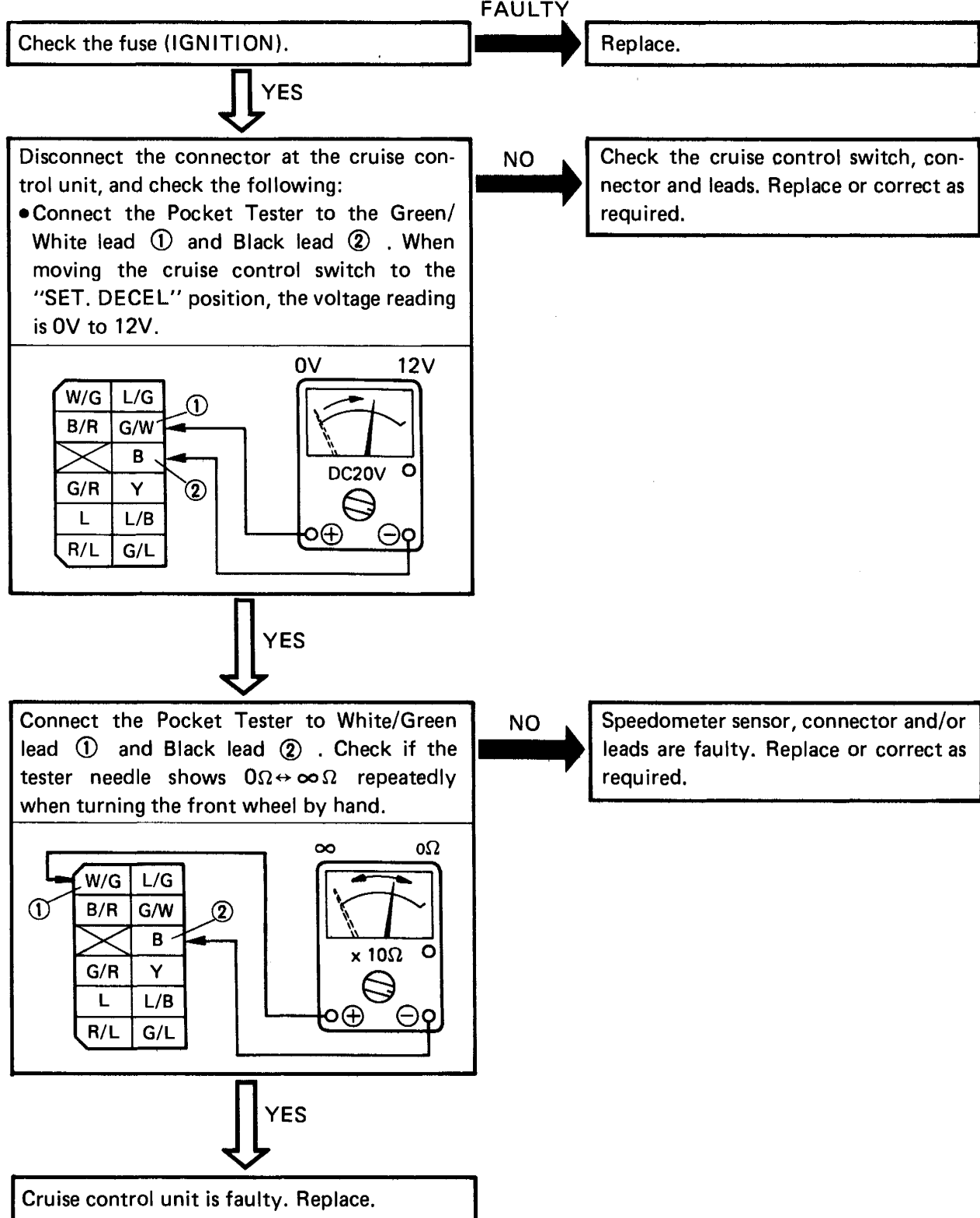


If this happens, the cruise control unit is faulty. Replace.



DETECTING AND ABNORMALITY DURING OPERATION

Cruise control system can not be set ("SET" indicator light does not come on)

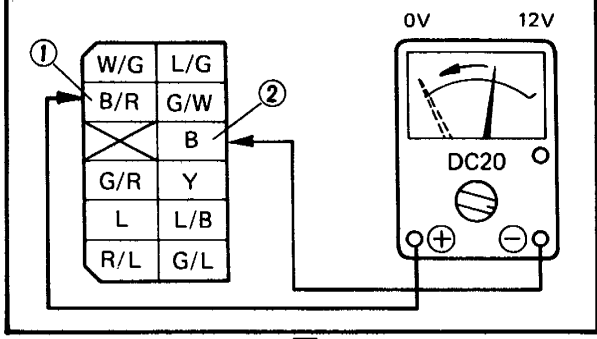




Set speed can not be cancelled by cancel switch (cancel, front brake, rear brake and/or clutch switches)

Disconnect the connector at the cruise control unit and check the following:

- Connect the Pocket Tester to the Black/Red lead ① and Black lead ②. When operating the cancel switch (cancel, front brake, rear brake or clutch switches), the voltage reading is 12V to 0V.



NO → Check the cancel switch(es), connector and leads. Replace or correct as required.

YES ↓

- Check the vacuum hose for clogging and/or damage.
- Check the throttle cables and throttle housing condition.


FAULTY → Correct.

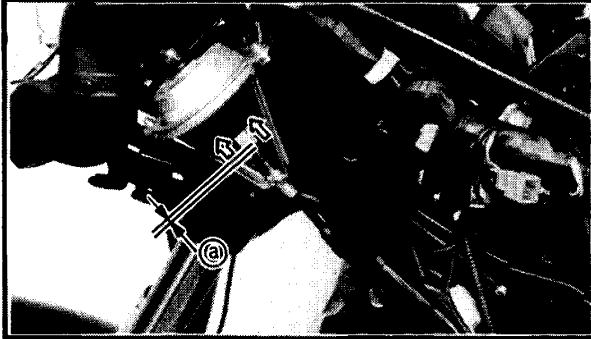
OK ↓

Cruise control unit is faulty. Replace.

Cruise control system can not be set ("SET" indicator light comes on)

Check the throttle cable free play (a).

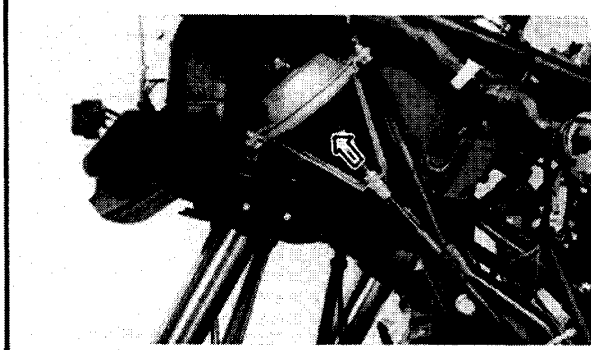
 Free Play (a) :
1 ~ 2 mm (0.04 ~ 0.08 in)



NO → Adjust free play. Refer to "CHAPTER 2. THROTTLE CABLE ADJUSTMENT" section.

↓ YES

Check the throttle cable joint operation by operating the actuator manually, and check if the throttle valve opens.



NO → Throttle cable and/or throttle joint are faulty. Replace as required.

↓ YES

Disconnect the vacuum hose at the vacuum pump and operate the actuator manually and play the open end of the hose by a finger, and check if the actuator diaphragm stays or returns.



RETURNS → Actuator diaphragm and/or vacuum hose are faulty. Replace as required.

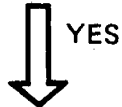
↓ STAYS
*



Reconnect the vacuum hose and disconnect the vacuum pump connector. Connect a battery (12V) to all leads (Red/Blue ①, Black/Blue ②, Yellow ③, Green/Red ④ and Blue ⑤). Check if the actuator operates.

The diagram shows a vacuum actuator with five terminals labeled 1 through 5. Terminal 1 is Red/Blue, 2 is Black/Blue, 3 is Yellow, 4 is Green/Red, and 5 is Blue. A 12V battery is connected to all five terminals. Terminal 2 is also connected to a vacuum hose.

NO → Vacuum pump is faulty. Replace.



After operating the actuator, stop the vacuum pump by disconnecting the battery lead from the Red/Blue ① and/or Green/Red ② terminals. In this condition, leave it approximately 5 seconds and check if the actuator diaphragm stays or returns.

The diagram shows the same vacuum actuator. The 12V battery is now only connected to terminals 3, 4, and 5. Terminals 1 and 2 are marked with an asterisk and the word "Disconnect".

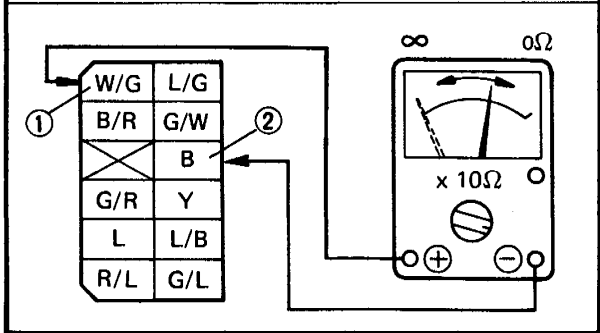
RETURNS → Vacuum pump is faulty. Replace.



Cruise control unit is faulty. Replace.

Vehicle speed fluctuates during the cruising

Disconnect the connector at the cruise control unit. Connect the Pocket Tester to White/Green lead ① and Black lead ②. Check if the tester needle shows $0\Omega \leftrightarrow \infty\Omega$ repeatedly when turning the front wheel by hand.

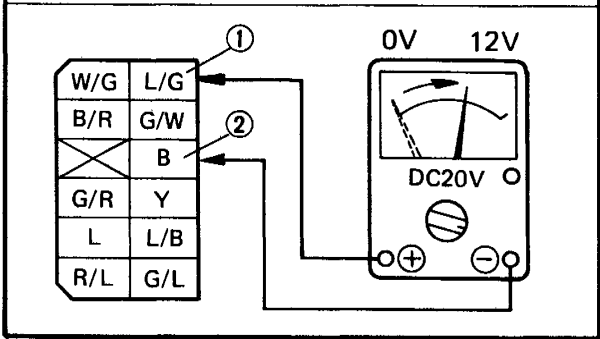


NO → Speedometer sensor, connector and/or leads are faulty. Replace or correct as required.

YES ↓ Cruise control unit is faulty. Replace.

Cruising speed can not be increased or resume can not be operated by cruise control switch

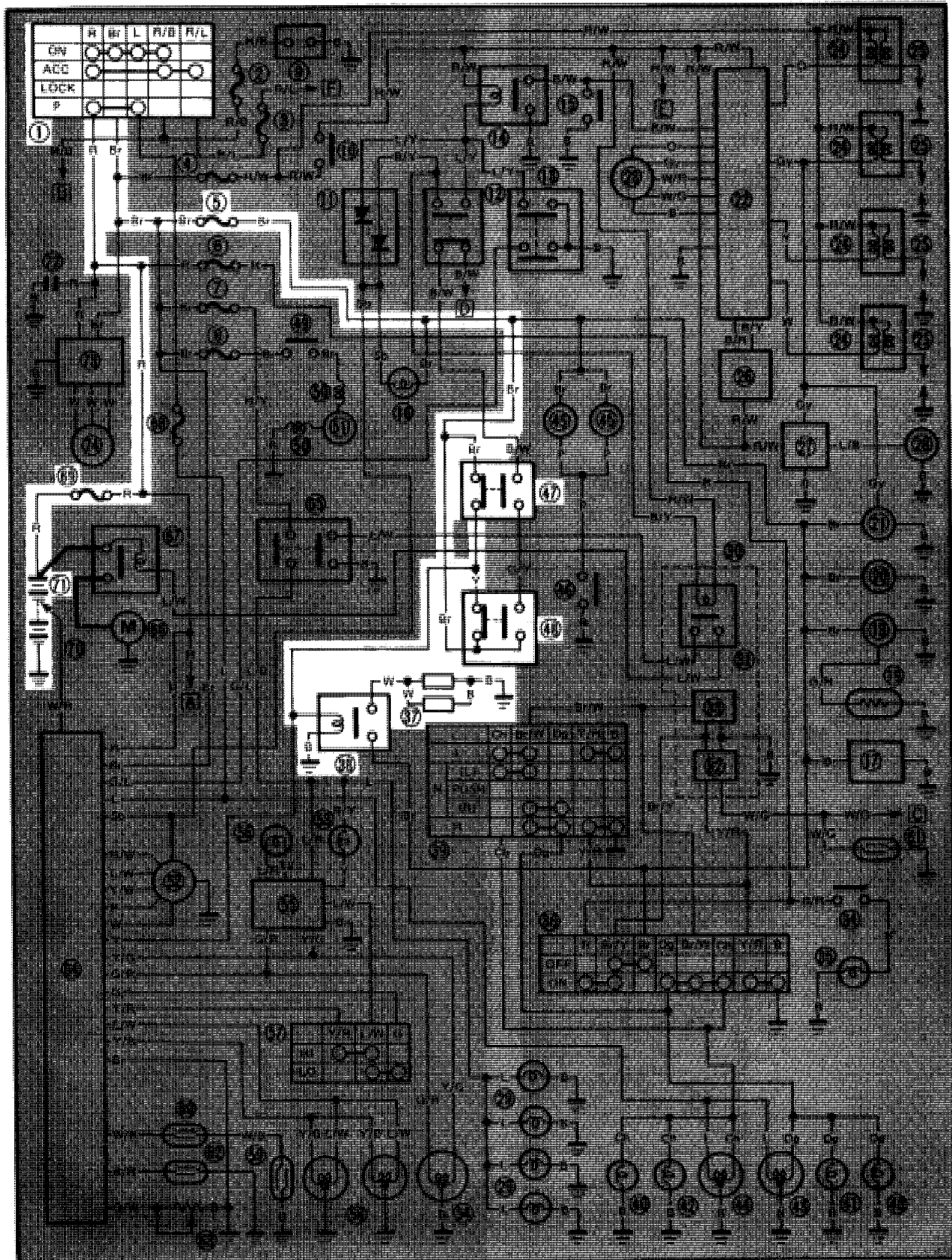
Disconnect the connector at the cruise control unit and check the following:
 • Connect the Pocket Tester to the Blue/Green ① and Black lead ②. When moving the cruise control switch to the "RESUME, ACCEL", the voltage reading is 0V to 12V.



NO → Check the cruise control switch, connector and leads. Replace or correct as required.

YES ↓ Cruise control unit is faulty. Replace.

**EAND (Electric Anti Dive) SYSTEM
CIRCUIT DIAGRAM**



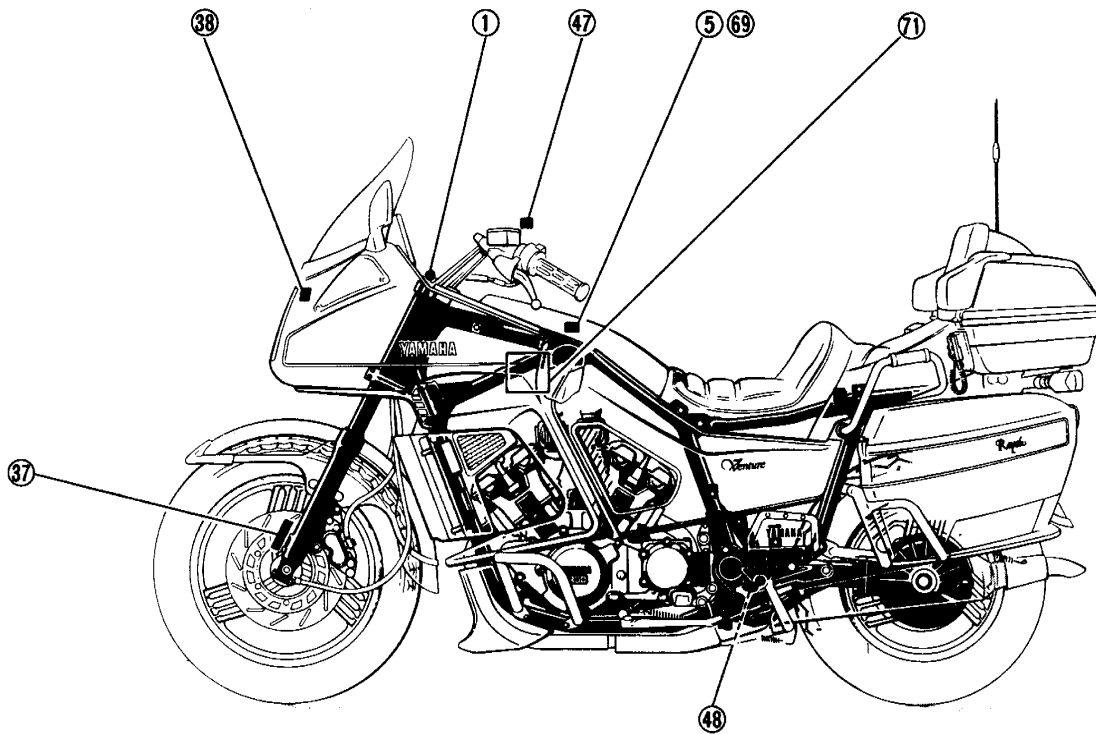


Aforementioned circuit diagram shown electric anti dive circuit in wiring diagram.

NOTE:

For the encircled numbers and color codes, see page 7-2.

- ① Main switch
- ⑤ Fuse (SIGNAL)
- ③⑦ Solenoid valve (EAND)
- ③⑧ EAND relay
- ④⑦ Front brake switch
- ④⑧ Rear brake switch
- ⑥⑨ Fuse (MAIN)
- ⑦① Battery





TROUBLESHOOTING

The anti dive system does not operate. ate.



Remove the fairing.



Disconnect the EAND relay connector. Turn the main switch to ON.



Check the battery voltage (12V) on the Brown lead ①.

NO VOLTAGE

Check for an open or poor connection between the main switch and EAND relay.



Pull the brake lever or depress the brake pedal. Check the battery voltage (12V) on the Yellow lead ①.

NO VOLTAGE

Check the front and rear brake switches.



Connect the EAND relay connector.



Disconnect the solenoid valve (EAND) connectors.



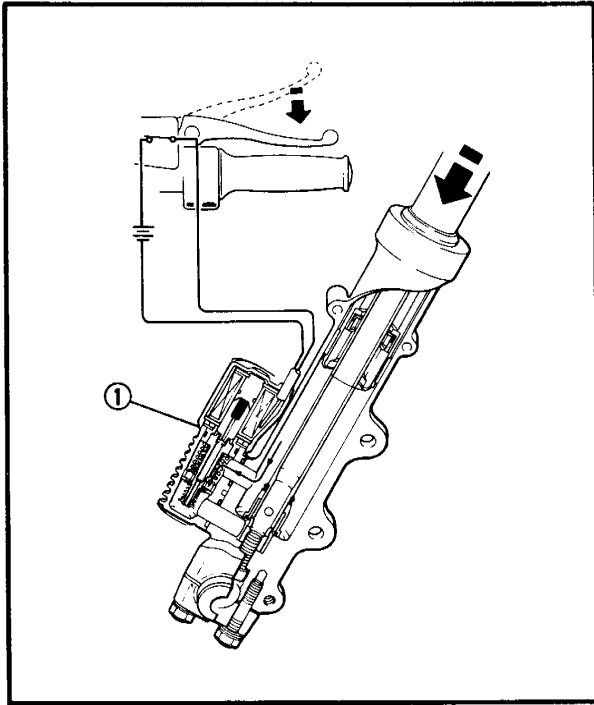
Pull the brake lever or depress the brake pedal. Check the battery voltage (12V) on the White leads.

NO VOLTAGE

Replace the EAND relay.



Check the solenoid valves (EAND).



ELECTRIC ANTI DIVE SYSTEM OPERATION
 When the front or rear brake applied, the solenoid valve operates in conjunction with the brake switch to increase the damping on the compression stroke and thus control dive.

① Solenoid valve

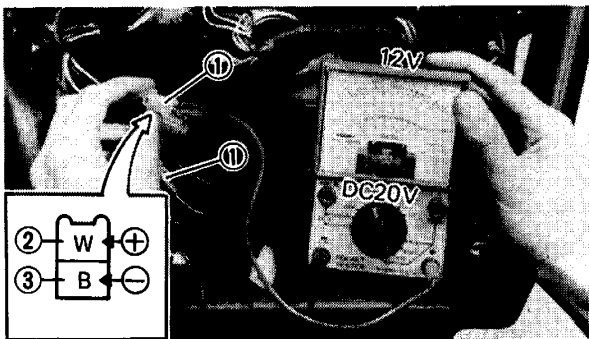
EAND RELAY TEST

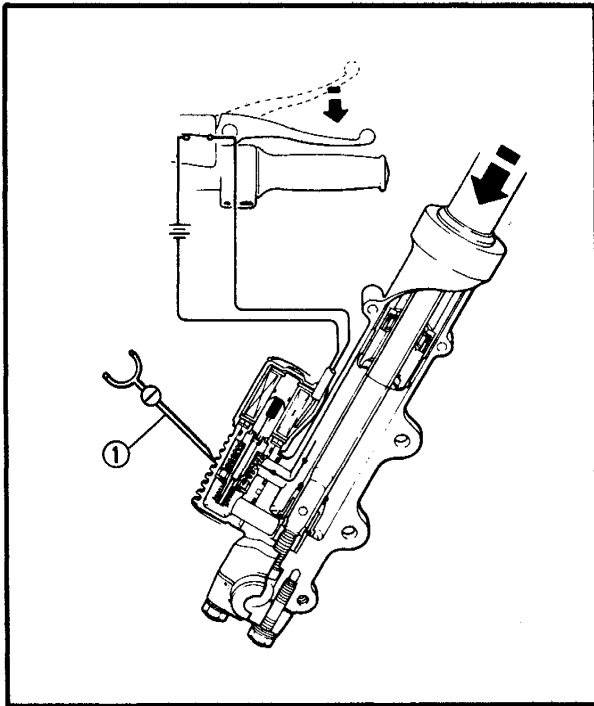
1. Inspect:
 - EAND relay
 - Poor condition → Replace.
 - By the following inspection steps.

EAND relay inspection steps:

- Remove the fairing.
- Disconnect the solenoid valve (EAND) connectors ① .
- Turn main switch to ON, and pull the brake lever or depress the brake pedal.
- Check the battery voltage (12V) on the White leads.
- No voltage → Replace EAND relay.

- ② White
- ③ Black



**SOLENOID VALVE (EAND) TEST**

1. Inspect:

- Solenoid valves
- Poor condition → Replace valve(s).
By the following inspection steps.

Solenoid valve (EAND) inspection steps:

- Turn main switch to ON.
- Using the sound scope ①, check for a solenoid valve sound when the brake lever is pulled or brake pedal is depressed.
Sound → Solenoid valve is OK.
No sound → Replace valve.

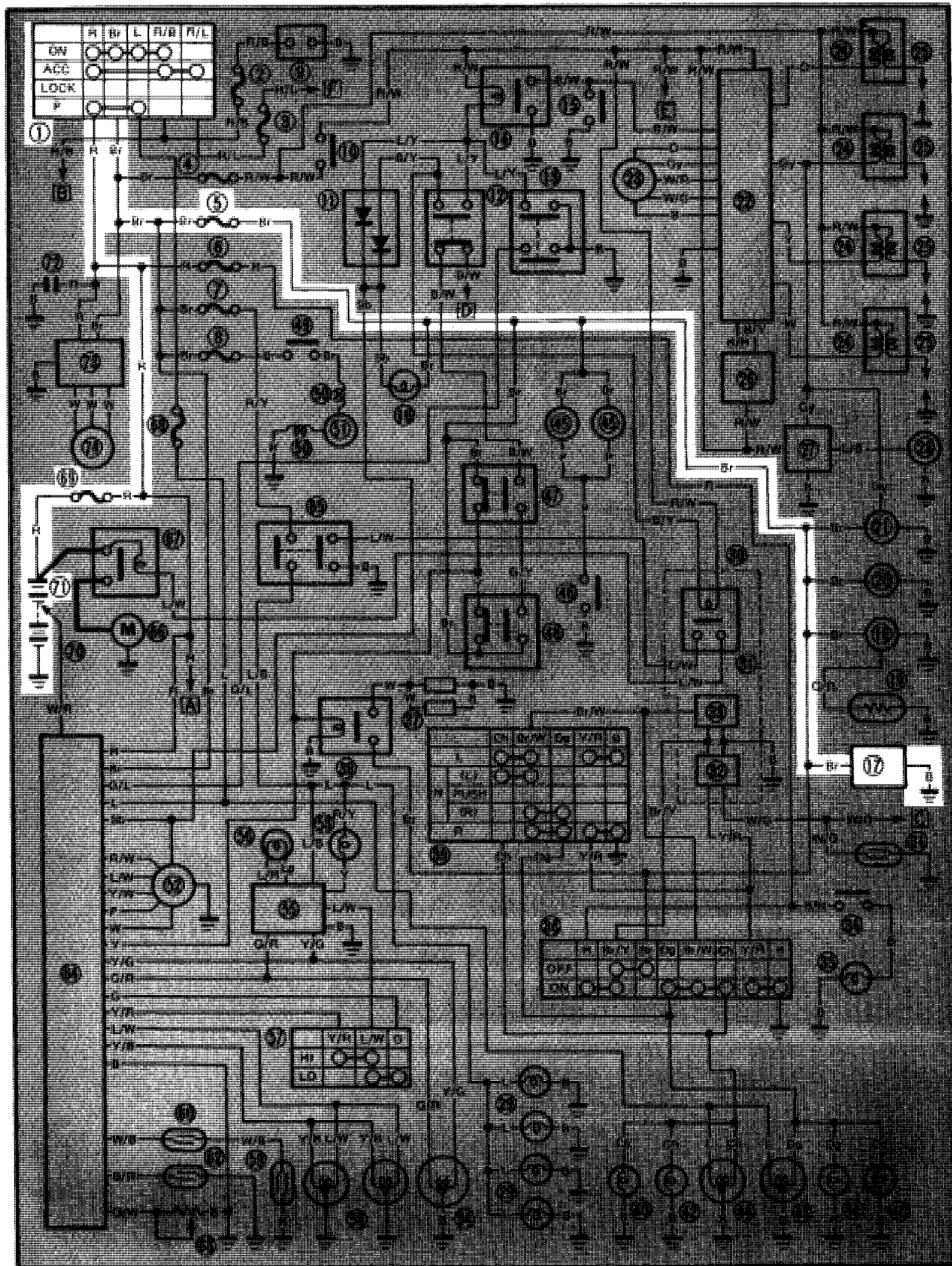
NOTE: _____

Be sure to check on both sides.



CARBURETOR AIR VENT SYSTEM

CIRCUIT DIAGRAM



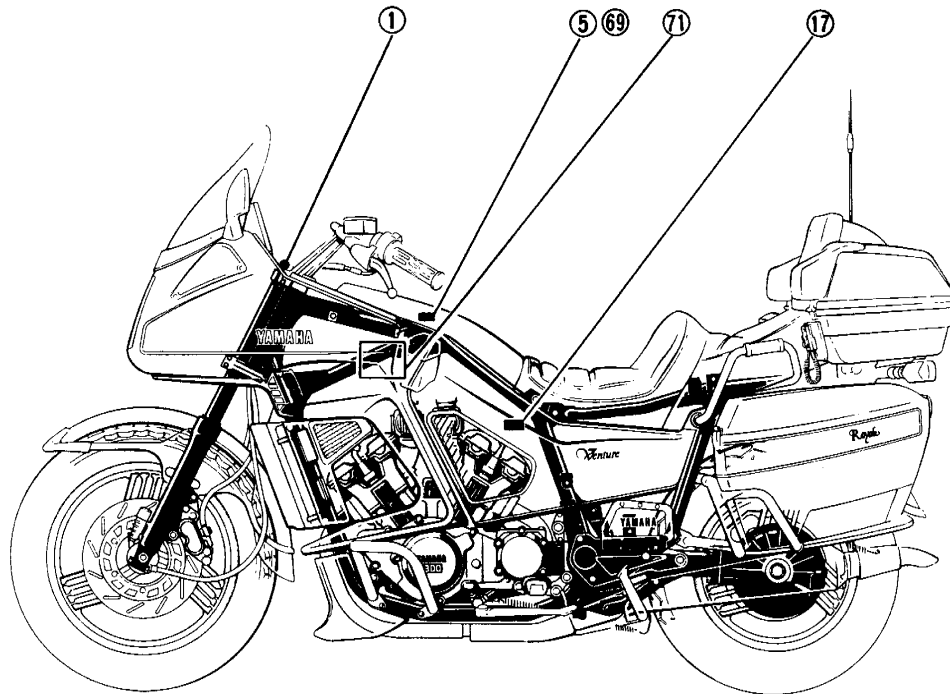


Aforementioned circuit diagram shows carburetor air vent circuit in wiring diagram.

NOTE:

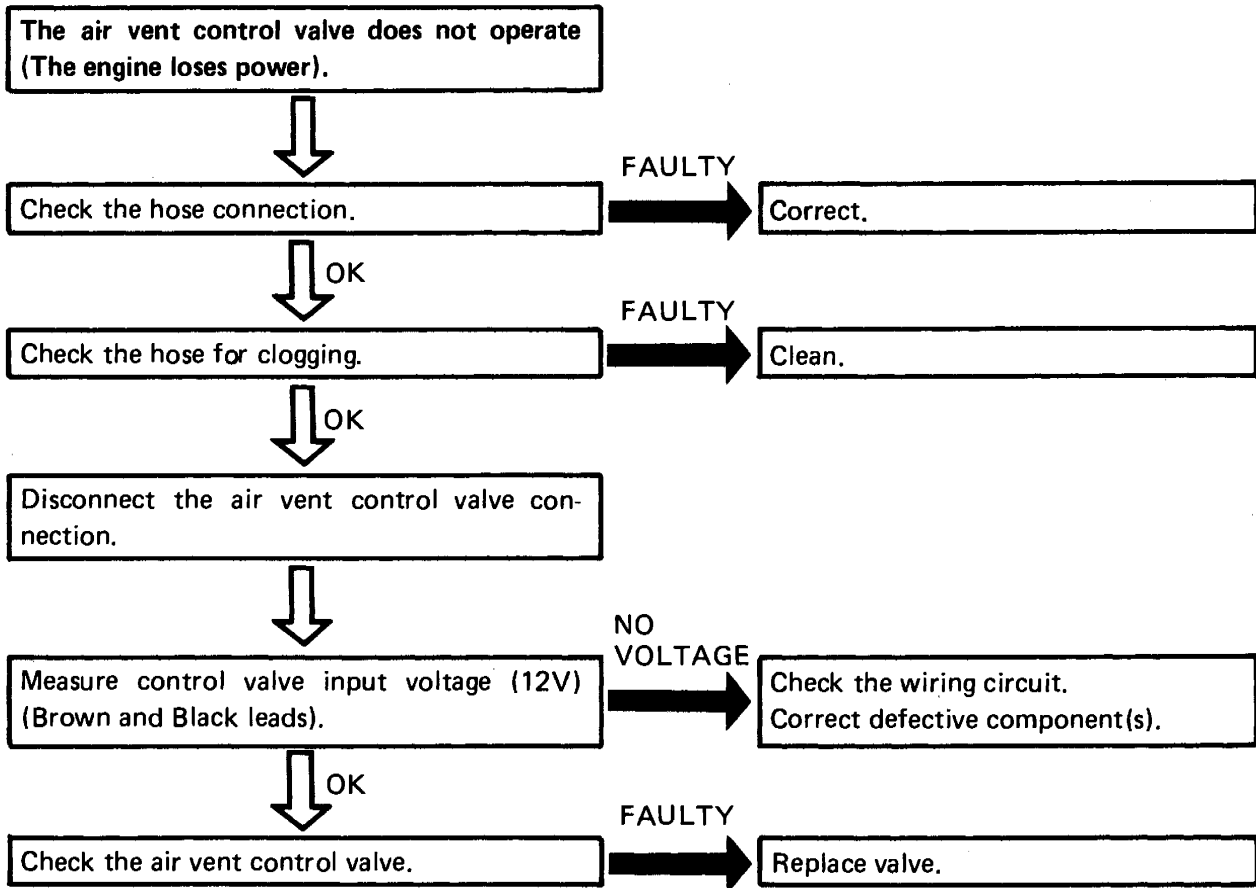
For the encircled numbers and color codes, see page 7-2.

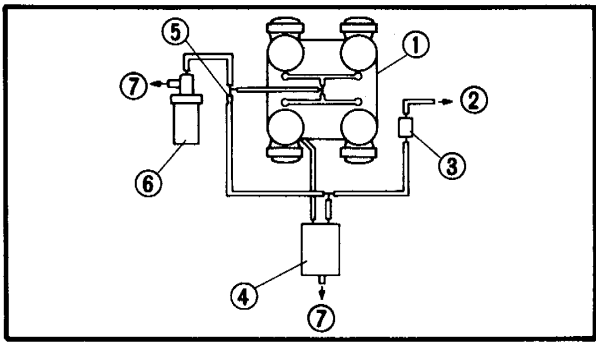
- ① Main switch
- ⑤ Fuse (SIGNAL)
- ⑰ Air vent control valve (For California)
- ⑥⑨ Fuse (MAIN)
- ⑦① Battery





TROUBLESHOOTING





CARBURETOR AIR VENT SYSTEM

Description

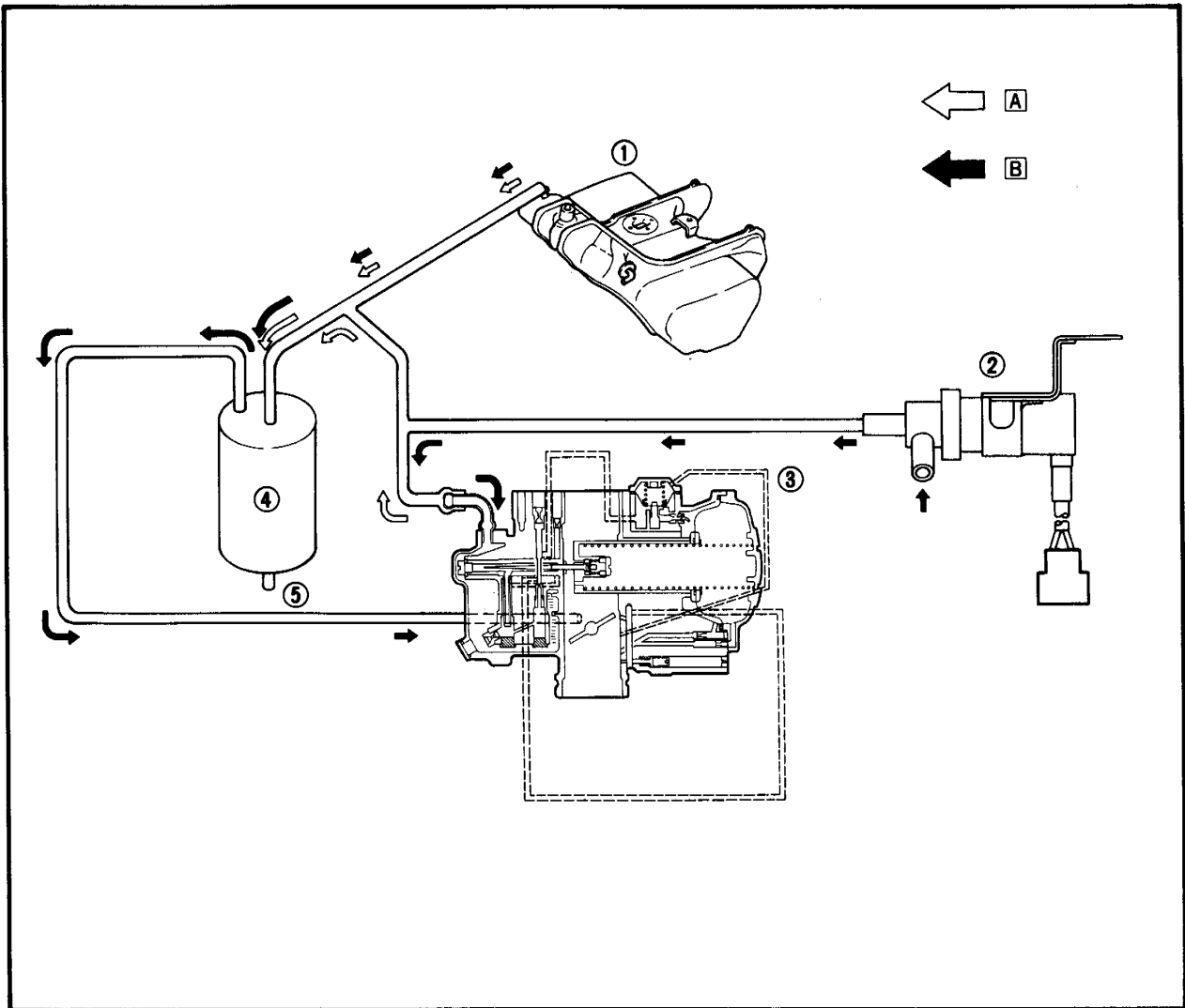
This model is equipped with a canister to prevent the discharging of fuel vapor and carburetor air vent into the atmosphere.

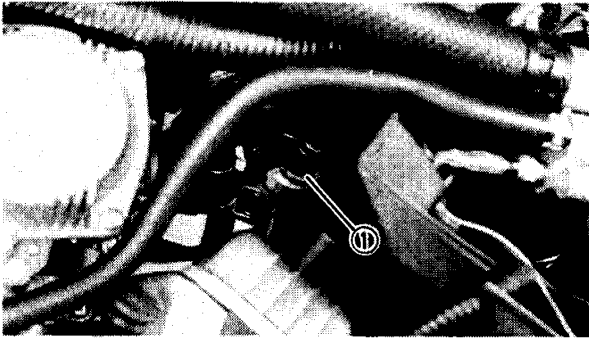
- ① Carburetor
- ② To carburetor
- ③ Roll over valve
- ④ Canister
- ⑤ Nozzle
- ⑥ Air vent control valve
- ⑦ To atmosphere

Operation

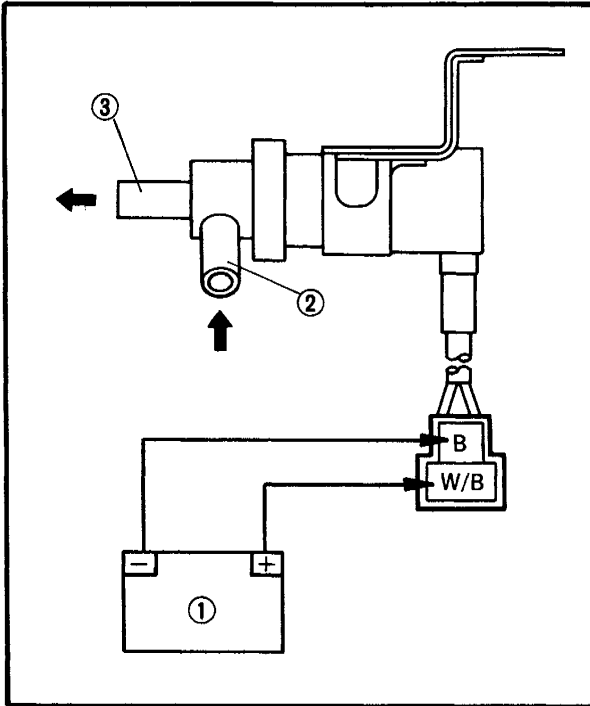
The carburetor air vent is controlled by the air vent control valve when the main switch is ON.

- ① Fuel tank
- ② Air vent control valve
- ③ Carburetor
- ④ Canister
- ⑤ To atmosphere
- A Main switch is OFF
- B Main switch is ON



**AIR VENT CONTROL VALVE TEST**

1. Remove:
 - Top cover
 - Side panels
 - Air filter case assembly
 - Air vent control valve ①
2. Inspect:
 - Air vent control valve operation
 By the following inspection steps.

**Air vent control valve inspection steps:**

- Connect the battery (12V) ① as shown.
- Blow air inside at nozzle ② which is open to the air.
- Check for air escape at nozzle ③ on the canister side.
No air escape → Replace valve.
- Disconnect the battery and blow air inside at nozzle ② which is open to the air.
- Check for air escape at nozzle ③ on the canister side.
Air escape → Replace valve.
No air escape → Valve is OK.

**CHAPTER 8.
APPENDICES**

SPECIFICATIONS 8-1
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 MAINTENANCE SPECIFICATIONS 8-3
 AUDIO SYSTEM AND C.B. RADIO SPECIFICATIONS 8-19

GENERAL TORQUE SPECIFICATIONS. 8-21

DEFINITION OF UNITS 8-21

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LUBRICATION DIAGRAMS 8-23

CABLE ROUTING 8-27

WIRING DIAGRAM



APPENDICES

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	XVZ13DS/DSC
Model Code Number	XVZ13DS: 1NL XVZ13DSC: 1UN
Engine Starting Number	XVZ13DS: 1NL-000101 XVZ13DSC: 1UN-000101
Vehicle Identification Number	XVZ13DS: JYA1NL00 * GA000101 XVZ13DSC: JYA1UN00 * GA000101
Dimensions:	
Overall Length	2,540 mm (100.0 in)
Overall Width	940 mm (37.0 in)
Overall Height	1,535 mm (60.4 in)
Seat Height	785 mm (30.9 in)
Wheelbase	1,610 mm (63.4 in)
Minimum Ground Clearance	145 mm (5.7 in)
Basic Weight:	
Weight Oil and Full Fuel Tank	XVZ13DS: 355 kg (783 lb) XVZ13DSC: 356 kg (785 lb)
Minimum Turning Radius:	2,900 mm (114 in)
Engine:	
Engine Type	Liquid cooled 4-stroke gasoline, DOHC
Cylinder Arrangement	V-4 cylinder
Displacement	1,294 cm ³
Bore x Stroke	79 x 66 mm (3.110 x 2.598 in)
Compression Ratio	10.5 : 1
Compression Pressure	1,177 kPa (12 kg/cm ² , 171 psi)
Starting System	Electric starter
Lubrication System:	Wet sump
Oil Type or Grade:	
Engine Oil	<p>Yamalube 4-cycle oil or SAE 20W40 type SE motor oil (If temperature does not go below 5°C (40°F)) SAE 10W30 type SE motor oil (If temperature does not go above 15°C (60°F)) SAE 80 API "GL-4" Hypoid gear oil</p>
Final Gear Oil	
Oil Capacity:	
Engine Oil:	
Periodic Oil Change	3.5 L (3.1 Imp qt, 3.7 US qt)
With Oil Filter Replacement	3.8 L (3.3 Imp qt, 4.0 US qt)
Total Amount	4.7 L (4.1 Imp qt, 5.0 US qt)
Final Gear Case:	
Total Amount	0.2 L (0.18 Imp qt, 0.21 US qt)
Radiator Capacity:	
(Including All routes)	2.8 L (2.46 Imp qt, 2.96 US qt)
Air Filter:	Dry type element
Fuel:	
Type	Regular gasoline
Tank Capacity:	
Total	20 L (4.4 Imp gal, 5.3 US gal)
Reserve	4.0 L (0.88 Imp gal, 1.06 US gal)

SPECIFICATIONS



Model	XVZ13DS/DSC													
Carburetor: Type/Manufacturer	BDS 34 x 4/MIKUNI													
Spark Plug: Type/Manufacturer Gap	DPR8EA-9/NGK, X24EPR-U9/NIPPONDENSO 0.8 ~ 0.9 mm (0.031 ~ 0.035 in)													
Clutch Type:	Wet, multiple-disc													
Transmission: Primary Reduction System Primary Reduction Ratio Secondary Reduction System Secondary Reduction Ratio Transmission Type Operation Gear Ratio: 1st 2nd 3rd 4th 5th	Spur gear 87/49 (1.775) Shaft drive 21/27 x 33/10 (2.566) Constant mesh, 5-speed Left foot operation 39/15 (2.600) 39/22 (1.772) 31/23 (1.347) 31/29 (1.068) 29/32 (0.906)													
Chassis: Frame Type Caster Angle Trail	Double cradle 28.5° 125 mm (4.9 in)													
Tire: Type Size (F) Size (R) Wear Limit	Tubeless 120/90-18 65H BRIDGESTONE L303/DUNLOP F16 140/90-16 71H BRIDGESTONE G508/DUNLOP K827 1.0 mm (0.04 in)													
Tire Pressure (Cold Tire): Basic Weight: With Oil and Full Fuel Tank Maximum Load * Cold Tire Pressure: Up to 90 kg (198 lb) Load * 90 kg (198 lb)* ~ Maximum Load * High Speed Riding	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">XVZ13DS: 355 kg (783 lb) XVZ13DSC: 356 kg (785 lb) XVZ13DS: 175 kg (386 lb) XVZ13DSC: 174 kg (384 lb)</td> </tr> <tr> <th>FRONT</th> <th>REAR</th> </tr> <tr> <td>225 kPa (2.3 kg/cm², 32 psi)</td> <td>225 kPa (2.3 kg/cm², 32 psi)</td> </tr> <tr> <td>225 kPa (2.3 kg/cm², 32 psi)</td> <td>275 kPa (2.8 kg/cm², 40 psi)</td> </tr> <tr> <td>225 kPa (2.3 kg/cm², 32 psi)</td> <td>225 kPa (2.3 kg/cm², 32 psi)</td> </tr> <tr> <td colspan="2">* Load is the total weight of cargo, rider, passenger, and accessories.</td> </tr> </table>		XVZ13DS: 355 kg (783 lb) XVZ13DSC: 356 kg (785 lb) XVZ13DS: 175 kg (386 lb) XVZ13DSC: 174 kg (384 lb)		FRONT	REAR	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)	275 kPa (2.8 kg/cm ² , 40 psi)	225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)	* Load is the total weight of cargo, rider, passenger, and accessories.	
XVZ13DS: 355 kg (783 lb) XVZ13DSC: 356 kg (785 lb) XVZ13DS: 175 kg (386 lb) XVZ13DSC: 174 kg (384 lb)														
FRONT	REAR													
225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)													
225 kPa (2.3 kg/cm ² , 32 psi)	275 kPa (2.8 kg/cm ² , 40 psi)													
225 kPa (2.3 kg/cm ² , 32 psi)	225 kPa (2.3 kg/cm ² , 32 psi)													
* Load is the total weight of cargo, rider, passenger, and accessories.														
Brake: Front (Right) Operation Front (Left) and Rear Operation	Disc brake Right hand operation Disc brake (Unified Brake) Right foot operation													

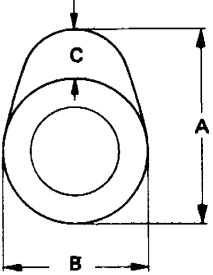
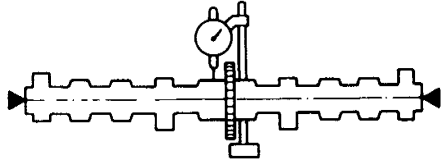
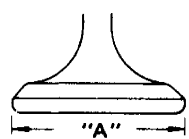
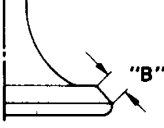
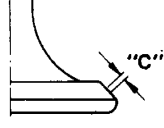
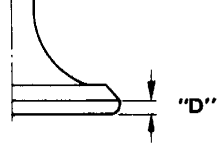


Model	XVZ13DS/DSC
Suspension: Front Suspension Rear Suspension	Telescopic fork Swing arm (New Monocross)
Shock Absorber: Front Shock Absorber Rear Shock Absorber	Air/Coil spring, Oil damper Air/Coil spring, Gas/Oil damper
Wheel Travel: Front Wheel Travel Rear Wheel Travel	140 mm (5.5 in) 105 mm (4.1 in)
Electrical: Ignition System Generator System Battery Type or Model Battery Capacity	T.C.I. A.C. magneto generator GM18Z-3A 12V 20AH
Headlight Type:	Bulb type (Quartz bulb)
Bulb Wattage x Quantity: Headlight Tail/Brake Light Flasher Light Parking/Running Light Trunk Light Indicator Light: "NEUTRAL" "HIGH BEAM" "HEAD LAMP" "TURN" "ON" "SET" "RESUME" Meter Light	12V, 60W/55W x 1 12V, 8W/27W x 2 12V, 27W x 4 12V, 8W x 2 12V, 5W x 1 12V, 3.4W x 1 12V, 3.4W x 1 12V, 3.4W x 1 12V, 3.4W x 2 12V, 3W x 1 12V, 3W x 1 12V, 3W x 1 12V, 3.4W x 4

MAINTENANCE SPECIFICATIONS

Engine

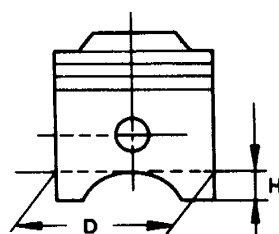
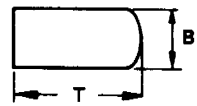


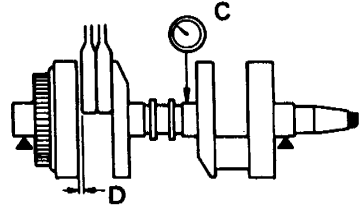
Model	XVZ13DS/DSC
Cylinder Head: Warp Limit *	0.03 mm (0.0012 in)
Cylinder: Bore Size/Measureing Point * Out of Round Limit	78.967 ~ 79.016 mm (3.109 ~ 3.111 in)/ 40 mm (1.57 in) 0.05 mm (0.002 in)

Model	XVZ13DS/DSC	
<p>Camshaft: Drive Method Cam Cap Inside Dia. Camshaft Outside Dia. Shaft-to-Cap Clearance Cam Dimensions: Intake "A" < Limit > Intake "B" < Limit > Exhaust "A" < Limit > Exhaust "B" < Limit > Camshaft Runout Limit</p>  	<p>Chain drive (Center) 25.000 ~ 25.021 mm (0.9843 ~ 0.9851 in) 24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in) 0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)</p> <p>35.75 ~ 35.85 mm (1.407 ~ 1.411 in) 35.65 mm (1.404 in) 27.95 ~ 28.05 mm (1.100 ~ 1.104 in) 27.85 mm (1.096 in) 35.75 ~ 35.85 mm (1.407 ~ 1.411 in) 35.65 mm (1.404 in) 27.95 ~ 28.05 mm (1.100 ~ 1.104 in) 27.85 mm (1.096 in)</p> <p>0.03 mm (0.0012 in)</p>	
<p>Cam Chain: Cam Chain Type/No. of Links Cam Chain Adjustment Method</p>	<p>BF05M/118 Automatic</p>	
<p>Valve, Valve Seat, Valve Guide: Valve Clearance (Cold): IN. EX. Valve Dimensions:    </p> <p>"A" Head Dia. IN. EX. "B" Face Width IN. EX. "C" Seat Width IN. EX. < Limit > IN. EX. "D" Margin Thickness IN. EX. < Limit > IN. EX. Stem Outside Dia. IN. EX. < Limit > IN. EX. Guide Inside Dia. IN. EX. < Limit > IN. EX.</p>	<p>0.11 ~ 0.15 mm (0.004 ~ 0.006 in) 0.16 ~ 0.20 mm (0.006 ~ 0.008 in)</p> <p>28.9 ~ 29.1 mm (1.138 ~ 1.146 in) 23.9 ~ 24.1 mm (0.941 ~ 0.945 in) 1.3 ~ 3.1 mm (0.051 ~ 0.122 in) 1.3 ~ 2.4 mm (0.051 ~ 0.095 in) 0.9 ~ 1.1 mm (0.035 ~ 0.043 in) 0.9 ~ 1.1 mm (0.035 ~ 0.043 in) 1.4 mm (0.055 in) 1.4 mm (0.055 in) 1.1 ~ 1.5 mm (0.043 ~ 0.059 in) 1.1 ~ 1.5 mm (0.043 ~ 0.059 in) 0.7 mm (0.028 in) 0.7 mm (0.028 in) 5.975 ~ 5.990 mm (0.2352 ~ 0.2358 in) 5.960 ~ 5.975 mm (0.2346 ~ 0.2352 in) 5.945 mm (0.234 in) 5.920 mm (0.233 in) 6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in) 6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in) 6.05 mm (0.238 in) 6.05 mm (0.238 in)</p>	



Model		XVZ13DS/DSC
Stem-to-Guide Clearance	IN. EX.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in) 0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
< Limit >	IN. EX.	0.08 mm (0.0031 in) 0.10 mm (0.0039 in)
Stem Runout Limit		0.01 mm (0.0004 in)
Valve Spring:		
Inner Spring:		
Free Length	IN. EX.	37.30 mm (1.469 in) 37.30 mm (1.469 in)
< Limit >	IN. EX.	35.30 mm (1.390 in) 35.30 mm (1.390 in)
Set Length (Valve Closed)	IN. EX.	31.8 mm (1.25 in) 31.8 mm (1.25 in)
Compressed Pressure (Installed)	IN. EX.	4.57 ~ 5.37 kg (10.1 ~ 11.8 lb) 4.57 ~ 5.37 kg (10.1 ~ 11.8 lb)
Tilt Limit *	IN. EX.	2.5°/1.6 mm (0.063 in) 2.5°/1.6 mm (0.063 in)
Direction of Winding	IN. EX.	Clockwise Clockwise
Outer Spring:		
Free Length	IN. EX.	39.45 mm (1.553 in) 39.45 mm (1.553 in)
< Limit >	IN. EX.	37.25 mm (1.467 in) 37.25 mm (1.467 in)
Set Length (Valve Closed)	IN. EX.	33.8 mm (1.331 in) 33.8 mm (1.331 in)
Compressed Pressure (Installed)	IN. EX.	10.1 ~ 11.9 kg (22.3 ~ 26.2 lb) 10.1 ~ 11.9 kg (22.3 ~ 26.2 lb)
Tilt Limit *	IN. EX.	2.5°/1.7 mm (0.067 in) 2.5°/1.7 mm (0.067 in)
Direction of Winding	IN. EX.	Counterclockwise Counterclockwise



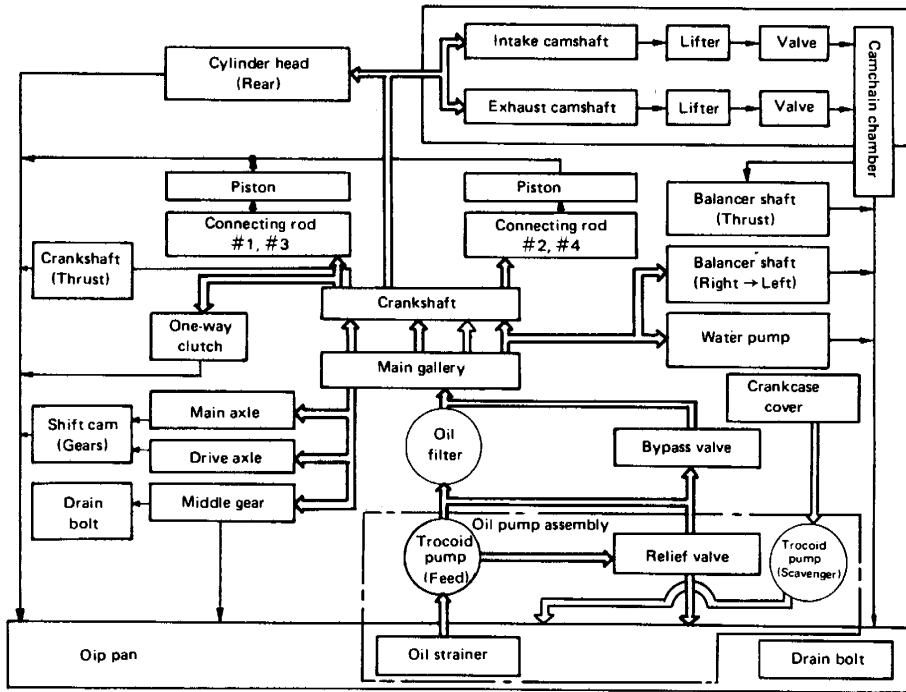
Model	XVZ13DS/DSC	
<p>Piston: Piston Clearance < Limit > Piston Size "D" Measuring Point "H"</p> 	<p>0.055 ~ 0.069 mm (0.0022 ~ 0.0027 in) 0.15 mm (0.0059 in) 78.926 ~ 78.933 mm (3.1073 ~ 3.1076 in) 6.2 mm (0.244 in)</p>	
<p>Oversize:</p>	<p>1st 2nd</p>	<p>79.25 mm (3.120 in) 79.50 mm (3.130 in)</p>
<p>Piston Ring: Top Ring: Type Dimensions (B x T) End Gap (Installed) < Limit > Side Clearance (Installed) < Limit ></p>  <p>2nd Ring: Type Dimensions (B x T) End Gap (Installed) < Limit > Side Clearance < Limit ></p>  <p>Oil Ring: Dimensions (B x T) End Gap (Installed)</p> 	<p>Barrel 3.1 x 1.0 mm (0.122 x 0.040 in) 0.35 ~ 0.50 mm (0.0138 ~ 0.0197 in) 0.70 mm (0.0276 in) 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) 0.12 mm (0.0047 in)</p> <p>Taper 3.1 x 1.2 mm (0.122 x 0.047 in) 0.35 ~ 0.50 mm (0.0138 ~ 0.0197 in) 0.80 mm (0.0315 in) 0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in) 0.12 mm (0.0047 in)</p> <p>3.1 x 2.5 mm (0.122 x 0.098 in) 0.3 ~ 0.9 mm (0.0118 ~ 0.0354 in)</p>	
<p>Connecting Rod: Oil Clearance Bearing Color Code</p>	<p>0.021 ~ 0.039 mm (0.0008 ~ 0.0015 in) 1. Blue 2. Black 3. Brown 4. Green 5. Yellow 6. Pink</p>	
<p>Crankshaft:</p>  <p>Runout Limit "C" Big End Side Clearance "D" Journal Oil Clearance Bearing Color Code</p>	<p>0.03 mm (0.0012 in) 0.160 ~ 0.264 mm (0.0063 ~ 0.0104 in) 0.020 ~ 0.038 mm (0.0008 ~ 0.0015 in) 1. Blue 2. Black 3. Brown 4. Green 5. Yellow 6. Pink 7. Red</p>	



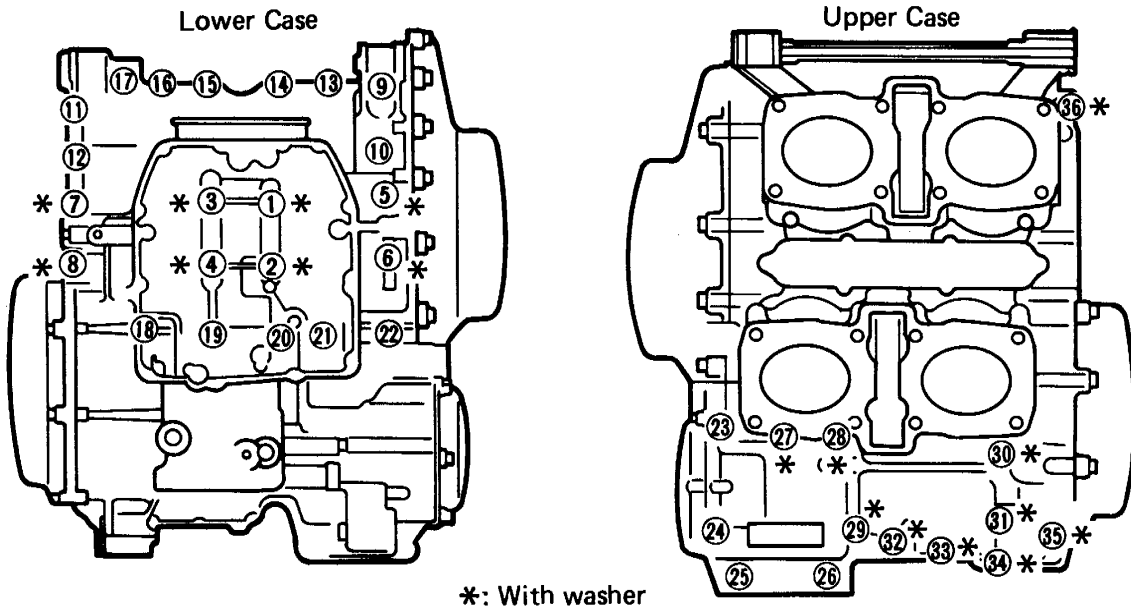
Model	XVZ13DS/DSC
Clutch: Friction Plate: Thickness Quantity Wear Limit Clutch Plate: Thickness Quantity Warp Limit Clutch Spring: Free Height Quantity Minimum Height Warp Limit Push Rod Bending Limit	2.9 ~ 3.1 mm (0.114 ~ 0.122 in) 8 pcs. 2.8 mm (0.11 in) 2.2 ~ 2.4 mm (0.087 ~ 0.095 in) 7 pcs. 0.2 mm (0.008 in) 7.0 mm (0.28 in) 1 pc. 6.5 mm (0.26 in) 0.1 mm (0.004 in) 0.5 mm (0.02 in)
Transmission: Main Axle Deflection Limit Drive Axle Deflection Limit	0.08 mm (0.0031 in) 0.08 mm (0.0031 in)
Shifter: Shifter Type Guide Bar Bending Limit	Guide Bar 0.025 mm (0.001 in)
Carburetor: I.D. Mark Main Jet (M.J.) Main Air Jet (M.A.J.) Jet Needle (J.N.) Needle Jet (N.J.) Pilot Jet (P.J.) Pilot Air Jet (P.A.J. 1) (P.A.J. 2) Pilot Screw (P.S.) Pilot Outlet (P.O.) Bypass (B.P. 1) (B.P. 2) (B.P. 3) Valve Seat Size (V.S.) Starter Jet (G.S. 1) (G.S. 2) Fuel Level Engine Idling Speed Vacuum Pressure at Idling Speed Vacuum Synchronous Difference	XVZ13DS: 1NL00 XVZ13DSC: 1UN00 #125 φ2.0 5DZ3-1 Y-0 #37.5 #80 #180 Preset 0.9 0.8 0.8 0.9 1.5 #45 0.8 15.5 ~ 16.5 mm (0.61 ~ 0.65 in) 950 ~ 1,050 r/min Above 33.3 kPa (250 mmHg, 9.84 inHg) Below 1.33 kPa (10 mmHg, 0.40 inHg)
Fuel Pump: Type Consumption Amperage (Max.) Out-put Pressure	Electrical type 0.7A 14.7 ~ 19.6 kPa (0.15 ~ 0.20 kg/cm ² , 2.13 ~ 2.84 psi)
Lubrication System: Oil Filter Type Oil Pump Type: Tip Clearance < Limit > Side Clearance < Limit > Bypass Valve Setting Pressure Relief Valve Operating Pressure	Paper type Trochoid type 0 ~ 0.12 mm (0 ~ 0.0047 in) 0.17 mm (0.0067 in) 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in) 0.08 mm (0.0031 in) 167 ~ 235 kPa (1.7 ~ 2.4 kg/cm ² , 24 ~ 34 psi) 432 ~ 549 kPa (4.4 ~ 5.6 kg/cm ² , 63 ~ 80 psi)

Model	XVZ13DS/DSC
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Lubrication Chart:






Crankcase Tightening Sequence:





Model	XVZ13DS/DSC
<p>Cooling System:</p> <p>Radiator Core Size:</p> <p style="padding-left: 150px;">Width</p> <p style="padding-left: 150px;">Height</p> <p style="padding-left: 150px;">Thickness</p> <p>Radiator Cap Opening Pressure</p> <p>Reservoir Tank Capacity < From Low to Full Level ></p> <p>Water Pump:</p> <p style="padding-left: 20px;">Type</p> <p style="padding-left: 20px;">Reduction Ratio</p>	<p>363.8 mm (14.3 in)</p> <p>240 mm (9.45 in)</p> <p>16 mm (0.63 in)</p> <p>73.6 ~ 103.0 kPa (0.75 ~ 1.05 kg/cm², 10.7 ~ 14.9 psi)</p> <p>0.39 L (0.34 Imp qt, 0.41 US qt) 0.25 L (0.22 Imp qt, 0.26 US qt)</p> <p>Single-suction centrifugal pump</p> <p>31/21 (1.476)</p>
<p>Shaft Drive:</p> <p>Middle Gear Backlash < Limit ></p> <p>Final Gear Backlash < Limit ></p> <p>Ring Gear Stopper Clearance</p>	<p>0.05 ~ 0.12 mm (0.002 ~ 0.005 in)</p> <p>0.3 mm (0.012 in)</p> <p>0.1 ~ 0.2 mm (0.004 ~ 0.008 in)</p> <p>0.3 mm (0.012 in)</p> <p>0.30 ~ 0.60 mm (0.012 ~ 0.024 in)</p>

TIGHTENING TORQUE

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Camshaft Cap	Bolt	M6	32	10	1.0	7.2	
Spark Plug	—	M12	4	17.5	1.75	12.5	
Cylinder Head	Nut	M10	10	43	4.3	31	
Cylinder Head Cover	Bolt	M6	16	10	1.0	7.2	
Connecting Rod	Nut	M8	8	36	3.6	25	
AC Magneto Rotor	Bolt	M12	1	130	13.0	94	
Cam Sprocket	Flange Bolt	M7	8	20	2.0	14	
Plate (Damper Chain)	Flange Bolt	M8	1	24	2.4	17	
Tensioner	Bolt	M6	4	12	1.2	8.7	
Tensioner Stopper Bolt	Bolt	M16	2	20	2.0	14	
Water Pump Cover	Bolt	M6	5	10	1.0	7.2	
Water Pump Housing	Bolt	M6	4	10	1.0	7.2	
Coolant Drain Plug	Bolt	M14	1	43	4.3	31	
Thermostatic Valve Housing	Bolt	M6	2	10	1.0	7.2	
Thermostatic Valve Cover	Screw	M6	2	7	0.7	5.1	
Electric Fan Motor	Screw	M5	3	4	0.4	2.9	
Electric Fan	Nut	M5	1	4	0.4	2.9	
Radiator Assembly	Bolt	M6	4	7	0.7	5.1	
Radiator Cover	Screw	M5	4	4	0.4	2.9	
Chamber Cover (Oil/Water/Breather)	Bolt	M6	6	10	1.0	7.2	
Oil Pump Cover	Screw	M6	4	7	0.7	5.1	
Oil Strainer Housing	Screw	M6	3	7	0.7	5.1	
Oil Pump	Bolt	M6	3	10	1.0	7.2	
Oil Filter Cover	Union Bolt	M20	1	32	3.2	23	
Engine Oil Drain Bolt	Bolt	M14	1	43	4.3	31	
Oil Pan	Bolt	M6	12	10	1.0	7.2	
Oil Baffle Plate	Flange Bolt	M6	2	12	1.2	8.7	
Oil Delivery Pipe (Lower)	Union Bolt	M10	1	20	2.0	14	
Oil Delivery Pipe (Upper)	Union Bolt	M8	2	18	1.8	13	
Oil Delivery Pipe 4	Flange Bolt	M6	2	12	1.2	8.7	
Oil Pipe	Union Bolt	M8	1	18	1.8	13	
Carburetor Joint	Bolt	M6	6	10	1.0	7.2	
	Bolt	M6	2	5	0.5	3.6	
Fuel Pump	Flange Bolt	M6	2	12	1.2	8.7	
Exhaust Pipe (# 1, # 3) and Exhaust Joint	Bolt	M6	2	7	0.7	5.1	
Exhaust Pipe (# 2, # 4) and Chamber Clamp	Bolt	M8	2	25	2.5	18	
Chamber	Bolt	M8	4	25	2.5	18	
Exhaust Pipe Flange	Nut	M8	8	20	2.0	14	
Muffler Bracket	Flange Bolt	M10	2	25	2.5	18	
Muffler Stay and Chamber	Nut	M8	2	24	2.4	17	
Muffler Stay and Lower Case	Bolt	M8	2	20	2.0	14	
Exhaust Joint Cover	Bolt	M6	3	10	1.0	7.2	
Crankcase	Bolt	M6	10	12	1.2	8.7	
	Bolt	M8	19	24	2.4	17	
	Bolt	M10	8	40	4.0	29	



Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Drive Axle Bearing Retainer	Torx Screw	M8	4	25	2.5	18	Stake
Main Axle Bearing Retainer	Screw	M6	3	7	0.7	5.1	
Crankcase Cover (Left)	Bolt	M6	11	10	1.0	7.2	
Lead Clamp	Screw	M6	2	7	0.7	5.1	
Crankcase Cover (Right)	Bolt	M6	6	10	1.0	7.2	
Middle Gear Case Cover	Bolt	M6	9	10	1.0	7.2	
Middle Gear Oil Drain Bolt	Bolt	M8	1	38	3.8	27	
Stator One-way Clutch	Bolt	M8	3	24	2.4	17	Stake
Clutch Boss	Nut	M20	1	70	7.0	50	Use lock washer
Clutch Release Cylinder	Bolt	M6	2	12	1.2	8.7	
Clutch Pressure Plate	Screw	M6	6	8	0.8	5.8	
Middle Drive Gear	Nut	M44	1	110	11.0	80	Stake
Middle Drive Shaft	Lock Nut	M14	1	90	9.0	65	
Middle Drive Shaft Bearing Housing	Bolt	M8	3	30	3.0	22	
Shift Cam Segment	Torx Screw	M6	1	12	1.2	8.7	
Shift Cam Plate (Neutral)	Screw	M5	1	4	0.4	2.9	
Shift Cam Bearing Stopper	Screw	M6	3	7	0.7	5.1	
Change Lever Adjuster	Screw	M8	1	22	2.2	16	Use lock washer
Shift Cam Stopper Lever	Screw	M6	1	8	0.8	5.8	
Change Pedal Adjuster Lock Nut	Nut	M6	4	10	1.0	7.2	
Change Pedal and Linkage Pinch Bolt	Bolt	M6	3	10	1.0	7.2	
Thermostatic Switch	—	—	1	8	0.8	5.8	Apply Sealant
Thermo-unit	—	—	1	15	1.5	11	Apply Sealant
Neutral Switch	Screw	M5	3	4	0.4	2.9	
Starter Motor	Flange Bolt	M6	2	10	1.0	7.2	
Oil Level Switch	Bolt	M6	2	10	1.0	7.2	
Bearing Housing	Nut	M8	6	23	2.3	17	
	Flange Bolt	M10	2	40	4.0	29	
Bearing Retainer	Retainer	M65	1	110	11.0	80	
Coupling Gear	Nut	M14	1	110	11.0	80	
Final Gear Filler Bolt	Bolt	M14	1	23	2.3	17	
Final Gear Drain Bolt	Bolt	M14	1	23	2.3	17	




Chassis

Model	XVZ13DS/DSC
Steering System: Steering Bearing Type	Taper roller bearing
Front Suspension: Front Fork Travel Fork Spring Free Length < Limit > Collar Length Spring Rate: Stroke: Optional Spring Oil Capacity Oil Level Oil Grade Enclosed Air Pressure (Standard) < Min. ~ Max. >	140 mm (5.51 in) 461.5 mm (18.2 in) 456.5 mm (18.0 in) 97 mm (3.82 in) 4.12 N/mm (0.42 kg/mm, 23.5 lb/in) 7.85 N/mm (0.80 kg/mm, 44.8 lb/in) 0 ~ 110 mm (0 ~ 4.33 in) 110 ~ 140 mm (4.33 ~ 5.51 in) No. 409 cm ³ (14.4 Imp oz, 13.8 US oz) 172 mm (6.8 in) Yamaha fork oil 10wt or equivalent 78.5 kPa (0.8 kg/cm ² , 11 psi) 49.0 ~ 147 kPa (0.5 ~ 1.5 kg/cm ² , 7 ~ 21 psi)
Rear Suspension: Shock Absorber Travel Spring Free Length < Limit > Fitting Length Spring Rate: Stroke: Optional Spring Enclosed Gas Pressure: Enclosed Air Pressure: Minimum Standard Maximum	40 mm (1.57 in) 162 mm (6.38 in) 157 mm (6.18 in) 115 mm (4.53 in) 71.1 N/mm (7.25 kg/mm, 406 lb/in) 0 ~ 40 mm (0 ~ 1.57 in) No. 1,471 kPa (15 kg/cm ² , 213 psi) 49.0 kPa (0.5 kg/cm ² , 7 psi) 98.1 kPa (1.0 kg/cm ² , 14 psi) 588 kPa (6.0 kg/cm ² , 85 psi)
Rear Arm: Swingarm Free Play Limit: End Side	Zero mm (Zero in) Zero mm (Zero in)
Front Wheel: Type Rim Size Rim Material Rim Runout Limit: Vertical Lateral	Cast wheel MT21.5 x 18 Aluminum 2 mm (0.08 in) 2 mm (0.08 in)
Rear Wheel: Type Rim Size Rim Material Rim Runout Limit: Vertical Lateral	Cast wheel MT3.00 x 16 Aluminum 2 mm (0.08 in) 2 mm (0.08 in)
Front Disc Brake: Type Disc Outside Diameter x Thickness Pad Thickness Inner < Limit > * Pad Thickness Outer < Limit > *	Dual (4-pot caliper) 282 x 7.0 mm (11.1 x 0.28 in) 7.5 mm (0.30 in) 0.5 mm (0.02 in) 7.5 mm (0.30 in) 0.5 mm (0.02 in)





Model	XVZ13DS/DSC
Master Cylinder Inside Diameter Caliper Cylinder Inside Diameter: Left Right Brake Fluid Type	14 mm (0.55 in) 32.10 mm (1.26 in)/2 pcs. 33.96 mm (1.34 in)/2 pcs. DOT #3
Rear Disc Brake: Type Disc Outside Diameter x Thickness Pad Thickness Inner < Limit > * Pad Thickness Outer < Limit > * 	Single (4-pot caliper) 320 x 5 mm (12.6 x 0.20 in) 7.5 mm (0.30 in) 0.5 mm (0.02 in) 7.5 mm (0.30 in) 0.5 mm (0.02 in)
Master Cylinder Inside Diameter Caliper Cylinder Inside Diameter Brake Fluid Type	17.46 mm (0.69 in) 33.96 mm (1.34 in)/2 pcs. DOT #3
Clutch: Master Cylinder Inside Diameter Release Cylinder Inside Diameter Brake Fluid Type	15.87 mm (0.63 in) 38.1 mm (1.50 in) DOT #3
Brake Lever and Brake Pedal: Brake Lever Free Play Brake Pedal Position Brake Pedal Free Play	2 ~ 5 mm (0.08 ~ 0.20 in) 10 mm (0.4 in) 13 ~ 15 mm (0.5 ~ 0.6 in)

Recommended combinations of the front fork and the rear shock absorber

Use this table as guidance to meet specific riding conditions and motorcycle load.

Loading condition	Solo rider			With passenger or accessory equipments			With accessory equipments and passenger			
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	
Air Pressure	Front	78.5	0.8	11	78.5 ~ 98.1	0.8 ~ 1.0	11 ~ 14	78.5 ~ 118	0.8 ~ 1.2	11 ~ 17
	Rear	98.1	1.0	14	196 ~ 294	2.0 ~ 3.0	28 ~ 43	294 ~ 490	3.0 ~ 5.0	43 ~ 71
Damping adjuster	1 or 2			2 or 3			3 or 4			



TIGHTENING TORQUE

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Front Wheel Axle	M14	105	10.5	75	} Refer to NOTE
Front Axle Pinch Bolt	M8	20	2.0	14	
Under Bracket and Inner Tube	M8	23	2.3	17	
Steering Crown and Inner Tube	M8	20	2.0	14	
Steering Crown and Steering Shaft	M22	110	11.0	80	
Steering Shaft Ring Nut (Lower)	M25	50	5.0	36	
	M25	3	0.3	2.2	} Refer to NOTE
Steering Shaft Ring Nut (Upper)	M25	—	—	—	
Caliper and Front Fork	M10	45	4.5	32	Front Rear
Caliper and Bracket	M10	45	4.5	32	
Caliper and Bleed Screw	M8	5	0.5	3.6	} Brake & Clutch
Brake Hose Union Bolt	M10	25	2.5	18	
Clutch Hose Union Bolt	M10	25	2.5	18	
Brake Hose and Brake Pipe	M10	19	1.9	13	
Clutch Hose and Clutch Pipe	M10	19	1.9	13	
Front Master Cylinder Cap	M4	1	0.1	0.7	
Master Cylinder and Master Cylinder Bracket	M8	9	0.9	6.5	
Rear Master Cylinder and Proportioning Valve	M10	26	2.6	19	
Rear Master Cylinder and Frame	M8	23	2.3	17	
Pivot Shaft (Left) and Frame	M22	100	10.0	72	
Pivot Shaft (Right) and Frame	M25	6	0.6	4.3	
Pivot Shaft (Right) and Locknut	M25	100	10.0	72	
Front Fender and Front Fork	M8	20	2.0	14	} Brake & Clutch
Handlebar Lower Holder and Handlebar					
— Pinch Bolt	M8	30	3.0	22	
— Stopper Nut	M22	125	12.5	90	
Handlebar and Handlebar Grip					
— Pinch Bolt	M10	17	1.7	12	
— Stopper Nut	M10	35	3.5	25	
Engine Bracket (Front Upper)	M10	42	4.2	30	
Engine Bracket (Front Lower)	M10	42	4.2	30	
Engine Bracket (Rear)	M12	70	7.0	50	
Engine Stay and Frame	M8	16	1.6	11	
Rear Wheel Axle and Nut	M18	150	15.0	110	
Fuel Sender and Fuel Tank	M6	5	0.5	3.6	
Relay Arm and Frame	M12	60	6.0	43	
Relay Arm and Rear Shock Absorber	M10	60	6.0	43	

NOTE:

- Ring nut (lower):
 - 1) First, tighten the ring nut approximately 50 Nm (5.0 m·kg, 36 ft·lb) by using the torque wrench, then loosen the ring nut completely.
 - 2) Retighten the ring nut 3 Nm (0.3 m·kg, 2.2 ft·lb).
- Ring nut (upper):
 - 1) Finger tighten the ring nut.



SPECIFICATIONS

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Swingarm and Arm	M10	30	3.0	22	
Rear Shock Absorber and Frame	M10	30	3.0	22	
Down Tube and Frame	M10	48	4.8	35	
Footrest Bracket and Frame	M10	28	2.8	20	
Frame and Rear Frame – Upper	M10	55	5.5	40	
– Lower	M10	55	5.5	40	
Frame and Cross Bar Assembly	M8	23	2.3	17	
Footrest and Footrest Bracket – Right	M10	48	4.8	35	
– Left	M12	105	10.5	75	



Electrical

Model	XVZ13DS/DSC
Voltage:	12V
Ignition System: Ignition Timing (B.T.D.C.) Advancer Type	5° at 1,000 r/min Vacuum and electrical
<p>5.3 kPa (40 mmHg, 1.57 inHg)</p> <p>33.3 kPa (250 mmHg, 9.84 inHg)</p>	
T.C.I.: Pickup Coil Resistance (Color)	93.5 ~ 126.5Ω at 20°C (68°F) (Black – Orange) (Black – Gray) (Black – White/Green), (Black – White/Red)
T.C.I. Unit-Model/Manufacturer	T1D14-17/HITACHI
Ignition Coil: Model/Manufacturer Primary Winding Resistance Secondary Winding Resistance	CM11-61/HITACHI 2.4 ~ 3.0Ω at 20°C (68°F) 10.6 ~ 15.8 kΩ at 20°C (68°F)
Charging System/Type:	A.C. magneto generator
A.C. Generator: Model/Manufacturer Nominal Output	F-X736/HITACHI 14V, 30A at 5,000 r/min



Model	XVZ13DS/DSC
Voltage Regulator: Type Model/Manufacturer No Load Regulated Voltage	Short control SH545-12/SHINDENGEN 14 ~ 15V
Rectifier: Model/Manufacturer Capacity Withstand Voltage	SH545-12/SHINDENGEN 26A 200V
Battery: Capacity Specific Gravity	12V, 20AH 1.280
Electric Starter System: Type Starter Motor: Model/Manufacturer Out put Bush: Overall Length < Limit > Spring Pressure Commutator: Outside Diameter < Wear Limit > Mica Undercut Starter Relay: Model/Manufacturer Amperage Rating Coil Winding Resistance	Constant mesh type SM-229C/MITSUBA 0.6 kW 12.5 mm (0.49 in) 5.5 mm (0.22 in) 560 ~ 680 g (19.7 ~ 23.9 oz) 28 mm (1.1 in) 27 mm (1.06 in) 0.5 mm (0.020 in) A104-128/HITACHI 100A 3.9 ~ 4.7Ω at 20°C (68°F)
Horn: Type/Quantity Model/Manufacturer Maximum Amperage	Plain type x 2 CF3-12/NIKKO 3A
Flasher Relay: Type Model/Manufacturer Self Cancelling Device Flasher Frequency Wattage	Semi transistor type FX257N/NIPPONDENSO Yes. 75 ~ 95 cycle/min 27W x 2 + 3.4W x 2
Self Cancelling Unit: Model/Manufacturer	FX257N/NIPPONDENSO
Oil Level Switch: Model/Manufacturer	1NL/NIPPONDENSO
Fuel Gauge: Model/Manufacturer Sender Unit Resistance: Full Empty	26H/NIPPONSEIKI 36 ~ 44Ω at 20°C (68°F) 273 ~ 347Ω at 20°C (68°F)
Sidestand Relay: Model/Manufacturer Coil Winding Resistance Diode	G2MW-1121T-01D-Y4/TATEISHI 90 ~ 110Ω at 20°C (68°F) No.

SPECIFICATIONS



Model	XVZ13DS/DSC
Reserve Lighting Unit: Model/Manufacturer	337-81901/KOITO
Starting Circuit Cut-off Relay: Model/Manufacturer Coil Winding Resistance Diode	FX257N/NIPPONDENSO 203 ~ 248Ω at 20°C (68° F) No.
Fuel Pump Control Relay: Model/Manufacturer	G8D-02Y/OMRON
Electric Fan: Model/Manufacturer	26H/NIPPONDENSO
Thermo Switch: Model/Manufacturer	47X/NIPPON THERMOSTAT
Thermo-unit: Model/Manufacturer	11H/NIPPONSEIKI
Circuit Breaker: Type Amperage for Individual Circuit x Quantity: MAIN ACC HEAD TAIL SIGNAL IGNITION RESERVE CLASS BACK UP AUDIO CB FAN HAZARD RESERVE	Fuse 40A x 1 10A x 1 15A x 1 10A x 1 20A x 1 15A x 1 10A x 1/15A x 1/20A x 1 20A x 1 5A x 1 5A x 1 10A x 1 15A x 1 5A x 1/10A x 1/15A x 1



SPECIFICATIONS

AUDIO SYSTEM AND C.B. RADIO SPECIFICATIONS

Model	XVZ13DS/DSC
AM/FM Radio: Tuning Range: AM FM Intermediate Frequency: AM FM Usable Sensitivity: AM FM Stop Sensitivity: AM FM Stereo Separation: FM Dimensions (Length x Width x Height): Radio Panel Radio Black Box Current Consumption: Switch ON Switch OFF	530 ~ 1,620 KHz 87.9 ~ 107.9 MHz 450 KHz 10.7 MHz 38 dB μ V (Maximum) 18 dB μ V (Maximum) DX: 30 dB μ V (Normal) LOC: 55 dB μ V (Normal) DX: 15 dB μ V (Normal) LOC: 45 dB μ V (Normal) 20 dB (Minimum) 93 x 82 x 30 mm (3.66 x 3.23 x 1.18 in) 160 x 50 x 99 mm (6.30 x 1.97 x 3.90 in) 100 mA (Maximum) 1 mA (Maximum)
Amplifier: Output Power Auto-Vol. Range Output Impedance: Speaker Headphone Dimensions (Length x Width x Height): Panel Black Box Current Consumption: Switch ON Switch OFF	15W x 2 (SP)/70 mW x 2 (HP) 20 dB 4 Ω 8 Ω 73 x 32 x 45 mm (2.87 x 1.26 x 1.77 in) 160 x 50 x 99 mm (6.30 x 1.97 x 3.90 in) 5.5A (Maximum) 100 mA (Maximum)
Deck: Circuit System Tape Speed Tape Dimensions (Length x Width x Height): Deck Current Consumption: Switch ON Switch OFF	4-track, 2-channel, Stereo for reproduction 4.76 cm/sec. Normal and Metal 87 x 142 x 162 mm (3.43 x 5.59 x 6.38 in) 1A (Maximum) 5 mA (Maximum)
C.B. Radio: Channels Frequency Range Frequency Control Frequency Tolerance Operating Temperature Range Humidity (Maximum) Power Voltage Operating Voltage Range Antenna Impedance Dimensions (Length x Width x Height): C.B. Radio Weight	40 26.965 ~ 27.405 MHz Phase Lock Loop (PLL) synthesizer \pm 0.005% -30 $^{\circ}$ C ~ +70 $^{\circ}$ C (-22 $^{\circ}$ F ~ +158 $^{\circ}$ F) 95% 13.8V negative ground 10 ~ 16V 50 Ω 97 x 82 x 174 mm (3.82 x 3.23 x 6.85 in) 900 g (32 oz)



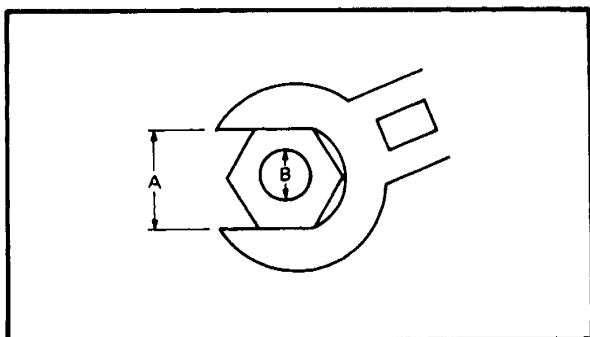
Model	XVZ13DS/DSC
Transmitter: Power Output Frequency Response Spurious Harmonic Emission AMC Range 50 ~ 95% MOD Output Protection Receiver: Sensitivity (S + N/N: 10 dB) Image Rejection Ratio (910 KHz) Adjacent Channel Rejection Squelch Sensitivity Automatic Gain Control (AGC) Figure of Merit Frequency Response THD at 50 k μ V Input Back-up Current Indicators:	4W 350 ~ 2,500 Hz -65 dB 60 dB 5 minutes for all VSWR's 0.7 μ V 60 dB 120 dB Threshold: 0.5 μ V Tight: 1,000 μ V 85 dB 400 ~ 2,500 Hz 3% 180 μ A TX RX CH9 LO CHANNEL



GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^3 gram	Weight
N	Newton	$1 \text{ kg} \times \text{m}/\text{sec}^2$	Force
Nm	Newton meter	$\text{N} \times \text{m}$	Torque
m·kg	Meter kilogram	$\text{m} \times \text{kg}$	Torque
Pa	Paskal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter	—	Volume or Capacity
cm^3	Cubic centimeter	—	Volume or Capacity
r/min	Rotation per minute	—	Engine speed

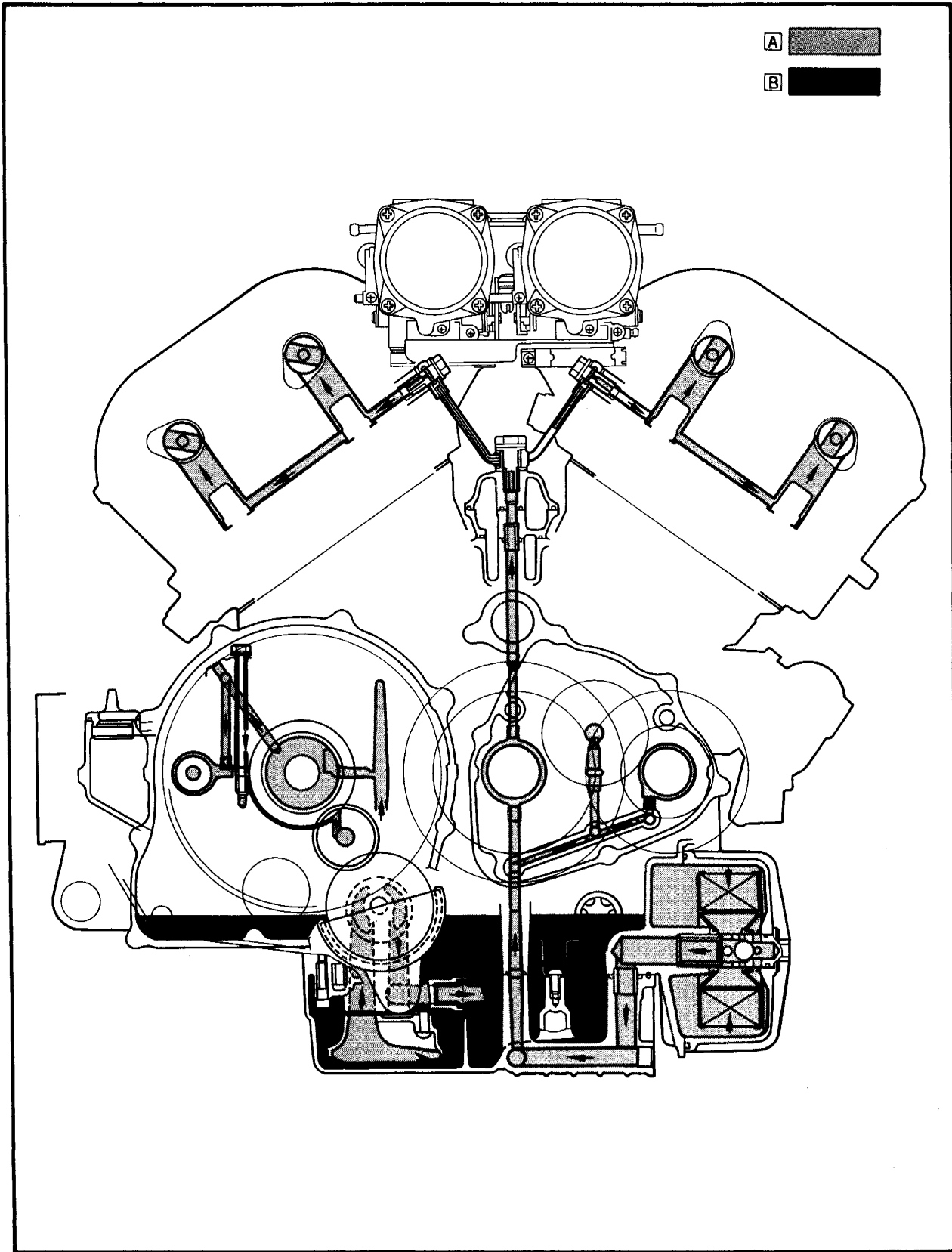
CONVERSION TABLES

Metric to inch system		
Known	Multiplier	Result
m·kg	7.233	ft·lb
m·kg	86.80	in·lb
cm·kg	0.0723	ft·lb
cm·kg	0.8680	in·lb
kg	2.205	lb
g	0.03527	oz
km/lit	2.352	mpg
km/hr	0.6214	mph
km	0.6214	mi
m	3.281	ft
m	1.094	yd
cm	0.3937	in
mm	0.03937	in
cc (cm ³)	0.03382	oz (US liq)
cc (cm ³)	0.06102	cu in
lit (liter)	2.1134	pt (US liq)
lit (liter)	1.057	qt (US liq)
lit (liter)	0.2642	gal (US liq)
kg/mm	56.007	lb/in
kg/cm ²	14.2234	psi (lb/in ²)
Centigrade (°C)	9/5 (°C) + 32	Fahrenheit (°F)

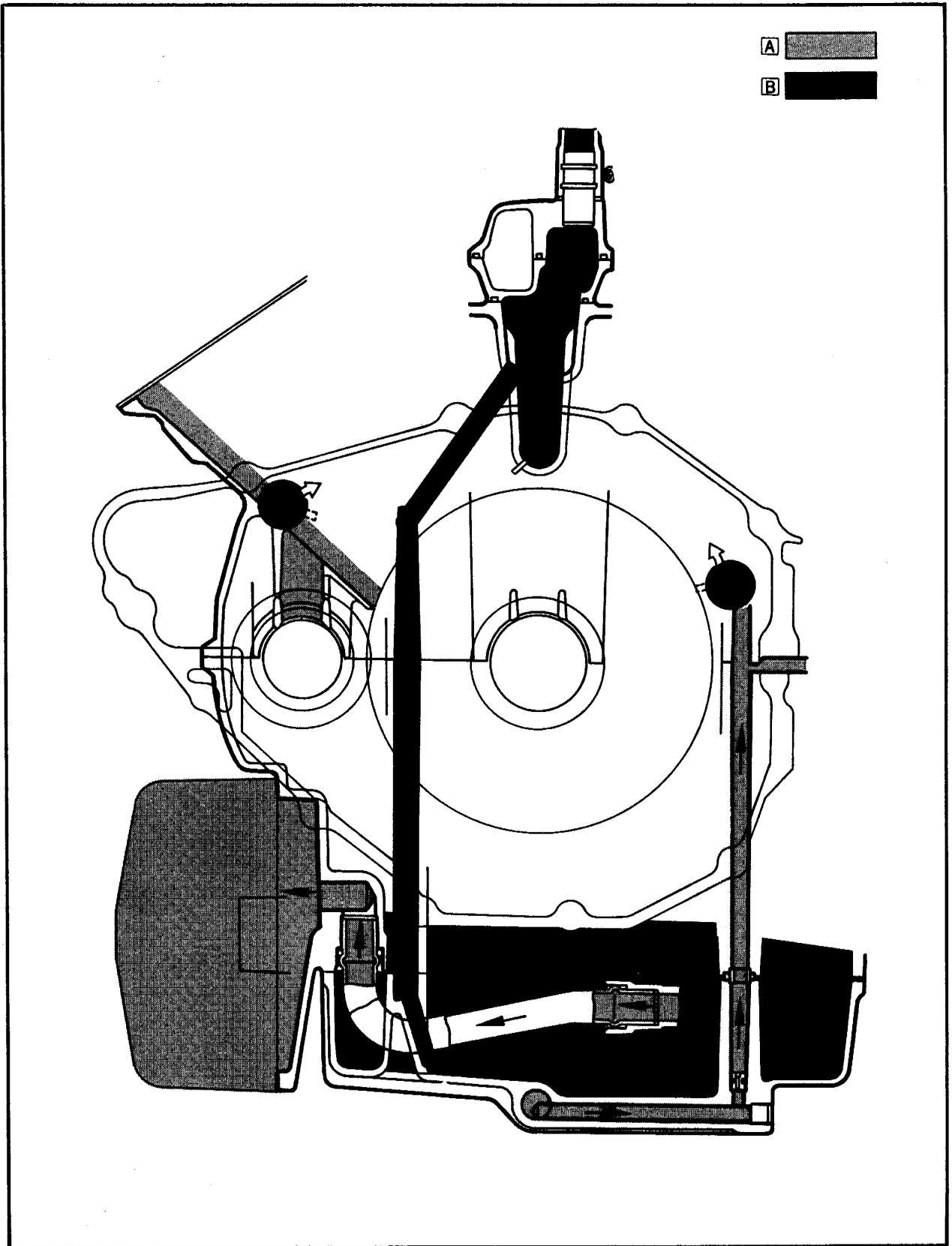
Inch to metric system		
Known	Multiplier	Result
ft·lb	0.13826	m·kg
in·lb	0.01152	m·kg
ft·lb	13.831	cm·kg
in·lb	1.1521	cm·kg
lb	0.4535	kg
oz	28.352	g
mpg	0.4252	km/lit
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
oz (US liq)	29.57	cc (cm ³)
cu in	16.387	cc (cm ³)
pt (US liq)	0.4732	lit (liter)
qt (US liq)	0.9461	lit (liter)
gal (US liq)	3.785	lit (liter)
lb/in	0.017855	kg/mm
psi (lb/in ²)	0.07031	kg/cm ²
Fahrenheit (°F)	5/9 (°F - 32)	Centigrade (°C)

LUBRICATION DIAGRAMS

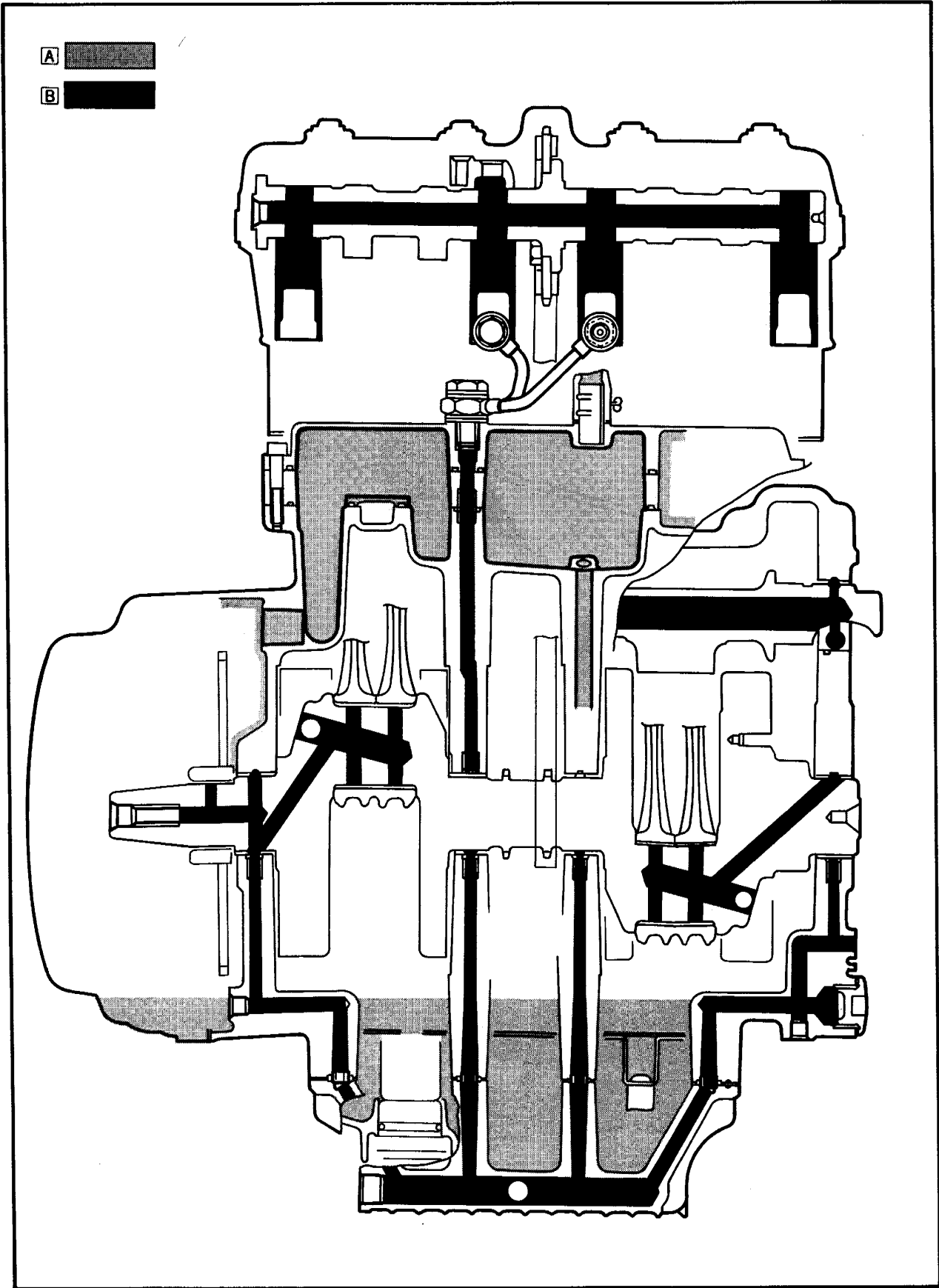
- A** Feed
- B** Scavenge



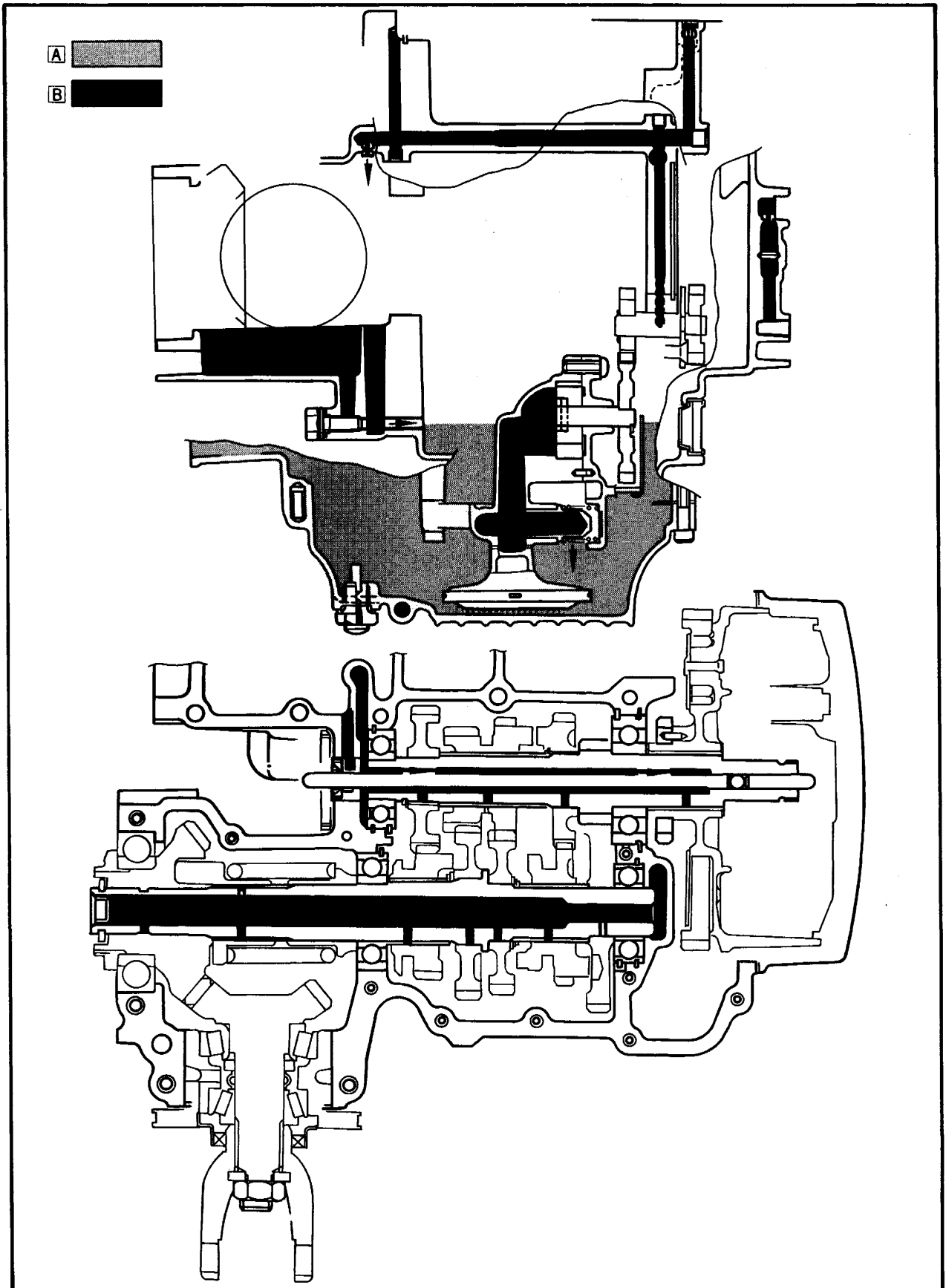
- A Feed
- B Scavenge



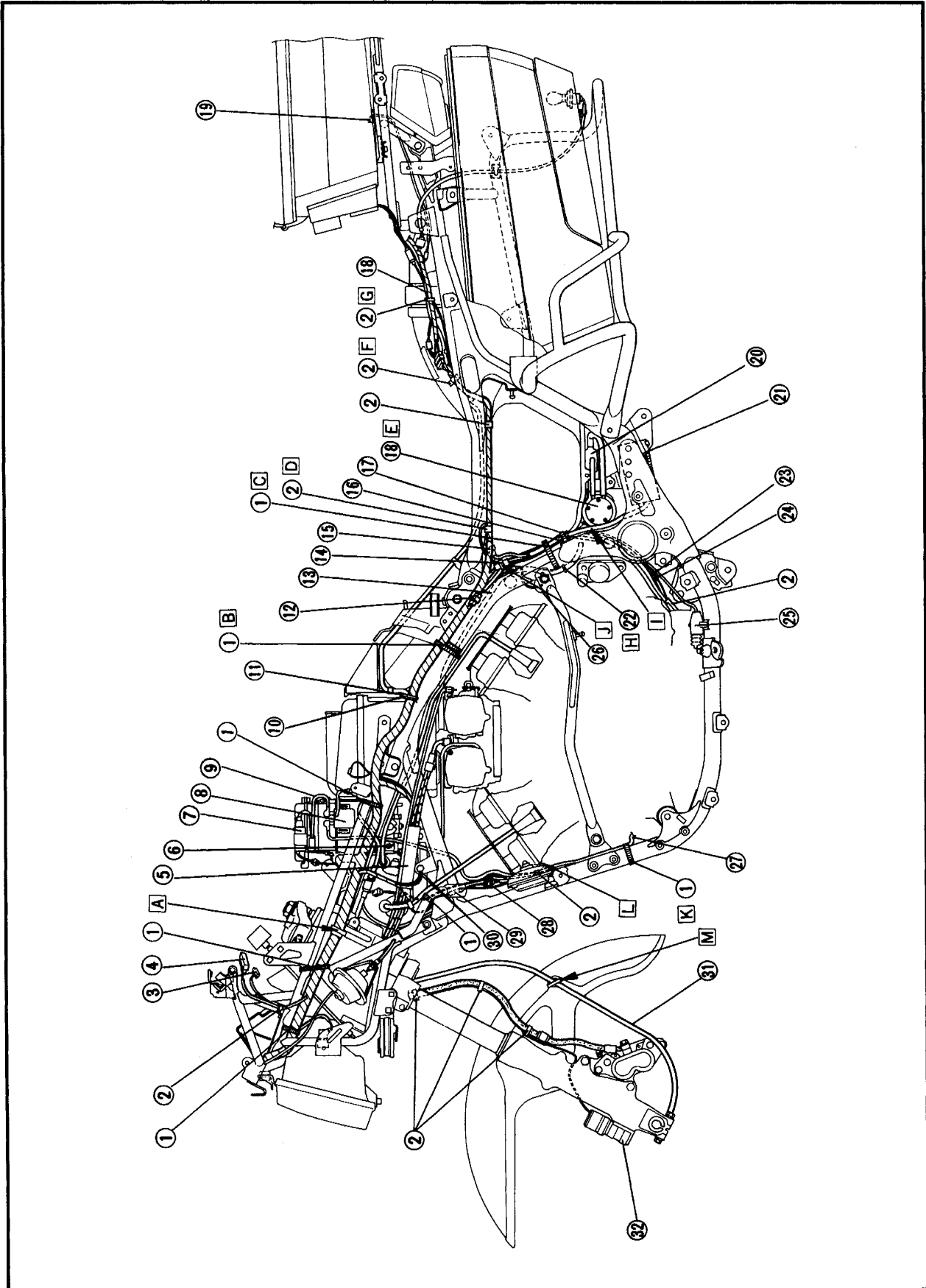
- A** Feed
- B** Scavenge



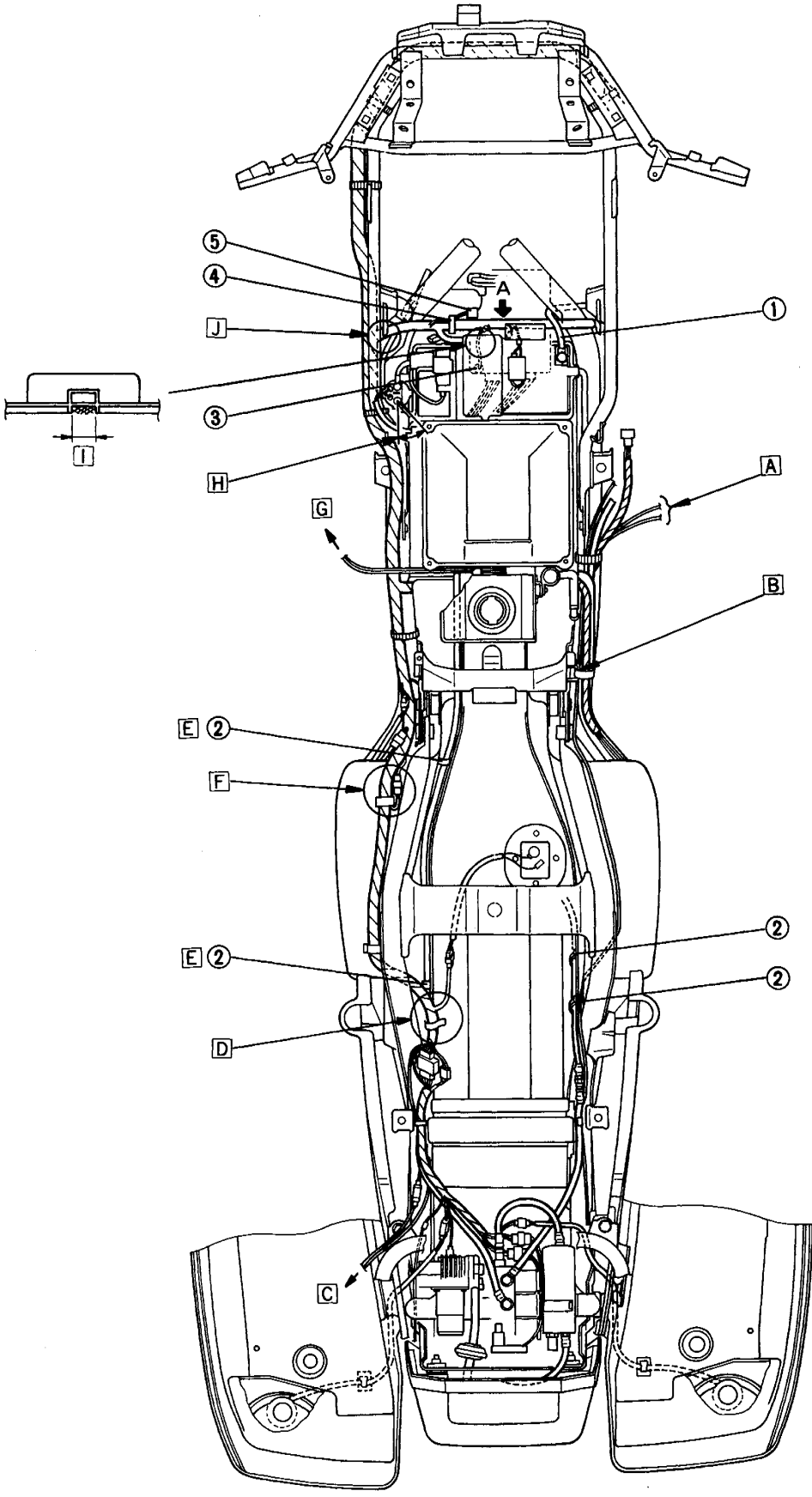
- A Feed
- B Scavenge



CABLE ROUTING

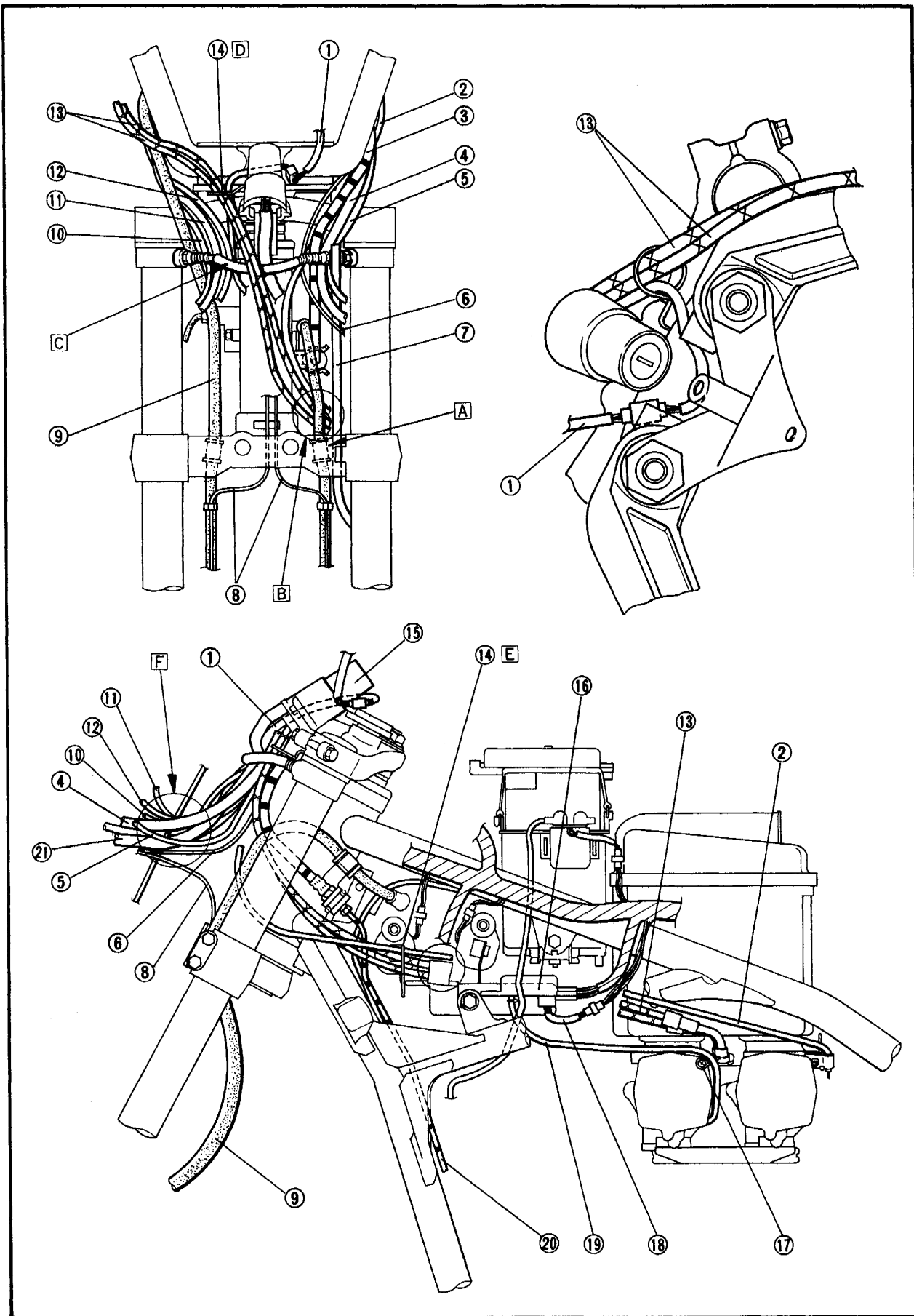


- ① Band
 - ② Clamp
 - ③ Speaker lead
 - ④ Front flasher light lead
 - ⑤ Throttle cable housing
 - ⑥ Pressure sensor lead
 - ⑦ Fuse holder
 - ⑧ Starter relay
 - ⑨ Battery positive lead
 - ⑩ C.B. radio cord
 - ⑪ Audio antenna cord
 - ⑫ Pick up coil lead
 - ⑬ Fuel hose
 - ⑭ Rectifier/regulator lead
 - ⑮ A.C. generator lead
 - ⑯ Sidestand switch lead
 - ⑰ Fuel pump lead
 - ⑱ Air hose
 - ⑲ Trunk light lead
 - ⑳ Fuel strainer
 - ㉑ Rectifier with regulator
 - ㉒ Holder
 - ㉓ Shift position switch lead
 - ㉔ Oil level sender lead
 - ㉕ Sidestand switch
 - ㉖ Condensor
 - ㉗ Ground lead
 - ㉘ Fan motor lead
 - ㉙ Noise filter (Fan motor)
 - ㉚ Earth
 - ㉛ Speedometer cable
 - ㉜ EAND unit
- A Clamp the wire harness at the white tape would around it.
 - B Clamp only the wire harness.
 - C Clamp all leads.
 - D Clamp the A.C. generator lead and wire harness.
 - E Route the fuel pump lead on the upper side of the fuel pump.
 - F Clamp the wire harness and front air hose.
 - G Clamp the sub lead, front air hose and remote control unit cord.
 - H Pass the fuel hose into the holder.
 - I Pass the rectifier cord outside of the fuel pump.
 - J Do not pinch the rectifier/regulator lead coupler.
 - K Do not touch the ground lead to the exhaust pipe.
 - L Pass the horn leads under the horn.
 - M Pass the speedometer cable through the guide.





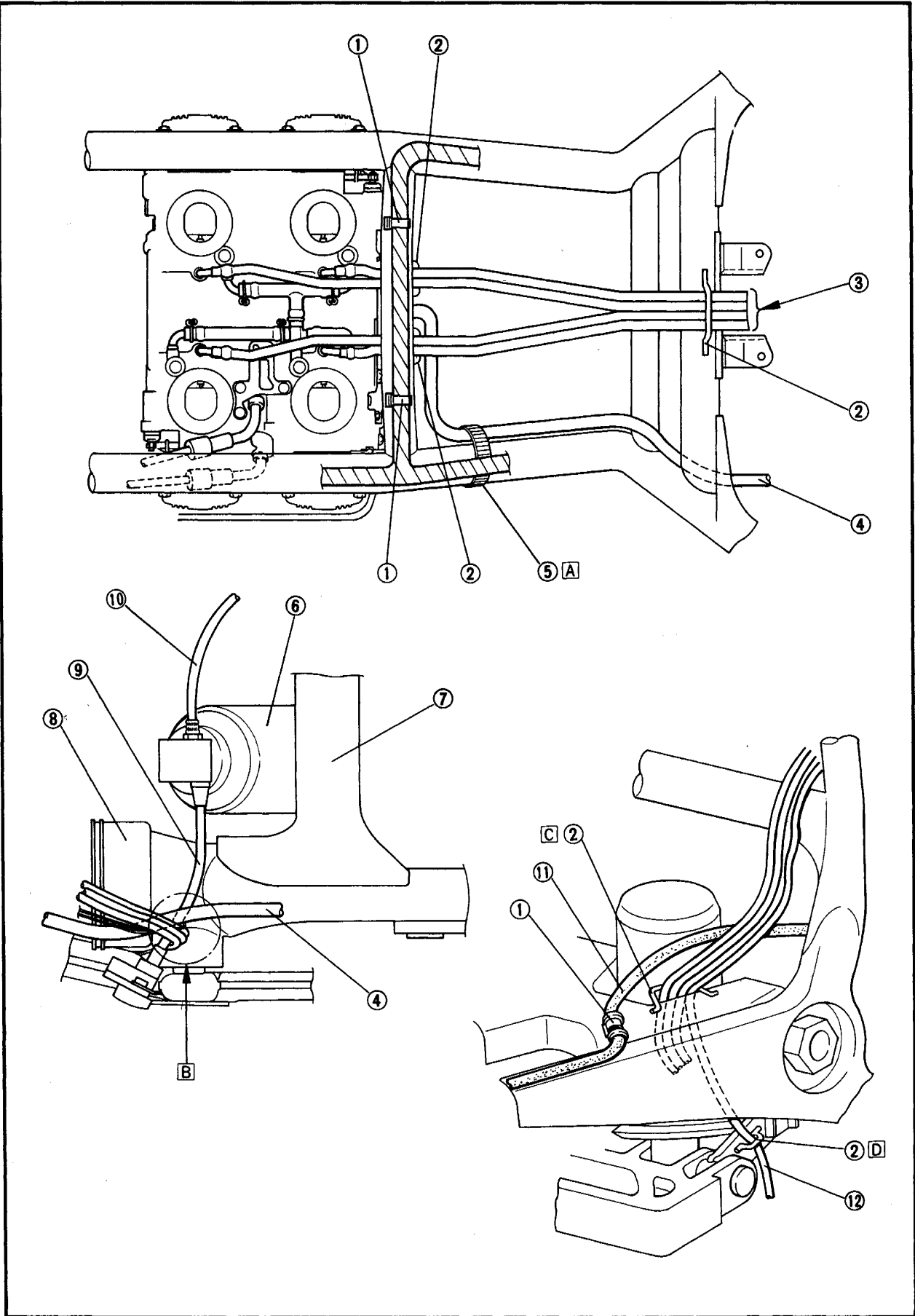
- ① Battery negative lead
 - ② Clamp
 - ③ Battery fluid level sensor
 - ④ Band
 - ⑤ Diode
- A To C.B. radio and matching box.
 - B Secure all lead to the guide with band.
 - C To remote control unit.
 - D Do not touch the cords to the fuel tank flange.
 - E Clamp only the air hose.
 - F Clamp the A.C. generator lead coupler inside of the wire harness.
 - G To audio.
 - H Install the positive lead at approx. 30°.
 - I Viewed A:
Pass the lead through the groove so that the lead is not put between the plates.
 - J Pay attention so that the wire harness is not put between the frames.





- ① Pilot light lead
- ② Choke cable
- ③ Clutch hose
- ④ Handlebar switch (Left) lead
- ⑤ Clutch switch lead
- ⑥ Remote controller lead (For rider)
- ⑦ Speedometer cable
- ⑧ EAND lead
- ⑨ Brake hose
- ⑩ Brake fluid level sensor lead
- ⑪ Handlebar switch (Right) lead
- ⑫ Front brake switch lead
- ⑬ Throttle cable
- ⑭ Cable holder
- ⑮ Main switch
- ⑯ Pressure sensor (Ignition)
- ⑰ Clamp
- ⑱ Sub lead
- ⑲ Vacuum hose
- ⑳ Clutch pipe
- ㉑ Main switch lead

- A Clamp the brake hose at the both sides. Route the speedometer cable outside of the left brake hose.
- B Route the throttle cables and choke cable inside of the brake hose.
- C Pass all leads inside of the air hose except for the speedometer cable and throttle cables.
- D Pass the throttle cables and pilot light lead into the cable holder.
- E Pass the throttle cables and choke cable into the cable holder.
- F Pass these leads of the main switch, brake fluid level sensor, handlebar switches (Left and right), clutch switch, front brake switch and EAND unit into the hole of the fairing.

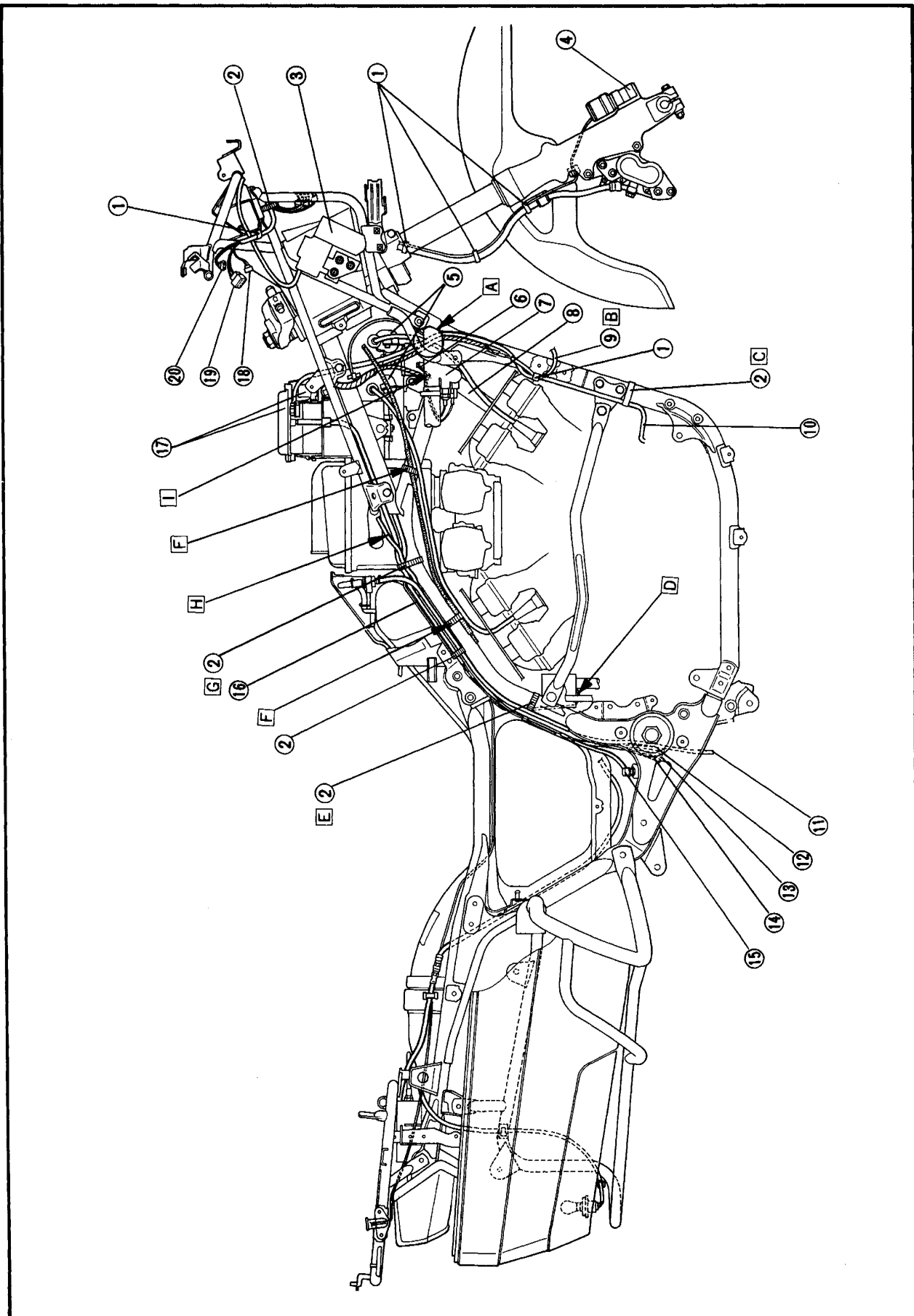


CABLE ROUTING

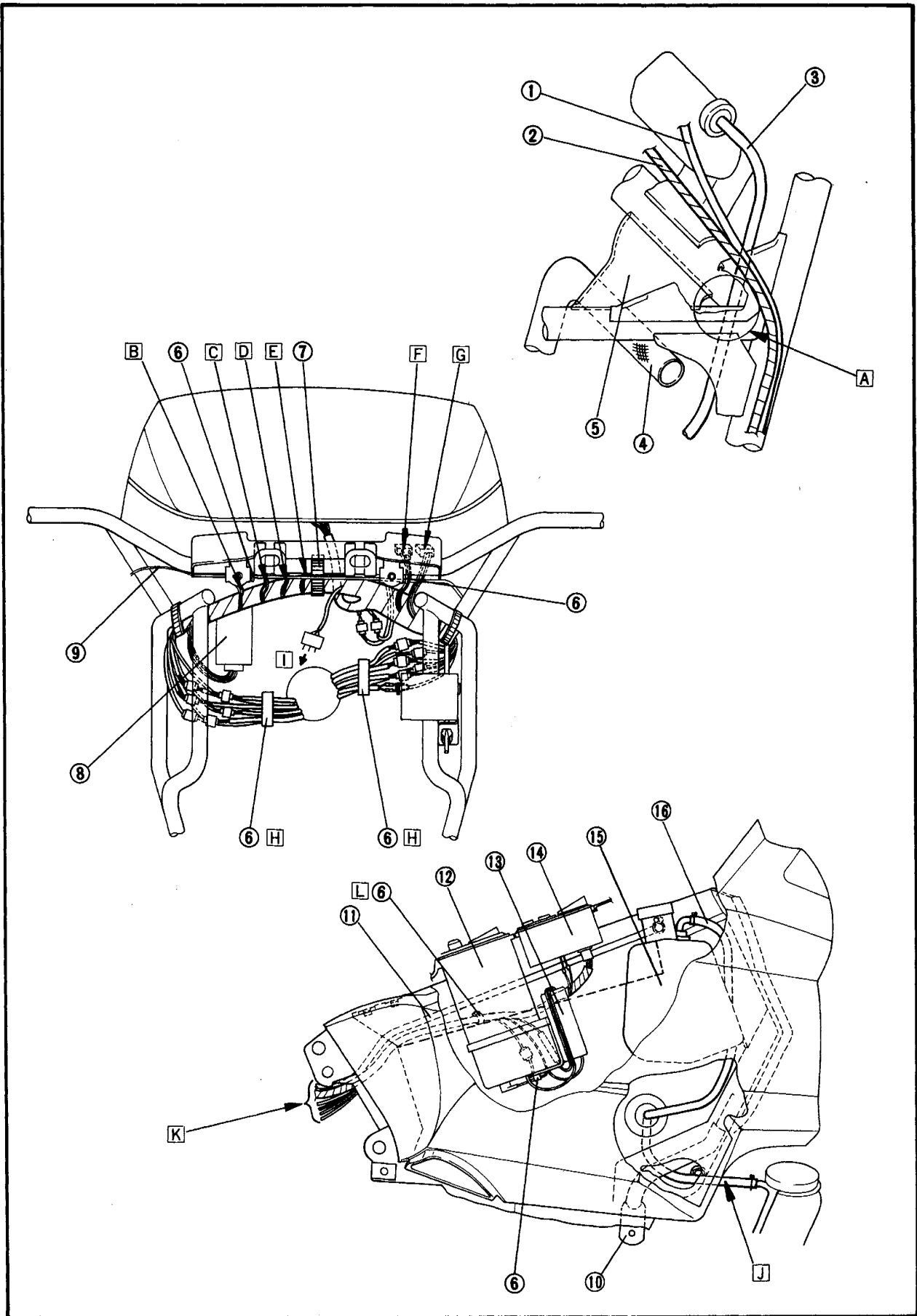


- ① Clamp
- ② Holder
- ③ Air vent pipe
- ④ Fuel hose
- ⑤ Band
- ⑥ Rear shock absorber
- ⑦ Swingarm
- ⑧ Rubber boot
- ⑨ Damper adjusting cable
- ⑩ Air hose
- ⑪ Brake hose
- ⑫ Battery breather hose

- A Clamp only the fuel hose.
- B Pass these leads of the A.C. generator, pick up coil, sidestand switch between the damper adjusting cable and swingarm, outside of the fuel hose.
- C Pass the breather hoses through the holder.
- D Pass only the battery breather hose through the holder.

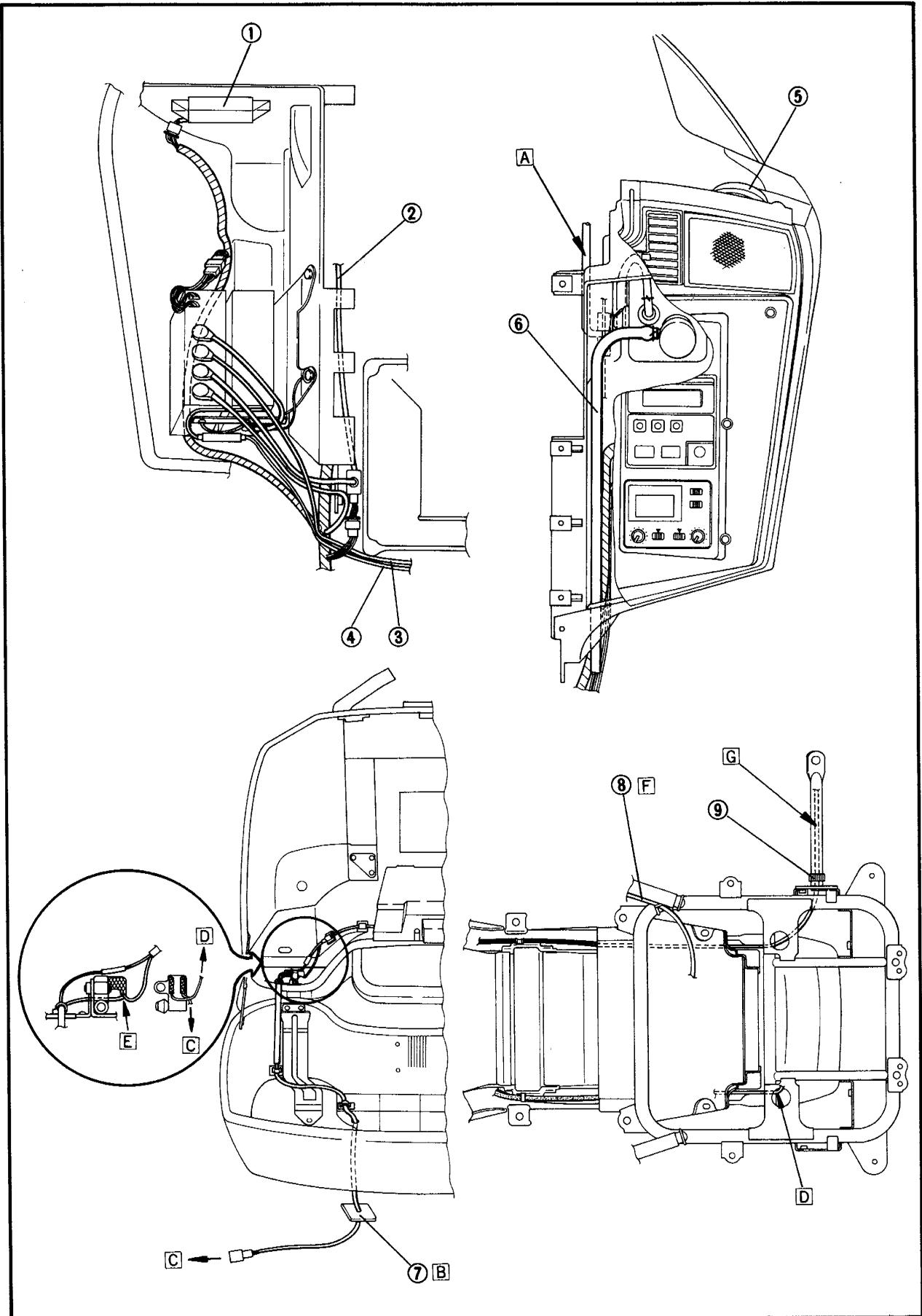


- ① Clamp
 - ② Band
 - ③ Vacuum pump (Venture cruise)
 - ④ EAND unit
 - ⑤ Ignition coil
 - ⑥ Earth
 - ⑦ Joint
 - ⑧ Water hose
 - ⑨ Horn lead
 - ⑩ Ground lead
 - ⑪ Battery breather hose
 - ⑫ Fuel tank breather hose
 - ⑬ Filler tube drain hose
 - ⑭ Reservoir tank hose
 - ⑮ Rear brake switch
 - ⑯ Antenna cord
 - ⑰ Fuse box
 - ⑱ Speaker lead
 - ⑲ Hazard switch lead
 - ⑳ Front flasher light lead
- A Pass the high tension cord, ground lead and horn lead between the frame and joint.
 - B Pass the horn leads under the horn.
 - C Do not touch the ground lead to the exhaust pipe.
 - D Pass the brake fluid level sensor lead inside of the reservoir tank. Do not touch the lead to the exhaust pipe.
 - E Clamp the brake fluid level sensor lead and rear brake switch lead.
 - F Clamp only the brake pipe.
 - G Clamp the battery breather hose, reservoir tank hose, antenna cord and venture cruise cord.
 - H To reservoir tank.
 - I Pass the thermo switch lead and thermo unit lead between the joint and tension pipe.



- ① Horn lead
- ② Ground lead
- ③ High tension cord
- ④ Water hose
- ⑤ Air baffle plate
- ⑥ Clamp
- ⑦ Band
- ⑧ Cruise control unit
- ⑨ Vacuum hose (Cruise control)
- ⑩ Fairing stay
- ⑪ Reservoir tank hose
- ⑫ C.B. radio
- ⑬ Matching box
- ⑭ CLASS controller unit
- ⑮ Reservoir tank
- ⑯ Breather hose

- A Pass the high tension cord between the frame and air baffle plate.
- B To EAND relay.
- C To fuel pump control relay.
- D To relay assembly.
- E To reserve lighting unit.
- F To sidestand relay.
- G To CLASS relay.
- H Clamp all leads.
- I To headlight.
- J Pass the breather hose inside of the fairing stay.
- K Pass the reservoir tank hose, wire harness and cords between the frame and inner panel.

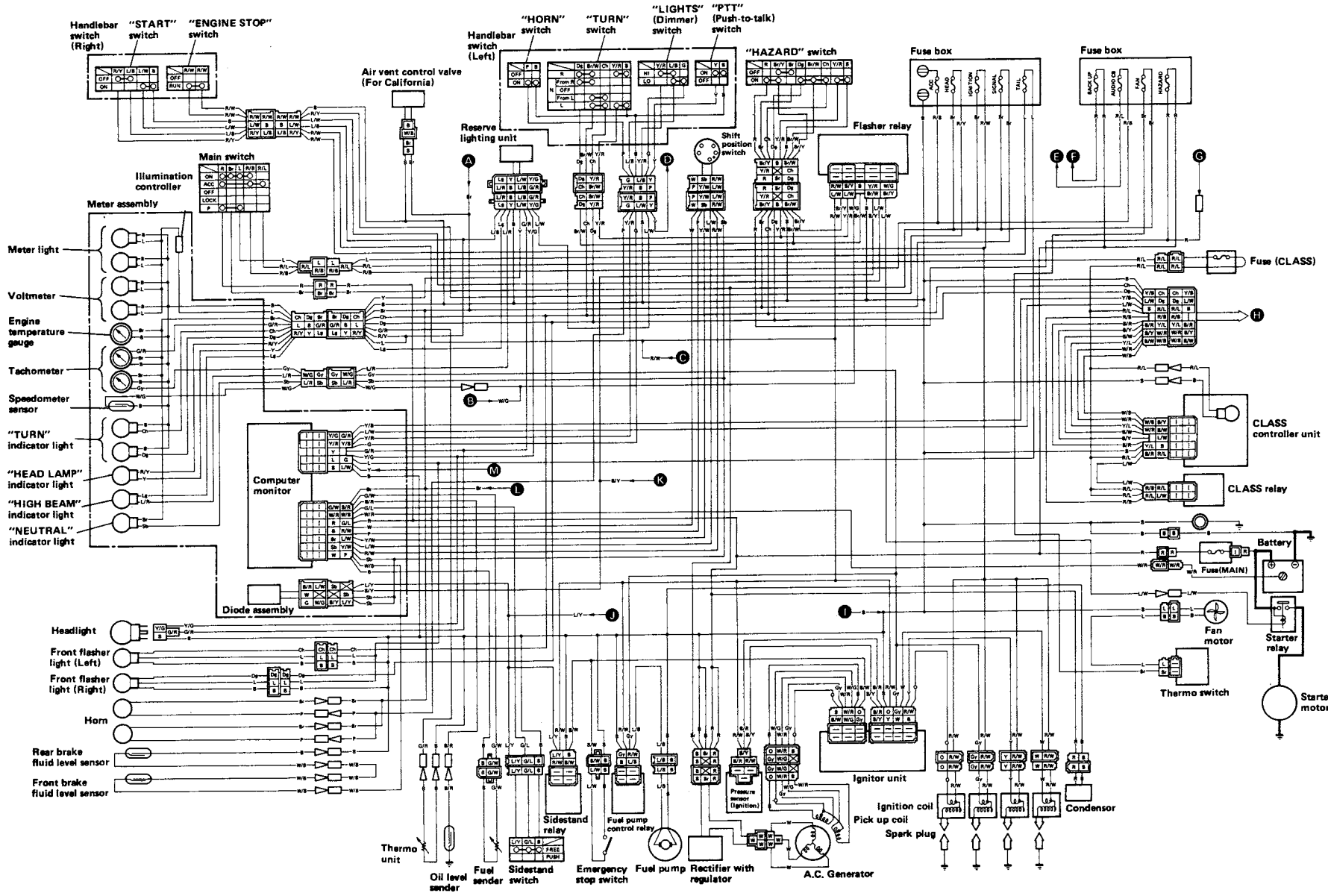




- ① Noise filter (Wire harness)
- ② Head set cord
- ③ C.B. radio cord
- ④ Audio antenna cord
- ⑤ Speaker
- ⑥ Reservoir tank hose
- ⑦ Seat
- ⑧ Back rest adjusting cable
- ⑨ Band

- A To radiator.
- B Put it between the travel trunk and the frame.
- C To main wire harness.
- D To trunk light.
- E Insert the trunk light lead as shown.
- F Pass the back rest adjusting cable into the guide.
- G To antenna.

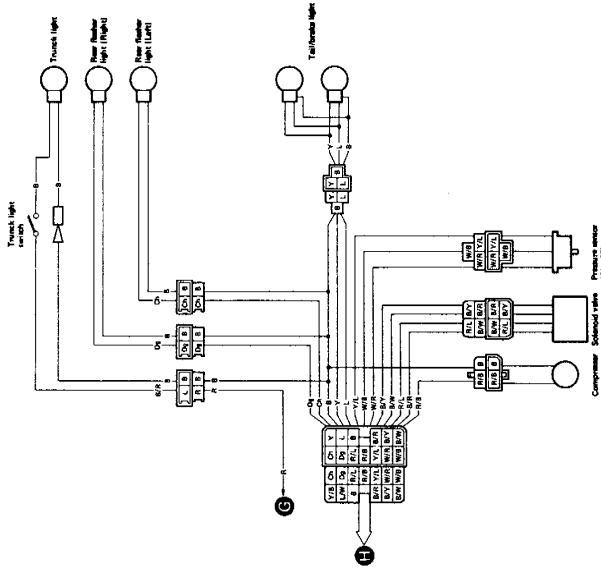
XVZ13DS/XVZ13DSC WIRING DIAGRAM



COLOR CODE

B	.....	Black
L	.....	Blue
R	.....	Red
Y	.....	Yellow
P	.....	Pink
G	.....	Green
W	.....	White
O	.....	Orange
Br.	.....	Brown
Ch	.....	Chocolate
Sb	.....	Sky blue
Gy	.....	Gray
Dg	.....	Dark green
Lg	.....	Light green
B/R	.....	Black/Red
B/Y	.....	Black/Yellow
B/W	.....	Black/White
B/L	.....	Black/Blue
B/G	.....	Black/Green
B/Gy	.....	Black/Gray
L/W	.....	Blue/White
L/B	.....	Blue/Black
L/R	.....	Blue/Red
L/Y	.....	Blue/Yellow
L/G	.....	Blue/Green
R/W	.....	Red/White
R/Y	.....	Red/Yellow
R/B	.....	Red/Black
R/L	.....	Red/Blue
Y/G	.....	Yellow/Green
Y/R	.....	Yellow/Red
Y/B	.....	Yellow/Black
Y/W	.....	Yellow/White
Y/L	.....	Yellow/Blue
G/R	.....	Green/Red
G/L	.....	Green/Blue
G/Y	.....	Green/Yellow
G/W	.....	Green/White
W/G	.....	White/Green
W/B	.....	White/Black
W/R	.....	White/Red
Br/W	.....	Brown/White
Br/Y	.....	Brown/Yellow
Br/Gy	.....	Brown/Gray
Br/R	.....	Brown/Red

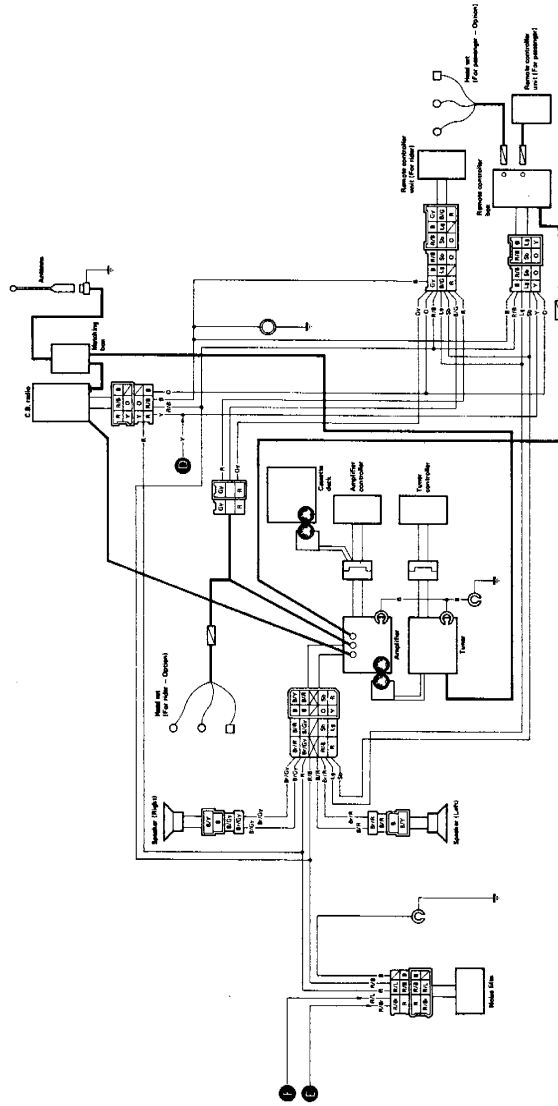
AIR SUSPENSION CONTROLLER



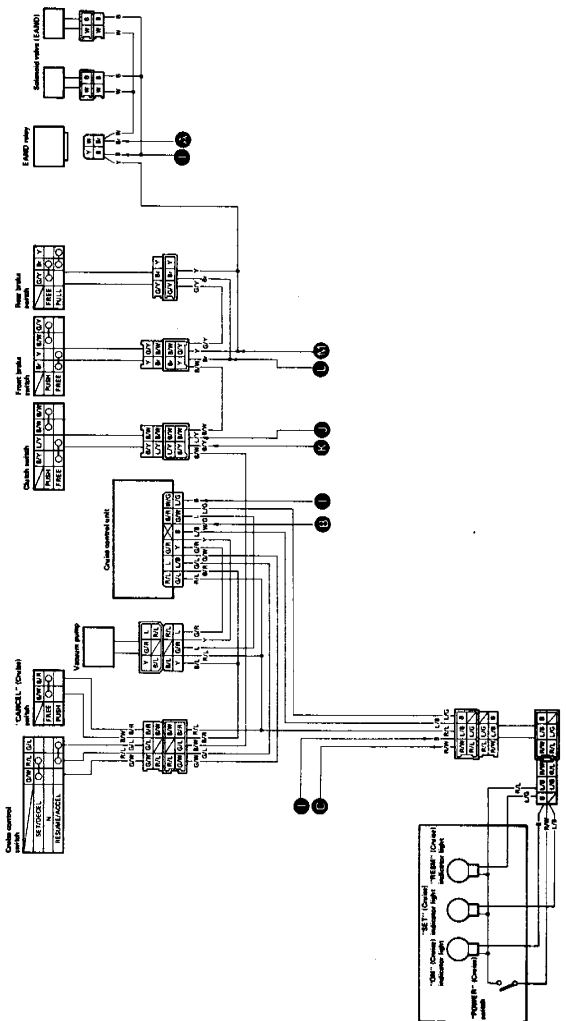
COLOR CODE

B	.....	.Black
L	.....	.Blue
R	.....	.Red
Y	.....	.Yellow
G	.....	.Green
W	.....	.White
O	.....	.Orange
Br	.....	.Brown
Ch	.....	.Chocolate
Sb	.....	.Sky blue
Gy	.....	.Gray
Dg	.....	.Dark green
Lg	.....	.Light green
B/R	.....	.Black/Red
B/Y	.....	.Black/Yellow
B/L	.....	.Black/Blue
B/Gy	.....	.Black/Gray
L/W	.....	.Blue/White
L/B	.....	.Blue/Black
L/Y	.....	.Blue/Yellow
L/G	.....	.Blue/Green
R/W	.....	.Red/White
R/Y	.....	.Red/Yellow
R/B	.....	.Red/Black
R/L	.....	.Red/Blue
Y/G	.....	.Yellow/Green
Y/R	.....	.Yellow/Red
Y/B	.....	.Yellow/Black
Y/L	.....	.Yellow/Blue
G/R	.....	.Green/Red
G/L	.....	.Green/Blue
G/W	.....	.Green/White
W/B	.....	.White/Black
W/R	.....	.White/Red
Br/W	.....	.Brown/White
Br/Y	.....	.Brown/Yellow
Br/Gy	.....	.Brown/Gray
Br/R	.....	.Brown/Red

C.B. RADIO AND AUDIO SYSTEM



"VENTURE CRUISE" control system





YAMAHA MOTOR CO.,LTD.

IWATA, JAPAN

PRINTED IN U.S.A.



YAMAHA

**XVZ13DU/DUC
XVZ13U/UC**

**Supplementary
Service Manual**

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the XVZ13DU/DUC/U/UC. For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manual:

XVZ13DS/DSC Service Manual: LIT-11616-04-96

**XVZ13DU/XVZ13DUC/XVZ13U/XVZ13UC
SUPPLEMENTARY SERVICE MANUAL**

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P/N LIT-11616-06-06

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 motorcycles have a basic understanding of the mechanical concepts and procedures inherent in motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

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 motorcycle 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 motorcycle and to conform with federal environmental quality objectives.

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.

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the XVZ13DU/DUC/U/UC. Please read this material carefully.

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLES OPERATIONS
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPOTANT INFORMATION

This material is distinguished by the following notations.

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

CAUTION:

A **CAUTION** indicates special procedures that must be followed to avoid damage to the motorcycle.

WARNING:

A **WARNING** indicates special procedures that must be followed to avoid injury to a motorcycle operator or person inspecting or repairing the motorcycle.

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 disassembly, repair, assembly, and inspection operations.

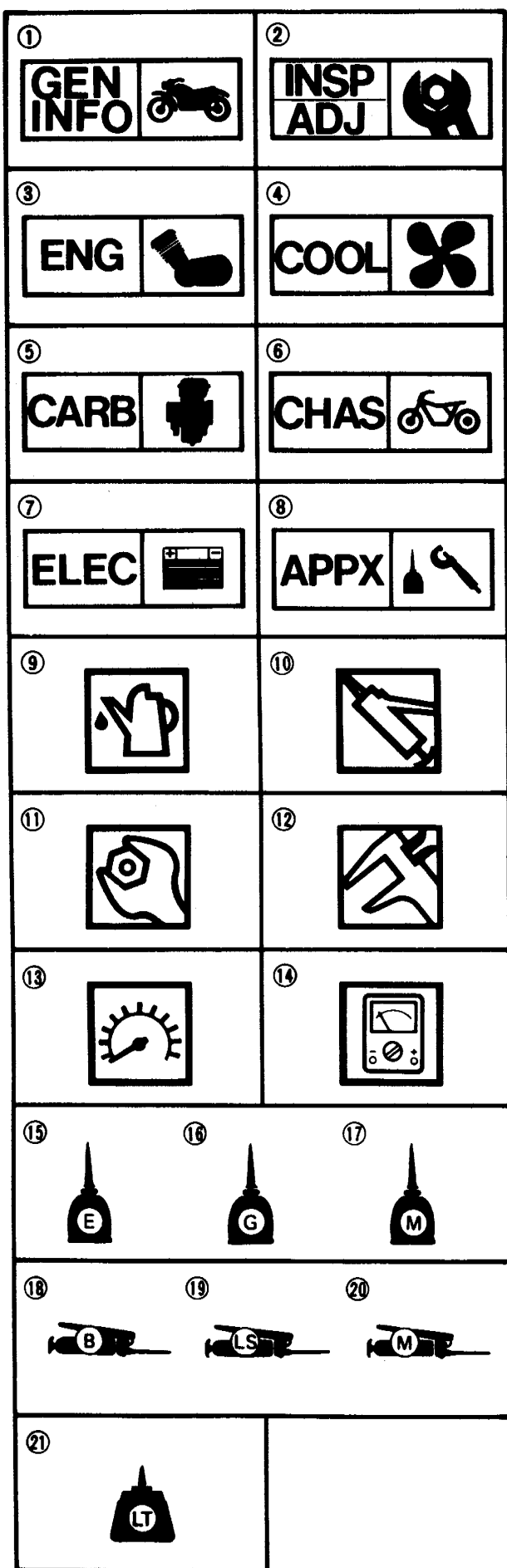
In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

● **Bearings:**

Pitting/Damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.



ILLUSTRATED SYMBOLS

(Refer to the illustration)

Illustrated symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

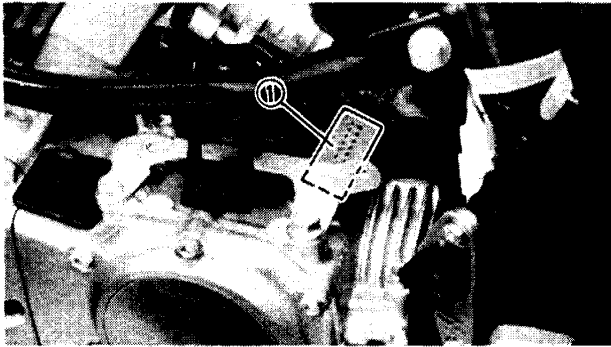
- ① General information
- ② Periodic inspection and adjustment
- ③ Engine
- ④ Cooling system
- ⑤ Carburetion
- ⑥ Chassis
- ⑦ Electrical
- ⑧ Appendices

Illustrated symbols ⑨ to ⑭ are used to identify the specifications appearing.

- ⑨ Filling fluid
- ⑩ Lubricant
- ⑪ Tightening
- ⑫ Wear limit, clearance
- ⑬ Engine speed
- ⑭ Ω, V, A

Illustrated symbols ⑮ to ㉑ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑮ Apply engine oil
- ⑯ Apply gear oil
- ⑰ Apply molybdenum disulfide oil
- ⑱ Apply wheel bearing grease
- ⑲ Apply lightweight lithium-soap base grease
- ⑳ Apply molybdenum disulfide grease
- ㉑ Apply locking agent (LOCTITE®)



GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

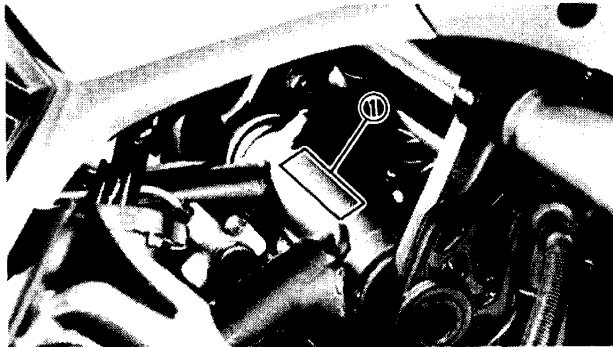
The vehicle identification number ① is stamped into the steering head pipe.

NOTE: _____

The vehicle identification number is used to identify your motorcycle and may be used to register your motorcycle with the licensing authority in your state.

Starting Serial Number:

XVZ13DU JYA1NLE0*JA022101
 XVZ13DUC JYA1UNC0*JA003101
 XVZ13U JYA2LWE0*JA003101
 XVZ13UC JYA2LXC0*JA001101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the left side of the engine.

NOTE: _____

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:

XVZ13DU 1NL-022101
 XVZ13DUC 1UN-003101
 XVZ13U 2LW-003101
 XVZ13UC 2LX-001101

NOTE: _____

Designs and specifications are subject to change without notice.

APPENDICES

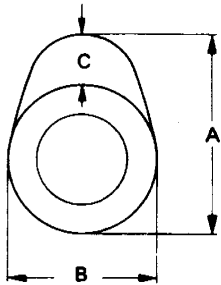
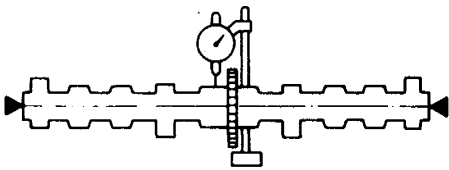
SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	XVZ13DU/DUC/U/UC
Model Code Number	XVZ13DU : 2WR XVZ13DUC : 2WT XVZ13U : 2WV XVZ13UC : 2WW
Engine Starting Number	XVZ13DU : 1NL-022101 XVZ13DUC : 1UN-003101 XVZ13U : 2LW-003101 XVZ13UC : 2LX-001101
Vehicle Identification Number	XVZ13DU : JYA1NLE0*JA022101 XVZ13DUC : JYA1UNC0*JA003101 XVZ13U : JYA2LWE0*JA003101 XVZ13UC : JYA2LXC0*JA001101

MAINTENANCE SPECIFICATIONS

Engine

Model	XVZ13DU/DUC/U/UC
<p>Camshaft:</p> <p>Drive Method</p> <p>Cam Cap Inside Dia.</p> <p>Camshaft Outside Dia.</p> <p>Shaft-to-Cap Clearance</p> <p>Cam Dimensions:</p> <p>Intake "A"</p>  <p>< Limit ></p> <p>Intake "B"</p> <p>< Limit ></p> <p>Exhaust "A"</p> <p>< Limit ></p> <p>Exhaust "B"</p> <p>< Limit ></p> <p>Camshaft Runout Limit</p> 	<p>Chain drive (Center)</p> <p>25.000 ~ 25.021 mm (0.9843 ~ 0.9851 in)</p> <p>24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in)</p> <p>0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)</p> <p>XVZ13DU/U:</p> <p>35.75 ~ 35.85 mm (1.407 ~ 1.411 in)</p> <p>XVZ13DUC/UC:</p> <p>34.65 ~ 34.75 mm (1.364 ~ 1.368 in)</p> <p>XVZ13DU/U:</p> <p>35.65 mm (1.404 in)</p> <p>XVZ13DUC/UC:</p> <p>34.55 mm (1.360 in)</p> <p>27.95 ~ 28.05 mm (1.100 ~ 1.104 in)</p> <p>27.85 mm (1.096 in)</p> <p>35.75 ~ 35.85 mm (1.407 ~ 1.411 in)</p> <p>35.65 mm (1.404 in)</p> <p>27.95 ~ 28.05 mm (1.100 ~ 1.104 in)</p> <p>27.85 mm (1.096 in)</p> <p>0.03 mm (0.0012 in)</p>

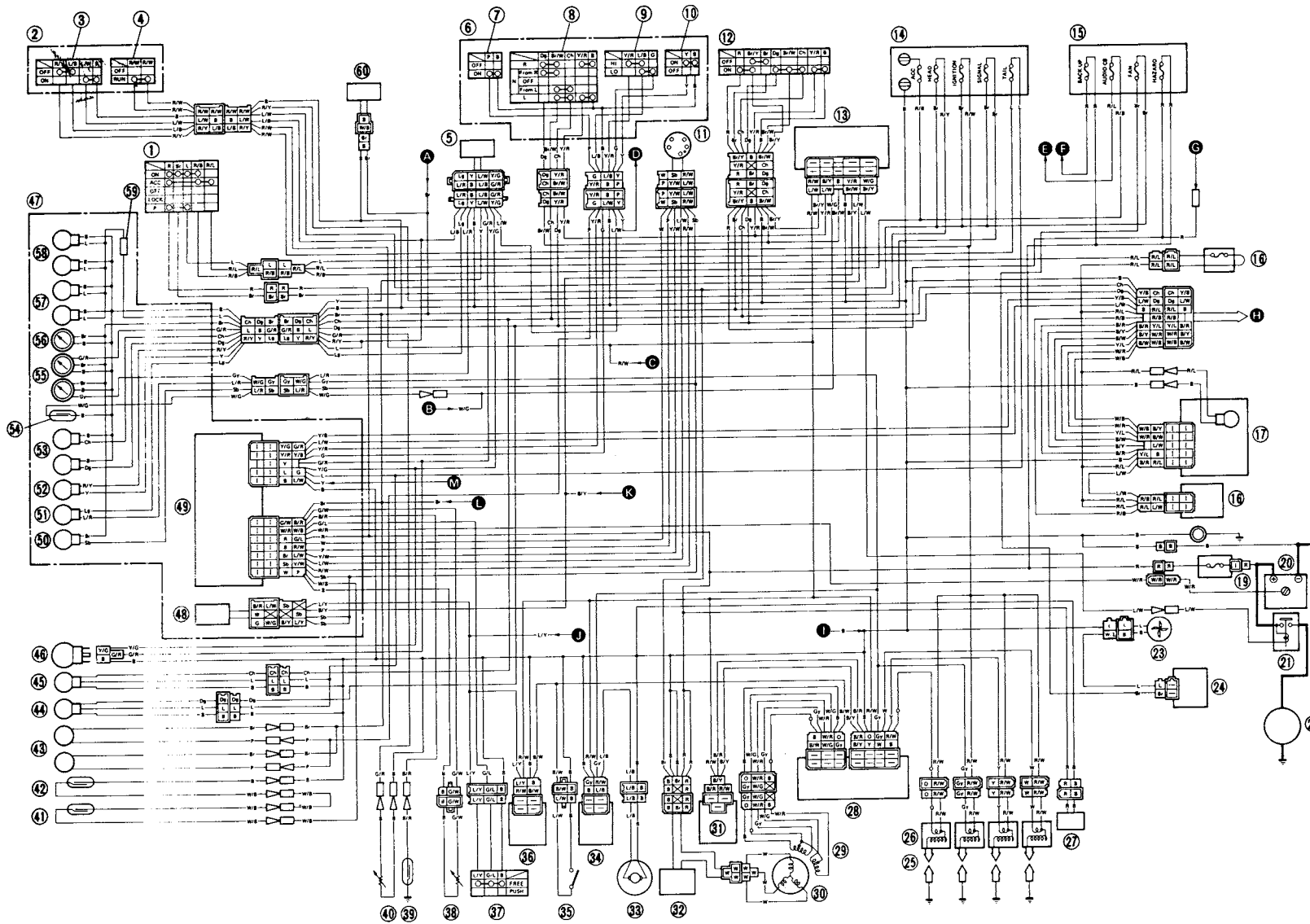
**Chassis**

Model	XVZ13DU/DUC/U/UC
Front Disc Brake: Brake Fluid Type	DOT #3 or #4
Rear Disc Brake: Brake Fluid Type	DOT #3 or #4
Clutch: Brake Fluid Type	DOT #3 or #4

Electrical

Model	XVZ13DU/DUC/U/UC
Voltage Regulator: Type Model/Manufacturer No Load Regulated Voltage	Short-control SH545A/SHINDENGEN (XVZ13DU/DUC) SH545-12/SHINDENGEN (XVZ13U/UC) 14 ~ 15V
Rectifier: Model/Manufacturer Capacity Withstand Voltage	SH545A/SHINDENGEN (XVZ13DU/DUC) SH545-12/SHINDENGEN (XVZ13U/UC) 26A 200V

XVZ13DU/XVZ13DUC WIRING DIAGRAM



COLOR CODE

B	.....	Black
L	.....	Blue
R	.....	Red
Y	.....	Yellow
P	.....	Pink
G	.....	Green
W	.....	White
O	.....	Orange
Br	.....	Brown
Ch	.....	Chocolate
Sb	.....	Sky blue
Gy	.....	Gray
Dg	.....	Dark green
Lg	.....	Light green
B/R	.....	Black/Red
B/Y	.....	Black/Yellow
B/W	.....	Black/White
B/L	.....	Black/Blue
B/G	.....	Black/Green
B/Gy	.....	Black/Gray
L/W	.....	Blue/White
L/B	.....	Blue/Black
L/R	.....	Blue/Red
L/Y	.....	Blue/Yellow
L/G	.....	Blue/Green
R/W	.....	Red/White
R/Y	.....	Red/Yellow
R/B	.....	Red/Black
R/L	.....	Red/Blue
Y/G	.....	Yellow/Green
Y/R	.....	Yellow/Red
Y/B	.....	Yellow/Black
Y/W	.....	Yellow/White
Y/L	.....	Yellow/Blue
G/R	.....	Green/Red
G/L	.....	Green/Blue
G/Y	.....	Green/Yellow
G/W	.....	Green/White
W/G	.....	White/Green
W/B	.....	White/Black
W/R	.....	White/Red
Br/W	.....	Brown/White
Br/Y	.....	Brown/Yellow
Br/Gy	.....	Brown/Gray
Br/R	.....	Brown/Red
W/L	.....	White/Blue

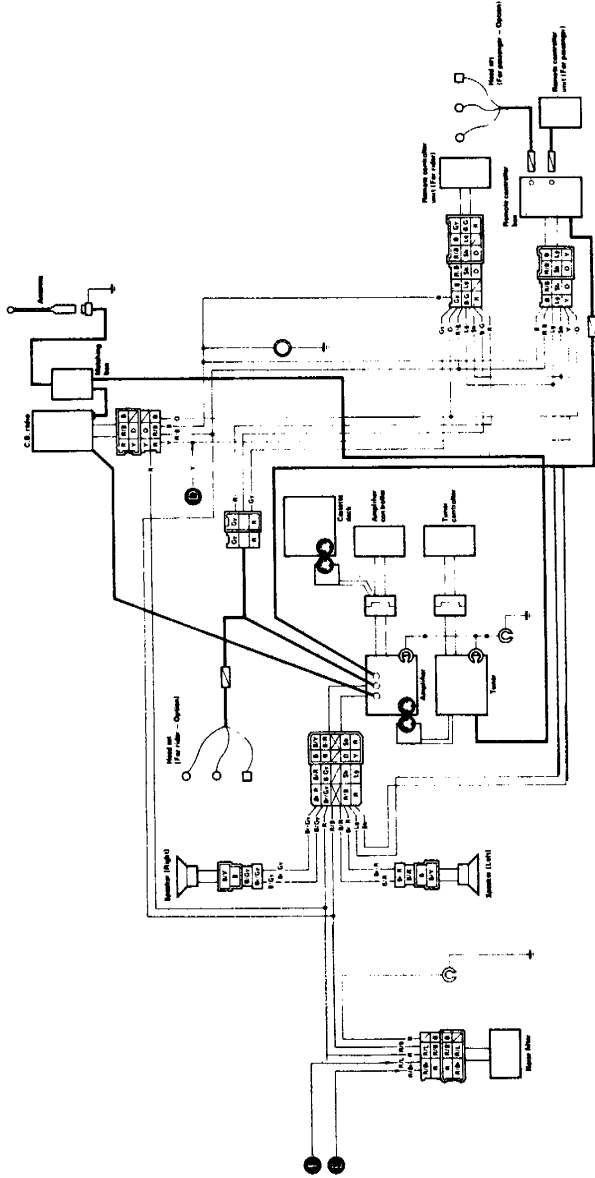
- 1. Main switch
- 2. Handlebar switch (Right)
- 3. "START" switch
- 4. "ENGINE STOP" switch
- 5. Reserve lighting unit
- 6. Handlebar switch (Left)
- 7. "HORN" switch
- 8. "TURN" switch
- 9. "LIGHTS" (Dimmer) switch
- 10. "PTT" (Push-to-talk) switch
- 11. Shift position switch

- 13. Flasher relay
- 14. Fuse box
- 15. Fuse (MAIN)
- 16. Fuse (CLASS)
- 17. CLASS controller unit
- 18. CLASS relay
- 19. Fuse (MAIN)
- 20. Battery
- 21. Starter relay
- 22. Starter motor
- 23. Fan motor
- 25. Spark plug
- 26. Ignition coil
- 27. Condenser
- 28. Ignitor unit
- 29. Pick up coil
- 30. A.C. Generator
- 31. Pressure sensor (Ignition)
- 32. Rectifier with regulator
- 33. Fuel pump
- 34. Fuel pump control relay
- 35. Emergency stop switch

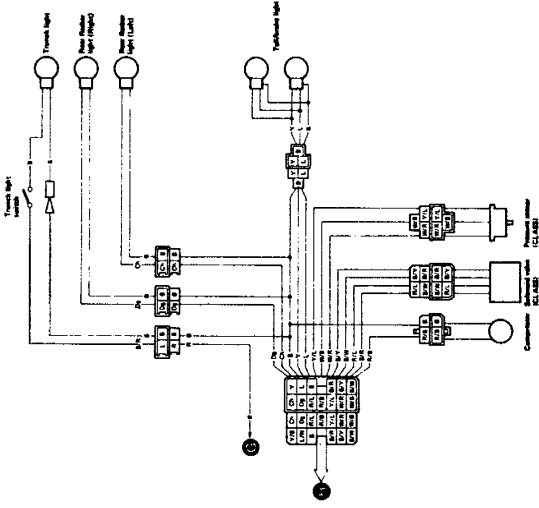
- 37. Sidestand switch
- 38. Fuel sender
- 39. Oil level sender
- 40. Thermo unit
- 41. Front brake fluid level sensor
- 42. Rear brake fluid level sensor
- 43. Horn
- 44. Front flasher light (Right)
- 45. Front flasher light (Left)
- 46. Headlight
- 47. Meter assembly
- 48. Diode assembly

- 49. Computer monitor
- 50. "NEUTRAL" indicator light
- 51. "HIGH BEAM" indicator light
- 52. "HEAD LAMP" indicator light
- 53. "TURN" indicator light
- 54. Speedometer sensor
- 55. Tachometer
- 56. Engine temperature gauge
- 57. Voltmeter
- 58. Meter light
- 59. Illumination controller
- 60. Air vent control valve (For California)

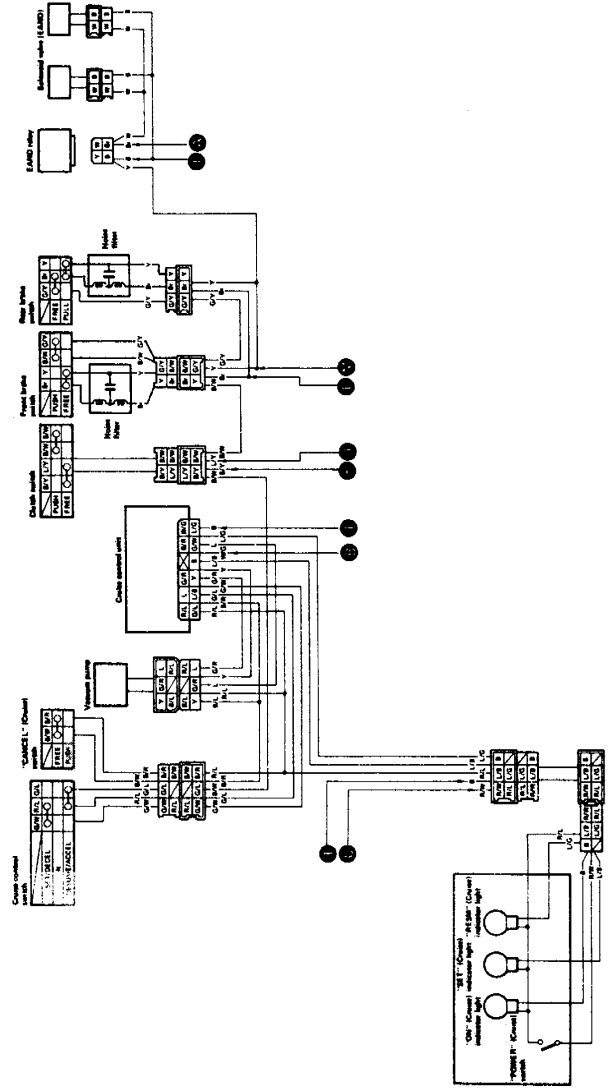
C.B. RADIO AND AUDIO SYSTEM



AIR SUSPENSION CONTROLLER/ TAIL LIGHT/FLASHER LIGHT



"VENTURE CRUISE" control system



COLOR CODE

B	.....	Black	L/Y	.....	Blue/Yellow
L	.....	Blue	L/G	.....	Blue/Green
R	.....	Red	R/W	.....	Red/White
Y	.....	Yellow	R/Y	.....	Red/Yellow
P	.....	Pink	R/B	.....	Red/Black
G	.....	Green	R/L	.....	Red/Blue
W	.....	White	Y/G	.....	Yellow/Green
O	.....	Orange	Y/R	.....	Yellow/Red
Br	.....	Brown	Y/B	.....	Yellow/Black
Ch	.....	Chocolate	Y/W	.....	Yellow/White
Sb	.....	Sky blue	Y/L	.....	Yellow/Blue
Gy	.....	Gray	G/R	.....	Green/Red
Dg	.....	Dark green	G/L	.....	Green/Blue
Lg	.....	Light green	G/Y	.....	Green/Yellow
B/R	.....	Black/Red	G/W	.....	Green/White
B/Y	.....	Black/Yellow	W/G	.....	White/Green
B/W	.....	Black/White	W/B	.....	White/Black
B/L	.....	Black/Blue	W/R	.....	White/Red
B/G	.....	Black/Green	Br/W	.....	Brown/White
B/Gy	.....	Black/Gray	Br/Y	.....	Brown/Yellow
L/W	.....	Blue/White	Br/Gy	.....	Brown/Gray
L/B	.....	Blue/Black	Br/R	.....	Brown/Red
L/R	.....	Blue/Red			



YAMAHA MOTOR CO.,LTD.

IWATA, JAPAN

PRINTED IN U.S



XVZ13DA XVZ13DAC

SUPPLEMENTARY SERVICE MANUAL

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the XVZ13DA/DAC. For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manual:

XVZ13DS/DSC SERVICE MANUAL: LIT-11616-04-96

XVZ13DU/DUC, XVZ13U/UC SUPPLEMENTARY SERVICE MANUAL: LIT-11616-06-06

**XVZ13DA/XVZ13DAC
SUPPLEMENTARY SERVICE MANUAL
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P/N LIT-11616-07-27**

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 motorcycles have a basic understanding of the mechanical concepts and procedures inherent in motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

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 motorcycle 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 motorcycle and to conform with federal environmental quality objectives.

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.

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the XVZ13DA/DAC. Please read this material carefully.

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLES GROUP
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notations.



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

WARNING

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

CAUTION:

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

NOTE:

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

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 disassembly, repair, assembly, and inspection operations.























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

● Bearings:

Pitting/Damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.

① GEN INFO 	② SPEC 	
③ INSP ADJ 	④ ENG 	
⑤ COOL 	⑥ CARB 	
⑦ CHAS 	⑧ ELEC 	
⑨ TRBL SHTG ?	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	
⑰ 	⑱ 	⑲ 
⑳ 	㉑ 	㉒ 
㉓ 		

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 Specifications
- ③ Periodic inspection and adjustment
- ④ Engine
- ⑤ Cooling system
- ⑥ Carburetion
- ⑦ Chassis
- ⑧ Electrical
- ⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing.

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

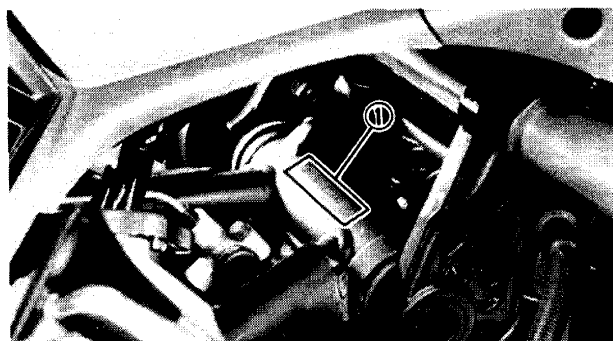
Illustrated symbols ⑰ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑰ Apply engine oil
- ⑱ Apply gear oil
- ⑲ Apply molybdenum disulfide oil
- ⑳ Apply wheel bearing grease
- ㉑ Apply lightweight lithium-soap base grease
- ㉒ Apply molybdenum disulfide grease
- ㉓ Apply locking agent (LOCTITE®)

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GENERAL INFORMATION



MOTORCYCLE IDENTIFICATION

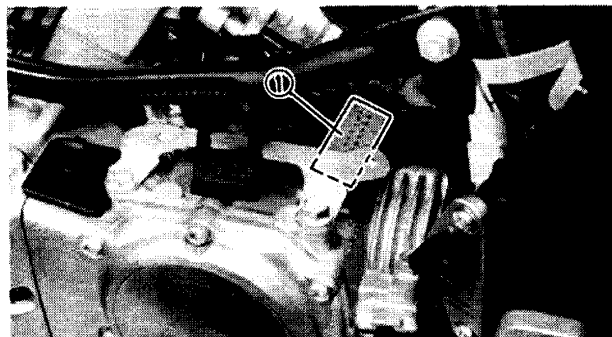
VEHICLE IDENTIFICATION NUMBER

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

NOTE: _____
The vehicle identification number is used to identify your motorcycle and may be used to register your motorcycle with the licensing authority in your state.

Starting Serial Number:

For USA:
 XVZ13DA JYA1NLE0*LA033101
 XVZ13DAC . . . JYA1UNC0*LA007101
For CDN:
 XVZ13DA . . . JYA1UMN0*LA008101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the left side of the engine.

NOTE: _____
The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:

For USA:
 XVZ13DA 1NL-033101
 XVZ13DAC 1UN-007101
For CDN:
 XVZ13DA 1UM-008101

NOTE: _____
Designs and specifications are subject to change without notice.



SPECIFICATIONS

GENERAL SPECIFICATIONS

Model		XVZ13DA/DAC
Model Code Number	For USA	XVZ13DA: 3JJ4 XVZ13DAC: 3JJ5
Engine Starting Number	For CDN	XVZ13DA: 3JJ6
	For USA	XVZ13DA: 1NL-033101 XVZ13DAC: 1UN-007101
Vehicle Identification Number	For CDN	XVZ13DA: 1UM-008101
	For USA	XVZ13DA: JYA1NLE0*LA033101 XVZ13DAC: JYA1UNC0*LA007101
	For CDN	XVZ13DA: JYA1UMN0*LA008101
Tire:		
Type		Tubeless
Size (F)		120/90-18 65H BRIDGESTONE L303/DUNLOP F16
Size (R)		140/90-16 71H BRIDGESTONE G508/DUNLOP K425
Wear Limit		1.0 mm (0.04 in)

MAINTENANCE SPECIFICATIONS

CHASSIS

Model		XVZ13DA/DAC
Front Wheel:		
Type		Cast wheel
Rim Size		18 x MT2.50
Rim Material		Aluminum
Rim Runout Limit:	Vertical	2 mm (0.08 in)
	Lateral	2 mm (0.08 in)
Rear Wheel:		
Type		Cast wheel
Rim Size		16 x MT3.00
Rim Material		Aluminum
Rim Runout Limit:	Vertical	2 mm (0.08 in)
	Lateral	2 mm (0.08 in)



TIGHTENING TORQUE

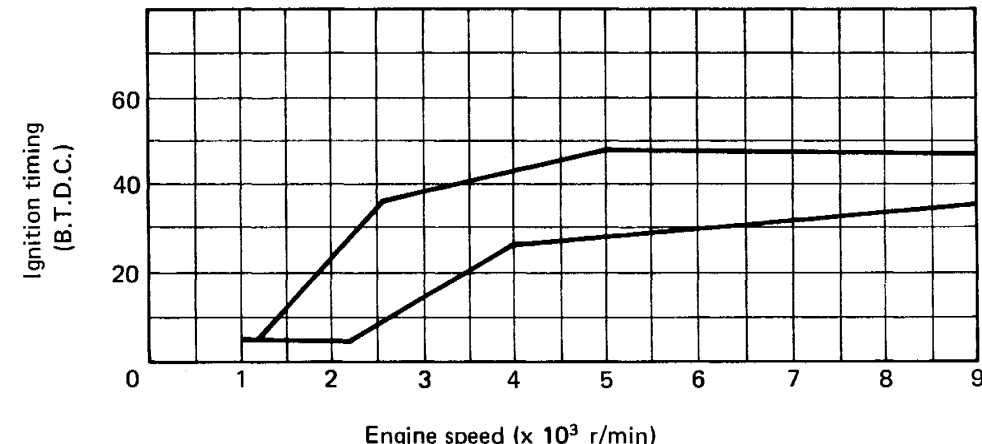
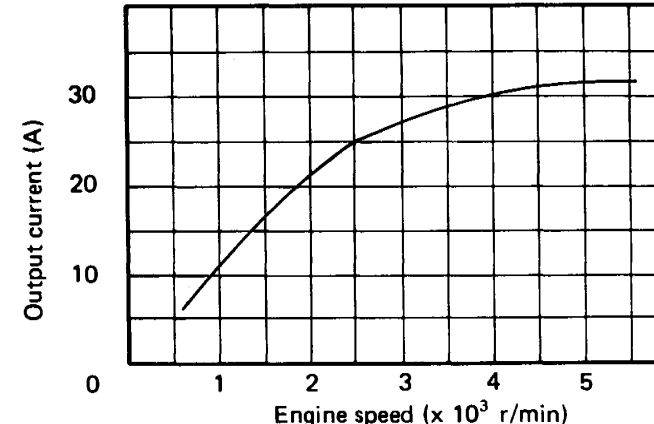
Part to be tightened	Thread size	Tightening torque			Remarks	
		Nm	m·kg	ft·lb		
Front Wheel Axle	M14	105	10.5	75	Refer to NOTE	
Front Axle Pinch Bolt	M8	20	2.0	14		
Under Bracket and Inner Tube	M8	17	1.7	12		
Steering Crown and Inner Tube	M8	20	2.0	14		
Steering Crown and Steering Shaft	M22	110	11.0	80		
Steering Shaft Ring Nut (Lower)	M25	50	5.0	36		
	M25	3	0.3	2.2		
Steering Shaft Ring Nut (Upper)	M25	—	—	—		
Caliper and Front Fork	M10	45	4.5	32		Front
Caliper and Bracket	M10	45	4.5	32		Rear
Caliper and Bleed Screw	M8	5	0.5	3.6		
Brake Hose Union Bolt	M10	25	2.5	18		
Clutch Hose Union Bolt	M10	25	2.5	18		
Brake Hose and Brake Pipe	M10	19	1.9	13		
Clutch Hose and Clutch Pipe	M10	19	1.9	13		
Front Master Cylinder Cap	M4	1	0.1	0.7	Brake & Clutch	
Master Cylinder and Master Cylinder Bracket	M6	9	0.9	6.5	Brake & Clutch	
Rear Master Cylinder and Proportioning Valve	M10	26	2.6	19		
Rear Master Cylinder and Frame	M8	23	2.3	17		
Pivot Shaft (Left) and Frame	M22	100	10.0	72		
Pivot Shaft (Right) and Frame	M25	6	0.6	4.3		
Pivot Shaft (Right) and Locknut	M25	100	10.0	72		
Front Fender and Front Fork	M8	20	2.0	14		
Handlebar Lower Holder and Handlebar						
— Pinch Bolt	M8	30	3.0	22		
— Stopper Nut	M22	125	12.5	90		
Handlebar and Handlebar Grip						
— Pinch Bolt	M6	17	1.7	12		
— Stopper Nut	M10	35	3.5	25		
Engine Bracket (Front Upper)	M10	42	4.2	30		
Engine Bracket (Front Lower)	M10	42	4.2	30		
Engine Bracket (Rear)	M12	70	7.0	50		
Engine Stay and Frame	M8	16	1.6	11		
Rear Wheel Axle and Nut	M18	150	15.0	110		
Fuel Sender and Fuel Tank	M6	5	0.5	3.6		
Relay Arm and Frame	M12	59	5.9	43		
Relay Arm and Rear Shock Absorber	M10	48	4.8	35		

NOTE:

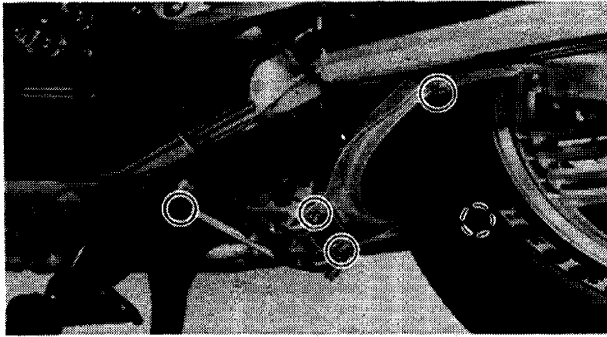
- Ring nut (lower):
 - 1) First, tighten the ring nut approximately 50 Nm (5.0 m·kg, 36 ft·lb) by using the torque wrench, then loosen the ring nut completely.
 - 2) Retighten the ring nut 3 Nm (0.3 m·kg, 2.2 ft·lb).
- Ring nut (upper):
 - 1) Finger tighten the ring nut.



ELECTRICAL

Model	XVZ13DA/DAC
Ignition System: Ignition Timing (B.T.D.C.) Advancer Type	5° at 1,000 r/min Vacuum and electrical 
T.C.I.: Pickup Coil Resistance (Color) T.C.I. Unit-Model/Manufacturer	81 ~ 121Ω at 20°C (68°F) (Black – Orange) T1D14-94/HITACHI
A.C. Generator: Model/Manufacturer Nominal Output	FL-130-07/HITACHI 14V, 30A at 5,000 r/min 
Stator Coil Resistance	0.26 ~ 0.35Ω at 20°C (68°F) (White – White)
Fuel Pump Control Relay: Model/Manufacturer	25G/OMRON

PERIODIC INSPECTION AND ADJUSTMENT



CHASSIS

REAR SUSPENSION LINK LUBRICATION

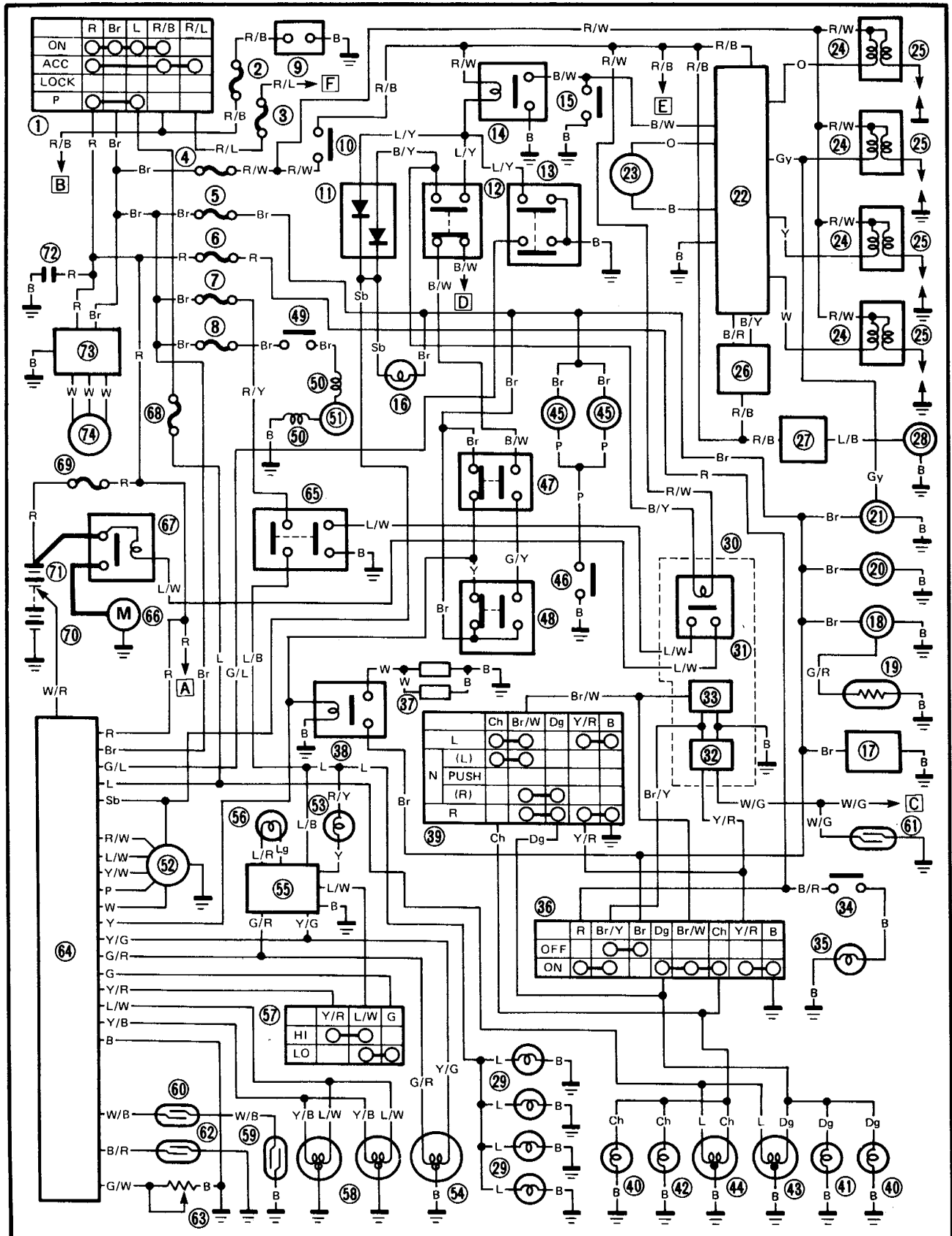
Lubricate pivoting parts of suspension link.

	Molybdenum Disulfide Grease
---	------------------------------------



ELECTRICAL

XVZ13DA/DAC CIRCUIT DIAGRAM



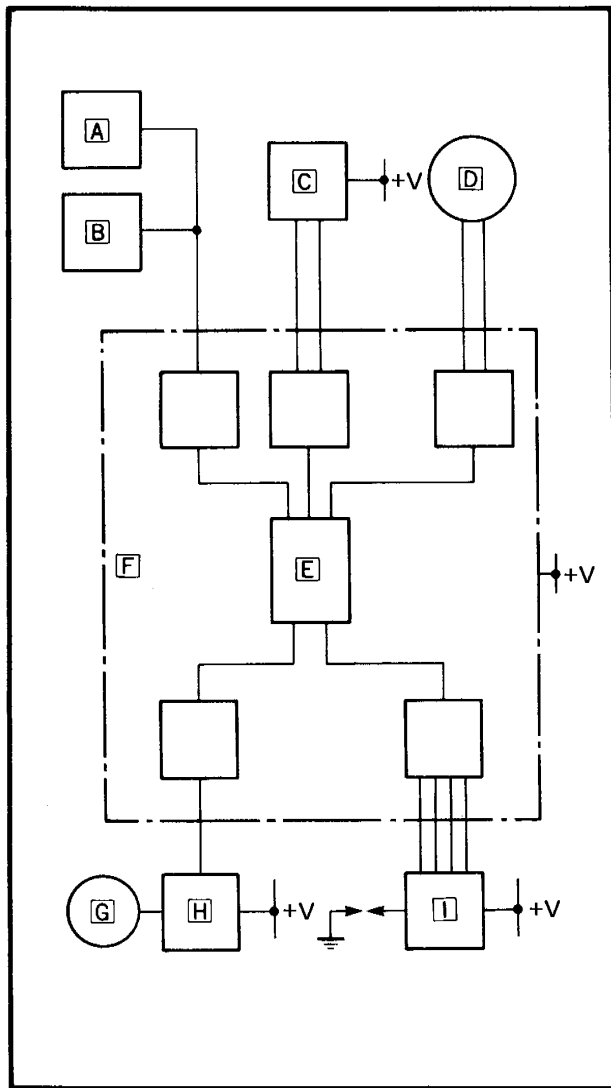


- ① Main switch
- ② Fuse
- ③ Fuse (CLASS)
- ④ Fuse (IGNITION)
- ⑤ Fuse (SIGNAL)
- ⑥ Fuse (HAZARD)
- ⑦ Fuse (HEAD)
- ⑧ Fuse (FAN)
- ⑨ Auxiliary D.C. terminal
- ⑩ "ENGINE STOP" switch
- ⑪ Diode assembly
- ⑫ Clutch switch
- ⑬ Sidestand switch
- ⑭ Sidestand relay
- ⑮ Emergency stop switch
- ⑯ "NEUTRAL" indicator light
- ⑰ Air vent control valve
(For California)
- ⑱ Engine temperature gauge
- ⑲ Thermo unit
- ⑳ Voltmeter
- ㉑ Tachometer
- ㉒ Ignitor unit
- ㉓ Pick up coil
- ㉔ Ignition coil (#1 ~ #4)
- ㉕ Spark plug (#1 ~ #4)
- ㉖ Pressure sensor (Ignition)
- ㉗ Fuel pump control relay
- ㉘ Fuel pump
- ㉙ Meter light
- ㉚ Relay assembly
- ㉛ Starting circuit cut-off relay
- ㉜ Cancellng unit
- ㉝ Flasher relay
- ㉞ Trunk light switch
- ㉟ Trunk light
- ㊱ "HAZARD" switch
- ㊲ Solenoid valve (EAND)

- ㊳ EAND relay
- ㊴ "TURN" switch
- ㊵ "TURN" indicator light
- ㊶ Rear flasher light (Right)
- ㊷ Rear flasher light (Left)
- ㊸ Front flasher light (Right)/
Parking and running light
- ㊹ Front flasher light (Left)/
Parking and running light
- ㊺ Horn
- ㊻ "HORN" switch
- ㊼ Front brake switch
- ㊽ Rear brake switch
- ㊾ Thermo switch
- ㊿ Noise filter (Fan motor)
- 1 Fan motor
- 2 Shift position switch
- 3 "HIGH BEAM" indicator light
- 4 Headlight
- 5 Reserve lighting unit
- 6 "HEAD LAMP" indicator light
- 7 "LIGHTS" (Dimmer) switch
- 8 Tail/brake light
- 9 Rear brake fluid level sensor
- 0 Front brake fluid level sensor
- 1 Speedometer sensor
- 2 Oil level sender
- 3 Fuel sender
- 4 Computer monitor
- 5 "START" switch
- 6 Starter motor
- 7 Starter relay
- 8 Fuse (TAIL)
- 9 Fuse (MAIN)
- 0 Battery sensor
- 1 Battery
- 2 Condensator
- 3 Rectifier with regulator
- 4 A.C. Generator

COLOR CODE

- BBlack
- LBlue
- OOrange
- GGreen
- RRed
- PPink
- YYellow
- WWhite
- Br.Brown
- DgDark green
- ChChocolate
- SbSky blue
- GyGray
- LgLight green
- G/RGreen/Red
- G/YGreen/Yellow
- B/RBlack/Red
- B/WBlack/White
- B/YBlack/Yellow
- L/YBlue/Yellow
- L/BBlue/Black
- L/WBlue/White
- R/WRed/White
- R/BRed/Black
- R/YRed/Yellow
- W/RWhite/Red
- W/GWhite/Green
- W/BWhite/Black
- Y/RYellow/Red
- Y/LYellow/Blue
- Br/W.Brown/White
- B/LBlack/Blue
- B/GBlack/Green
- B/Gy.Black/Gray
- L/RBlue/Red
- L/GBlue/Green
- R/LRed/Blue
- Y/GYellow/Green
- Y/BYellow/Black
- Y/WYellow/White
- G/LGreen/Blue
- G/WGreen/White
- Br/YBrown/Yellow
- Br/GyBrown/Gray
- Br/RBrown/Red



DIGITAL IGNITION CONTROL SYSTEM DESCRIPTION

The electronic ignition that sparks the engine is computer controlled and operated by the digital CPU (microprocessor). It has a pre-programmed ignition advance curve.

This programmed advance curve closely matches the spark timing to the engine's ignition requirements. Only one pickup coil is needed to meet the requirements of the digital ignitor unit.

The digital ignitor also includes the control unit for the electric fuel pump.

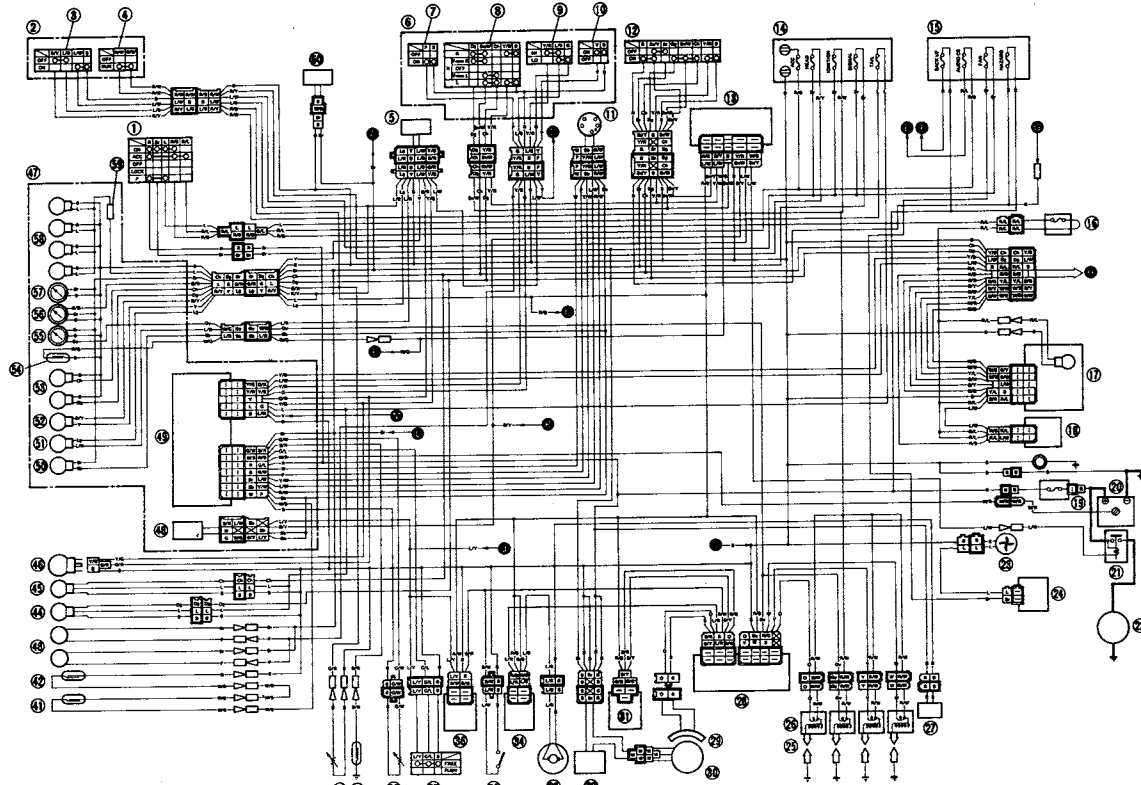
- A** Sidestand switch
- B** Emergency stop switch
- C** Pressure sensor
- D** Pickup coil
- E** CPU (Microprocessor)
- F** Digital ignitor unit
- G** Fuel pump
- H** Fuel pump control relay
- I** Ignition coil

OPERATION

The following operations are digitally-performed by signal from the pickup coil signal:

1. Determining proper ignition timing.
2. Sensing the engine revolution speed.
3. Determining timing for switching on ignition coil (duty control).
4. Increasing ignition coil primary current for starting the engine.
5. Sensing engine stall.
6. Preventing over-revolution of the engine.

XVZ13DA/XVZ13DAC WIRING DIAGRAM



COLOR CODE

B	Black
L	Blue
R	Red
Y	Yellow
P	Pink
G	Green
W	White
O	Orange
Br	Brown
Ch	Chocolate
Sb	Sky blue
Gy	Grey
Dp	Dark green
Ld	Light green
B/R	Black/Red
B/Y	Black/Yellow
B/W	Black/White
B/L	Black/Blue
B/G	Black/Green
B/Gy	Black/Gray
L/W	Blue/White
L/B	Blue/Black
L/R	Blue/Red
L/Y	Blue/Yellow
L/G	Blue/Green
R/W	Red/White
R/Y	Red/Yellow
R/B	Red/Black
R/L	Red/Blue
R/G	Red/Green
Y/R	Yellow/Red
Y/B	Yellow/Black
Y/W	Yellow/White
Y/L	Yellow/Blue
G/R	Green/Red
G/L	Green/Blue
G/Y	Green/Yellow
G/W	Green/White
W/G	White/Green
W/B	White/Black
W/R	White/Red
Br/W	Brown/White
Br/Y	Brown/Yellow
Br/Gy	Brown/Gray
Br/R	Brown/Red
W/L	White/Blue

- | | | | |
|-------------------------------|-------------------------|------------------------------|---|
| ① Main switch | ⑬ Flasher relay | ⑳ Spark plug | ⑳ Sidestand switch |
| ② Handlebar switch (Right) | ⑭ Fuse box | ㉑ Ignition coil | ㉑ Computer monitor |
| ③ "START" switch | ⑮ Fuse box | ㉒ Condenser | ㉒ "NEUTRAL" indicator light |
| ④ "ENGINE STOP" switch | ⑯ Fuse (CLASS) | ㉓ Ignitor unit | ㉓ "HIGH BEAM" indicator light |
| ⑤ Reserve lighting unit | ⑰ CLASS controller unit | ㉔ Pick up coil | ㉔ "HEAD LAMP" indicator light |
| ⑥ Handlebar switch (Left) | ⑱ CLASS relay | ㉕ A.C. Generator | ㉕ "TURN" indicator light |
| ⑦ "HORN" switch | ⑲ Fuse (MAIN) | ㉖ Pressure sensor (Ignition) | ㉖ Speedometer sensor |
| ⑧ "TURN" switch | ⑳ Battery | ㉗ Rectifier/regulator | ㉗ Tachometer |
| ⑨ "LIGHTS" (Dimmer) switch | ㉑ Starter relay | ㉘ Fuel pump | ㉘ Engine temperature gauge |
| ⑩ "PTT" (Push-to-talk) switch | ㉒ Starter motor | ㉙ Fuel pump control relay | ㉙ Voltmeter |
| ⑪ Shift position switch | ㉓ Fan motor | ㉚ Emergency stop switch | ㉚ Meter light |
| ⑫ "HAZARD" switch | ㉔ Thermo switch | ㉛ Sidestand relay | ㉛ Illumination controller |
| | | | ㉜ Air vent control valve (For California) |



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