YAMAHA

XT600L
XT600LC

Service Manual

LIT-11616-04-22

49N-28197-10

XT600L/XT600LC
SERVICE MANUAL
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1st Edition, January 1984
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permission of Yamaha Motor Corporation,
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Printed in USA
P/N LIT-11616-04-22



NOTE:

The motorcycle you have purchased may differ slightly from those shown in the photographs.

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 to 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 XT600L/XT600LC. Please read this material carefully.

Particularly important information is distinguished in this manual 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.

OVERSEAS SERVICE
OVERSEAS OPERATIONS
YAMAHA MOTOR CO., LTD.

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CHAPTER 1. GENERAL INFORMATION

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GENERAL INFORMATION

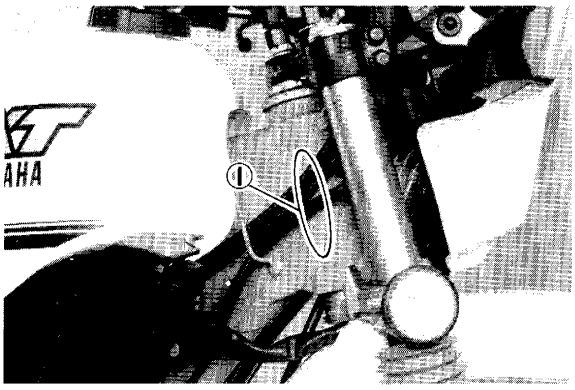
MOTORCYCLE IDENTIFICATION

Vehicle Identification Number

The vehicle identification number 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.



1. Vehicle identification number

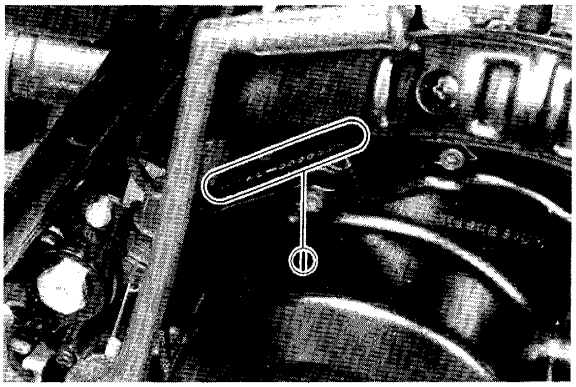
Engine Serial Number

The engine serial number is stamped into the right side of the engine.

NOTE:

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

Starting Serial Number:	
XT600L	49N-000101
XT600LC	49R-000101



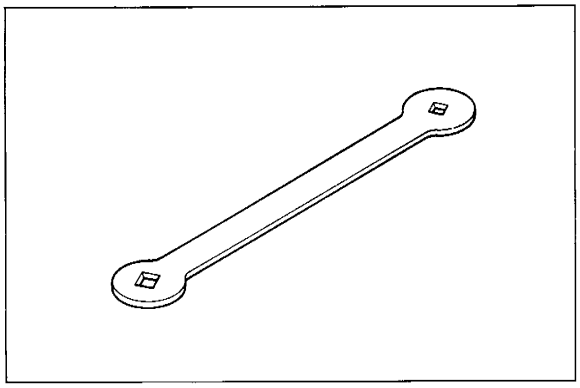
1. Engine serial number

SPECIAL TOOLS

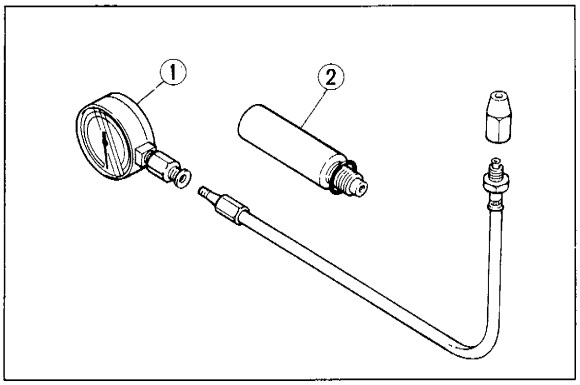
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

For Tune-up

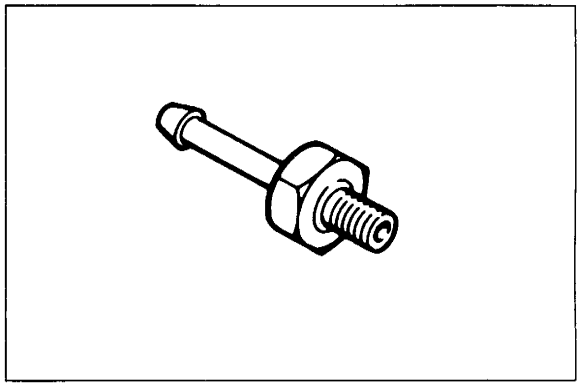
1. Valve Adjusting Tool
   P/N. YM-08035



2. Compression Gauge
P/N. YU-33223 1
Adapter
P/N. YU-33223-3 2

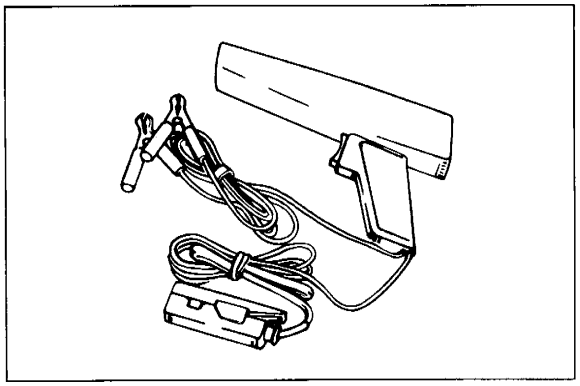


3. Oil pressure Gauge Adapter
P/N. YU-08030-1

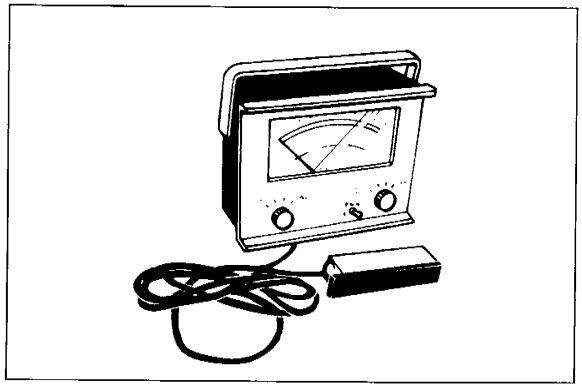


This adapter is attached at the top of the oil filter cover after removing the air bleed screw.

4. Inductive Timing Light
P/N. YU-08037

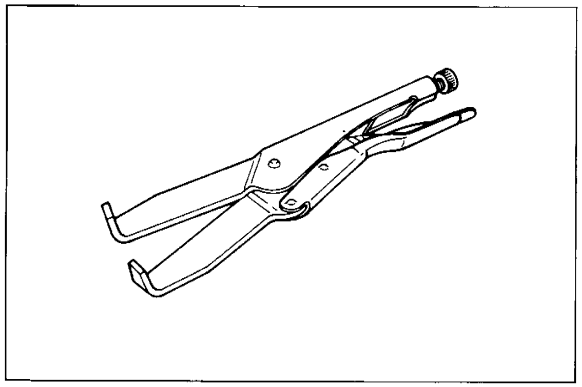


5. Inductive Tachometer
P/N. YU-08036



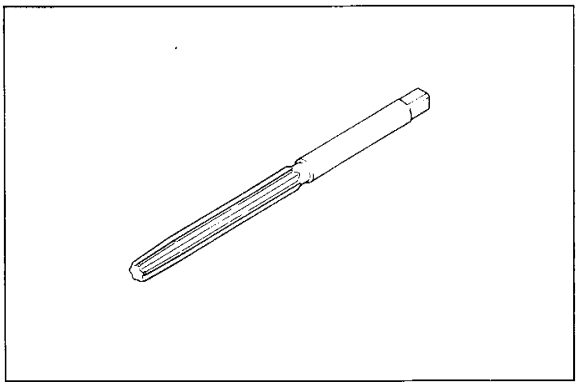
For Engine Service

1. Clutch Holding Tool
P/N. YM-91042



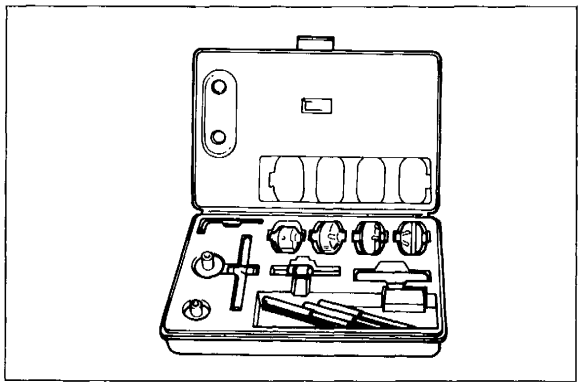
This tools is used to hold the clutch when removing or installing the clutch boss locknut.

2. Valve Guide Reamer
P/N. YM-01227



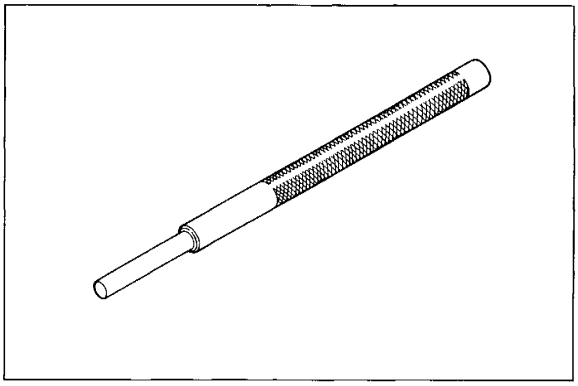
This must be used when replacing the valve guide.

3. Valve Seat Cutter
P/N. YM-91043



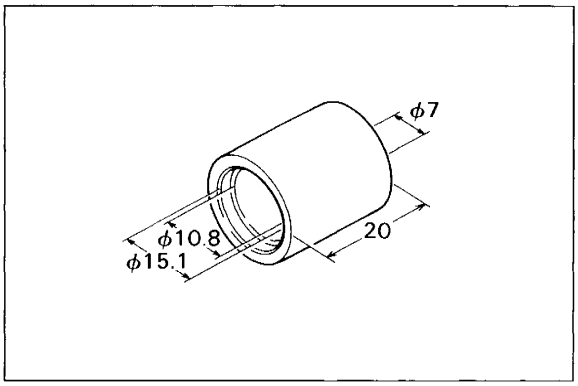
This tool is needed to resurface the valve seat.

4. Valve Guide Remover
P/N. YM-01225



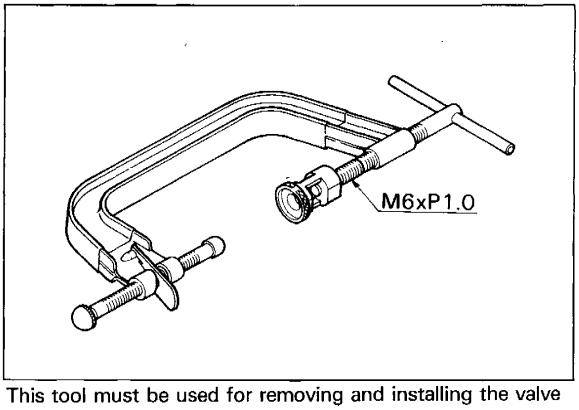
This must be used to remove the valve guides.

5. Valve Guide Installer
P/N. YM-04017



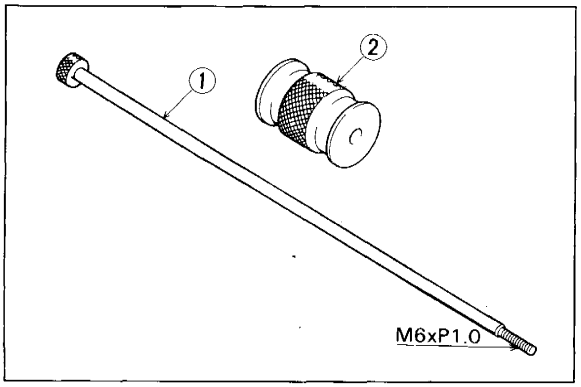
This tool is needed for proper installation of the valve guides.

6. Valve Spring Compressor
P/N. YM-04019



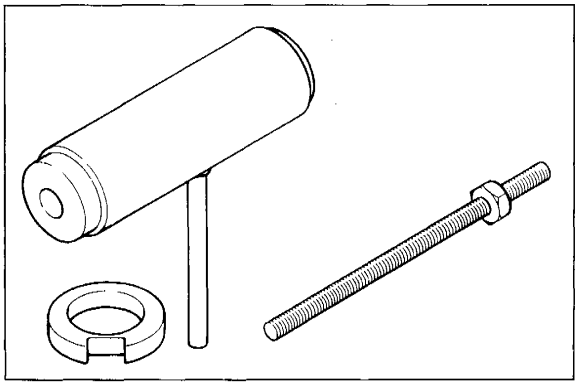
This tool must be used for removing and installing the valve assemblies.

7. Slide Hammer Set
Bolt P/N. YU-01083-1 1
Weight P/N. YU-01083-3 2



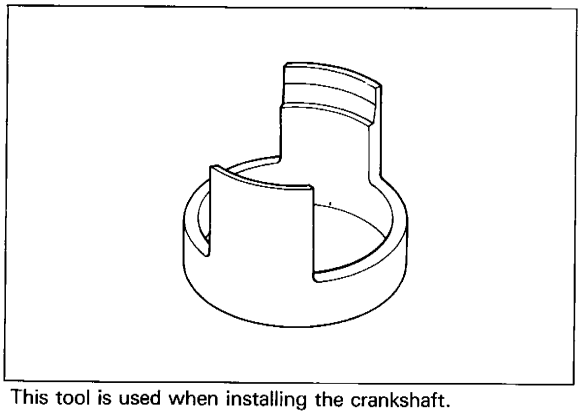
These tools are used when removing the rocker arm shaft.

8. Crankshaft Installing Set
P/N. YU-90050



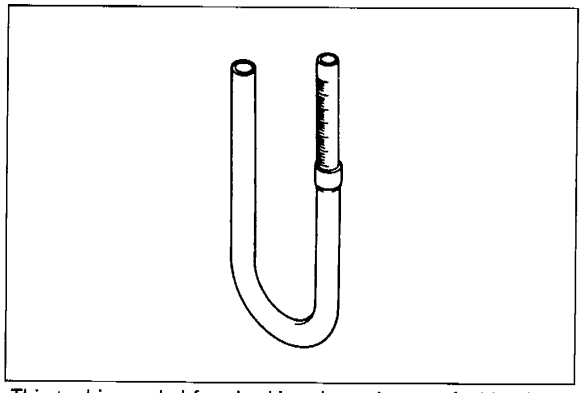
This tool is used when installing the crankshaft.

9. Crank Pot Spacer
P/N. YM-91044



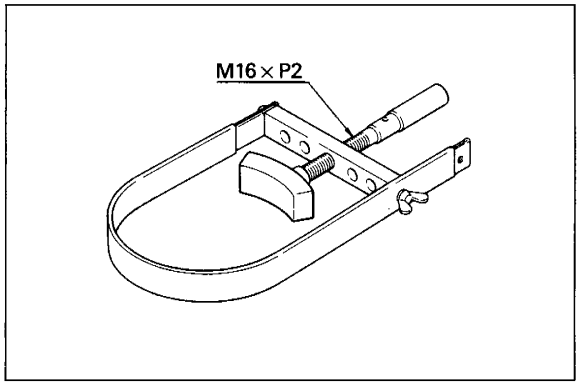
This tool is used when installing the crankshaft.

12. Fuel Level Gauge
P/N. YM-01312



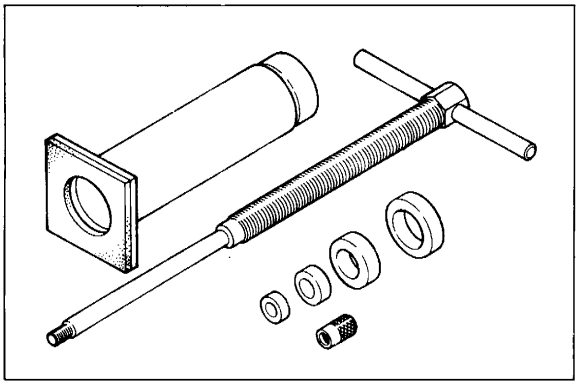
This tool is needed for checking the carburetor fuel level.

10. Rotor Holding Tool
P/N. YU-01701



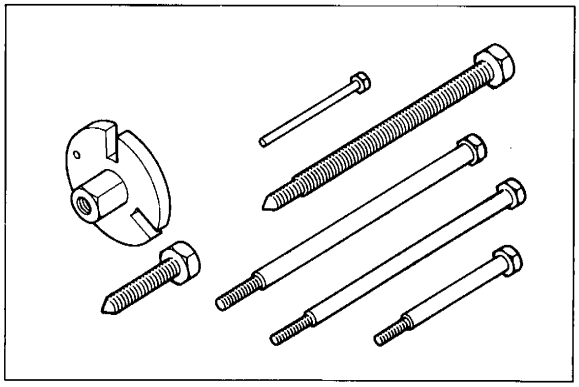
This tool is used for loosening and tightening the CDI rotor securing nut.

13. Piston Pin Puller
P/N. YU-01304



This tool is used when removing the tight pistion pin.

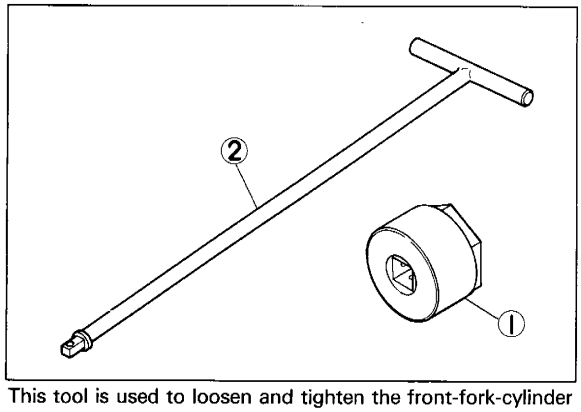
11. Flywheel Puller
P/N. YU-90105



This tool is used for removing the CDI rotor.

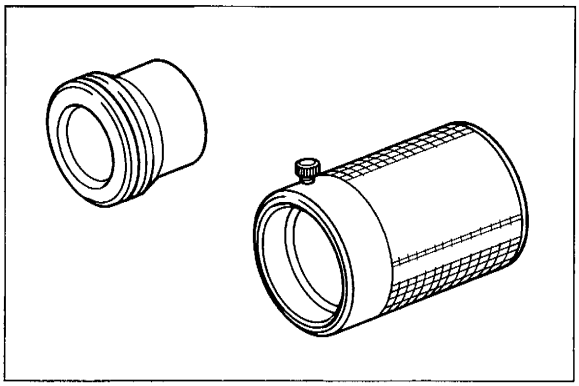
For Chassis Service

1. Front-fork-cylinder Holder
   P/N. YM-01327 1
   T-handle
   P/N. YM-01301 2



This tool is used to loosen and tighten the front-fork-cylinder bolt.

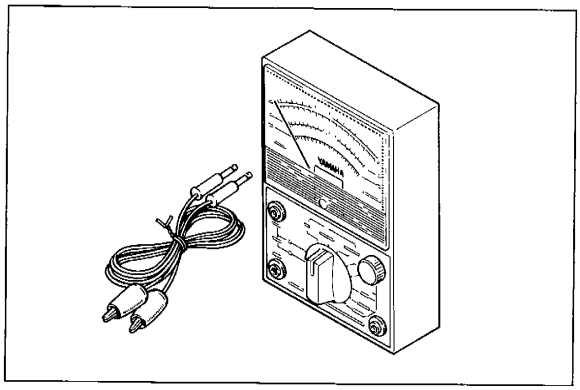
2. Front-fork-oil-seal and Guide-bush Installing Tool
   P/N. YM-08020



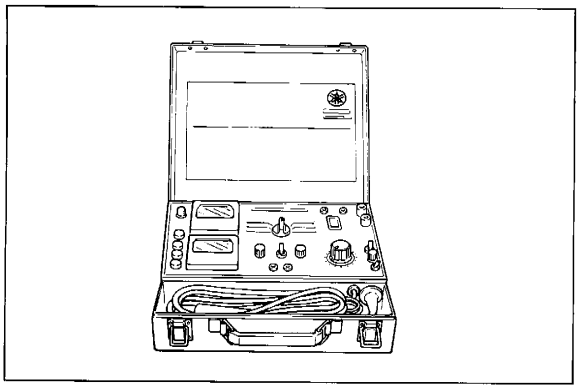
These tools are used when installing guide bush and/or oil seal into the outer fork tube.

For Electrical Components

1. Pocket Tester
   P/N. YU-03112



2. Electro Tester
   P/N. YU-03021



CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

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PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended indpections 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 and to 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

Unit: km (miles)

NO.	ITEM	REMARKS	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)	25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
1.*	Valve clearance	Check and adjust valve clearance when engine is cold.	○	○	○	○	○	○
2.	Spark plug	Check condition. Adjust gap and clean. Replace at 13,000 km (8,200 mi) (or 13 months) and thereafter every 12,000 km (7,600 mi) (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 for cracks or damage. Replace if necessary.		○	○	○	○	○
5.*	Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	○	○	○
6.*	Idle speed	Check and adjust engine idle speed. Adjust cable free play.		○	○	○	○	○
7.*	Decompression	Check and adjust decomp-cable free play after valve clearance maintenance.		○	○	○	○	○

*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), intervals.

GENERAL MAINTENANCE/LUBRICATION

Unit: km (mi)

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	Yamalube 4-cycle oil or SAE 20W40 type "SE" motor oil	○	○	○	○	○	○
2.	Oil filter/strainer	Replace filter element and clean oil strainer. Replace oil strainer if damaged.	–	○		○		○	
3.*	Air filter	Wet type filter must be washed and damped with oil.	Yamalube 2-cycle oil or equivalent.		○	○	○	○	○
4.*	Brake system	Adjust free play. Replace pads if necessary. (Front) Replace shoes if necessary. (Rear)	–	○	○	○	○	○	○
5.*	Clutch	Adjust free play	–	○	○	○	○	○	○
6.	Drive chain	Check chain condition. Adjust and lubricate chain thoroughly.	SAE 30 ~ 50W motor oil	Every 500 km (300 mi)					
7.*	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W30 motor oil	○	○	○	○	○	○
8.*	Rear arm pivot shaft and rear suspension link pivots	Apply until new grease shows.	Lithium soap base grease.		○	○	○	○	○
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.	Sidestand pivots and kick crank boss	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.	–		○	○	○	○	○
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.	Battery	Check specific gravity and beather pipe for proper operation.	–		○	○	○	○	○
16.	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), **3: Every 24,000 km (15,200 mi) intervals.

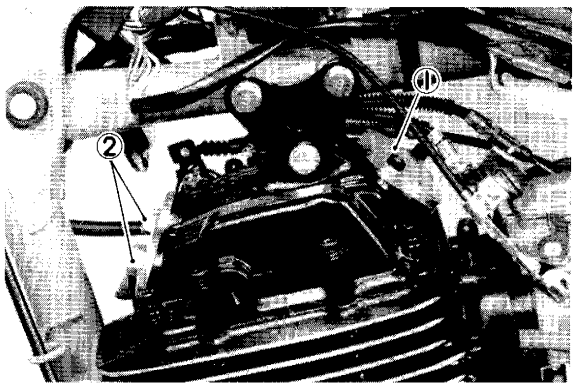
ENGINE

Valve Clearance Adjustment

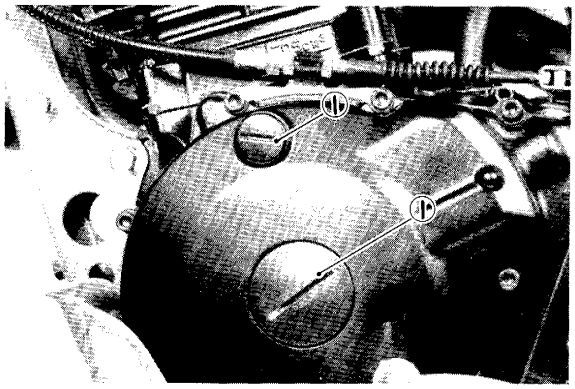
NOTE:

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

1. Remove the intake and exhaust tappet covers and two blind plugs on the left crankcase cover.

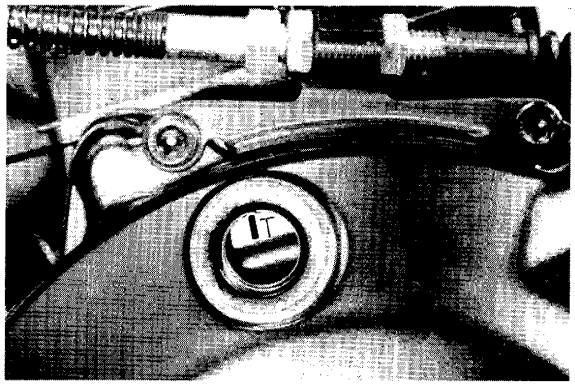


1. Intake tappet cover 2. Exhaust tappet covers



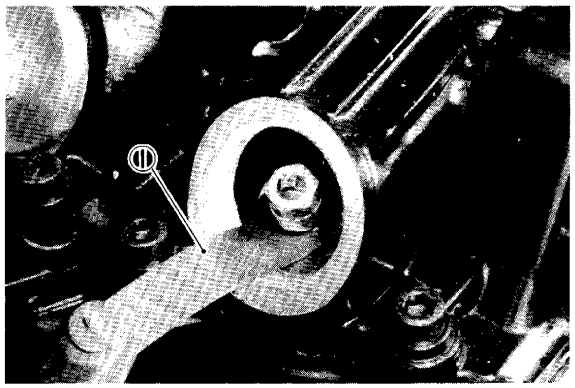
1. Blind plug

2. Align the "T" mark on the flywheel with the timing mark on the crankcase cover. This places the piston at the Top Dead Center and the valve clearance should be checked and adjusted at T.D.C. on the compression stroke by observing when the valve adjusters have clearance.



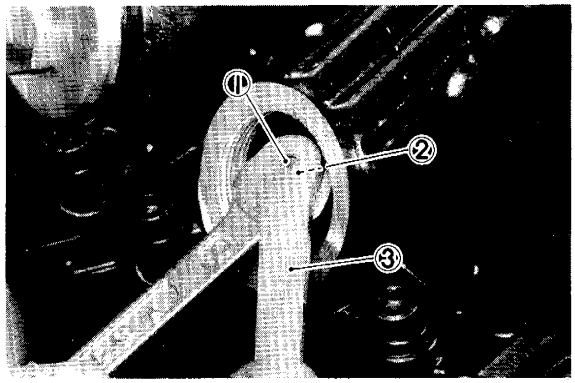
3. Use a feeler gauge to determine the clearance.

Intake Valve (cold): 0.07 ~ 0.12 mm (0.0028 ~ 0.0047 in) Exhaust Valve (cold): 0.12 ~ 0.17 mm (0.0047 ~ 0.0067 in)



1. Feeler gauge

4. Loosen the valve adjuster locknut. Turn the adjuster in or out to obtain the correct clearance. Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.
   Recheck the clearance after tightening.



1. Adjuster
2. Locknut
3. Valve Adjusting Tool (P/N. YM-08035)

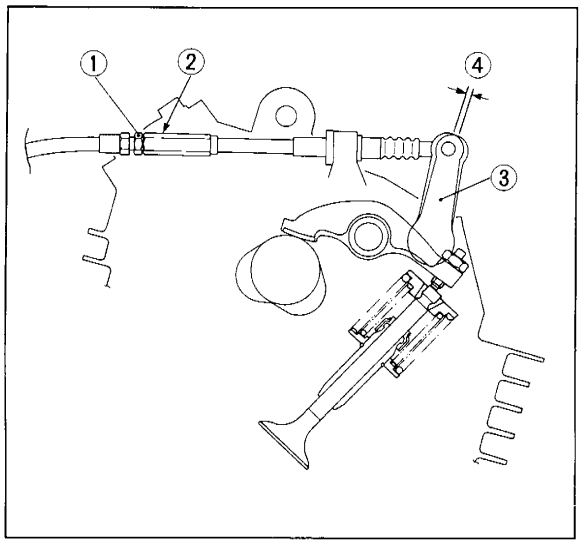
5. Reinstall the intake and exhaust tappet covers and two blind plugs on the left crankcase cover.

Decompression Cable Adjustment

NOTE:

Decomp-cable adjustment must follow the valve clearance adjustment.

1. Remove the two blind plugs on the left crankcase cover.
2. Align the "T" mark on the flywheel with the timing mark on the crankcase cover. This places the piston at Top Dead Center, and the decomp-cable adjustment should be checked and adjusted with the piston at T.D.C. on the compression stroke.
3. Loosen the locknut on the decomp-cable adjuster. Then turn the adjuster so 0.5 mm (0.02 in) free play can be provided for the end of the decomp-lever.



1. Adjuster
2. Locknut
3. Decomp-lever
4. Free play 0.5 mm (0.02 in)

4. After the above adjustment, tighten the locknut on the decomp-cable adjuster.
5. Reinstall the two blind plugs on the left crankcase cover.

Spark Plug Inspection

1. Check electrode condition and wear, insulator color and electrode gap.
2. Clean the spark plug with a spark plug cleaner if necessary.
   Use a wire gauge to adjust the plug gap to the specification.
3. If the electrodes become too worn, replace it.
4. When installing the plug, always clean the gasket surface, wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

Standard Spark Plug:
DP8A-9 (NGK) or X24EP-U9 (N.D.)
Spark Plug Gap:
0.8 ~ 0.9 mm (0.031 ~ 0.035 in)
Spark Plug Tightening Torque:
18 Nm (1.8 m · kg, 13 ft · lb)

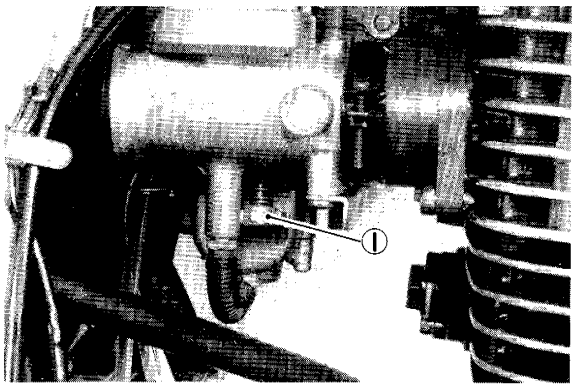
Crankcase Ventilation System
Check ventilation pipe from cylinder head cover to oil tank and breather assembly from crankcase to air cleaner for cracks or damage; replace if necessary.

Fuel Line
Check fuel pipe from fuel cock to carburetor for cracks or damage; replace if necessary.

Exhaust System
1. Replace the joint gasket(s) if necessary.
2. Tighten the joint bolt and nuts.

Idling Speed Adjustment
1. Start the engine and warm it up for a few minutes. The engine is warm when it quickly responds to the throttle.
2. Set the engine idle speed to the specified level by adjusting the throttle stop screw on the carburetor. Turning the throttle stop screw in (clockwise) increase the engine speed; turning it out (counter-clockwise) decreases the engine speed. Use a tachometer for checking and adjusting the engine speed.

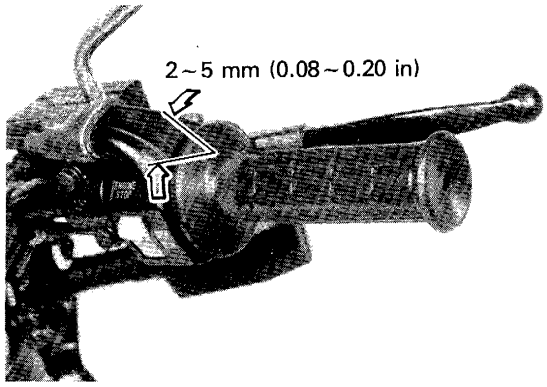
Standard Idle Speed: 1,300 r/min



1. Throttle stop screw

Throttle Cable Adjustment

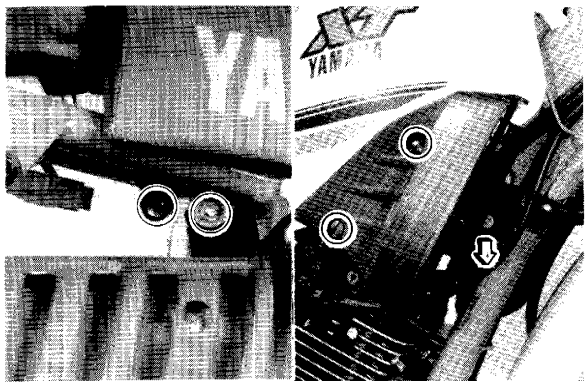
NOTE:
Idle speed should be set before making this adjustment.



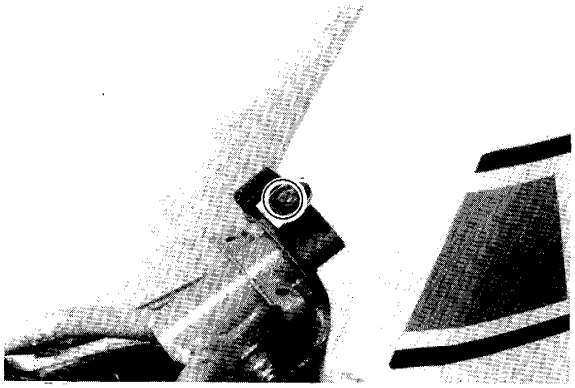
The throttle grip should have a play of 2~5 mm (0.08~0.2 in) in the turning direction at the grip flange. If the play is not in this range, take the following steps for adjustment:

Throttle Cable Free Play: 2~5 mm (0.08~0.20 in)

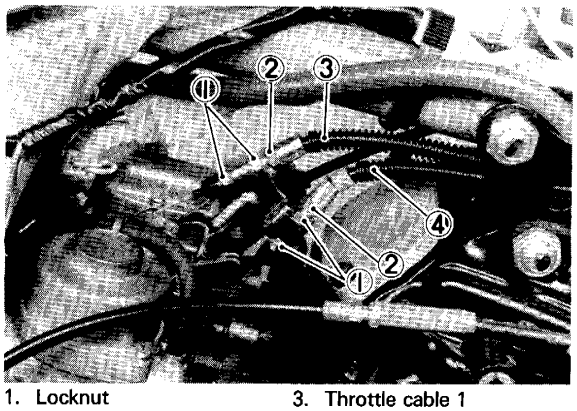
1. Remove the seat.
2. Remove the air ducts.



3. Turn the fuel cock to "OFF" and remove the fuel pipe.
4. Remove the fuel tank.



5. Loosen the locknuts on the carburetor side of throttle cable 1, and turn the adjuster in and out so the play is correct. After the adjustment, be sure to tighten the locknut.
6. If the play is still incorrect after the adjuster is loosened 5 mm (0.20 in), make an adjustment with the adjuster on the throttle cable 2.



1. Locknut
2. Adjuster
3. Throttle cable 1
4. Throttle cable 2

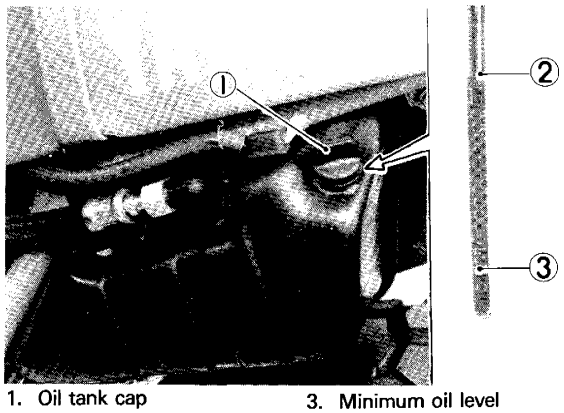
Engine Oil Level Measurement

1. Place the motorcycle on a level place and hold it in an upright position.
2. Remove the oil tank cap, and check the oil level.

NOTE:

When checking, do not screw the oil level gauge into the oil tank. Insert the gauge lightly. For accuracy, check with the motorcycle held upright.

3. If the oil level is between the minimum and maximum level lines marked on the oil level gauge, you may start the engine. If there is no oil on the oil level gauge, add oil up to the minimum level.



1. Oil tank cap
2. Maximum oil level
3. Minimum oil level

4. Start the engine and warm up until the oil temperature rises to approximately 60°C (140°F).
5. Idle the engine more than 10 seconds while keeping the motorcycle upright. Then stop the engine and check the oil level on the upright motorcycle.
6. Adjust the oil level to the maximum level line.

CAUTION:

When the oil tank is empty, never start the engine.

WARNING:

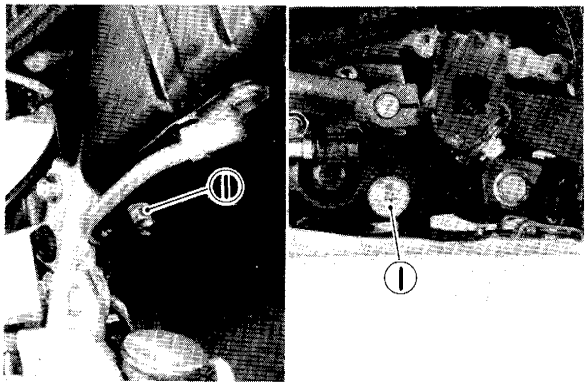
Never attempt to remove the oil tank cap just after high speed operation. The heated oil could spout out, causing danger. Wait until the oil cools down to approximately 60°C (140°F).

Engine Oil and Oil Filter Replacement

1. Start the engine and stop after a few minutes of warm-up.
2. Place an oil receiver under the engine and oil tank.
3. Remove the oil tank cap, drain bolts (at two places), and air bleed screw attached to the oil filter cover.

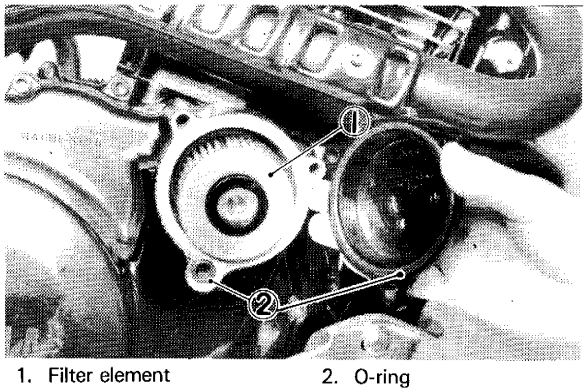
NOTE:

The oil filter cover is secured by three screws. The lower one should be removed so that the filter cavity will drain.



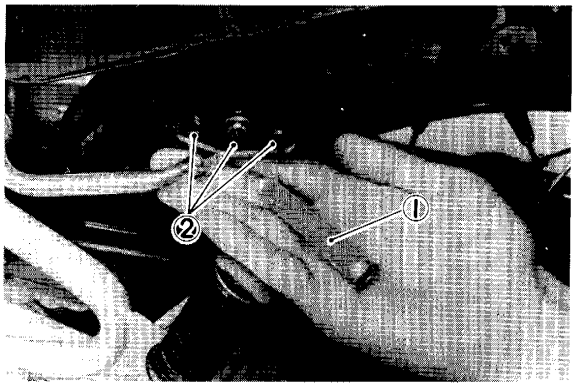
1. Drain bolt

4. Check each gasket. If damaged, replace.
5. Remove the other filter cover screws and, remove the oil filter cover. Replace the filter element.
6. Check O-ring for damage. Replace if damaged.



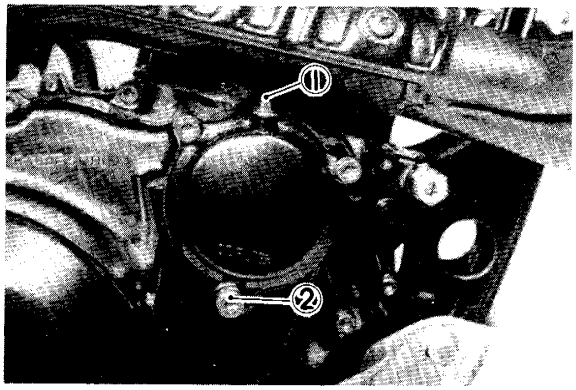
1. Filter element
2. O-ring

7. Remove the oil hose and oil strainer.
8. Clean the oil strainer with solvent.
9. Check the oil strainer and O-rings for damage.



1. Oil strainer
2. O-ring

10. Install the drain bolts (at two places), the air bleed screw, and the filter cover screw.



1. Air bleed screw
2. Filter cover screw

Tightening Torque:
Drain Bolt (Crankcase):
30 Nm (3.0 m·kg, 22 ft·lb)
Drain Bolt (Oil Tank):
18 Nm (1.8 m·kg, 13 ft·lb)
Filter Cover Screw:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Air Bleed Screw:
5 Nm (0.5 m·kg, 3.6 ft·lb)

11. Add engine oil. Install the oil tank filter cap and tighten.

Recommended Oil:
Yamalube 4-cycle oil or
SAE 20W40 type SE motor oil
Oil Capacity:
Total:
2.4 L (2.1 Imp qt, 2.5 US qt)
Periodic Oil Change:
1.9 L (1.7 Imp qt, 2.0 US qt)
With Oil Filter Replacement:
2.0 L (1.8 Imp qt, 2.1 US qt)
Oil Tank Capacity:
1.7 L (1.5 Imp qt, 1.8 US qt)

12. Start the engine and allow a few minutes of warm-up.
While warming up, check for oil leakage. If oil leaks, stop the engine immediately, and check for the cause.
13. Stop the engine and check the oil level.

CAUTION:

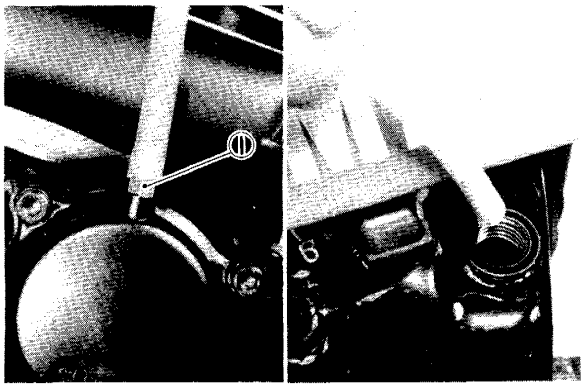
After replacing the engine oil, be sure to check the oil pressure as described below:

1. **Remove the air bleed screw from oil filter cover.**
2. **Start the engine and keep it idling until oil flows out of the bleed hole.**
If no oil comes out after a lapse of one minute, turn off the engine immediately so it will not seize.
3. **After checking, tighten the air bleed screw securely.**

Oil Pressure Check

Oil pressure can be checked using the following procedure:

1. Start the engine and let it idle for a few minutes.
2. Stop the engine.
3. Remove the air bleed screw from the oil filter cover.
4. Remove the exhaust pipe protecter.
5. Install the Oil Pressure Gauge Adapter (P/N. YU-08030-1).
6. Install a oil pressure gauge or pass a vinyl tube over the fuel tank and put it into the oil tank.



1. Oil Pressure Gauge Adapter (P/N. YU-08030-1)

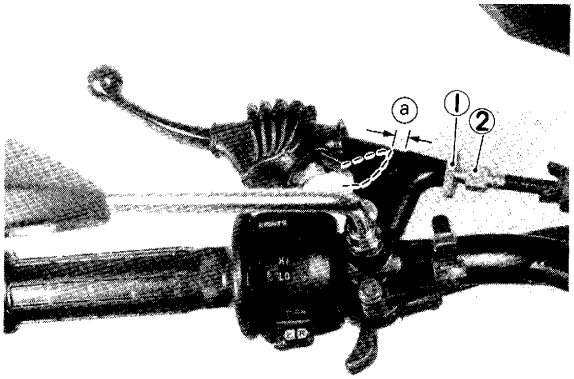
7. Start the engine.
8. If oil pressure is below the specified range or if oil does not flow into the oil tank, stop the engine immediately, and check for the cause.

Specified oil pressure:
9.81 ~ 19.6 kPa
(0.1 ~ 0.2 kg/cm^2, 1.42 ~ 2.84 psi)

Clutch Adjustment

This model has two clutch cable length adjusters and a clutch mechanism adjuster. Cable length adjusters are used to take up slack from cable stretch and to provide sufficient free play for proper clutch operation under various operating conditions. The clutch mechanism adjuster is used to provide the correct amount of clutch "throw" for proper disengagement. Normally, once the mechanism is properly adjusted, the only adjustment required is maintenance of free play at the clutch handlebar lever.

1. Free play adjustment
   Loosen either the handlebar lever adjuster locknut or the cable in-line length adjuster locknut. Next, turn the length adjuster either in or out until proper lever free play is achieved.



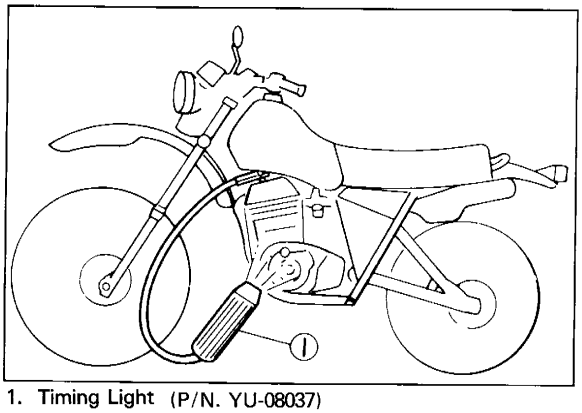
1. Locknut
2. Adjuster

a. 2~3 mm (0.08~0.12 in)

2. Mechanism adjustment
   See Chapter 3 "Clutch Mechanical Adjustement".

Ignition Timing Check

Check the ignition timing with a Timing Light by observing the stationary pointer and the marks stamped on the flywheel.

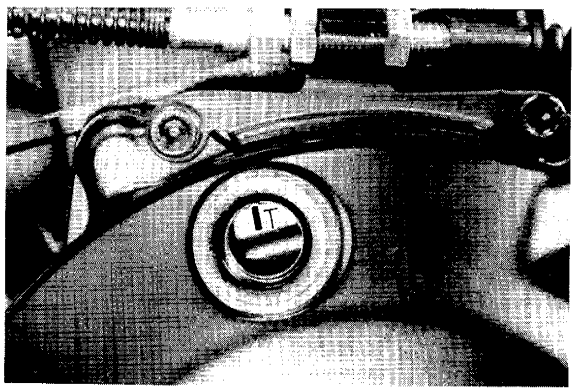


1. Timing Light (P/N. YU-08037)

1. Remove the upper blid plug on the left crankcase cover.
2. Connect the timing light to the spark plug wire.
3. Start the engine, and keep the engine running at the specified speed. Use a tachometer to check the engine speed.

Engine Speed:
1,200 r/min

4. The stationary pointer (in the timing window) should be within the firing range shown on the flywheel. If the pointer is not within the range or if it is not steady, check the flywheel and/or pickup assembly for tightness and/or damage. (See "Chapter 6: ELECTRICAL" for further information.)



5. Reinstall the blind plug.

Compression Pressure Measurement

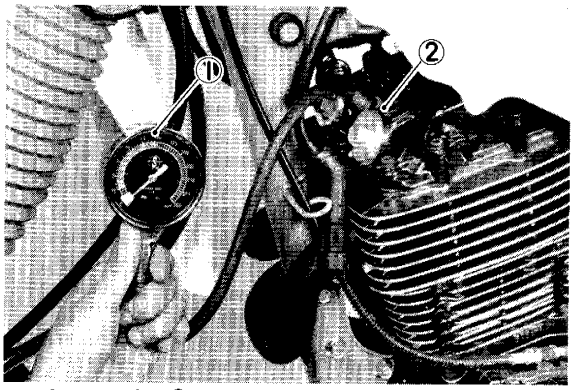
Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.

1. Make sure the valve clearance is correct.
2. Warm up the engine for 2~3 minutes; stop the engine.
3. Remove the spark plug.
4. Install a Compression Gauge.
5. Turn over the engine with the kick starter with the throttle wide open until the pressure indicated on the gauge does not increase further. The compression should be within the specified levels.

Compression Pressure (at sea level):
Standard ...
1,079 kPa (11 kg/cm^2, 156 psi)
Minimum ...
883 kPa(9 kg/cm^2, 128 psi)
Maximum ...
1,177 kPa (12 kg/cm^2, 171 psi)

WARNING:

When cranking the engine, ground the spark plug lead to prevent sparking.



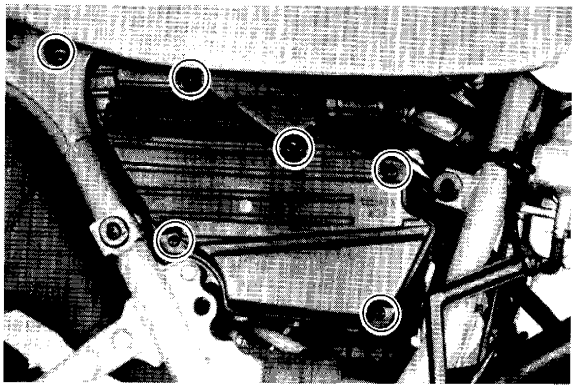
1. Compression Gauge (P/N. YU-33223)
2. Compression Gauge Adapter (P/N. YU-33223-3)

6. If the pressure is too low, squirt a few drops of oil into the cylinder. Measure compression again. If there is a higher reading than before (without oil), the piston rings may be worn or damaged. If the pressure remains the same after measuring with the oil, one or both rings and valves may be the source of the problem.

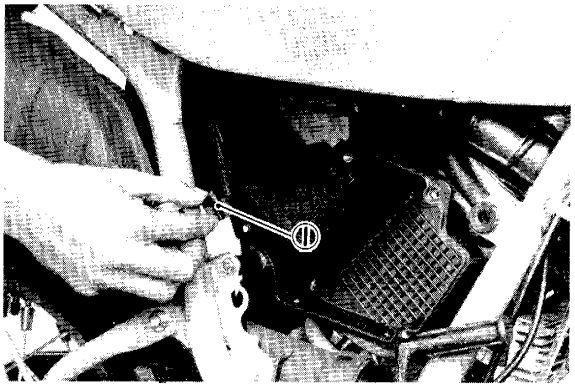
CHASSIS

Air Filter Cleaning

1. Removal
a. Remove the side cover.
b. Remove the air filter case fitting screws and the filter case cover.



c. Pull out the element set plate.



1. Element set plate

d. Pull out the element.

CAUTION:

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

2. Cleaning method
a. Slip the guide from the element.
b. Wash the element gently, but thoroughly, in solvent.
c. Squeeze the excess solvent out of the element and let dry.
d. Pour a small quantity of SAE 10W30 motor oil onto the filter element and work thoroughly into the porous foam material.

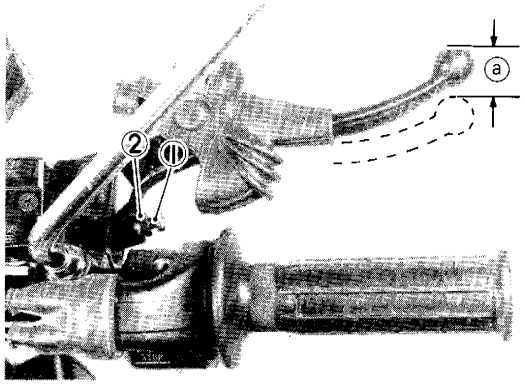
NOTE:

In order to function properly, the element must be damp with oil at all time, but not "dripping" with oil.

e. Reinsert the guide into the element.
f. Coat the sealing side of the element with light grease for an air-tight seal between the element and case.
g. Install the filter element and filter case cover.

Front Brake Adjustment

The free play at the end of the front brake lever should be 5~8 mm (0.2~0.3 in).



1. Adjuster
2. Locknut
3. 5~8 mm (0.2~0.3 in)

1. Loosen the locknut.
2. Turn the adjuster so that the brake lever movement at the lever end is 5~8 mm (0.2~0.3 in) before the adjuster contacts the master cylinder piston.
3. After adjusting, tighten the locknut.

WARNING:

Check the brake lever free play. Be sure the brake is working properly.

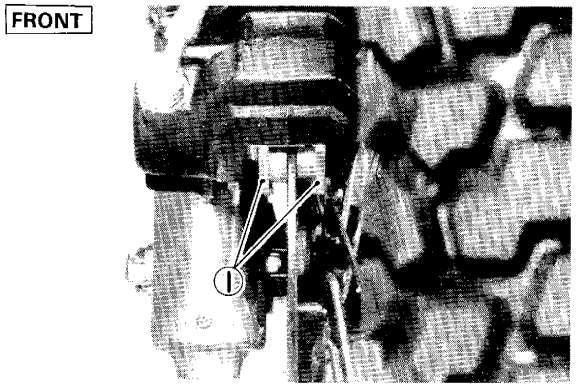
WARNING:

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.

Front Brake Pad Check

To check, look at the pad wear indicator in back of the caliper. If any pad is worn to the wear limit, replace both pads in the caliper.

Wear Limit:
0.8 mm (0.031 in)

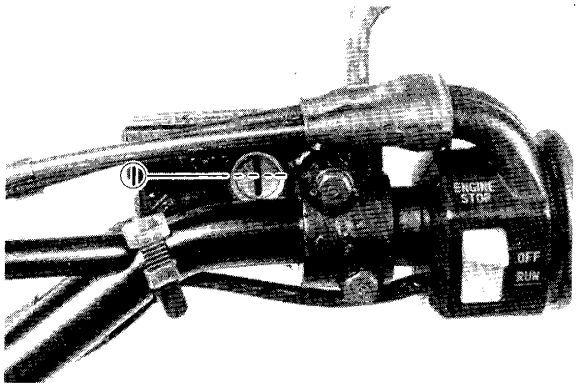


1. Wear indicator

Brake Fluid Level Inspection

Insufficient brake fluid may let air enter the brake system, possibly causing the brakes to become ineffective.

Before riding, check the brake fluid level and replenish when necessary; observe these precautions:



1. Lower level

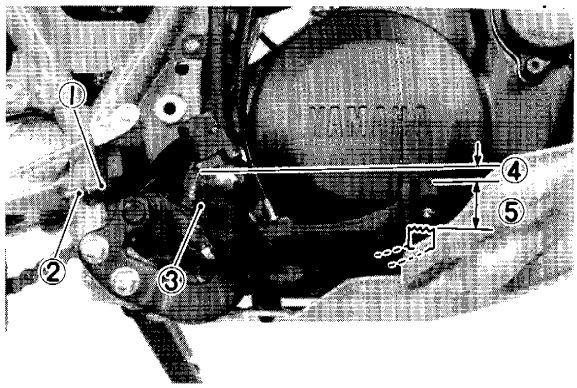
1. Use only the designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.

Recommended Brake Fluid:
DOT #3

2. Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
3. Be careful that water does not enter the master cylinder when refilling. Water will significatnly lower the boiling point of the fluid and may result in vapor lock.
4. Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

Rear Brake Adjustment

1. Pedal height
   a. Loosen the adjuster locknut (for pedal height).
   b. By turning the adjuster clockwise or counterclockwise, adjust the brake penal position to that its top end is approx. 5~10 mm (0.2~0.4 in) below the top of the footrest.
   c. Secure the adjuster locknut.



1. Adjuster bolt (For pedal height)
2. Locknut
3. Footrest
4. Pedal height 5~10 mm (0.2~0.4 in)
5. Free play 20~30 (0.8~1.2 in)

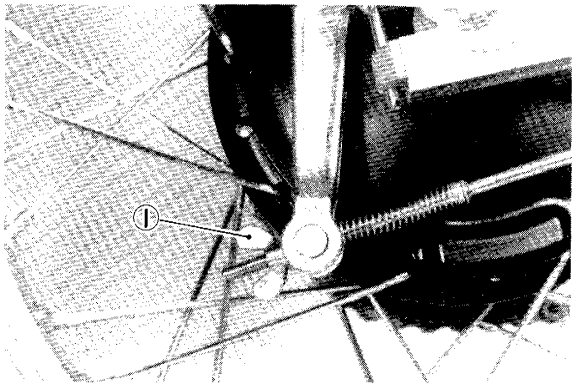
WARNING:

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

2. Free play
   The rear brake should be adjusted to suit the rider's preference; but free play at the brake pedal end must be 20~30 mm (0.8~1.2 in). Turn the adjuster on the brake rod clockwise to reduce play; turn the adjuster counterclockwise to increase play.

WARNING:

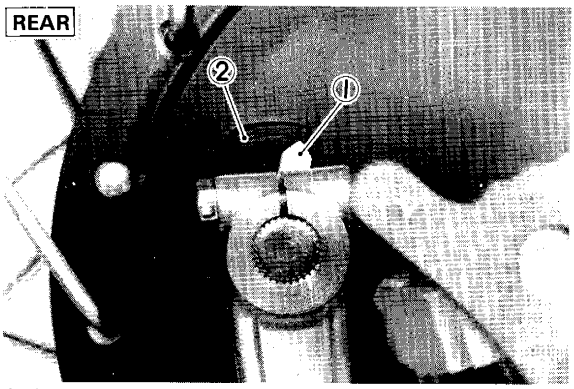
Check the operation of the brake light after adjusting the rear brake.



1. Adjuster

Rear Brake Shoe Lining Check

To check, examine the wear indicator position while depressing the brake pedal. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear indicator
2. Wear limit

Cable Inspection and Lubrication

The throttle twist grip assembly should be greased when the cable is lubricated, since the grip must be removed to get at the end of the throttle cable. Two screws clamp the throttle housing to the handlebar. Once these two are removed, the end of the cable can be held high to pour in several drops of lubricant. With the throttle grip disassembled, coat the metal surface of the grip assembly with a suitable all-purpose grease to cut down friction.

1. Damage to the outer housing of the various cables may cause corrosion. Often free movement will be obstructed. An unsafe condition may result. Replace such cables as soon as possible.
2. If the inner cables do not operate smoothly, lubricate or replace them.

Recommended lubricant:
Yamaha Chain and Cable Lube or
10W30 motor oil

Brake and Change Pedals/Brake and Clutch Levers/Sidestand

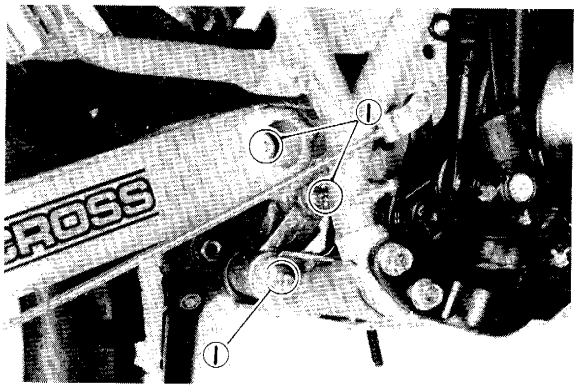
Lubricate the pivoting parts of the lever, pedal, and sidestand.

Recommended lubricant:
Yamaha Chain and Cable Lube or
10W30 motor oil

Swingarm and Relayarm Pivot Lubrication

The swingarm and relayarm must pivot freely on its bearings, but not have any excess play. Check swingarm and relayarm pivot bearing operation according to the PERIODIC MAINTENANCE SCHEDULE.
Using a grease gun, lubricate the swingarm and relayarm pivot points.

Recommended Lubricant:
Lithium Base Grease



1. Grease nipple

Drive Chain Tention Check

NOTE:

Before checking and/or adjusting the chain tension, rotate the rear wheel through several revolutions. Check the chain tension several times to find the point where the chain is the tightest. Check and/or adjust the chain tension where the rear wheel is in this "tight chain" position.

To check the chain tension the motorcycle must stand vertically with its both wheels on the ground and without a rider. Check the tension at the position shown in the illustration. The normal vertical deflection is approximately 30 ~ 40 mm (1.2 ~ 1.6 in). If the deflection exceeds 40 mm (1.6 in) adjust the chain tension.



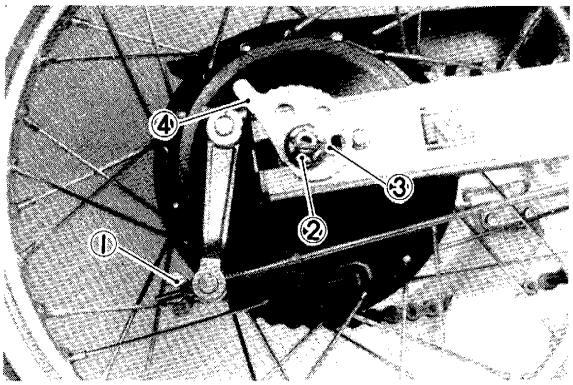
a. 30 ~ 40 mm (1.2 ~ 1.6 in)

Drive Chain Tension Adjustment

CAUTION:

Excessive chain tension will overload the engine and other vital parts; keep the tension within the specified limits.

1. Loosen the rear brake adjuster.
2. Remove the cotter pin from the rear wheel axle nut.
3. Loosen the rear wheel axle nut.
4. Turn chain puller both left and right, until axle is situated in same puller slot position.

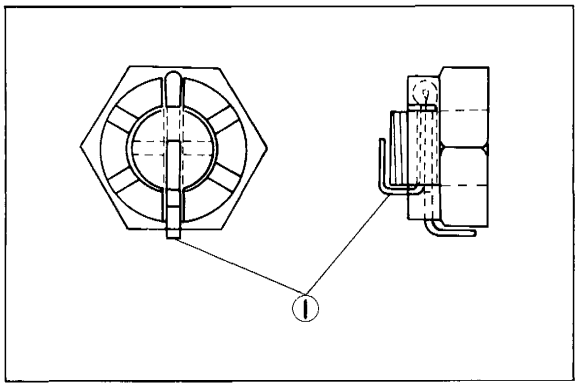


1. Adjuster
2. Axle nut
3. Cotter pin
4. Chain puller

5. After adjusting, be sure to tighten the axle nut.

Tightening Torque:
100 Nm (10.0 m·kg, 72 ft·lb)

6. Insert new cotter pin into the rear wheel axle nut and bend the end of cotter pin as shown in the illustration. (If the nut notch and cotter pin hole do not match, tighten the nut slightly to align them.)



1. Cotter pin

WARNING:

Always use a new cotter pin on the axle nut.

7. Adjust the free play in the brake pedal.

WARNING:

Check the operation of the brake light after adjusting the rear brake.

Drive Chain Lubrication

The chain consists of many parts which work against each other. If the chain is not maintained properly, it will wear out rapidly, therefore, especially necessary when riding in dusty conditions.

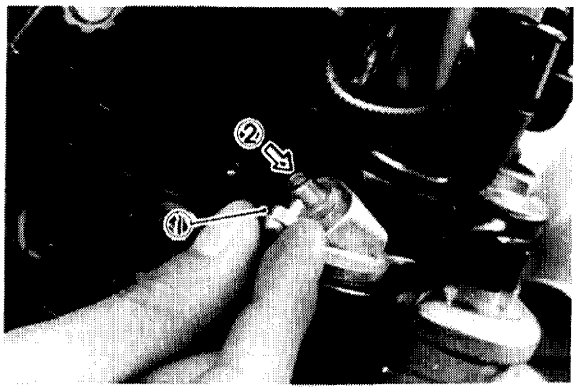
This motorcycle has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain. Wipe it dry, and thoroughly lubricate it with SAE 30~50W motor oil. Do not use any other lubricatns on the drive chain. They may contain solvents that could damage the O-rings.

Front Fork Oil Change

WARNING:

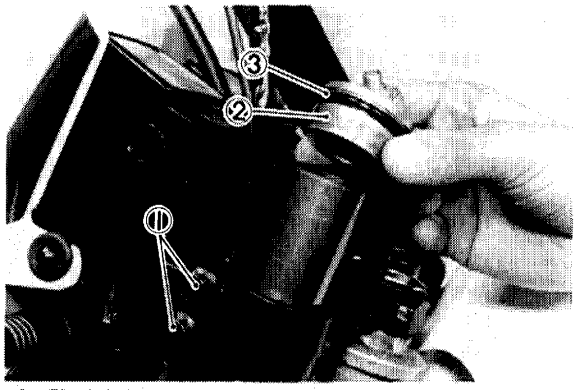
1. **Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the motorcycle.**
2. **Securely support the motorcycle so there is no danger of it falling over.**

1. Elevate the front wheel by placing a suitable stand under the engine. Remove the handlebars.
2. Remove the air valve cap from each fork.
3. Keep the valve open by pressing it for several seconds to that the air can be let out of the inner tube.



1. Air valve cap
2. Push

4. Loosen the front fork pinch bolts and remove the cap bolts from the inner fork tubes.



1. Pinch bolt
2. Cap bolt
3. O-ring

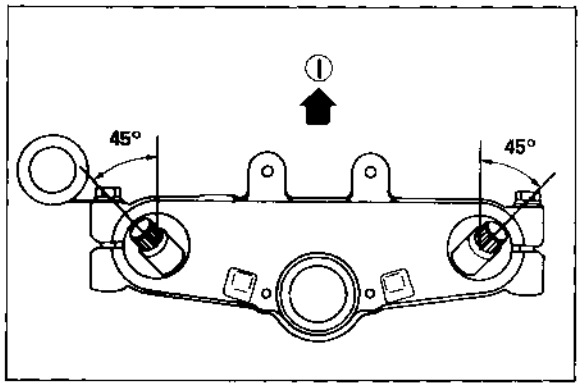
5. Place an open container under each drain hole. Remove the drain screw from each outer tube.

WARNING:

Do not let oil contact the disk brake components. If any oil should contact the brake components, it must be removed before the motorcycle is operated. Oil will cause diminished braking capacity and will damage the rubber components of the brake assembly.



1. Drain screw



1. Frontward

6. After most of the oil has been drained, slowly pump the forks up and down to remove any remaining oil.
7. Inspect the drain screw gasket. Replace if damaged. Reinstall the drain screws.
8. Pour the specified amount of oil into each fork inner tube.

Front Fork Oil Capacity (each fork):
483 cm^3 (17.0 Imp oz, 16.3 US oz)
Recommended Oil:
Yamaha fork oil 10Wt or SAE 10W30 type SE motor oil

9. After filling, slowly pump the forks up and down to distribute the oil.
10. Inspect the O-ring on the cap bolt. Replace if damaged.
11. Reinstall the cap bolt.

Tightening Torque:
Cap bolt:
23 Nm (2.3 m·kg, 17 ft·lb)

12. If the air valve does not face towards the illustration, loosen the pinch bolts on the under bracket and reset the forks in the following procedure:
a. Level the top of the inner fork tube with the top of the steering crown.
b. Face the air valve towards the front.

13. Tighten the front fork pinch bolts and install the handlebars.

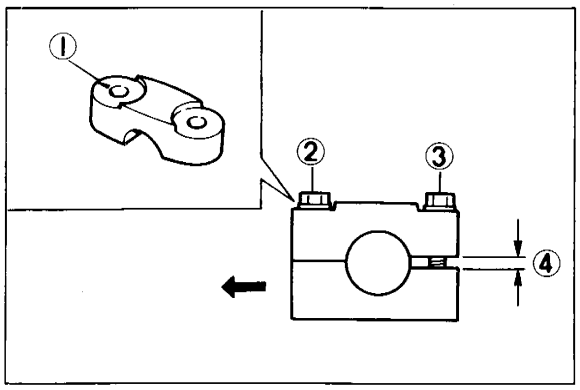
NOTE:

The upper handlebar holder should be installed with the punched mark forward.

CAUTION:

First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.

Tightening Torque:
Front Fork Pinch Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)
Handlebar Installation Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)



1. Punched mark
2. 1st
3. 2nd
4. Gap

14. Fill the fork with air using an air pump or pressurized air supply. Refer to "Front Fork Adjustment" for proper air pressure adjusting.

Maximum Air Pressure: 98.1 kPa (1.0 kg/cm^2, 14.2 psi) Do not exceed this amount.

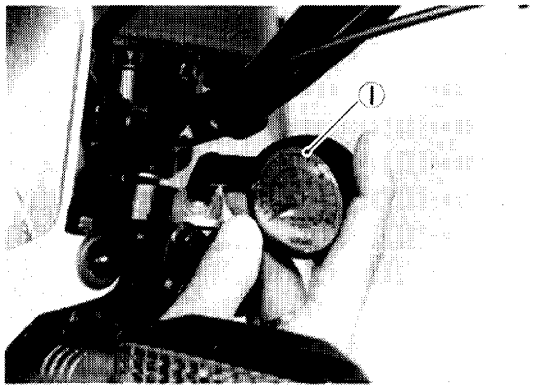
Front Fork Adjustment

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

NOTE:

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

2. Remove the valve cap from each fork.
3. Using the air check gauge, check and adjust the air pressure. If the air pressure is increased, the suspension becomes stiffer, and if decreased, it becomes softer.



1. Air check gauge

To increase:
Use an air pump or pressurized air supply.
To decrease:
Release the air by pushing the valve.

NOTE:

An optional air check gauge is available.
P/N. 2X4-2811A-00.

CAUTION:

Never exceed the maximum pressure, or oil seal damage may occure.

WARNING:

The difference between both the left and right rubes should be 9.81 kPa (0.1 kg/cm^2 1.4 psi) or less.

Standard Air Pressure: 39.2 kPa (0.4 kg/cm^2, 5.7 psi) Maximum Air Pressure: 98.1 kPa (1.0 kg/cm^2, 14.2 psi) Minimum Air Pressure: Zero

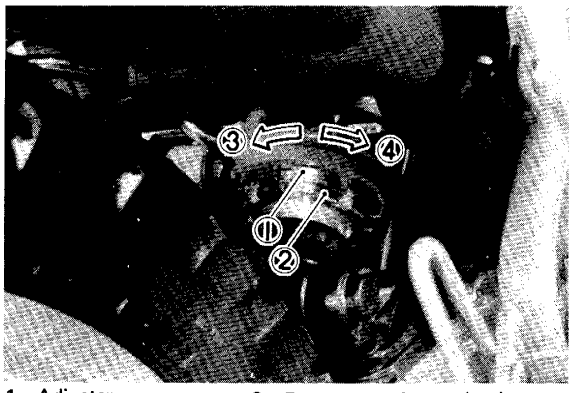
4. Install the valve caps securely.

Rear Shock Absorber Adjustment

1. Spring
   The spring preload of the rear shock absorber can be adjusted to suit rider's preference, weight, and the course conditions.
   a. Loosen the locknut.
   b. To increase the preload, turn the adjuster clockwise. To decrease the preload, turn the adjuster counterclockwise.

CAUTION:

Never attempt to turn the adjuster beyond the maximum or minimum setting.



1. Adjuster
2. Locknut
3. Decrease spring preload
4. Increase spring preload

   c. The length of the spring (installed) changes 1 mm (0.04 in) per turn of the adjuster.

NOTE:

When adjusting, use the special wrench which is included in the owner's tool kit.

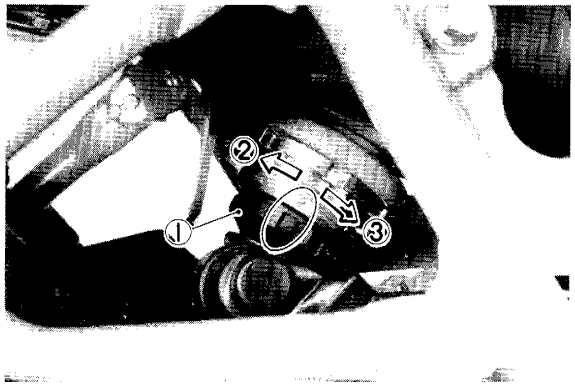
CAUTION:

Always tighten the lock nut against the spring adjuster and torque the locknut to specification.

S.T.D. Length	239 mm (9.4 in)
MIN. Length	226.5 mm (8.9 in)
MAX. Length	247.5 mm (9.7 in)

Tightening Torque:
70 Nm (7.0 m·kg, 50 ft·lb)

2. Damping
   a. Turn the damping adjuster to increase or decrease the damping.



1. Damping adjuster
2. Decrease
3. Increase

   b. If the damping adjuster is turned toward the "5", the damping becomes harder; if the adjuster is turned forward the "1", damping becomes softer.

CAUTION:

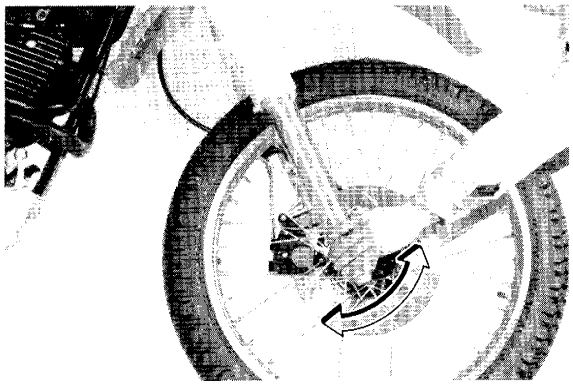
Never attempt to turn the adjuster beyond the maximum or minimum setting.

	Hard			STD	Soft
Adjusting position	5	4	3	2	1

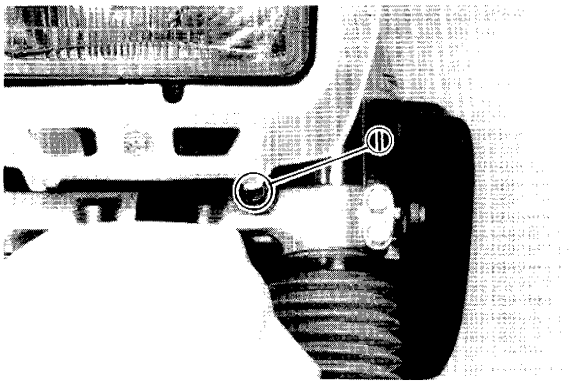
Steering Head Adjustment

The steering assembly should be checked periodically for looseness.

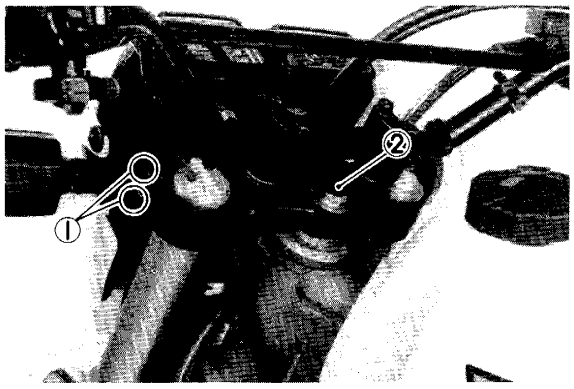
1. Raise the front end of the motorcycle so that there is no weight on the front wheel.
2. Grasp the bottom of the forks and gently rock the fork assembly backward and forward, checking for looseness in the steering assembly bearings.



3. If the steering head is loose, adjust it. Loosen the steering fitting bolt, front fork pinch bolts and headlight stay.



1. Securing bolt



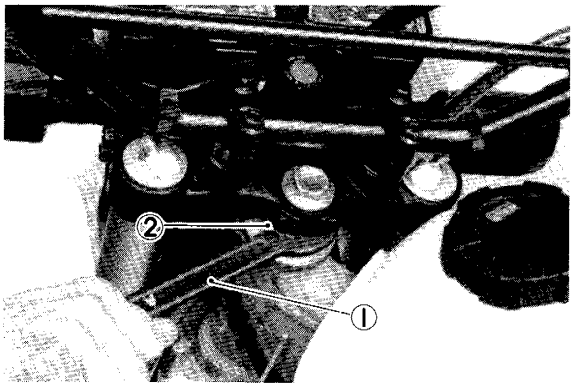
1. Front fork pinch bolt
2. Steering fitting bolt

4. Using the ring nut wrench, adjust the steering ring nut until steering head is tight without binding when the forks are turned.

NOTE:

Excessive tightening of this nut will cause rapid wear of the bearings and races. Recheck for looseness and freedom of movement.

Tightening Torque:
Steering Ring Nut:
38 Nm (3.8 m·kg, 27 ft·lb)



1. Ring nut wrench
2. Steering ring nut

5. Retighten the steering fitting bolt, and the front fork pinch bolts in that order.

Tightening Torque:
Steering Fitting Bolt:
95 Nm (9.5 m·kg, 68 ft·lb)
Front Fork Pinch Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)

6. Recheck steering adjustment to make sure there is no binding when the forks are moved from lock to lock. If necessary, repeat the adjustment procedure.

Wheel Bearings

1. Front wheel
   If a rolling rumble is noticed and increases with increasing wheel speed (not engine or transmission speed), the wheel bearings may be worn. Check the wheel bearings on both the front and rear wheels.

a. Raise the front end of the motorcycle, and spin the wheel by hand. Touch the axle or front fender while spinning the wheel. If you feel any excessive vibration, the bearings are rough and should be replaced.

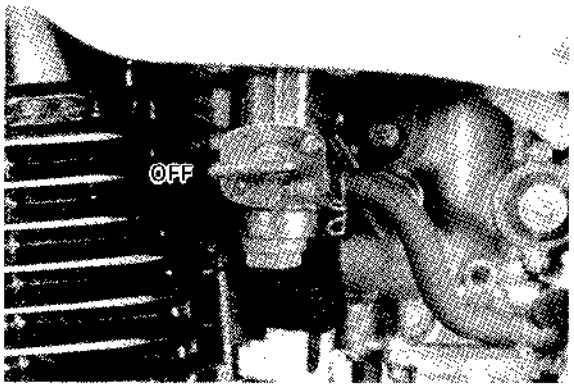
2. Rear wheel

a. Remove the rear wheel, and check the bearing movement with your finger. Replace the bearings if they are rough or worn.

Fuel Cock Cleaning

The fuel cock has a built-in filter to remove any partaicles before they reach the carburetor. If the filter becomes blocked, fuel cannot enter the carburetor.

1. First, turn the cock lever to the "OFF" then remove the filter cup and clean the bottom of the cup with solvent.
2. When reassembling, be careful not to clamp the filter cup too tightly as this may unseat the O-ring and lead to a fuel leak.



Tires Inspection

To insure maximum performance, long service, and safe operation, note the following precautions:

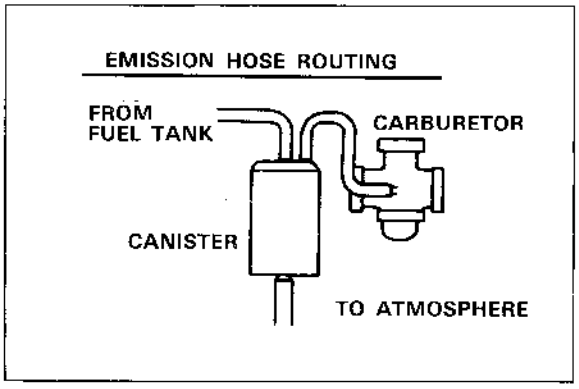
1. Check tire pressure before riding; adjust as necessary.
2. Before operation, always check the tire surfaces for wear and/or damage; lock for cracks, glass, nails, metal fragments, stones, etc. Correct any such hazard before riding.
3. Always inspect the wheels before a ride. Place the motorcycle on the sidestand and check for cracks, bends, or warpage of the wheels. Do not attempt even small repairs to the wheel. If a wheel is deformed or cracked, it must be replaced.
4. After installing a tire, ride conservatively to allow the tire to seat itself on the rim properly. Failure to allow proper seating may cause tire failure resulting in damage to the motorcycle and injury to the rider.
5. After repairing or replacing a tire, check to be sure the bead stopper locknut is securely fastened. If not, torque it as specified.

Tightening Torque:
10 Nm (1.0 m.kg, 7.2 ft.lb)

Canister (for California only)

This model is equipped with a canister to prevent the discharging of fuel vapor into the atmosphere. Before using this motorcycle be sure to check the following:

1. Check each hose connection.
2. Check each hose and canister for cracks or damage. Replace if damaged.
3. Make sure the bottom (vent.) hose is not blocked. Clean it if necesary.



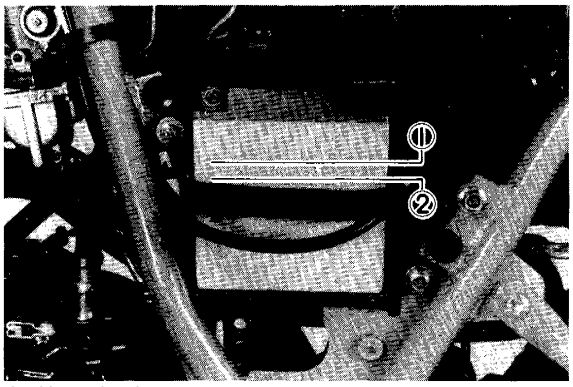
ELECTRICAL

Battery Inspection

1. The fluid level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.

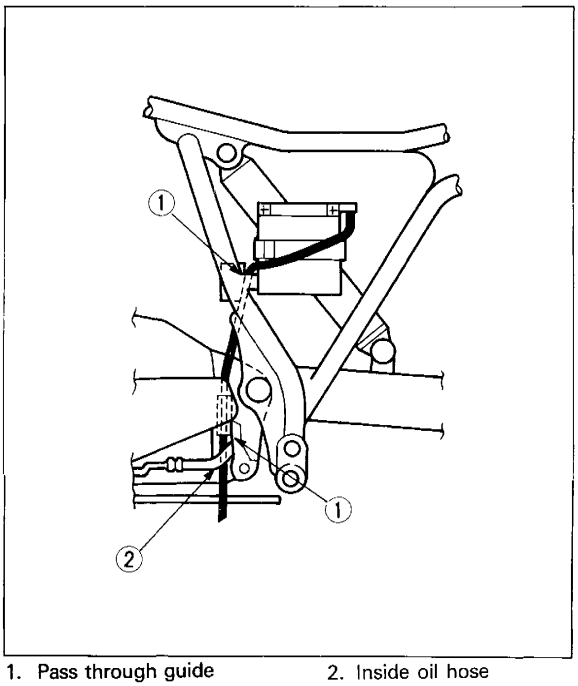
CAUTION:

Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.



1. Upper level 2. Lower level

2. Always make sure the connections are correct when installing the battery. Make sure the breather pipe is properly connected, properly routed, and is not damaged or obstructed.



1. Pass through guide 2. Inside oil hose

CAUTION:

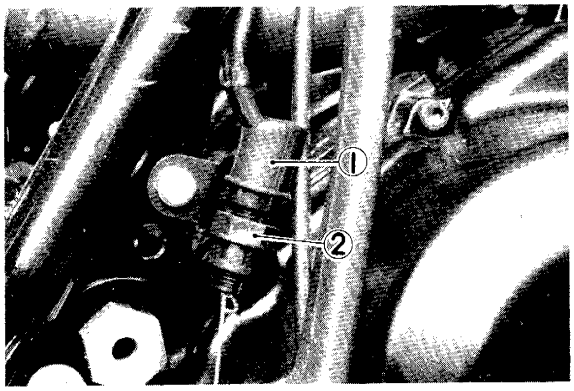
The battery must be changed before using to ensure maximum performance. Failure to charge the battery properly before first use or a low electrolyte level will cause premature failure of the battery. Charging current: 0.4 amps/10 hrs. or until the specific gravity reaches 1,260 at 20°C (68°F).

WARNING:

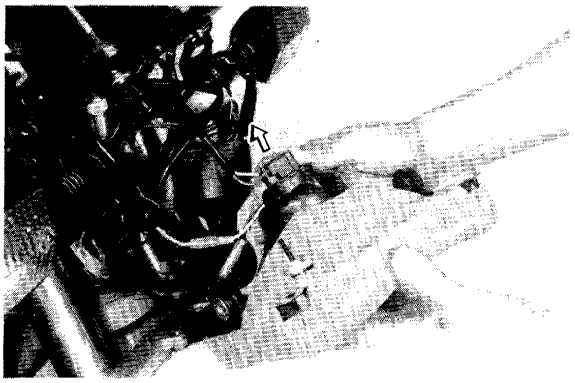
Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes, or clothing.
Antidote: EXTERNAL - Flush with water. INTERNAL - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in closed space. Always shield eyes when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

Brake Light Switch Adjustment

The brake light switch is operated by movement of the brake pedal. To adjust, hold the main body of the swtich with your hand so it does not rotate and turn the adjusting nut. Proper adjustment is achieved when the brake light comes on just before the brake beings to take effect.



1. Main body 2. Adjusting nut

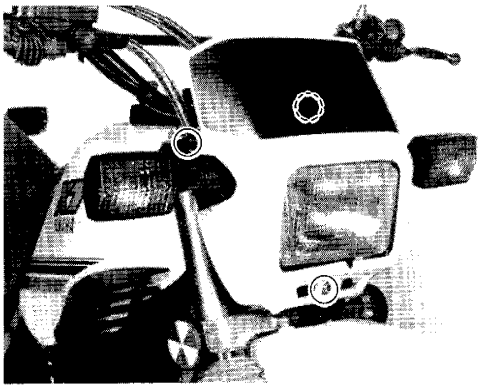


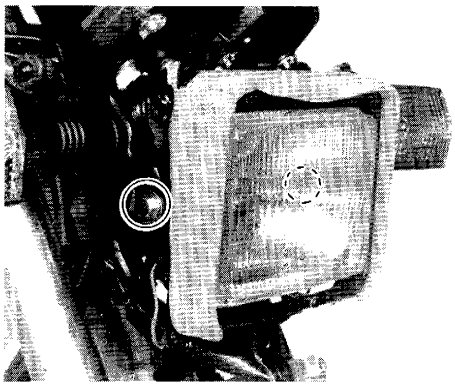
3. Turn the bulb holder counterclockwise and remove the defective bulb.

Replacing the Headlight Bulb

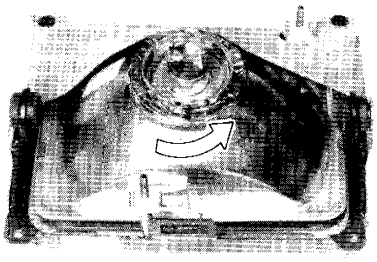
This motorcycle is equipped with a quartz bulb headlight. If the headlight bulb burns out, replace the bulb as follows:

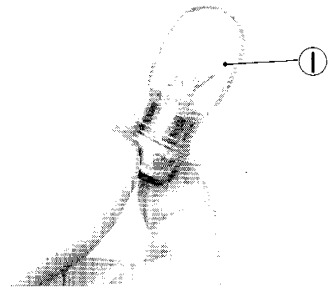
1. Remove the headlight cowling and headlight unit assembly.





2. Disconnect the leads.





1. Don't touch

CAUTION:

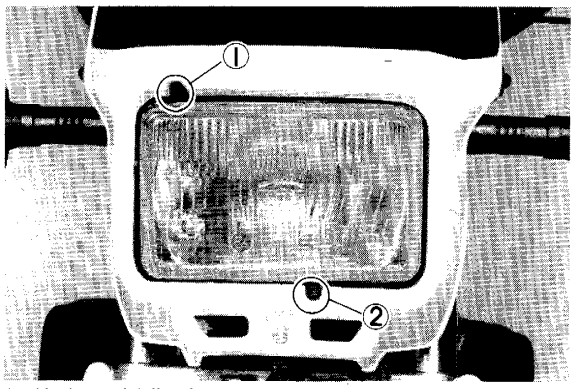
Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and illuminous flux will be adversely affected. If oil gets on the bulb, throughly clean it with a cloth moistened with alcohol or lacquer thinner.

WARNING:

Keep flammable products or your hands away from the bulb while it is on, it will be hot. Do not touch the bulb until it cools down.

4. Slip a new bulb into positon and secure it in place with the bulb holder.
5. Reinstall the light unit assembly and headlight cowling. Adjust the headlight beam if necessary.

Headlight Beam Adjustment

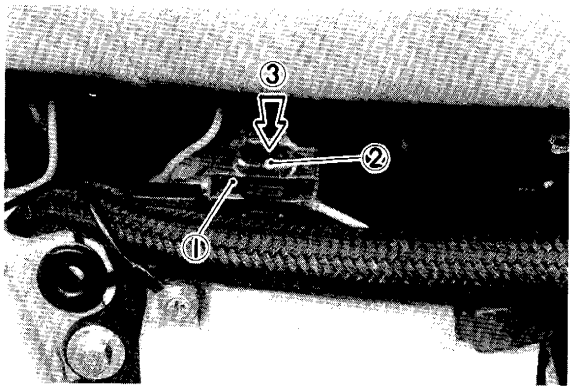


1. Horizontal adjusting screw
2. Vertical adjusting screw

1. Horizontal adjustment:
   To adjust the beam to the left, turn the adjusting screw clockwise.
   To adjust the beam to the right, turn the screw counterclockwise.
2. Vertical adjustment:
   To raise the beam, turn the adjusting screw clockwise.
   To lower the beam, turn the screw counterclockwise.

Circuit Breaker

This model features a circuit breaker fitted behind the battery. If any problem should occur to an electric omponenet and cause a shoft circuit, this breaker works to shut off the current. If the current is thus shut off by the breaker, perform the following procedure:



1. Circuit breaker
2. Breaker knob
3. Push

1. Turn off the ignition switch and the switch in the circuit in question.
2. Push in the breaker knob.

CAUTION:

Wait 30 seconds before resetting the circuit breaker.

3. Turn on the switches and see if the electrical device operates. If the circuit breaker interrupts the circuit again, check the circuit in question.

CHAPTER 3. ENGINE OVERHAUL

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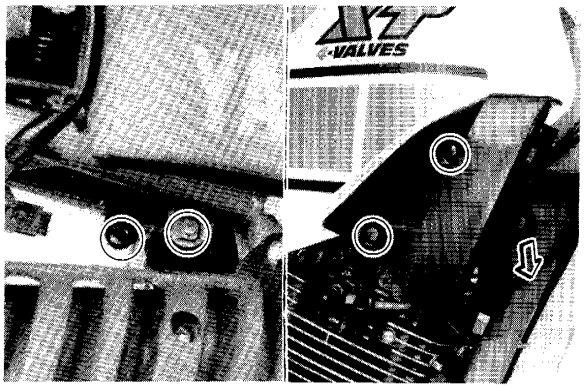
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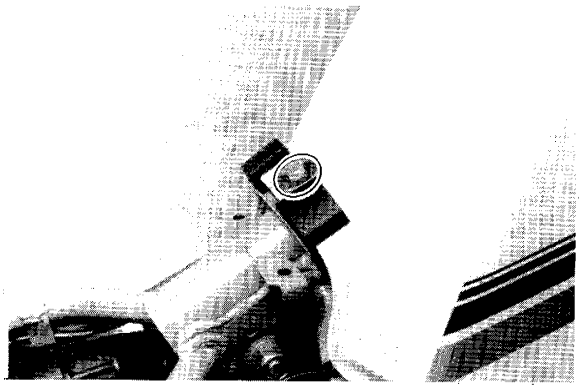
ENGINE MOUNTING 3-52

Seat and Fuel Tank

1. Remove the seat.
2. Remove the air ducts.

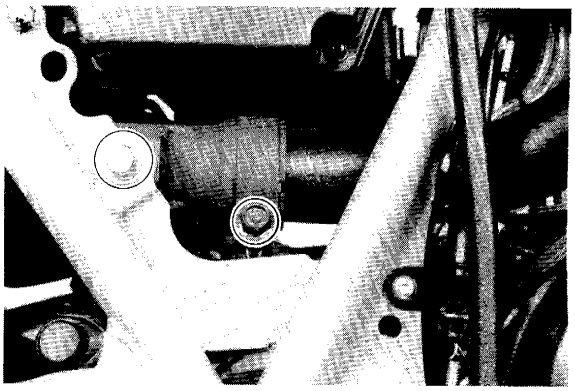


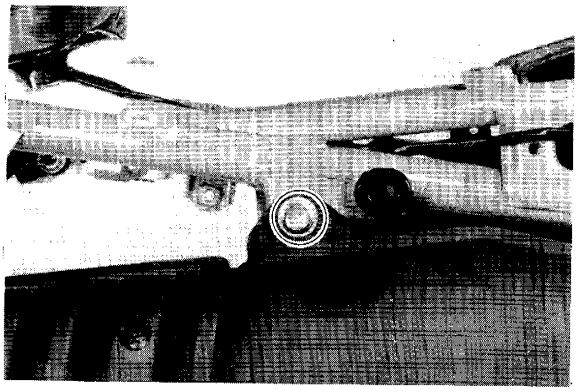
3. Turn the fuel cock to "OFF" and remove the fuel pipe.
4. Remove the fuel tank.



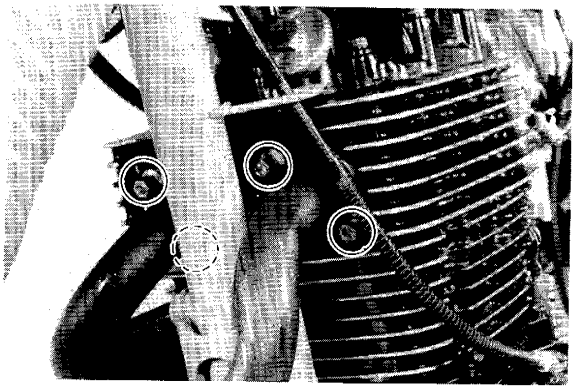
Muffler, Footrest and Brake Pedal

1. Loosen the muffler band pinch bolt, and remove the muffler holding bolts. Then, remove the muffler.

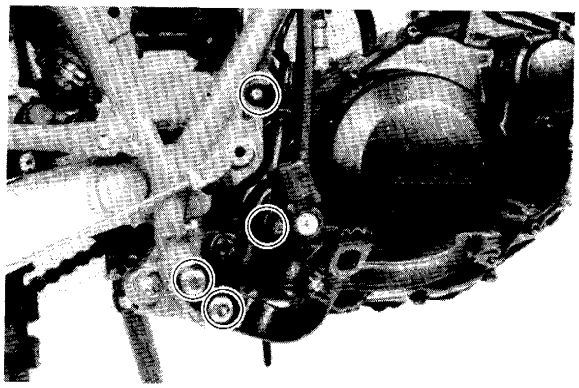


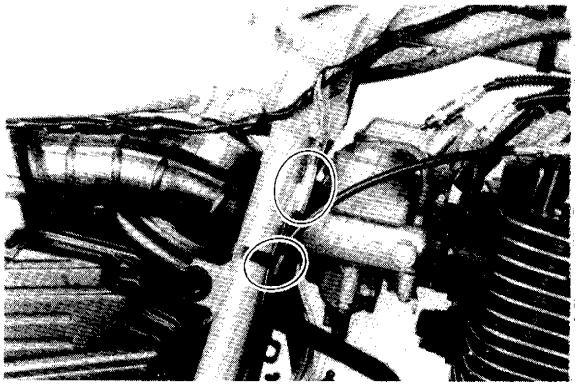


2. Remove the exhaust pipe holding nuts, and remove the exhaust pipes.



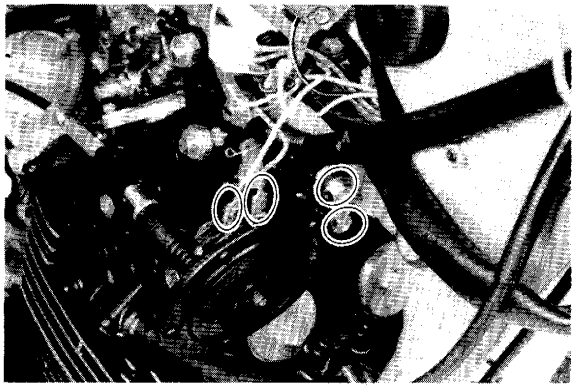
3. Remove the rear brake switch assembly and right side footrest with brake pedal. Then, disconnect the rear brake switch leads.





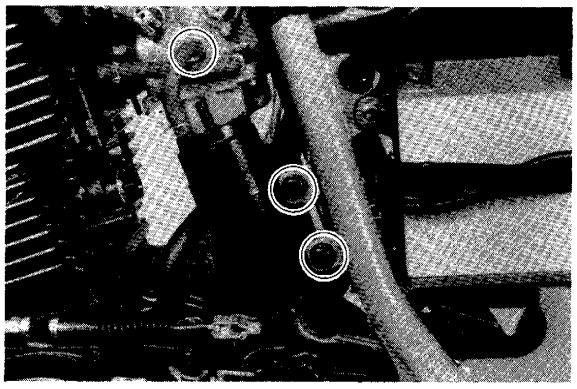
Horn

1. Disconnect the horn leads, and remove the horn securing bolts.



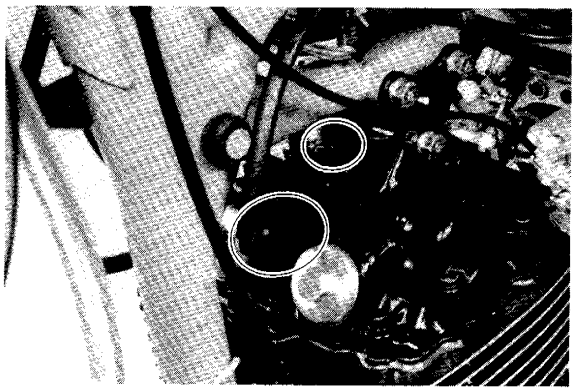
Canister

1. Remove the canister assembly.

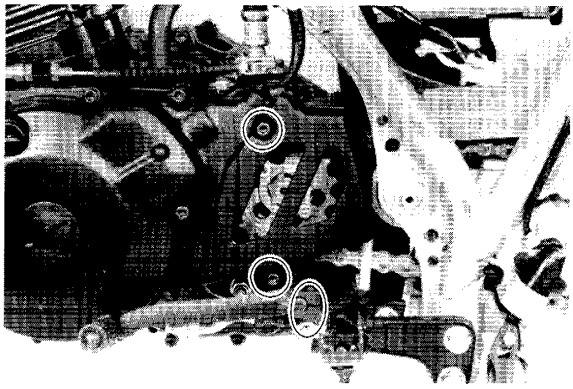


Oil Hoses, Cable and Wiring

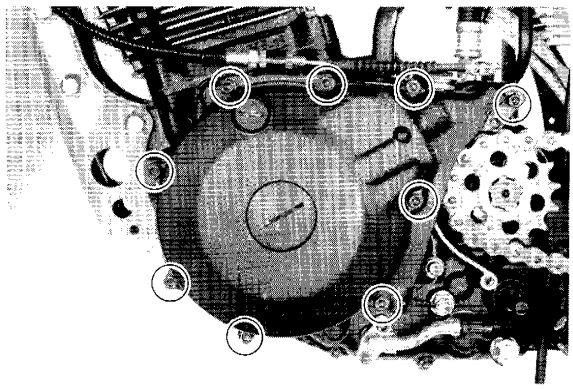
1. Remove the spark plug cap.
2. Remove the breather pipe.



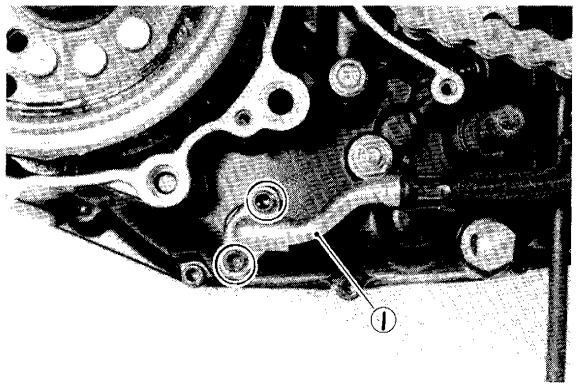
3. Remove the change pedal and sprocket cover.



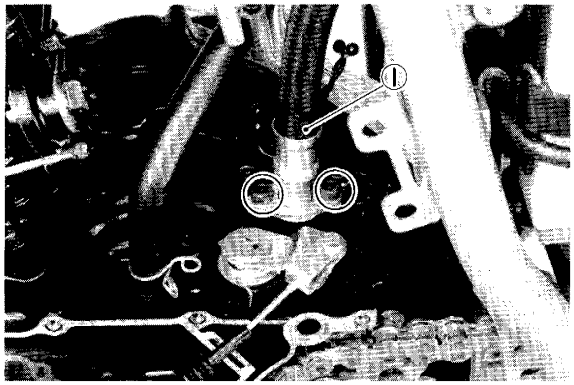
4. Remove the left crankcase cover.



5. Remove the oil hoses (Inlet and Outlet).

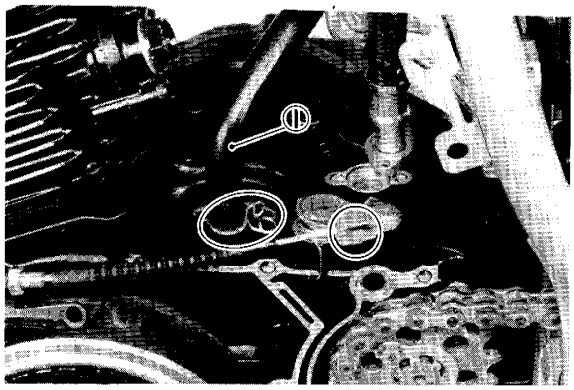


1. Oil hose (Inlet)



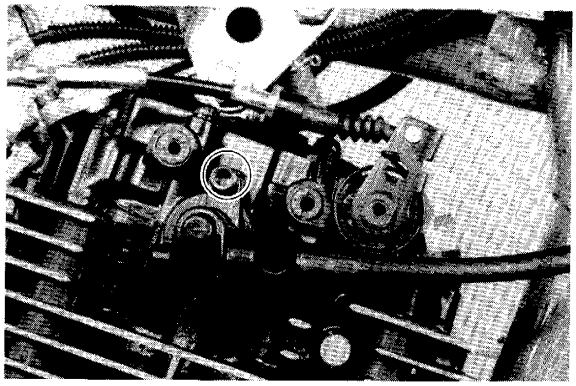
1. Oil hose (Outlet)

6. Remove the clutch cable at handlebar lever first and then at clutch-push lever. Next, remove breather assembly.



1. Breather pipe

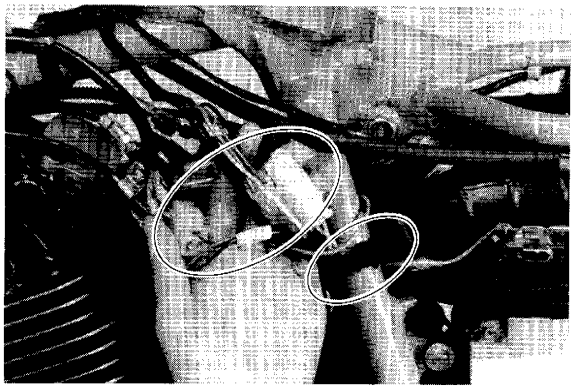
7. Remove the tachometer gear unit assembly.



8. Disconnect the CDI magneto leads. Position the disconnect the leads so that they can be safely removed.

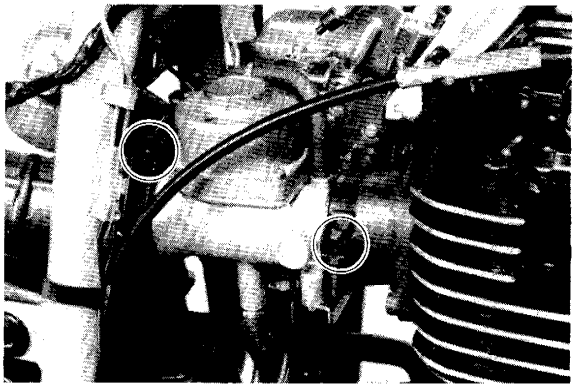
CAUTION:

The CDI magneto leads are clamped at the cross tube of the frame. Do not forget to remove this clamp before removing the engine.



Carburetor

1. Remove the throttle cables and starter calbe.
2. Remove the carburetor joint holding bolts and loosen carburetor hose clamp (air cleaner side) as shown in the photo.



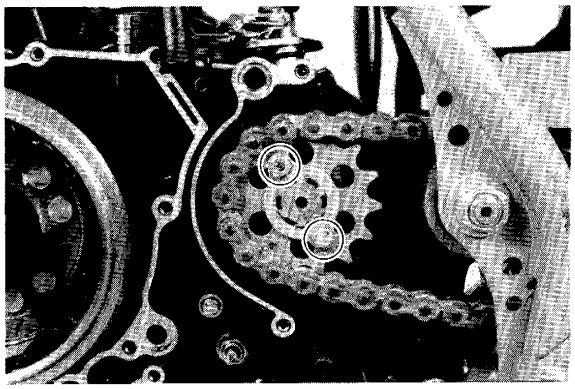
3. Remove the air cleaner case securing bolts and move the case backward.
4. Remove the carburetor assembly, pulling carburetor toward you.

NOTE:

Nothing the presence, location, and routing of all vent and overflow tubes, remove carburetor.

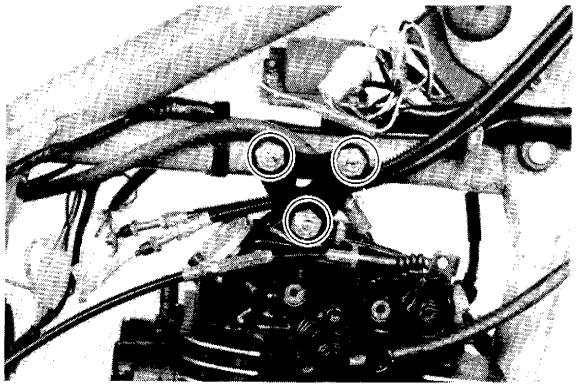
Drive Chain and Drive Sprocket

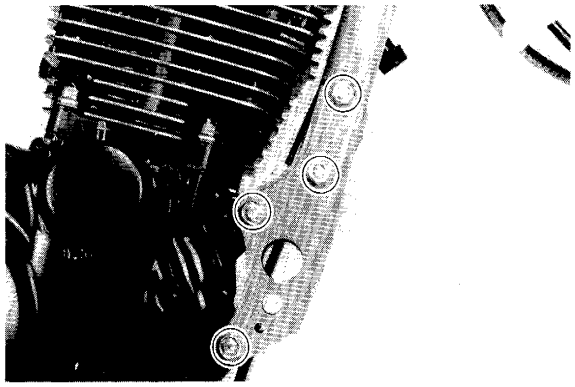
1. Remove the drive sprocket securing bolts and holding plate. Then, remove the drive sprocket.

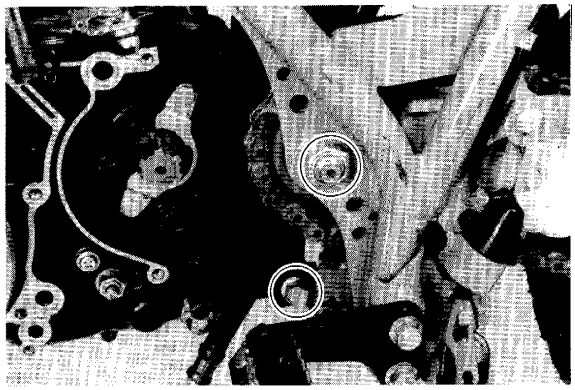


Engine Mounting Bolts

1. Place a suitable stand under the engine.
2. Remove the engine mounting bolts and nuts. Remove the brackets.



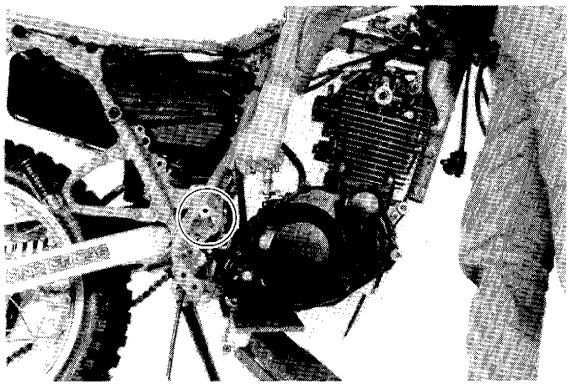




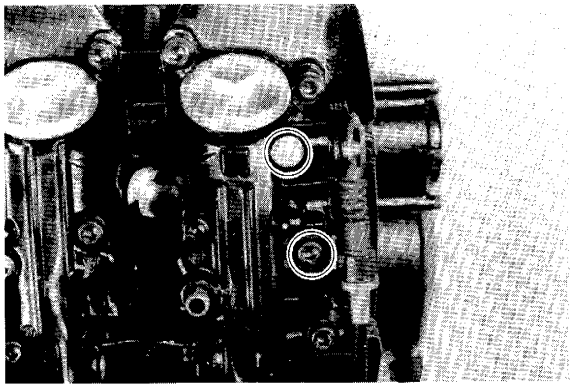
3. Remove the engine from the right side of the frame.

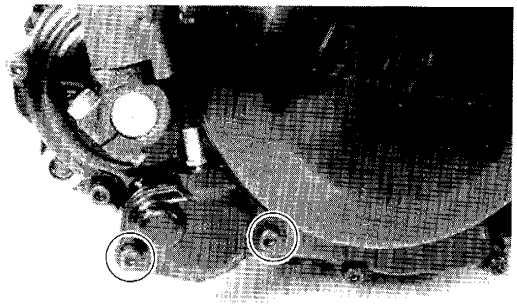
NOTE:

The engine and rear arm are installed using the same pivot shaft. Therefore, take care so that the pivot shaft is not pulled entirely out, but for enough to set the engine free.



4. Remove the decompression cable.

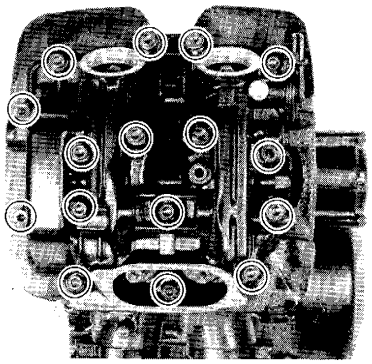




DISASSEMBLY

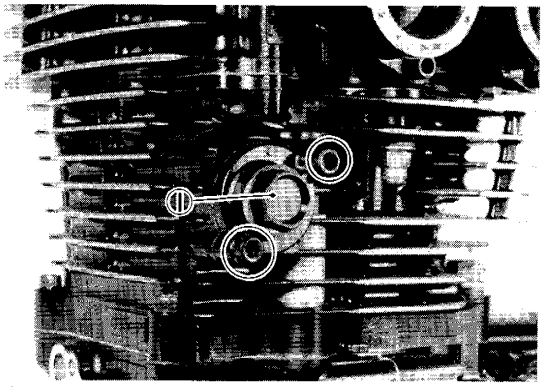
Cylinder Head Cover

1. Remove the spark plug.
2. Remove the inlet and exhaust valve covers.
3. Loosen the cylinder head cover securing bolts, and remove the cylinder head cover.



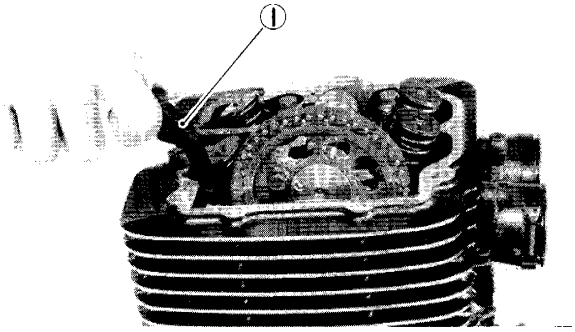
Cylinder Head

1. Loosen the cam chain tensioner end plug and tensioner securing bolts, and remove the cam chain tensioner assembly.



1. End plug

2. Remove the cam chain guide (Front).

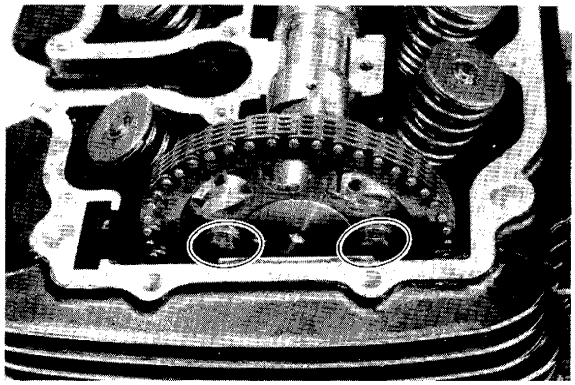


1. Cam chain guide (Front)

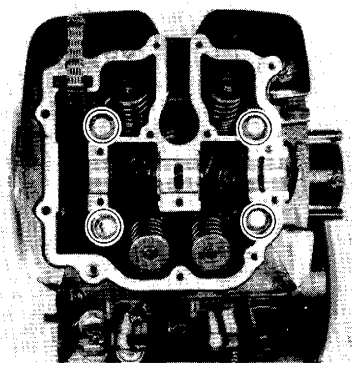
3. Remove the cam sprocket securing bolts, and remove the cam sprocket and cam shaft.

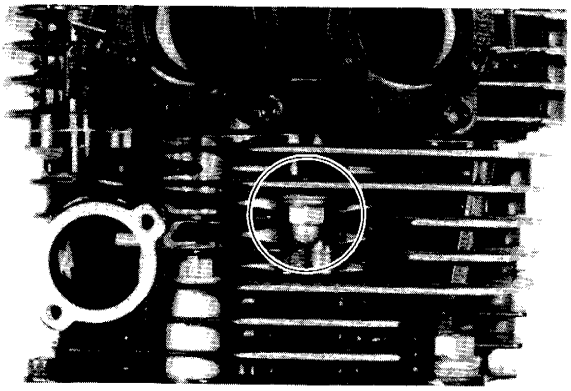
NOTE:

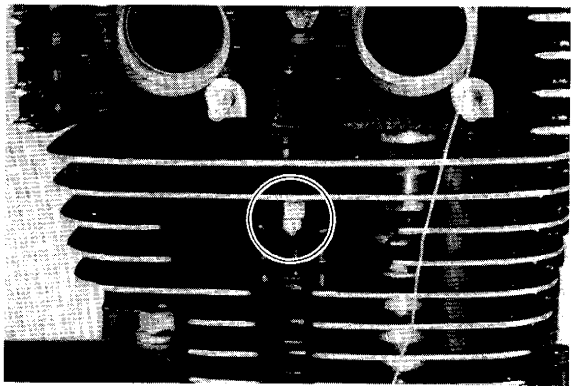
When removing the cam sprocket, it is not necessary to separate the cam chain.



4. Loosen the cylinder head securing bolts and nuts, and remove the cylinder head.

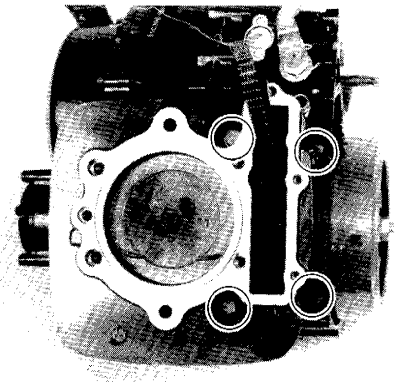


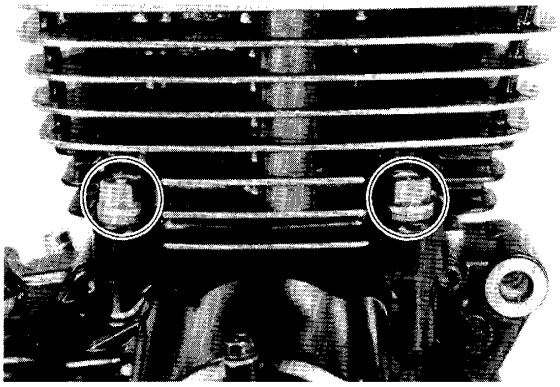




Cylinder

1. Remove the cylinder holding nuts and bolts, and remove the cylinder.



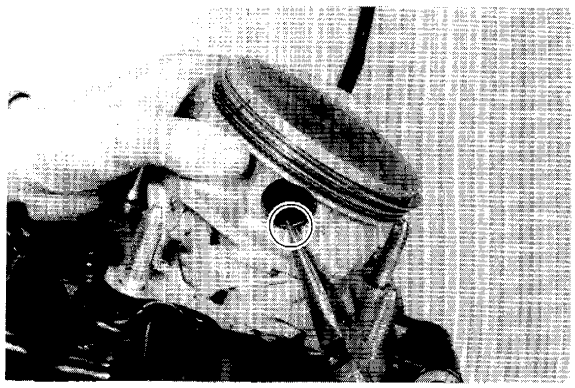


Piston Pin and Piston

1. Remove the piston pin clip from the piston.

NOTE:

Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.



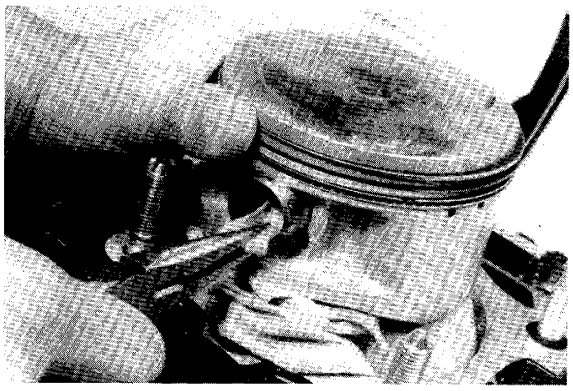
2. Push the piston pin from the opposite side. Then, pull out the piston pin, and remove the piston.

NOTE:

Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use Piston Pin Puller (special tool).

CAUTION:

Do not use a hammer to drive the piston pin out.



Kick Crank

1. Loosen the kick crank securing bolt, and remove the kick crank.

NOTE:

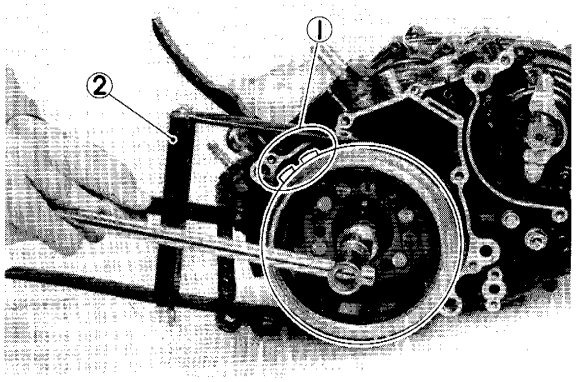
The bolt must be completely removed from the kick crank.

CDI Rotor

1. Loosen the rotor securing nut by using the Rotor Holding Tool (P/N. YU-01701)

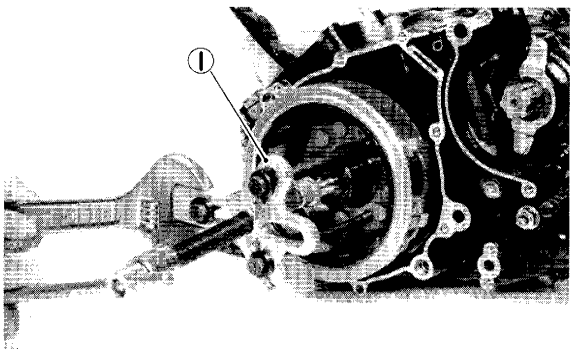
NOTE:

Don't allow the tool to touch the projections.



1. Projections 2. Rotor Holding Tool (YU-01701)

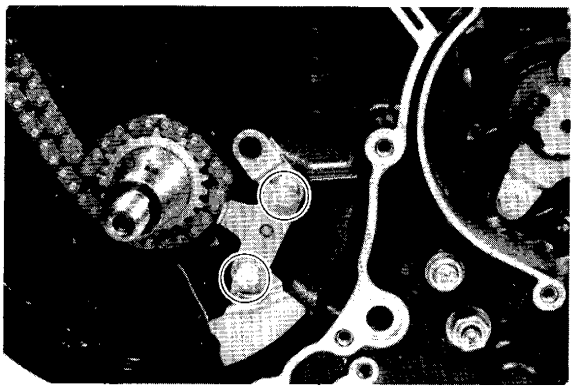
2. Remove the rotor by using the Rotor Puller (P/N. YU-90105).



1. Rotor Puller (YU-90105)

Cam Chain and Guide Stopper

1. Remove the guide stopper securing bolts and remove the guide stopper, baffle plate and cam chain.

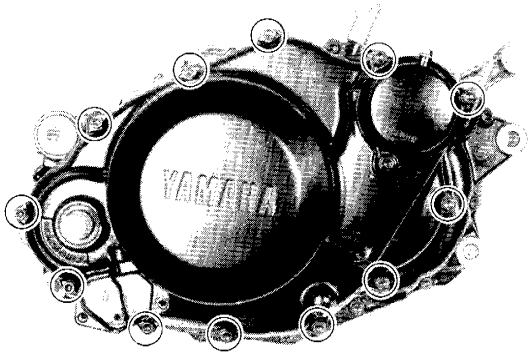


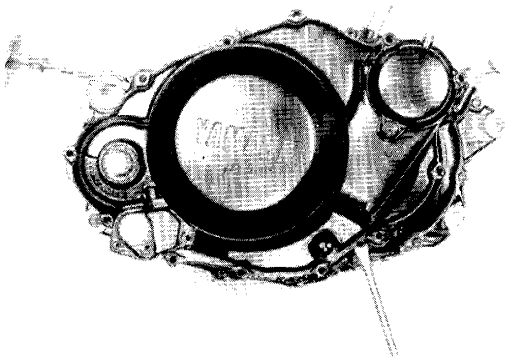
Crankcase Cover (Right)

1. Remove the crankcase cover holding bolts and crankcase cover.

NOTE:

For this removal, slits in the crankcase can be used as shown in the photo.

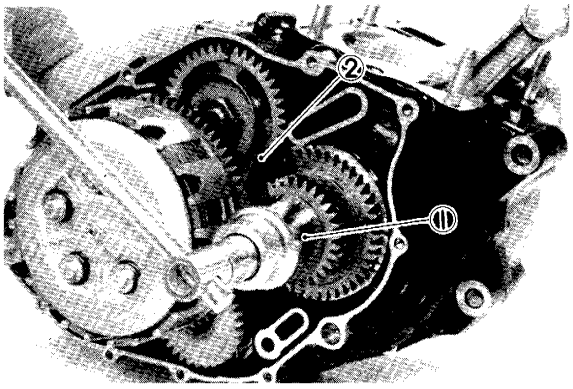




2. Remove the oil filter cover holding bolts and cover.
3. Remove the oil filter element.

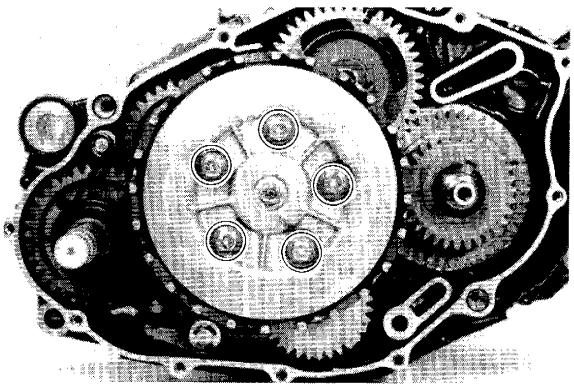
Clutch Assembly and Drive Gear

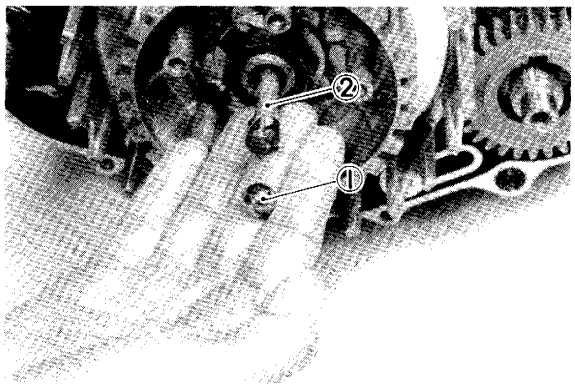
1. Straighten the lock washer tab on the primary drive gear.
2. Place a folded rag between the teeth of the driven and primary drive gear to lock them as shown. Then, loosen the primary drive gear securing nut.



1. Primary drive gear securing nut 2. Folded rag

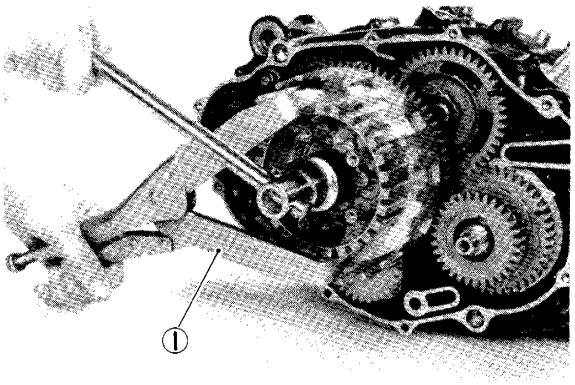
3. Remove the five clutch spring holding screws, pressure plates, clutch plates, friction plates, ball and push rod # 2.





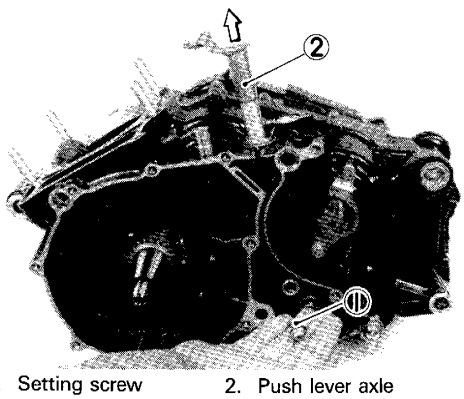
1. Ball 2. Push rod #2.

4. Straighten the lock washer tab on the clutch boss securing nut.
5. Use the Clutch Holding Tool (P/N. YM-91042) to hold the clutch boss, and remove the locknut and lockwasher.



1. Clutch Holding Tool (YM-91042)

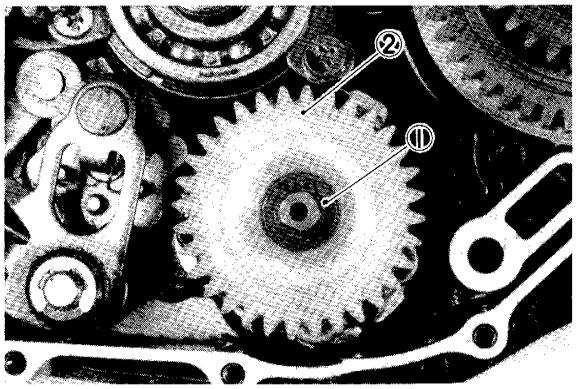
6. Remove the clutch boss, holding plate and primary driven gear.
7. Remove the setting screw, and unhook the push lever axle spring from its position. Then, pull up the push lever axle.



1. Setting screw 2. Push lever axle

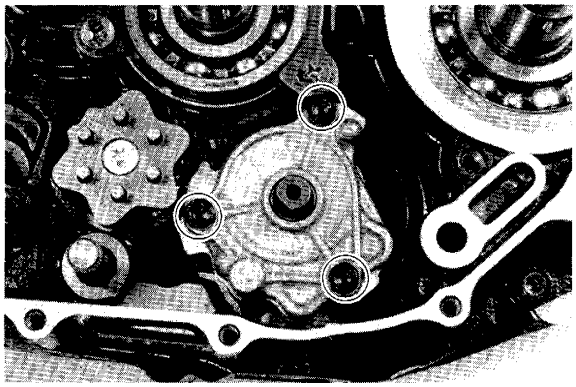
Oil Pump Assembly

1. Remove the pump idle gear clip, and remove the pump idle gear.



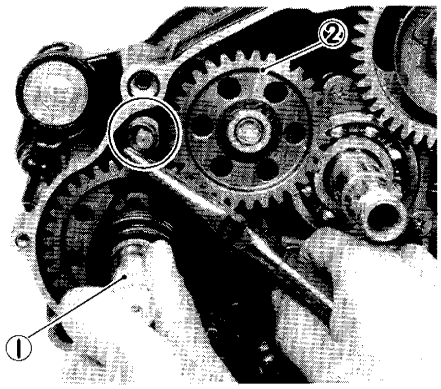
1. Circlip 2. Pump idle gear

2. Remove the oil pump securing bolts, and remove the oil pump assembly.



Kick Axle Assembly

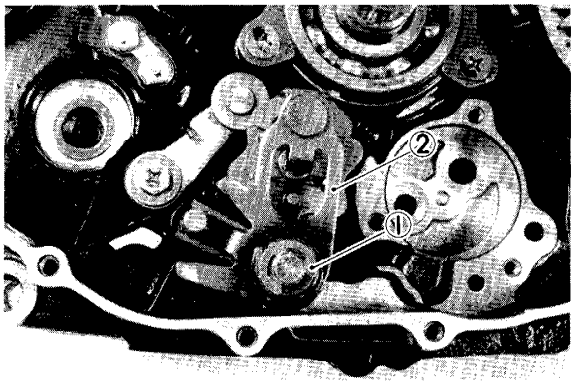
1. Unhook the kick spring from its position. Then, remove the kick axle assembly by rotating the shaft counterclockwise.
2. Remove the kick idle gear.



1. Kick axle assembly 2. Kick idle gear

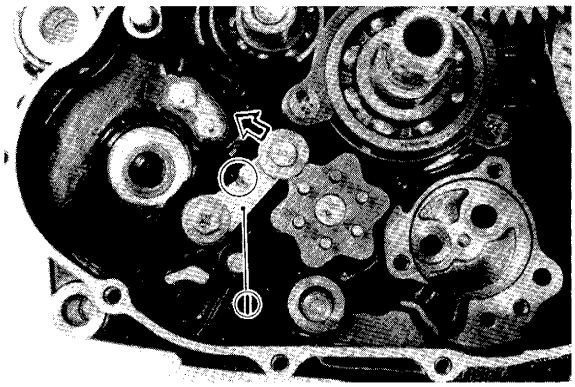
Shift Shaft Assembly

1. Remove the circlip, and pull out the shift lever assembly.



1. Circlip 2. Shift lever assembly

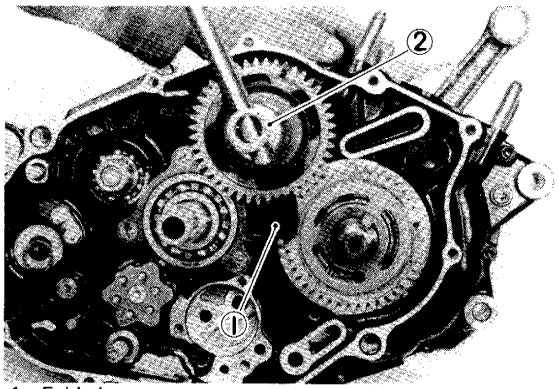
2. Unhook the torsion spring from its position, and remove the stopper lever securing bolt. Then, remove the stopper lever assembly.



1. Stopper lever assembly

Balancer Gear

1. Remove the primary drive gear securing nut, lock washer and primary drive gear.
2. Straighten the lock washer tab on the balancer gear.
3. Place a folded rag between the teeth of the drive and balancer gear to lock them as shown. Then, loosen the balancer gear securing nut.



1. Folded rag 2. Balancer gear securing nut

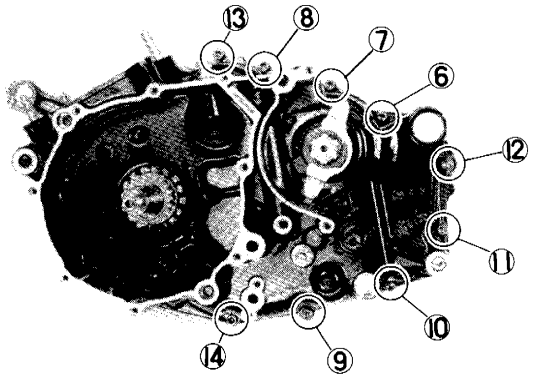
4. Remove the balancer gear securing nut, lock washer, holding plate, balancer gear and key. Then, remove the holding plates, drive gear and key.

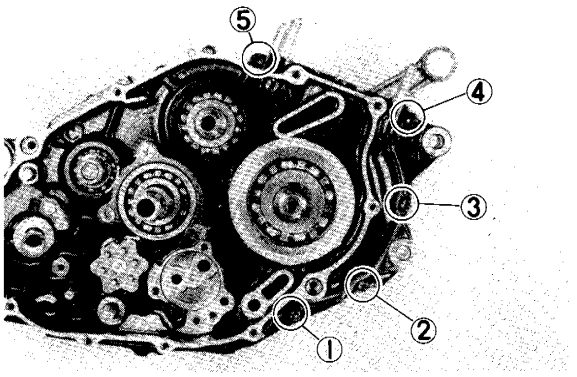
NOTE:

When removing the balancer gear and primary drive gear, do not forget to remove the keys (balancer gear and primary drive gear).

Crankcase

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





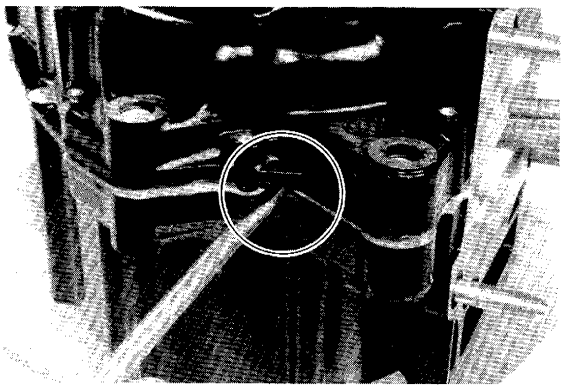
2. Remove the right crankcase. As pressure is applied, alternately tap on the front engine mounting boss, the transmission shafts, and the shift drum.

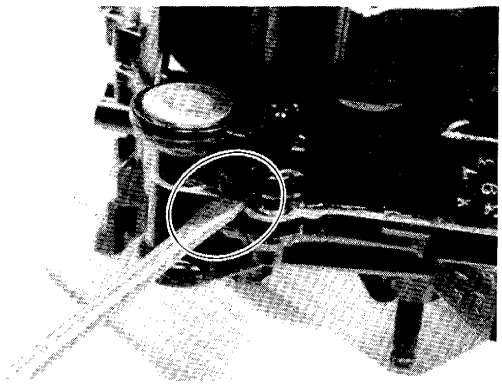
NOTE:

For this removal, slits in the crankcase can be used as shown in the photo.

CAUTION:

Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up," take pressure off the push screw, realign, and start over. If the cases do not separate, check for a remaining case screw or fitting.
Do not force.



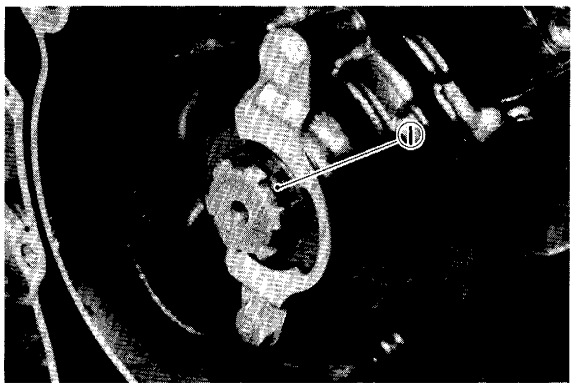


Transmission

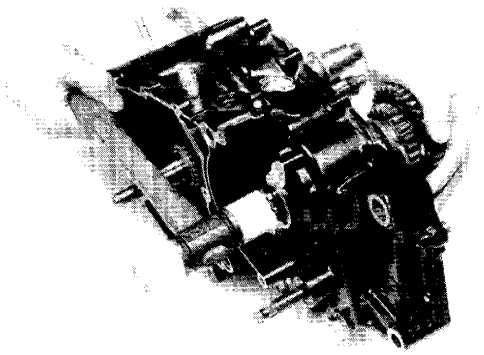
1. Remove the transmission shaft, shift forks, and shift cam. Tap lightly on the transmission drive shaft with a soft hammer to remove.

NOTE:

1. While removing the drive axle from the crankcase, pay careful attention to the oilseal lip. A recommended practice is to fit the O-ring and to apply grease over the fitted area.
2. Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.



1. O-ring



Crankshaft

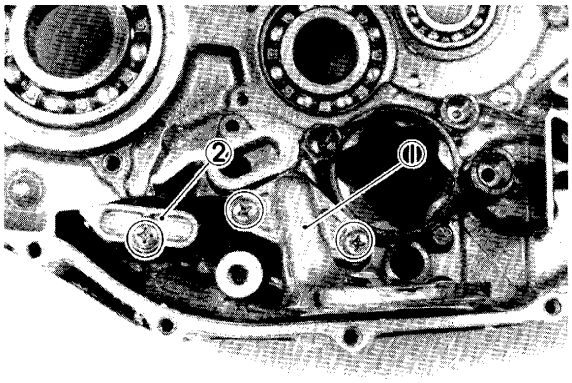
1. Remove the crankshaft assembly.

Oil Strainer Assembly

1. Remove the oil strainer and oil passage cover.

NOTE:

It is recommended that the oil strainer be replaced whenever the engine is disassembled.



1. Oil strainer 2. Oil passage cover

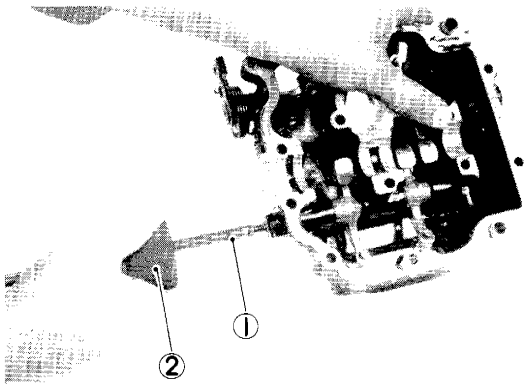
INSPECTION AND REPAIR

Cylinder Head Cover

1. Remove two rocker shaft covers.
2. Insert a 6 mm (0.24 in) screw into the rocker shaft, and withdraw the rocker shaft. It should slide out easily.

NOTE:

If the rocker shaft does not slide out easily, use the Slide Hammer (P/N. YU-01083-1 and YU-01083-3).



1. Bolt (YU-01083-1) 2. Weight (YU-01083-3)

3. Rocker arm and rocker shaft

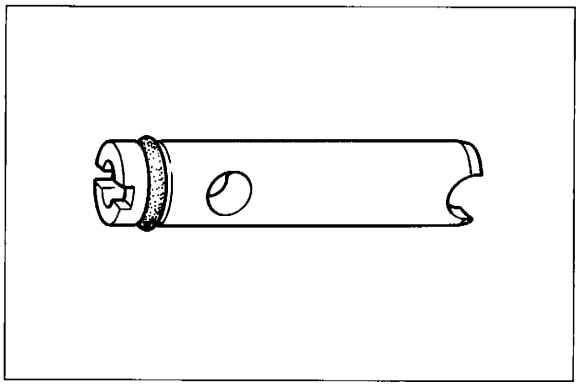
a. The rocker arm usually wears at two locations: (1) at the rocker shaft hole; (2) at the cam lobe contacting surface.

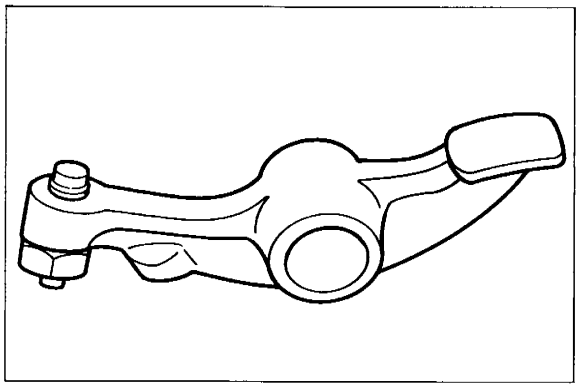
b. Measure the rocker shaft hole in the rocker arm.

Standard Size:
12.000 ~ 12.018 mm (0.4724 ~ 0.4731 in)

c. The shaft has been hardened, and it should not wear excessively. If a groove has developed in this surface that can be felt or if it shows a blue discoloration, then the shaft should be replaced and the lubrication system (pump and passages) cheched.

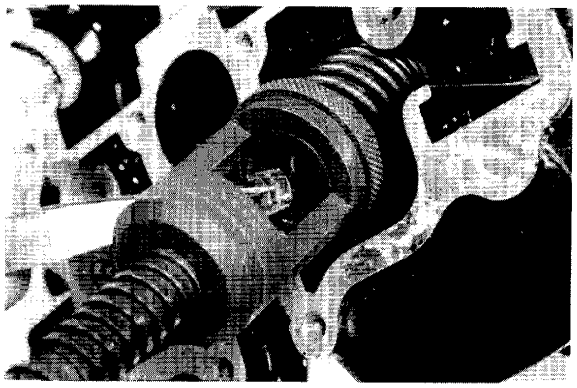
Standard Shaft Diameter:
11.991 ~ 11.976 mm (0.4721 ~ 0.4715 in)





Cylinder Head

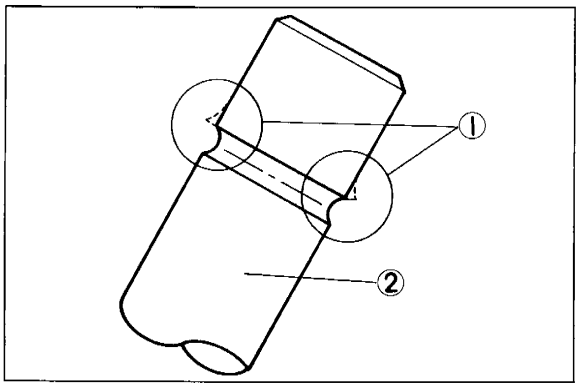
1. Mount the valve spring compressor on the head and depress each valve spring. Remove the valve retainers with a magnet or tweezers, and remove the valve springs.



2. Remove the valves. Mark each valve so it will be reinstalled in the same cylinder head.

NOTE:

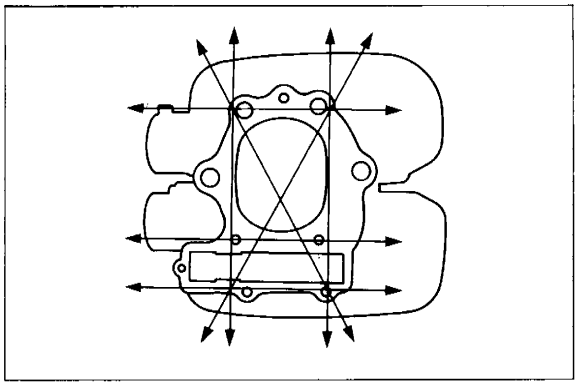
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end. This will help prevent damage to the valve guide during valve removal.



1. Deburr 2. Valve stem

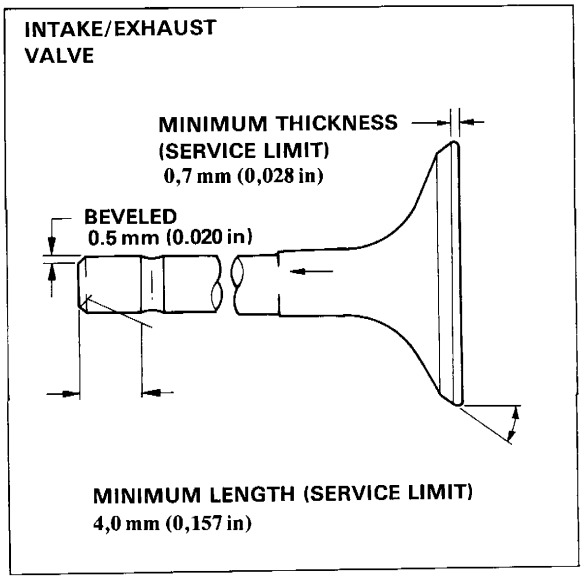
3. Using a rounded scraper, remove the carbon deposits from the cobmustion chamber. Take care to avoid damaging the spark plug threads and valve seats. Do not use a sharp instrument. Avoid scratching the aluminum.
4. Check the cylinder head warpage with a straightedge as shown.
   The warpage should not exceed the specified limit; if necessary, resurface the cylinder head. If the warpage exceeds allowable limit, the cylinder head should be replaced with a new one.

Cylinder Head Warpage:
Less than 0.03 mm (0.0012 in)



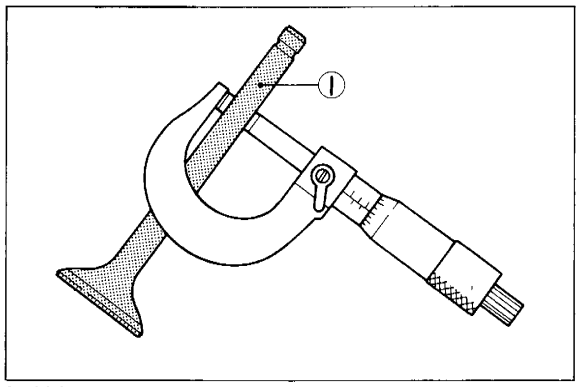
Valves

1. Check the valve face and the stem end for wear. If the valve face and/or the stem end are pitted or worn, regrind the valve with a valve refacer. Replace the valve if any dimension exceeds the specifications in the illustration.

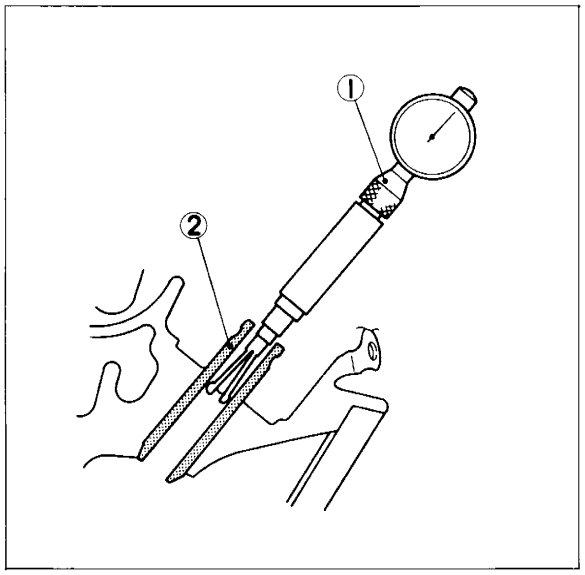


2. Valve stem wear must be measured and then combined with valve guide measurements to obtain guide clearance. This clearance must be within tolerances. If it exceeds the maximum limit, then replace either or both valve and guide as necessary.

	Valve Stem Clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.10 mm (0.004 in)
Exhaust	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in)	0.12 mm (0.005 in)



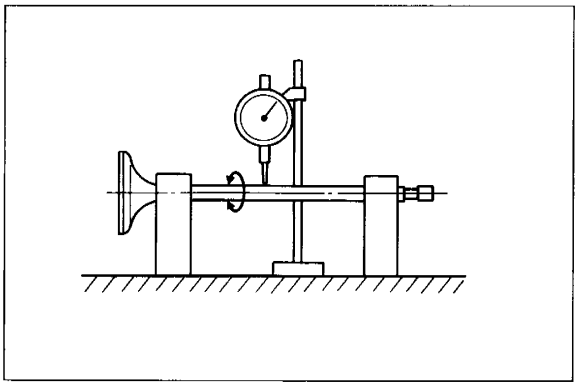
1. Valve



1. Bore gauge 2. Valve guide

3. Inspect the end of the valve stem. If the end appears to be "mushroomed" or has a larger diameter than the rest of the stem, the valve, valve guide, and oil seal should be replaced.
4. Place the valve on V-blocks, and measure the amount of stem runout with a dial gauge. If it exceeds the maximum limit, replace the valve.

Maximum Valve Stem Runout:
0.01 mm (0.0004 in)



Valve Guides

If oil leaks into the cylinder through a valve due to a worn valve guide or if a valve is replaced, the valve guide should also be replaced.

NOTE:

The valve oil seal should be replaced whenever a valve is removed or replaced.

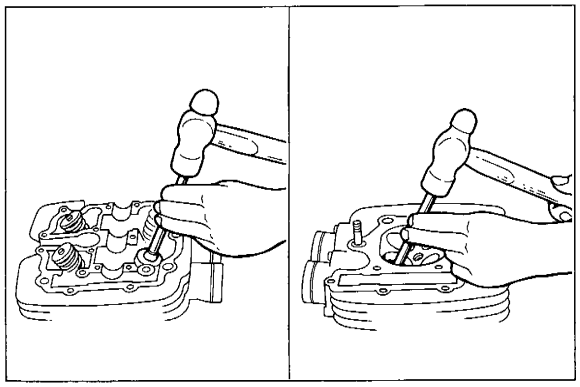
1. Measure the valve guide inside diameter with a small bore gauge. If it exceeds the limit, replace it with an oversize valve guide.

Guide Diameter Limit (I.D.):
Limit: 7.10 mm (0.2795 in)

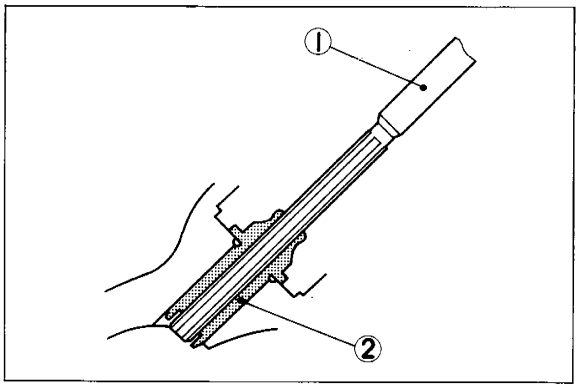
2. To ease guide removal and reinstallation and to maintain the correct interference fit, heat the head to 100°C (212°F). Use an oven to avoid any possibility of head warpage due to uneven heating.
3. Use the valve guide remover and valve guide installer to drive the old guide out and drive the new guide in.

NOTE:

The valve guide oil seal should be replaced whenever a valve is removed or replaced.



4. After installing the valve guide, use the 7 mm (0.28 in) Reamer (P/N. 90890-01227) to obtain the proper valve-guide-to-valve-stem clearance.
5. After intalling the valve guide in the cylinder head, the valve seat must be recut. The valve should be lapped to the new seat.



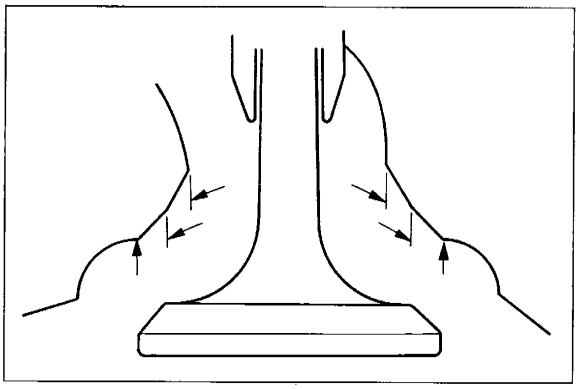
1. Reamer 2. Valve guide

Valve Seat

1. The valve seat is subject to severe wear. Whenever the valve is replaced or the valve face is resurfaced (see caution), the valve seat should be resurfaced at a 45° angle. If a new valve guide has been installed, the valve seat must be recut to guarantee complete sealing between the valve face and seat.
   If cutting section A of the valve seat, use a 30° cutter. If cuttint section B, use the

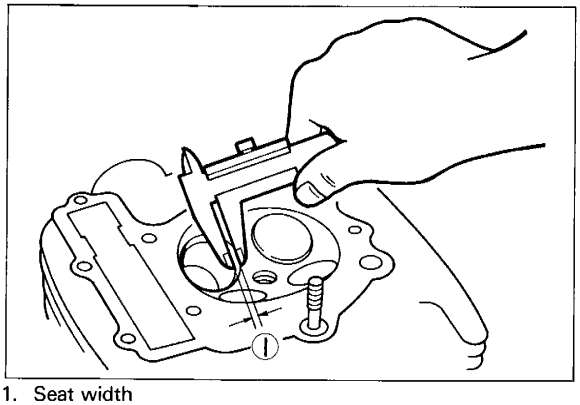
CAUTION:

If the valve seat is obviously pitted or worn, it should be cleaned with a valve seat cutter. Use the 45° cutter. When twisting the cutter, keep an even downward pressure to prevent chatter marks.



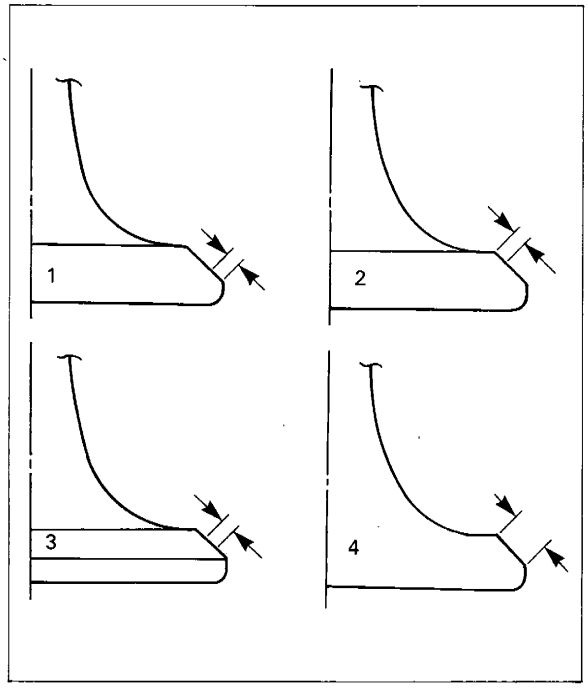
2. Measure the valve seat width. Apply mechanic's bluing dye (such as Dykem) to the valve face and valve seat, apply a very small amount of fine grinding compound around the surface of the valve face, insert the valve into position, and spin the valve quickly back and forth. Lift the valve, clean off all grinding compound, and check valve seat width. The valve seat and valve face will have removed the bluing wherever they contacted each other. Measure the seat width with vernier calipers. It should measure approximately 1.3 mm (0.051 in). The valve-seat contact area should be one uniform width. If valve seat width varies or if pits still exist, further cutting will be necessary. Remove just enough material to achieve a satisfactory seat.

	Standard Width	Wear Limit
Seat width	1.1 mm (0.043 in)	2.0 mm (0.080 in)

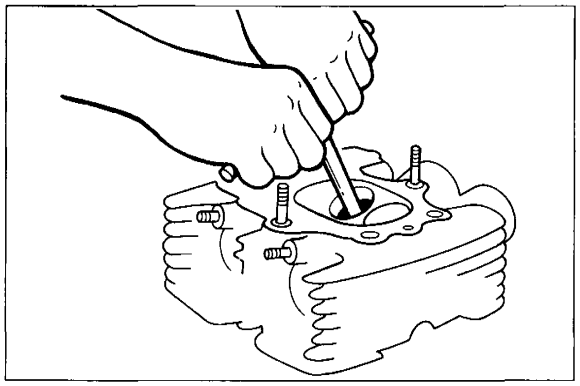


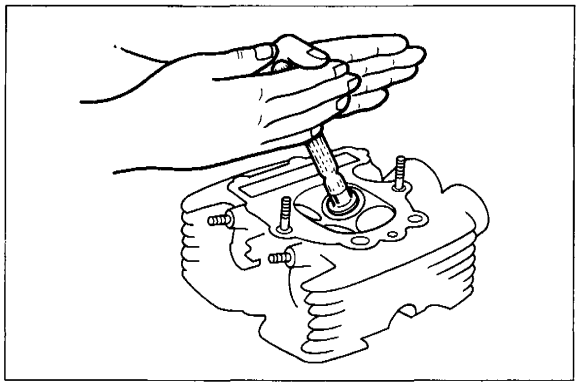
1. Seat width

3. If the valve seat is uniform around the perimeter of the valve face but is too wide or not centered on the valve face, it must be altered. Use either the 30°, 45°, or 60° cutters to correct the improper seat location in the manner described below:



a. If the valve face shows that the valve seat is centered on the valve face but is too wide, then lightly use both the 30° and the 60° cutters to reduce the seat width to 1.1 mm (0.043 in).





b. If the seat shows to be in the middle of the valve face but too narrow, use the 45° cutter until the width equals 1.1 mm (0.043 in).
c. If the seat is too narrow and right up near the valve margin, then first use the 30° cutter and then the 45° cutter to get the correct seat width.
d. If the seat is too narrow and down near the bottom edge of the valve face, then first use the 60° cutter and then the 45° cutter.

Lapping

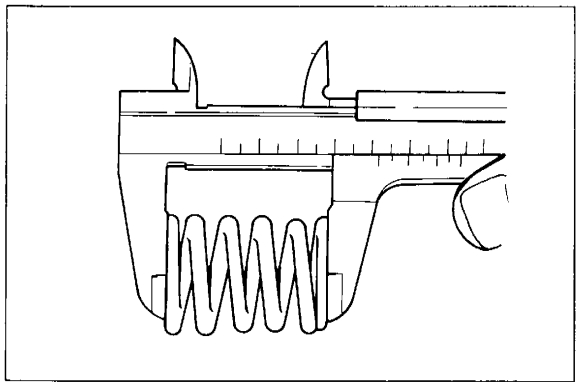
The valve/valve seat assembly should be lapped if neither the seat nor the valve face are severely worn.

1. Apply a small amount of coarse lapping compound to the valve face. Insert the valve into the head. Rotate the valve until the valve and valve seat are evenly polished. Clean off the coarse compound, then follow the same procedure with fine compound.
   Continue lapping until the valve face shows a complete and smooth surface all the way around. Clean off the compound material. Applying bluing dye to the valve face and seat, and rotate the valve. Check for full seat contact which is indicated by a grey surface all around the valve face where the bluing has been rubbed away.
   45° cutter. If cutting section C, use the 60° cutter.
2. After all work has been performed on the valve and valve seat and all head parts have been assembled, check for proper valve/valve seat sealing by pouring solvent into each of the intake ports, then the exhaust ports. There should be no leakage past the seat. If fluid leaks, disassemble and continue to lap with fine lapping compound. Clean all parts thoroughly; reassemble and check again with solvent. Repeat this procedure as often as necessary to obtain a satisfactory seal.

Valve Springs

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

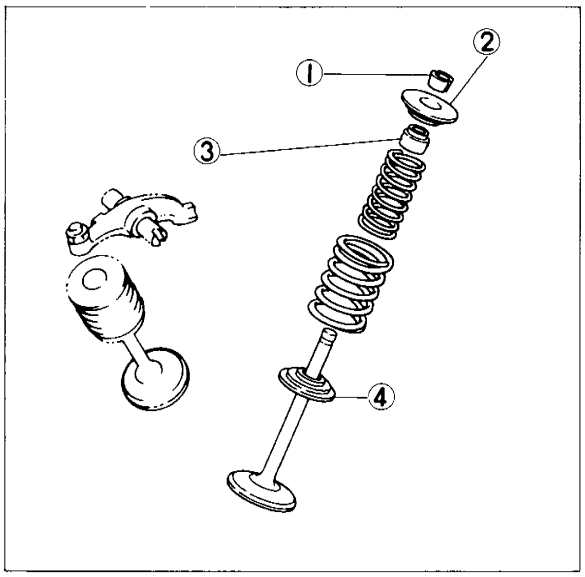
1. Even though the spring is constructed of durable spring steel, it gradually loses some of its tension. This is envidenced by a gradual shortening of free length. Use a vernier caliper to measure spring free length. If the free length of any spring has decreased more than 2 mm (0.080 in) from its specification, replace it.



2. Another symptom of spring fatigue is insufficient spring pressure. This can be checked with a valve-spring-compression-rate gague. Test each spring individually. Place a spring in the gauge and note the spring pressure when the spring is compressed to the installed length (valve closed). If the pressure does not equal the specified value, replace the spring.

Valve Spring Specifications		
	Outer Spring	Inner Spring
Free Length	43.8 mm (1.724 in)	40.1 mm (1.579 in)
Installed Length (valve closed)	34.2 mm (1.346 in)	22.7 mm (0.894 in)
Installed Pressure (valve closed)	16.0 kg (37.3 lb)	8.1 kg (17.9 lb)
Allowable Tilt (from Vertical)	2.5° (1.7 mm) (0.067 in)	2.5° (1.7 mm) (0.067 in)

Valve Installation

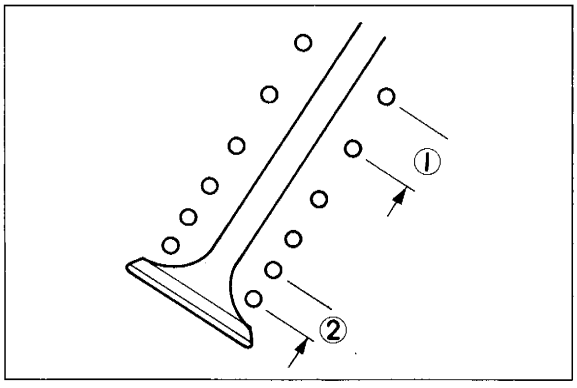


1. Retainers
2. Collar
3. Oil seal
4. Spring seat

1. Lubricate the valve stem and the oil seal with a high-quality molybdenum disulfide motor oil or molybdenum disulfide grease.
2. Inset the valve in the cylinder head, and install the oil seal. Carefully fit the oil seal over the valve stem and push it into position on top of the valve guide.
3. Install the spring seat, and install both valve srpings.

NOTE:

All valve springs must be installaed with the larger pitch upward as shown.



1. Larger pitch
2. Smaller pitch

4. Install the collar. Be sure it is properly seated on the valve springs.
5. Install the valve spring compressor, and compress the springs.
6. Install the valve retainers. Be sure the retainers properly engage the valve stem.
7. Carefully remove the valve spring compressor.

WARNING:

Proceed slowly. If a retainer has not been properly installed, it could be ejected from the cylinder head.

8. Gently tap the end of the valve stem with a plastic mallet. This will ensure that the retainers are properly seated in the collar.

Rocker Arms and Rocker Arm Shafts

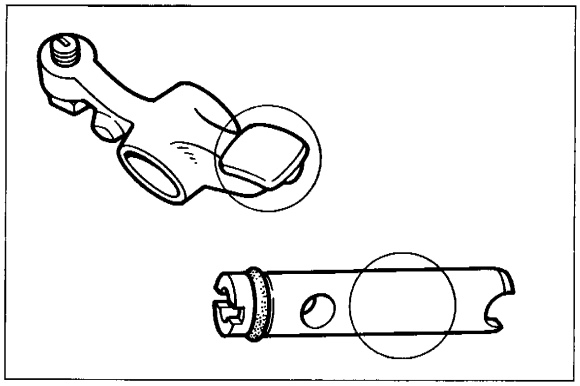
1. The rocker arm usually wears at two locations: at the rocker shaft hole and at the cam-lobe-contact surface. Check these areas for signs of unusual wear.
2. Measure the rocker arm inside diameter. If it exceeds specification, replace the rocker arm.

Maximum Inside Diameter: 12.05 mm (0.4744 in)

3. Measure the outside diameter of the rocker arm shaft. If it is less than the specified value, replace the rocker arm.

Minimum Outside Diameter: 11.95 mm (0.4705 in)

4. Calculate the clearance by subtracting the rocker-arm-shaft outside diameter from the rocker-arm inside diameter. If this clearance is greater than 0.1 mm (0.0039 in) replace either or both parts as necessary.



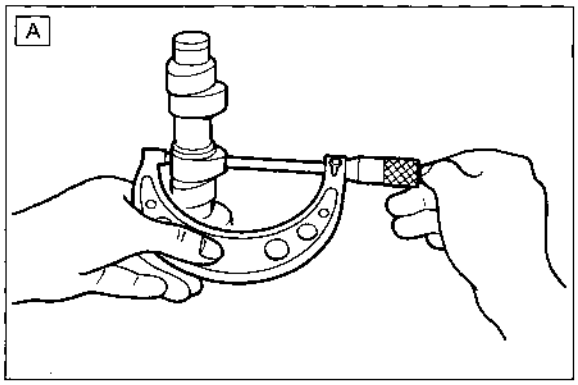
5. The rocker arm shaft has been hardened; it should not wear excessively. If a groove can be felt in the bearing surface or if the shaft shows a blue discoloratiaon, the shaft should be replaced and the lubrication system checked.

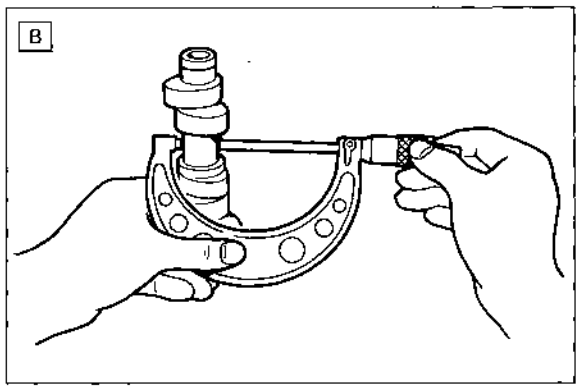
Camshaft

The cam lobe metal surface may have a blue discoloratin due to excessive friction. The metal surface could also start to flake off or become pitted.

1. If any of the above wear conditions are readily visible, the camshaft should be replaced.
2. Even though the cam lobe surface appears to be in satisfactory condition, the lobes should be measured with a micrometer. Cam lobe wear can occur without scarring the surface. If this wear exceeds the wear limit, valve timing and lift are affected. Replace the camshaft if wear exceeds the limit.

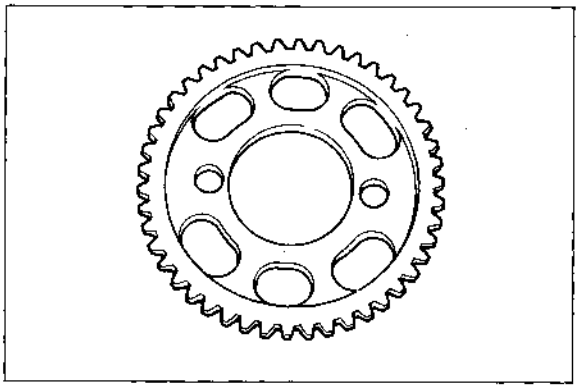
Wear Limit	A	B
Intake	36.40 mm (1.4331 in)	28.97 mm (1.1405 in)
Exhaust	36.57 mm (1.4398 in)	28.99 mm (1.1413 in)

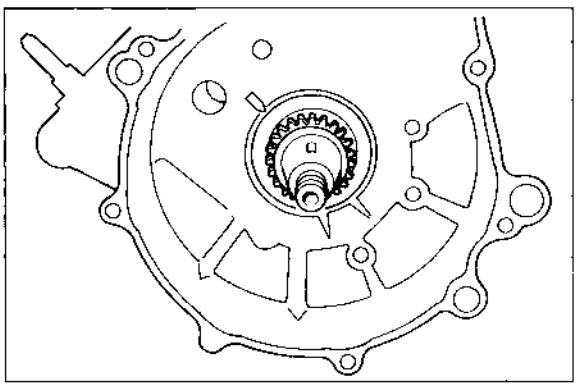




Cam Sprockets and Cam Drive Sprocket

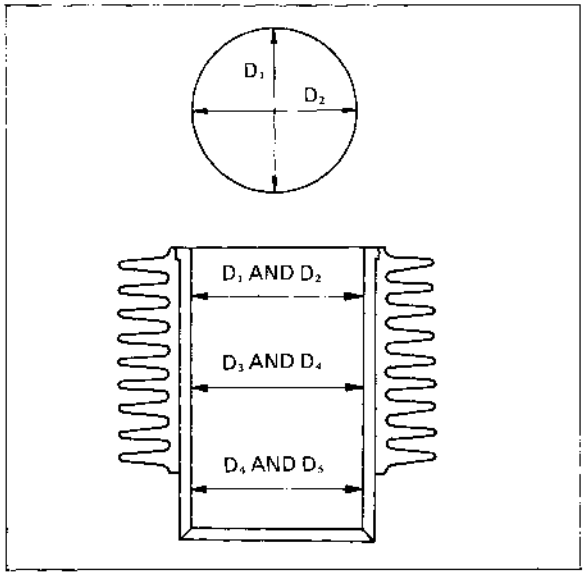
1. Check the cam sprocket and cam drive sprocket for wear.





Cylinder

1. Visually check the cylinder walls for scratches. If vertical scratches are evident, the cylinder wall should be rebored or the cylinder should be replaced.
2. Measure cylinder wall wear in the manner as shown. If wear is excessive, compression pressure will decrease, and engine trouble will occur. Rebore the cylinder wall, and repalce the piston and piston rings.
   Cylinder wear should be measured at three depths by placing the measuring instrument parallel to and at right angles to the crankshaft. (See the illustration.)
   If the cylinder wall is worn beyond the wear limit, it should be rebored.

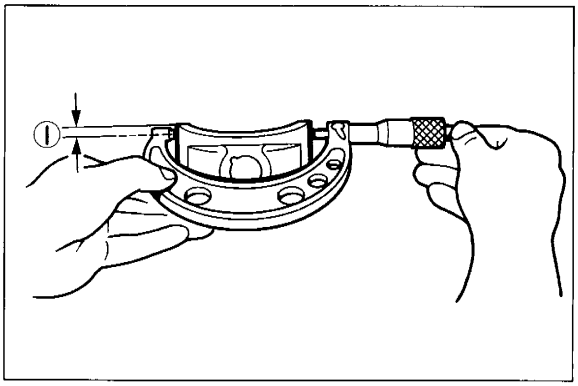


	Standard	Wear limit
Cylinder Bore	95 mm (3.7402 in)	95.1 mm (3.7441 in)
Cylinder Taper	—	0.05 mm (0.0020 in)

Piston

1. Using the micrometer, measure the outside diameter of the piston at the piston skirt. Measurement should be made at a point 5.0 mm (0.197 in) above the bottom edge of the piston by placing the micrometer parallel to and at right angles to the piston pin.

Piston Clearance: 0.045 ~ 0.065 mm
(0.0018 ~ 0.0026 in)

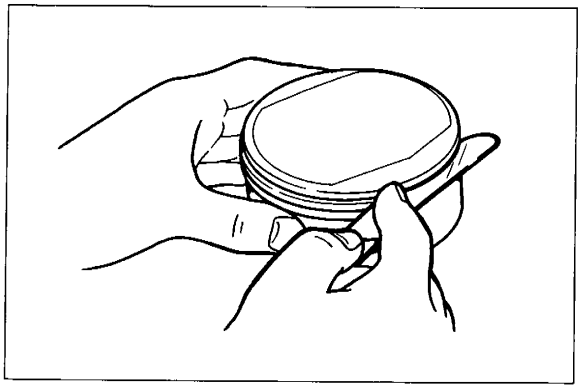


1. 5.0 mm (0.197 in)

	Size A
Standard	95.00 mm (3.740 in)
Oversize 1	—
Oversize 2	95.50 mm (3.760 in)
Oversize 3	—
Oversize 4	96.00 mm (3.780 in)

2. Piston ring/ring groove fit must have correct clearance. If the piston and ring have already been used in the engine, the ring must be removed, the ring groove cleaned of carbon, then the ring should be reinstalled. Use a feeler gauge to measure the gap between the ring and the land.

Side Clearance	Top	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
	2nd	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
	Oil ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)



Piston Ring

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

Oversize 1	—
Oversize 2	0.50 mm (0.020 in)
Oversize 3	—
Oversize 4	1.00 mm (0.040 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.

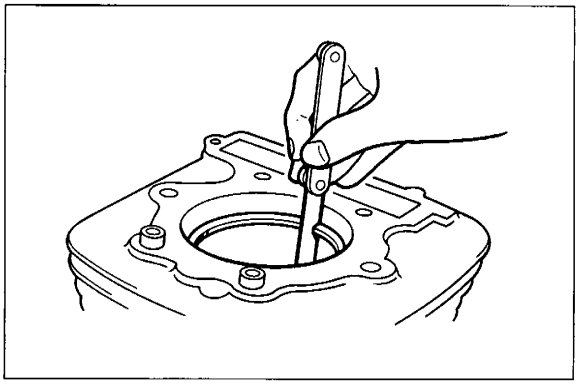
Size	Color
Oversize 1	—
Oversize 2	Brown
Oversize 3	—
Oversize 4	Black

1. Measure the end gap of each piston ring. Insert a ring into the cylinder, and push it approximately 20 mm (0.8 in) into the cylinder. Push the ring with the piston crown so the ring will be at a right angle to the cylinder bore.
2. Measure the ring end gap with a feeler gauge. If the end gap exceeds tolerance, replace the whole set of rings.

NOTE:

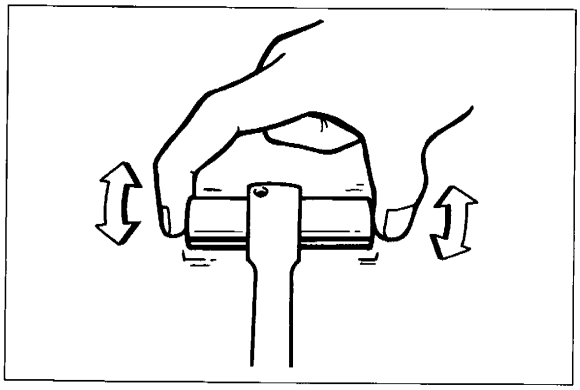
You cannot measure the end gap on the expander spacer of the oil control ring. If the oil-control-ring rails show excessive gap, replace all three rings.

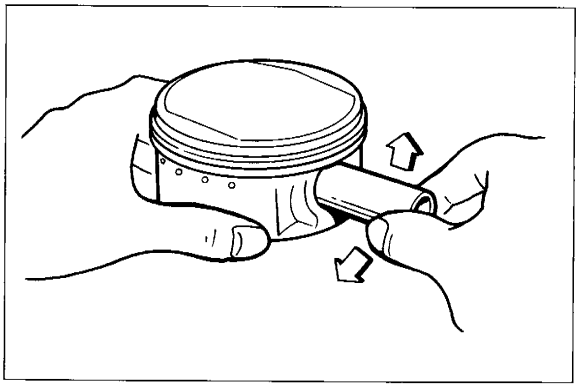
	Standard	Limit
Top ring	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.80 mm (0.0315 in)
2nd ring	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.80 mm (0.0315 in)
Oil ring (Rails)	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)	–



Piston Pin

1. Lightly oil the piston pin, and install it in the small end of the connecting rod.
2. Check the free play. There shuld be no noticeable vertical play. If any free play exists, check the connecting rod for wear. Replace the pin and connecting rod as required.
3. Insert the piston pin in the piston, and check the free play. There should be no noticeable fee play when the pin is in place in the piston. If the piston pin is loose, replace the pin and/or the piston as required.



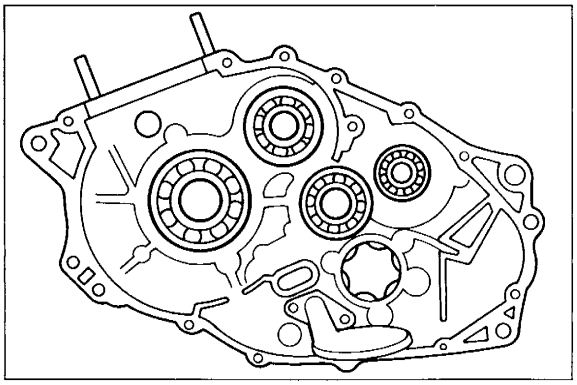


Crankshaft Bearing

1. Bearings should be cleaned, dried, and the races visually checked for pits, rust spots, or chatter marks where the balls have dragged. If any of these conditions exist, the bearings should be replaced.

NOTE:

Lubricate the bearings immediately after examining them to prevent rust.



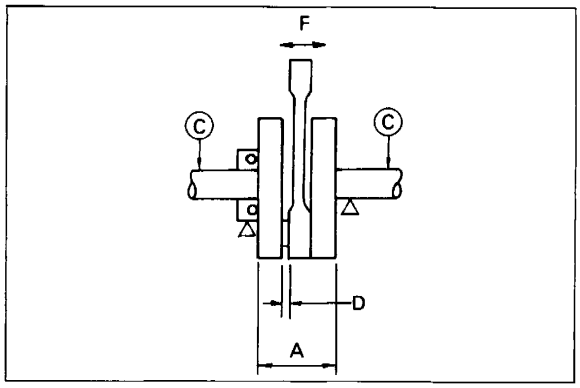
Crankshaft

1. Check crankshaft components per chart.

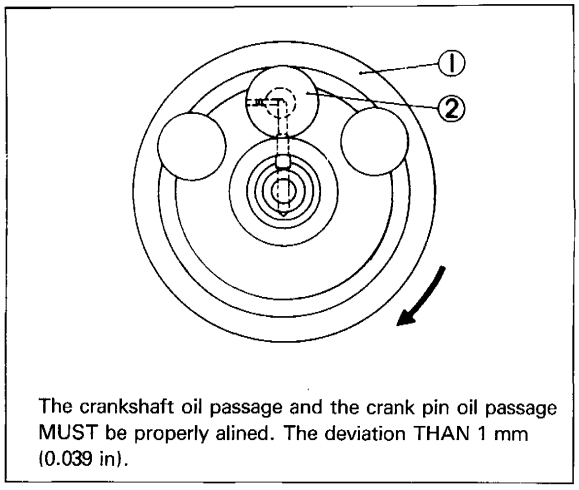
Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at big end).	Small end play should not exceed 2 mm (0.08 in).	If small end play exceeds 2 mm (0.079 in) disassemble crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within 0.8 ~ 1.0 mm (0.031 ~ 0.039 in).
Check the connecting rod side clearance at big end.	Move the connecting rod to one side and insert a feeler gauge. Big end axial play should be within 0.25 ~ 0.75 mm (0.0098 ~ 0.0295 in)	If excessive axial play is present, 0.8 mm (0.032 in) or more, disassemble the crankshaft and replace any worn parts.
Check crankshaft assembly runout. (Misalignment of crankshaft parts.)	Dial gauge readings should be within 0.03 mm (0.0012 in).	Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.

Crank Specifications

Runout limit	Assembly width	Rod clearance			
		Axial "F"		Side "D"	
C	A	Min.	Max.	Min.	Max.
0.03 mm (0.0012 in)	74.95 ~ 75.00 mm (2.951 ~ 2.953 in)	0.8 mm (0.031 in)	2.0 mm (0.08 in)	0.25 mm (0.0098 in)	0.8 mm (0.032 in)



2. In disassembling and reassembling the crank, follow the illustration.



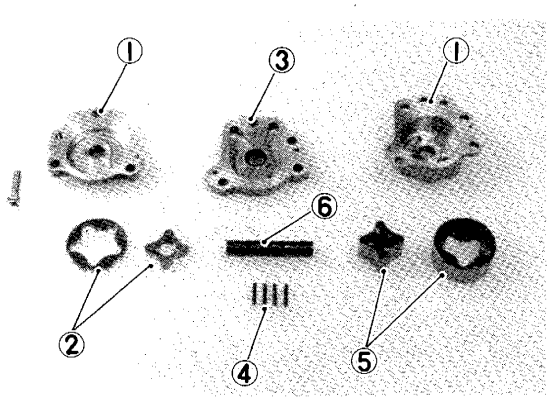
The crankshaft oil passage and the crank pin oil passage MUST be properly alined. The deviation THAN 1 mm (0.039 in).

1. Crank assembly 2. Crank pin

NOTE:

Make sure oil passages of crank and crank pin are lined up during assembly.

Oil Pump



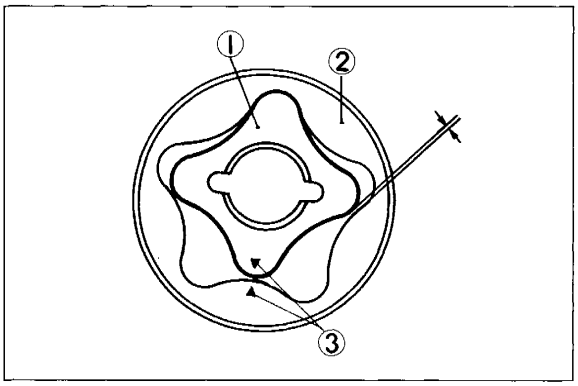
1. Pump cover
2. Feed pump rotor
3. Rotor housing
4. Dowel pin
5. Scavenger pump rotor
6. Pump shaft

1. Oil pump rotor width

Feed Pump: 4 mm (0.16 in) Scavenger Pump: 18 mm (0.71 in)

2. inner and outer rotor dimensions

Clearance "A" Standard: 0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in) Limit: 0.15 mm (0.006 in)



1. Inner rotor
2. Outer rotor
3. Match marks

Primary Drive

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

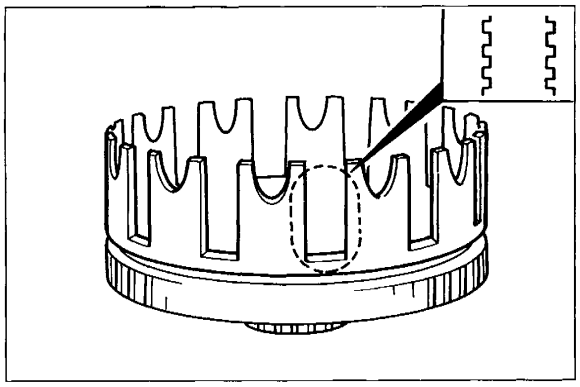
1. Check the drive gear and the driven gear for obvious signs of wear or damage from foreign material within the primary case.
2. If the primary drive is excessively noisy during operation, replace both the drive and the driven gears.

Clutch Housing

1. Check the dogs on the clutch housing. Look for cracks and signs of galling on the edges. If damage is moderate, deburr; if severe, replace the clutch.

NOTE:

Galling on the clutch plate splines will cause erratic operation.



2. Check the clutch housing bearing for damage. If damaged, replace the bearing.

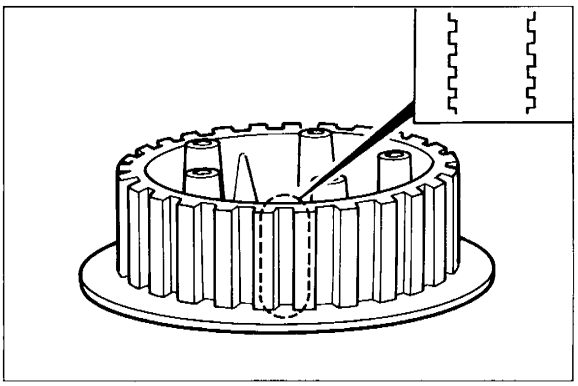
Clutch Boss

The clutch boss contains a built-in damper beneath the first clutch plate (clutch plate 2). It is not normally necessary to remove the circlip and disassemble the built-in damper unless there is serious clutch chattering.

1. Check the splines on the clutch boss for galling. If damage is slight to moderate, deburr; if it is severe, replace the clutch boss.

NOTE:

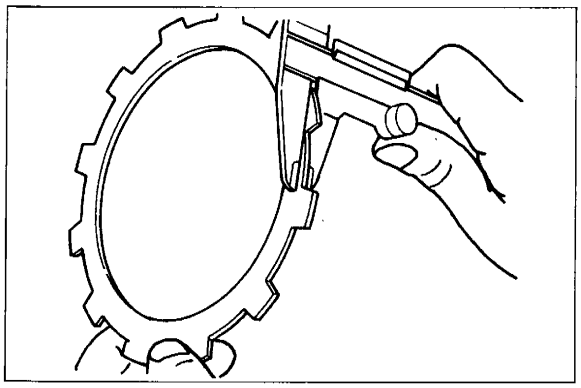
Galling on clutch plate spliens will cause erratic operation.

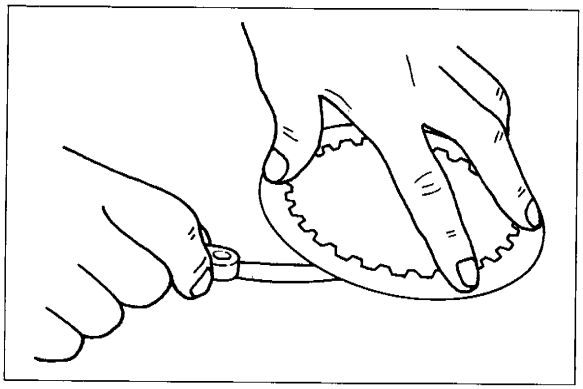


Friction and Clutch Plates

1. Check the clutch plates and friction plates for heat damage. Measure friction plate thickness at 3 or 4 points. Measure the clutch plates for warpage with a feeler gauge and surface plate. Replace clutch plates or friction plates as a set if any is faulty or beyond wear limits.

		Standard	Wear Limit
Friction Plate Thicknes	#2 & #8	3.0 ± 0.1 mm (0.12 ± 0.004 in)	2.8 mm (0.11 in)
	Other	2.8 ± 0.08 mm (0.11 ± 0.003 in)	2.6 mm (0.10 in)
Clutch Plate Warp Limit		—	0.2 mm (0.008 in)

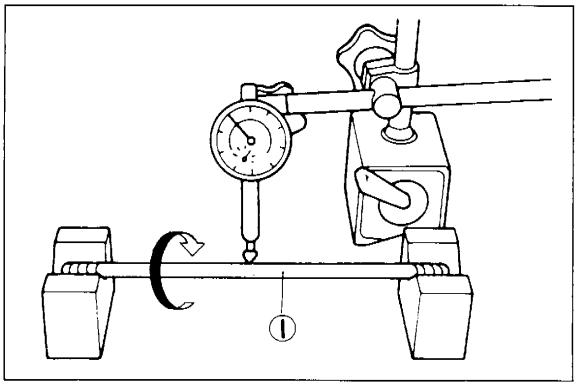




Clutch Push Rod

1. Check the push rod 1 for wear and damage; replace if damaged.
2. By rolling the push rod 2 on the V-blocks, check for bends. If any bend is found, replace the push rod.

Bend limit: 0.5 mm (0.02 in)

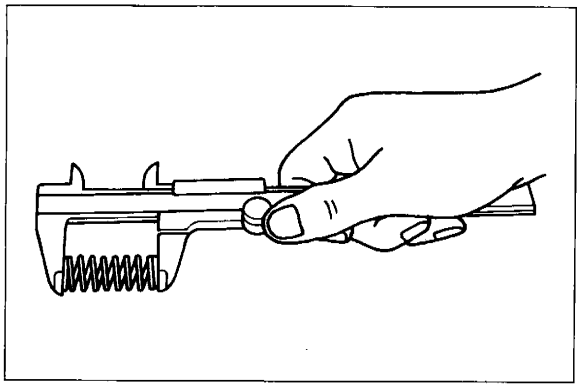


1. Push rod 2

Clutch Springs

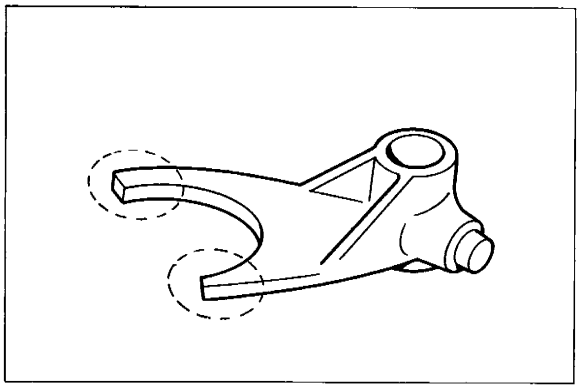
1. Measure the clutch spring free length. Replace the springs as a set if any is less than minimum free length.

Clutch Spring Minimum Length: 32.6 mm (1.284 in)

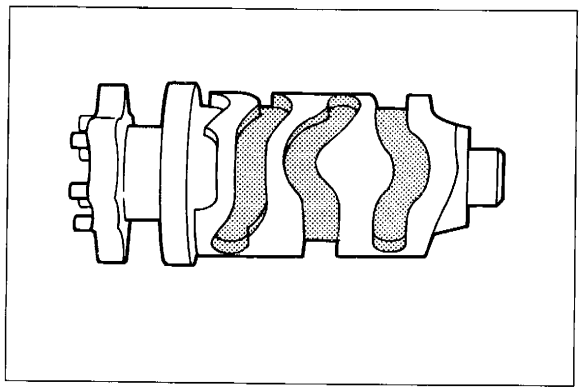


Transmission

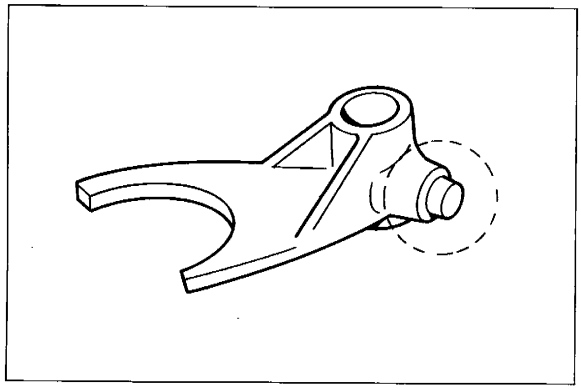
1. Inspect each shift fork for signs of galling on the gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.



2. Roll the guide bar across a surface place. If the bar is bent, replace it.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or damage, replace the cam.



4. Check the cam followers on each shift fork for wear. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace the shift fork.



5. Check the shift cam dowel and side plate for looseness, damage, or wear. Replace as required.
6. Check the shift-cam stopper plate, circlip, and stopper for wear. Replace as required.
7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent beyond the specified limit, replace the shaft.

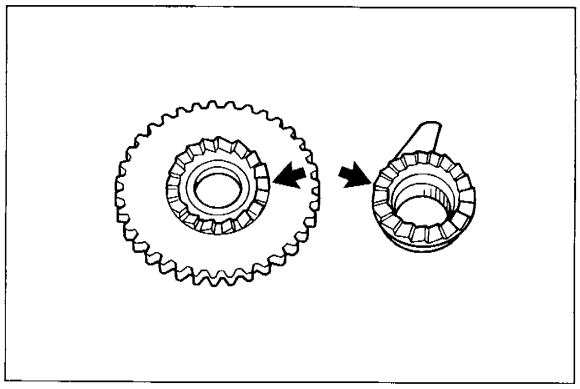
Maximum Runout: 0.08 mm (0.0031 in)

8. Carefully inspect each gear. Lock for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galing, or other exterme wear. Replace as required.

9. Check to see that each gear moves freely on its shaft.
10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

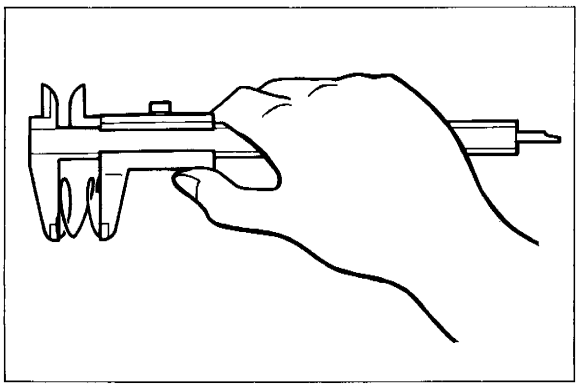
Kick Starter

1. Check the ratchet teeth on the kick gear and ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as a set.

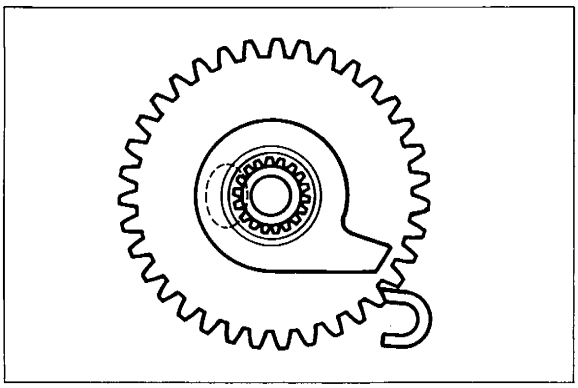


2. Check to see that the kick gear spins freely on the kick axle. If not, replace either or both as required. Replace if any signs of galling are found.
3. Check to see that the ratchet wheel (splined) slides freely on the kick axle. Check for burrs or other damage. Replace as required.
4. Check axle and wheel splines for wear. The ratchet wheel is a fairly loose fit on splines. However, if the wheel is so loose it catches on the shaft keeping the ratchet wheel spring from forcing it out, replace the wheel.
5. Check the ratchet wheel spring for fatigue. If the free length shows the spring has collapsed beyond specification, replace the spring.

Ratchet Wheel Spring Free Length	
Standard	Minimum
17.2 mm (0.677 in)	15.0 mm (0.591 in)



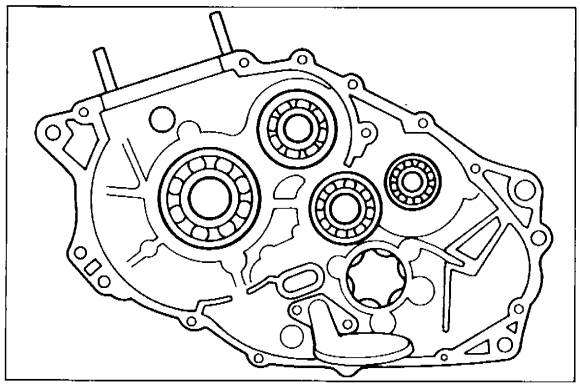
6. When reassembling the kick starter, align the mark on the ratchet wheel with the one on the kick axle as shown.



Bearings and Oil Seals

1. Inspection

a. After cleaning and lubricating the bearings, rotate the inner race with a finger. If rough spots are noticed, replace the bearing.
b. Check the oil seal lips for damage and wear. Replace as required.



2. Removal
   a. Pry oil seal(s) out of place with a screwdriver.
      Replce all oil seals when overhauling the engine.

NOTE:

Place a piece of wood under the screwdriver to prevent damage to the case.

2. Drive out the bearing(s) with a socket and hammer or with a hydraulic press.

NOTE:

Bearing(s) are most easily removed or installed if the cases are first heated to approximately 95° ~ 125°C (205° ~ 257°F). Bring the case up to proper temperature slowly. Use an oven.

3. Installation
   See next ENGINE ASSEMBLY "Important Information."

CAUTION:

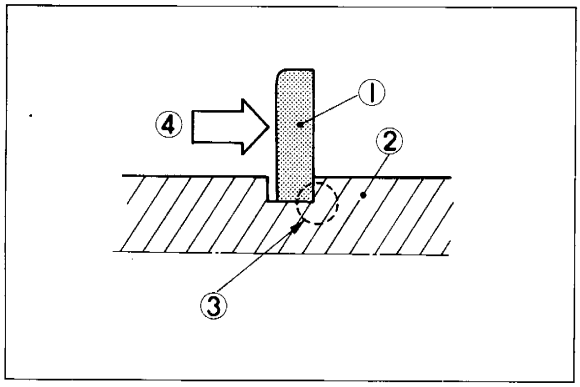
The right side crankshaft oil seal in the right crankcase cover must be installed with the guide plate side facing in toward the engine.

ENGINE ASSEMBLY AND ADJUSTMENT

Important Information

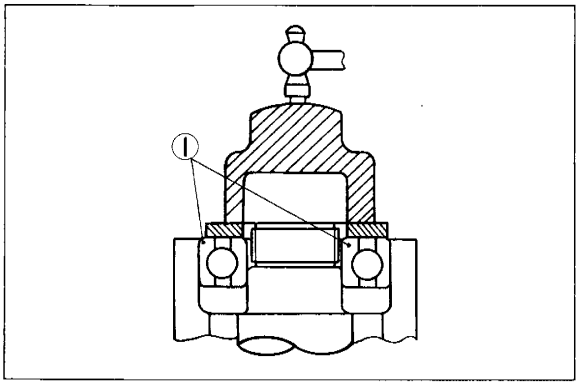
1. Gaskets and seals
   a. All gaskets and seals should be replaced when an engine is overhaued. All gasket surfaces and oil seal lips must be cleaned.
   b. Properly oil all mating parts and bearings during reassembly.

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



1. Circlip
2. Shaft
3. Sharp edged corner
4. Thrust

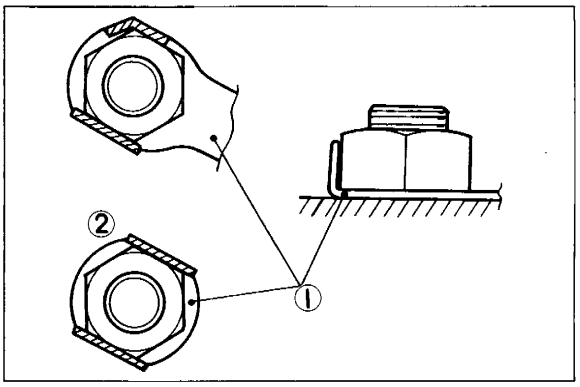
3. Bearings and oil seals
   a. Install the bearing(s) and oil seal(s) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of lightweight lithium base grease to the seal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



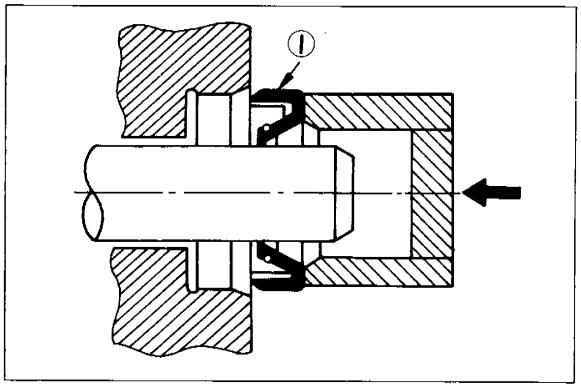
1. Bearing

4. Lock washers/plates and cotter pins

a. All lock washers/plates 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.



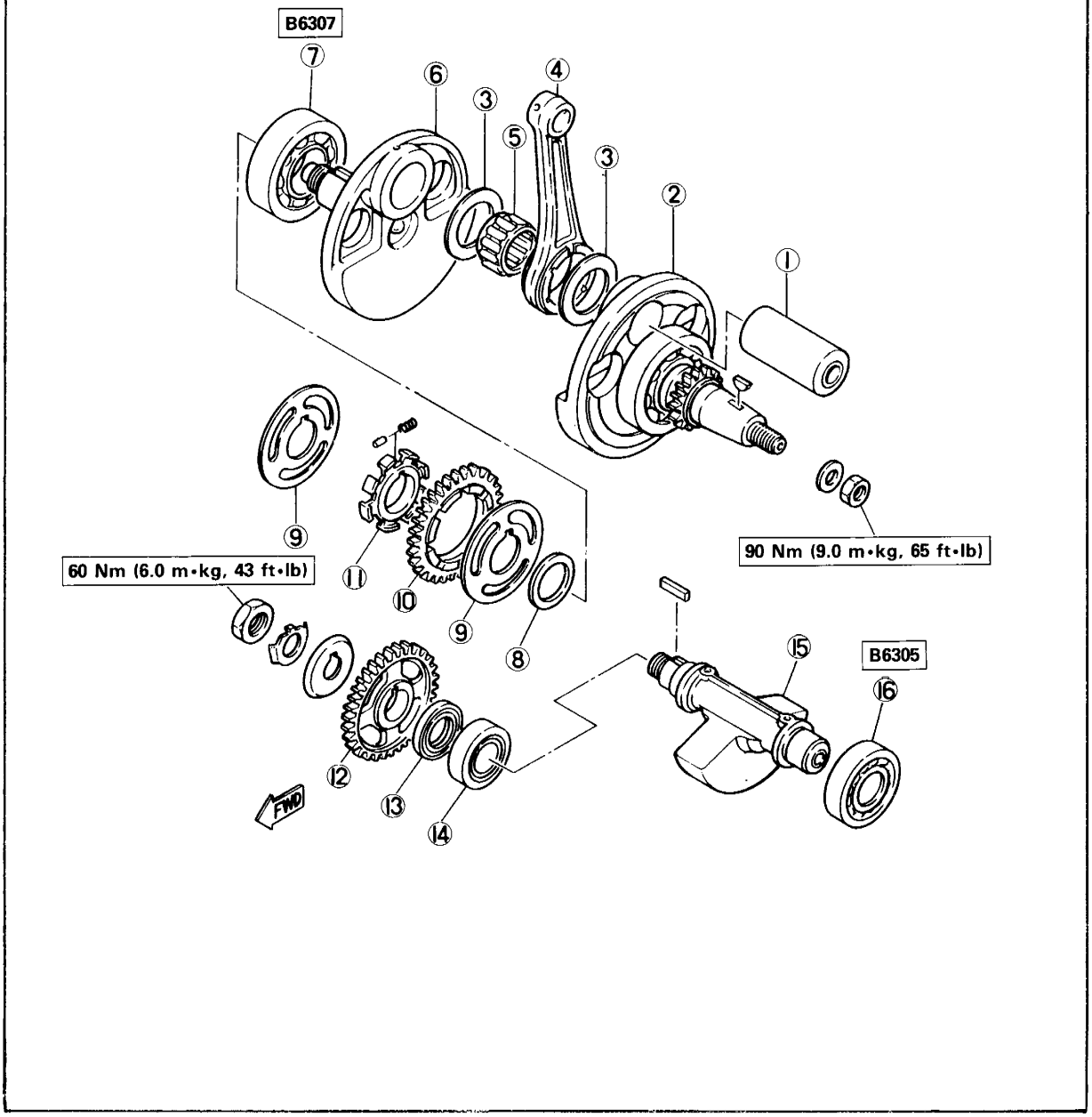
1. Lock washer or lock plate 2. Or



1. Oil seal

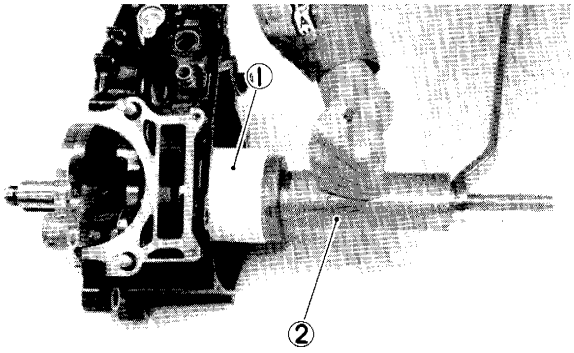
Crankshaft

① Crank pin
② Crank 1
③ Washer
④ Connecting rod
⑤ Big end bearing
⑥ Crank 2
⑦ Bearing
⑧ Plain washer
⑨ Bearing cover washer
⑩ Drive gear
⑪ Buffer boss
⑫ Balancer gear
⑬ Oil seal
⑭ Bearing
⑮ Balancer
⑯ Bearing



After all bearings and seals have been installed in both crankcase halves, install crankshaft as follows:

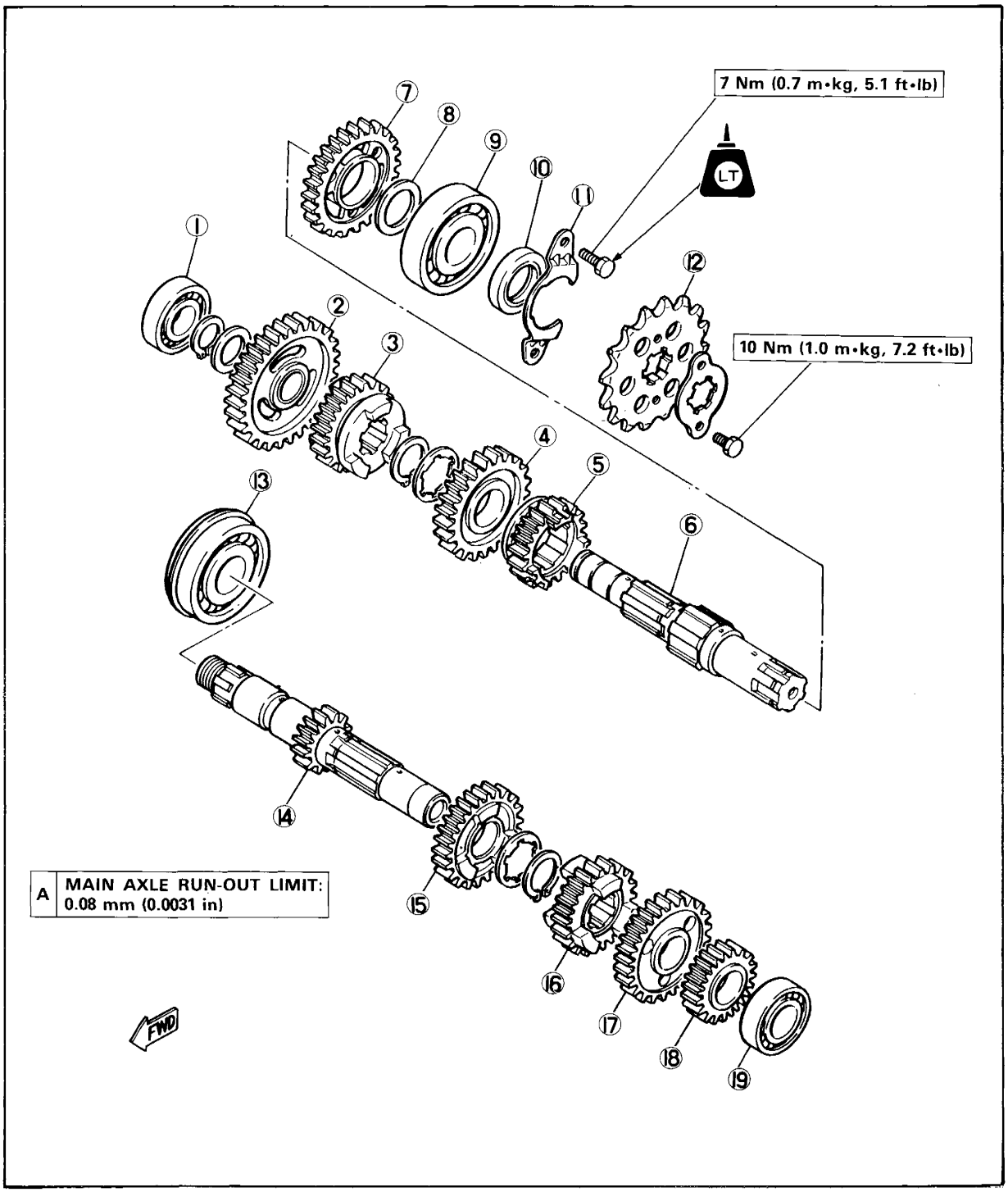
1. Set the crankshaft into left case half using the Crankshaft Installing Tool (P/N. YU-90050) and Pot Spacer (P/N. YM-91044).
2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.



1. Pot Spacer (YM-91044)
2. Crankshaft Installing Set (YU-90050)

Transmission

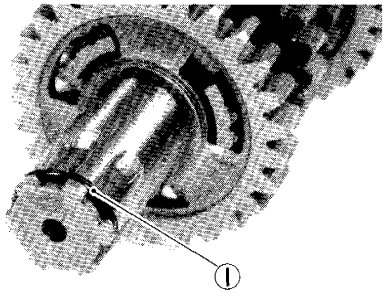
① Bearing
② 1st wheel gear
③ 4th wheel gear
④ 3rd wheel gear
⑤ 5th wheel gear
⑥ Drive axle
⑦ 2nd wheel gear
⑧ Shim
⑨ Bearing
⑩ Oil seal
⑪ Plate cover
⑫ Drive sprocket
⑬ Bearing
⑭ Main axle
⑮ 4th pinion gear
⑯ 3rd pinion gear
⑰ 5th pinion gear
⑱ 2nd pinion gear
⑲ Bearing



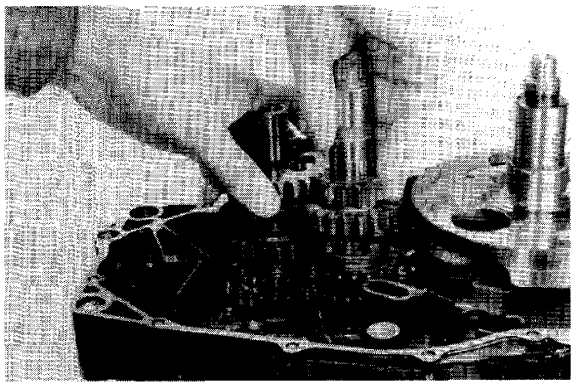
1. Install the drive axle and main axle.

NOTE:

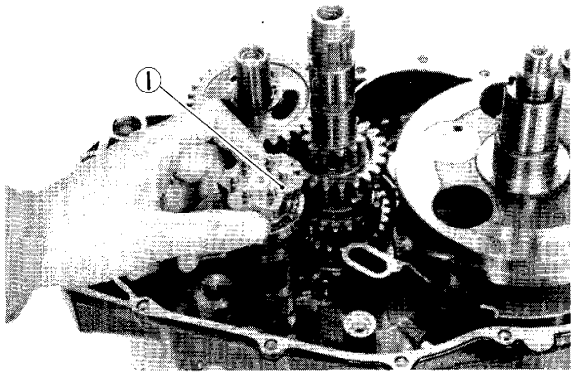
While installing the drive axle into the crankcase, pay careful attention to the oil seal lip.
It is recommended to set a suitable O-ring into the drive axle groove.



1. O-ring



2. Install the shfit cam.

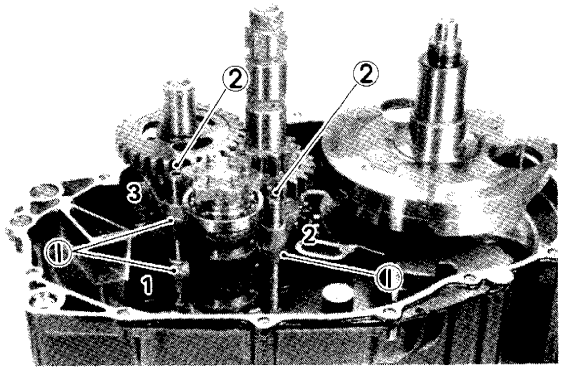


1. Shift cam assembly

3. Install the shift forks and guide bar.

NOTE:

Each shift fork is identified by a number cast on its side. All the numbers should face the left side.

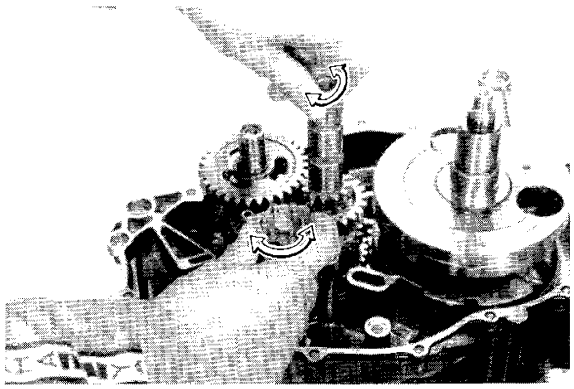


1. Shift fork 2. Guide bar

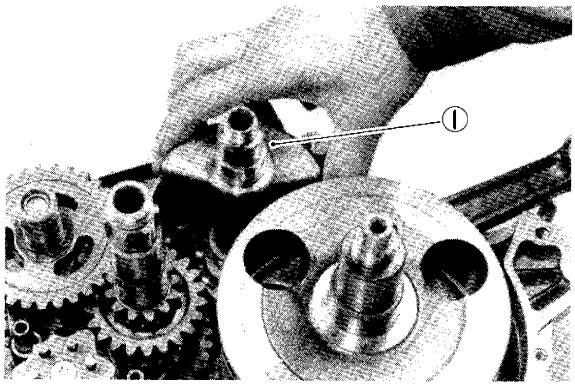
4. Check to see that all parts move freely prior to installing right case half.
Check for correct transmission operation and make certain that all loose shims are in place.

NOTE:

Oil each gear and bearing thoroughly.



5. Install the balancer shaft.

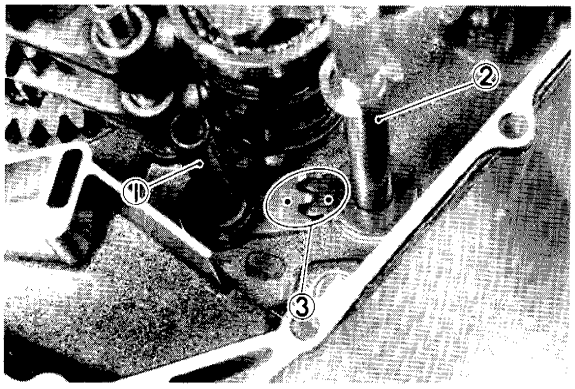


1. Balancer shaft

6. Install the change shaft and shift shaft.

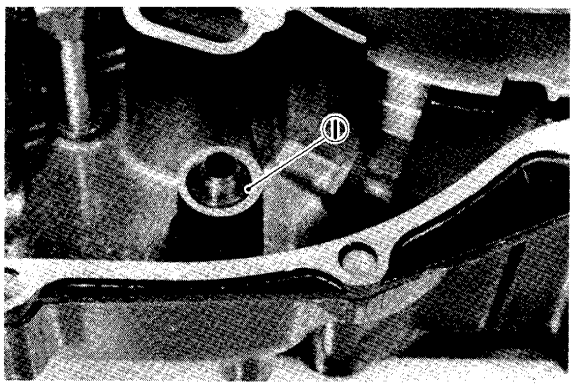
NOTE:

Note that there is the punch mark on the change shaft and punch mark on the shift shaft which must be aligned to install the shift shaft.



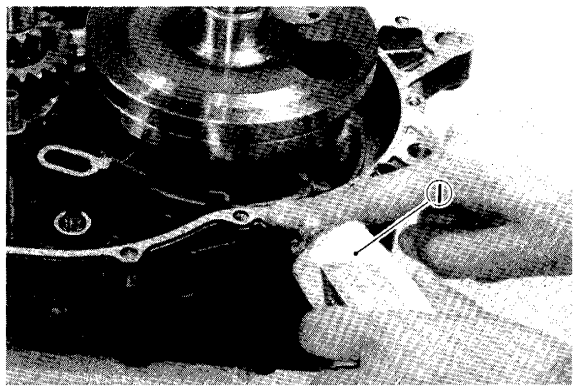
1. Shift fork
2. Change shaft
3. Punched mark

7. Install the O-ring to the inlet oil passage.



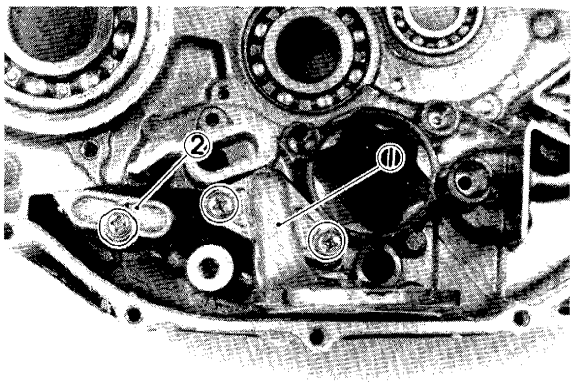
1. O-ring

8. Apply Quick Gasket® (P/N. ACC-11001-05-01) to the mating surfaces of both case halves.
   Apply thoroughly over all case mating surfaces.



1. Quick Gasket® (P/N. ACC-11001-05-01)

9. Install the oil strainer and oil passage cover to the right crankcase.



1. Oil strainer
2. Oil passage cover

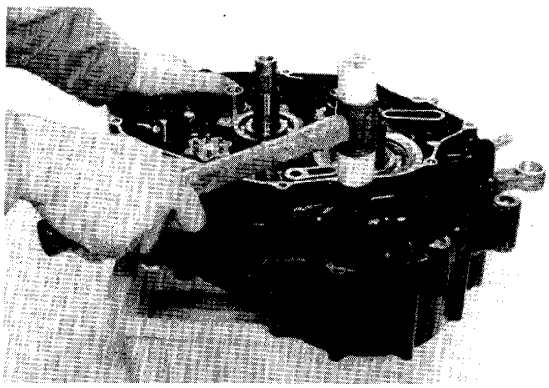
10. Set the right half crankcase onto the shafts, and tap lightly on the case with a soft hammer to assemble.

NOTE:

1. Do not tap on machined surface or end of crankshaft.
2. Work slowly and carefully while making sure of the parallelism of the mating surface of the left half with that of the right half.

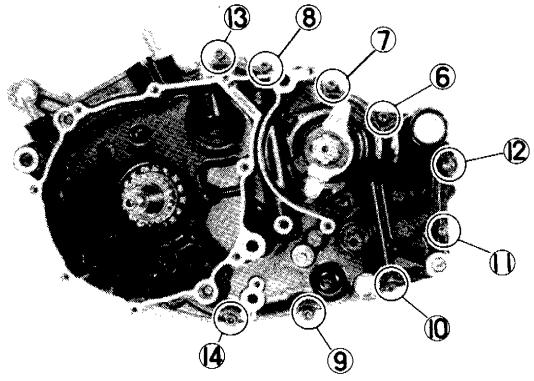
CAUTION:

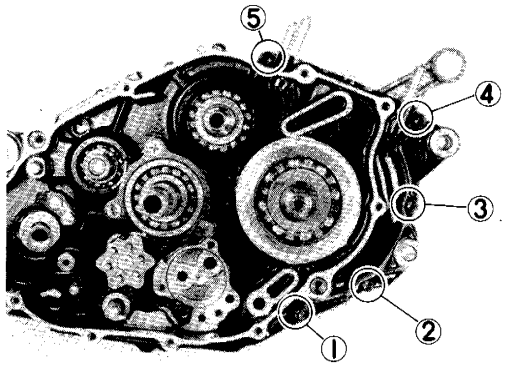
Before installing and torquing the crankcase bolts, be sure to check whether the transmission is functioning properly by manually rotating the shift cam either way.



11. Install all crankcase bolts and tighten in stages, using a crisscross pattern.

Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)





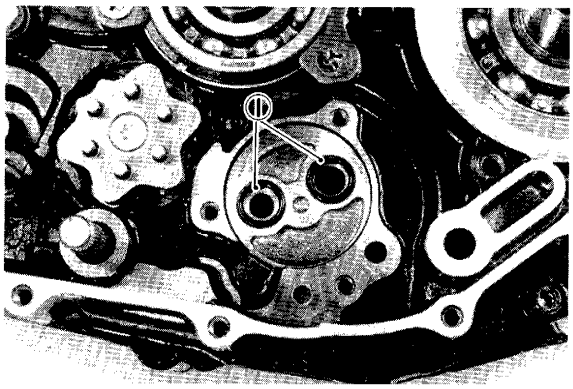
12. Check crankshaft and transmission shafts for proper operation and freedom of movement.
13. Apply a liberal coating of 4-stroke engine oil to the crank pin and bearing.

Oil Pump

CAUTION:

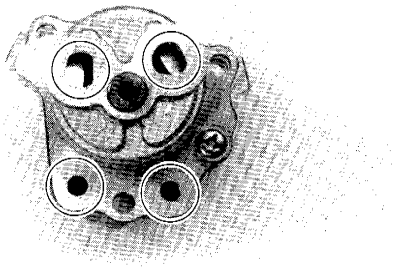
Apply a liberal amount of 4-stroke engine oil to the oil pump passages in the crankcase or the engine may be damaged.

1. Install the two O-rings. Apply a liberal amount of 4-stroke engine oil to the oil passages.



1. O-ring

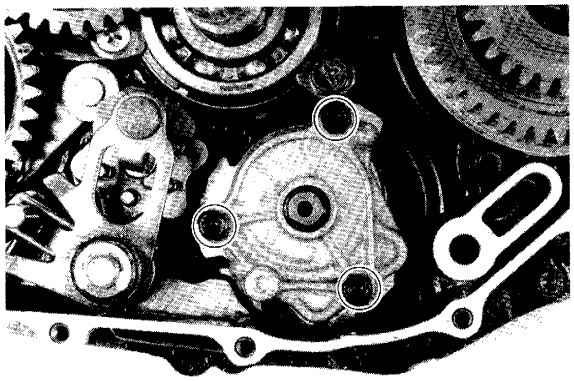
2. Apply a liberal amount of 4-stroke engine oil to both the scavenger pump and feed pump rotor assemblies.



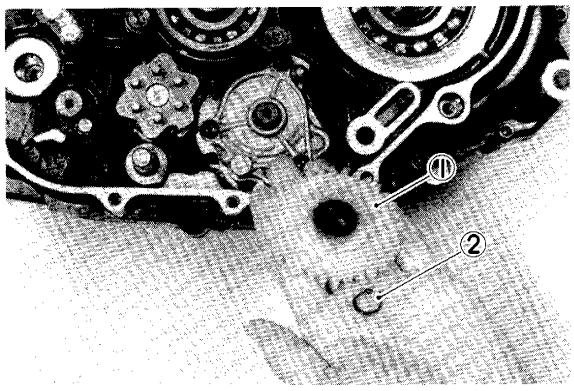
1. Oil passage

3. Install the oil pump assembly.

Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)



4. Install the oil pump gear.



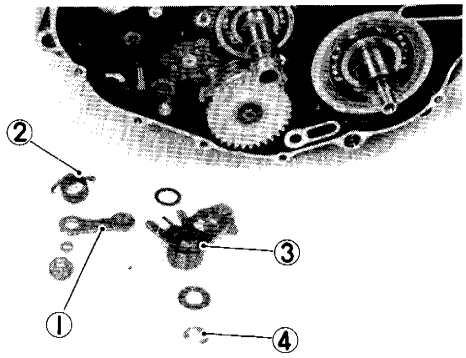
1. Oil pump gear
2. Circlip

Shifter

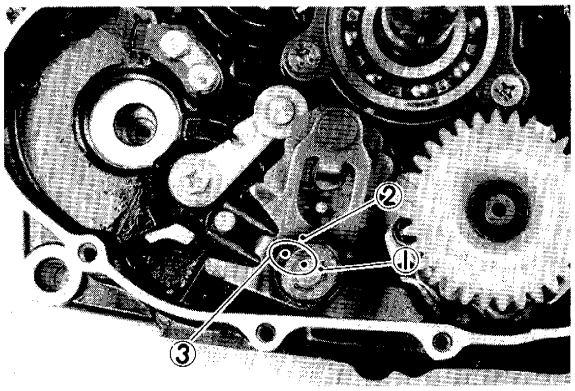
1. Set the stopper lever and torsion spring as properly position.
2. Install the shift lever assembly on the shift shaft.

NOTE:

Note that there is the punched mark on the shift shaft and punched mark on the shift lever which must be aligned to install the shift lever.



1. Stopper lever
2. Torsion spring
3. Shift lever
4. Circlip

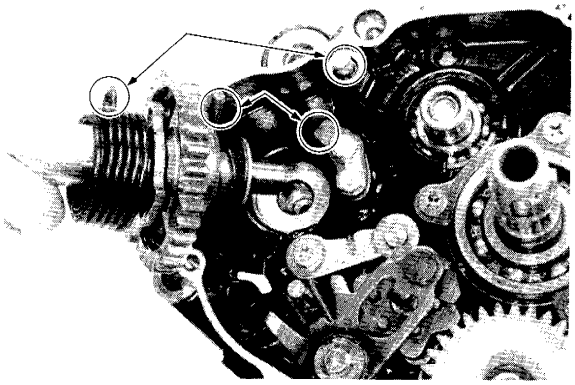


1. Shift shaft
2. Shift lever
3. Punched mark

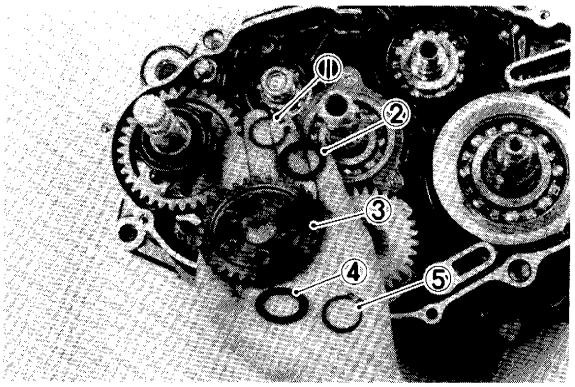
3. Secure the shift lever assembly with the circlip.

Kick Starter

1. While pushing the kick starter assembly straight in, rotate kick axle counter-clockwise slightly from its home position and engage the stopepr to the ratchet wheel guide.
2. Hook the spring to the spring hook.



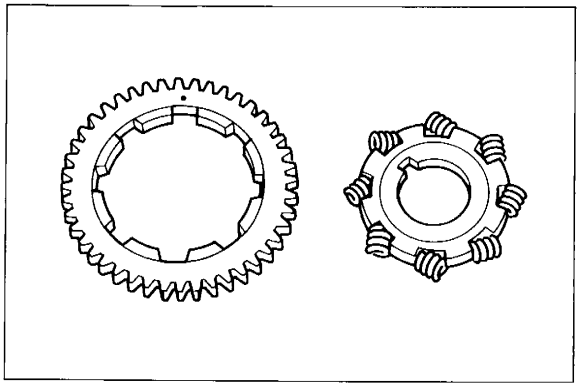
3. Install the circlip, plain washer, kick idle gear, special washer and circlip in that order into the drive axle.



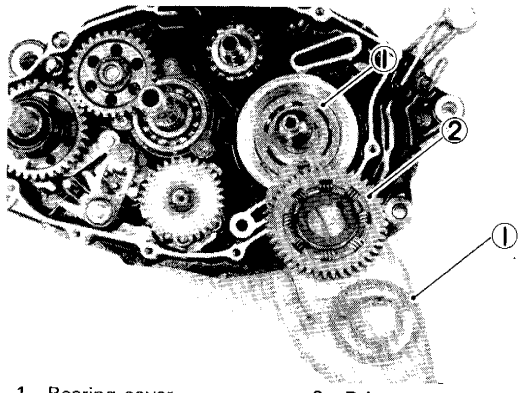
1. Circlip
2. Plain washer
3. Hich idle gear
4. Special washer
5. Circlip

Drive Gear/Primary Drive Gear/Balancer Gear

1. Install the damper assembly into the drive gear.



2. Place the bearing coverts on both sides of the drive gear, and install the key into the crankshaft.

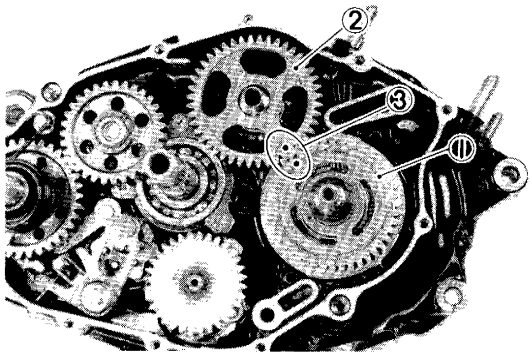


1. Bearing cover
2. Drive gear

4. Install the balancer gear and key.

NOTE:

Note that there is the punched mark on the drive gear and pnched mark on the balancer gear which must be aligned to install the balancer gear.

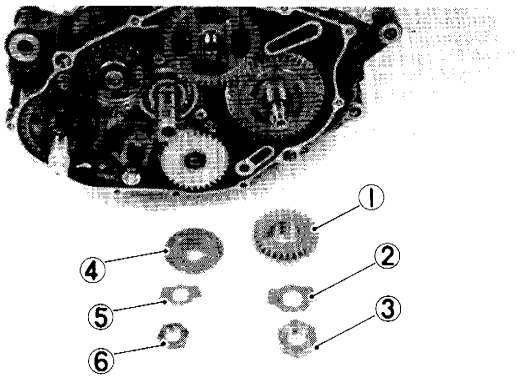


1. Drive gear
2. Balancer gear
3. Punched mark

5. Install the primary drive gear, new lock washer and primary drive gear securing nut in that order to the crankshaft. Then, install the holding plate, new lock washer and balancer gear securing nut in that order to the balancer shaft.

CAUTION:

Always use the new lock washer.



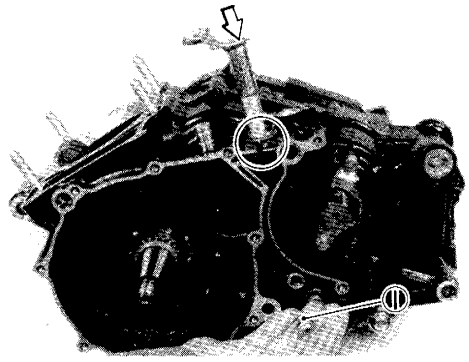
1. Primary drive gear
2. Lock washer
3. Primary drive gear securing nut
4. Holding plate
5. Lock washer
6. Balancer gear securing nut

6. Place a folded rag between the teeth of the balancer gear and drive gear to lock them. Then, torque the nuts to specification.

Tightening Torque:
Balancer Gear:
60 Nm (6.0 m·kg, 43 ft·lb)
Primary Drive Gear:
110 Nm (11.0 m·kg, 80 ft·lb)

7. Bend the lock washer tab along the each nut flats.
8. Insert the push lever axle, and hook the push lever axle spring to its position. Then, torque the setting screw to the specification.

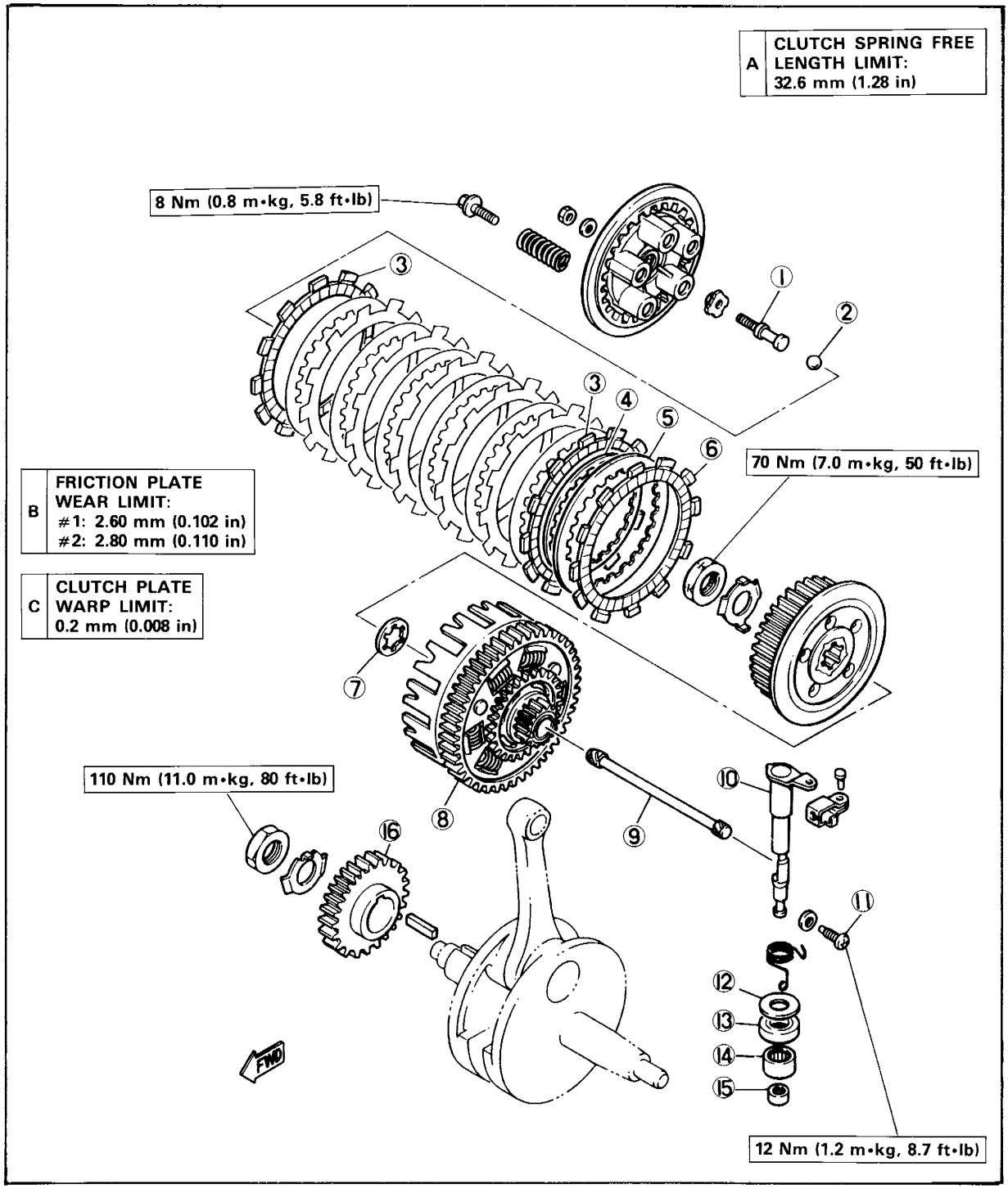
Tightening Torque:
12 Nm (1.2 m·kg, 8.7 ft·lb)



1. Setting screw

Clutch

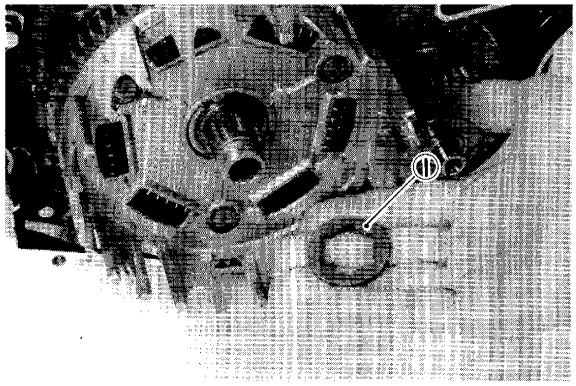
① Push rod 1
② Ball
③ Friction plate (#2 & #8)
④ Clutch boss spring
⑤ Clutch plate
⑥ Friction plate (other)
⑦ Thrust plate
⑧ Primary driven gear complete
⑨ Push rod 2
⑩ Push lever complete
⑪ Set screw
⑫ Plain washer
⑬ Oil seal
⑭ Cylindrical bearing
⑮ Cylindrical bearing
⑯ Primary drive gear



1. Install the primary driven gear, holding plate and clutch boss in that order to the main axle.

NOTE:

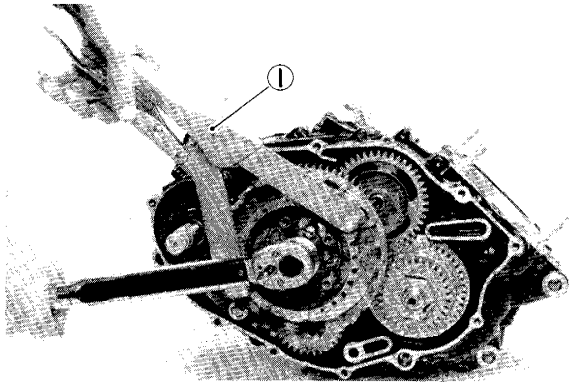
Install the clutch housing while turning the kick idle gear, pump gear and balancer gear.



1. Holding plate

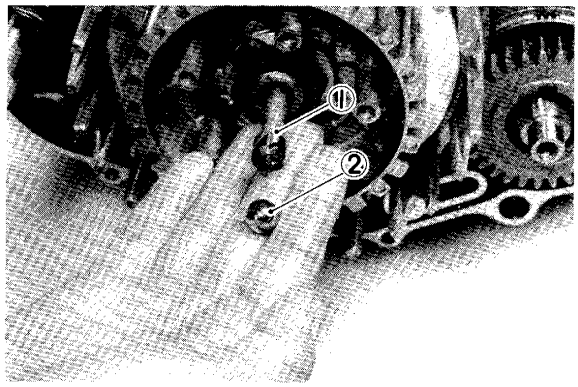
2. Install a new lock washer and lock nut, and tighten the nut to the specification. Use the Clutch Holding Tool (P/N. YM-91042).

Tightening Torque:
70 Nm (7.0 m·kg, 50 ft·lb)



1. Clutch Holding Tool (YM-91042)

3. Bend the lock washer tab along the nut flats.
4. Install the push rod #2 and ball into the main axle hole.



1. Push rod #2 2. Ball

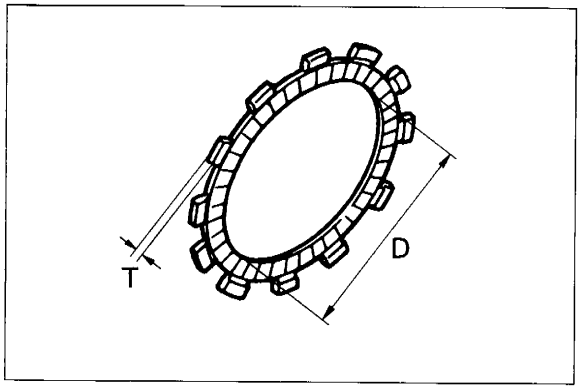
5. Install the clutch plates and friction plate alternately on the clutch boss, starting with a friction plate and ending with a friction plate.

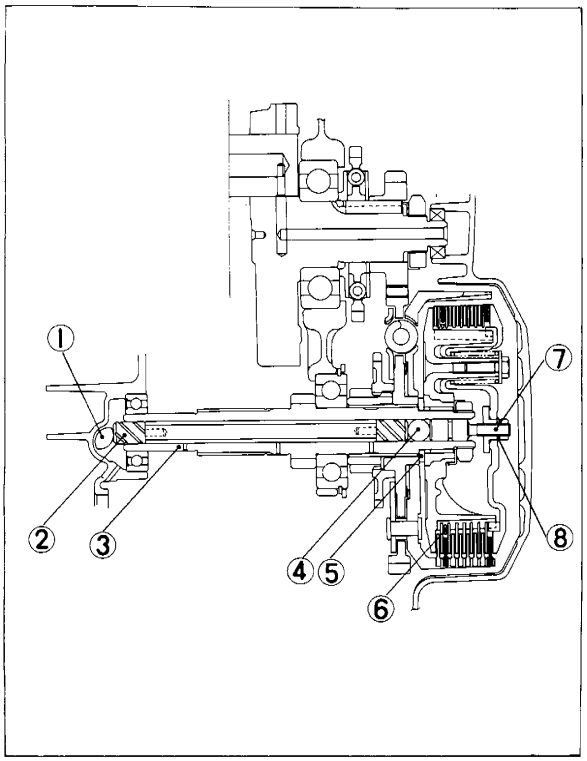
CAUTION:

When installing the friction plates, pay careful attention to the inside diameter.

1. **The friction plate with the larger of the inside diameters must be installed in the second and last places.**
2. **The wave plate must be placed on the inside of the second friction plate.**

	Quantity	Inside dia. (D)	Thickness (T)
Friction Plate # and #8	2 pcs.	116 mm (4.57 in)	3.0 mm (0.12 in)
The Other Friction Plate	6 pcs.	113 mm (4.45 in)	2.8 mm (0.11 in)



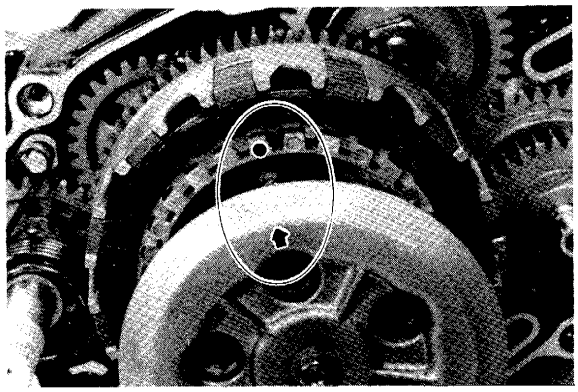


1. Push lever
2. Push rod 2
3. Main axle
4. Ball
5. Thrust plate
6. Wave plate
7. Push rod 1
8. Locknut

6. Install the clutch pressure plate onto the clutch boss.

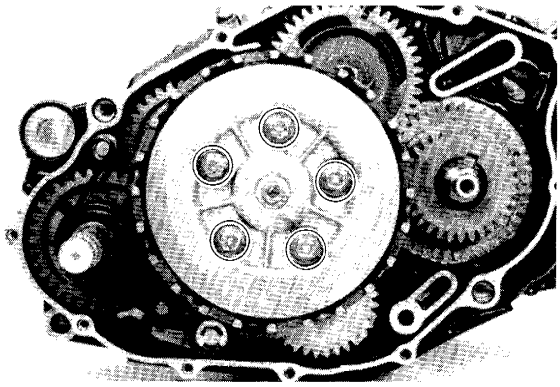
NOTE:

Align the punched mark on the clutch boss with the arrow mark on the clutch pressure plate.



7. Install the clutch springs and screws. Torque the screws to specification.

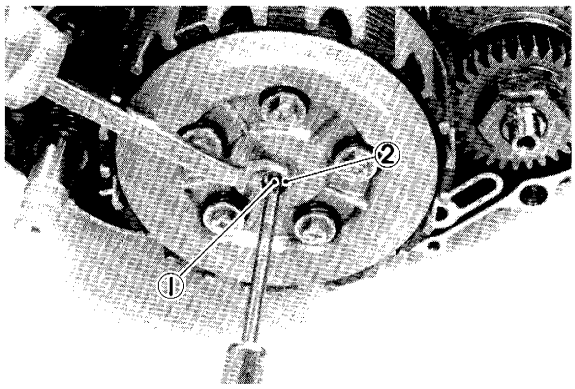
Tightening Torque:
8 Nm (0.8 m·kg, 5.8 ft·lb)



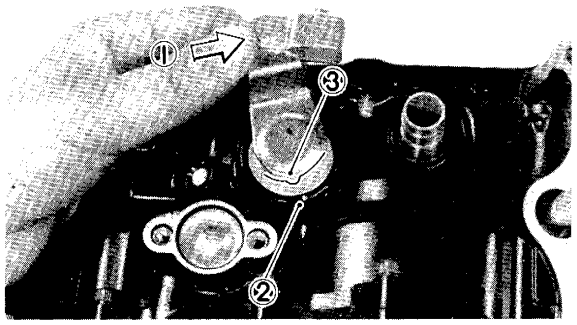
8. Clutch mechanism adjustment
Adjustment of the cluch free play is accomplished as follows:

a. Loosen the locknut on the pressure plate.

b. Push the push lever to toward the front of the engine with your finger until it stops. With the push lever in this position, turn the adjuster either in or out until the push lever mark and crankcase match mark are aligned.



1. Adjuster
2. Locknut



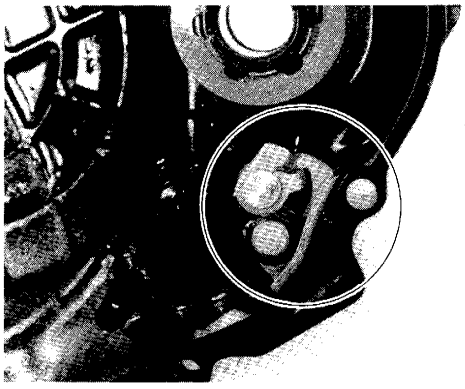
1. Push
2. Crankcase mark
3. Push lever mark

c. Torque the locknut to the specification.

Tightening Torque:
8 Nm (0.8 m·kg, 5.8 ft·lb)

Crankcase Cover Right

1. Before installing the crankcase cover, place the decompression lever as shown in the photo.



2. Fit the right crankcase cover onto the right case. Tap lightly on the cover with a soft hammer.

NOTE:

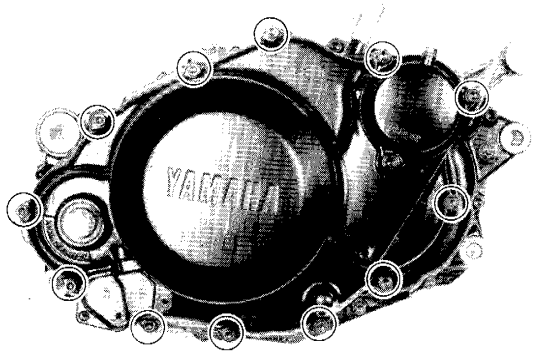
Always use a new gasket.

3. Tighten the right crankcase cover securing bolts. Torque the bolts to the specification.

NOTE:

1. Check to see the decompression lever assembly moves freely prior to tightening the bolts.
2. Tighten the screws using a crisscross pattern.

Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)



Kick Crank Assembly

1. Install the kick crank assembly and tighten the securing bolt.

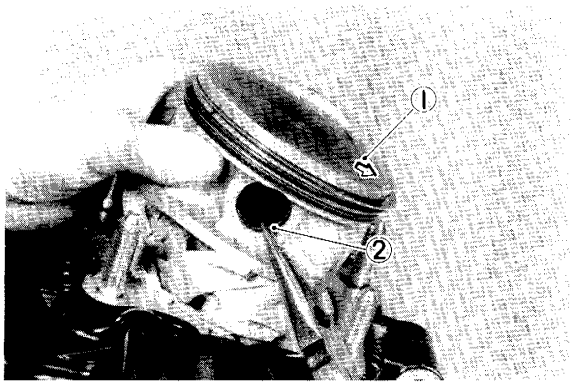
Tightening Torque:
7 Nm (0.7 m·kg, 5.1 ft·lb)

Piston and Piston Ring

1. Fit the piston onto the connecting rod, and push in the piston pin into the piston. Then, install the piston pin clip.

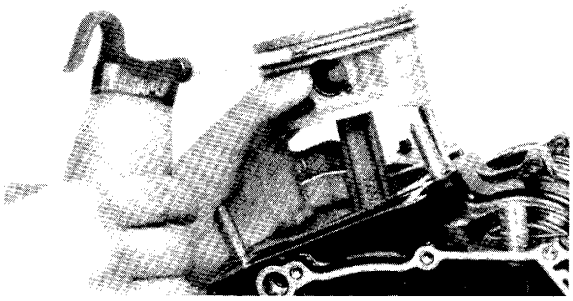
NOTE:

1. The arrow on the piston must point to the front of the engine.
2. Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.
3. Always use a new piston pin clip.



1. Arrow 2. Piston pin clip

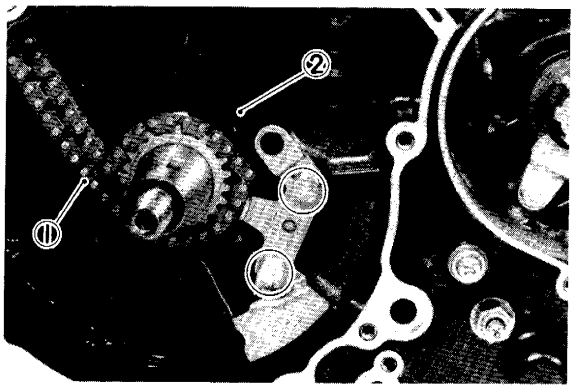
2. Apply the piston ring grooves, piston skirt areas, and piston pin with 4-stroke engine oil.



Cylinder

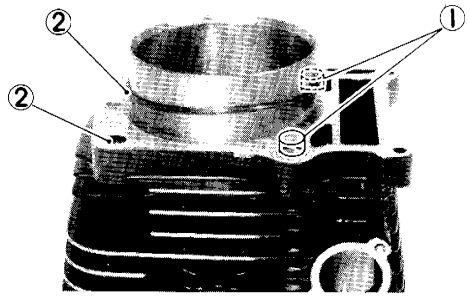
1. Install the cam chain to the cam chain drive gear, and install the rear cam chain guide. Torque the cam chain guide securing bolt to specification.

Tightening Torque:
8 Nm (0.8 m·kg, 5.8 ft·lb)



1. Cam chain 2. Rear cam chain guide

2. Install a new cylinder base gasket and dowel pins. Install the new O-rings to the crankcase and cylinder bottom.



1. Dowel pin 2. O-ring

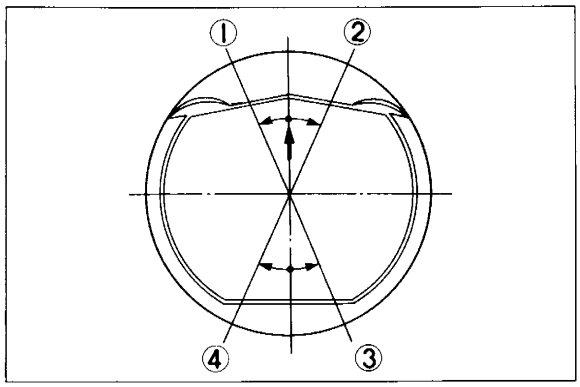
3. Offset the piston ring and gaps as shown.

NOTE:

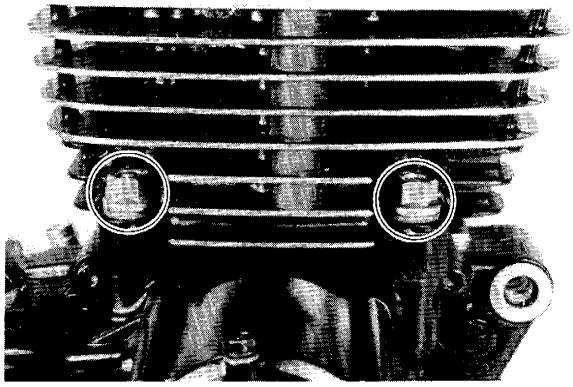
Be sure to check the manufacture's marks or numbers stamped on the rings are on the top side of the rings.

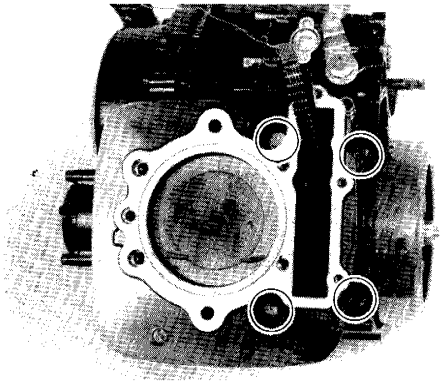
CAUTION:

Make sure the ends of the oil ring expanders are not overlapped.



1. Top
2. Oil ring (Lower rail)
3. 2nd
4. Oil ring (Upper rail)

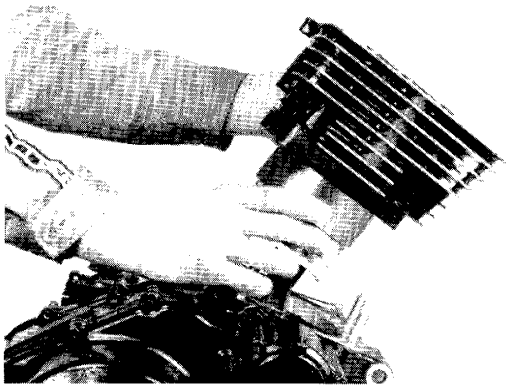




4. Install the cylinder with one hand while compressing piston rings with other hand.

NOTE:

Tie the cam chain with a piece of mechanics wire, and feed it through the chain opening.

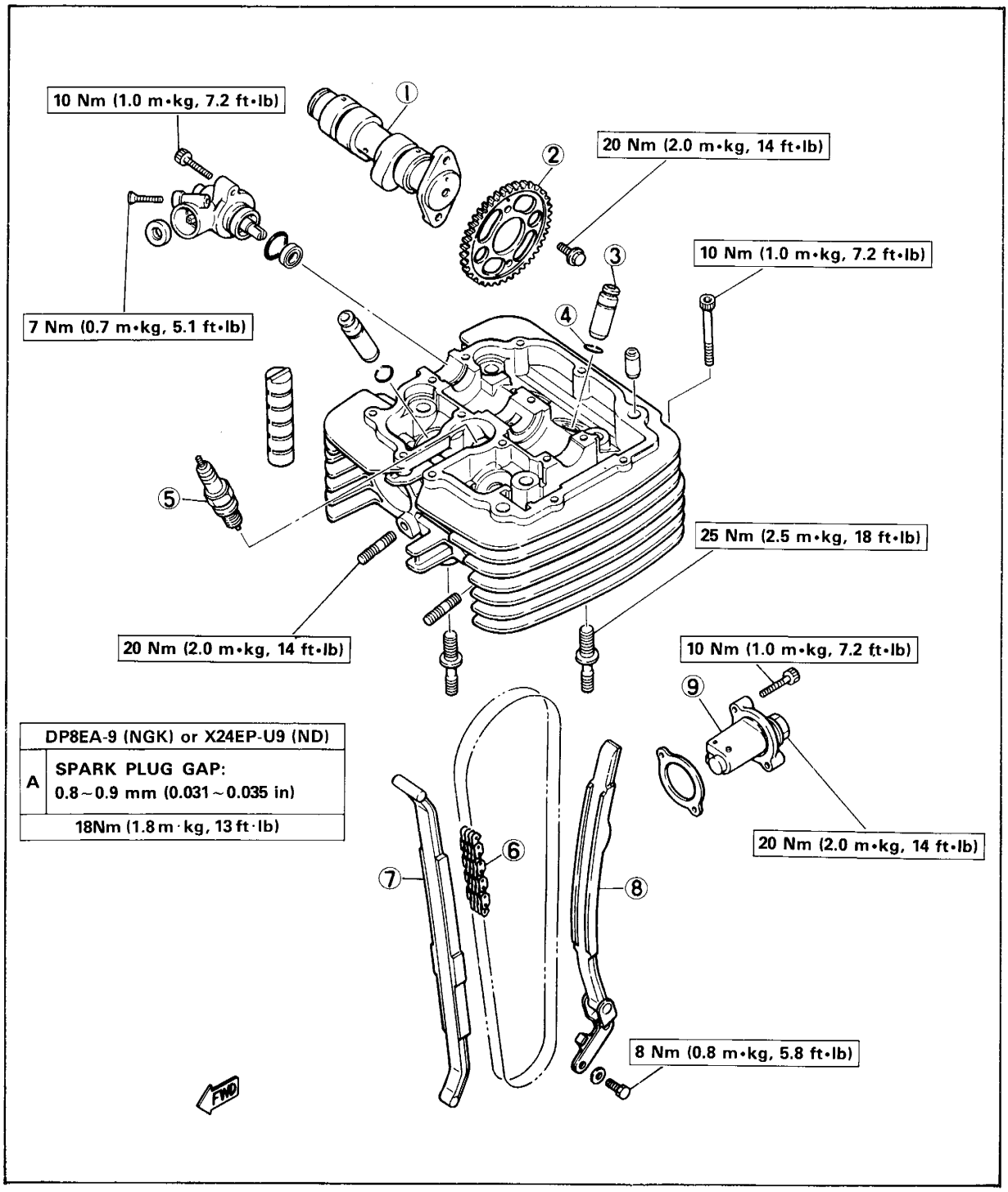


5. Install the cylinder securing nuts and bolts. Torque the bolts and nuts to the specification.

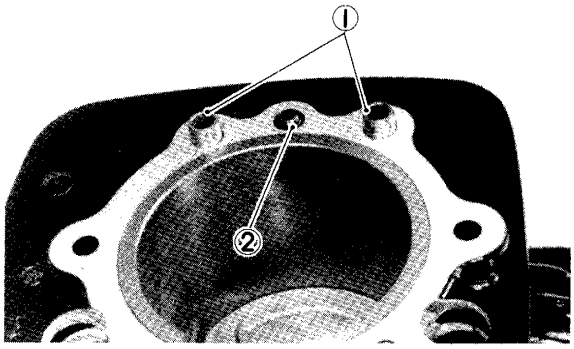
Tightening Torque:
- Nut (M8):
  - 22 Nm (2.2 m·kg, 16 ft·lb)
- Nut (M10):
  - 38 Nm (3.8 m·kg, 27 ft·lb)
- Bolt:
  - 10 Nm (1.0 m·kg, 7.2 ft·lb)

Cylinder Head

① Camshaft
② Cam sprocket
③ Valve guide
④ O-ring
⑤ Spark plug
⑥ Chain guide (Front)
⑦ Cam chain
⑧ Chain guide (Rear)
⑨ Chain tensioner



1. Install the dowel pins and O-ring to the cylinder. Then, install a new gasket.



1. Dowel pin 2. O-ring

2. Install the cylinder head onto the cylinder. Pull the cam chain through the cylinder head as it is installed.

NOTE:

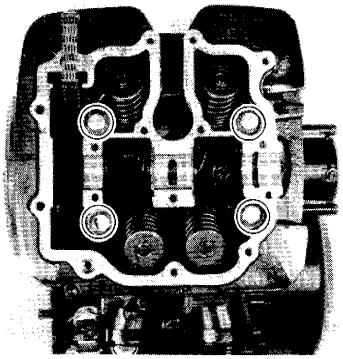
Tie the cam chain so that it does not fall into the crankcase.

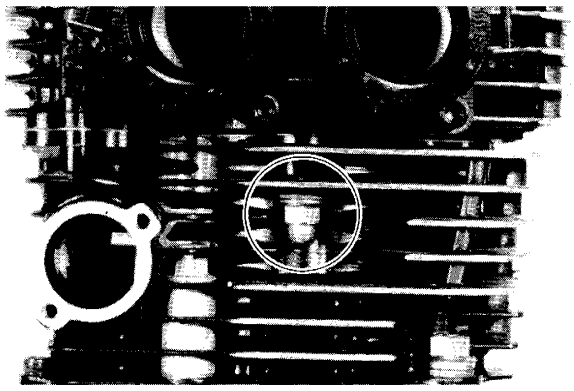
3. Tighten the cylinder head securing bolts and nuts. Torque the bolts and nuts to the specification.

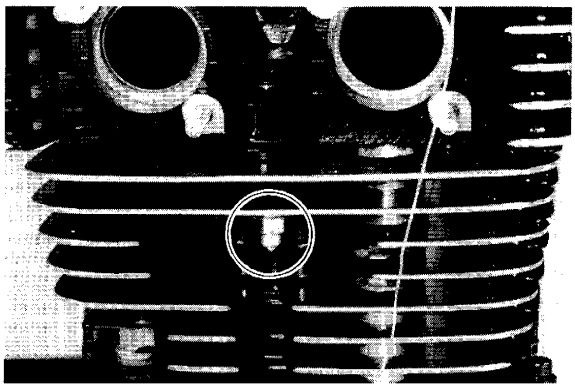
NOTE:

Tighten the bolts using a crisscross pattern.

Tightening Torque:
Bolt:
25 Nm (2.5 m·kg, 18 ft·lb)
Nut:
20 Nm (2.0 m·kg, 14 ft·lb)

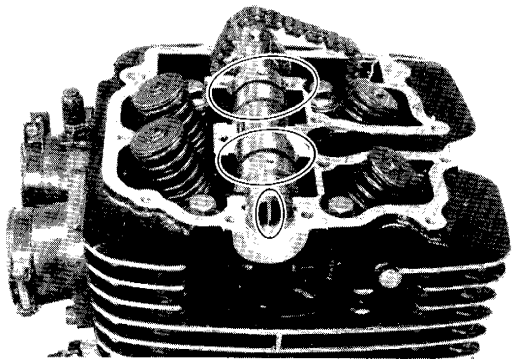




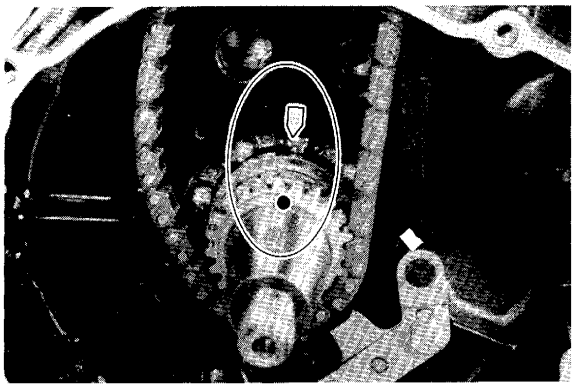


Camshaft/Cam Sprocket

1. Install the camshaft onto the cylinder head as shown in the photograph (Compression stroke)

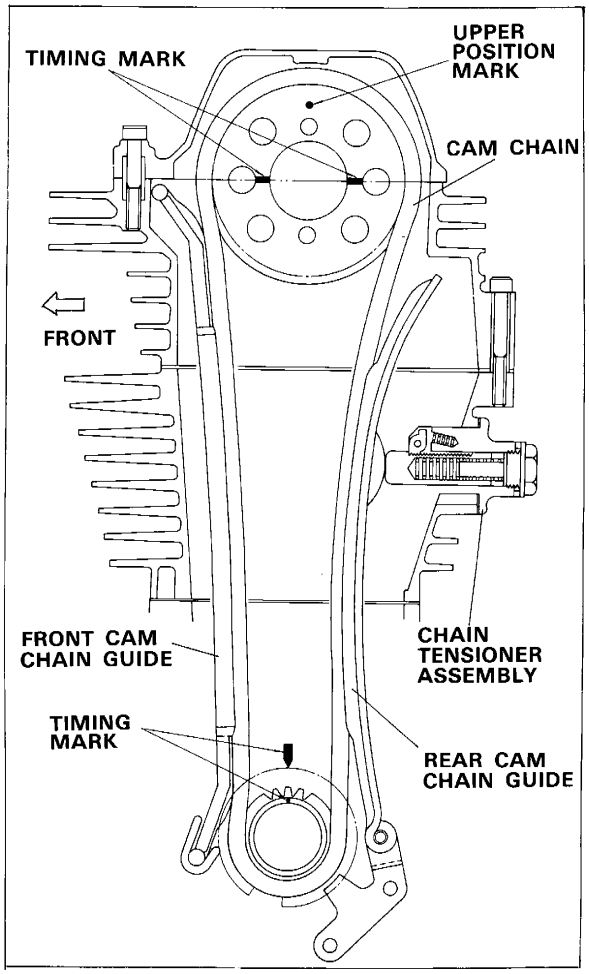


2. Rotate the crankshaft counterclockwise direction until the crankcase pointer and a dot on the cam chain drive sprocket are aligned.

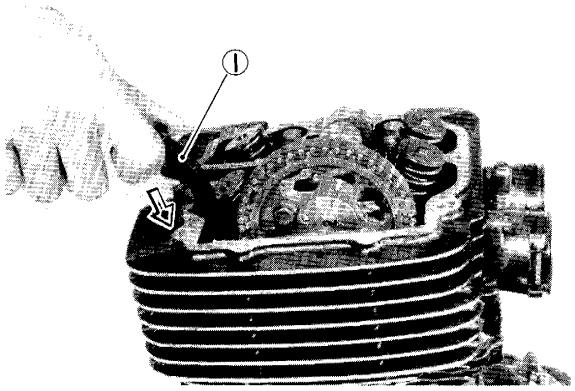


3. Install the cam sprocket onto the camshaft. The timing mark on the sprocket must be alighed as shown in the illustration, while pulling all the slack from the front side of the cam chain. The front side of the cam chain must be taut when the cam chain sprocket is installed.

Tightening Torque:
20 Nm (2.0 m·kg, 14 ft·lb)



4. Install the front cam chain guide onto the crankcase.



1. Front cam chain guide

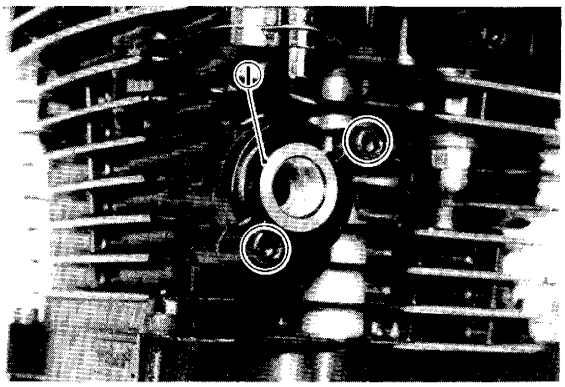
Cam Chain Tensioner

1. Install the cam chain tensioner body onto the cylinder.Torque the bolts to the specification.

NOTE:

Always use a new gasket.

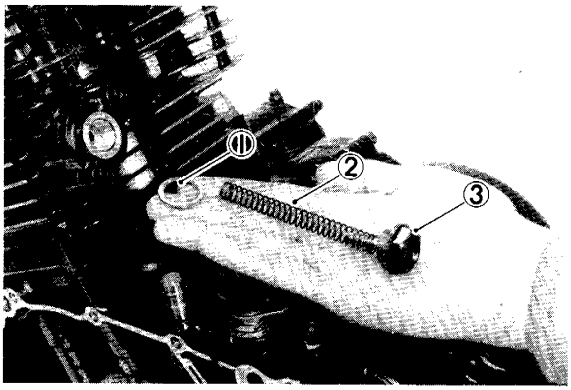
Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)



1. Cam chain tensioner body

2. Install the new gasket, spring and end plug in that order to the tensioner body. Torque the end plug to the specification.

Tightening Torque:
20 Nm (2.0 m·kg, 14 ft·lb)



1. Gasket
2. Spring
3. End plug

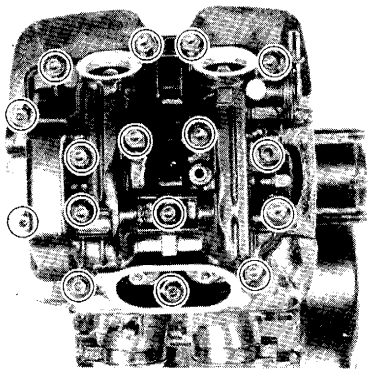
Cylinder Head Cover

1. Install the dowel pins in the cylinder.
2. Install the cylinder head cover onto the cylinder head. Tighten the cylinder head cover securing bolts. Torque the bolts to the specification.

NOTE:

Tighten the bolts using a crisscross pattern.

Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb

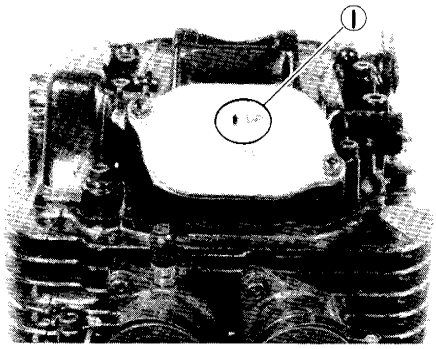


3. Adjust the valve clearance.
4. Install the intake and exhaust tapped covers. Torque the bolts to the specification.

NOTE:

The intake tappet cover should be installed with the arrow mark upward.

Tightening Torque:
Intake tappet cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Exhaust tappet cover:
12 Nm (1.2 m·kg, 8.7 ft·lb)



1. Arrow

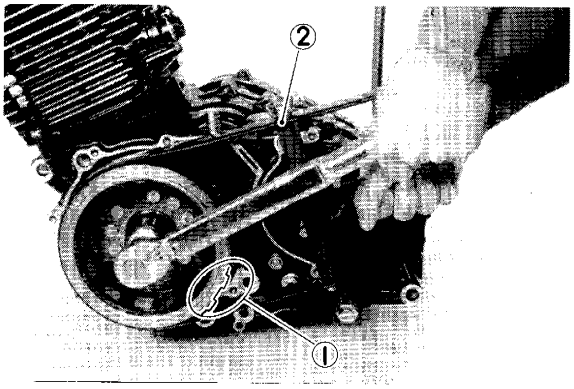
CDI Rotor

1. Install the woodruff key into the crankshaft keyway.
2. Install the CDI rotor onto the crankshaft. The key in the crankshaft should engage the keyway in the CDI rotor.
3. Install the washer and the rotor securing nut onto the crankshaft.
4. Install the Rotor Holding Tool (P/N. YU-01701) and tighten the securing bolt.

NOTE:

Don't allow the tool to touch the projections.

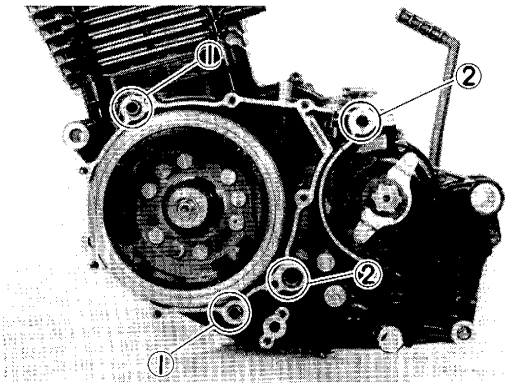
Tightening Torque:
90 Nm (9.0 m·kg, 65 ft·lb)



1. Projections 2. Rotor Holding Tool (YU-01701)

Crankcase Cover Left

1. Install the two dowel pins and two O-rings in the left side crankcase as shown in the photograph. Then, install a new gasket.



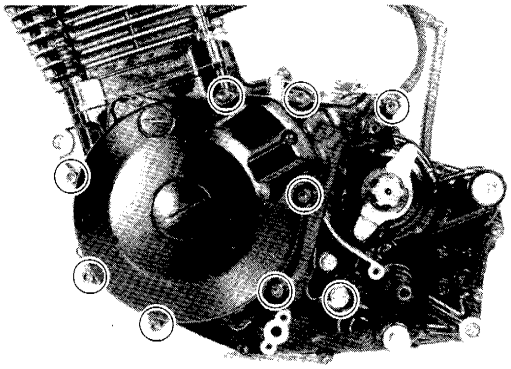
1. Dowel pin 2. O-ring

2. Set the neutral lead into the left-side crankcase ditch, and connect the neutral lead to the neutral switch.
3. Install the left crankcase cover onto the crankcase. Tighten the bolts to the specification.

NOTE:

Tighten the bolts using a crisscross pattern.

Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

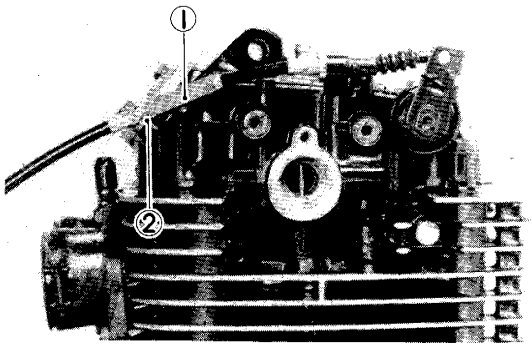


Decompression Cable

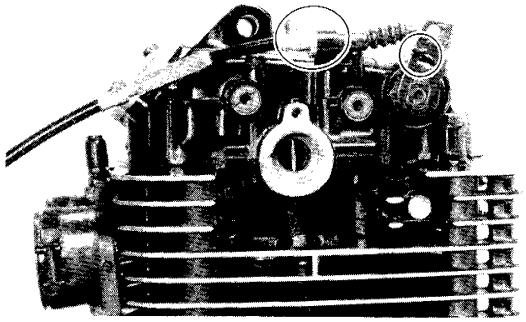
1. Install the decompression cable asasembly to the engine.

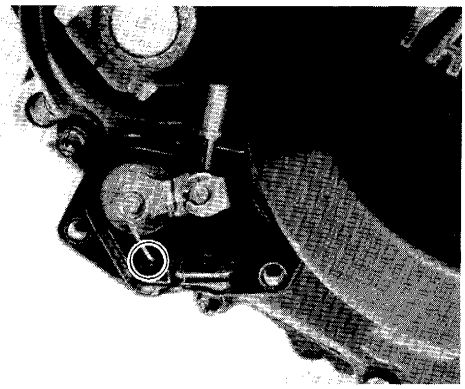
NOTE:

Hook the decompression shaft spring to is position.



1. Adjuster 2. Locknut

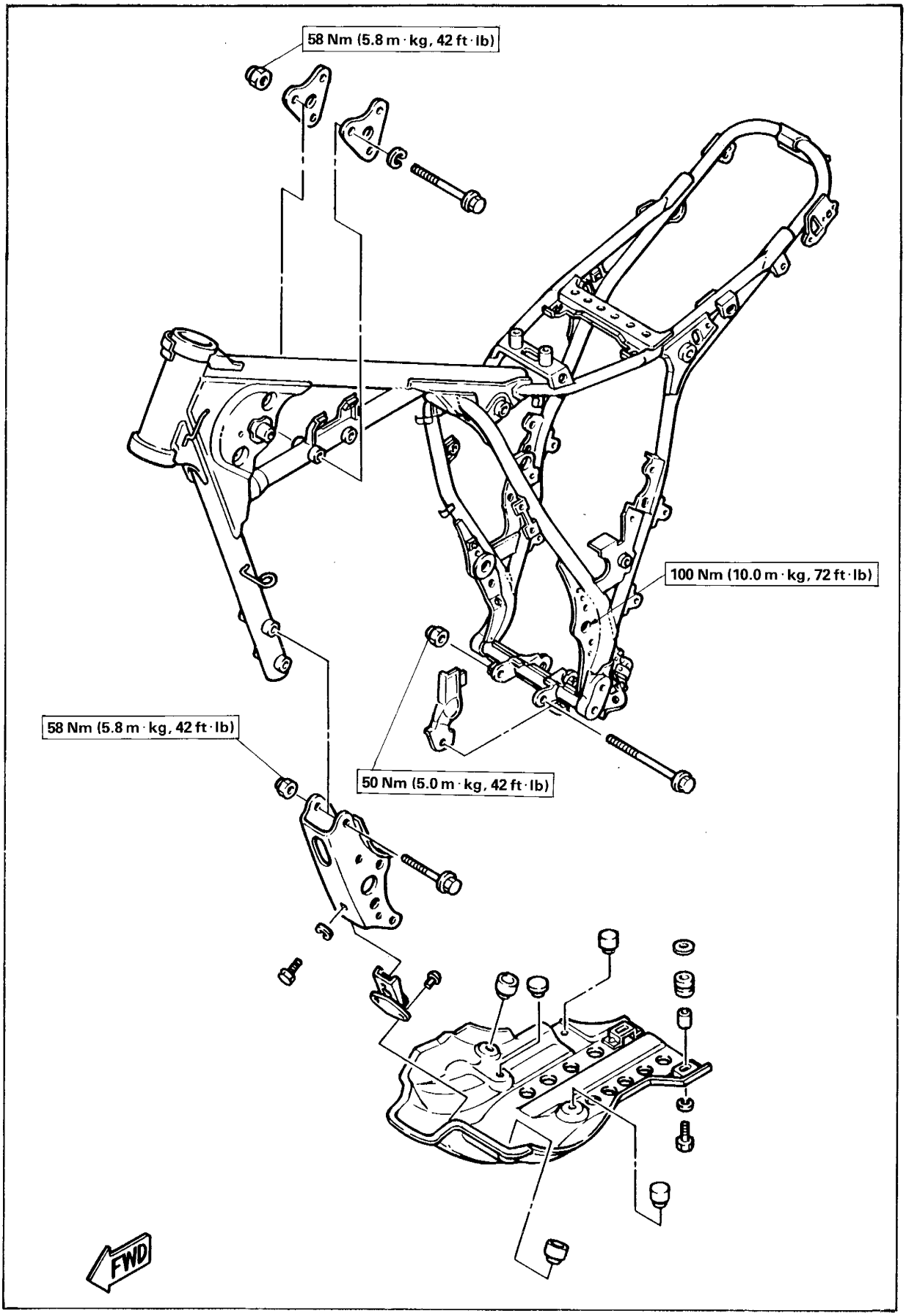




2. Adjust the decompression cable free play.

Decompression Cable Free Play: 0.5 mm (0.02 in)

ENGINE MOUNTING



When installing the engine, reverse the removal procedure. Note the follwoing points:

1. Mount the engine in the frame from the right side.

NOTE:

Place a suitable stand under the engine.

2. Install the engine mounting bolts and nuts. Torque the bolts and nut to the specification.

Tightening Torque:
- Engine Stay (Front)
  - 58 Nm (5.8 m · kg, 42 ft · lb)
- Engine Stay (Top):
  - 58 Nm (5.8 m · kg, 42 ft · lb)
- Engine (Rear):
  - 50 Nm (5.0 m · kg, 36 ft · lb)
- Pivot Shaft:
  - 100 Nm (10.0 m · kg, 72 ft · lb)

3. Install the holding plate and drive sprocket with drive chain to the drive shaft. Torque the bolts to the specification.

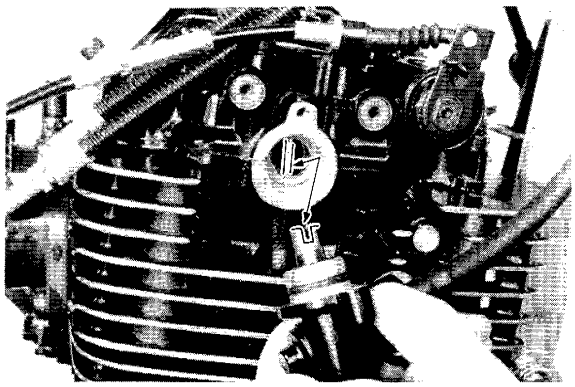
Tightening Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

4. Install the tachometer gear unit. Torque the securing bolt to the specification.

CAUTION:

Do not force the tachometer unit. Put it in slowly. Twist and turn it gently until it fits in place.

Tightening Torque:
8 Nm (0.8 m·kg, 5.8 ft·lb)



5. Install the inlet and outlet hose, and tighten the securing bolts and nuts.

NOTE:

Oil the inlet oil passage before installing the inlet oil hose and install the O-ring to the inlet hose.

6. Install the drain bolts. Torque the bolts to the specification.

Tightening Torque:
- Drain Bolt (Crankcase):
  - 30 Nm (3.0 m · kg, 22 ft · lb)
- Drain Bolt (Oil Tank):
  - 18 Nm (1.8 m · kg, 13 ft · lb)

7. Add oil to the oil tank.

NOTE:

The oil quantities are for an overhauled engine.

Recommended Oil:
Yamalube 4-cycle oil or SAE 20W40 type SE motor oil.
Oil Quantity:
2.4 L (2.1 Imp qt, 2.5 US qt)

8. Start the engine, and check the oil pressure and oil leakage.
9. Adjust the rear brake and clutch.

CHAPTER 4. CARBURETION

CARBURETOR 4-1
Sectional View 4-2
Specifications 4-3
Removal 4-3
Disassembly 4-3
Inspection 4-6
Assembly and Installation 4-7
Adjustment 4-8

AIR CLEANER AND CRANKCASE VENTILATION SYSTEM 4-11

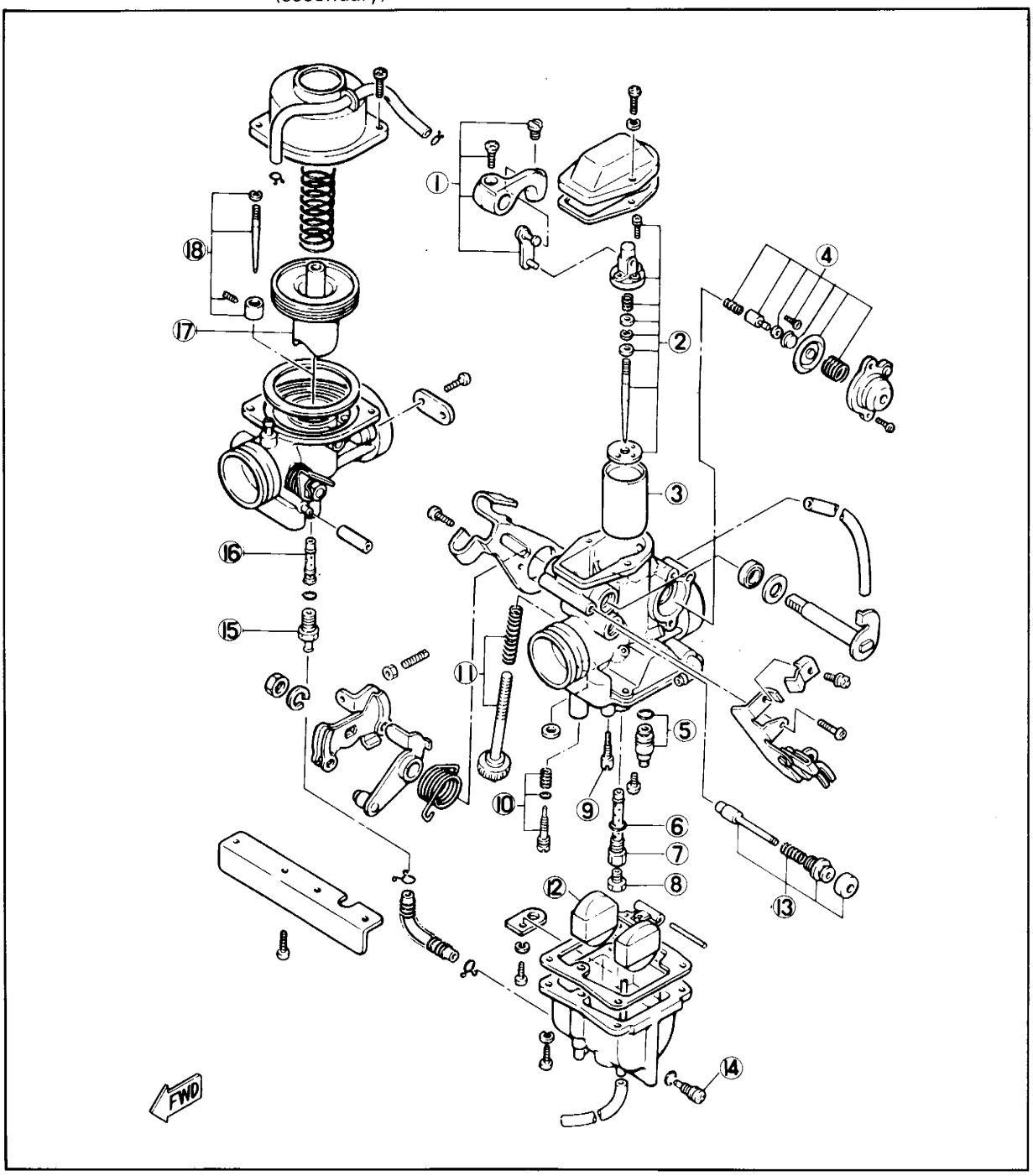
4

CARBURETION

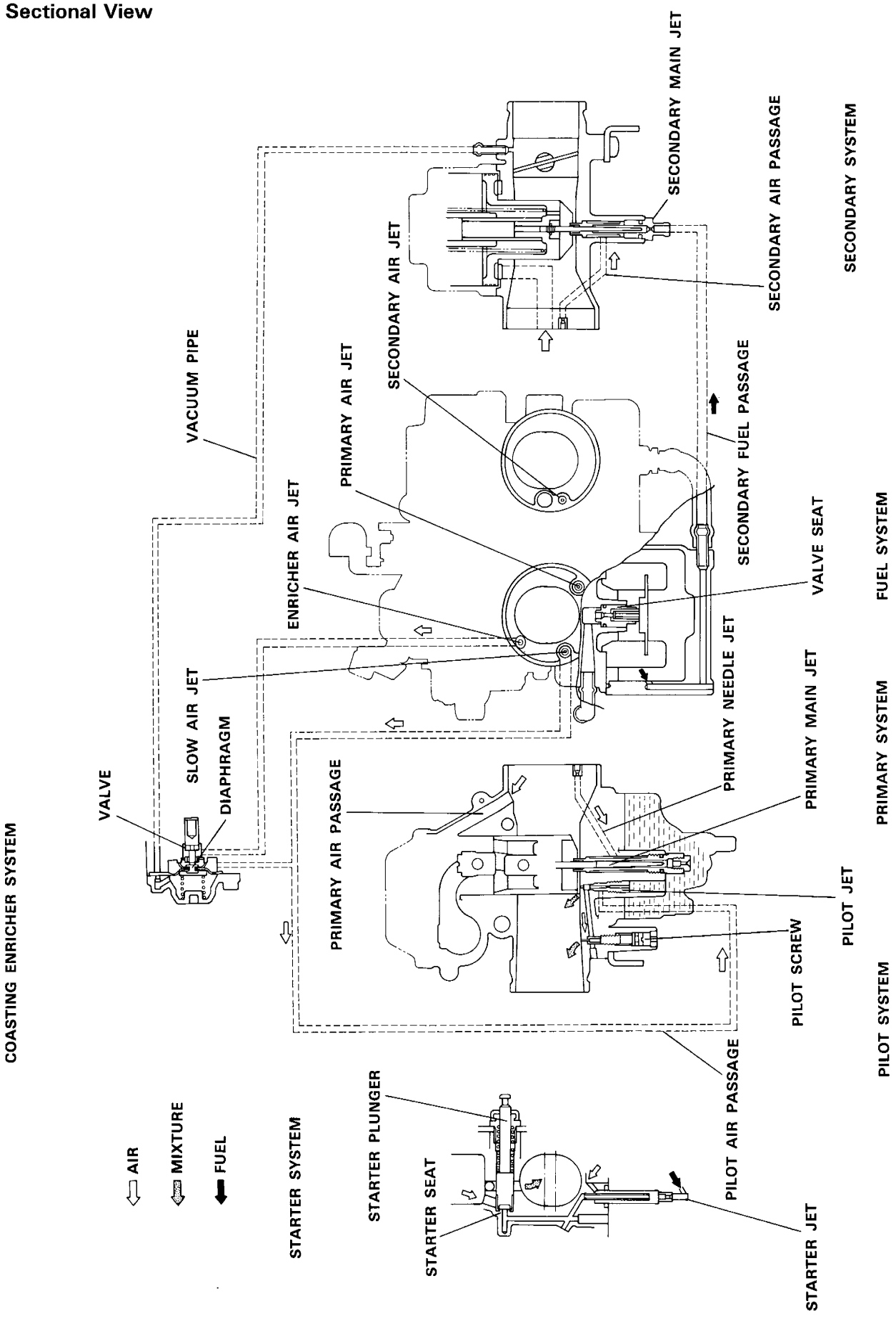
CARBURATOR

① Connection arm
② Jet needle set (primary)
③ Throttle valve
④ Coasting enricher assembly
⑤ Needle valve set
⑥ O-ring
⑦ Main nozzle (primary)
⑧ Main jet (primary)
⑨ Pilot jet
⑩ Pilot screw set
⑪ Throttle screw set
⑫ Float
⑬ Starter plunger set
⑭ Drain screw
⑮ Main jet (secondary)
⑯ Main nozzle (secondary)
⑰ Secondary piston
⑱ Jet needle set (secondary)

SPECIFICATIONS		
	Primary	Secondary
Main Jet	#125	#130
Jet Needle	5C38	4A72
Pilot Jet	#46	—
Pilot Screw	Preset	—
Starter Jet	ϕ0.64	ϕ0.62
Fuel Level	7±1 mm (0.28±0.04 in)	—
Float Height	26.0±1.0 mm (1.02±0.04 in)	—
Engine Idling Speed	1,300 r/min	—



Sectional View



Specifications

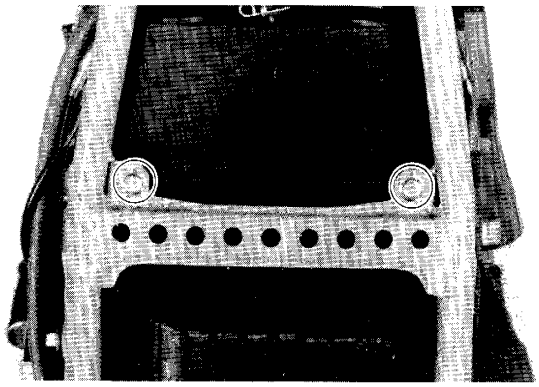
	Primary Carb	Secondary Carb
Main jet (M.J.)	#125	#130
Jet Needle (J.M.)	5C38	4A72
Starter Jet (G.S.)	ø0.64	ø0.62
Pilot Screw (P.S.)	Preset	-
Valve Seat (V.S.)	ϕ2.5	-
Engine Idle Speed	1,300r/min	

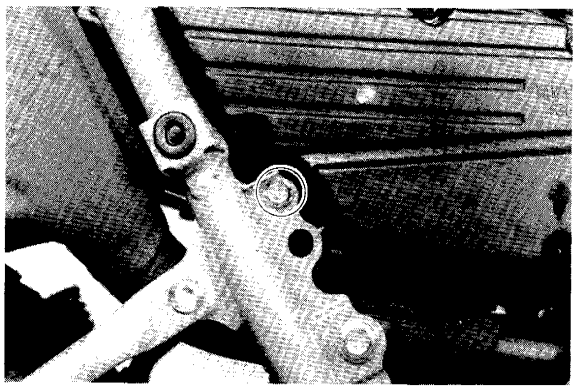
WARNING:

The pilot screw settings are adjusted for maximum performance at the factory with special equipment. DO NOT attempt to change these settings. If all other engine systems are functioning correctly, any changes will decrease performance and cause increased exhaust emissions.

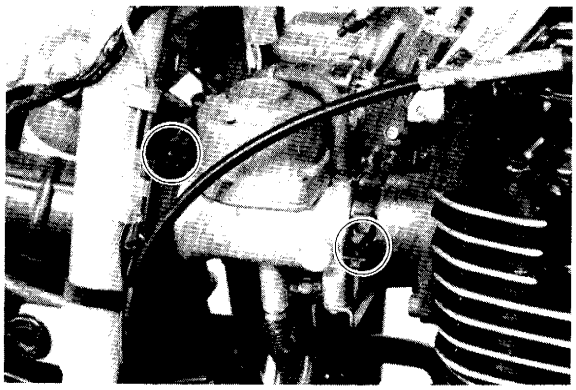
Removal

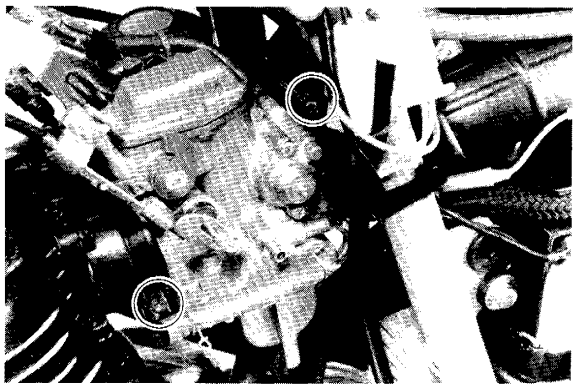
1. Remove the seat.
2. Turn the fuel cock to "OFF", and remove the fuel hose and the fuel tank.
3. Remove the throttle cables and the starter cable.
4. Loosen the air filter securing bolts.





5. Loosen the rubber joint band securing bolts.

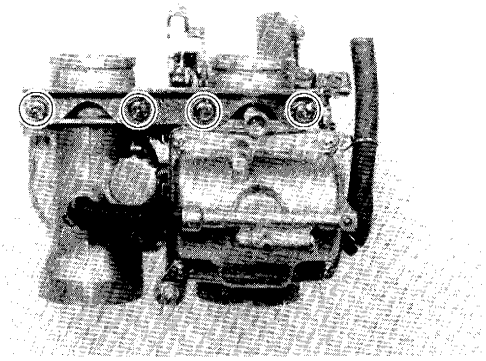


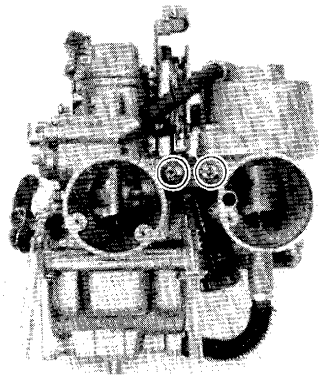


6. Remove the carburetor.

Disassembly

1. Remove the rear and front plate stays from the carburetors.

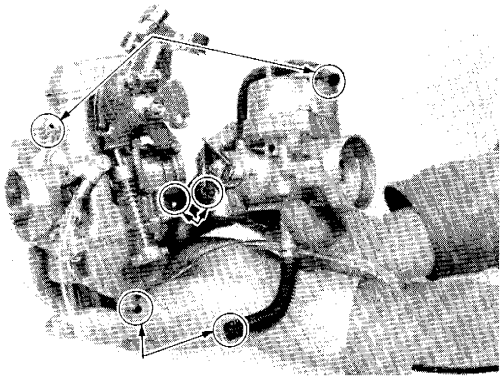




2. Separate the primary carburetor and the secondary carburetor.

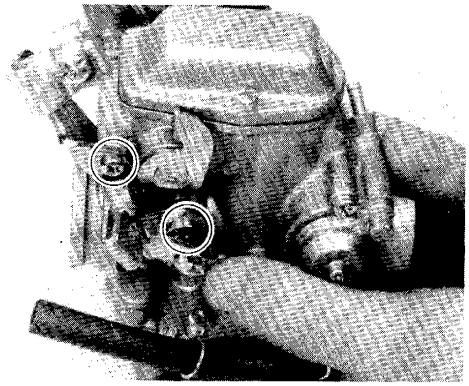
NOTE:

The primary and secondary carburetors are connected by a rubber balance pipe a fuel line and a vacuum pipe. To separate the carburetors, pull them apart, applying an equal amount of force on each carburetor; see the photograph.



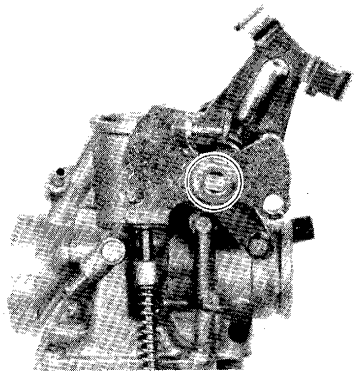
3. Primary carburetor

a. Remove the starter cable bracket and starter plunger.



b. Remove the primary carburetor cap.

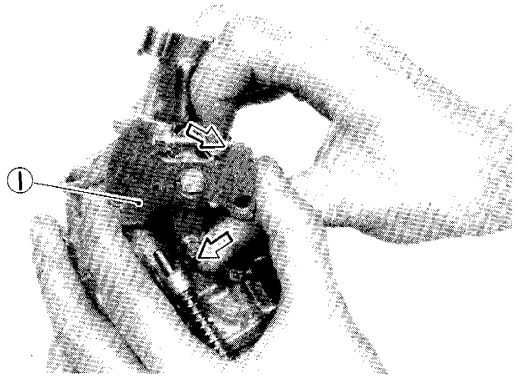
c. Remove the shaft securing nut.



d. Remove the throttle lever assembly.

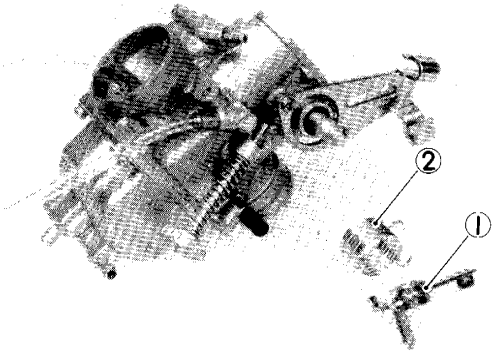
NOTE:

Pay attention when removing the throttle lever asasembly, pressing the springs with one hand as they will turn.



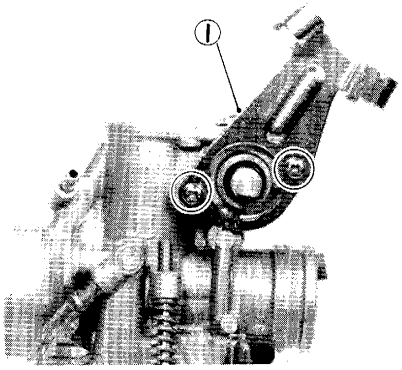
1. Throttle lever assembly

e. Remove the drum wire assembly.



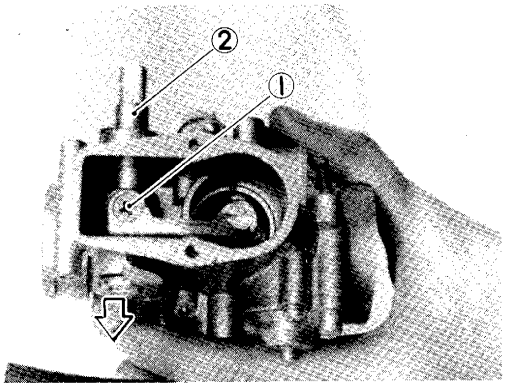
1. Drum wire 2. Spring

f. Remove the throttle cable holder.



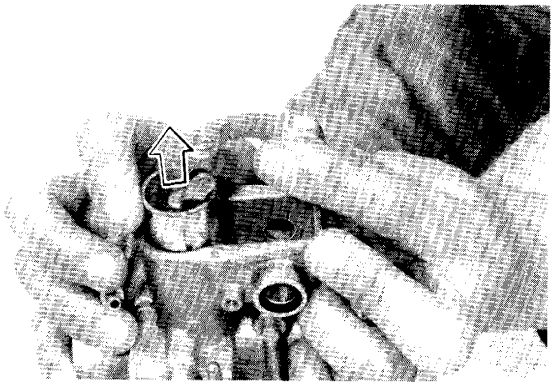
1. Throttle cable holder

g. Remove the connection arm securing screw, and pull out the shaft.

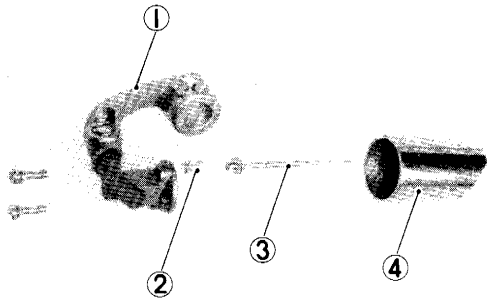


1. Securing screw
2. Shaft

h. Pull out the throttle valve assembly.



i. Remove the jet needle securing screws, and separate the connection arm assembly, spring, jet needle assembly and throttle valve.

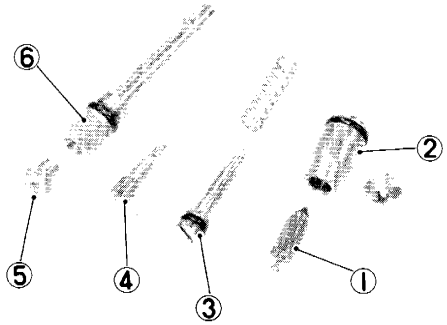


1. Connection arm assembly
2. Spring
3. Jet needle assembly
4. Throttle valve

j. Remove the float chamber.

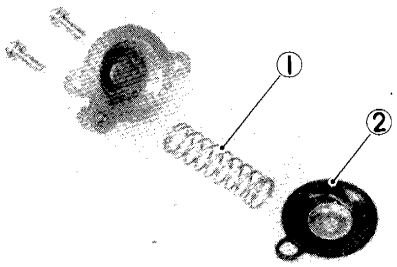
k. Remove the following parts:

- Needle valve ①
- Valve seat ②
- Pilot screw ③
- Pilot jet ④
- Main jet ⑤
- Main nozzle ⑥

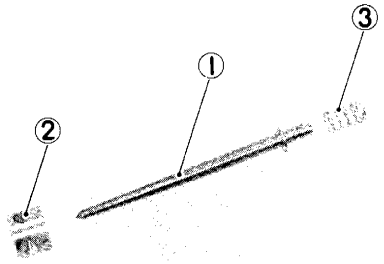


l. Remove the coasting enricher cap.

m. Remove the spring and diaphragm.

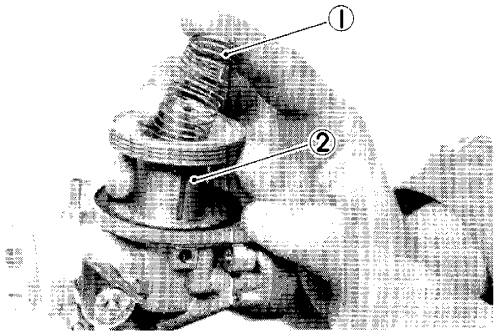


1. Spring 2. Diaphragm



1. Jet needle 2. Needle holder 3. Spring

4. Secondary carburetor
   a. Remove the secondary carburetor cap.
   b. Remove the spring and secondary piston.

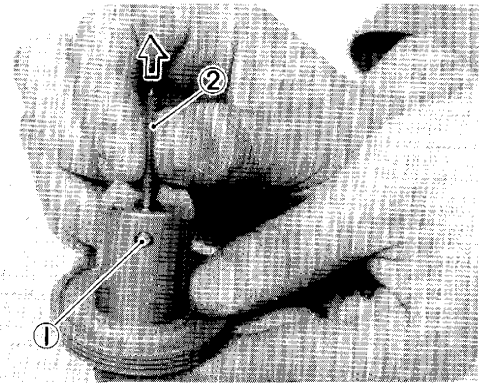


1. Spring 2. Secondary piston

   c. Loosen the jet needle tightening screw, and pull out the jet needle with needle holder.

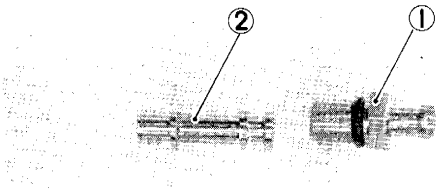
NOTE:

Pay close attention to the small spring supporting the jet needle; it may jump out when the jet needle is removed from the secondary piston.



1. Tightening screw 2. Jet needle

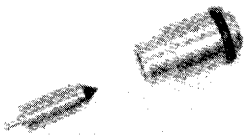
   d. Remove the fuel pipe.
   e. Remove the main jet and needle jet.



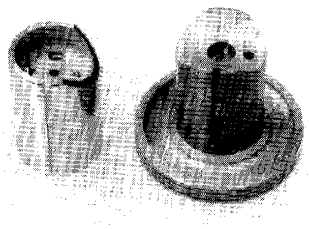
1. Main jet 2. Needle jet

Inspection

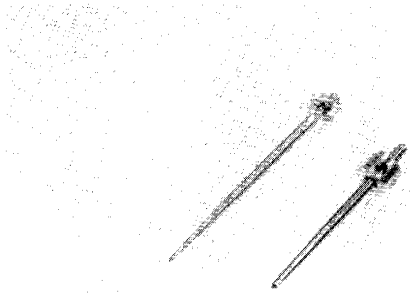
1. Examine the carburetor body and fuel passages. If they are contaminated, wash the carburetor in a petroleum based solvent. Do not use any caustic carburetor cleaning solutions. Blow out all passages and jets with compressed air.
2. Examine the condition of the floatas. If the floats are damaged, they should be replaced.
3. Inspect the float needle valve and seat for wear or contamination. Replace these components as a set.



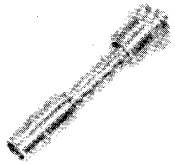
4. Inspect the primary and secondary pistons. If the piston is scratched, it must be replaced.



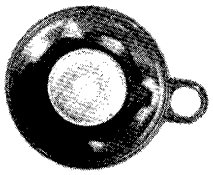
5. Inspect the jet needle for bends or wear. If the needle is bent or severely worn, replace it.



6. Inspect the starter plunger. If it is worn or damaged, replace it.



7. Inspect the coasting enricher diaphragm. If it is damaged, replace it.



Assembly and Installation

To assemble the carburetors, reverse the disassembly and removal procedures. Note the following points.

CAUTION:

1. **Before reassembling, wash all parts in clean gasoline.**
2. **Always use a new gasket.**

1. Install the jet needle together with needle holder into the secondary piston. Then, install the jet needle tightening screw.

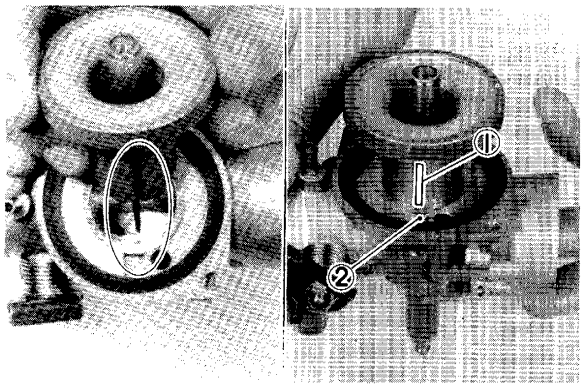
NOTE:

Apply thread-locking compound such as LOCTITE to the jet needle tightening screw, and tighten the screw securely.

2. Install the secondary piston into the secondary carburetor body.

NOTE:

Align the groove of the secondary piston with the punched mark of the carburetor body.

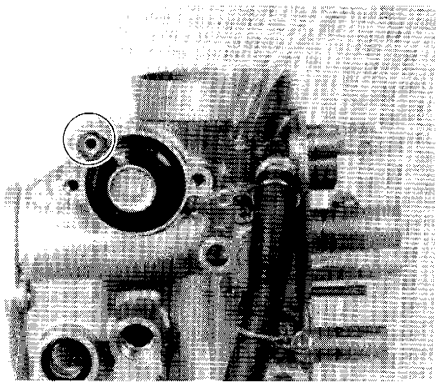


1. Groove
2. Punched mark

3. Install the coasting enricher diaphragm into the coasting enricher.

NOTE:

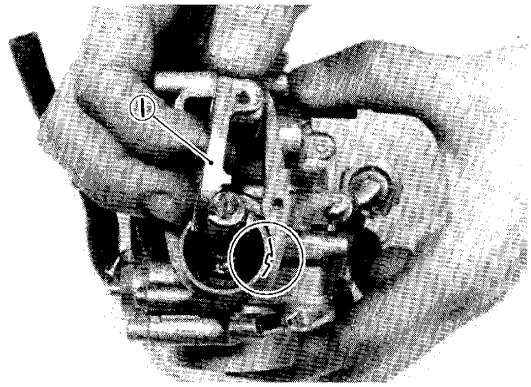
Match the tab on the diaphragm to the matching recess in the coasting enricher.



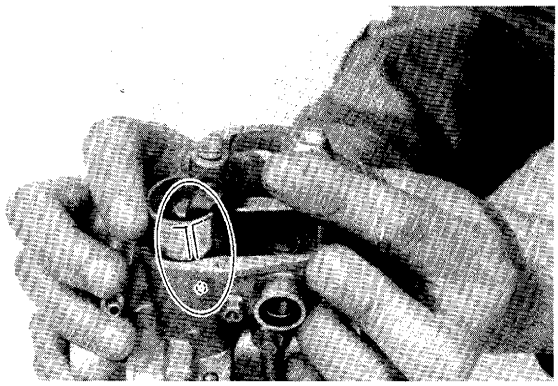
4. Install the throttle valve assembly into the primary carburetor.

NOTE:

1. Check that the connection arm assembly is at the illustrated position.
2. Align the groove of the throttle valve with the projection of the carburetor body.



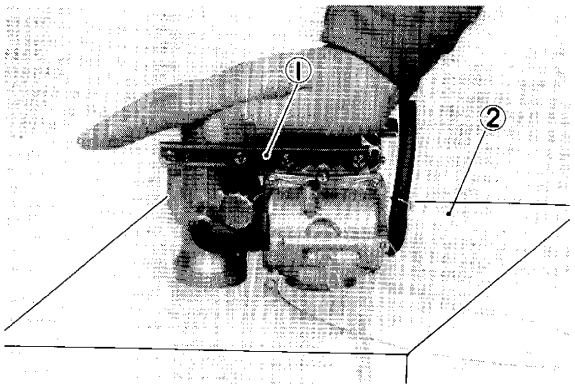
1. Connection arm



5. Place the carburetors on a surface plate, and install the front and rear plates.

NOTE:

When reassembling, the surface plates should be used for the proper carburetor alignment.



1. Front plate
2. Surface plate

Adjustment

1. Fuel level

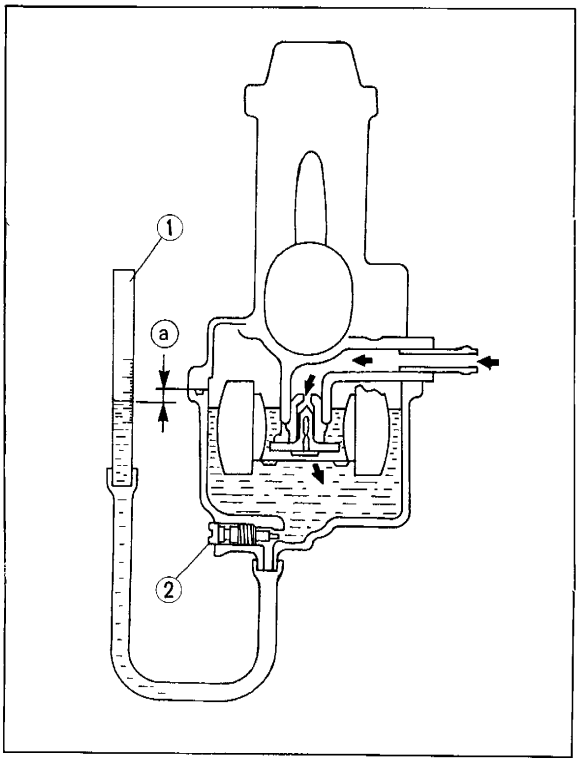
NOTE:

Before checking the fuel level, note the following:

1. Place the motorcycle on a level surface.
2. Adjust the motorcycle position by placing a suitable stand or a garage jack under the engine so that the carburetor is positioned vertically.

a. Connect the Level Gauge (P/N. YM-01312) or a vinyl pipe of 6 mm (0.24 in) in inside diameter to the float bowl nozzle on the carburetor.
b. Set the gauge as shown and loosen the drain screw.
c. Start the engine and stop it after a few minutes. This procedure is necessary to obtain the correct fuel level.
d. The fuel level shaould be in the specified range.

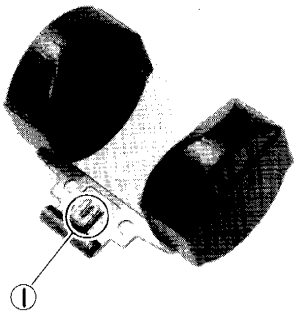
Fuel Level:
7 ± 1 mm (0.28 ± 0.04 in)
below the carb body edge



1. Fuel Level Gauge (YM-01312)
2. Drain screw

a. Fuel level

e. If the fuel level is incorrect, remove the carburetor from the motorcycle and check the fuel valve and float assembly for damage. Replace if damaged.
f. If no damage is found, correct the fuel level by slightly bending the float arm tang.



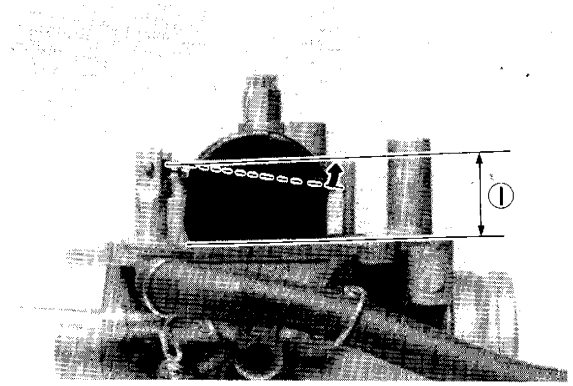
1. Float arm tang

g. Check the float height for reference. Using a vernier caliper, measure the distance from the top of the float chamber gasket seat (with the gasket removed) to the top of the float; see the photograph.

Float Height:
26.0 ± 1.0 mm (1.02 ± 0.04 in)

NOTE:

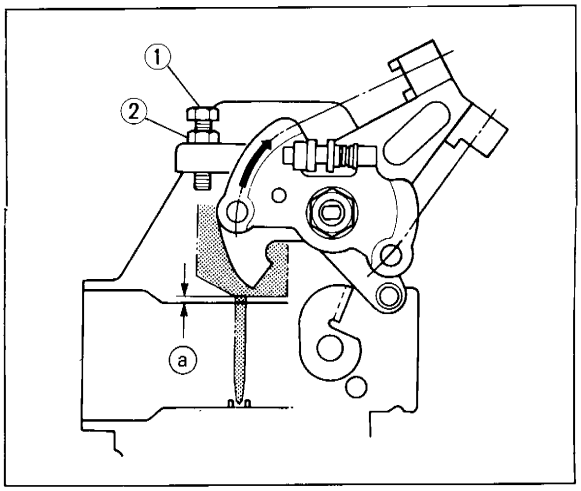
The float should be just resting on, but not depressing, the spring-loaded inlet needle.



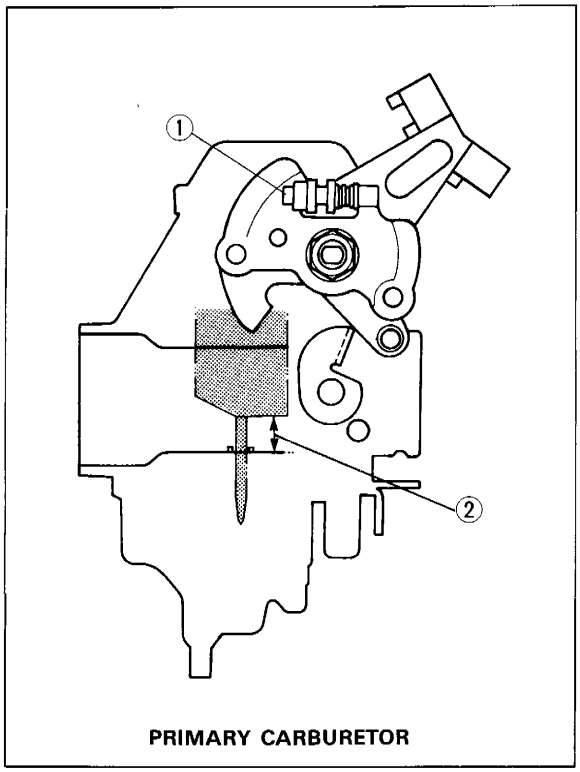
1. Float height

h. Recheck the fuel level.

2. Primary carb full-open adjustment
Turn the grip to move the drum-wire assembly to the full-throttle position. Then turn the full-open adjusting screw in or out so the carb valve bottom is positioned within the limits as specified, then secure the locknut on it.



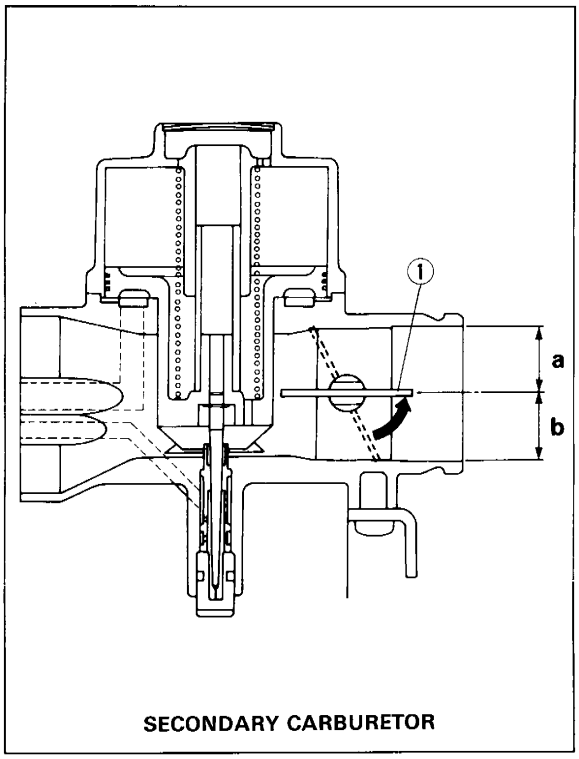
1. Full opening adjusting screw
2. Nut
a. 0 ~ 1.0 mm (0 ~ 0.04 in)



PRIMARY CARBURETOR

1. Synchroning screw 2. 5 mm (0.20 in)

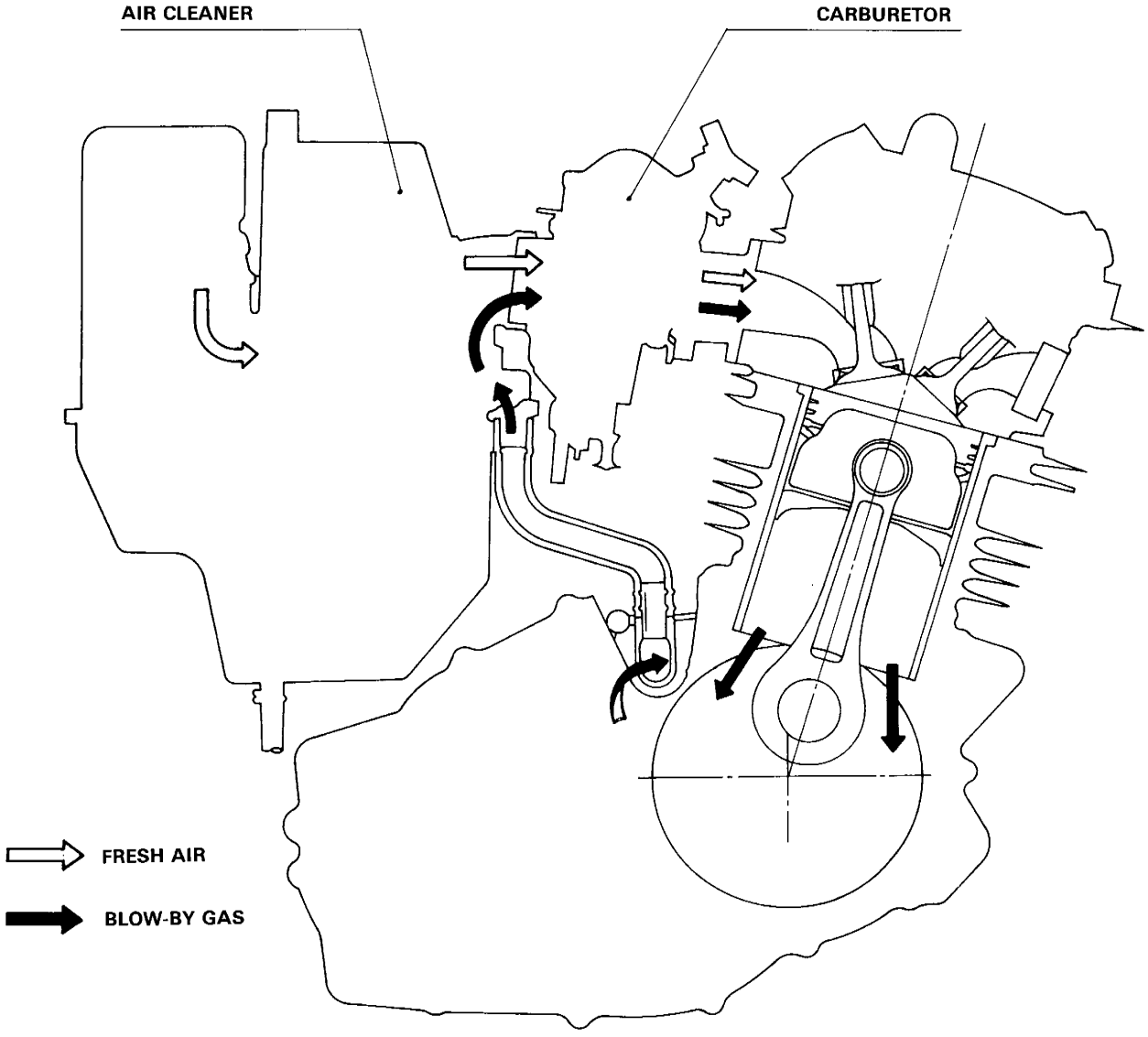
3. Secondary carburetor synchronization
Raise the primary carb valve to a height of 5 mm (0.20 in) as indicated. Then adjust the synchronizing screw so the secondary throttle shaft just contacts the secondary throttle push lever.
As the primary carb valve is further opened, the secondary butterfly valve will finally be opened to its full horizontal position. (a = b)



SECONDARY CARBURETOR

1. Full open: a = b

AIR CLEANER AND CRANKCASE VENTILATION SYSTEM



CHAPTER 5. CHASSIS

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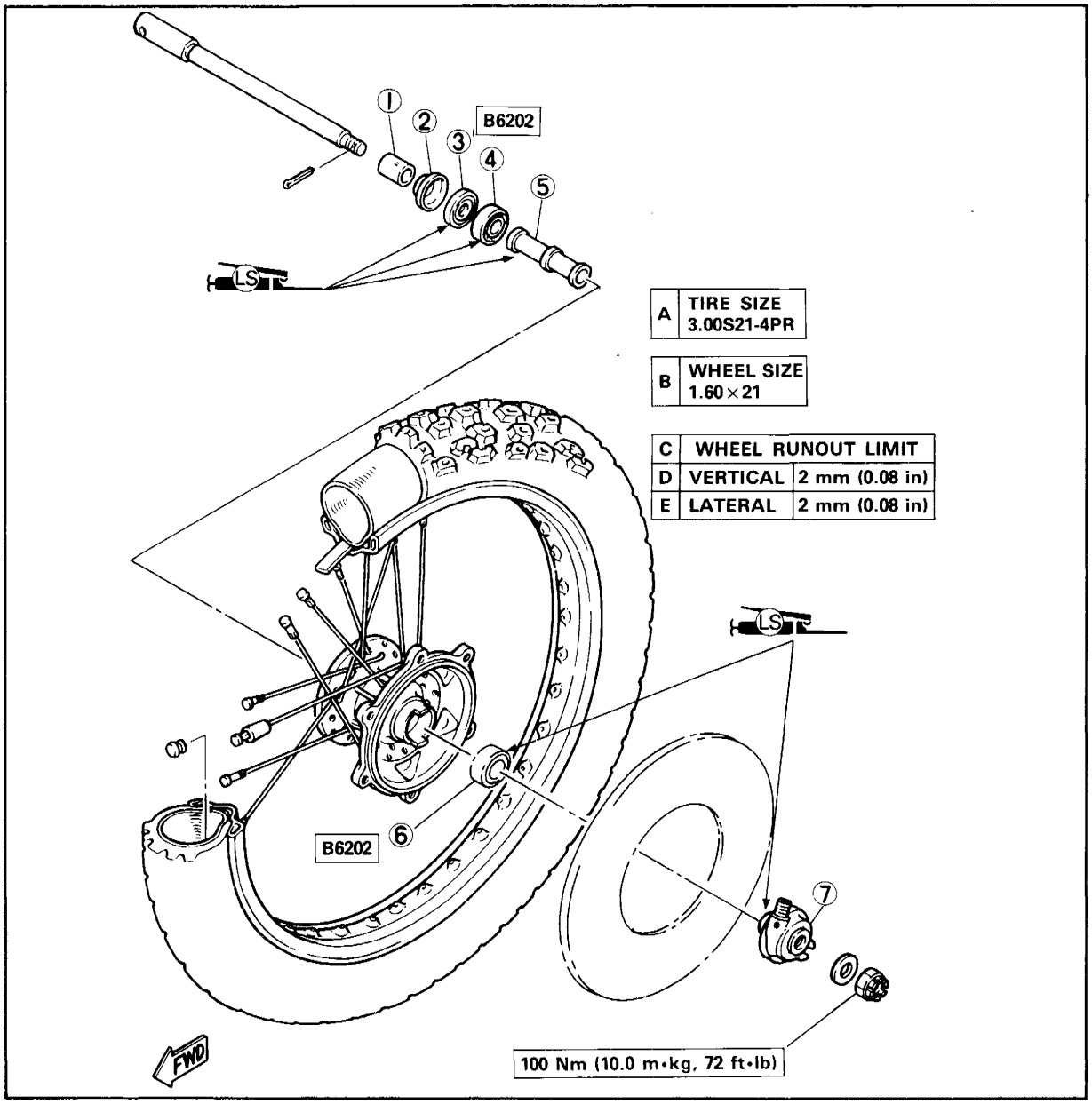
CHASSIS

FRONT WHEEL

① Collar
② Dust cover
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Bearing
⑦ Speedometer gear unit

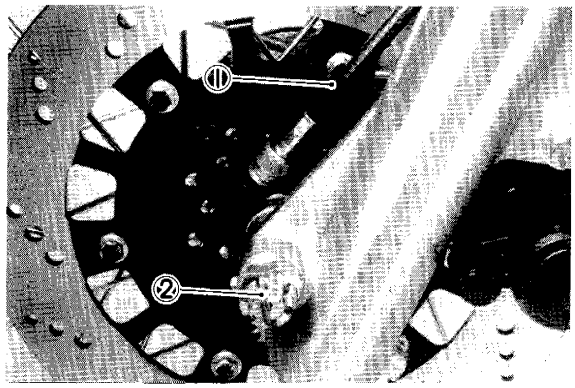
TIRE AIR PRESSURE		
Basic weight: With oil and full fuel tank	XT600L: 148 kg (326 lb) XT600LC: 149 kg (328 lb)	
Maximum load*:	159 kg (351 lb)	
Cold tire pressure:	Front	Rear
Up to 90 kg (198 lb) load*	147 kPa (1.5 kg/cm^2, 22 psi)	147 kPa (1.5 kg/cm^2, 22 psi)
90 kg (198 lb) ~ Maximum load*	147 kPa (1.5 kg/cm^2, 22 psi)	177 kPa (1.8 kg/cm^2, 26 psi)
Off-road riding	98.1 kPa (1.0 kg/cm^2, 14 psi)	98.1 kPa (1.0 kg/cm^2, 14 psi)
High speed riding	147 kPa (1.5 kg/cm^2, 22 psi)	147 kPa (1.5 kg/cm^2, 22 psi)

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



Removal

1. Remove the speedometer cable.
2. Remove the cotter pin and wheel axle nut.

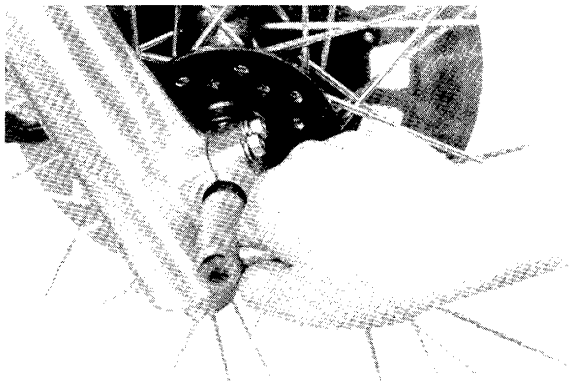


1. Speedometer cable 2. Cotter pin

3. Elevate the front wheel by placing a suitable stand under the engine.
4. Loosen the wheel axle holder nuts.
5. Remove the axle and the front wheel. Make sure the motorcycle is properly supported.

NOTE:

Do not depress the brake lever when the wheel is off the motorcycle as the brake pads will be forced to shut.



Front Axle Inspection

Remove any corrosion from the axle with fine emery cloth. Place the axle on a surface plate, and check for bends. If bent, repalce the axle. Do not attempt to straighten a bent axle.

Replacing Wheel Bearings

If the bearings allow play in the wheel hub or if the wheel does not turn smoothly, replace the bearings as follows:

1. Clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside and tapping around the perimeter of the bearing inner race with a soft metal drift punch and hammer. The spacer "floats" between the bearings. Both bearings can be removed in this manner.

WARNING:

Eye protection is recommended when using striking tools.

3. To install the wheel bearing, reverse the above sequence. Use a socket that matches the outside diameter of the race of the bearing to drive in the bearing.

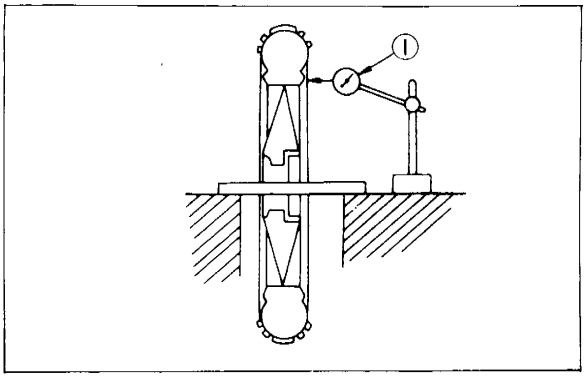
CAUTION:

Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

Front Wheel Inspection

1. Check for cracks, bends, or warpage of the wheels. If a wheel is deformed or cracked, it must be replaced.
2. Check wheel run-out. If the deflection exceeds the tolerance below, check the spoke-tension, rim deformation, and wheel bearings. Replace the wheel as required.

Rim Run-out Limit: Vertical: 2 mm (0.079 in) Lateral: 2 mm (0.079 in)



1. Dial gauge

3. Check the wheel balance. Rotate the wheel lightly several times and note where the wheel comes to rest. If the wheel is not statically balanced, it will come to rest at the same point each time. Install an appropriate balance weight at the lightest point (at top).
4. After installing a tire, ride conservatively to allow the tire to seat itself properly on the rim. Failure to allow proper seating may cause tire failure resulting in damage to the motorcycle and injury to the rider.
5. After repairing or replacing a tire, check to be sure the valve-stem locknut is securely fastened. If not, torque it as specified.

Tightening Torque:
1.5 Nm (0.15 m·kg, 1.1 ft·lb)

Spoke Inspection

Loose spokes can be checked by bracing the machine off the ground so that the wheel can spin freely.

Slowly rotate the wheel and at the same time let the metal shaft of a fairly heavy screwdriver bounce off each spoke. If all the spockes are tightened approximately the same, then the sound given off by the screwdriver hitting the spokes should sound the same. If one spoke makes a dull flat sound, then check it for looseness.

Check each spoke for tightness.

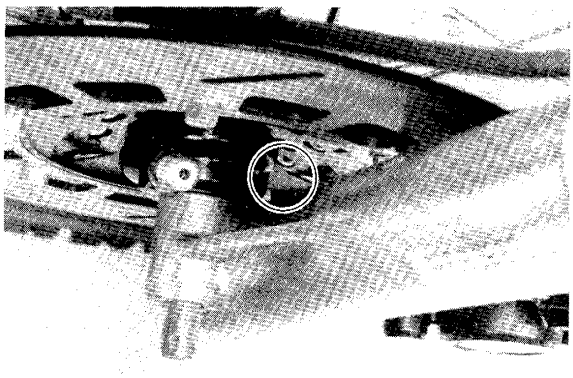
Spoke Torque:
3 Nm (0.3 m·kg, 2.2 ft·lb)

Installation

When installing the front wheel, reverse the removal procedure.

Note the following points:

1. Make sure the projecting portion (torque stopper) of the speedometer housing is positioned correctly.



2. Make sure the axle nut is properly torqued, and a new cotter pin is installed.

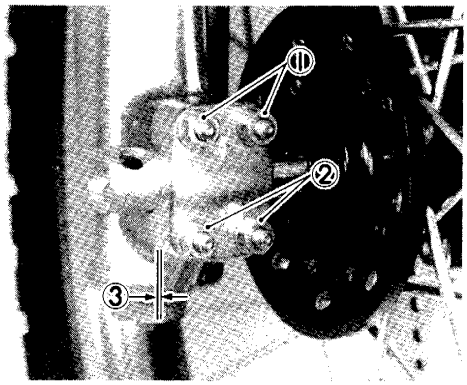
WARNING:

Always use a new cotter pin on the axle nut.

Tightening Torque:
100 Nm (10.0 m·kg, 72 ft·lb)

3. Before tightening the holder nuts, pump the front forks several times to check for proper fork operation.
4. Tighten the axle holder nuts; first the upper and then lower ones.

Tightening Torque:
8 Nm (0.8 m·kg, 5.8 ft·lb)

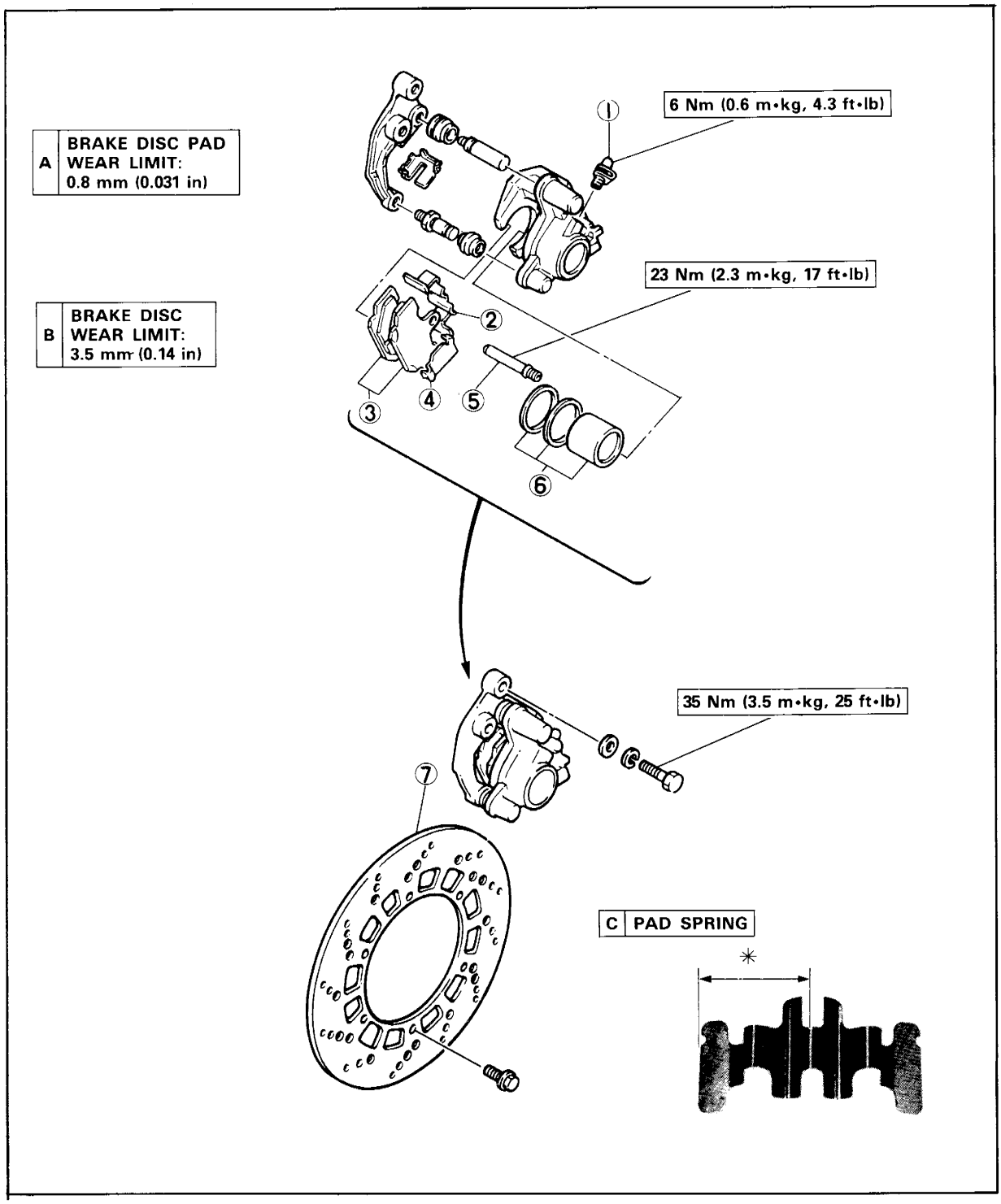


1. 1st 2. 2nd 3. Gap

FRONT BRAKE

① Bleed screw
② Pad spring
③ Brake pad
④ Pad shim
⑤ Retaining bolt
⑥ Caliper piston assembly
⑦ Brake disc

*Install the pad spring with its longer tang (*) in the disc rotation direction.



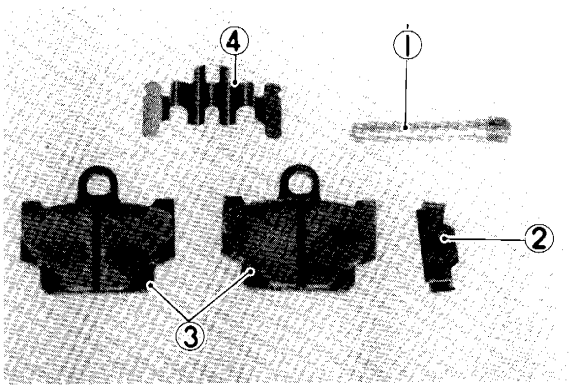
CAUTION:

Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection in the system is opened, the entire system should be disassembled, drained, cleaned and then properly filled and bled upon reassembly. Do not use solvents on brake internal components. Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. . Brake fluid is injurious to eyes and will damage painted surfaces and plastic parts.

Caliper Pad Replacement

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Remove the retaining bolt from the caliper cylinder. Then, remove the pads, pad shim and pad spring.

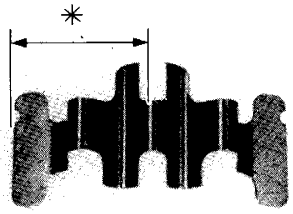


1. Retaining bolt
2. Pad shim
3. Pads
4. Pad spring

2. Install the pad spring into the caliper cylinder.

NOTE:

Install the pad spring with its longer tang (*) in the disc rotation direction.



3. Install the new brake pads. Replace the following parts if pad replacement is required.

NOTE:

Replace the pads as set if either if found to be worn to the wear limit.

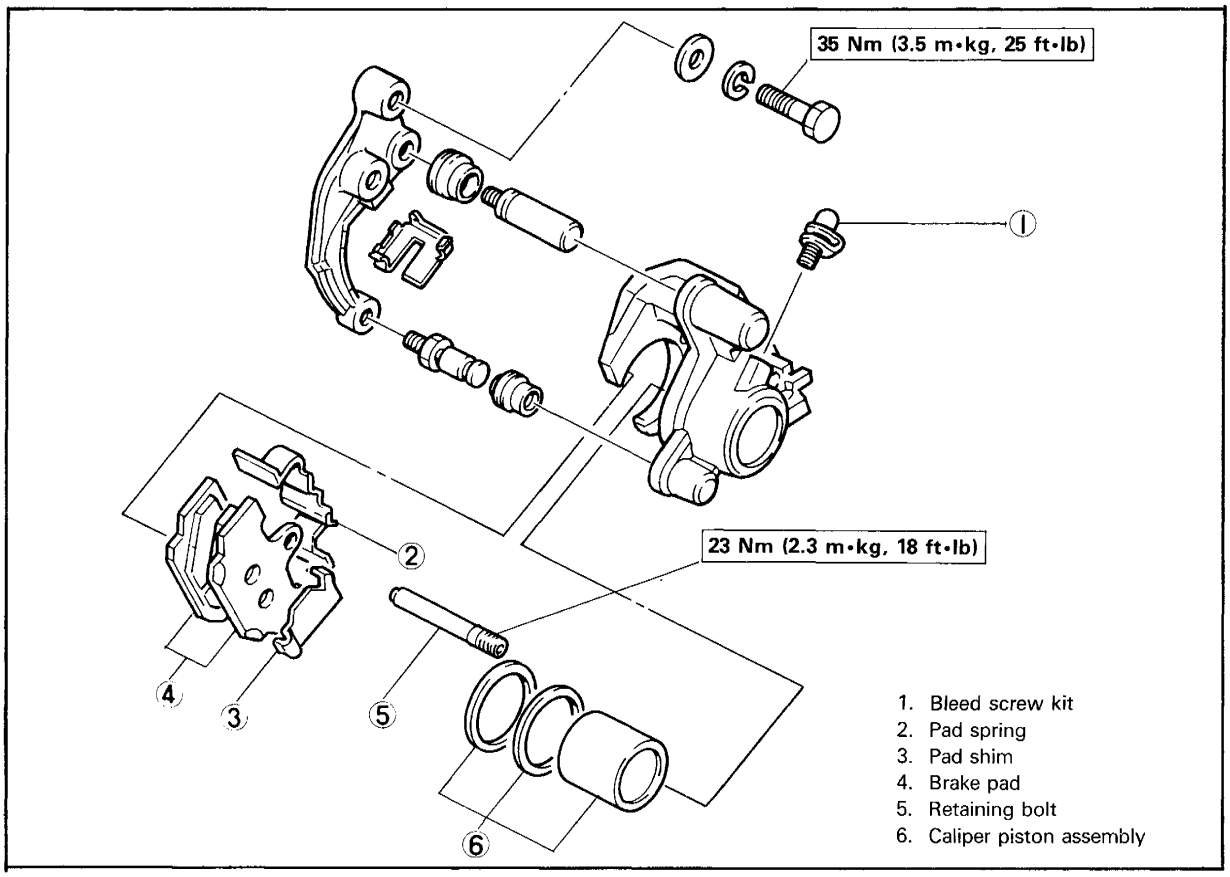
Front Brake Pad Wear Limit:
0.8 mm (0.031 in)

- Brake pads
- Pad Shim

4. Install the retaining bolt to the caliper cylinder. Torque the bolt to the specification.

Tightening Torque:
23 Nm (2.3 m·kg, 18 ft·lb)

Caliper Disassembly



1. Remove the caliper brake hose. Allow fluid in the caliper assembly to drain into a container.
2. Place the open hose end into the container and pump the old fluid out carefully.
3. Remove the caliper support bolts and the brake pads as described in the caliper pad replacement procedure.
4. Remove the caliper assembly from the caliper frame.
5. Remove the dust seal.
6. Remove the piston.

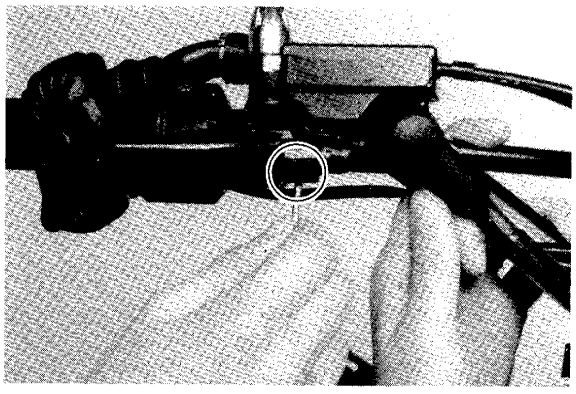
CAUTION:

Cover the piston with a rag. Use care so that the piston does not cause injury as it is expelled from the cylinder.

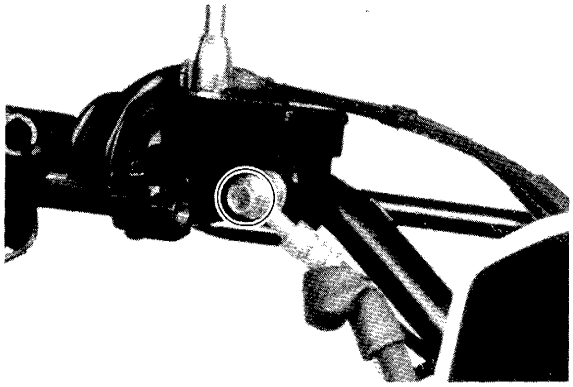
7. Remove the piston seal.

Master Cylinder Disassembly

1. Remove the brake light switch.



2. Remove the brake hose.



3. Remove the brake lever and spring.
4. Remove the master cylinder from the handlebar. Remove the reservoir cap and drain the remaining fluid.
5. Remove the master cylinder dust boot.
6. Remove the snap ring.
7. Remove the master cylinder cup assembly. Note that the cylinder cups are installed with the larger diameter (lips) inserted first.

Brake Inspection and Repair

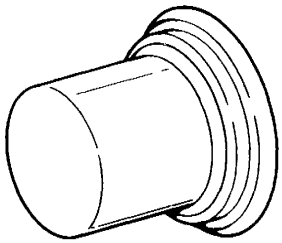
Recommended Brake Component Replacement Schedule:
- Brake Pads: As required
- Piston Seal, Dust Seal: Every two years
- Brake Hoses: Every four years
- Brake Fluid: Replace only when brakes are disassembled.

1. Replace the caliper piston if it is scratched.
2. Replace any brake pad worn beyond limits. Always replace the brake pads as a set.

NOTE:

See Caliper Pad Replacement procedure for a listing of the parts to be replaced when pads are replaced.

Wear Limit: 0.8 mm (0.031 in)

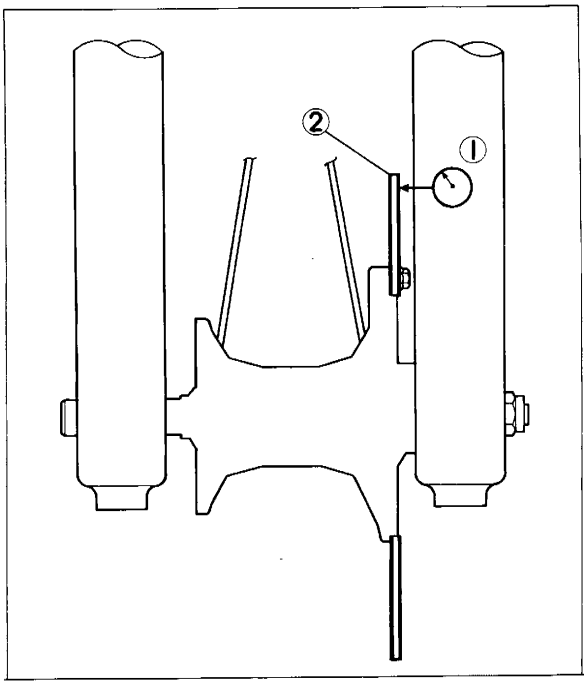


3. Replace piston and dust seals if damaged. Replace seals every two years.
4. Inspect master cylinder body. Replace if scratched. Clean all passages with new brake fluid.
5. Inspect the brake hoses. Replace every four years or immediately if cracked, frayed, or damaged.
6. Check for wear and deflection or disc.

Maximum Deflection:
0.15 mm (0.006 in)
Minimum Disc Thickness:
3.5 mm (0.14 in)

WARNING:

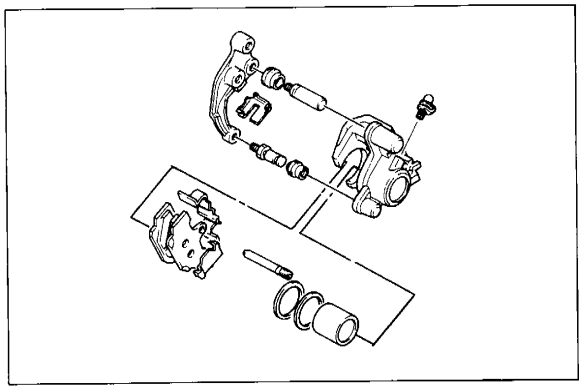
If disc is worn beyond minimum thickness or deflection exceeds specified amount, replace disc.



1. Dial gauge 2. Disc

Brake Reassembly

1. All internal parts should be cleaned in new brake fluid only. Internal parts should be lubricated with brake fluid when installed.
2. Replace the following parts whenever a caliper(s) is disassembled.
   - Dust seal
   - Piston seal
   - Pad shim



3. Install the dust seal, piston seal and piston.
4. Install the pad spring, pads, and retaining bolt into the caliper cylinder. Torque the retaining bolt to specification.

Tightening Torque:
23 Nm (2.3 m·kg, 17 ft·lb)

5. Apply rubber grease to the piston seals, caliper cylinder and piston.
6. Install the caliper assembly on the front fork. Torque the bolts to specification.

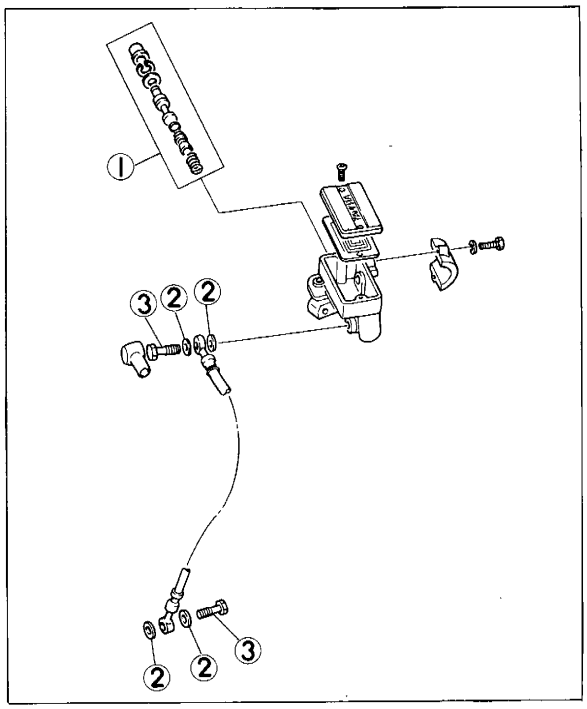
Tightening Torque:
35 Nm (3.5 m·kg, 25 ft·lb)

7. Attach the brake hoses.

Tightening Torque:
20 Nm (2.0 m·kg, 14 ft·lb)

8. Reassemble the master cylinder as shown in the illustration.

Tightening Torque:
(all brake union bolts)
26 Nm (2.6 m·kg, 19 ft·lb)



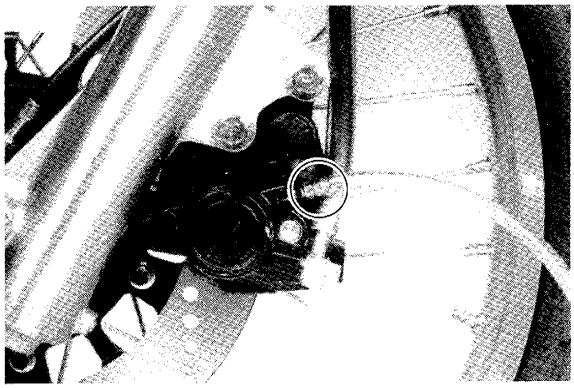
1. Master cylinder kit
2. Copper washer
3. Union bolt

9. Air bleeding

WARNING:

If the brake system is disassembled or if any brake hose has been loosened or removed, the brake system must be bled to remove air from the brake fluid. If the brake fluid level is very low or brake operation is incorrect, bleed the brake system. Failure to bleed the brake system properly can result in a dangerous loss of braking performance.

a. Add proper brake fluid to the reservoir. Install the disphragm, being careful not to spill or overflow the reservoir.
b. Connect a clear plastic tube, 4.5 mm (3/16 in) inside diameter, tightly to the caliper bleed screw. Put the other end of the tube into a container.



c. Slowly apply the brake lever several times. Pull in the lever. Hold the lever in this "on" position. Loosen the bleed screw. Allow the lever to travel slowly toward its limit. When the limit is reached, tighten the bleed screw. Then, release the lever.

Tightening Torque:
6 Nm (0.6 m·kg, 4.3 ft·lb)

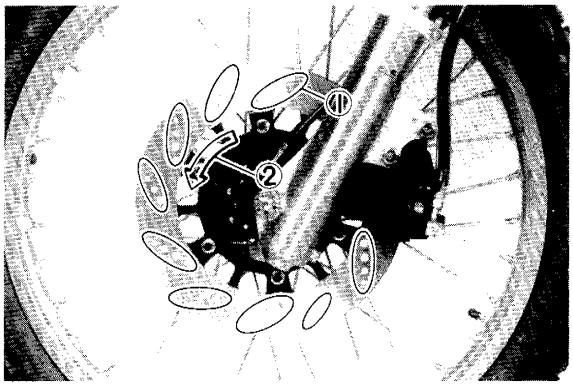
d. Repeat the above procedure until all air bubbles are removed from the system.

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 settled out.

Brake Disc Installation

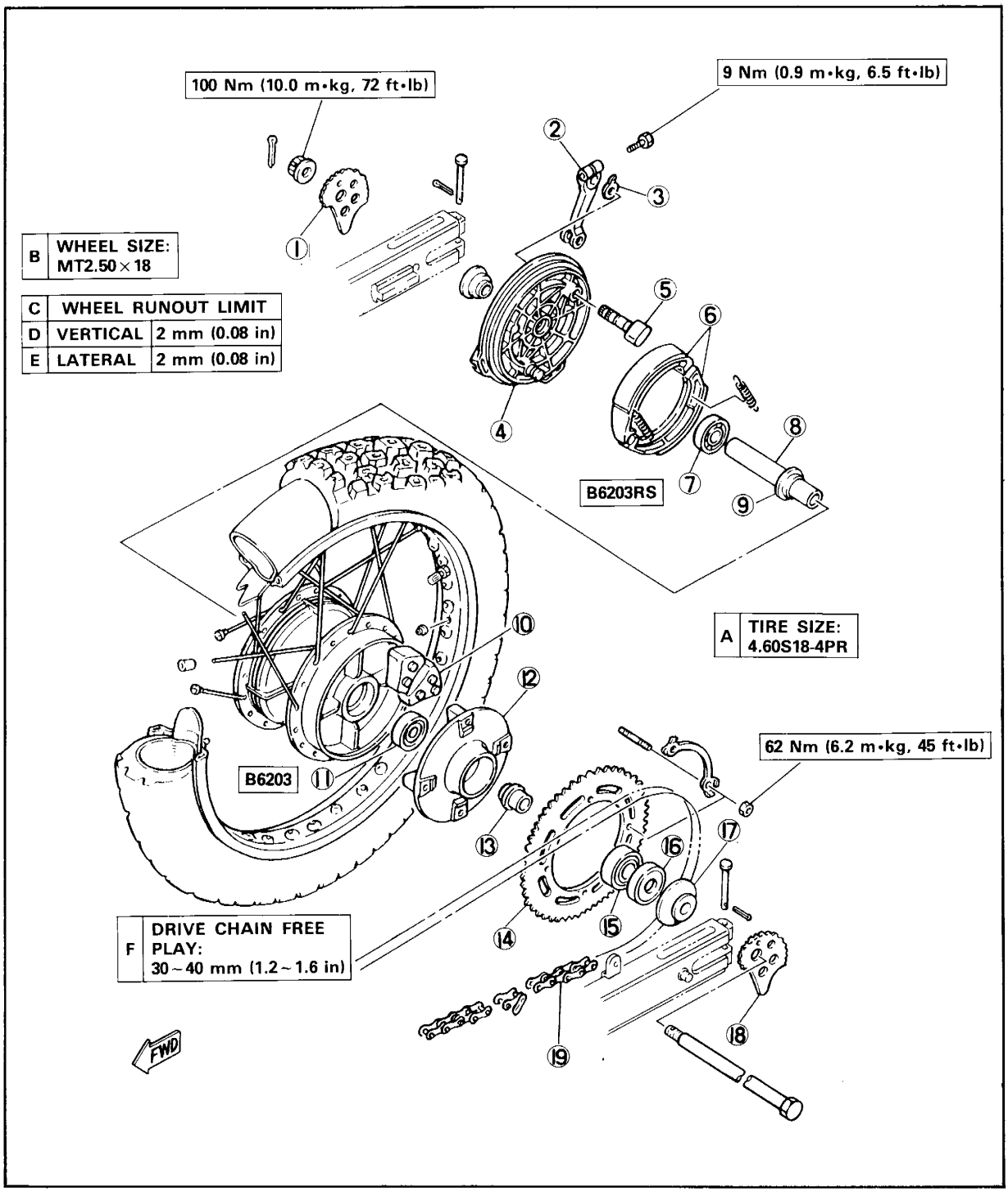
1. When installing the brake disc(s), the slots on the disc should be positioned as shown.



1. Slot 2. Rotating direction

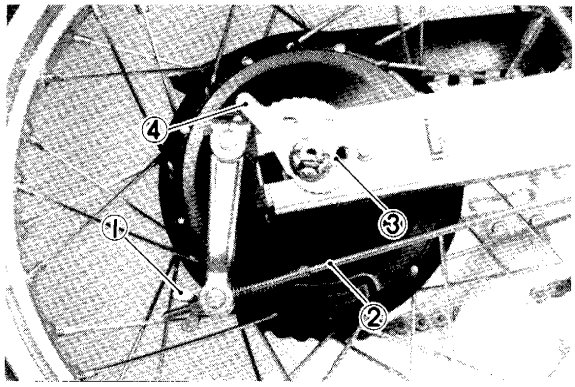
REAR WHEEL

① Chain puller (Right)
② Camshaft lever
③ Wear indicator
④ Brake shoe plate
⑤ Camshaft
⑥ Brake shoe lining
⑦ Bearing
⑧ Bearing spacer
⑨ Spacer flange
⑩ Damper
⑪ Bearing
⑫ Clutch hub
⑬ Wheel collar
⑭ Driven sprocket
⑮ Bearing
⑯ Oil seal
⑰ Wheel collar
⑱ Chain puller (Left)
⑲ Drive chain



Removal

1. Remove the brake adjuster and brake rod from the brake cam lever.
2. Remove the cotter pin from the axle nut and remove the axle nut.



1. Adjuster
2. Brake rod
3. Cotter pin
4. Chain puller

3. Elevate the rear wheel by placing a suitable stand under the engine.
4. The rear wheel assembly, the collar, the chain puller(s), etc., can be removed from the motorcycle by pulling the wheel axle.

NOTE:

A special tools is usually required for separating the chain; however, it is usually not necessary to unlink the chain to remove or reinstall the rear wheel.

Rear Axle Inspection

Refer to "Front Axle Inspection".

Replacing Wheel Bearings

Rear wheel bearing replacement is similar to the procedure for the front wheel bearings.

Rear Wheel Inspection

See "Front Wheel Inspection".

Spoke Inspection

See "FRONT WHEEL, Spoke Inspection".

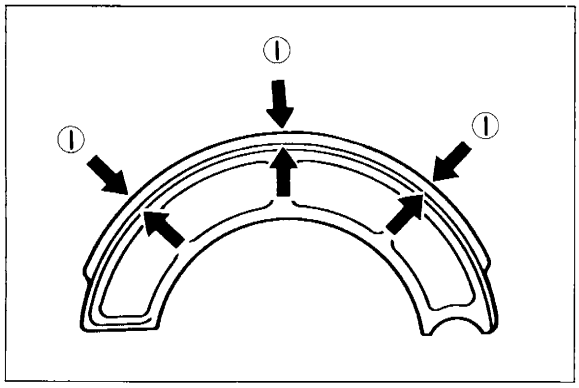
Brake Shoe Lining Inspection

1. Check the brake lining thickness with slide calipers.

NOTE:

Replace the brake shoes as a set if either is found to be worn to the wear limit.

Brake Lining Thickness: 4 mm (0.16 in) Wear Limit: 2 mm (0.08 in)



1. Measuring points

2. Check any glazed areas on the brake lining surface. If any, remove the glazed areas from brake lining using coarse sand paper.

NOTE:

After using the sand paper, clean off the polished particles with cloth.

Brake Drum Inspection

Oil or scratches on the inner surface of the brake drum will impair braking performance or result in abnormal noises.

Remove oil by wiping with a rag soaked in lacquer thinner or solvent.

Remove scratches by lightly and evenly polishing with emery cloth.

Brake Camshaft Inspection

1. Remove the camshaft and grease. If the cam face is worn, replace.

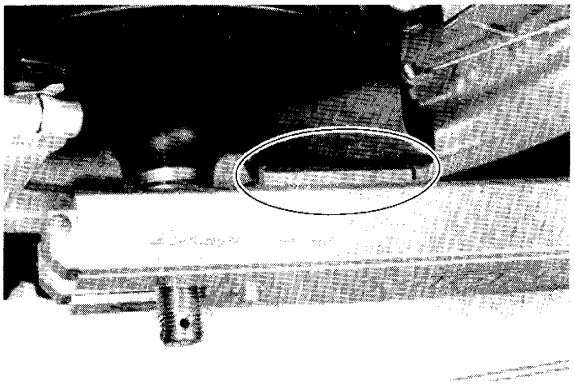
NOTE:

Before removing the cam lever, put a match mark (punches) on the cam lever and camshaft to indicate their positions for easy assembly.

Installation

When installing the rear wheel, reverse the removal procedure. Note the following points:

1. Be sure the swingarm boss correctly engages the locating slot on the brake shoe plate.



2. Make sure the rear wheel axle is inserted on the left-hand side and that the chain pullers are installed with the punched side outward.
3. Adjust the drive chain.
4. Make sure the axle nut is properly torqued, and a new cotter pin is installed.

WARNING:

Always use a new cotter pin on the axle nut.

Tightening Torque:
100 Nm (10.0 m·kg, 72 ft·lb)

5. Adjust the rear brake.

WARNING:

Check the operation of the brake light after adjusting the rear brake.

TIRES AND TUBES

Tubes

1. Removal
   a. Remove valve cap, valve core, and valve stem locknut. Loosen bead spacer(s), (rim locks).
   b. When all air is out of tube, separate tire bead from rim (both sides) by stepping on tire with your foot.
   c. Use two tire removal irons (with rounded edges) to work the tire bead over the edge of the rim, starting 180° opposite the tube stem. Take care to avoid pinching the tube as you do this.
   d. After you have worked one side of the tire completely off the rim, then you can slip the tube out. Be very careful not to damage the stem while pushing it back out of the rim hole.

NOTE:

If you are changing the tire itself, then finish the removal by working the second bead off the rim.

2. Installation
   Reinstalling the tire and tube can be accomplished by reversing the disassembly procedure. The only difference in procedure would be right after the tube has been installed. Before the tire has been completely slipped onto the rim, momentarily inflate the tube. This removes any creases that might exist. Release the air and continue with reassembly. Also, right after the tire has been completely slipped onto the rim, check to make sure that the stem comes out of the hole in the rim at a right angle to the rim.

Tires

To ensure maximum performance, long service, and safe operation, note the following:

1. Tire air pressure
   Always check and adjust the tire pressure before operating the motorcycle.

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.

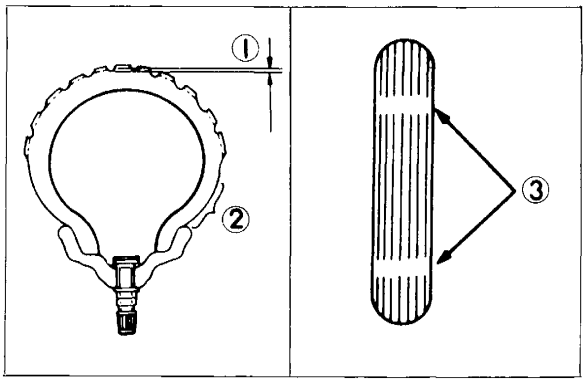
Basic weight: With oil and full fuel tank	XT600L: 148 kg (326 lb) XT600LC: 149 kg (328 lb)	
Maximum load*	159 kg (351 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	147 kPa (1.5 kg/cm^2, 22 psi)	147 kPa (1.5 kg/cm^2, 22 psi)
90 kg (198 lb) ~ Maximum load*	147 kPa (1.5 kg/cm^2, 22 psi)	177 kPa (1.8 kg/cm^2, 26 psi)
Off-road riding	98.1 kPa (1.0 kg/cm^2, 14 psi)	98.1 kPa (1.0 kg/cm^2, 14 psi)
High speed riding	147 kPa (1.5 kg/cm^2, 22 psi)	147 kPa (1.5 kg/cm^2, 22 psi)

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

WARNING:

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. Operatin of an overloaded motorcycle could cause tire damage, an accident, or even injury.

2. Tire inspection
   Always check the tires before operating the motorcycle. If a tire tread show crosswise lines (minimum tread depth), if the tire has a nail or glass fragments in it, or if the side wall is cracked, replace the tire.



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

WARNING:

1. **It is dangerous to ride with a wornout tire. When a tire tread begins to show lines, replace the tire immediately.**
2. **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.**

DRIVE CHAIN AND SPROCKETS

NOTE:

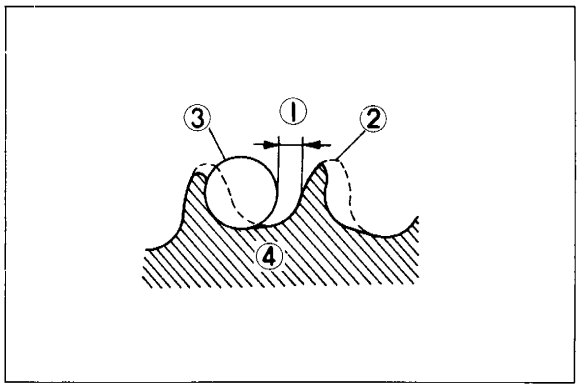
Please refer to Maintenance Interval and Lubrication Interval charts for additional information.

Drive Sprocket Inspection

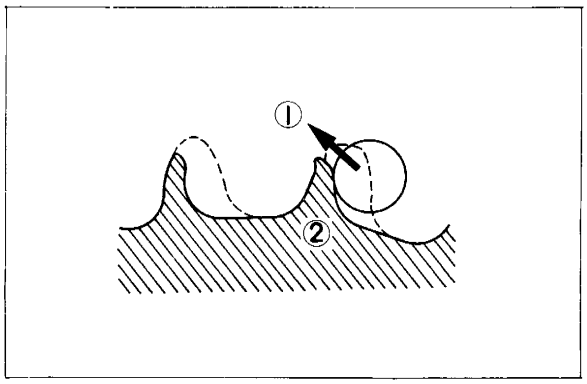
With the left crankcase cover removed proceed as follows:

1. With the drive chain in place and transmission in gear, firmly apply the rear brake. Remove the sprocket securing bolts. Remove the sprocket.
2. Check sprocket wear. Replace if wear decreases tooth width as shown.
3. Replace if tooth wear shows a pattern such as that in the illustration, or as precaution and common senses dictate.
4. Tighten the securing bolts.

Drive Sprocket Securing Bolt Torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)



1. 1/4 tooth 2. Correct 3. Roller 4. Sprocket



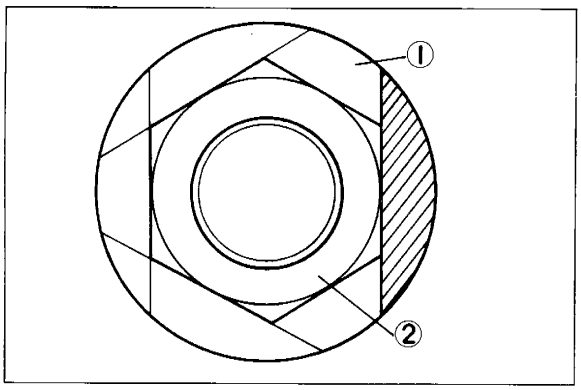
1. Slip off 2. Bent teeth

Driven Sprocket Inspection

With the rear wheel removed, proceed as follows:

1. Using a blunt chisel, flatten the securing nuts lock-washer tabs.
   Remove the securing nuts. Remove the lock washers and sprocket.
2. Check the sprocket wear using procedures for the drive sprocket.
3. Check the sprocket to see that it runs true. If bent, replace.
4. During reassembly, make sure that sprocket and sprocket seat are clean.
   Tighten the securing nuts in a crisscross pattern.
   Bend the tabs of the lock washers fully against the securing nut flatas.

Driven Sprocket Securing Nut Torque:
62 Nm (6.2 m·kg, 45 ft·lb)

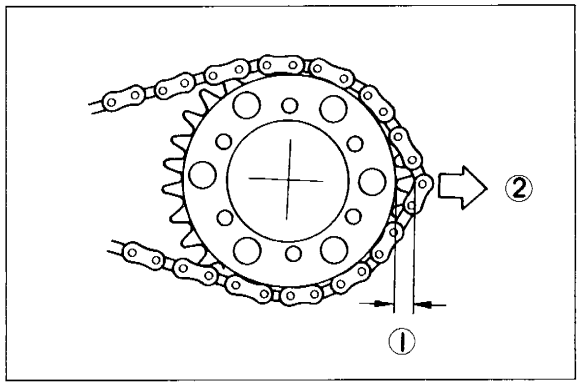


1. Lock washer 2. Nut

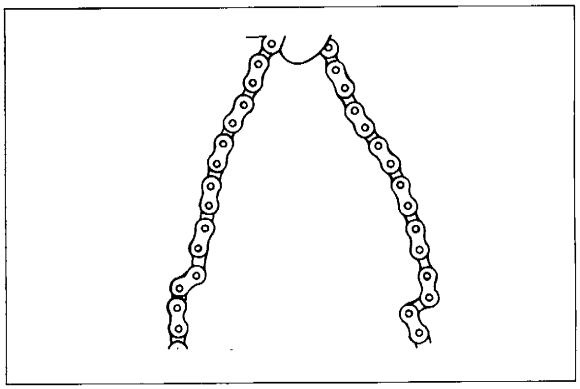
Chain Inspection

1. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect.
   If any portion of the chain shows signs of damage or if either sprocket shows signs of excessive wear, remove and inspect.

2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution, clean with wire brush and dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff, replace.
3. Check the side plate for damage. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.



1. 1/2 tooth 2. Pull



Chain Maintenance

The chain should be lubricated according to the recommendations given in the Maintenacne and Lubrication Intervals charts, or more.

See "Chassis and Suspension, Swingarm", for additional information regarding chain guide.

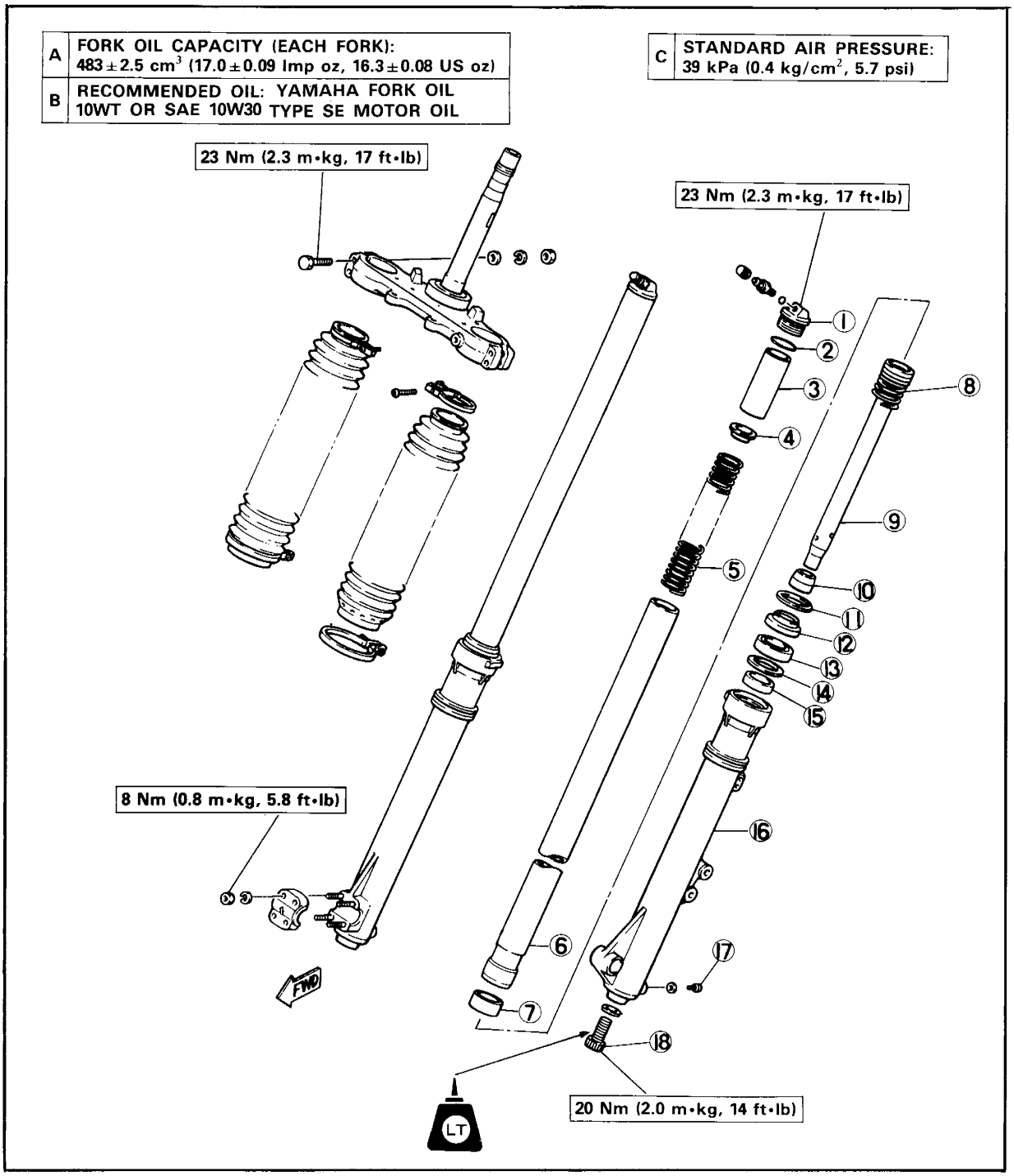
1. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
2. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly. Wipe off excess.

Recommended lubricant:
YAMAHA CHAIN AND CABLE LUBE or SAE 10W30 type SE motor oil

3. Periodically remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubraicate thoroughly to make sure lubricant penetrates. Wipe off excess. Reinstall.

FRONT FORK

① Cap bolt
② O-ring
③ Spacer
④ Spring seat
⑤ Fork spring
⑥ Inner tube
⑦ Slide bush
⑧ Rebound spring
⑨ Damper rod (cylinder complete)
⑩ Oil lock piece
⑪ Retaining clip
⑫ Dust seal
⑬ Oil seal
⑭ Seal spacer
⑮ Guide bush
⑯ Outer tube
⑰ Drain screw
⑱ Cylinder securing bolt

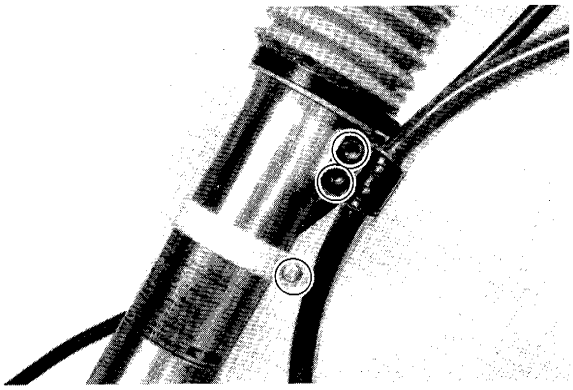


Removal and Disassembly

WARNING:

Securely support the motorcycle so it won't fall over when the front wheel and front forks are removed.

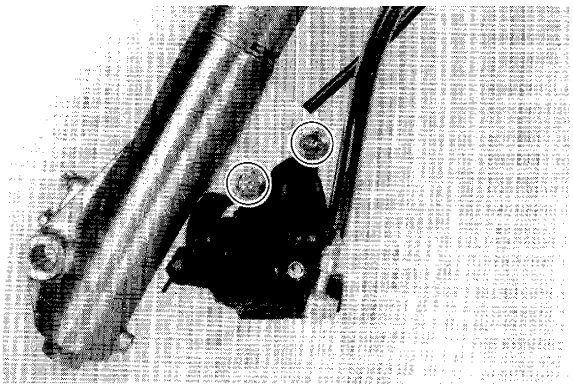
1. Remove the front wheel.
2. Remove the handlebars.
3. Remove the brake hose holder and speedometer cable holder.



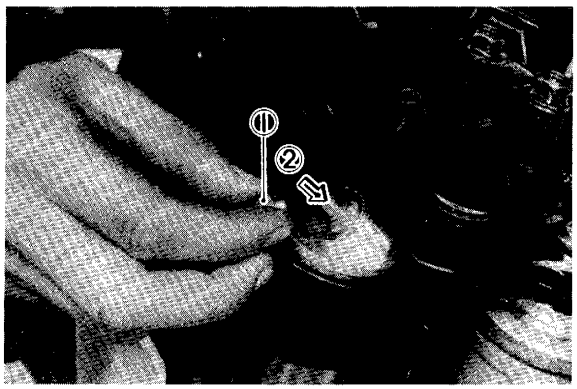
4. Remove the caliper cylinder securing bolts.

NOTE:

Do not depress the brake lever when the wheel is off the motorcycle as brake pads will be forced shut.

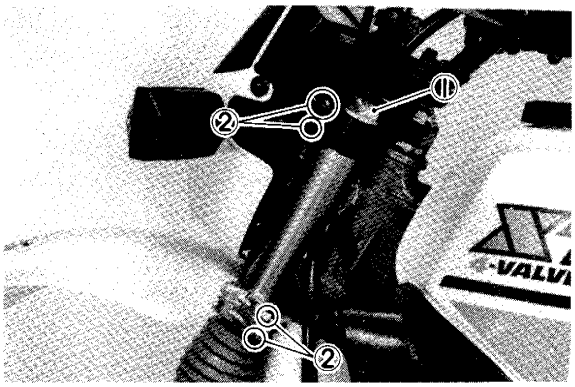


5. Remove the fork air valve cap and depress the valve until the air pressure escapes completely from the both forks.



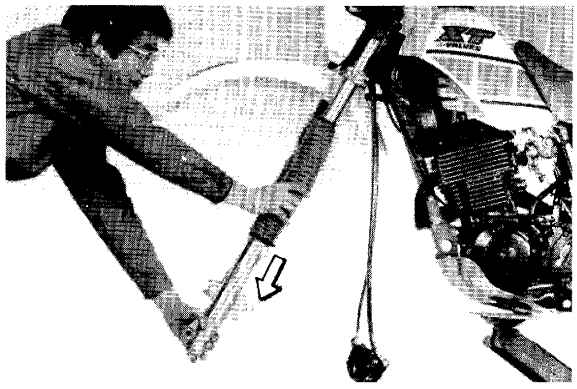
1. Air valve cap 2. Push

6. Loosen the cap bolt.
7. Loosen the front fork pinch bolts in the handle crown and under bracket.

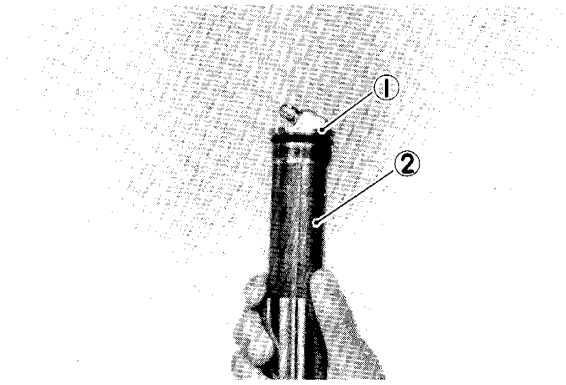


1. Cap bolt 2. Pinch bolt

8. Slide the inner fork tube out of the handle crown and under bracket. Remove the front forks.

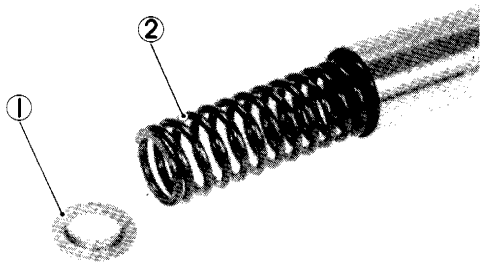


9. Remove the rubber boot.
10. Remove the cap bolt and spacer.



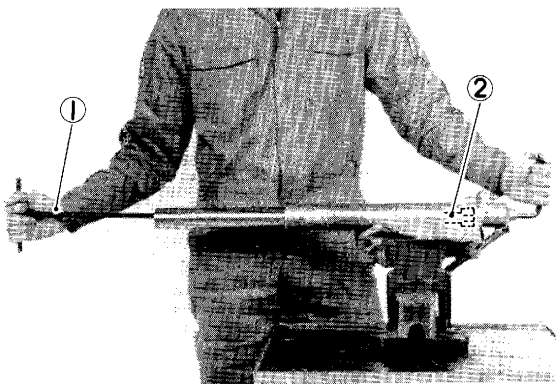
1. Cap bolt
2. Spacer

11. Place an open container under the fork and turn the fork upside down and drain the oil.
12. Remove the spring seat and fork spring.



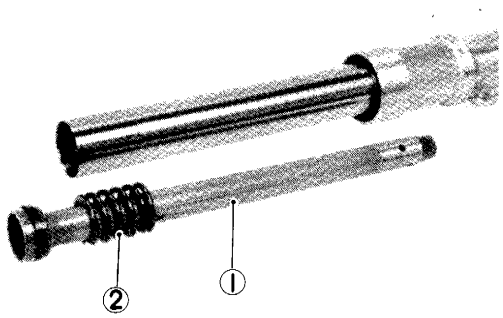
1. Spring seat
2. Fork spring

13. Remove the cylinder securing bolt from the bottom of the outer fork tube with special tools. (T-handle: YM-01301, Damper Rod Holder: YM-01327).



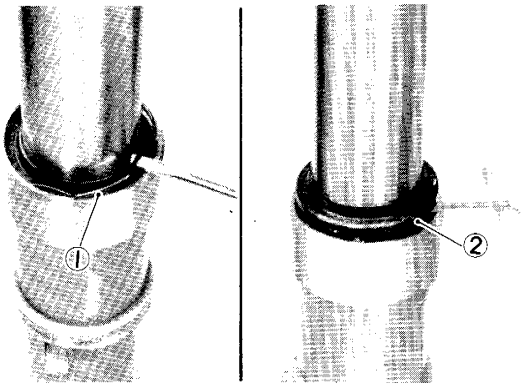
1. T-handle (YM-01301)
2. Damper Rod Holder (YM-01327)

14. Remove the damper rod (cylinder complete) and rebound spring.



1. Damper rod (Cylinder complete)
2. Rebound spring

15. Remove the retaining clip from the outer fork tube.
16. Remove the dust seal with a thin screwdriver. Take care not to scratch the inner fork tube. Discard the dust seal.

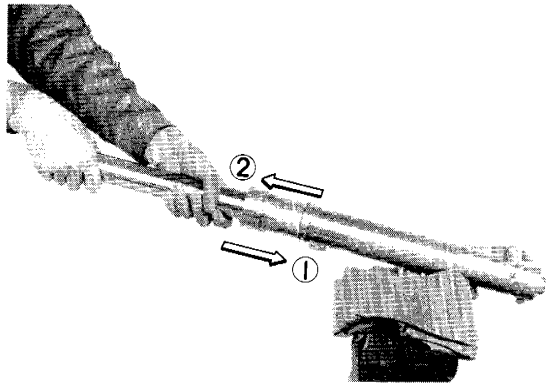


1. Retaining clip
2. Dust seal

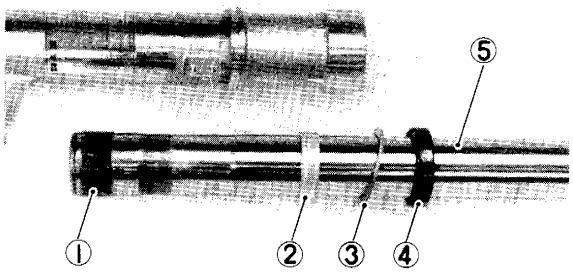
17. Hold the front fork outer tube in a vise horizontally. Put in the inner fork tube just before it bottoms out and then pull it back quickly. Repeat this step until the inner fork tube can be pulled out from the outer fork tube (usual 2 or 3 times). Then, the oil seal, seal spacer, guide bush, and slide bush all come out together, and remove the oil lock piece.

CAUTION:

Don't bottom out the inner fork tube in the above step, or the oil lock piece will be damaged.



1. Put in slowly
2. Pull back quickly



1. Slide bush
2. Guide bush
3. Seal spacer
4. Oil seal
5. Inner fork tube

Inspection

Clean and inspect all front fork components. Replace any worn or damaged components prior to reassembly.

1. Check the inner fork tube and repalce if the tube is badly scratched or bent.

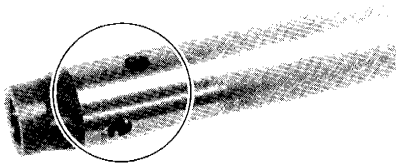
WARNING:

Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.

2. Check the outer surface of the fork seal seat in the otuer fork tube for damage. Replace the tube if for necessary.
3. Check the outer tube for dents. Replace the tube if for necessary.
4. Check the free length of the fork springs.

Fork Spring Free Length Limit:
460.5 mm (18.13 in)

5. Check the O-ring of the cap bolt. Replace any damaged O-ring.
6. Check the damper rod for wear, damage, or contamination. Blow out all oil passages with compressed air. If it is worn or damaged, replace it.



7. Check the oil lock piece. Replace it, if damaged.

Reassembly

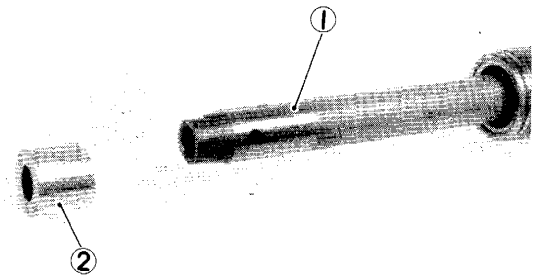
NOTE:

In front fork reassembly, be sure to use following new parts.

- Guide bush
- Slide bush
- Oil seal
- Dust seal

1. Make sure all components are clean before reassembly.
2. Install the rebound spring to the damper rod.

3. Slide the damper rod into the inner fork tube from its top.
4. Fit the oil lock piece over the damper rod sticking out of the inner fork tube.

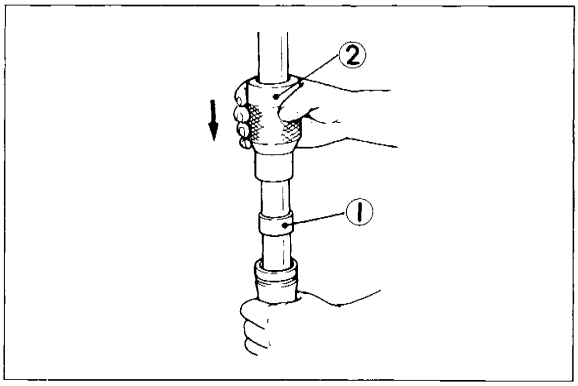


1. Damper rod
2. Oil lock piece

5. Apply thread-locking compound such as LOCTITE® to the cylinder securing bolt, and install it. Torque the bolt to specification.

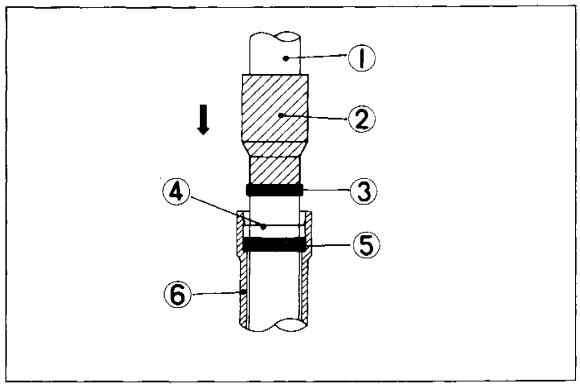
Tightening Torque:
20 Nm (2.0 m·kg, 14 ft·lb)

6. Install the guide bush by pressing it in with special tool. Then, install the seal spacer into the outer fork tube.



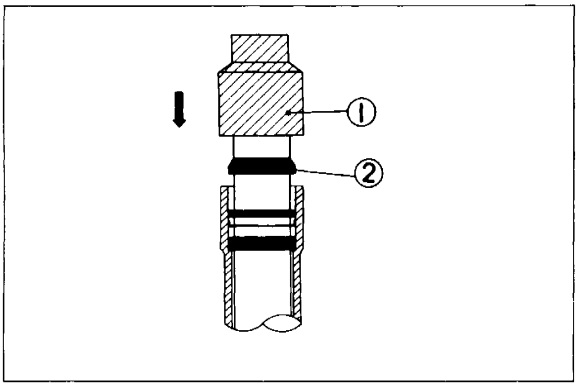
1. Guide bush
2. Special tool

7. Apply oil to the oil seal, and install the oil seal by pressing it in with special tool. Then, install the retaining clip.



1. Inner tube
2. Special tool
3. Oil seal
4. Seal spacer
5. Guide bush
6. Outer tube

8. Install the dust seal by pressing it in with special tool.



1. Special tool
2. Dust seal

9. Install the retaining clip, fork spring, spring seat and fork spring in that order.
10. Pour the specified amount of recommended fork oil into the inner fork tube.

Fork Oil Capacity (each fork):
483±2.5 cm^3 (17.0±0.09 Imp oz, 16.3±0.08 US oz)
Recommended Oil:
Yamaha Fork Oil 10Wt or
SAE 10W30 type SE motor oil

11. After filling, slowly pump the forks up and down to distribute the oil. Install the spacer, and temporarily install the cap bolt.

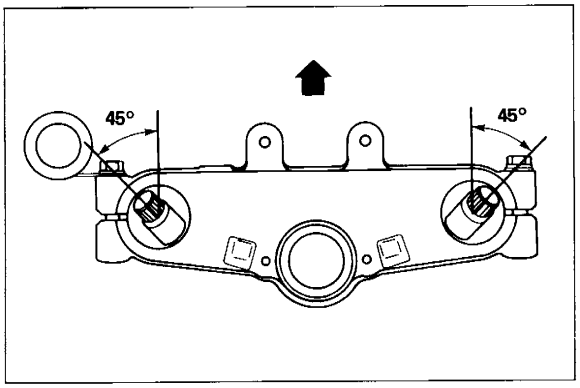
12. Install the rubber boot.
13. Slide the fork into the under bracket.
14. Slide the fork into the handle crown in the following way.

NOTE:

Fit the front fork by pushing it up until its top is flush with the handle crown top end. Holding the front fork in this position, temporarily tighten the pinch bolts with fingers.

15. Tighten the fork pinch bolts at the handle crown and under bracket. Then, tighten the cap bolt.

Tightening Torque:
- Handle Crown:
  - 23 Nm (2.3 m·kg, 17 ft·lb)
- Under Bracket:
  - 20 Nm (2.0 m·kg, 14 ft·lb)
- Cap Bolt
  - 23 Nm (2.3 m·kg, 17 ft·lb)



16. If the air valve does not face towards the illustration, loosen the pinch bolts on the under bracket and reset the forks in the following procedure:
    a. Level the top of the inner fork rube with the top of the steering crown.
    b. Face the air valve towards the front.
17. Fit the fork with air using a manual air pump or other pressurized air supply.

Standard Air Pressure:
39 kPa (0.4 kg/cm^2, 5.7 psi)

18. Install the air valve cap.
19. Install the caliper cylinder, the brake hose holder, the speedometer cable holder and the front wheel.

Tightening Torque:
- Caliper Cylinder:
  - 35 Nm (3.5 m·kg, 25 ft·lb)

20. Install the handlebars.

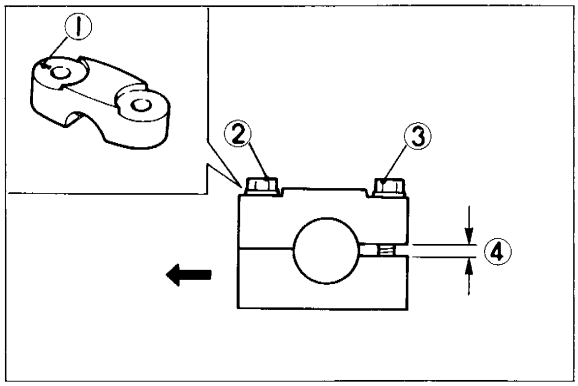
Tightening Torque:
- Handlerbar Installation Bolt:
  - 23 Nm (2.3 m·kg, 17 ft·lb)

NOTE:

The upper handlebar holder should be installed with the punched mark forward.

CAUTION:

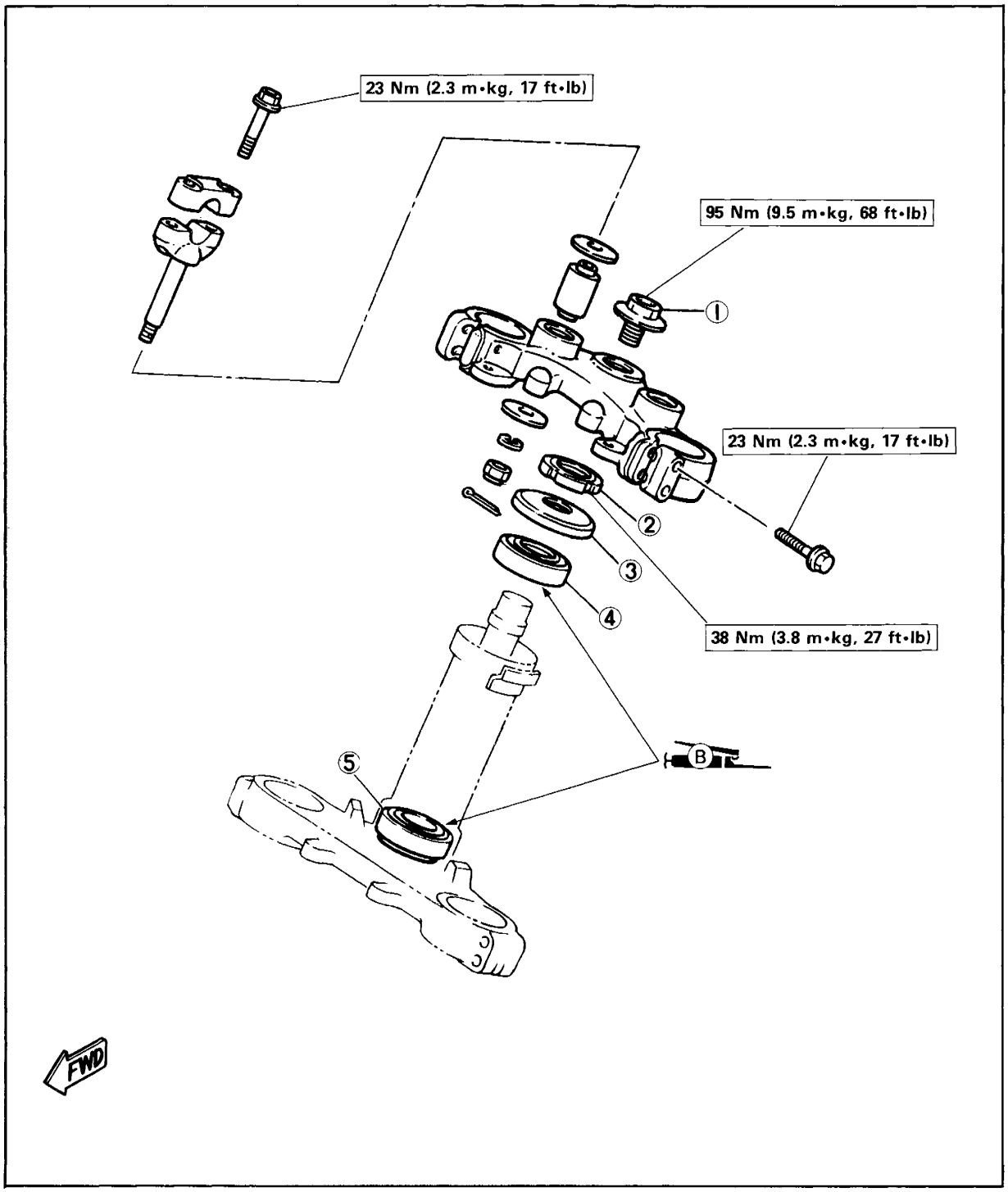
First tighten the bolts on the front side of the handlebar, and then tighten the bolts on the rear holder side.



1. Punched mark
2. 1st
3. 2nd
4. Gap

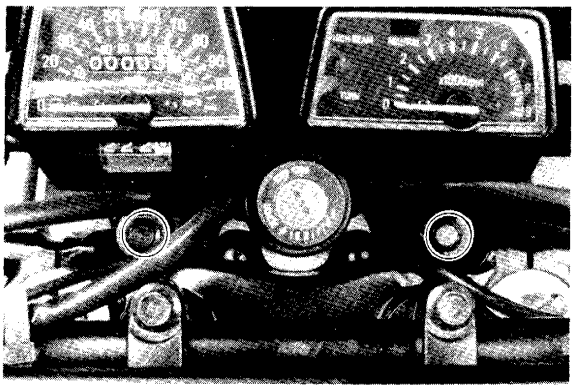
STEERING HEAD

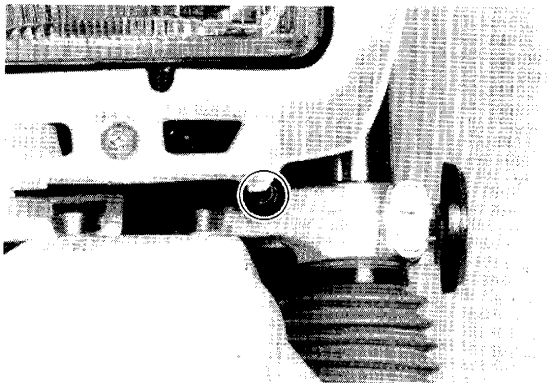
① Steering fitting bolt
② Ring nut
③ Bearing cover
④ Bearing
⑤ Bearing



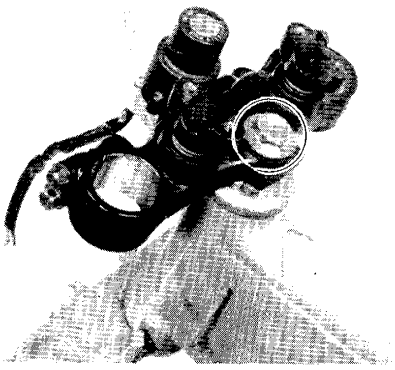
Removal

1. Remove the seat and fuel tank.
2. Remove the headlight and meters.

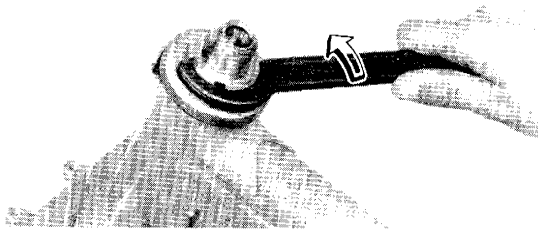




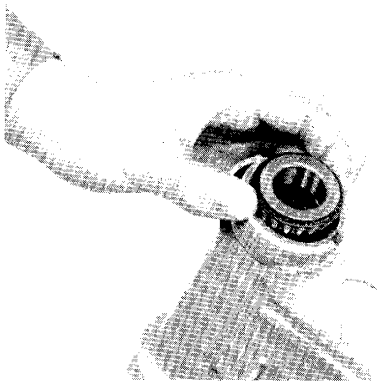
3. Remove the handlebar.
4. Remove the front fork assembly.
5. Remove the steering fitting bolt, and remove the handle crown.



6. Remove the ring nut supporting the under bracket so that it may not fall down.

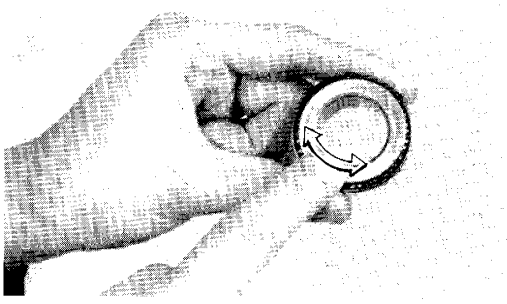


7. Remove the bearing cover and the upper and lower bearings.



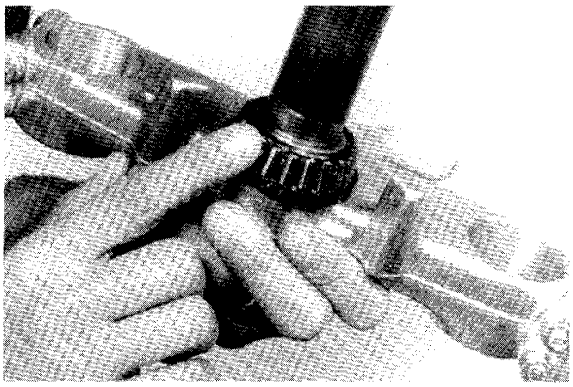
Inspection

1. Wash the bearings in solvent.
2. Inspect the bearings for pitting or other damage. Replace the bearings if pitted or damaged.
3. Clean and inspect the bearings. Spin the bearings by hand. If the bearings are not smooth in their operation, replace the bearings.



Assembly

1. Grease the bearings and races with wheel bearing grease.



2. Install the under bracket and bearing.
3. Tighten the ring nut.

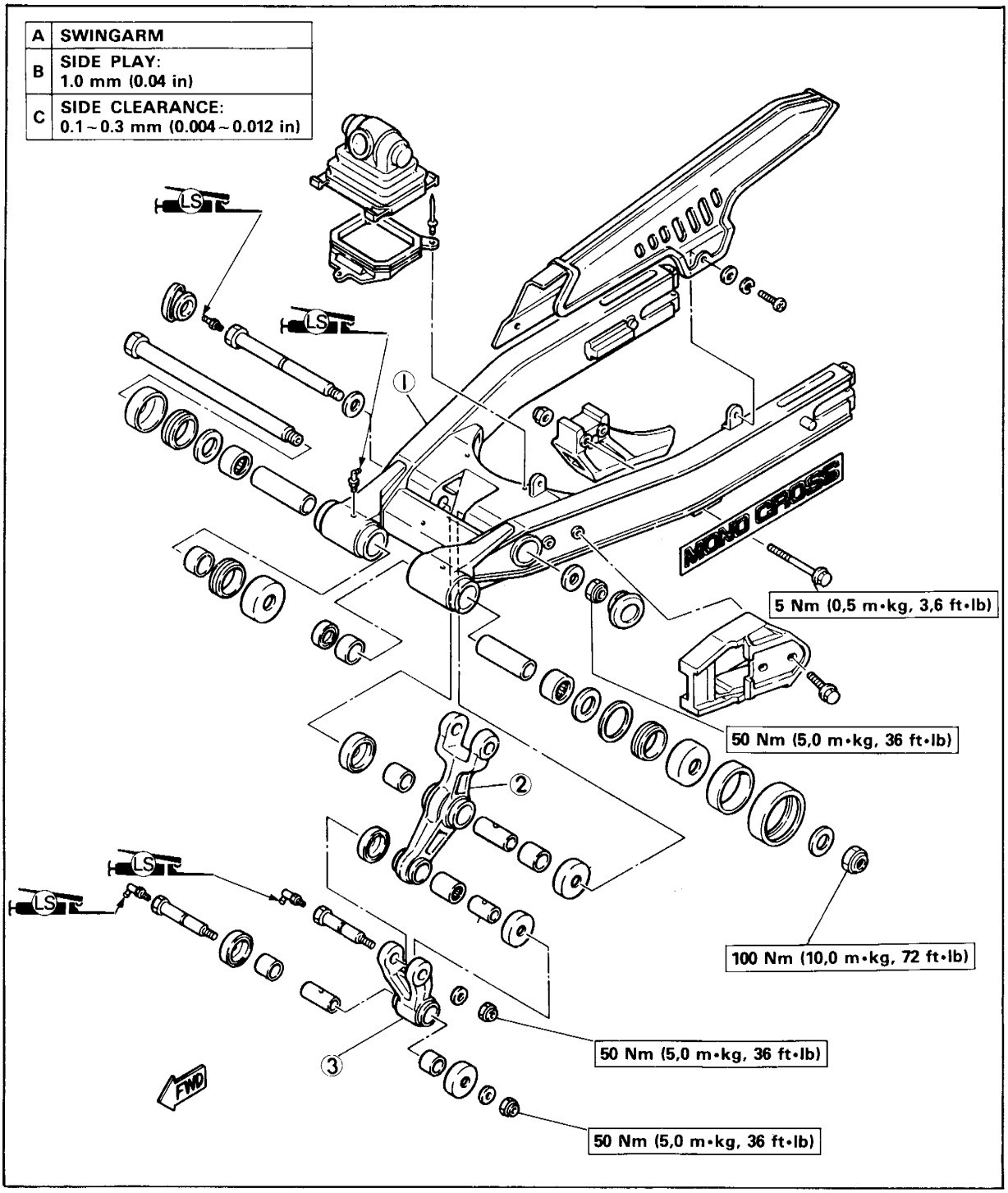
Tightening Torque:
38 Nm (3.8 m·kg, 27 ft·lb)

4. Continue assembly; reverse the disassembly procedure.
5. When assembly is complete, check the under bracket by turning it from lock to lock. If there is any binding or looseness, readjust the tightness of the under bracket.

Tightening Torque:
Front Fork Pinch Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)
Steering Fitting Bolt:
95 Nm (9.5 m·kg, 68 ft·lb)

SWINGARM

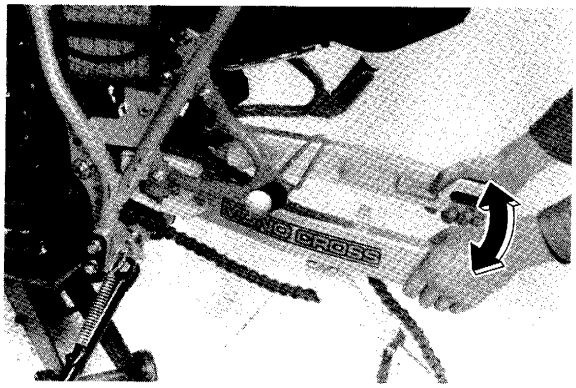
① Swingarm
② Relay arm
③ Relay arm connecting rod



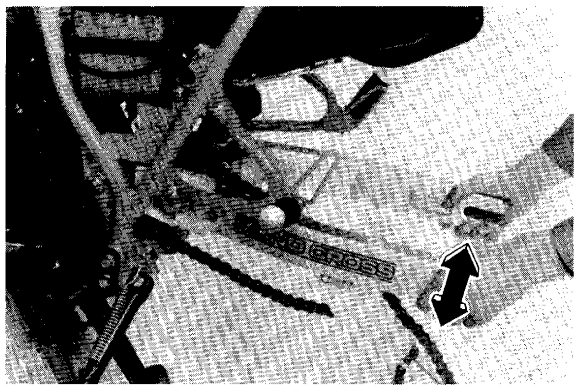
Inspection

1. Remove the rear wheel and the shock absorber. Grasp the swingarm and try to move it from side to side as shown. Check for free play.

Free Play (at end of swingarm): 1.0 mm (0.04 in)

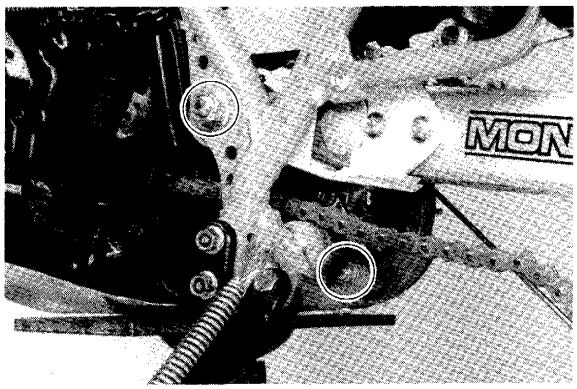


2. If free play is excessive, remove the swingarm and replace the bushings or bearings. Replace the thrust cover or oil seal if necessary.
3. The swingarm is mounted on needle bearings and bushings. Move the swingarm up and down. The swingarm should move smoothly, without tightness, binding, or rough spots that could indicate damaged bearings.

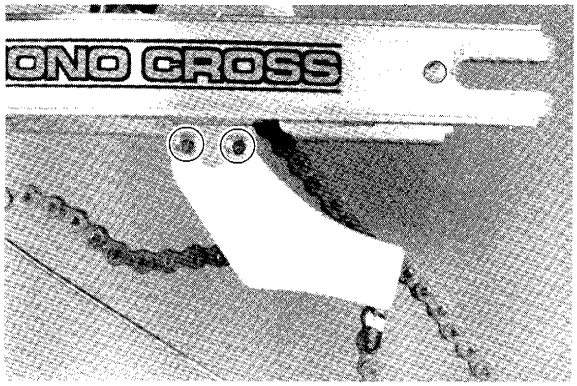


Removal

1. Remove the seat and rear wheel.
2. Remove the all bolts securing the swingarm and relay arm.

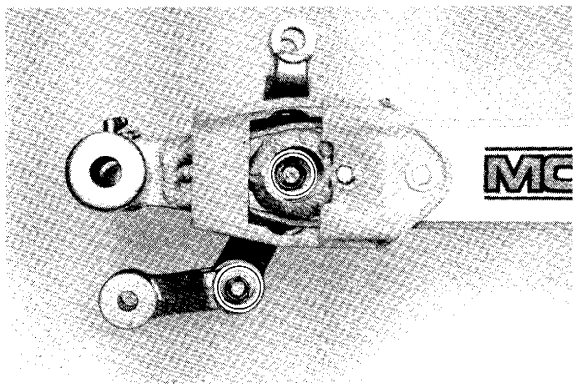


3. Remove the chain guide.

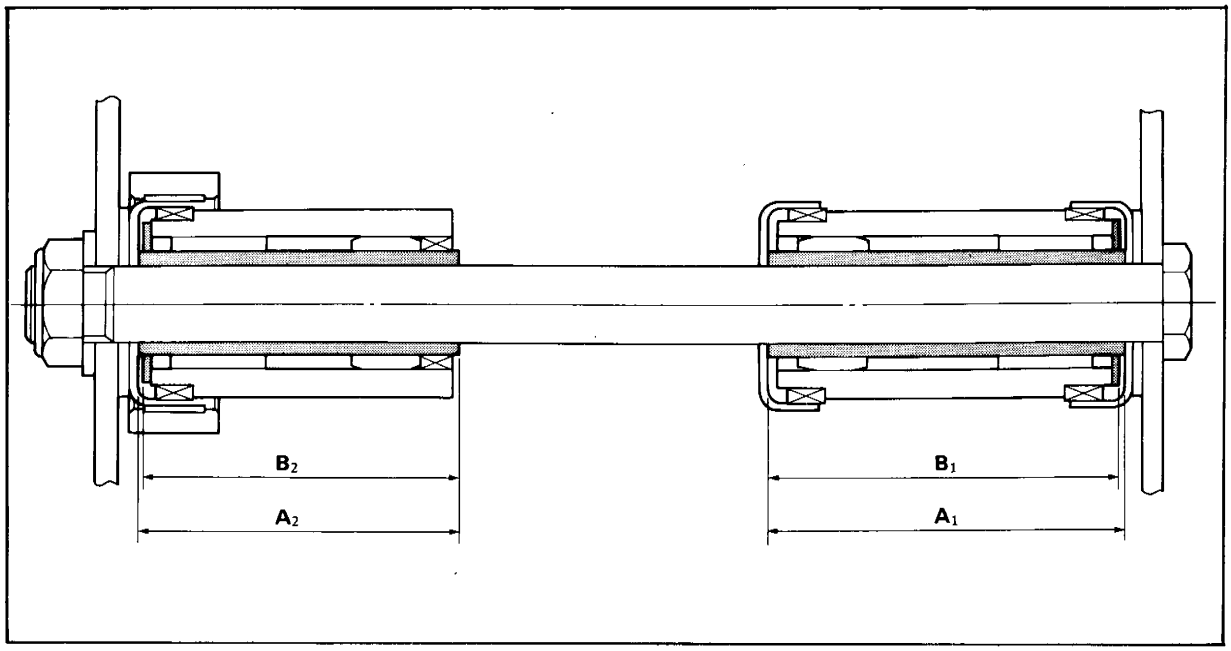


4. Remove the swingarm assembly from the frame.

5. Remove the relay arm and relay arm connecting rod from the swingarm.



Adjustment



1. Measure the bushing length A_1 and A_2. If A_1 and A_2 are not within specification, replace the bushings.

Specificated Length:
A_1: 75.2 ~ 75.3 mm (2.961 ~ 2.965 in)
A_2: 68.2 ~ 68.3 mm (2.685 ~ 2.689 in)

2. Measure the length B_1 and B_2 as illustration.
3. Calculate the side clearance C by using the formula given below.

$$C = (A_1 + A_2) - (B_1 + B_2)$$

Example:
1) If the bushing length A_1 and A_2 are below.
A_1 ..... 75.2 mm
A_2 ..... 68.2 mm
2) If the length B_1 and B_2 are below.
B_1 ..... 75.0 mm
B_2 ..... 68.0 mm

$C = (75.2 + 68.2) - (75.0 + 68.0)$
$= 143.4 - 143.0$
$= 0.4$ mm (0.016 in)
Then, install the one shim
[Shim thickness: 0.3 mm (0.012 in)]

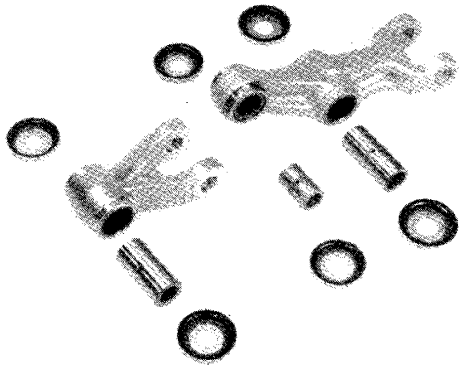
4. If the side clearacne is not within specification, adjust it by means of shim.

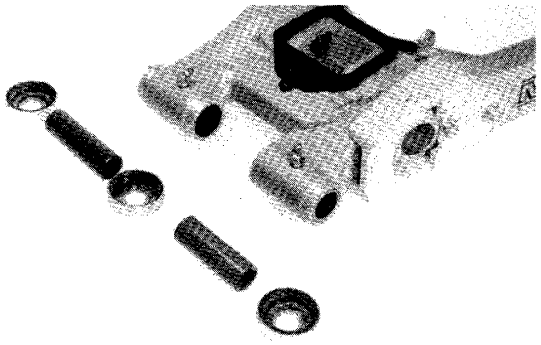
NOTE:
If only one shim is used, install it on the left side. Two shims must be installed both sides.

Side Clearance:
0.1 ~ 0.3 mm (0.004 ~ 0.012 in)

Inspection and Lubrication

1. Examine the thrust covers and oil seals. Replace if they are damaged.
2. Inspect the bearings and bushings for scratches or other damage.
   Make sure that the needle bearing rolles freely.
   If the bearings or bushings are damaged, they should be replaced.

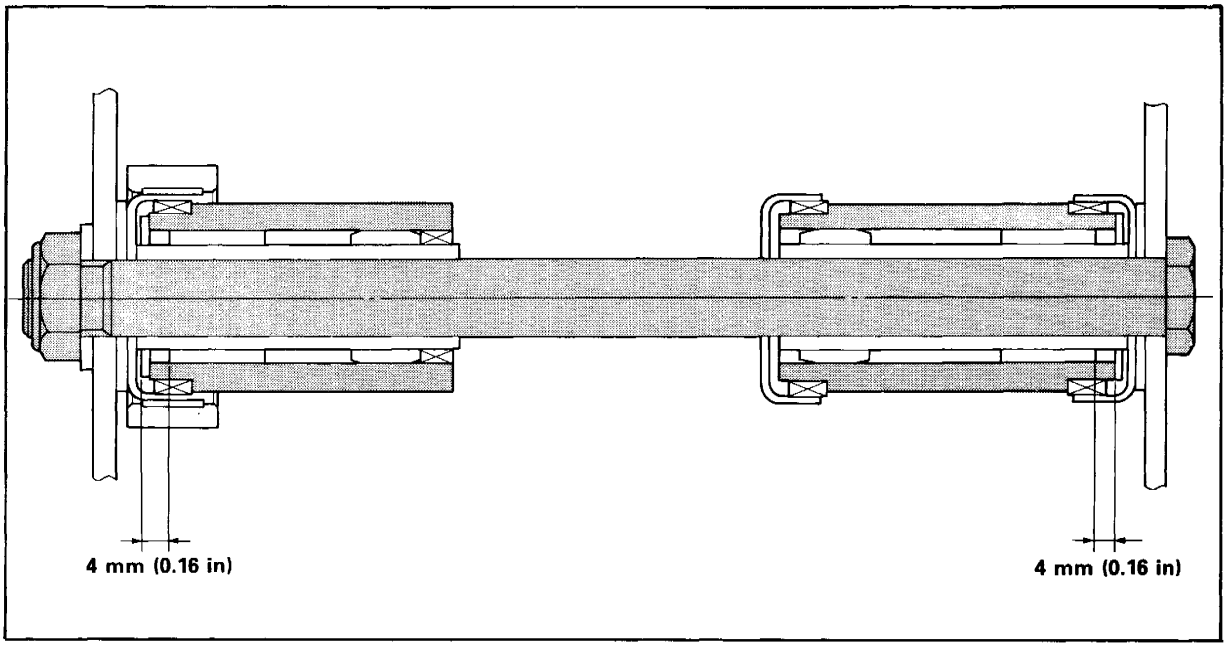




NOTE:

When pressing the new bearings and bushings, note the following points:

1. Bearings should be exactly located as shown in the illustration [4 mm (0.16 in) from each side].
2. Grease them liberally with lithium base waterproof wheel bearing grease.



Reassembly

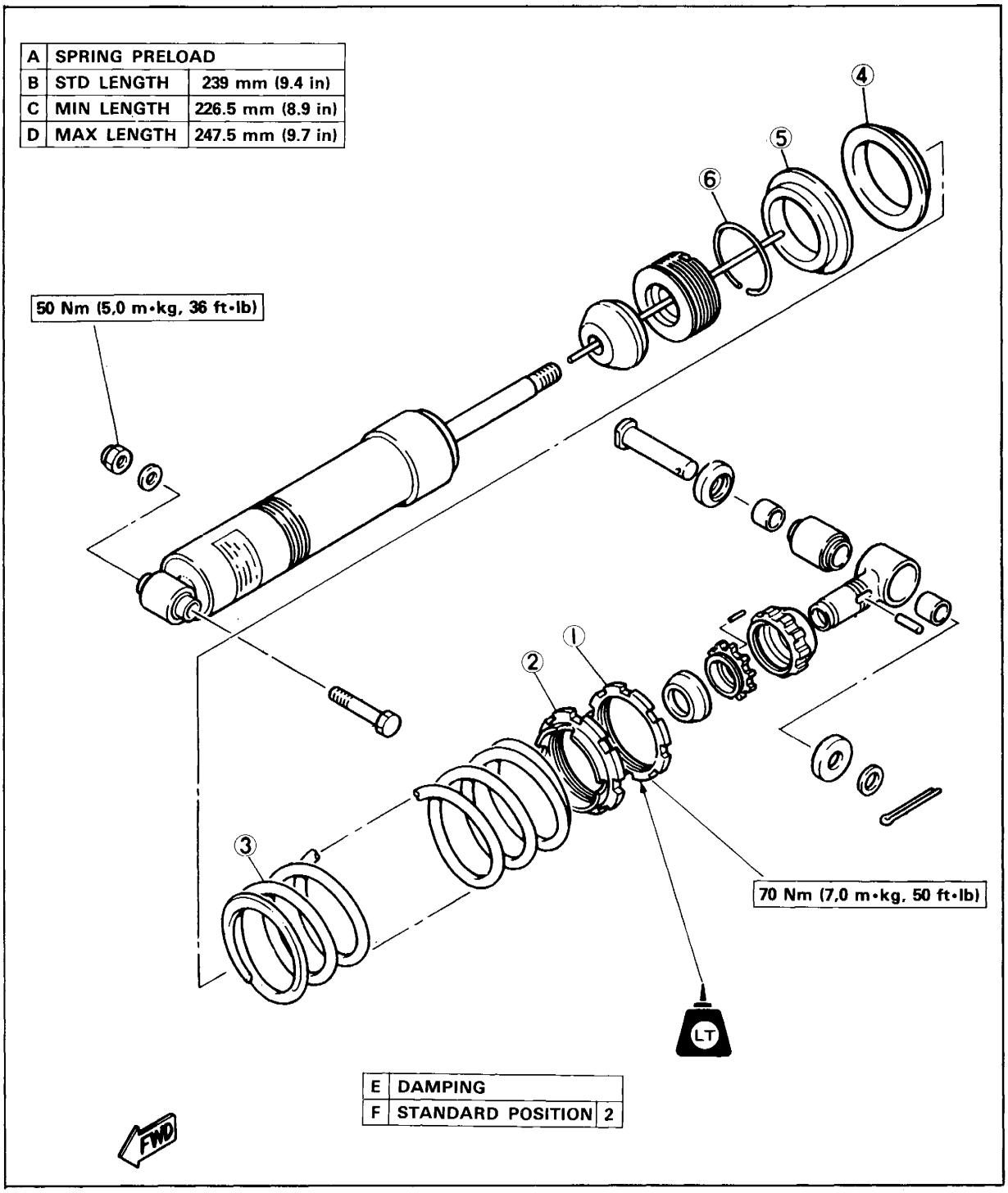
1. Assembly the swingarm by reversing the removal procedures. Torque the bolt to specification.

Tightening Torque:
- Pivot Shaft:
  - 100 Nm (10.0 m·kg, 72 ft·lb)
- Swingarm and Relay Arm:
  - 50 Nm (5.0 m·kg, 36 ft·lb)
- Relay Arm and Relay Arm Connecting Rod:
  - 50 Nm (5.0 m·kg, 36 ft·lb)
- Relay Arm Connecting Rod and Frame:
  - 50 Nm (5.0 m·kg, 36 ft·lb)

2. Using a grease gun, lubricate the pivot points. Refer to page 5-26.

REAR SHOCK ABSORBER

① Locknut
② Adjuster
③ Spring
④ Spring guide
⑤ Spring seat
⑥ Circlip



Handling Notes

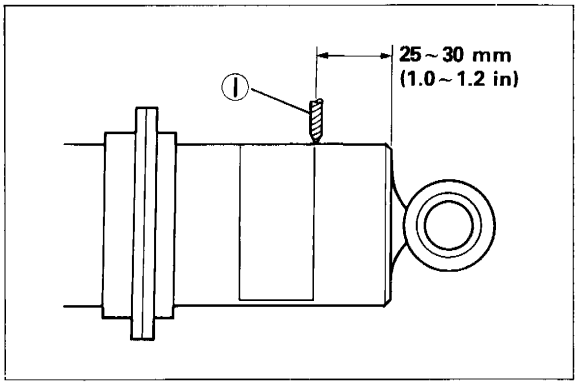
WARNING:

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

1. **Do not tamper with or attempt to open the cylinder assembly.**
2. **Do not subject shock absorber to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**
4. **Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.**
5. **When scrapping the shock absorber, follow the instructions on disposal.**

Notes on Disposal

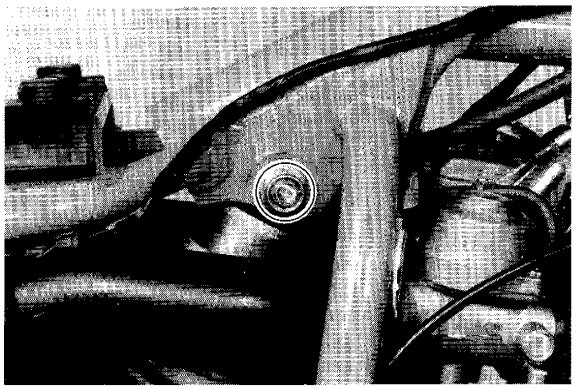
Before disposing the shock absorber, be sure to extract the nitrogen gas. To do so, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the tank at a position 25 ~ 30 mm (1.0 ~ 1.2 in) from the bottom end of the tank. At this time, wear eye protection to prevent eye damage from escaping gas and/or metal chips.



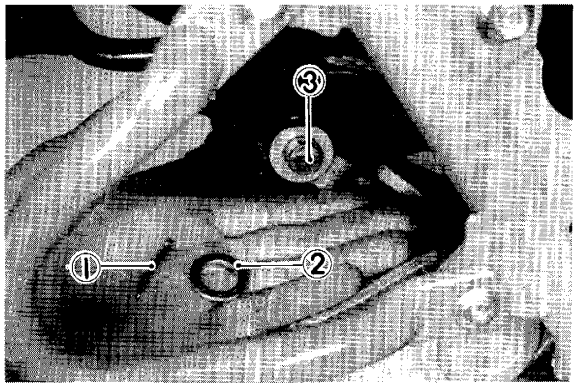
1. Drill
ø2 ~ 3 mm (ø0.08 ~ 0.12 in)

Removal

1. Remove the seat and fuel tank.
2. Remove the rear wheel and chain case.
3. Remove the rear shock absorber top holding bolt.

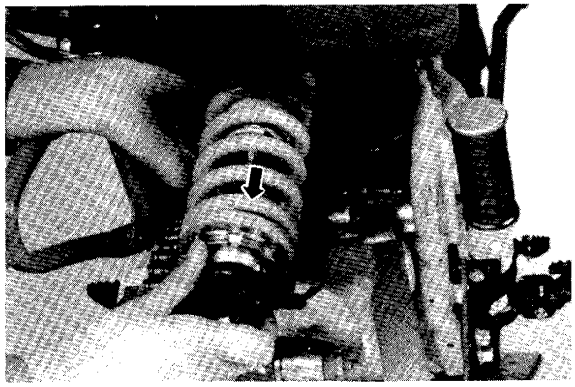


4. Remove the cotter pin, plain washer and holding pin.



1. Cotter pin
2. Plain washer
3. Holding pin

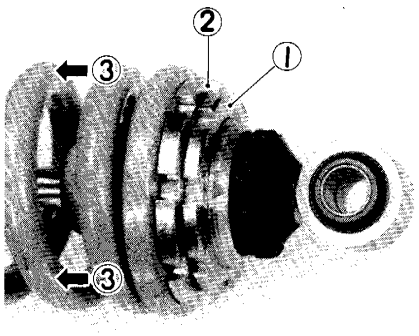
5. Carefully remove the shock absorber from the frame. Then, remove the rubber boot.



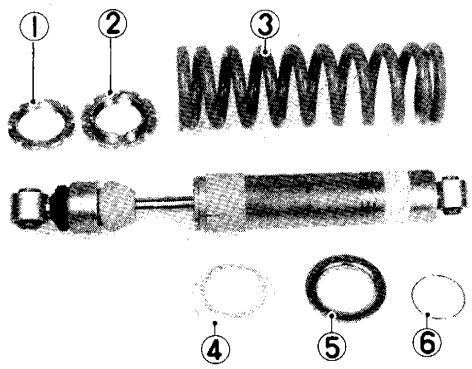
6. Push down the spring. Then, remove the spring retainer and spring.

NOTE:

Before pushing the spring, loosen the lock nut and adjuster. This will make it easy to remove the spring.



1. Locknut 2. Adjuster 3. Push down



1. Locknut
2. Adjuster
3. Spring
4. Spring guide
5. Spring seat
6. Circlip

Inspection

1. Check the rod, and if it is bent or damaged, replace the shock absorer.
2. Check for oil leakage. If oil leakage is evident, replace the shock absorber.
3. By moving the spring, check to see if it has proper damping effect. Slight resistance should be felt on the compression (down) stroke and considerable resistance should be felt on the return (up) stroke.

Reassembly

1. Install the circlip, spring seat, spring guide, spring and adjuster. Turn to set the adjuster.

Standard Length (installed): 239 mm (9.4 in) Minimum Length (intalled): 226.5 mm (8.9 in) Maximum Length (installed): 247.5 mm (9.7 in)

NOTE:

One complete turn of the adjuster will change the preload 1 mm (0.04 in).

CAUTION:

Never attempt to turn the adjsuter beyond the maximum or minimum setting.

2. Install the locknut. Tighten the nut to specification.

NOTE:

Apply LOCTITE® .

Tightening Torque: 70 Nm (7.0 m·kg, 50 ft·lb)

3. Apply grease to the pivot shafts.

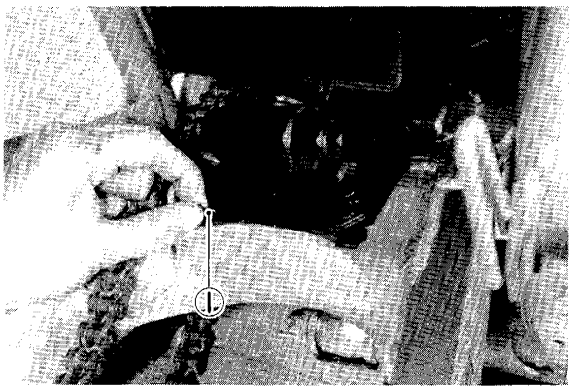
CAUTION:

Wipe off any excessive grease, and avoid getting grease on the brake shoes.

4. Install the rubber boot to the shock absorber. Then, install the shock absorber on the frame.
5. Install the shock absorber top holding bolt to specification.

Tightening Torque: 50 Nm (5.0 m·kg, 36 ft·lb)

6. Install the rubber boot securly to the swing arm.



1. Rubber boot

CABLES AND FITTINGS

Cable Maintenance

NOTE:

See "Maintenance and Lubrication" interval charts. Cable maintenance is primarily concerned with preventing deterioration and providing proper lubrication to allow the cable to move freely within its housing. Cable removal is straightforward and uncomplicated. Removal is not discussed within this section.

WARNING:

Cable routing is very important. For details of cable routing, see the cable routing diagrams at the end of this manual. Improperly routed or adjusted cables may make the motorcycle unsafe for operation.

1. Remove the cable.
2. Check for free movement of the cable within its housing. If movement is obstructed, check for frayed stands or kinking of the cable. If damage is evident, replace the cable.
3. To lubricate the calbe, hold it in a vertical position. Apply lubricant to the uppermost end of the cable. Leave it in the vertical position until the lubricant appears at the bottom. Allow any excess to drain, and reinstall the cable.

NOTE:

Choice of a lubricant depends upon conditions and preferences. However, a Yamaha chain and cable lubricant or its equivalent will perform adequately under most conditions.

Throttle Maintenance

1. Remove the Phillips head screws from the throttle housing assembly and separate the two halves of the housing.
2. Disconnect the cable end from the throttle grip assembly, and remove the grip assembly.
3. Wash all parts in a mild solvent, and check all contact surfaces for burrs or other damage. (Also clean and inspect the right-hand end of the handlebar.)
4. Lubraicate all contact surfaces with a light coat of lithium-base grease and reassemble.

NOTE:

Tighten the housing screws evenly to maintain an even gap between the two halves.

5. Check for smooth throttle operation and quick spring return. Make certain that the housing does not rotate on the handlebar.

NOTE:

The starter lever has been installed on the lever holder with Loctite. When reinstalling the starter lever screw, always use a new screw.

Remove the old Loctite in the lever holder screw hole by using a 6 mm (0.24 in) screw tap.

CHAPTER 6. ELECTRICAL

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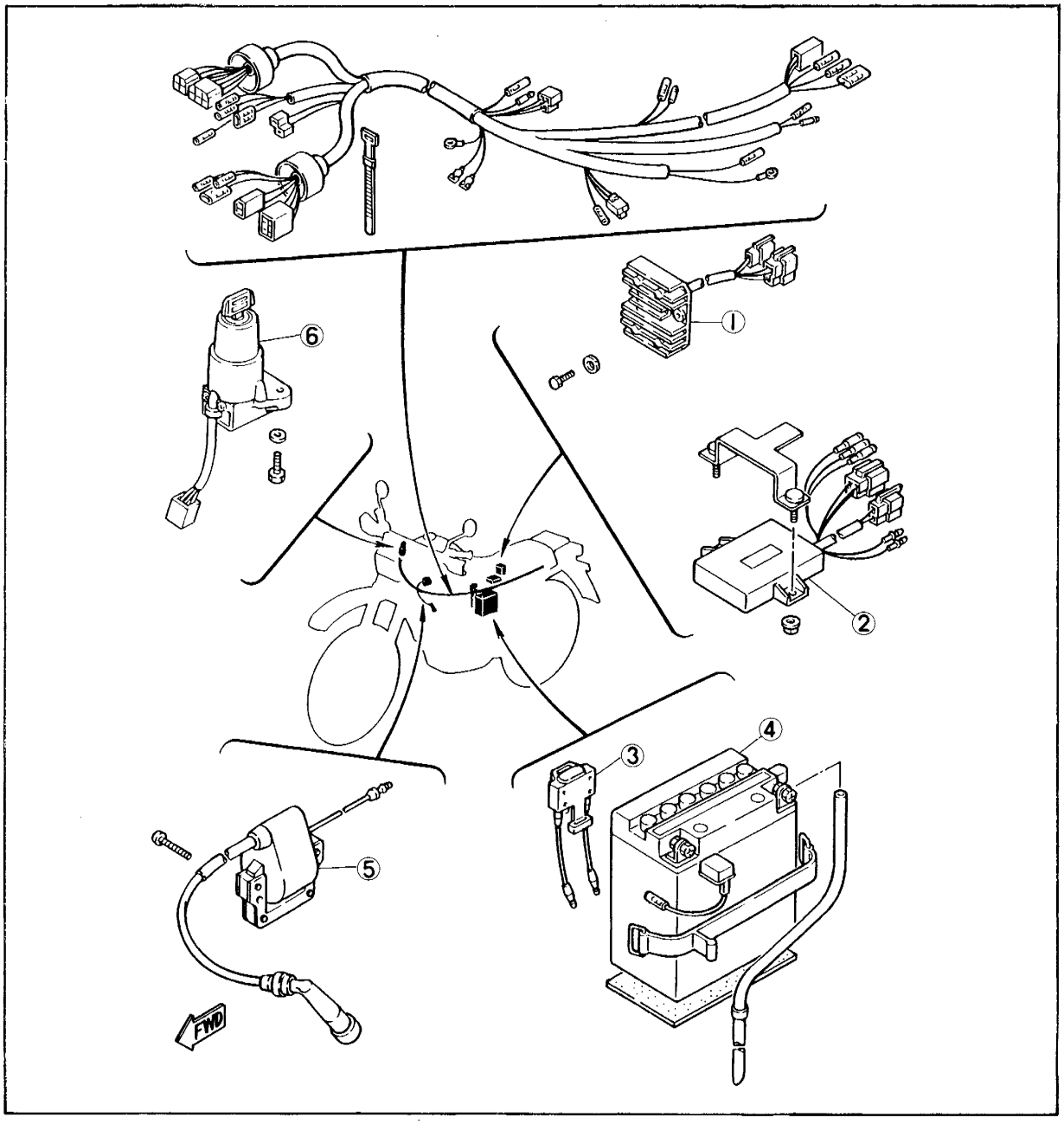
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ELECTRICAL

ELECTRICAL COMPONENTS 1

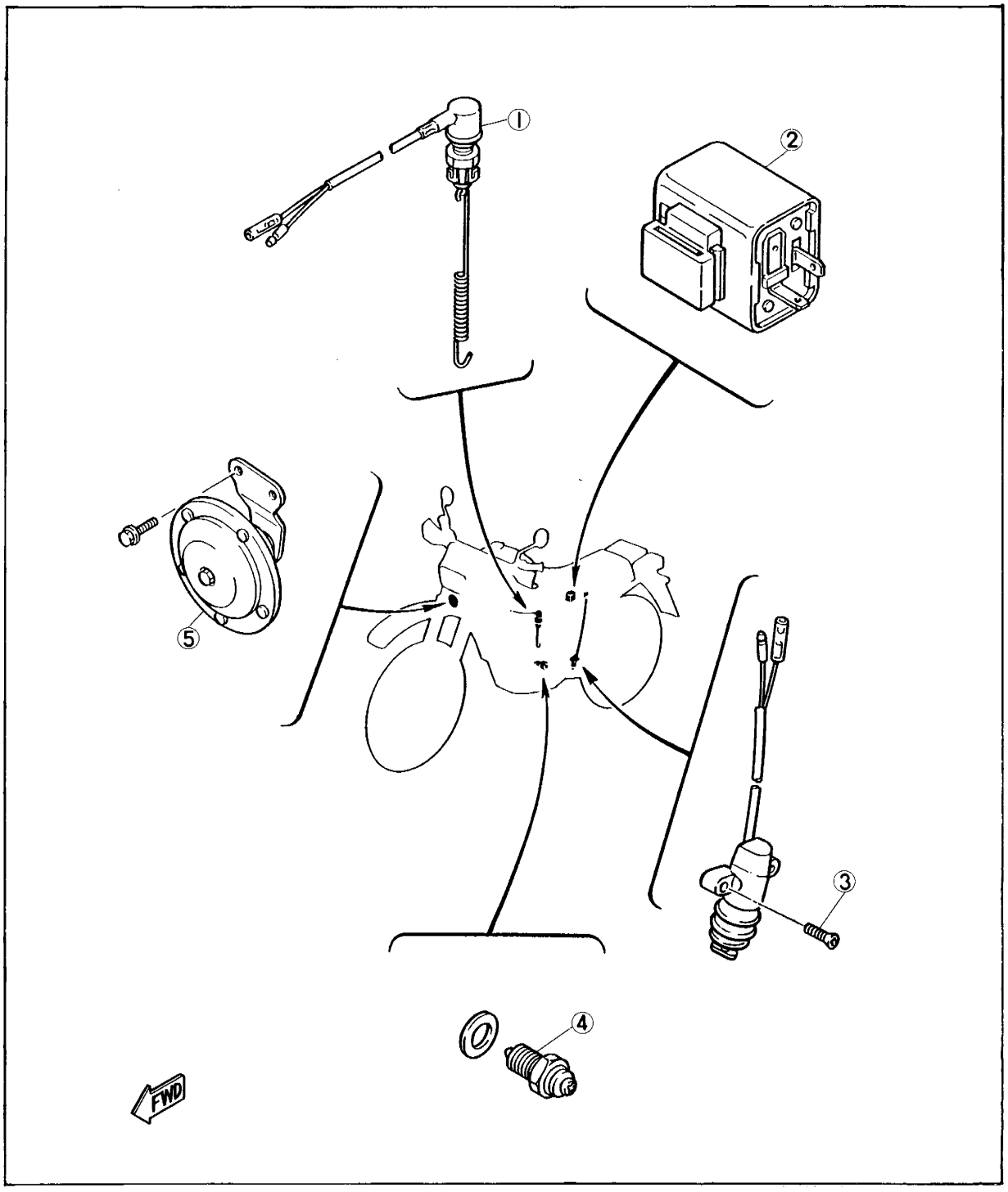
① Rectifier with regulator
② CDI unit
③ Non-fuse breaker
④ Battery
⑤ Ignition coil
⑥ Main switch

SPECIFICATIONS	RESISTANCE
Pickup Coil	110Ω ± 18%
Source Coil	200Ω ± 20%
Charging Coil	0.4Ω ± 50%
Ignition Coil	
(Primary)	0.3Ω ± 10%
(Secondary)	4.3KΩ ± 20%

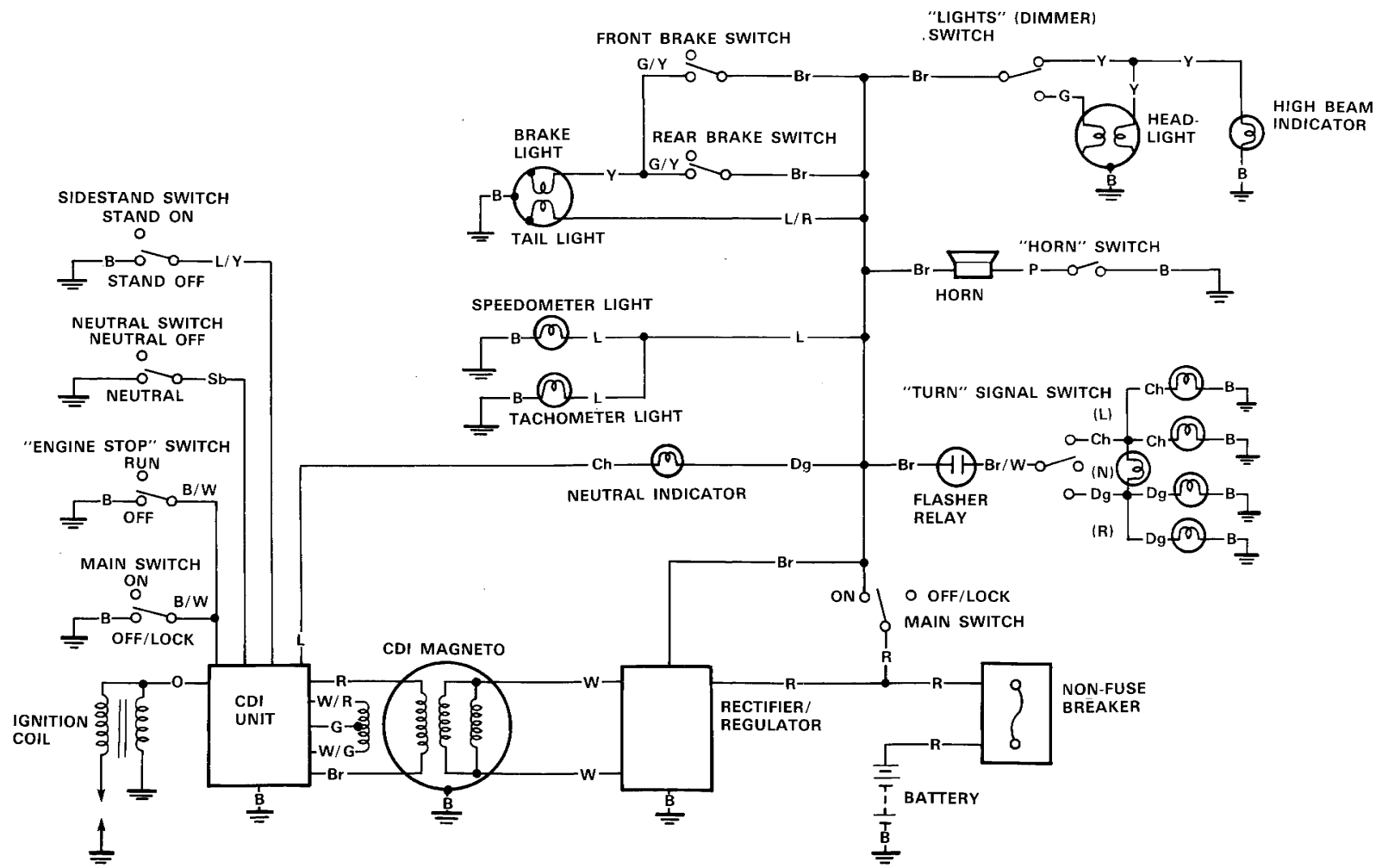


ELECTRICAL COMPONENTS 2

① Rear brake switch
② Flasher relay
③ Sidestand switch
④ Neutral switch
⑤ Horn



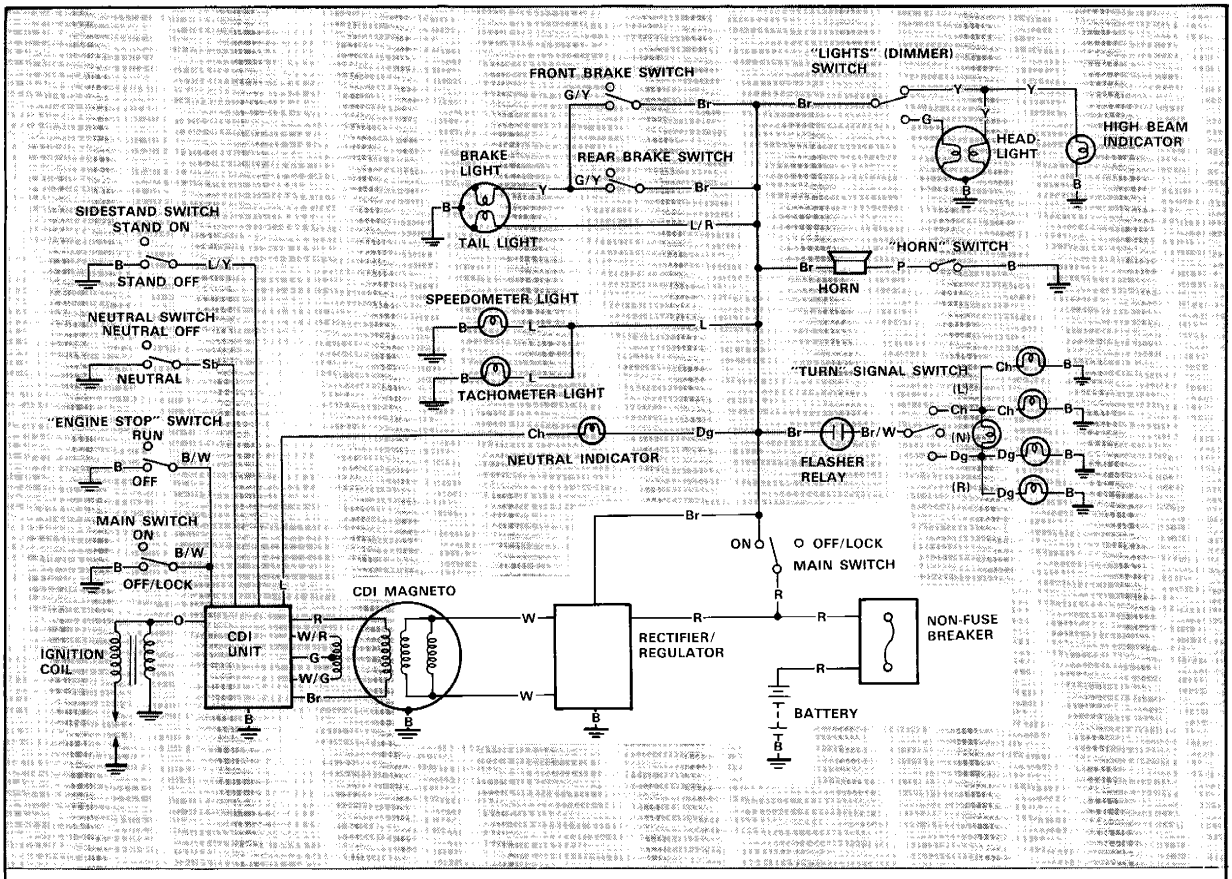
XT600L CIRCUIT DIAGRAM

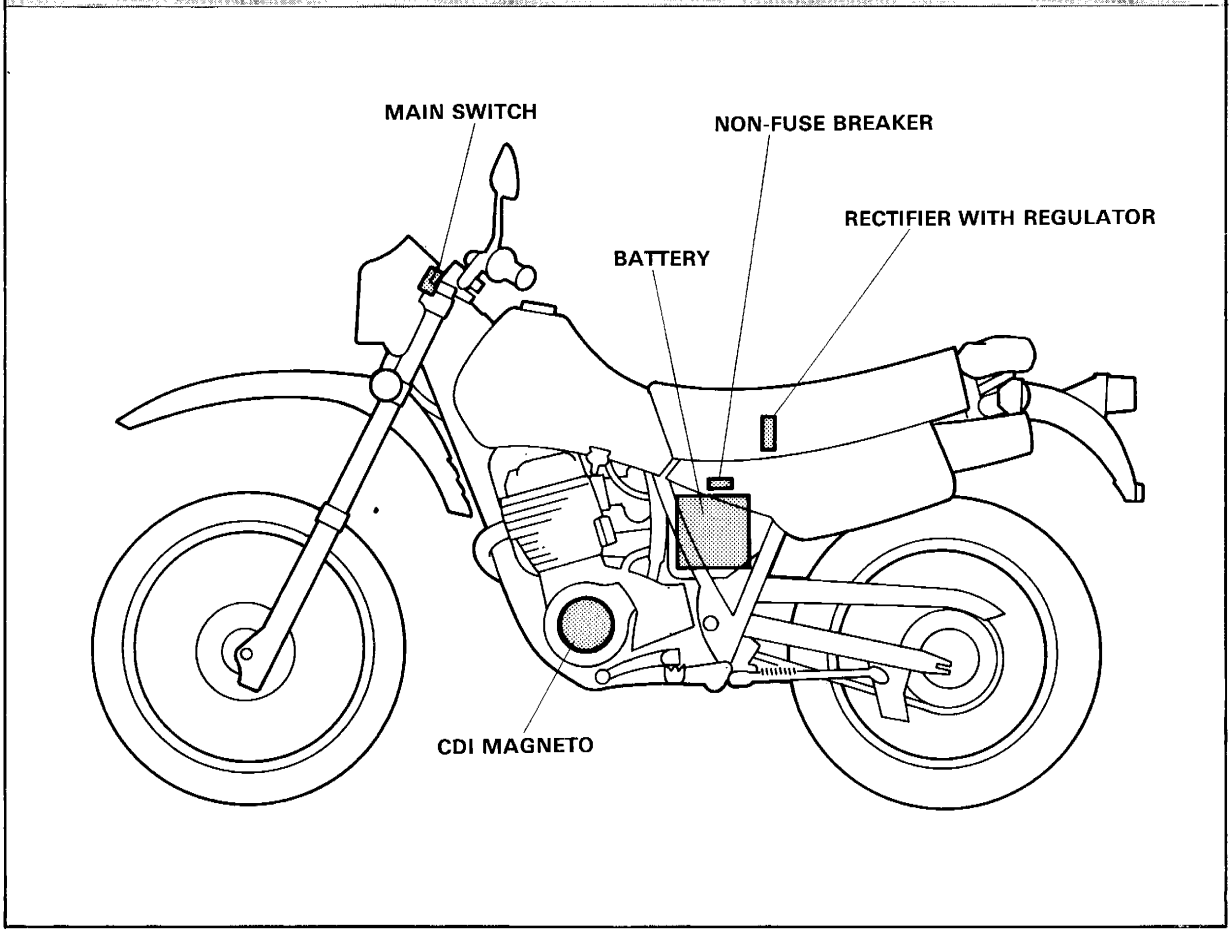


COLOR CODE

R	Red	L	Blue	B/W	Black/White	R/W	Red/White
B	Black	Y	Yellow	Y/R	Yellow/Red	L/B	Blue/Black
Sb	Sky blue	O	Orange	B/Y	Black/Yellow	L/Y	Blue/Yellow
Br	Brown	G	Green	G/Y	Green/Yellow	L/R	Blue/Red
Ch	Chocolate	P	Pink	L/W	Blue/White	W/R	White/Red
Dg	Dark green	W	White	Br/W	Brown/White	W/G	White/Green

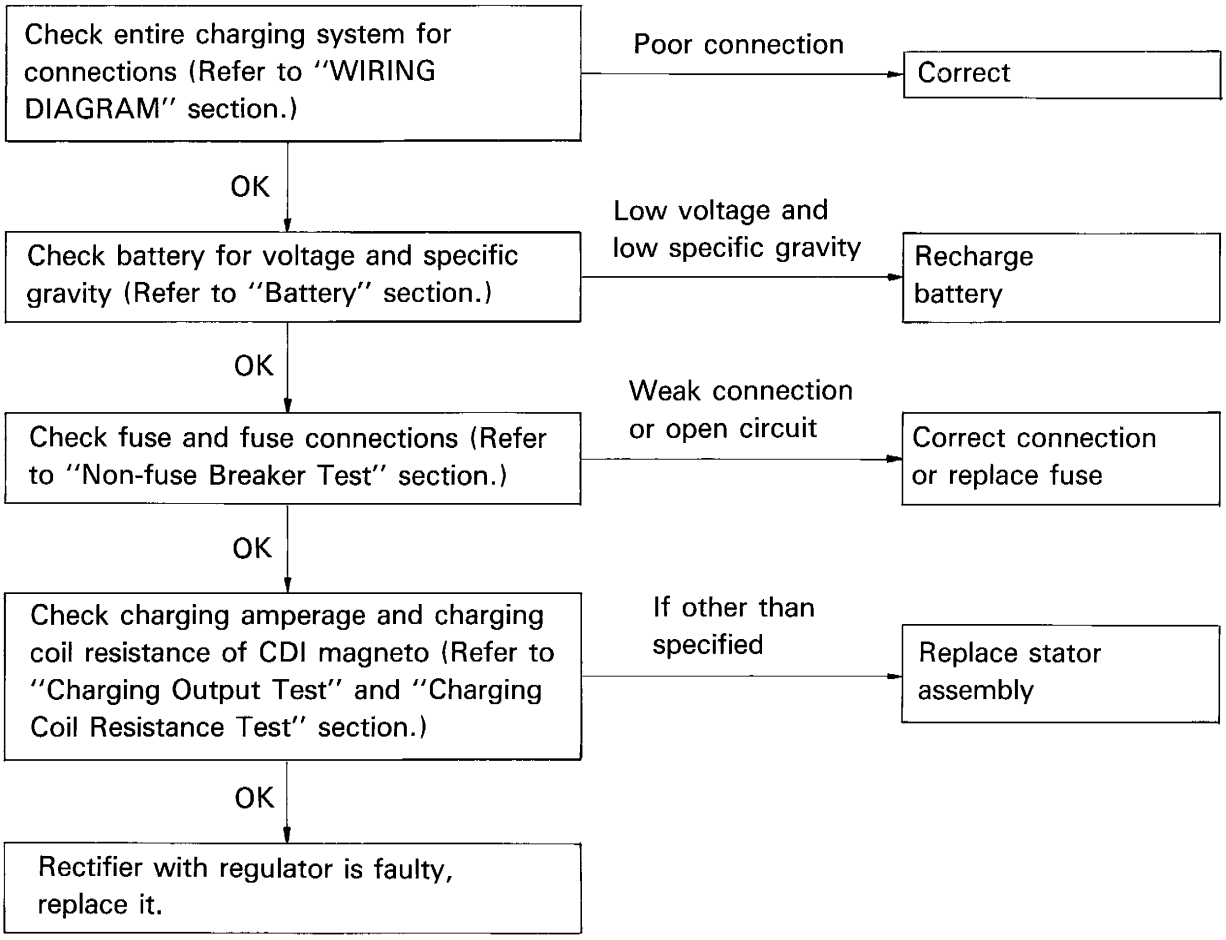
CHARGING SYSTEM





Troubleshooting

If the charging system should become inoperative, the troubleshooting aids will be useful.



Battery

If the battery shows the following defects, it should be replaced:

1. The battery voltage will not rise to a specific value nor will bubbles rise in any cell even after many hours of charging.
2. Sulfation of one or more cells is indicated by the plates turning white or an accumulation of material in the bottom of the cell.
3. Specific gravity readings after a long, slow charge indicate a cell to be lower than any others.
4. Warpage or buckling of plates or insultators is evident.

WARNING:

Battery fluid is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contacat with the skin, eyes, or clothing.
Antidote: EXTERNAL—Flush with water. INTERNAL—Drink large quantities of water or milk. Follow with milk of magnesia, beaten eggs, or vegetable oil. Call physician immediately.
Eyes: Flush with water for 15 minutes, and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

The service life of a battery is usually two to three years. Lack of care, as described below, will shorten the life of the battery:

- Negligence in keeping battery topped off with distilled water.
- Battery left discharged.
- Over-changing with heavy charge.
- Freezing.
- Filling with tap water or sulfuric acid containing impurities.
- Improper charging voltage or current on new battery.

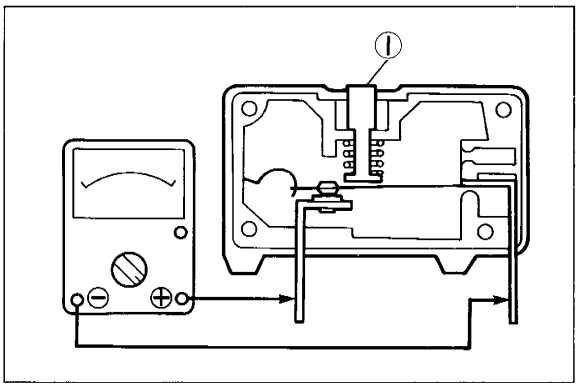
If the motorcycle is not to be used for a long time, remove the battery and have it stored. The following instructions should be observed:

1. Recharge the battery periodically.
2. Store the battery in a cool, dry place.
3. Recharge the battery before reinstallation.

Battery	GM4A-3B or FB4L-B
Electrolyte	Specific gravity: 1,260
Initial charging current	0.4 amp for 10 hours (new battery)
Recharging current	10 hours (or until specific gravity reaches 1,260)
Refill fluid	Distilled water (to maximum level line)
Refill period	Check once per month (or more often, as required)

Non-fuse Breaker Test

1. Remove the non-fuse breaker.
2. Connect the Pocket Tester leads as shown, and set the tester selector to "Ohm X 1" position.
3. Check the fuse for continuity between terminals. If it is not continuity, fuse is broken. Replace the fuse.



1. Circuit is closed

Charging Output Test

NOTE:

The battery must be fully charged when testing the charging output.

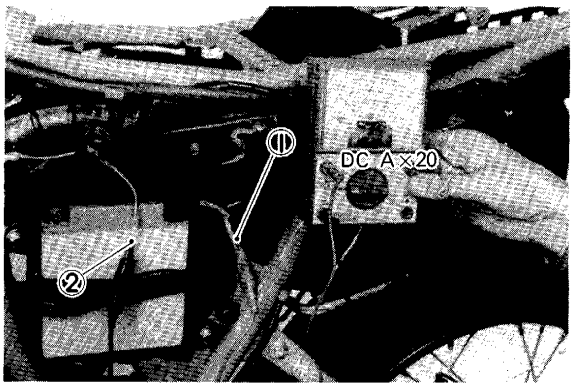
1. Disconnect the positive lead from the battery.
2. Connect the pocket tester leads as shown, and set the tester selector to "DC A X 20" position.
3. Start the engine.

4. Accelerate engine to specifications and check the charging amperage.

CAUTION:

Never disconnect the leads from the battery before stopping the engine.

Charging Amperage:
6.3A or more at 1,500 r/min
10A or less at 5,000 r/min



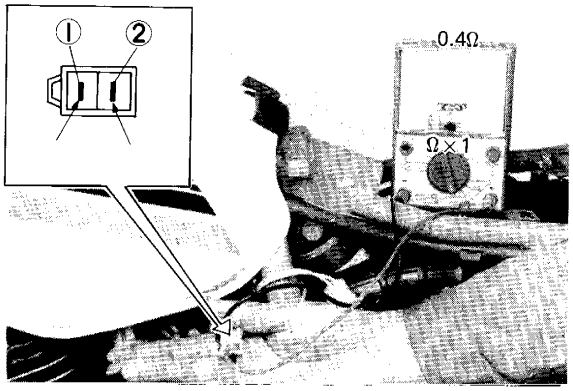
1. Battery positive lead 2. Fuse positive lead

5. If the indicated amperage cannot be reached, then perform the next test.

Charging Coil Resistance Test

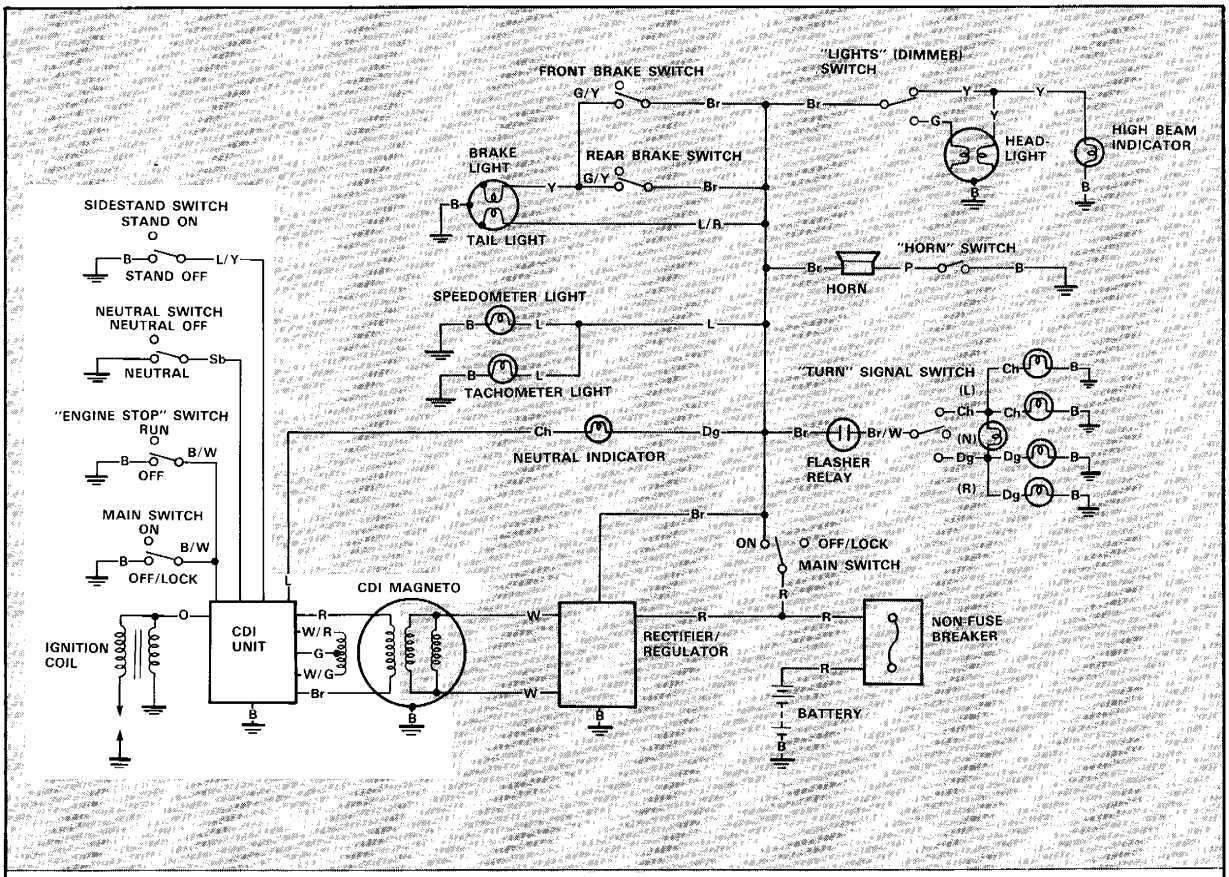
1. Disconnect the 2-pin connector from the CDI magneto.
2. Connect the Pocket Tester leads as shown, and set the tester selector to "Ohm X 1" position.
3. Check the resistance between terminals. If resistance is out of specification, coil is broken. Replace the stator assembly.

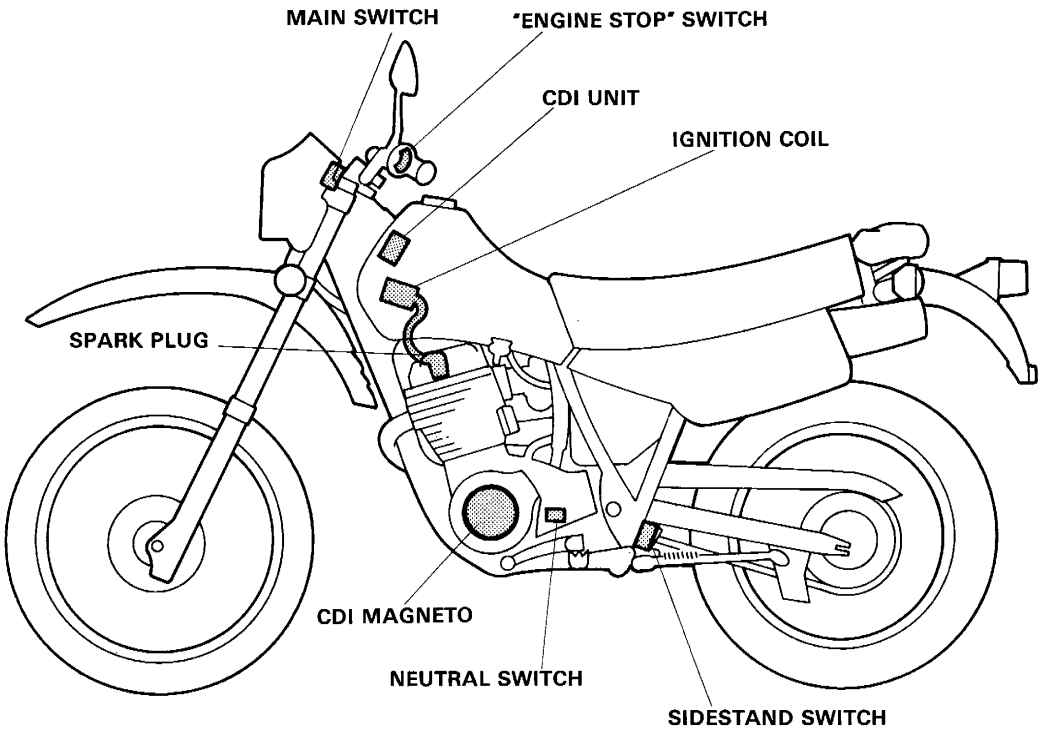
Charging coil resistance (White-White):
0.4Ω ± 50% at 20°C (68°F)



1. White 2. White

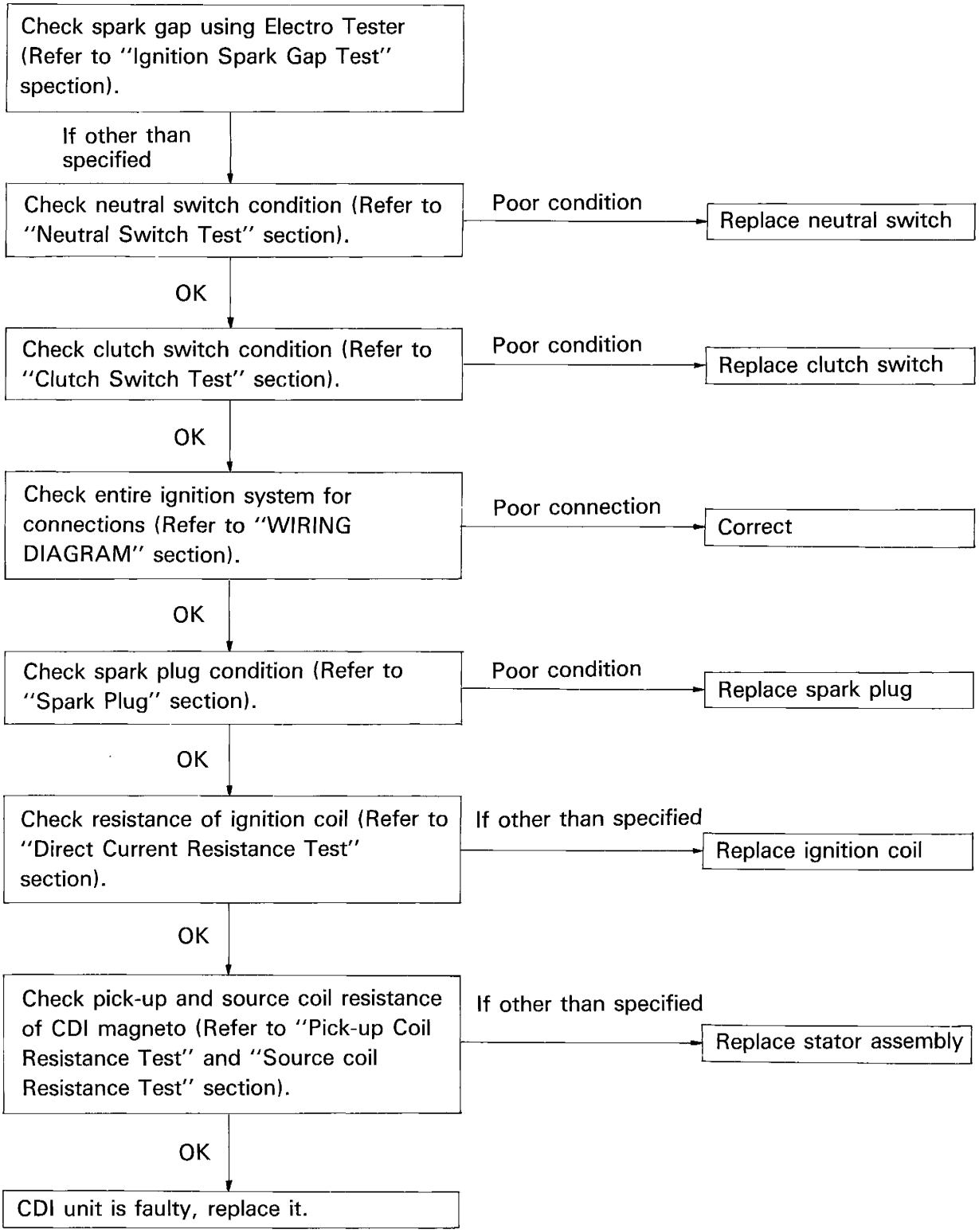
IGNITION SYSTEM





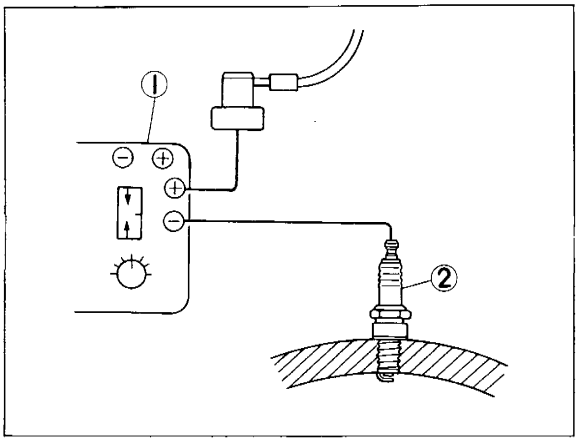
Troubleshooting

If the ignition system should become inoperative (No spark or intermittent spark), the troubleshooting aids will be useful.



Ignition Spark Gap Test

1. Disconnect the high tension cord from the spark plug.
2. Connect the Electro Tester as shown.



1. Electro Tester 2. Spark plug

3. Start the engine, and increase the spark gap until misfire occurs (Test at various revolution between 1,000 ~ 6,500 r/min).

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)

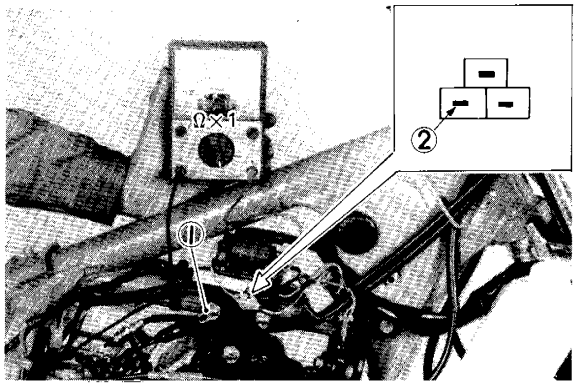
4. If the indicated spark gap cannot be reached, then perform the next test.

Neutral Switch Test

1. Disconnect the 3-pin connector from the wire harness.
2. Connect the Pocket Tester leads as shown, and set the tester selector to "Ohm X 1" position.
3. Check the neutral switch condition as tabulated. If the checkup is bad condition, replace the neutral switch.

Transmission Condition	Checkup		
	Good	Bad	Bad
In neutral	○	○	×
In gear	×	○	×

○: Continuity ×: Discontinuity



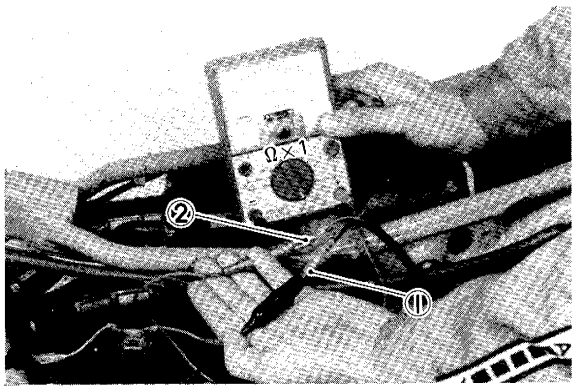
1. Ground 2. Sky blue

Sidestand Switch Test

1. Disconnect the two leads (Blue/Yellow and Black) from the wire harness.
2. Connect the Pocket Tester leads as shown, and set the tester selector to "Ohm X 1" position.
3. Check the sidestand switch condition as tabulated. If the checkup is bad condition, replace the clutch switch.

Sidestand Condition	Checkup		
	Good	Bad	Bad
Up	○	○	×
Down	×	○	×

○: Continuity ×: Discontinuity



1. Black 2. Blue/Yellow

Spark Plug

The life of a spark plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with new ones of the specified type. It is actually economical to install new plugs often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

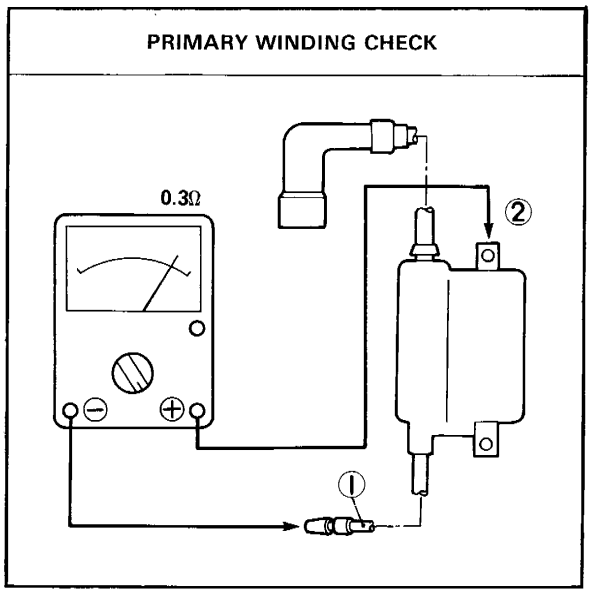
1. Inspection
   a. Inspect and clean at the specified intervals and replace as required.
   b. Clean the electrodes of carbon, and adjust the electrode gap to the specification.
2. Installation
   Be sure to use a spark plug with the correct reach, electrode gap, and heat range to avoid overheating, fouling, or piston damage.

Type: DP8EA-9 (NGK) or
X24EP-U9 (ND)
Electrode Gap:
0.8 ~ 0.9 mm (0.031 ~ 0.035 in)
Tightening Torque:
18 Nm (1.8 m·kg, 13 ft·lb)

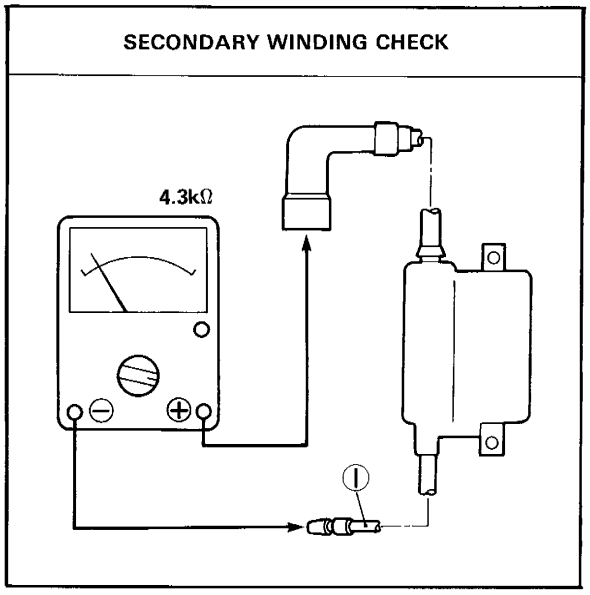
Direct Current Resistance Test

1. Remove the fuel tank.
2. Disconnect the ignition coil leads from the wire harness and spark plug.
3. Connect the Pocket Tester as shown, and set the tester selector to "Ohm X 1" (For primary winding resistane check) or "Ohm X 100" (For secondary winding coil resistance check) position.
4. Check the resistance between terminals. If resistance are out of specification, coil is broken. Replace the ignition coil.

Primary Winding Resistance:
0.3Ω ± 25% at 20°C (68°F)
Secondary Winding Resistance:
4.3Ω ± 20% at 20°C (68°F)



1. Orange 2. Ground

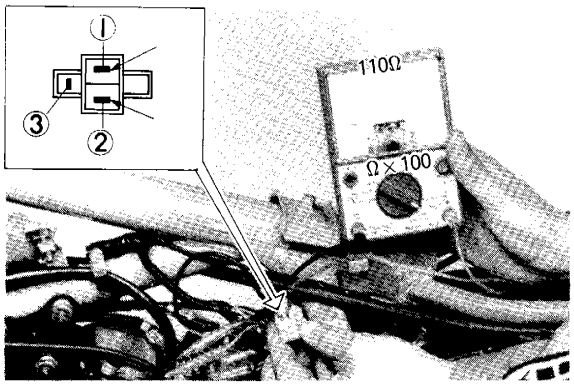


1. Orange

Pick-up Coil Resistance Test

1. Disconnect the 3-pin connector from the CDI magneto.
2. Connect the Pocket Tester as shown, and set the tester selector to "Ohm X 100" position.
3. Check the resistance between terminals. If resistacne is out of specification, coil is broken. Replace the pick-up coil assembly.

Pick-up Coil Resistance:
110Ω ± 18% at 20°C (68°F)

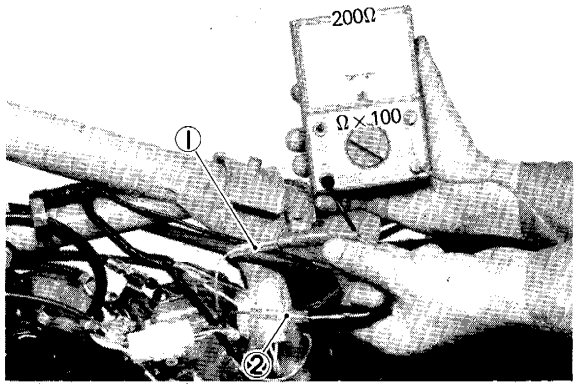


1. White/Red 2. White/Green 3. Green

Source Coil Resistance Test

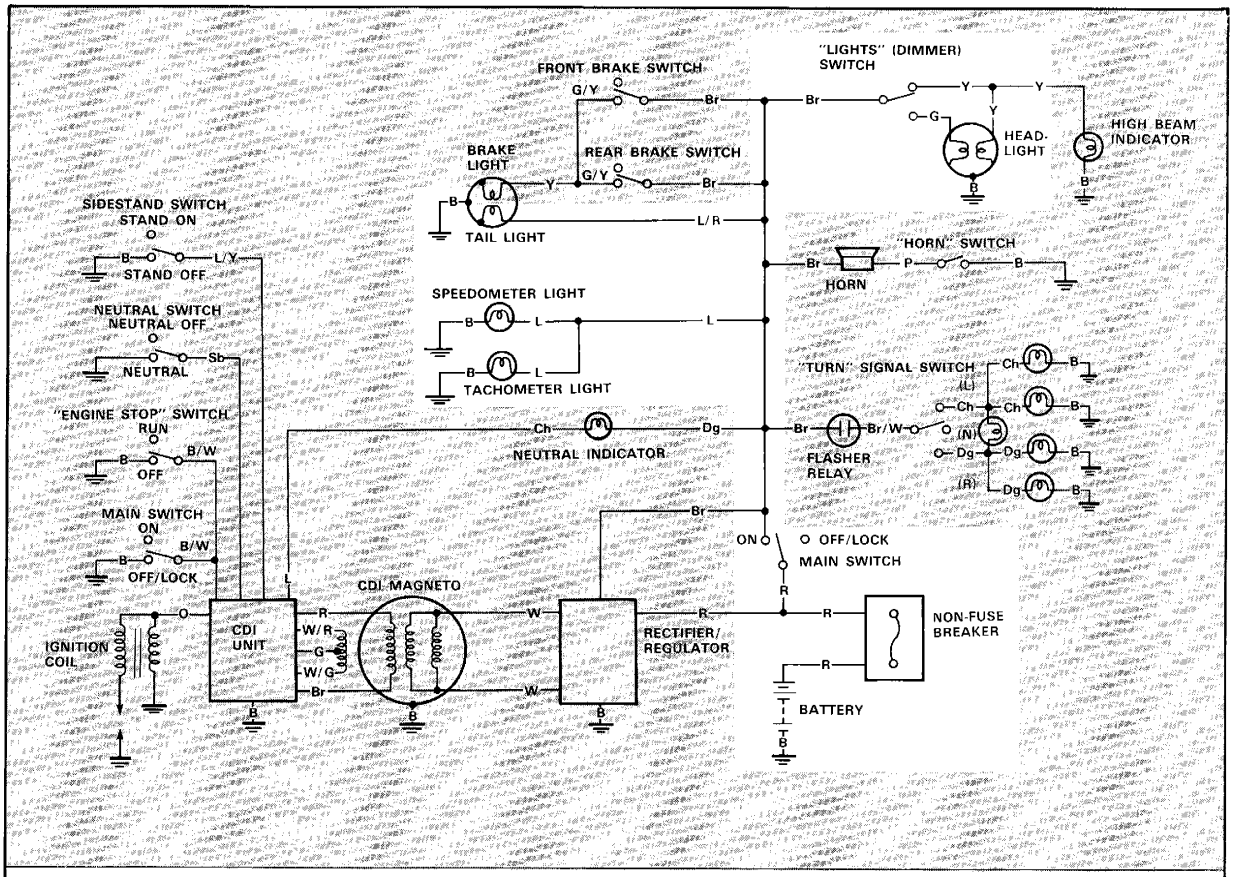
1. Disconnect the two leads (Brown and Red) from the CDI magneto.
2. Connect the Pocket Tester as shown, and set the tester selector to "Ohm X 100" position.
3. Check the resistance between terminals. If resistance is out of specification, coil is broken. Replace the stator assembly.

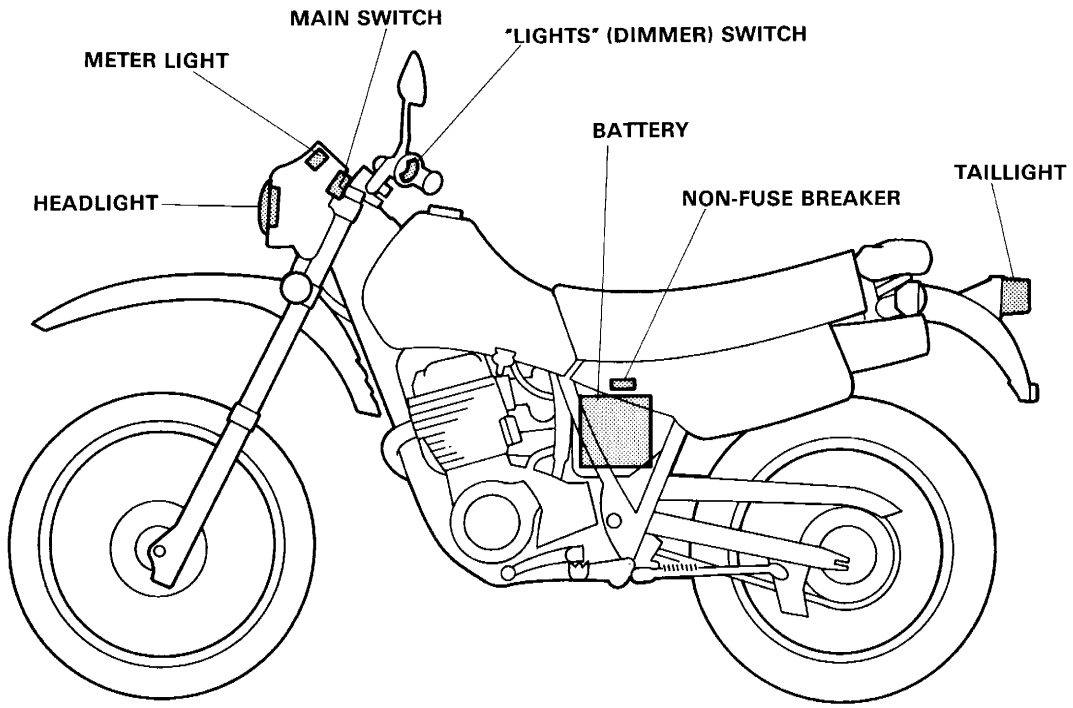
Source Coil Resistance:
200Ω ± 20% at 20°C (68°F)



1. Brown 2. Red

LIGHTING SYSTEM





Lighting System Tests and Checks

The battery provides power for operation of the headlight, taillight, and meter lights. If none of the above operates, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery electrolyte, or a defective charging system. See "CHARGING SYSTEM" for checks of the battery and charging system.

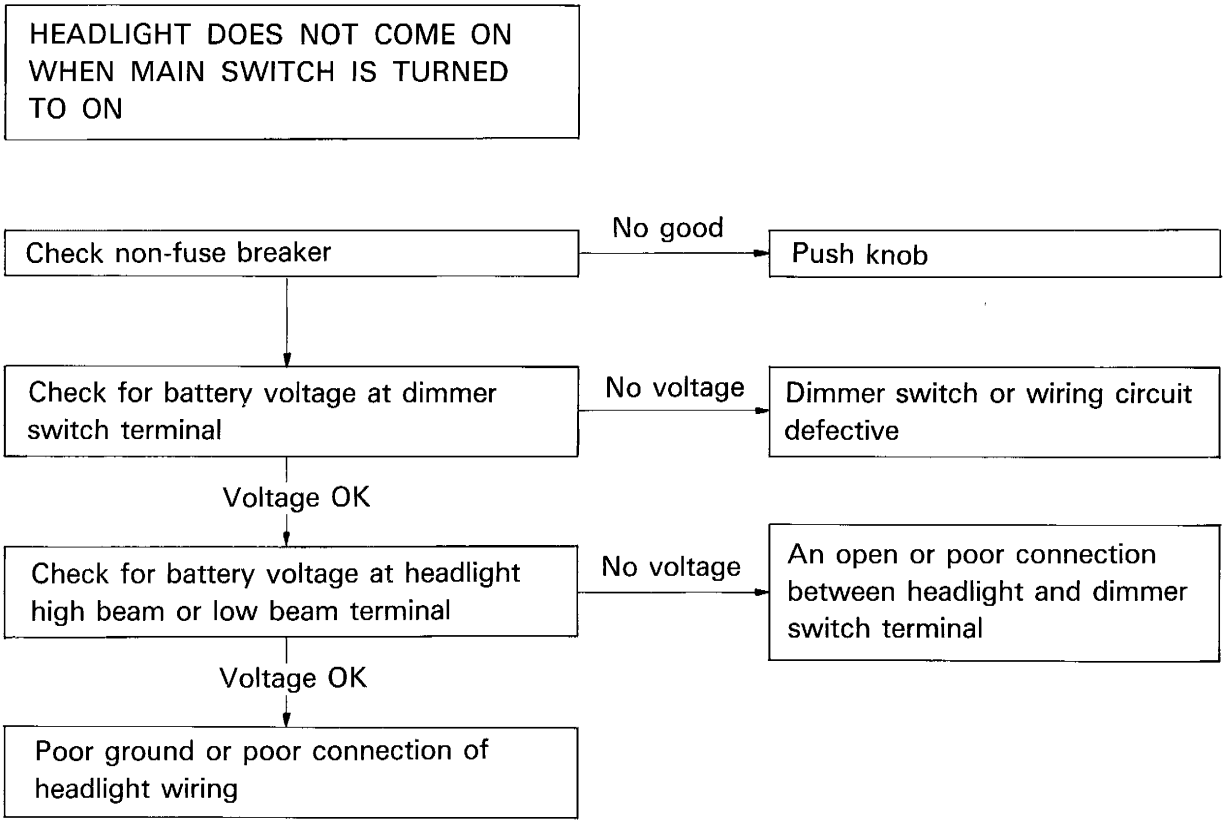
1. Headlight check.

NOTE:

When the main switch is turend to ON, the headlight, meter lights, and taillight come on.

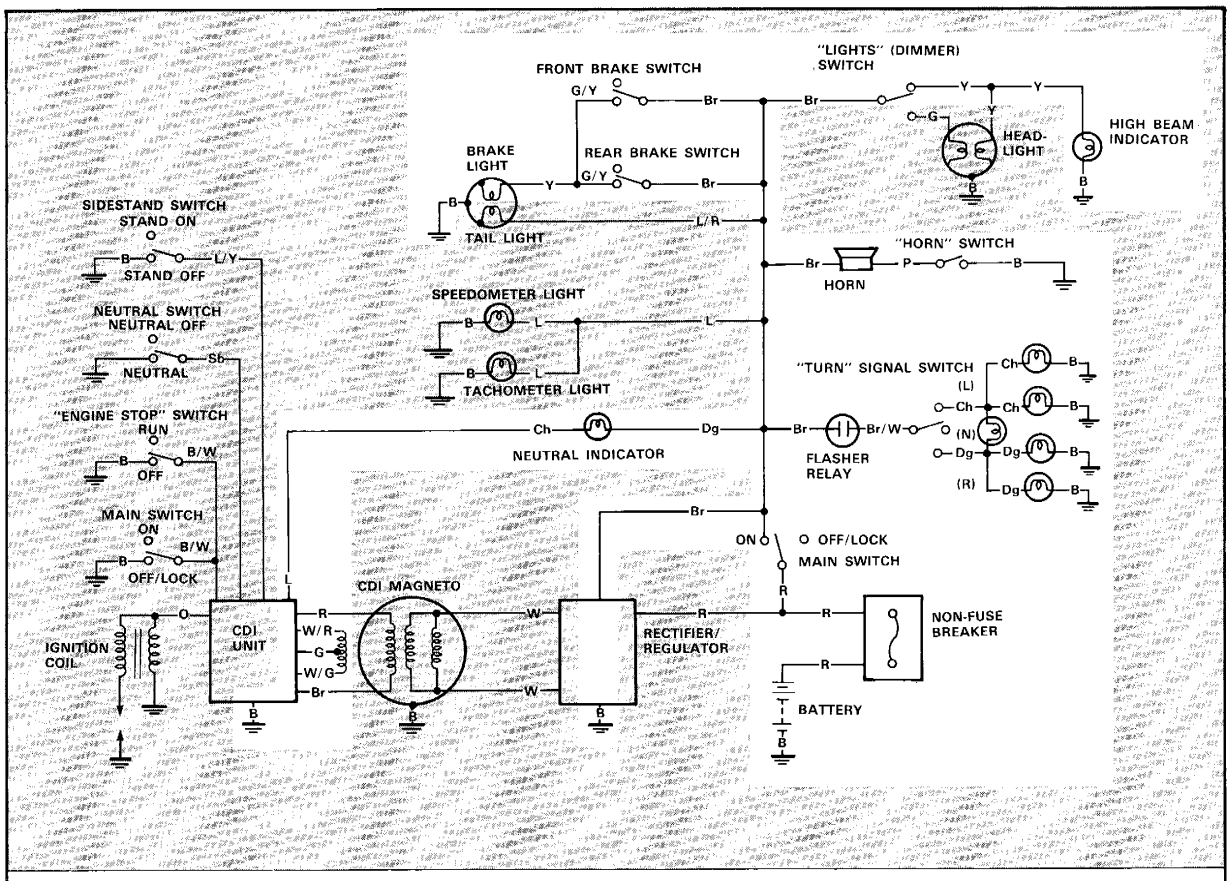
NOTE:

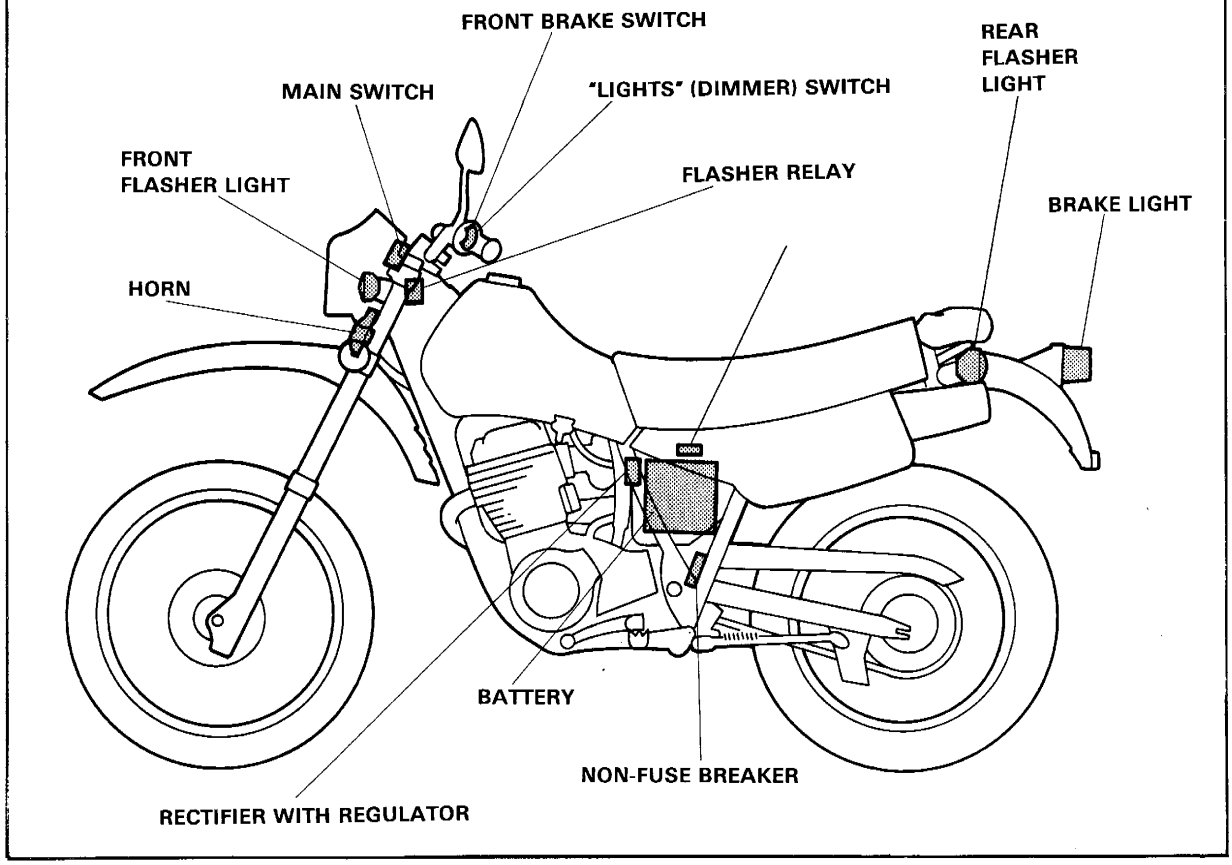
Check the headlight bulb filament first before performing the following check.



2. Taillight does not work:
   - Check the bulb.
   - Check for 12V on the L/R (Blue/Red) lead.
   - Check for ground on B (Black) lead to tail/brake light.

SIGNAL SYSTEM





Signal System Tests and Checks

The battery provides power for operation of the horn, brake light, indicator lights, and flasher light. If none of the above operates, always check the battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery electrolyte, or a defective charging system. See "CHARGING SYSTEM" for checks of the battery and charging system. Alsao check the non-fuse breaker. If the circuit is open, push the knob down.

Horn does not work:

1. Check for 12V on the Br (Brown) lead to the horn.
2. Check for good grounding of the horn (Pink lead) when the horn button is pressed.

Brake light does not work:

1. Check the bulb.
2. Check for 12V on the Y (Yellow) lead to the brake light with brake pedal depressed.
3. Check for 12V on the Br (Brown) lead to each brake light switch (front brake and rear brake switches).

Flasher light(s) do not work:

1. Check the bulb.
2. Right circuit:

a. Check for 12V on the Dg (Dark green) lead to the light.
b. Check for ground on the B (Black) lead to the light assembly.

3. Left circuit:

a. Check for 12V on the dark Br (Brown) lead to the light.
b. Check for ground on the B (Black) lead to the light assembly.

4. right and left circuits do not work:

a. Check for 12V on the Br/W (Brown/White) lead to the flasher switch on the left handlebar.
b. Check for 12V on the Br (Brown) lead to the flasher relay.
c. Replace the flasher relay.
d. Replace the flasher switch.

Neutral light does not work:

1. Check the bulb.
2. Check for 12V on the Sb (Sky blue) lead to the neutral switch.
3. Replace the neutral switch.

Switches

Switches may be checked for continuity with a Pocket Tester on the "Ohms X 1" scale.

1. Main switch

Switch Position	Lead Color				
	B/W	B	B	Br	L/R
ON			○	○	○
OFF	○	○			
LOCK	○	○			
P (parking)	○	○	○		○

2. "ENGINE STOP" switch

Switch Position	Lead Color	
	B/W	B
RUN		
OFF	○	○

3. "LIGHT" (Dimmer) switch

Switch Position	Lead Color		
	Y	Br	G
HI	○	○	
LO		○	○

4. "TURN" signal switch

Switch Position	Lead Color		
	Dg	Br/W	Ch
B	○——○		
N			
L		○——○	

5. "HORN" switch

Switch Position	Lead Color	
	P	B
PUSH	○—— ——○	
OFF		

CHAPTER 7. APPENDICES

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APPENDICES

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

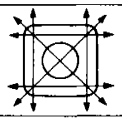
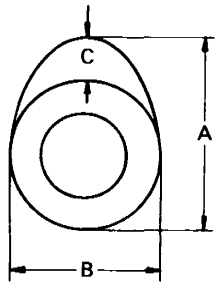
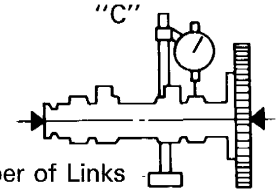
Model	XT600L/XT600LC
Model Code Number	XT600L: 49N XT600LC: 49R
Engine Starting Number	XT600L: 49N-000101 XT600LC: 49R-000101
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 2,190 mm (86.2 in) 845 mm (33.3 in) 1,190 mm (46.9 in) 860 mm (33.9 in) 1,440 mm (56.7 in) 260 mm (10.2 in)
Basic Weight: With Oil and Full Fuel Tank	 XT600L: 148 kg (326 lb) XT600LC: 149 kg (329 lb)
Minimum Turning Radius	2,200 mm (86.6 in)
Engine: Engine Type Cylinder Arrangement Displacement Bore × Stroke Compression Ratio Compression Pressure Starting System	 4-stroke, gasoline, SOHC, 4-valve Single cylinder 595 cm³ (36.3 cu.in) 95.0×84.0 mm (3,740×3,307) 8.5 : 1 1,079 kPa (11 kg/cm², 156 psi) Kick starter
Lubrication System	Dry sump
Oil Type or Grade: Engine Oil	 Yamalube 4-cycle oil or SAE 20W40 type SE motor oil
Engine Oil Capacity: Periodic Oil Change With Oil Filter Replacement Total Amount Oil Tank	 1.9 L (1.7 Imp qt, 2.0 US qt) 2.0 L (1.8 Imp qt, 2.1 US qt) 2.4 L (2.1 Imp qt, 2.5 US qt) 1.7 L (1.5 Imp qt, 1.8 US qt)
Air Filter	Wet type element
Fuel: Type Tank Capacity Reserve Amount	 Regular gasoline 11.0 L (2.4 Imp gal, 2.9 US gal) 2 L (0.4 Imp gal, 0.5 US gal)
Carburetor: Type/Manufacturer	 Y27PV/TEIKEI
Spark Plug: Type/Manufacturer Gap	 DP8EA-9 (NGK) or X24EP-U9 (ND) 0.8 ~ 0.9 mm (0.031 ~ 0.035 in)
Clutch Type	Wet, multiple-disc

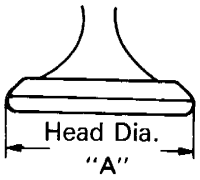
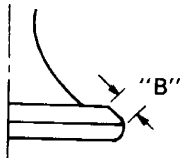
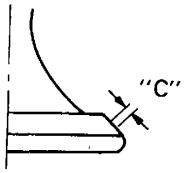
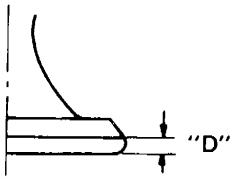
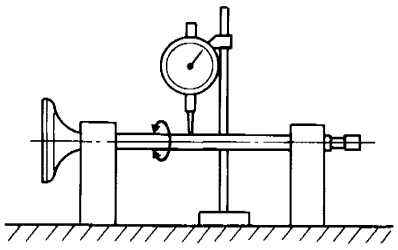
Model	XT600L/XT600LC					
Transmission:						
Primary Reduction System	Spar gear					
Primary Reduction Ratio	74/31 (2.387)					
Secondary Reduction System	Chain drive					
Secondary Reduction Ratio	42/15 (2.800)					
Transmission Type	Constant mesh, 5-speed					
Operation	Left foot operation					
Gear Ratio:						
1st	31/12 (2.387)					
2nd	27/17 (1.588)					
3rd	24/20 (1.200)					
4th	21/22 (0.954)					
5th	21/27 (0.777)					
Chassis:						
Frame Type	Diamond					
Caster Angle	28°					
Trail	107 mm (4.21 in)					
Tire:						
Type	With tube					
Size (F)	3.00S21 - 4PR					
Size (R)	4.60S18 - 4PR					
Tire Pressure (Cold tire):	Front			Rear		
*Load is the total weight of cargo, rider, passenger, and accessories.	kPa	kg/cm²	psi	kPa	kg/cm²	psi
Up to 90kg (198 lb) load*	147	1.5	22	147	1.5	22
90 kg (198 lb) load* ~ 159 kg (351 lb) load*	147	1.5	22	177	1.8	26
High-speed Riding	147	1.5	22	147	1.5	22
Off-road Riding	98.1	1.0	14	98.1	1.0	14
Brake:						
Front Brake Type	Single hydraulic disc					
Operation	Right hand operation					
Rear Brake Type	Drum brake					
Operation	Right foot operation					
Suspension:						
Front Suspension	Telescopic fork (Pneumo-mechanical)					
Rear Suspension	Swingarm (Monocross suspension)					
Shock Absorber:						
Front Shock Absorber	Air & Coil spring, Oil damper					
Rear Shock Absorber	Gas & Coil spring, Oil damper					
Wheel Travel:						
Front Wheel Travel	255 mm (10.0 in)					
Rear Wheel Travel	235 mm (9.3 in)					
Electrical:						
Ignition System	C.D.I. Magneto					
Generator System	A.C. generator					
Battery Type or Model	GM4A-3B or FB4L-B					
Battery Capacity	12V 4AH					
Headlight Type	Bulb type (HALOGEN)					

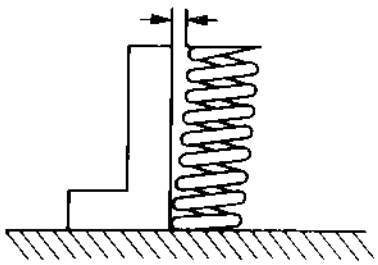
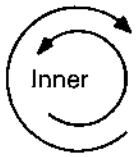
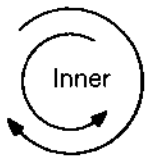
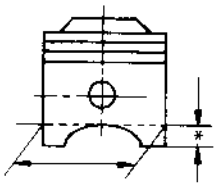
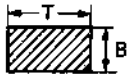
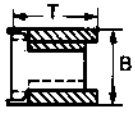
Model	XT600L/XT600LC
Bulb Wattage/Quantity:	
Headlight	60W/55W
Tail/Brake Light	8W/27W
Flasher Light	27W×4
Meter Lighr	3.4W×2
Indicator light Wattage/Quantity:	
"NEUTRAL"	3.4W
"HIGH BEAM"	3.4W
"TURN"	3.4W

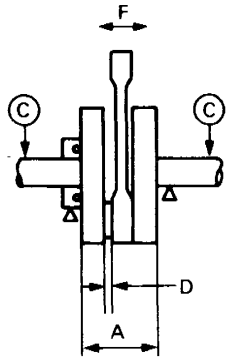
II. MAINTENANCE SPECIFICATIONS

A. Engine

Model	XT600L/XT600LC
Cylinder Head Warp Limit 	<0.03mm (0.0012 in)> *Lines indicate straightedge measurement.
Cylinder: Bore Size Taper Limit Out-of-Round Limit	$95^{+0.02}_{-0.03}$ mm ($3.7402^{+0.0008}_{-0.0012}$ in) <0.05 mm (0.0020 in)> <0.01 mm (0.0004 in)>
Camshaft: Drive Method Cam Cap Inside Diameter Camshaft Outside Diameter <Cap Clearance Limit> Cam Dimensions Intake "A" <Limit> "B" <Limit> "C"  Exhaust "A" <Limit> "B" <Limit> "C" Camshaft Runout Limit  Cam Chain Type/Number of Links Cam Chain Adjustment Method	Chain (Left) $23^{+0.021}_{0}$ mm ($0.9055^{+0.0008}_{0}$ in) $23^{-0.020}_{-0.033}$ mm ($0.9055^{-0.0008}_{-0.0012}$ in) <0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)> 36.52 ~ 36.62 mm (1.438 ~ 1.442 in) <36.42 mm (1.433 in)> 30.01 ~ 30.11 mm (1.182 ~ 1.185 in) <28.91 mm (1.138 in)> 6.51 mm (0.256 in) 36.70 ~ 36.80 mm (1.445 ~ 1.449 in) <36.60 mm (1.441 in)> 30.07 ~ 30.17 mm (1.184 ~ 1.188 in) <28.97 mm (1.141 in)> 6.63 mm (0.261 in) <0.03 mm (0.001 in)> 75-010/126 Links Automatic
Rocker Arm/Rocker Arm Shaft: Bearing Inside Diameter <Limit> Shaft Outside Diameter <Limit> Arm-to-shaft Clearance	$12^{+0.018}_{0}$ mm ($0.4724^{+0.0007}_{0}$ in) <12.05 mm (0.4744 in)> $12^{+0.009}_{-0.024}$ mm ($0.4724^{-0.0004}_{-0.0009}$ in) <11.95 mm (0.4705 in)> 0.009 ~ 0.042 mm (0.0004 ~ 0.0017 in)
Valve, Valve Seat, Valve Guide: Valve Clearance (Code) IN. EX.	0.07 ~ 0.12 mm (0.0028 ~ 0.0047 in) 0.12 ~ 0.17 mm (0.0047 ~ 0.0067 in)

Model		XT600L/XT600LC
Valve Dimensions:		
  Face Width		 Seat Width  Margin Thickness
"A" Head Dia.	IN.	36.0 ± 0.1 mm (1.417 ± 0.004 in)
	EX.	31.0 ± 0.1 mm (1.220 ± 0.004 in)
"B" Face Width	IN.	2.26 mm (0.089 in)
	EX.	2.26 mm (0.089 in)
"C" Seat Width Limit	IN.	<1.1 ± 0.1 mm (0.043 ± 0.004 in)>
	EX.	<1.1 ± 0.1 mm (0.043 ± 0.004 in)>
"D" Margin Thickness Limit		
	IN.	<1.2 ± 0.2 mm (0.047 ± 0.008 in)>
	EX.	<1.0 ± 0.2 mm (0.039 ± 0.008 in)>
Stem Outside Diameter		
	IN.	$7^{-0.010}_{-0.025}$ mm ($0.2756^{-0.0004}_{-0.0010}$ in)
	EX.	$7^{+0.030}_{-0.045}$ mm ($0.2756^{-0.0012}_{-0.0018}$ in)
Guide Inside Diameter		
	IN.	$7^{+0.012}_{0}$ mm ($0.2756^{+0.0005}_{0}$ in)
	<Limit>	<7.10 mm (0.2795 in)>
	EX.	$7^{+0.012}_{0}$ mm ($0.2756^{+0.0005}_{0}$ in)
	<Limit>	<7.10 mm (0.2795 in)>
Stem-to-guide Clearance		
	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in)
Stem Runout Limit		<0.01 mm (0.0004 in)>
		
Valve Seat Width Standard		1.1 mm (0.043 in)
Valve Spring:		
Free Lengeh		
Inner Spring	IN.	40.1 mm (1.579 in)
	EX.	40.1 mm (1.579 in)
Outer Spring	IN.	43.8 mm (1.724 in)
	EX.	43.8 mm (1.724 in)

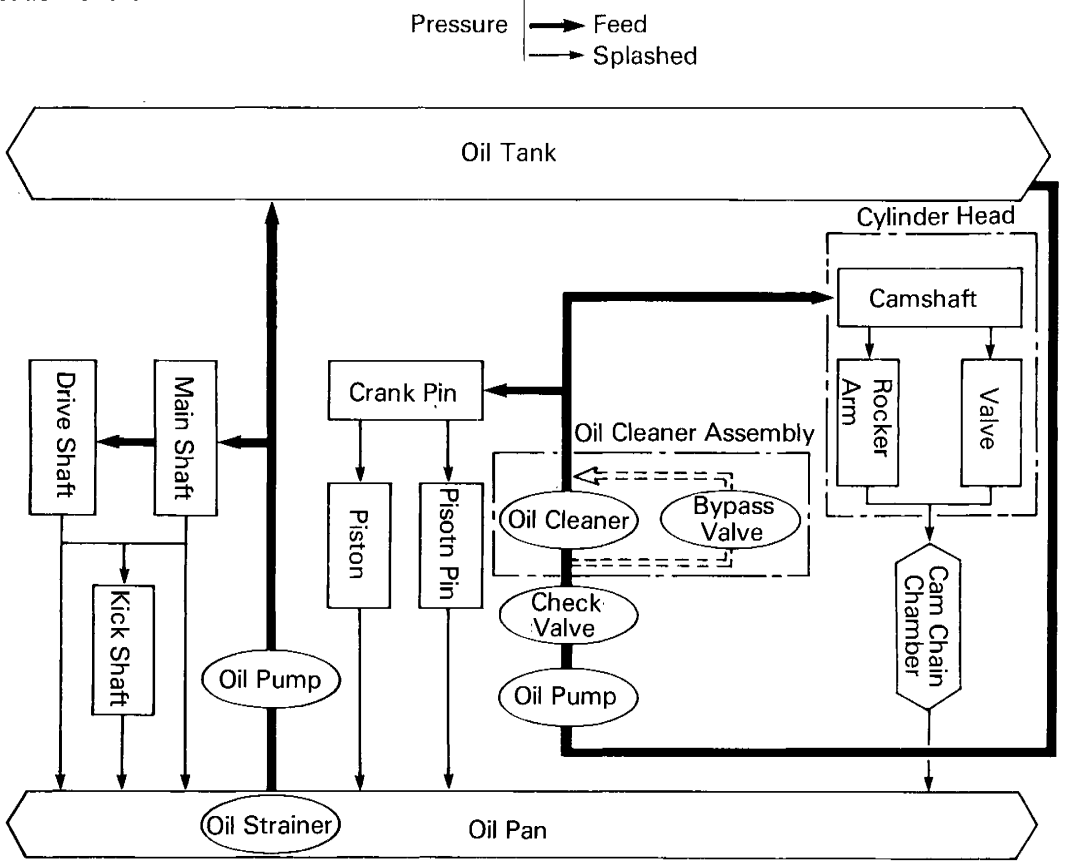
Model		XT600L/XT600LC
Compressed Length (Valve Closed)		
Inner Spring	IN.	22.7 mm (0.894 in)
	EX.	22.7 mm (0.894 in)
Outer Spring	IN.	34.2 mm (1.346 in)
	EX.	34.2 mm (1.346 in)
Tilt Limit*		
Inner Spring	IN. & EX.	2.5° or 1.7 mm (0.067 in)
Outer Spring	IN. & EX.	2.5° or 1.7 mm (0.067 in)
		
Direction of Winding (Top view)		Intake: Outer / Inner  Exhaust: Outer / Inner 
Piston:		
Piston Size/ Measuring Point*		$95^{+0.035}_{-0.055}$ mm ($3.7409^{-0.0014}_{-0.0022}$ in) 5 mm (0.197 in) (From bottom line of piston skirt)
Piston Clearance		0.045 ~ 0.065 mm (0.0018 ~ 0.0026 in)
Oversize 1st		—
2nd		95.50 mm (3.760 in)
3rd		—
4th		96.00 mm (3.780 in)
Piston Ring:		
Sectional Sketch		
Top Ring		B = 1.2 mm (0.0472 in) T = 3.8 mm (0.150 in)
2nd Ring		B = 1.2 mm (0.0472 in) T = 3.8 mm (0.150 in)
Oil ring		B = 2.5 mm (0.098 in) T = 3.4 mm (0.134 in)

Model	XT600L/XT600LC
End Gap (Installed)	
Top Ring	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)
2nd Ring	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)
Oil Ring	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)
Side Clearance	
Top Ring	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
2nd Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
Oil Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Crankshaft: 	
Crank Width "A"	74.95 ~ 75.00 mm (2.951 ~ 2.953 in)
Deflection Limit "C"	<0.03 mm (0.0012 in)>
Big End Side Clearance "D"	0.25 ~ 0.75 mm (0.0098 ~ 0.0295 in)
Small End Free Play "F"	0.8 mm (0.031 in)
Balancer Drive Method	Gear
Clutch:	
Friction Plate Thickness/Quantity	#1 2.80 ± 0.08 mm (0.110 ± 0.003 in)/6 #2 3.00 ± 0.10 mm (0.118 ± 0.004 in)/2
Wear Limit	#1 <2.60 mm (0.102 in)> #2 <2.80 mm (0.110 in)>
Clutch Plate Thickness/Quantity	1.2 mm (0.047 in)/7
Warp Limit	<0.2 mm (0.008 in)>
Clutch Spring Free Length/Quantity	34.6 mm (1.362 in)/5
Clutch Spring Minimum Length	<32.6 mm (1.284 in)>
Primary Reduction Gear Backlash Tolerance	7 ~ 71μ
Clutch Release Method	Inner push (Cam push)
Push Rod Bending Limit	<0.5 mm (0.02 in)>
Transmission:	
Main Axle Run-out Limit	<0.08 mm (0.0031 in)>
Shifter:	
Shifter Type	Cam drum and guide bar
Kick Starter:	
Kick Starter Type	Ratchet
Decompression Device:	
Type	Kick synchronous
Cable Free Play	0.5 mm (0.02 in)
Air Filter Oil Grade (Oiled Filter)	SAE 10W30 SE motor oil

Model		XT600L/XT600LC	
Carburetor:			
Type/Manufacturer/Quantity		Y27PV/TEIKEI/1	
I.D. Mark		XT600L: 49N 00	XT600LC: 49R 00
		Primary carb.	Secondary carb.
Main Jet	(M.J.)	#125	#130
Main Air Jet	(M.A.J.)	ø0.8	ϕ1.0
Jet Needle-clip Position	(J.N.)	5C38	4A72
Cutaway	(C.A.)	#5,5	—
Pilot Jet	(P.J.)	#46	—
Pilot Air Jet	(P.A.J.)	ϕ 1.0	—
Pilot Screw (turns out)	(P.S.)	Preset	—
Pilot Outlet Size	(P.O.)	ϕ 0.8	—
Starter Jet	(G.S.)	ϕ 0.64	ϕ 0.62
Valve Seat Size	(V.S.)	ϕ 2.5	—
Fuel Level	(F.L.)	7±1 mm (0.28±0.04 in)	
Float Height	(F.H.)	26.0±1.0 mm (1.02±0.04 in)	
Engine Idling Speed		1,300 r/min	
Vacuum Pressure at Idling Speed		26.6 kPa (200 mmHg, 7.9 inHg)	
Lubrication System:			
Oil Filter Type		Paper, Wire mesh	
Oil Pump Type		Trochoid pump	
Tip Clearance			
<Limit>		<0.12 mm (0.0047 in)>	
Side Clearance		0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in)	
Bypass Valve Setting Pressure		98±20 kPa (1.0±0.2 kg/cm², 14.2±2.8 psi)	
Relief Valve Operating Pressure		98±20 kPa (1.0±0.2 kg/cm², 14,2±2.8 psi)	

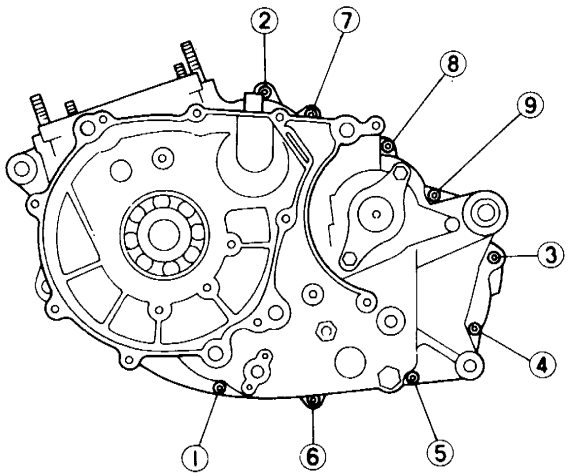
Model	XT600L/XT600LC

Lubrication Chart

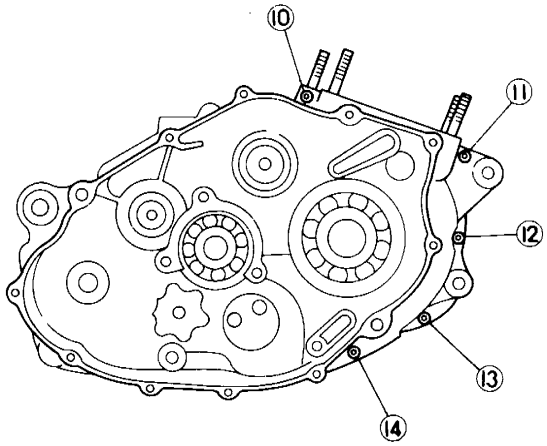


Crankcase Tightening Sequence

Left Side



Right Side

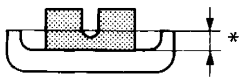


Tightening torque							
Parts to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
ENGINE:							
Cylinder head	Flange bolt	M 8×1.25	4	25	2.5	18	
	Stud bolt	M10×1.25	2	20	2.0	14	
	Hexagon socket bolt	M 6	1	10	1.0	7.2	
	Stud bolt	M 6	4	7	0.7	5.1	
Spark plug		M12×1.25	1	18	1.8	13	
Cylinder head cover	Hexagon socket bolt	M 6	18	10	1.0	7.2	
	Bolt	M32×1.5	2	12	1.2	8.7	
Tachometer gear housing	Hexagon socket bolt	M 6	1	10	1.0	7.2	
	Flat head screw	M 6	1	7	0.7	5.1	
Cylinder	Nut	M 8×1.25	2	22	2.2	16	
	Nut	M10×1.25	4	38	3.8	27	
	Hexagon socket bolt	M 6	2	10	1.0	7.2	
Balancer	Nut	M16×1.0	1	60	6.0	43	Use lock washer
A.C. Magneto generator	Nut	M14×1.5	1	90	9.0	65	
Valve clearance adjusting screw	Nut	M 6	4	14	1.4	10	
Stopper guide	Hexagon bolt	M 6	2	8	0.8	5.8	
Cam sprocket	Flange bolt	M 7	2	20	2.0	14	
Cam chain tensioner	Hexagon socket bolt	M 6	2	10	1.0	7.2	
Decompression cam	Bolt	M 6	1	8	0.8	5.8	
Rocker arm shaft	Bolt	M 6	2	10	1.0	7.2	
Oil pump	Hexagon socket bolt	M 6	3	10	1.0	7.2	

Parts to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Oil pump cover	Panhead screw	M 6	1	7	0.7	5.1	
Strainer housing	Panhead screw	M 6	2	7	0.7	5.1	
Drain plug	Plug	M14 × 1.5	1	30	3.0	22	
Oil filter cover	Hexagon socket bolt	M 6	3	10	1.0	7.2	
Oil filter cover (Air bleeding screw)	Screw	M 5	1	5	0.5	3.6	
Oil hose	Hexagon socket bolt	M 6	4	10	1.0	7.2	
Carburetor joint	Hexagon socket bolt	M 6	4	10	1.0	7.2	
Carburetor	Hose clamp	M 4	2	2	0.2	1.4	
Exhaust pipe	Nut	M 6	4	10	1.0	7.2	
Exhaust pipe protector	Screw	M 6	2	7	0.7	5.1	Use LOCTITE
Muffler protector	Screw	M 6	4	7	0.7	5.1	Use LOCTITE
Outlet pipe	Panhead screw	M 6	1	7	0.7	5.1	
Exhaust pipe and muffler	Hexagon bolt	M 8 × 1.25	2	20	2.0	14	
Muffler	Flange bolt	M 8 × 1.25	2	20	2.0	14	
Crankcase	Hexagon socket bolt	M 6	14	10	1.0	7.2	
	Stud bolt	M10 × 1.25	4	20	2.0	14	
	Screw	M 6	1	7	0.7	5.1	Clamp
Crankcase cover	Hexagon socket bolt	M 6	19	10	1.0	7.2	
	Plug	M 6	1	10	1.0	7.2	
Decompression cover	Hexagon socket bolt	M 6	2	10	1.0	7.2	
Bearing plate cover	Flat head screw	M 6	3	7	0.7	5.1	Use LOCTITE
Ratchet wheel guide	Hexagon bolt	M 6	2	10	1.0	7.2	
Cable lever	Hexagon nut	M 6	1	8	0.8	5.8	

Parts to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Kick crank boss	Hexagon bolt	M 8×1.25	1	20	2.0	14	
Clutch spring	Screw	M 6	5	8	0.8	5.8	
Clutch boss	Nut	M20×1.0	1	70	7.0	50	Use lock washer
Primary drive gear	Nut	M20×1.0	1	110	11.0	80	Use lock washer
Push lever	Screw	M 8×1.0	1	12	1.2	8.7	
Drive sprocket	Hexagon bolt	M 6	2	10	1.0	7.2	
Oil seal cover	Hexagon bolt	M 6	2	10	1.0	7.2	
Stopper lever	Screw	M 6	1	10	1.0	7.2	
Change pedal	Bolt	M 6	1	10	1.0	7.2	
Neutral switch	Bolt	M10×1.25	1	20	2.0	14	
Chain tensioner spring	Plug	M16×1.0	1	20	2.0	14	
Kick crank	Screw	M 6	1	7	0.7	5.1	
Oil hose	Hexagon socket bolt	M 6	4	10	1.0	7.2	

B. Chassis

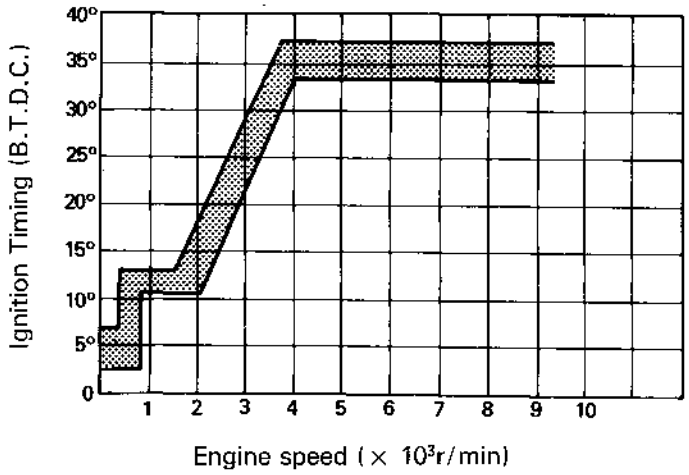
Model	XT600L/XT600LC
Steering System:	
Steering Bearing Type	Taper roller bearing
Front Suspension:	
Front Fork Travel	255 mm (10.0 in)
Fork Spring Free Length/Limit	465.5 mm (18.33 in)/<460.5 mm (18.13 in)>
Spring Rate/Stroke	K_1= 2.1 N/mm (0.21 kg/mm, 11.8 lb/in)/ 0~170 mm (0~6.69 in) K_2= 4.1 N/mm (0.41 kg/mm, 23.0 lb/in)/ 170~255 mm (6.69~10.0 in)
Oil Capacity or Oil Level	483±2.5 cm³ (17.0±0.09 Imp oz, 16.3±0.08 US oz)/147 mm (5.79 in) (From top of inner tube fully compressed without spring.)
Oil Grade	Yamaha fork Oil 10Wt or SAE 10W30 type SE motor Oil
Enclosed Air Pressure	39 kPa(0.4 kg/cm², 5.7 psi)
Rear Suspension:	
Shock Absorber Travel	82 mm (3.23 in)
Spring Free Length	253.5 mm (9.98 in)
Spring Rate/Stroke	83.3 N/mm (8.33 kg/mm, 467 lb/in)/0~107 mm (0~4.21 in)
Enclosed Gas Pressure	1.471 kPa (15 kg/cm², 213 psi)
Rear Arm:	
Swing Arm Free Play Limit	
End	<1.0 mm (0.04 in)>
Side	<0.3 mm (0.012 in)>
Wheel:	
Front Wheel Type	Spoke Wheel
Rear Wheel Type	Spoke Wheel
Front Rim Size/Material	1.60×21/Aluminum
Rear Rim Size/Material	MT2.50×18/Aluminum
Rim Runout Limit	
Vertical	<2.0 mm (0.08 in)>
Lateral	<2.0 mm (0.08 in)>
Drive Chain:	
Type/Manufacturer	520VC/DAIDO
Number of Links	101 links + Joint
Chain Free Play	30~40 mm (1.2~1.6 in)
Disc Brake:	
Type Front	Single disc
Outside Dia.×Thickness Front	267×4.0 mm (10.5×0.16 in)
Pad Thickness Front	6.8 mm (0.27 in)
Limit* 	<0.8 mm (0.031 in)>
Master Cylinder Inside Dia. Front	11.0 mm (0.43 in)
Caliper Cylinder Inside Dia. Front	38.1 mm (1.50 in)
Brake Fluid Type	DOT #3

Model		XT600L/XT600LC
Drum Brake:		
Type	Rear	Leading and trailing
Drum Inside Dia	Rear	150 mm (5.91 in)
	Limit	<151 mm (5.94 in)>
Lining thickness	Rear	4 mm (0.16 in)
	Limit	<2 mm (0.08 in)>
Shoe Spring Free Length		58.0 mm (2.28 in)
Brake Lever & Brake Pedal:		
Brake Lever Free Play		5~8 mm (0.2~0.3 in)
Brake Pedal Free Play		20~30 mm (0.8~1.2 in)
Brake Pedal Position		10 mm (0.4 in) (Vertical height below footrest top.)
Clutch Lever free Play/position		2~3 mm (0.8~0.12 in)/at lever pivot

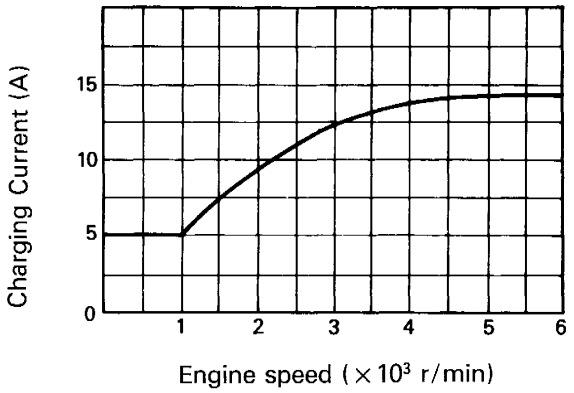
Tightening torque					
Parts to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
CHASSIS:					
Front wheel axle and nut	M14×1.5	100	10.0	72	
Handle crown and inner tube	M 8×1.25	23	2.3	17	
Handle crown and steering shaft	M14×1.25	95	9.5	68	
Upper handlebar holder and lower handlebar holder	M 8×1.25	23	2.3	17	
Steering shaft and ring nut	M25×1.0	38	3.8	27	
Rear wheel axle and nut	M16×1.5	100	10.0	72	
Camshaft lever and camshaft	M 6×1.0	9	0.9	6.5	
Sprocket wheel	M10×1.25	62	6.2	45	
Oil tank drain bolt	M 8×1.25	18	1.8	13	
Engine stay (front)	M10×1.25	58	5.8	42	
Engine stay (top)	M10×1.25	58	5.8	42	
Engine (rear)	M10×1.25	50	5.0	36	
Pivot shaft	M16×1.5	100	10.0	72	
Swingarm and relay arm	M12×1.25	50	5.0	36	
Relay arm and relay arm connecting rod	M10×1.25	50	5.0	36	
Relay arm connecting rod and frame	M10×1.25	50	5.0	36	
Under bracket and inner tube	M 8×1.25	20	2.0	14	
Innter tube cap bolt	M34×1.0	23	2.3	17	
Front axle holder	M 6×1.0	20	2.0	14	
Footrest and frame	M10×1.25	45	4.5	32	
Rear shock absorber and frame	M12×1.25	50	5.0	36	
Swing arm and chain protector	M 6×1.0	5	0.5	3.6	

C. Electrical

Model	XT600L/XT600LC
Voltage	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	12° at 1,200 r/min
Advanced Timing (B.T.D.C.)	36° at 4,500 r/min
Advancer Type	Electrical



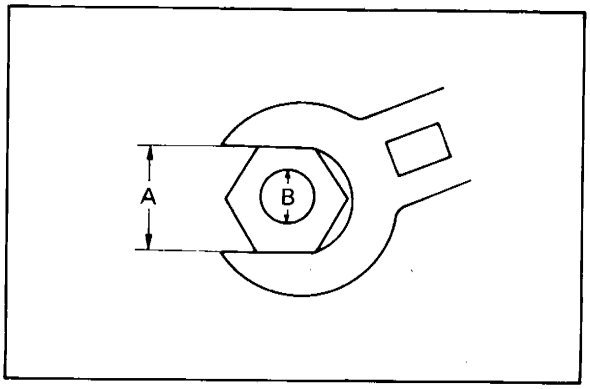
C.D.I.:	
Pickup Coil Resistance (Color)	110Ω ± 18% at 20°C (68°F) (G — W/R G—W/G)
Source Coil Resistance (Color)	200Ω ± 20% at 29°C (68°F) (Br—R)
C.D.I. Unit-Model/Manufacturer	07000-1080/NIPPONDENSO
Ignition Coil:	
-Model/Manufacturer	43F-50/NIPPONDENSO
Minimum Spark Gap	6 mm (0.24 in) or more at 500/min (17kV/300 r/min at 6V, 17 kV/6,500 r/min at 14V)
Primary Winding Resistance	0.3Ω ± 25% at 20°C (68°F)
Secondary Winding Resistance	4.3 KΩ ± 20% at 20°C (68°F)
Charging System:	
Type	A.C. Magneto Generator
Model/Manufacturer	032000-2450/NIPPONDENSO
Output	6.3A or more at 1,500 r/min 10A or less at 5,000 r/min

Model	XT600L/XT600LC
	
Charging Coil Resistance (Color) Charging	0.4Ω ± 50% at 29°C (68°F) (W—W)
Voltage Regulator: Type Model/Manufacture No Load Regulated Voltage	 Semi Conductor Type SH222/SHINDENGEN 14.5V
Rectifier: Model/Manufacturer	 SH222/SHINDENGEN
Battery: Capacity Specific Gravity	 12V 4AH 1,260
Horn: Type/Quantity Model/Manufacturer Maximum Amperage	 Plain type/1 CF-12/NIKKO 2.5A
Flash Relay: Type Model/Manufacturer Flasher Frequency Wattage	 Condenser type FZ257SD/NIPPONDENSO 85 ± 10 cycle/min 27W × 2 + 3.4W
Circuit Breaker: Type Amperage for Individual Circuit/ Quantity Main	 Non fuse breaker 15A/1

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



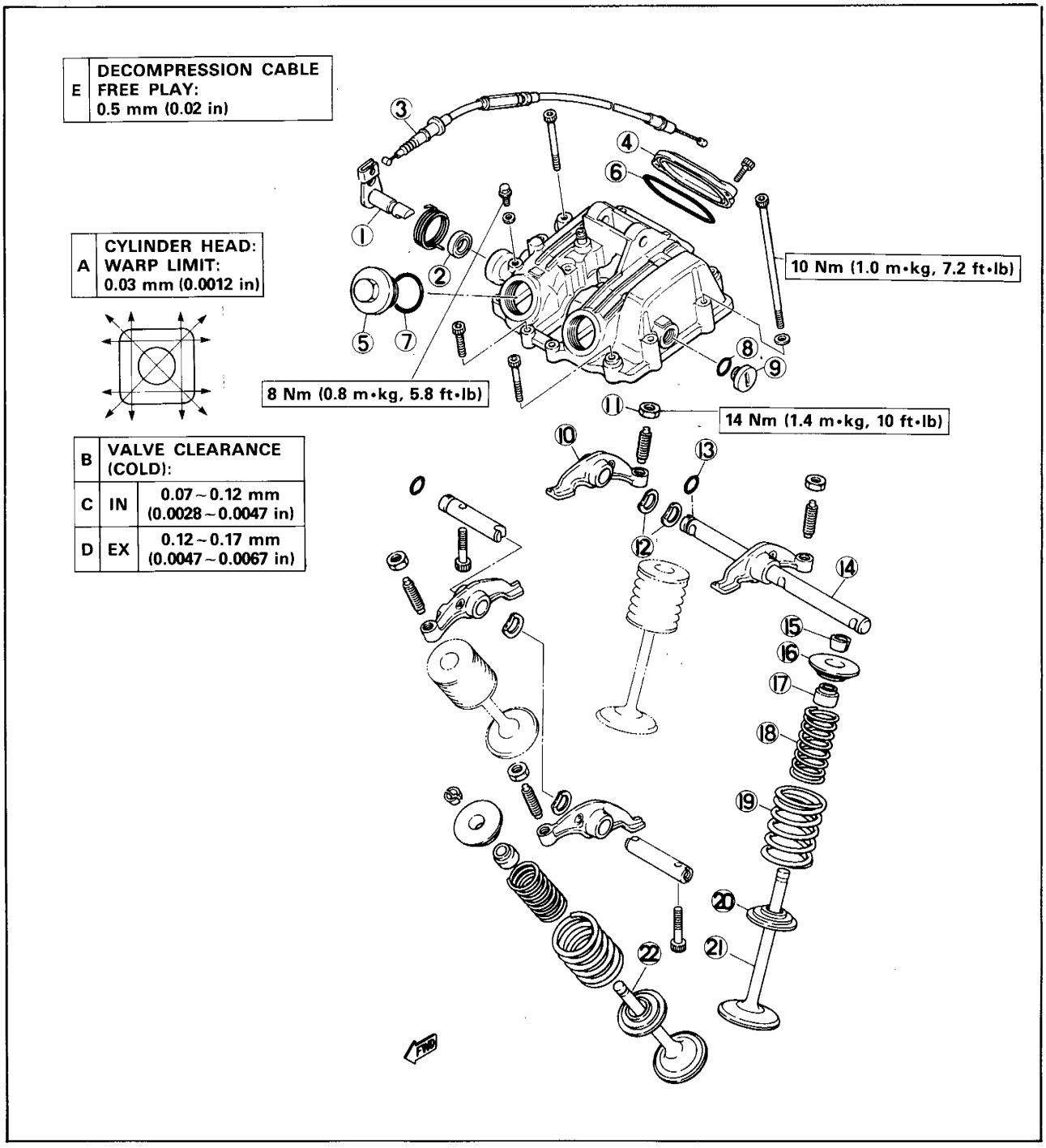
A: Distance across flats
B: Outside thread diameter

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg × m/sec^{2}	Force
Nm m·kg	Newton meter Meter kilogram	N × m m × kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m^{2} N/mm	Pressure Spring rate
L cm^{3}	Liter Cubic centimeter	———	Volume or Capacity
r/min	Rotation per minute	———	Engine Speed

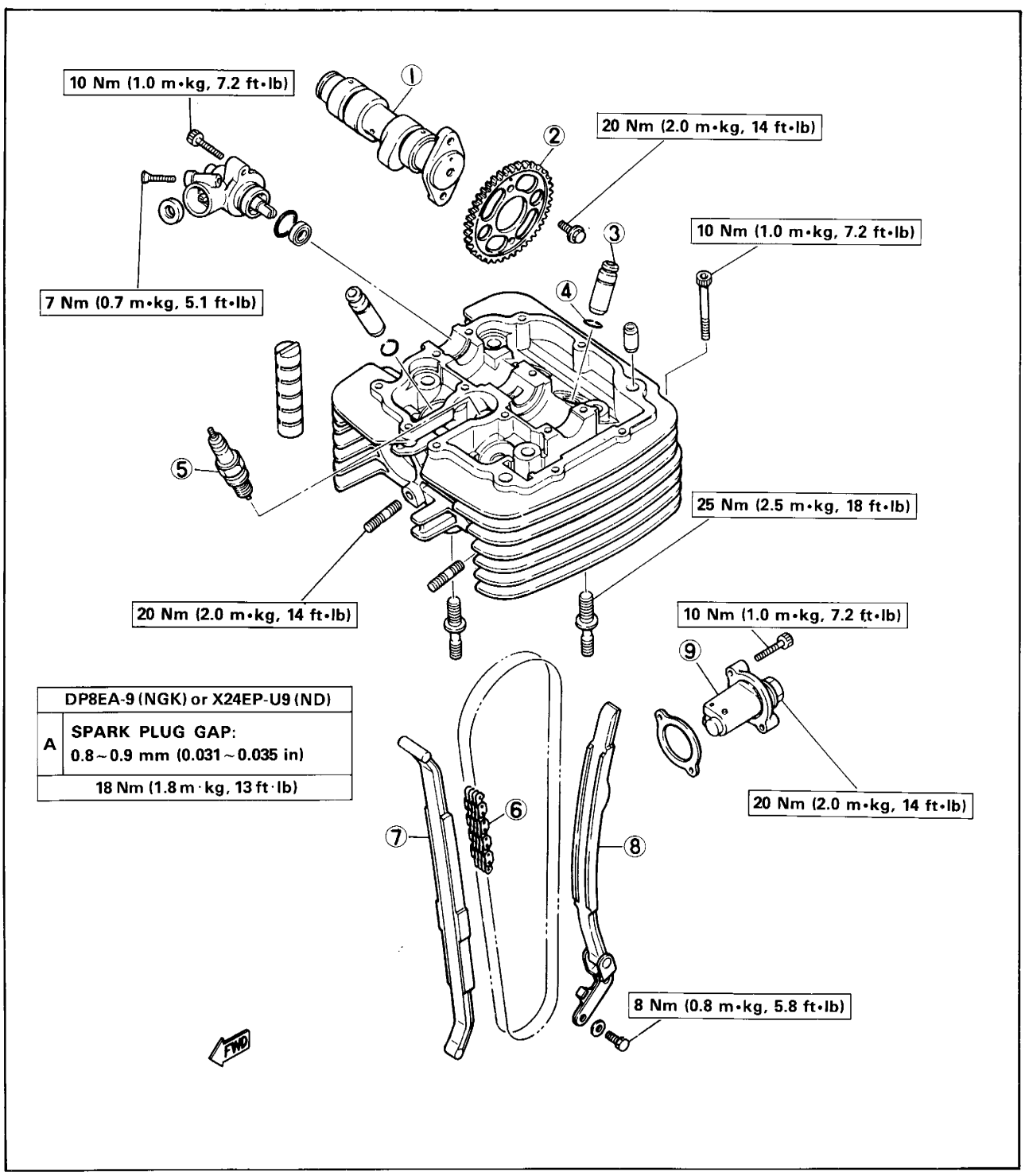
EXPLODED DIAGRAMS
CYLINDER HEAD COVER/ROCKER ARM/VALVE

① Decompression lever
② Oil seal
③ Decompression cable
④ Intake tappet cover
⑤ Exhaust tappet cover
⑥ O-ring
⑦ O-ring
⑧ O-ring
⑨ Blind plug
⑩ Rocker arm
⑪ Locknut
⑫ Wave washer
⑬ O-ring
⑭ Rocker arm shaft
⑮ Valve cotter
⑯ Valve spring retainer
⑰ Valve stem seal
⑱ Valve inner spring
⑲ Valve outer spring
⑳ Valve spring seat
㉑ Intake valve
㉒ Exhaust valve



CYLINDER HEAD/CAMSHAFT

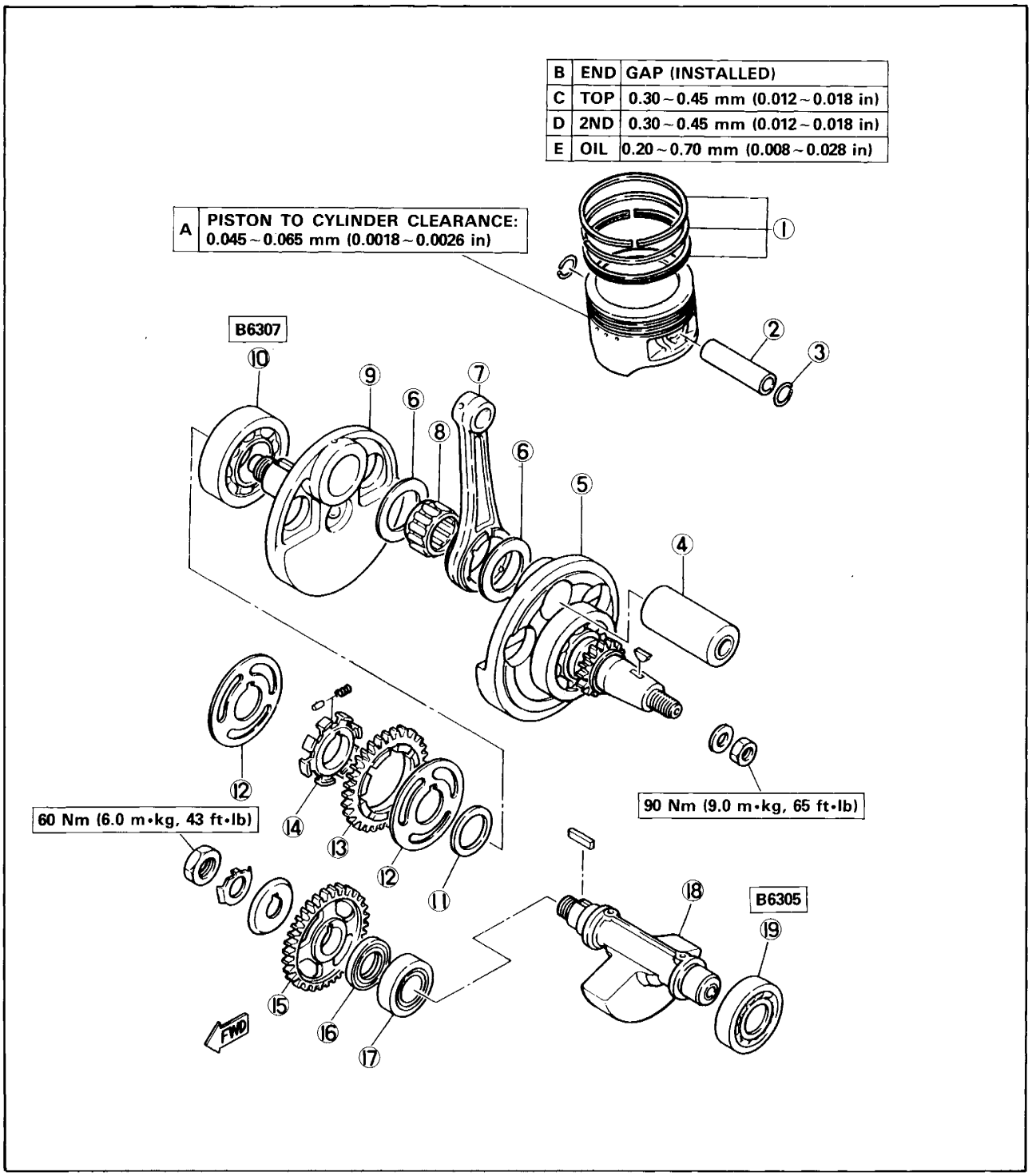
① Camshaft
② Cam sprocket
③ Valve guide
④ O-ring
⑤ Spark plug
⑥ Chain guide (Front)
⑦ Cam chain
⑧ Chain guide (Rear)
⑨ Chain tensioner



DP8EA-9 (NGK) or X24EP-U9 (ND)	
A	SPARK PLUG GAP: 0.8 ~ 0.9 mm (0.031 ~ 0.035 in)
18 Nm (1.8 m · kg, 13 ft · lb)	

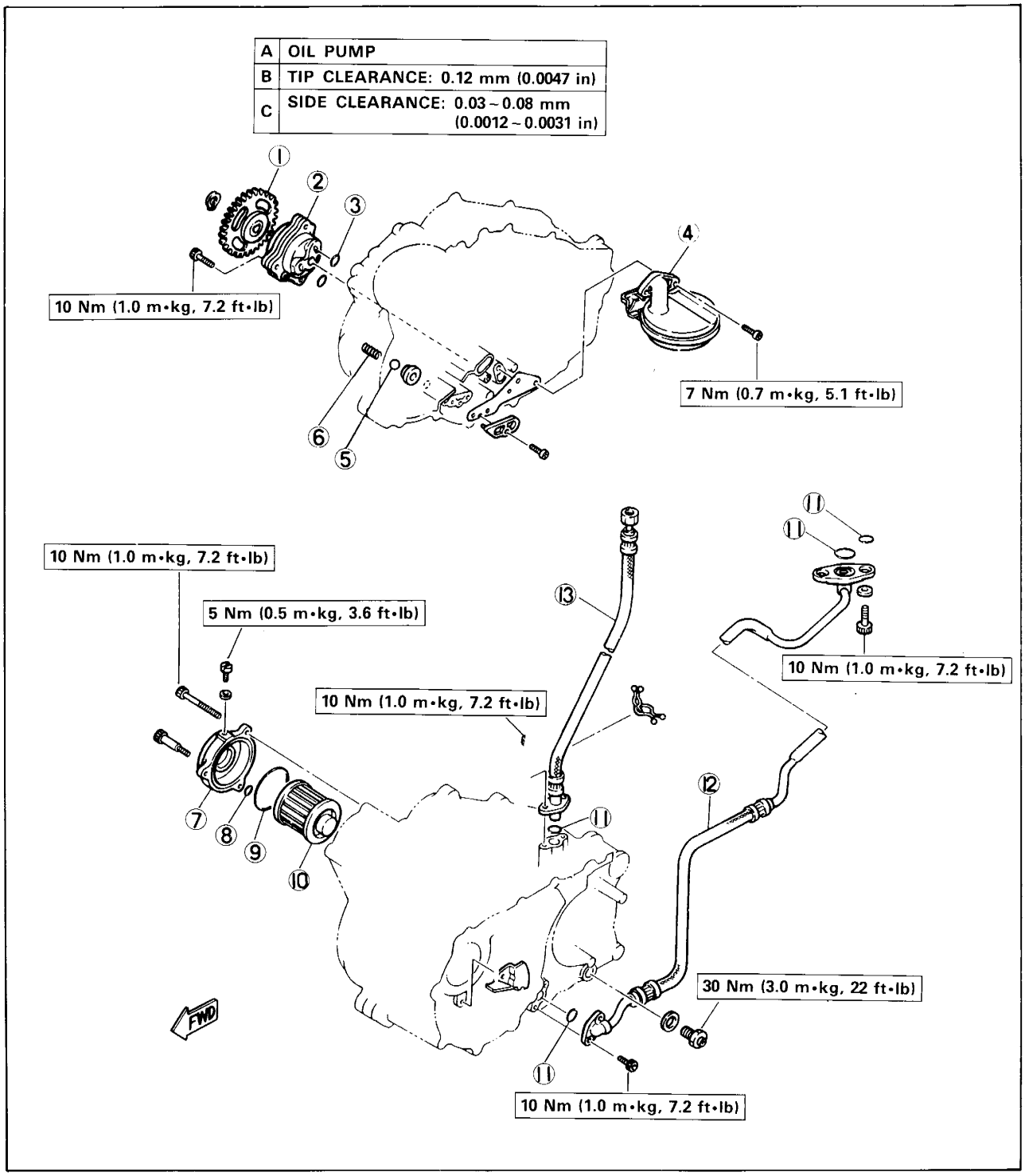
CRANKSHAFT/PISTON

① Piston ring set
② Piston pin
③ Circlip
④ Crank pin
⑤ Crank 1
⑥ Washer
⑦ Connecting rod
⑧ Big end bearing
⑨ Crank 2
⑩ Bearing
⑪ Plain washer
⑫ Bearing cover washer
⑬ Drive gear
⑭ Buffer boss
⑮ Balancer gear
⑯ Oil seal
⑰ Bearing
⑱ Balancer
⑲ Bearing



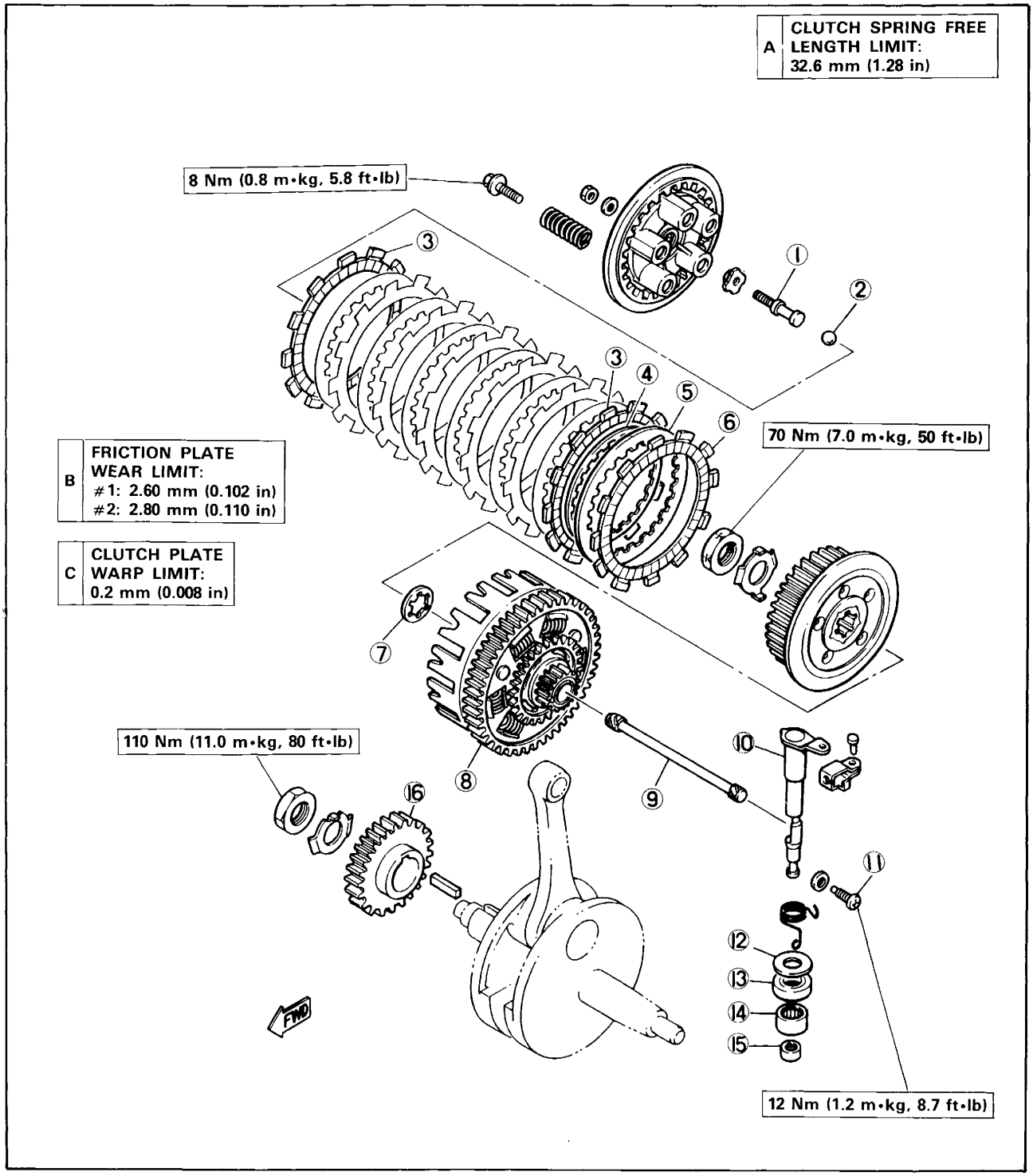
OIL PUMP/OIL CLEANER

① Pump driven gear
② Oil pump assembly
③ O-ring
④ Oil strainer
⑤ Check ball
⑥ Spring
⑦ Oil cleaner cover
⑧ O-ring
⑨ O-ring
⑩ Oil cleaner element
⑪ O-ring
⑫ Oil hose 1
⑬ Oil hose 2



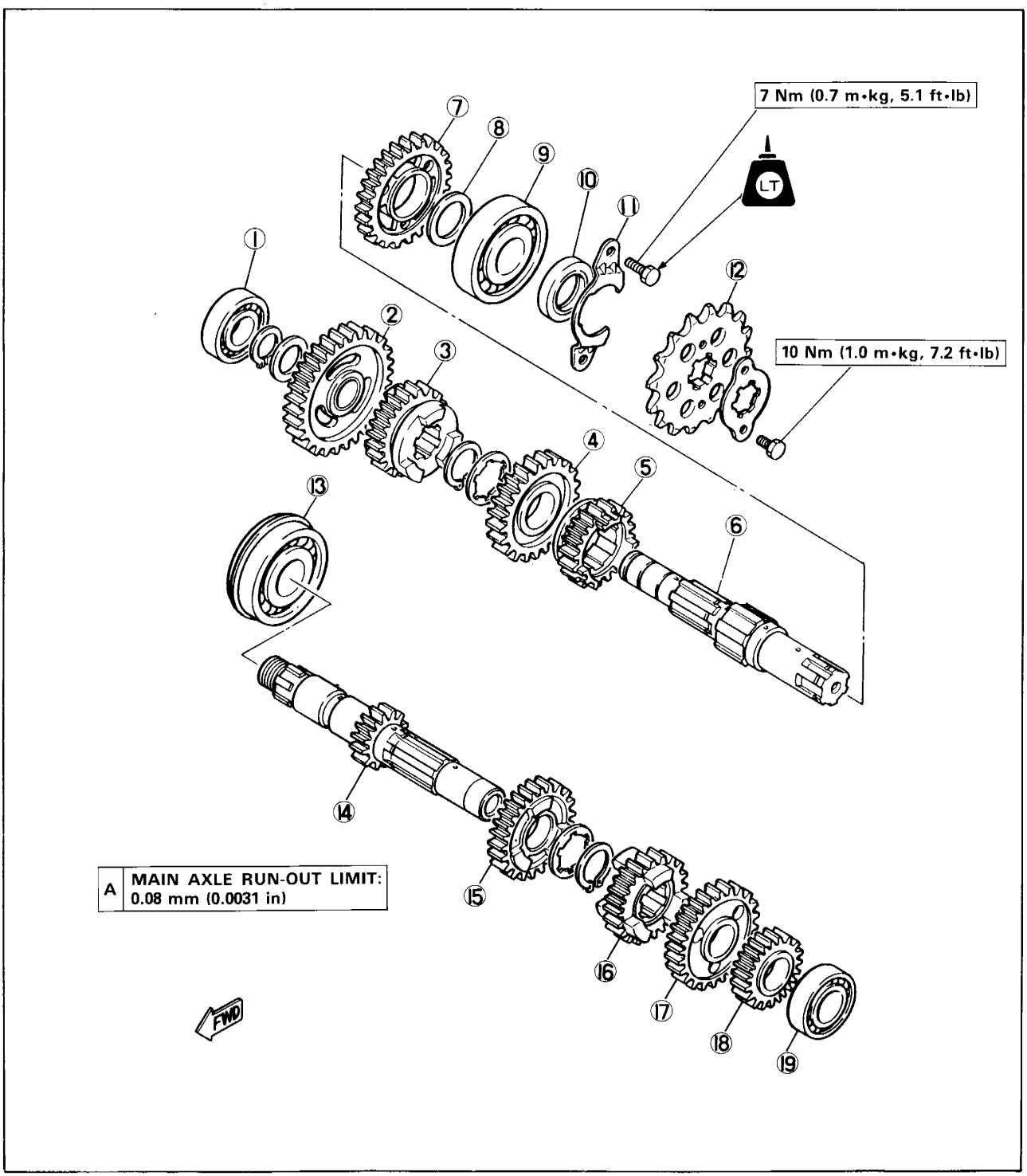
CLUTCH

① Push rod 1
② Ball
③ Friction plate (#2 & #8)
④ Clutch boss spring
⑤ Clutch plate
⑥ Friction plate (other)
⑦ Thrust plate
⑧ Primary driven gear complete
⑨ Push rod 2
⑩ Push lever complete
⑪ Set screw
⑫ Plain washer
⑬ Oil seal
⑭ Cylindrical bearing
⑮ Cylindrical bearing
⑯ Primary drive gear



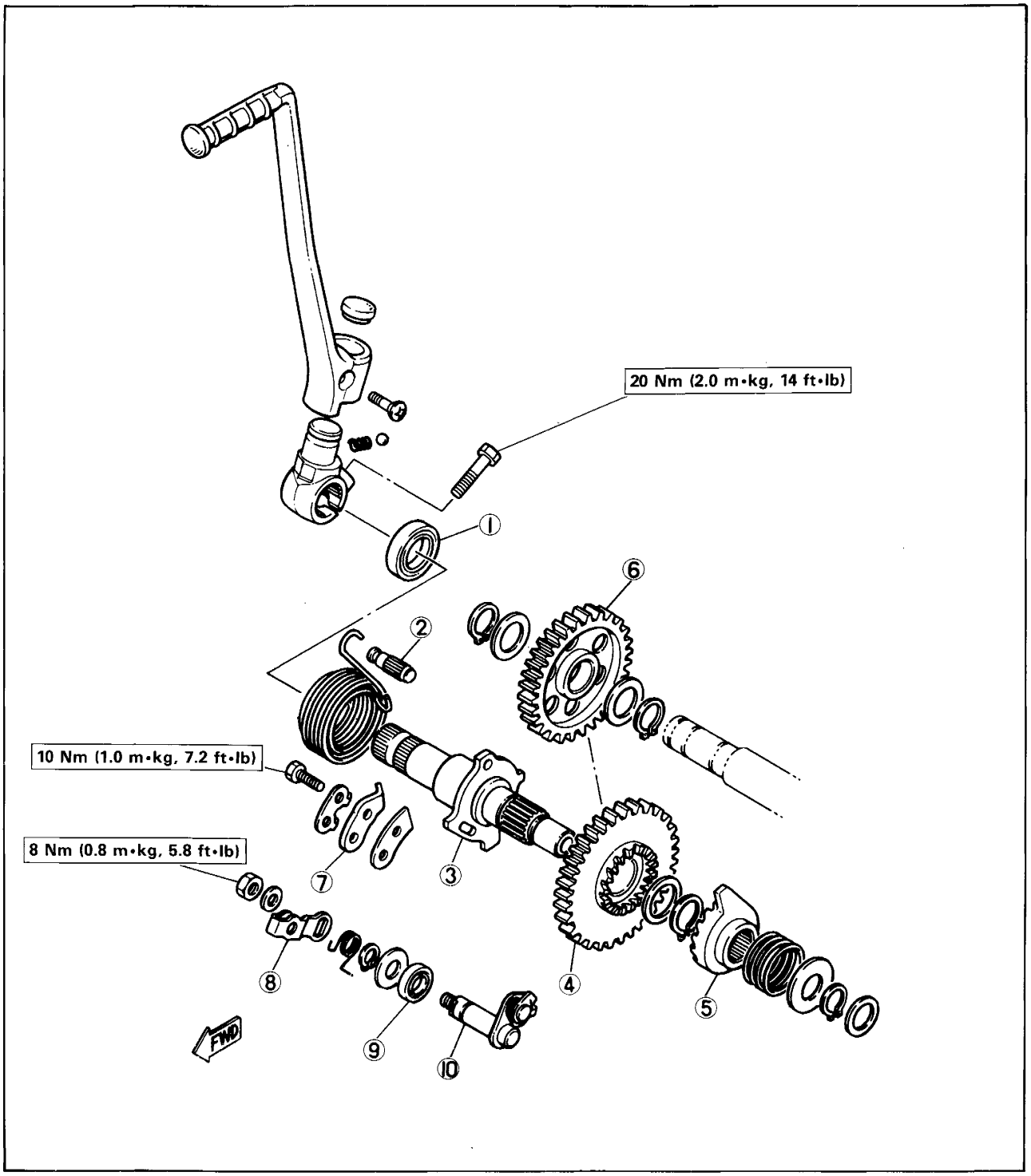
TRANSMISSION

① Bearing
② 1st wheel gear
③ 4th wheel gear
④ 3rd wheel gear
⑤ 5th wheel gear
⑥ Drive axle
⑦ 2nd wheel gear
⑧ Shim
⑨ Bearing
⑩ Oil seal
⑪ Plate cover
⑫ Drive sprocket
⑬ Bearing
⑭ Main axle
⑮ 4th pinion gear
⑯ 3rd pinion gear
⑰ 5th pinion gear
⑱ 2nd pinion gear
⑲ Bearing



STARTER

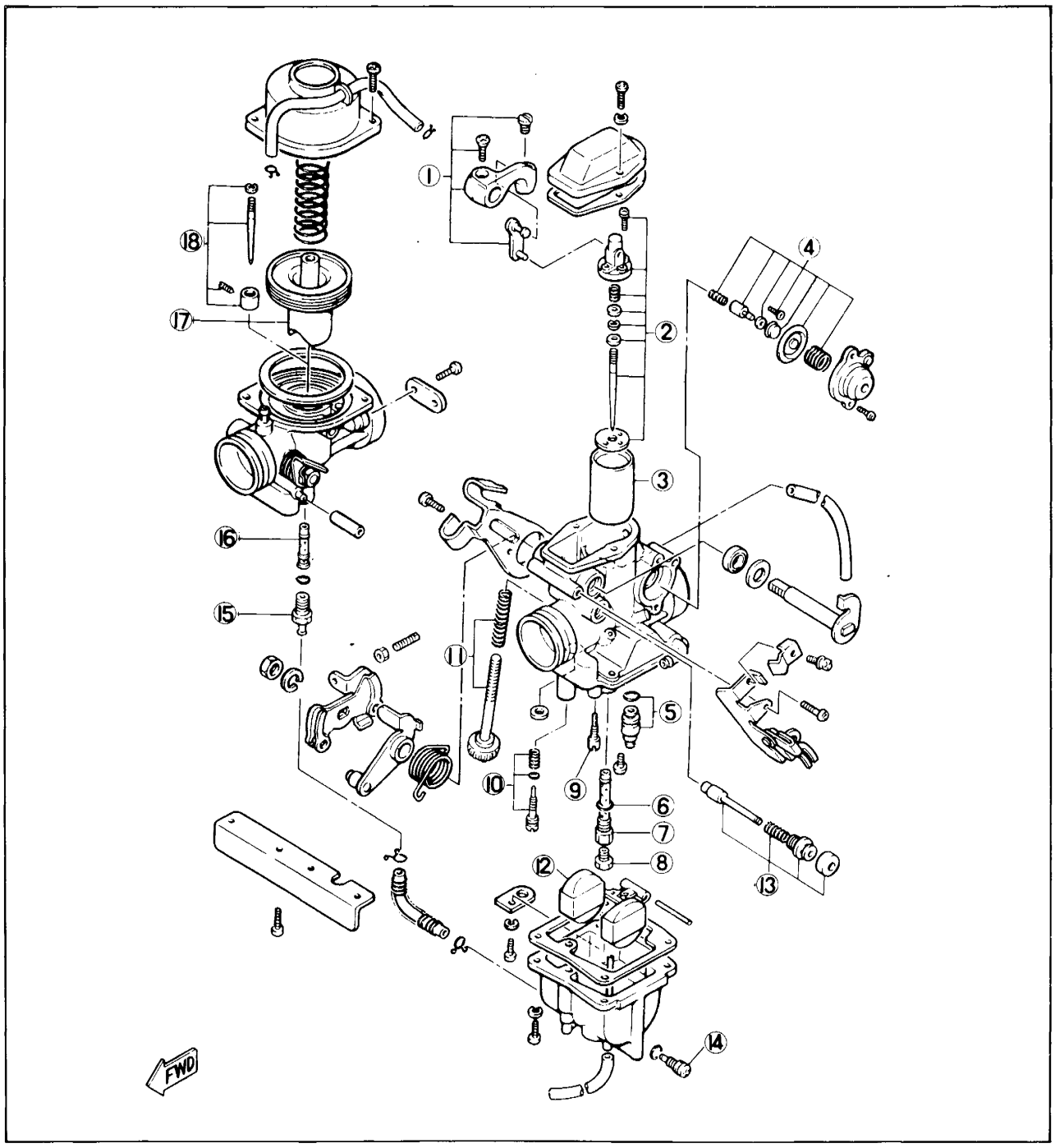
① Oil seal
② Stopper
③ Kick axle assembly
④ Kick gear
⑤ Ratchet wheel
⑥ Kick idle gear
⑦ Ratchet wheel guide
⑧ Cable lever
⑨ Oil seal
⑩ Decompression lever



CARBURETOR

① Connection arm
② Jet needle set (primary)
③ Throttle valve
④ Coasting enricher assembly
⑤ Needle valve set
⑥ O-ring
⑦ Main nozzle (primary)
⑧ Main jet (primary)
⑨ Pilot jet
⑩ Pilot screw set
⑪ Throttle screw set
⑫ Float
⑬ Starter plunger set
⑭ Drain screw
⑮ Main jet (secondary)
⑯ Main nozzle (secondary)
⑰ Secondary piston
⑱ Jet needle set (secondary)

SPECIFICATIONS		
	Primary	Secondary
Main Jet	#125	#130
Jet Needle	5C38	4A72
Pilot Jet	#46	–
Pilot Screw	Preset	–
Starter Jet	φ0.64	φ0.62
Fuel Level	7±1 mm (0.28±0.04 in)	–
Float Height	26.0±1.0 mm (1.02±0.04 in)	–
Engine Idling Speed	1,300 r/min	–

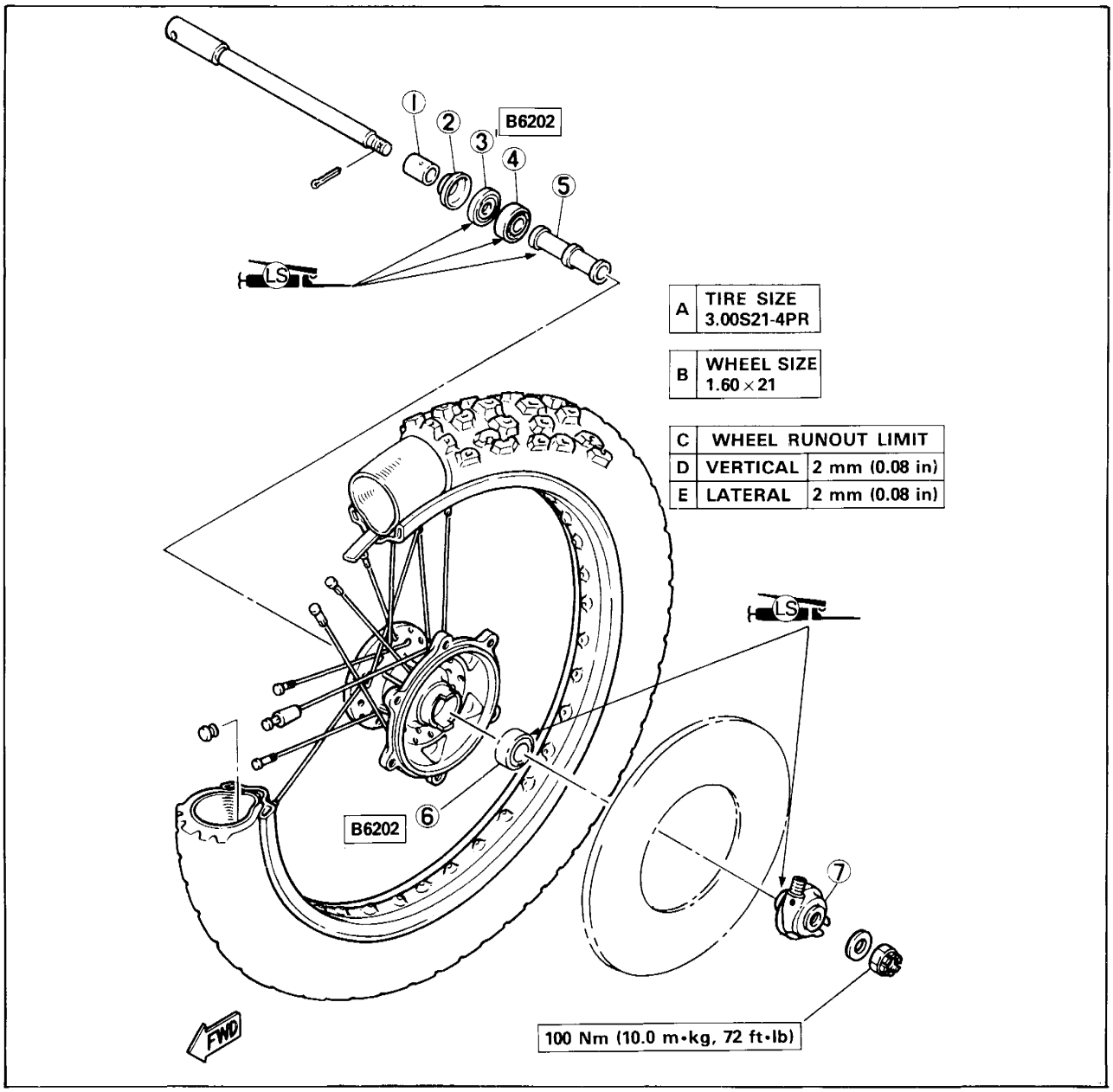


FRONT WHEEL

① Collar
② Dust cover
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Bearing
⑦ Speedometer gear unit

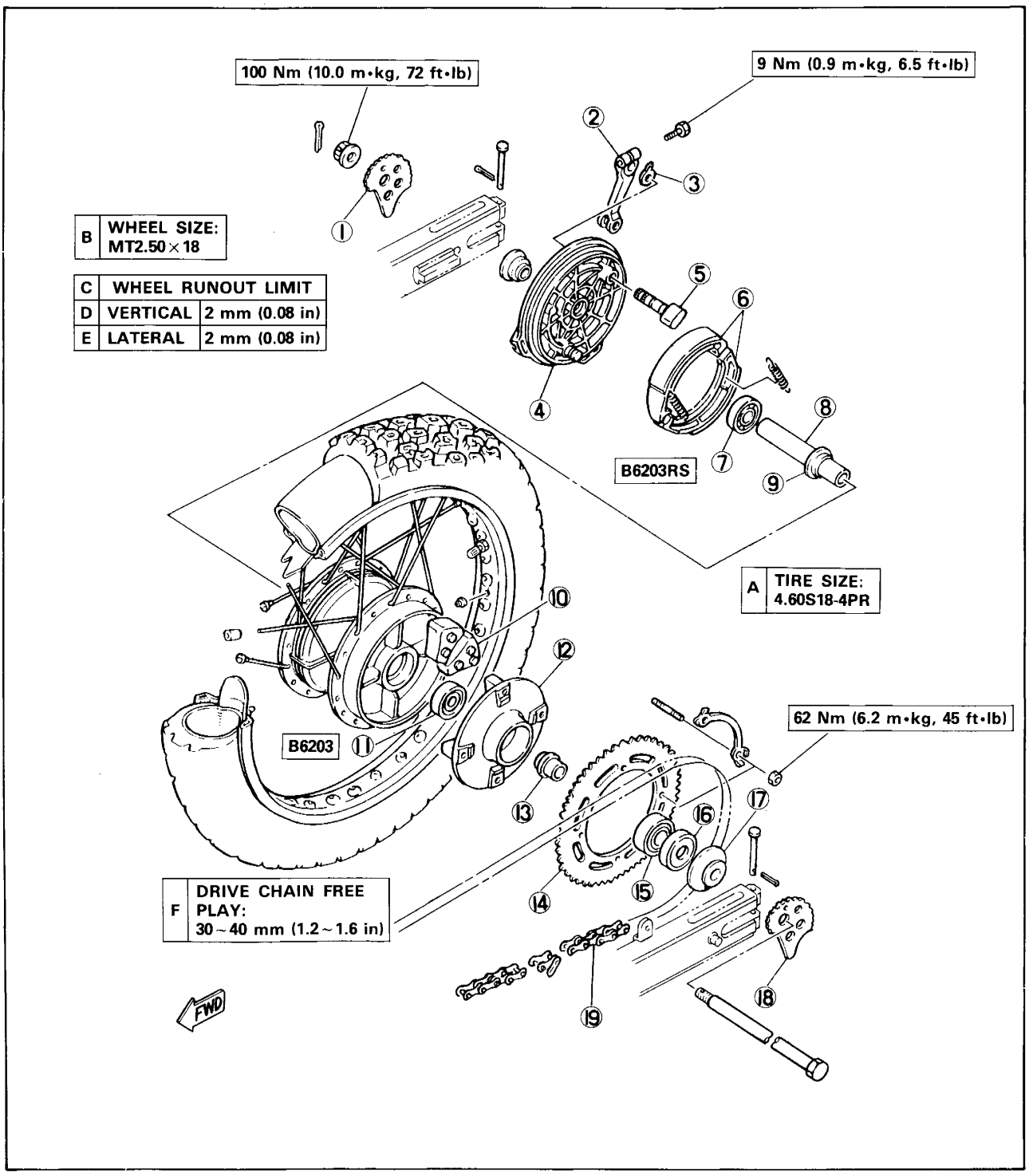
TIRE AIR PRESSURE		
Basic weight: With oil and full fuel tank	XT600L: 148 kg (326 lb) XT600LC: 149 kg (328 lb)	
Maximum load*:	159 kg (351 lb)	
Cold tire pressure:	Front	Rear
Up to 90 kg (198 lb) load*	147 kPa (1.5 kg/cm^2, 22 psi)	147 kPa (1.5 kg/cm^2, 22 psi)
90 kg (198 lb) ~ Maximum load*	147 kPa (1.5 kg/cm^2, 22 psi)	177 kPa (1.8 kg/cm^2, 26 psi)
Off-road riding	98.1 kPa (1.0 kg/cm^2, 14 psi)	98.1 kPa (1.0 kg/cm^2, 14 psi)
High speed riding	147 kPa (1.5 kg/cm^2, 22 psi)	147 kPa (1.5 kg/cm^2, 22 psi)

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



REAR WHEEL

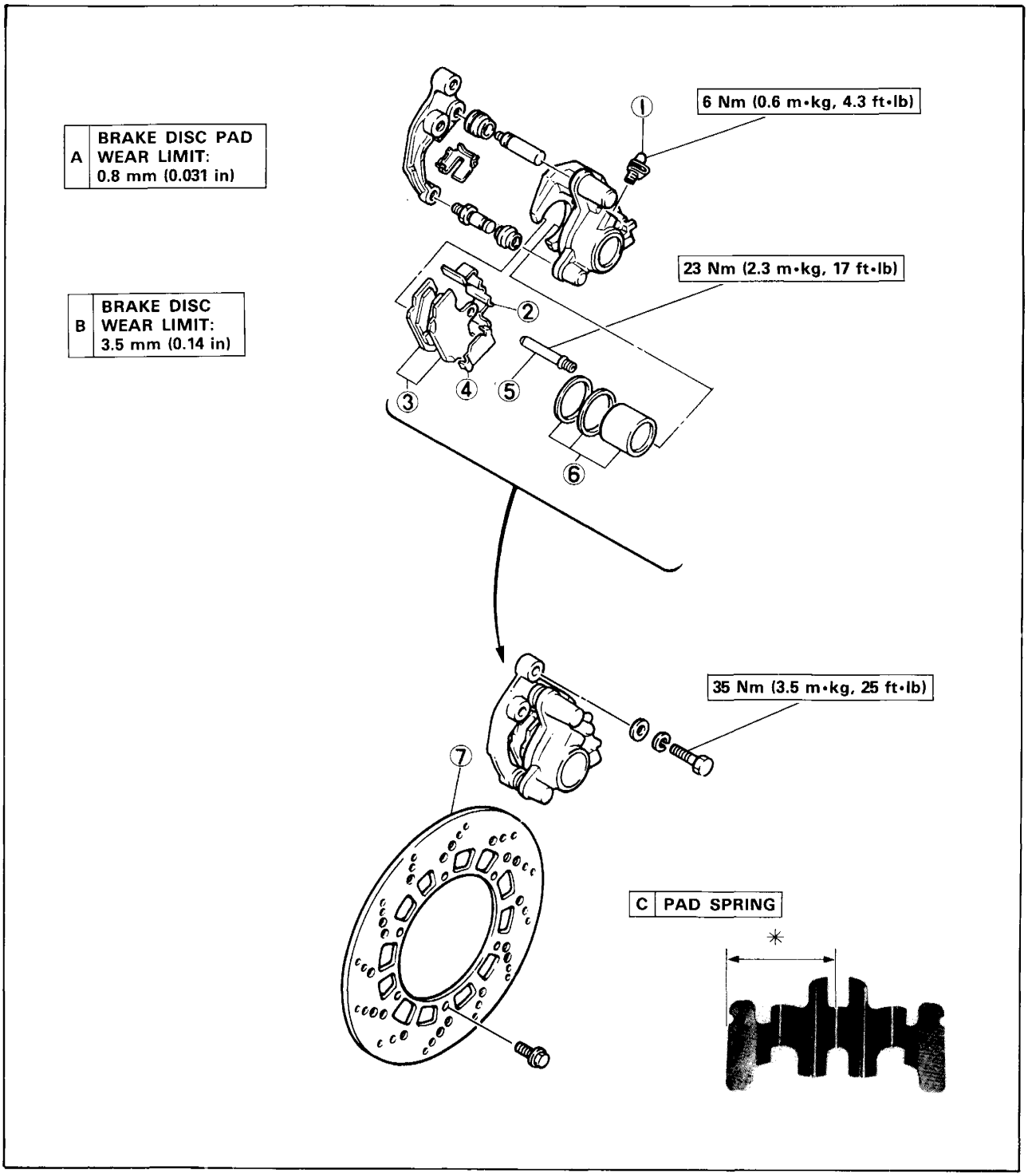
① Chain puller (Right)
② Camshaft lever
③ Wear indicator
④ Brake shoe plate
⑤ Camshaft
⑥ Brake shoe lining
⑦ Bearing
⑧ Bearing spacer
⑨ Spacer flange
⑩ Damper
⑪ Bearing
⑫ Clutch hub
⑬ Wheel collar
⑭ Driven sprocket
⑮ Bearing
⑯ Oil seal
⑰ Wheel collar
⑱ Chain puller (Left)
⑲ Drive chain



FRONT BRAKE CALIPER

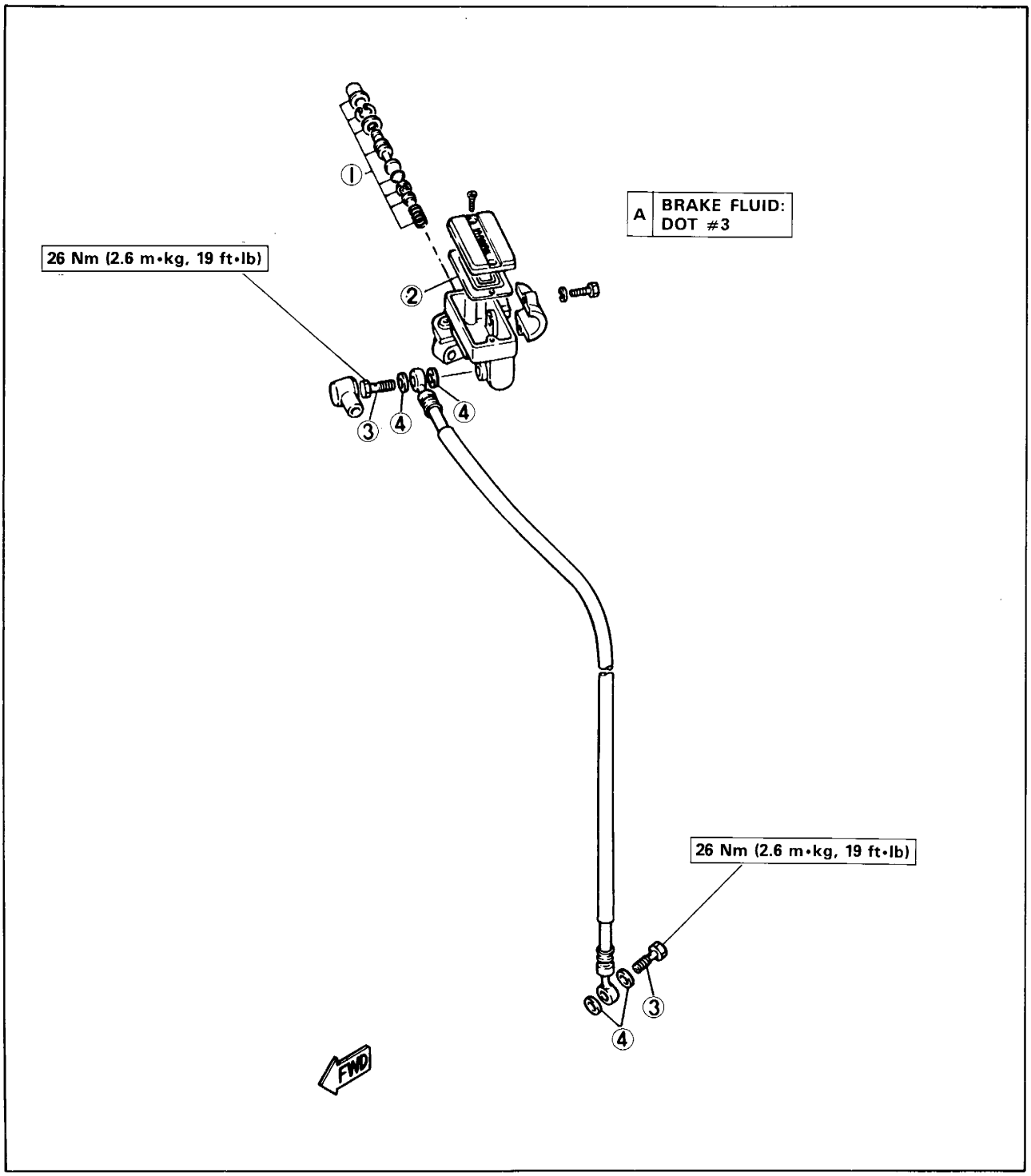
① Bleed screw
② Pad spring
③ Brake pad
④ Pad shim
⑤ Retaining bolt
⑥ Caliper piston assembly
⑦ Brake disc

*Install the pad spring with its longer tang (*) in the disc rotation direction.



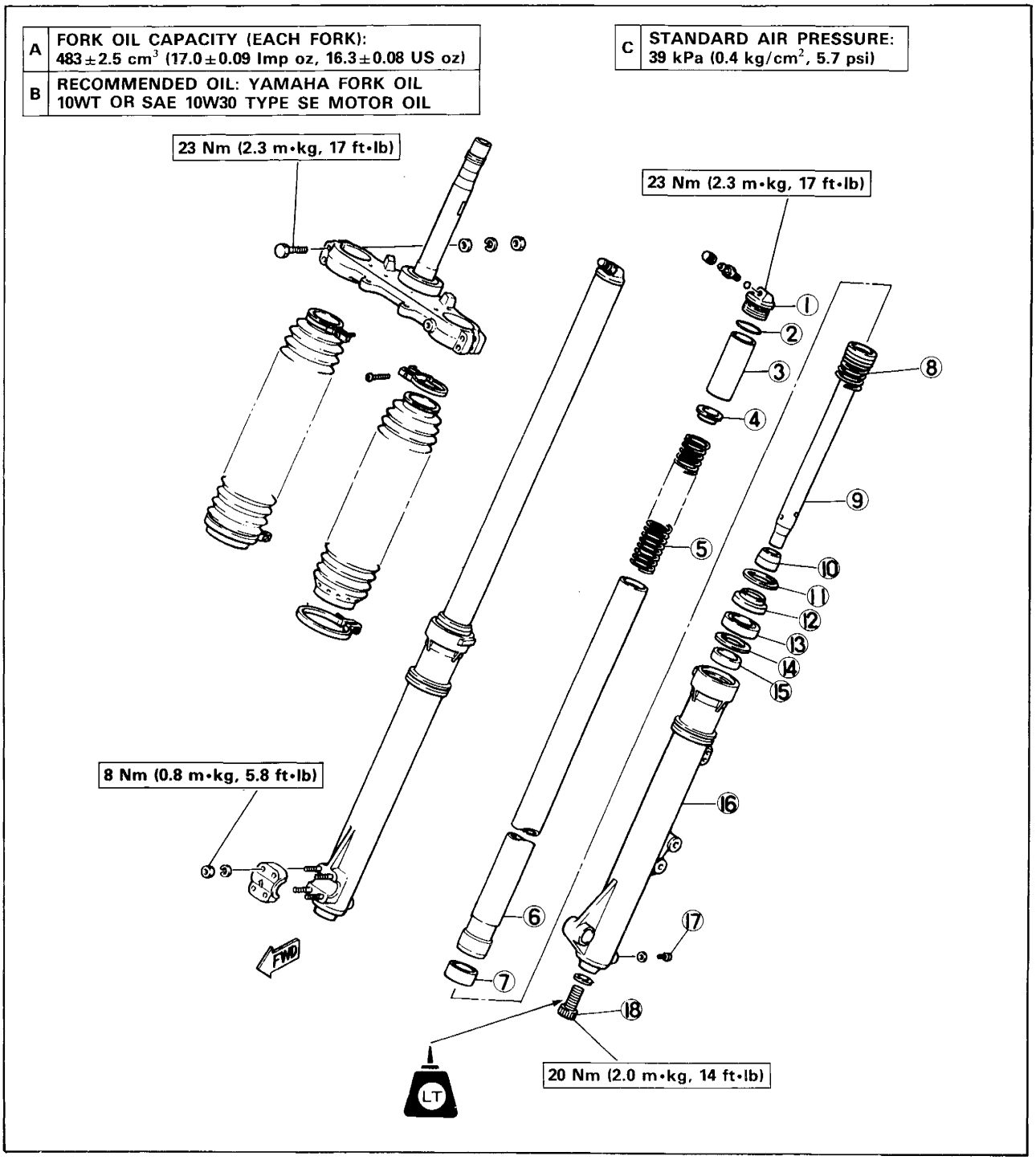
FRONT BRAKE MASTER CYLINDER

① Master cylinder kit
② Diaphragm
③ Union bolt
④ Copper washer



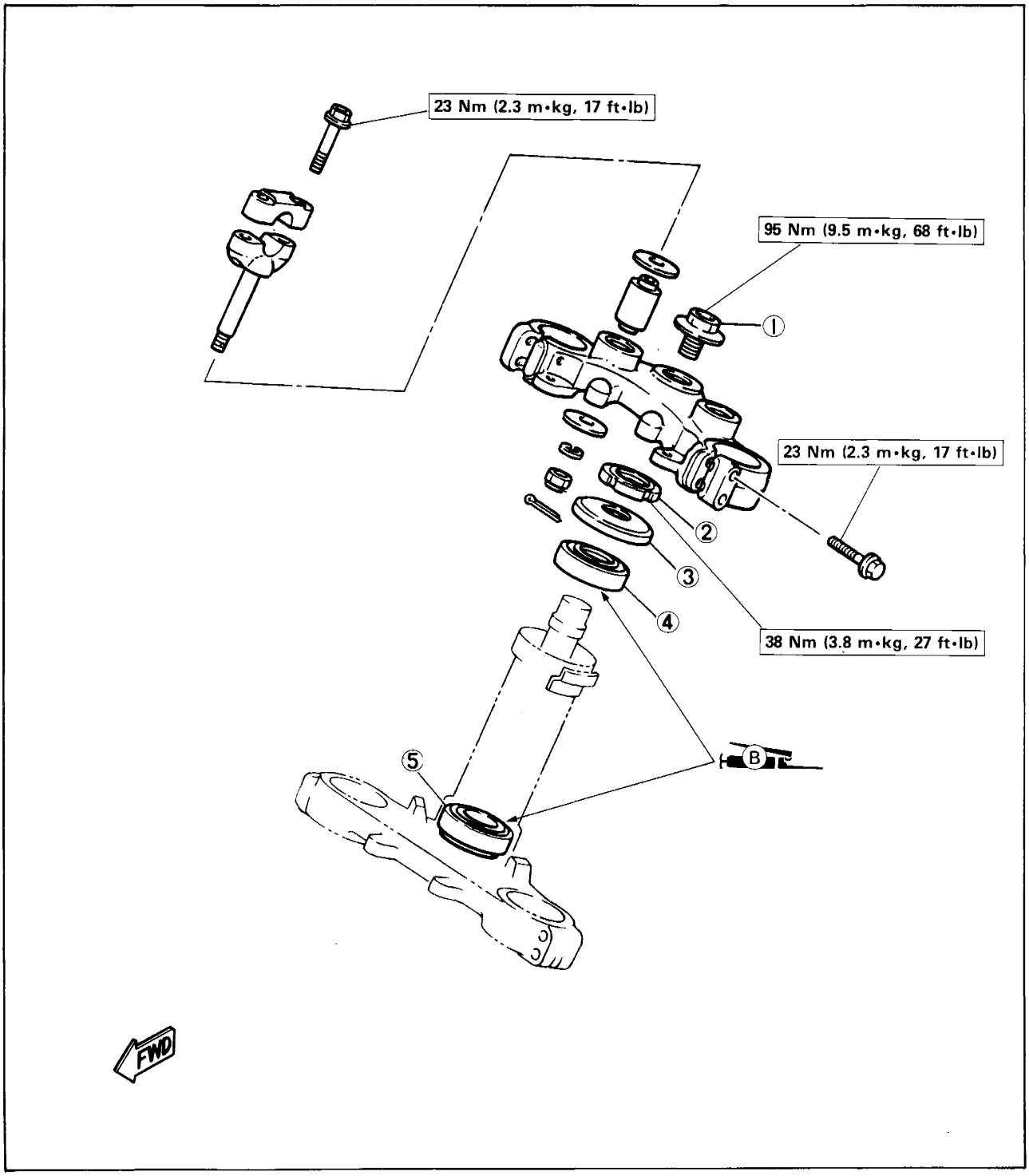
FRONT FORKS

① Cap bolt
② O-ring
③ Spacer
④ Spring seat
⑤ Fork spring
⑥ Inner tube
⑦ Slide bush
⑧ Rebound spring
⑨ Damper rod (cylinder complete)
⑩ Oil lock piece
⑪ Retaining clip
⑫ Dust seal
⑬ Oil seal
⑭ Seal spacer
⑮ Guide bush
⑯ Outer tube
⑰ Drain screw
⑱ Cylinder securing bolt



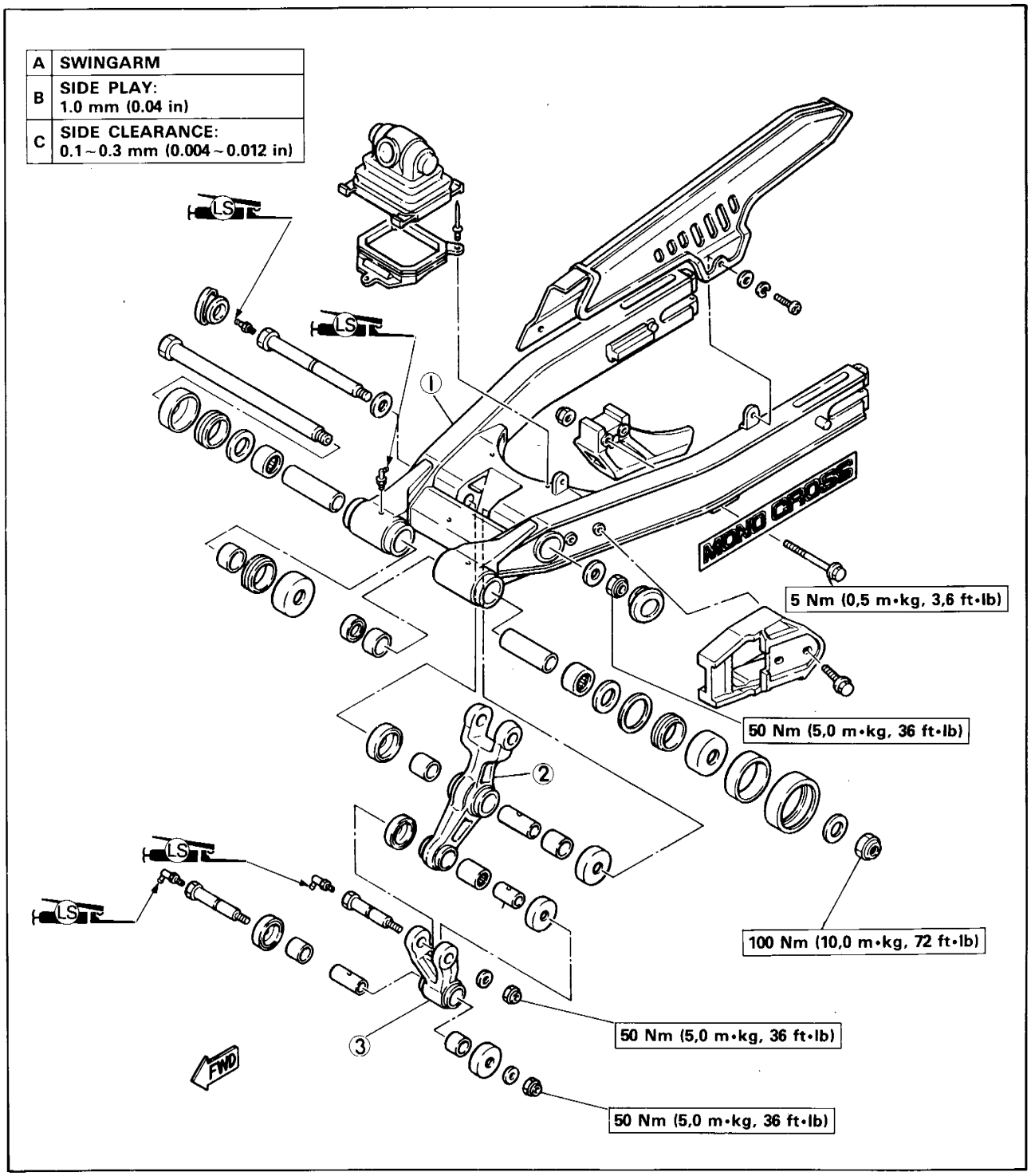
STEERING HEAD

① Steering fitting bolt
② Ring nut
③ Bearing cover
④ Bearing
⑤ Bearing



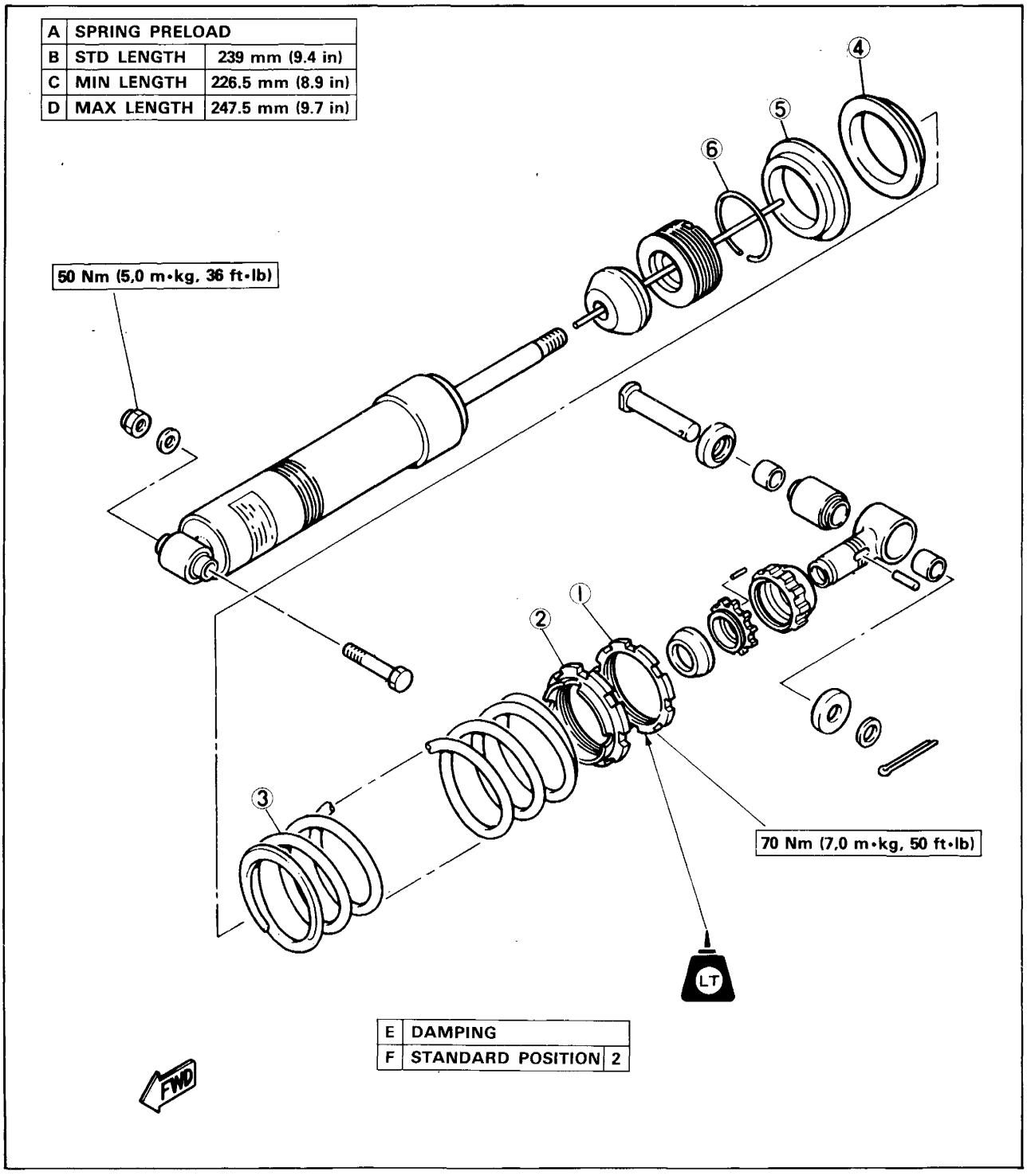
SWINGARM

① Swingarm
② Relay arm
③ Relay arm connecting rod



REAR SHOCK ABSORBER

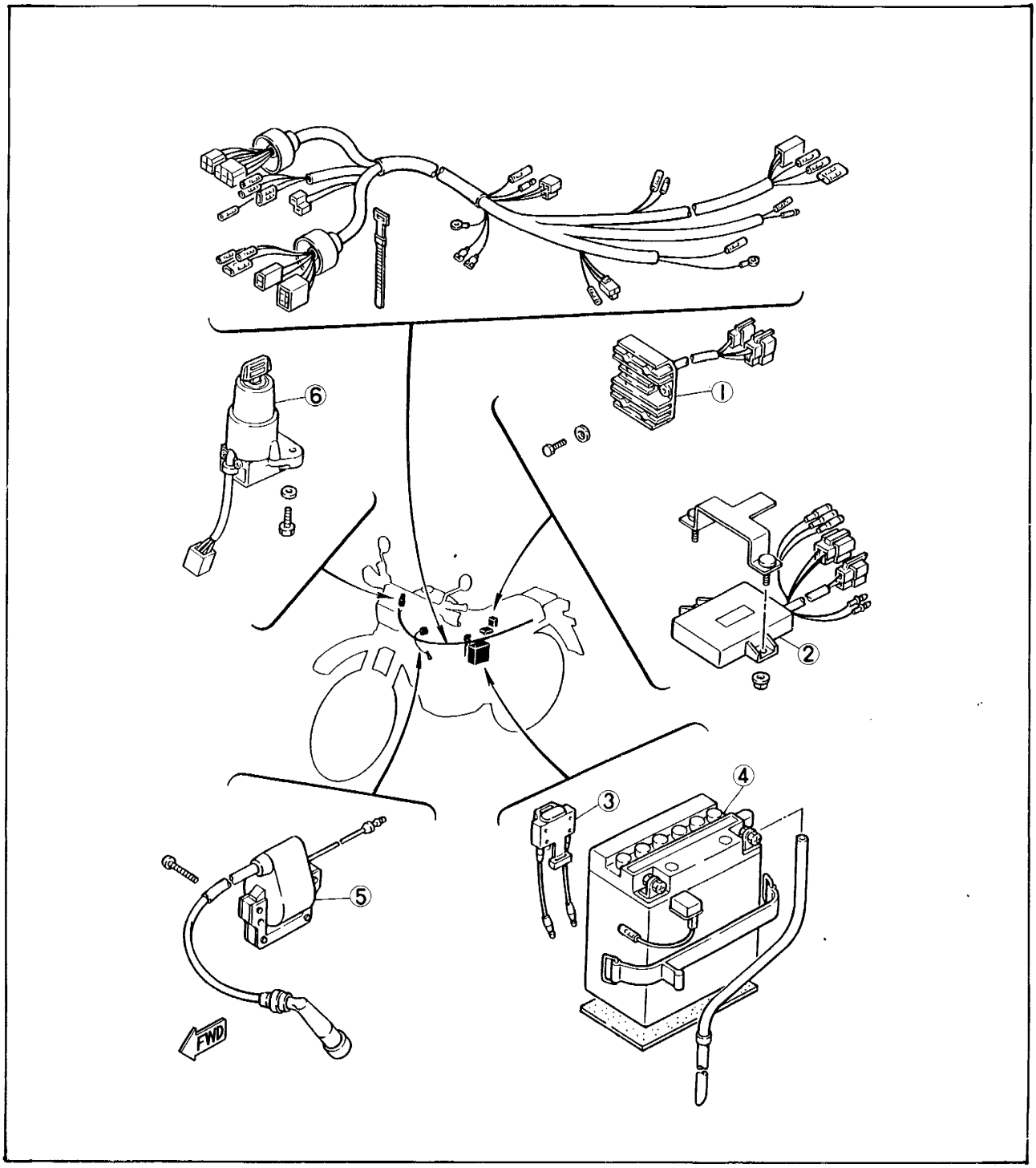
① Locknut
② Adjuster
③ Spring
④ Spring guide
⑤ Spring seat
⑥ Circlip



ELECTRICAL COMPONENTS 1

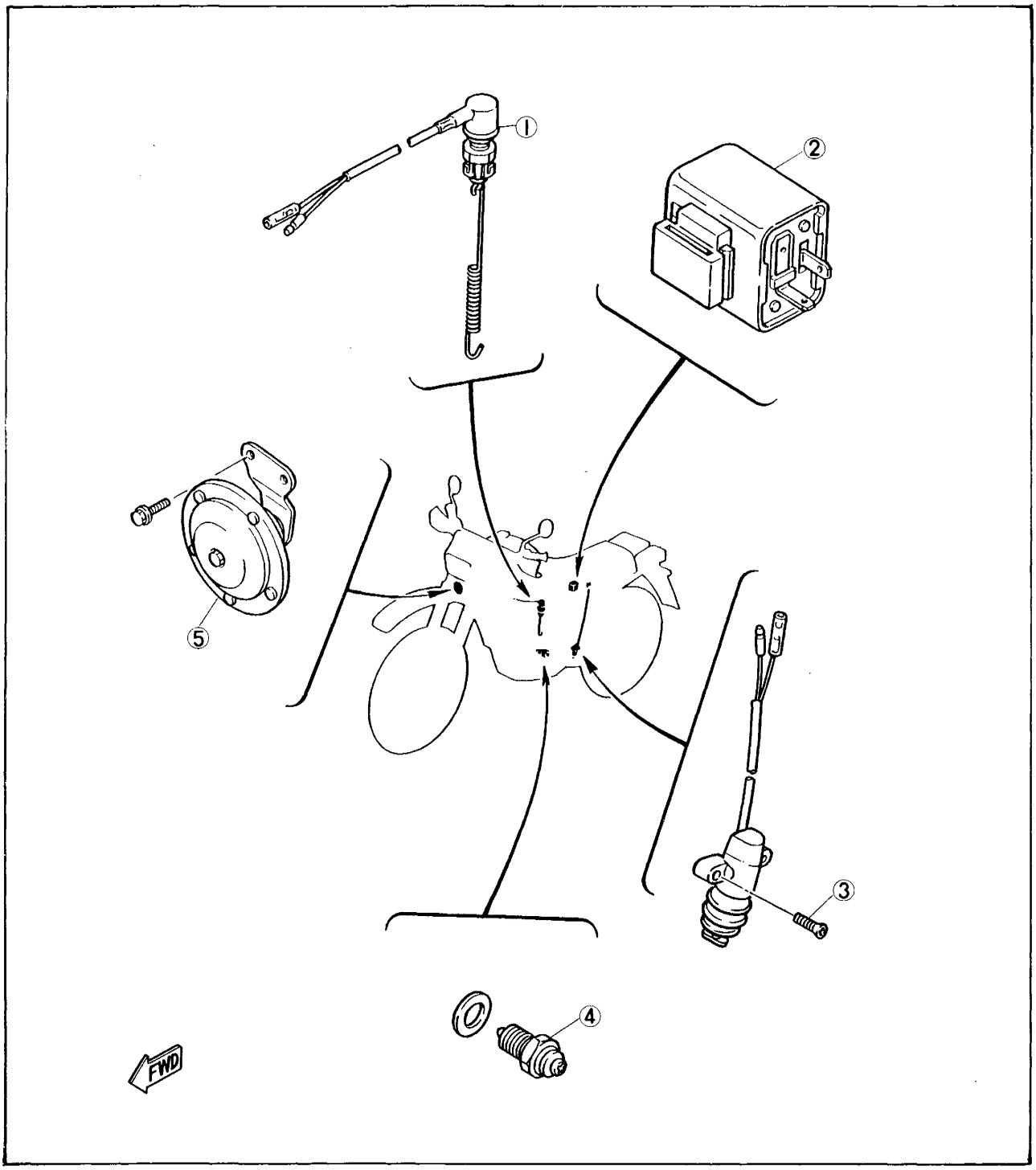
① Rectifier with regulator
② CDI unit
③ Non-fuse braker
④ Battery
⑤ Ignition coil
⑥ Main switch

SPECIFICATIONS	RESISTANCE
Pickup Coil	110Ω ± 18%
Source Coil	200Ω ± 20%
Charging Coil	0.4Ω ± 50%
Ignition Coil	
(Primary)	0.3Ω ± 10%
(Secondary)	4.3KΩ ± 20%



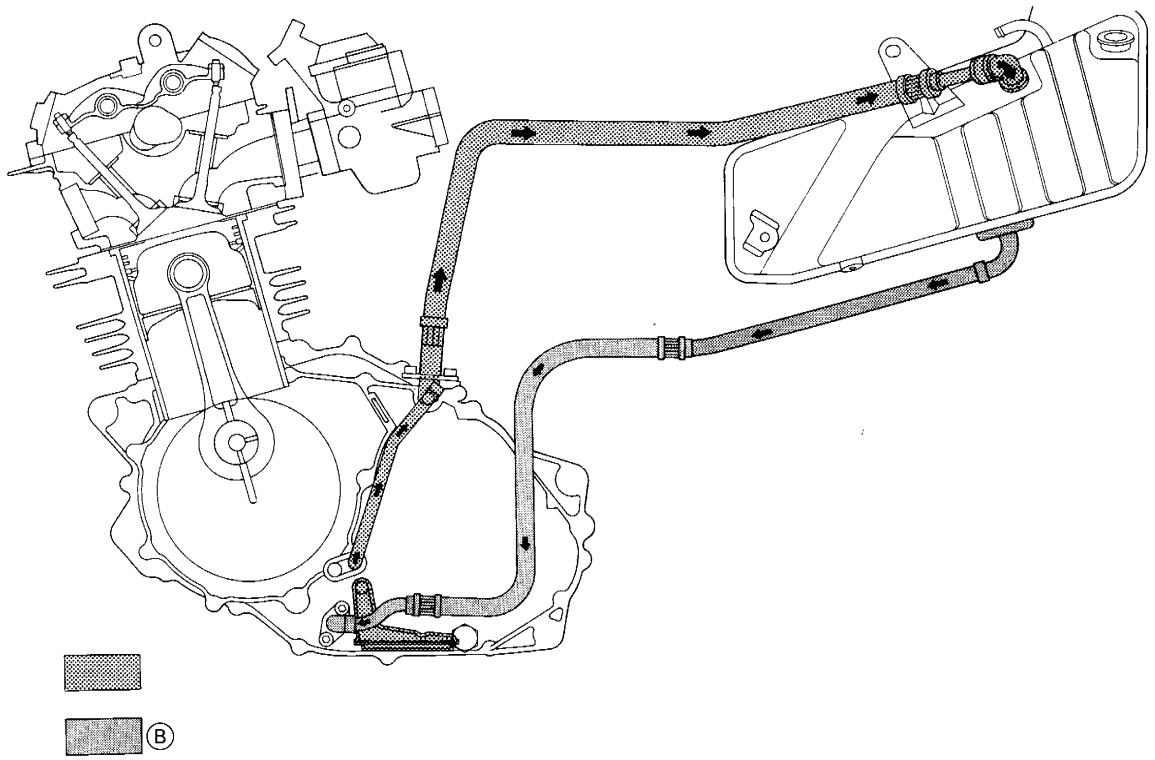
ELECTRICAL COMPONENTS 2

① Rear brake switch
② Flasher relay
③ Sidestand switch
④ Neutral switch
⑤ Horn



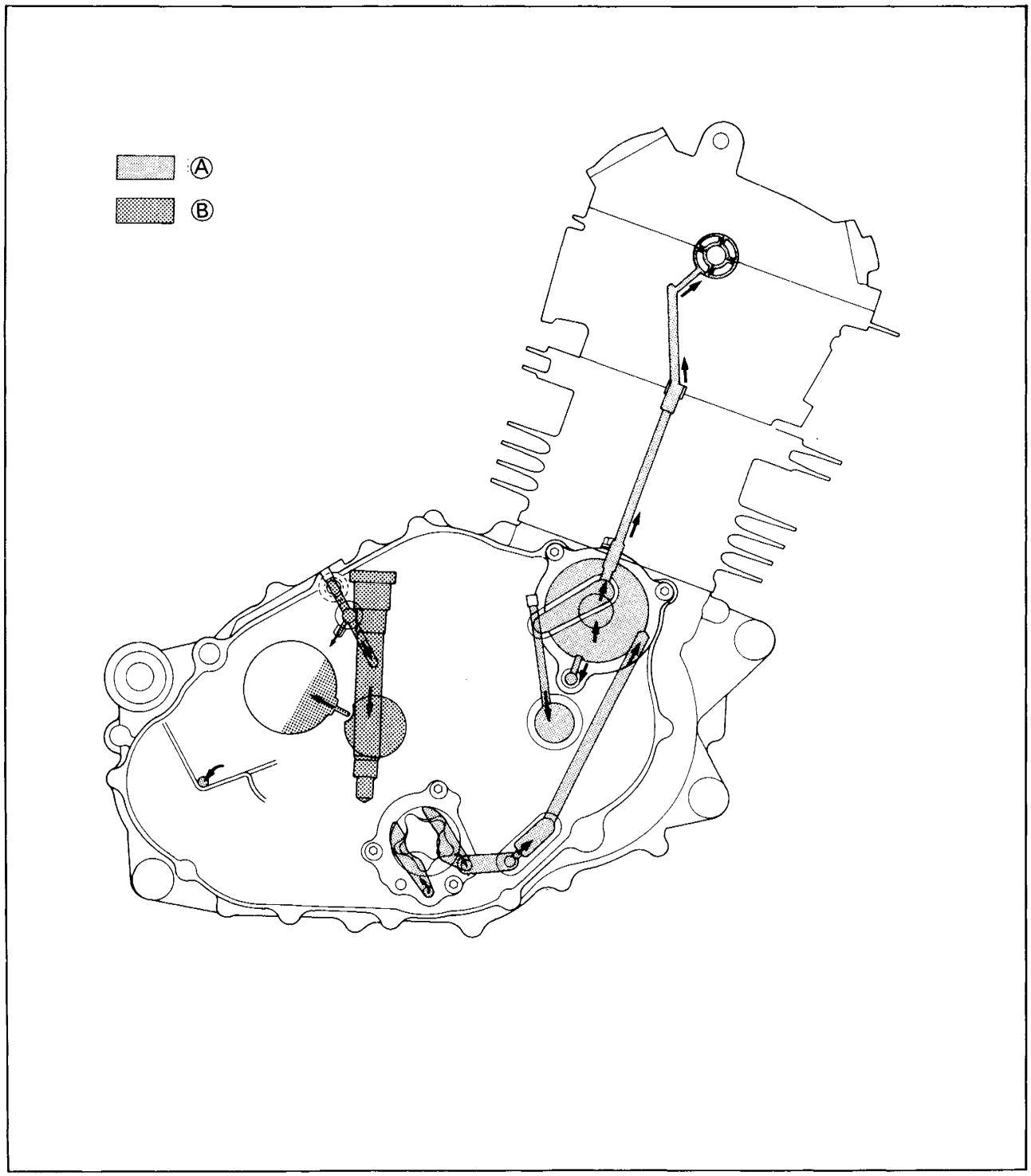
LUBRICATION DIAGRAMS

Ⓐ Feed oil
Ⓑ Scavenge oil



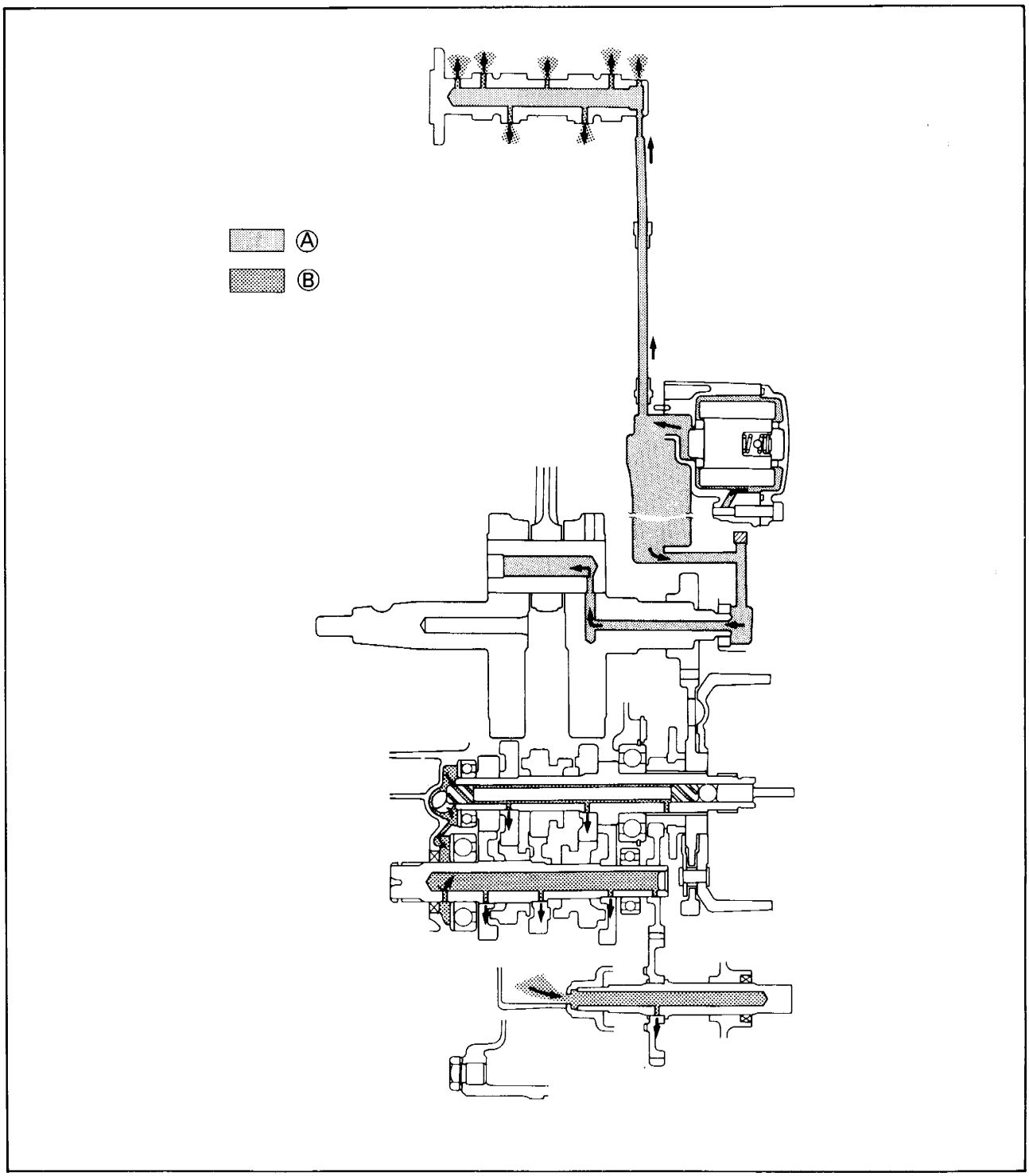
LUBRICATION DIAGRAMS

Ⓐ Feed oil
Ⓑ Scavenge oil



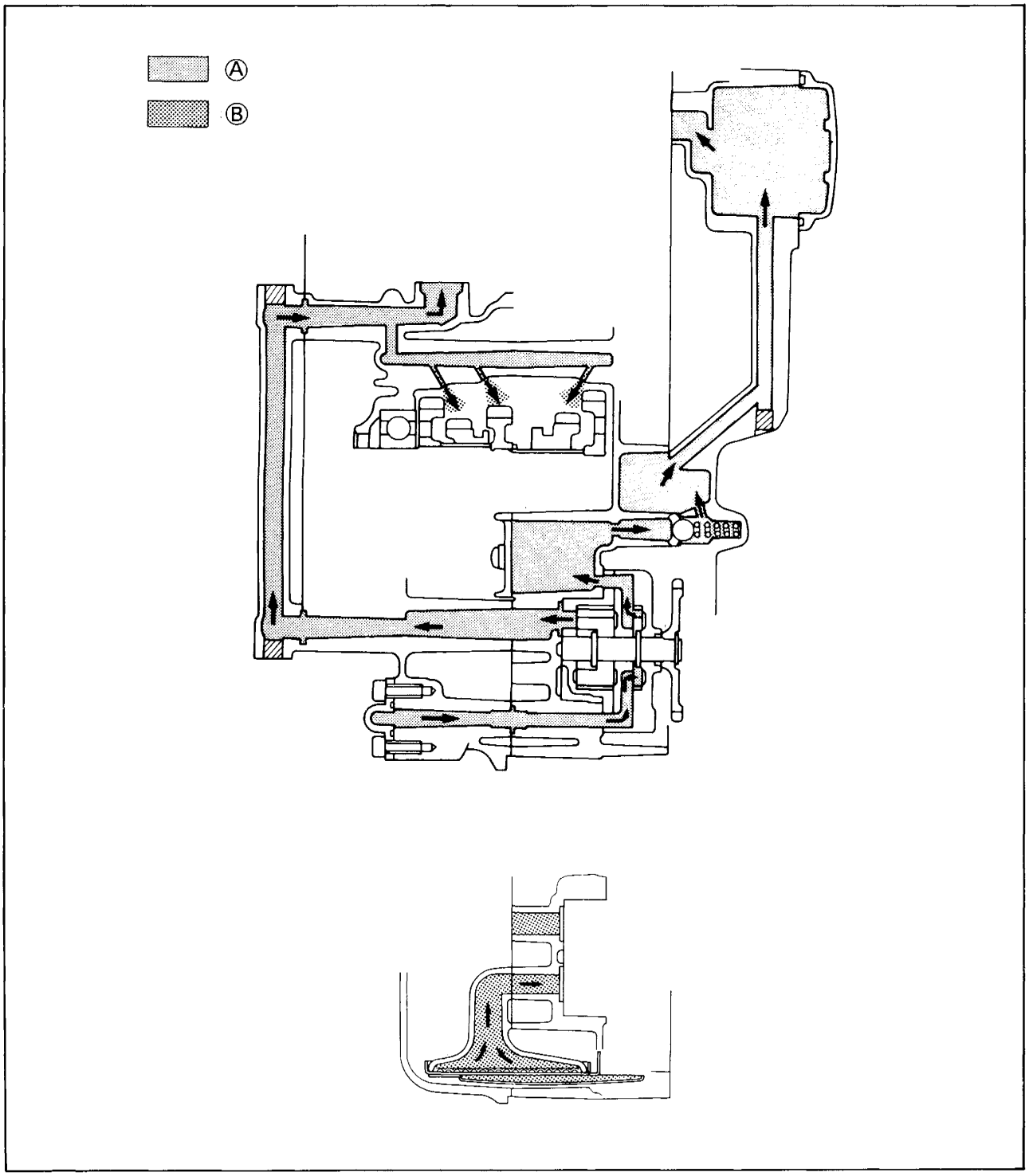
LUBRICATION DIAGRAMS

Ⓐ Feed oil
Ⓑ Scavenge oil



LUBRICATION DIAGRAMS

Ⓐ Feel oil
Ⓑ Scavenge oil

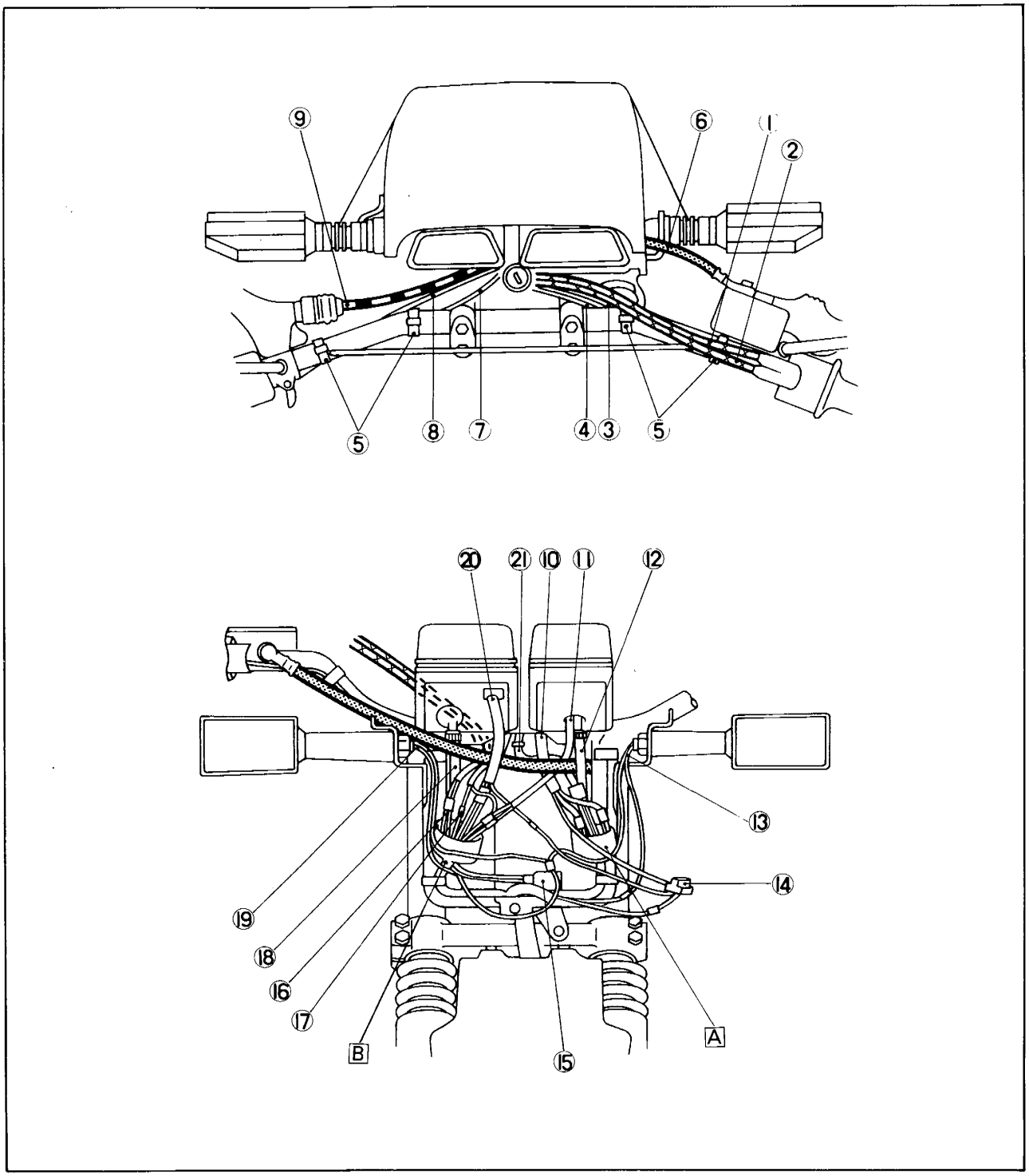


CABLE ROUTING

① Throttle cable 2
② Throttle cable 1
③ Brake switch lead
④ Handlebar switch lead (Right)
⑤ Band
⑥ Brake hose
⑦ Handlebar switch lead (Left)
⑧ Starter cable
⑨ Clutch cable
⑩ Handlebar switch lead (Left)
⑪ Speedometer lead
⑫ Speedometer cable
⑬ Front flasher light lead (Left)
⑭ Headlight socket
⑮ Flasher relay
⑯ Brake switch lead
⑰ Engine stop switch lead
⑱ Tachometer cable
⑲ Front flasher light lead (Right)
⑳ Meter light lead
㉑ Main switch lead

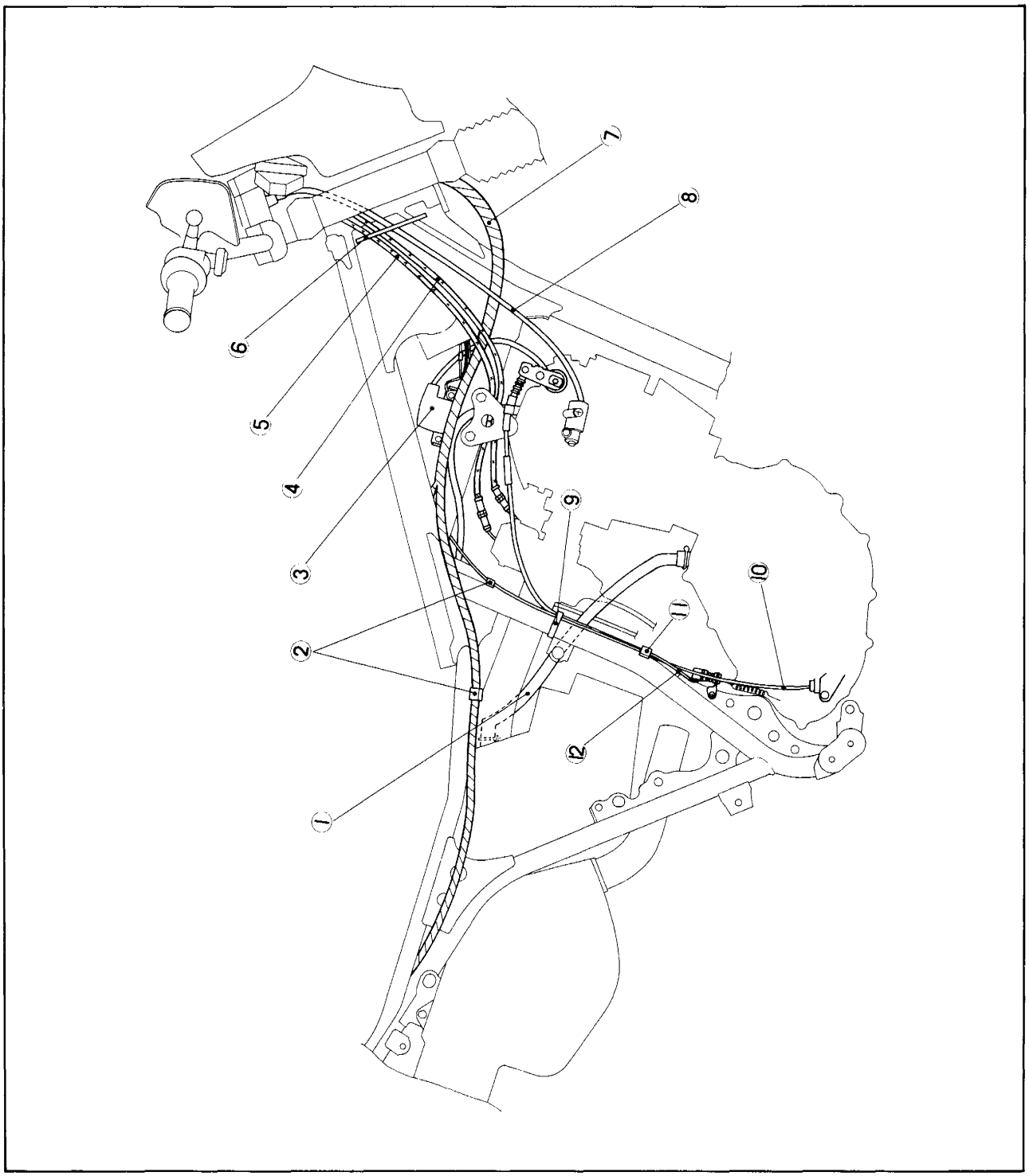
[A] After connecting, cover the connector cover (Left).

[B] After connecting, cover the connector cover (Right).



CABLE ROUTING

① Breather hose
② Clamp
③ Ignition coil
④ Throttle cable 2
⑤ Throttle cable 1
⑥ Cable guide
⑦ Wire harness
⑧ Tachometer cable
⑨ Band
⑩ Decompression cable
⑪ Clamp
⑫ Rear brake switch lead



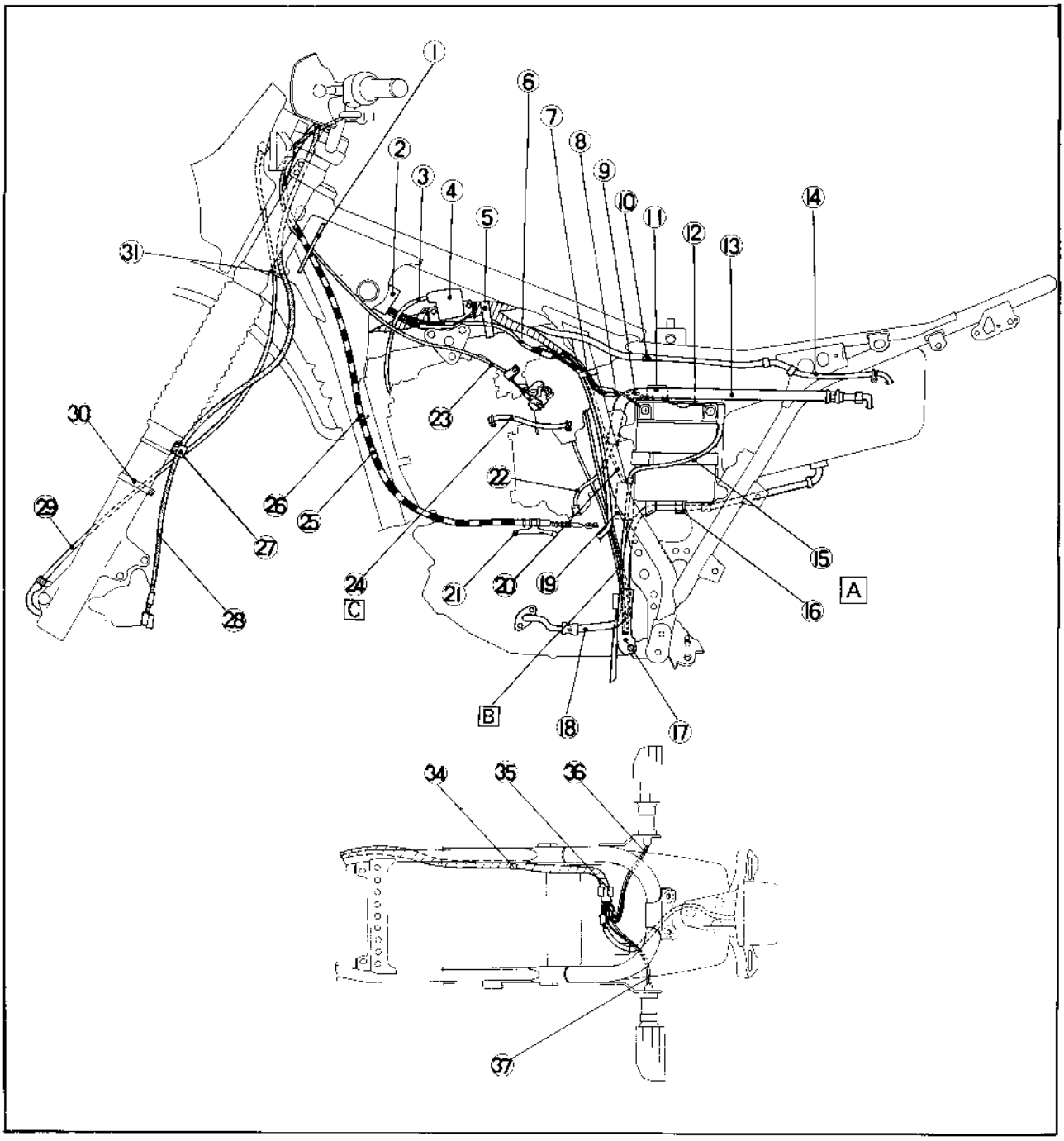
CABLE ROUTING

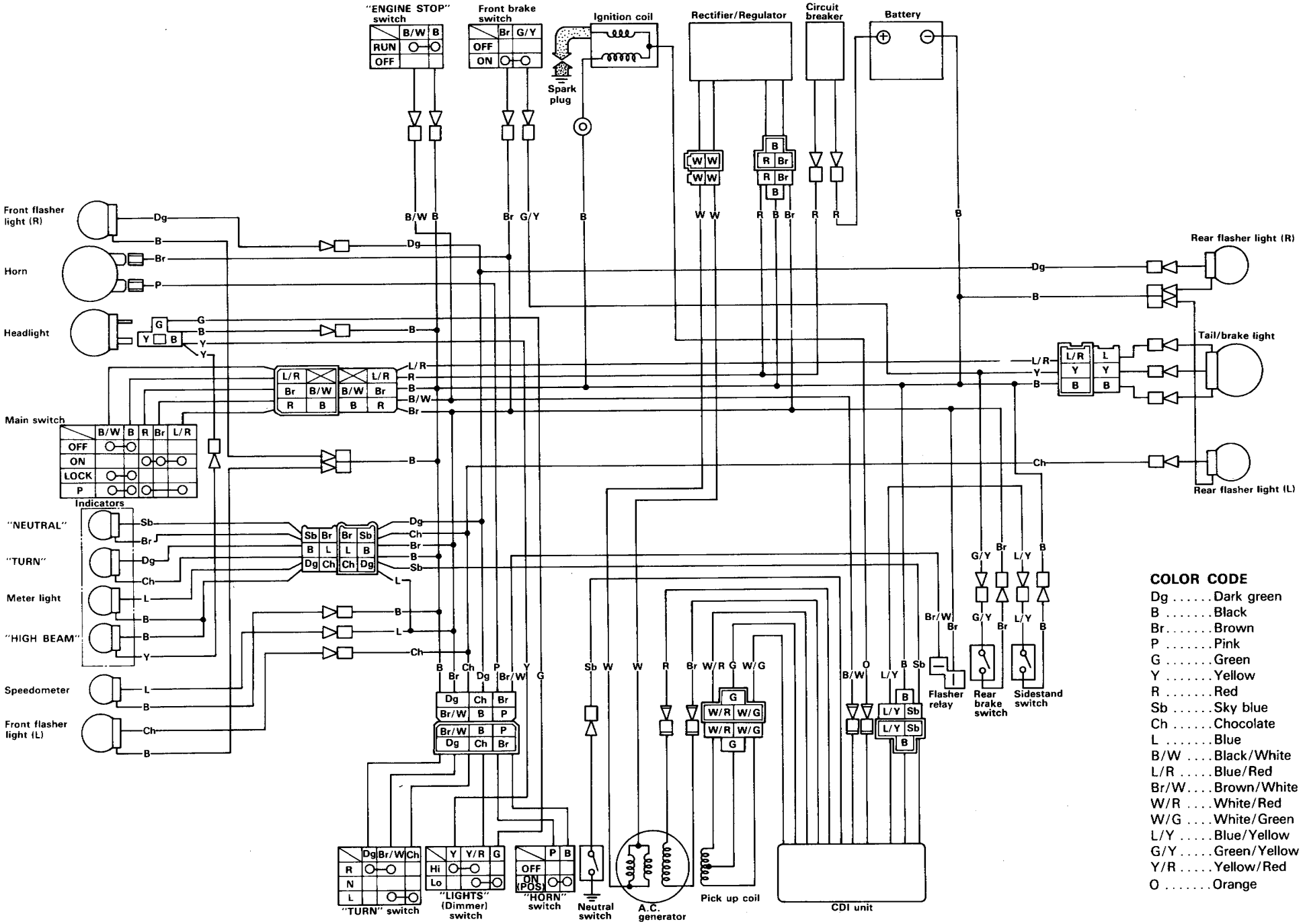
① Cable guide
② C.D.I. unit
③ High tension cord
④ Ignition coil
⑤ Band
⑥ C.D.I. unit lead
⑦ Band
⑧ Battery positive lead
⑨ Circuit breaker lead
⑩ Clamp
⑪ Circuit breaker
⑫ Battery negative lead
⑬ Oil hose
⑭ Oil breather pipe
⑮ Battery breather pipe
⑯ Battery box guide
⑰ Plate
⑱ Oil hose
⑲ Regulator
⑳ Regulator lead
㉑ Holder
㉒ Oil hose
㉓ Starter cable
㉔ Fuel pipe
㉕ Clutch cable
㉖ Cable guide
㉗ Clamp
㉘ Brake hose
㉙ Speedometer cable
㉚ Band
㉛ Clamp
㉜ Clamp
㉝ Rear fender guide
㉞ Rear flasher light lead (Right)
㉟ Rear flasher light lead (Left)

[A]
Pass between battery and regulator, and pass between left crankcase and plate, then pass engine protector (left).

[B]
Carburetor overflow pipe clamp pipe with plate.

[C]
Don't touch cylinder, oil cooler and tank flange.





COLOR CODE

Dg	Dark green
B	Black
Br	Brown
P	Pink
G	Green
Y	Yellow
R	Red
Sb	Sky blue
Ch	Chocolate
L	Blue
B/W	Black/White
L/R	Blue/Red
Br/W	Brown/White
W/R	White/Red
W/G	White/Green
L/Y	Blue/Yellow
G/Y	Green/Yellow
Y/R	Yellow/Red
O	Orange