SUZUKI

FD110

SERVICE MANUAL

SUZUKI Way of Life!

DATE 06/2013

SUZUKI

FD110

SERVICE MANUAL

FOREWORD

This manual contains an introductory description On SUZUKI FD 110 and procedures for Its inspection/service and overhaul of its main components. Other information considered as generally known is not included. Read GENERAL INFORMATION section to Familiarize yourself with outline of the vehicle and MAINTENANCE and other sections to use as a guide for proper inspection and service. This manual will help you now the vehicle better so that you can assure your customers of your optimum and quick service.

- ** This manual has been prepared on the basis of the latest specifications at the time of publication.*
  If modifications have been made since then, differences may exist between the content of this manual and the actual motorcycle.
- ** IIlustrations in this manual are used to show the basic principles of operation and work procedures. They may not represent the actual motorcycle exactly in detail.*
- ** This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI motorcycles. If you do not have the proper knowledge and tools, ask your authorized SUZUKI motorcycle dealer to help you.*

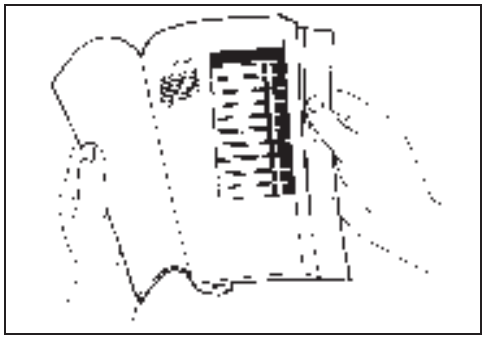
⚠ WARNING

Inexperienced mechanics or mechanics Without the proper tools and equipment may not be able to properly perform the service described I this manual. Improper repair may result I injury to the mechanic and may render the motorcycle unsafe for the rider and passenger.

GROUP INDEX

HOW TO USE THIS MANUAL
TO LOCATE WHAT YOU ARE LOOKING FOR :

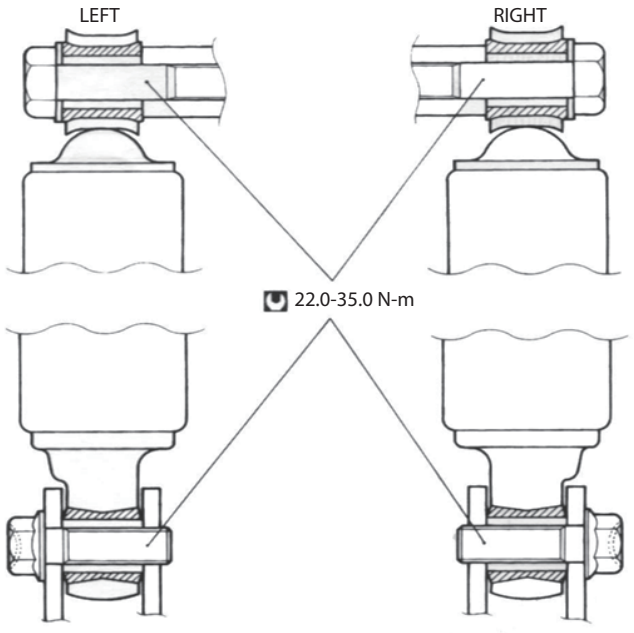
1. The text of this manual is divided into sections.
2. As the title of these sections are listed on the previous page as GROUP INDEX, select the section where what you are looking for belong.
3. Holding the manual as shown as the right will allow
4. On the first page of each section, its contents are listed. Find the item and page you need.



COMPONENT PARTS AND WORK TO BE DONE

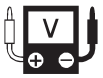
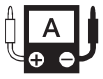
Under the name of each system or unit, its exploded view provided with work instruction and other service information such as the tightening torque, lubricating and locking agent points.

Example:



SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing and meaning associated with them respectively.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates Specified torque.		Apply THREAD LOCK SUPER “1303” 99000-32030
	Apply oil, Use engine oil unless otherwise specified.		Apply THREAD LOCK “1342” 99000-32050
	Apply SUZUKI SUPER GREASE “A” 99000-25010		Apply or use brake fluid.
	Apply SUZUKI SILICONE GREASE. 99000-25100		Measure in voltage range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in resistance range.
	Apply SUZUKI BOND “1215” 99000-31110		Measure in current range.
	Apply THREAD LOCK SUPER “1322” 99000-31110		Use special tool.
	Apply THREAD LOCK SUPER “1360” 99000-32130		Use fork oil. 99000-99044-10G

GENERAL INFORMATION

1

CONTENTS

WARNING/CAUTION/NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol and the words WARNING, CAUTION and NOTE have special meanings. Pay special attention to the messages highlighted by these signal words.

⚠ WARNING

Indicates a potential hazard that could result in death or injury.

⚠ WARNING

Indicates a potential hazard that could result in vehicle damage.

NOTE:
Indicates special information to make maintenance easier or instructions clearer.

Please note, however, that the warnings and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the motorcycle. In addition to the WARNINGS and CAUTIONS stated, you must use good judgement and basic mechanical safety principles. If you are unsure about how to perform a particular service operation, ask a more experienced mechanic for advice.

GENERAL PRECAUTIONS

⚠ WARNING

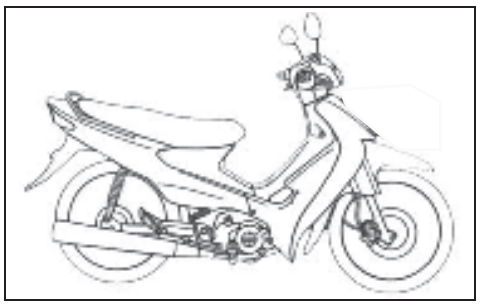
- **Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the vehicle.**
- **When 2 or more persons work together, pay attention to the safety of each other.**
- **When it is necessary to run the engine indoors, make sure that exhaust gas is forced outdoors.**
- **When working with toxic or the flammable materials, make sure that the area you work in is well ventilated and that you follow all of the material manufacturer's instructions.**
- **Never use getting burned, do not touch the engine, engine oil or exhaust system during or for a while after engine operation.**
- **After servicing fuel, oil, exhaust or brake systems, check all lines and fittings related to the system for leaks.**

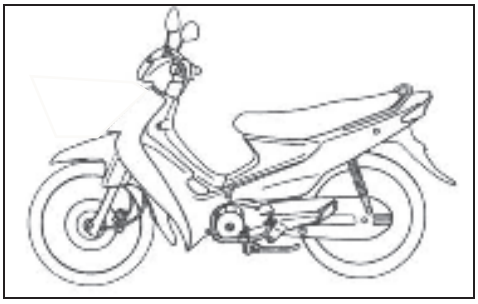
CAUTION

* If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
* When removing arts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
* Be sure to use special tools when instructed.
* Make sure that all parts used in reassembly are clean, and also lubricated when specified.
* When use of a certain type of lubricant, bond, or sealant is specified be sure to sue the specified type.
* When removing the battery, disconnect the negative cable first and then positive cable. When reconnecting the battery, connect the positive cablefirst and then negative cable, and replace the terminal cover on the positive terminal.
* When performing service to electrical arts, if the service procedures not require use of battery power, disconnect the negative cable of the battery.
* Tighten cylinder head case bolts and nuts, beginning with larger diameter and ending with smaller diameter, from inside to outside diagonally, to the specified tightening torque.
* Whenever you remove oil seals, gaskets, packing, O-rings, locking washers, cotter pins, circlips and certain other parts as specified, be sure to replace them with new ones. Also, before installing these new parts, be sure to remove any left over material from the mating surfaces.
* Never reuse a circlip. When installing a new circlip, take care not to expand the end gap larger than required to slip the circlip over the shaft. After installing a circlip, always ensure that it is completely seated in its groove and securely fitted.
* Do not use self-locking nuts a few times over.
* Use a torque wrench to tighten fasteners to the torque values when specified. Wipe off grease or oil if a thread is smeared with them.
* After reassembly, check parts for tightness and operation.

* To protect environment, do not unlawfully dispose of used motor oil and other fluids: batteries, and tires.
* To protect Earth’s natural resources, properly dispose of used vehicles and parts.

SUZUKI FD 110 （XB517QD/XB517QSC）

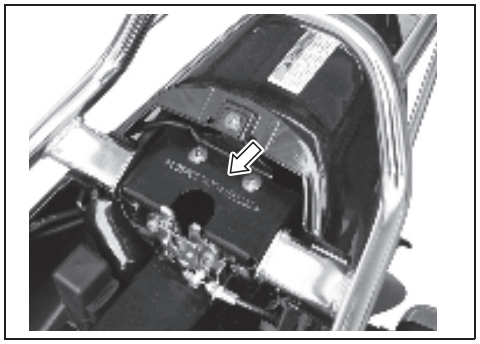


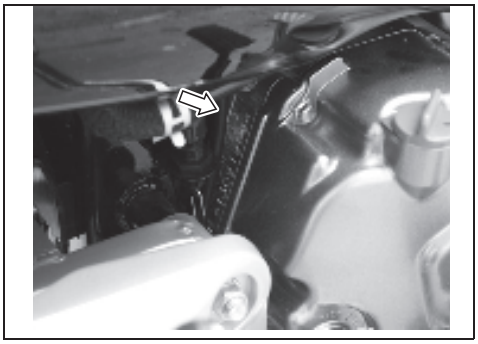


• Difference between illustrations and actual motorcycles depends on the markets.

SERIAL NUMBER LOCATION

The frame serial number or V.I.N. (Vehicle Identification Number) is stamped on the left side of the steering head tube. The engine serial number is located on the upper right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.





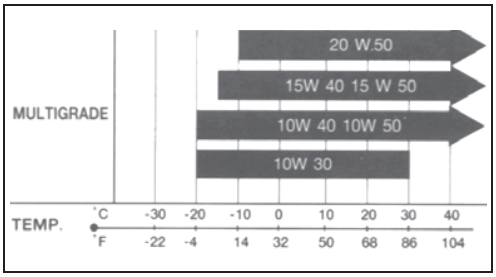
FUEL AND OIL RECOMMENDATIONS

FUEL

Gasoline used should be graded 91 (Research Method)_ or higher. An unleaded gasoline type is recommended.

ENGINE OIL

Be sure the engine oil you use comes under API classification of SF or SG and that its viscosity rating is SAE 40. If an SAE 40 motor oil is not available, select an alternate according to the right chart



BRAKE FLUID

Specification and classification: DOT 4

⚠ WARNING

Since the brake system of this motorcycle is filled with a glycol-based brake fluidby the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.
Do not use any brake fluid taken from old or used or unsealed containers.
Never re-use brake fluid left over from a previous servicing, which has been stored for a long period.

FRONT FORK OIL

Use fork oil # 10.

BREAK-IN PROCEDURES

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to “BREAK-IN” before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows.

- Keep to this break-in throttle position. Initial 500 km: less than ½ throttle Up to 1,600 km: Less than ¾ throttle
- Upon reaching an odometer reading of 1,600 km you can subject the motorcycle to full throttle operation for short periods of time.

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	1,932 mm
Overall width	650 mm
Overall height	1,062 mm
Seat height	755 mm
Wheel base	1,230 mm
Ground clearance	153 mm
Dry mass	96 kg

ENGINE

Type	Four-stroke, air-cooled, SOHC
Number of cylinder	1
Bore	53.5 mm
Stroke	48.8 mm
Piston Displacement	109.6 cm^3
Compression ration	9.6 : 1
Carburetor	MIKUNI VM17
Air cleaner	Paper
Starter system	Electric starter & Kick starter
starter Lubrication system	Wet sump
Valve clearance	IN : 0.04-0.07 mm. EX : 0.04-0.07 mm.

TRANSMISSION

Clutch	Wet shoe, automatic, centrifugal type
Transmission	4-speed constant mesh
Gearshift pattern	All-down
Primary reduction ratio	3.666 (77/21)
Final reduction ratio	2.428 (34/14)
Gear ratios, Low	3.000 (33/11)
2nd	1.875 (30/16)
3rd	1.368 (26/19)
Top	1.052 (20/19)
Drive chain	DIADO D.I.D 428, 98 links

CHASSIS

Frame	SSRF (SUZUKI SINGLE RECTANGULAR FRAME)
Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swing arm type, coil spring
Steering angle	45° (right & left)
Caster	27°
Trail	65 mm
Front brake	Disc brake, hydraulically operated
	Expanding, drum, brake.
Rear brake	Internal expanding, drum brake
Front tire size	2.25 – 17 NR72 33L
Rear tire size	2.50 – 17 NR72 38L
Front fork stroke	90 mm
Rear wheel travel	79 mm

ELECTRICAL

Ignition type	DC-CDI
Spark plug	ND: U20FS-U
	NGK: C6HS
Batter	12 V 5AH 10HR
Fuse	10 A
Headlight	12 V 35/35 W
Turn signal light	12 V 10 W
Taillight/Brake light	12 V5/21W
Speedometer light	12 V 3 W
High beam indicator light	12 V 1.7 W
Turn signal indicator light	12 V 1.7 W
Neutral, gear position indicator light	12 V 1.7 W

CAPACITY

Fuel tank	4.2 L
Engine oil, oil change	800 ml
with filter change	900 ml
overhaul	1,000 ml
Front fork oil	70 ml

These specifications are subject to change without notice.

PERIODICAL MAINTENANCE

CONTENTS

PERIODICAL MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary t keep the motorcycle operating at peak performance and economy. Mileages are expressed in terms of kilometers and time for your convenience.

NOTE:
More frequent servicing may be performed on motorcycles that are used under severe conditions.

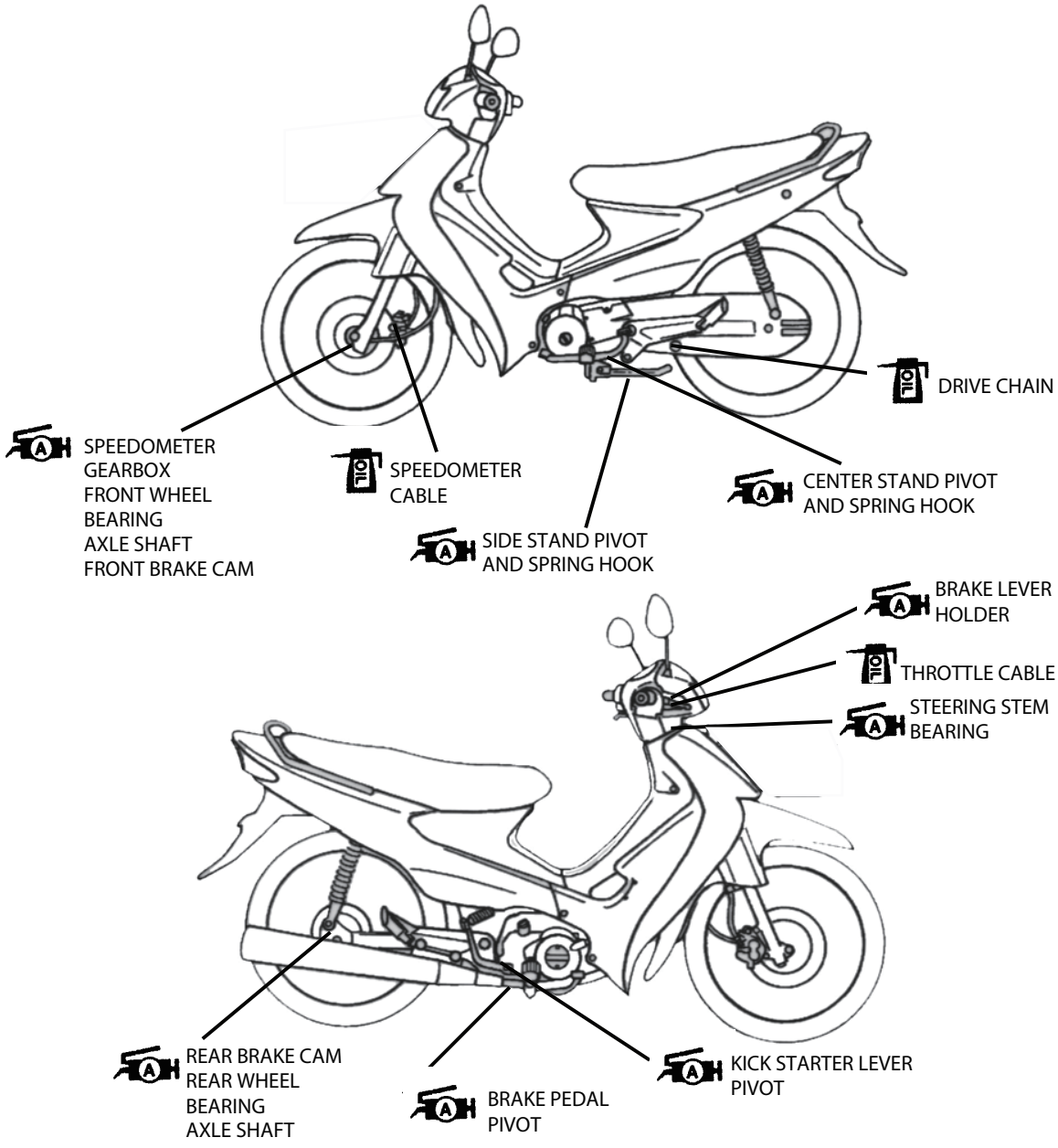
PERIODIC MAINTENANCE CHART

Interval / Item	Km	1,000	4,000	8,000	12,000	16,000	20,000	24,000
	Months	1	6	12	18	24	30	36
Battery		I	I	I	I	I	I	I
Exhaust pipe bolts		T	T	T	T	T	T	T
Air cleaner		—	C	C	R	C	C	R
Valve clearance		I	I	I	I	I	I	I
Spark		I	I	R	I	R	I	R
Engine oil		R	R	R	R	R	R	R
		Replace every 4,000 km						
Engine oil filter		R	—	R	—	R	I	R
		Replace every 8,000 km						
Fuel hose		I	I	I	I	I	I	I
Clutch		I	I	I	I	I	I	I
Fuel filter		I	I	I	I	I	I	I
Engine idle rpm (Carburetor)		I	I	I	I	I	I	I
Throttle cable play (Carburetor)		I	I	I	I	I	I	I
Drive chain		I	I	I	I	I	I	I
Brakes		I	I	I	I	I	I	I
Tires		I	I	I	I	I	I	I
Steering		I	I	I	I	I	I	I
Cylinder head nut		T	T	T	T	T	T	T
Suspension		—	—	I	—	I	—	I
Chassis bolts and nuts		T	T	T	T	T	T	T

NOTE:
I: Inspection and adjust, clean, Lubricate or replace as necessary
C: Clean R: Replace T: Tighten

LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle. Major lubrication points are indicated below.



NOTE:

** Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.*

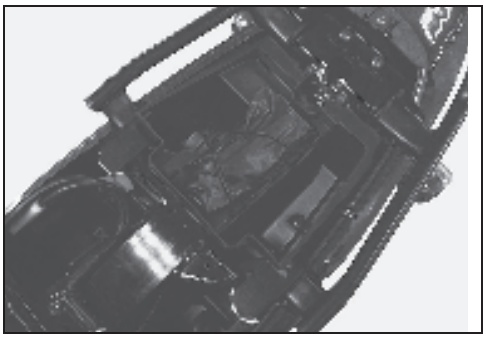
** Lubricate exposed parts which are subject to rust, with a rust preventative spry whenever the motorcycle has been operated under wet or rainy condition.*

MAINTENANCE AND TUNE-UP PROCEDURES

This section describes the servicing procedures for each item of the Periodic Maintenance requirements.

BATTERY

Inspect initially at 1,000 km (1 month) and Every 4,000 km (4 months) thereafter.



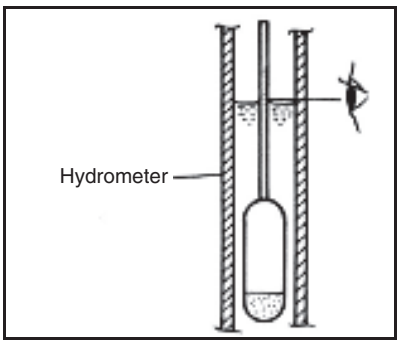
- The battery must be removed to check the electrolyte level and specific gravity.
- Open the seat.
- Remove battery ⊖ and ⊕ leads at the battery terminals.

CAUTION

When removing the battery, disconnect the negative cable first and then the positive cable.

- Remove battery from the frame.
- Check electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOWER. Level line but not above the UPPER. Level line.

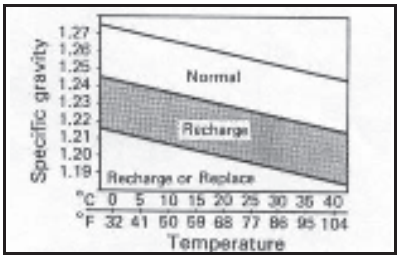
For checking specific gravity, use a hydrometer to determine the charged condition.



09900-28403: Hydrometer

Battery type ….GM3-3B

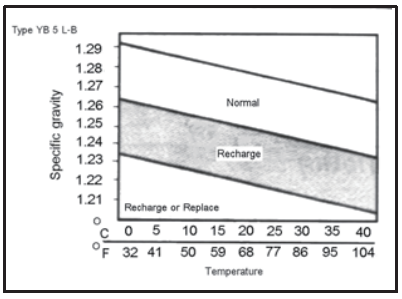
Standard specific gravity	1.26 at 20 °C



Battery type …. YB5L-B

Standard specific gravity	1.28 at 20 °C

An S.G. reading of 1.22 [YB5L-B] 1.20 [GM 3-3B] (AT 20oC) or under means that the battery needs recharging off the machine: Take if off and charge it from a recharge. Charging the battery in place can lead to failure of the regulator or rectifier.

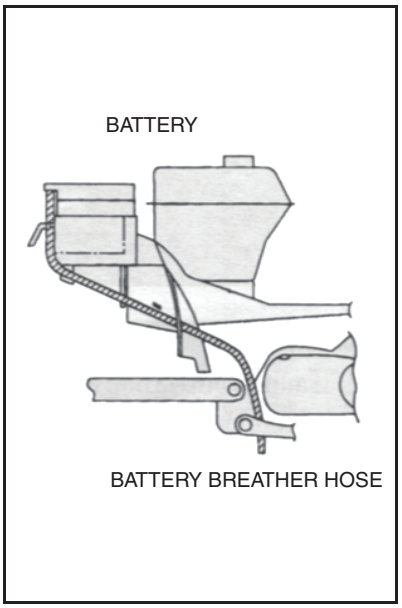


- To install the battery, reverse the procedure cribbed above.

CAUTION

When installing the battery lead wires fix the ⊕ Led first and ⊖ lead last.

- Make sure that the breather pipe is tightly secured and undamaged, and is routed as shown in the photograph.

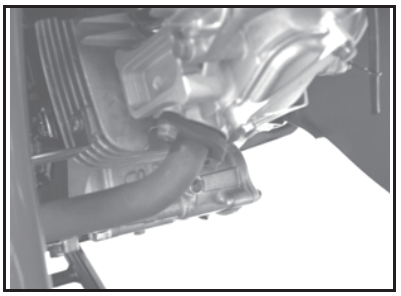


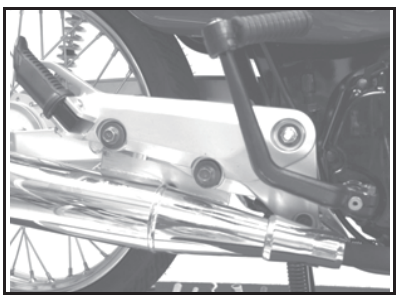
EXHAUST PIPE BOLTS

Tighten Initially at 1,000 km (1 month) and Inspect Every 4,000 km (6 months) thereafter.

- Tighten the exhaust pipe clamp bolts and muffler mounting bolts to the specified torque with a torque wrench.

Exhaust pipe nut: 1.1 kg-m
Muffler mounting bolt: 2.6 kg-m



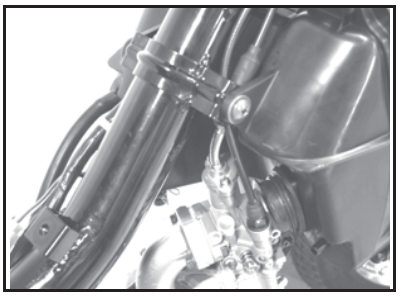


AIR CLEANER

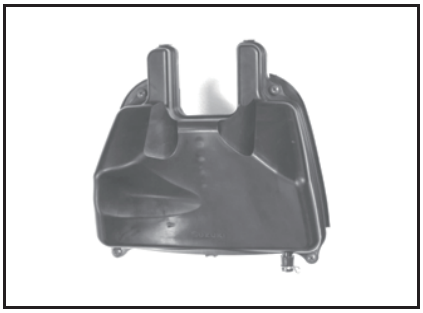
Clean Every 4,000 km (6 months).

If the air cleaner is clogged with dust, intake resistance will be increased with a resultant decrease in output and an increase the fuel consumption. Check and clean the element in the following manner.

- Loosen the 3 screw.
- Take off the air cleaner cover.
- Remove the element from the case.

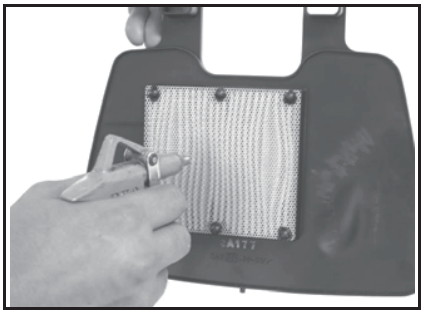


- Loosen the four screw and remove the air cleaner cover.
- Remove the air cleaner element.
- Carefully use an air hose to blow the dust form the cleaner element inside.
- Reinstall the cleaned or new cleaner element in the reverse order of removal.



CAUTION

Always use air pressure on the side of the steel sheet.

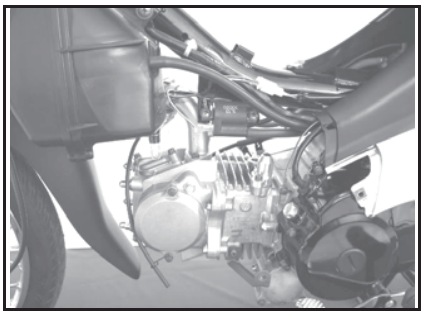


CAUTION

If driving under dusty condition, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a ruptured element. Make sure that the air cleaner is in good condition at all times. Life of the engine depends largely on this component !

VALVE CLEARANCE

Inspect Initially at 1,000 km (1 month) and Every 4,000 km (6 months) thereafter.



Excessive valve clearance results in valve noise and insufficient valve clearance results in valve damage and reduced power. At the distances indicated above, check and adjust the clearance to the following specification.

Clean Every 4,000 km (6 months).

Valve clearance (When cold):

IN.: 0.04 - 0.07 mm

EX.: 0.04 - 0.07 mm

- Remove the center leg shield.
- Remove the leg shields, left and right.
- Remove the carburetor by loosening the screws

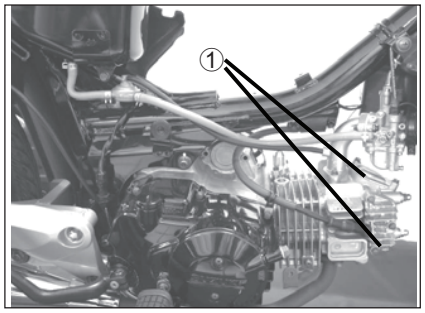
The procedure for adjusting the valve clearance is as follows:

NOTE:

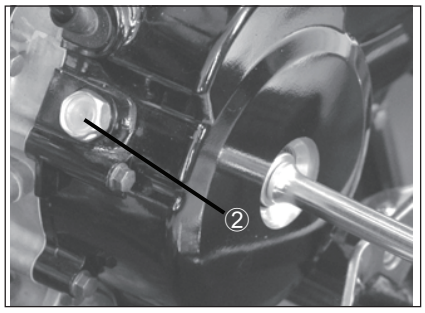
** The piston must be at (TDC) on the compression stroke in order to check the valve clearance or to adjust valve clearance.*

** The clearance specification is for GOLD state.*

- Remove spark plug, valve inspection caps ① and valve timing inspection plug ②.

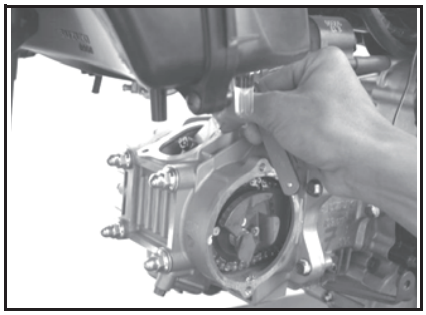


- Remove the magneto cover cap and rotate the magneto rotor with box wrench to set the piston at (TDC) of the compression stroke. (Rotate the rotor until the “T” line on the rotor is aligned with the center of hole on the magneto cover.



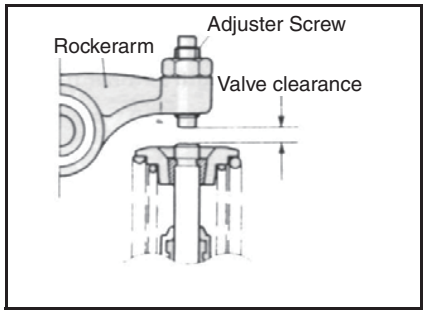
- Insert the thickness gauge to the clearance between the valve stem end and the adjusting screw on the rocker arm.

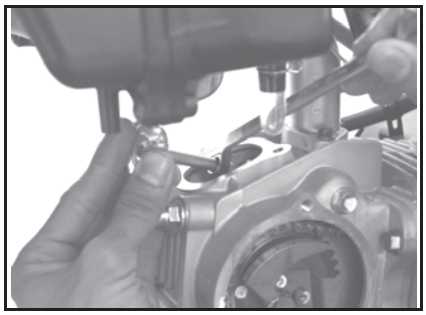
09900-20803: Thickness gauge



- If clearance is off the specification, bring it into the specified range by using the special tool.
- Reinstall spark plug, valve inspection caps, valve timing inspection plug and magneto cover cap.

09917-14910: Tappet adjust driver



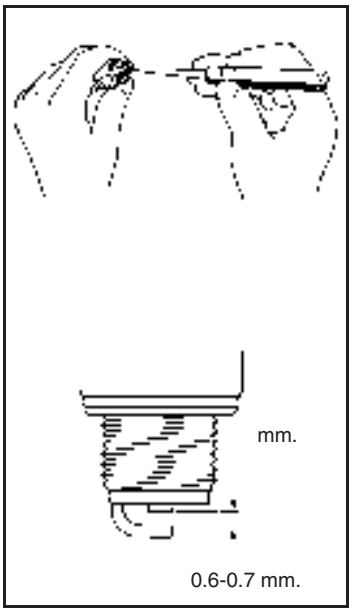


NOTE:

** The clearance specification is for GOLD state*

SPARK PLUG

Inspect at 4,000 km (6 month) Replace Every 8,000 km (12 months).



- Carbon deposits on the spark plug will prevent good sparking and cause misfiring. Clean the deposits off periodically
- If the center electrode is fairly worn down, the plug should be replaced and the plug gap set to the specified gap using a thickness gauge.

09900-20803: Thickness gauge

Spark plug gap	0.6 - 0.7 mm

- Check spark plug for burnt condition. If abnormal, replace the plug as indicated below.

NGK	NIPPON DENSO	REMARKS
CR6HSA	0.6 - 0.7 mm	0.6 - 0.7 mm

- Tighten the spark plug in the cylinder head with the specified torque by using special tool.

Spark plug: 1.1 kg-m

9930-10121: Spark plug socket wrench set

CAUTION

Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

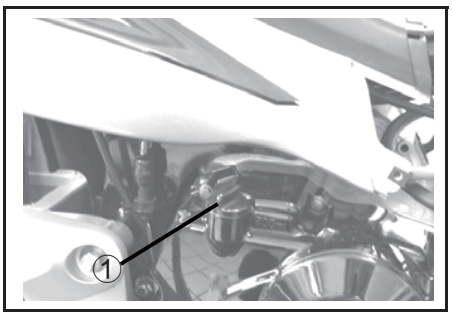
ENGINE OIL

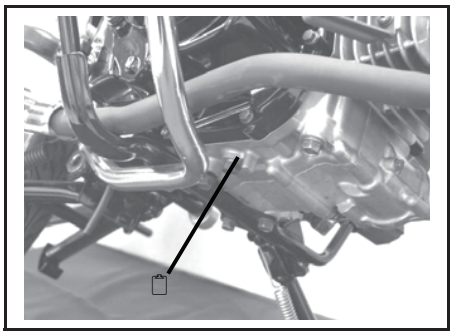
Replace Initially at 1,000 km (1 month) and Every 4,000 km thereafter.

After a long period of use, the engine oil will deteriorate and quicken the wear of sliding and interlocking surfaces. Replace the transmission oil periodically following the procedure below.

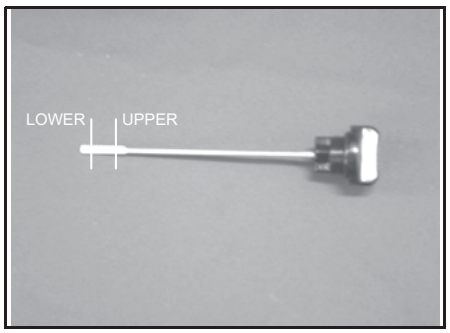
- Start the engine to warm up the oil, this will facilitate draining of oil, Turn off the engine.
- Unscrew the oil filler cap ① and drain plug ② and drain the oil completely.
- Tighten the drain plug.
- Supply the good quality SAE 40 motor oil.
- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about one minute.
- Check the oil level with the dipstick.

The level found in the dipstick should be between “L” (Low) and “F” (Full) lines
Oil viscosity and classification: SAE 40, API: SF, SG





Oil drain plug: 1.8 kg-m



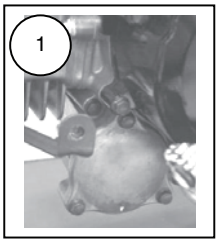
NOTE:
To check the oil level, holding the motorcycle vertically, reinsert the dipstick until the threads touch filler neck, but do not screw the cap in.

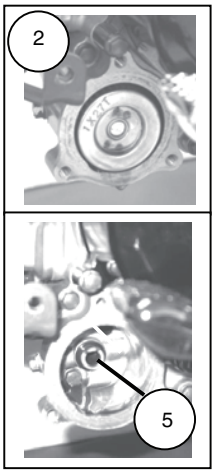
OIL FILTER

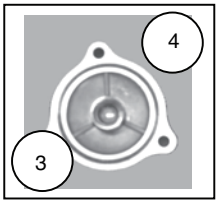
The engine oil should be changed while the engine is hot. Oil filter replacement at the above intervals should be done together with engine oil change.

- Keep the motorcycle upright with Center stand.
- Place an oil pan under the engine.
- Remove the oil filter cap ① by removing the bolts.
- Remove the oil filter ② and install the new one.
- Replace the filter and tighten the bolts securely

NOTE:
Before installing the new oil filter and filter cap, check to be sure that the spring ③ and new o-rings ④, ⑤ are installed correctly.

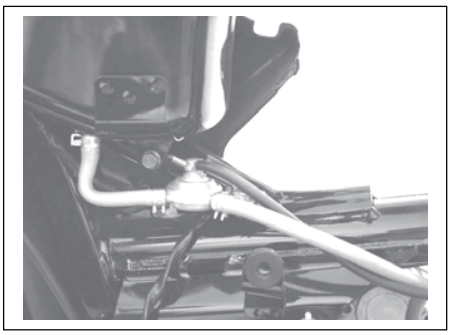






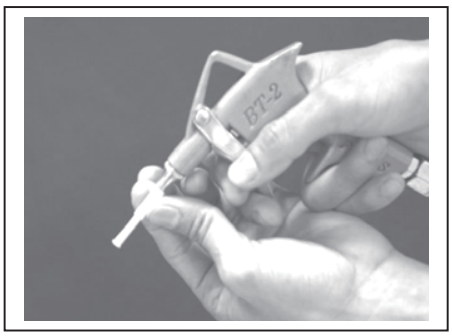
NECESSARY AMOUNT OF ENGINE OIL

OIL CHANGE:	800 ml
OIL FILTER CHANGE:	900 ml
OVER HAUL:	1,000 ml



FUEL HOSE

Inspect at 4,000 km (6 month) Replace Every 4 years

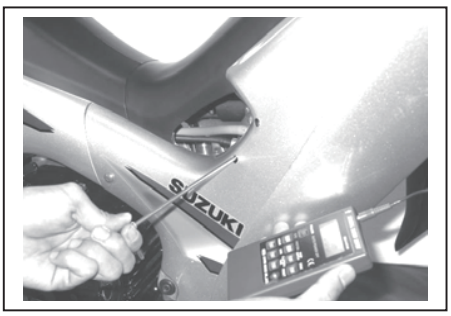


FUEL FILTER

Clean Every 8,000 km (12 months).

CARBURETOR

Inspect Initially at 1,000 km (1 month) and Every 4,000 km (6 months) thereafter.



IDLE RPM (Idling adjustment)

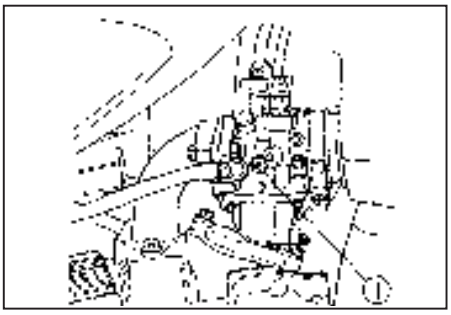
- Adjust the throttle cable play.
- Warm up the engine

NOTE:

Make this adjustment when the engine is hot.

- Connect an electric tachometer.
- Start up the engine and set its speed at any where between 1,500 and 1,600 r/min by turning adjust screws.

Engine idle speed: 1,500 ± 100 r/min

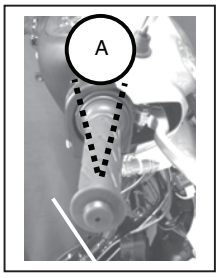


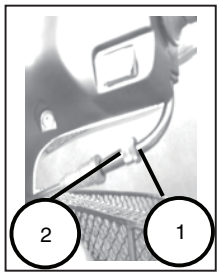
09900-26006: Tachometer

THROTTLE CABLE PLAY

Throttle cable play Ⓐ should be 2-4 mm as measured at throttle grip when turning the throttle grip lightly. If the play Ⓐ in the throttle cable is incorrect, adjust it in the following way:

- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Tighten the lock nut ① while holding the adjuster ②.
  Throttle cable play A: 2- 4 mm.



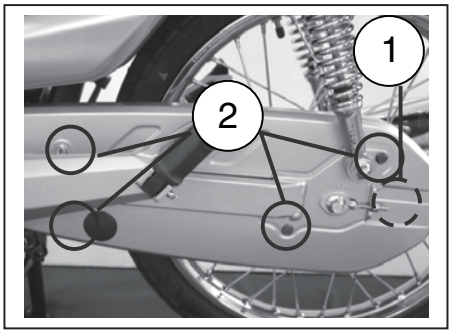


⚠ WARNING

After the adjustment is completed, check that handlebar movernent does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.

DRIVE CHAIN

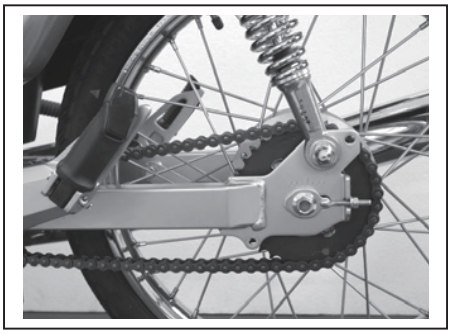
Inspect Initially at 1,000 km (1 month) and Every 4,000 km (6 months) thereafter. Clean and lubricate Every 1,000 km



Visually inspect the drive chain for the below listed possible malconditions.

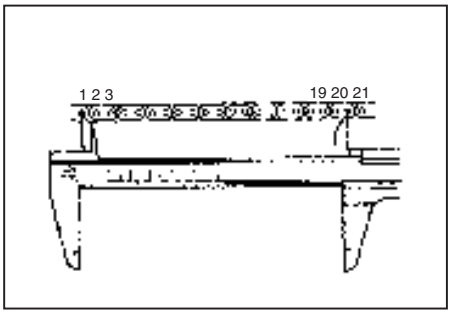
- Loose pins
- Damaged rollers
- Rusted links
- Twisted or seized links
  Excessive wear

If any defects are found, the drive chain must be replaced.



Checking

- Remove the chain case by loosening four screws ①
  and bolt ②.

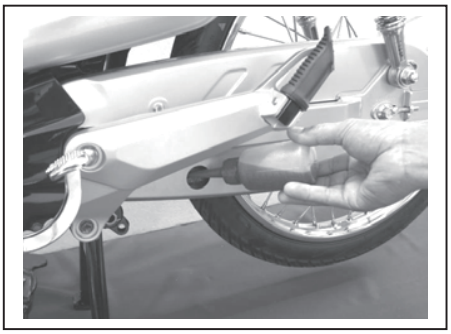


CAUTION

The standard drive chain is DAIDO DID 428. SUZUKI recommends that this standard drive chain should be used for the replacement.

- Count out 21 pins (20-pitch) on the chain measure the distance between the two. If the distance exceed following limit, the chain must be replaced.
  Drive chain 20-pitch length: 259 mm

NOTE:
When replacing the drive chain, replace the drive chain and sprockets as a set.



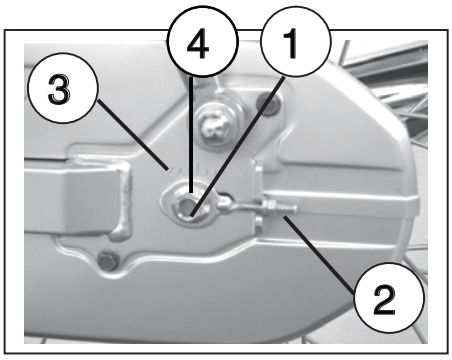
CLEANING AND LUBRICATING

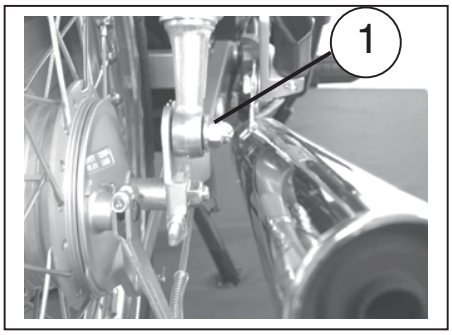
Wash the drive chain in cleaning solvent and lubricate it with chain lube or motor oil. If the motorcycle operates under dusty conditions, frequent rapid acceleration or at sustained high speeds, the drive chain should be cleaned and lubricated more often.

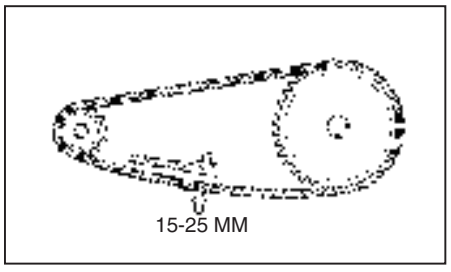
ADJUSTING

- Loosen the nut ①.
- Loosen or tighten the adjusters ② until the chain has 15-25 mm of slag at the middle between engine and rear sprockets, the mark ③ on the swing arm must be at the same position the scale mark on both chain adjuster ④ to ensure that the front and rear wheels are correctly aligned.
- Tighten the axle nut ① after adjusting the drive chain and tighten the adjuster nuts ②.

Rear axle nut: 4.5 kg-m







BRAKE

(BRAKE)
Inspect Initially at 1,000 km (1 month) and Every 4,000 km (6 months) thereafter.

(BRAKE HOSE AND BRAKE FLUID)
Inspect Every 4,000 km (6 month) Replace houses Every 4 years. Replace Fluid Every 2 years.

FRONT BRAKE (DISC TYPE)

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the lower limit line on the front brake fluid reservoir.
- When the level is below the lower limit line, remove the front handlebar's cover and replenish with brake fluid that meets the following specification.

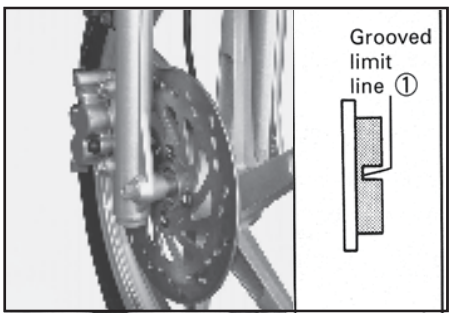
Specification and Classification: DOT 4

⚠ WARNING

The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based or petroleum-based. Do not use any brake fluid taken from oil, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period. Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hoses and hose joints for cracks and oil leakage before riding.

BRAKE PADS (DISC TYPE)

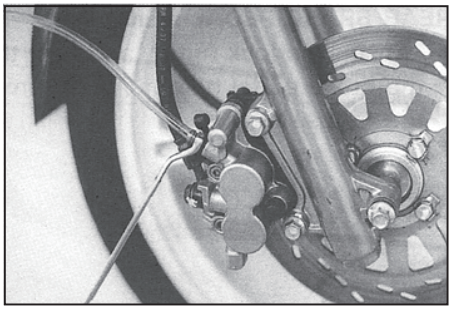
The extent to brake pad wear can be checked by observing the grooved limit line ① on the pad. When the wear exceeds the grooved limit line, replace the pads with new ones. (Refer to page 5-12.)



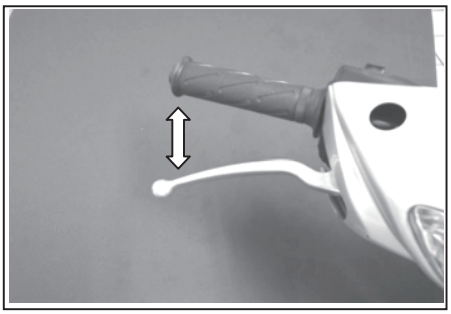
CAUTION

Replace the brake pad as a set, otherwise braking performance will be adversely affected.

AIR BLEEDING THE BRAKE FLUID CIRCUIT (DISC BRAKE)

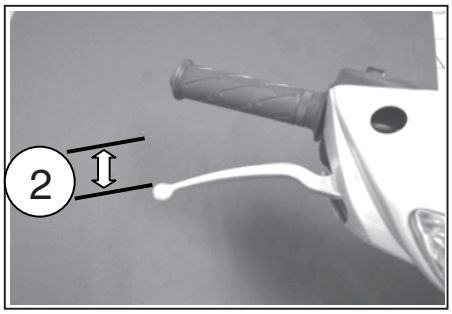


Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by “sponginess” of the brake lever and also by lack of braking force.
Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner.



- Fill up the master cylinder reservoir to the upper end of the inspection window. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.
- Front brake: Bleed air from the air bleeder valve.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle; this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the valve, pump and squeeze the lever, and open the valve.
- Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.

NOTE:
Replenish the brake fluid in the reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.

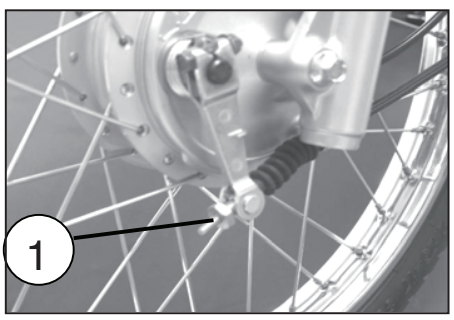


- Close the bleeder valve, and disconnect the pipe. Fill the reservoir with brake fluid to the “UPPER” end of the inspection window.

Air bleeder valve: 8.0 N-m (0.8 kg-m)

CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc.

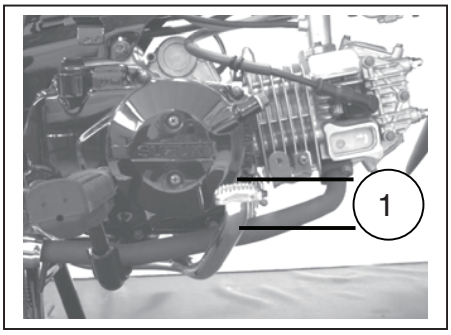


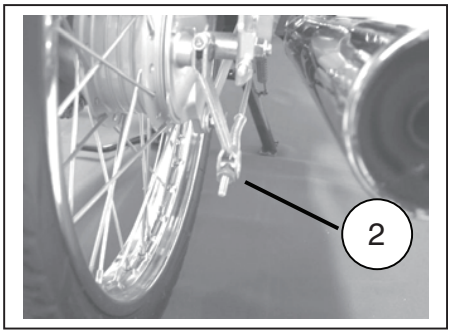
BRAKE LEVER PLAY ADJUSTING (DRUM TYPE)

Adjust by turning the adjusting nut ① so that the play ② is 15-25 mm as follows.

REAR BRAKE ADJUSTING

Adjust the free travel ① to 15-25 mm. by turning the adjusting nut ②.



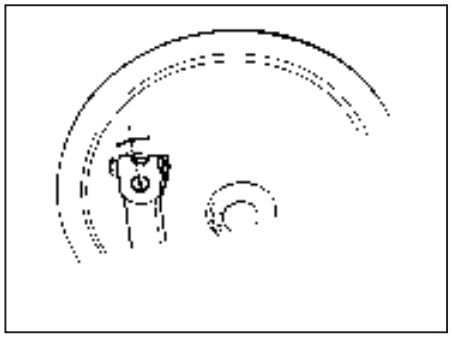


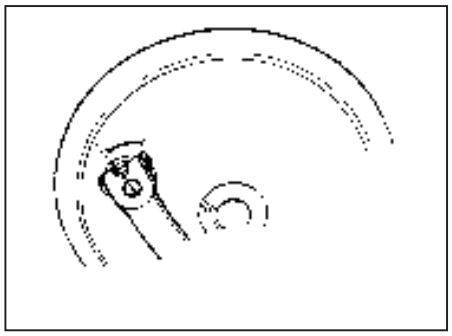
REAR BRAKE SHOE WEAR

This motorcycle is equipped with brake lining wear limit indicator. As shown in Fig., at the condition of normal lining wear, the extension line of the index mark on the brake camshaft should be within the range embossed on the brake panel with brake on.

To check wear of the brake lining, perform the following steps.

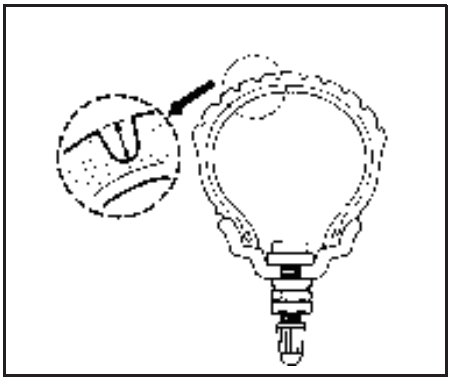
- First check if the brake system is properly adjusted.
- While operating the brake, check to see that the extension line of the index mark is within the range on the brake panel
- If the index mark is beyond the range as shown in the Fig., the brake shoe assembly should be replaced with a new set of shoes.





TIRE

Inspect Every 4,000 km (6 months).



TIRE TREAD CONDITION

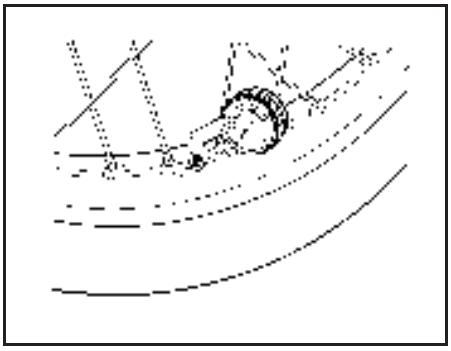
Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous ours situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

Tire tread depth limit: 1.6 mm

09900-2080: Tire depth gauge

TIRE PRESSURE

If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good readability of shorter tire life will result. Cold inflation tire pressure is follows.



COLD INFLATION TIRE PRESSURE	kPa	kg/cm³
FRONT	175	1.75
REAR	225	2.25

CAUTION

The standard tire fitted on this motorcycle is 2.50-17 for front and 2.75-17 for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

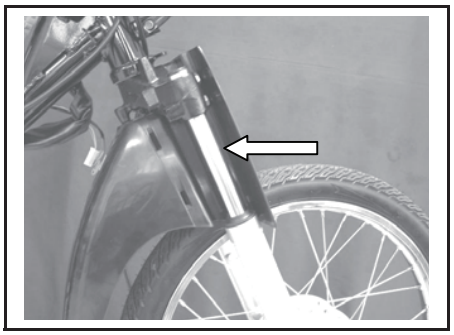
STEERING

Inspect Initially at 1,000 km (1 month) and Every 8,000 km (12 months) thereafter.

Ball type bearings are equipped on the steering system. Steering should be adjusted properly for smooth turning of handlebars and safe running. Over tight steering prevents smooth fuming of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering. bearing adjustment as described in page 5-25 of this manual.

FRONT FORK

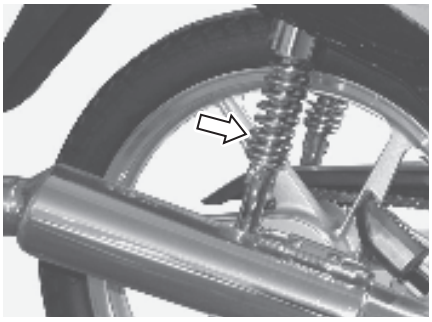
Inspect Every 8,000 km (12 months).



Inspect the front forks oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (Refer to page 5-19)

REAR SUSPENSION

Inspect Every 8,000 km (12 months).



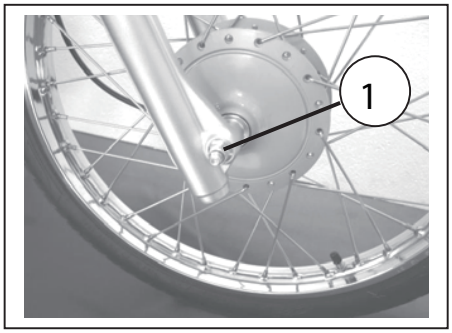
Inspect the rear shock absorber for oil leakage and damage. Replace any defective parts, if necessary.

CHASSIS BOLTS AND NUTS

Tighten Initially at 1,000 km (1 month) and Every 4,000 km (6 months) thereafter.

The nuts and bolts listed below are important safety related parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-18 for the locations of the following nuts and bolts on the motorcycle.)

ITEM	kPa	kg/cm^3
1 Front axle nut	30.0-47.0	3.0-4.0
2 Steering stem lock nut	25.0-35.0	8.0
3 Handlebars clamp bolt	50.0-60.0	8.3
4 ---	---	---
5 Front fork cap bolt	23	2.3
6 Rear axle nut	42.0-66.0	4.5
7 Engine mounting nut/bolt	50.0-66.0	5.5
8 Brake cam lever nut	7.0	0.7
9 Front footrest bolt	20.0-31.0	1.3
10 Swing arm pivot nut	27.0-43.0	3.5
11 Rear torque link nut	10.0-16.0	1.3
12 Rear shock absorber nut	22.0-35.0	2.9
13 Rear sprocket mounting nut	18.0-28.0	2.3
14 Spoke nipple	2.0	0.2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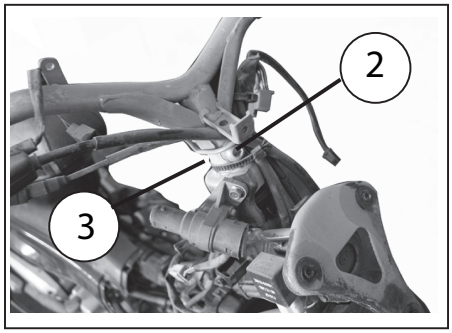
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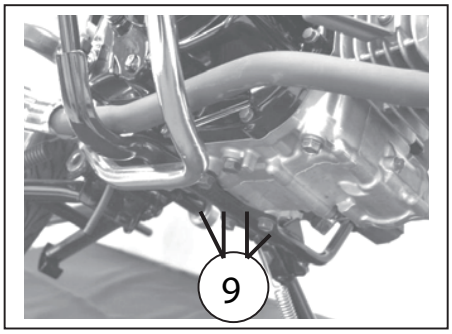
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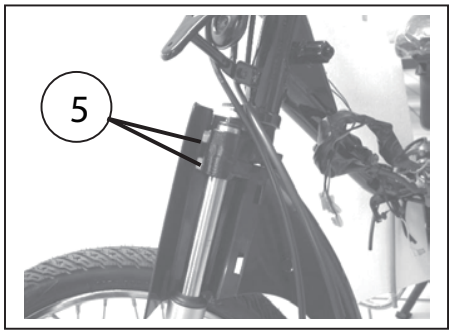
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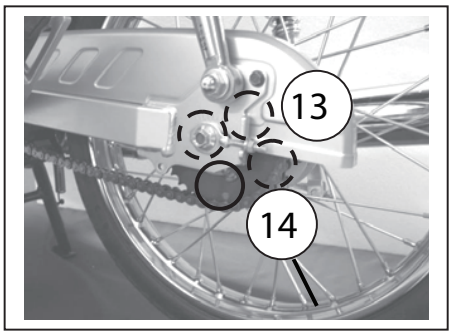
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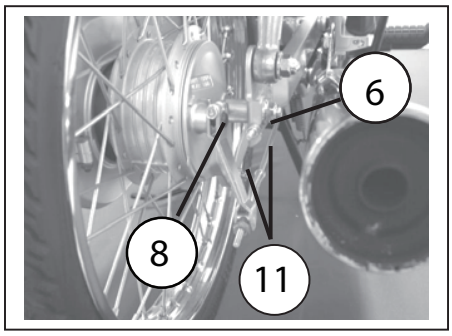
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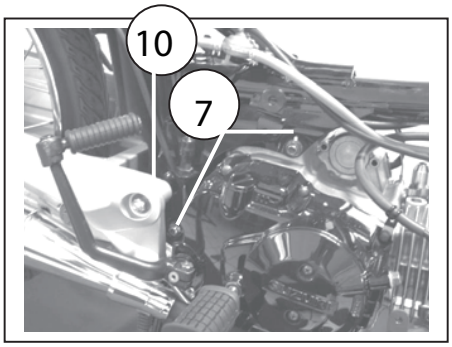
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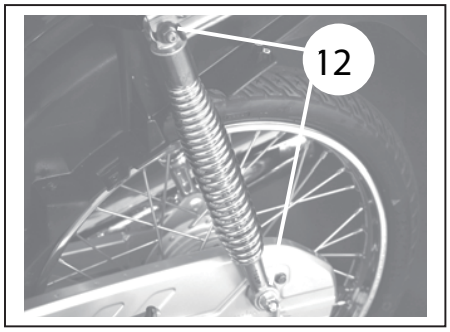

12

COMPRESSION PRESSURE CHECK (FD110XC / XCS / XCD / XCSD)

The compression of a cylinder is a good indicator of its internal condition.
The decision to overhaul the cylinder is often based on the results of a compression test.
Periodic maintenance records kept at your dealership should include compression readings for each maintenance service.

COMPRESSION PRESSURE SPECIFICATION

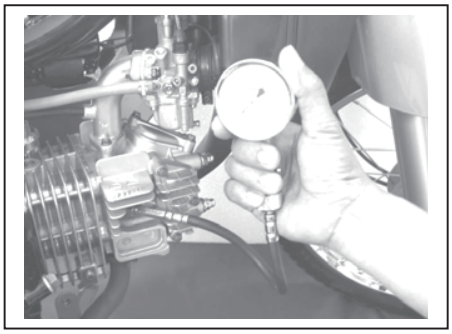
Standard	Version
14.0 kg/cm^2	FD110 XC, XCS
15.0 kg/cm^2	FD110 XC, XCS

Low compression pressure can indicate any of the following conditions:
- Excessively worn cylinder wall
- Worn-down piston or piston rings
- Piston rings stuck in grooves
- Poor seating of valves
- Ruptured or otherwise defective cylinder head gasket

COMPRESSION TEST PROCEDURE

NOTE:
** Before testing the engine for compression pressure, make sure that the cylinder head nuts are tightened to the specified torque values and valves are properly adjusted.*
** Have the engine warmed up by idling before testing.*
** Be sure that the battery used is in fully-charged condition.*

Remove the parts concerned and test the compression pressure in the following maner.
- Support the motorcycle with the center stand.
- Remove the spark plug.
- Fit the compression gauge in the plug hole, while taking care that the connection tight.
- Keep the throttle grip in full-open position.
- While cranking the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.



09915-64510: Compression gauge
09915-63310: Adaptor

OIL PRESSURE CHECK

Check periodically the oil pressure in the engine to judge roughly the condition of the moving parts.

OIL PRESSURE SPECIFICATION

Above 0.1 kg/cm.^{2} Below 0.3 kg/cm.^{2}	**at 3,000 r/min., Oil temp. at 60°C**

If the oil pressure is lower or higher than the specification, the following causes may be considered.

LOW OIL PRESSURE

- Clogged oil filter
- Oil leakage from the oil passage way
- Damaged O-ring
- Defective oil pump
- Combination of above items

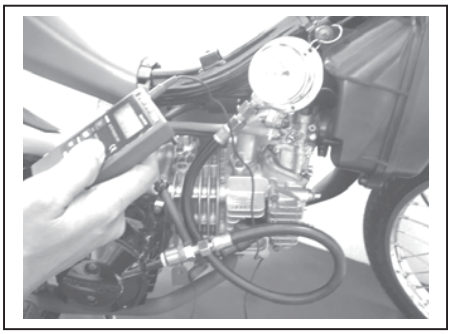
HIGH OIL PRESSURE

- Used an engine oil which is too high viscosity
- Clogged oil passage way
- Combination of above items

OIL PRESSURE TEST PROCEDURE

Check the oil pressure in the following manner.

- Support the motorcycle with the center stand.
- Install the oil pressure gauge with adapter in the position shown in the figure.
- Connect an electric tachometer.
- Warm up the engine as follows: Summer 10 min. at 2,000 r/min. Winter 20 min. at 2,000 r/min.
- After warming up, increase the engine speed to 3,000 r/min. (with the electric tachometer), and read the oil pressure gauge.



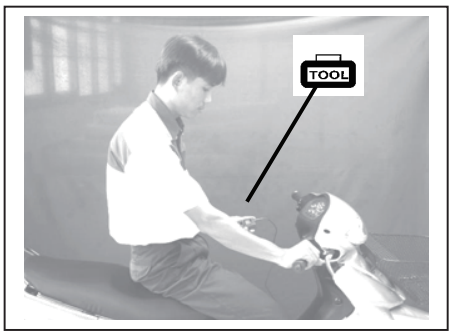
09915-64510: Oil pressure gauge
09915-74531: Adaptor
09900-26006: Tachometer

AUTOMATIC CLUTCH INSPECTION

This motorcycle is equipped with an automatic clutch.
The engagement of the clutch is Gove med by engine RPM and centrifugal mechanism located in the clutch.
To insure proper performance and longer lifetime of the clutch assembly it is essential that the clutch engages smoothly and gradually. The following inspections must be performed:

1. INITIAL ENGAGEMENT INSPECTION

- Warm up the engine to normal operating temperature.
- Connect an electric tachometer.
- Seated on the motorcycle with the motorcycle on level ground, increase the engine RPM slowly and note the RPM at which the motorcycle begins to move forward.



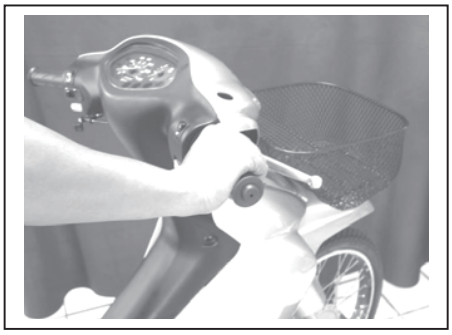
09900-26006: Tachometer

Engagement r/min: 1,900 - 2,300 r/min

2. CLUTCH "LOCK-UP" INSPECTION

Perform this inspection to determine if the clutch is engaging fully and not slipping.

- Apply the rear brake as firm as possible.
- Briefly open the throttle fully and note the maximum engine RPM



CAUTION

Do not apply full power for more than 3 seconds or damage to the clutch or engine may occur.

Lock-up r/min: 3,150 – 3,850 r/min

ENGINE

CONTENTS

ENGINE COMPONENTS REMOVABLE WITH THE ENGINE IN PLACE

The part listed below can be removed and reinstalled without removing the engine from the frame.
Refer to the page listed in each section for removal and reinstallation instructions.

ENGINE CENTER

Exhaust pipe
Carburetor
Cam chain tensioned adjuster
Cylinder head
Piston
Cylinder
Camshaft

ENGINE LEFT SIDE

Engine sprocket
Magneto cover
Rotor
Gearshift switch
Starter clutch
Starter idle gear
Starter motor
Cam drive chain
Oil filter
Oil filter cover

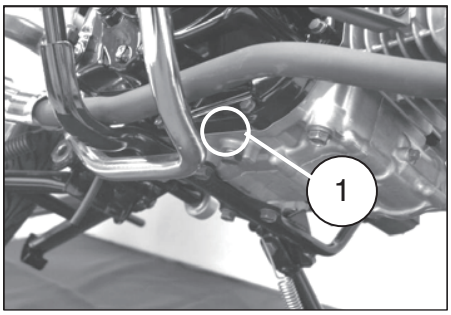
ENGINE RIGHT SIDE

Clutch cover
First clutch
Primary drive gear
Oil sump filter
Oil pump assembly
Shift cam
Gearshift shaft
Oil pump drive gear

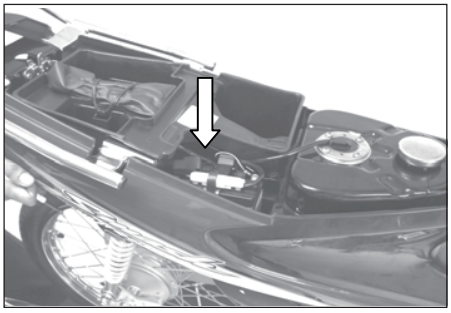
ENGINE REMOVAL AND REINSTALLATION

ENGINE REMOVAL

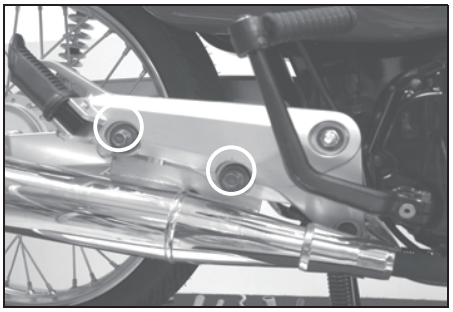
Before taking the engine out of the frame, wash the engine with a steam cleaner. The procedure of engine removal is sequentially explained in the following steps.



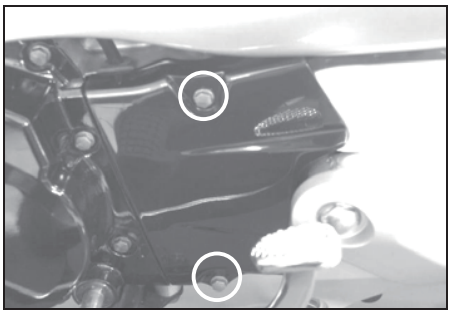
- Support the motorcycle with the center stand.
- Remove the oil drain plug ① to drain out engine oil. (See page 2-8)
- Open the seat and disconnect the battery(-) lead wire. (See page 6-2 and 6-6)
- Remove the leg shields, left and right. (See page 5-1.)
- Remove the frame covers, left and right.
- Remove the footrest bar. See page 2-8.)



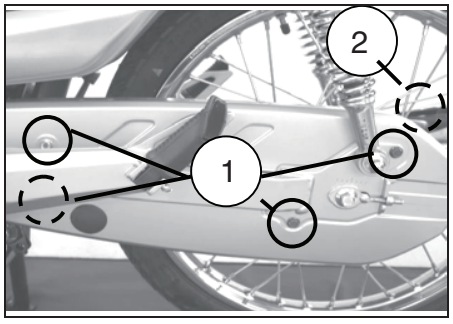
- Remove the exhaust pipe by removing its clamp bolts and muffler mounting bolts.



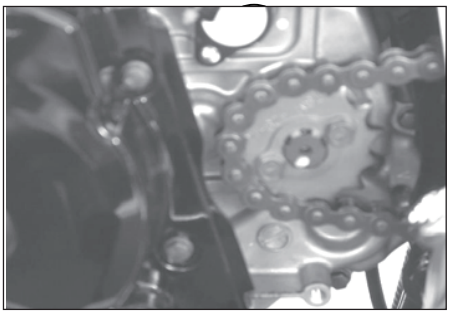
- Remove the engine sprocket cover.



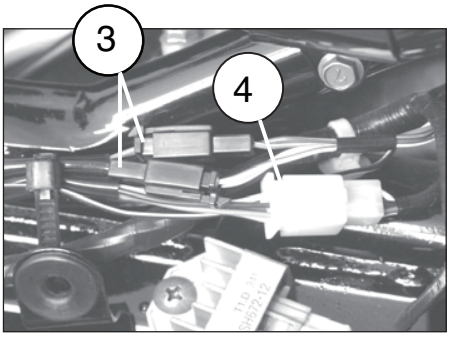
- Remove the chain case by loosening four bolts ① and one bolt ②.



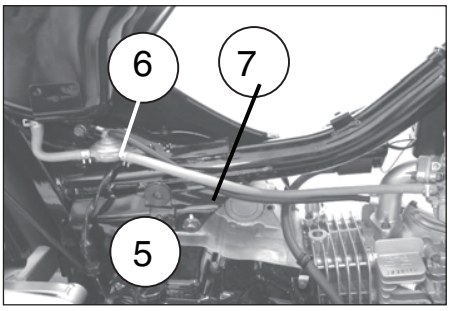
- Remove the engine sprocket by loosen the bolt ① and sprocket lock plate ②.
- Remove the sprocket.
- Disconnect the several lead wires.



- Magneto lead wire coupler ③.
- Gearshift indicator lead wire coupler ④.
- Engine ground coupler
- Disconnect the engine breather pipe.



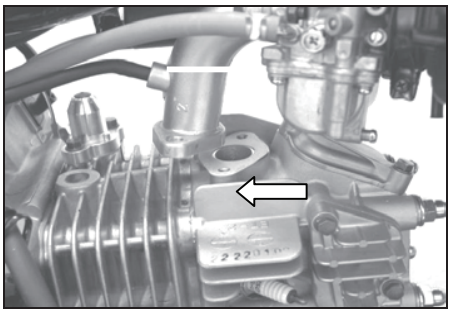
- Disconnect the spark plug cap ⑤.
- Disconnect the starter motor (+) lead coupler.
- Disconnect the fuel hose ⑥.
- Disconnect the fuel tap vacuum hose ⑦ from the intake pipe.



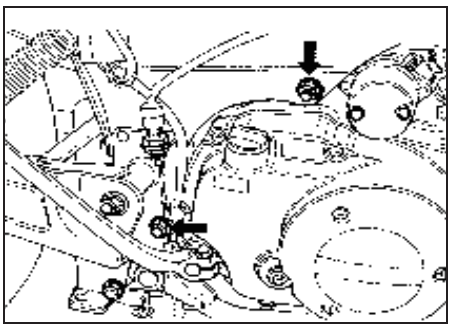
⚠ WARNING

Gasoline is very explosive. Extreme care must be taken.

- Remove the carburetor with intake pipe.



- Remove the engine mounting bolts and dismount the engine.



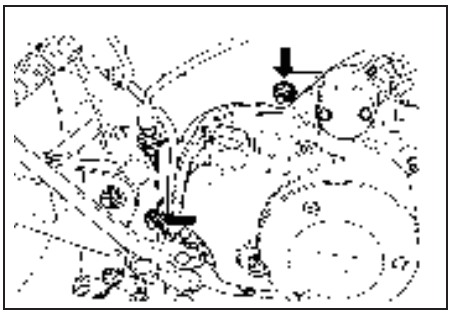
ENGINE REINSTALLATION

Reinstall the engine in the reverse of engine removal.

- Install the engine mounting bolts and tighten the nuts to the specification.

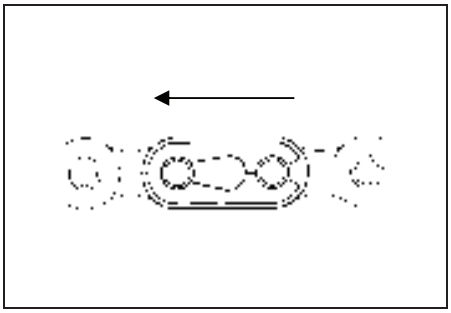
  Engine mounting nut: 55 N-m (5.5 kg-m)

- Install the drive chain.



CAUTION

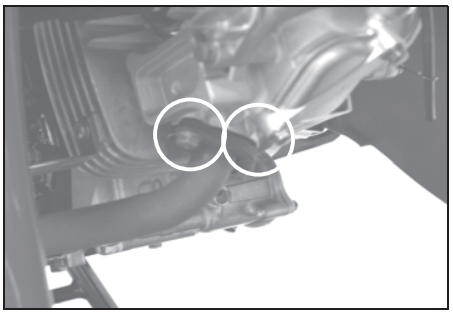
The drive chain joint clip should be attached in the way that the slit end will face opposite to the direction of rotation.



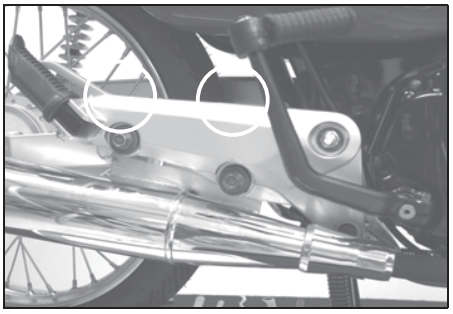
- Tighten the exhaust pipe clamp bolts and muffler mounting bolts to specified torque.

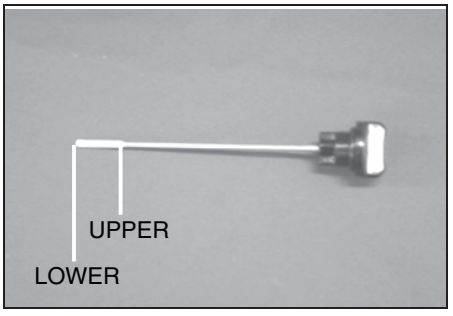
CAUTION

Check the wire, cable and hose routing.
(See page 7-10.)



- After remounting the engine, following adjustments are necessary.
  * Throttle cable..... (Page: 2-9)
  * Drive chain..... (Page: 2-10)
  * Rear brake pedal..... (Page: 2-12)
  * Idling speed..... (Page: 2-9)
- Pour 1,000 ml of engine oil SAE 40 graded SF or SG into the engine after overhauling engine. Start up the engine and allow it run for several seconds at idle speed. About one minute after stopping engine, check oil level. If the level is below the “L” line, add oil until the level reaches the “F” line.
  (See page 2-8).

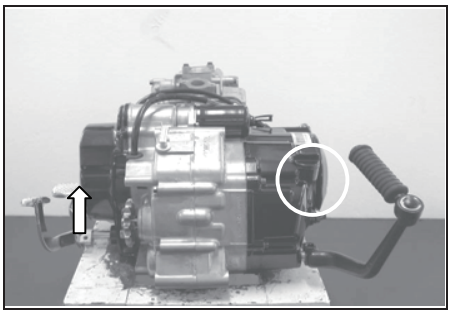




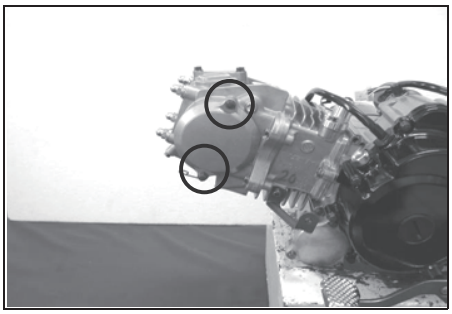
ENGINE DISASSEMBLY

The procedure for engine disassembly is sequentially explained in the following steps.

- Remove the gearshift lever and kick starter lever.

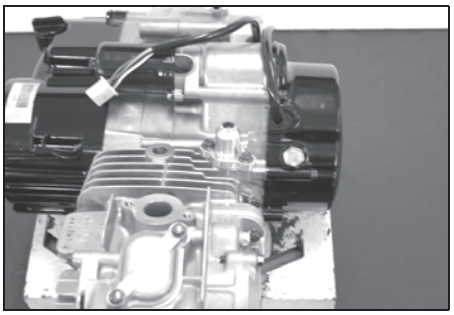


- Remove the cam pocket cover.

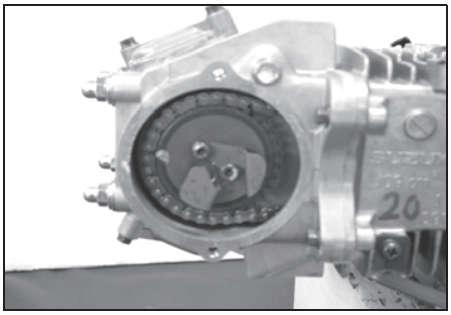


- Remove the cap and insert the screwdriver into the slotted end of the cam chain tension adjuster and turn it clockwise to lock the spring tension.

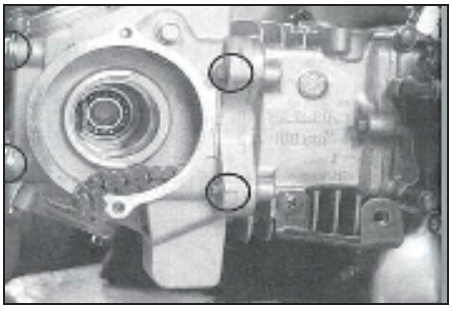
NOTE:
When remove the camshaft, the piston must be at (TDC) on compression stroke.



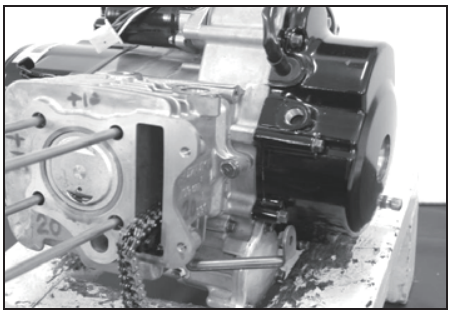
- Remove the cam.



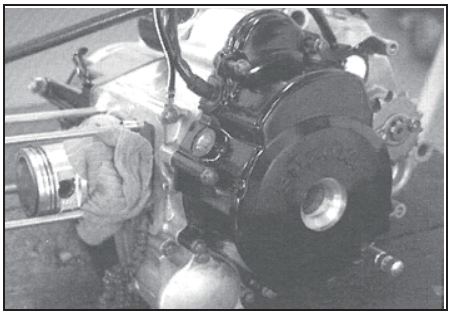
- Loosen and remove the cylinder head nut and bolt.
- Remove the cylinder head.



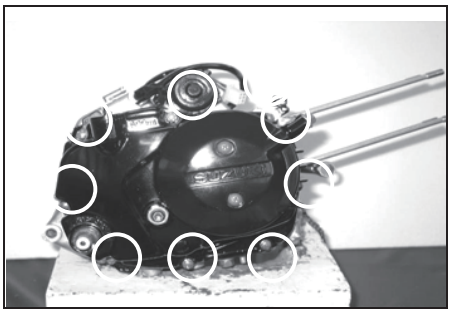
- Remove the chain guide and gasket.
- Loosen the cylinder nut and remove the cylinder.



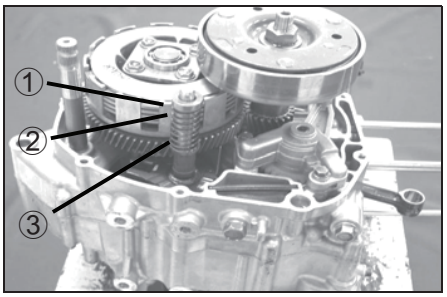
- Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into the crankcase and then, remove the piston pin circlip with a long-nose pliers.
- Remove the piston pin and piston.



- Remove the clutch cover.

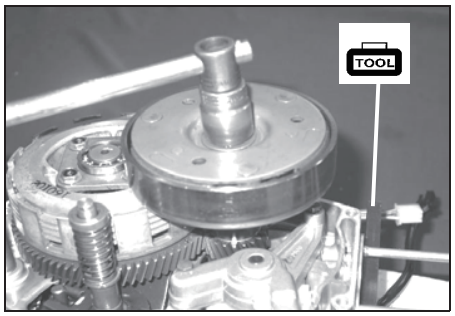


- Remove the bush ②, spring ① and washer ③ shaft gear shift.

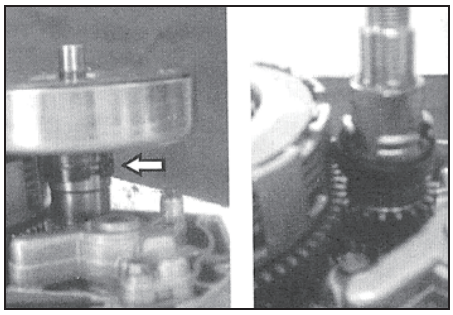


• Loosen the nut by using the special tool.

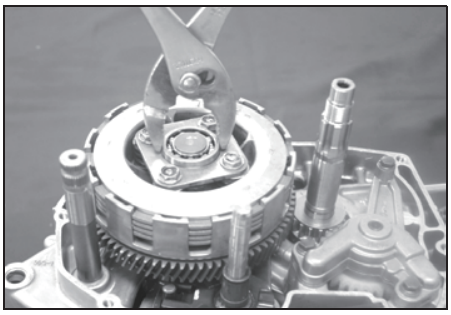
09910-20115: Con-rod stopper



• Remove the first clutch assembly, circlip and primary drive gear.



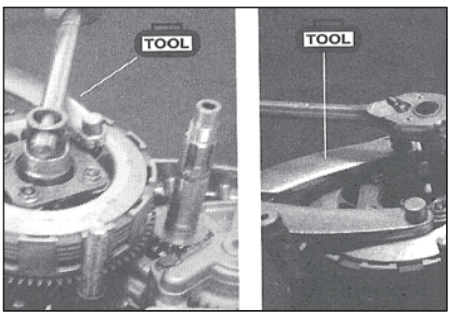
• Remove the clutch bearing.



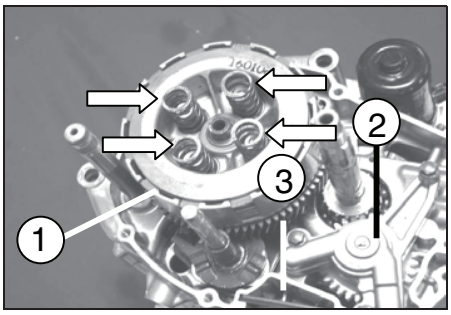
• Loosen the nut by using the special tool.

09930-40113: Rotor holder

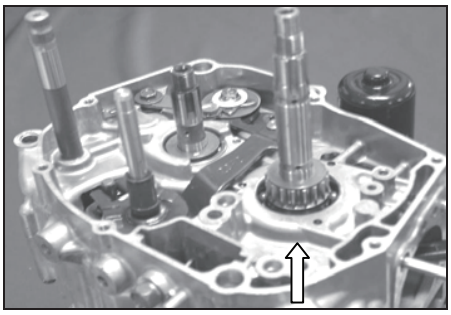
• Loosen the spring mousing bolt by using the special tool
• Remove the clutch pressure and spring clutch



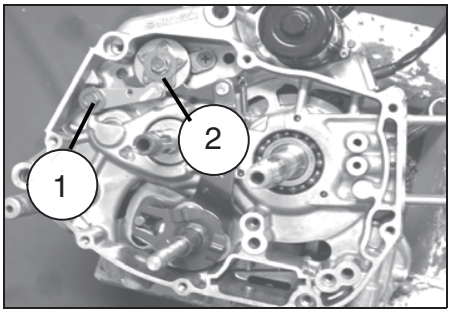
• Remove the clutch sleeve hub ①.
• Remove the oil pump ②.
• Remove the oil sump filter ③.



• Remove the oil washer and oil pump drive gear.

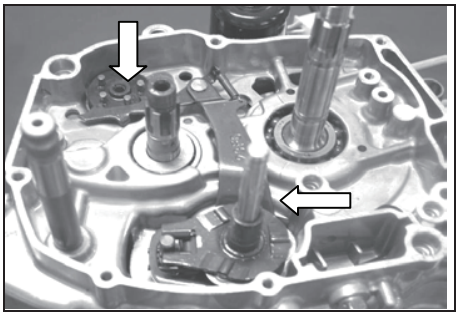


• Remove the shift cam stopper bolt ①.
• Remove the shift cam pin bolt ②.

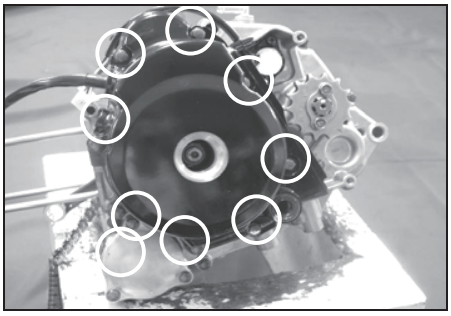


• Remove the shift cam stopper plate, shift cam pin guide and pins.

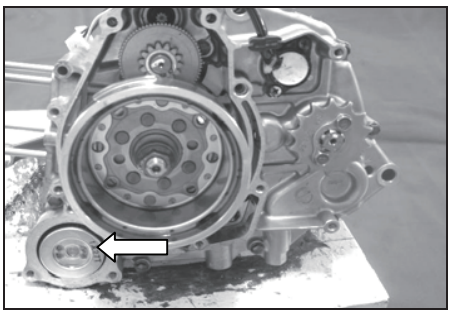
• Remove the outer bearing, clutch bearing, and gearshift shaft and plate shift cam.



• Remove the starter motor and magneto cover.

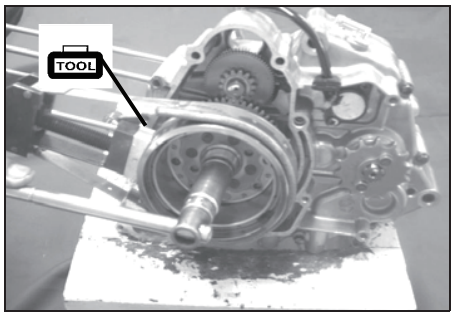


• Remove the oil filter.



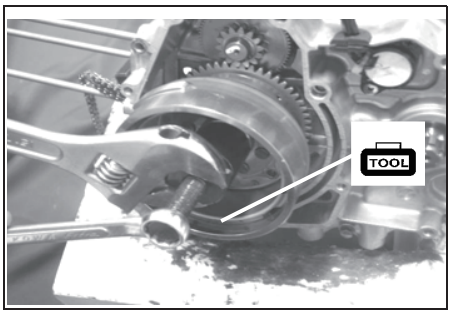
- Loosen the rotor nut by using the special tool.

  09930-44550: Rotor holder



- Loosen the rotor by using the special tool.

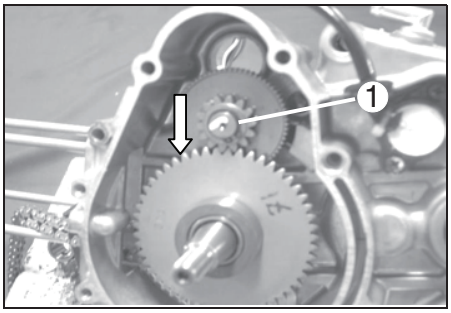
  09930-34951: Rotor remover



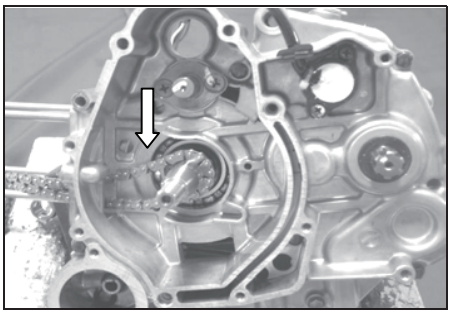
- Loosen the screw and remove the starter clutch plate

- Remove the starter driven gear.
- Remove the starter driven idle gear by removing the circlip ① and washer.

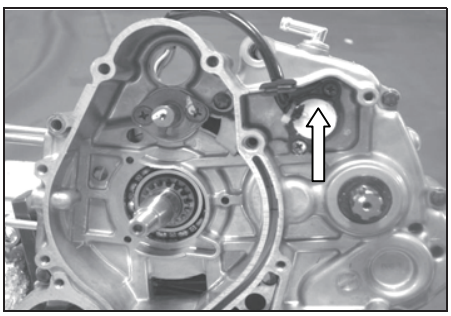
  09900-06107: Snap ring-pliers



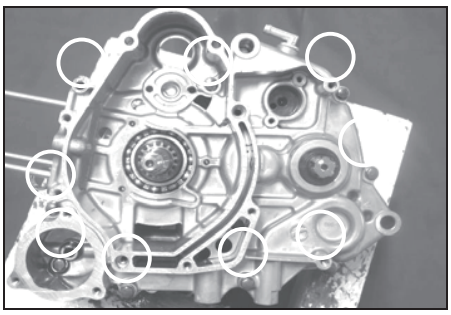
- Remove the camshaft drive chain.



- Remove the gearshift switch, gearshift pin and spring.

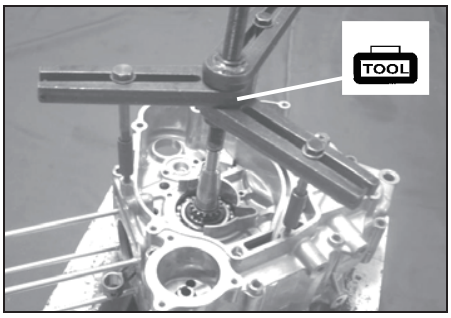


• Remove the crankcase screws.

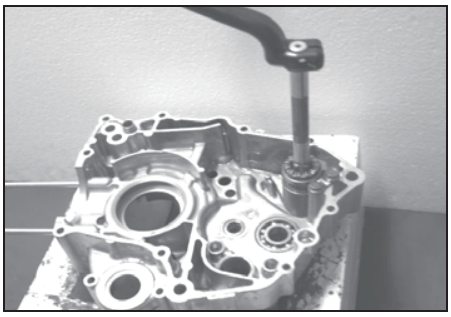


• Separate the right and left crankcase by using the special tool.

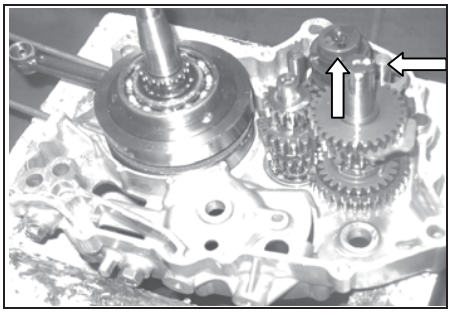
09920-13120: Crankcase/crank shaft separator



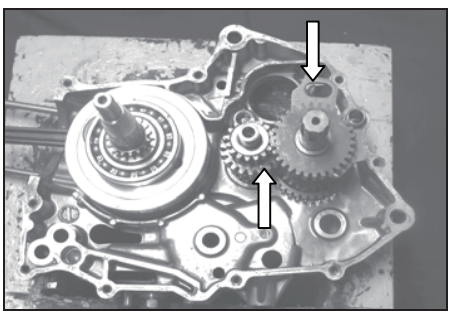
• Remove the kick starter shaft by turning it.



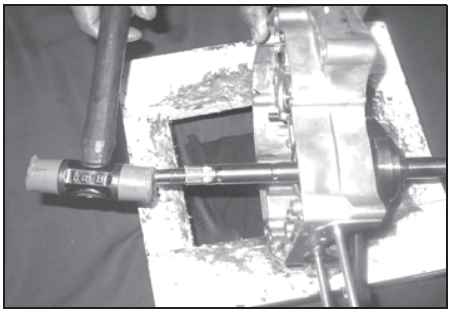
• Remove the gearshift fork shaft, gearshift fork and gearshift cam.



• Remove the transmission assembly.

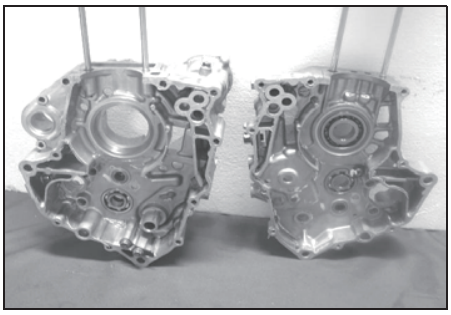


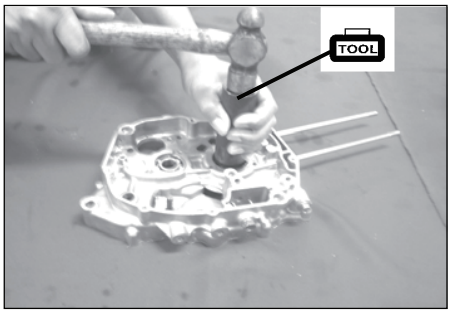
• Remove the crankshaft by using a plastic mallet.

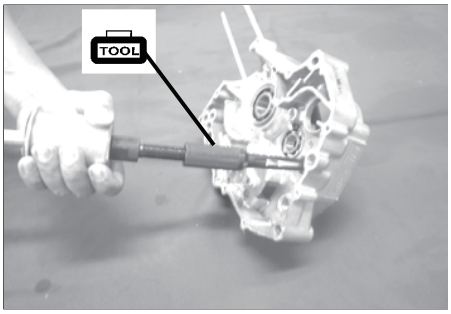


• Remove the oil seals and bearings by using the special tools.

09914-79610: Bearing installer
09921-20210: Bearing puller
09930-30102: Sliding shaft
09913-76010: Bearing installer
09925-98221: Bearing installer
09913-75520: Bearing installer
09913-75821: Bearing installer

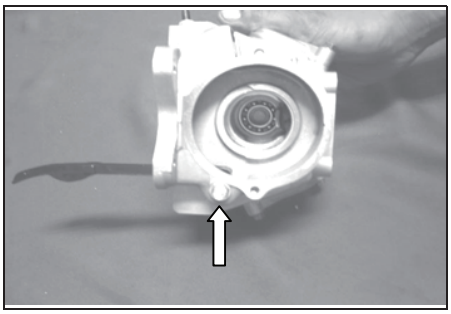




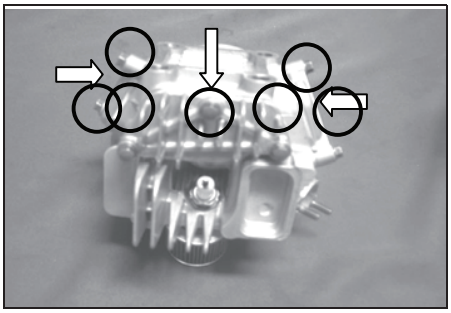


CYLINDER HEAD

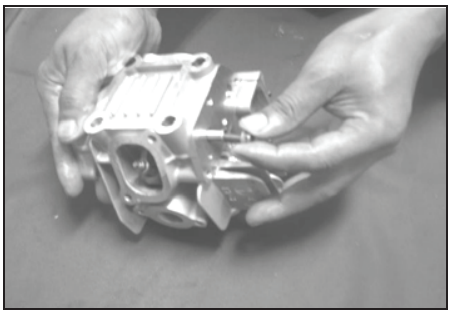
• Remove the chain guide by loosening the bolt.



• Remove the cylinder head right cover and valve inspection caps.

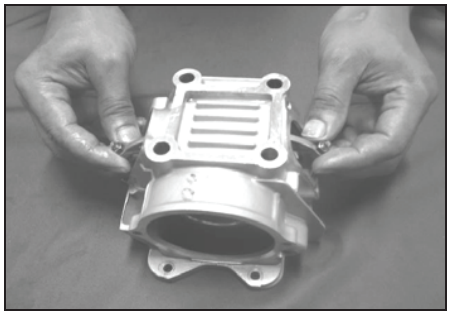


• Remove the rocker arm shafts by using an 8 mm thread bolt.



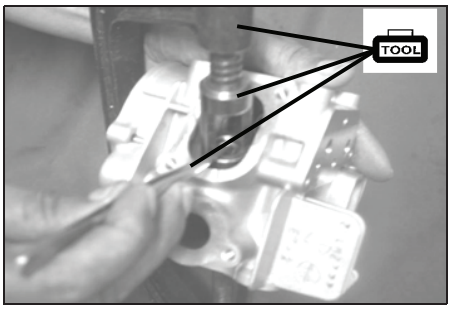
NOTE:
Intake and exhaust rocker arm shafts differ in the length.

• Remove the rocker arms
• Remove the wave washer



• Remove the spring valve by compress the valve springs with the special tools.

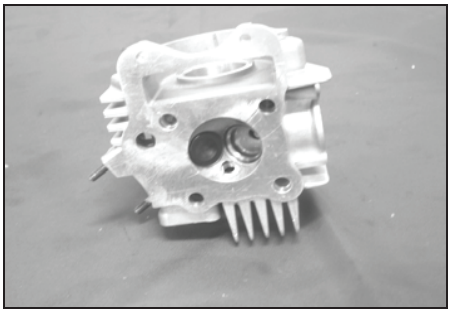
09916-14510: Valve spring compressor
09916-14521: Attachment



• Remove the two valve cotter halves from the valve stem by using the special tool.

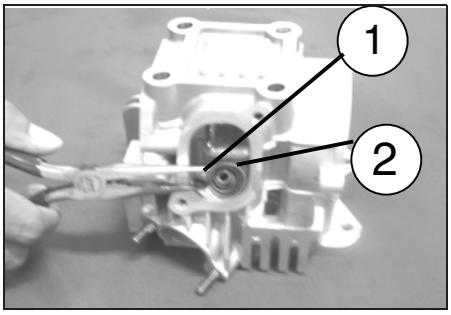
09916-14511: Tweezers

• Remove the valve spring retainer, inner spring and outer spring
• Pull out the valve from the other side.
For reassembling the valve and valve springs, refer to page 3-24.



• Remove the stem seal ① with a long nose pliers.
• Take out the spring seat ②.

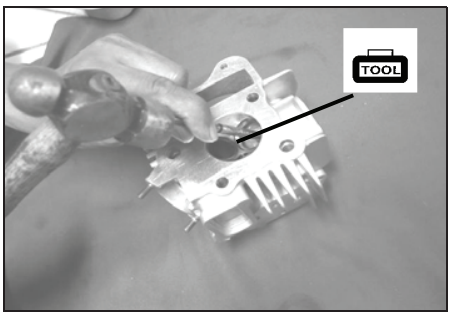
For installing the valve spring seat and valve stem seal, refer to pages 3-21 and 22.



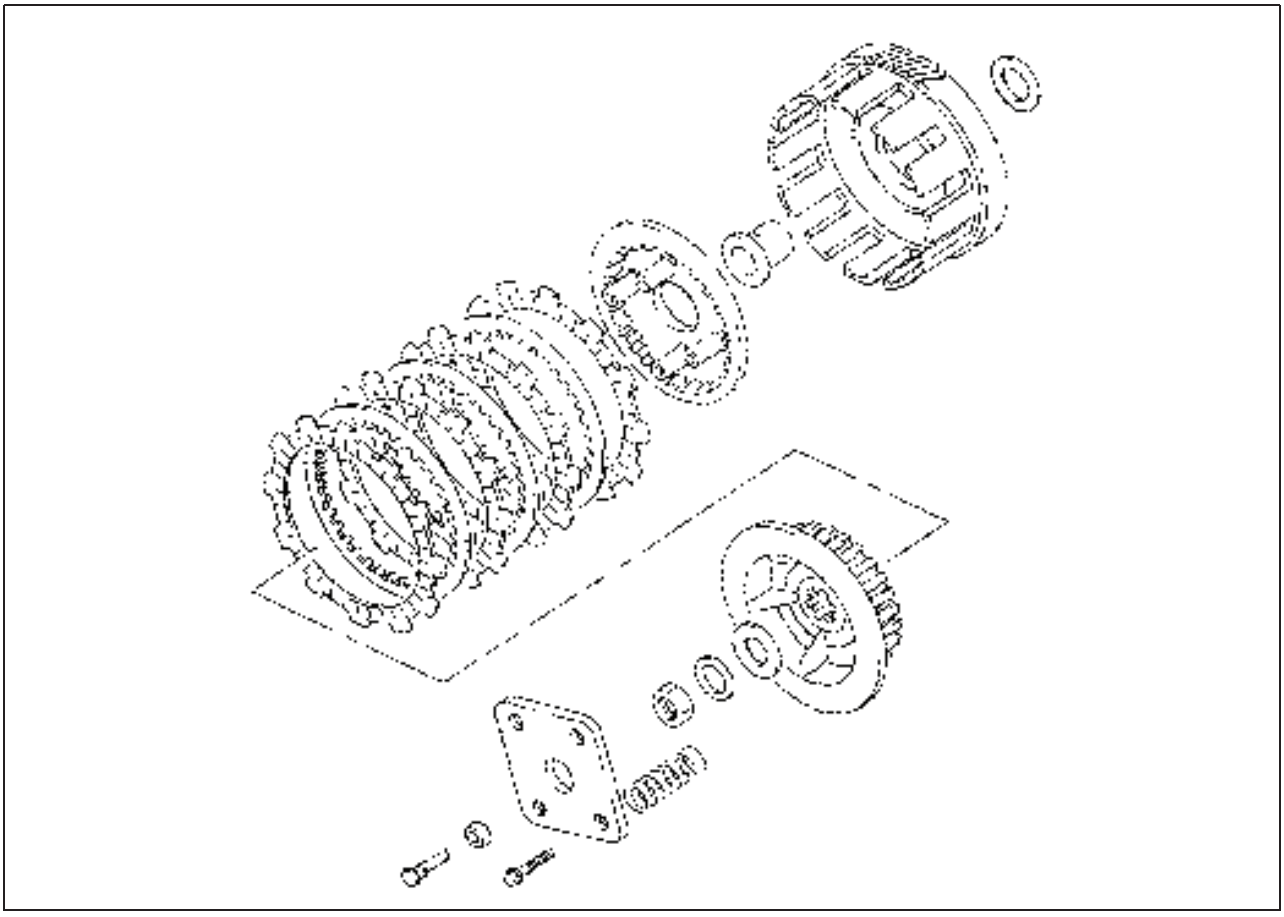
• Remove the valve guide by using the special tool.

09916-44310: Valve guide remover

For servicing the valve guide, refer to page 3-21.

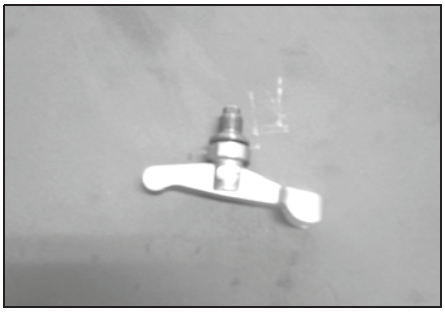


GEAR SHIFTING CLUTCH

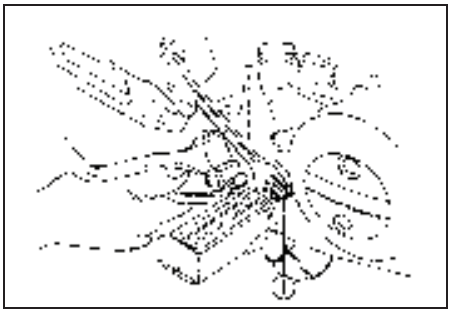


CLUTCH COVER AND CLUTCH ADJUSTMENTS

- Loosen the lock nut and remove clutch release arm.



CLUTCH ADJUSTMENT

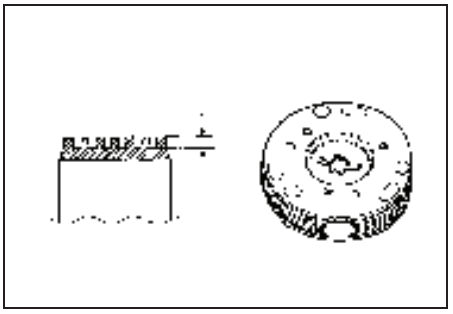


- Loosen the lock nut ①.
- First, turn the adjusting bolt clockwise by a one turn and turn it counterclockwise until resistance is felt, then turn it clockwise by a 1/8 turn.
- Tighten the lock nut.

ENGINE COMPONENTS INSPECTION AND SERVICE

FIRST CLUTCH

CLUTCH SHOE INSPECTION



Inspect the linings for crack, uneven wear or burning. Measure the lining thickness with a venire calipers. If any defects are found or measurement exceeds the limit, replace the clutch shoe assembly with a new one.

Service Limit: No groove

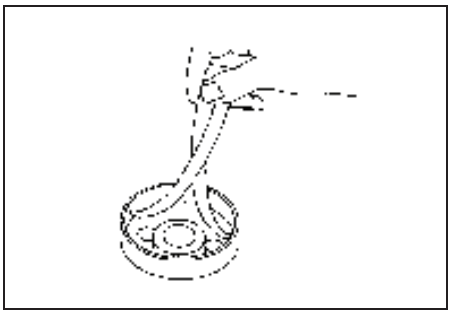
TOOL 09900-20101: Venire calipers

- Clutch springs-visually inspect the clutch springs for stretched coils or broken coils.

CAUTION

Clutch shoes or springs must be changed as a set and never individually.

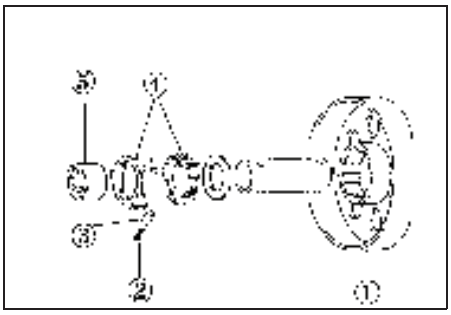
• Clutch wheel-inspect visually the condition of the inner clutch wheel surface for scoring, cracks, or uneven wear.



CLUTCH HOUSING INSPECTION

Inspect the inner surface of clutch housing for deep scratches or discoloration caused by burning.
If any defects are found, replace the clutch housing with a new one.

Inspect each roller and one way clutch retainer for abnormal wear or damage.
If any defects are found, replace them as a set.

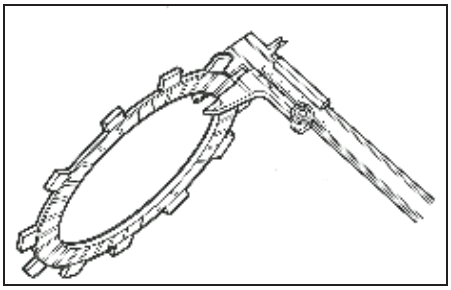


1 Clutch wheel
2 One way clutch spring
3 One way clutch roller
4 One way clutch retainer
5 One way clutch inner race

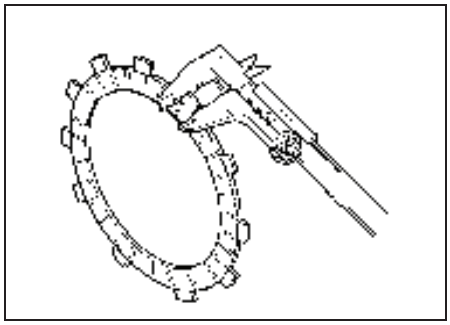
GEAR SHIFTING CLUTCH

DRIVE PLATE AND DRIVEN PLATES

Clutch plates in service remain in oily condition as if they were lubricated with oil. Because of this condition, both drive and driven plates are subject to little wearing action and therefore last much longer. Their life depends largely on the quality of oil used in the clutch and also on the way the clutch is operated.
These plates are expendable, they are meant to be replaced when found whom down or the respective limit: use a caliper to check thickness.



09900-20101: Venire calipers

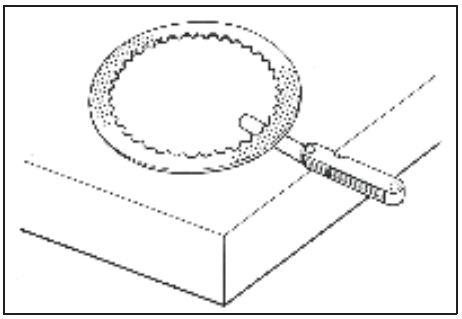


Drive plate

Item	Service Limit
Thickness	2.60 (No groove)
Claw width	11.20 mm

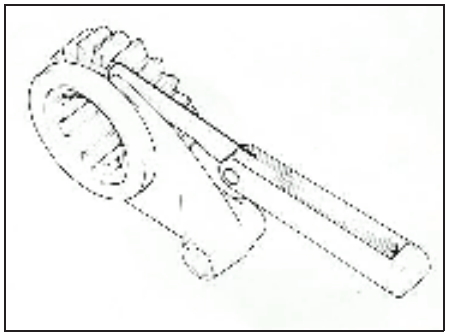
Drive plate distortion

Item	Service Limit
No. 1, 2	0.1 mm



GEAR SHIFT FORK

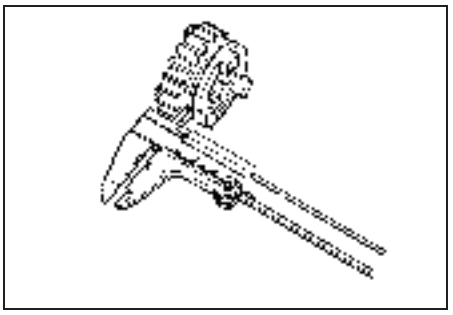
Using a thickness gauge, check the shifting fork clearance in the groove of its gear. this clearance for each of the two shifting forks plays an important role in the smoothness and positive ness of shifting action. each fork has its prongs fitted into the annular groove provided in its gear. in operation, there is sliding contact between fork and gear axially. too much a clearance is, therefore , liable to clearance check is noted to exceed the limit specified, replace the fork its gear, or both.



09900 – 2088803: thickness gauge

Shift fork – groove clearance

Item	Service Limit
No. 1	0.5 mm.
No. 2	

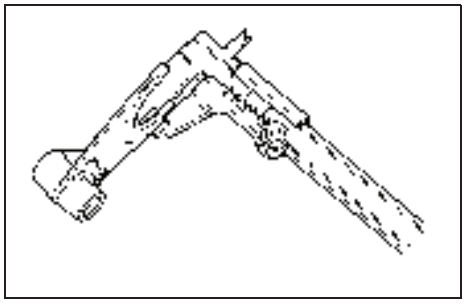


Shift fork – groove with

Item	4.5 – 4.6 mm.

Shift fork thickness

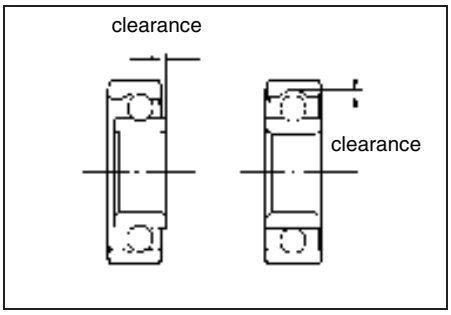
Item	4.3 – 4.4 mm.



CRANKCASE BEARING AND OIL SEAL

BEARING INSPECTION

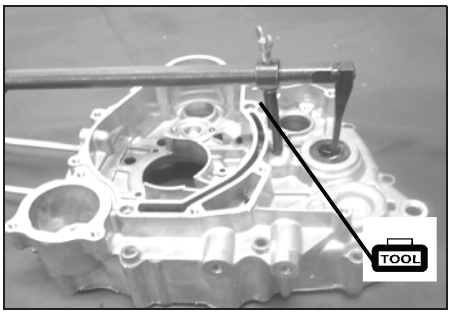
Rotate the bearing inner race by finger to inspect for abnormal play, noise and smooth rotation while the bearings are in the crankcase.
Replace the bearing in the following procedure if there is anything unusual.



LEFT CRANKCASE OIL SEAL AND BEARING DISASSEMBLY

- Remove the left crankcase oil seal by using the special tool.

09913-50121: Oil seal remover



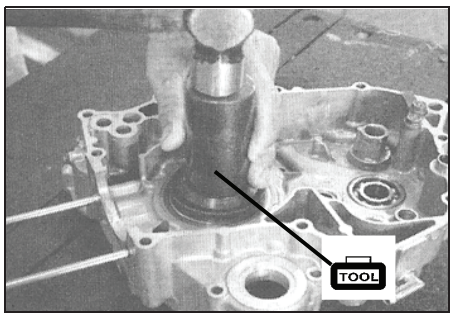
CAUTION

The removed oil seal should be replaced with a new one.

- Remove the left crankcase bearing by using the special tool.

09930-30102: Sliding shaft
09913-76010: Bearing installer
09921-20210: Bearing puller
09925-98221: Bearing installer

NOTE:
If abnormal noise does not occur, it is necessary to remove the bearing.



LEFT CRANKCASE BEARING REASSEMBLY

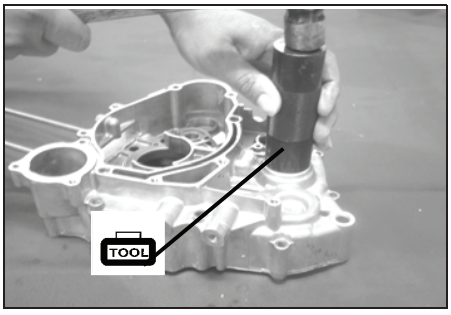
- Install the left crankcase bearing into the crankcase by using the special tool.

09913-75520: Bearing installer
09913-75821: Bearing installer
09914-79610: Bearing installer

LEFT CRANKCASE BEARING REASSEMBLY

- Install the oil seal into the crankcase using the special tool.

09913-75821: Bearing installer



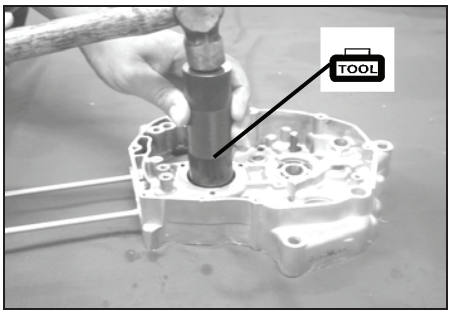
- Apply a small quantity of SUZUKI SUPER GREASE “A” TO THE LIP OF OIL SEAL.

99000-25010: SUZUKI SUPER GREASE “A”

RIGHT CRANKCASE BEARING DISASSEMBLY

- Remove the right crankcase bearing by using the special tool.

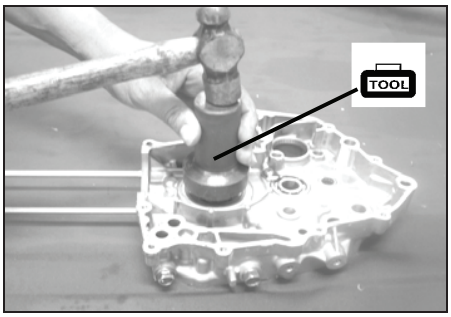
09913-75821: Bearing installer
09921-20210: Bearing puller
09930-30102: Sliding shaft



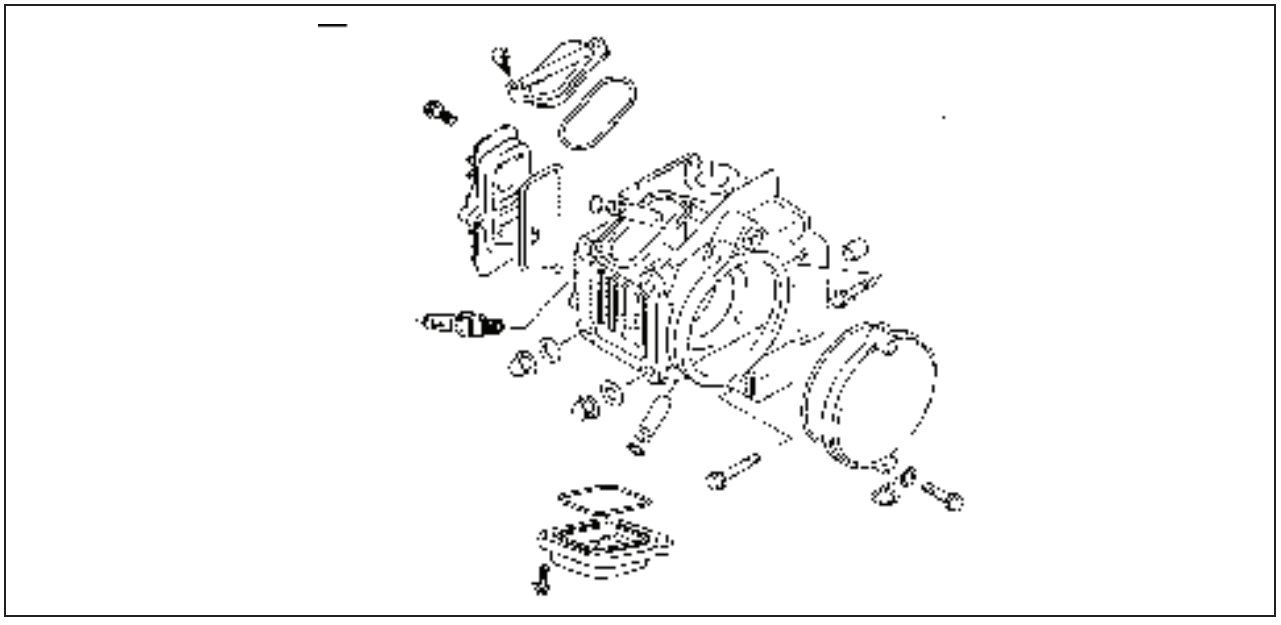
RIGHT CRANKCASE BEARING REASSEMBLY

- Install the right crankcase bearing into the crankcase by using the special tool.

09913-70122: Bearing installer
09914-79610: Bearing installer
0991375821: Bearing installer



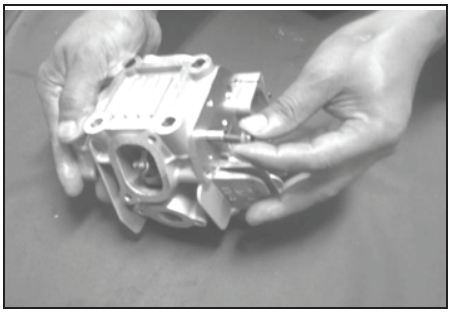
CYLINDER HEAD RELATED PARTS



ROCKER ARM AND SHAFT

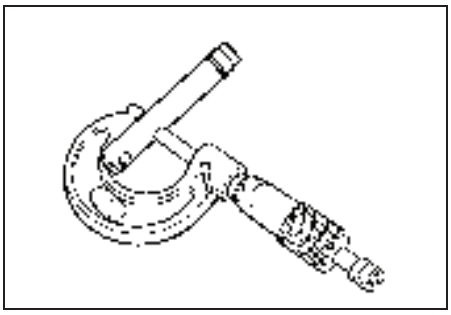
DISASSEMBLY

- Pull out the intake and exhaust rocker arm shafts by using an 8 mm thread bolt.



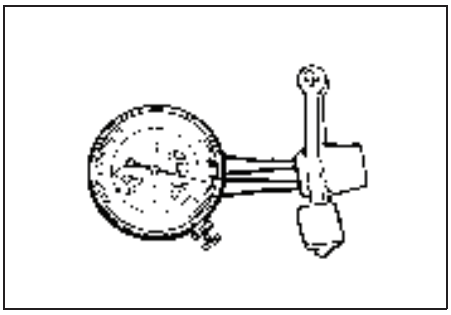
Measure the diameter of rocker arm shaft with a micrometer
Standard: 9.981 - 9.990 mm

09900-20205: Micrometer (0-25 mm)



When checking the valve rocker arm, the inside diameter of the valve rocker arm and wear of the camshaft contacting surface should be checked.
Standard: 10.003-10.018 mm

09900-20605: Dial calipers

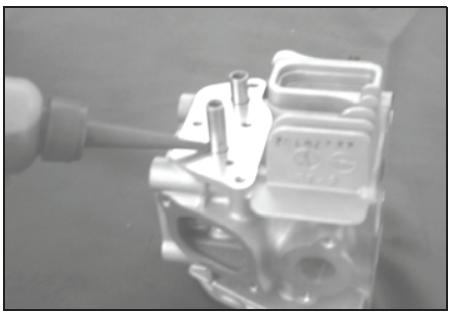


REASSEMBLY
- Apply engine oil to the rocker arm shafts.
- Install the rocker arms and shafts to the cylinder.

NOTE:
- The exhaust rocker arm shaft is shorter than the intake one.
- Be sure to bring the threaded side of the rocker arm shaft to the outside when installing it.
- Reassembly the spring rocker arm exhaust only.

VALVE AND VALVE SPRING DISASSEMBLY
- Compress the valve springs with the valve spring compressor.
- Remove the valve cotters from the valve stem.

09916-14510: Valve spring compresso
09916-14521: Attachment
09916-84511: Tweezers

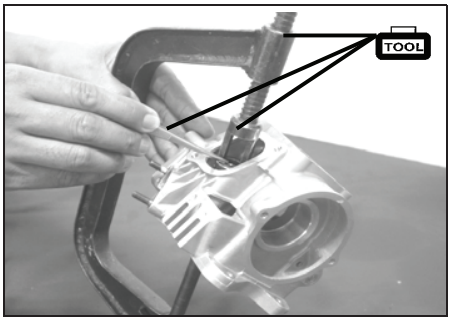


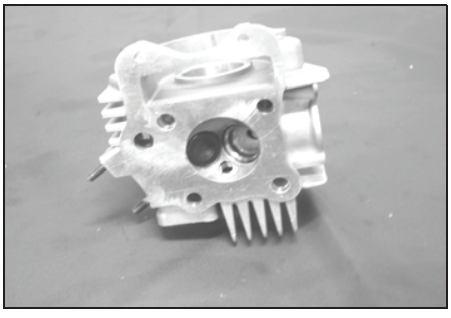
- Remove the valve spring retainer and valve springs.

For reassembling the valve and valve springs, refer to page 3-24

CYLINDER HEAD
DISTORTION
De-carbon the combustion chamber.
Check the gasket surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Service Limit: 0.05 mm
09900-20803: Thickness gauge





VALVE

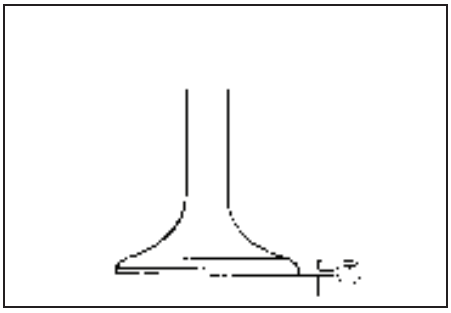
VALVE FACE WEAR

Measure the thickness “T” and, if the thickness is found to have been reduced to the limit, replace the valve.

NOTE:

Visually in sport each valve for wear of its seating face, Replace any valve with an abnormally worm face.

Service Limit : 0.05 mm

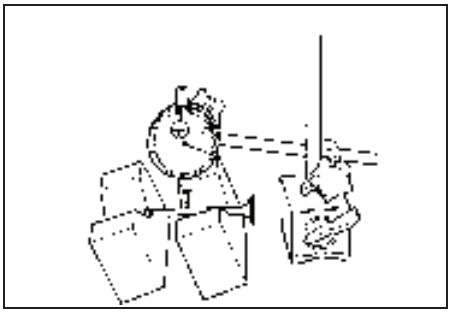


VALVE STEM RUNOUT

Support the valve with “V” blocks, as shown, and check its run out with a dial gauge. The valve must be replaced if the run out exceeds the limit.

Service Limit: 0.05 mm

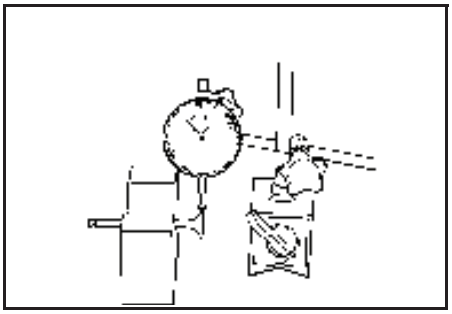
09900-20701: Magnetic stand
09900-20606: Dial gauge (1/100 mm)
09900-21304: V-block (100 mm)



VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve head, and measure the valve head radial run out. If it measures more than limit, replace the valve

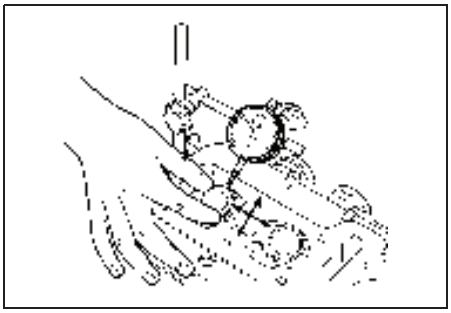
Service Limit: 0.03 mm



VALVE STEM DEFLECTION

Lift the valve about 10 mm (0.39 in) from the valve seat. Measure the valve stem deflection in two directions “X” and “Y”, perpendicular to each other, by positioning the dial gauge as shown. If the deflection measured exceeds the limit, (see below) then determine whether the valve or the guide should be replaced with the new one.

Service Limit Intake and exhaust valves: 0.35 mm



VALVE STEM WEAR

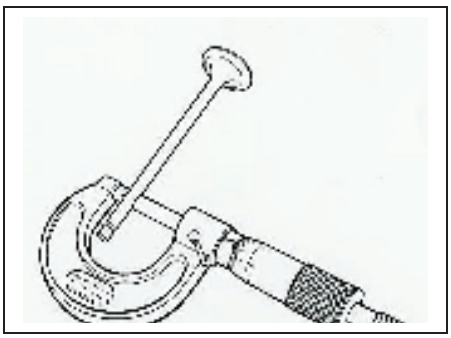
If the valve stem is worn down to the limit, when measured with a micrometer, and the clearance is found to be in excess of the limit indicated previously, replace the valve, if the stem is with in the limit, then replace the guide. After replacing valve or guide, be sure to re-check the clearance.

Valve stem O.D.

IN: 4.975-4.990 mm

Standard EX: 4.955-4.970 mm

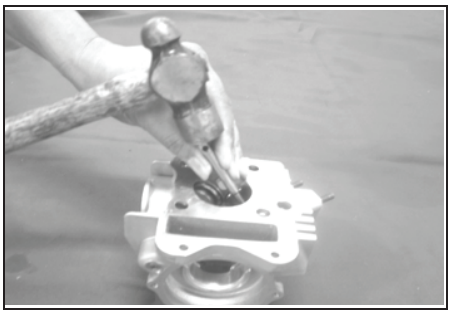
09900-20205: Micrometer (0-25 mm)



VALVE GUIDE SERVICE

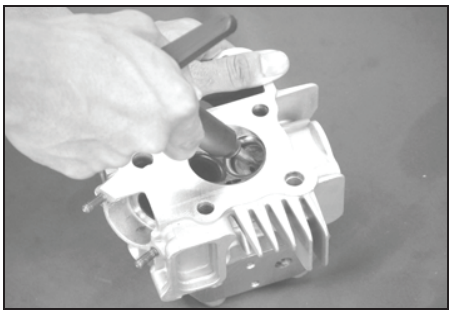
- Remove the valve guide with the valve guide remover.

09916-44310: Valve guide remover



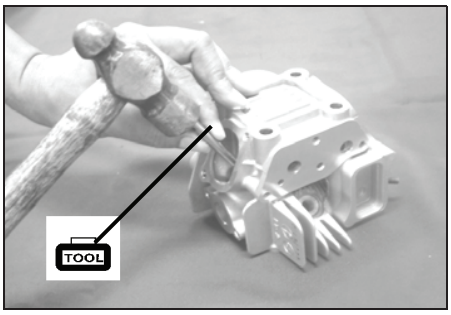
- Re-finish the valve guide holes in cylinder head with a reamer ① and handle ②.

09916-34580: Valve guide remover (10.8 mm)
09916-34542: Handle

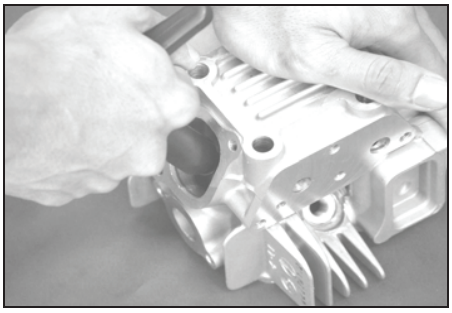


- Fit a ring to each valve guide.
- Lubricate each valve guide with oil, and drive the guide into the guide hole using the valve guide installer.

09916-44310: Valve guide installer



NOTE:
Only oversized valve guides are available as replacement parts.



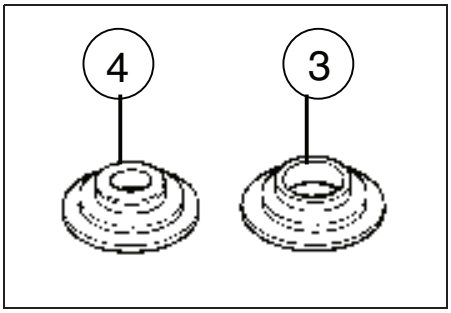
CAUTION

Be sure to use new valve guide ring and valve guide.

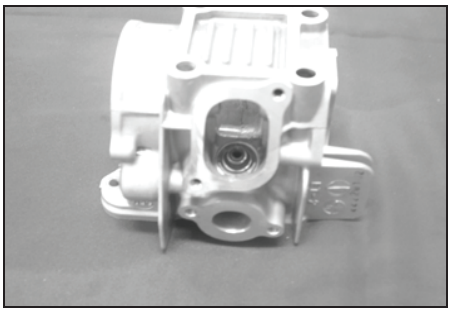
- After fitting the valve guides, re-finish their guiding bores with the reamer ① and handle. ② Be sure to clean an oil the guides after reaming.

09916-34570: Valve guide reamer (5.0 mm)
09916-34542: Handle

- Install the valve spring seat ③. Be careful not to confuse the lower seat with the spring retainer ④.



• Lubricate valve stem seal with oil, and press-fit the seal into position with a finger tip.



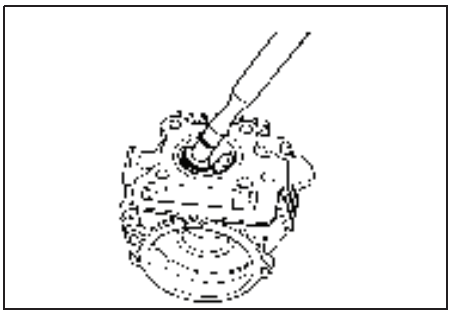
CAUTION

Do not reuse the stem seals.

VALVE SEAT WIDTH

• Coat the valve seat uniformly with Prussian blue. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.

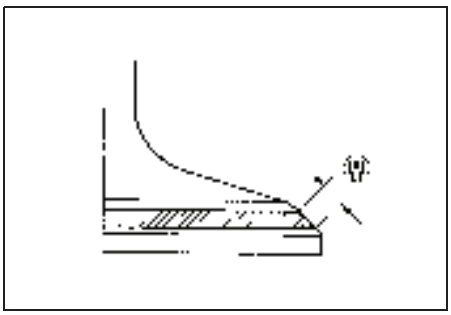
• The ring-like dye impression left of the valve face must be continuous-without any break. In addition, the width of the dye ring, which is the visualized seat "width", must be within the following specification:



Standard

Valve seat width Ⓦ: 0.9-1.1 mm

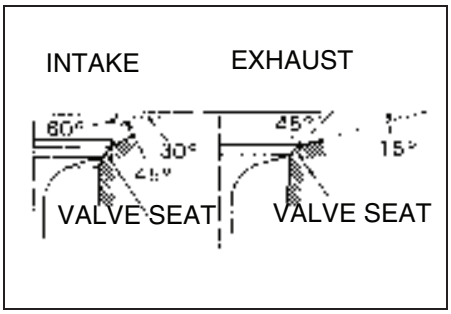
If either requirement is not met, correct the seat by servicing it as follows.



VALVE SEAT SERVICE

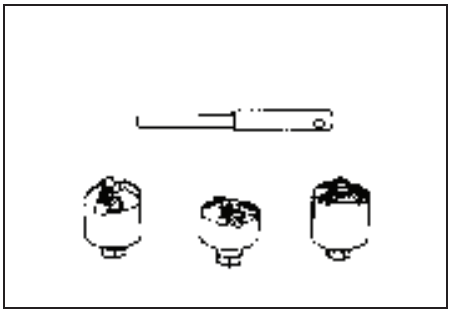
The valve seat for both intake and exhaust valves are machined to four different angles. (The seat contact surface is cut 45°)

	INTAKE SIDE		EXHAUST SIDE
45°	N -12	45°	N - 122
30°	N - 126	15°	N - 121
60°	N - 111		



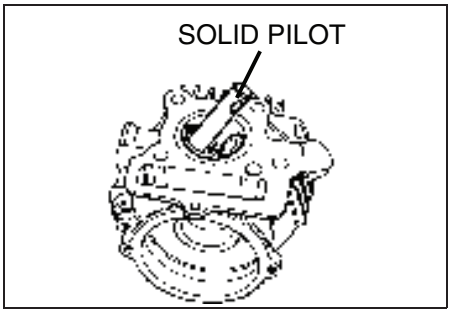
09916-21110: Valve seat cutter set (N-111,126,121,122)
09916-24311: Solid pilot: (N-100-5.0)

NOTE:
The valve set contact area must be inspected after each cut.



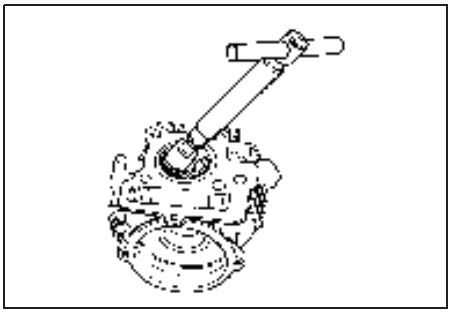
09916-20630: Valve seat cutter set (N-126)
09916-24311: Solid pilot (N-100-5.0)
09916-21110: Valve seat cutter set

- Insert the solid pilot with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T-handle.
- Using the 45° cutter, rescale and clean up the seat with one or row turns.
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required



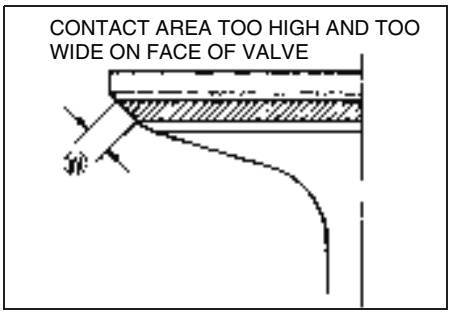
NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocket arm for correct valve contact angle.

- If the contact area is too high on the valve or if it is too wide, use the 15° cutter (for exhaust side) and30°/60° cutters (for intake side) to lower and narrow the contact area.
- If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area. After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations.

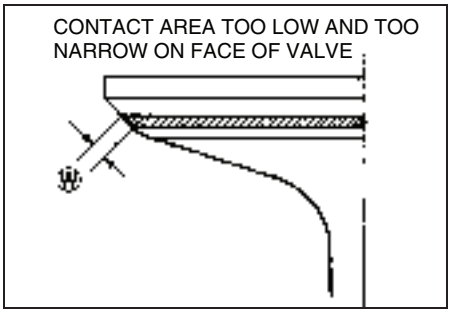


CAUTION

DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operations.

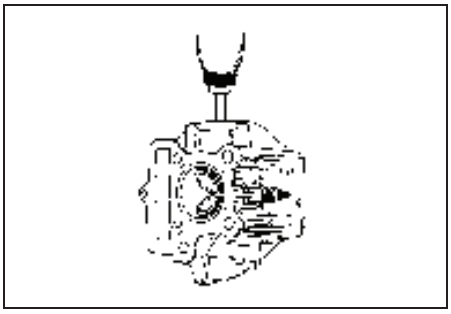


- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks, occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.



⚠ WARNING

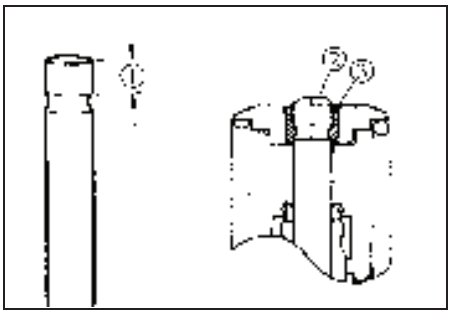
Always use extreme caution when handling gasoline.



NOTE:
After servicing the valve seats, be sure to check the valve clearance after the cylinder has been reinstalled (See page 2-5)

VALVE STEM END CONDITION

Inspect the valve stem end face for pitting and wear. If pitting or wear of the stem end face are present, the valve stem end may be resurfaced, providing that the length ① will not be reduced to less than 2 mm. If this length becomes less than 2.4 mm, the valve must be replaced. After installing a valve whose stem end has been ground off as above, check to ensure that the face ② of the valve stem end is above the cotters ③.



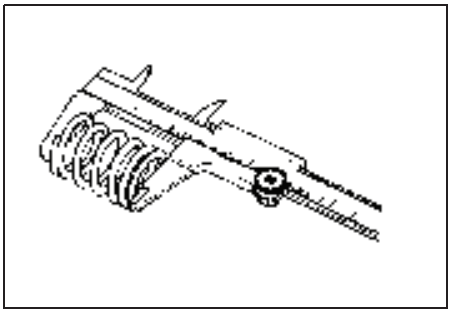
VALVE SPRING

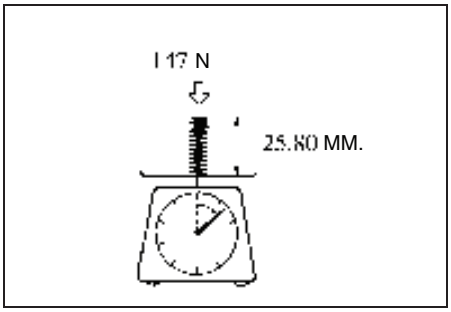
Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force does not fail within the range specified, replace both the inner and outer springs as a set.

Valve spring free length
Service Limit: 30.09 mm.

09900-20201: Venire calipers

Valve spring tension Standard: 147 nm. HEIGHT 25.80 mm.





VALVE AND VALVE SPRING REASSEMBLY

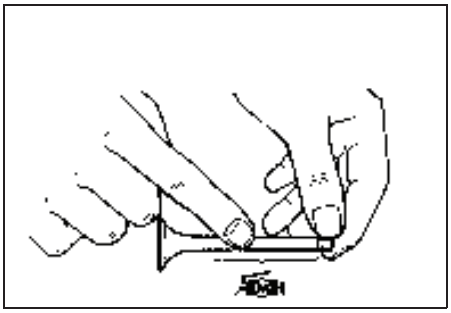
- Insert the valves, with their stems coated with (SUZUKI MOLY PASTE) all around and along the full stem length without any break. Similarly oil the lip of the stem seal.

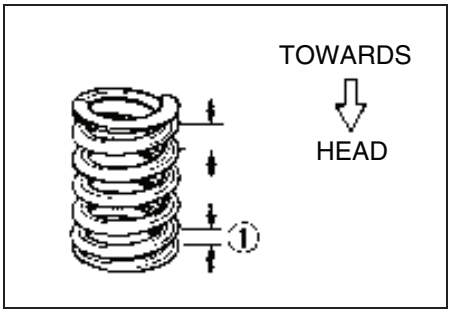
99000-25140: SUZUKI MOLY PASTE

CAUTION

When inserting each valve, take care not to damage the lip of the stem seal.

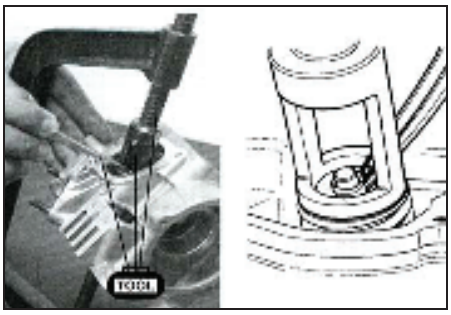
- Install the valve springs, making sure that the close pitch end ① of each spring goes in first to rest on the head. The coil pitch of both inner and outer springs very: the pitch decreases from top to bottom, as shown in the illustration.





• Fit a valve spring retainer, compress the springs with a valve spring compressor and fit the cotter halves to the stem end.

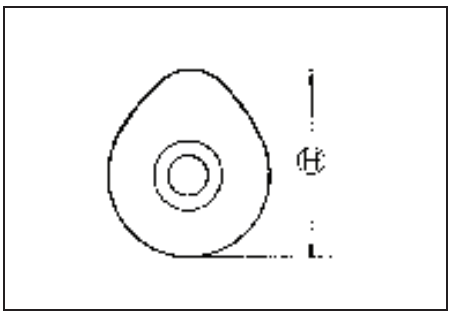
09916-14510: valve spring compressor
09916-14521: Attachment
09916-84511: Tweezers



CAMSHAFT

CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced output power. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height “H” , which is to be measured with a micrometer.
Replace the camshaft if found it worn down to the limit.



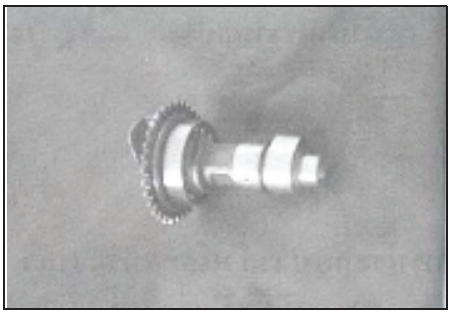
Cam height “H”

Intake cam: 27.66 mm
Exhaust cam: 27.47 mm

09900-20202 : Micrometer (25-50 mm)

CAMSHAFT BEARING

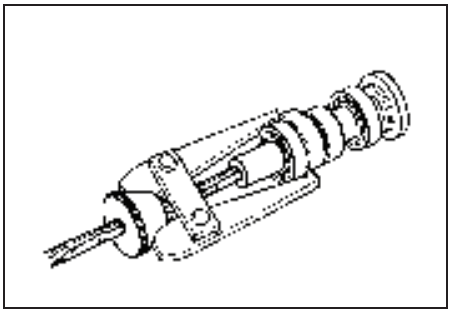
Rotate the camshaft bearing outer race by finger to inspect for abnormal play, nose and smooth rotation.
Replace the bearing in the following procedure if there is anything unusual.



• Remove the bearings with a bearing puller.

09913-60910: Bearing puller

NOTE:
Avoid removing the came sprocket flange and right-side bearing from the camshaft unless you really need to do so, for example, removing the damaged right-side bearing.

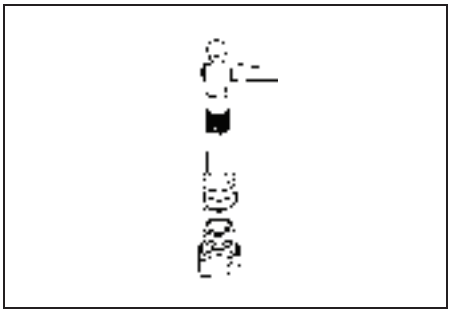


CAUTION

The removed bearing should be replaced with a new one.

• Press in the bearing to the camshaft with a bearing installer.

09951-76010 : Bearing installer



NOTE:

** Before reassembling the cam sprocket flange onto the camshaft, apply the internal face of the cam sprocket flange with THREAD LOCK SUPER "1303".*

** This procedure may be performed only once before camshaft replacement is required.*

** Installation of the cam sprocket flange requires exact alignment to severe correction of the valve timing.*

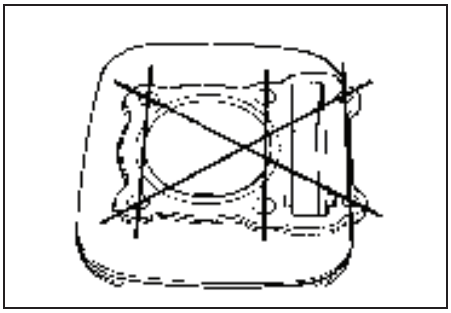
** The camshaft has automatic DE-COMPRESSOR INSTALLED. (FD 110 XC ONLY) Press in the cam sprocket flange to the camshaft as shown in the illustration.*

CYLINDER DISTORTION

Check the gasket surface of the cylinder for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder.

Service limit: 0.05 mm.

09900-20803: Thickness gauge

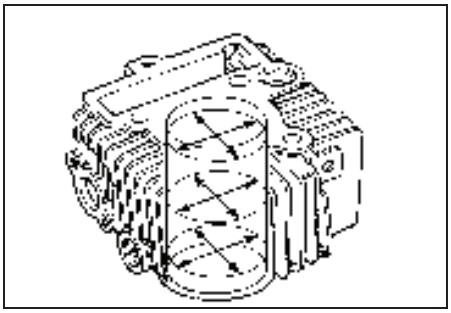


CYLINDER BORE

Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder.

Service Limit: 53.595 mm

09900-20508: Cylinder bore gauge set



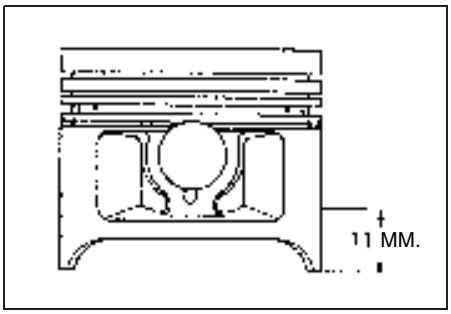
PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place 11 mm from the skirt end as shown in Fig. If the measurement is less than the limit, replace the piston.

Service Limit: 53.380 mm

Piston oversize: 0.5, 1.0 mm

09900-20203: Micrometer (50-75 mm)

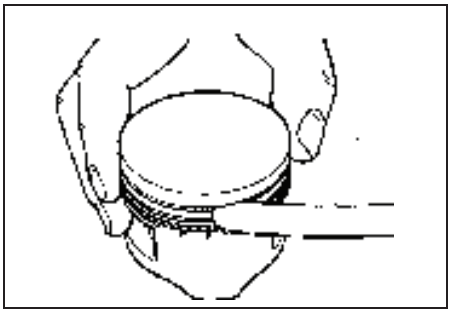


PISTON CYLINDER CLEARANCE

As a result of the above measurement, if the piston to cylinder clearance exceeds the following Limit, overhaul the cylinder and use an oversize piston, or replace both cylinder and piston.
Service Limit: 0.120 mm

PISTON RING-GROOVE CLEARANCE

Using a thickness gauge, measure the side clearance of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.



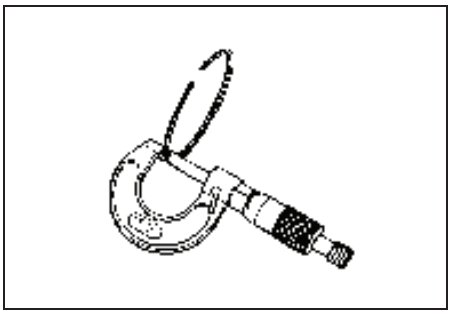
Piston ring - groove clearance

Service limit: 1 st: 0.180 mm
2nd: 0.150 mm

Piston ring groove width
standard 1 st : 1.01-1.03 mm.
2 nd : 1.01-1.03 mm.
Oil : 2.01-2.03 mm.

Piston ring thickness
Standard 1 st and 2nd : 0.97 - 0.99 mm

09900-20803 : Thickness gauge

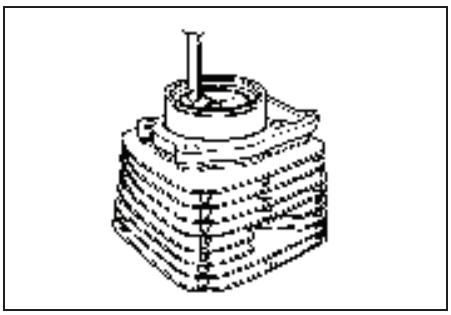


NOTE:
Using a soft-metal scraper, de-carbon the crown of the piston. Clean the ring grooves similarly.

PISTON RING END GAP

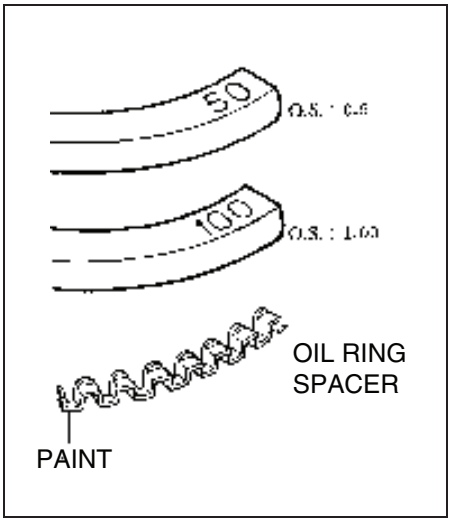
Fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.
If any ring has an excess end gap, replace the ring.
Piston ring end gap
Service Limit 1 st and 2 nd : 0.50 mm

09900-20803: Thickness gauge



OVERSIZE RINGS

- Oversize piston ring The following two types of oversize piston ring are used. They bear the following identification numbers.
  Piston ring 1 st. and 2nd 0.5 mm: 50
  1.0 mm: 100
- Oversize oil ring
  The following two types of oversize oil ring are used.
  They bear the following identification marks.
  Oil ring 0.5 mm: Painted red
  1.0 mm: Painted yellow
- Oversize side rail
  Just measure outside diameter to identify the side rail as there is no mark or numbers on it.



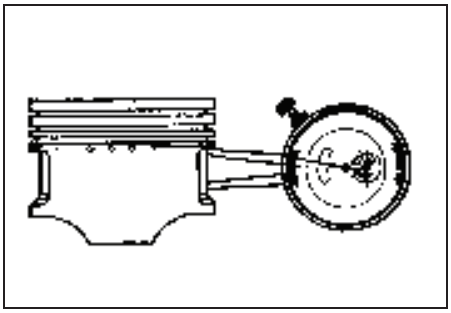
PISTON PIN

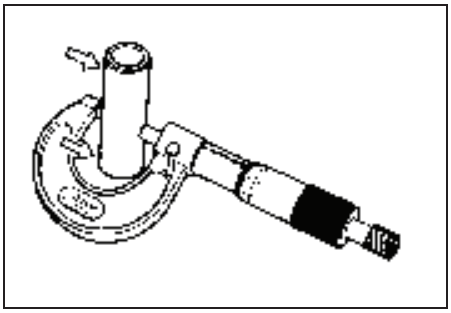
PIN BORE

Using a caliper gauge, measure the piston pin bore inside diameter, and using a micrometer measure the piston pin outside diameter. If the difference between these two measurements is more than the limits, replace both piston and piston pin.

Piston pin bore
Service Limit: 14.030 mm
Piston pin O.D.
Service Limit: 13.980 mm

09900-20605: Dial calipers
09900-20205: Micrometer (0-25 mm)





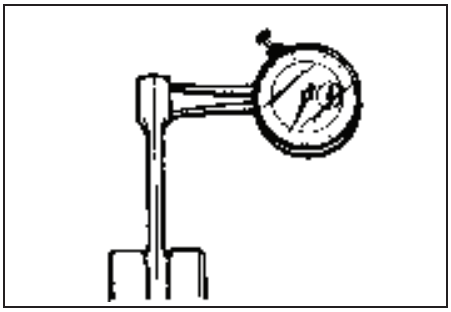
CONROD

SMALL END I.D.

Using a caliper gauge, measure the con rod small end inside diameter.
Service Limit: 14.040 mm

09900-20605: Dial calipers

If the con rod small end bore inside diameter exceeds the limits, replace control.



CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

Wear on the big end of the con rod can be estimated by checking the movement of the small end of the rod. This method can also check the extent of wear on the parts of the con rod's big end.

Service Limit: 3.0 mm

09900-20701: Magnetic stand
09900-20606: Dial gauge (1/100 mm)
09900-21304: V-block

Push the big end of the control to one side and measure the side clearance with a thickness gauge.

Standard : 0.10-0.45 mm
Service Limit: 1.00 mm

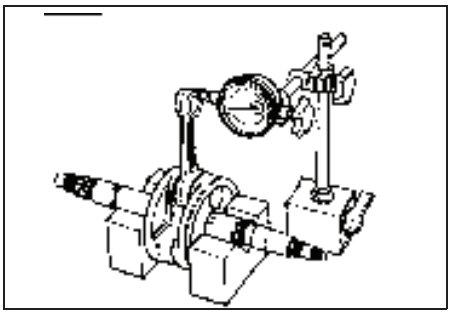
09900-20803 : Thickness gauge

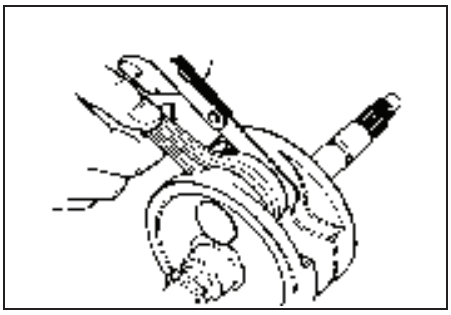
Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance to within the limit by replacing the worn parts-con rod, big end bearing and crank pin etc.

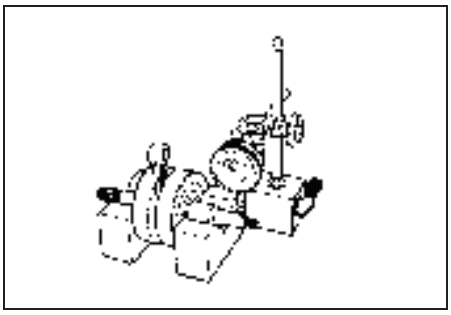
CRANK SHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end journals resting on the blocks. Position the dial gauge, as shown, and rotate the crankshaft slowly to read the run out. Correct or replace the crankshaft if the run out is greater than the limit.

Service Limit. 0.08 mm







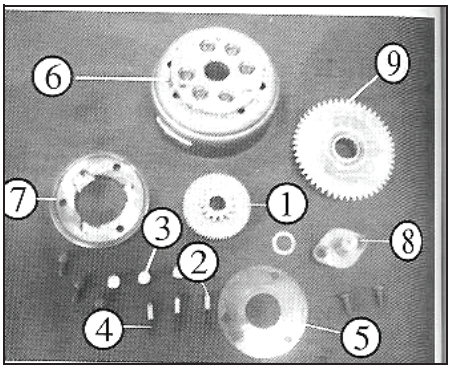
STARTER CLUTCH AND STARTER DRIVEN GEAR BEARING

STARTER CLUTCH

Install the starter driven gear onto the starter clutch and turn the starter driven gear by hand to inspect the starter clutch for a smooth movement. The gear turns one direction only. If a large resistance is felt to rotation, inspect the starter clutch for damage or inspect the starter clutch contacting surface of the starter driven gear for wear or damage. If they are found to be damaged, replace them with new ones.

STARTER DRIVEN GEAR BEARING

Install the starter driven bearing and gear on to the crankshaft and turn the starter driven gear by hand to inspect the starter driven gear bearing for a smooth rotation and abnormal noise. If abnormal noise does not occur, it is not necessary to replace the bearin



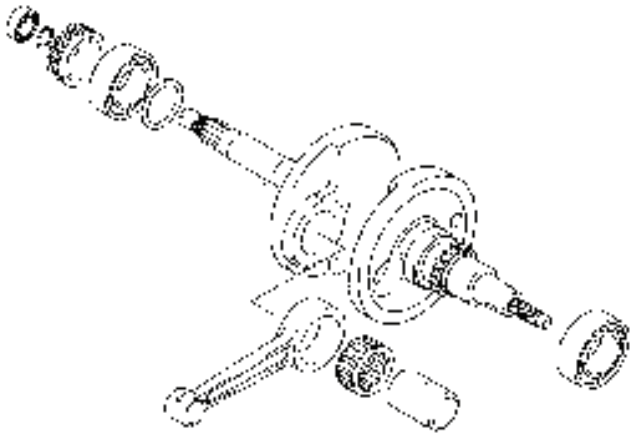
1) STARTER IDLE GEAR
2) PUSH PIECE
3) ROLLER
4) SPRING
5) STARTER CLUTCH HUB SHIM
6) ROTOR
7) STARTER CLUTCH HOLDER
8) SHAFT
9) STARTER GEAR

ENGINE REASSEMBLY

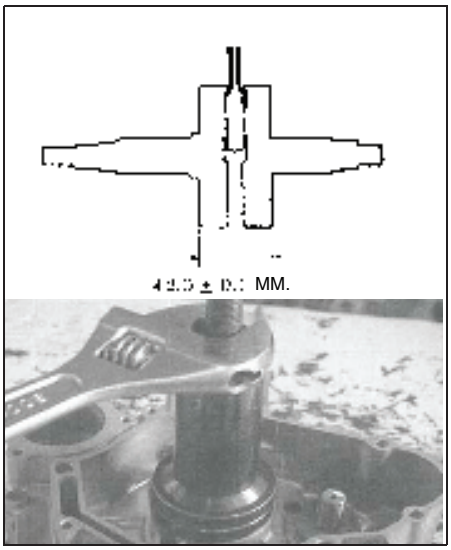
The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special description or precautionary measures.

NOTE:
Apply engine oil to each running and sliding part before reassembling.

CRANKSHAFT



- Decide the width between the webs referring to the figure below when rebuilding the crankshaft.



Standard width between webs: 42.0 ± 0.1 mm

- When installing the crankshaft into the crankcase, it is necessary to pull its left end into the left crankcase by using the special tools.
- Apply engine oil to the crankshaft bearings.

09910-32812: Crankshaft installer
09910-32820: Spacer
09911-11310: Attachment

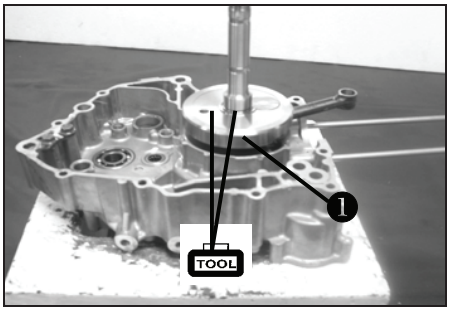
CAUTION

Never install the crankshaft into the crankcase by striking it with a plastic hammer. Always use the special tool, otherwise crankshaft alignment accuracy will be affected

CRANKSHAFT SHIM SELECTION

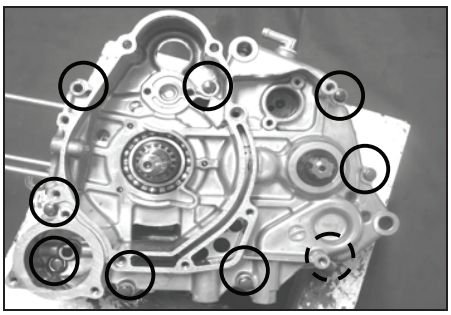
- Degrease the right crankshaft web, shim and inner race of the right crankshaft bearing.
- Place the removed shim ① on the right crankshaft.
- Put the plastic-gauges (special tool) cut out about 10 mm. on the shim, as shown in the photograph at right.

09900-22302: Plastic gauge



- Install the right crankshaft and tighten the crankcase screws.
- Remove the crankcase screws and separate the crank case into 2 parts, left and right, with the special tool.
(See page 3-10)

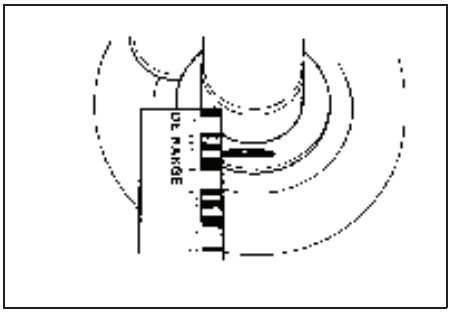
09920-13120: Crankcase separator



- Measure the width of compressed plastic-gauge with the envelope scale.

Standard Thrust clearance: 0.01-0.07 mm

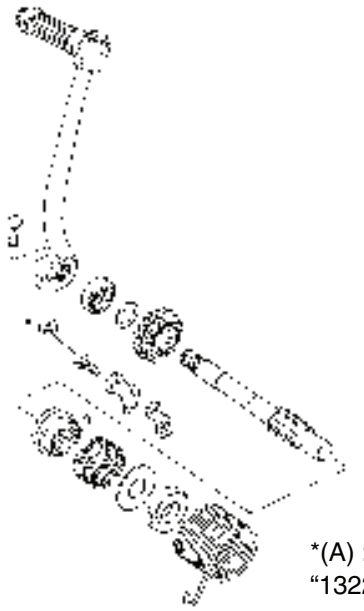
- If the thrust clearance is not within specification, select the proper size of shim.
  The shim size is printed on the shim surface.
- After selecting the proper size of shim, place it on the right crankshaft.



LIST OF SHIMS

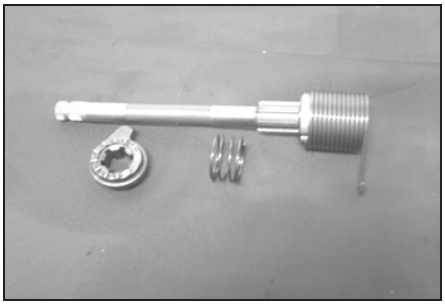
Part No.	Shim thickness	Part No.	Shim thickness
09181-25051	0.60 mm	09181-25059	1.00 mm
09181-25052	0.65 mm	09181-25060	1.05 mm
09181-25051	0.70 mm	09181-25061	1.10 mm
09181-25054	0.75 mm	09181-25062	1.15 mm
09181-25055	0.80 mm	09181-25063	1.20 mm
09181-25056	0.85 mm	09181-25064	1.25 mm
09181-25057	0.90 mm	09181-25065	1.30 mm
09181-25058	0.95 mm		

KICK STARTER

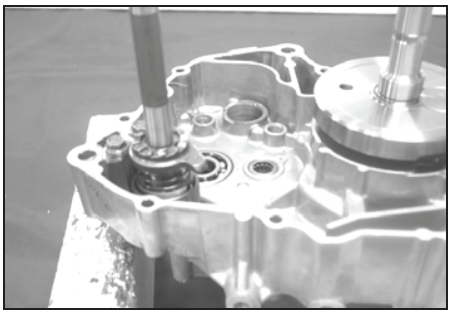


*(A) : THREAD LOCK SUPER "1322"

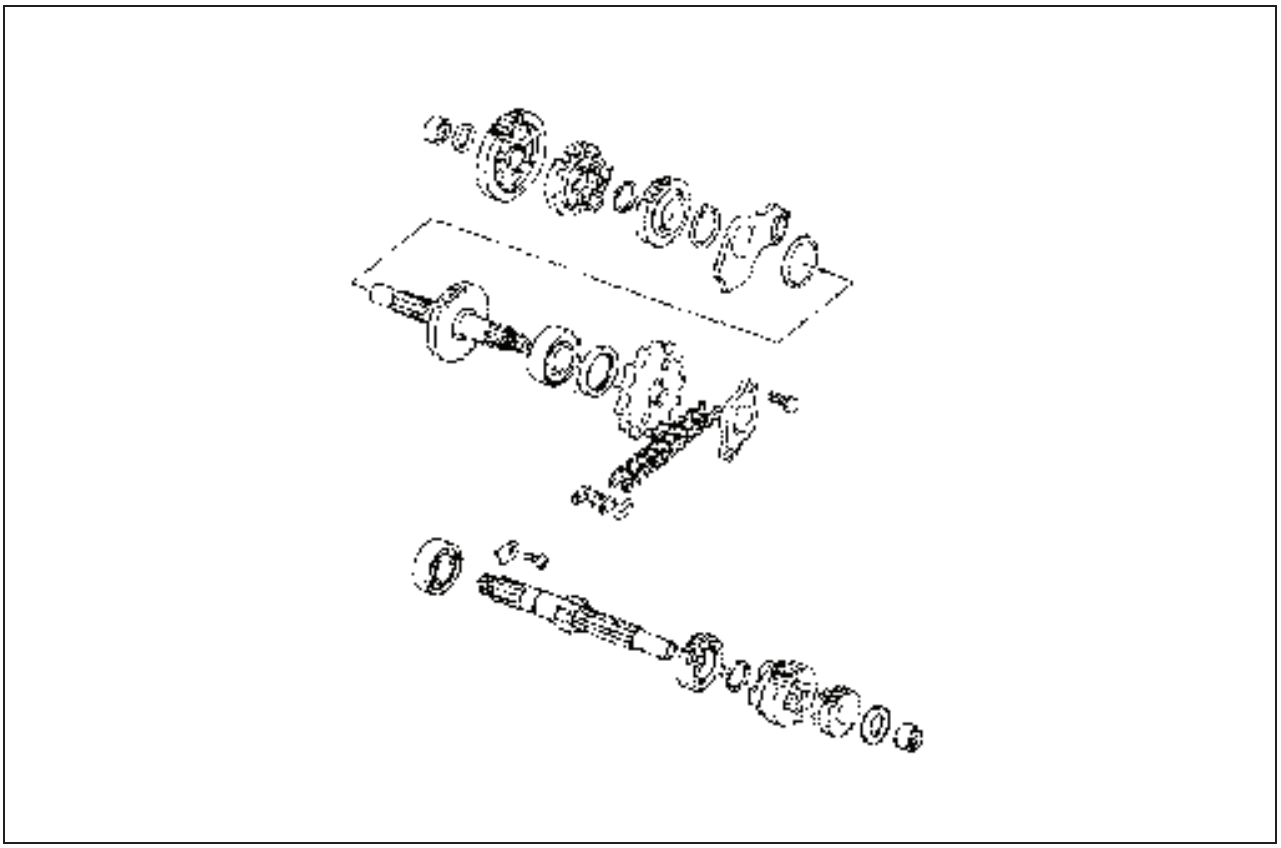
- Align the punch mark ① of kick starter shaft with punch mark ② of kick starter



- Turn the kick starter shaft counter-clockwise and then lock the kick starter with kick starter guide.

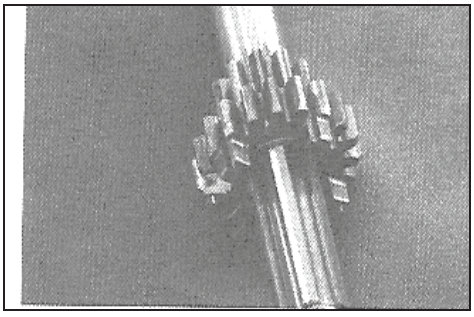


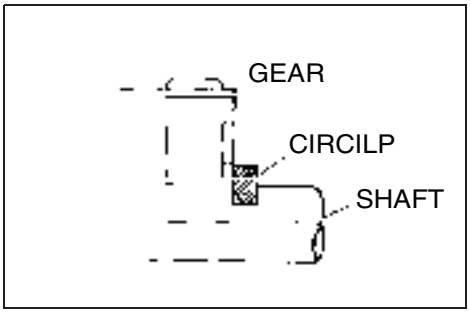
TRANSMISSION



CAUTION

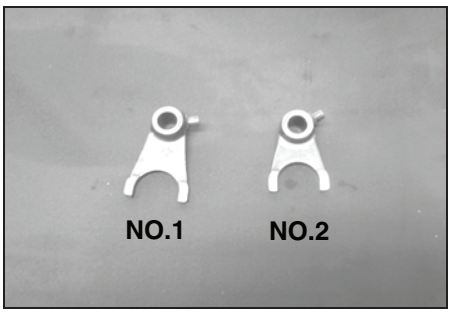
- **Seat the circlip in the groove and its ends A should be located as shown in the photo.**
- **When mounting circlip, pay attention to the direction of the circlip. Fit it to the rounded side against the gear surface**



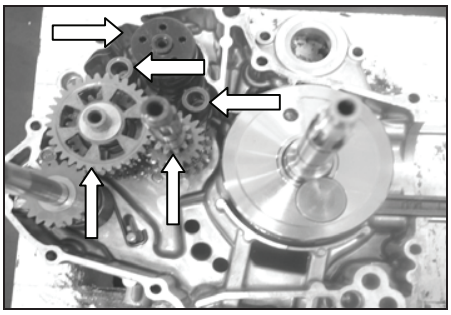


GEARSHIFT FORK

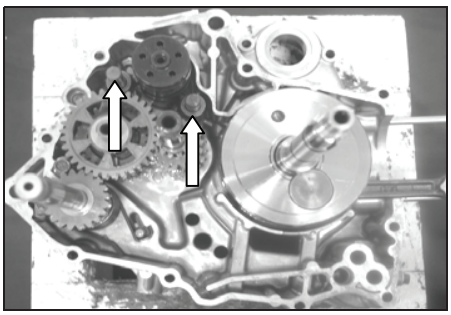
- NO.1 gearshift fork drive and NO.2 driven



- Install the transmission assembly and gearshift forks
- Install the gearshift cam.



- Install the gearshift fork shafts.

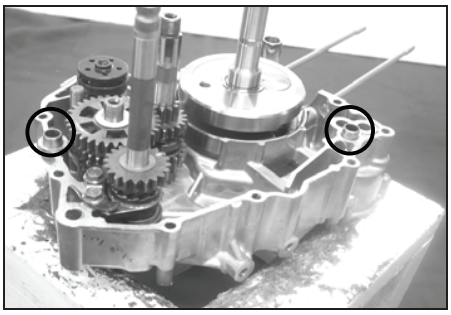


CRANKCASE

- Wipe the crankcase mating surfaces (both surfaces) with a cleaning solvent.
- Fit the dowel pins on to the left half of the crankcase.
- Apply engine oil to con rod big end and T/M. gears.
- Apply BOND NO. 1215 to the mating surface of the left crankcase.

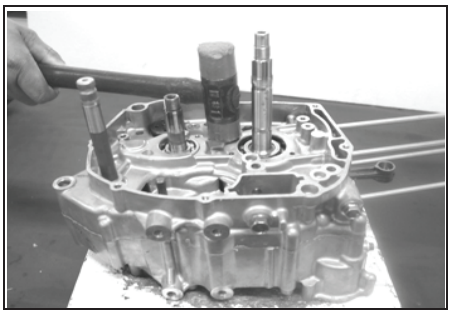
  1215 **99000-31110: SUZUKI BOND NO.1215**

- Assemble the crankcases within few minutes.



NOTE:

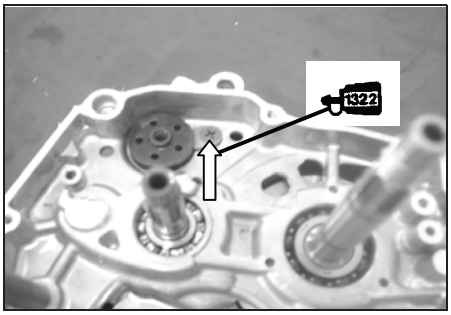
- *After crankcase crews have been tightened, check if crankshaft rotate smoothly.*
- *If a large resistance is felt to rotation, try to free the shafts by tapping the drive shaft or countershaft with a plastic hammer as shown in photograph.*



SHIFT CAM RETAINER

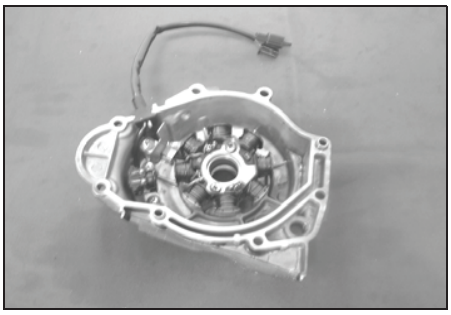
- install the shift cam retainer after applying THREAD LOCK SUPER “1322” to the screws.

99000-32110: THREAD LOCK SUPER “1322”



ROTOR AND STATOR

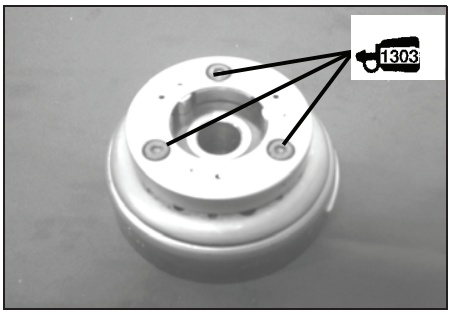
- Install the stator magneto cover.



STARTER CLUCTH

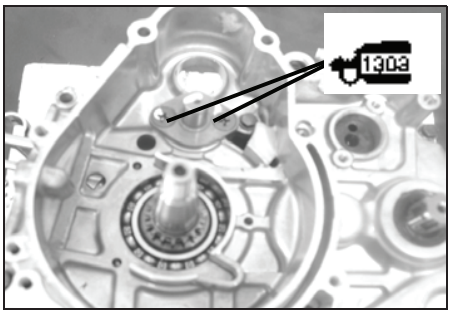
- Apply a small quantity of THREAD LOCK SUPER “1303” to the starter clutch bolts and tighten them to the specified toque by holding the crankshaft.

99000-32030: THREAD LOCK SUPER “1303”
Starter clutch boil: 10 Nm. (1.0 kg-m)



- install the starter idle gear shaft after applying THREAD LOCK SUPER “1322” to the screws.

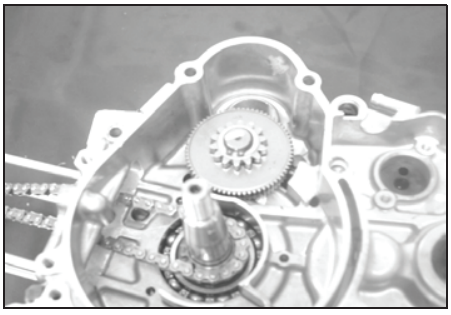
99000-32030: THREAD LOCK SUPER “1303”



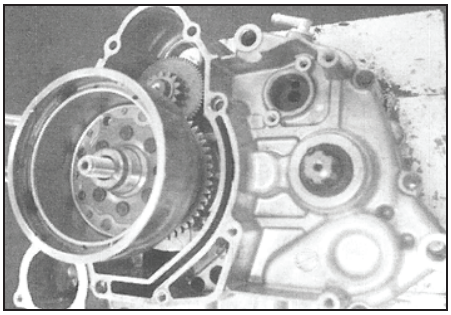
- install the idle gear and washer.
- Fix the idle gear circlip by using a special tool.

99000-06107: Snap ring pliers

- Install the cam chain.



- Wipe the tapered portion of the crankshaft and also the generator rotor with a cleaning solvent.
- Install the key to the crankshaft.
- Install the rotor assembly after resembling the rotor and starter gear.

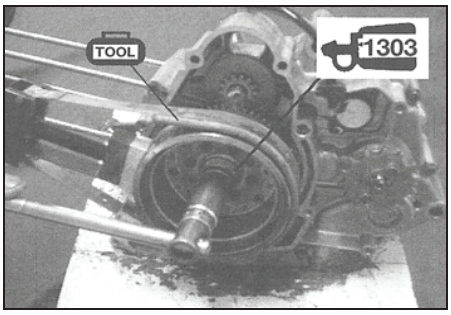


- Apply THREAD LOCK SUPER “1303” to the thread and tighten the nut by using the special tool.

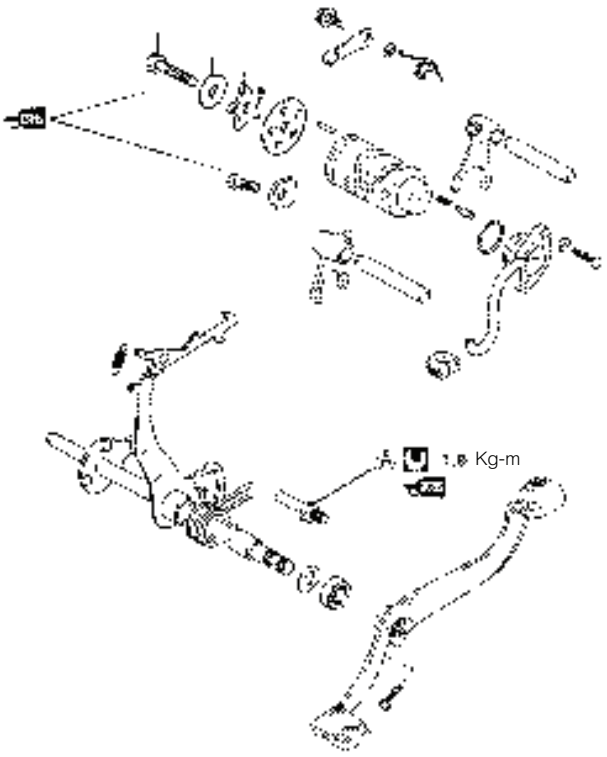
99000-32030: THREAD LOCK SUPER “1303”

09930-44512: Generator Rotor Holder

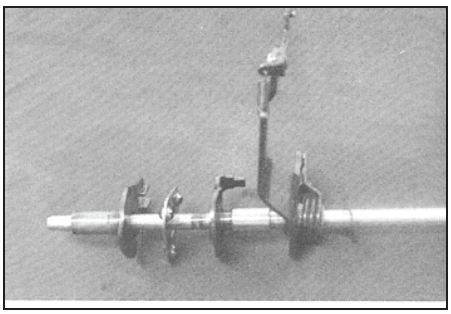
Rotor nut: 80 N.m (8.0 kg-m)



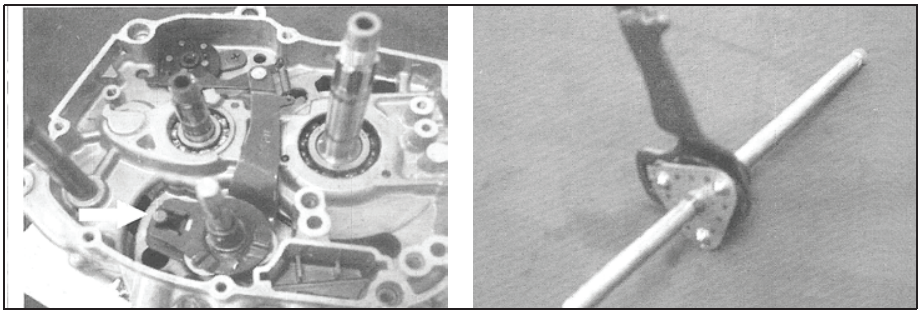
GEARSHIFT



• When installing the gearshift lever, align the stopper bolt with gearshift lever relating part.

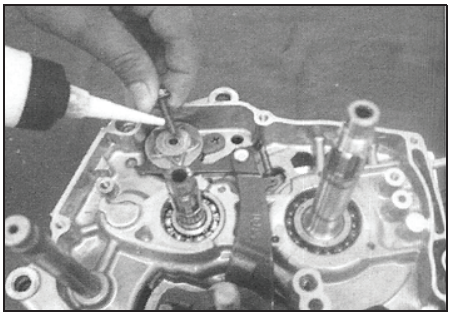


NOTE:
Install the bearing as shown in the photograph.



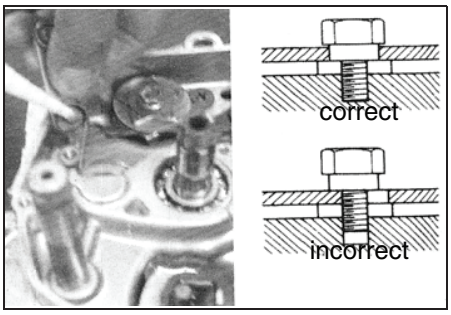
• When install the shift cam pin bolt, apply THREAD LOCK SUPER “1322” to thread.

99000-32110: THREAD LOCK SUPER “1322”



• When install the shift cam stopper bolt, apply THREAD LOCK SUPER “1342” to thread.

99000-32050: THREAD LOCK SUPER “1342



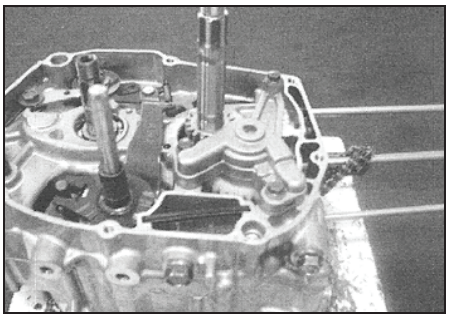
CAUTION

When installing the cam stopper as illustrated.

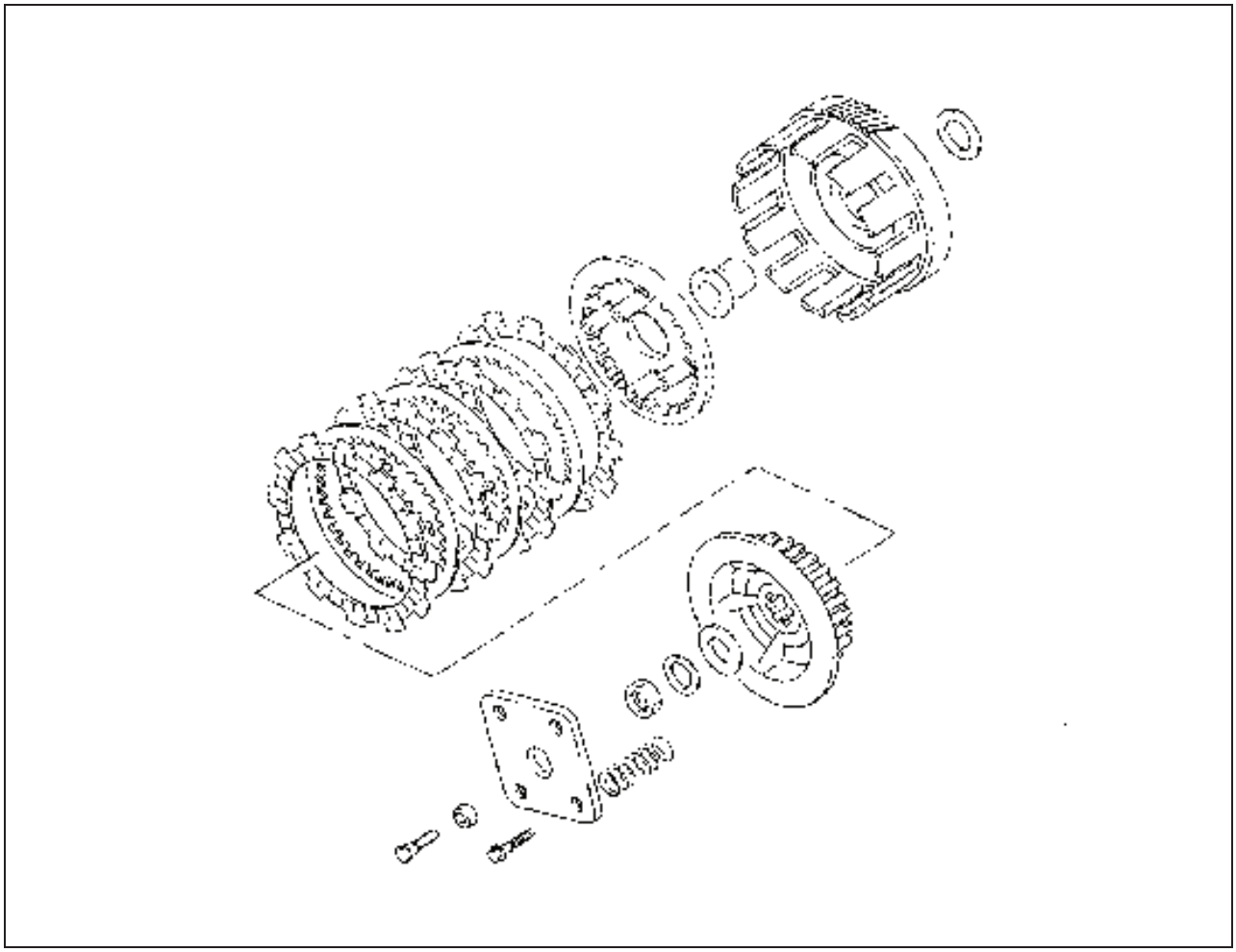
OIL PUMP

- When Installing the oil pump, use dowel pin and new O-rings.
- Apply THREAD LOCK “1342” to the oil pump securing screws.

99000-32050: THREAD LOCK SUPER “1342”

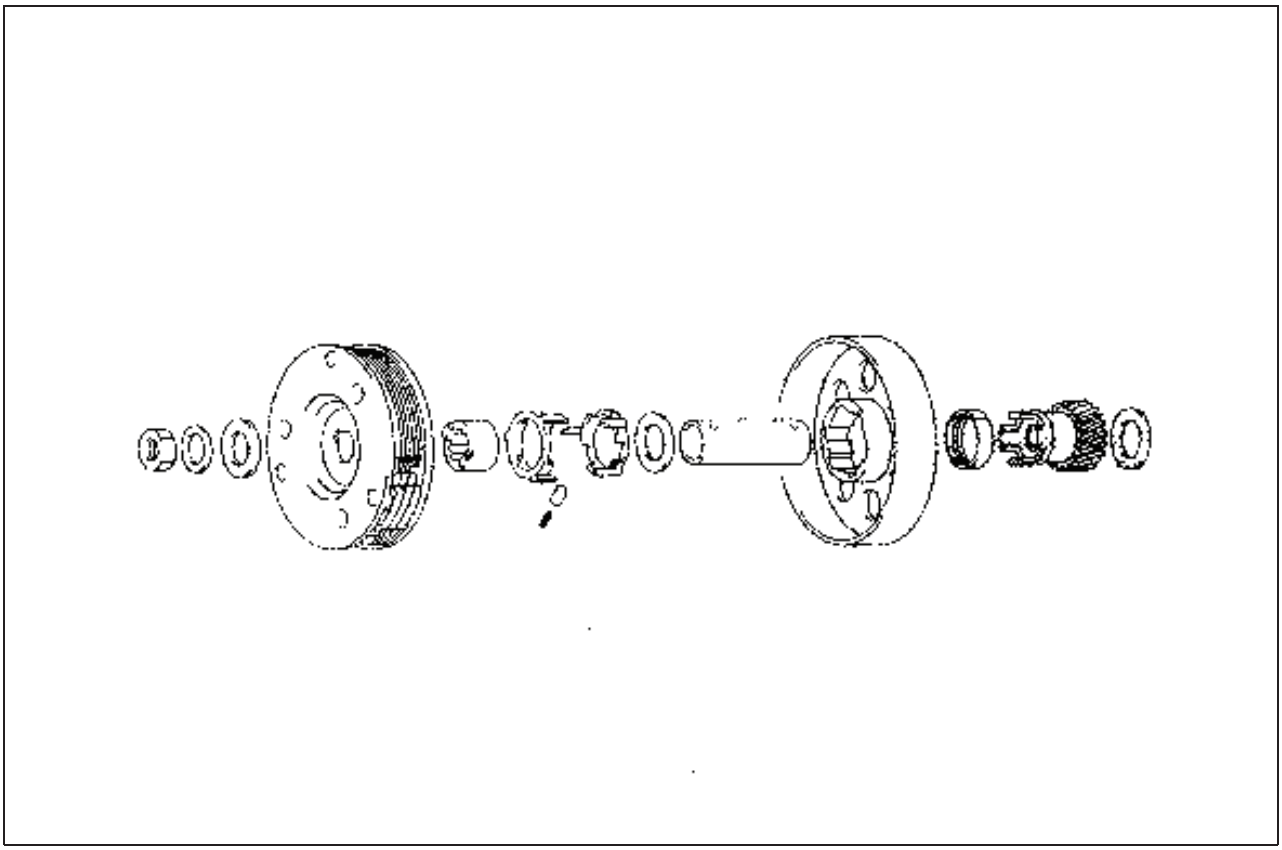


GEAR SHIFTING CLUTCH

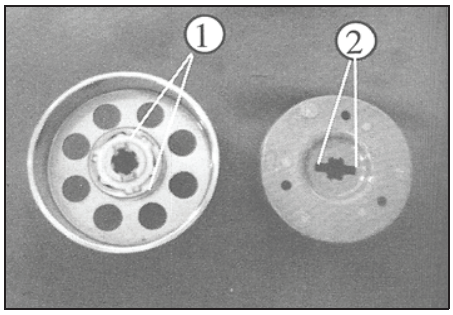


- Install the gear shifting clutch by using the circlip.
- Apply engine oil to push piece and drive plates.

FIRST CLUTCH

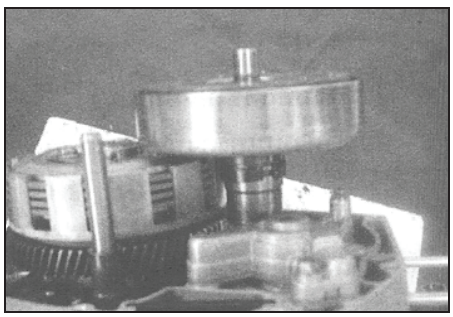


- When installing the clutch shoe in the clutch housing align the boss ① of one way clutch inner with slit ② of clutch shoes.

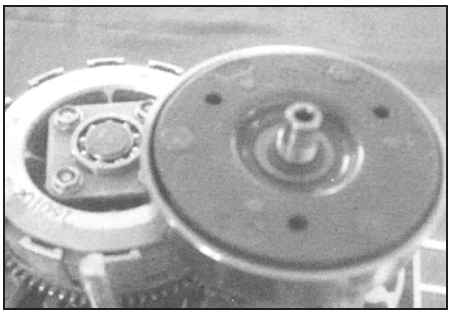


- Fix the primary drive gear to clutch housing, circlip by using a special tool.

99000-06107: Snap ring pliers



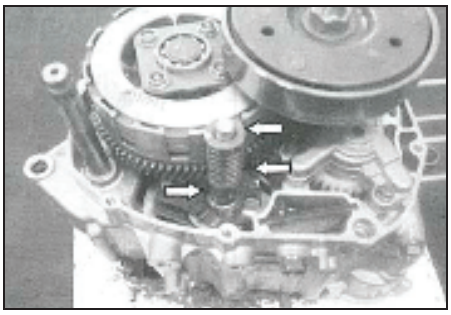
• Installing the first clutch to the crankshaft.



• Tighten the first clutch shoe nut to specified torque by using the special tool.

First clutch shoe nut: 5 N-m (5.0 kg-m)

9915-20115: Conrod holder



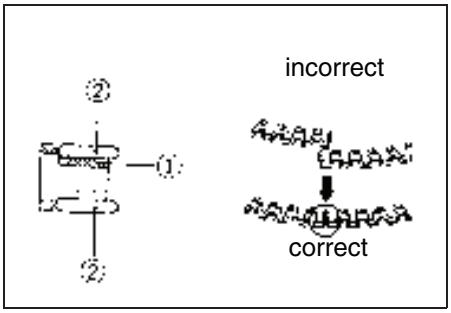
NOTE:
Clean the oil filter when reassembling it.

CLUTCH ADJUSTMENT

Refer to page 3-14.

PISTON AND RING

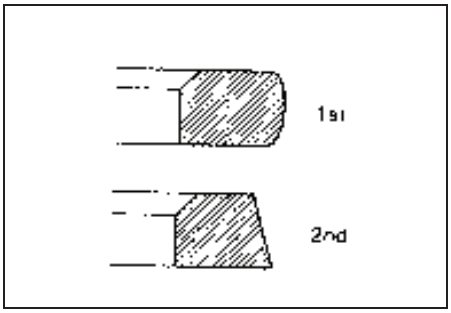
• Install space ① into the bottom ring groove first. Then install both side rails ② , one on each side of the spacer. The spacer and side rails do not have a specific top or bottom when they are new. When reassembling used parts, install them in their original place and direction



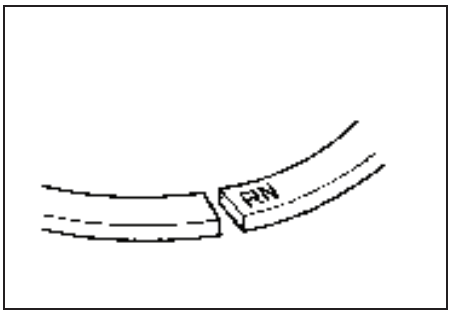
CAUTION

When installing the spacer, be careful not to allow its two ends to overlap in the groove.

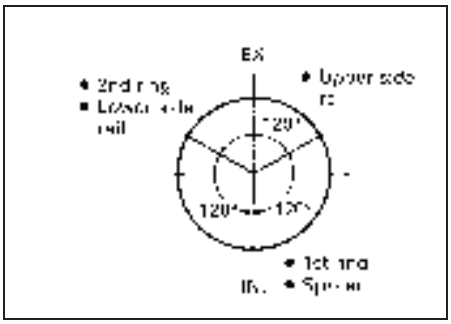
• 1st ring and 2nd ring differ in the shape of ring face and the face of 1st ring is chrome-plated whereas that of 2nd ring is not. the color of 2nd ring appears darker than that of the 1st ring.



- 1st and 2nd rings have the letter “RN” marked on the top. Be sure to bring the marked side to the top when fitting them to the piston.

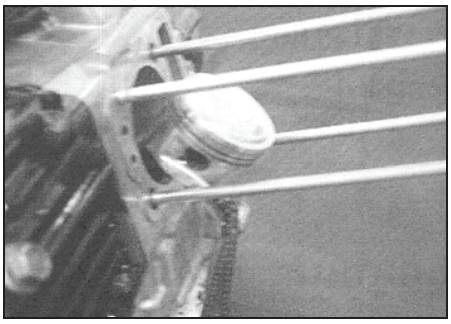


- Position the gaps of the three rings as shown. Before inserting piston into the cylinder, check that the gaps are so located.

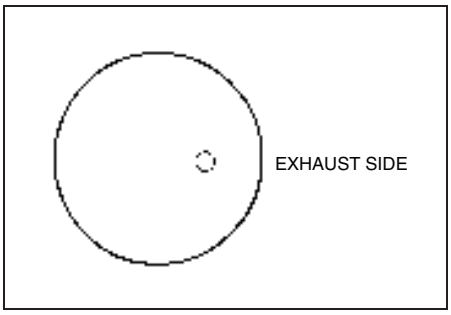


The following are reminders for piston installation:

- Rub a small quantity of SUZUKI MOLY PASTE on to the piston pin.
- Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase, and then fit the piston pin circlip with long nose pliers.



- When fitting the piston, turn point mark on the piston head to exhaust side.

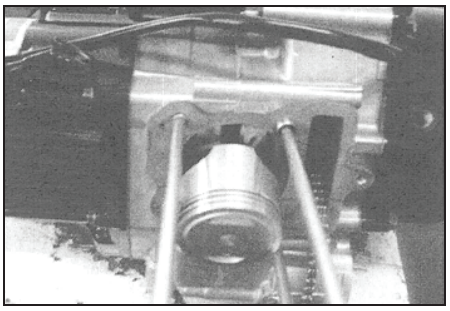


CAUTION

Use a new piston pin circlip to prevent circlip failure which will occur with a bent one.

CYLINDER

Before mounting the cylinder block, oil the big end and small end of the conrod and the sliding surface of the piston.

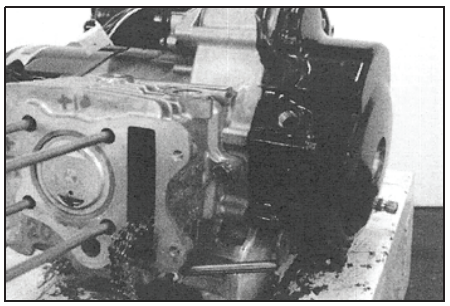


- Inspect the oil orifice for cragged.
- Fit dowel pins to crankcase and then fit gasket.

CAUTION

To prevent oil leakage. do not use the old gasket again, always use a new one.

- Hold each piston ring with the piston ring section properly and insert them the cylinder.
- Check to ensure that the piston rings are properly inserted into the cylinder skirt.
- Temporarily tighten the cylinder base nut.

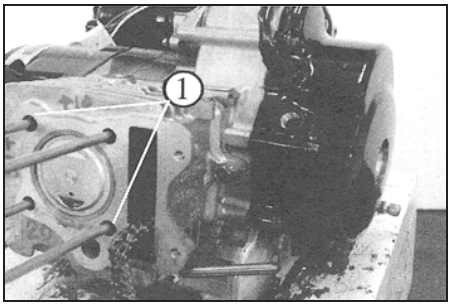


NOTE:
When mounting the cylinder, after attaching camshaft drive chain, keep the camshaft drive chain taut. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.

NOTE:
There is a holder for the bottom end of cam chain guide cast in the crankcase. Be sure that the guide is inserted property or binding of the cam chain and guide may result.

CYLINDER HEAD

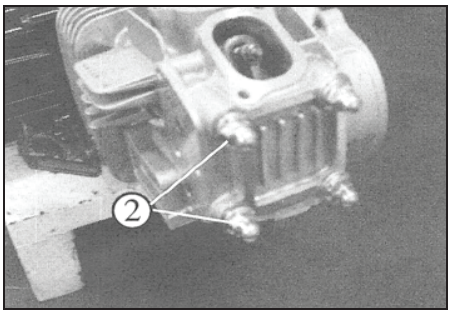
- Fit the dowel pins ① to the cylinder and then, attach the gasket to the cylinder.



CAUTION

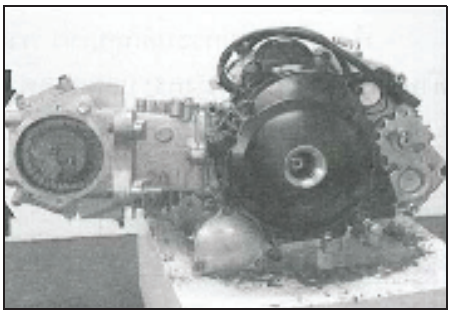
To prevent oil leakage. do not use the old gasket again, always use a new one.

- Copper washer ② is positioned as shown in the photograph.



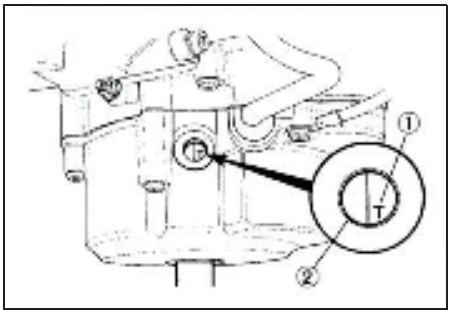
• Tighten the cylinder head nut to the specified torque.

Cylinder head nut: 20 N.m (2.0 kg-m)
Cylinder head nut: 10 N.m (1.0 kg-m)
Cylinder base nut: 10 N.m (1.0 kg-m)



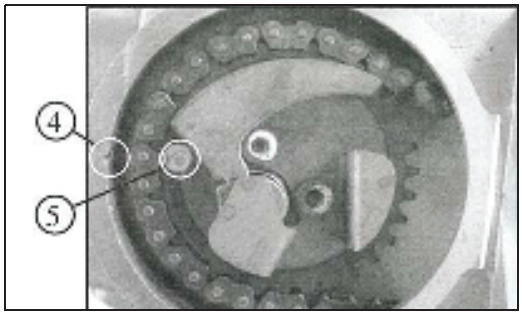
IGNITION TIMING

• Position “T” mark ① on the magneto rotor with the center of magneto cover hole ② keeping the camshaft drive chain pulled up ward.



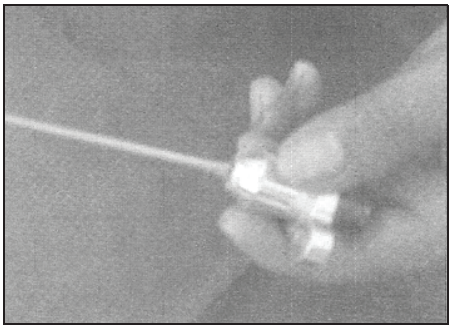
NOTE:
If crankshaft is turned without drawing the camshaft drive chain upward, the chain will be caught between crankcase and cam chain drive sprocket.

• Engage the chain on the cam sprocket and then install the cam sprocket on the camshaft, after align top mark ⑤ of cam sprocket with top mark ④ of cylinder head.



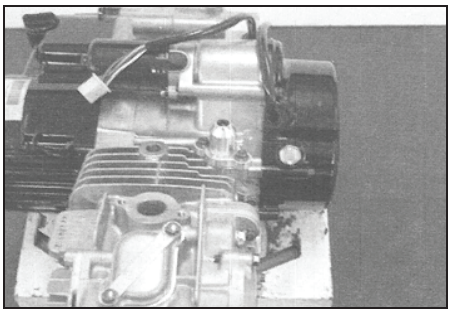
NOTE:
** Do not rotate magneto rotor while doing this.*
When the sprocket is not positioned correctly, turn the sprocket.

CAM CHAIN TENSION ADJUSTER



- Install a new gasket and the cam chain tension adjuster to the cylinder with the two bolts and tighten them to the specified torque.

chain tension adjuster bolt : 1.2 kg-m

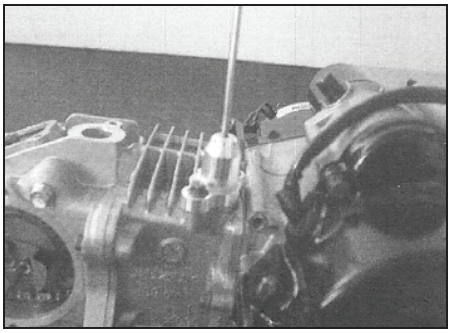


NOTE:

** Before installing the cam chain tension adjuster, lock the tension spring with a screwdriver.*

** Before installing the cam chain tension adjuster, turn the crankshaft normal direction to remove the cam chain slack between the crank sprocket and exhaust sprocket*

- After installing the cam chain tension adjuster, turn a screwdriver counter clockwise. As the slotted of the cam chain tension adjuster turns, the tension rod is advanced under spring force and pushes the cam chain tension adjuster against the cam chain.



CAUTION

After installing the cam chain tension adjuster, check to be sure that the adjuster work properly by checking the slack of cam chain.

VALVE CLEARANCE

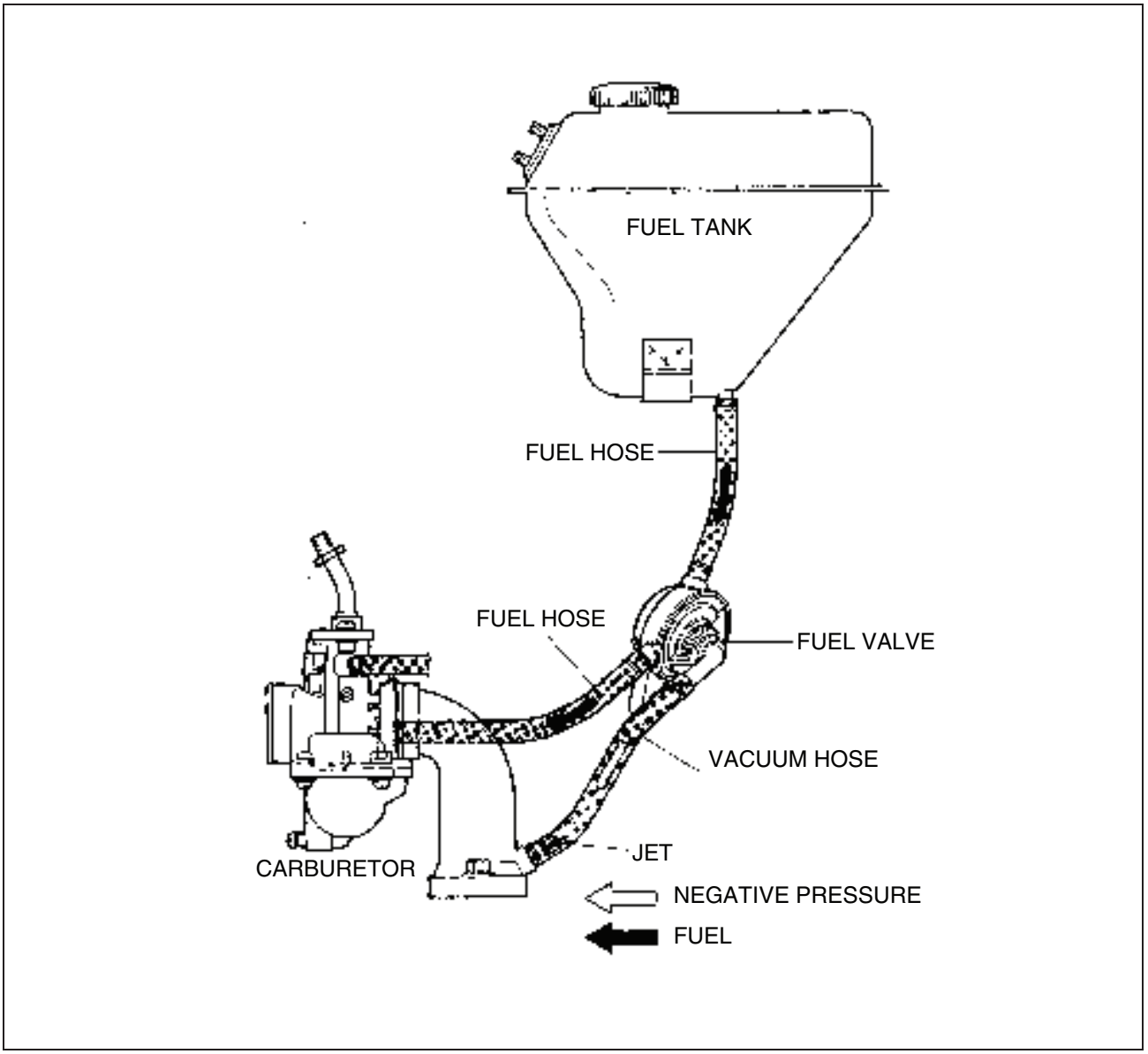
- Check and adjust the valve clearance. Refer to page 2-5 for procedures.

FUEL AND LUBRICATION SYSTEM

CONTENTS

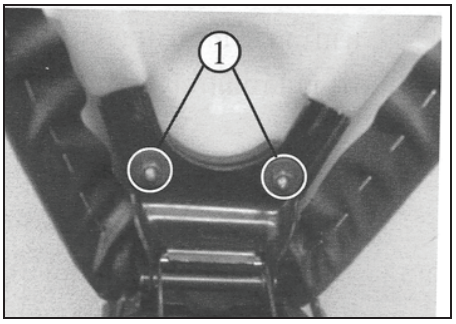
FUEL SYSTEM

When tuning the starter motor, a negative pressure is generated in the combustion chamber. This negative pressure draws on the fuel tap diaphragm, (through a passage way in the carburetor intake pipe) and vacuum hose. Due to this, the negative pressure increases behind the fuel tap diaphragm, until it is higher than the valve spring pressure. The fuel valve in the fuel tap is then forced to open (due to this diaphragm operation) and allows fuel to flow into the carburetor float chamber.

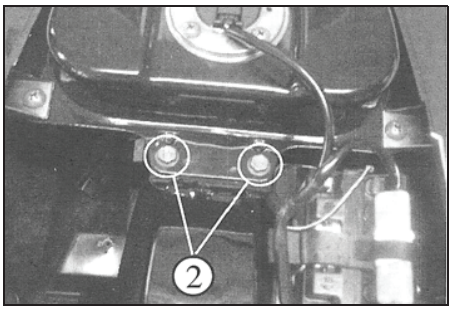


FUEL TANK, FUEL VALVE, FUEL FILTER AND FUEL LEVEL GAUGE

FUEL TANK AND FUEL VALVE REMOVAL



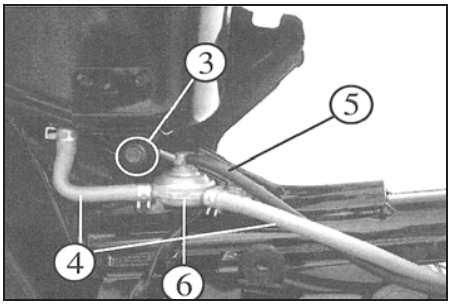
- Remove the leg side shields/frame covers, left and right. (See page 5-1.)
- Remove the seat by removing its mounting nuts ①.
- Remove the fuel tank mounting bolts ②.
- Remove the fuel tank mounting nuts ③ left and right.
- Disconnect the fuel hose ④ and vacuum hose ⑤ from the fuel valve ⑥
- Remove the fuel valve mounting bolt
- Disconnect the fuel level gauge lead wire ⑧.
- Remove the fuel tank along with the fuel valve.
- Drain the fuel.



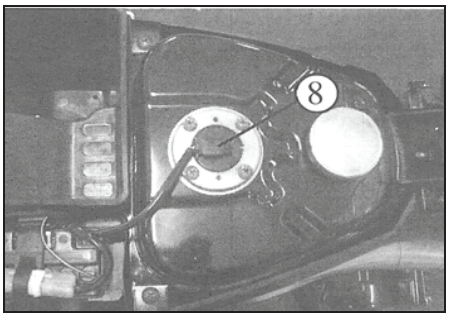
⚠ WARNING

Gasoline is very explosive. Extreme care must be taken.

FUEL FILTER REMOVAL

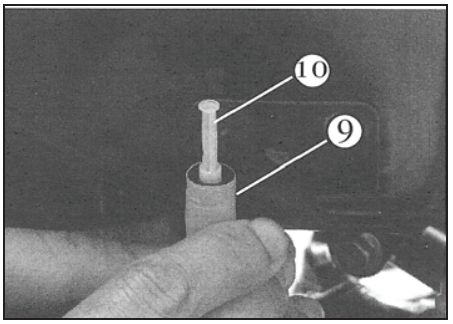


- Remove the left leg side shield/left frame cover. (See page 5-1.)
- Drain the fuel by disconnecting the fuel hose ⑨.
- Remove the fuel filter ⑩ from the fuel hose ⑨.



⚠ WARNING

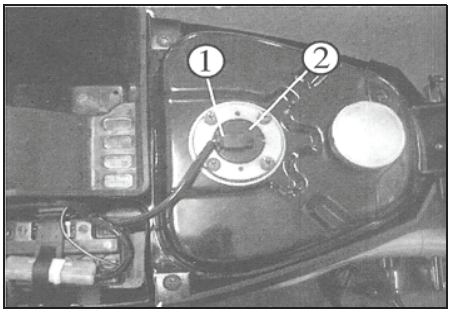
Gasoline is very explosive. Extreme care must be taken.



FUEL LEVEL GAUGE REMOVAL

- Remove the right leg side shield/right frame cover. (See page 5-1.)
- Disconnect the fuel level gauge lead wire coupler ①.
- Remove the fuel level gauge ② by removing the mounting screws.

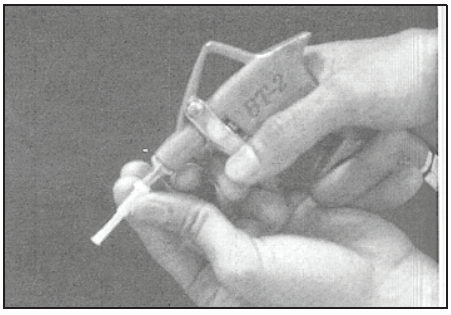
For inspecting the fuel level gauge, refer to page 6-18.



INSPECTION AND CLEANING

FUEL FILTER

If the fuel filter is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel filter with a compressed air.



FUEL VALVE

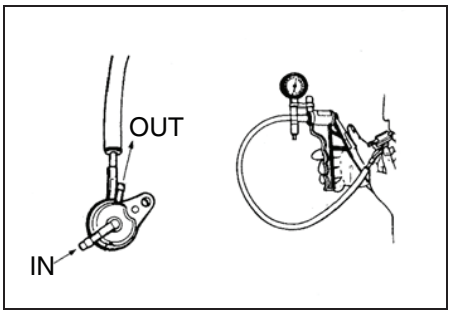
Connect the vacuum pump gauge to the vacuum port of the fuel valve as shown in the illustration. Apply negative pressure to the fuel valve and blow the fuel inlet port. If air does not flow out, replace the fuel valve with a new one.

Specified vacuum: 22 mm Hg

09917-47910: Vacuum pump gauge

CAUTION

Use a hand operated vacuum pump. Do not apply high negative pressure to prevent the fuel tap damage.

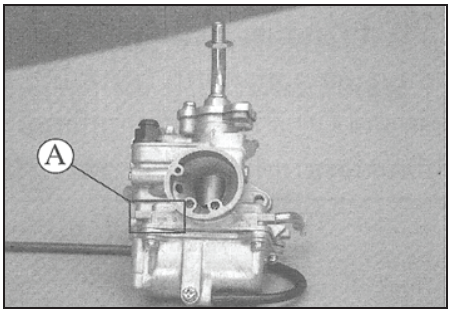


CARBURETOR SPECIFICATIONS

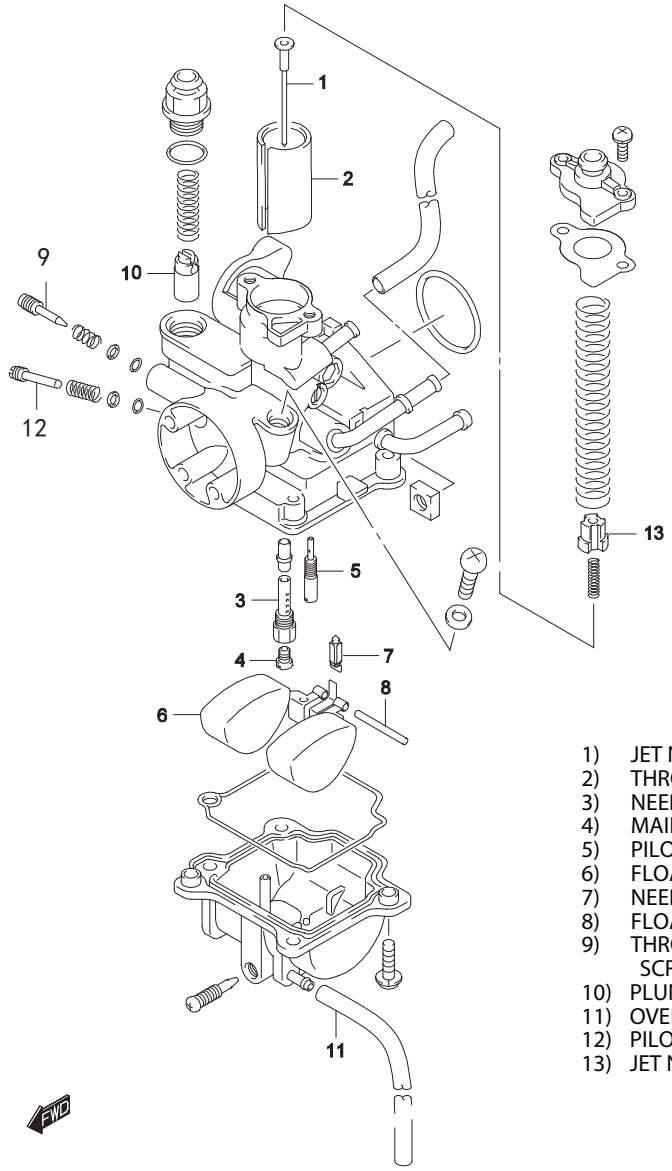
ITEM	SERVICE LIMIT
Carburetor type	MIKUNI VM 17
Bore size	17 mm
I.D. No.	09GF
Idle r/min	1,500 ± 100 r/min
Float height	16 ± 1.0 mm
Main jet (M.J.)	#92.5
Main air jet (M.A.J.)	1.65 mm.
Jet needle (J.N.)	4 PA11-2
Needle jet (N.J.)	E-0M
Pilot jet (P.J.)	#15
Pilot outlet (P.O.)	0.7 mm.
Pilot screw (P.S.)	1 1/2 turns out
Valve seat (V.S.)	1.5 mm.
Starter jet (G.S.)	# 30

I.D. NO. LOCATION

The carburetor has I.D. Number A stamped on the carburetor body according to its specifications.



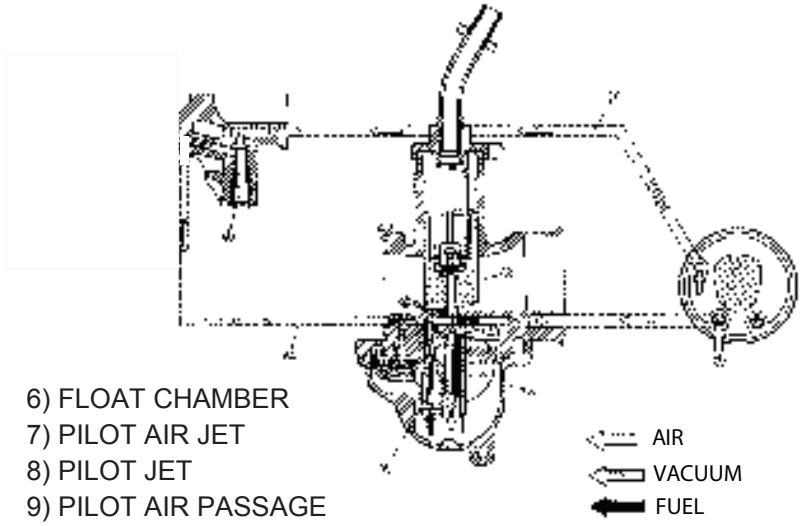
CARBURETOR



1) JET NEEDLE
2) THROTTLE VALVE
3) NEEDLE JET
4) MAIN JET
5) PILOT JET
6) FLOAT
7) NEEDLE VALVE
8) FLOAT PIN
9) THROTTLE VALVE ADJUSTER SCREW
10) PLUNGER
11) OVERFLOW PIPE
12) PILOT AIR SCREW
13) JET NEEDLE LOCKER

SLOW SYSTEM

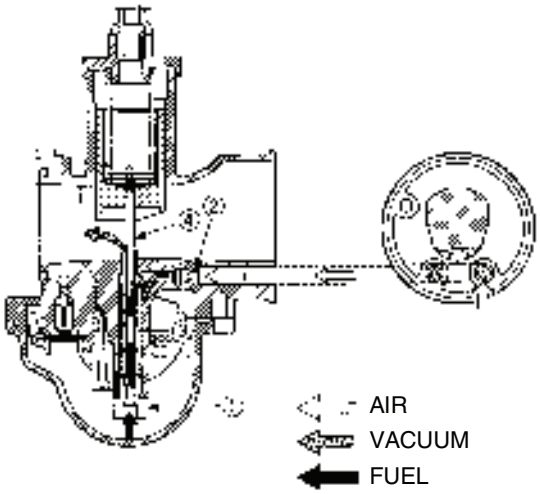
This system supplies fuel to the engine operation with the piston valve ⑤ close or slightly opened. The fuel from the float chamber ⑥ is metered by the pilot jet ⑧. Where it mixes with air coming in the pilot air jet #1 and pilot air passage ⑨. This mixture, rich with fuel, then goes up through to pilot air screw ④. The mixture is discharged into the pilot air passage.



1) VACUUM
2) ----
3) ----
4) PILOT SCREW
5) PISTON
6) FLOAT CHAMBER
7) PILOT AIR JET
8) PILOT JET
9) PILOT AIR PASSAGE

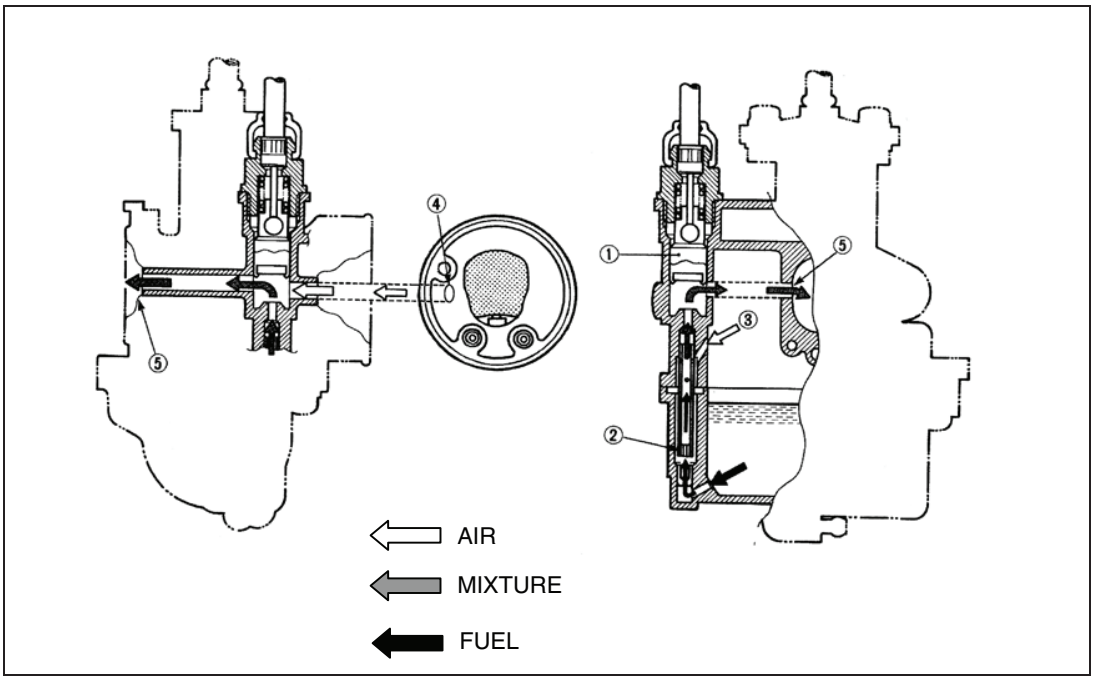
MAIN SYSTEM

This system supplies fuel during engine operation when the piston valve is ¼ -- full open. The fuel passes through the main jet ① and mixes with air metered by the main air jet ②. The mixture passes by the clearance between the needle jet ③ and jet needle ④, and then exits into the main bore after being metered by the jet needle.



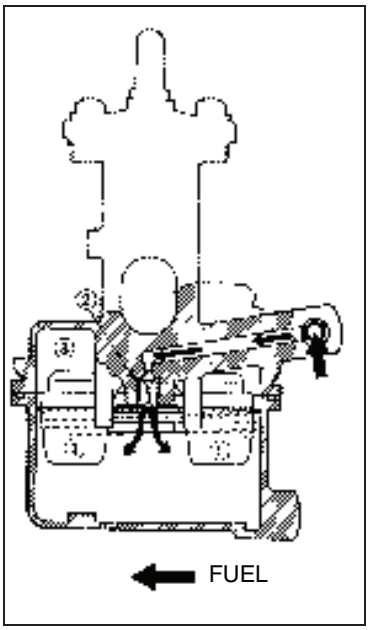
STARTER SYSTEM

When the starter plunger ① is lifted, the fuel metered by the starter jet ② is mixed with the air coming from the float chamber ③. The mixture, rich in fuel content, reaches plunger area and mixes again with air coming from the starter air passage ④.
The two successive mixings of fuel with air are such that a proper fuel/air mixture for starting is produced when the mixture is sprayed out through the starter outlet ⑤ into the main bore.



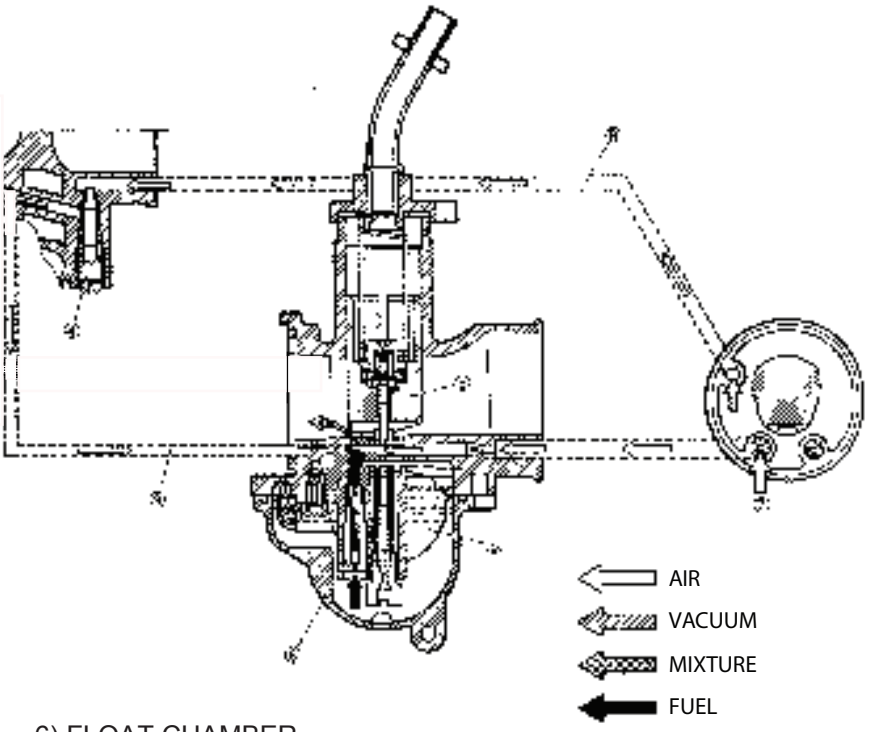
FLOAT SYSTEM

The floats ① and needle valve ② are associated with the same mechanism, so that, as the floats move up and down, the needle valve ② too moves likewise. When the fuel level is up in the float chamber ③, the floats ① are up and the needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters the float chamber(.As the fuel level falls, the floats ① go down and the needle valve unseats itself to admit fuel into the chamber ③. In this manner, the needle valve ② admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber ③.



TRANSIENT ENRICHMENT SYSTEM

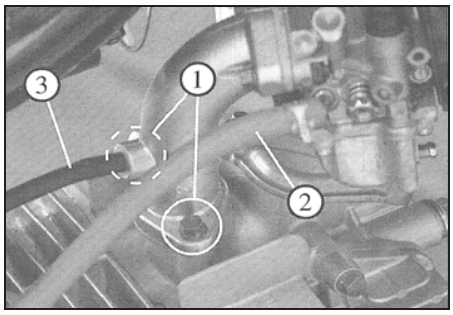
The transient enrichment system is a device which keeps fuel/air mixture ratio constant in order not to generate unstable combustion when the throttle grip is returned suddenly during high speed driving. When the throttle valve is closed suddenly, large negative pressure generated on cylinder side works on to a diaphragm ②. The ball ⑩ held by the diaphragm ② closes the air passage ③, therefore, the fuel/air mixture becomes rich with fuel.
This system is to keep the combustion condition constant by varying the air/flue mixture ratio by controlling air flow from the pilot air jet.

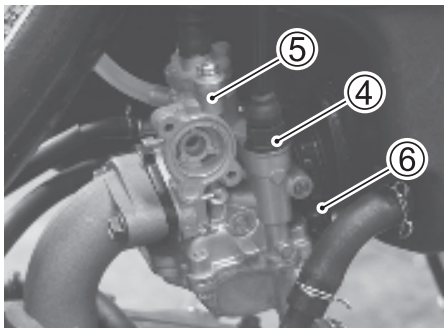


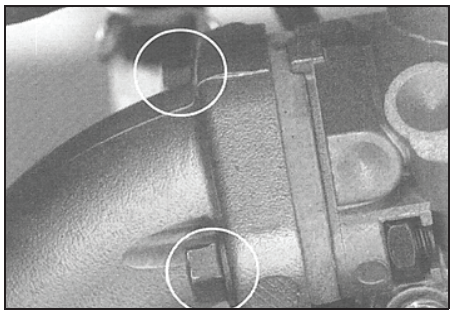
1) -----
2) ----
3) -----
4) PILOT SCREW
5) PISTON VALVE
6) FLOAT CHAMBER
7) PILOT AIR JET
8) PILOT JET
9) PILOT AIR PASSAGE

CARBURETOR REMOVAL

- Remove the center leg shield. (See page 5-1.)
- Remove the leg shields, left and right. (See page 5-1.)
- Remove the carburetor intake pipe ①.
- Disconnect the fuel hose ② and ③ vacuum hose.
- Remove the starter plunger ④ from the carburetor body.
- Loosen the belt ⑤.
- Remove the throttle cable assembly ⑥.





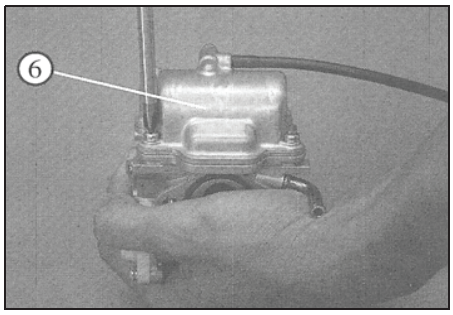


CARBURETOR DISASSEMBLY

- Remove the carburetor intake pipe by remove the bolt.
- Remove the carburetor capby removing the screws.

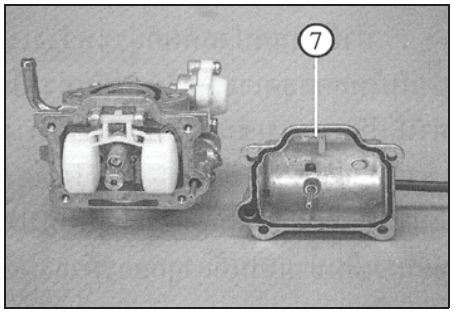
09900-09003: Impact driver set

- Remove the o-ring

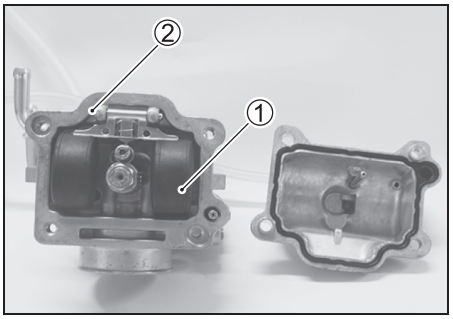


CAUTION

Replace the o-ring with a new one



• Remove the float assembly ① by removing the pin ②.



CAUTION

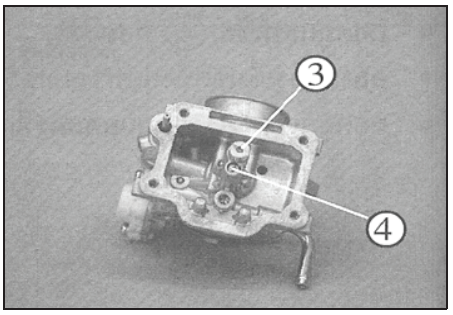
Do not use a wire for cleaning of passage and jets.

• Remove the main jet ③.
• Remove the pilot jet ④.

CAUTION

Do not use a wire for cleaning of passage and jets.

• Remove the pilot air jet ⑤.

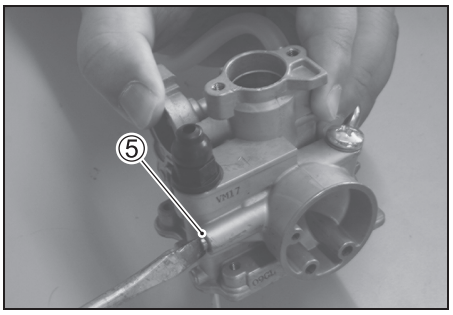


NOTE:
Before removing the pilot air screw, determine the setting by slowing turning it clockwise and count the number of turns required to lightly seat the screw. This counted number is important when reassembling pilot screw to original position.

CARBURETOR JET INSPECTION

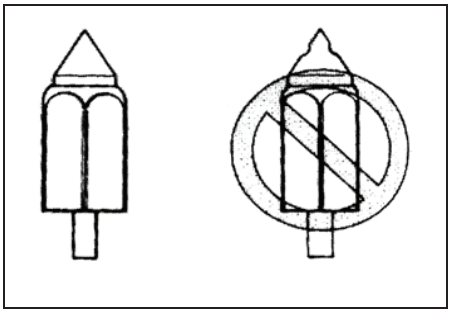
Check following items for any damage or clogging.

* Pilot jet
* Main jet
* Main air jet
* Pilot screw
* Needle jet air bleeding hole
* Float
* Needle valve
* starter jet
* Gasket and o-ring
* Pilot outlet and by- pass holes



NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn beyond the permissibly limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline. If the needle is worn as shown in the illustration, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.

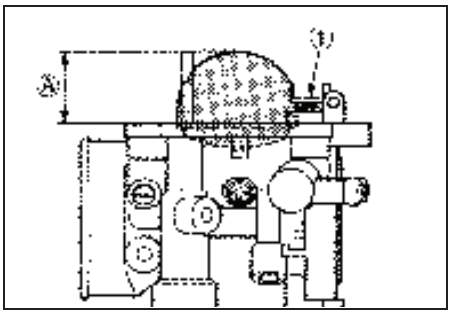


FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body, with the float arm kept free, measure the height Ⓐ while float arm is just in contact with needle valve by using calipers. Bend the tongue ① as necessary to bring the height A to this value.

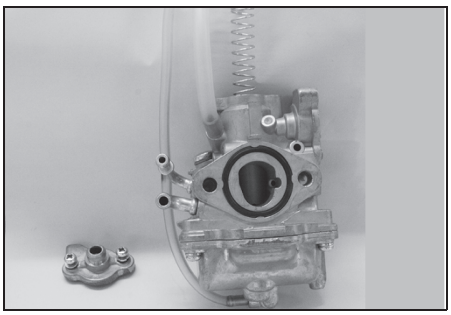
Float height A: 16 ± 1.0 mm

09900-20101: Vernier calipers



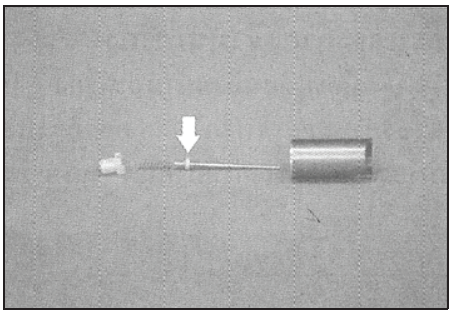
JET NEEDLE ADJUSTMENT

- Remove the throttle cable.
- Remove the jet needle locker by screwdriver
- Remove the jet needle.



JET NEEDLE ADJUSTING

- Slide the circlip upper, this mixture is diluted.
- Slide the circlip lower, this mixture is rich.

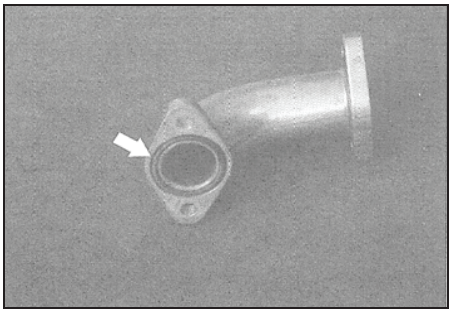


REASSEMBLY

Reassemble and remount the carburetor in the reverse order of removal and disassembly.

CAUTION

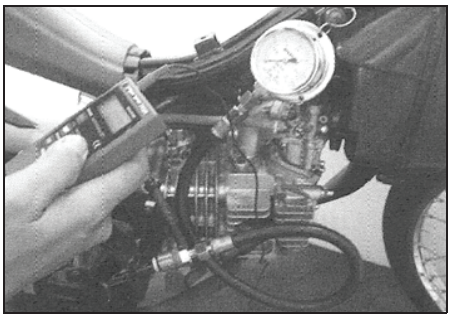
Replace the o-ring with a new one



LUBRICATION SYSTEM

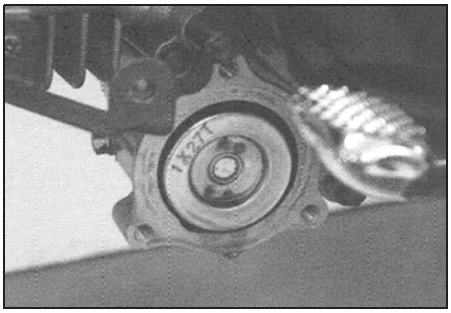
OIL PRESSURE

Refer to page 2-18



OIL FILTER

Refer to page 2-8.

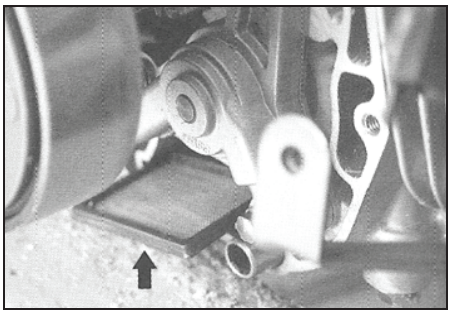


OIL SUMP FILTER

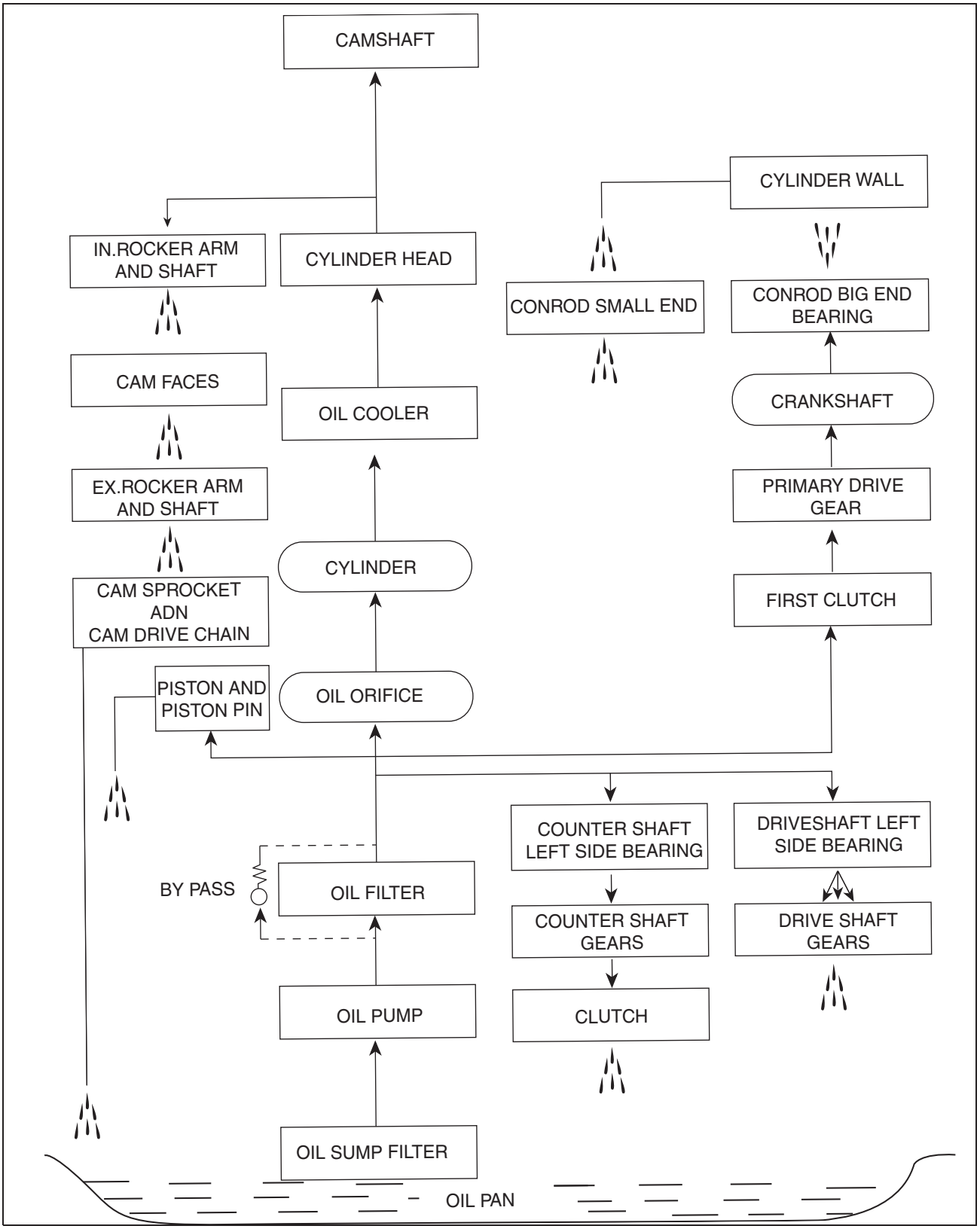
When you replace the engine oil, check to be sure that the oil sump filter is free from any sign of rupture, also wash the oil sump filter clean periodically.

CAUTION

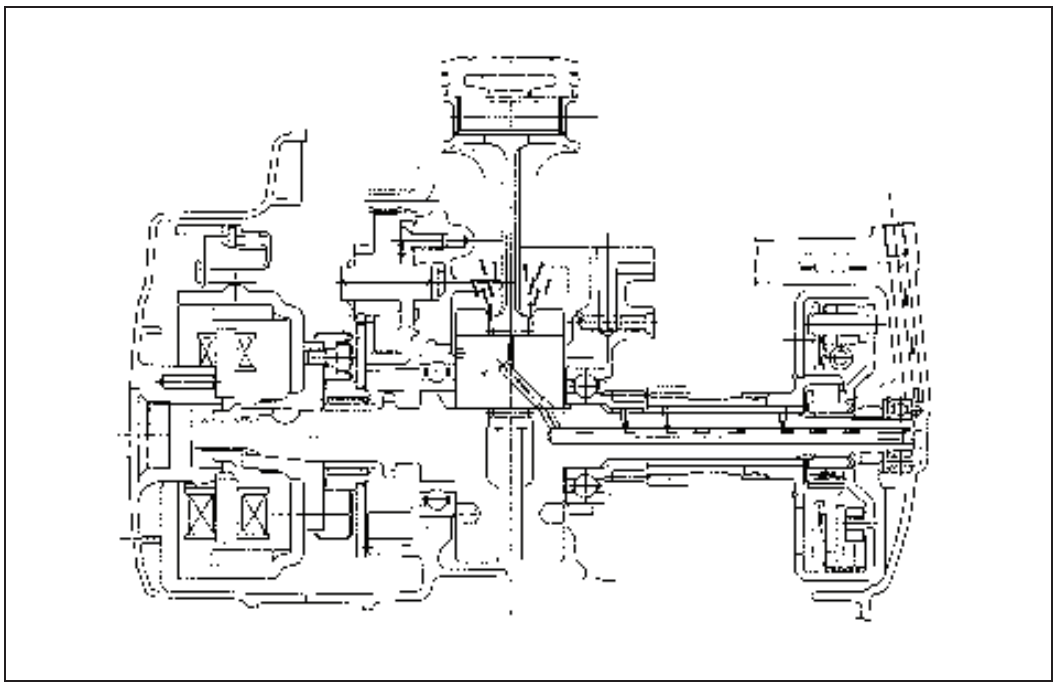
Replace the clutch cover gasket with a new one to prevent oil leakage.

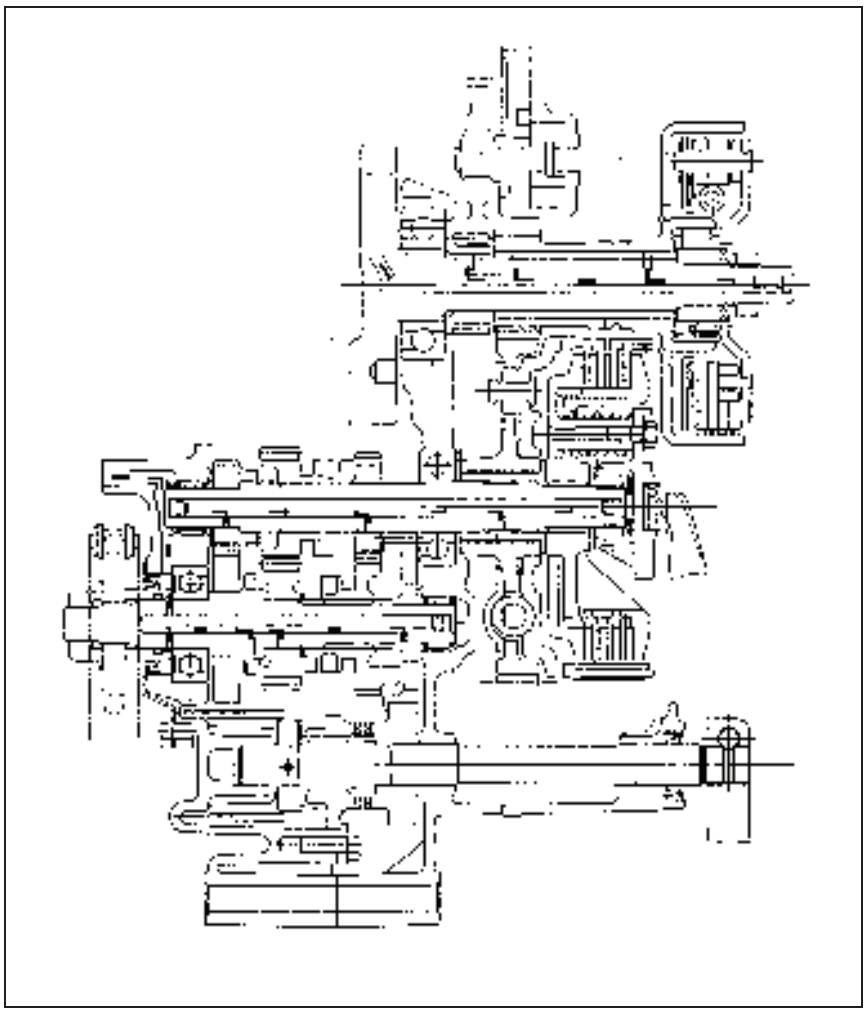


ENGINE LUBRICATION SYSTEM CHART



LUBRICATION SYSTEM

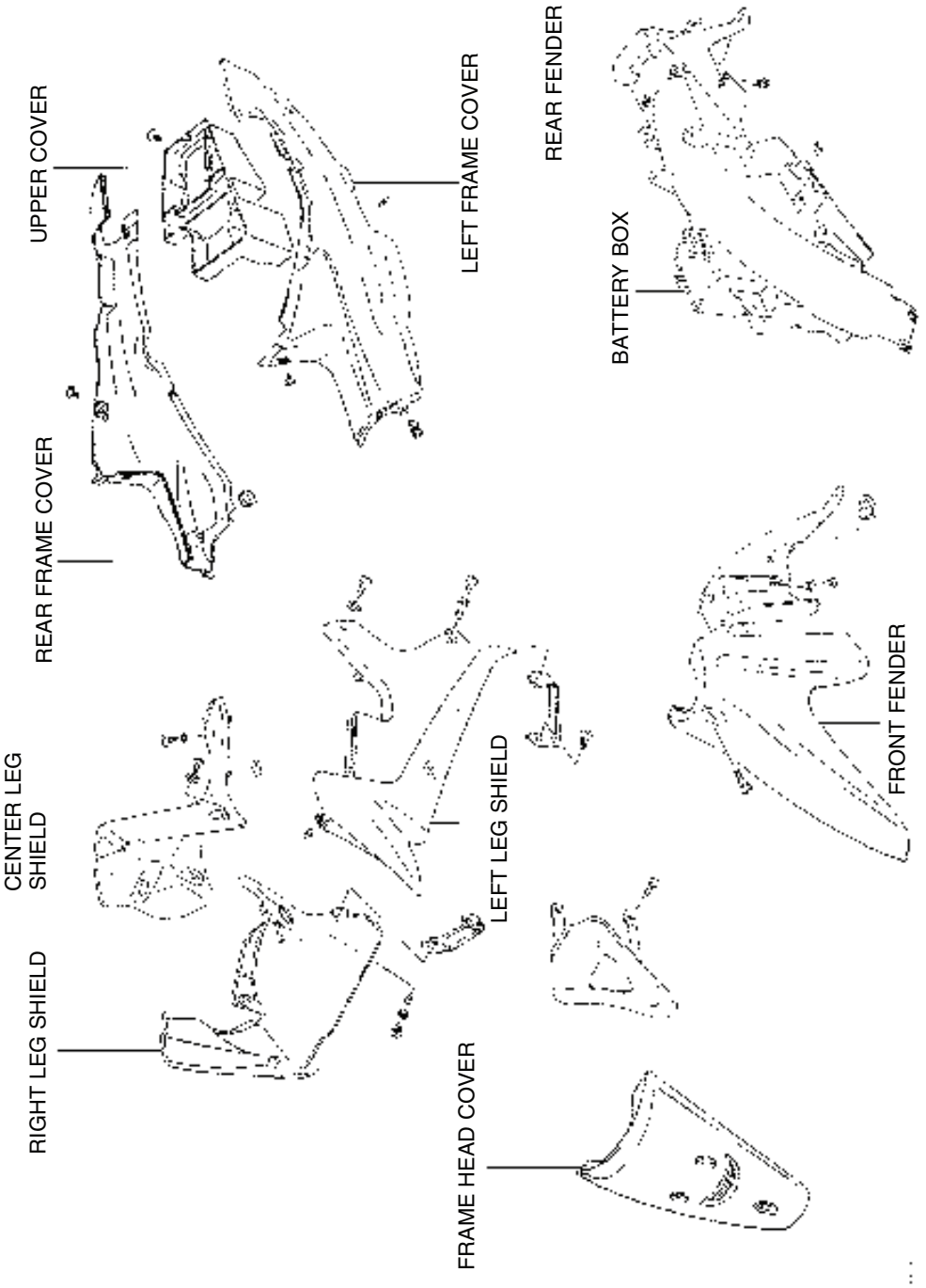


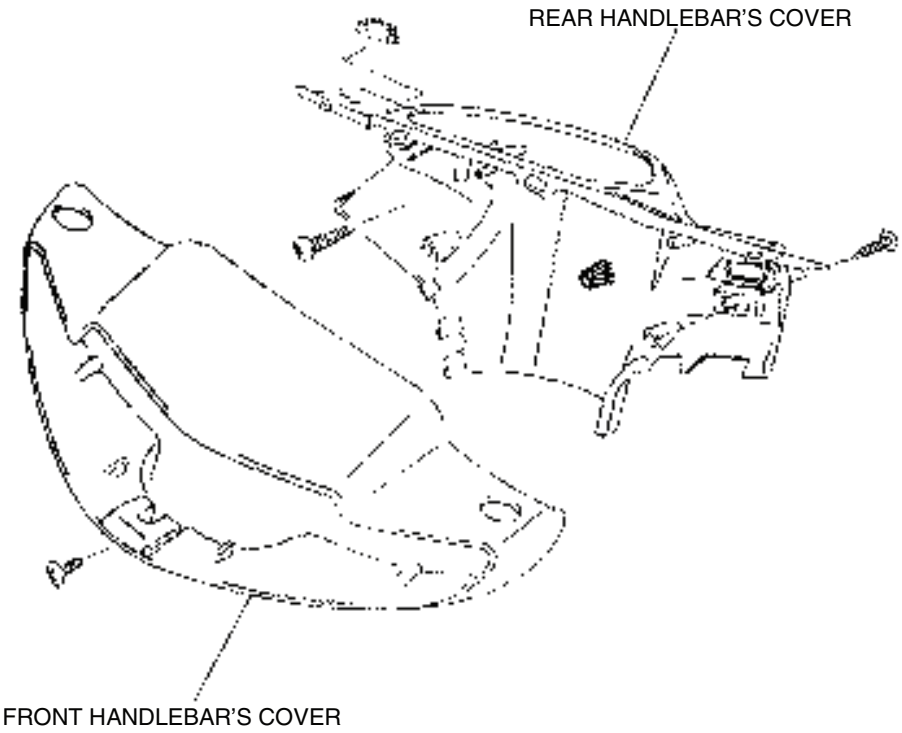


CHASSIS

CONTENTS

EXTERIOR PARTS

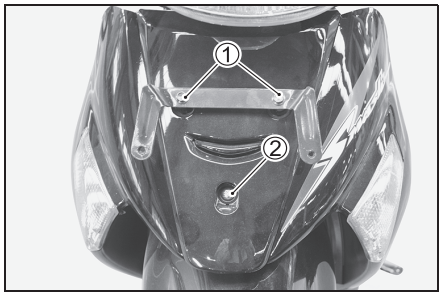



REAR HANDLEBAR'S COVER
FRONT HANDLEBAR'S COVER

REMOVAL

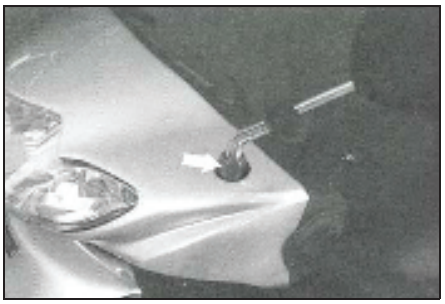
COVER, FRAME HEAD

- Remove the PLATE, FRONT LICENSE by removing the bolts ① and ②.
- Remove the frame head cover.



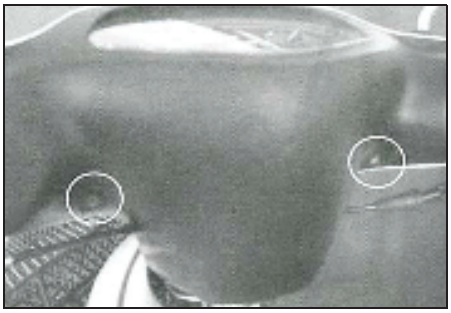
REAR - VIEW MIRROR

- Remove the rear-view mirrors, left and right, by loosening the lock nuts.

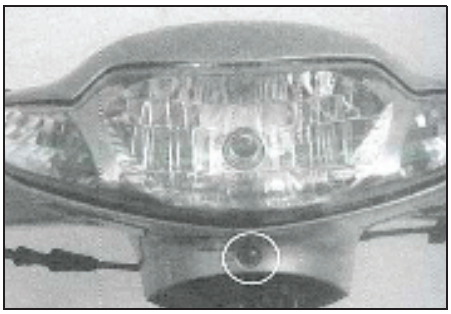


HANDLEBAR'S COVER

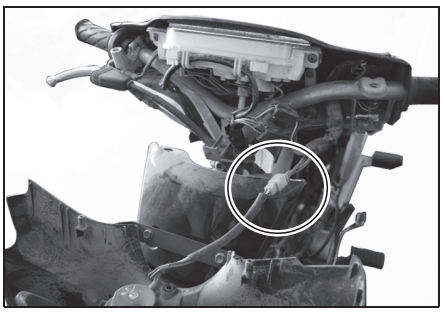
- Remove the handlebar's cover screws.



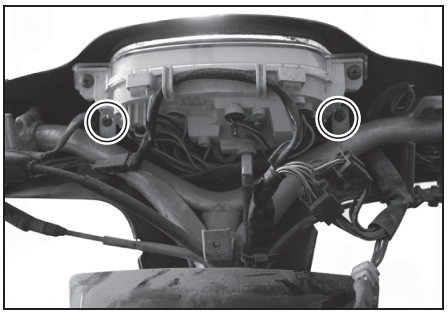
- Remove the screw and unhook the hooked parts.



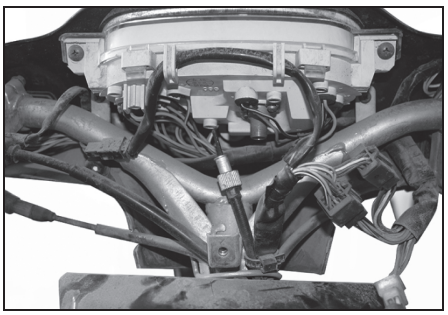
- Remove the front-side of the handlebar's cover by disconnecting each lead wire coupler.



• Remove the handlebar's cover screws.



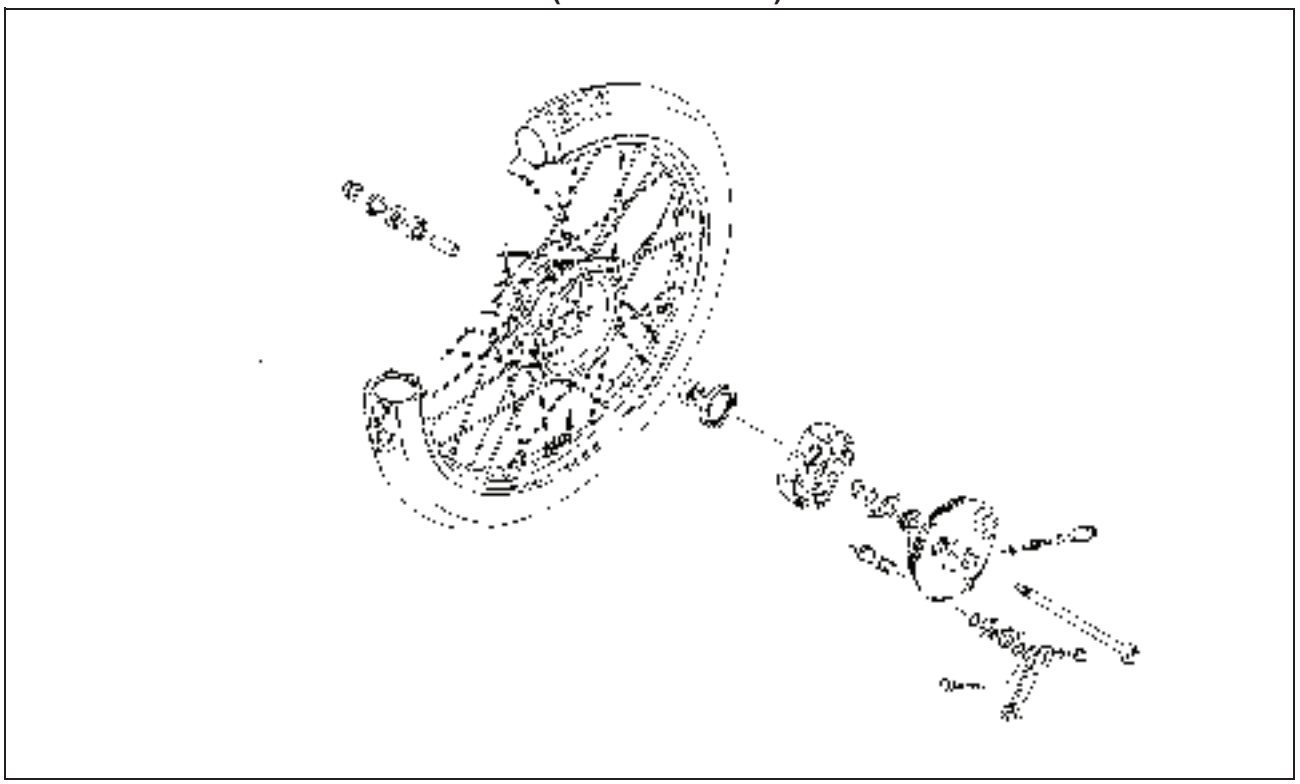
• Remove the rear-side of the handlebar's cover along with the speedometer by disconnecting the speedometer cable and speedometer lead wire couplers.



REINSTALLATION

• Reinstall the removed parts in the reverse order of removal.

FRONT WHEEL AND FRONT BRAKE (DRUM BRAKE)

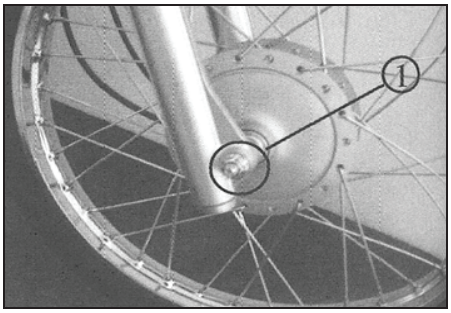


REMOVAL AND DISASSEMBLY

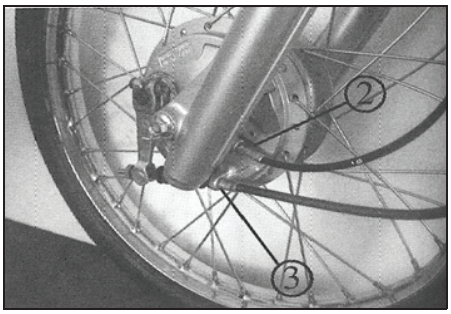
FRONT WHEEL

Raise the front wheel of the ground with a jack or wooden block.

- Remove the axle nut ①.

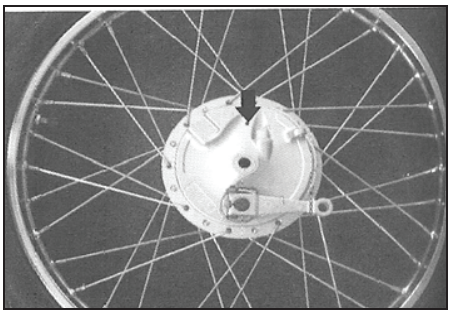


- Disconnect the speedometer cable ②.
- Disconnect the front brake cable ③.
- Remove the axle and front wheel.

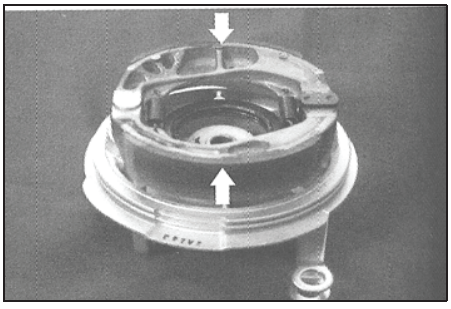


FRONT BRAKE

- Remove the front brake panel from the wheel.

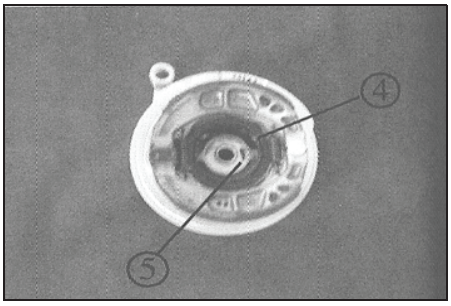


- Remove the brake shoes from the brake panel.



- Remove the oil seal ④.
- Remove the speedometer gear ⑤ by removing the circlip.

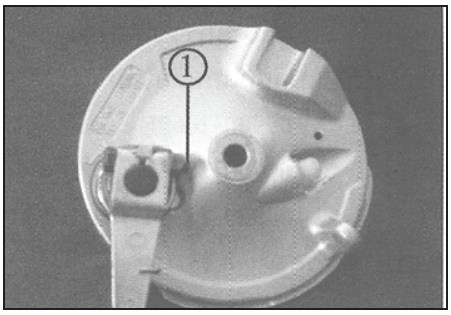
TOOL **09900-06107: Snap ring pliers**



CAUTION

The removed oil seal should be replaced with a new one.

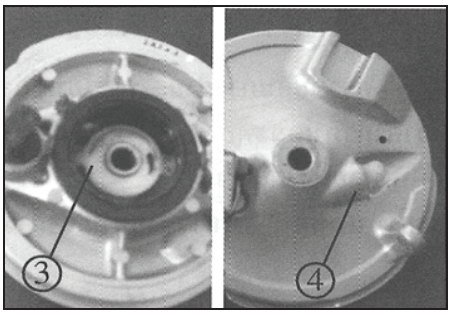
- Remove the brake cam lever bolt/nut ①.
- Remove the brake cam lever, brake lining wear indicator, washer, spring, O-ring and brake cam. (See page 5-4)



INSPECTION AND DISASSEMBLY

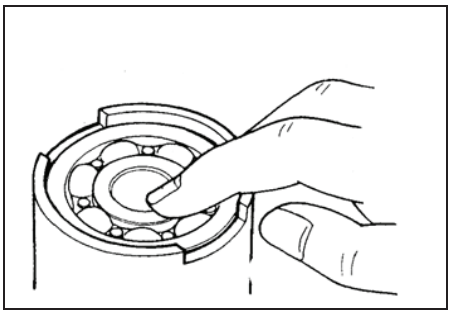
SPEEDOMETER GEARBOX

Turn the speedometer gear ③ and check to see that gear turns smoothly together with the speedometer pinion ④.



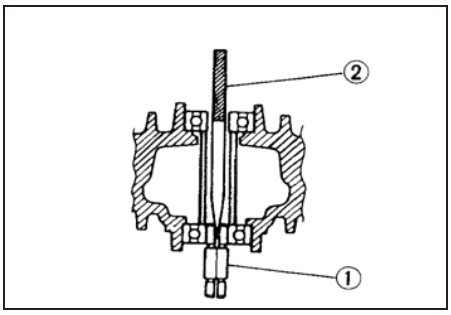
WHEEL BEARING

Rotate the inner race by fingers to inspect for abnormal play, noise and smooth rotation while the bearings are in the wheel. Replace the bearing in the following procedure if there is anything unusual.

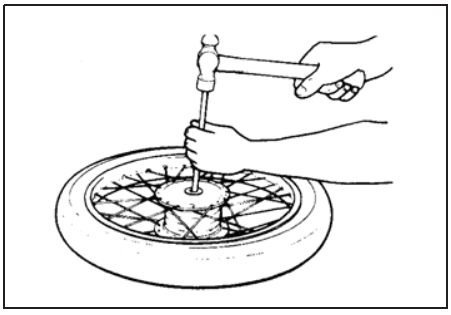


- Insert the adapter ① of bearing remover to the bearing as shown.
- Insert the wedge ② of bearing remover to the adapter from the opposite side, lock the wedge in the slit of adapter.

09941-50111 : Bearing remover



Drive out the wheel bearing by knocking the wedge.
Remove the remaining bearing in a similar way with a suitable bar.



CAUTION

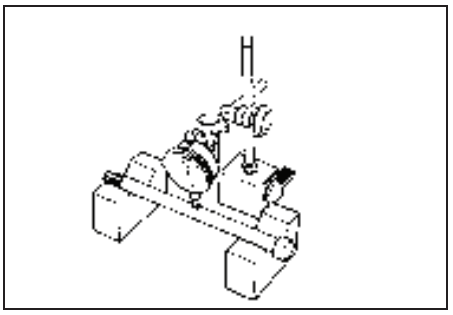
The removed bearings should be replaced with new ones.

AXLE: SHAFT

Using a dial gauge, check the axle shaft for run out and replace it if run out exceeds the limit.

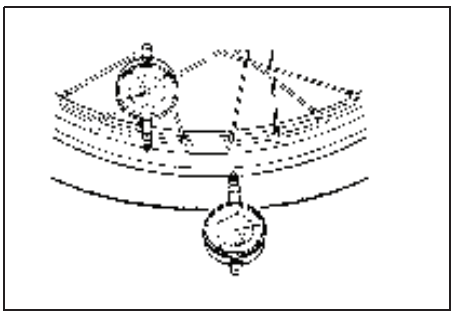
09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand
09900-21304: V-block set (100 mm)

Service Limit: 0.25 mm



WHEEL

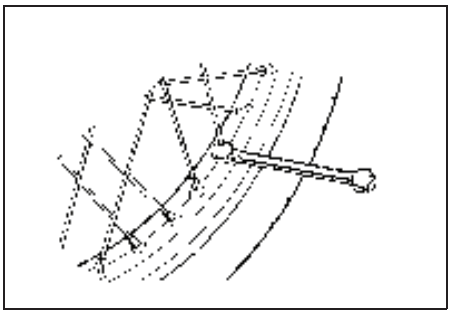
Inspect the wheel run out.
Excessive run out is usually due to worn or loosen wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the run out, replace the wheel.



SPOKE NIPPLE

Check to be sure that all nipples are tight, and retighten them as necessary using a spoke nipple wrench.

Spoke nipple: 2.0 N - m (0.2 kg-m)

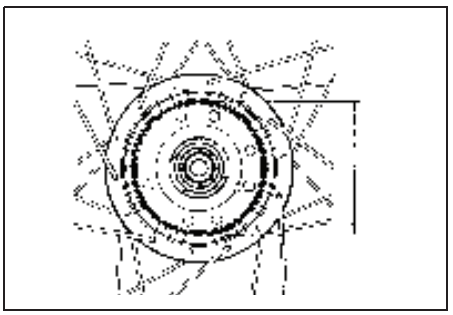


BRAKE DRUM

Measure the brake drum I.D. to determine the extent of wear and, if the limit is exceeded by the wear noted, replace the drum. The value of this limit is indicated inside the drum.

09900-20101: Vernier calipers

Service Limit : 110.7 mm



BRAKE SHOE

Check the brake shoe and decide whether it should be replaced or not from the thickness of the brake shoe lining.

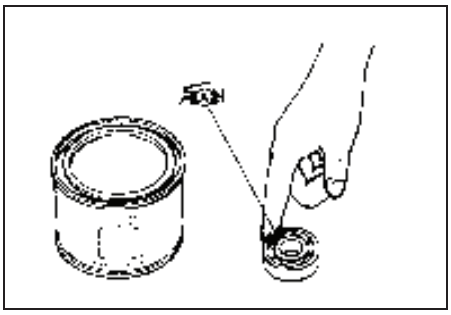
Service Limit: 1.5 mm

CAUTION

Replace the brake shoe as a set, otherwise braking performance will be adversely affected.

REASSEMBLY AND REMOUNTING

Reassemble and remount the front wheel and front brake in the reverse order of removal and disassembly. Pay attention to the following points:



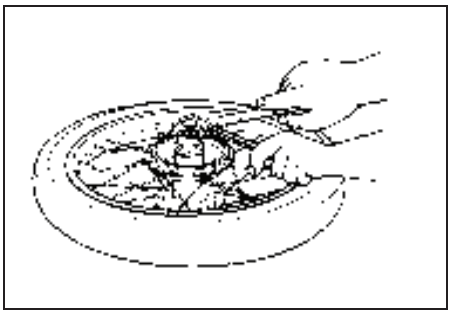
WHEEL BEARING

- Apply SUZUKI SUPER GREASE "A" to the bearings before installing.

  99000-25010: SUZUKI SUPER GREASE "A"

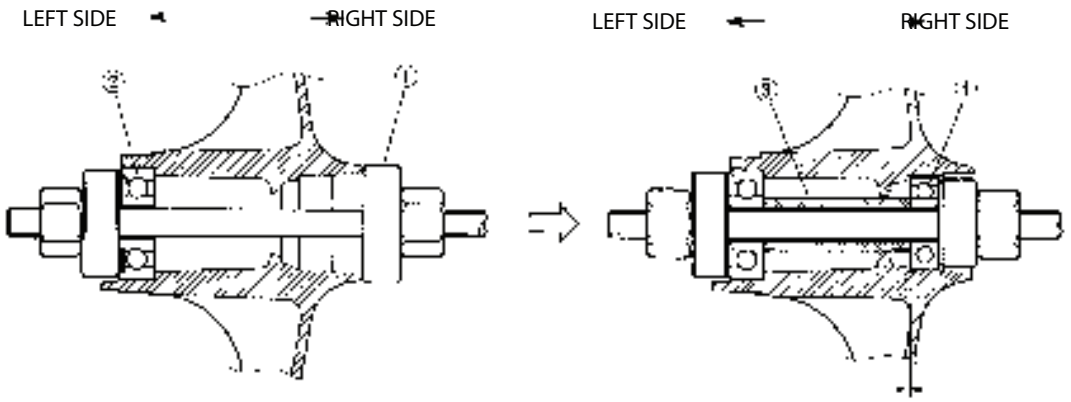
- Using the bearing installer set ①, press fit the bearing to the wheel. First install the left wheel bearing, then right wheel bearing.

  09924-84521 : bearing installer set



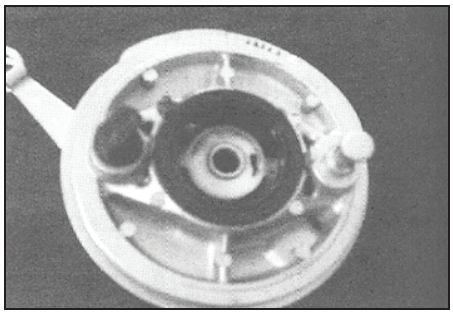
CAUTION

The seal side of the bearing should be faced to outside.



1) BEARING INSTALLER SET
2) LEFT WHEEL BEARING
3) SPACER
4) RIGHT WHEEL BEARING

BRAKE CAM/SHAFT

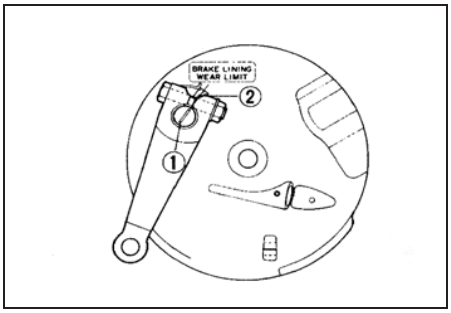


- Apply SUZUKI SUPER GREASE "A" to the brake cam/shaft and pin before installing the brake shoes.

99000-25010 SUZUKI SUPER GREASE "A"

CAUTION

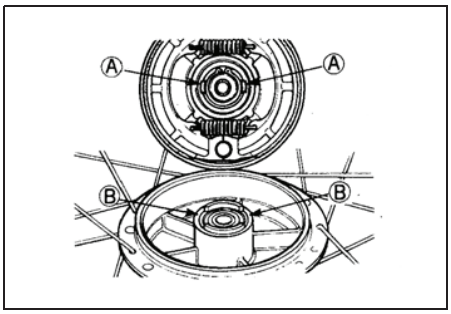
Be careful not to apply too much grease to the cam/shaft and pin. If grease gets on the lining, brake effectiveness will be lost.



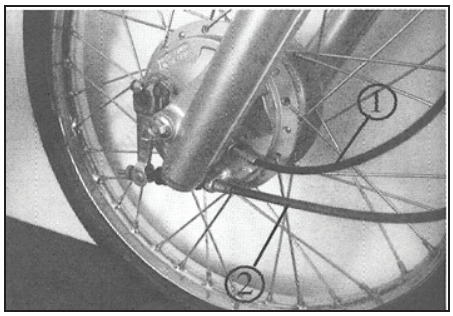
BRAKE CAM LEVER

- When installing the brake cam lever and brake lining wear indicator, align the groove ① on the cam/shaft with the punched mark ② on the brake lining wear indicator as shown in the illustration.

Brake cam lever nut: 8 N -m (0.8 kg-m)



SPEEDOMETER GEARBOX AND FRONT WHEEL



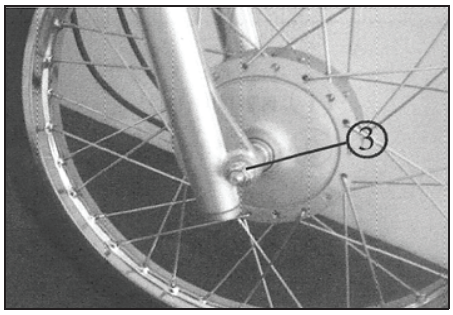
- Before installing the speedometer gearbox, apply SUZUKI SUPER GREASE "A" to its dust seal lip.
- Align the drive lugs Ⓐ to the recesses Ⓑ of the wheel hub and attach the speedometer gearbox to the wheel hub.

99000-25010: SUZUKI SUPER GREASE "A"

- Connect the speedometer cable ① and brake ②.
- Rotate the wheel by hand to inspect for smooth rotation and operation of the speedometer.

CAUTION

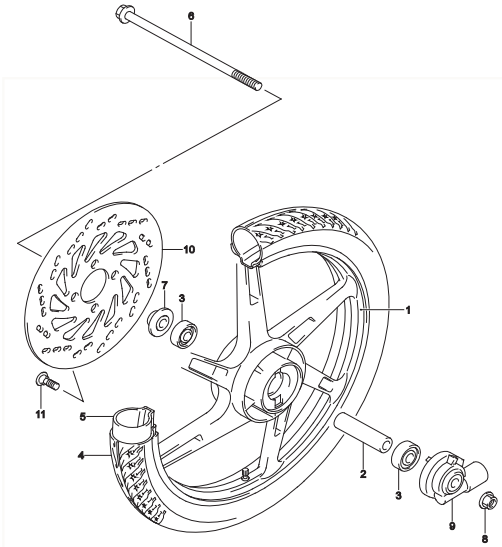
Make sure that the drive lugs of the speedometer gear fit to the recesses of the wheel hub or it may cause damage of the speedometer gear.



- Tighten the axle nut ③ to the specified torque.

Axle nut: 43 N-m (4.3 kg-m)

FRONT WHEEL AND FRONT BRAKE (DISC BRAKE)



1	WHEEL, FRONT
2	SPACER
3	BEARING
4	TIRE, FRONT
5	TUBE ASSY, WHEEL INNER
6	AXLE, FRONT
7	SPACER, FRONTAXLE, RH
8	NUT
9	BOXASSY, SPEEDOMETERGEAR
10	DISC, FRONT BRAKE
11	BOLT

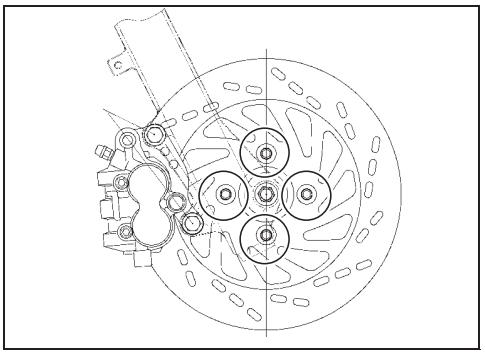
REMOVAL AND DISASSEMBLY

FRONT WHEEL

Remove the front wheel in the same manner of the drum brake type. (See page 5-5.)

FRONT BRAKE

- Flatten the lock portions of the lock washers.
- Remove the brake disc from the wheel by removing its bolts.



INSPECTION AND DISASSEMNBLY

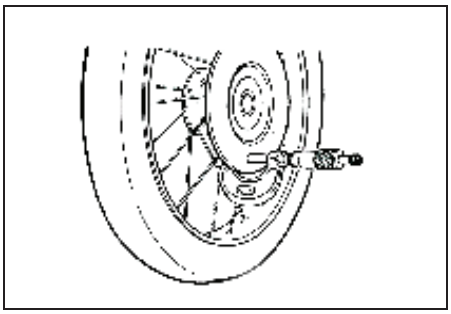
SPEEDOMETER GEARBOX ..... Refer to page 5-6.
WHEEL BEARING ..... Refer to page 5-6.
AXLE SHAFT ..... Refer to page 5-7.
FRONT WHEEL ..... Refer to page 5-7.
SPOKE NIPPLE ..... Refer to page 5-7.

BRAKE DISC

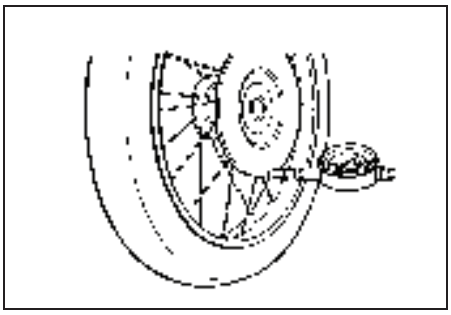
Visually check the brake disc for damage or cracks.
Measure the thickness with a micrometer.
Replace the disc if the thick ness is less than the service limit or it damage is found.

Service Limit
Brake disc thickness: 3.0 mm

TOOL 09900-20250: Micrometer (0-25 mm)



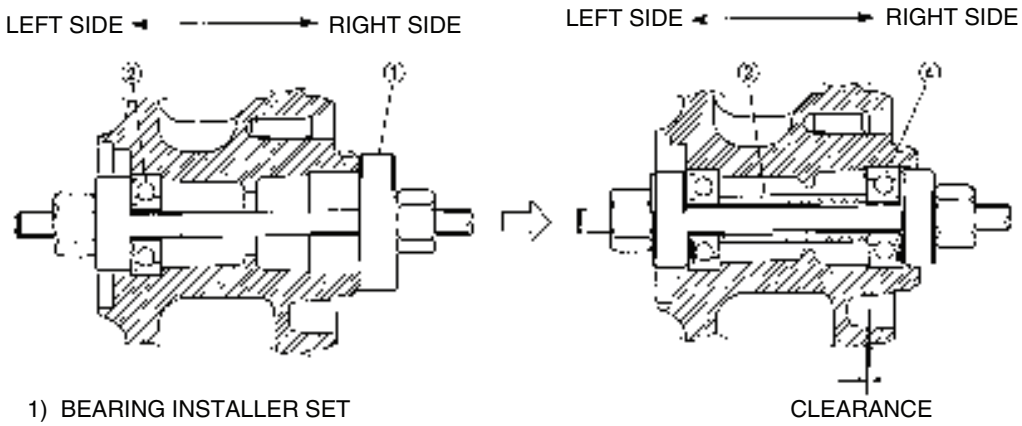
Measure the run out with a dial gauge.
Replace the disc if the run out exceeds the service limit.
Service Limit
Brake disc run out: 0.3 mm



09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand

REASSEMBLY AND REMOUNTING

WHEEL BEARING …….. Refer to page 5-8.

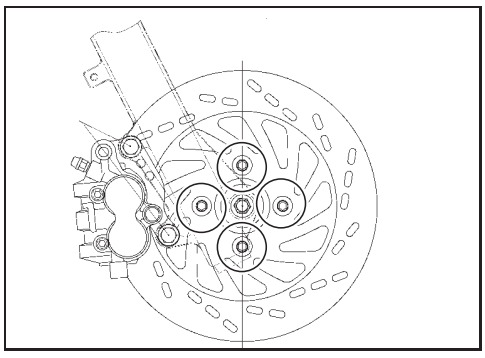


1) BEARING INSTALLER SET
2) LEFT WHEEL BEARING
3) SPACER

BRAKE DISC

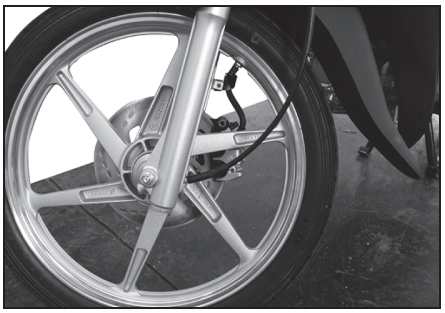
Make sure that the brake disc is clean and free of any greasy matter, Tighten the disc mounting bolts to the specified torque and bend up the lock washer tongues positively to lock its bolts.

Brake disc bolt : 23 N-m (23. Kg-m)



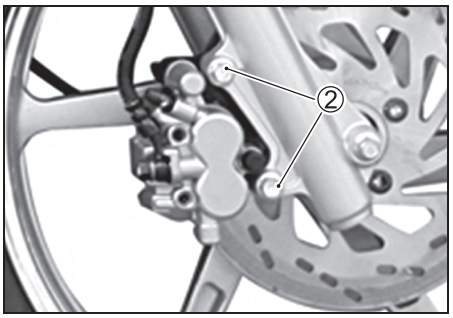
SPEEDOMETER GEARBOX AND FRONT WHEEL

Refer to page 5-9.



BRAKE PAD REPLACEMENT

- Loosen the brake pad pins ①.
  Remove the brake caliper by removing the caliper mounting bolts ②.

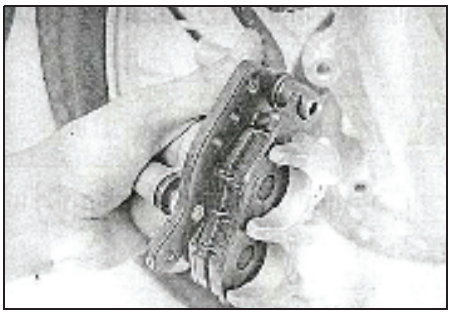


CAUTION

Hang the brake caliper on the frame with a string etc., taking care not to bend the brake hose.

CAUTION

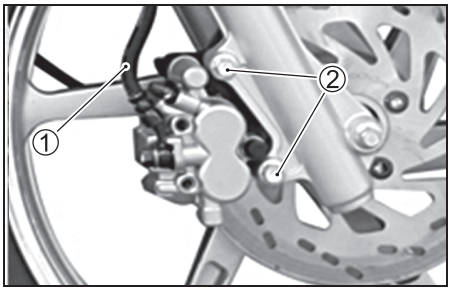
- Remove the brake pads by removing the brake pad pins.



*** Do not operate the brake lever while dismounting the pads.**
*** Replace the brake pads as a set, otherwise braking performance will be adversely affected.**

CALIPER REMOVAL AND DISASSEMBLY

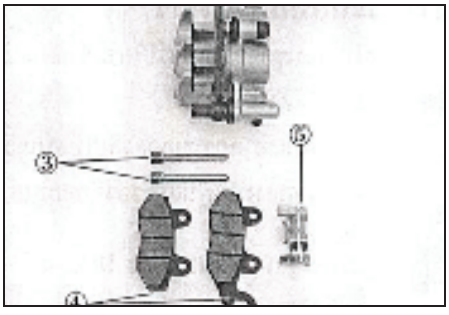
- Disconnect the brake hose ① from the caliper by removing the union bolt and catch the brake fluid in a suitable receptacle.
- Remove the caliper mounting bolts ②.



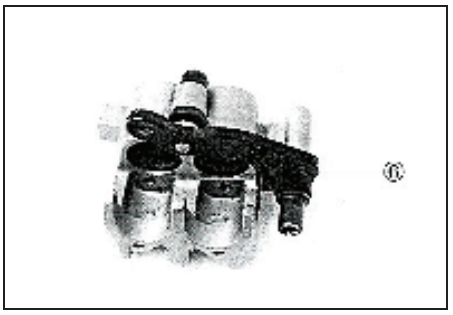
CAUTION

Never reuse the brake fluid left over from previous servicing and stored for long periods.

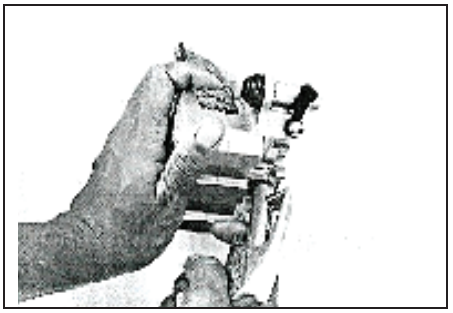
- Remove the caliper.
- Remove the brake pad pins ③.
- Remove the brake pads ④.
- Remove the brake pad spring ⑤.



• Remove the caliper bracket ⑥.



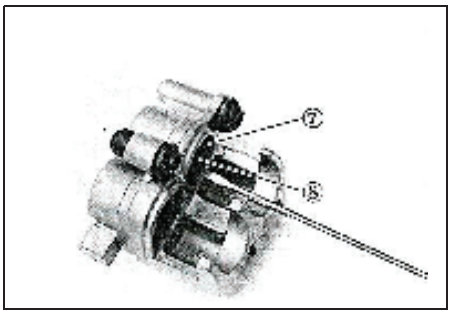
• Place a rag over the piston to prevent its popping out and push out the piston with an air gun.



CAUTION

Do not use high pressure air to prevent piston damage.

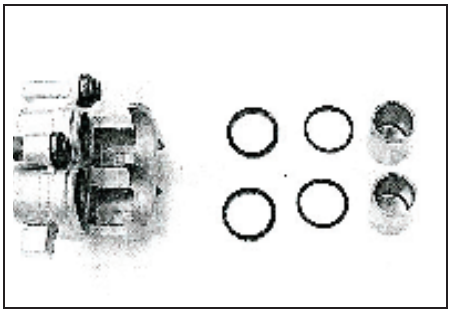
• Remove the dust seal ⑦ and piston seal ⑧.



CAUTION

Do not reuse the piston seal and dust seal to prevent fluid leakage..

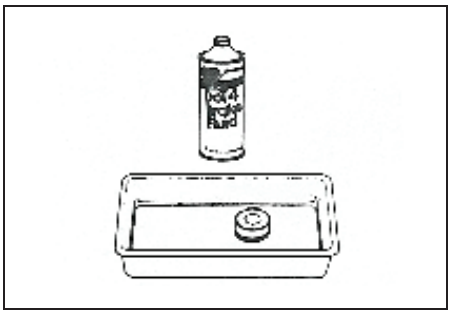
CALIPER INSPECTION



• Inspect the piston surface and caliper cylinder wall for nicks, scratches or other damage.
• The removed rubber parts should be replaced with new ones.

CALIPER REASSEMBLY AND REMOUNTING

Reassemble the caliper in the reverse order of removal and disassembly. Pay attention to the following points:

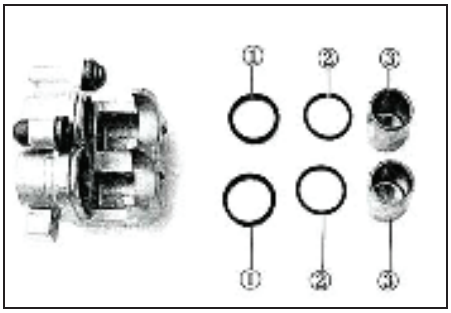


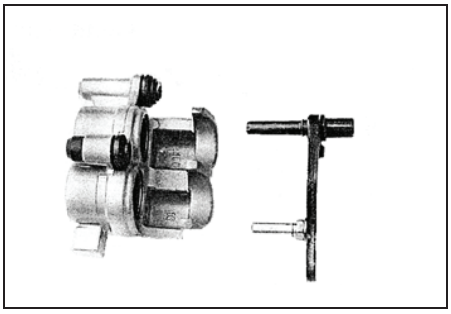
• Wash the caliper bore and piston with specified break fluid. Particularly wash the dust seal groove and piston seal groove.

Specification and classification: DOT 4

CAUTION

- **Wash the caliper components with fresh break fluid before reassembly.**
- **Do not wipe the components with a rag.**
- **when washing the components, use the specified break fluid. Never use different types of fluid or cleaning solvent such as gasoline, kerosene or the other.**
- **Replace the piston seal and dust seal with new ones when reassembly. Apply the break fluid to the seals and pistons when installing them.**



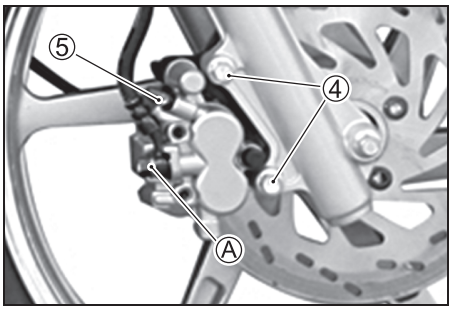


- Install the pistons seal ② and dust seals ①.
- Install the pistons ③.
- Apply SUZUKI SILICONE GREASE to the caliper axles.

99000:25100: SUZUKI SILICONE GREASE

- Install the break pads.
- Tighten the caliper mounting bolts ④ to the specified torque.
- After touching the break hose union to the stopper Ⓐ, tighten the union bolt ⑤ to the specified torque.

Caliper mounting bolt ④: 26 N-m (2.6 kg-m)
Break hose union bolt ⑤: 23 N-m (2.3 kg-m)

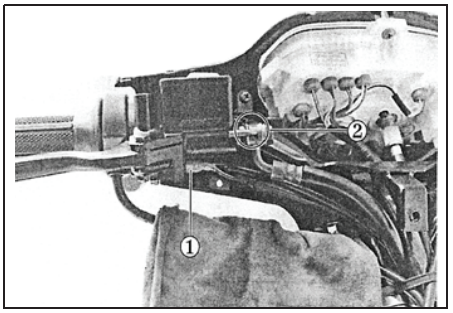


NOTE:
Before remounting the caliper, push the piston all the way into the caliper.

MASTER CYLINDER REMOVAL AND DISASSEMBLY

The procedure of master cylinder removal is as follows.

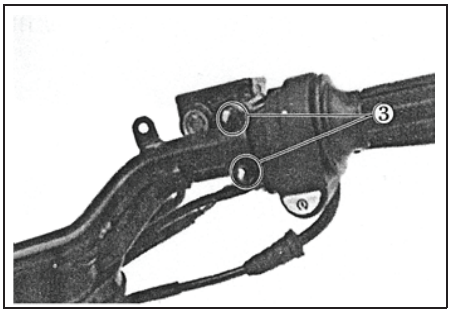
- Rear-view mirrors.
- Handlebar's cover. (See page 5-3.)
- Break light switch lead ①.
- Break hose union bolt ②.



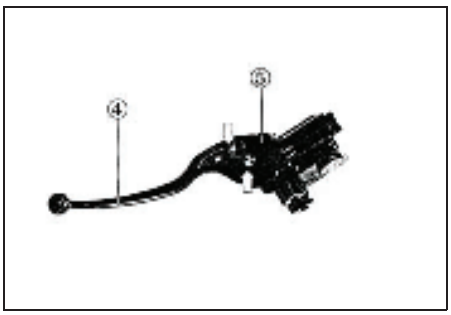
CAUTION

The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them

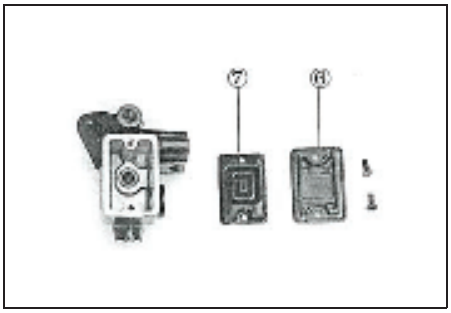
- Master cylinder mounting bolts ③.



- Break lever ④.
- Break light switch ⑤.



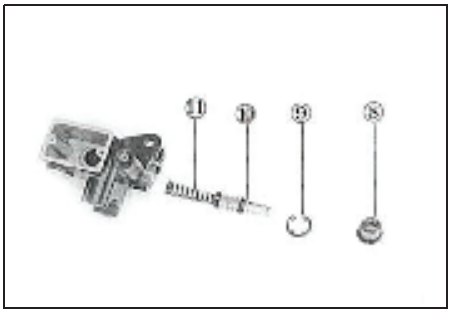
- Remove the reservoir cap ⑥ and diaphragm ⑦.
- Drain break fluid.



- Remove the dust seal ⑧.
- Remove the circlip ⑨ by using the special too.

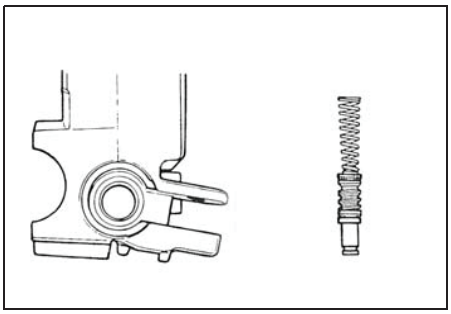
09900-06108: Snap ring pliers

- Remove the piston / cup ⑩ and return spring ⑪.



MASTER CYLINDER INSPECTION

Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the piston cup and dust seal for wear or damage.



MASTER CYLINDER REASSEMBLY AND REMOUNTING

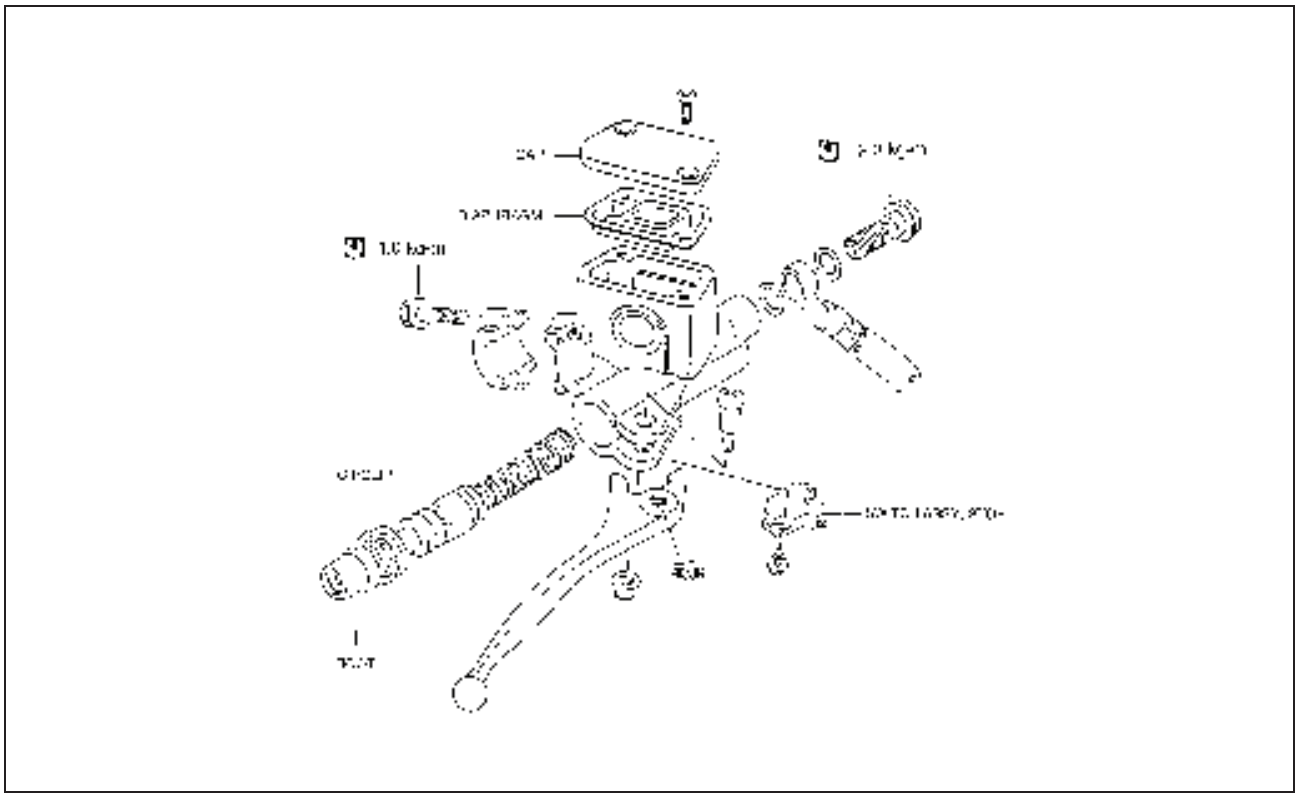
Reassembly the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION

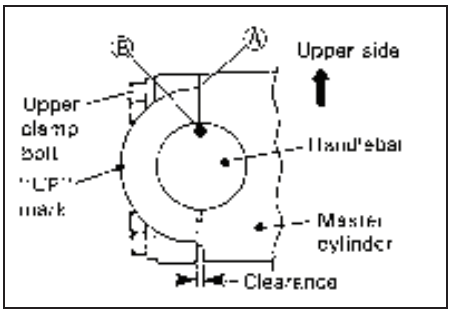
- **Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.**
- **Do not wipe the components with a rag.**
- **Apply brake fluid to the cylinder bore and all the components to be inserted into the bore.**

Specification and classification: DOT 4

NOTE:
When fitting the circlip, make sure that the sharp edge of the circlip faces outside.



- When remounting the master cylinder on the handlebar, align the master cylinder holder's mating surface “A” with punched mark “B” on the handlebar and tighten the upper clamp bolt first as shown.



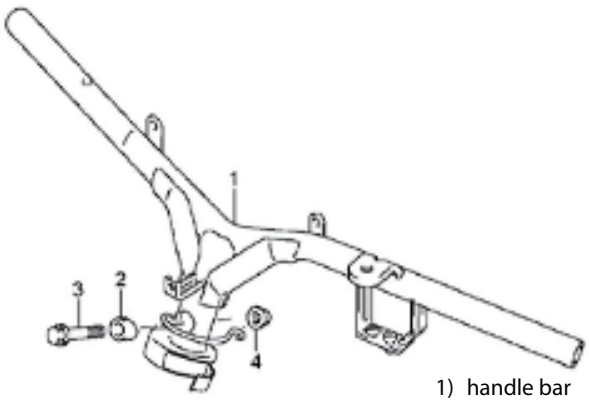
Tightening torque : 10 N-m. (1.0 kg-m)

NOTE:
Be sure to face the "Up" mark on the holder to the up-side.

CAUTION

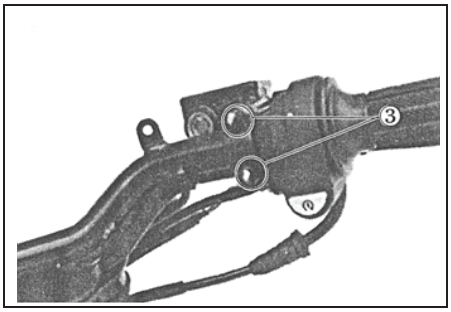
Bleed air from the air bleeder valve after reassembling master cylinder. (Refer to page 2-13.)

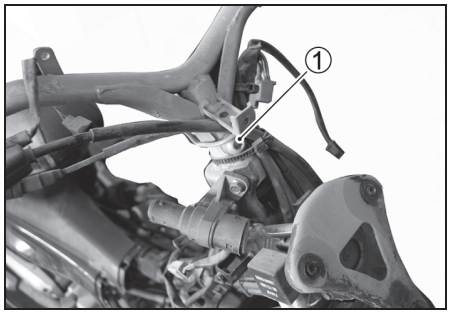
HANDLEBAR
REMOVAL



1) handle bar
2) stopper, handle
3) bolt
4) nut

- Remove the rear-view mirrors. (See page 5-3.)
- Remove the front and rear handlebar's covers. (See pages 5-3 and 5-4.)
- Disconnect the speedometer cable and speedometer lead wire couplers.
- Disconnect the brake light switch lead.
- Remove the left handlebar parts. (Refer to above illustration.)
- Remove the brake master cylinder. (For disc brake: Refer to page 5-14.)
- Remove the right handlebar parts. (Refer to above illustration.)
- Remove the handlebar bol ①.
- Remove the handlebar clamp bolt ③.
- Remove the handlebar.



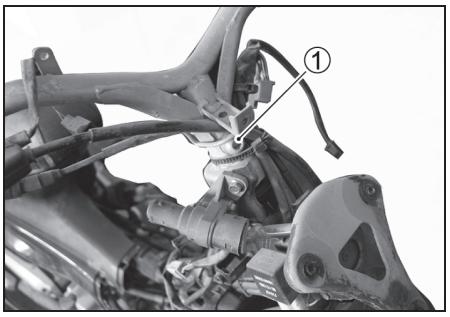


REASSEMBLY

Reassembly the handlebar in the reverse order of removal.
Pay attention to the following points:

- Install the handlebar clamp bolt ①.
- Tighten the handlebar clamp bolt ① to the specified torque.

Handlebar clamp bolt ①: 55 N-m (5.5kg-m)

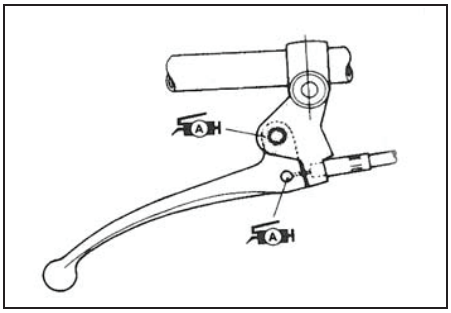


NOTE:
Before installing the front brake lever, apply a small quantity of SUZUKI SUPER GREASE "A" to the front brake lever pivot.

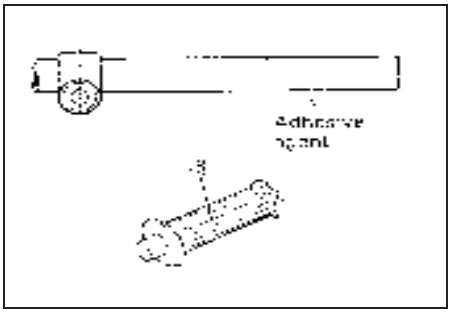
- Install the front brake cable. (For drum brake)

NOTE:
Apply a small quantity of SUZUKI SUPER GREASE "A" o the front brake cable end. (For drum brake)

99000-25010: SUZUKI SUPER GREASE "A"



- Apply an adhesive agent onto the left handlebar, then install the left handle grip ③.



- Install the throttle cable ④.
- Connect the throttle cable end ⑤ to the throttle grip and install the throttle case ⑥, then temporarily tighten the throttle case screw.

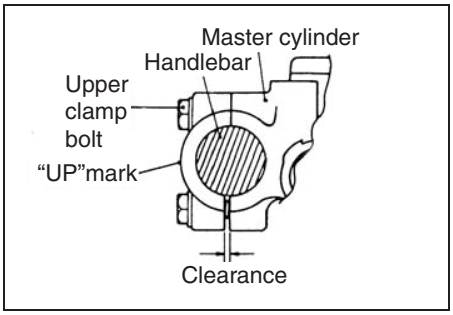
NOTE:
Apply a small quantity of SUZUKI SUPER GREASE "A" to the throttle cable end.

⚠ WARNING

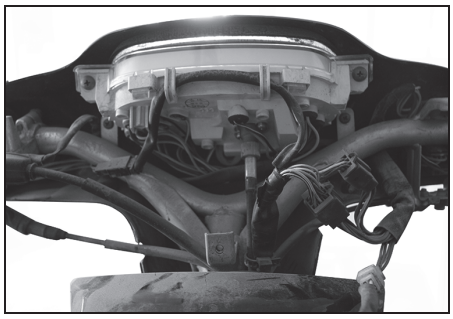
After tightening the throttle case screw, make sure that the throttle grip turns smoothly.

(Install the brake master cylinder. (For disc brake: Refer to page 5-16.)

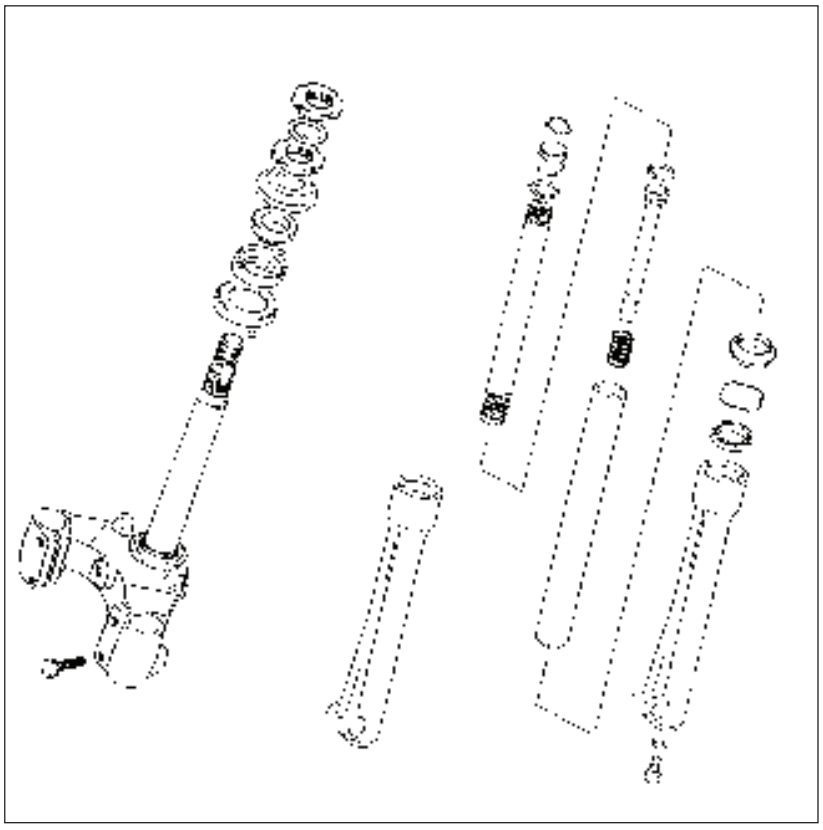
NOTE:
Be sure to face the "UP" mark on the holder to the up-side.
Connect the front brake light switch lead.



- Connect each lead wire.
- Connect the speedometer cable.
- Install the front and rear handlebar's covers.

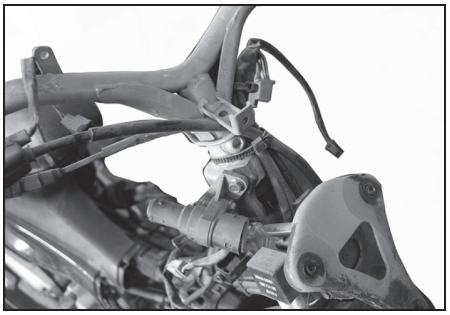


FRONT FORK AND STEERING

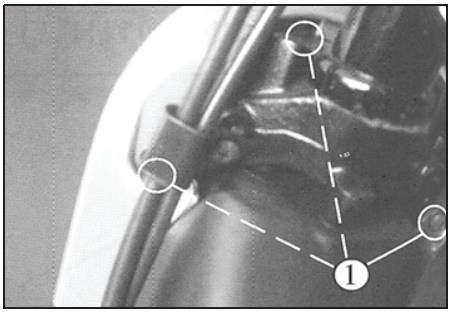


REMOVAL AND DISASSEMBLY

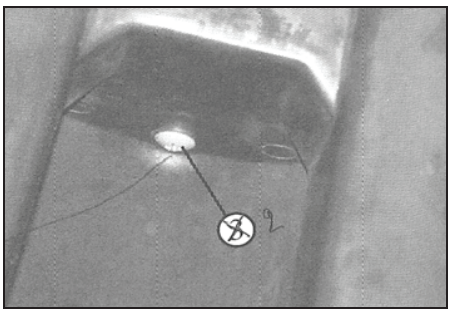
- Remove the rear-view mirror. (See page 5-3.)
- Remove the left and right leg shields. (See page 5-1.)
- Remove the handle bar



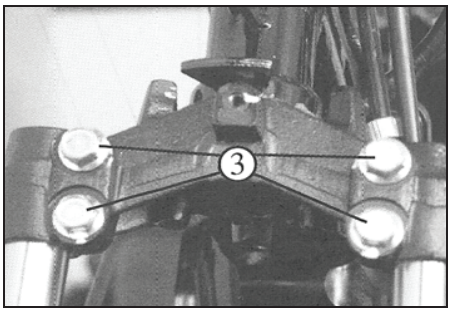
- Remove the front fender ①.



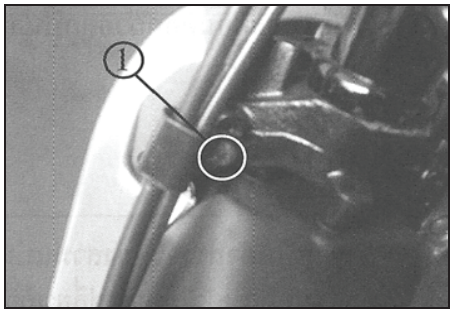
- Remove the front fender by remove the screw ②.



- Remove the front fork, left and right by loosen the bolt ③.



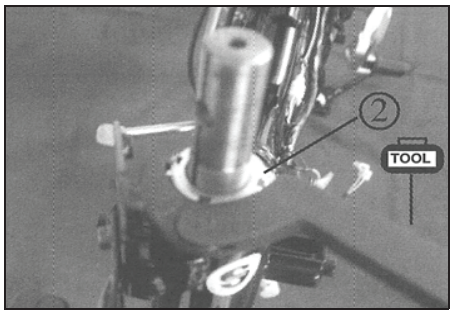
- Loosen the speedometer cable/front brake cable ① (For drum brake clamp bolt.)



- Remove the steering stem lock nut ② by using universal clamp wrench.

  09910-60611: Universal clamp wrench

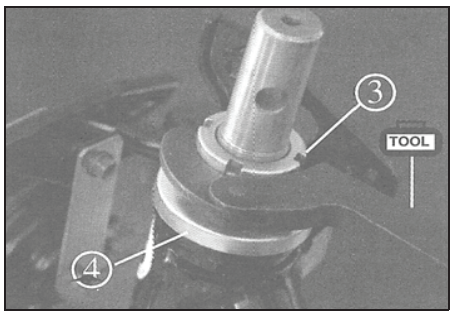
- Remove the washer.



- Remove the steering stem nut ③.

  9910-60611: Universal clamp wrench

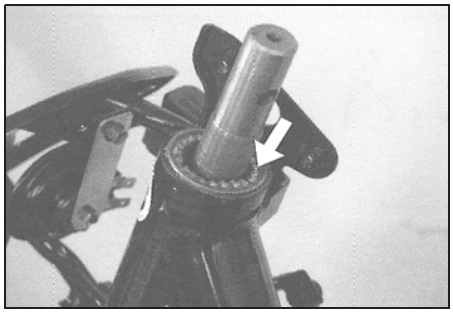
- Remove the dust seal ④ and outer upper race.



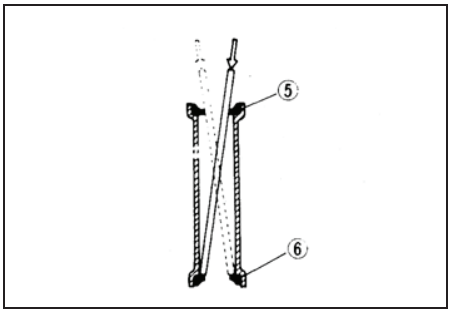
- Remove the steering stem bracket.
- Remove the upper balls (22 pcs).
- Remove the lower balls (27 pcs).

CAUTION

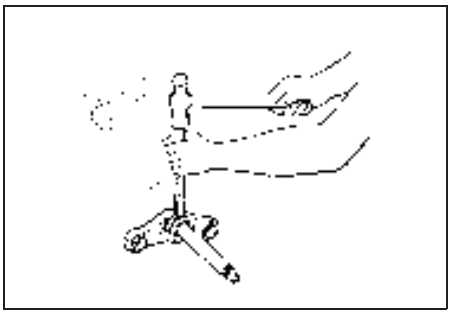
Do not drop the balls.



- Drive out the steering stem races, upper ⑤ and lower ⑥, with a suitable bar.



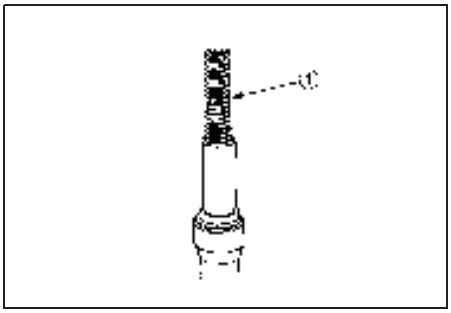
• Remove the outer lower race with a thin chisel or screw driver.



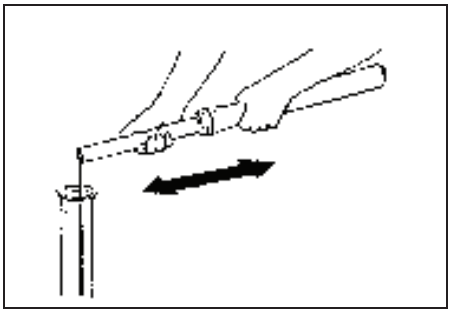
CAUTION

- **The outer lower race is pressed to the steering stem. If the lower race is removed, replace it with a new one.**
- **It is not necessary to remove the outer lower race if corrosion, dents or damage on the race have not occurred.**

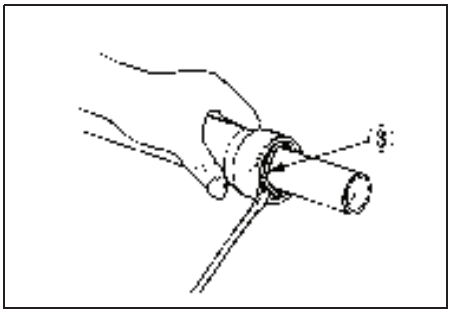
• Remove the spring ①.

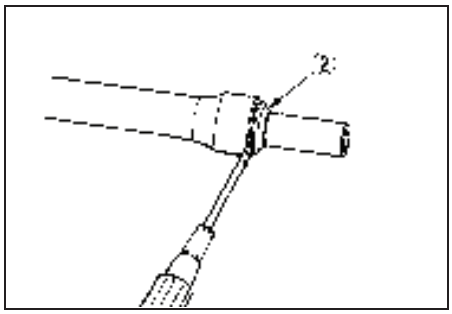


• Invert the fork and stroke it several times to drain out fork oil.
• Hold the fork inverted for a few-minutes to drain oil.



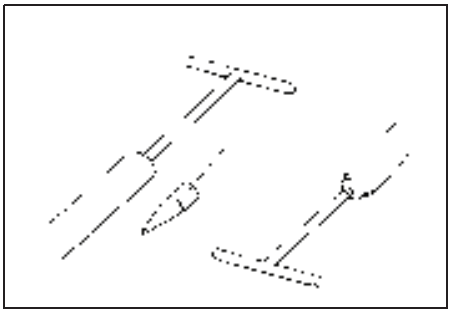
• Remove the dust seal ② and stopper ring ③.



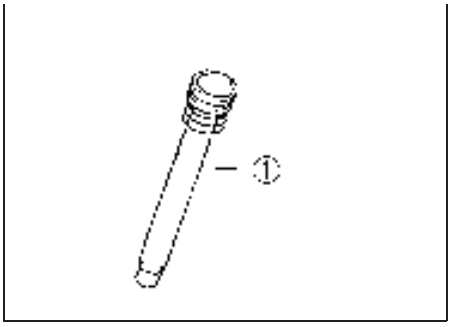


• Remove the damper rod bolt with the special tools.
• Remove the inner tube from the outer tube.

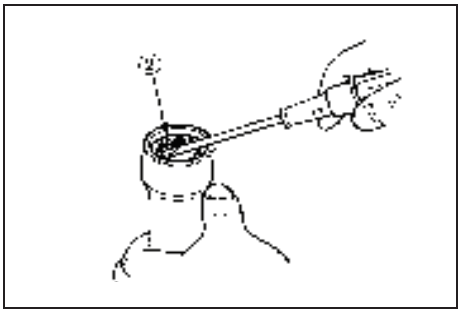
09940-34520: T-handle
09940-34561: Attachment "D"
09900-00410: Hexagon wrench set



• Remove the damper rod ① from the inner tube.



• Remove the oil seal ②.



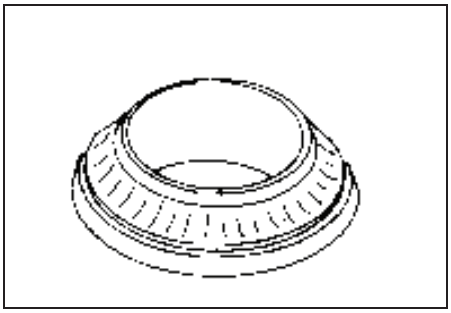
INSPECTION

STEERING RACE AND BALL

• Inspect the upper race, lower race and balls for corrosion, dents or damage.

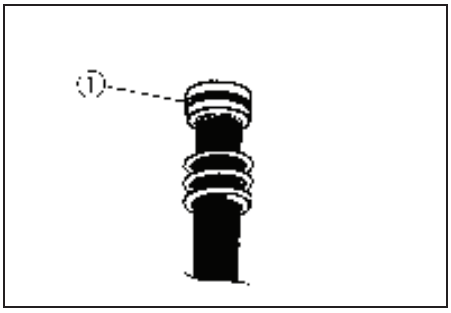
CAUTION

If dents are noticed on the race, replace the balls and races as a set.



DAMPER ROD RING

Inspect the damper rod ring ① for wear or damage.



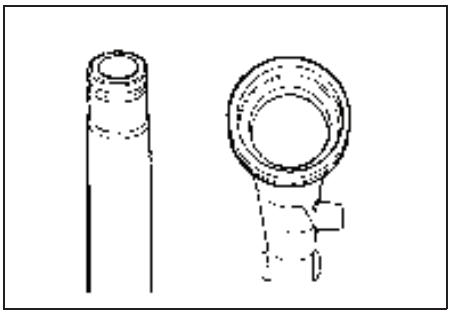
FRONT FORK SPRING

Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

Service Limit: 277 mm.

INNER AND OUTER TUBE

Inspect the inner tube sliding surface and outer tube sliding surface for any scuffing



REASSEMBLY AND REMOUNTING

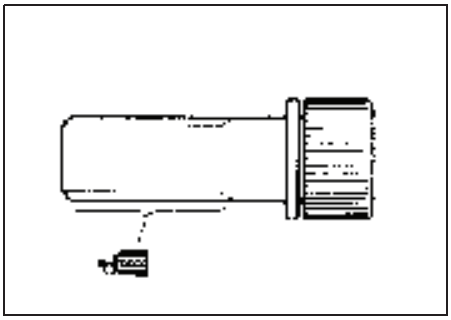
Reassemble and remount the front fork/steering in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION

*** Wash each metal part with cleaning solvent before reassembly.**
*** Never re-use fork oil left over from the last servicing.**
*** Replace the oil seal and dust seal with new ones when reassembly**

- Apply THREAD LOCK SUPER “1322” to the damper rod bolt and tighten it to the specified torque with the special tools.

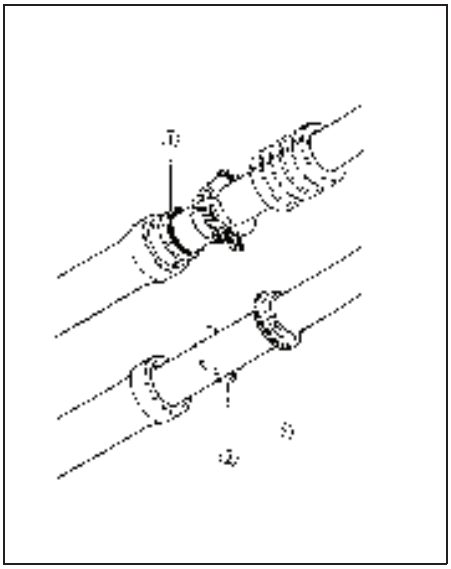
Damper rod: 23 N-m (2.3 kg-m)
99000-32110: THREAD LOCK SUPER “1322” “1322”
09900-00410: Hexagon wrench set
09940-34520: T-handle
09940-34561: Attachment “D”



- Install the oil seal with the special tool.

NOTE:
** Before installing the oil seal apply a small quantity of SUZUKI SUPER GREASE “A” to the lip of oil seal.*

09900-25010: SUZUKI SUPER GREASE “A”
09940-52860: Front fork oil seal installer



- Install the stopper ring and dust seal

CAUTION

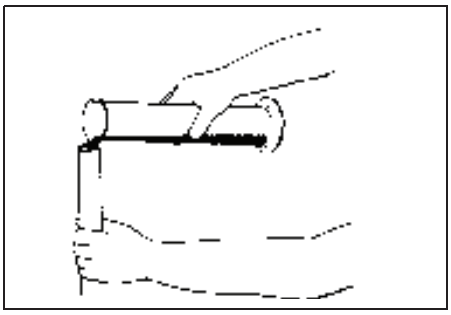
Make sure that the stopper ring ② fitted securely.

• Pour specified fork oil into the inner tube.

Fork oil type : Fork oil # 10

9000-99044-10 G: SUZUKI FORK OIL # 10

Capacity (each leg): 70 ml

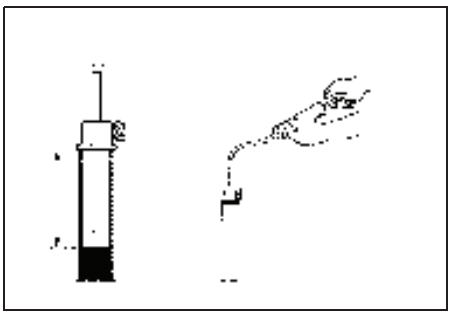


• hold the front fork vertical and adjust the fork oil level with the special tool.

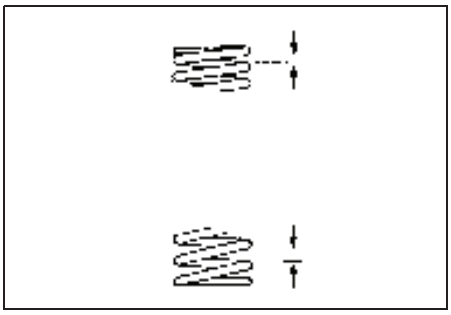
09943-74111 : Fork oil level gauge

Oil level: 116 mm

NOTE:
When adjusting the oil level , remove the fork spring and compress the inner tube fully,.

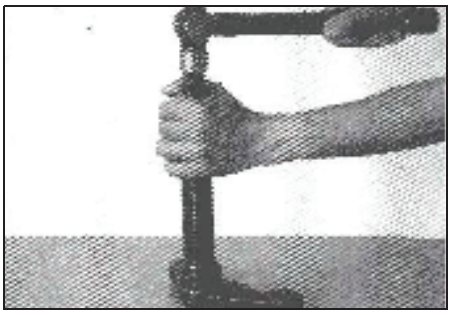


• Be sure to bring the close-pitch side of fork spring to the top.



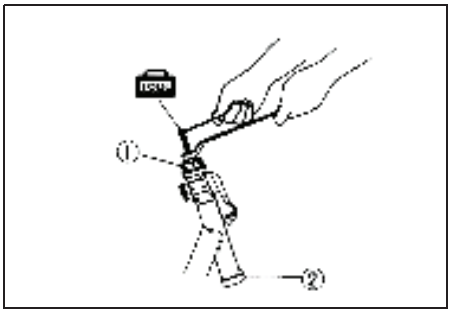
• Press in the outer lower race with the special tool.

09940-51710 : Steering race installer



• Press in the steering stem upper race ① and lower race ② with the special tool.

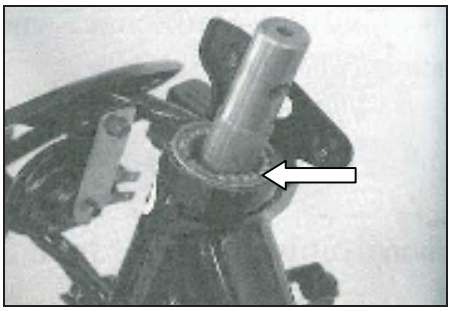
09941-34513 : Steering race installer



- Apply SUZUKI SUPER GREASE “A” to the upper and lower races sufficiently and place the balls to the specified quantity.

Number of balls **(Upper): 22 pcs**
(Lower): 28 pcs

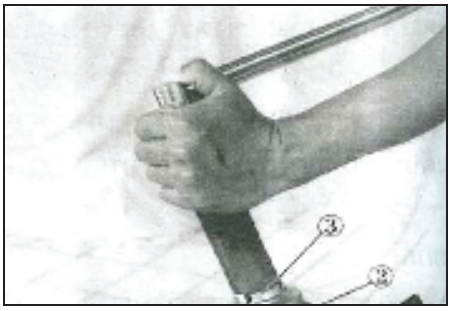
99000-25010: SUZUKI SUPER GREASE “A”



- Install the steering stem bracket ②.
- Install the dust seal ③.
- Tighten the steering stem nut ④ to the specified torque.

09940-14920: Steering stem nut wrench

Steering stem nut: 45 N - m (4.5 kg-m)

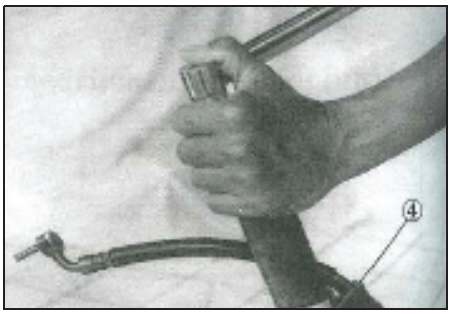


NOTE:
This adjustment will vary from motorcycle to motorcycle. Make sure that the steering turns smoothly and easily, left to right.

- Install the washer
- Tighten the steering stem lock nut ④ with the special tool.

09940-14920: Steering stem nut wrench

Steering stem lock nut: 30 N-m (3.0 kg-m)



NOTE:
After tightening the stem lock nut, inspect the steering movement again.

- Tighten the front fork clamp bolts and front fork caps to the specified torque.

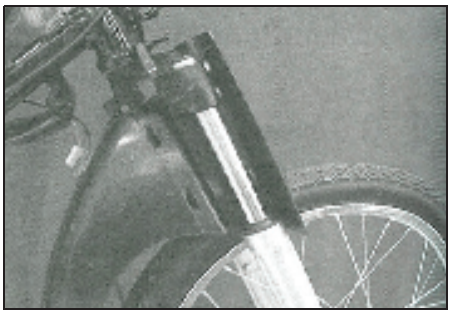
Front fork clamp bolt: 32 N-m (3.2 kg-m)

- Install the handlebar. (See page 5-18.)

Handlebar clamp bolt: 55N-m (5.5kg-m)

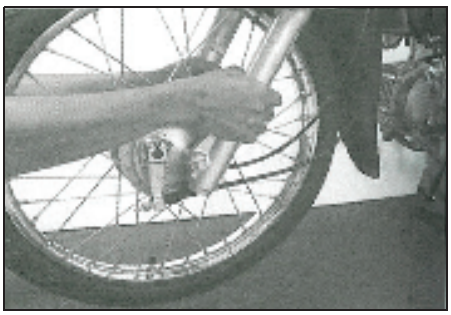
- Install the front wheel. (See page 5-9.)

Axle nut: 43 N-m (4.3 kg-m)

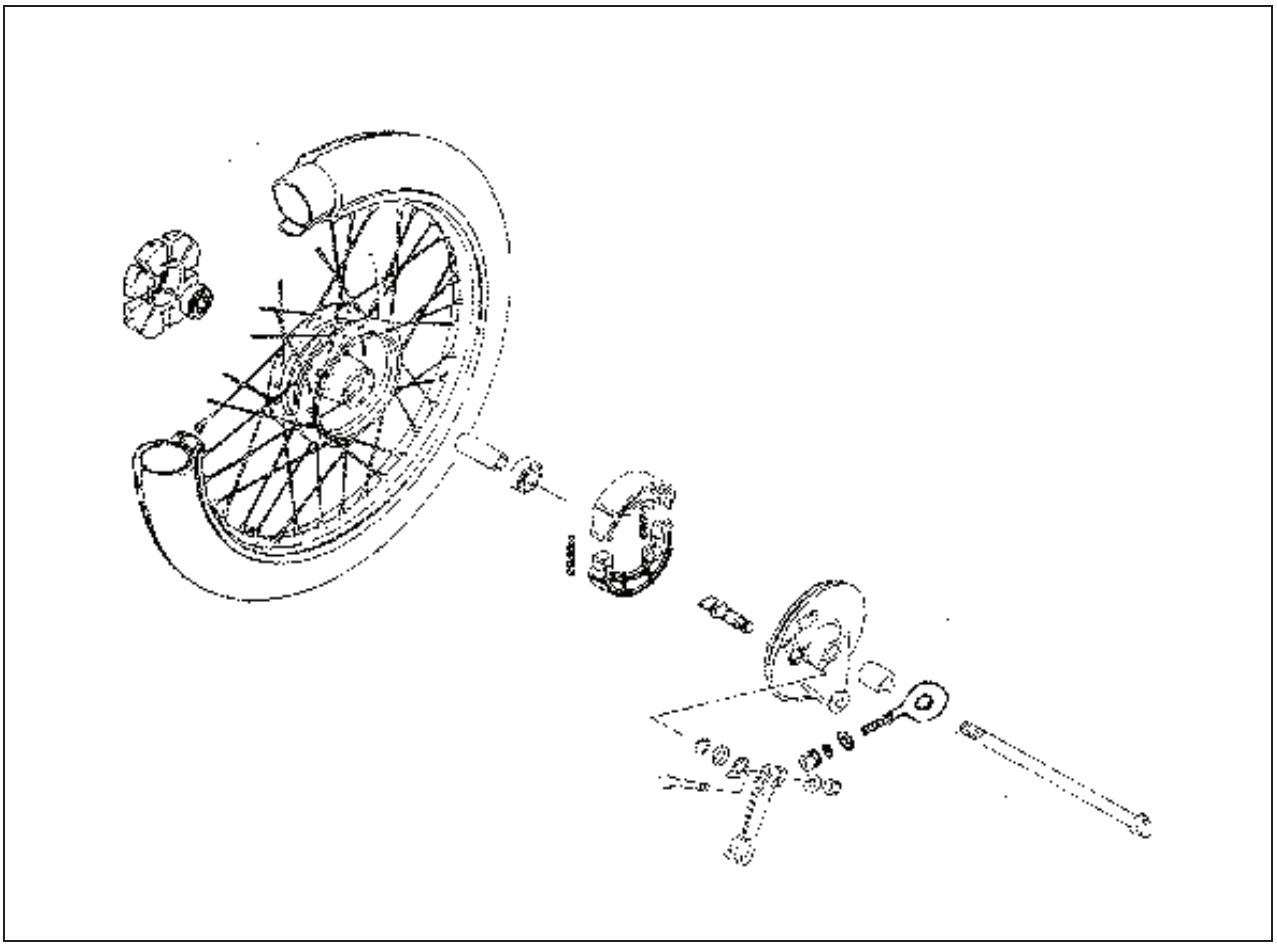


NOTE:
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

- Install the front and rear handlebar's covers. (See pages 5-3 and 4.)



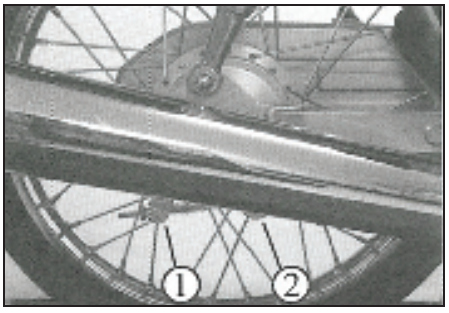
REAR WHEEL AND REAR BRAKE

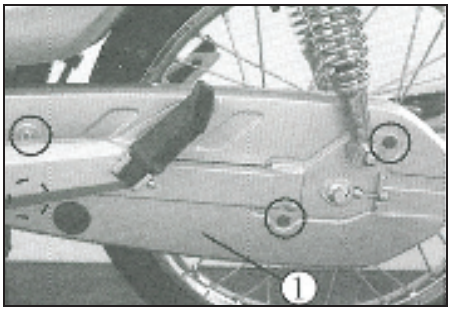


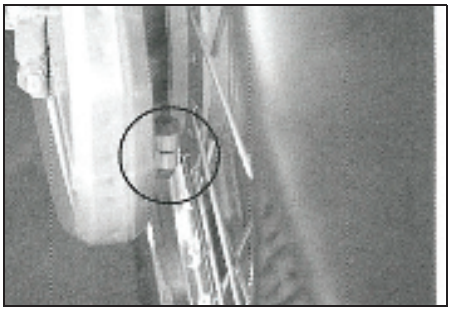
REMOVAL AND DISASSEMBLY

REAR WHEEL

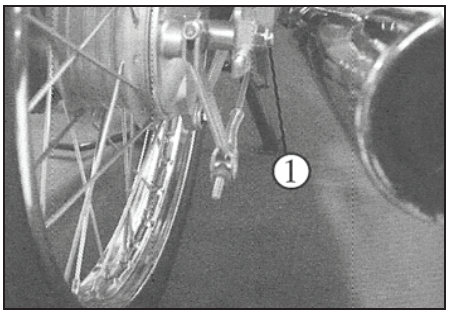
- Support the motorcycle with the center stand.
- Remove the rear brake adjusting nut ①.
- Remove the cotter pin and torque link nut ②.
- Remove the chain case ① by removing the bolts and screw.



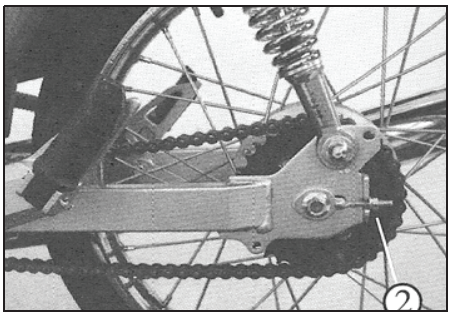




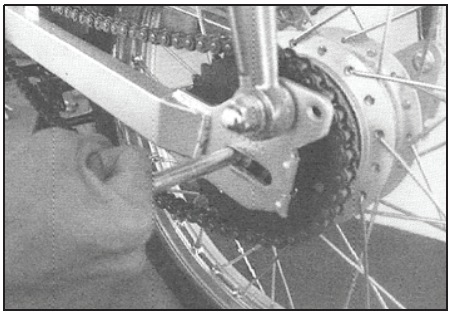
• Remove the rear axle nut ①.



• Loosen the drive chain adjusting nuts ②, left and right.

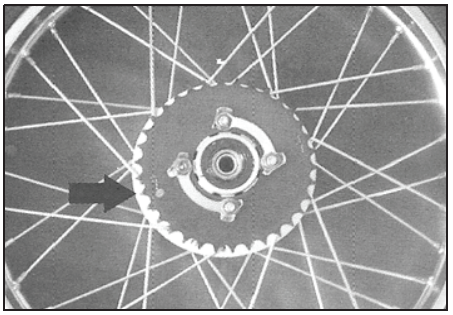


• Draw out the axle shaft.
• Disengage the drive chain from the rear sprocket.
• Remove the rear wheel.

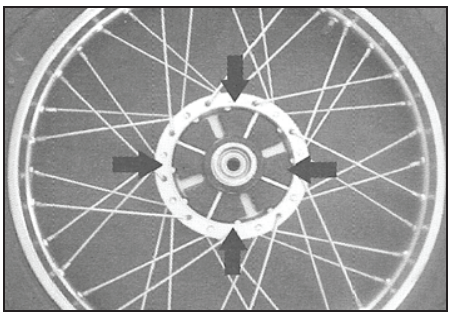


REAR SPROCKET

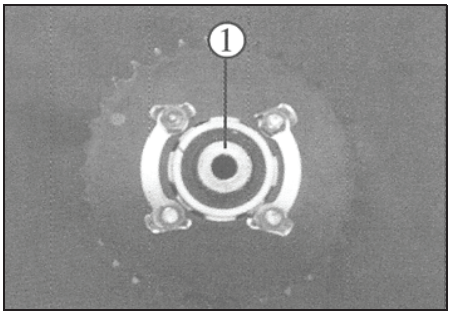
• Remove the rear sprocket along with its mounting drum out of the wheel hub.



• Remove the rear sprocket dampers out of the wheel hub.

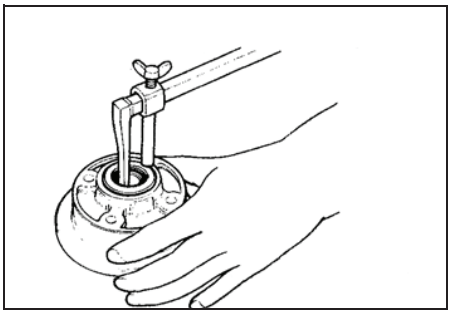


- Flatten the lock portions of the lock washers.
- Remove the rear sprocket by removing the nuts.
- Remove the spacer out of the sprocket ① mounting drum.



- Remove the oil seal with the special tool.

09913-50121: Oil seal remover

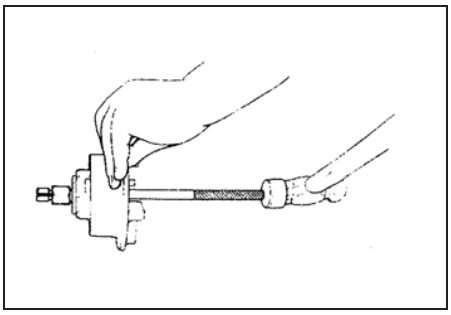


CAUTION

The removed oil seal should be replaced with a new one.

- Remove the rear sprocket drum bearing in the same manner of the front wheel bearing. (Refer to page 5-6.)

09941-50111: Bearing remover

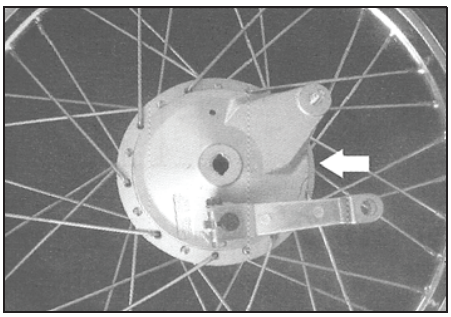


CAUTION

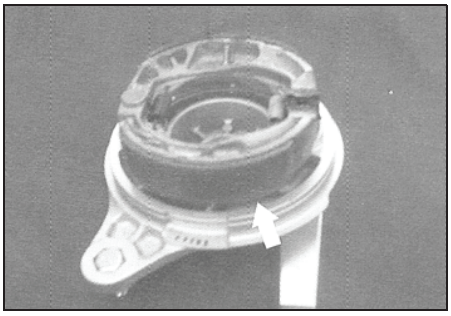
The removed oil seal should be replaced with a new one.

REAR BRAKE

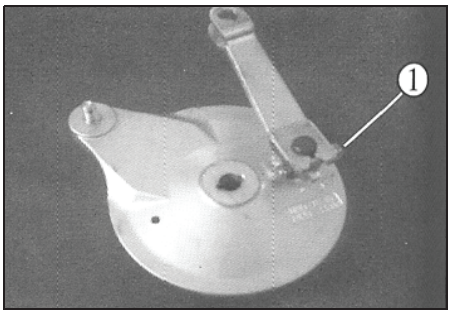
- Remove the rear brake panel from the wheel.



- Remove the brake shoes from the brake panel.



- Remove the brake cam lever bolt/nut ①.
- Remove the brake cam lever, brake lining wear indicator, washer, O-ring and brake cam. (See page 5-27.)



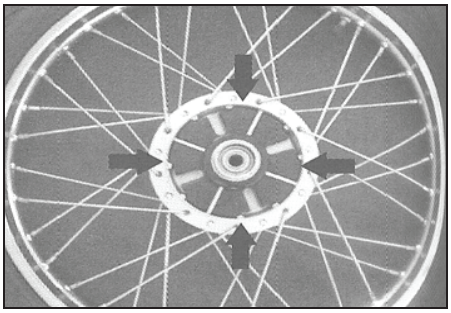
INSPECTION AND DISASSEMBLY.

WHEEL BEARING ..... Refer to page 5-6.
AXLE SHAFT ..... Refer to page 5-7.
WHEEL ..... Refer to page 5-7.
SPOKE NIPPLE ..... Refer to page 5-7.
BRAKE DRUM ..... Refer to page 5-7.
REAR SPROCKET DRUM BEARING ... Refer to page 5-6

- The inspection of the rear sprocket drum bearing in the same manner of the wheel bearing.

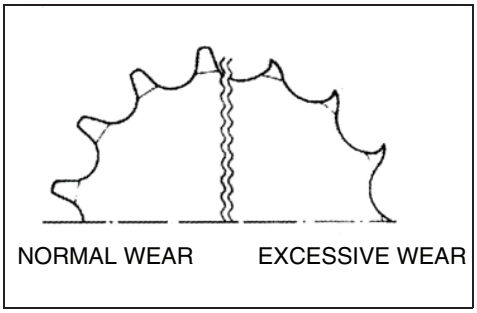
REAR SPROCKET DAMPER

Inspect the cushion for wear and damage.



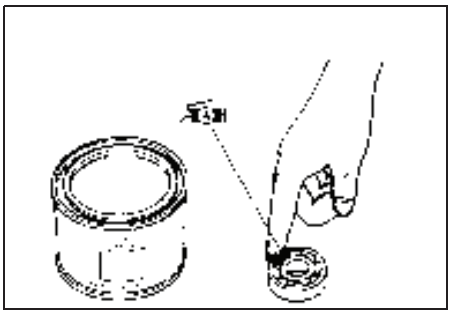
REAR SPROCKET

Inspect the sprocket teeth for wear. If they are worn as shown, replace the sprockets and drive chain as a set.



REASSEMBLY AND REMOUNTING

Reassemble and remount the rear wheel and rear brake in the reverse order of removal and disassembly. Pay attention to the following points:



WHEEL BEARING

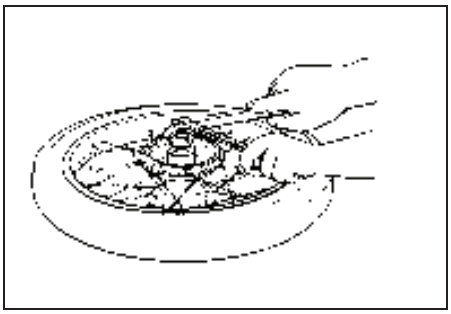
- Apply SUZUKI SUPER GREASE "A" to the bearings before installing.

  99000-25010 : SUZUKI SUPER GREASE "A"

- Using the bearing installer set, press fit the bearing to the wheel. First install the right wheel bearing, then left wheel bearings.

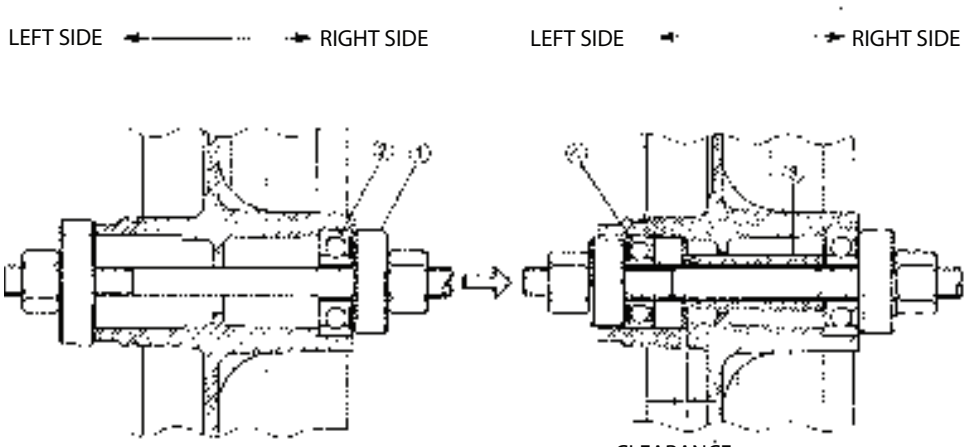
  09924-84521 : Bearing installer set

- Refer to the following illustration for pressing procedure.



CAUTION

The seal side of the bearing should be faced to outside.

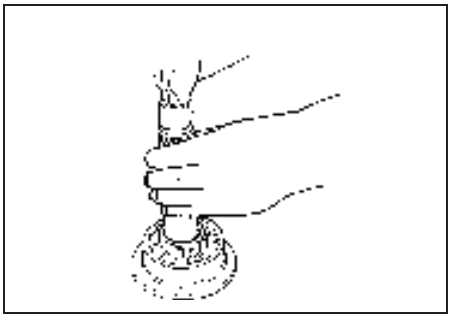


1) BEARING INSTALLER SET
2) RIGHT WHEEL BEARING
3) SPACER
4) LEFT WHEEL BEARING

REAR SPROCKET DRUM BEARING

• Install the bearing by using the bearing installer.

09913-84510: Bearing installer

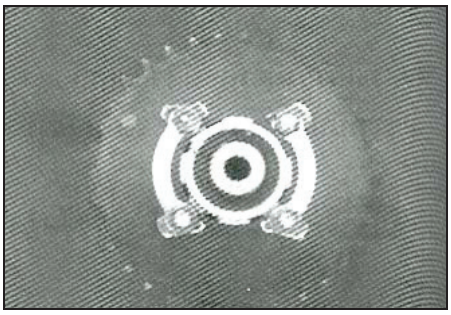


NOTE:
Apply grease to the bearing and oil seal lip before assembling rear wheel.

REAR SPROCKET

• Tighten the sprocket mounting nuts to the specified torque and bend up the lock washer tongues positively to lock its nuts.

Rear sprocket nut: 23 N-m (2.3 kg-m)



NOTE:
Face the stamped mark on the sprocket to outside.

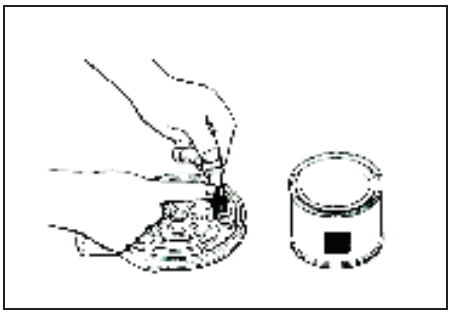
BRAKE CAM/SHAFT

• Apply SUZUKI SUPER GREASE “A” to the brake cam/shaft and pin before installing the brake shoes.

99000-25010 : SUZUKI SUPER GREASE "A"

CAUTION

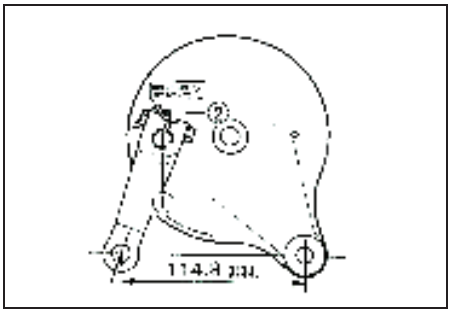
Be careful not to apply too much grease to the cam/shaft and pin. If grease gets on the lining, brake effectiveness will be lost.



BRAKE CAM LEVER

• When installing the brake cam lever and brake lining wear indicator, align the groove ① on the cam/shaft with the punched mark ② on the brake lining wear indicators as shown in the illustration.

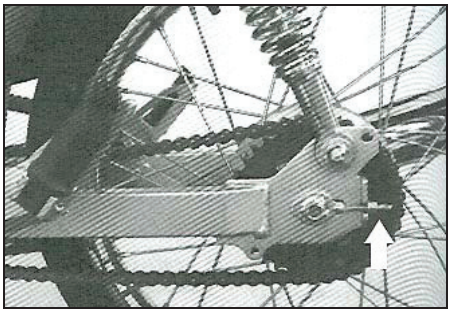
Brake cam lever nut : 8 N-m (0.8 kg-m)



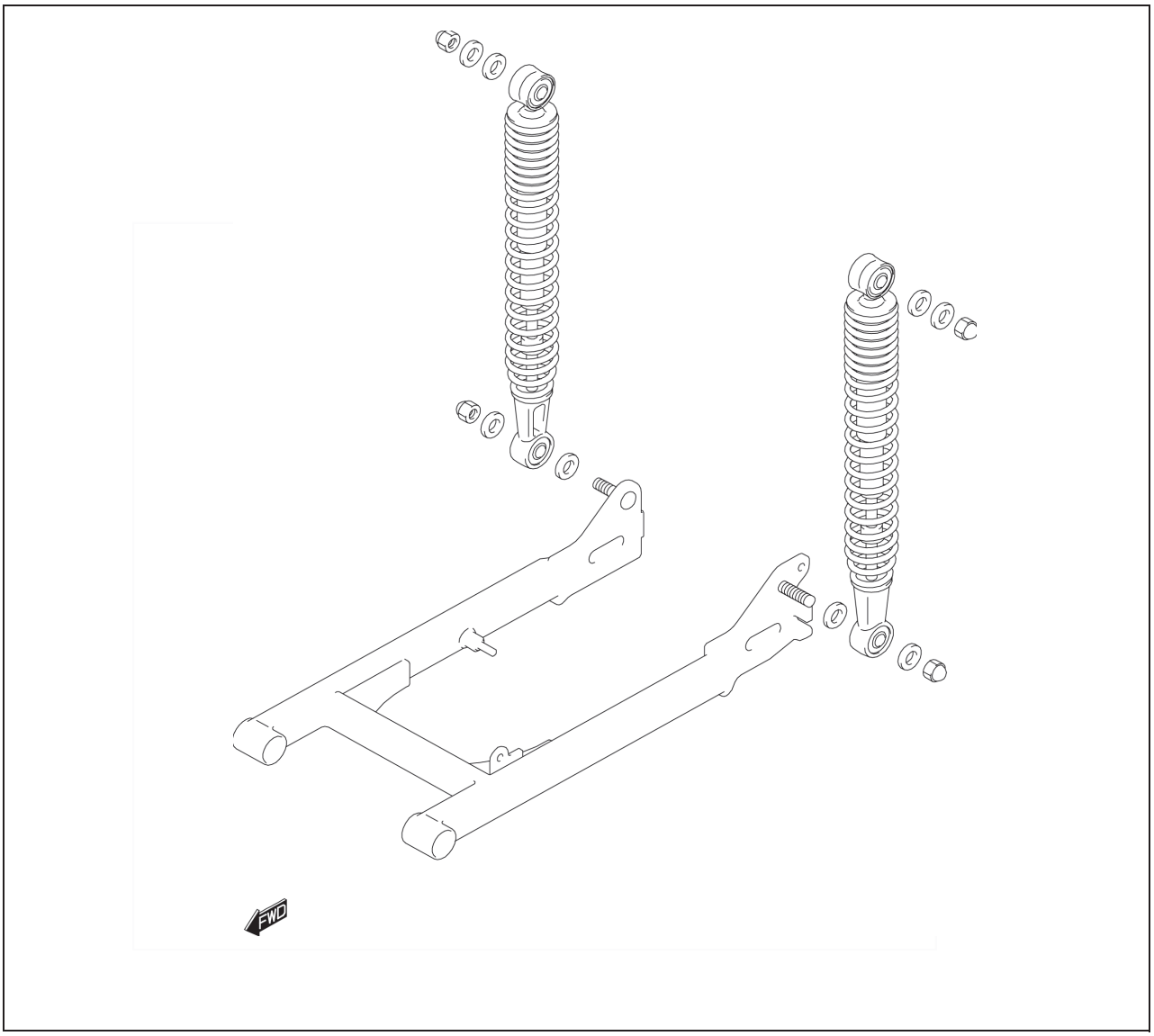
REAR WHEEL

• Adjust the chain slack after rear wheel installation. (Refer to page 2-11.)
• Tighten the rear axle nut to the specified torque.
• Tighten both chain adjusting nuts securely.

Axle nut: 45 N-m (4.5 kg-m)

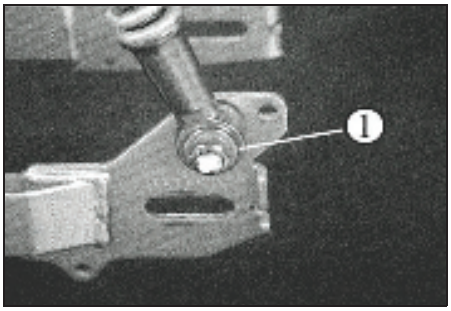


REAR SUSPENSION
SWING ARM AND SHOCK ABSORBER

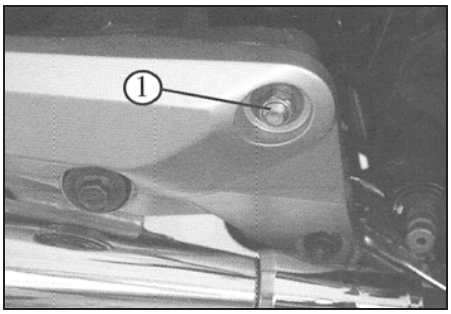


REMOVAL

- Remove the rear wheel.(see page 5-27)
- Remove the shock absorber mounting lower bolts ①, left and right



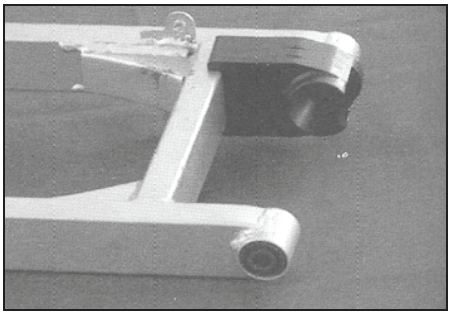
- Remove the swing arm pivot nut ①.
- Remove the swing arm by removing its pivot shaft.



INSPECTION AND DISASSEMBLY

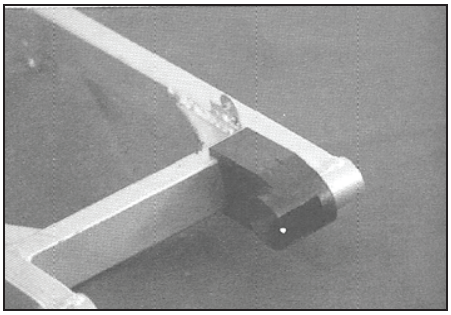
SWINGARM BUSHING/SWINGARM

Inspect the swing arm bushing for wear or damage. Inspect the swinger for distortion.
If any defects are found, replace the swing arm bushings and swing arm with new ones.



CHAIN BUFFER

Inspect the chain buffer for wear or damage. If any defects are found, replace the chain buffer with a new one.

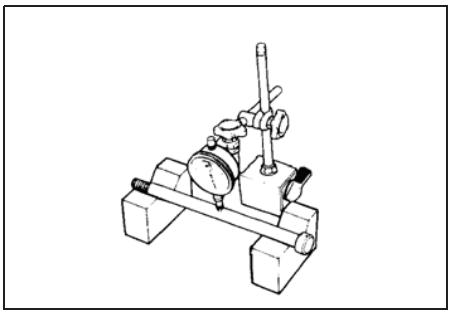


SWINGARM PIVOT SHAFT

Using a dial gauge, check the pivot shaft run out and replace it if the run out exceeds the limit.

09900-20606: Dial gauge (1/100 mm, 10 mm)
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

Service Limit: 0.3 mm

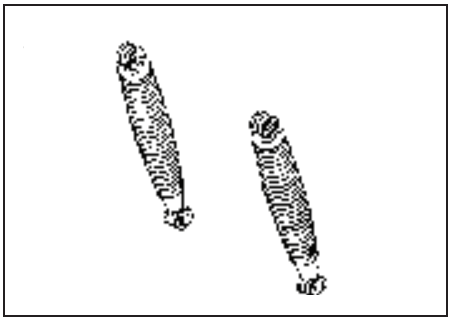


SHOCK ABSORBER

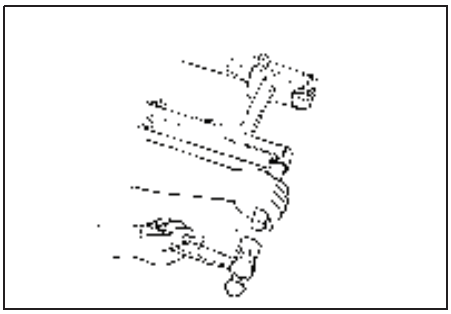
Inspect the shock absorber body for damage and oil leakage. If any defects are found, replace the shock absorber with a new one.

CAUTION

Do not attempt to disassemble the rear shock absorber unit. It is unserviceable.



• Remove the bushing from the swing arm by using a suitable hand-press.

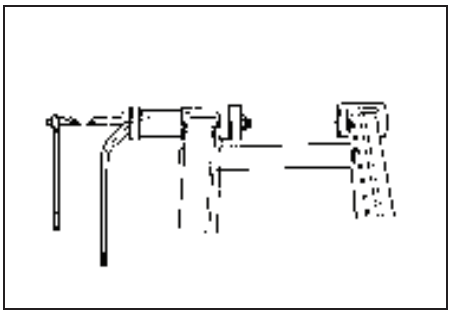


CAUTION

The removed bushing should be replaced with a new one.

REASSEMBLY AND REMOUNTING

Reassemble and remount the swing arm and shock absorber in the reverse order of removal and disassembly, and also carry out the following steps:

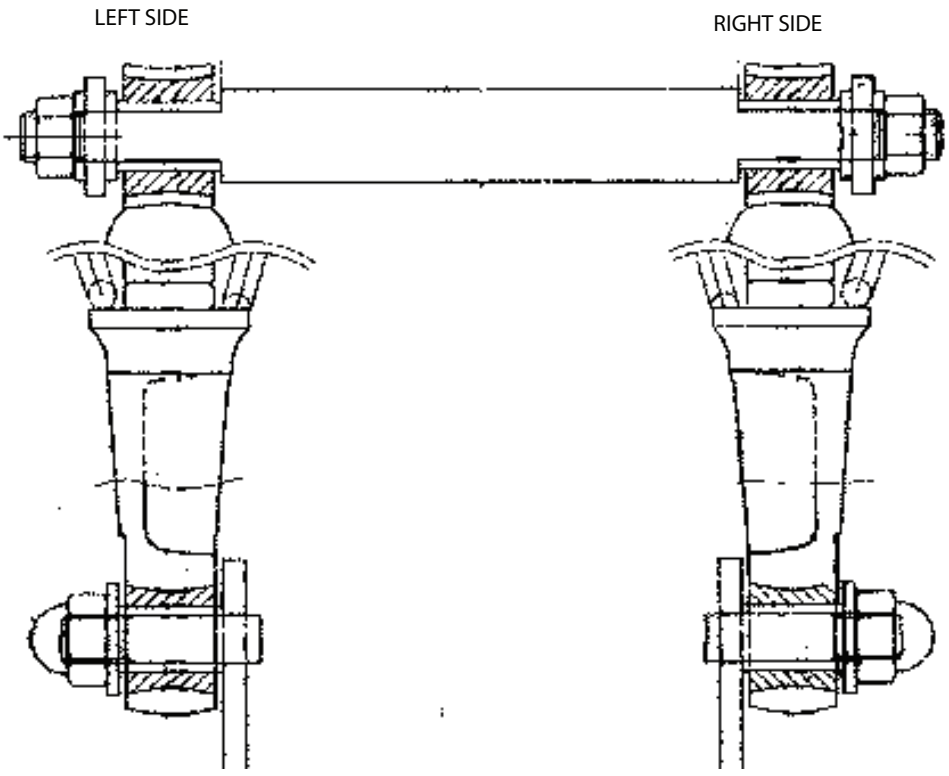


SWINGARM BUSHING

• Press the bushing into swing arm pivot by using the special too.

09941-34513: Steering race installer

SHOCK ABSOBER



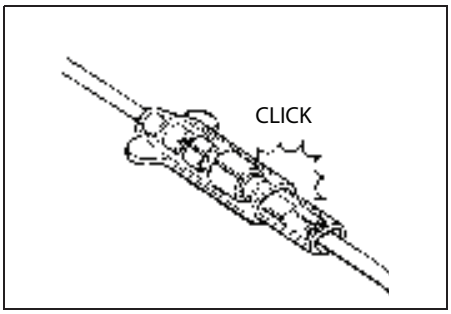
ELECTRICAL SYSTEM

CONTENTS

CAUTIONS IN SERVICING

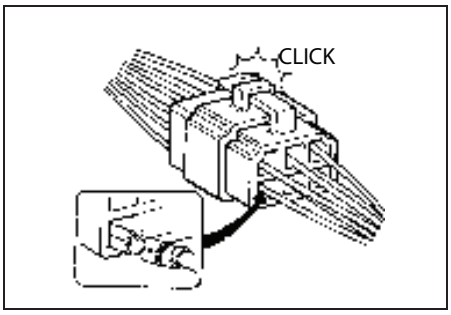
CONNECTOR

- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.



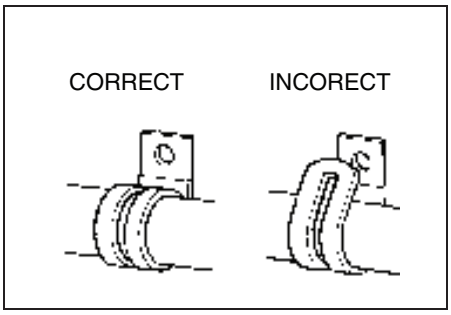
COUPLER

- With a lock type coupler, be sure to release the lock before disconnecting it and push it in fully till the lock works when connecting.
- When disconnecting the coupler, be sure to hold the coupler it self and do not pull the lead wires.
- Inspect each terminal on the coupler for being loose or bent.
- Inspect each terminal for corrosion and contamination.



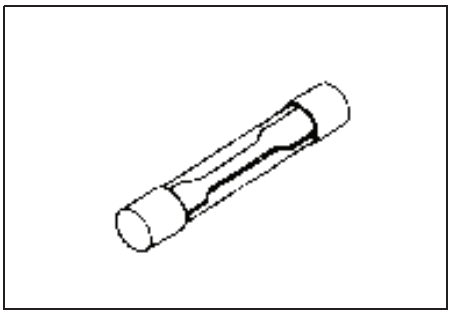
CLAMP

- Clamp the wire harness at such positions as indicated in “WIRE HARNESS ROUTING” (Refer to page 7-10.).
- Bend the clamp properly so that the wire harness is clamped securely.
- In clamping the wire harness, use care not ot allow it to hang down.
- Do not use wire or any other substitute for the band type clamp.



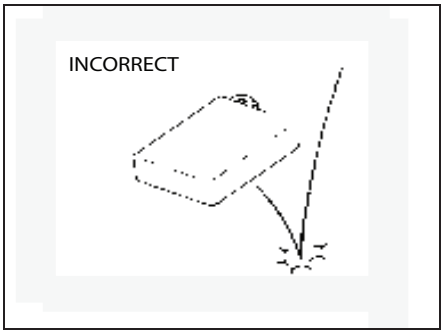
FUSE

- When a fuse blows, always investigate the cause, correct it and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use wire or any other substitute for the fuse.

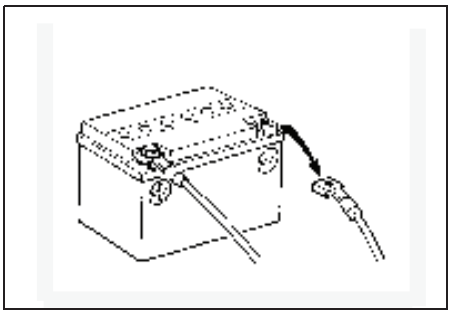


SEMI-CONDUCTOR EQUIPPED PART

- Be careful not to drop the part with a semi-conductor built in such as CDI unit and regulator/rectifier.
- When inspecting these parts, follow inspection instruction strictly. Neglecting proper procedure may cause damage to these parts.

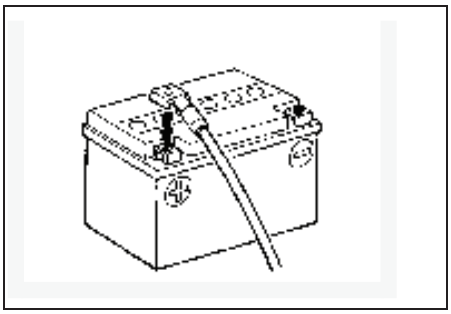


CONNECTING BATTERY



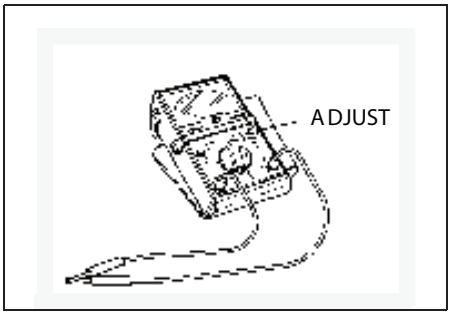
- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the negative ⊖ terminal first,
- When connecting terminals to the battery, be sureto connect the positive ⊕ terminal first.
- If the terminal is found corroded, remove the battery, pour warm water over it and clean with a wire brush.
- Upon completion of connection, apply grease lightly.
- Put a cover over the positive ⊕ terminal.

WIRING PROCEDURE



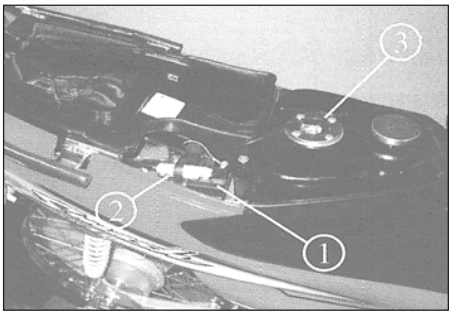
- Route the wire harness properly according to “WIRE HARNESS ROUTING” (Refer to page 7-10).

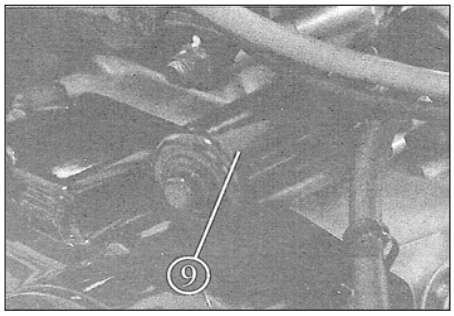
ADJUSTUSING POCKET TESTER

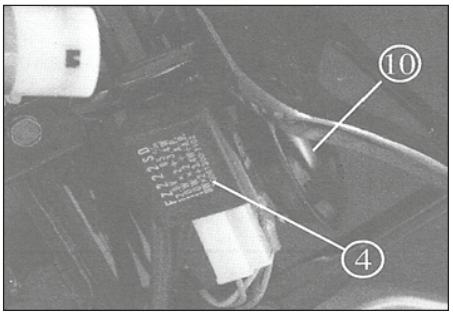


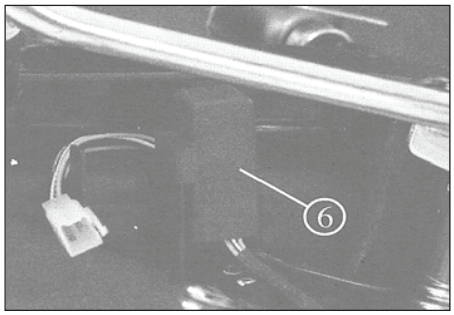
- Be sure to use positive ⊕ and negative ⊖ probes of the tester properly. Their false use may cause damage in the tester.
- If the voltage and current values are not known, start measuring in the higher range.
- before measuring the resistance and after changing the resistance range, always perform O Ω adjustment.
- Taking a measurement where voltage is applied in the resistance range may cause damage in the tester. When measuring resistance, check to make sure that no voltage is applied there.
- After using the tester, turn the switch to the OFF position.

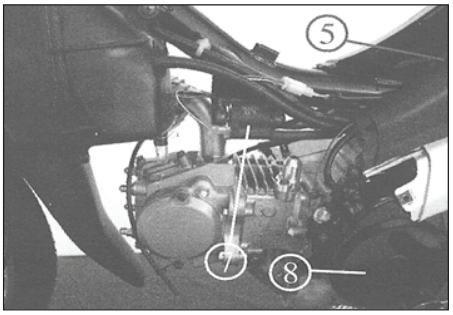
LOCATION OF ELECTRICAL COMPONENTS

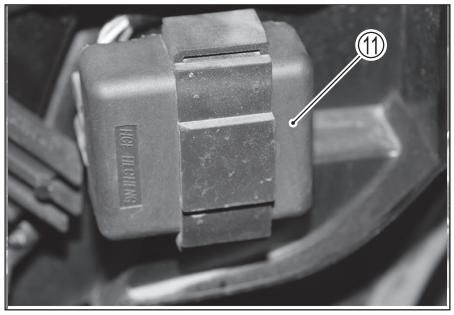












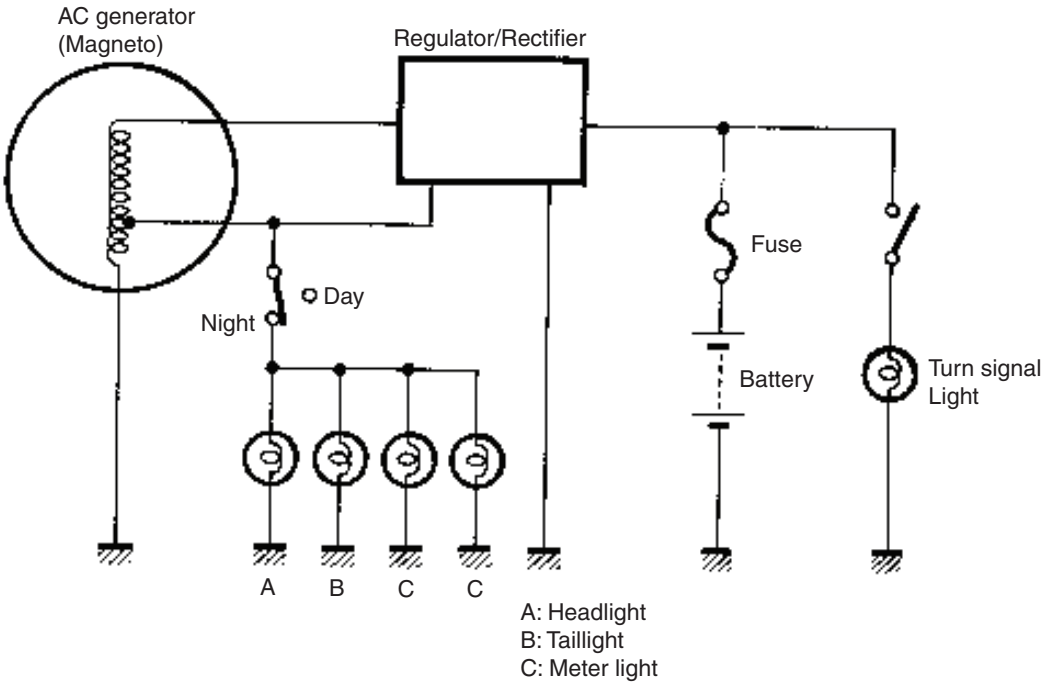
1) Battery
2) Fuse
3) Fuel level gauge
4) Turn signal relay
5) Regulator / rectifier
6) Starter relay
7) Ignition coil
8) Generator
9) Starter motor
10) Horn
11) CDI unit

CHARGING AND LIGHTING SYSTEM

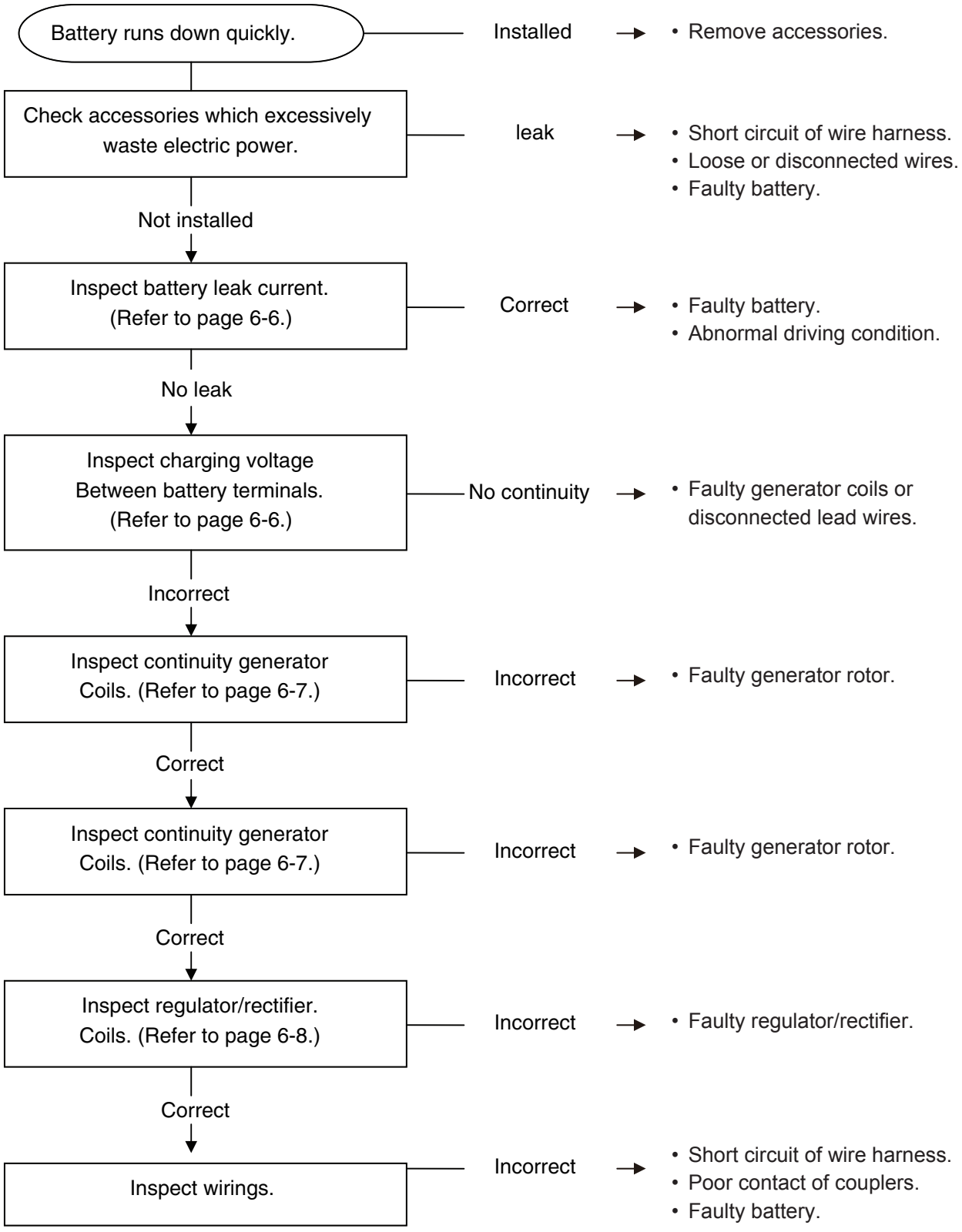
DESCRIPTION

The circuit of the charging and lighting system is indicated in the figure, which is composed of an AC generator, regulator / rectifier unit and battery.

The AC current generated from AC generator is converted by rectifier and is turned into DC current, then it charges the battery. On the other hand, lighting coil supplies A current to the headlight, taillight and meter light under the regulated condition.

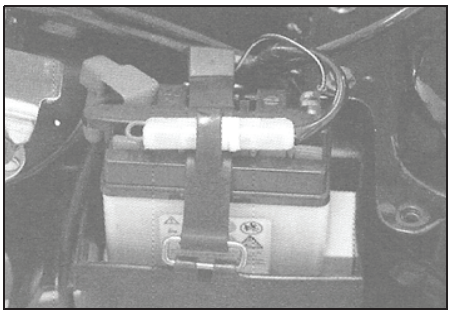


TROUBLESHOOTING



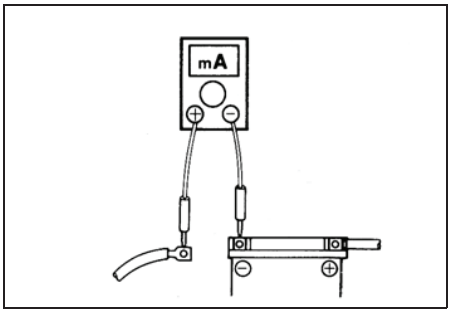
INSPECTION

BATTERY LEAK CURRENT INSPECTION



- Open the seat.
- Turn the ignition switch to the OFF position.
- Disconnect the battery ⊖ lead wire.

Note that leakage is indicated if the needle swings even a little when the milliampare meter of the pocket tester is connected between a ⊖ terminal and lead wire of the battery as shown.



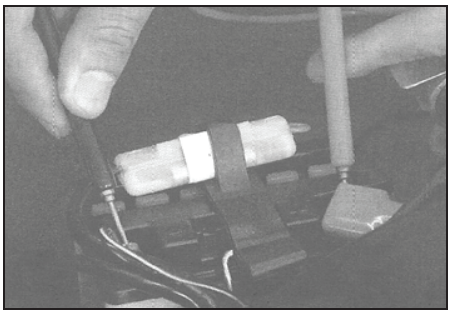
09900-25002: Pocket tester

CAUTION

- **Because the leak current might be large, turn the tester to high rang first when connecting an ammeter.**
- **Do not turn the ignition switch to the ON position when measuring current.**

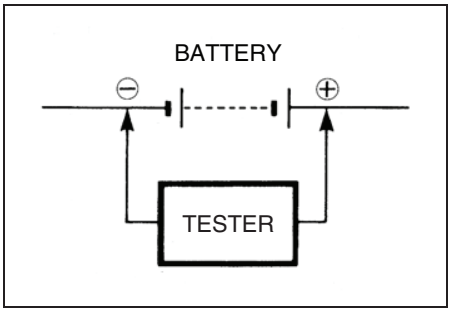
When leakage is found, look for the part where the needle does not swing through the couplers and connectors are removed one by one.

CHARGINNG OUTPUT INSPECTION



- Open the seat.
- Start the engine and keep it running at 5,000 r/min. with lighting switch turned ON.

Measure the DC voltage between the batter ⊕ with a pocket tester. If the tester reads under the specified value, inspect the generator coil and ⊖ regulator / rectifier.



CAUTION

If the pocket tester is set to read current or resistance and a voltage is applied across the test probes, damage will result. Therefore, it is important that the tester knob on the pocket tester be set the proper position before making any measurements.

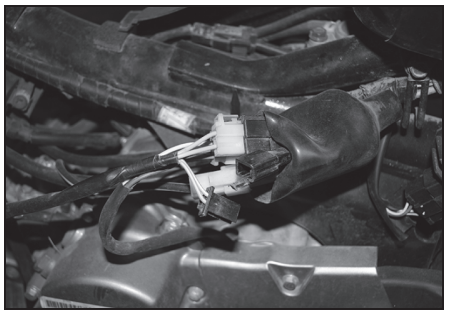
NOTE:

When making this test, be sure that the battery is fully charged condition.

09900-25002: Pocket tester
Tester knob indication: DC 25VCharging output
Standard: 13.0 V-16.0 V at 5,000 r/min.

GENERATOR (CHARGING/LIGHTING) COIL

INSPECTION

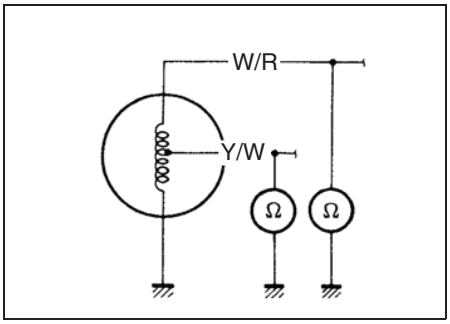


- Remove the center leg shield, leg shields and leg side shields/frame covers. (See page 5-1)
- Disconnect the generator lead wire coupler.

Using the pocket tester, measure the resistance between the lead wires and ground.
If the resistance checked is incorrect, replace the charging/Lighting coil with a new one.

TOOL 099000-25002: Pocket tester

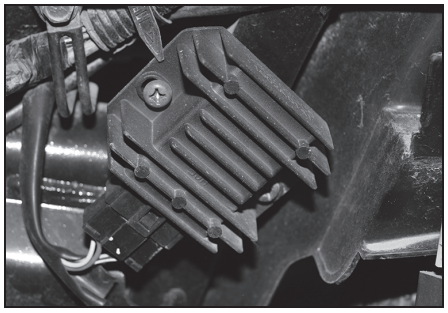
Charging/Lighting coil resistance
W/R – Ground: 0.5 – 2.0 Ω
Y/W – Ground: 0.3 – 1.5 Ω



Tester knob indication : x1 Ω range
W/R: White with Red tracer
Y/W: Yellow with white tracer

GENERATOR NO-LOAD PERFORMANCE

INSPECTION



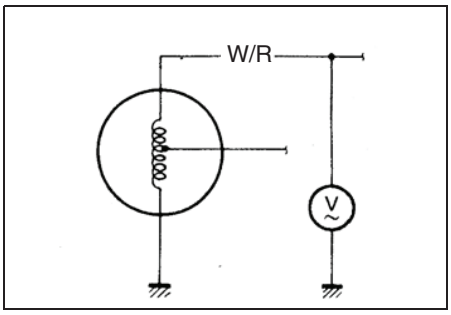
- Remove the center leg shield, leg shields and leg side shields/frame covers. (See page 5-1.)
- Disconnect the regulator/rectifier coupler from the regulator/rectifier.
- Turn the lighting switch to OFF position.
- Start the engine and keep it running at 5,000 r/min.

Using a pocket tester, measure the AC voltage between the W/R lead wire and ground. If the tester reads under the specified value, replace the charging/lighting coil or rotor with a new one.

TOOL 09900-25002: Pocket tester

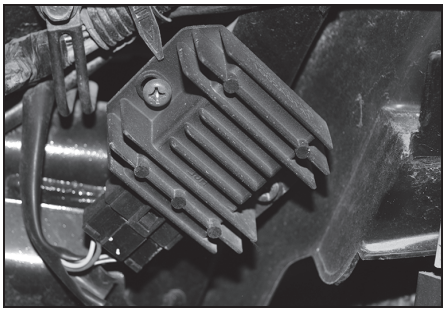
Tester knob indication : AC250V

Generator no-load performance:
More than 50V / 5,000 r/min
(When engine is cold)



NOTE:
When making above test, it is not necessary to remove the generator.

REGULATOR/RECTIFIER INSPECTION



- Remove the right leg side shield/right frame cover. (See page 5-1).
- Disconnect the regulator/rectifier coupler.

Using a pocket tester (x1 kΩ range), measure the resistance between the terminals in the following table.

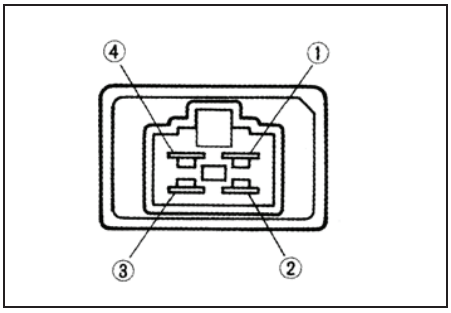
09900-25002: Pocket tester

Tester knob indication : x1 kΩ range), measure

Unit : Approx. KΩ

⊖Probe of tester	⊕Probe of tester				
		①	②	③	④
	①		11.5-15	∞	∞
	②	∞		∞	∞
	③	∞	∞		∞
	④	∞	∞	28-36	

∞: Infinity



NOTE:

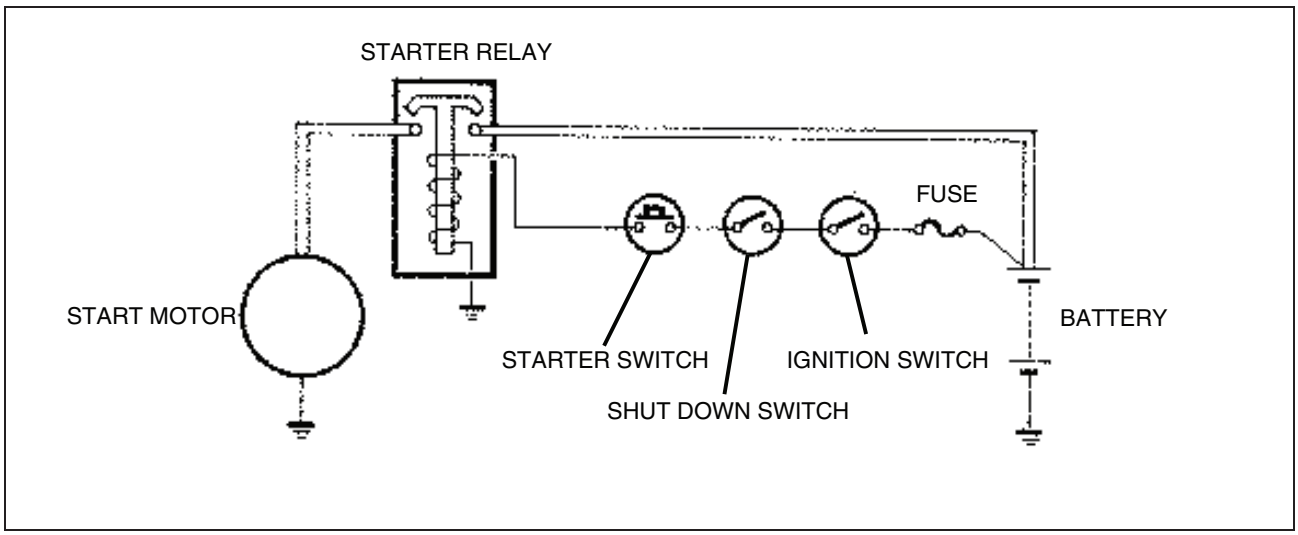
As diodes, thyristors are used inside this rectifier, the resistance values will differ between testers.

STARTER SYSTEM

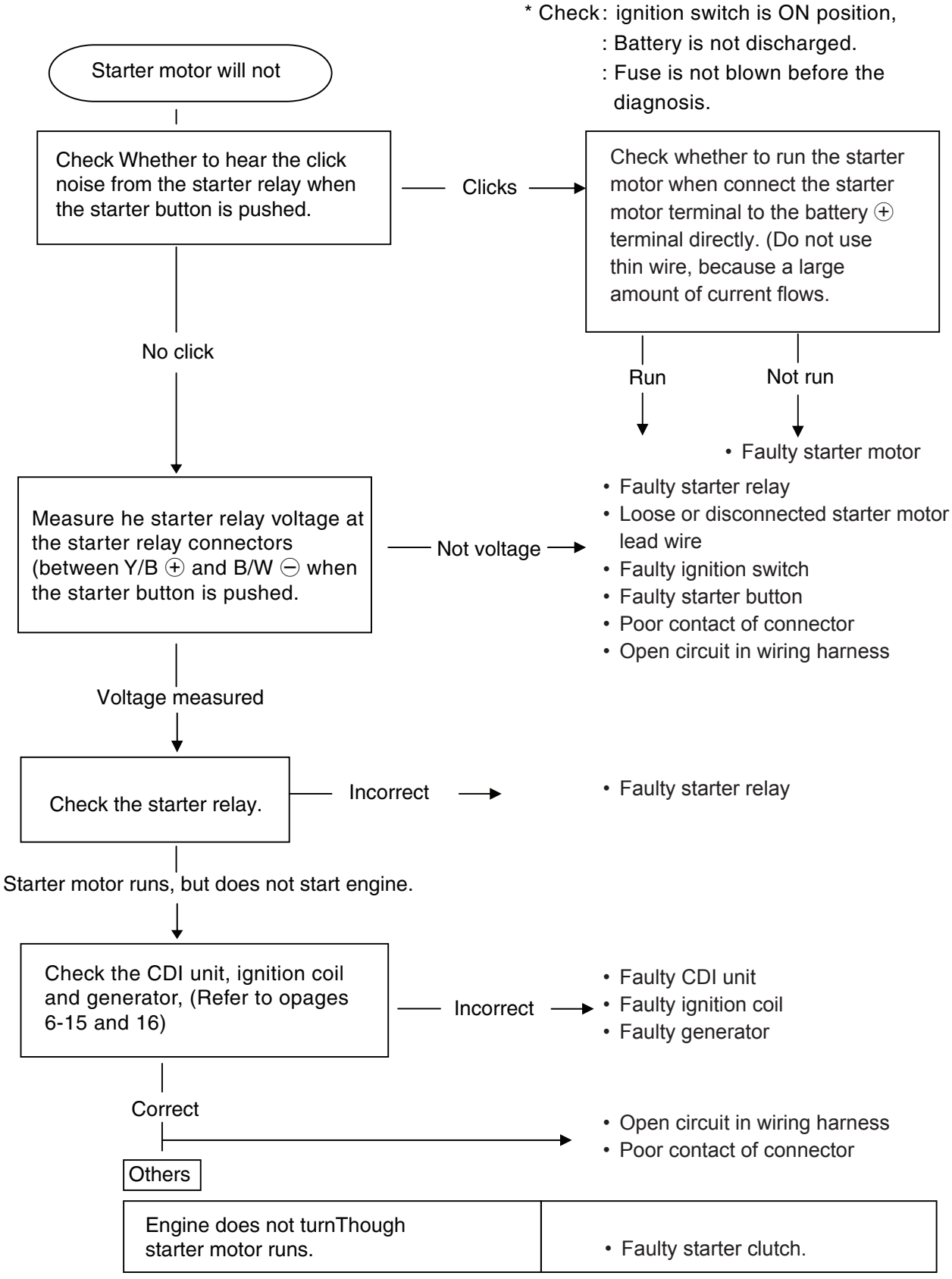
DESCRIPTION

The starter system is shown in the diagram below :namely, the starter motor, starter relay, starter switch, IG switch ad battery.

Depressing the starter switch (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 40 amperes to start the engine.

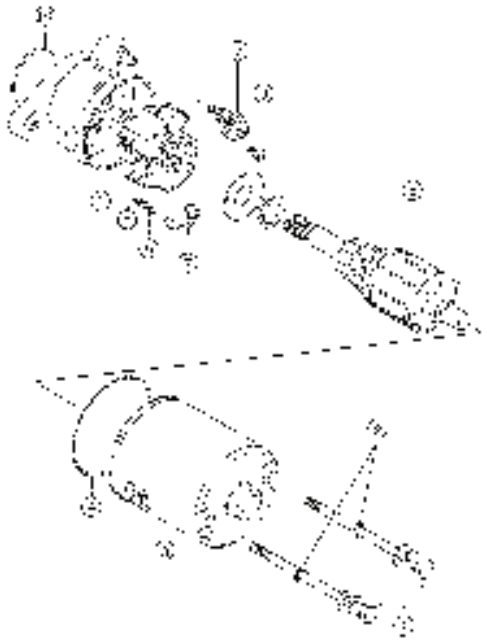


TROUBLESHOOTING



STARTER MOTOR REMOVAL AND DISASSEMBLE

- Remove the center leg shield and leg shields.
- Disconnect the starter motor lead wire and remove the starter motor by removing the mounting screws.
  (Refer to page 3-15)
- Disassemble the starter motor as shown in the illustration.

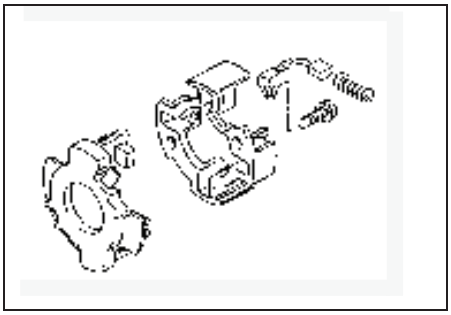


1) BOLT (2PCS)
2) O-RING
3) STARTER MOTER CASE
4) O-RING
5) ARMATURE
6) BRUSH SPRING (2PCS)
7) BRUSH (2PCS)
8) BRUSH HOLDER WITH BRUSH
9) HOUSING END
10) O-RING

STARTER MOTOR INSPECTION

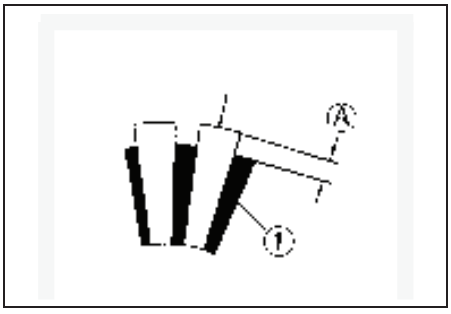
CARBON BRUSH

Inspect the brushes for abnormal wear, crack or smoothness in the brush holder.
In the brush holder.
If the brush has failed, replace the brush sub assy.



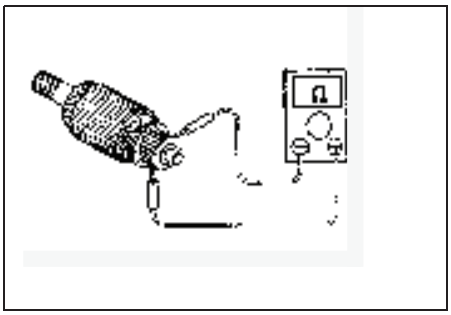
COMMUTATOR

Inspect the commutator for discoloration, abnormal wear Ⓐ or undercut.
If the commutator is abnormally worn, replace the armature.
When surface is discolored, polish it with # 400 sand paper and clean it with dry cloth. If there is no undercut, scrape out the insulator ① with saw blade.



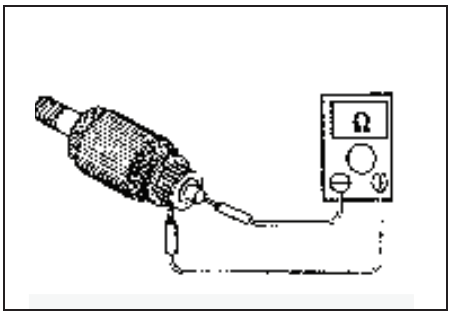
ARMATURE COIL INSPECTION

Check for continuity between each segment.
Check for continuity between each segment and the armature shaft.
If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.



OIL SEAL INSPECTION

Check the seal lip for damage or leakage.
If any damage is found, replace the bracket.

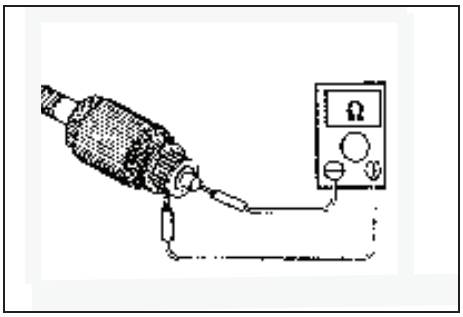


STARTER MOTOR REASSEMBLY

Reassemble the starter motor in the reverse order of disassembly, Pay attention to the following points:

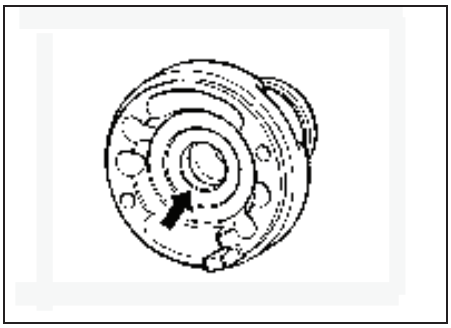
CAUTION

Replace the O-rings with new ones to prevent oil leakage and moisture.



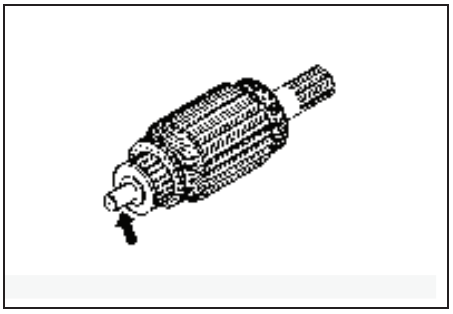
- Apply SUZUKI SUPER GREASE Ⓐ to the lip of the oil seal.

  99000-25010: SUZUKI SUPER GREASE Ⓐ



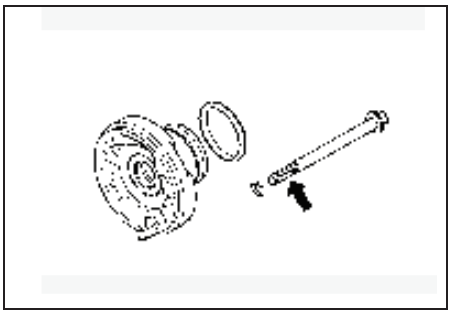
- Apply a small quantity of MOLY PASTE to the armature shaft.

  99000-25140: SUKUKI MOLY PASTE



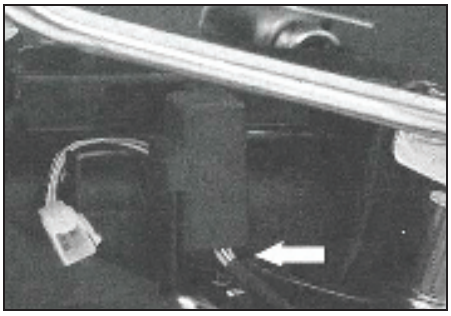
• Apply a small quantity of THREAD LOCK SUPER “1322” to the starter motor housing screws.

9000-32110: THREAD LOCK SUPER “1322”



STARTER RELAY INSPECTION

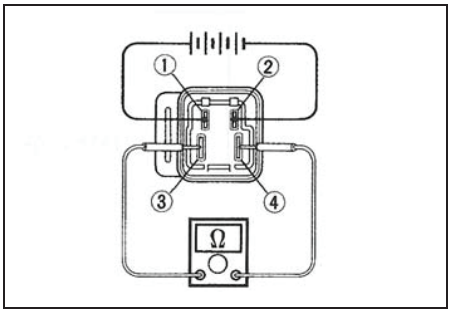
• Remove the right leg side shield/right frame cover. (See page 5-1.)
• Disconnect the lead wire coupler from the starter relay.



• Apply 12 volts to ① and ② terminals, inspect the continuity between the terminals, ③ and ④ If the starter relay is in sound condition, continuity is found..

09900-25002: Pocket tester

Tester knob indication : X1Ω range



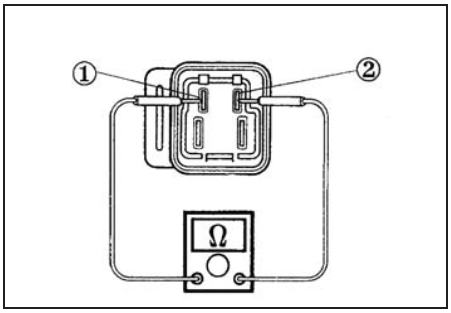
CAUTION

Do not apply a battery voltage more than 5 seconds to the starter relay as it may overheat and cause damage to the relay coil.

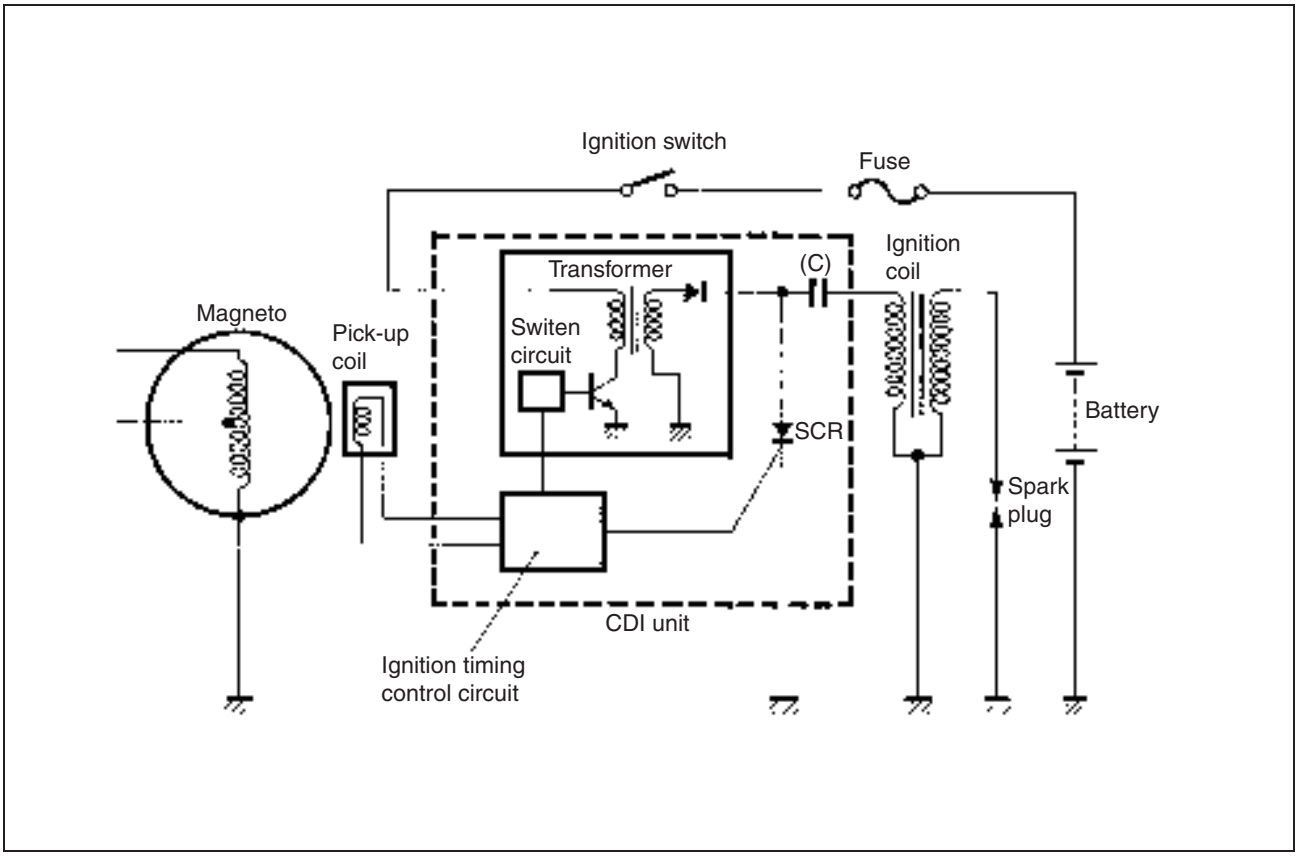
• Check the coil for “open” , “ground” and ohmic resistance. The coil is in good condition if the resistance is as follows.

9900-25002: Pocket tester
Tester knob indication : X1 Ω range

Starter rely resistance Standard : 60 Ω



IGNITION SYSTEM



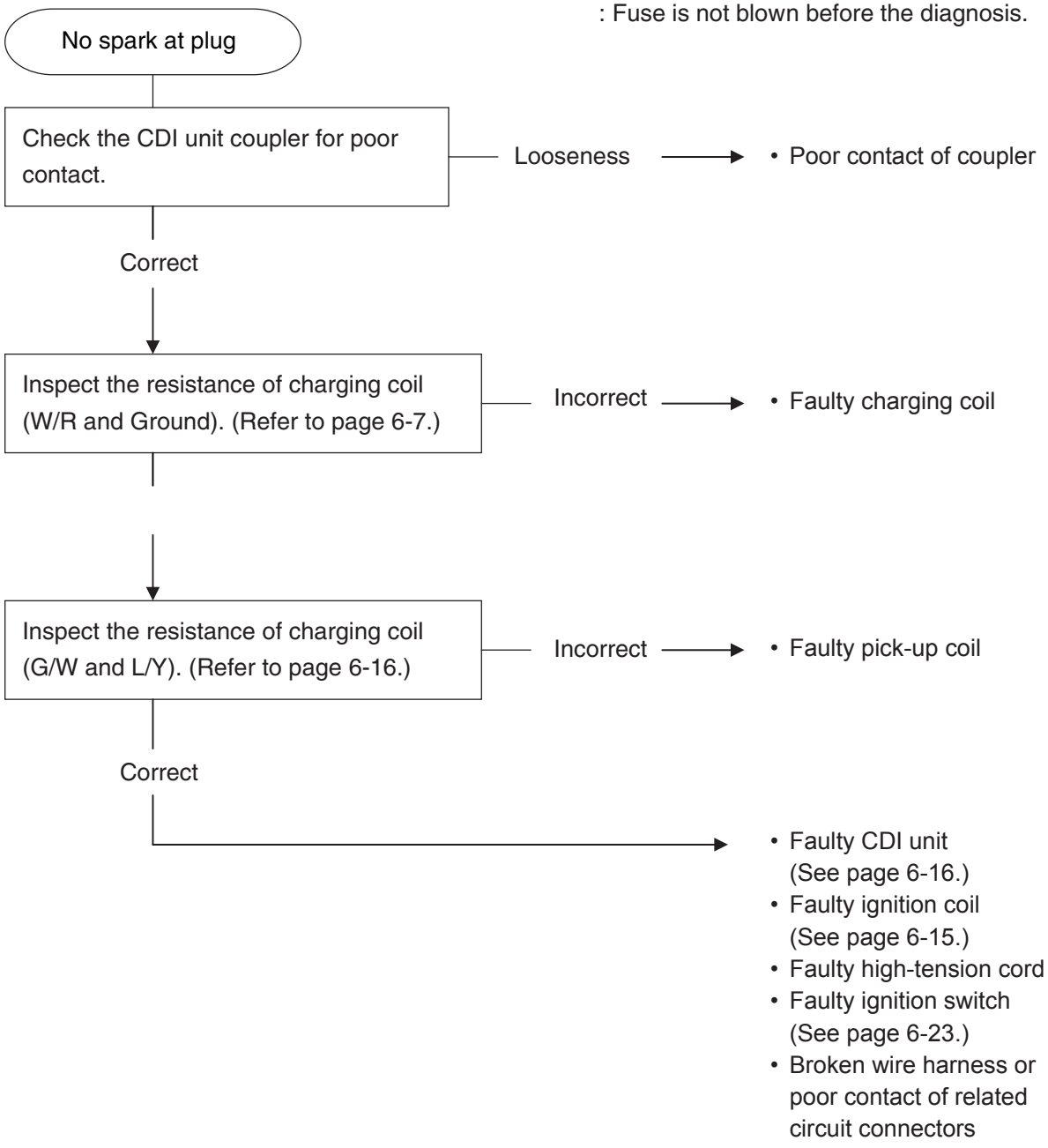
DESCRIPTION

The FD110 XC / XCS / XCD / XCSD engine is equipped with a new type ignition system. This new system minimizes timing fluctuations. It has an “ignition timing control circuit” which accurately controls ignition timing depending on the engine r/min.

There is a transformer in the CDI unit, which steps up the battery voltage to a higher voltage and charges the capacitor (C). An SCR connected to the capacitor becomes conductive (turns on) when a forward voltage signal is sent to SCR gate allowing the electric energy stored in the capacitor (C) to discharge instantly to the ignition primary coil. This then causes a high voltage to be induced in the secondary coil and a hot spark jumps across the spark plug pap. This ignition timing is controlled by the ignition timing control circuit which processes the signal generator uses to the form an SCR gate signal. The signal is then sent to the SCR just when the crankshaft has reached the best ignition timing for the current engine revolutions.

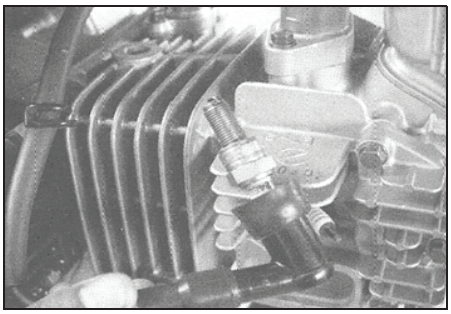
TROUBLESHOOTING

*Check : Ignition switch is ON Position.
: Fuse is not blown before the diagnosis.



INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE



- Remove the spark plug cap.
- Connect a new spark plug to the spark plug and ground it to the cylinder head.

NOTE:

Make sure that the spark plug cap and spark plug are connected properly.

Measure ignition coil primary voltage using the multi circuit tester (DM 200) in the following procedure.

- Connect the multi circuit tester with the peak voltage adaptor as following:

⊕Probe: Black / white lead wire
⊖Probe: Blue / white lead wire

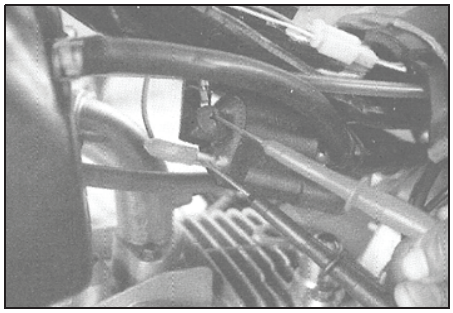
NOTE:

Do not disconnect the ignition coil lead wires.

09900-25008: Multi circuit tester set (Digital)

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.



- Turn the ignition switch to the “on” position.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.

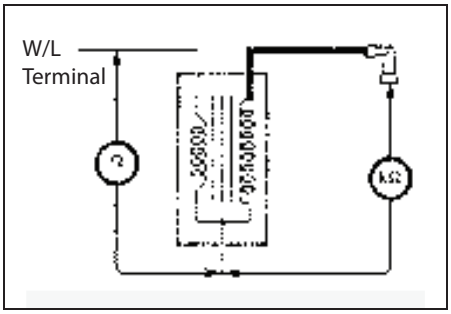
Tester knob indication : voltage (v)
Ignition coil primary peak voltage : More then130 V

⚠ WARNING

While testing, do not touch the tester probes and spark plug to prevent receiving an electric shock

* If the voltage is lower then the specified values, inspect the ignition coil.

IGNITION COIL RESISTANCE

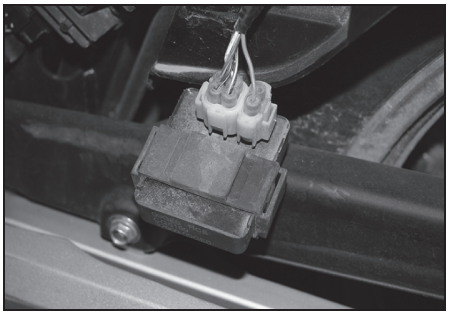


• Disconnect the ignition coil lead wires and spark plug cap.

Measure the ignition coil resistance in both the primary and secondary windings using the multi circuit tester. If the resistance in both the primary and secondary windings is close to the specified values, the windings are in sound condition.

09900-25002: Pocket tester
Tester knob indication : Resistance (Ω)
Ignition coil resistance
Primary: 0.2 – 1.5 Ω (⊕ Tap - ⊖Tap)
Secondary: 10 – 20 kΩ (⊕ Tap - spark plug cap)

PICK-UP COIL PEAK VOLTAGE`



• Remove the center leg shield, leg shields and leg side shields/frame covers. (See page 5-1).

NOTE:
Make sure that all of the couplers are connected properly and the battery is fully charged.

• Disconnect the CDI unit coil coupler.

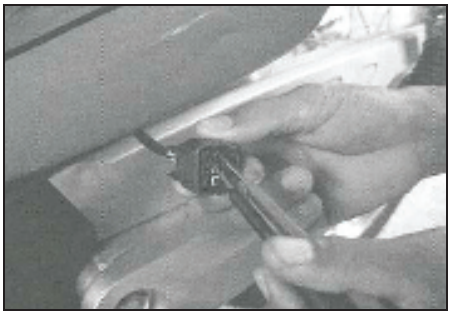
Measure the pickup coil peak voltage in the following procedure.

• Connect the multi circuit tester (DM 200) with the peak volt adaptor as follows.
⊕ Probe: Blue with yellow tracer lead wire
⊖ Probe: Green with white tracer lead wire

Multi circuit tester set (DM 200)

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate



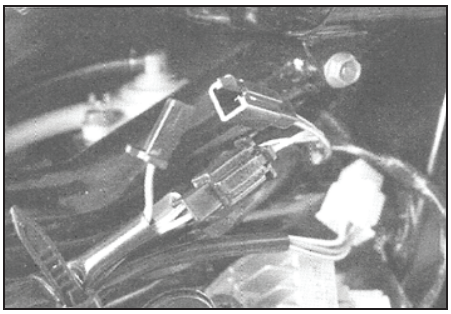
• Turn the ignition switch to the “ON” position. Measure the pick up coil peak voltage while squeezing the front or rear brake lever and pressing the starter button to turn the engine for a few seconds.
• Repeat the above procedure a few times and measure the highest pickup coil peak voltage.

Tester knob indication : voltage (v)
Pickup coil primary peak voltage : More then 4 V
Multi circuit tester set (Digital)

If the peak voltage measured on the CDI unit coupler is lower then the standard value, measure the peak voltage on the pickup coil coupler as follows.

- Disconnect the pickup coil coupler
- Connect the multi circuit tester (DM 200) with the peak volt adaptor as follows.

  ⊕ Probe: Blue with yellow tracer lead wire
  ⊖ Probe: Green with white tracer lead wire

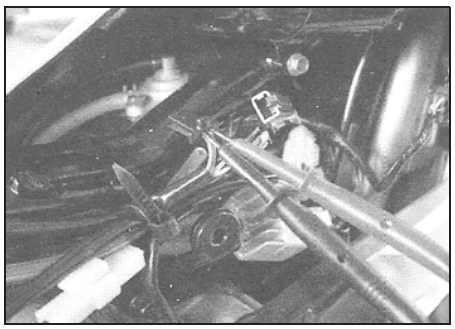


Measure the pickup coil peak voltage in the same manner as on the CDI unit coupler.

Tester knob indication : voltage (v)
Pickup coil primary peak voltage : More then 4 V

Multi circuit tester set (DM 200)

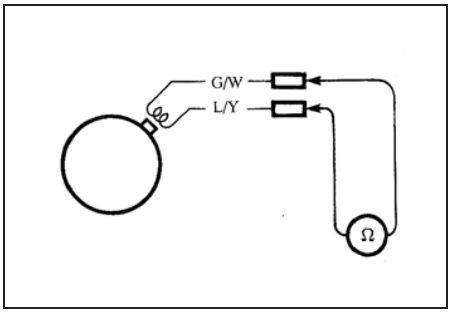
If the peak voltage on the pickup coil coupler is within specification, but on the CDI unit coupler is not within specification, replace the wire harness with a new one. If both peak voltage are out of specification, replace the pickup coil with a new one.



PICKUP COIL RESISTANCE

- Remove the right side frame cover.
- Disconnect the generator coupler

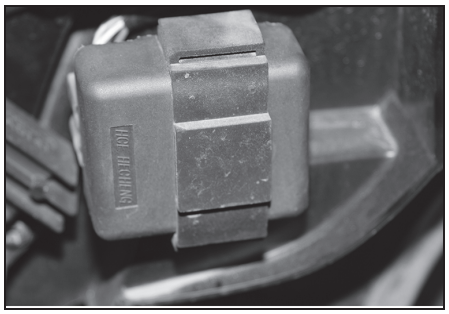
Measure the resistance between the lead wire using the multi circuit tester(DM 200). It the resistance is not within the specified value, the pickup coil must be replaced.



09900-25002: Pocket tester
Tester knob indication: Resistance (Ω)

Ignition coil resistance: 180 - 280 Ω
(Blue with yellow - Green with white)

CDI UNIT



- Remove the left leg side shield/left frame cover. (See page 5-1.)
- Disconnect the CDI unit coupler.

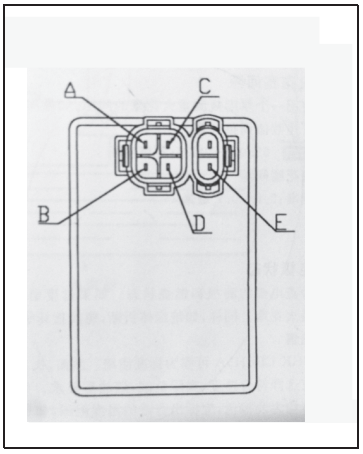
Measure the resistance between the terminals. If the resistance is infinity or less than the specifications, the CDI unit must be replaced.

NOTE:

As capacitor, thyristors, diodes, etc. are used inside this CDI unit, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.

09900-25002 : Pocket tester

Tester knob indication: X1 kΩ range



Unit: Approx. KΩ

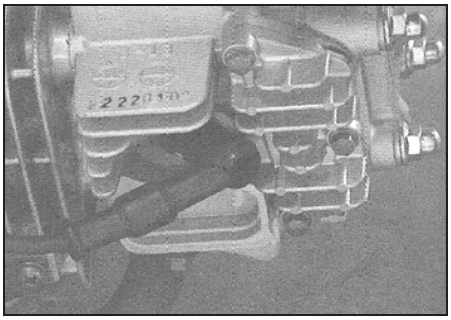
⊖Probe of tester	⊕Probe of tester						
		(A)	(B)	(C)	(D)	(E)	
	(A)		**90-120**	∞	80-120	250-400	
	(B)	**30-50**		∞	**0**	**11-20**	
	(C)	∞	∞		0.6-1.0	∞	
	(D)	30-50	**0**	∞		11-20	
	(E)	80-120	**11-20**	∞	11-20		

CON: When the capacitor is discharged state, the needle of tester swings first then return to infinity (∞).

NOTE:

If not sparking at spark plug gap, replace the CDI unit or inspect the magneto coil, ignition coil, spark plug and battery. If the magneto pick-up coil, ignition coil, spark plug and battery checked are correct, the CDI unit may be faulty, replace the CDI unit with a new one.

SPARK PLUG



• Remove the spark plug.

09930-10121: Spark plug socket wrench set

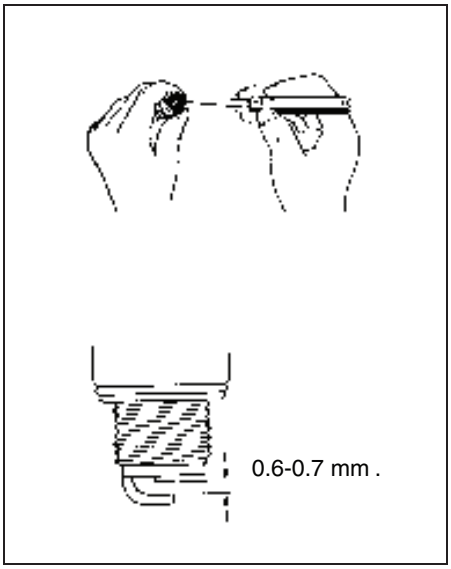
Carbon Deposit

Check to see the carbon deposit on the plug.
If the carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.

Spark Plug Gap

Measure the plug gap with a thickness gauge if it is correct. If not, adjust it to the following gap.

09900-20803: Thickness gauge



Spark plug gap
Standard: 0.6-0.7 mm

Electrode's Condition

Check to see a worn or burnt condition of the electrode. If it is extremely worn or burnt, replace the plug. Also replace the plug if it has broken insulator, damaged thread, etc.

Heat Range

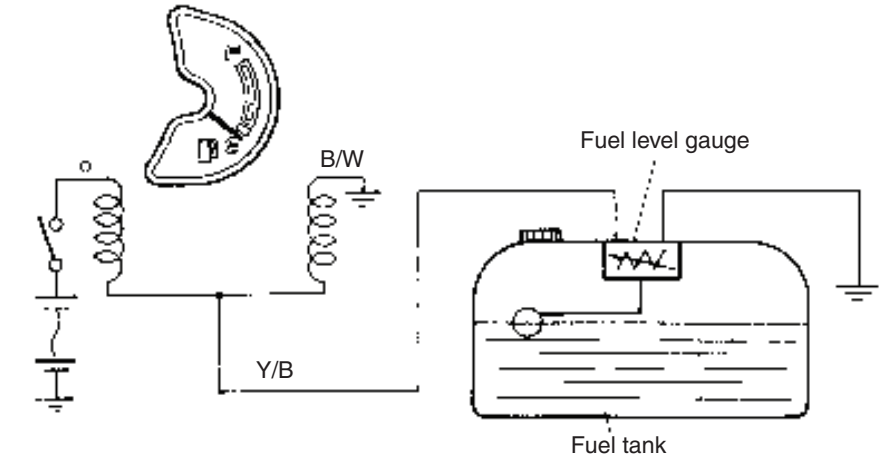
NGK C 6 HS should be used as the standard. However, the heat range of the spark plug should be selected to meet the requirements of speed, actual load, fuel and etc. Proper heat range would be indicated if all insulators were LIGH BROWN in color. If they are baked white, they should be replaced with a cold type plug NGK C 7 HS or NIPPONDENSO U 22 FS-U

	Standard	Cold type
NGK	C 6 HS	C 7 HS
NIPPON DENSO	U 20 FS-U	U 22 FS-U

CAUTION

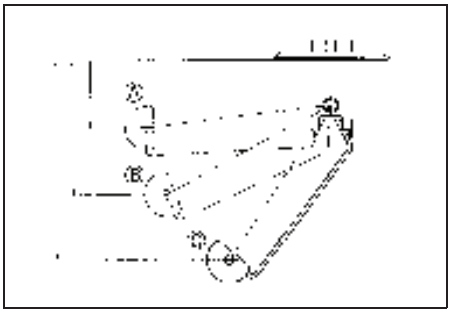
Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

FUEL METER
FUEL METER CIRCUIT



O : Orange
B/W: Black with White tracer
Y/B : Yellow with Black tracer

INSPECTION
FUEL LEVEL GAUGE



• Remove the fuel level gauge. (See page 4-3).

Check the resistance of each float position with a pocket tester.
If the resistance measured is incorrect, replace the fuel gauge assembly with new one.
The relation between the position of the fuel gauge float and resistance is shown in the following table.

Float position	Height	Resistance
A Full	39.3 mm	4-10 Ω
B ½	74.5mm	38 Ω
C Empty	135.2 mm	90-100 Ω

09900-25002: Pocket tester

Tester knob indication: X1Ω range

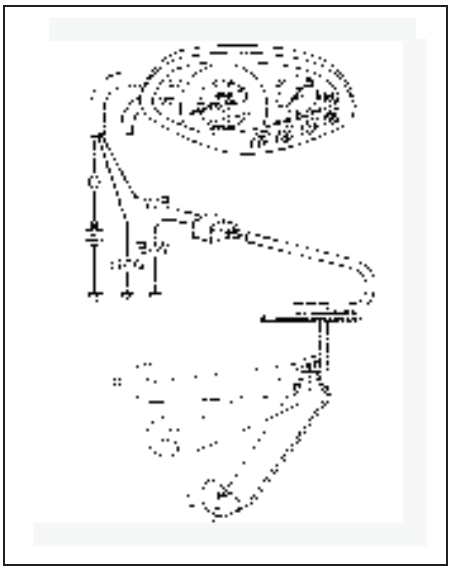
FUEL METER

• Disconnect the fuel level gauge lead wire coupler.
(See page 4-3).

To test the fuel meter two different checks may be used. The first connect a jumper wire between B/W and Y/B wires coming from the main wiring harness. With the ignition switch turned ON, the fuel meter should indicate “F”.

Fuel meter is normal if its pointer indicates the E (empty) position when the specified resistance is applied to the circuit and if its pointer indicates the F (full) position when the resistor is changed to 4-10 ohms. If either one or both indicator are abnormal, replace the fuel meter with a new one.

Resistance	4-10 Ω	90-100 Ω
Float position	Full	Empty



O : ORANGE
B/W: BLACK WITH WHITE TRACER
Y/B : YELLOW WITH BLACK TRACER

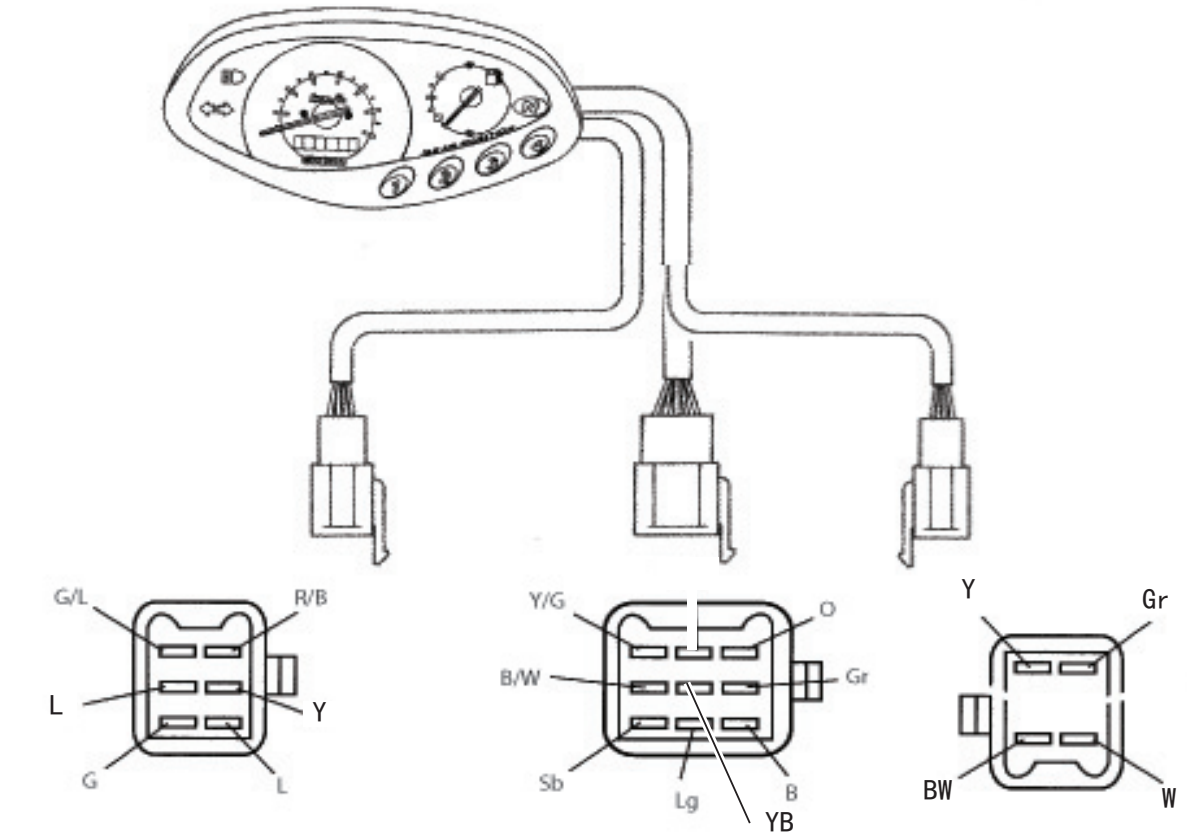
CAUTION

When inspection the gauge resistance, be sure to disconnect the battery lead wire, or a pocket tester may be damaged.

COMBINATION METER

REMOVAL AND DISASSEMBLY

• Remove the combination meter.
• Disassemble the combination meter as follows.



G/L : GREEN WITH BLUE TRACER
Y/L : YELLOW WITH BLUE TRACER
W : WHITE
Y/W : YELLOW WITH WHITE TRACER
Y/B : YELLOW WITH BLACK TRACER
B/W : BLACK WITH WHITE TRACER
Y/G : YELLOW WITH GREEN TRACER
Sb : LIGHT BLUE

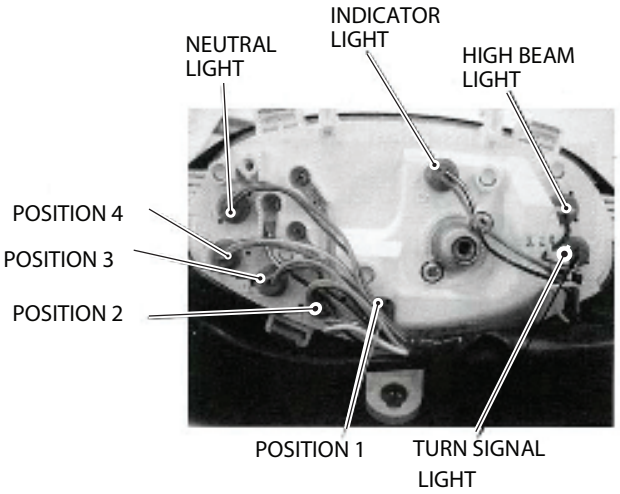
INSPECTION

Using the pocket tester, check the continuity between lead wires.
If the continuity measured is incorrect, replace the respective parts.

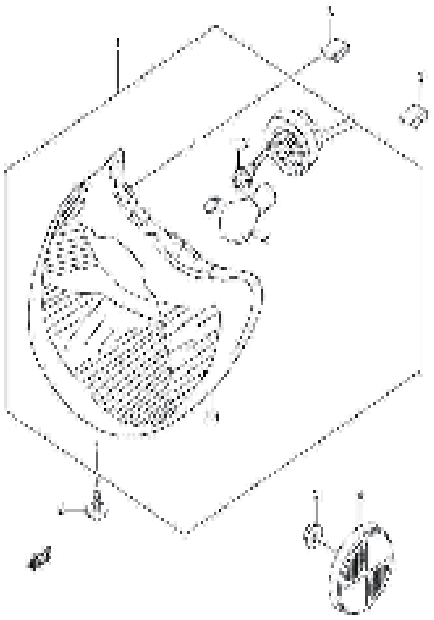
09900-25002: Pocket tester

Tester knob indication: X 1Ω range

NOTE:
When making this test, it is not necessary to remove the combination meter.

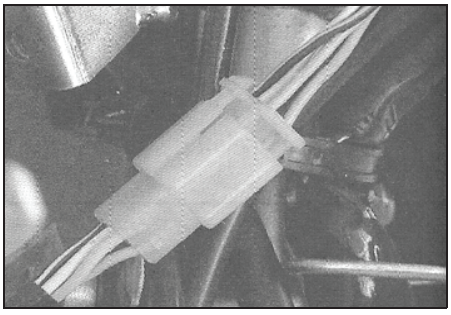


LAMPS
HEADLIGHT AND TURN SIGNAL LIGHT



1-1 HEADLAMP ASSY
1-2 HEADLAMP ASSY
2 SCREW, HEADLAMP
3 CLIP, HEADLAMP
4 REFLECTOR ASSY, FRONT
5 NUT

HEADLIGHT BULB REPLACEMENT
- Remove the front handlebar's cover.
- Push in on the bulb socket, turn it to the left, and pull it out
- Remove the headlight bulb.



CAUTION

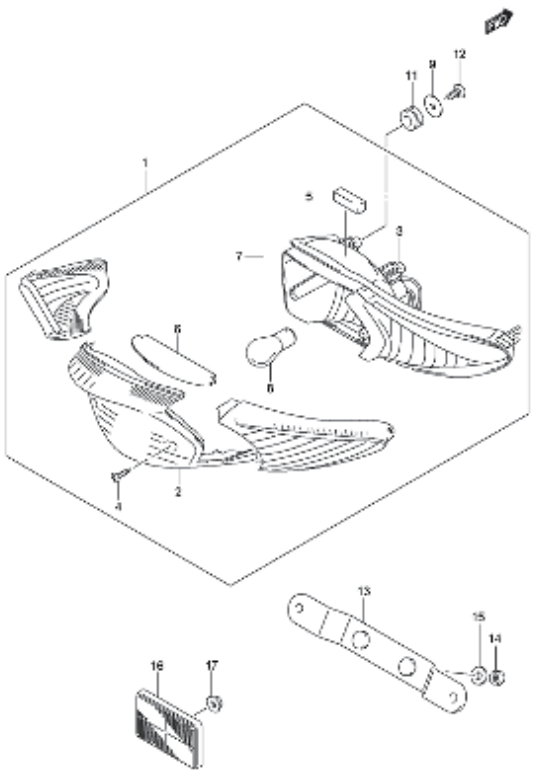
When replacing the headlight bulb , do not touch the glass. Grasp the new bulb with a clean cloth.

TURN SIGNAL LIGHT BULB REPLACEMENT
- Remove the turn signal light lenses.
- Pull out each bulb.

CAUTION

Do not overtighten the lens fitting screws.

TAIL/BRAKE LIGHT AND TURN SIGNAL LIGHT



1	LAMP ASSY, REAR COMB
2	LENS, REAR LAMP
3	SOCKET & CORD
4	SCREW
5	CUSHION
6	LENS, LICENSE LAMP
7	GASKET, LENS
8	BULB
9	WASHER
10	CUSHION
11	CUSHION
12	SCREW
13	BRACKET, LICENSE PLATE
14	NUT, LICENSE
15	WASHER
16	REFLEX REFLECTOR ASSY
17	NUT

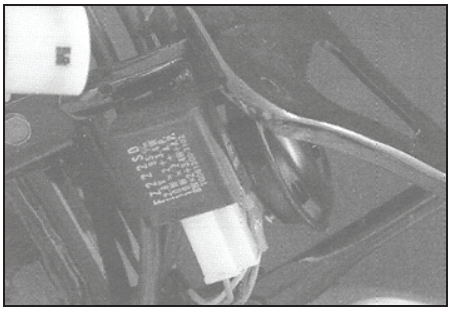
TAIL / BRAKE LIGHT BULB AND TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the tail/brake light lens and turn signal lens.
- Push in on the bulb, turn it to the left, and pull it out.

CAUTION

Do not over tighten the lens fitting screws.

TURN SIGNAL RELAY



The turn signal relay ① is located the front stem side. If the turn signal light does not light. Inspect the bulb or repair the circuit connection.

If the bulb and circuit connection checked are correct, the turn signal relay may be faulty, replace it with a new one.

NOTE:

Be sure that the battery used is in full-charged condition.

SWITCHES

Inspect each switch for continuity with the pocket tester. If any abnormality is found, replace the respective switch assemblies with new ones.

09900-25002: Pocket tester

Tester knob indication: X 1Ω range

IGNITION SWITCH

Position \ Color	R	O
OFF		
ON	●	●

HORN BUTTON

Position \ Color	G	B/W
●		
PUSH	●	●

LIGHTING SWITCH

Position \ Color	R	O
OFF		
ON	●	●

FRONT BRAKE SWITCH

Position \ Color	O	W/B
OFF		
ON	●	●

DIMMER SWITCH

Position \ Color	YW	W	Y
HI	●		●
LO	●	●	

REAR BRAKE SWITCH

Position \ Color	O	W/B
OFF		
ON	●	●

TURN SIGNAL SWITCH

Position \ Color	Lg	Sb	B
L		●	●
PUSH			

GEAR POSITION INDICATION SWITCH

Position \ Color	GROUND	L	W/L	R/B	G/L	Y/L
N	●	●				
1	●		●			
2	●			●		
3	●				●	
4	●					●

STARTER BUTTON

Position \ Color	O	Y/G
OFF		
ON	●	●

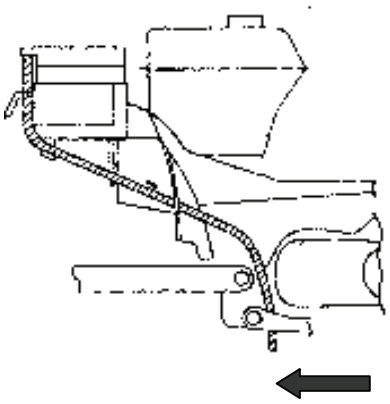
WIRE COLOR

B	: Black	R	: Red
L	: Blue	Lg	: Light green
G	: Green	O	: Orange
Gr	: Gray	Y	: Yellow
Sb	: Light blue	W	: White
B/W	: Black with White tracer	G/L	: Green with Blue tracer
R/B	: Red with Black tracer	W/B	: White with Black tracer
W/Y	: White with Yellow tracer	Y/L	: Yellow with Blue tracer
Y/W	: Yellow with White tracer	Y/G	: Yellow with Green tracer

BATTERY
SPECIFICATIONS

Item	Electric starter with kick starter type	Kick starter type
Type designation	YB 5L-B	GM3 –3B
Capacity	12V 15kC (5Ah/10 HR)	12V 10.8 kC (3Ah/10HR)
Standard Electrolyte S.G.	1.28 at 20 °C	1.26 at 20 °C

In fitting the battery to the motorcycle, connect the breather Pipe to the battery vent.

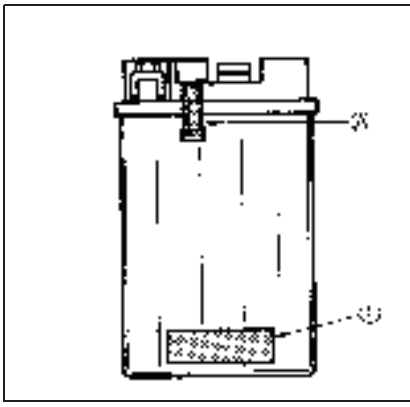


BATTERY BREATHER HOSE

INTIAL CHARGING

Filling electrolyte

Remove the short sealed tube “A” before filling electrolyte. Fill the battery with electrolyte (dilute sulfuric acid solution with acid concentration of 35.0% by weight, having a specific gravity of 1.28 at 20 °C up to indicated UPPER LEVEL. Electrolyte should be always cooled below 30 °C before filling into battery. Leave battery standing for half an hour after filling. Add additional electrolyte if necessary. Charge battery with current as described in the tables shown below.



Maximum charging current: 0.5 A… YB5L –B
0.3 A .. GM3-3B

Charging time

The charging time for a new battery is determined by the number of months that have elapsed since the date of manufacture. Confirmation for date of manufacture Date of manufacture is indicated by a three-part number ①, as shown in the photograph, each indicating month, date and year. Near the end of charging period, adjust the specific gravity of electrolyte to value specified. After charging ,adjust the electrolyte level to the UPPER LEVEL with DISTILLED WATER

SERVICING

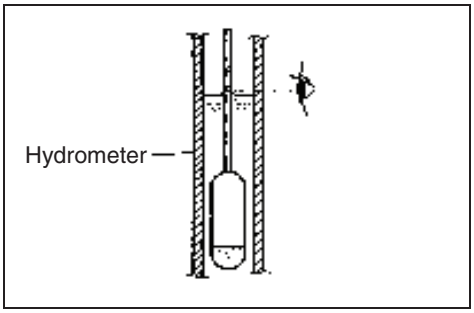
Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

Check the electrolyte level and add distilled water, as necessary to raise the electrolyte to each cell's UPPER level. Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.22 (YB5L-B) or less/1.20 (GM3-3B) or less, as corrected to 20 °C, it means that the battery is still a run-down condition and needs recharging.

NOTE:

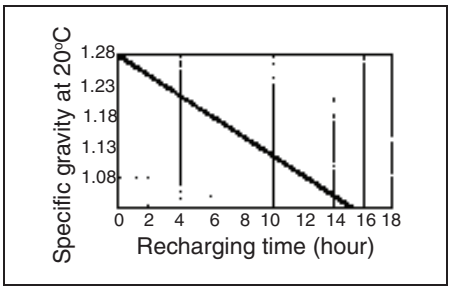
First, remove the ⊖ lead wire.

Months after Man-ufacturing	Within 6	Within 9	Within 12	Within 12
Necessary charging hours	20	30	40	60

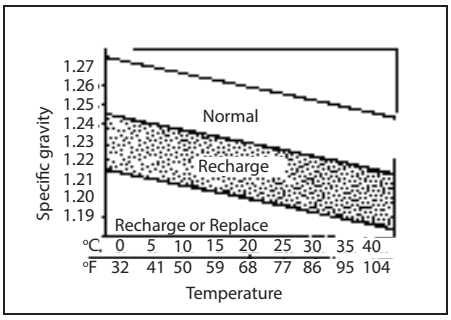


RECHARGING OPERATION

To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduation on the float scale bordering on the meniscus (curved-up position of electrolyte surface), as shown in figure. Check the reading (as corrected to 20 °C) with chart to determine the recharging time in hour by constant-current charging (which is tenth of the capacity of the present battery). Be careful not to permit the electrolyte temperature to exceed 45 °C, at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification



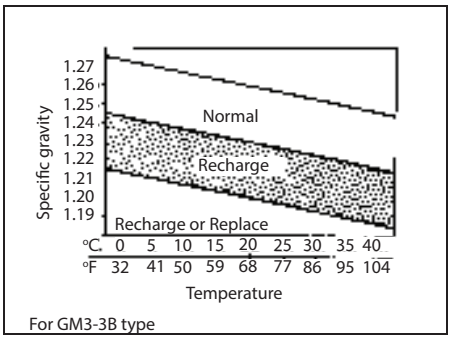
Electrolyte specific gravity: 1.28 at 20 °C ..YB5L –B
FD 110 （XB517QD)
1.26 at 20 °C ..GM3- 3B
FD 110 （XB517QSC）



CAUTION

Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery.

099000-28403: Hydrometer



For GM3-3B type

SERVICE LIFE

Lead oxide is applied to the pole plates of the battery which will come off gradually during the service. When will come off gradually during the sediment, the battery can not be used any more. If the battery is not charged for a long time, lead sulfate is generated on the surface of the pole plates and will deteriorate the performance (suifation). Replace the battery with new one in such a case. When a battery is left for a long tem without using , it is apt to subject to sulfation. When the motorcycle is not used for more than 1 month (especially during the winter season), recharge the battery once a month at least.

⚠ WARNING

*** Before charging a battery, remove the seal cap from each cell.**
*** Keep fire and sparks away from a battery being charged.**
*** When removing a battery from the motorcycle, be sure to remove the ⊖ terminal first.**

SERVICING INFORMATION

CONTENTS

TROUBLESHOOTING
ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Out of adjustment valve clearance.	Adjust.
	2. Worn valve guides or poor seating of valves.	Repair or replace.
	3. Mistiming valves.	Adjust.
	4. Excessively worn piston rings.	Replace.
	5. Worn-down cylinder bore.	Replace or rebore.
	6. Too slowly starter motor cranks.	See electrical section.
	7. Poor seating of spark plug.	Retighten.
	Plugs not sparking	
	1. Fouled spark plug.	Clean.
	2. Wet spark plug.	Clean and dry.
	3. Defective ignition coil.	Replace.
	4. Open or short in high-tension cord.	Replace.
	5. Defective pick-up coil or CDI unit.	Replace.
	No fuel reaching the carburetor	
	1. Clogged fuel tank air-vent hose.	Clean.
	2. Clogged or defective tap.	Clean or replace.
	3. Defective carburetor needle valve	Replace.
	4. Clogged fuel hose, fuel filter or vacuum hose.	Clean or replace.
Engine stalls easily.	1. Fouled spark plug.	Clean.
	2. Defective pick-up coil or CDI unit.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Clogged jets in carburetor.	Clean.
	5. Out of adjustment valve clearance.	Adjust.
Noisy engine.	**Excessive valve chatter**	
	1. Too large valve clearance.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Worn rocker arm or cam surface.	Replace.
	4. Worn and burnt camshaft journal.	Replace.
	Noise seems to come from piston	
	1. Worn down piston or cylinder.	Replace.
	2. Fouled with carbon combustion chamber.	Clean.
	3. worn piston pin or position pin bore.	Replace.
	4. Worn piston rings or ring grooves.	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Not working tension adjuster.	Repair or replace.
Complaint	**Symptom and possible causes**	**Remedy**

	Noise seems to come from clutch 1. Worn or slipping clutch shoe. 2. Worn or slipping clutch drive plate.	 Replace. Replace.
	Noise seems to come from crankshaft **1. Due to wear ratting bearings.** **2. Worn and burnt big-end bearing.** **3. Worn and burnt journal bearings.** **4. Too large thrust clearance.**	 Replace. Replace. Replace. Replace. Or adjust Thrust shim
Noisy engine.	**Noise seems to come from transmission** 1. Worn or rubbing gears. 2. Badly worn splines. 3. Badly worn bearings. 4. Primary gears worn or rubbing.	 Replace. Replace. Replace. Replace.
Slipping clutch.	1. Worn or damaged clutch shoes. 2. Weakened clutch shoe springs. 3. Worn clutch housing.	Replace. Replace. Replace.
Turning throttle grip upward makes the engine pick up speed in the normal manner, but the cycle will not pick up speed.	1. Slipping first clutch. 2. Slipping gear shifting clutch.	Replace clutch shoe. Adjust or replace.
Transmission will not Shift.	1. Broken gearshift cam. 2. Distorted gearshift forks. 3. Worn gearshift pawl.	Replace Replace Replace
Transmission will not shift back.	1. Broken return spring on shift shaft. 2. Shift shafts are rubbing or sticky. 3. Distorted or worn gearshift forks.	Replace Replace Replace
Transmission jumps Out of gear.	1. Worn shifting gears on driveshaft or countershaft. 2. Distorted or worn gearshift fork. 3. Weakened cam stopper spring of gearshift cam. 4. Worn gearshift pawl.	Replace Replace Replace Replace
Engine idles poorly.	1. Out of adjustment valve clearance. 2. Poor seating of valves. 3. Defective valve guides. 4. Worn rocker arm or cam surface. 5. Too wide spark plug gap. 6. Defective ignition coil. 7. Defective pick-up coil or CDI unit. 8. Out of adjustment in carburetor float- chamber fuel level.	Adjust. Replace or repair. Replace. Replace. Adjust or replace. Replace. Replace. Adjust
Complaint	**Symptom and possible causes**	**Remedy**

	9. Spark plug too cold. 10. Clogged jets in carburetor. 11. Deflective magneto.	Replace by hot type Plug. Clean. Replace.
Engine runs poorly in high speed rage.	1. Weakened valve springs. 2. Worn camshaft or rocker arms. 3. Valve timing out of adjustment. 4. Too narrow spark plug gap. 5. Ignition not advanced sufficiently due to poorly working timing advance circuit. 6. Defective ignition coil. 7. Defective pick-up coil or CDI unit. 8. Too low float-chamber fuel level. 9. Clogged air cleaner element. 10. Clogged fuel hose, resulting in inadequate fuel supply to carburetor.	Replace. Adjust. Adjust. Adjust. Replace CDI unit. Replace. Replace Adjust. Clean. Clean and prime.
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine. 2. Worn piston rings or cylinder. 3. Worn valve guides. 4. Scored or scuffed cylinder wall. 5. Worn valves or stems. 6. Defective stem seals. 7. Worn oil ring side rails.	Drain out excess oil Replace. Replace. Rebore or replace Replace. Replace. Replace.
Engine lacks power.	1. Loss of valves clearance. 2. Weakened valve springs. 3. Out of valve timing adjustment. 4. Worn piston rings or cylinder. 5. Poor seating of valves. 6. Fouled spark plug. 7. Incorrect spark plug. 8. Clogged jets in carburetor. 9. Out of float-chamber fuel level adjustment. 10. Clogged air cleaner element. 11. Sucking air from intake pipe. 12. Too much engine oil. 13. Worn rocker arms or shafts.	Adjust. Replace. Adjust. Replace. Repair. Clean or replace. Adjust or replace. Clean. Adjust. Clean. Retighten or replace. Drain out excess oil. Replace.
Engine overheats.	1. Heavy carbon deposit on piston crown. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Too low in float chambers fuel level. 5. Sucking air from intake pipe. 6. Use incorrect engine oil. 7. Clogged air intake with dust.	Clean. Add oil. Replace or clean. Adjust. Retighten or replace. Change. Clean.

Complaint	Symptom and possible causes	Remedy
Engine overheats.	1. Heavy carbon deposit on piston crown. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Too low in float chambers fuel level. 5. Sucking air from intake pipe. 6. Use incorrect engine oil. 7. Clogged air intake with dust.	Clean. Add oil. Replace or clean. Adjust. Retighten or replace. Change. Clean.

CLUTCH SLIPS OR DRAGS

Symptom		Possible cause	Remedy
Clutch slips	First clutch	1. Excessively worn clutch shoe.	Replace.
	Gear shifting clutch	1. Clutch out of adjustment. 2. Excessively worn clutch plates.	Adjust. Replace.
Clutch drags	First clutch	1. Erratic clutch weight movement.	Replace.
	Gear shifting Clutch	1. Too heavy oil. 2. Clutch out of adjustment.	Replace with proper Grade oil. Adjust.

HARD GEARSHIFTING

Symptom	Possible cause	Remedy
Engine runs but motorcycle will not start or run.	1. Damaged first clutch. 2. Gear shifting clutch out of adjustment. 3. Seized gears. 4. Damaged countershaft and driveshaft.	Replace clutch shoe. Adjust. Replace. Replace.
Gearshift point is too early.	1. Erratic clutch weight movement.	Replace clutch shoe.
Gearshift point too late.	1. Excessively worn clutch shoe.	Replace clutch shoe.
Trouble with starting.		

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	1. Clogged starter jet. 2. Clogged fuel pipe. 3. Starter plunger is not operating properly. 4. Starter plunger is not operating property. joint. 5. Not operation properly starter plunger. 6. Air leaking from a joint between starter body and carburetor.	Clean. Clean. Check and adjust. Check and adjust. Check and adjust. Or replace. Clean and retighten.
Idling or low-speed	1. Clogged or loose pilot jet, pilot air jet. 2. Air leaking from carburetor's joint or vacuum hose joint. 3 Clogged pilot outlet or by pass. 4. Not fully closed starter plunger.	Check and clean. Check and replace. Check and clean. Check and clean.

Complaint	Symptom and possible causes	Remedy
Medium-or high Speed trouble.	1. Clogged main jet or main air jet. 2. Clogged needle jet. 3. Not operating properly throttle valve. 4. Clogged fuel filter. 5. Clogged fuel tank air vent hose.	Check and clean. Check and clean. Check throttle valve For operation. Check and clean. Check and clean.
Overflow and fuel Level fluctuations.	1. Worn of damaged needle valve. 2. Broken spring in needle valve. 3. Not working properly float. 4. Foreign matter has adhered to needle valve. 5. Too high or low fuel level.	Replace. Replace. Check and adjust. Clean. Adjust float height.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering.	1. Over tightened steering stem nut. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires.	Adjust. Replace. Replace. Adjust.
Wobbly handlebars.	1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle or crooked tire.	Replace. Repair. or replace. Replace.
Wobbly front wheel.	1. Distorted wheel rim. 2. Worn front wheel bearings. 3. Defective or incorrect tire. 4. Loose axle nut. 5. Incorrect front fork oil level. 6. Loose wheel spoke.	Replace. Replace. Replace. Retighten. Adjust. Retighten.
Front suspension too soft.	1. Weakened springs. 2. Not enough fork oil.	Replace Replenish.
Front suspension too stiff.	1. Too viscous fork oil. 2. Too much fork oil.	Replace. Drain excess oil.
Noisy front suspension.	1. Not enough fork oil. 2. Loose bolts on suspension.	Replenish. Retighten.
Wobbly rear wheel exhaust smoke.	1. Distorted wheel rim. 2. Worn rear wheel bearing. 3. Defective o incorrect tire. 4. Worn swing arm bushing. 5. Loose axle nut or engine mounting nut. 6. Loosen wheel spokes. 7. Loosen nut or rear shock.	Replace. Replace. Replace. Replace. Replace. Replace. Replace.

Complaint	Symptom and possible causes	Remedy
Rear suspension too soft.	1. Weakened shock absorber spring. 2. Leakage oil of shock absorber.	Replace. Replace.
Noisy rear suspension	1. Loose bolts on shock absorber. 2. Worn swing arm bushing.	Retighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Worn disc. 4. Air in hydraulic system. 5. Worn shoe. 6. Friction surfaces of shoes are dirty with oil. 7. Excessively worn drum. 8. Too much brake lever play.	Repair or replace. Replace. Replace. Bleed air. Replace. Replace. Replace. Adjust.
Brake squeaking,	1. Carbon adhesion on pad surface. 2. Titled pad. 3. Damaged wheel bearing. 4. Loosen front-wheel axle or rear-wheel axle. 5. Worn pads. 6. Foreign material in brake fluid. 7. Clogged return port of master cylinder. 8. Brake shoe surface glazed. 9. Worn shoe.	Repair surface with sand-paper. Modify pad fitting or replace. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder. Repair surface with sand-paper. Replace.
Excessive brake lever stroke.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3 Improper quality of brake fluid. 4. Worn brake cam lever. 5. Excessively worn shoes and/or drum.	Bleed air. Replenish fluid to Specified level; bleed air. Replace with correct fluid. Replace. Replace.
Leakage of brake fluid.	1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup.	Tighten to specified torque. Replace. Replace piston and/or cup.
No sparking or poor become fouled with carbon.	1. Defective ignition coil or CDI unit. 2. Defective spark plug. 3 Defective pick-up coil.	Replace. Replace. Replace.

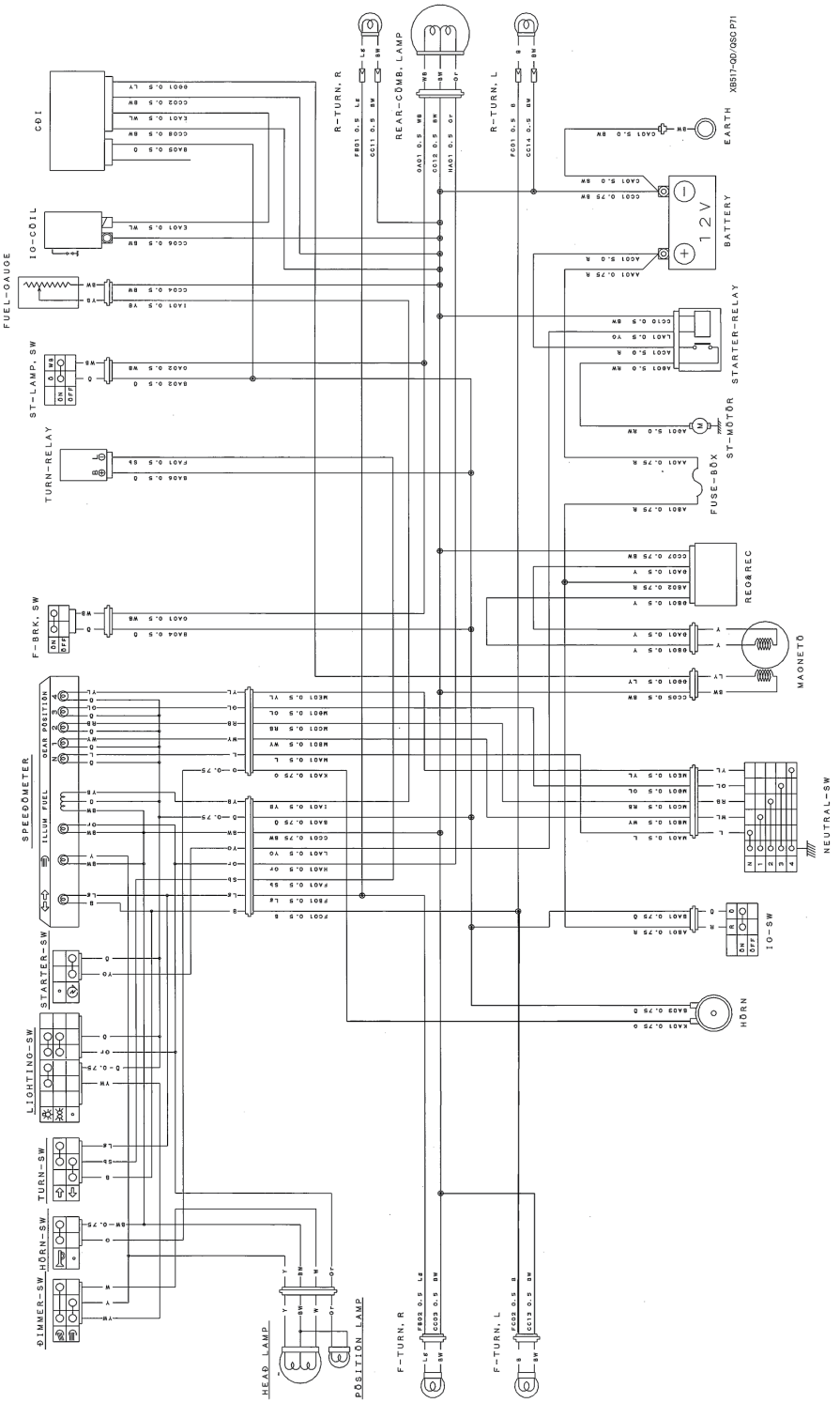
ELECTRICAL

Complaint	Symptom and possible causes	Remedy
	4. Loose connection of lead wire.	Connect/tighten.
Spark plug soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Too cold spark plug.	Adjust carburetor. Adjust carburetor. Change. Clean. Replace with hot type Plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Worn piston or cylinder. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal.	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Too hot spark plug. 2. Overheated the engine. 3. Loose spark plug. 4. Too lean mixture.	Replace with cold type plugs. Tune up. Retighten. Adjust carburetor.
Generator does not charge.	1. Open or short lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or punctured regulator/rectifier.	Repair or replace or retighten. Replace. Replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils or generator. 3. Defective regulator/rectifier. 4. Defective cell plates in the battery. 5. Not enough electrolyte in the battery.	Repair or retighten. Replace. Replace. Replace the battery. Add distilled water to the upper level.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Damaged or defective resistor element in the regulator/rectifier. 3. Poorly grounded regulator/rectifier.	Replace the battery. Replace. Cleaned and tighten ground connection.
Unstable charging	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Internally shorted generator. 3. Defective regulator/rectifier.	Repair or replace. Replace. Replace.
Starter button is not effective.	1. Run down battery. 2. Defective switch contacts. 3. Not seating properly brushes on commutator in starter motor. 4. Defective starter relay.	Repair or replace. Replace. Repair or replace. Replace.

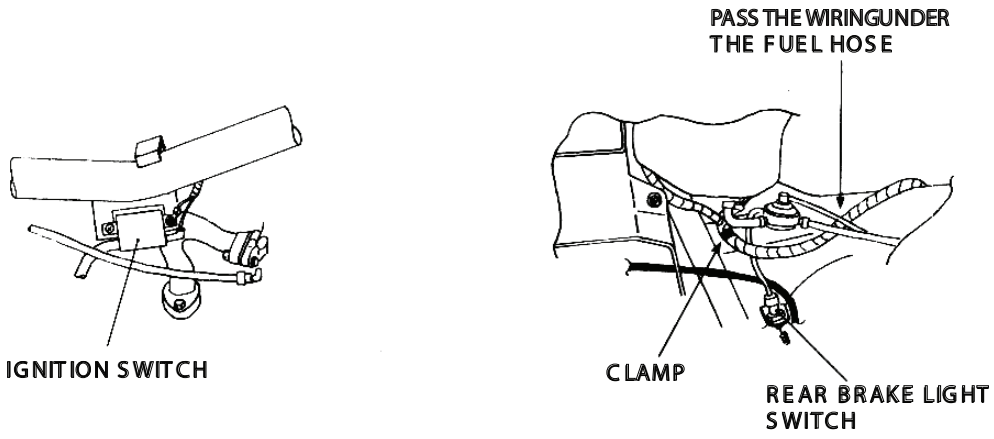
BATTERY

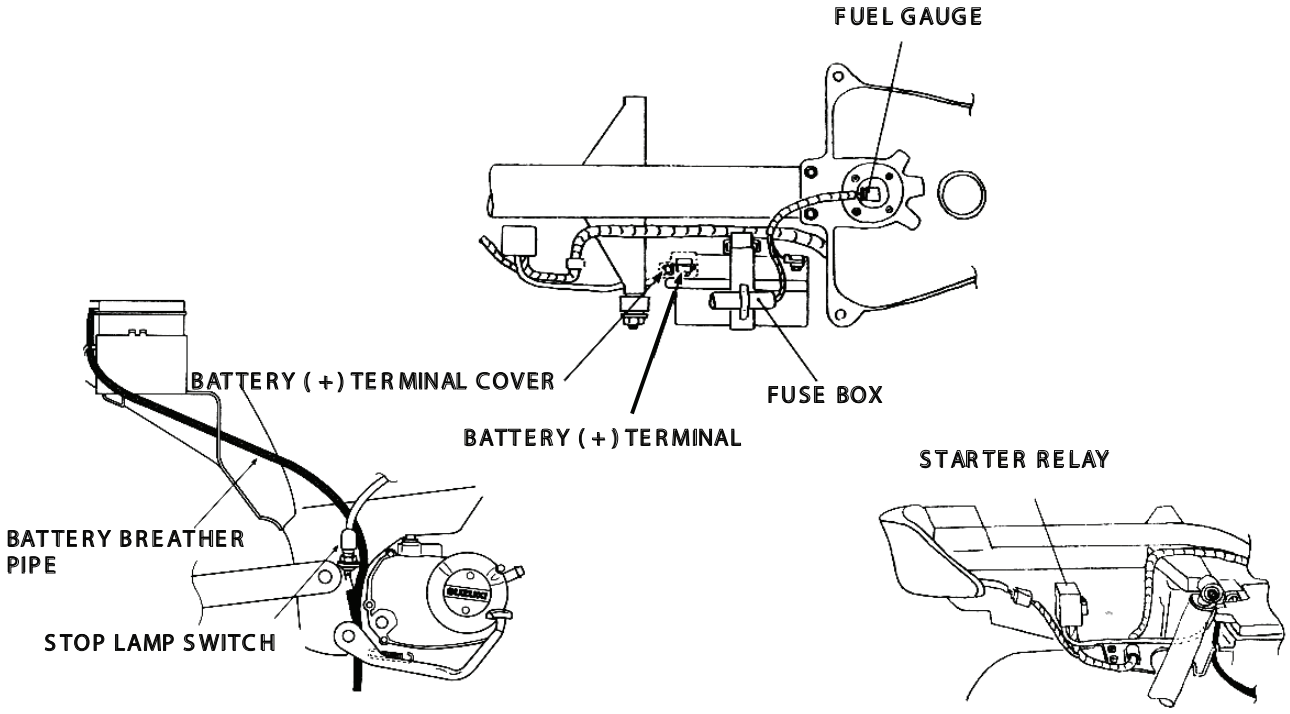
Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Not enough electrolyte. 2. Battery case is cracked. 3. Battery has been left in a run down condition for a long time. 4. Contaminated electrolyte (Foreign matter has entered the battery and become mixed with the electrolyte).	Add distilled water, if the battery has not bee n damaged and "sulfation" has not advanced too far, and recharge. Replace the battery. Replace the battery. If "sulfation" has not advanced too far, try to restored the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte S.G.
Battery runs down quickly.	1. The charging method is not correct. 2. Cell plates have lost much of their active material as a result of over charging. 3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte S.G. 4. Electrolyte S.G. is too low. 5. Contaminated electrolyte. 6. Battery is too old.	Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation. Replace the battery, and correct the charging system. Replace the battery Recharge the battery fully and adjust electrolyte, S.G. Replace the battery.
Reversed battery polarity.	The battery has been connected the wrong way round in the system, so that is being charged in the reverse direction.	Replace the battery and be sure to connect the battery properly.
Battery Sulfation"	1. Charging rate too low or too high. (When not in use battery should be recharged at least once a month to avoid sufation.) 2. Battery electrolyte excessive or insufficient, or its specified gravity too high or too low. 3. The battery left unused for too long in cold climate.	Replace the battery. Keep the electrolyte up the prescribed level, or adjust the S.G. by consulting the battery maker's directions. Replace the battery, if badly sulfated.
Battery discharges too rapidly. 1. Dirty container top and sides.	1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte S.G. is too high.	Clean. Change the electrolyte by consulting the battery maker's directions.

WIRING DIAGRAM FD 110 (XB517QSC/XB517QD)

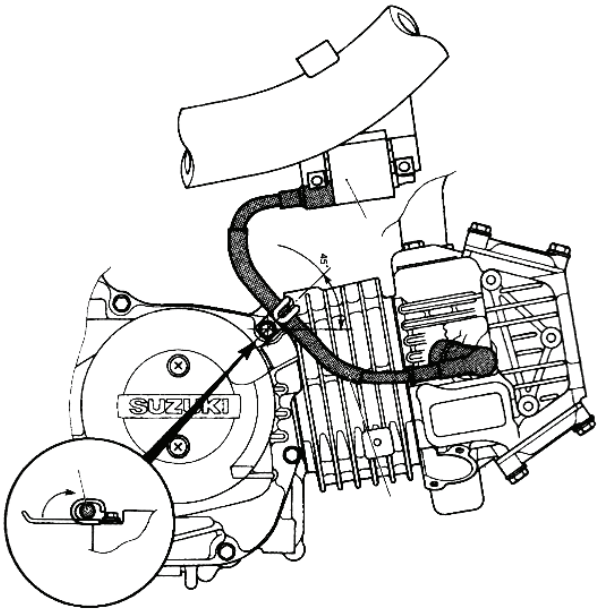


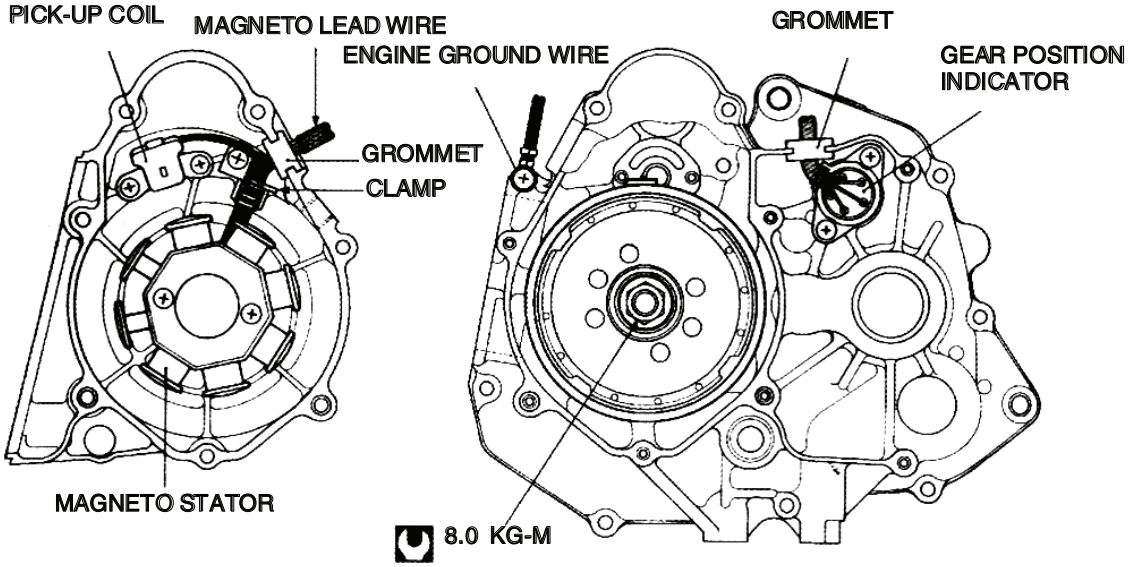
WIRE HARNESS, CABLE AND HOSE ROUTING
WIRE HARNESS ROUTING



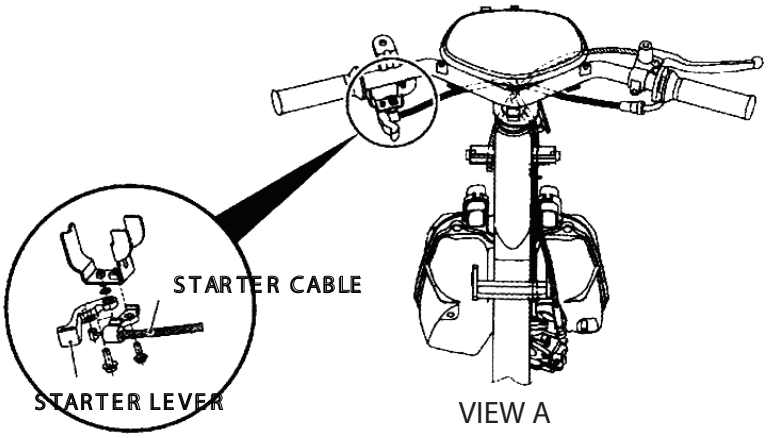


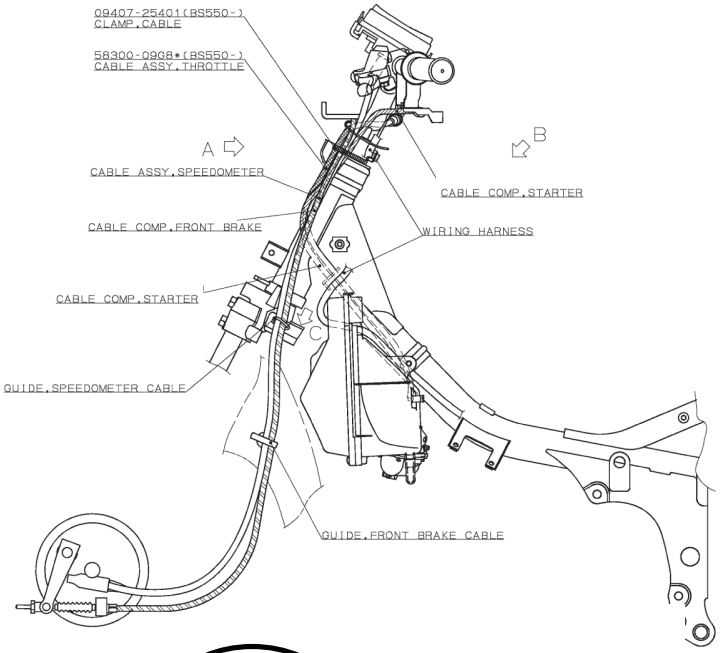
MAGNETO LEAD WIRE ROUTING

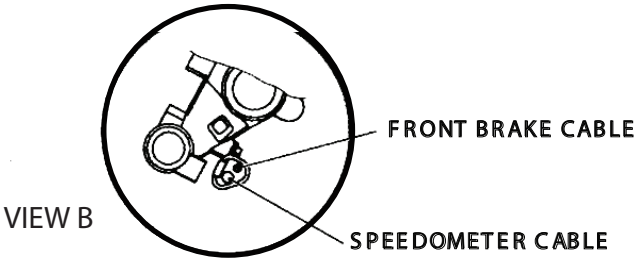




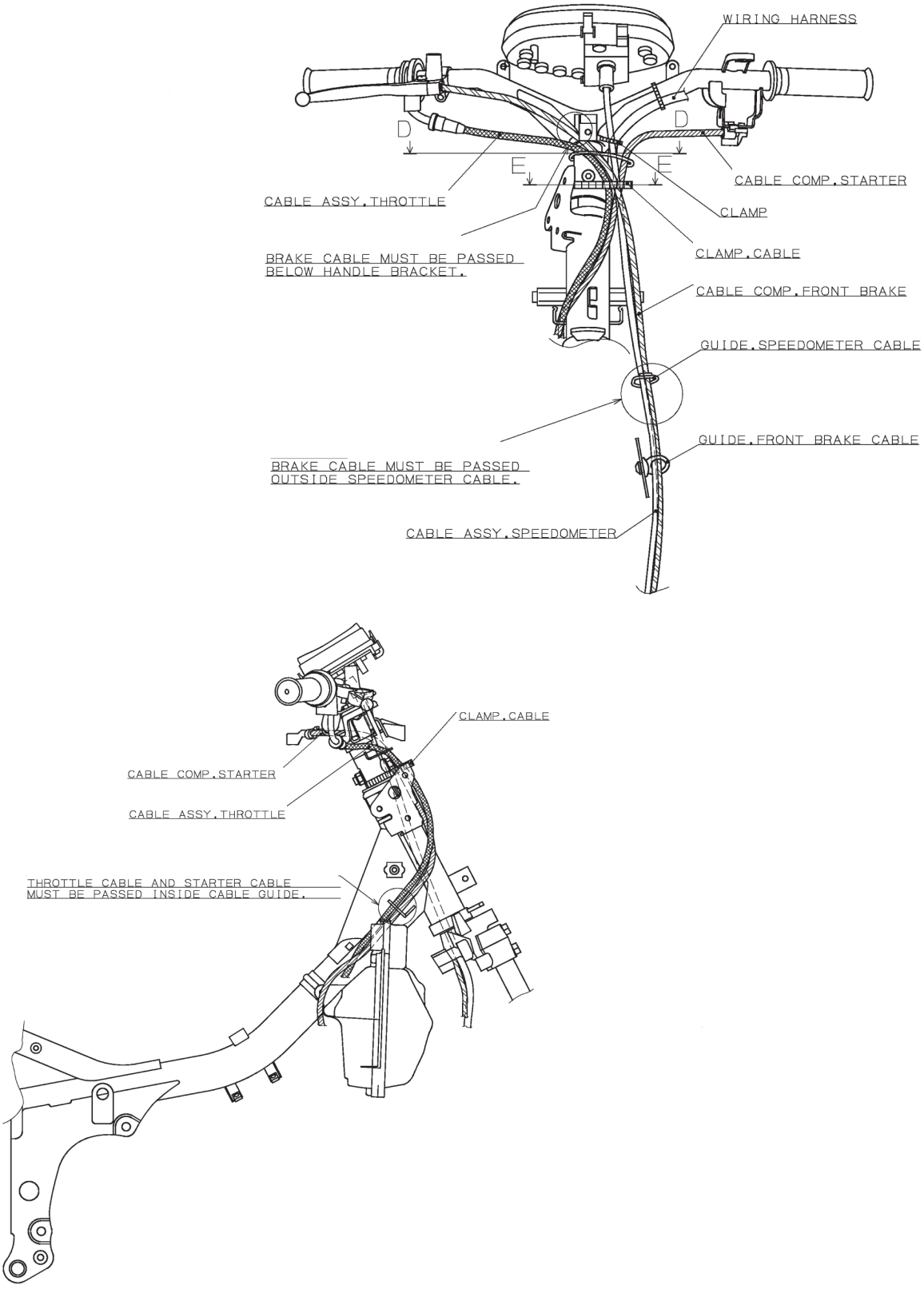
CABLE ROUTING



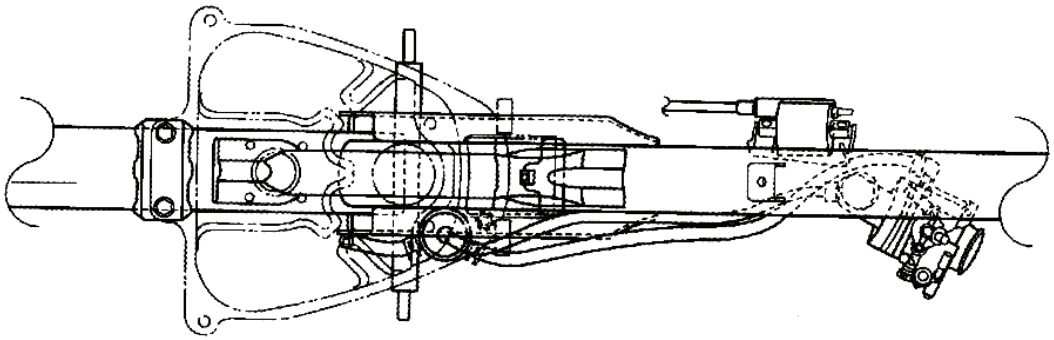


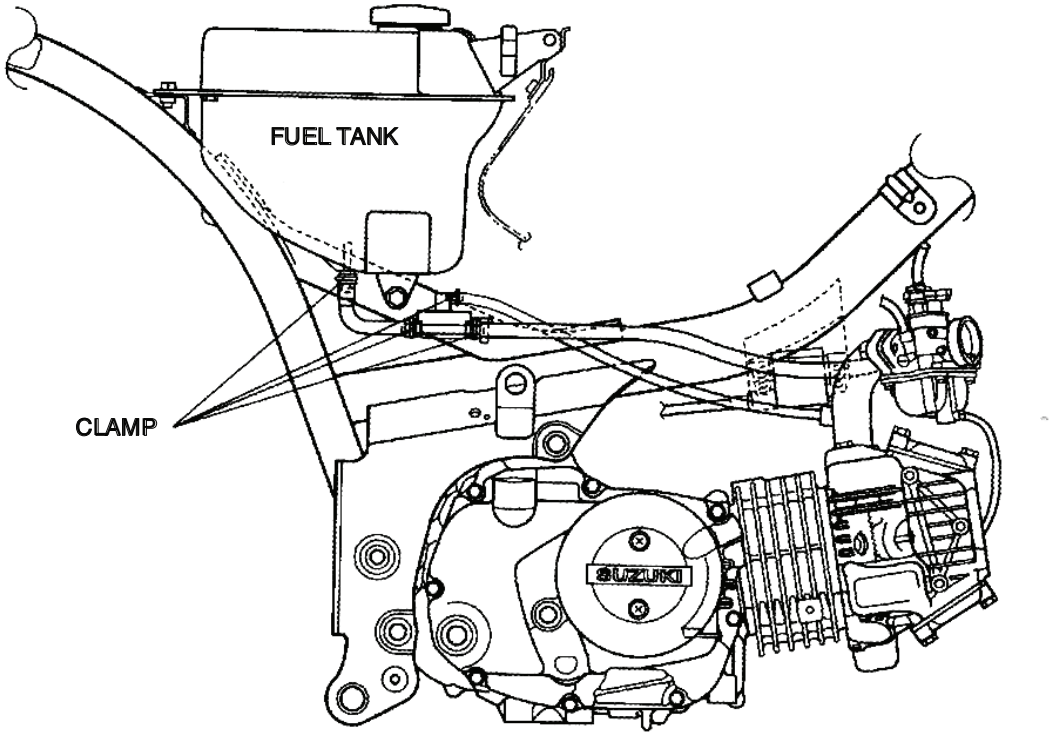


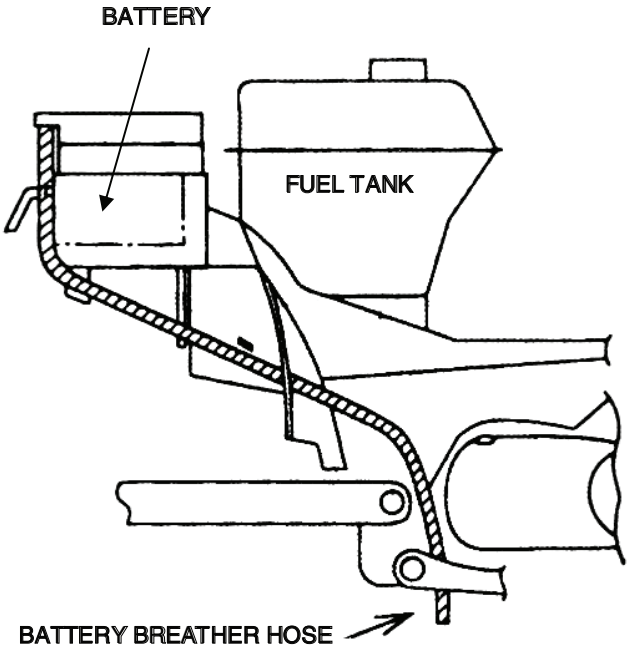
FRONT BRAKE HOSE ROUTING



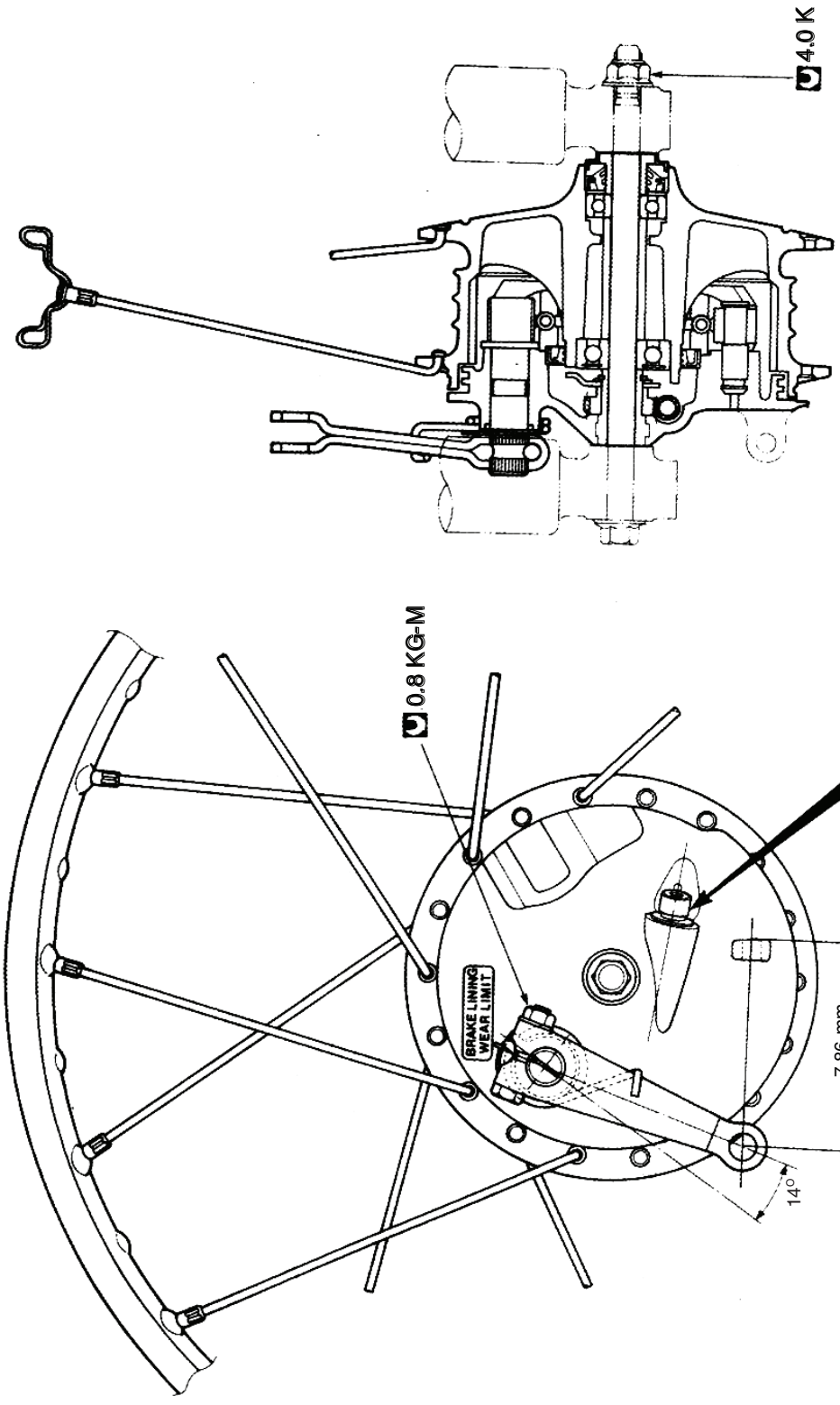
FUEL HOSE ROUTING



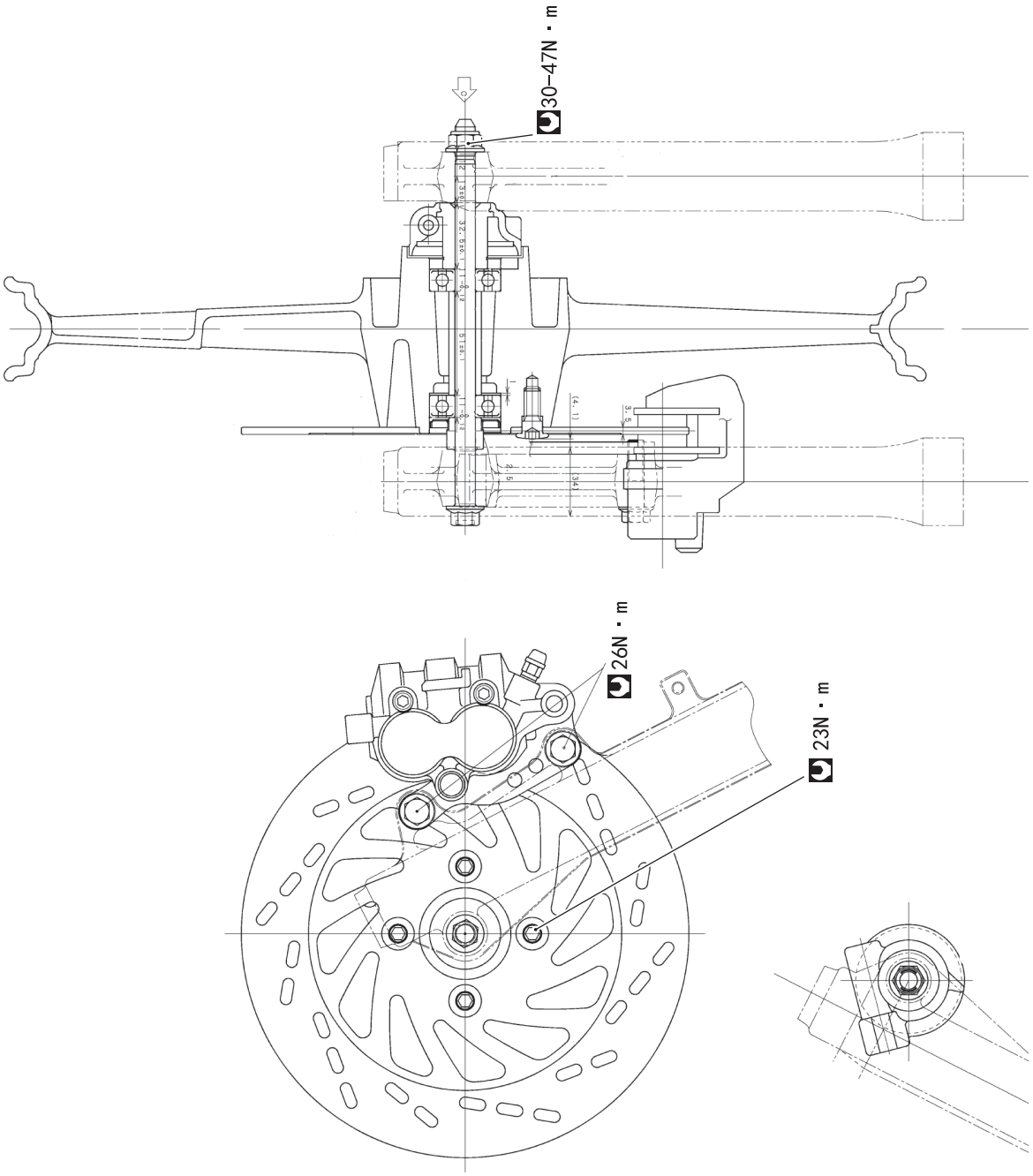



BATTERY
FUEL TANK
BATTERY BREATHER HOSE

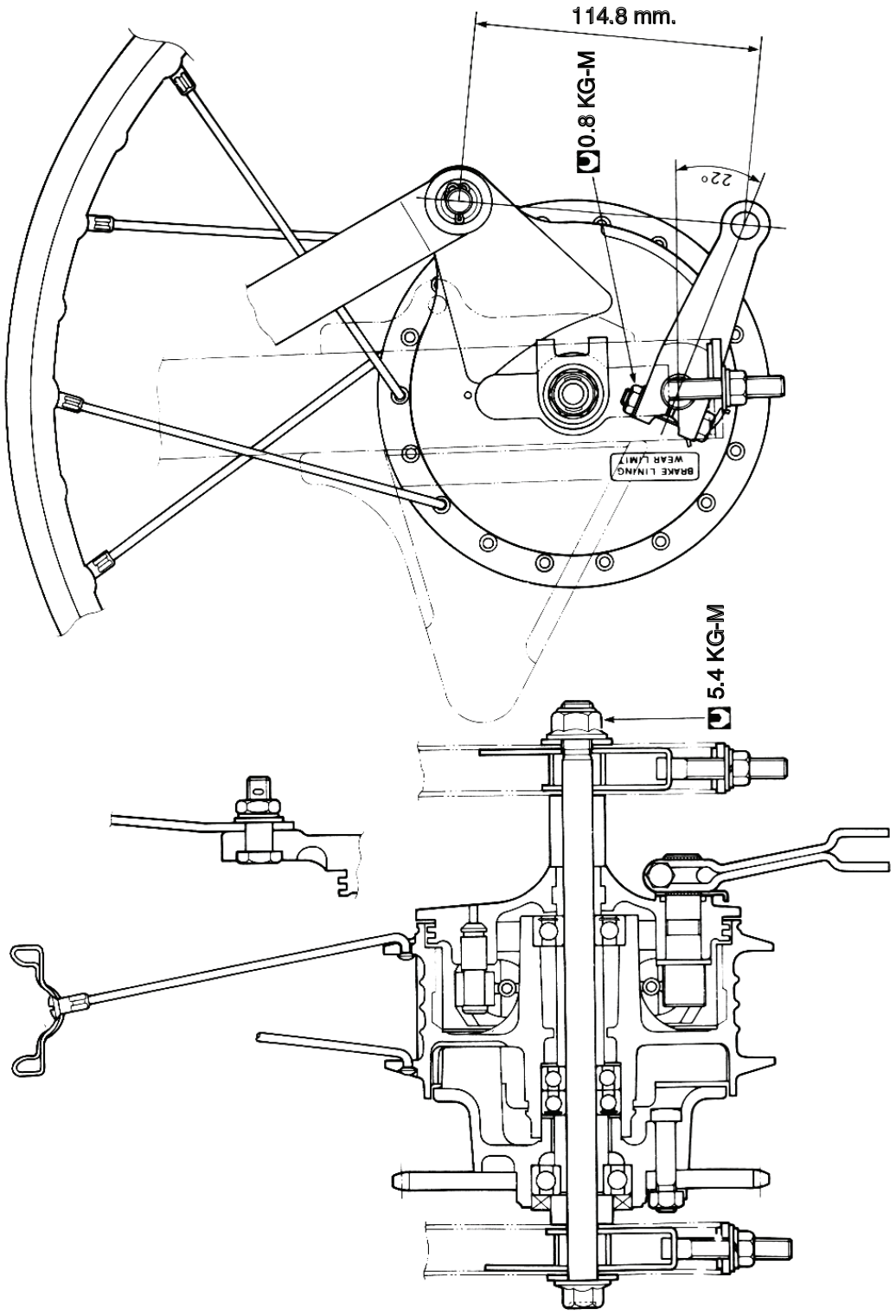
FRONT WHEEL SET UP (DRUM TYPE)



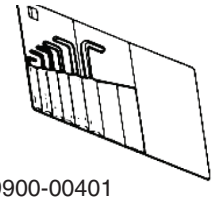
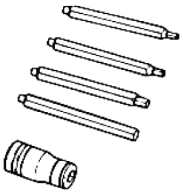
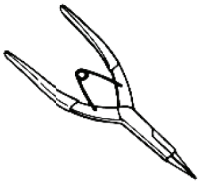
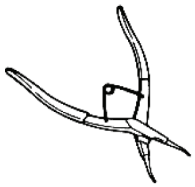
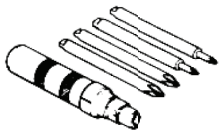
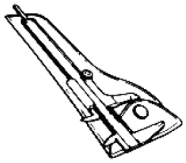
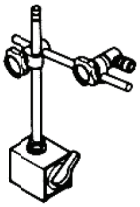
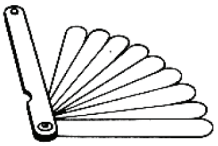
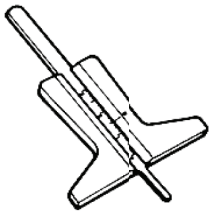
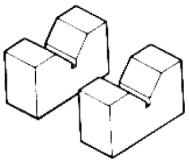
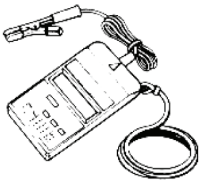
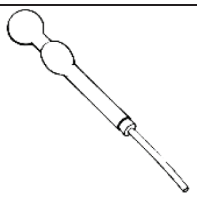
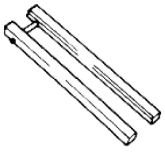
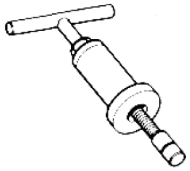
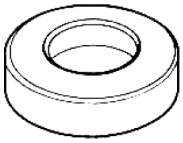
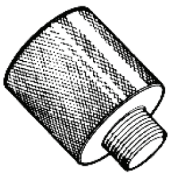
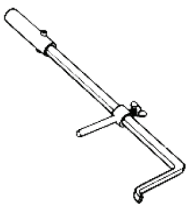
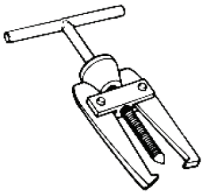
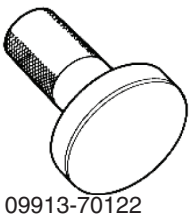
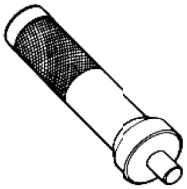
FRONT WHEEL SET UP (DISK TYPE)

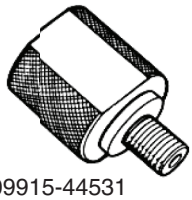
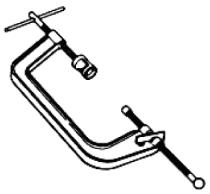
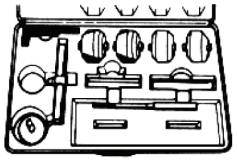
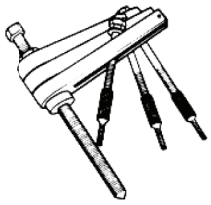
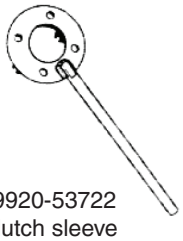
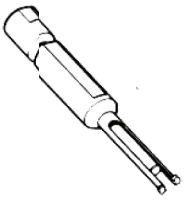
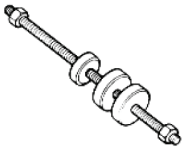
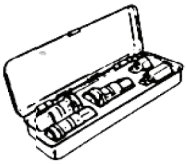
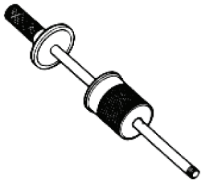
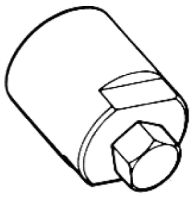
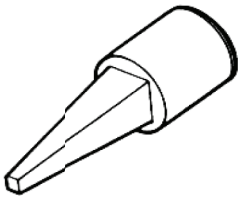


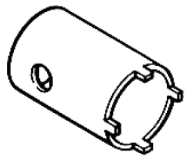
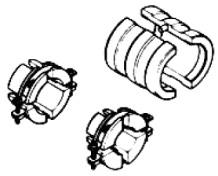
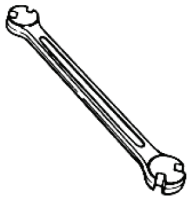
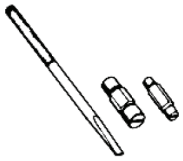
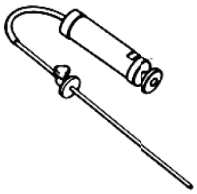
REAR WHEEL SET UP



SPECIAL TOOLS

 09900-00401 "L" type haxagon wrench set	 09900-00410 Hexagon wrench set	 09900-06107 Snap ring pliers	 09900-06108 Snap ring pliers	 09900-09003 Impact driver set
 09900-20101 Vernier calipers (1/20 mm, 150 mm)	 09900-20202 Micrometer (1/100 mm, 25-50 mm)	 09900-20203 Micrometer (1/100 mm, 50-75 mm)	 09900-20205 Micrometer (1/1000 mm, 0-25 mm)	 09900-20508 Cylinder gauge set (1/100 mm, 40-80 mm)
 09900-20605 Dial calipers (1/100 mm, 10-34 mm)	 09900-20606 Dial gauge (1/100 mm, 10 mm)	 09900-20701 Magnetic stand	 09900-20803 Thichness gauge	 09900-20805 Tire depth gauge
 09900-21304 V-block set (100 mm)	 0900-22302 Plastigauge	 09900-25002 Pocket tester	 0900-26006 Tacho meter	 0900-28108 Electro tester
 09900-28403 Hydrometer	 09910-20115 Con-rod holder	 09910-32812 Crankshaft installer	 09910-32820 Crankshaft installer spacer	 09910-60611 Universal clamp wrench
 09911-11310 Crankshaft installer attachment	 09913-50121 Oil seal remover	 09913-60910 Bearing puller	 09913-70122 09913-75520 Bearing installer	 09913-75821 Bearing installer

 09913-84510 Bearing installer	 09913-76010 09914-79610 Bearinginstaller	 09915-64510 Compression gauge 09915-63310 (Adaptor)	 09915-74510 Oil pressure gauge	 09915-44531 Oil pressure gauge adaptor
 09916-14510 Valve spring compressor	 09916-14521 Valve lifter attachment	 09916-21110 Valve seat cutter set	 09916-20630 Valve seat cutter head (n-126)	 09916-24311 Solid pilot (N-100-5.0)
 09916-34542 Valve guide reamer handle	 09916-34570 Valve guide reamer (5.0 mm)	 09916-34580 Valve guide reamer (10.8 mm)	 09916-44310 Valve guide remover/ installer	 09916-84511 Tweezers
 09917-14910 Vale clearance adjusting driver	 099-17-47910 Vacuum pump gauge	 09920-13120 Crankcase separator	 09920-53722 Clutch sleeve hub holder	 09921-20210 Bearing remover
 09922-55131 Bearing installer	 09923-74510 09923-73210 Bearing puller (17-20 mm)	 09924-84521 Bearing installer set	 09925-98221 Bearing installer	 09930-10121 Spark plug socket wrench set
 09930-30102 Sliding shaft	 09930-34951 Rotor remover	 09930-44550 Generator rotor holder	 09940-34520 T-Handle	 09940-34561 Front fork assembling tool attachment “D”

 09940-14920 Steering stem nut wrench	 09940-52860 Front fork oil seal installer set	 09940-51710 Steering race installer	 09940-60113 Spoke nipple wrench	 09941-34513 Steering outer race installer
 09941-50111 Bearing remover	 09941-74910 Steering bearing installer	 09943-74111 Front fork oil level gauge	 09951-16080 Bearing installer	

NOTE:
When ordering the special tool please confirm whether it is available of not.

TIGHTENING TORQUE

ENGINE

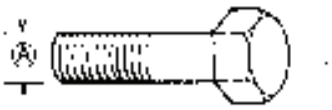
ITEM	N-m	Kg-m
Cylinder head nut	18.0-22.0	1.8-2.2
Cylinder head bolt	8.0-12.0	0.8-1.2
Cam sprocket bolt	9.0-11.0	0.9-1.1
Cam chain tensioner bolt	8.0-12.0	0.8-1.2
Starter clutch bolt	14.0-16.0	1.4-1.6
Spark plug	10.0-12.0	1.0-1.2
Valve clearance inspection cap bolt	10	1.0
Cylinder head right cover bolt	8.0-12.0	0.8-1.2
Cylinder head left cover bolt	8.0-12.0	0.8-1.2
Cam chain guide bolt	8.0-12.0	0.8-1.2
First clutch nut	40.0-60.0	4.0-6.0
Second clutch nu	40.0-60.0	4.0-6.0
Shift arm stopper bolt	19	1.9
Magneto rotor nut	70.0-90.0	7.0-9.0
Engine oil drain plug	15.0-20.0	1.5-2.0
Exhaust pipe bolt	8.0-12.0	0.8-1.2
Muffler mounting bolt	26	2.6
Engine mounting bolt	55	5.5
Oil filter cap bolts	8.0-12.0	0.8-1.2
Sprocket nut	23	2.3

CHASSIS

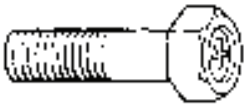
ITEM	N-m	Kg-m
Front axle/nut	30.0-47.0	3.0-4.7
Steering stem lock nut	25.0-35.0	2.5-3.5
Handlebar clamp bolt	50.0-60.0	5.0-6.0
Handlebar mounting nut	13	1.3
Front fork cap bolt	45	4.5
Front fork clamp bolt	25.0-40.0	2.5-4.0
Front brake master cylinder bolt	8.0-12.0	0.8-1.2
Front brake hose union bolt	23	2.3
Front brake caliper mounting bolt	18.0-28.0	1.8-2.8
Front brake air bleeder valve	8	0.8
Rear axle nut	42.0-66.0	4.2-6.6
Engine mounting nut/bolt	50.0-60.0	5.0-6.0
Brake cam lever nut	7	0.7
Front footrest bolt	20.0-31.0	2.0-3.1
Swing arm pivot nut	27.0-43.0	2.7-4.3
Rear torque link nut	10.0-16.0	1.0-1.6
Rear shock absorber bolt	22.0-35.0	2.2-3.5
Rear sprocket mounting nut	18.0-28.0	1.8-2.8
Spoke nipple	2	0.2
Brake disc bolt	18.0-28.0	1.8-2.8

TIGHTENING TORQUE CHART

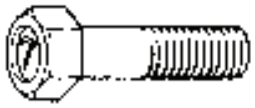
Bolt Diameter A (mm)	Conventional or W4W marked bolt		"7" marked bolt	
	N-m	Kg-m	N-m	Kg-m
4	1.5	0.15	2	0.2
5	3	0.3	5	0.5
6	6	0.6	10	1.0
8	13	1.3	23	2.3
10	29	2.9	50	5.0
12	45	4.5	85	8.5
14	65	6.5	135	13.5
16	105	10.5	210	21.0
18	160	16.0	240	24.0



Conventional bolt



"4" marked bolt



"7" marked bolt

SERVICE DATA

VALVE + GUIDE **Unit: mm**

ITEM	STANDARD		LIMIT
Valve diam.	IN.	25	----------
	EX.	22	----------
Valve clearance (when cold)	IN.	0.04-0.07	----------
	EX.	0.04-0.07	----------
Valve guide to valve stem Clearance	IN.	0.010-0.037	----------
	EX.	0.030-0.057	----------
Valve stem deflection	IN.&EX.	----------	0.350
Valve guide I.D.	IN.&EX.	5.000-5.012	----------
Valve stem O.D.	IN.	4.975-4.990	----------
	EX.	4.955-4.970	----------
Valve stem run out	In. & EX.	----------	0.050
Valve head thickness	In. & EX.	----------	0.500
Valve stem end length	In. & EX.	----------	2.400
Valve seat width	In. & EX.	1.0	----------
Valve head radial run out	In. & EX.	----------	0.030
Valve spring free length	In. & EX.		30.090
Valve spring tension	In. & EX.	14.7 N at length 25.8 mm.	----------

CAMSHAFT + CYLINDER HEAD **Unit: mm**

ITEM	STANDARD		LIMIT
Cam height.	IN.	27.61-27.71	27.34
	EX.	27.42-27.52	27.150
Rocker arm I.D.	IN. & EX.	10.003-10.018	----------
Rocker arm shaft O.D.	IN. & EX.	9.981-9.990	----------
Cylinder head distortion	----------		0.050

CYLINDER + PISTON + PISTON RING **Unit: mm**

ITEM	STANDARD			LIMIT
Compression pressure	FD 110 XC / XCS / XCD / XCSD is a 14 kg/cm²			----------
Piston to cylinder clearance	0.035-0.055			0.120
Cylinder bore	53.5-53.515			53.595
Piston diam.	53.460-53.475 Measure at 11 from the skirt end.			53.380
Cylinder distortion	----------			0.050
Piston ring free and gap	1 st	R	Approx. 6.5	5.3
	1 nd	R	Approx. 4.5	4.2

Unit: mm

ITEM	STANDARD		LIMIT
Piston ring end gap	1 st	0.10 – 0.25	0.500
	2 nd	0.10 – 0.25	0.500
Piston ring to groove clearance	1 st	----------	0.180
	2 nd	----------	0.150
Piston ring groove width	1 st	1.01-1.03	----------
	2 nd	1.01-1.03	----------
	Oil	2.01-2.03	----------
Piston ring thickness	1 st	0.97-0.99	----------
	2 nd	0.97-0.99	----------
Piston pin bore	14.002-14.008		14.030
Piston pin O.D.	13.996-14.00		13.960

CONROD + CRANKSHAFT

Unit: mm

ITEM	STANDARD	LIMIT
Conrod small end I.D.	14.006-14.014	14.040
Conrod deflection	----------	3.000
Conrod big end side clearance	0.10-0.45	1.0
Crank web to web width	42.0 ±0.1	----------
Crankshaft thrust bearing thickness	0.60-1.35	----------
Crankshaft thrust clearance	0.00-0.07	----------
Crankshaft run out	----------	0.08

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ration	1.824 (31/17)	----------
Oil pressure (at 60°C)	Above 10 kPg (0.1 kg/cm^{2}X Below 30 kPg (0.3 kg/cm^2) at 3,000 r/min.	----------

FIRST CLUTCH

Unit: mm

ITEM	STANDARD	LIMIT
Clutch release screw	1/8 turn back	----------
Clutch heel I.D.	105.00 – 105.15	----------
Clutch shoe O.D.	----------	No groove
Clutch engagement	1,900-2,300 r/min.	----------
Clutch lock-up	3,150-3,850 r/min	----------

GEAR SHIFT CLUTCH

Unit: mm

ITEM	STANDARD		LIMIT
Drive plate thickness	2.9-3.1		2.600 (No groove)
Drive plate distortion	No.1	----------	0.100
Drive plate claw width	11.80-12.00		11.200

TRANSMISSION + DRIVE CHAIN **Unit: mm**

ITEM		STANDARD		LIMIT
Primary reduction ratio		3.666 (77/21)		----------
Final reduction ratio		2.428 (34/14)		----------
Gear ratios	Low	3.000 (33/11)		----------
	2 nd	1.875 (30/16)		----------
	3 rd	1.368 (26/19)		----------
	Top	1.052 (20/19)		----------
Shift fork to groove clearance		No. 1, No. 2	0.1-0.3	0.50
Shift fork groove width		No. 1, No. 2	4.5-4.6	----------
Shift fork thickness		No. 1, No. 2	4.3-4.4	----------
Drive chain		Type	DID428	----------
		Links	98 links	----------
		20-pitch length	----------	259
Drive chain slack		15-25		----------

CARBURETOR **Unit: mm**

ITEM		STANDARD
Carburetor type		MIKUNI 17
Bore size		17 mm
I.D. No.		09GF1
Idle r/min.		1,500±100 r/min
Float height		16
Main jet	(M.J.)	#92.5
Main air jet	(M.A.J.)	1.65
Jet needle	(J.N.)	4PA11-2
Needle jet	(N.J.)	E-OM
Pilot jet	(P.J.)	#15
Pilot outlet	(P.O.)	07 mm
Air screw	(A.S.)	1 1/2 turns out
Valve seat	(V.S.)	1.5 mm
Starter jet	(G.S.)	#30

ELECTRICAL

ITEM	STANDARD		LIMIT
Ignition timing	15° B.T.D.C. Below 1,500 r/min.		
Spark plug	Type	NGK: CR6HSA	
	Gap	0.6-0.7 mm	
Spark performance	Over 8 at 1 atm.		
Ignition coil resistance	Primary	(+) tap-Ground 0.3-1.1 Ω	
	Secondary	Plug cap-Ground 11 – 18 kΩ	

ITEM	STANDARD		LIMIT
Primary peak voltage	Morn then 130 V	(+)ground , (-)white/blue	
Pickup coil peak voltage	Morn then 4 V	(+)green/white , (-)blue/yellow	
Magneto coil resistance	Lighting	Y/W – B/W 0.3 - 1.5 Ω	
	Charging	W/R – B/W 0.5 – 2.0 Ω	
	Pick-up	G/W-L/Y 180 – 280 Ω	
Regulated voltage	13.0 – 16.0 V at 5,000 r/min		Night time
Battery	Capacity	12V 5Ah/10HR	FD 110
	Standard Electrolytes S.G.	1.28 at 20°C	
Fuse side	Main	10A	

WATTAGE

ITEM		STANDARD
Headlight	HI	32
	LO	32
Tail/Brake light		5/18
Turn signal light		10
Turn signal indicator light		1.7
Speedometer light		3
High beam indicator light		1.7
Neutral indicator light		1.7
Gear position light		1.7

BRAKE + WHEEL

ITEM	STANDARD	LIMIT
Font brake lever play (drum type)	15.25	----------
Rear brake pedal free ravel	15.25	----------
Brake lining thickness	----------	1.5
Brake disc thickness	4±0.2	3
Brake disc run out	----------	0.30

BRAKE + WHEEL

ITEM	STANDARD		LIMIT
Master cylinder bore	12.700-12.743		----------
Master cylinder piston diam.	12.657-12.684		----------
Brake caliper cylinder bore	27.00-27.050		----------
Brake caliper piston diam.	2.930-26.50		----------
Brake drum I.D.	Front	----------	110.7
	Rear	----------	110.7
Wheel axle run out	Axle	----------	2.0
	Radial	----------	2.0
Tire size	Front	2.50-17	----------
	Rear	2.75-17	----------
Tire tread depth	Front	----------	1.6
	Rear	----------	1.6

SUSPENSION

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	90	----------	----------
Rear wheel travel	77.9	----------	----------
Swing arm pivot shaft run out	----------	0.6	----------

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL AND DUAL RIDING	
	Psi	Kg/cm^2
FRONT	25	1.75
REAR	33	2.80

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		
Fuel tank capacity	4.2L		
Engine oil type	SAE 40, API SF or SG		
Engine oil capacity	Change	800 ml	
	Filter change	900 ml	
	Overhaul	1,000 ml	
Front fork oil type	Fork oil # 10 or (SAE5W/20)		
Front fork oil capacity (each leg)	70 ml		
Brake fluid type	DOT 4		