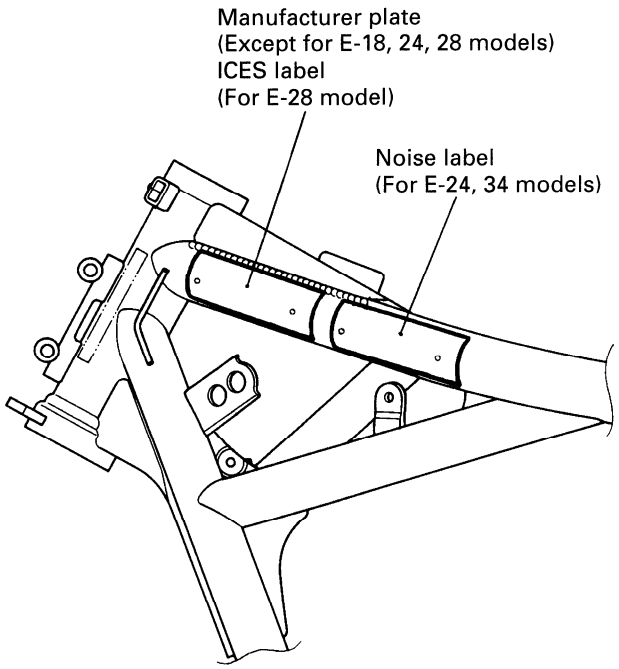
SUZUKI

GSF1200/S

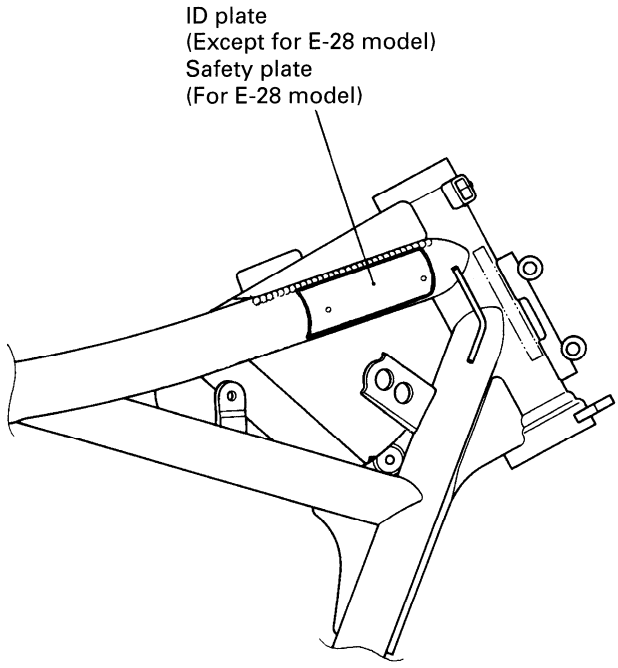
SERVICE MANUAL

99500-39134-01E

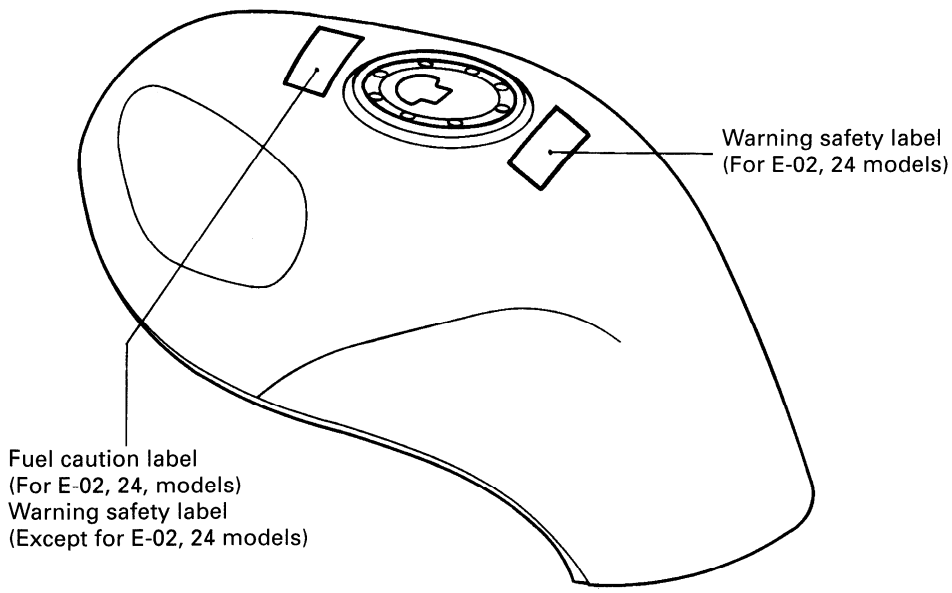
INFORMATION LABELS



LEFT SIDE

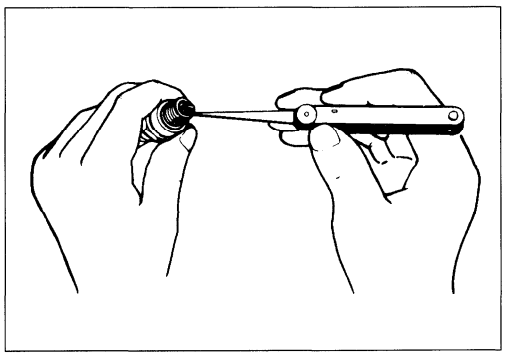


RIGHT SIDE



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.

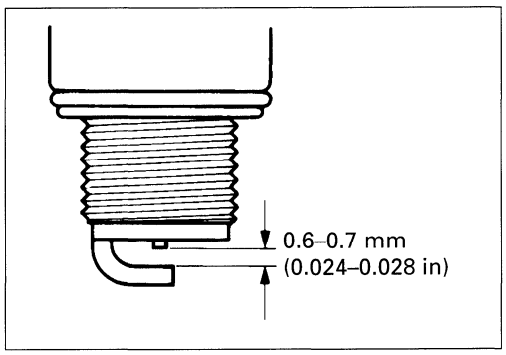


SPARK PLUG GAP

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

	Standard
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)

09900-20803: Thickness gauge



ELECTRODE'S CONDITION

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

⚠ CAUTION

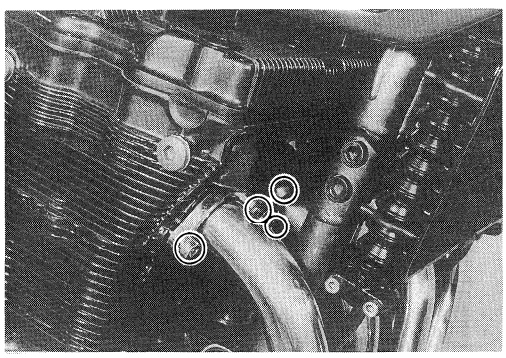
Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

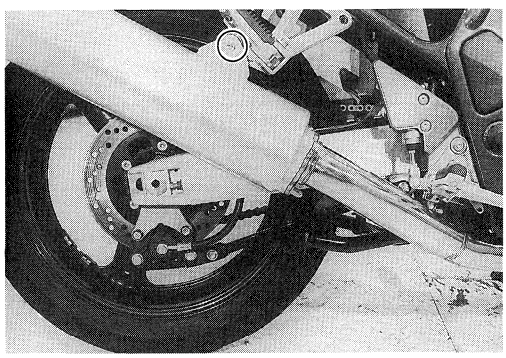
EXHAUST PIPE BOLTS AND MUFFLER BOLTS

Tighten Initially at 1 000 km (600 miles, 1 month) and Every 12 000 km (7 500 miles, 12 months).

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

Exhaust pipe bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)
Muffler mounting bolt: 29 N·m (2.9 kg-m, 21.0 lb-ft)

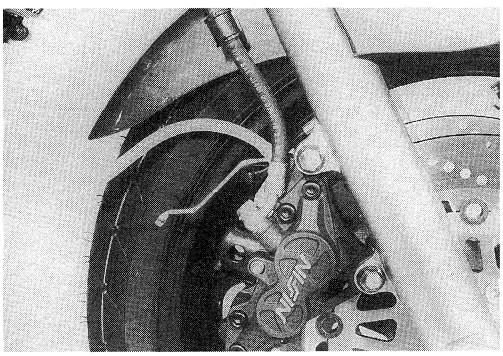


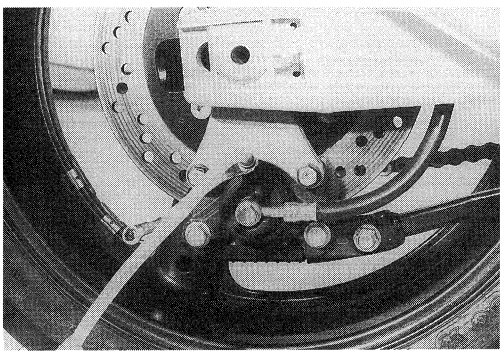


AIR BLEEDING THE BRAKE FLUID CIRCUIT

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" line. 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 the 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 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.

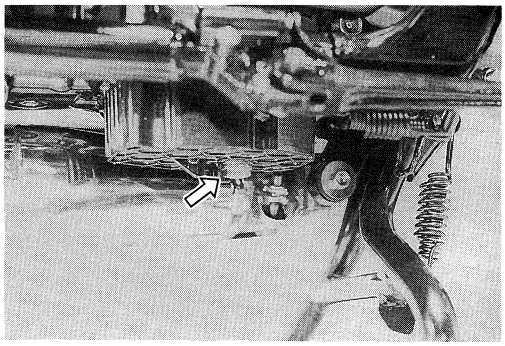
Air bleeder valve: 8 N·m (0.8 kg-m, 6.0 lb-ft)

⚠ CAUTION

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

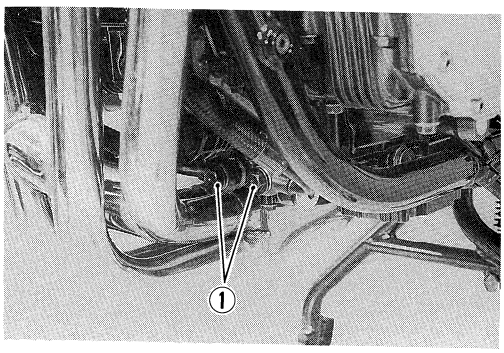
- The only difference between bleeding the front and rear brakes is that the rear master cylinder is actuated by a pedal.

- Remove the oil drain plug to drain out engine oil.

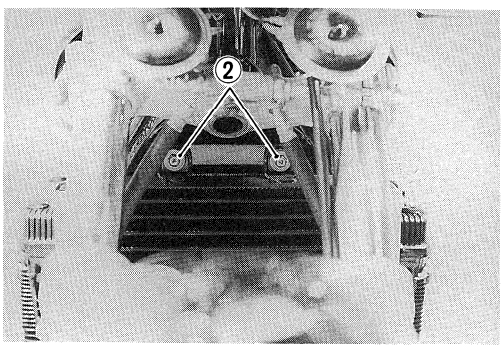


- Remove the oil cooler hose union bolts ①.

Oil cooler hose union bolt: 28 N·m (2.8 kg-m, 20.0 lb-ft)

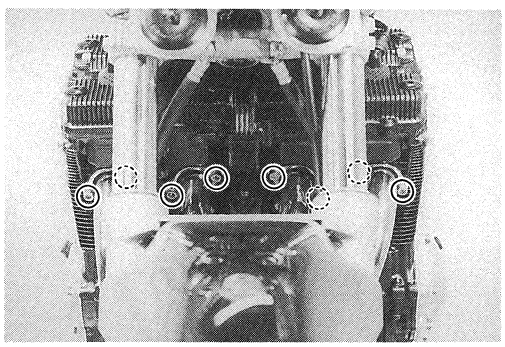


- Remove the oil cooler by removing its mounting bolts ②.



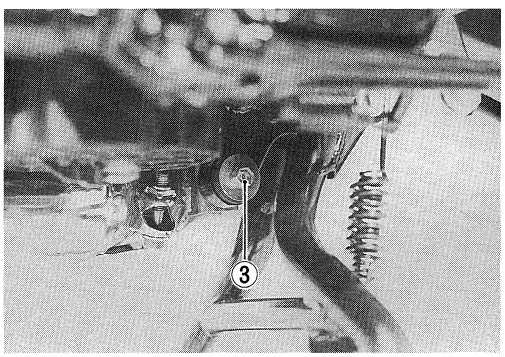
- Remove the eight exhaust pipe clamp bolts.

Exhaust pipe clamp bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

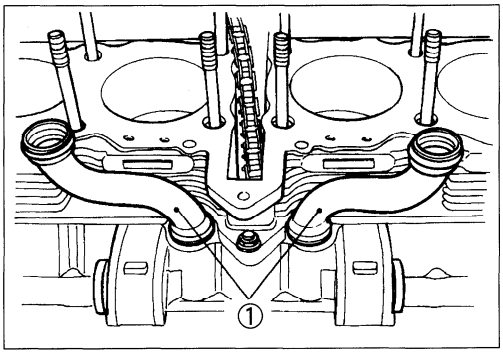


- Remove the exhaust pipe mounting bolt ③.

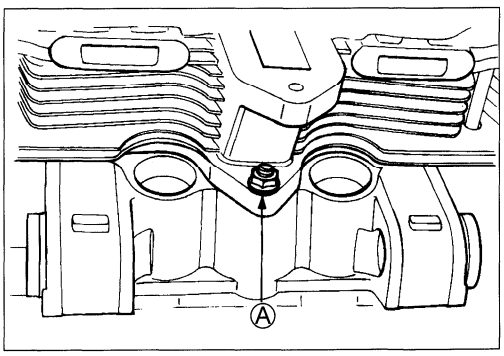
Exhaust pipe mounting bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)



- Remove the left and right oil pipes ①.



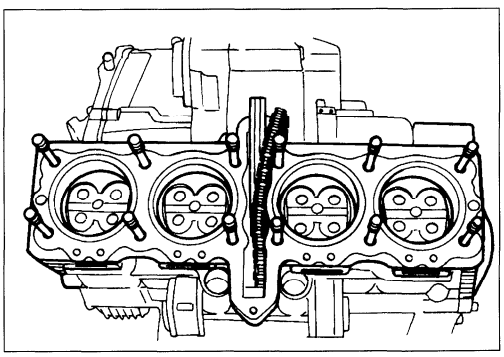
- Remove the cylinder nut Ⓐ.



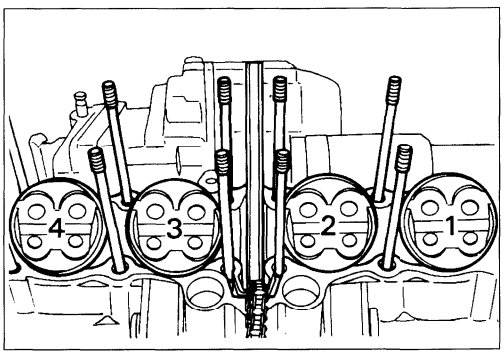
- Firmly grip both ends of the cylinder block and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to make the gasketed joint loose.

⚠ CAUTION

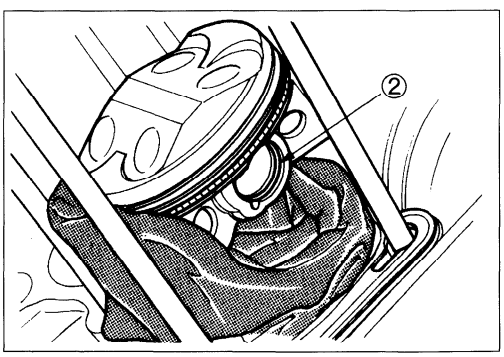
Be careful not to damage the fins when removing or handling the cylinder block.



- Scribe the cylinder number on the head of the respective pistons.



- Place a cloth beneath the piston so as not to drop any parts in the crankcase, and remove the circlip ② with long-nose pliers.
- Draw out the piston pin. Place each piston pin in the same piston as that it was removed from.



ENGINE COMPONENTS INSPECTION AND SERVICE

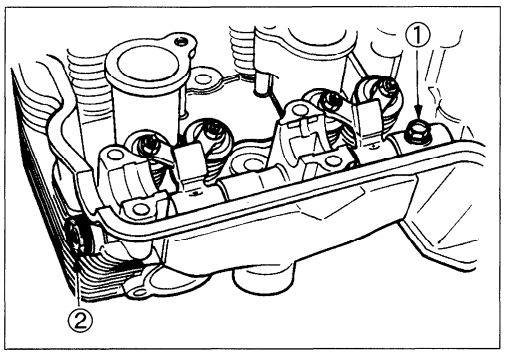
CYLINDER HEAD SERVICE

⚠ CAUTION

Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "No.1", "No.2", "Exhaust", "Inlet", so that each will be restored to the original location during assembly.

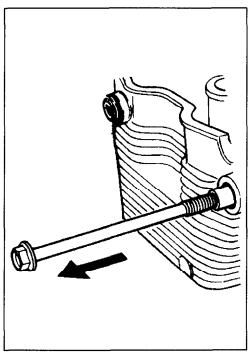
NOTE:

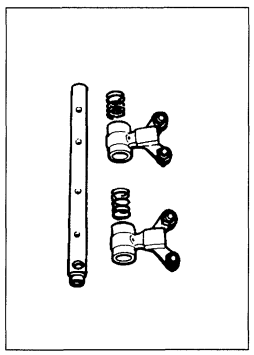
* *When removing rocker arm shaft, remove the rocker arm shaft set bolt ① and plug ②, and then screw 8 mm bolt into the rocker arm shaft end and pull it out.*
Tighten the set bolt ① and plug ② to the specified torque.
Removal of valves completes ordinary disassembling work. If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.



TOOL 09900-00410: Hexagon wrench set

Rocker arm shaft set bolt ①: 9 N·m (0.9 kg-m, 6.5 lb-ft)
Cylinder head plug ②: 28 N·m (2.8 kg-m, 20.0 lb-ft)

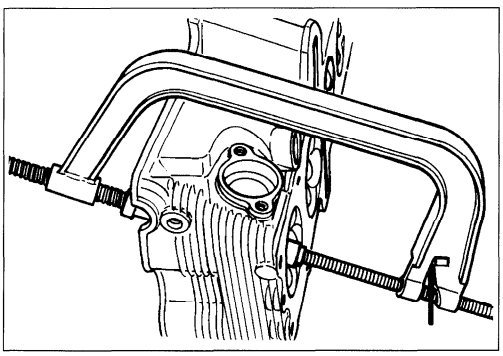


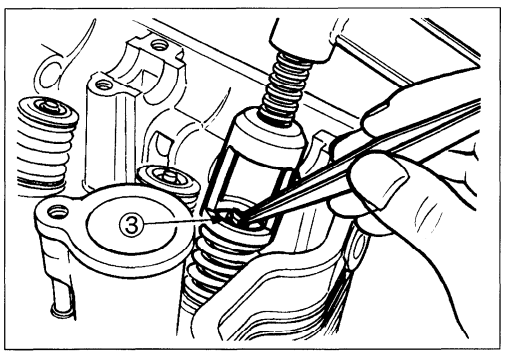


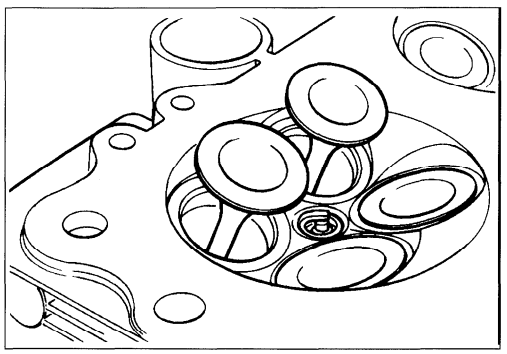
- Using special tools, compress the valve spring and remove the two cotter halves ③ from valve stem.

TOOL 09916-14510: Valve lifter
09916-14910: Valve lifter attachment
09916-84511: Tweezers

- Remove the valve spring retainer, inner and outer valve springs.
- Remove the valve spring seat.
- Remove the valve from the other side.

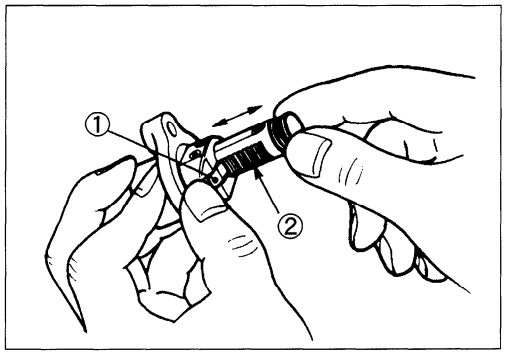






CAM CHAIN TENSION ADJUSTER

The cam chain tension adjuster is maintained at the proper tension by an automatically adjusted tensioner.
Unlock the ratchet mechanism ① , and move the push rod ② in place to see if it slides smoothly. If any stickiness is noted or ratchet mechanism is faulty, replace the cam chain tension adjuster assembly with a new one.



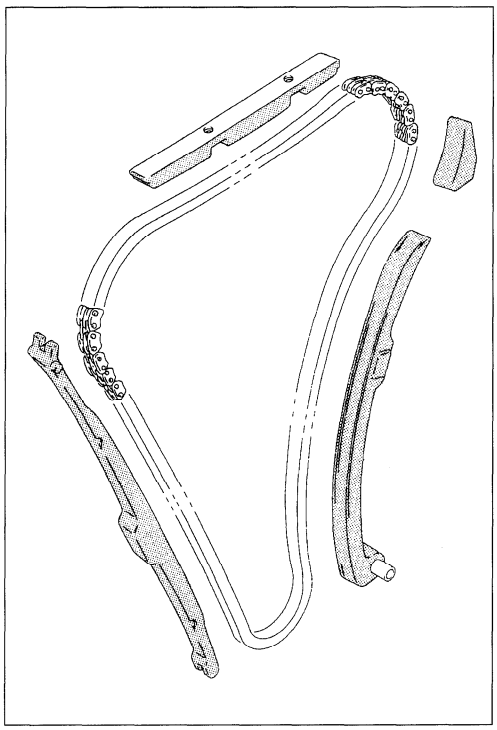
CAM CHAIN GUIDE AND TENSIONER

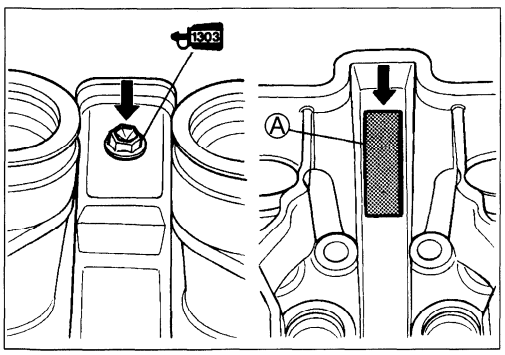
Check the cam chain guides and tensioner for wear and damage. If they are found to be damaged, replace them with new ones.

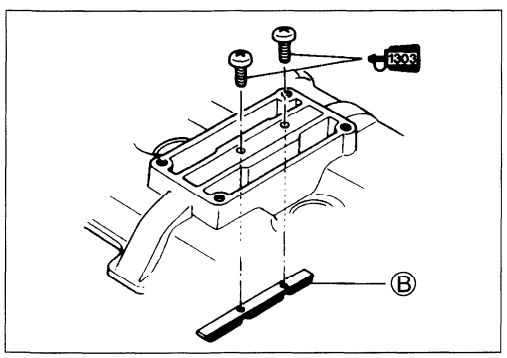
NOTE:
When replacing the cam chain guides Ⓐ and Ⓑ, apply SUZUKI THREAD LOCK SUPER "1303" to threads of bolt and screws.

1303 99000-32030: THREAD LOCK SUPER "1303"

Cam chain guide mounting bolt: 6 N·m (0.6 kg-m, 4.5 lb-ft)





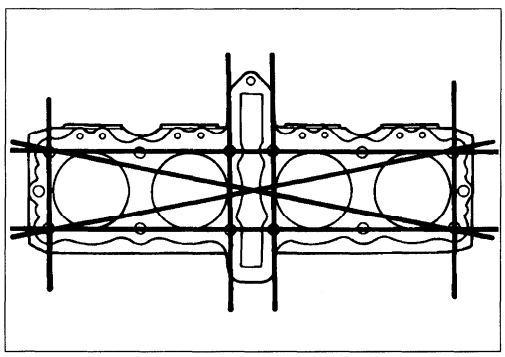


CYLINDER BLOCK DISTORTION

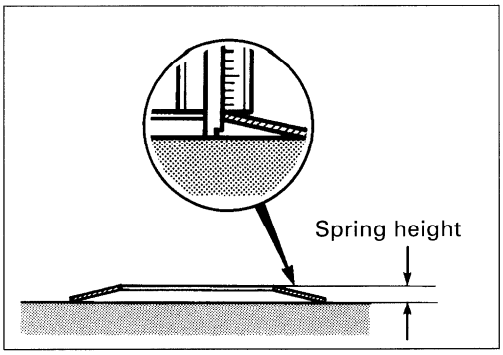
Check the gasketed surface of the cylinder block for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder block.

TOOL 09900-20803: Thickness gauge

Cylinder distortion
Service Limit: 0.2 mm (0.008 in)



CLUTCH INSPECTION



CLUTCH DIAPHRAGM SPRING

Measure the free height of each diaphragm spring with a vernier calipers. If each diaphragm spring height is not within the specified limit, replace it with a new one.

09900-20102: Vernier calipers

Service Limit: 2.9 mm (0.11 in)

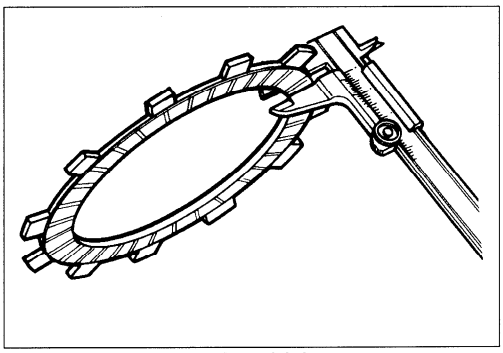
CLUTCH DRIVE AND DRIVEN PLATES

NOTE:
Wipe off the engine oil from the drive and driven plates with a clean rag.

Measure the thickness of drive plates with a vernier calipers. If each drive plate is not within the standard range, replace it with a new one.

09900-20102: Vernier calipers

Standard (No.1 and No.2 drive plates)
Thickness: 2.92–3.08 mm (0.115–0.121 in)

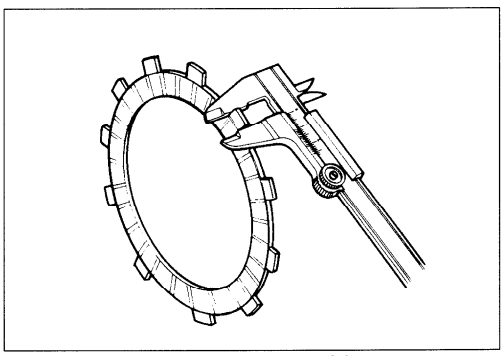


Measuring thickness

Measure the claw width of drive plates with a vernier calipers. Replace the drive plates found to have worn down to the limit.

09900-20102: Vernier calipers

Service Limit (No.1 and No.2 drive plates)
Claw width: 13.0 mm (0.51 in)

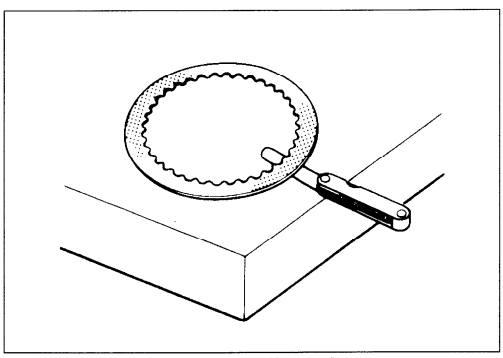


Measuring claw wide

Measure each driven plate for distortion with a thickness gauge and surface plate.
Replace driven plates which exceed the limit.

09900-20803: Thickness gauge

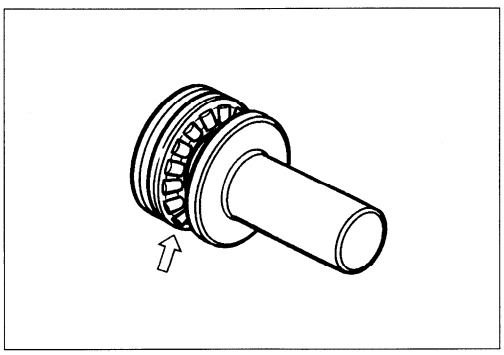
Service Limit: 0.1 mm (0.004 in)



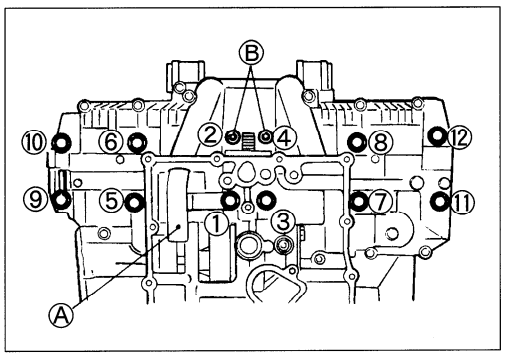
Measuring distortion

CLUTCH BEARING

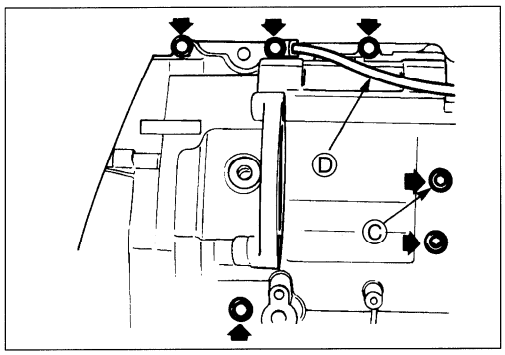
Inspect the clutch release bearing for any abnormality, particularly cracks, to decide whether it can be reused or should be replaced.
Smooth engagement and disengagement of the clutch depends on the condition of the bearing.



- Fix the right oil pipe Ⓐ with No. ① bolt.
- Fit the copper washers to the No. ⑨ and No. ⑪ bolts.
- Locate two allen bolts at position Ⓑ and ten 8-mm bolts.
- Tighten the crankshaft tightening 8-mm bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure.
- Fit the copper washer to the bolt Ⓒ.
- Tighten the lower and upper crankcase tightening bolts and nuts to the specified torque values.



Crankcase bolt	Initial tightening			Final tightening		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
6 mm bolt	6	0.6	4.5	13	1.3	9.5
8 mm bolt	13	1.3	9.5	22	2.2	16.0

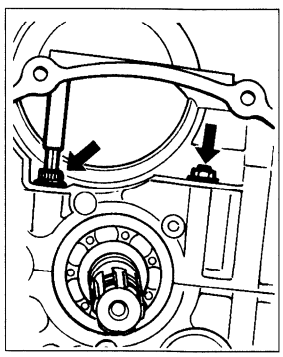


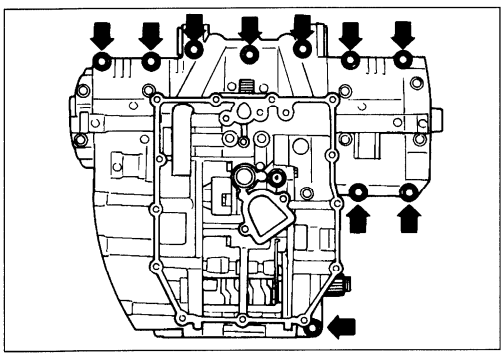
NOTE:

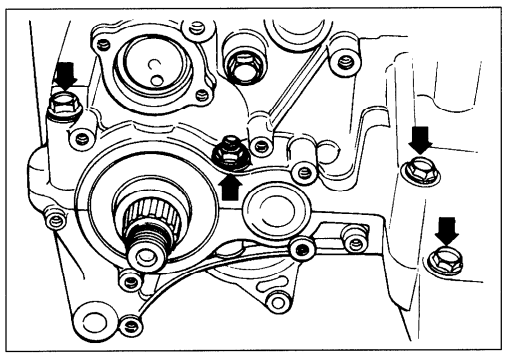
** Install the main oil gallery plug. (Refer to page 3-20.)*

** Fit the engine ground wire Ⓓ to the correct position as shown in the figure.*

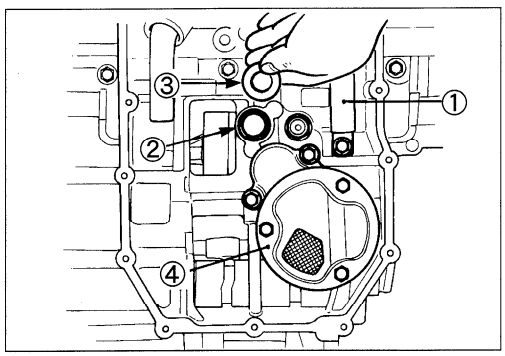
TOOL 09900-00410: Hexagon wrench set







- Install the left oil pipe ① with bolt.
- Fit a new O-ring ② and shim ③.
- Fit a new gasket and install the oil sump filter ④ with two bolts.

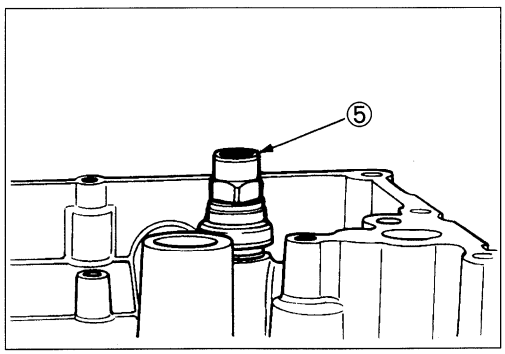


⚠ CAUTION

Replace the gasket and O-ring with new ones to prevent oil leakage.

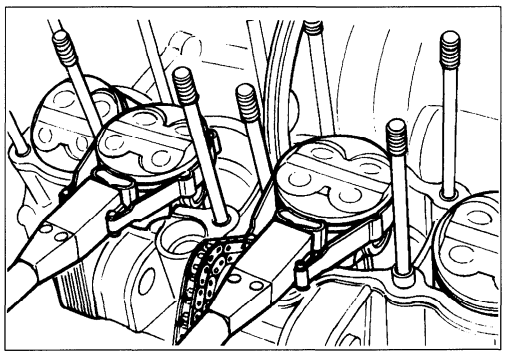
- Seat the washer and install the oil pressure regulator ⑤ to the oil pan and tighten it to the specified torque.

Oil pressure regulator: 28 N·m (2.8 kg-m, 20.0 lb-ft)



- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.
- With No.2 and No.3 pistons in place, install No.1 and No.4 pistons, and insert them into the cylinder.

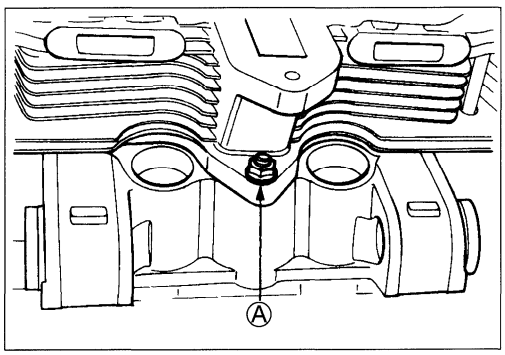
TOOL 09916-74521: Holder body
09916-74540: Band



NOTE:
Do not overtighten the special tool bands or the pistons entry into the cylinders will be difficult.

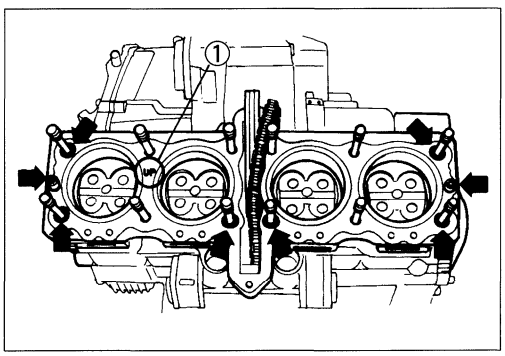
- Tighten the cylinder base nut Ⓐ to the specified torque.

Cylinder base nut: 9 N·m (0.9 kg-m, 6.5 lb-ft)



- Place the six O-rings, two dowel pins and new cylinder head gasket on the cylinder.

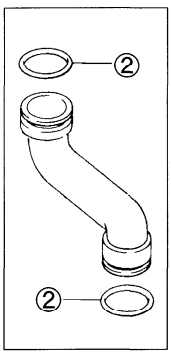
NOTE:
Be sure to identify the top surface "UP" mark ① on the cylinder head gasket as shown in the Fig.

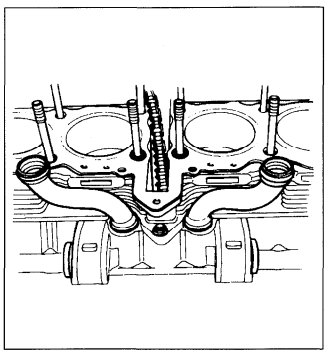


⚠ CAUTION

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

- Fit the new O-rings ② onto the oil pipes and apply SUZUKI SUPER GREASE "A" to the O-rings.
- Install the right and left oil pipes.





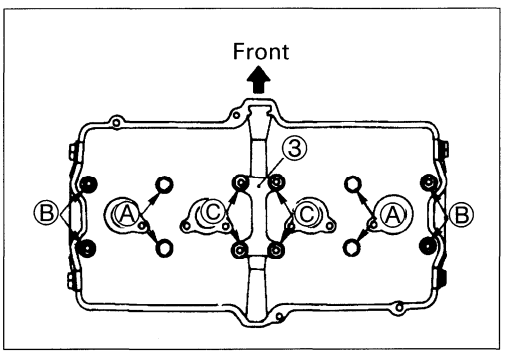
⚠ CAUTION

Replace the O-rings ② with new ones to prevent oil leakage.

99000-25010: SUZUKI SUPER GREASE "A"

- Place the cylinder head onto the cylinder.
- Place the cylinder head plate ③ onto the cylinder head.
- Cylinder head nuts and washers must be fitted in the correct positions, as shown in the illustration.

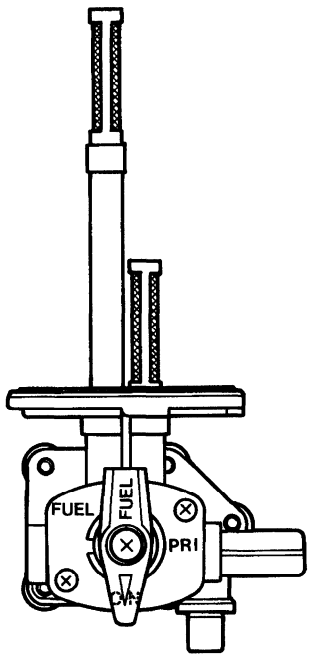
Ⓐ Copper washer with cap nut (4 pcs)
Ⓑ Steel washer with normal nut (4 pcs)
Ⓒ Copper washer with normal nut (4 pcs)

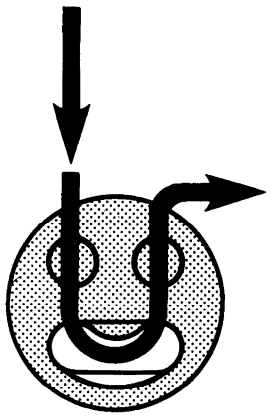


FUEL VALVE

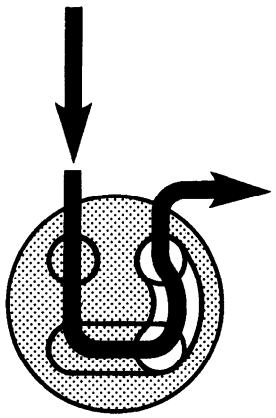
FUEL VALVE MECHANISM

A valve is provided at the end of the fuel valve lever and can switch over to "OFF", "ON" and "RES". With the valve "ON" (normal), the main passage opens. With the valve "OFF", both holes close.

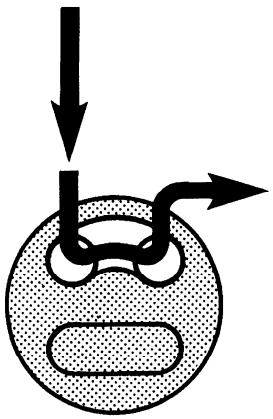




"ON" position



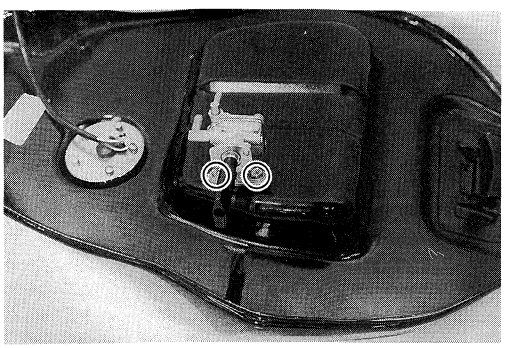
"PRI" position



"RES" position

FUEL VALVE/FUEL FILTER REMOVAL

- Remove the seat and frame cover assembly. (Refer to page 5-3.)
- Remove the fuel tank. (Refer to page 4-3.)
- Remove the fuel valve/fuel filter by removing the mounting bolts.



⚠WARNING

Gasoline is very explosive. Extreme care must be taken. Gaskets and O-ring must be replaced with new ones to prevent fuel leakage.

CARBURETOR JET INSPECTION

Check following items for any damage or clogging.

* Pilot jet
* Main jet
* Main air jet
* Pilot air jet
* Needle jet air bleeding hole
* Float
* Needle valve
* Starter (Enrichener) jet
* Gasket and O-ring
* Throttle shaft oil seal
* Diaphragm
* Pilot outlet and by-pass holes

THROTTLE POSITION SENSOR INSPECTION

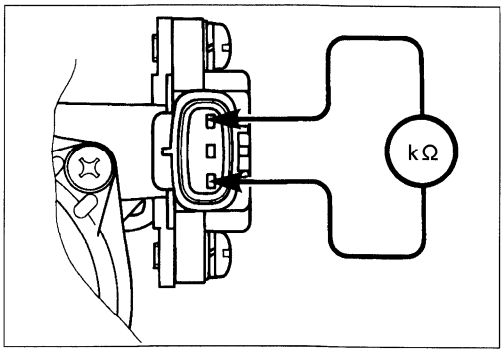
Using pocket tester, measure the resistance between the terminals as shown in the right illustration.

09900-25002: Pocket tester

Tester knob indication: × 1kΩ range

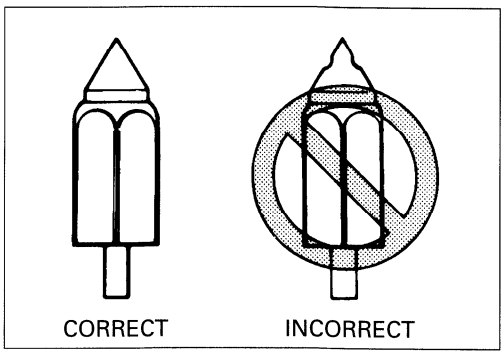
Throttle position sensor resistance: 3.5–6.5 kΩ

NOTE:
When making above test, it is not necessary to remove the throttle position sensor.



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 permissible 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.

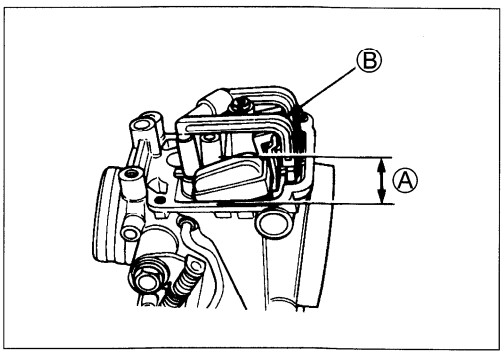


FLOAT HEIGHT ADJUSTMENT

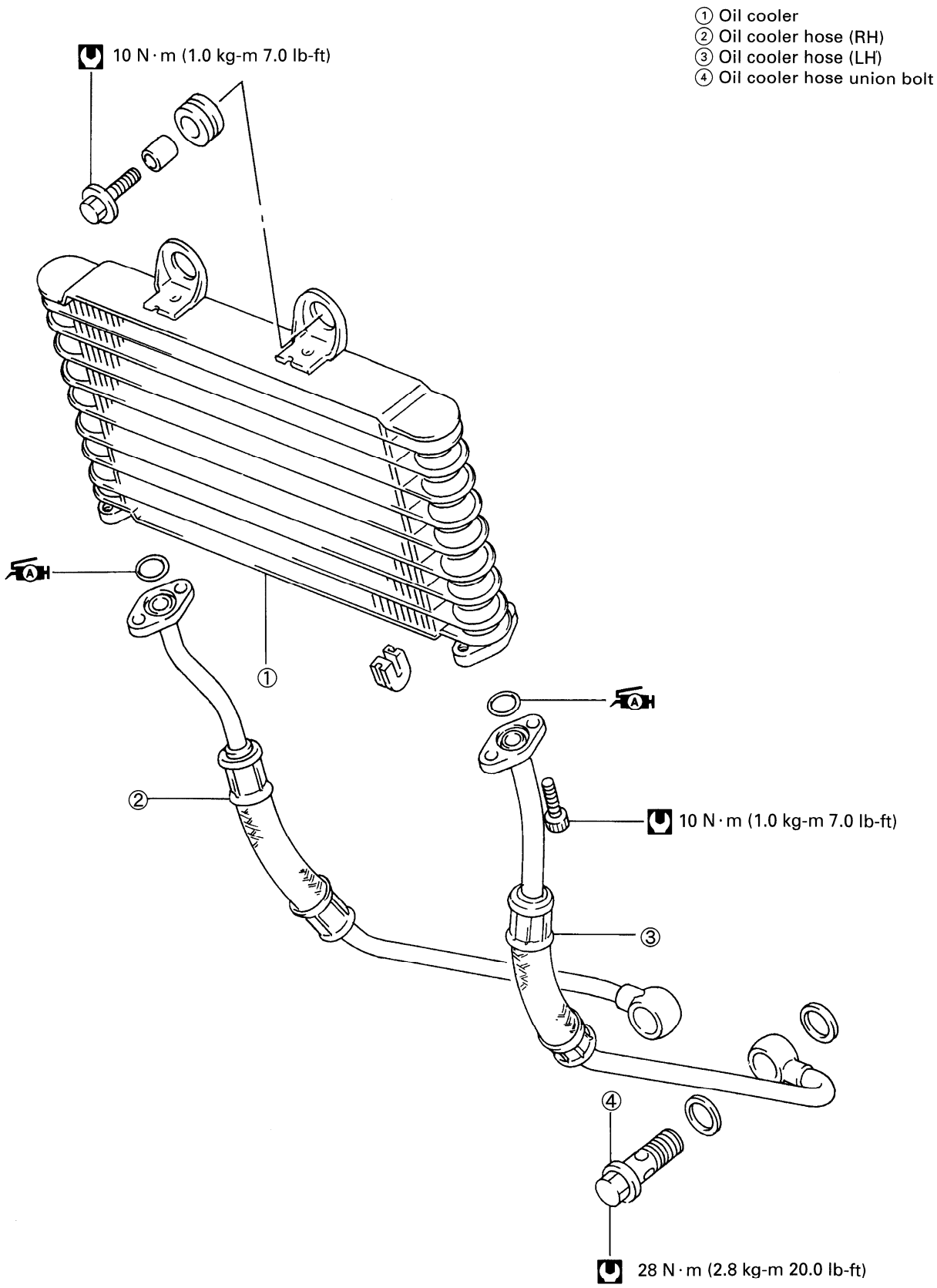
To check the float height, invert the carburetor body, with the float arm kept free, measure the height Ⓐ while float arm is just in contact with needle valve by using calipers. Bend the tongue Ⓑ as necessary to bring the height Ⓐ to this value.

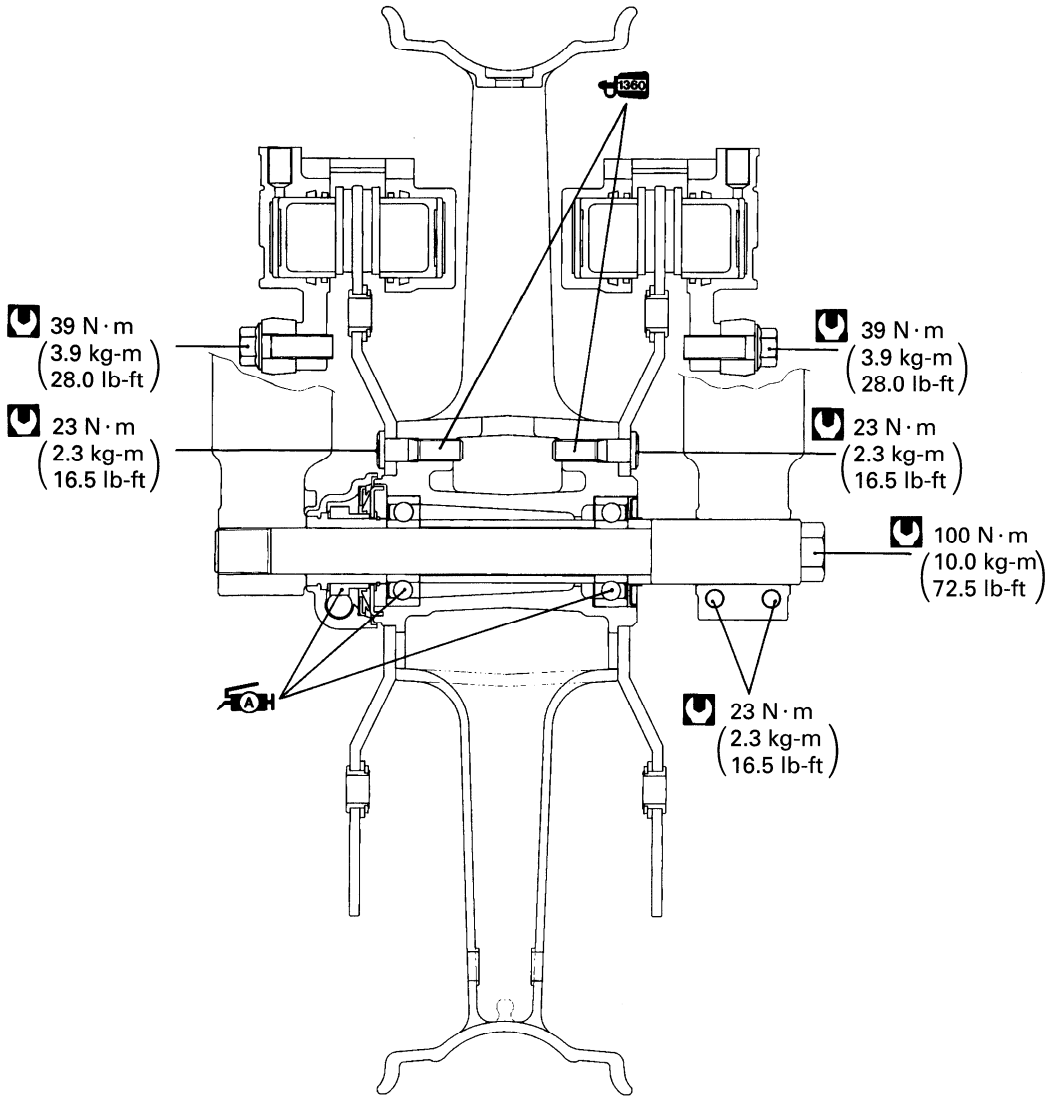
Float height Ⓐ : 14.6 ± 1.0 mm (0.58 ± 0.04 in)

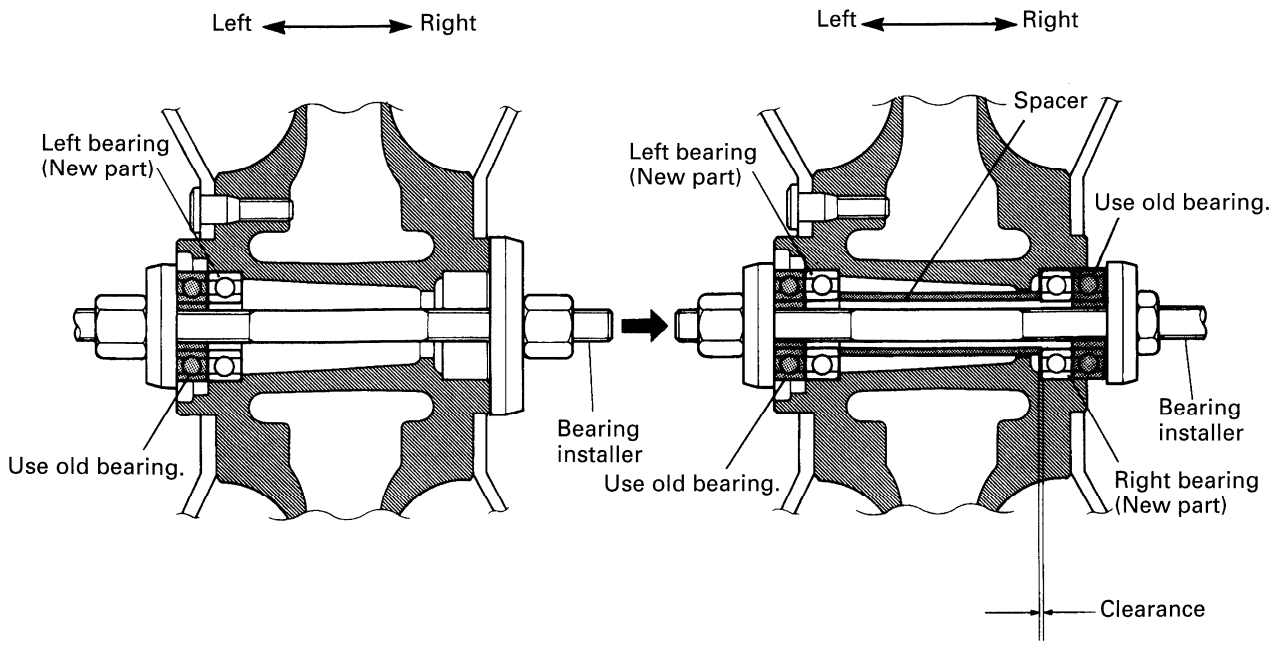
09900-20102: Vernier calipers



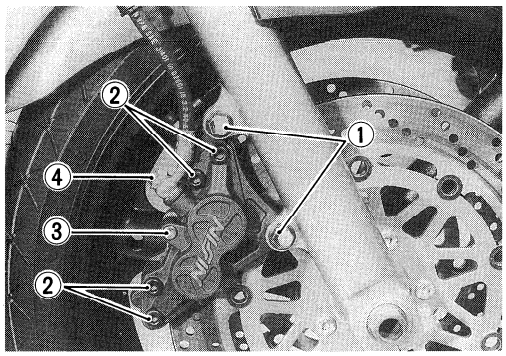
ENGINE OIL COOLING SYSTEM




39 N·m
(3.9 kg-m
28.0 lb-ft)
23 N·m
(2.3 kg-m
16.5 lb-ft)
39 N·m
(3.9 kg-m
28.0 lb-ft)
23 N·m
(2.3 kg-m
16.5 lb-ft)
100 N·m
(10.0 kg-m
72.5 lb-ft)
23 N·m
(2.3 kg-m
16.5 lb-ft)


Left
Right
Left bearing
(New part)
Use old bearing.
Bearing
installer
Left
Right
Spacer
Left bearing
(New part)
Use old bearing.
Bearing
installer
Use old bearing.
Right bearing
(New part)
Clearance

- Tighten each bolt to the specified torque.



Caliper mounting bolt ① : 39 N·m (3.9 kg-m, 28.0 lb-ft)
Caliper housing bolt ② : 23 N·m (2.3 kg-m, 16.5 lb-ft)
Pads mounting pin ③ : 18 N·m (1.8 kg-m, 13.0 lb-ft)
Brake hose union bolt ④ : 23 N·m (2.3 kg-m, 16.5 lb-ft)

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

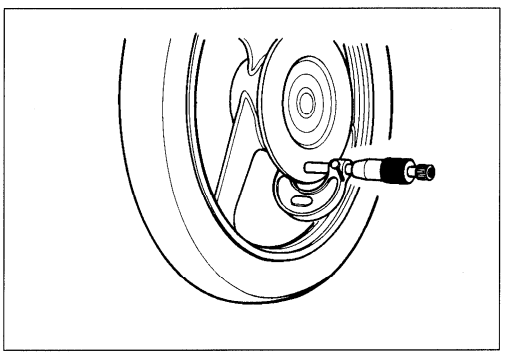
⚠ CAUTION

Bleed air from the system after reassembling the caliper. (Refer to page 2-15.)

BRAKE DISC INSPECTION

- Remove the front and rear wheels. (Refer to pages 5-5 and 5-36.)

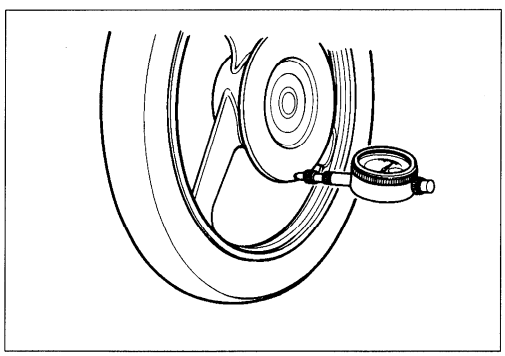
Visually check the brake disc for damage or cracks.
Measure the thickness with a micrometer
Replace the disc if the thickness is less than the service limit or if damage is found.



Service Limit
Front disc: 4.0 mm (0.16 in)
Rear disc: 4.5 mm (0.18 in)

TOOL 09900-20205: Micrometer (0–25 mm)

Measure the runout with a dial gauge.
Replace the disc if the runout exceeds the service limit.



Service Limit
Front and Rear disc: 0.3 mm (0.012 in)

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

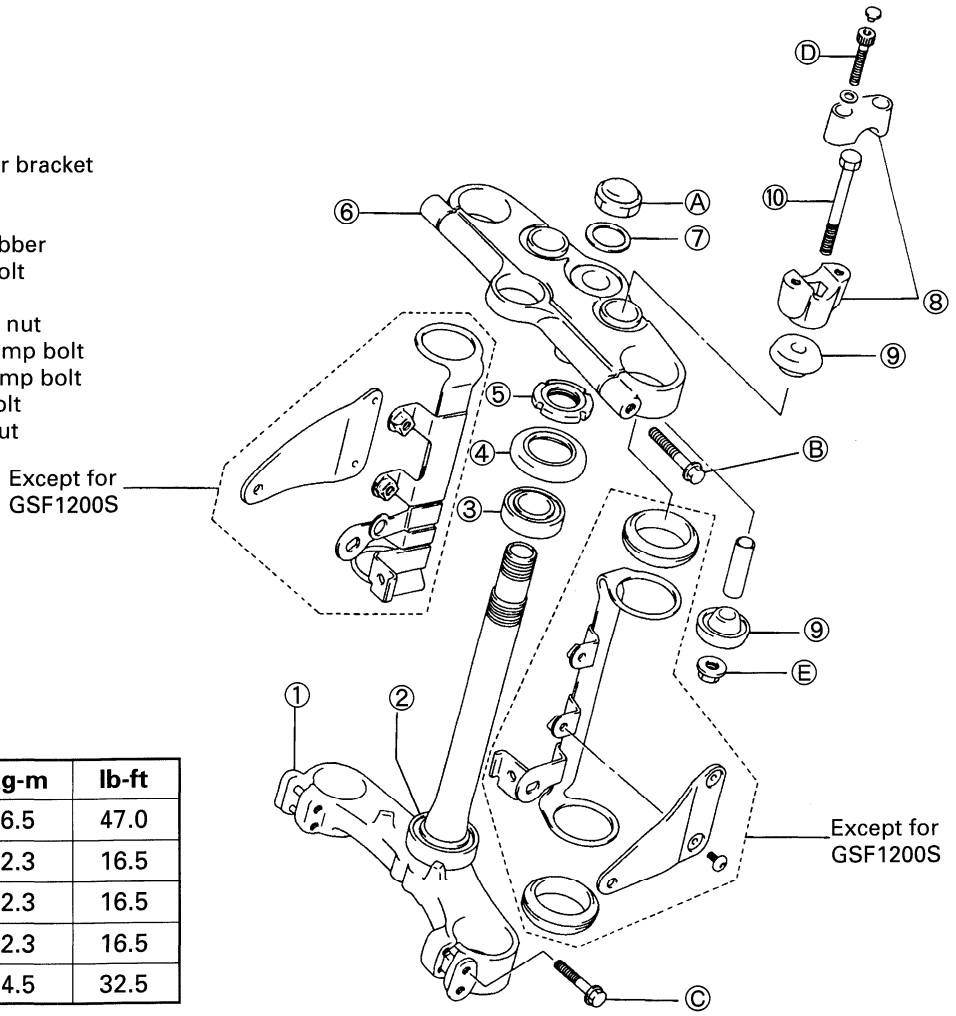
Replacement of the brake disc

- Remove the disc. (Refer to pages 5-6 and 5-37.)
- Install the disc. (Refer to pages 5-7 and 5-39.)

STEERING

① Steering stem
② Bearing
③ Bearing
④ Dust seal
⑤ Steering stem nut
⑥ Steering stem upper bracket
⑦ Washer
⑧ Handlebar holder
⑨ Cushion damper rubber
⑩ Handlebar holder bolt

Ⓐ Steering stem head nut
Ⓑ Front fork upper clamp bolt
Ⓒ Front fork lower clamp bolt
Ⓓ Handlebar clamp bolt
Ⓔ Handlebar holder nut

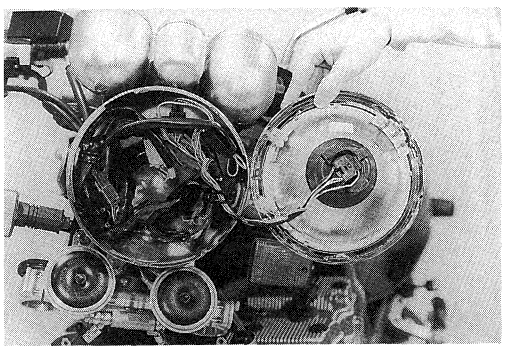


ITEM	N·m	kg-m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	23	2.3	16.5
Ⓒ	23	2.3	16.5
Ⓓ	23	2.3	16.5
Ⓔ	45	4.5	32.5

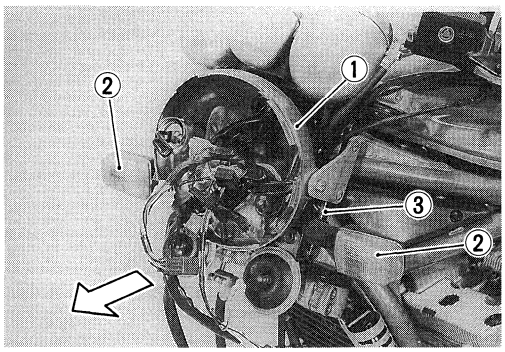
REMOVAL AND DISASSEMBLY

GSF1200

- Remove the front wheel. (Refer to page 5-5.)
- Remove the front fork. (Refer to page 5-22.)
- Remove the headlight and disconnect the lead wire couplers.



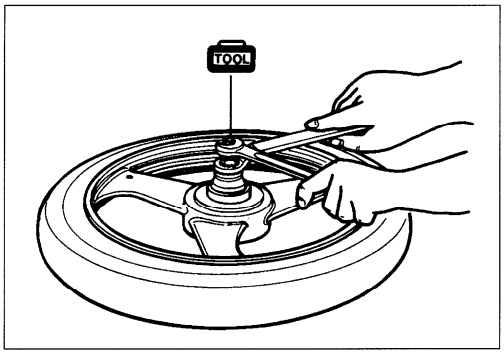
- Remove the headlight housing ①, turn signal lights ② and housing brackets ③.

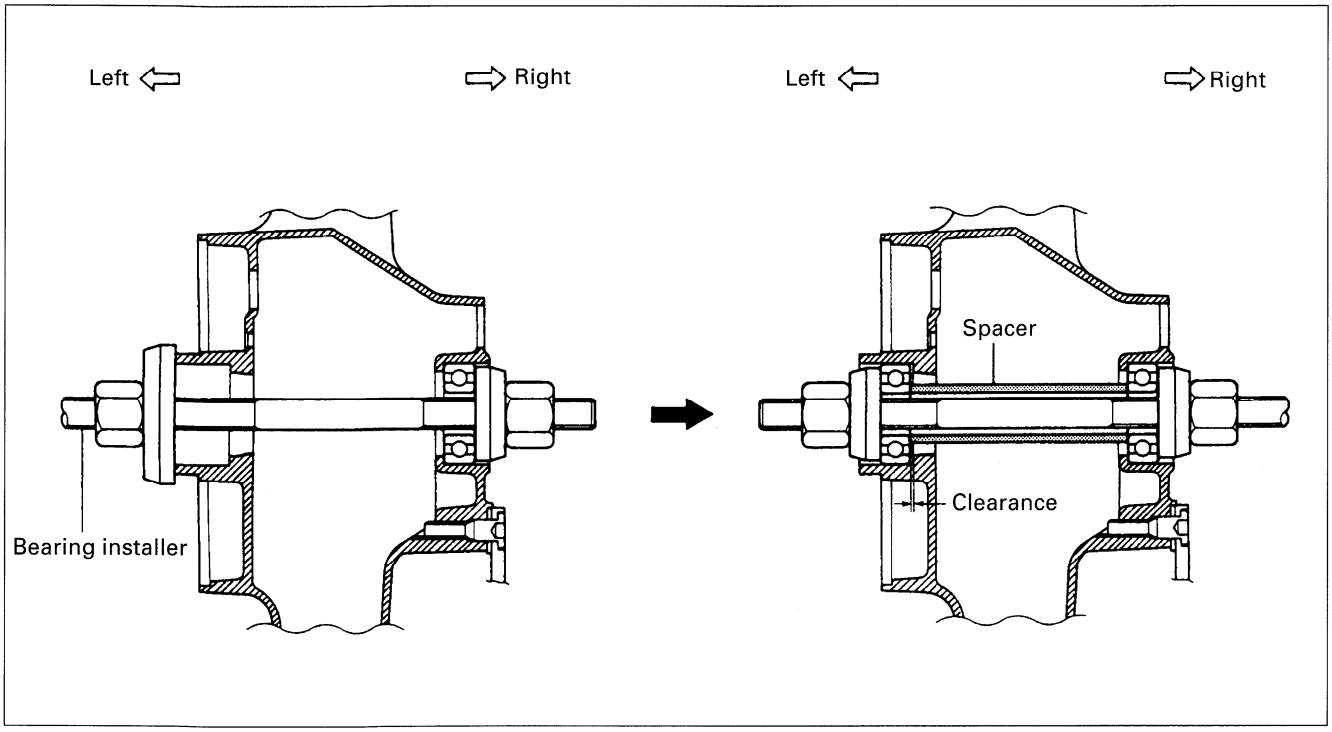


- Install the wheel bearings with the special tool.

09941-34513: Bearing installer set

NOTE:
First install the right wheel bearing, then install the left wheel bearing.



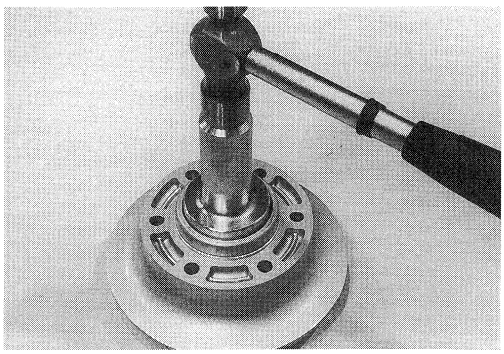


MOUNTING DRUM BEARING

- Install the new bearing with the special tool.

09913-75520: Bearing installer

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



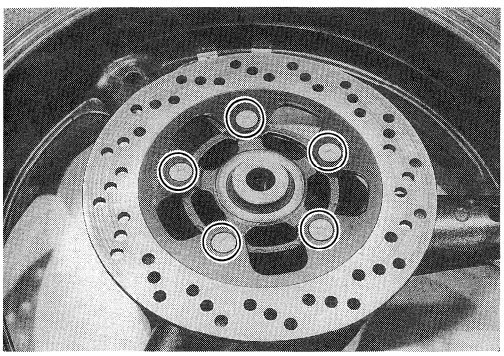
BRAKE DISC

- Apply THREAD LOCK SUPER "1360" to the disc bolts and tighten them to the specified torque.

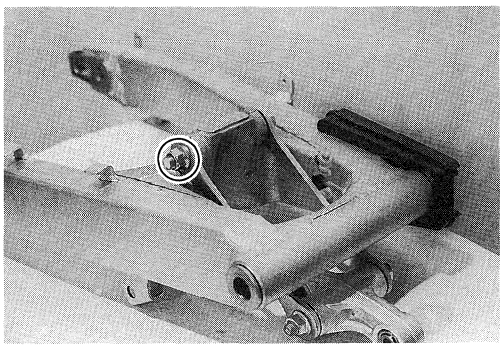
NOTE:
Make sure that the brake disc is clean and free of any greasy matter.

99000-32130: THREAD LOCK SUPER "1360"

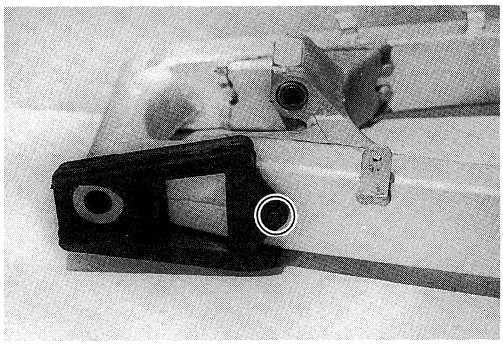
Brake disc bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)



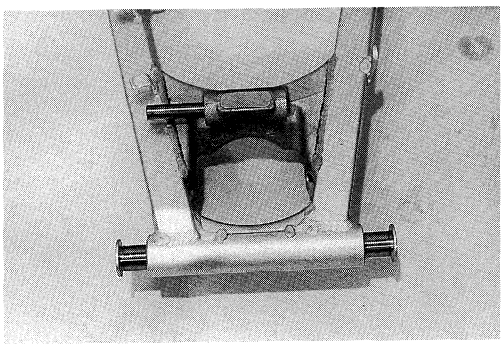
- Remove the cushion rod with cushion lever.



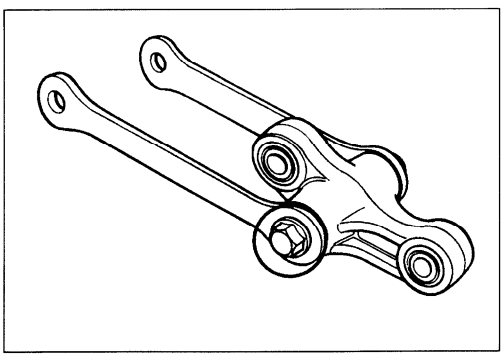
- Remove the chain buffer.



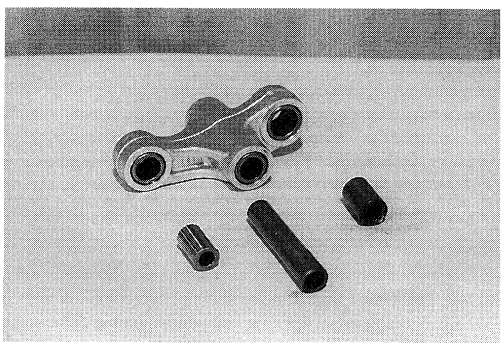
- Remove the swingarm spacers.



- Remove the cushion rods.



- Remove the cushion lever spacers.



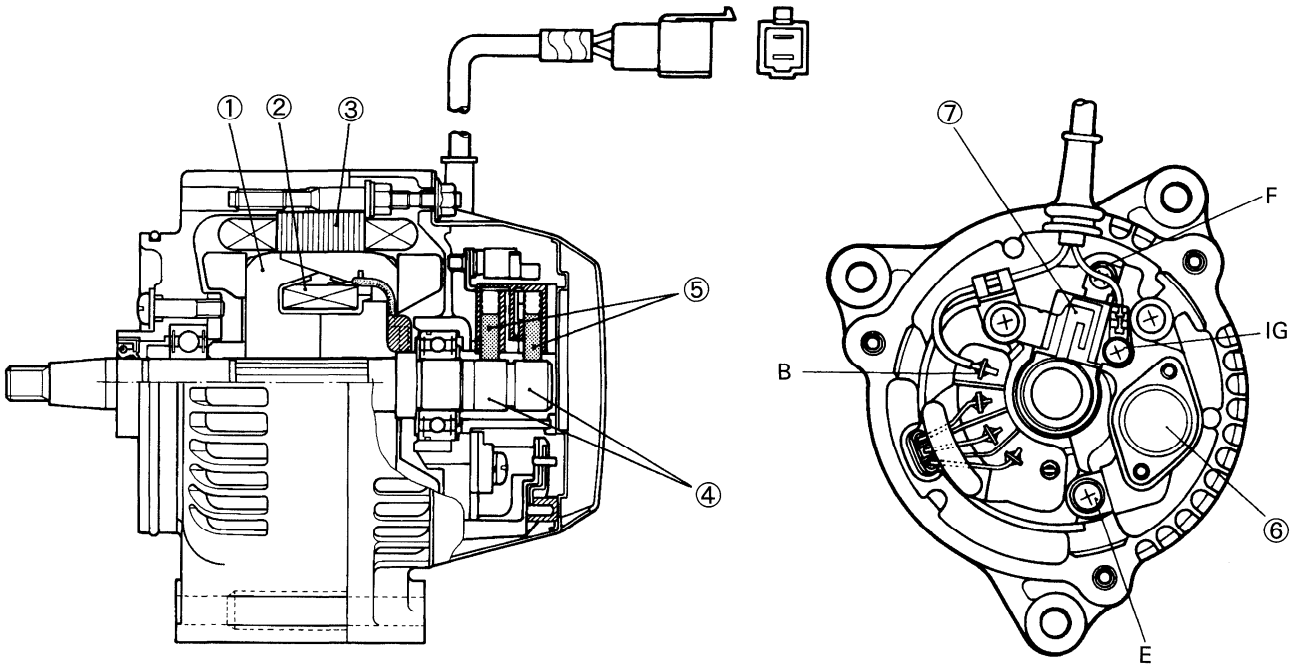
CHARGING SYSTEM

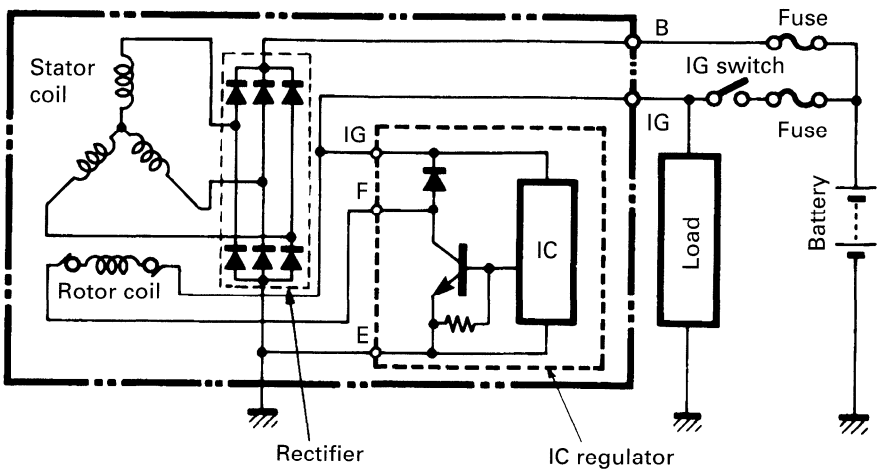
DESCRIPTION (GENERATOR WITH IC REGULATOR)

The generator features a solid-state regulator that is mounted inside the generator. All regulator components are enclosed into a solid mold, and this unit is attached to the brush holder frame. The regulator voltage setting cannot be adjusted.

Two brushes carry current through the two slip rings to the rotor coil mounted on the rotor.

The stator windings are assembled on the inside of a laminated core that forms part of the generator housing. A rectifier bridge connected to the stator windings contains six diodes, and electrically changes the stator A.C. voltages to a D.C. voltage which appears at the generator output terminal.





① Rotor
② Rotor coil
③ Stator coil
④ Slip ring
⑤ Brush
⑥ IC regulator
⑦ Brush holder

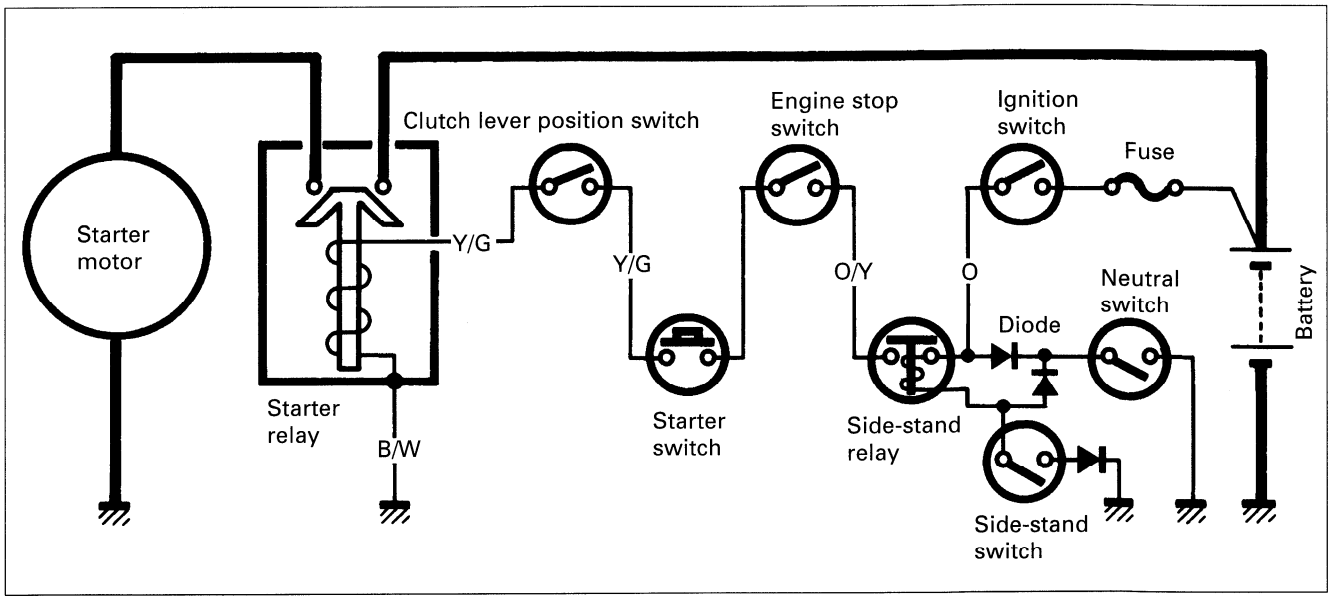
B : Battery terminal
IG : Ignition terminal
F : Rotor coil terminal
E : Ground

STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM

STARTER SYSTEM DESCRIPTION

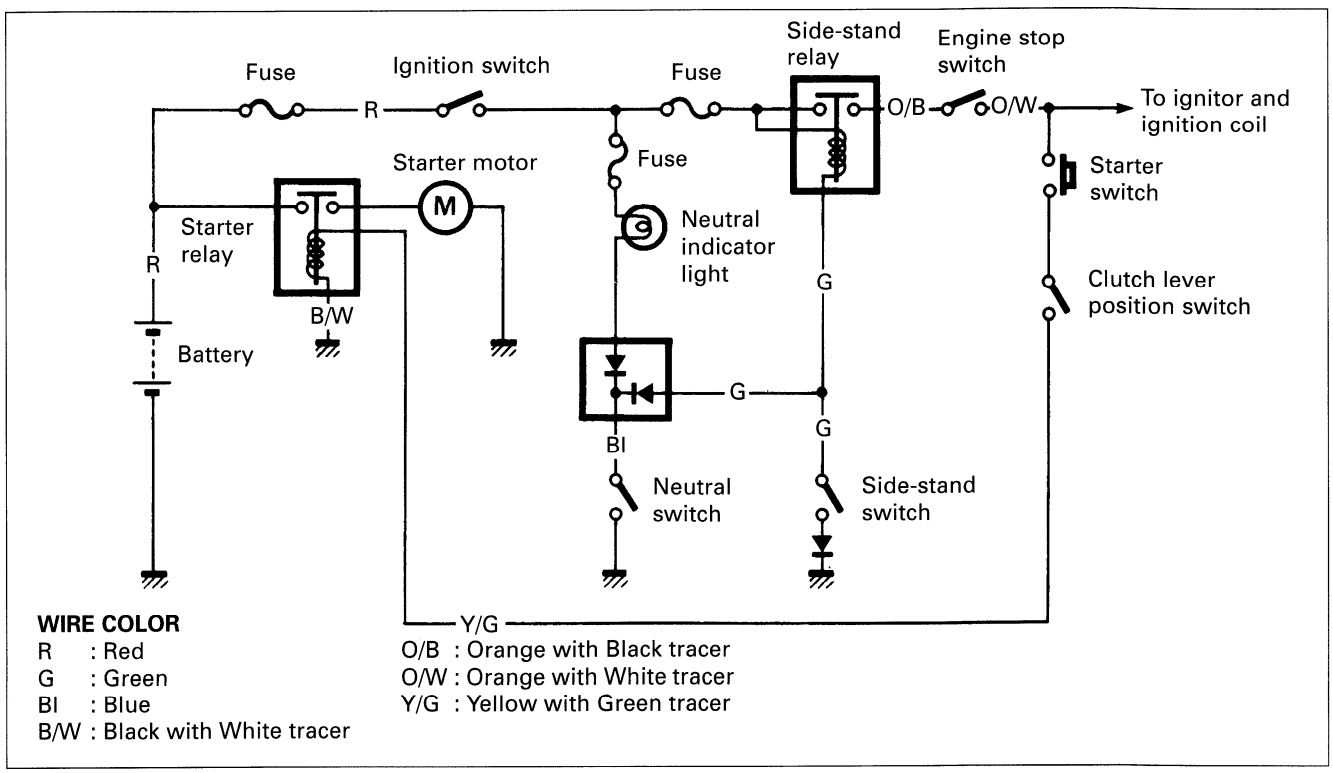
The starter system is shown in the diagram below: namely, the starter motor, starter relay, side-stand relay, side-stand switch, neutral switch, clutch lever position switch, starter switch, engine stop switch, IG switch and battery.

Depressing the starter switch (on the right handlebars switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.



SIDE-STAND/IGNITION INTERLOCK SYSTEM DESCRIPTION

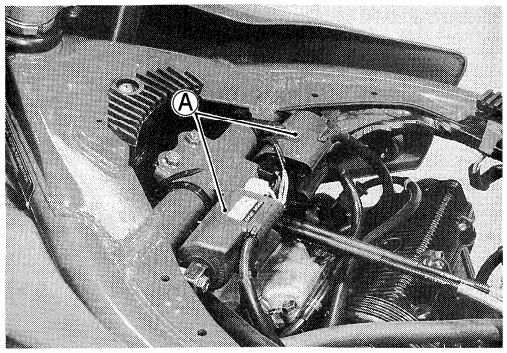
This side-stand/ignition interlock system is to prevent starting the motorcycle with the side-stand left down. The system is operated by an electric circuit provided between the battery and ignition coil.



INSPECTION

IGNITION COIL (Checking with Electro Tester)

- Remove the seat. (Refer to page 5-3.)
- Remove the fuel tank. (Refer to page 4-3.)
- Remove the ignition coils Ⓐ.



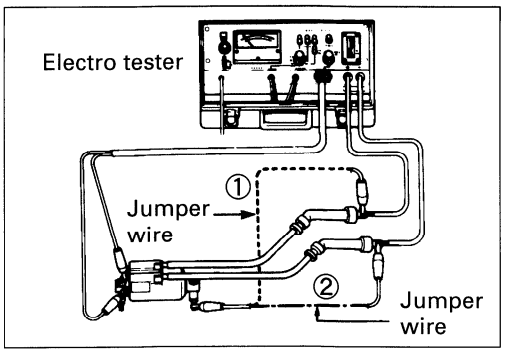
NOTE:
Make sure that the three-needle sparking distance of electro tester is set at 8 mm (0.3 in).

With the tester and jumper wire, test the ignition coil for sparking performance in accordance with the following two steps.

STEP① : Connect the jumper wire to the spark plug cap and ignition coil ground.

STEP② : Switch over the jumper wire to the other plug cap and ground.

If no sparking or orange color sparking occurs in the above conditions, it may be caused by defective coil.

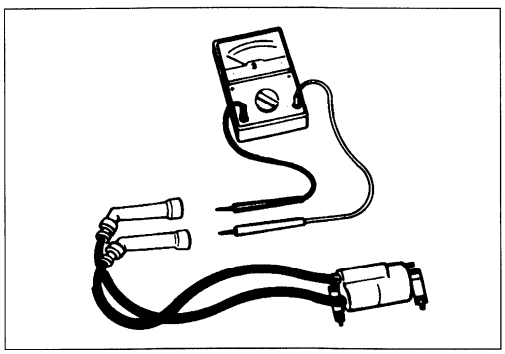


09900-28106: Electro tester

Spark performance: Over 8 mm (0.3 in)

IGNITION COIL (Checking with Pocket Tester)

A SUZUKI pocket tester or an ohm meter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings. Exact ohmic readings are not necessary, but, if the windings are in sound condition, their continuity will be noted with these approximate ohmic values.



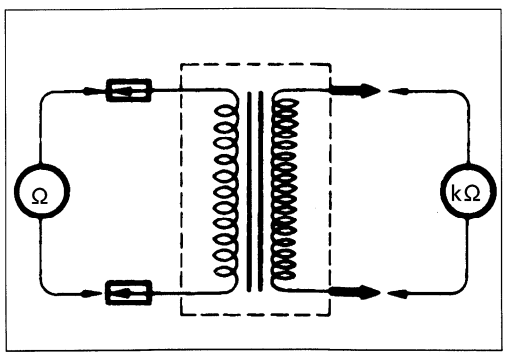
09900-25002: Pocket tester

Ignition coil resistance
Primary: 2—4Ω (⊕ tap–⊖ tap)

Tester knob indication: ×1Ω range

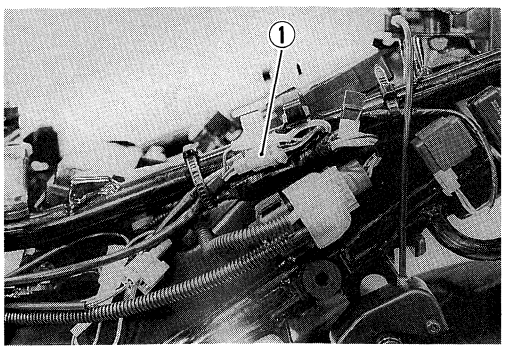
Secondary: 30—40 kΩ (Plug cap–Plug cap)

Tester knob indication: ×1kΩ range



SIGNAL GENERATOR (Checking with Pocket Tester)

- Remove the seat and frame cover assembly. (Refer to page 5-3.)
- Disconnect the lead wire coupler ①.



Measure the resistance between lead wires. If the resistance is infinity or less than the specifications, the signal generator must be replaced.

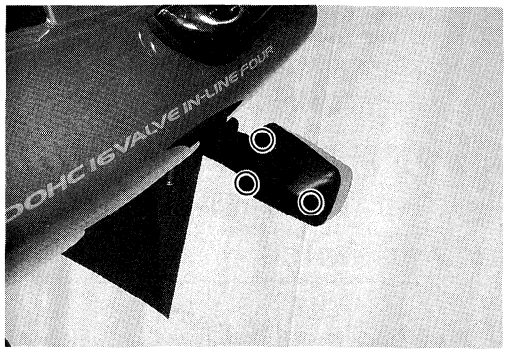
09900-25002: Pocket tester

Signal coil resistance: Approx. 135—200Ω (Yellow–Black/Blue)

Tester knob indication: ×1Ω range

TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the turn signal light lens.
- Push in on the turn signal light bulb, turn it to the left, and pull it out.
- Reinstall the bulb in the reverse order of removal.



⚠ CAUTION

Do not overtighten the lens fitting screws.

RELAY

STARTER RELAY

The starter relay is located behind the left frame cover. (Refer to page 6-19 for details.)

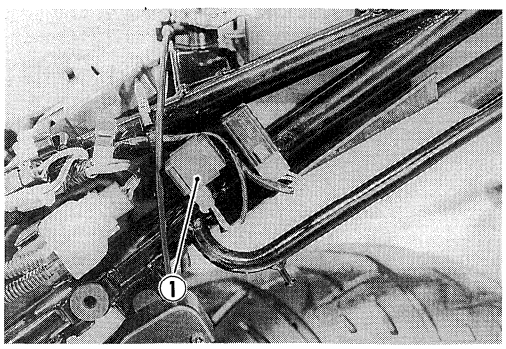
SIDE-STAND RELAY

The side-stand relay is located behind the left frame cover. (Refer to page 6-21 for details.)

TURN SIGNAL RELAY

The turn signal relay ① is located behind the left frame cover. If the turn signal light dose not light, inspect the bulb or repair the circuit connection.
If the bulb, turn signal switch and circuit connection checked are all right, the turn signal relay may be faulty, replace it with a new one.

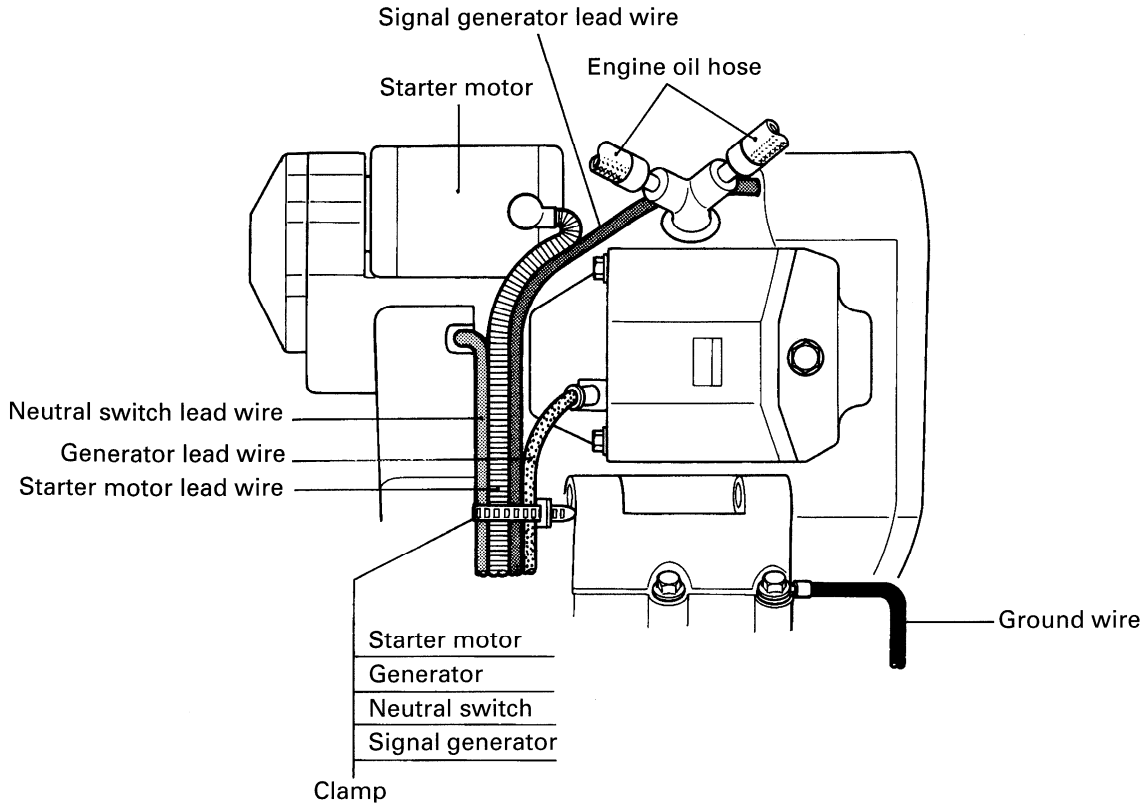
NOTE:
Be sure that the battery used is in full-charged condition.



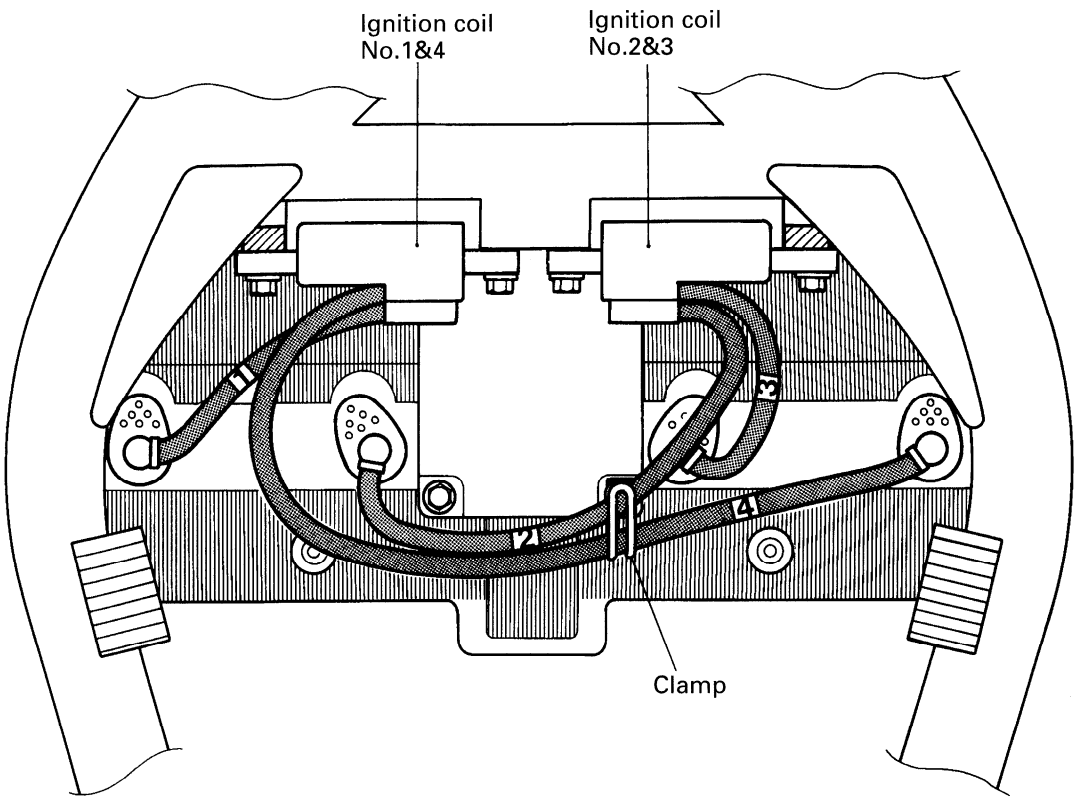
Complaint	Symptom and possible causes	Remedy
Wobbly rear wheel.	1. Distorted wheel rim. 2. Worn rear wheel bearing or swingarm bearings. 3. Defective or incorrect tire. 4. Worn swingarm and rear suspension related bearings. 5. Loose nuts or bolts on rear suspensions.	Replace. Replace. Replace. Replace. Retighten.
Rear suspension too soft.	1. Weakened shock absorber spring. 2. Improperly set rear suspension adjuster. 3. Leakage oil of shock absorber.	Replace. Adjust. Replace.
Rear suspension too stiff.	1. Improperly set rear suspension adjuster. 2. Bent shock absorber shaft. 3. Bent swingarm. 4. Worn swingarm and rear suspension related bearings.	Adjust. Replace. Replace. Replace.
Noisy rear suspension.	1. Loose nuts or bolts on rear suspension. 2. Worn swingarm and rear suspension related bearings.	Retighten. Replace.

BRAKES

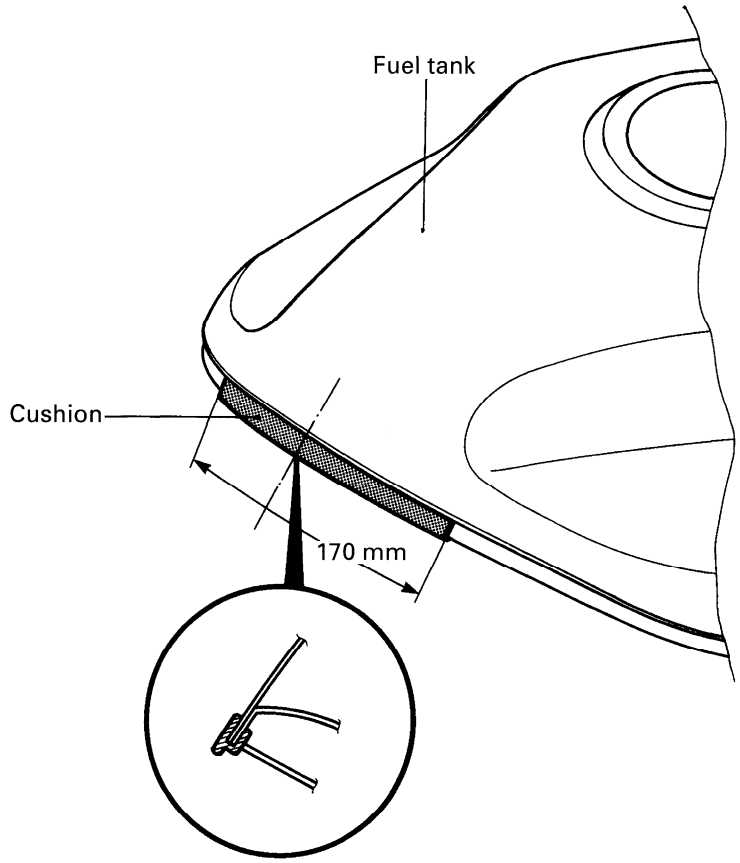
Complaint	Symptom and possible causes	Remedy
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion of engaging surface of pads. 4. Worn disc. 5. Air in hydraulic system.	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air.
Brake squeaking.	1. Carbon adhesion on pad surface. 2. Tilted 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.	Repair surface with sandpaper. Modify pad fitting or replace. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever or pedal stroke.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid.	Bleed air. Replenish fluid to specified level; bleed air. Replace with correct fluid.
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.



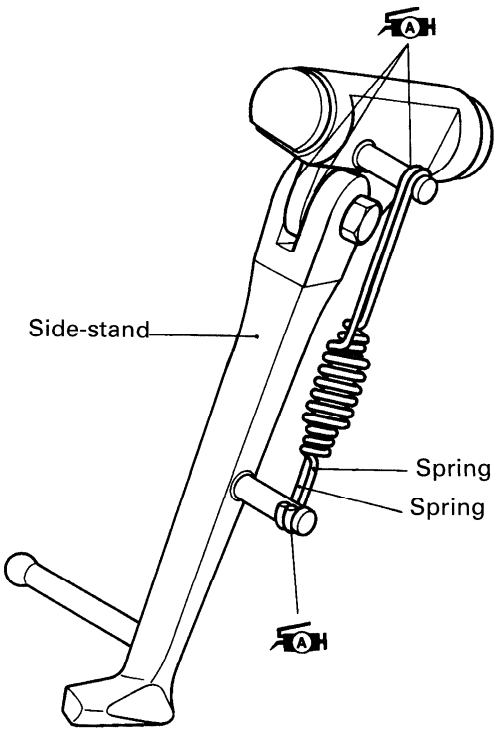
HIGH-TENSION CORD ROUTING

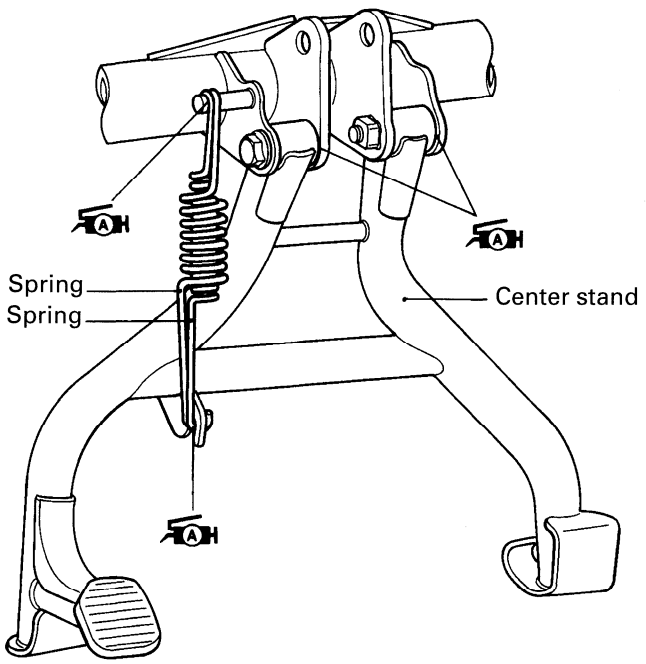


FUEL TANK CUSHION



SIDE-STAND AND CENTER STAND SPRINGS





TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		1.565 (72/46)		———
Final reduction ratio		3.000 (45/15)		———
Gear ratios	Low	2.384 (31/13)		———
	2nd	1.631 (31/19)		———
	3rd	1.250 (25/20)		———
	4th	1.045 (23/22)		———
	Top	0.913 (21/23)		———
Shift fork to groove clearance		No.1, No.2 & No.3	0.1–0.3 (0.004–0.012)	0.50 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.0–5.1 (0.197–0.201)	———
Shift fork thickness		No.1, No.2 & No.3	4.8–4.9 (0.189–0.193)	———
Drive chain		Type	RK GB50MFOZ1	———
		Links	110 links	———
		20-pitch length	———	319.4 (12.6)
Drive chain slack		20–30 (0.8–1.2)		———
Gearshift lever height		55 (2.2)		———

CARBURETOR

ITEM		SPECIFICATION		
		E-02,04,17,22, 24,25,28,34	E-18	E-37
Carburetor type		MIKUNI BST36SS	←	←
Bore size		36 mm (1.4 in)	←	←
I.D. No.		27E1	27E3	27E4
Idle r/min.		1 200 ± 100 r/min.	1 200 $^{+100}_{-\ 50}$ r/min.	1 200 ± 100 r/min.
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet	(M.J.)	#102.5	←	←
Jet needle	(J.N.)	5D76-4th	5D55-2nd	5D76-4th
Needle jet	(N.J.)	O-8	←	←
Throttle valve	(Th.V.)	#120	←	←
Pilot jet	(P.J.)	#37.5	←	←
Pilot screw	(P.S.)	PRE-SET (1-$^3/_4$ turns back)	←	←
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

CARBURETOR

ITEM		SPECIFICATION		
		E-02,04,17,22, 24,25,34	E-18	E-37
Carburetor type		MIKUNI BST36SS	←	←
Bore size		36 mm (1.4 in)	←	←
I.D. No.		27E1	27E3	27E4
Idle r/min.		1 200 ± 100 r/min.	1 200 $^{+100}_{-50}$ r/min.	1 200 ± 100 r/min.
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet	(M.J.)	#102.5	←	←
Jet needle	(J.N.)	5D76-4th	5D55-2nd	5D76-4th
Needle jet	(N.J.)	O-8	←	←
Throttle valve	(Th.V.)	#120	←	←
Pilot jet	(P.J.)	#37.5	←	←
Pilot screw	(P.S.)	PRE-SET (1-$^{3}/_{4}$ turns back)	←	←
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

CARBURETOR

ITEM		SPECIFICATION	
		E-03,28	E-33 (Calif. model)
Carburetor type		MIKUNI BST36SS	←
Bore size		36 mm (1.4 in)	←
I.D. No.		27E5	27E6
Idle r/min.		1 200 ± 50 r/min.	←
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←
Main jet	(M.J.)	#102.5	←
Jet needle	(J.N.)	5D80	←
Needle jet	(N.J.)	O-8M	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	#37.5	←
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		7° B.T.D.C. Below 1 500 r/min.		
Firing order		1·2·4·3		
Spark plug		Type	NGK: JR9B	
		Gap	0.6–0.7 (0.024–0.028)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		Approx. 135–200 Ω		Tester range: (× 100 Ω)
Ignition coil resistance		Primary	⊕ tap–⊖ tap Approx. 2–4 Ω	Tester range: (× 1 Ω)
		Secondary	Plug cap–Plug cap Approx. 30–40 kΩ	Tester range: (× 1 kΩ)

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.58-33.62 (1.3220-1.3236)	33.28 (1.3102)
	EX	33.41-33.45 (1.3154-1.3170)	33.11 (1.3035)
Camshaft journal clearance	IN. & EX.	0.032-0.066 (0.0013-0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012-22.025 (0.8666-0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959-21.980 (0.8645-0.8654)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")	24th pin		—
Rocker arm I.D.	IN. & EX.	12.000-12.018 (0.4724-0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.973-11.984 (0.4714-0.4718)	—
Cylinder head distortion	—		0.20 (0.008)

CYLINDER + PISTON + PISTON RING

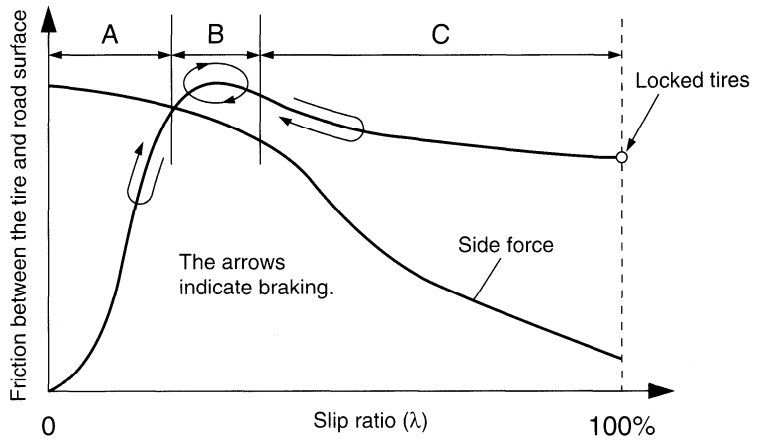
Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1250 kPa (12.5 kg/cm^2) (178 psi)			875 kPa (8.75 kg/cm^2) (124 psi)
Compression pressure difference	—			200 kPa (2 kg/cm^2) (28 psi)
Piston to cylinder clearance	0.040-0.070 (0.0016-0.0028)			0.120 (0.0047)
Cylinder bore	79.000-79.015 (3.1102-3.1108)			79.080 (3.1134)
Piston diameter	78.945-78.960 (3.1081-3.1087) Measure at 15 (0.6) from the skirt end.			78.880 (3.1055)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 10.0 (0.39)	8.0 (0.31)
	2nd	R	Approx. 12.0 (0.47)	9.6 (0.38)

RELATIONSHIP BETWEEN THE SLIP RATIO, SIDE FORCE AND THE FRICTION BETWEEN THE TIRE AND ROAD SURFACE

The relationship between the slip ratio, the side force and the friction between the tire and road surface is shown in the following graph.

*"Side force" is the force that supports the motorcycle sides.



The friction between the tire and road surface is generally at its maximum when the slip ratio is within section B and the friction is at its lowest when the wheels are locked (100% slip ratio). In addition, since braking reduces the side force, suddenly braking when there is a large slip ratio reduces the supporting force on the sides of the motorcycle and decreases the motorcycle's stability. The above graph shows that optimal braking occurs within section B, where the friction between the tire and road surface is maximum and the side force is not significantly reduced.

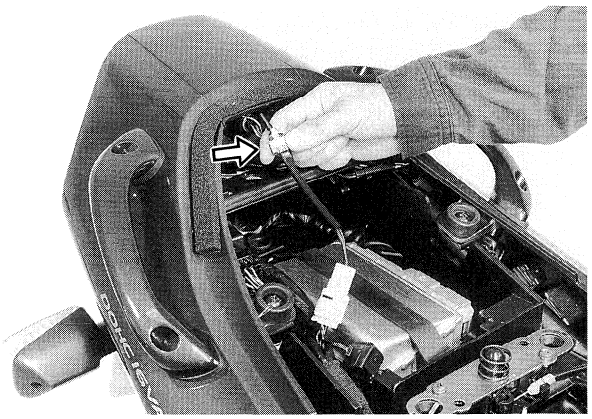
PERFECT CONTROL

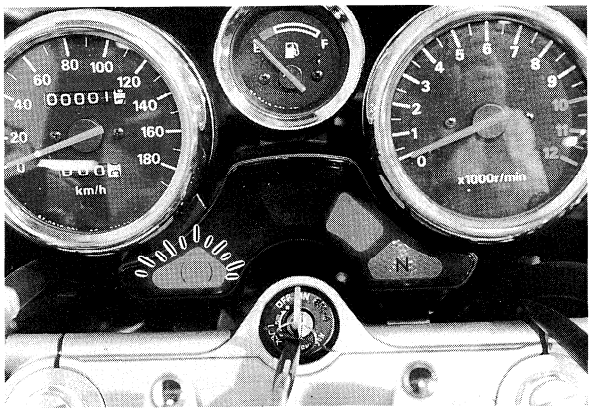
The brake fluid pressure is adjusted to provide the proper braking force.

While the slip ratio is within section B, the brake fluid pressure is slightly increased, decreased or maintained. If the slip ratio enters section C due to changes in road conditions, the brake fluid pressure is quickly decreased so that the slip ratio returns to section B. If the slip ratio enters section A, the brake fluid pressure is quickly increased so that the slip ratio returns to section B.

It is very difficult for a person to make these types of adjustments quickly and accurately. The ABS, which is a control system that uses electrical and hydraulic technology, makes these adjustments automatically to provide the ideal braking force.

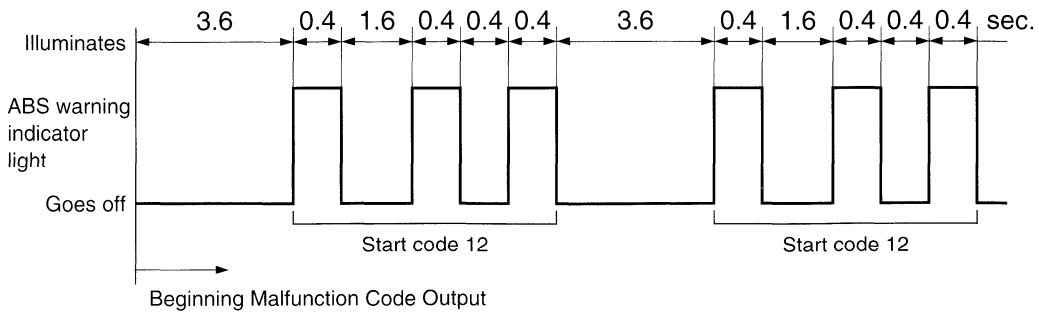
- If a malfunction occurred in the ABS, connect the ABS test switch coupler to the ECU check coupler to display the malfunction codes on the ABS warning indicator light.



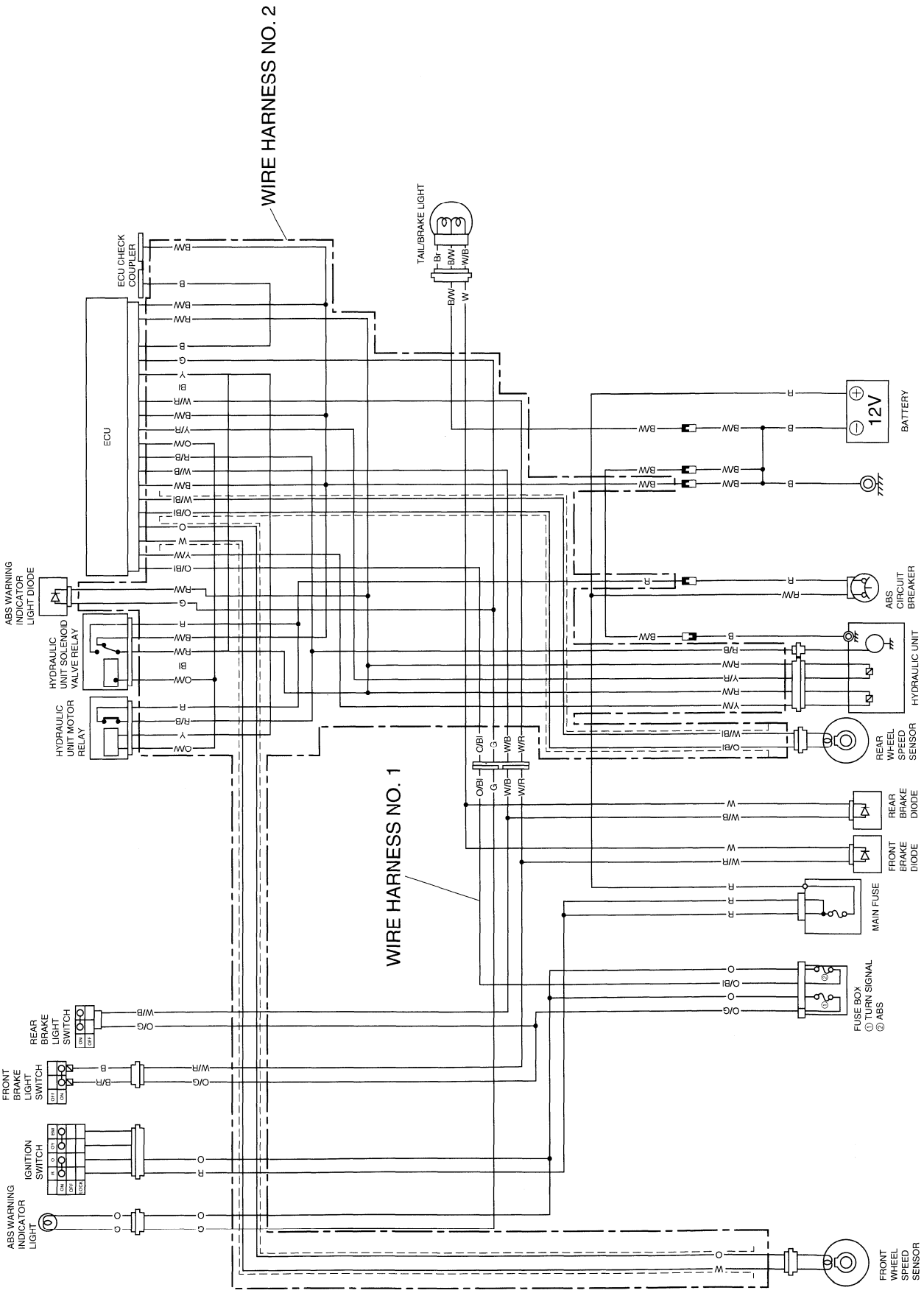


A two-digit malfunction code is shown through the lighting pattern of the ABS warning indicator light. A number between 1 and 9 is represented by the number of times that the ABS warning indicator light illuminates for 0.4 second and the separation between the tens and ones are indicated by the light staying off for 1.6 seconds. In addition, the separation between the start code and the malfunction code is indicated by the light being off for 3.6 seconds.
After the start code is displayed, up to three malfunction codes appear. This cycle repeats for five minutes.
If no malfunction codes were memorized, only start code 12 is displayed continuously.

Malfunction Code Display Example (no malfunction occurred)

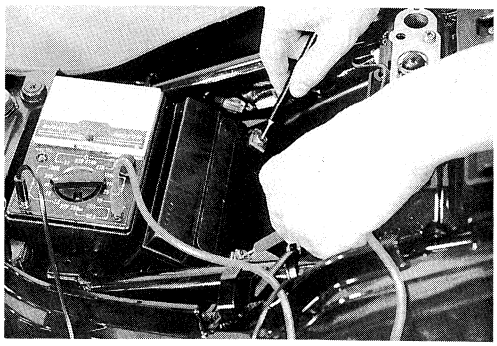


ABS WIRING DIAGRAM



BATTERY VOLTAGE

Measure the DC voltage between the ⊕ and ⊖ battery terminals, with a pocket tester. If the voltage reading is less than 12.0V, recharge the battery with a battery charger.



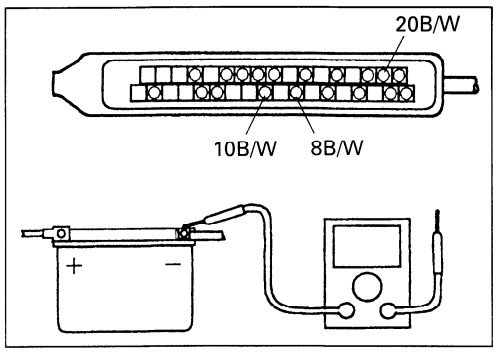
TOOL 09900-25002: Pocket tester

Tester knob indication: DC 25V

ECU GROUND WIRE INSPECTION

- Turn the ignition switch to OFF.
- Disconnect the coupler at the ECU, then measure the continuity between the ground and the ⊖ battery terminal.

If there is no continuity, repair the coupler or replace the wire harness.



TOOL 09900-25002: Pocket tester

8 B/W — ⊖ Battery terminal: 0Ω

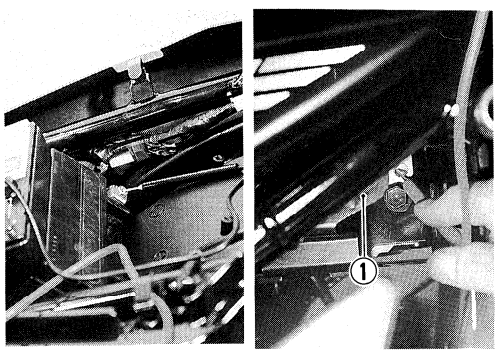
10 B/W — ⊖ Battery terminal: 0Ω

20 B/W — ⊖ Battery terminal: 0Ω

Tester knob indication: × 1Ω range

HYDRAULIC UNIT GROUND WIRE INSPECTION

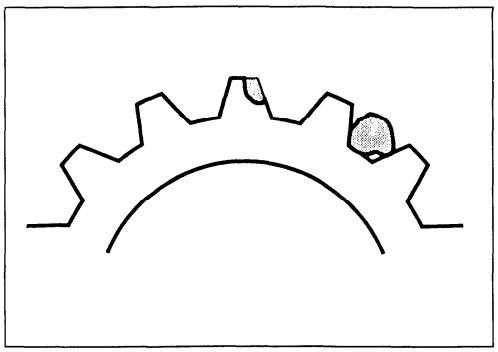
- Turn the ignition switch to OFF.
- Measure the continuity between the hydraulic unit ground ① and the ⊖ battery terminal.
  If there is no continuity, check if the hydraulic unit ground wire is disconnected or replace the wire harness.



TOOL 09900-25002: Pocket tester

Hydraulic unit ground wire — ⊖ Battery terminal: 0Ω

Tester knob indication: × 1Ω range



B

Check that no wheel speed sensor rotor teeth are broken and that no foreign objects are caught in the wheel speed sensor. (Refer to page 66.)

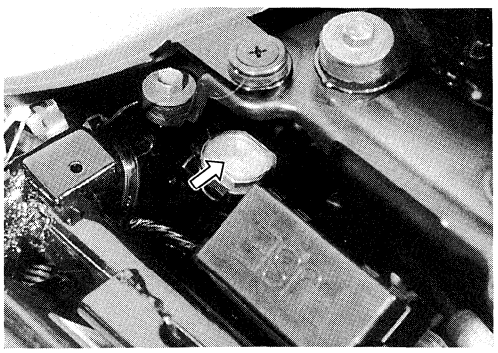
Incorrect → Replace the wheel or clean the wheel speed sensor rotor.

Correct

Inspect the wheel. (Refer to page 43.)

Incorrect → Replace the wheel.

Malfunction code 35 – Faulty hydraulic unit motor and hydraulic unit motor relay wiring
Relay power supply line discontinuity



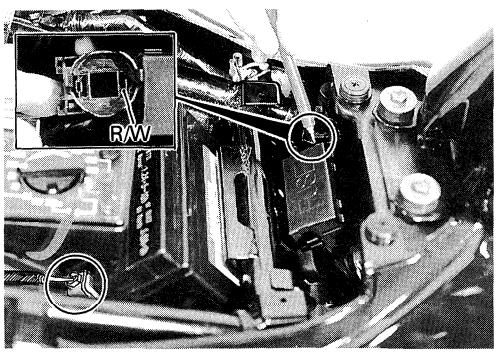
Check that the ABS circuit breaker is not activated.

Activated → Reset the ABS circuit breaker.

Not activated

Turn the ignition switch to OFF. Disconnect the ABS circuit breaker coupler, then measure the voltage between the ABS circuit breaker R/W and the ⊖ battery terminal.
R/W — ⊖ battery terminal:
about 12.3V
Measuring range: 25V

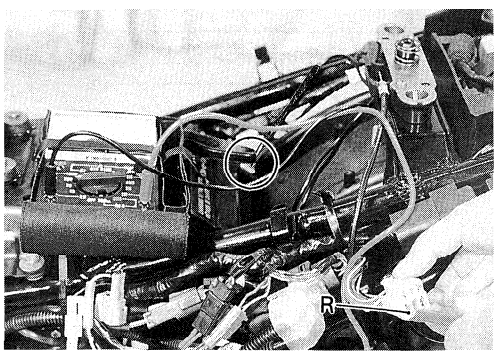
Incorrect → Replace the ⊕ battery terminal lead wire.



Correct

Disconnect the hydraulic unit motor relay coupler, then measure the voltage between R on the wire harness and the ⊖ battery terminal.
R — ⊖ battery terminal:
about 12.3V
Measuring range: 25V

Incorrect → Replace wire harness No.2.



Correct

C

Faulty hydraulic unit solenoid valve power supply wiring relay power supply line discontinuity

Activated

Check that the ABS circuit breaker is not activated. → Reset the ABS circuit breaker.

Not activated

Turn the ignition switch to OFF. Disconnect the ABS circuit breaker coupler, then measure the voltage between the ABS circuit breaker R/W and the ⊖ battery terminal.
R/W — ⊖ battery terminal:
about 12.3V
Measuring range: 25V

Incorrect → Replace the ⊕ battery terminal lead wire.

Correct

Disconnect the solenoid valve relay coupler, then measure the voltage between R on the wire harness and the ⊖ battery terminal.
R — ⊖ battery terminal:
about 12.3V
Measuring range: 25V

Incorrect → Replace wire harness No.2.

Correct

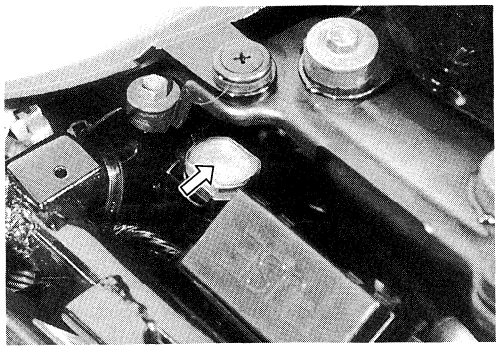
Faulty hydraulic unit solenoid valve power supply monitor line

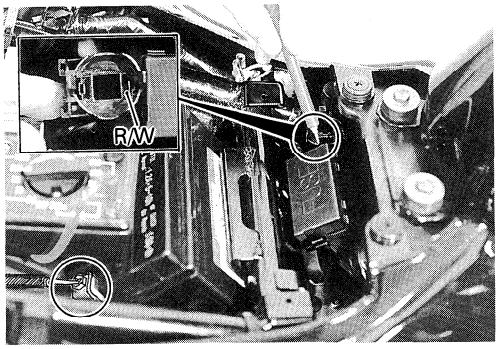
Disconnect the coupler at the hydraulic unit solenoid valve relay and the the coupler at the ECU, then measure the continuity between the wire harnesses.
32R/W — R/W : 0Ω
Measuring range: 1Ω

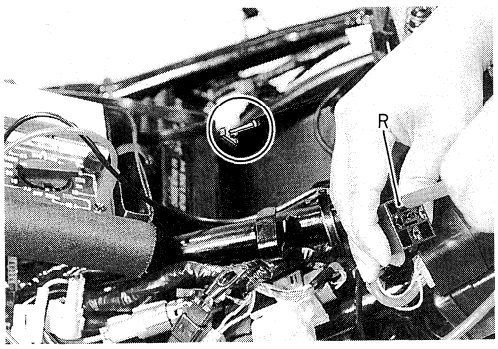
Incorrect → Replace wire harness No.2.

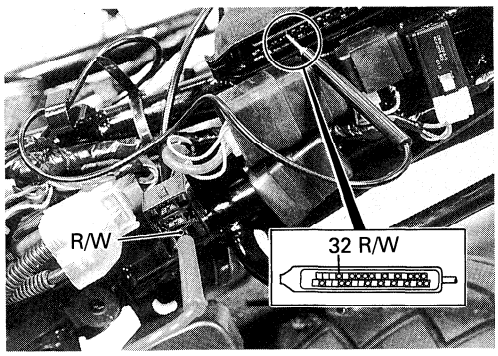
Correct

(F)

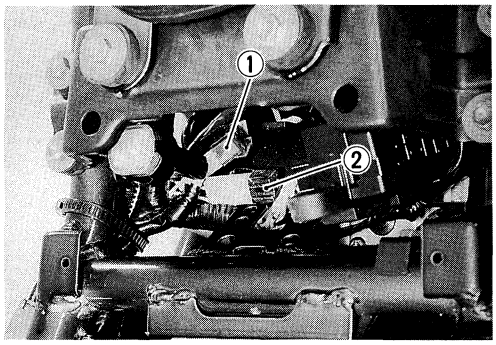








- Remove the front brake diode ① and rear brake diode ②, then disconnect their couplers.



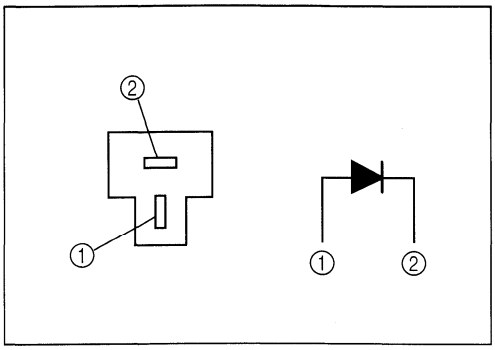
VI-6 FRONT BRAKE DIODE AND REAR BRAKE DIODE INSPECTION

- Check the continuity between terminals ① and ②, with a pocket tester. If the readings are out of specification, replace the diode.

TOOL 09900-25002: Pocket tester

Tester knob indication: × 1Ω range

Tester ⊕ to ① and tester ⊖ to ②: No continuity
Tester ⊕ to ② and tester ⊖ to ①: Continuity



- Measure the voltage between terminals ① and ②, with the multi-circuit tester set. If the voltage is out of specification, replace the diode.

TOOL 09900-25008: Multi-circuit tester set

Tester knob indication: →|– range

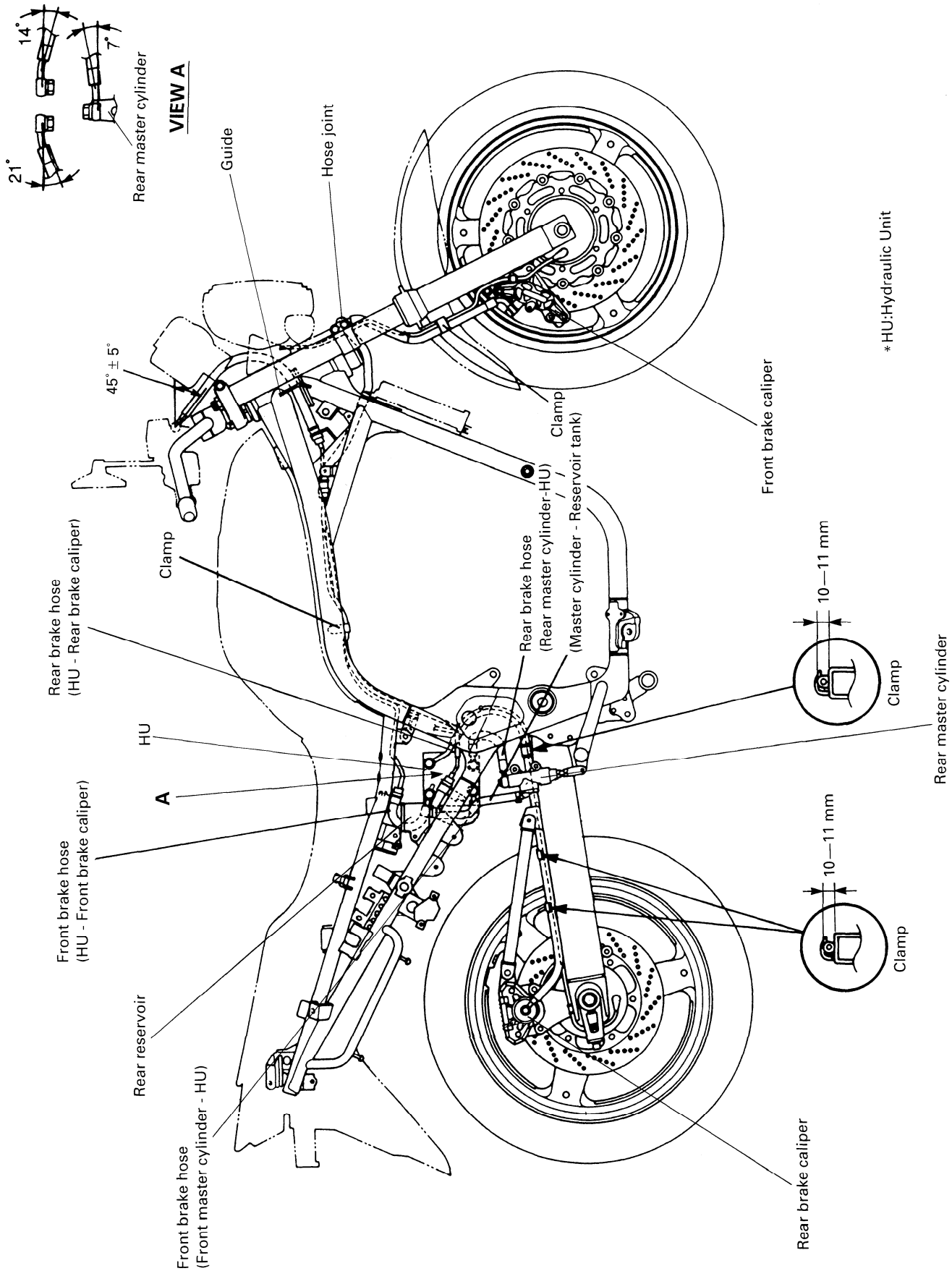
Tester ⊕ to ① and tester ⊖ to ②: About 0.5V
Tester ⊕ to ② and tester ⊖ to ①: About 1.5V

VI-6 FRONT BRAKE DIODE AND REAR BRAKE DIODE REMOUNTING

Remount the front brake diode and rear brake diode in the reverse order of removal. Pay attention to the following points:

- Retape the area in the same way that it was taped before.

BRAKE HOSE ROUTING



CARBURETOR

ITEM		SPECIFICATION		
		E-02,04,17,22, 24,25,34	E-18 (GSF1200S)	E-18 (GSF1200)
Carburetor type		MIKUNI BST36SS	←	←
Bore size		36 mm (1.4 in)	←	←
I.D. No.		27E1	27E3	27E7
Idle r/min.		1 200 ± 100 r/min.	1 200 $^{+100}_{-50}$ r/min.	←
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet	(M.J.)	#102.5	←	←
Jet needle	(J.N.)	5D76-4th	5D55-2nd	←
Needle jet	(N.J.)	O-8	←	←
Throttle valve	(Th.V.)	#120	←	←
Pilot jet	(P.J.)	#37.5	←	←
Pilot screw	(P.S.)	PRE-SET (1-3/4 turns back)	PRE-SET (1-7/8 turns back)	←
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

CARBURETOR

ITEM		SPECIFICATION		
		E-03,28	E-33 (Calif. model)	P-37
Carburetor type		MIKUNI BST36SS	←	←
Bore size		36 mm (1.4 in)	←	←
I.D. No.		27E5	27E6	27E4
Idle r/min.		1 200 ± 50 r/min.	←	1 200 ± 100 r/min.
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet	(M.J.)	#102.5	←	#102.5
Jet needle	(J.N.)	5D80	←	5D76-4th
Needle jet	(N.J.)	O-8M	←	O-8
Throttle valve	(Th.V.)	#120	←	←
Pilot jet	(P.J.)	#37.5	←	#37.5
Pilot screw	(P.S.)	PRE-SET	←	PRE-SET (1-3/4 turns back)
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	7° B.T.D.C. Below 1 500 r/min.		
Firing order	1-2-4-3		
Spark plug	Type	NGK: JR9B	
	Gap	0.6–0.7 (0.024–0.028)	
Spark performance	Over 8 (0.3) at 1 atm.		