

MAINTENANCE AND TUNE-UP PROCEDURES

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

VALVE CLEARANCE

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

The valve clearance specification is different for intake and exhaust valves.

Valve clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshaft is disturbed by removing it for servicing.

Valve clearance (when cold):

IN.: 0.08—0.13 mm (0.003—0.005 in)

EX.: 0.17—0.22 mm (0.007—0.009 in)

NOTE:

Valve clearance is to be checked when the engine is cold. Both intake and exhaust valves must be checked and adjusted when the piston is at Top—Dead—Center (TDC) on the compression stroke.

- Remove the frame covers, seat and fuel tank.
- Remove the spark plug and valve inspection caps, intake and exhaust.
- Remove the valve timing inspection plug and magneto cover cap.
- Turn the crankshaft counterclockwise with the box wrench to set the piston at T.D.C. on the compression stroke. (Turn the crankshaft until the "T" line ① on the magneto rotor is aligned with the center of hole on the magneto cover.)
- Insert the thickness gauge into the clearance between the valve stem end and the adjusting screw on the rocker arm.



09900-20803: Thickness gauge

09917-14910: Valve clearance adjusting driver

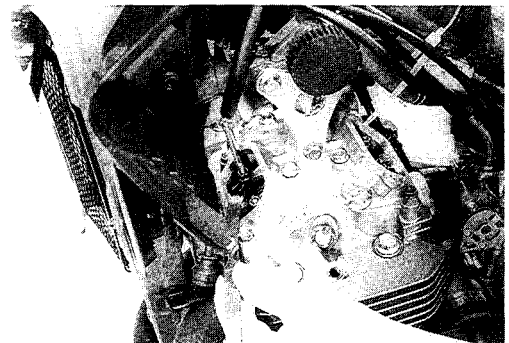
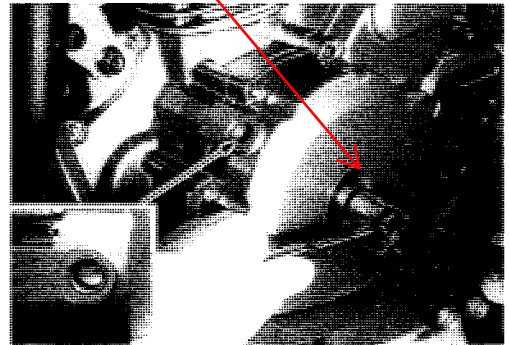
- If clearance is out of the specification, bring it into the specified range.
- Securely tighten the lock nut after adjustment is completed.

⚠ CAUTION

Both right and left valve clearances, should be as closely set as possible.

- Reinstall the spark plug, valve inspection caps, valve timing inspection plug and magneto cover cap.

**Loosen magneto cover plug with engine hot!!
Use anti-seize on threads to reassemble.**



SPARK PLUGS

Inspect Every 6 000 km (4 000 miles, 12 months) and
Replace Every 12 000 km (7 500 miles, 24 months).

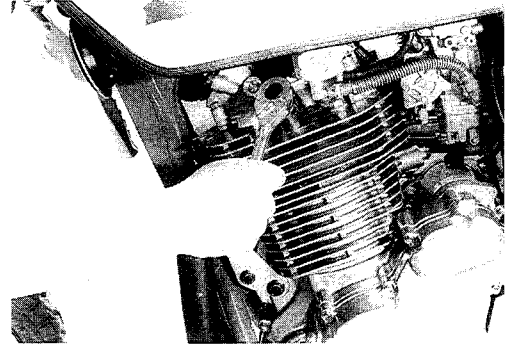
- Remove the spark plugs.

TOOL 09930-10121: Spark plug socket wrench set

	Standard	Hot type
NGK	CR10E	CR9E
ND	U31ESR-N	U27ESR-N

NGK CR10EIX (Iridium)
NGK CR10EK (Dual Ground)

Other popular sparkplugs used
in the DR650.



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.

Spark plug gap	Standard
	0.7–0.8 mm (0.028–0.031 in)

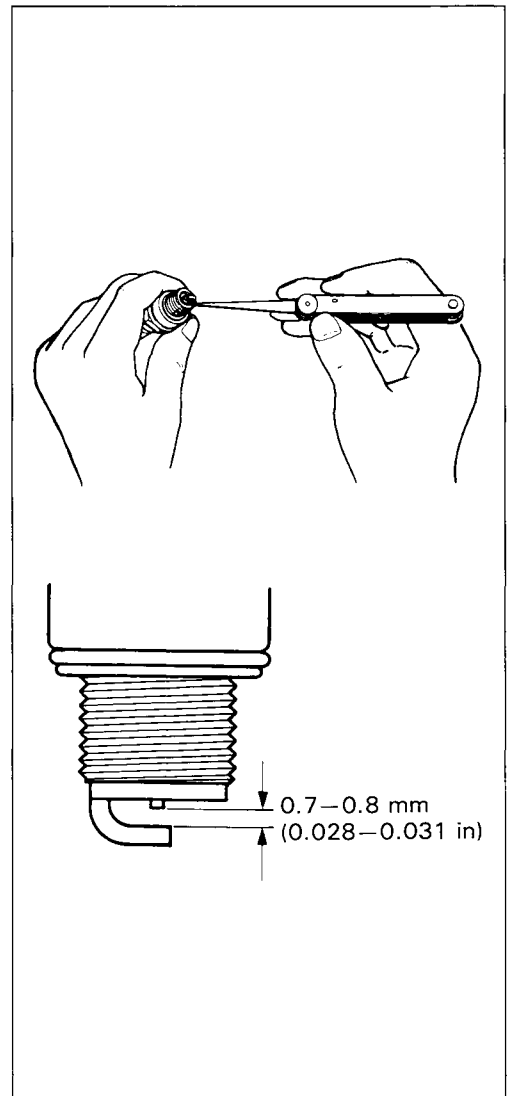
TOOL 09900-20803: Thickness gauge

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.



AIR CLEANER ELEMENT

Clean Every 3 000 km (2 000 miles).

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

Check and clean the element in the following manner.

- Remove the left frame cover.
- Remove the air cleaner case cover by removing screws ①.
- Remove the air cleaner element by removing its support screw ②.
- Remove the polyurethane foam element ③ from the element frame ④.
- Fill a washing pan of a proper size with non-flammable cleaning solvent. Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands.
- Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.

NOTE:

Do not twist or wring the element because it will tear or the individual cells of the element will be damaged.

⚠ CAUTION

Inspect the element carefully for rips, torn seams, etc. If any damage is noted, replace the element.

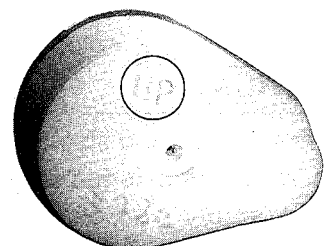
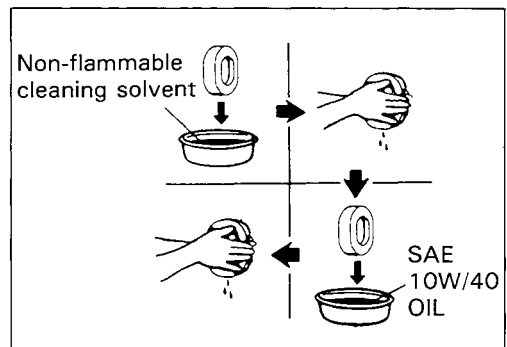
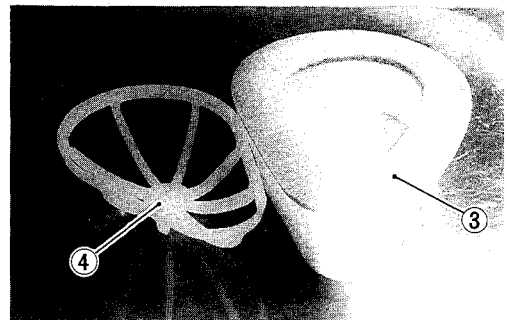
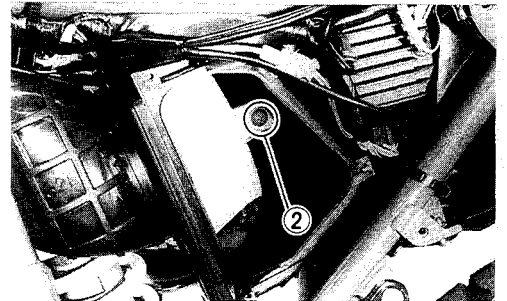
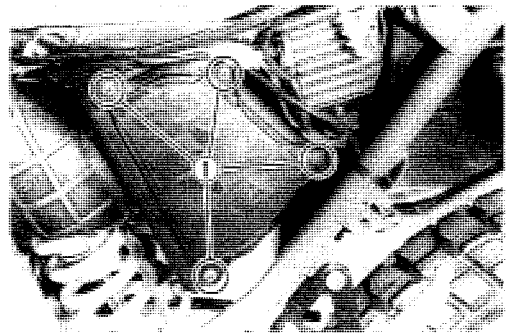
- Reinstall the cleaned or new cleaner element in the reverse order of removal.
- When installing the air cleaner element in the cleaner case, make sure that the "UP" mark comes upward.

⚠ CAUTION

If driving under dusty conditions, 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!

NOTE:

When you clean the air cleaner element, drain water from the air cleaner drain hose by removing the drain plug.



CARBURETOR

BST Tuning Information

Inspect Initially at 1 000 km (600 miles, 2 months) and
Every 6 000 km (4 000 miles, 12 months) thereafter.

THROTTLE CABLE ADJUSTMENT

A twin throttle cable system is used in this motorcycle. Cable ① is for pulling and cable ② is for returning. To adjust the cable play, adjust the returning cable first and then adjust the pulling cable.

Returning cable play

The returning cable should be adjusted to have a thread length \textcircled{A} of 3–4 mm (0.12–0.16 in) as shown in the Fig. If the adjustment is necessary, adjust the thread length in the following way:

- Loosen the lock nuts ③.
- Move the adjuster ④ to obtain the thread length \textcircled{A} of 3–4 mm (0.12–0.16 in).
- Tighten the lock nuts ③ securely.

Pulling cable play

The pulling cable should be adjusted to have a cable play \textcircled{B} of 0.5–1.0 mm (0.02–0.04 in) as shown in the Fig. If the adjustment is necessary, adjust the cable play in the following way:

- Turn the handlebar all the way to the left.
- Loosen the lock nuts ⑤, ⑥).
- Turn the adjuster ⑦ or move the adjuster ⑧ to obtain the cable play \textcircled{B} of 0.5–1.0 mm (0.02–0.04 in).
- Tighten the lock nuts ⑤, ⑥) securely.

⚠ WARNING

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

IDLE RPM ADJUSTMENT

NOTE:

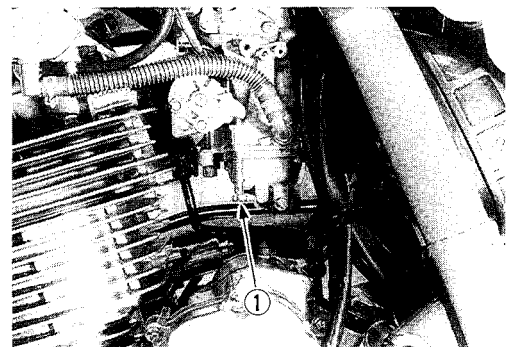
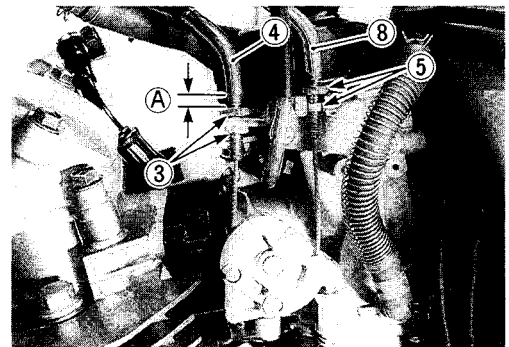
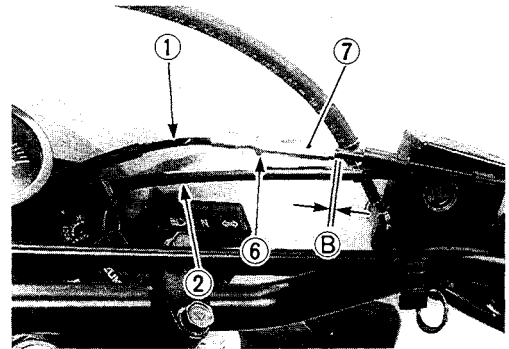
Make this adjustment when the engine is warm.

- Connect a tachometer.



09900-26006: Tachometer

- Start up the engine and set its speed at anywhere between 1 400 and 1 600 r/min by turning the throttle stop screw ①.
- Turn in or out the pilot screw within 1/2 turn from the standard setting, and set it when the engine speed is at the highest possible level.
- After previous adjustment, recheck the idling speed and adjust to between 1 400 and 1 600 r/min with throttle stop screw if necessary.

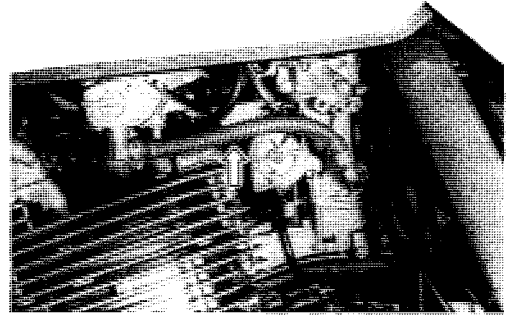


Engine idle speed:

1 500 ± 50 r/min ... for Switzerland
1 500 ± 100 r/min ... for the Others

FUEL LINE (EVAP HOSE ... California model only)

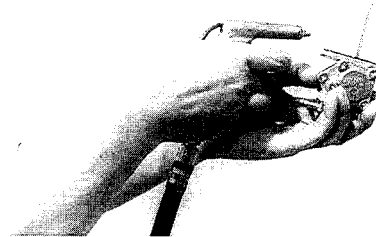
Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.
Replace Every 4 years.



FUEL VALVE STRAINER

Clean Every 12 000 km (7 500 miles, 24 months).

Refer to page 4-2 for removal procedure.



CLUTCH

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

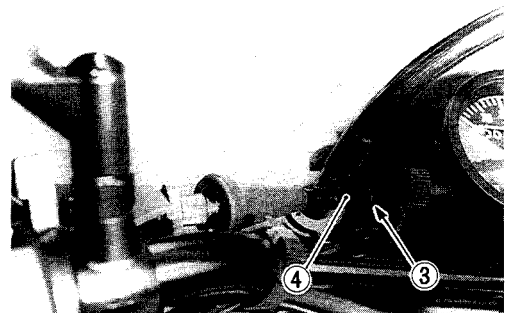
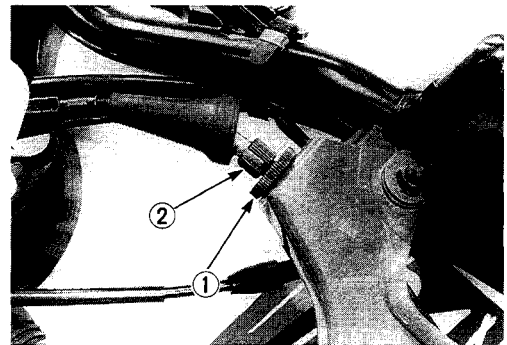
- Loosen the lock nut ① and turn the clutch cable adjuster ② fully in.
- Loosen the lock nut ③ and turn the clutch cable adjuster ④ to provide the specified clutch lever play ⑤.

Clutch lever play ⑤: 10–15 mm (0.4–0.6 in)

- Tighten the lock nuts (① and ③) while holding the adjusters (② and ④) in positions.

NOTE:

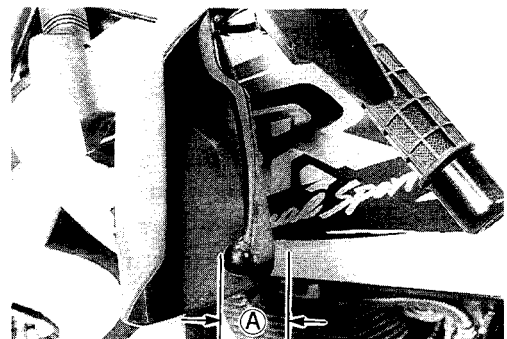
Minor adjustment can be made by the adjuster ② after loosening the lock nut ①. At the same intervals, lubricate the clutch cable with motor oil



Clutch lever safety switch bypass

Dragging clutch?

Slipping Clutch?



ENGINE OIL AND OIL FILTER

(ENGINE OIL)

Replace (Change) Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

(OIL FILTER)

Replace Initially at 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

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

- Keep the motorcycle upright, supported by jack or wooden block.
- Place an oil pan below the engine and remove the engine oil drain plug ① and oil filler cap ② to drain engine oil.
- Remove the oil filter cap by removing the three bolts ③.
- Remove the oil filter ④ and install the new one.
- Install the oil filter cap and tighten the bolts ③ securely.

NOTE:

Before installing the oil filter and oil filter cap, check to be sure that the spring ⑤ and new O-rings (⑥ and ⑦) are installed correctly and apply engine oil lightly to the new O-ring ⑥.

- Tighten the oil drain plug ① securely, and pour fresh oil through the oil filler. The engine will hold about 2 300 ml of oil. Use an API classification of SE, SF or SG oil with SAE 10W/40 viscosity.

Drain plug: 24 N·m (2.4 kg-m, 17.5 lb-ft)

- Install the oil filler cap ②.
- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ⑧. If the level is below mark "F", add oil to the level.

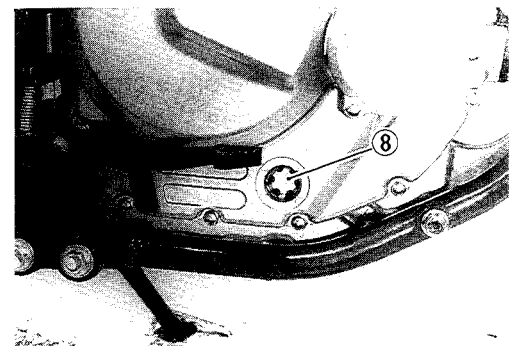
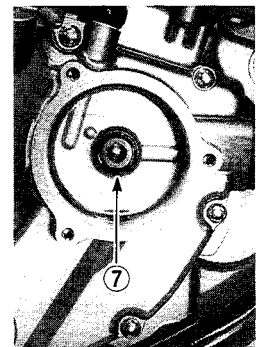
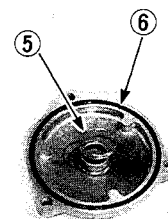
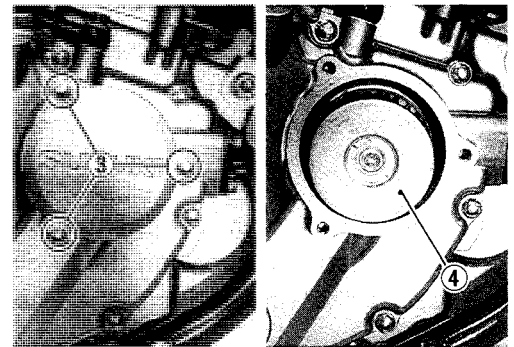
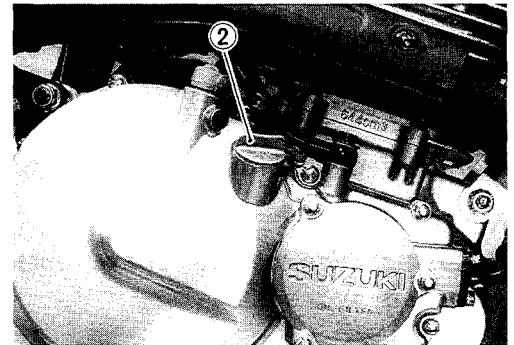
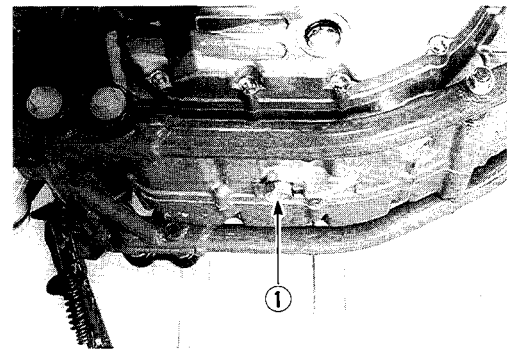
NECESSARY AMOUNT OF ENGINE OIL

Oil change : 2 300 ml (2.4/2.0 US/Imp qt)

Filter change : 2 400 ml (2.5/2.1 US/Imp qt)

Overhaul engine: 2 600 ml (2.7/2.3 US/Imp qt)

Use 2 US qt/2L or equiv then check level.
After running machine. Add more if required.
Do not over fill.



DRIVE CHAIN

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.
Clean and Lubricate Every 1 000 km (600 miles).

Visually check the drive chain for the possible defects listed below. (Support the motorcycle by a jack and a wooden block, turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

- * Loose pins
- * Excessive wear
- * Damaged rollers
- * Improper chain adjustment
- * Dry or rusted links
- * Missing O-ring seals
- * Kinked or binding links

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

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

CHECKING

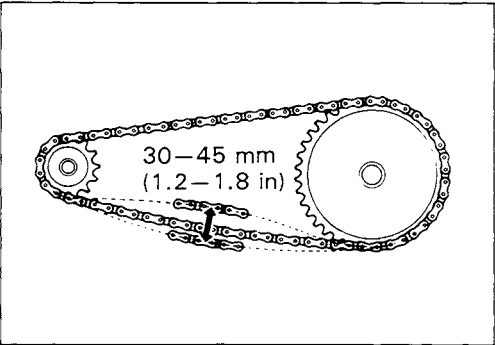
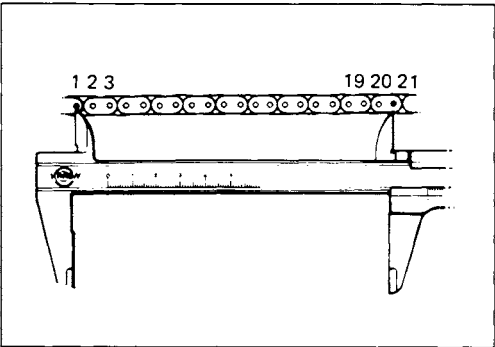
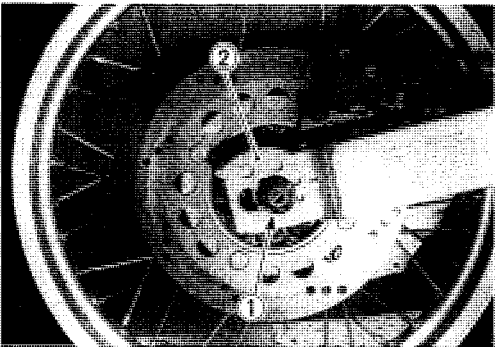
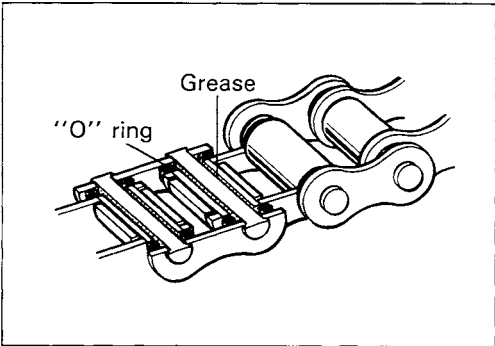
- Remove the axle cotter pin (Canada and U.S.A).
- Loosen the axle nut ① .
- Tense the drive chain fully by turning both chain adjusters ② .
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.

	Service Limit
Drive chain 20-pitch length	319.4 mm (12.6 in)

ADJUSTING

- Turn both chain adjusters ② until the chain has 30–45 mm (1.2–1.8 in) of slack in the middle between engine and rear sprockets. The number on both chain adjusters must be at the same number on the scale to ensure that the front and rear wheels are correctly aligned.
- Place the motorcycle on its side-stand for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut ① to the specified torque.

- 🔧 **Rear axle nut: 100 N·m (10.0 kg·m, 72.5 lb·ft) (with cotter pin)**
Rear axle nut: 110 N·m (11.0 kg·m, 79.5 lb·ft) (Self-locking)



CLEANING AND LUBRICATING

- Wash the chain with kerosene. If the chain tends to rust quickly, the intervals must be shortened.

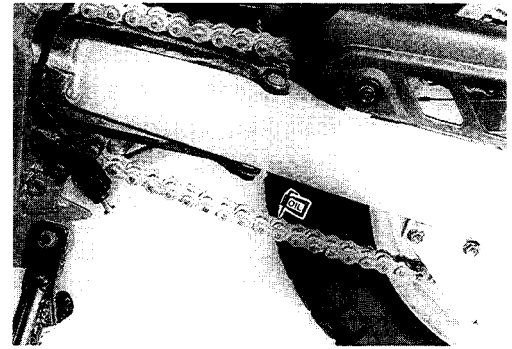
⚠ CAUTION

Do not use trichlene, gasoline or any similar fluids: These fluids have too great a dissolving power for this chain and, what is more important, they can damage the "O"-rings (or seals) confining the grease in the bush to pin clearance. Remember, high durability comes from the presence of grease in that clearance.

- After washing and drying the chain, oil it with a heavy-weight motor oil.

⚠ CAUTION

- * Do not use any oil sold commercially as "drive chain oil". Such oil can damage the "O"-rings (or seals).
- * The standard drive chain is D.I.D. 525 V9, 110 links. SUZUKI recommends that this standard drive chain should be used for the replacement.

**BRAKES****(BRAKE)**

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

(BRAKE HOSE AND BRAKE FLUID)

Inspect Every 6 000 km (4 000 miles, 12 months). Replace hoses Every 4 years. Replace fluid Every 2 years.

BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the lower limit lines on the front and rear brake fluid reservoirs.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.



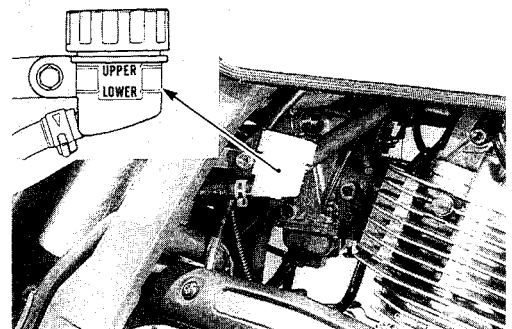
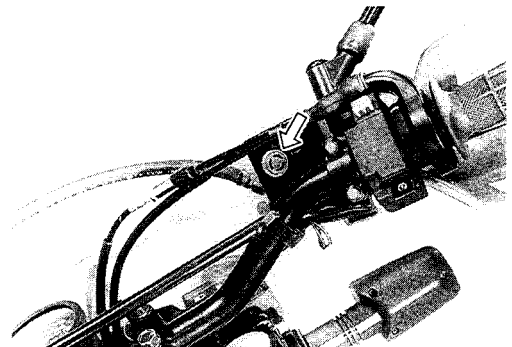
Specification and Classification: DOT 4

⚠ 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 old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period.

⚠ WARNING

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.

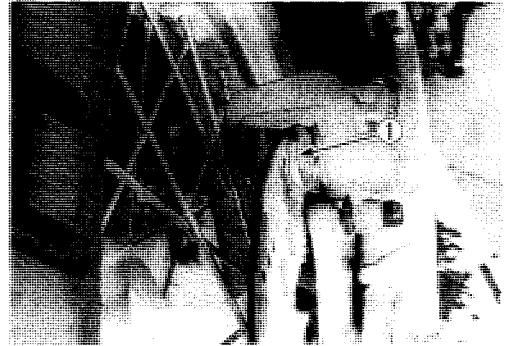
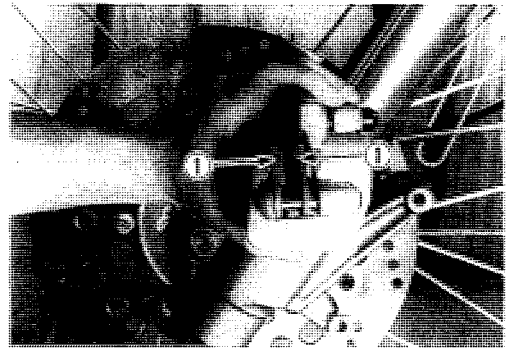


BRAKE PADS

The extent of 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 pages 5-7 and 5-34.)

⚠ CAUTION

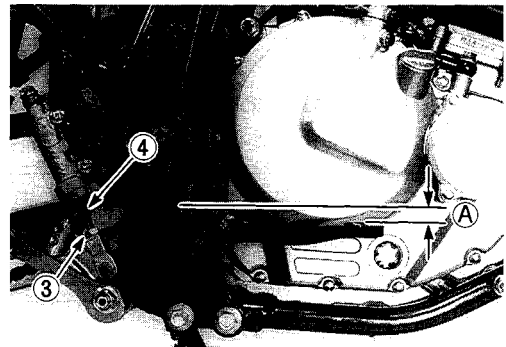
Replace the brake pad as a set, otherwise braking performance will be adversely affected.



BRAKE PEDAL HEIGHT

- Loosen the lock nut ③ and rotate the push rod ④ to locate brake pedal 5 mm below the top face of the footrest.
- Retighten the lock nut ③ to secure the push rod ④ in the proper position.

Brake pedal height ①: 5 mm (0.2 in)



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 lever. 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 re-mounting 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.

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

- 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:

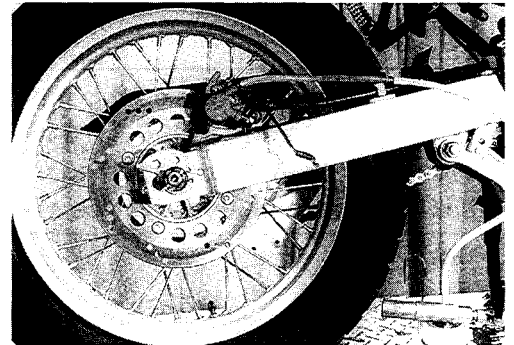
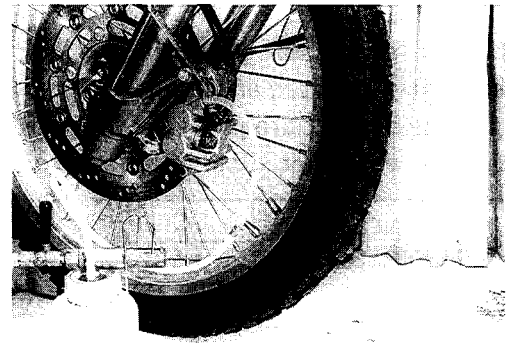
Replenish the brake fluid in the reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.

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

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.

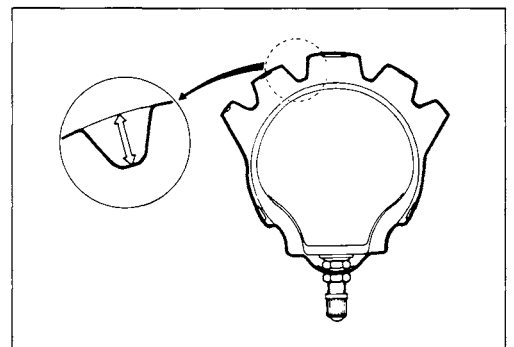
**TIRES**

Inspect Every 6 000 km (4 000 miles, 12 months).

TIRE TREAD CONDITION

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

Tire tread depth limit: FRONT & REAR 3.0 mm (0.12 in)



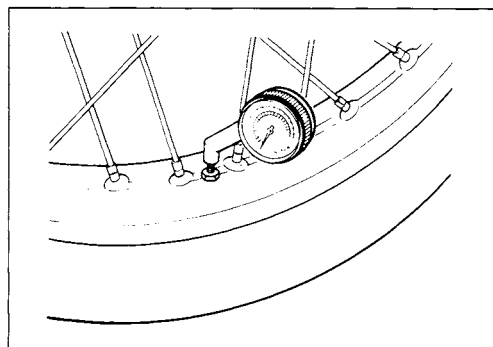
TIRE PRESSURE

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 roadability or shorter tire life will result. Cold inflation tire pressure is as follows.

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	150	1.50	22	175	1.75	25
REAR	175	1.75	25	200	2.00	29

⚠ CAUTION

The standard tire fitted on this motorcycle is 90/90-21 54S for front and 120/90-17 64S for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

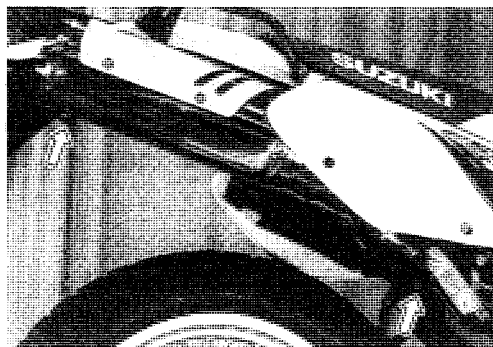


SPARK ARRESTER (For U.S.A. and CANADA)

Clean Every 6 000 km (4 000 miles).

If the muffler is clogged with carbon particles, exhaust resistance will be increased with a resultant decrease in power output.

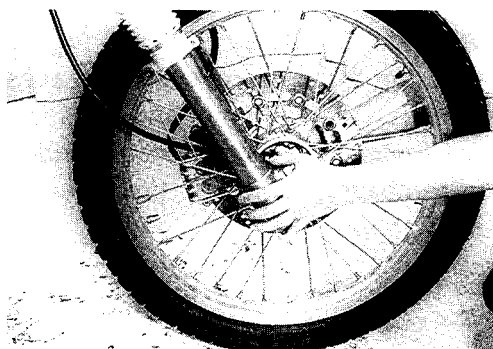
- Remove the drain plugs.
- Start the engine and rev it to blow out the accumulated carbon particles.
- Turn off the engine and wait until the muffler cools, then replace the drain plugs and tighten them securely.



STEERING

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

Taper roller type bearings are used on the steering system for better handling. Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning 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 5-20 of this manual.



FRONT FORKS

Inspect Every 12 000 km (7 500 miles, 24 months).

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (Refer to page 5-14.)

REAR SUSPENSION


Inspect Every 12 000 km (7 500 miles, 24 months).

Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

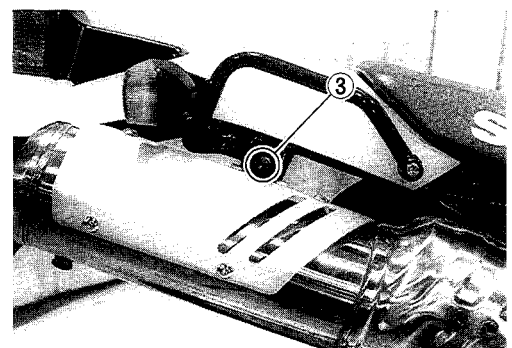
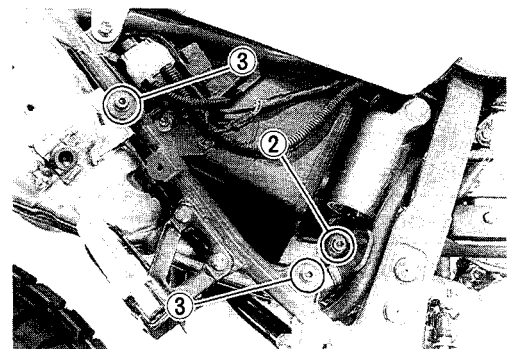
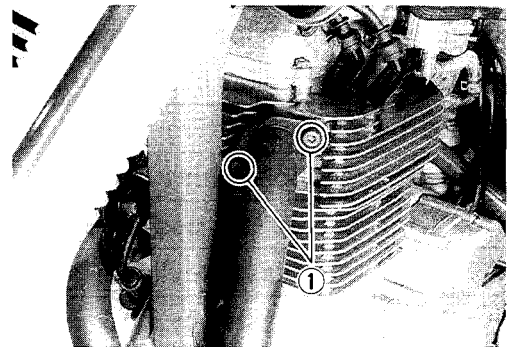
EXHAUST PIPE AND MUFFLER BOLTS

Tighten Initially at 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

- Remove the right frame cover.
- Tighten the exhaust pipe bolts ①, muffler connection bolt ② and muffler bolts ③ to the specified torque.

 **Exhaust pipe bolt/Muffler connection bolt/
Muffler bolt: 26 N·m (2.6 kg-m, 19.0 lb-ft)**

Note: Use high temp anti-seize compound on flange bolts and pinch bolt.



COMPRESSION PRESSURE CHECK

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
850 kPa Approx. $\left(\begin{array}{l} 8.5 \text{ kg/cm}^2 \\ 120 \text{ psi} \end{array} \right)$

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

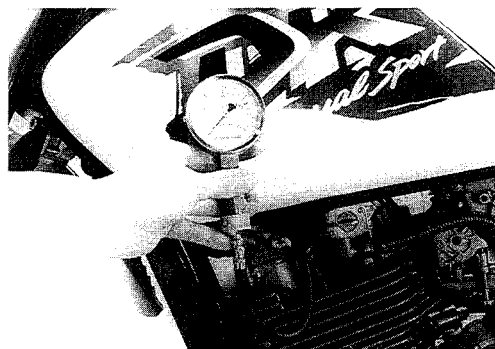
COMPRESSION TEST PROCEDURE

NOTE:

- * *Before testing the engine for compression pressure, make sure that the cylinder head bolts 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 manner.

- 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.



TOOL 09915-64510: Compression gauge
09915-63310: Adaptor

Note: Due to the DR650's de-compression mechanism on the cam using cranking pressure is less accurate in determining if your engine is suffering from compression loss. A leak-down test would be the best way to determine if there are issues.

OIL PRESSURE CHECK

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

OIL PRESSURE SPECIFICATION

Above 30 kPa (0.3 kg/cm², 4.3 psi) Below 70 kPa (0.7 kg/cm², 10 psi)	at 3 000 r/min., Oil temp. at 60°C (140°F)
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If the oil pressure is lower or higher than the specification, the following causes may be considered.

LOW OIL PRESSURE

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

HIGH OIL PRESSURE

- * Used a 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.

- Remove the oil pressure inspection plug.
- Install the oil pressure gauge in the position shown in the figure.
- 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 engine tachometer), and read the oil pressure gauge.



09915-74510: Oil pressure gauge

09900-26006: Tachometer

