CBR250FOUR (MC14)

NH-138
NO.1

NH-1
NO.2

CBR250FG (MC14-1000014~1015467)

PB-1270-U
NO.3

CBR250FG-YA (MC14-1000060~1015767)

CBR250R(H) (MC17) 1987

NH-206-M
NO.4

NH-196
NO.5

NH-196
NO.6

CBR250RH (MC17-1000006~1025449)

CBR250R(J) (MC19) 1988

PB-184M-U
NO.7

PB-190
NO.8

CBR250RJ (MC19-1000006~1023630)

NH-193P
NO.9

CBR250RJ (MC19-1011439~1023630)

CBR250R(K) (MC19) 1989

PB-184M-U
NO.10

NH-193P
NO.11

NH-193P
NO.12

CBR250RK (MC19-1050006~1067954)

CBR250RR(L) (MC22) 1990-1991

NH-193P
NO.1

PB-184M
NO.2

PB-193P
NO.3

PB-184M
NO.4

CBR250RRL (MC22-1000001~1020576)

CBR250RR(N) (MC22)

NH-193P
NO.5

NH-237P
NO.6

CBR250RRN (MC22-1050001~1056770)

1992-1993

CBR250RR(R) (MC22)

NH-196
NO.7

R-210C
NO.8

CBR250RRR (MC22-1100001~)

1994-1996*

*Any CBR250RR(R) Bought new after 1996 was actually built in 96 and labelled the CBR250RR(R-II)

CBR250R,RR

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CBR250R,RR

- **Preface**

This service manual includes the service information for HondaCBR250FOUR and CBR25OR. However, only the part which differs from 250FOUR is described for 25OR. Amended points from CBR25OR(H) are described for CBR25OR(J), so for CBR25OR(K). Differences such as the outlook are not mentioned as they do not affect the maintenance.

Section 1 - includes general cautions for maintenance work. Please use this manual after reading the section.

Section 2 - describes about procedures for inspection and adjustments. Please conduct regular inspection by following the procedure.

Section 3 - and onwards describes procedures for inspection and assembly/disassembly of individual parts.

In the first pages of each sections, you find the figures, maintenance information, troubleshooting charts for your convenience.

Please note:
The contents may change without prior notice due to modifications of the model.

- **SERVICE INFORMATION**

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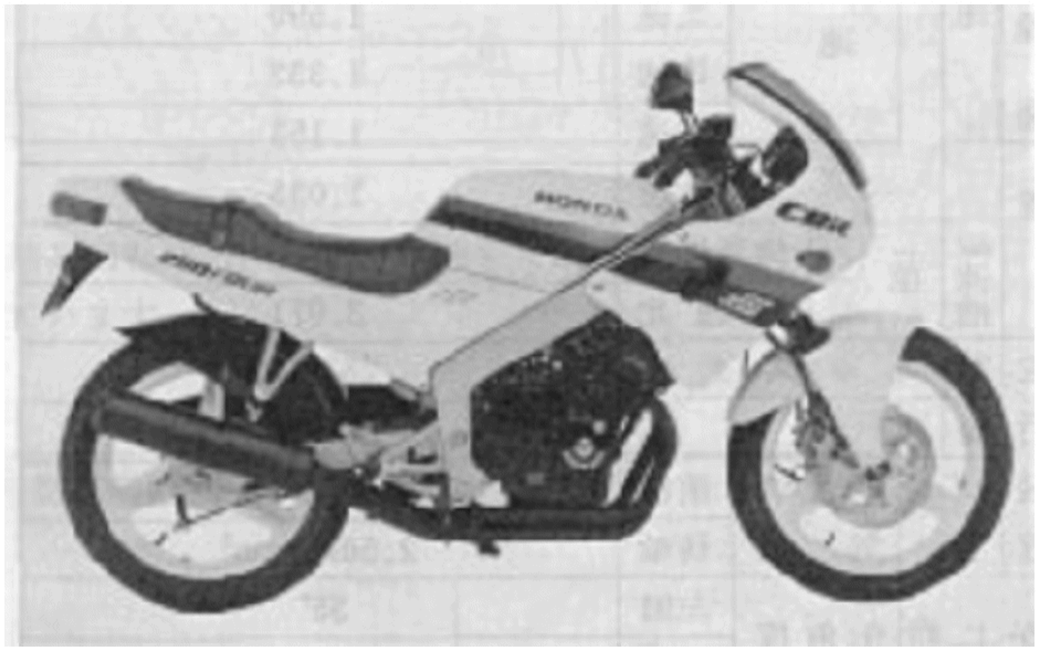
- **LOCATION OF SERIAL NUMBER AND COLOR LABLES**

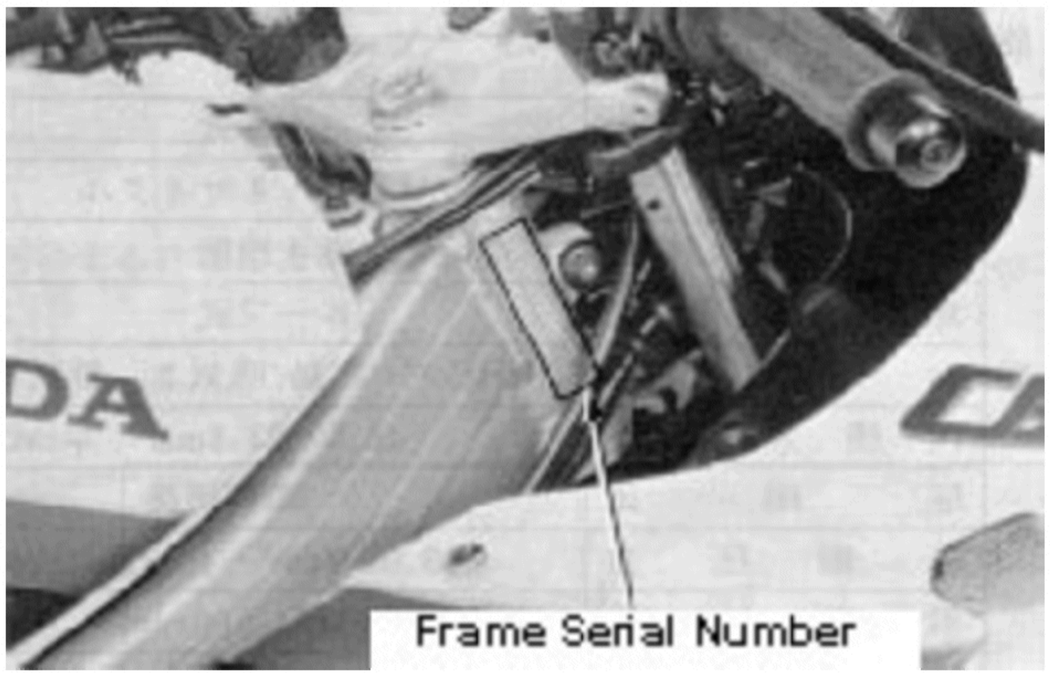
Top right figure:---------- Frame Serial Number Label

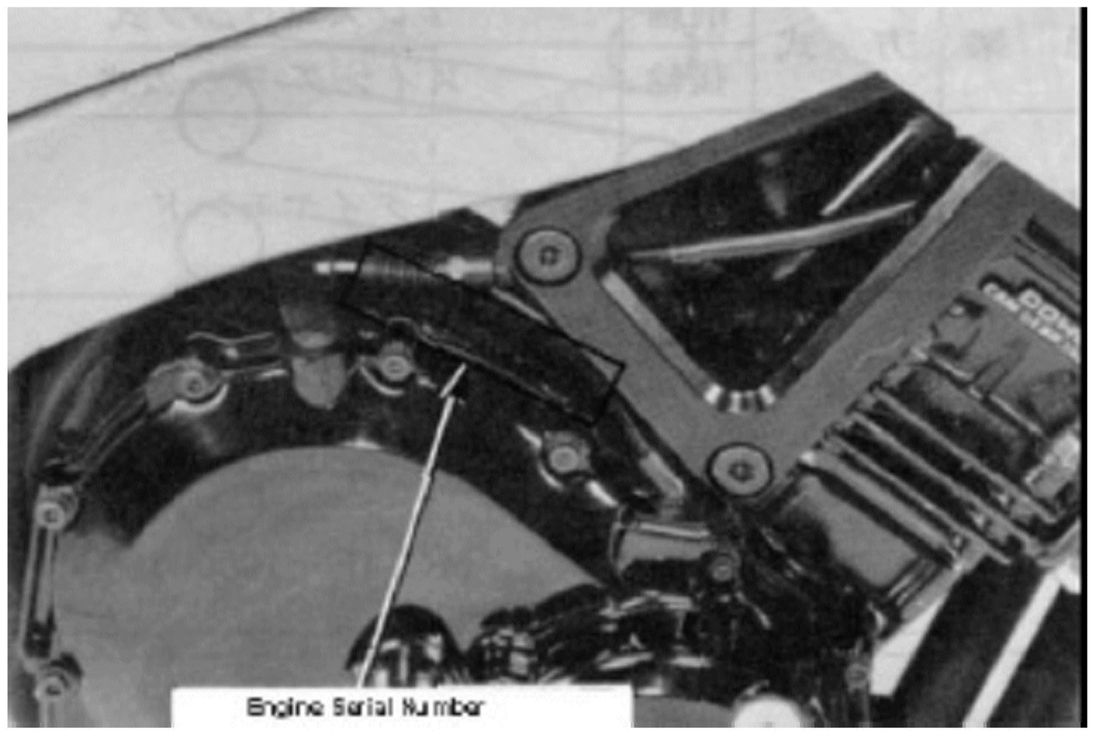
Bottom left figure:----------.Engine Serial Number Label

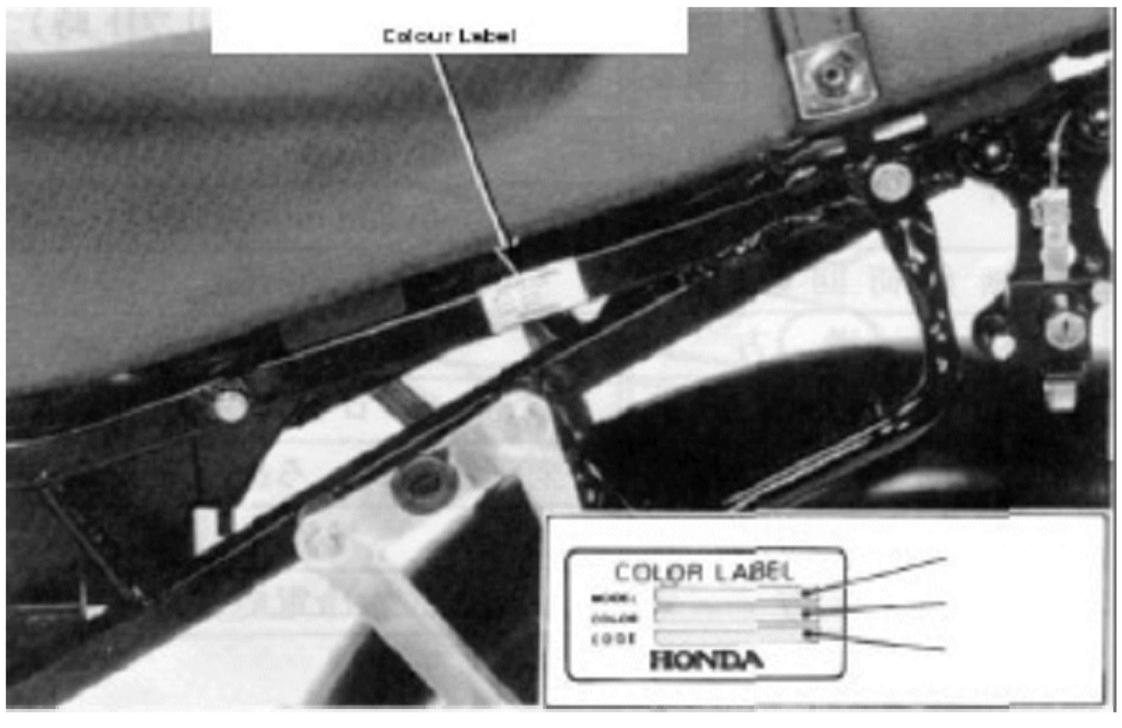
Bottom right figure:---------- Colour label

When ordering the colored part, use the model name and the color code.









● Specifications

Item			Specification
Model Code			Honda MC14
Length			2.000mm
Width			0.685m
Height			1.120m
Wheel-base			1.370m
Power-plant model			MC14E
Total displacement			0.249 litres
Fuel type			Petrol
Vehicle empty weight	Front Axle		77 kg
	Rear Axle		76 kg
	Total		153 kg
Maximum capacity			2 people
Vehicle gross weight	Front Axle		97 kg
	Rear Axle		166 kg
	Total		263 kg
Tyre	Front		100/80 – 17 52H
	Rear		130/70 – 17 62H
Minimum clearance			0.140m
Braking Distance			14.0m (50km/h)
Minimum turning radius			2.6m
Powerplant	Starter type		Electric
	Type of engine		Petrol 4 Stroke
	Cylinders		2 abreast
	Configuration		Inline 4 cylinder
	Valve operation		DOHC
	Bore X Stroke		48.5 x 33.8mm
	Compression ratio		11.0
	Compression Pressure		13.0kg/cm^2 - 400rpm
	Maximum output		45 PS / 14,500 rpm
	Maximum torque		2.5 kg-m / 10,500 rpm
	Valve operation time	Intake Valve Open	10° BTDC (1mm lifted)
		Intake Valve Close	40° ABDC (1mm lifted)
		Exhaust Valve Open	30° BBDC (1mm lifted)
		Exhaust Valve Close	10° BTDC (1mm lifted)
	Valve Clearance	In	0.16mm (cold)
		Out	0.23mm (cold)
	Idle Speed		1,500rpm
	Lubrication		Forced Pressure
	Oil filter		Total flow
	Oil pump		Trochoid Rotor
	Oil capacity		2.7 litres
	Cooling System		Liquid cooled

● Specifications

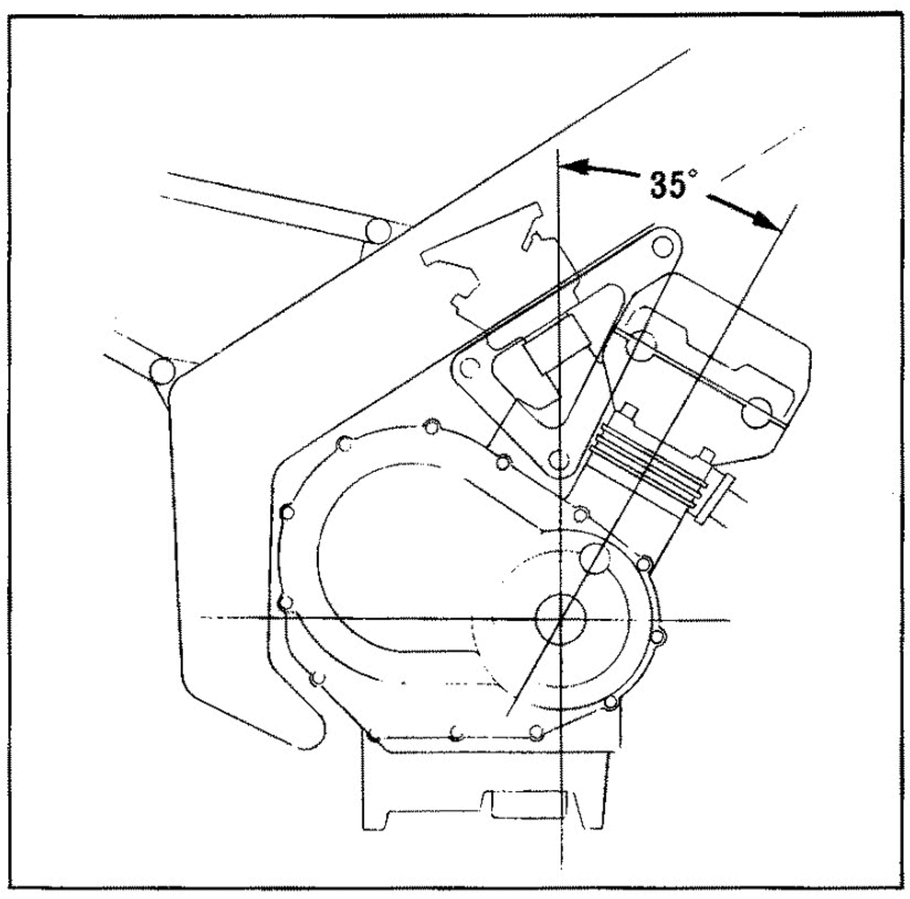
Item				Specification
Fuel system	Air filter	Type		Viscous Paper
	Carburetor	Fuel Capacity		14.0 litres
		Carburettor		VG01
		Piston size		28mm
		Venturi diameter		25mm
		Ignition Timing		20^0 BTDC / 1,500 rpm
		Spark Plug	NGK	C8EH – 9, C9EH - 9
			ND	U24FE 9, U27FE 9
		Plug Gap		0.8 – 0.9 mm
		Battery		12V 8AH
	Clutch	Type		Multi-wet plate
		Operation		Mechanical
	Transmission	Primary Reduction		2.966
		Type		Constant Mesh
		Gear ratio	1st	2.733
			2nd	2.000
			3rd	1.590
			4th	1.333
			5th	1.153
			6th	1.035
	Reduction : First	Gear type		Chain
		Reduction ratio		3.071
	Tyre Pressure	Front		26° 00’
		Rear		97mm
Steering system	Steering stem angle	Left		35°
		Right		35°
Braking system		Front		Hydraulic Disc
		Rear		Hydraulic Disc
Shock absorbing system	Suspension	Front wheel		Telescopic fork
		Rear wheel		Swing arm
Frame		Type		Diamond

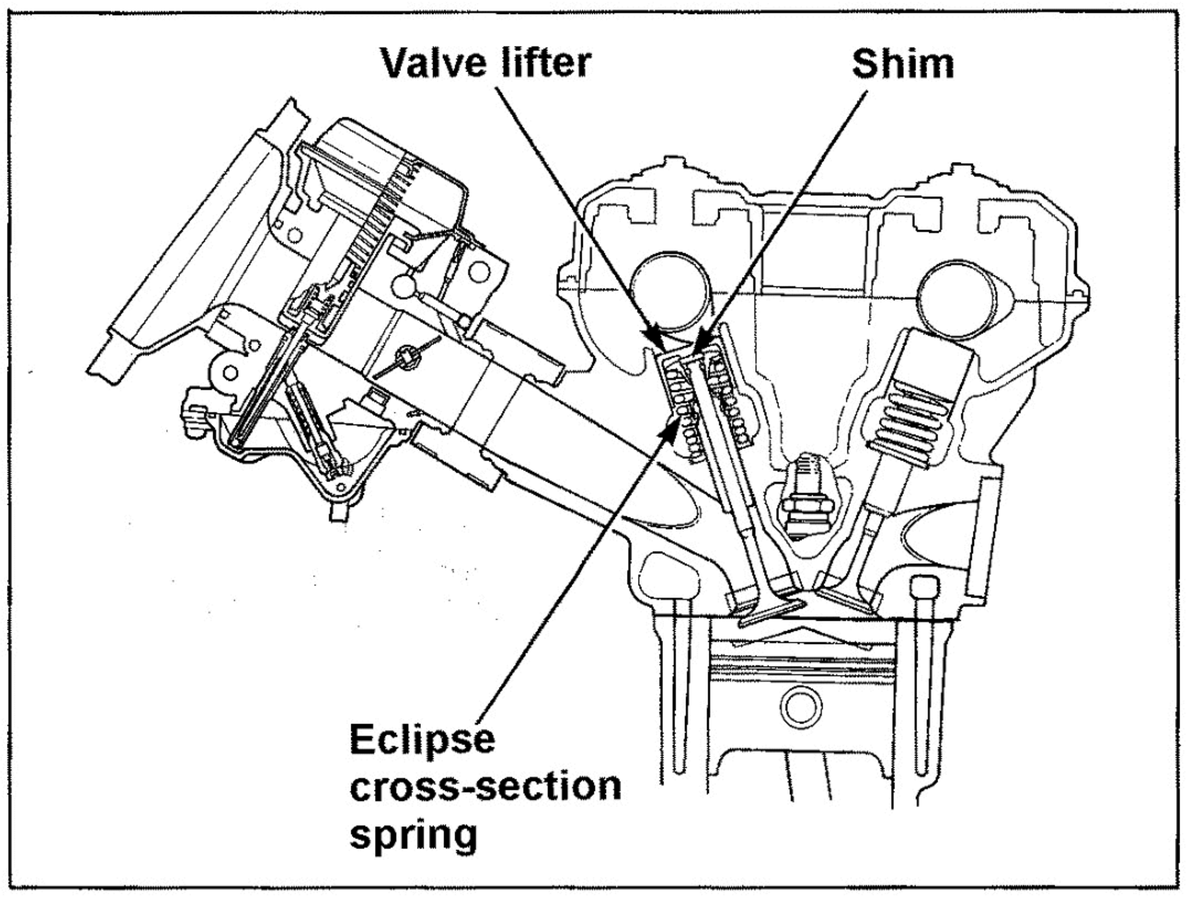
Structure Description

Engine

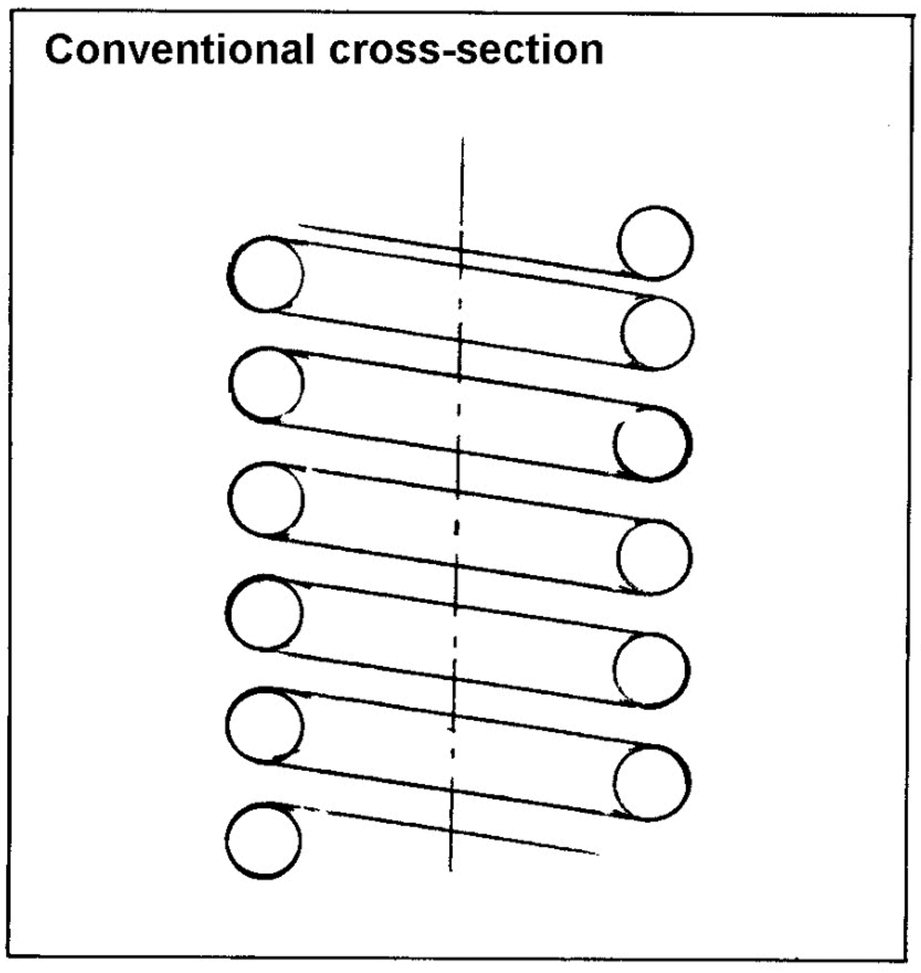
The vehicle is equipped with a water cooled inline 4 cylinder engine. The engine is inclined forward- 35° This inclination enables an improved straight intake manifold port, which allows smooth flow of air-fuel mixture gas.

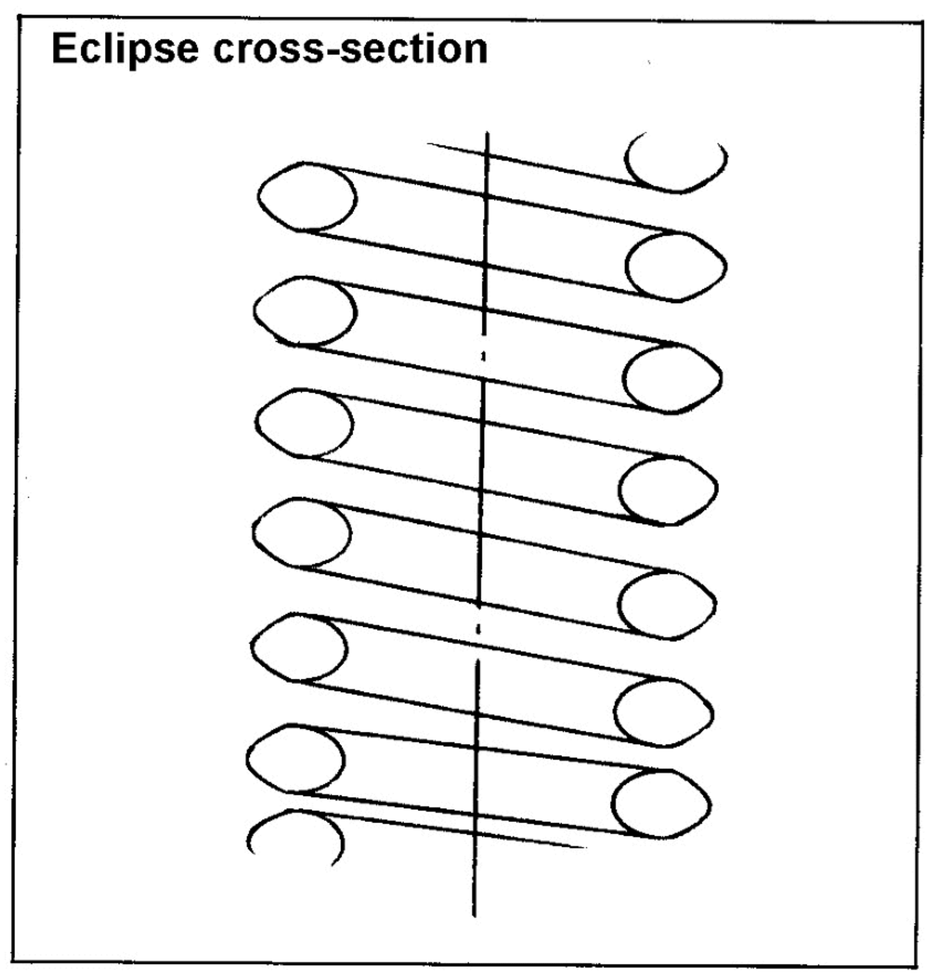
Gear drive system was applied to the cam shaft instead of chain drive system. The gear system is optimised for high speed operation.
In order to provide smooth valve operation at high speed, the engine has lower shim design. Also, carbon hardened connecting rods used to reduce friction loss.



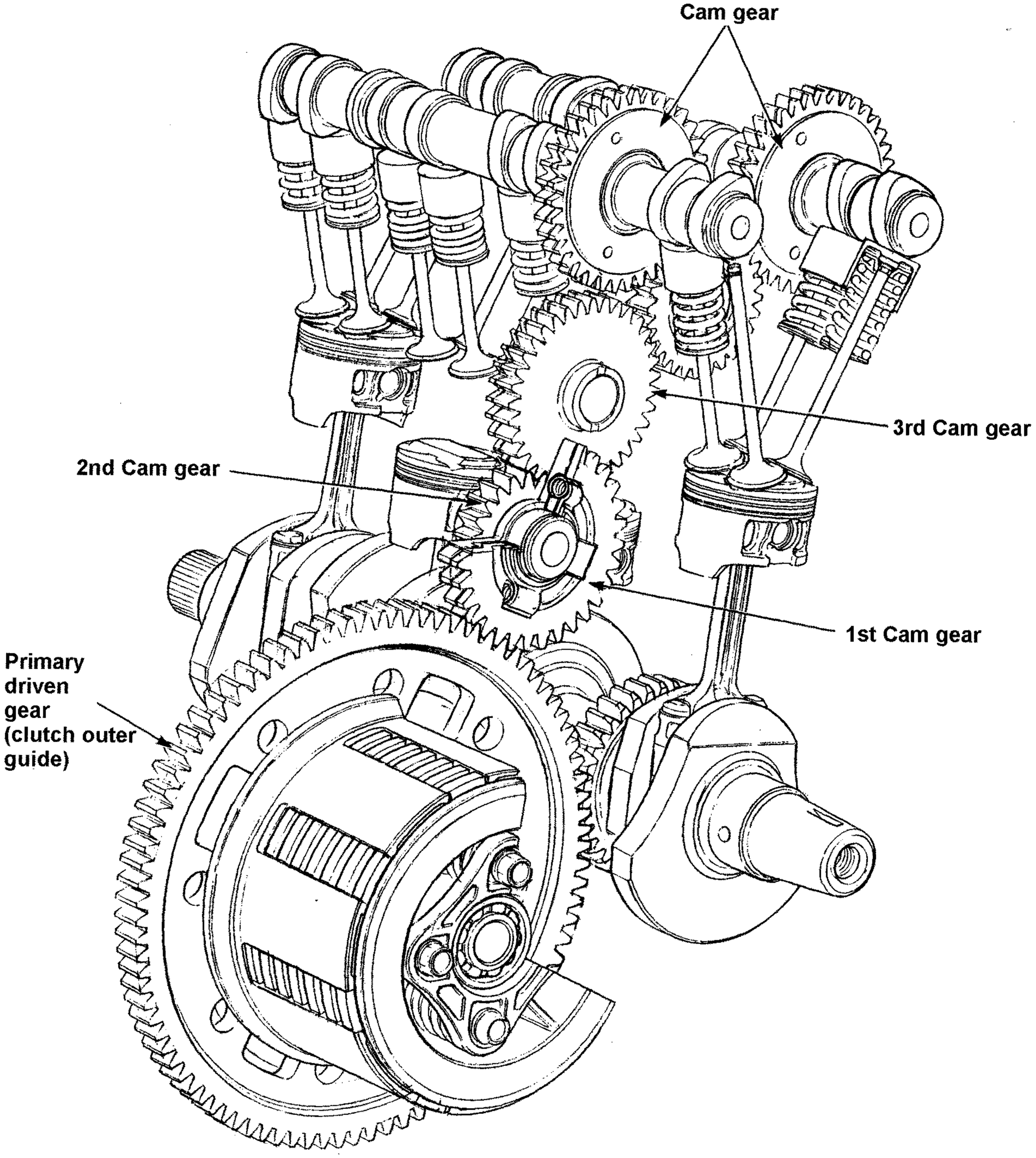


To provide smooth valve operation in high speed, the valve spring was computer designed to endure higher stress.



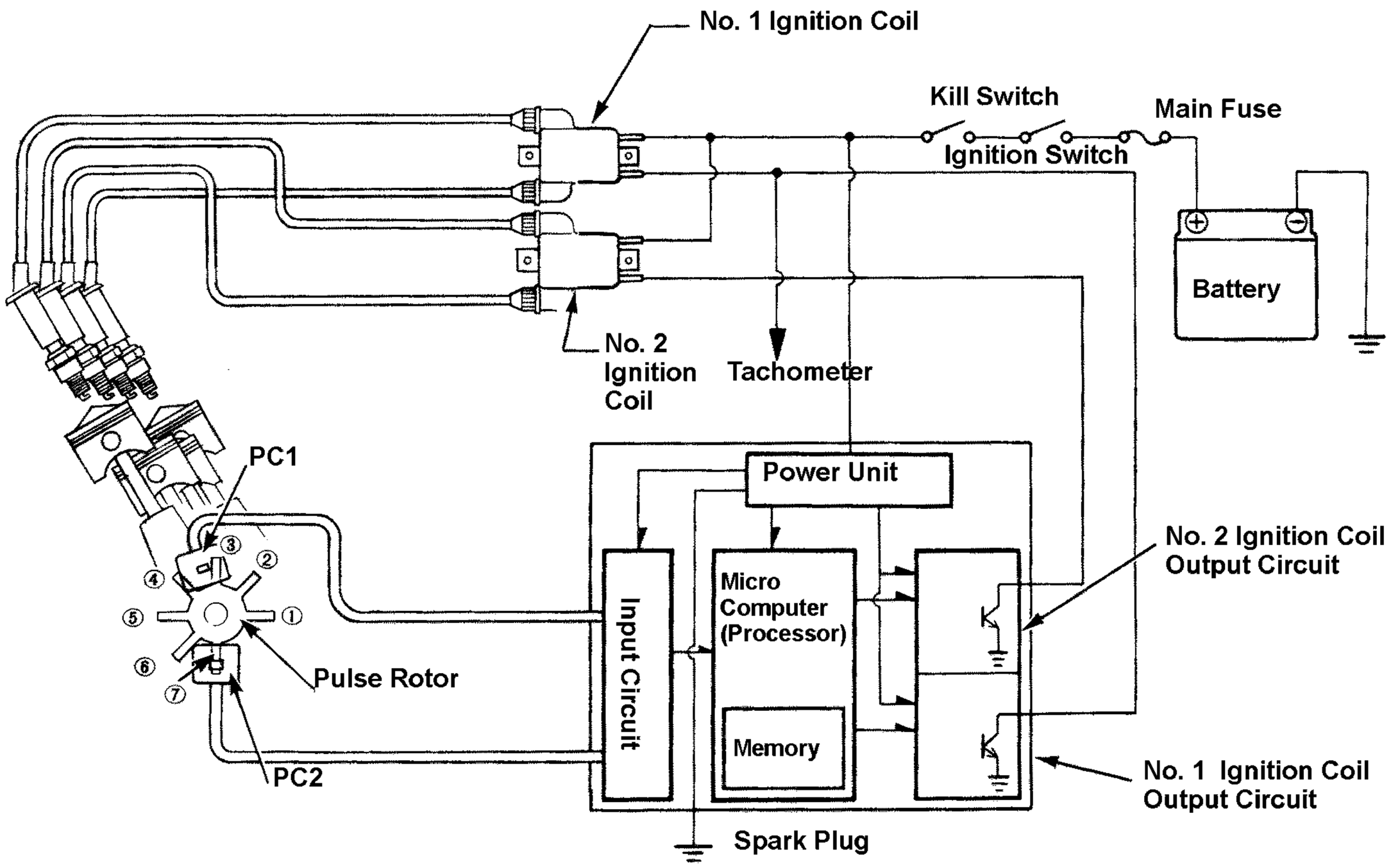


In order to reduce friction loss and to operate valves in accurate timing, gear driven cam system is applied.
The figure below shows the linkage between the crankshaft and the cam gears.
The crankshaft power is transmitted to the cam gear through the primary driven gear (clutch outer gear), which is on the same axle for the transmission main shaft.
This mechanism is quite different from the V-gear drive system, which the crankshaft directly drives cam gears.



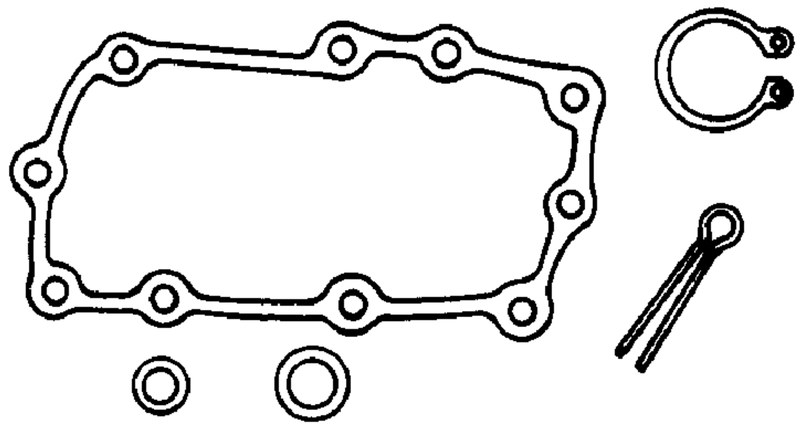
Ignition System

A newly designed digital ignition unit with a built-in micro computer provides best ignition throughout its operating speed range.
A pulse rotor has seven projections. From (1) – (7) have 45°separation and 90°for (7) to (1). The engine rpm and crank position for each cylinder are detected from the relative position of the seven projections and two pulser coils. The two pulser coils are installed so as to have 15° inclination from level line for PC2 end, compared to PC1. This angular offset is to detect crank positions.
The time when the pulse rotor's projection passes the PC1 pulser coil is referred as "O-reference". By detecting the time required to have the projection at the pulser coil again, the engine rpm is determined and the micro computer determines ignition timing.

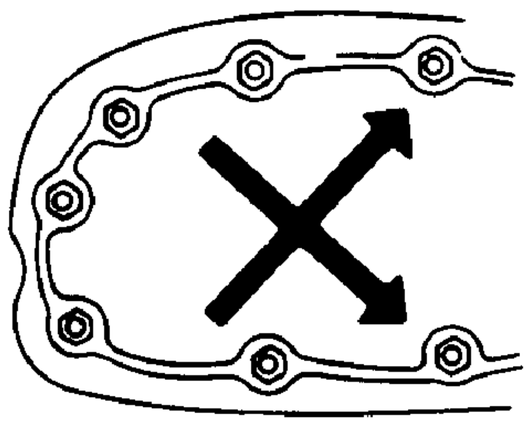


General Caution

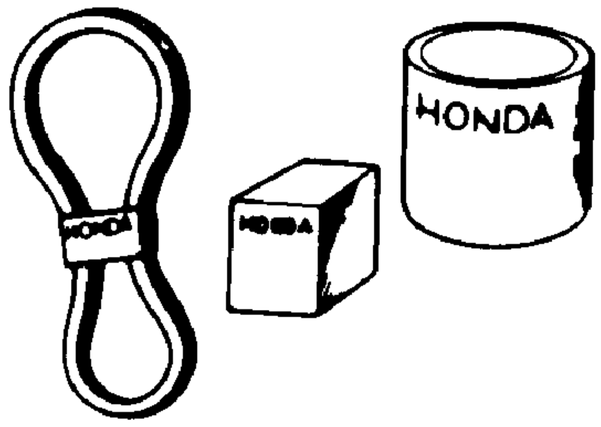
- Replace gaskets, O-Rings, circlips and cotter pins when they are removed.



- When screwing, temporarily tighten screws/bolts.
  Screw bigger diameter first, then smaller diameter.
  Inner ones first, then outer ones. Tighten in criss-cross way whenever possible.
  Apply designated torque.

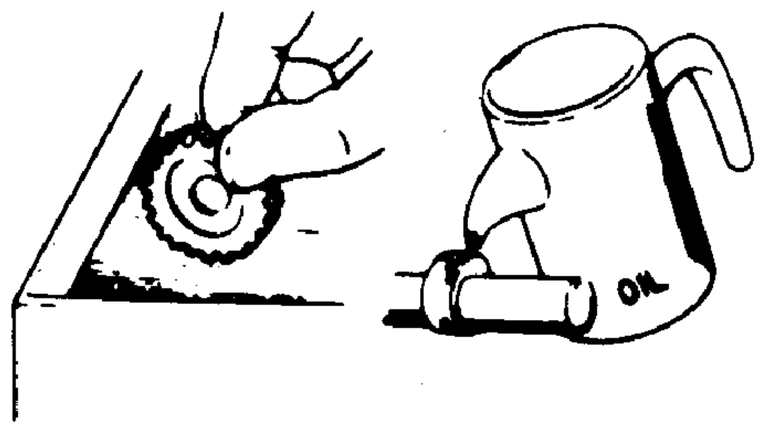


- Use genuine Honda or recommended parts, lubricants, and other products.

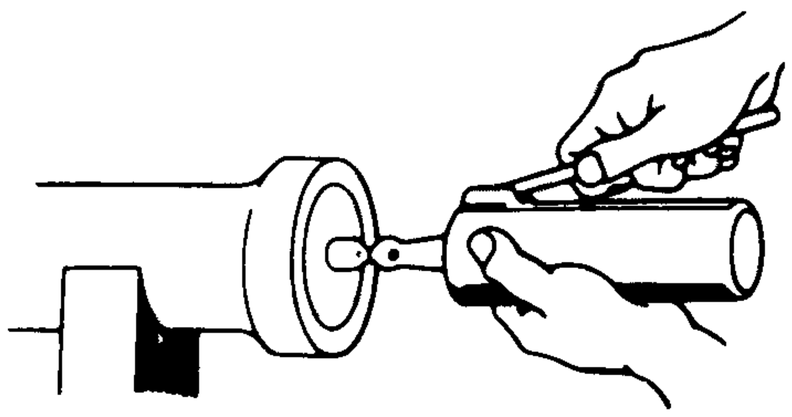


- Use special / common tools as instructed.

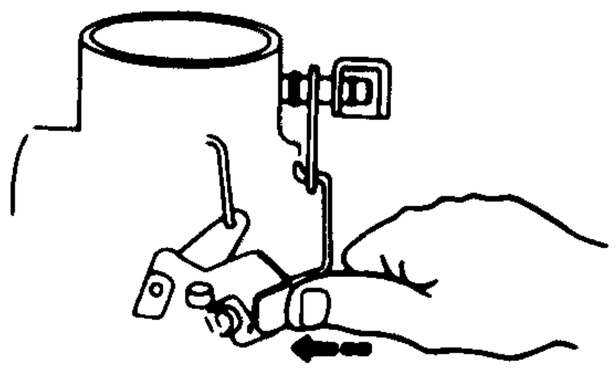
- Disassembled parts are to be cleaned before the inspection/measurement.
  Apply oil to contact area when installing them.



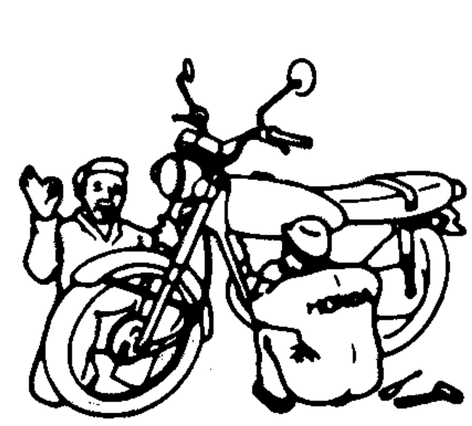
- Apply grease or equivalent to designated parts.



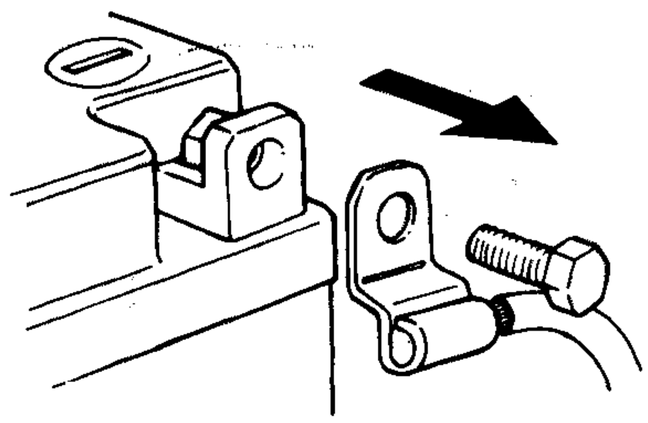
- After assembling, check the operation and fittings.



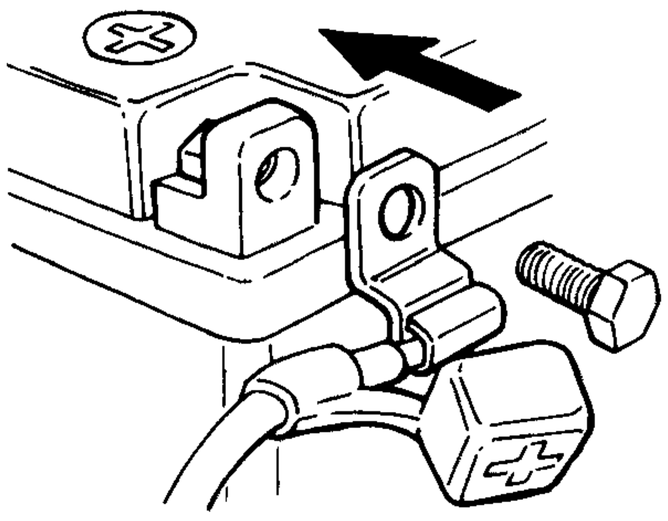
- When multiple people are working at the same time, always confirm each other's safety.



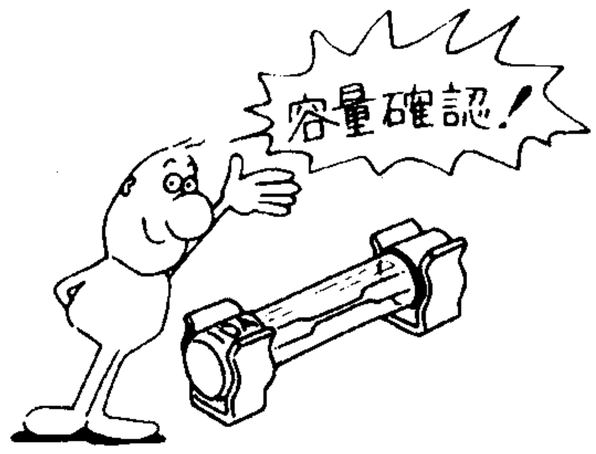
- Disconnect (-) lead from the battery prior to servicing the vehicle.
- Do not touch the frame with a wrench or any other metal tools.



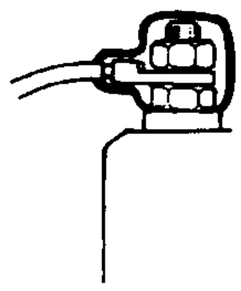
- After servicing the vehicle, check each connection, fittings and routing.
- If the battery has been disconnected, connect (+) lead first.
- Apply grease to the terminals after connecting leads.
- Attach covers to the terminals.



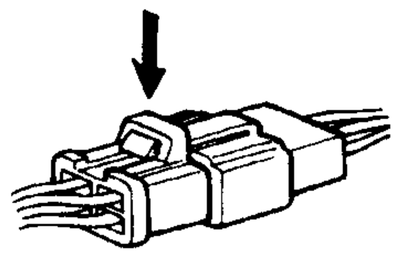
- If a fuse has blown, inspect and fix the cause and install the new fuse with the correct capacity.



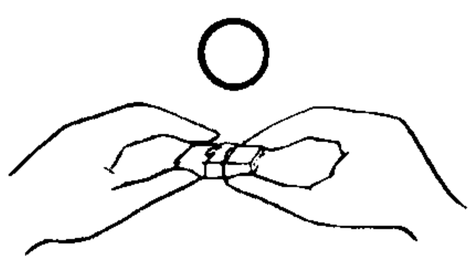
- Apply covers to terminals after servicing.

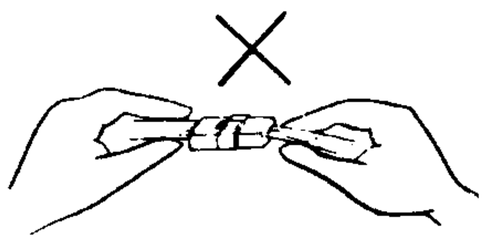


- When disconnecting locked couplers, unlock before disconnecting.

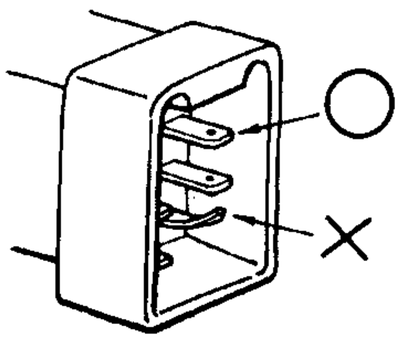


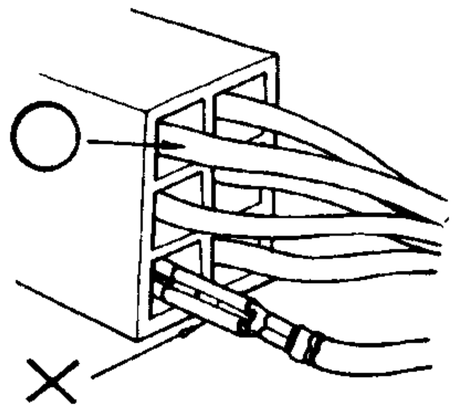
- When disconnecting couplers, hold the coupler body.
  Do not pull the wire harness.



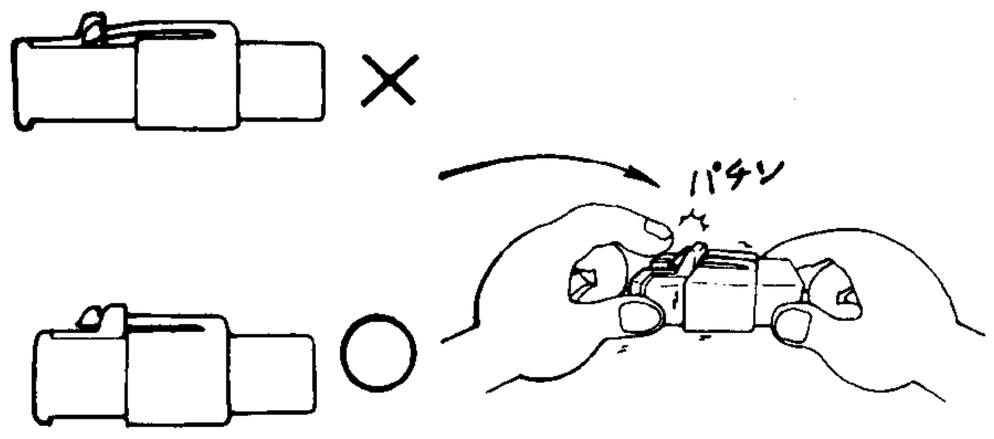


- Before connecting couplers, make sure there is no damage or any abnormalities on the terminals.

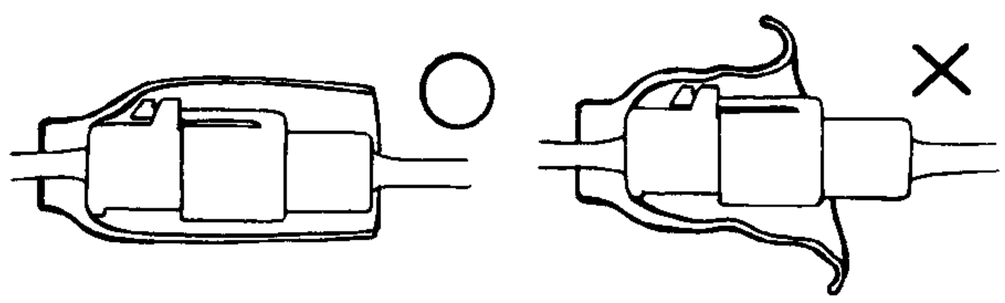




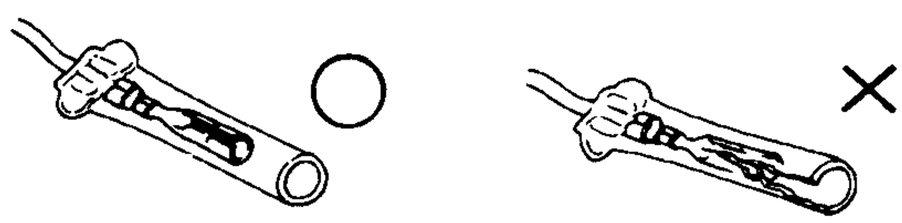
- Firmly insert couplers.
- Check couplers are locked if the couplers have locks.
- Check all harnesses are connected.



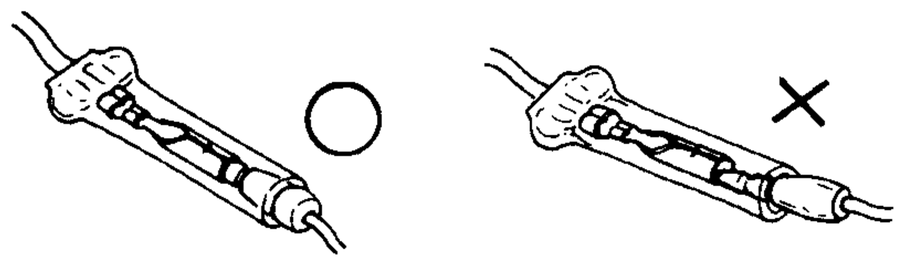
- Coupler covers should cover whole coupler unit without any peels.



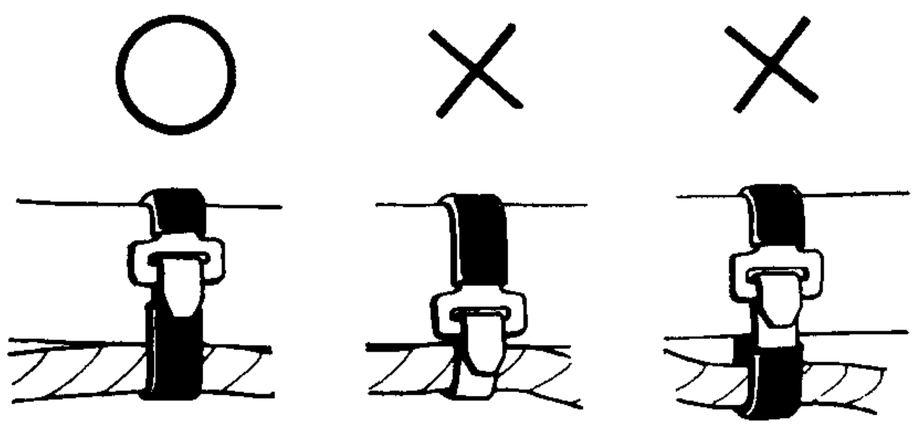
- Connector covers should not be damaged and female terminals should not be loose.



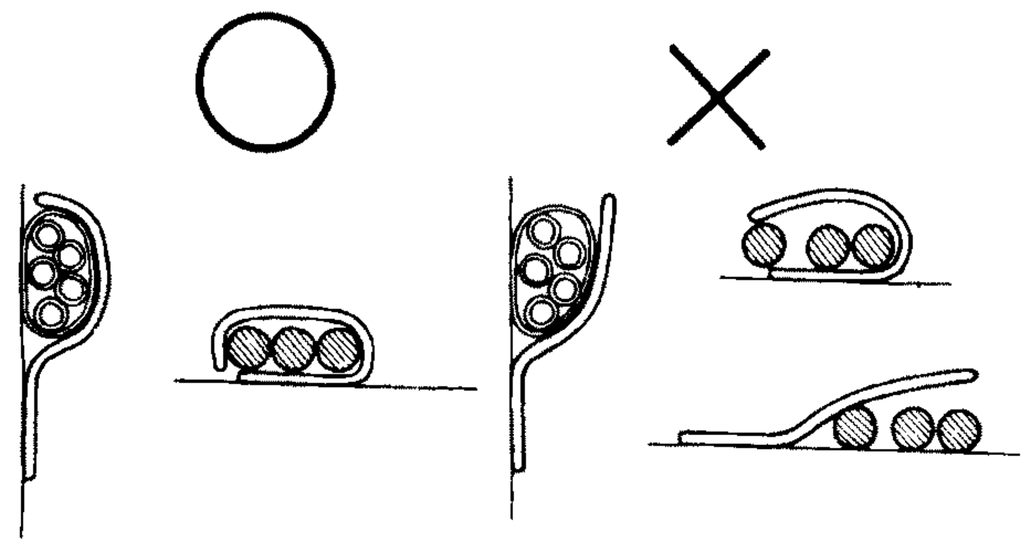
- Firmly secure the connectors.
- Covers should wrap whole terminals.
- Open end of the covers should not face upwards.



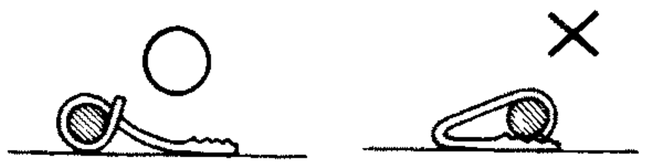
- Fix wire steps to designated position on the frame.
- Clamp wire harnesses at the coated area when aluminium straps are used.



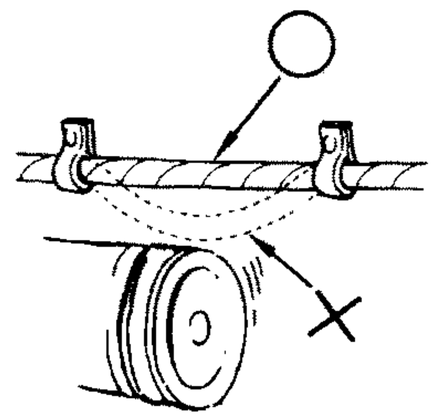
- Make sure wire harnesses are properly clamped.



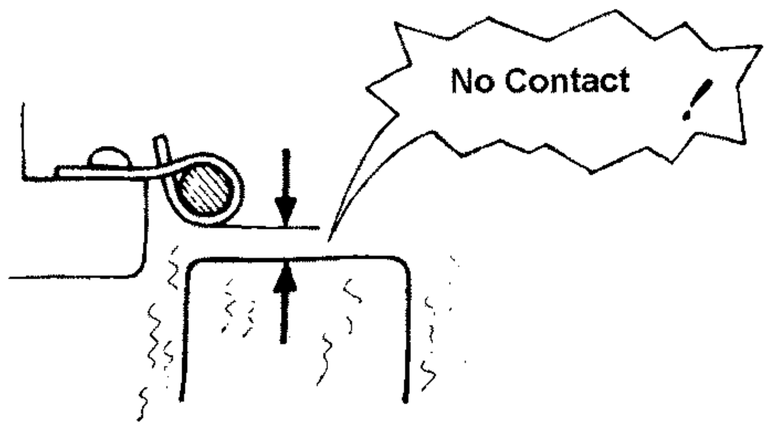
- Do not clamp to the welded side when weld-clamping.



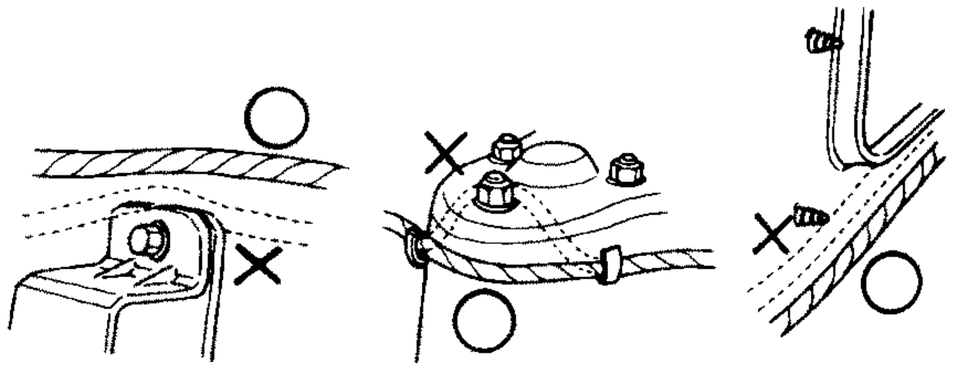
- Clamp wire harnesses so as to keep them away from moving parts.



- Clamp wire harnesses so as to keep them away from heated parts.

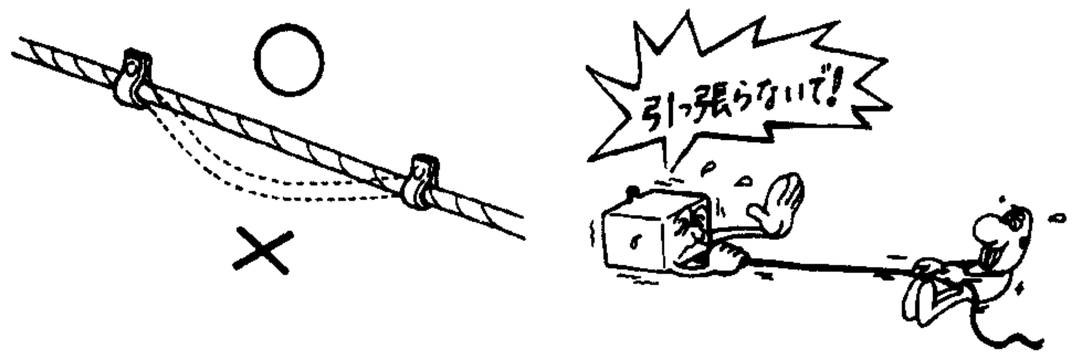


- Wire harnesses are to be routed to avoid body edges or sharp edges.

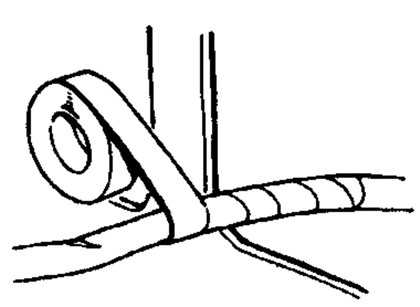


- Do not let wire harnesses to touch bolt/screw heads and their ends.

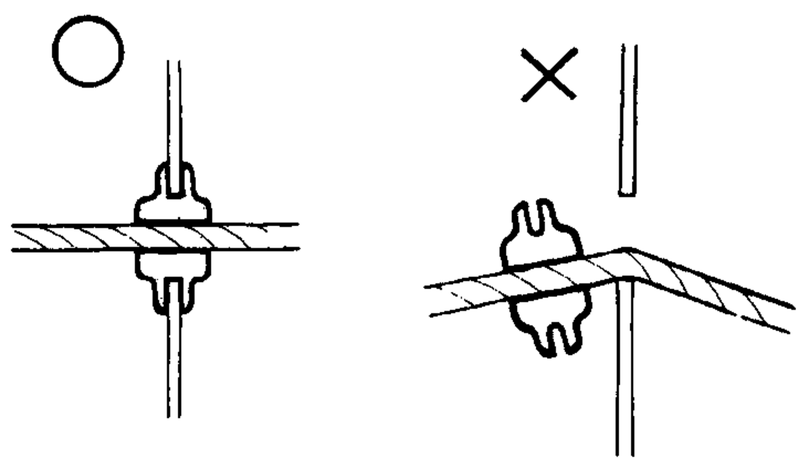
- Do not apply excessive tension / slack to the wire harnesses.



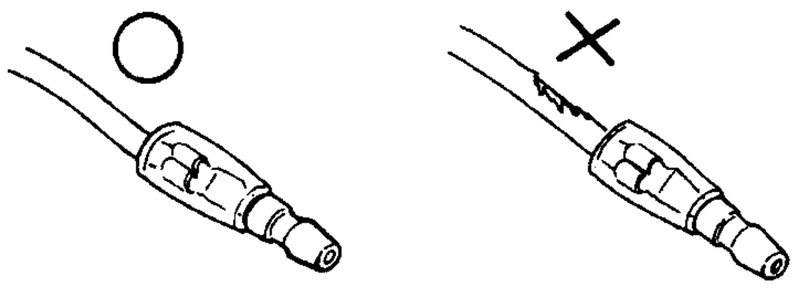
- If there is no other alternatives but to route wire harnesses through sharp edges, protect the part with tubes or tape.



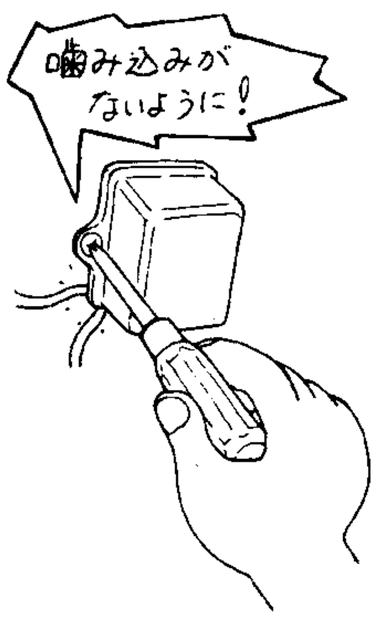
- Firmly set grommets if available.



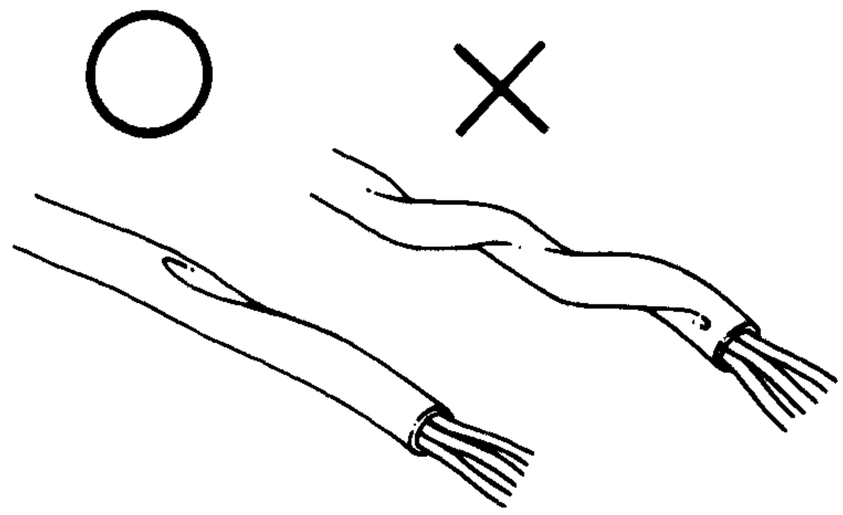
- Do not unwrap wire harnesses.
- Wrap the wire harness with adhesive vinyl tape if it is unwrapped.



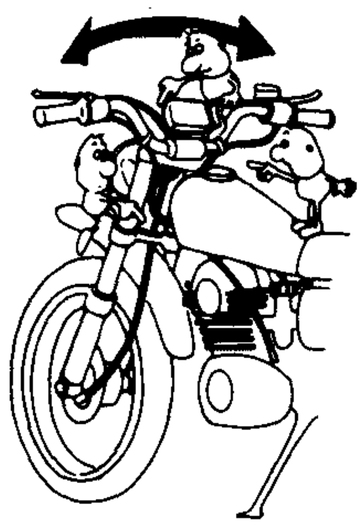
- Do not catch wire harnesses when installing parts.



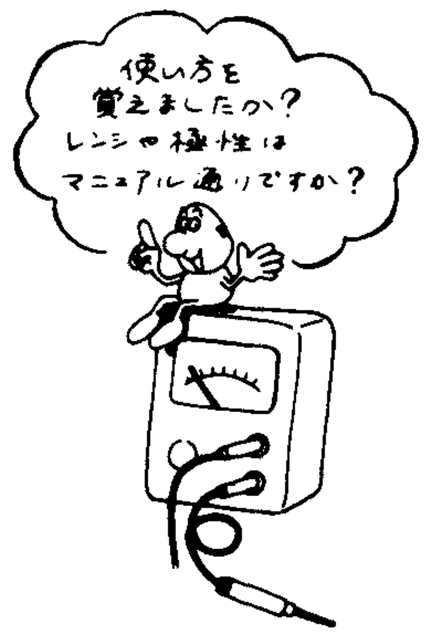
- Do not twist wire harnesses.



- Make sure wire harnesses are not over-tensioned or over-slack when the handlebar is fully turned to either side. Also, they should not have any sharp bending, catching or contact with sharp edges.



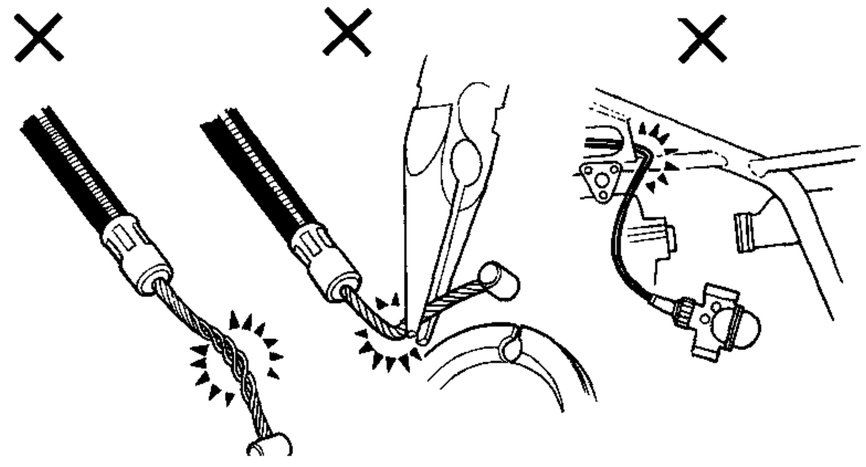
- Read instructions when using a multi meter, and follow the instruction on the service manual.



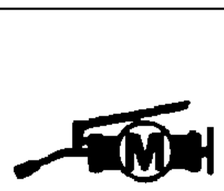
- Do not drop or throw parts.

- If rust is forming on the terminal, remove with sandpaper before re-connecting.

- Do not twist or sharply bend cables. Such deformations or damages may cause failure.



Symbol	Meaning	Symbol	Meaning
	Danger: Its neglect may lead to serious injuries.		Important: Its neglect may lead to minor injury or damaging the parts.
			General caution: Tips of the work

Symbol	Meaning	Symbol	Meaning
	Apply oil: Unless specified, use designated or recommended oil.		Apply sealant
	Apply Molybdenum solution: The solution is a mixture of engine oil and Molybdenum grease at		Replace with new parts whenever disassembled.
	Apply multi-purpose grease. (Lithium soap based NLG #2 equivalent. Example: SHELL Albania EP-2		Apply brake fluid. Use recommended grade (DOT4)
	Apply Molybdenum grease (3% or more Molybdenum, NLGI#2 equivalent) Mitsubishi multi purpose M2 Dow Corning Molycoat BR – 2 PLUS		Apply recommended cushion oil.
	Apply Molybdenum paste. (40% or more Disulphide Molybdenum. NLGI#2 equivalent). Local paste Molycote G-n Paste (Dow Corning)		Use exclusive tools
	Apply silicone grease Silicone grease G40M (ShinEtsu)		O.P. (Option) tool. Refer to parts list as these tools are considered to be parts.
	Apply screw locker. Use medium class unless specified.	-> 3-1	Reference pages.

Tightening Torque

- **Engine**

Part Name	Qty	Screw Dia	Tightening Torque kg-m	Notes
Cylinder head cover (special bolt)	6	6	0.8 - 1.2	
Cam shaft holder (flange bolt)	16	6	1.2 - 1.6	
Cylinder head (flange bolt)	12	7	1.7 - 2.1	Apply oil
Spark Plug	4	10	1.0 - 1.2	
Con rod (con rod bolt/nut)	8	-	1.5 - 1.9	Apply oil
Gear train holder nut	2	8	1.8 - 2.2	
AC generator fly wheel	1	10	8.0 - 9.0	UBS
Starter Clutch	1	10	7.0 - 8.0	UBS
Clutch Centre	1	20	6.0 - 7.0	
Oil pump driven sprocket (flange bolt)	1	6	1.3 - 1.7	Apply screw lock
Oil Pressure Switch	1	-	1.0 - 1.4	Apply screw lock
Neutral Switch	1	10	1.0 - 1.4	
Oil filter centre bolt	1	20	1.5 - 2.0	
Drain plug bolt	1	14	3.5 - 4.0	
Crankcase attachment bolt (6mm) (8mm)	16 11	6 8	1.0 - 1.4 2.1 - 2.5	Apply oil Apply oil
Cover attachment bolt (6mm)	25	6	0.8 - 1.2	
Shift drum center (Shifter pin)	1	-	2.1 - 2.5	Apply screw lock

- **Frame**

Part Name	Qty	Screw Dia	Tightening Torque kg-m	Notes
Handle attachment Bolt	2	8	2.5 - 3.0	
Brake Disc Bolt	12	8	3.7 - 4.3	
Front accelerator nut	1	14	5.5 - 6.5	
Front accelerator holder nut	4	8	1.8 - 2.5	U-Nut
Caliper bracket bolt	4	8	2.4 - 3.0	
Master cylinder holder nut	2	6	1.0 - 1.4	
Front folk socket bolt	2	8	1.5 - 2.0	
Bottom bridge bolt	2	10	3.0 - 4.0	
Top bridge bolt	2	7	0.9 - 1.3	
Front Folk bolt	2	31	1.5 - 3.0	
Steering adjusting bolt	1	26	2.0 - 2.4	
Steering stem bolt	1	24	9.0 - 12.0	
Driven sprocket nut	6	8	2.8 - 3.4	
Rear accelerator bolt	1	16	8.0 - 10.0	U-Nut
Rear cushion lower joint locking nut	1	12	3.8 - 6.0	Apply screw locker
Rear cushion upper bolt	1	10	5.0 - 6.0	U-Nut
Rear cushion lower bolt	1	10	5.0 - 6.0	U-Nut
5.0 - 6.0	1	10	5.0 - 6.0	U-Nut
Con rod bolt (Custom arm side) (Frame side)	1 1	10 10	5.0 - 6.0 5.0 - 6.0	U-Nut U-Nut
Rear folk pivot adjusting bolt	1	26	1.0 - 2.0	
Rear folk pivot locking nut	1	26	6.0 - 7.0	
Rear folk pivot nut	1	14	6.0 - 7.0	U-Nut

Part Name	Qty	Screw Dia.	Tigtening Torque kg-m	Notes
Hanger pin	4	10	1.5 - 2.0	
Hanger pin plug	4	10	0.1 - 0.2	
Brake hose attachment bolt	4	10	2.5 - 3.5	
Brake hose tightening bolt	1	10	3.0 - 4.0	Right side under a bottom bridge
Exhaust pipe joint nut	8	6	0.8 - 1.2	
Muffler attachment bolt	1	8	2.4 - 3.0	
Change pedal	1	6	1.0 - 1.4	
Engine mount bolt	8	10	4.5 - 5.5	
Engine hanger bracket	4	10	3.5 - 4.5	
Sub frame	4	10	4.5 - 5.5	
Side stand bracket	2	8	2.5 - 3.0	
Step holder	4	8	2.5 - 3.0	
Tandem step holder	4	8	2.5 - 3.0	
Ignition switch	2	8	2.5 - 3.0	
Thermostat case	2	6	1.0 - 1.4	
Radiator upper stay	2	6	1.0 - 1.4	
Radiator grill	2	6	0.8 - 1.2	
Fuel cock	1	22	2.0 - 2.5	
Fuel tank attachment nut	1	6	0.8 - 1.2	
Fuel tank attachment bolt	1	8	1.8 - 2.5	
Air cleaner case (step bolt)	6	5	0.6 - 1.0	
Air cleaner duct	1	6	0.5 - 0.8	
Sub air cleaner	1	6	0.5 - 0.8	
Fairing	6	6	0.7 - 1.1	
Fairing inside cover	4	6	0.6 - 1.0	
Head light	4	6	0.3 - 0.5	
Fairing stay	2	10	3.0 - 4.0	
Meter	2	6	0.8 - 1.2	
Cooling fan switch	1	16	2.4 - 3.2	Apply sealer
Front fender (6mm bolt) (6mm bis)	4 2	6 6	0.8 - 1.2 0.7 - 1.1	
Read fender A	4	6	0.7 - 1.1	
Rear fender B	5	6	0.8 - 1.2	
Tail light	2	6	0.8 - 1.2	
Starter motor terminal cable	1	6	0.8 - 1.2	
Front direction indicator	2	5	0.35 - 0.50	
Horn stay	1	6	0.8 - 1.2	

- For the parts not specified in the above tables, use the following standards.

- **Standard Tightening Torque** SH (Small Head) Bolt: 8mm flange head 6mm bolt

Type of bolt/nut	Torque kg-m	Type of bolt/screw/nut	Torque kg-m
5mm bolt/nut	0.45 - 0.6	5mm screw	0.35 - 0.5
6mm bolt/nut	0.8 - 1.2	6mm screw, 6mm flange bolt	0.7 - 1.1
8mm bolt/nut	1.8 - 2.5	6mm flange bolt/nut	1.0 - 1.4
10mm bolt/nut	3.0 - 4.0	8mm flange bolt/nut	2.4 - 3.0
12mm bolt/nut	5.0 - 6.0	10mm flange bolt/nut	3.5 - 4.5

- **Exclusive / Common Tools**

- **New Exclusive tools**

Name of the tool	Tool Number	Application	Section in the Manual
Compression gauge attachment	07GMJ-KT70100	Cylinder compression meas.	2
Clutch center holder	07GMB-KT70100	Clutch assembly/disassembly	10
Valve spring compressor attachment	07GME-KT70200	Valve assembly/disassembly	7
Tappet hole protector	07GME-KT70200	Valve assembly/disassembly	7
Valve guide remover (4mm)	07GMD-KT70100	Valve guide assembly/disassembly	7
Socket wrench (Dodecagon)	07GMA-KT70100	Cylinder head 7mm bold (dodecagon) attach/detachment	7
Needle bearing remover	07GMA-KT70200	Rear fork L-bearing detachment	14
Lock nut wrench	07GMA-KT70200	Rear fork attach/detachment	14

- **Existing exclusive tools**

Name of the tool	Tool number	Application	Section in the manual
Oil pressure gauge attachment	07510-4220100	Oil pressure measurement	3
Steering stem attachment	07916-3710100	Adjust nut attach/detachment	13
Bearing remover - Remover handle - remover sliding weight	07936-3710300 07936-3710100 07741-00110201	Detachment of needle bearings of rear fork and suspension linkage, main shaft L-bearing	14 8
Driver attachment (28X30mm)	07946-1870100	Attachment of rear fork L-bearing	14
Steering stem driver	07946-MB00000	Inner race attachment	13
Driver shaft	07946-MJ00100	Rear fork bearing detachment	14
Fork seal driver attachment	07947-KA20200	Front fork assembly	13
Ball race remover set - driver shaft assy(incl. nut) - assembly base - driver attachment A - driver attachment B - bearing remover A - bearing remover B	07946-KM90000 07946-KM90300 07946-KM90600 07946-KM90100 07946-KM90200 07946-KM90400 07946-KM90500	Ball race attach/detachment	13
Rear cushion compressor attachment	07959-MB10000	Rear cushion Assembly/disassembly	14
Valve guide reamer	07964-8840000	Valve guide clean/finish	7
Snap ring pliers	07914-3230001	Snap ring attach/detachment	15
Piston ring compressor	07955-ZG00000	Piston assembly	9

- **Common Tools**

Name of the tool	Tool number	Application	Section in the manual
Float level gauge	07401-0010000	Carburettor float level measurement	4
Lock nut wrench (26x30mm)	07716-0020203	Clutch lock nut attach/detachment	10
Extension bar	07716-0020500	Attach to the lock nut wrench	10,13
Lock nut wrench (30x32mm)	07716-0020400	Steering stem nut attach/detachment	13
Fly wheel holder	07725-0040000	Fly wheel attach/detachment	10
Rotor puller	07733-0020001	Fly wheel detachment	10
Outer driver (32x35mm)	07746-0010100	Front wheel R-bearing, Rear fork R-bearing attachment	13 14
Outer driver (37x40mm)	07746-0010200	Rear wheel bearing, main shaft, L-bearing attachment	14 8
Outer driver (42x47mm)	07746-0010300	Front wheel L-bearing driven flange bearing attachment	13 14
Outer driver (24x26mm)	07746-0010700	Suspension linkage needle bearing attachment	14
Pilot (15mm)	07746-0040300	Front wheel bearing, rear fork R-bearing attachment	13 14
Pilot (17mm)	07746-0040400	Rear wheel, suspension linkage, driven sprocket, main shaft L-bearing attachment	8 14
Pilot (22mm)	07746-0041000	Rear fork L-bearing	14
Bearing remover head (15mm)	07746-0050400	Front wheel bearing removal	13
Bearing remover shaft	07746-0050100	Wheel bearing removal	13,14
Bearing remover head (17mm)	07746-0050500	Rear wheel bearing removal	14
Fork seal driver	07747-0010100	Front fork assembly	13
Driver handle A	07749-0010000	Bearing attachment	8,13,14
Valve spring compressor	07959-3290001	Rear cushion assembly/disassembly	14

- **Measurement tools**

Name of the tool	Tool number	Application	Section in the manual
Digital circuit multimeter (KOWA)	07411-002000	Kowa circuit multimeter (TH-5H) Or Sanwa's 07309-0020000 ***Use the multimeter to check the charge of MF battery.**	17,18,19, 20
Oil pressure gauge	07506-3000000	Oil pressure measurement	3
Vacuum gauge	07404-0030000	Carburettor synchronizing adjust	4
Compression gauge	07305-0010000	Cylinder compression meas.	2

Valve seat cutting tools

Name of the tool	Tool number	Application	Section in the manual
Sheet surface cutter (20.5mm)	07780-0011000	45°IN) valve sheet adjustment	7
Sheet surface cutter (17mm)*	07GMH-KT70500	(45°EX) valve sheet adjustment	7
Plane cutter (17mm)*	07GMH-KT70100	(32°IN) valve sheet adjustment	7
Plane cutter (17mm)*	07GMH-KT70200	(32°EX) valve sheet adjustment	7
Inner surface cutter (20.5mm)	07780-0014300	(60°IN) valve sheet adjustment	7
Inner surface cutter (17mm)*	07GMH-KT70400	(60°EX) valve sheet adjustment	7
Cutter holder (4mm)*	07GMH-KT70300	Attach the cutter	7

*Newly-organized tools

- **Lubrication**

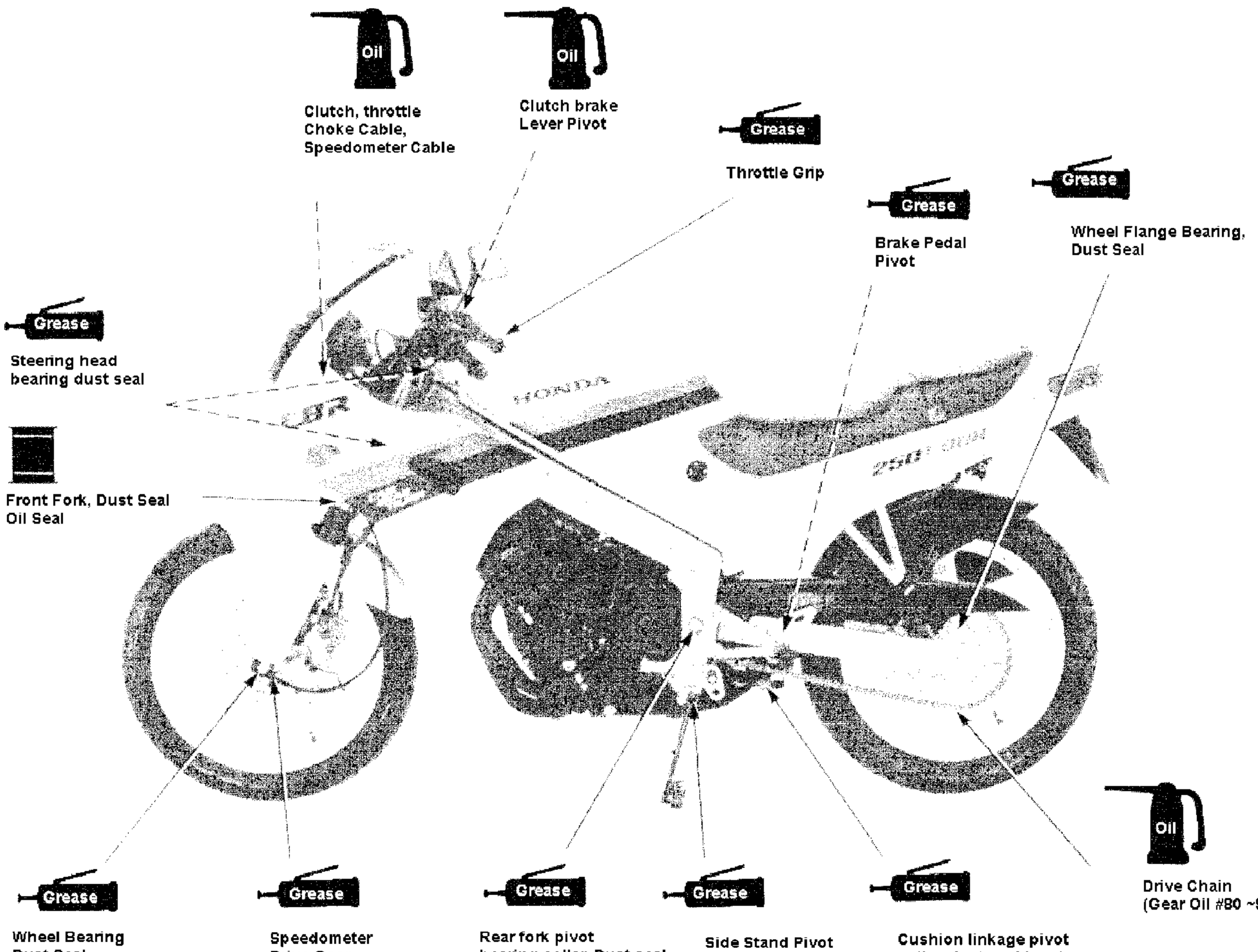
Engine Components

Part	Recommended Oil Grade
Inside cylinder head rev. part and contact surface Inside crankcase rev. part and contact surface.	SAE10W-40 or 20W-50.

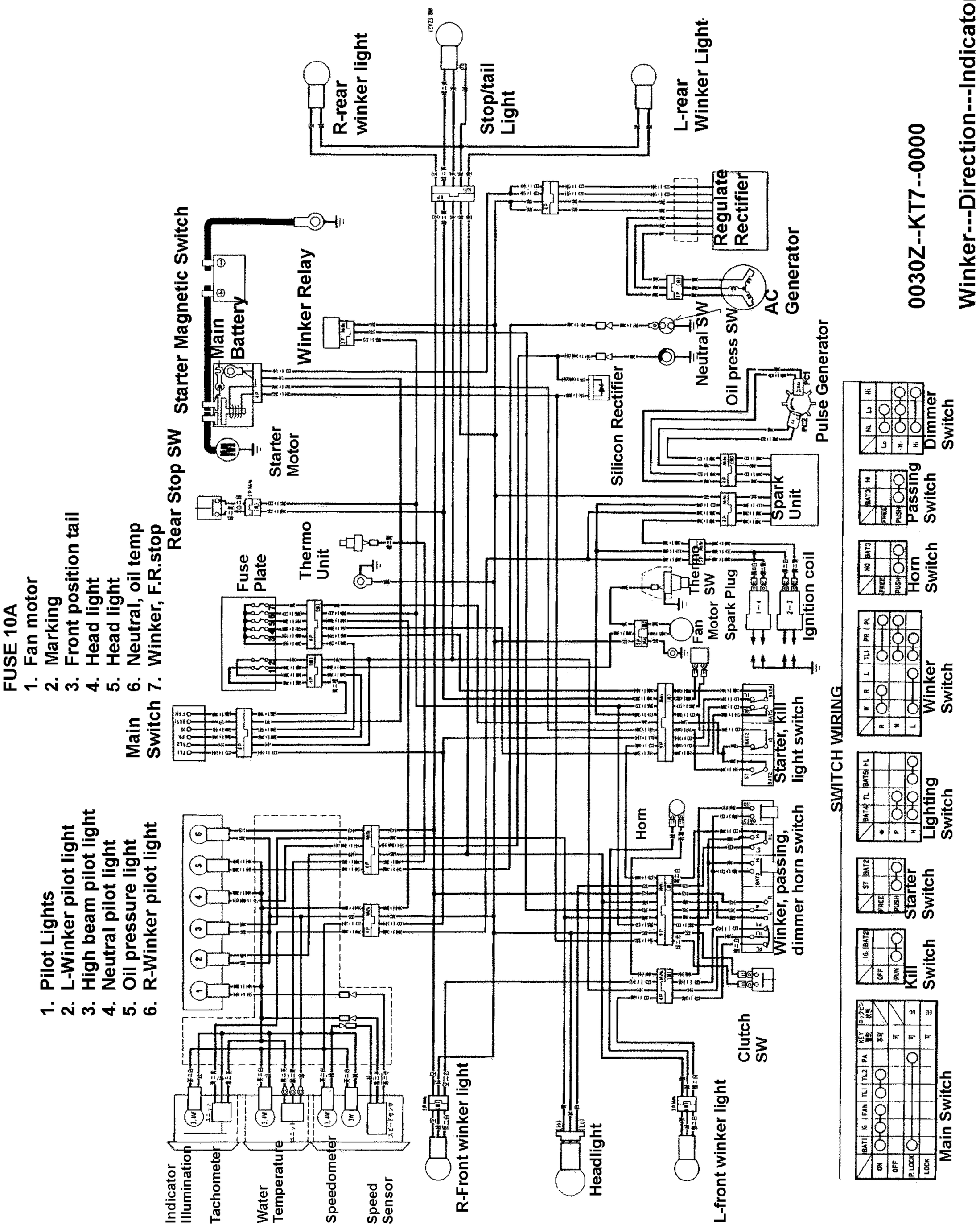
Frame

Unless specified, use multi-purpose grease for greasing symbol.

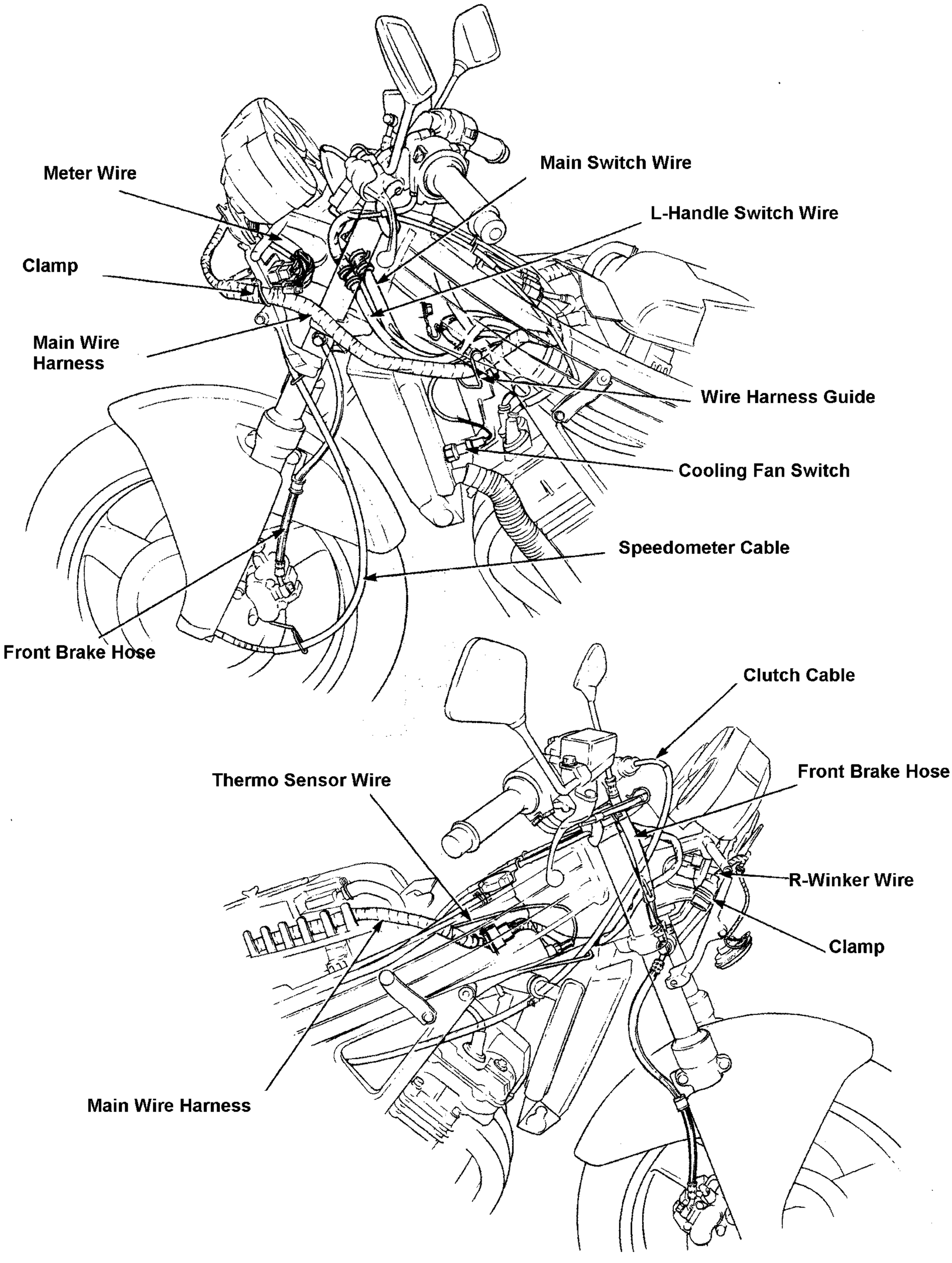
Apply oil or grease to any other moving parts not specified here to prevent noise and extend and endurance.



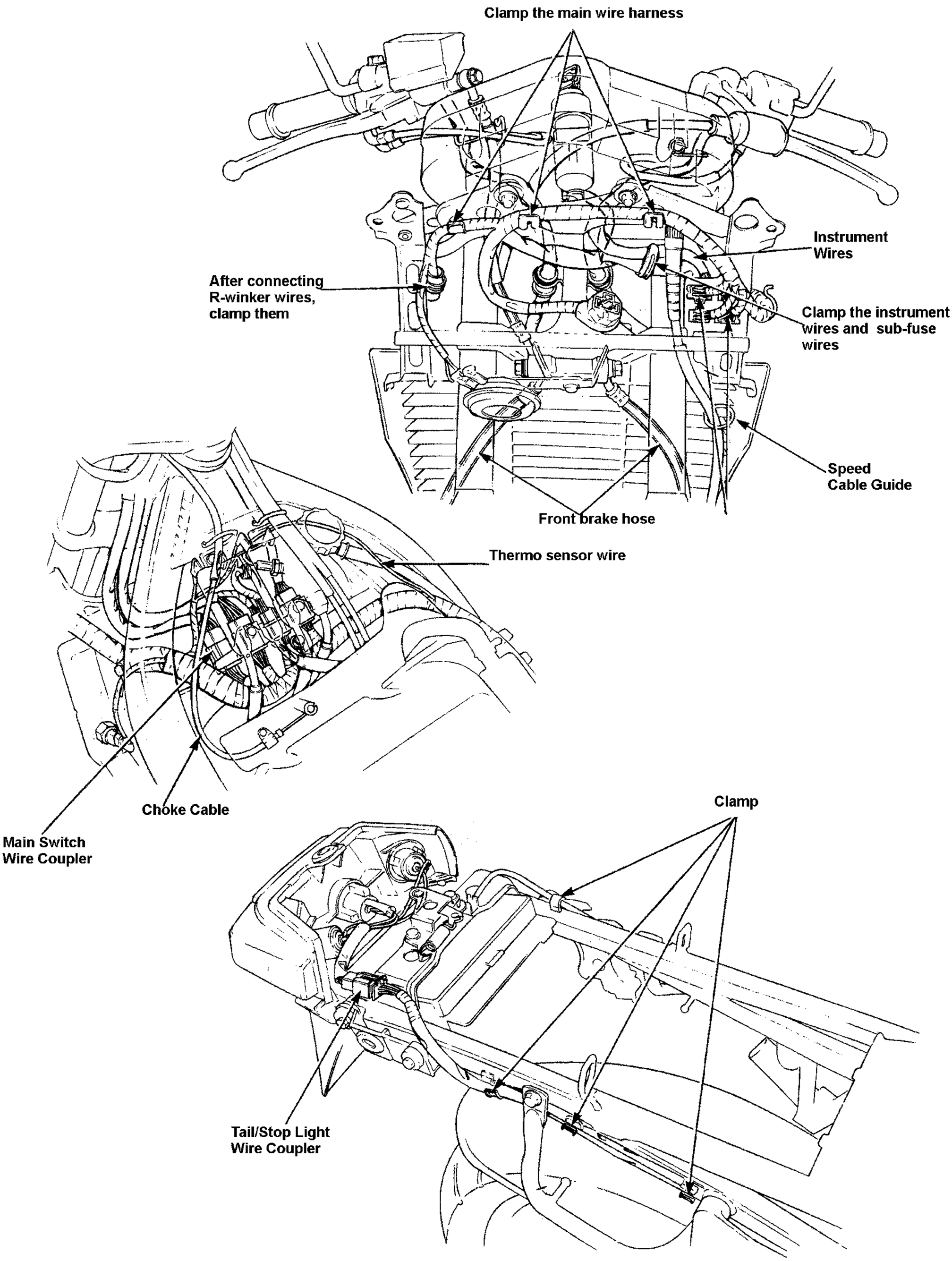
- **Electrical Circuits**



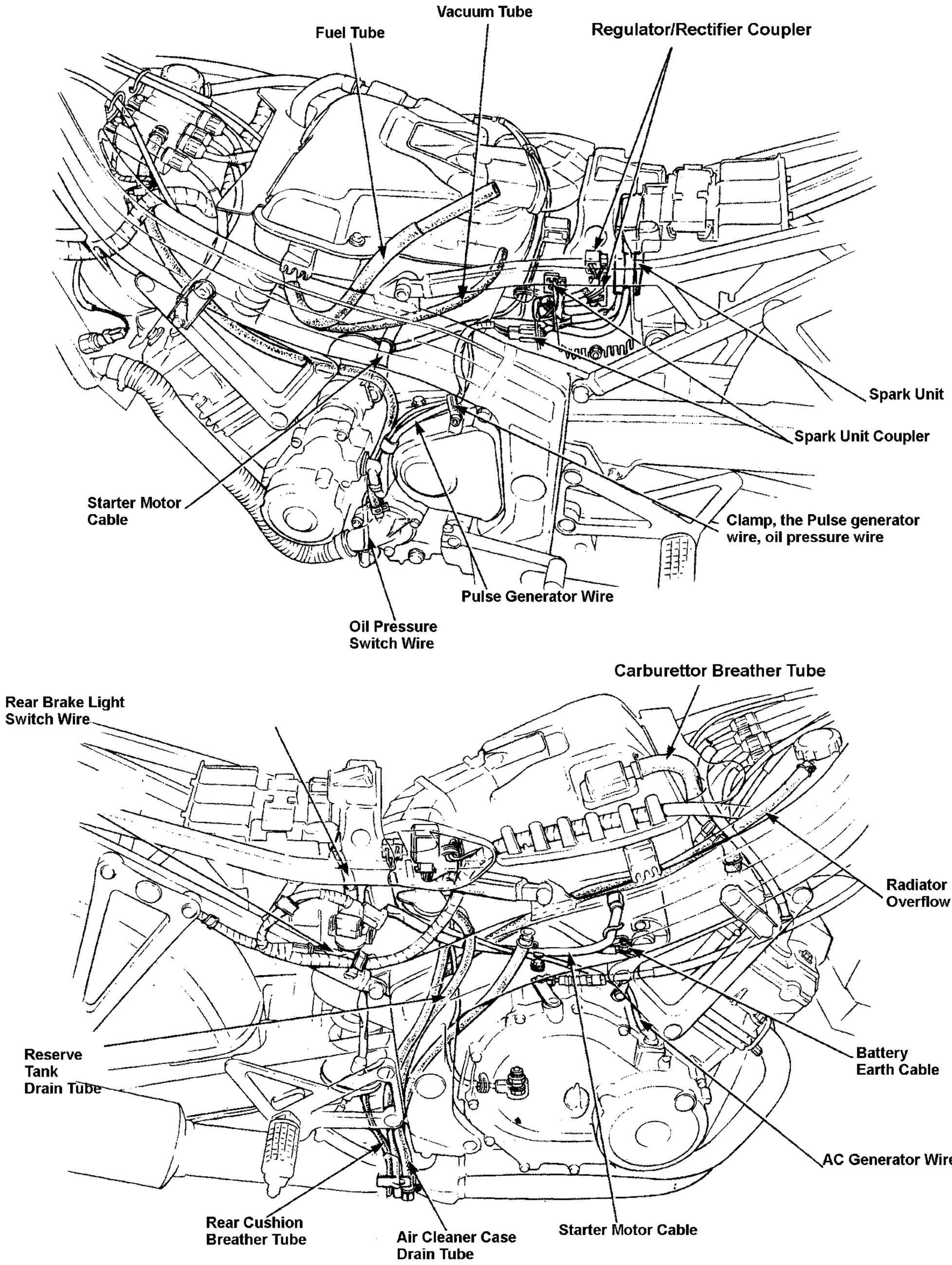
- **Wiring**


Meter Wire
Main Switch Wire
L-Handle Switch Wire
Clamp
Main Wire Harness
Wire Harness Guide
Cooling Fan Switch
Speedometer Cable
Front Brake Hose
Clutch Cable
Front Brake Hose
Thermo Sensor Wire
R-Winker Wire
Clamp
Main Wire Harness
Main Wire Harness

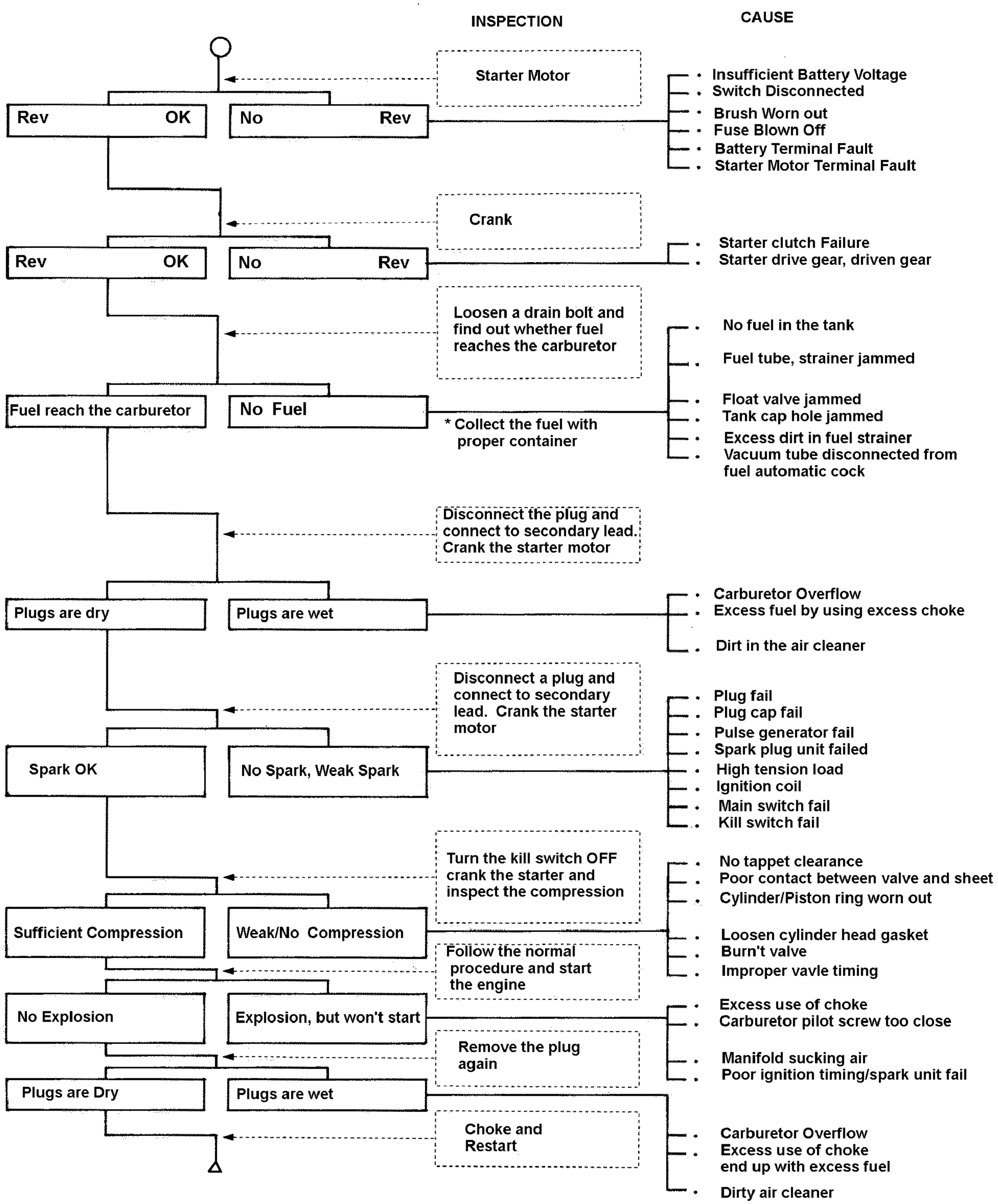
- **Wiring**

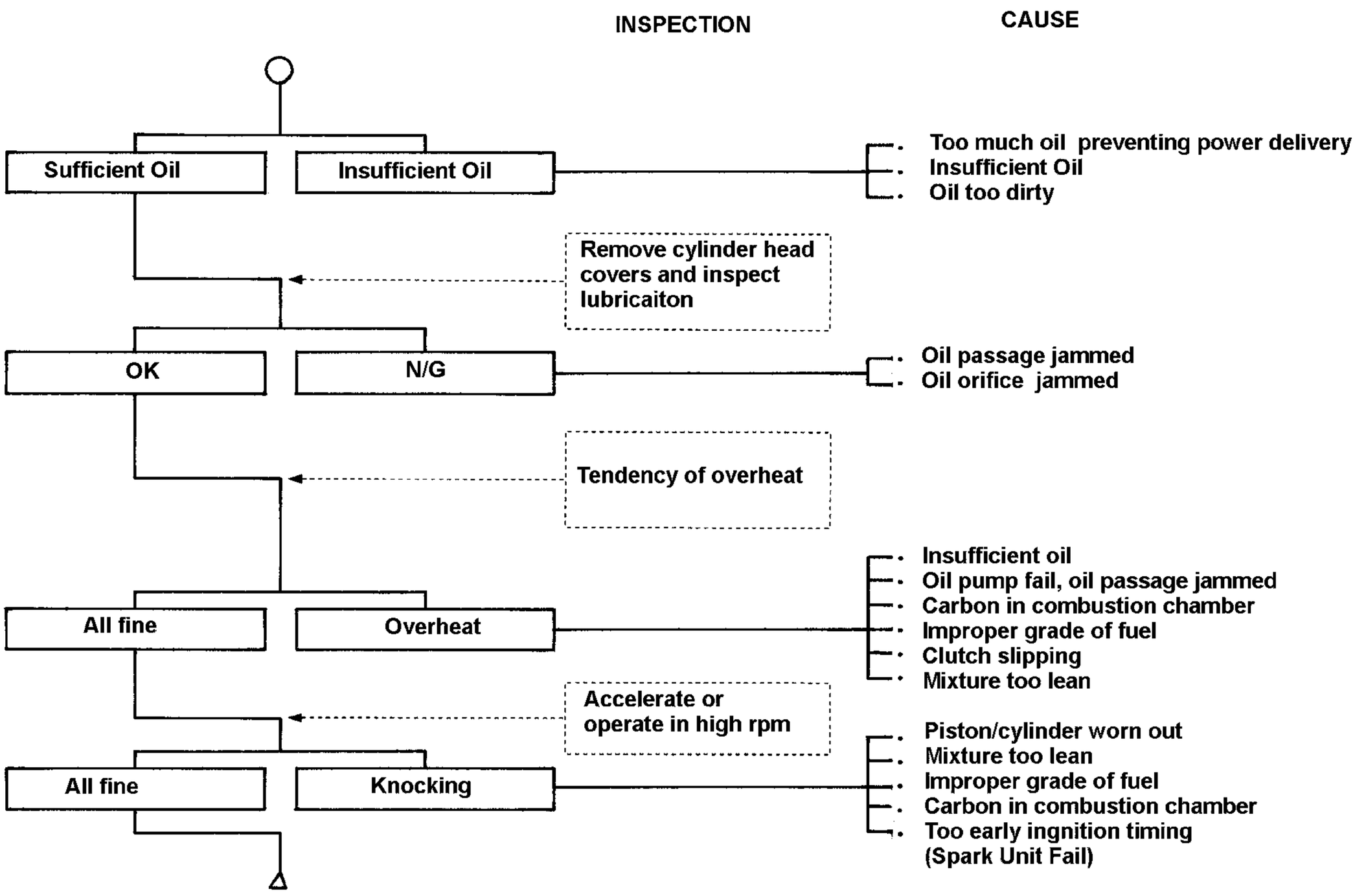

Clamp the main wire harness
Instrument Wires
After connecting R-winker wires, clamp them
Clamp the instrument wires and sub-fuse wires
Speed Cable Guide
Front brake hose
Thermo sensor wire
Choke Cable
Main Switch Wire Coupler
Clamp
Tail/Stop Light Wire Coupler

- **Wiring**

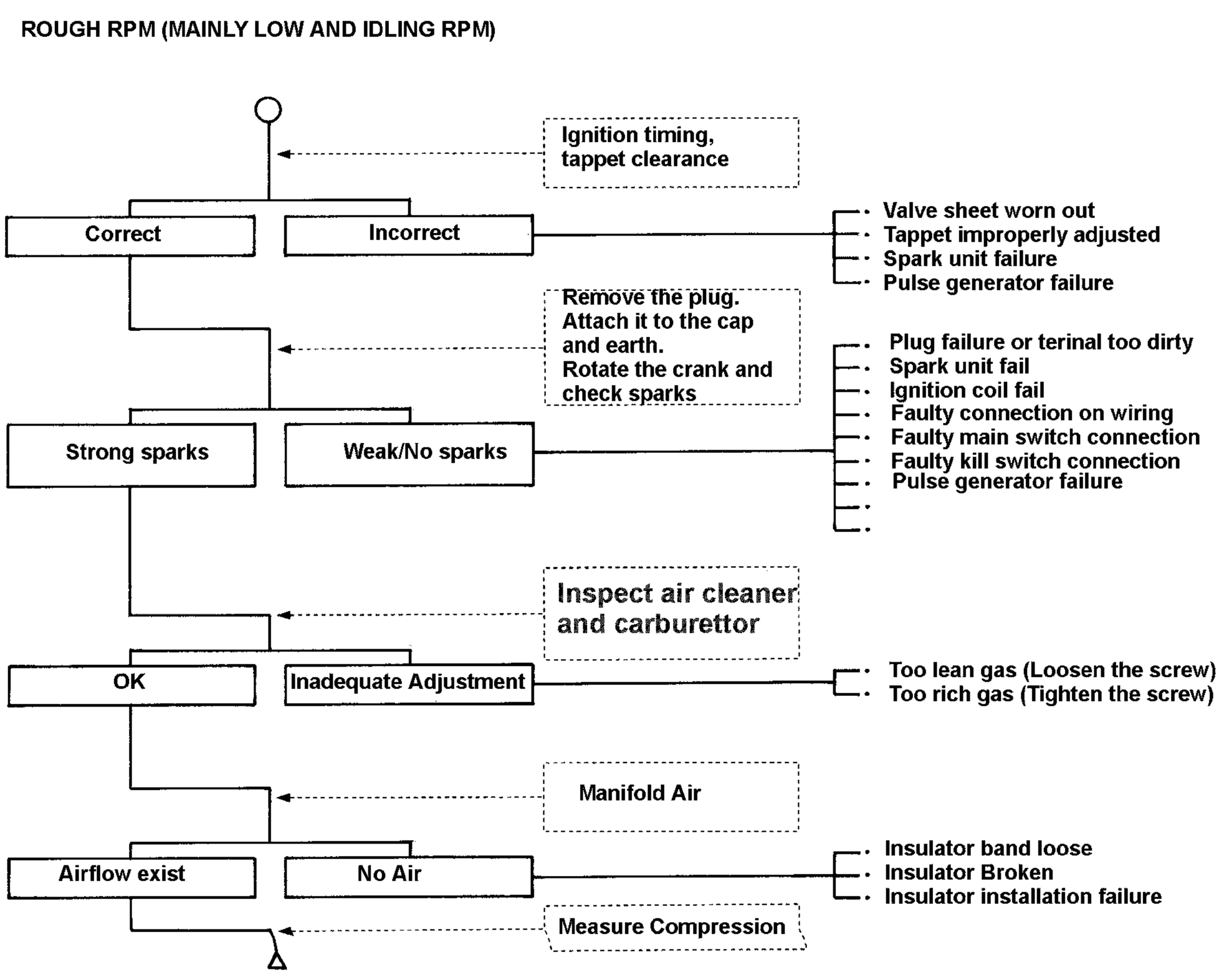

Vacuum Tube
Fuel Tube
Regulator/Rectifier Coupler
Spark Unit
Spark Unit Coupler
Starter Motor Cable
Clamp, the Pulse generator wire, oil pressure wire
Pulse Generator Wire
Oil Pressure Switch Wire
Carburettor Breather Tube
Rear Brake Light Switch Wire
Radiator Overflow Tube
Reserve Tank Drain Tube
Battery Earth Cable
AC Generator Wire
Rear Cushion Breather Tube
Air Cleaner Case Drain Tube
Starter Motor Cable

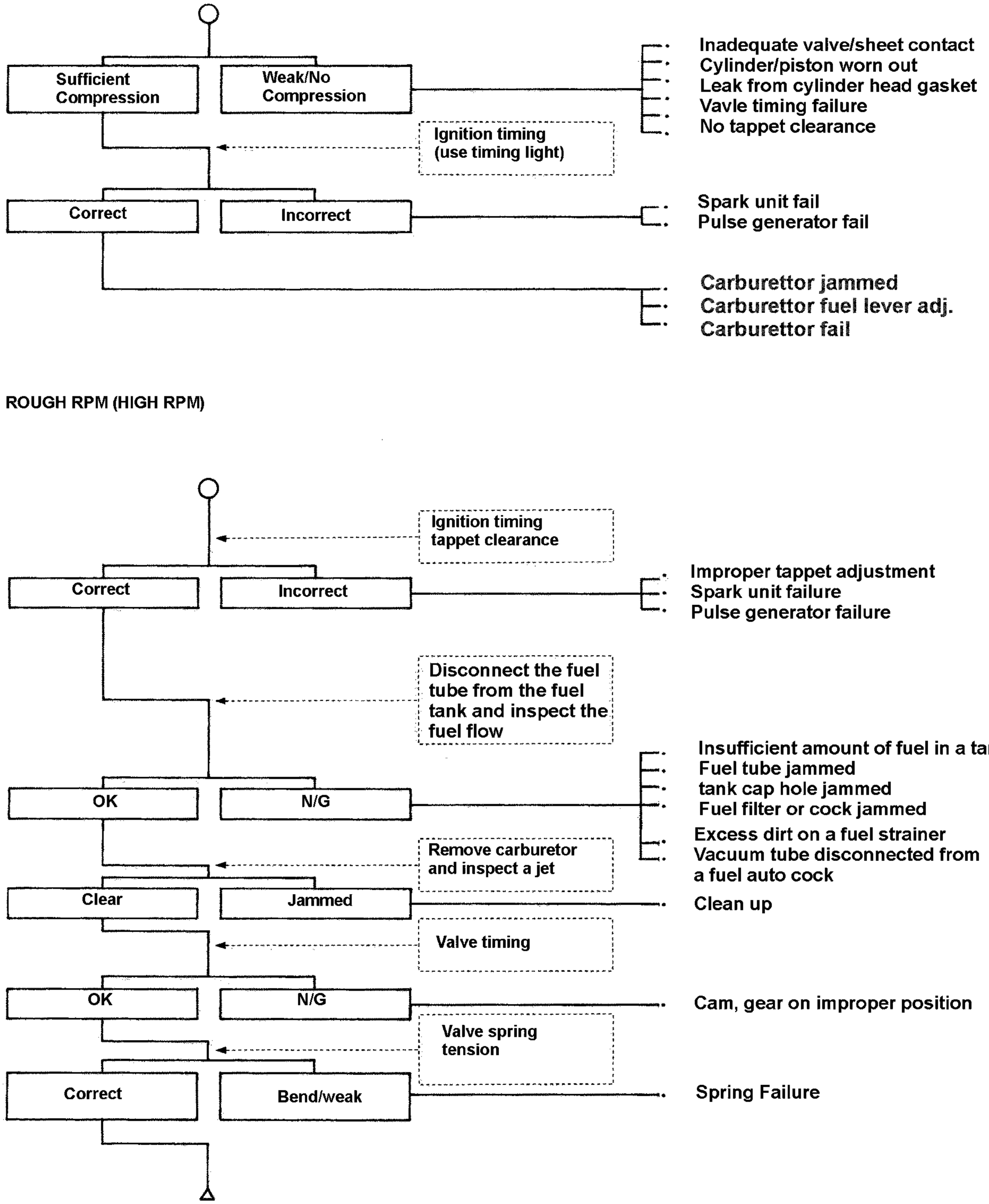
- **Troubleshooting**
- Failure/Difficult to Start



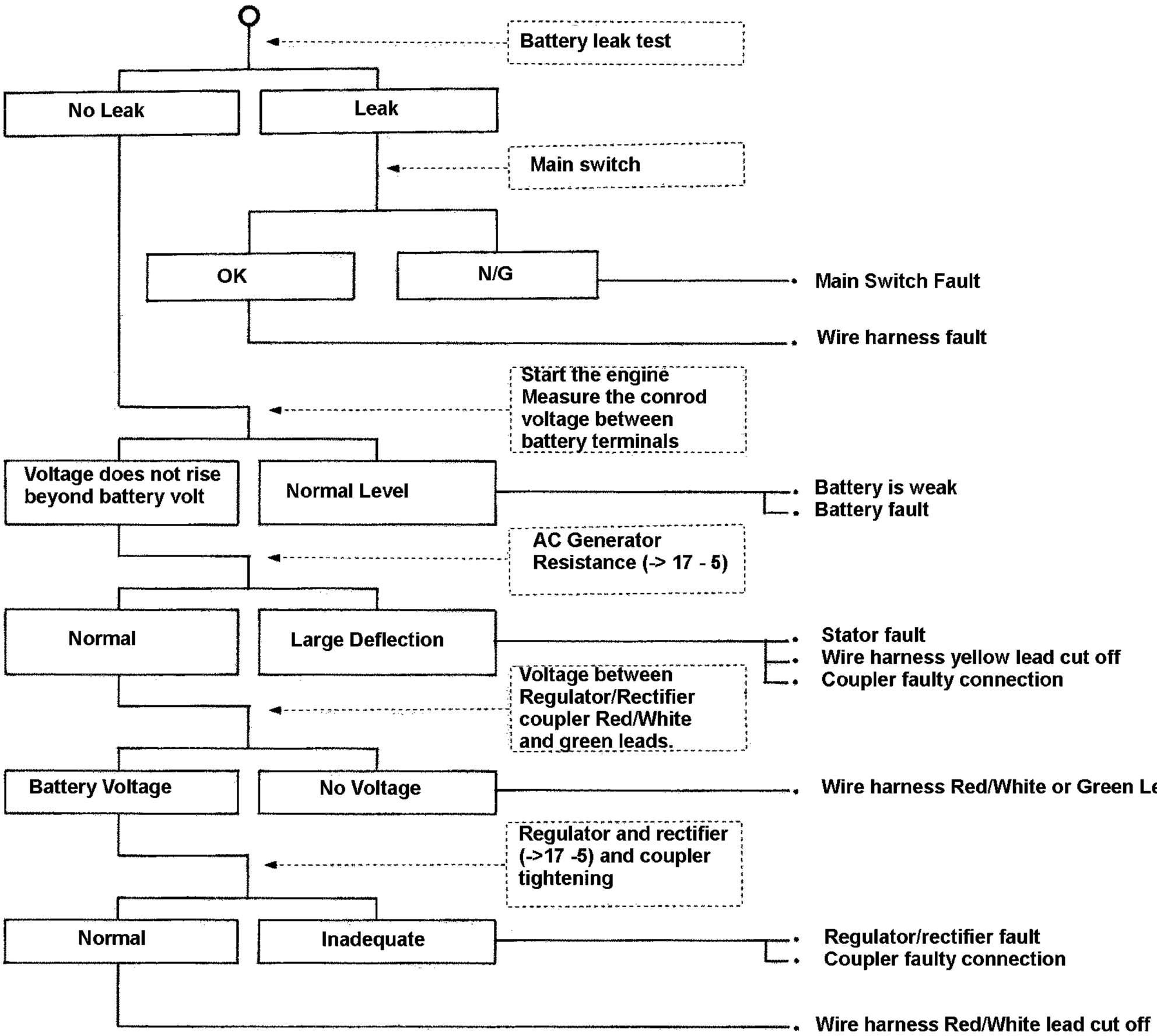


ROUGH RPM (MAINLY LOW AND IDLING RPM)

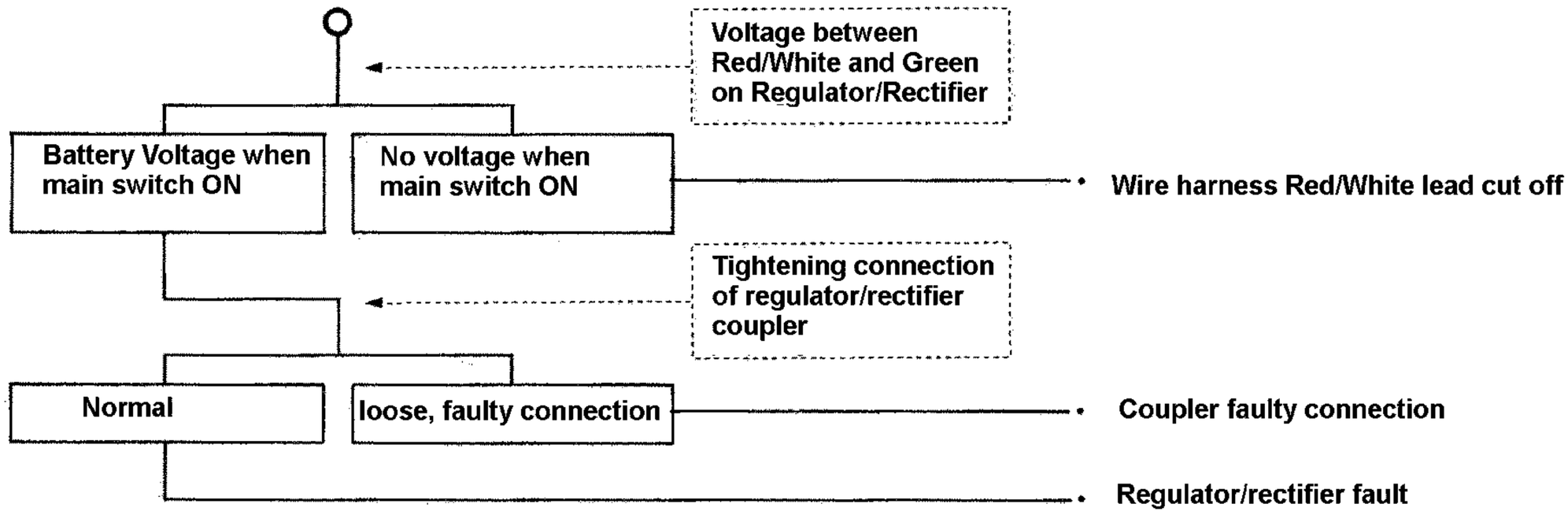


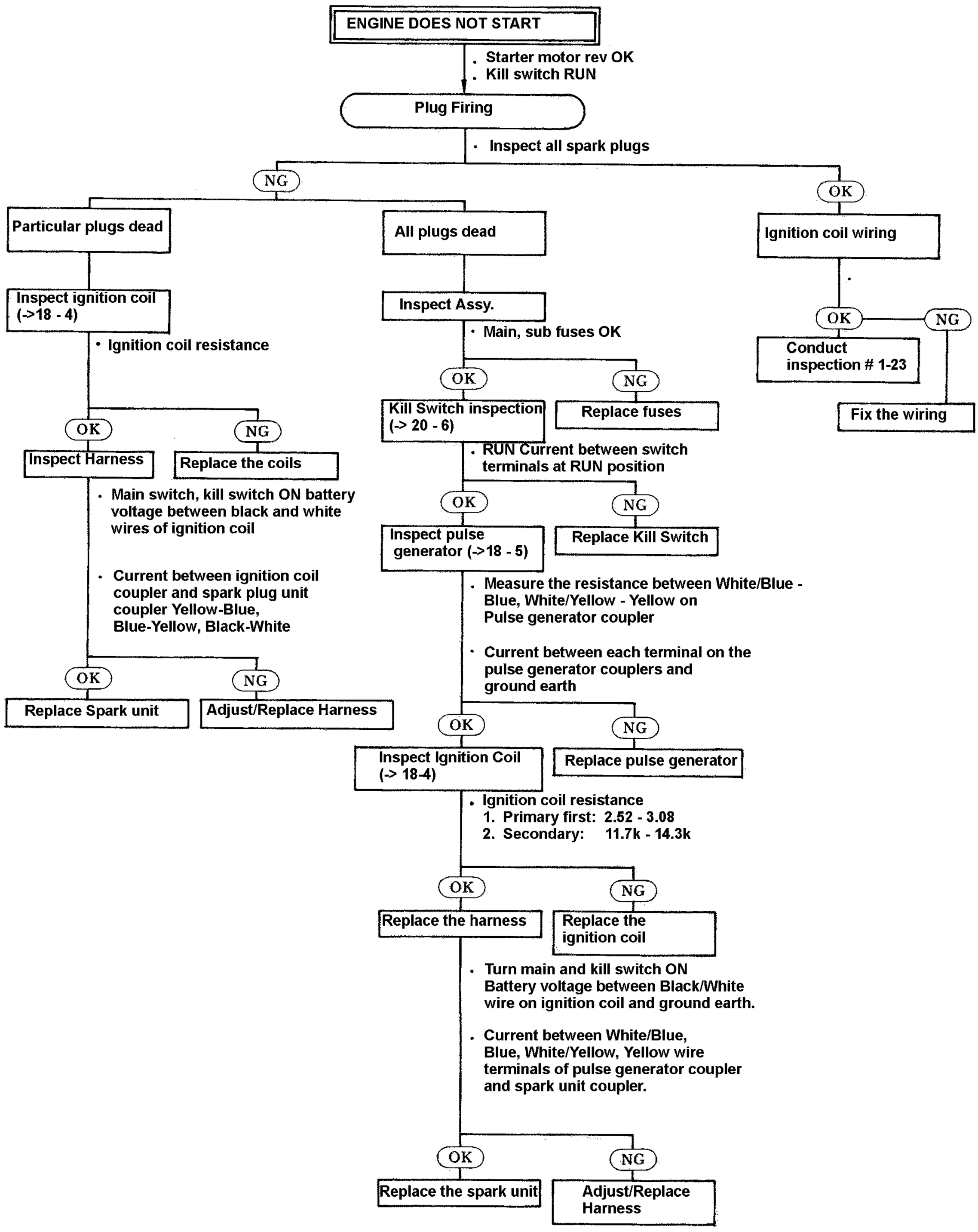


ROUGH RPM (HIGH RPM)



CHARGING PROBLEM (OVERCHARGE)



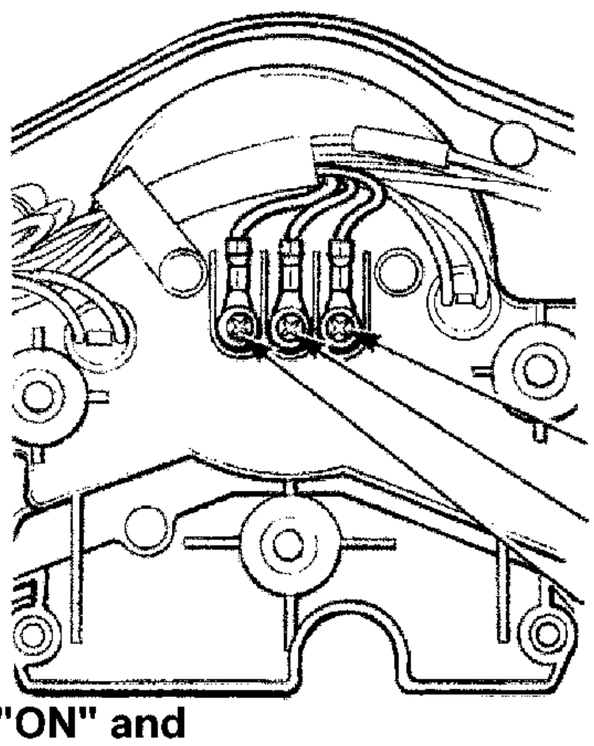

ENGINE DOES NOT START
. Starter motor rev OK
. Kill switch RUN
Plug Firing
• Inspect all spark plugs
NG
OK
Particular plugs dead
All plugs dead
Ignition coil wiring
Inspect ignition coil (->18 - 4)
• Ignition coil resistance
Inspect Assy.
• Main, sub fuses OK
OK
NG
Kill Switch inspection (-> 20 - 6)
Replace fuses
• RUN Current between switch terminals at RUN position
OK
NG
Inspect pulse generator (->18 - 5)
Replace Kill Switch
• Measure the resistance between White/Blue - Blue, White/Yellow - Yellow on Pulse generator coupler
• Current between each terminal on the pulse generator couplers and ground earth
OK
NG
Inspect Ignition Coil (-> 18-4)
Replace pulse generator
• Ignition coil resistance
1. Primary first: 2.52 - 3.08
2. Secondary: 11.7k - 14.3k
OK
NG
Replace the harness
Replace the ignition coil
• Turn main and kill switch ON Battery voltage between Black/White wire on ignition coil and ground earth.
• Current between White/Blue, Blue, White/Yellow, Yellow wire terminals of pulse generator coupler and spark unit coupler.
OK
NG
Replace the spark unit
Adjust/Replace Harness
OK
NG
Conduct inspection # 1-23
Fix the wiring
OK
NG
Inspect Harness
Replace the coils
• Main switch, kill switch ON battery voltage between black and white wires of ignition coil
• Current between ignition coil coupler and spark plug unit coupler Yellow-Blue, Blue-Yellow, Black-White
OK
NG
Replace Spark unit
Adjust/Replace Harness

TACHOMETER NOT WORKING

NORMAL SPARK ON #1 (MOST LEFT)

OK

Tachometer Wiring



Yellow/Blue wire for pulse (to the ignition coil)

Ground earth green wire

Power supply black/brown wire

Main switch "ON" and
Battery voltage between
(Yellow/Blue - Green Wire)
(Black/Brown - Green Wire)
Current between Green-Ground earth

OK

Replace Tacho Assy

NG

Tlghten screws Adjust

NG

Refer - Ignition System

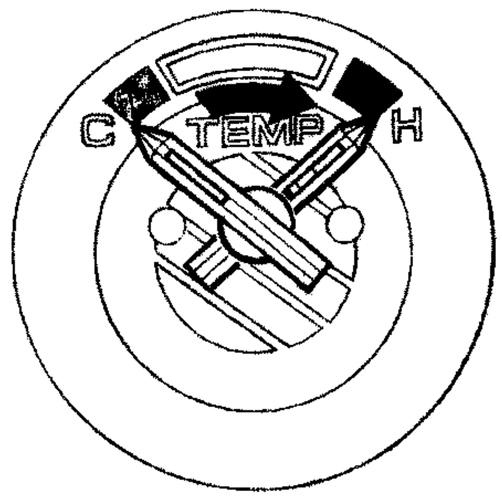
Indicates "C" while the actual temp is high

Tighten the upper case bolt for a thermostat

Inspect the function of water temp meter

- Disconnect Green/Blue wire from a thermo sensor and earth to the engine. Main switch ON should bring the water temperature needle full deflection towards "H" side.

✱ Do not earth for more than 5 seconds



OK → Replace the thermo sensor

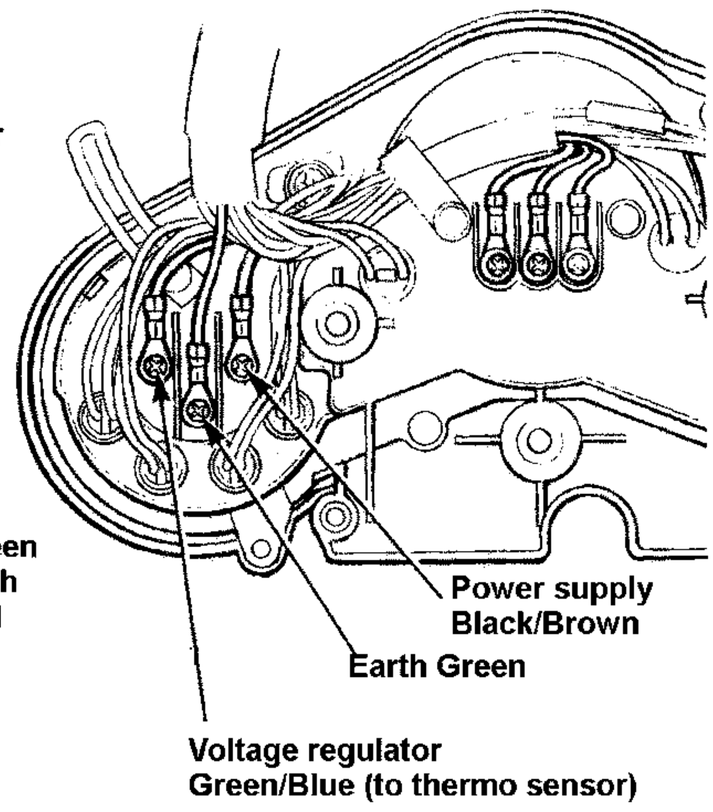
NG → Inspect the harness voltage

- Voltage between the thermo sensor Green/Blue and earth when main switch ON

OK → Replace the water temp meter

NG → Inspect the voltage of the water temp. meter

- Voltage between Green/Blue and earth on water temp. meter when main switch ON



OK → Inspect the continuenty of the harness

NG → Water temp. meter terminals

- Battery voltage between Black/Brown and earth when main switch ON
- Continuenty between Green and earth

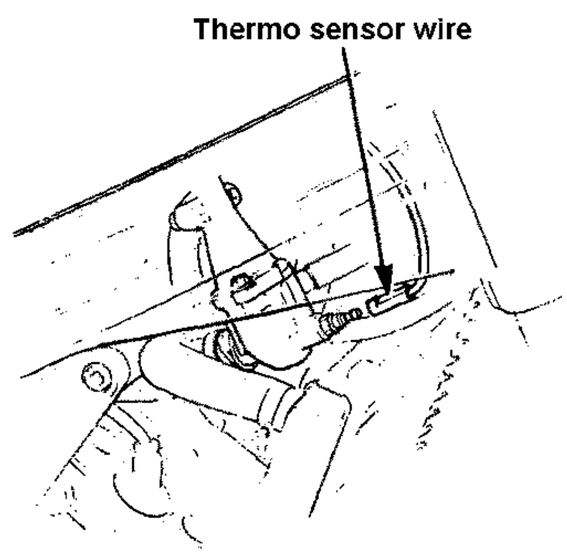
OK → Replace the water temp meter

NG → Adjust/replace the tightening harness for terminals

INDICATES "H" WHILE THE ACTUAL TEMP. IS LOW

Inspect the function of water temp. meter

- Disconnect thermo sensor wire and turn the main switch ON. Water temp. meter indicates "C"



OK

Replace thermo sensor

NG

Inspect for the short circuit of the harness

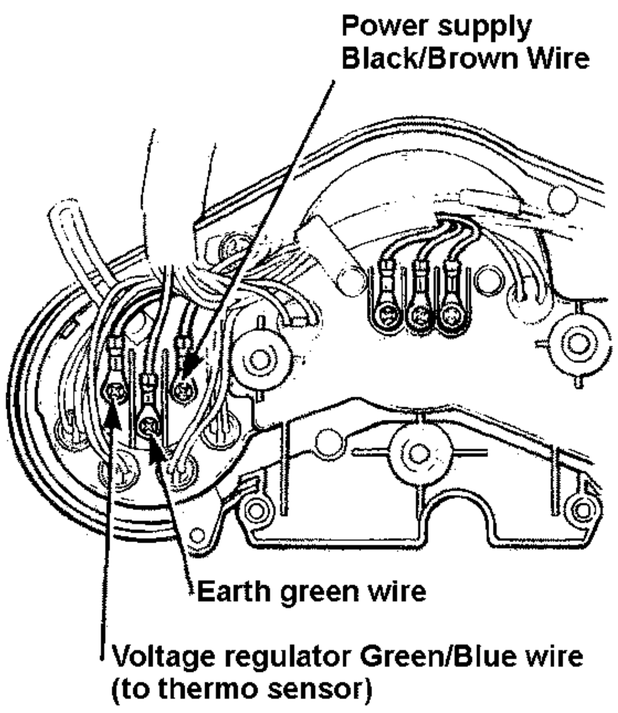
- Disconnect the meter coupler inside the fairing. Confirm there is no short circuit between Green/Blue and Green

NG

Repair/replace the harness

OK

Inspect the terminals of the water temp. meter



NG

Repair/replace the harness

OK

Replace the water temp. meter

No/Insufficient fuel flow

Tank cap hole jammed

Quantity of fuel

Vacuum tube jammed/bent

Air vent jammed

Automatic cock disassemly and inspect

Cover Comp.

- Manifold tube jammed
- Check valve operation failure
  Replace the cover comp.

Diaphragm

- Damage.....Replace
- Poor Installation.....Adjust

Cock Body

- Jam, dirt.....Clean

Fuel Strainer

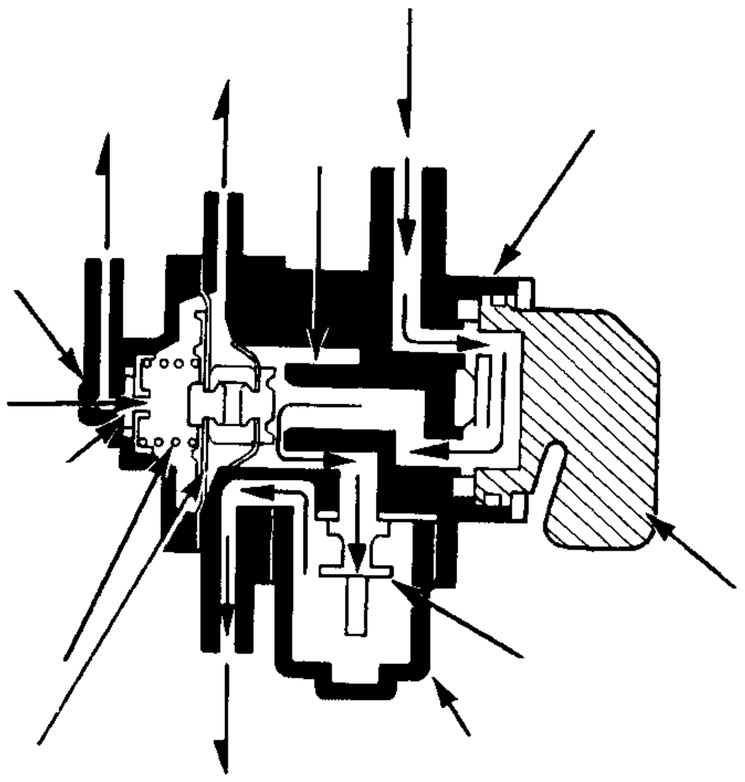
- Screen jammed.....Clean

Still N/G

NG

Clean the fuel tank adjust and replace

FUEL FLOWS AFTER SHUTTING THE ENGINE DOWN (COCK ON RES)



Cover Comp

- Leak hole jammed
- Check valve failure.....replace the cover temp.

Diaphragm

- Damage.....Replace
- Poor installation.....Adjust
- Seating compartment damage.... ..Replace

Cock Body

- Jam, dirt .....Clean
- Seat surface damaged, centre line offset..replacee the body

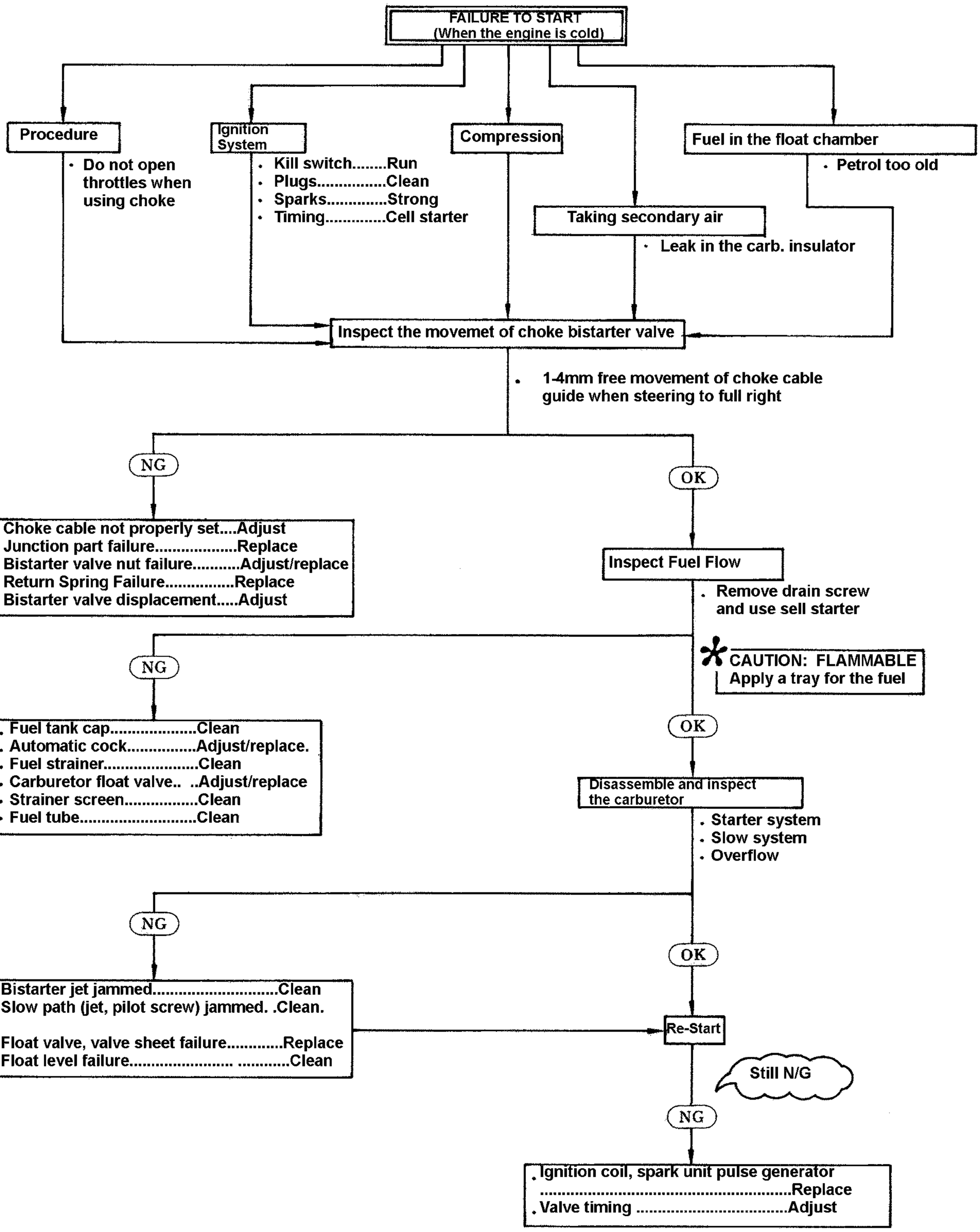
Spring

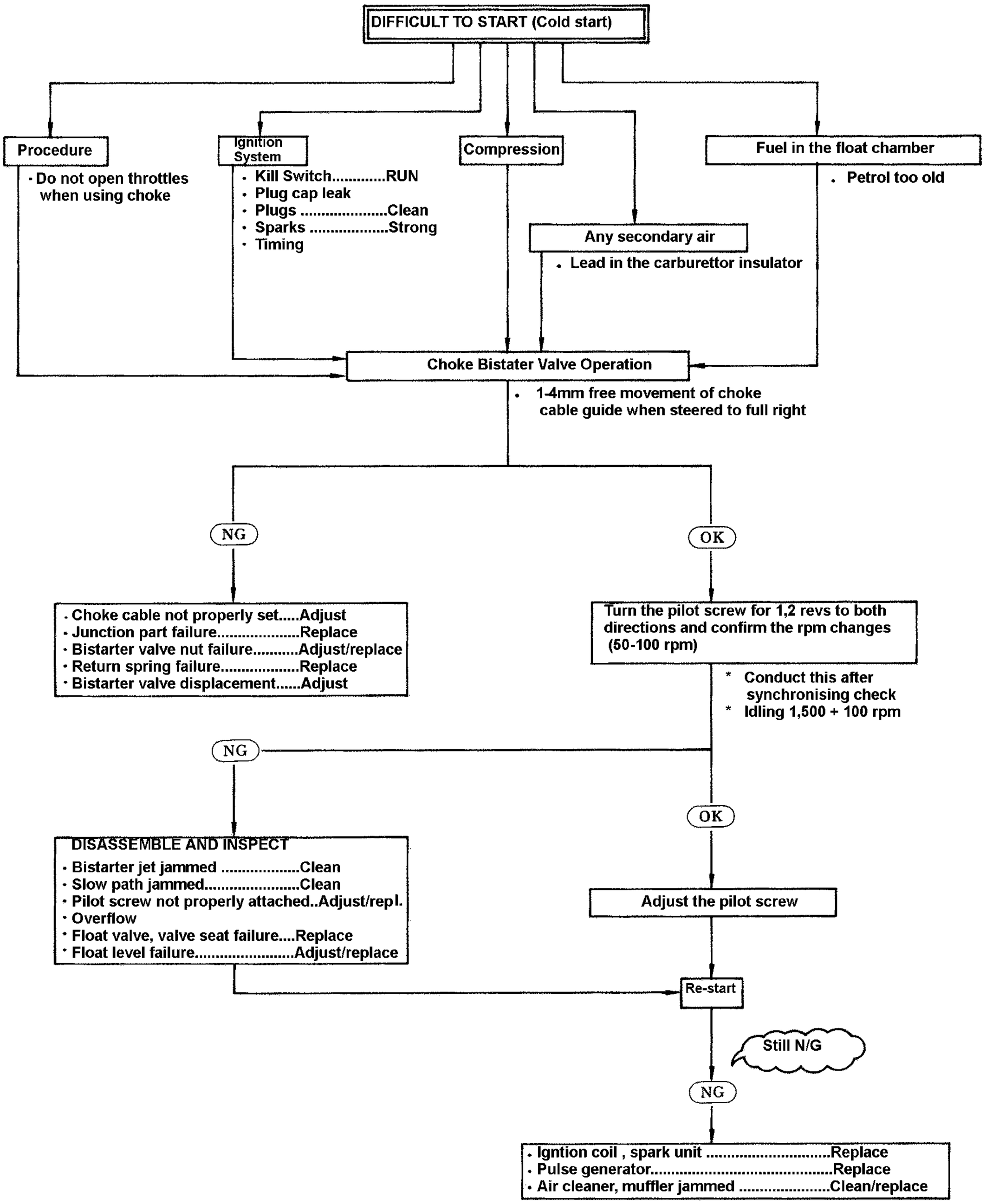
- Displacement.....Adjust
- damaged.....Replace
- Not installed.....Install

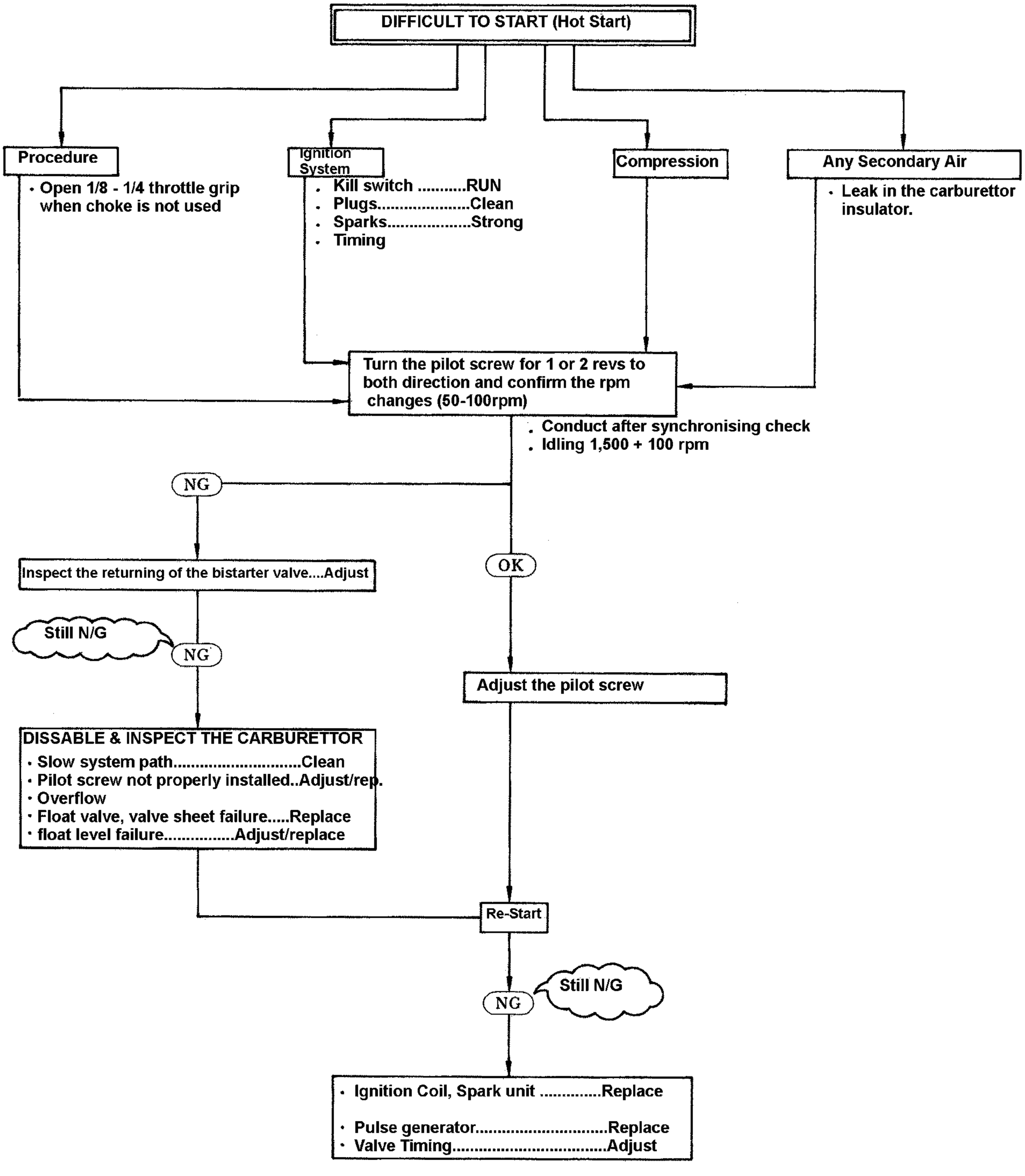
Still N/G

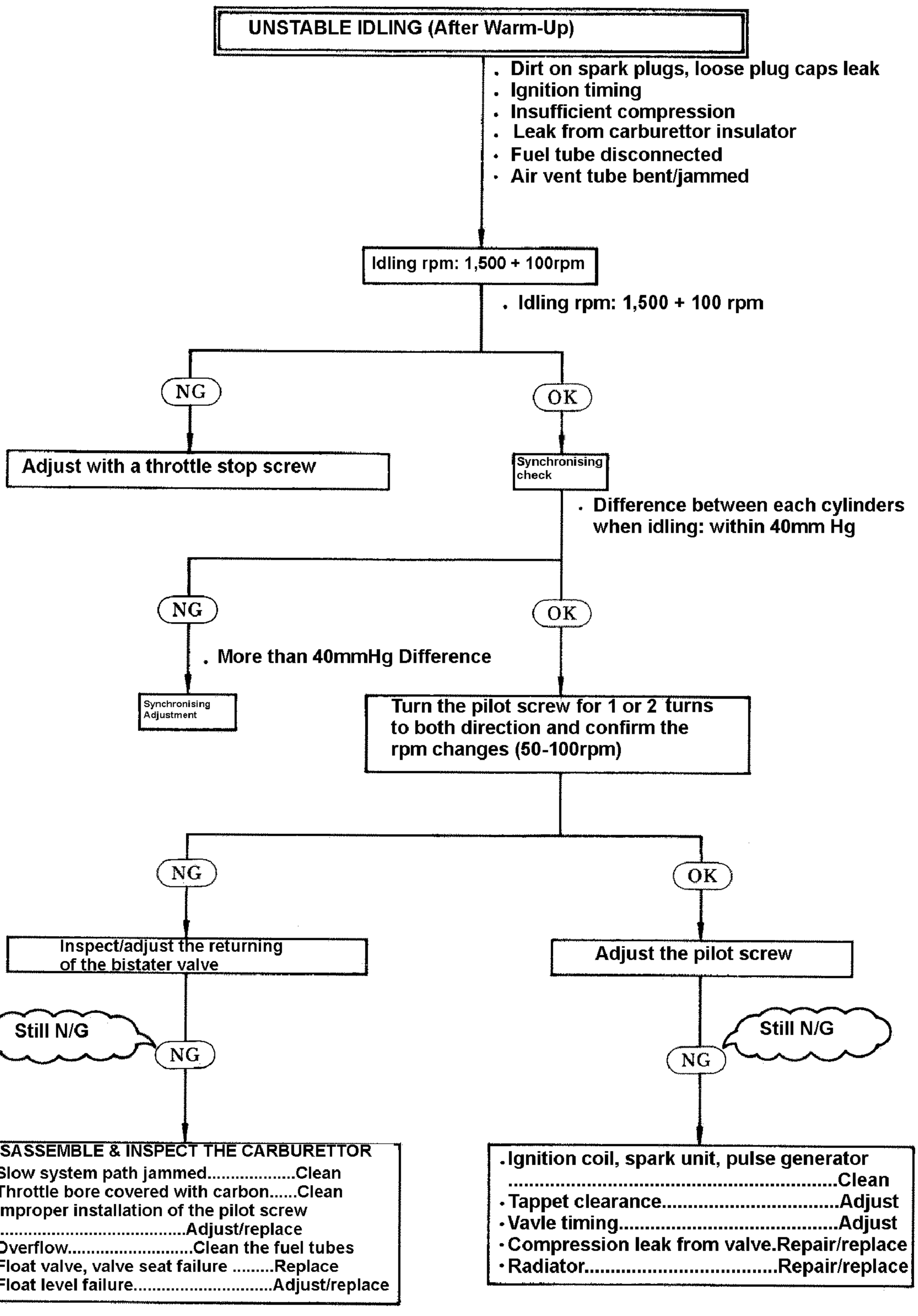
NG

Clean, adjust / replace the fuel tank


FAILURE TO START
(When the engine is cold)
Procedure
• Do not open throttles when using choke
Ignition System
• Kill switch.....Run
• Plugs.....Clean
• Sparks.....Strong
• Timing.....Cell starter
Compression
Fuel in the float chamber
• Petrol too old
Taking secondary air
• Leak in the carb. insulator
Inspect the movemet of choke bistarter valve
• 1-4mm free movement of choke cable guide when steering to full right
NG
• Choke cable not properly set....Adjust
• Junction part failure.....Replace
• Bistarter valve nut failure.....Adjust/replace
• Return Spring Failure.....Replace
• Bistarter valve displacement.....Adjust
OK
Inspect Fuel Flow
• Remove drain screw and use sell starter
CAUTION: FLAMMABLE
Apply a tray for the fuel
NG
• Fuel tank cap.....Clean
• Automatic cock.....Adjust/replace.
• Fuel strainer.....Clean
• Carburetor float valve.. ..Adjust/replace
• Strainer screen.....Clean
• Fuel tube.....Clean
OK
Disassemble and inspect the carburetor
• Starter system
• Slow system
• Overflow
NG
• Bistarter jet jammed.....Clean
• Slow path (jet, pilot screw) jammed. .Clean.
• Float valve, valve sheet failure.....Replace
• Float level failure..... .....Clean
OK
Re-Start
Still N/G
NG
• Ignition coil, spark unit pulse generator .....Replace
• Valve timing .....Adjust


DIFFICULT TO START (Cold start)
Procedure
· Do not open throttles when using choke
Ignition System
· Kill Switch.....RUN
· Plug cap leak
· Plugs .....Clean
· Sparks .....Strong
· Timing
Compression
Fuel in the float chamber
· Petrol too old
Any secondary air
· Lead in the carburettor insulator
Choke Bistater Valve Operation
· 1-4mm free movement of choke cable guide when steered to full right
NG
OK
· Choke cable not properly set.....Adjust
· Junction part failure.....Replace
· Bistarter valve nut failure.....Adjust/replace
· Return spring failure.....Replace
· Bistarter valve displacement.....Adjust
Turn the pilot screw for 1,2 revs to both directions and confirm the rpm changes (50-100 rpm)
* Conduct this after synchronising check
* Idling 1,500 + 100 rpm
NG
OK
DISASSEMBLE AND INSPECT
· Bistarter jet jammed .....Clean
· Slow path jammed.....Clean
· Pilot screw not properly attached..Adjust/repl.
· Overflow
· Float valve, valve seat failure....Replace
· Float level failure.....Adjust/replace
Adjust the pilot screw
Re-start
Still N/G
NG
· Igntion coil , spark unit .....Replace
· Pulse generator.....Replace
· Air cleaner, muffler jammed .....Clean/replace


DIFFICULT TO START (Hot Start)
Procedure
• Open 1/8 - 1/4 throttle grip when choke is not used
Ignition System
• Kill switch .....RUN
• Plugs.....Clean
• Sparks.....Strong
• Timing
Compression
Any Secondary Air
• Leak in the carburettor insulator.
Turn the pilot screw for 1 or 2 revs to both direction and confirm the rpm changes (50-100rpm)
• Conduct after synchronising check
• Idling 1,500 + 100 rpm
NG
OK
Inspect the returning of the bistarter valve....Adjust
Still N/G
NG
Adjust the pilot screw
DISSABLE & INSPECT THE CARBURETTOR
• Slow system path.....Clean
• Pilot screw not properly installed..Adjust/rep.
• Overflow
• Float valve, valve sheet failure.....Replace
• float level failure.....Adjust/replace
Re-Start
NG
Still N/G
• Ignition Coil, Spark unit .....Replace
• Pulse generator.....Replace
• Valve Timing.....Adjust


UNSTABLE IDLING (After Warm-Up)
. Dirt on spark plugs, loose plug caps leak
. Ignition timing
. Insufficient compression
. Leak from carburettor insulator
. Fuel tube disconnected
. Air vent tube bent/jammed
Idling rpm: 1,500 + 100rpm
. Idling rpm: 1,500 + 100 rpm
NG
OK
Adjust with a throttle stop screw
Synchronising check
. Difference between each cylinders when idling: within 40mm Hg
NG
OK
. More than 40mmHg Difference
Synchronising Adjustment
Turn the pilot screw for 1 or 2 turns to both direction and confirm the rpm changes (50-100rpm)
NG
OK
Inspect/adjust the returning of the bistater valve
Adjust the pilot screw
Still N/G
NG
Still N/G
NG
DISASSEMBLE & INSPECT THE CARBURETTOR
. Slow system path jammed.....Clean
. Throttle bore covered with carbon.....Clean
. Improper installation of the pilot screw .....Adjust/replace
. Overflow.....Clean the fuel tubes
. Float valve, valve seat failure .....Replace
. Float level failure.....Adjust/replace
. Ignition coil, spark unit, pulse generator .....Clean
. Tappet clearance.....Adjust
. Vavle timing.....Adjust
. Compression leak from valve.Repair/replace
. Radiator.....Repair/replace

SOME CYLINDERS WOULD NOT HAVE COMBUSTION WHILE IDLING (After-Warm-Up)

- Dirty spark plugs, loose plug caps, leak
- Inadequate ignition timing
- Insufficient compression
- Leak from carburetor insulator
- Fuel tube disconnected
- Air vent tube bent/jammed

Idling rpm: 1,500 + 100rpm

- Idling rpm: 1,500 + 100rpm
- Difference between the cylinders: < 40mm Hg

NG

- More than 40mm Hg Difference

Synchronising Adjustment

OK

Turn the pilot screw for 1 or 2 turns to both direction and confirm the rpm changes (50-100 rpm)

NG

Inspect/Adjust the returning of the bistarter valve

Still N/G

NG

DISASSEMBLE & INSPECT THE CARBURETTOR

- Slow system path jammed.....Clean
- Carbon on a throttle bore.....Clean
- Improper installation of the pilot screw . Adjust/replace
- Overflow.....Clean the fuel tubes
- Float valve, valve seat failure.....Replace
- Float level failure.....Adjust/replace

OK

Adjust the pilot screw

NG

Still N/G

- Ignition coil failure.....Replace
- Spark unit failure.....Replace
- Pulse generator failure.....Repalce

EXTREMELY LOW VACUUM AT IDLE
(Vacuum pressure differ more than 40mm Hg between the cylinders after warm-up)

Low Vacuum at idling would result in:-
- Unstable idling (Fluctuating rpm, cylinders with no combustion, engine stops)
- Rpm does not decrease easily
- Difficult to warm up after start

- Spark plug, plug cap
- Ignition timing
- Compression
- Leak in carburettor insulator
- Oil Quantity
- Carburettor synchronizing

Turn the pilot screw for 1 or 2 revs to both directions and confirm the rpm changes (50-100rpm)

NG

Inspect/Adjust the returning of the bistarter valve

Still N/G

NG

DISASSEMBLE & INSPECT THE CARBURETTOR
- Slow system path jammed.....Clean
- Improper installation of the pilot screw . Adjust/replace
- Carbon on a throttle bore..Clean the fuel tubes
- Float valve, valve seat failure.....Replace
- Float level failure.....Adjust/replace

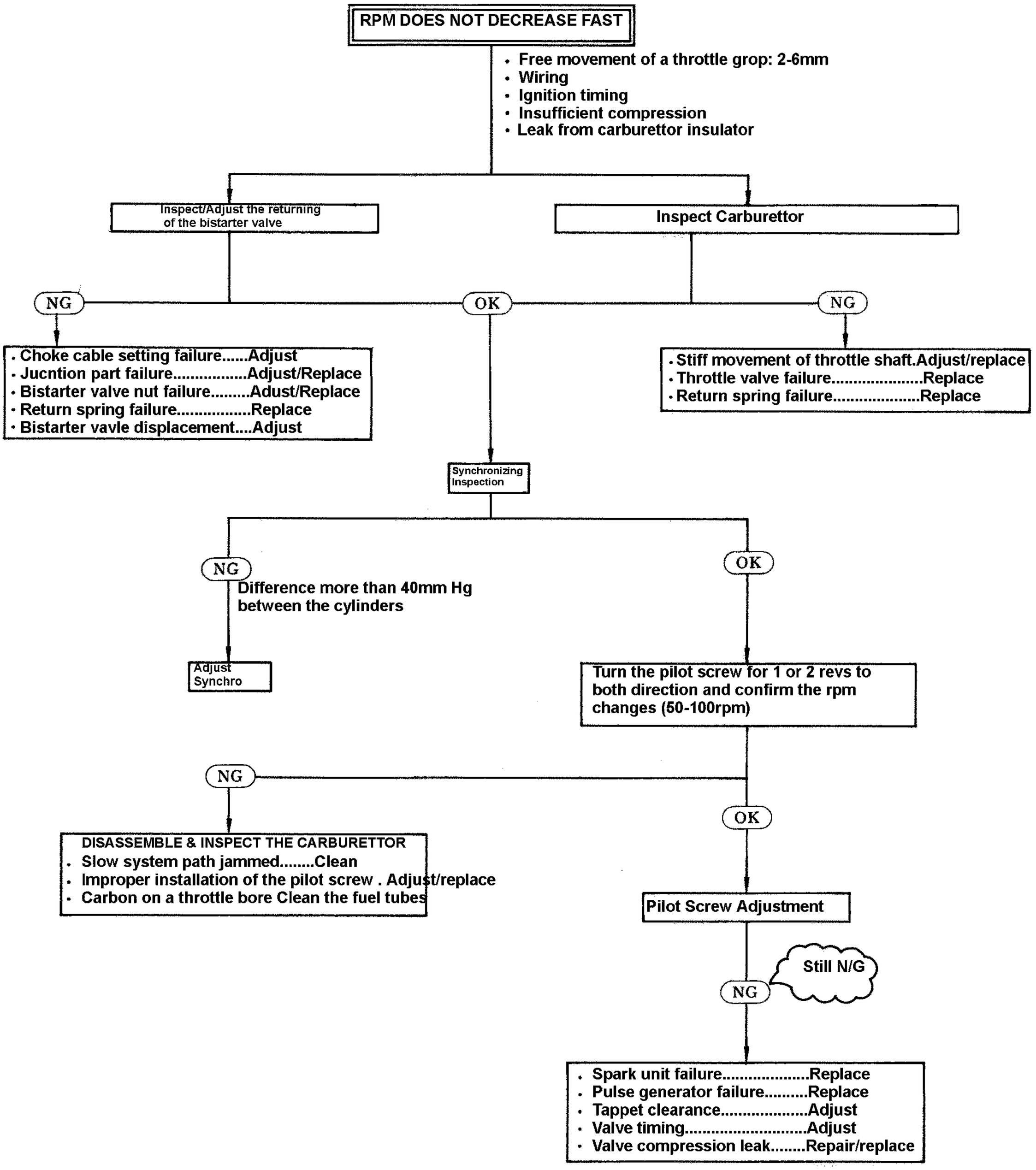
OK

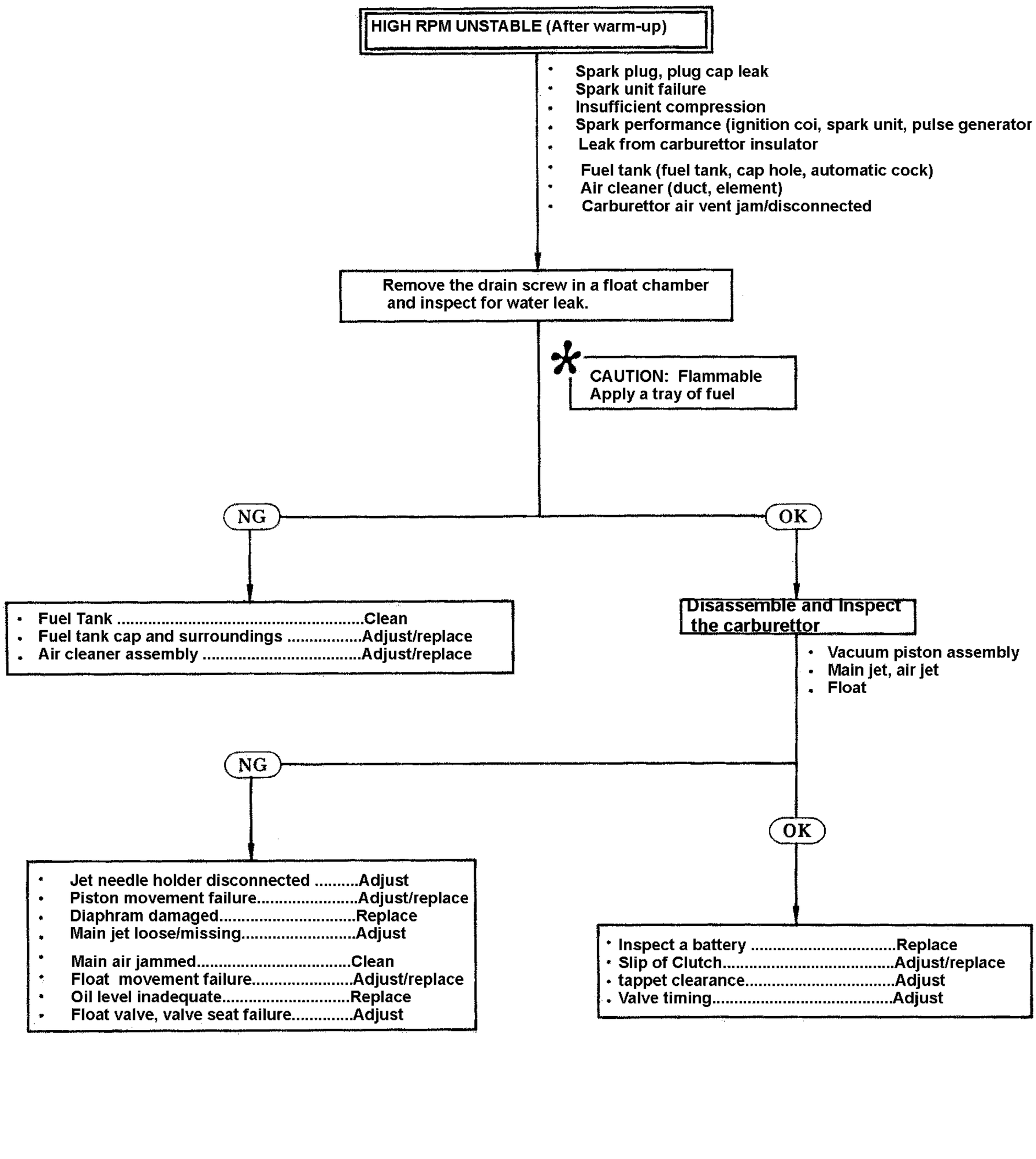
Adjust the pilot screw

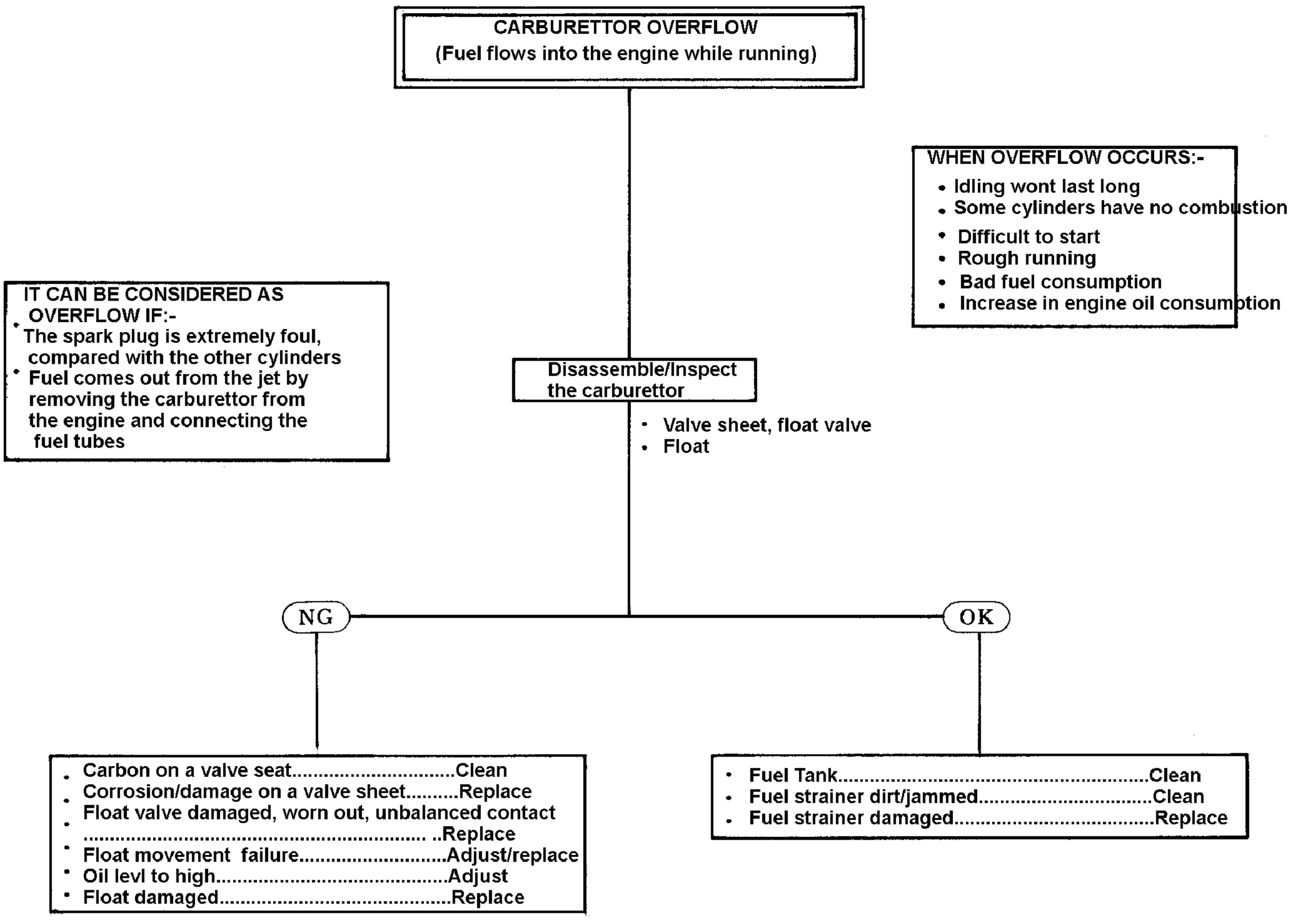
Still N/G

NG

- Ignition coil failure.....Replace
- Spark unit.....Replace
- Pulse generator failure.....Replace
- Tappet clearance.....Adjust
- Valve timing.....Adjust
- Valve compression leak.....Repair/replace


RPM DOES NOT DECREASE FAST
• Free movement of a throttle grop: 2-6mm
• Wiring
• Ignition timing
• Insufficient compression
• Leak from carburettor insulator
Inspect/Adjust the returning of the bistarter valve
Inspect Carburettor
NG
OK
NG
• Choke cable setting failure.....Adjust
• Jucntion part failure.....Adjust/Replace
• Bistarter valve nut failure.....Adust/Replace
• Return spring failure.....Replace
• Bistarter vavle displacement....Adjust
• Stiff movement of throttle shaft.Adjust/replace
• Throttle valve failure.....Replace
• Return spring failure.....Replace
Synchronizing Inspection
NG
Difference more than 40mm Hg between the cylinders
Adjust Synchro
OK
Turn the pilot screw for 1 or 2 revs to both direction and confirm the rpm changes (50-100rpm)
NG
OK
DISASSEMBLE & INSPECT THE CARBURETTOR
• Slow system path jammed.....Clean
• Improper installation of the pilot screw . Adjust/replace
• Carbon on a throttle bore Clean the fuel tubes
Pilot Screw Adjustment
Still N/G
NG
• Spark unit failure.....Replace
• Pulse generator failure.....Replace
• Tappet clearance.....Adjust
• Valve timing.....Adjust
• Valve compression leak.....Repair/replace


HIGH RPM UNSTABLE (After warm-up)
• Spark plug, plug cap leak
• Spark unit failure
• Insufficient compression
• Spark performance (ignition coi, spark unit, pulse generator
• Leak from carburettor insulator
• Fuel tank (fuel tank, cap hole, automatic cock)
• Air cleaner (duct, element)
• Carburettor air vent jam/disconnected
Remove the drain screw in a float chamber and inspect for water leak.
CAUTION: Flammable
Apply a tray of fuel
NG
OK
• Fuel Tank .....Clean
• Fuel tank cap and surroundings .....Adjust/replace
• Air cleaner assembly .....Adjust/replace
Disassemble and Inspect the carburettor
• Vacuum piston assembly
• Main jet, air jet
• Float
NG
OK
• Jet needle holder disconnected .....Adjust
• Piston movement failure.....Adjust/replace
• Diaphram damaged.....Replace
• Main jet loose/missing.....Adjust
• Main air jammed.....Clean
• Float movement failure.....Adjust/replace
• Oil level inadequate.....Replace
• Float valve, valve seat failure.....Adjust
• Inspect a battery .....Replace
• Slip of Clutch.....Adjust/replace
• tappet clearance.....Adjust
• Valve timing.....Adjust


CARBURETTOR OVERFLOW
(Fuel flows into the engine while running)
WHEN OVERFLOW OCCURS:-
• Idling wont last long
• Some cylinders have no combustion
• Difficult to start
• Rough running
• Bad fuel consumption
• Increase in engine oil consumption
IT CAN BE CONSIDERED AS OVERFLOW IF:-
• The spark plug is extremely foul, compared with the other cylinders
• Fuel comes out from the jet by removing the carburettor from the engine and connecting the fuel tubes
Disassemble/Inspect the carburettor
• Valve sheet, float valve
• Float
NG
OK
• Carbon on a valve seat.....Clean
• Corrosion/damage on a valve sheet.....Replace
• Float valve damaged, worn out, unbalanced contact ....Replace
• Float movement failure.....Adjust/replace
• Oil levl to high.....Adjust
• Float damaged.....Replace
• Fuel Tank.....Clean
• Fuel strainer dirt/jammed.....Clean
• Fuel strainer damaged.....Replace

Service schedule	2 – 1	Drive system	2 – 8
Steering system	2 – 4	Electrical system	2 – 10
Braking system	2 – 4	Powerplant	2 – 11
Driving system	2 – 6	Lubrication	2 – 16
Shock absorbing system	2 - 6	Others	2 - 19

Service Schedule

(Notes): 1. Service items include high speed operation items.
2. (●) indicates mandatory inspection. (❍) indicates the manufacturers recommendation.
3. (✯) indicates scheduled replacement of security parts. However, the schedule may be adjusted accordingly to the vehicle's operating environment.
4. "High speed operation" is defined as the operation at or above 80kph.

Items			Schedule				Notes
			Regular	1 month or 1000km	Private: Every 6 months	Private: Every 12	
Steering system	Handlebar	Free play and attachment				●	
		Smoothness				●	
	Wheel	Steering angle				●	
	Fork	Damage			●	●	
		Fork spindle attachment			●	●	Steering stem
		Fork spindle bearing looseness				●	Steering stem
Brake System	Brake pedal	Clearance between the floor and fully depressed pedal and free play.			●	●	Free play: Front brake (lever) at lever end: 20-30mm Rear brake (pedal): 20-30mm
		Free play and movement	●				
		Braking performance		❍	●	●	
	Rod & cables	Looseness, damage		❍		●	
	Hose & pipe	Leak, damage, attachment		❍	●	●	
		Brake hose replacement					✯ every four years
	Reservoir	Quantity	●		●	●	Reservoir fluid level: Front: at or above minimum line Rear: between minimum and maximum
	Cylinders & calipers	Function, wear and damage				●	
		Master cylinder and wheel cylinder cups, dust seal and disc caliper rubber parts replacement					✯ bi-annual
	Drum & shoe	Drum lining clearance			●	●	
		Shoe contact area and lining wear				●	Indicator
		Drum wear and damage				●	Standard: 140mm Service limit: 141mm
	Pad & disc	Disc – pad clearance				●	
		Pad wear			❍	●	Indicator
		Disc wear and damage				●	Standard thickness: 4.0mm Service limit: 3.5mm
	Fluid	Brake fluid change					

Items			Schedule				Notes
			Regular	1 month or 1000km	Private: Every 6 months	Private: Every 12 months	
Drive System	Wheel	Tyre pressure	●		●	●	(unit: kg/cm²) Front: Rear One person – Normal: 2.00 / 2.25 One person – High speed: 2.00 / 2.25 Two people – Normal: 2.00 / 2.25 Tyre specification: 100/80 -17 52H / 130/70 -17 52H
		Tyre crack, damage	●		●	●	
		Tyre tread and unusual wear	●		●	●	Tread depth ≦ 0.8mm front, rear
		Any debris on tyres	●		●	●	
		Wheel nuts and wheel bolts tightness			●	●	Axle nuts / holders: Front axle holder torque: 1.8-2.5kg-m Front axle torque: 5.5-6.5kg-m Rear axle nut torque: 8.0-10.0kg-m
		Rim, side ring, and wheel disc damage		○		●	Wheel rim runout at rim edge. Front: Axial 2.0mm or less Radial 2.0mm or less Rear: Axial 2.0mm or less Radial 2.0mm or less
		Front wheel bearing looseness				●	
		Rear wheel bearing looseness				●	
Shock absorbing system	Chassis spring	Damage				●	Cushion spring
	Suspension arm	Joint looseness and arm damage				●	
	Shock absorber	Oil leak and damage				●	Air – contained cushion (unit: kg/cm²) Front: Air pressure 0 – 0.4
		Attachment looseness				●	
Transmission	Clutch	Lever free play			●	●	Clutch lever free play: 10 – 20mm
		Clutch function		○	●	●	
	Transmission	Leak and fluid level			●	●	Dipstick between min-max lines
		Control looseness				●	
	[illegible]	Chain slack		○	●	●	Mid point between two sprockets, Sidestand is used 15-25mm

		Sprocket installation / wear				●	

Items			Schedule				Notes
			Regular	1 month or 1000km	Private		
					Every 6 months	Every 12 months	
Electrical system	Ignition	Spark plug status			●	●	Plug gap: 0.8 – 0.9mm
	Battery	Terminal connection				●	
	Wiring	Connection and damage				●	
Powerplant	Main component	Starting and noise			●	●	
		Low speed and acceleration		❍	●	●	Idling rpm: 1,500 ± 100 rpm
		Exhaust			●	●	
		Air filter element replacement					Every 20,000km
		Valve clearance		❍		●	Intake: 0.13 - 0.19mm) when Exhaust: 0.20 - 0.26mm) cooled
	Lubrication System	Oil contamination and level			●	●	Dipstick between min-max levels
		Oil leak			●	●	
		Oil quantity (level)	●				
		Oil change		❍			Initial: 1,000km 6,000km after initial change
		Oil filter change					Initial: 1,000km 12,000km after initial change
	Fuel System	Fuel leak			●	●	
		Carburettor linkage system				●	
		Throttle valve / choke valve status				●	
		Fuel filter				●	
		Fuel level	●				
		Fuel hose change					Every four years
	Cooling System	Coolant level	●		●	●	Reservoir should be between min-max lines
		Coolant leak	●			●	
		Radiator cap function				●	0.75-1.05kg/cm² valve opening pressure
		Coolant change					Bi-annual

Steering System

- Steering fork

Lift the front wheel. Check for smooth movement by turning the handle bars left and right.

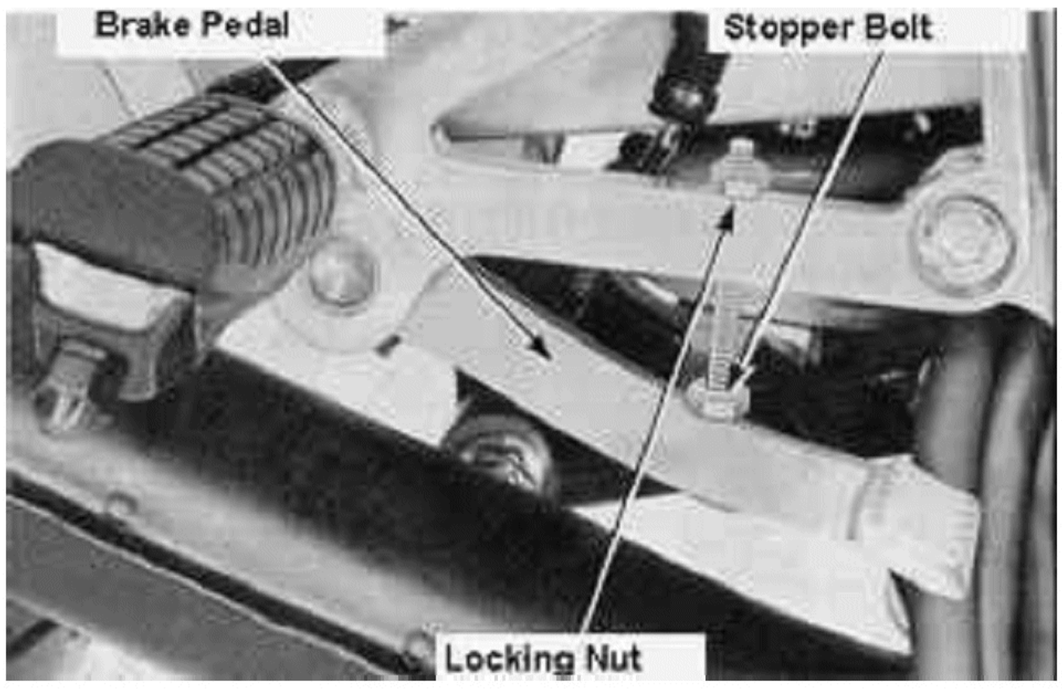
Inspect the steering head bearing if resistance was found. Replace the bearing as required (13-26). Adjust the steering adjust nut (13-29). Confirm no obstruction on wires and cables.

Brake System

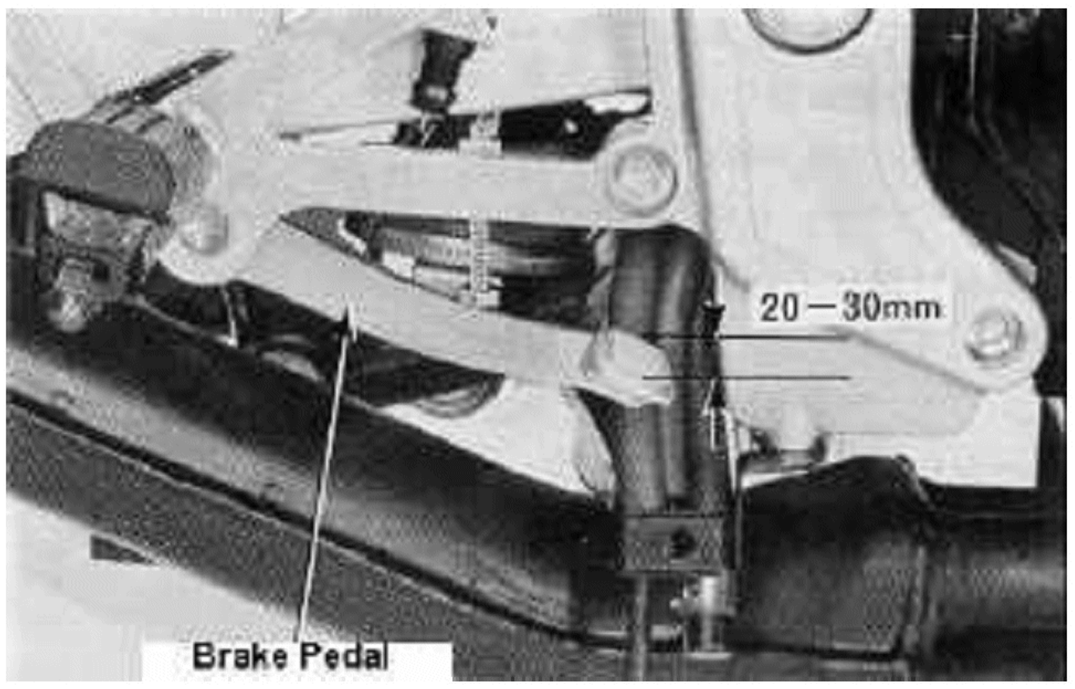
- Brake pedal.

[Height adjustment]

- Adjust the height by loosening a locking nut and rotating the stopper bolt.
- Tighten the locking nut.
- After the adjustment confirm the function of rear stoplight switch and adjust as required (2-19).

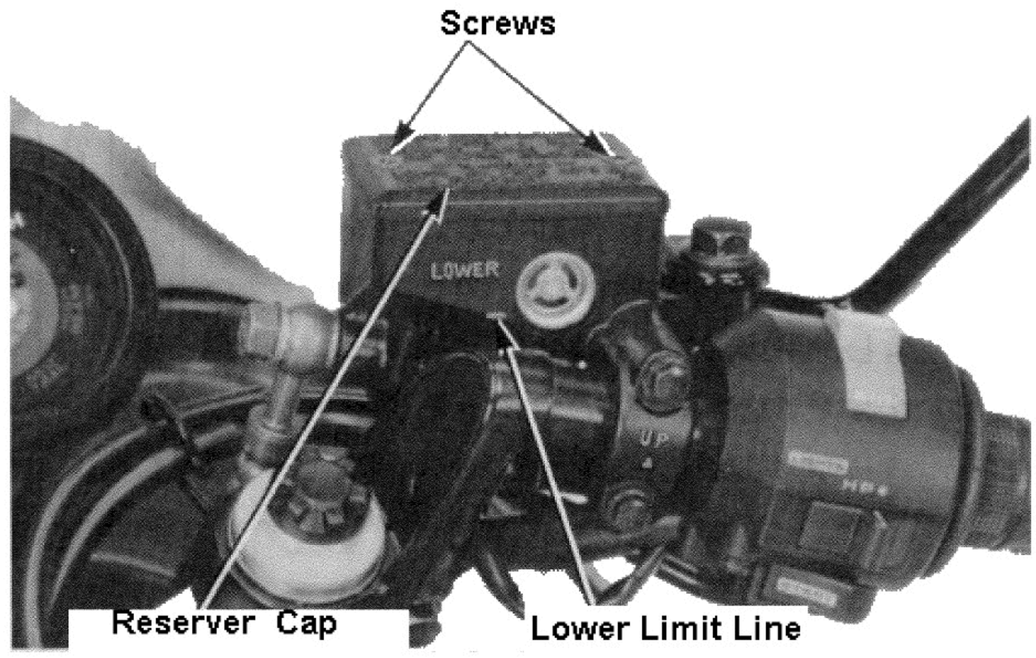


- Inspect the free movement of a brake pedal (20~30mm).



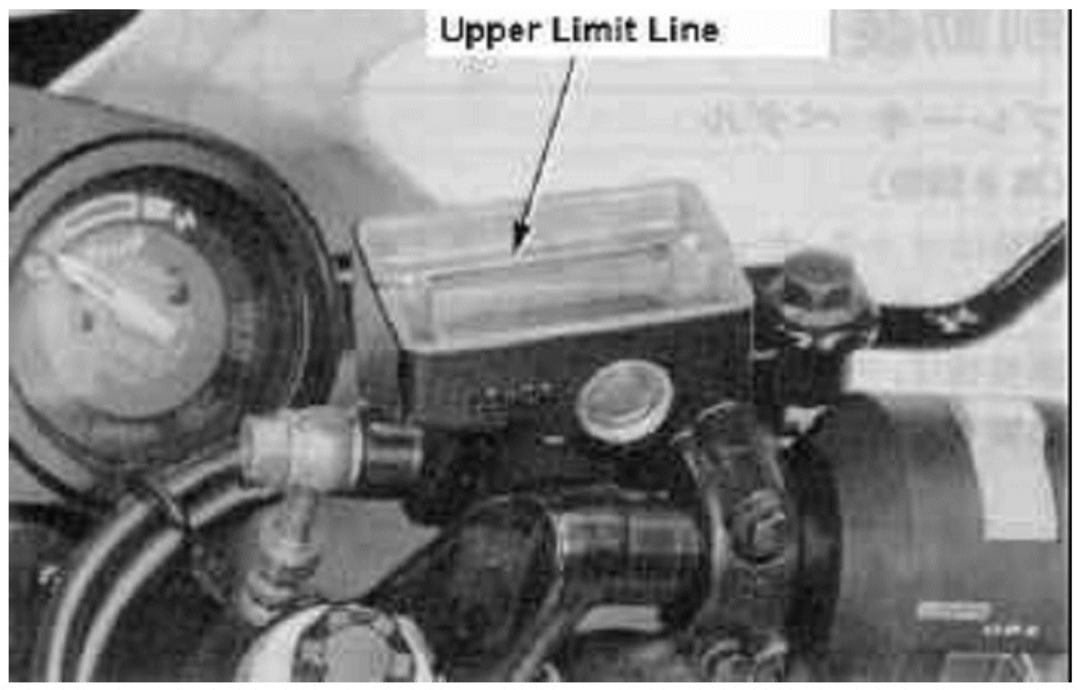
Brake Lever

Operate the front brake lever and inspect its operation for air in the system.
If air is suspected to exist, drain the air (15-3).



(Brake Fluid)

- Check the quantity of the brake fluid. If the fluid level is low, inspect for any leaks. Remove the two screws on the reservoir cap and refill with DOT3 or DOT 4 standard brake fluid till the upper limit is reached.



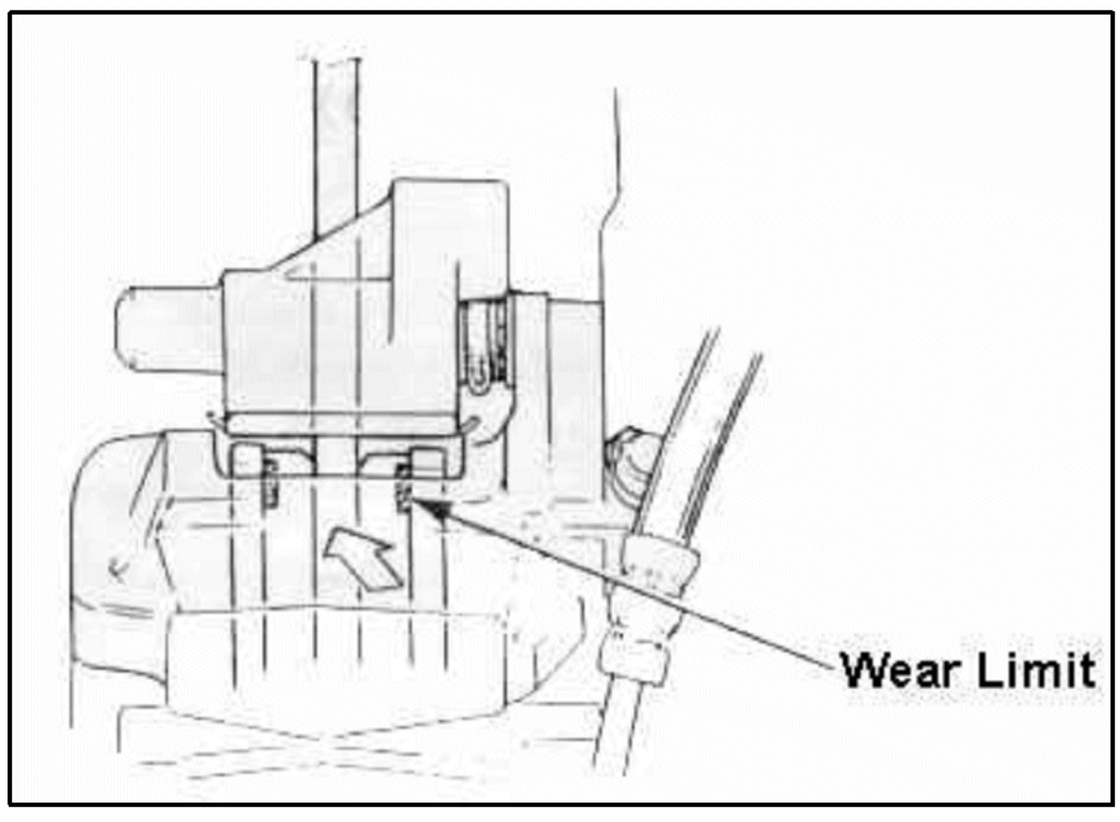
- Do not mix different suppliers' fluids to avoid chemical reaction.
- Make sure no water or debris go in when refilling.
- The fluid may damage the paint, plastic and rubber surface.

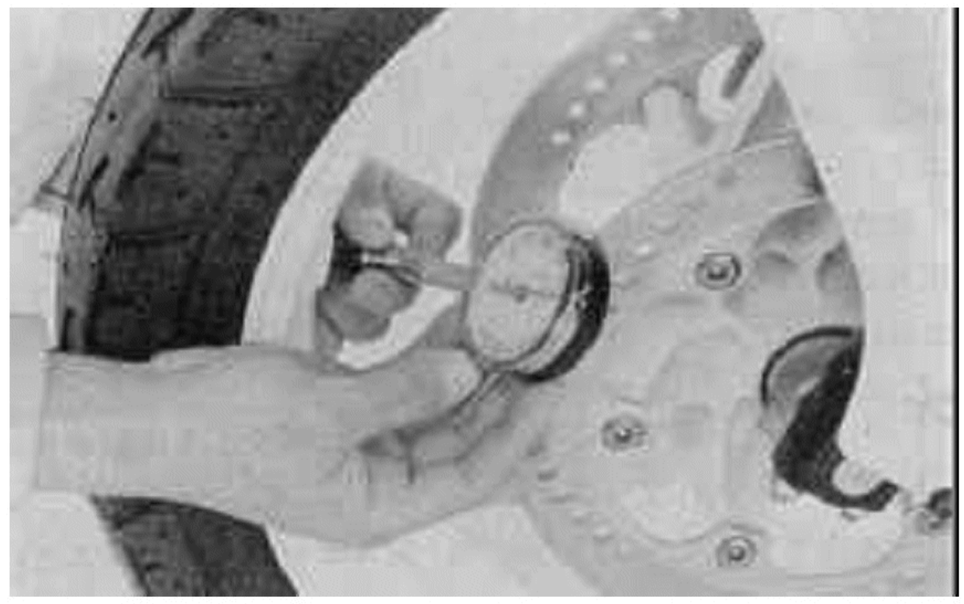
Brake disk/pad.

Hold the brake lever to its limit and inspect inner/outer brake pads. Inspect the wear from the direction shown in the figure. If they were worn out to the limit mark, replace them (15-4).

Replace pads in a set.

Inspect the brake disk contact surface for abnormal wear or damage.





Wheels

- Measure the tyre air pressure.

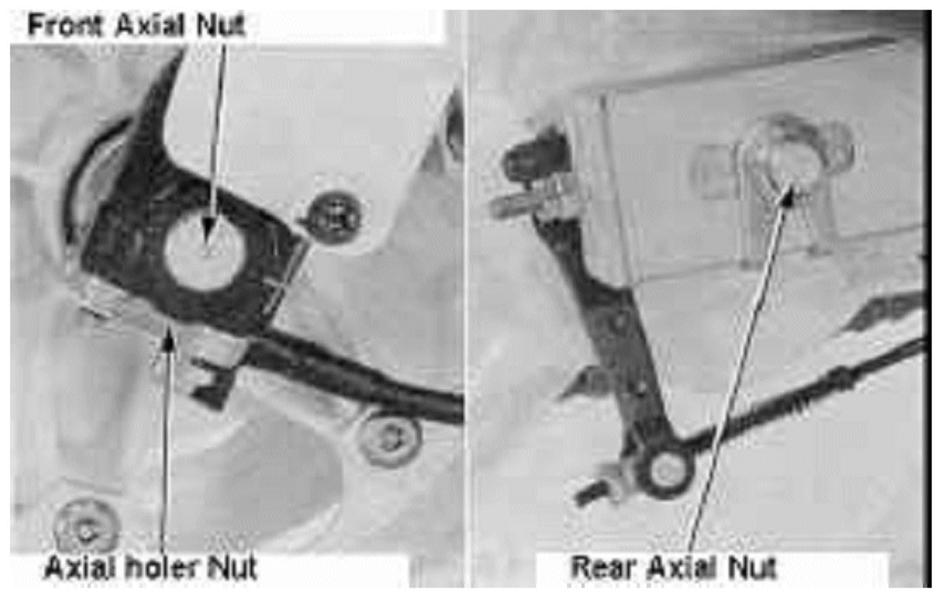
Measure when the tyres are cold.

Tyre air pressure:

		Front kpa	Rear kpa
	Normal	2.00	2.25
One person	High speed	2.00	2.25
Two people	Normal	2.00	2.50
Tyre specification		100/80-1752H	130/70-1762H

- Wheel nuts and wheel bolts.

Inspect the tightness of wheel axial nut, axial holder nut on the front wheel and rear axial nut. Tighten as required.

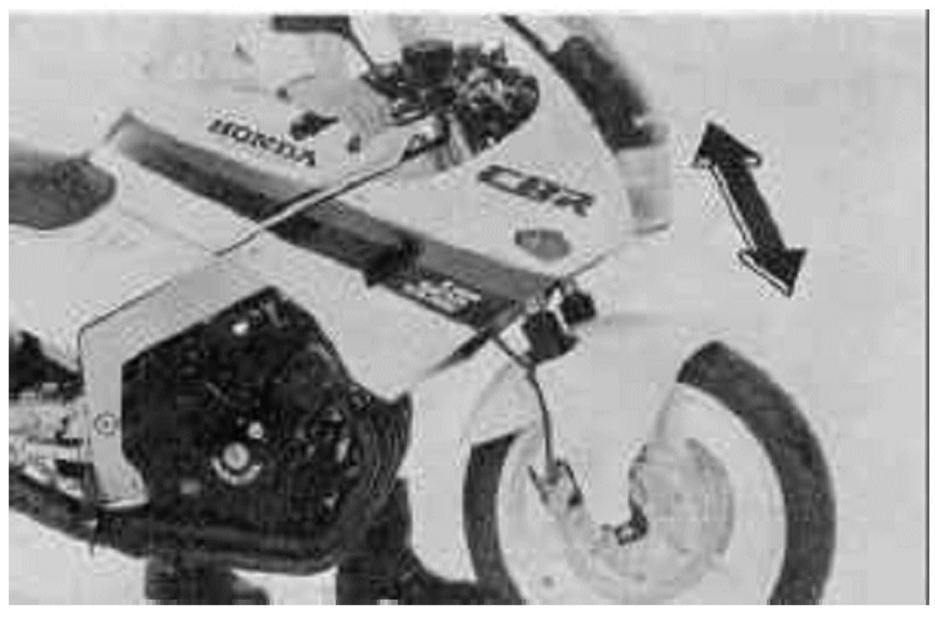


Tightening torques:

Front axial: 5.5 ~ 6.5 kg.m
Axial holder nut: 1.8 ~ 2.5 kg.m
Rear axial nut: 8.0 ~ 10.0 kg.m

- Rim and wheel disk damage

Inspect corrosion of front/rear rims /misalignment of wheels (13-10,14-3)

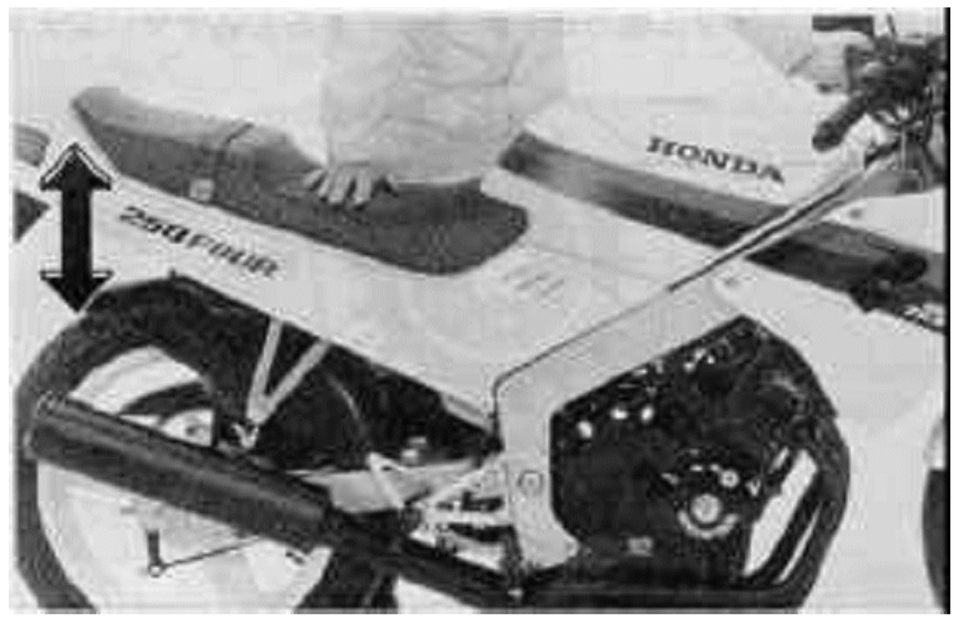


Dampers

- Oil leak, damage apply a front brake and compress the front cushion for several times and check it's operation.

Inspect the front fork for oil leak, damage and loose parts.

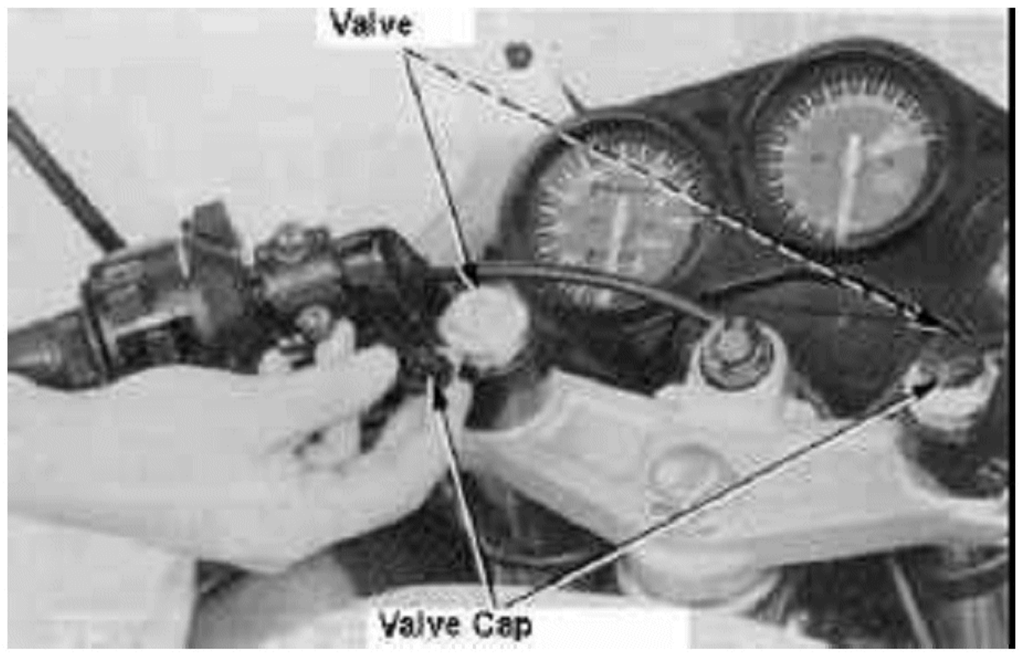
Compress the rear cushion for several times and check its movement.
Inspect the rear cushion for oil leak, damage and loose parts.



Lift the rear wheel, push the wheel to left and right, inspect the rattling of rear fork pivot bearing. Inspect the bearing if there is any rattling and replace it as required.

Front fork air pressure.

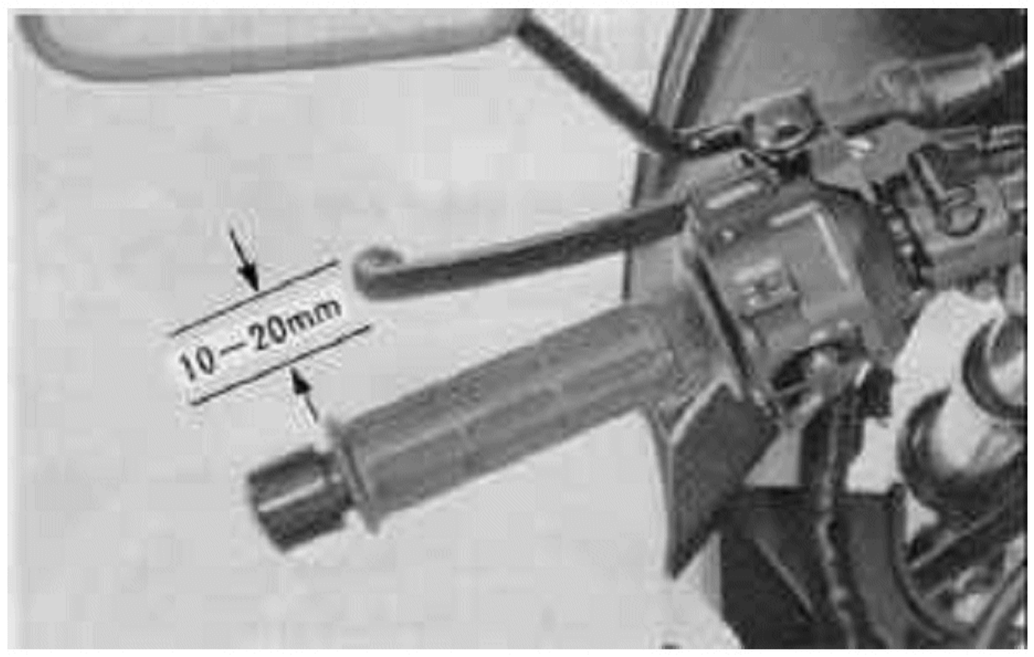
Support the frame and lift the front wheel.
Remove the valve cap.
Measure the air pressure with an air pressure gauge.



Max Air pressure : 0.4 kpa

In order to adjust the air pressure, increase the pressure by manual pump and gradually drain the air and adjust to the same pressure on both sides.

- When adjusting the air pressure, increase the pressure gradually.

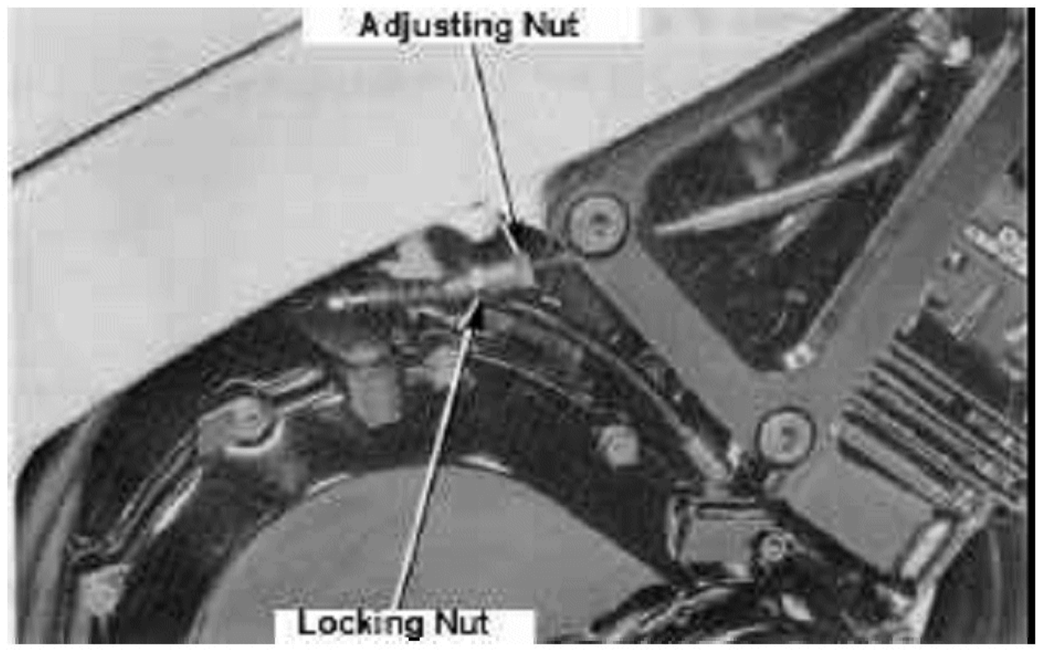


Transmission

Clutch.
Inspect the free movement of clutch lever.

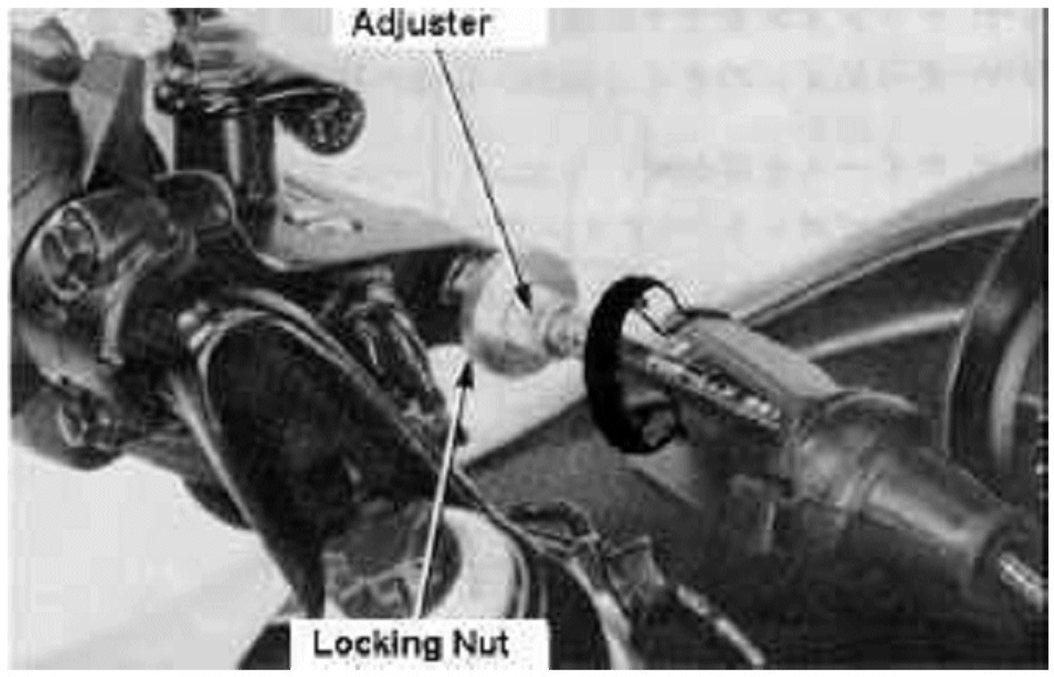
10 ~ 20 mm.

Major adjustment can be done by loosening the locking nut and rotating the adjusting nut.

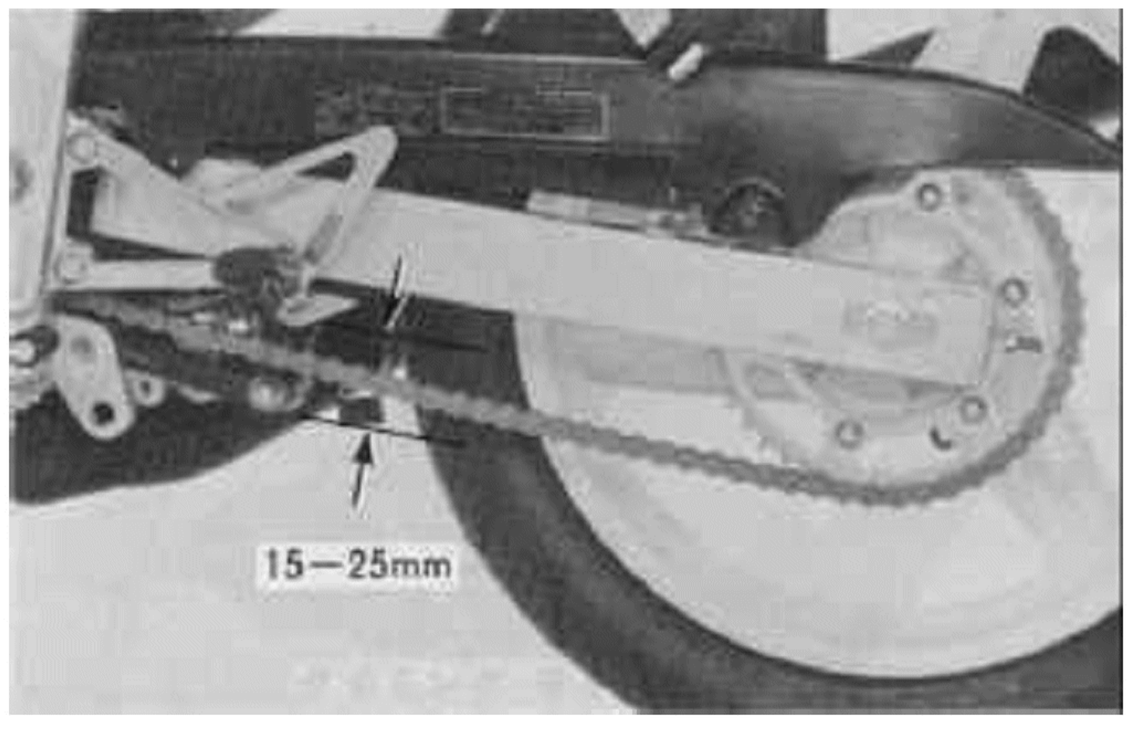


Precise adjustment can be done by loosening the locking nut on the handle side and rotating the adjuster.

Do not expose the threaded part of the adjuster for more than 8mm.



Chain and Sprocket



Never inspect/adjust the drive chain while the engine is running.

Replace the chain, chain roller and pin as required.

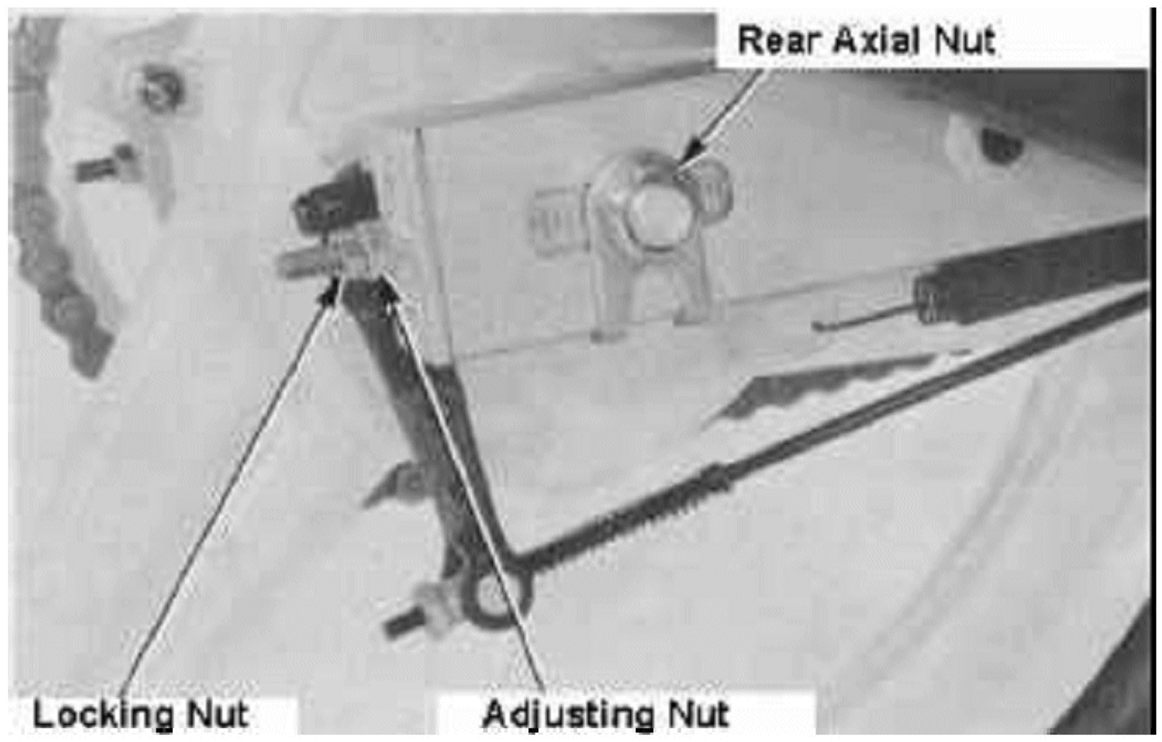
- Loose drive chain.

Set the gear to neutral and apply a side stand. Inspect the tension of the chain at the mid point from sprockets on the lower side.

Max. amplitude : 15~25mm (with side stand)

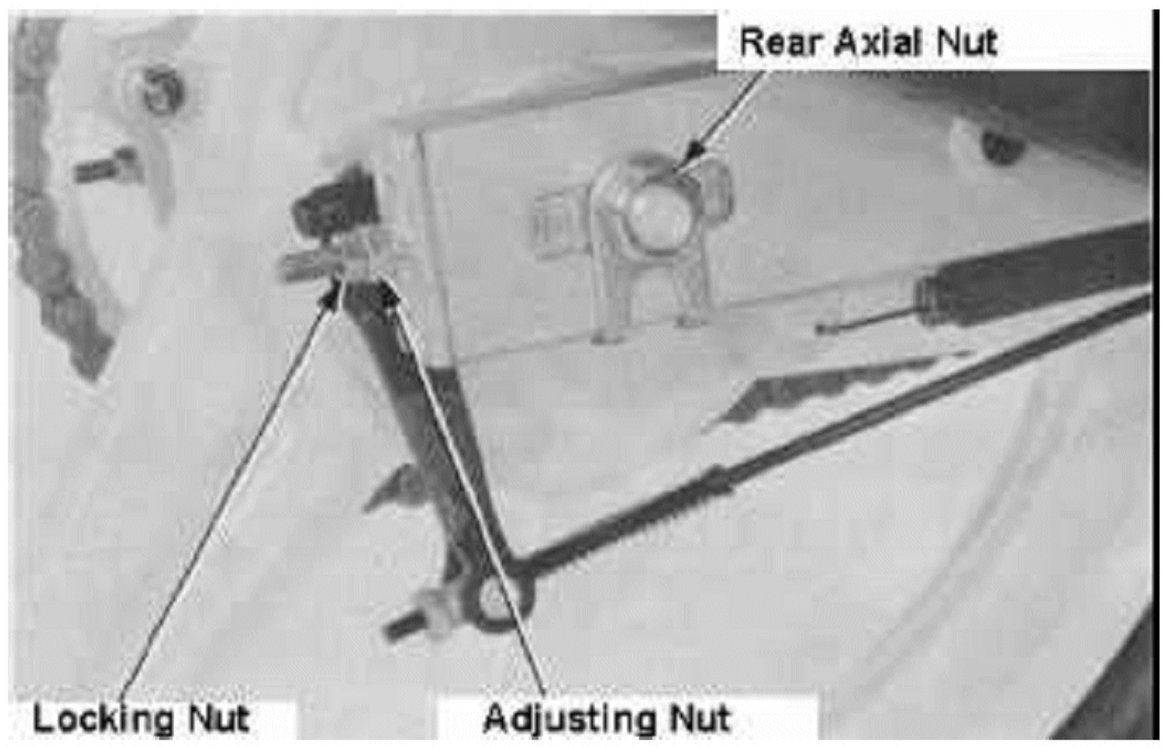
Adjustment

1. Loosen the axial nut.
2. Loosen the locking nut and rotate the adjusting nut.



- Always align the arrow in a chain adjuster to the scales on both sides.
- If the arrow of a chain adjuster behind the axial shaft is aligned with the red zone of the rear fork, replace the drive chain.

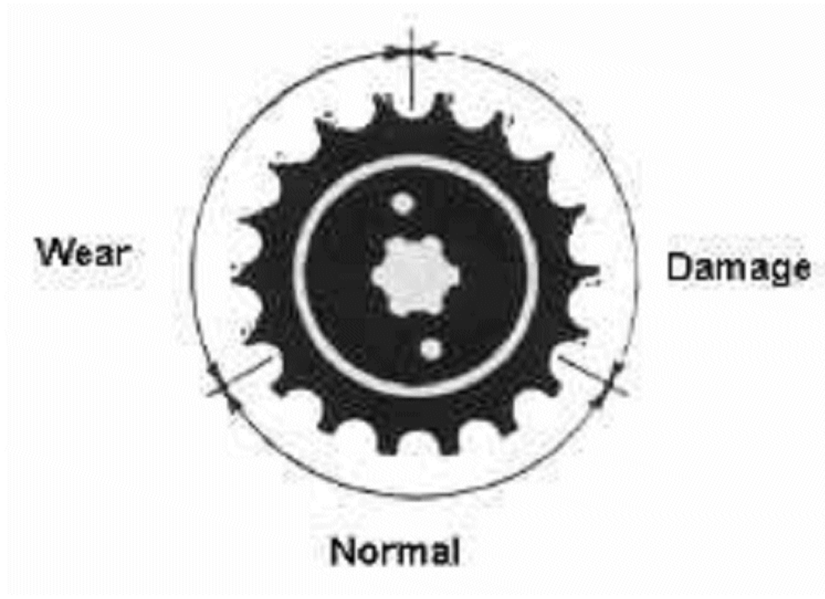
Tighten the axial nut. Torque : 8.0~10.0 kgm.
Tighten the adjusting nut and a locking nut.
Apply SAE#90 oil on drive chain.



- Do not use steam washer, high pressure vehicle washer, or washing oil as they damage 0-rings.
- Do not use chain spray contains thinner to avoid damaging 0-rings.

- Installation and wear of sprockets.

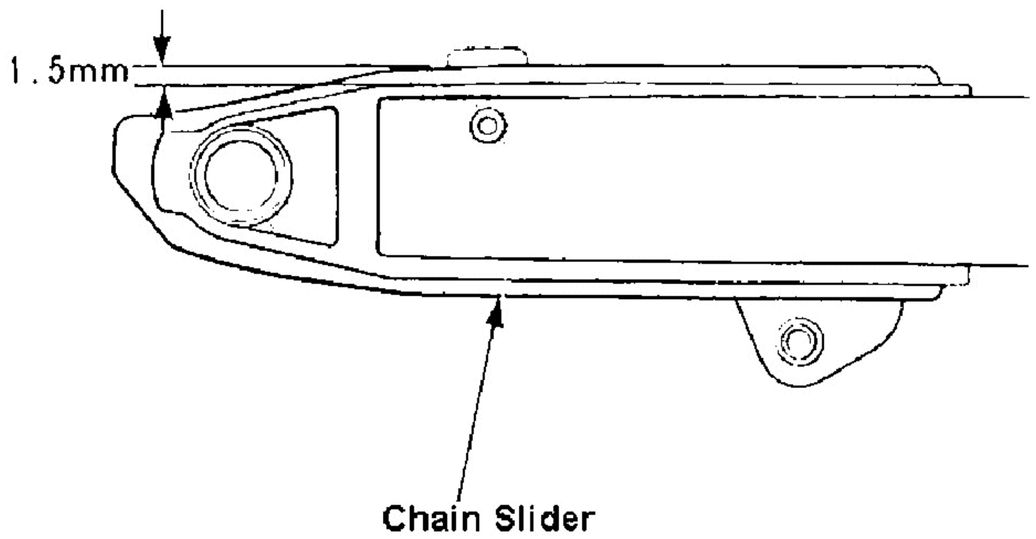
Inspect and replace the drive, driven sprockets as required.



Replace drive chain and both sprockets at a same time.

- Wear of chain slider.

Inspect/replace the chain slider.



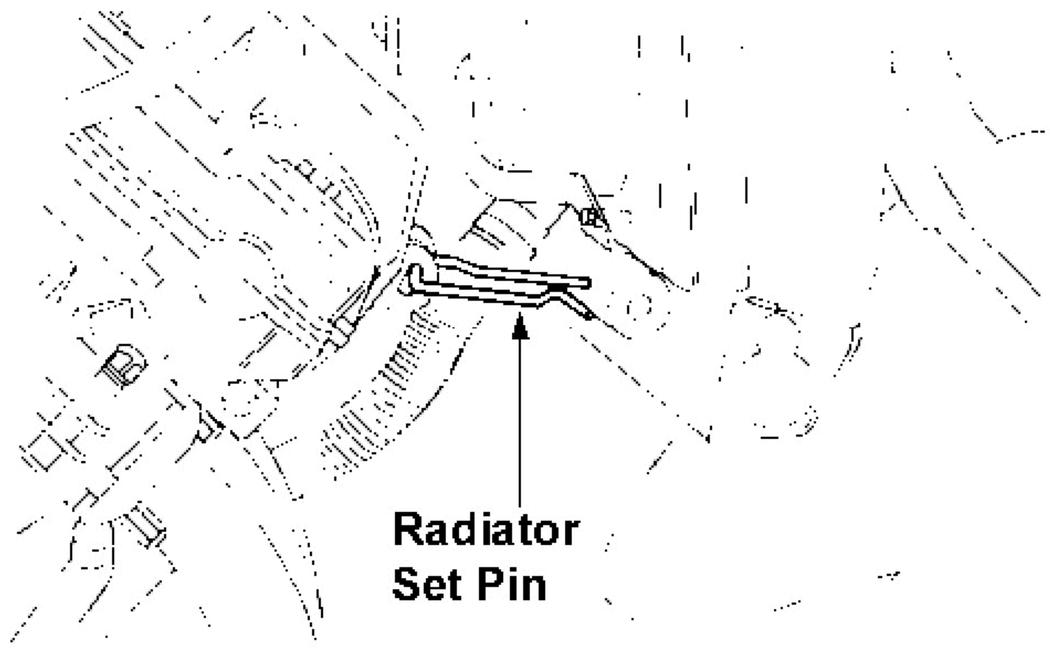
The contact of the chain and the rear fork may cause damage/wear out of rear fork and chain. Replace frequently.

Inspect wear/damage of the chain slider.
Replace if it is less than 1.5mm.

Electrical System

Ignition system.

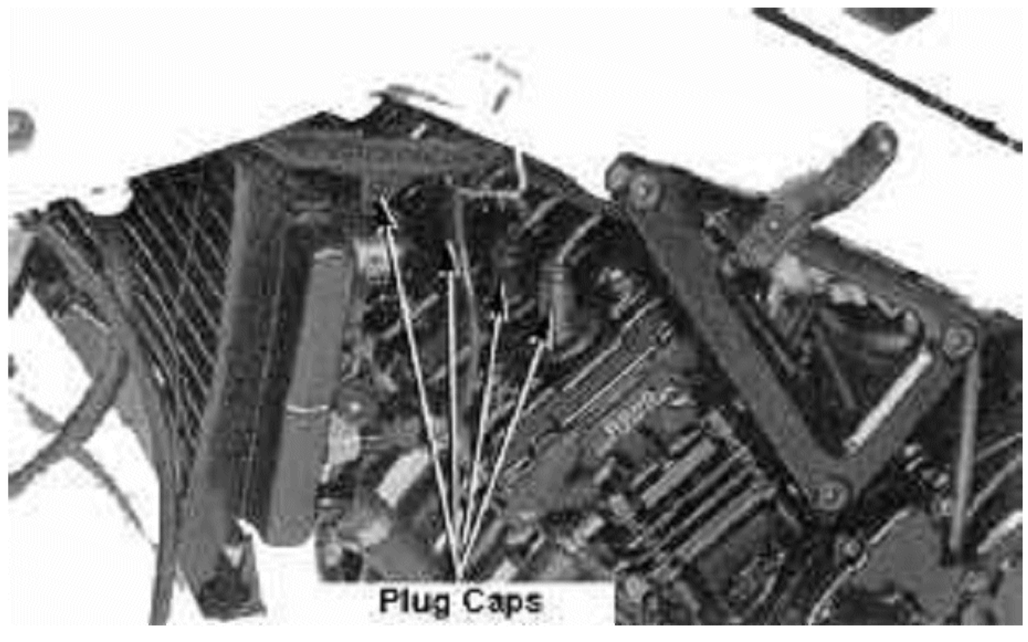
Remove a radiator set pin and swing the radiator to the front.



It can easily be detached by pushing down the set pin head and the pulling the pin out.

By using the pin, fix the radiator on an opened position.

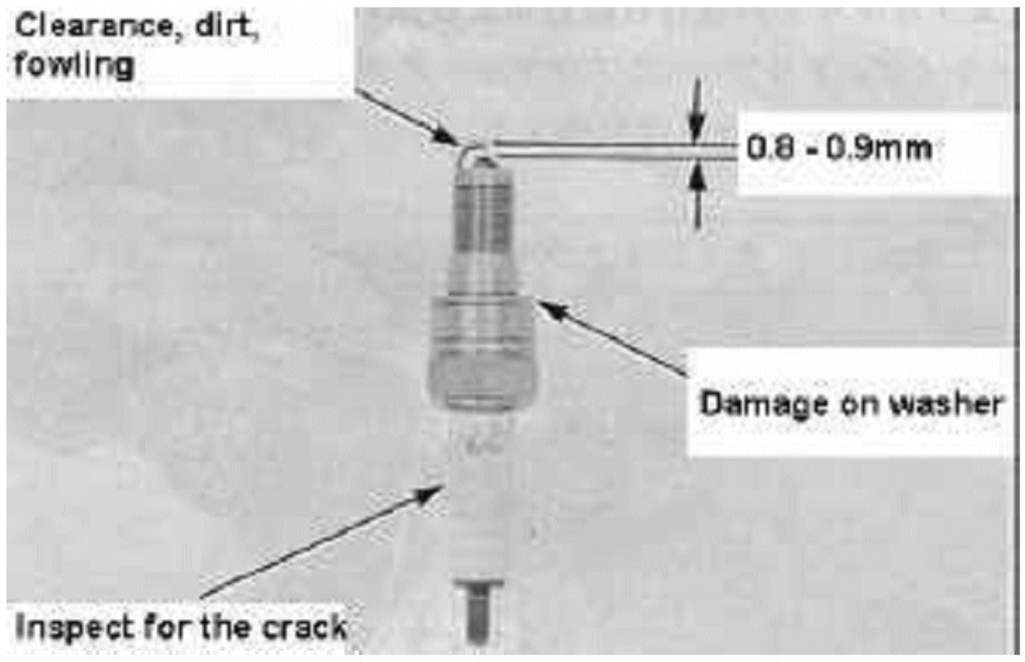
Remove plug caps.



Spark plugs.

Remove the plugs.
Inspect for damage, dirt on the plugs.
Clean the dirt with a plug cleaner or a wire brush.

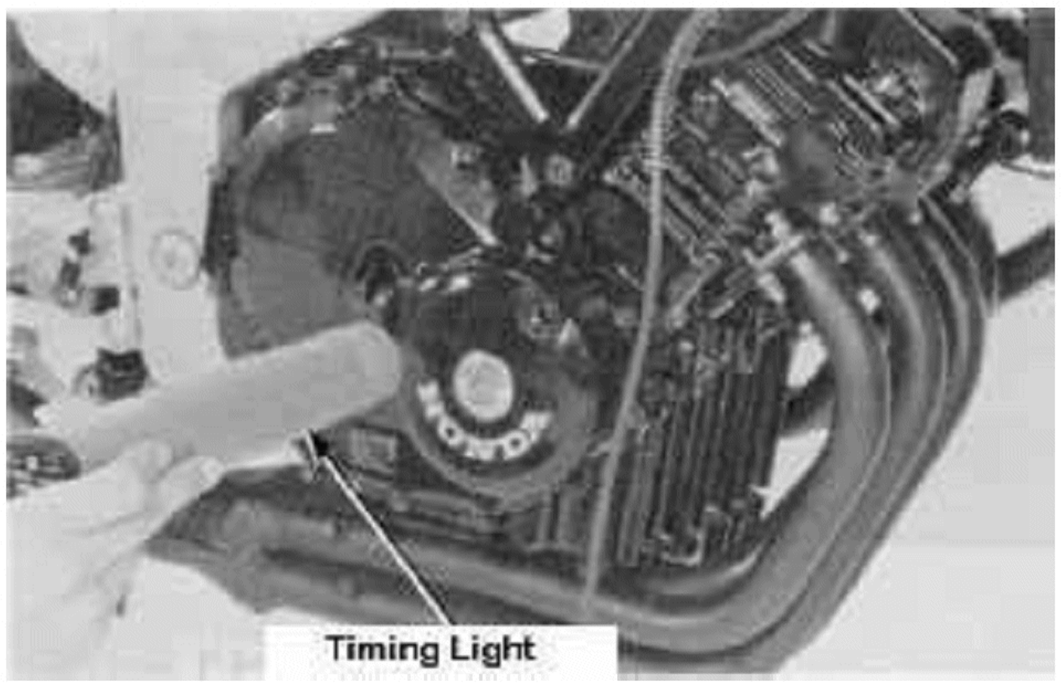
Nominated plugs: NGK:C8EH-9
C9EH-9
ND:U24FE9
U27FE9



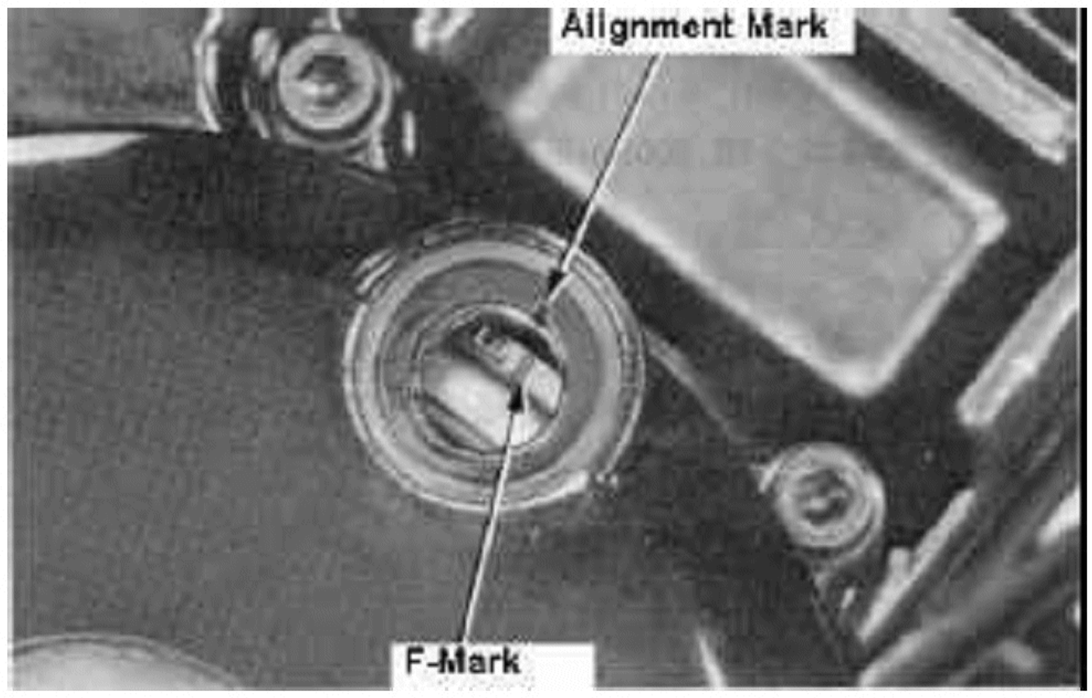
Set the plug clearance 0.8~0.9mm.
When tightening the plugs tighten with your fingers and then apply torque by using a plug wrench.

Torque:1.0~1.2kg/m

Ignition timing and adjustment is not required as we use transistor ignition system. If the ignition timing is inadequate, inspect/replace the spark unit, pulse generator.



Warm up the engine.
Remove timing hold cap.
Connect the timing light lead to the high tension lead for #1 cylinder.

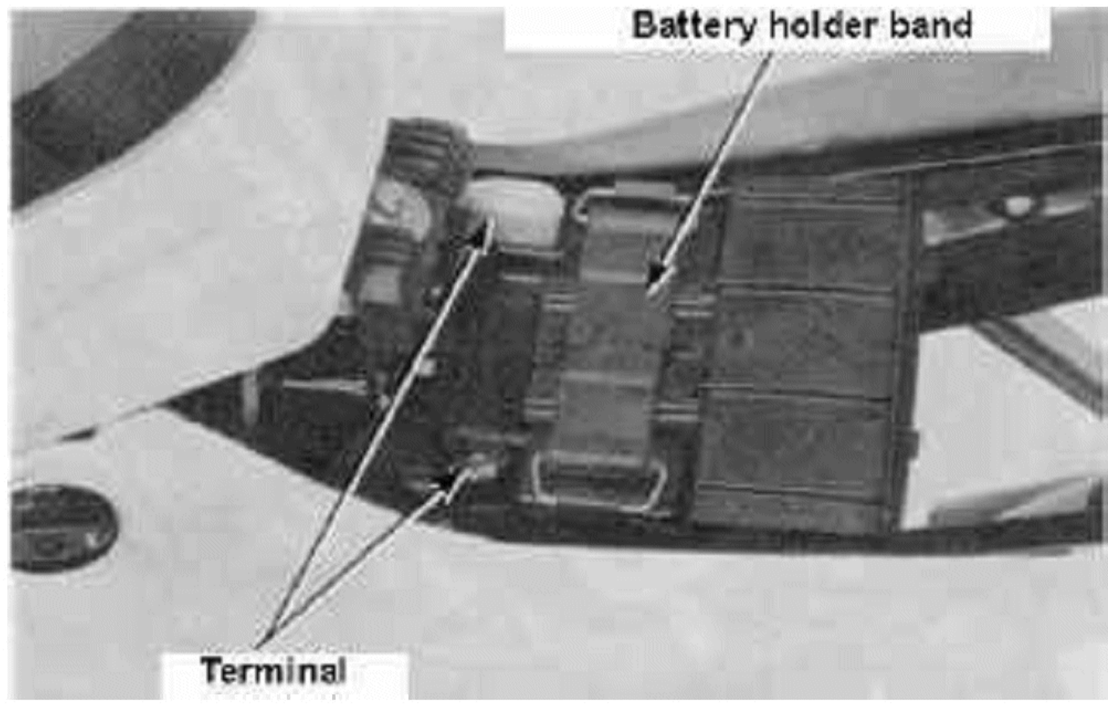


"F" should align on the mark at idling (1500 ± 100 rpm). "F" moves towards left as engine rpm increases.
Apply oil on 0-ring for a timing hole cap.

Battery

- Terminal connection

Remove a seat.
Confirm the battery is fixed with battery holder band.
Make sure the + and – cables are properly connected to the terminals.



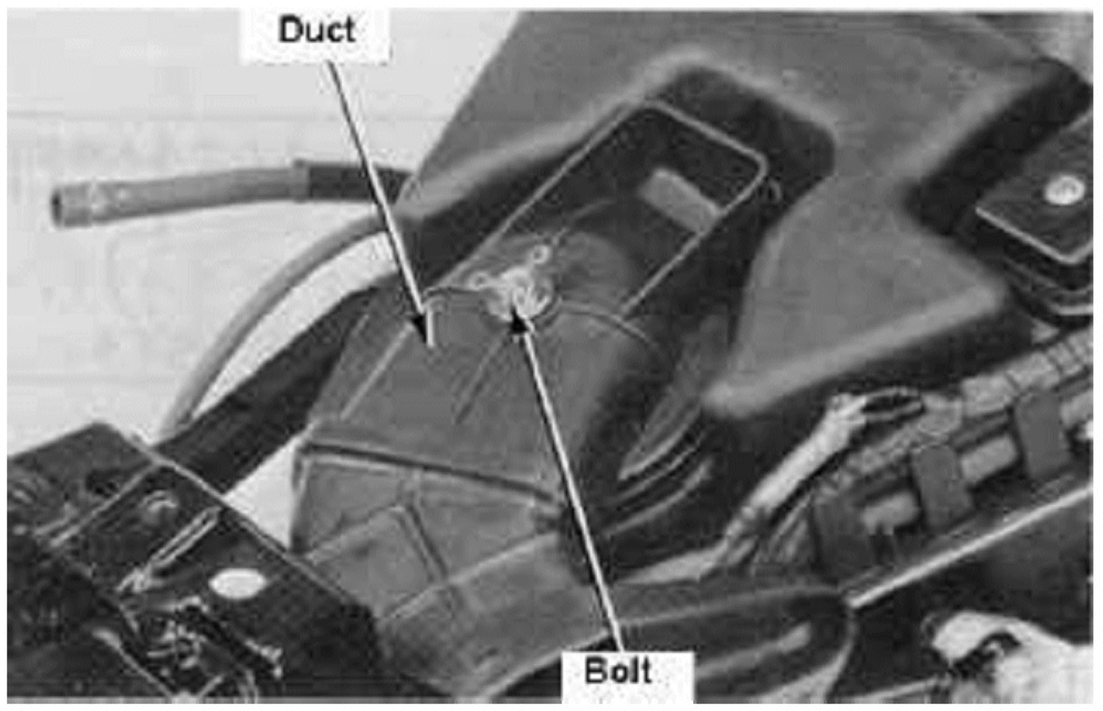
Powerplant

- Idling and acceleration.

- Adjust idling rpm after warming up.
- When carburettor is overhauled, idling adjustment should be done after the pilot screw adjustment (4-18).

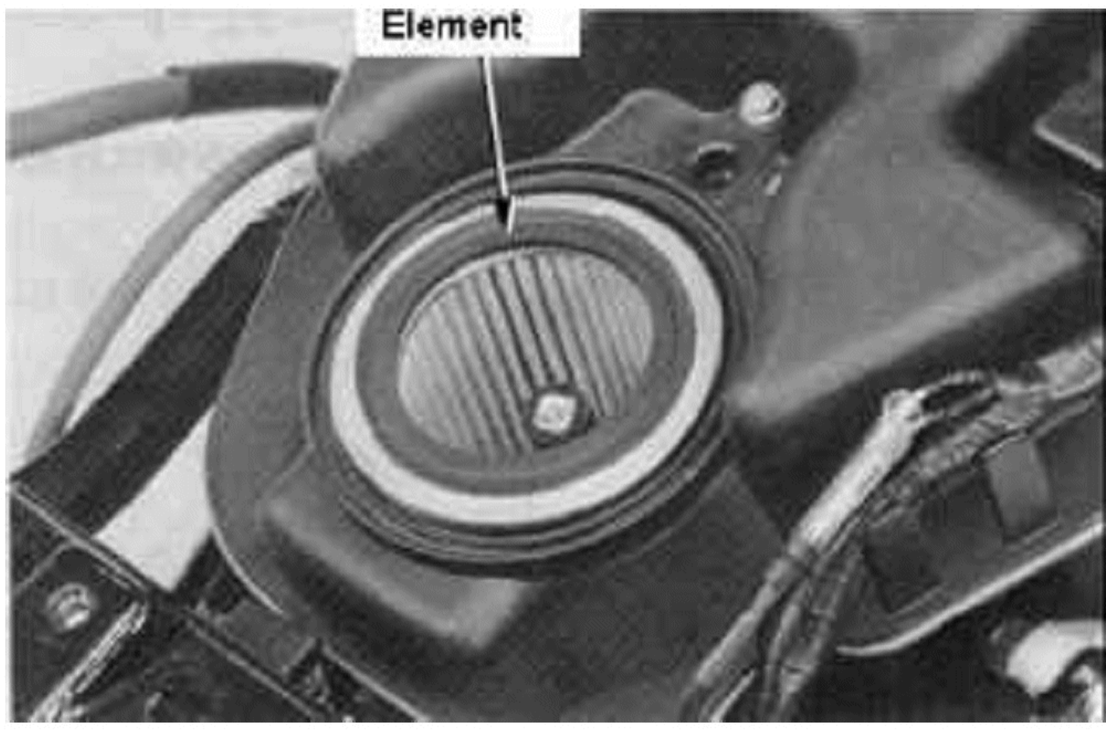
Set the neutral gear. By rotating the throttle stop screw, adjust the - Idling rpm (1500±100rpm).
If idling rpm is unstable or snaps, adjust the pilot screw (4-18).

(Replacement of an air cleaner).
Remove the fuel tank. (4-3).
Remove a bolt, then a duct.



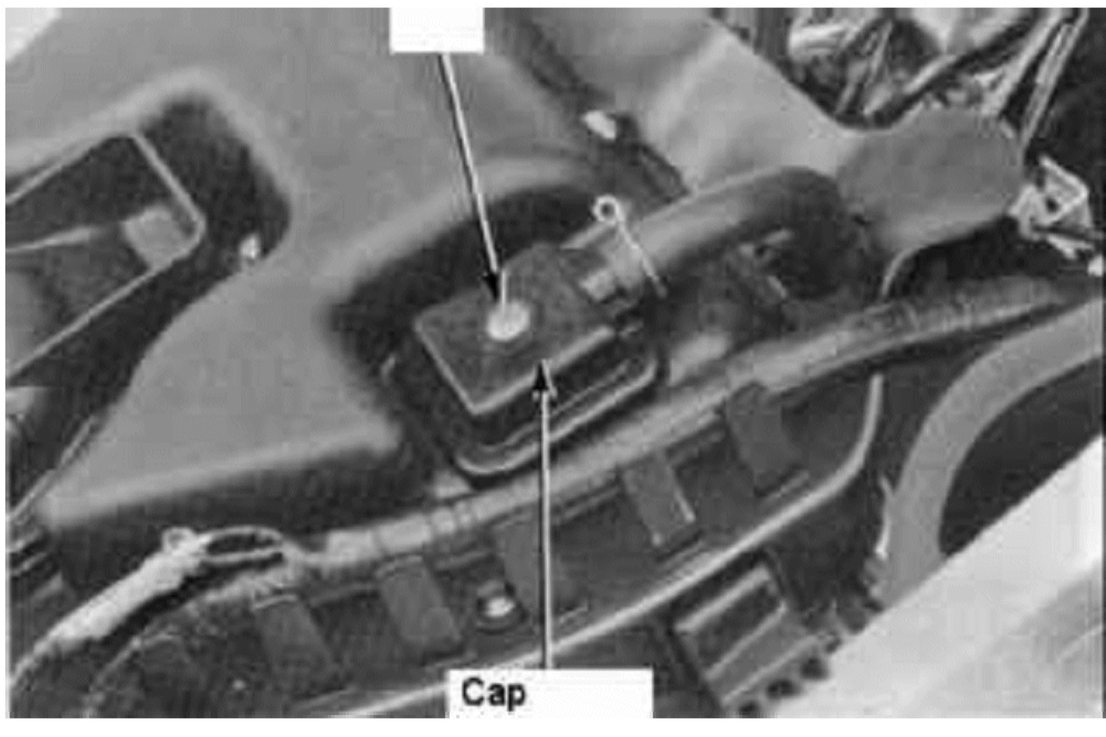
Inspect the element for dirt and damage.
If there are severe dirt/damages, replace with the new unit.
Recommended part change: every 20,000km.

- The filter paper in the element contains oil. (viscous type).
  Do not wipe or clean.
- If the vehicle is to be used in dusty conditions replace earlier than the period recommended.



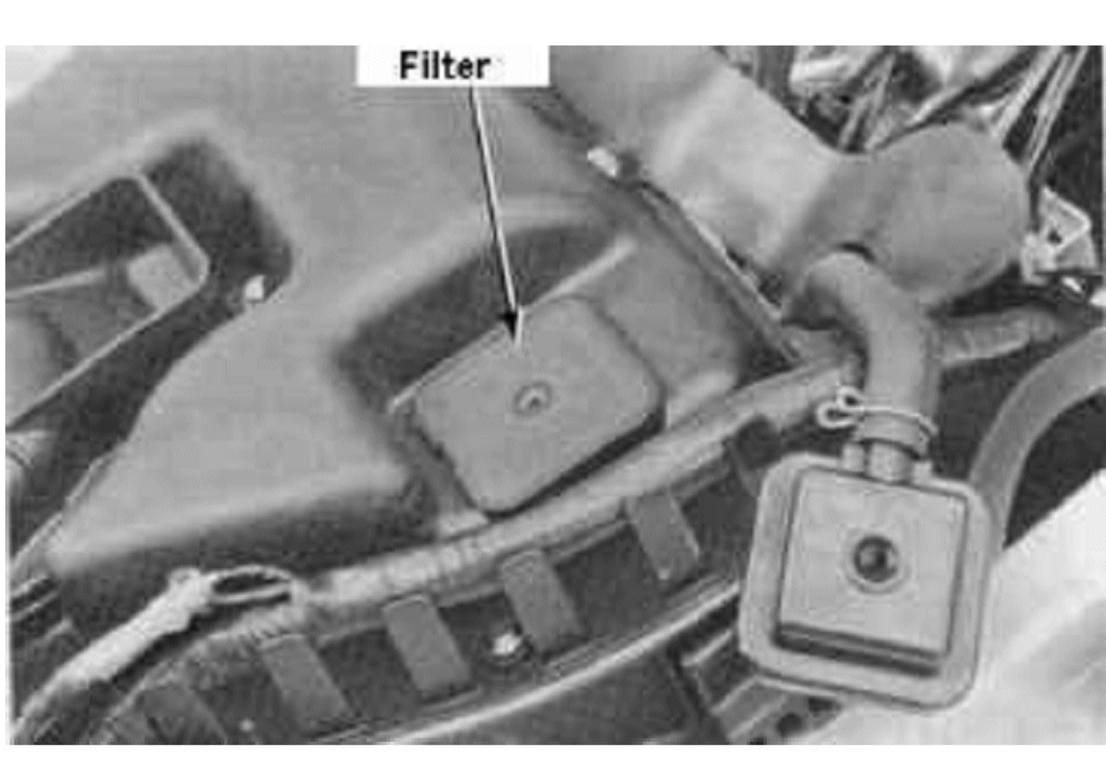
Reverse the above procedure for installation.

(Cleaning the sub air cleaner).
Remove the fuel tank. (4-3).
Remove the sub air cleaner cap.



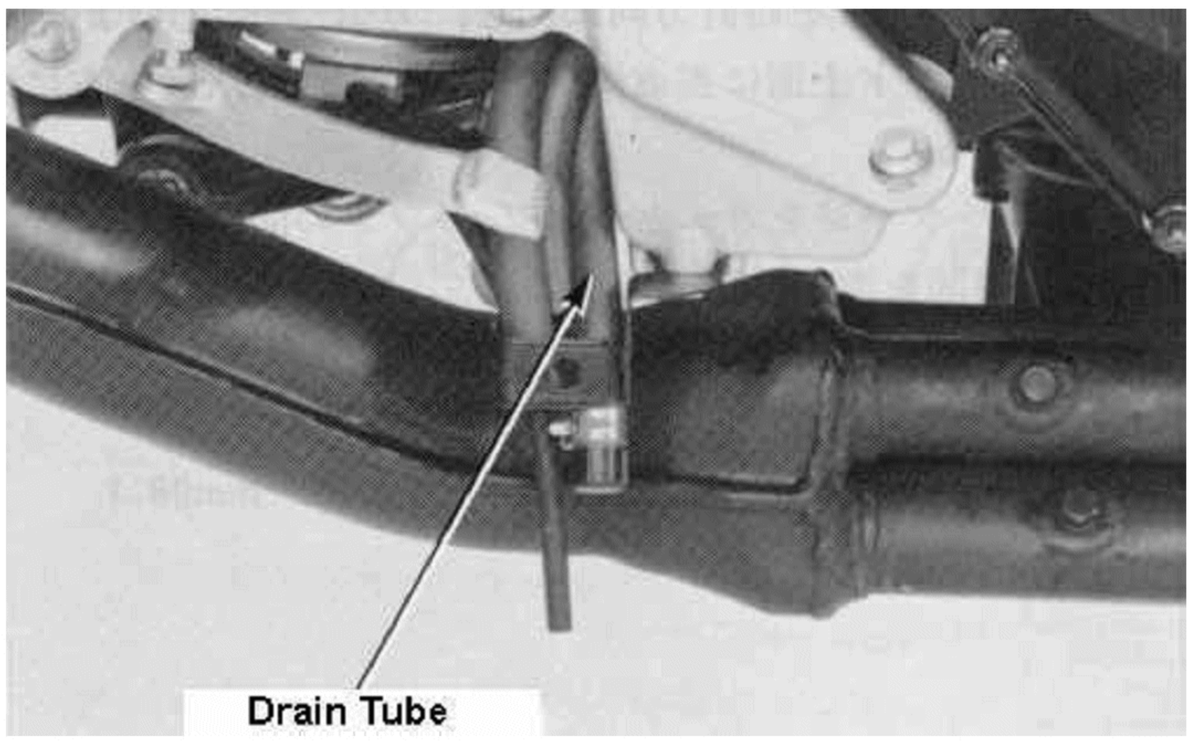
If the filter is jammed or dirty, clean by using washing oil and dry.
Attach the filter and tighten the bis.

Tightening torque : 0.5~0.8 kgm.



(Air cleaner drain tube)

Inspect the air cleaner drain tube for any damages.

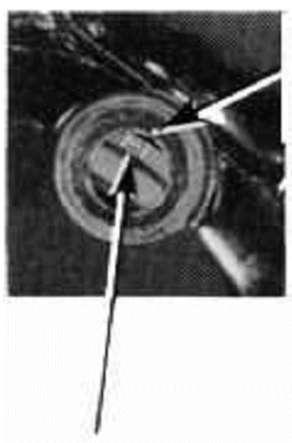

Drain Tube

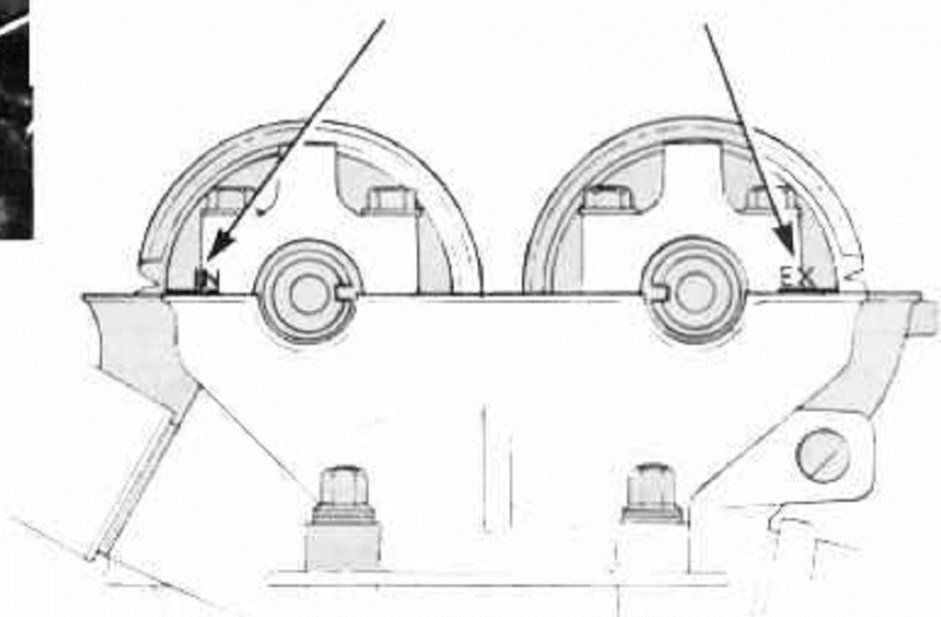
(Valve clearance)

- Inspection/Adjustment should be when the engine is cold (35^{O} C).
- Tilt the vehicle and let the remaining oil return to the crank case from cylinder heads.

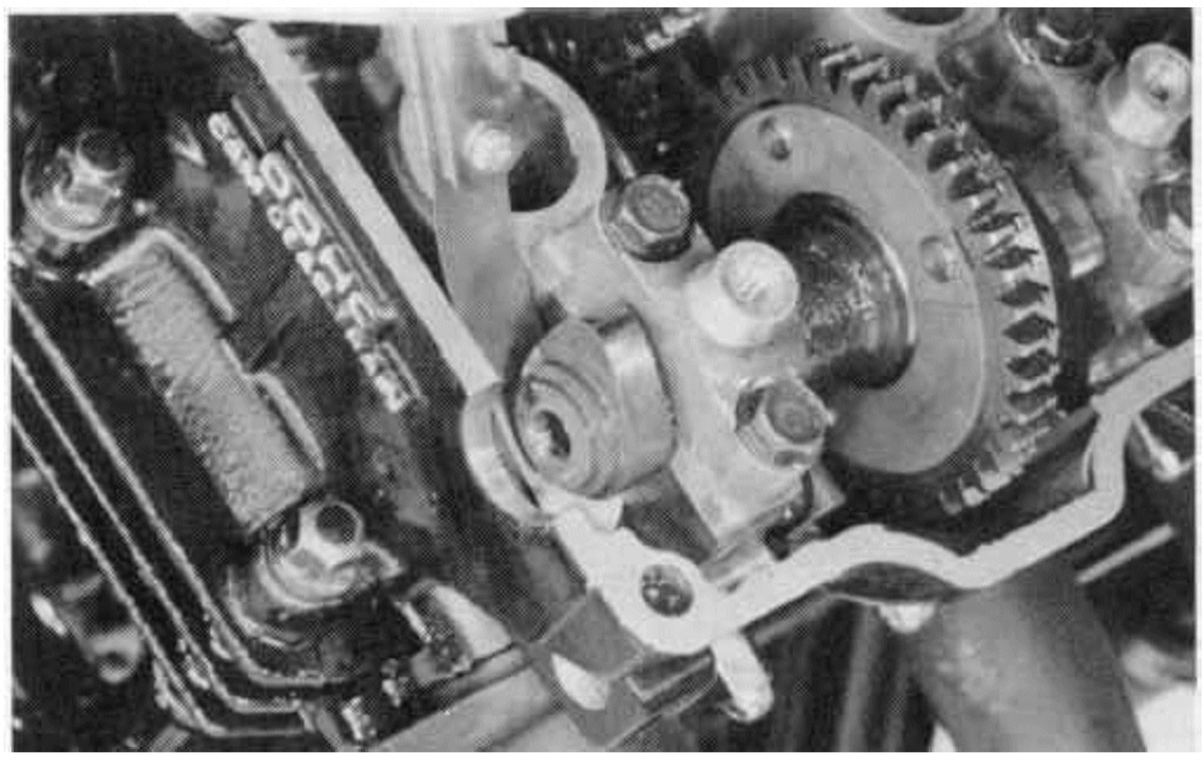
Tappet clearance (cold engine)

IN : 0.13 – 0.19 mm
EX : 0.20 – 0.26 mm.





Remove the cylinder head cover (7-3).
Remove the crankshaft bolt cap.
Rotate the crankshaft clockwise and bring the
marked lines on the cam gears parallel to the top surface of the cylinder head and facing outwards for both IN and EX sides.



Measure the No.1 tappet clearance by inserting the thickness gauge between the cam and the valve lifter.

Rotate the crankshaft clockwise and this time bring the lines perpendicular to the cylinder head surface and "IN" side upwards and "EX" side facing downwards.

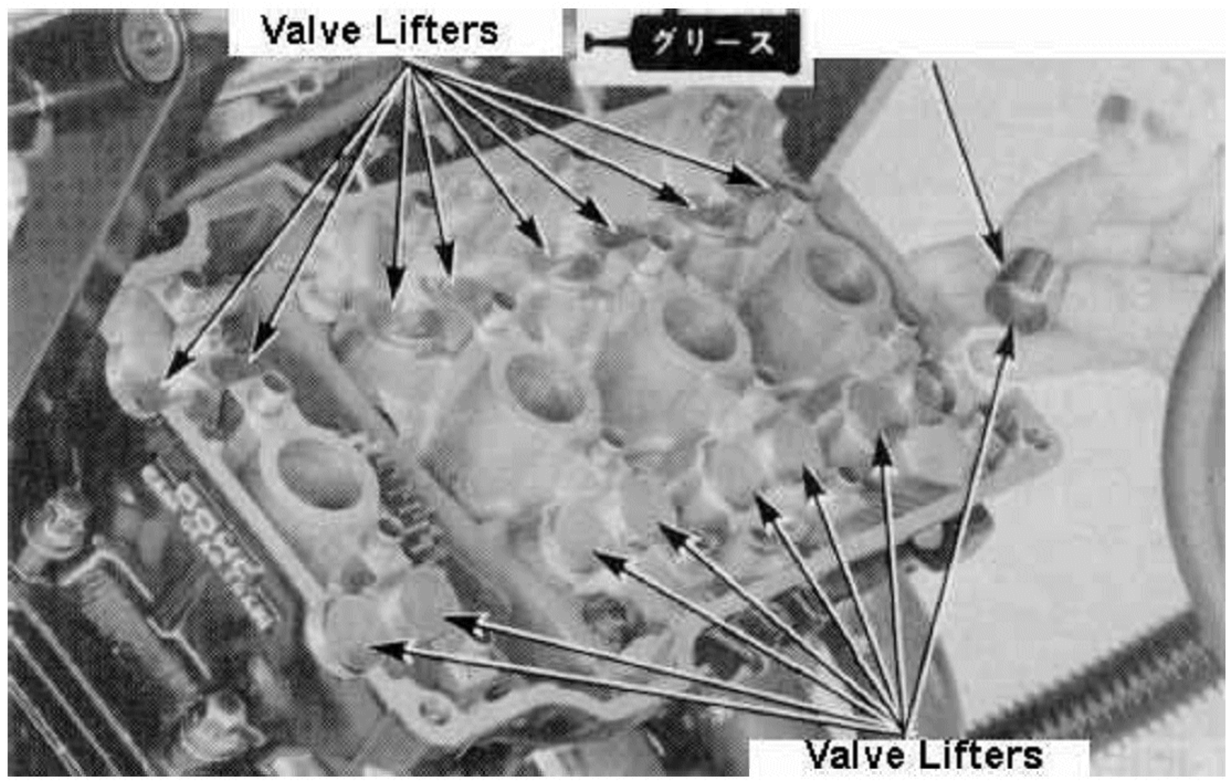
Measure the No.2 tappet clearance in the same manner.

- Rotate the crankshaft clockwise. This time, the lines should be parallel to the cylinder head surface and facing inwards for both sides.
- Measure the No.4 tappet clearance in the same manner.

Rotate the crankshaft. Cam gear lines should be perpendicular to the cylinder head “IN” should face downwards and “EX” upwards. Measure the No.3 tappet clearance.

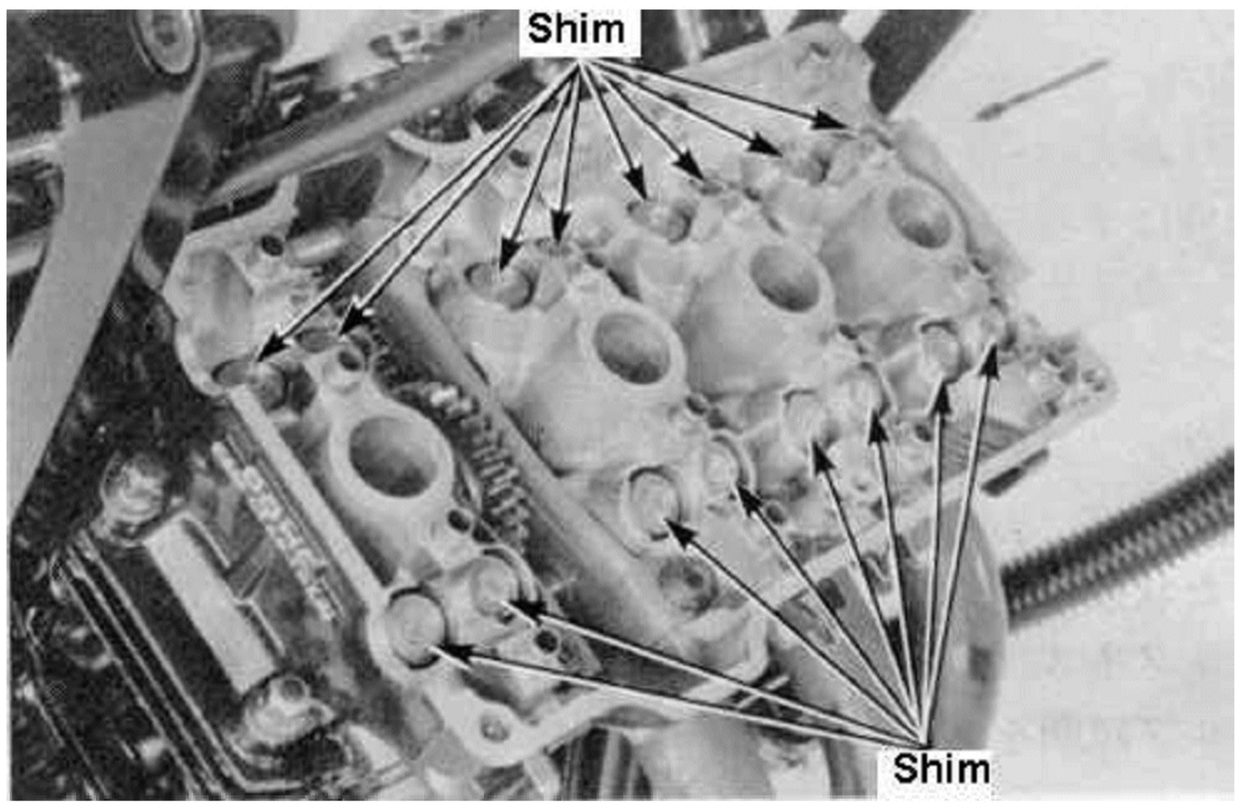
ADJUSTMENT

Remove the cam shaft (7-3).
Remove the valve lifter.
If it is difficult to remove, use a valve flapper.

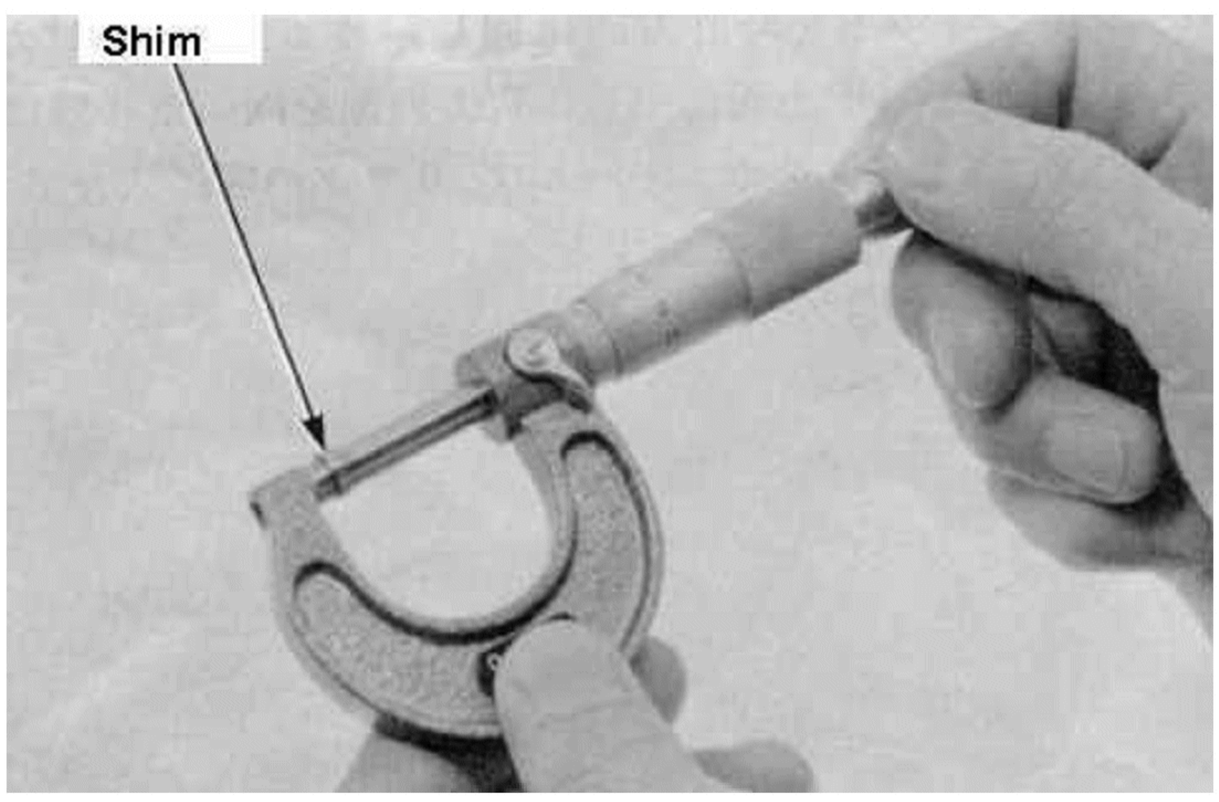


It may come out while the shim is still attached to the valve lifter.

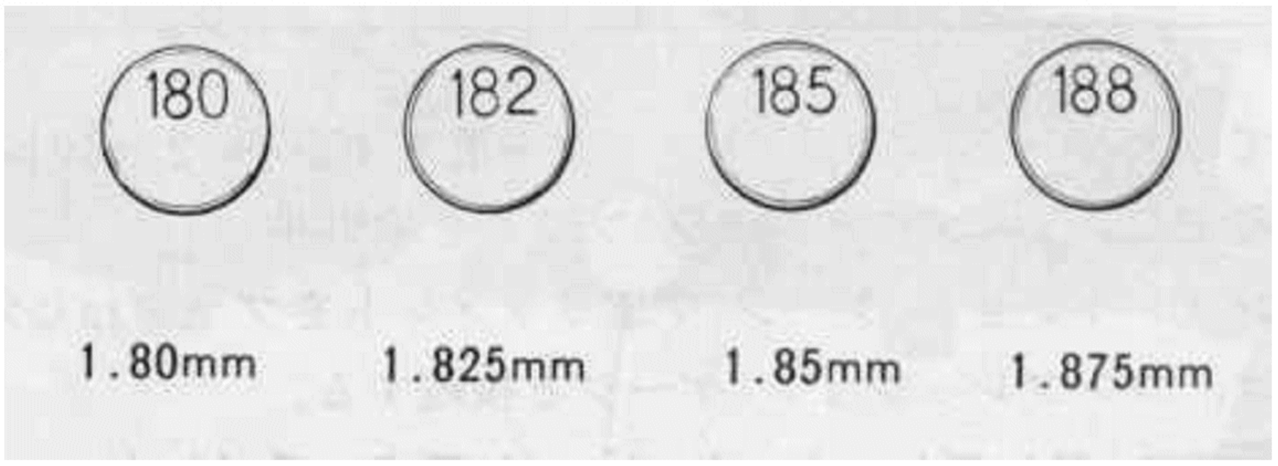
Remove the shim.
Use a magnet or tweezers if necessary to remove.
Clean the shim attachment on the retainer with air.



Wipe the oil off from the shim and measure its thickness with a micrometer.



How to select a proper shim



There are 65 different shims ranging from 1.2mm to 2.8mm, in 0.025mm steps.

Required shim thickness : a
Recorded tappet clearance; b
Specified tappet clearance : c
Attached shim thickness : d

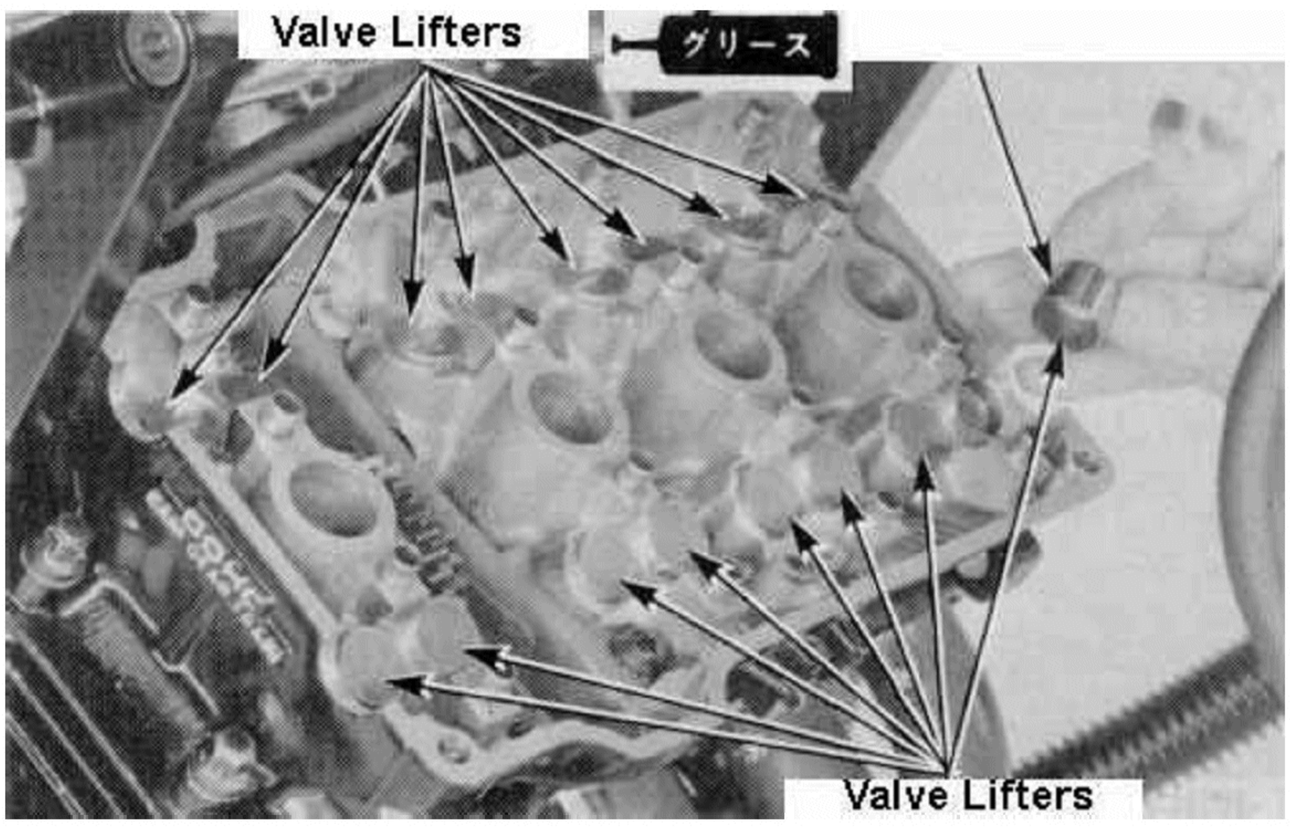
a=b-c+d

(Example)

Intake tappet clearance 0.06 mm - b
Attached shim thickness 1.875mm - d
Specified tappet clearance 0.16 mm - c

A=0.06 – 0.16 + 1.875
=1.775.

- Use a micrometer to measure the new and the attached shims' thickness.
- If the required shim thickness is greater than 2.80mm, remove carbon from a valve seat and adjust the seat.



Attach the selected shim.
Apply MoS2 on the valve lifter and attach it.
Install the camshaft (7-19).
Rotate the crankshaft for a couple of times and allow the shims to fit and re-inspect the tappet clearance.
Attach the cylinder head cover (7-21).

Cylinder compression

Measure after warming up.

Remove all spark plug caps (2-10).
Remove the spark plug for the cylinder you want to measure.
Set the compression gauge attachment to the plug screw hole and connect with a compression gauge.

Exclusive tool : Compression gauge attachment 07GMJ-KT70100
Measuring tool : Compression gauge 07305-0010000

Fully open the throttle.
Engage the starter motor and measure the compression.

Do not crank for more than 7 seconds to avoid flattening the battery.

Cylinder compression gauge attachment.
If the compression is LOW, inspect the following items:

- **Valve compression leak.**
- **Inadequate tappet clearance.**
- **Cylinder head gasket failure.**
- **Piston ring worn out (9-4).**
- **Piston/Cylinder worn out (9-5).**

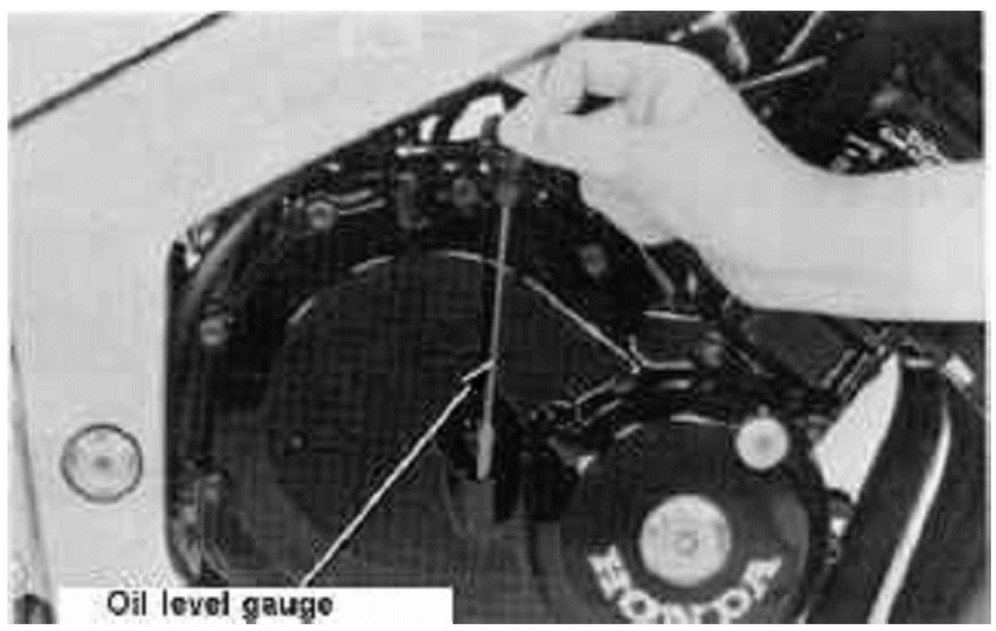
If too HIGH, inspect the following:

- **Carbon on the piston head, cylinder head.**

Lubrication

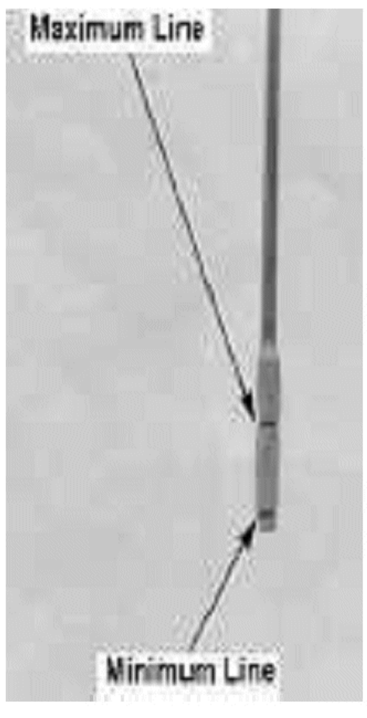
(Oil quantity and condition).

- The vehicle should be straight up when inspecting oil level.
- Warm up the engine for 2~3 minutes. Then conduct the inspection after allowing 2~3 minutes after shutdown.



Inspect the oil level but do not screw the level gauge in.
If the level is below the minimum line, supply the specific oil up to the maximum line.
If the oil is too dirty, change the oil.
Specified engine oil:
Genuine Honda oil Ultra GP.
4-cycled motorcycle SAE 1OW-40 or SAE20W-50

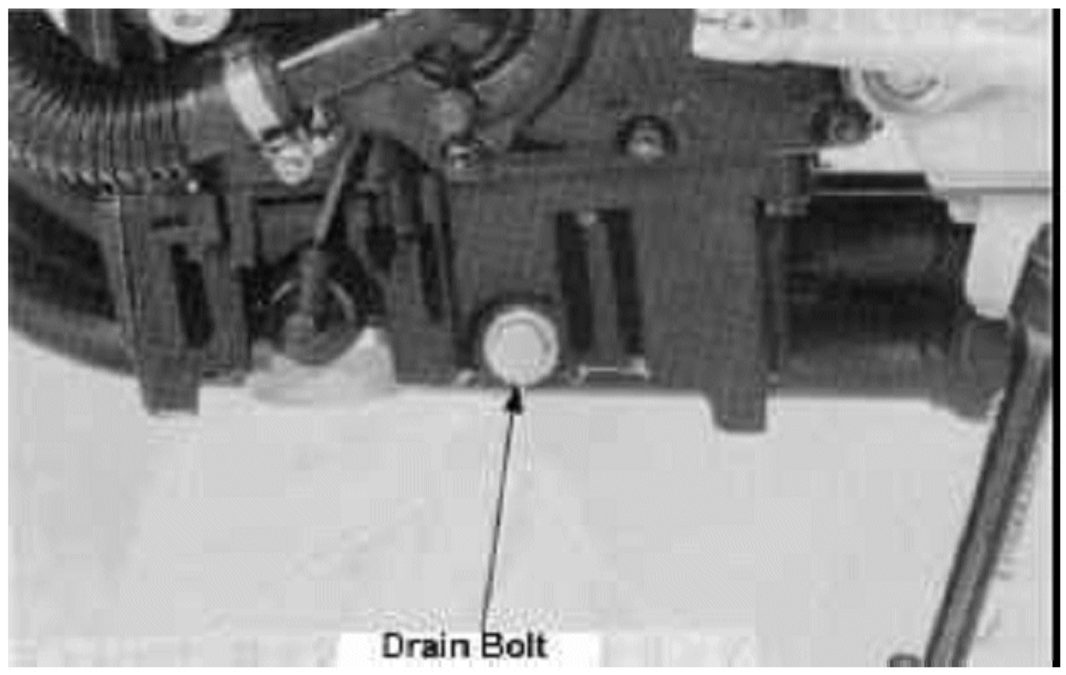
Follow the table 3-2 and use the adequate viscosity oil corresponding the local temperature.



Oil Change

Drain the oil after warming up the engine and oil.

- Remove the oil level gauge.
- Remove the drain bolt and drain all oil.
- Turn the kill switch OFF and engage the starter for 2~3 seconds and drain the remaining oil.
- Attach the drain bolt after cleaning.
- Tightening torque : 3.5 ~ 4.0kg.m.

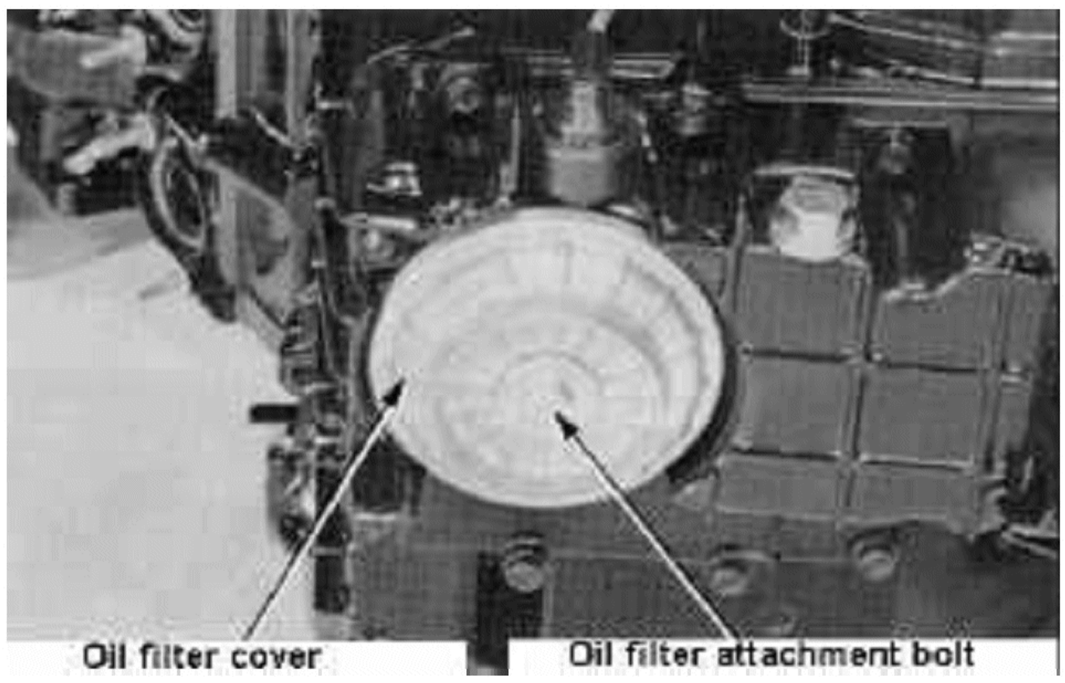


Replace the sealing washer.

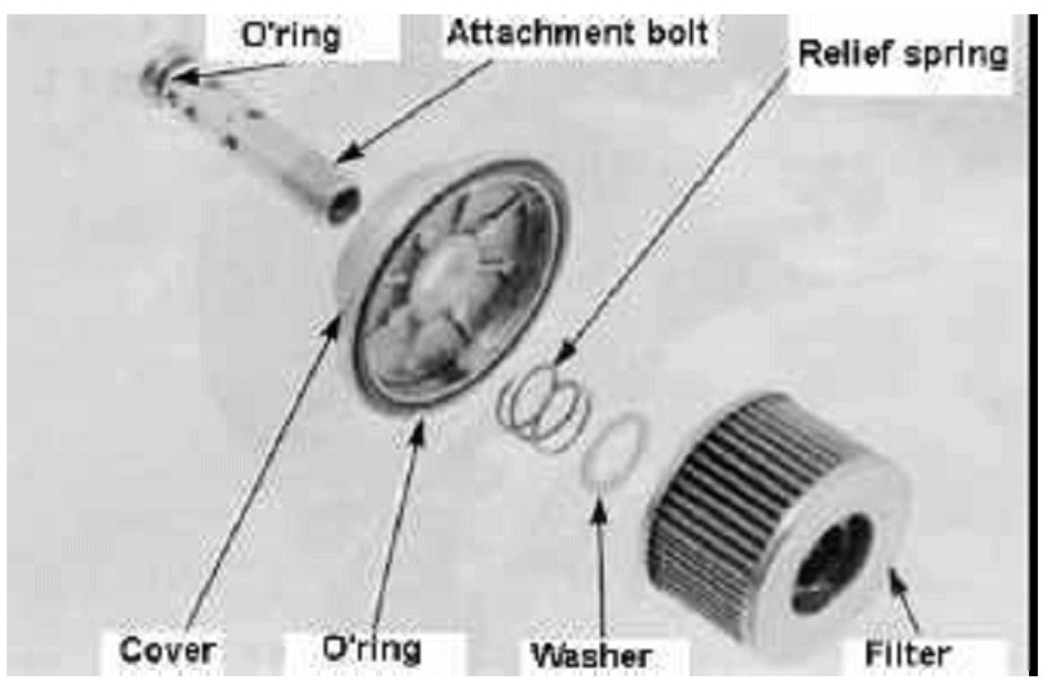
Supply the specific engine oil.
Engine oil capacity :

Oil change	- 2.2l
Oil/filter change	- 2.4l
Engine disassembled	- 2.7l

After confirming no oil leak, check the oil level.



(Replacing the oil cleaner)
Recommended replacement interval:
Initial : 1,000kms.
12,000kms after initial change.

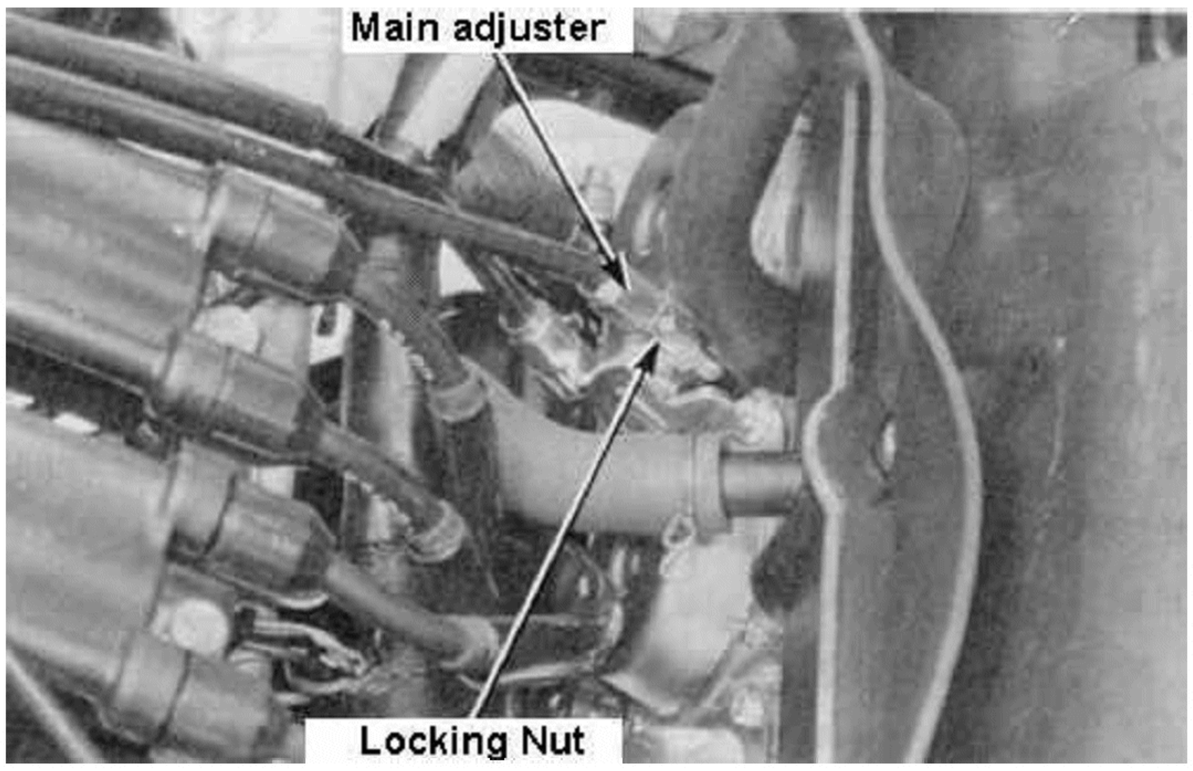


- Drain the oil.
- Remove the oil filter cover by removing the filter attachment bolts.
- Remove the oil filter.
- Remove the O-ring and apply oil.
- Attach a spring and the new oil filter and attach an oil filter cover
- Tighten the filter attachment bolt.
  Tightening torque : 1.5~2.0kg.m.
- Fill the specific oil.
- After checking no oil leak, check the oil level.

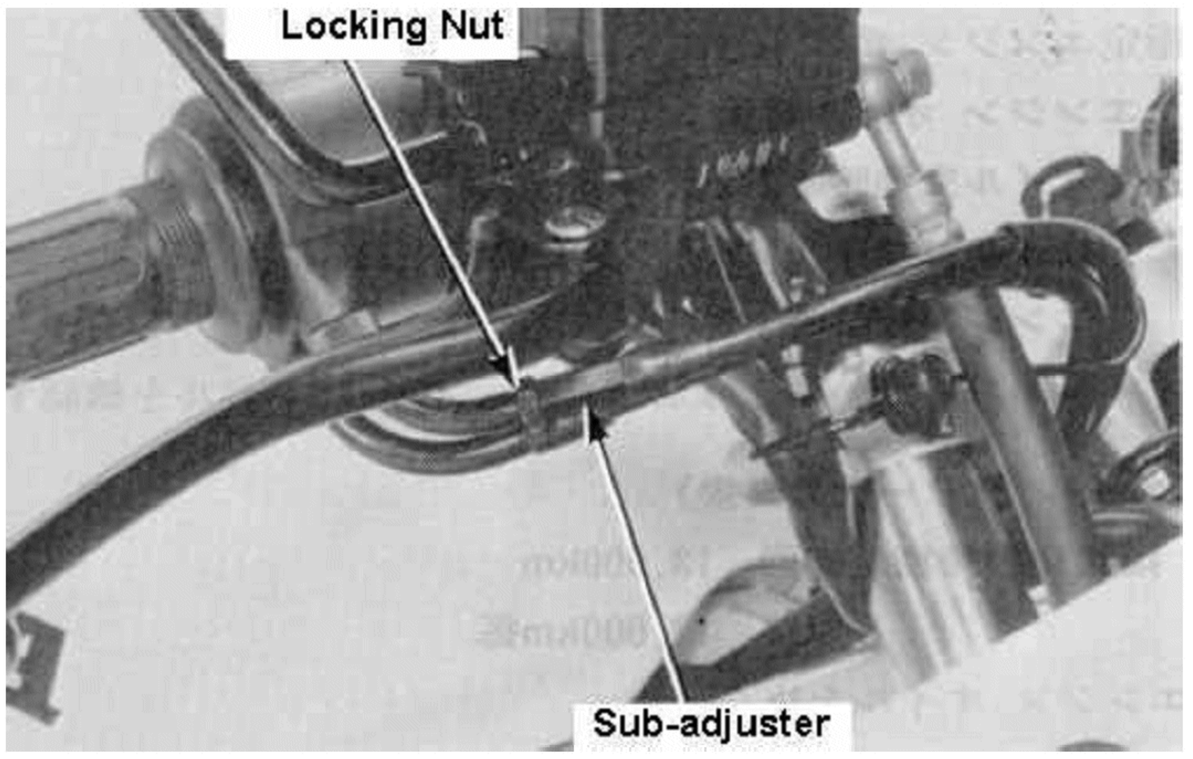
(Fuel System)
(Throttle valve and choke lever).

Inspect the free movement of the throttle grip.
Free movement : 2~6mm.
Inspect the throttle cable for damage.
Confirm the smooth movement of the throttle grip in all steering direction.

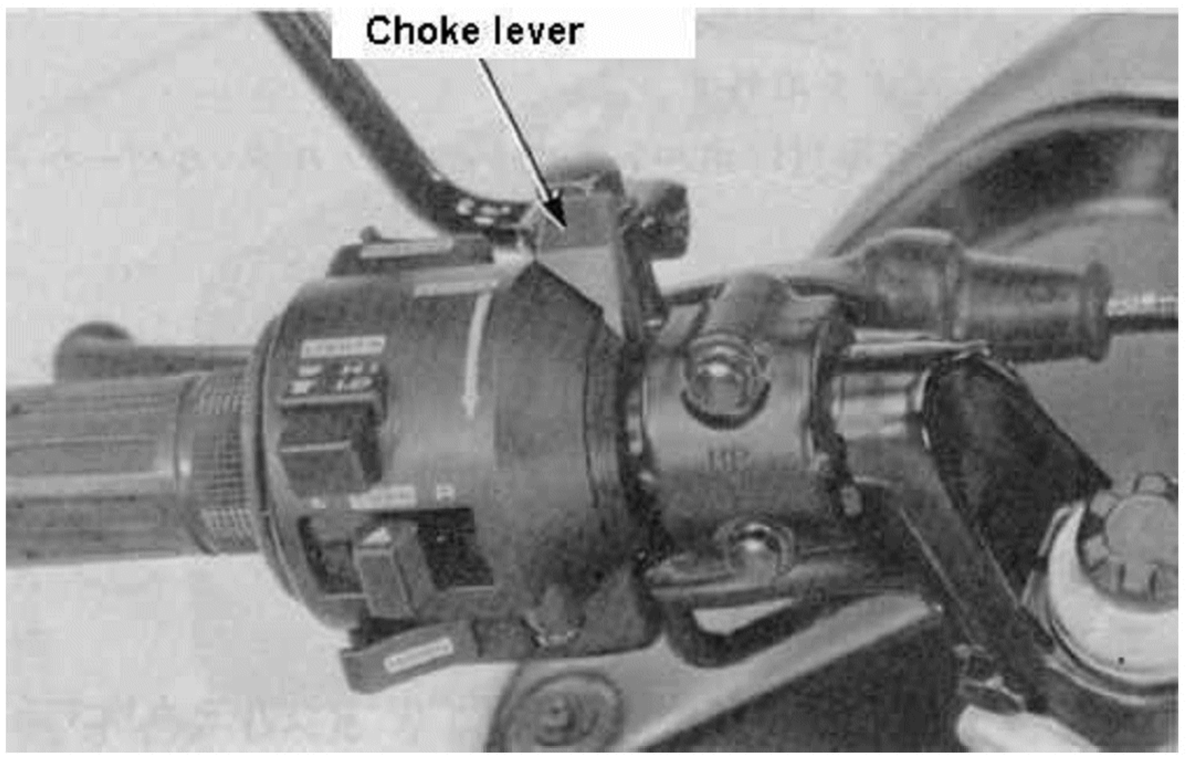
The adjustment of the free movement should be done at the carburettor section.
Remove the fuel tank (4-3).
Loosen the locking nut of the throttle cable on pulling side and adjust the free movement by rotating the main adjuster.



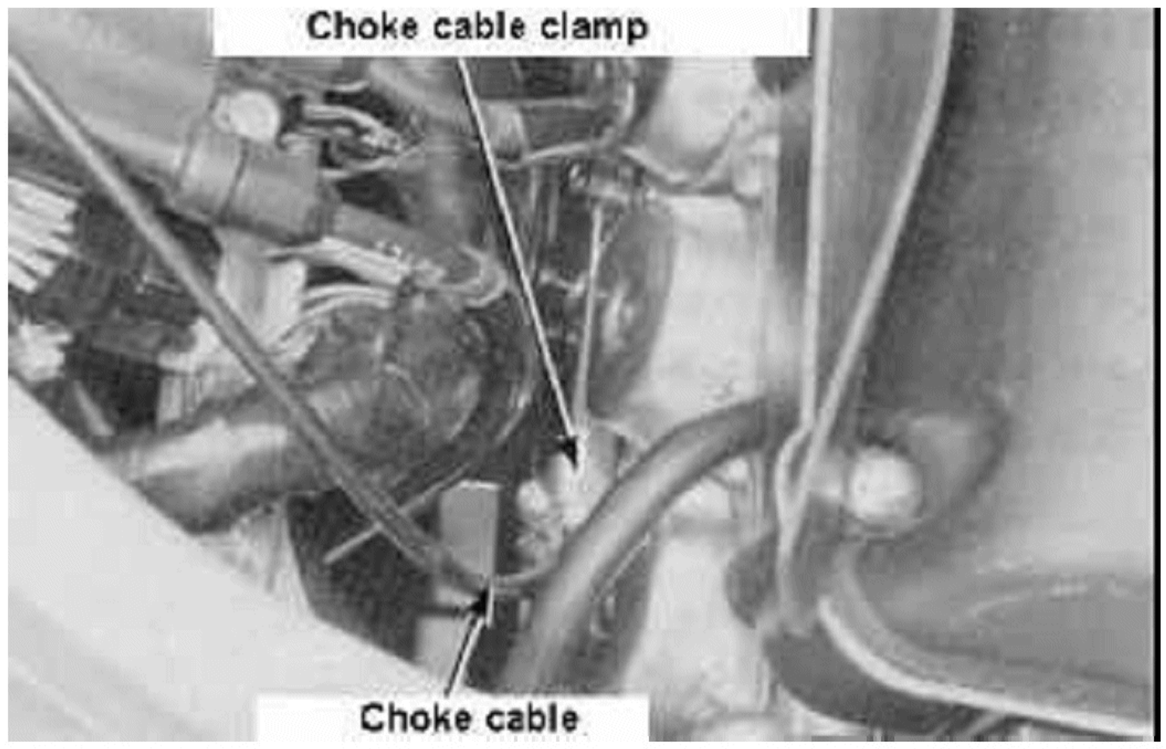
Precise adjustment should be done at the throttle holder section.
Loosen the locking nut and adjust by rotating the sub-adjuster.
If still unable to have standard or smooth movement, replace the throttle cables.



Inspect the smooth movement of the choke lever from fully closed to fully opened.
Inspect the cable for wear, damage and twist.

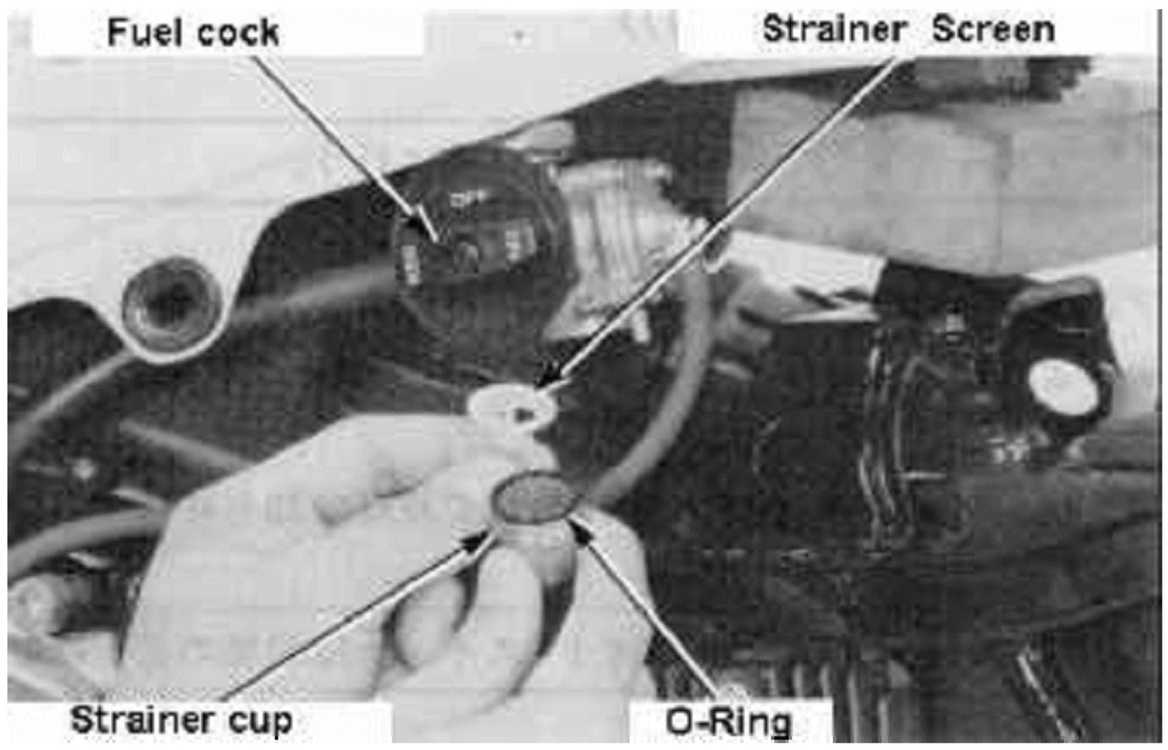


Check the movement of the carburettor bistarter valve by moving the choke lever.
Loosen the choke cable clamp and shift the cable clamping position for adjustment.



(Clogged fuel strainer)

Remove the seat, fuel tank attachment bolts and nuts.
Turn the fuel cock OFF.
Remove the strainer cup, and remove the O-ring and the strainer screen from the fuel cock body.
Clean the strainer cup and the screen with washing oil.
Attach the strainer screen to the cock body.
After attaching the new O-ring, tighten the strainer cup.

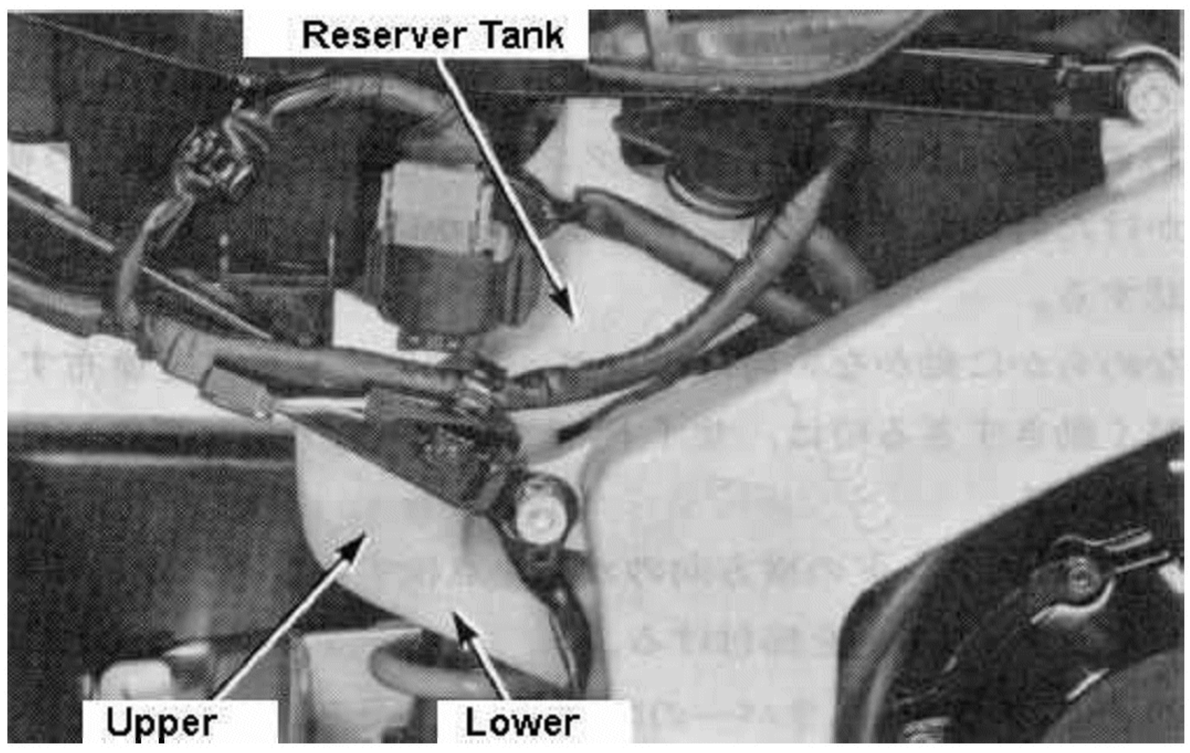


Do not over tighten the strainer cup.

Turn the fuel cock ON and check no fuel leak.

Cooling System
(Water level)

• When inspecting the radiator water level, place the body vertically. • Inspect the water level at the reserve tank.



Remove the righthand side cover.
Check that the water level in the reservoir tank is between UPPER and LOWER.
If the level is below LOWER, refill the specified radiator liquid to UPPER line.
Specified radiator liquid:

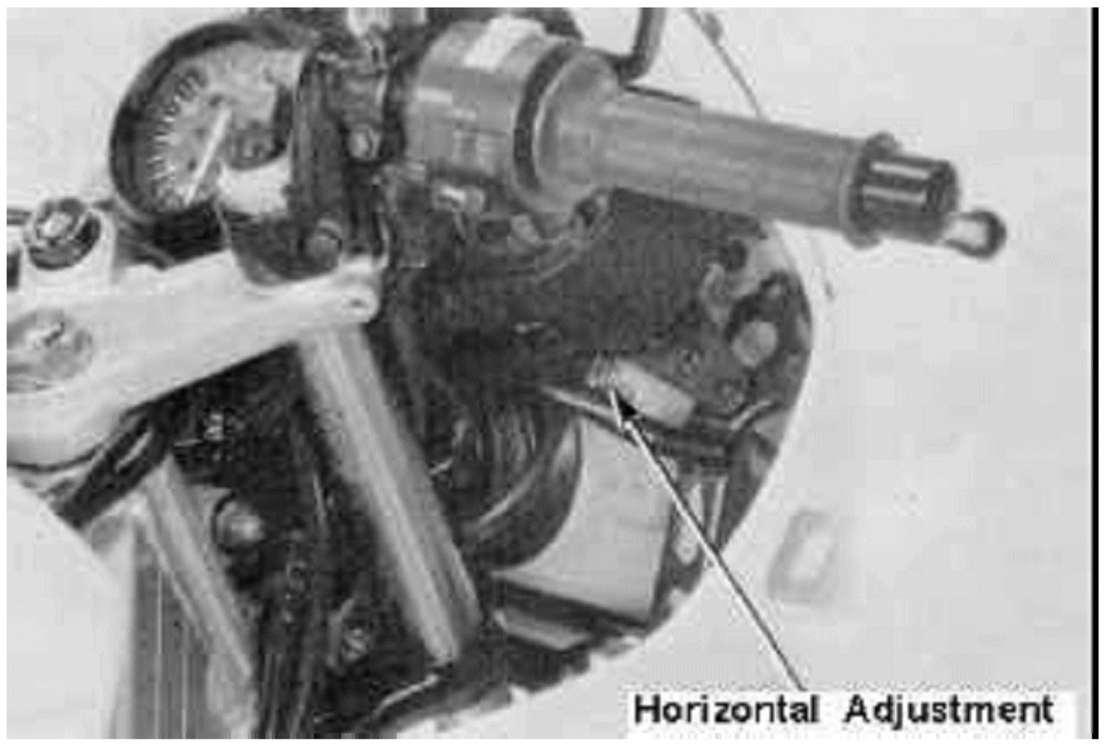
Genuine Honda Ultra radiator liquid.
(30% standard concentration)

Lighting system - (Head light)

Use a screwdriver to rotate vertical adjustment screw to adjust the vertical axis of the headlight.

Remove the rear fairing inside cover.

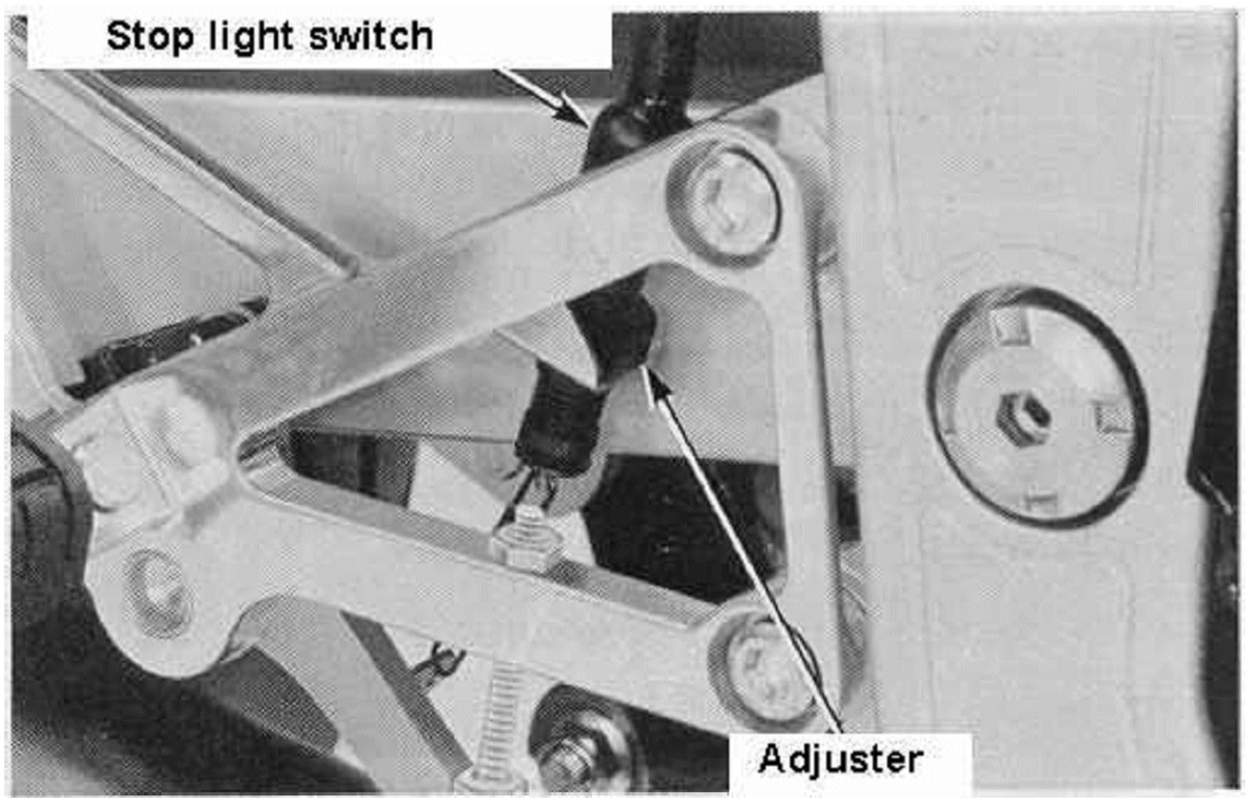
Rotate horizontal direction adjust screw to adjust the horizontal axis of the light.



(Stop light/Brake light)

Conduct after adjusting the brake pedal height.

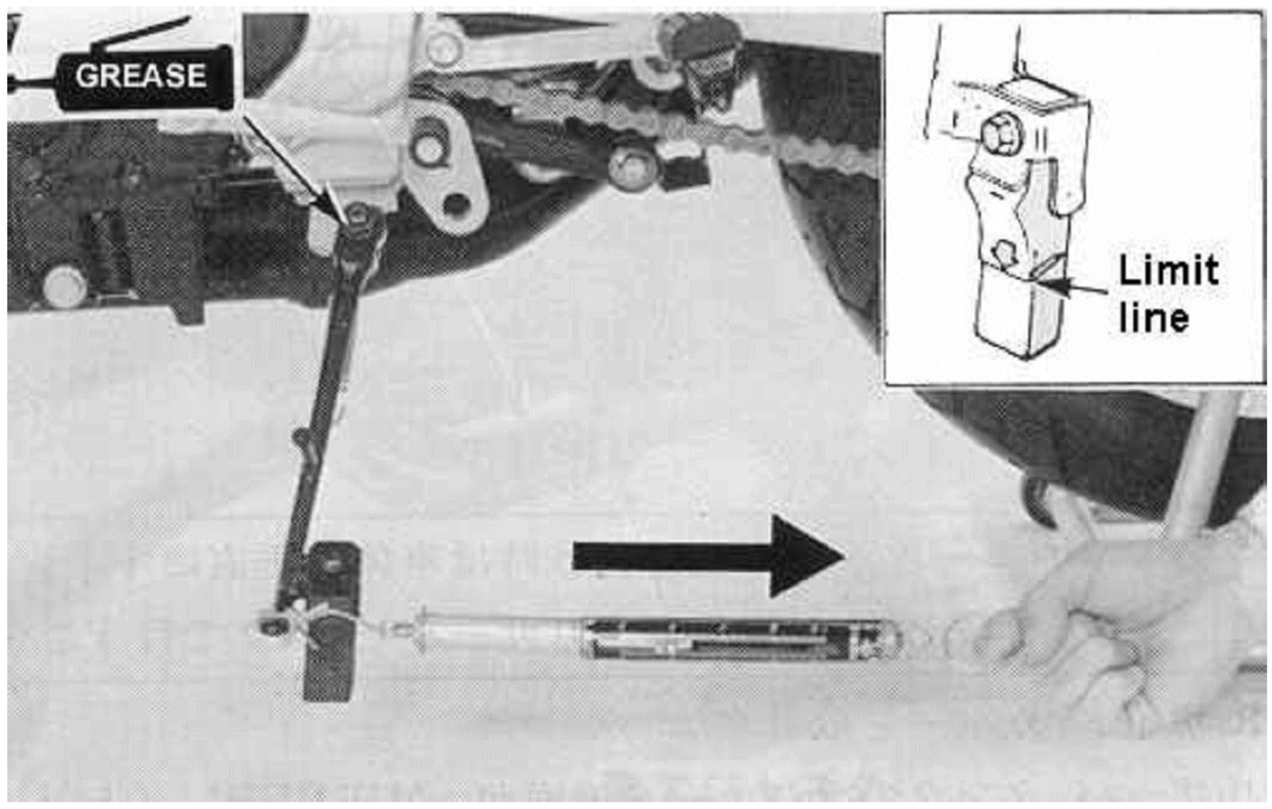
Adjust by rotating the adjuster while holding the stoplight switch so as to illuminate the light when the brake pedal is pushed for 20mm.
After adjusting, check by pressing the brake pedal.



There is no need to adjust the front brake light switch.

Side stand

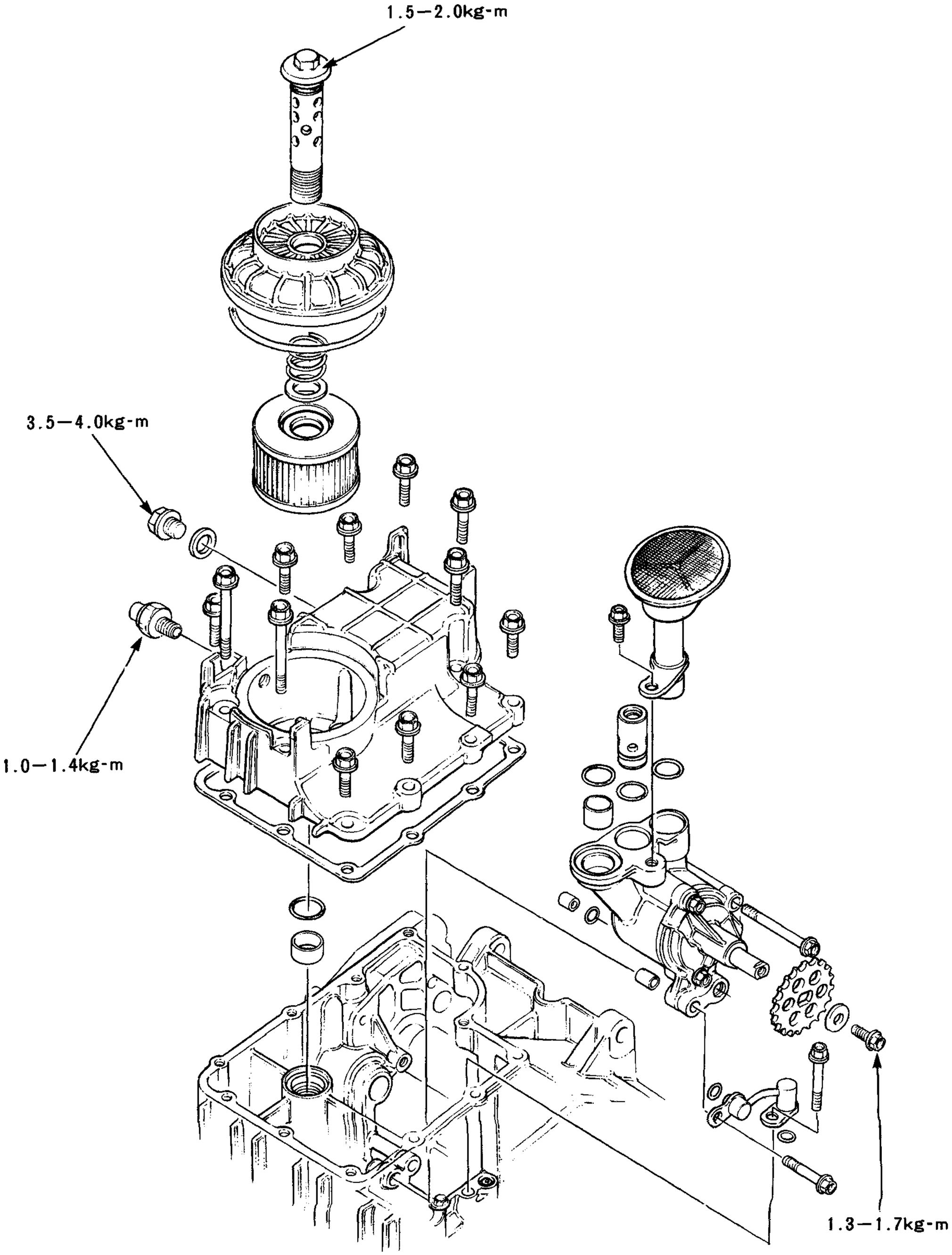
Support the frame and lift the rear wheel.
As shown in the figure, apply 2.0~3.0kg. load on the edge of the stand and confirm its retraction.
If there is no smooth movement, apply grease on the pivot area.
If it retracts too easily, inspect the wear of the side stand spring?.
Inspect for lateral tension. Tighten the pivot bolt if it is loose.
Inspect the side stand rubber and replace the rubber if it is worn out till the limit line.



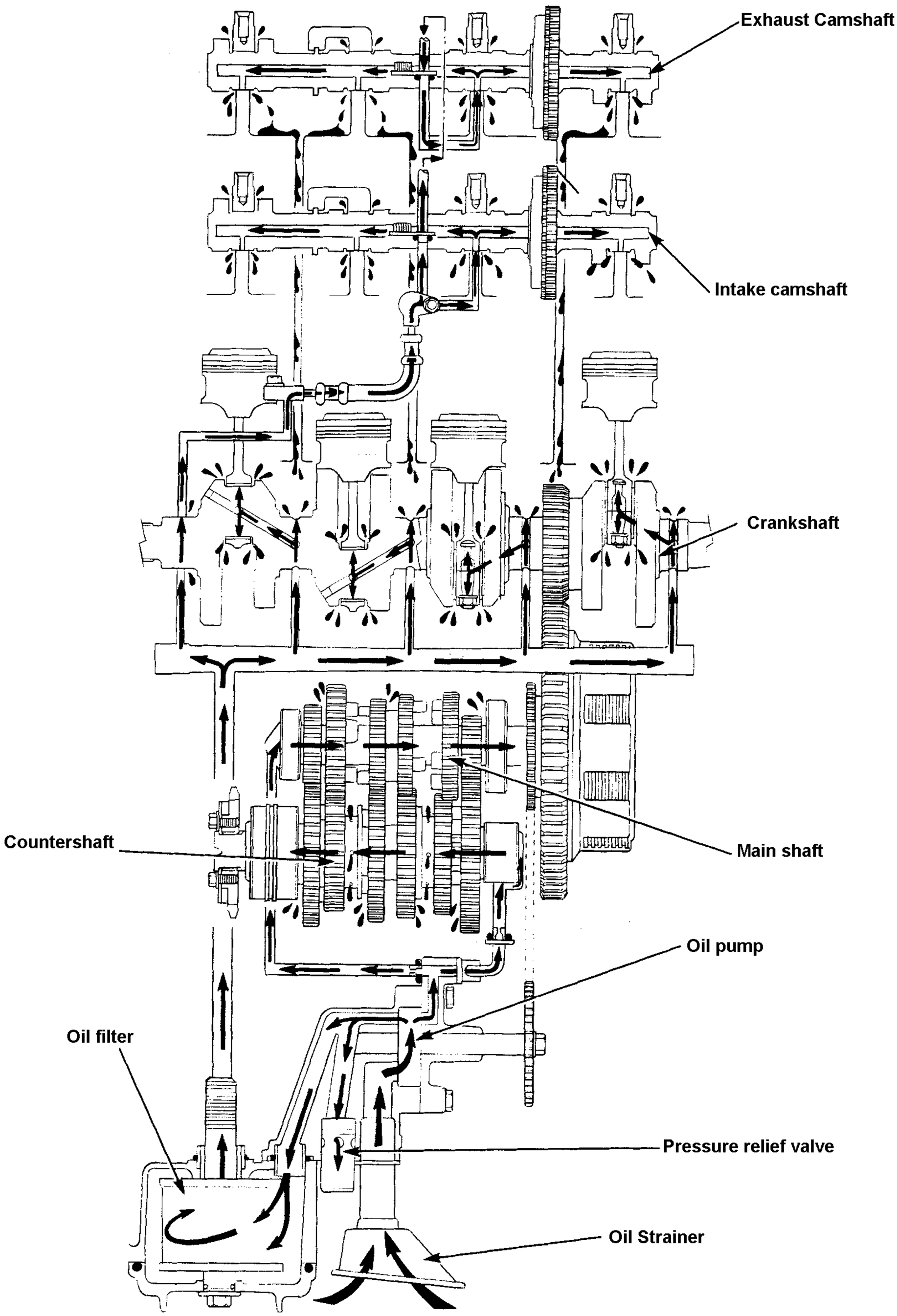
Tightening torque:

Side stand bracket : 2.5~3.0kg-m.

• Assembly



- **Lubrication System Diagram**



3. Oil Lubrication

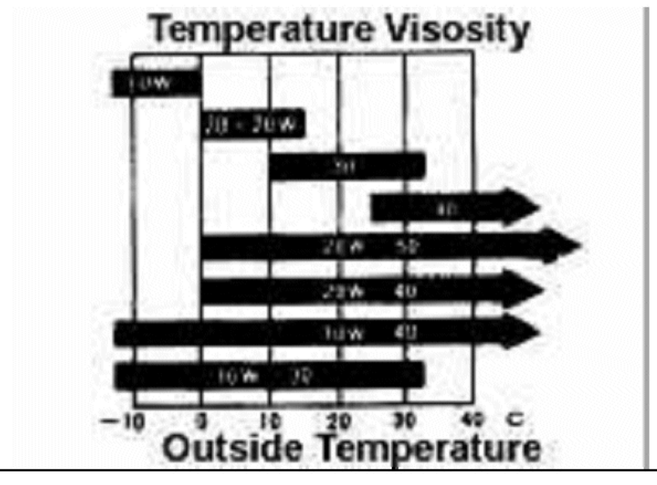
Assembly	3 - 0	Removing the oil strainer pressure relief valve	3 - 4
Lubrication Diagram	3 - 1	Removing the oil Pump	3 - 5
Maintenance Information	3 - 2	Attaching the oil pump	3 - 8
Troubleshooting	3 - 3	Attaching the oil strainer pressure valve	3 - 8
Oil Pressure	3 - 4		

- **Maintenance Information**

General Caution
- All of the works on this chapter can be done on the vehicle.
- Do not allow debris to enter the engine when removing an oil pump.
- Replace by assy when the oil pump is on its limit.

- **Maintenance Standard**

Item	Standard	Standard	Limit
Oil Pump	Rotor tip clearance	0.15	0.20
	Pump body - outer rotor clearance	0.15 - 0.22	0.35
	Rotor body clearance	0.02 - 0.07	0.10
	Pump out pressure	4.0-5.0kg-cm^2 (6,000 rpm,60^{o}C)	
Engine Oil Capacity	2.2 litre (Oil Change), 2.4 litre (oil/filter change) 2.7 litre Total Capacity		
Specified Engine Oil	Genuine Honda Oil Ultra GP (4 cycle Motorcycle) (SAE10W-40 or SAE20W-50)		



- **Find out the proper oil grade corresponding to local temperature**

Tightening Torque
- Oil drain bolt 3.5 - 4.0kg-m
- Oil filter attachment bolt 1.5 - 2.0kg-m
- Oil pressure switch 1.0 - 1.4kg-m
- Oil Pump driven sprocket bolt 1.3 - 1.7kg-m

Tools
- Exclusive tools
- Oil pressure gauge attachment 07510 - 4220100
- Measuring tools
- Oil Pressure gauge 07510 - 3000000

- **Troubleshooting**

Low oil level

- Naturally consumed the oil.
- Oil leak.
- Piston ring worn out.
- Valve guide or seal worn out.

Dirty oil

- Unchanged/Out of Service.
- Head gasket failure.
- Piston ring worn out.

Low oil pressure

- Low oil level.
- Pressure relief valve does not close.
- Oil strainer clogged.
- Oil pump worn out.
- Oil leak.
- Improper oil grade.

High oil pressure

- Pressure relief valve does not open.
- Oil filter, oil tube, orifice clogged.
- Improper grade of oil.

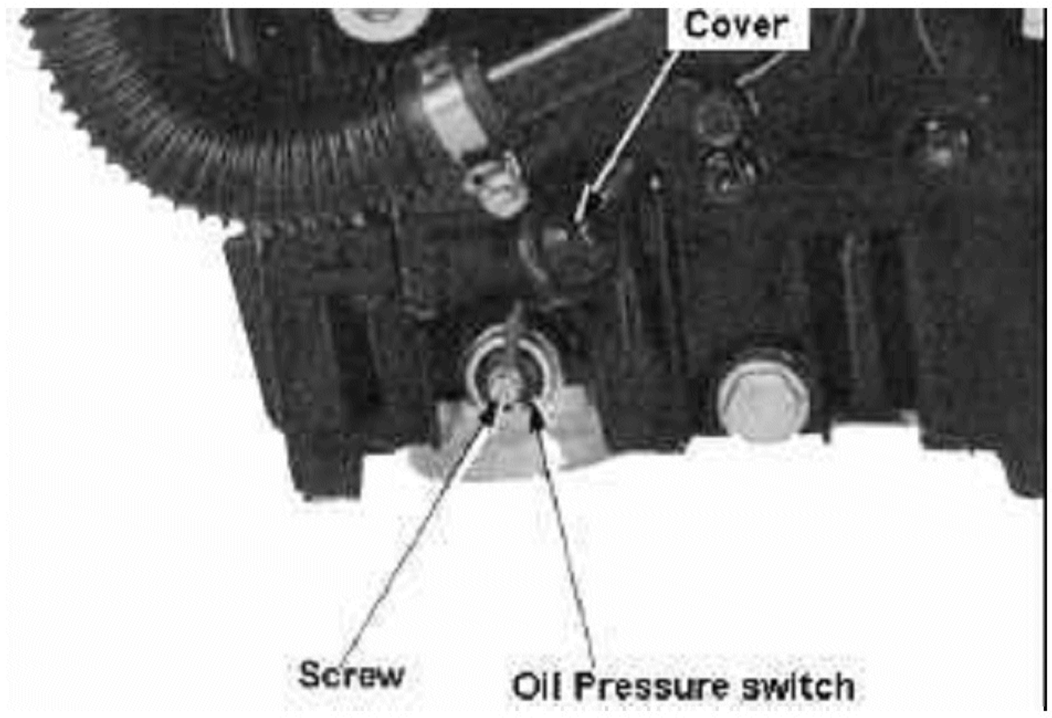
No oil pressure

- Low oil level.
- Oil pump drive sprocket failure.
- Oil pump drive chain failure.
- Oil pump failure.
- Internal oil leak.

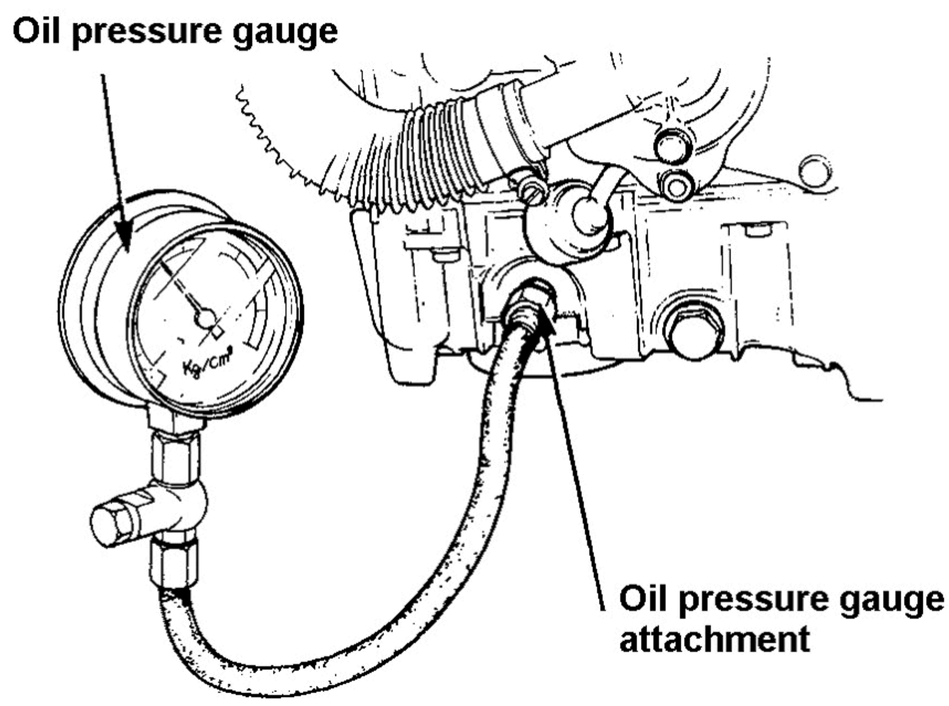
- **Oil Pressure Inspection**

Conduct after warm up.

Remove the cover and screw for oil pressure switch.
Disconnect the oil pressure warning light wiring.
Remove the oil pressure switch.
Connect the oil pressure gauge to the pressure switch hole.
Inspect the oil quantity.
Start the engine and measure the oil pressure at 6000 rpm.



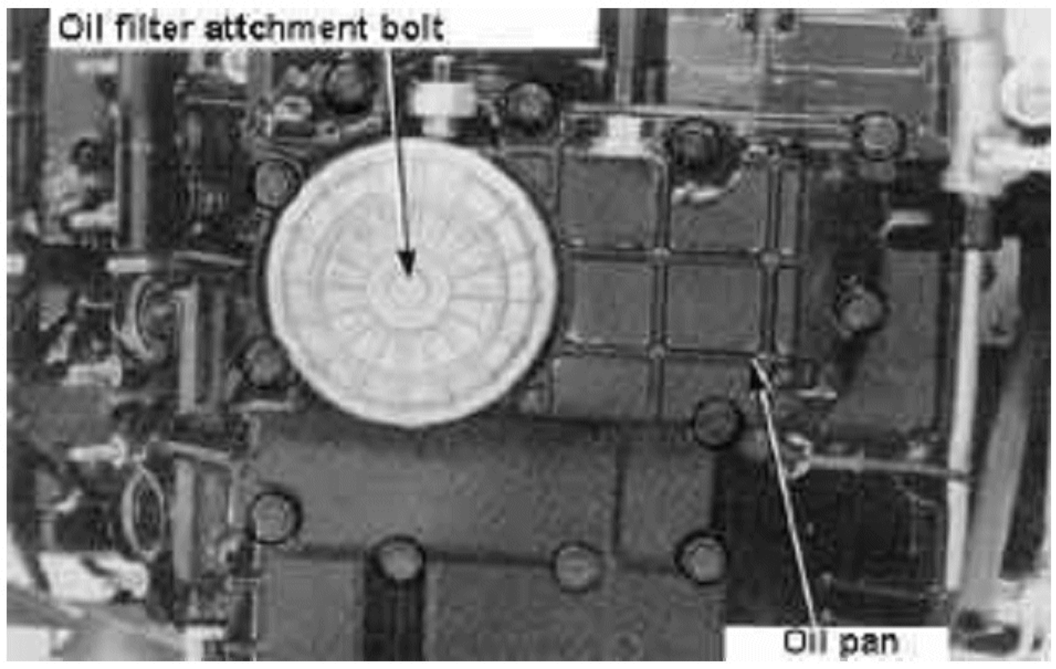
Standard Oil Pressure :4.0~5.0kg/cm^2 (6000rpm, oil 60°C)



Shutdown the engine.
Apply sealer on the screw of the oil pressure switch and tighten.

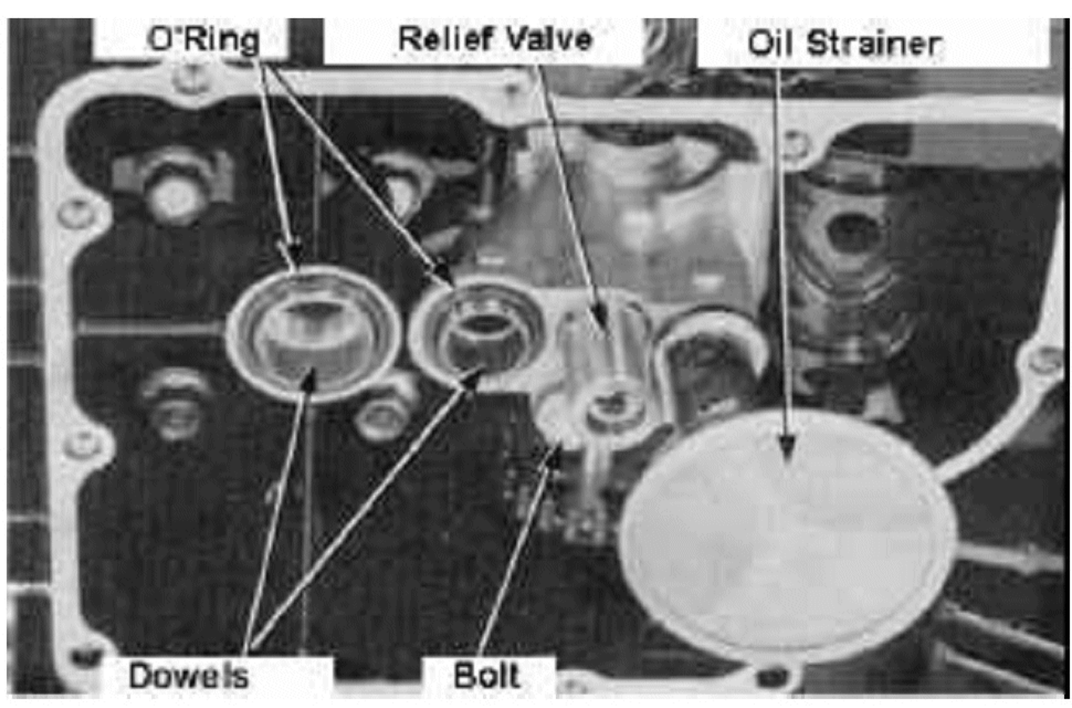
Tightening torque : 1.0-1.4kgm.

Connect the oil pressure warning light wiring.
Restart the engine and check the warning light turns off
1~2 seconds after starting.
Exclusive tool : Oil pressure gauge attachment 07510-4220100.
Measuring tool: Oil pressure gauge 07506-3000000.



Oil strainer, pressure relief valve

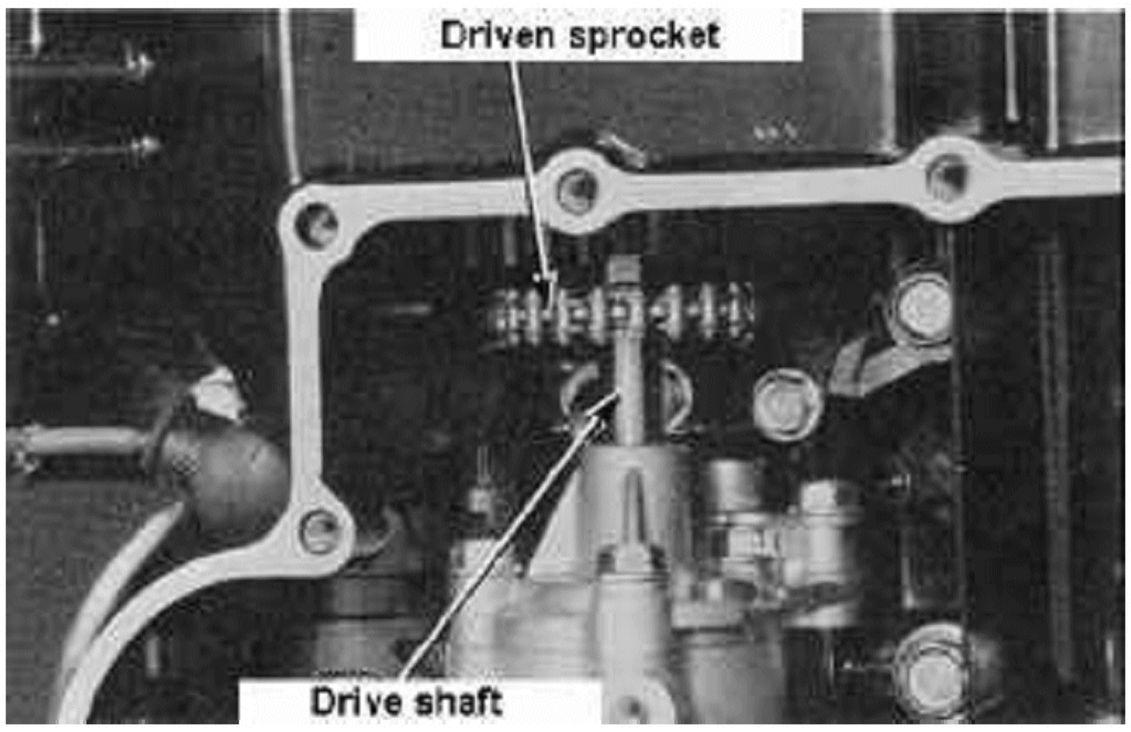
Remove the cover and screw for oil pressure switch.
Remove the exhaust pipe (16-2).
Drain engine oil (2-17).
Remove the oil filter attachment bolt.
Remove 12 bolts and remove oil pan, gaskets.
Remove the bolts and remove the oil strainer from oil pump, clean the strainer.
Remove the oil pressure relief valve.
Remove O-ring and knocking pin.

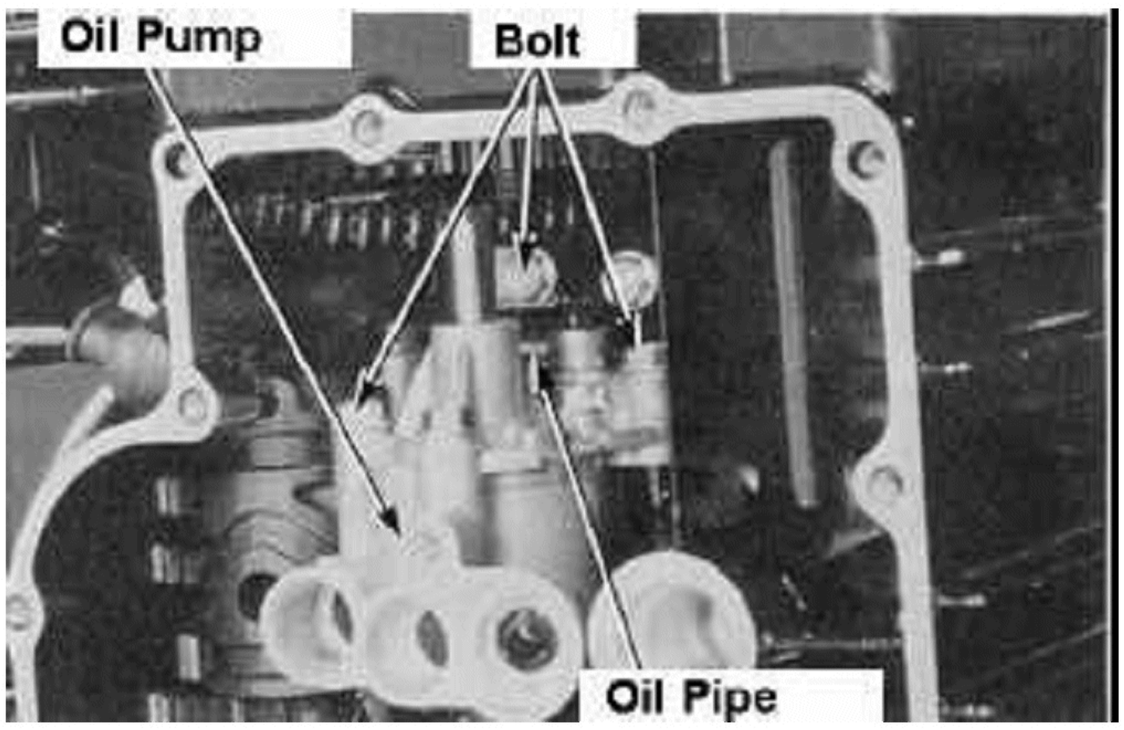


- **Detaching the Oil Pump**

Remove the oil strainer, pressure relief Valve (3-4).
Remove bolts and washers and detach the driven sprocket with drive chain from oil pump drive shaft.

Remove three bolts and detach the oil pump, oil pipes.
Remove the dowels.



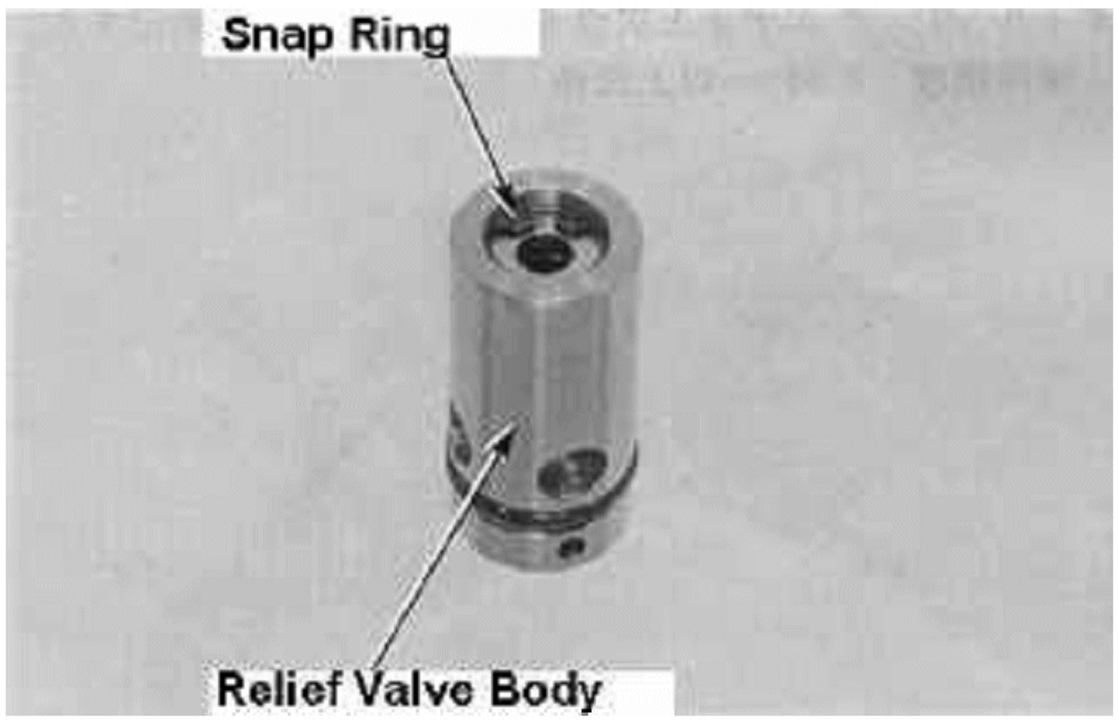


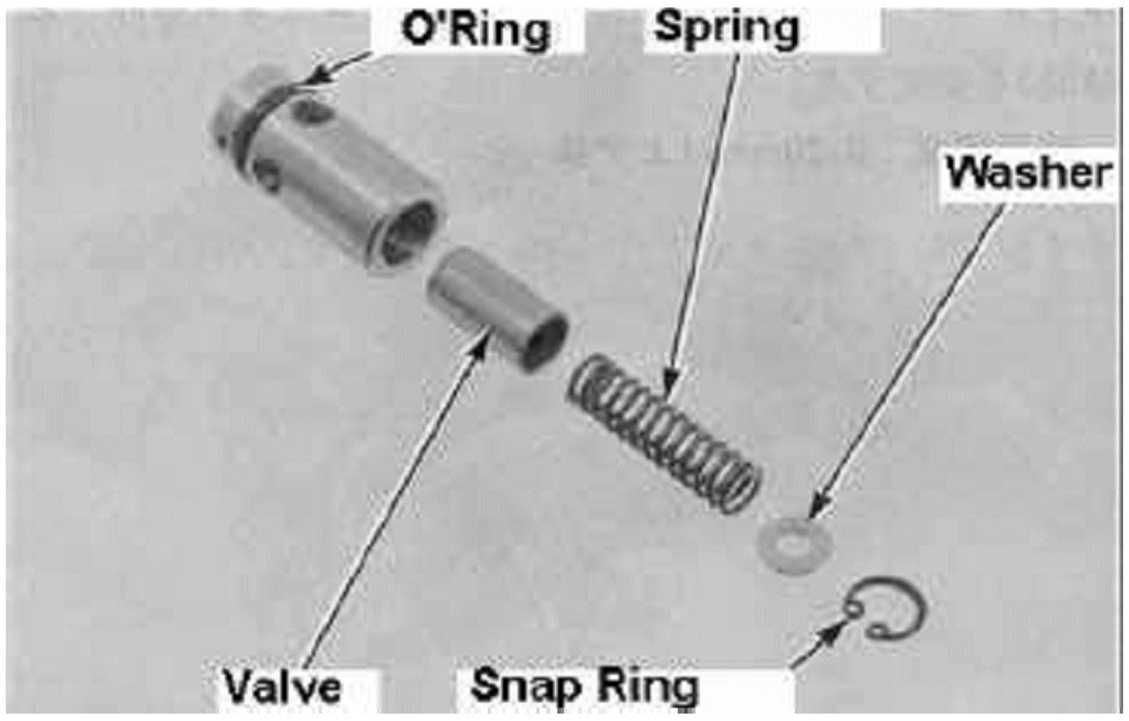
- **Disassembly of Relief Valve**

Remove the snap ring and disassemble the relief valve body.

- **Inspection, Assembly of Relief Valve**

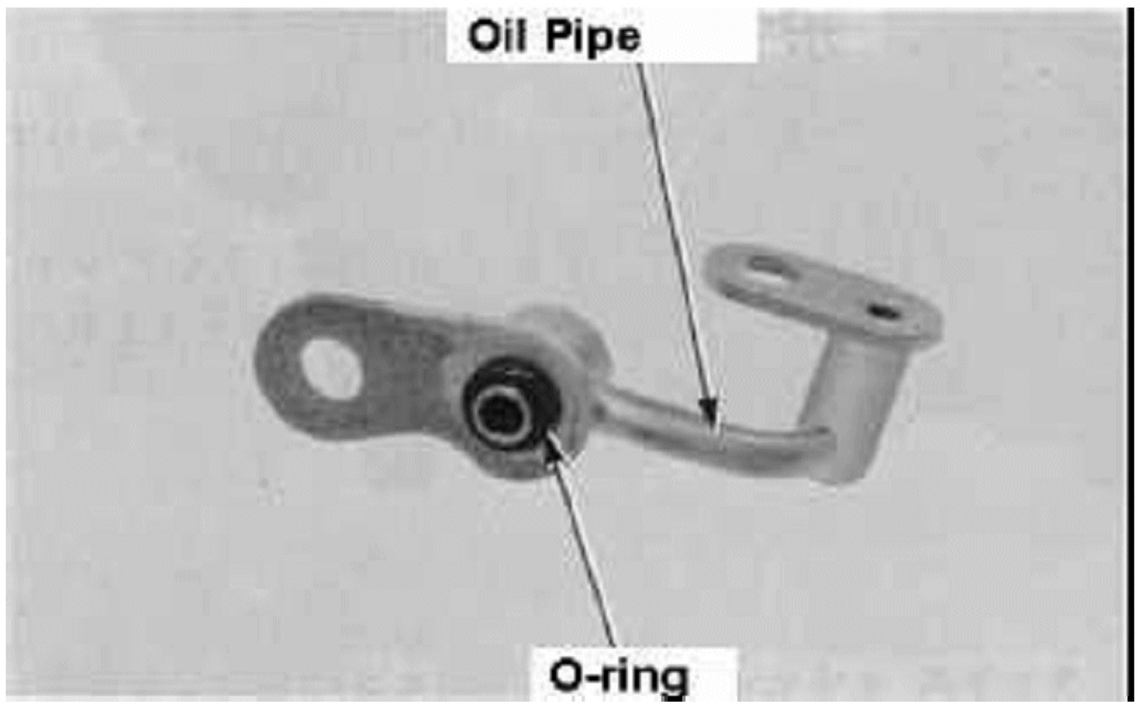
Inspect for damages on the spring and valve.
Re-assemble the relief valve.
Inspect the O-ring for damage/wear.





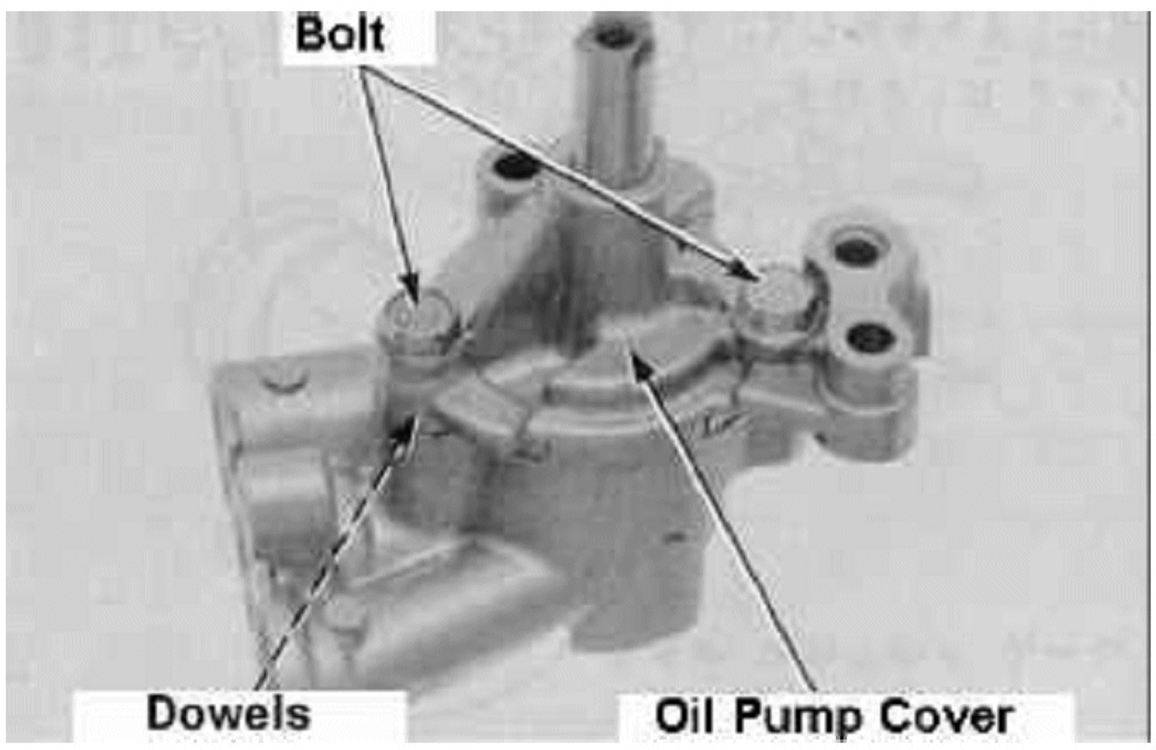
Oil Valve Inspection

Inspect the pipe for jam/leak.
Inspect the O-ring for wear/damage.



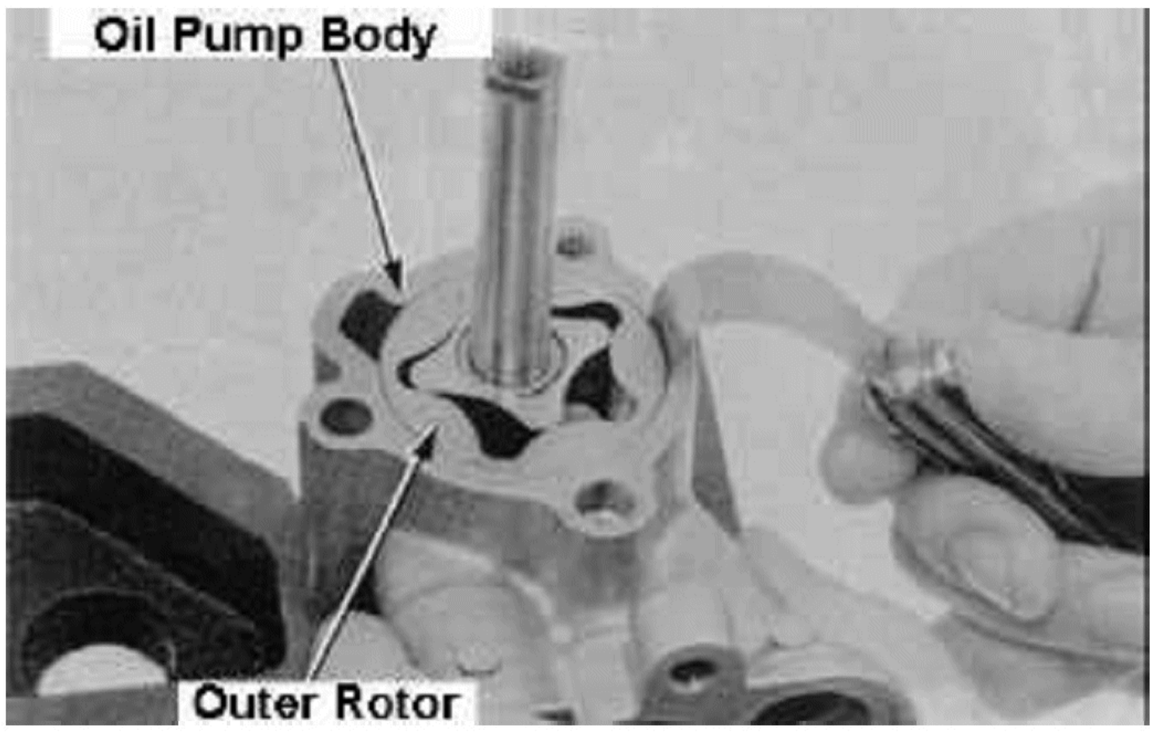
Disassembly/Inspection of Oil Pump

Remove the two bolts and remove the oil pump cover.
Remove the dowels.



Measure the clearance between the oil pump body and the Outer rotor.

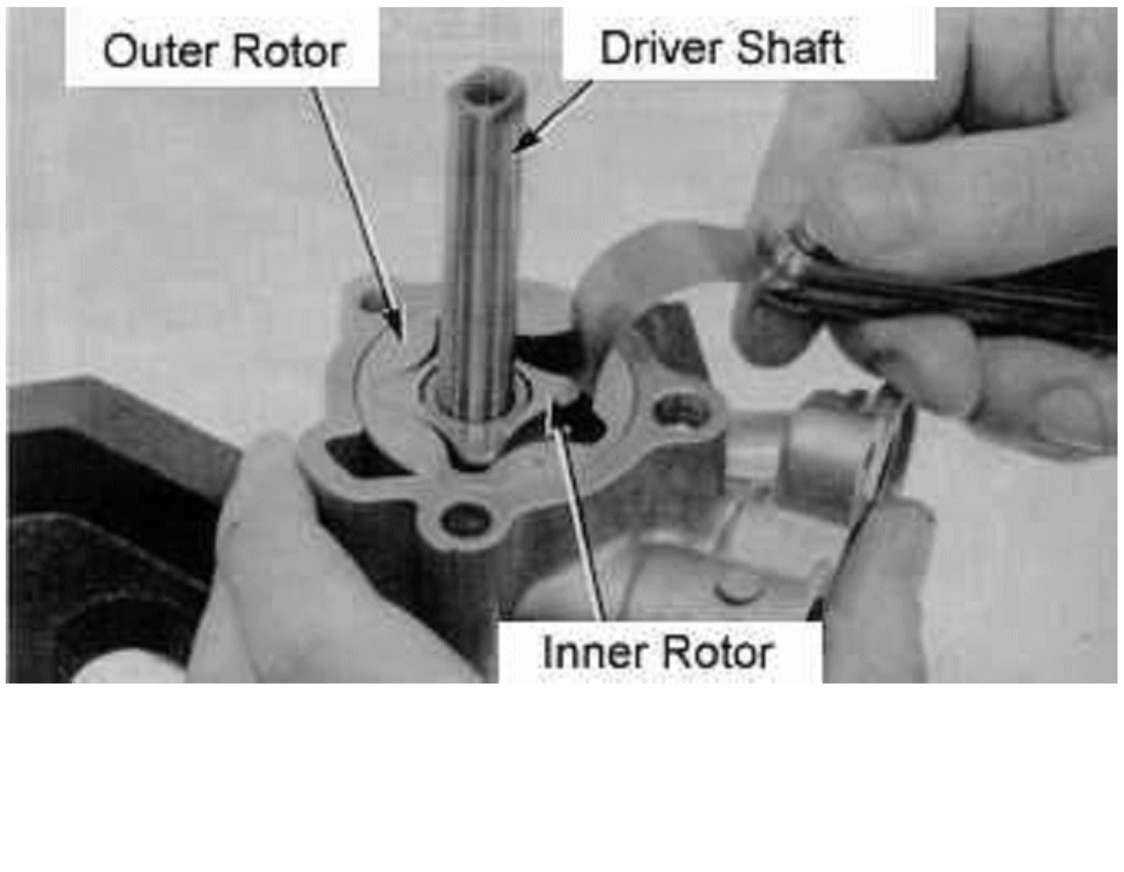
0.35mm or more → replace.



Measure the clearance between the inner rotor and outer rotor (tip clearance).

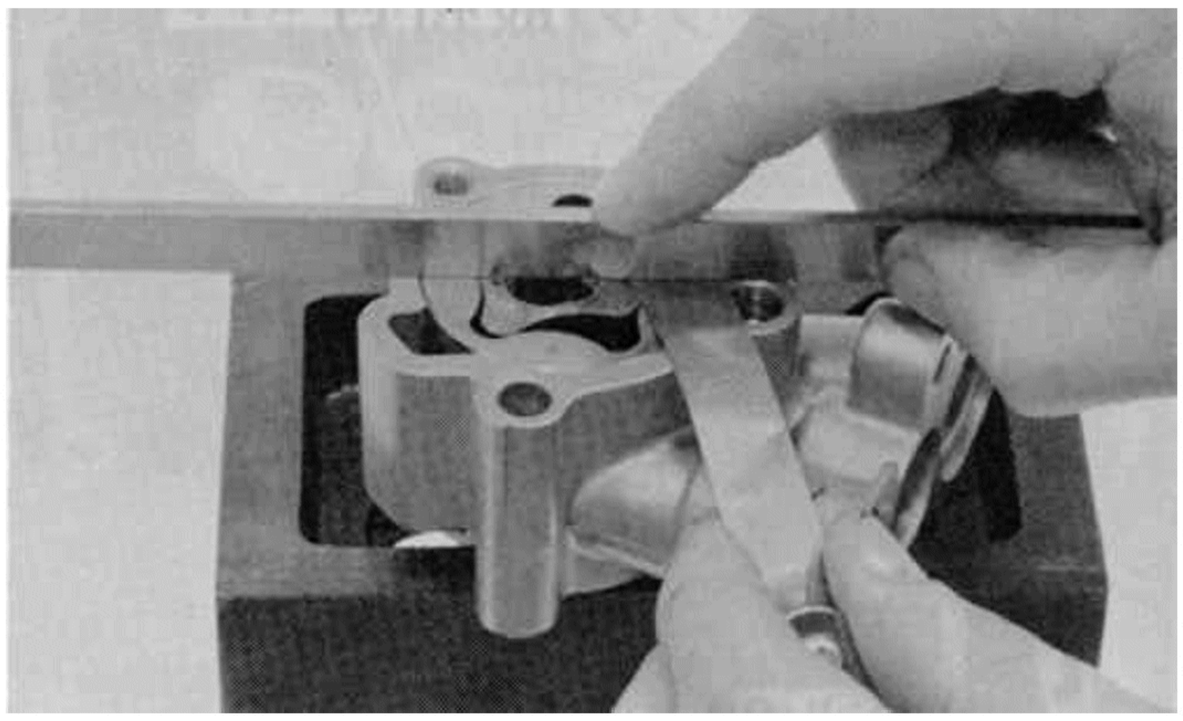
0.20mm or more → replace

Remove the oil pump drive shaft.



Measure the clearance between the edge surface of inner/outer rotor and the pump body.

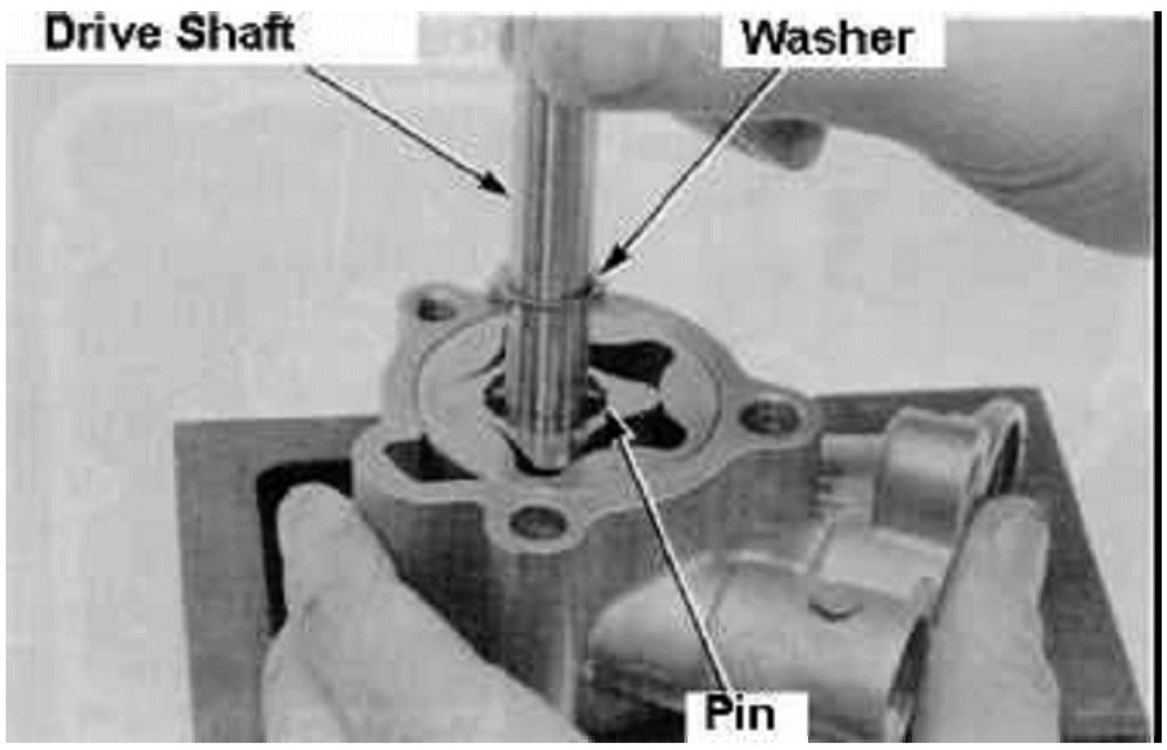
0.10mm or more → replace.



Assembly of the Oil Pump.

Clean each parts before assembly and keep them away from debris.

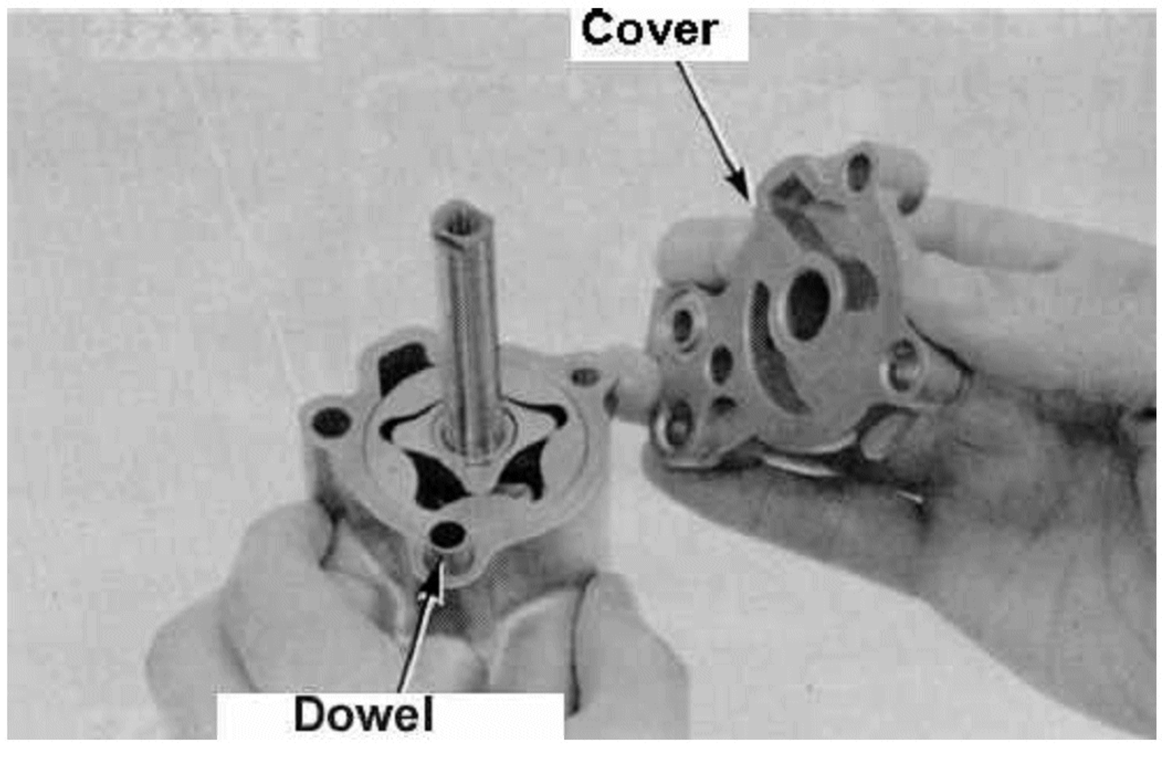
Apply the specified oil to the contact surface of the oil pump. Insert the pin in the pump shaft and attach the thrust washer.
Align the key slit on the inner rotor and the pin and attach the drive shaft to the oil pump body.

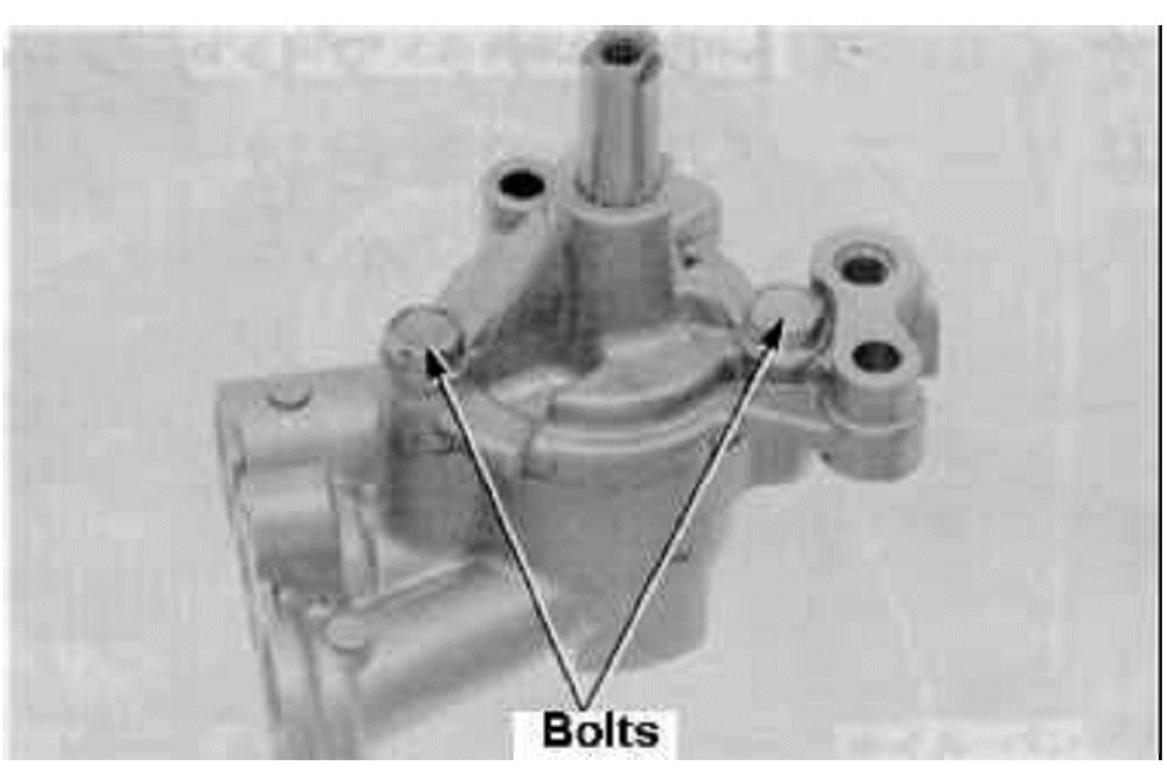


Attach the dowels to the oil pump body.

Attach the oil pump cover.

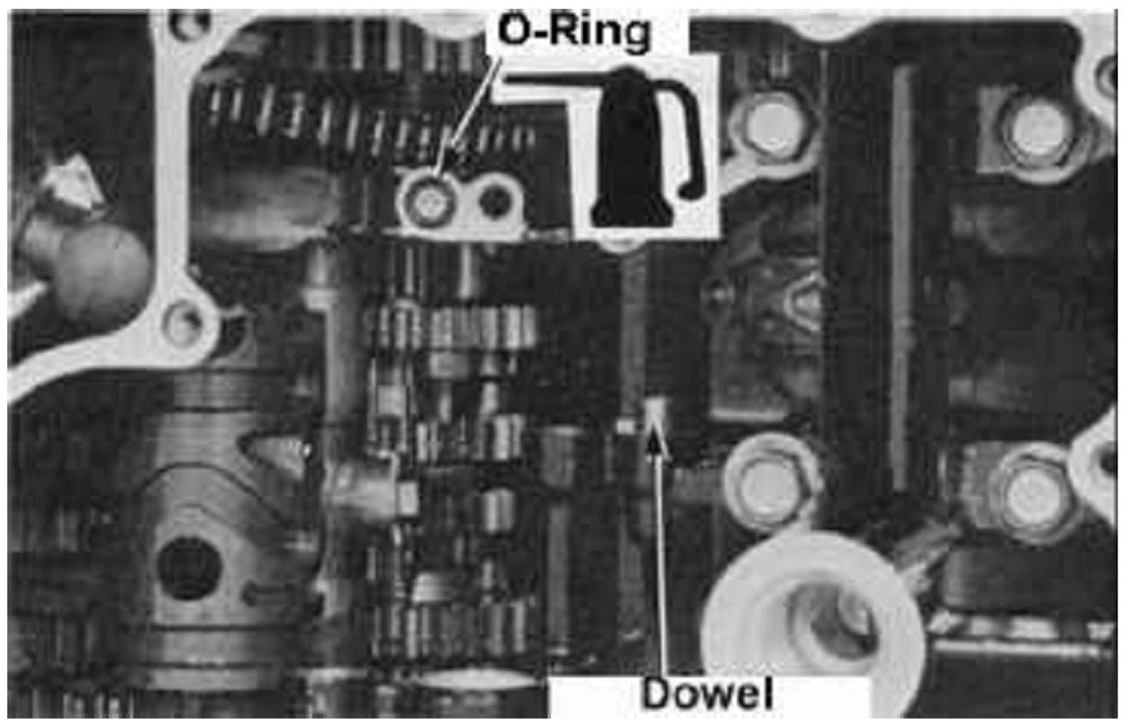
Attach two bolts and rotate the drive shaft to check for smooth movement.



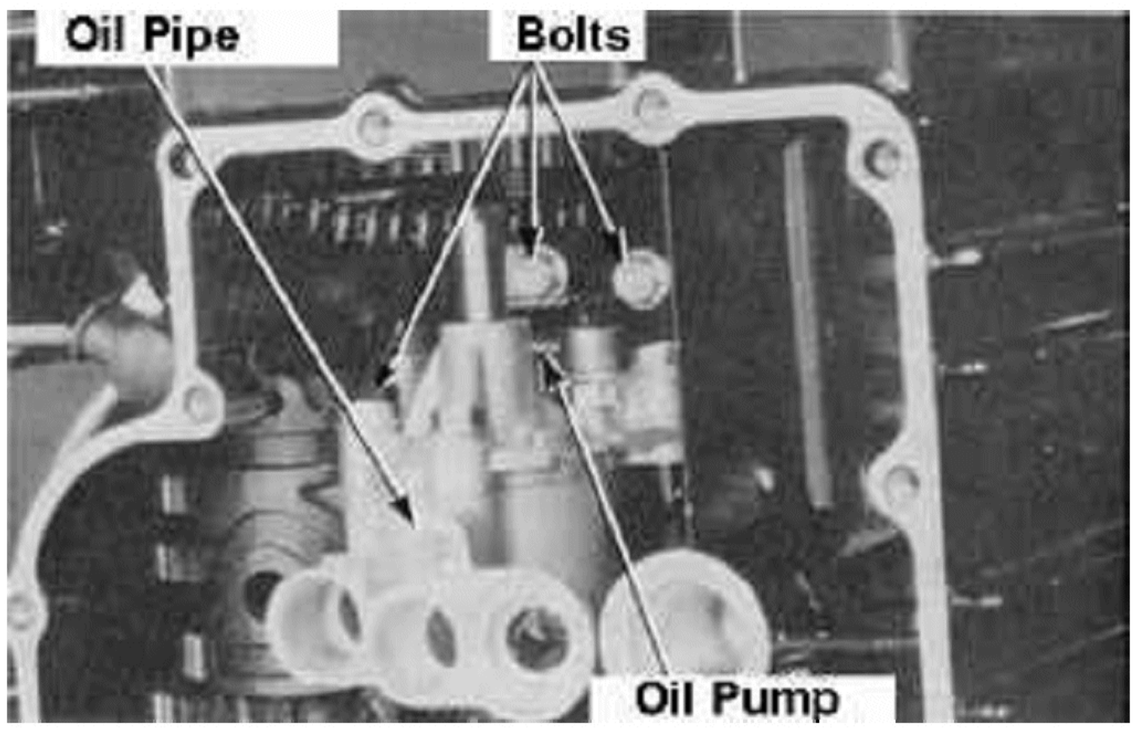


Attachment of the Oil Pump

Attach the dowel.
Apply oil to the O-ring and attach.

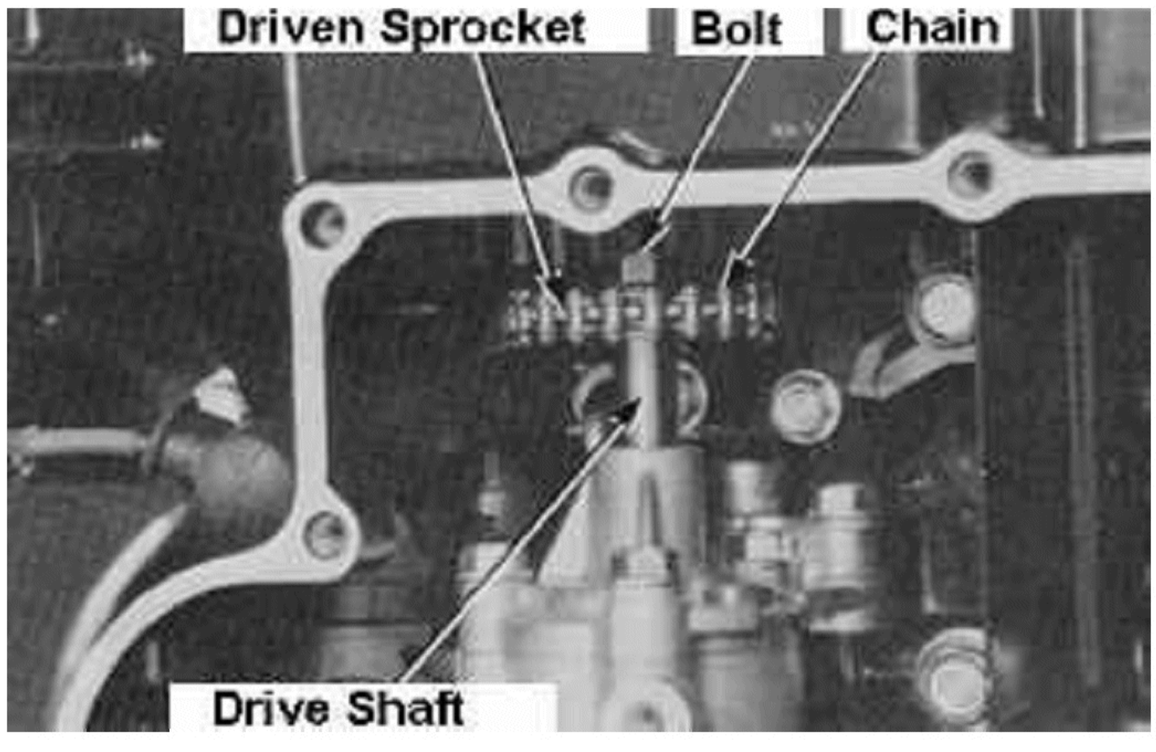


Attach the oil pump, oil pipe and tighten the three screws.



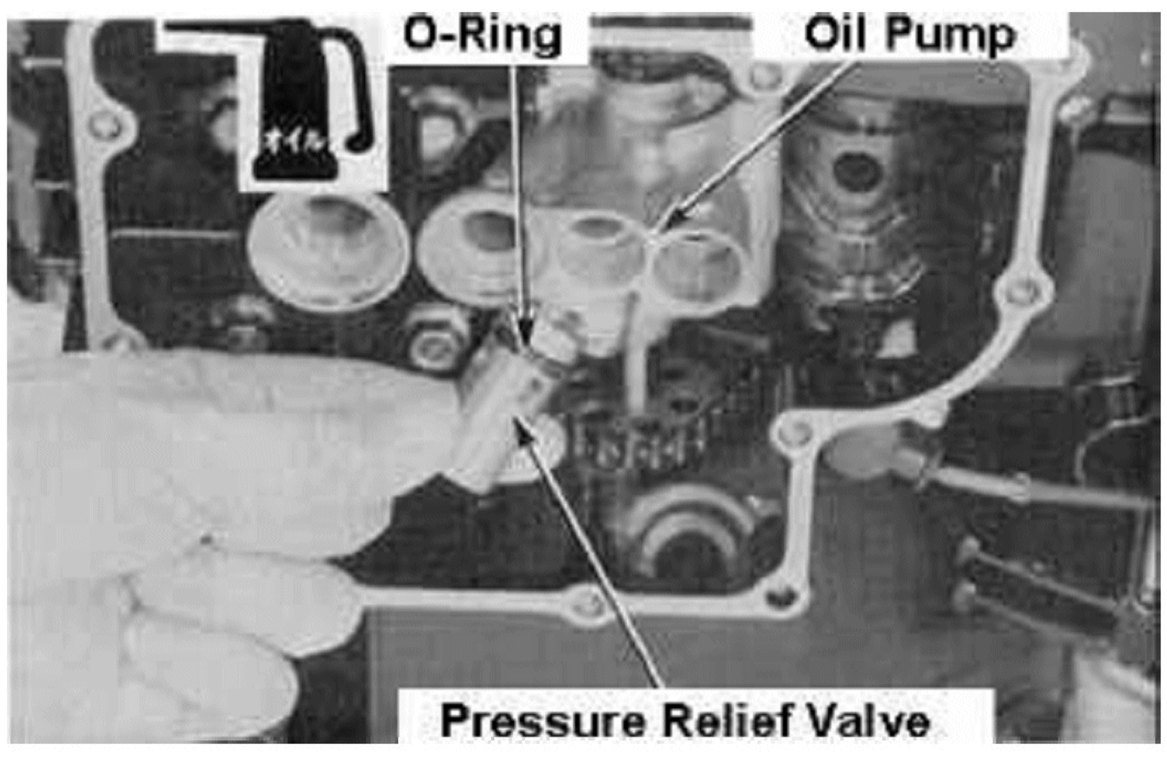
Attach the drive chain to the oil pump driven sprocket and attach to the drive shaft.
Apply locking agent to the bolt and tighten with washers fitted.

Tightening torque : 1.3~1.7KGm

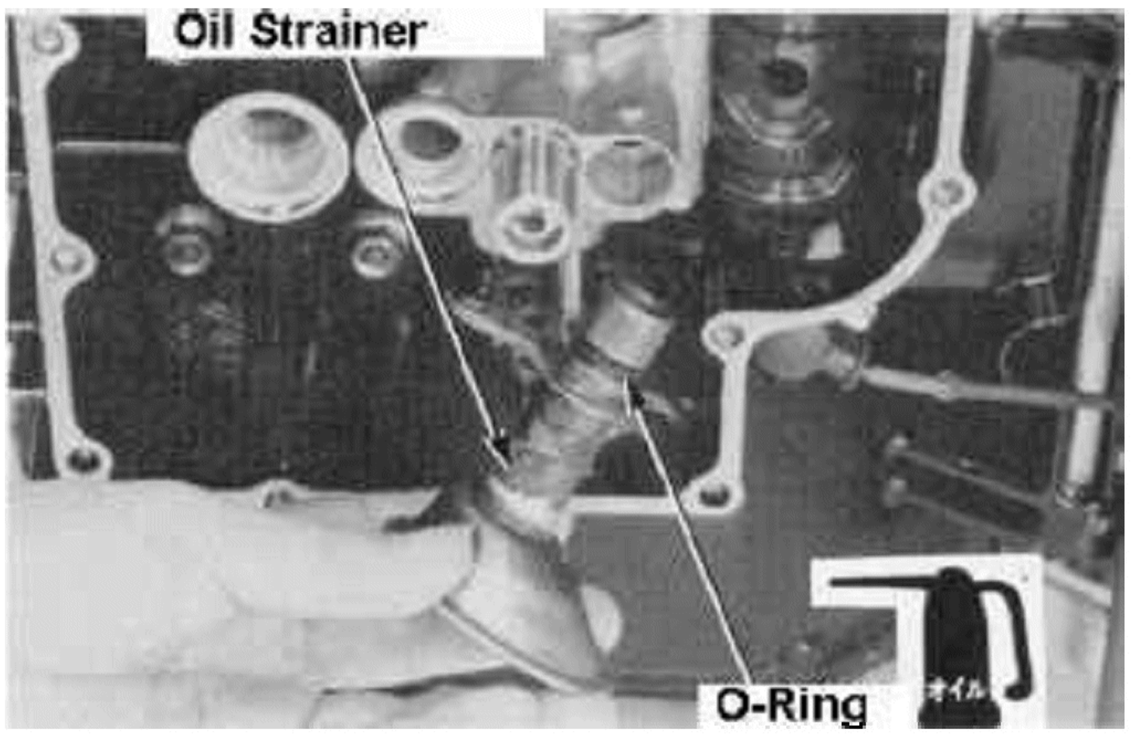


Attachment of the Oil Strainer Pressure Relief Valve

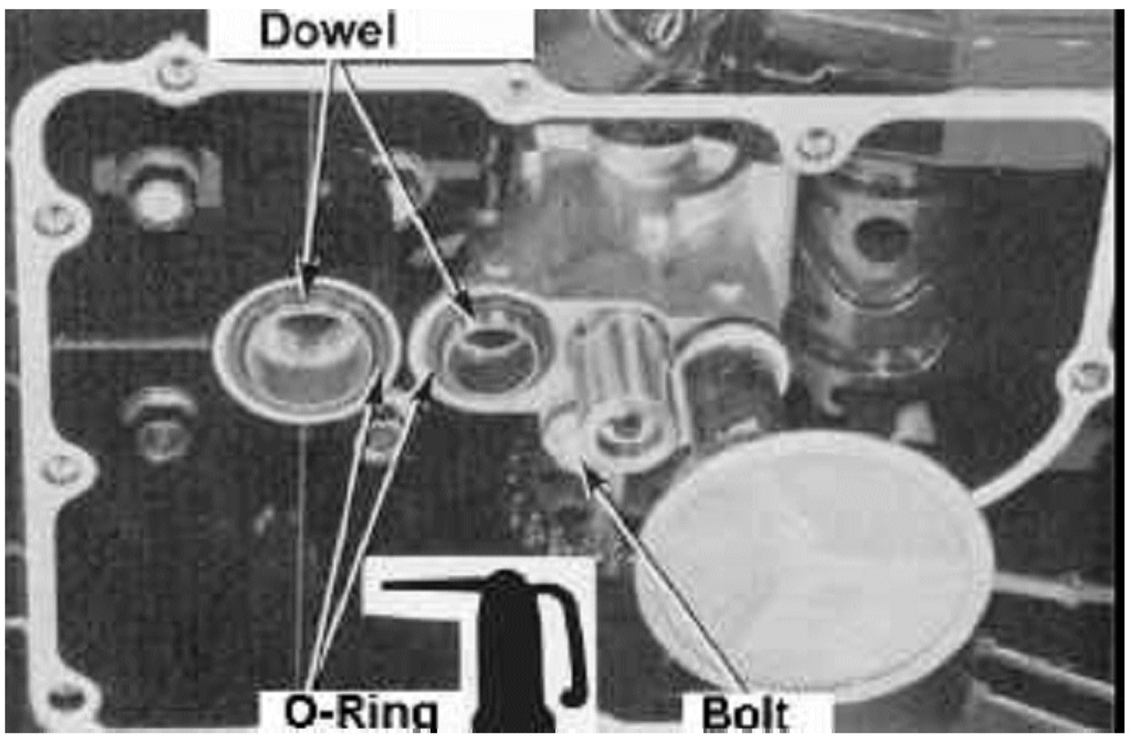
Apply oil to the pressure relief valve's O-ring and attach to the oil pump.



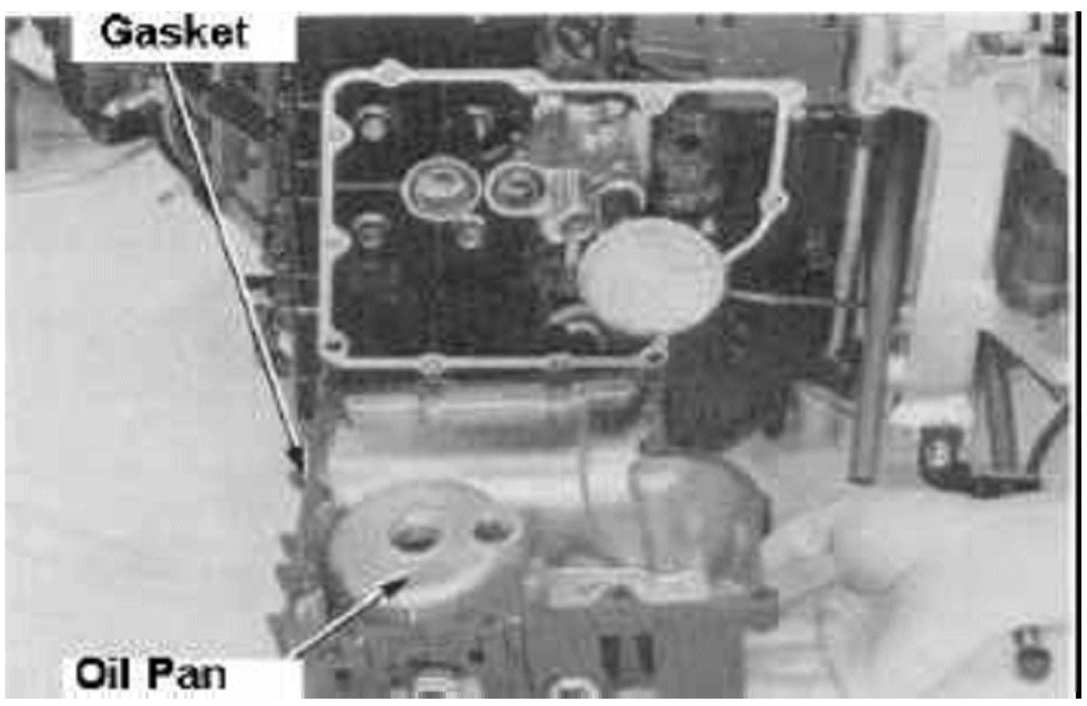
Apply oil to the O-ring for the oil strainer and attach to the oil pump.



Tighten the bolt for the oil strainer.
Attach the dowel, attach the O-ring after applying oil on it.

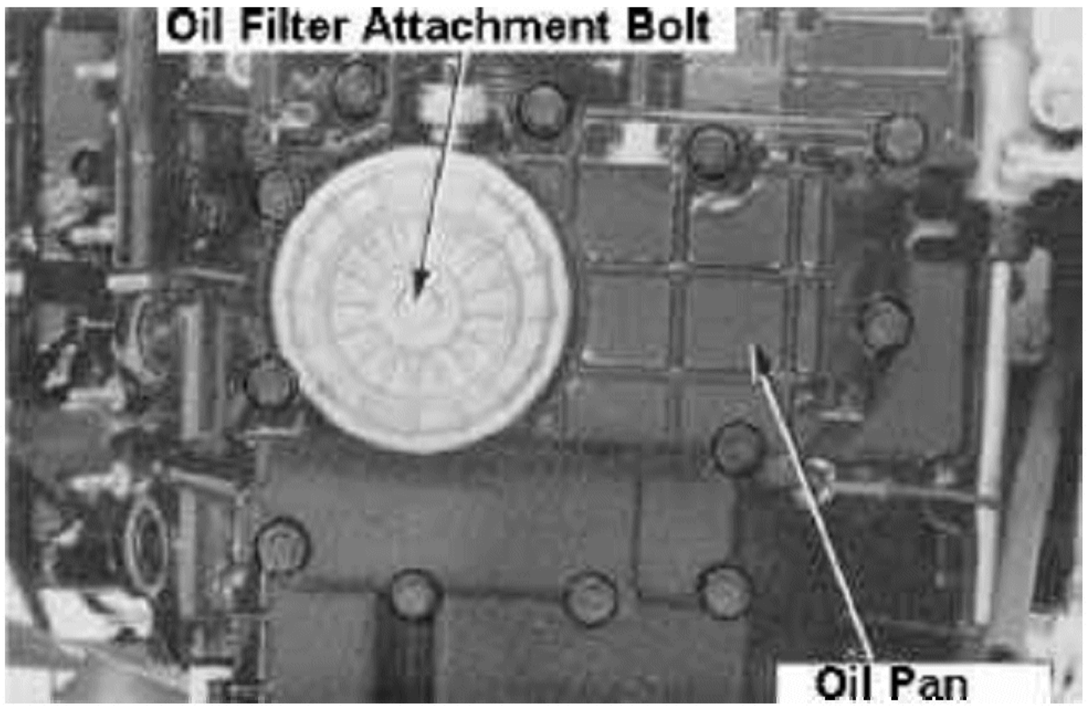


Clean the oil pan and attach with new gaskets.



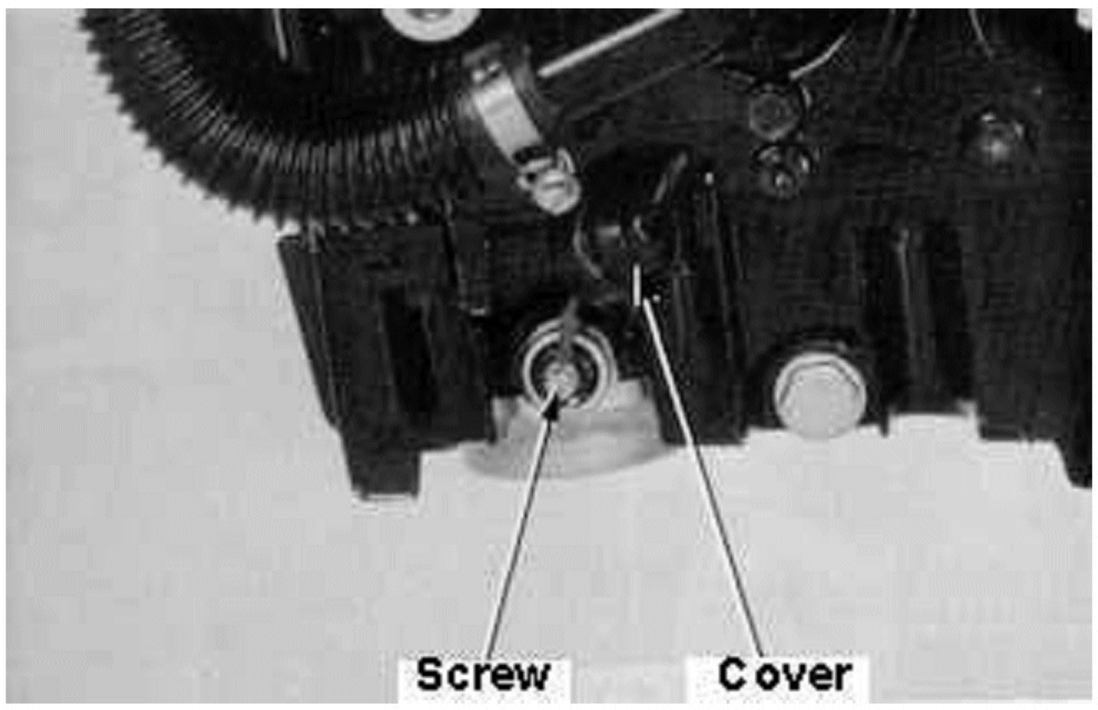
Attach 12 oil pan attachment bolts.
Attach the oil filter attachment bolts.

Tightening torque : 1.5~2.0kgm

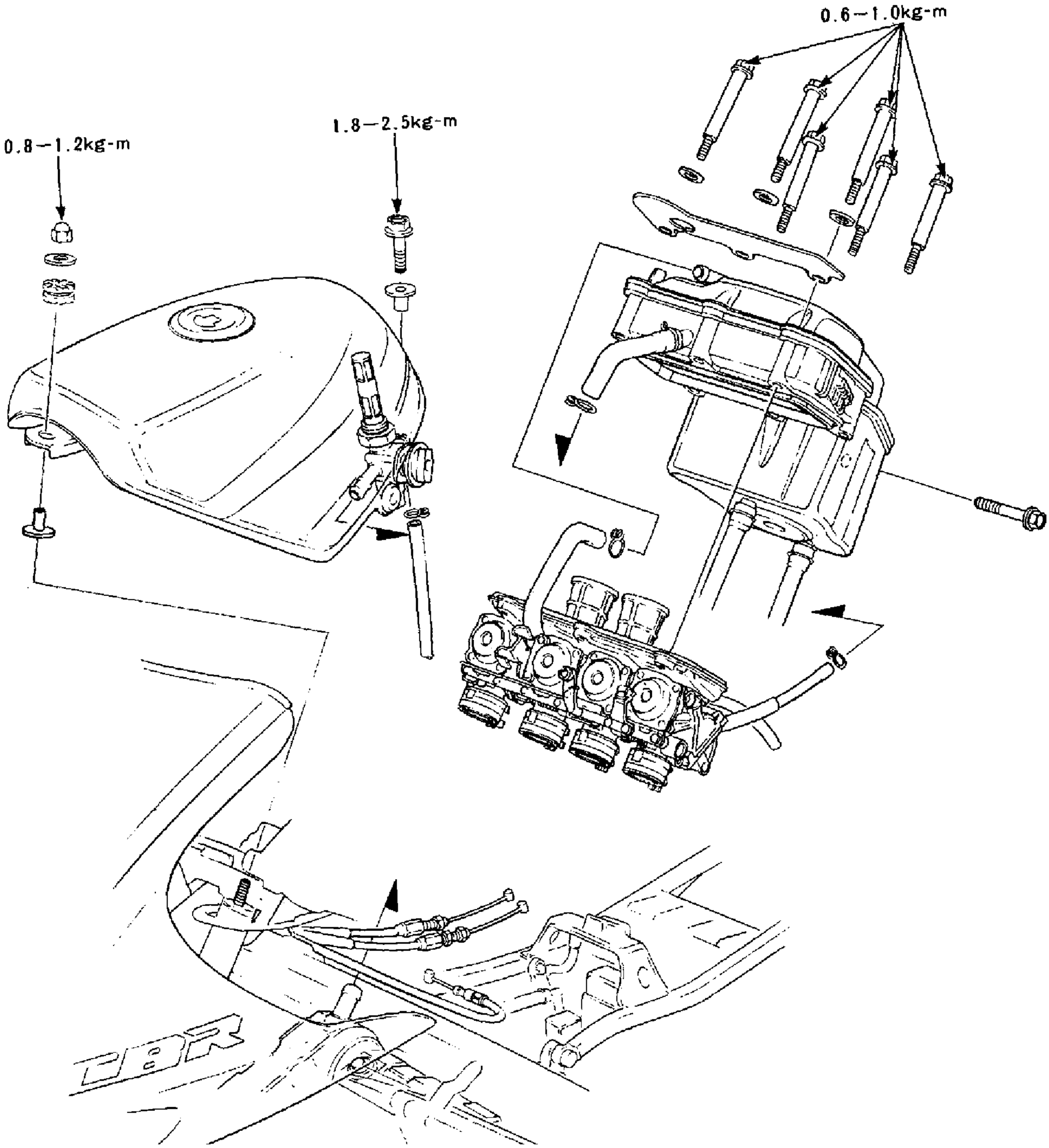


Tighten the oil pressure switch screw and attach the cover.

Fill the engine oil (2-17).
Attach the exhaust pipe (16-2).
Start the engine and confirm there is no oil leak.



- **Assembly**



Assembly	4 – 0	Air cleaner case	4 – 6
Maintenance Information	4 – 1	Carburettor	4 – 8
Troubleshooting	4 – 2	Pilot screw adjustment	4 - 18
Fuel Tank	4 – 3	Carburettor synchronism adjustment	4 - 19
Fuel auto cock	4 - 4		

- **Maintenance Information**

General Caution

- Do not overstress the cables to bend or twist. Damaged or deformed cables may cause failure or binding.
- Exercise caution to avoid flames when handling fuel.
- Always check the position of O-Ring when installing them. Replace with new ones upon assembly.
- Before disassembly, loosen the drain screw in float chamber and collect the drained fuel with a tray.
- The vacuum chamber and float chamber are able to accessed without removing the carburettor.

Maintenance Standard

Item		Standard Value
Venturi Diameter		25mm
Setting Mark		VG01A
Fuel level		7mm
Main jet		#85
Slow jet		#35
Idle speed		1,500 ± 100rpm
Free movement of a throttle grip		2 – 6mm
Air screw		2-½ turns
	Total	14 l
	Reserve	2.5 l

Tightening Torque

Fuel cock	2.0 – 2.5kg-m
Fuel tank attachment nut	0.8 – 1.2kg-m
Fuel tank attachment bolt	1.8 – 2.5kg-m
Air cleaner case	0.6 – 1.0kg-m
Air cleaner duct	0.5 – 0.8kg-m

Tools

Common Tools

Float level gauge	07401 – 0010000

Measuring Tools

Vacuum gauge	07404 – 0020000

- **Fuel System Troubleshooting**

Starter Engages, but fails to start

- No fuel in a tank.
- Fuel is not reaching to the carburettor.
- The engine is flooded with fuel.
  - Clogged fuel filter.
  - Clogged fuel tube.
  - Float valve fixed in one position.
  - Inadequate fuel level.
  - Clogged air vent hole on a tank cap.
  - Fuel Auto cock failure.
  - Clogged/damaged vacuum tube.
- No sparks (→Sec.18)
- Clogged air cleaner element.
- Manifold air leak.
- Throttle grip failure.

Difficult to start/starts but stops soon.

- Faulty ignition (→sec. 18)
- Faulty synchronizing.
- Faulty carburetor.
- Bad quality fuel.
- Vacuum leak from manifold.
- Faulty bistarter valve.
- Choke lever, cable failure.

- Inadequate tappet clearance (→Sec.2).

Unstable idling.

- Faulty ignition (→18)
- Inadequate idling.
- Inadequate synchronizing.
- Faulty carburettor.
- Bad quality fuel.
- Clogged air filter.
- Vacuum leak from manifold.
- Inadequate tappet clearance (→2)

Misfire during acceleration

- Faulty ignition (-> Sec 18)
- Too lean mixture

After burn

- Faulty ignition (-> Sec18)
- Too lean mixture

Unable to achieve power/bad fuel consumptiion

- Clogged fuel system
- Faulty igniton
- Clogged air cleaner element

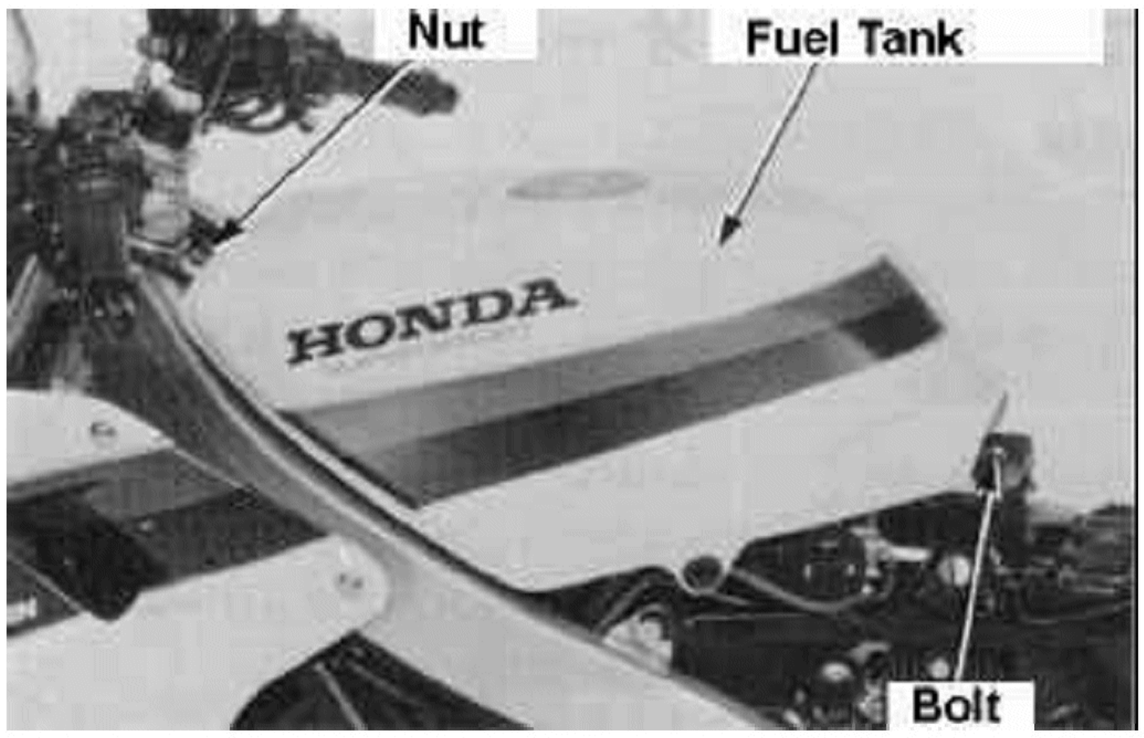
Too Lean Mixture

- Clogged fuel jet
- Faulty vacuum piston
- Faulty float valve
- Fuel level too low
- Clogged air vent on a fuel tank cap
- Clogged fuel strainer screen
- Clogged/bent/damaged fuel tube
- Clogged air vent tube
- Air from manifold
- Clogged fuel filter
- Faulty fuel auto cock
- Clogged./damaged vacuum tube
- Inadequate pilot screw adjustment

Too Rich Mixture

- Choke lever fixed in pulled position
- Faulty float valve
- Fuel level too high
- Clogged air jet
- Dirt on air cleaner element
- Inadequate pilot screw adjustment

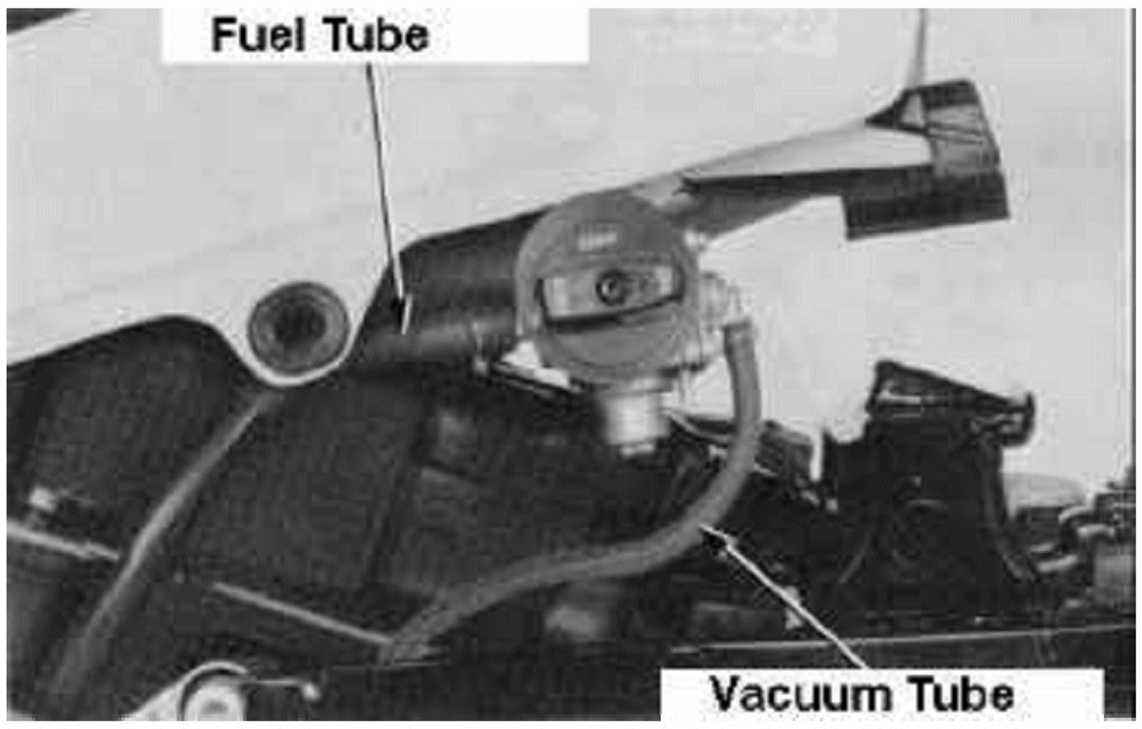
FUEL TANK



Removal

Watch out for flame.

Turn the fuel cock OFF.
Remove the seat, side cover.
Remove the tank attachment bolt/nut.

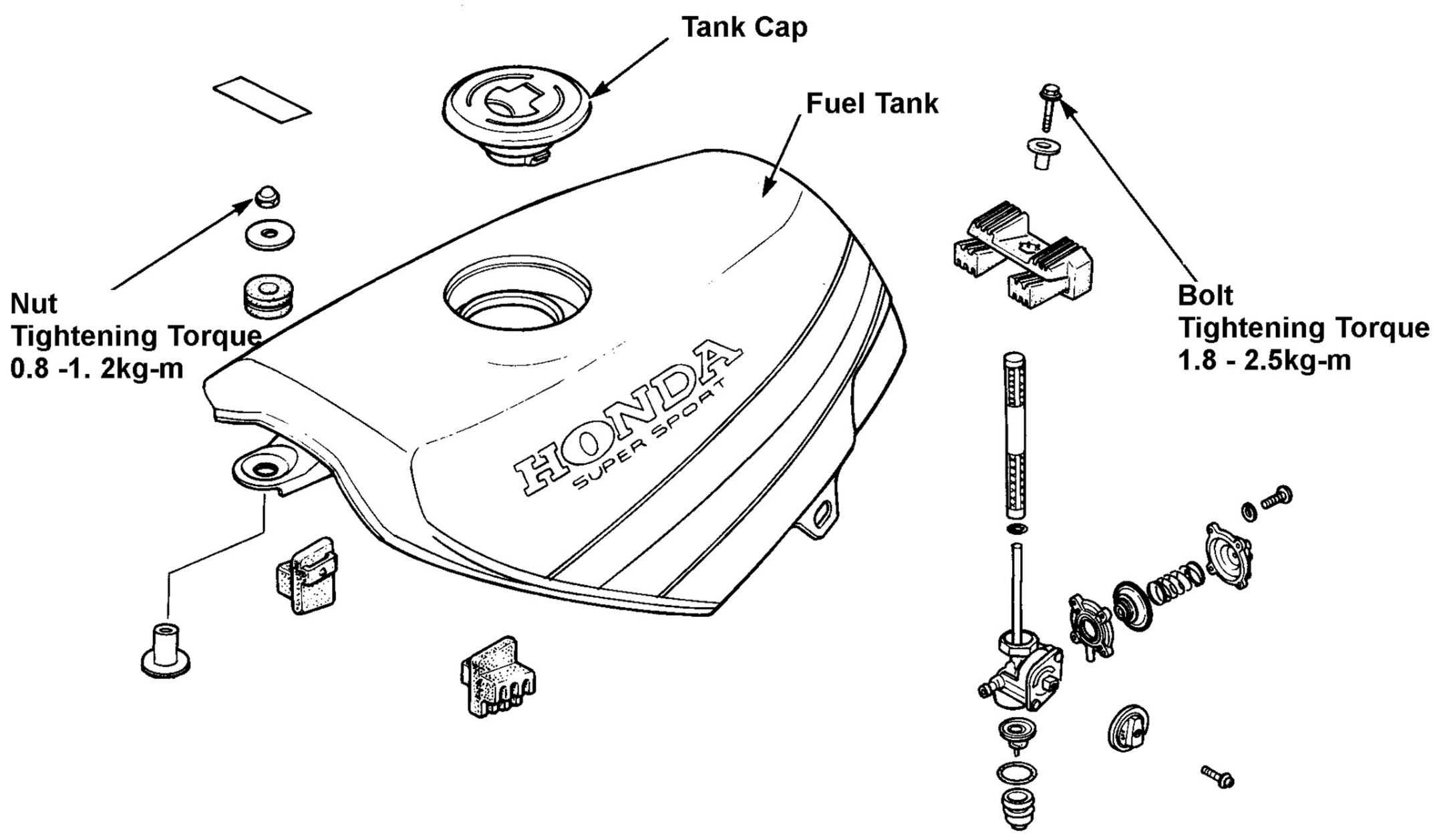


Remove the vacuum and fuel tubes and then the fuel tank.
Ensure the air ventilation hole on a tank cap is not clogged.

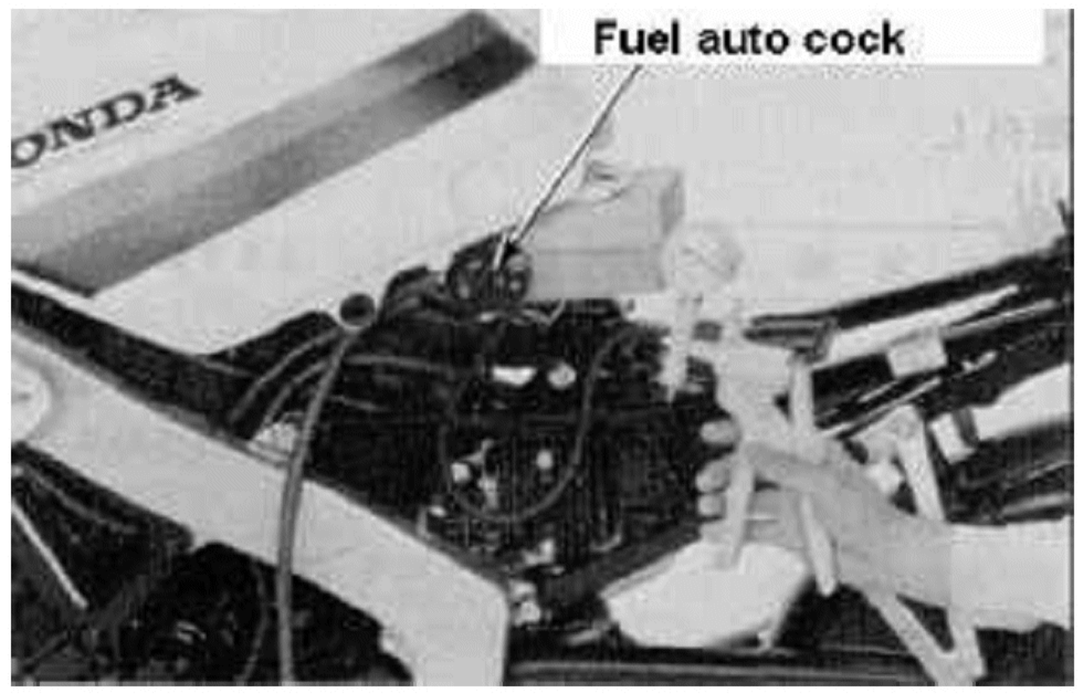
Installation

Reverse the above procedure.

Check for fuel leaks after installation.



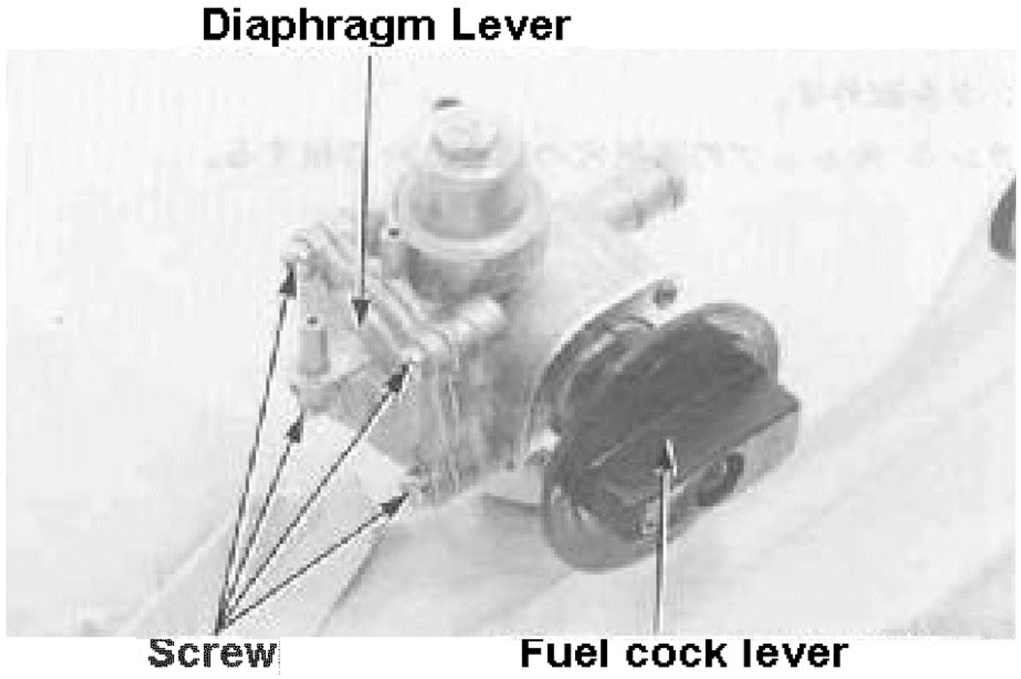
- **Fuel Auto Cock**



Inspection

Remove fuel tank (4-3)
Apply negative pressure to the vacuum tube for fuel auto cock with a vacuum pump, and inspect the (proper) fuel flow.
If the flow is not smooth, inspect the fuel filter and vacuum diaphragm. If the fuel flows without applying negative pressure, replace the diaphragm.

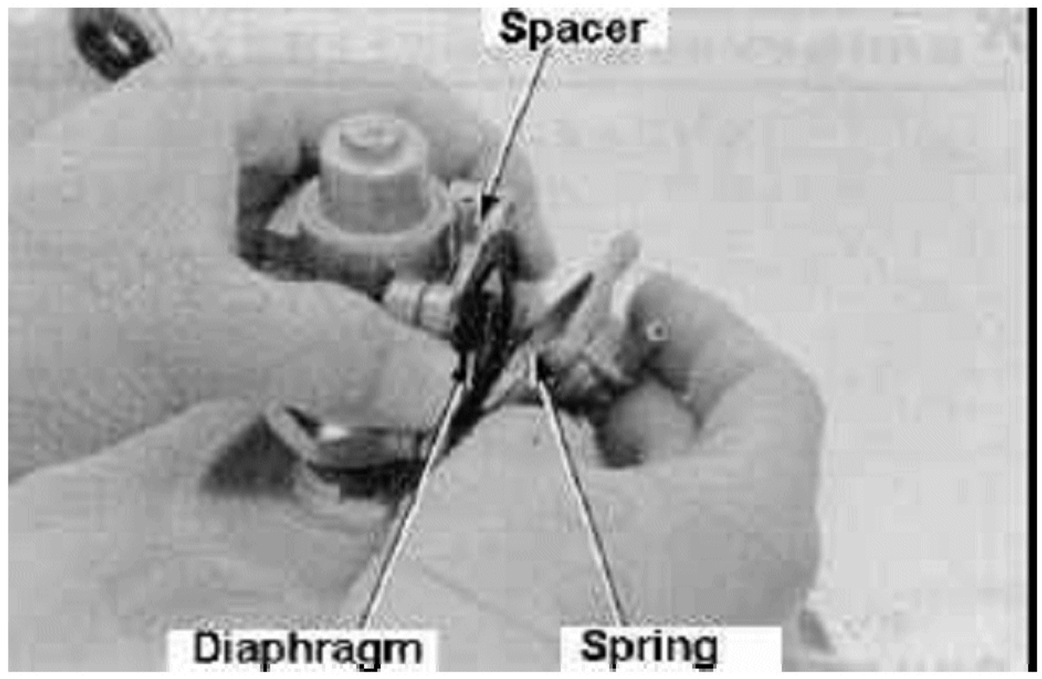
Place a clean tray underneath the fuel tube



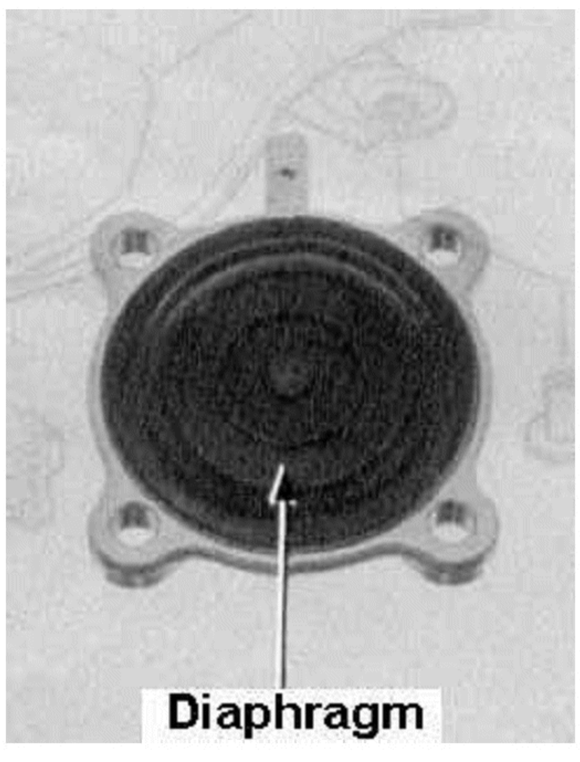
Disassembly

Remove the fuel cock lever.
Remove the four screws and remove the diaphragm cover.

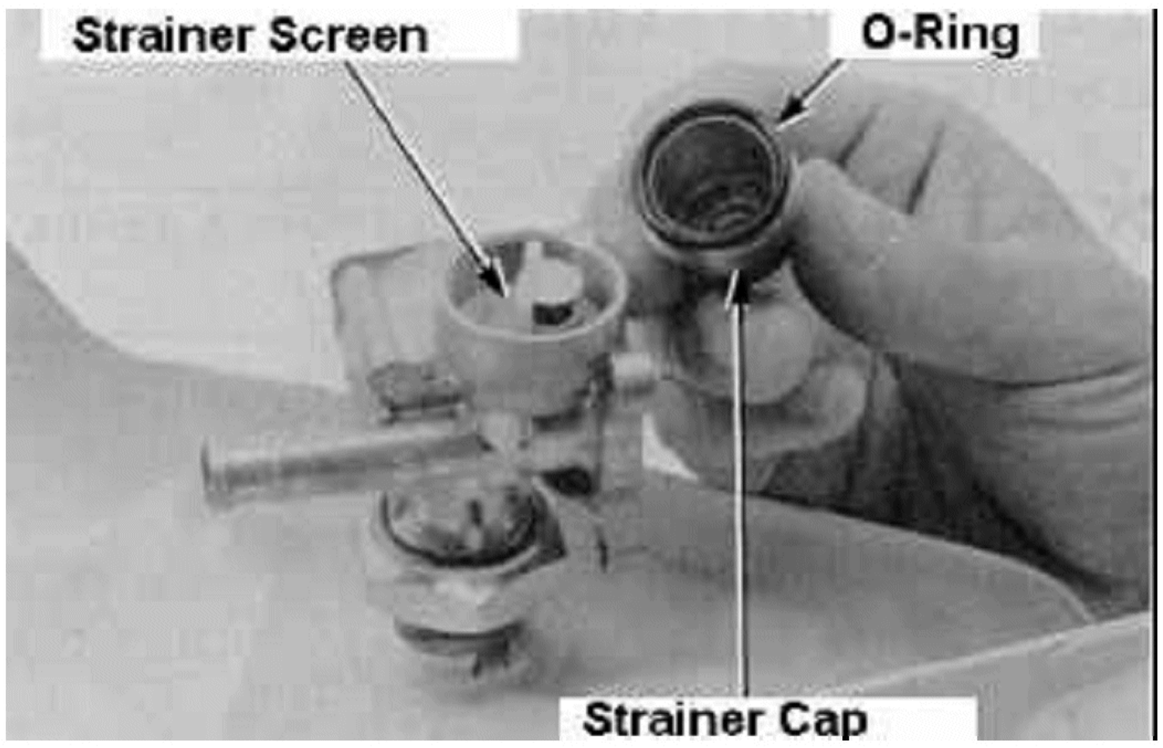
Remove the spring, diaphragm and the spacer.
Inspect the diaphragm spring for wear/damage.



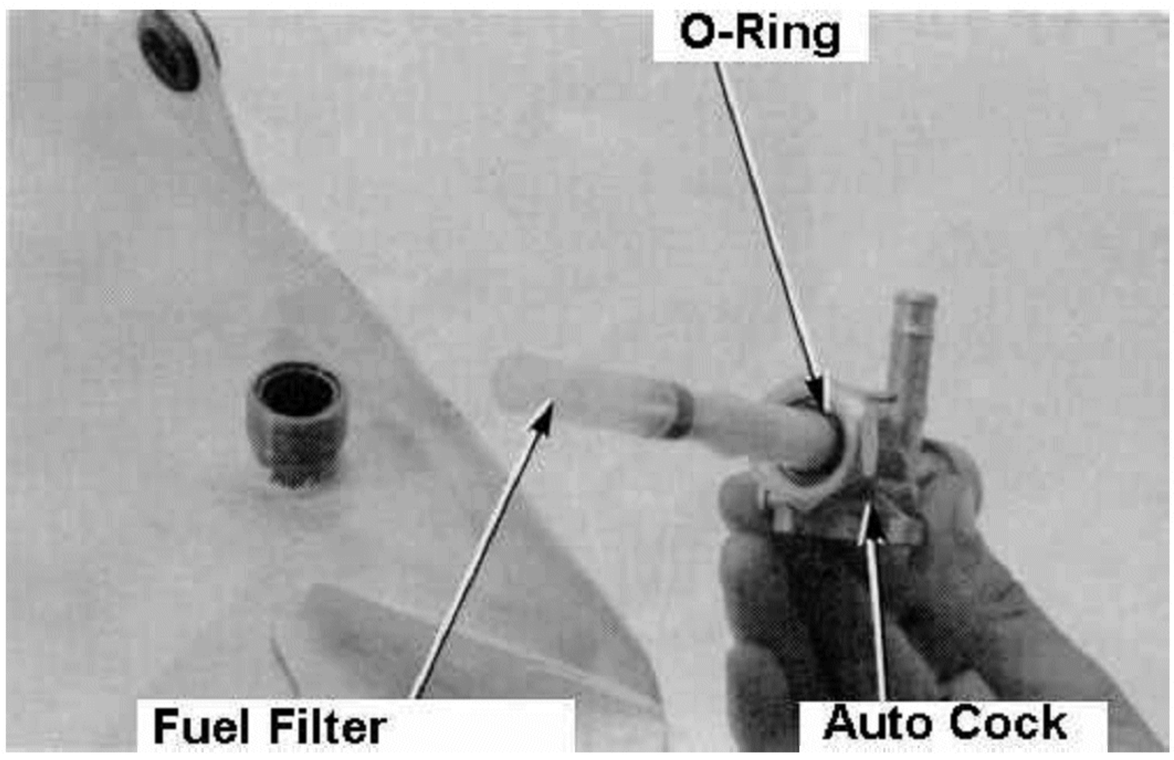
Inspect the diaphragm for wear, damage.



Remove the fuel strainer cap, O-ring, strainer screen.
Clean the strainer screen.
Inspect the O-ring for wear.



Loosen the locking nut and remove the fuel auto cock from fuel tank.
Remove the fuel filter and the O-ring.
Clean the fuel filter.
Inspect the O-ring for wear.



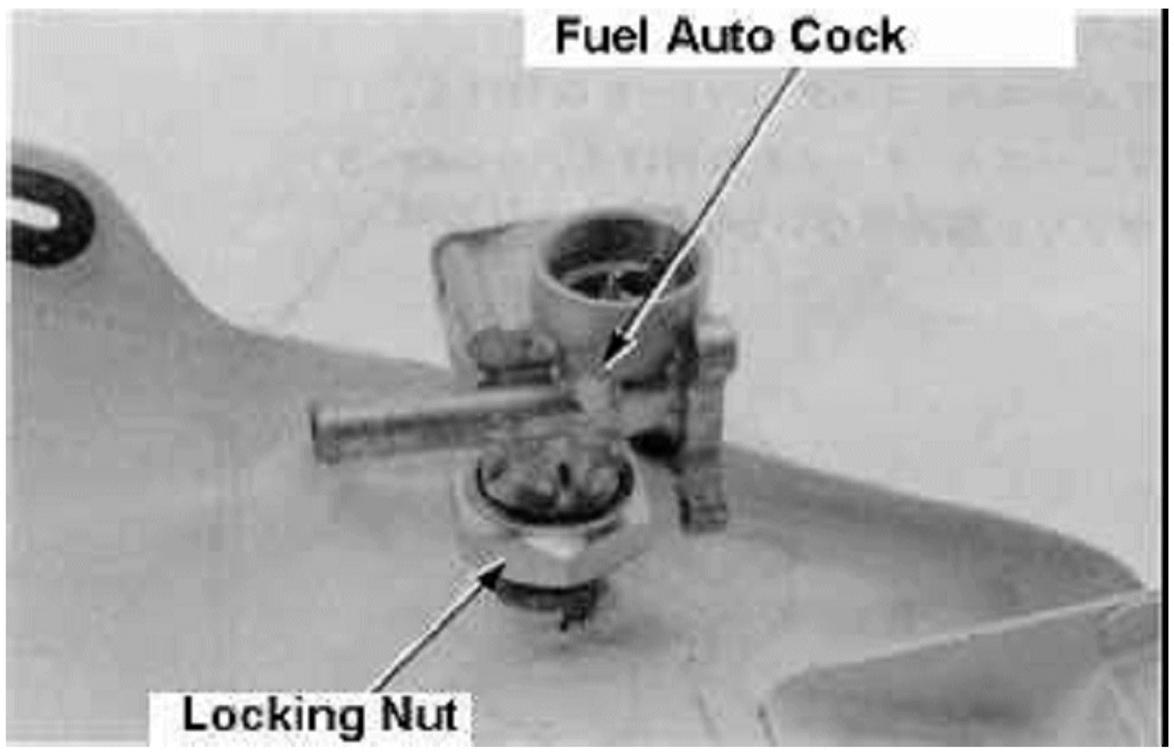
Assembly

Attach the fuel filter and the O-ring to the fuel auto cock.

Attach the fuel auto cock to the tank.

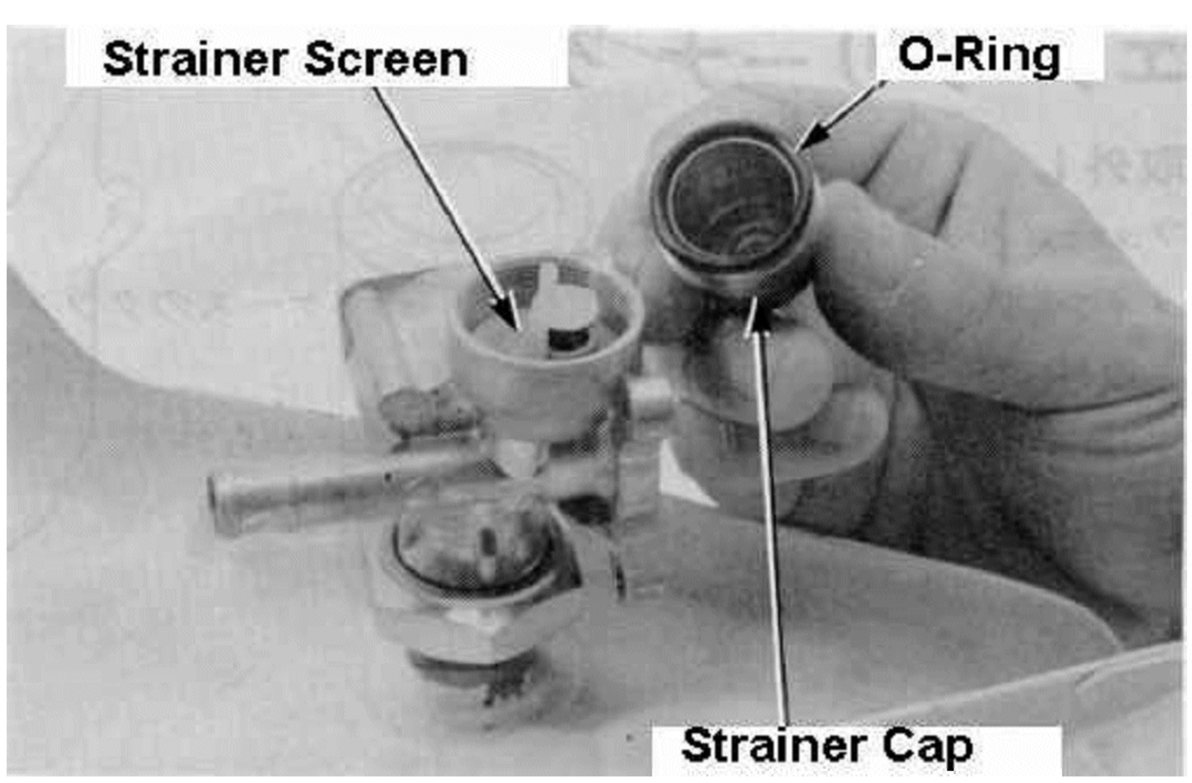
Tightening torque: 2.0~2.5kg m

Do not overtighten the locking nut.



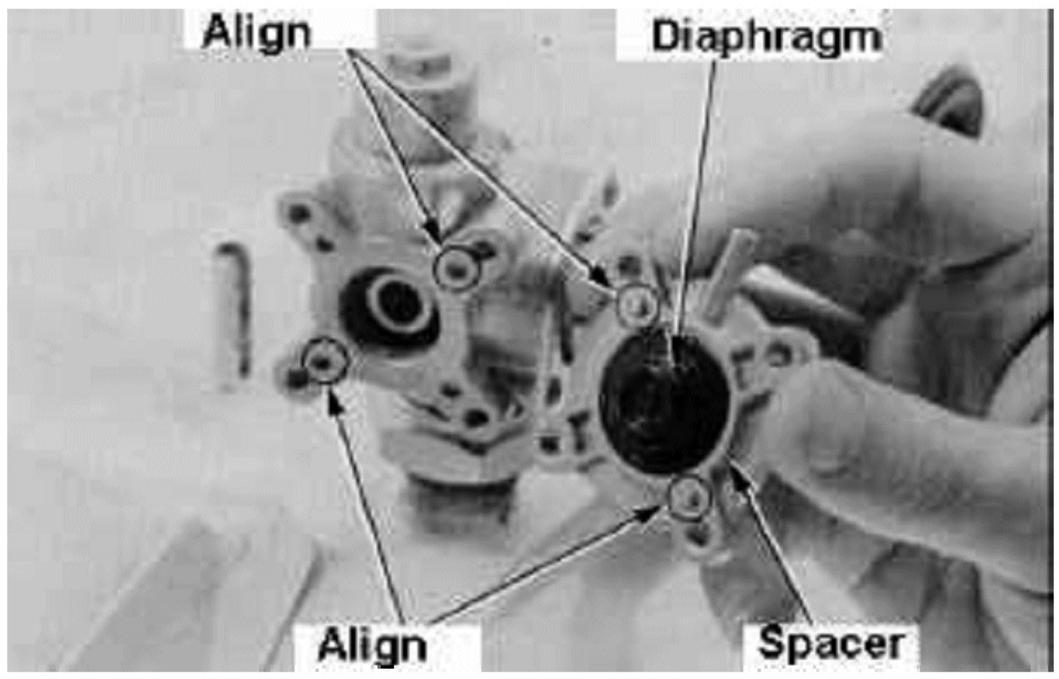
Attach the strainer screen.
Attach the O-ring to the strainer cap and attach the cap to the fuel auto cock.

Do not overtighten the fuel strainer cap.

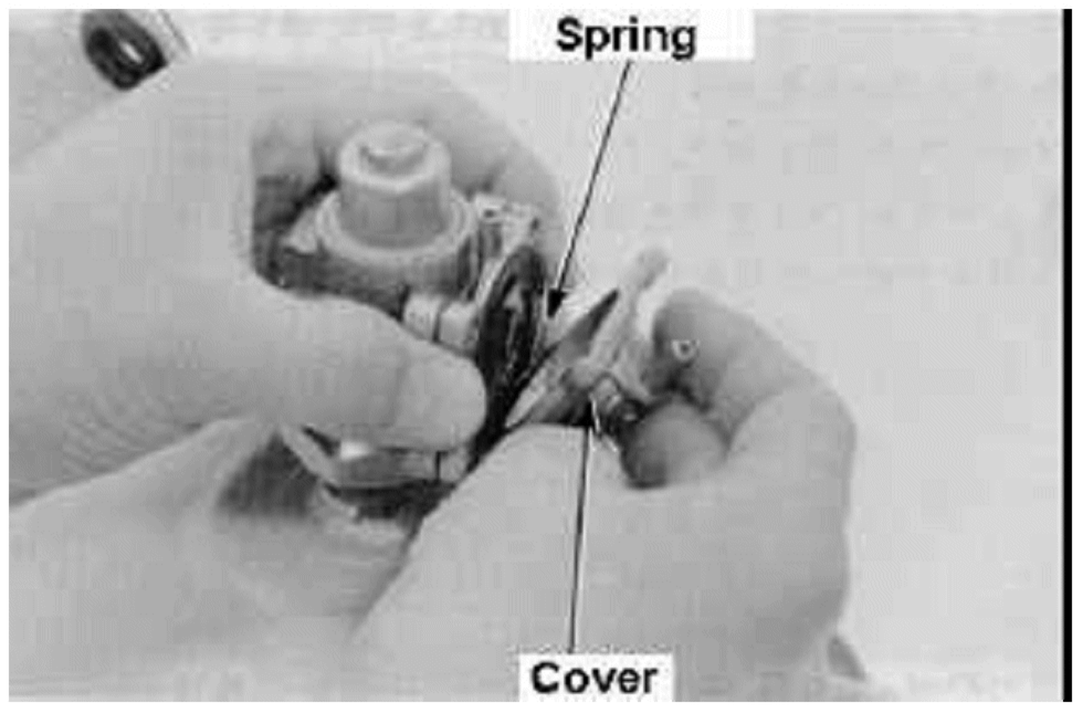


Attach the diaphragm to the spacer and attach to the fuel auto cock.

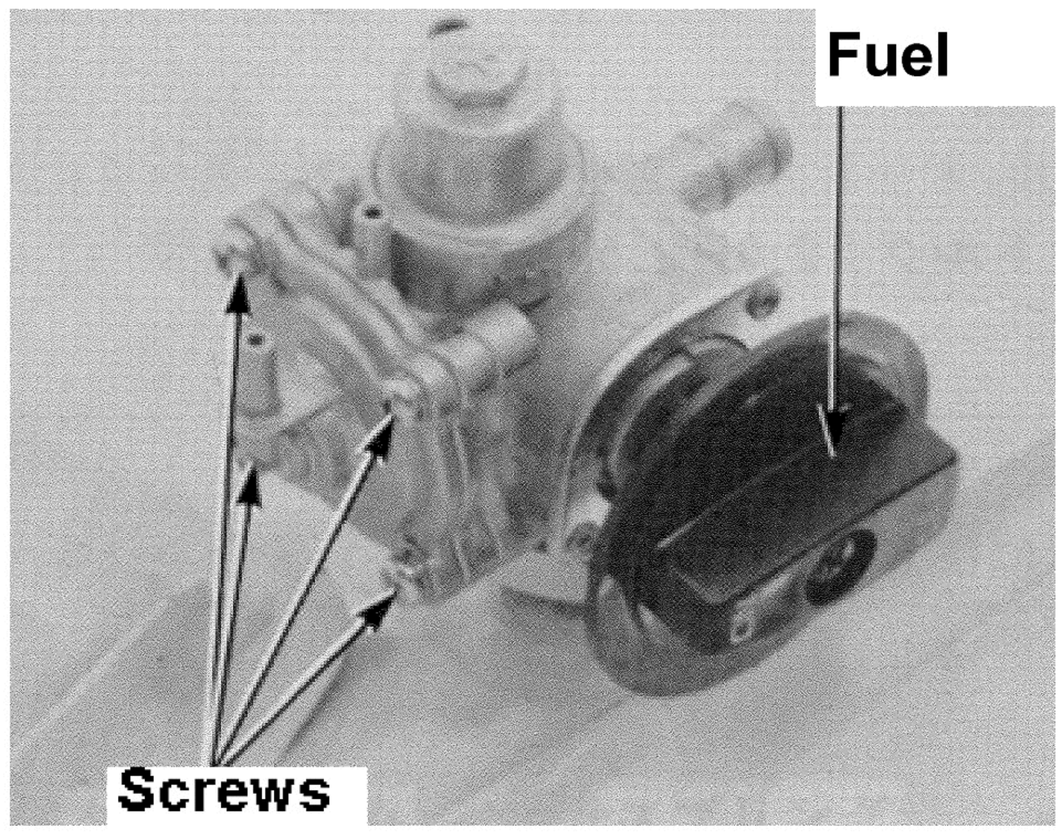
Align the spacer's projection with the hole on the fuel cock.



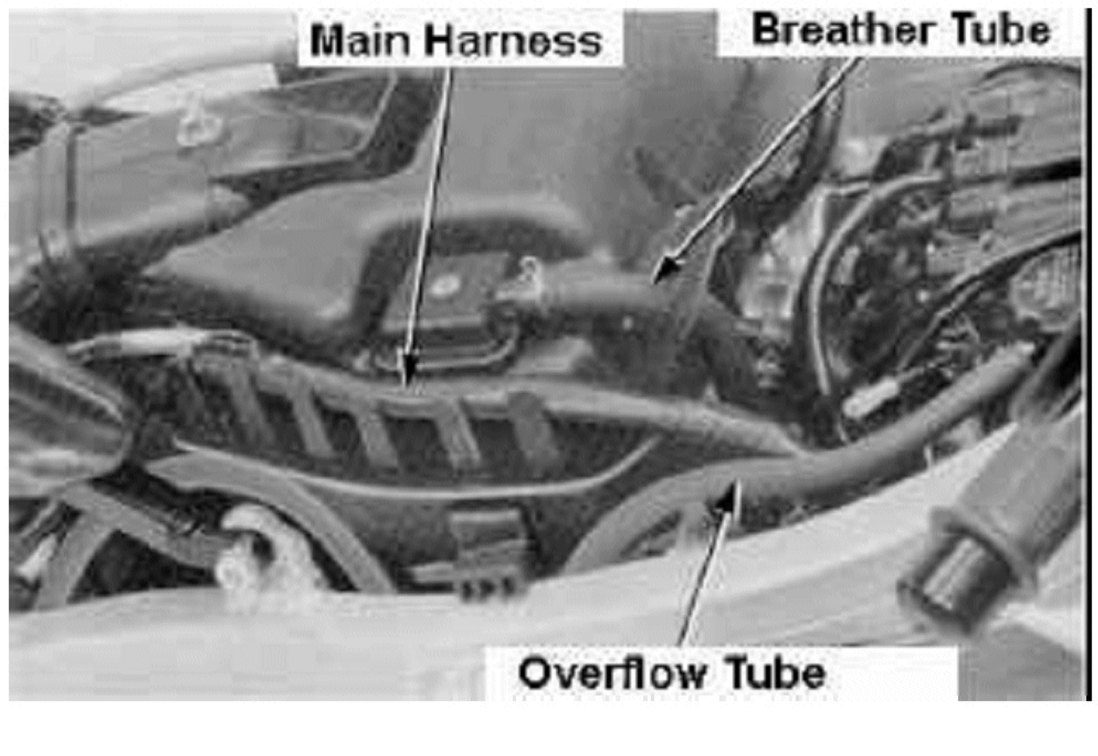
Attach the diaphragm spring and the diaphragm cover.



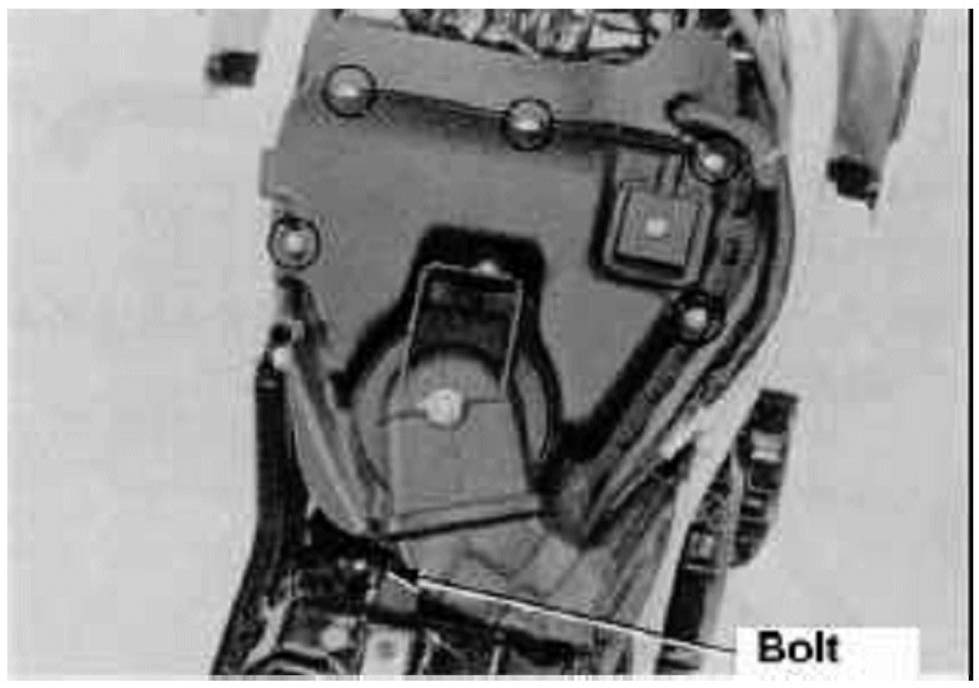
Tighten the four screws.
Attach the fuel cock lever.
Attach the fuel tank. (4-3).
Inspect for fuel leaks.



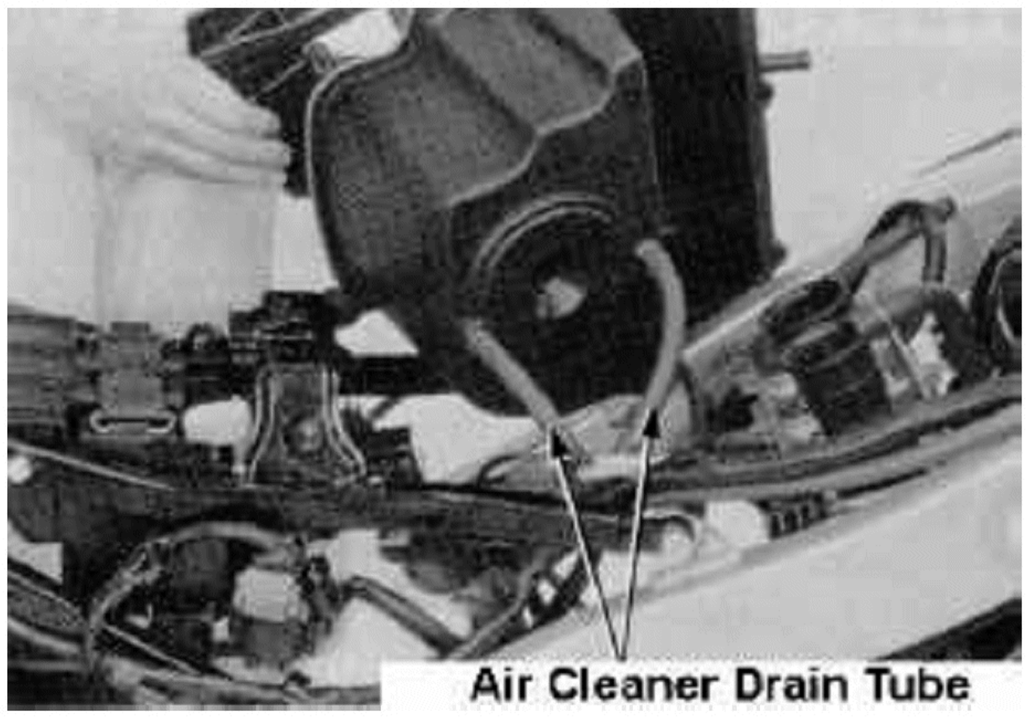
- **Air cleaner case**.
  Removal
  Remove the fuel tank.
  Remove the main harness from clamps on the air cleaner case.
  Disconnect the breather tube from the air cleaner case.



Remove the seven bolts for the air cleaner case.



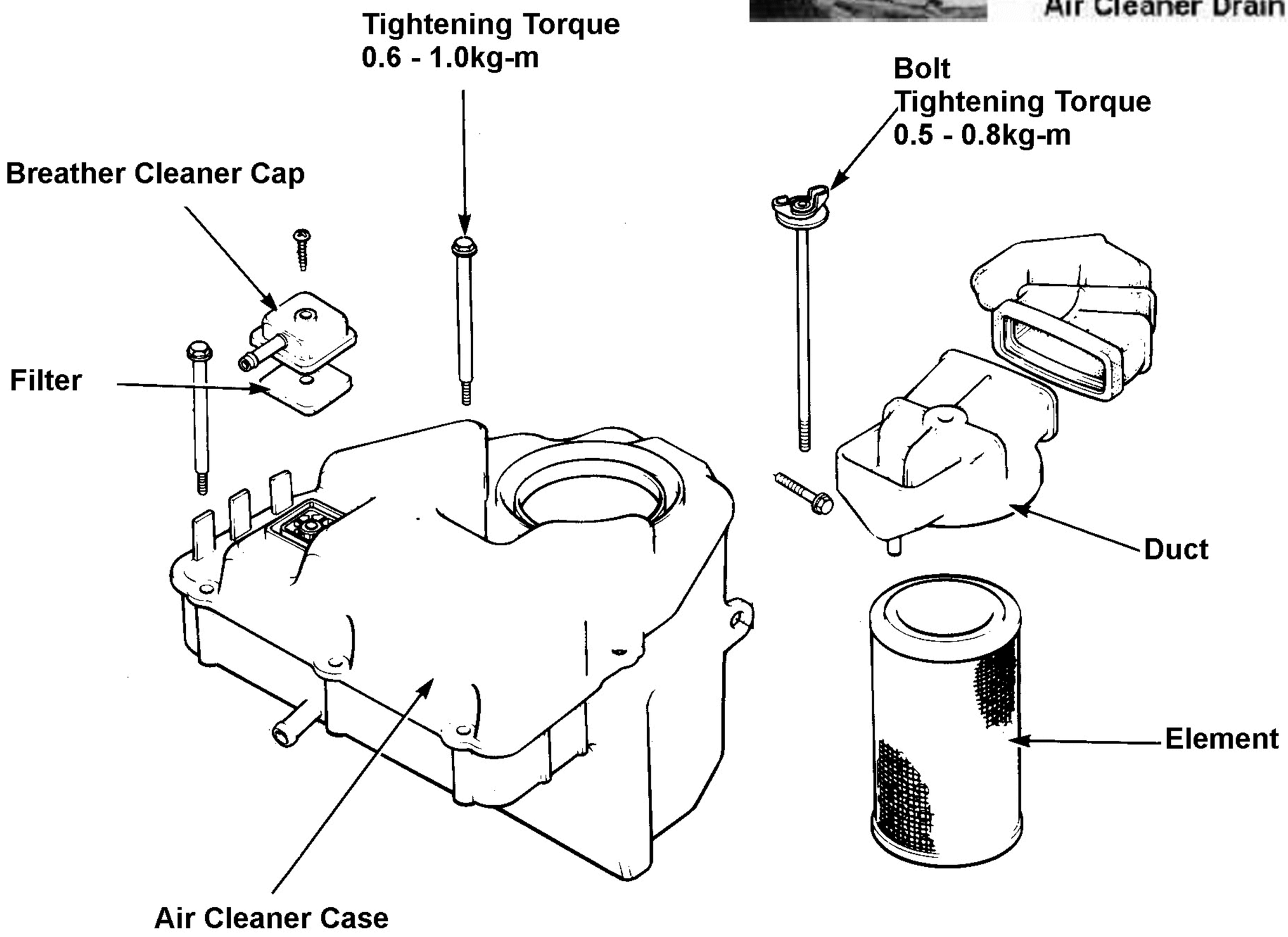
Disconnect the air cleaner drain tubes and remove the air cleaner.



Attachment

Reverse the above procedure.

Make sure the air cleaner drain tube and main wire harness are correctly attached.

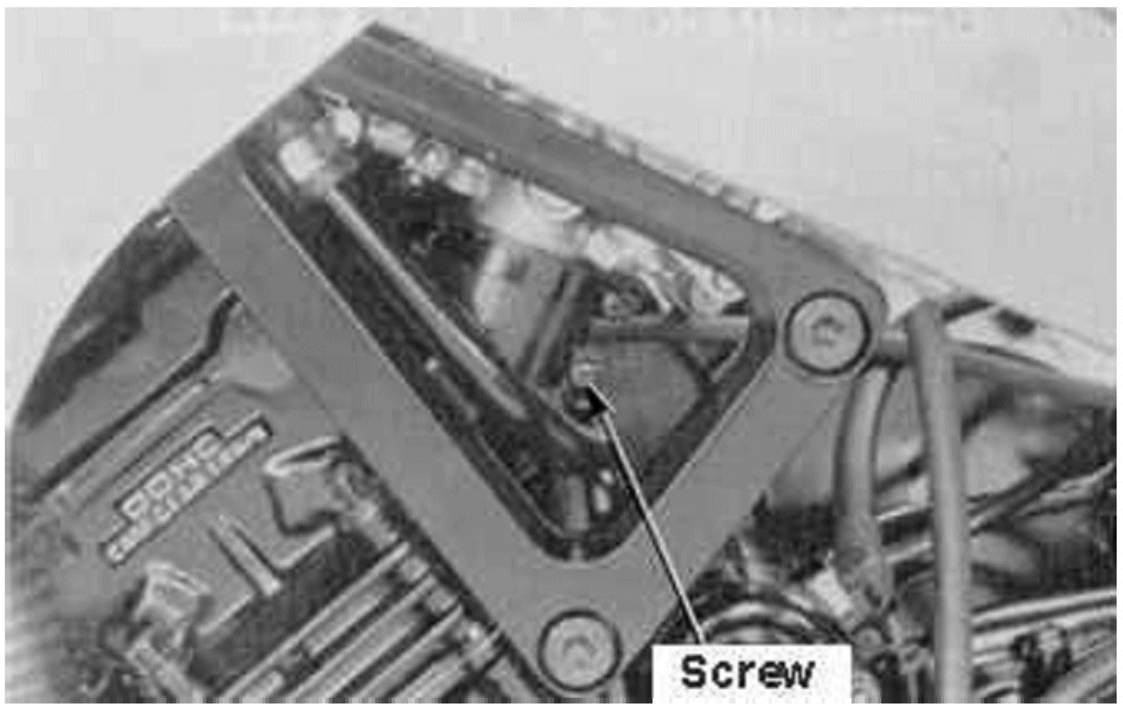


- **Carburettor**

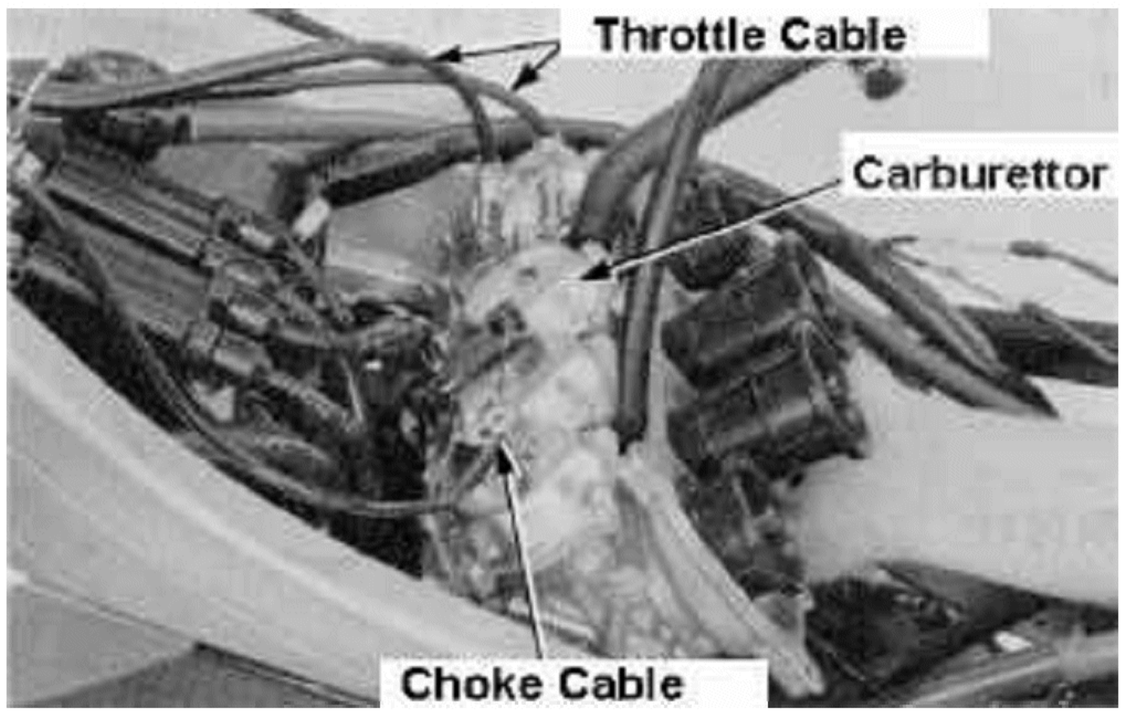
Removal

Remove the fuel tank (4-3) and the air cleaner (4-6).

Loosen the 4 screws on the carburetor insulator band (4 on cylinder side).



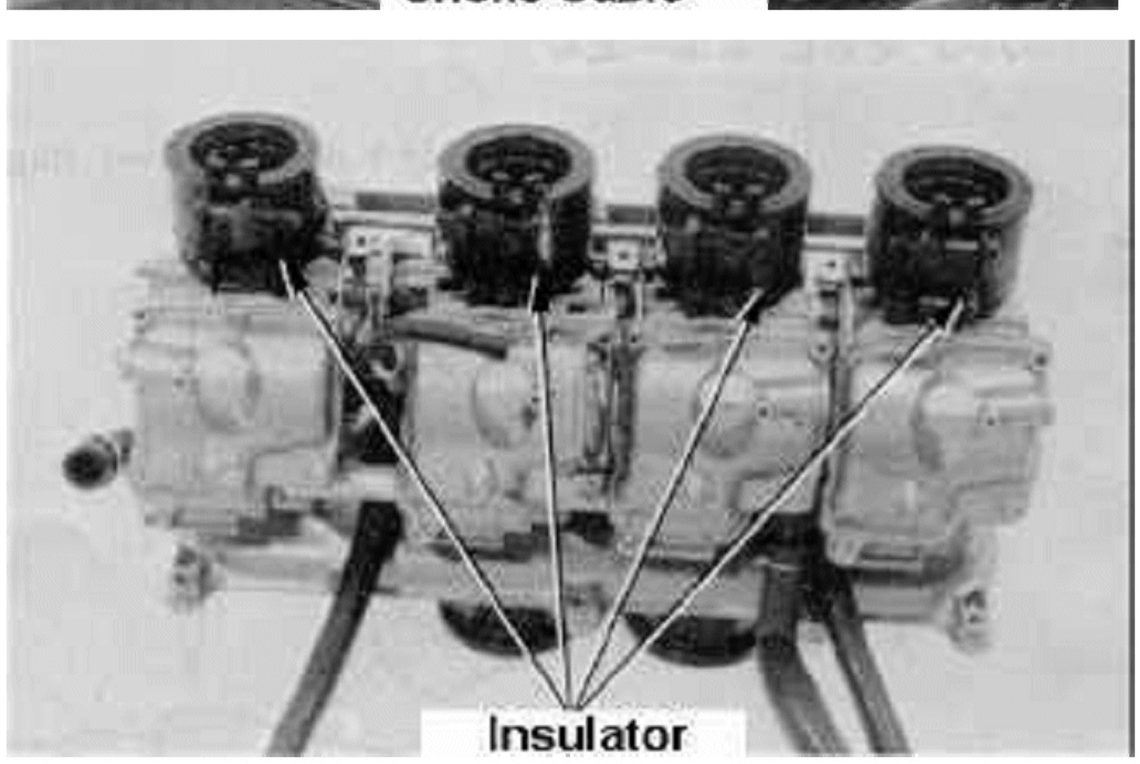
Disconnect the throttle and choke cables and remove carburetor assy.



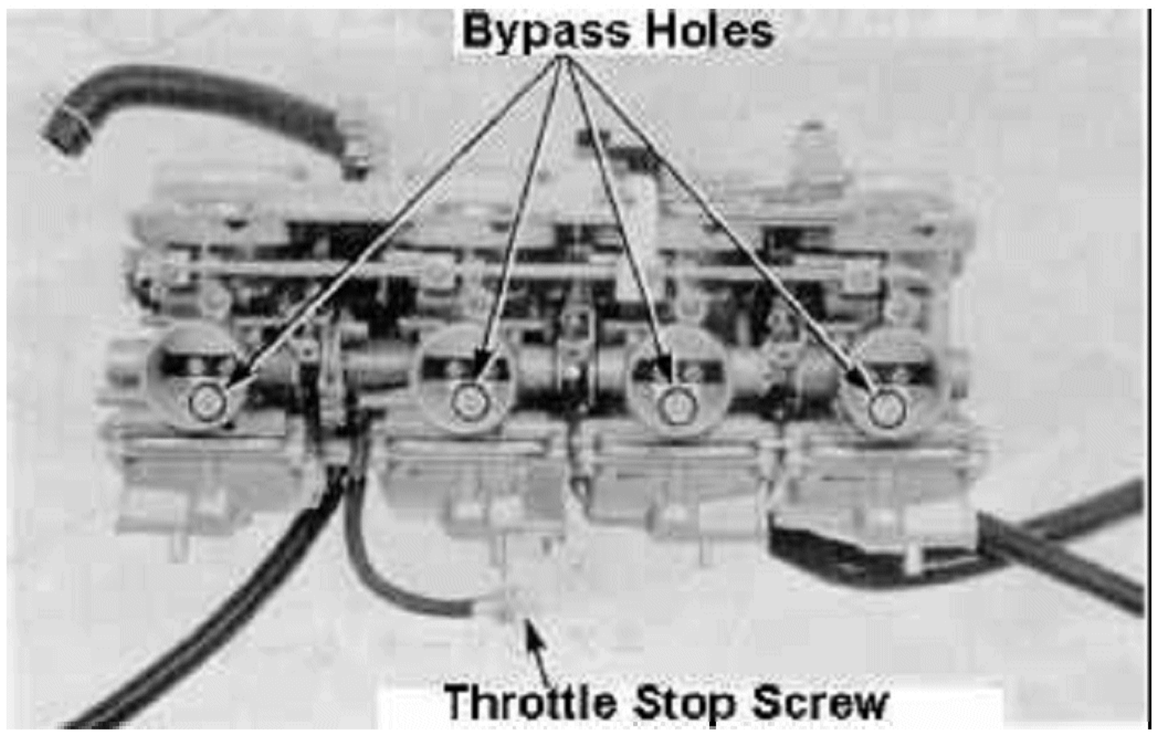
Disassembly

Disassembly of the vacuum chamber and the float chamber are possible without removing the carburettor.

Remove the insulator from the carburettor.

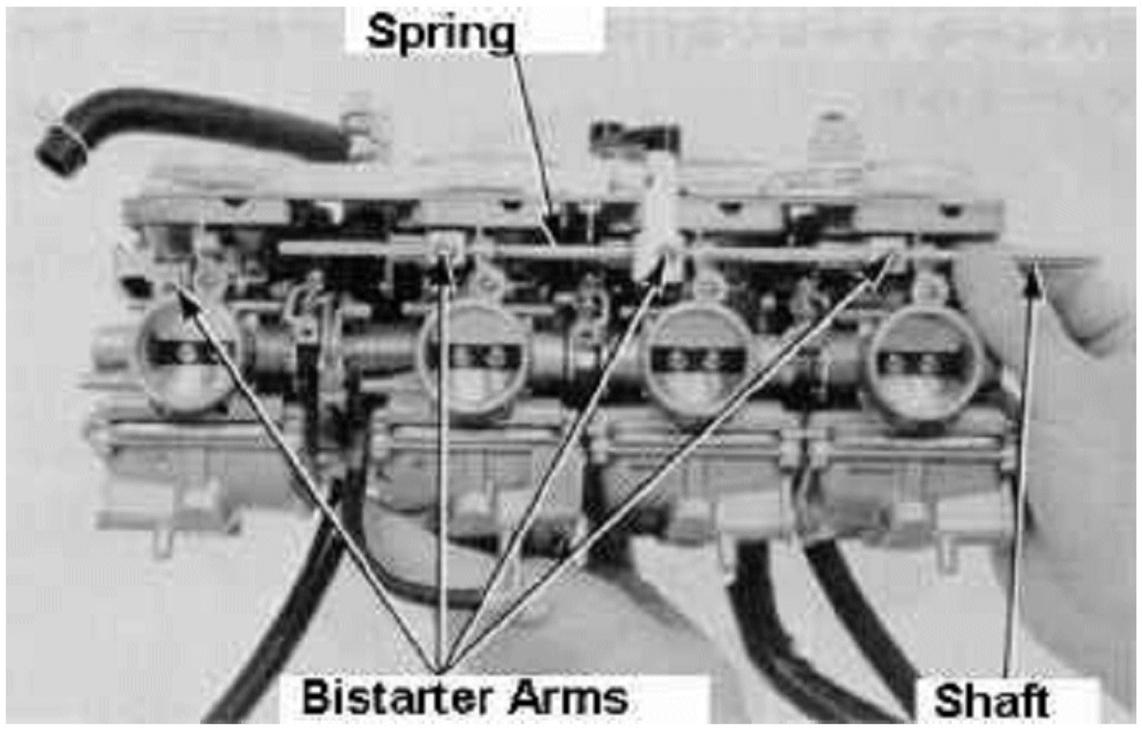


Rotate the throttle stop screw and set so as to have all carburettors' bypass holes visible.

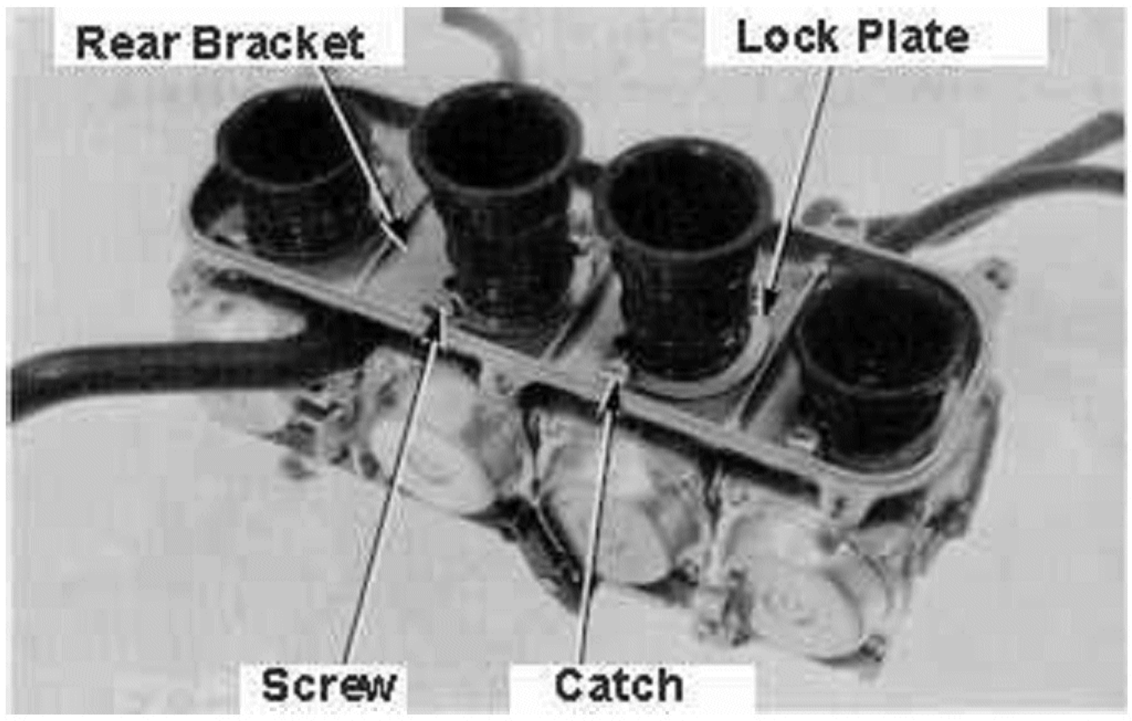


Loosen the bolts on bistarter arms and remove the bistarter arm shaft and spring.

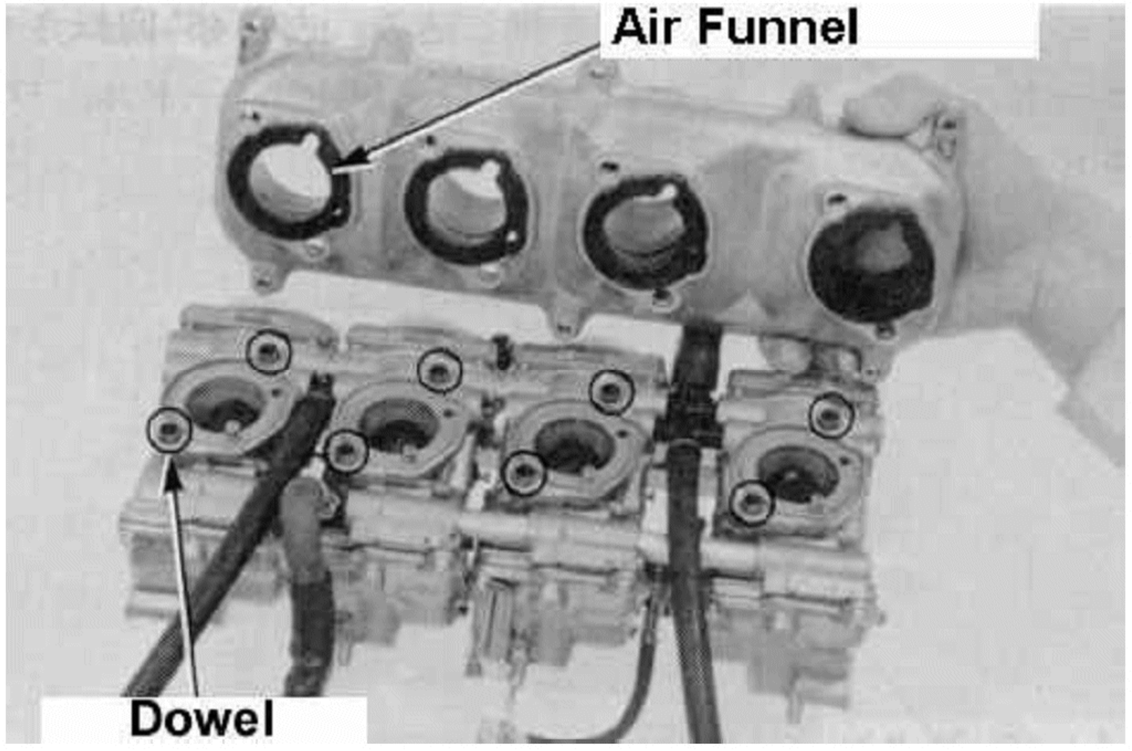
Remove the bistarter arms.



Raise the catch (projection).
Remove the screw to remove the rear bracket.

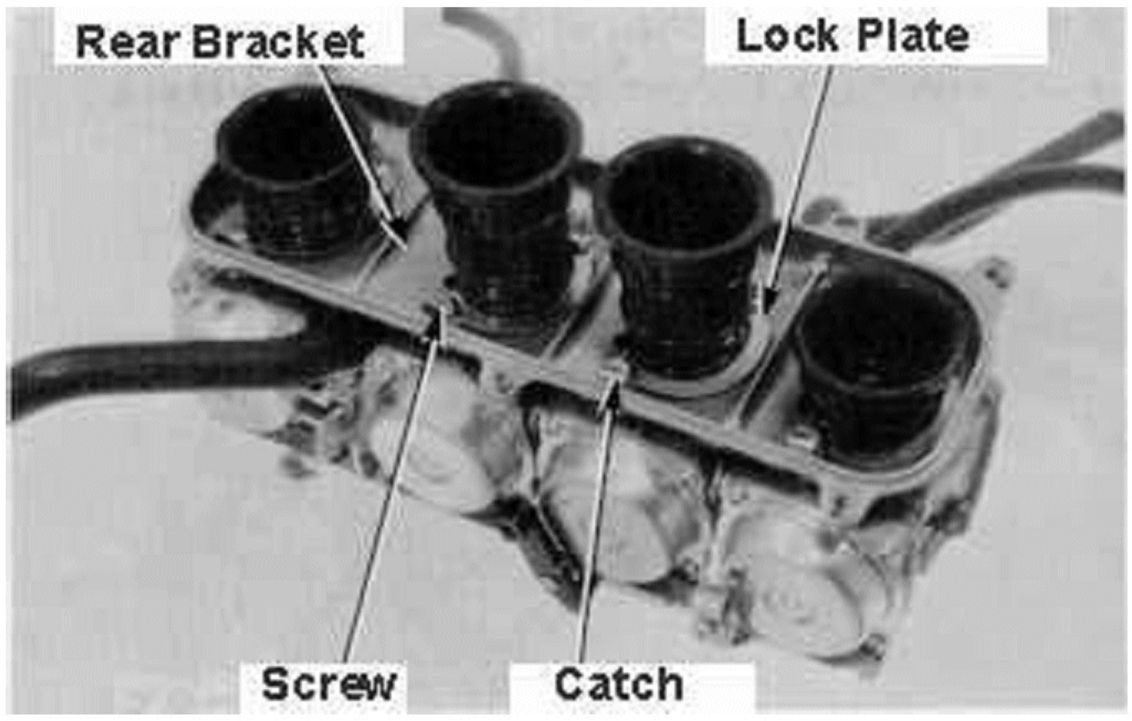


Remove the eight dowels.
Inspect the air funnels for damage.

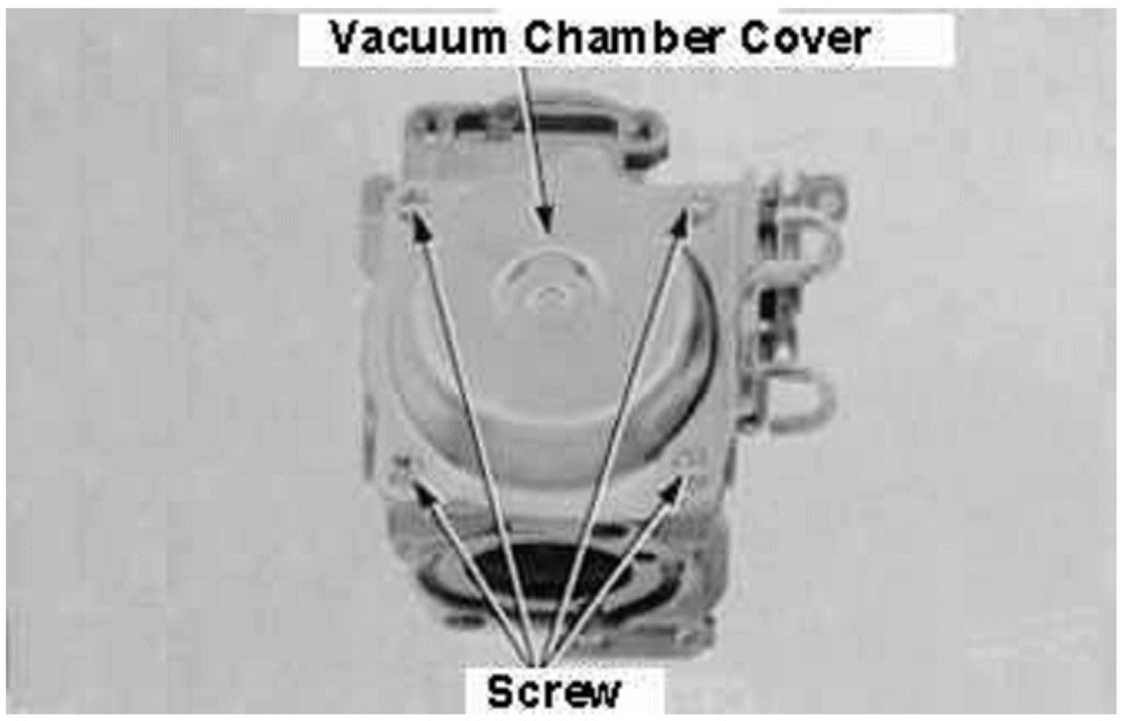


Remove the eight screws and remove the front bracket.

- The two carburettors thrust springs and three synchro adjust springs come off at the same time. Make sure not to lose them.
- Separate horizontally in order to avoid damaging the fuel and air joint pipe.

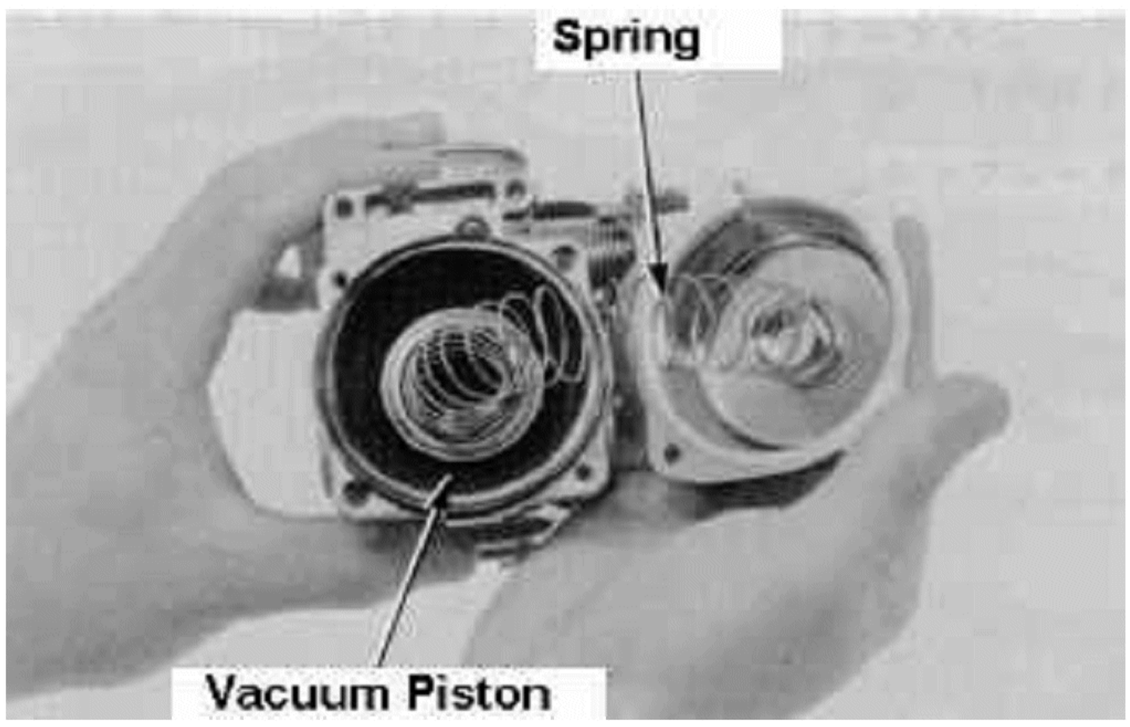


Remove the vacuum chamber cover.



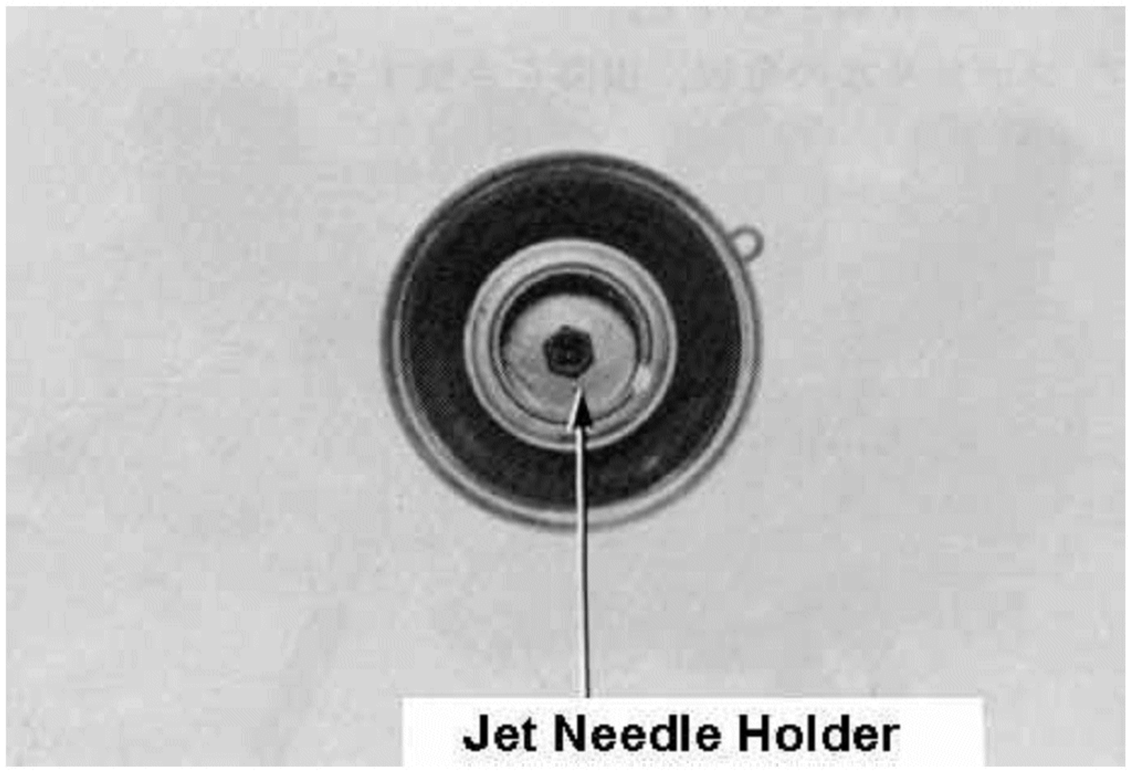
Remove the spring, diaphragm and the vacuum piston.

Ensure that there is smooth movement of the piston in the chamber.



Push the jet needle holder in and rotate 45° to the left.

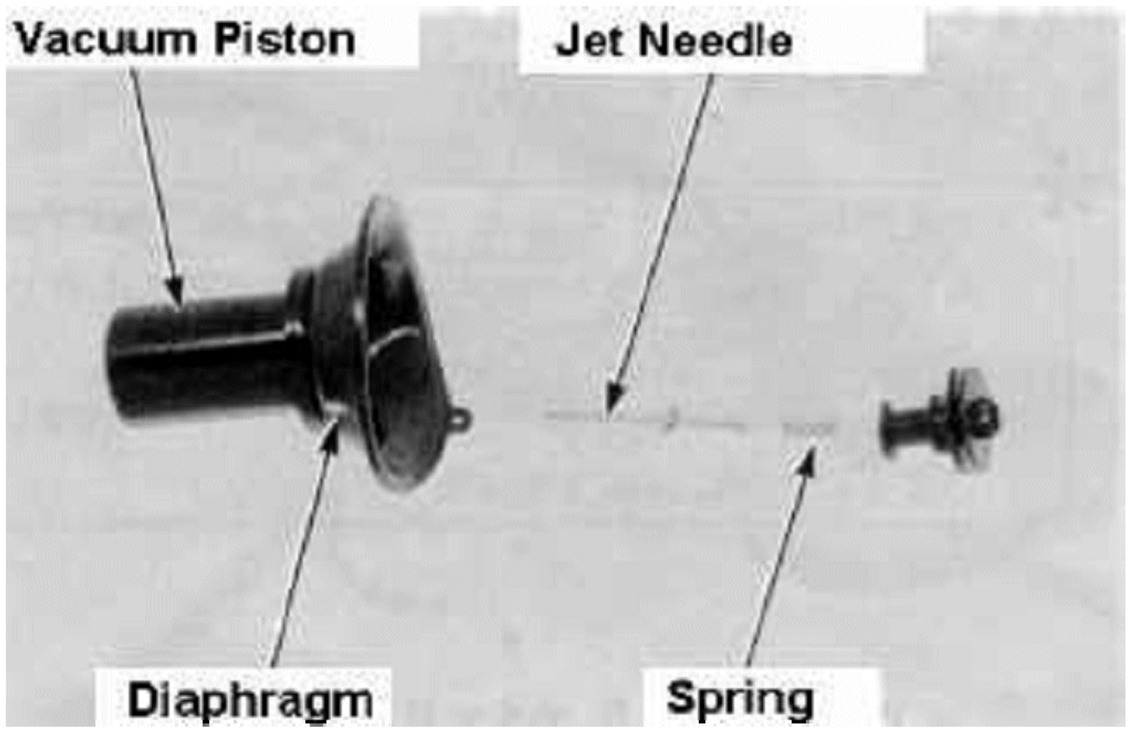
Remove the needle holder, spring, jet needle and washer from piston.



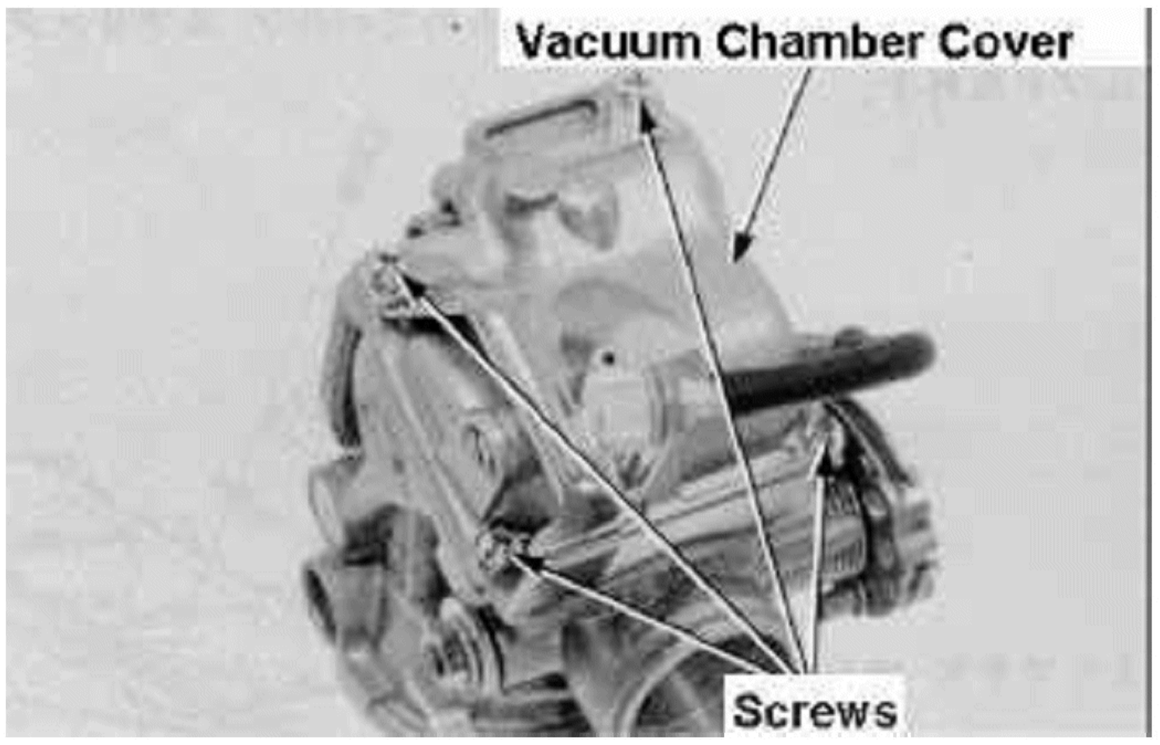
Inspect the needle head for wear, twist or damage.

Inspect the diaphragm for damage.

Inspect the vacuum piston for wear, damage.

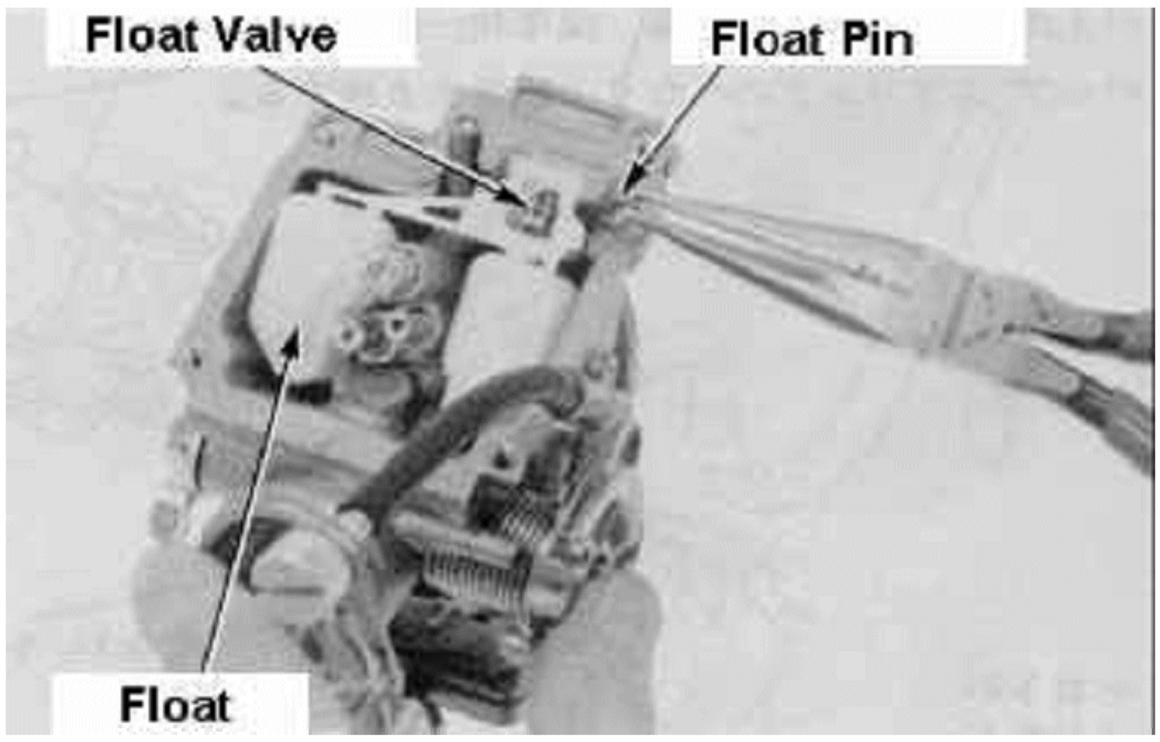


Remove the float chamber.



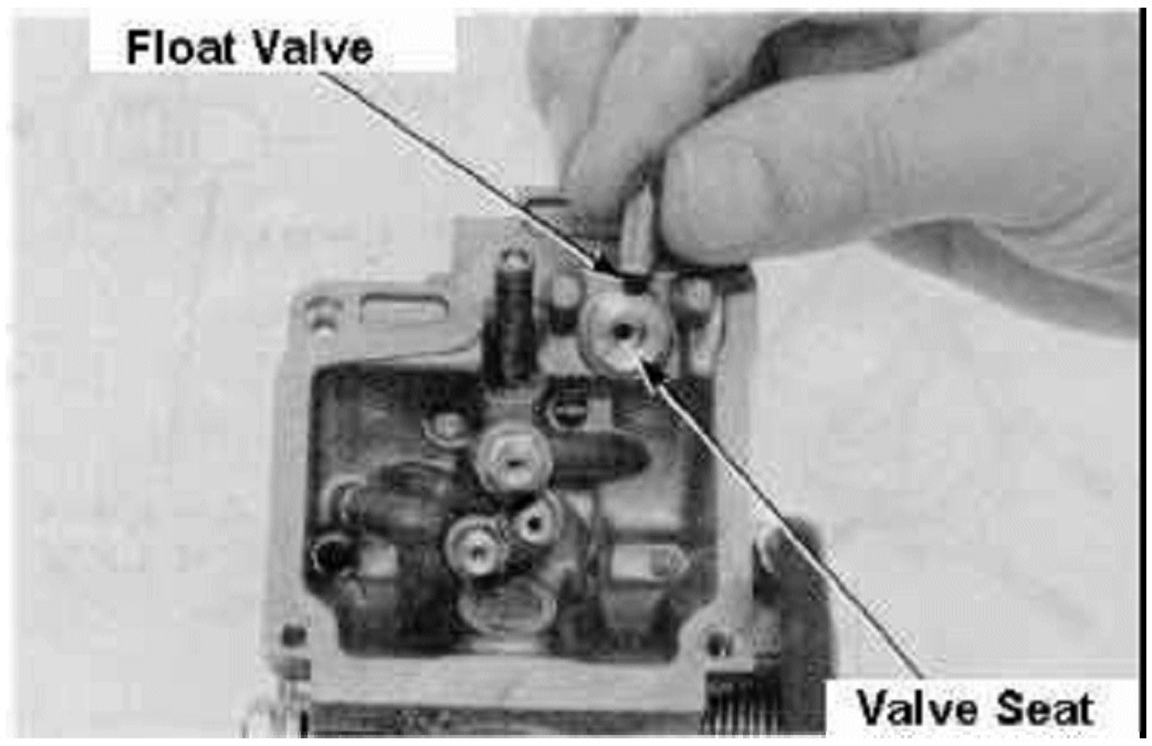
Pull out the float pin and remove the float and the float valve.

Inspect the float.



Inspect the float valve and a valve seat for damage, clogging.

Inspect the contact surface between the valve and the seat for wear.

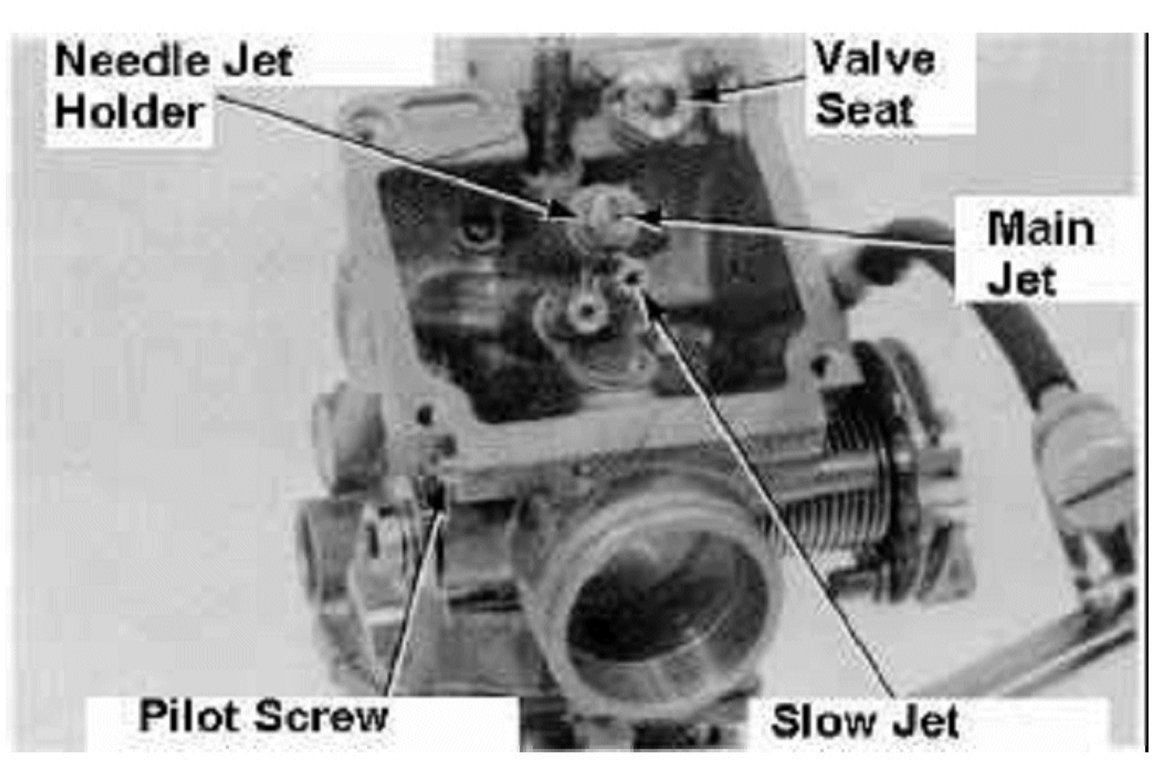


Remove the main jet, needle jet holder, slow jet and the valve seats.

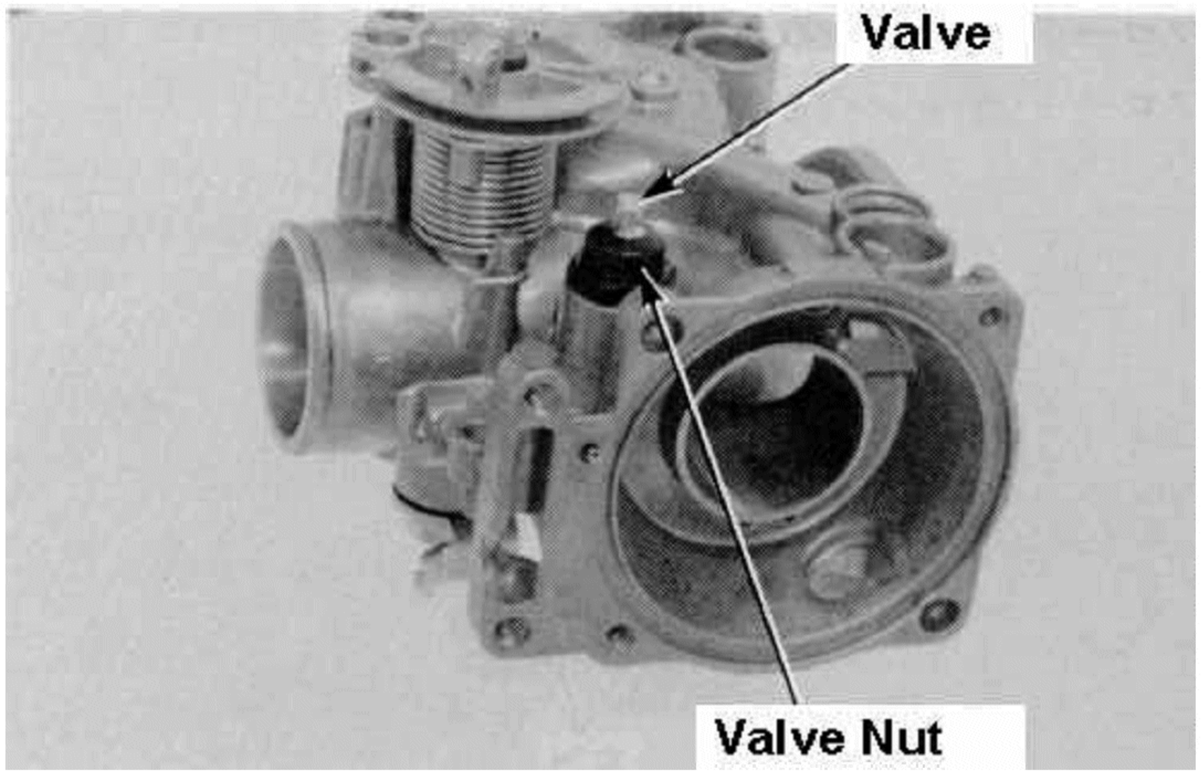
Record the number of turns on the pilot screw to fully-tighten. Then remove the screw.

Do not overtighten the pilot screw. May cause damage on the seats.

Clean the jets with clean fuel.

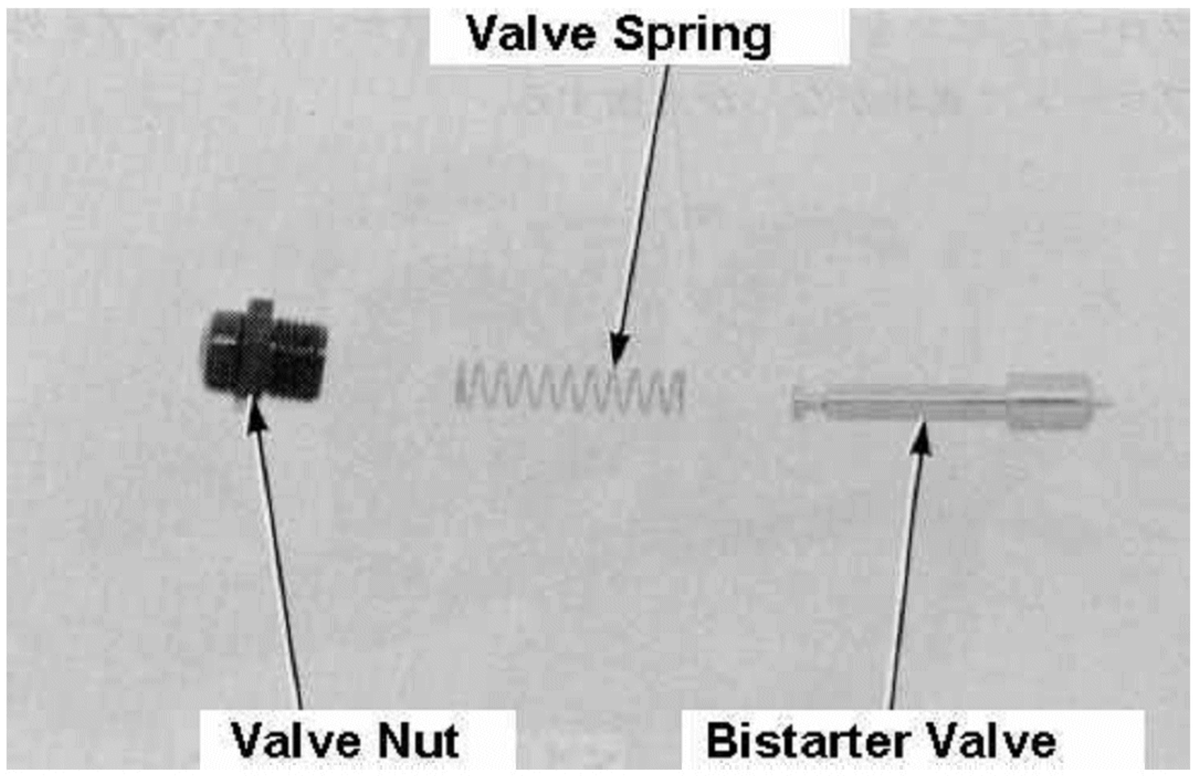


Loosen the bistarter valve nut and remove the valve spring and the valve.

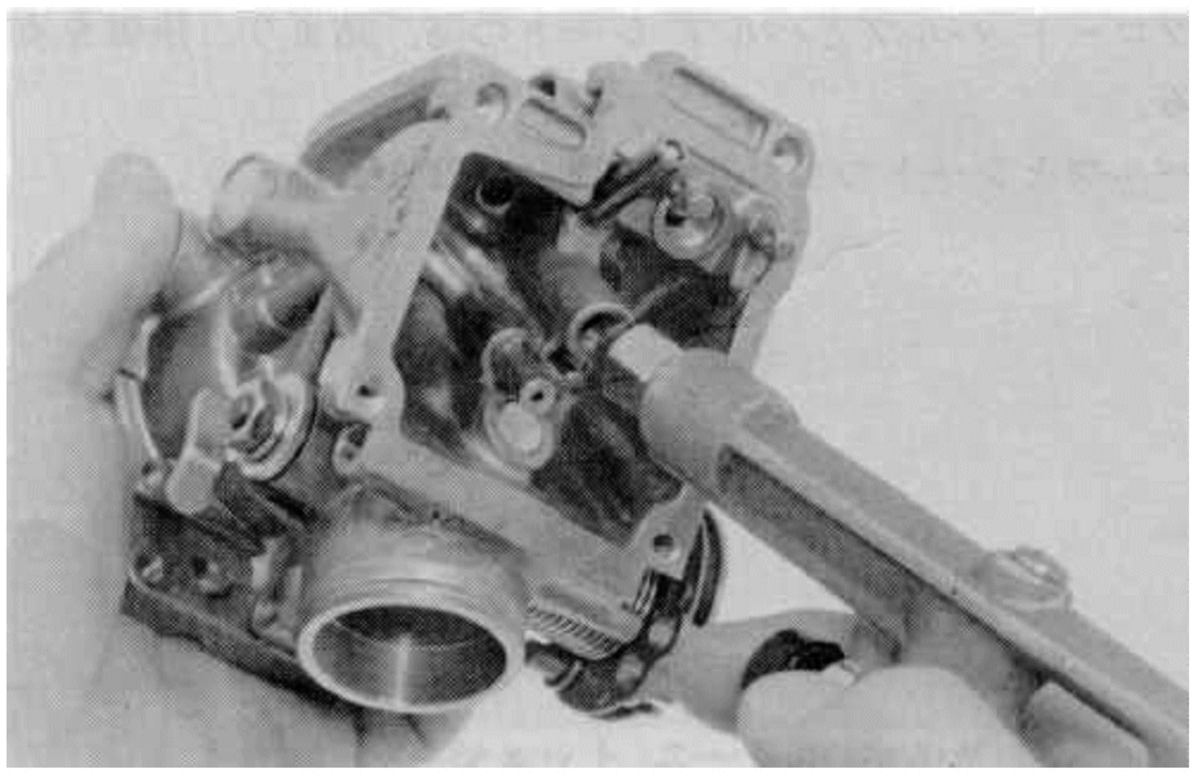


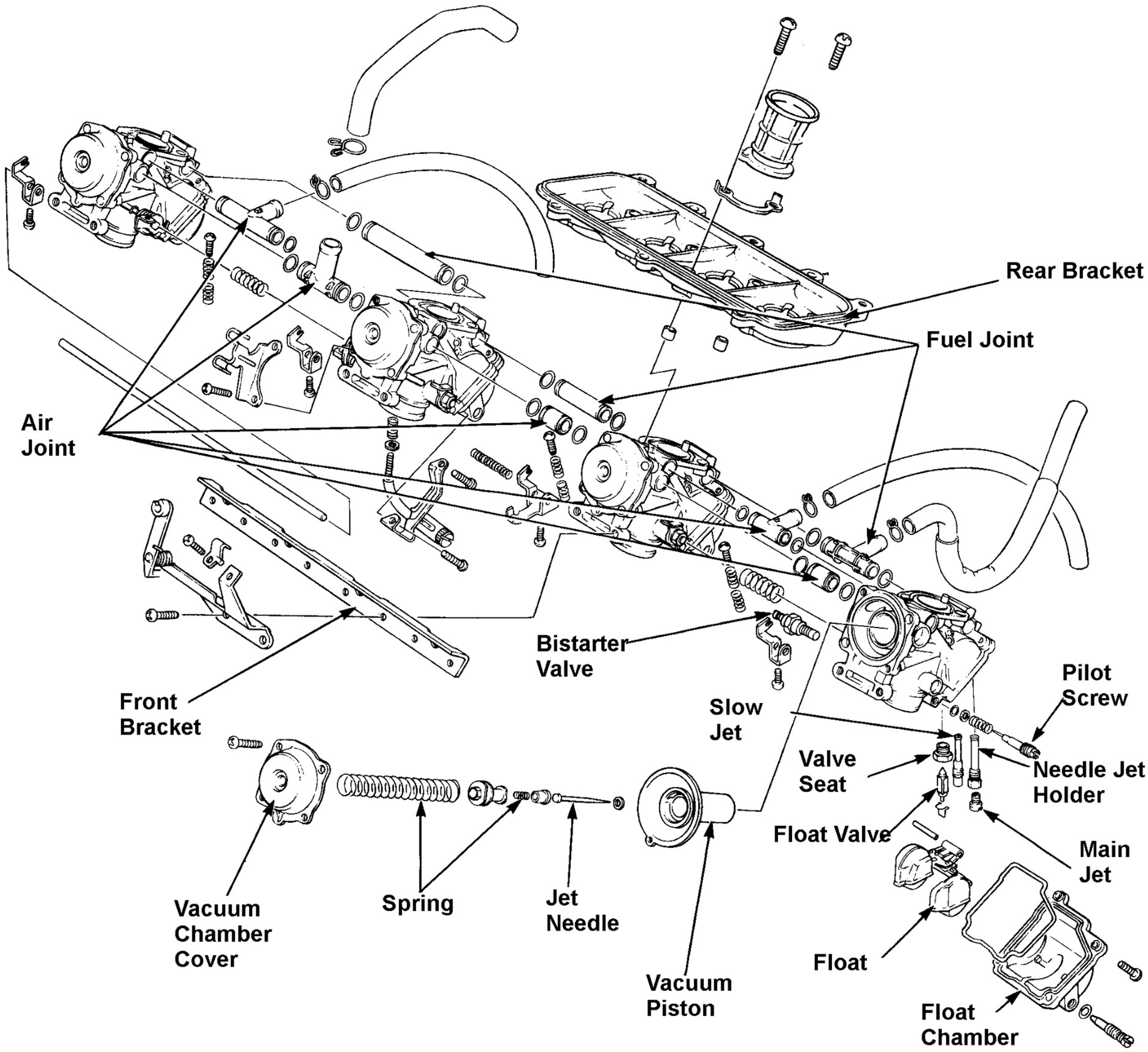
Inspect the bistarter valve for damage and wear.

Do the same for the valve spring.

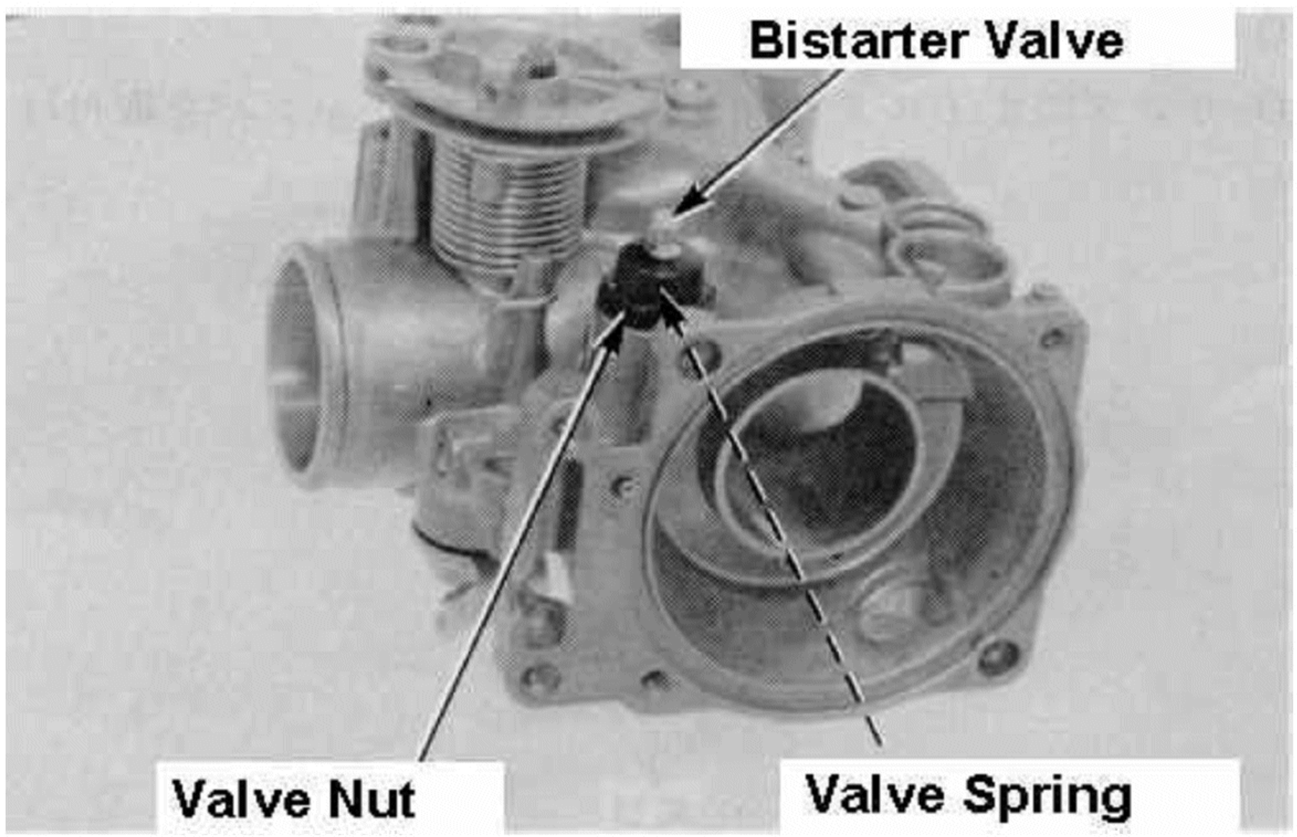


Clean the carburetor body air passage by using the compressed air.

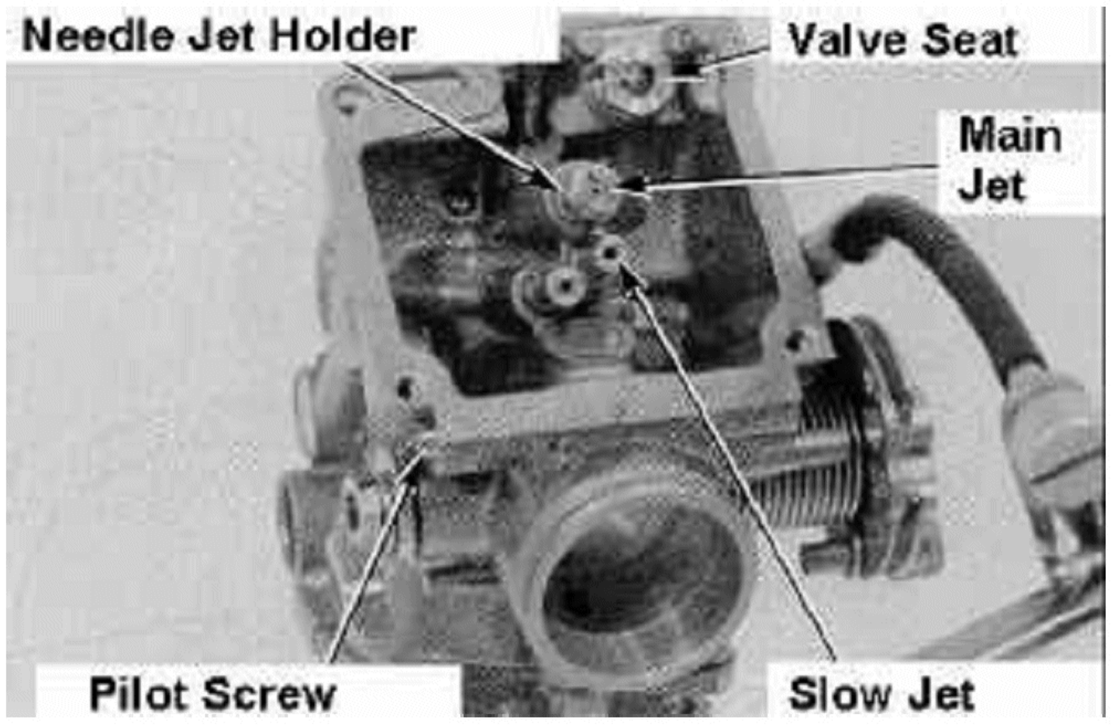




Attach the bistarter valve, valve springs and valve nuts.

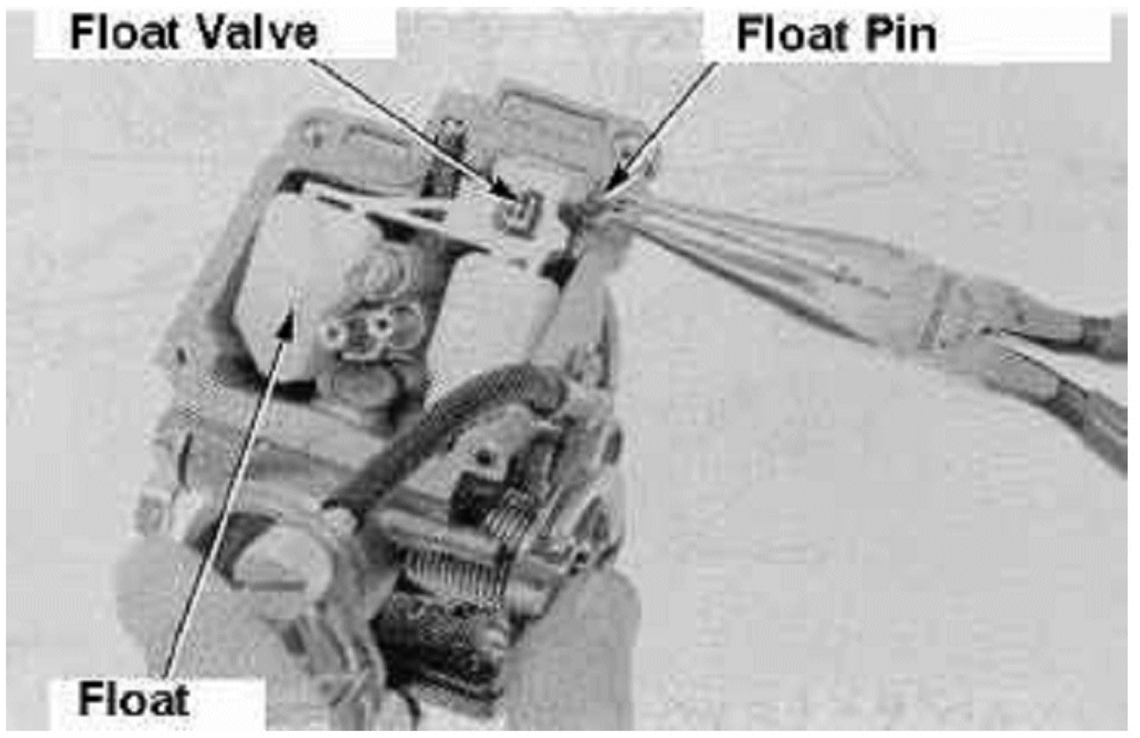


Attach the needle jet holder, main jet, slowjet, valve sheet and the pilot screw to the carburettor body.



Fully tighten the pilot screw and wind back number of turns recorded upon disassembly. Do not tighten hard or it may damage the seat surface.

Attach the float and the float valve with the float pin to the carburetor body.



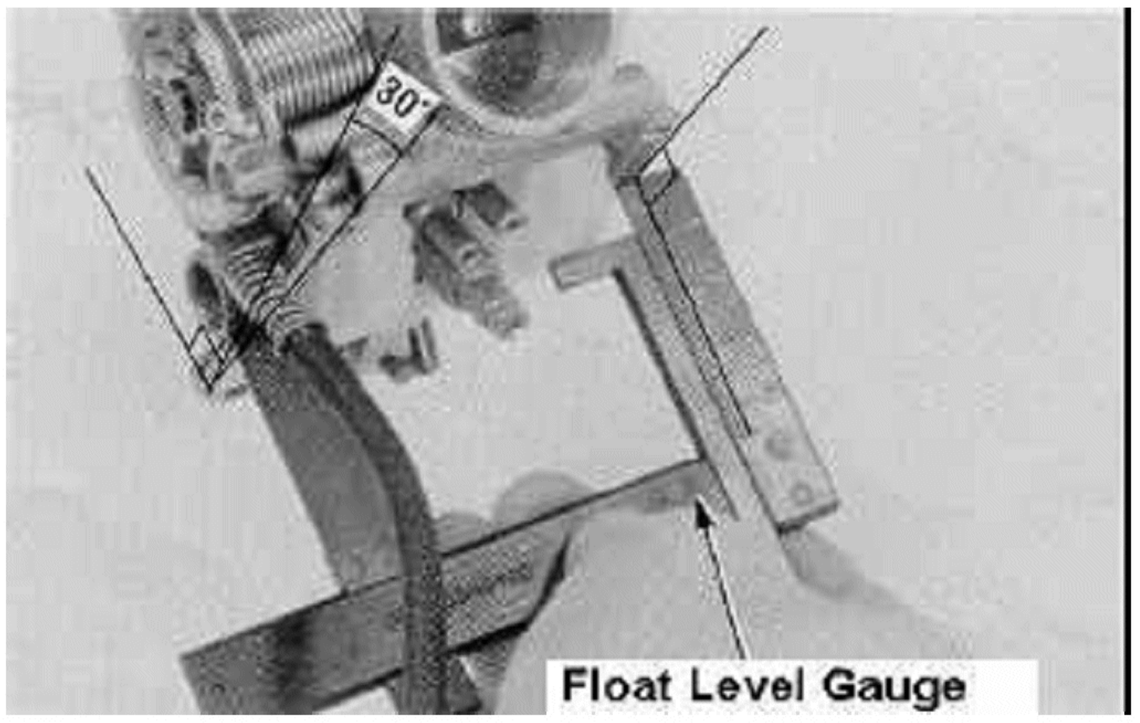
Fuel Level

Set the float chamber attachment surface vertically.

Tilt the carburettor to forward 30° (the float valve and the float arm contact) and measure the fuel level.

Standard level : 7mm.

Bend the lip of the float arm to adjust the level.



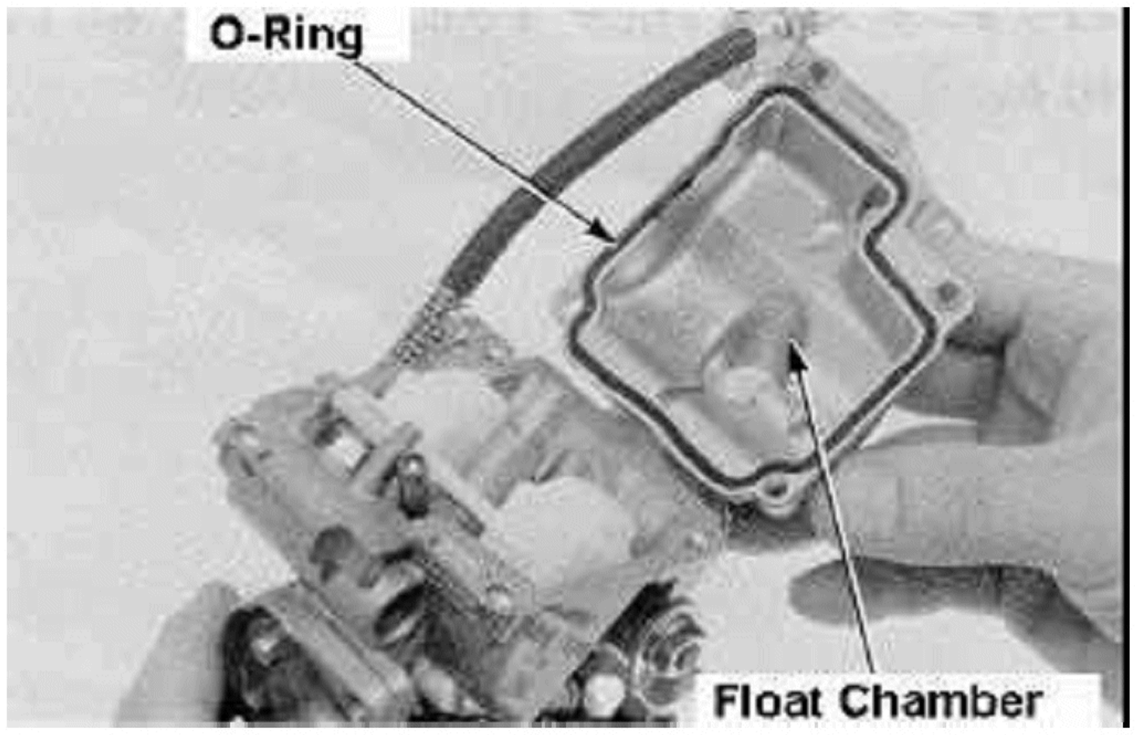
Common Tool

Float level gauge

Use the gauge at a position for main jet and set perpendicular to the float chamber attachment surface.

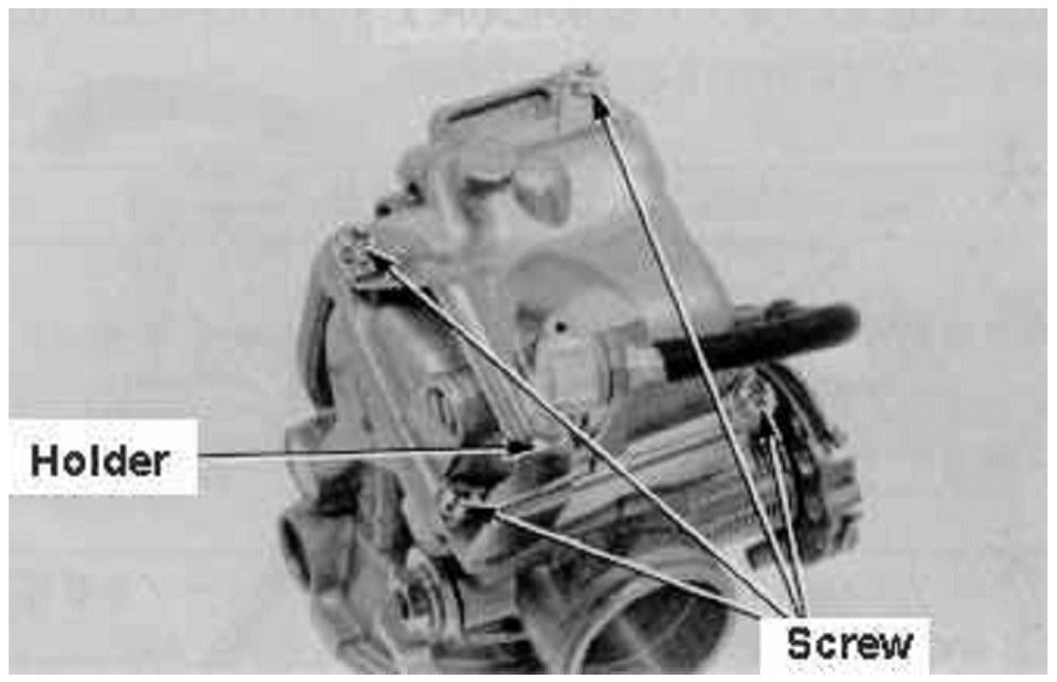
Inspect the O-ring for wear.

Apply oil on the O-ring and attach the float chamber.

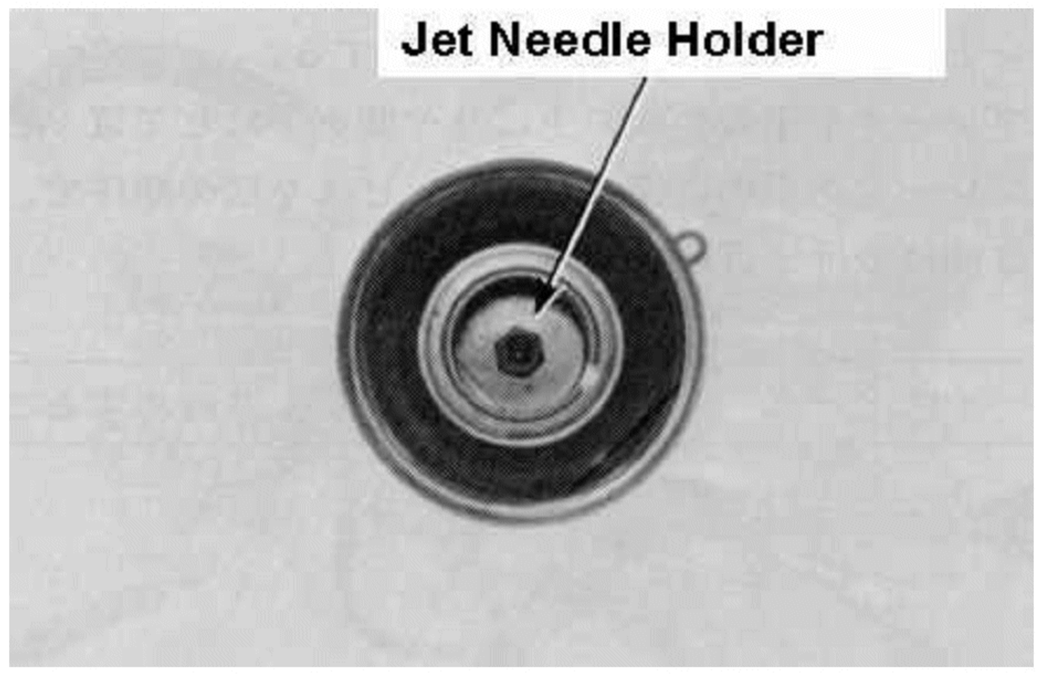


Tighten with four screws.

Tighten and attach the throttle stop screw holder to a carburettor body with 2 screws.



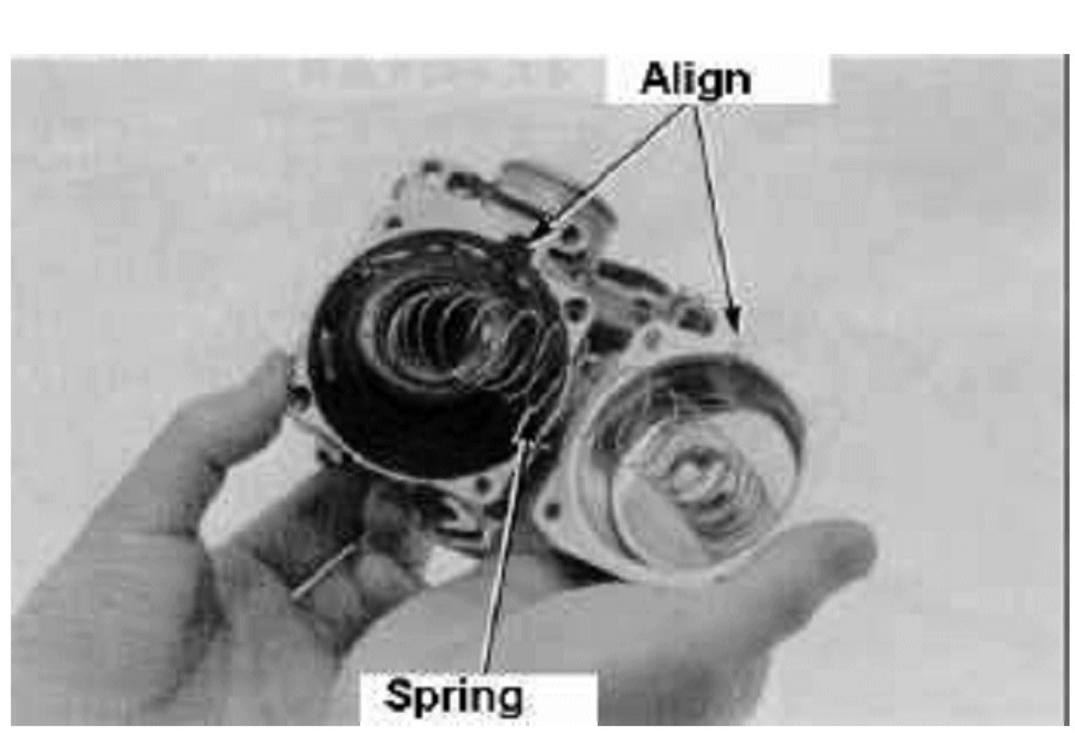
Attach the washer, jet needle and a spring to the vacuum piston. Push the jet needle holder in and rotate 45° to the right.



Push the bottom of the vacuum piston towards vacuum chamber side and make it nearly full open position.

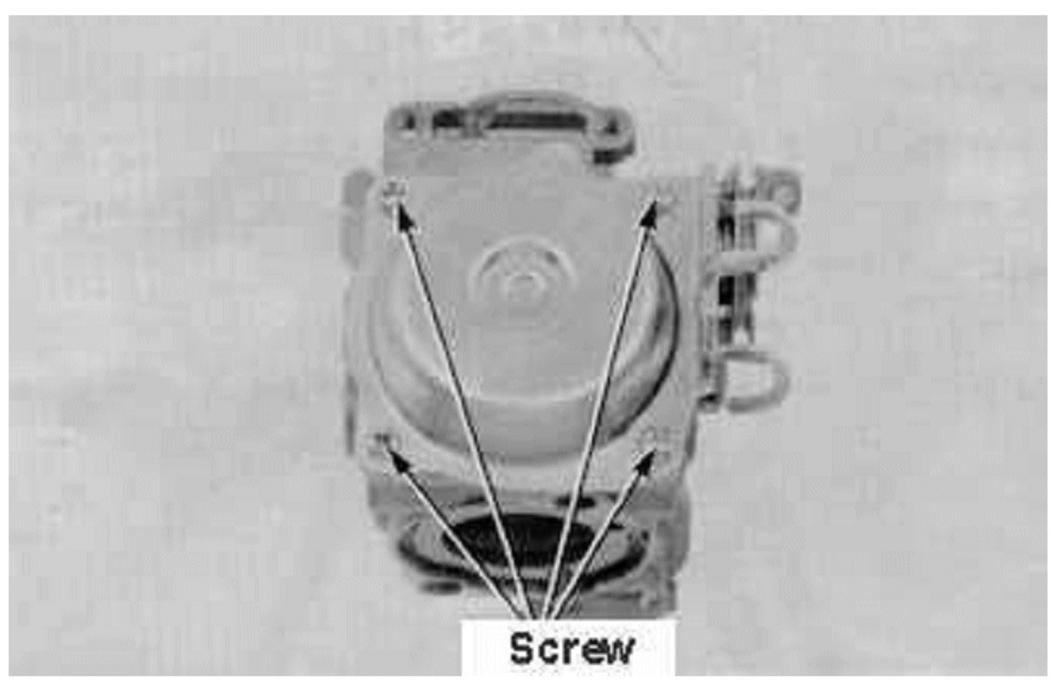
Firmly fit the rib of the diaphragm to the slit on the body.

Attach the spring and align the hole on the diaphragm and the slit on the cover to attach the cover.



The cover should not catch the diaphram.

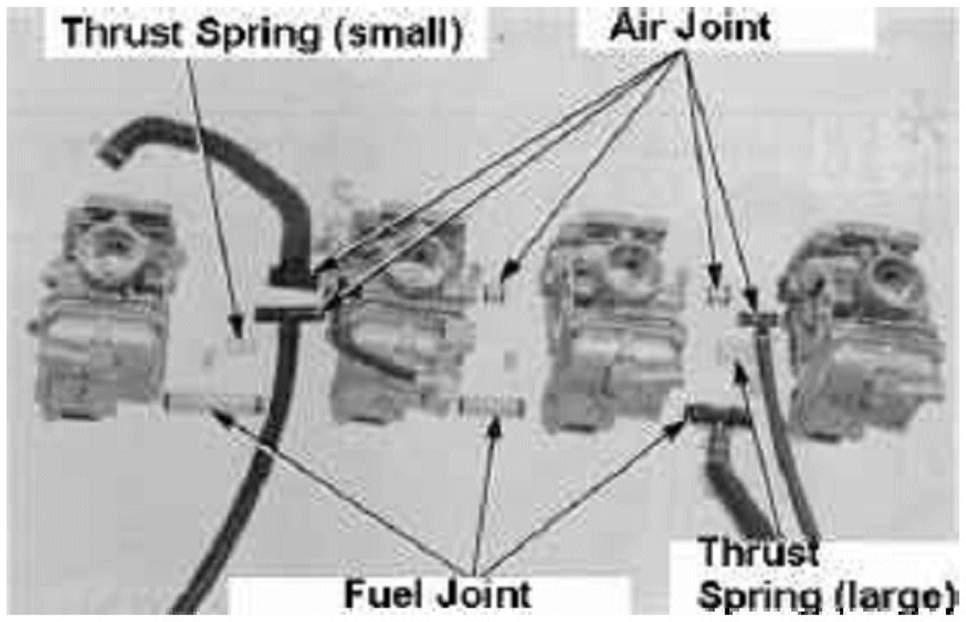
Tighten the 4 screws.



Attach new O-rings to the air joint valves, fuel joint valves.

Apply small amount of oil to the O-rings.

Connect the carburetors via thrust springs, air and fuel joints.

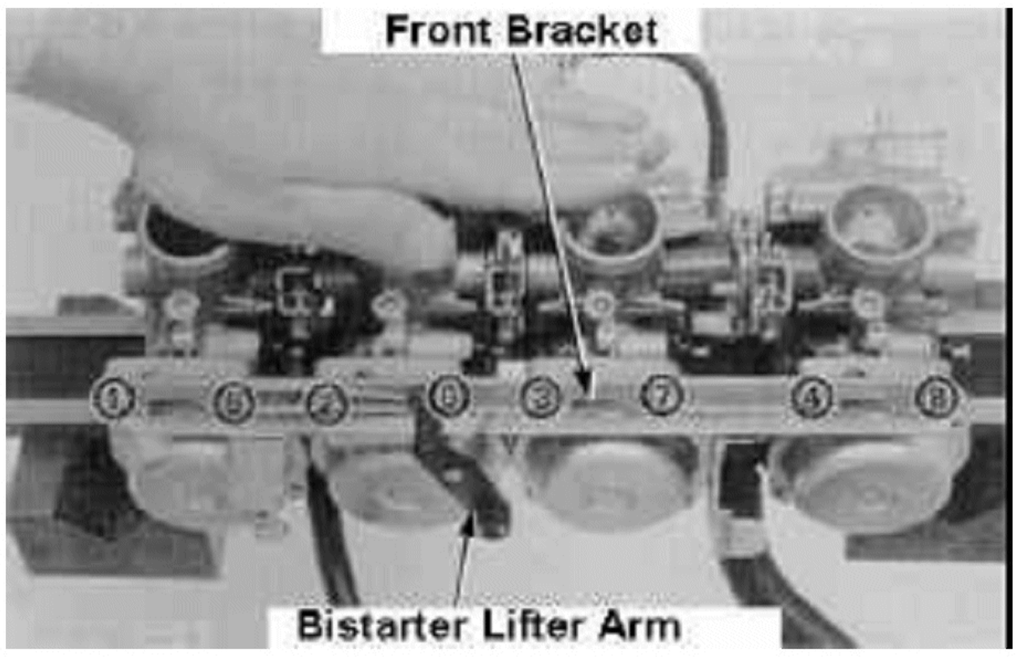


Attach the synchronizing spring.

Set the springs, joints and tubes in accordance with the diagram.

Temporarily fix the front bracket with screws.

Place the carburetor on a flat plate with the rear side facing down.



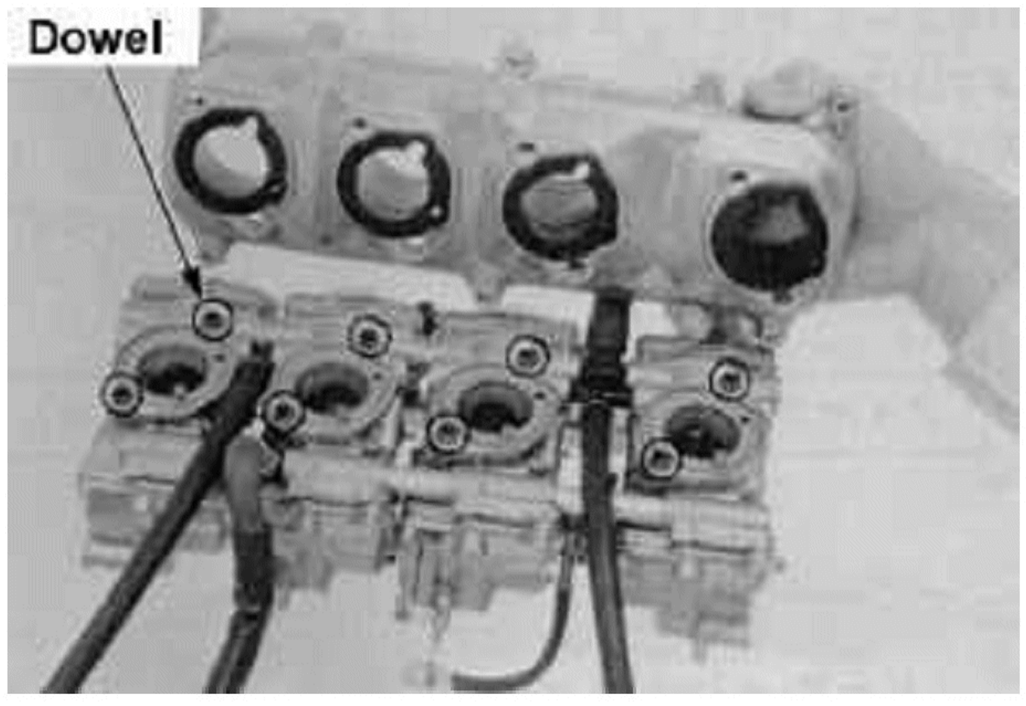
Apply equal pressure on the carburettors and temporarily tighten the screws in the sequence shown.

Repeat this procedure 2~3 times to fix.

Fix the bistarter arm together.

Attach the dowel.

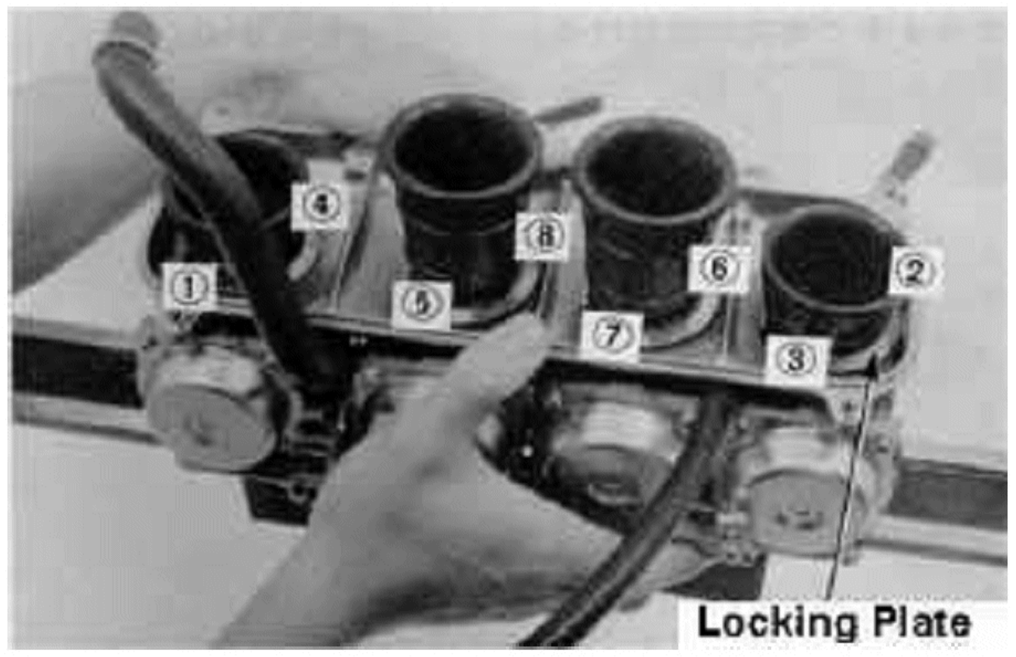
Set joints and tubes correctly as shown in the figure.



Attach the rear bracket.

Attach the new locking plates and temporarily fix with screws.

Place the carburettor on flat plate facing the front side down.



Apply equal pressure on the carburettors and tighten the screws in the sequence shown.

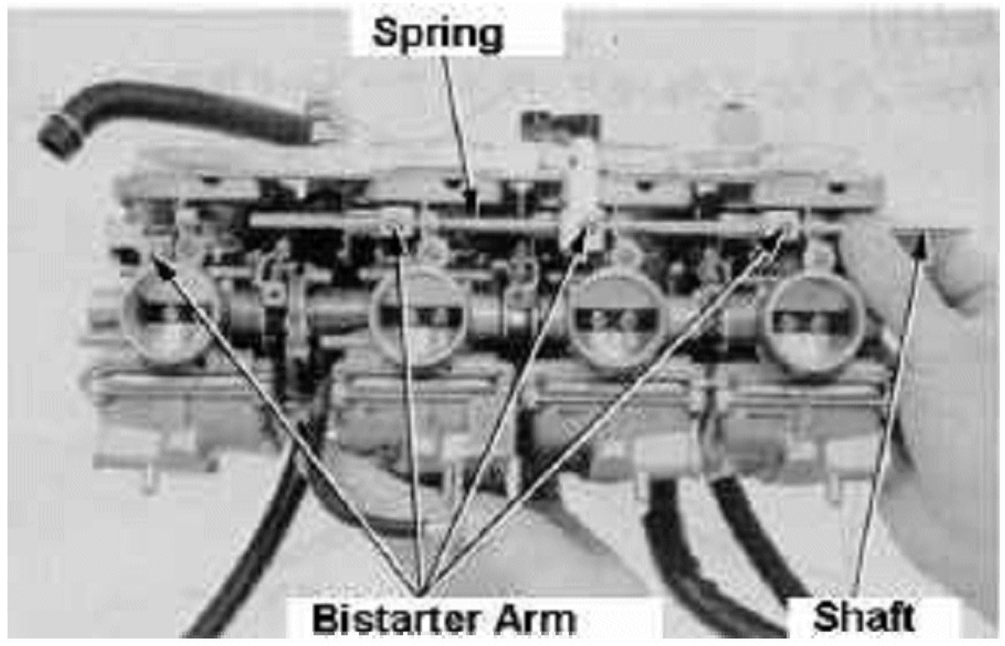
Repeat the procedure 2~3 times to fix.

Firmly tighten the screws for the front bracket.

Lock the screws by bending the catch of the locking plate.

Attach the bistarter arms to bistarter valves.

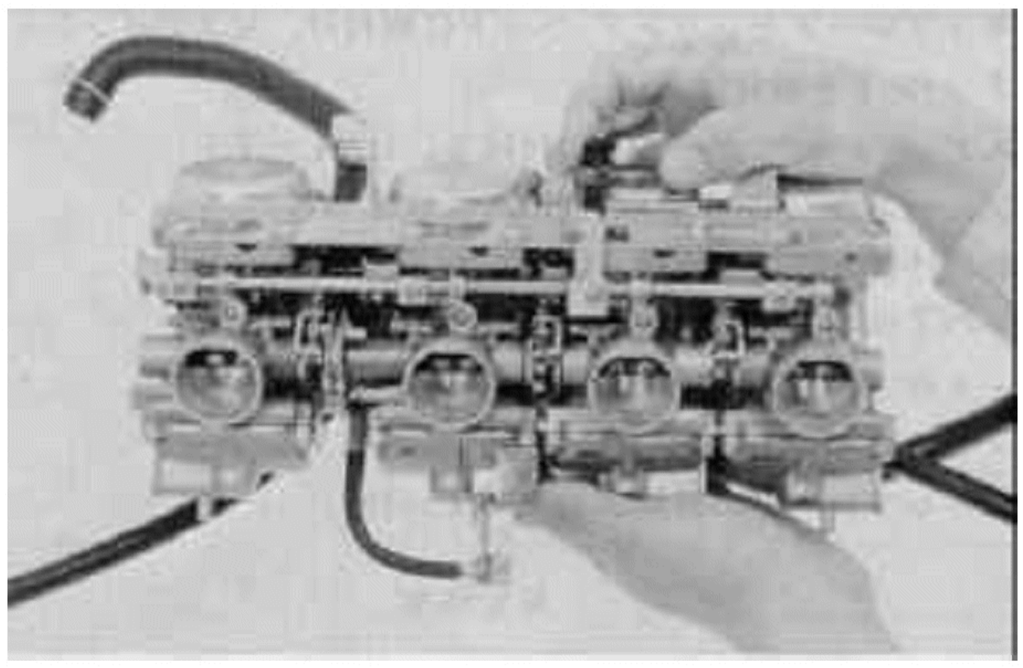
Attach the spring and the arm shaft.



Fix the bistarter arms to the shaft.
Move the bistarter lifter arm and ensure the movement of the bistarter valves.

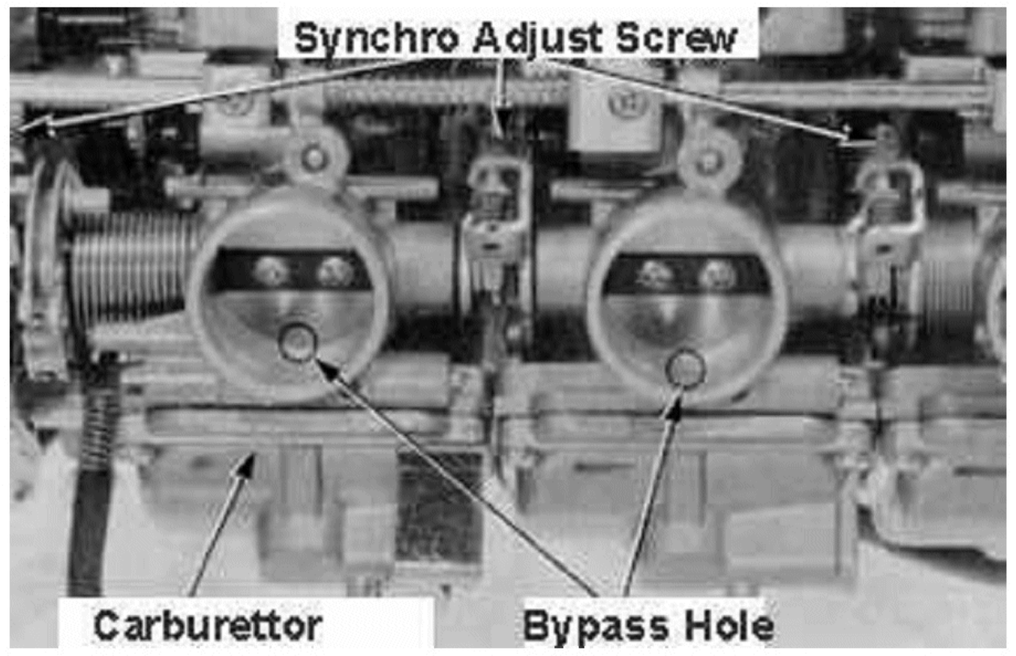
Inspect the throttle movement by following the procedure:

- Push the throttle linkage and open the throttle a bit and ensure the throttle returns smoothly.
- Open and close the throttle and ensure the smooth movement.



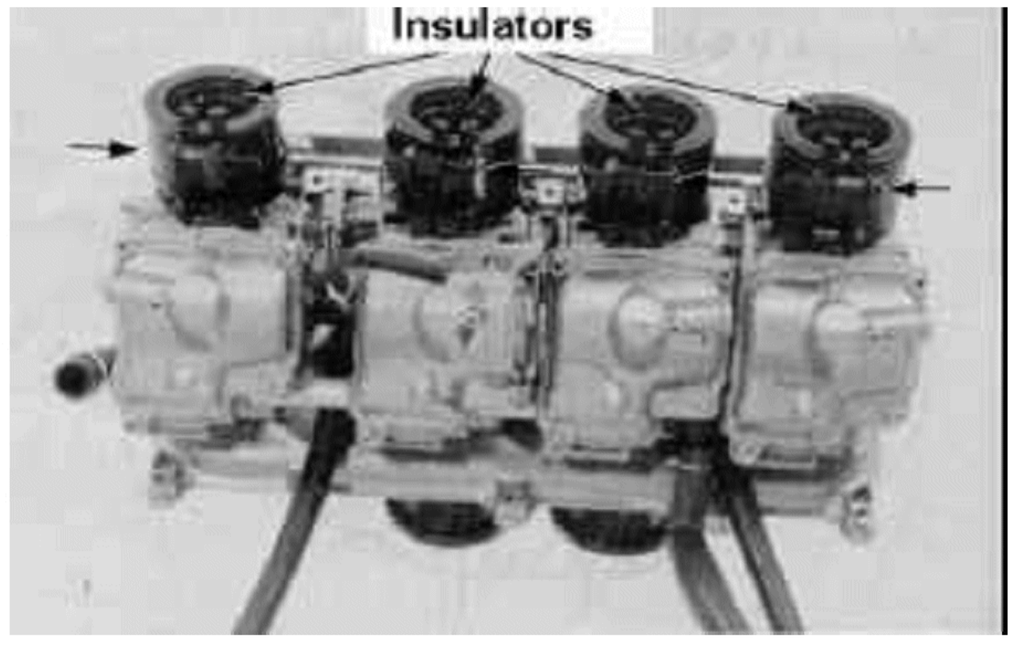
Rotate the synchronizing adjust screw and align all carburettor bypass holes and the position of the throttle valve.

Use No.3 carburettor as a reference.



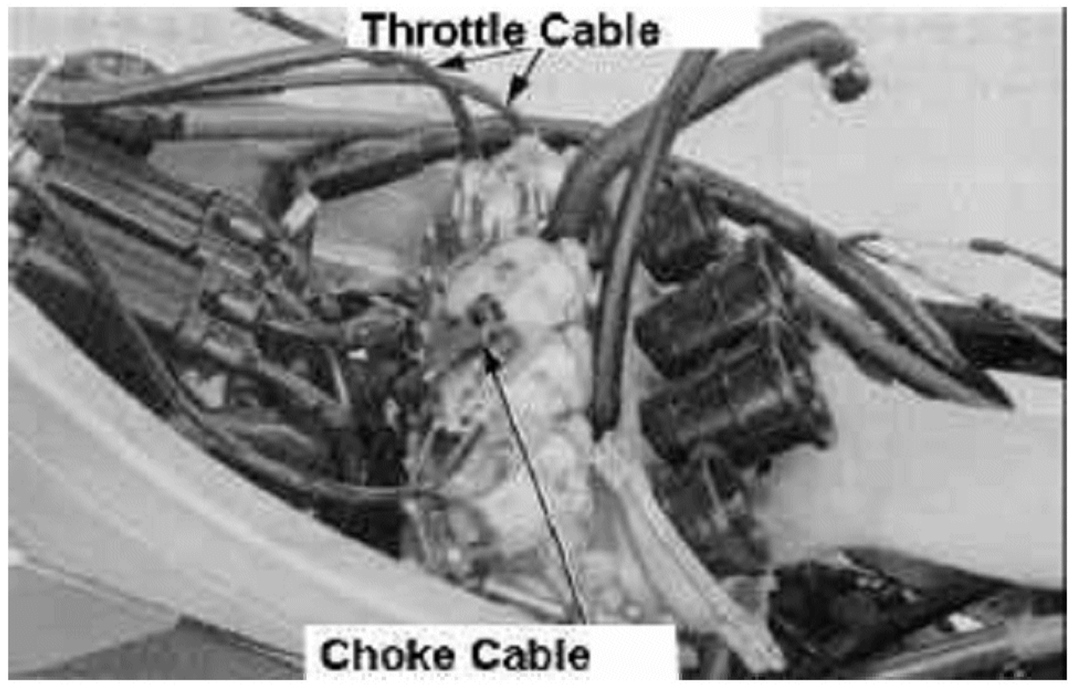
Attach insulator to carburettor.

Set the insulator screws to the direction indicated by arrow symbols.



Attachment

Connect the choke and throttle cables.

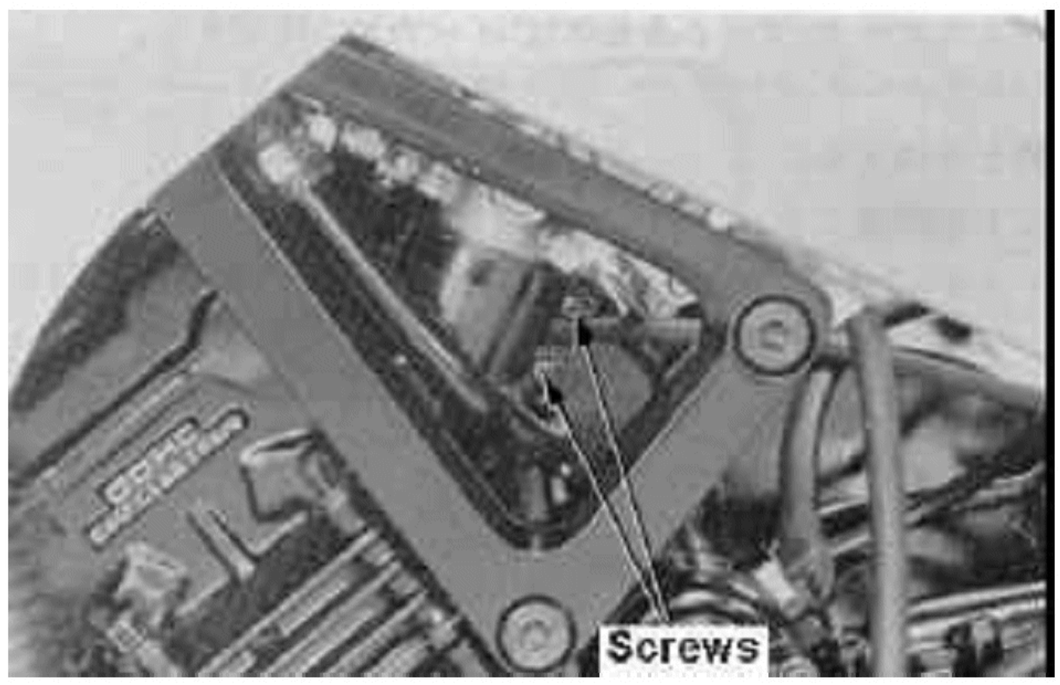


Attach the carburettor to the cylinder head.
Tighten the insulator screw.
Attach the air cleaner case. (4-7)
Attach the fuel tank. (4-3)

After attaching the above items, inspect/adjust the following items.

- Pilot screw
- Throttle grip (2-17)

Idling speed (2-11).
Carburetor synchronizing (4-19)

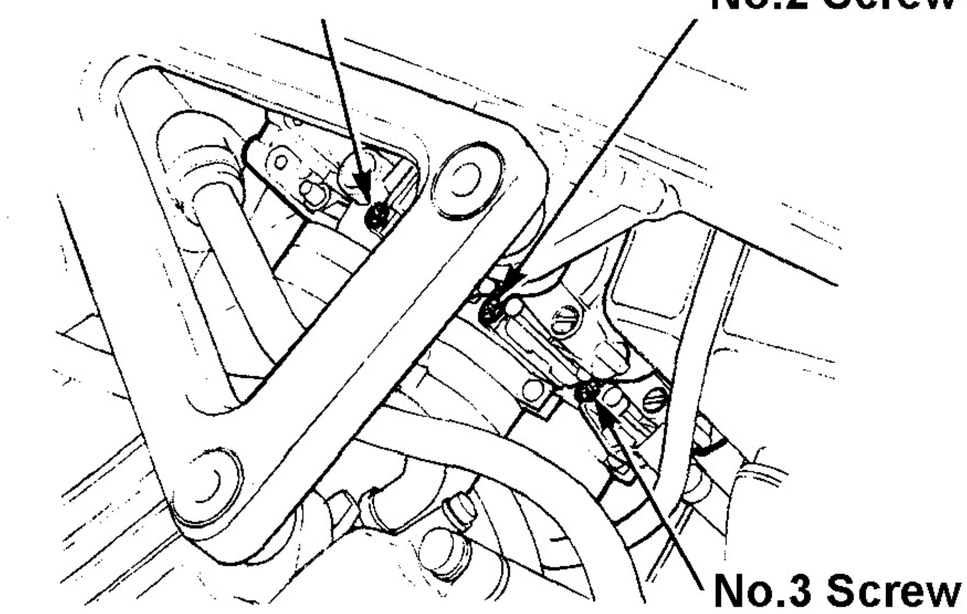


Pilot screw adjustment

Screw the pilot screw in until it stops and rewind to the number of turns recorded when disassembling.
If the body or the pilot screw has been replaced, wind back to the standard setting.

Standard rounds : 2 and ½ turns.

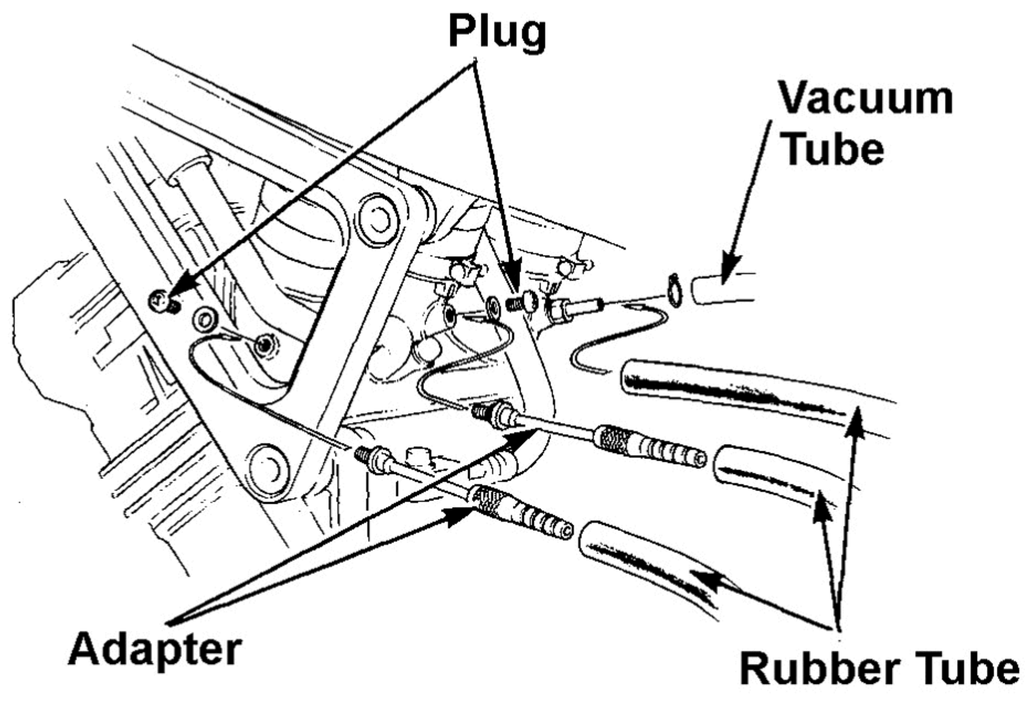
Do not overtighten the pilot screw. It may damage the seat surface.



Carburetor Synchronizing

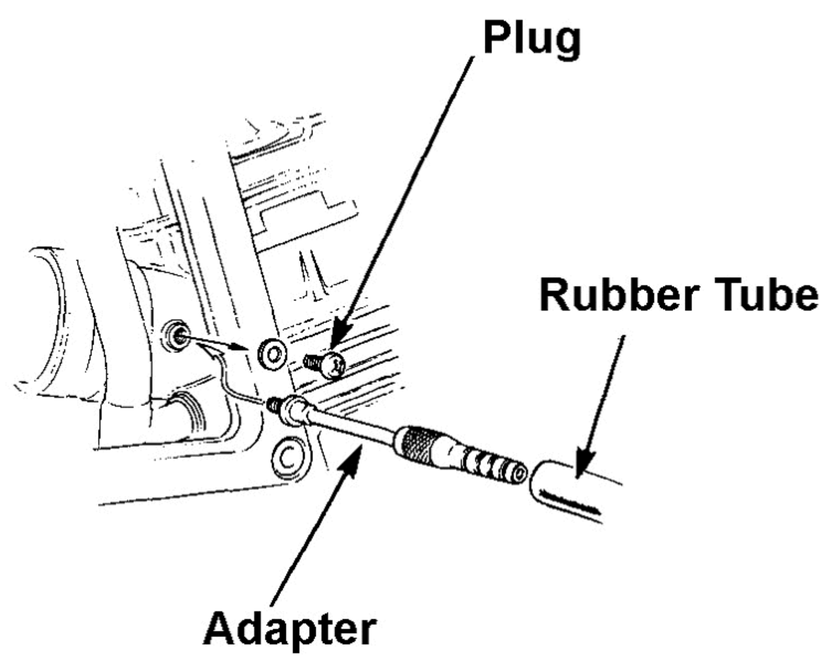
Conduct after warming up.

Start the engine. Fix the vacuum tube on the fuel auto cock with the tube clip so as to apply vacuum to auto cock. Then stop the engine.



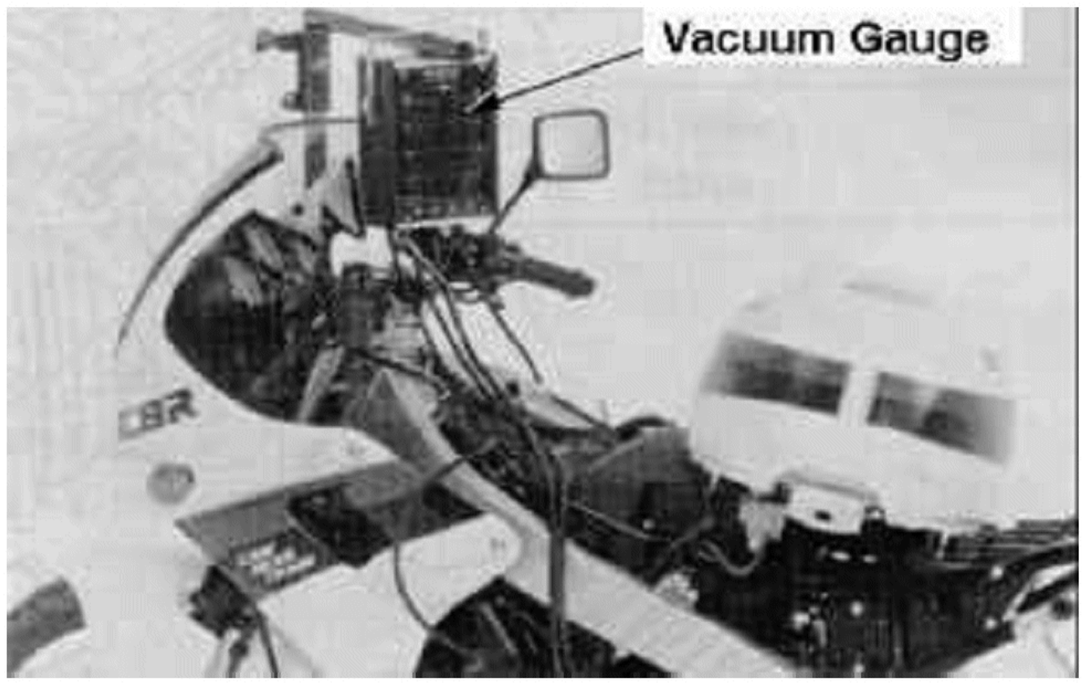
This procedure is not necessary if the vacuum pump is available. After removing the tank, apply negative pressure on the vacuum tube with the pump.

Remove the fuel tank with the tube attached and locate behind the vehicle.
Remove plugs/washers from each cylinder head. (Remove vacuum tube for #3 cylinder).
Attach the vacuum gauge adapter to each plug holes.
Connect the rubber tubes on the vacuum gauge to the adapter. (Directly connect the rubber tube to #3 cylinder).



Start the engine and set to specific idling rpm.

Idling rpm : 1500±100rpm.



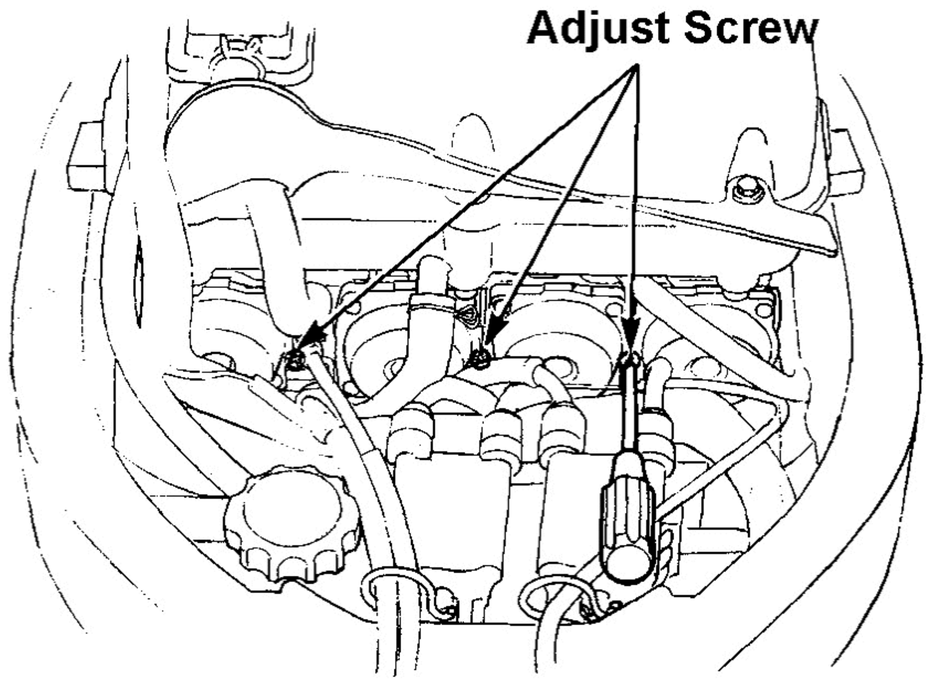
Measure the vacuum pressure difference between the cylinders.

Vacuum pressure difference : 40mm Hg

Measuring tool : Vacuum gauge 07404-0020000

If the number exceeds the above limit, adjust in the following way.

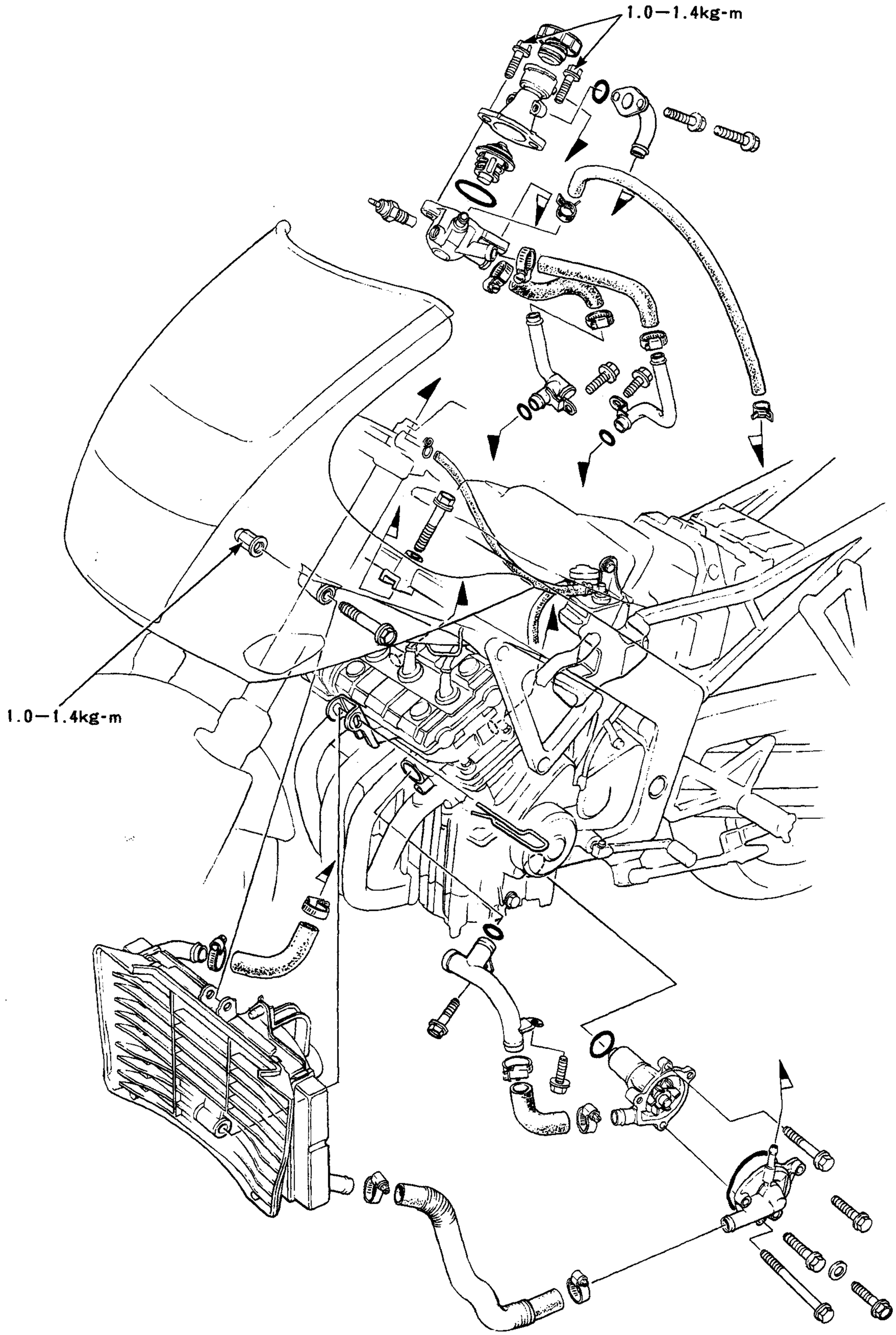
1. Confirm the individual carburettors' pilot screws are set to standard setting.
2. Adjust the synchronization by rotating the adjusting screw.



#3 Carburettor is the standard.

After adjustment re-check the synchronizing and adjust the idling.
Reverse the procedure for re-assembly.

- **Assembly**



Assembly	5 - 0	Thermostat	5 – 6
Maintenance Information	5 – 1	Thermal Sensor	5 –8
Troubleshooting	5 – 1	Water Pump	5 –9
Radiator	5 – 3	Reservoir Tank	5 – 11

- **Maintenance Information**

General Caution

- Conduct the maintenance while the engine is cool.
- Do not open the radiator cap when it is hot.
- All of the cooling system maintenance can be conducted on the vehicle.
- Refill of the radiator fluid should be done through the reservoir tank. Do not remove the radiator cap except for radiator fluid refill / drain purposes.
- Radiator coolant may damage the painted surface. Wash off with water immediately.
- After the work, inspect all joints / seals for water leak by using a radiator cap tester.

Maintenance Standard		Standard	Limitation
Radiator Cap	Valve Opening Press	0.75 – 1.05kg/cm²	≦0.75kg/cm² or ≧1.05kg/cm² → Replace
Thermostat Valve Opening Temperature	Initial Opening	80 – 84°C	-
	Full Open	95°C	-
	Full Open Lift	8mm or more	-
Cooling Water Capacity		Total Approx. 1.300cc	Radiator Side Approx 1.100cc Reservoir Tanked 200cc

Tightening Torque

Radiator Upper Stay	1.0 – 1.4kg-m
Thermostat Cover	1.0 – 1.4kg-m
Radiator Grill	0.8 – 1.2kg-m

Troubleshooting

Too High water temperature	Water Leak
• Water Temp indicator or the thermal sensor failure	• Mechanical seal failure
• Radiator Cap failure	• Worn out / damaged water hose
• Thermostat failure	• Worn out / loose O rings
• Radiator liquid level too low	
• Clogged water hose / jacket	**Water temp too low or slow rise**
• Bent Pin	• Temp indicator / thermal sensor failure
• Clogged radiator	• Thermal sensor failure
• Water pump failure	• Thermostat Failure

Radiator Liquid Specific Gravity

Density % Temp	0	5	10	15	20	25	30	35	40	45	50
5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.001	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
***30**	**1.053**	**1.052**	**1.051**	**1.049**	**1.047**	**1.045**	**1.043**	**1.041**	**1.038**	**1.035**	**1.032**
35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.080	1.078	1.076	1.074	1.072	1.069	1.056	1.063	1.060	1.057	1.054
50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

*** Standard**

Radiator liquid mixture table (anti-corrosion / ice-free)

Minimum Temp	Mixture	Honda Ultra Radiator Liquid	Purified Water
-9c	20%	260cc	1.040cc
-16c	**30%**	**390cc**	**910cc**
-25c	40%	520cc	780cc
-37c	50%	650cc	650cc
-44.5c	55%	715cc	585cc

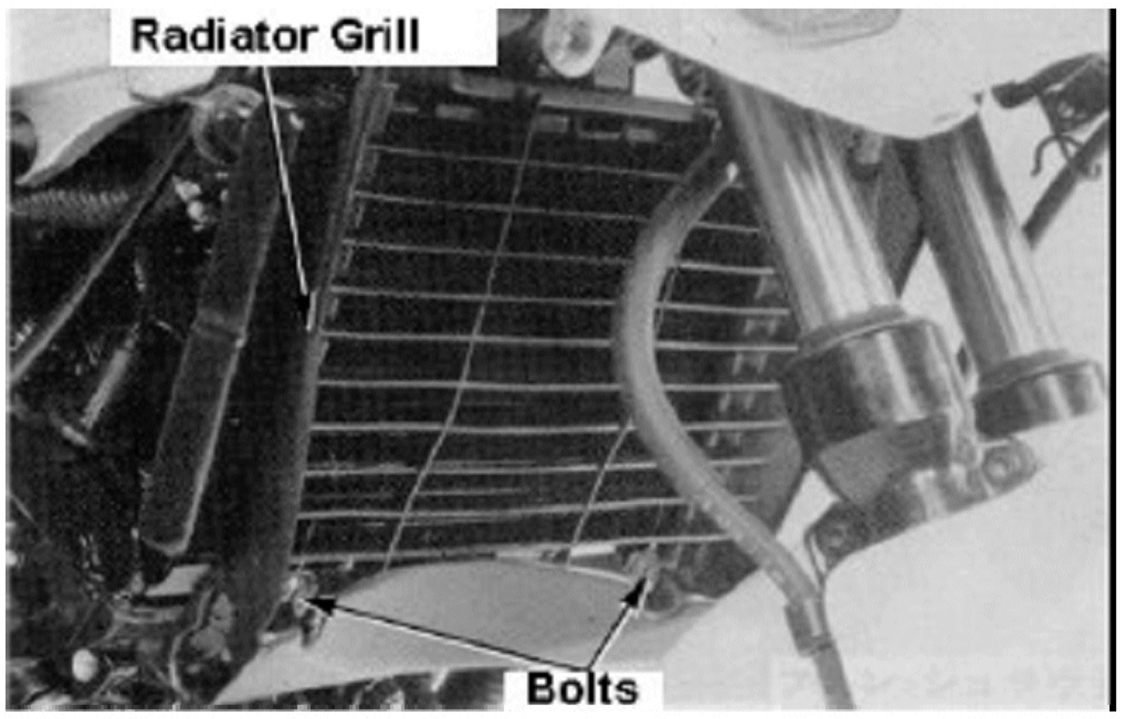
General caution for the radiator liquid

- Use Honda Ultra radiator liquid or equivalent
- Do not mix with the other product
- Toxic. Do not drink
- Apply 5°c allowance to the minimum temperature

- **Radiator**

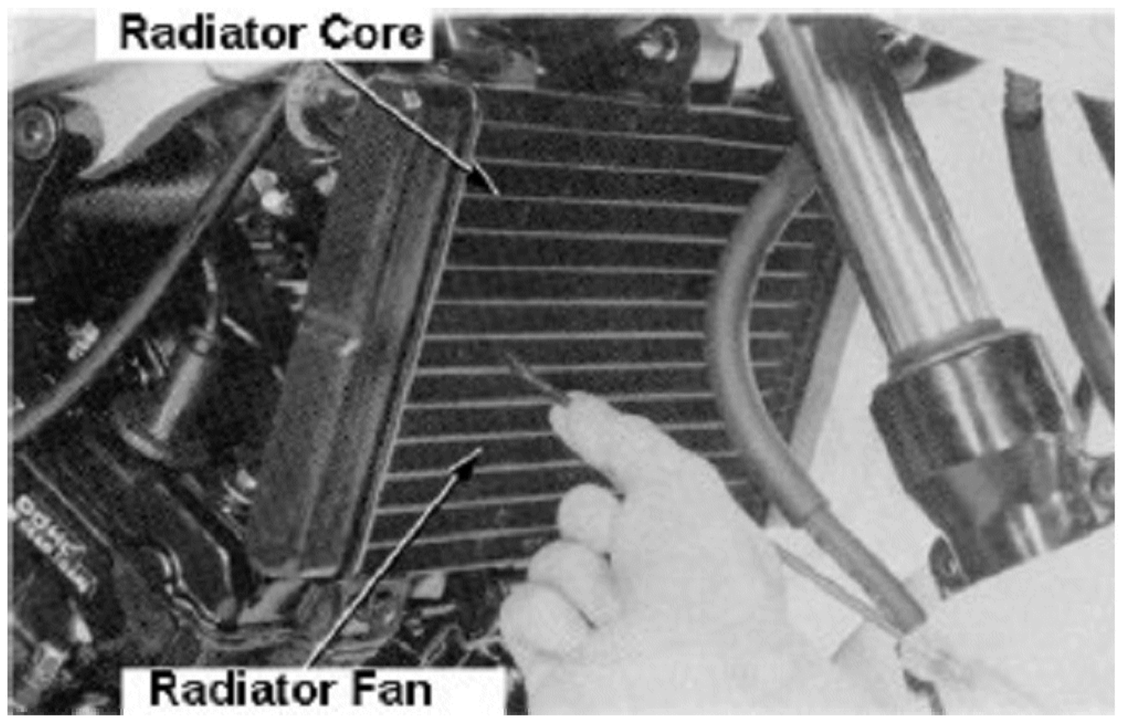
Inspection of radiator hoses

Remove the side cowl (13-4)
Remove two bolts and detach the radiator grill.



Inspect the hose/clamps for damage/wear.
Check the radiator core for clogging and bending of the fins.

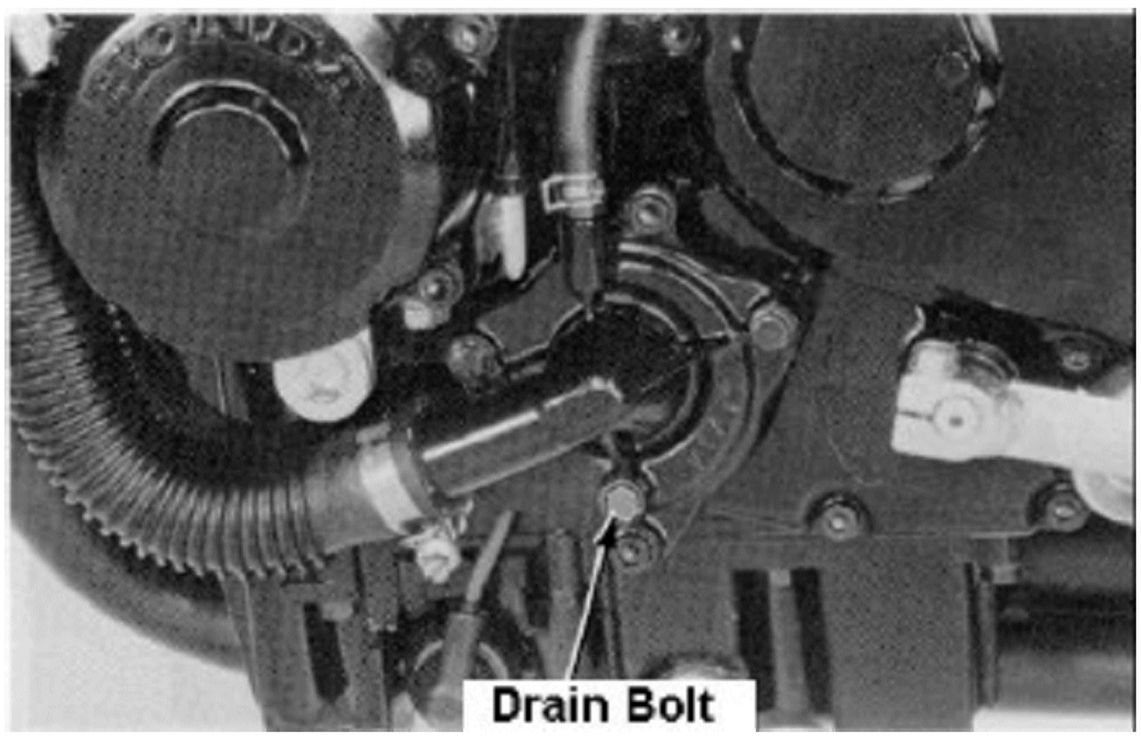
Adjust / replace the radiator if the clogging of the radiator core exceeds 20% of Total heat radiation area.



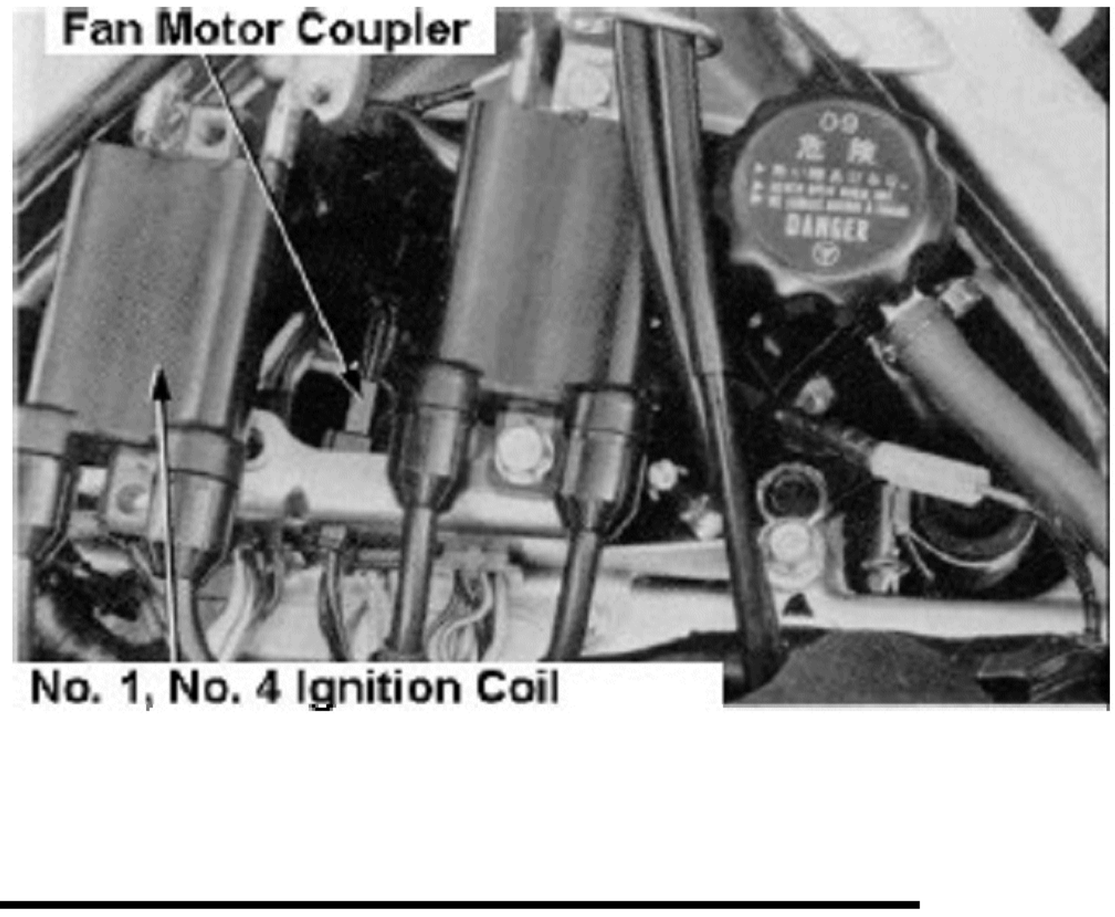
Adjust the bent fins with a screwdriver.

Removal

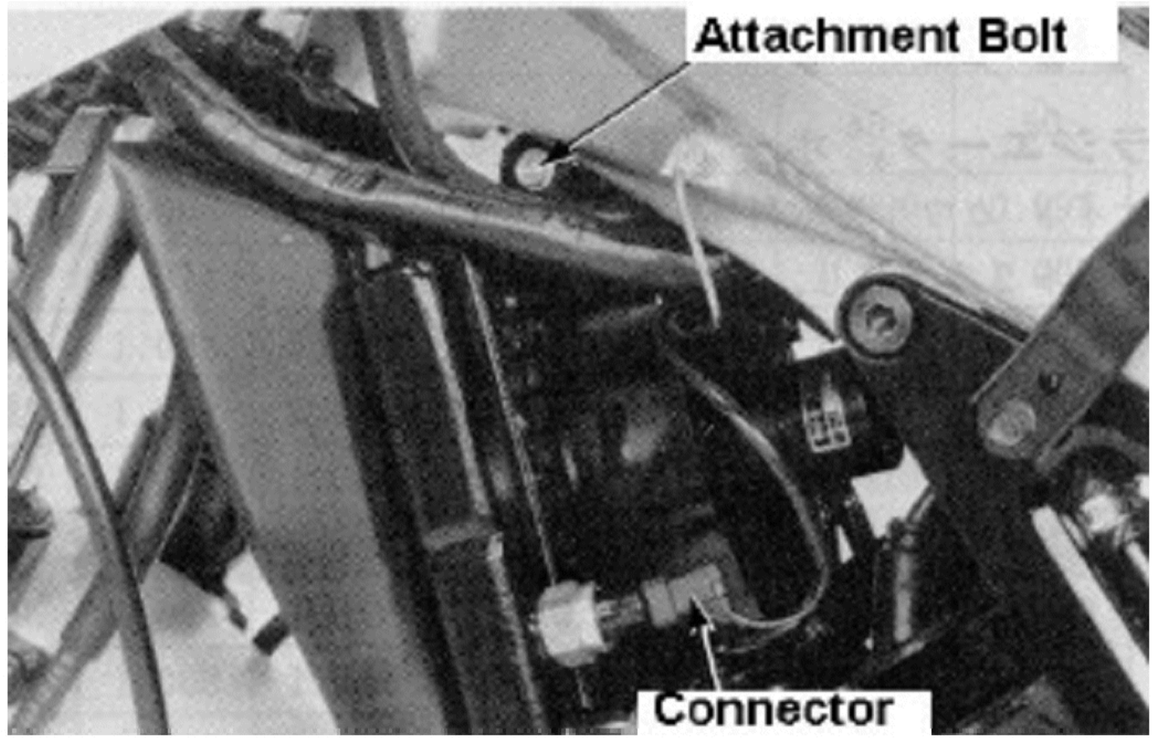
Remove the drain bolt and drain the radiator liquid in the cylinders.



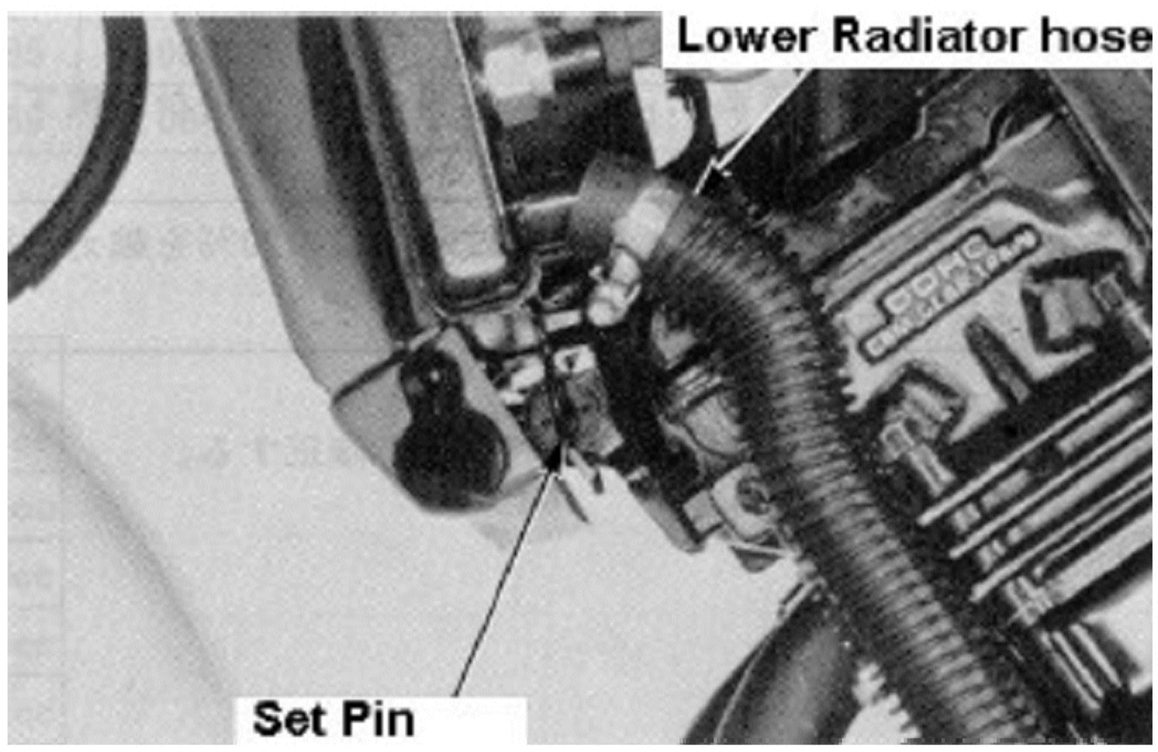
Remove the side cowl. (13-4)
Remove the fuel tank. (4 – 3)
Remove the #1, 4 ignition coil
Attachment bolts and slide.
Remove the radiator fan motor coupler.



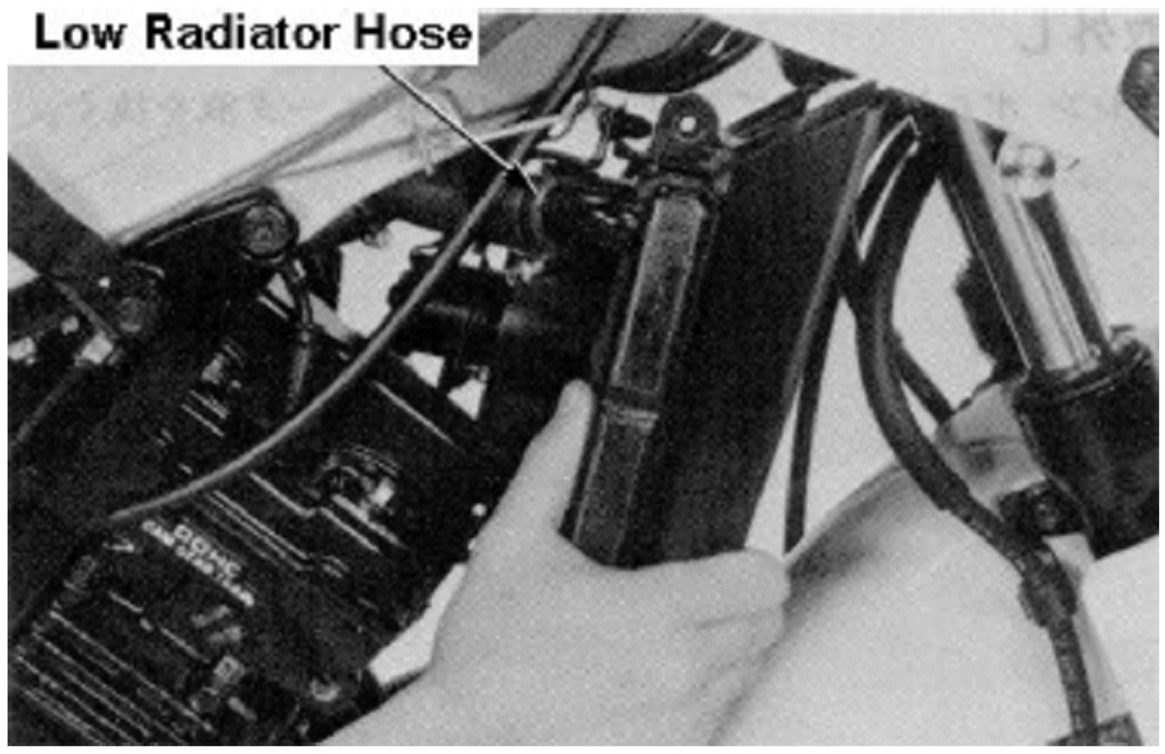
Remove the radiator attachment bolt.
Remove the cooling fan switch wire connector.



Remove the radiator set pin.
Remove the lower radiator hose.



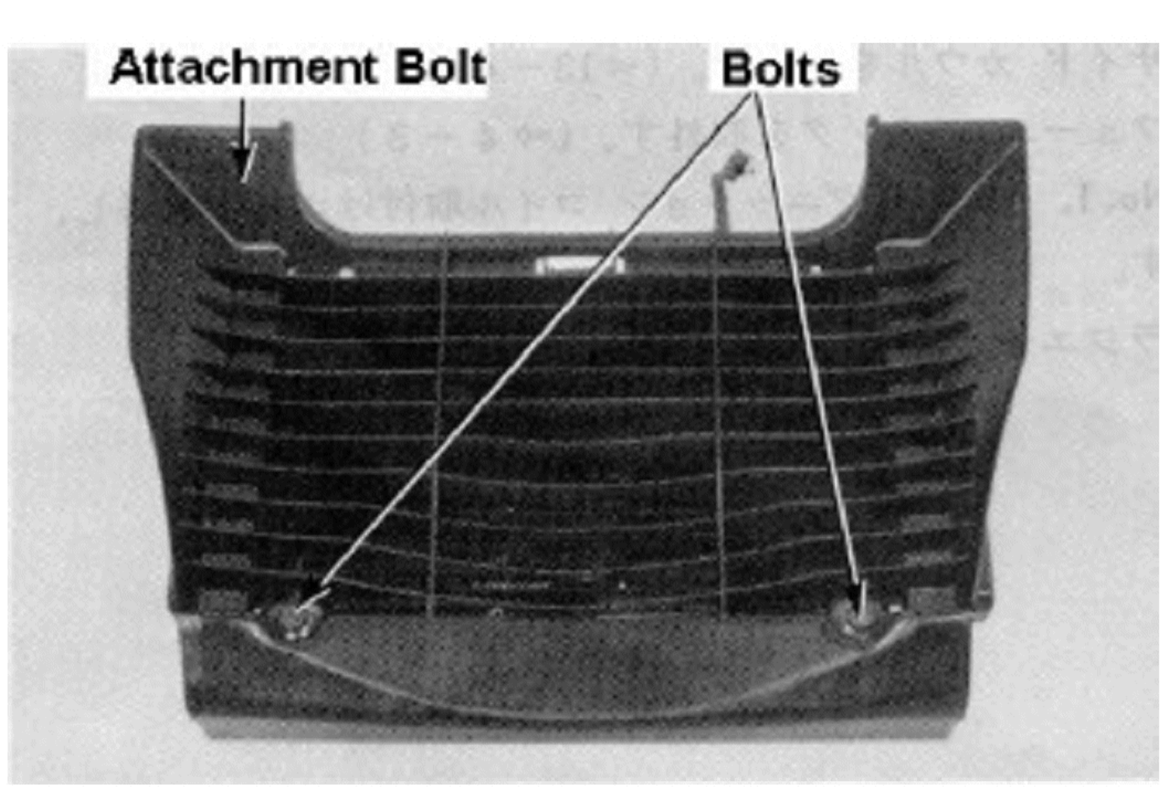
Pull the radiator forward.
Disconnect the upper radiator hose and remove the radiator.



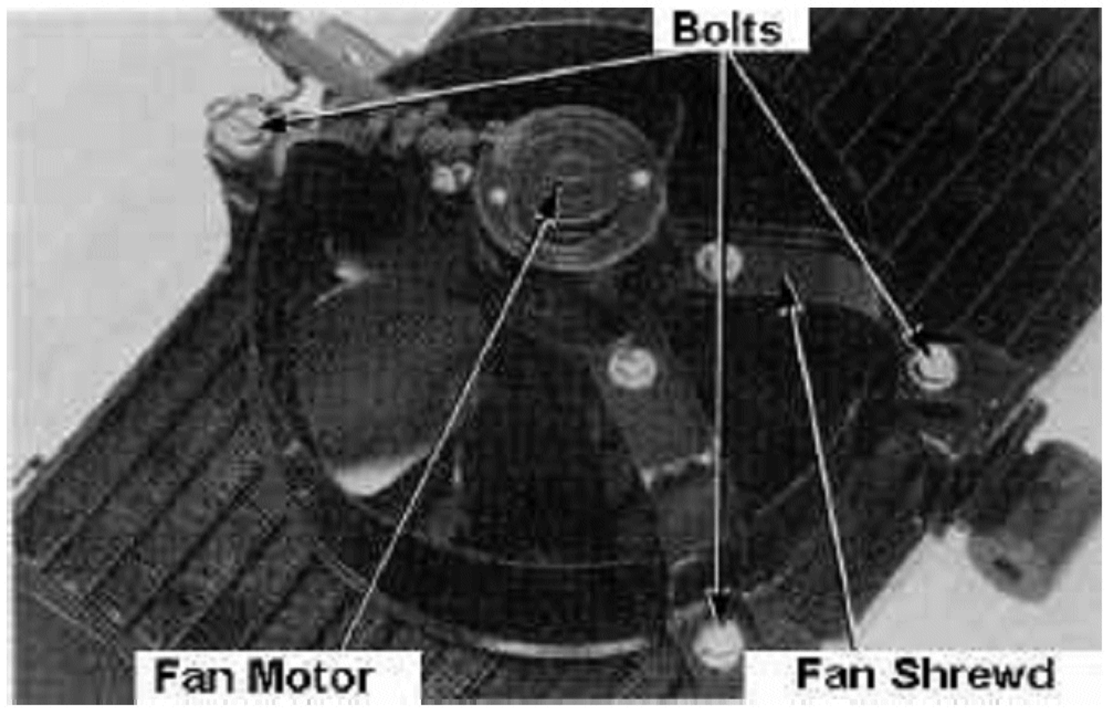
Do not damage radiator fins.

Disassembly

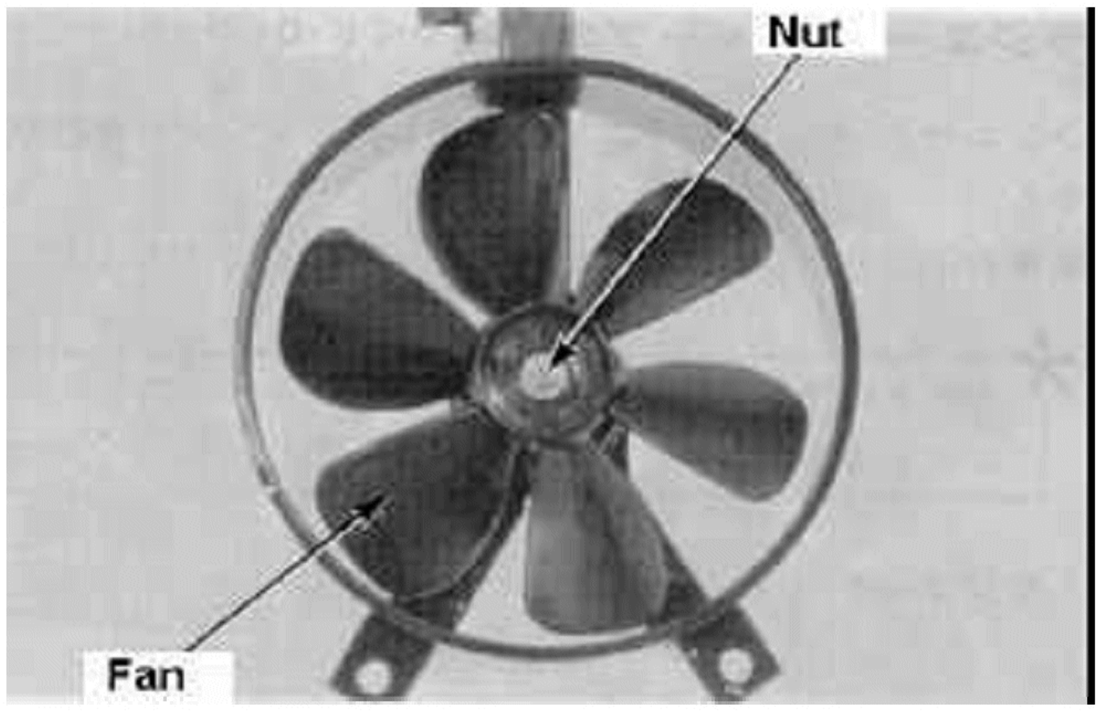
Remove the two bolts and detach the radiator grill.



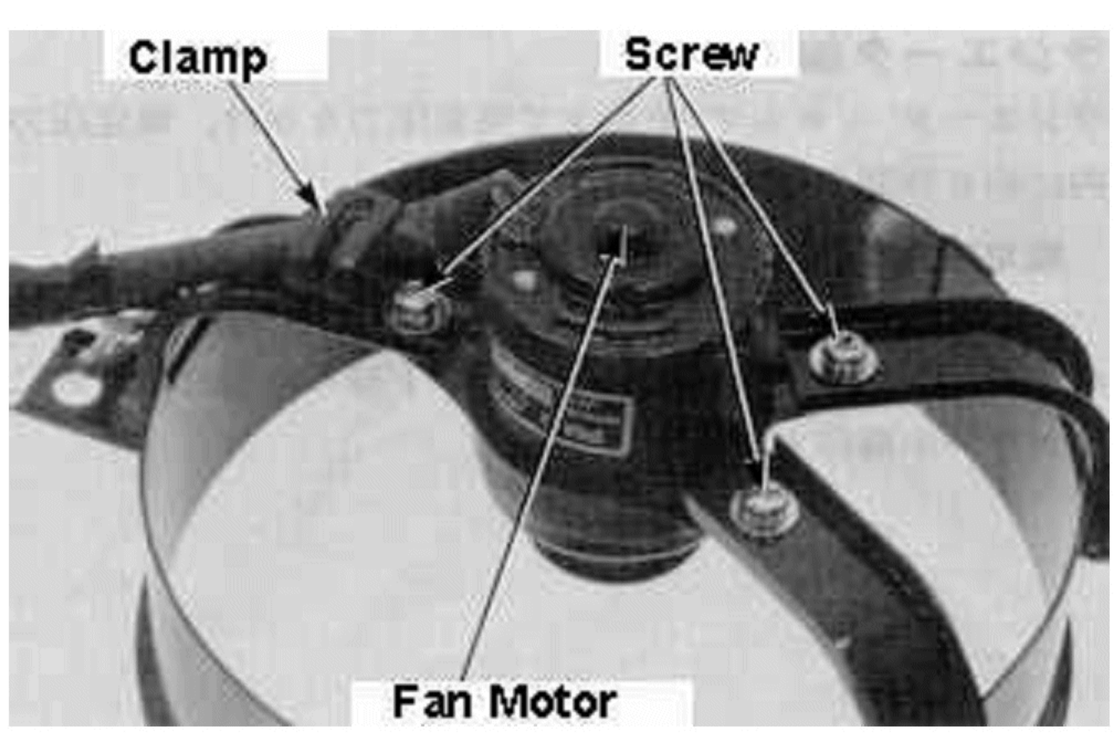
Remove the three bolts behind the radiator and detach the fan shroud and the fan motor at the ASSY.



Remove nuts and remove the fan.



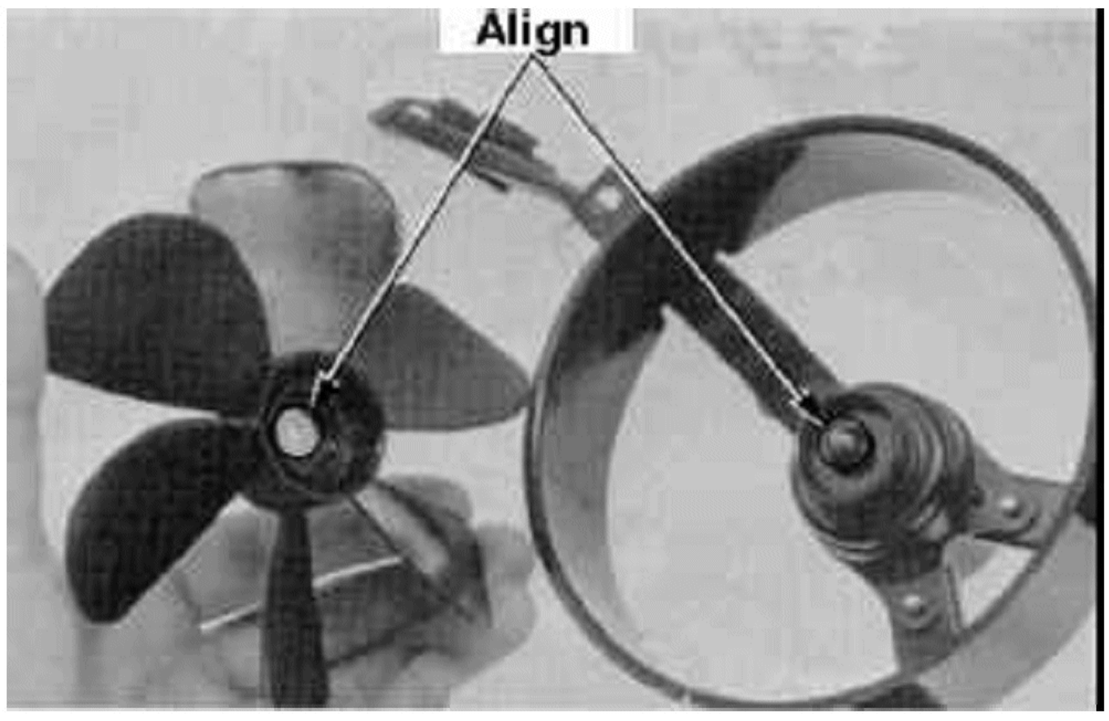
Detach the wire from the clamp.
Remove three screws and detach the motor from fan shroud.



Assembly

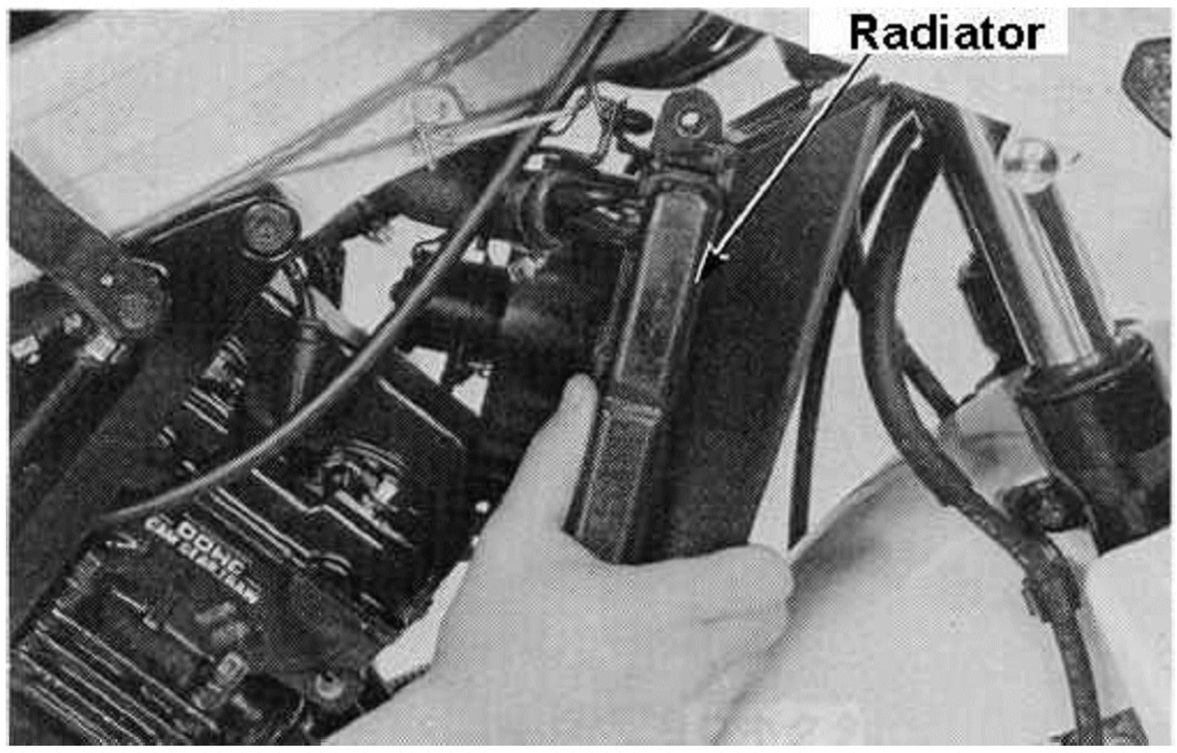
Inspect all parts for damage.
Reverse the disassembly procedure for the assembly.

Align the fan motor axis and the slit on the fan when assembling the fan.



Attachment

Reverse the detachment procedure.
Tightening torque.
Radiator upper stay: 1.0 ~ 1.4kg m
Radiator grill : 0.8 ~ 1.2kg m
Fill the radiator liquid. (2-19)
Apply pressure to the radiator and inspect for water leak.

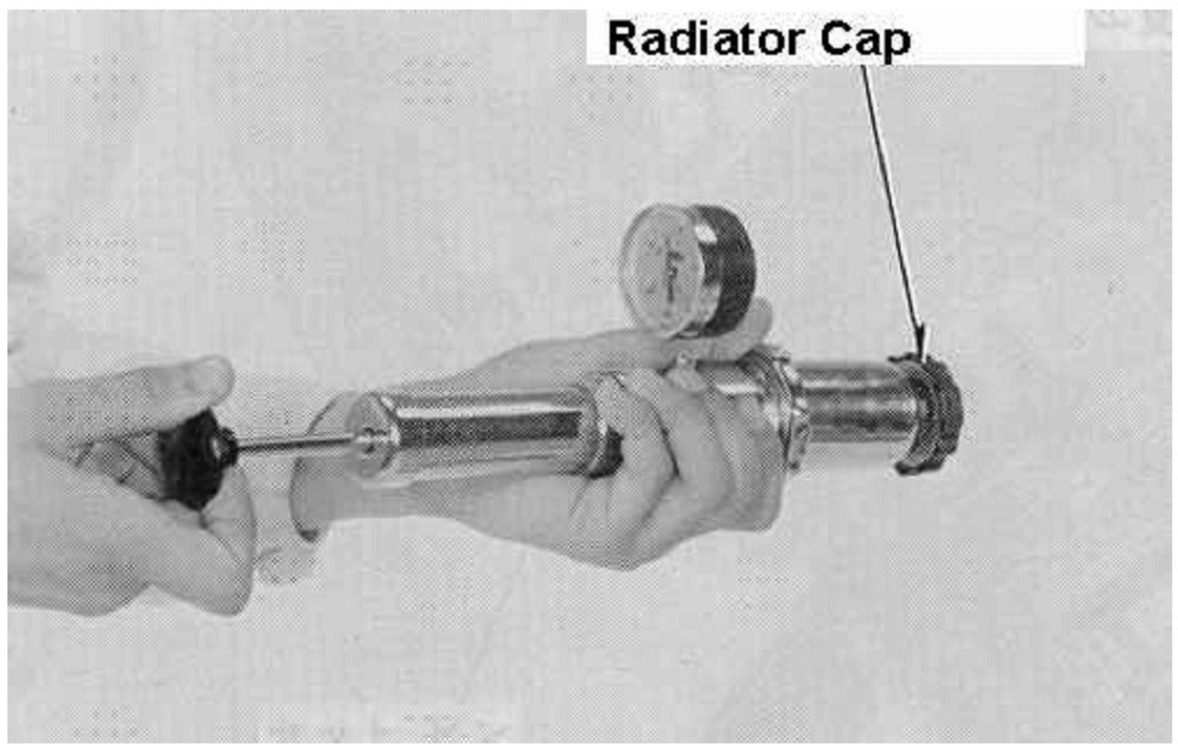


Radiator cap inspection

Inspect the cap with a radiator cap tester.
It should sustain 6 sec for standard pressure.

- Apply water on the seal surface of the cap when attaching the tester

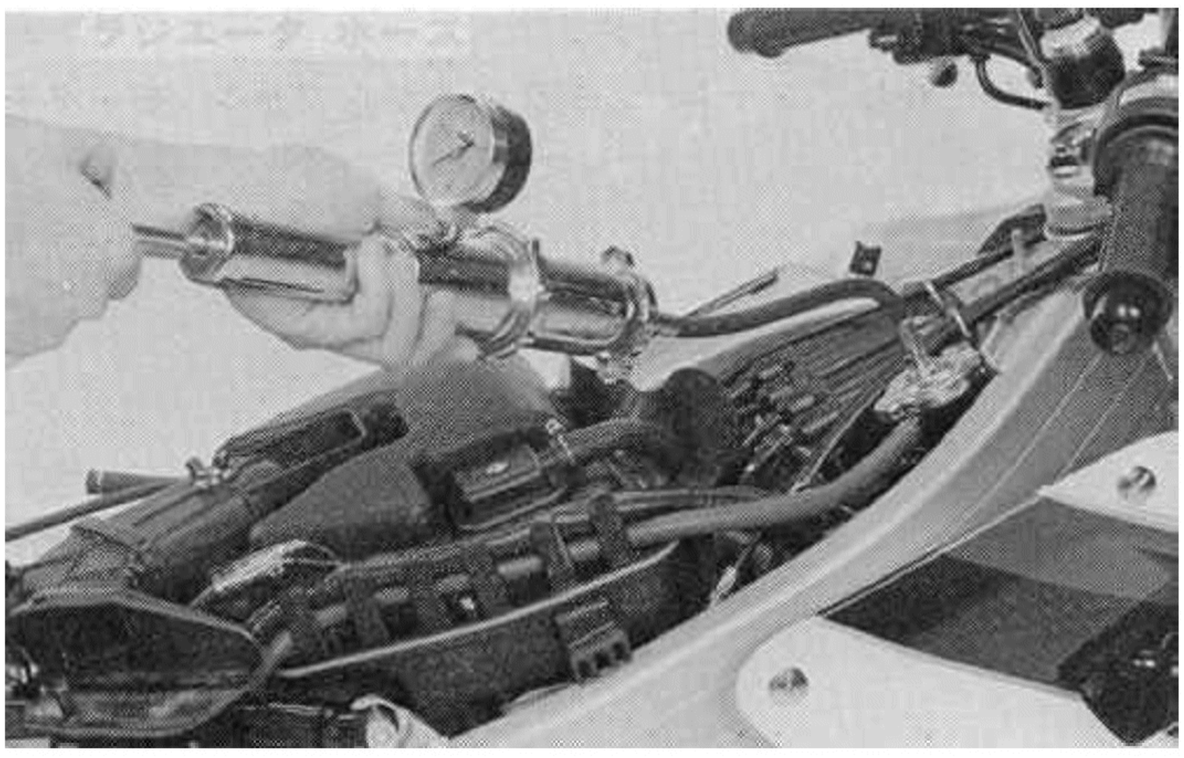
Radiator cap valve opening pressure: 0.9 kg/cm²



Radiator pressurization test

Apply standard pressure with the tester.
Should sustain for 6 sec.
Standard pressure: 0.75 ~ 1.05kg/cm²

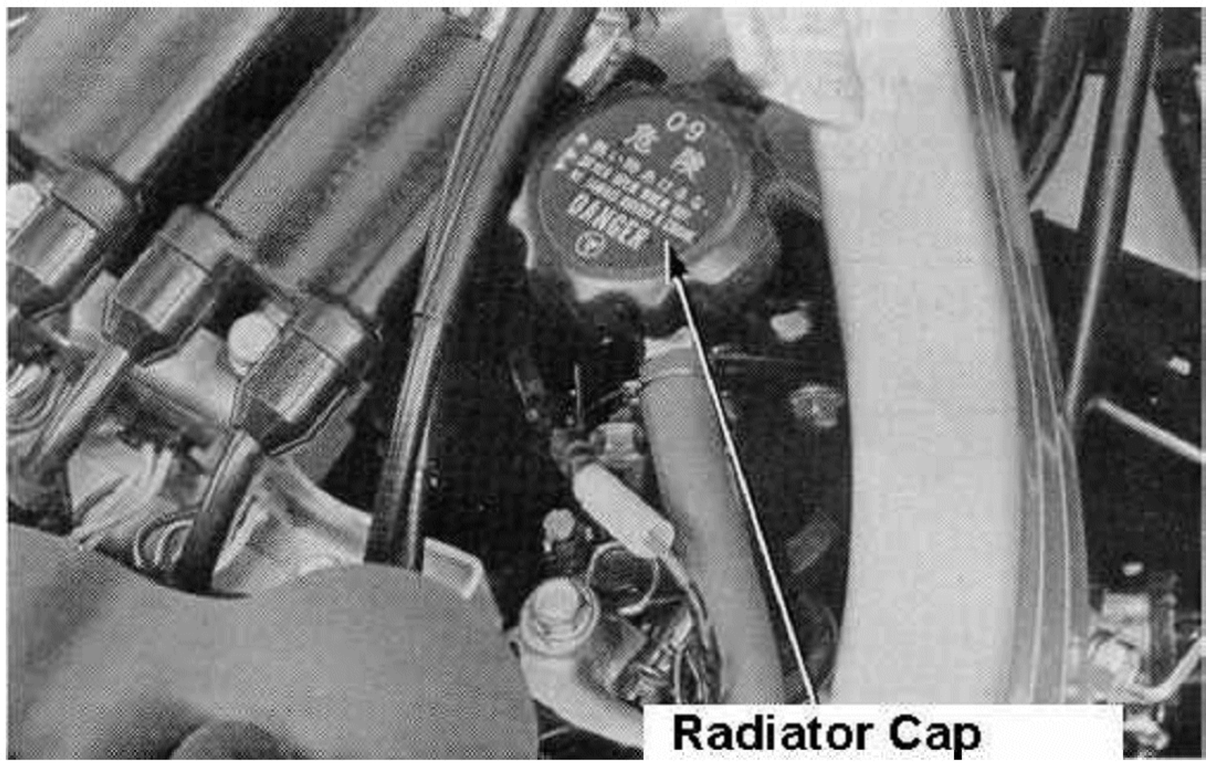
Inspect the hoses, each joint, bottom of the water pump for water leak.



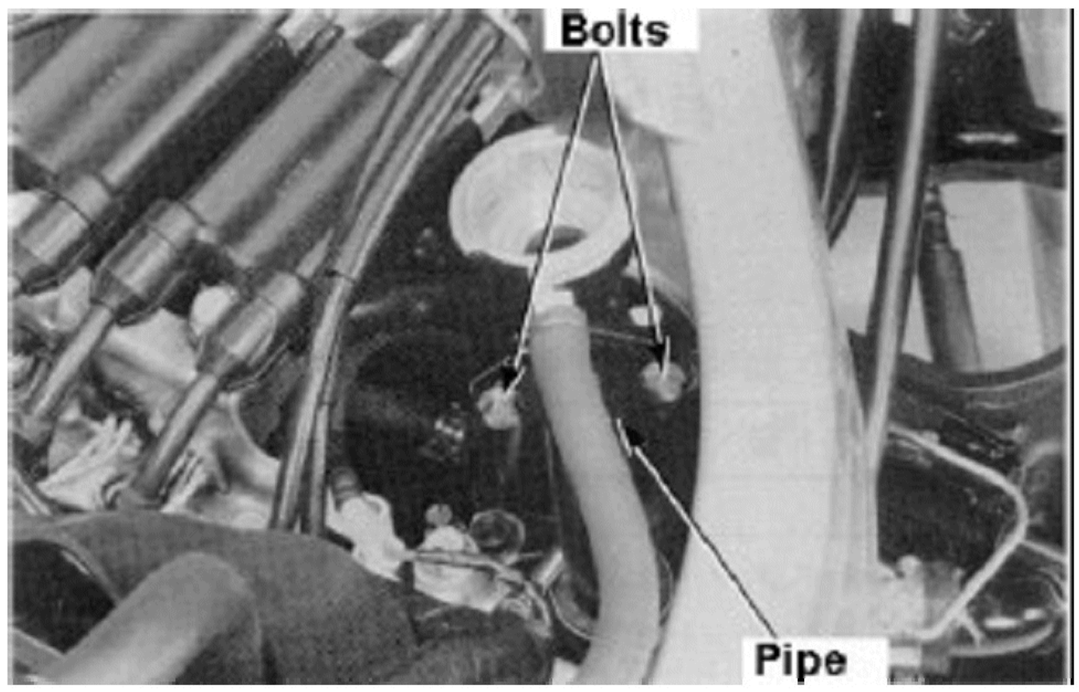
Thermostat

Removal

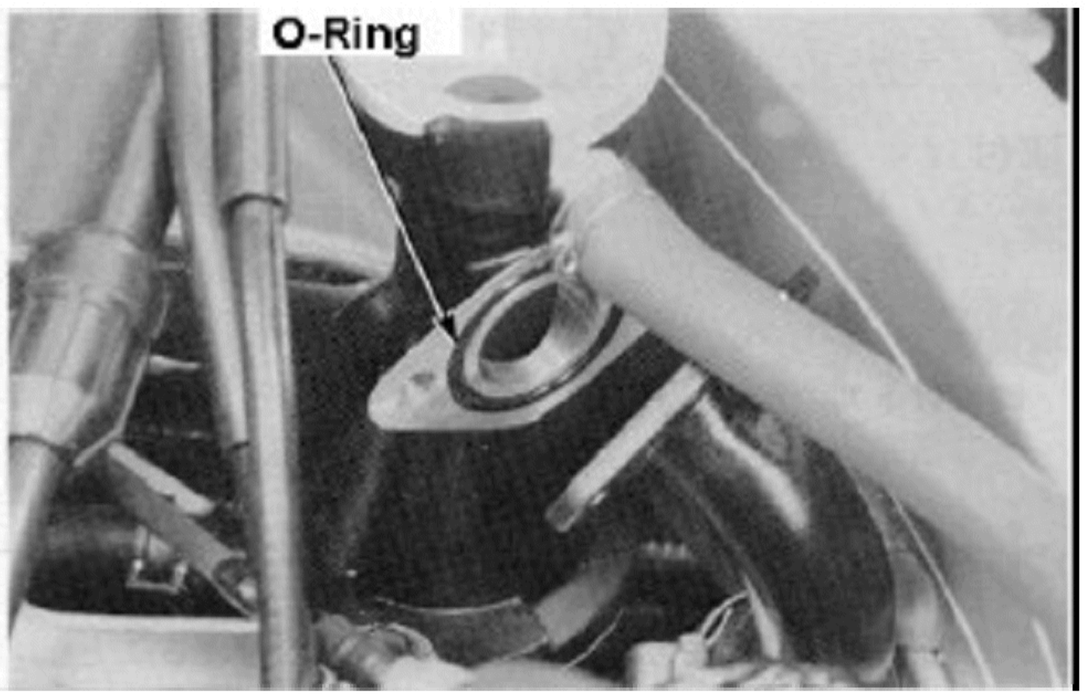
Remove the radiator cap.
Drain radiator liquid (5-3)



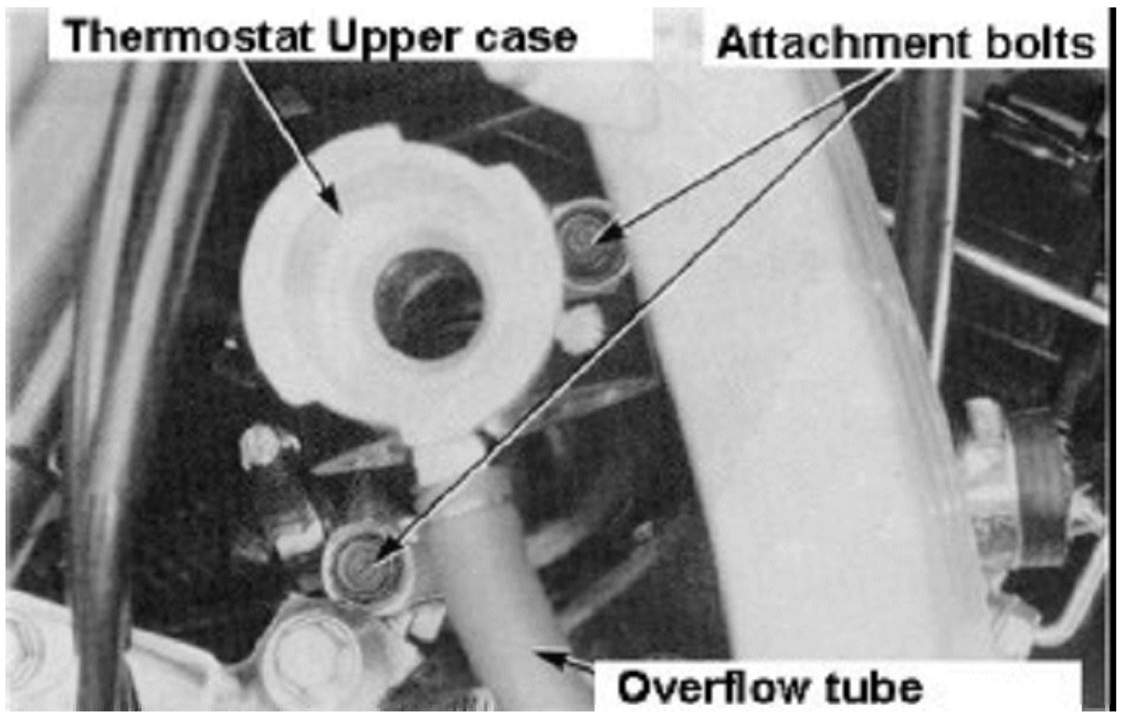
Remove two bolts and detach the pipe.



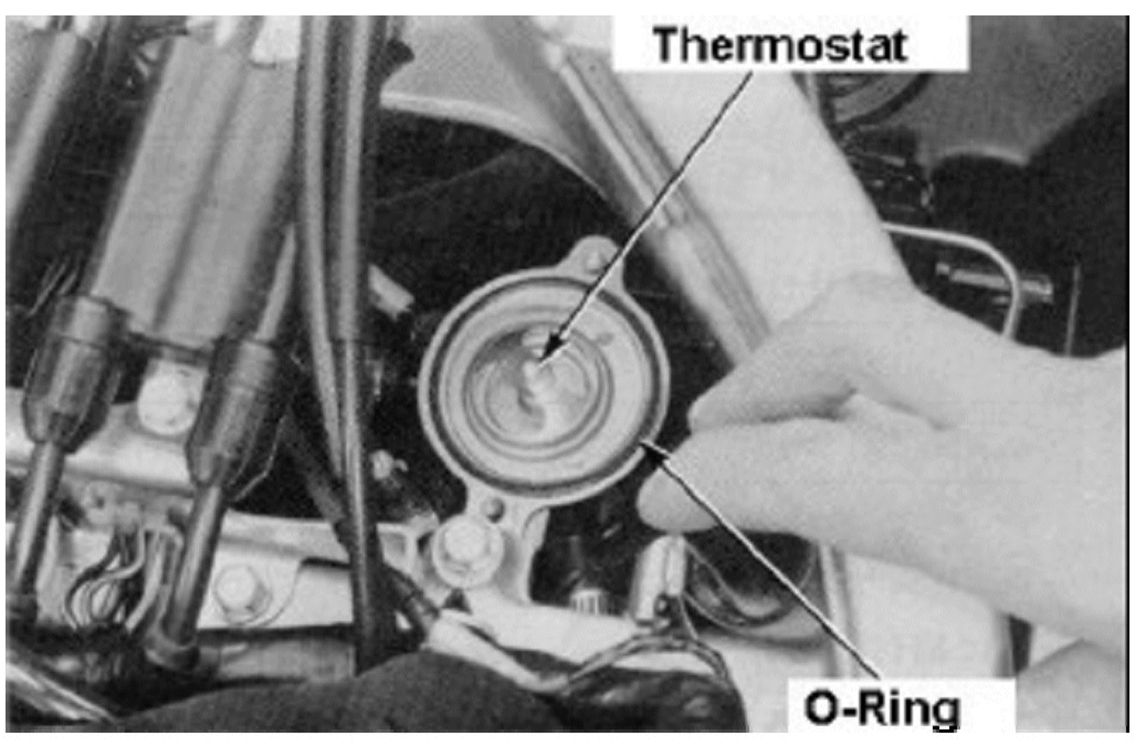
Remove O-Ring on the thermostat upper case.



Disconnect the overflow tube.
Remove two attachment bolts and detach the thermostat uppercase.



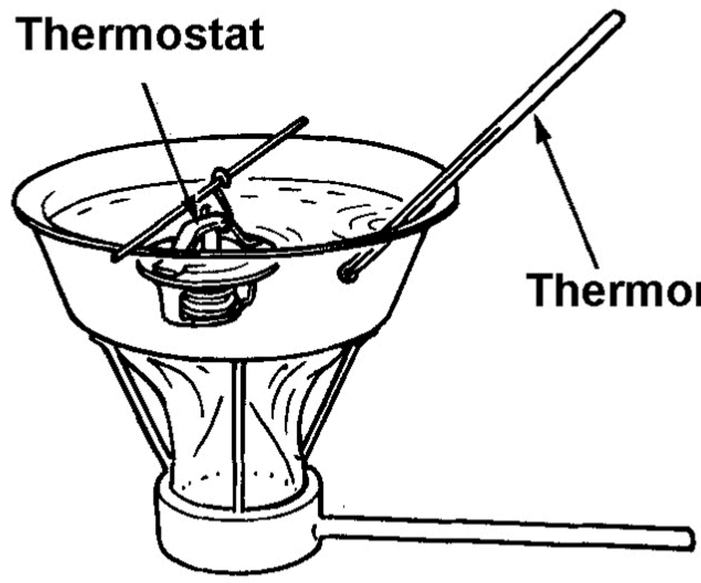
Remove the O-Ring and the thermostat.



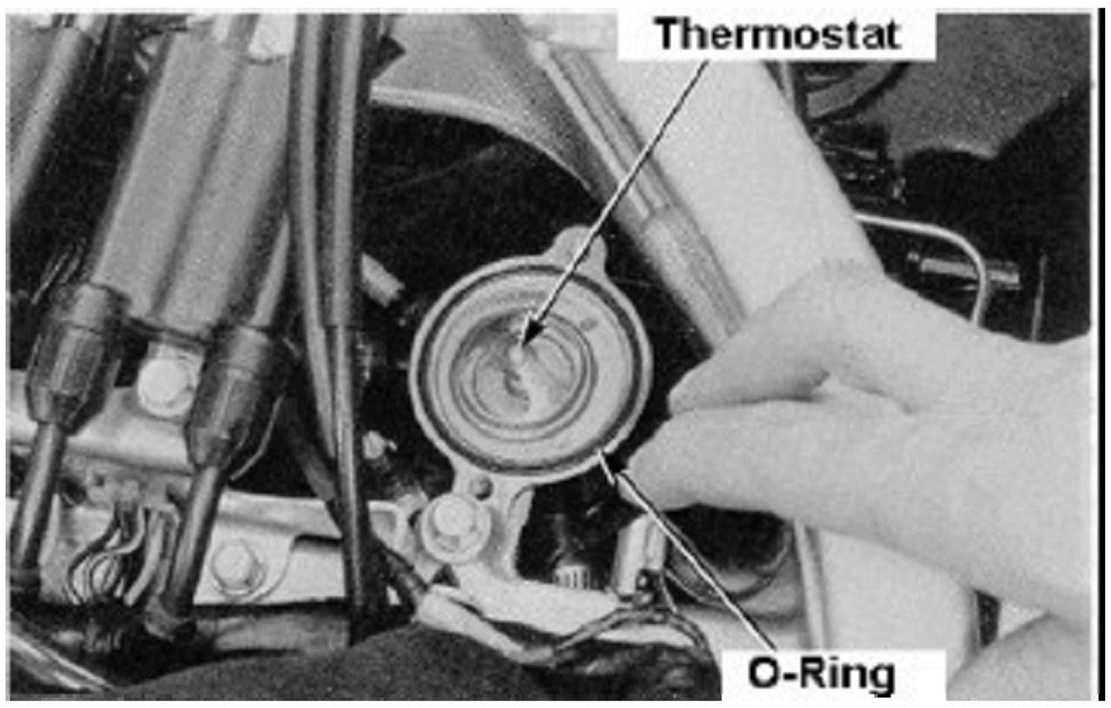
Inspection

Put the thermostat into the testing container
And gradually raise the temperature.
Thermostat specification

Initial opening temp	80~84c
Full open temp	95c
Full open lift	≥ 8mm



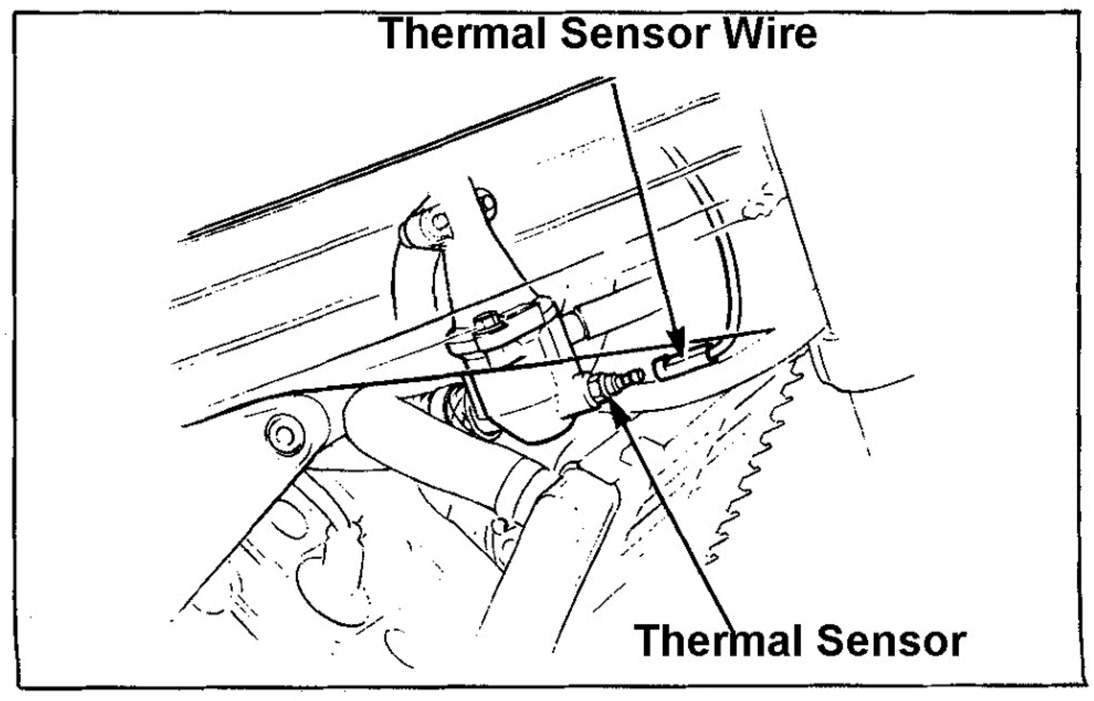
- The thermostat should not contact the container wall.
- Replace the thermostat if it is opened in room temperature.
- Measure the full open lift after applying 95°c for 5 min.



Attachment

Attach an O-Ring to the thermostat body.
Reverse the procedure for attachment.

Tightening torque.
Thermostat case: 1.0 ~ 1.4kg m



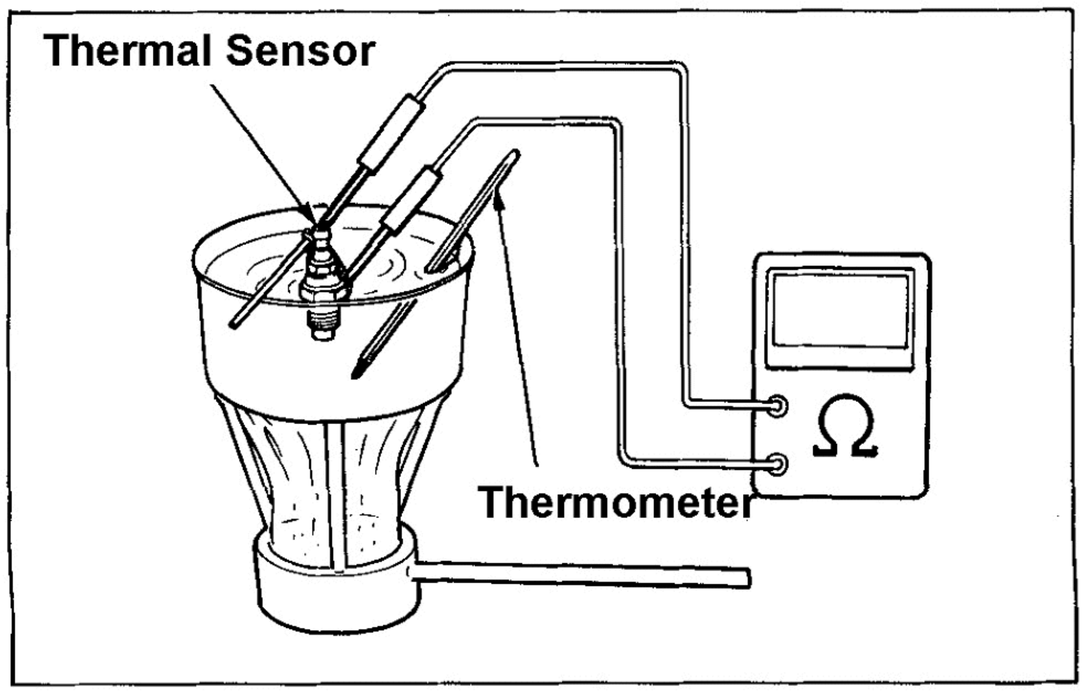
Thermal Sensor

Detachment

Detach the wire from the thermal sensor.
Remove the thermal sensor.

Place the thermal sensor in a test container filled with 50% radiator liquid.
Gradually increase temperature and measure the resistance.

- The thermal sensor should not contact the container wall.



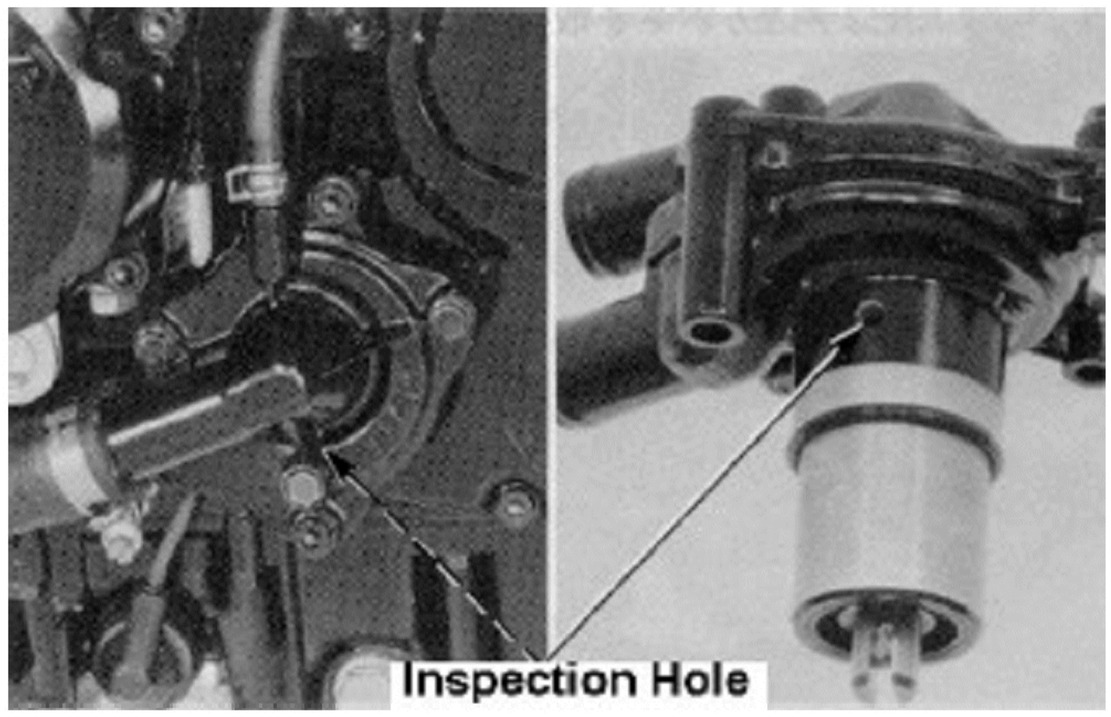
Thermal sensor specification.

Temp °C	50	80	120
Resistance Ω	153.9	51.9	16.1

Apply sealer to the screw of the thermal sensor and tighten to the thermostat case.
Connect the wires.

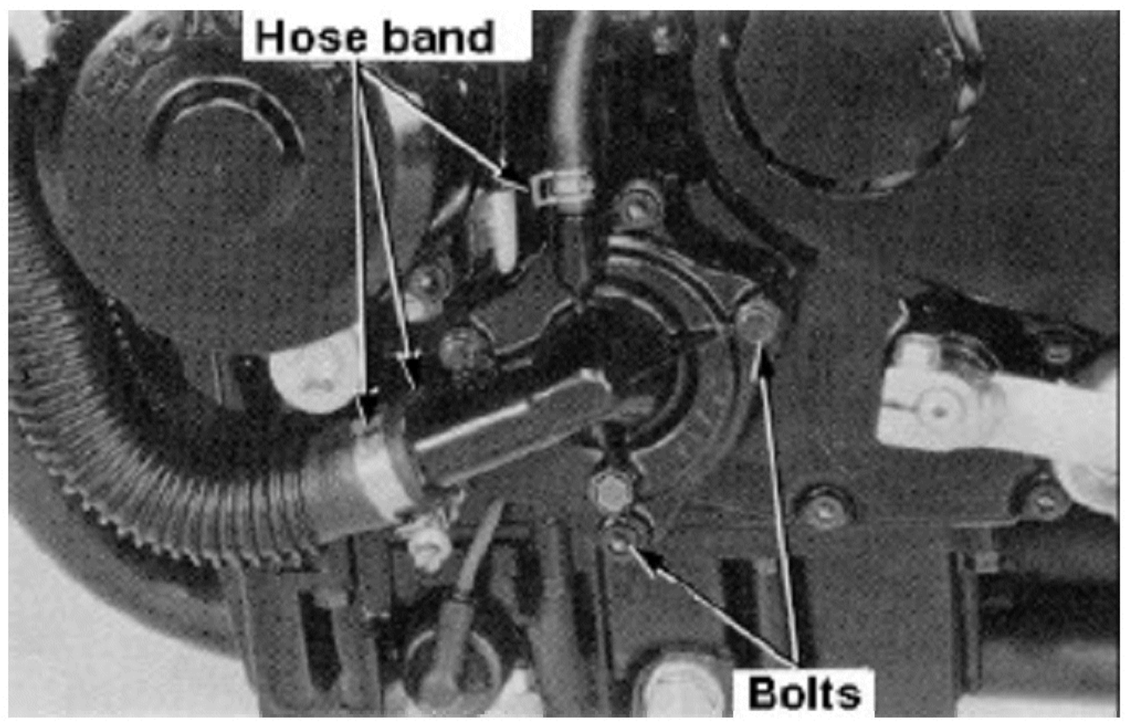
Water Pump

Inspection of mechanical seals
Inspect the water pump inspection hole for radiator liquid leak. If leak was found, replace the water pump ASSY.

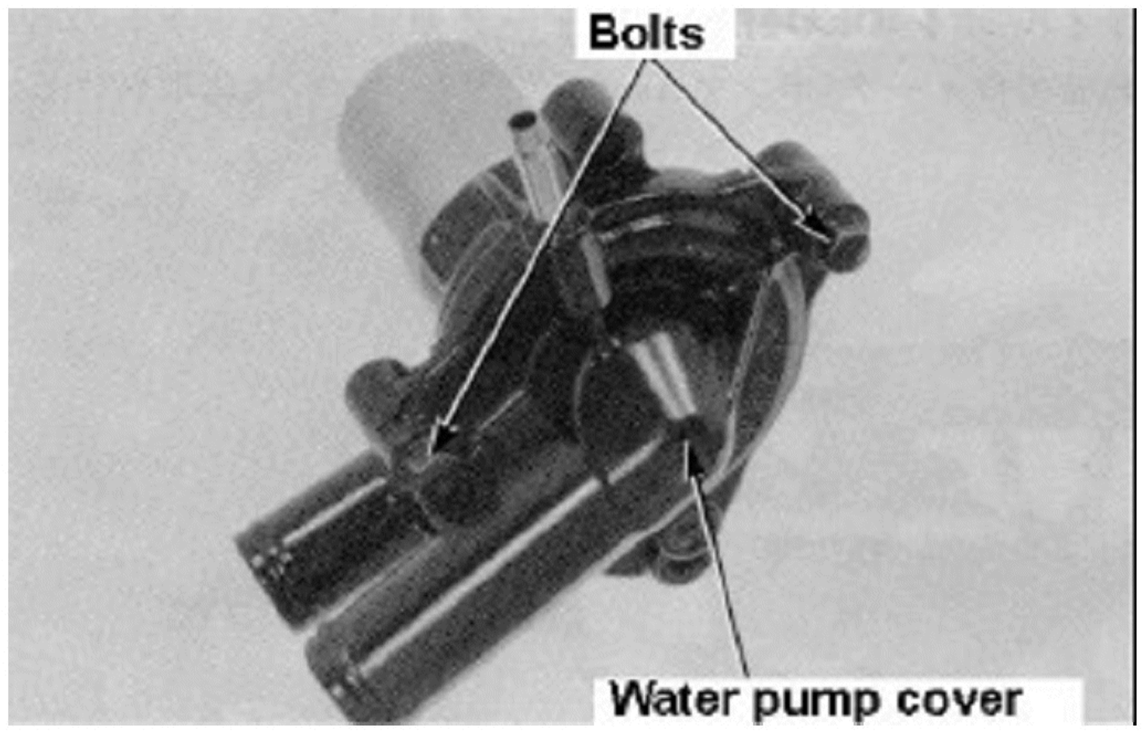


Removal (Detachment)

Drain engine oil. (2 - 16)
Drain radiator liquid. (5-3)
Loosen the hose band and detach the radiator hose from the water pump cover.
remove two attachment bolts and detach the Water pump ASSY.
Remove O-Rings.



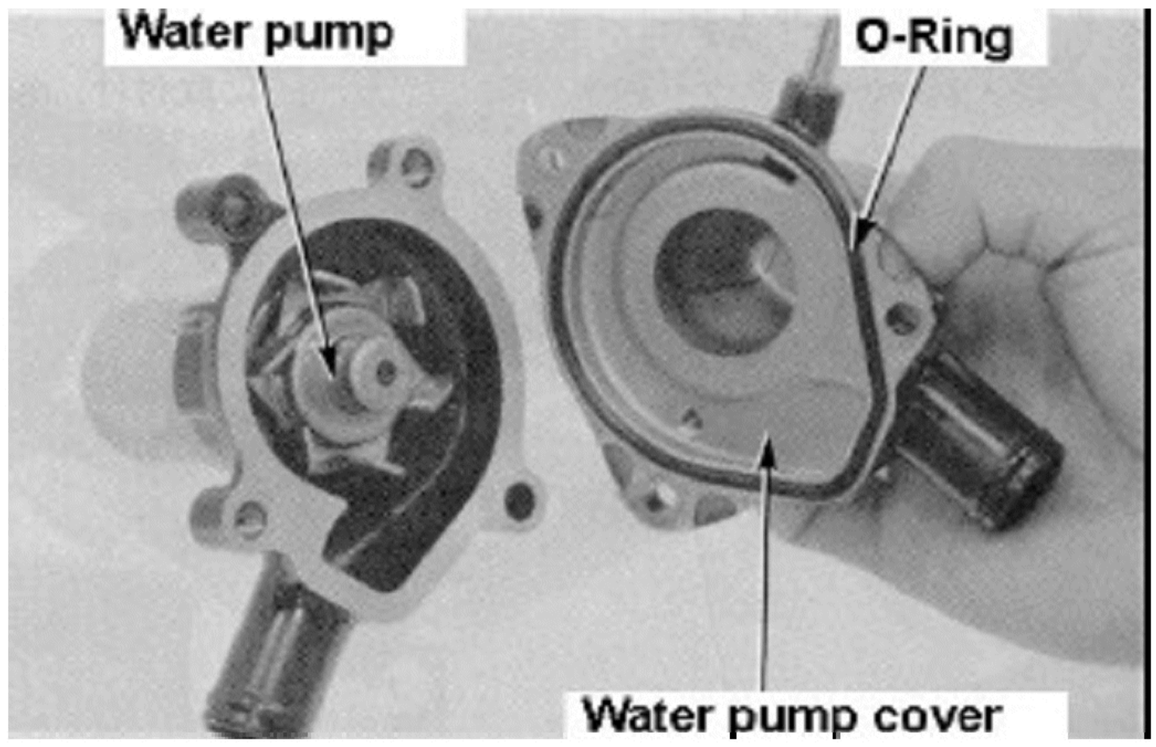
Remove the two bolts and separate the Water pump and its cover.



Inspection

Inspect the pump for damage, replace as ASSY if damaged.

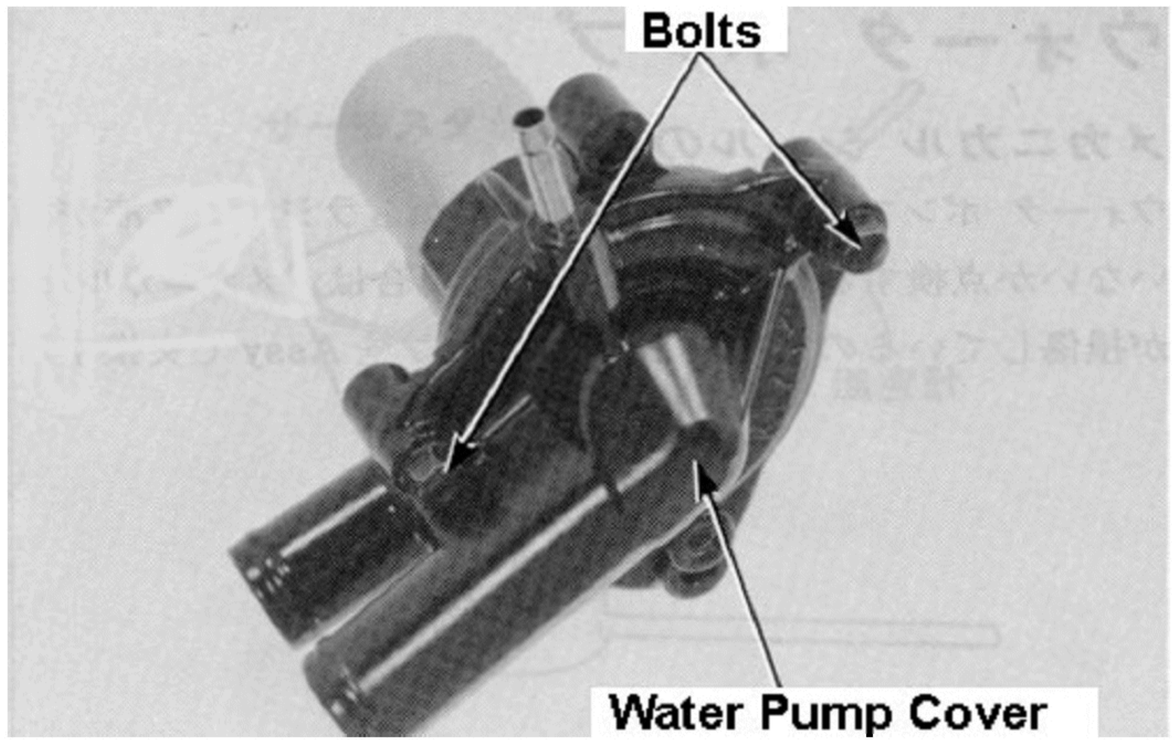
- Do not disassemble the water pump.
- Water pump replacement is considered to be ASSY replacement.



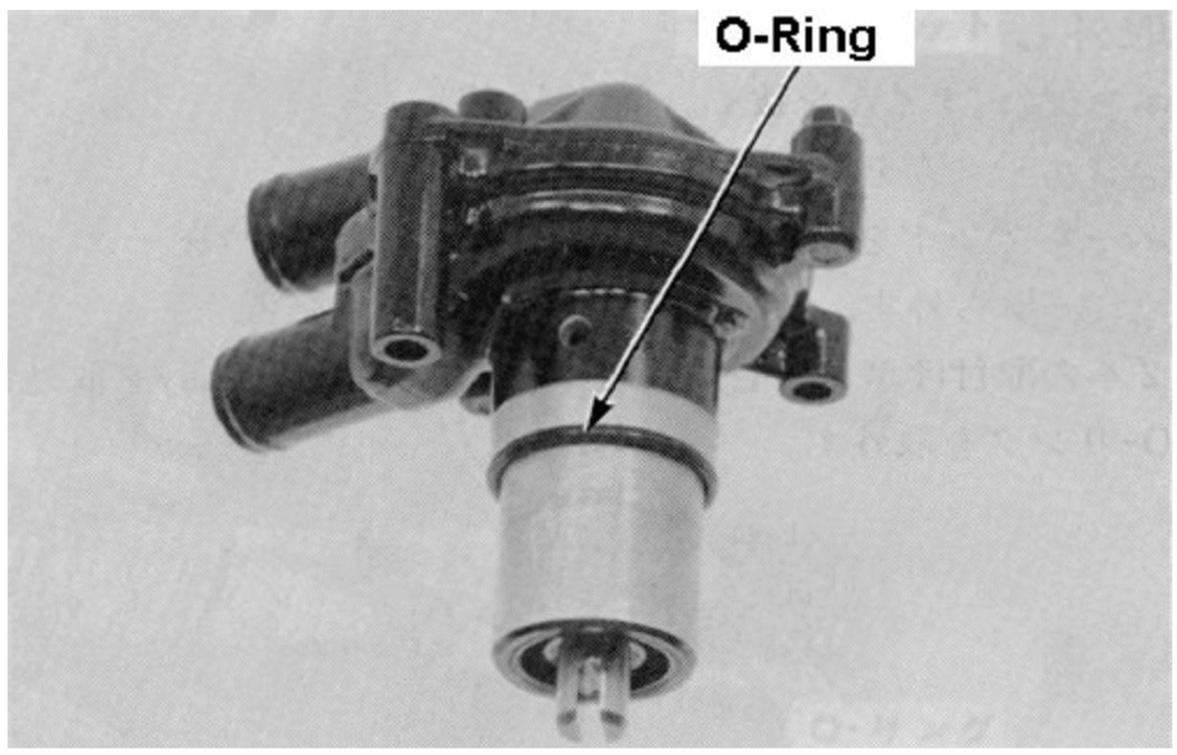
Attachment

Attach O-Ring to the water pump cover.

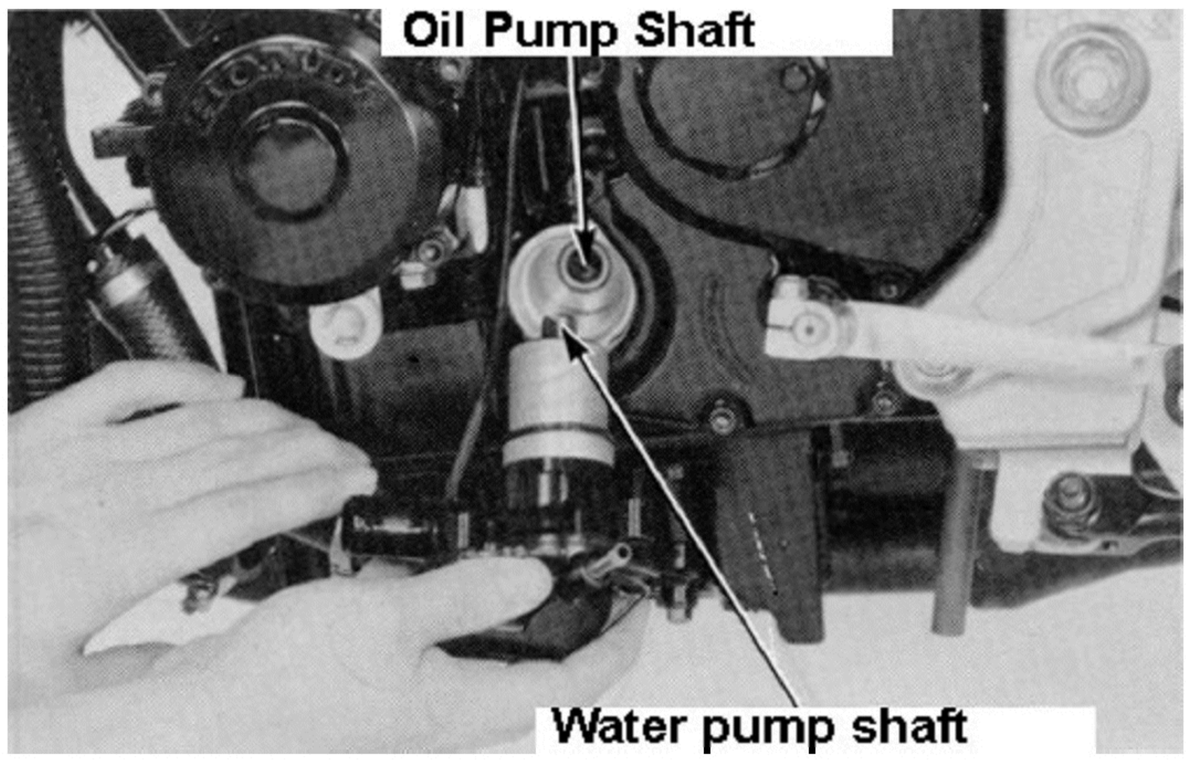
Attach cover to the pump and
Tighten the two bolts.



Attach the O-Ring to the water pump.

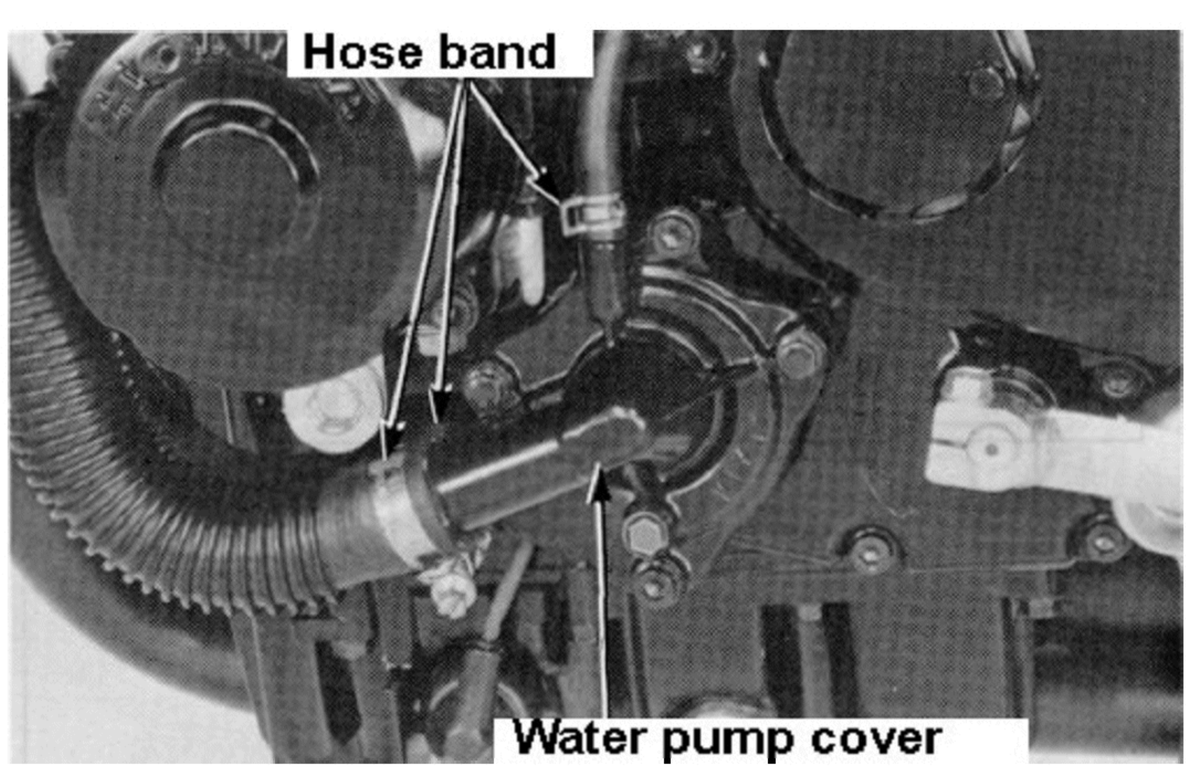


Align the oil pump shaft and the slit of
the water pump shaft and attach the water
pump ASSY to the crank case.



Tighten the two attachment bolts.
Attach the radiator hose to the water
pump cover and tighten the hose band.
Fill the radiator liquid (2 – 19).
Fill the engine oil (2 – 17)

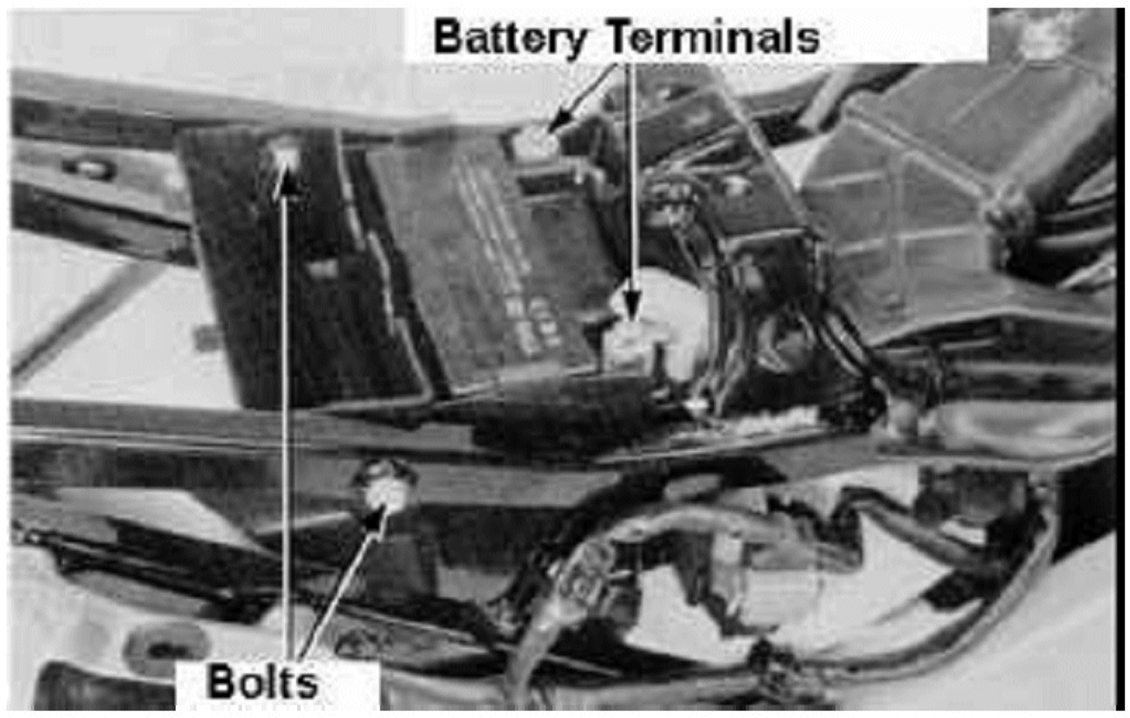
Ensure there are no leaks after the work is
completed.



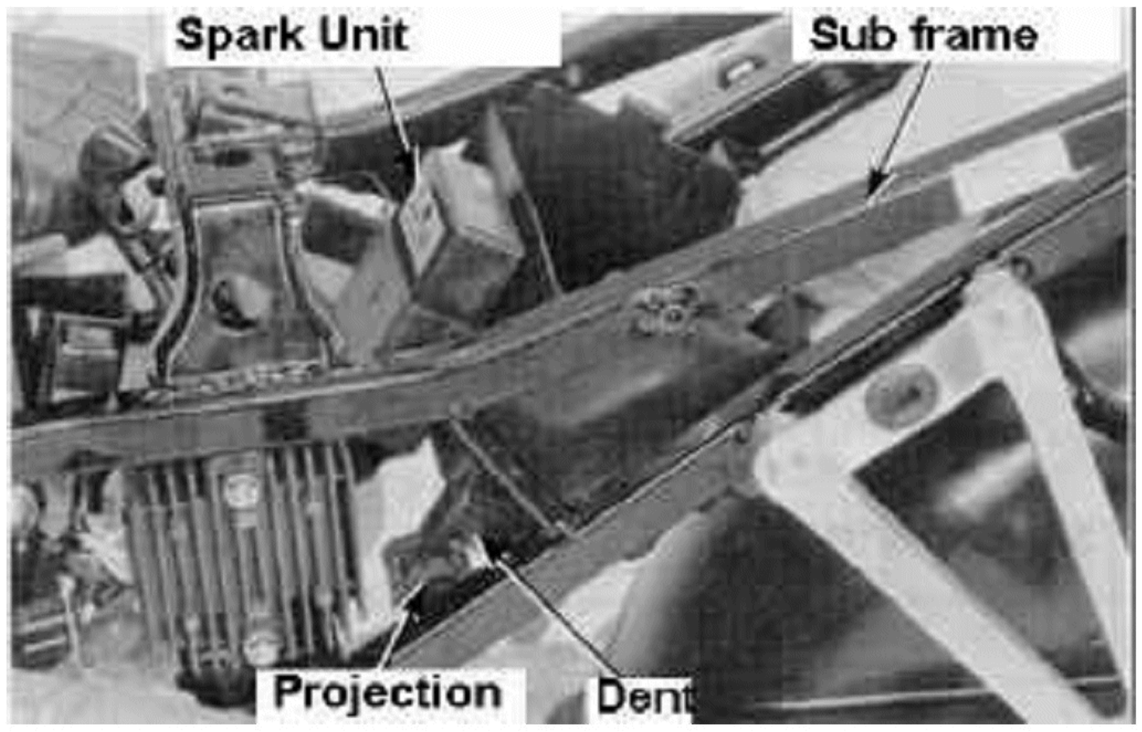
Reservoir Tank

Detachment

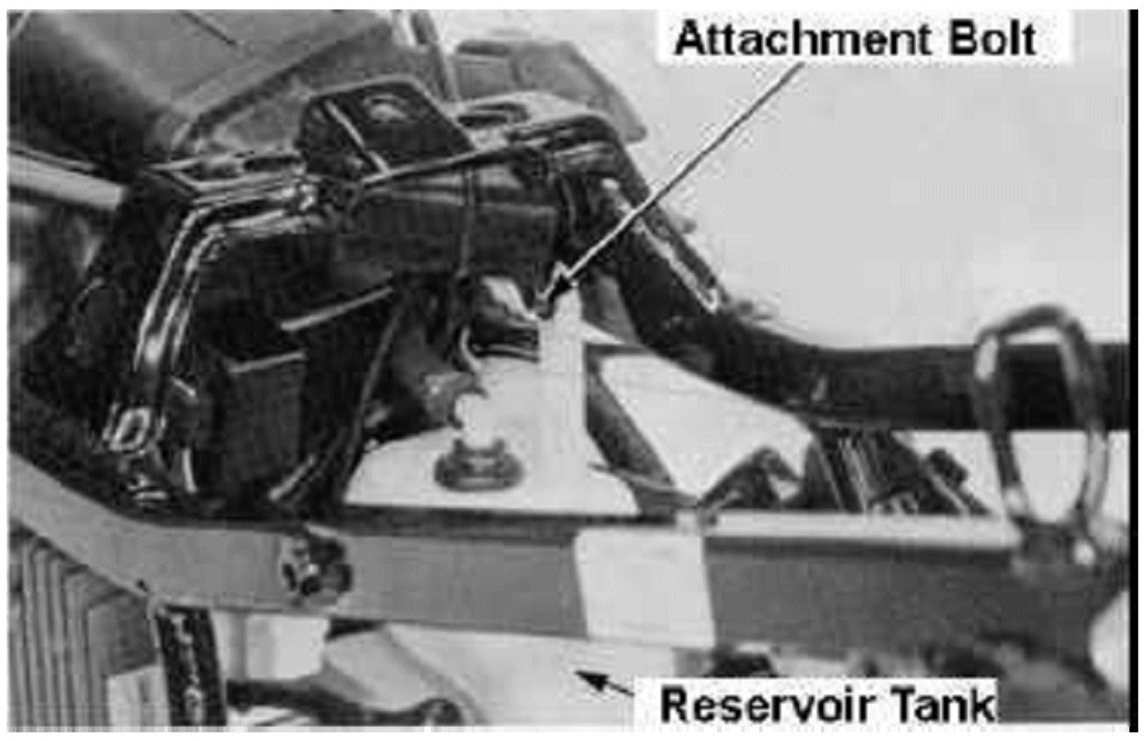
Remove the seat side cover.
Remove the fuel tank. (4-3)
Disconnect the battery terminals and
Remove the battery.
Remove battery holder bolts.



Tilt the battery holder backwards and
Detach the spark units.
Detach the dent part of the battery holder
From the sub frame projection.



Remove the reservoir tank attachment bolt.

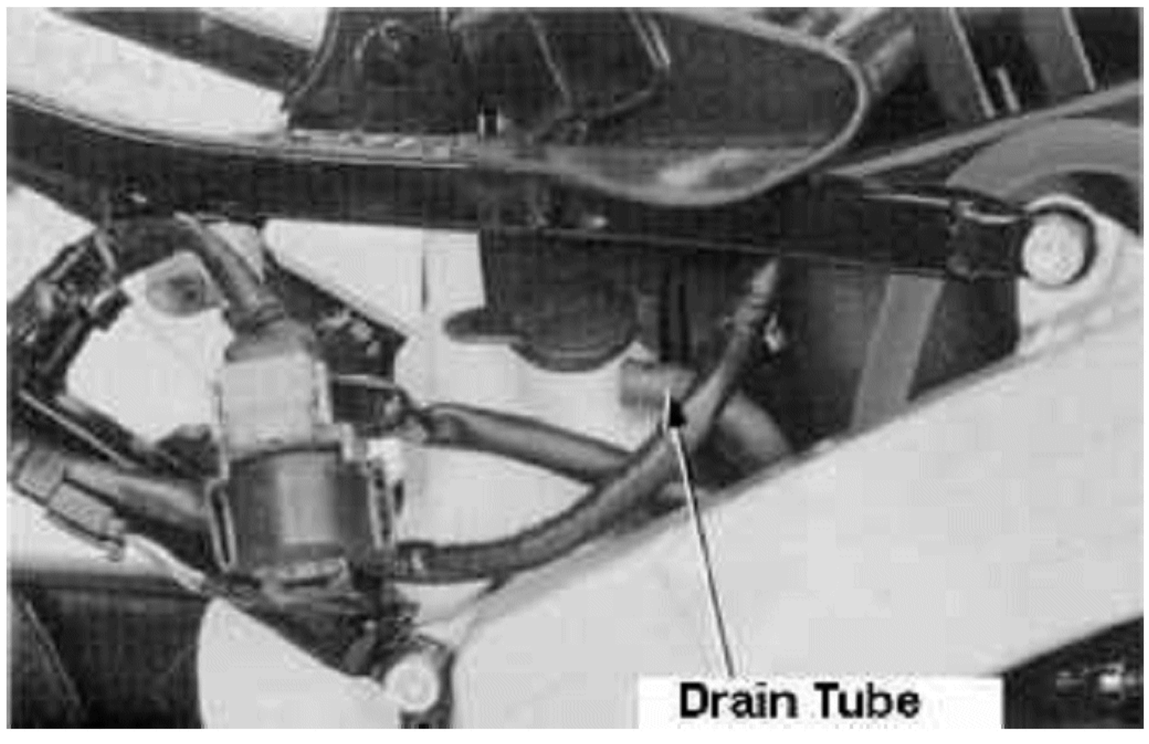


Disconnect the drain tube and overflow tube from the reservoir tank.
Slide the projection on the bottom of the reservoir tank backwards and detach from the subframe.

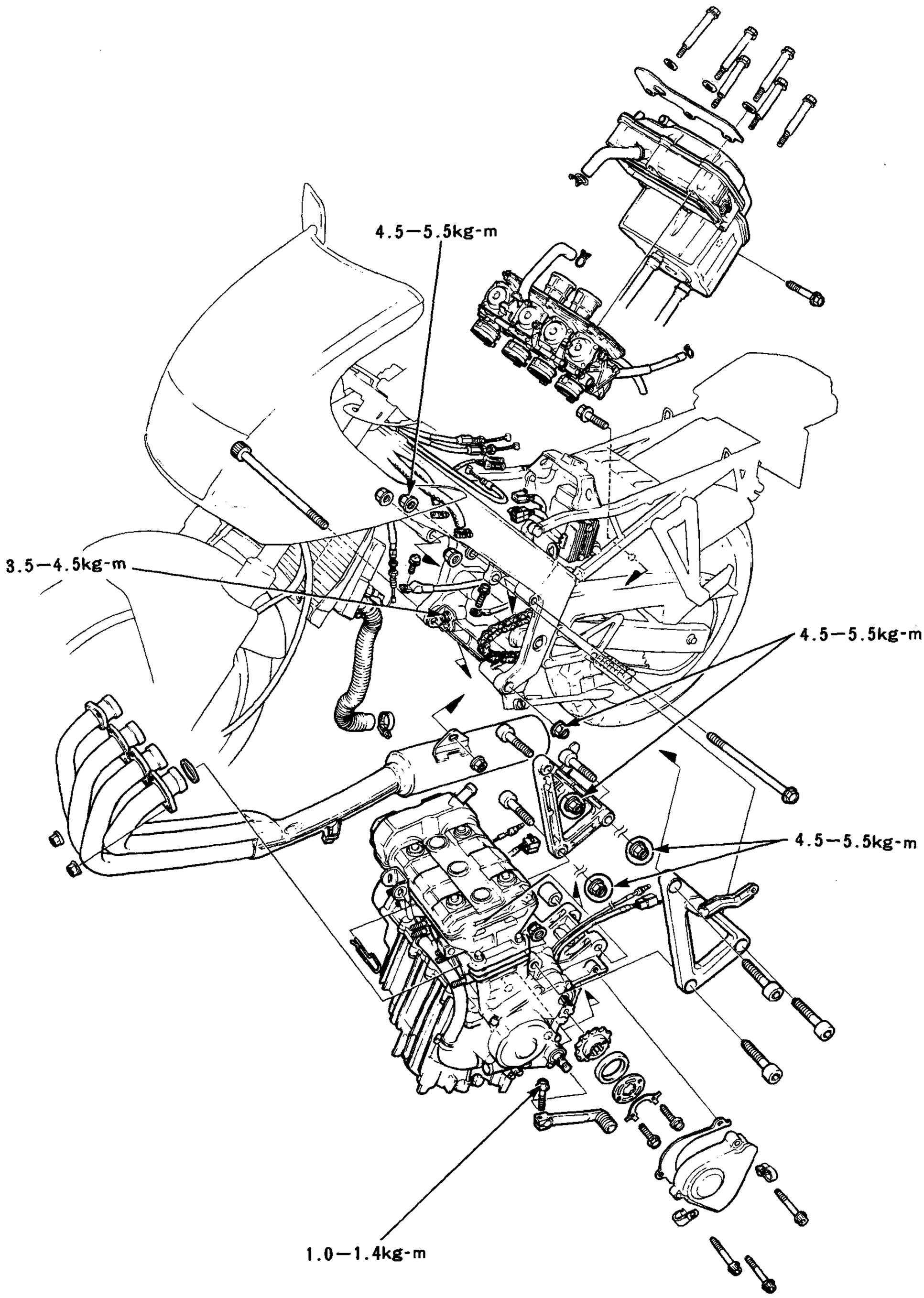
Attachment

Reverse the detachment procedure.

Put the tubes through designated parts. (1-22)



- **Assembly**



Assembly	6 – 0	Removal	6 – 2
Maintenance Information	6 – 1	Refit	6 - 5

General Caution

The following items are to be serviced with the engine removed from frame.

- crank shaft, conrod, cylinder, piston
- transmission
- shift drum, shift fork (except for the shift linkage)

Support the bottom part of the engine with a garage jack for remove/refit.

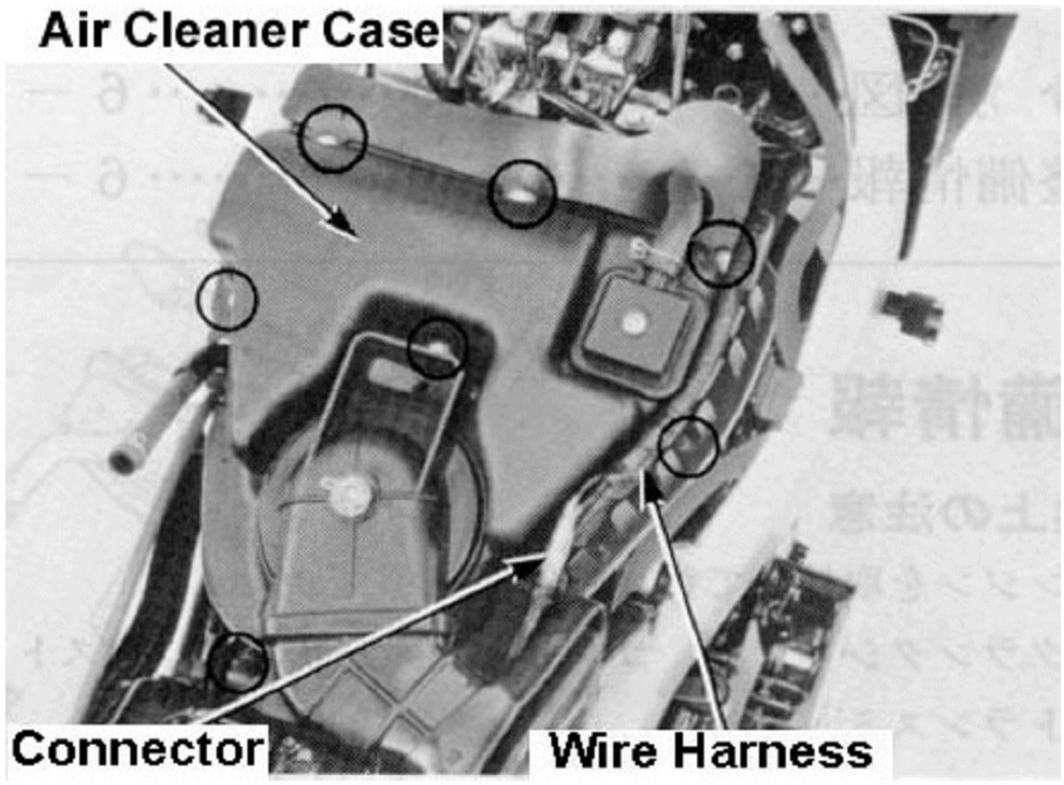
Maintenance Standard

Weight		49kg
Recommended Oil		Genuine Honda Ultra GP (4 cycle motorbike) SAE low 40 or SAE 20w-50 API – SE or – SF class oil (refer to 3-2 for viscosity)
Oil Capacity	Total	2.7l
	Oil change	2.2 l
	Oil and filter change	2.4 l

Torque:

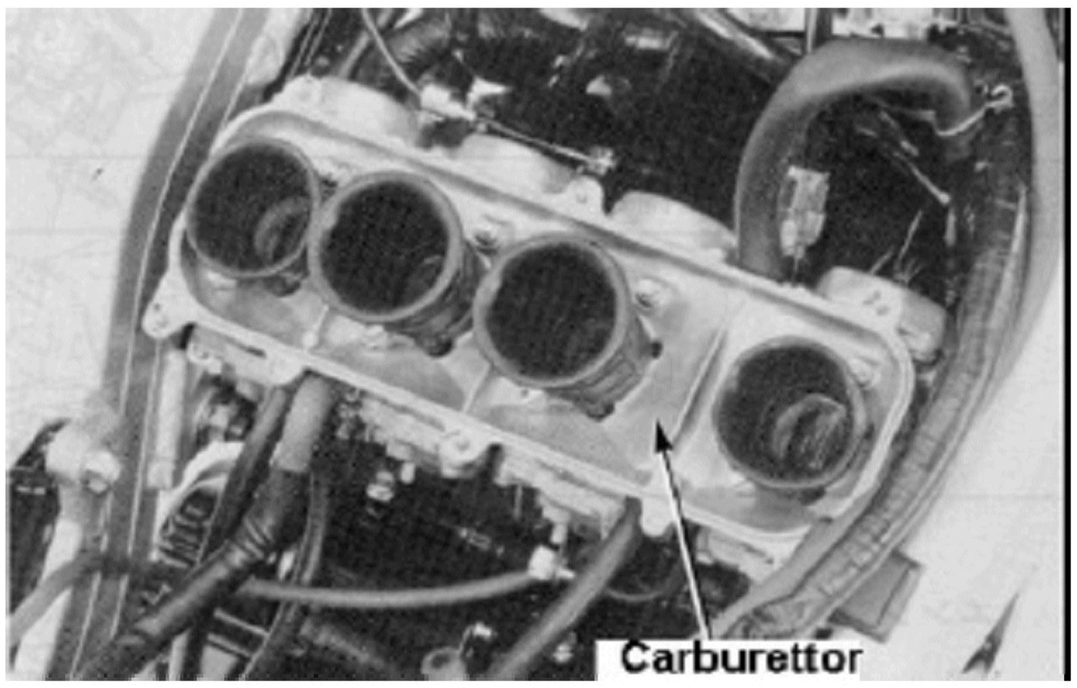
Top engine mount bolt (10mm bolt, nut)	4.5 ~ 5.5kg m
Rear upper engine mount bolt (10mm bolt, nut)	4.5 ~ 5.5kg m
Rear lower engine mount bolt (10mm bolt, nut)	4.5 ~ 5.5kg m
Engine hanger bracket (8mm bolt)	3.5 ~ 4.5kg m
Change pedal	1.0 ~ 1.4kg m
Starter motor terminal cable	0.8 ~ 1.2kg m

Drain engine oil (2-16)
Drain radiator fluid (5-3)
Remove the seat and side covers.
Remove the fuel tank (4-3)
Disconnect the leads from the battery.
Disconnect the two connectors and detach, the wire harness from an air cleaner case.
Detach the air cleaner case by removing 7 bolts.

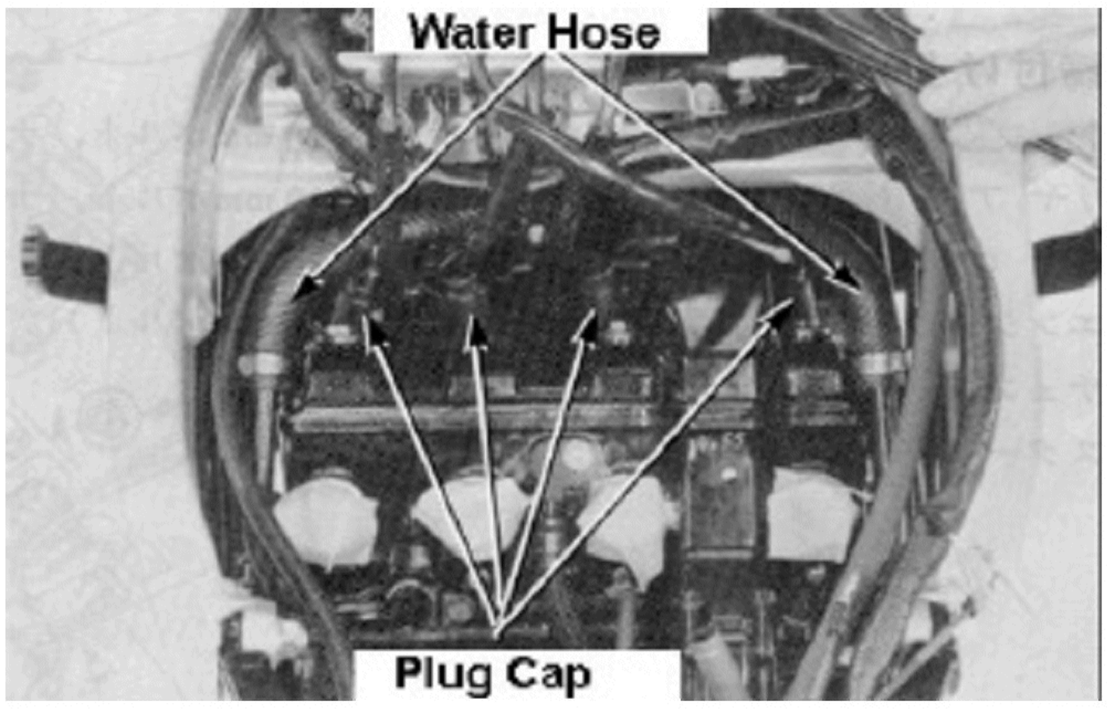


Remove the carburettor (4-8)

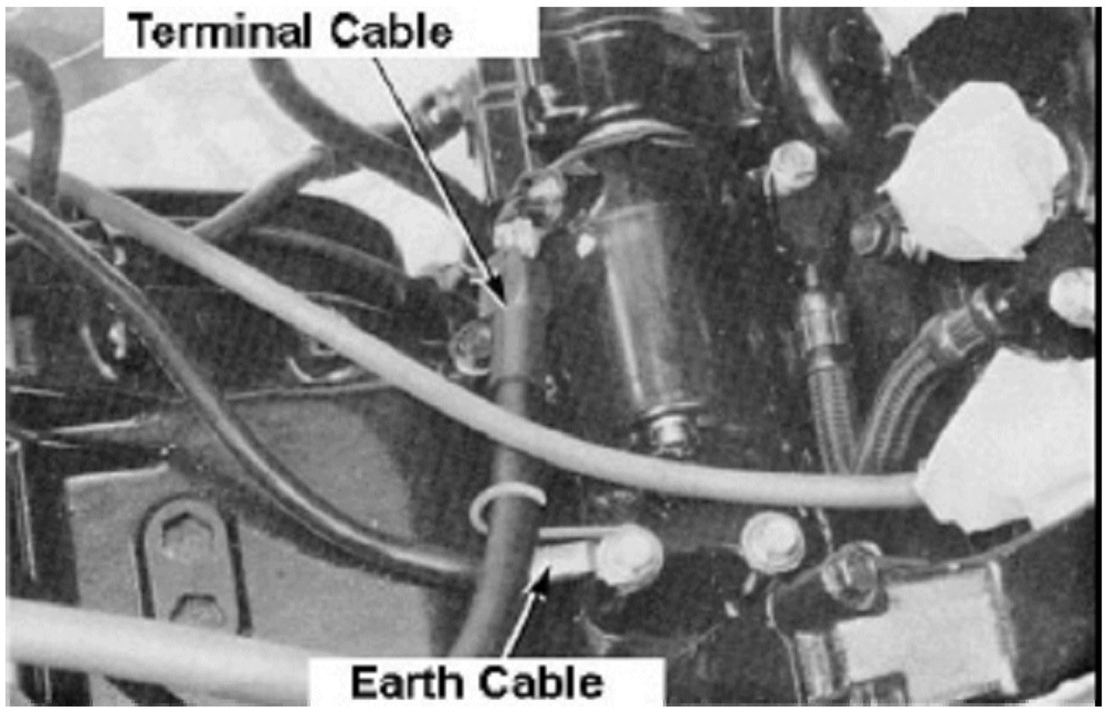
After detaching the carburettor, seal the intake manifold with adhesive tape.



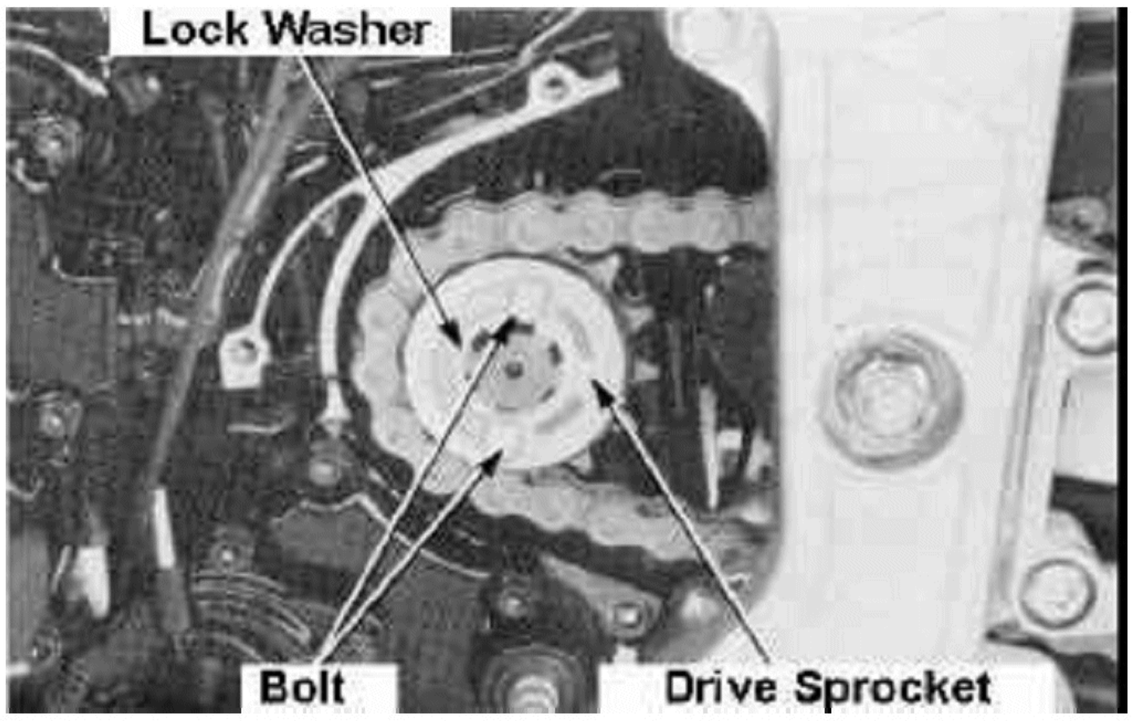
Disconnect the two water hoses and four plug caps.



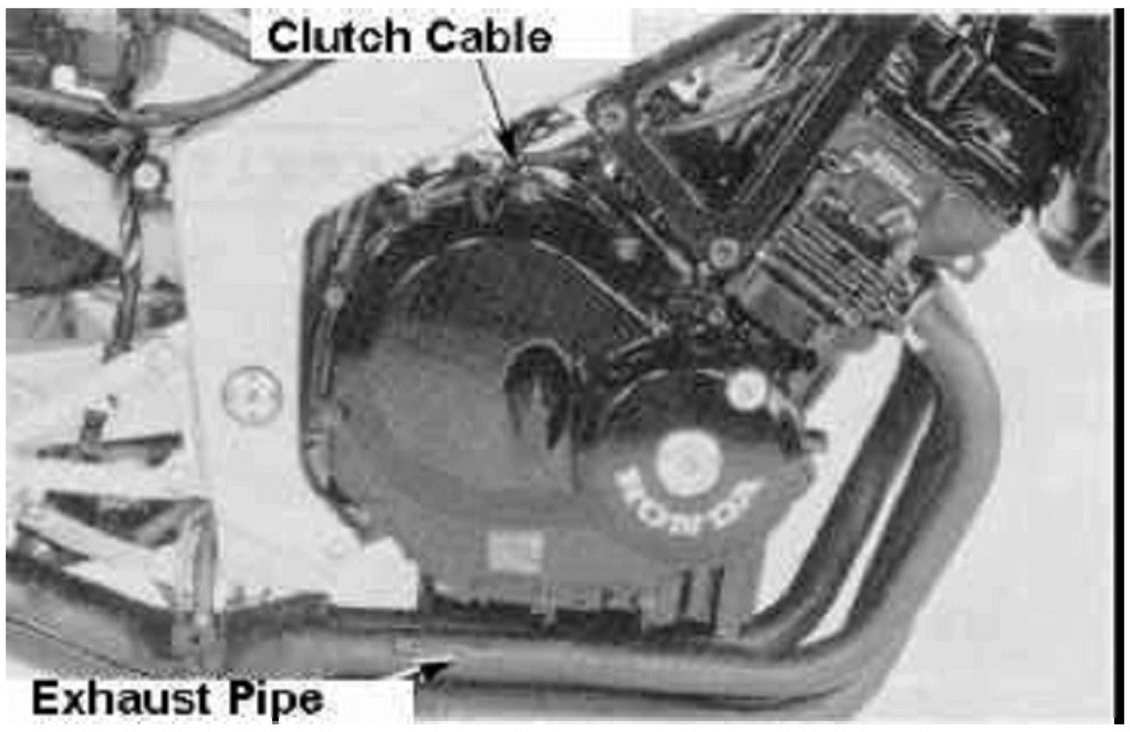
Disconnect the earth cable and the terminal cable.



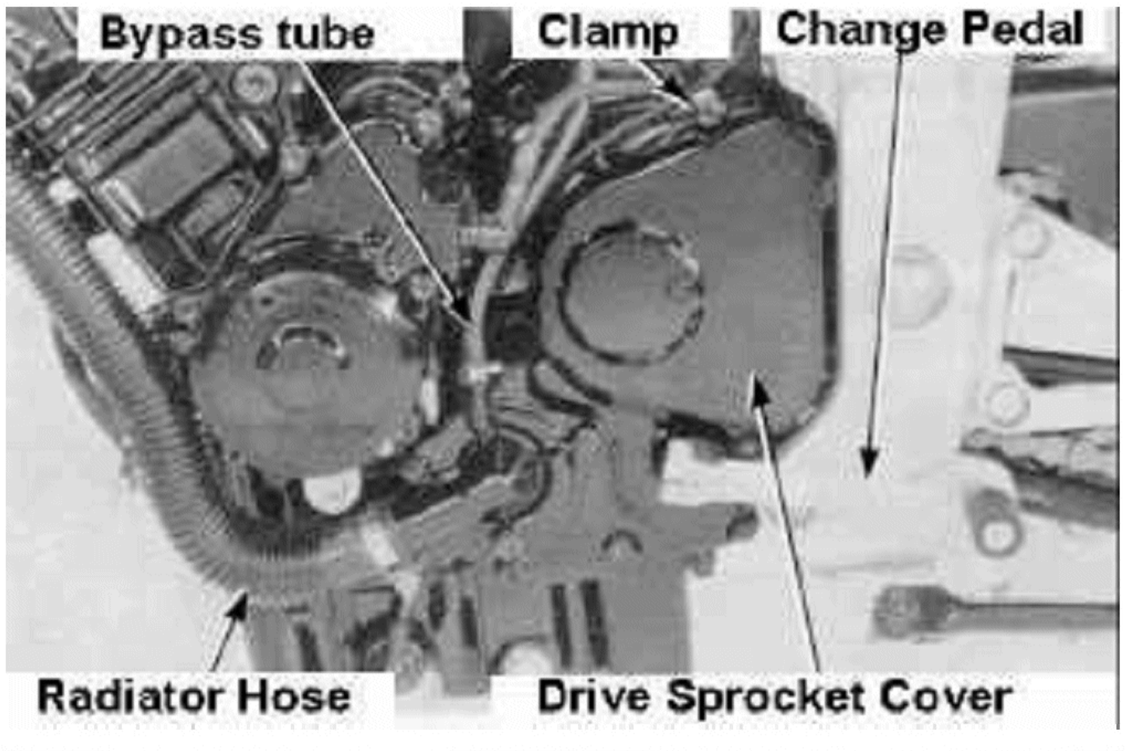
Disconnect the pulse generator coupler and the AC generator coupler.



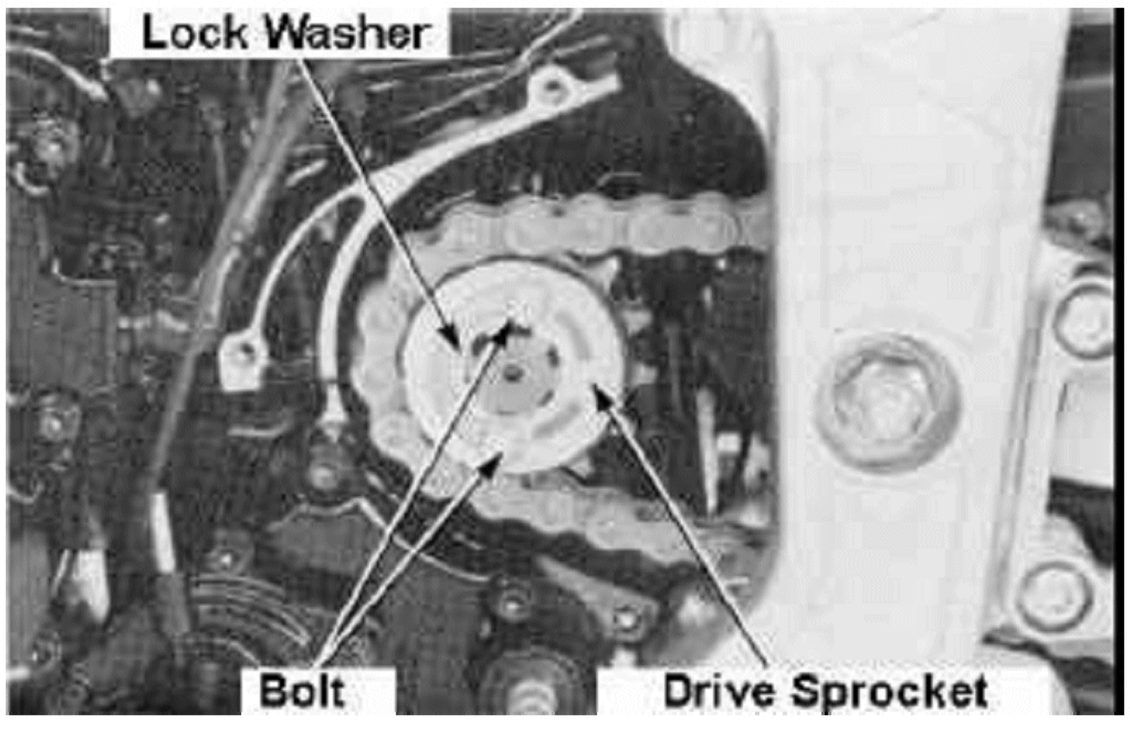
Disconnect the clutch cable.
Disconnect the exhaust pipe.



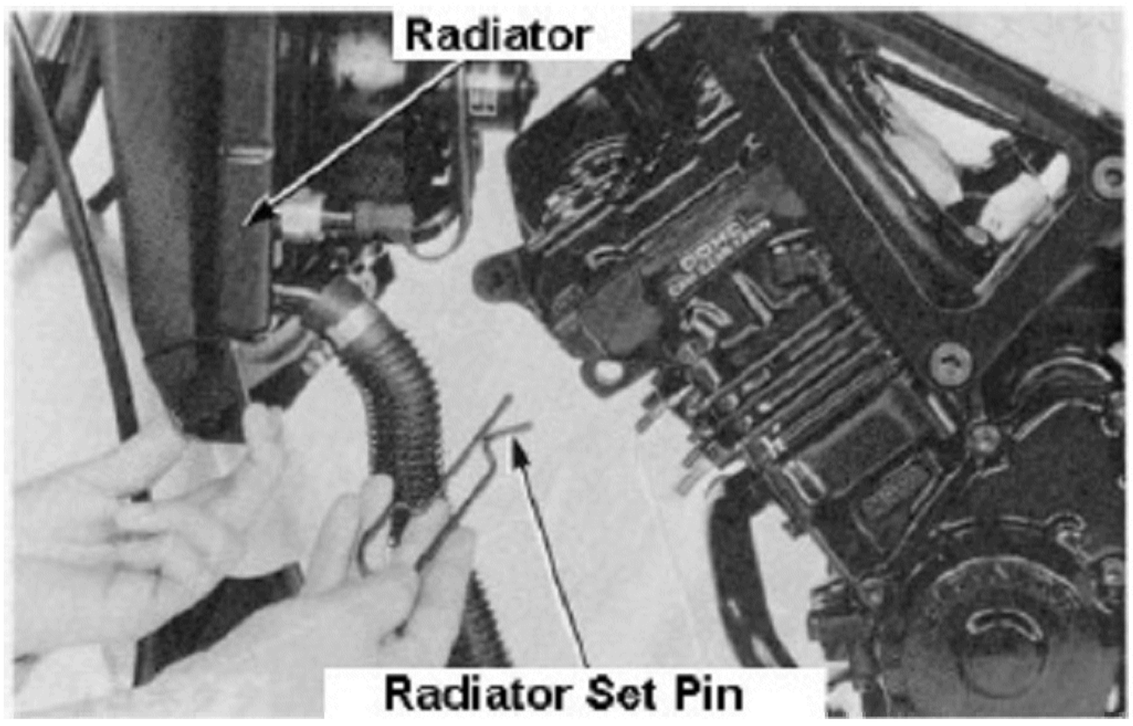
Disconnect the radiator hose and bypass tube.
Remove the drive sprocket cover and remove the pulse generator wire and oil pressure switch wire from the clamp.



Loosen the rear axle nut and loosen the tension of the drive chain.
Stretch the catch of the lock washer and remove the two bolts. Remove the lock washer and the drive sprocket.

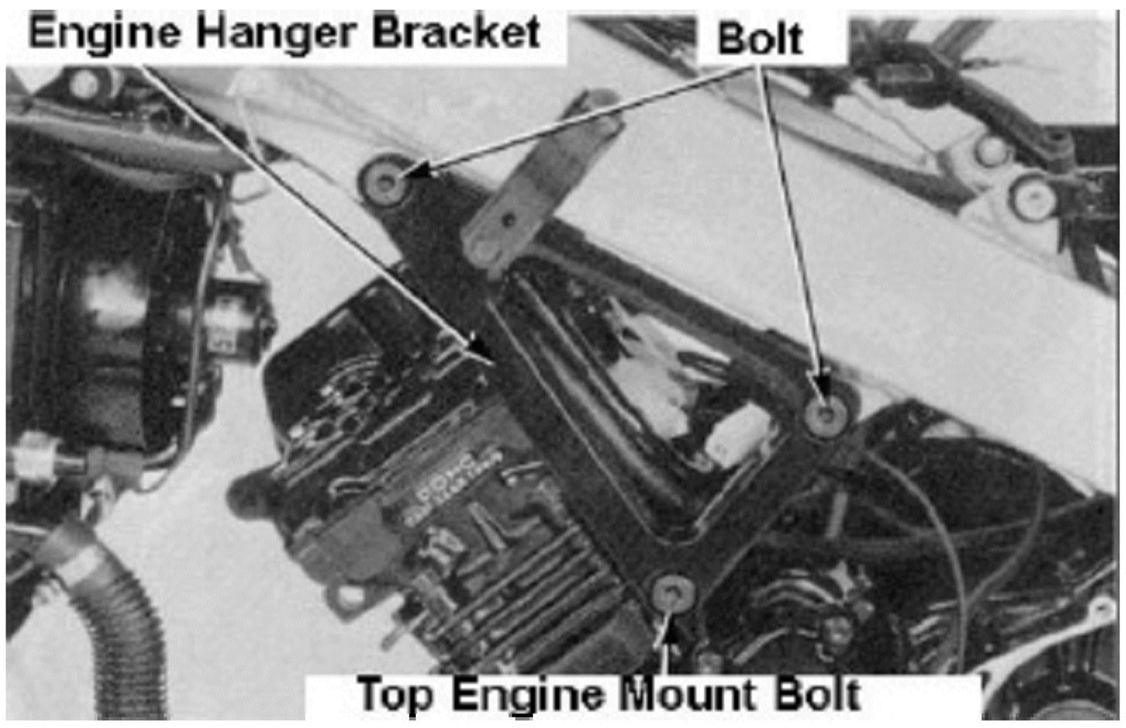


Remove the radiator set pin.
Swing the radiator forward and fix to the frame.

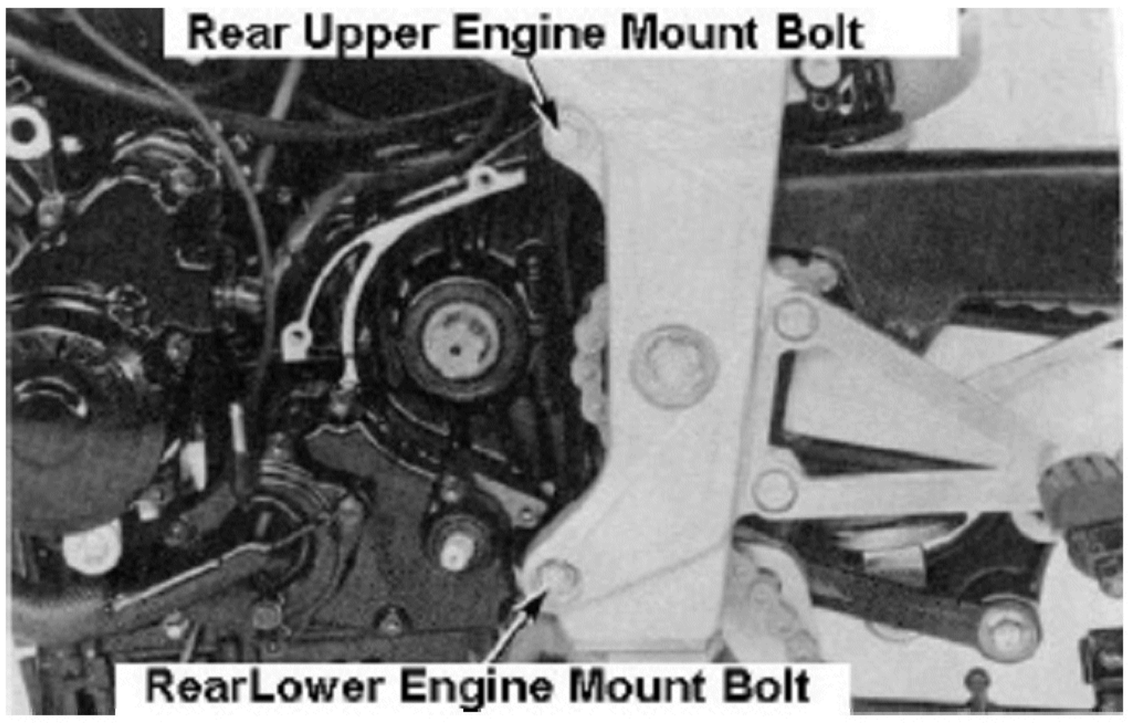


Remove three bolts and detach the engine hanger bracket.

Support the engine with a jack.

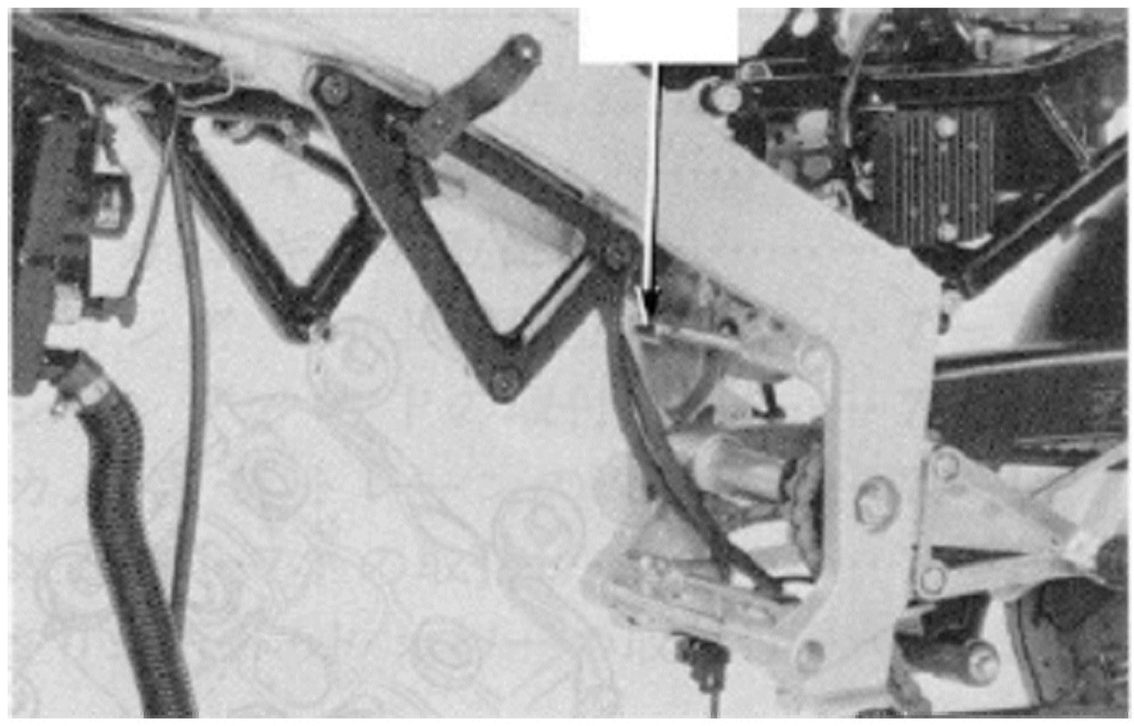


Remove the rear upper engine mount bolt and rear lower engine mount bolt.
Remove the engine from the frame.



Engine Refit

Reverse the removal procedure for the refit.



- Do not damage the harness and cables.
- Do not damage the frame, bolts and screws.
- Firmly lock the drive sprocket bolt with a catch or a lock washer.
- Apply leads, tubes and hoses through the proper places (1-22)

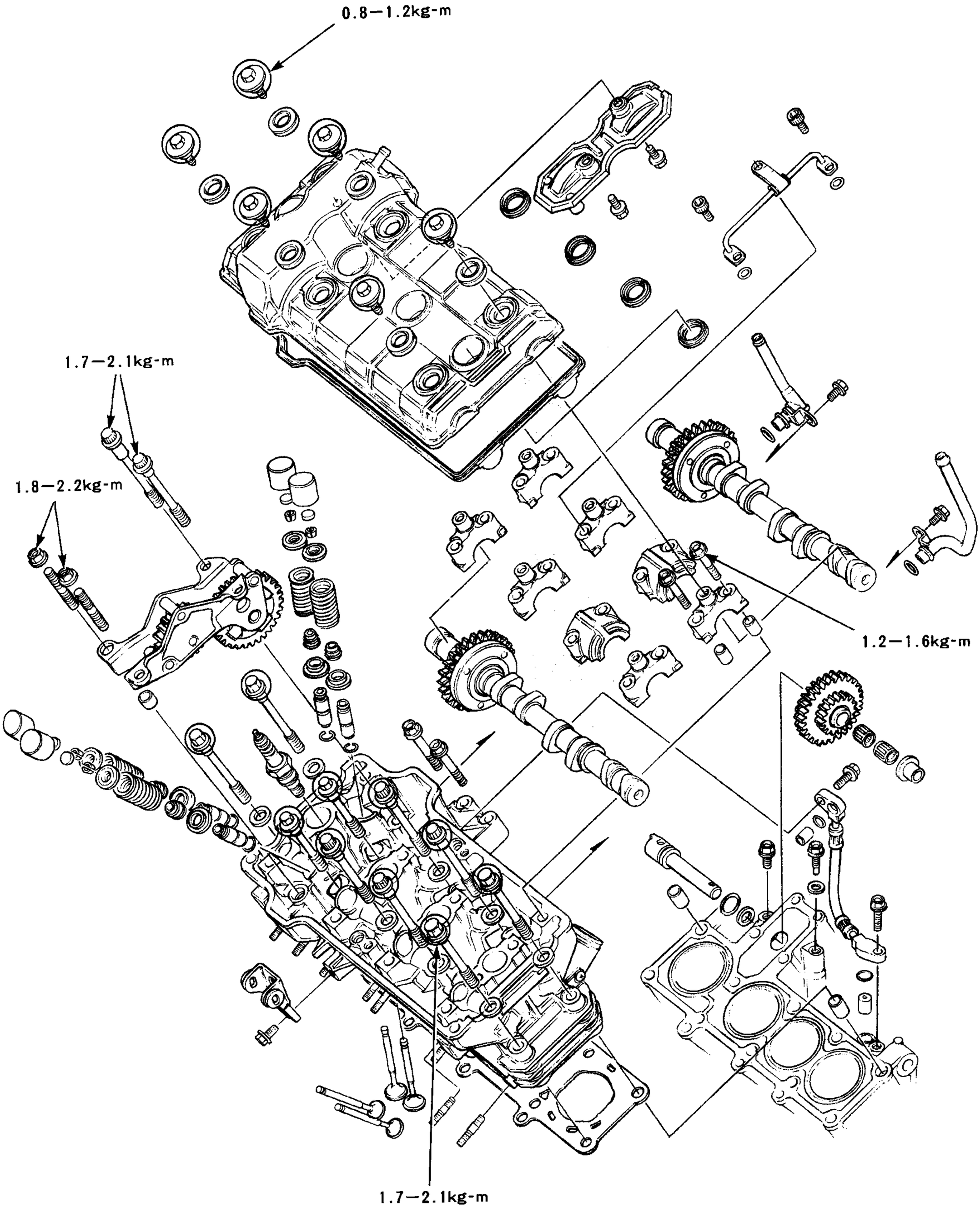
Torque:

Top engine mount bolt	4.5 ~ 5.5kg m
Rear upper engine mount bolt	4.5 ~ 5.5kg m
Rear lower engine mount bolt	4.5 ~ 5.5kg m
Engine hanger bracket	3.5 ~ 4.5kg m
Change pedal	1.0 ~ 1.4kg m

After the refit, conduct the following inspections / adjustments.

- Free movement of the clutch lever (2-8)
- Free movement of the throttle grip (2-17)
- Drive chain (2-9)
- Brake pedal (2-5)
- Engine Oil (2-15)
- Choke lever (2-17)
- Radiator (2-18)

- **Assembly**



Assembly	7–0	Valve Seat Inspection/Adjustment	7–10
Maintenance Information	7-1	1st Cam gear detachment	7-12
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Cylinder head cover detachment	7-3	Cylinder head assembly	7-15
Cam shaft detachment	7-3	Cylinder head attachment	7-17
Cam gear train detachment	7-5	Cam gear train attachment	7-18
Cylinder head detachment	7-5	Cam shaft attachment	7-19
Cylinder head disassembly	7-6	Cylinder head cover attachment	7-21
Valve guide replacement	7-9		

Maintenance Information

General Caution

- Service related to the cylinder head and valves should be conducted on the vehicle.
- Oil is supplied to the camshafts through the oil pipe. Inspect the pipes for clogging.
- On assembly, apply MoS^2 grease on the cam shaft journals, cam surface and a valve lifter.
- Fill the oil pit on the cylinder head with clean oil.

Maintenance Standard

			Standard	Limitation
Compression			13.0kg/cm²-400rpm	-
Cam shaft	Cam Lift	I N	29.3	29.15
		E X	29.0	28.85
	Oil Clearance	1	0.015-0.057	0.06
		2	0.015-0.057	0.06
		3	0.025-0.067	0.07
		4	0.015-0.057	0.06
	Displacement		-	0.05
Valve Spring	Relaxed Length		37.3	36.3
Valve, Valve guide	Valve Stem Outer Dia.	I N	3.970-3.995	3.965
		E X	3.950-3.975	3.935
	Valve Stem Inner Dia.	I N	4.000-4.012	4.065
		E X	4.000-4.012	4.065
	Stem guide clearance	I N	0.005-0.042	0.10
		E X	0.005-0.050	0.13
Valve lifter	Valve seat contact width	I N	0.8	1.3
		E X	1.0	1.5
	Outer diameter		19.978-19.993	19.970
Cylinder head	Strain/Distortion		-	0.05
	Valve lifter contact surface dia.		20.010-20.026	20.035

Torque

Cylinder head cover	0.8~1.2kg m	Cylinder head (7mm bolt, apply oil)	1.7~2.1kg m
Cam shaft holder	1.2~1.6kg m	Gear train holder (7mm bolt, apply oil)	1.7~2.1kg m
Engine mount bolt	4.5~5.5kg m	(8mm nut)	1.8~2,2kg m

Tools

Exclusive Tools

		Common Tools
Valve guide reamer	07984-8840000	Valve Spring
Valve guide remover	07GMD-KT70100	Compressor 07757-0010000
Valve Spring Compressor Attachment	07GME-KT70200	
Tappet hole protector	07GME-KT70100	
Socket wrench	07GMA-KT70100	

Valve seat cutter

Seat surface cutter	(20.5mm, 45° IN)	07780-0011000
Seat surface cutter	(17mm, 45° EX)	07GMH-KT70500
Flat surface cutter	(20mm, 32° IN)	07GMH-KT70100
Flat surface cutter	(17mm, 32° EX)	07GMH-KT70200
Inner surface cutter	(20.5mm, 60° IN)	07780-0014300
Inner surface cutter	(17mm, 60° EX)	07GMH-KT70400
Cutter holder (4mm)		07GMH-KT70300

Troubleshooting

Cylinder head related troubles are detected by compression measurement or a noise from the top part of the engine.

Too low or unstable compression

- Valve
  - Inadequate valve clearance
  - Valve bent/heat deformation
  - valve spring failure
  - valve timing failure
  - insufficient valve seat contact
- Cylinder Head
  - Head gasket leak
  - Head distortion / crack
- Cylinder / Piston failure (→ Sec. 9)

Too high compression

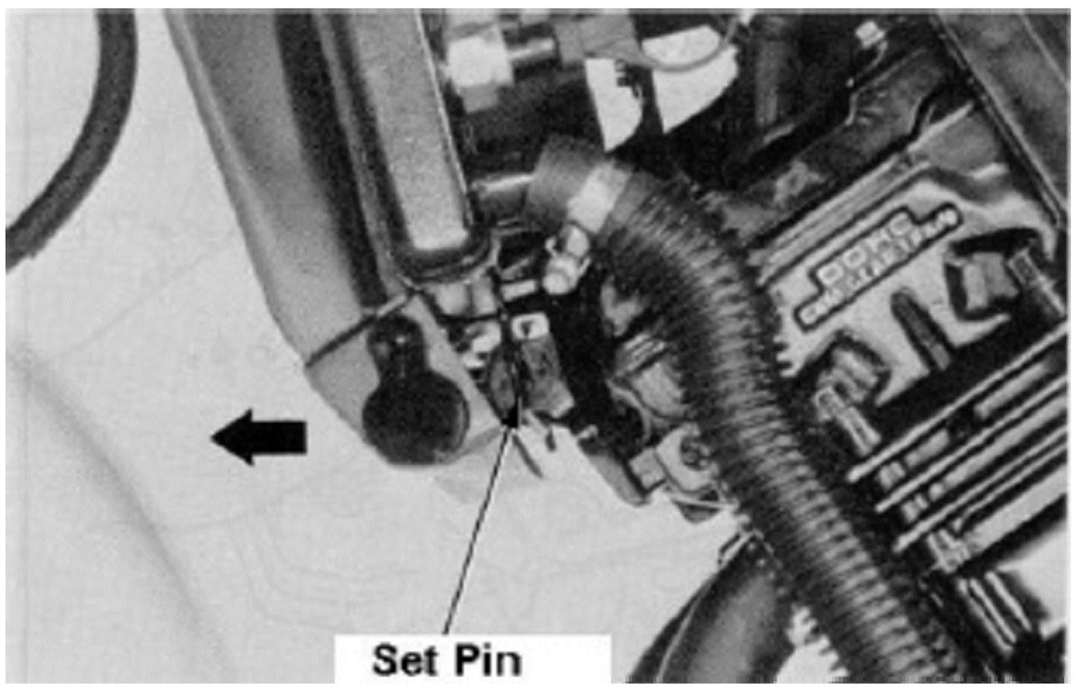
- Carbon on pistons, combustion chambers.

Noise

- Inadequate valve clearance
- Valve heat deformed or valve spring damaged / worn out
- Cam shaft damaged / worn out
- Cam gear train damaged / worn out
- Cam sprocket worn out

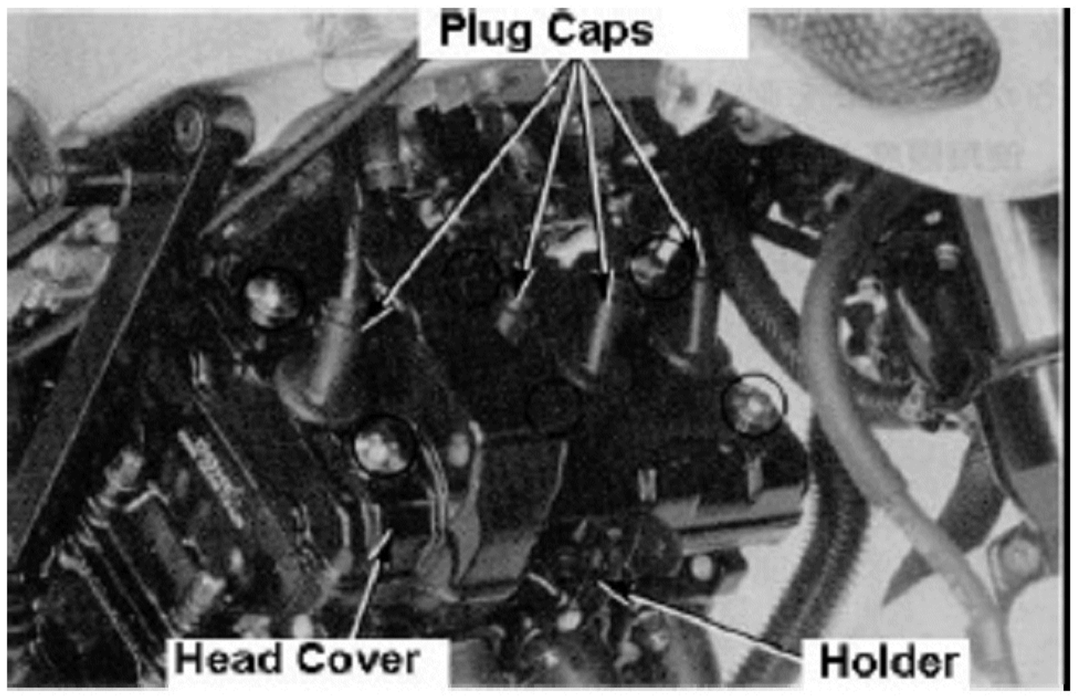
Cylinder head cover detachment

Detach the side cowl (13-4)
Remove the radiator set pin. Swing the radiator forward and fix it to the frame.

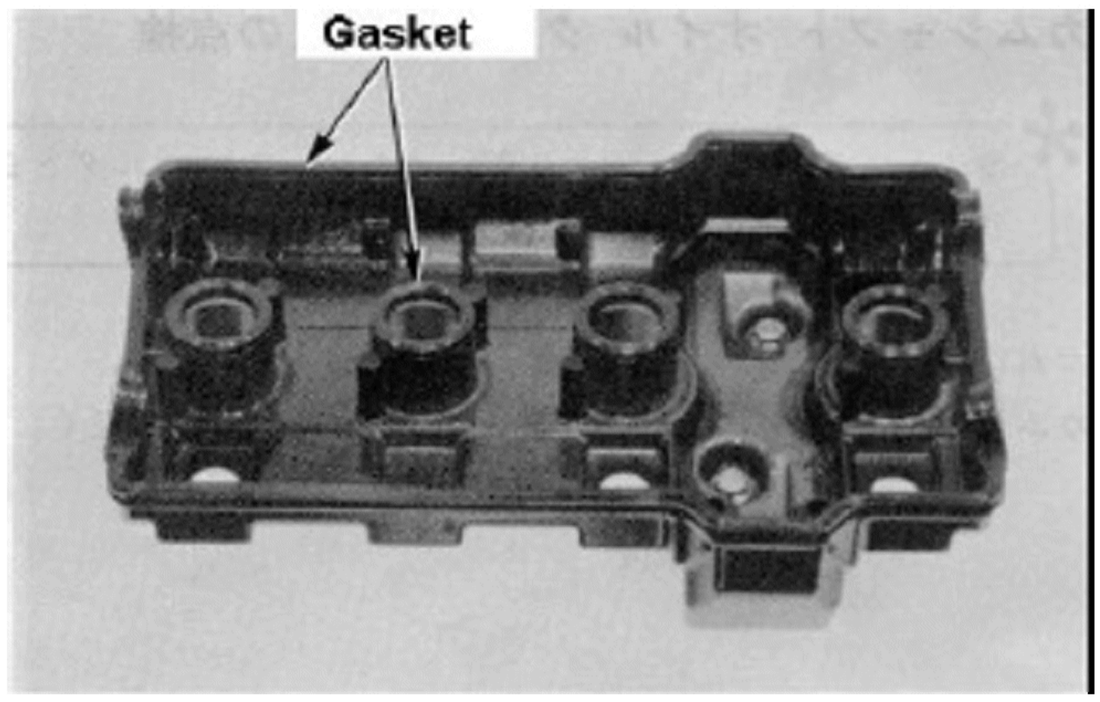


It can be easily removed by pushing the head of the radiator set pin down and pulling out.

Disconnect the radiator holder from the cylinder head.
Disconnect the breather tube from the cylinder head cover.
Remove spark plug caps.



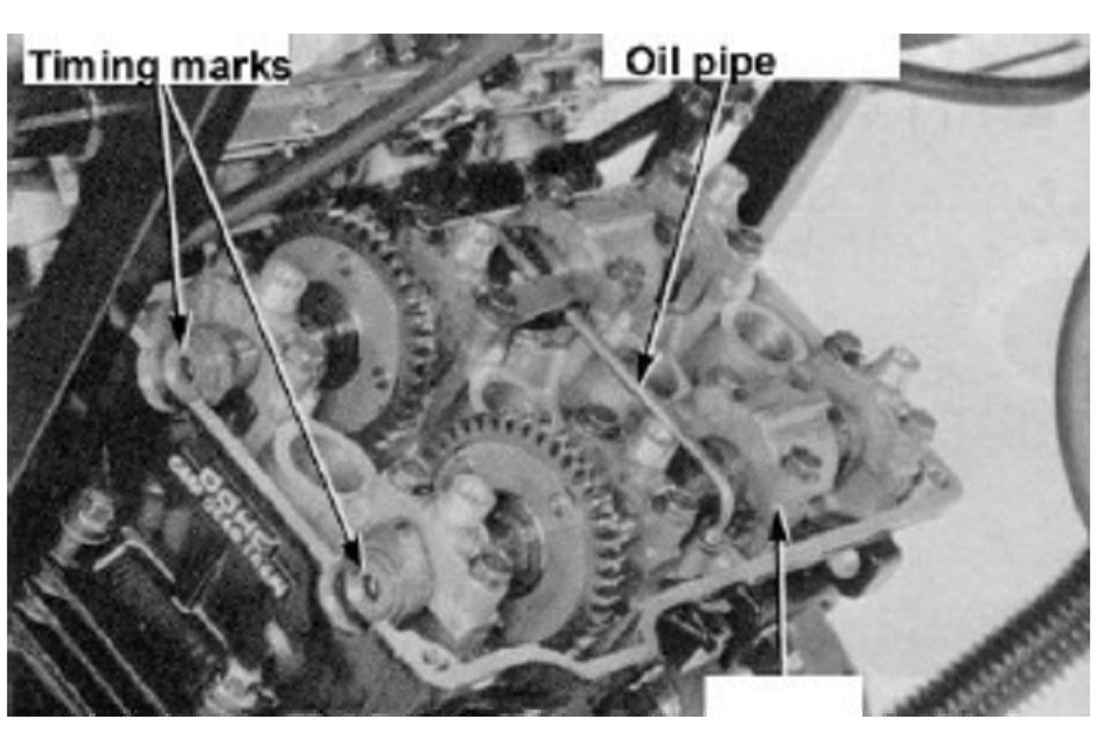
Inspect the cylinder head cover gaskets.



Cam shaft detachment

Remove the cylinder head cover.
Remove oil pipe attachment bolt.
Remove the cam shaft holder attachment bolt and detach the oil pipe, O-Ring, and the cam shaft holder.

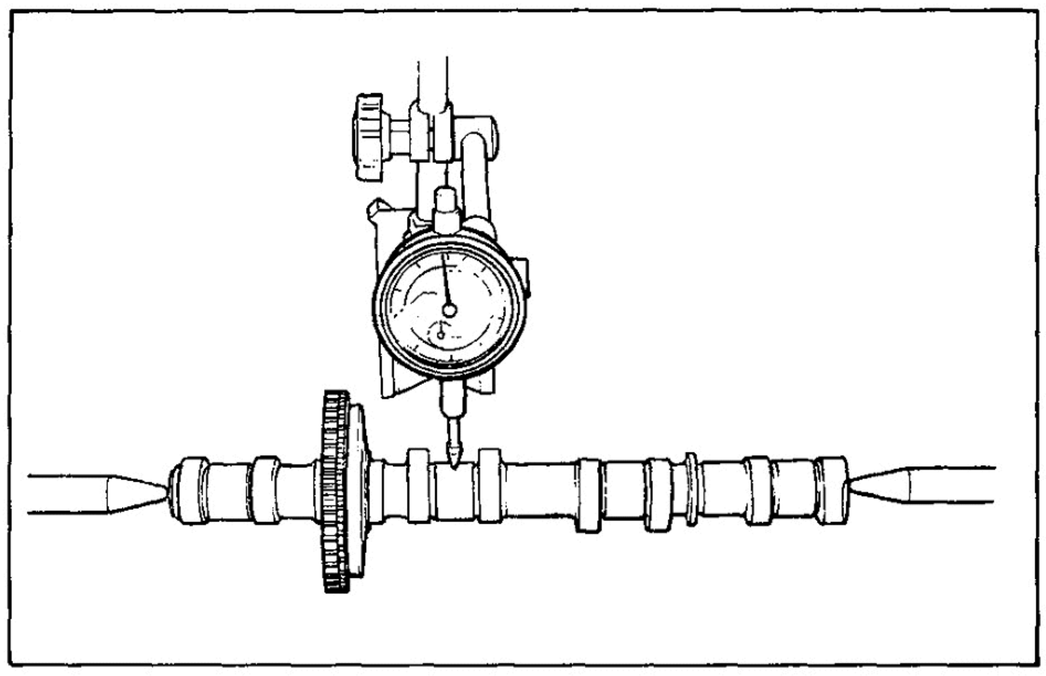
No need to remove the knock pin on the camshaft holder if it is difficult.



Detach the camshaft.
Inspect the oil pipe for clogging, deformation and damage.

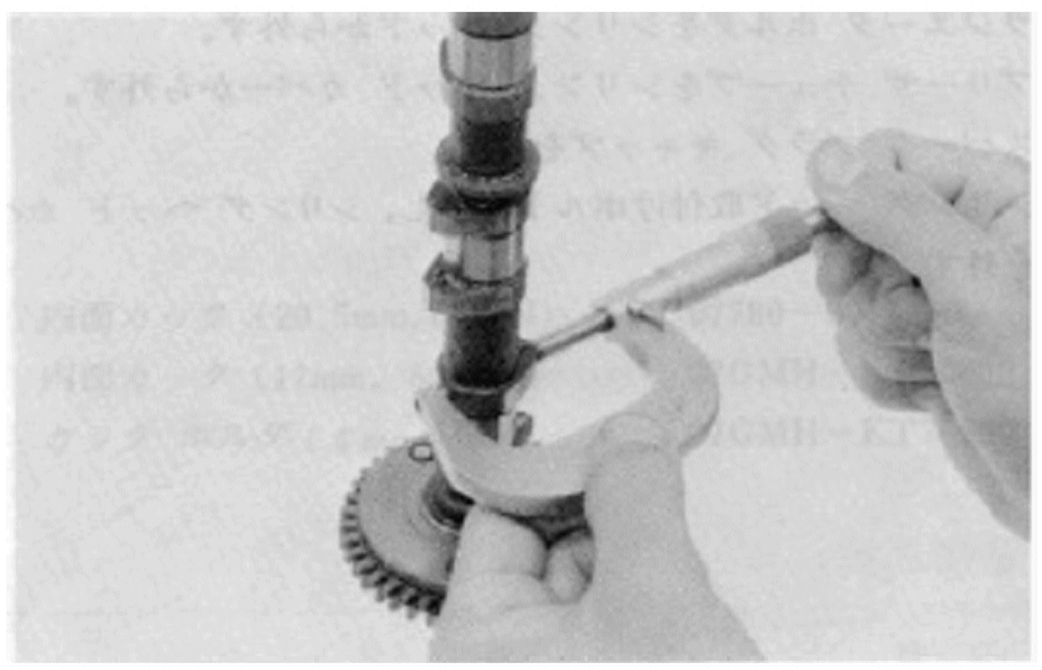
Cam shaft inspection

Inspect the cam gear for damage.
Inspect the journal surface for wear/damage.
Support the both ends of the shaft and measure its bend with a dial gauge.
Take half of the indicated valve.



More than 0.05mm → Replace

Inspect the cam surface for irregular wear/damage.
Measure each cam lobe height.

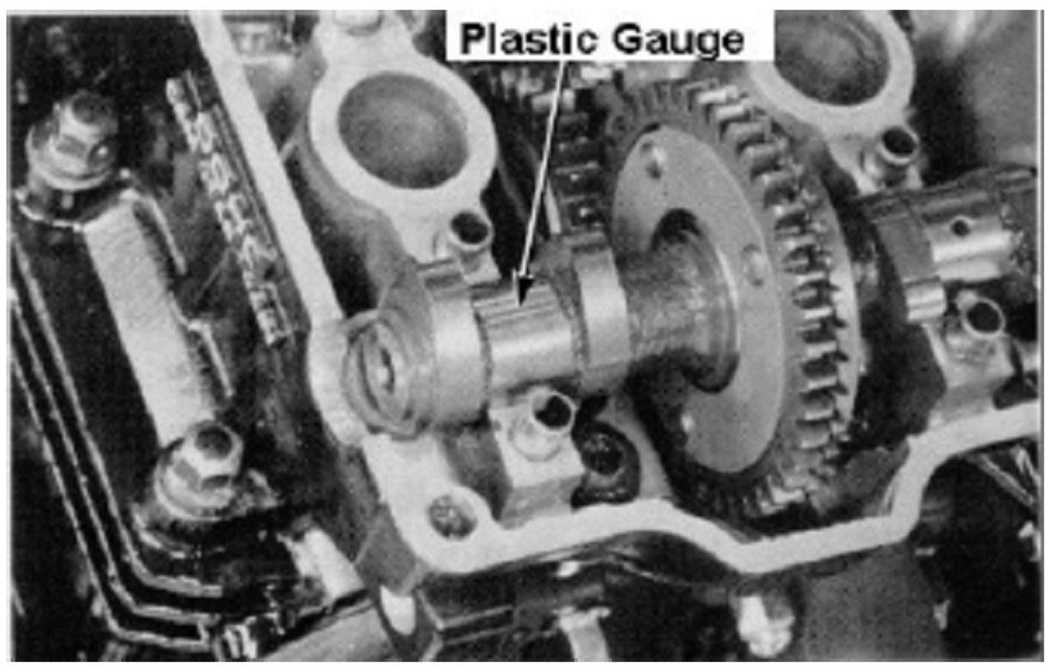


IN: Less than 29.15mm → Replace
EX: Less than 28.85mm → Replace

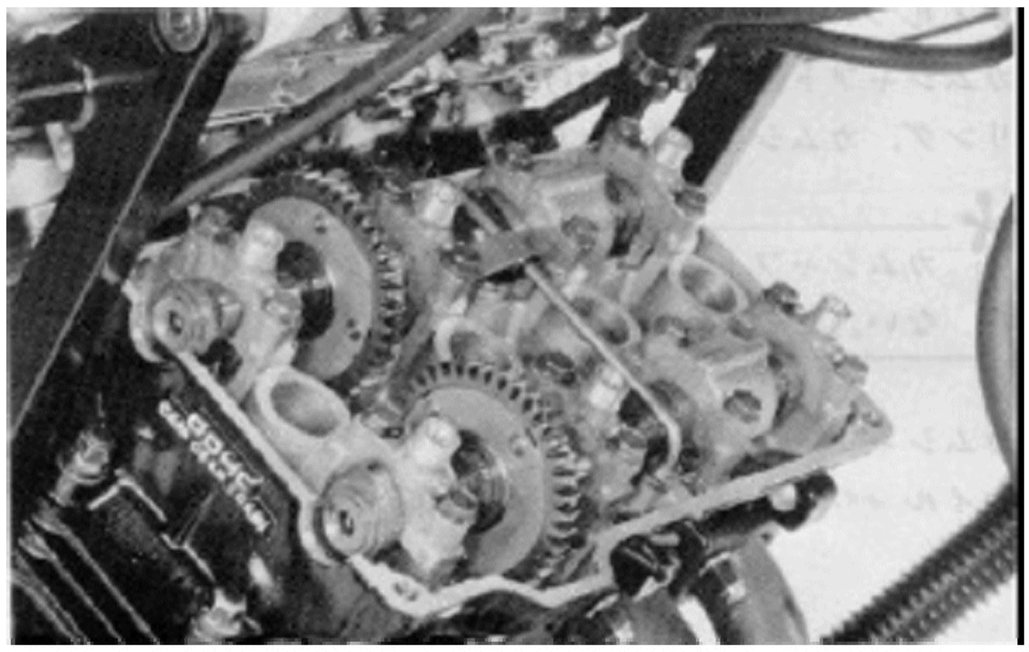
Camshaft oil clearance inspection

Wipe off the oil from camshaft journal, camshaft holder and cylinder head journals.

Attach the camshaft.
Apply plastic gauges on each journal surface.

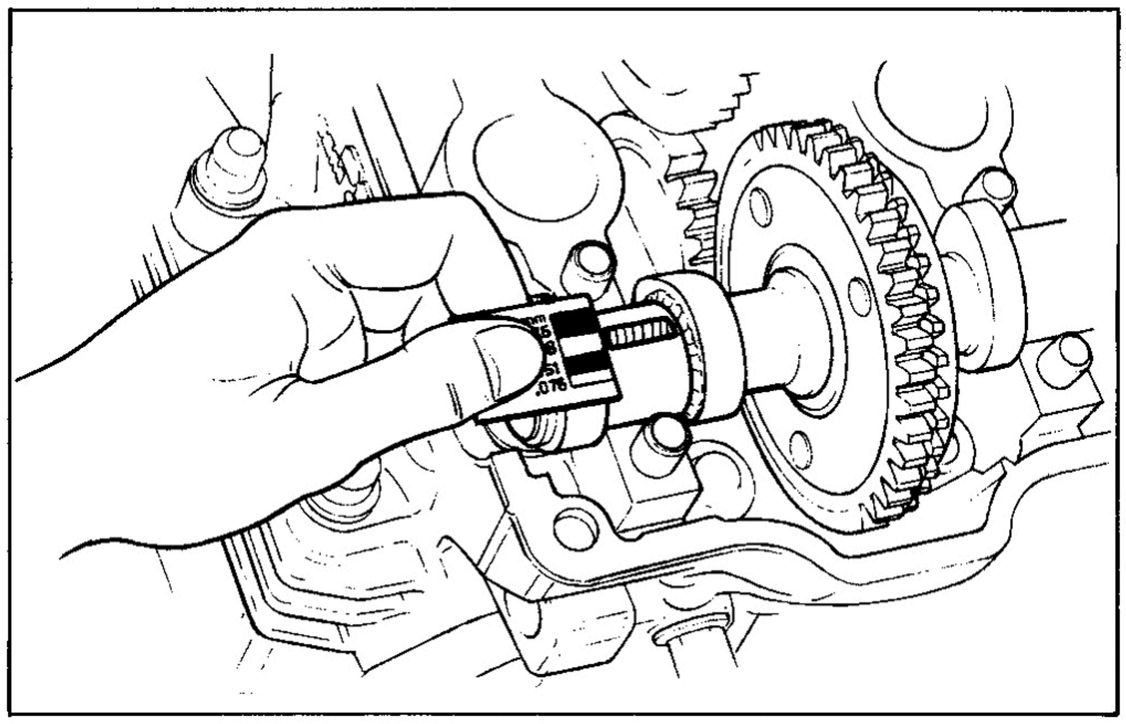


Attach the cam shaft holder and tighten the bolts.
Torque: 1.2~1.6kg m



- Take caution with the cam gear contact.
- Ensure the camshaft will not spin.
- Tighten the bolts equally.

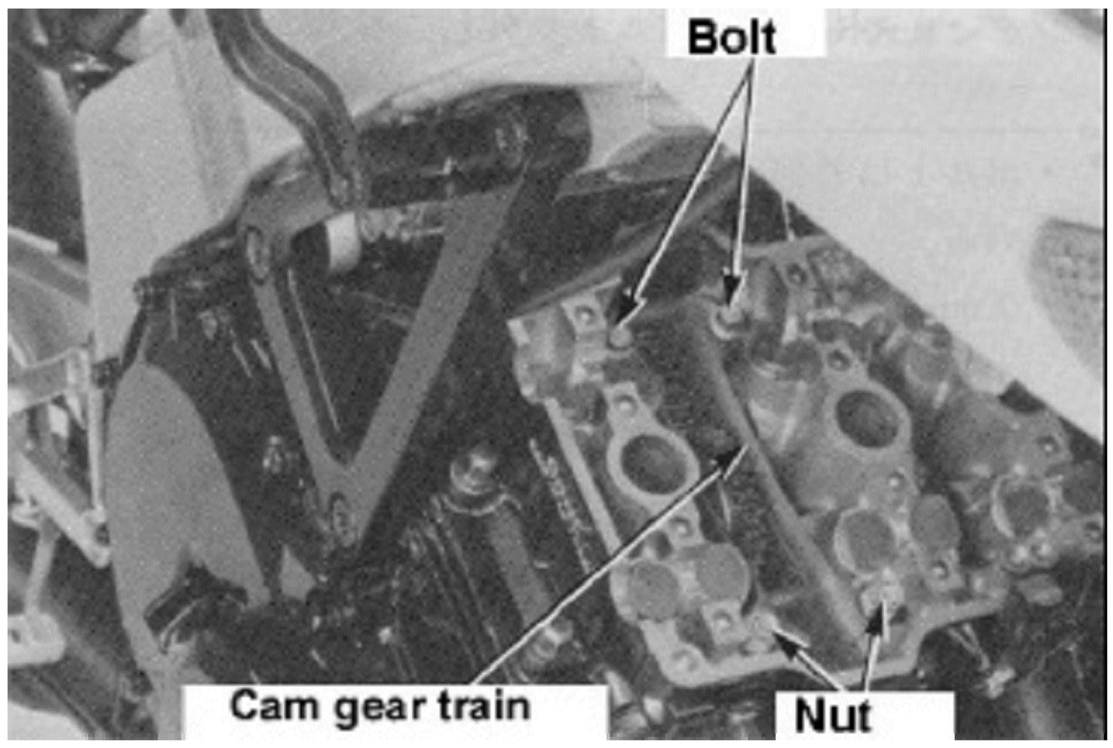
Remove the cam shaft holder and detach the camshaft.
Measure the widest plastic gauge on each journal surface.
Limitation: No. 1,2,4 equal to or more than 0.06→replace.
No. 3 equal to or more than 0.07→replace.



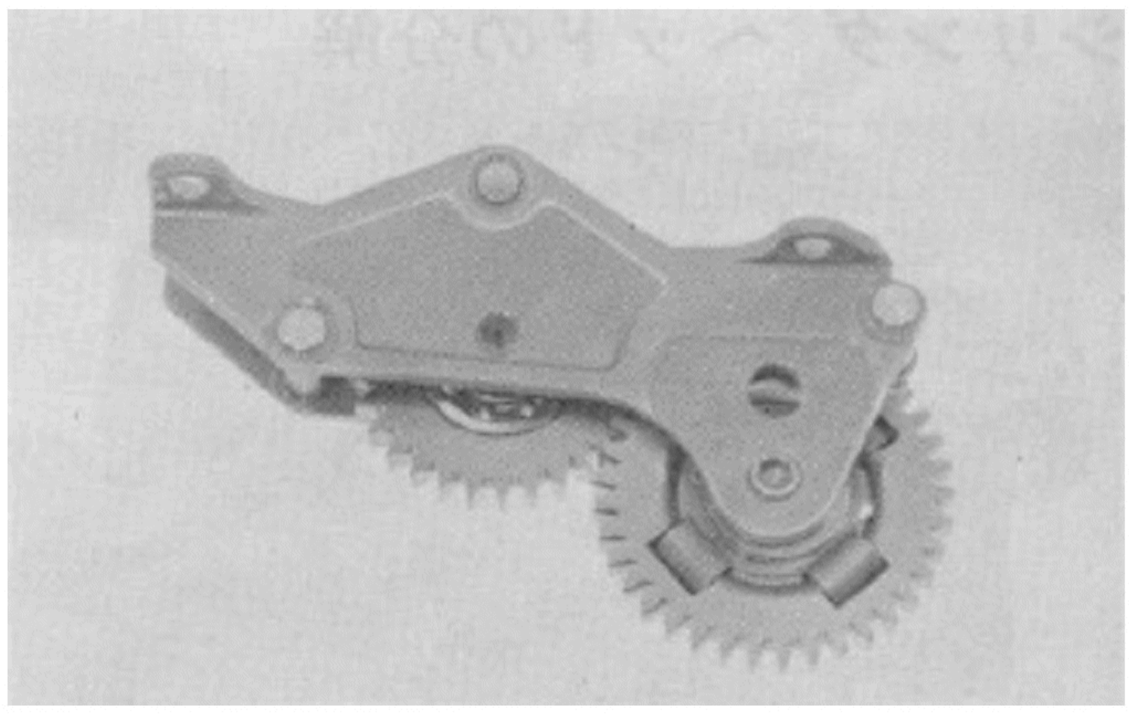
If the figure is above the limit, replace the camshaft and re-measure the oil clearance.
If the figure is still beyond the limit, replace the cylinder head and the holder.

<u>Cam gear train detachment</u>

Remove the two cam gear train attachment bolts, two nuts and detach the cam gear train.
Remove the knock pin.



Inspect the gear on the gear train for smooth rotation and damage.

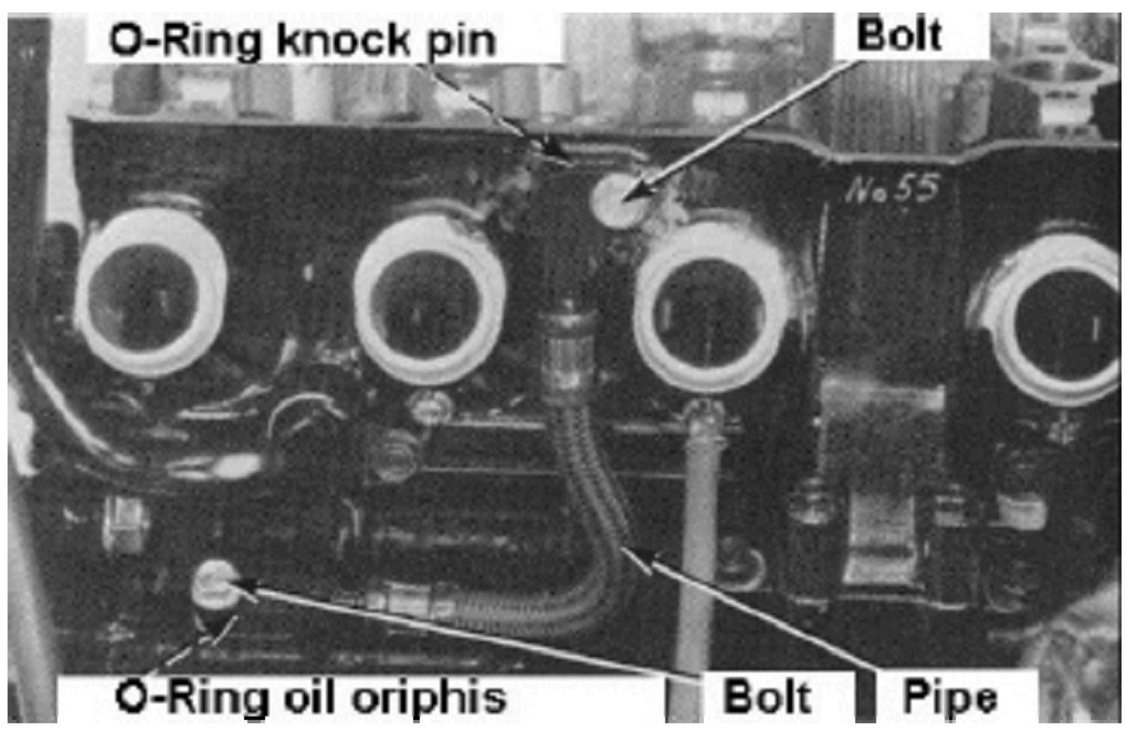


<u>Detachment of the cylinder head</u>

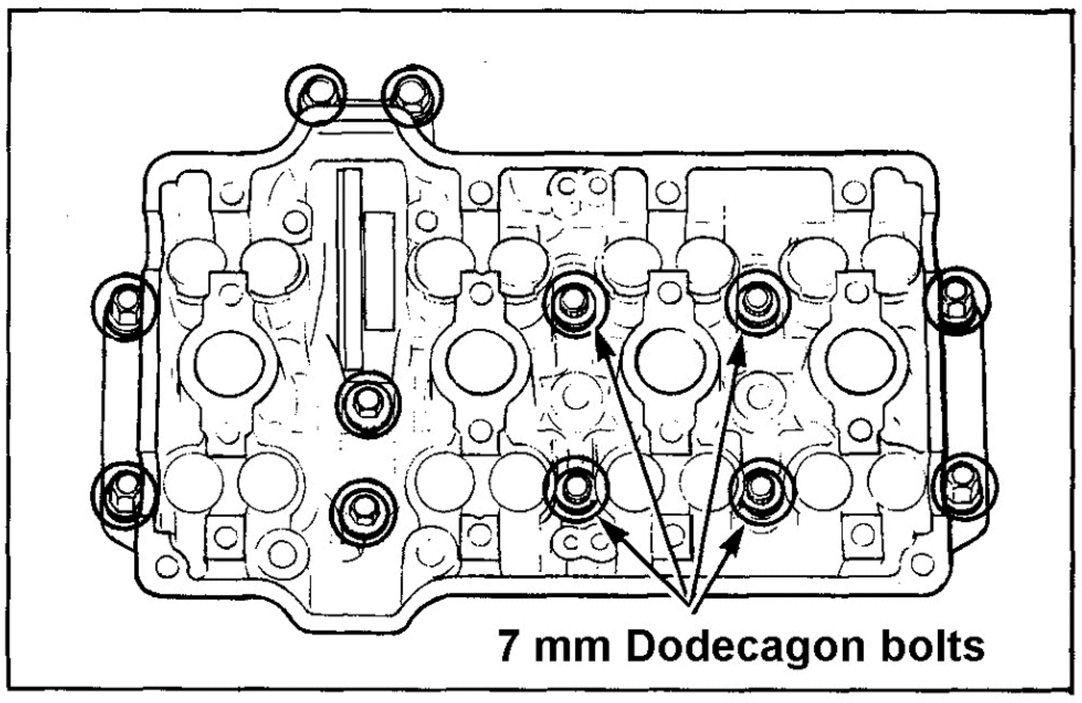
Detach the cam shaft (7-3)
Detach the following parts:

- Fuel tank (4-3)
- Air cleaner case (4-6)
- Carburetor (4-8)
- Exhaust pipe (16-2)

Remove the oil pipe and the O-Ring, knock pin and oil oriphis.

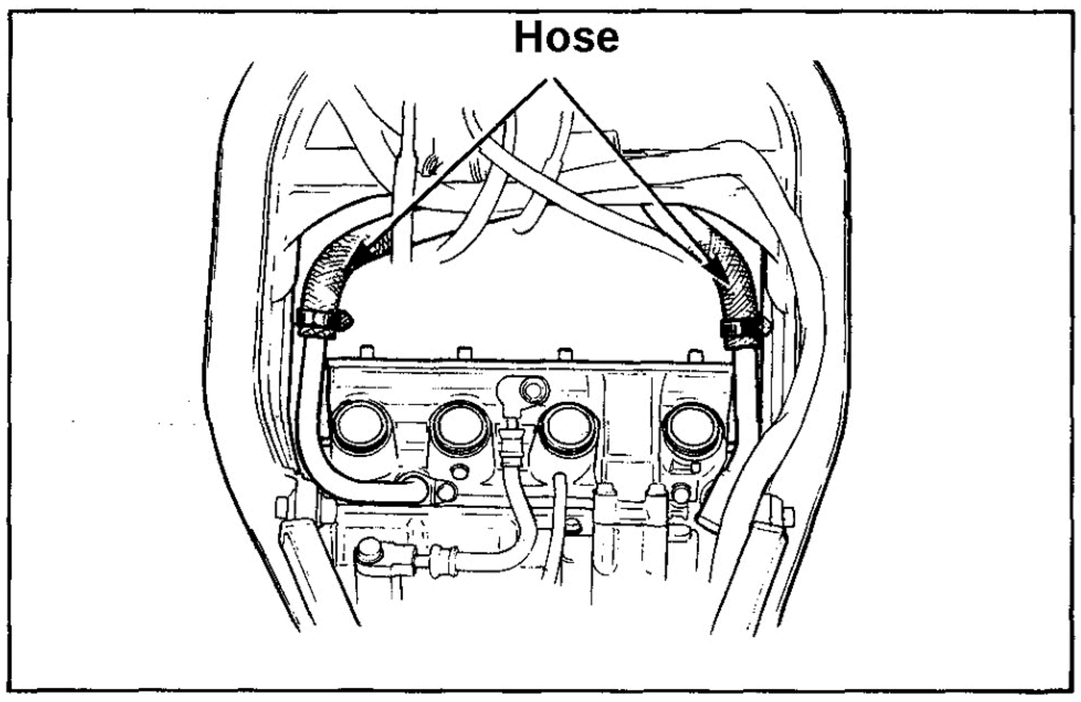


Disconnect the hoses from the water pipe on the cylinder head.

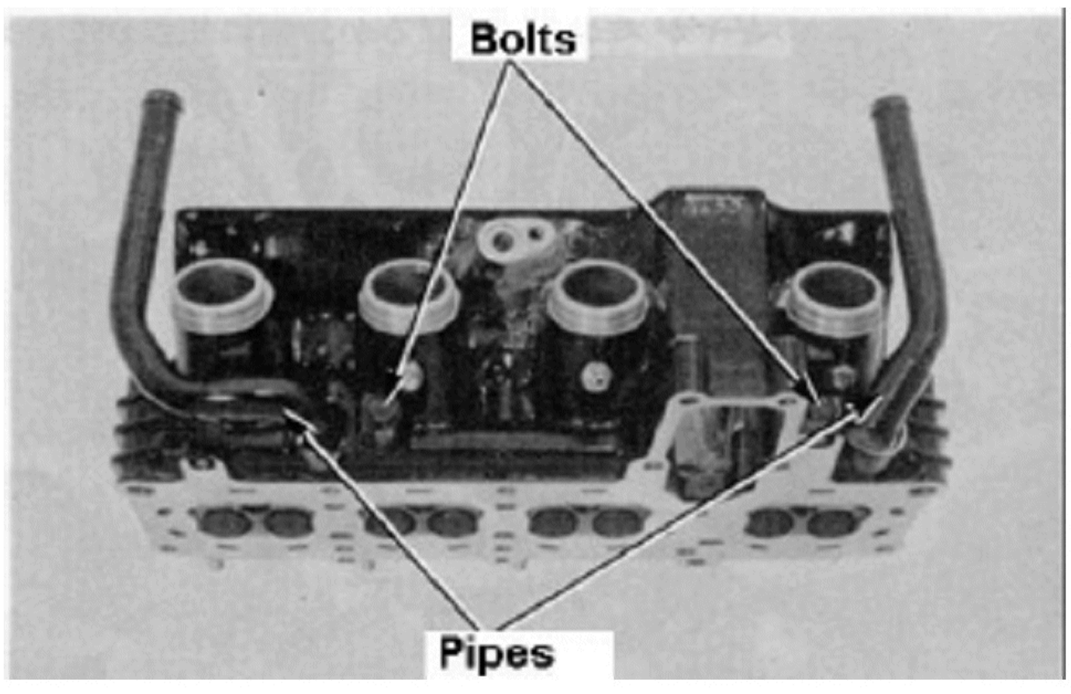


Remove the cylinder attachment bolts and detach the cylinder head.

- Loosen the bolts in two or three steps by opposite corners.
- Use of the exclusive tool is recommended to remove the bolts.
- Exclusive tool: Socket wrench 07GMAKT70100



Remove gasket and knock pin.

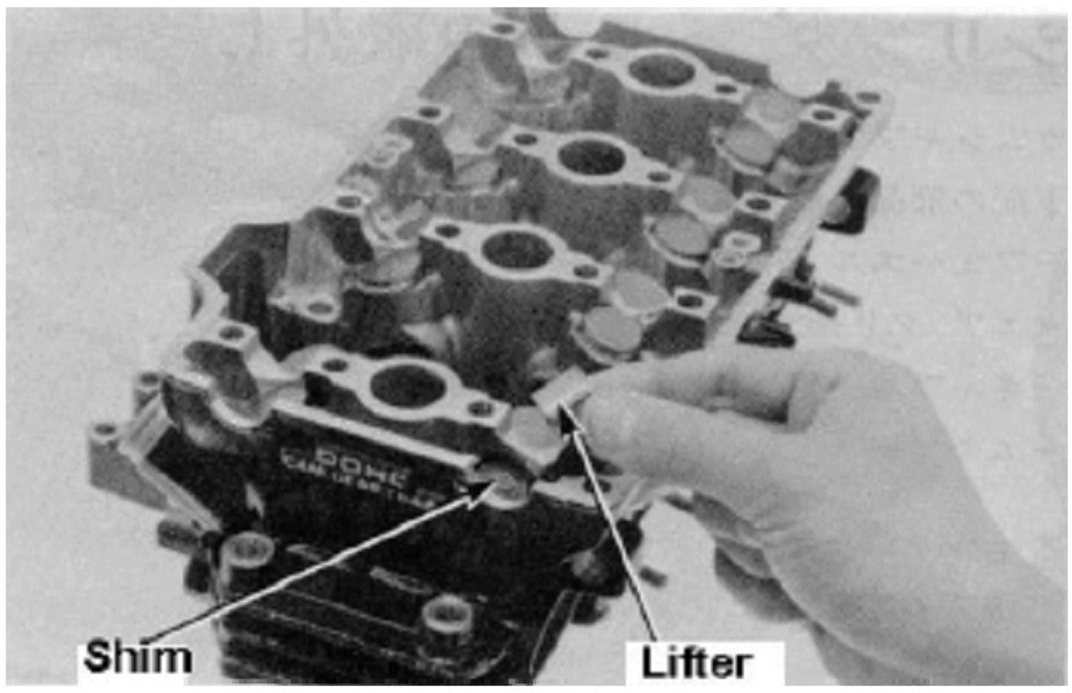


Cylinder head disassemble

Remove O-Ring and water pipe from the cylinder head.

Remove valve lifters and shims.

Mark the attachment position on the lifters and shims.



Attach the tappet hole protectors to the cylinder heads.

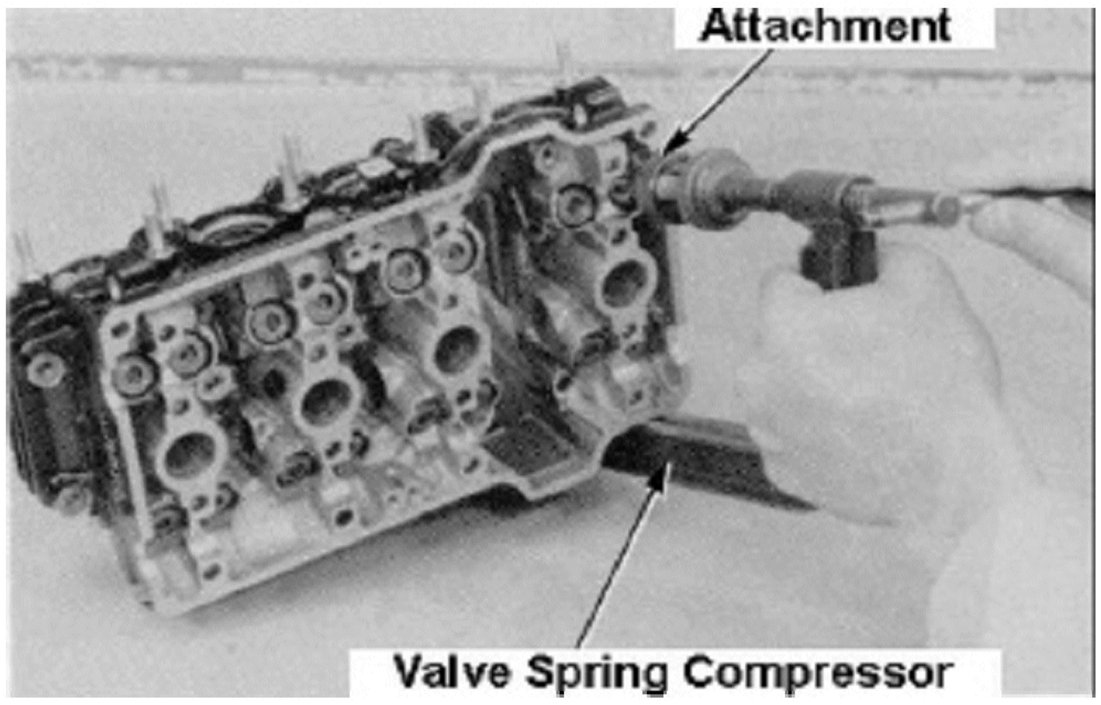
Exclusive tool: Tappet hole protector
07GME-KT70100

Remove the following items by using a valve spring compressor and the attachment.

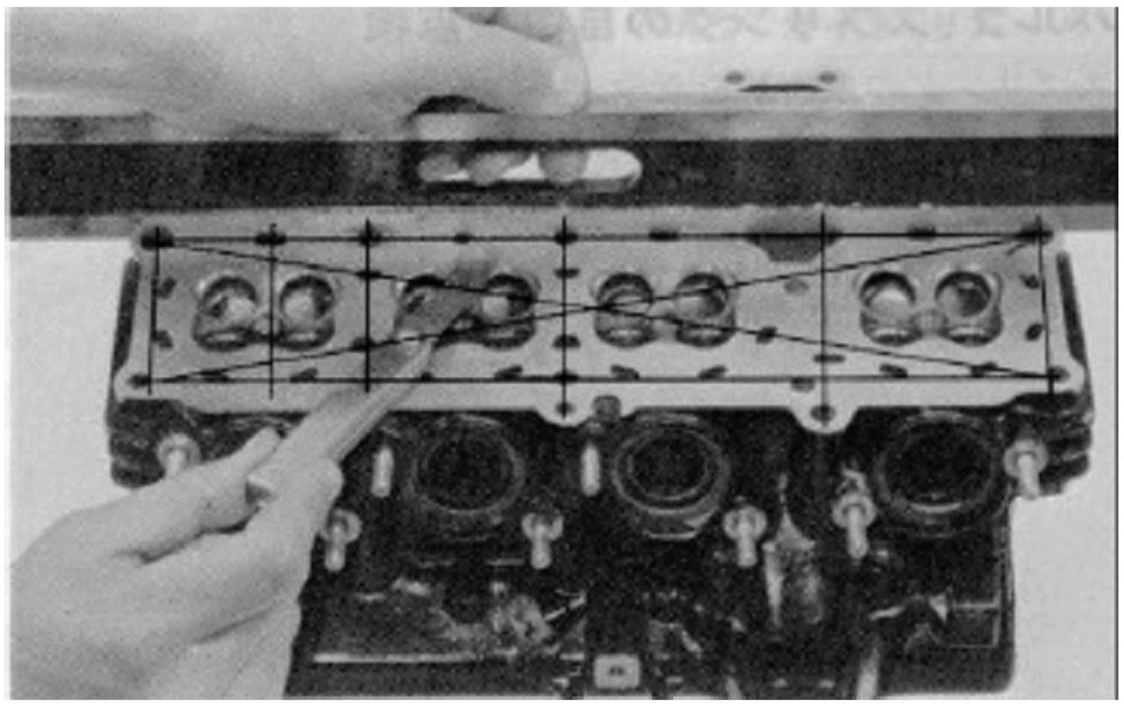
⇒ cotter ⇒ valve
⇒ retainer ⇒ valve stem seal
⇒ spring ⇒ spring seat

Common tool: Valve spring compressor
07757-0010000

Exclusive tool: Valve spring compressor attachment
07GME-KT70200



- Do not apply excess load on the valve springs.
- Mark the attachment position on each part.

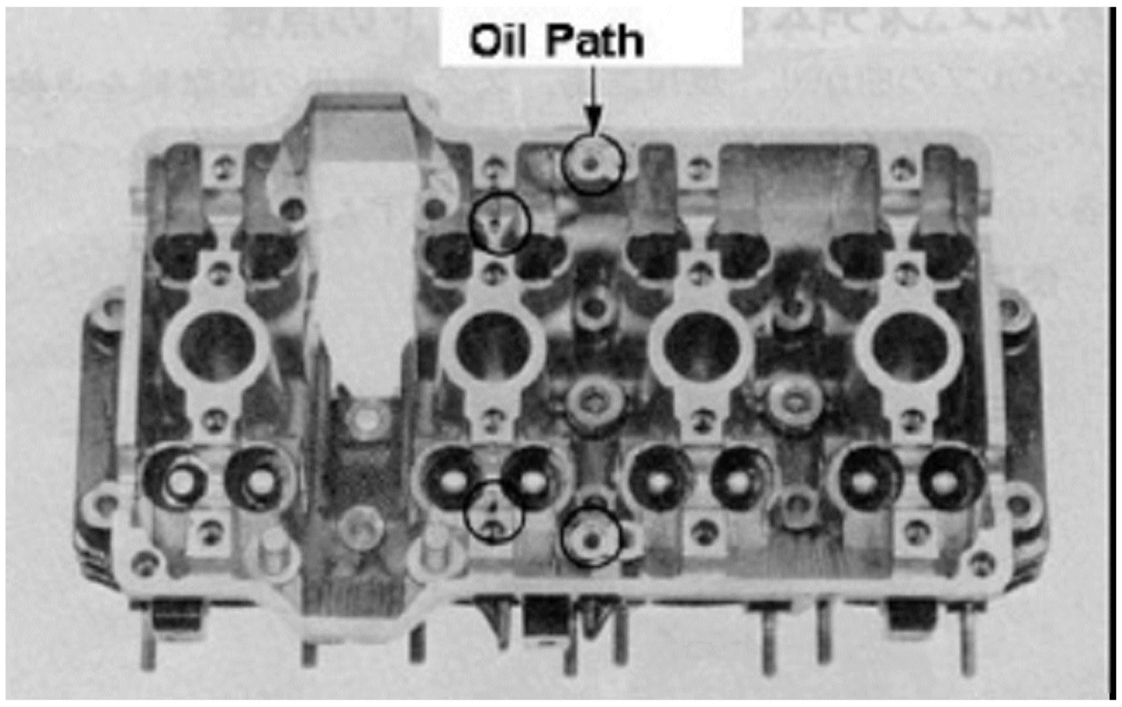


Cylinder head inspection

Remove carbon in combustion chambers.
Remove the gasket pieces from the head gasket surface.

Do not damage the gasket surface

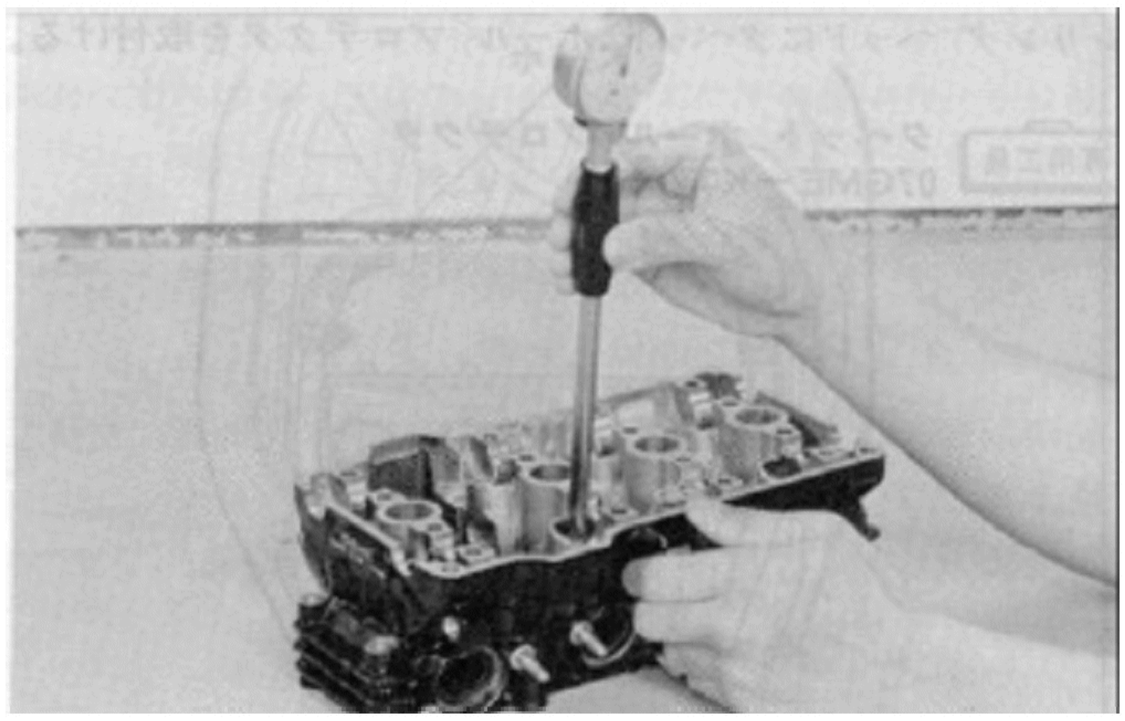
Inspect the spark plug hole and valve hole for cracks.
Measure the distortion of the cylinder head by using a straight edge and a thickness gauge.
Equal to or more than 0.05mm→replace.



Inspect the oil path on the cylinder head for clogging.

Inspect the valve lifter bore for damage and irregular wear.
Measure the inner diameter.

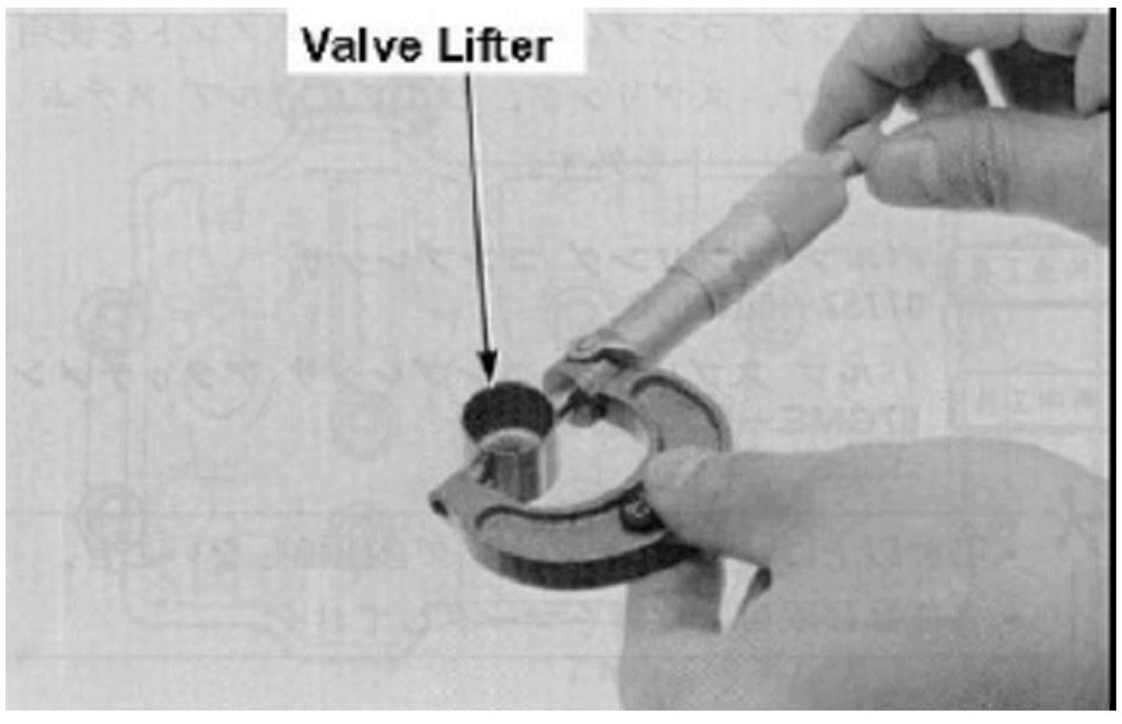
Equal to or less than 20.035mm→replace.



Inspection of the valve lifter.

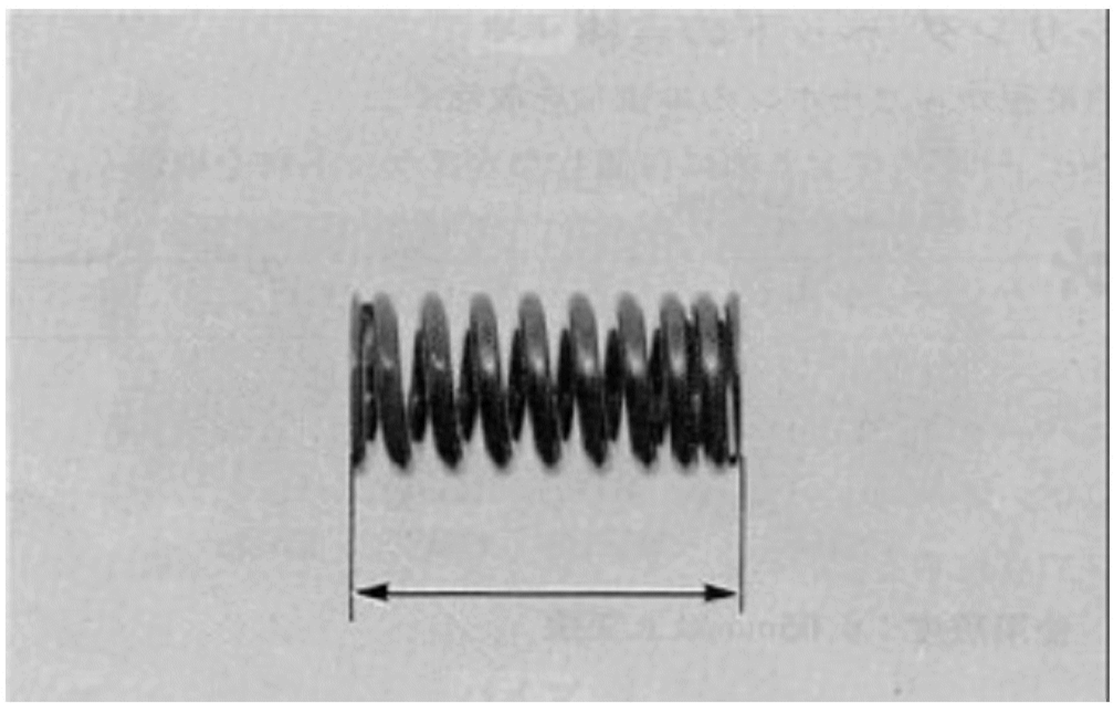
Inspect the lifter for damage/irregular wear.
Measure the out diameter

Equal to or less than 19.970mm → replace.



Valve spring relaxed length

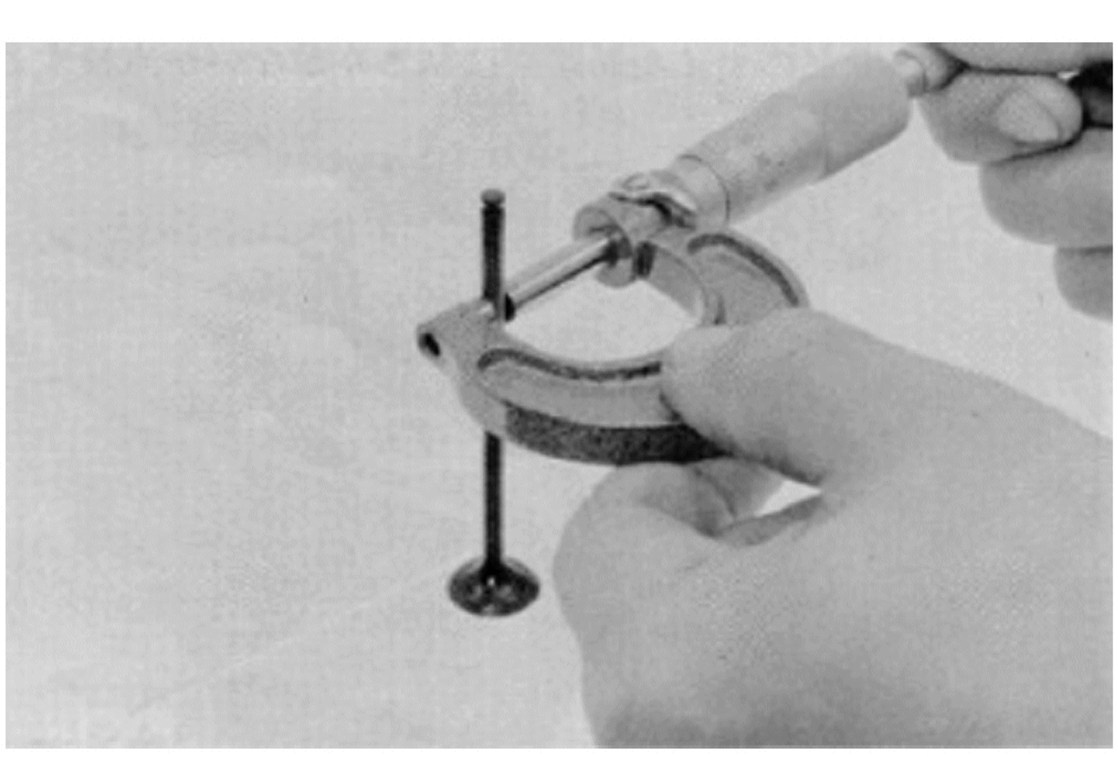
Equal to or less than 36.3mm → replace.



Valve stem / valve guide inspection

Inspect each valve for bend, heat damage, damage, irregular wear at the stem edge.
Place the valve to a guide and check for smooth operation.
Measure the outer diameter of each valves stems.

IN:
Equal to or less than 3.965mm → replace.
EX:
Equal to or less than 3.9350mm → replace.



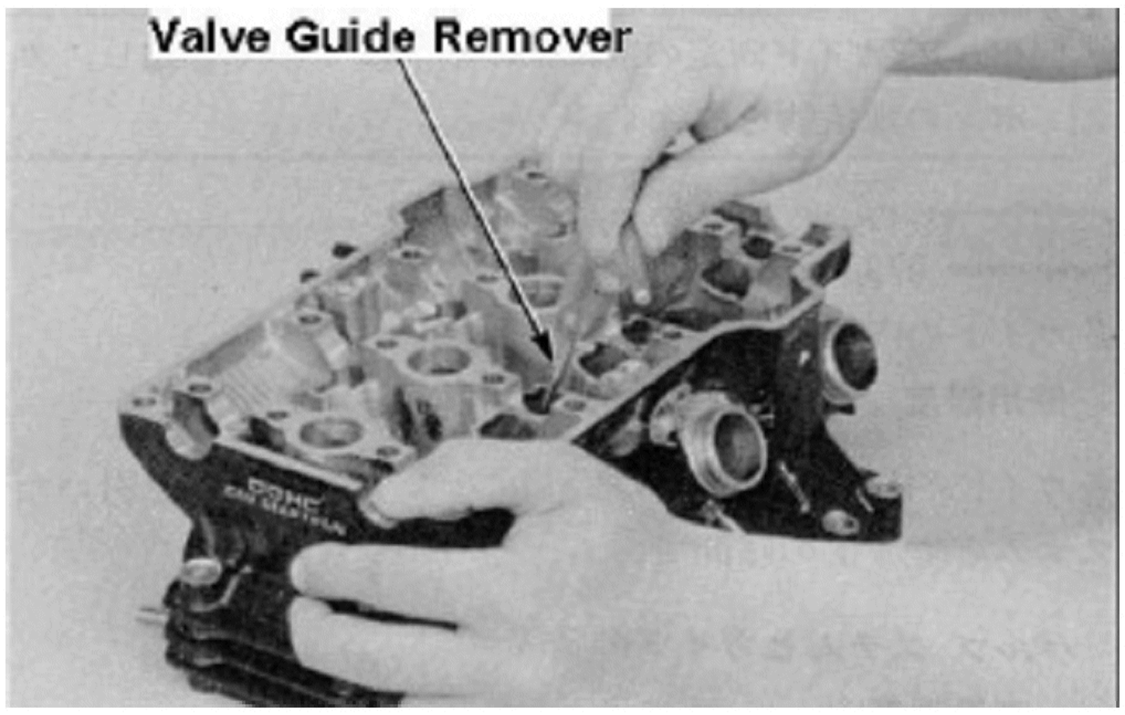
- Before measuring the valve guide, apply a reamer through a guide and remove carbon.

Exc. Tool

Valve guide reamer - 07984 – 884000

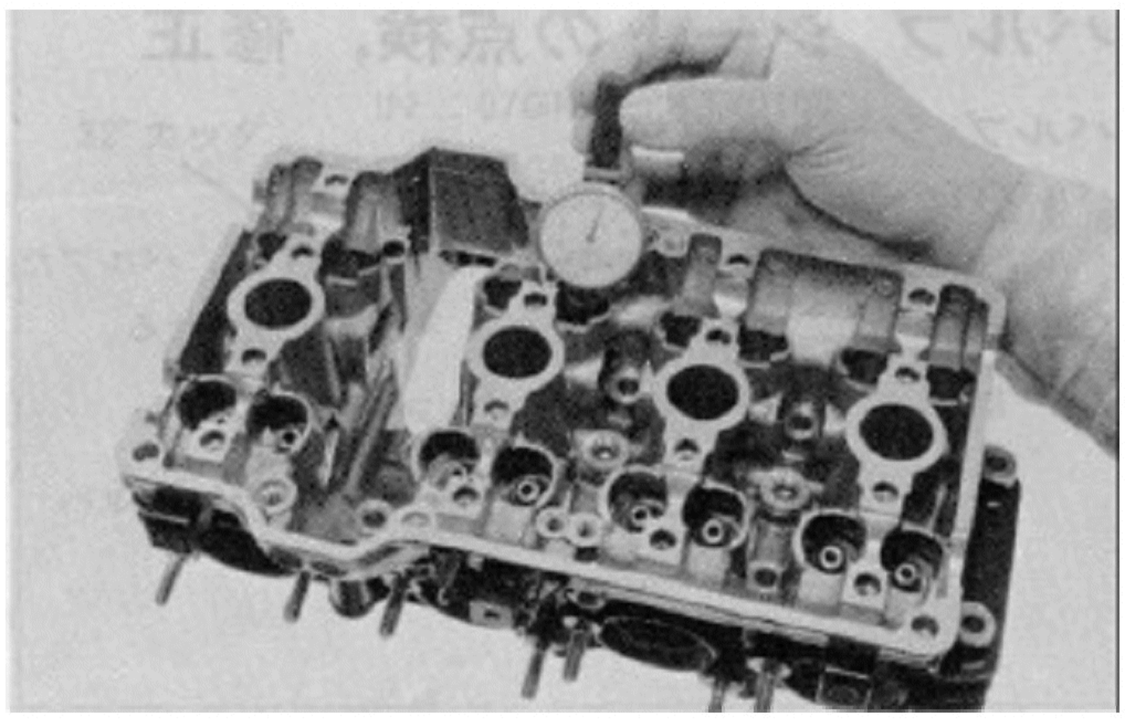
Measure inner diameter of each guides.
Equal to or greater than 4.065mm → replace.

(Stem-guide clearance)
= (valve guide inner diameter) –
(corresponding valve stem outer diameter).



<u>Stem to guide clearance</u>
IN:
Equal to or greater than 0.10mm → replace.
EX:
Equal to or greater than 0.13mm → replace.

If the figure is beyond the limit, calculate the clearance assuming the guide is the new one. If the assumption falls into the acceptable range, replace the guides only.

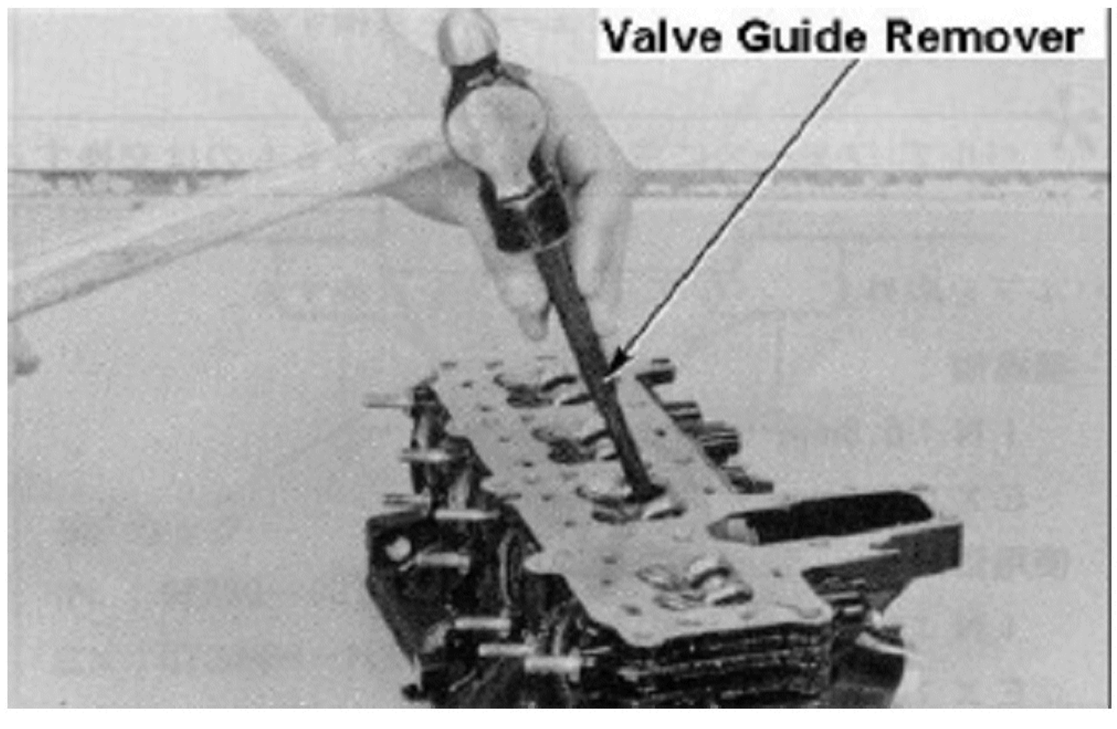


If the assumption still exceeds the limit, replace both the guide and the valve.

Cut the valve seat when the guide is replaced.

<u>Valve guide replacement</u>

Hit the valve guide through the cylinder head.

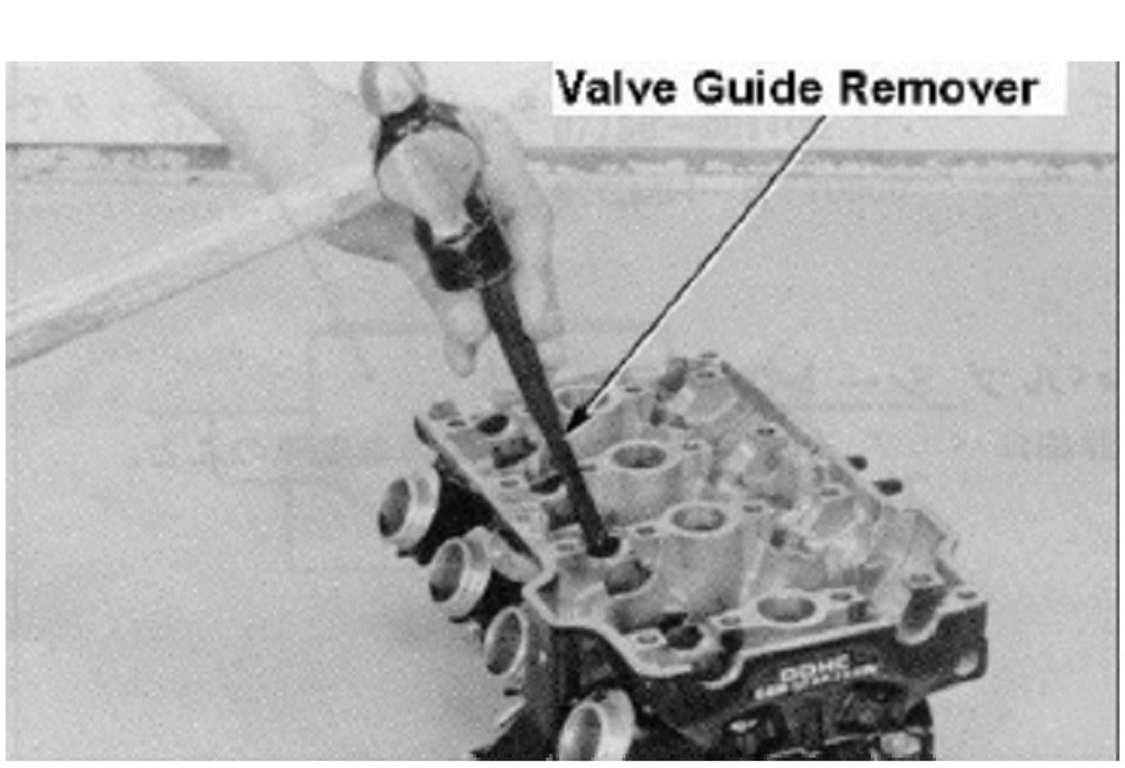


Do not damage the cylinder head.

Exc, Tool Valve guide remover
07GMD – KT70100

Hit the oversized valve guide in.

Exc. Tool Valve guide remover
07GMD – KT70100

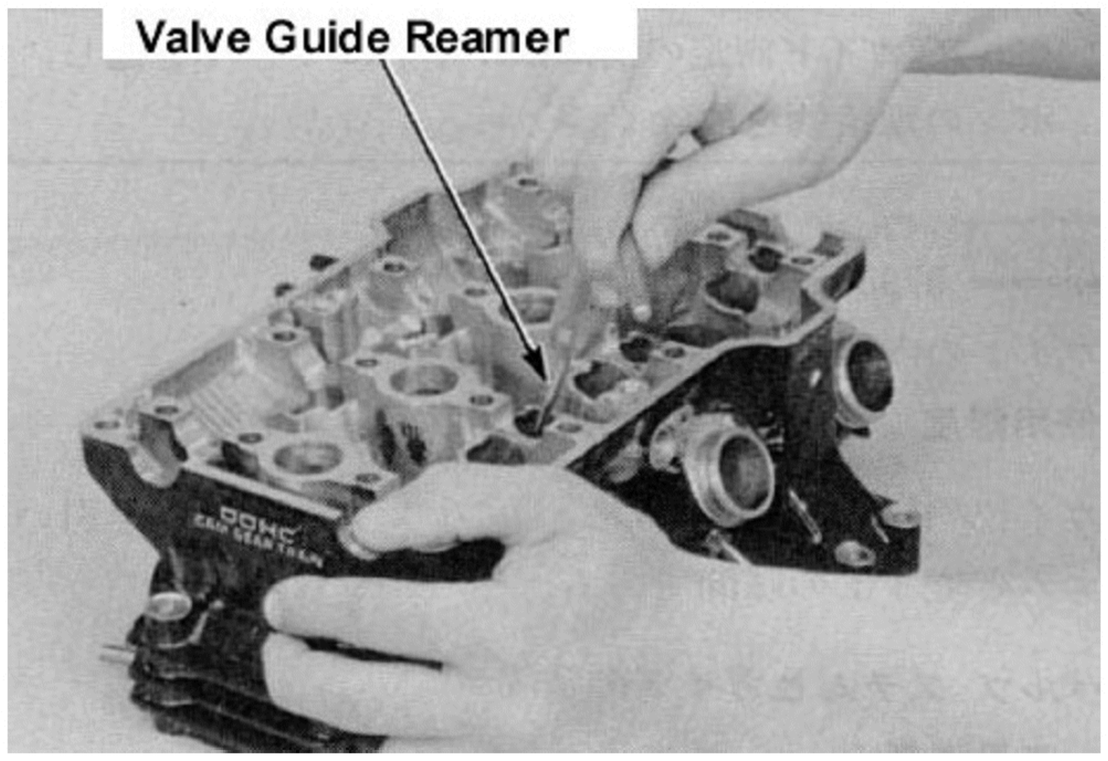


Finish the valve guide with a reamer.

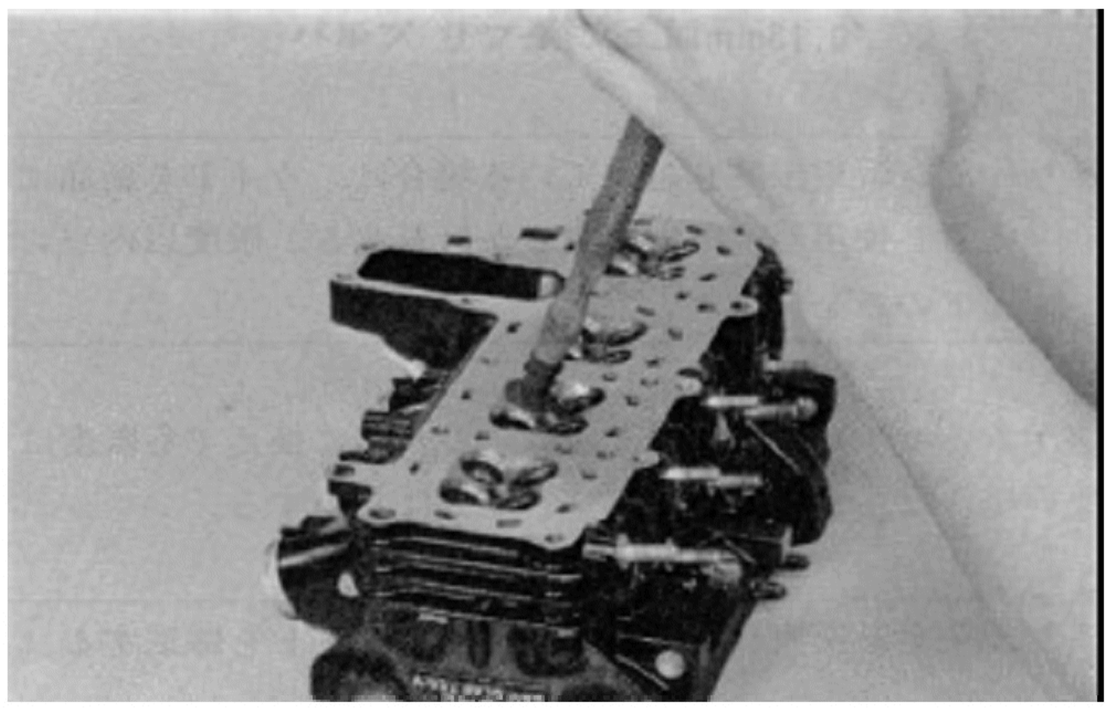
Use lubrication when reaming.

Exc. Tools

Valve guide reamer
07984 – 8840000



Clean the cylinder head and remove all debris.
Adjust the contact of the valve seat.



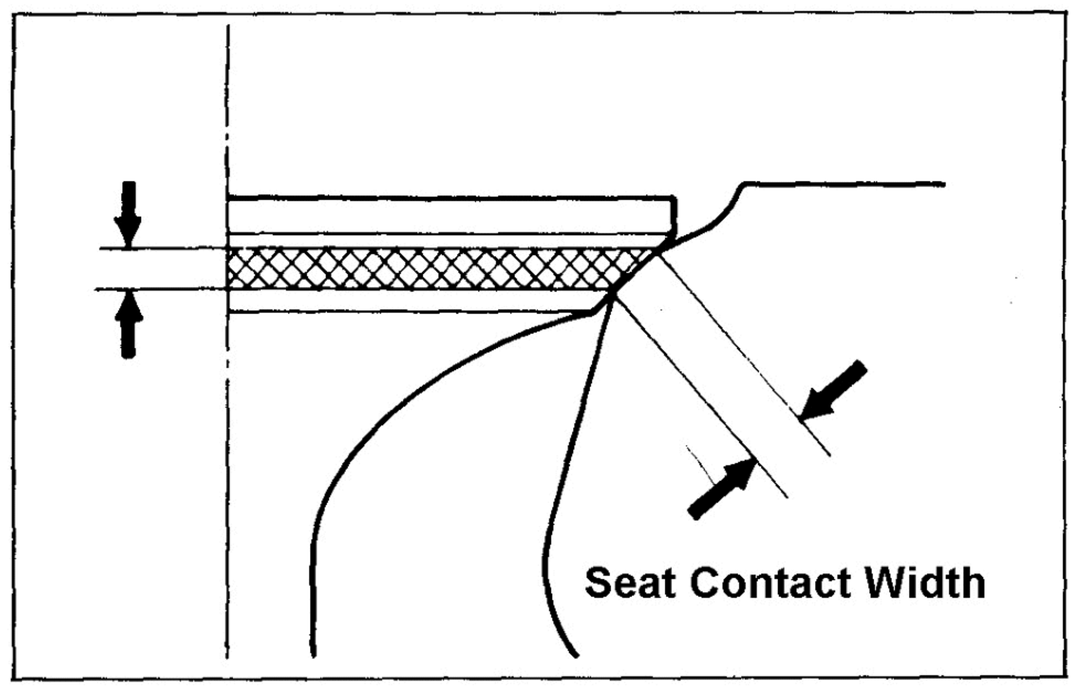
Valve seat inspection / adjustment

Valve seat inspection

Remove carbon from valves.
Apply lead (red dye) powder over the contact surface. Contact the valve by using a valve lapping stick.

Detach valves and inspect the valve faces.

Replace if you discover irregular wear or roughness on the surface.



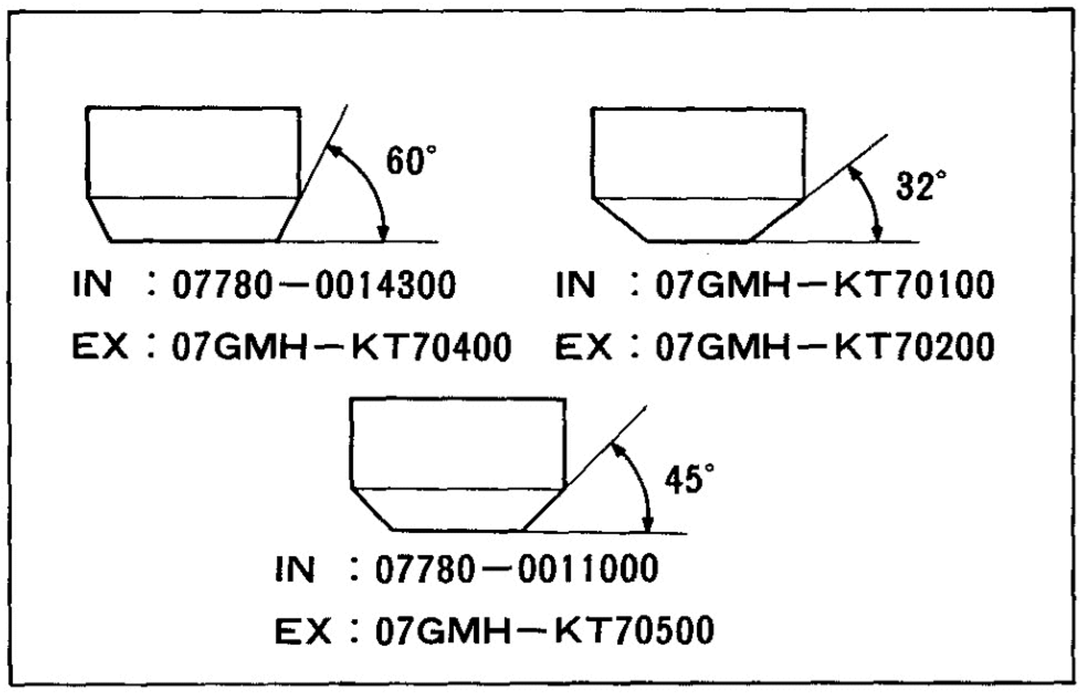
Standard: IN: 0.8mm
EX: 1.0mm

Circuit: IN: Equal to or above 1.3mm → adjust
EX: Equal to or above 1.5mm → adjust

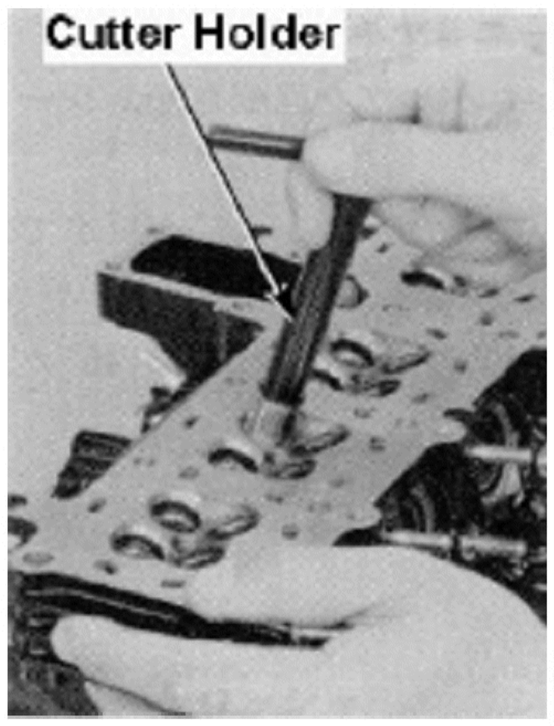
If the contact span is unequal, too wide, too narrow, contacting only at the top or bottom, adjust the valve seat with a valve seat cutter.

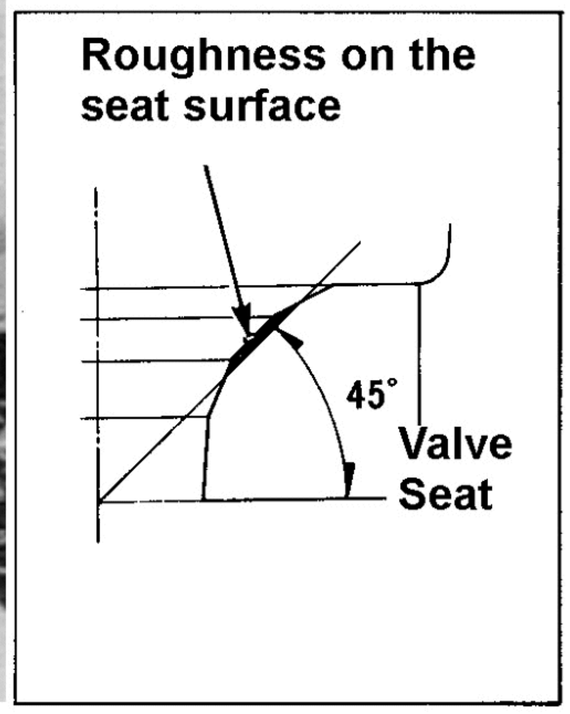
Valve seat adjustment

See the valve seat cutter manual.



Apply 4 ~ 5kg pressure by hand and rotate the cutter for the adjustment.



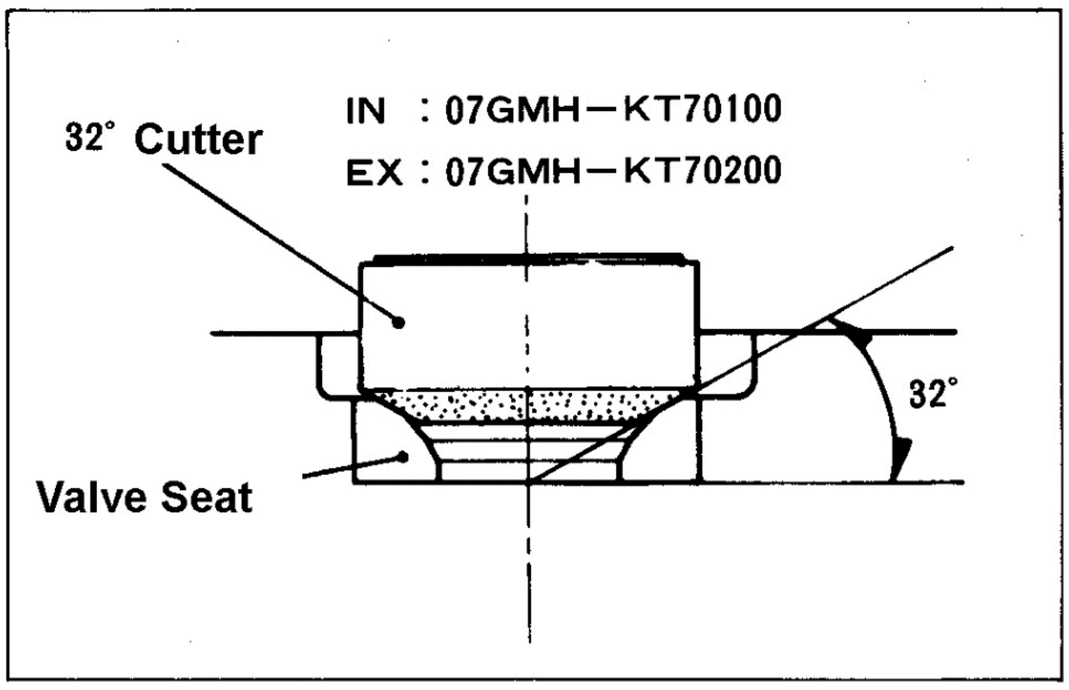


Apply engine oil to the cutter to remove the debris

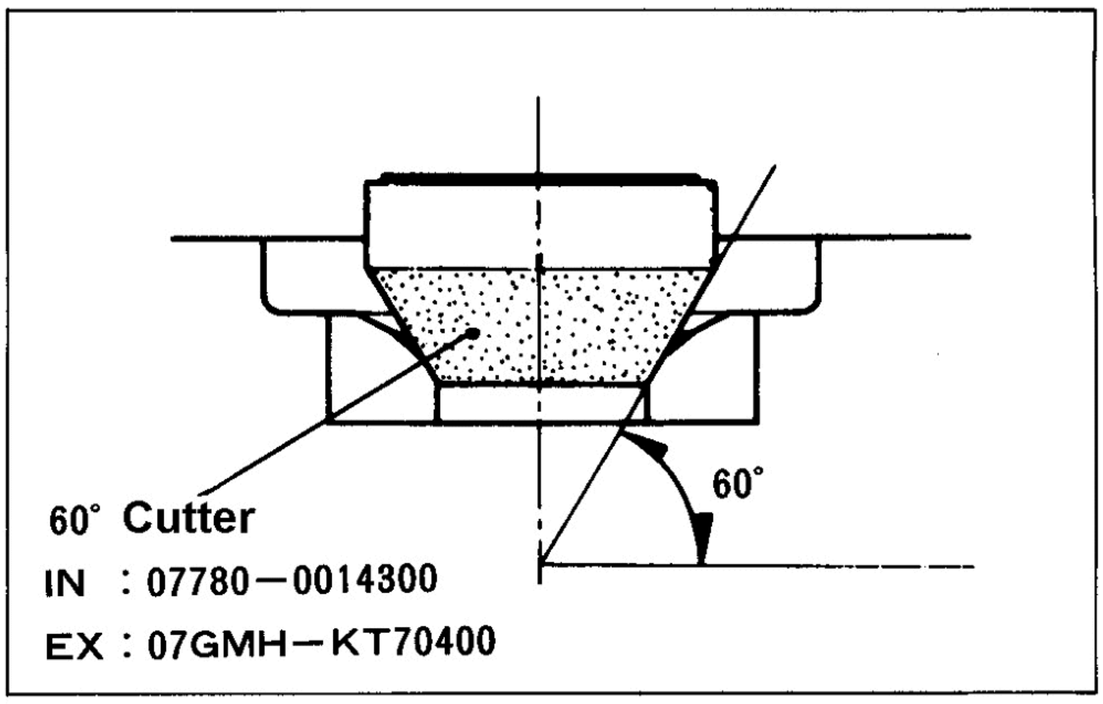
Use 45° cutter to grind the surface until the roughness or pin holes disappear from the seat surface.

Do not grind too much.

Use 32° cutter for flat surface adjustment.



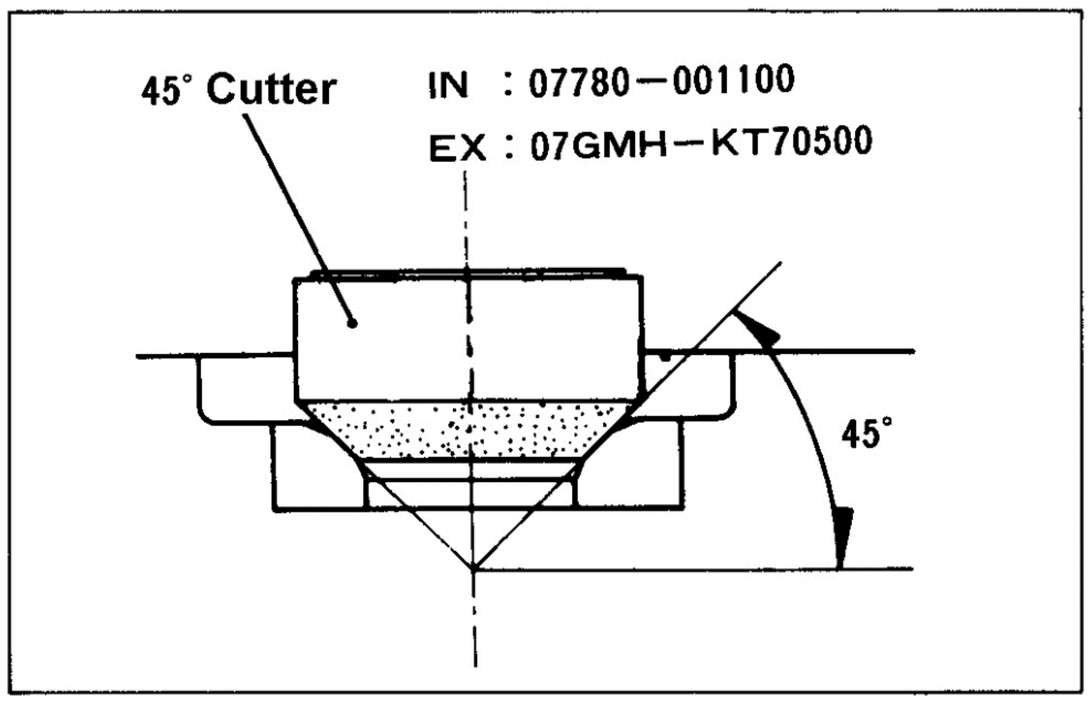
Use 60° cutter for inner surface adjustment.



Use 45° cutter to adjust the seat surface until it reaches to the specific width.

Standard valve seat width

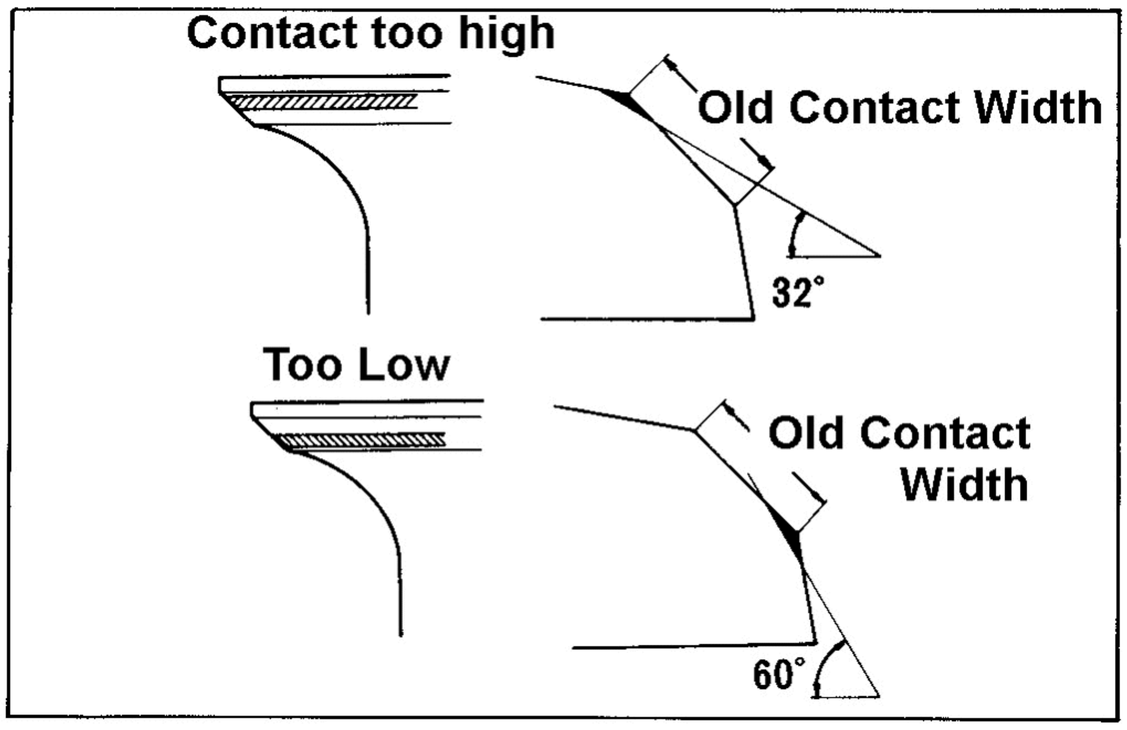
IN: 0.8mm
EX: 1.0mm



Apply the red dye on the valve seat.
Attach the valve. Confirm the contact position by gently pushing and rotating the valve.

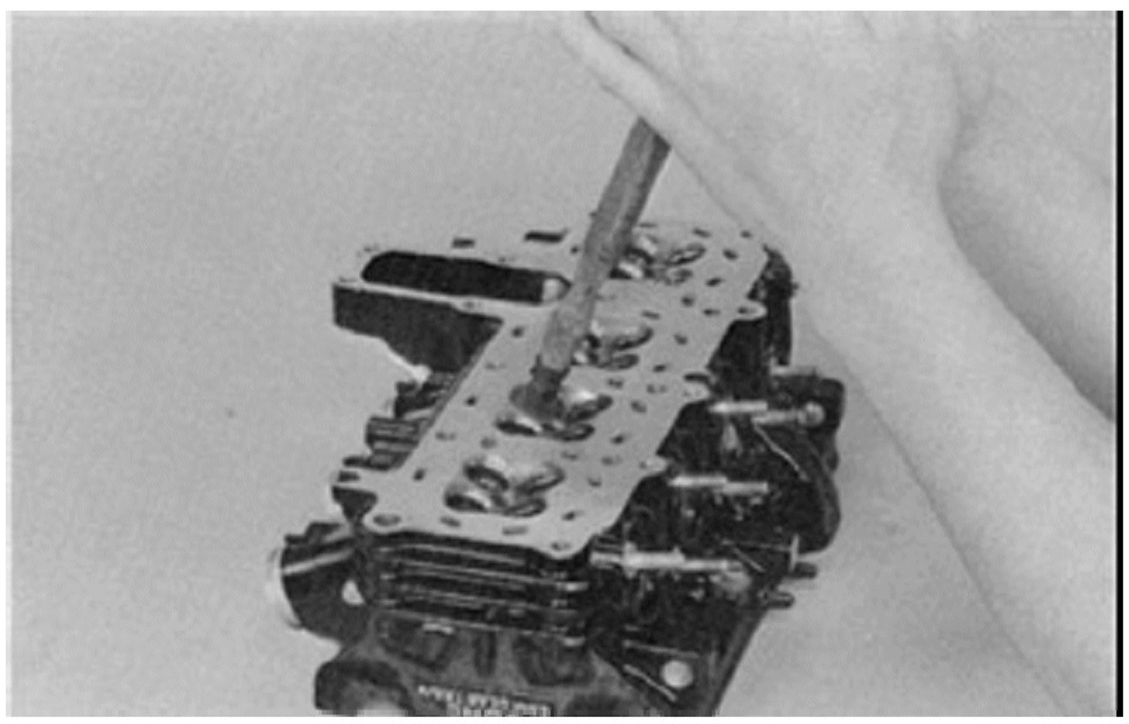
If the contact position is too high, grind with a 32° cutter and adjust to the standard width with a 45° cutter.

If the position is too low, use 60° cutter and adjust to standard with a 45° cutter.

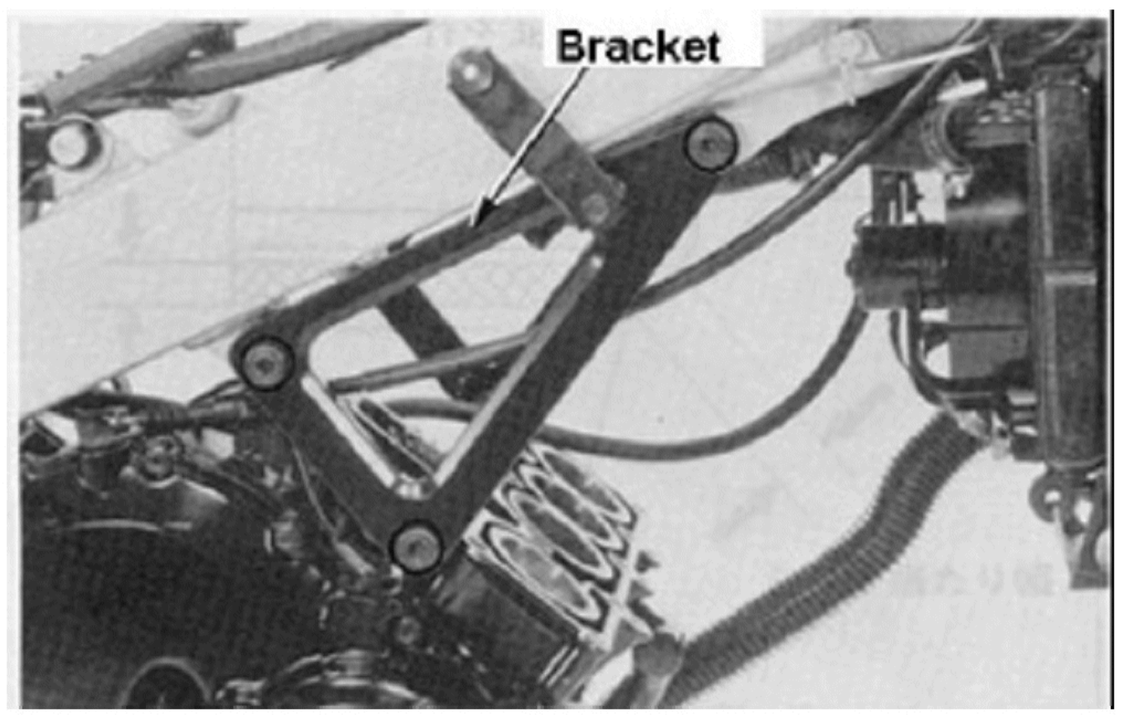


After the adjustment, apply compound over the valve face and chafe with a valve lapping stick.
Clean and wash the cylinder head and valve.

- Do not press the valve hard as it scratches the surface.
- The compound should not go into the stem or the guide.



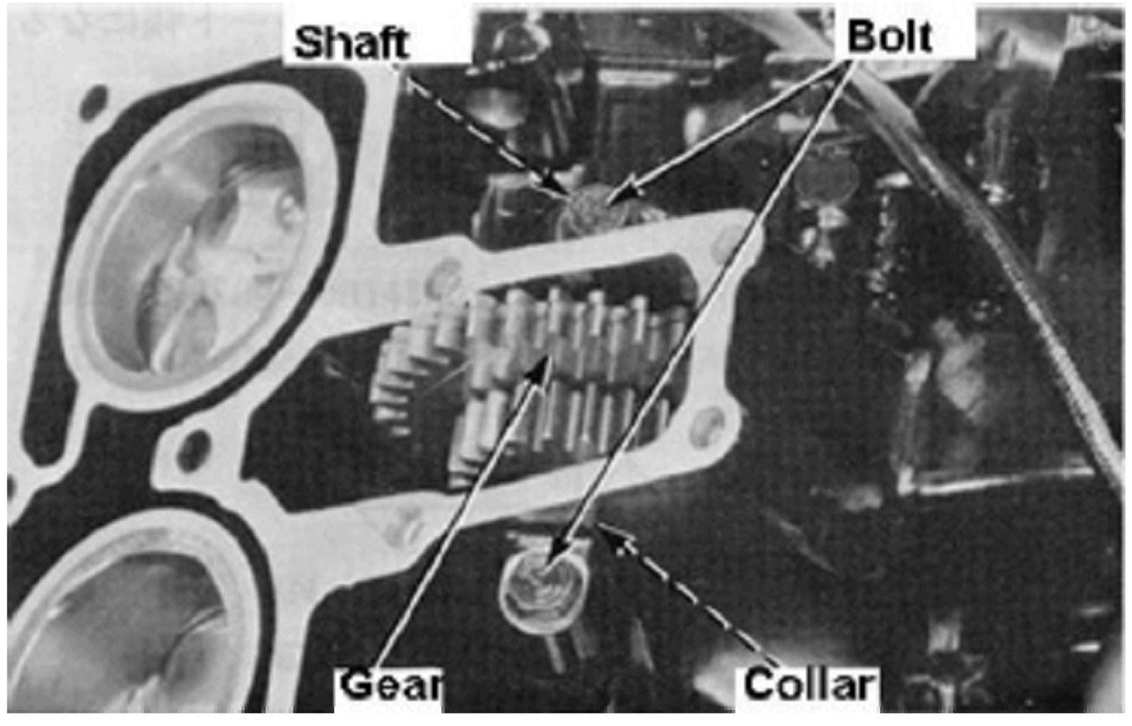
After the adjustment, use the red dye to check the 45° seat surface contacts with the valve equally on it's centre.



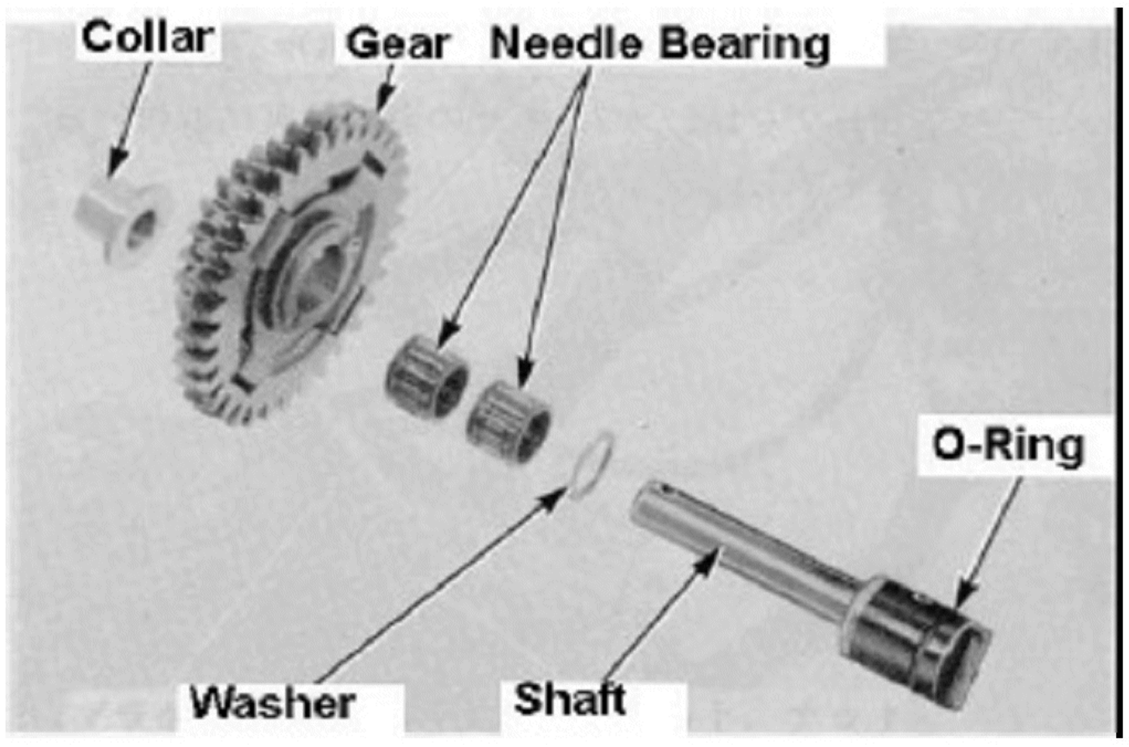
First Cam gear detachment

Remove the right engine hanger bracket.

Remove two bolts.
Pull out the shaft.
Detach the 1st cam gear and the collar.

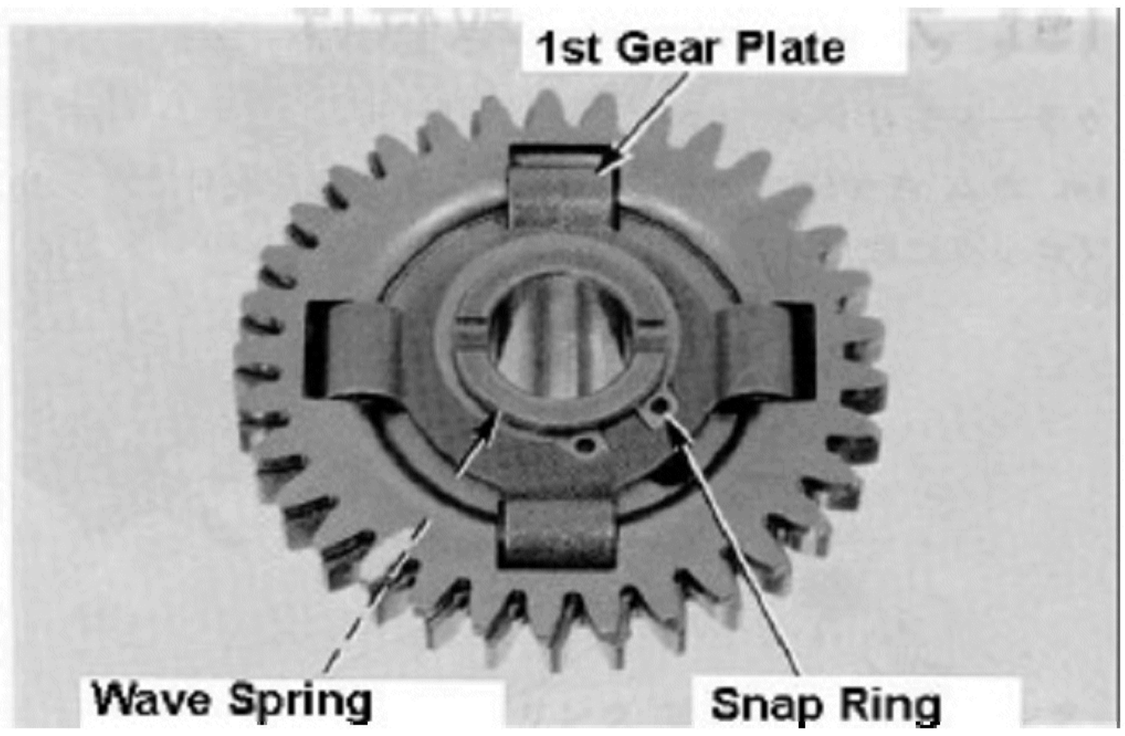


Inspect each part for damage or wear.

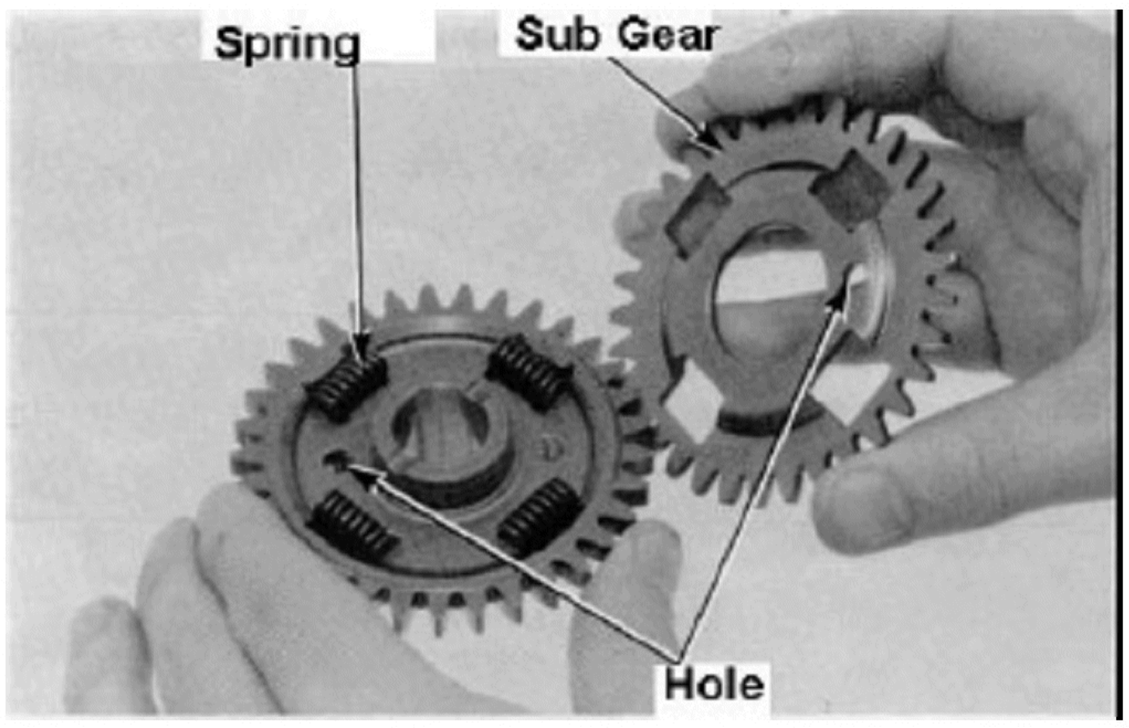


First cam gear disassembly

Remove the snap ring.
Detach the wave spring, first gear plate.



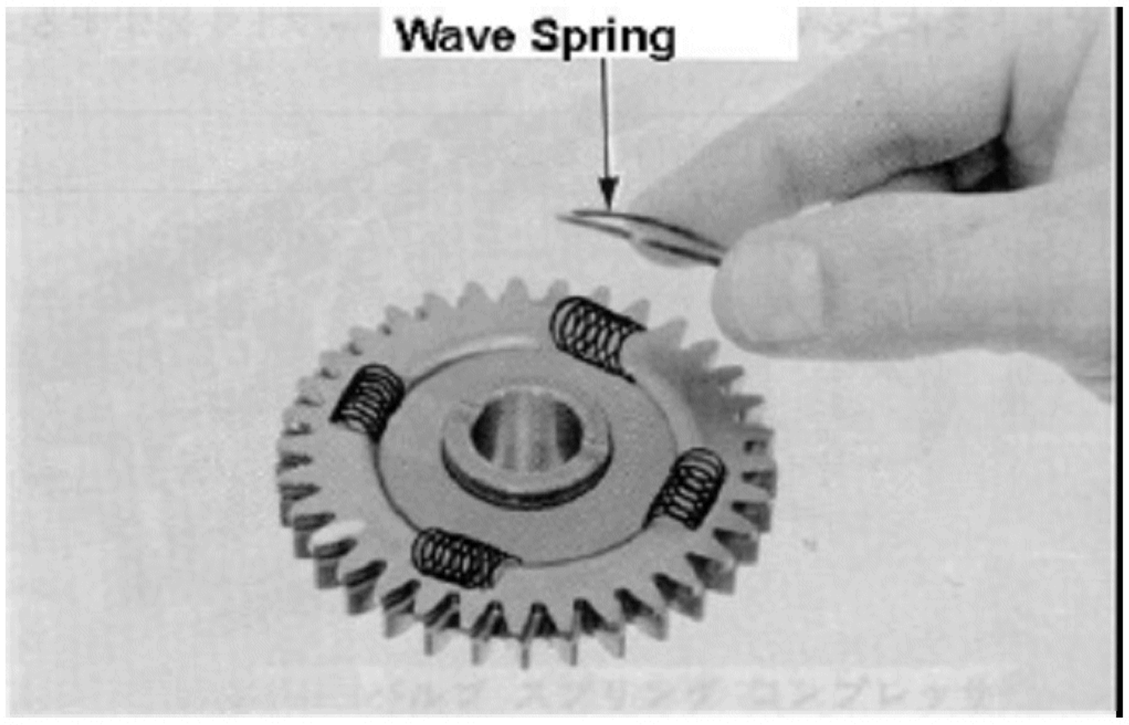
Remove the sub gear and springs.



First cam gear assembly

Attach the four springs to the first cam gear.
Align the holes on the sub gear and the first gear and attach.

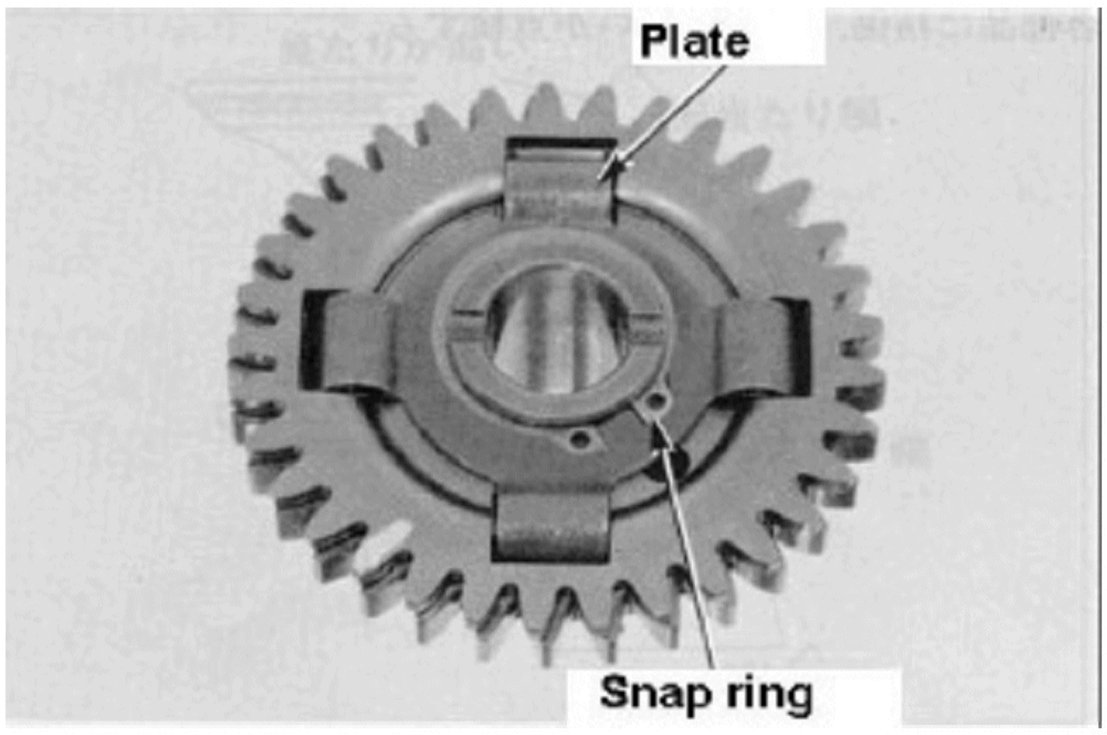
Install the wave spring.



Face the concave side of the wave spring to the gear side when installing.

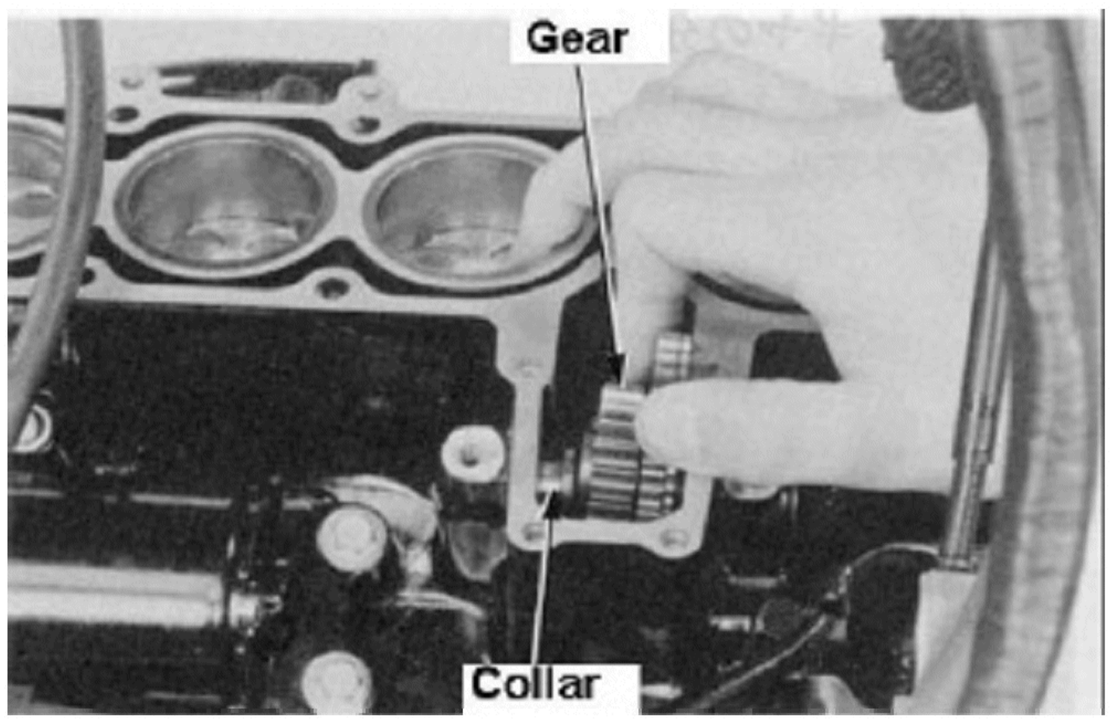
Attach the first gear plate.

Firmly attach the snap ring to the slit on the first cam gear.



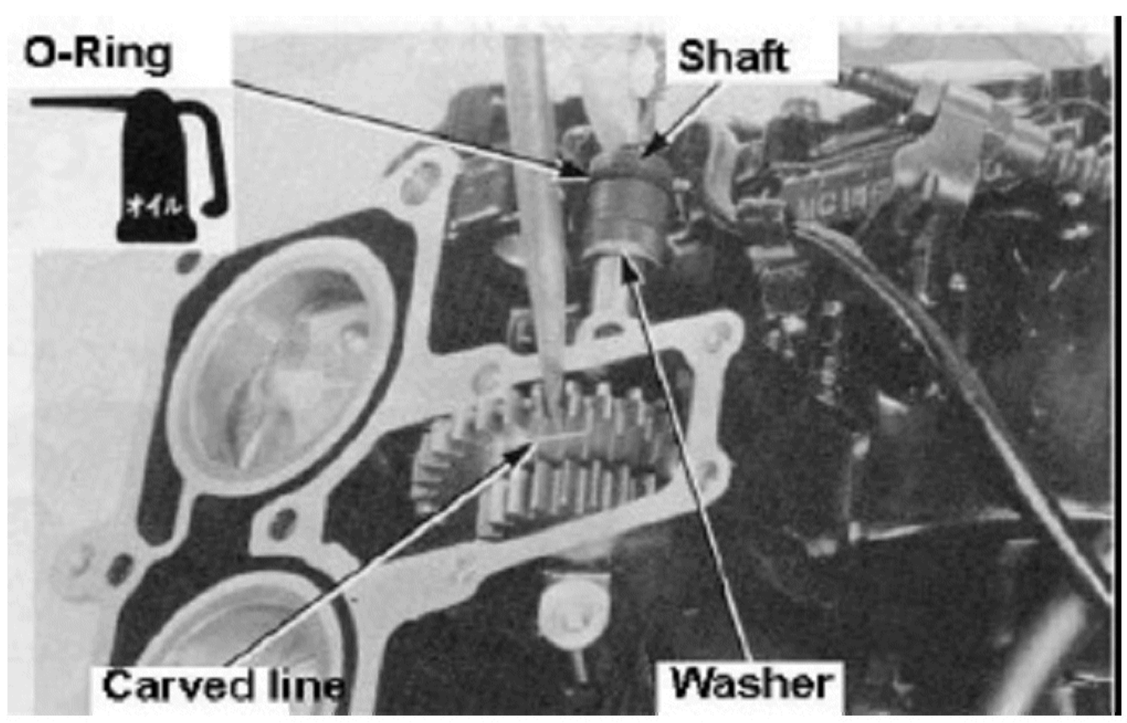
First cam gear attachment

Attach the collar to the hole in the cylinder block.
Attach two needle bearings to the first cam gear and attach it to the cylinder block.



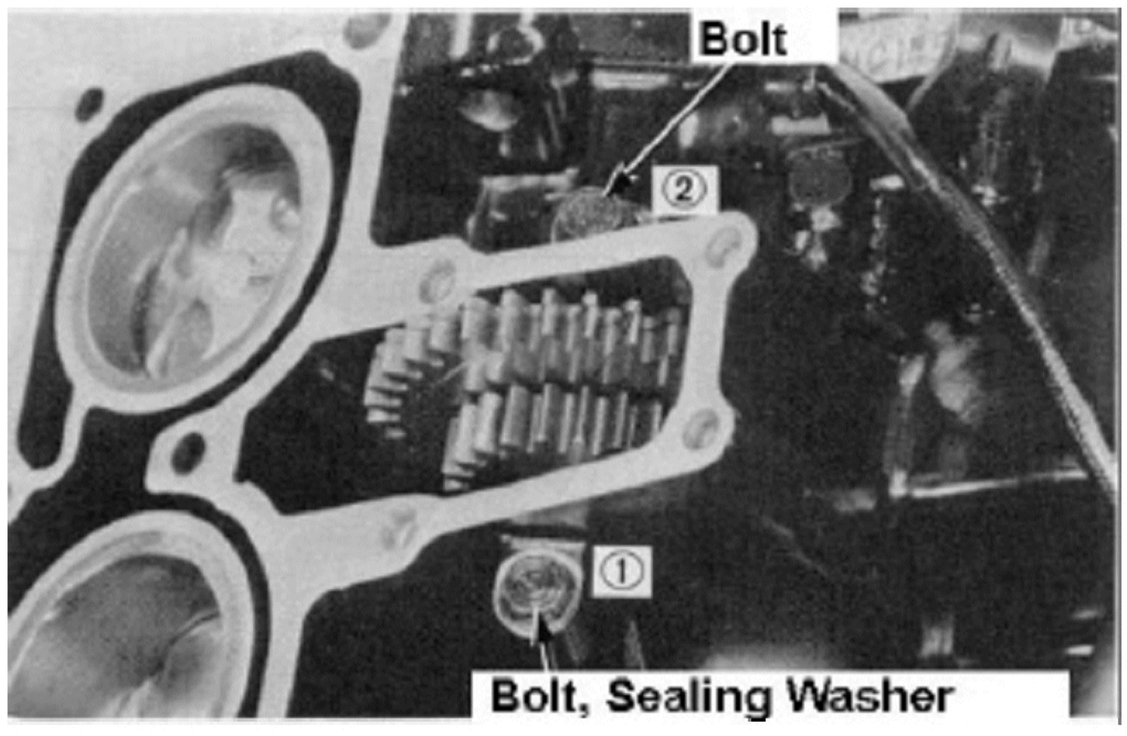
Attach the washer to the shaft and apply engine oil to the O-Ring.
Match the first cam gear and sub gear and insert the shaft.

- Do not damage the gear.
- Align the carved line parallel to the cylinder block top surface.



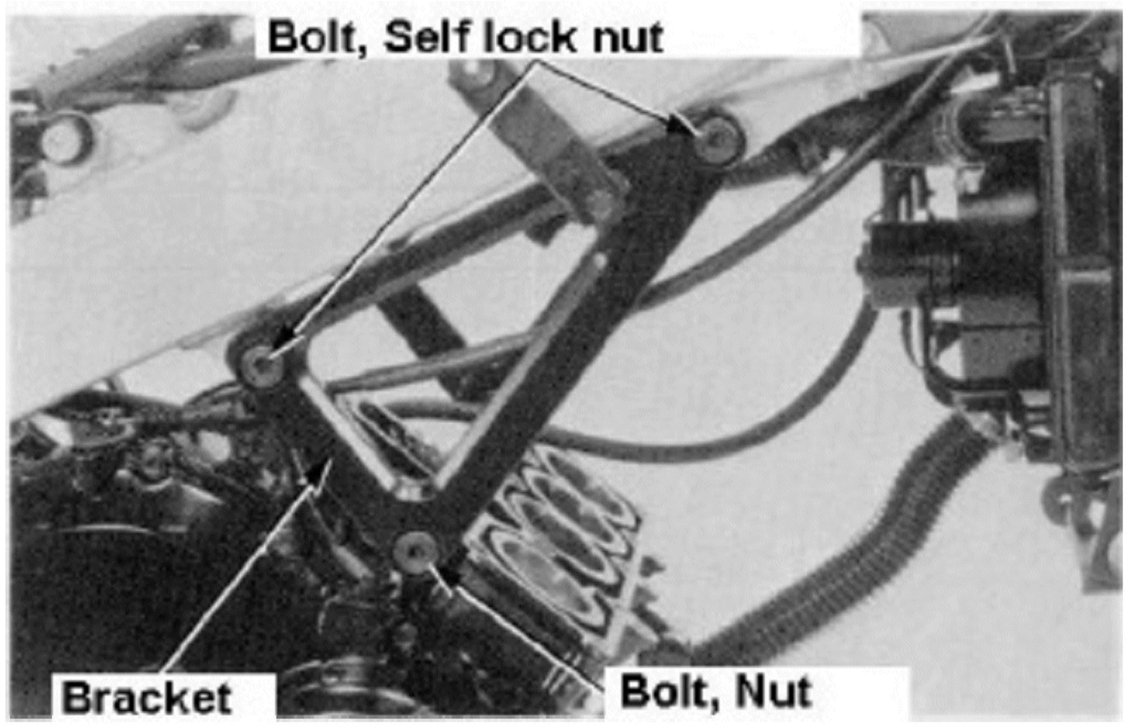
Fix the shaft with two bolts and sealing washers.

Tighten in accordance with the order shown in the figure.



Attach the rear engine hanger bracket and tighten the bolts / nuts.

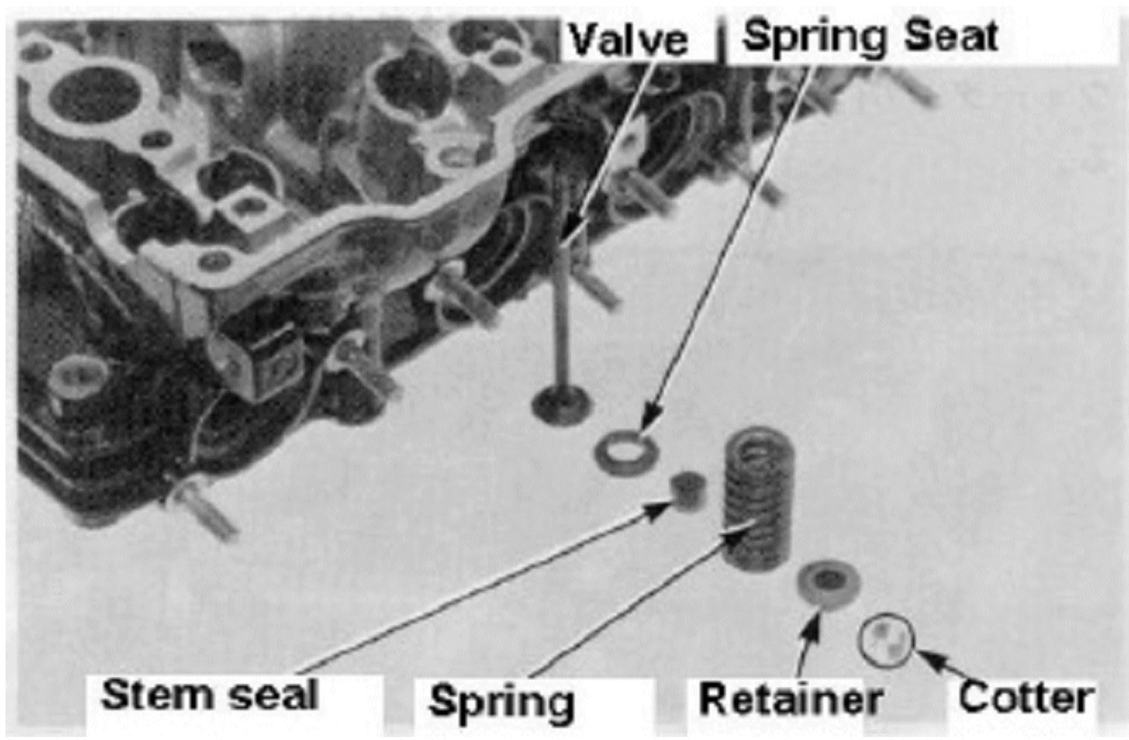
Torque: 4.5 ~ 5.5kg m



Cylinder head assembly

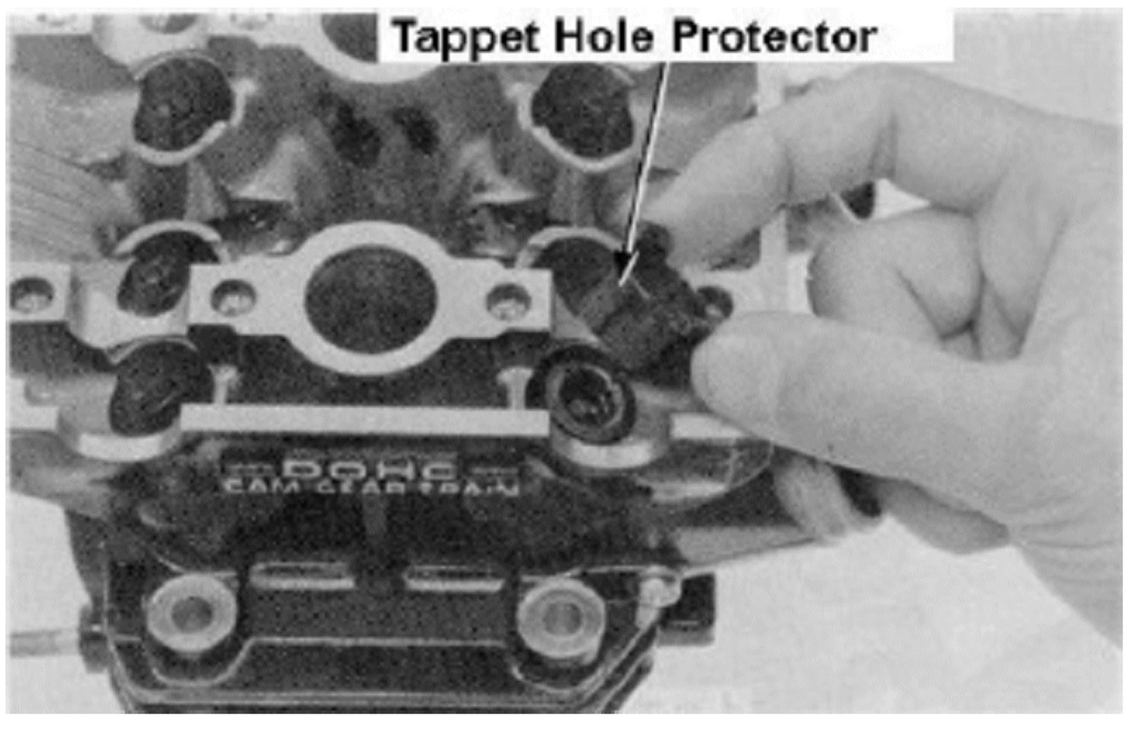
Attach the spring seats, new stem seals.
Apply small amounts of MoS^2 grease to the valve stems and insert to the guides.
Attach the valve springs and retainers.

- The narrow pitch of the valve springs come to the head side.
- Replace with new valve stem seals if they were detached.
- Slowly turn the valve stem and insert to the guide.



Attach tappet hole protectors.

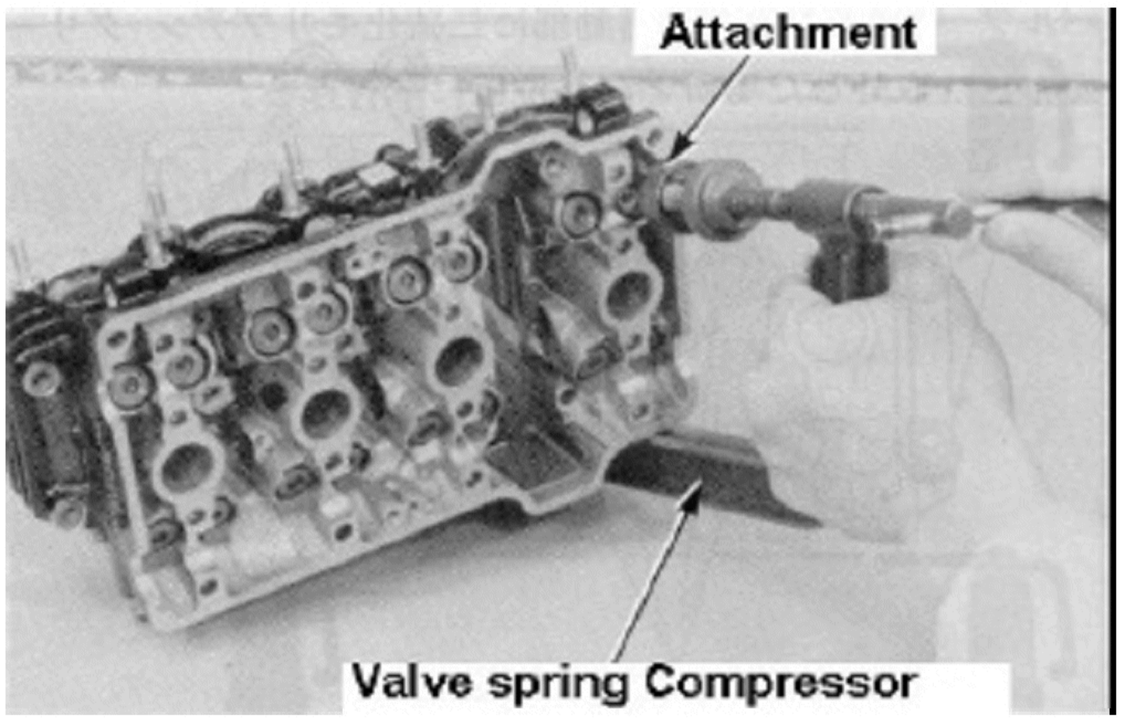
Exc. tools Tappet hole protectors
07GME – KT70100



Attach the valve cotter by using a valve spring compressor and an attachment.

Common tools Valve spring compressor
07757 - 0010000

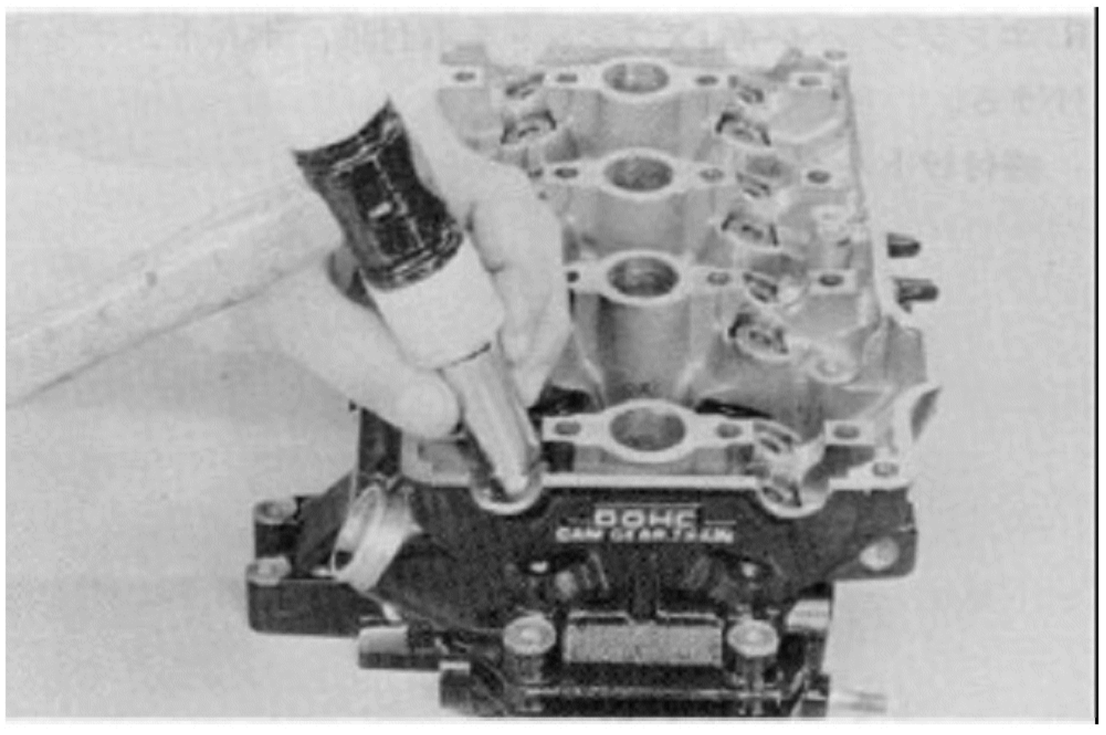
Exc. tools Valve spring compressor attachment
07GME – KT70200



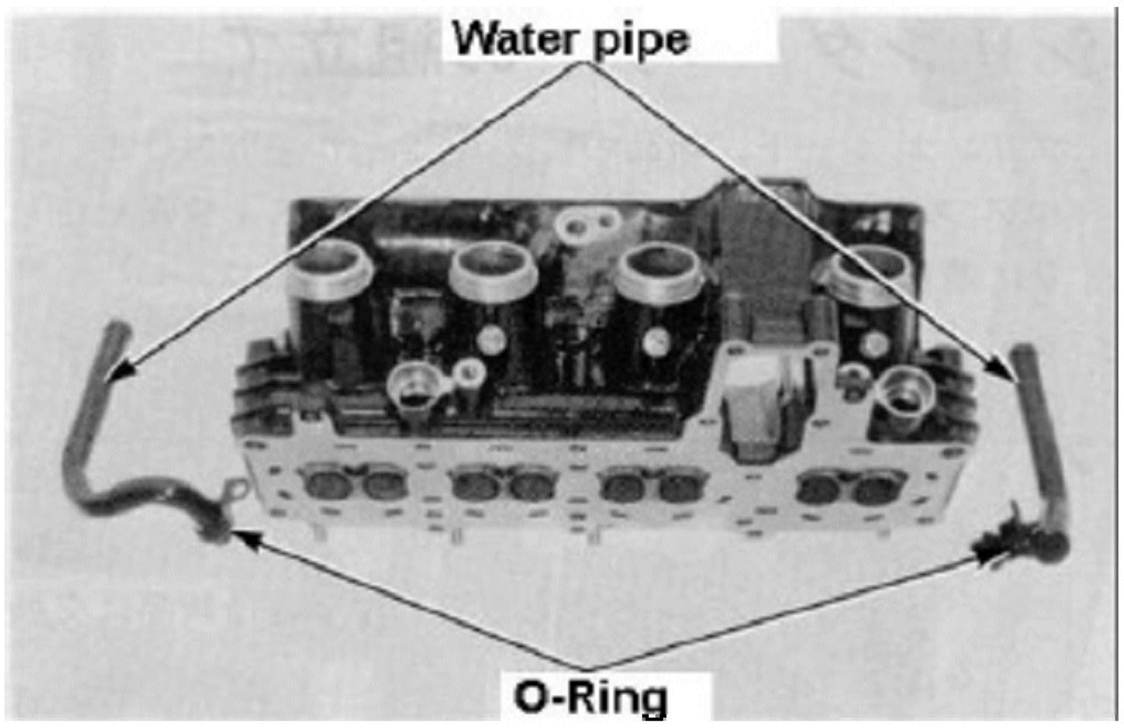
Do not over compress the valve spring

Gently hit the valve stem end a few times and let the valve and the cotter match.

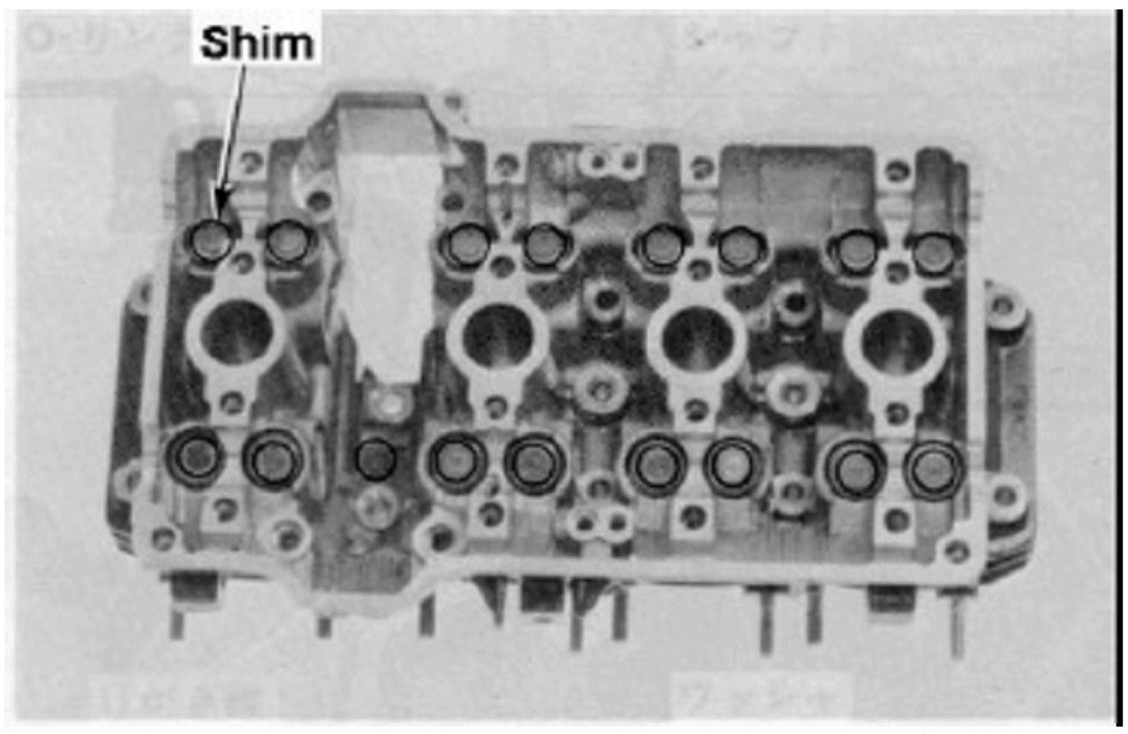
Do not damage the valve



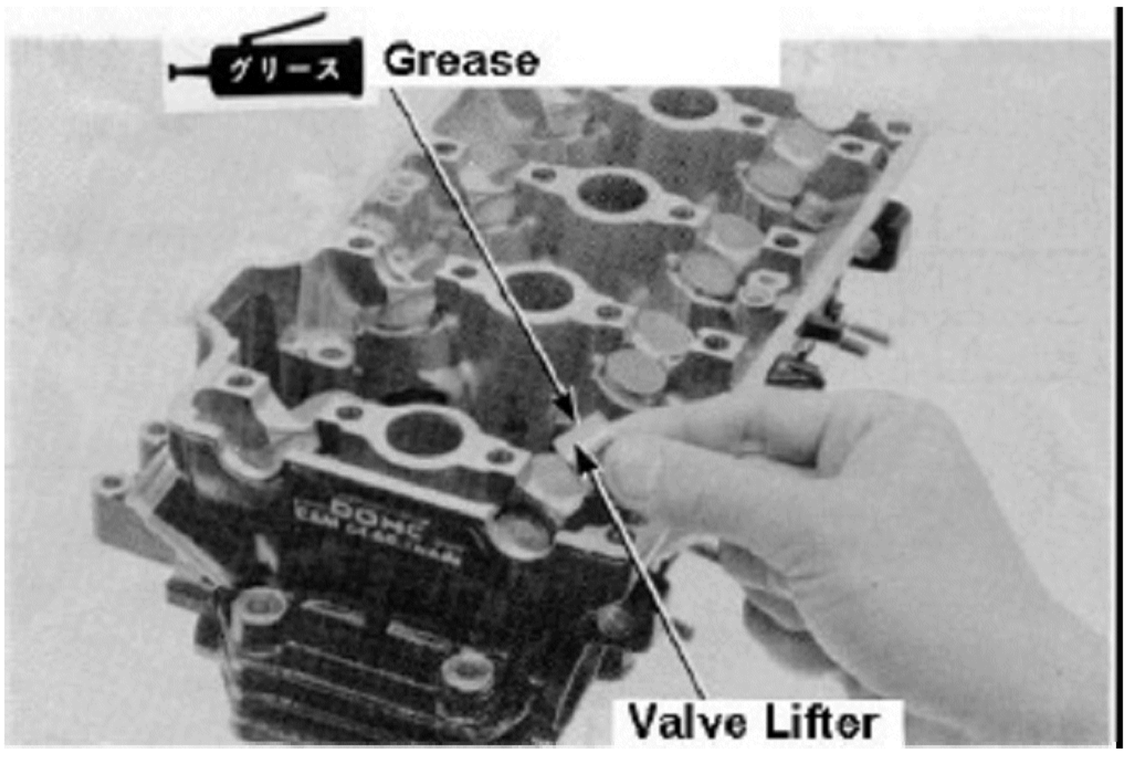
Attach new O-Rings to the water pipes.
Attach the pipes to the cylinder head.
Tighten the bolts.



Attach the lifter shim in to it's original position.



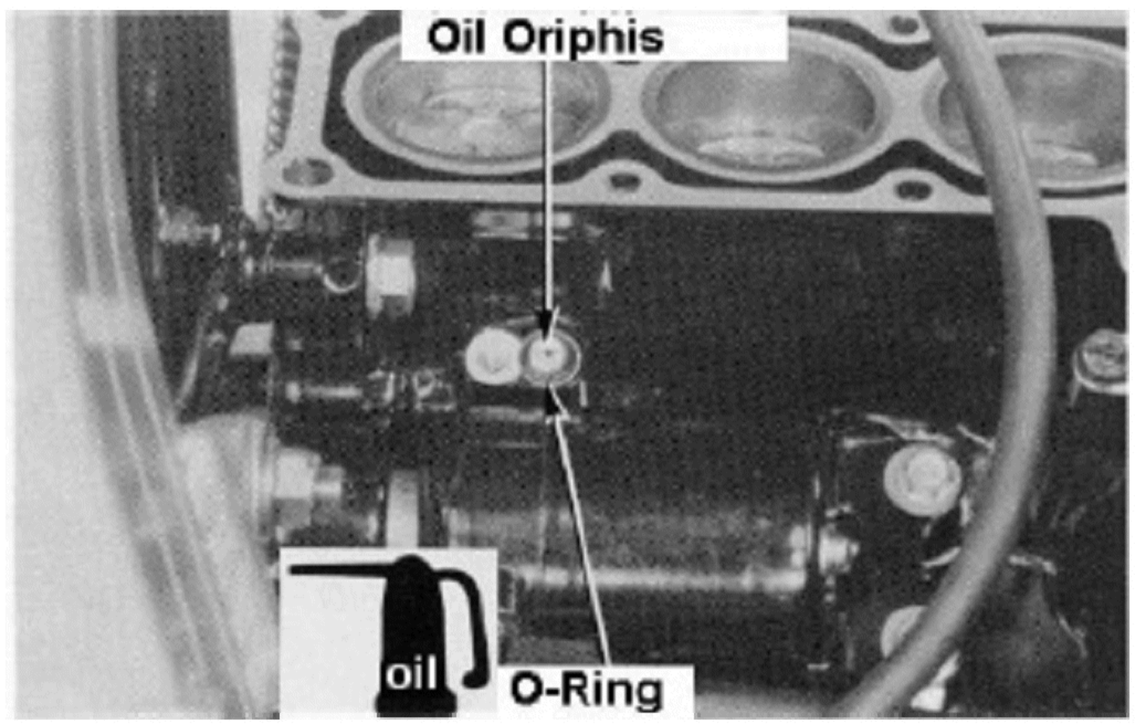
Apply grease on the contact surface over the outer surface of the lifter.
Place the lifter in to it's original position.



Cylinder head attachment

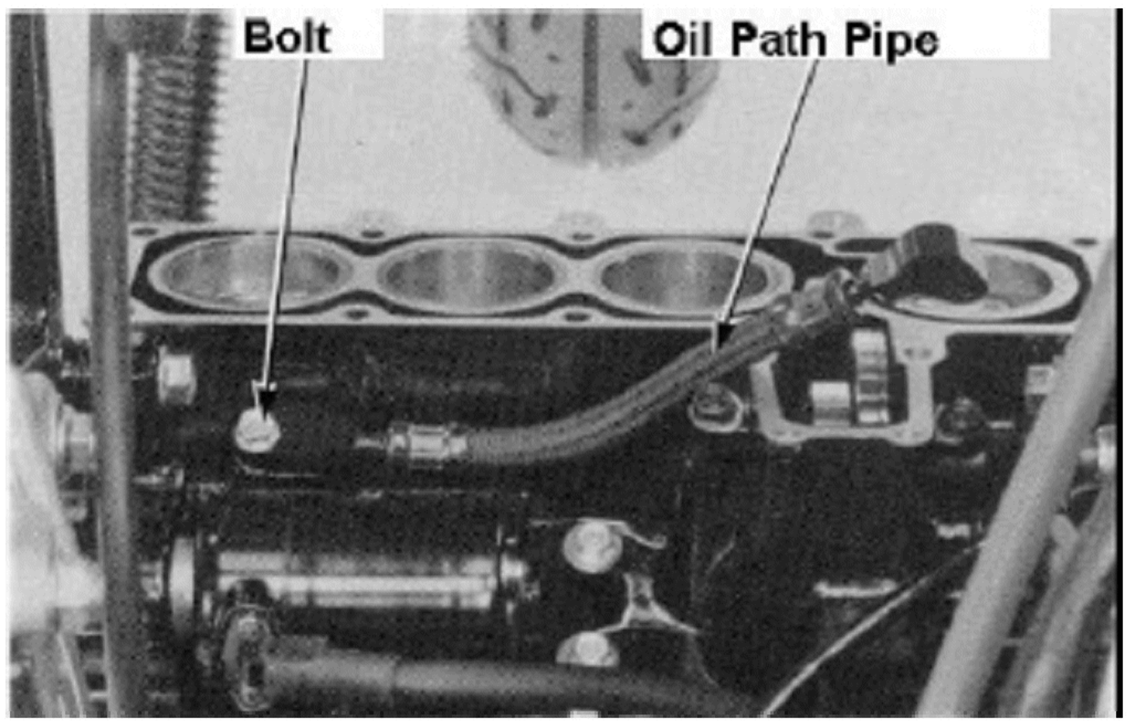
Inspect the oil oriphis on the cylinder block for clogging.

Apply engine oil to the O-Ring and attach it.

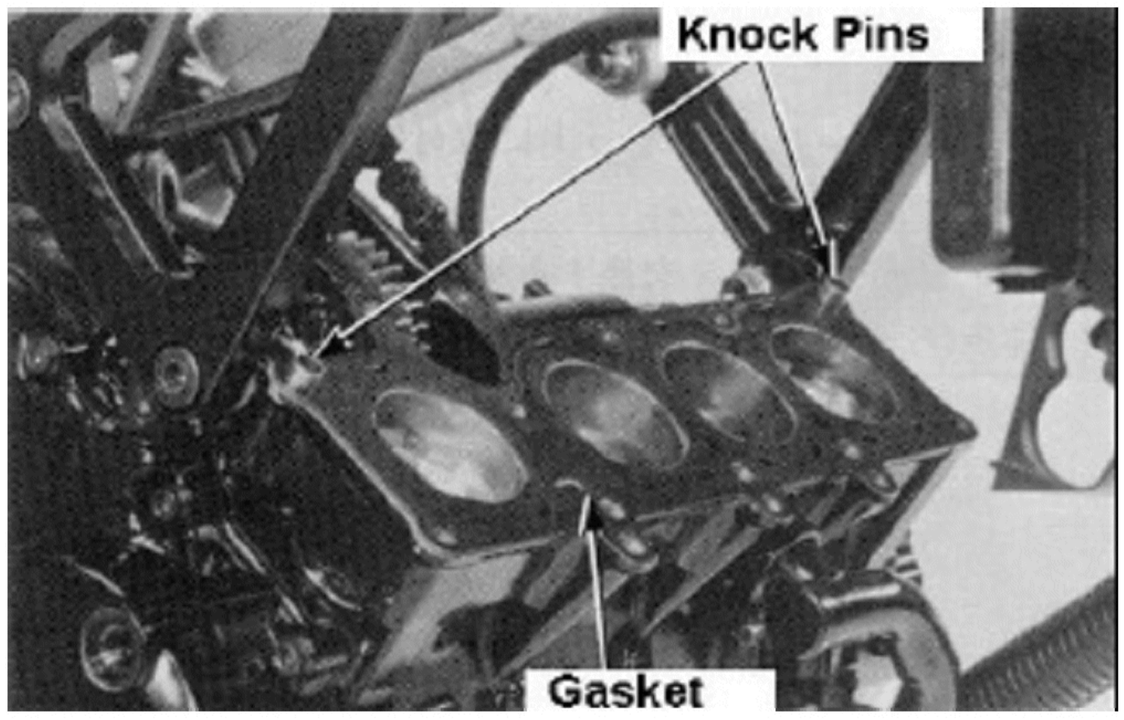


Connect the oil path pipe to the cylinder block.

Apply sealer to the thread of the attachment bolt and tighten.



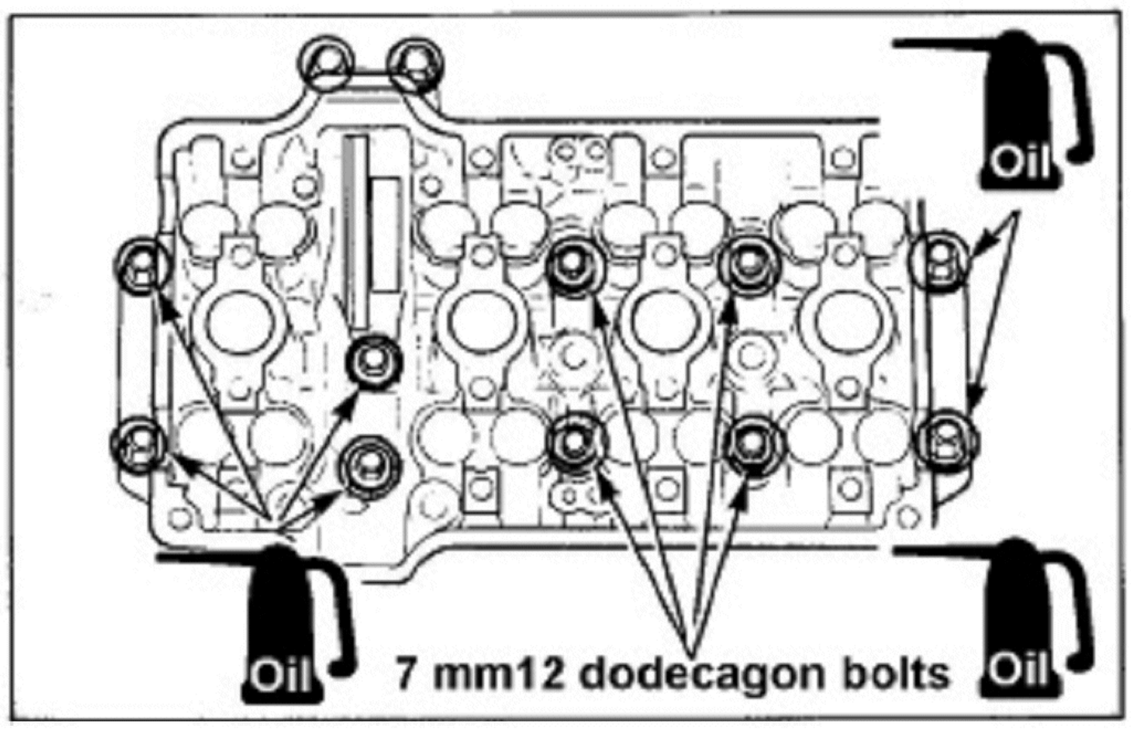
Attach knock pins and a new gasket.



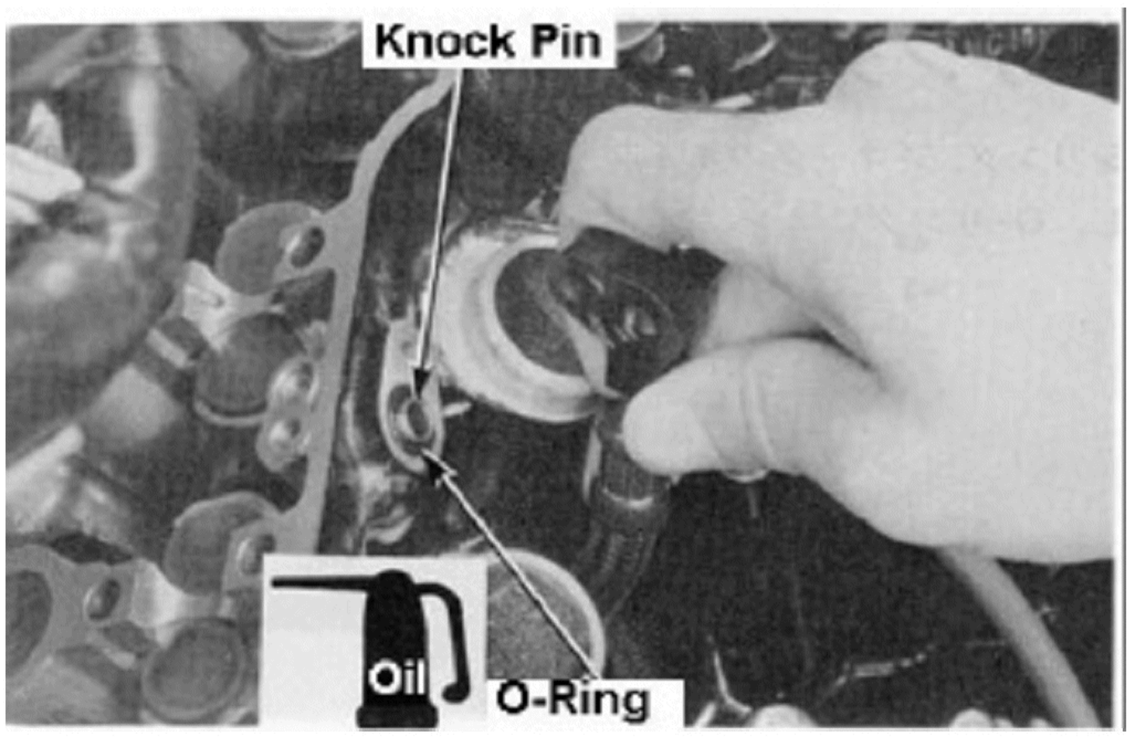
Attach cylinder head.
Apply engine oil to the cylinder head attachment bolts and washers.
Attach them to the cylinder heads and tighten.
Torque: 1.7 ~ 2.1kg m (7mm bolt)

- Tighten from inner corners to opposite outer corners. Do not tighten at once.
- Use of an exclusive tool is recommended.

  Socket wrench - 07GMA – KT70100

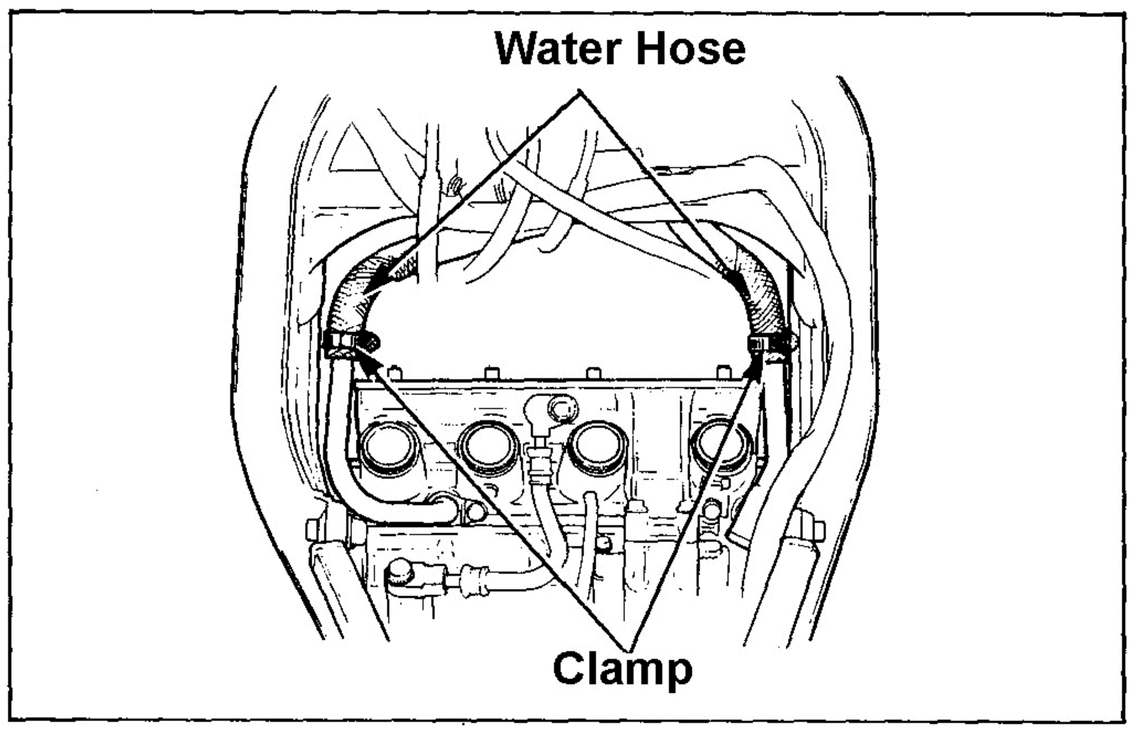


Apply engine oil to the new O-Ring and install it to the cylinder head.
Attach the knock pin.
Attach the oil path pipe to the cylinder head.



Connect water hoses to water pipes.

Tighten the hoses with clamps.

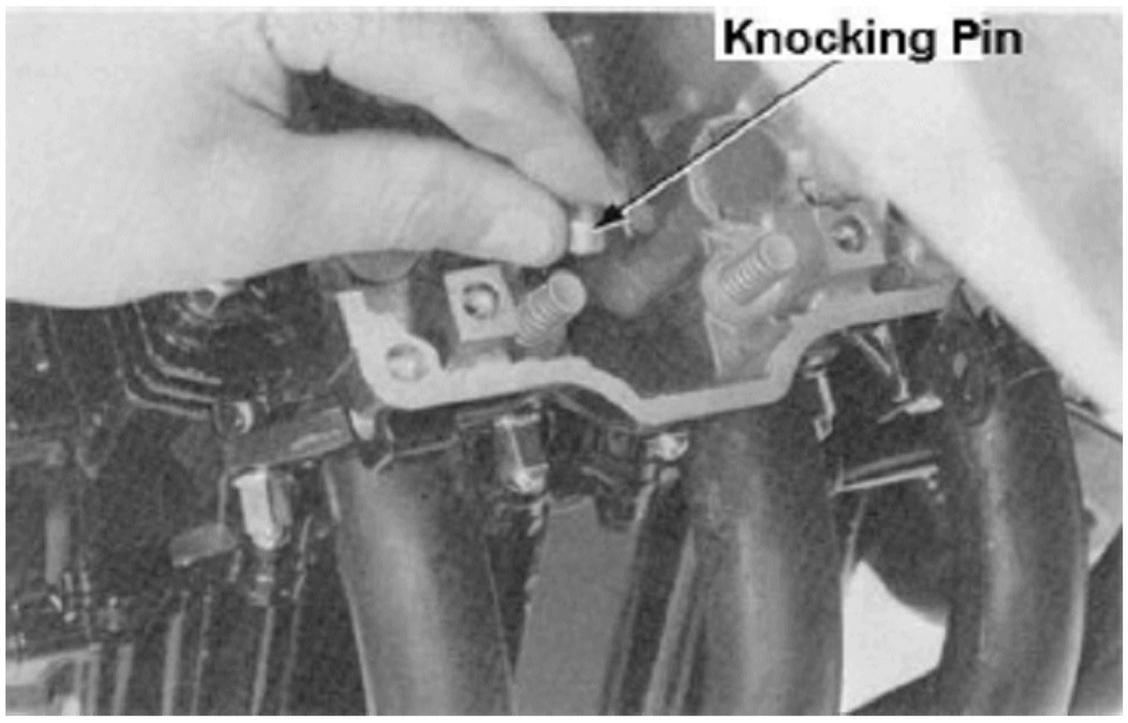


Attach the following parts:
- exhaust pipe (16-2)
- carburetor (4-18)
- air cleaner case (4-7)
- fuel tank (4-3)

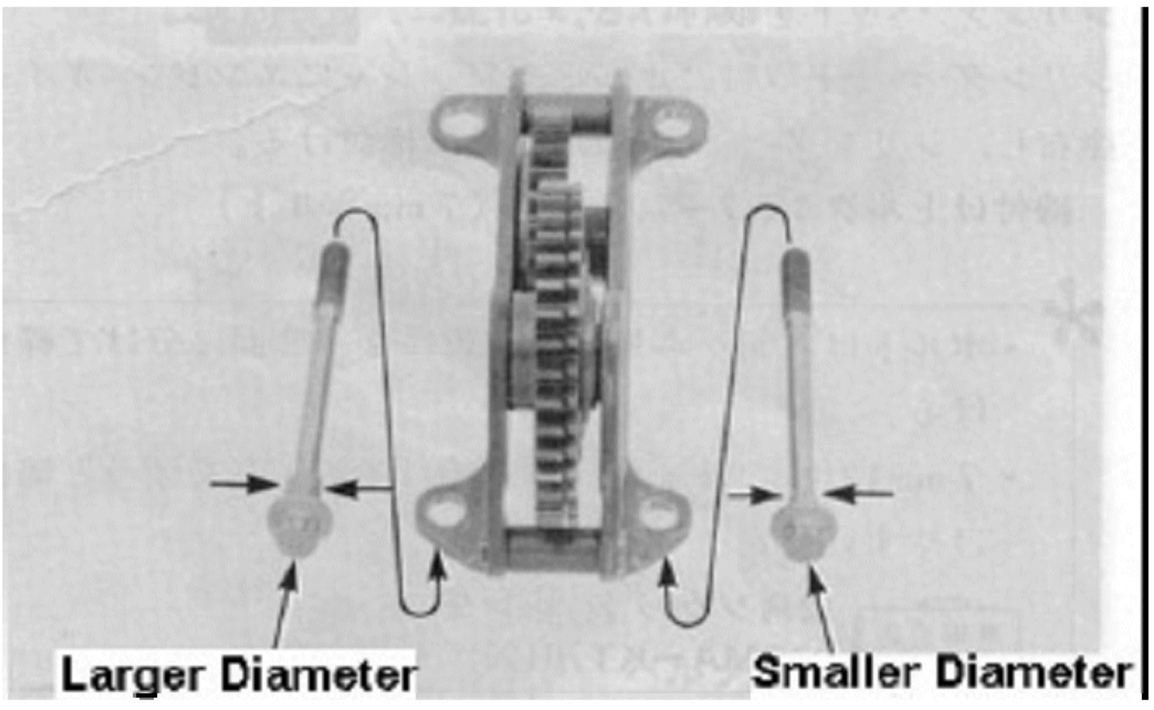
Cam gear train attachment

Attach the knock pin to the cylinder head.

When replacing the stud bolt, apply screw locker (sealer) to the head attachment bolts before attachment.

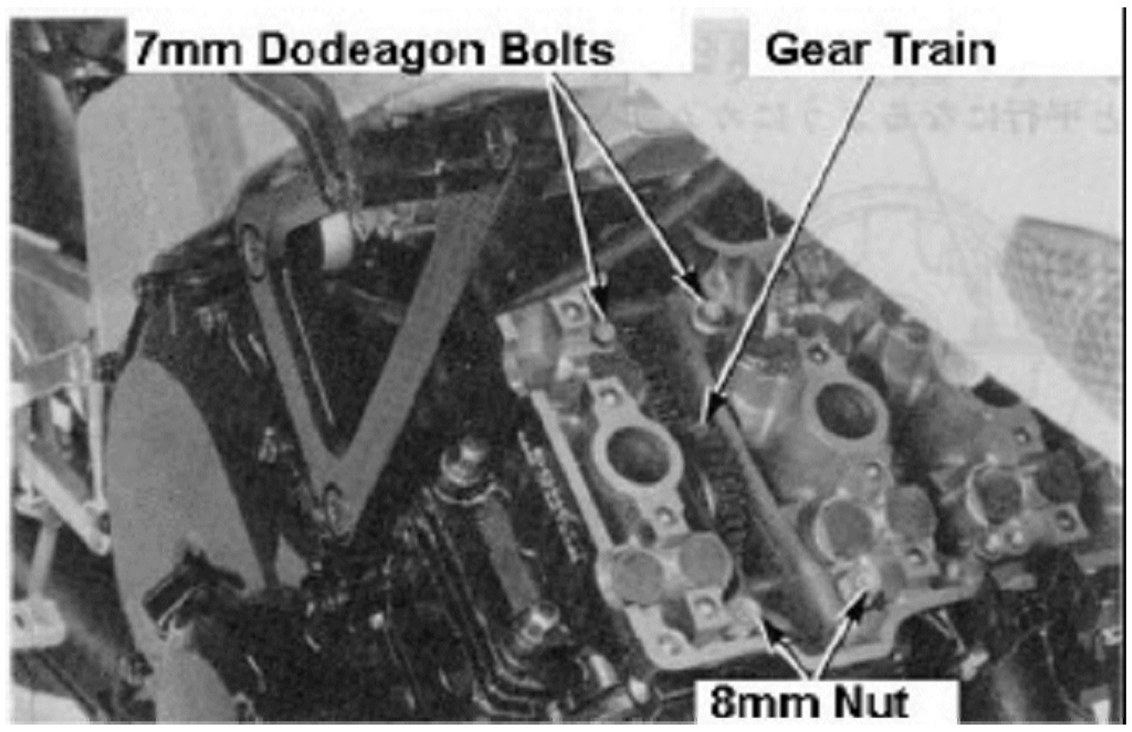


Be aware that there are two different 7mm bolts.



Attach the cam gear train. Tighten the bolts and nuts.

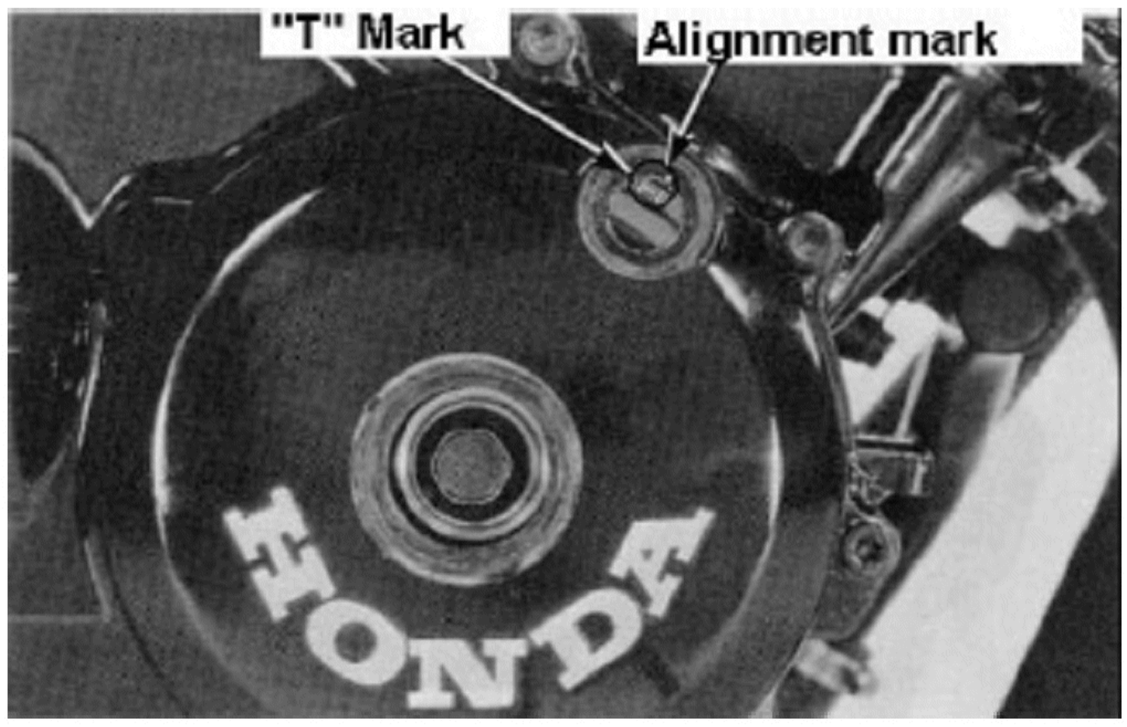
Torque: 7mm bolts: 1.7 ~ 2.1kg m
8mm nuts: 1.8 ~ 2.2kg m



Ensure the proper gear match.

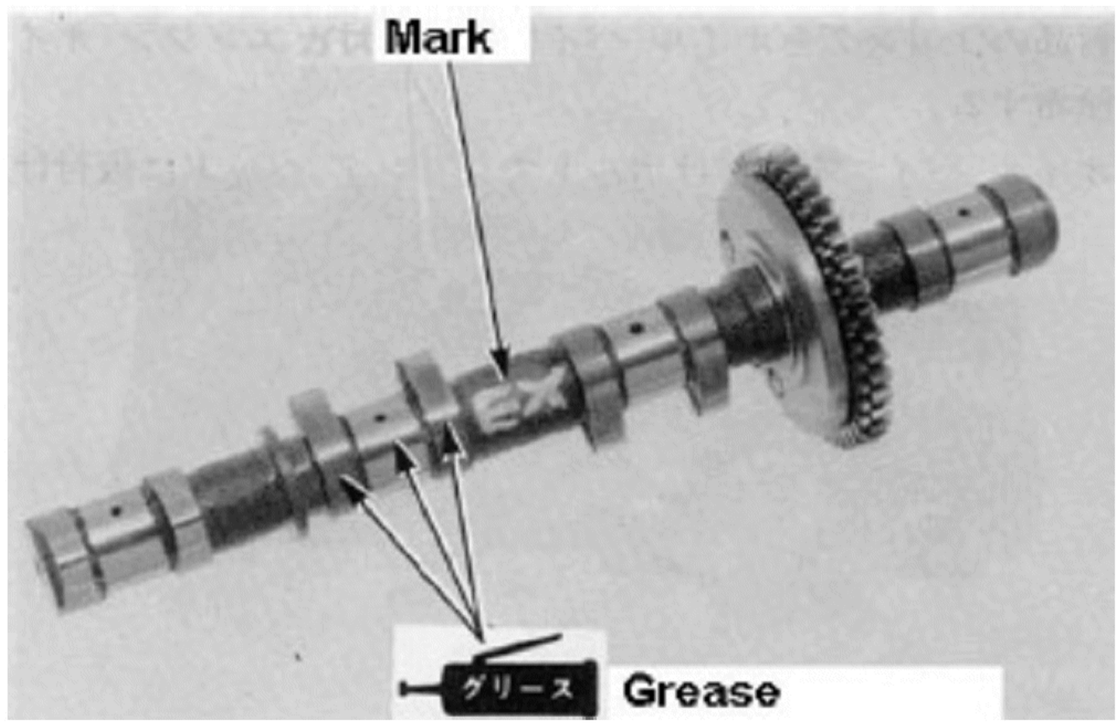
Cam shaft attachment

Remove the crankshaft hole cap and the timing hole cap. Rotate the crankshaft clockwise and align the “T” mark on the fly wheel with the alignment mark.



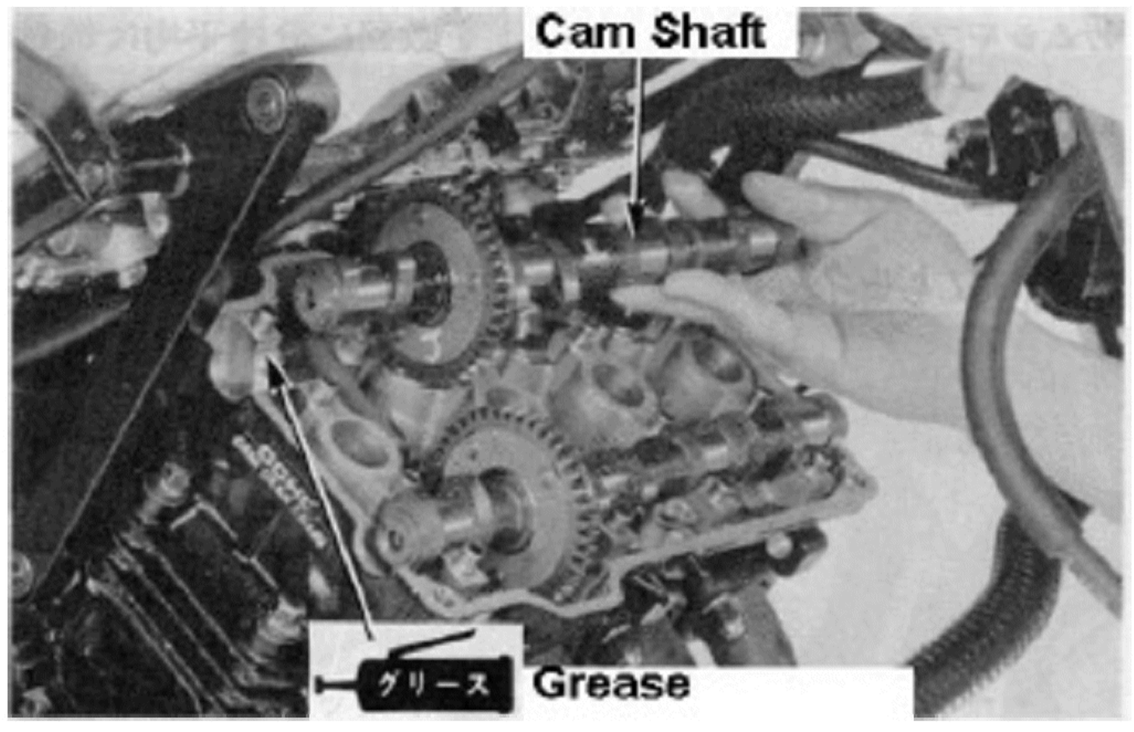
There are “IN” “EX” identification marks on the camshafts.

Apply grease on the journal and the cam surface of the camshaft.

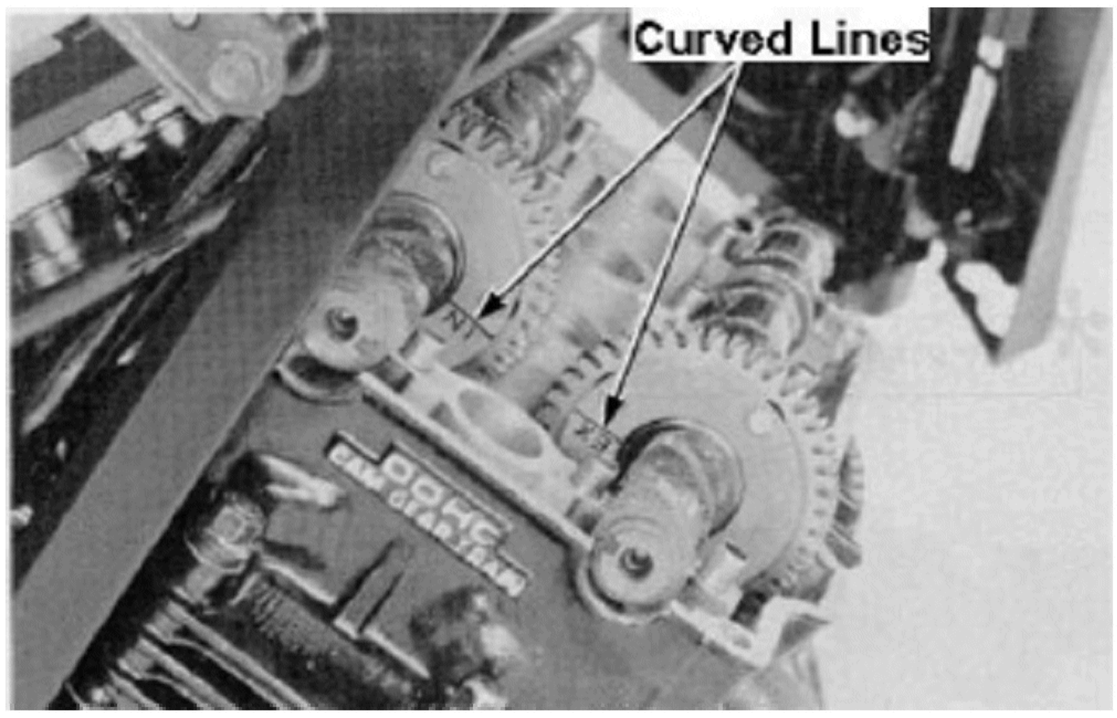


Apply grease on the journal or the cylinder head.

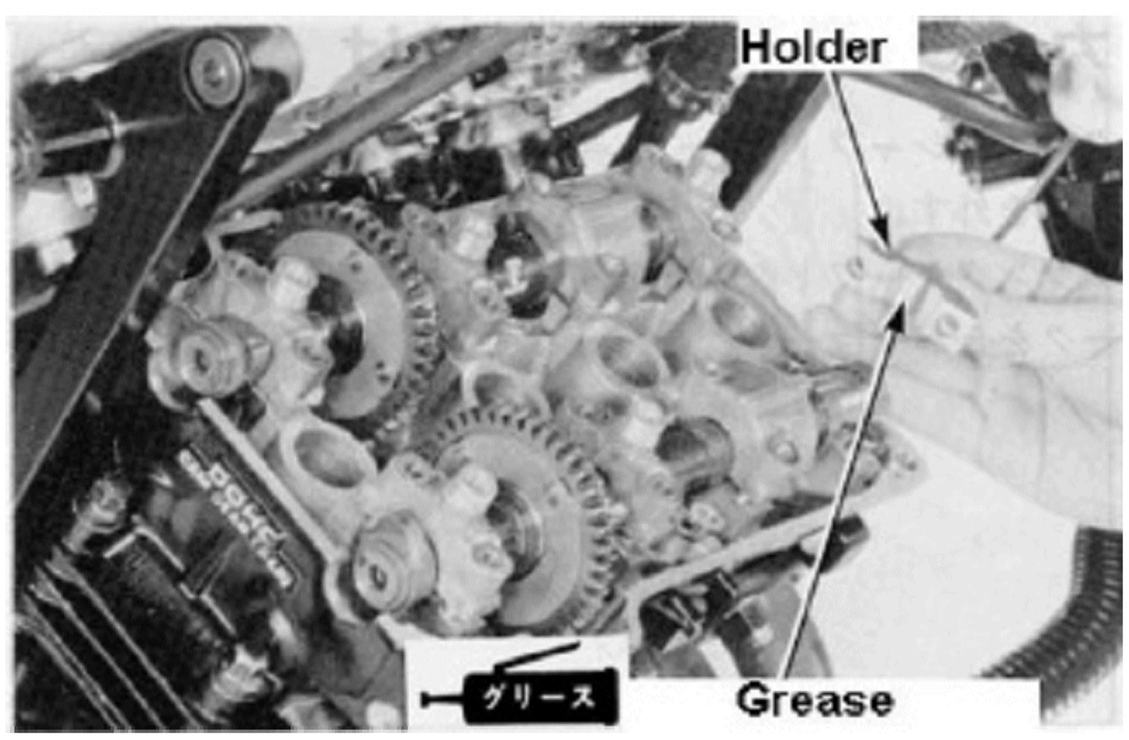
Attach the camshaft to the cylinder head.



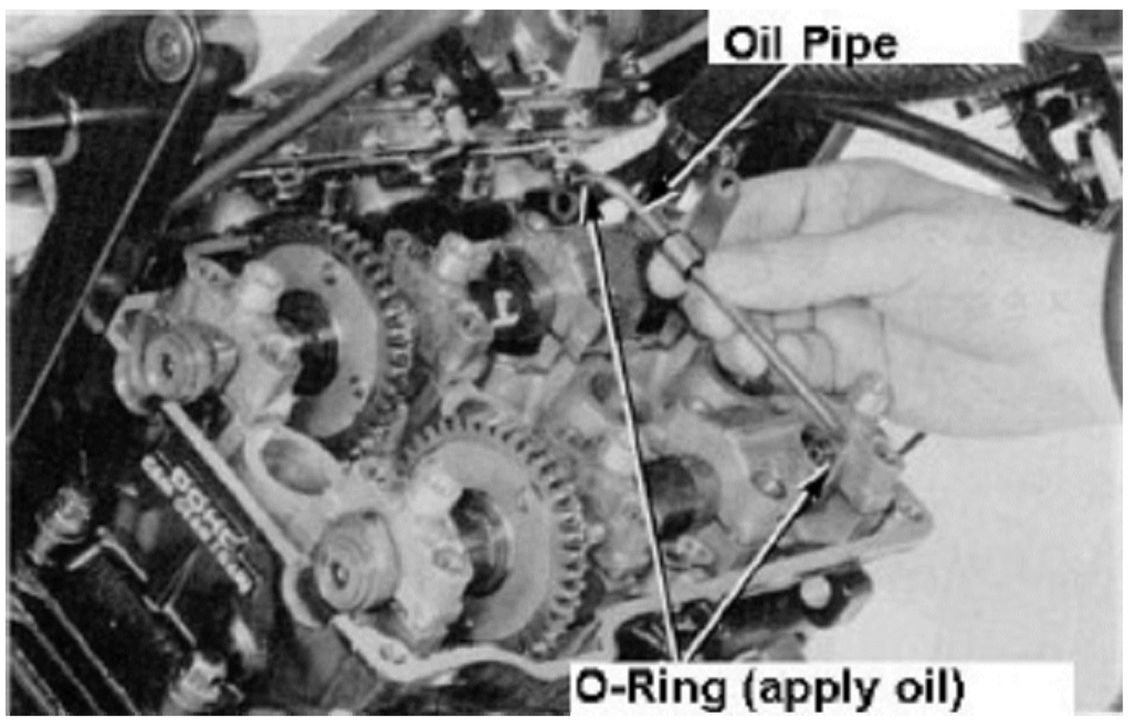
Place the cam shafts so as the two carved marks face each other and the lines are parallel to the cylinder head top surface.



Apply grease on the journal or the cam shaft holder.
Place it in it's original place.



Attach a new O-Ring to the oil pipe and apply engine oil.
Temporarily fix the oil pipe to the cylinder head with attachment bolts.

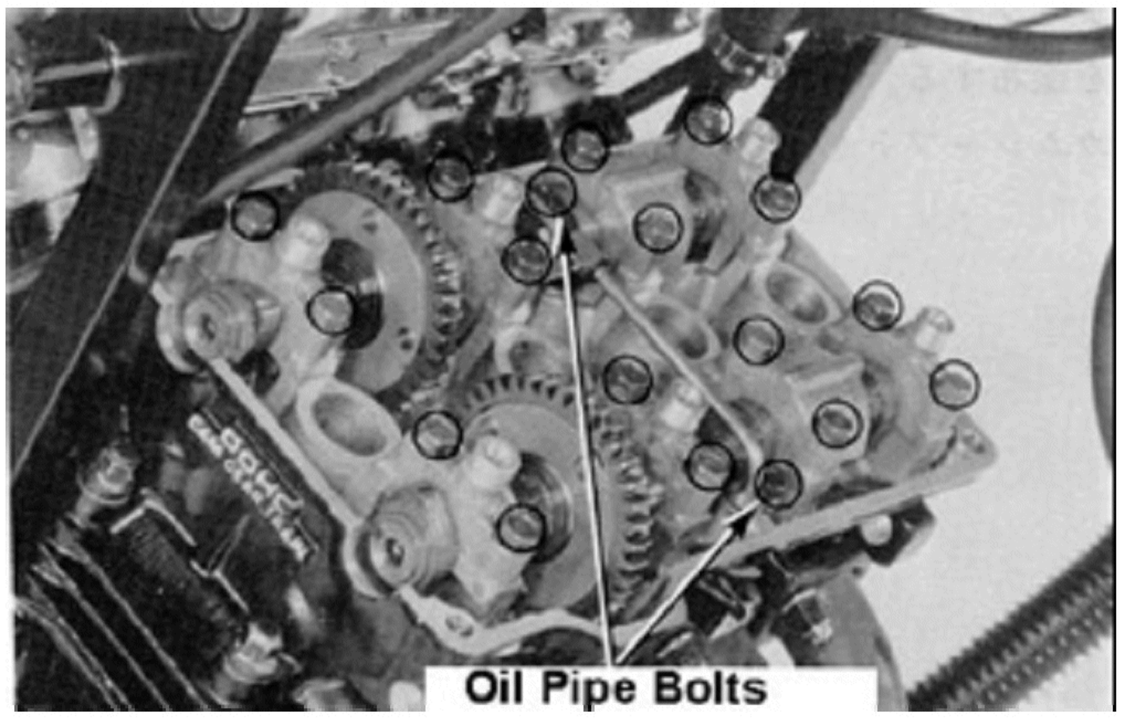


Evenly tighten the cam shaft holder attachment bolts in several steps.

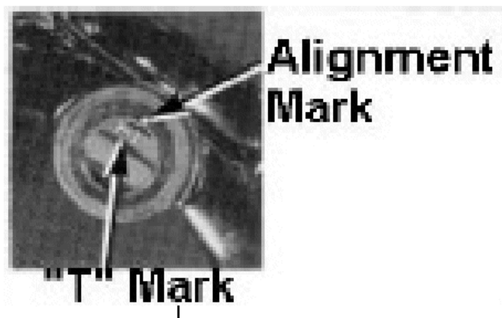
Ensure the cam gear is matching

Torque: 1.2 ~ 1.6kg m

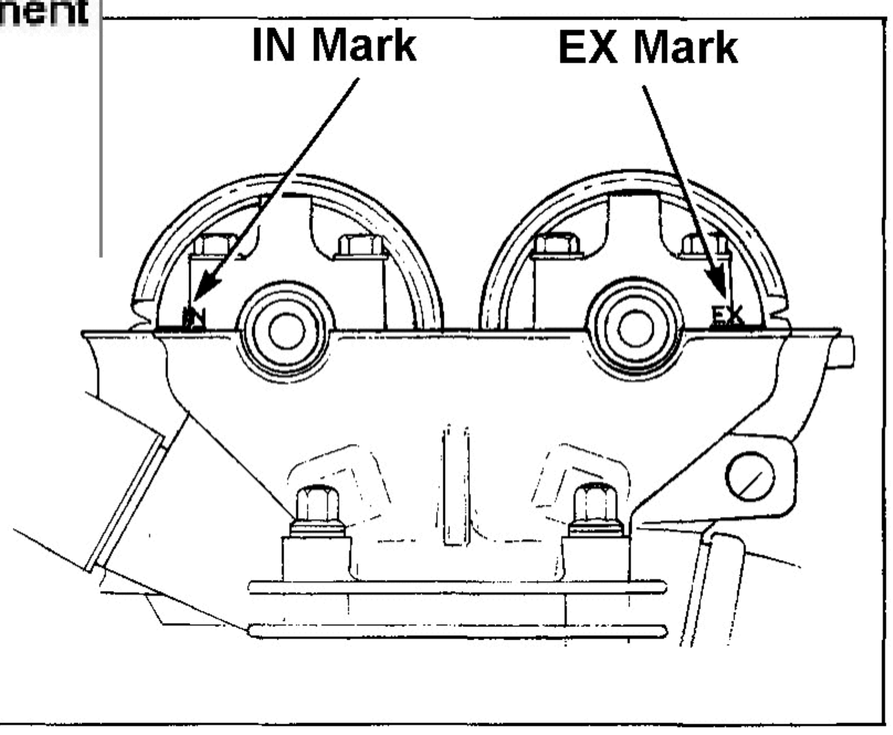
Apply locker (sealer) to oil pipe attachment bolts and tighten them up.



Ensure the “T” mark is aligned with the alignment mark.



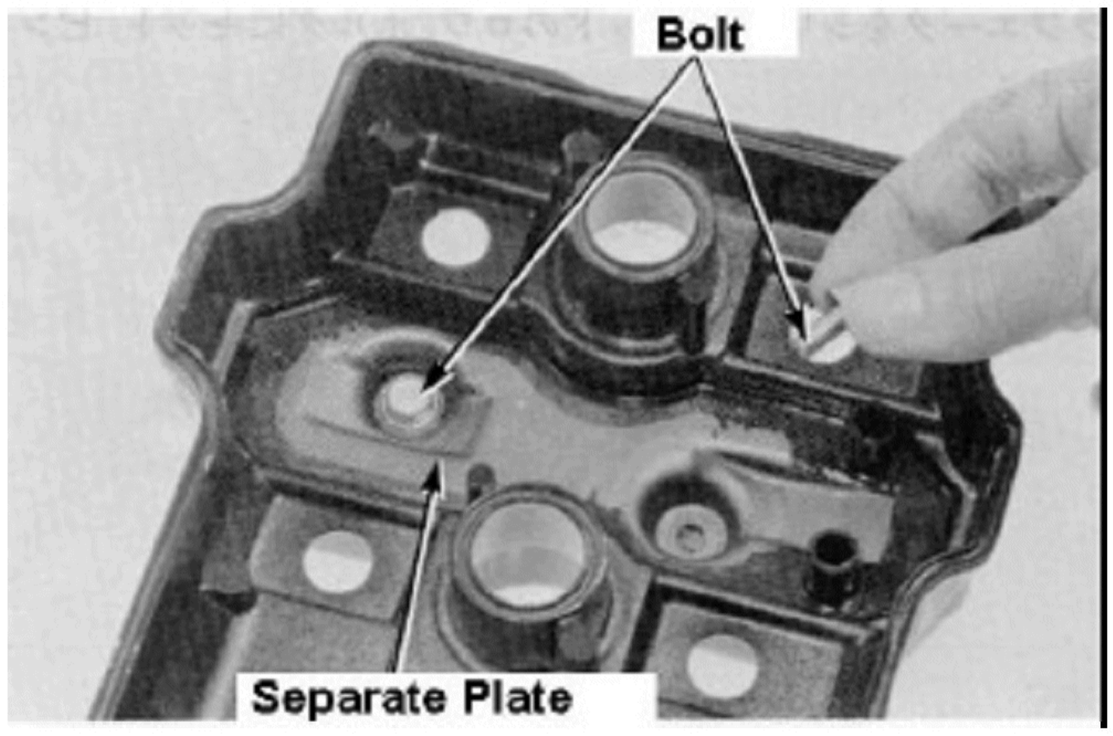
Confirm that the “IN”, “EX” marks face each other and they are parallel to the head top surface.



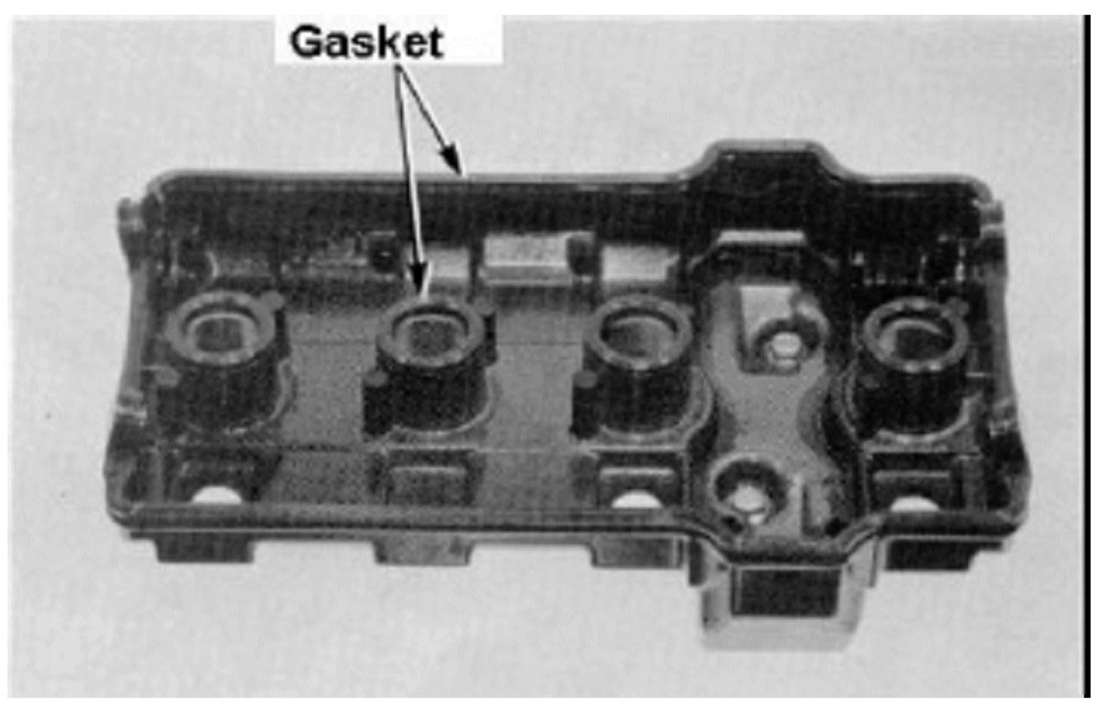
Adjust the tappet clearance (2 – 13)

Cylinder head cover attachment

Apply screw locker to the attachment bolts when tightening if the breather separate place has been removed.



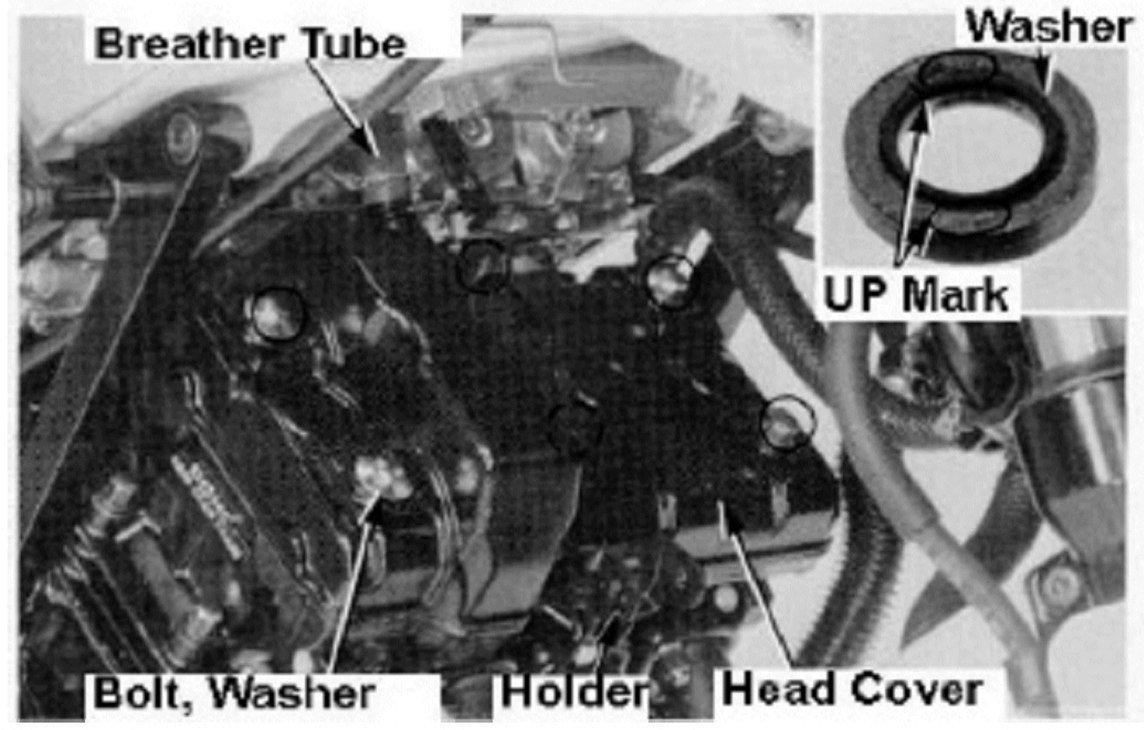
Attach the cylinder head cover gasket to the head cover.



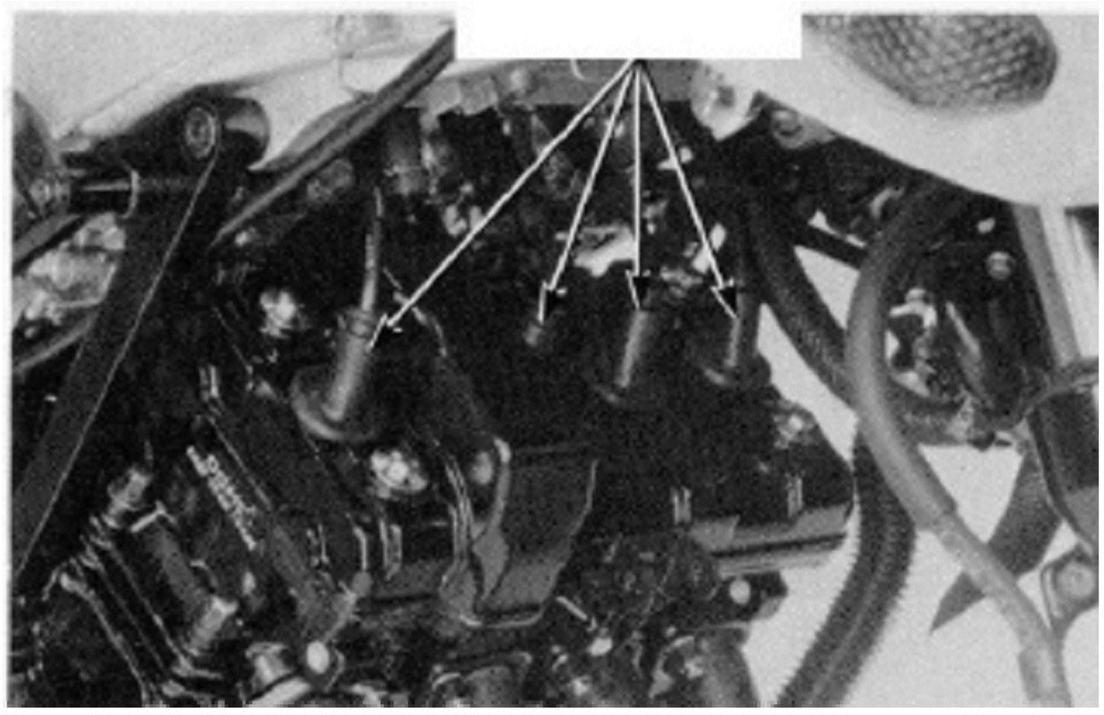
Attach the cylinder head cover to the cylinder head.

Be aware of “UP” mark on washers.

Apply washer and tighten the attachment bolts.
Torque: 0.8 ~ 1.2kg m
Connect the breather tube to the cylinder head cover.
Attach the radiator holder to the cylinder head.

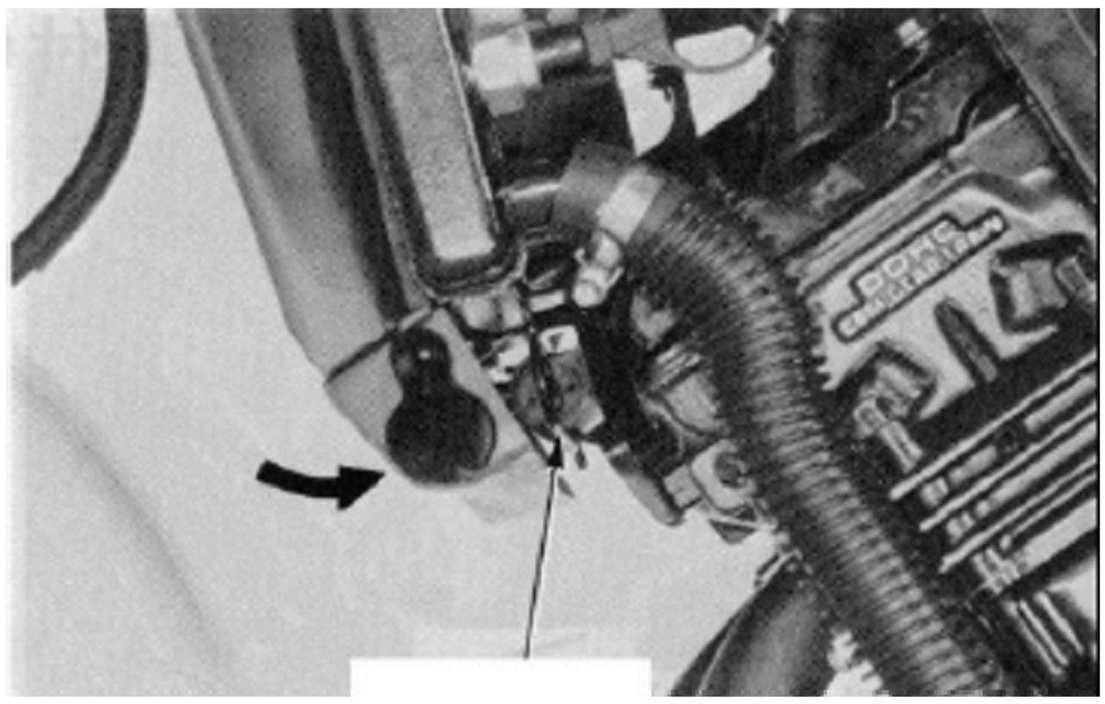


Attach the spark plug caps.

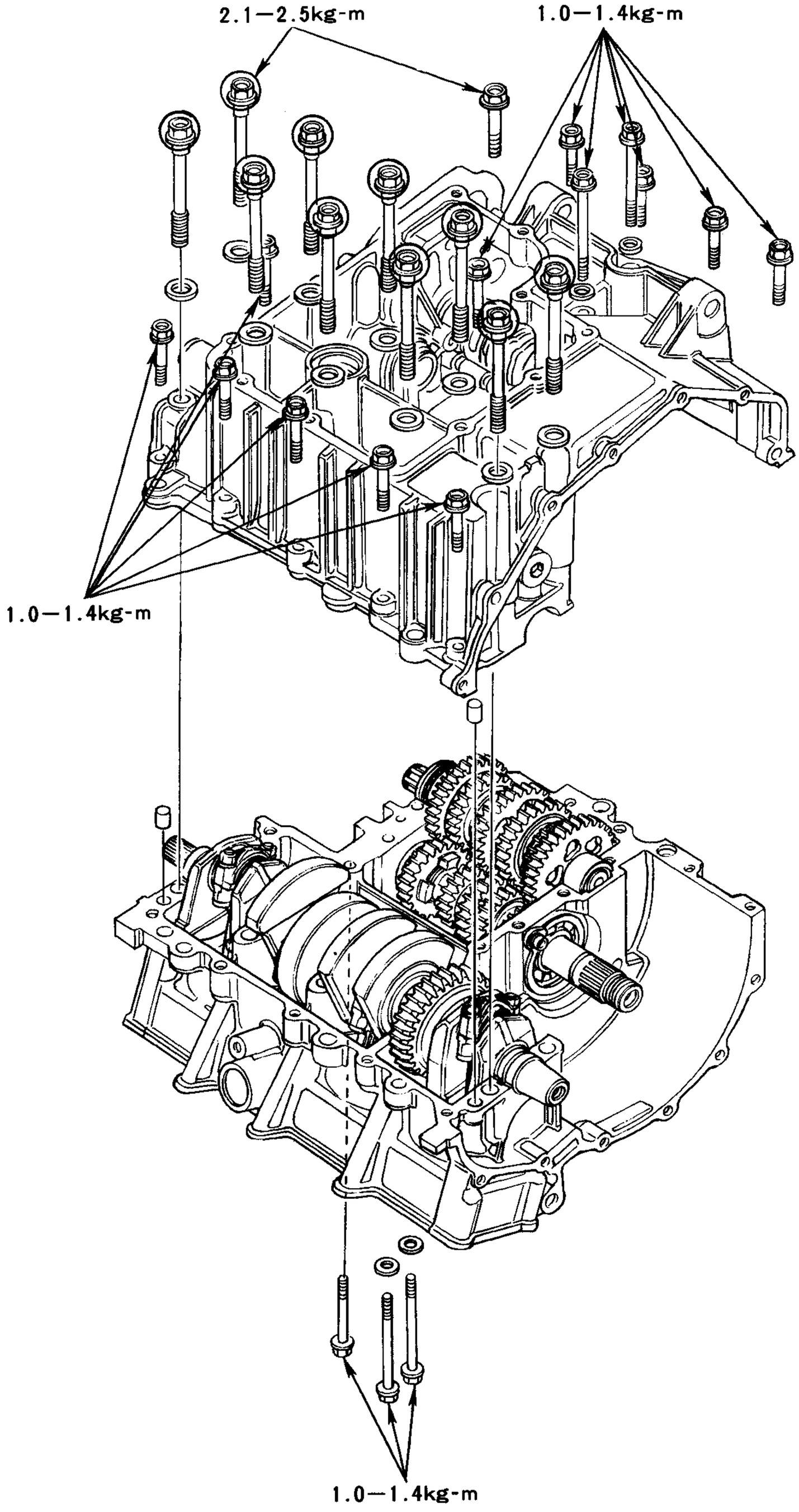


Fix the radiator to the lower holder on the cylinder head with the set pin.

Attach the side cowl.



- **Assembly**



Assembly	8 – 0	Replacing bearings	8 – 3
Maintenance Information	8 – 1	Crank case assembly	8 – 3
Separating the crankcase	8 - 2		

Maintenance Information

General caution

- Service the crankshaft, conrod, cylinder, piston and transmission (including shift fork drum) after separating the crankcase.
- The following parts should be detached before separating the crankcase.
- Procedures / photos in this section are after the detachment.

Parts to be serviced	Parts to be detached
Conrod, cylinder block, piston	Cam shaft (Sec.7), Clutch outer (Sec.10), Oil pump (Sec.3)
Crankshaft	Fly wheel (Sec.10), Starter clutch (Sec.19), Camshaft (Sec.7), Oil pump (Sec. 3)
Transmission The main shaft and the counter shaft can be serviced without disconnecting the linkage.	Clutch (Sec.10), gear shift linkage (Sec.11), Oil pump (Sec.3)

Torque

8mm Bolt		2.1 – 2.5kg m
Crankcase	6mm	1.0 – 1.4kg m

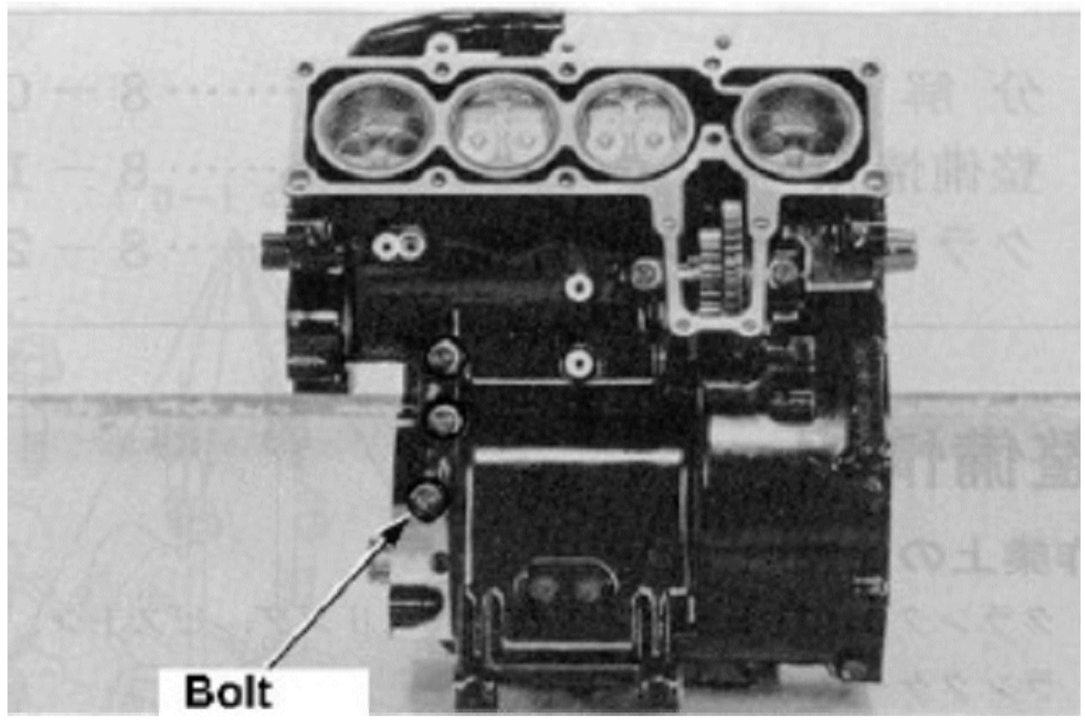
Tools

Exclusive		Common	
Bearing remover	07936-3710300	37x40mm	07746-0010200
Remover handle	07936-3710100	(17mm)	07746-0040400
Remover sliding weight	07741-0010201	Driver handle A	07749-0010000
		Outer driver (37 x 40mm)	07746-0010200
		Pilot (17mm)	07746-0040400

Separating the crankcase

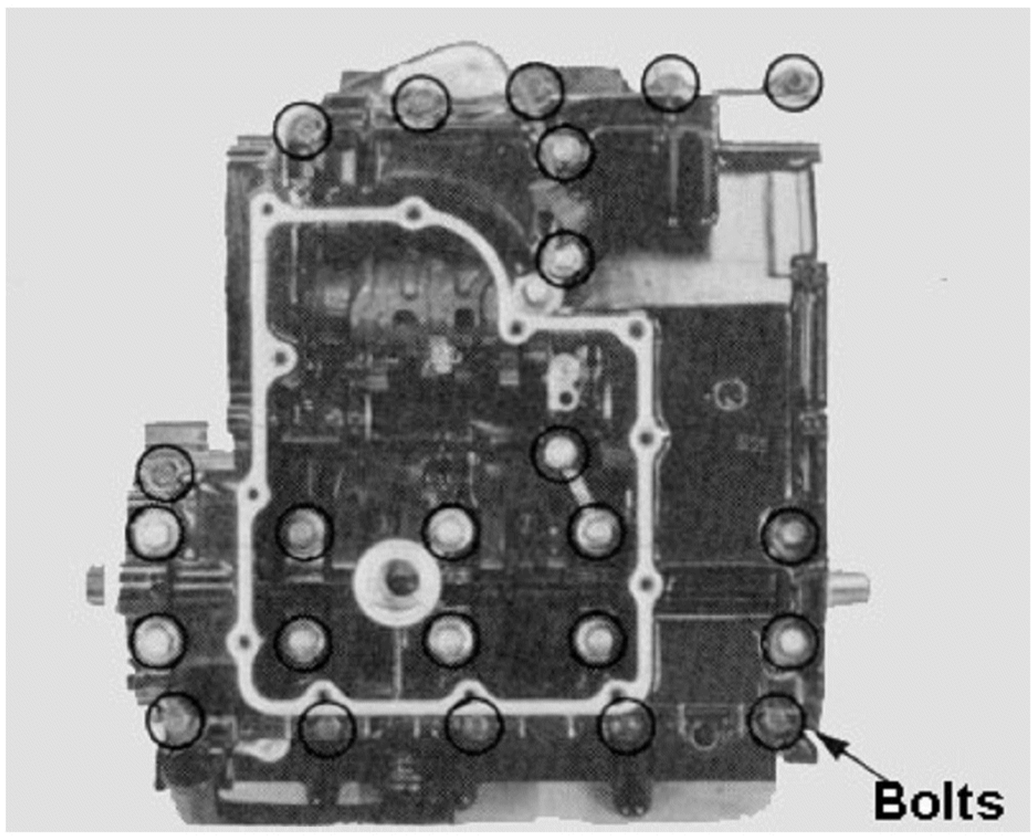
Detach the items specified in the maintenance information (8-1)

Remove the cylinder block tightening bolt.



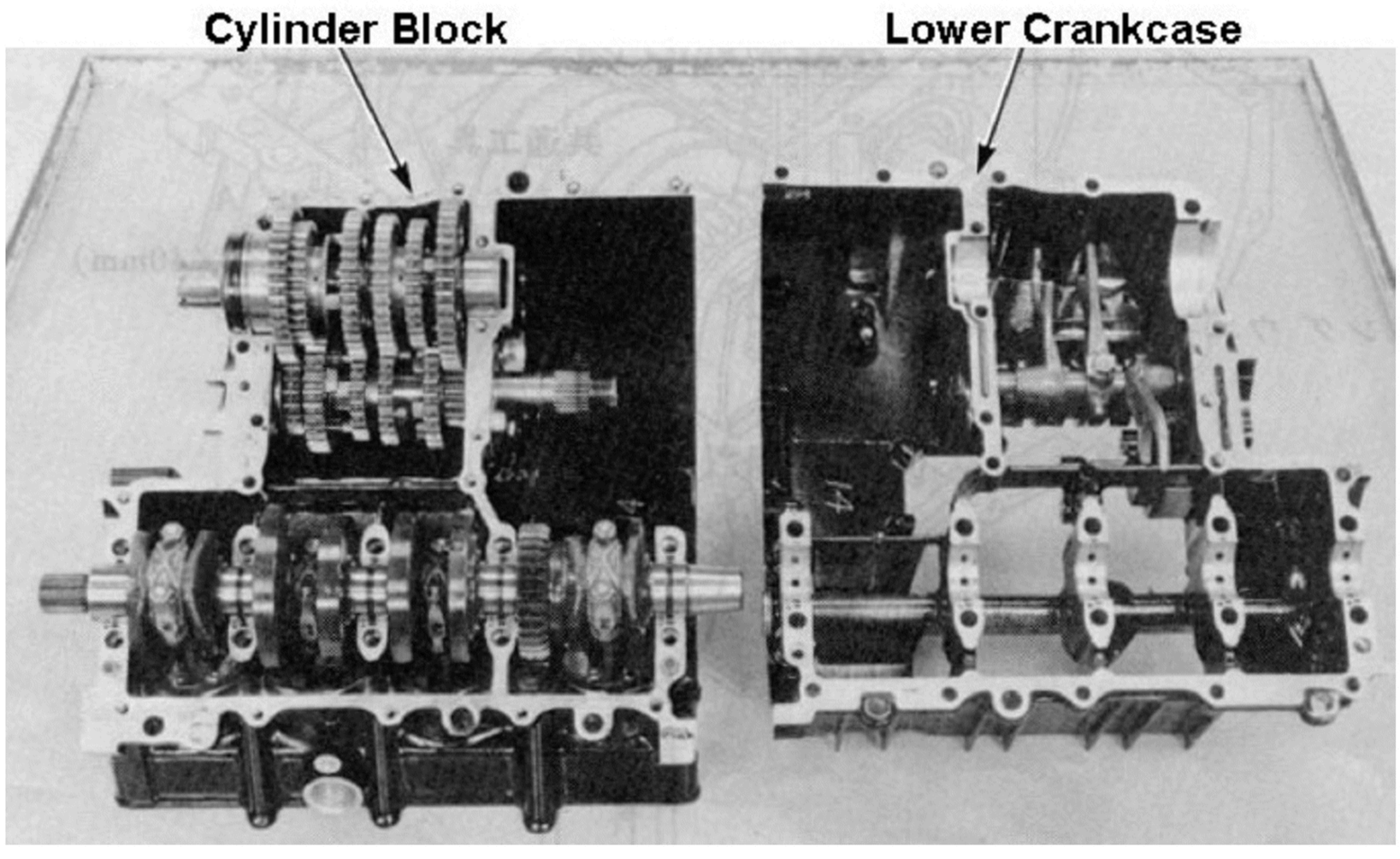
Face the cylinder head side downwards and remove the lower crankcase bolt.

Loosen the bolts in opposite angles so as to avoid distortion. Split into 2~3 sequences.



Detach the lower crankcase.

CAUTION:
Do not insert a screwdriver to the contact slit.



Replacing bearings

Detach the following items from the cylinder block.
- Crankshaft (9-3)
- Piston (9-3)
- Counter shaft (12-3)
- Main shaft (12-3)

Replace the main shaft bearing if it fails to rotate smoothly.
Remove the bearing.

Excl. tools

Bearing remover	07936-3710300
Remover handle	3710100
Remover sliding weight	07741-0010201

Install new bearing

Common Tools

Driver handle A	07749-0010000
Outer driver (37 x 40mm)	07746-0010200
Pilot (17mm)	07746-0040400

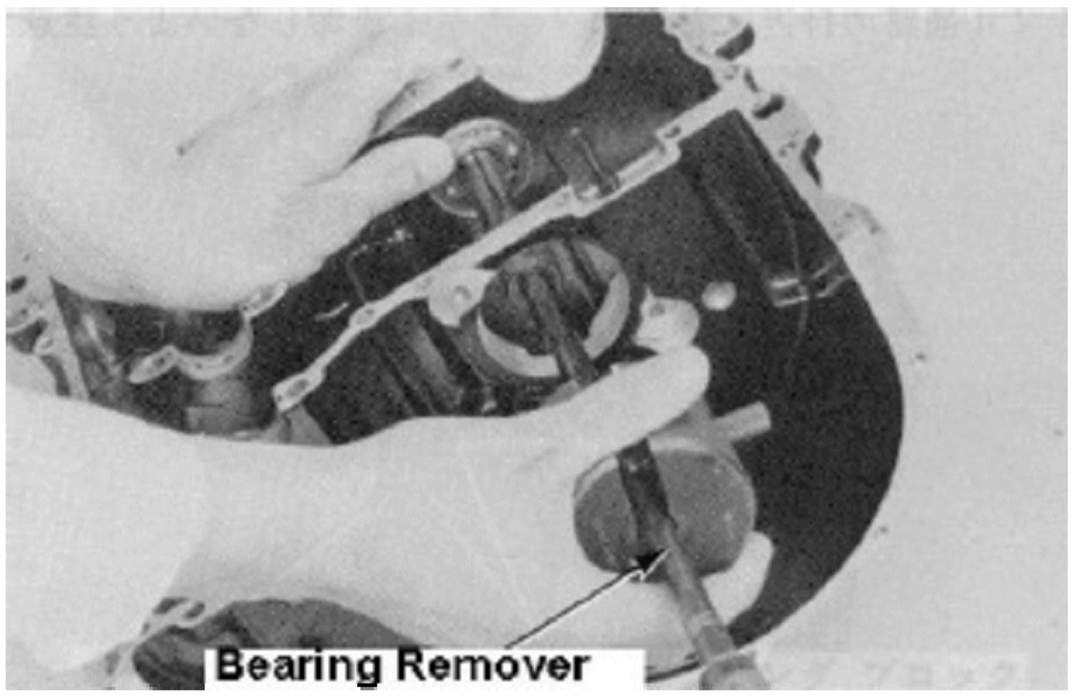
Insert the bearing horizontally.
Face the marked side downward.

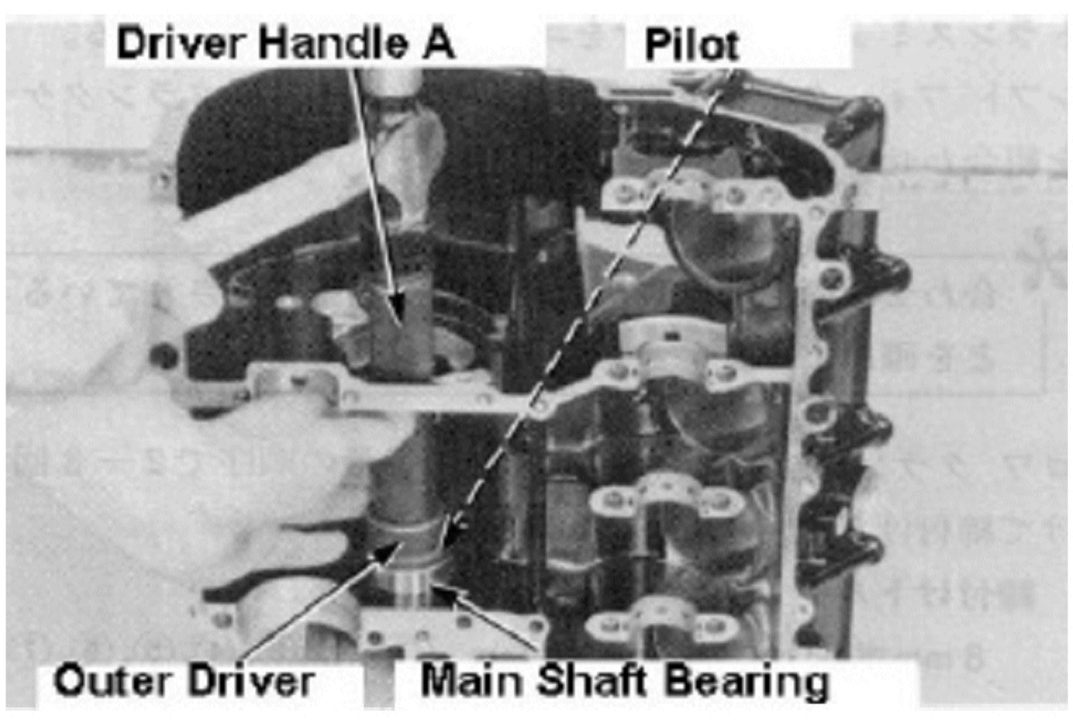
Attach the following parts to the cylinder block.
- piston (9-9)
- crankshaft ((9-9)
- main shaft (12-7)
- counter shaft (12-7)

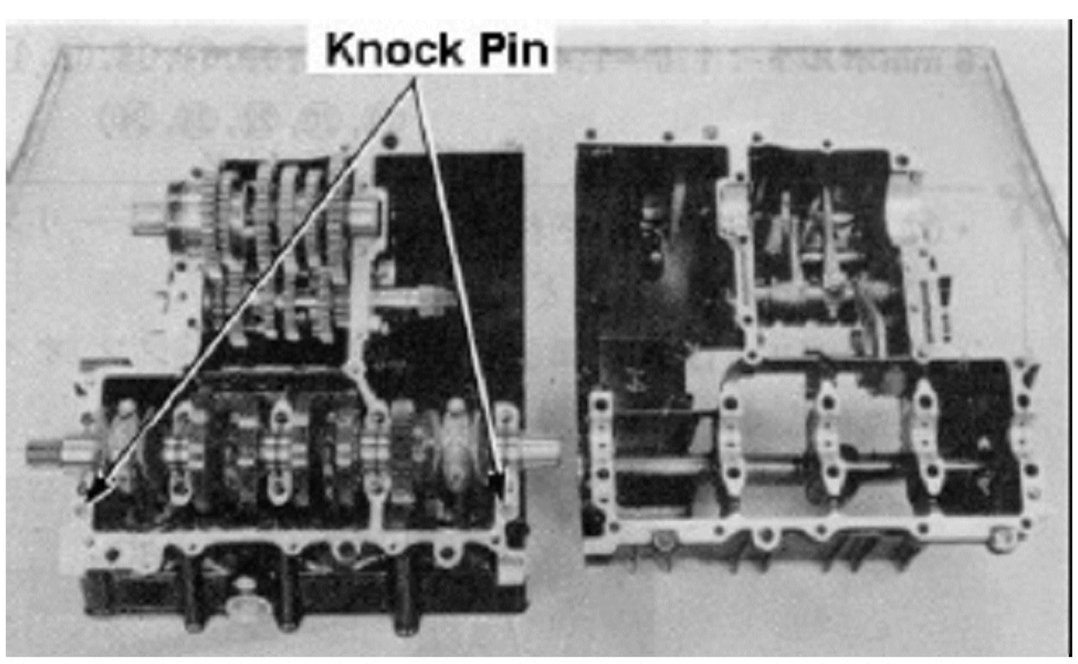
Crank case assembly

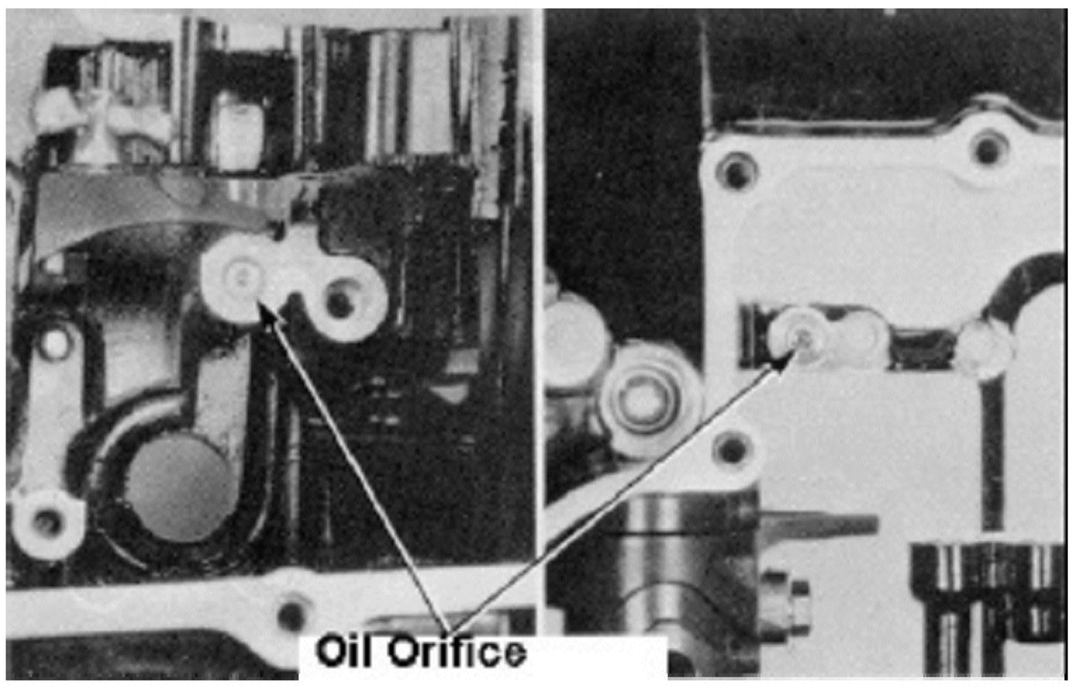
Clean the crankcase contact surface.
Attach the knock pin and oil orifice.
Apply liquid sealer to the contact surfaces on the cylinder block and a lower crankcase.

- Do not apply near the main bearing.
- Ensure the orifice is not jammed.
- Face the larger hole outward.

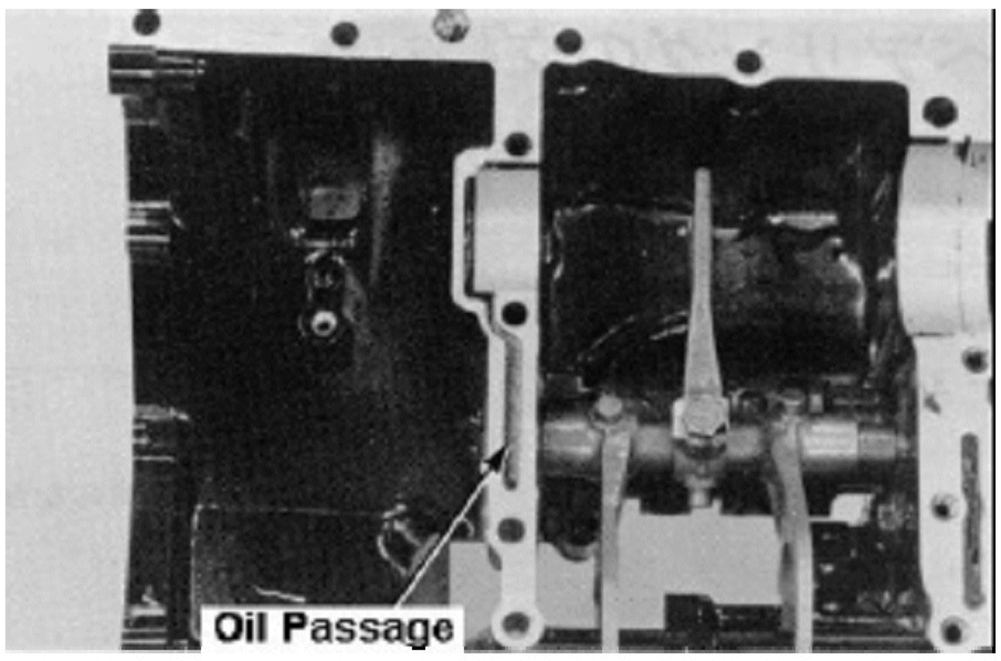




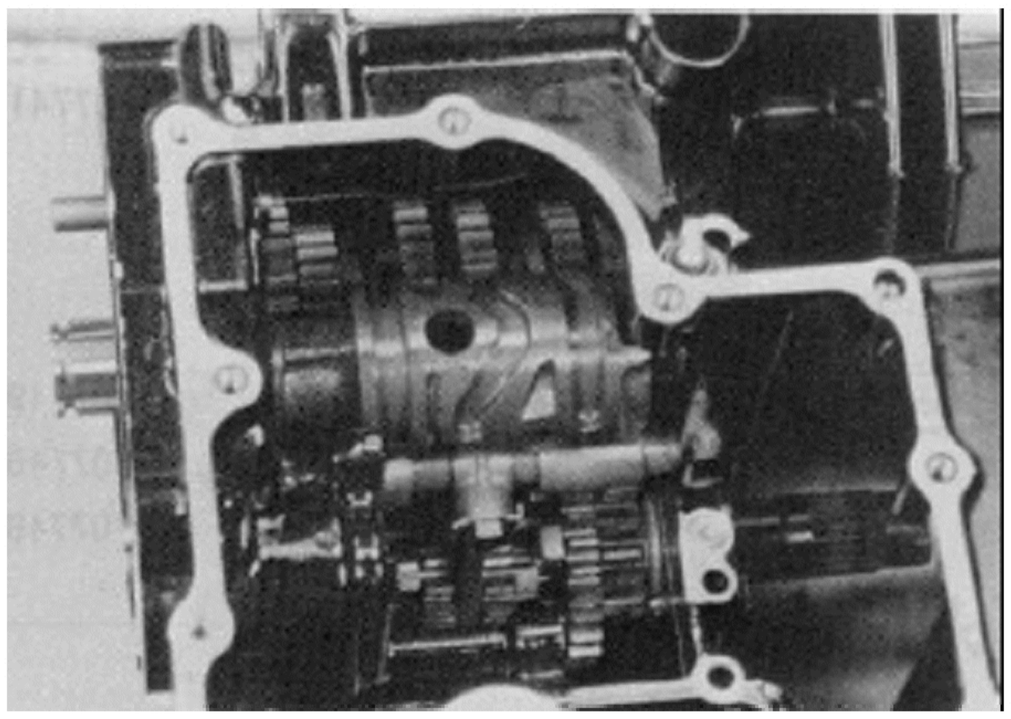




Do not apply the sealer near the oil passage.



Set the transmission gear to neutral.
Align the shift fork to the gear slit and attach the two crankcases.



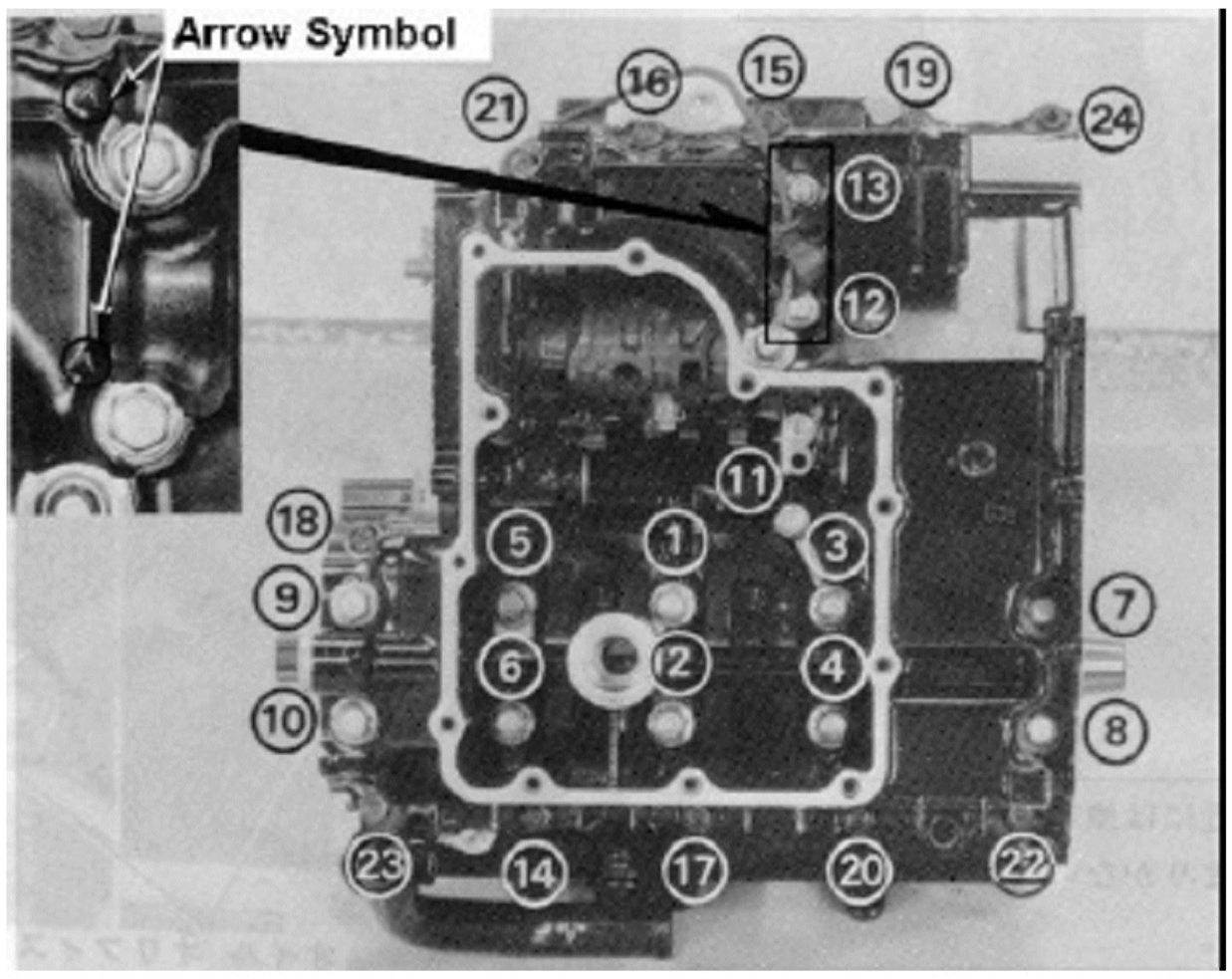
Ensure there is no slit along the contact surfaces.

Tighten the lower crankcase bolts in the following order.
Do not tighten in one step.

Torque: 8mm bolt → 2.1 ~ 2.5kg m
1-2-3-4-5-6-7-8-9-10 – with washers
21 – without washers

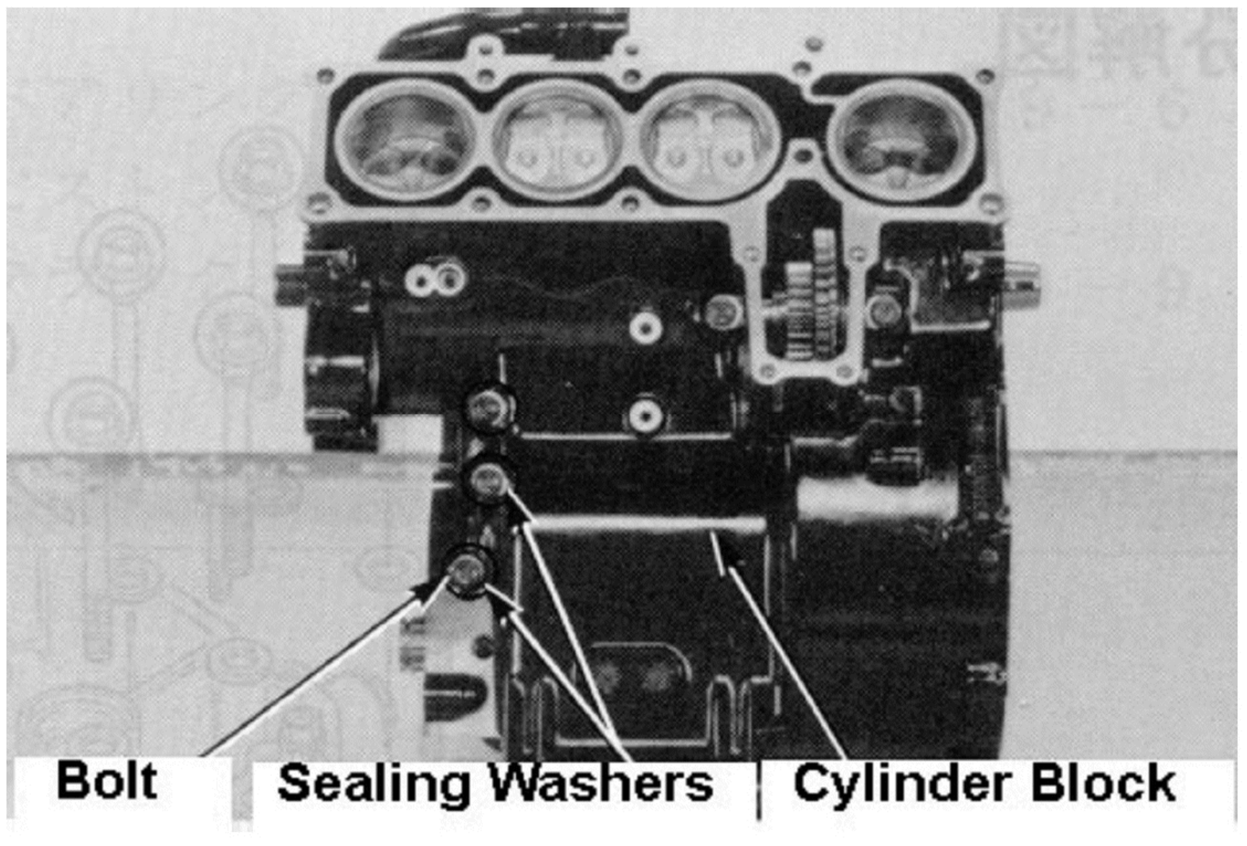
6mm bolt → 1.0 ~ 1.4kg m
11-12-13-14-15-16-17-18-19-20-22-23-24

- Place the sealing washers to the 6mm bolts specified as 12-13.
- Apply engine oil to the thread and flange on 8mm bolts before tightening.

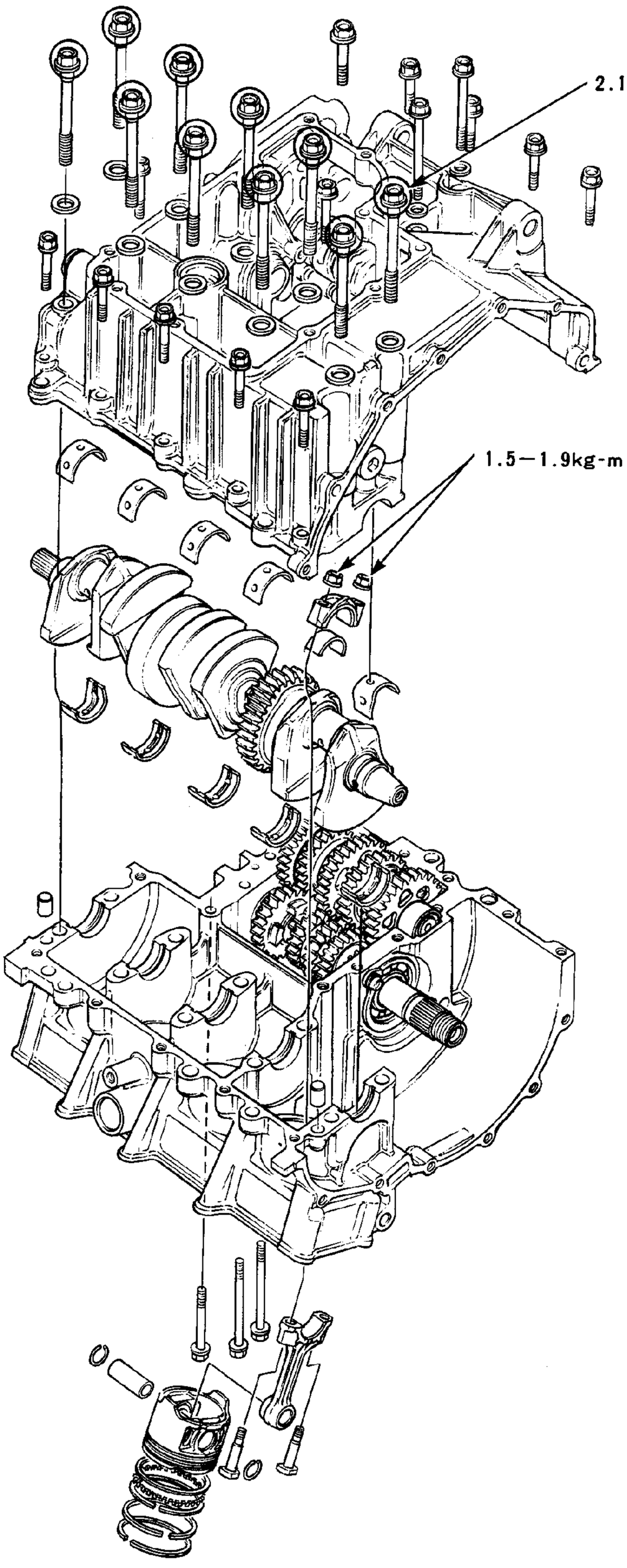


Tighten the cylinder block bolt to specified torque.
(Torque: 1.0 ~ 1.4kg m)

Re-attach the detached items



- **Assembly**



Assembly	9-0	Bearing inspection/selection	9-6
Maintenance Information	9-1	Attachment	9-9
Troubleshooting	9-2	Piston Installation	9-10
Crankshaft removal/Inspection	9-3		

CAUTION

- Select the proper crank pin and main journal from the coloured code. Select replacement bearings from the code table.
- After replacing the bearings, check the oil clearance with a plastic gauge.
- Apply MoS^2 and grease on main journal bearing and conrod bearings on assembly.
- Remove carbon and sludge on the cylinder before removing the piston and the conrod.
- Maintenance of piston, conrod and crankshaft should be done after disassembly of the crankcase.

Item			Standard	Limit
Crankshaft	Conrod side clearance (edge)		0.05-0.2	0.30
	Crankshaft deviation		-	0.05
	Crank pin oil clearance		0.020-0.044	0.05
Conrod	Main journal oil clearance		0.021-0.054	0.06
Cylinder	Internal diameter		48.500-48.510	48.60
	Upper surface distortion		-	0.05
	Circular distortion		-	0.005
	Cylindrical distortion		-	0.005
Piston Ring	Ring and ring slit clearance	Top	0.015-0.050	0.10
		Second	0.015-0.050	0.10
	Ring alignment slit clearance	Top	0.1-0.25	0.45
		Second	0.1-0.3	0.50
		Oil (side rail)	0.2-0.8	1.00
Piston	Piston external diameter		48.47-48.49	48.35
	Piston and cylinder clearance		0.01-0.04	0.10
	Piston pin hole diameter		13.002-13.008	13.02
	Piston pin external diameter		12.994-13.000	12.98
	Piston and piston pin clearance		0.002-0.014	0.04
	Conrod edge internal diameter		13.016-13.034	13.05
	Piston pin and conrod clearance		0.016-0.040	0.06

Tightening Torque

1.5 ~ 1.9kg m	Conrod bearing cap nut
2.1 ~ 2.5kg m	Crankcase attachment 8mm bolt

Tools

Exclusive Tool	07955-ZG00000	Piston ring compressor

Troubleshooting

Engine Noise

- Main journal bearing worn out
- Crank pin bearing worn out
- Piston, cylinder worn out
- Piston pin, piston pin hole, conrod little end worn out
- Piston ring worn out / stuck/ damaged.

Low compression, failure to start, rough idling

- Piston ring worn out / stuck / damaged
- Cylinder, piston worn out / damaged

High Compression

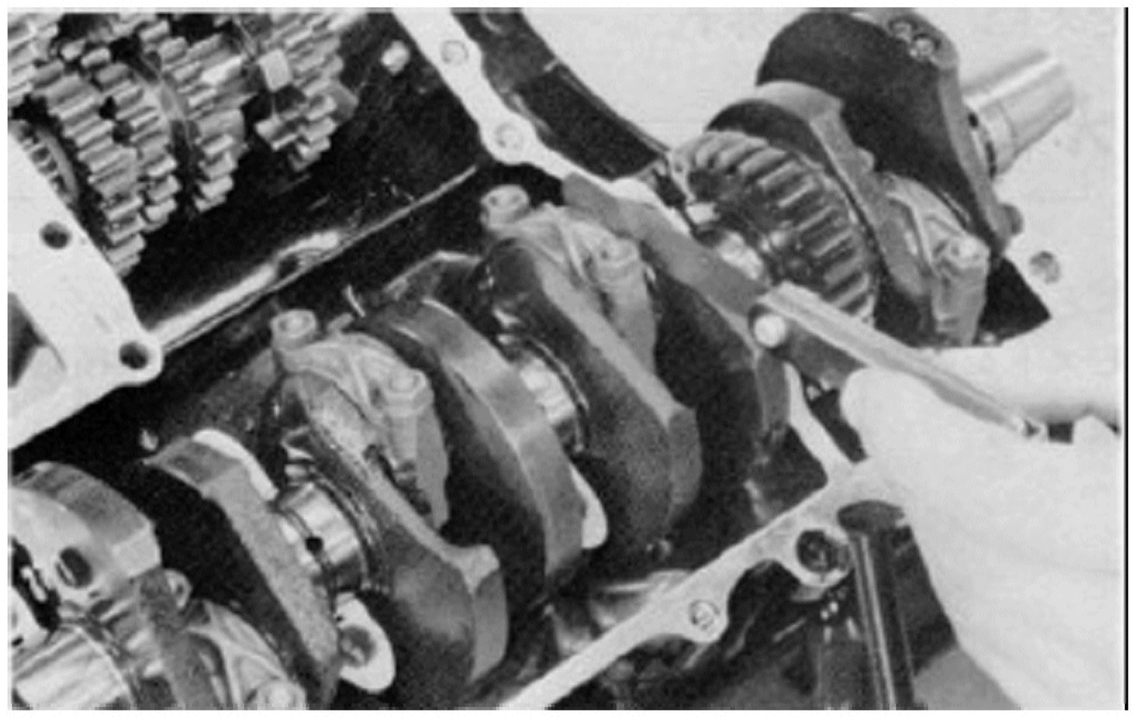
- Carbon on the cylinder head or piston top

Overheat

- Carbon on piston top
- Blocked cooling system

Smoke from a muffler

- Cylinder, piston, piston ring worn out
- Inadequate installation of the piston ring
- Piston / cylinder damaged



Removal of the piston, conrod and crankshaft

Separate the crankcase (8-2)

Remove the counter shaft (12-3)

Inspect the conrod side clearance

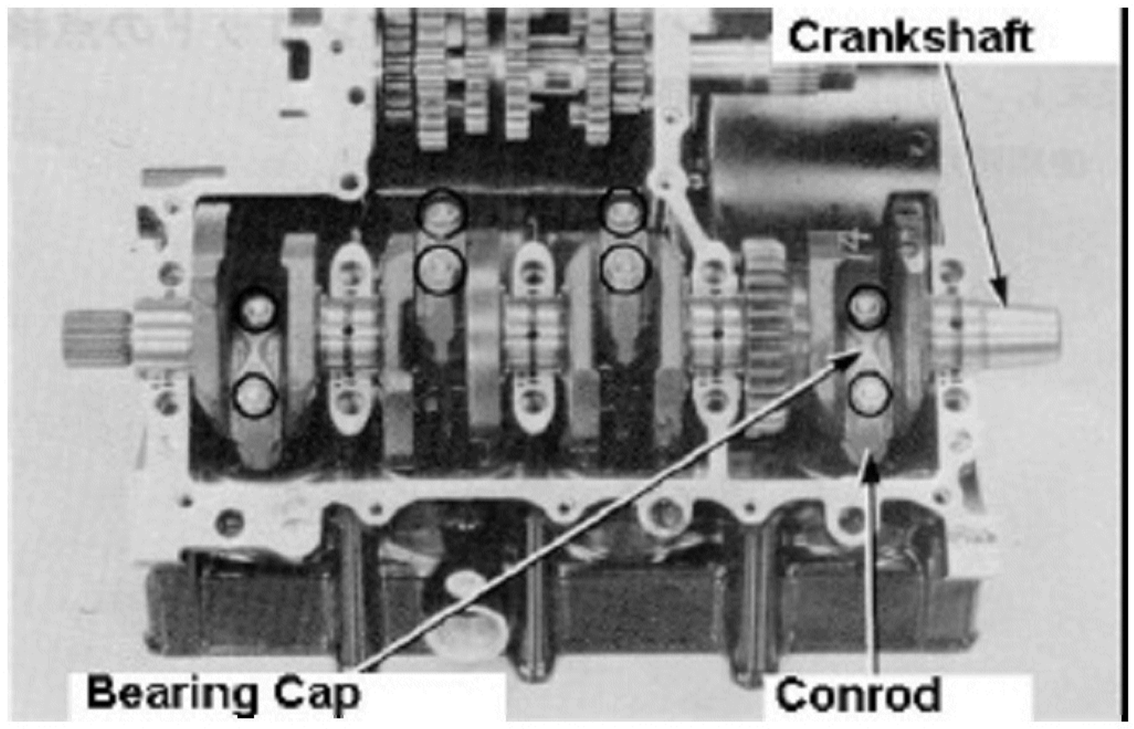
More than 0.30mm → replace

Remove the bearing cap nut and remove the bearing cap.

Push the piston and pull the piston and the conrod out.

> Mark the removed parts so as to remember the original place.

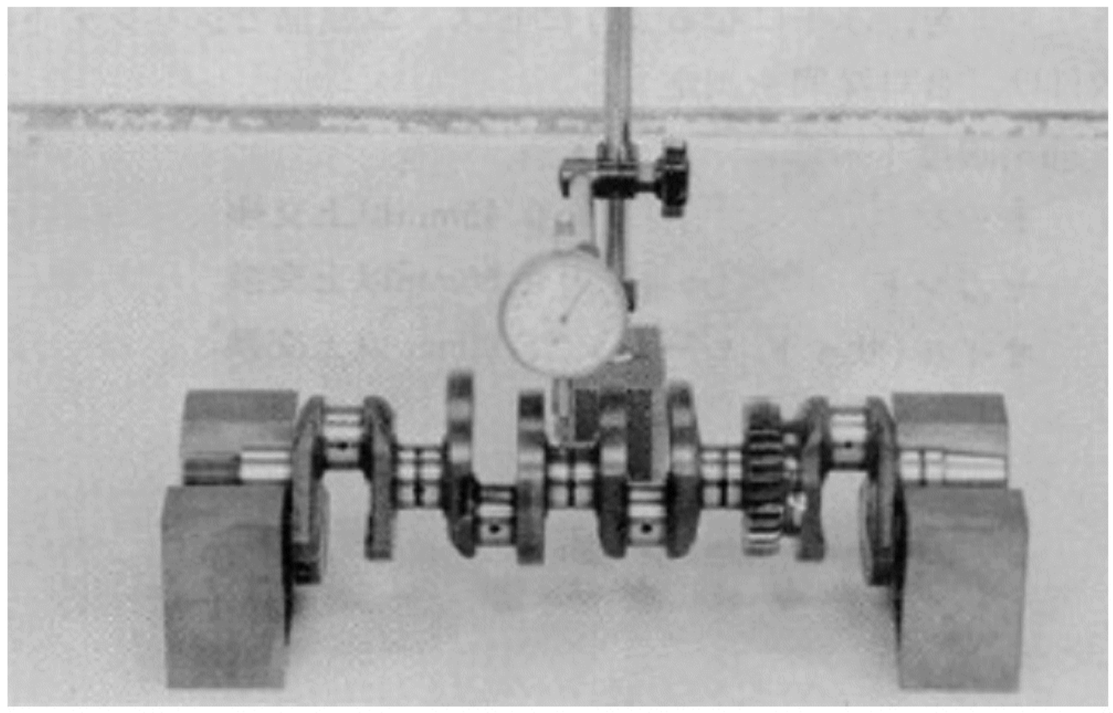
Remove the crankshaft.



Crankshaft inspection

Support both sides of the shaft and measure the displacement of the journal.

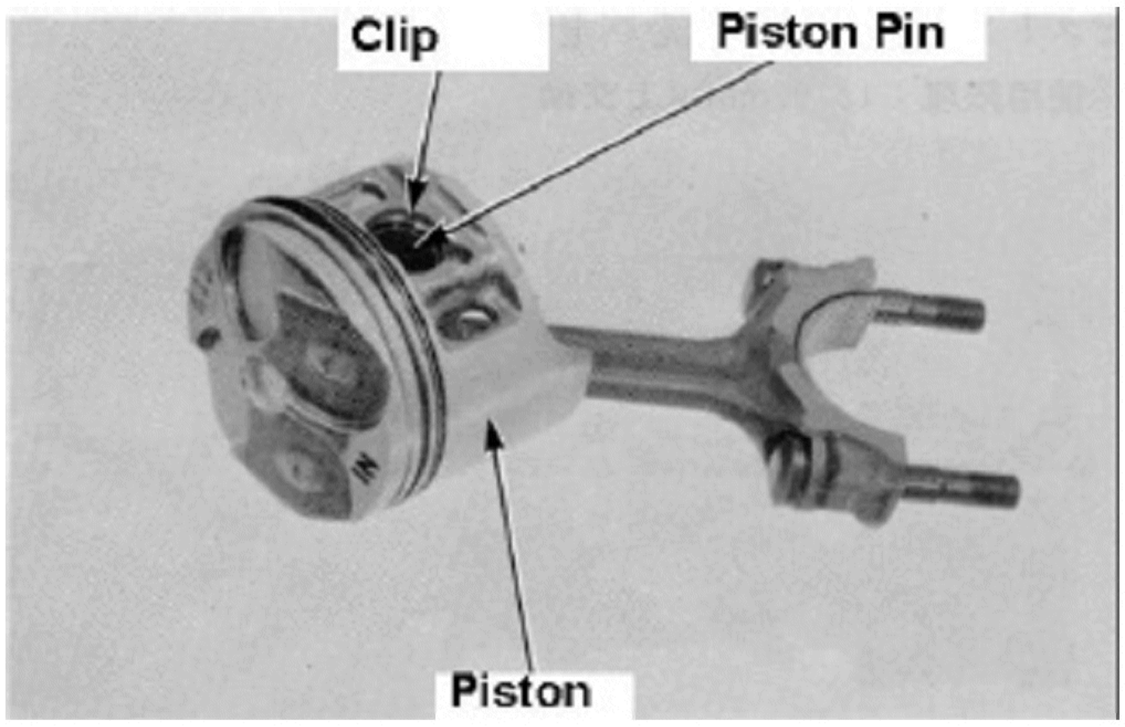
Greater than 0.05mm → replace



Disassembly of piston

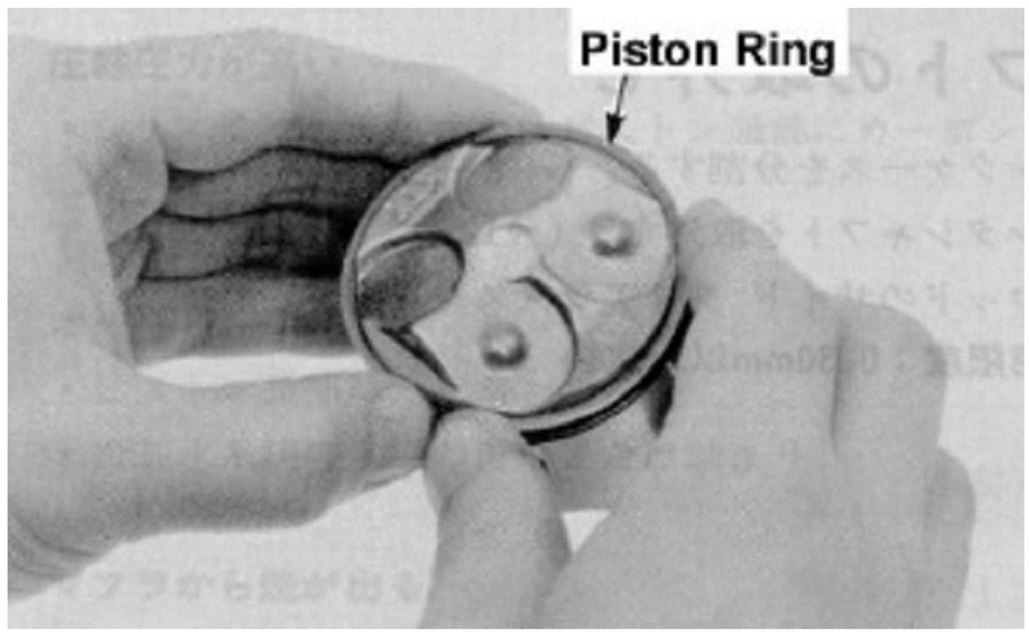
Remove the piston pin clip and pull out the piston pin.

Remove the piston from the conrod.



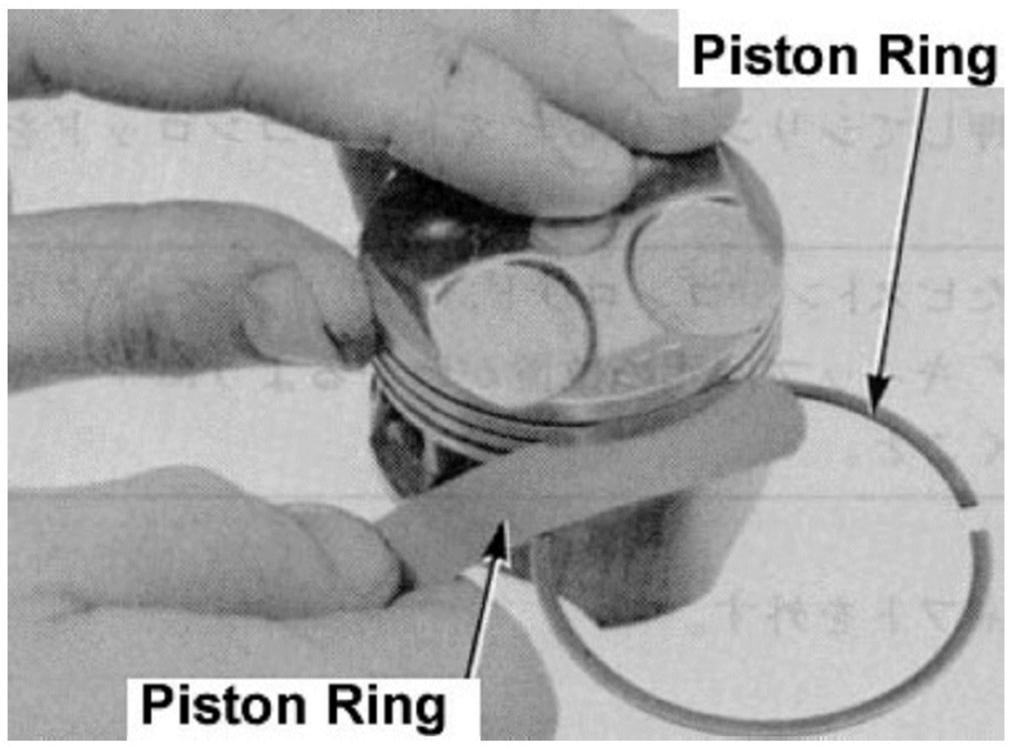
Remove the piston rings.

Separate rings for individual cylinders / pistons.



Remove sludge from the piston head.

Inspect the piston for scratch, crack, unequal ring groove and carbon.



Inspection of Piston, Piston ring, conrod

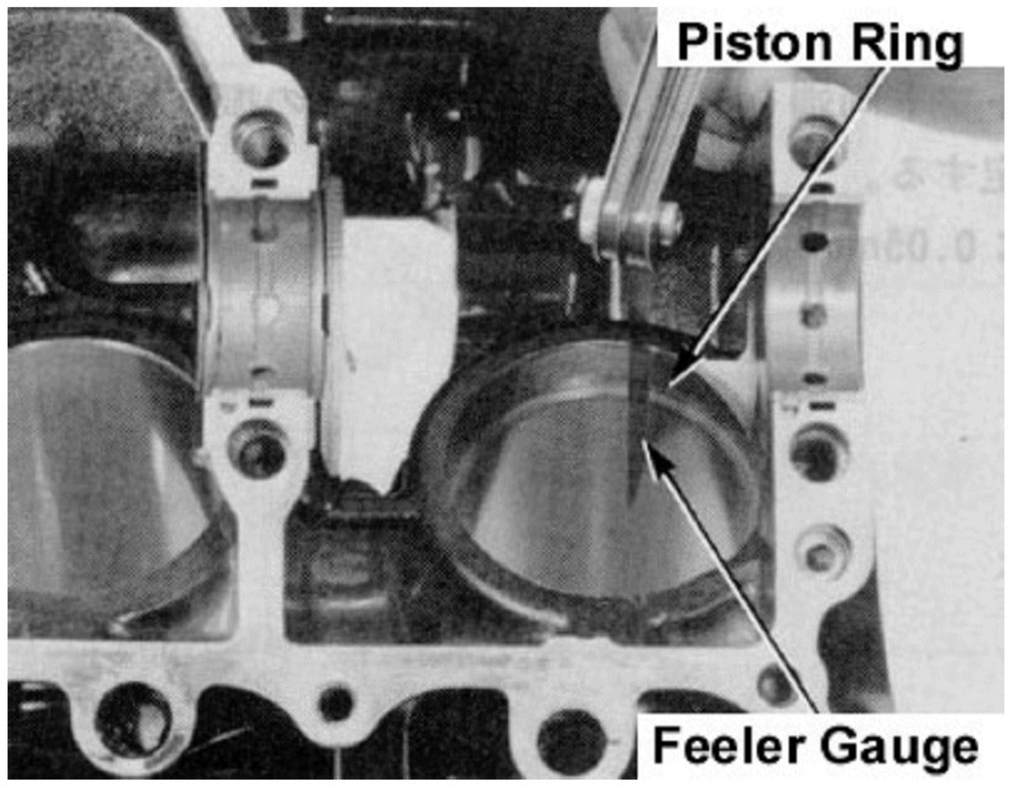
Measure the clearance between the piston ring and the groove.

Top ≧ 0.10mm → replace
Second ≧ 0.10mm → replace

Attach each ring with piston head to the bottom of the cylinders so as to be horizontal.

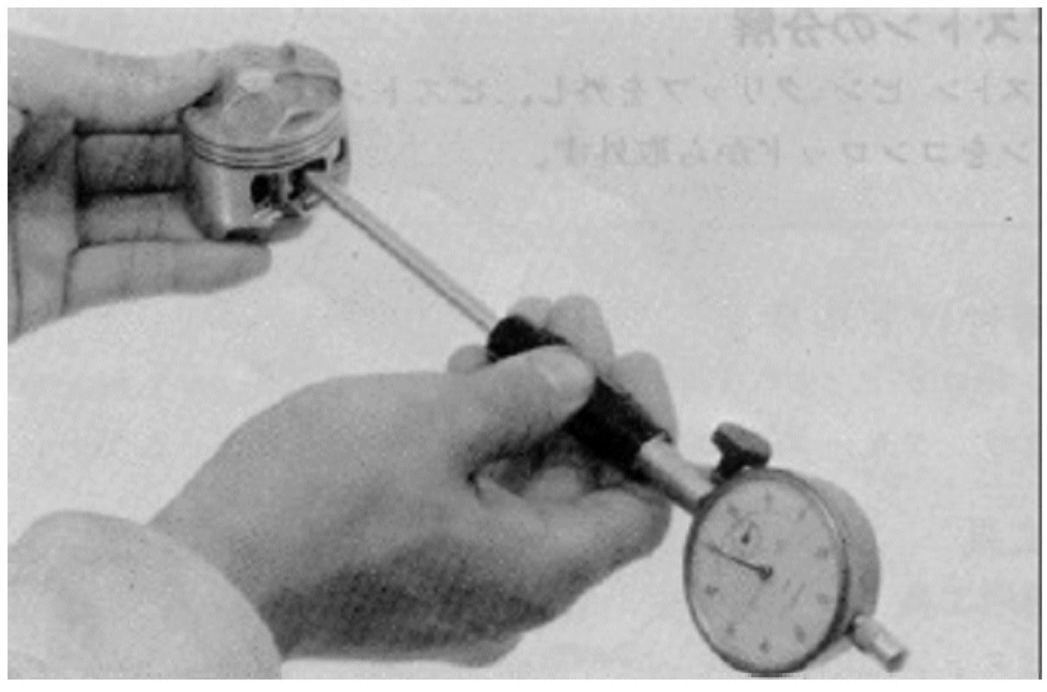
Measure the clearance.

Top ≧ 0.45mm	)	
Second ≧ 0.50mm	)	Replace
Oil (Side rail) ≧ 1.00mm	)	



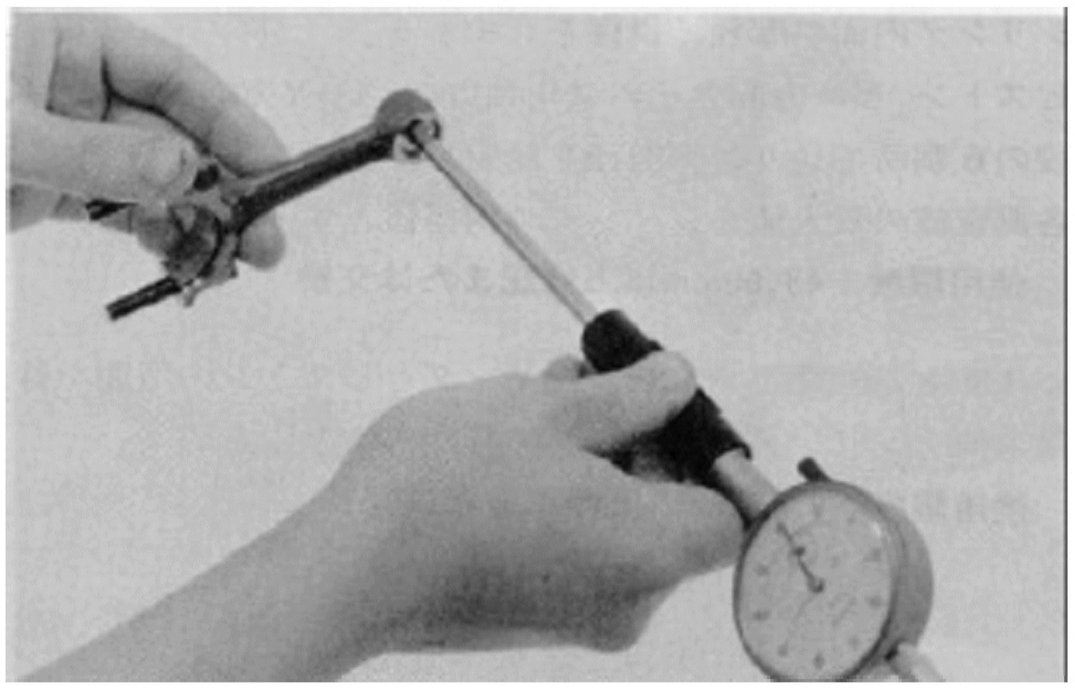
Measure the inner diameter of the piston pin hole.

Greater than 13.02mm → replace



Measure the inner diameter of conrod little end.

Greater than 13.05mm → replace

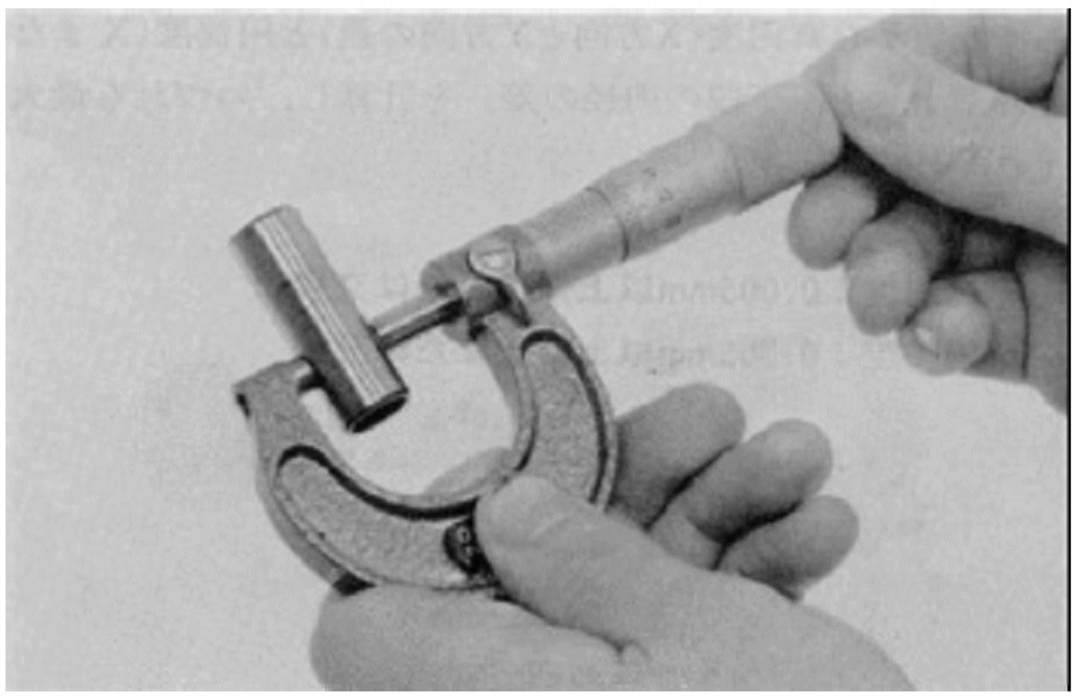


Measure the outside diameter of the piston pin.

Smaller than 12.98mm → replace

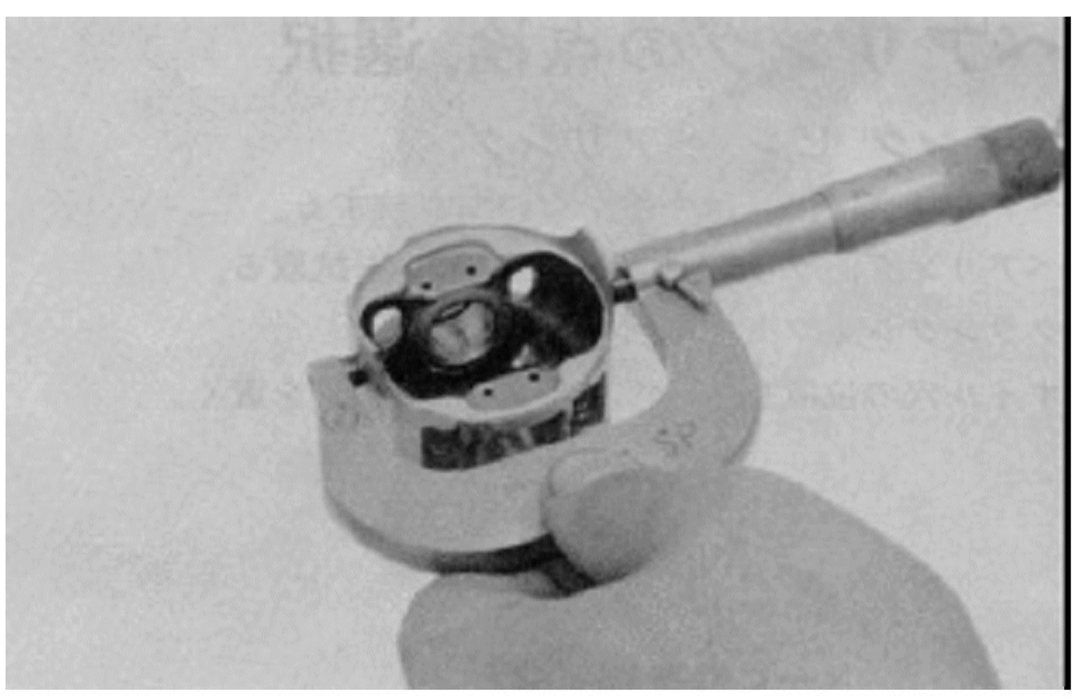
Calculate the clearance between the piston and piston pin.

Greater than 0.06mm→replace



Measure the outside diameter of a piston

Measure at 14mm from the bottom end of the skirt and perpendicular to the piston pin hole.

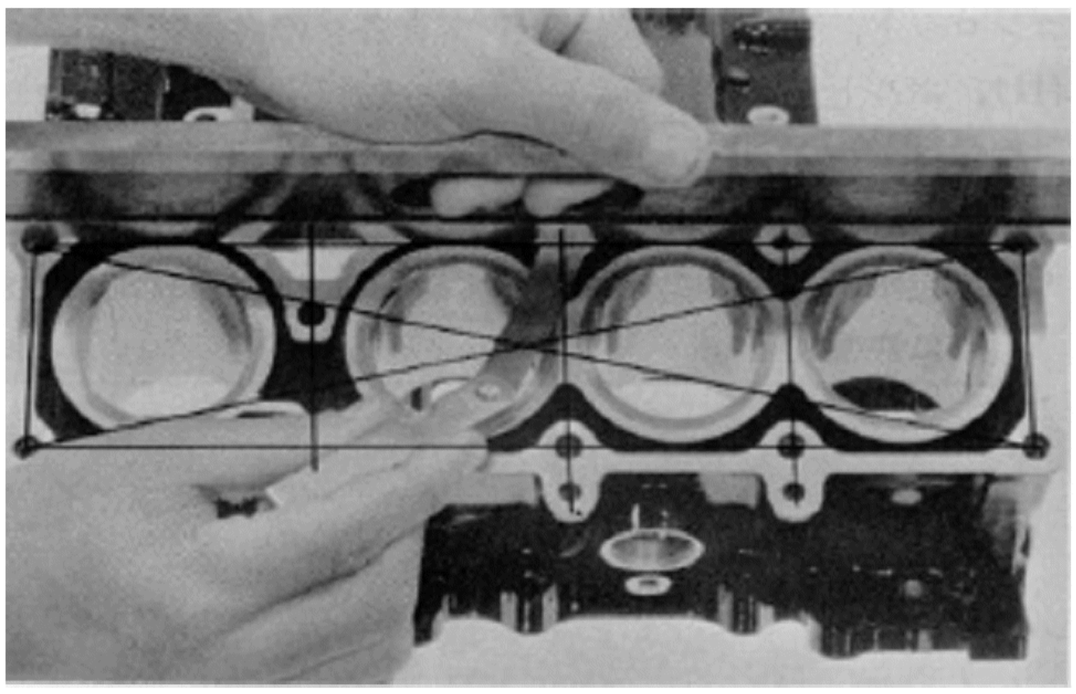


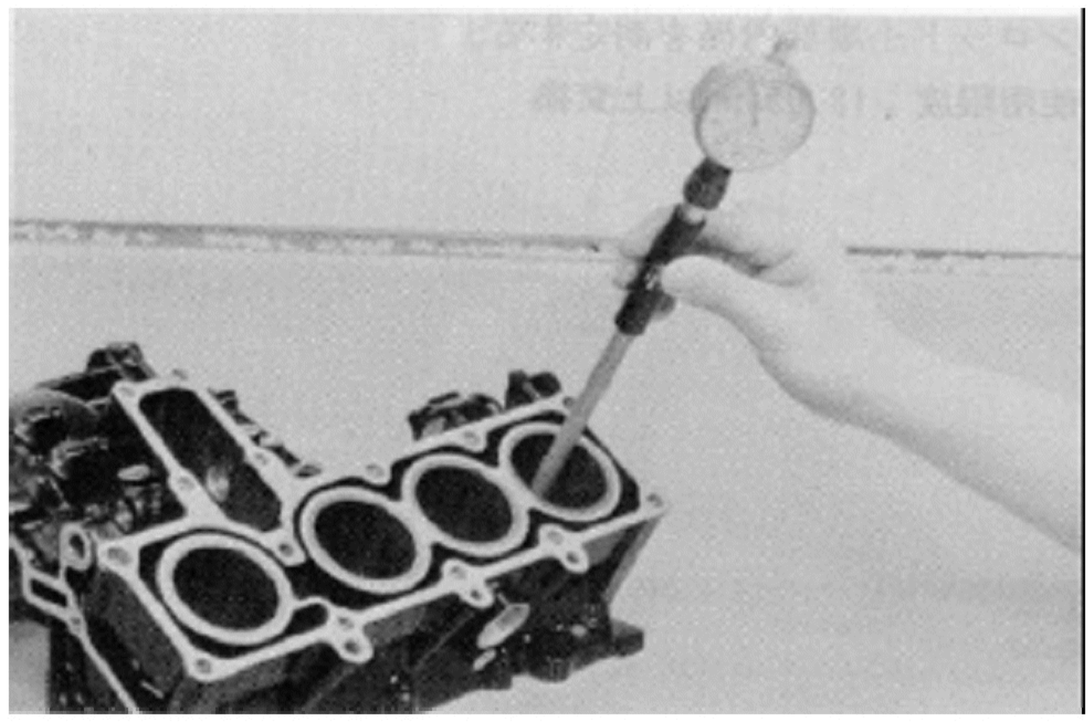
Smaller than 48.35mm → replace

Cylinder Inspection

Measure the distortion of the cylinder top surface.

Greater than 0.05mm → Adjust or replace





Inspect the inner surface of the cylinder.
Measure the inner diameter for X – Y direction at upper, middle, lower part of the cylinder, and record the six numbers.
The maximum number is considered as an inner diameter.

Greater than 48.60mm → adjust or replace

Calculate the clearance between the cylinder and a piston by measuring the outside diameter of a piston. Take the maximum value.

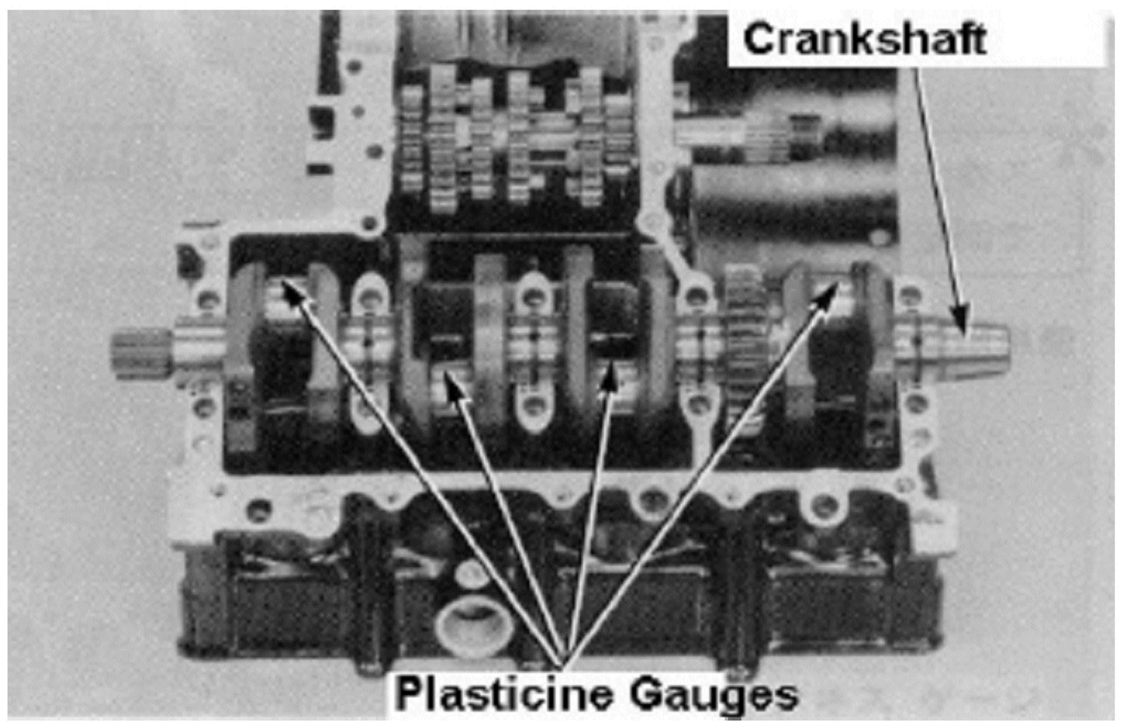
Greater than 0.10mm → adjust or replace

Calculate the following parameters and take maximum number:
Circular distortion:
= (X – direction diameter)
= (Y – direction diameter)

Cylindrical distortion:
= (Difference in X or Y direction
Diameter between three parts).

Both parameters should be ≦ 0.05mm

If greater → adjust / replace



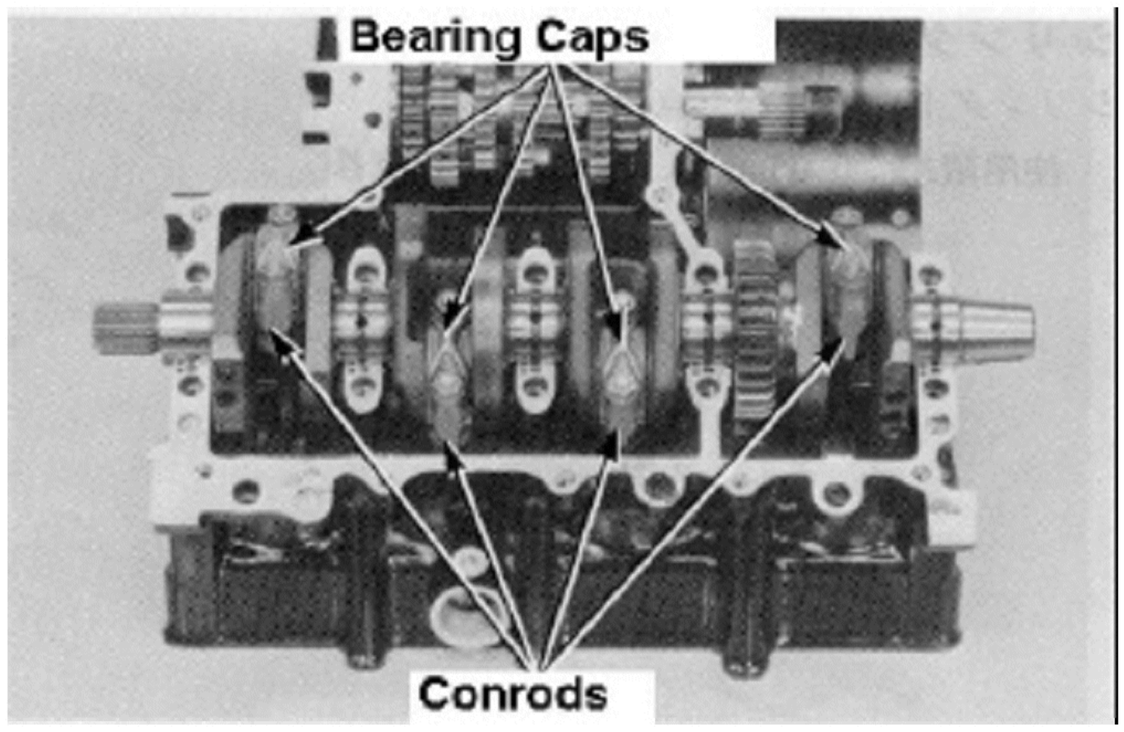
Inspection / Selection of bearings

Crank pin bearing

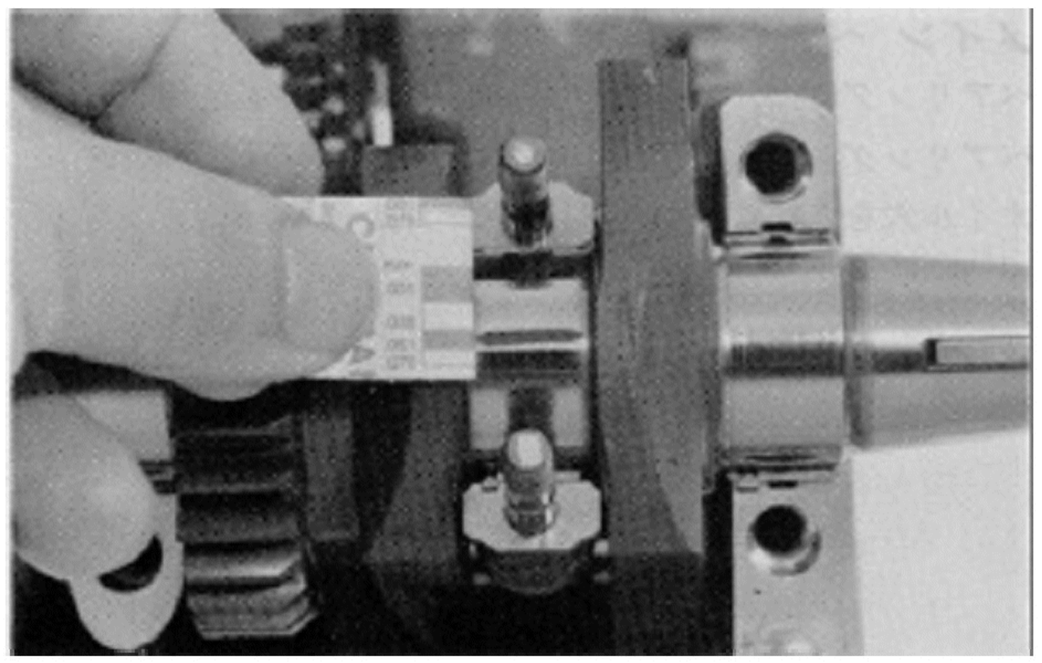
Inspect the bearing for scratch,or separation.
Wipe off the oil on the bearing and the crank pin.
Attach the crankshaft.
Avoid oil hole and apply plastic gauge.

Attach the conrod bearing caps to individual crank pins and tighten the bolts.
Tightening Torque: 1.5 ~ 1.9kg m

Ensure the crankshaft and conrod do not rotate while measuring.



Remove the bearing cap and measure the width of plasticine gauges.

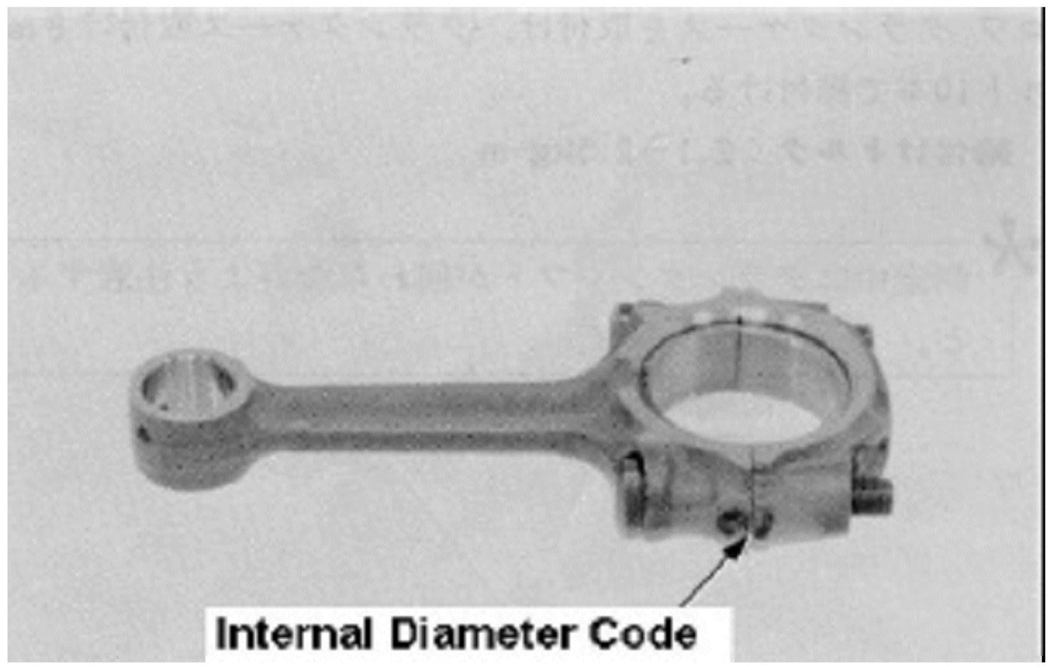


Oil clearance ≧ 0.05mm → replace

If the oil clearance is beyond the limit, replace the bearing.

Follow the procedure for bearing selection.
Record the conrod internal diameter code number.

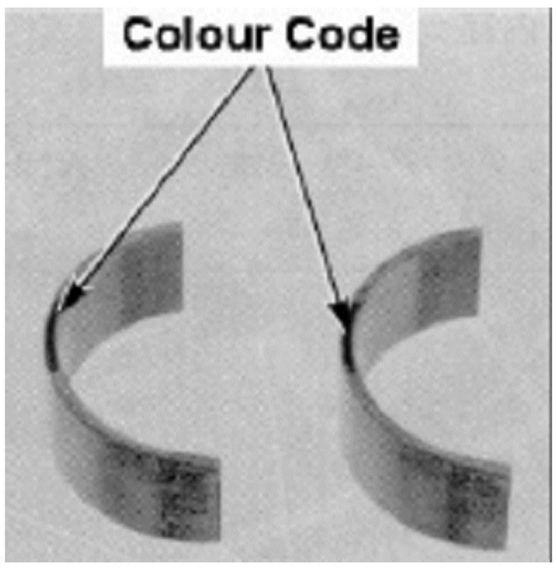
The 2 mark on the conrod is the internal diameter code number.

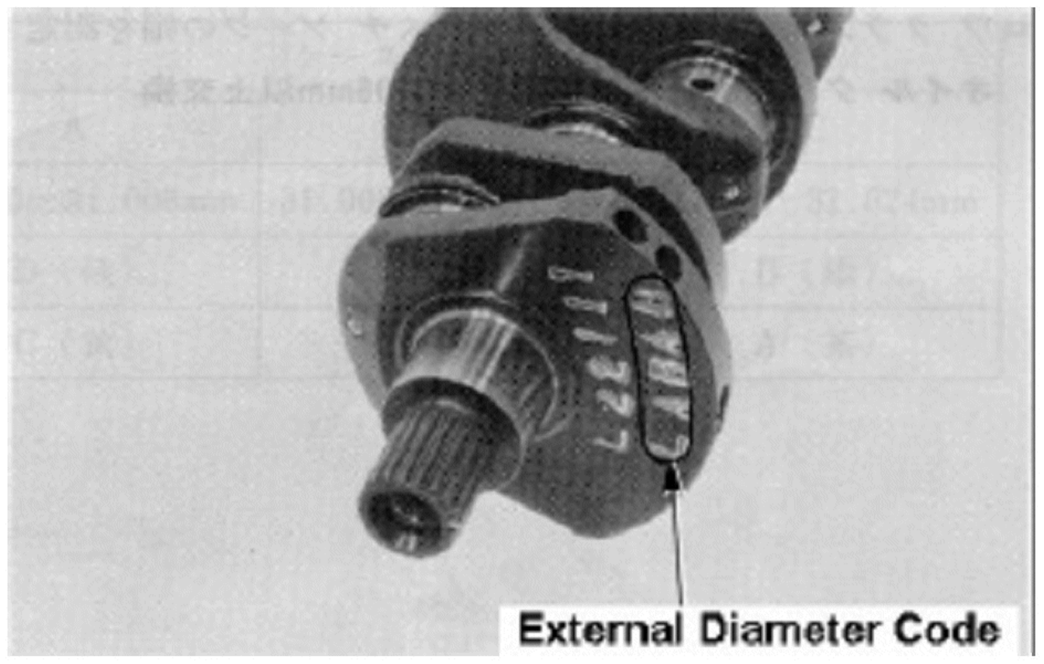


Record the crank pin external diameter code number (or measure it).

A or B on the crank weight is the code.

From the crankpin and conrod code numbers, find the colour code for the bearing.



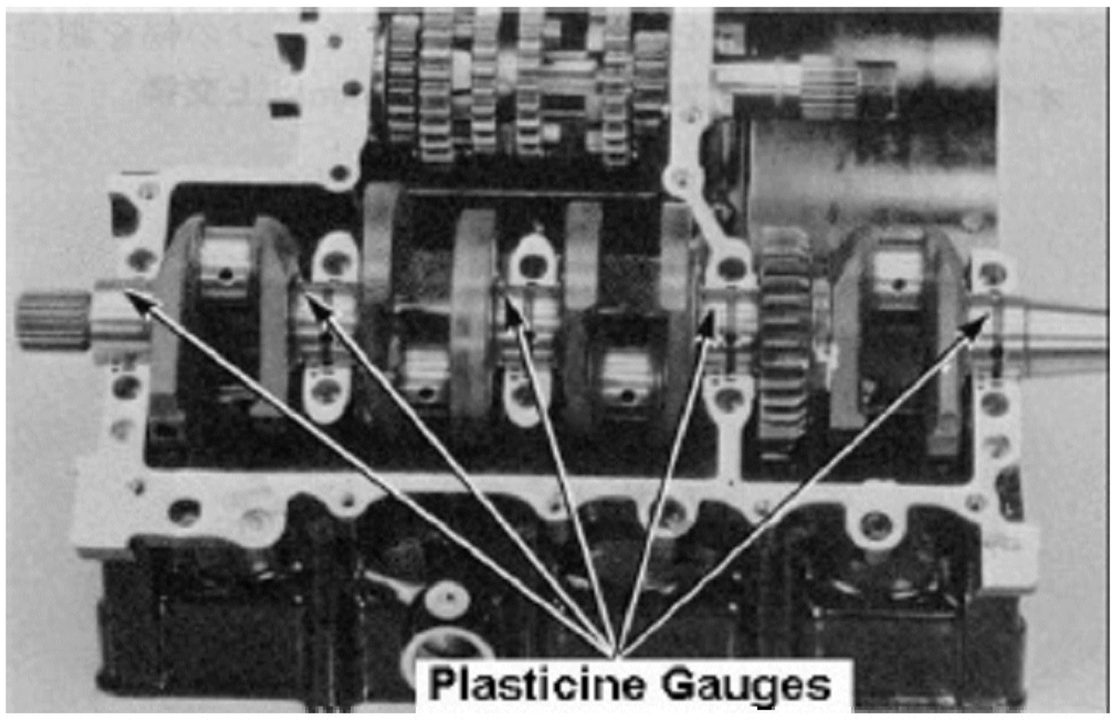


Bearing Metal Thickness
A (Brown): 1.502~1.506mm
B (Green): 1.498~1.502mm
C (Yellow): 1.494~1.498mm

			Conrod Internal Dia code	
			1	2
			30.000 ~30.00mm	30.008 ~30.016mm
Crank pin external diameter code	A	26.992 ~27.000mm	C (Yellow)	B (Green)
	B	26.984 ~26.992mm	B (Green)	A (Brown)

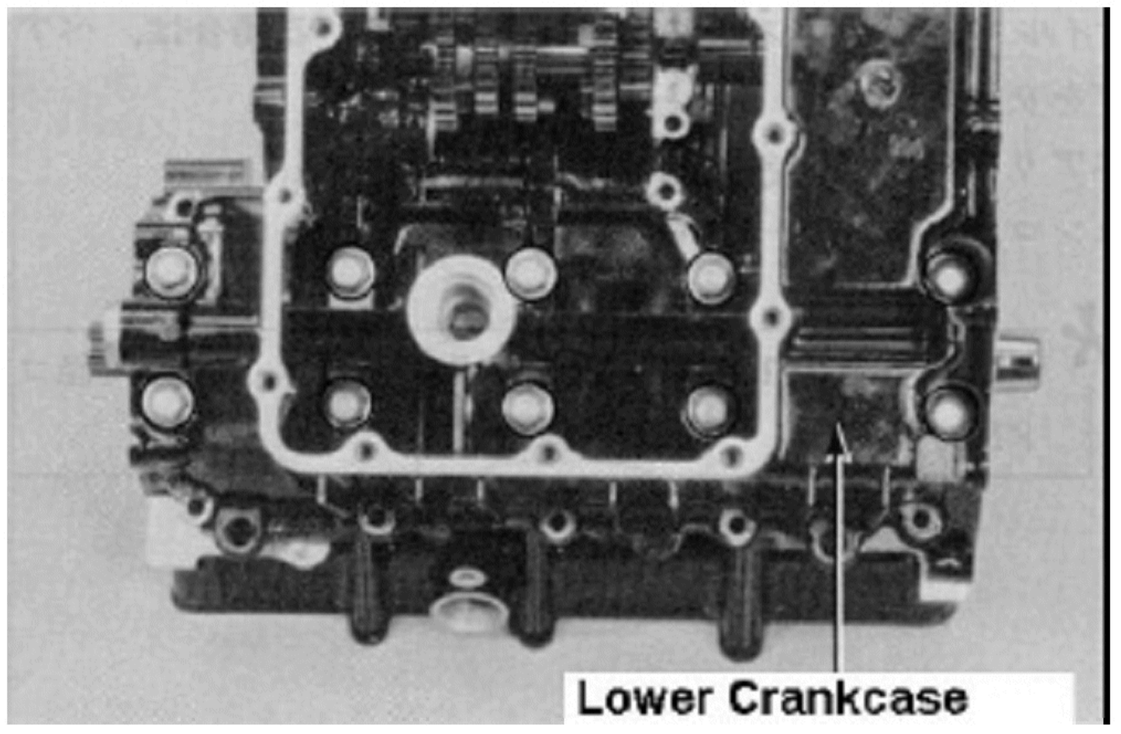
Main Bearing
Inspect for scratch or separation.

Wipe the oil off on the bearing and journal surface.
Place the plastic gauges avoiding the oil holes.



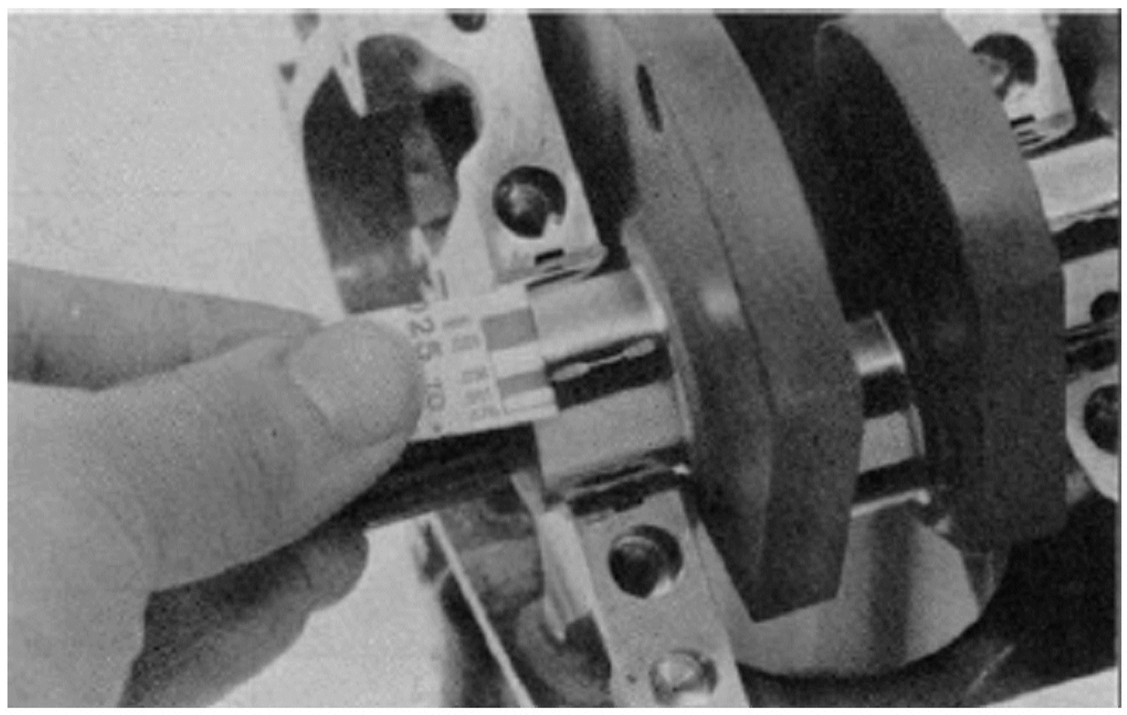
Attach the lower crankcase and fix with 8mm attachment bolts (x10).
Tightening torque: 2.1 ~ 2.5kg m

Ensure the crankshaft will not turn while measuring.



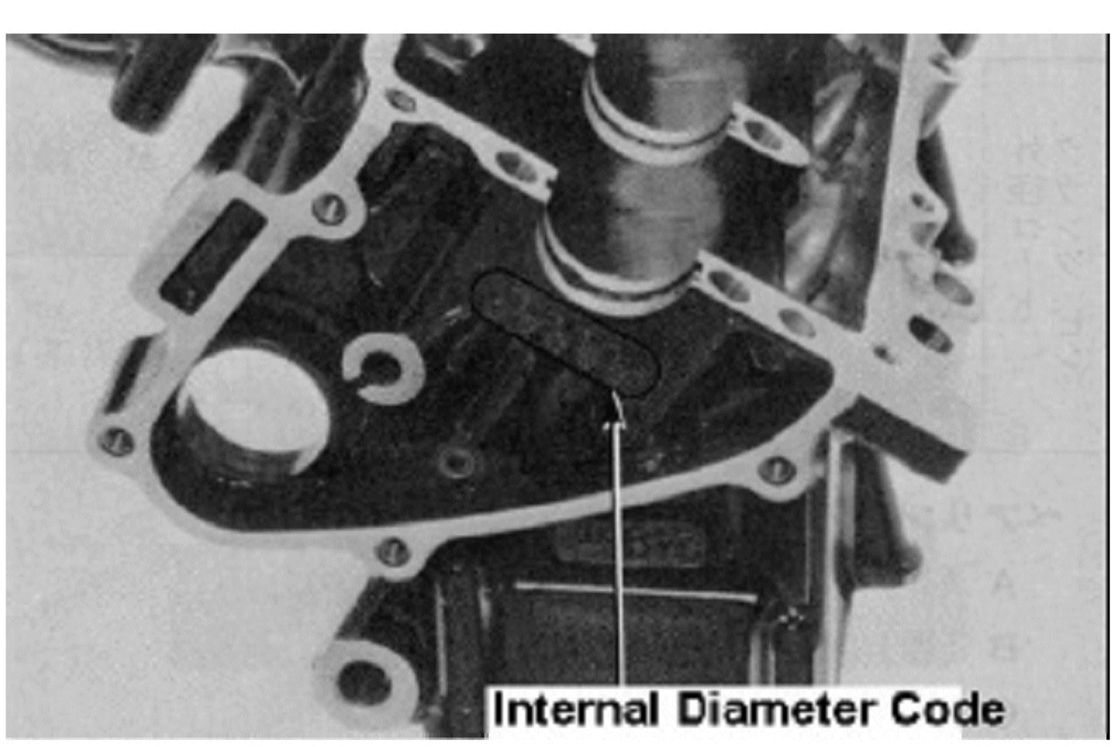
Remove the lower crankcase and measure the width of the plasticine gauges.

Oil clearance $\geqq$ 0.06mm $\rightarrow$ replace



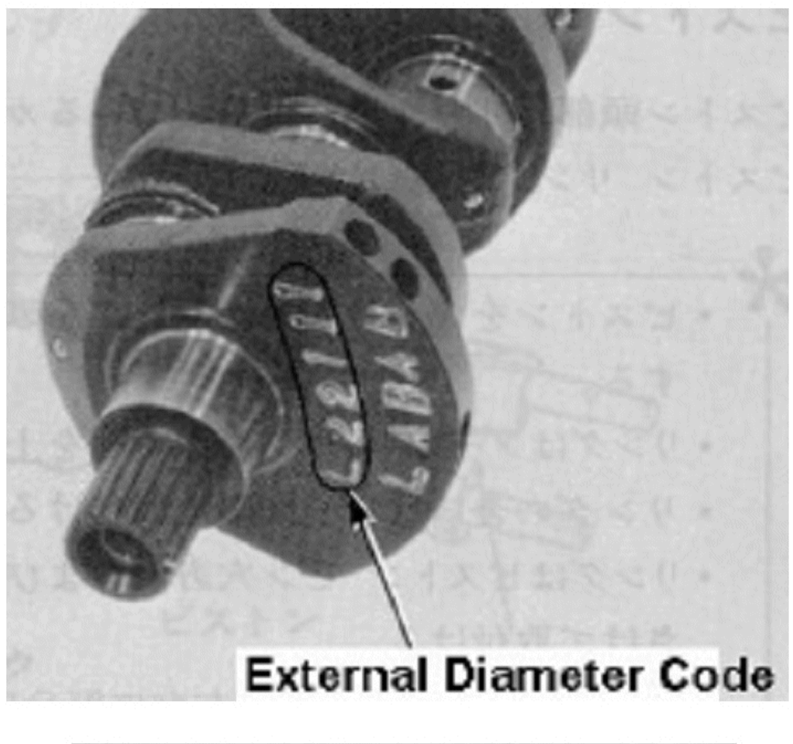
Record the crankcase internal diameter code.

The A, B or C mark on the rear part of the upper crankcase.

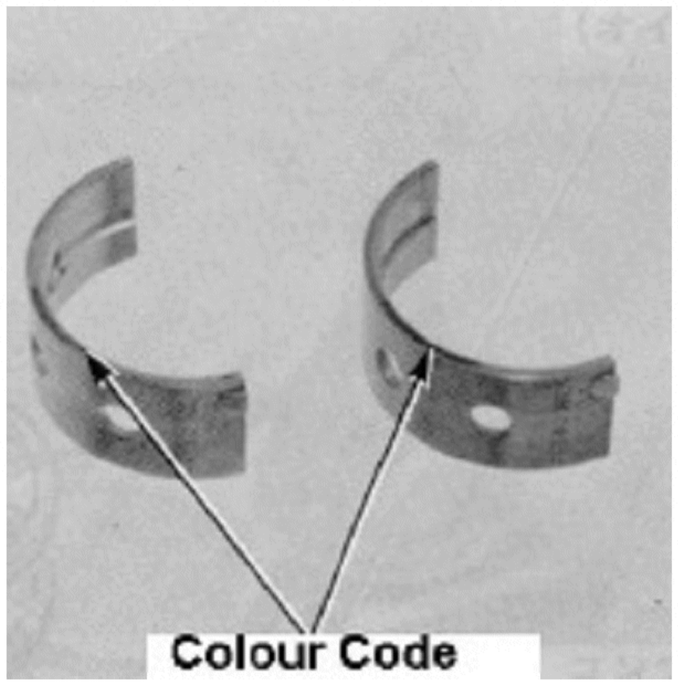


Record the crankshaft main journal external diameter code (or measure it).

The symbol 1,2 on the crankweight



Find out the corresponding bearing colour code from the crankcase and the crankshaft code numbers.



Bearing metal thickness

A	1.507 – 1.511mm	Brown
B	1.503 – 1.507mm	Green
C	1.499 – 1.503mm	Yellow
D	1.495 – 1.499mm	Pink

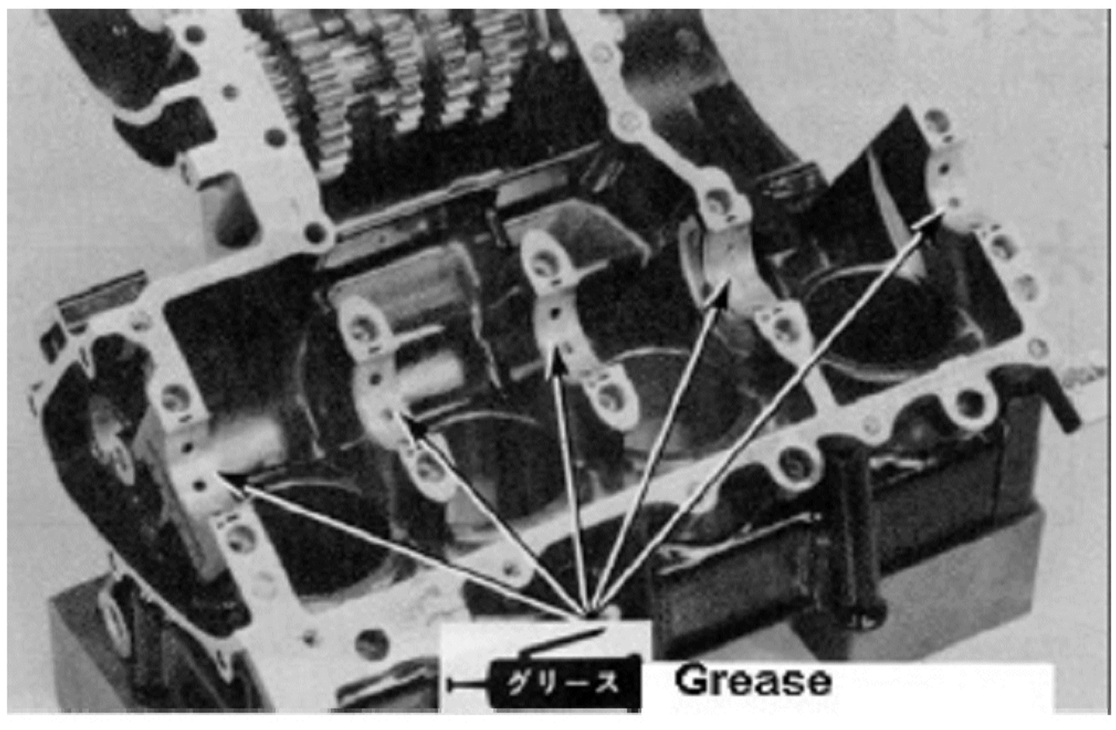
			Case Internal Diameter Code		
			A	B	C
			31.000 – 31.008mm	31.008 – 31.016mm	31.016 – 31.024mm
Main journal external diameter code	1	27.992-28.000mm	D (Pink)	C (Yellow)	B (Green)
	2	27.984 – 27.992mm	C (Yellow)	B (Green)	A (Brown)

Piston, conrod, crankshaft attachment

Attach the main bearing to the cylinder block, lower crankcase.

Apply MoS^2 Grease on the main bearing surface.

Align the key on the bearing to the key slit on the cylinder block and lower crankcase.

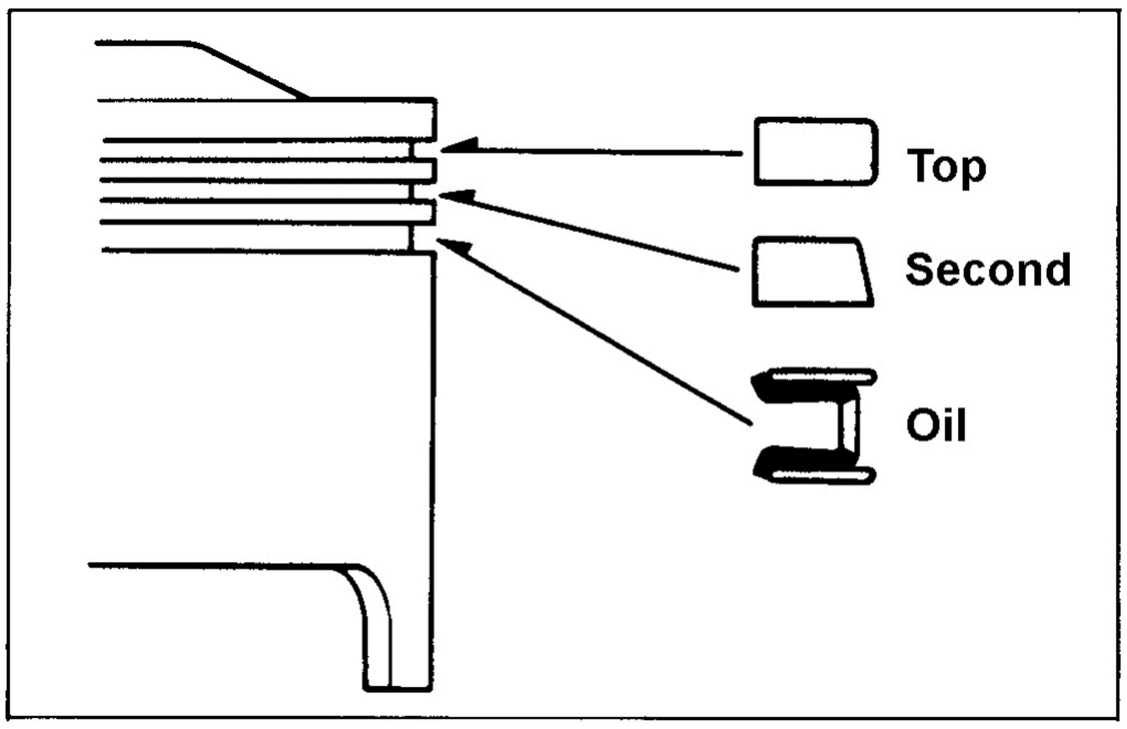


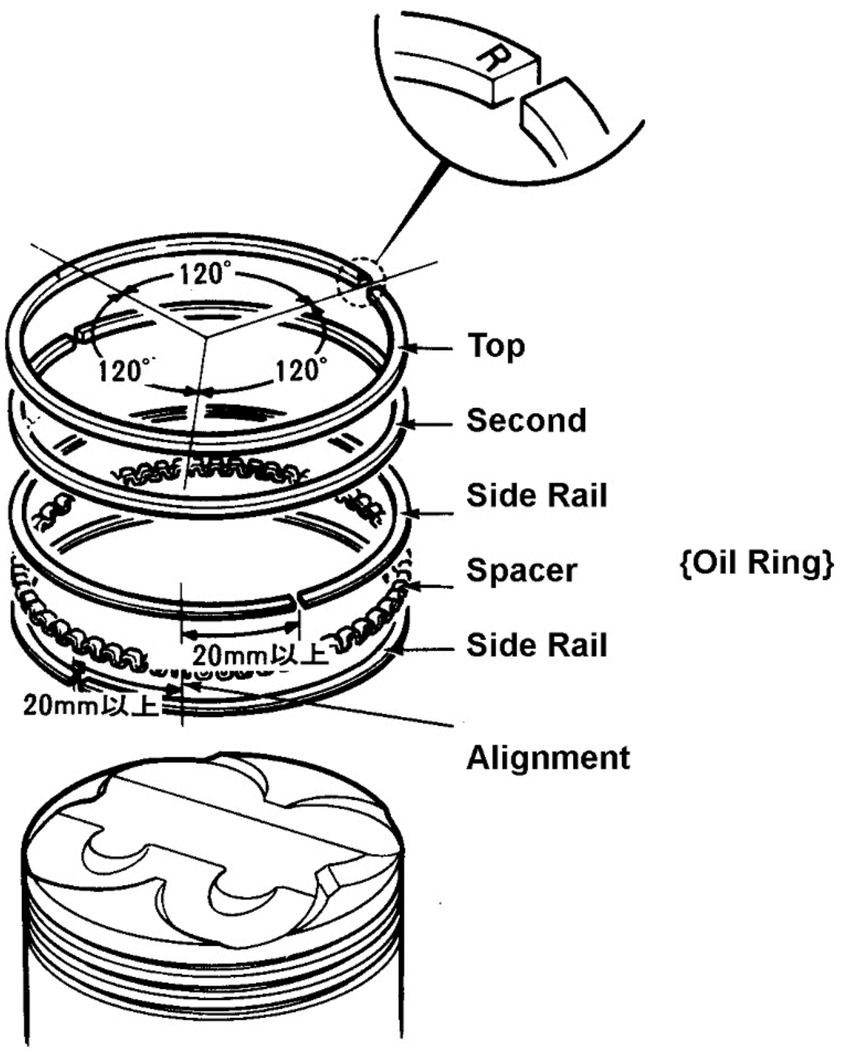
Piston Ring

Remove the carbon on the piston head and ring slits.

Attach the piston rings.

- Exercise caution not to damage the piston or the ring.
- Marked face on the ring should face up.
- Ensure 120° offset between the alignment slit.
- Avoid attaching the ring on piston pin hole direction and perpendicular to the pin.
- Offset the alignment slits on side rails to left and right.
- After attaching the rings, confirm the smooth movement of the rings.

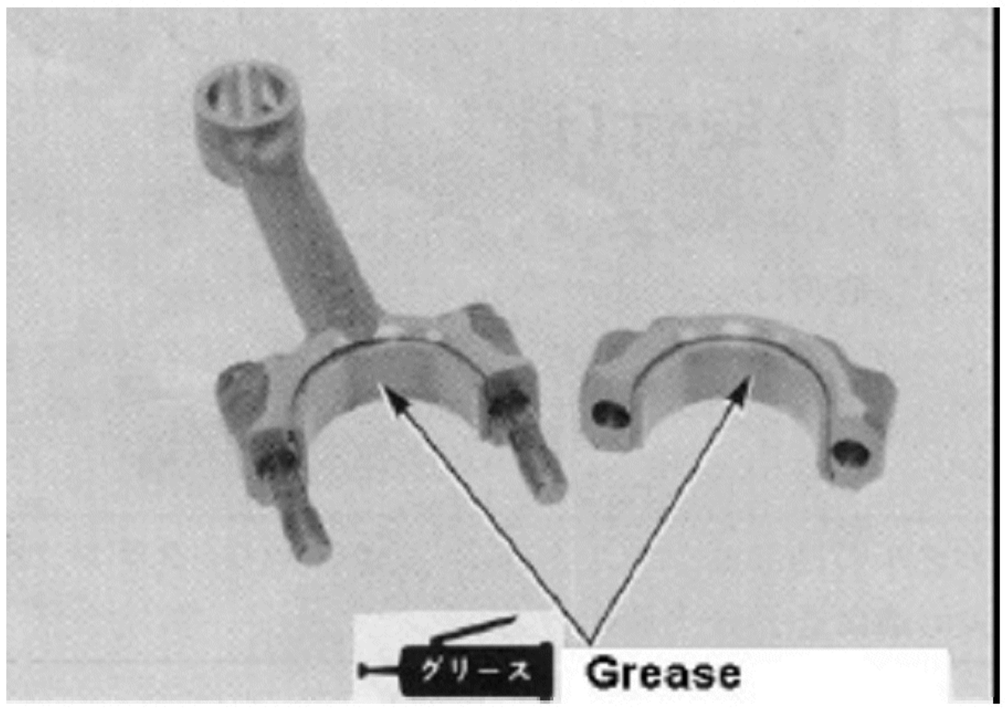




Assembly of the piston and the conrod

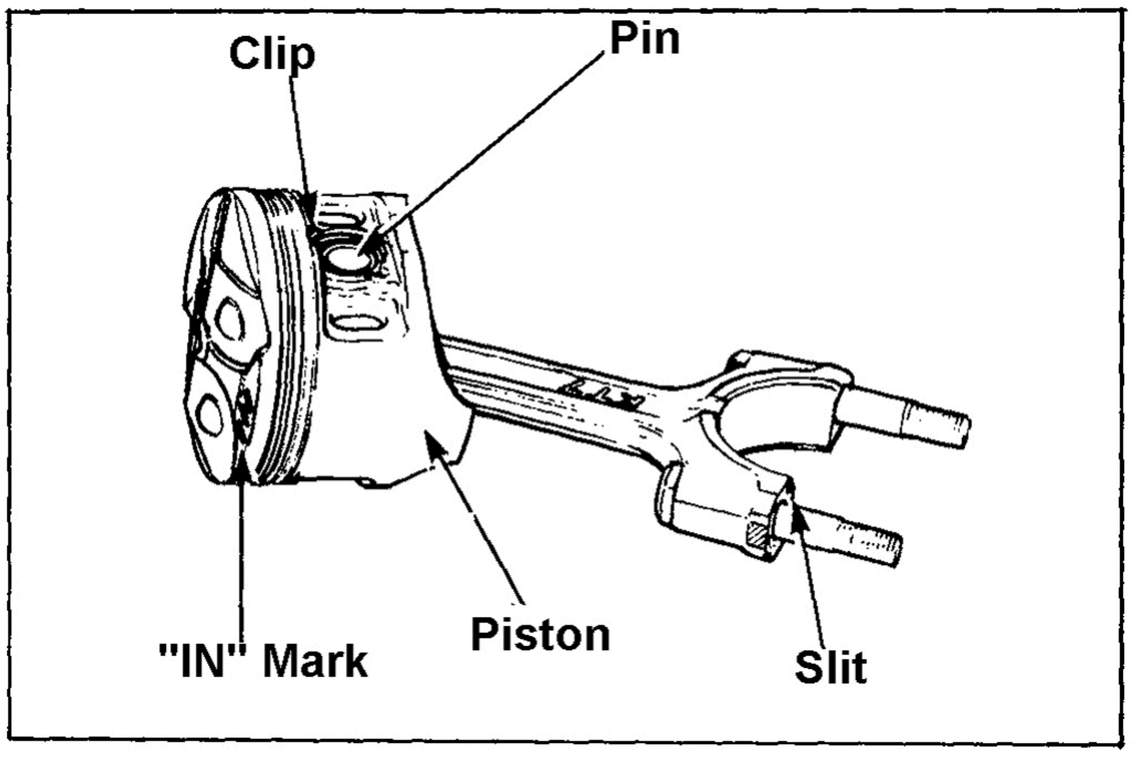
Attach the bearing to the conrod and bearing cap.

- Align the key on the bearing to the key slit on the conrod and bearing cap.
- Apply MoS^2 Grease on the bearing surface.



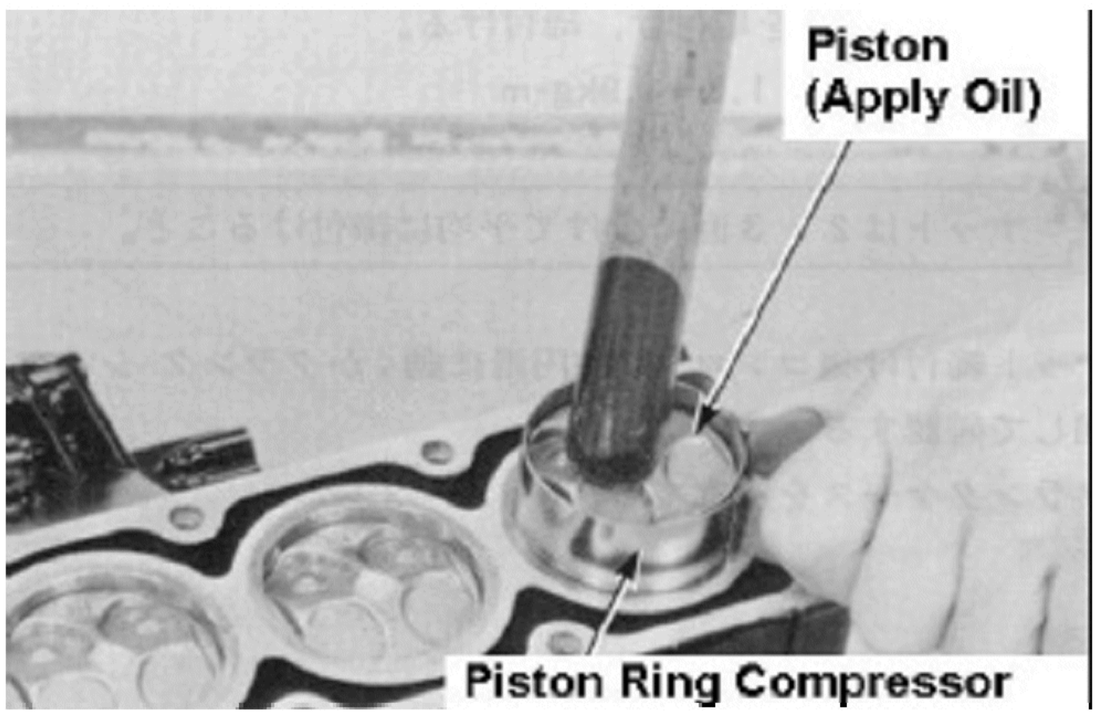
Apply oil to the conrod little end, piston pin external surface and piston pin hole surface.
Attach the piston to the conrod.
Attach the piston pin and set the piston pin clip to the piston slit firmly.

- Face the IN mark on the piston to the slit on the conrod.
- Align the marks which where made on disassembly



Attachment of the piston and the conrod
Apply oil on external surface of the piston.
Insert the conrod and piston to the top of the cylinder on the crankcase.
Compress the piston ring by using a piston ring compressor and insert the piston to the cylinder by lightly pushing the piston head.

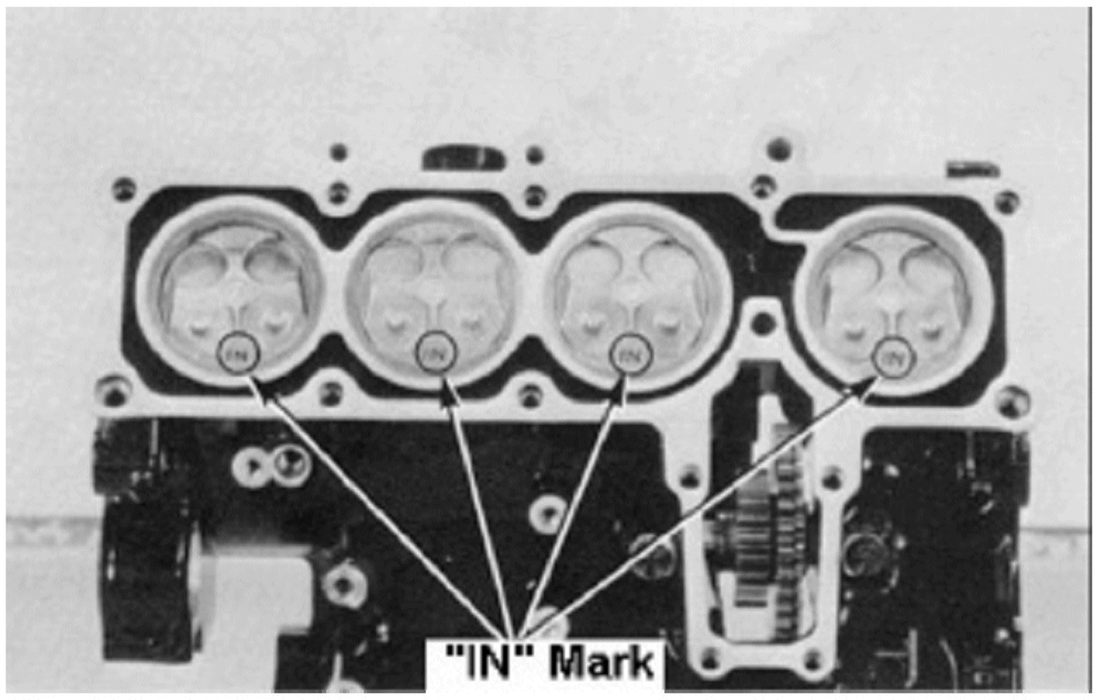
Beware of damaging the piston and piston ring



Exclusive tool:

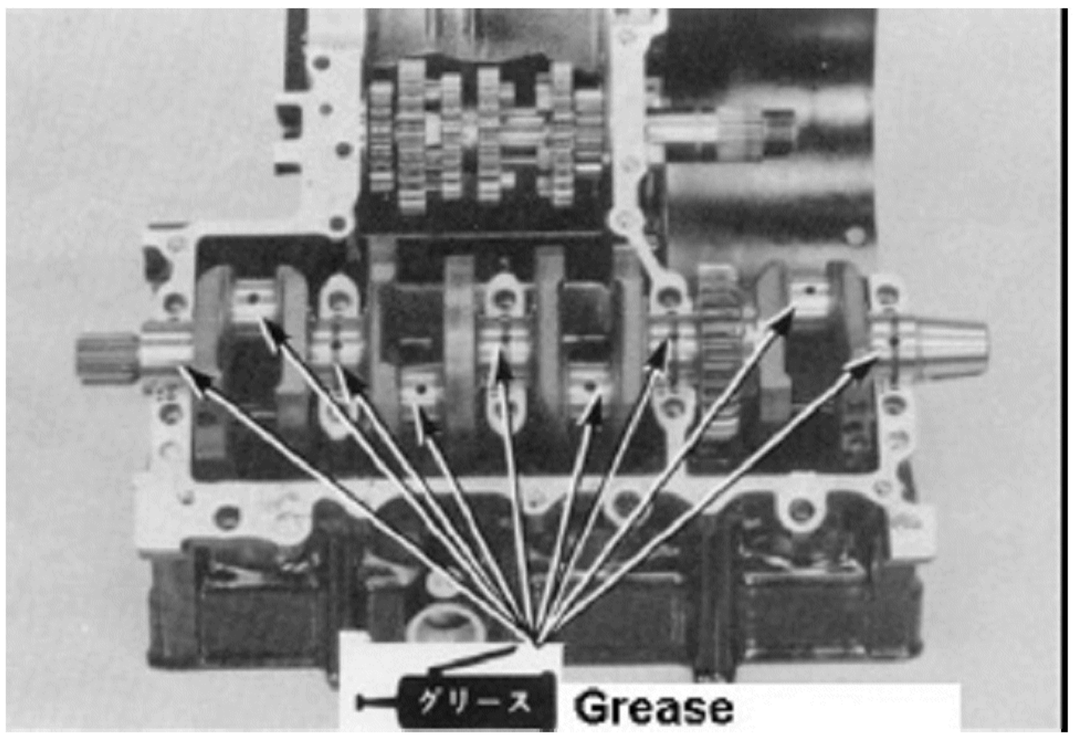
Piston ring compressor 07955 – ZG0000

Confirm the IN marks are facing towards the intake side.



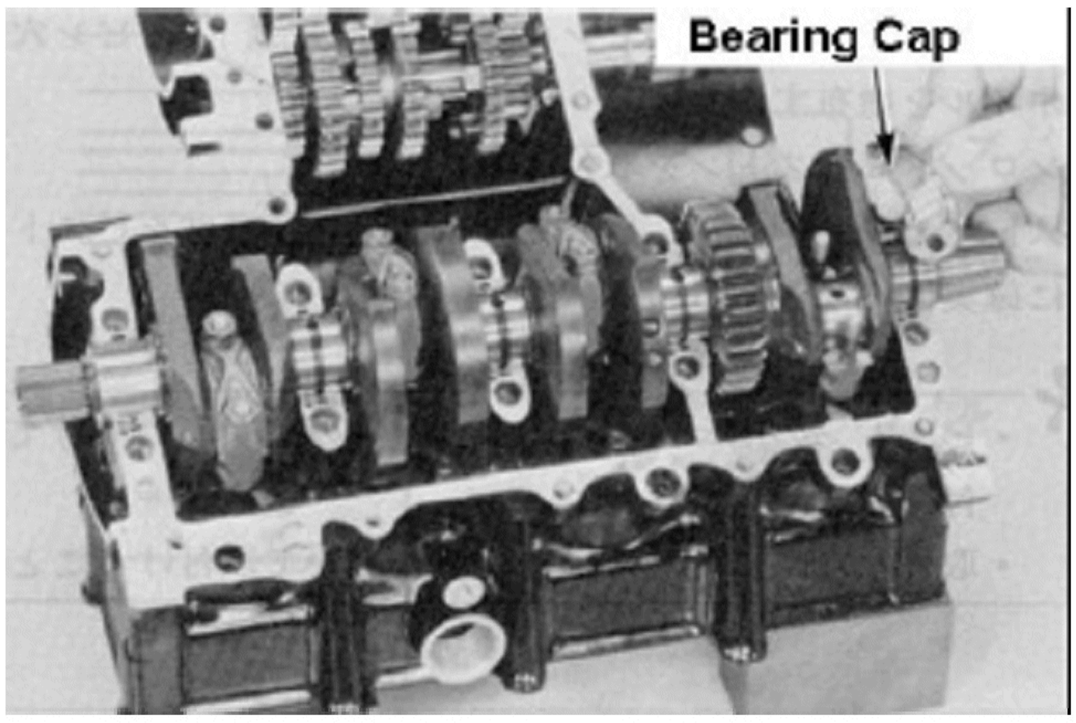
Attachment of the crankshaft
Apply MoS^2 grease to the journal of the crankshaft and the crankpin and attach to the cylinder block.

In order to avoid damaging the crankshaft with the conrod, align the larger edge of the conrod to the crankpin.



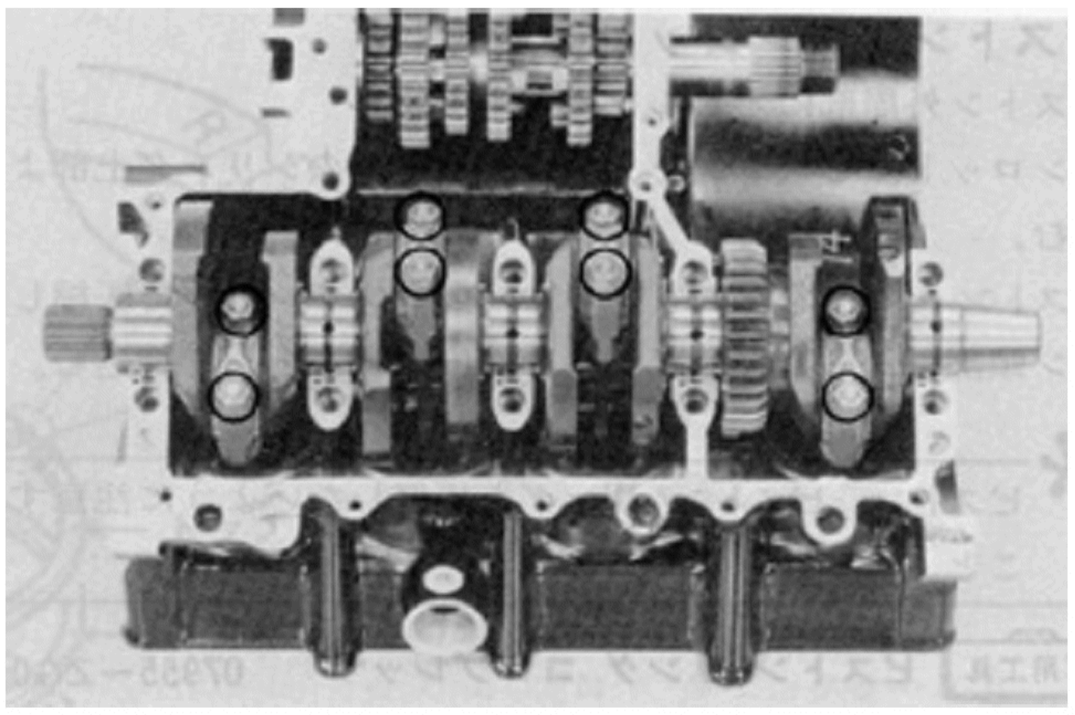
Attach the conrod bearing cap.

Ensure the bearing cap is attached in the direction the same as before disassembly.



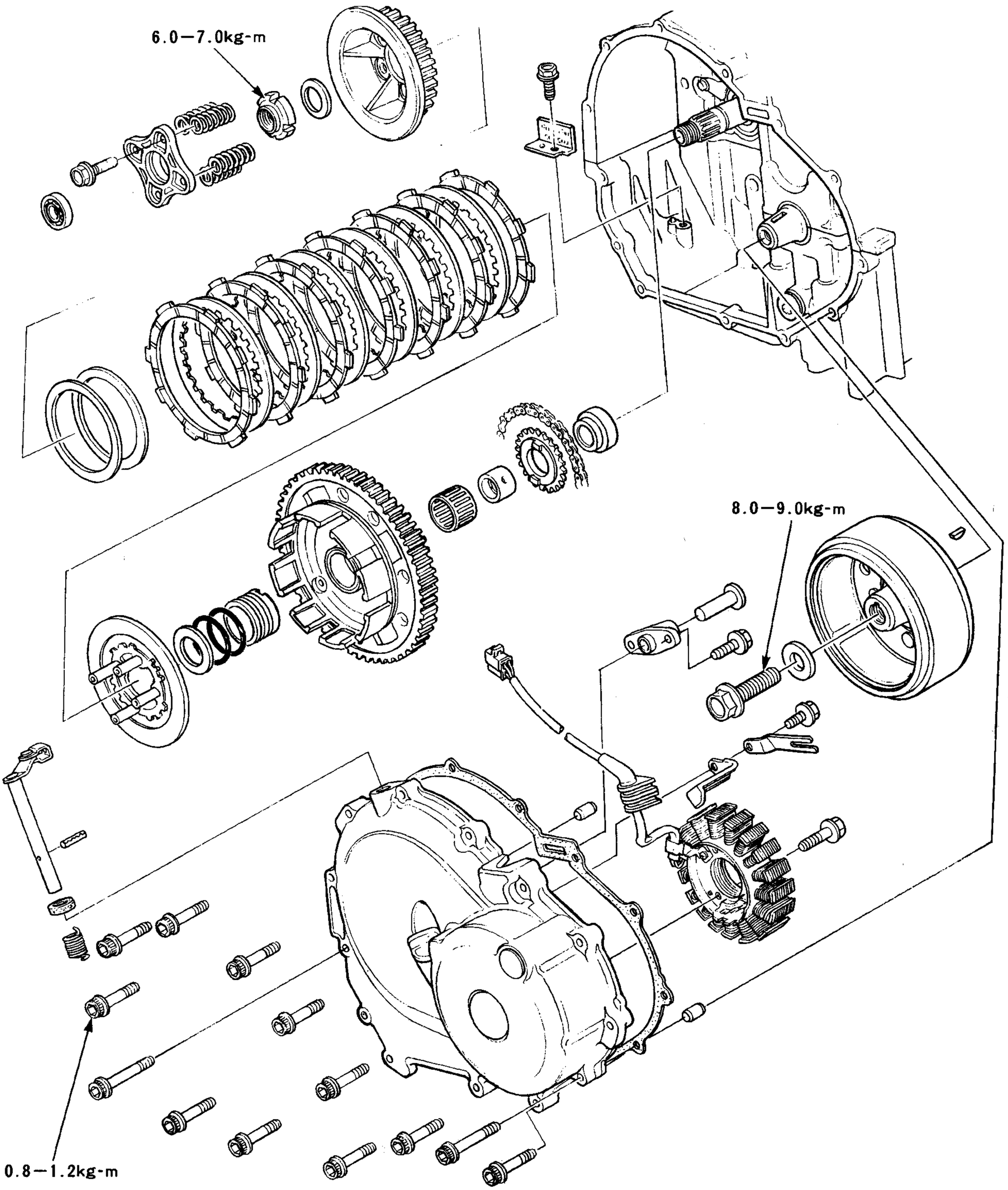
Attach cap nuts and tighten.
Tightening Torque: 1.5 ~ 1.9 kg m

Tighten the nuts in parallel so as to have equal torque among the nuts.



After tightening the nuts, confirm the smooth movement of the conrods by rotating the crankshaft.

- **Assembly**



Assembly	10–0	AC Generator detachment	10-4
Maintenance Information	10-1	Clutch	10-5
Troubleshooting	10-2	AC Generator attachment	10-12
Right crankcase cover detachment	10-3		

- Engine detachment is not required for the works in this chapter.
- Remove gasket materials on the attachment surfaces of the case.
- Keep the engine away from debris / mud.
- Do not damage the attachment surface when disassembling.
- AC generator troubleshooting (→ Sec. 17,18)
- Refer to 1-27 for AC generator total system troubleshooting.

Standard

Item		Standard	Limitation
Clutch	Free movement of the clutch lever	10-20	-
	Clutch spring resting length	34.79	33.79
	Clutch disk thickness	2.9-3.0	2.6
	Clutch plate distortion	-	0.3
	Clutch out guide inner diameter	21.995-22.015	22.03
Oil pump drive sprocket inner diameter		30.025-30.075	30.09
Oil pump drive gear collar	Inner dia	21.995-22.015	22.03
	Outer dia	29.987-30.000	29.97
	Height	22.300-22.400	22.20
Main shaft outer dia (clutch outer guide contact area)		21.980-21.990	21.97

Torque

Oil pump driven sprocket bolt	1.3-1.7kg m apply screw locking fluid
Clutch lock nut	6.0-7.0kg m
Flywheel bolt	8.0-9.0kg m
Right crankcase cover bolt	0.8-1.2kg m

Tools

Exclusive Tools

Clutch centre holder	07GMB – KT70100

Common tools

Flywheel holder	07725 - 0040000
Rotor puller	07733 - 0020001
Lock nut wrench (26x30mm)	07716 - 0020203
Extension Bar	07716 - 0020500

Clutch, AC Generator

Troubleshooting

Majority of the clutch troubles, come from inadequate free movement of the clutch lever. Inspect and adjust this before disassembling the clutch.

The clutch slips when accelerating

- Too small free movement of the lever.
- Clutch disks worn out.
- Clutch springs weak/sagged.

Unable to part the clutch

- Too much free movement of the lever.
- Distorted / bent clutch plate.

Unstable clutch movement

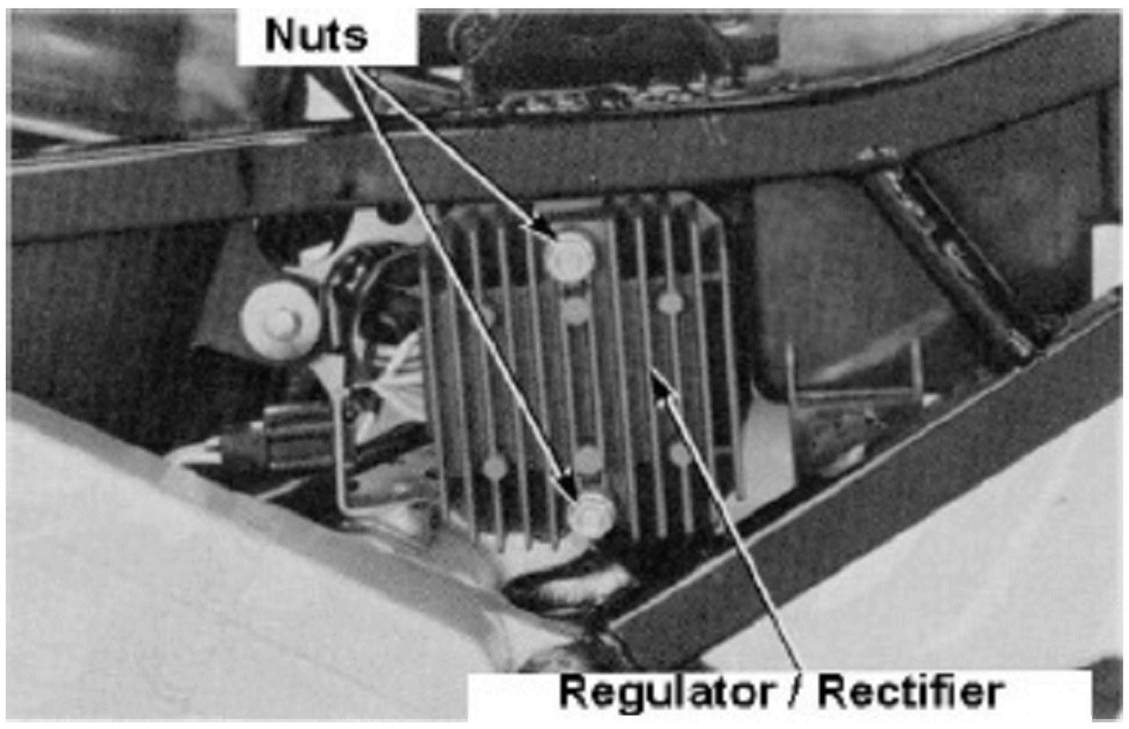
- Clutch outer slit worn out.

The lever is stiff

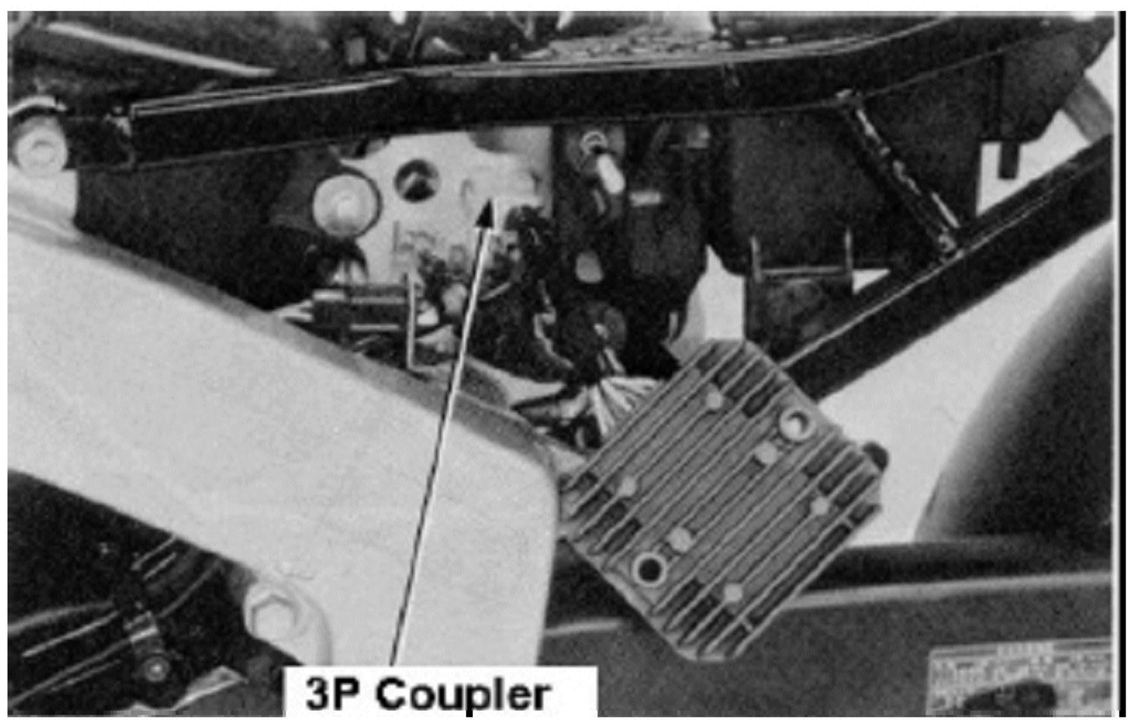
- Clutch cable damaged or clogged with mud.
- Lifter mechanism failure.
- The cable is not going through the proper places.

Crankcase detachment

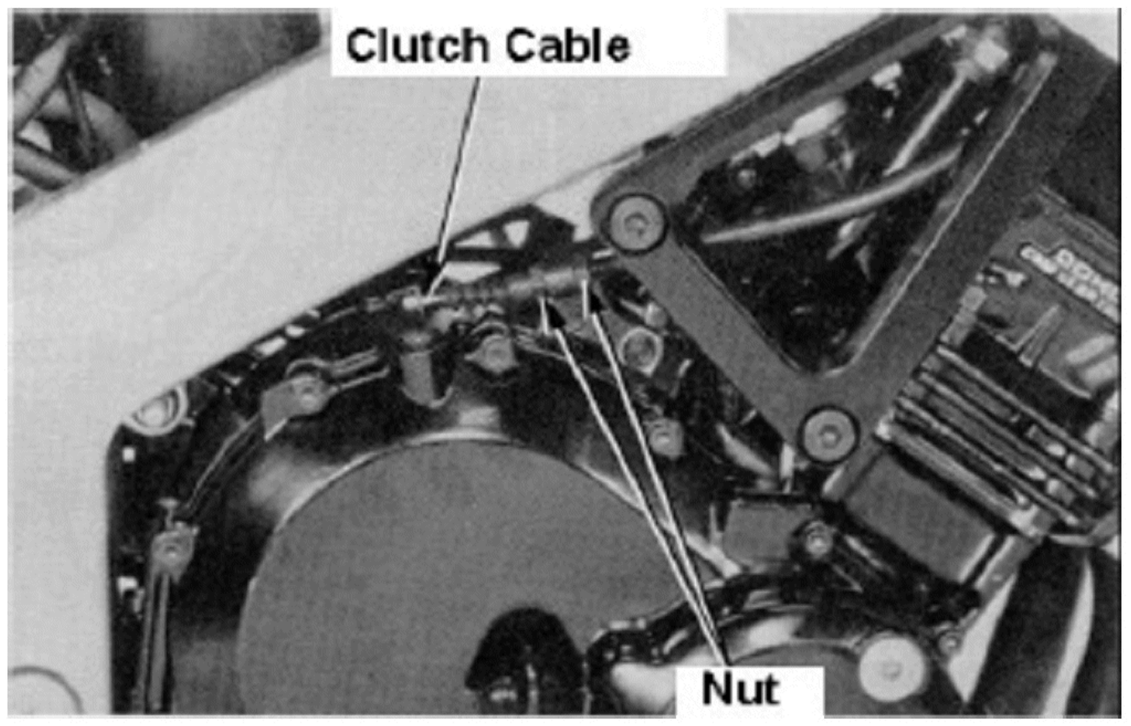
Drain engine oil (2-16)
Detach the seat
Remove the side cover
Remove regulator / rectifier attachment nuts.



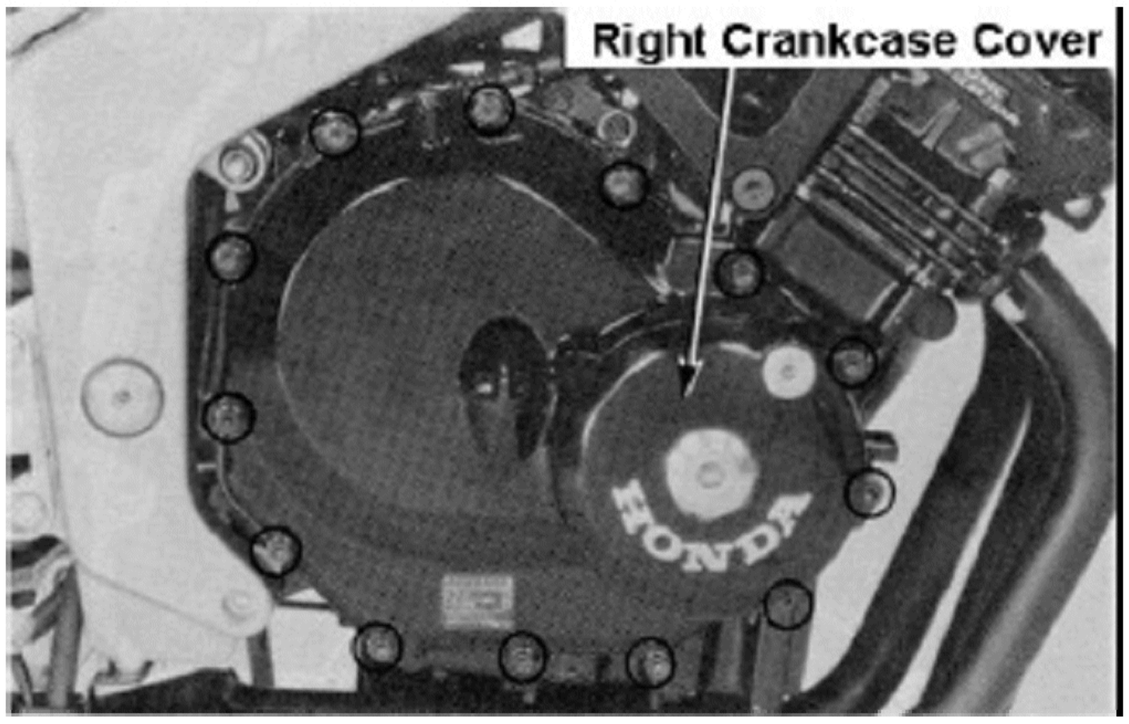
Disconnect the 3P coupler on the regulator / rectifier.



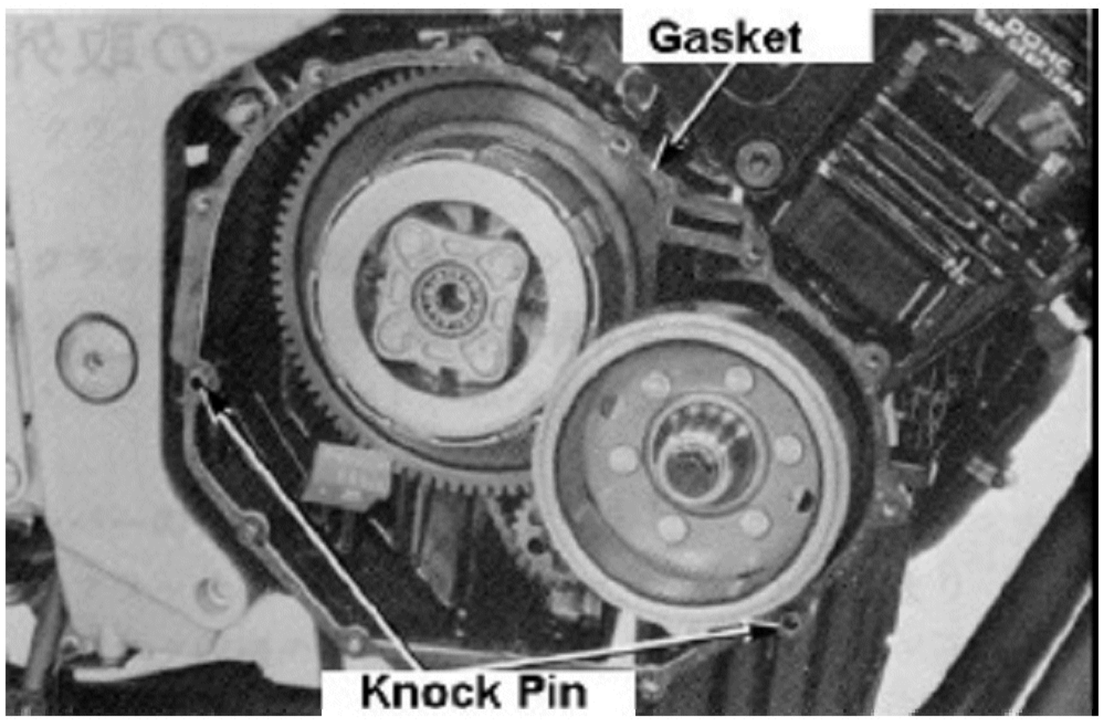
Loosen the clutch cable adjust nut and lock nut.
Remove the clutch cable.



Remove the right crankcase cover attachment bolts and detach the crankcase cover.

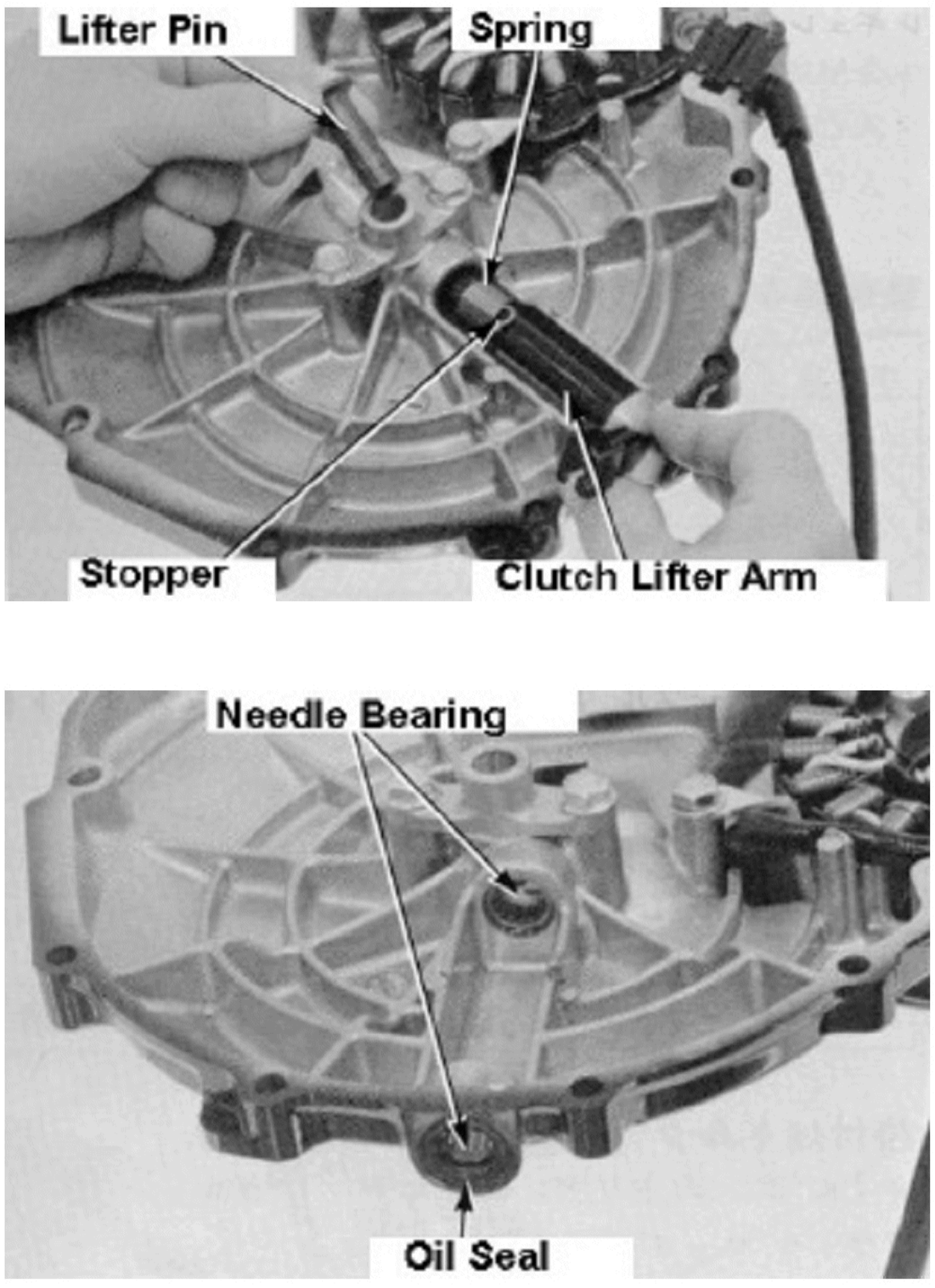


Remove gasket and knock pins.



Inspection of the clutch lifter

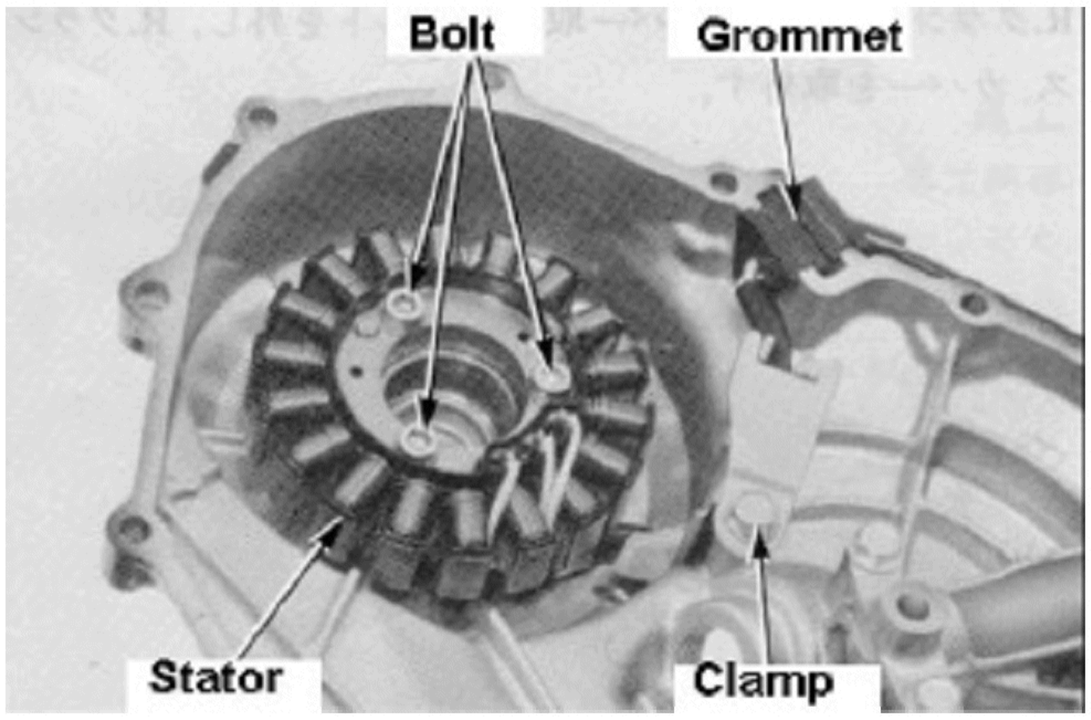
Remove the lifter pin and the spring.
Remove the spring stopper and detach the clutch lifter arm.
Inspect the lifter pin and the clutch lifter arm for damage.
Inspect the spring for stretch.



Inspect the needle bearing for wear, damage and loose attachment. Inspect the oil seal for wear and deformation.

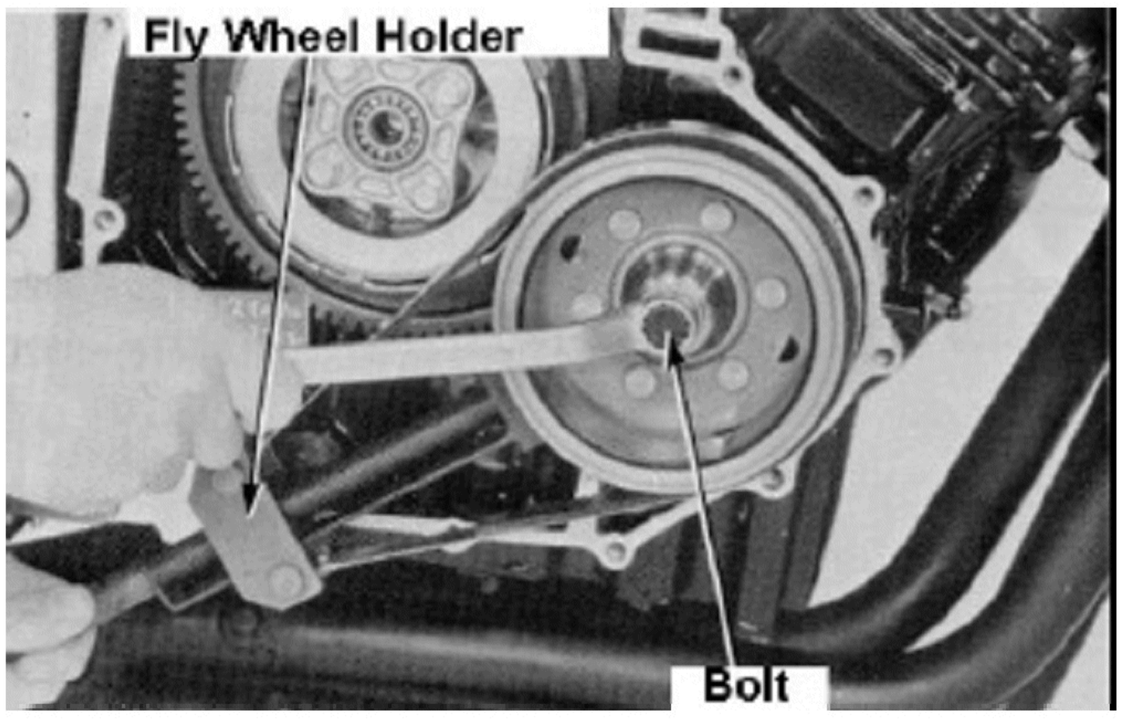
AC Generator Detachment

Remove the grommet.
Remove the AC Generator wire clamp.
Remove the stator attachment bolt and detach the stator from the right crankcase cover.



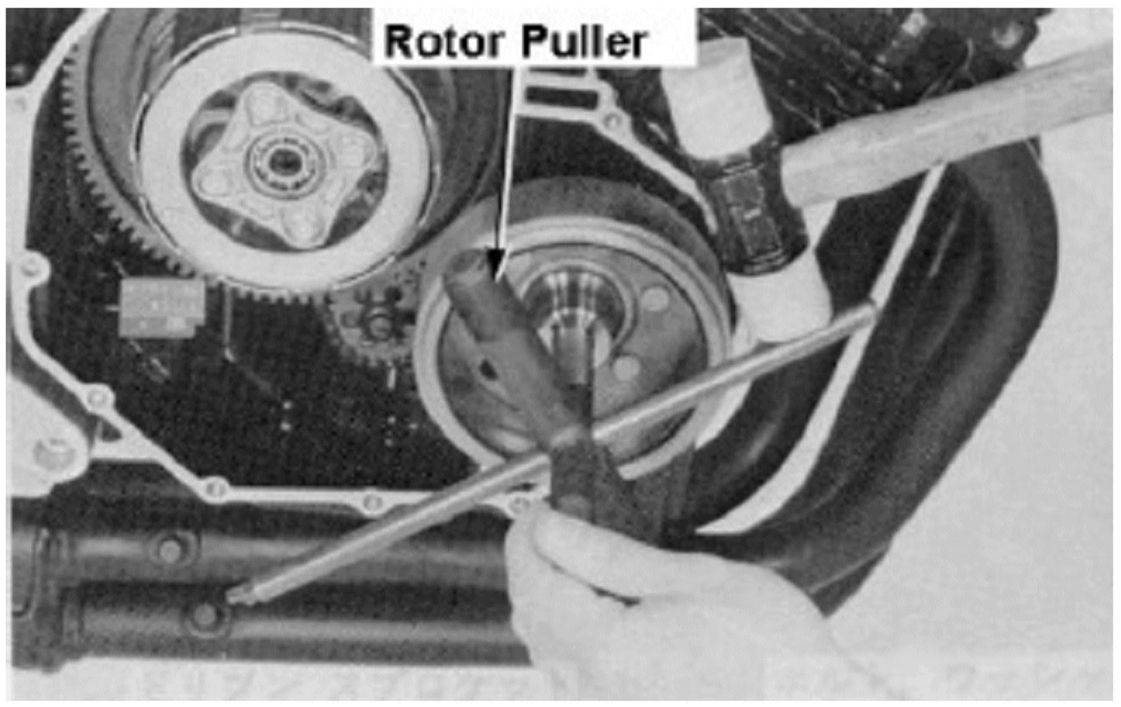
Fix the flywheel with a flywheel holder and remove the bolt.

Common Tool:
Flywheel holder 07725-0040000



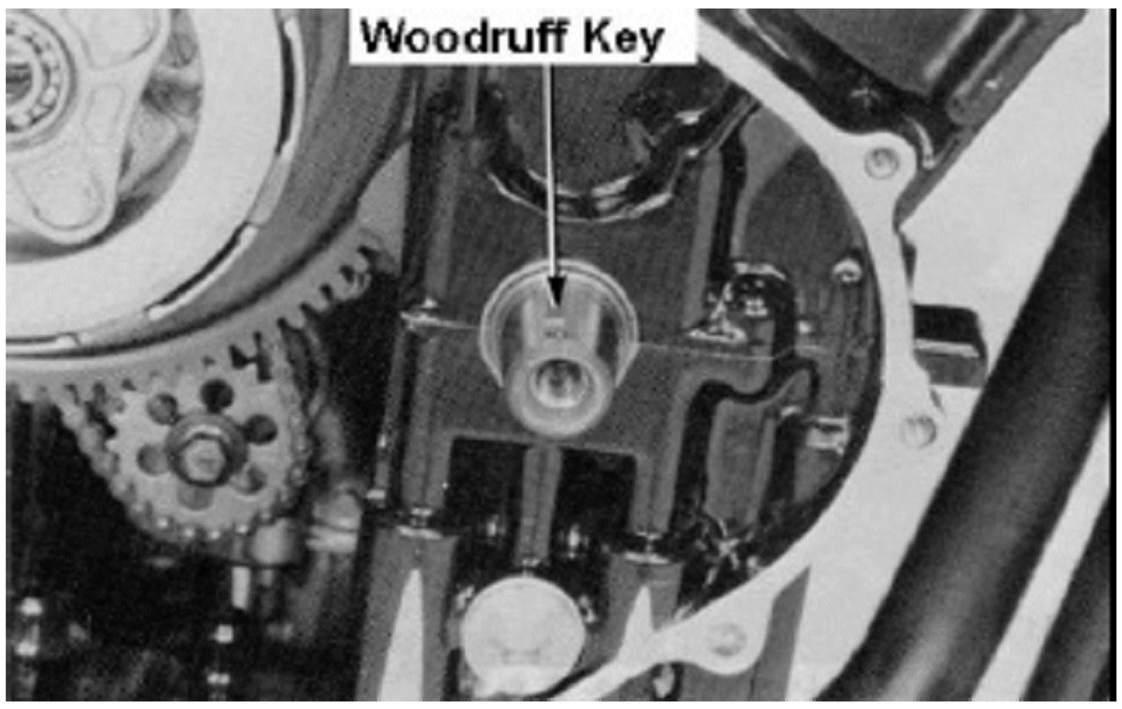
Use a rotor puller to detach the flywheel.

Common Tool:
Rotor puller 07733-0020001



Remove the wood ruff key from the crankshaft.

Do not lose the woodruff key

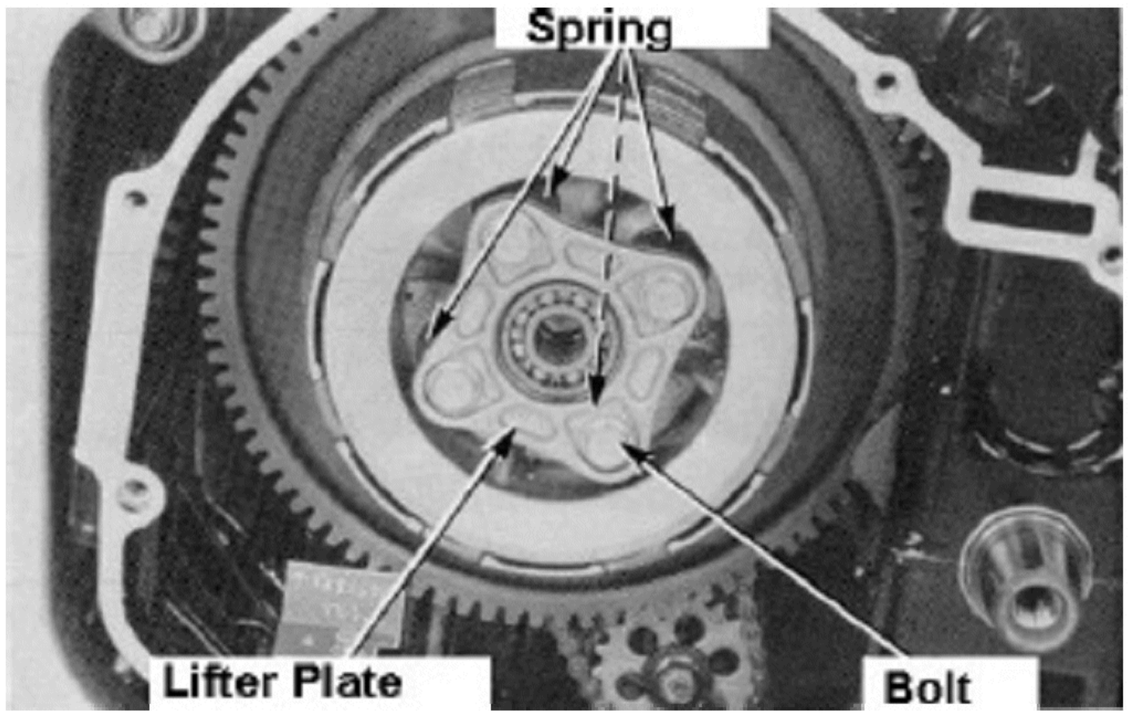


Clutch

Detachment

Detach the right crankcase cover (10-3).
Remove bolts and detach the clutch lifter plate and clutch springs.

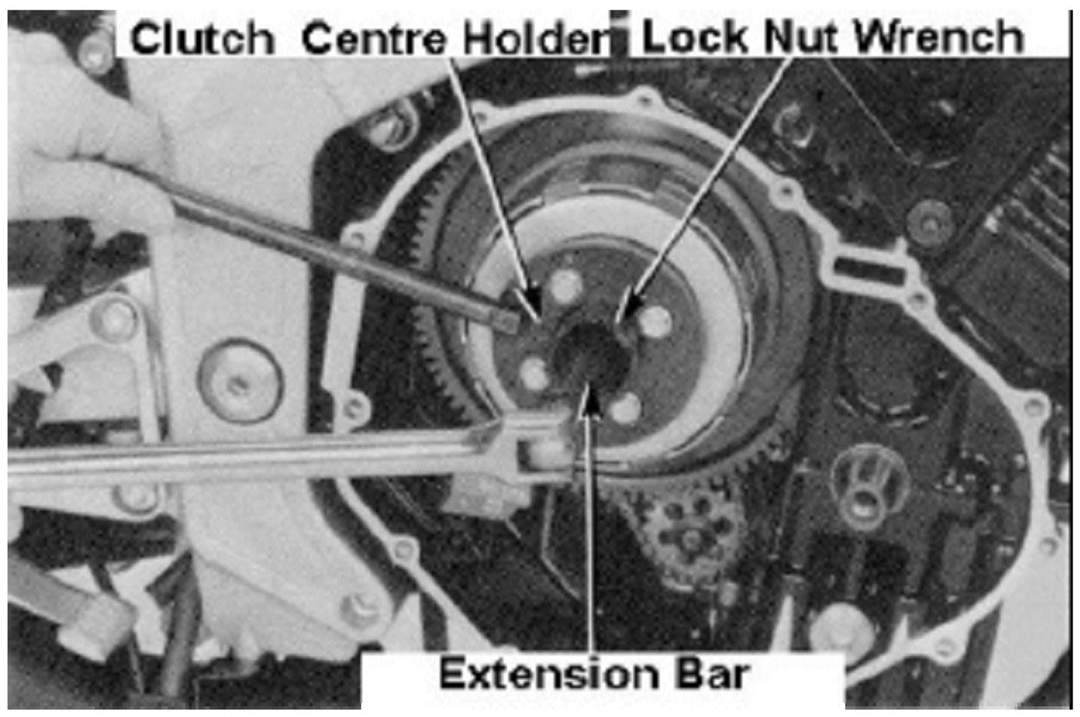
Loosen the clutch lifter attachment bolts by each opposite corner.



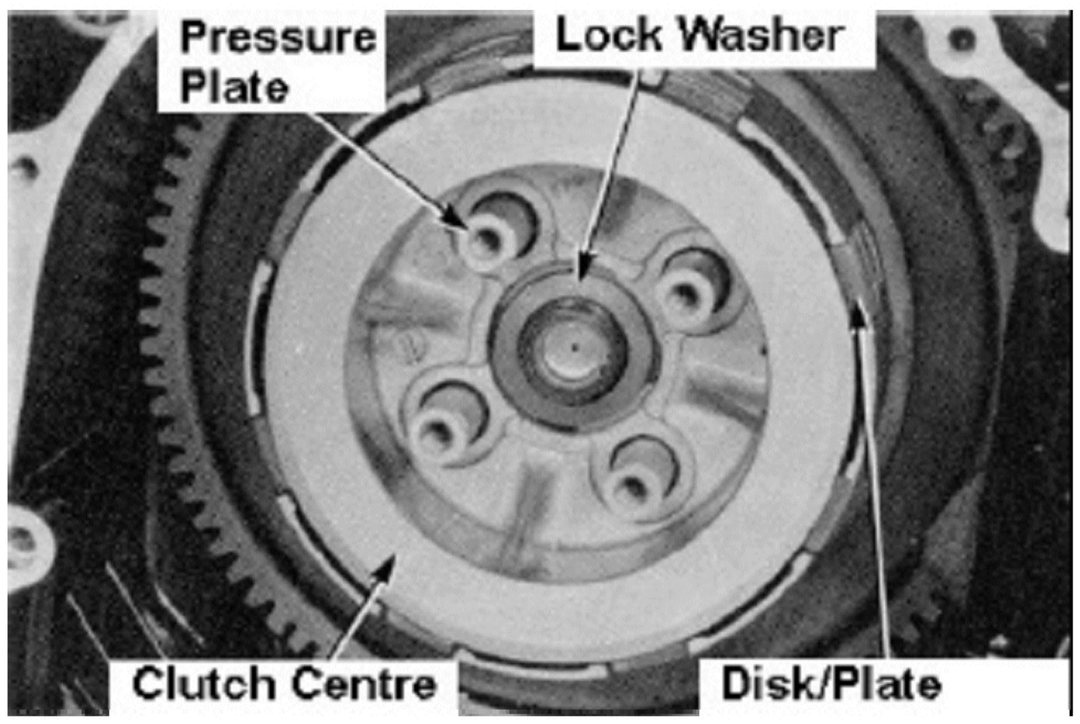
Fix the clutch with the clutch centre holder and remove the clutch centre lock nut.

Exclusive Tool:
Clutch centre holder 07GMB-KT0100

Common Tool:
Lock nut wrench (26 x 30mm)
07716-0020203
Extension bar 07716-0020500

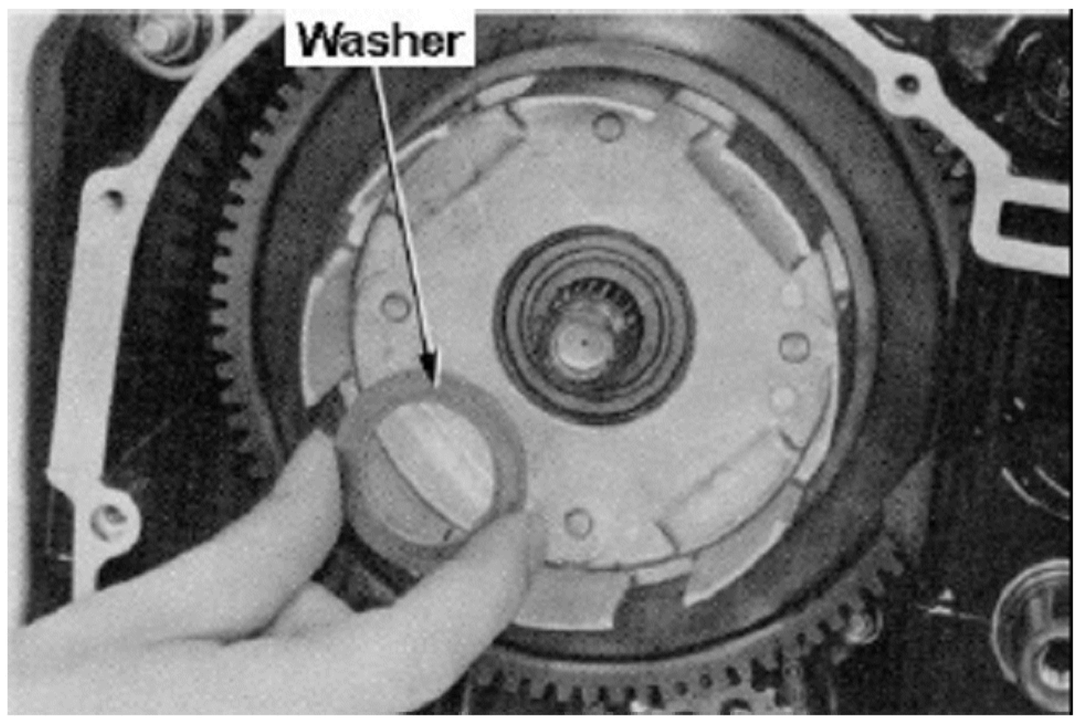


Detach the clutch centre holder. Detach the lock washer, clutch centre, shudder spring, disc, plate and the pressure plate.



Remove the thrust washer

Attach the woodruff key to the crankshaft and attach the flywheel. Rotate the flywheel clockwise until the weight and conrods on the crankshaft do not obstruct when detaching the primary driver gear.

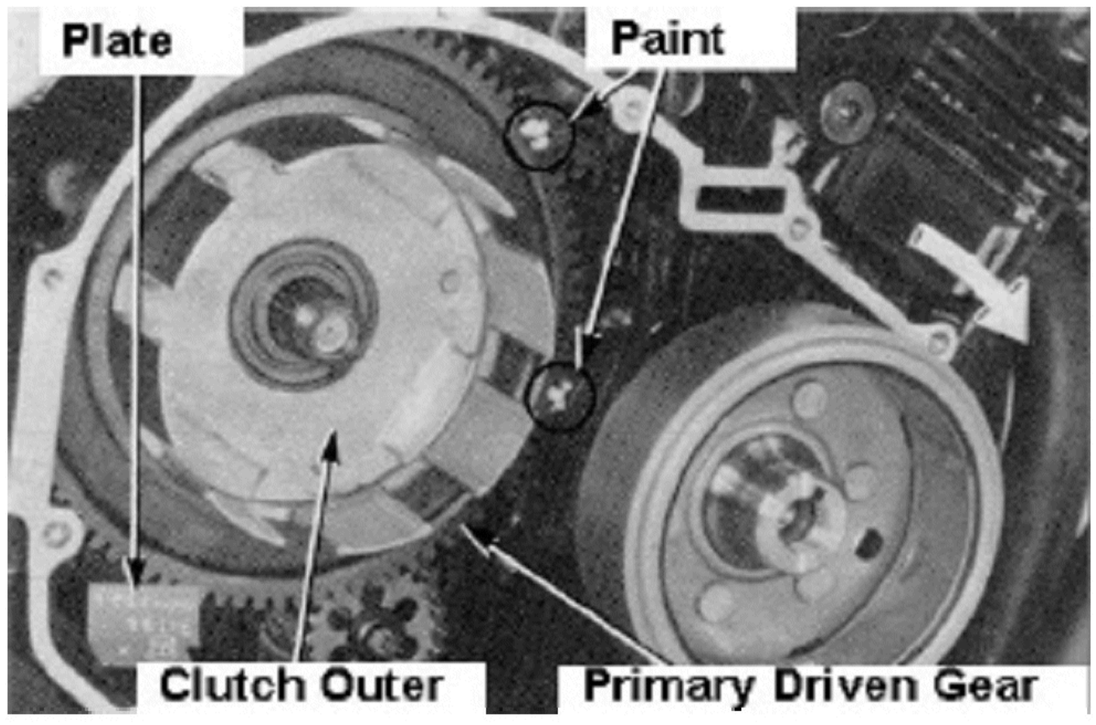


Paint the engaging part between the primary driver gear and a primary drive gear, first cam gear as shown in the photo on the right.

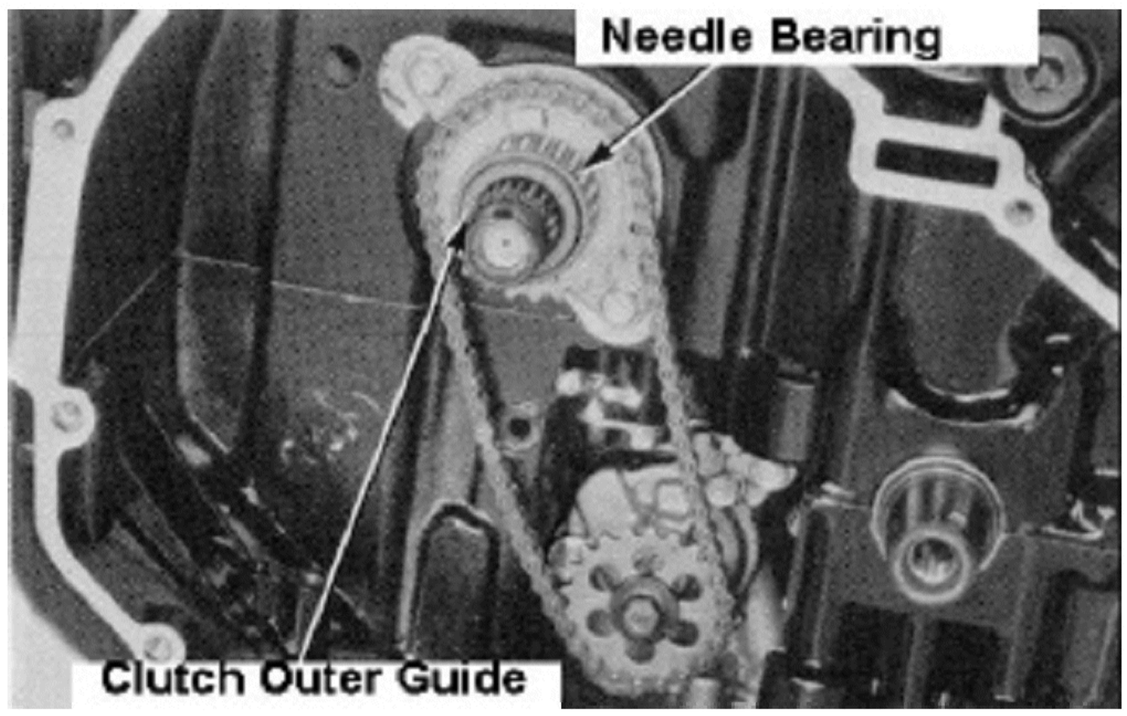
Wipe off oil when painting

Detach the stopper plate.
Detach the flywheel and the clutch outer.

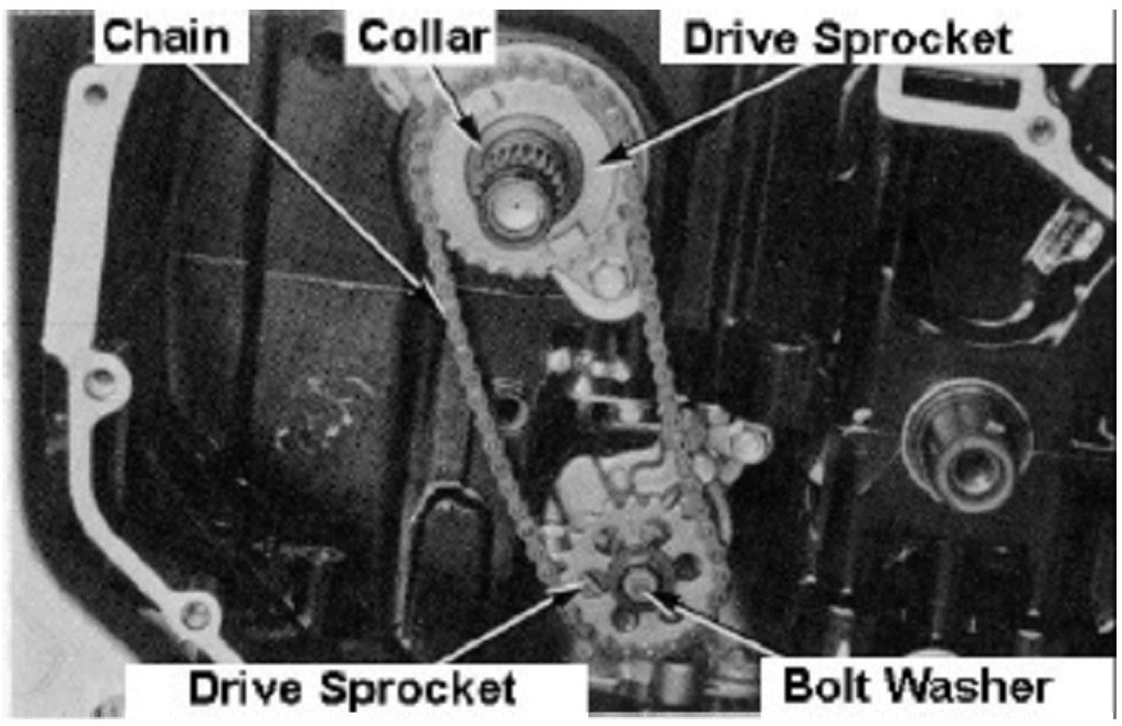
Do not rotate the crankshaft while detaching the clutch outer.



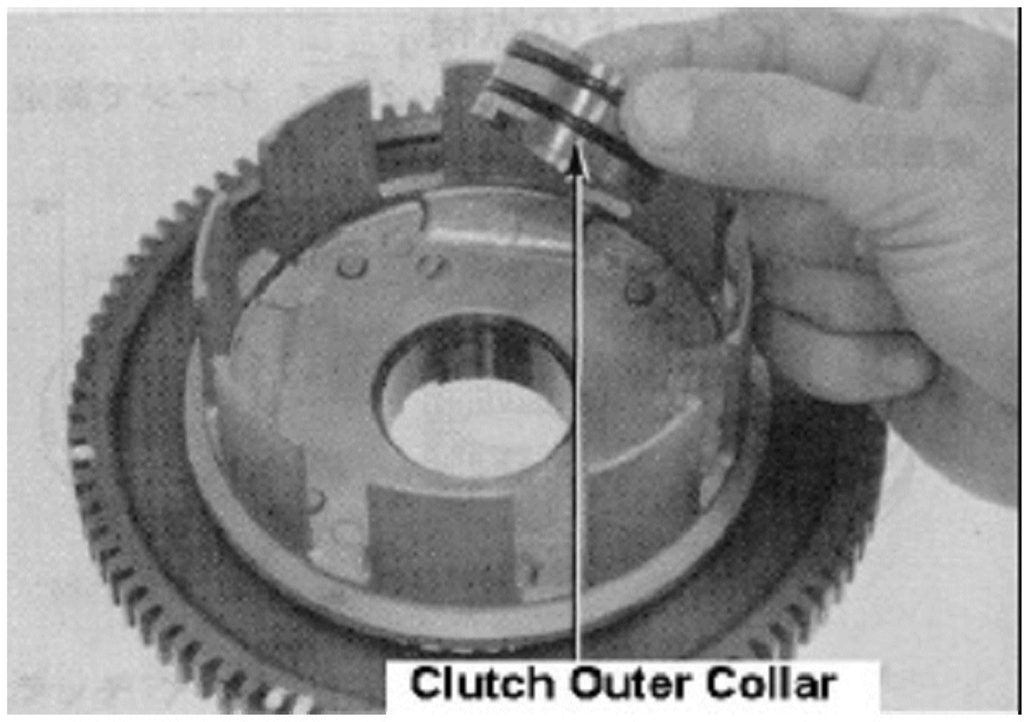
Detach the needle bearing and the clutch outer guide.



Remove bolts and washers. Detach oil pump drive sprocket, collar, chain and the oil pump driven sprocket.



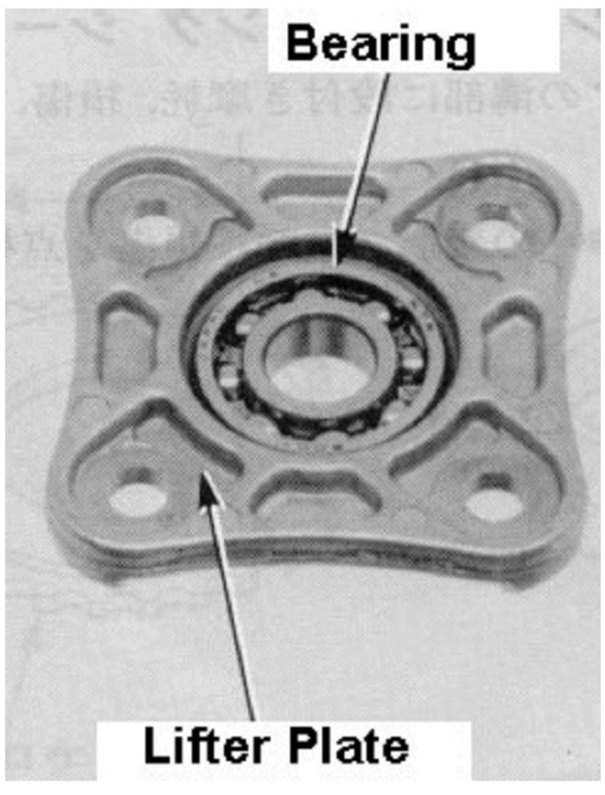
Detach the clutch outer collar from the clutch outer.



Lifter plate bearing inspection

Rotate the inner surface of the bearing by hand. Inspect for loose attachment or any abnormal noise.

Inspect the slit between the outer surface of the bearing and the lifter surface of the bearing and the lifter plate for any loose parts.

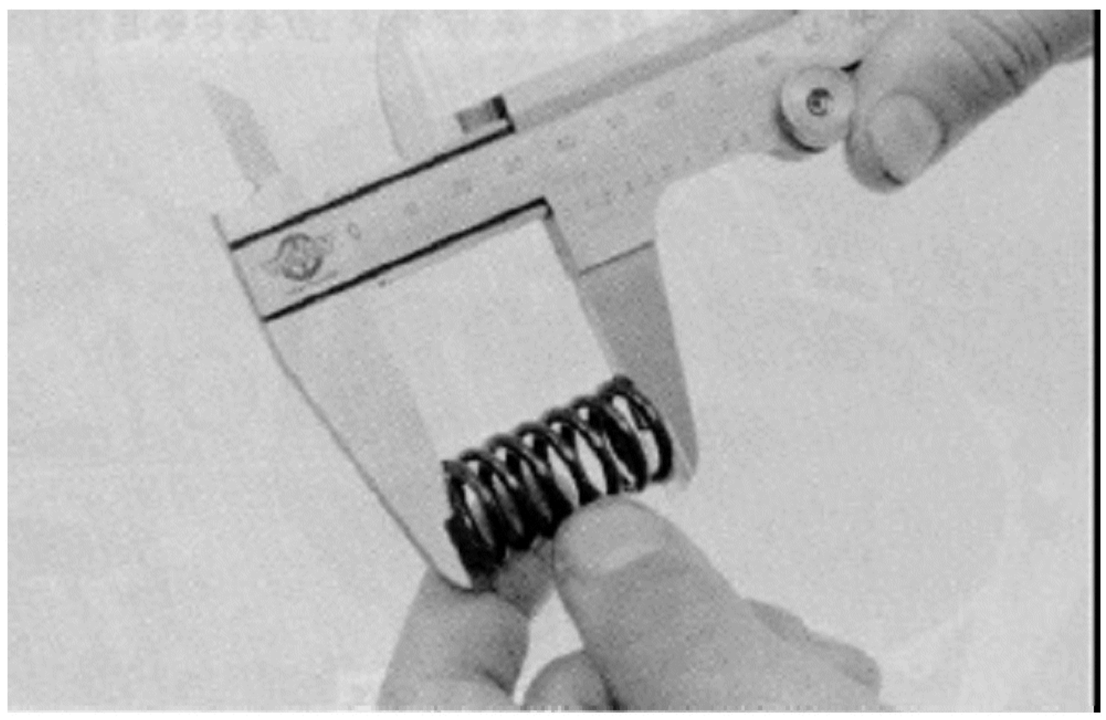


Clutch Springs Inspection

Measure the resting length of the spring

≦ 33.79 → replace

Replace all springs at the same time



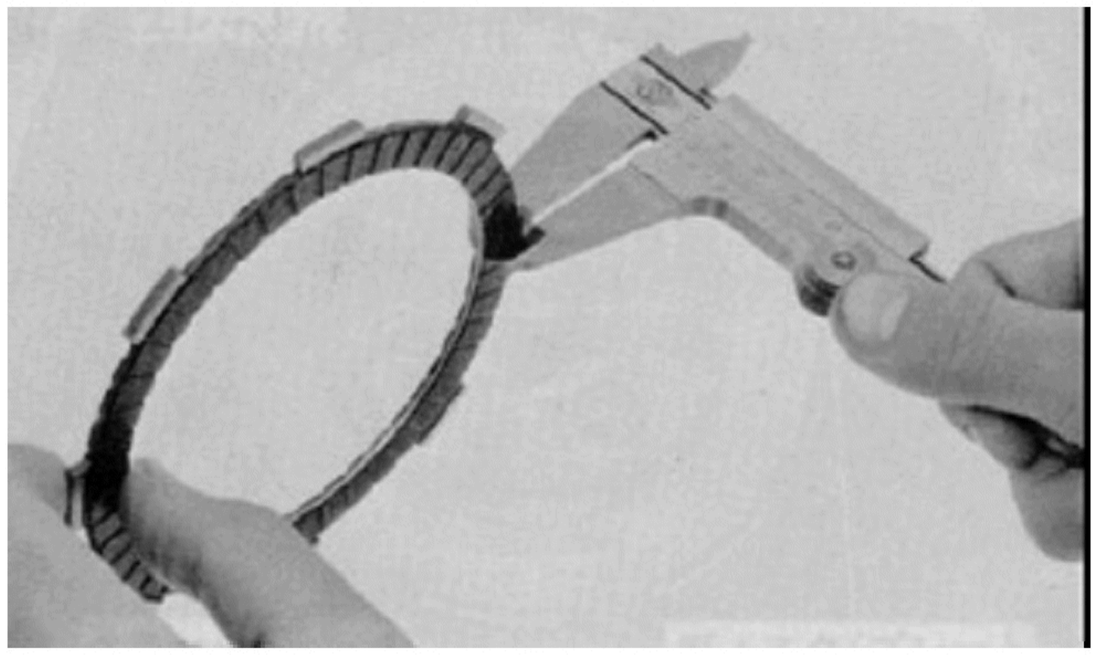
Clutch Disc Inspection

Replace the disc if there is any damage or irregular colour.

Measure the thickness of the disc.

≦ 2.6mm → replace

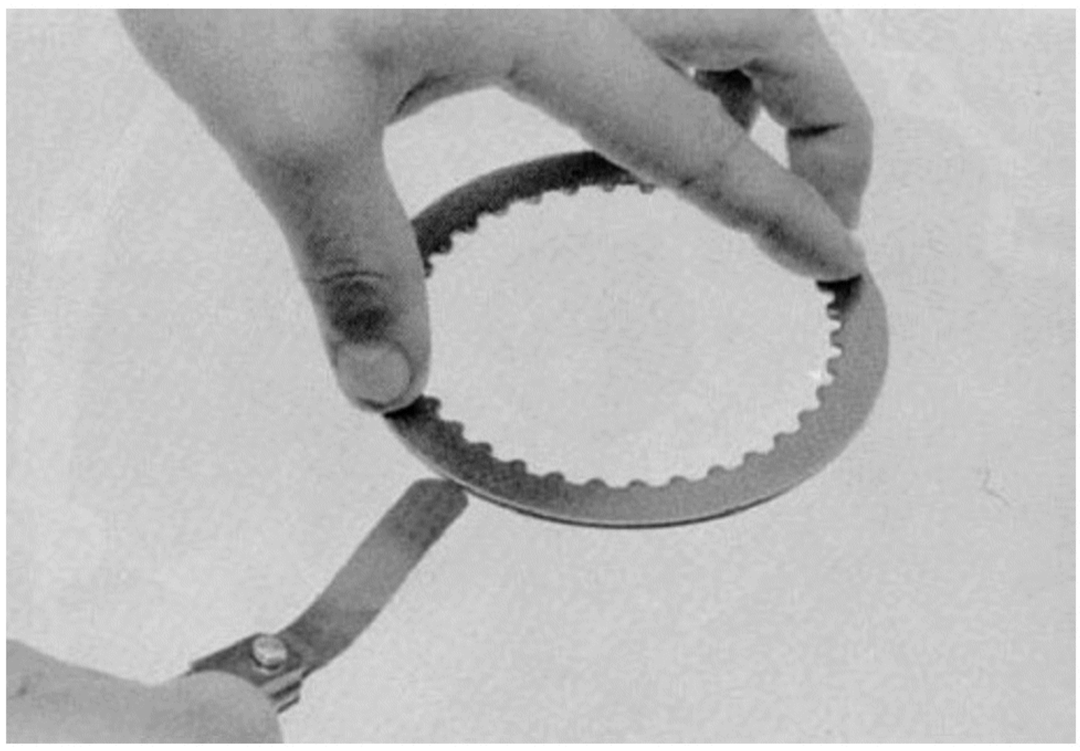
Replace both disc and the plate at the same time.



Clutch Plate Inspection

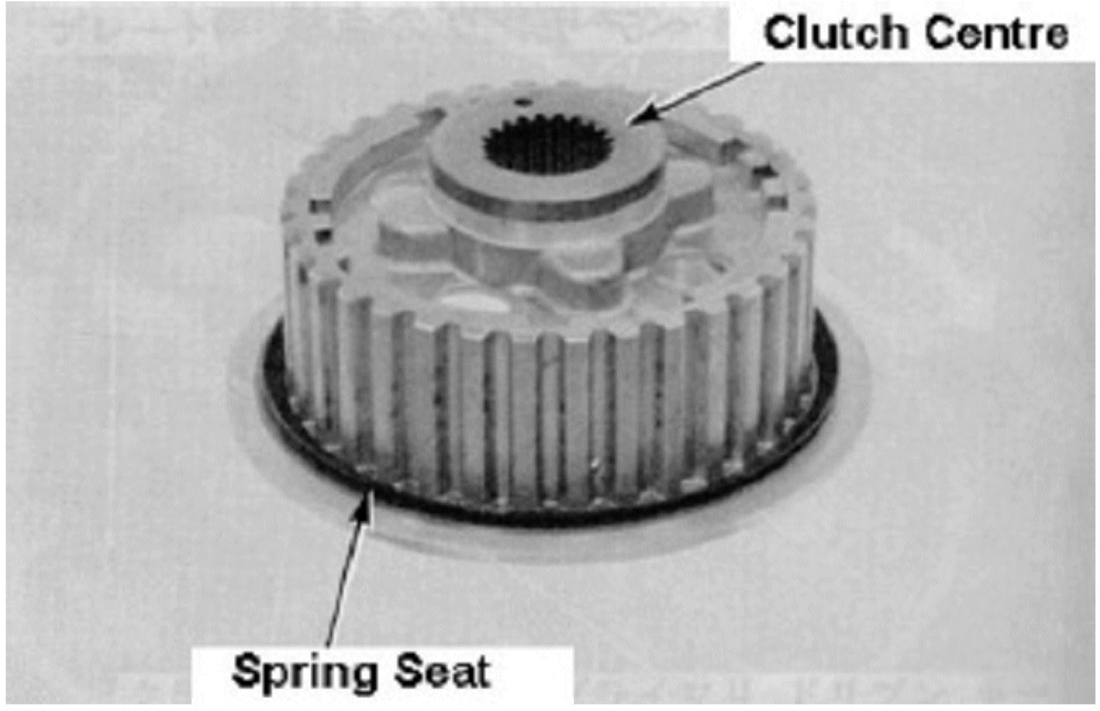
Place the plate on a working table.
Measure the distortion of the plate with a thickness gauge.

≧ 0.3mm → replace



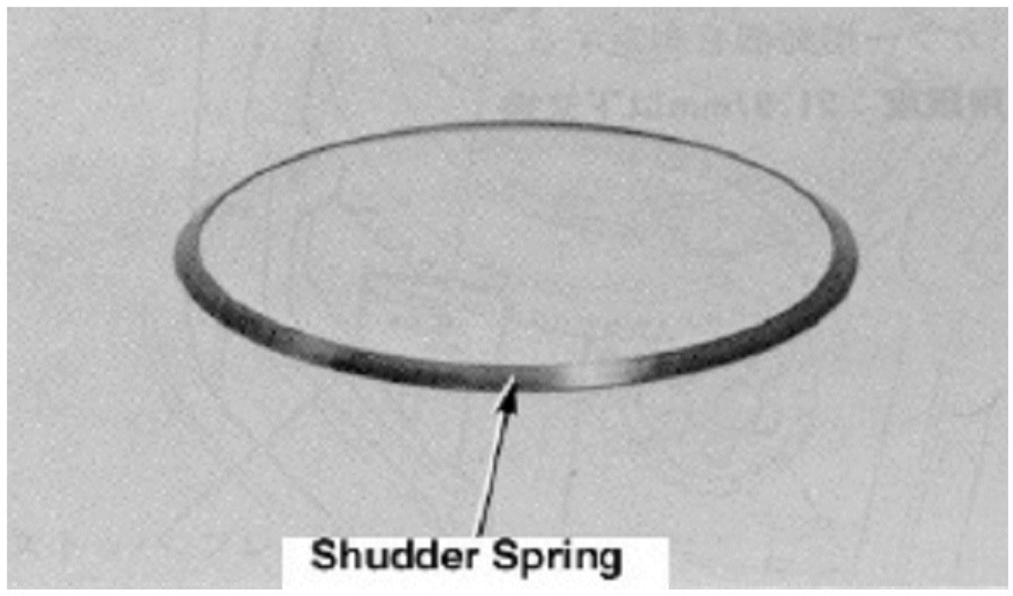
Clutch Centre and the Spring Seat Inspection

Inspect the slits on the clutch centre for stop wear, damage or cracking.
Inspect the spring seat for deformation, wear and damage.



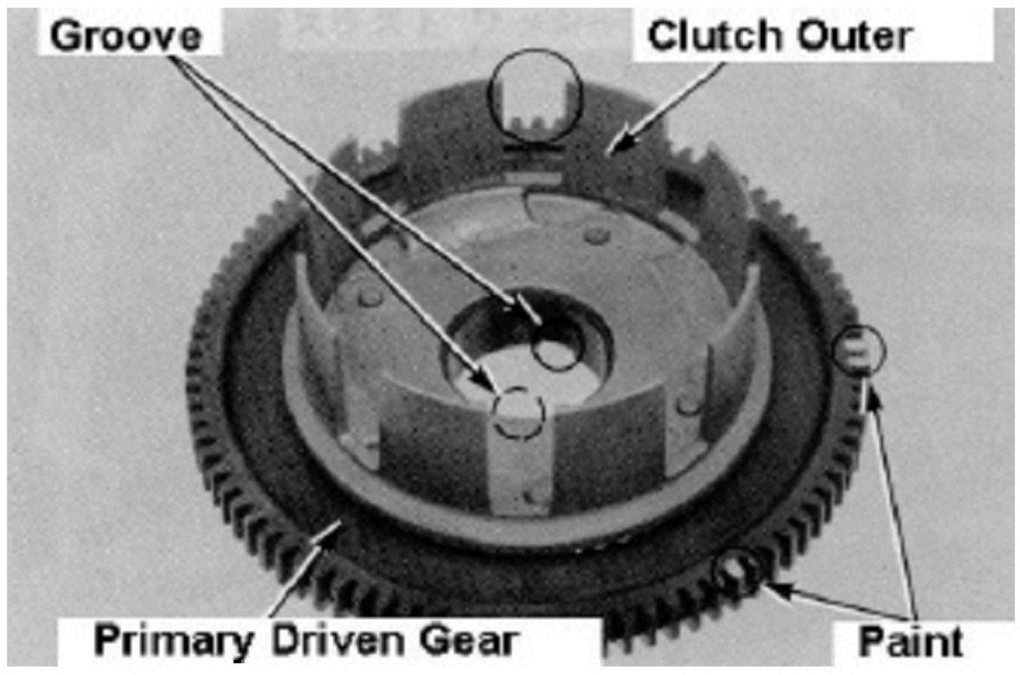
Shudder Spring Inspection

Inspect the spring for deformation, distortion, damage or wear.



Clutch Outer Inspection

Inspect the clutch outer for damage, cracking or irregular wear caused by the disc. Inspect the creeks for wear and damage.
Inspect the primary driven gears for wear and damage.



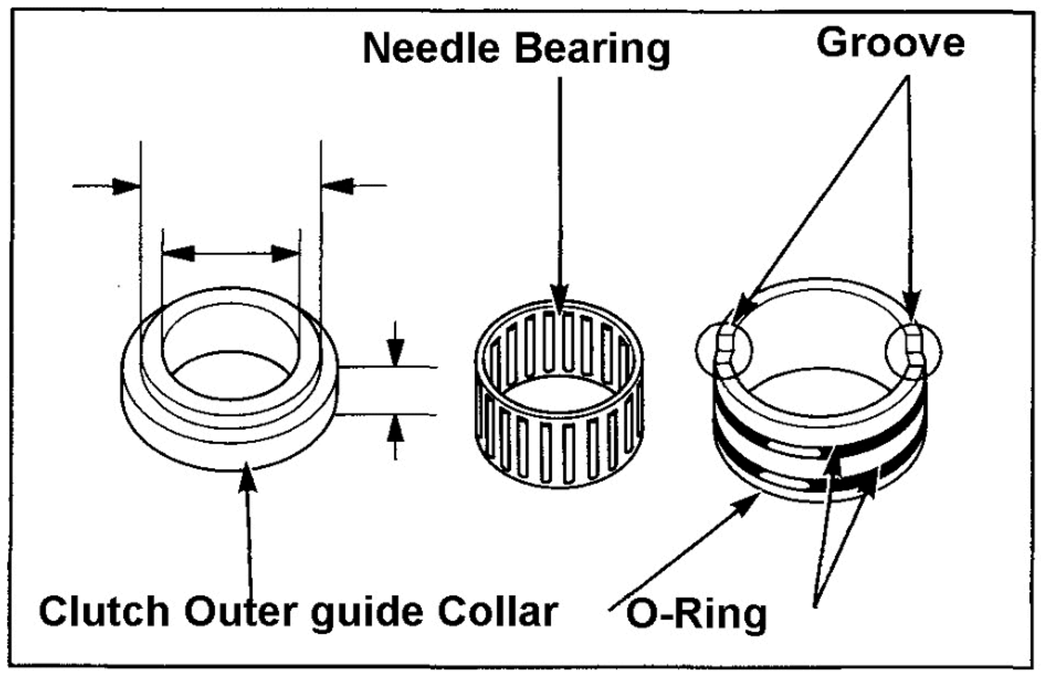
Paint the new clutch outer/primary driven gear on the same place as the old one when it needs to be replaced.

Clutch outer guide, clutch outer collar and needle bearing inspection

Measure the inner diameter of the clutch outer guide.

≧ 22.03mm → replace

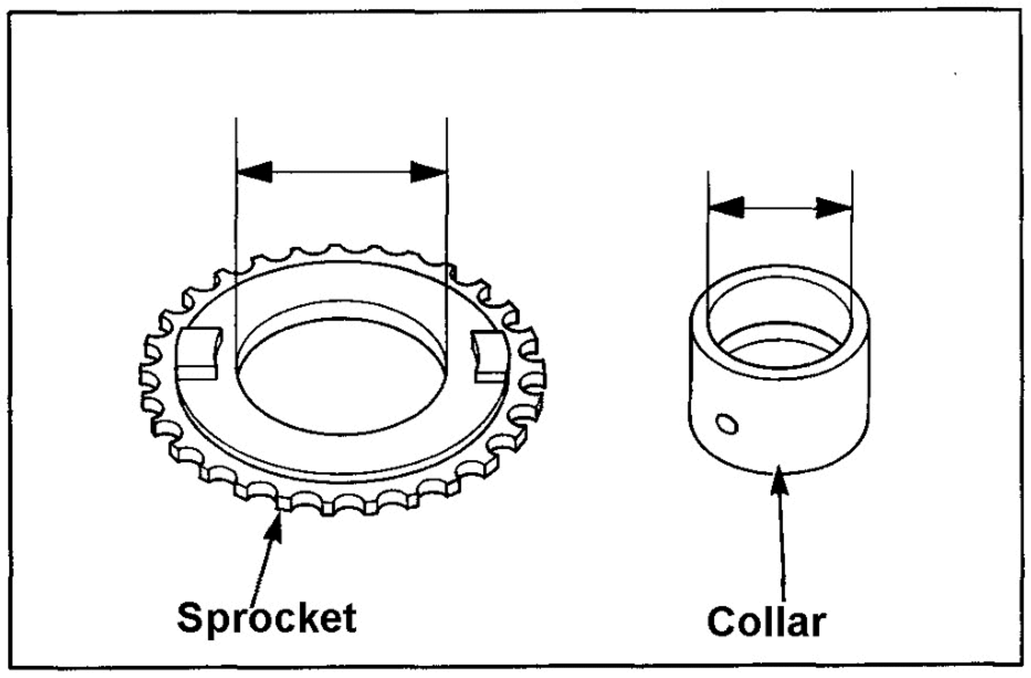
Inspect the O-Ring on the clutch outer collar for deformation. Inspect the creek for wear and damage.
Inspect the roller on the needle bearing for wear and damage.



Oil pump drive sprocket and collar inspection

Measure the inner diameter of the oil pump drive sprocket.

≧ 30.09mm → replace



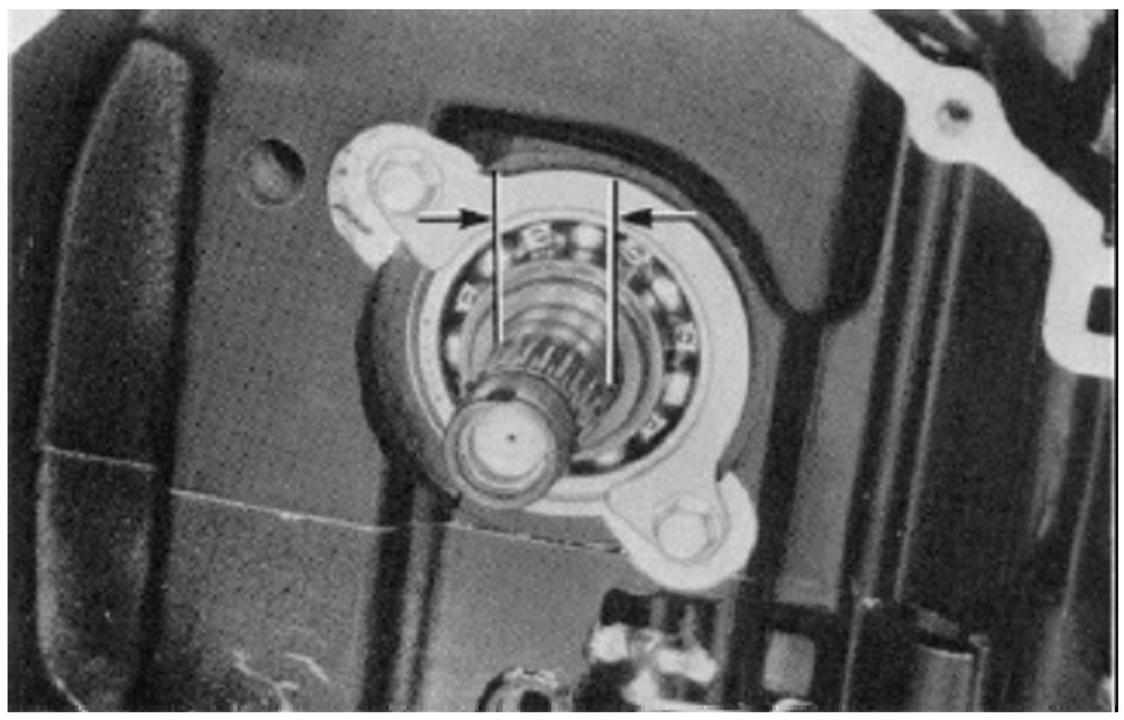
Measure the dimension of the collar.

Inner Diameter:	≧ 22.03mm	)
Outer Diameter:	≦ 29.97mm	) replace
Height:	≦ 22.20mm	)

Main Shaft Inspection

Measure the clutch outer guide, drive sprocket collar contact surface.

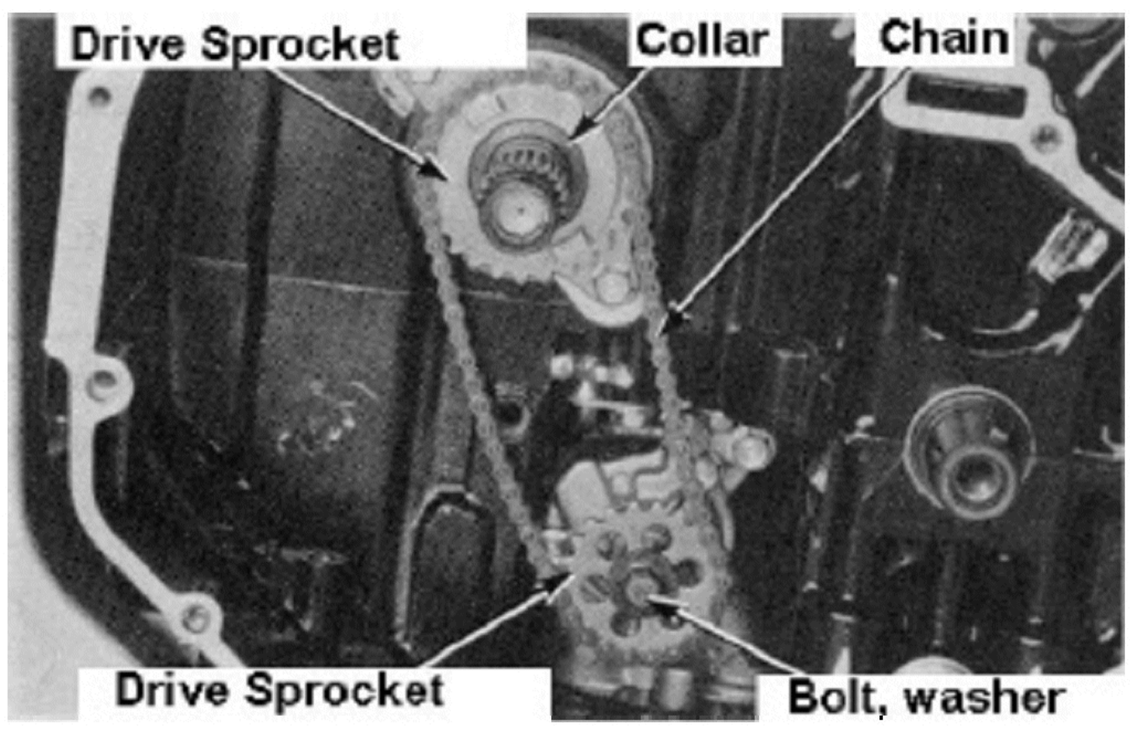
≦ 21.97mm → replace



Attachment

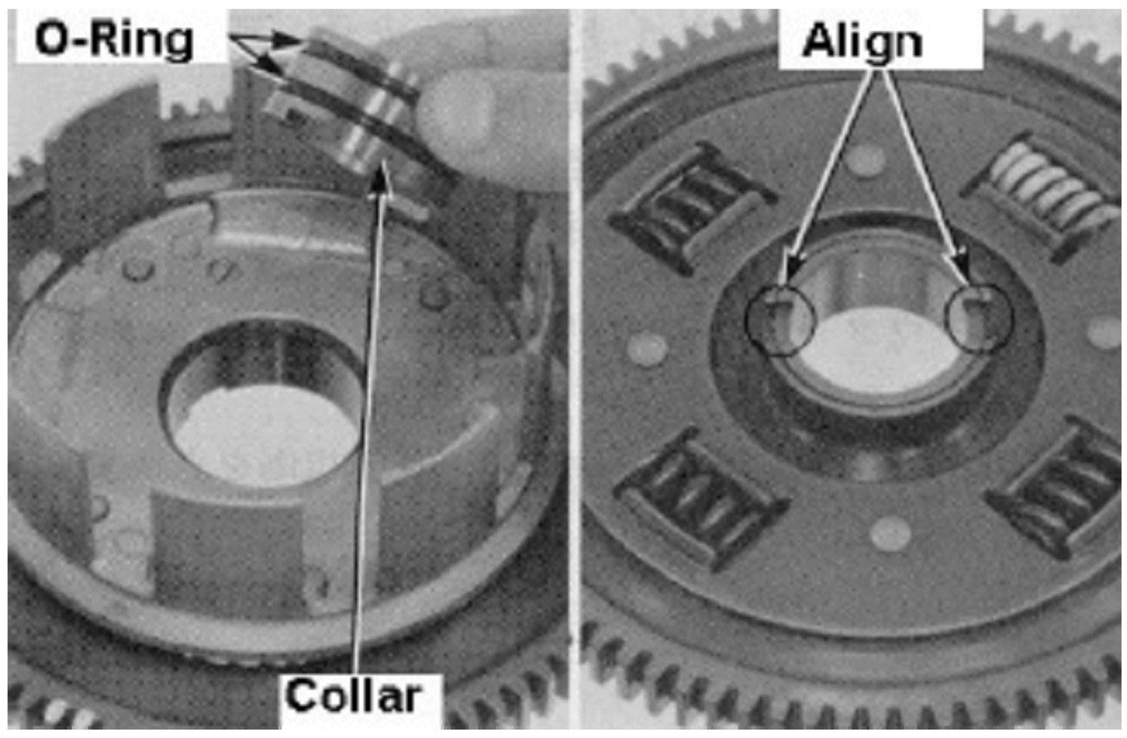
Attach the oil pump drive sprocket collar to the main shaft.
Attach the oil pump drive gear, chain and oil pump driven sprocket as an ASSY.
Apply screw-locking fluid to the thread of the driven sprocket attachment bolt and tighten with the washer to torque.

Torque: 1.3 ~ 1.7kg m

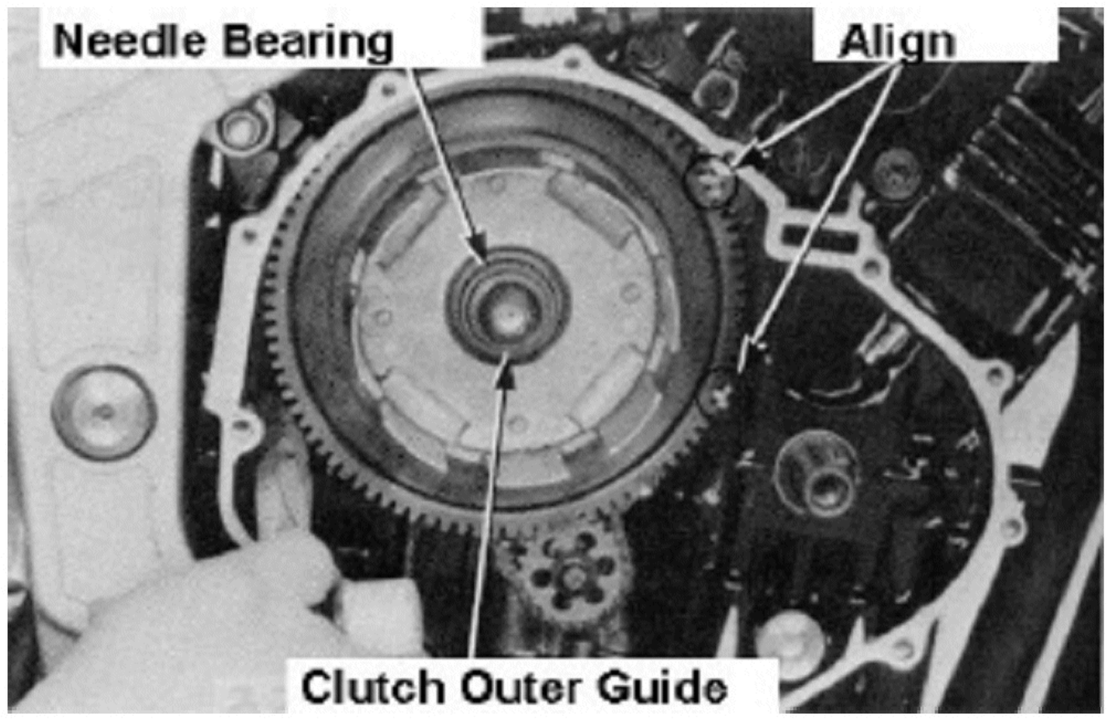


Apply oil to the bearing on the clutch outer.
Apply oil to the O-Ring and attach the clutch outer collar to the clutch outer.

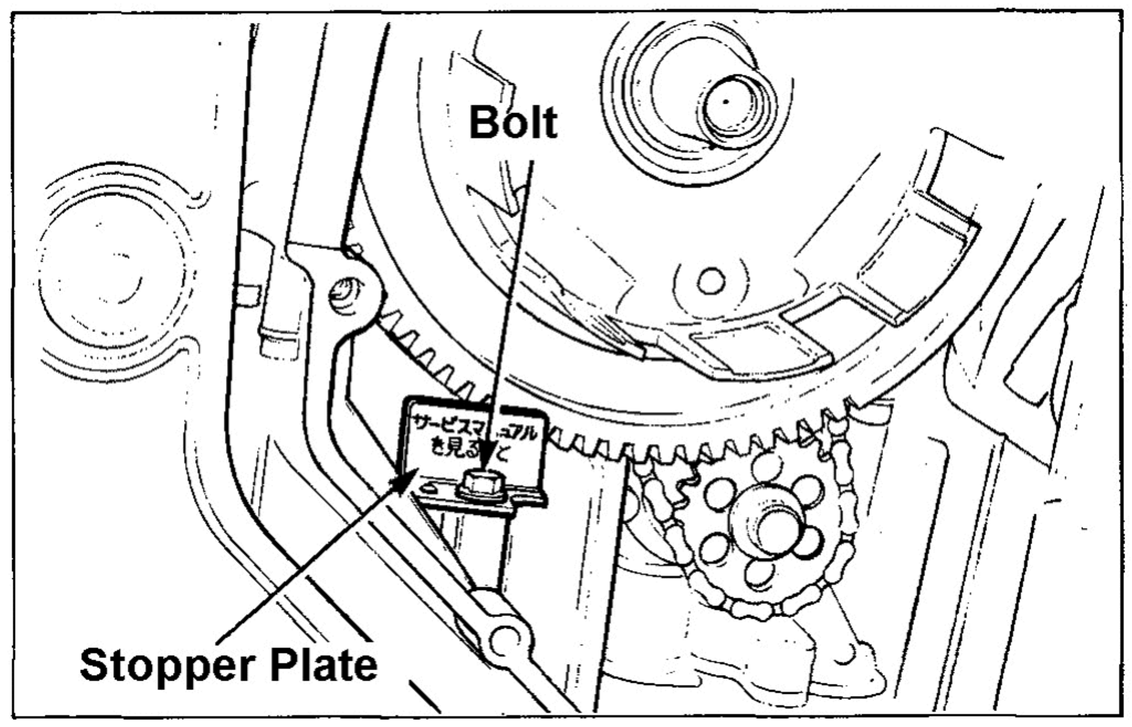
- As shown in the photo, the collar should be attached from the clutch outer side.
- Align the dent on the collar and the dent on the gear.



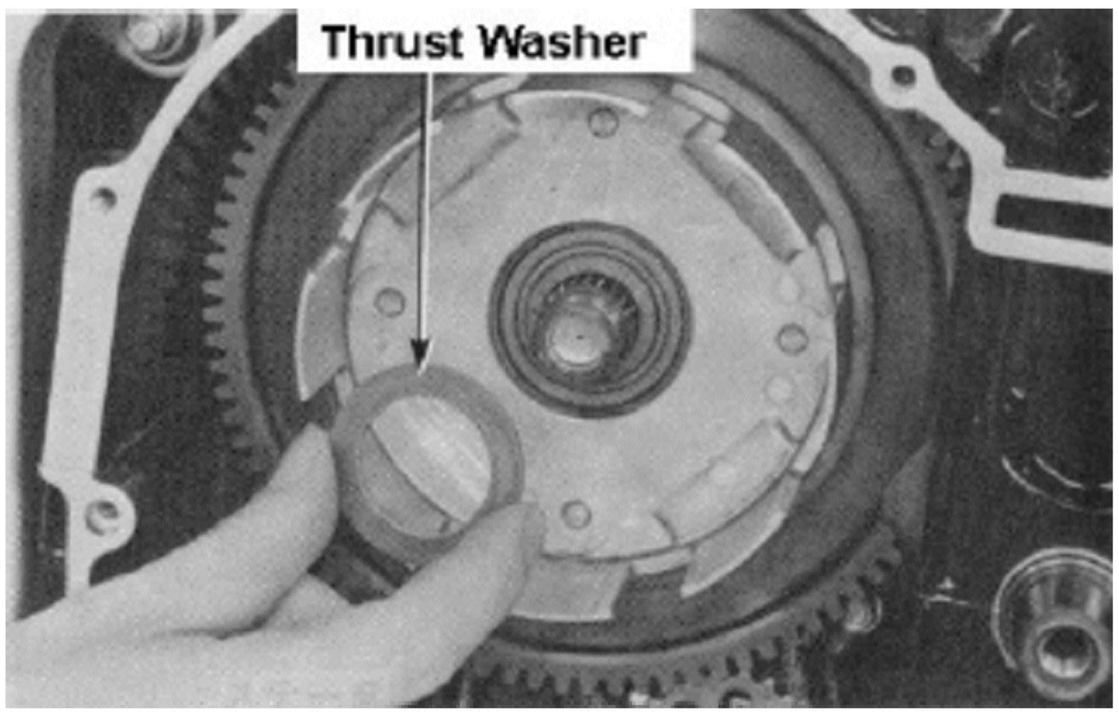
Align the painted marks and attach the gear to the shaft.
Align the projection on the oil pump drive sprocket and the dent on the primary driven gear.
Match the primary driven gear to the first cam gear.
Attach the needle bearing.
Attach the clutch outer guide.



Firmly attach the stopper plate.

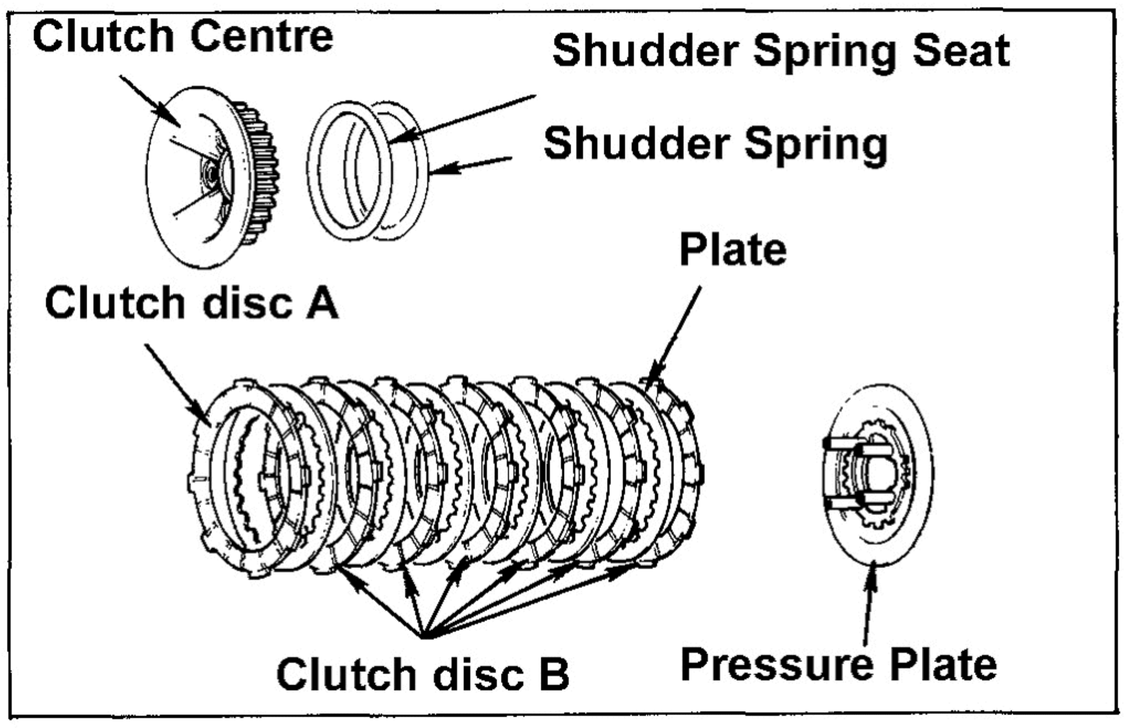


Attach the thrust washer to the main shaft.



Apply engine oil to the clutch disc and the clutch plate. Attach the shudder spring seat, shudder spring, disk, plate and the washer plate to the clutch centre.

Refer this figure to install a shudder spring, shudder spring seat and the clutch disc A.



Attach the clutch centre, spring seat, shudder spring, disc, plate and the pressure plate as an ASSY to the clutch outer.

Attach the lock washer.

Attach the new lock nut.
Attach the clutch centre holder.
Fix the clutch and tighten the lock nut.

Torque: 6.0 ~ 7.0kg m

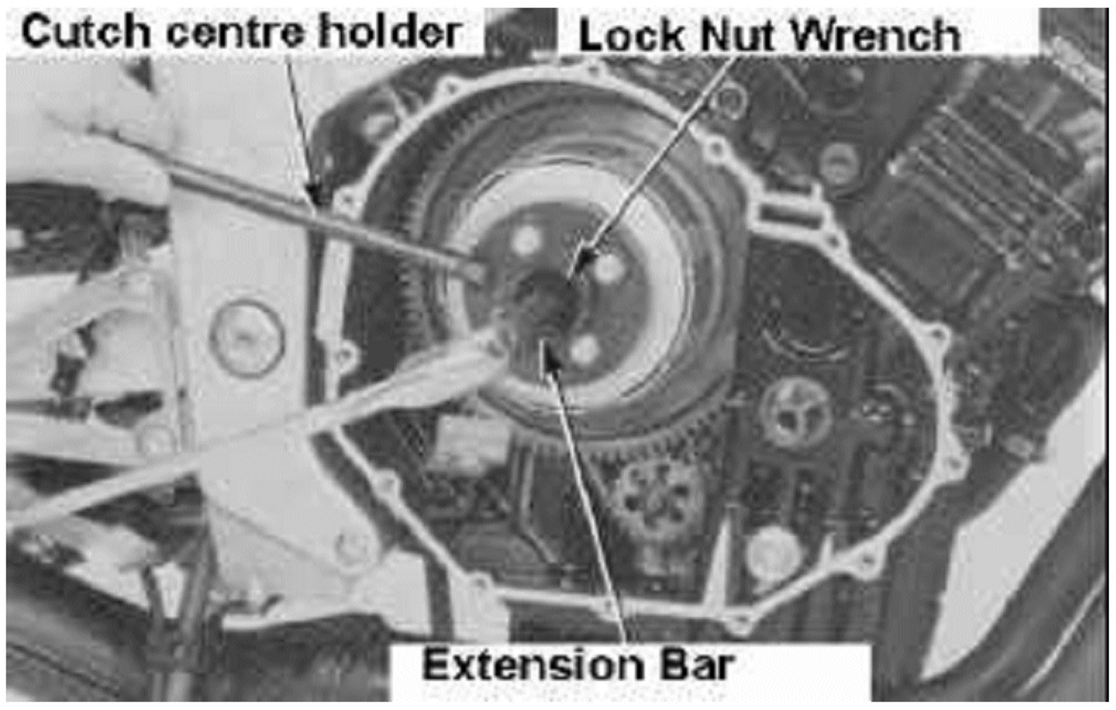
Excl. Tool

Clutch centre holder:
07GMB – KT70100

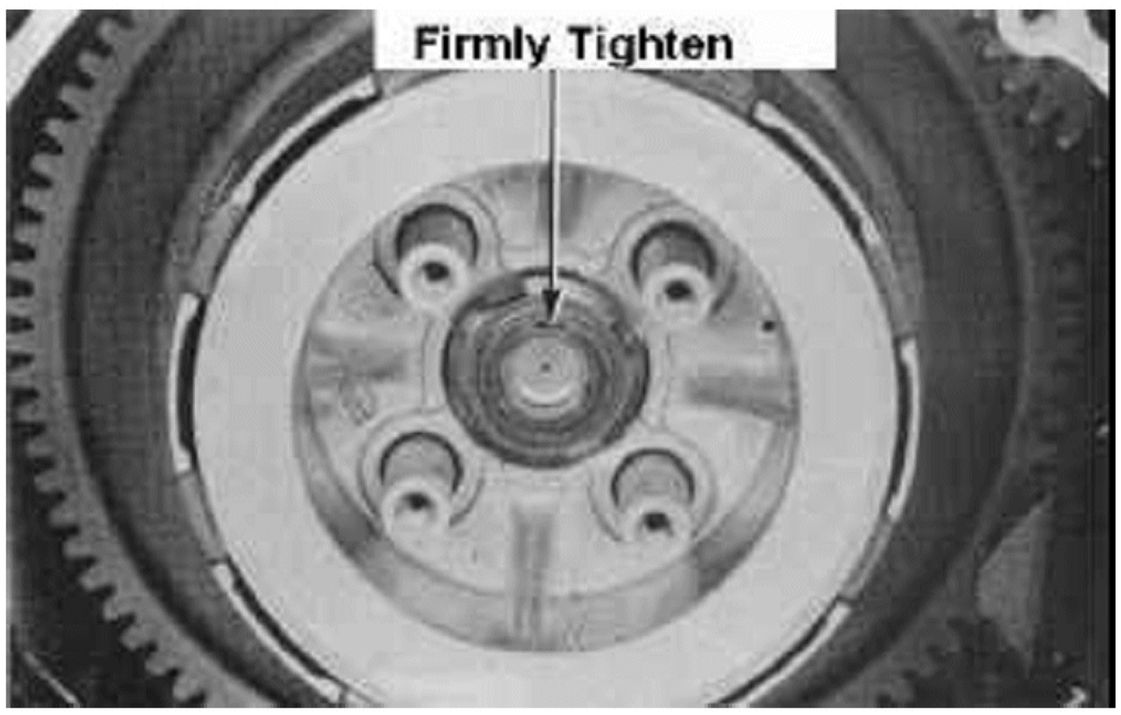
Common Tool

Locknut wrench
(26 x 30mm)
07716-0020203

Extension Bar
07716-0020500

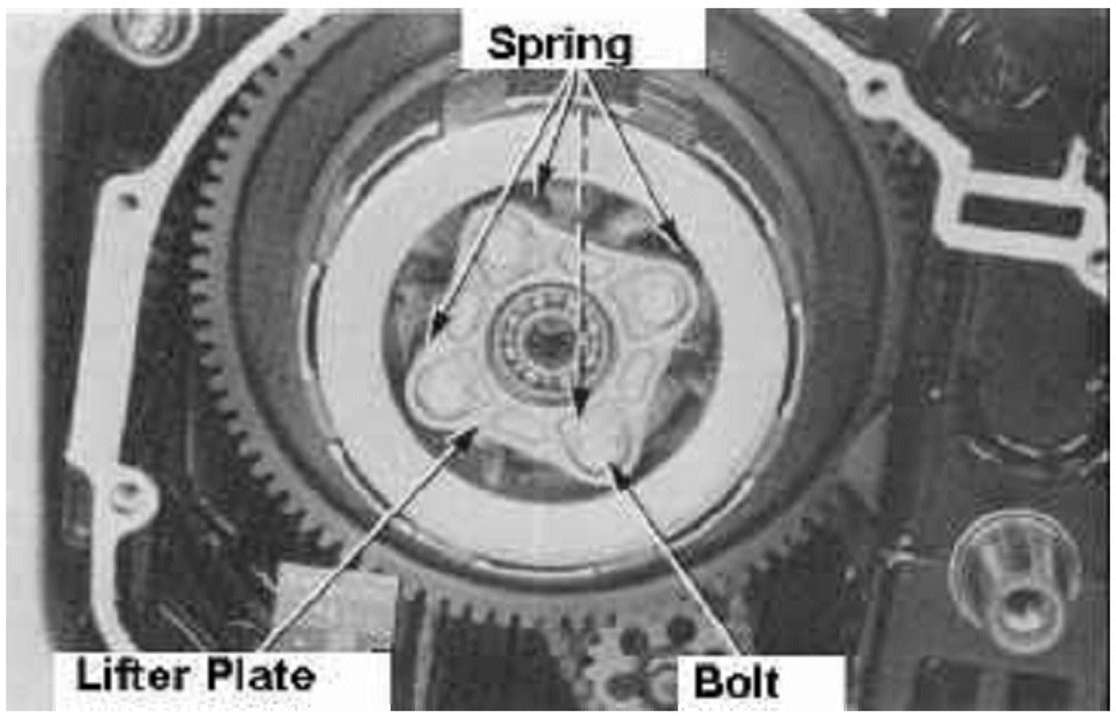


Firmly tighten the remaining thread of the locknut.



Install the clutch spring.
Attach the clutch lifter plate, tighten with bolts.

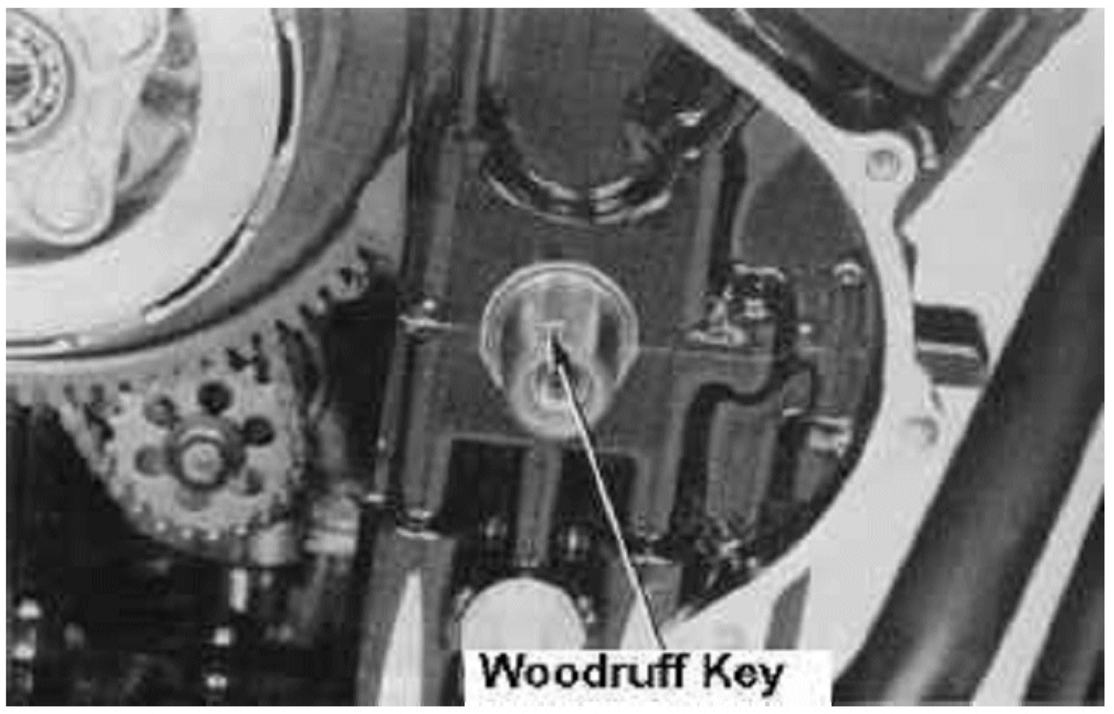
Tighten the opposite corner bolts each time.



AC Generator Attachment

Attach the woodruff key to the crankshaft.

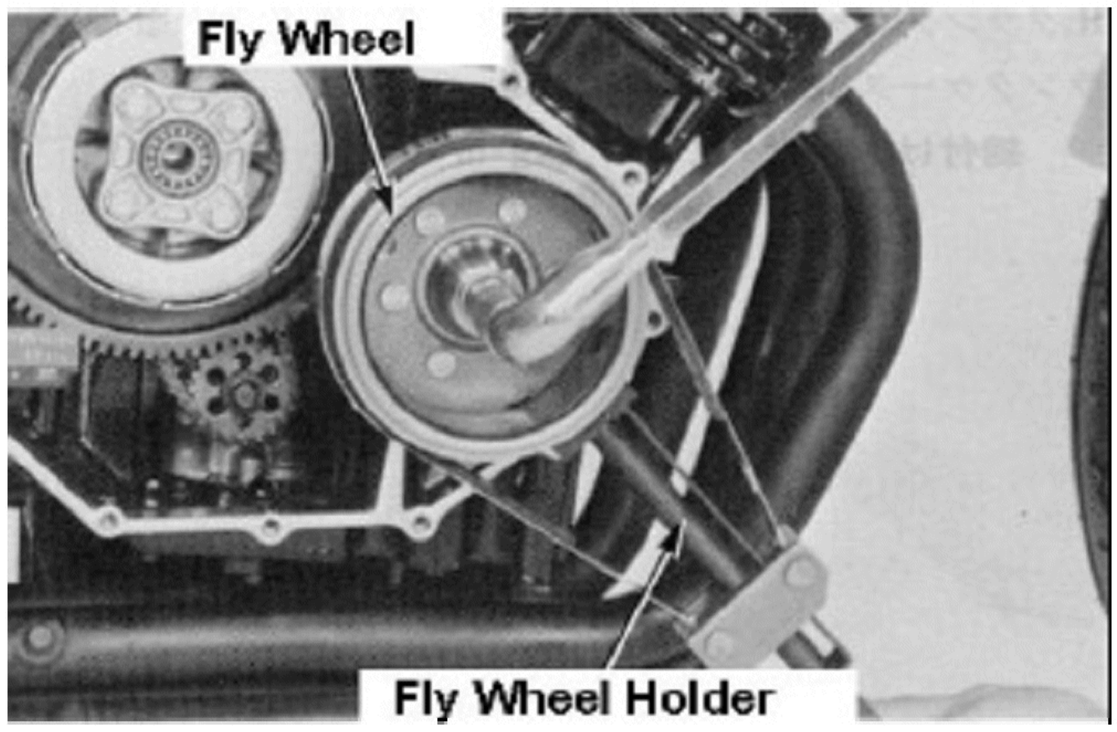
It is already attached if the clutch was disassembled.



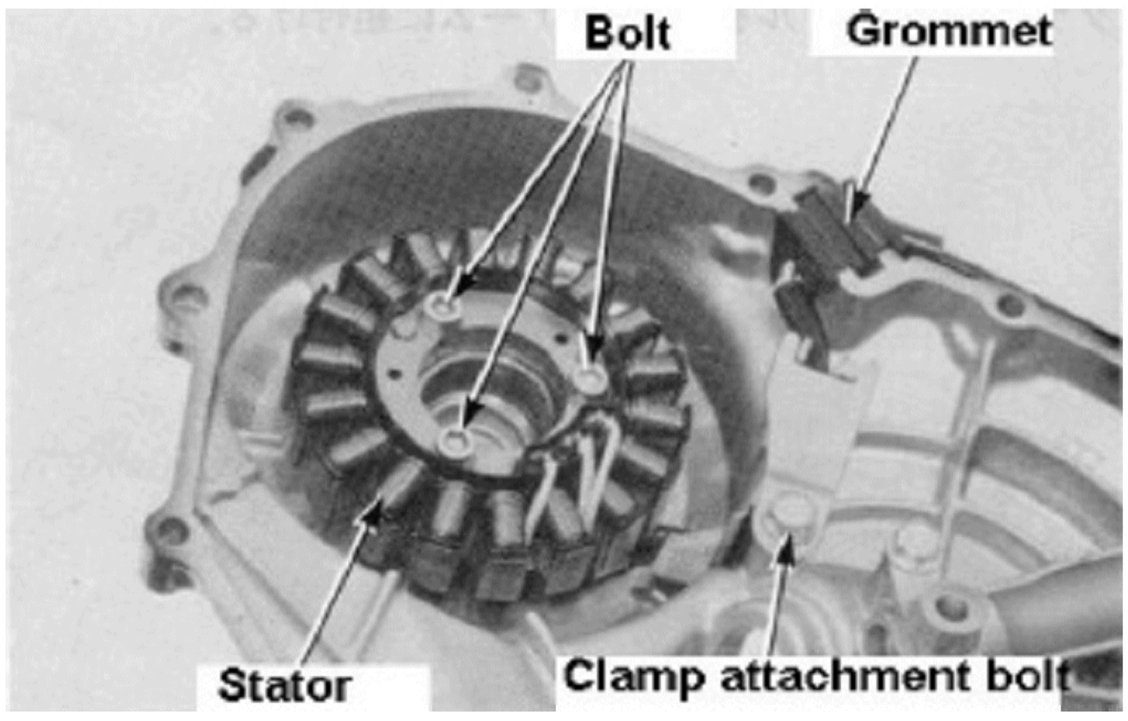
Attach the flywheel to the crankshaft.
Fix the flywheel with the flywheel holder and tighten the bolt.

Torque: 8.0 ~ 9.0kg m

Common Tool	lywheel holder: 07725-004000



Attach the stator to the right crankcase cover.
Apply screw locking fluid to the thread on the bolts and attach the AC Generator wire clamp.
Install the grommet correctly.

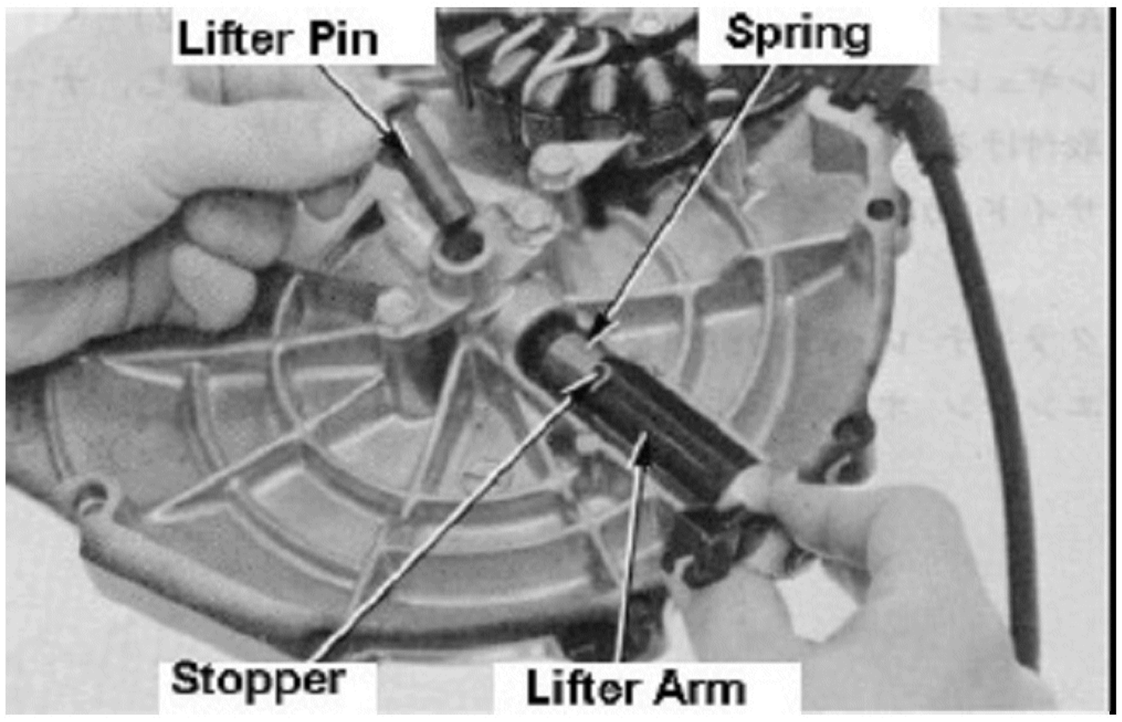


Right crankcase cover attachment

Assembly

Install the clutch lifter arm and attach the spring stopper.

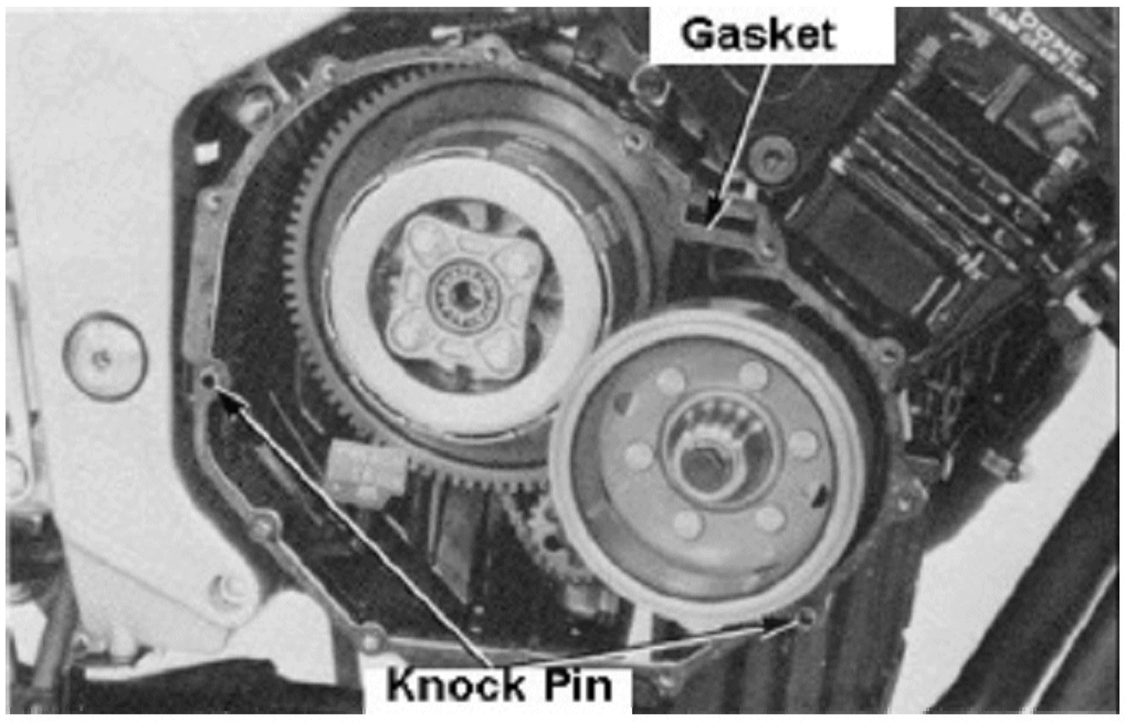
Check the free rotation of the arm after installing the stopper.



Install the spring, then the lifter pin.

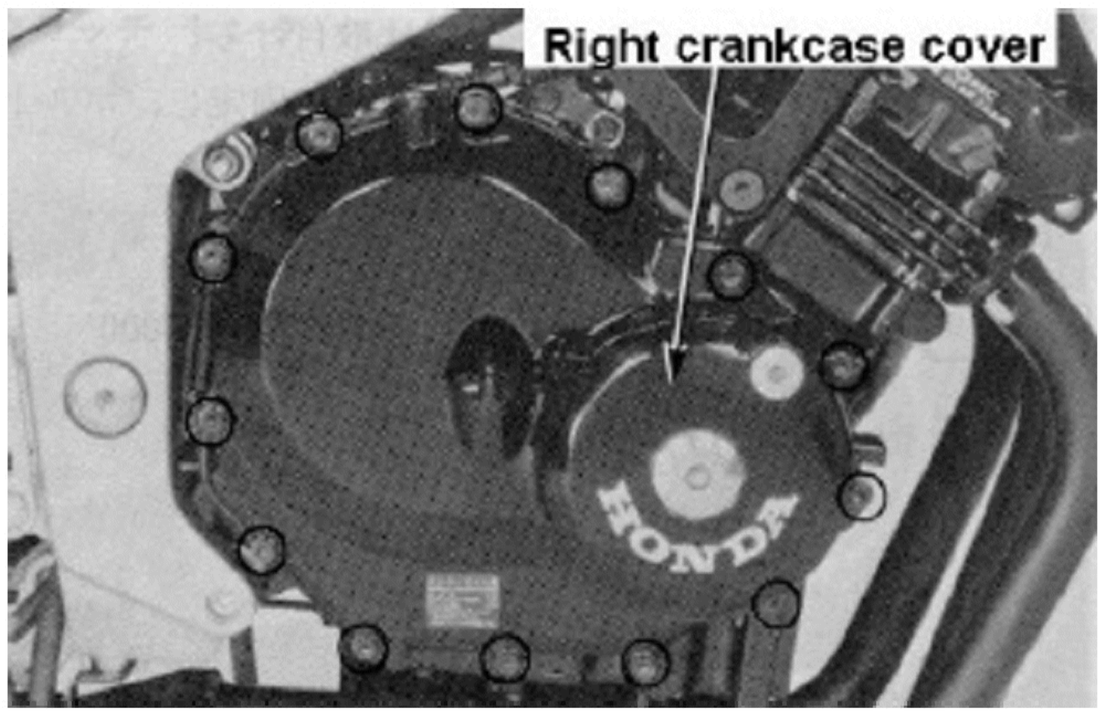
• One side of the stopper attachment hole on the lifter arm has a round edge. The spring is supposed to be attached. • Align the lifter pin to the dent on the lifter arm. Push the pin and firmly set.

Attach knock pins and the gasket.

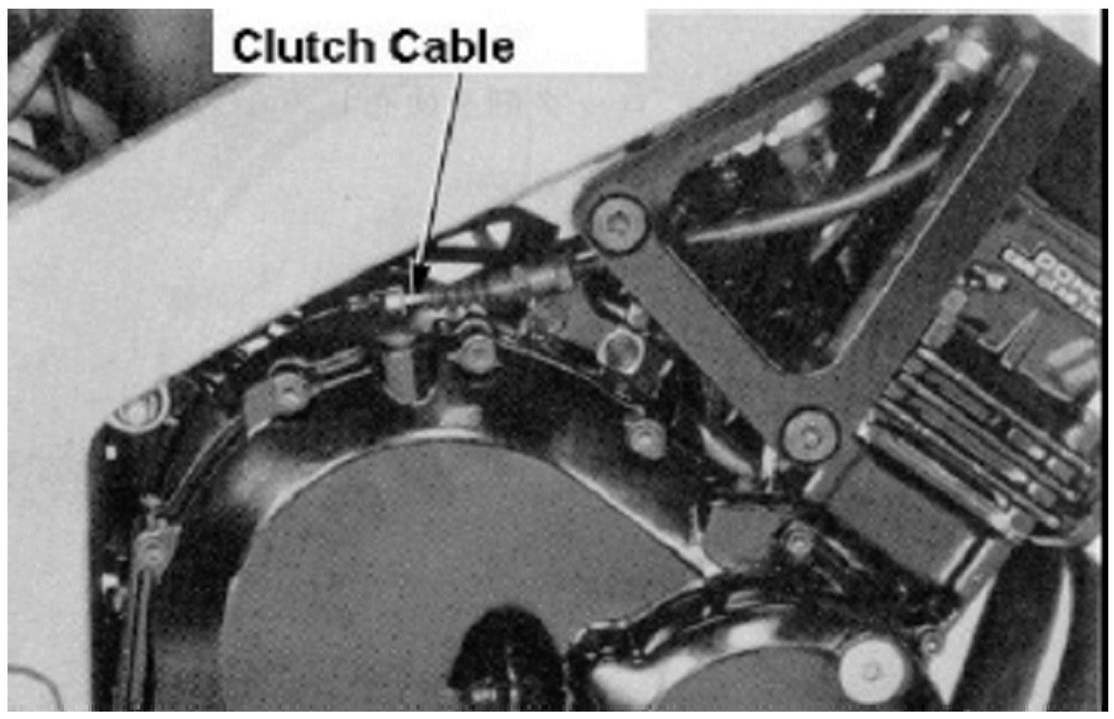


Apply oil to the right crankcase cover attachment bolts and attach the cover.

Torque: 0.8 ~ 1.2kg m



Connect the clutch cable to the lifter arm.

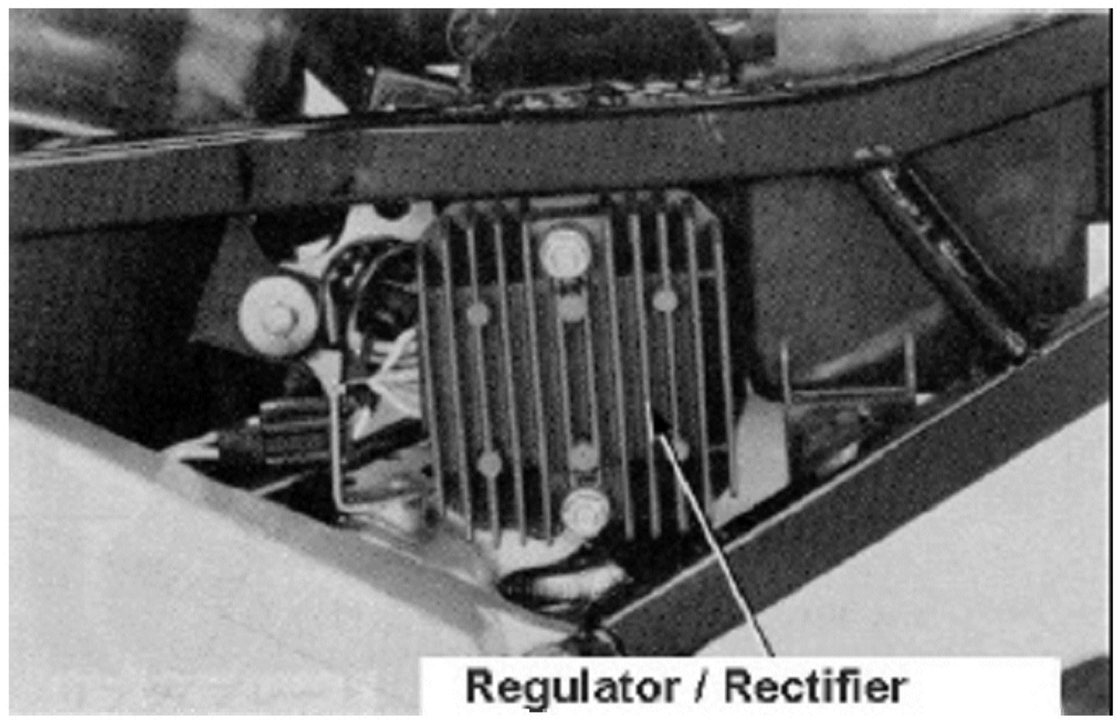


Place the AC generator wires correctly (1-22).

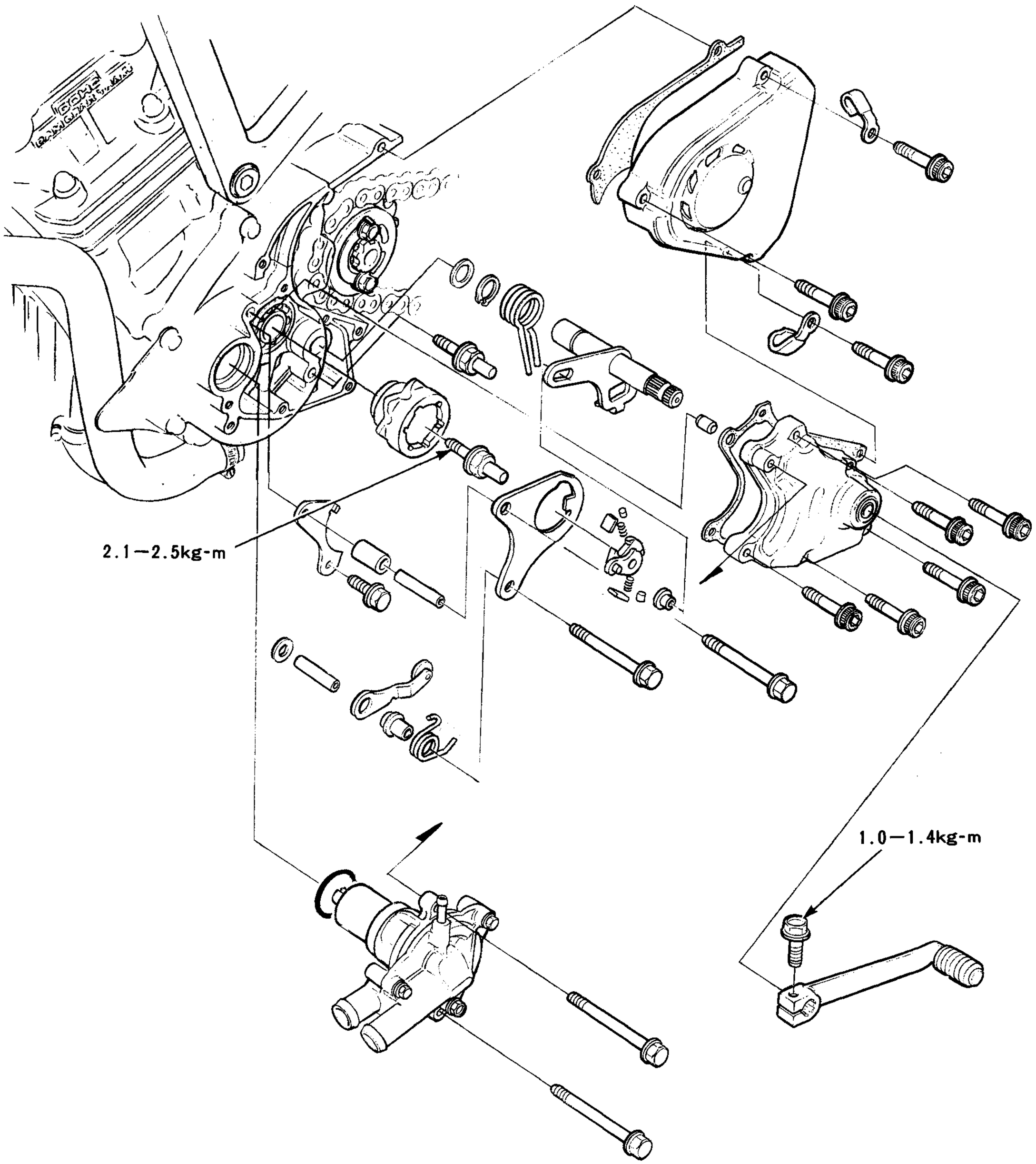
Connect the 3P coupler of regulator/rectifier and attach with nuts.

Attach the side cover, and the seat (21-42)

Fill with recommended engine oil (2-15).



- **Disassembly**



Disassembly	11-0	Gear shift linkage detachment	11-2
Service information	11-1	Gear shift linkage attachment	11-4
Troubleshooting	11-1		

Service Information

General Caution

- The gear shift linkage can be serviced without dismounting from the vehicle.
- When the transmission, shift drum and the shift fork need to be serviced, disassemble the crankcase.

Torque

- Change Pedal 1.0 – 1.4kg-m
- Drum centre bolt 2.1 – 2.5kg-m (apply screw locker)

Troubleshooting

Difficult to shift the gear

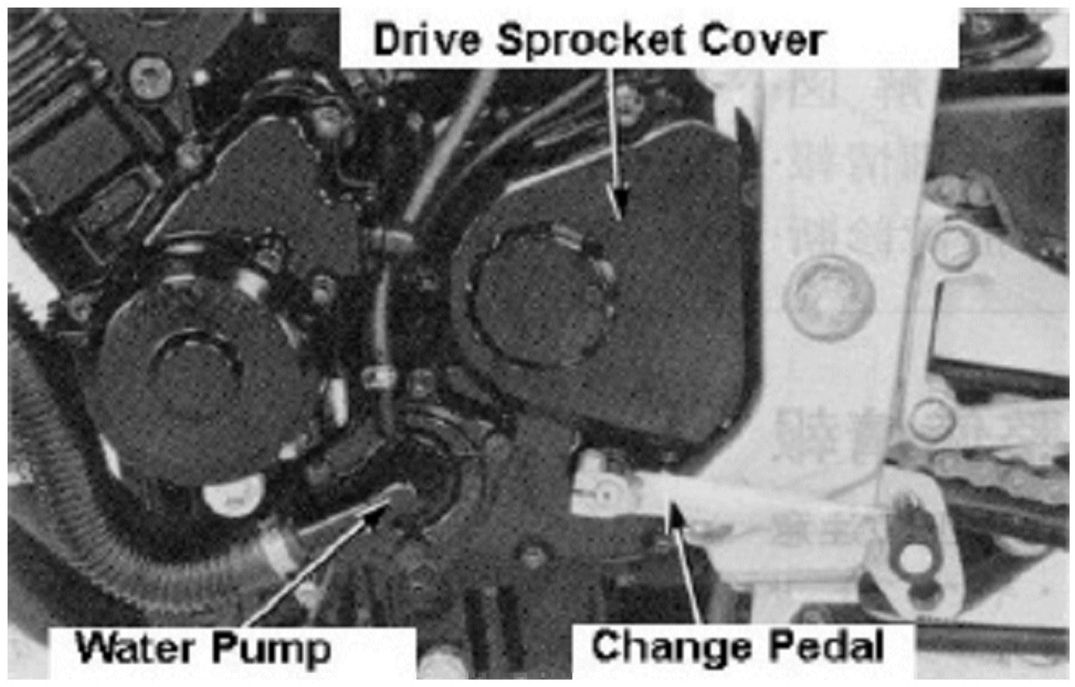
- Inadequate clutch adjustment
- Shift fork deformed
- Cam slit on the shift drum damaged
- A catch on the gear shift spindle bent

The gear disconnects

- Gear dog worn
- Shift shaft bent
- Stopper arm damaged
- Shift fork bent / damaged

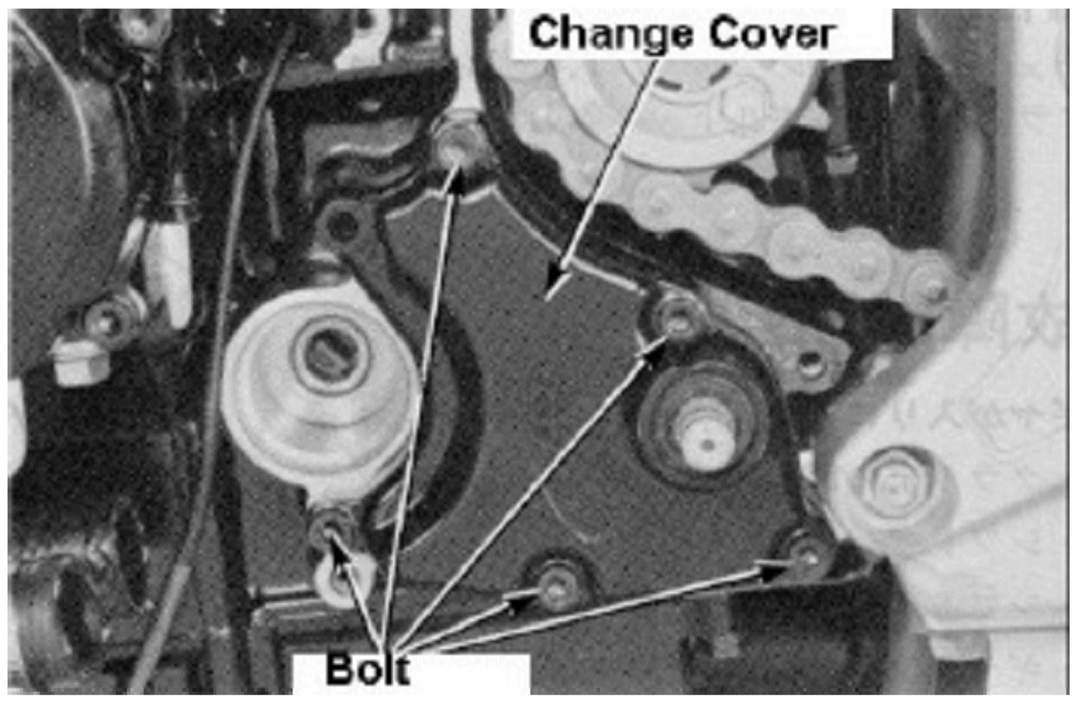
Gear Shift Linkage Detachment

Remove the water pump (5-9)
Remove the change pedal
Detach the drive sprocket cover



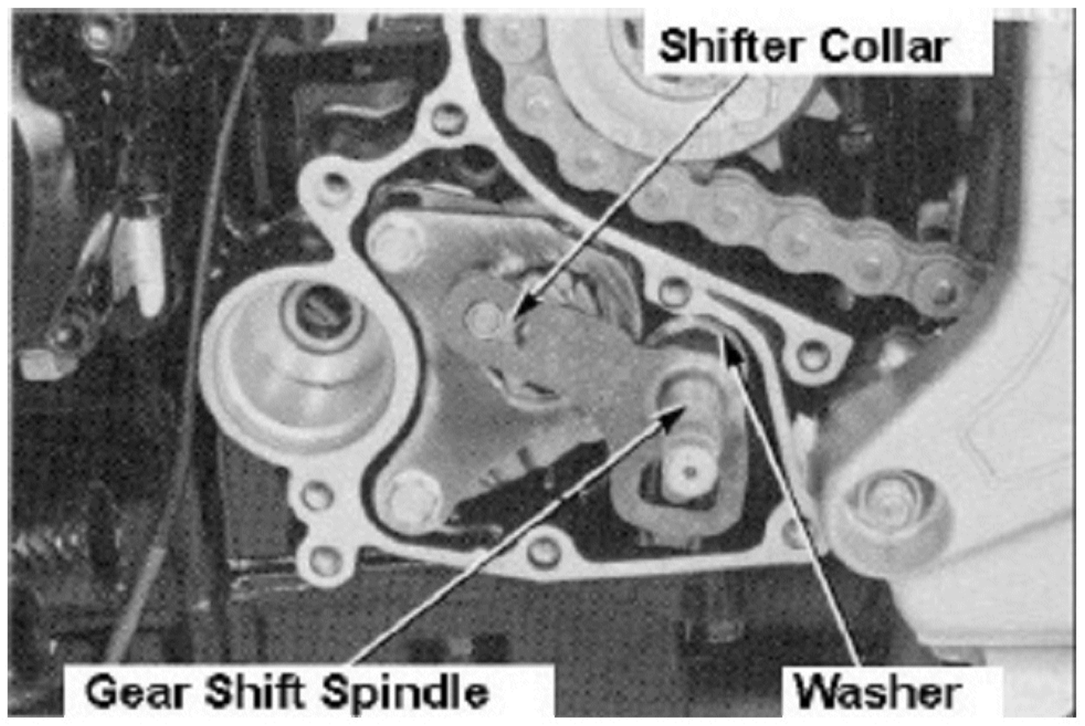
Note:
Set the gear to neutral before removing the change pedal.

Remove the five change cover attachment bolts.
Push the shift spindle in and remove the change cover.



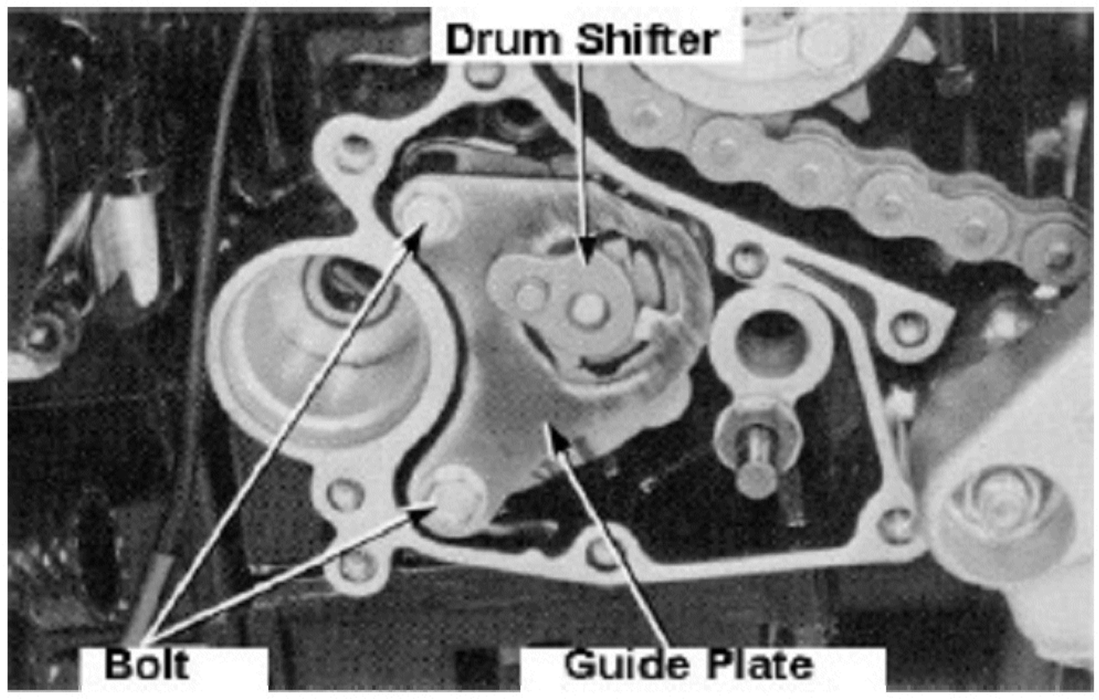
Remove the gasket and knock pins.

Remove the gear shift spindle and washer.
Remove the shifter collar.

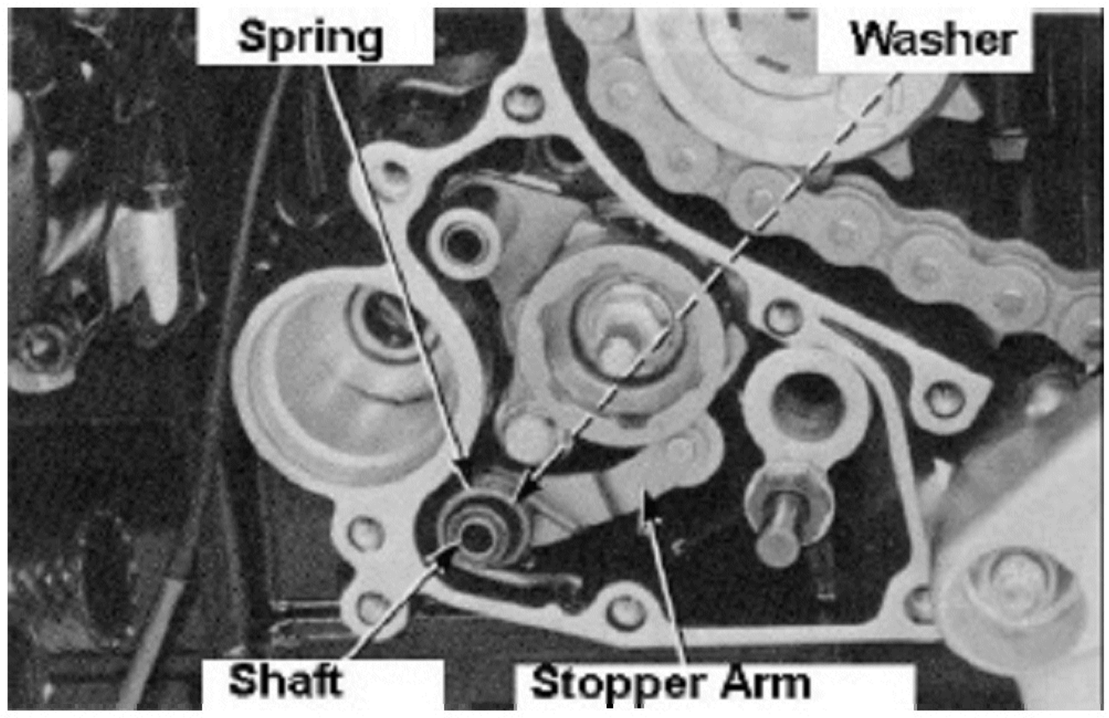


Remove the two bolts and detach the guide plate with the drive shifter.

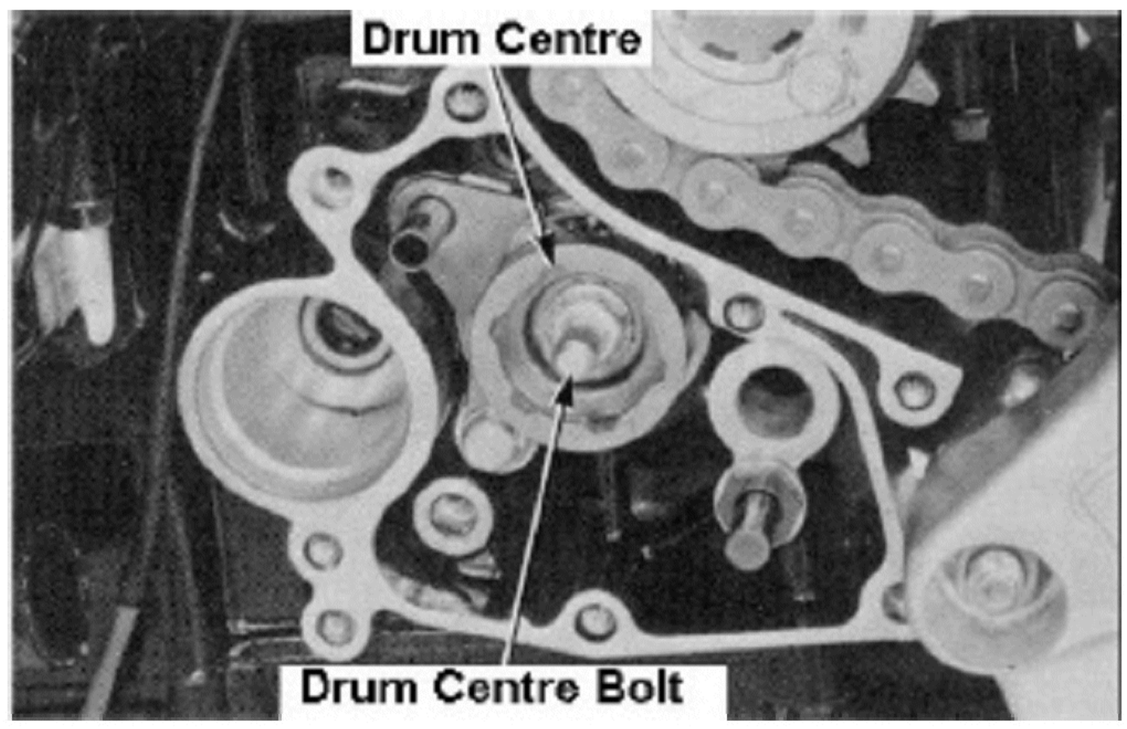
Caution:
A ratchet pole may pop out.



Detach the stopper arm, spring, shaft and the washer.

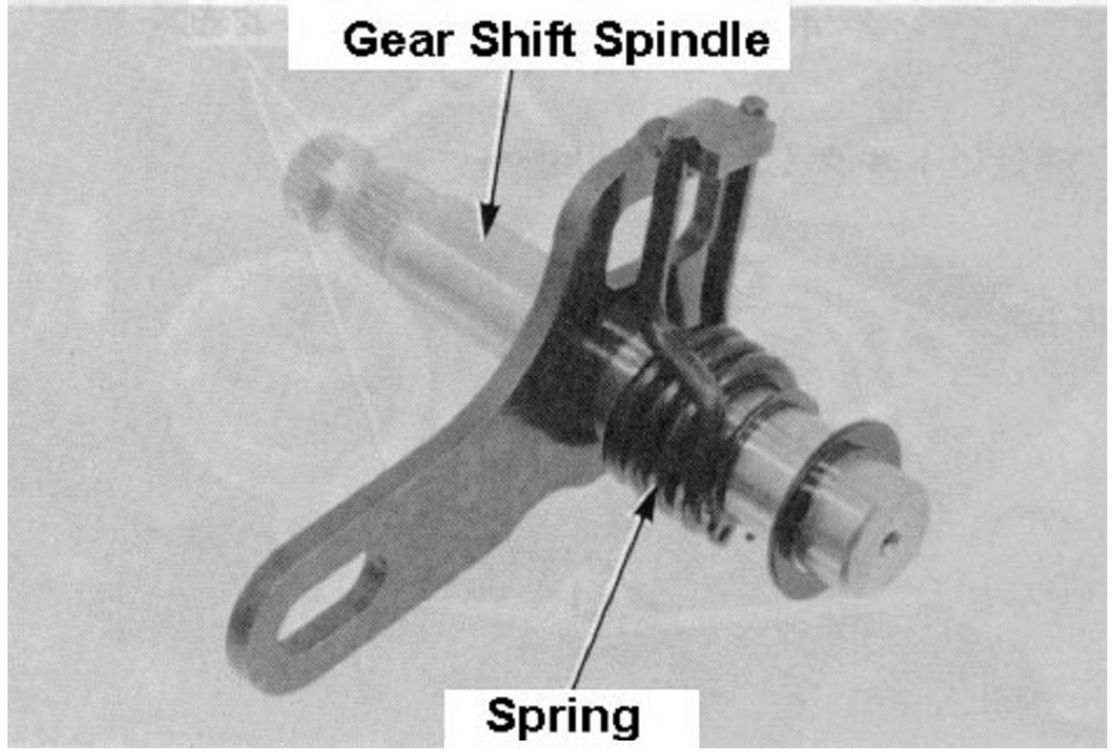


Remove the drum centre bolt and detach the drum centre.



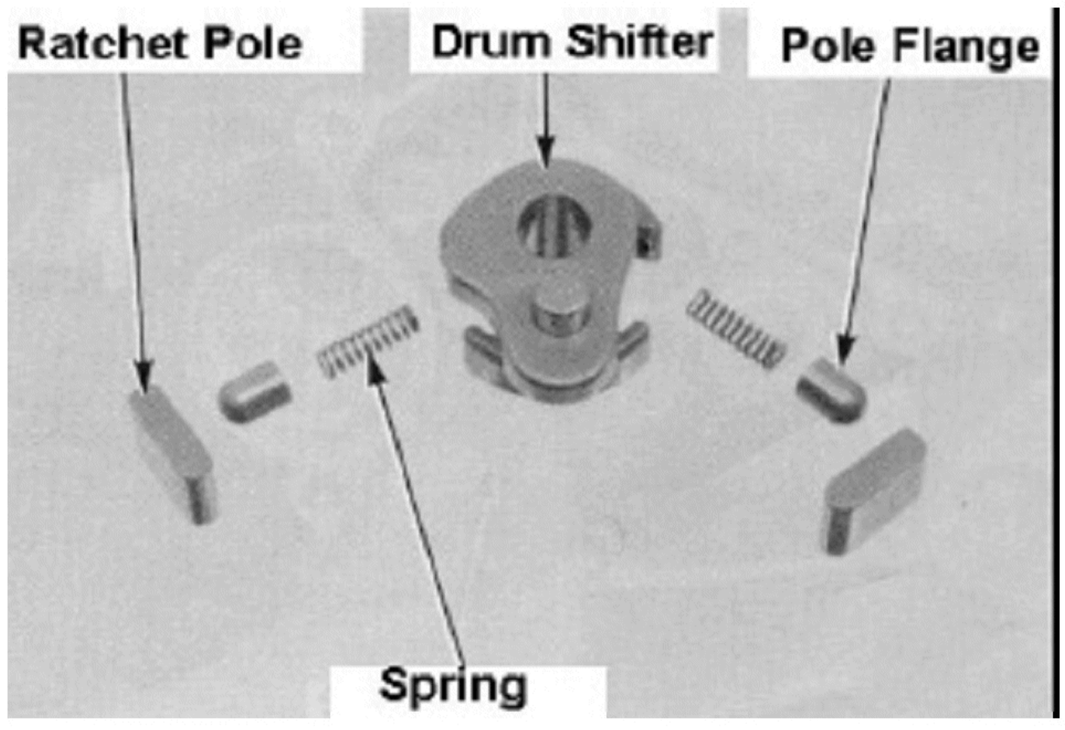
Gear shift spindle inspection

Inspect the gear shift spindle for wear / damage.
Inspect the spring for permanent deformation / damage.

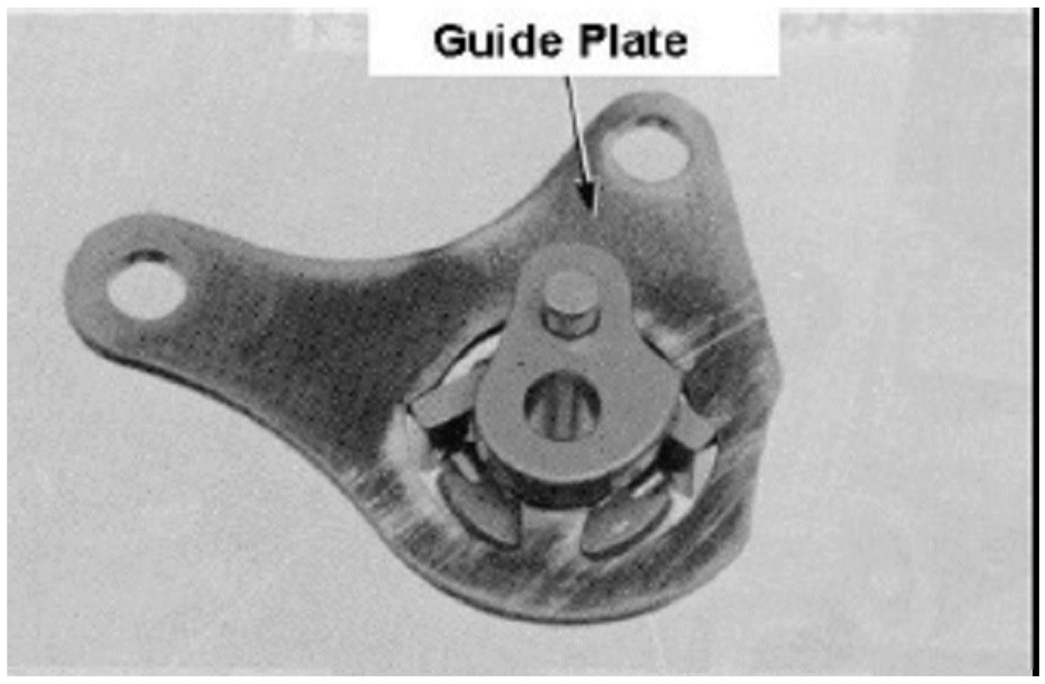


Guide plate assembly

Apply clean engine oil to the drum shifter, pole flanges, ratchet poles and springs.

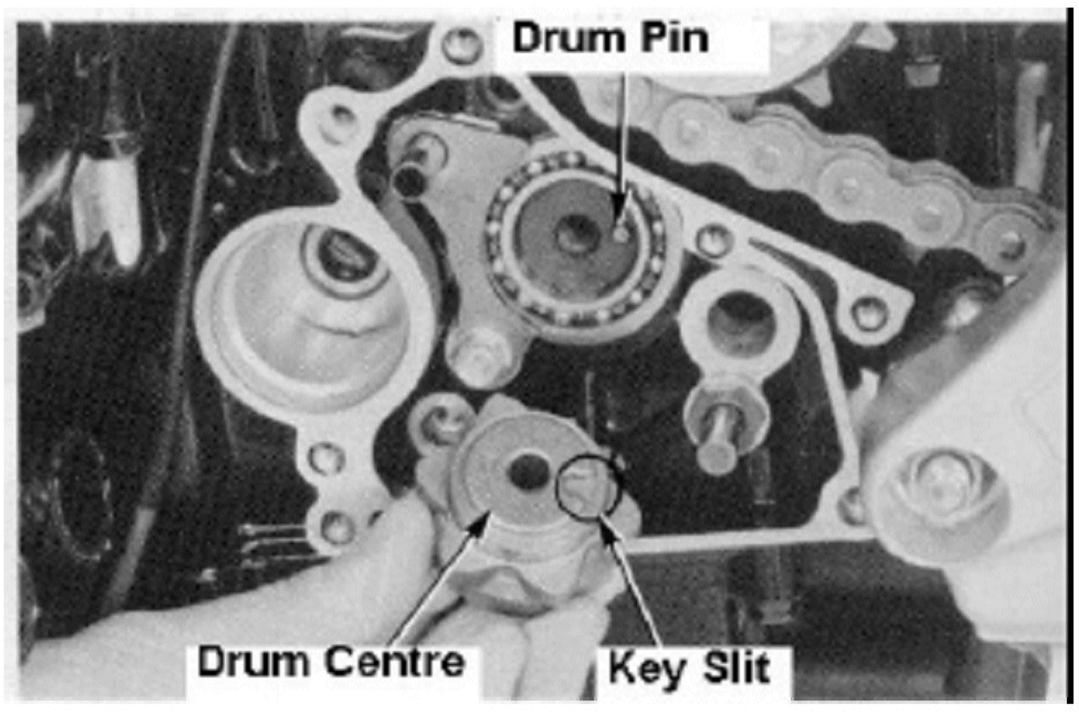


Attach the drum shifter, pole flanges, springs and ratchet poles to the guide plate.



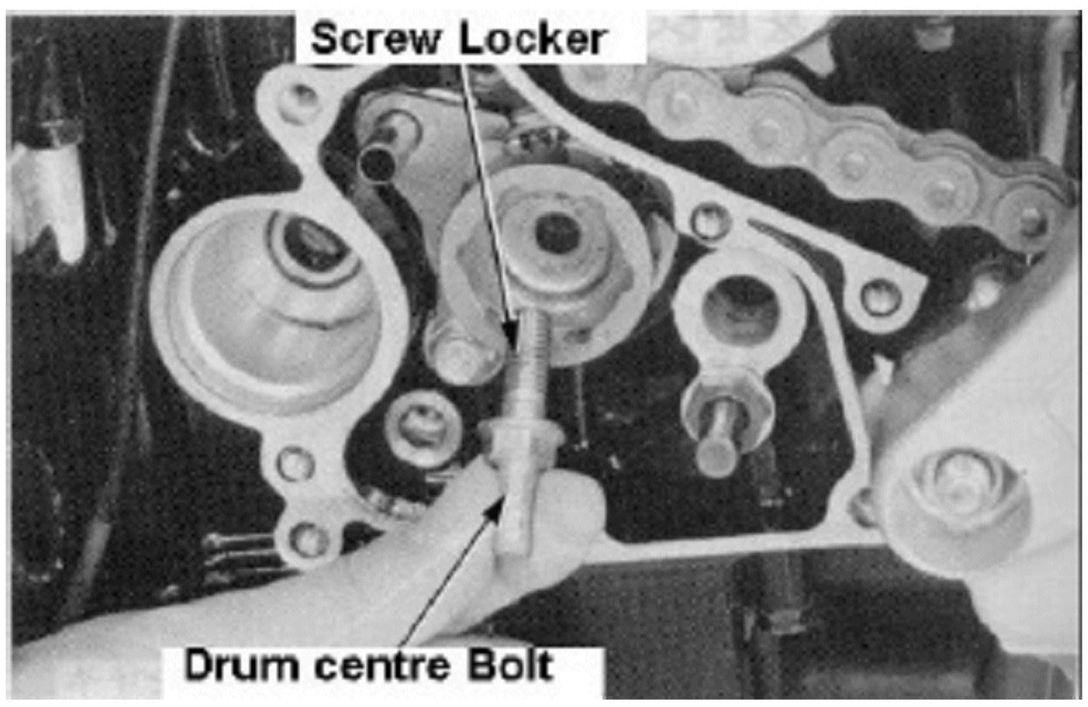
Gear shift linkage attachment

Align the key slit on the drum centre to the drum pin and attach.

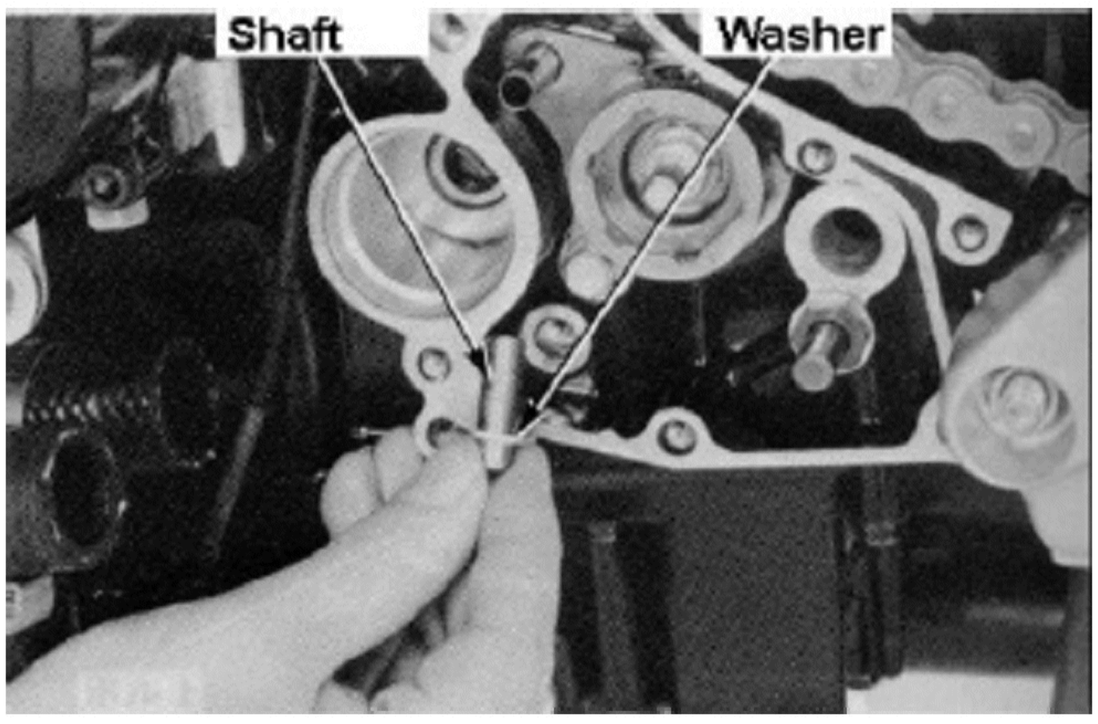


Apply screw locker to the thread and tighten the drum centre bolt.

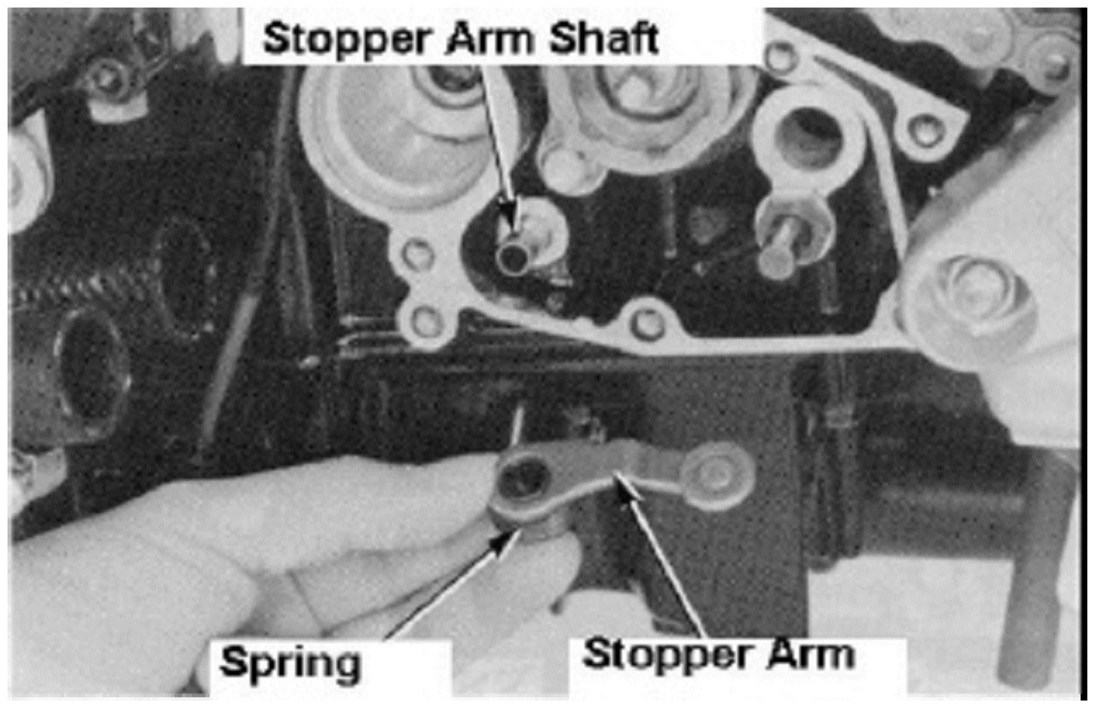
Torque: 2-1 ~ 2.5kg-m



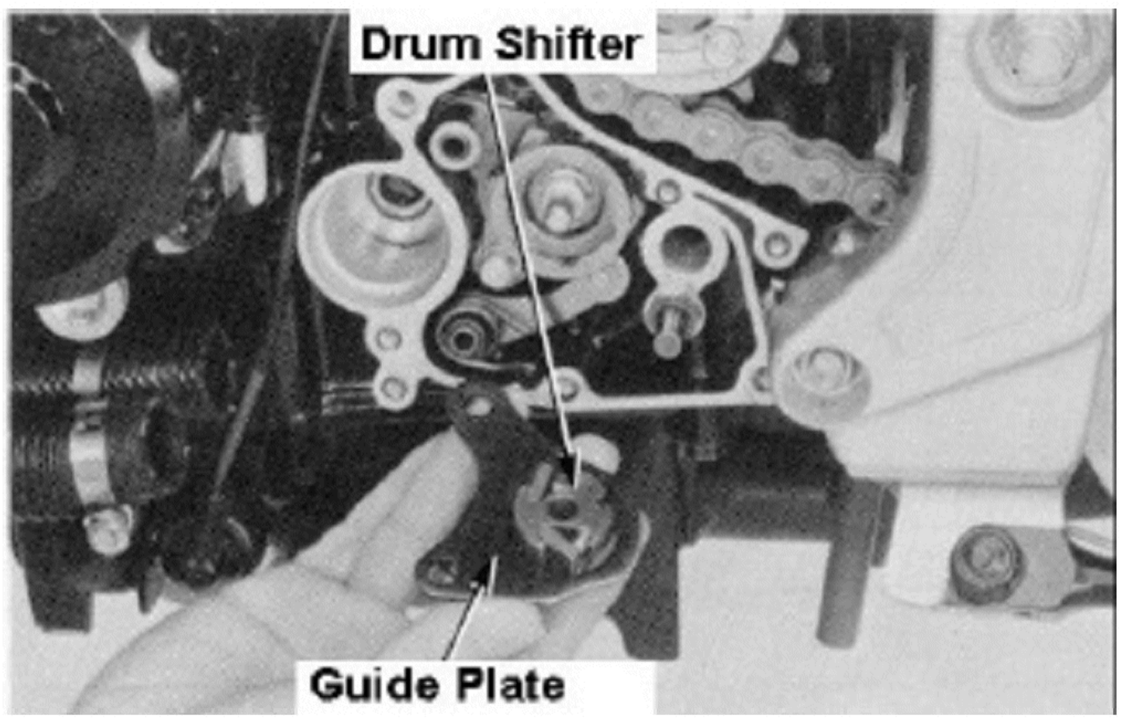
Attach the stopper arm shaft and the washer.



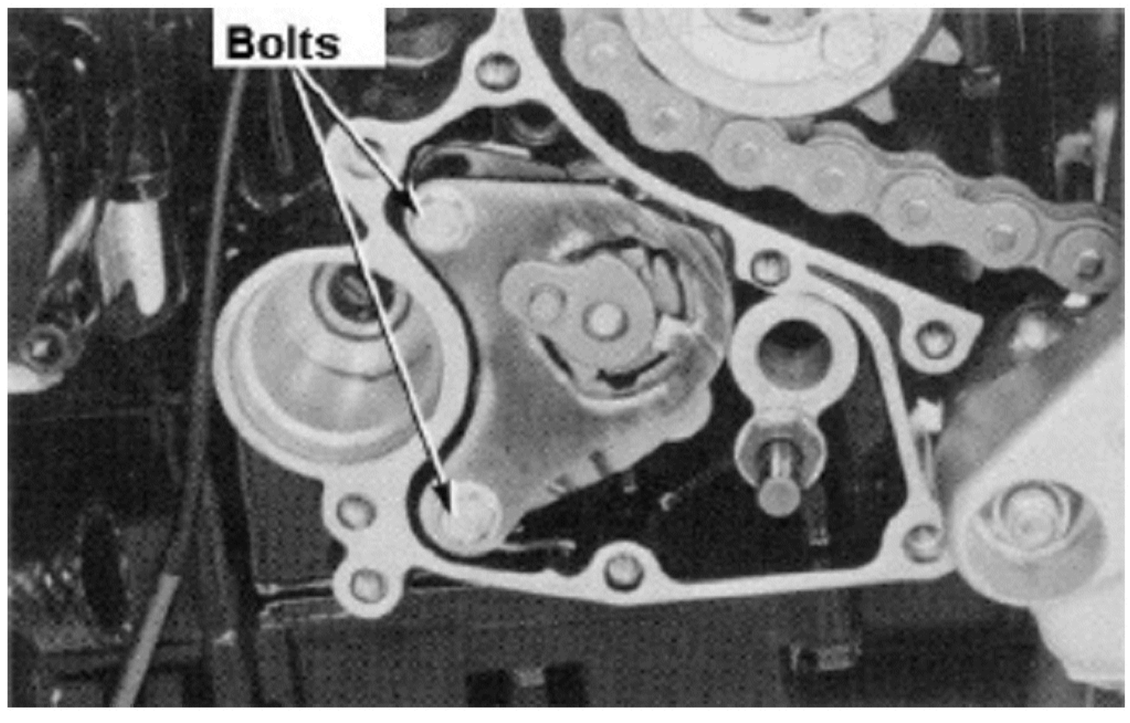
Attach the stopper arm and the spring to the stopper arm shaft.



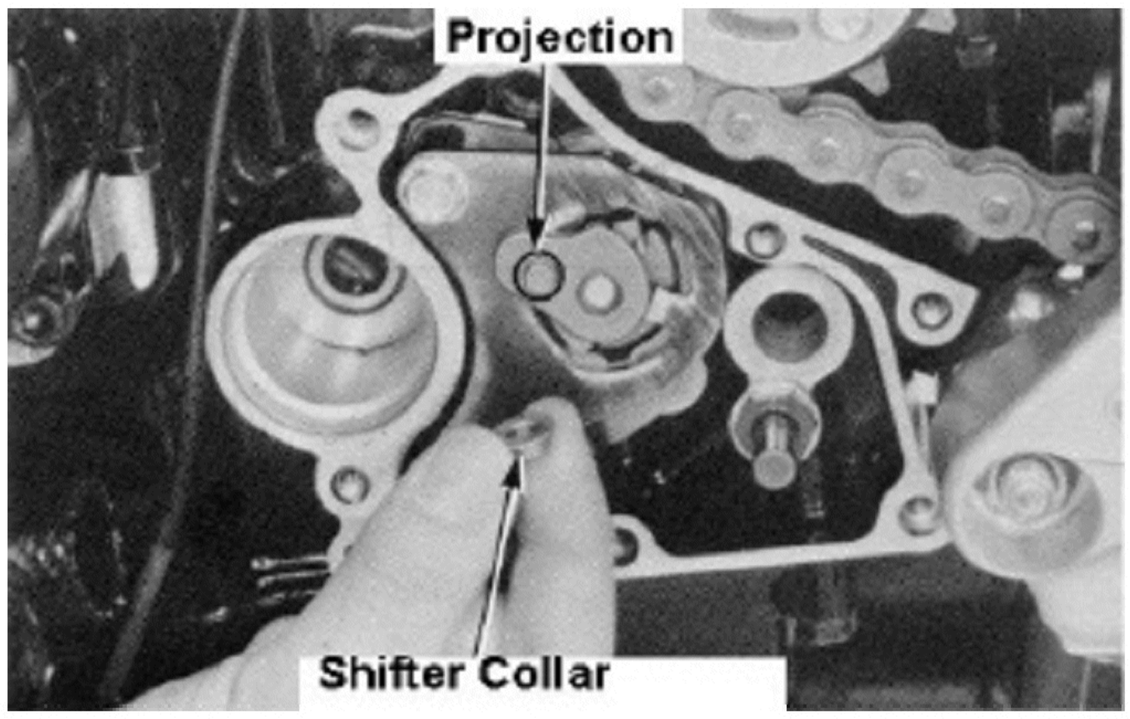
Attach the drum shifter and the guide plate.



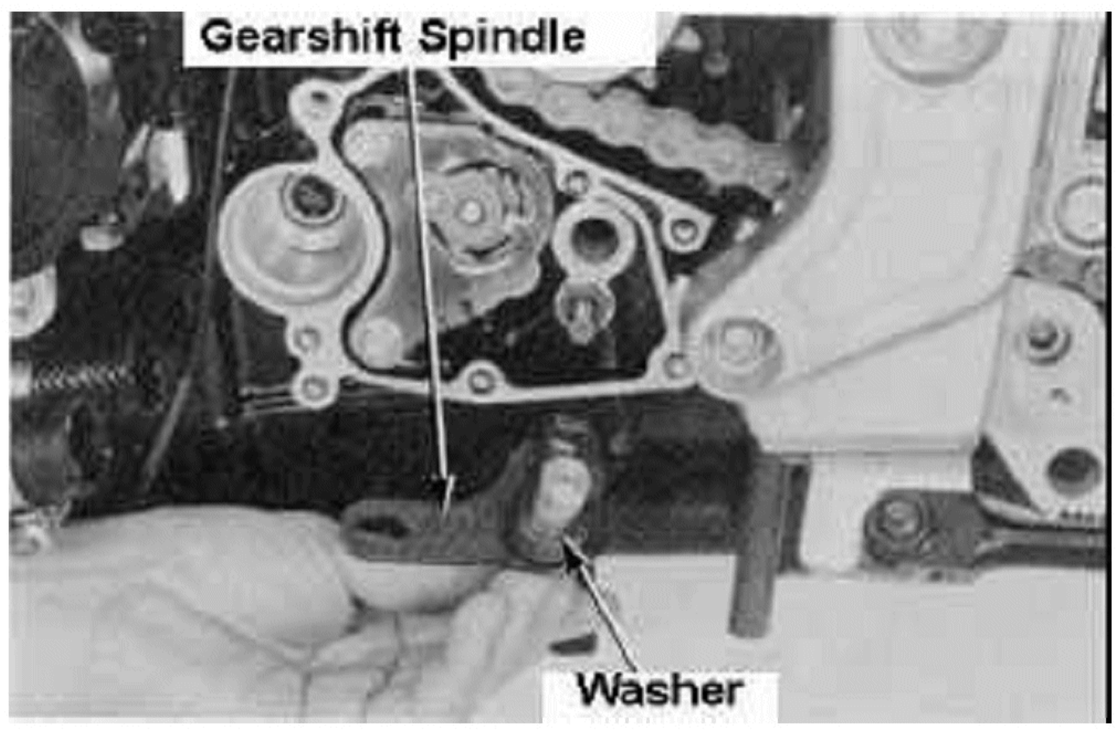
Firmly tighten the two guide plate attachment bolts.



Cover the projection of the drum shifter with the shifter collar.

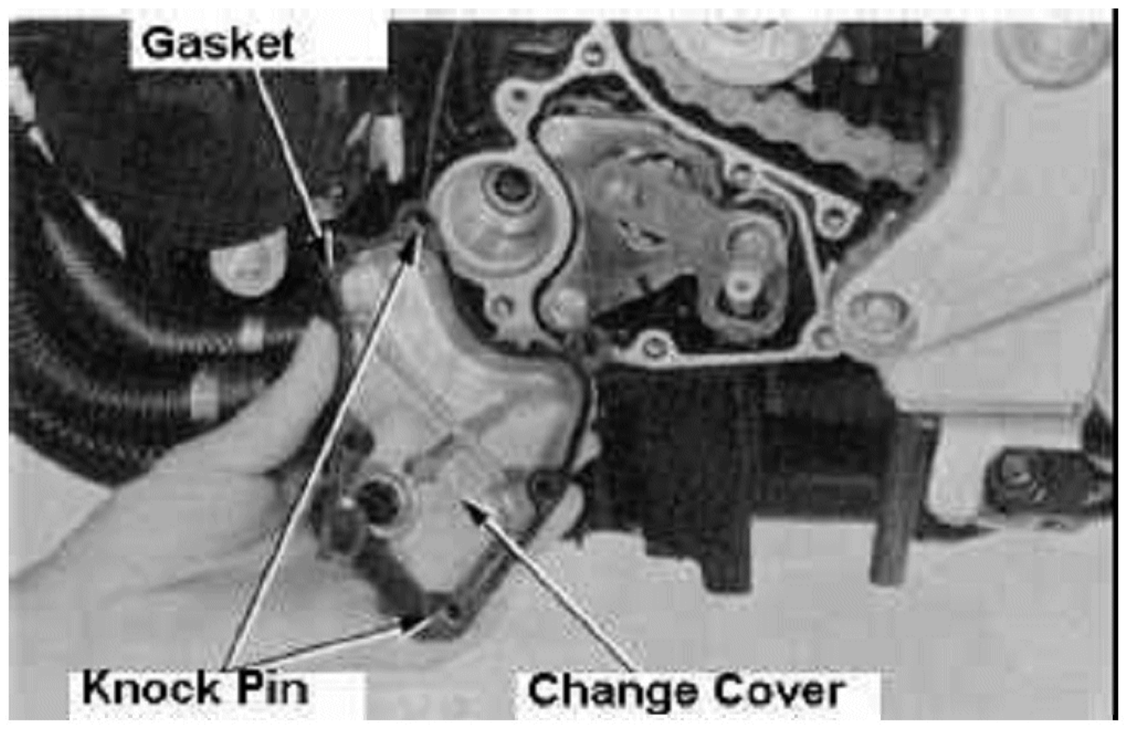


Attach the gear shift spindle and the washer.

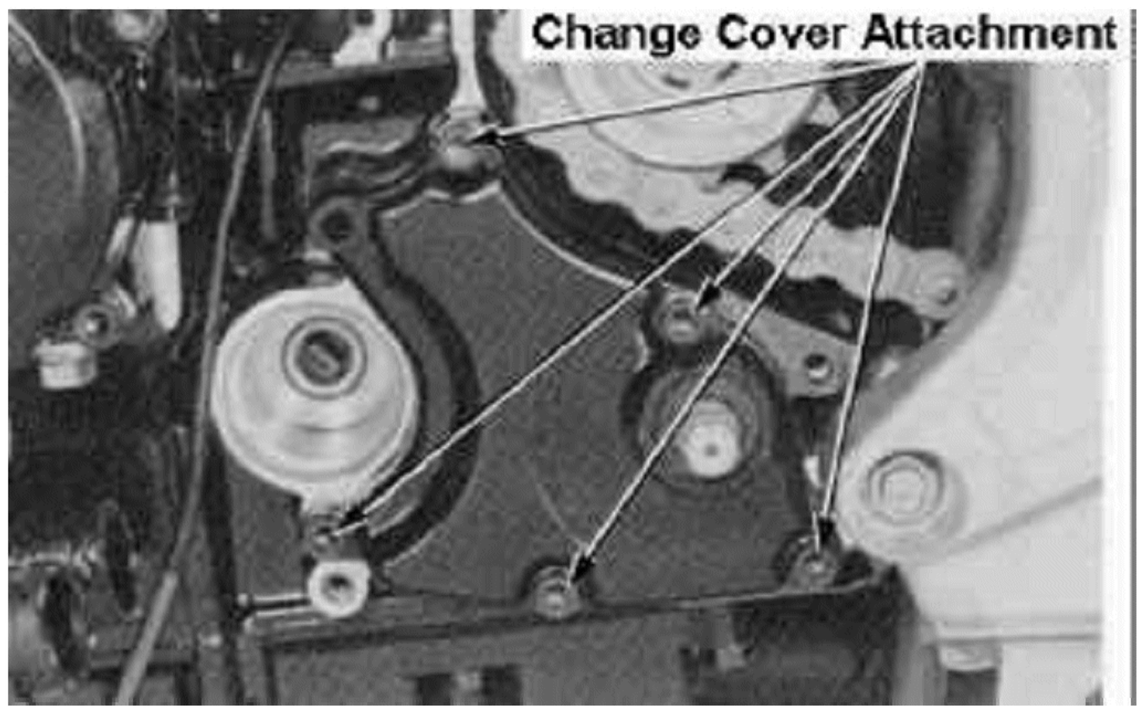


After attaching them, rotate the spindle and check the linkage movement.

Attach the change cover with a new gasket and knock pins.

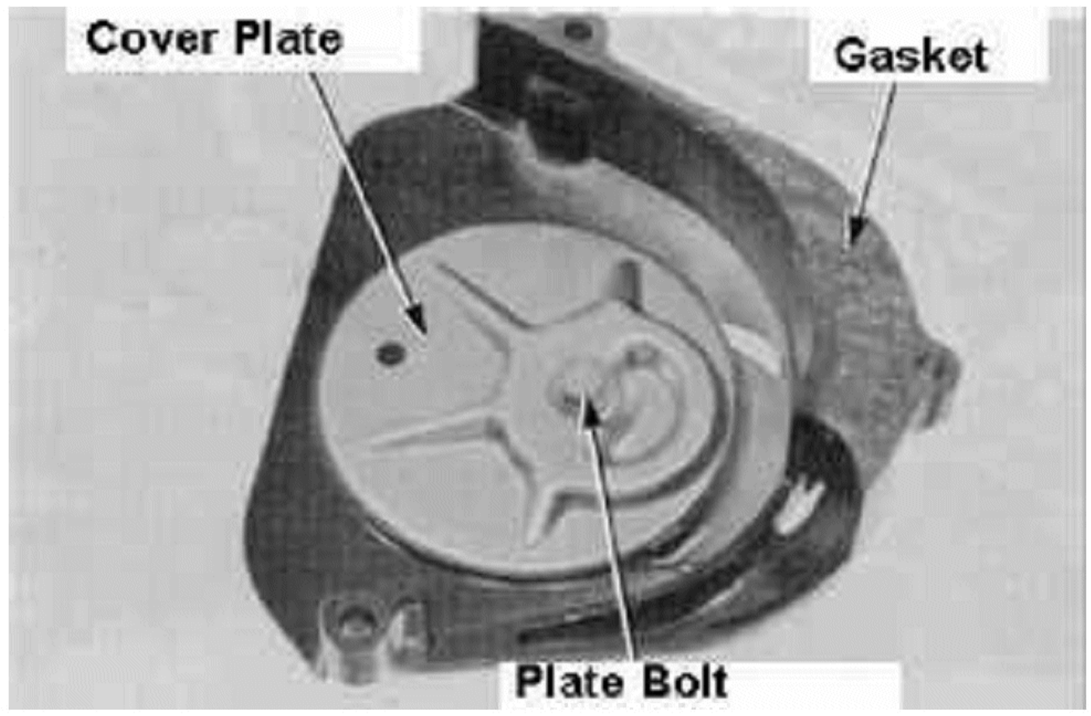


Tighten the five change cover attachment bolts.



Attach the gasket to the drive sprocket cover.

When the cover plate is removed, apply screw locker to the plate belt and attach it.

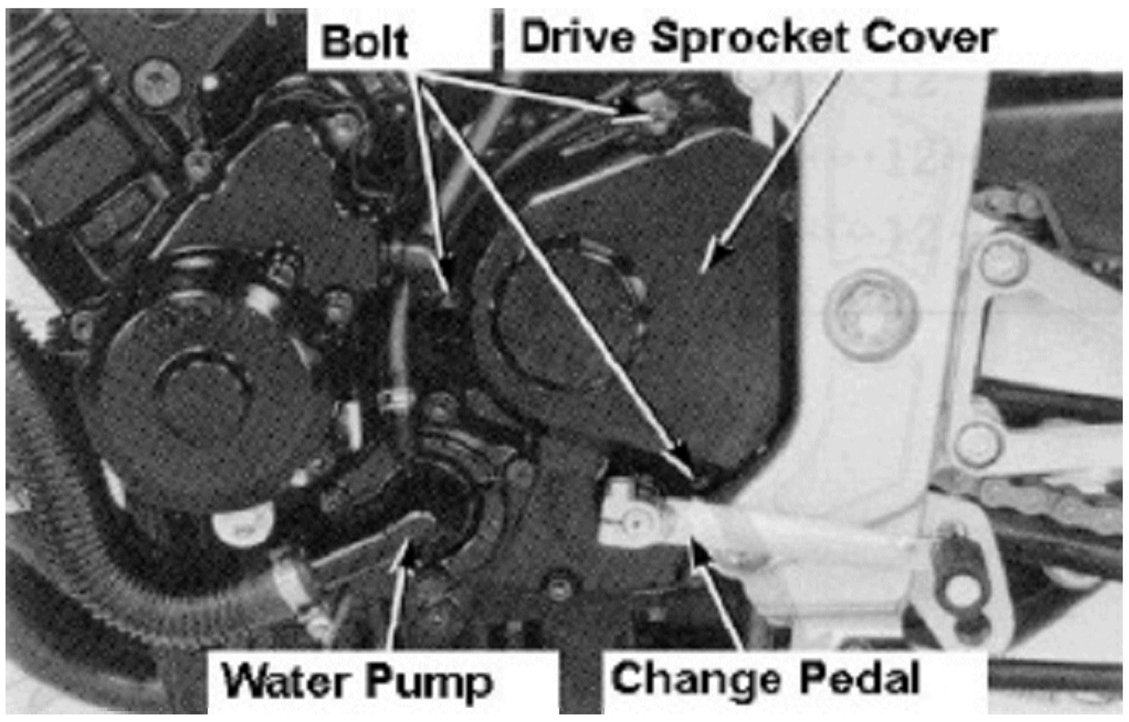


Attach the drive sprocket cover and tighten the three attachment bolts.

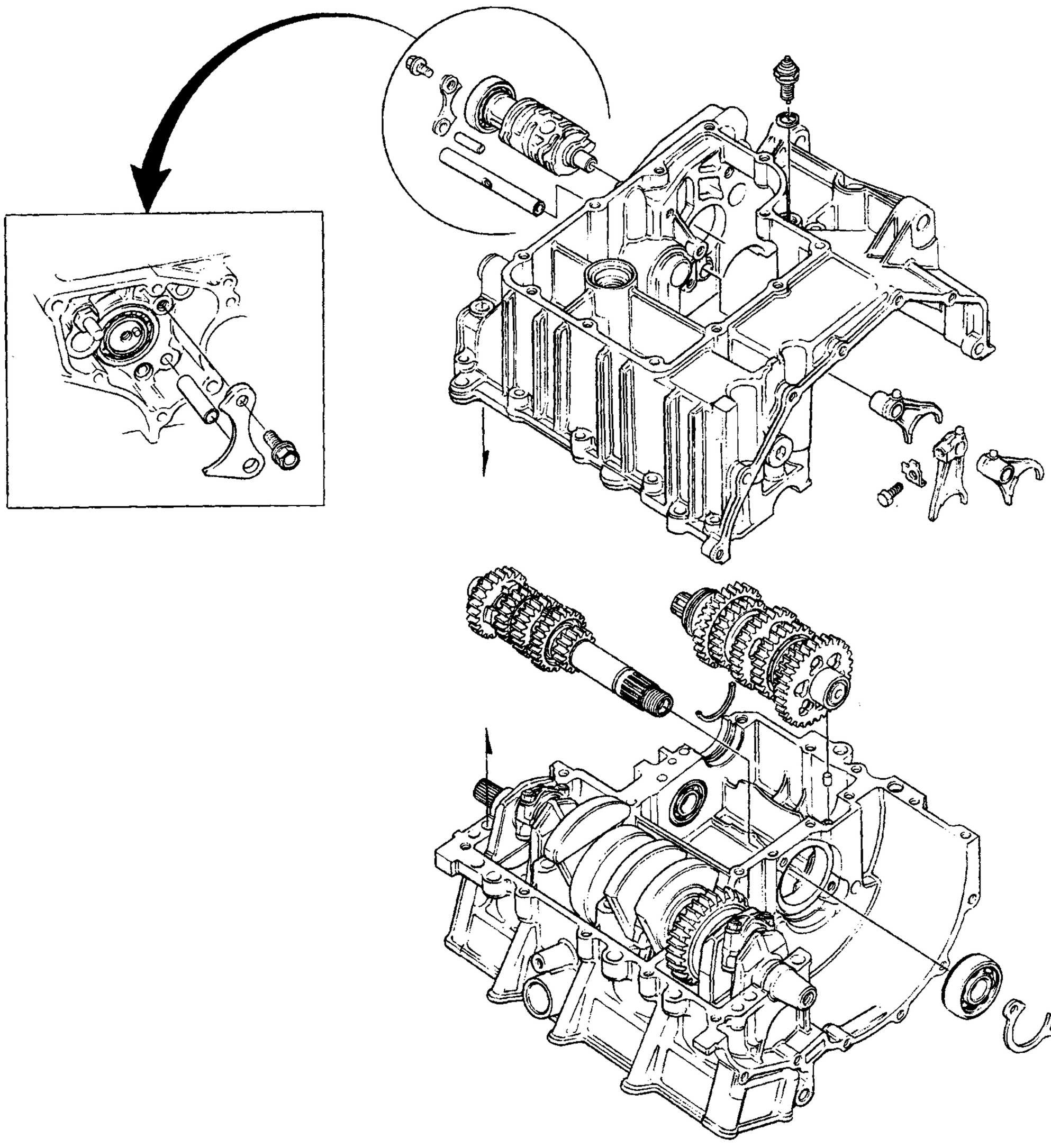
Attach the change pedal

Torque: 1.0 ~ 1.4kg-m

Attach the water pump (5-9)



- **Disassembly**



Transmission

Disassembly	12-0	Transmission Disassembly	12-3
Service Information	12-1	Transmission Inspection	12-5
Troubleshooting	12-2	Transmission Assembly	12-7

Service Information

General Caution

- Inspection of the transmission inside the crankcase should be conducted after separating the case.
- Separation of the crankcase → Sec. 8

Service Standard **Unit: mm**

Item			Standard	Limitation
Transmission	Backlash		0.044-0.140	0.3
	Gear inner diameter	M5	25.000-25021	25.05
		M6	25.000-25.021	25.05
		C1	23.000-23.021	23.05
		C2	28.000-28.021	28.05
		C3	28.000-28.021	28.05
		C4	28.000-28.021	28.05
	Gear Bush	M5 inner dia	21.985-22.006	22.07
		M5 outer dia	24.959-24.980	24.92
		M6 outer dia	24.959-24.980	24.92
		C1 outer dia	22.959-22.980	22.92
		C1 inner dia	20.007-20.028	20.10
		C2 outer dia	27.959-27.980	27.92
		C3 outer dia	27.959-27.980	27.92
		C4 outer dia	27.959-27.980	27.92
	Main shaft outer diameter	M5 at M5	21.959-21.980	21.92
		At clutch outer guide	21.980-21.990	22.20
	Counter shaft outer dia	C1 at C1	19.987-20.000	19.77
	Gear-bush or Bush-shaft clearance	M5 – bush	-	0.10
		M5 bush – shaft	-	0.15
		M6 – bush	-	0.10
		C1 – bush	-	0.10
		C1 – bush-shaft	-	0.15
		C2 – bush	-	0.10
		C3 – bush	-	0.10
		C4 – bush	-	0.10
	Shift fork	Thickness of a catch	-	5.60
		Inner dia	-	12.04
	Shift fork shaft	Outer dia	-	11.90

Troubleshooting

Difficult to select a gear

- Inadequate clutch setting (too much free movement)
- Shift fork bent
- Shift fork shaft bent
- Gear shift spindle damaged
- Shift drum guide slit damaged
- Guide pin damaged

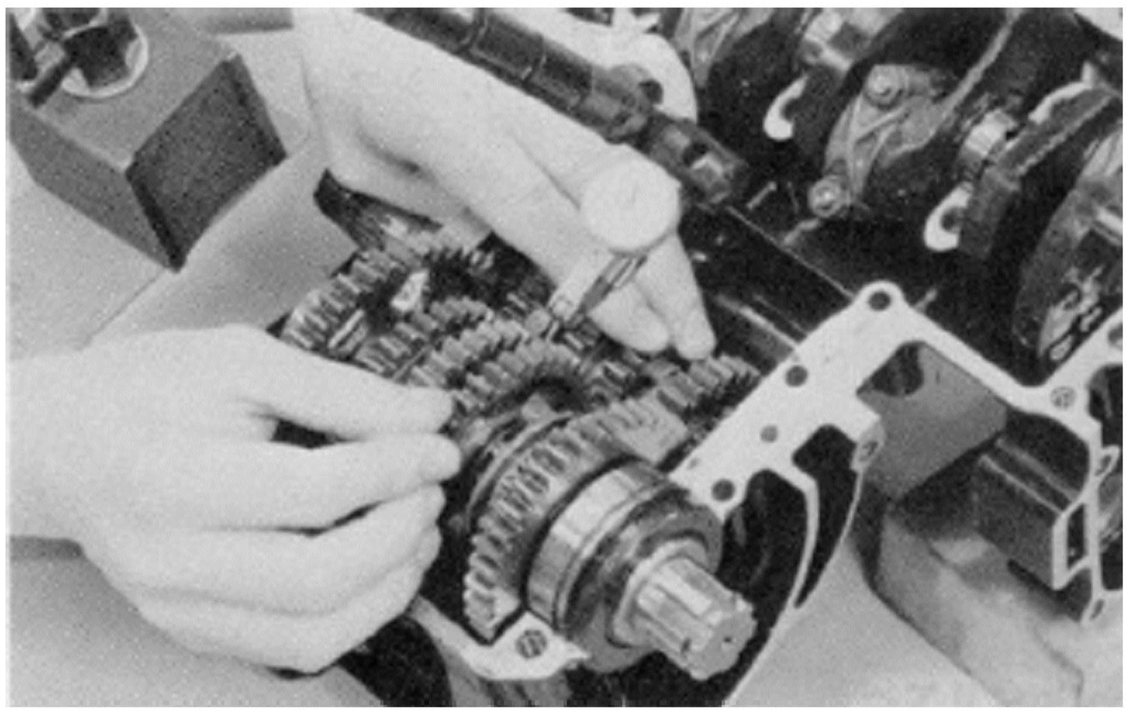
The gear disengages

- Gear dog worn out
- Shift fork shaft bent
- Shift drum stopper damaged
- Shift fork bent
- Shift drum guide slit worn out

Transmission disassembly

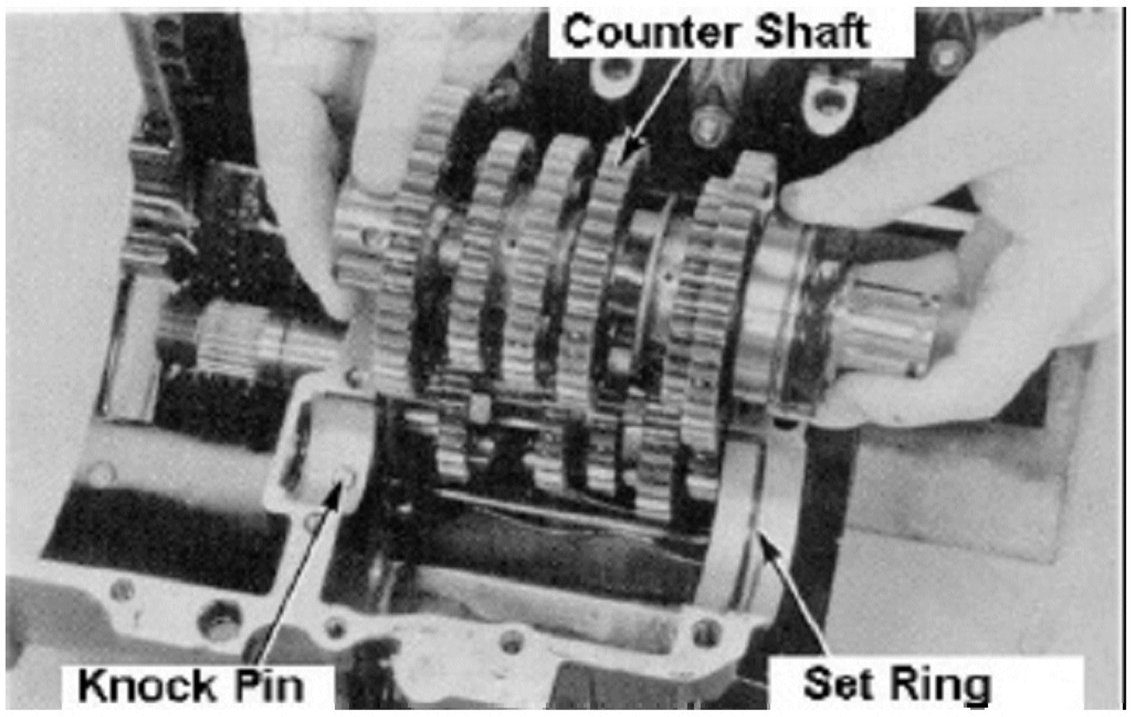
Separate the crankcase (Sec. 8)
Measure the backlash of each gear

Backlash > 0.3mm → replace



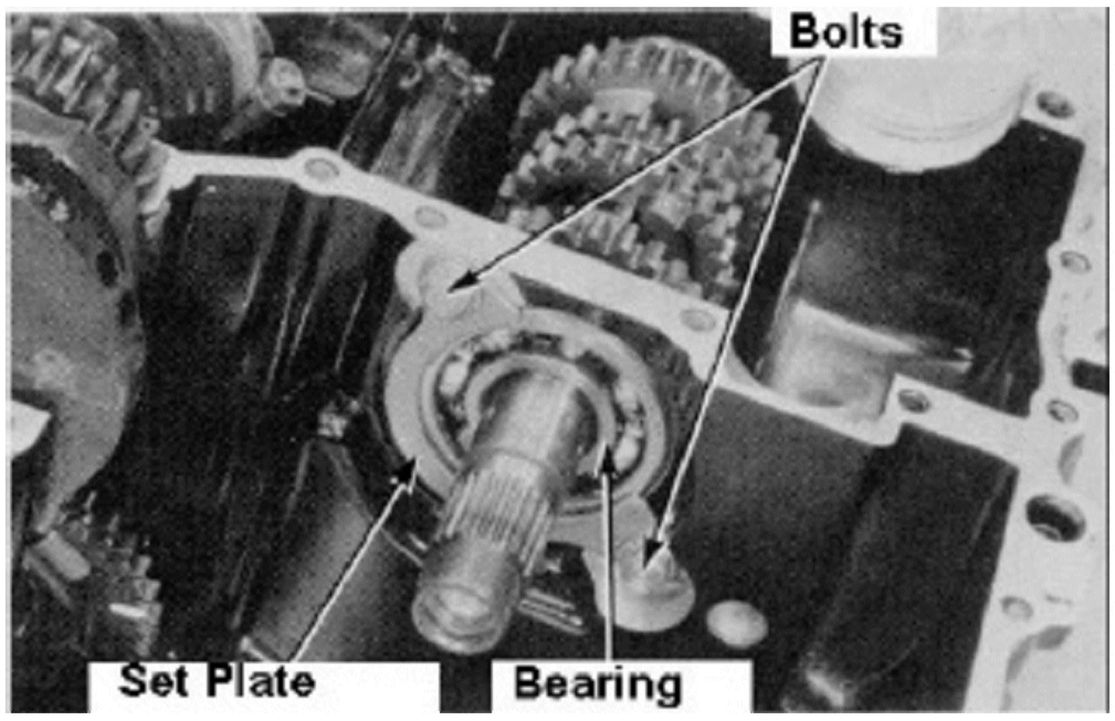
Remove the countershaft.

Detach the knock pin and the bearing set ring.

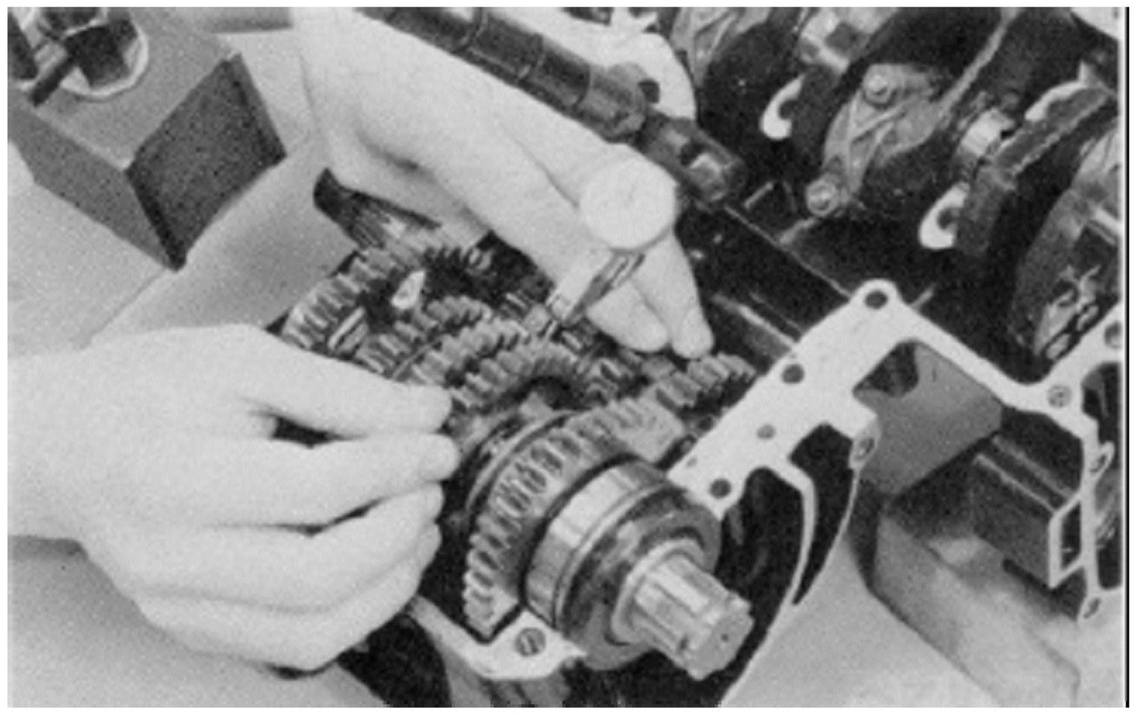


Remove two bolts and detach the stopper plate.

Pull out the bearing.

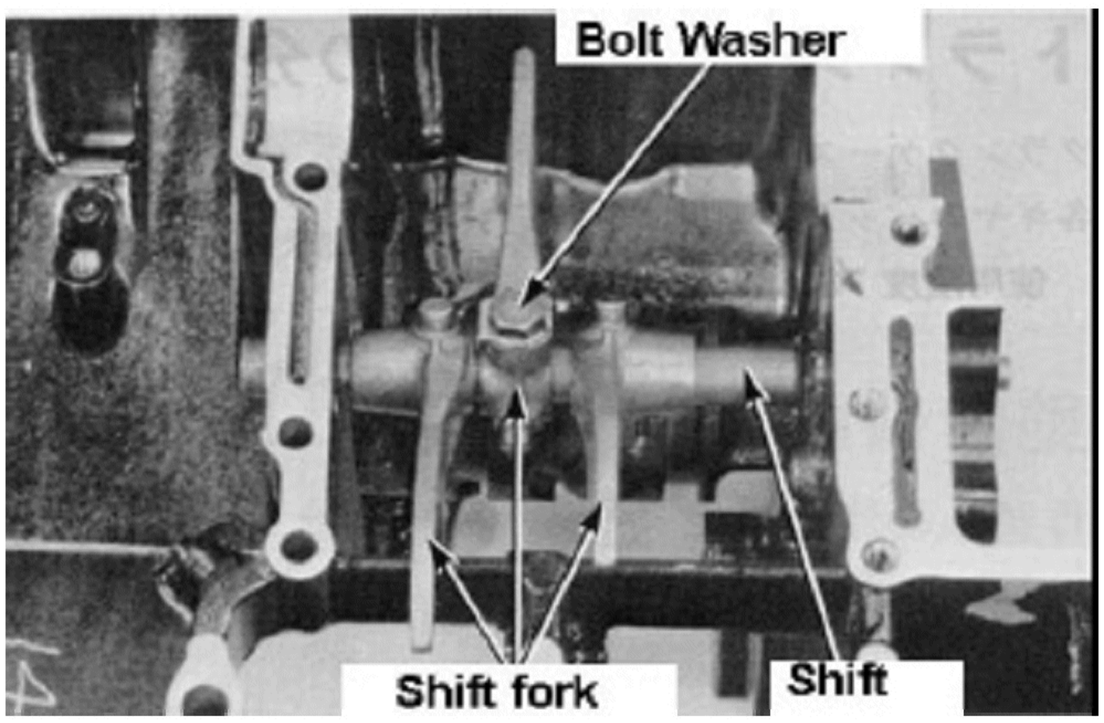


Remove the main shaft.

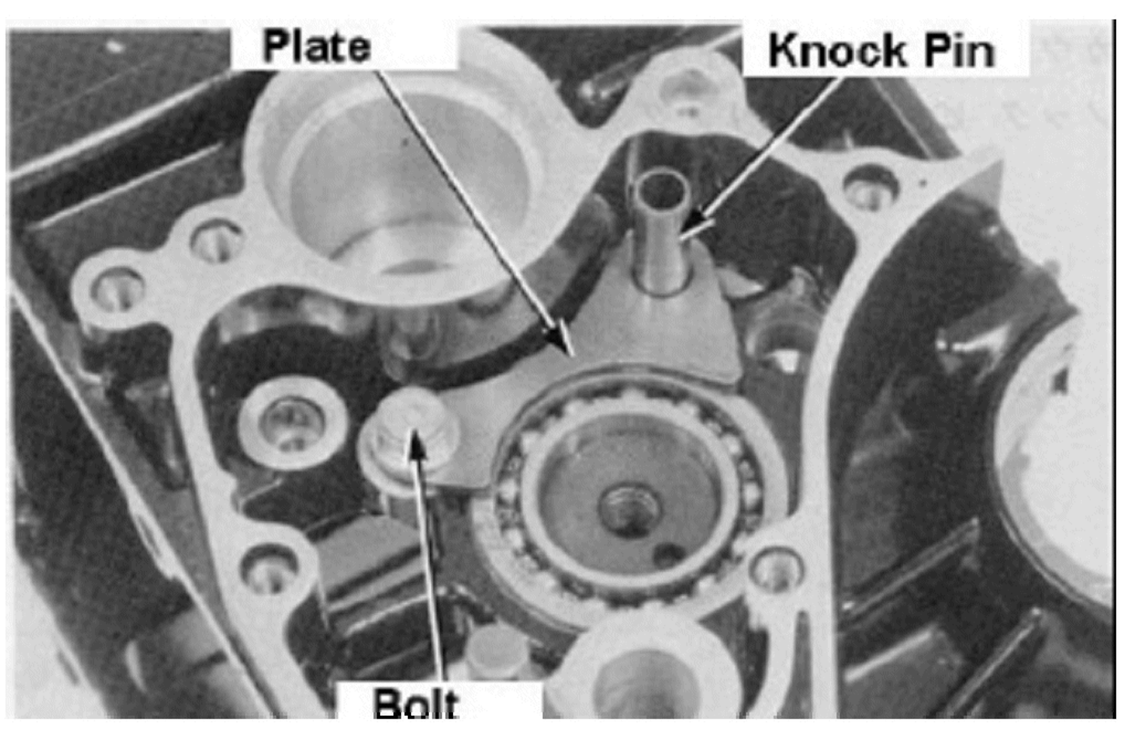


Fold the catch on the lock washer and remove the bolt and washer.

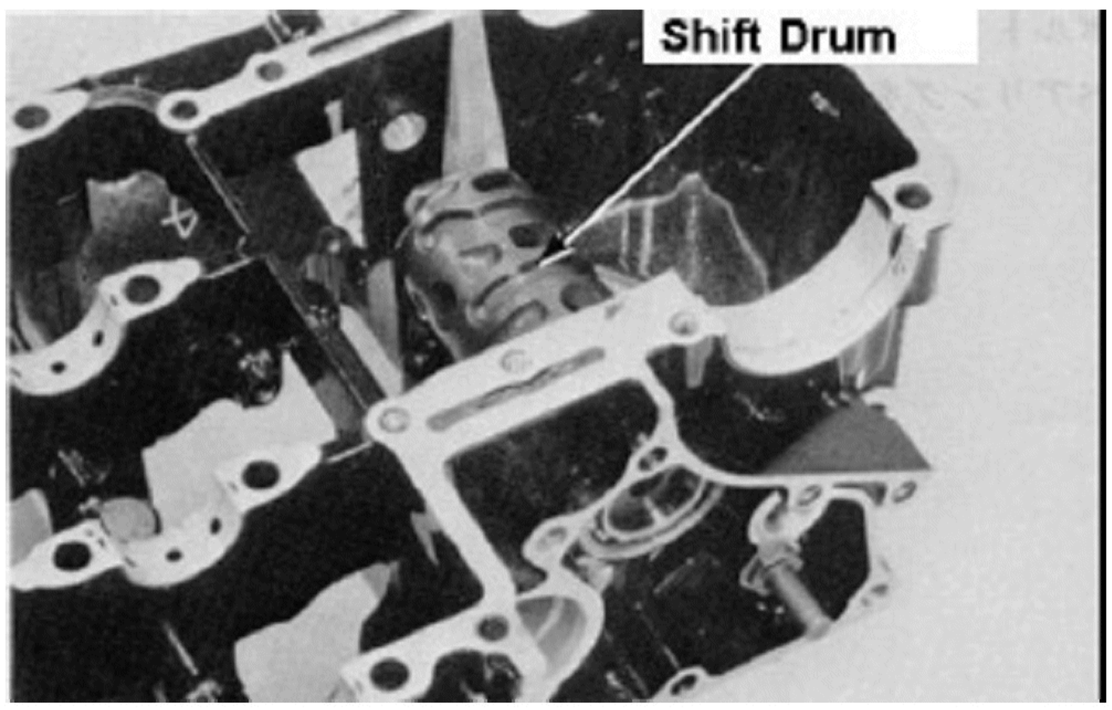
Pull out the shift fork shaft and detach shift forks.



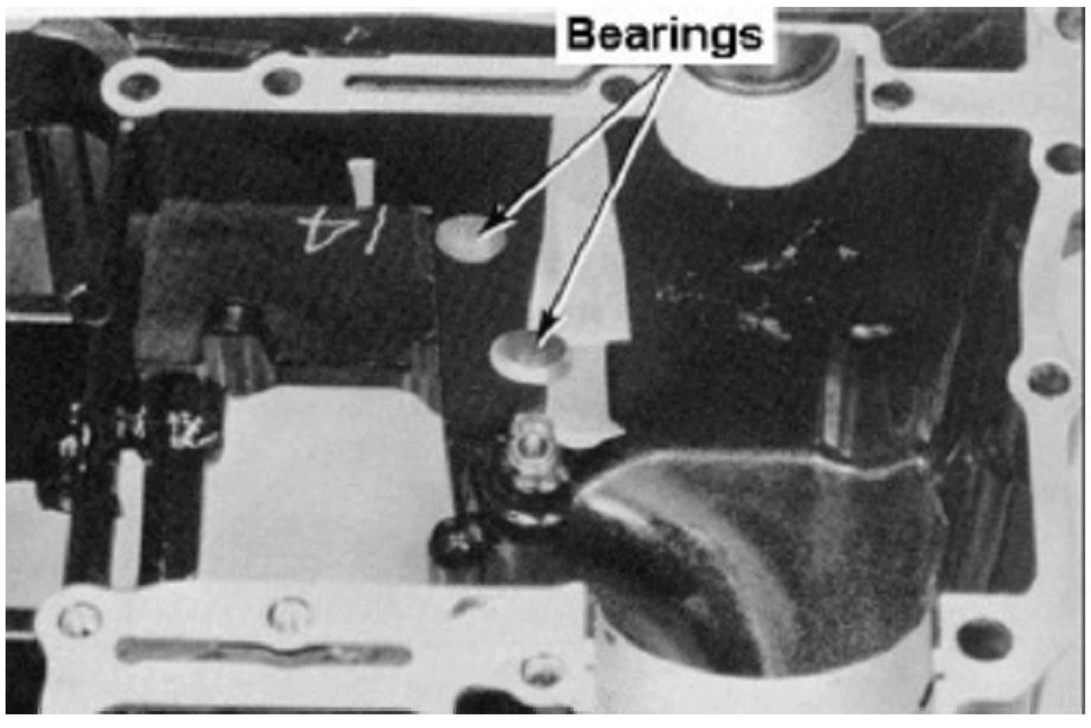
Remove the bolt to detach the set plate and knock pin.



Detach the shift drum.

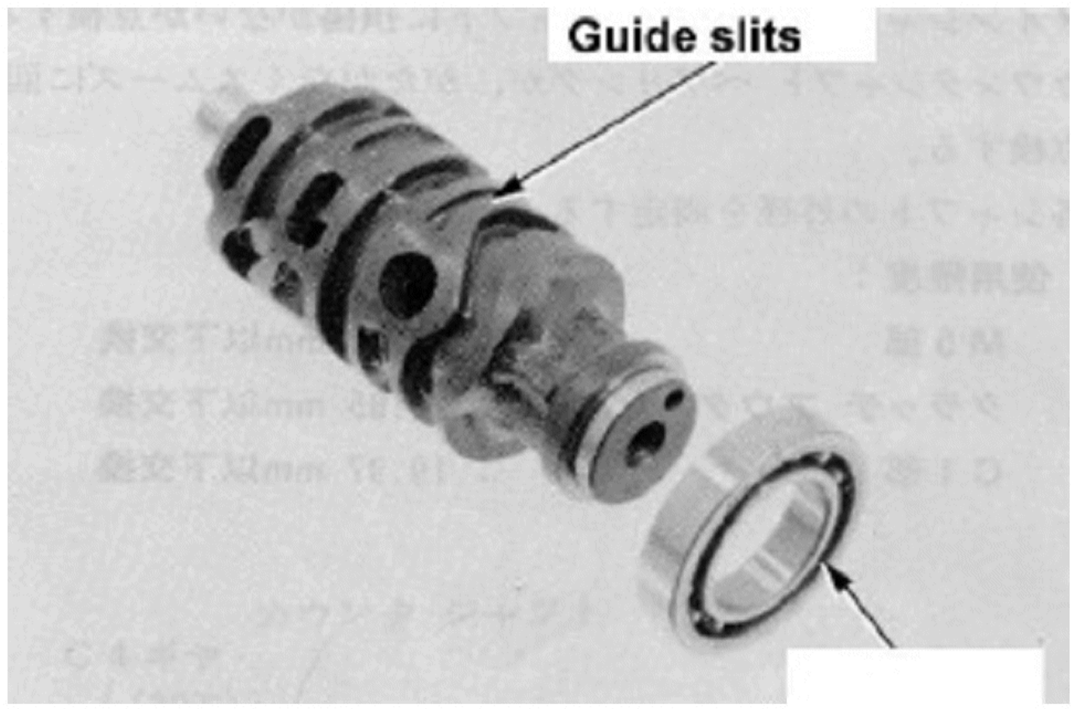


Inspect bearings for the shift fork shaft and the shift drum.



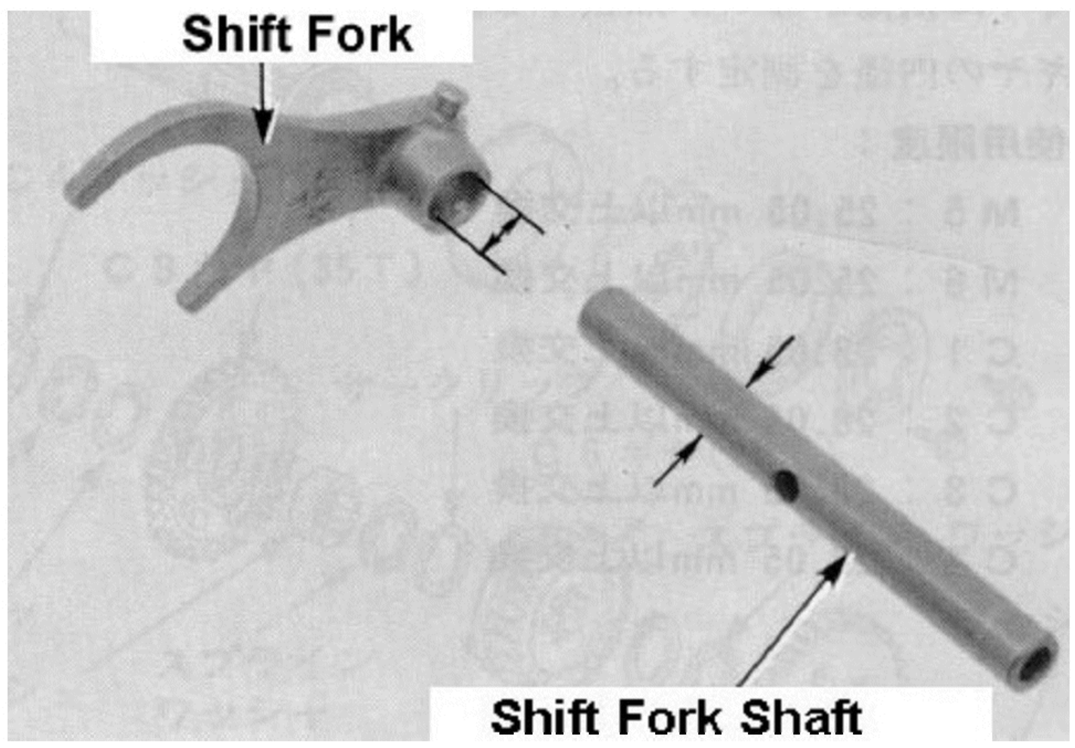
Transmission Inspection

Inspect the shift drum bearing for smooth rotation or any loose fit.
Inspect guide slits on the drum for damage or wear.



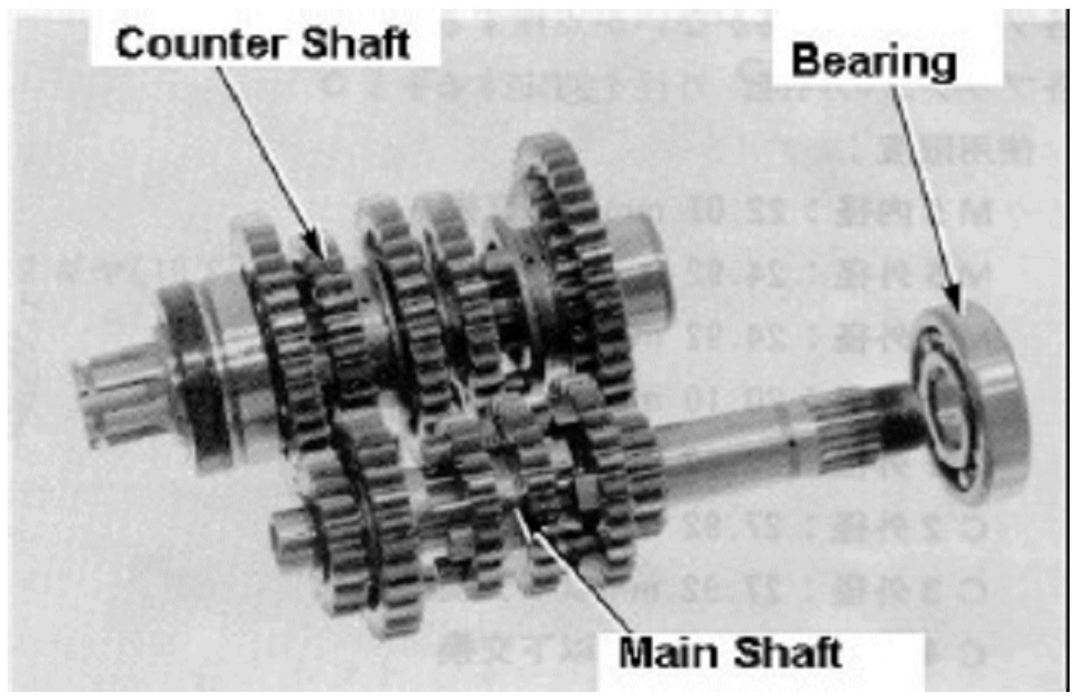
Inspect the shift fork for damage.
Measure the inner diameter and the thickness of the catch of the fork.

Inner diameter: ≧ 12.04mm)
Thickness of the catch.< 5.60mm) Replace



Inspect the shift fork for bend and damage.
Measure the outer diameter of the shaft.

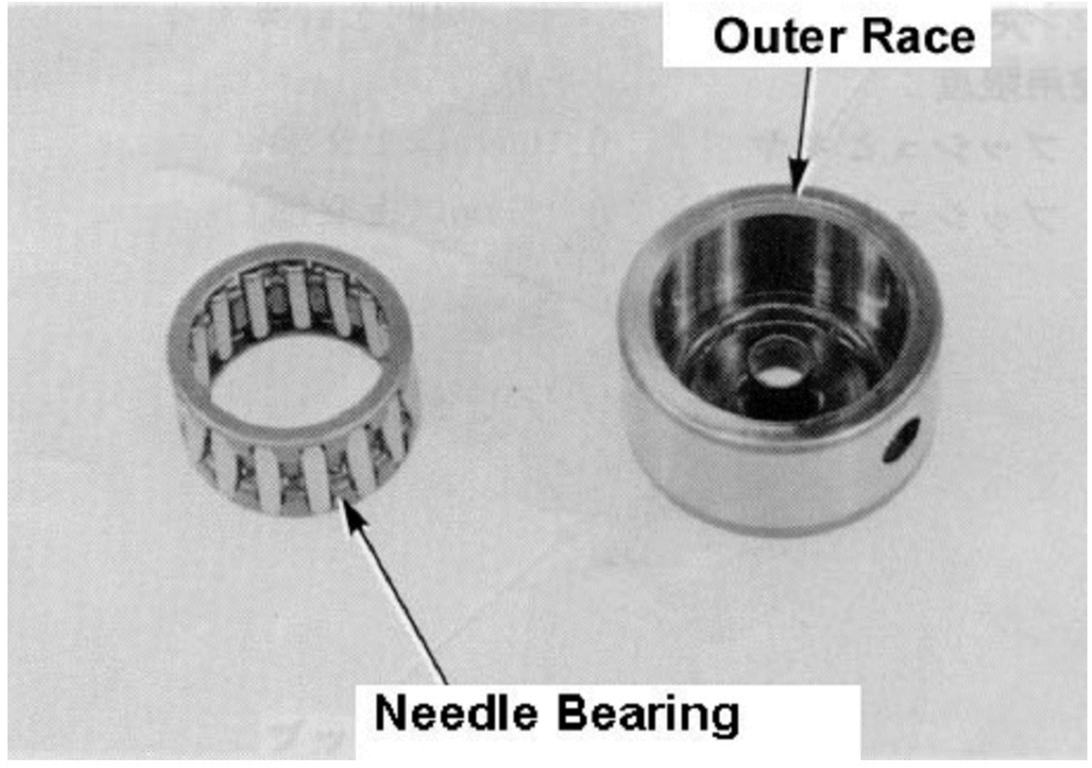
Outer diameter < 11.90mm → replace



Inspect the main shaft bearing for smooth rotation or loose fit.

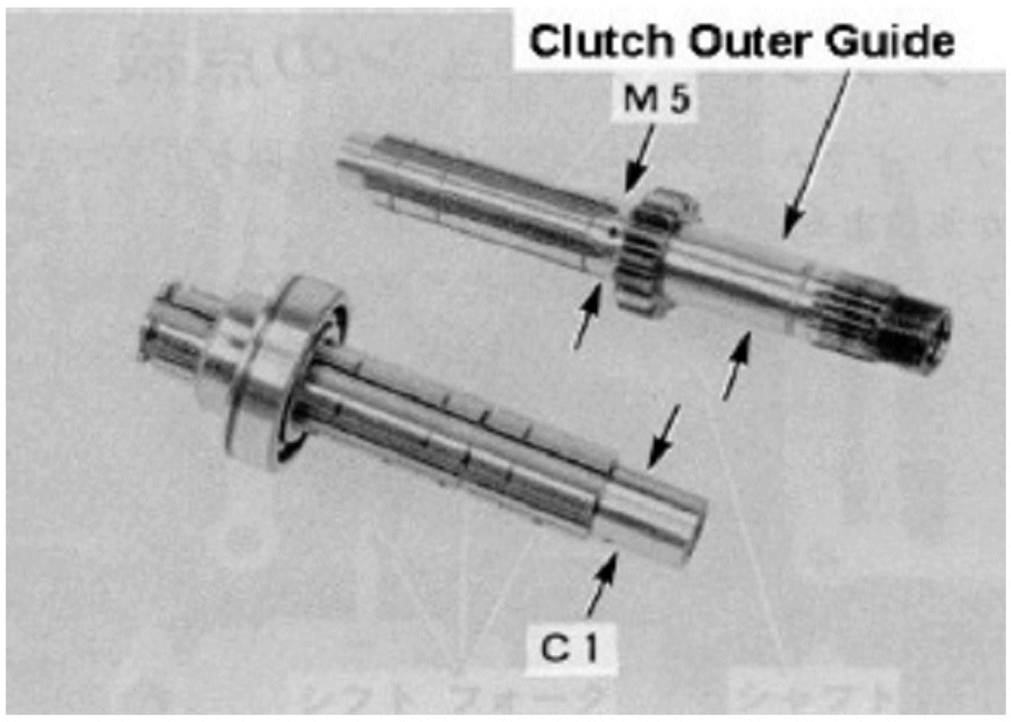
Disassemble the main shaft and the counter shaft.

Inspect the needle bearing and the outer race on the counter shaft bearing for damage.



Inspect the main shaft and the counter shaft for damage.

Inspect the countershaft bearing for smooth rotation and loose fit.

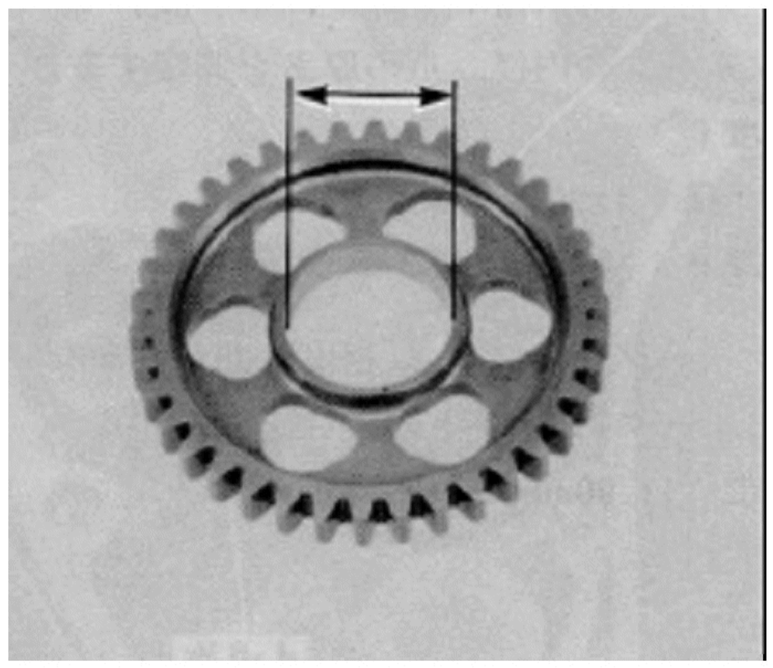


Measure outer diameter of each shaft.

M5 part:	≦ 21.92mm	)	
Clutch outer guide:	≦ 21.95mm	)	Replace
C1 part:	≦ 19.97mm	)	

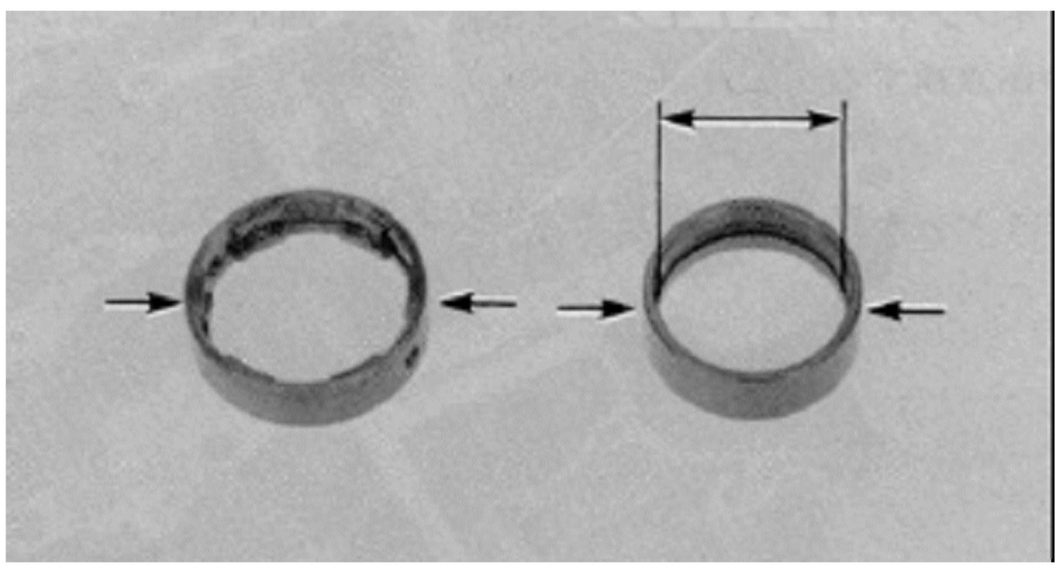
Inspect each gear for damage.

Measure the inner diameters.



M5:	≧ 25.05	)	
M6:	≧ 25.05	)	
C1:	≧ 23.05	)	Replace
C2:	≧ 28.05	)	
C3:	≧ 28.05	)	
C4:	≧ 28.05	)	

Inspect each bush for damage.
Measure inner / outer diameter for each bush.



M5 inner:	≧ 22.07mm	)	
M5 outer:	≦ 24.92mm	)	
M6 outer:	≦ 24.92mm	)	
C1 inner:	≧ 20.10mm	)	Replace
C1 outer:	≦ 22.92mm	)	
C2 outer:	≦ 27.92mm	)	
C3 outer:	≦ 27.92mm	)	
C4 outer:	≦ 27.92mm	)	

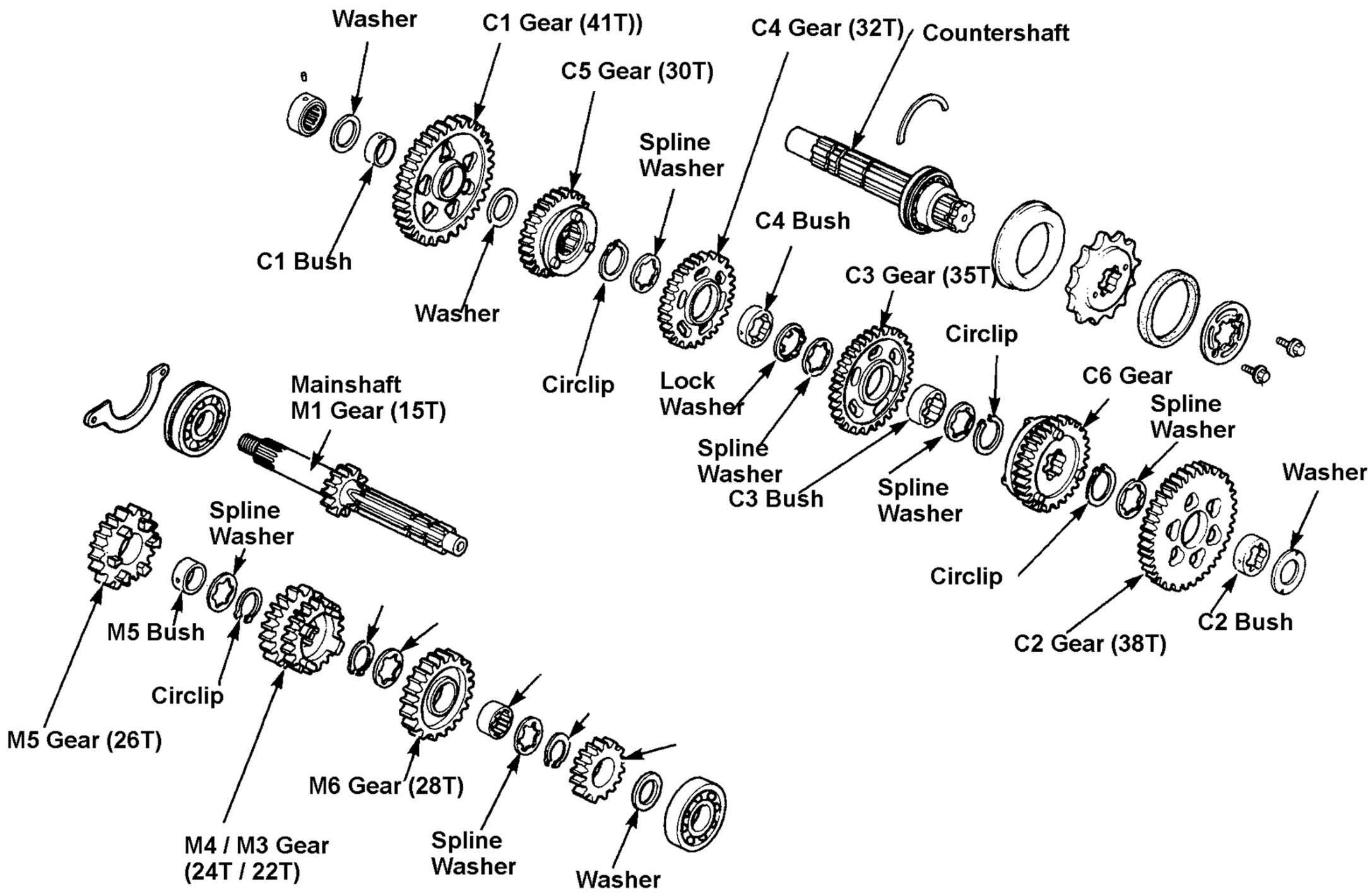
Calculate the clearance between the bush and the gear or the shaft.

Bush – gear	≧ 0.10mm	)	
Bush – shaft	≧ 0.15mm	)	Replace

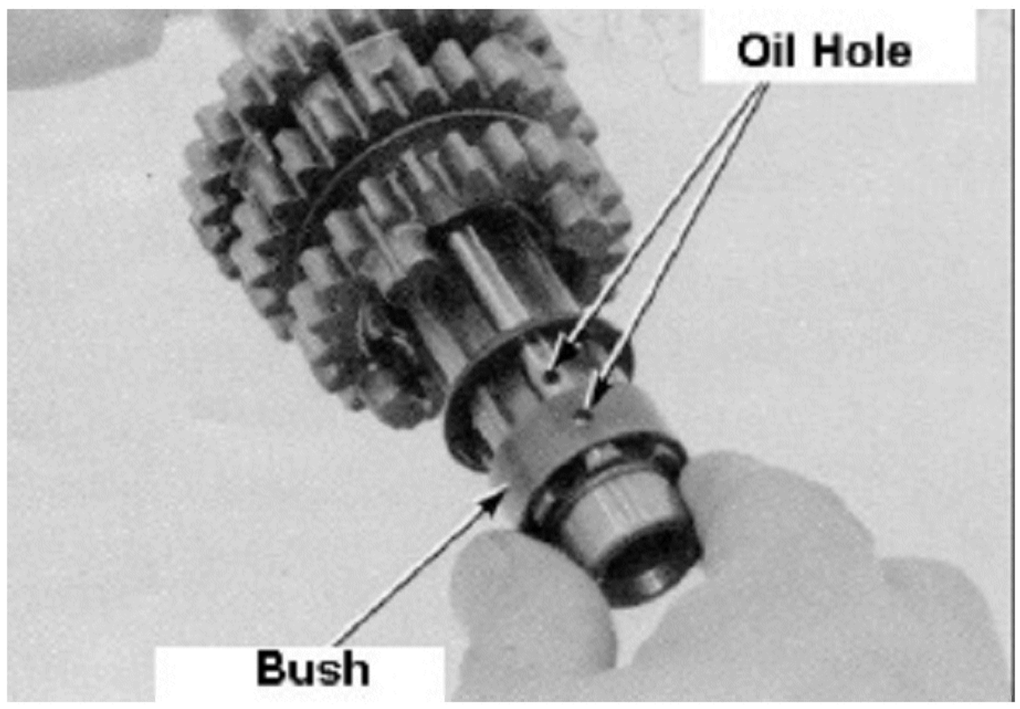
Transmission Assembly

Apply engine oil to all contact parts.

Apply grease on shift fork slits of M3/4, C5 and C6 gears. Apply grease and engine oil to the bush on C1.

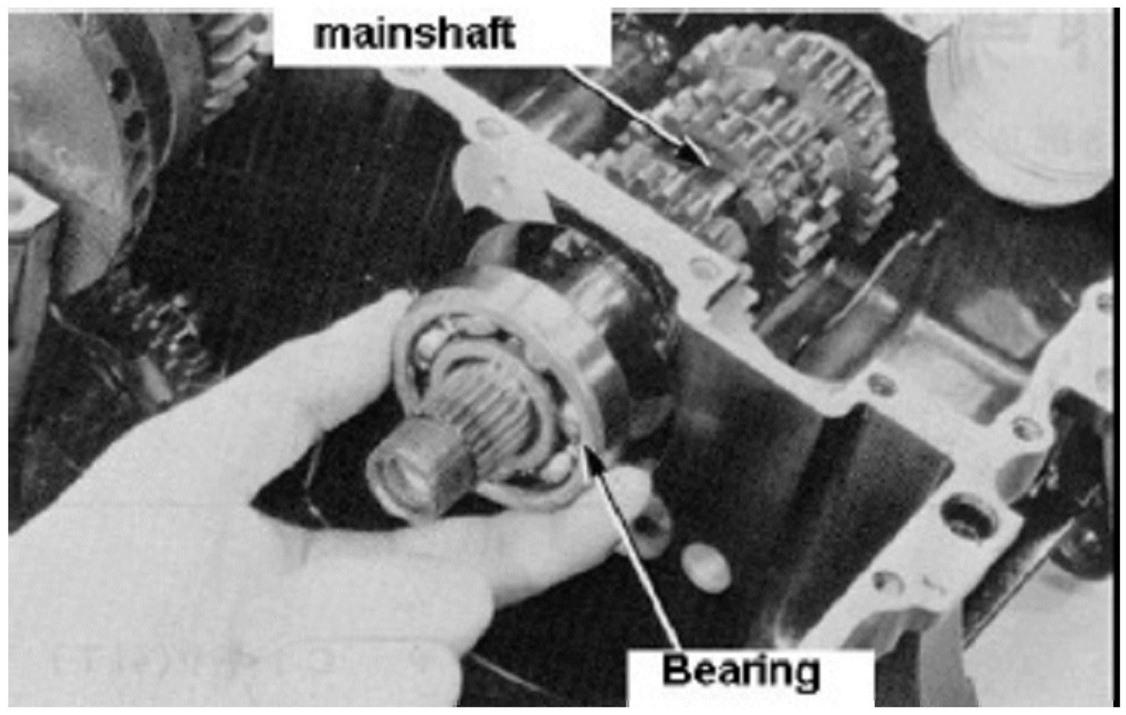


Important
Align an oil hole on the bush with an oil hole on the shaft.

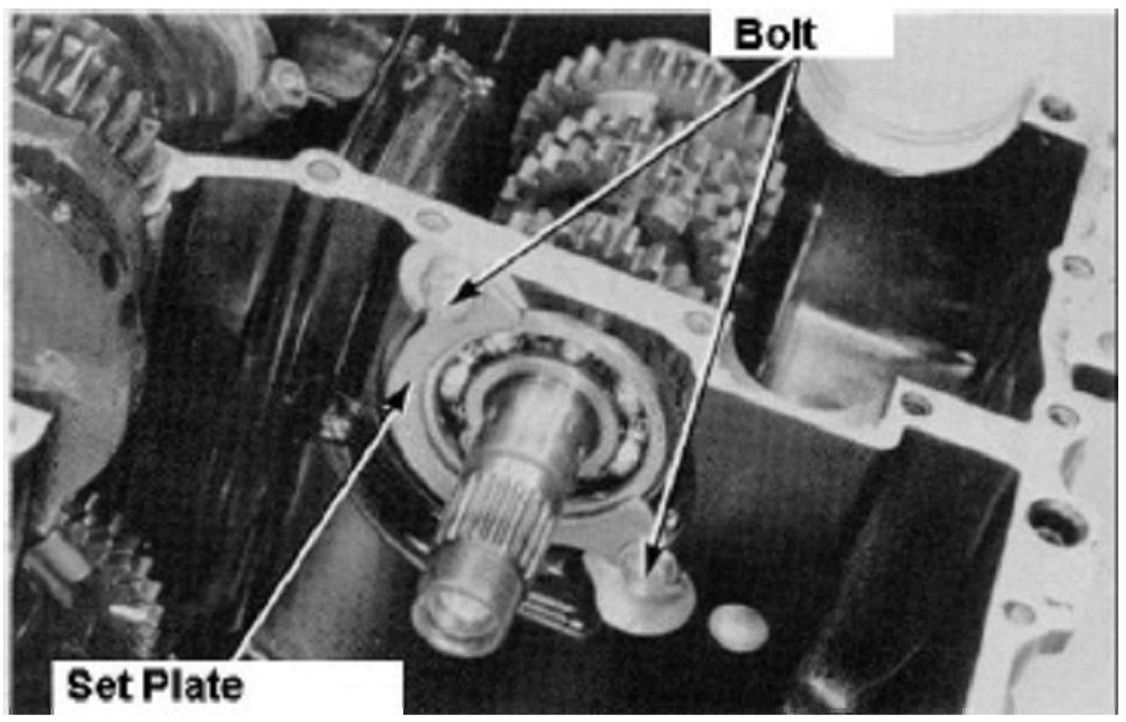


Attach the mainshaft.

Face the marked surface of the bearing outward.

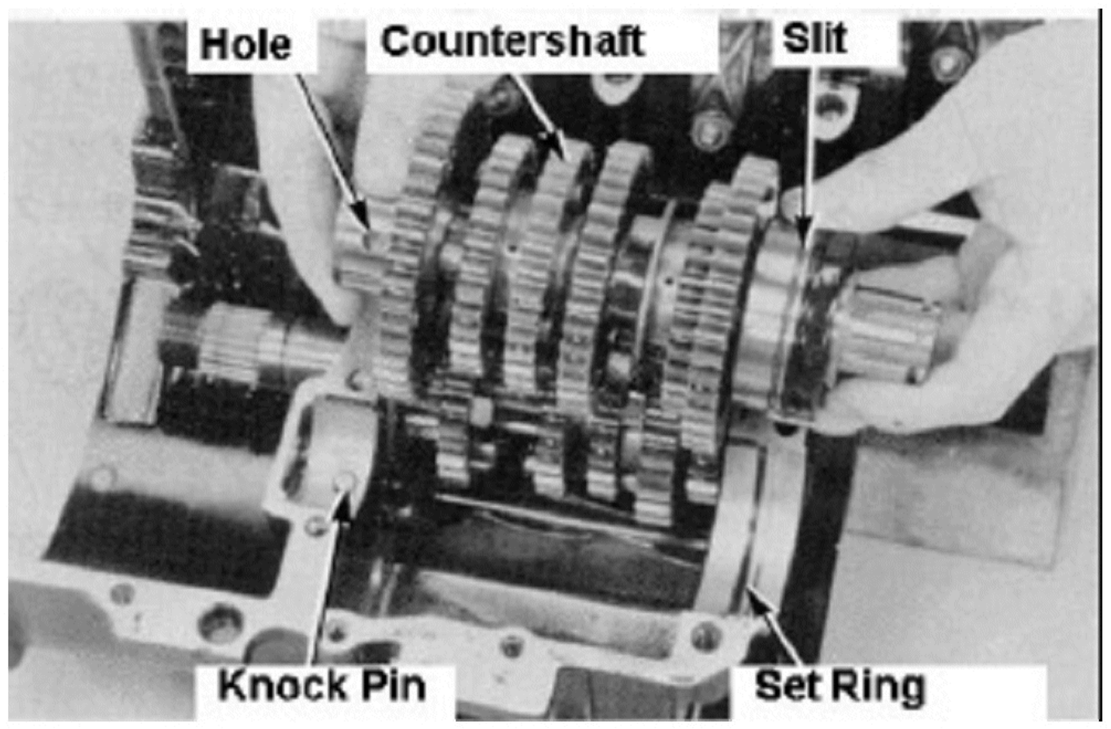


Apply screw holder on bolts and tighten the set plate.

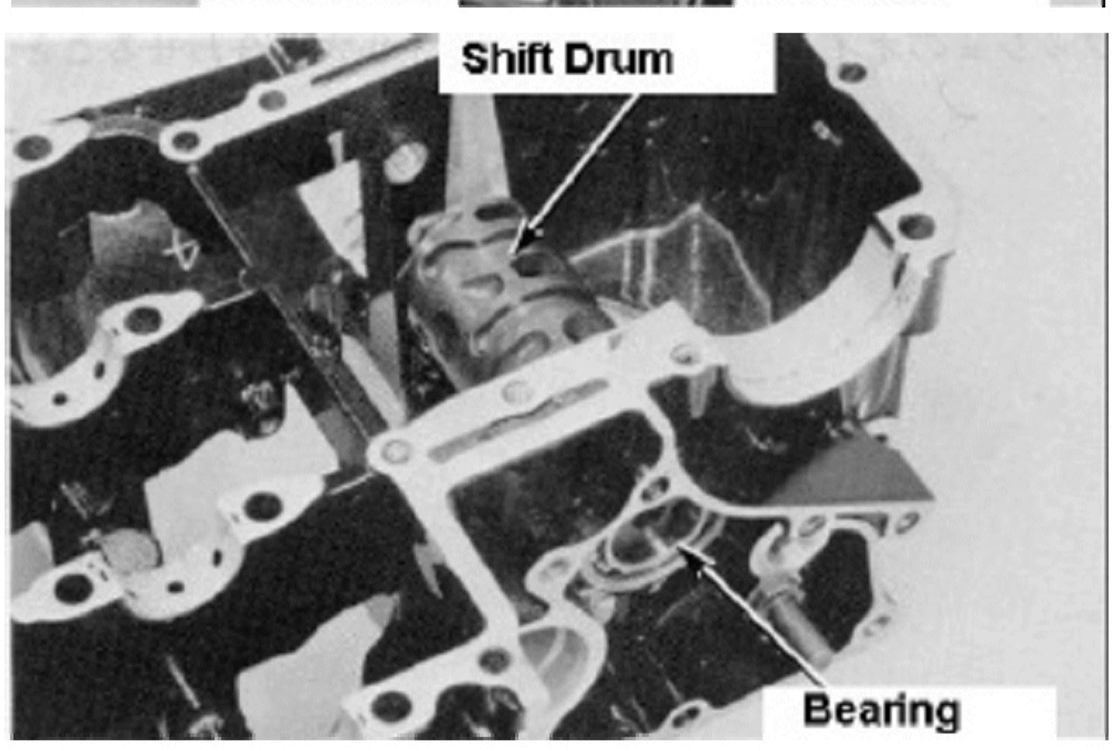


Attach the bearing set ring and the knock pin to the cylinder block.

Align the slit of the bearing with the ring, hole on the collar with knock pin, attach the counter shaft.

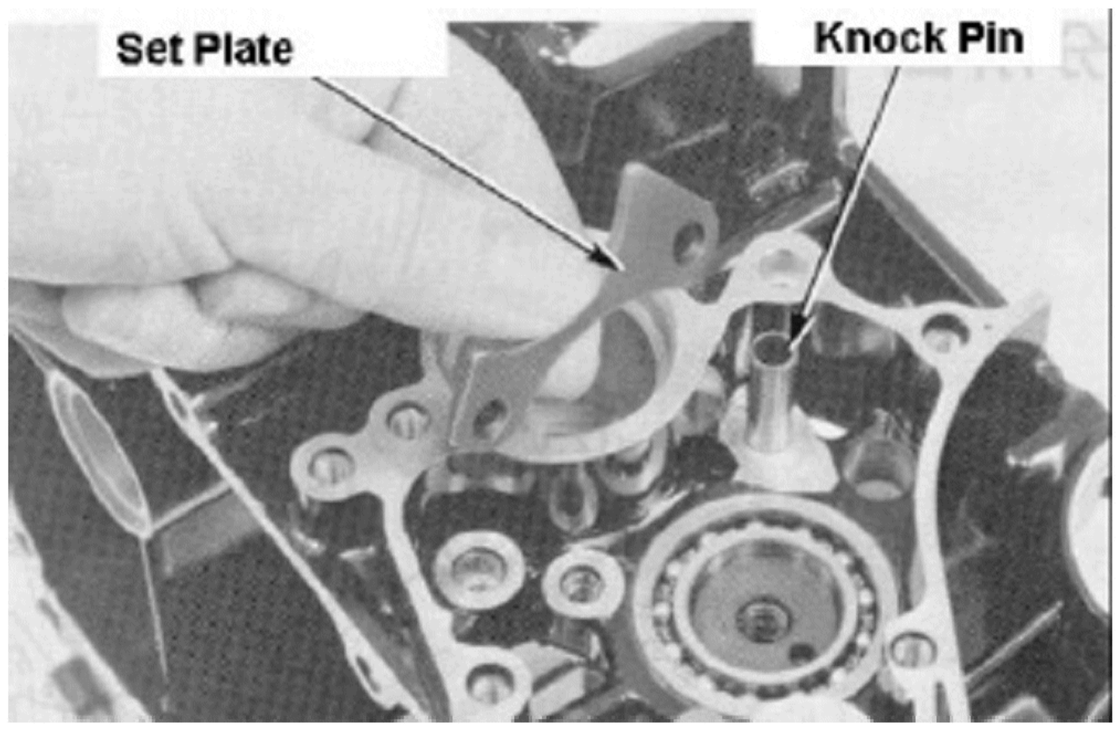


Attach the shift drum and bearing.

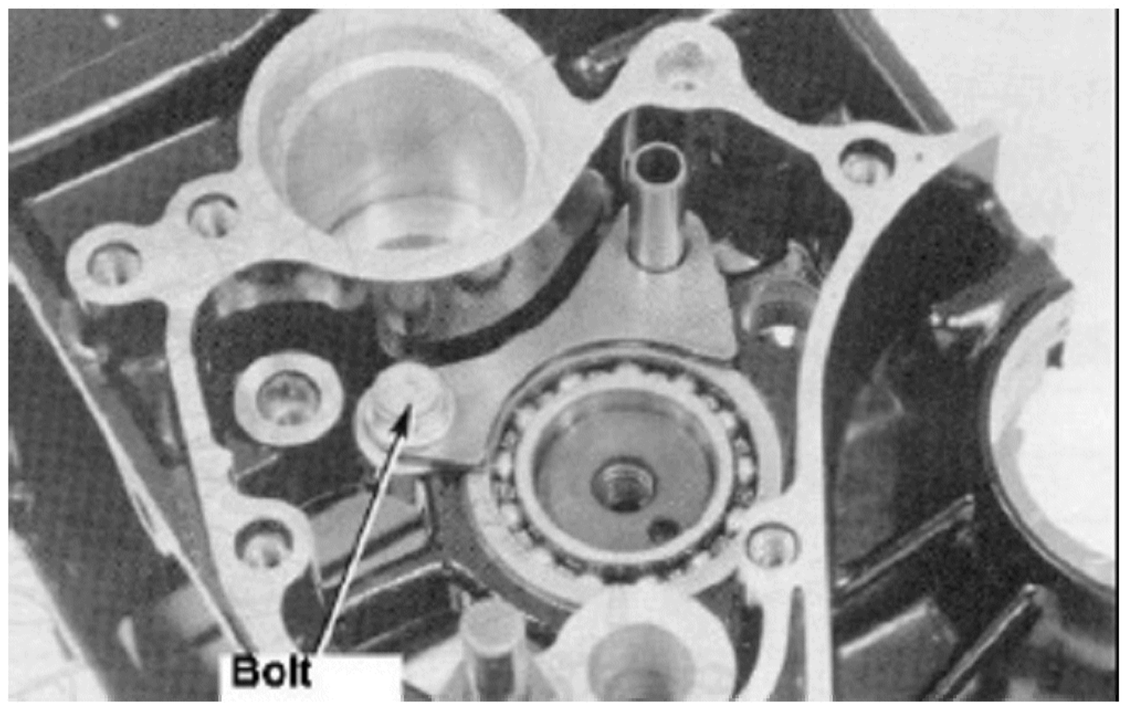


Install the knock pin.

Attach the set plate.



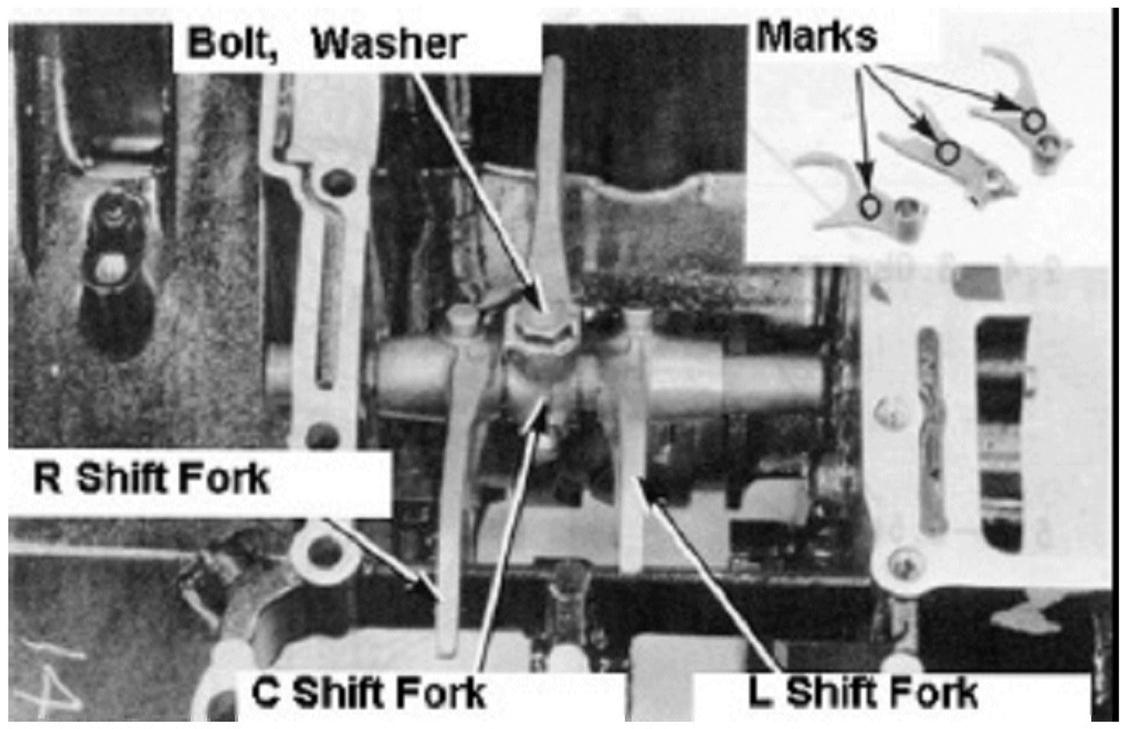
Tighten the bolt.



Install the shift fork and the shift fork shaft.

Install the fork so as to face “R”, “C”, “L” markings towards drive sprocket.

Align the hole on the shift fork shaft and the hole on the C. shift fork, install bolt with the new washer and tighten it.

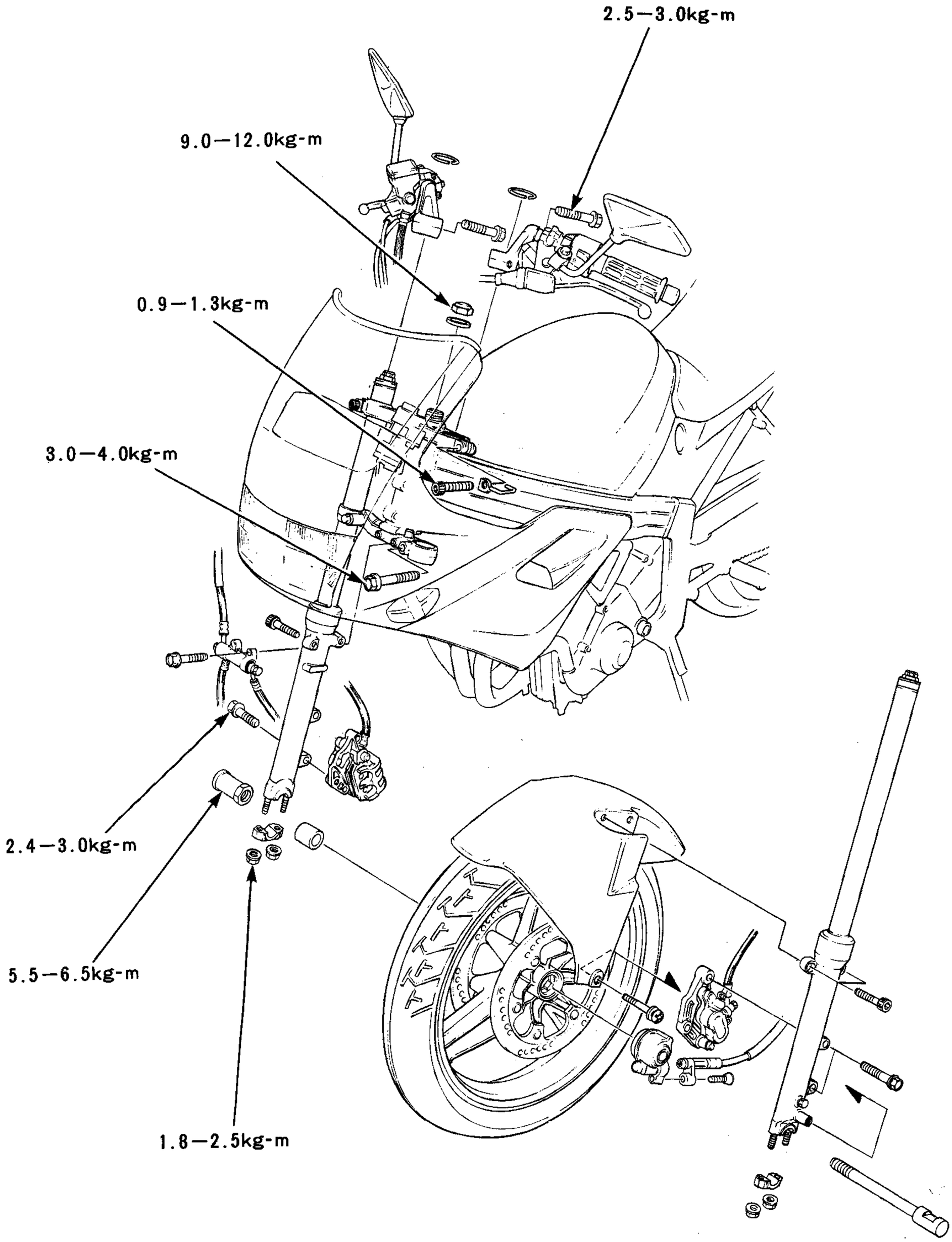


Bend the catch of the lock washer and lock the bolt.

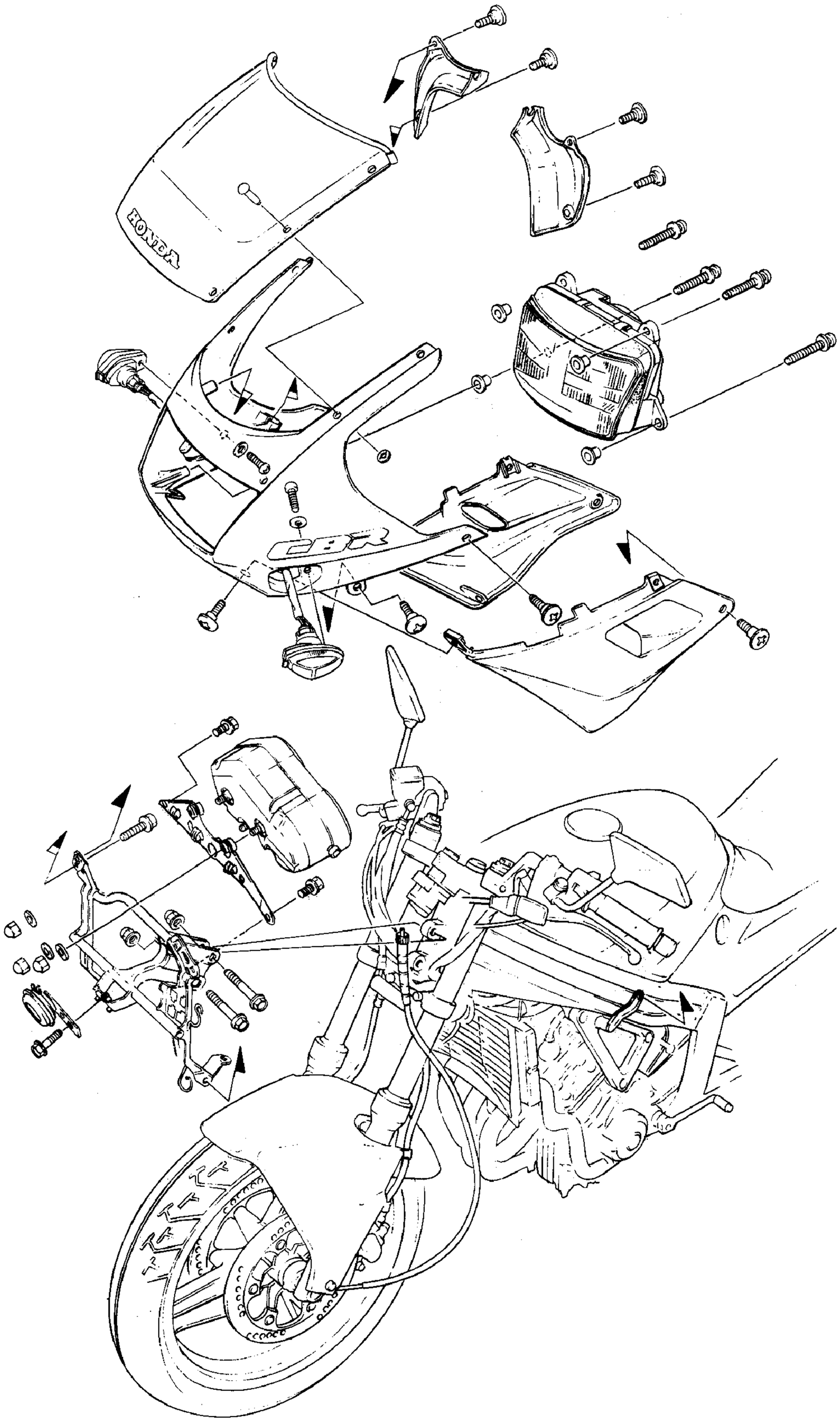
Assemble the crankcase (Sec. 8).

CBR250R,RR 13. Front Wheel Suspension Steering

- **Disassembly**



CBR250R,RR 13. Front Wheel Suspension Steering



CBR250R,RR 13. Front Wheel Suspension Steering

Disassembly	13-0	Steering handle	13-6
Service information	13-2	Front wheel	13-10
Troubleshooting	13-3	Front fork	13-16
Fairing	13-4	Steering stem	13-25

- **Service Information**

- **General caution**
  - Avoid applying excess force to the wheel. Do not step on it.
  - As a tubeless tyre is equipped, handle the tyre and the rim carefully.
  - When detaching the tyre from the rim, use exclusive “Tyre lever” and “Rim protector”.
  - Refer to “Honda Motorcycle tubeless tyre service manual (No. 6041551)” for the tubeless tyre handling.

- **Service**

		Standard	**Limitation**
Deformation of the front axle		-	0.2mm
Front wheel Deformation	Radial direction	-	2.0mm
	Side direction	-	2.0mm
Front cushion spring natural length		419.9mm	411.5mm
Front fork pipe deformation		-	0.2mm
Front fork Oil	Standard	290 ± 2.5cc	-
	Fully compressed	114mm	-
Front fork air pressure		0-0.4kg / cm²	-

- **Torque**

Handle attachment Bolt	2.5-3.0kg-m	Front fork socket bolt	1.5-2.0kg-m
Brake disk bolt	3.7-4.3kg-m	Bottom bridge bolt	3.0-4.0kg-m
Front axle nut	5.5-6.5kg-m	Top bridge bolt	0.9-1.3kg-m
Axle holder nut	1.8-2.5kg-m	Fork bolt	1.5-3.0kg-m
Caliper bracket bolt	2.4-3.0kg-m	Steering adjustment	2.0-2.4kg-m
Master cylinder Holder nut	1.0-1.4kg-m	Steering stem nut	9.0-12.0kg-m
Fairing	0.7-1.1kg-m	Fairing stay	3.0-4.0kg-m
Fairing inside cover	0.6-1.0kg-m	Front fender 6mm bolt	0.8-1.2kg-m
Ignition switch	2.5-3.0kg-m	6mm biss	0.7-1.1kg-m

- **Tools**
- **Exclusive Tools**

Steering stem socket	07916-3710100	1. Driver shaft Assy	07946-KM90300
Fork seal driver	07947-KA20200	2. Assembly base	07946-KM90600
Attachment	07946-MB00000	3. Driver attachment A	07946-KM90100
Steering stem driver	07946-KM90000	4. Driver attachment B	07946-KM90200
Ball race remover set	(1-6 inclusive)	5. Bearing remover A	07946-KM90400
		6. Bearing remover B	07946-KM90500

- **Common tool**

Fork seal driver	07747-0010100	Driver handle A	07749-0010000
Extension bar	07716-0020500	Pilot (15mm)	07746-0040300
Lock nut wrench (30 x 32mm)	07716-002400	Outer driver (42 x 47mm)	07746-0010300
Bearing remover Shaft	07746-0050100	Outer driver (32 x 35mm)	07746-0010100
Bearing remover Head (15mm)	07746-0050400		

- **Troubleshooting**

Heavy Steering
- Steering adjust nut excessively tightened.
- Steering bearing damaged.
- Interference between wires and cables
- Tyre pressure too low.

Too Light Steering
- Front fork bent.
- Front axle bent, tyre tilted.
- Rear axle bent.

Front wheel track unstable
- Rim deformed.
- Loose attachment of the front wheel bearing.
- Poor quality tyre.
- Inadequate tightening around the axle.

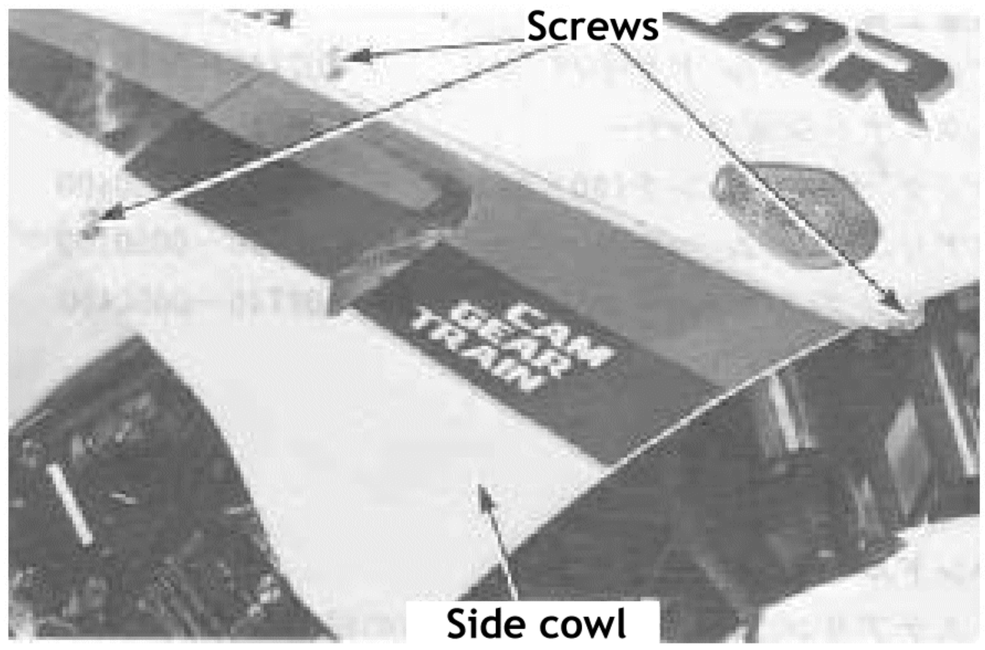
Noise from the front cushion
- Contact between a fork pipe and the bottom case.
- Lack of fork oil.
- Cushion attachment bolts loose.

Front cushion too soft
- Spring distorted.
- Lack of fork oil.
- Inadequate fork air pressure.
- Improper viscosity of oil.

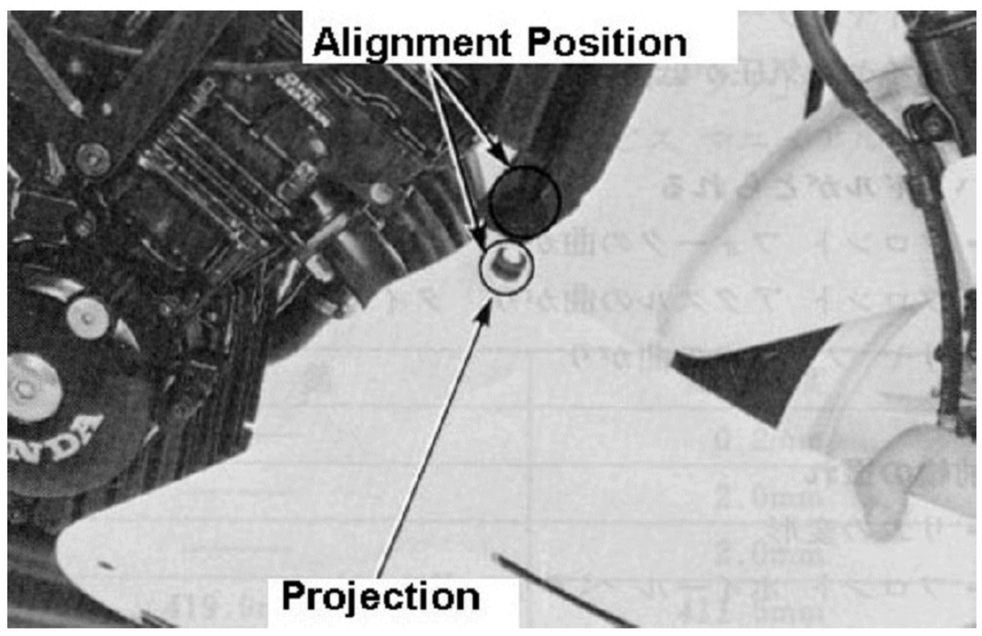
Front cushion too hard
- Inadequate fork oil.
- Inadequate fork air pressure.
- Fork pipe bent.
- Oil path jammed.
- Inadequate viscosity of oil.

- **Fairing**
- **Fairing detachment**

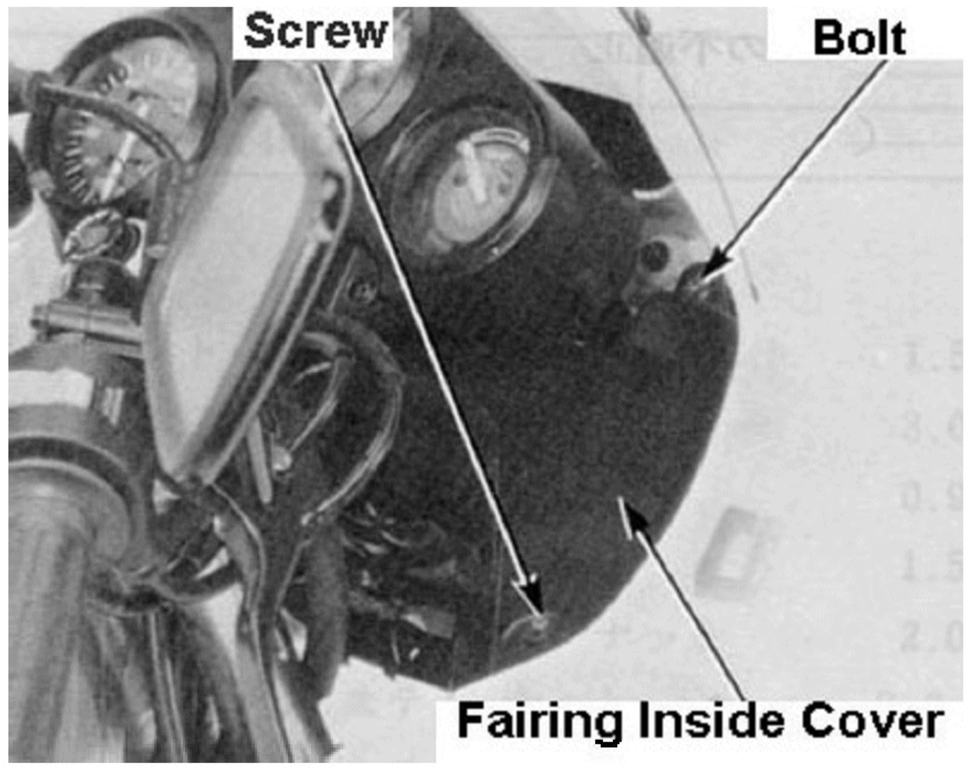
Remove attachment screw on a side cowl.



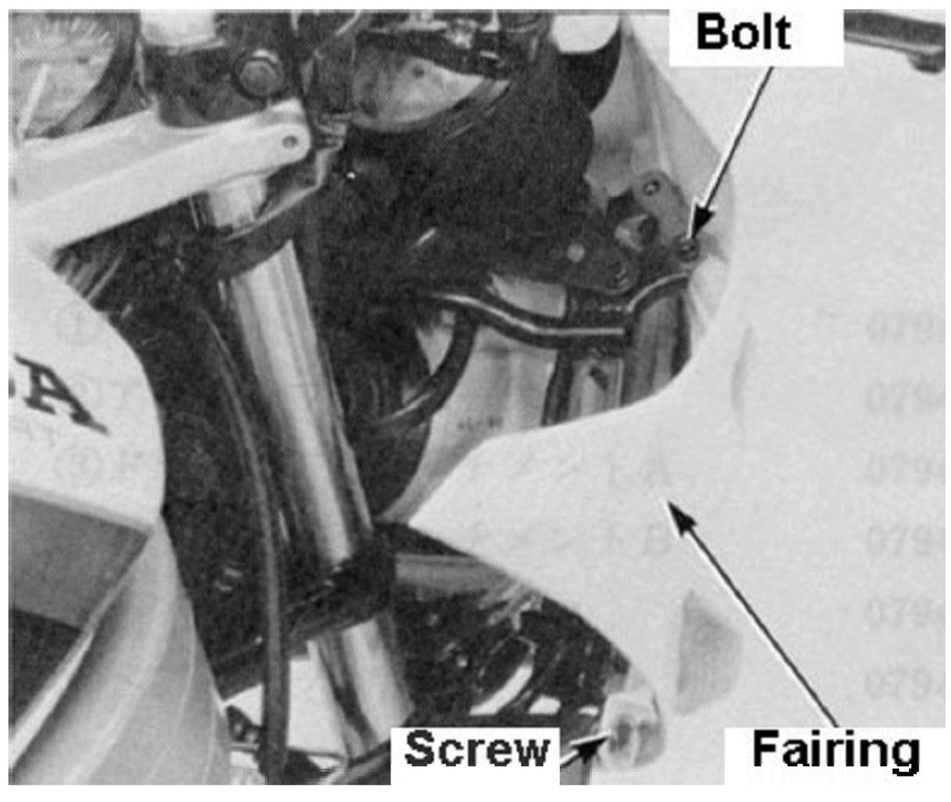
Slide the projection of the side cowl to the position lower than the alignment marking of the radiator and detach the side cowl.



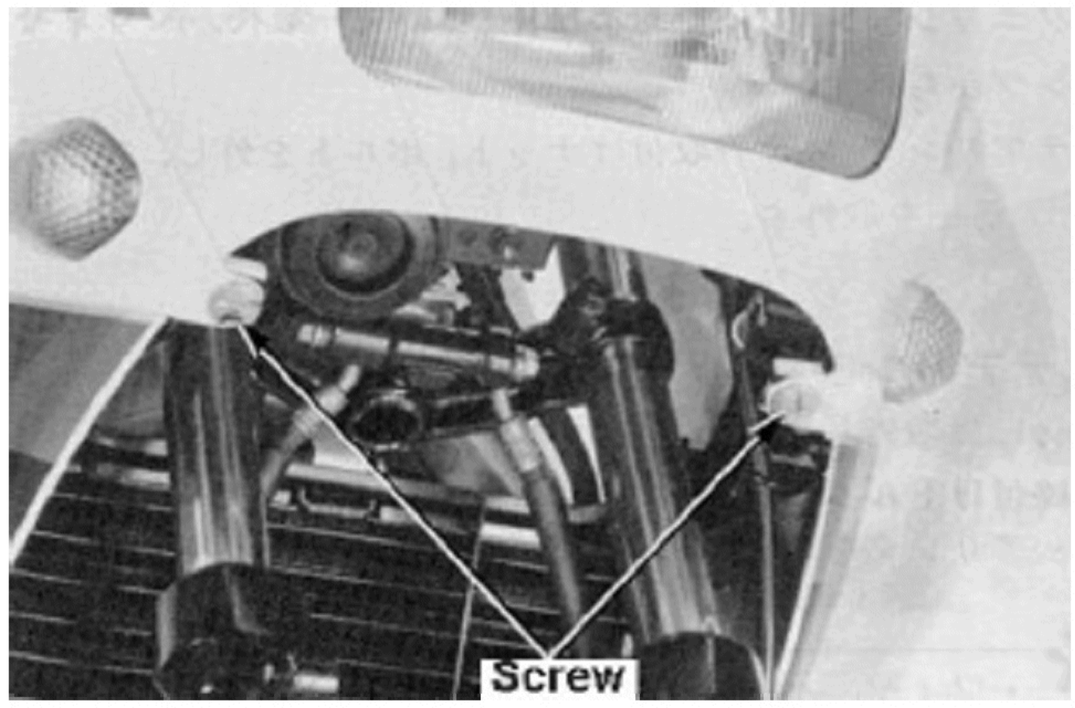
Remove the screw and detach fairing inside cover.



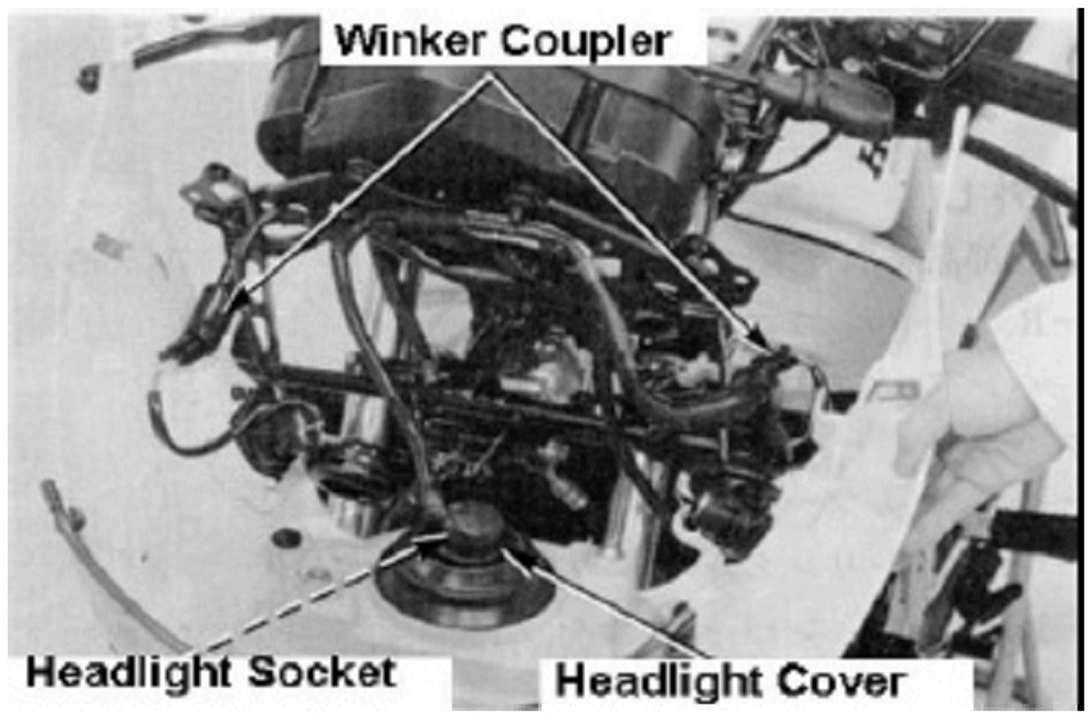
Remove the fairing attachment bolt and the screw from the meter stay.



Remove two screws on lower part of the fairing.
Pull the fairing forward



Slide the headlight cover and disconnect the socket.
Disconnect blinker couplers.

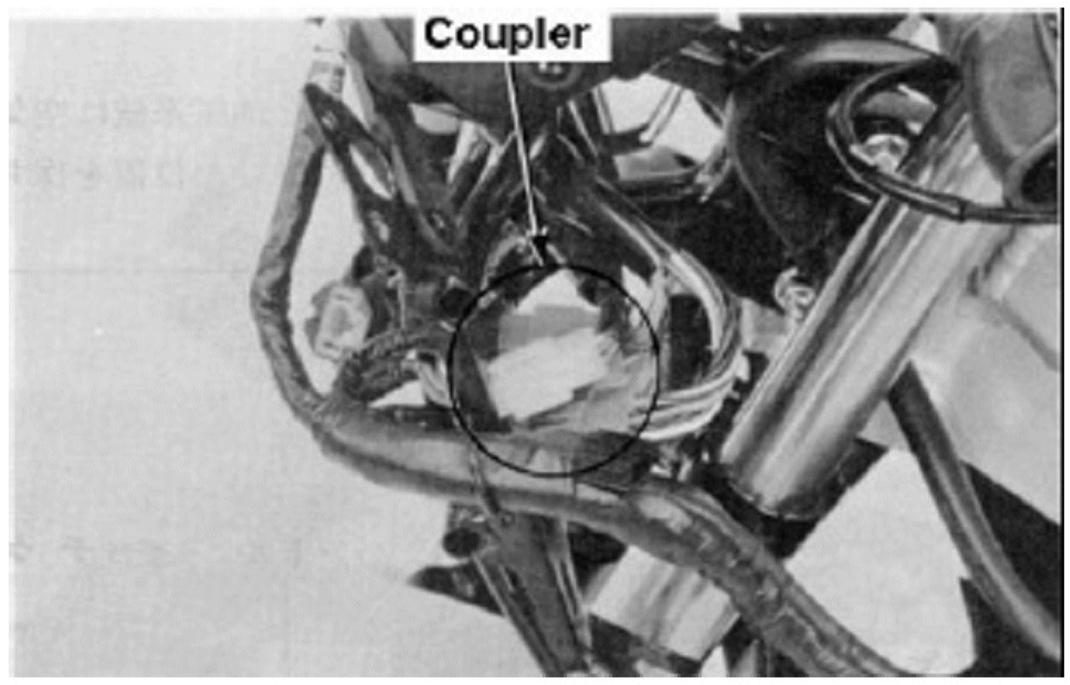


Fairing attachment

Reverse the detachment procedure.

Torque: Fairing 0.7 ~ 1.1kg-m
Fairing inside cover 0.6 ~ 1.0kg-m

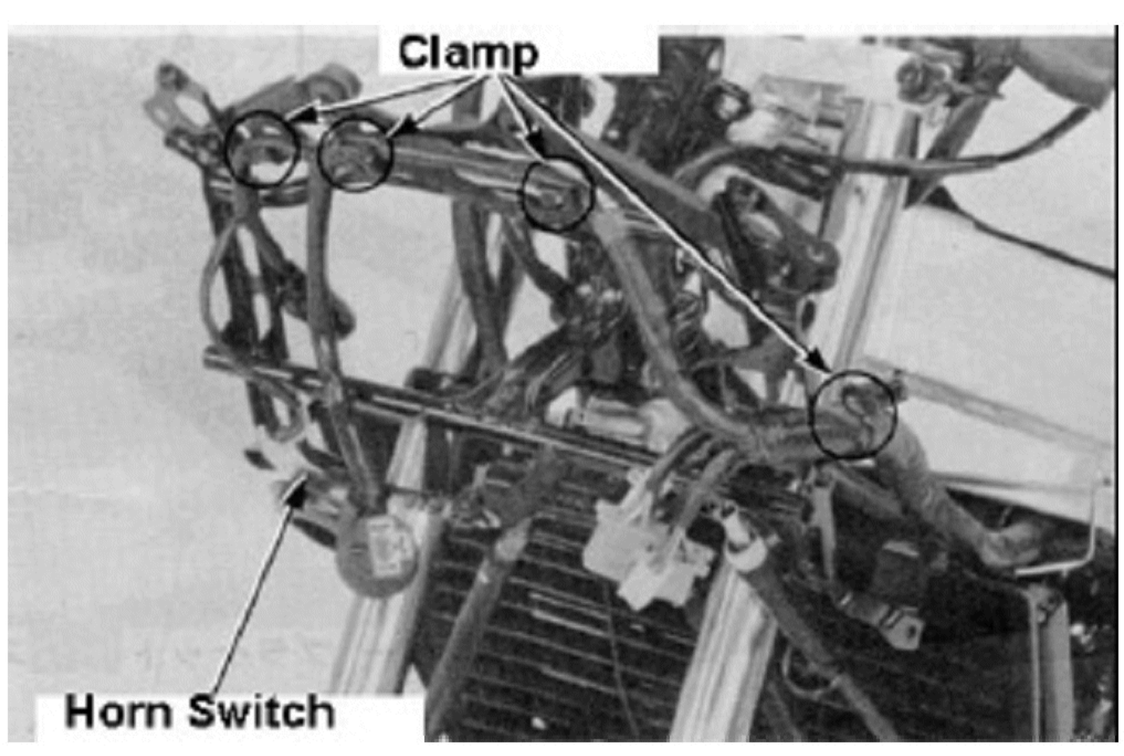
Align the slit on a fairing inside cover to the steering stay when attaching the cover.



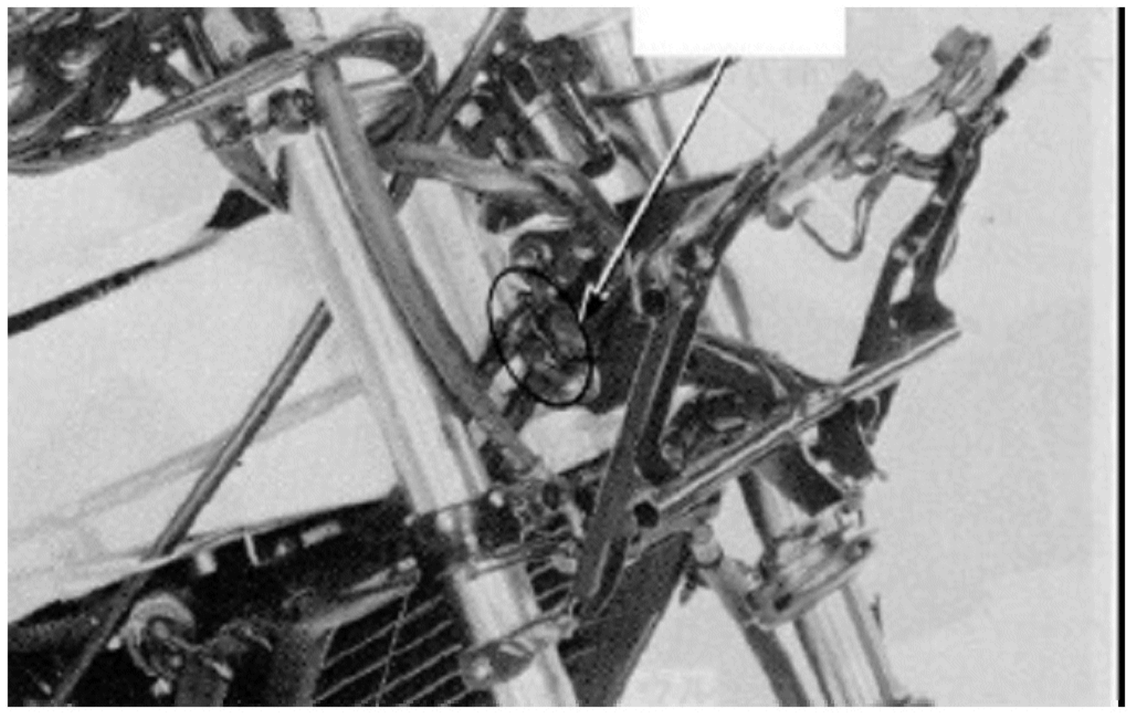
Steering stay detachment

Detach the fairing (13-4)
Disconnect the indicators and fuse couplers.
Detach the indicators (20-3).

Detach the harness from steering stay clamps.
Disconnect the horn switch wirings.



Disconnect ignition wires and right handle switch wires from the clamp.
Remove steering stay attachment bolt/nut and detach the steering stay.



Steering stay attachment

Reverse the detachment procedure.

Torque: 3.0 ~ 4.0kg-m

Attach the fairing (13-5)

Connect wires, harnesses and couplers correctly (1-22).

Caution

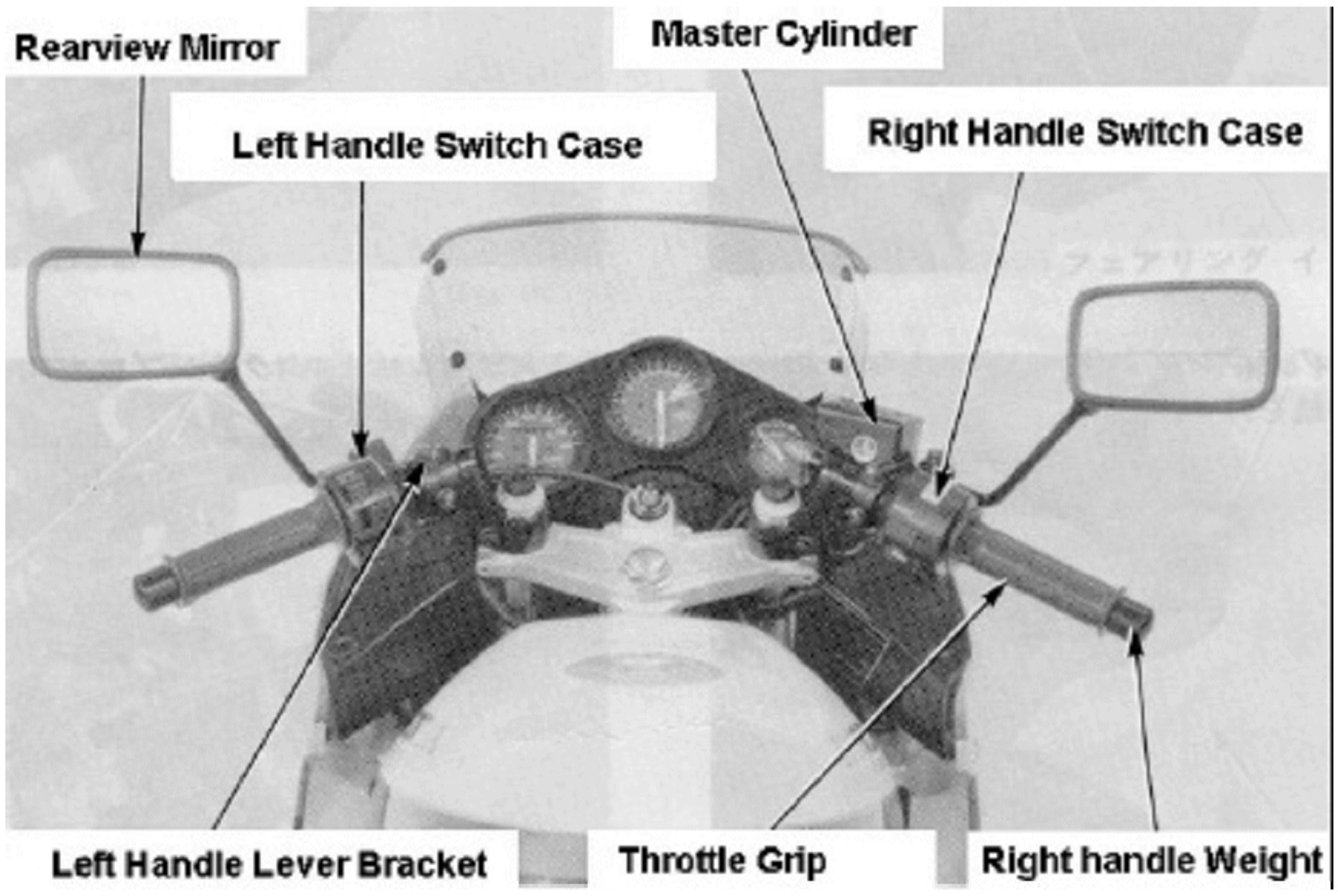
- Do not suspend the master cylinder by the brake hose.
- Do not turn the master cylinder upside down as it may let air go into the hydraulic systems. Maintain the original position and fix to the body.

Steering Handle

Detachment

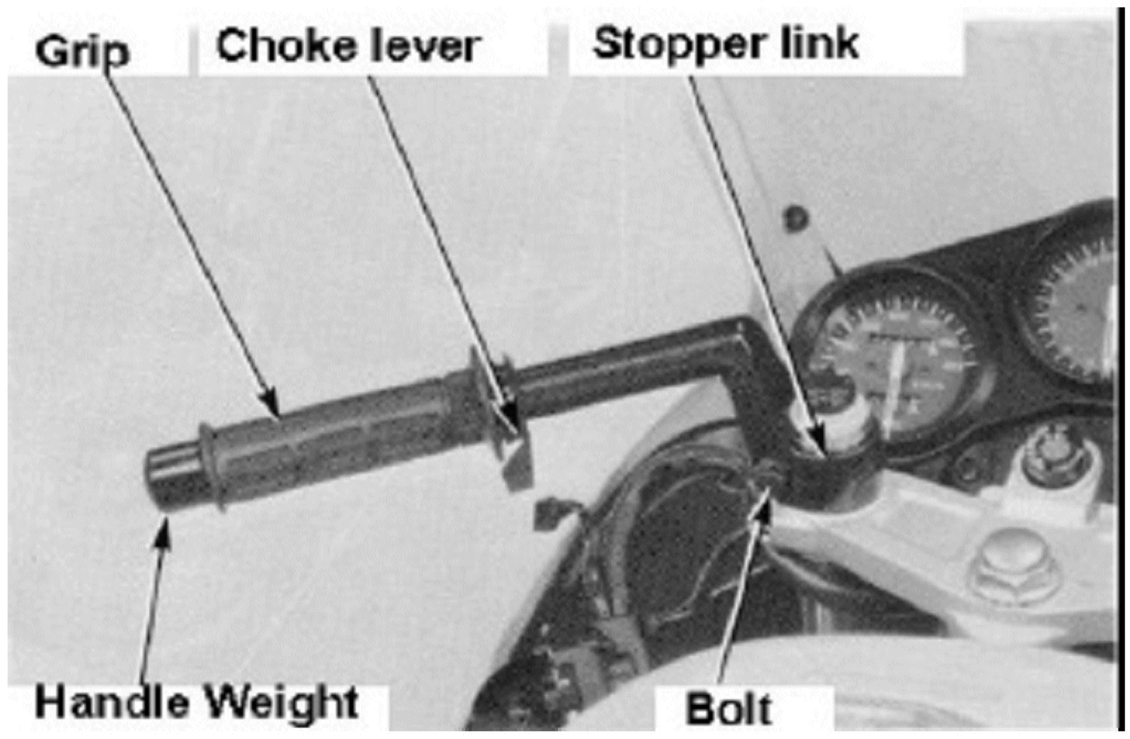
Detach the following parts:

- Right handle weight
- Handle switch case
- Throttle grip
- Rearview mirror
- Master cylinder
- Left handle lever bracket



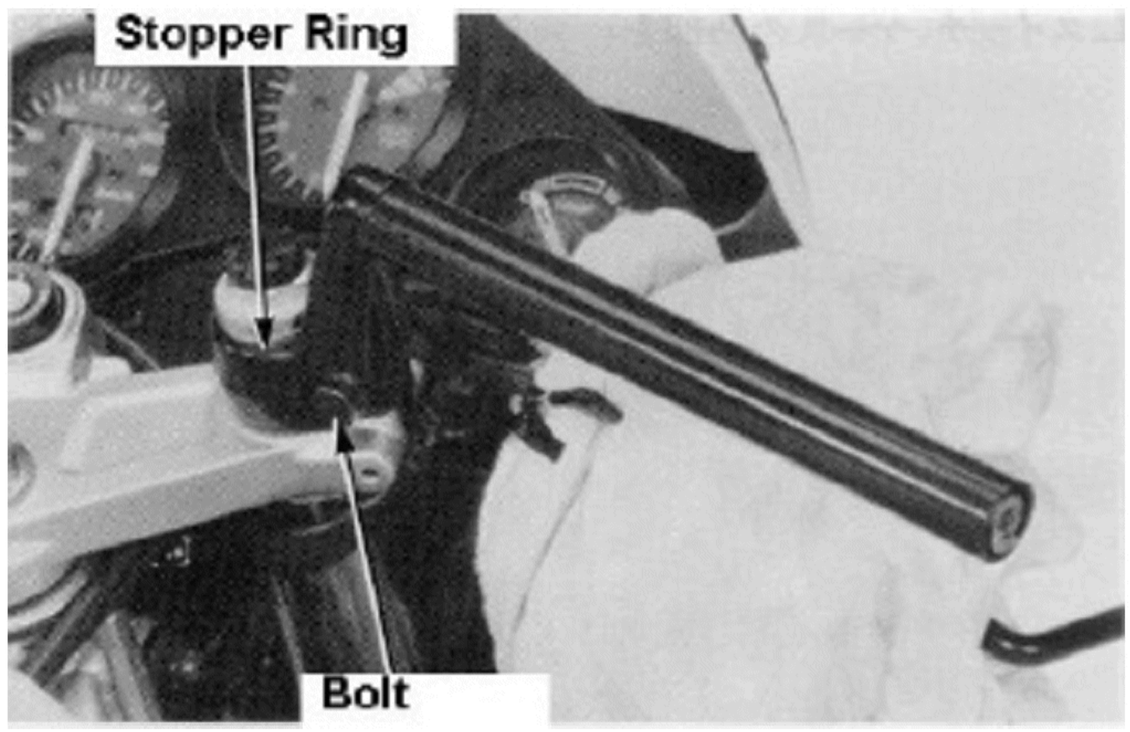
Left hand detachment

Remove the handle weight and detach the grip and choke lever.
Detach the stopper ring and remove the handle attachment bolt.
Detach the left handle from the fork pipe.



Right handle detachment

Detach the stopper ring and remove the handle attachment bolt.
Detach the right handle from the fork pipe.



Left handle attachment

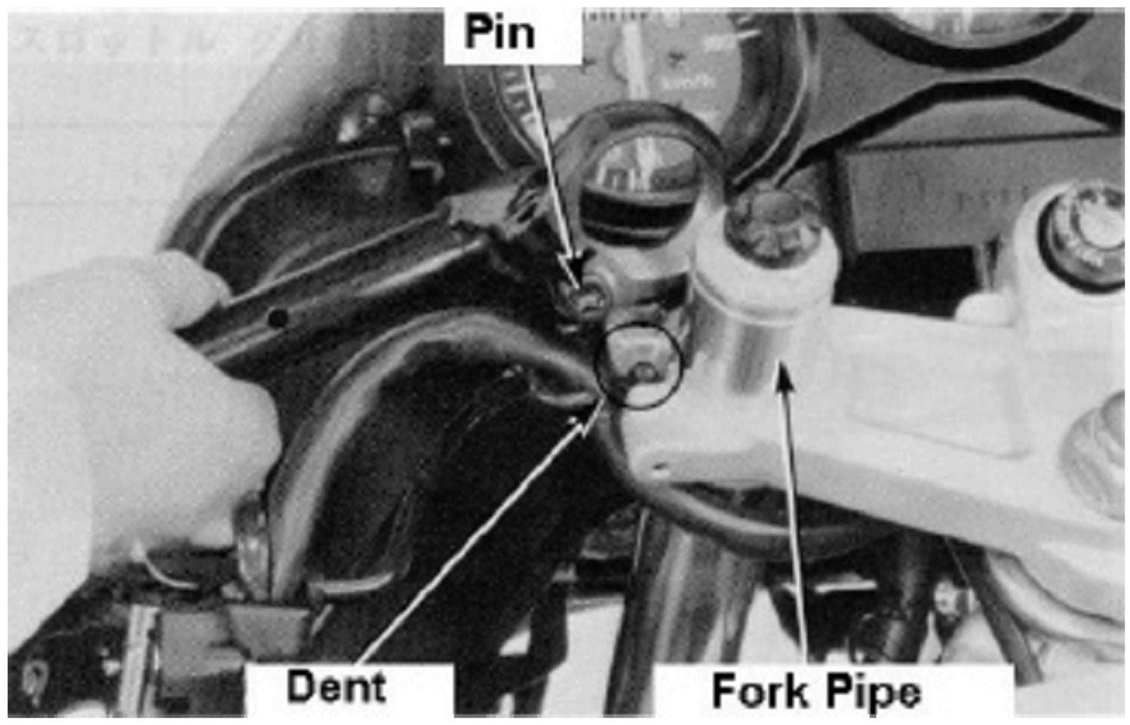
Align the handle position fixing pin with the dent on the top bridge and attach the pin to the fork pipe.

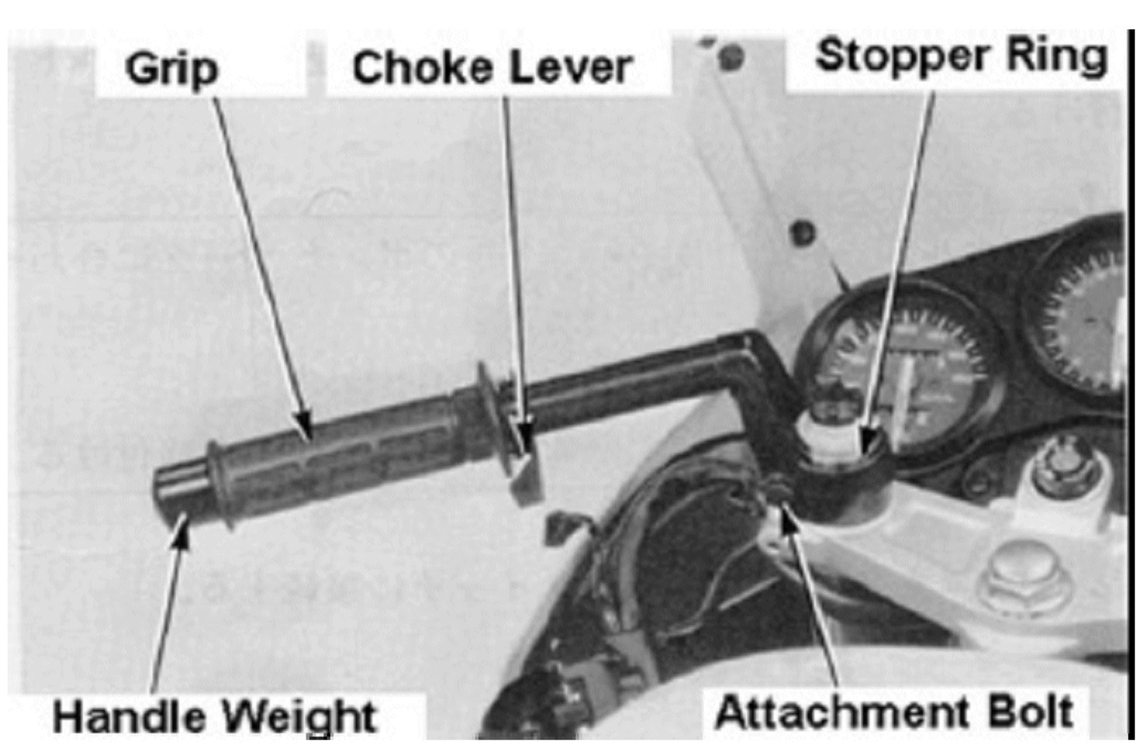
Firmly set the stopper ring to the slit on the fork pipe and tighten the handle attachment bolt. Torque: 2.5 ~ 3.0kg-m

Attach the choke lever to the handle.
Remove dirt, oil from the left handle grip bonding surface and let it dry.
Apply genuine Honda “Honda bond A” or “Cemedyne #540” to bonding surface and attach the grip by twisting it.

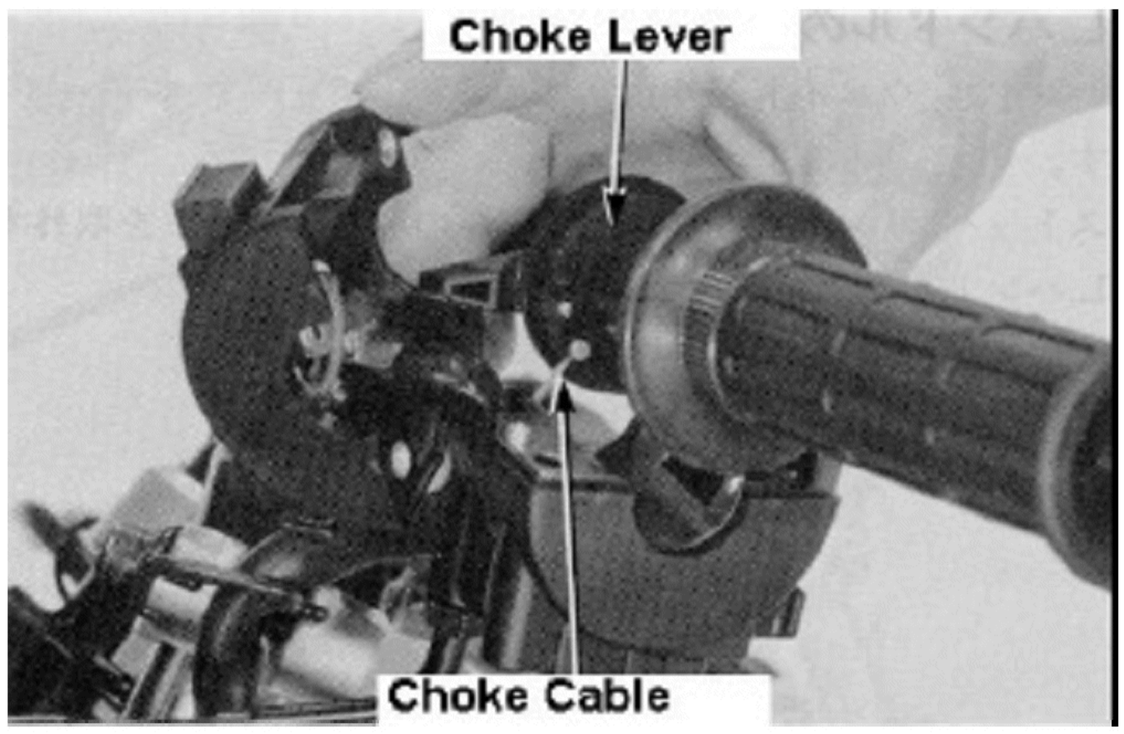
Allow a couple of hours for bond to dry.

Attach the handle weight.

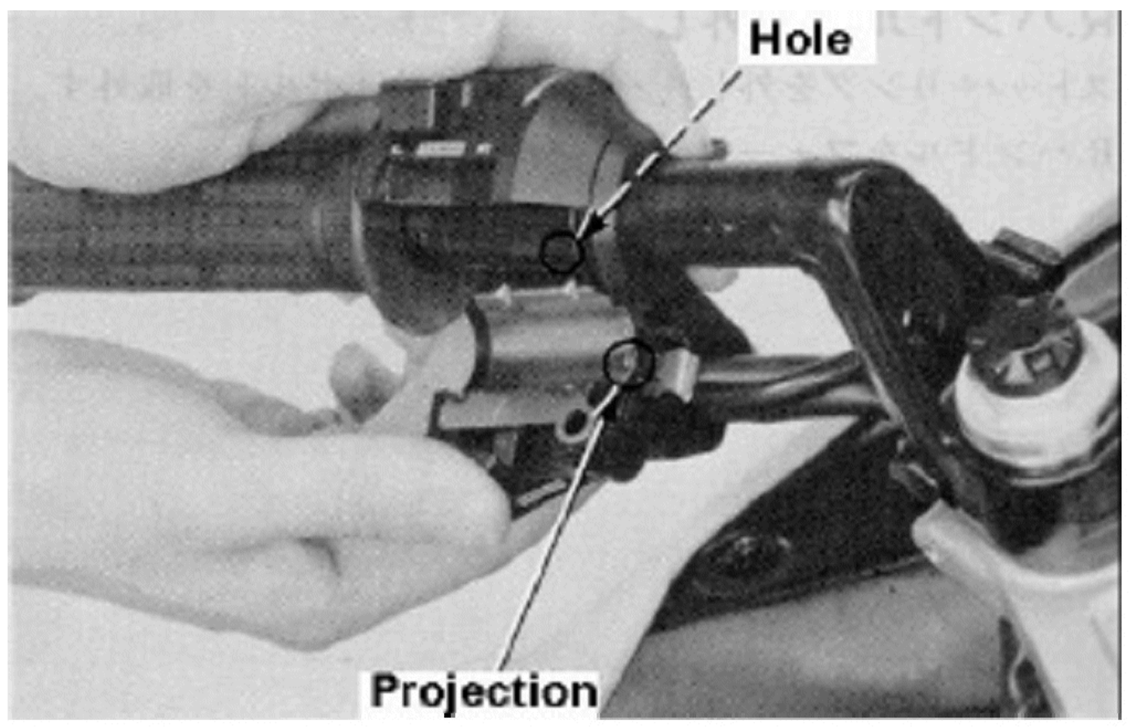




Connect the choke cable to the choke lever.

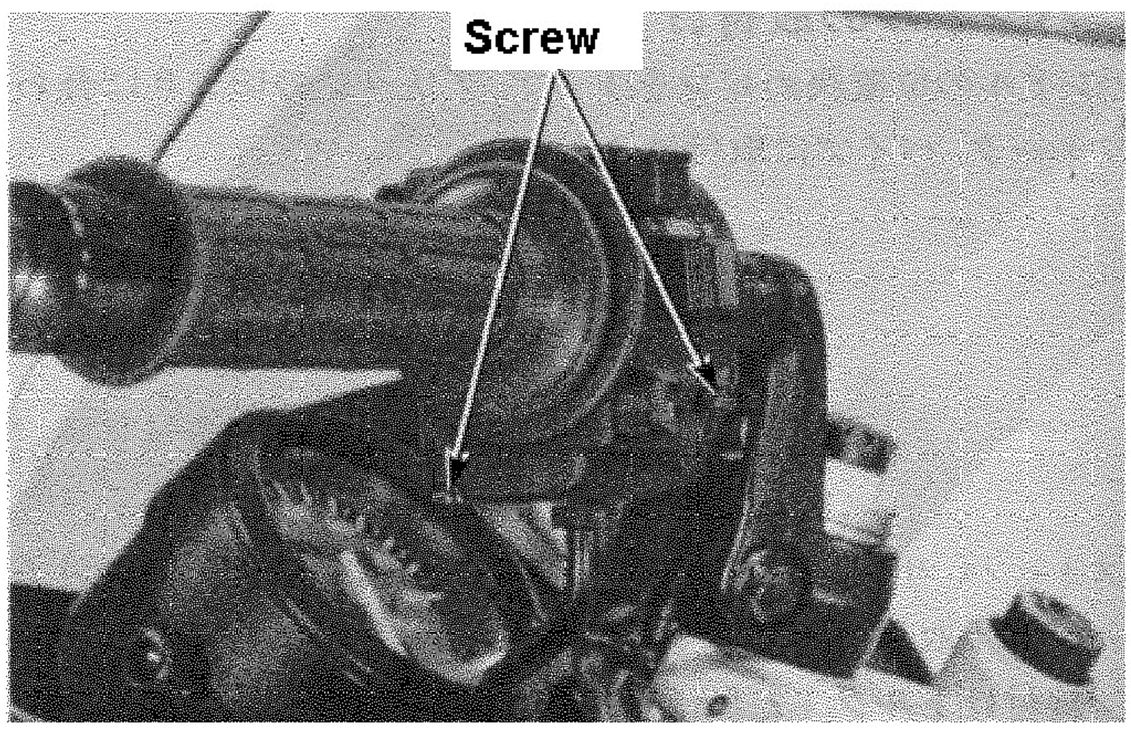


Align the projection on the left switch case with the hole on the handle and attach it.



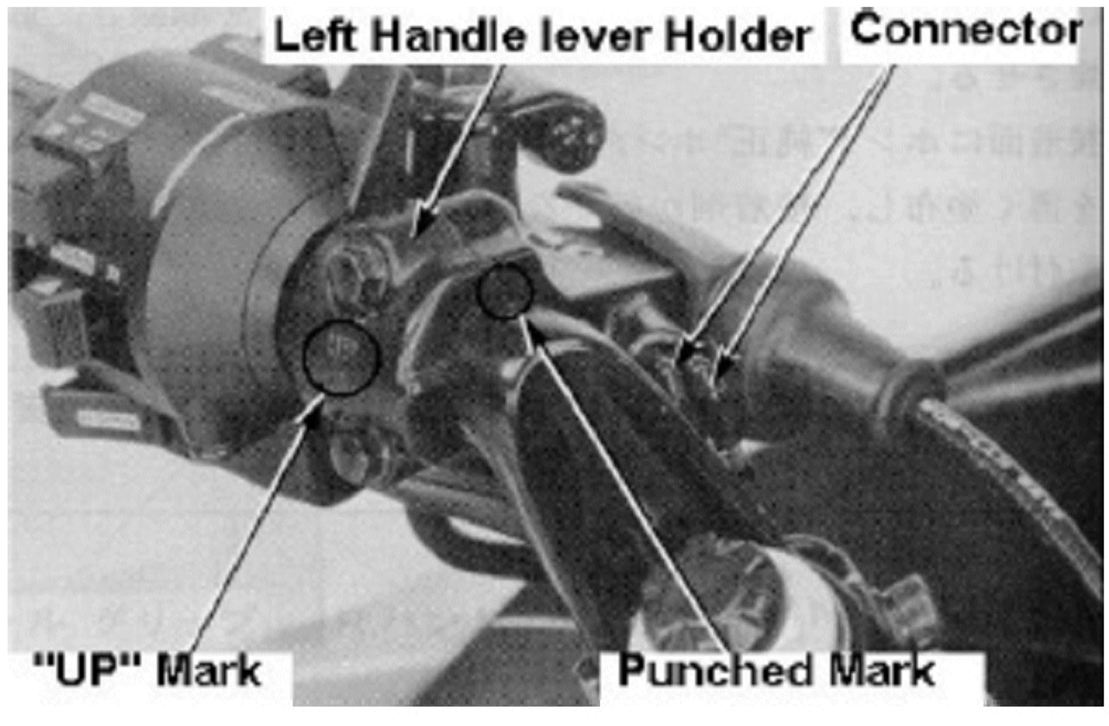
Fix the switchcase with two screws.

Front screws first, then the rear screws second to tighten.



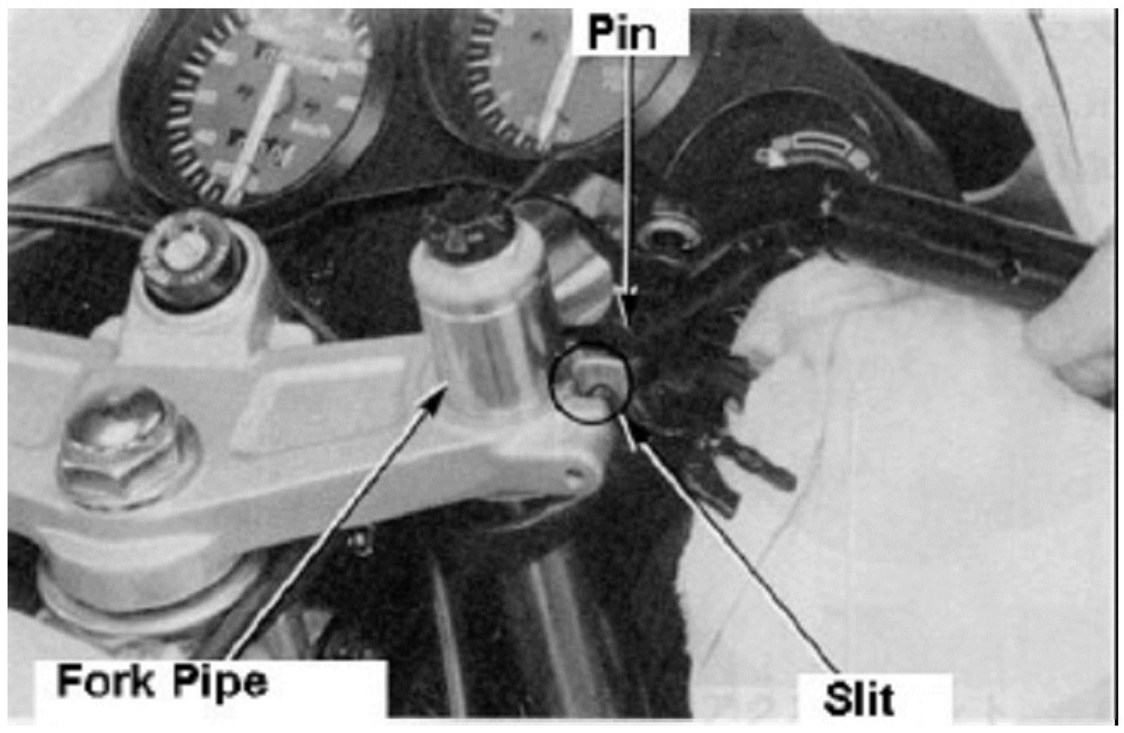
Attach the left handle over bracket and the holder and tighten the bolts.

- Align the alignment surface of the holder to the punched mark on the handle.
- Face the “UP” mark on the holder upwards.
- Tighten the top bolt first, then the bottom one.

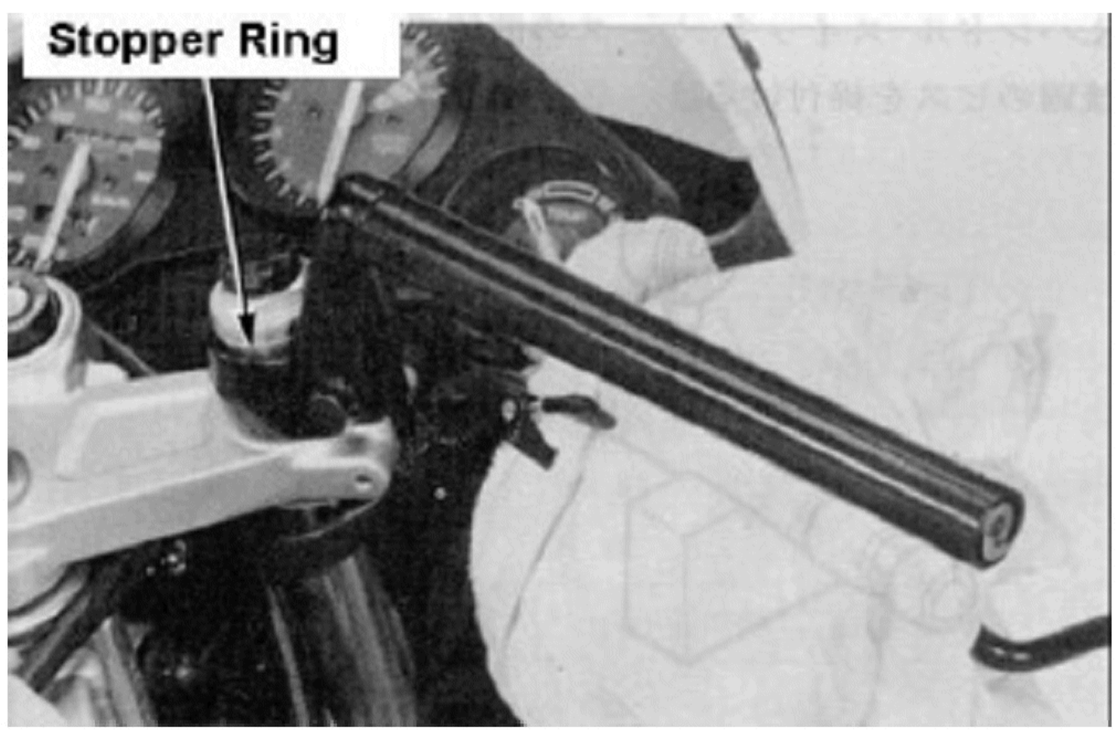


Right handle attachment

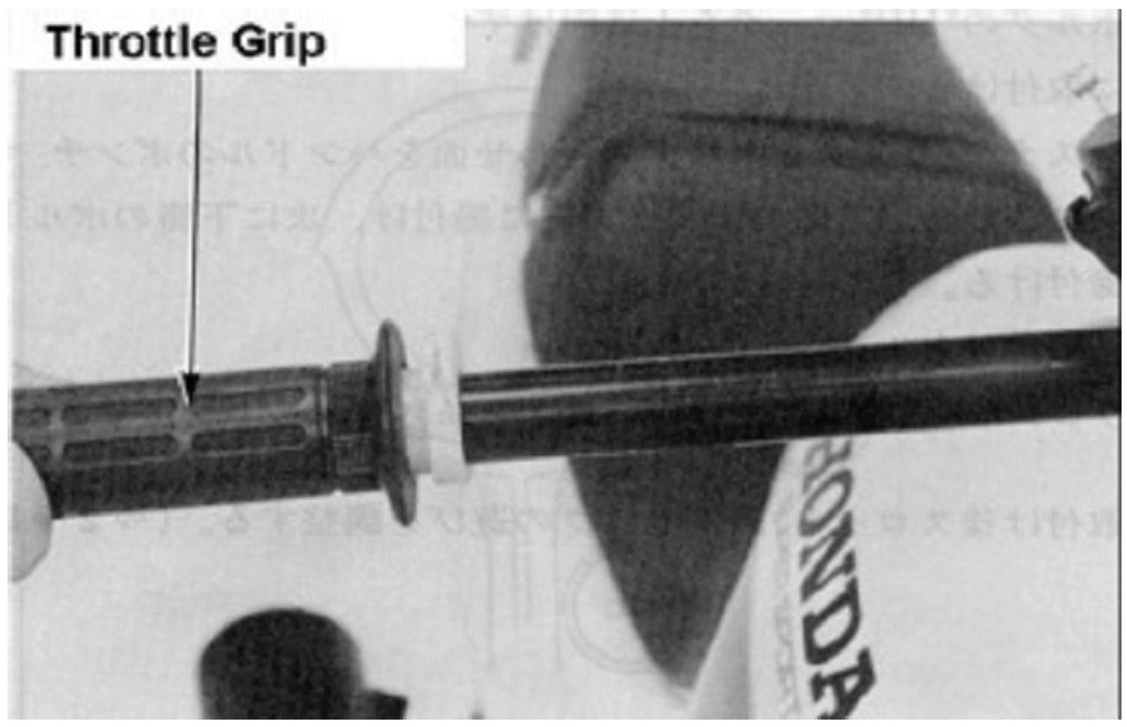
Align the handle positioning pin with the slit on the top bridge and attach the pin to the fork pipe.



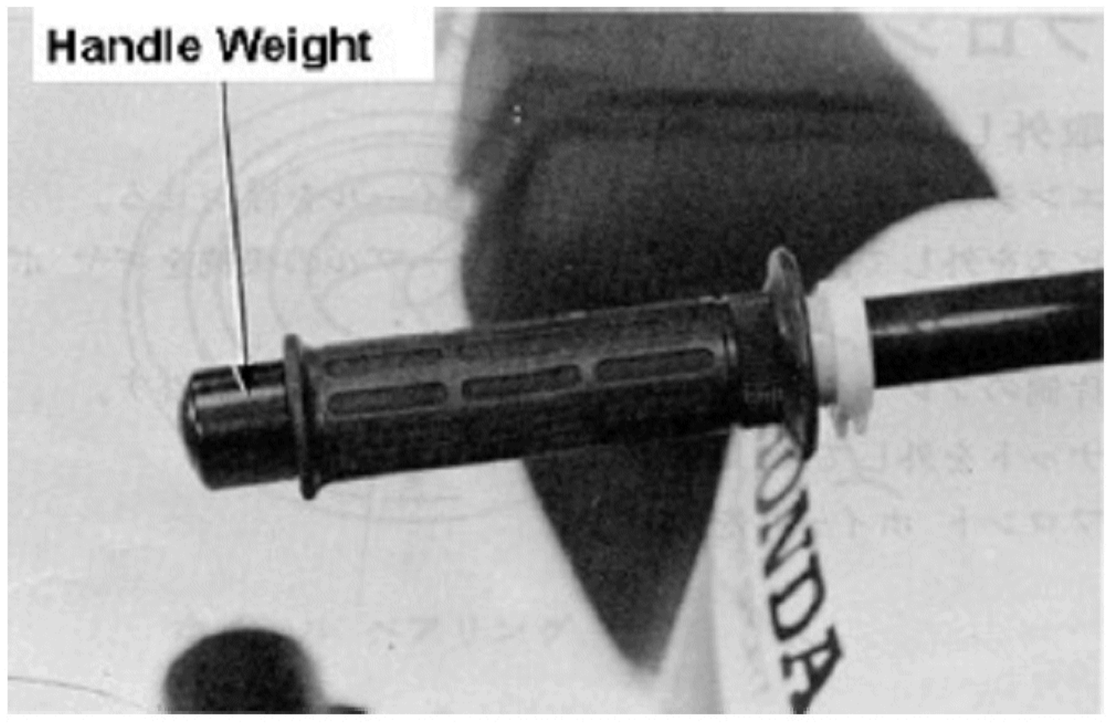
Firmly attach the stopper ring to the slit on the forkpipe.
Tighten the handle attachment bolt.
Torque: 2.5 ~ 3.0kg-m



Clean the contact surface for the throttle grip on the handle. Attach the throttle grip.



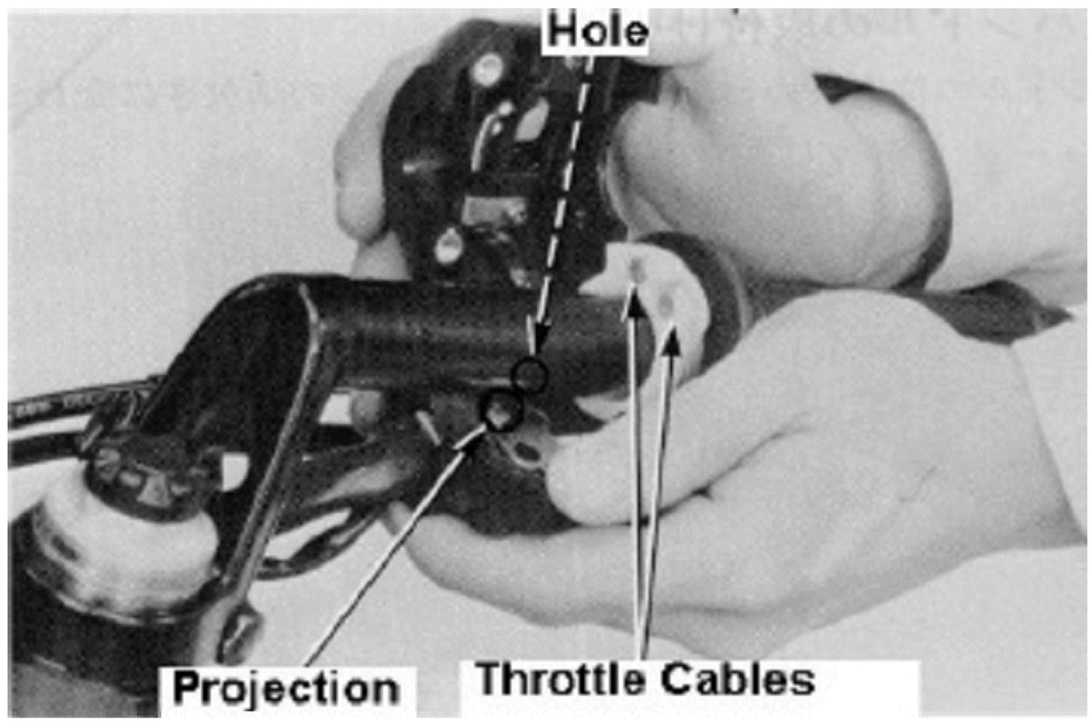
Attach the handle weight.



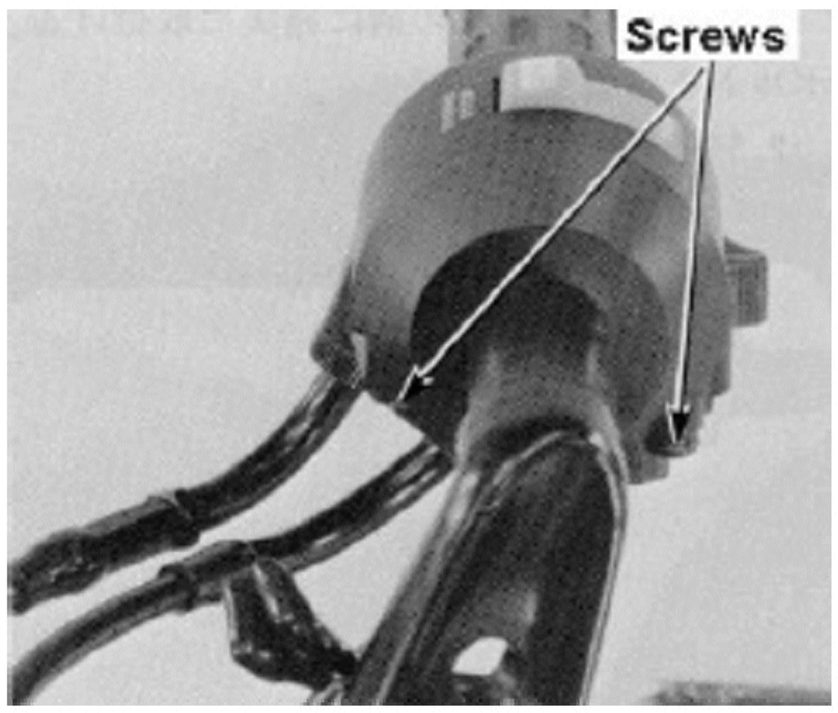
Connect throttle cables to the grip.

Align the projection of the right handle switch case and the hole on the handle.

Attach the case to the handle.



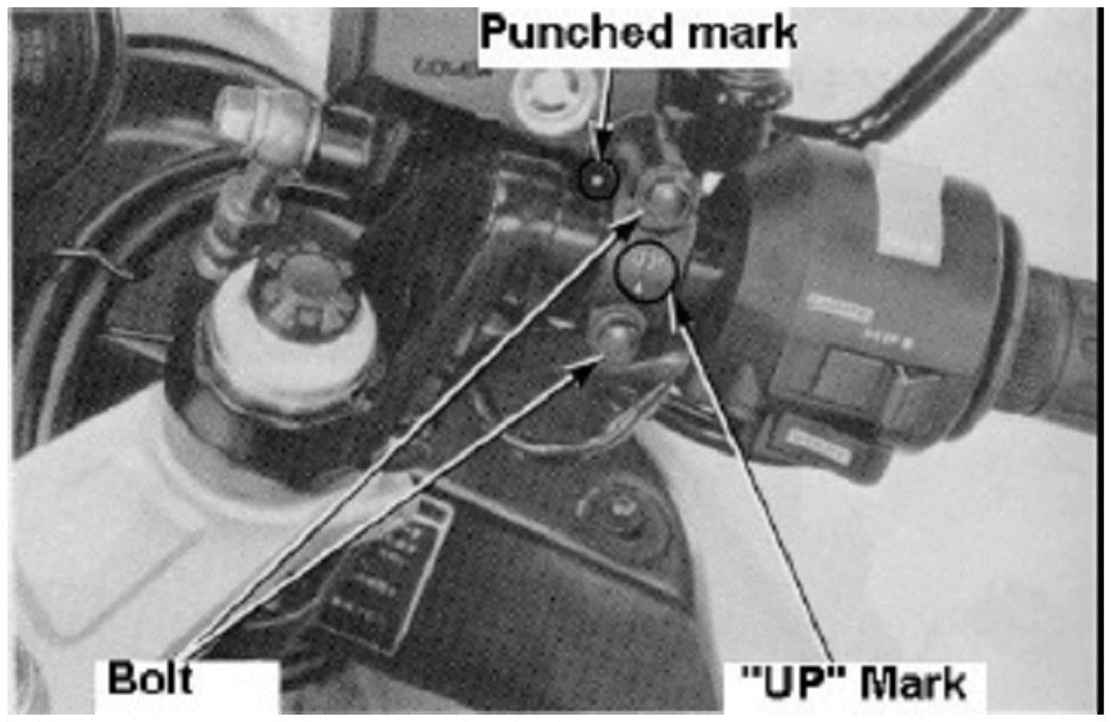
Tighten the front screw for the right handle switch case, then tighten the rear screws.



Face the “UP” making on the holder upwards, attach the master cylinder to the handle.

Align the alignment surface of the master cylinder and the holder with the punched mark on the handle. Tighten the top bolt first, then the bottom one.

Torque: 1.0 ~ 1.4kg-m

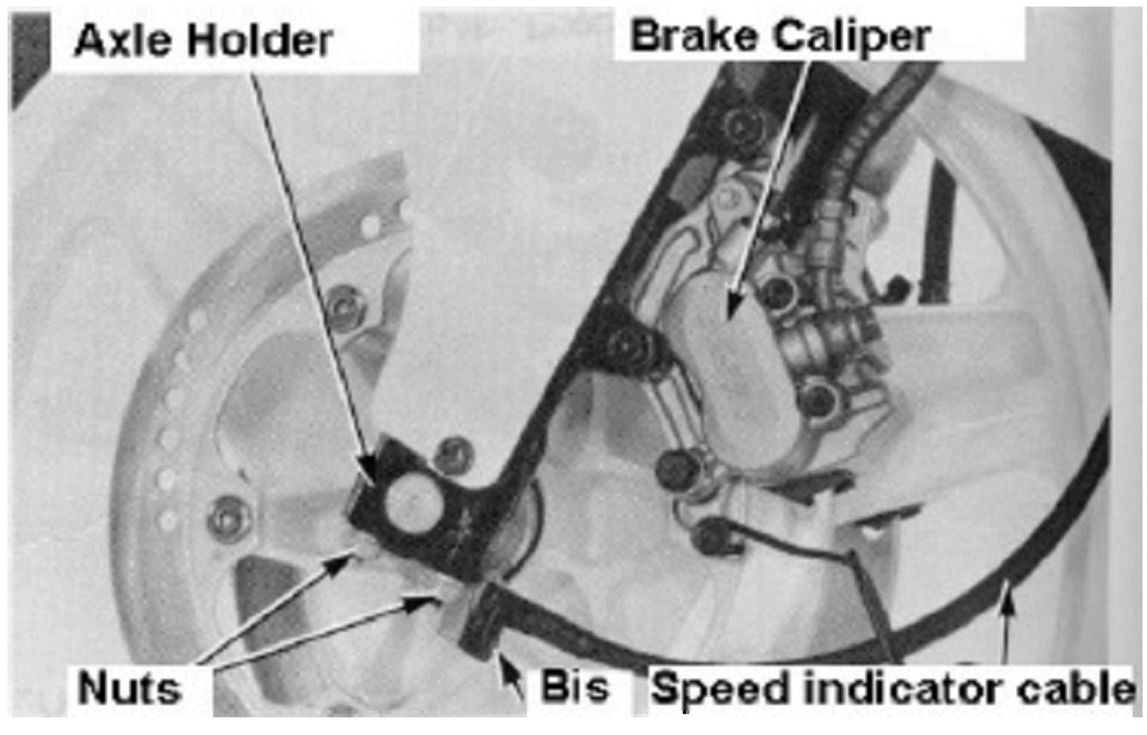


Connect wires to the front stop indicator switch. Adjust free movement of the throttle grip (2-17).

Front Wheel

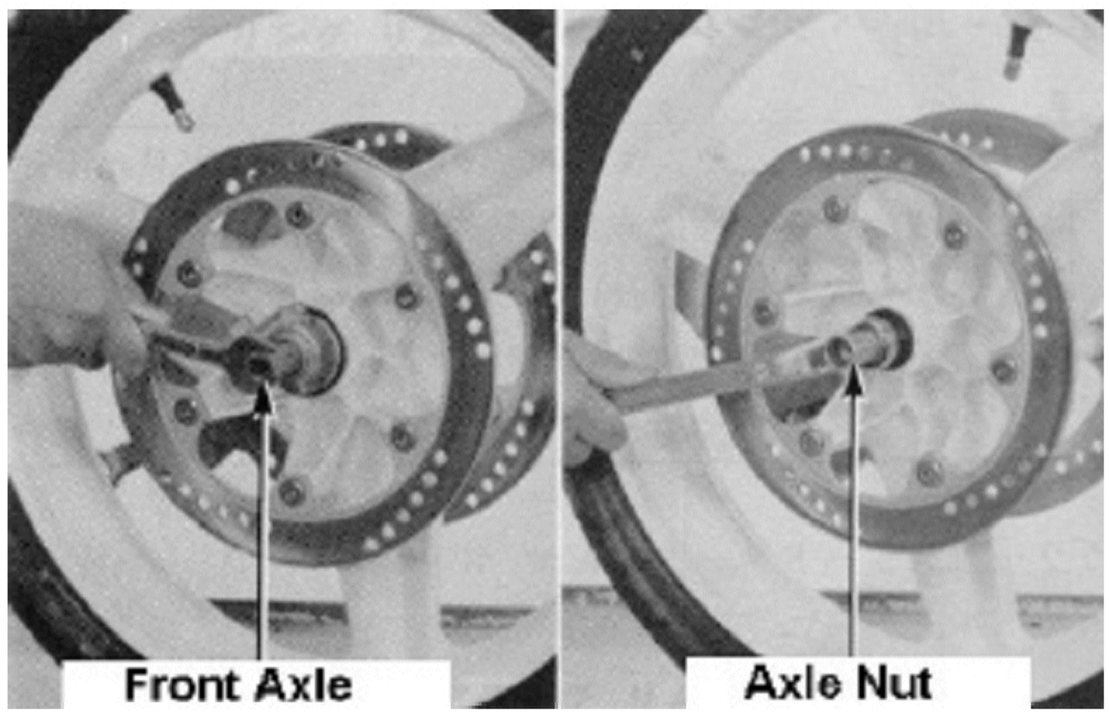
Detachment

Support bottom of the engine and float the wheel.
Remove screws and disconnect speed indicator cables from the gear box.
Remove the brake caliper with the bracket.
Remove nuts and detach right and left axle holders.
Remove the front wheel.



Front axle detachment

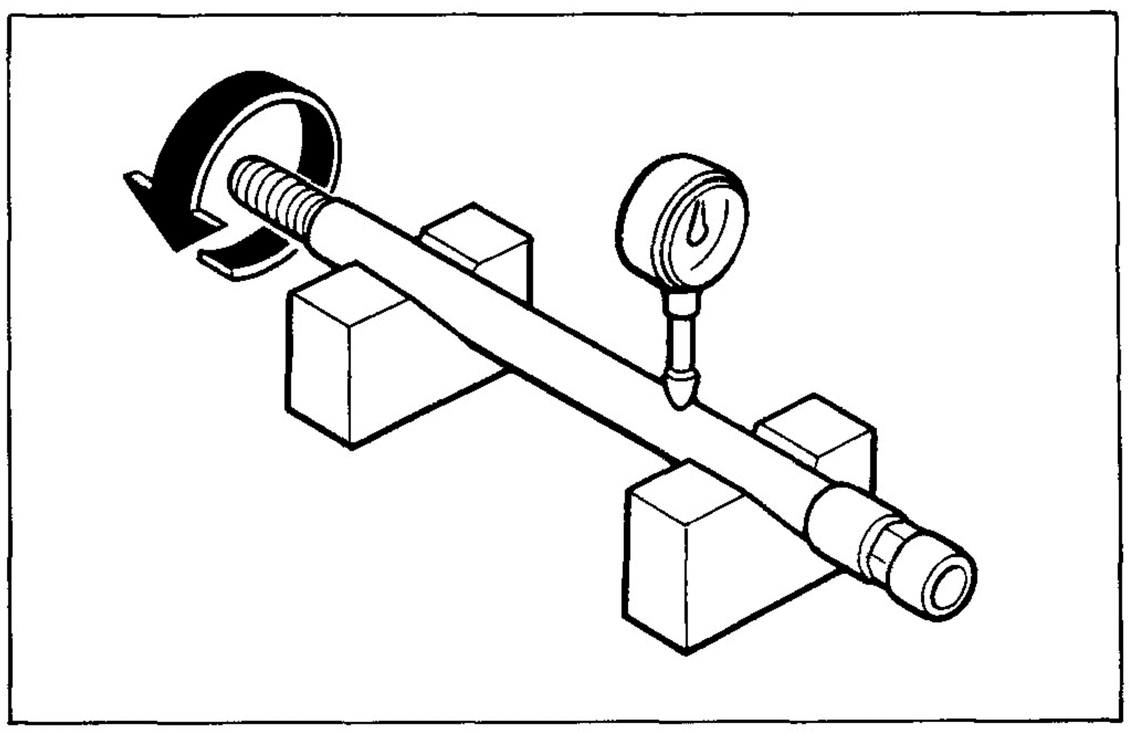
Support the axle from speed the indicator gear box side and remove axle nut.
Detach the front axle and the speed indicator gear box.



Inspection

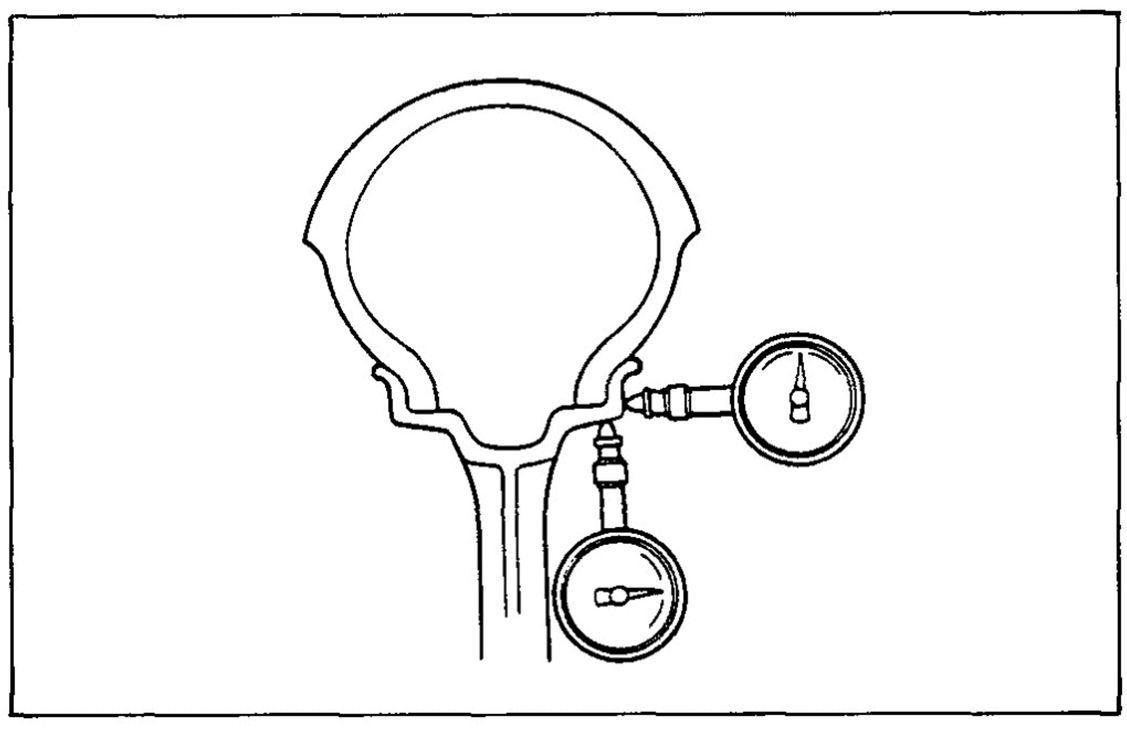
Inspect the front axle for deformation.
Place the axle on V-blocks and measure with a dial gauge.
Take half of the indicated value.

$\geqq$ 0.2mm $\rightarrow$ replace



Inspect the wheel for deformation.

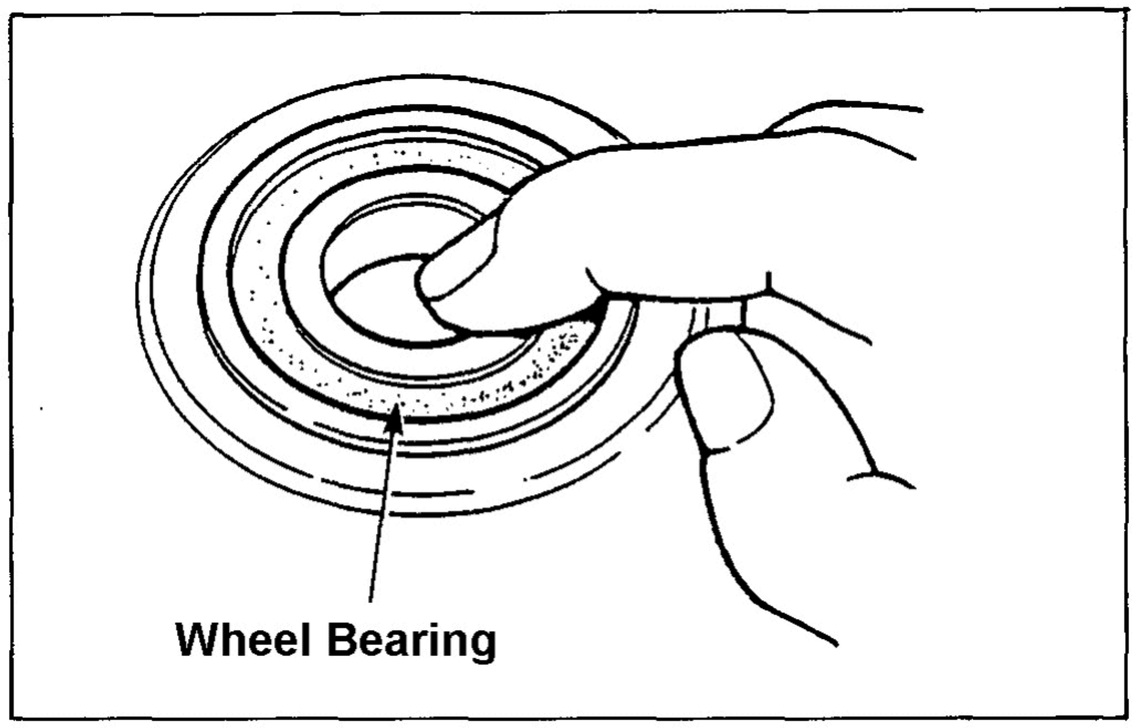
Radial: $\geqq$ 2.0mm)
Side: $\geqq$ 2.0mm) Replace



- You cannot adjust a cast wheel.
- Replace with new wheels, if the limit is exceeded.

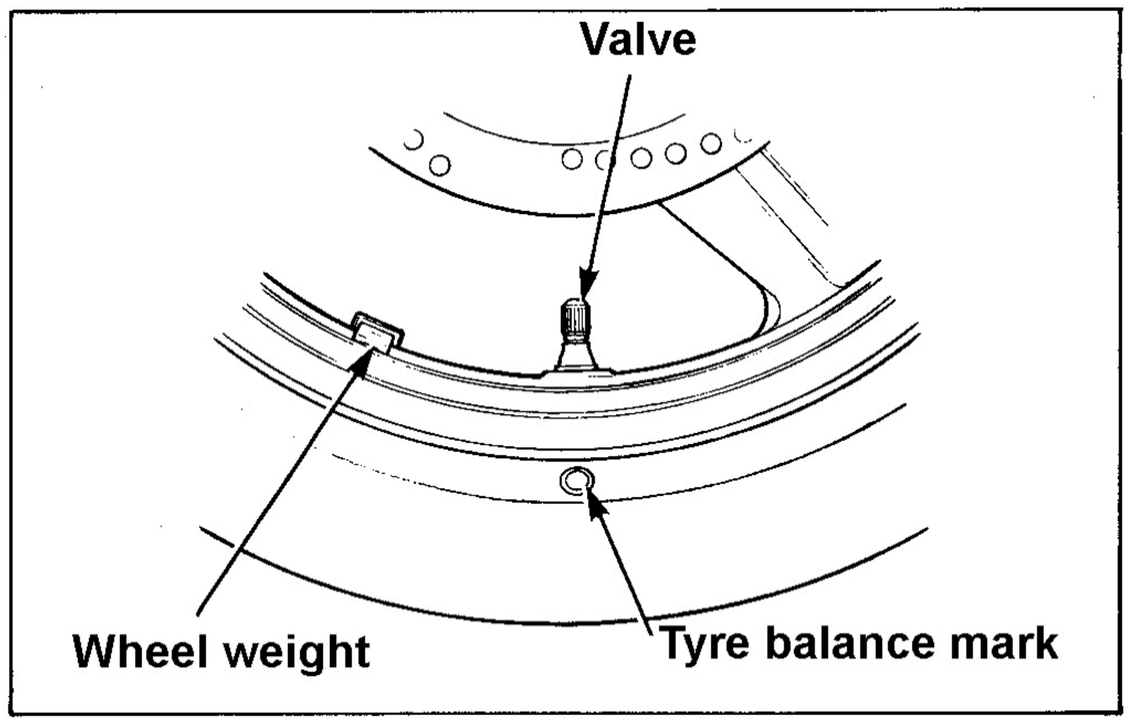
Rotate the bearing inner race by finger and replace if there is a noise or loose fit.

Always replace both sides at the same time.

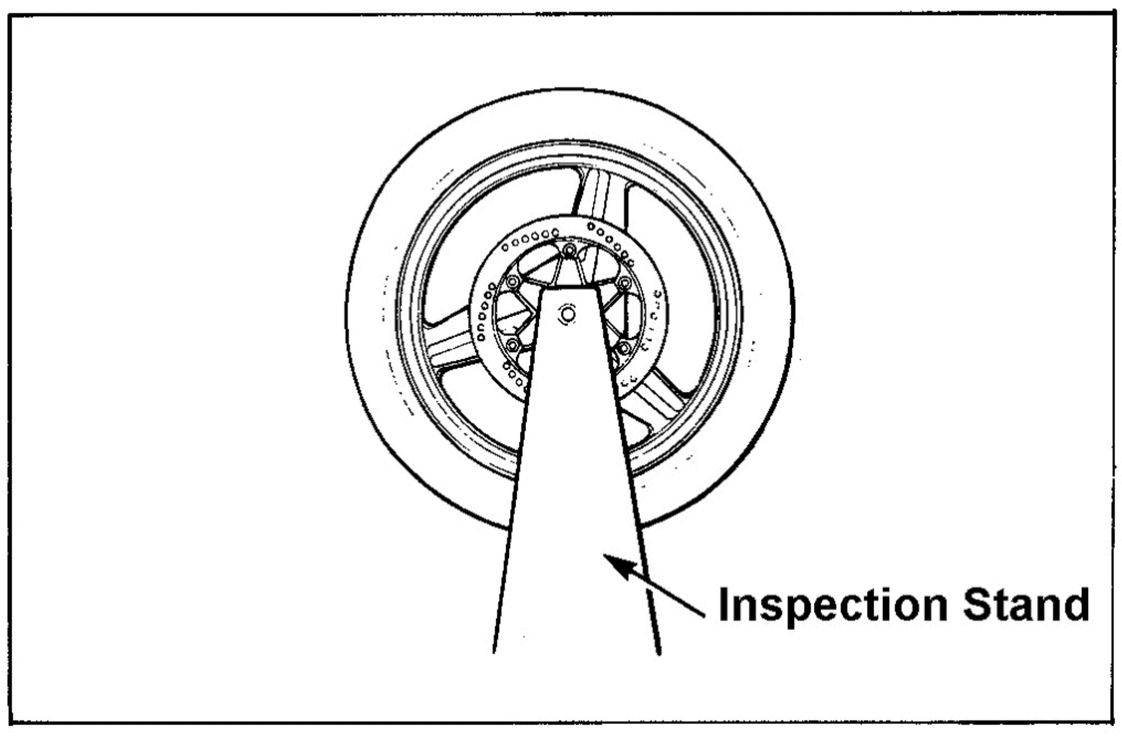


Wheel Balance

Note:
- Check the balance whenever removing a tyre from the wheel, as the wheel balance does affect the stability, steering and total safety of the vehicle.
- Check the tyre balance mark is aligned with the valve.



Remove the collar and the speed indicator gear box.
Attach the wheel, tyre and brake disc to an inspection stand.
Spin the wheel and mark the lowest (heaviest) part of the wheel with chalk once it has stopped.
Repeat this for two or three times and find the heaviest part. If the wheel is in balance, there is no specific heaviest part. Temporarily attach a wheel weight to the highest (lightest) part.
If the weight is adequate, the wheel will not stop at any particular position.
After confirming the balance, fix the weight.



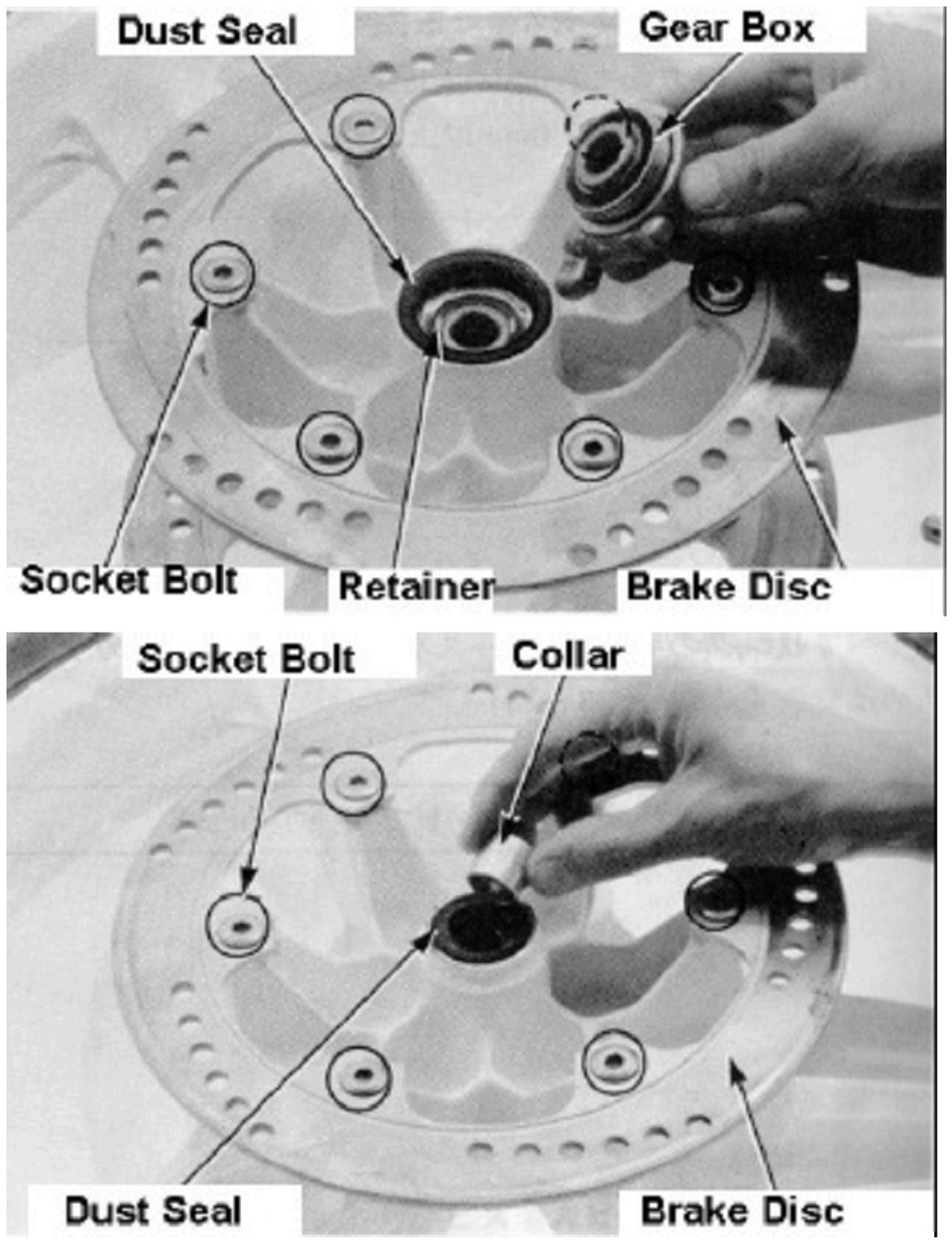
Caution:
Weight should not exceed 60g for each wheel.

Disassembly

Remove the speed indicator gear box, dust seal and gear box retainer.
Remove socket bolts and detach the left brake disc.

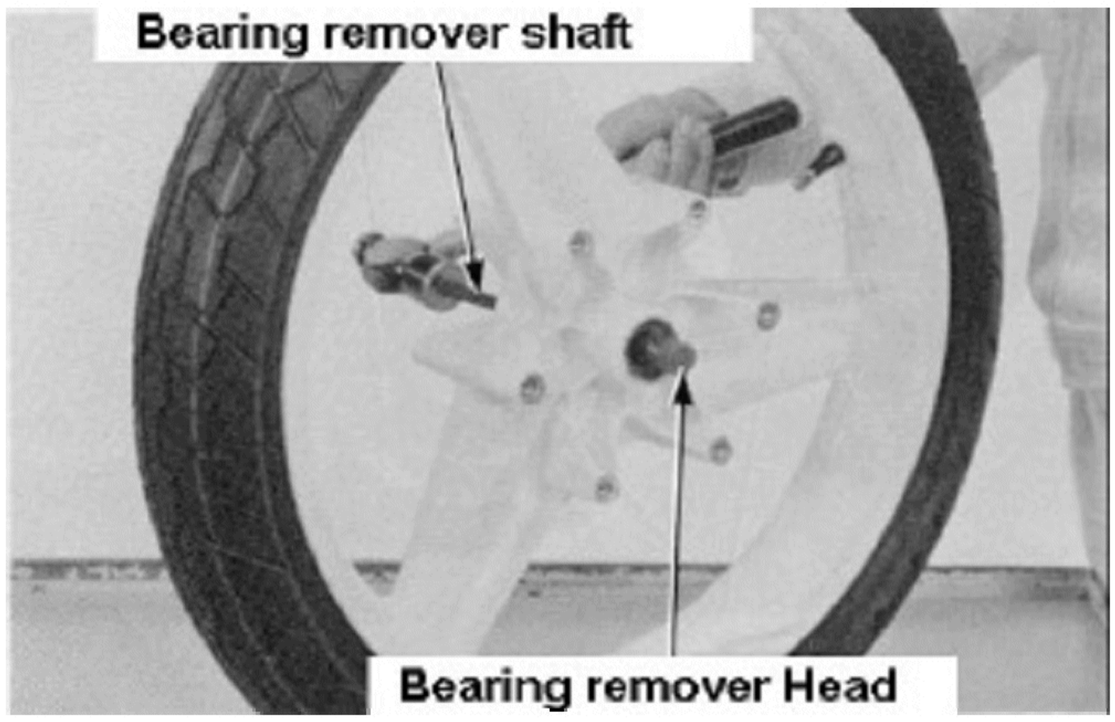
Remove the wheel collar and the dust seal from right side.

Remove socket bolts and detach the right brake disc.



Bearing detachment

Detach the bearing and the distance collar.

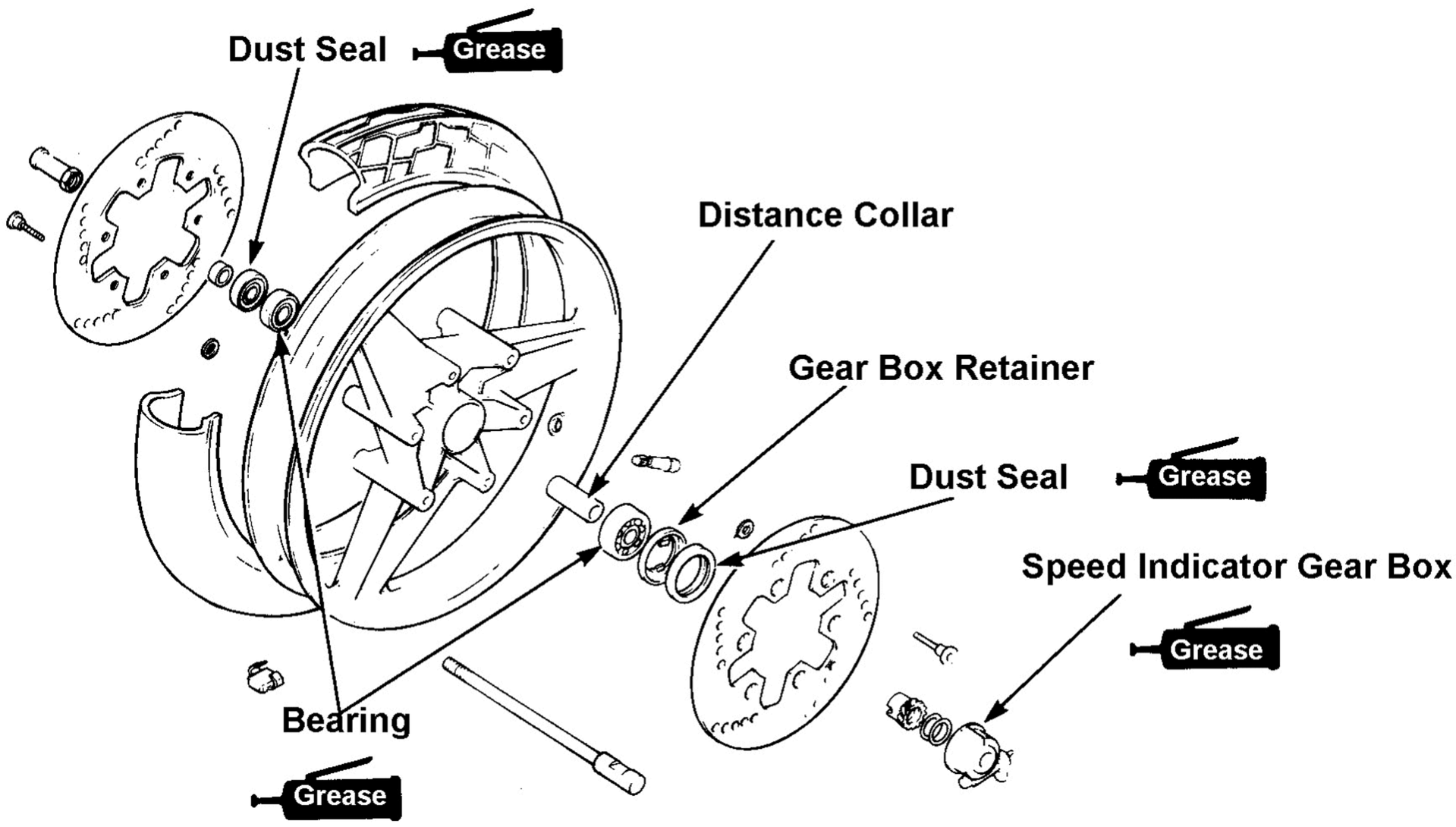


Common Tools

Bearing remover shaft	07746-0050100
Bearing remover head	07746-0040300

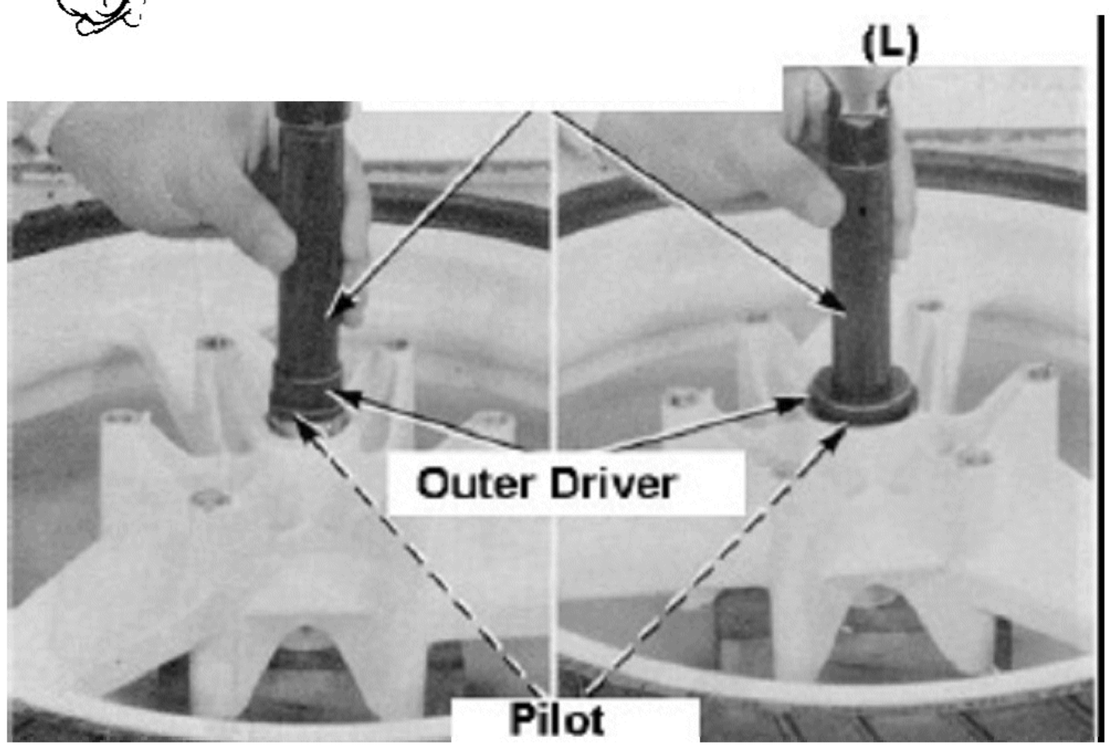
Assembly

Never let oil/grease touch the brake disk as it may result in reducing break performance. Wipe any dirt off from the disk.



Bearings should be set parallel.
Set the right bearing and attach the distance collar.

Check the position of the distance collar before attaching the bearings.

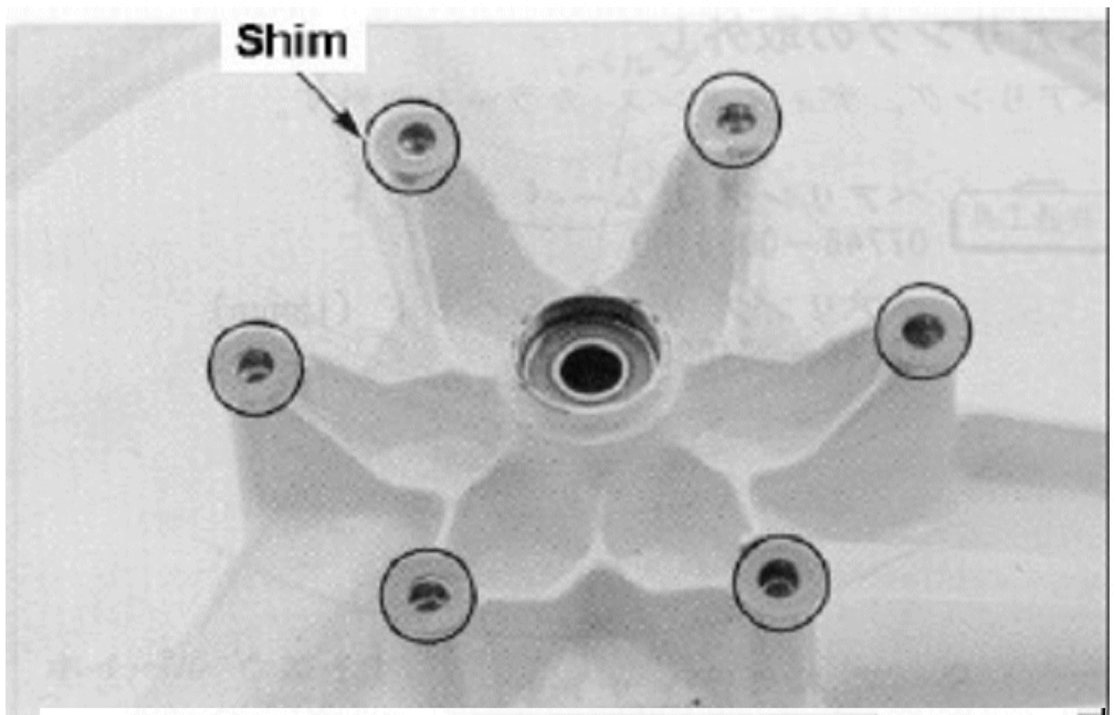


Set the left bearing.

Common tools

Driver handle A	07749-0010000
Pilot (15mm)	07746-0040300
(L) Outer driver (42x47mm)	07746-0010300
(R) Outer driver (32x35mm)	00746-0010100

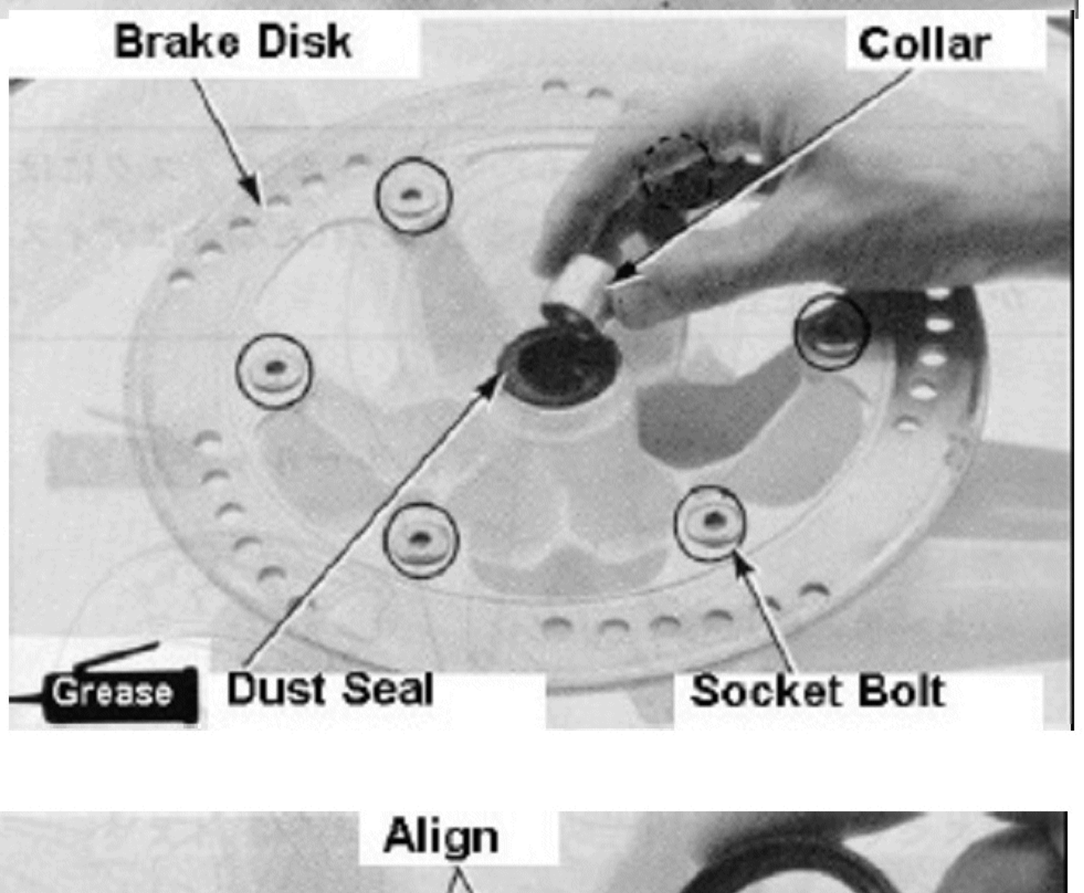
Attach brake disc shims to the right wheel hub.



Attach the right brake disc with six socket bolts.

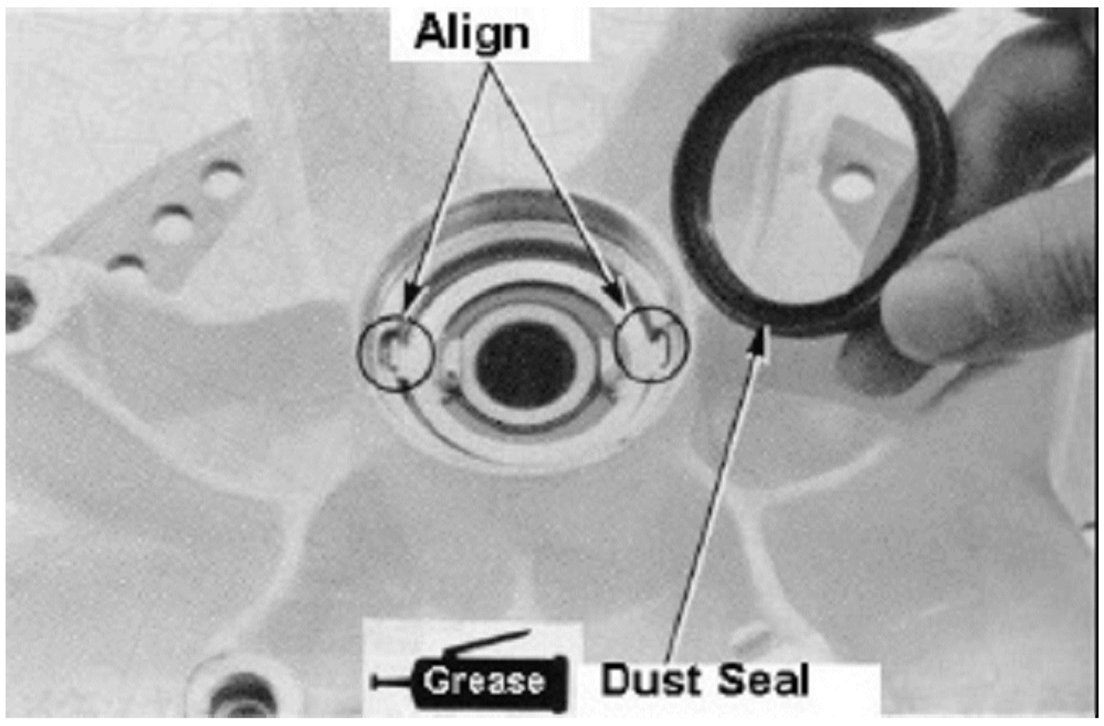
Torque: **3.7 ~ 4.3kg-m**

Attach the dust seal and wheel collar to the right hub.

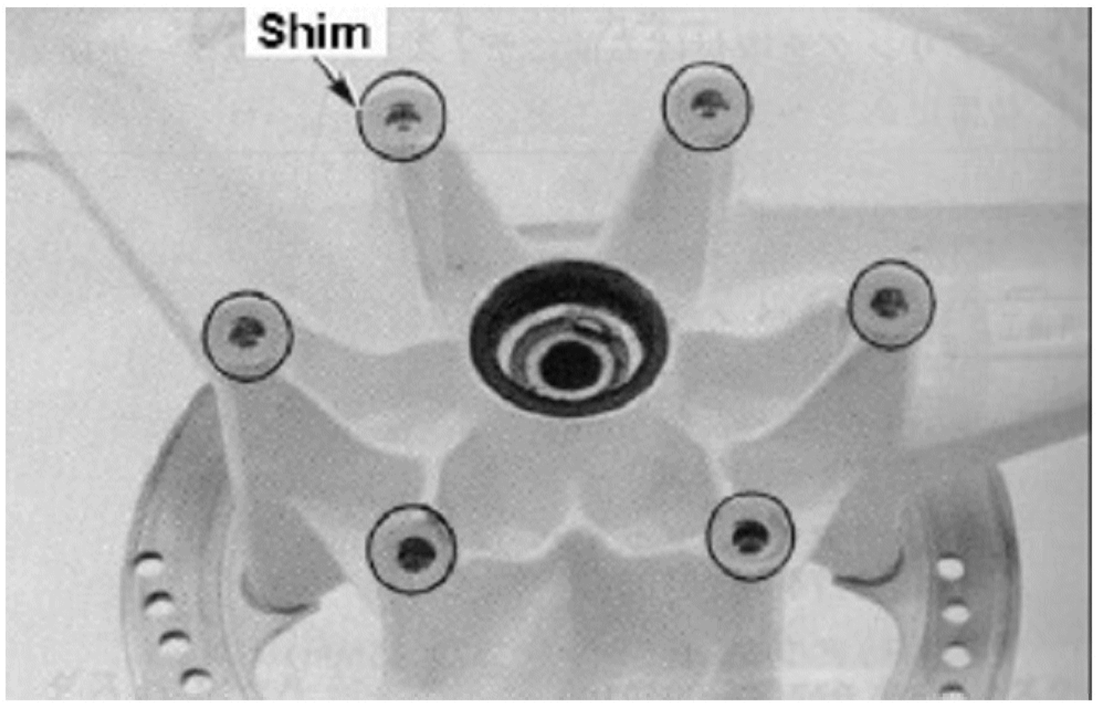


Attach the gear box retainer to the left wheel hub by aligning the projection on the retainer with the slits on the hub.

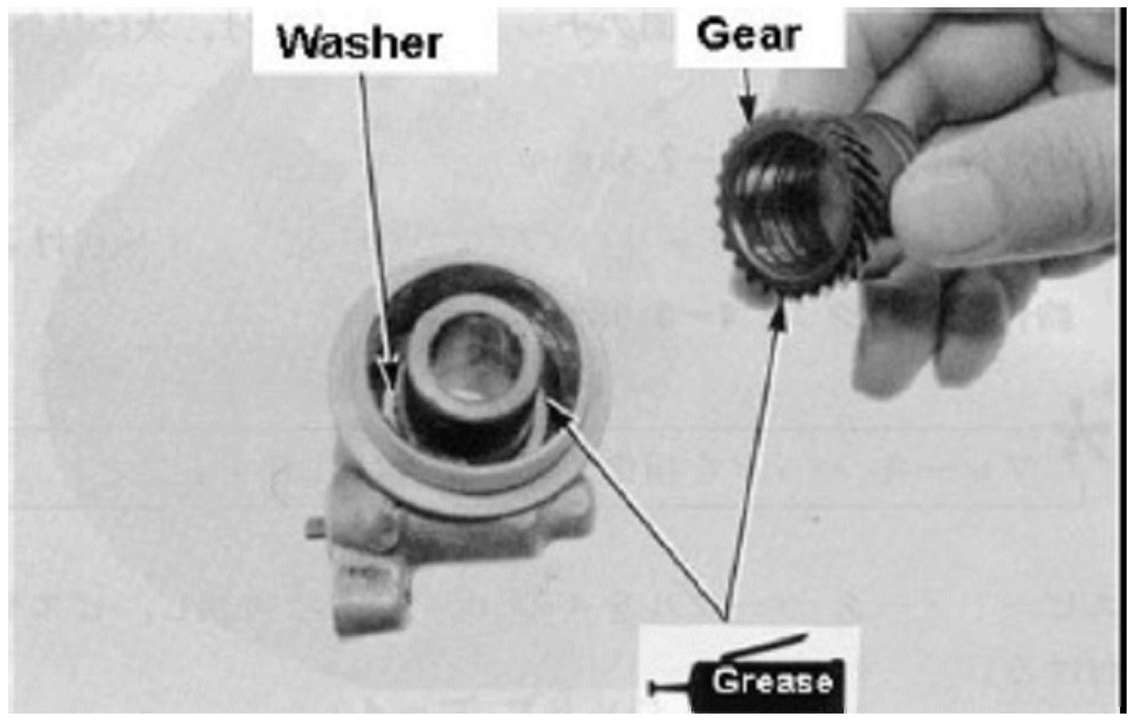
Attach the dust seal.



Attach brake disc shims to the left wheel hub.



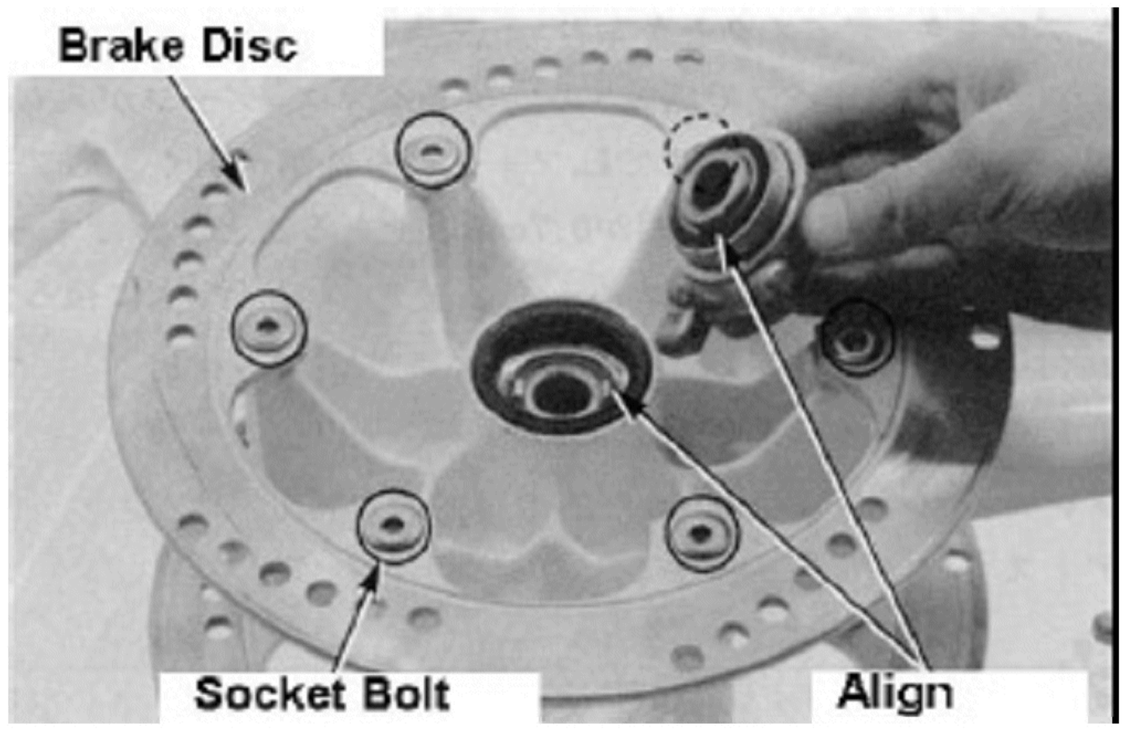
Apply grease to the speed indicator gear box, washer and gear.



Attach the left brake disc with six socket bolts.

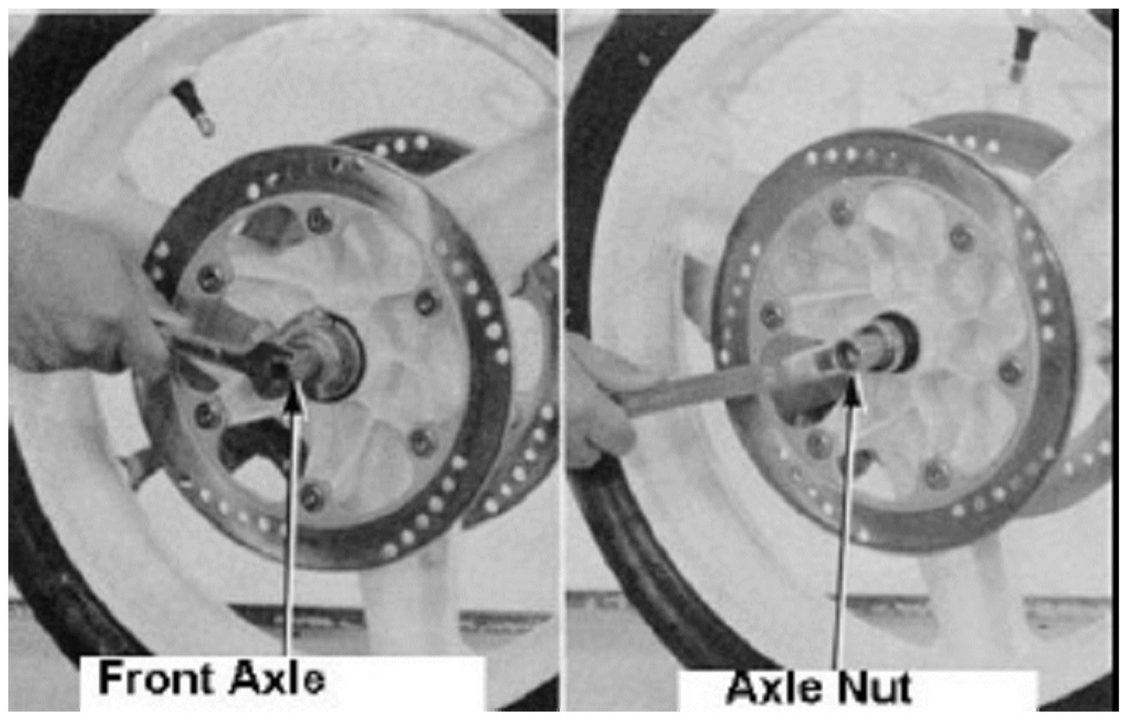
Torque: 3.7 ~ 4.3kg-m

Attach the speed indicator gear box and the retainer to the gear by aligning the projection of the box and the retainer with the slits on the gear.



Insert the front axle from the speed indicator gear box side and tighten axle nut.

Torque: 5.5 ~ 6.5kg-m

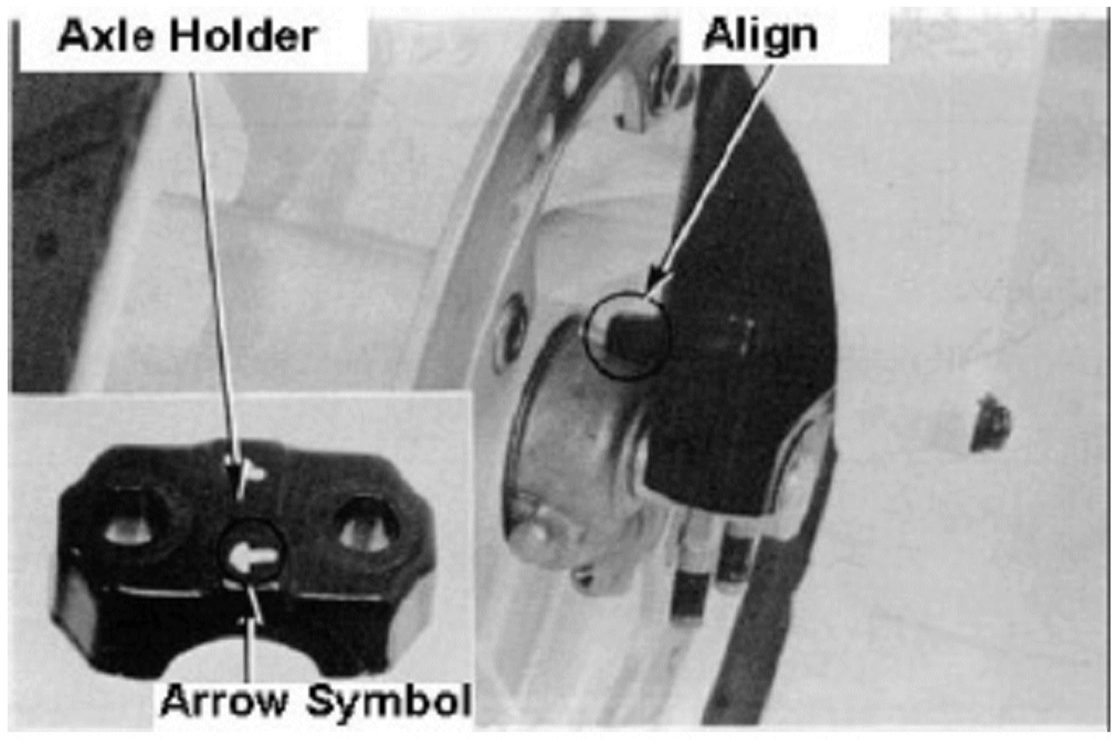


Attachment

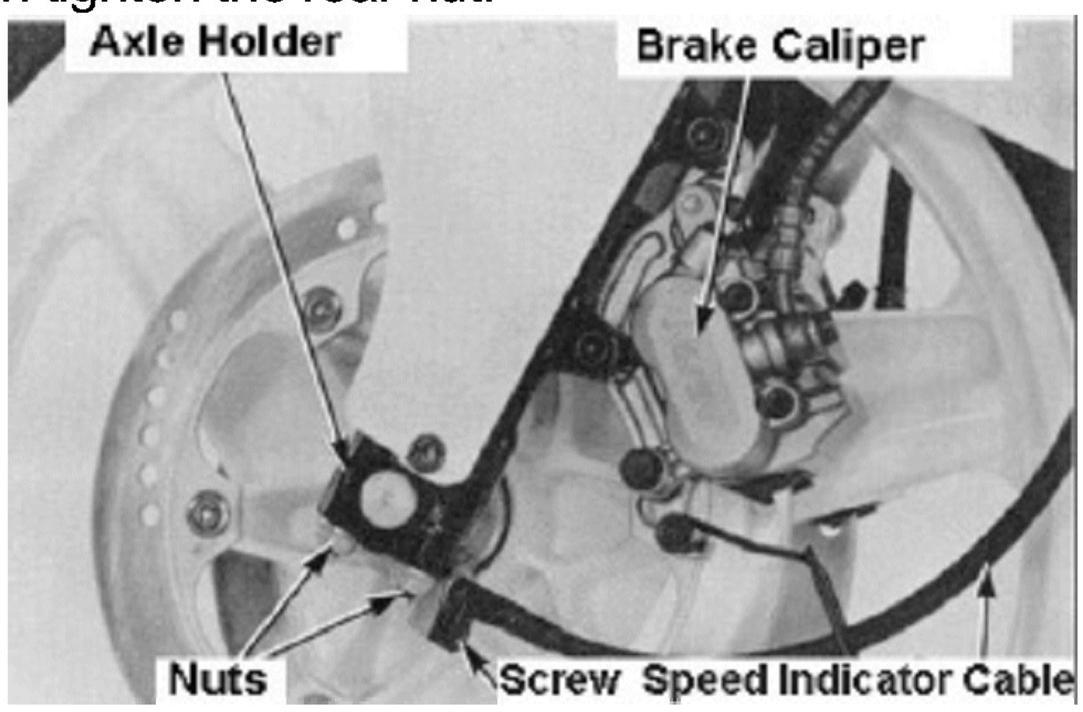
Set the brake disc between brake pads and set the front wheel.

Align the stopper of the speed indicator gear box with the rear part of the stopper on a left fork bottom case.

Set the arrow symbol on the axle holder forward and attach.



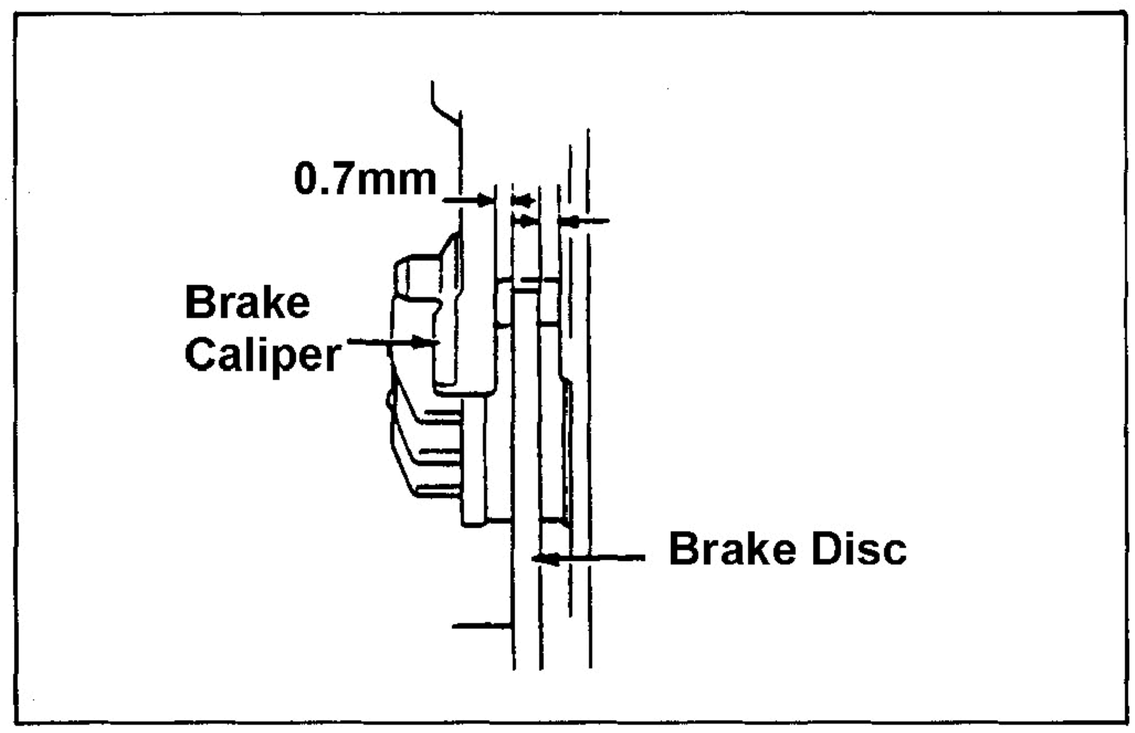
Tighten the front nut on the right axle holder and then tighten the rear nut.
Torque: 1.8 ~ 2.5kg-m
Attach the caliper and tighten the caliper bracket bolt.
Torque: 2.4 ~ 3.0kg-m



Do not damage the brake pads.

Connect the speed indicator cable to the gear box and tighten the screw.

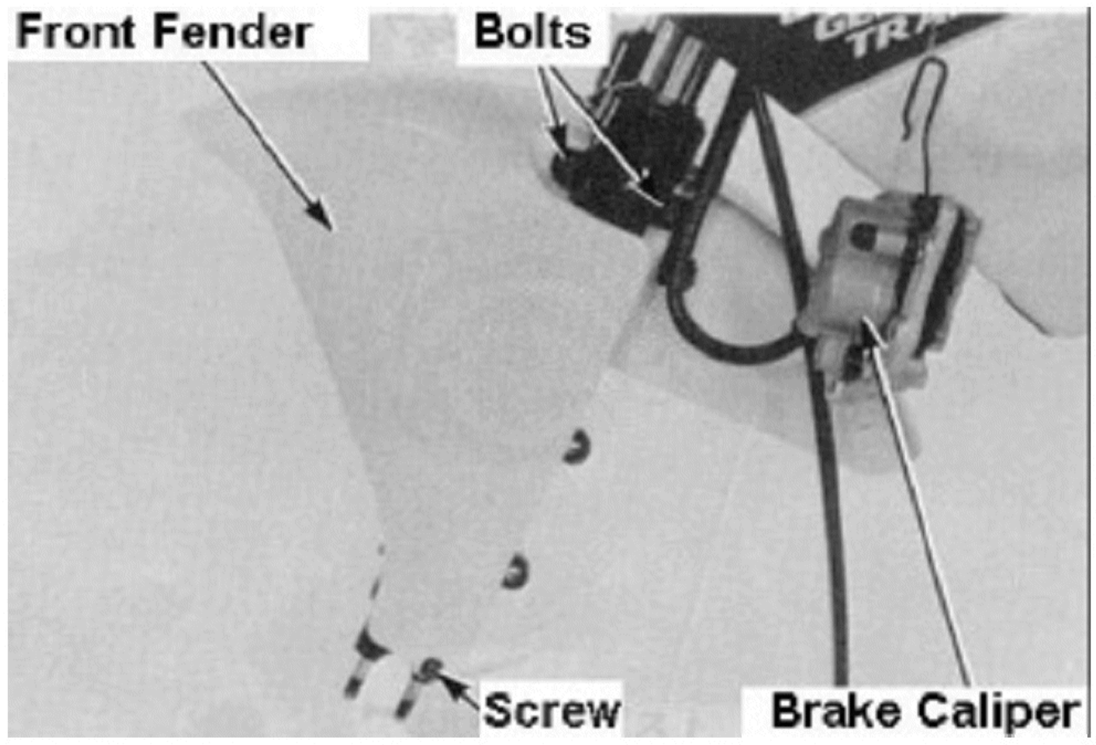
Measure the clearance between the left brake disc and the caliper bracket with a 0.7mm thickness gauge.
If you cannot insert the gauge, pull the left fork outward until the gauge fits in. Check the clearance is at least 0.7mm on both sides of the left brake disc. Tighten the front nut on the left axle holder first, then the rear nut.
Torque: 1.8 ~ 2.5kg-m
Operate the brake lever for several times and inspect the clearance between the caliper bracket and the disk on both sides.



Insufficient clearance may damage the disc.

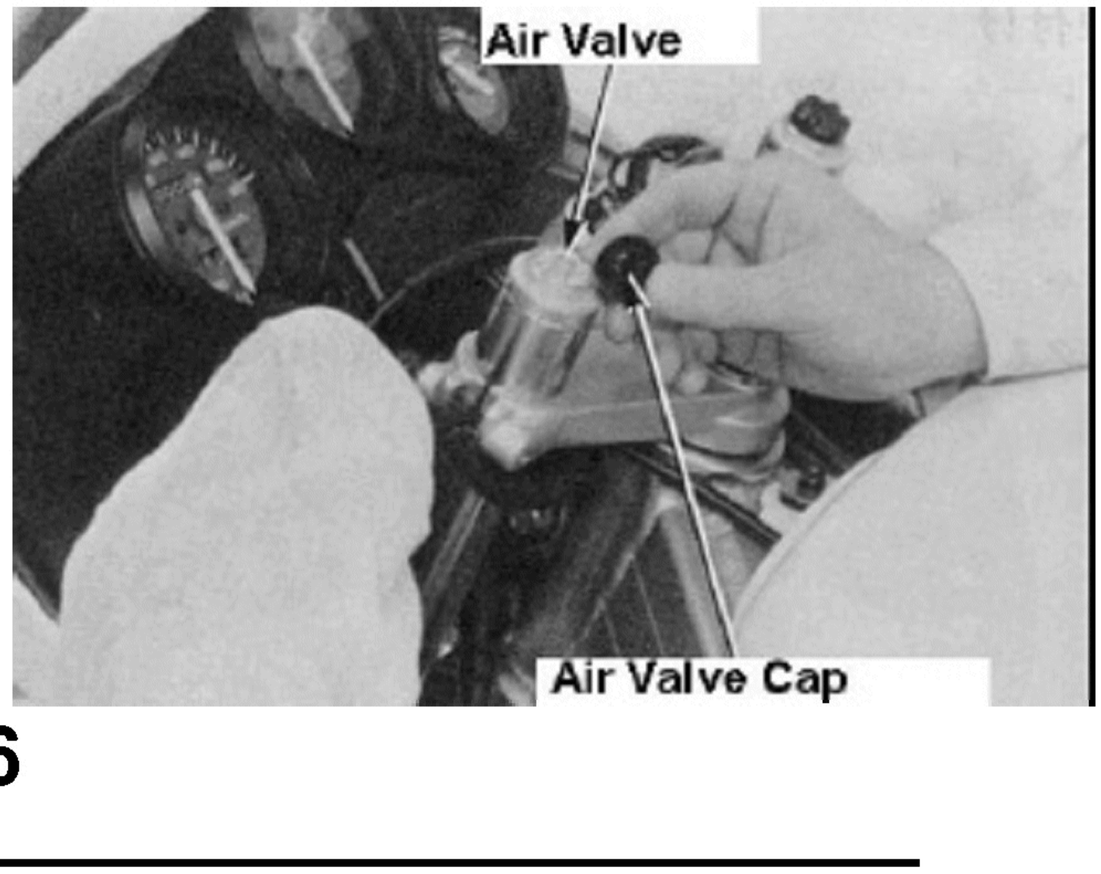
Front Fork
Detachment

Remove the front wheel (13-10)
Remove the brake caliper with the bracket.
Remove front fender attachment bolts and screws.
Detach the front fender.
Detach the steering handle (13-6)

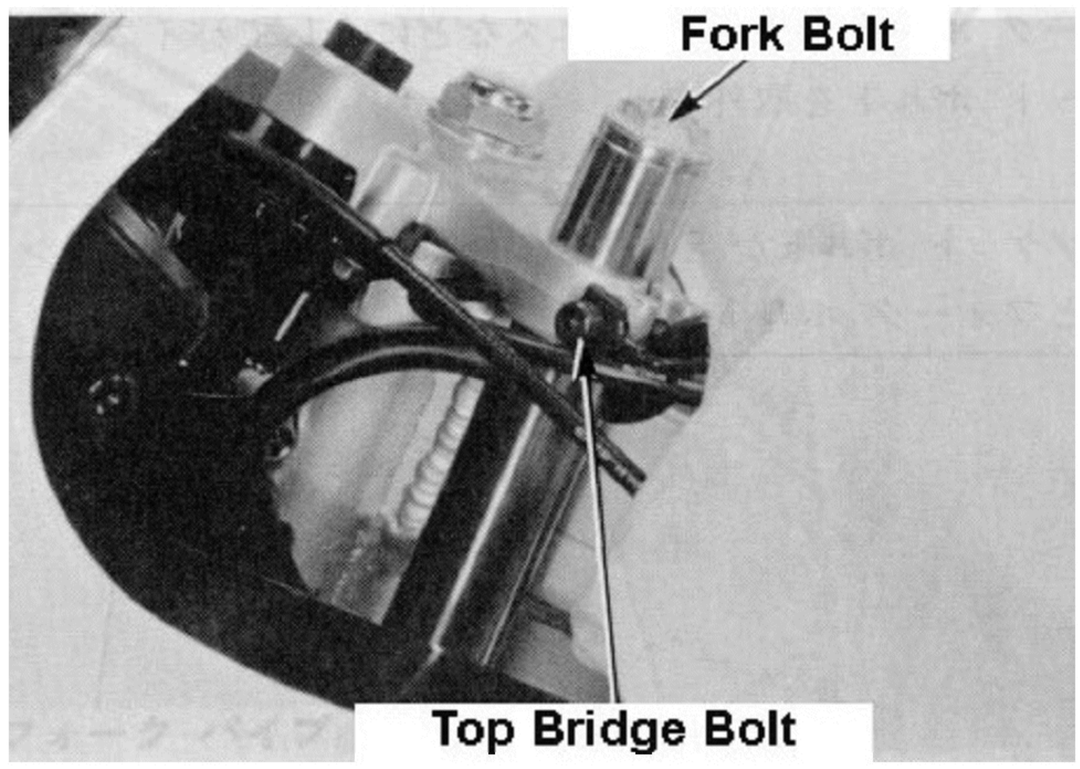


Caution
- Do not suspend the front brake master cylinder with the brake hose.
- Do not turn the master cylinder upside down. It may let air enter the hydraulic system. Maintain the attached position and fix to the body.

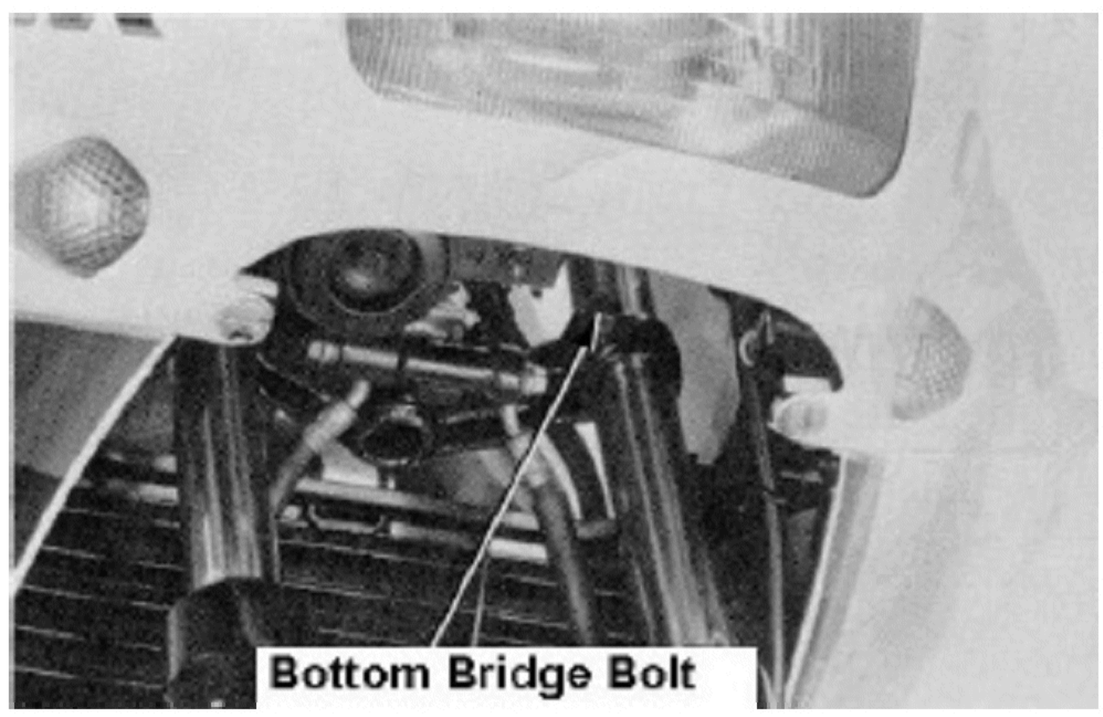
Remove the air valve cap. Push the air valve to drain air in the front fork.



Loosen the fork bolt.
Loosen the top bridge bolt.



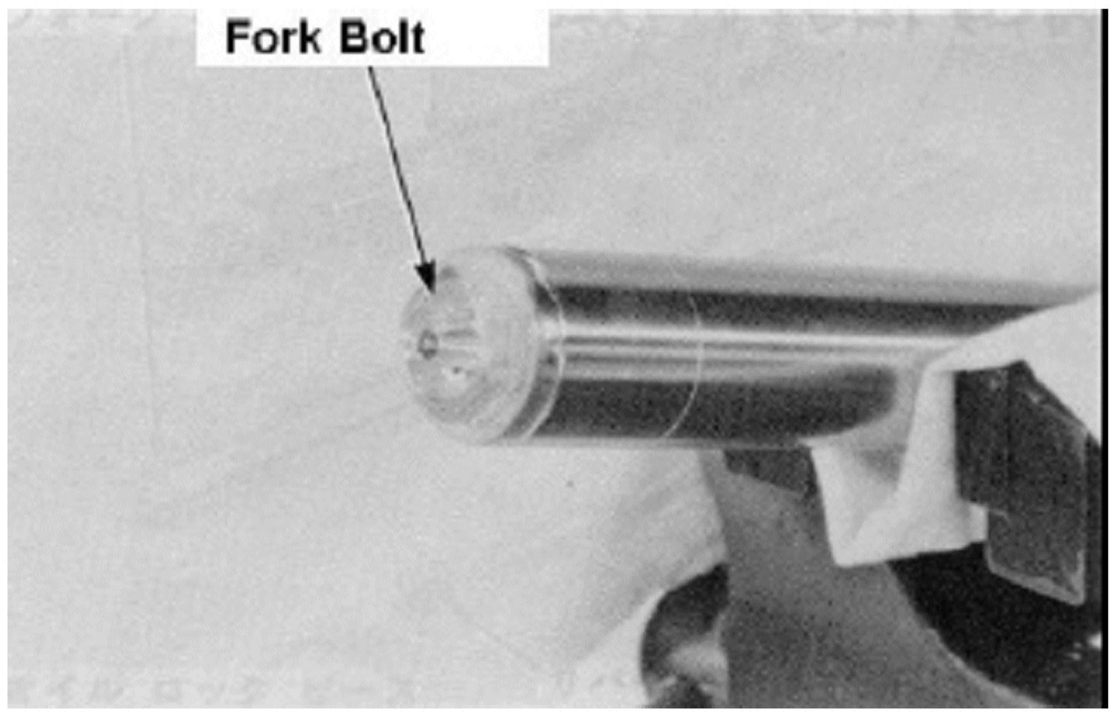
Loosen the bottom bridge bolt.
Remove the front fork.



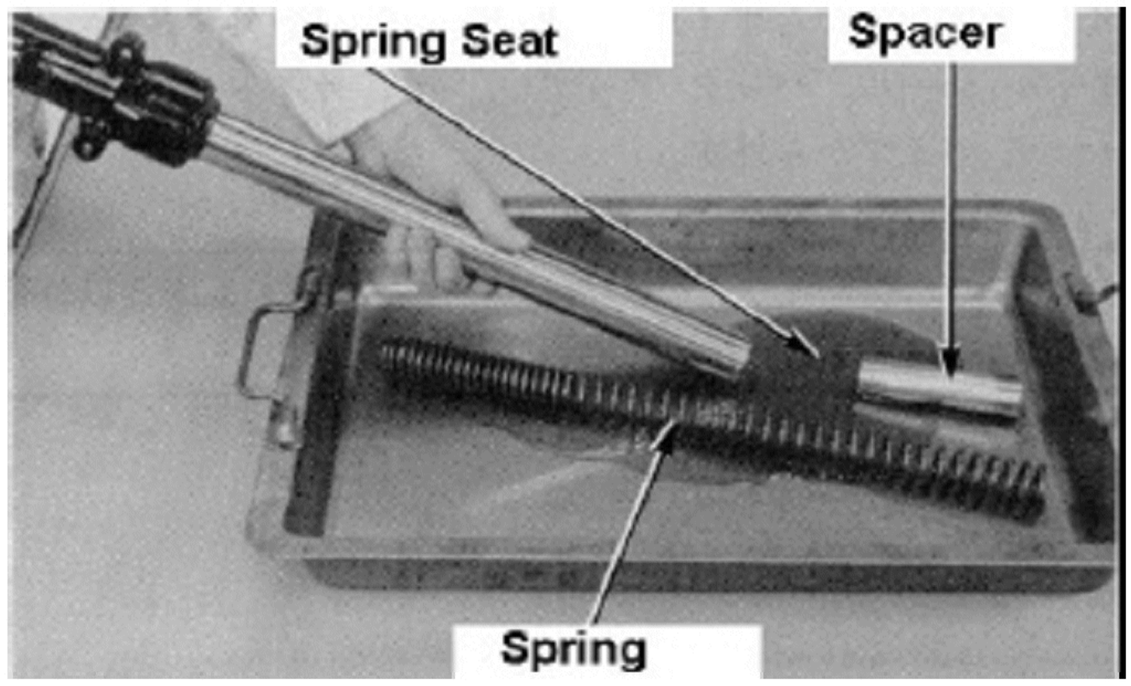
Disassembly

Remove the fork bolt.

- When using a vice, use a cloth to avoid damaging the fork pipe.
- Avoid the contact area of the pipe when setting to a vice.

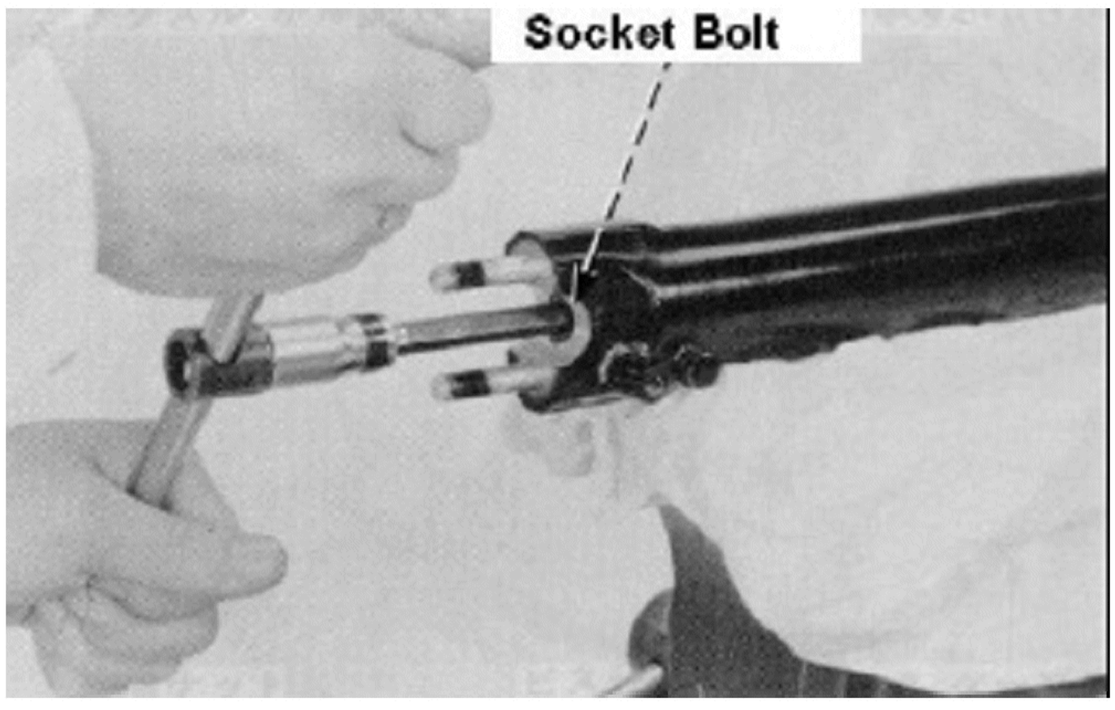


Remove the spacer, spring seat and the spring.
Drain oil by compressing the front fork for several times.

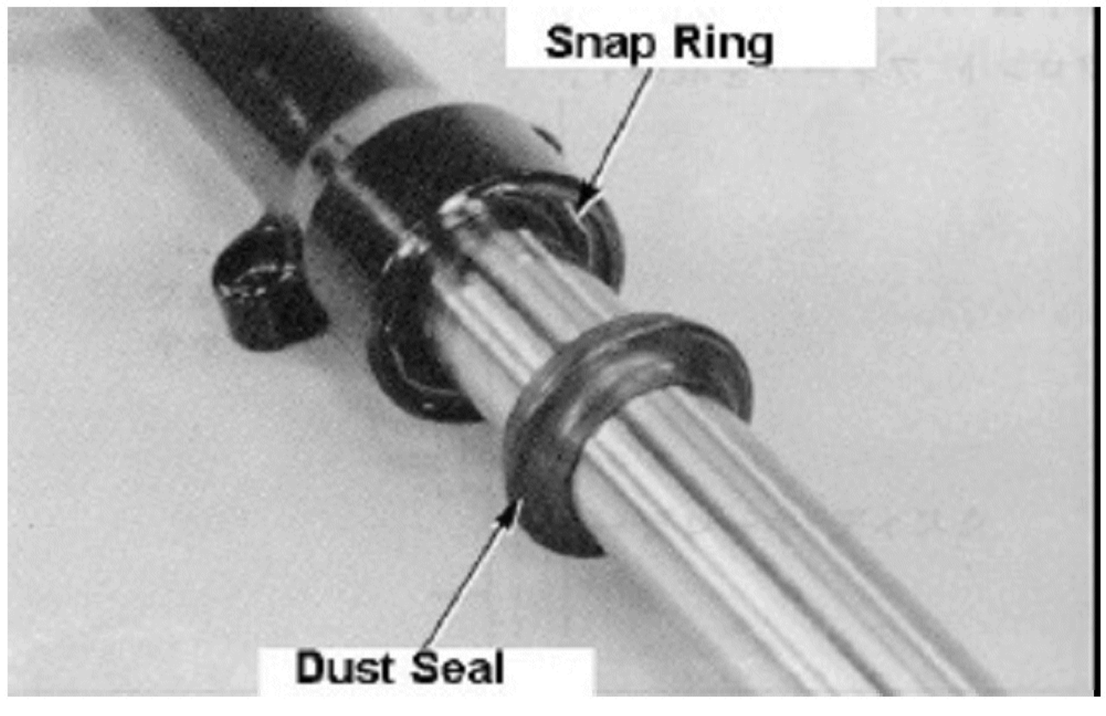


Fix the fork bottom case to a vice by applying a cloth. Remove the socket bolt.

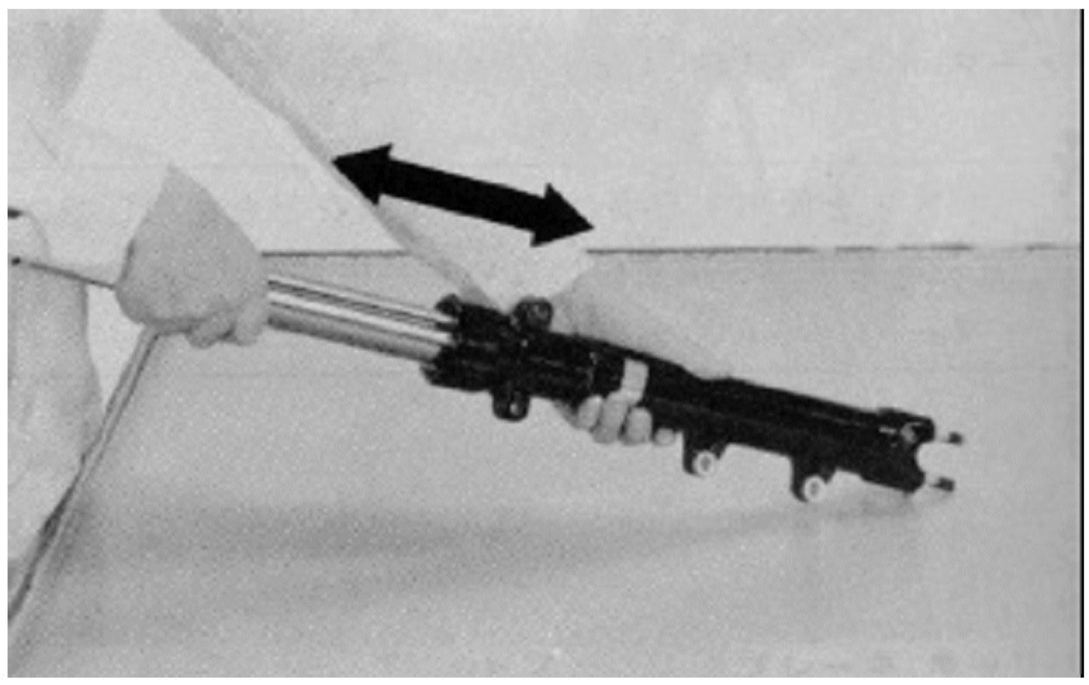
- If the socket bolt is spinning and won't come out, temporarily attach the spring and a fork belt.



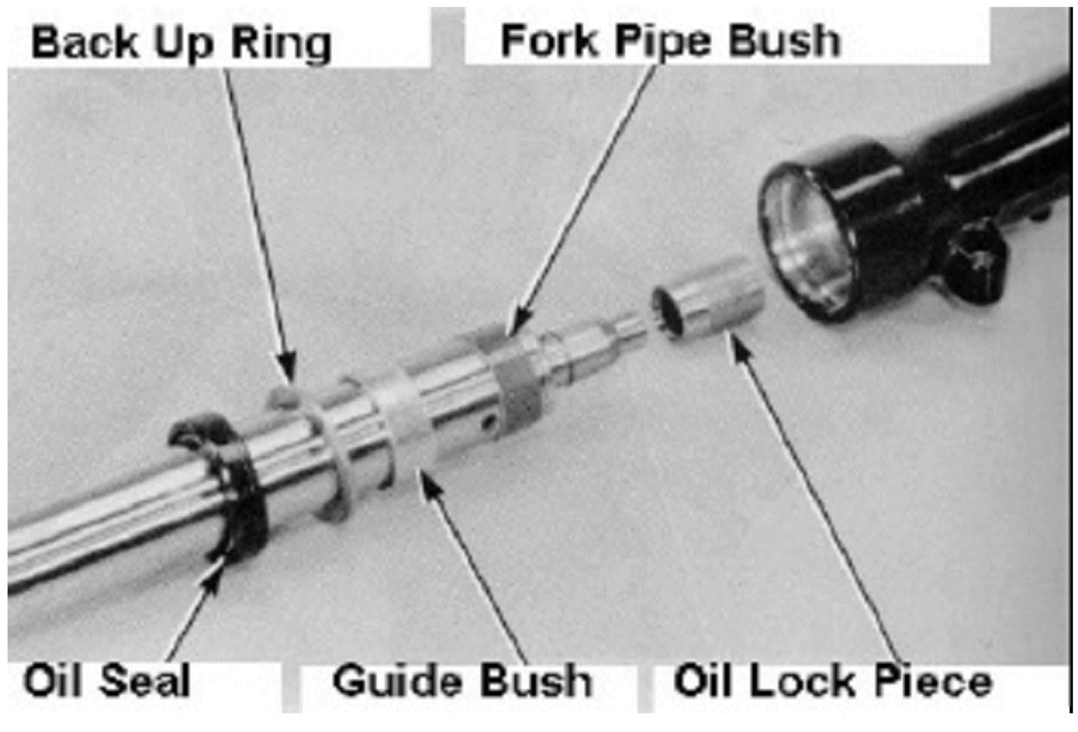
Detach the dust seal and the snap ring.



Pull the fork pipe out from the bottom case.

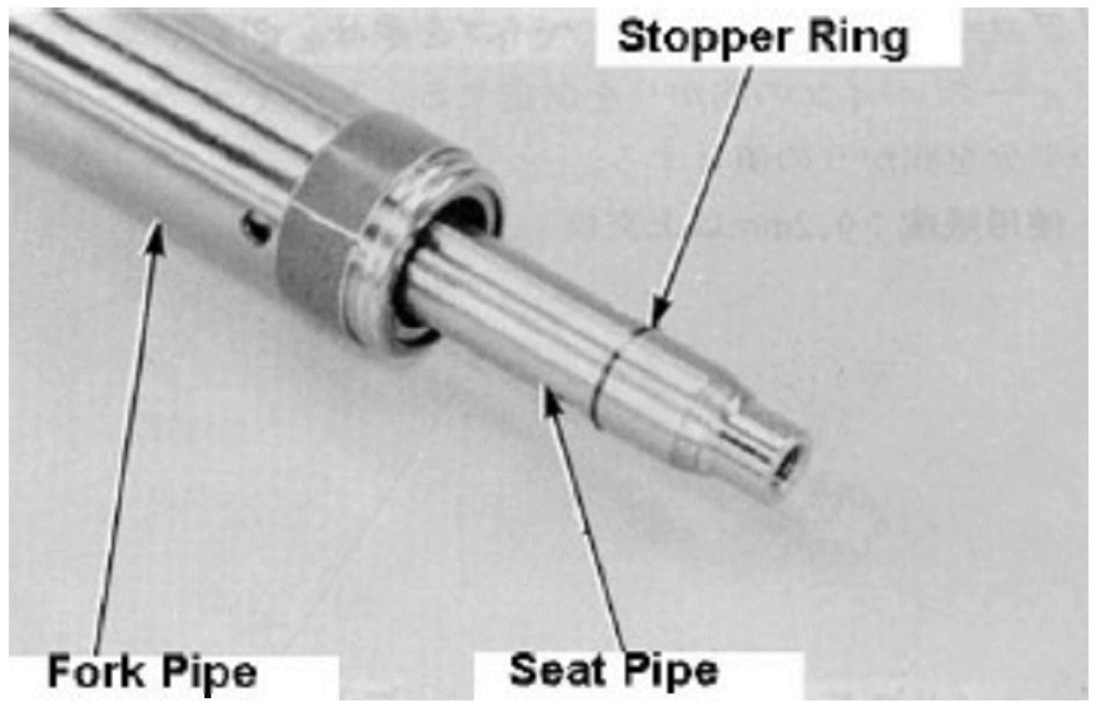


Remove the oil lock pin from the bottom case. Detach an oil seal, back up ring and the guide bush from the fork pipe.



Do not detach the fork pipe bush unless replacing with a new one.

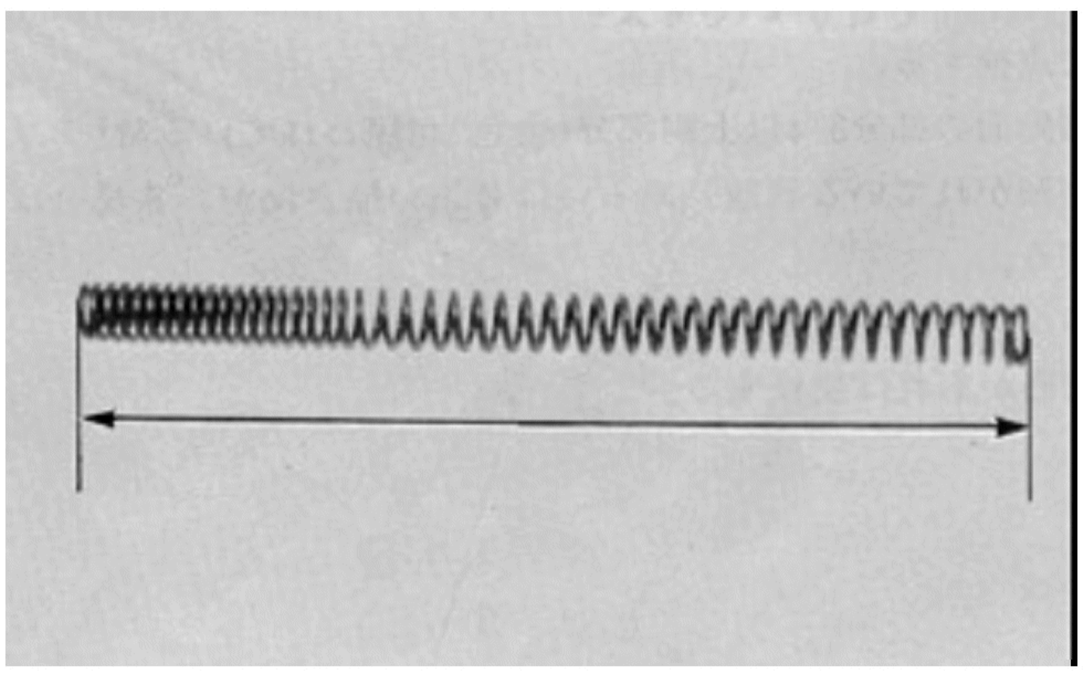
Remove the stopper ring.
Detach the seat pipe from the fork pipe.



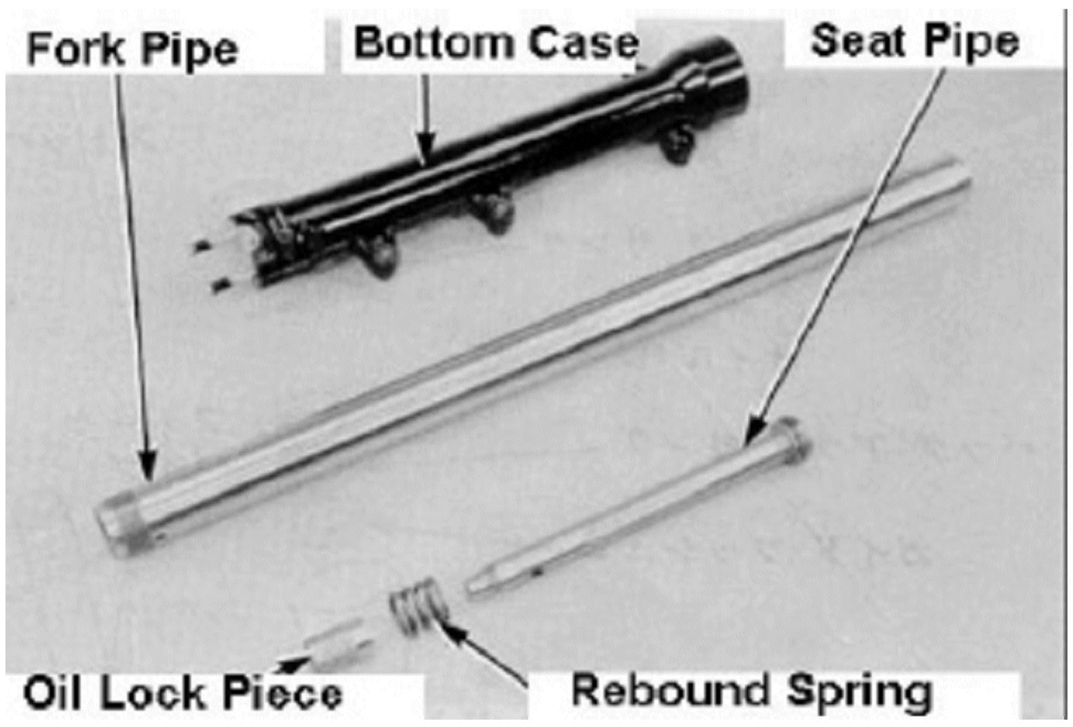
Inspection

Measure the relaxed length of the fork spring.

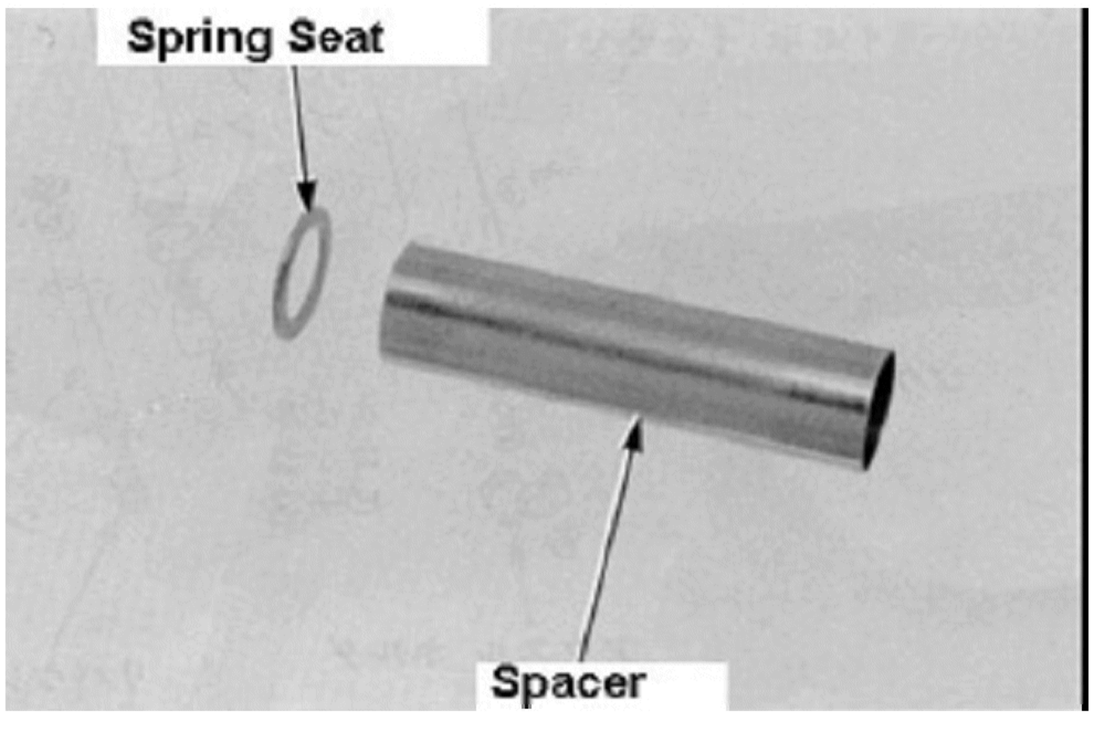
≦ 411.5mm → Replace



Inspect each part for damage, unusual wear and replace as required.



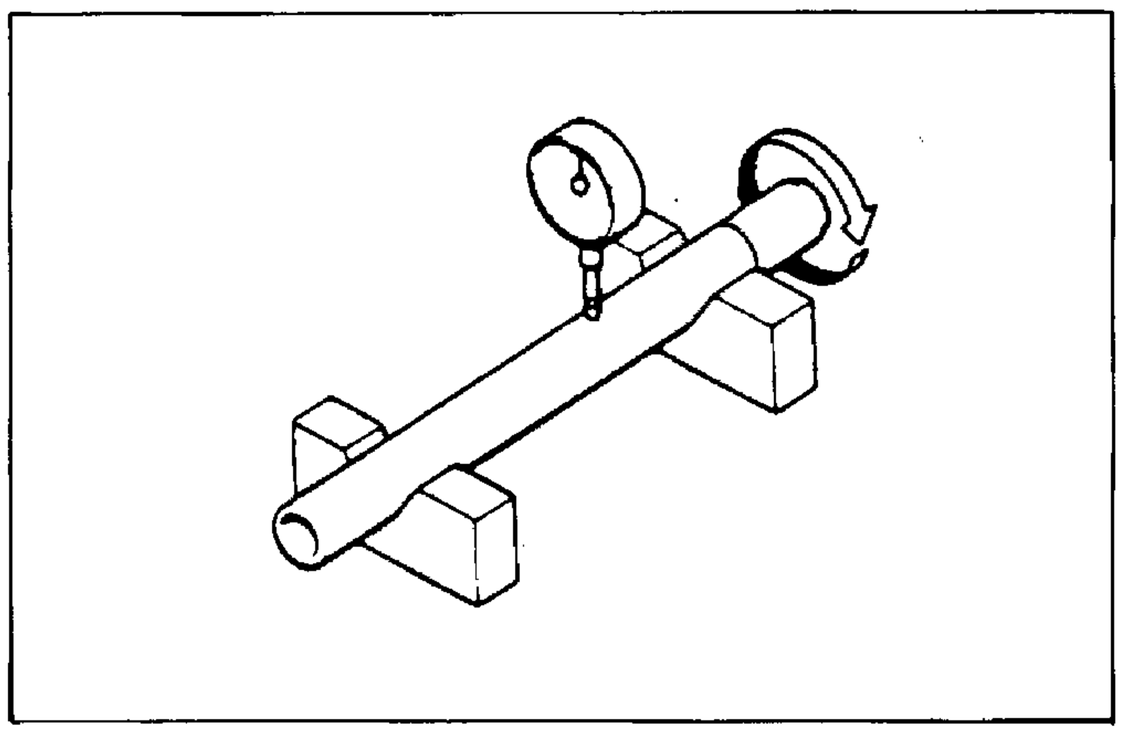
Inspect the spacer and the spring seat for damage and replace if necessary.



Place the fork pipe on V-blocks and measure the bend of the pipe with a dial gauge.

Take half of the indicated value.

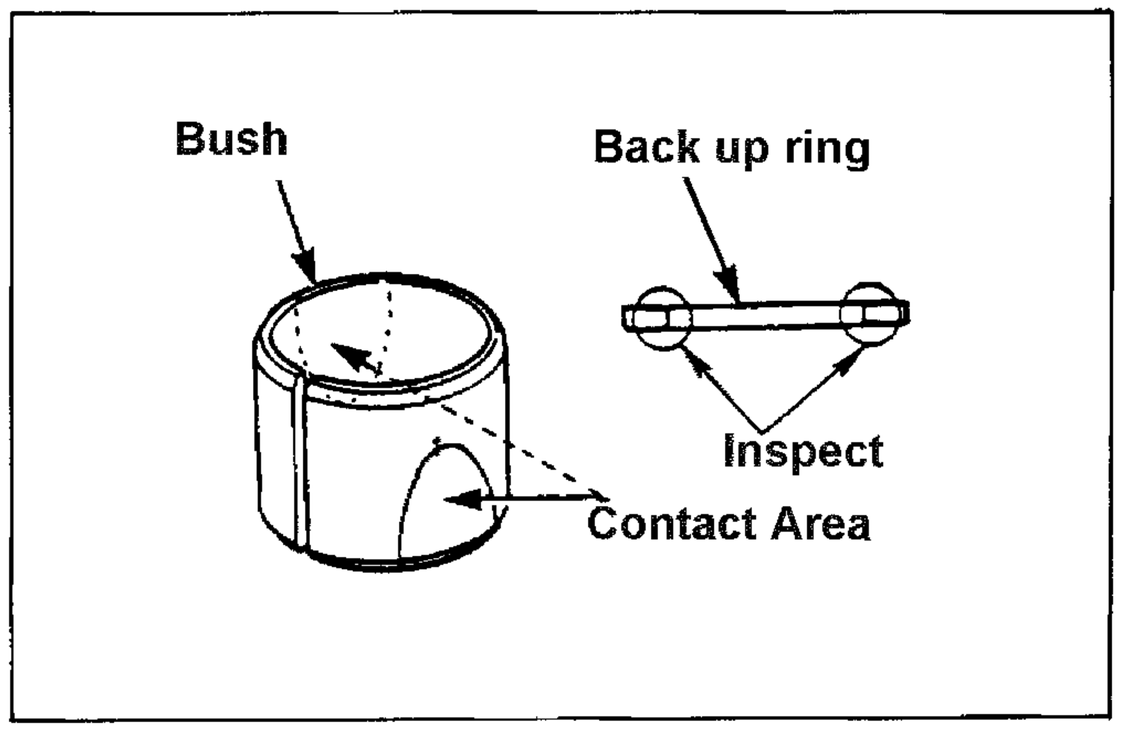
≦ 0.2mm → Replace

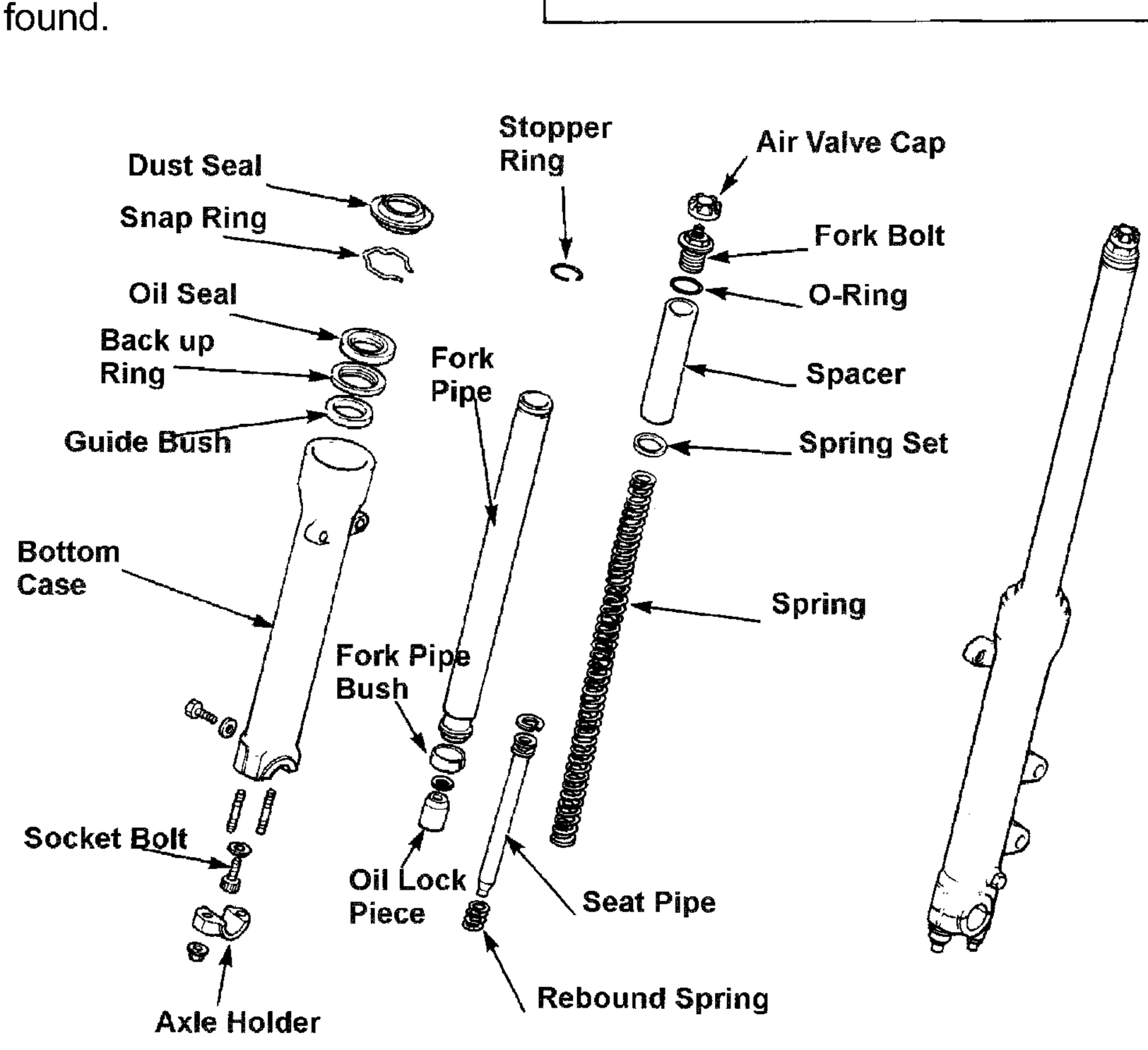


Visually inspect the contact part of the guide bush and the fork pipe bush. Replace if the surface coating has peeled off for more than ¾ of the contact area. The peeled area can be identified as an area if copper is exposed.

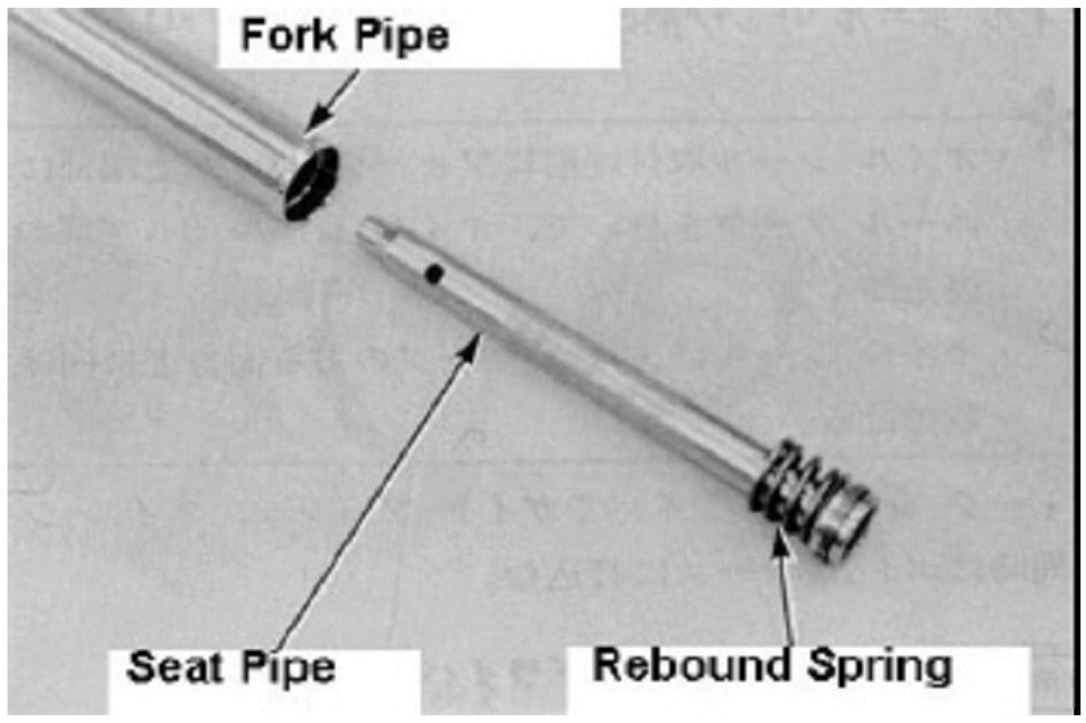
Replace where subsequent scratch is found as well.

Inspect the backup ring and replace if deformation is found.

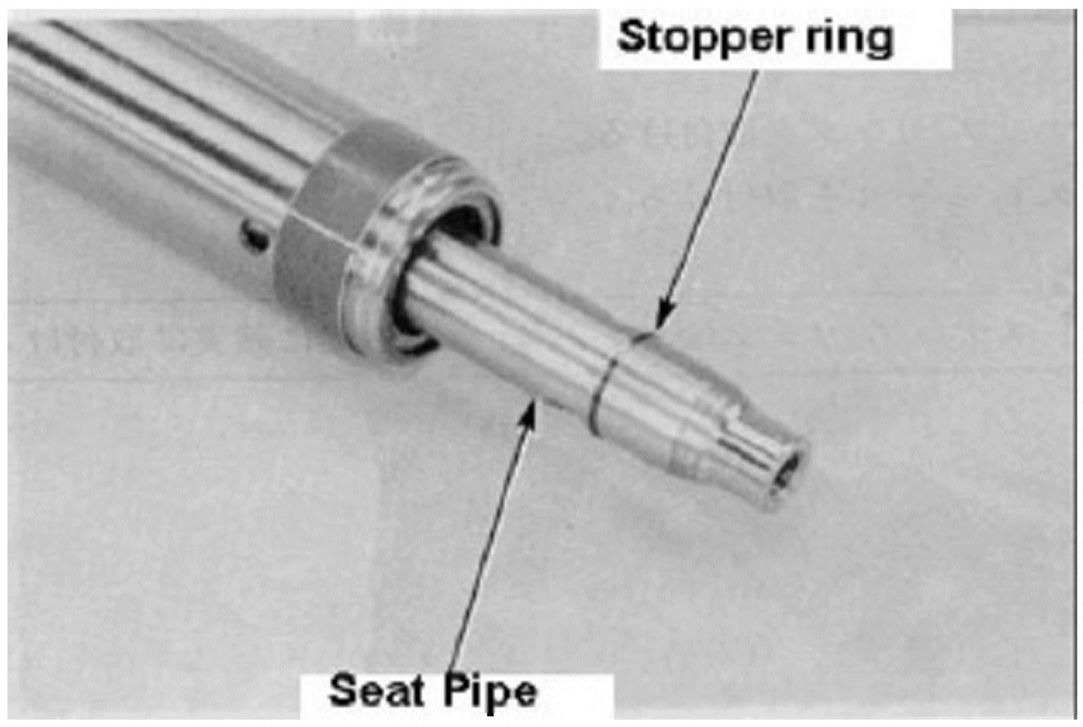




Insert the rebound spring and the seat pipe to the fork pipe.

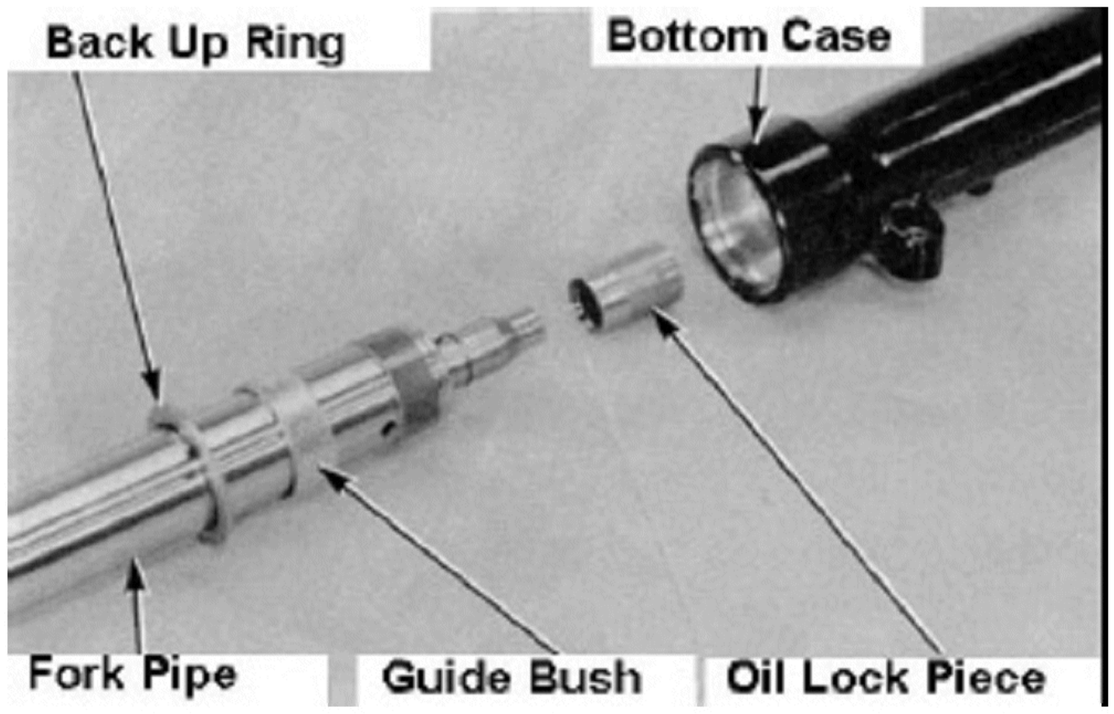


Attach the stopper ring to the seat pipe.

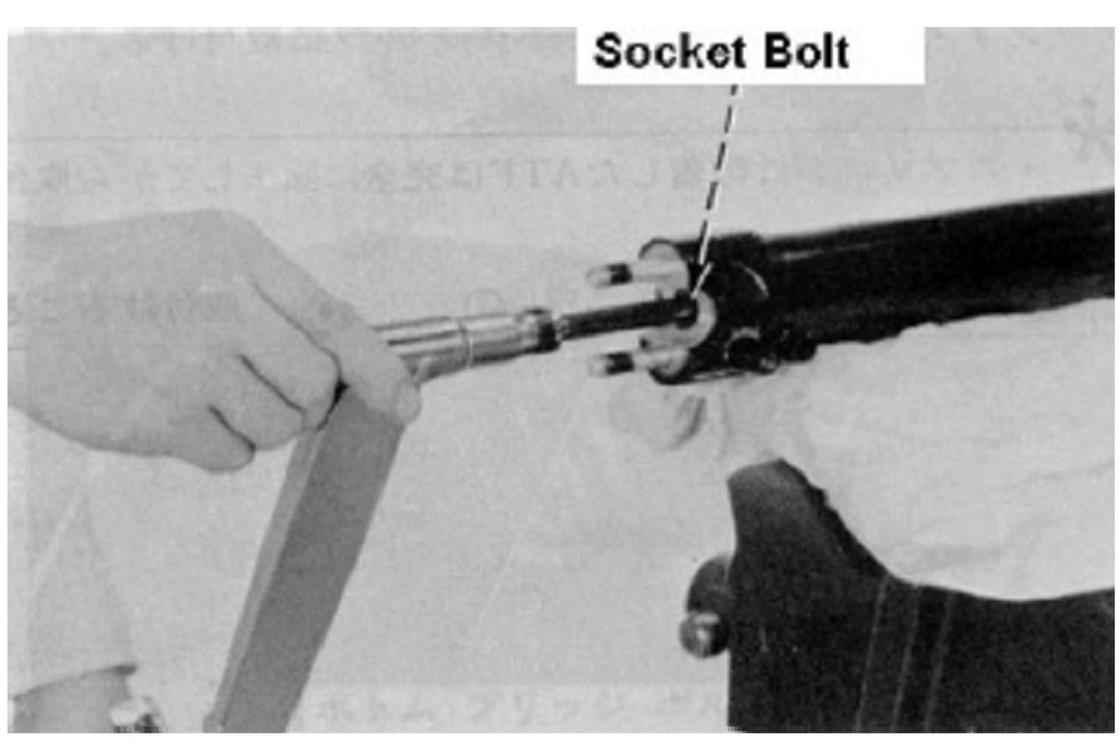


Attach the guide bush and the backup ring to the fork pipe.

Attach oil lock piece to the seat pipe.
Insert the fork pipe to the bottom case.

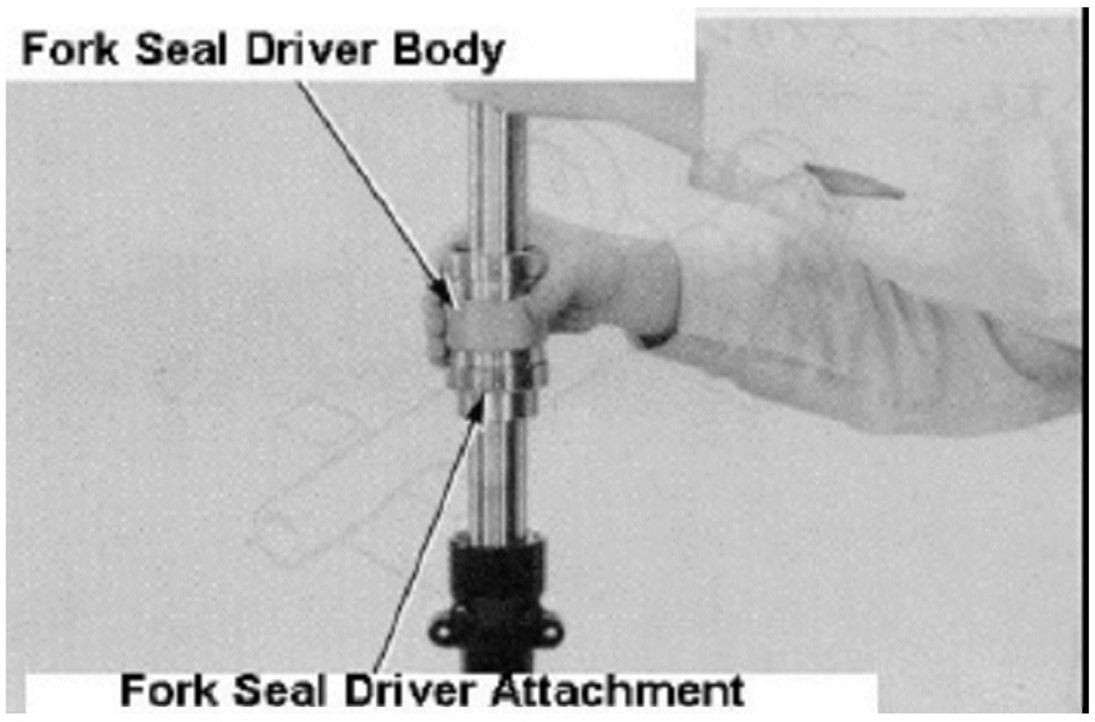


Apply cloth around the bottom case and fix the case to a vice.
Tighten the socket bolt to the seat pipe.
Torque: 0.5 ~ 2.0kg-m



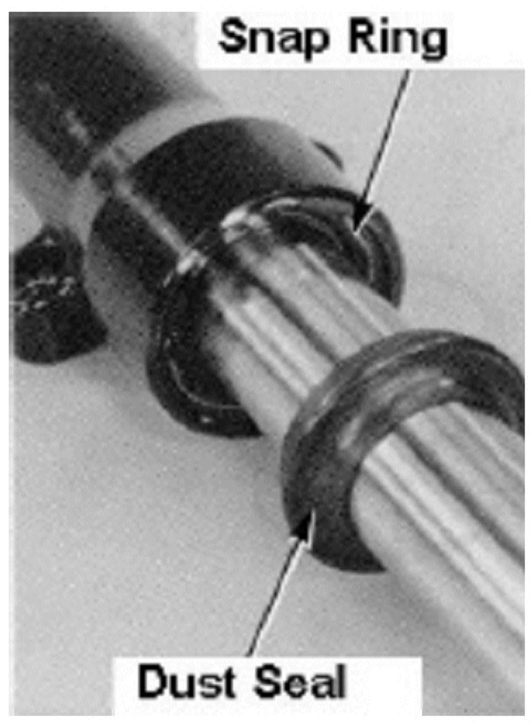
Apply ATF to the lip of the oil seal.

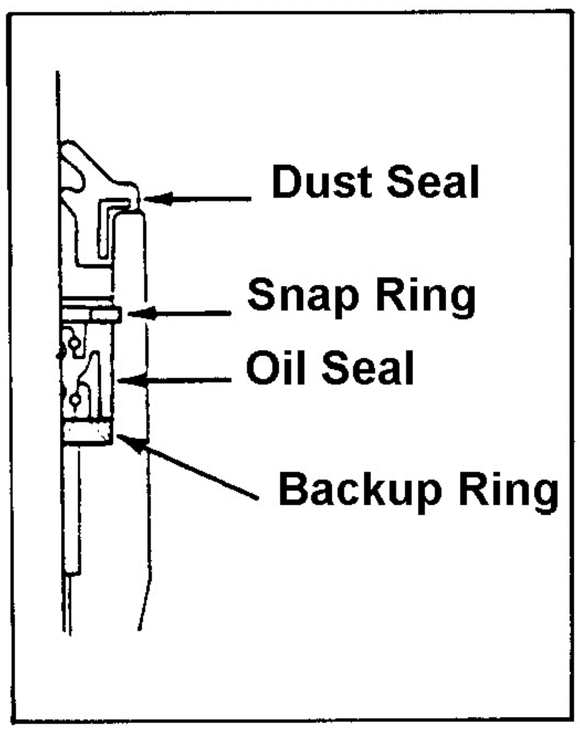
- When installing the oil seal, apply vinyl tape to the top end of the fork pipe in order to avoid damaging the oil seal lip.
- Manufacturer's name on the seal should face up.



Install the guide bush and the oil seal to the bottom case at the same time by using a fork seal driver.

Exc. tool	Fork seal driver attachment 07947-KA20200
Common tool	Fork seal driver body 07747-0010100



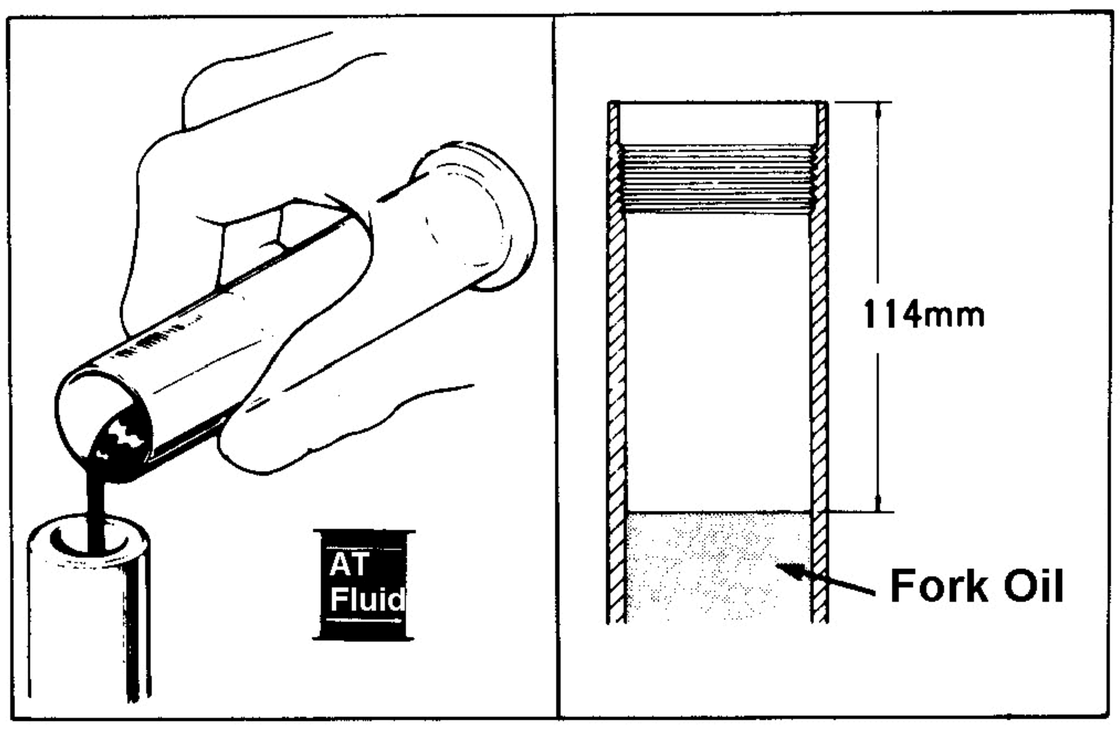


Attach the snap ring.
Attach the dust seal.

Firmly set the snap ring to the slit of the bottom case.

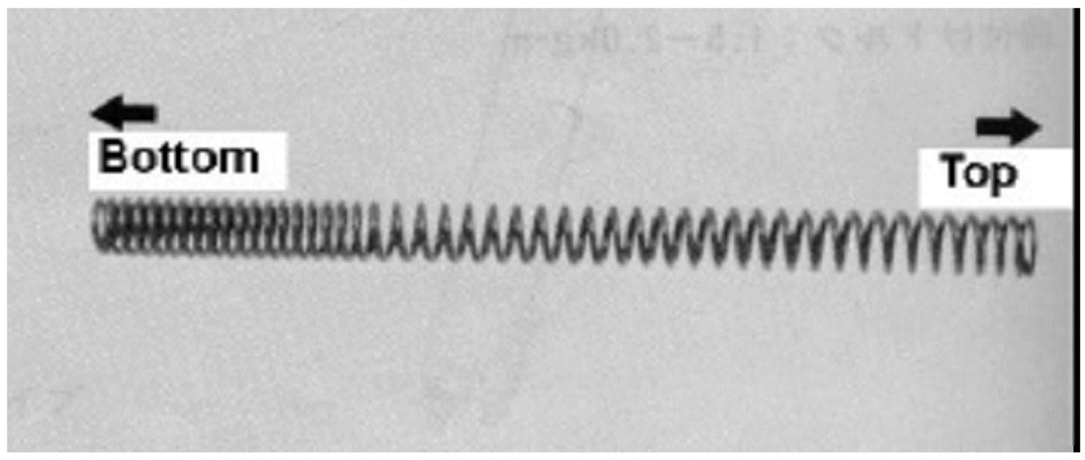
Fully compress the fork pipe and fill with ATF to the standard level.

Standard level: **114mm**
Capacity: **290 ± 2.5cc**



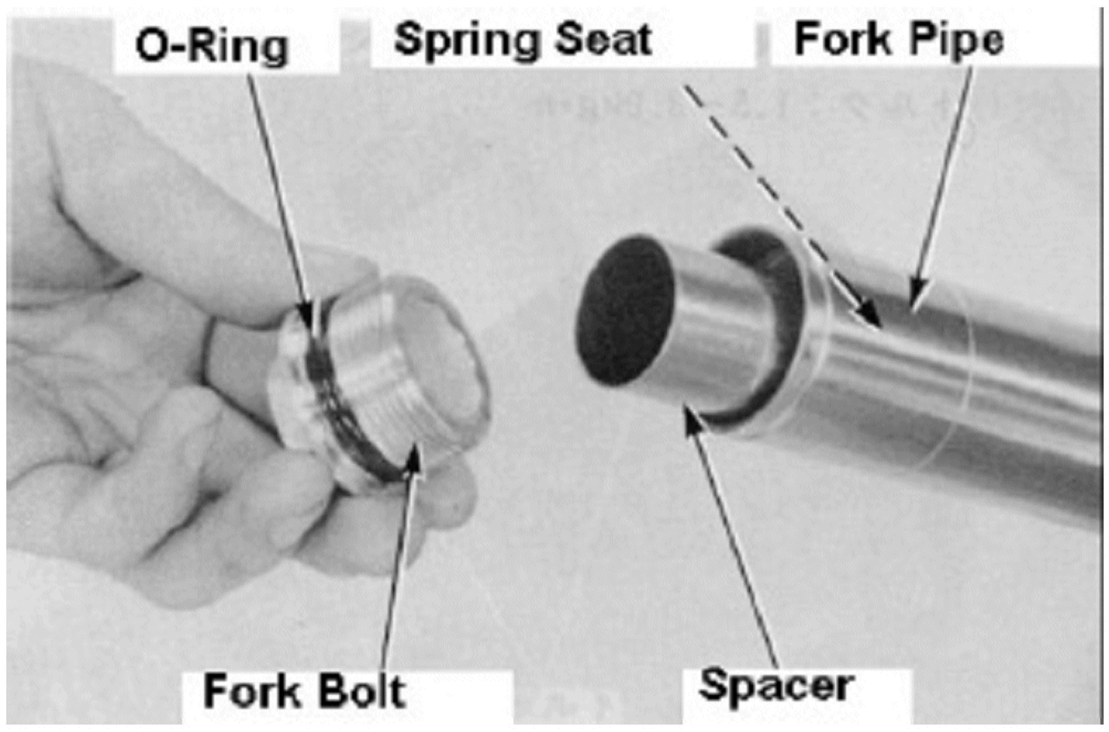
Attach the cushion spring to the fork pipe.

- Wipe all ATF off from the spring before attaching.
- The narrow pitch is the bottom.



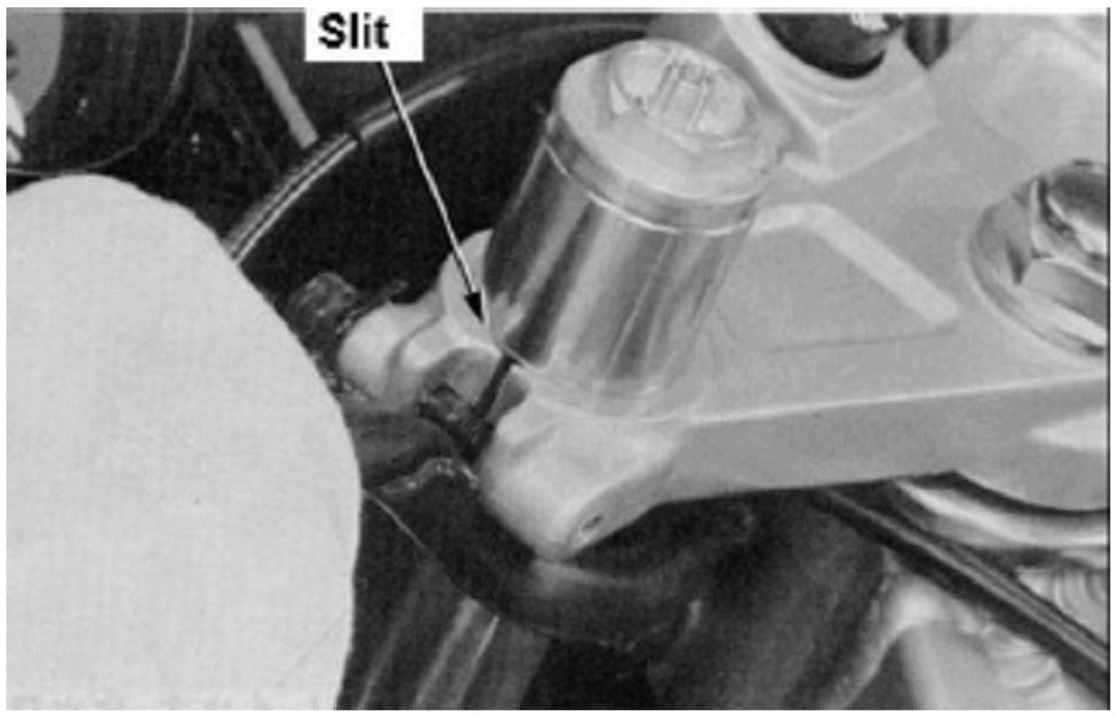
Attach the spring seat and the spacer to the fork pipe.

Install O-Ring to fork bolt and temporarily attach to the fork pipe.

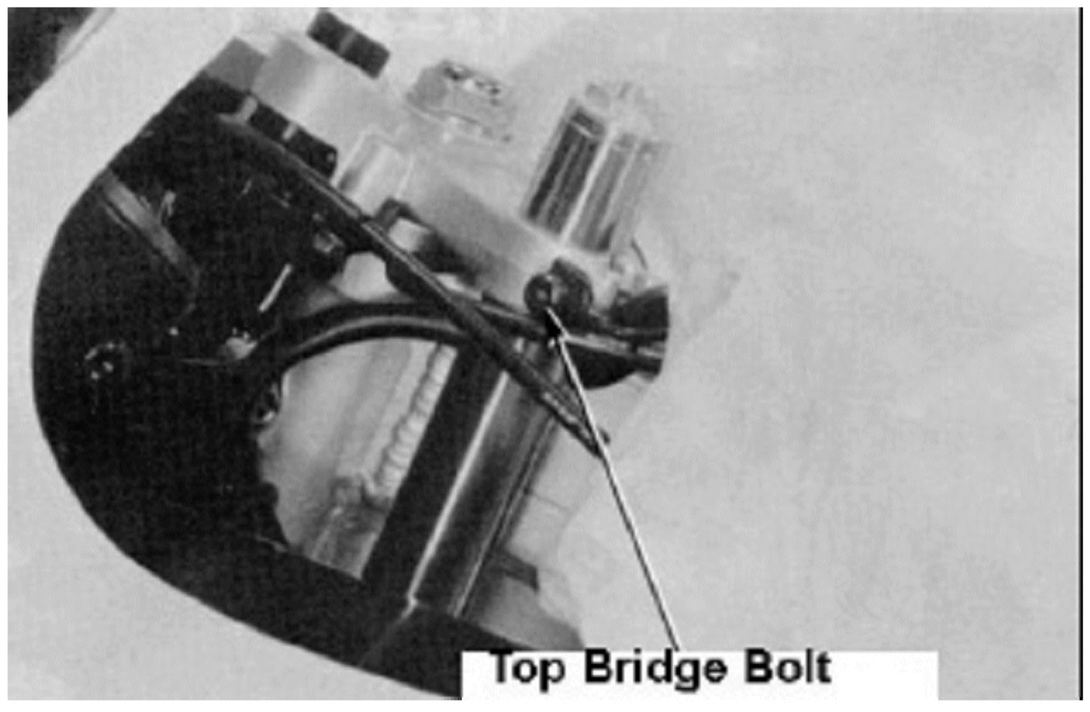


Attachment

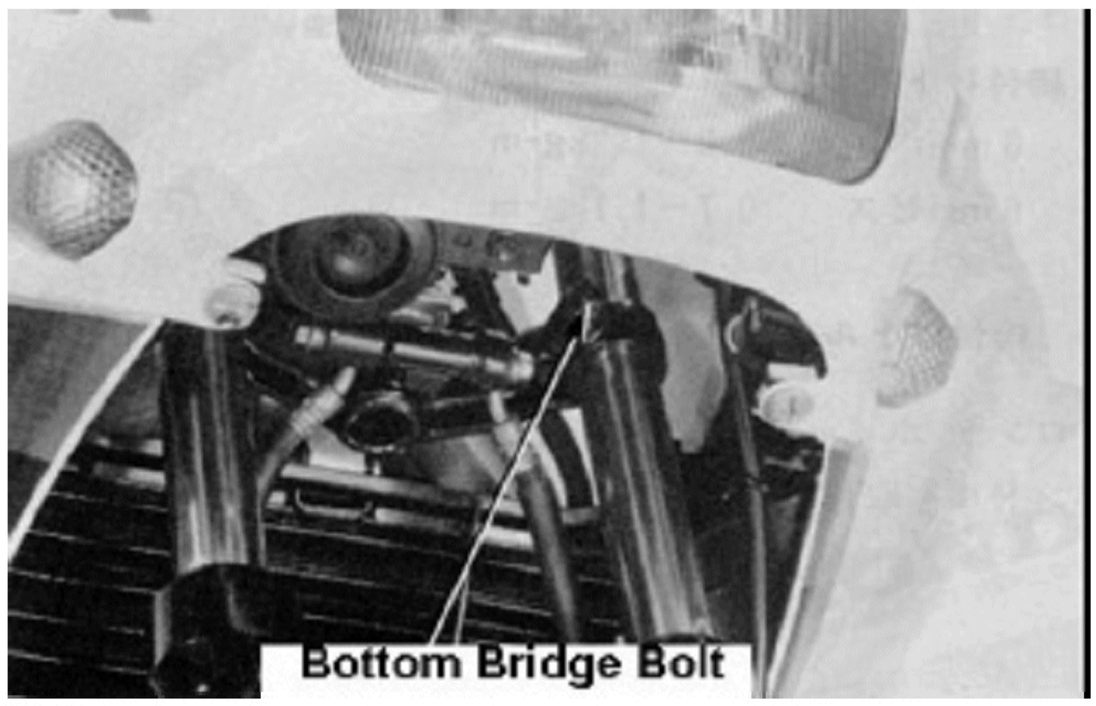
Attach the front fork.
Align the slit on the lower part of the fork pipe with the top surface of the top bridge.



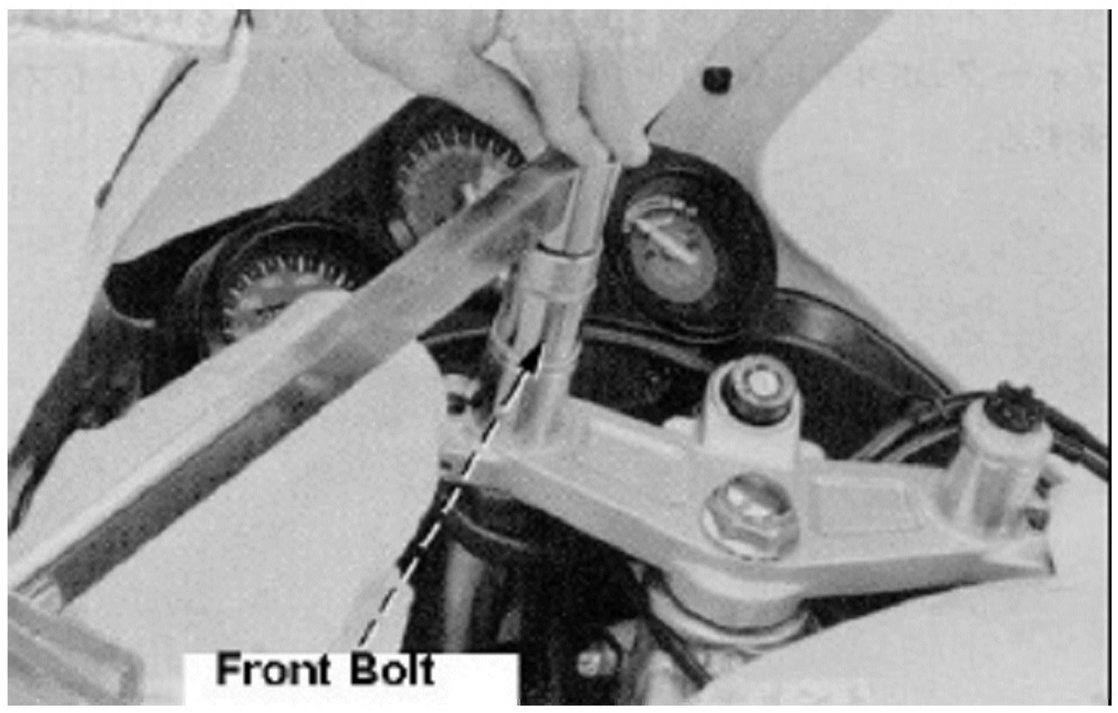
Tighten the top bridge bolt.
Torque: 0.9 ~ 1.3kg-m



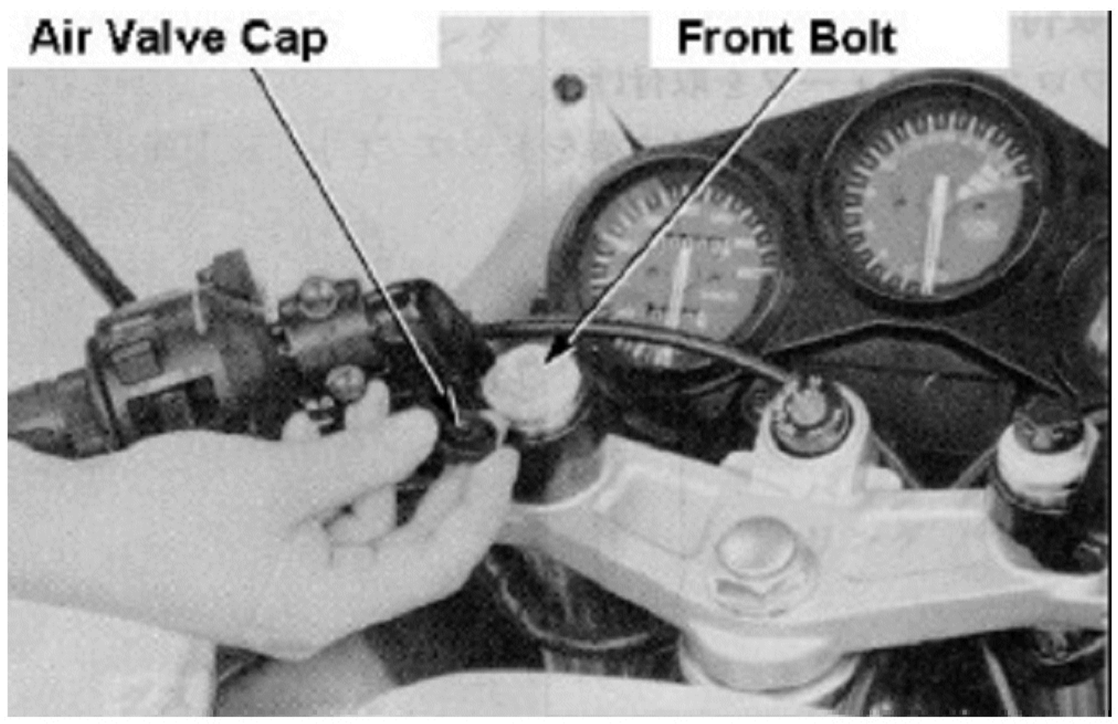
Tighten the bottom bridge bolt.
Torque: 3.0 ~ 4.0kg-m



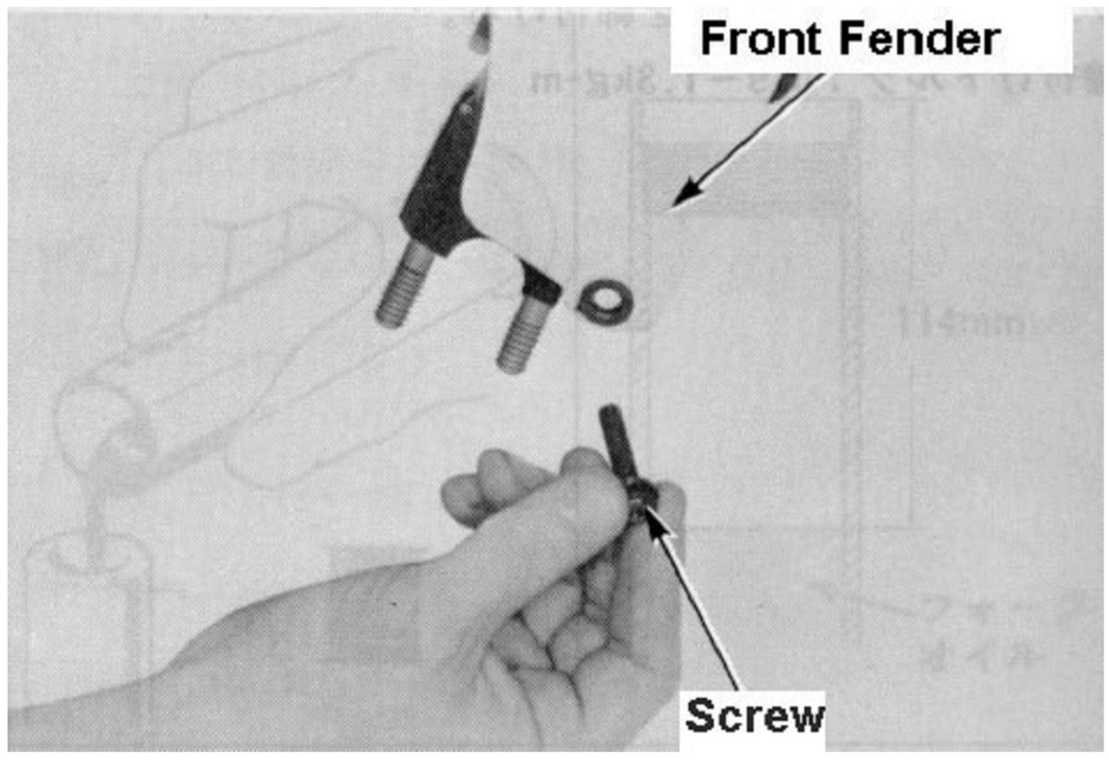
Tighten the fork bolt.
Torque: 1.5 ~ 3.0kg-m



Adjust the air pressure of the front fork (2-7).
Attach the air valve cap to the fork bolt.



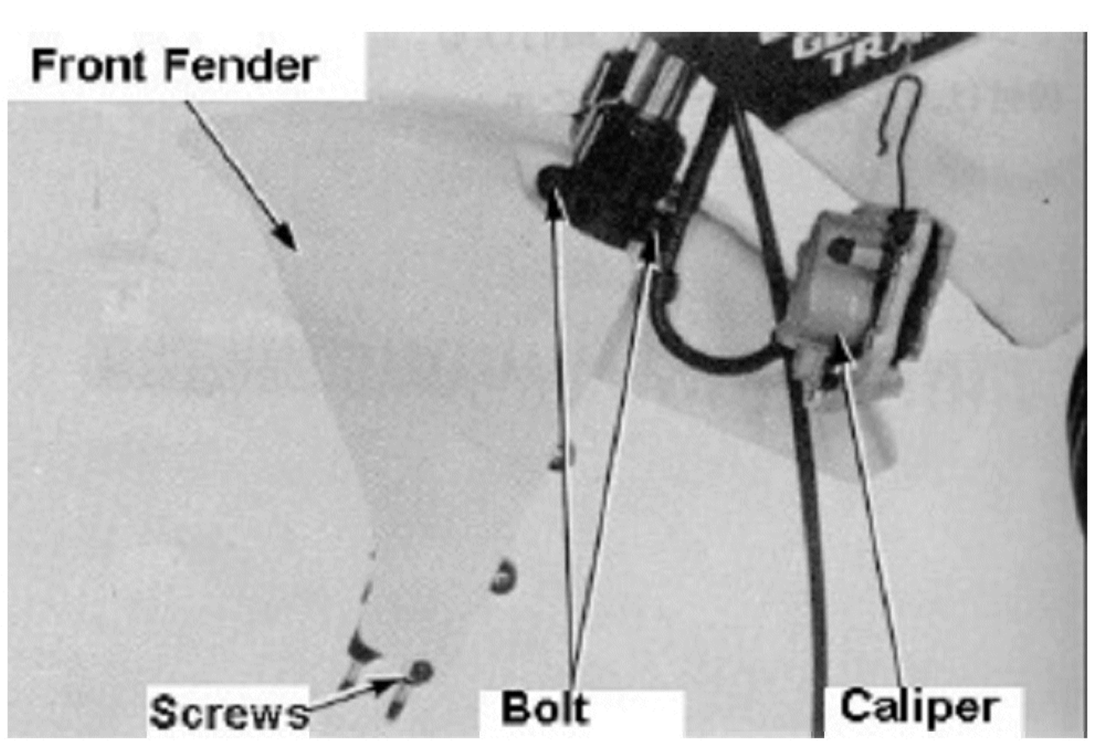
Tighten the screw and fix the front fender with the front fork.



Tighten the front fender attachment bolt.
Torque: 6mm bolt 0.8 ~ 1.2kg-m
6mm screw 0.7 ~ 1.1kg-m

Attach the brake caliper
Torque: 2.4 ~ 3.0kg-m

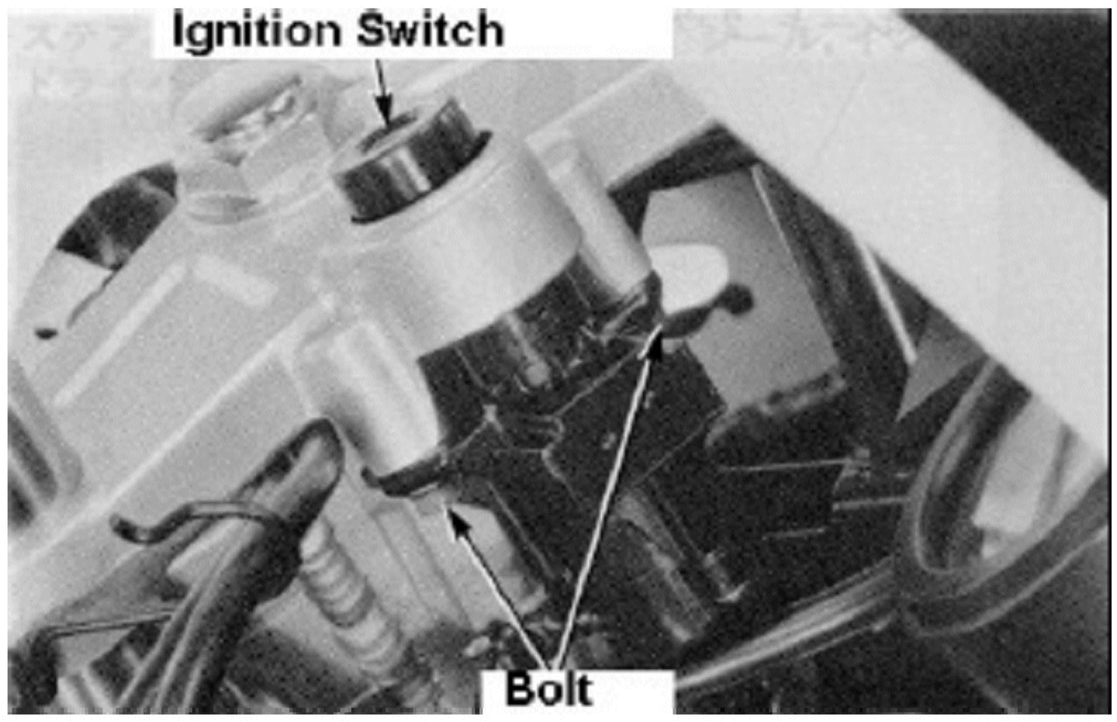
Attach the front wheel (13-15).
Attach the steering handle (13-7).



- **Steering Stem**

Detachment

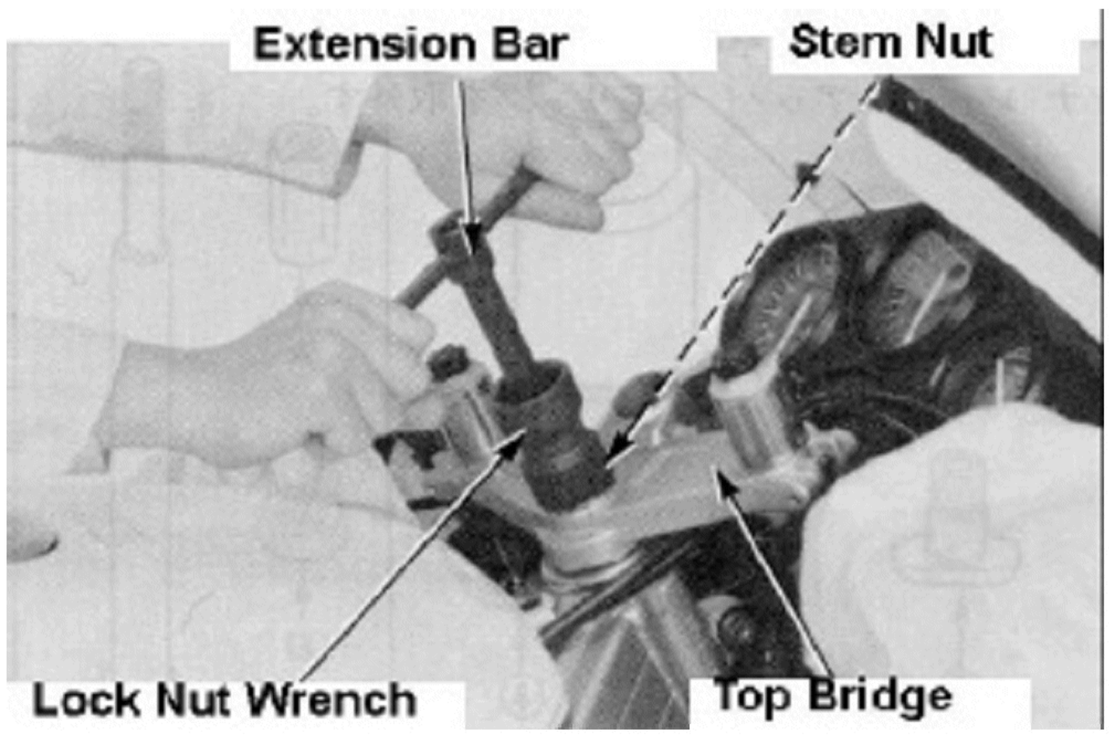
Detach the steering handle (13-6).
Remove the front wheel (13-10).
Remove two attachment bolts and detach the ignition switch.



Detach the steering stem nut and the washer.

Common tool

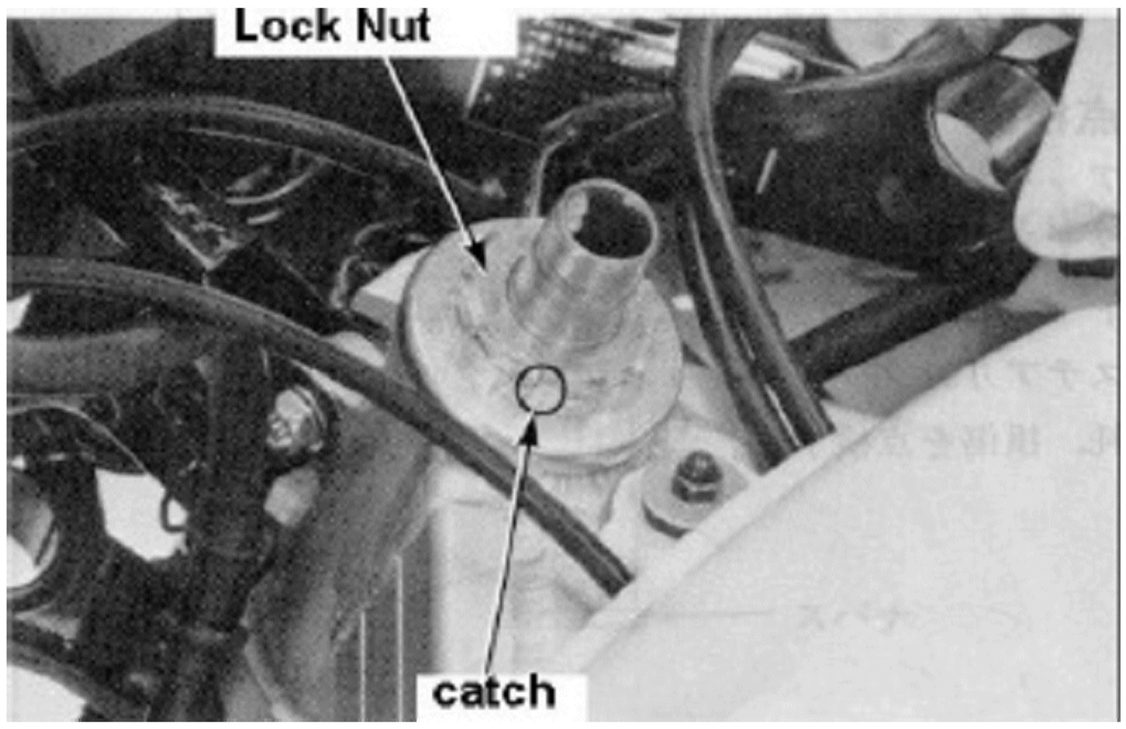
Lock nut wrench 30 x 32mm
07716-0020400
Extension bar
07716-0020500



Remove front forks (13-16).
Detach fork top bridge.

Straighten the catch of the lock washer.

Remove the lock nut and the lock washer.



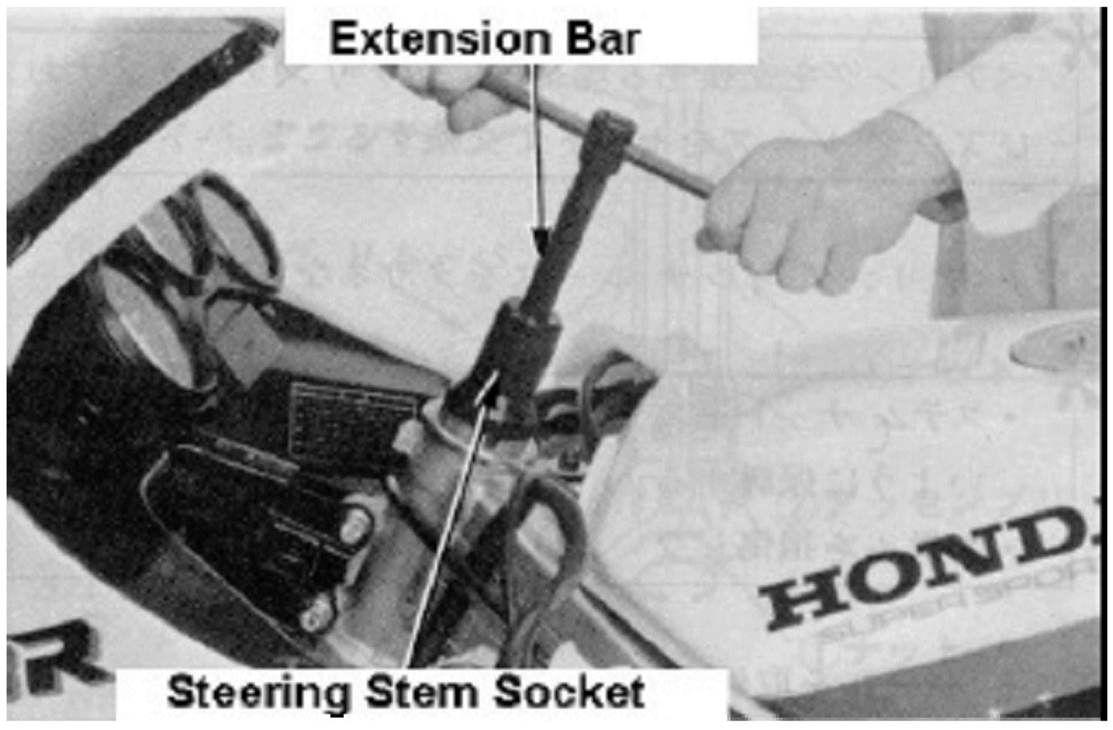
Remove the steering adjust nut.

Exc. tool

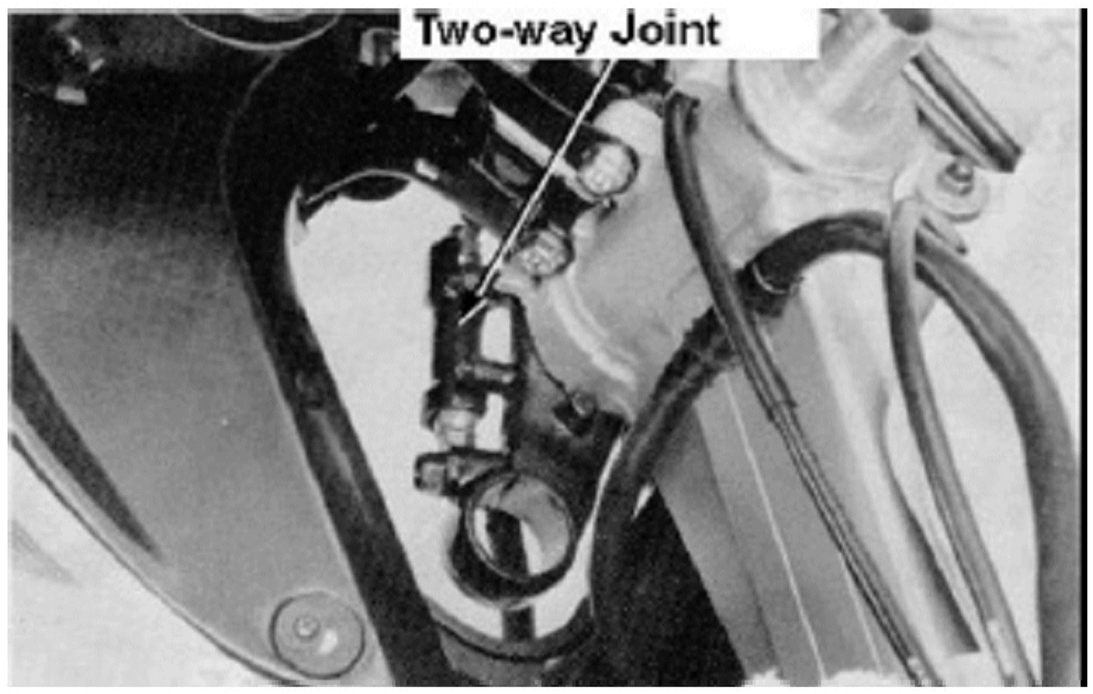
Steering stem socket
07916-3710100

Common tool

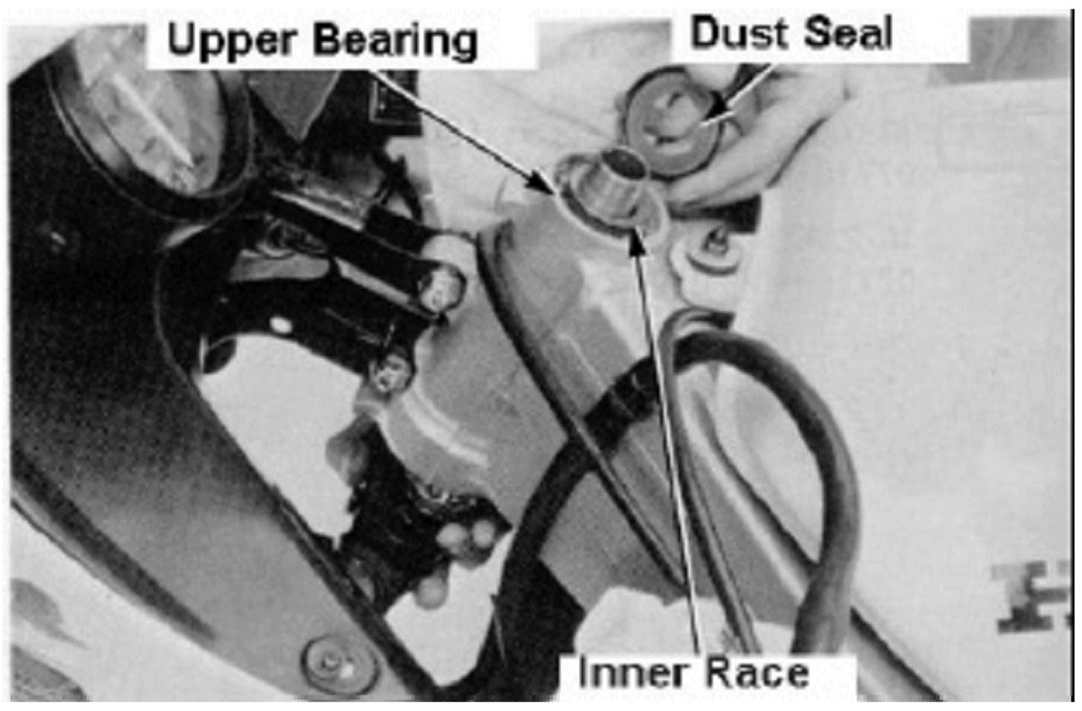
Extension bar
07716-0020500



Detach the front brake two-way joint.



Remove the steering stem, dust seal, upper bearing inner race and an upper bearing.



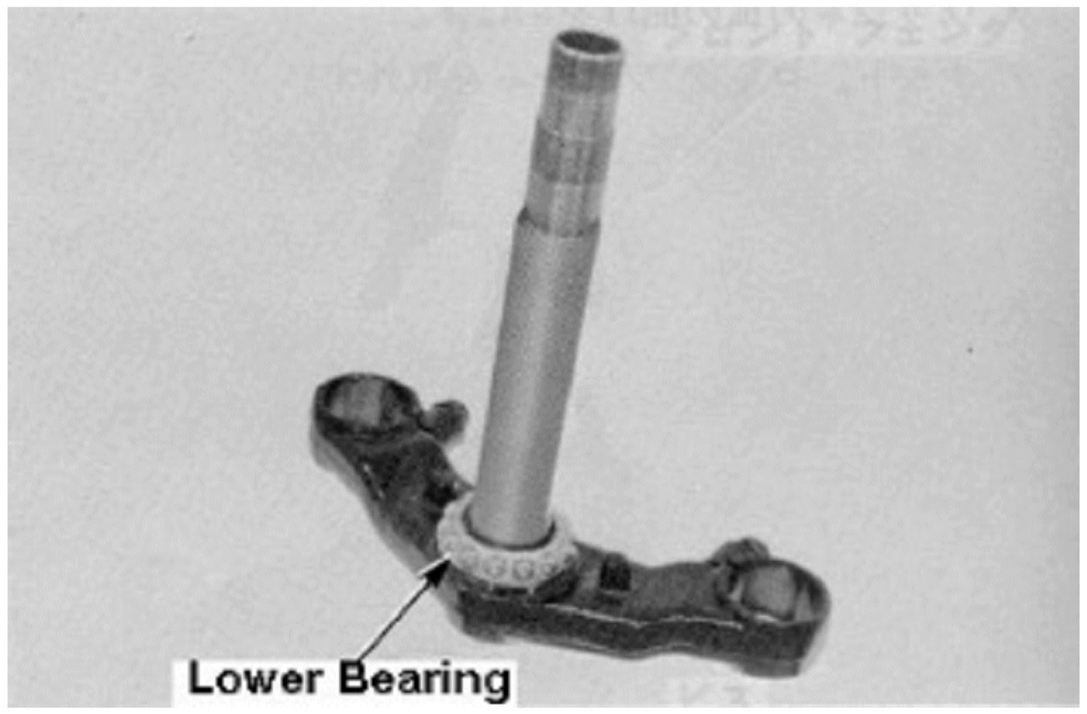
Detach the lower bearing from the stem.

Inspection

Inspect upper and lower bearings for wear and damage.

Inspect the inner race and the dust seal on lower bearing for wear and damage.

Inspect the bearing outer race of the steering head pipe for wear and damage.



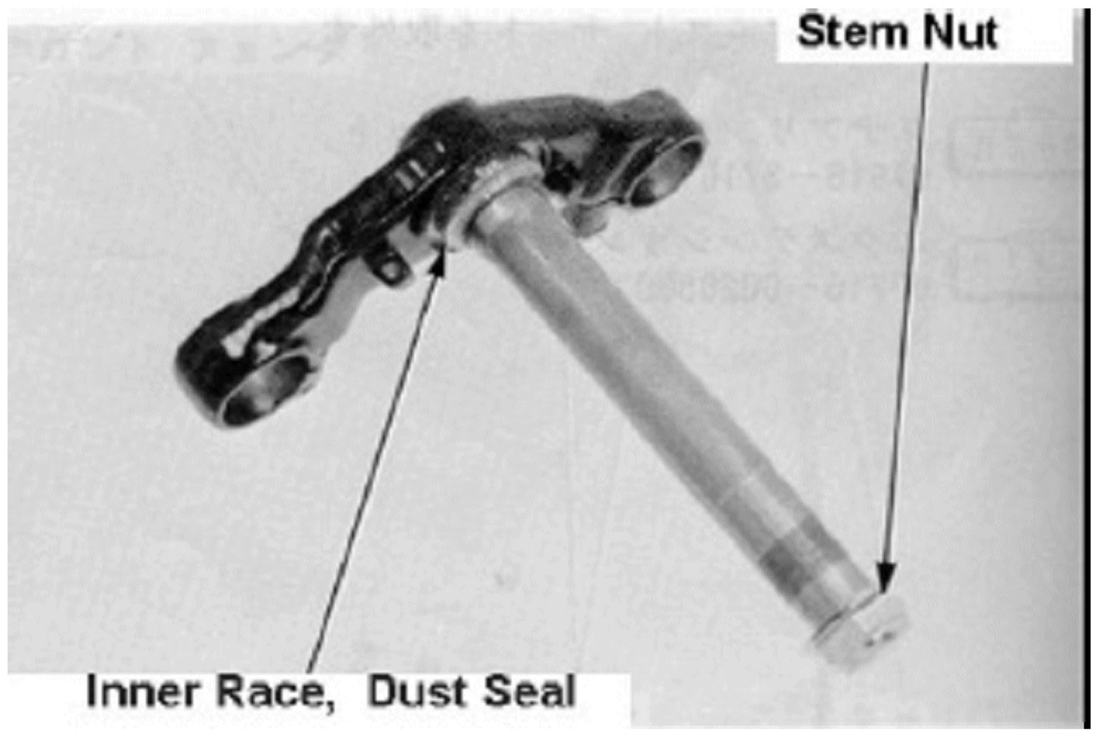
Bearing Replacement

Replace inner and outer races together with the bearing.

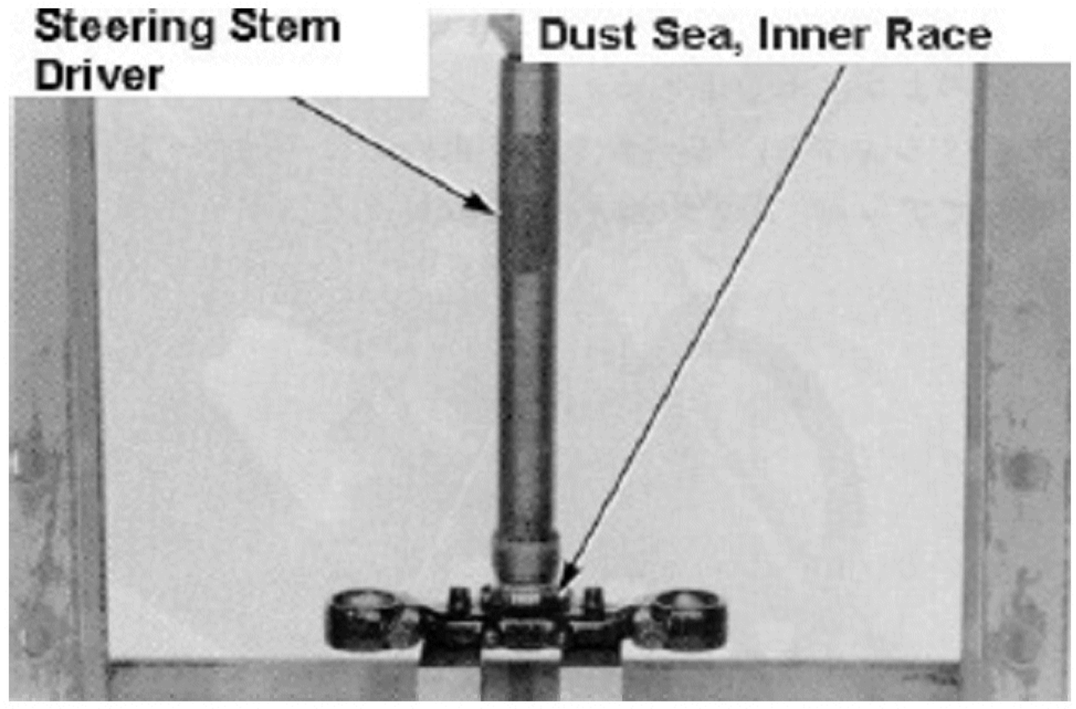
Detach the lower bearing inner race.

• Attach the stem nut to the stem to protect the thread. • Do not damage the stem.

Remove the dust seal.



Attach the new dust seal to the steering stem and press the inner race in.



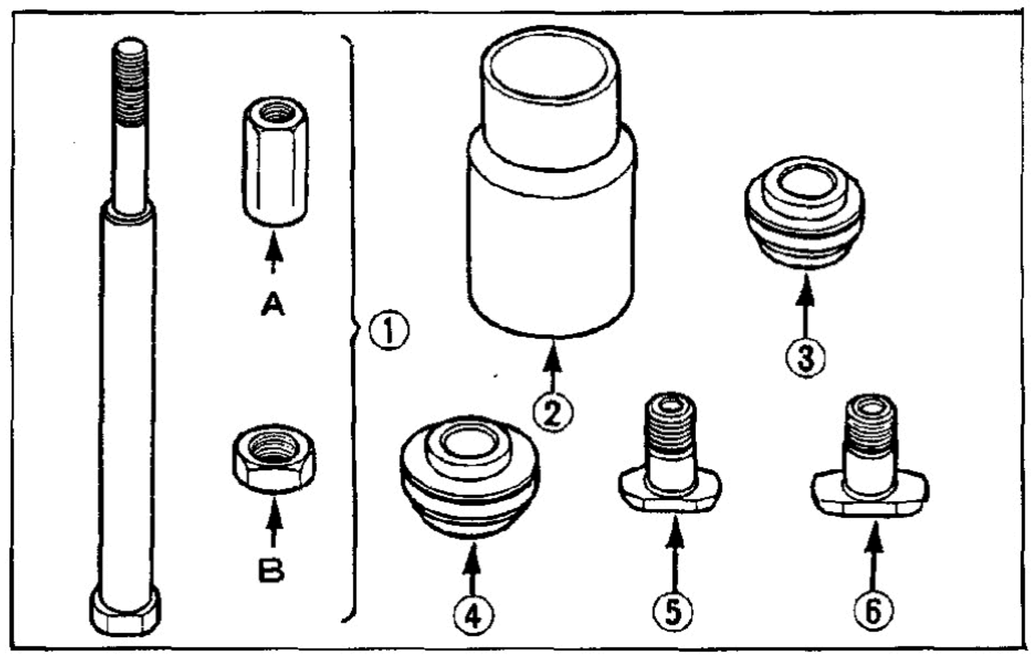
Exc. tool	Steering stem driver 07946-MB00000

Ball Race Replacement

Exc. tools

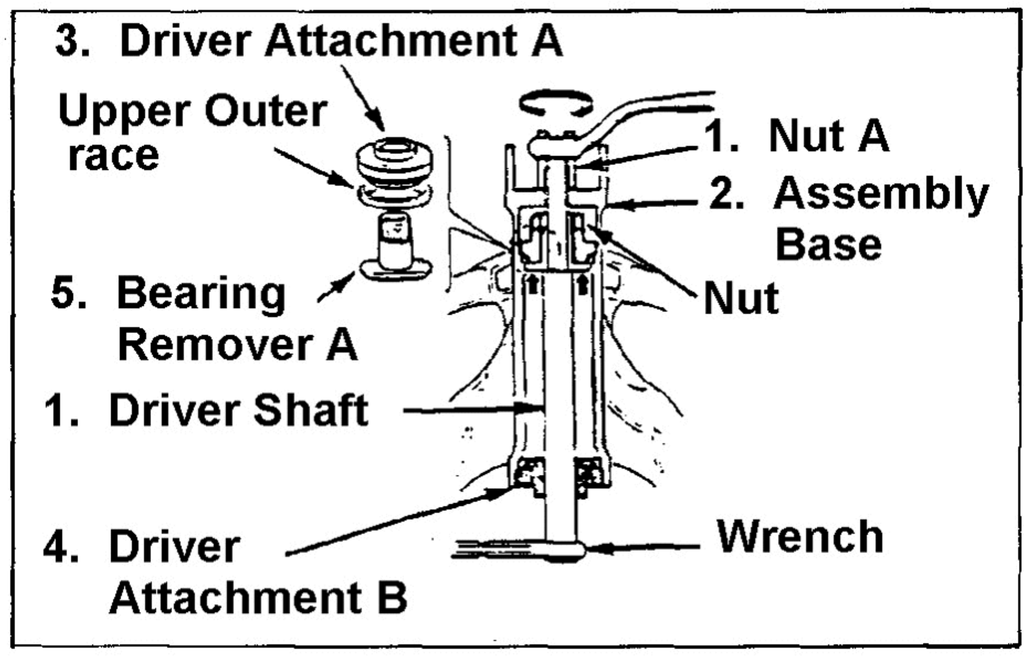
Ball race remover set (incl. 1-6)
07946-KM90000

1.	Driver shaft Assy (incl. Nuts A&B)	07946-KM90300
2.	Assembly base	07946-KM90600
3.	Driver attachment A	07946-KM90100
4.	Driver attachment B	07946-KM90200
5.	Bearing remover A	07946-KM90400
6.	Bearing remover B	07946-KM90500



Set a ball race remover to head pipe as shown in the figure.

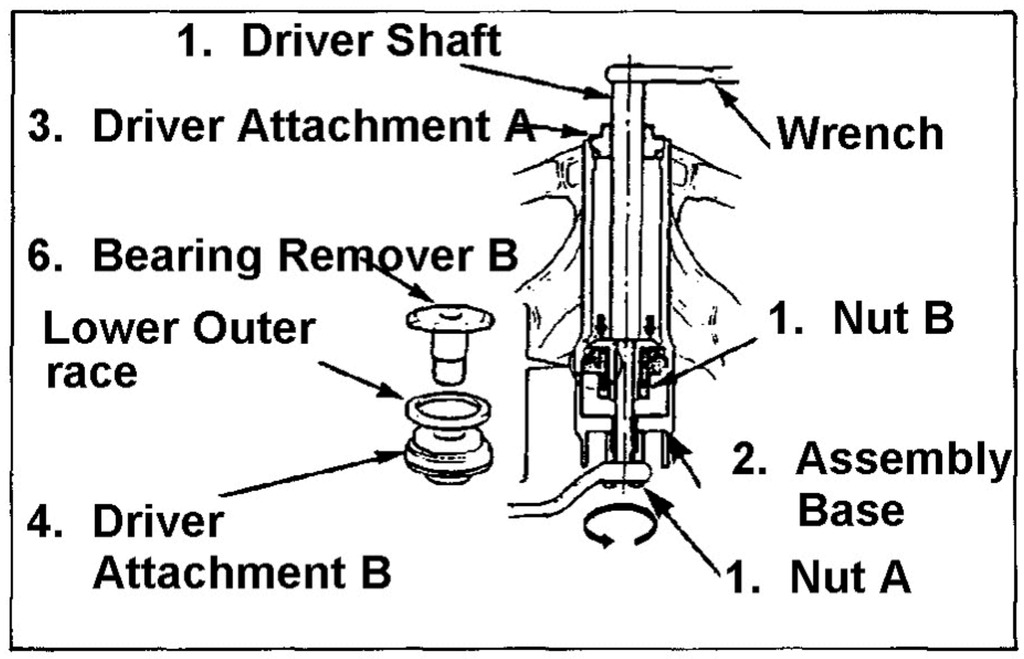
- Align the bearing remover A with the slit on the head pipe.
- Lightly tighten the nut B.
- Watch out the direction of an assembly base.



Hold the driver shaft with the wrench and remove the upper outer race by loosening the nut A.

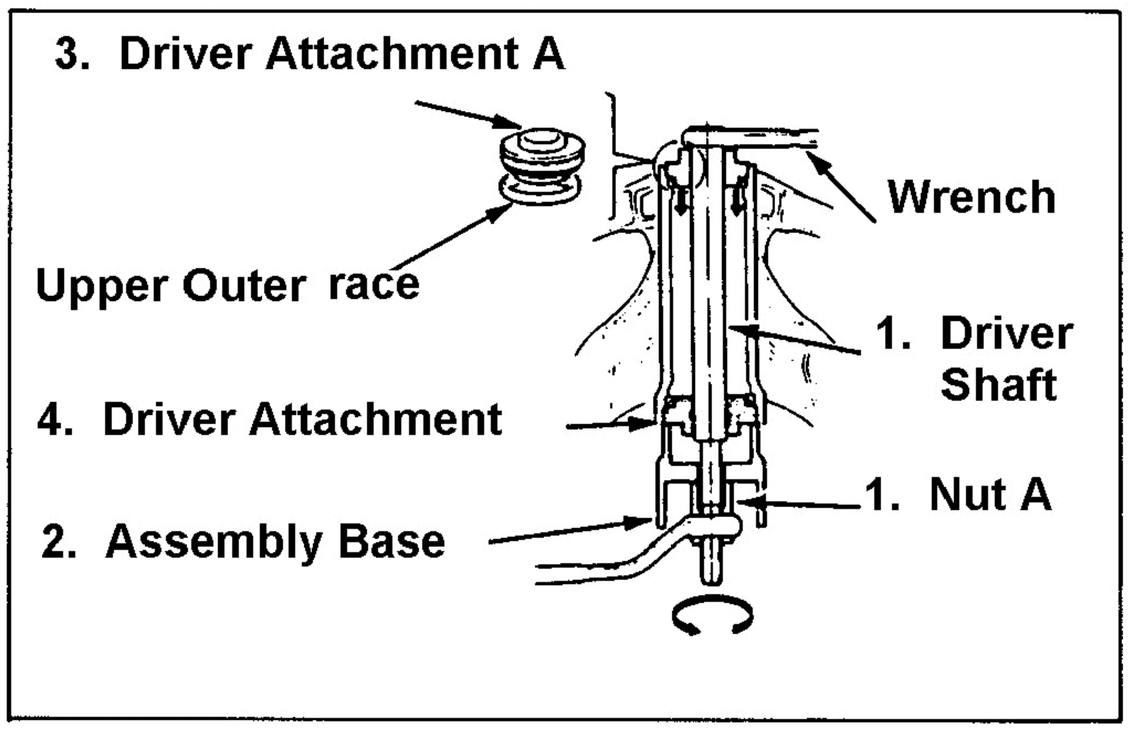
Remove the lower outer race in same manner.

- Align the bearing remover B with the slit on the head pipe to attach.

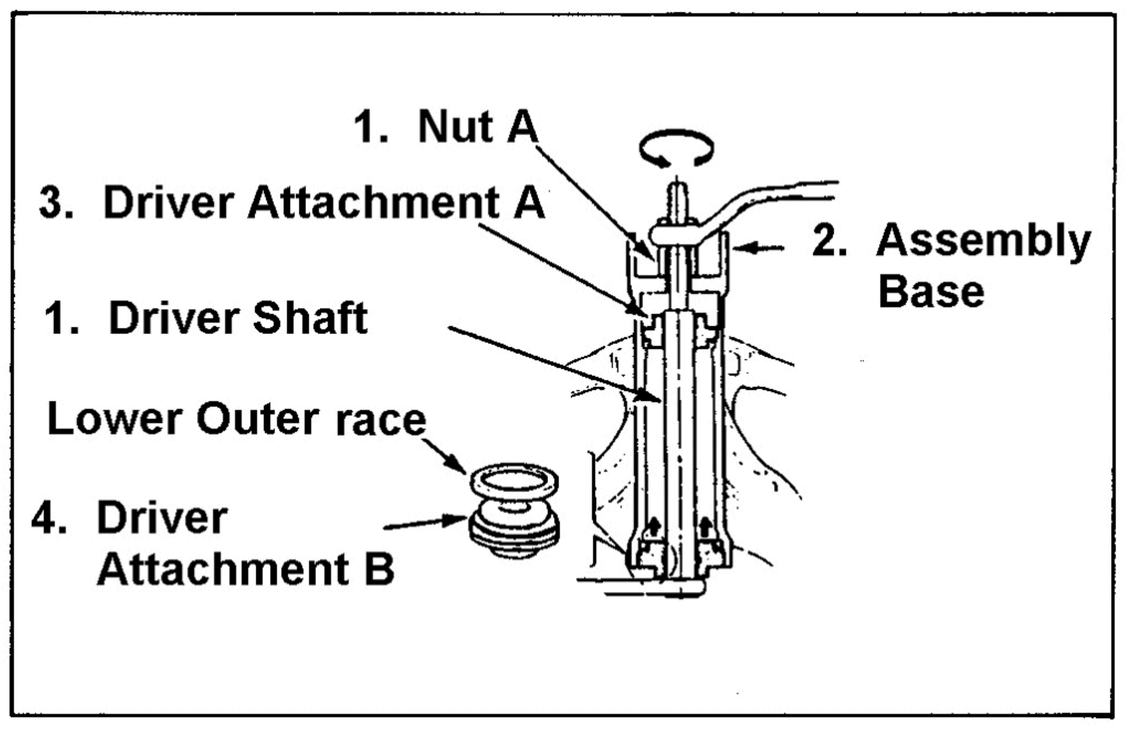


Set the upper outer race and the ball race remover to the head pipe as shown in the figure.

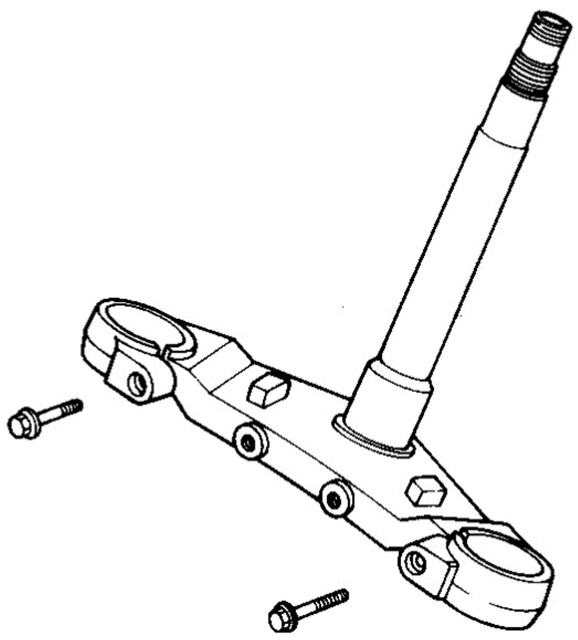
Hold the driver shaft with a wrench and attach the upper outer race by gradually rotating the nut A.

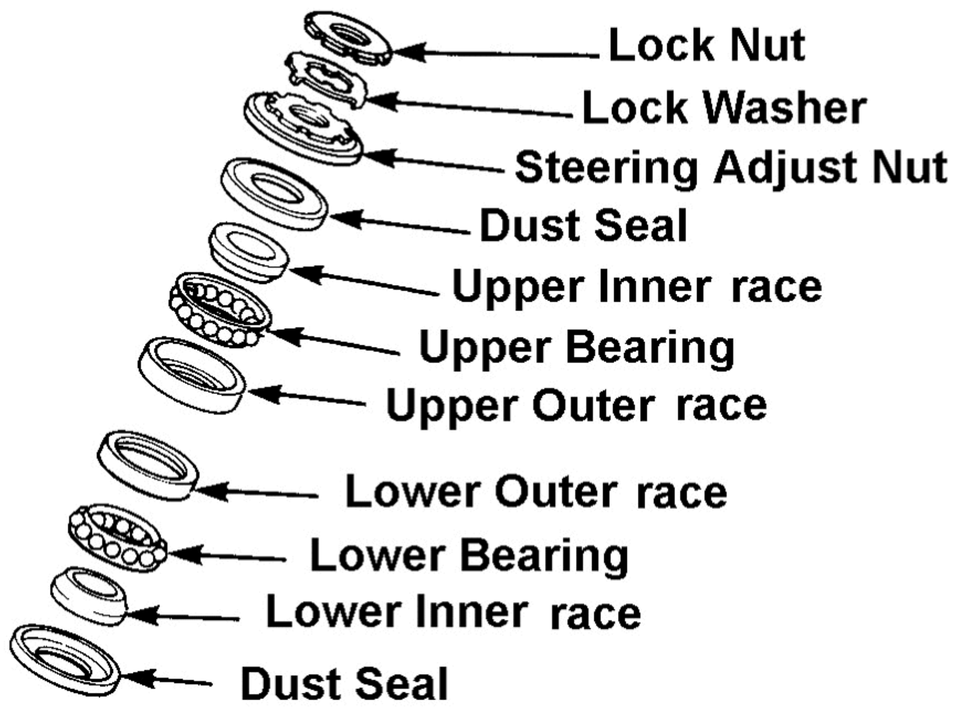


Attach the lower outer race in the same manner.



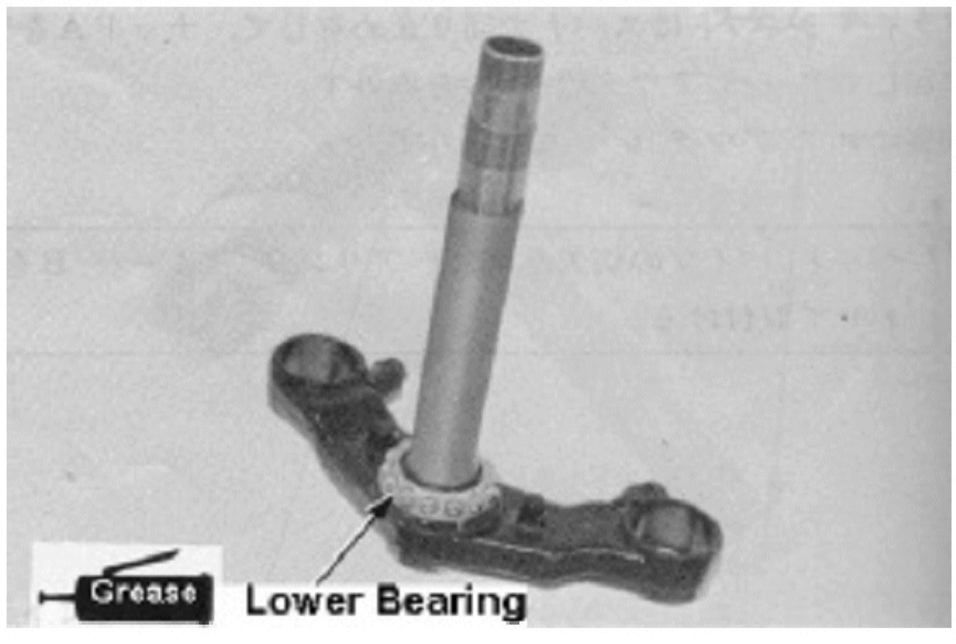
Attachment





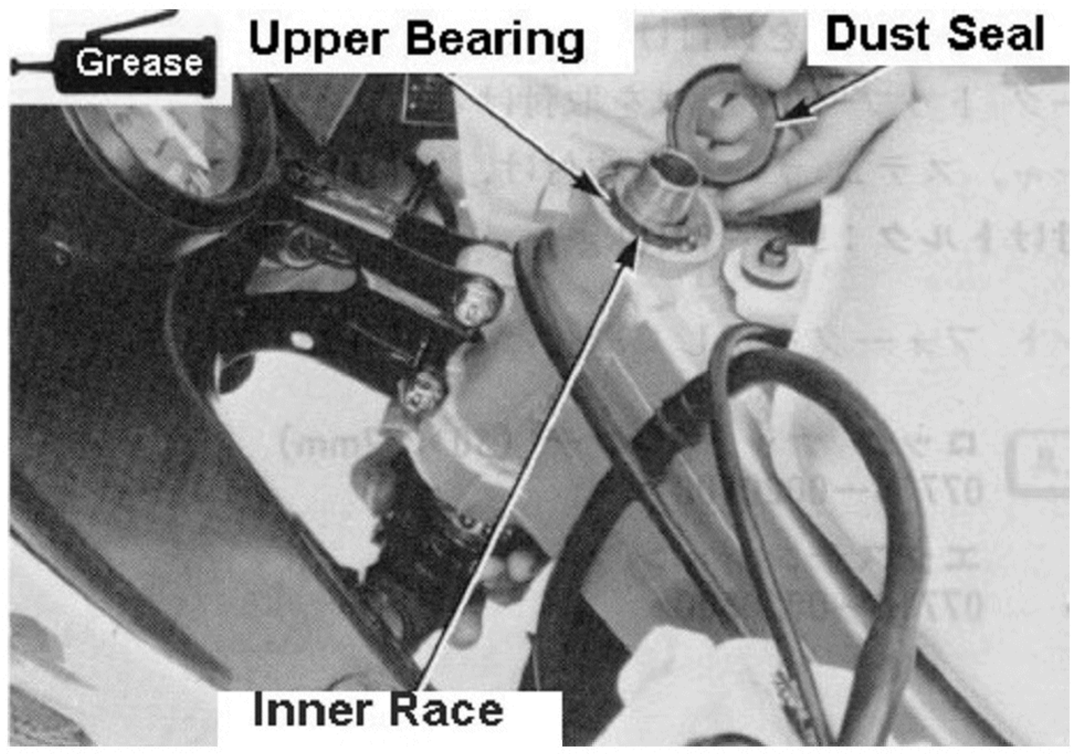
Apply enough grease to the bearing.

Attach the lower bearing to the steering stem.



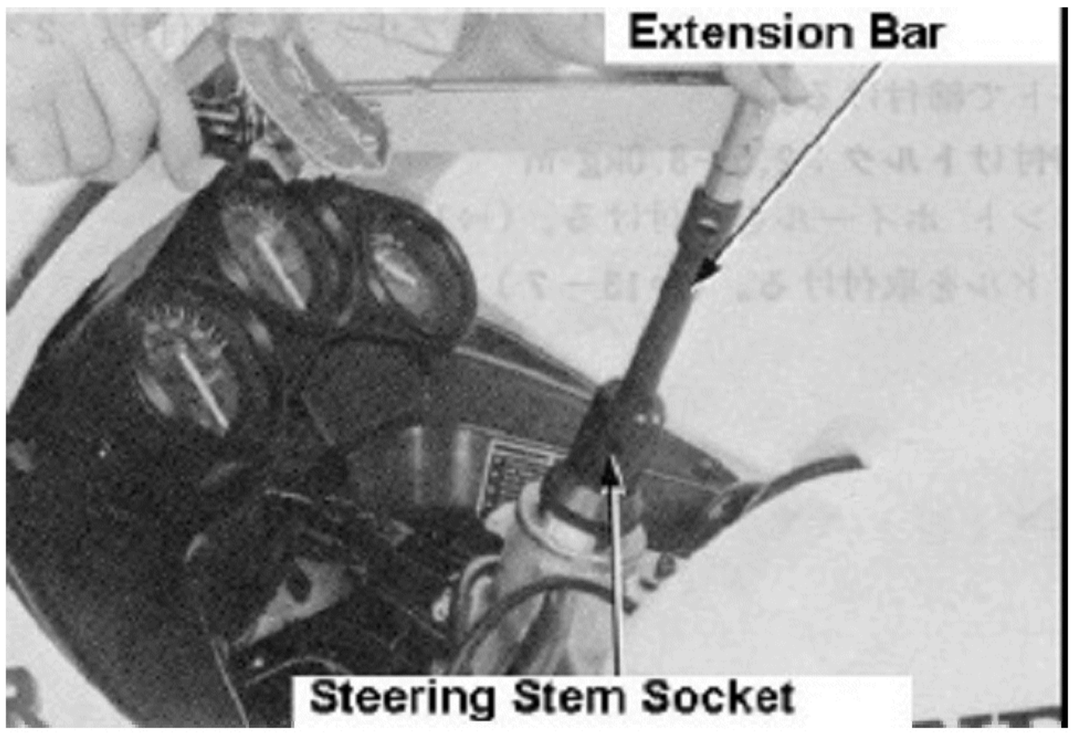
Attach the steering stem to the steering head.

Attach the upper bearing, inner race and the dust seal.



Tighten the steering adjust nut.
Torque: 2.0 ~ 2.4kg-m

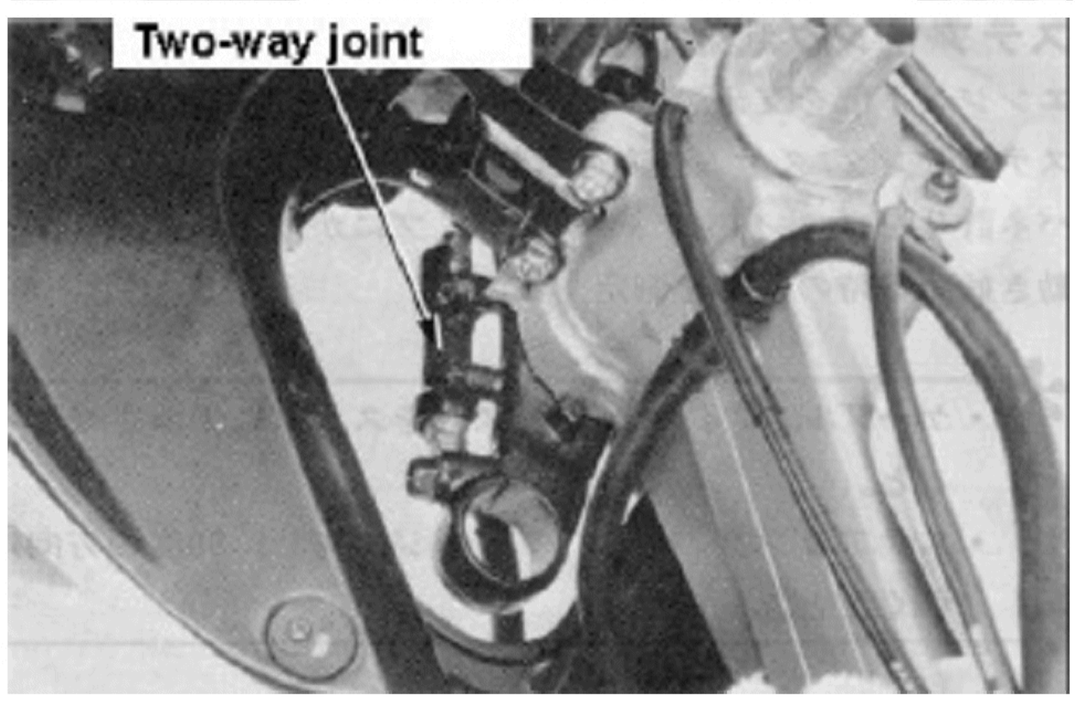
Exc. tool	Steering stem socket 07916-3710100
Common tool	Extension bar 07716-0020500



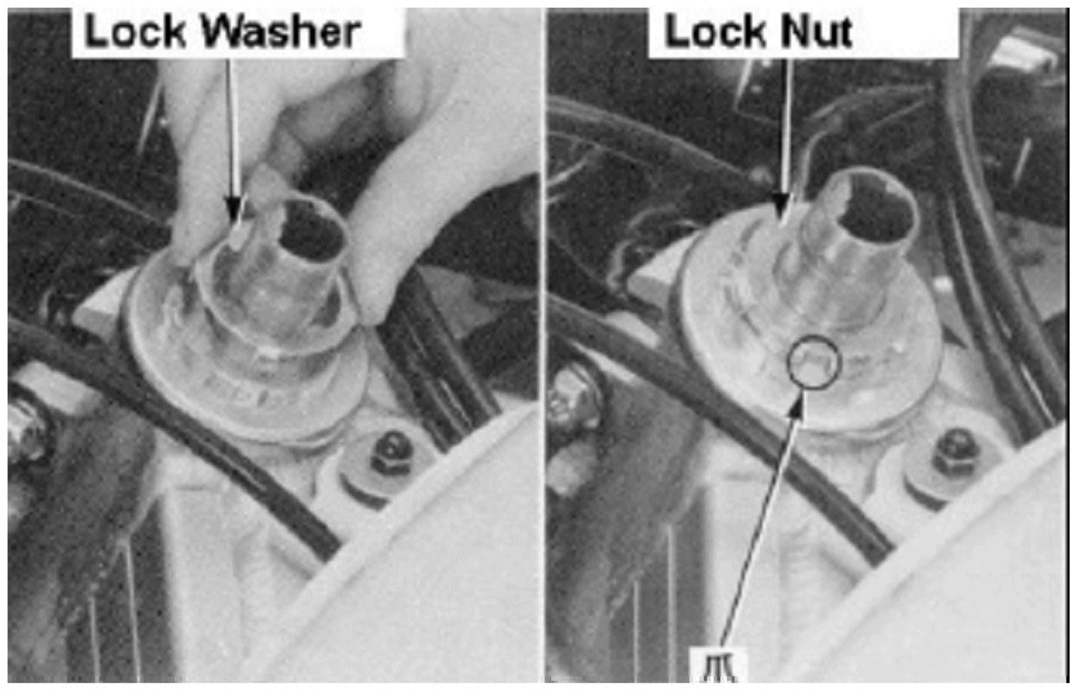
Steer full deflection both ways 5 ~ 6 times to smooth the bearings on the stem.

Re-tighten the steering adjust nut to specified torque.

Attach the front brake two-way joint.



Attach the catch of the new lock washer to the slit of the steering, adjust nut and attach the washer.
Tighten the lock nut until it touches the lock washer by hand.
Hold the steering, adjust nut and tighten the lock nut enough to align the catch of the lock washer with the slit on the lock nut.
Bend the catch of the lock washer to the slit of the lock nut.

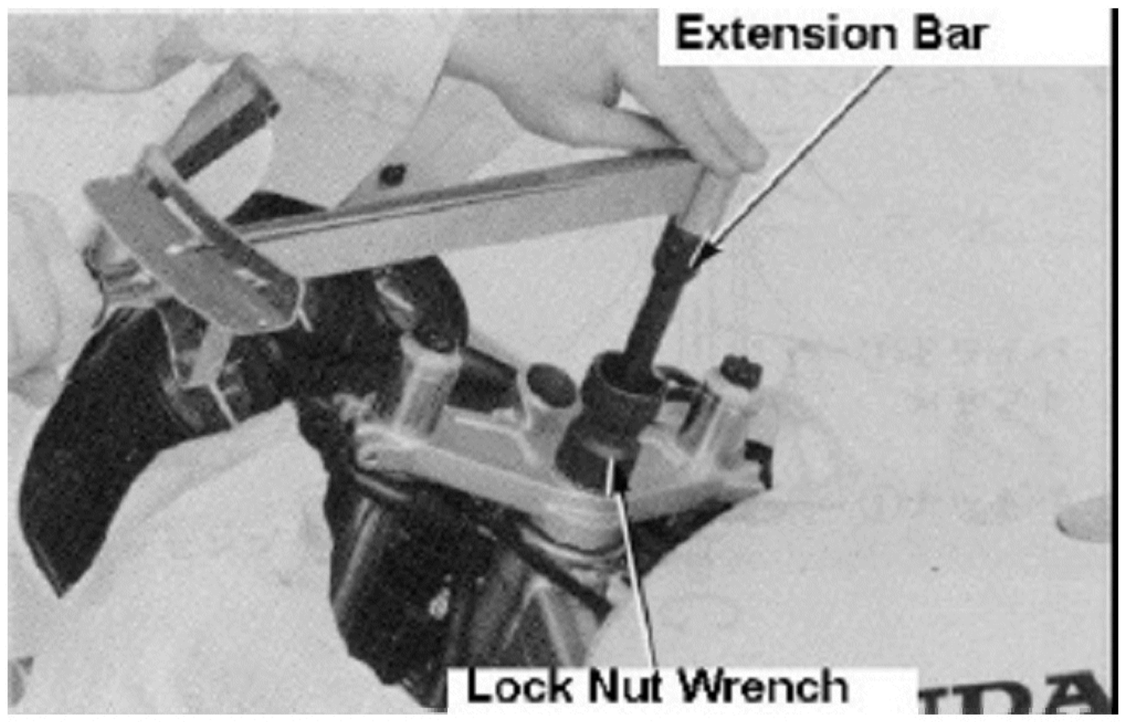


Attach the front fork temporarily.
Attach the fork top bridge.
Attach the washer and the stem nut and tighten.

Torque: 9.0 ~ 12.0kg-m

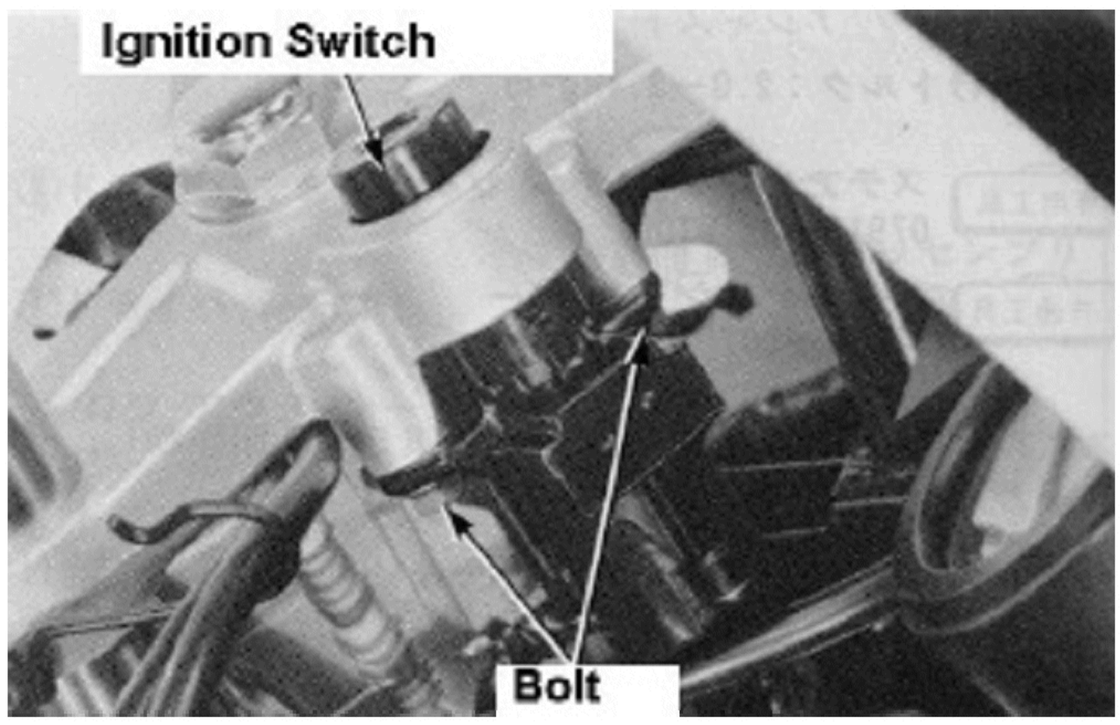
Attach the front fork correctly (13-23).

Common tool	Lock nut wrench (30 x 32mm) 07716-0020400 Extension bar 00716-0020500



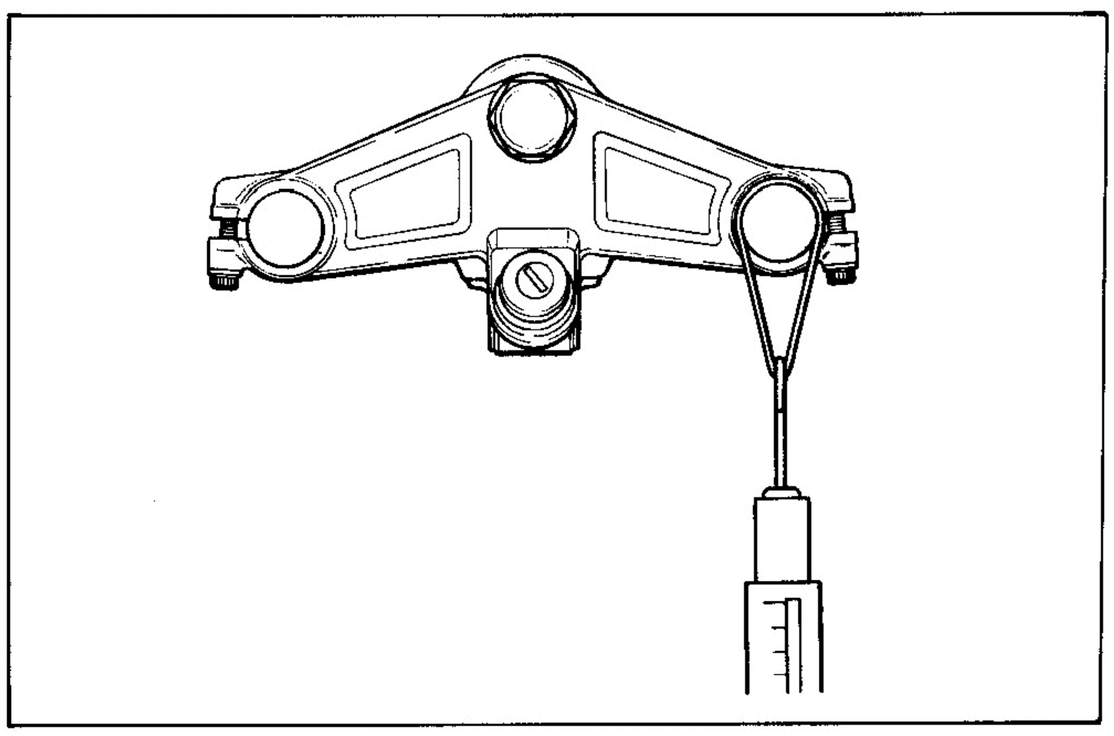
Attach the ignition switch to the top bridge and tighten the two bolts.
Torque: 2.5 ~ 3.0kg-m

Attach the front wheel (13-15)
Attach the steering handle (13-7).



Steering Load

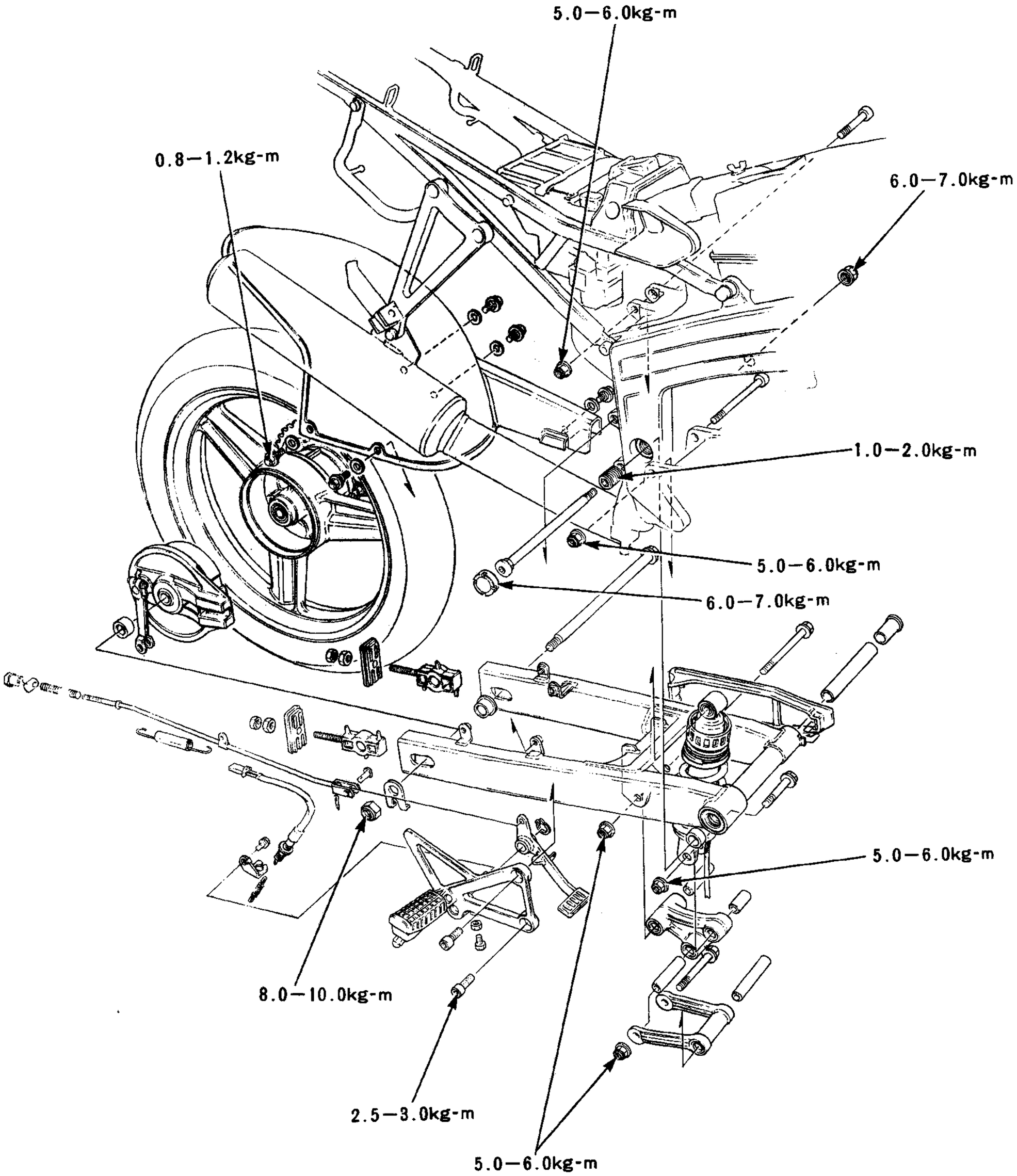
Support the bottom of the engine and lift the front wheel off.
Straighten the steering stem.
Apply a spring scale to the front fork pipe and measure the load when the steering begins to move.



- Do not obstruct cables, wires or harnesses with the stem.
- Pull perpendicular to the steering top bridge.

Adjust the tightening of the steering bearing adjustment nut to bring the average of both left / right forks of 1.1kg ~ 1.6kg.

- **Disassembly**



Disassembly	14-0	Brake pedal	14-10
Service information	14-1	Rear cushion	14-11
Troubleshooting	14-2	Suspension linkage	14-15
Rear wheel	14-3	Rear fork	14-18
Rear brake	14-7		

Caution

- Follow the safety instructions as the damper unit of the shock absorber is filled with highly pressurized nitrogen gas.
  - Do not heat or disassemble the damper unit or it may explode or spill the oil.
  - Drain the gas from the damper unit when disposing of the shock absorber.

- Do not step on the wheel or apply excess force on the wheel.
- Exercise caution not to damage the wheel.
- Exercise caution not to damage the tyre or rim as a tubeless tyre is equipped.
- When detaching the tyre from the rim, use “tyre lever” and “rim protector”.
- Refer to “Honda Motorcycle Tubeless Tyre Service Manual” (No. 6041551) when detaching / attaching the tubeless tyre.
- Use only specified products for the rear suspension linkage and the rear cushion attachment bolts / nuts. Use caution to the direction of the bolts.
- Refer to 13-12 for balancing the rear wheel.

- **Service Standard**

Item		Standard	Limitation
Rear axle bend		-	0.2mm
Rear wheel rim deformation	Radial	-	2.0mm
	side	-	2.0mm
Brake drum inner diameter		140mm	141mm
Brake lining thickness		4.0mm	2.0mm
Rear cushion damper compression		12.3-16.0kg	9.8kg
Rear cushion spring attachment length		173.8mm	-
Rear cushion spring natural length		189.9mm	186.0mm

- **Torque**

Driven sprocket nut	2.8-4kg-m	Conrod bolt (cushion arm side)	5.0-6.0kg-m
Rear axle nut	8.0-10kg-m	frame side	5.0-6.0kg-m
Rear cushion lower joint lock nut (apply screw locking liquid)	3.8-6.0kg-m	Rear fork pivot adjust bolt	1.0-2.0kg-m
Rear cushion upper bolt	5.0-6.0kg-m	Rear fork pivot lock nut	6.0-7.0kg-m
Rear cushion lower bolt	5.0-6.0kg-m	Rear fork pivot nut	6.0-7.0kg-m
Cushion arm bolt	5.0-6.0kg-m		

Stop holder	2.5-3.0kg-m		

Tools

- **Exclusive Tools**

Needle bearing remover	07GMD KT70200	Outer driver (28x30mm)	07946-1870100
Bearing remover	07936-3710300	Driver shaft	07946-MJ00100
remover handle	07936-3710100	Rear cushion compressor Attachment	07959-MB10000
remover sliding weight	07741-0010201		

- **Common tools**

Outer driver (32 x 35mm	07746-0010100	Pilot (22mm)	07746-0041000
Outer driver (37 x 40mm)	07746-0010200	Bearing remover shaft	07746-0050100
Outer driver (42 x 47mm)	07746-0010300	Bearing remover head (17mm)	07746-0050500
Outer driver (24 x 26mm)	07746-0010700	Driver handle A	07749-0010000
Pilot (15mm)	07746-0040300	Rear cushion compressor	07959-3290001
Pilot (17mm)	07746-0040400		

- **Troubleshooting**

Vibration of the rear wheel
- Rim deformed
- Loose rear wheel bearing
- Bad quality tyre
- Insufficient tightening around the axle
- Insufficient tyre air pressure
- Rear fork pivot bearing failure

Rear cushion too soft
- Spring deformed
- Inadequate adjustment of the rear cushion adjuster
- Rear damper getting loose

Rear cushion too hard
- Inadequate adjustment of the rear cushion adjuster
- Damper rod bent

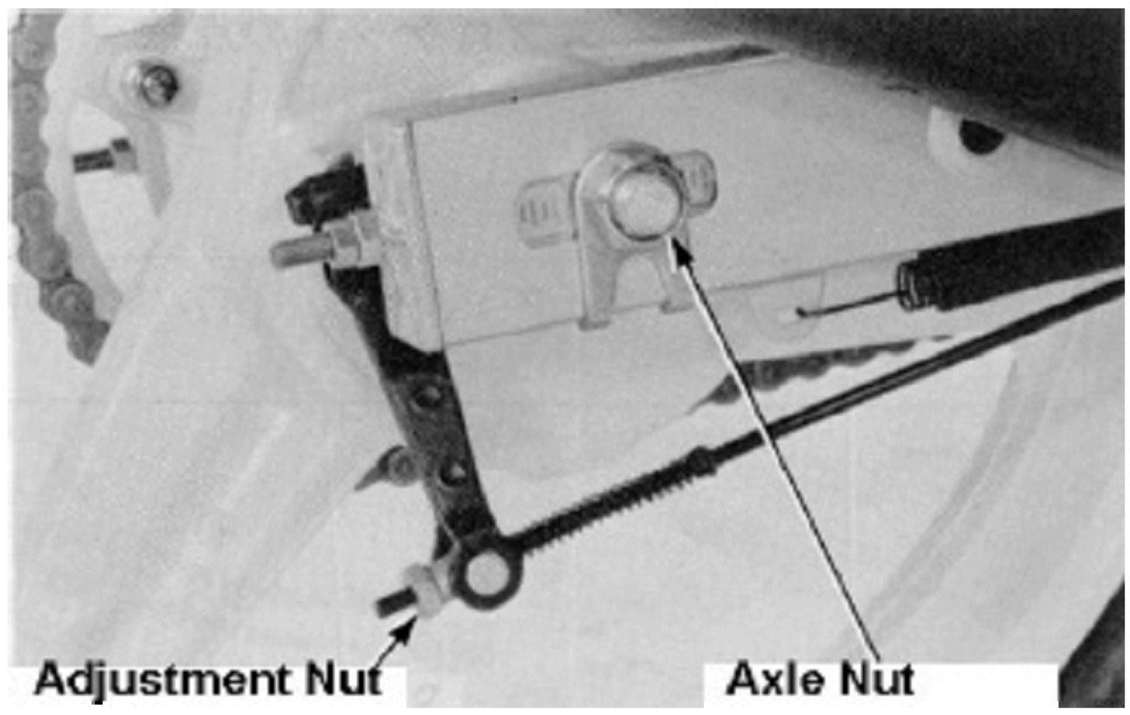
Noise from a rear cushion
- Cushion case touching something
- Loose tightening

Loose brake
- Inadequate brake adjustment
- Dirt/damage on the brake shoe surface
- Brake shoe cam worn out
- Brake cam worn out
- Brake drum worn out
- Brake arm collation attachment failure

Rear Wheel

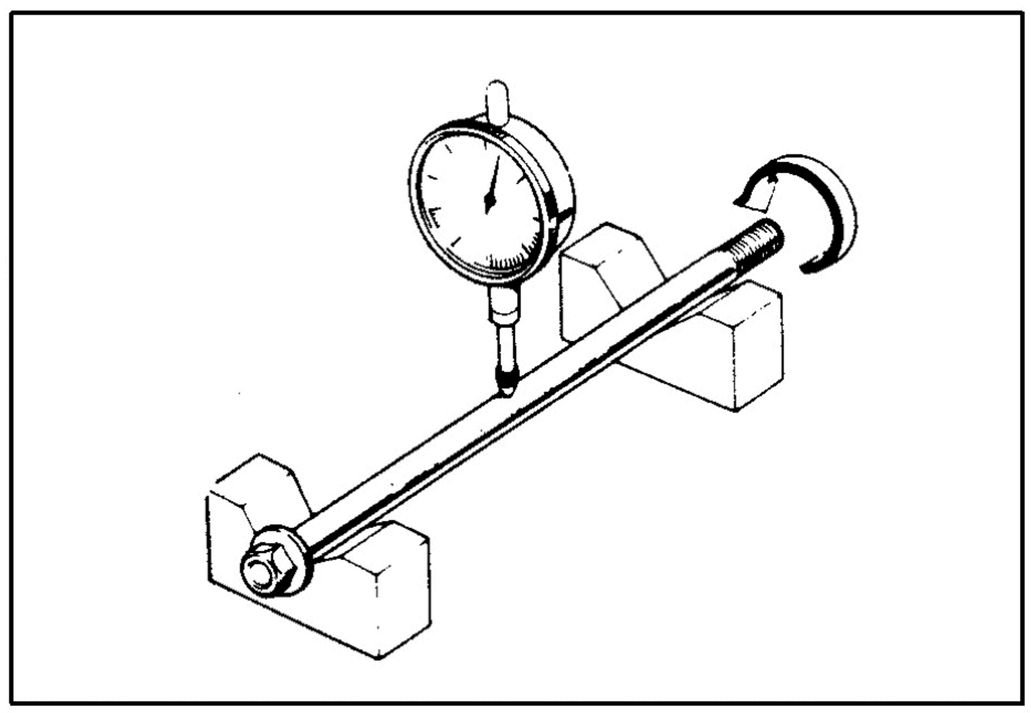
Detachment

Support the frame and lift the rear wheel.
Remove the adjustment nut and detach the brake rod from the brake arm.
Remove axle nut and detach the axle shaft.
Detach the rear wheel.



Rear axle bend inspection

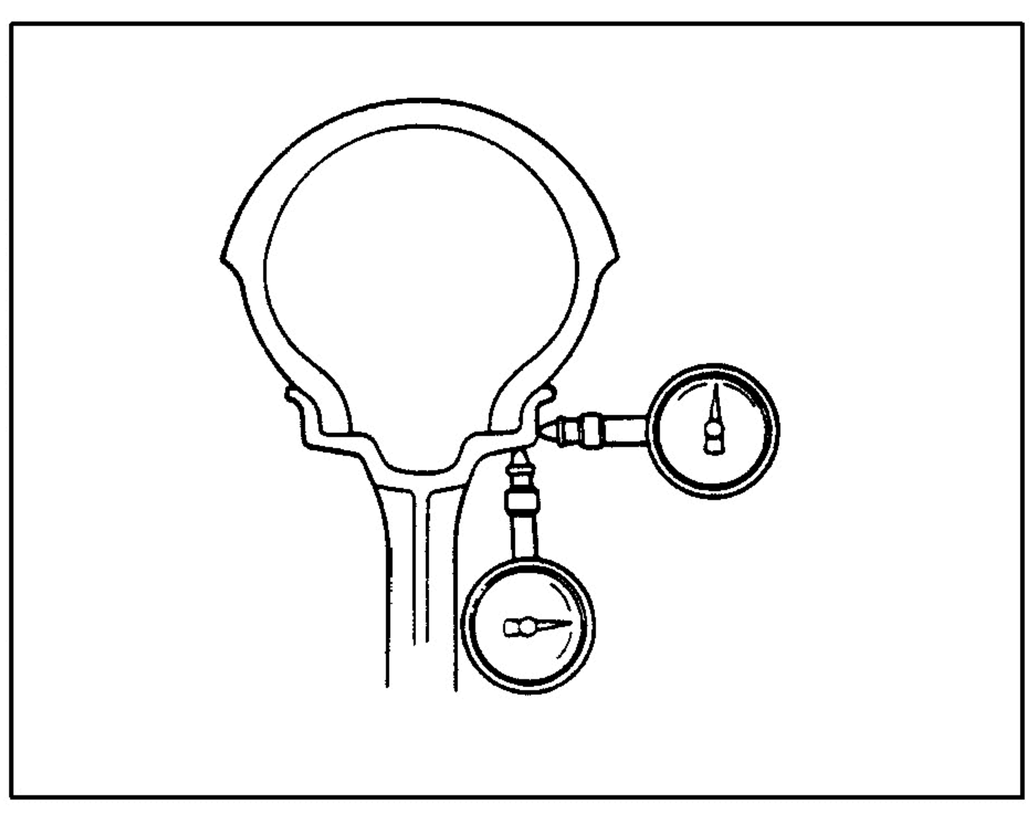
Place the axle on V-blocks and measure with a dial gauge.
Take half the value indicated.
≧ 0.2mm → Replace



Wheel rim inspection

Slowly turn the wheel and measure the deformation with a dial gauge.
Radial direction ≧ 2.0mm)
Sideways ≧ 2.0mm) Replace

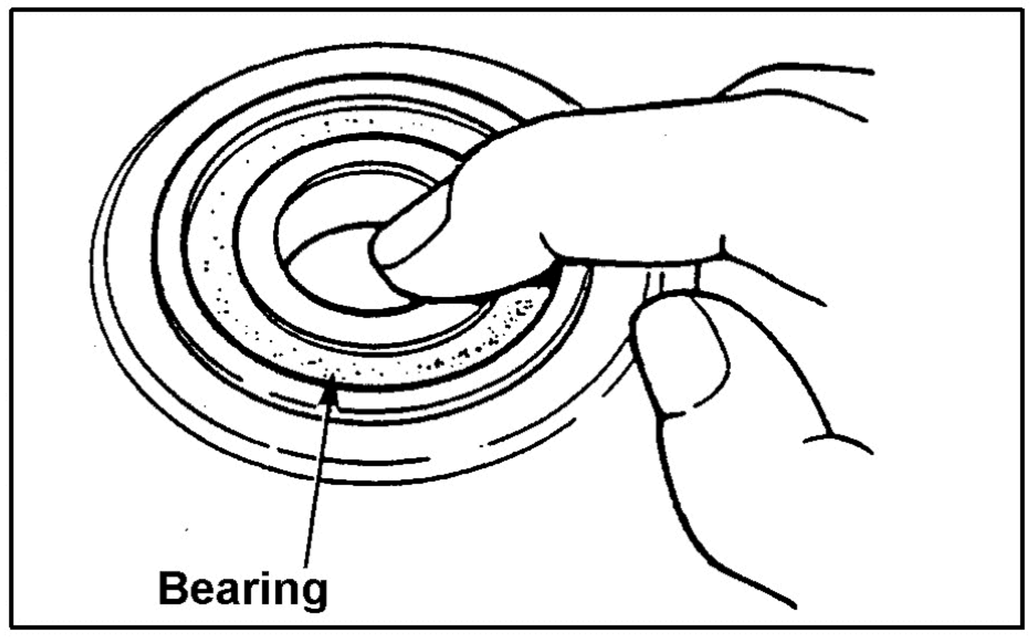
- A cast wheel cannot be adjusted.
- Replace with a new wheel if beyond limit.



Wheel and flange bearing inspection

Rotate the inner race of the bearing with a finger and replace if there is loose fit or noisy.

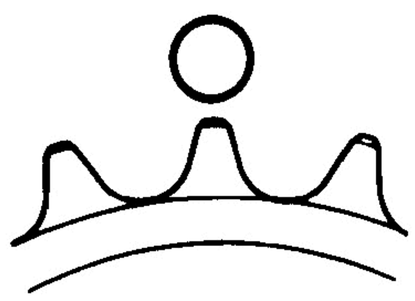
Replace all three at the same time.



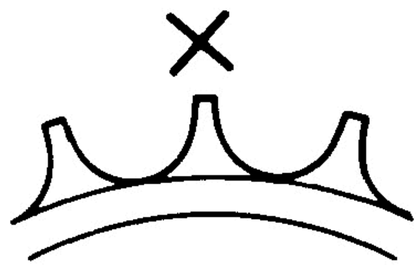
Final driven sprocket inspection

Inspect ≧ final driven sprocket for wear / damage.

Inspect the drive chain and drive sprocket at the same time.



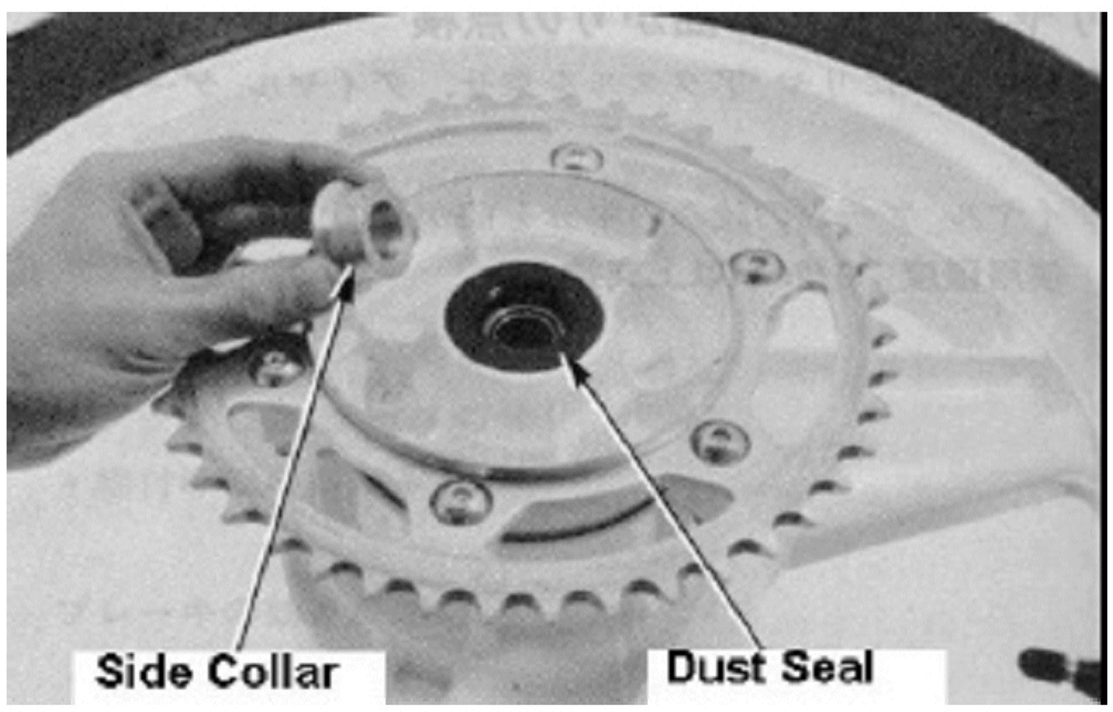
Good



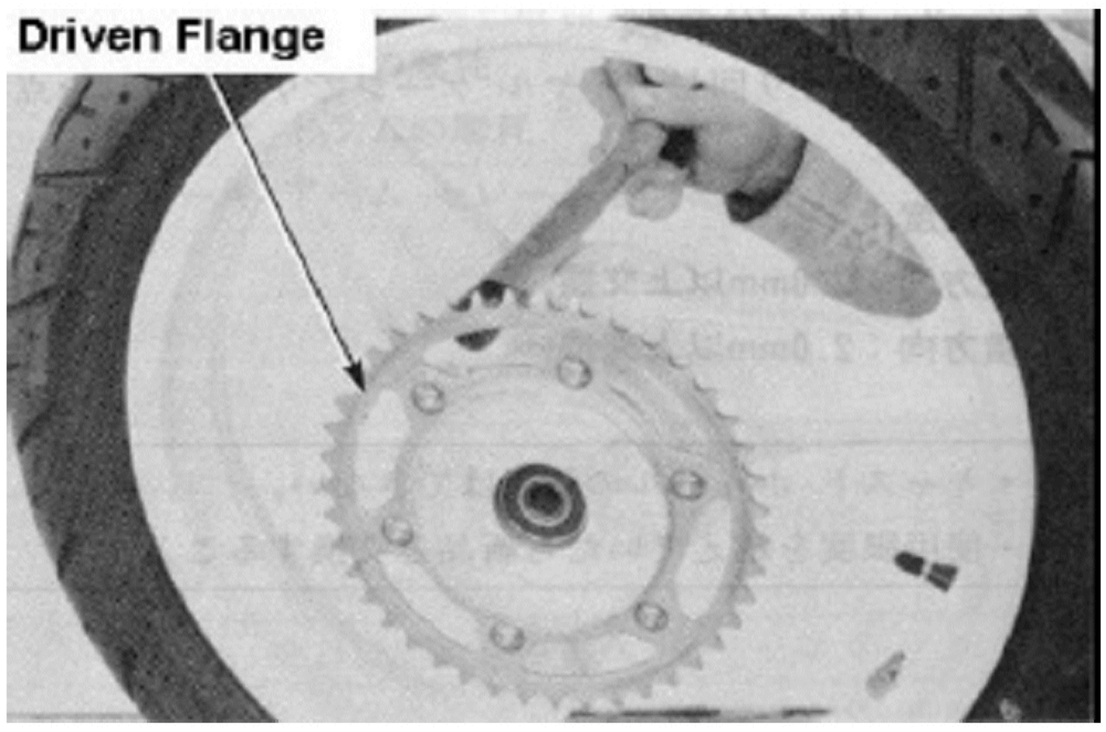
No Good

Disassembly

Remove the side collar.
Remove the dust seal.

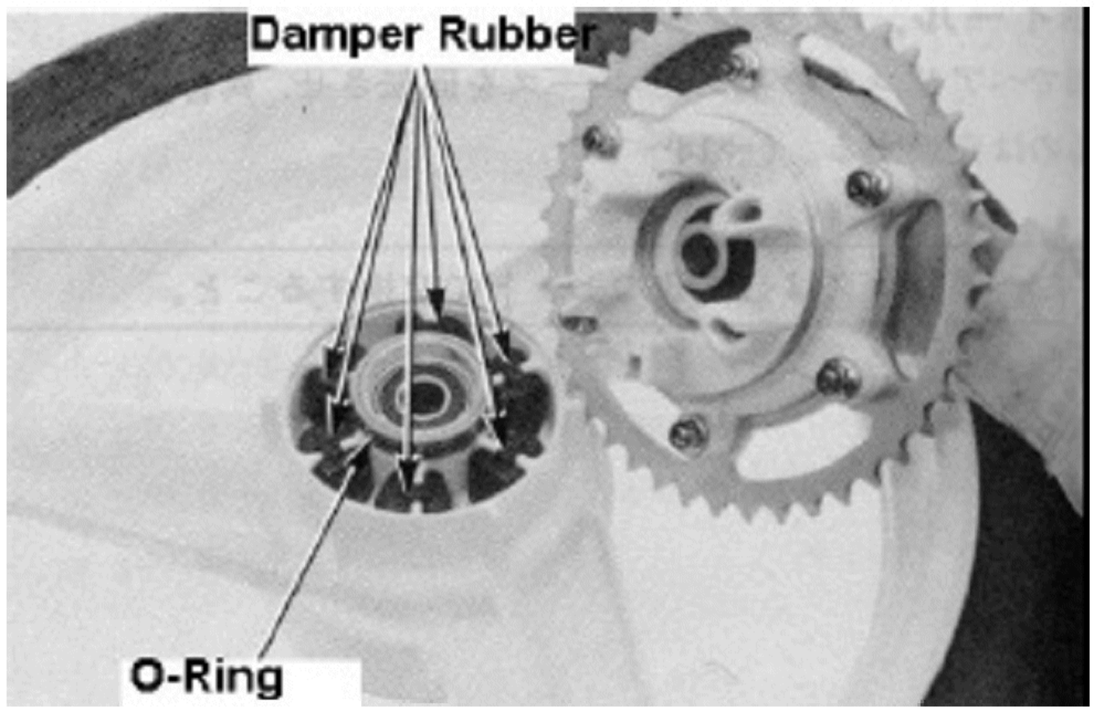


Remove the driven flange.

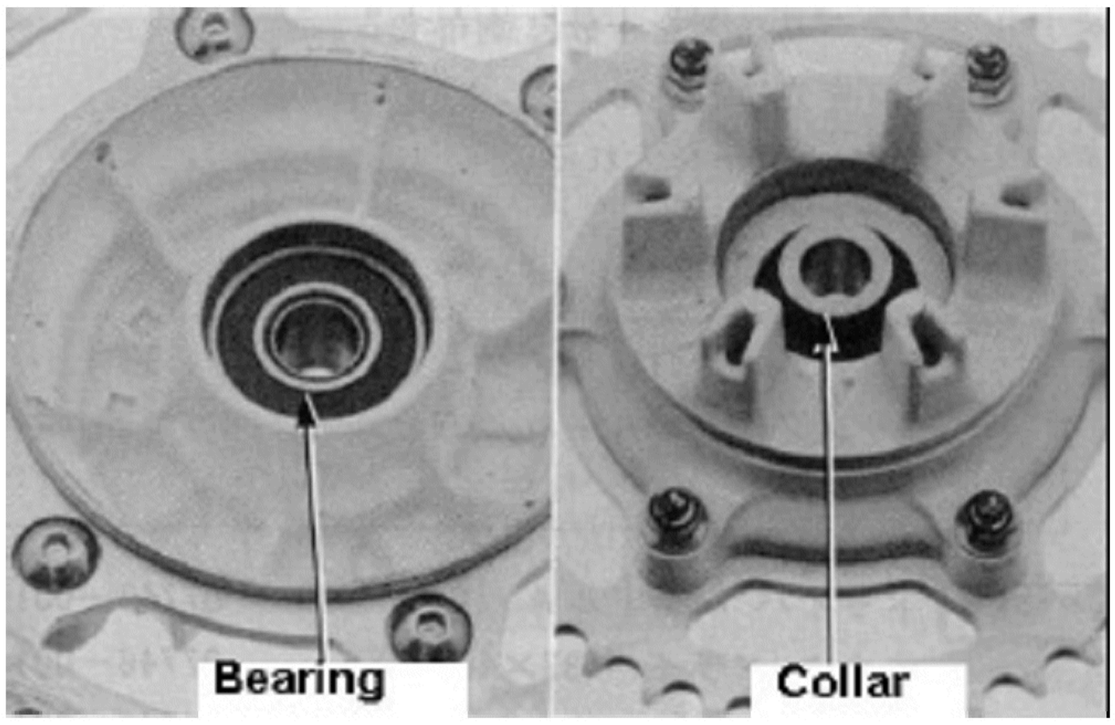


Remove the damper rubber.

Remove the O-Ring.



Remove the collar and detach bearing.

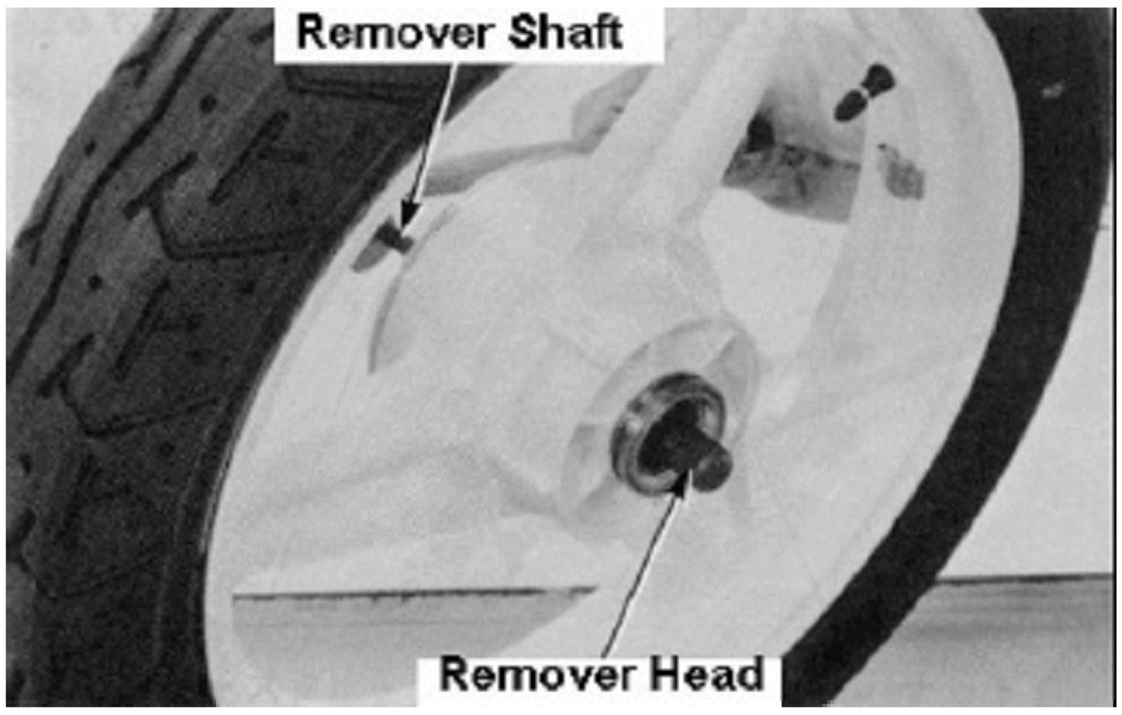


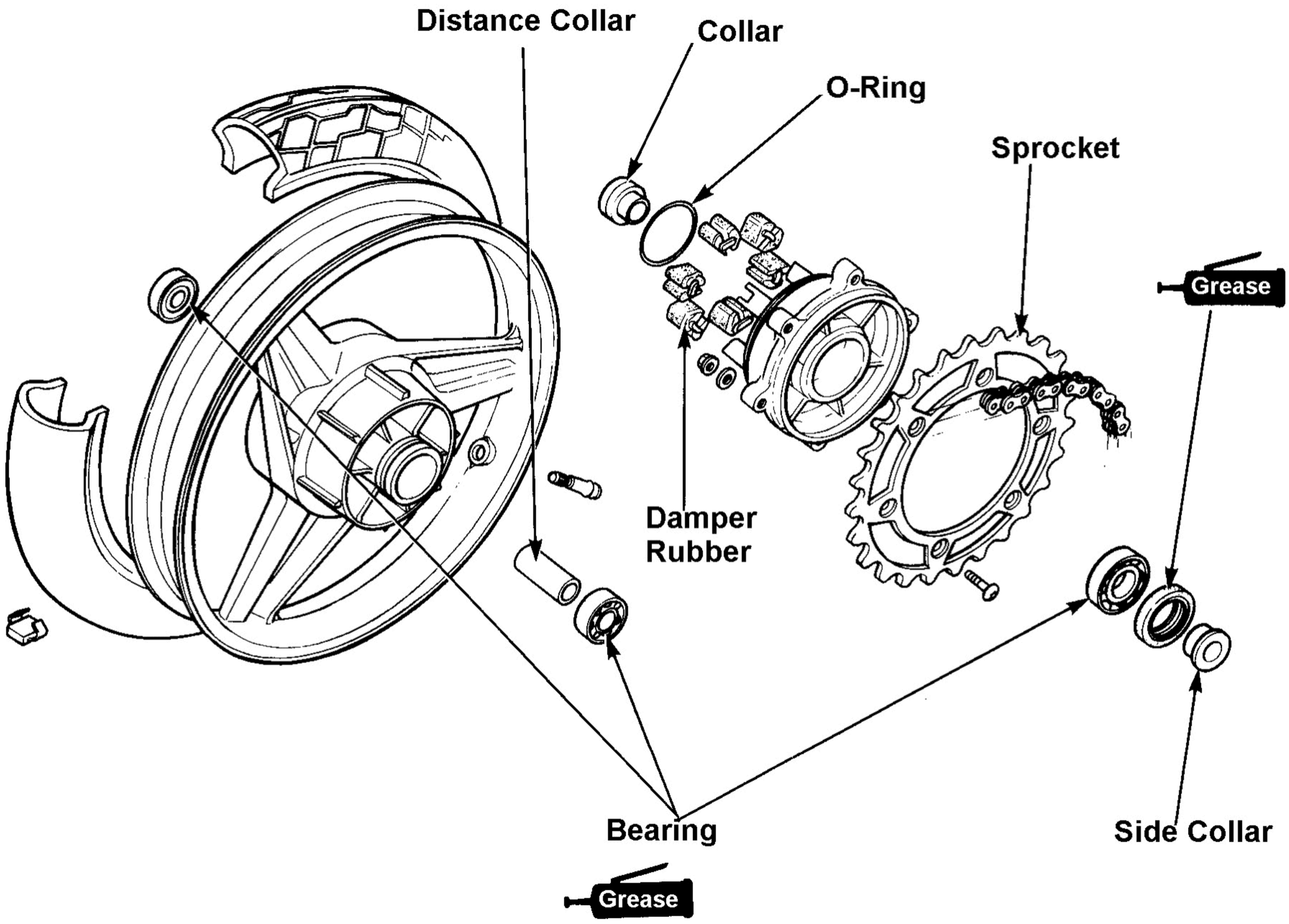
Remove the wheel bearing and distance collar.

Common tool

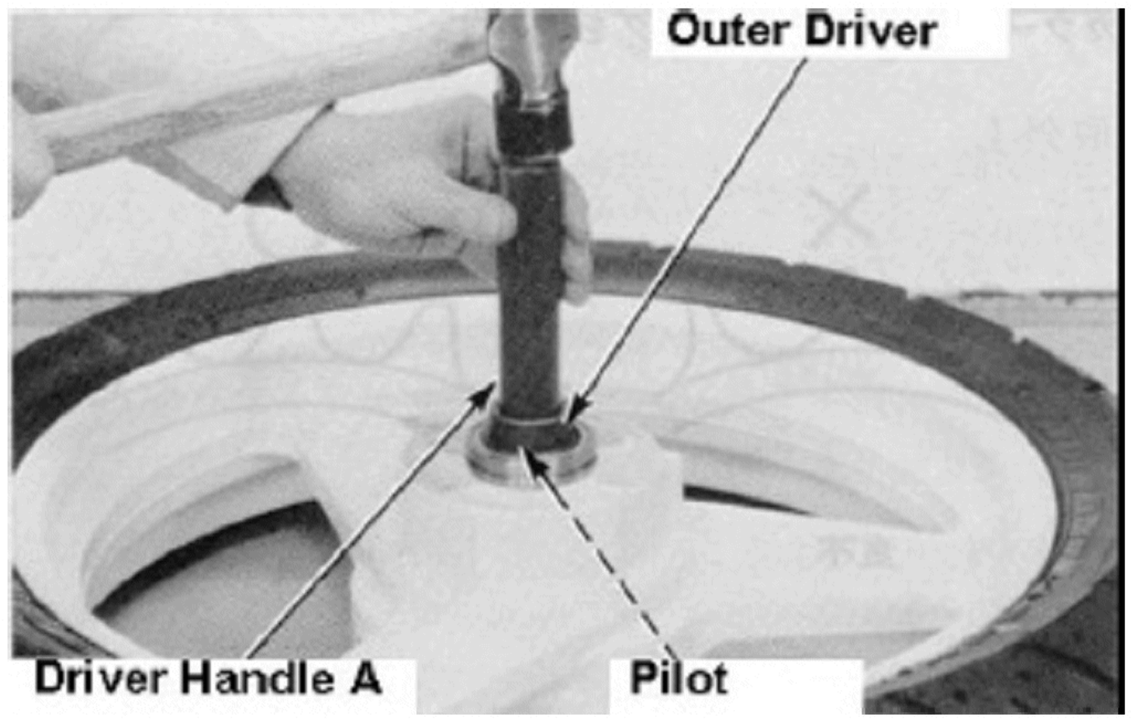
Bearing remover shaft
07746-0050100

Bearing remover head (17mm)
07746-0050500





Apply enough grease to the bearing.
Install the left bearing first.
Insert distance collar.
Install the right bearing.

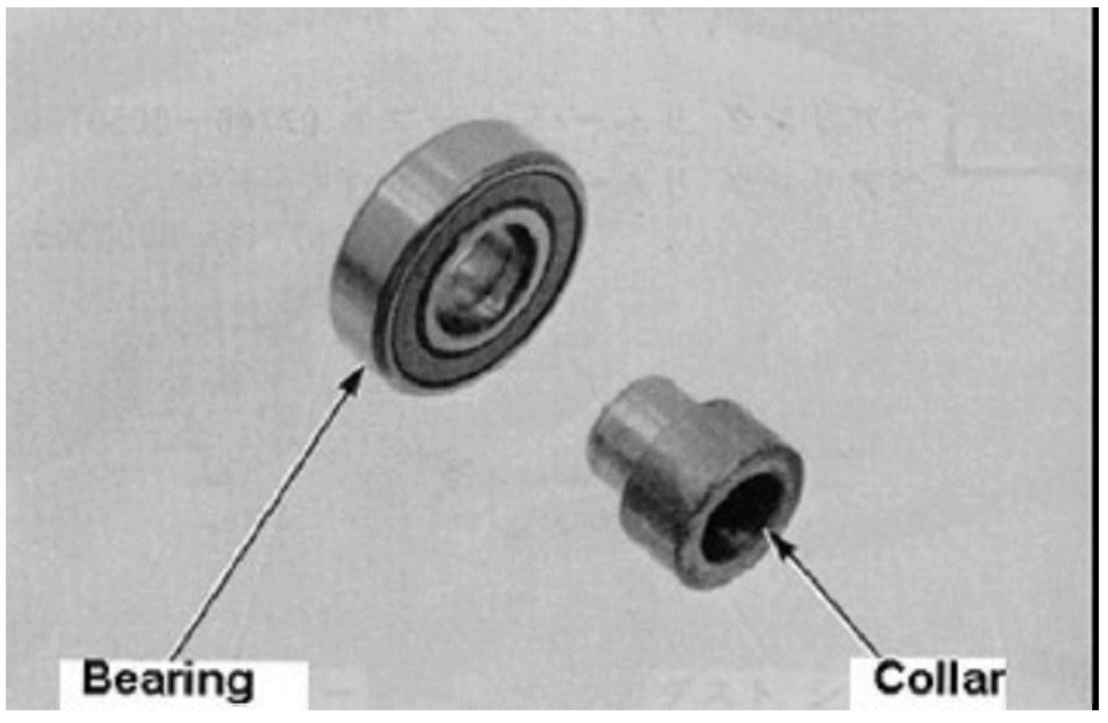


- Install the bearings in parallel.
- Sealed side of the bearings should face outward.

Common tools

Driver handle A	07749-0010000
Outer driver (37x40mm)	07746-0010200
Pilot (17mm)	07746-0040400

Place the bearing on a level surface and attach the collar.

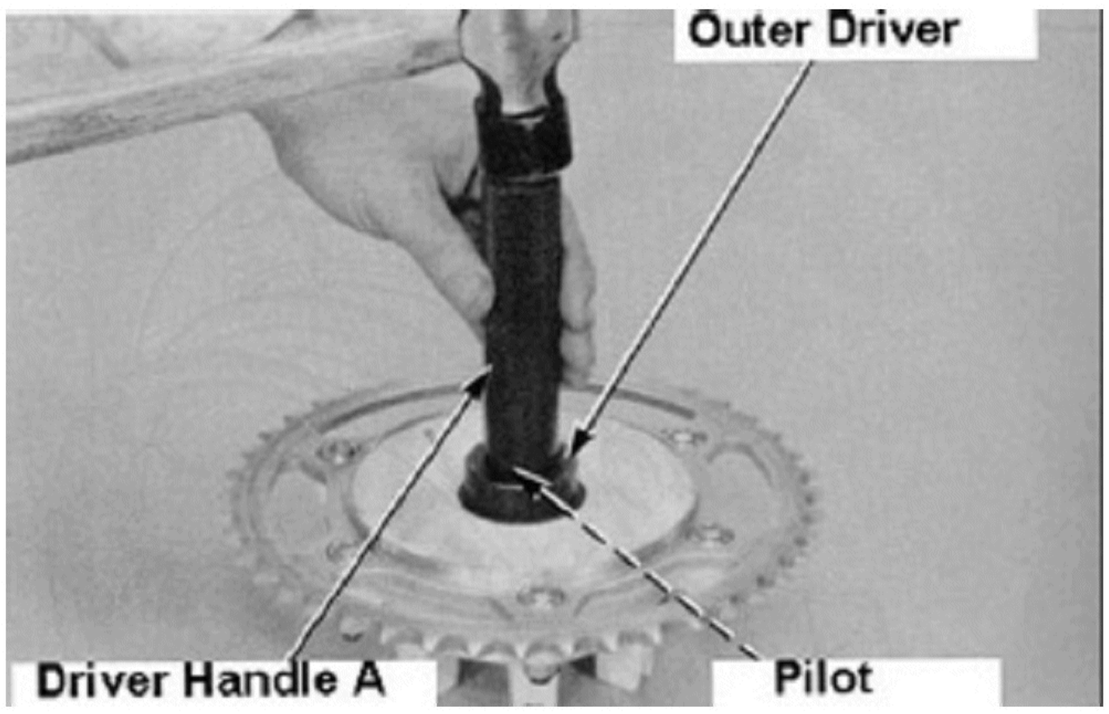


Apply enough grease to the bearing.
Install the bearing to the driven flange.

Install firmly so that the bearing does not project.

Common tools

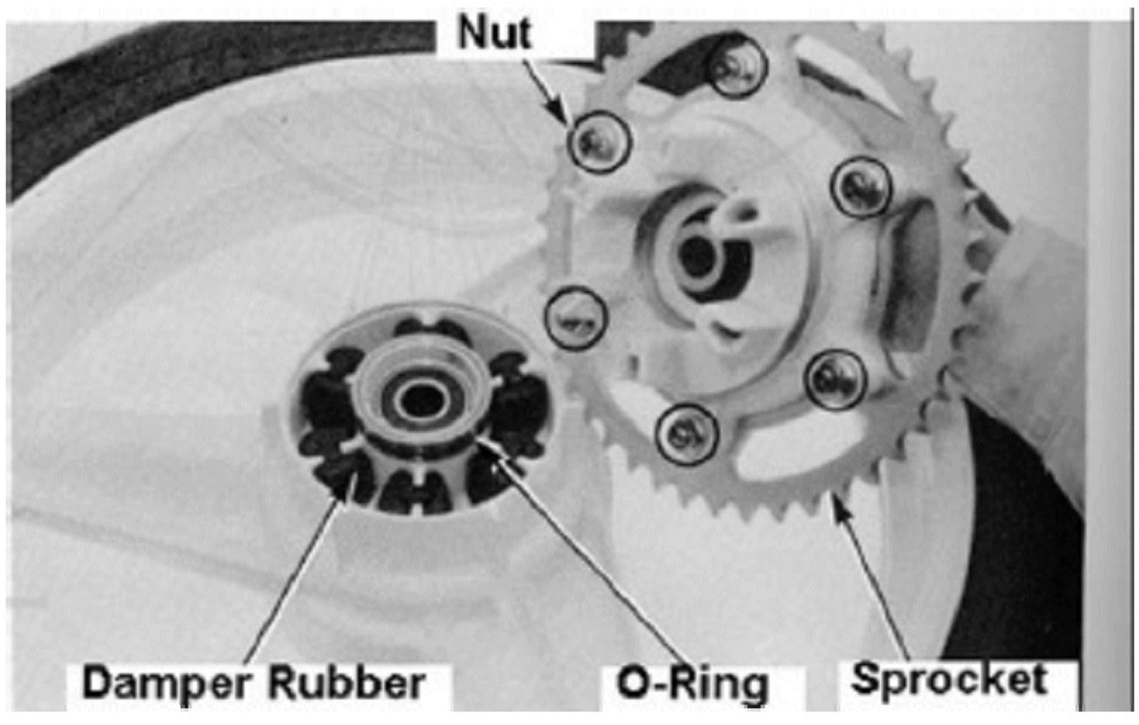
Driver handle A	07749-0010000
Outer driver (42x47mm)	07746-0010300
Pilot (17mm)	07746-0040400



Inspect the damper rubber and the O-Ring for deformation, damage and wear.

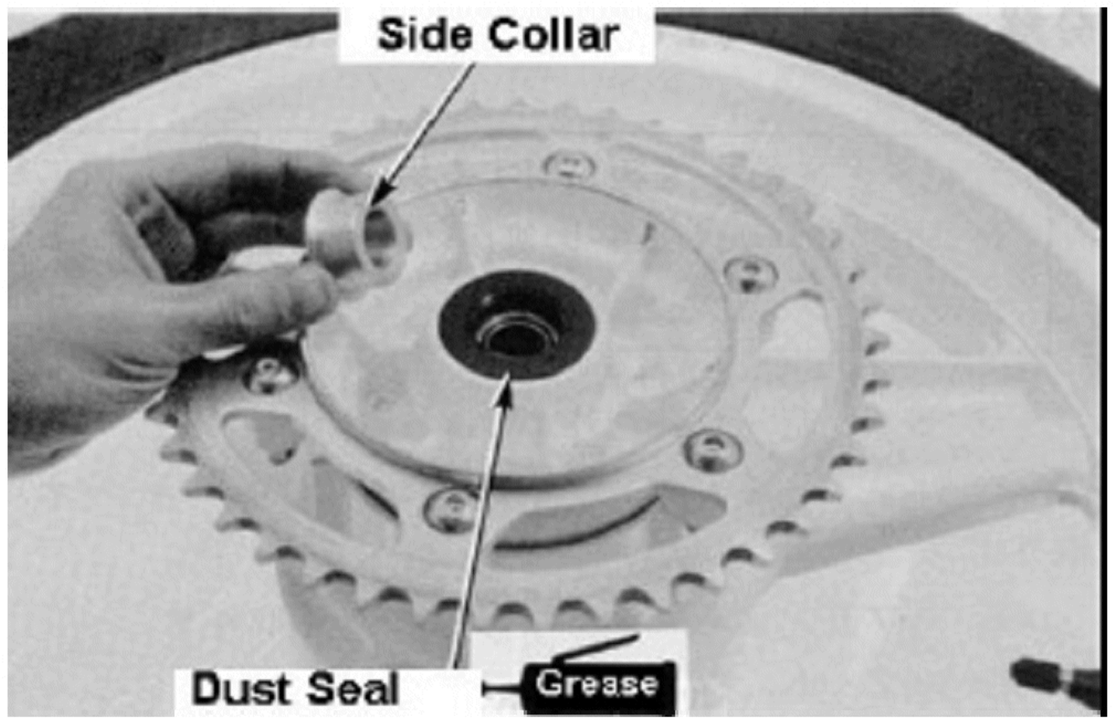
Attach the O-Ring.

Attach the final driven sprocket.
If the driven sprocket nut was removed, attach the washer and apply oil to the nut, then tighten the nut.
Torque: 2.8 ~ 3.4kg-m



Apply grease to the lip of the dust seal and attach it to the driven flange.

Attach the side collar.



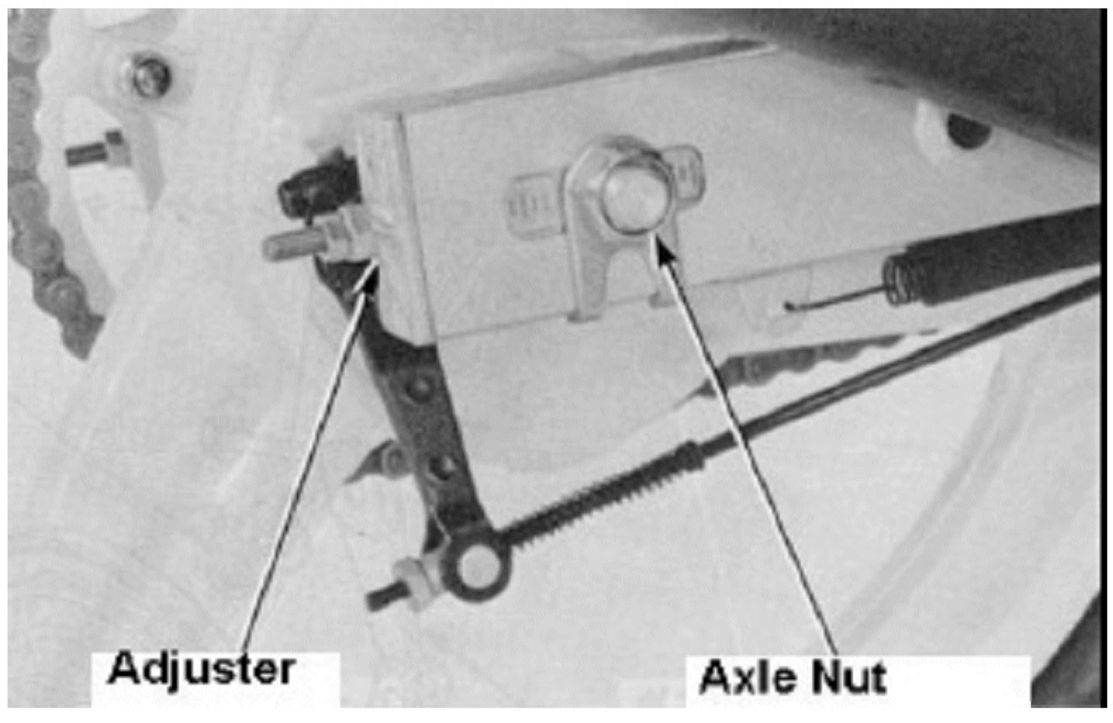
Attachment

Attach the brake panel to the rear wheel. Align the rear fork stopper with the slit on the brake panel.

Connect drive chain to the sprocket.

Attach the chain adjuster and fit the axle shaft from left side.

Tighten the axle nut:
Torque: 8.0 ~ 10.0kg-m



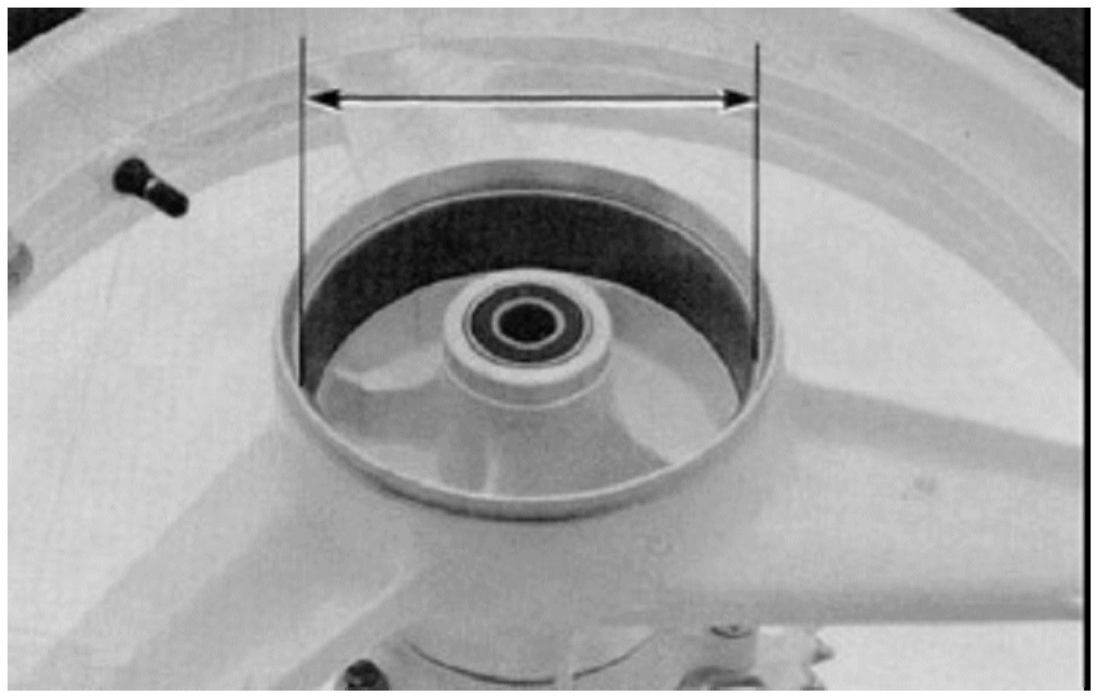
Adjust the drive chain (2-8)

Rear Brake

Inspection

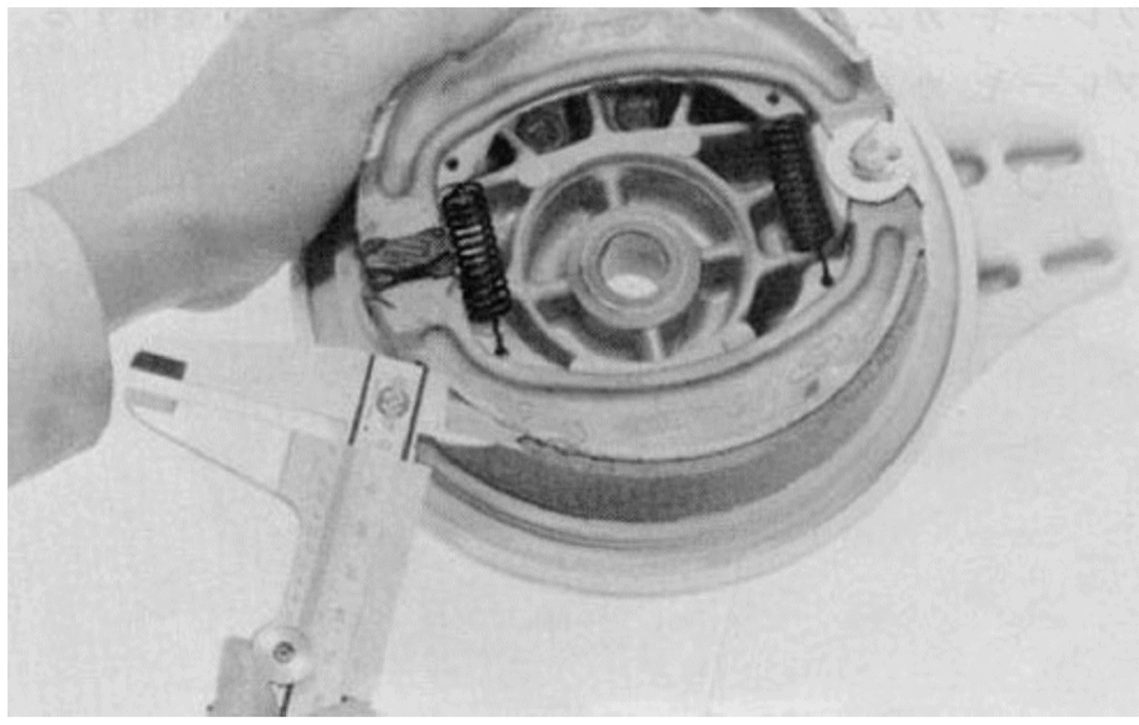
Measure the inner diameter of the brake drum.

≦ 141mm → Replace.



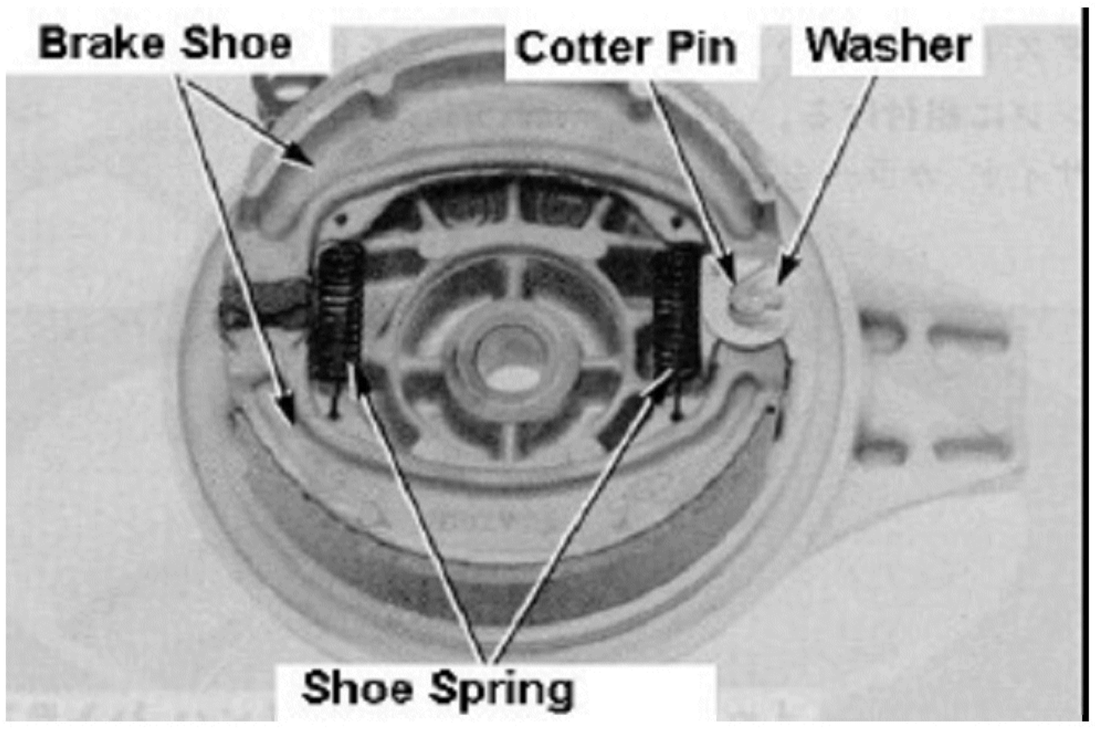
Measure the brake lining thickness.

≦ 2.0mm → Replace

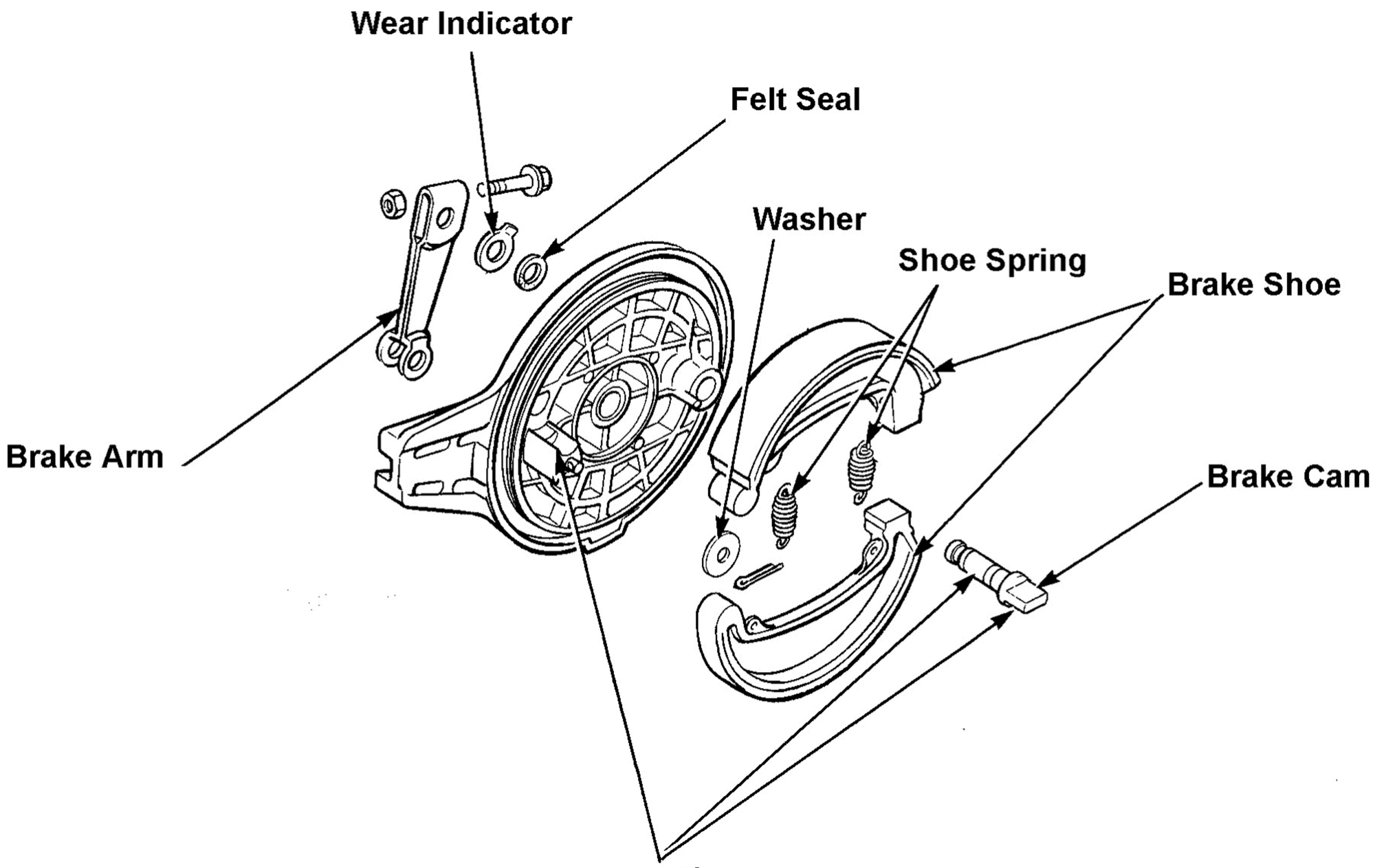


Disassembly

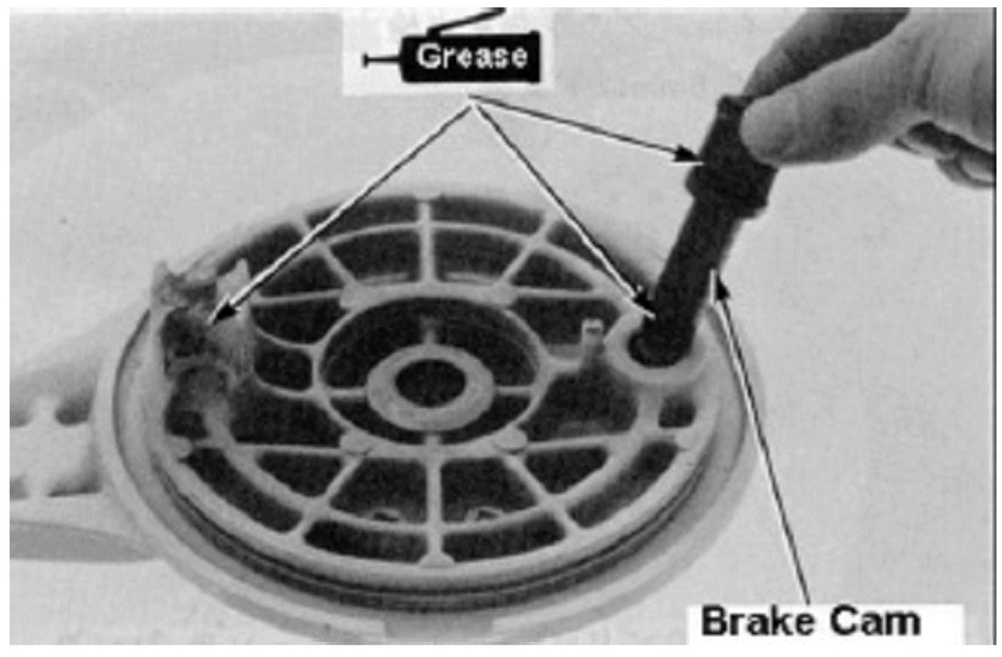
When re-using the brake shoes, mark on the side of the shoe so that the shoe can be re-fitted to the original place.



Remove the cotter pin and the washer.
Remove brake shoes from the brake panel by pushing them outwards.
Detach shoe springs from the shoes.
Remove the brake arm, wear indicator and the felt seal.
Remove the brake cam.

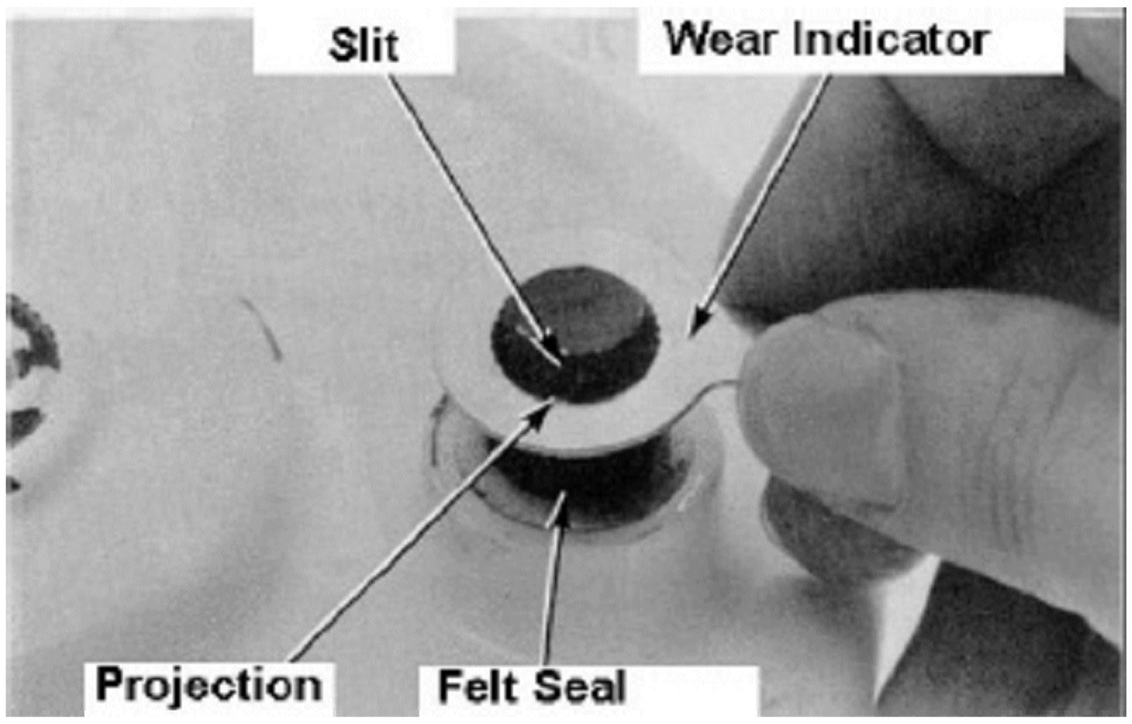


Apply small amount of grease to the brake cam and anchor pin.
Attach the brake cam.



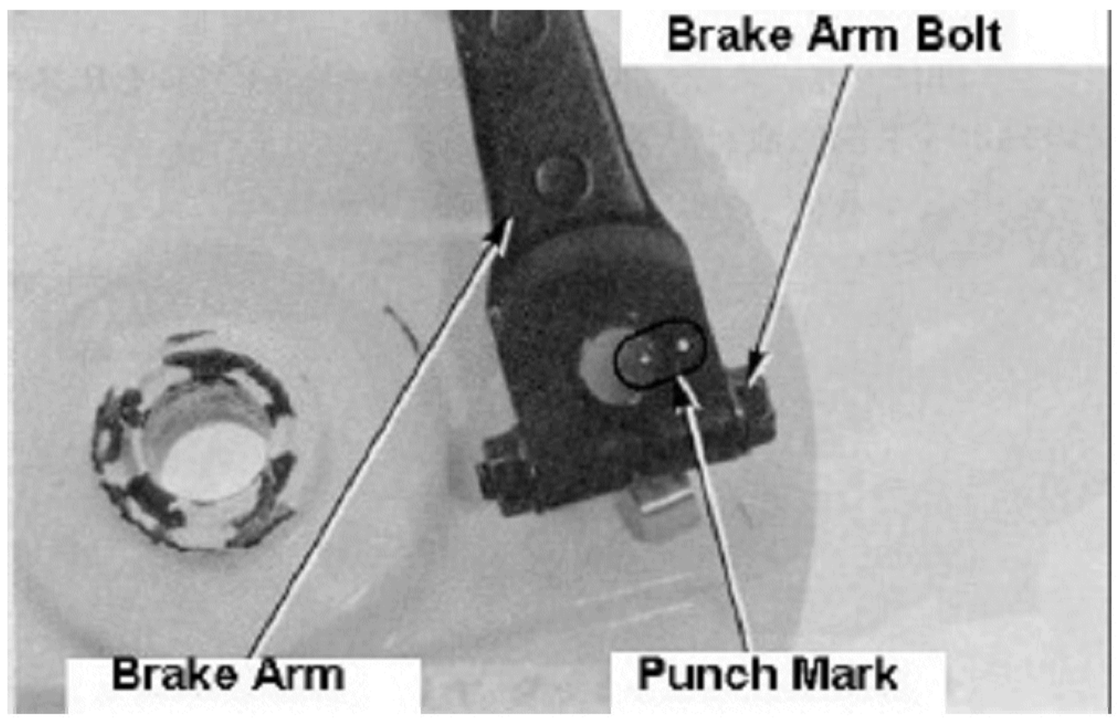
Dip the felt seal in engine oil and attach to the brake panel.

Align the projection on the wear indicator and the slit on the brake cam, and attach the wear indicator to the brake cam.



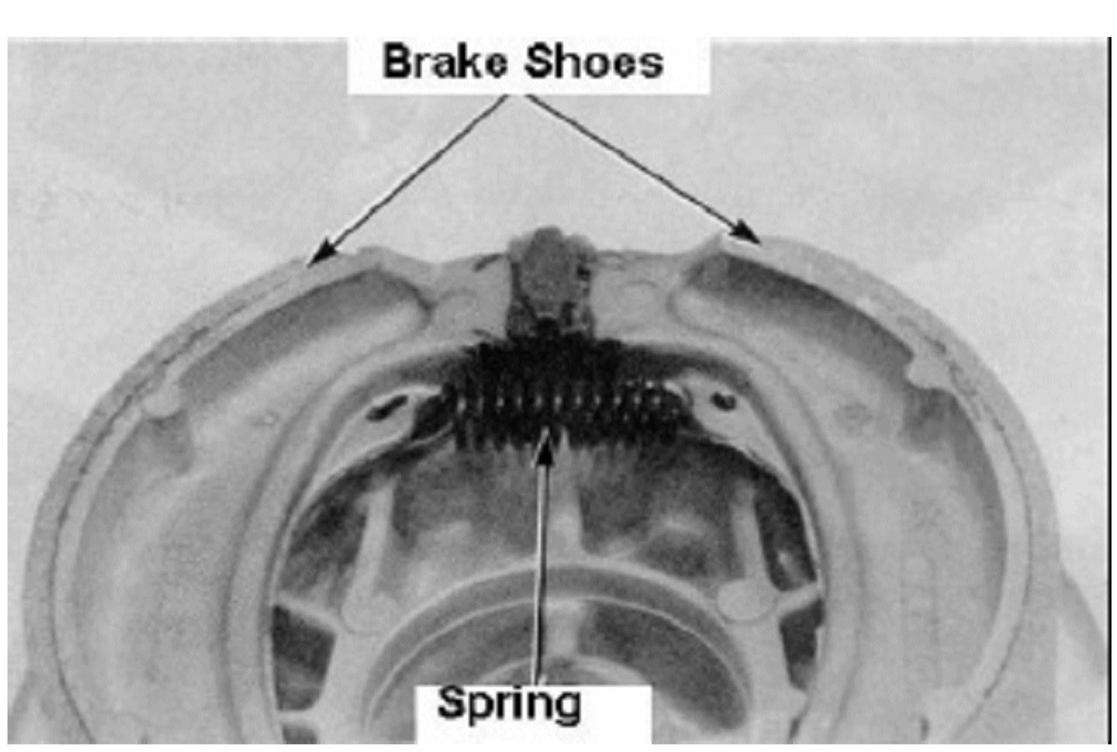
Attach the brake arm by aligning the punch marks.

Tighten the brake arm bolt.



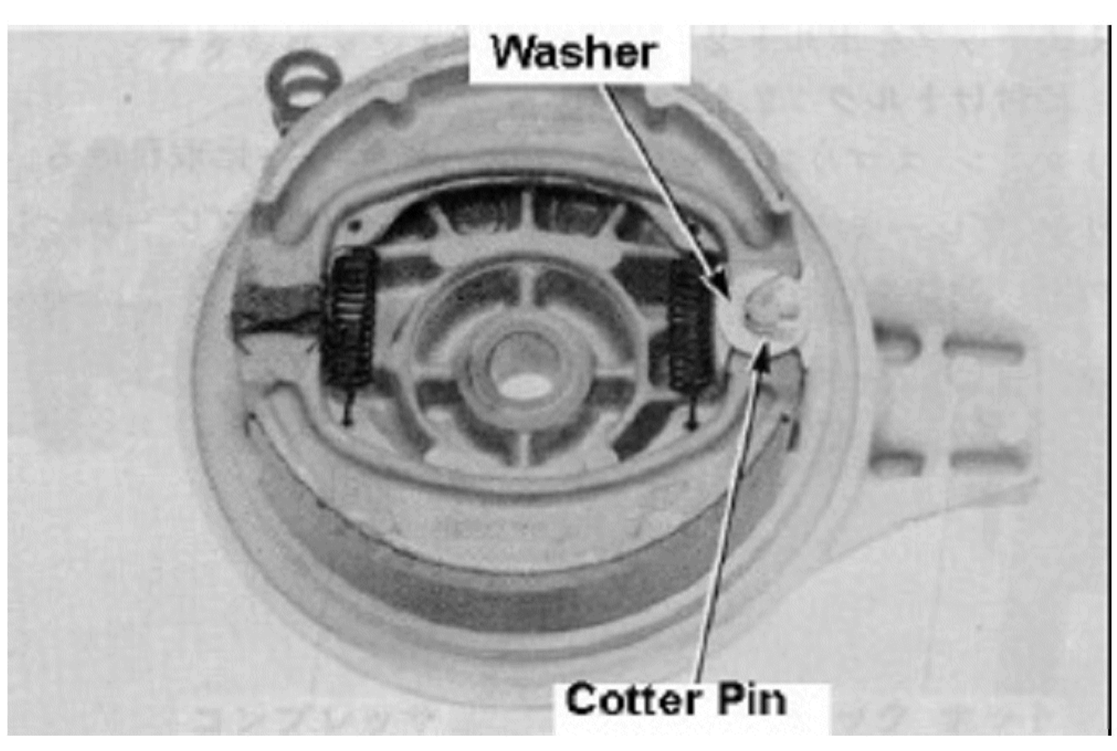
Install springs to the brake shoes.

Attach the shoes to the brake panel.



- When re-using the shoes, place them back to the original position by aligning the markings.
- Do not touch the brake lining to grease.
- Replace both shoes at the same time when replacing either of them.

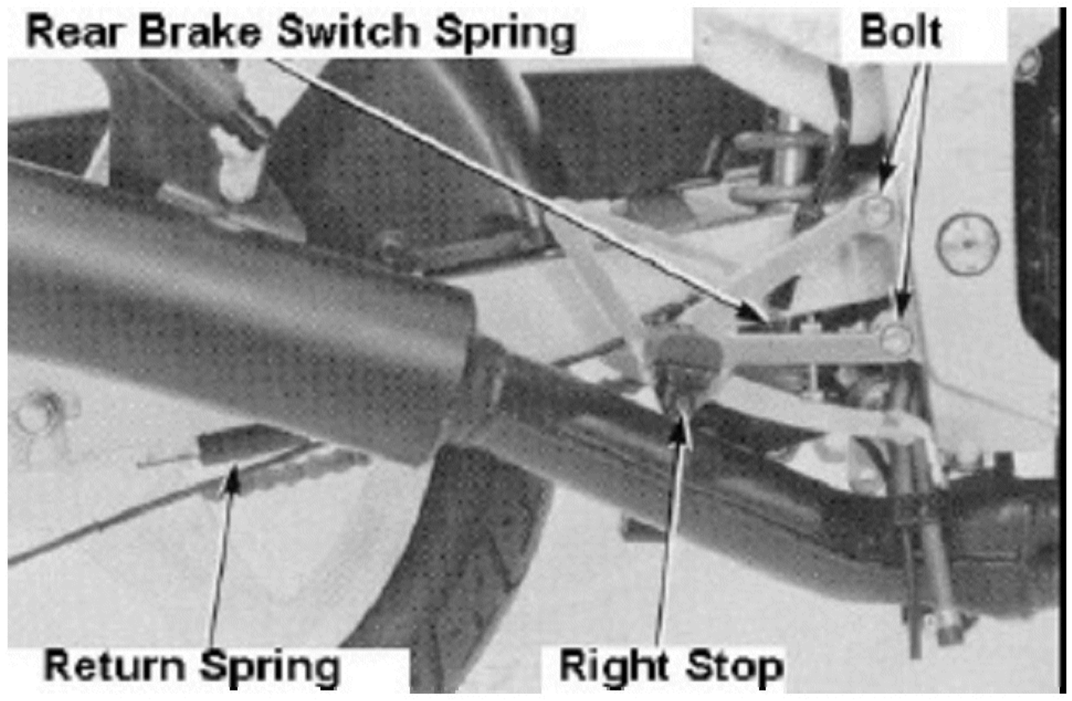
Attach the washer and the cotter pin.



Brake Pedal

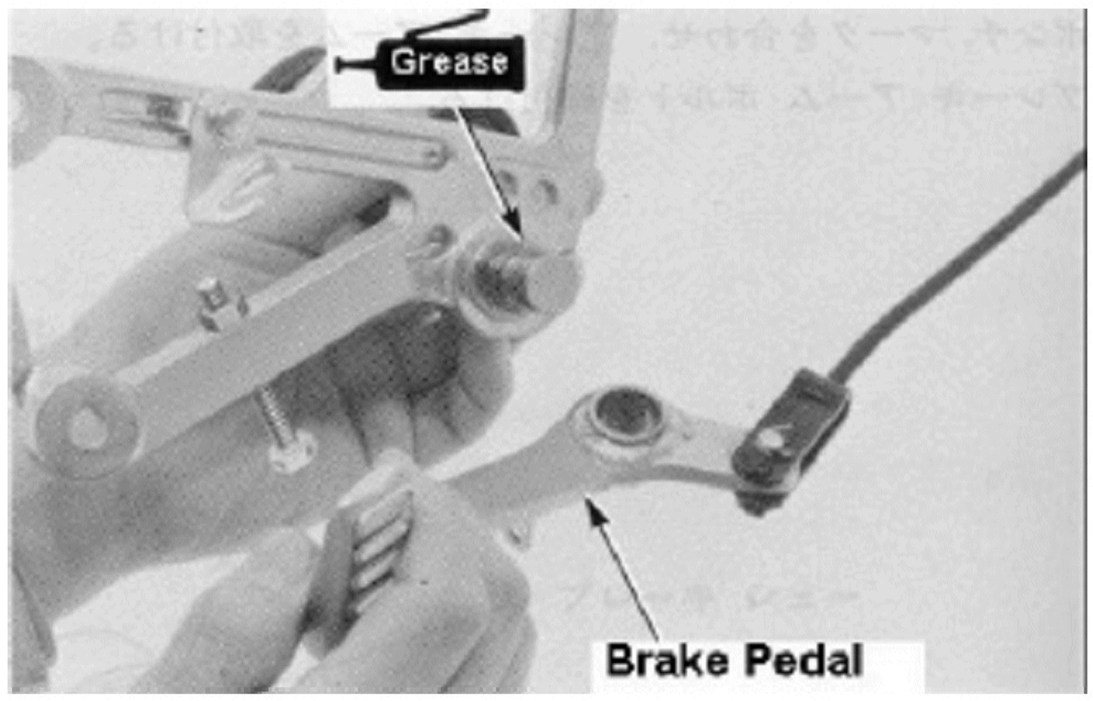
Detachment

Remove the rear brake adjust nut (14-3).
Remove the return spring.
Remove two bolts and detach the right step.
Detach the rear brake switch spring.
Remove the circlip and detach the brake pedal.



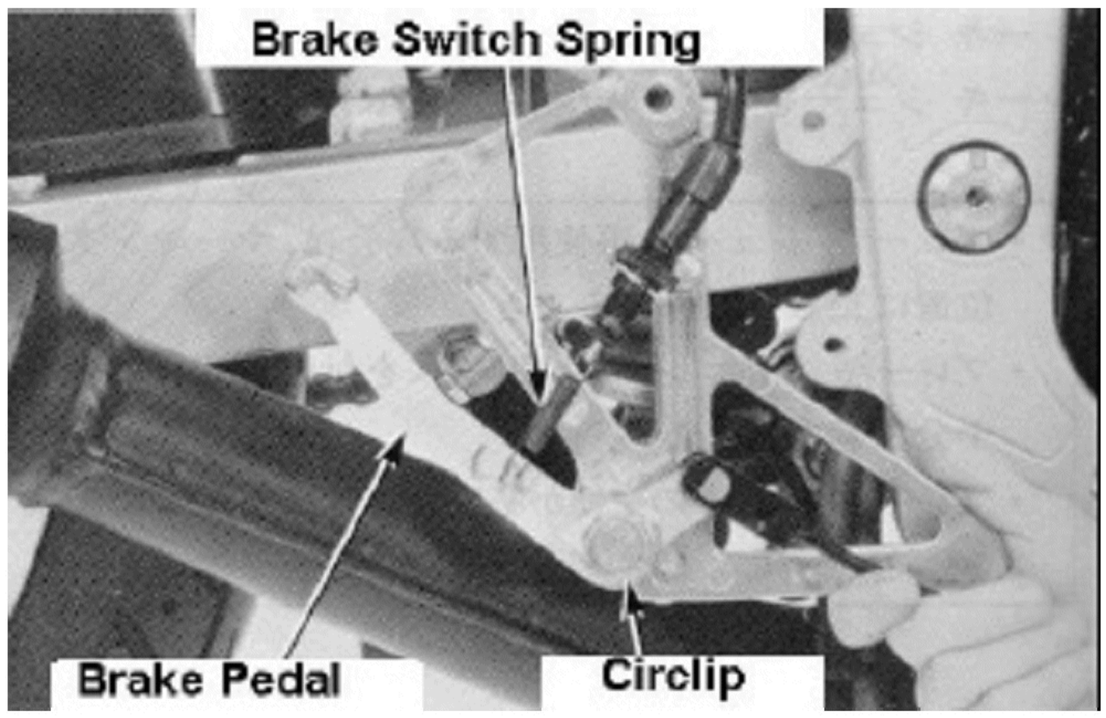
Attachment

Apply grease on the pivot and attach the brake pedal to the right step pivot.



Finally, attach the circlip to the slit on the brake pedal pivot.

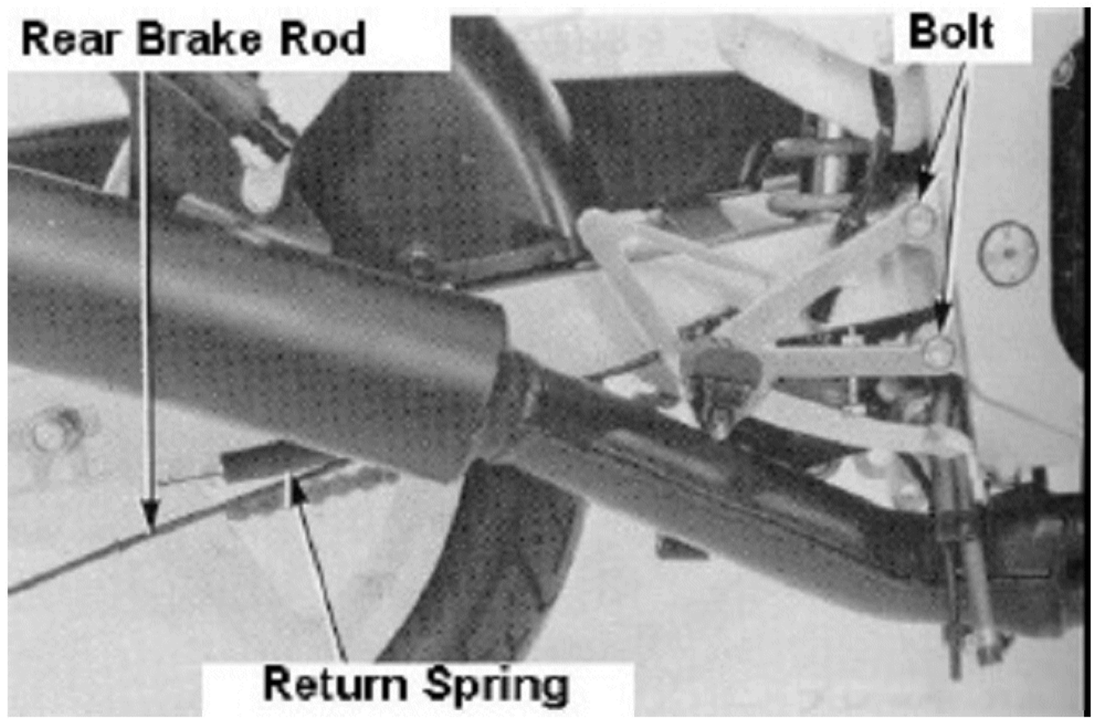
Attach the rear brake switch spring to the brake pedal.



Tighten the two bolts for the right step attachment.
Torque: 2.5 ~ 3.0kg-m

Attach the return spring to the rear brake rod.

Attach the rear brake, adjust nut and adjust the free movement of the brake pedal (2-5).

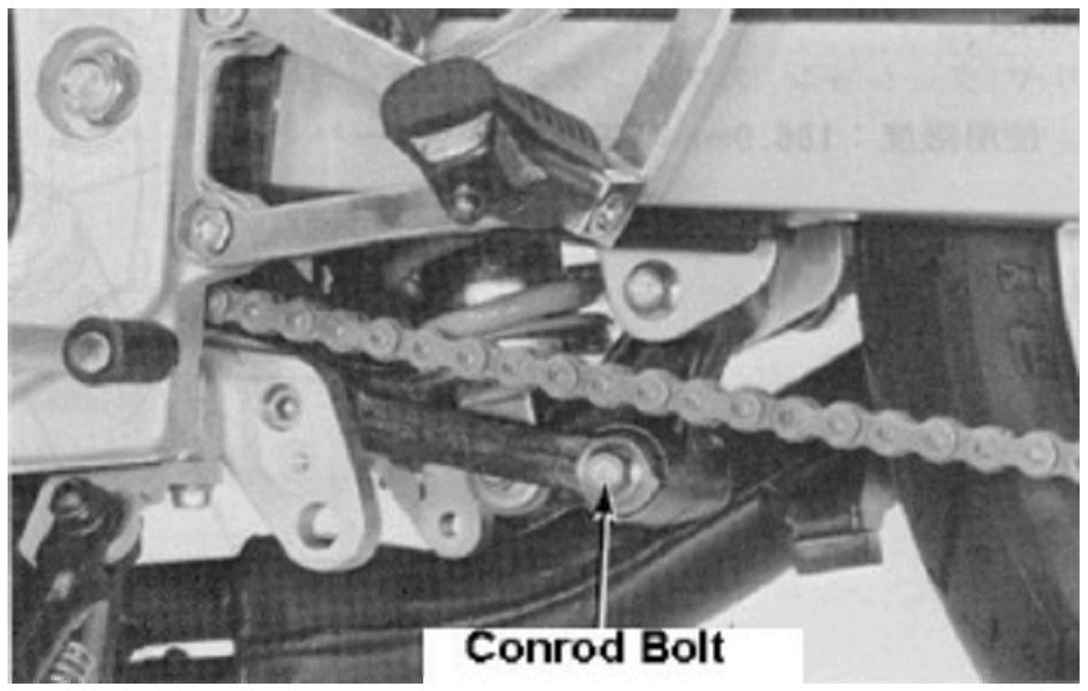


Rear cushion

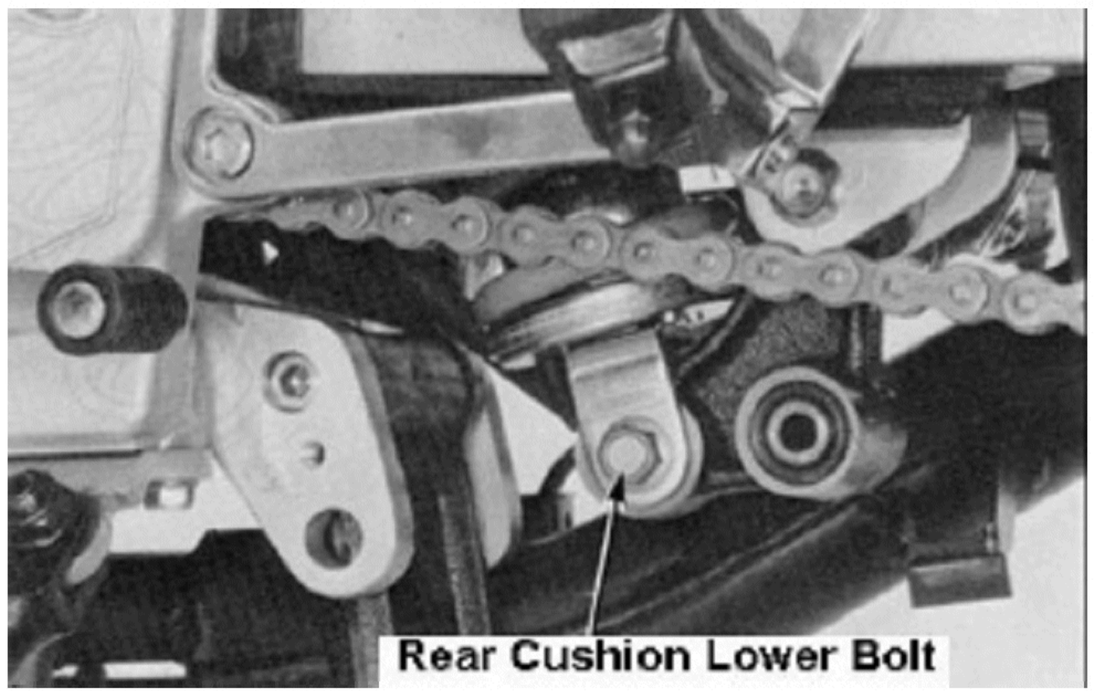
Detachment

Support the frame with the stand to lift the wheel.

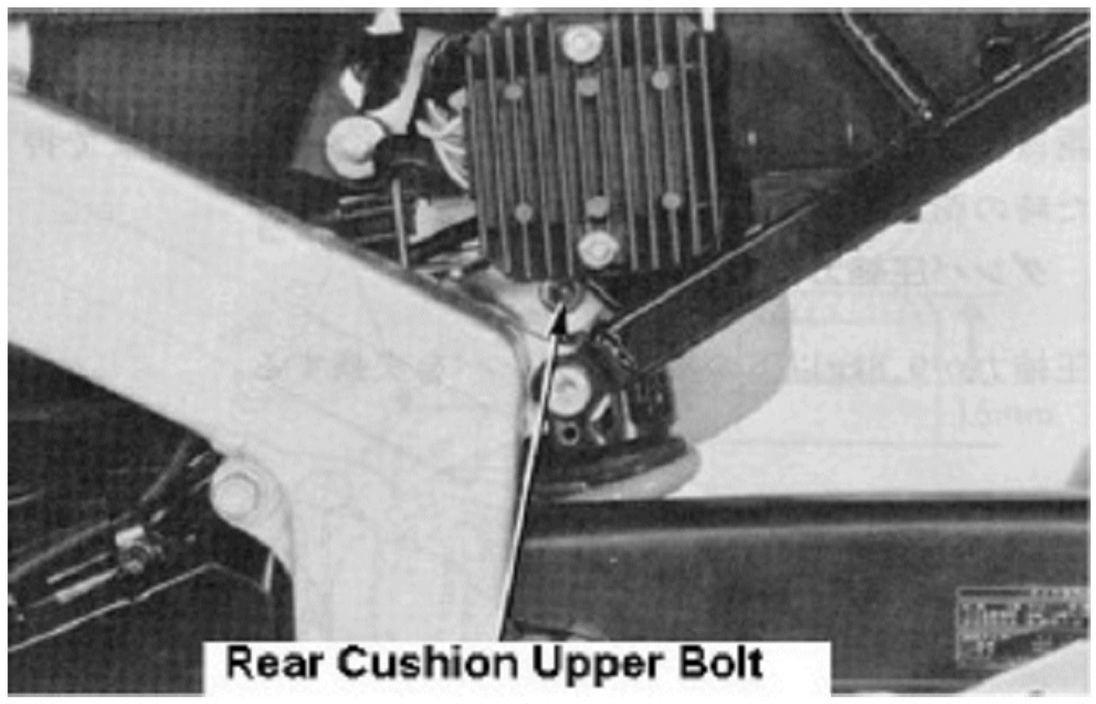
Detach the left side cover.
Remove the conrod bolt (cushion arm side).



Remove the rear cushion lower bolt.



Remove the rear cushion upper bolt to detach the rear cushion.



Disassembly

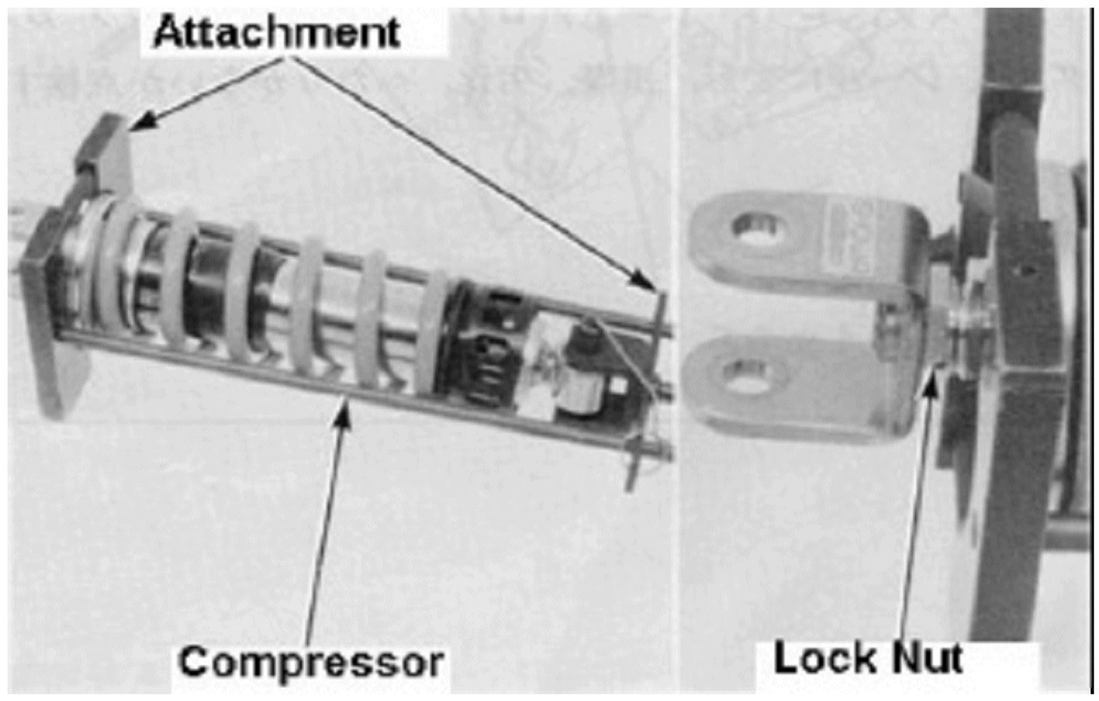
Attach the rear cushion compressor

Common tool

Rear cushion compressor
07959-3290001

Exc. tool

Rear cushion compressor attachment
07959-MB10000

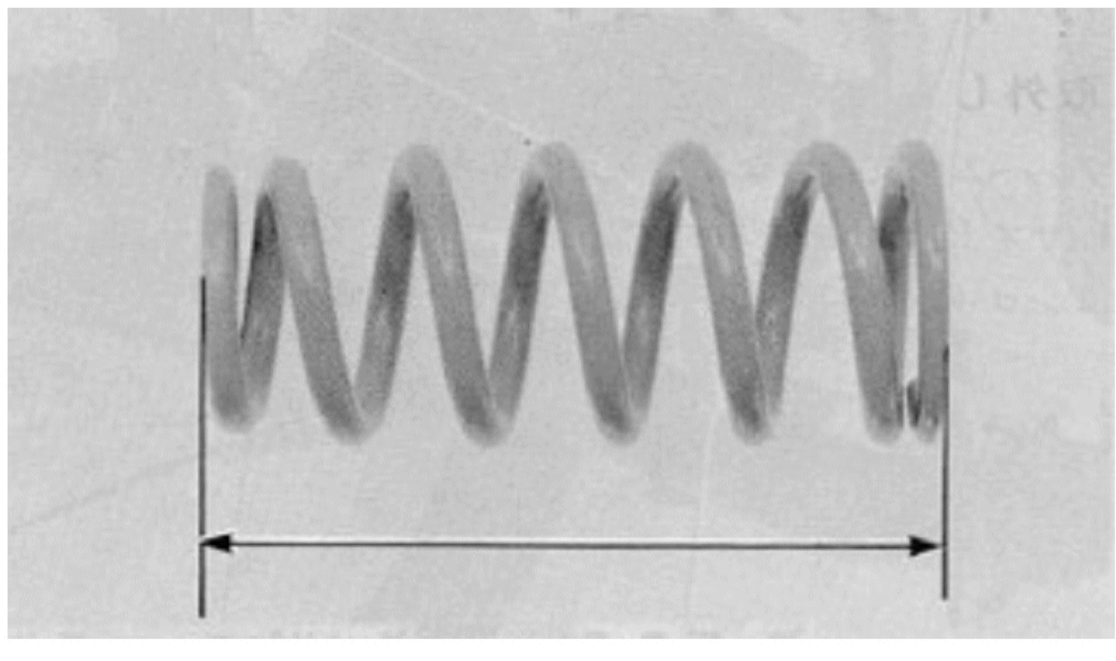


Compress the spring to the position so that a lock nut can be removed.
Loosen the lock nut and disconnect the lower joint.
Remove the compressor and remove the seat stopper, dust seal, spring guide, lower spring seat, spring, upper spring seat and the adjuster.

Inspection

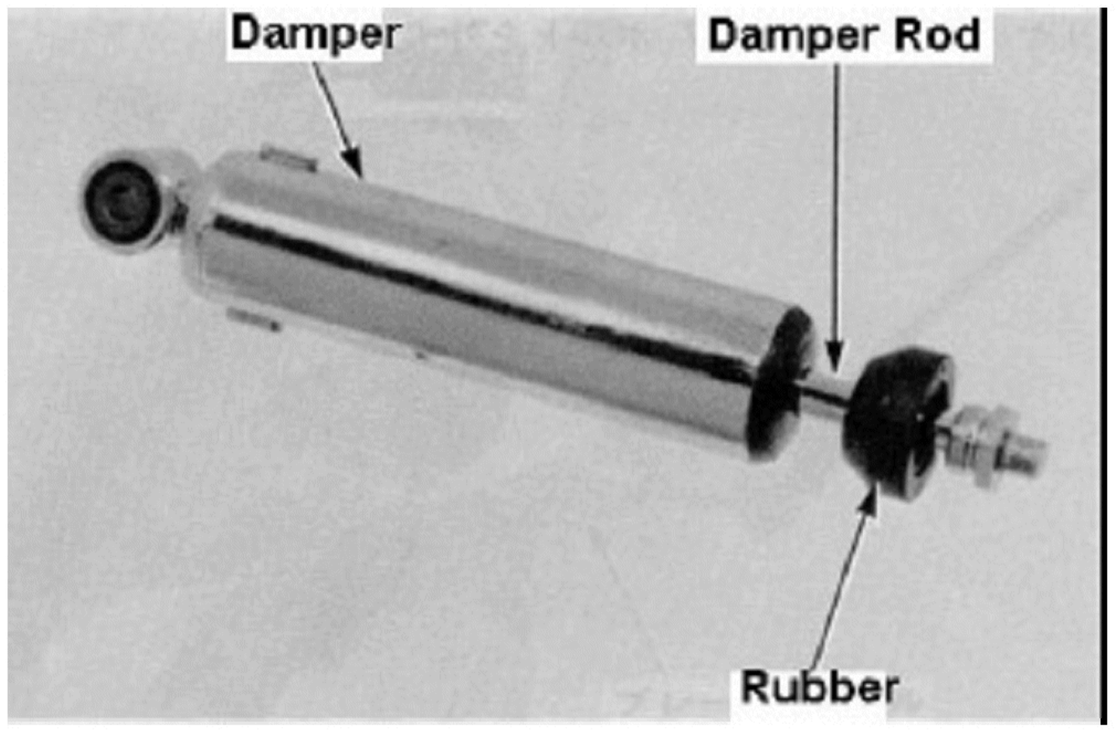
Measure the relaxed length of the cushion spring.

≦ 186.0mm → Replace



Inspect the rear damper for deformation, oil leak, bent rod and inspect the damper rubber for wear and damage.

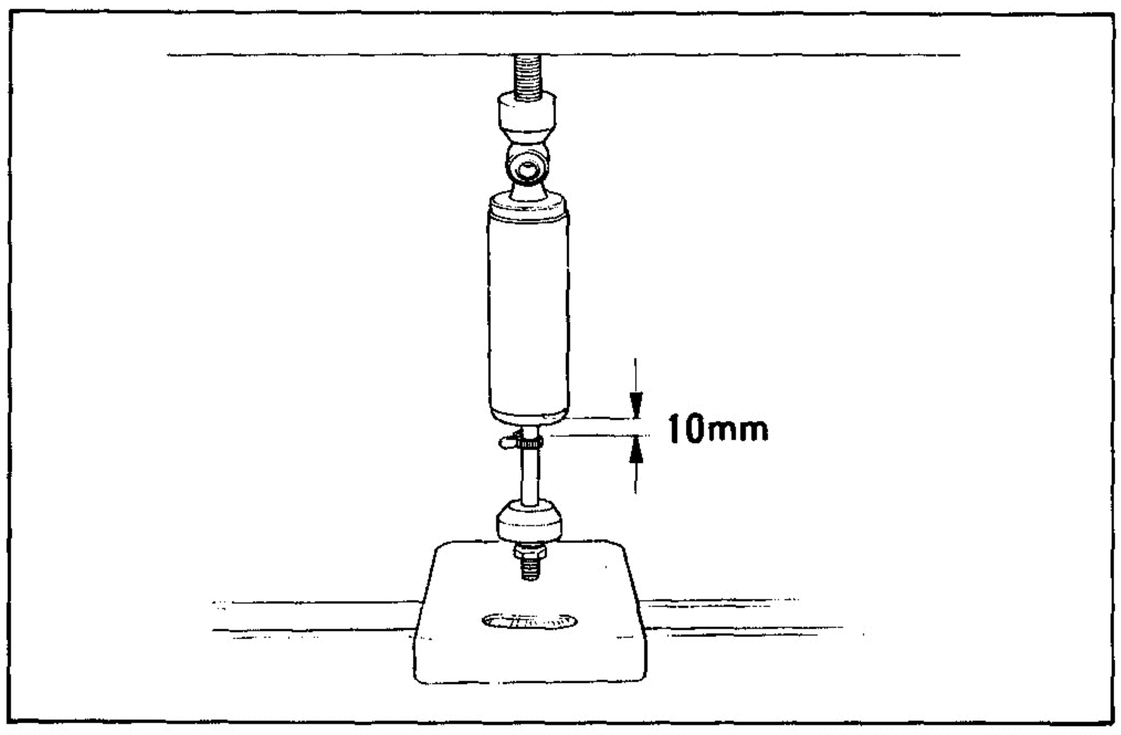
Check smooth operation of the rear damper.



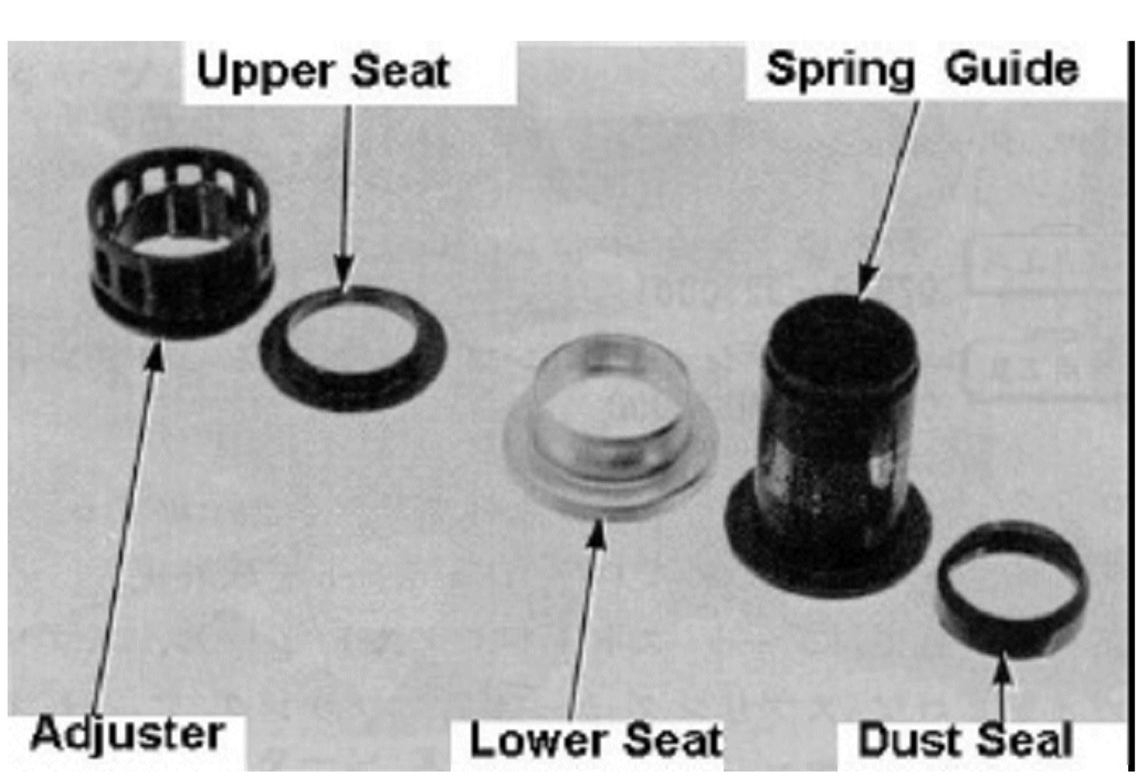
Fully stretch the rear damper and mark at 10mm from a damper edge.
Place on a scale vertically and press the damper until the mark (use hydraulic power).

Scale : 12.3 ~ 16.0kg

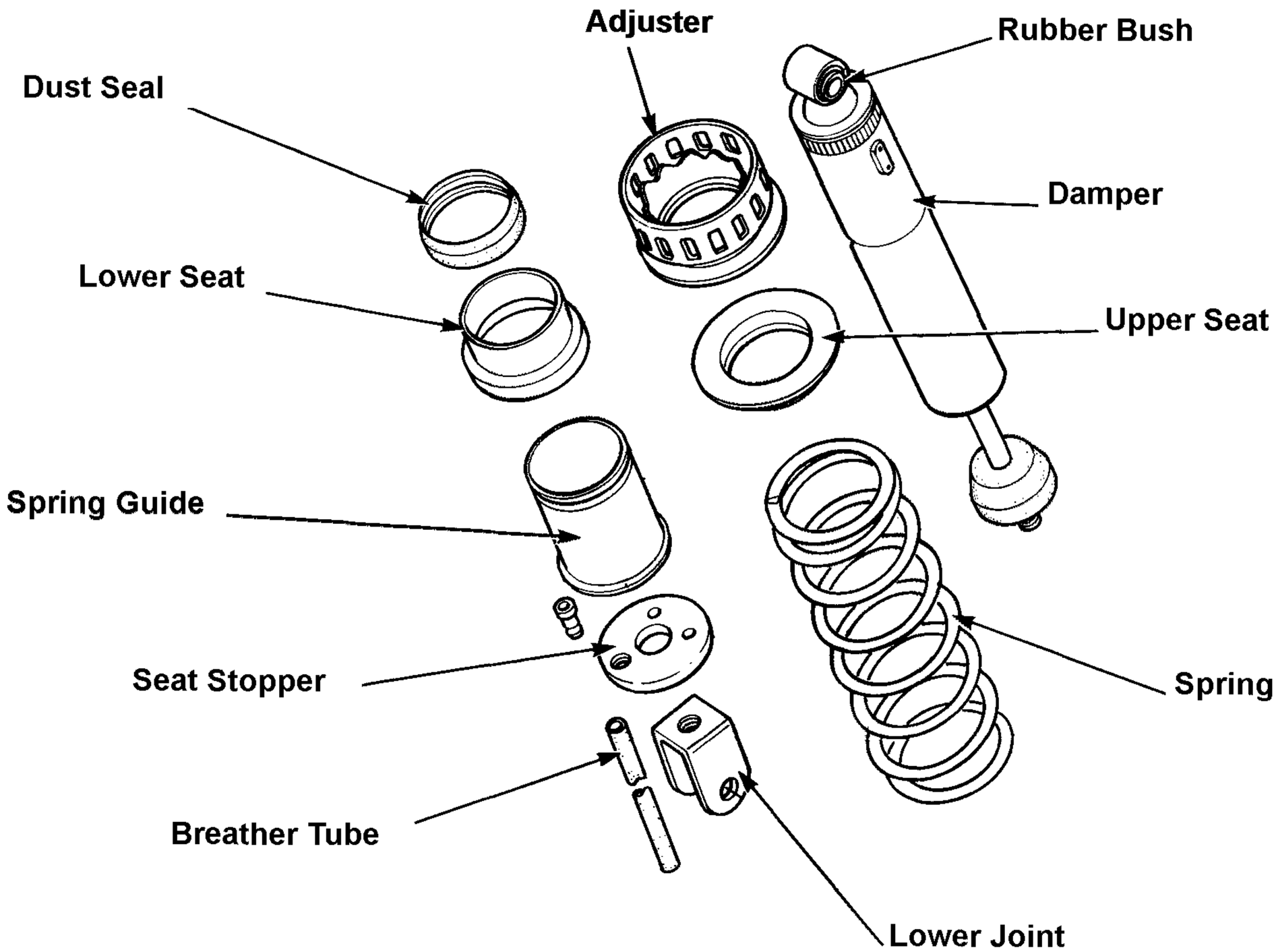
Replace the damper if the compression is less than 9.8kg.



Inspect the adjuster, upper seat, lower seat, spring guide and the dust seal for wear, deformation,or damage.



- Assembly



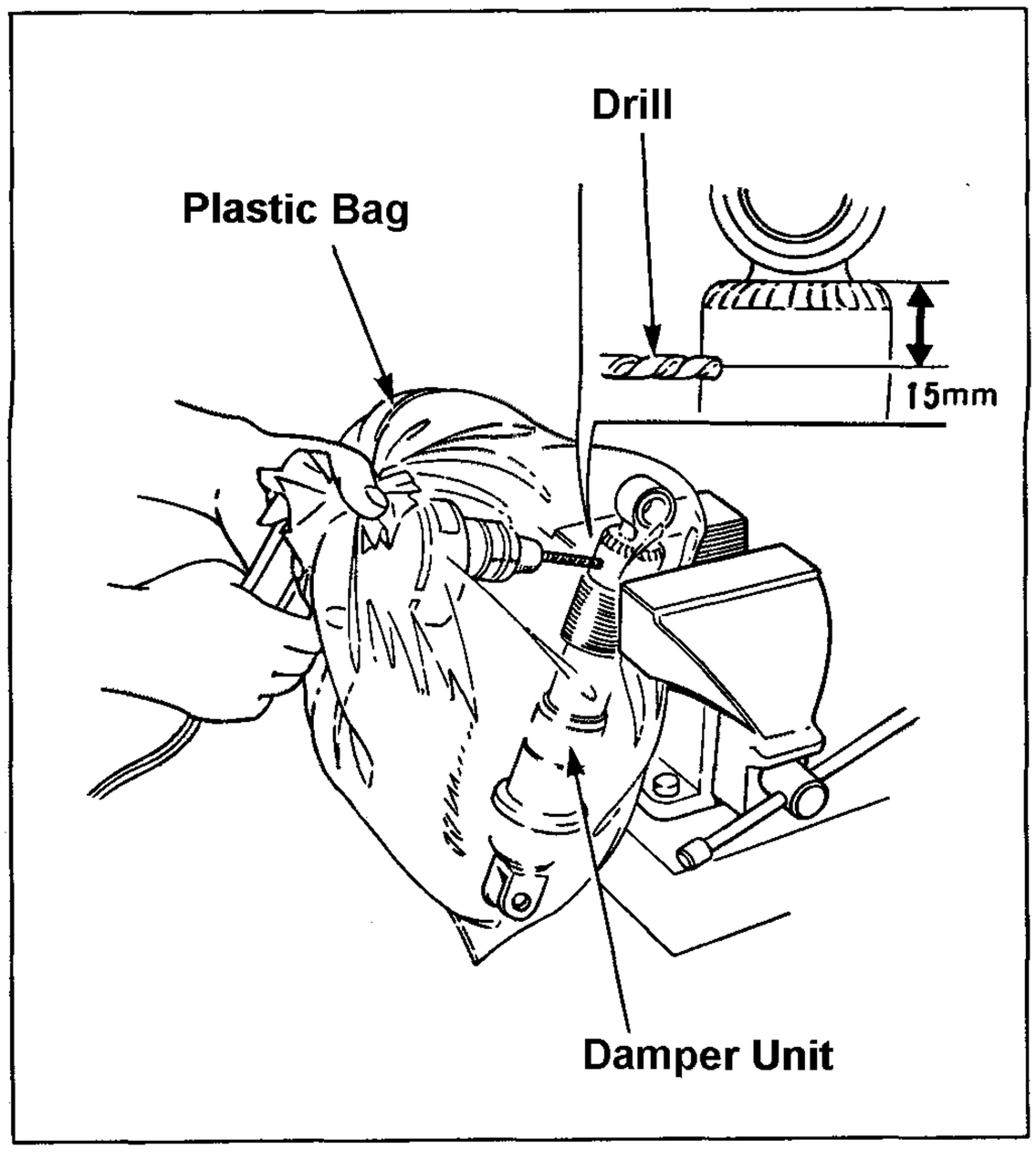
Draining gas from a damper unit

Please strictly follow the instructions

CAUTION
- Never heat or disassemble the unit or it may explode.
- When disposing the damper unit, drain gas by following the procedure below.

- When the hole is opened, debris will spurt out . Wear safety goggles.
- Do not drill anywhere else.

Disassemble the rear cushion (14-11)
Determine the position of the drill by using a hole puncher to the position shown in the figure. Wrap the damper unit with a plastic bag and fix it to a vice in standing position. By using the cooling air of the drill, inflate the bag in order to avoid the drill catching the bag. Release air as required. Drill a 3mm-diameter hole on the position marked with a punch to drain gas.



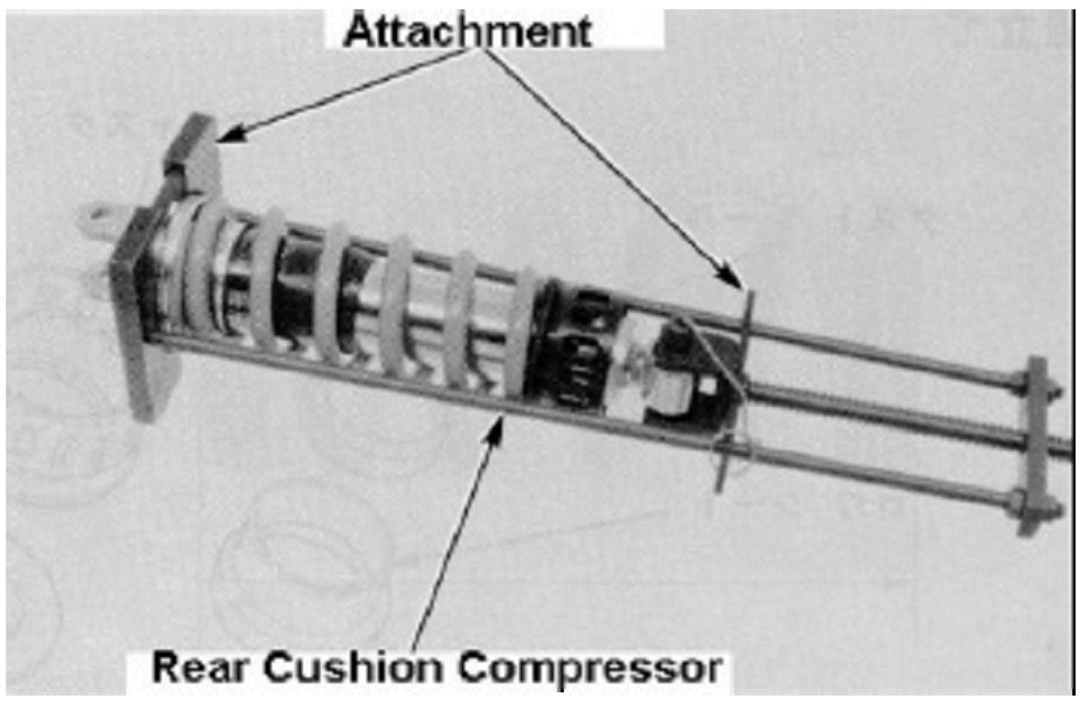
Attach the adjuster, upper seat, spring, lower seat, dust seal, spring guide and the seat stopper to the damper.

Compress the spring until the lower joint can be attached by using the rear cushion compressor.

Common tool

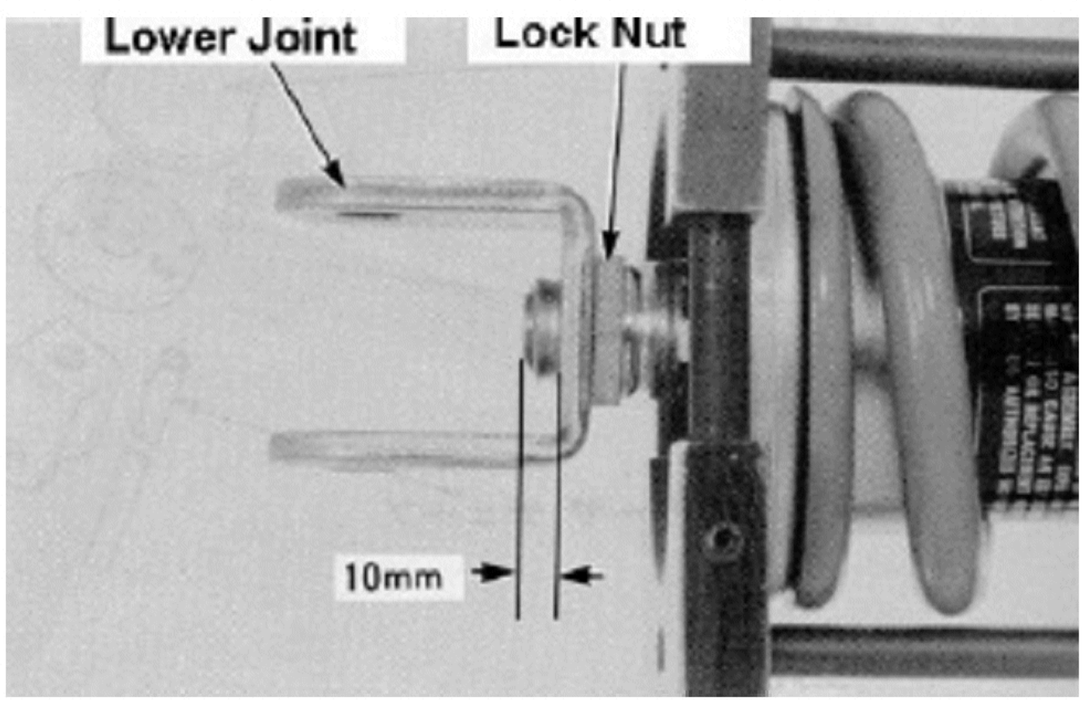
Rear cushion compressor
07959-3290001

Rear cushion compressor attachment
07959-MB10000



Attach the lower joint so as to have the end of the damper rod thread 10mm from the inner edge surface of the lower joint.

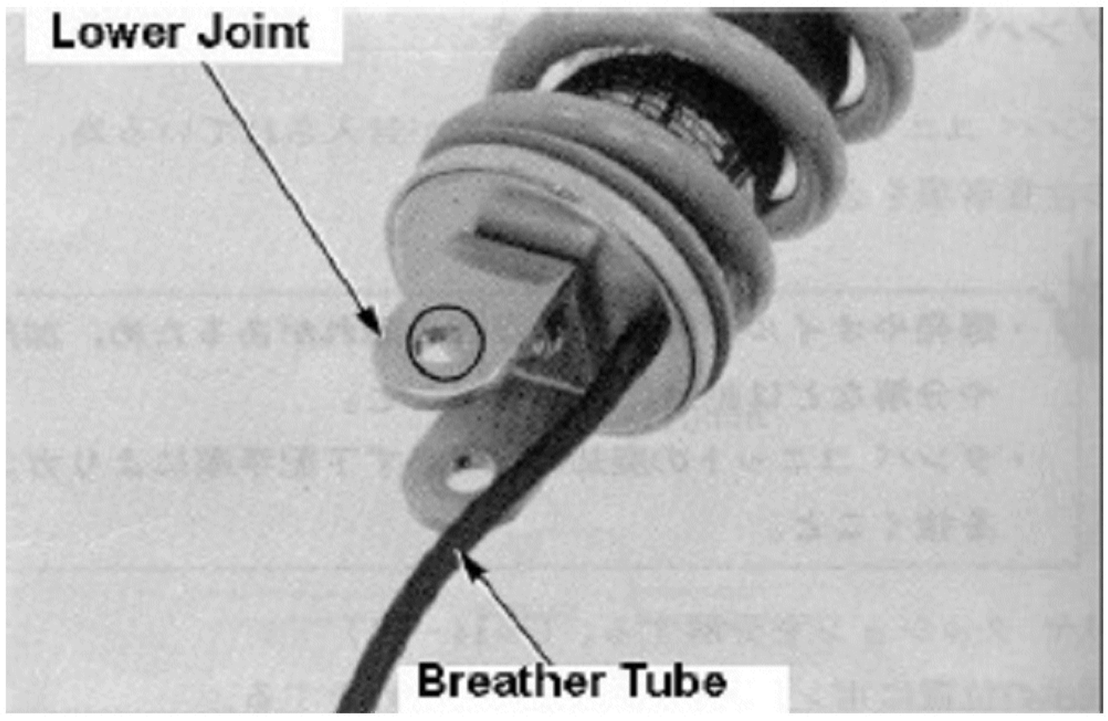
Spring attachment length: 173.8mm



Fix the lower joint and tighten the lock nut.

Torque: 3.8 ~ 6.0kg-m

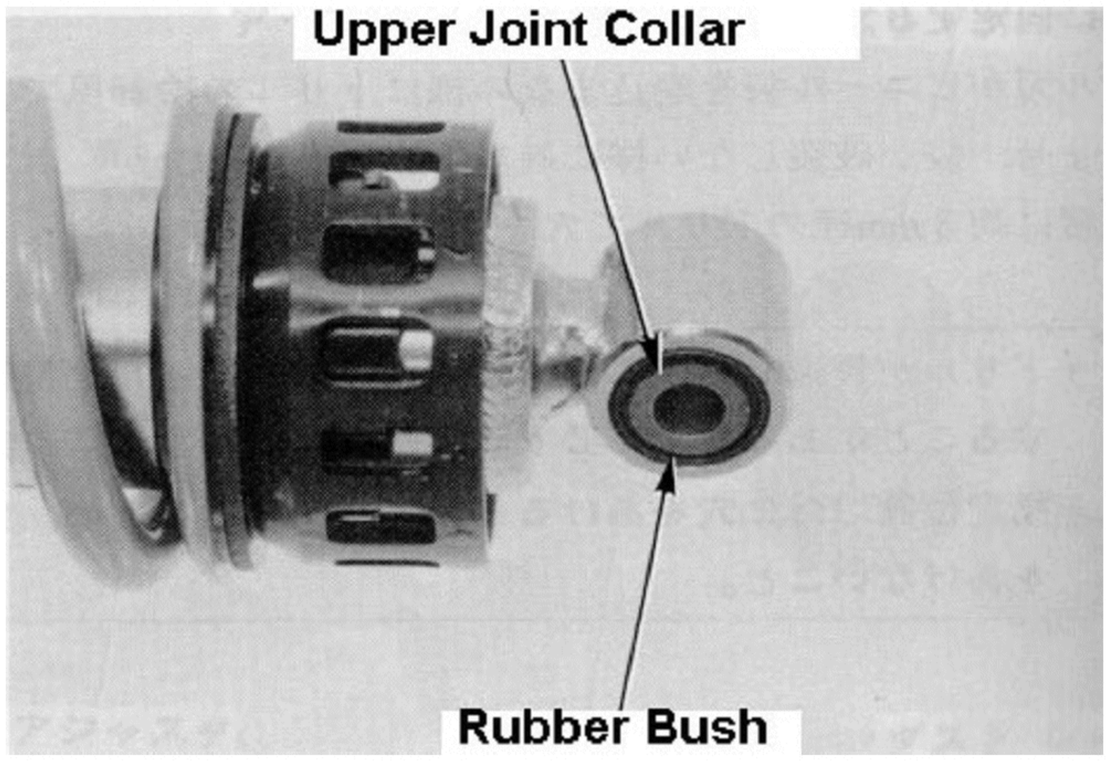
Apply screw locking liquid to the thread of the damper rod.



Firmly attach the breather tube to the lower joint.

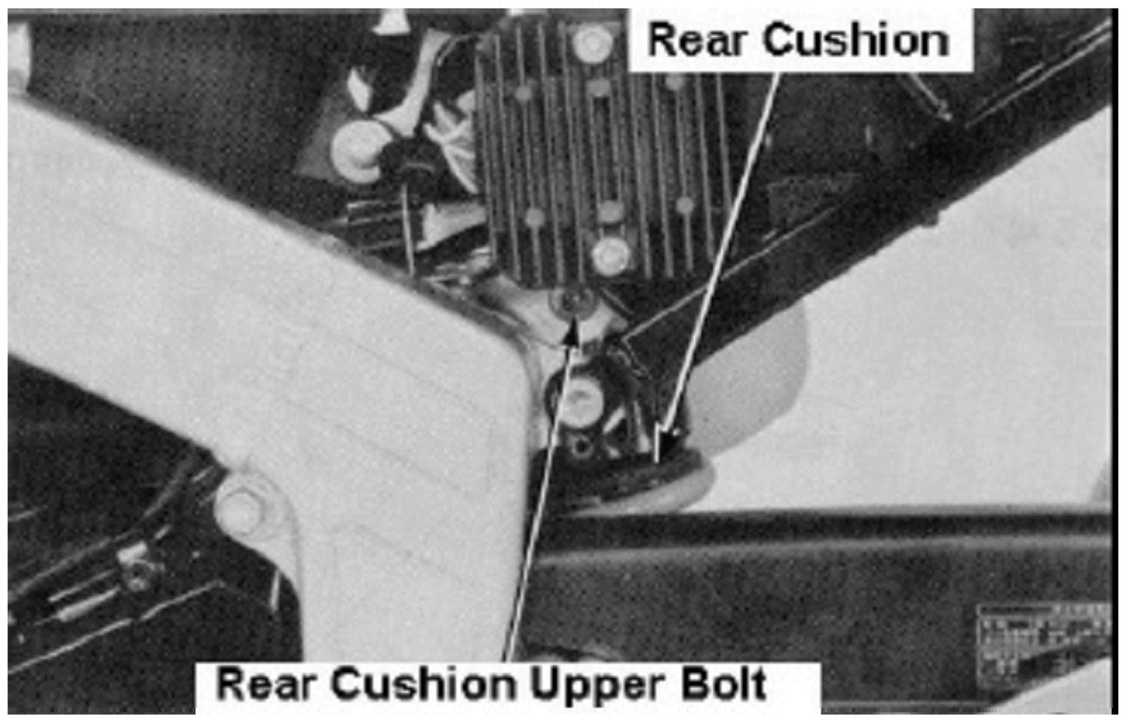
Bush inspection

Inspect an upper joint collar and the rubber bush for wear and damage.



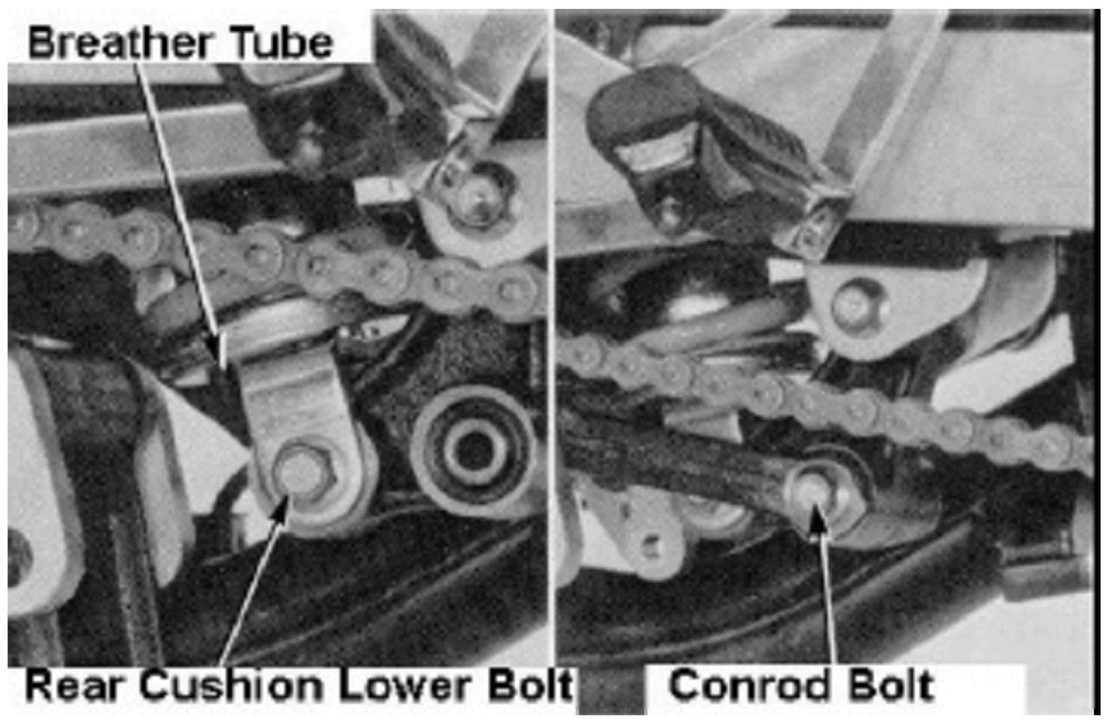
Attachment

Insert the rear cushion from underneath and tighten the rear cushion upper bolt.
Torque: 5.0 ~ 6.0kg-m



Tighten the rear cushion lower bolt.
Torque: 5.0 ~ 6.0kg-m

Attach the cushion so as to have the breather tube facing the front.

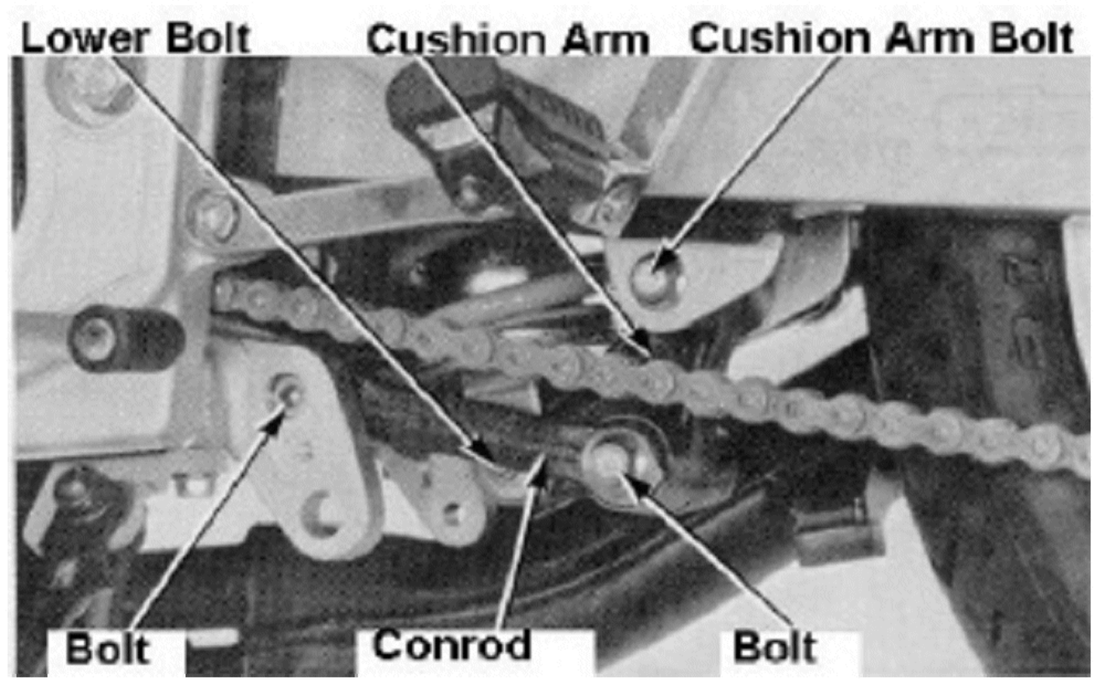


Tighten the conrod bolt (cushion arm side).
Torque: 5.0 ~ 6.0kg-m

Suspension linkage

Detachment

Remove the conrod bolt (frame and cushion side) and detach the cushion conrod.
Remove the rear cushion lower bolt and a cushion arm bolt and detach the cushion arm.

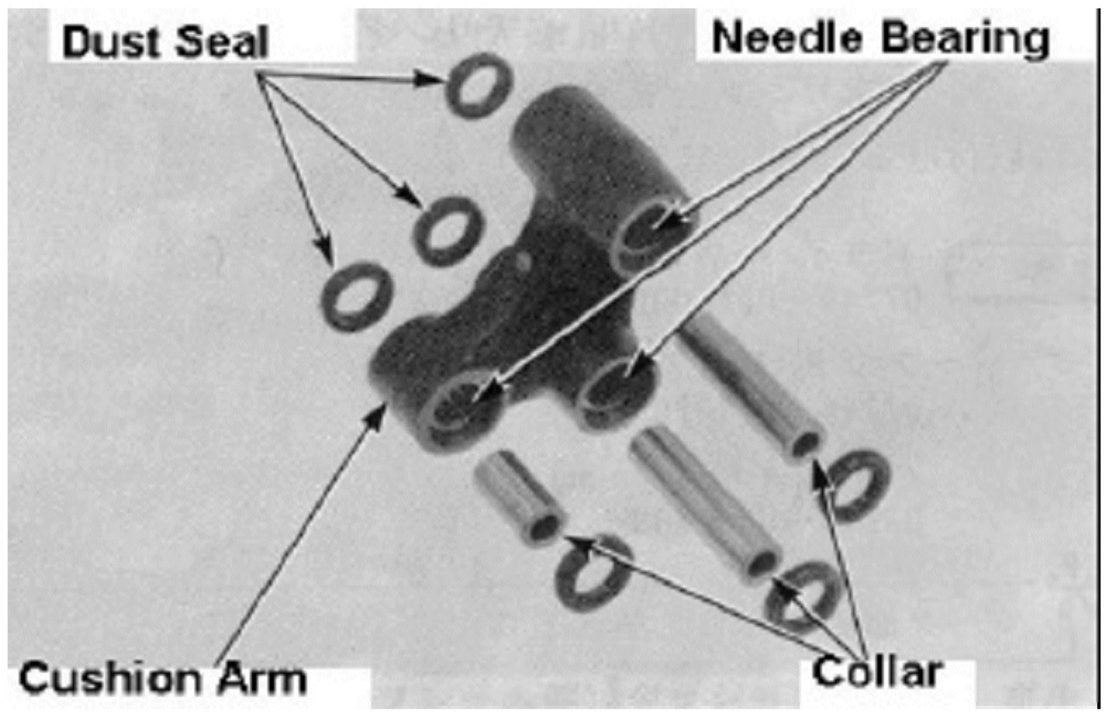


Disassembly / inspection

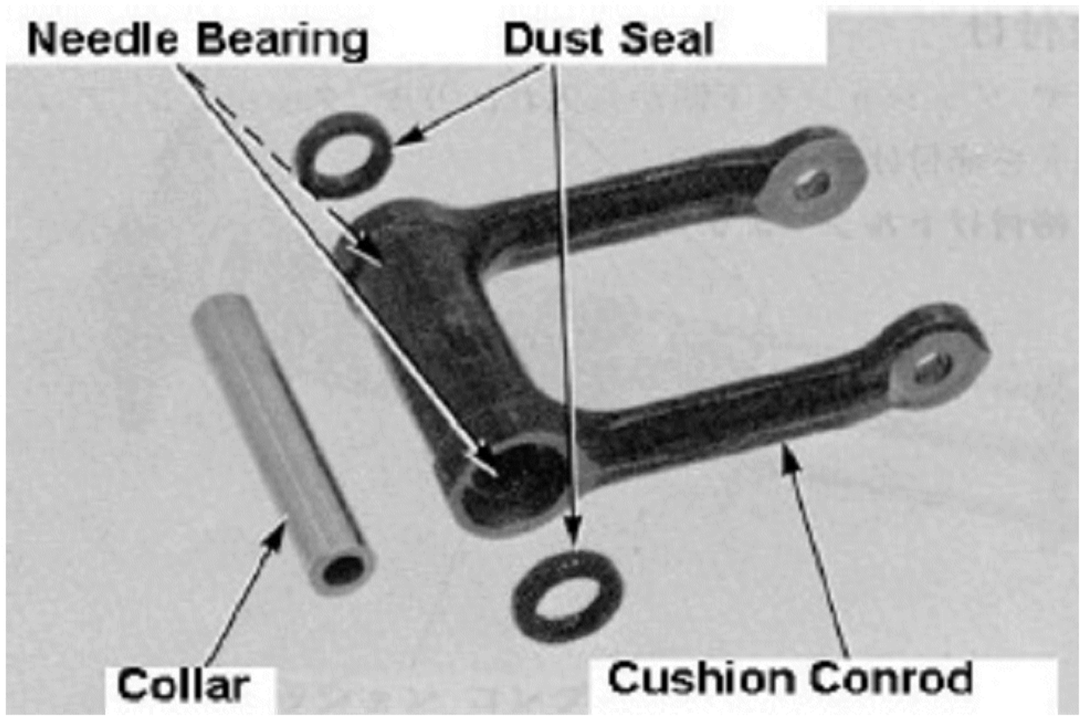
Detach the seal collar from the cushion arm and inspect the collar for wear, damage and deformation.

Replace needle bearings for the cushion arms if any loose or damage was found.
Detach dust seals from the cushion conrod and inspect them for wear, damage and deformation.

Replace needle bearings if loose fit or damage was found.



Detach dust seals from the cushion conrod and inspect them for wear, damage and deformation.
Replace needle bearings if loose fit or damage was found.

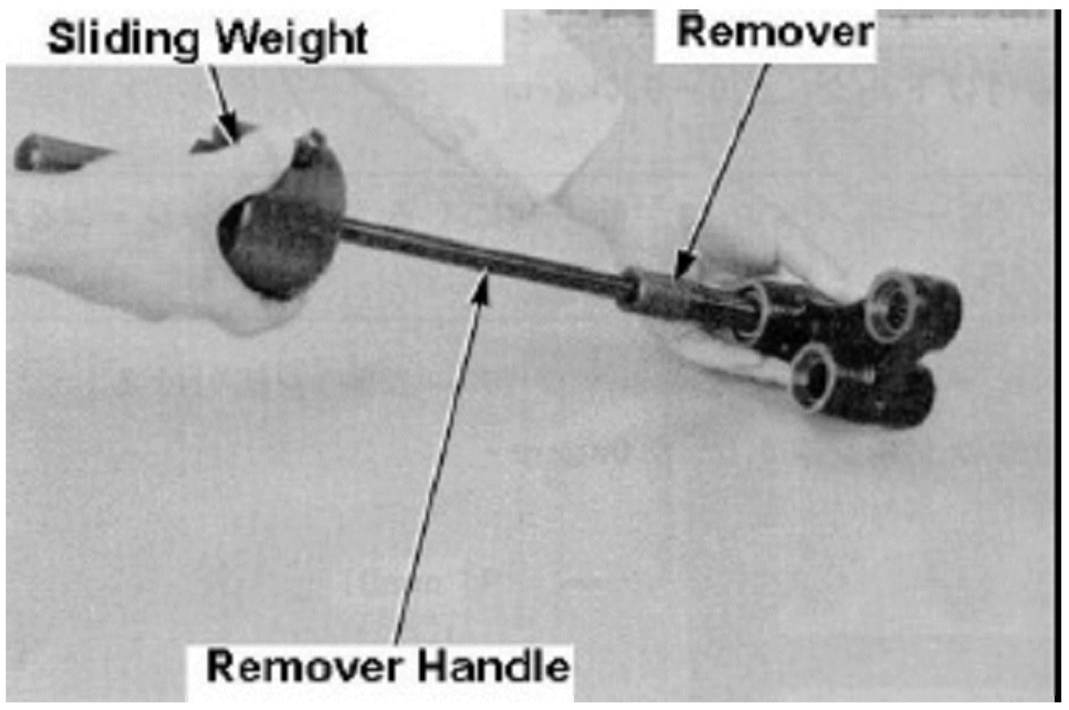


Needle bearing replacement

Remove the cushion arm needle bearing.

Exc. tools

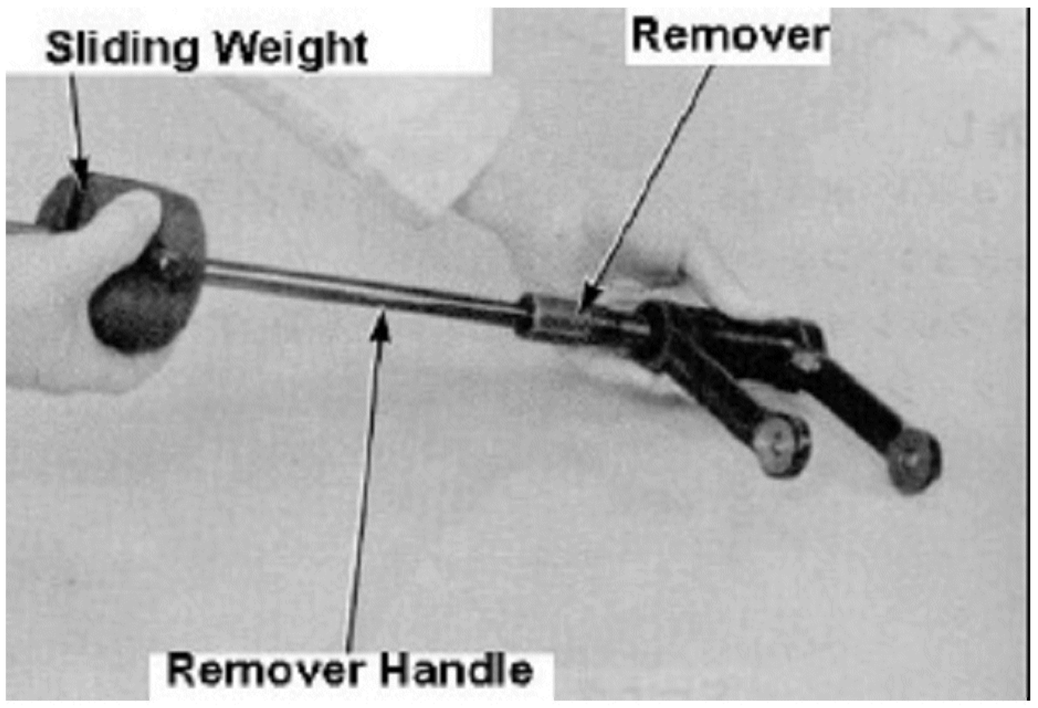
Bearing remover	07936-3710300
Remover handle	07936-3710100
Remover sliding weight	07741-0010201



Detach the cushion conrod needle bearing

Exc. tools

Bearing remover	07936-3710300
Remover handle	07936-3710100
Remover sliding weight	07741-0010201

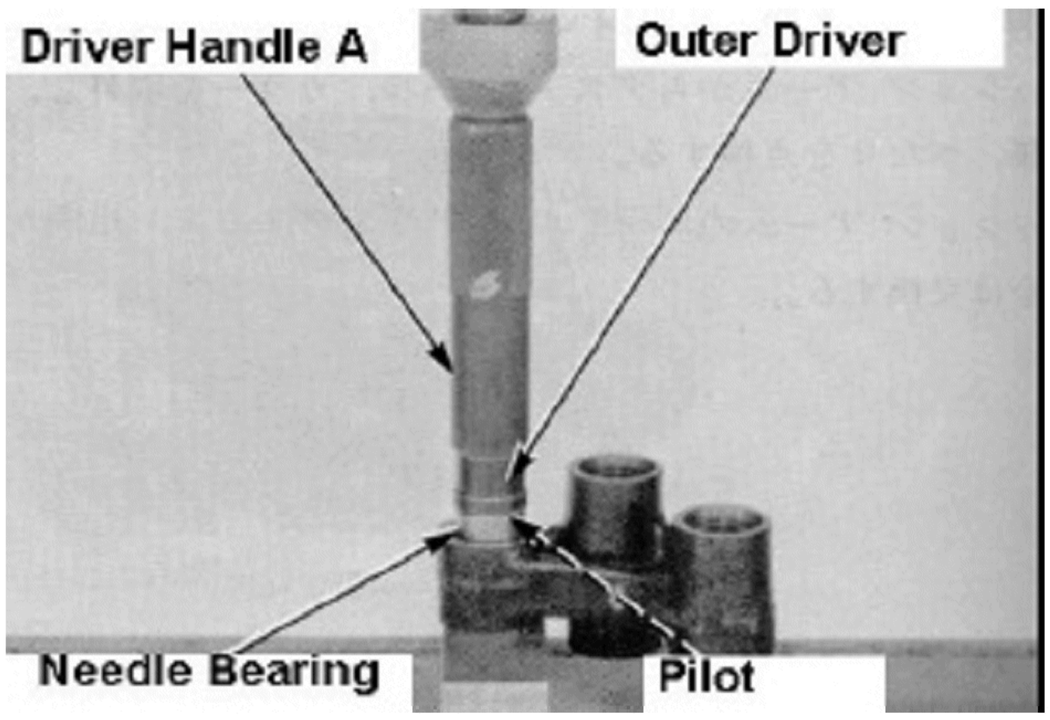


Apply grease to the cushion arm needle bearing.

By using a hydraulic compressor, attach the needle bearing to the cushion arm.

Common tools

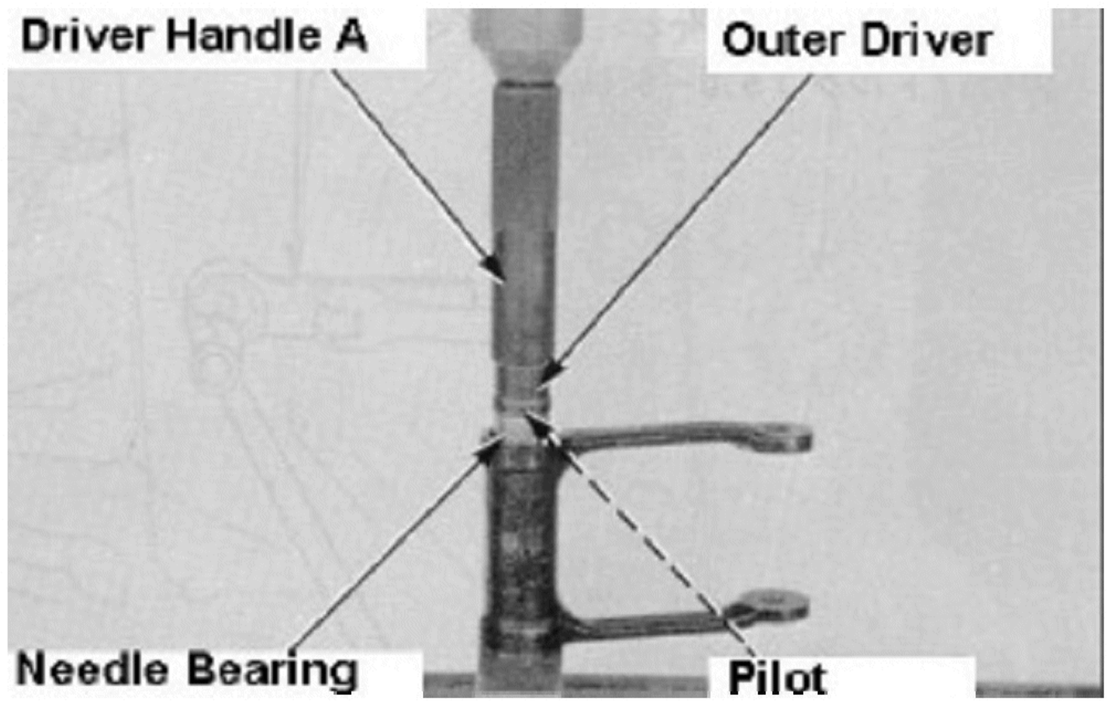
Driver handle A	07749-0010000
Outer driver (24x36mm)	07746-0010700
Pilot (17mm)	07746-0040400



- Press the marked surface in.

Apply grease to the cushion conrod needle bearing.

By using a hydraulic press, attach the needle bearing to the cushion arm.

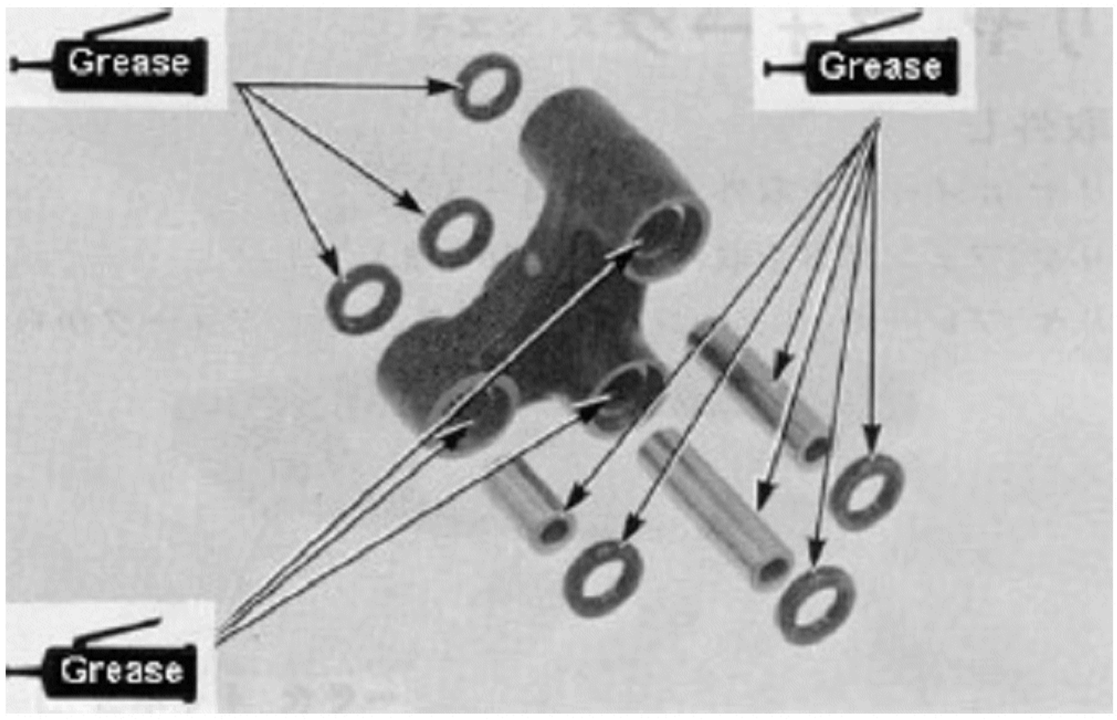


Common tools	
Driver handle A	07749-0010000
Outer driver (24x26mm)	07746-0010700
Pilot (17mm)	07746-0040400

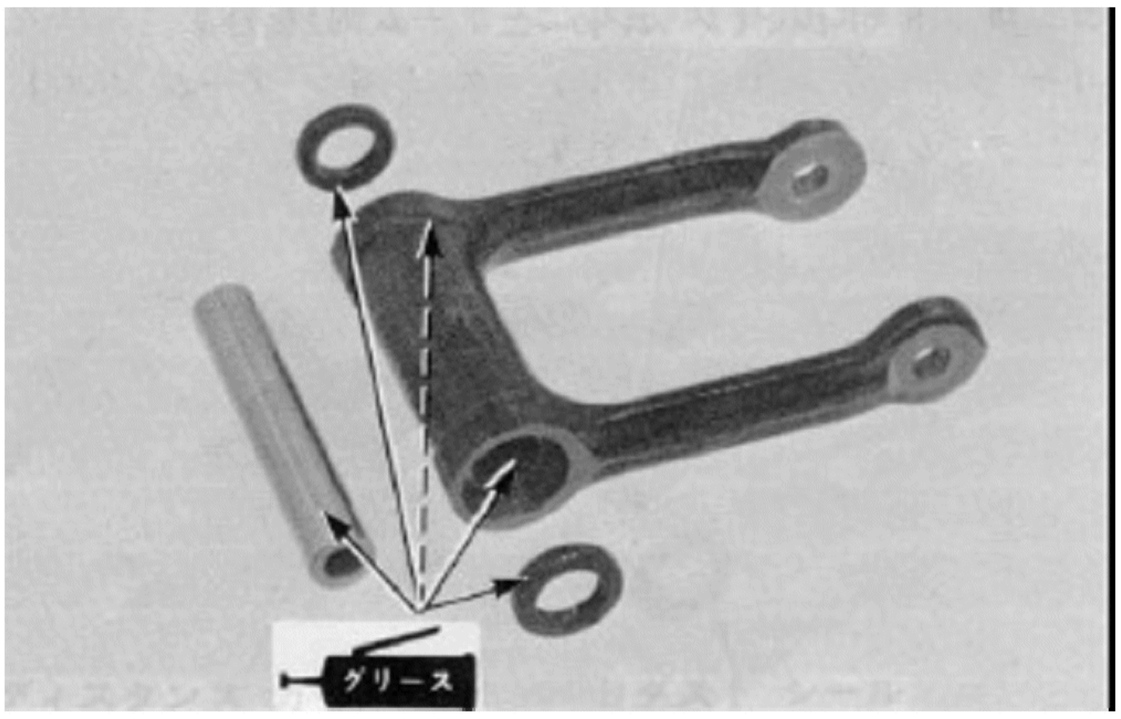
Press the marked side in.

Assembly

Apply grease to collars, lips of dust seals and needle bearings and attach to the cushion arm.



Apply grease to the collar, lips of dust seals and bearings and attach to the cushion conrod.

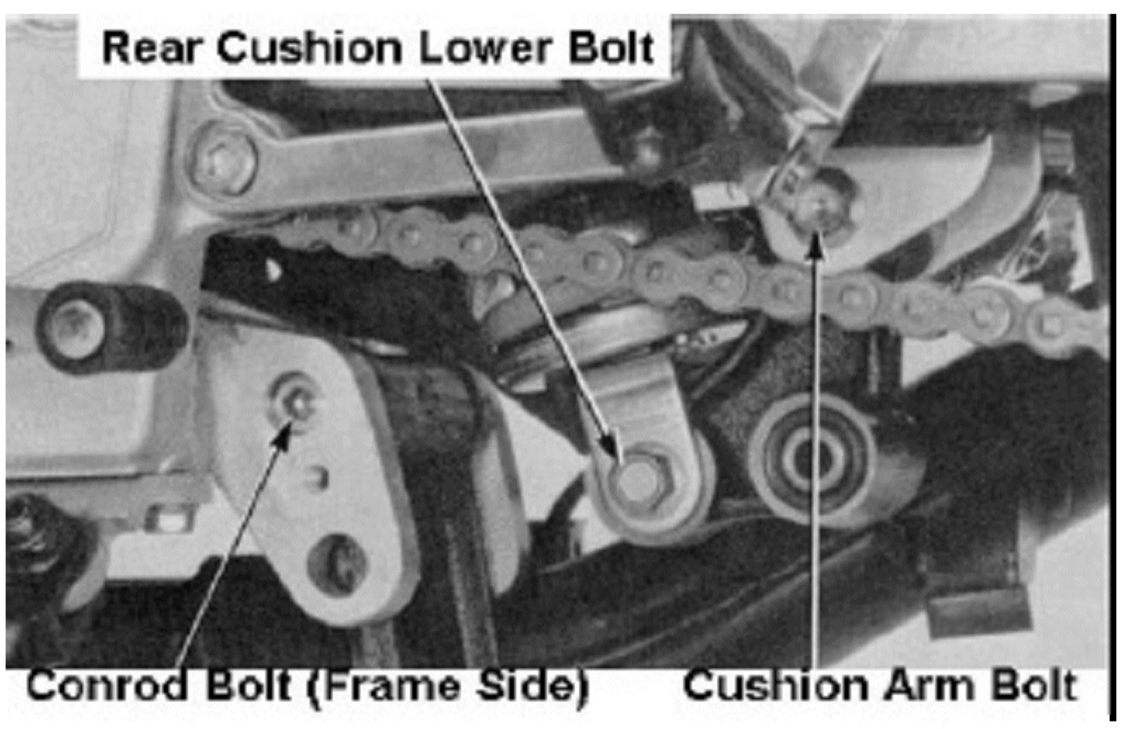


Attachment

Attach the cushion arm and the cushion conrod.

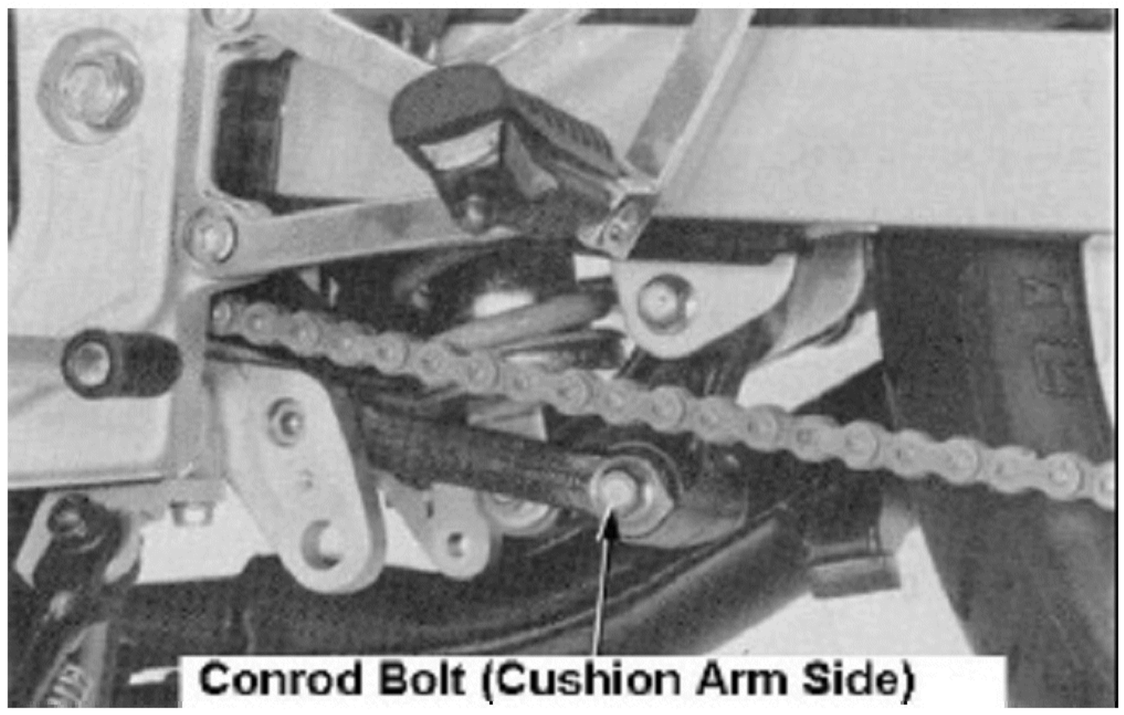
Torque:

Cushion arm bolt	5.0 ~ 6.0kg-m
Rear cushion lower bolt	5.0 ~ 6.0kg-m
Conrod bolt (frame side)	5.0 ~ 6.0kg-m



Tighten the conrod attachment bolt.

Torque: 5.0 ~ 6.0kg-m



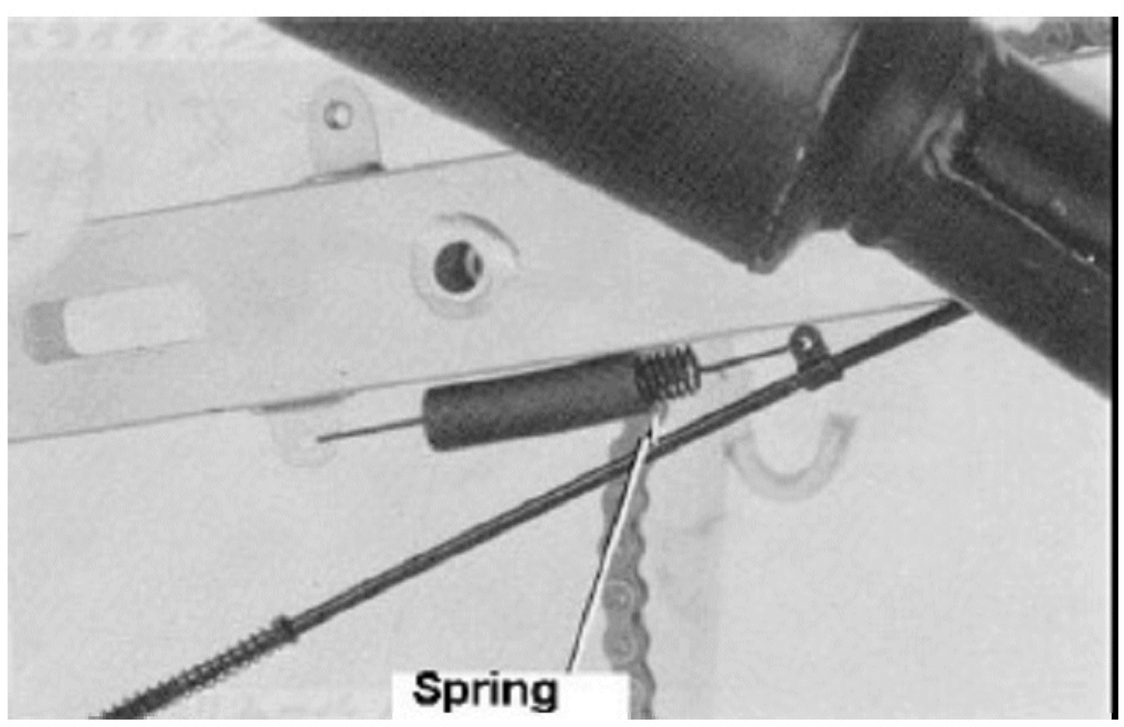
Rear fork

Detachment

Detach the rear wheel (14-3)

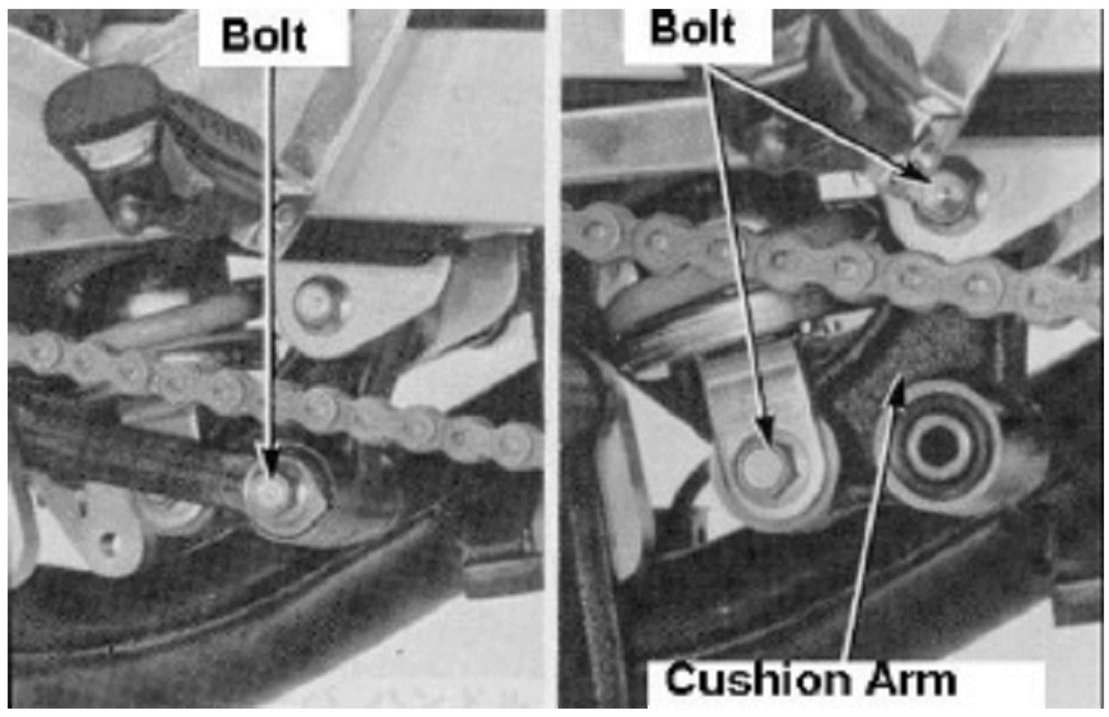
Detach the rear fender (16-2)

Detach the rear brake return spring from the rear fork.

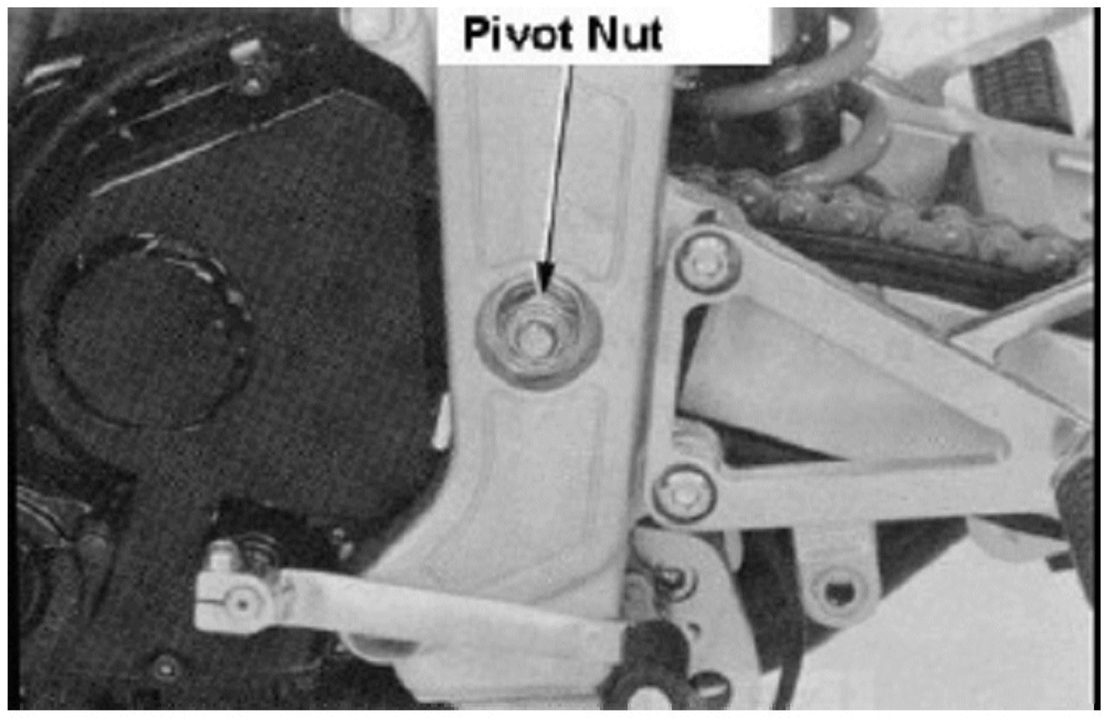


Remove the conrod bolt (cushion arm side)

Remove the cushion lower bolt and the cushion arm bolt and detach the cushion arm.



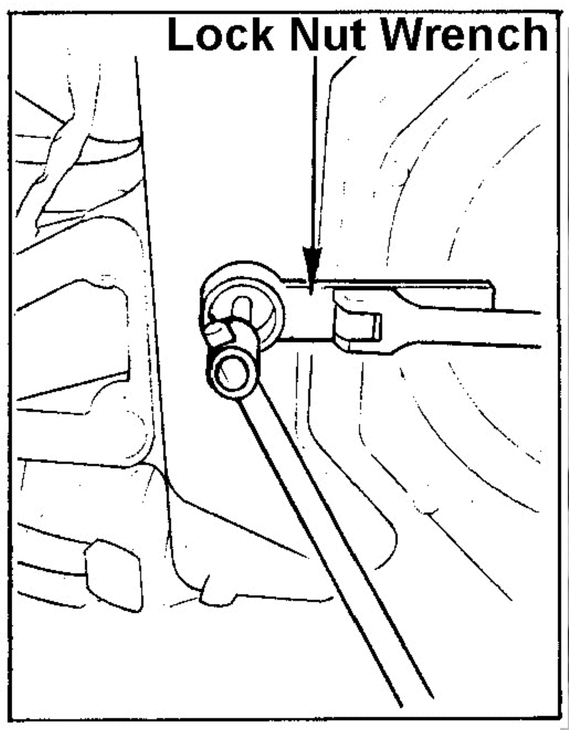
Remove the rear fork pivot nut.



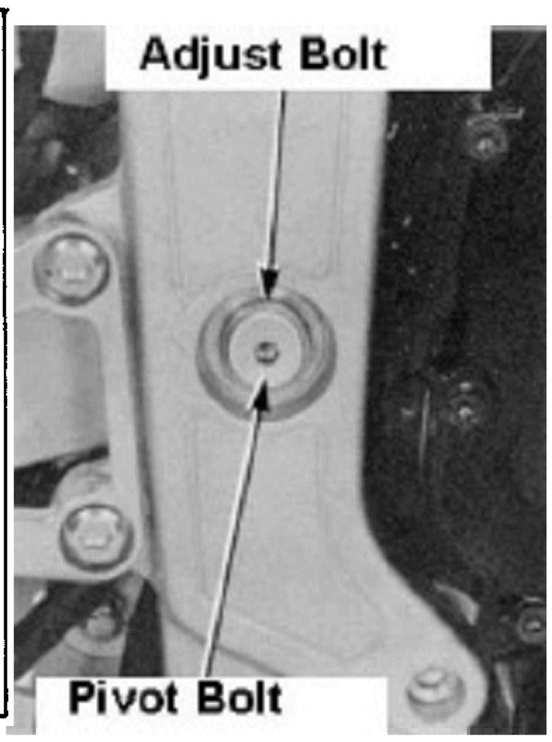
Remove the rear fork pivot lock nut.

Exc. tool

Lock nut wrench
07GMA-KT70200

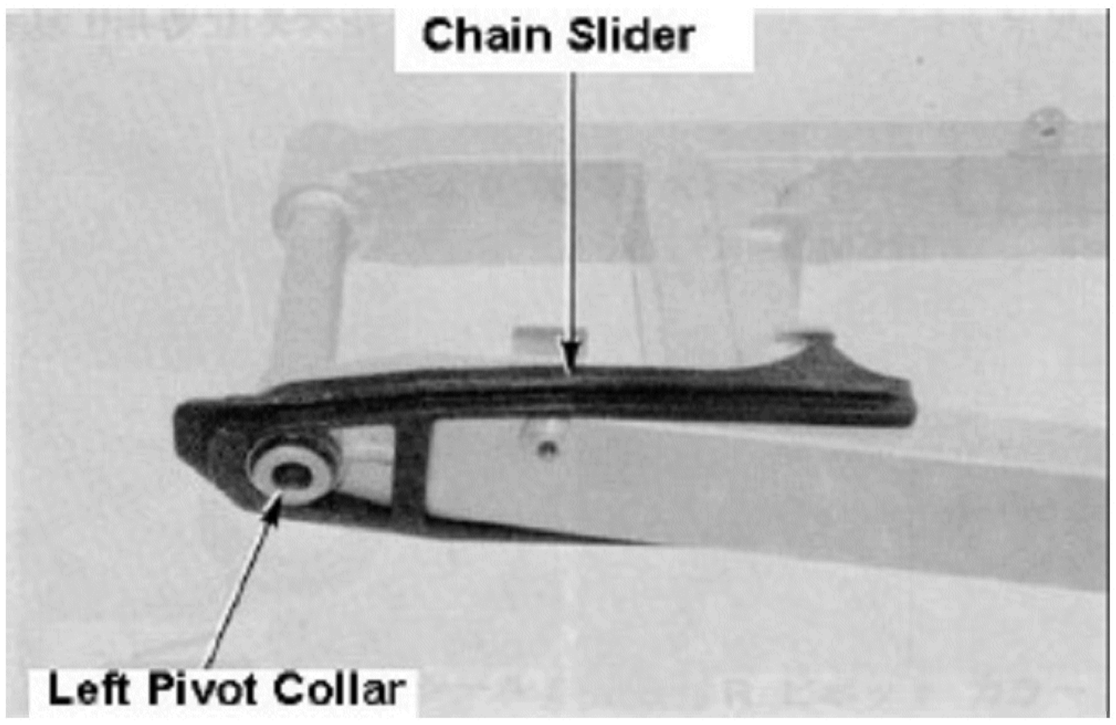


Remove the rear fork pivot adjust bolt and the pivot bolt at the same time.
Detach the rear fork.



Disassembly

Detach the chain slider and the left pivot collar from the rear fork.



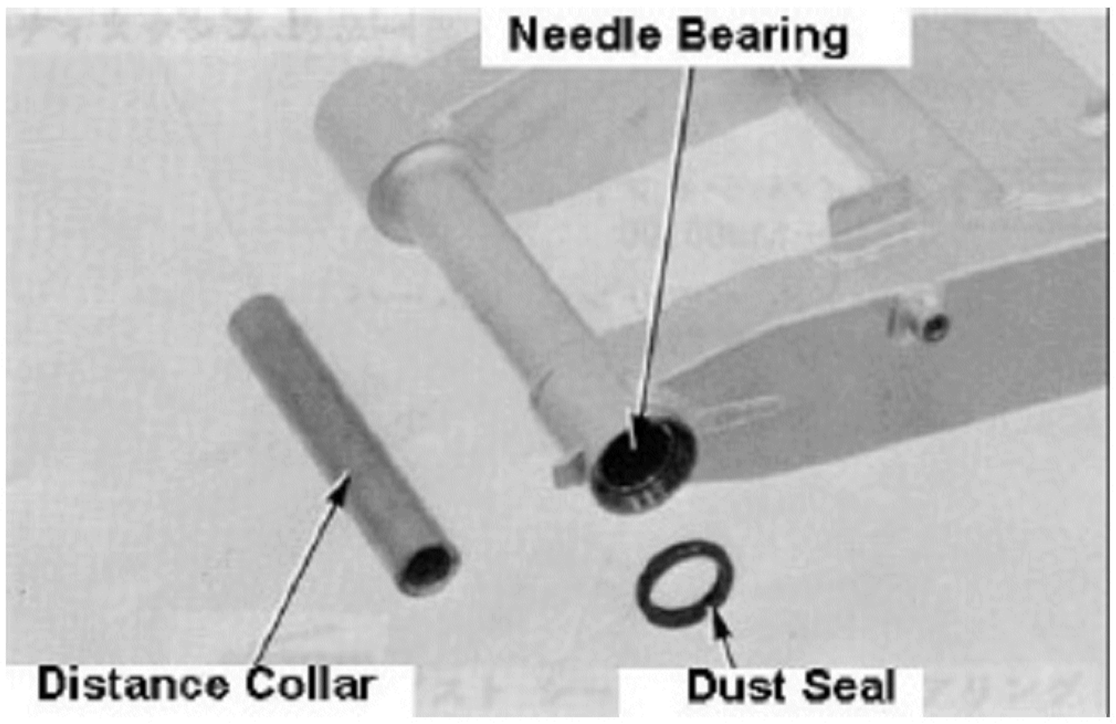
Inspect the pivot collar for damage.

Detach the dust seal.

Detach the distance collar.

Inspect the dust seal and the distance collar for damage.

Inspect needle bearing for damage.



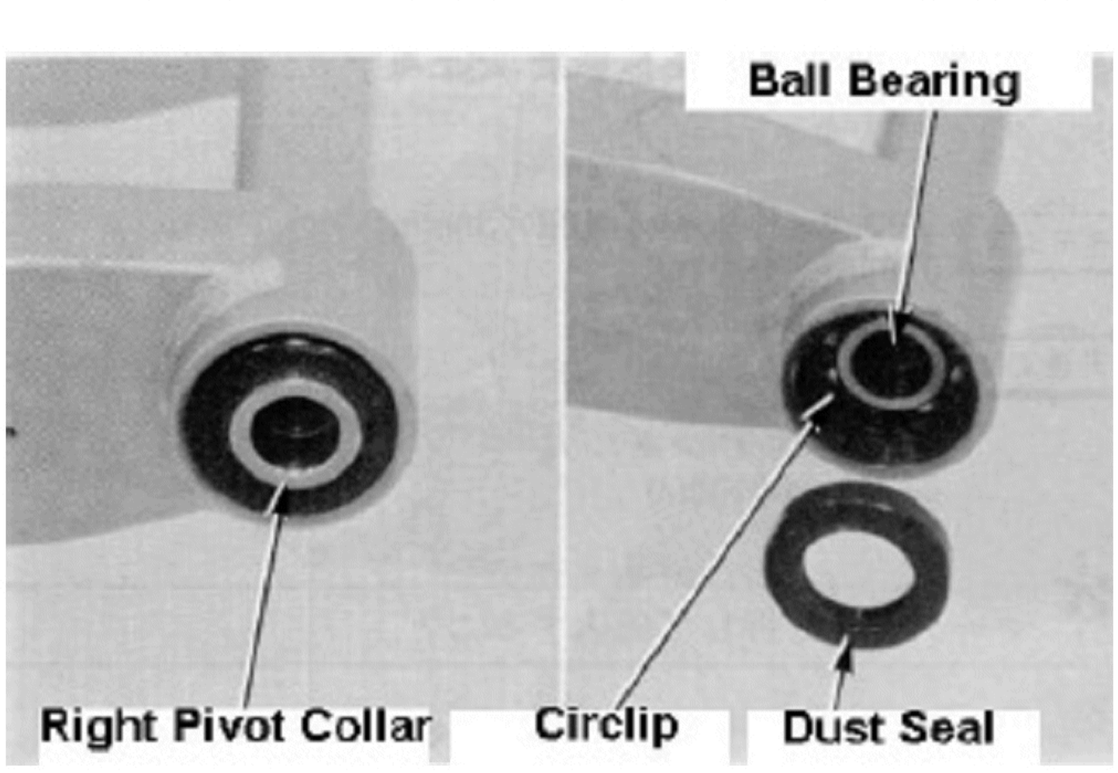
Detach the right pivot collar.

Detach the dust seal.

Inspect the pivot collar and the dust seal for damage.

Inspect the ballbearing for loose fit , sand and smooth spin.

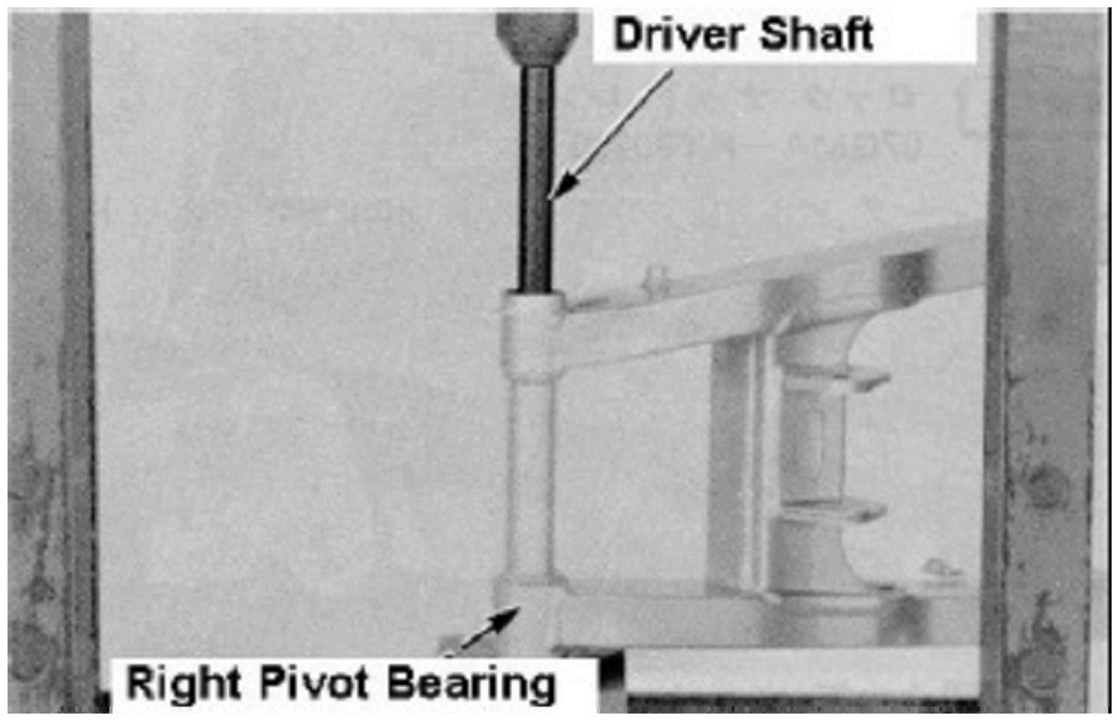
Remove the circlip when replacing the bearing.



Bearing Replacement

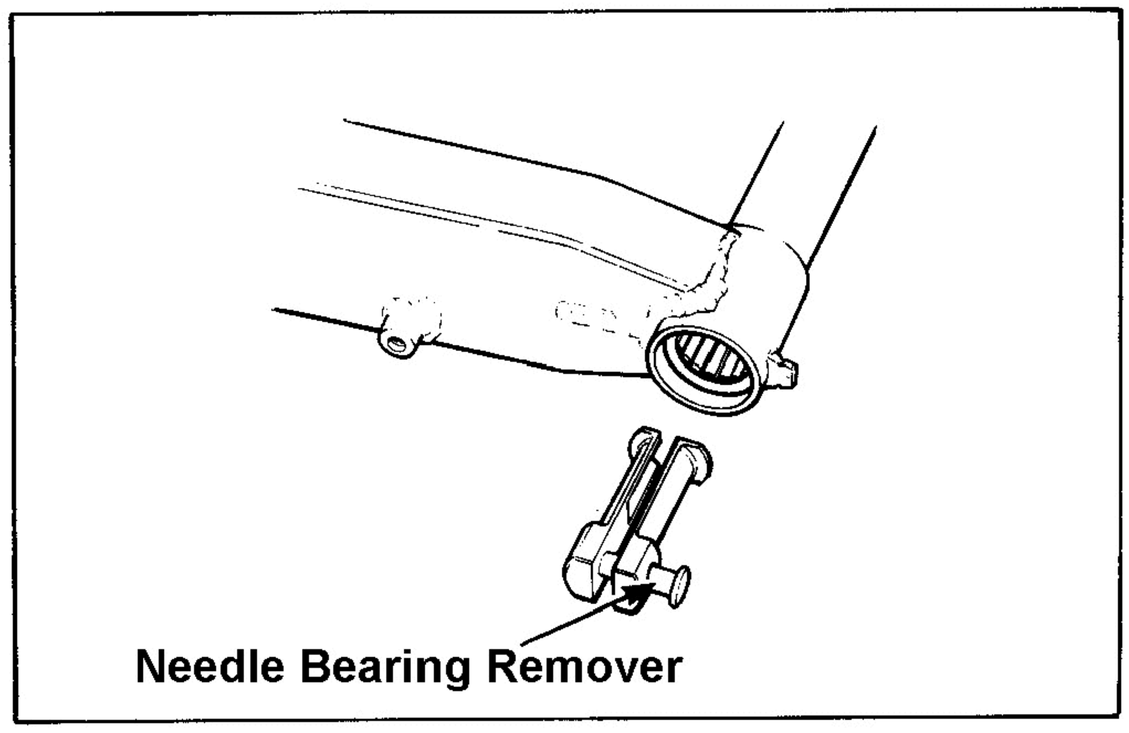
Detach the right pivot bearing (ball bearing).

Exc. tool	
Driver shaft	07946-MJ00100



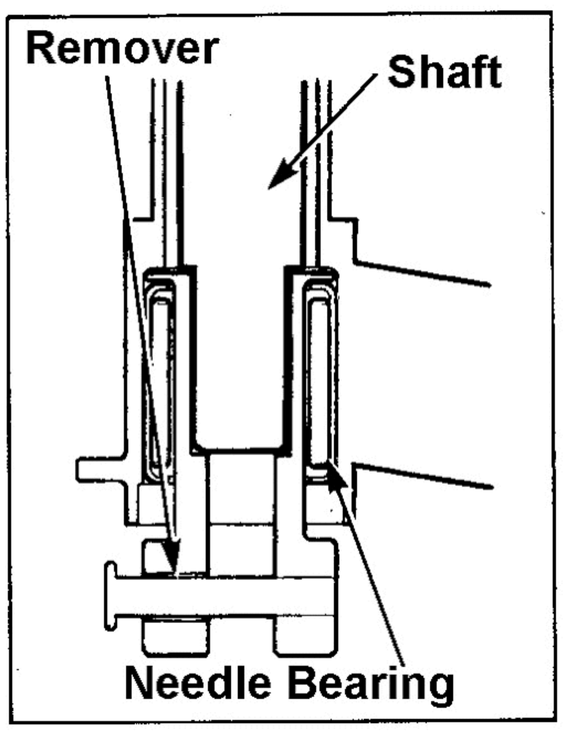
Set the exclusive tool to the left pivot bearing (needle bearing).

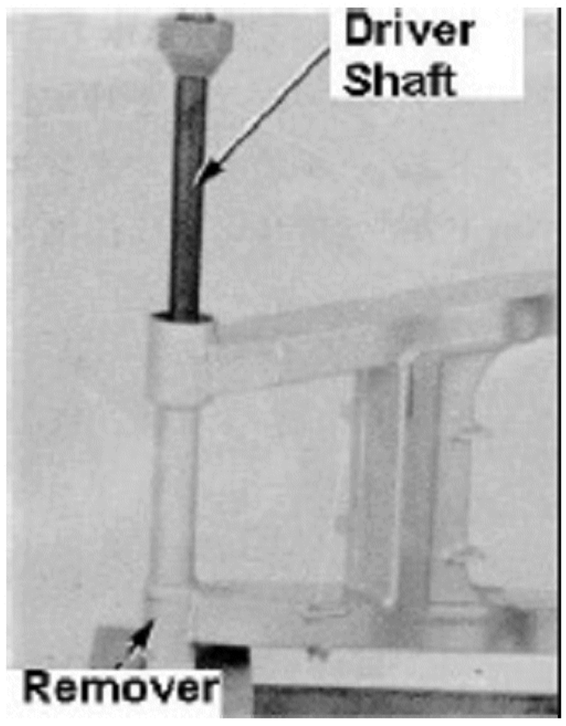
Exc. tool	
Needle bearing remover	07GMD-KT70200



Set the driver shaft as shown in the figure.
Detach the left pivot bearing.

Exc. tools	
Driver shaft	07946-MJ00100
Needle bearing remover	07GMD-KT70200



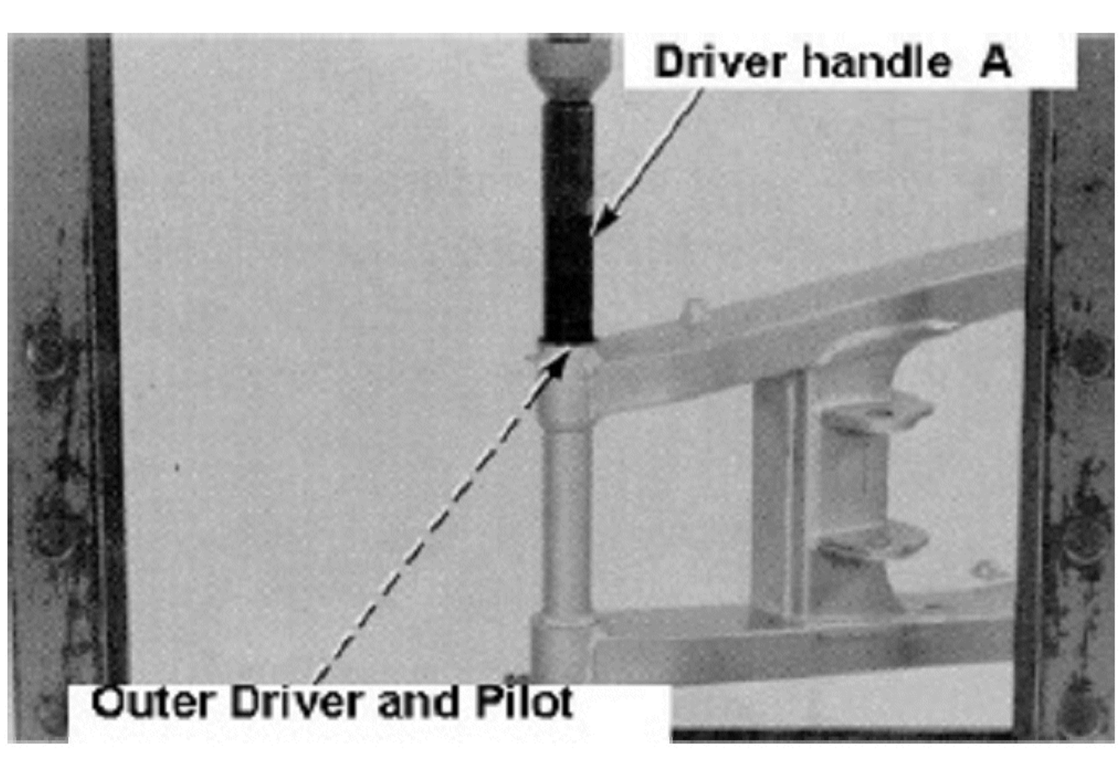


By using a hydraulic press, set the left pivot bearing (needle bearing).

Exc. tool	
Outer driver (28x30mm)	07946-1870100

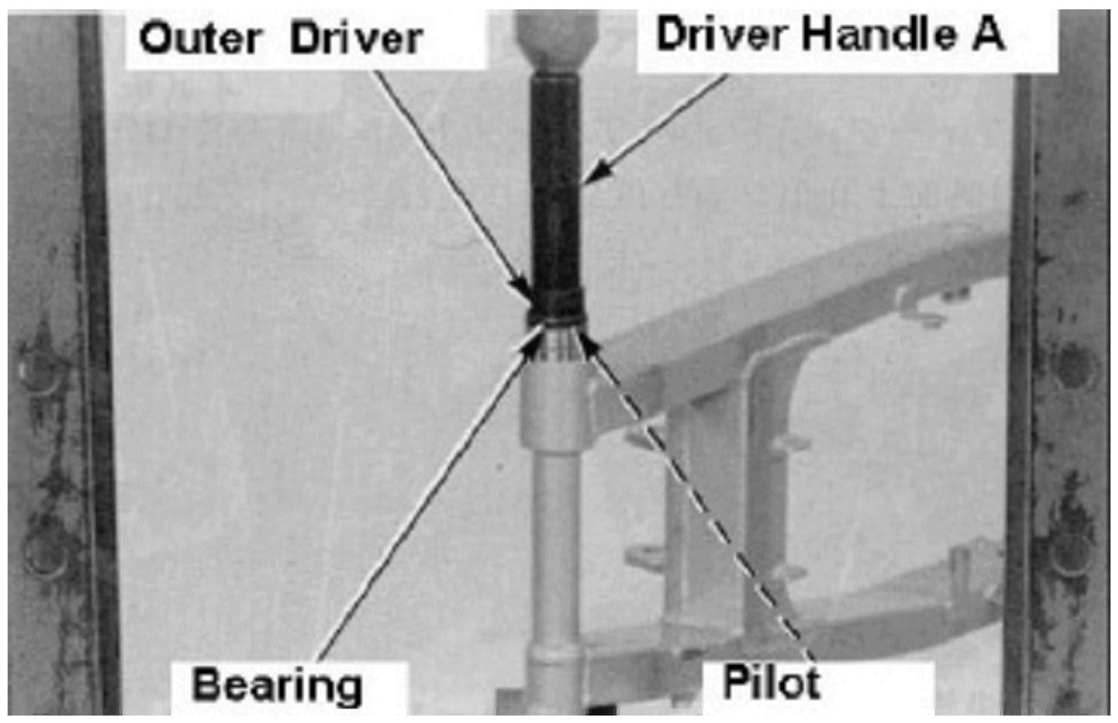
Common tool	
Pilot (22mm)	07746-0041000
Driver handle A	07749-0010000

Press the marked side in.



By using hydraulic press, insert the right pivot bearing (ball bearing).

Common tool	
Outer driver (32 x 35mm)	07746-0010100
Pilot (15mm)	07746-0040300
Driver handle A	07749-0010000

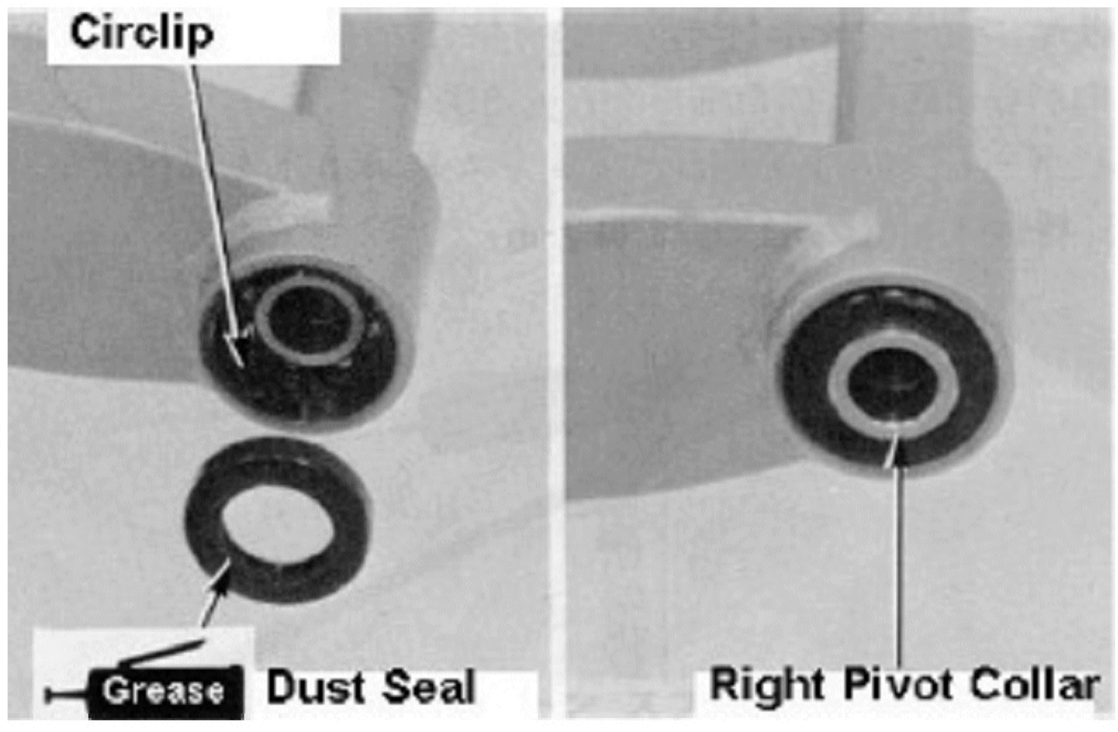


Assembly

Attach the circlip to the slit.

Apply grease to the lip of the right pivot dust seal and attach the seal.

Attach the right pivot collar.



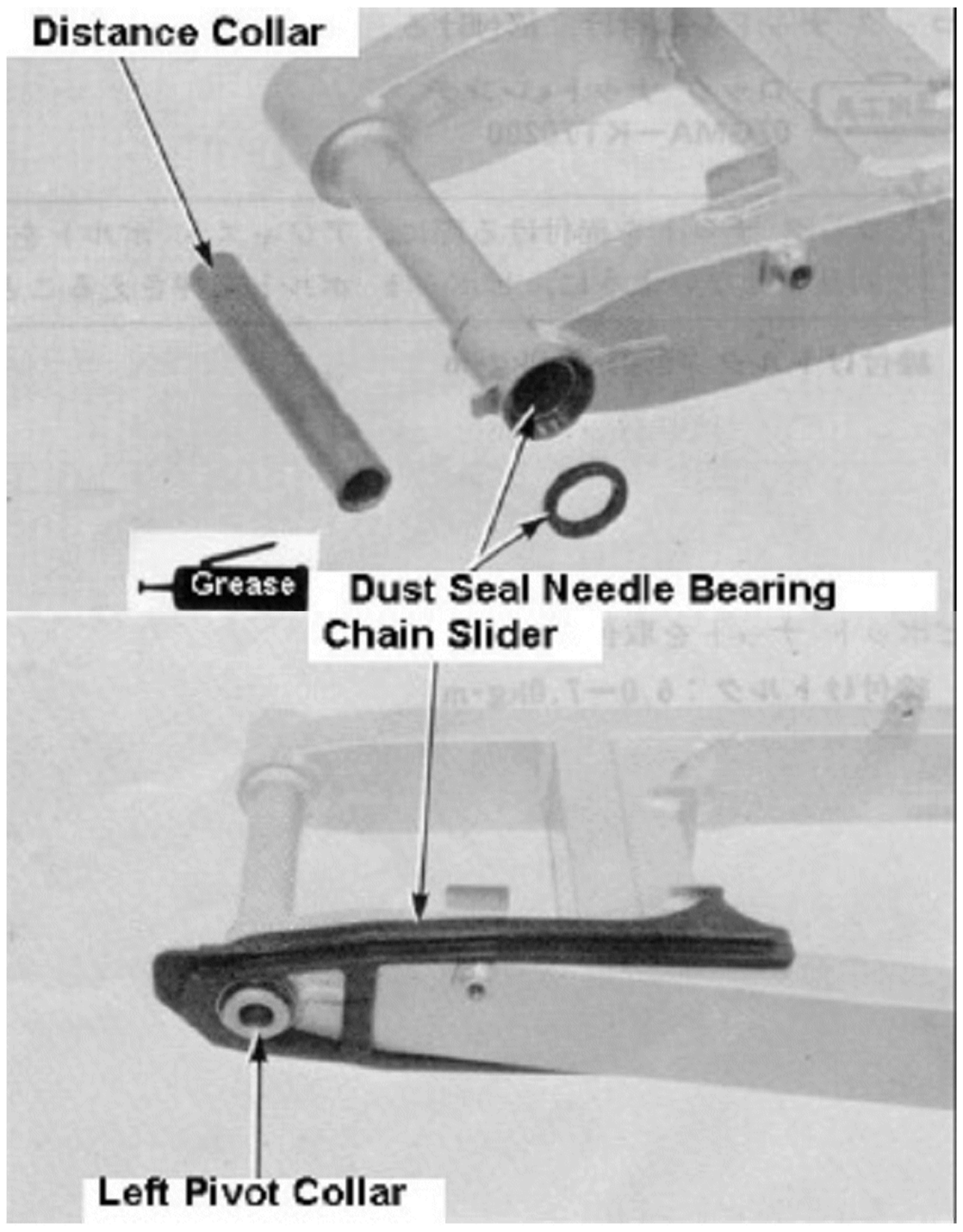
Apply enough grease to the left pivot bearing.

Attach the distance collar.

Apply grease to the lip of the left pivot dust seal and attach the dust seal.

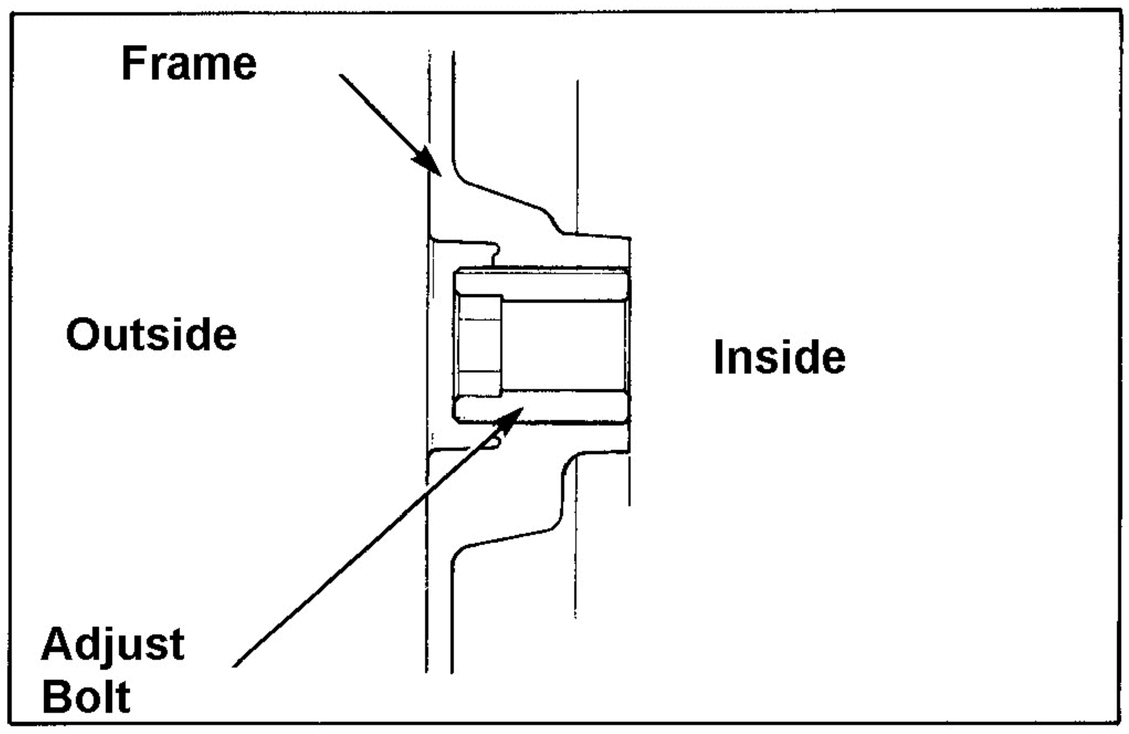
Attach the left pivot collar.

Attach the chain slider.



Attachment

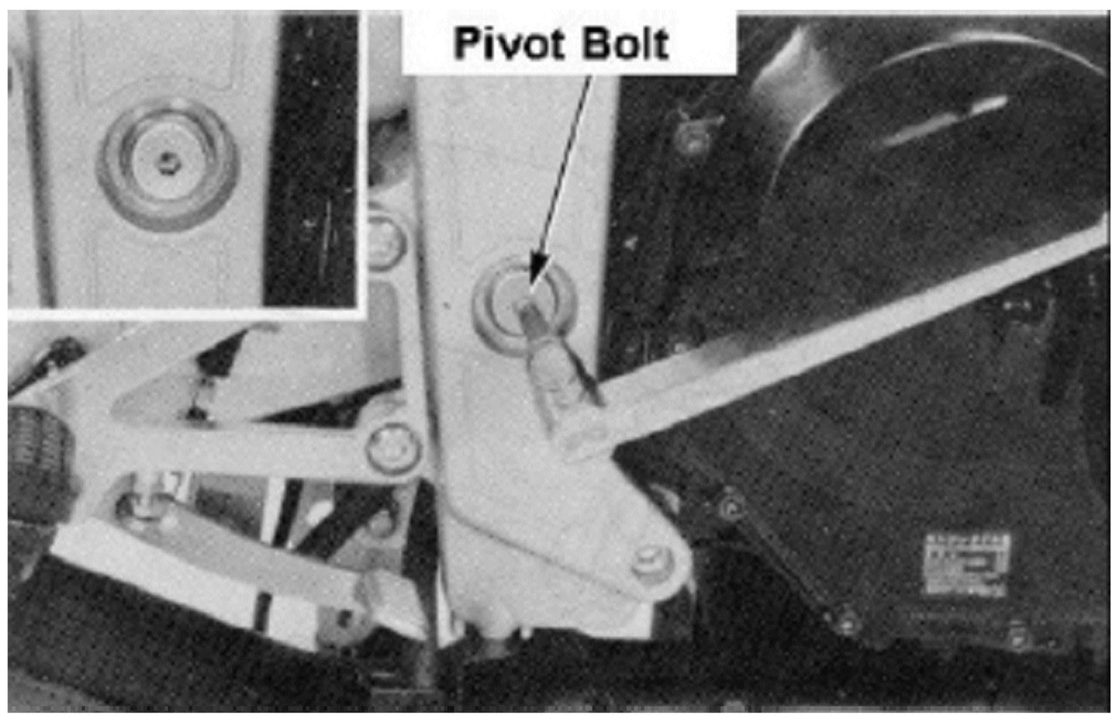
Screw in the rear fork pivot adjust bolt and stop before it's edge goes beyond the inner surface of the frame.



Attach the rear fork and insert the pivot bolt from an adjust bolt side and align the hexagon part.

Rotate the pivot bolt and tighten the adjust bolt.

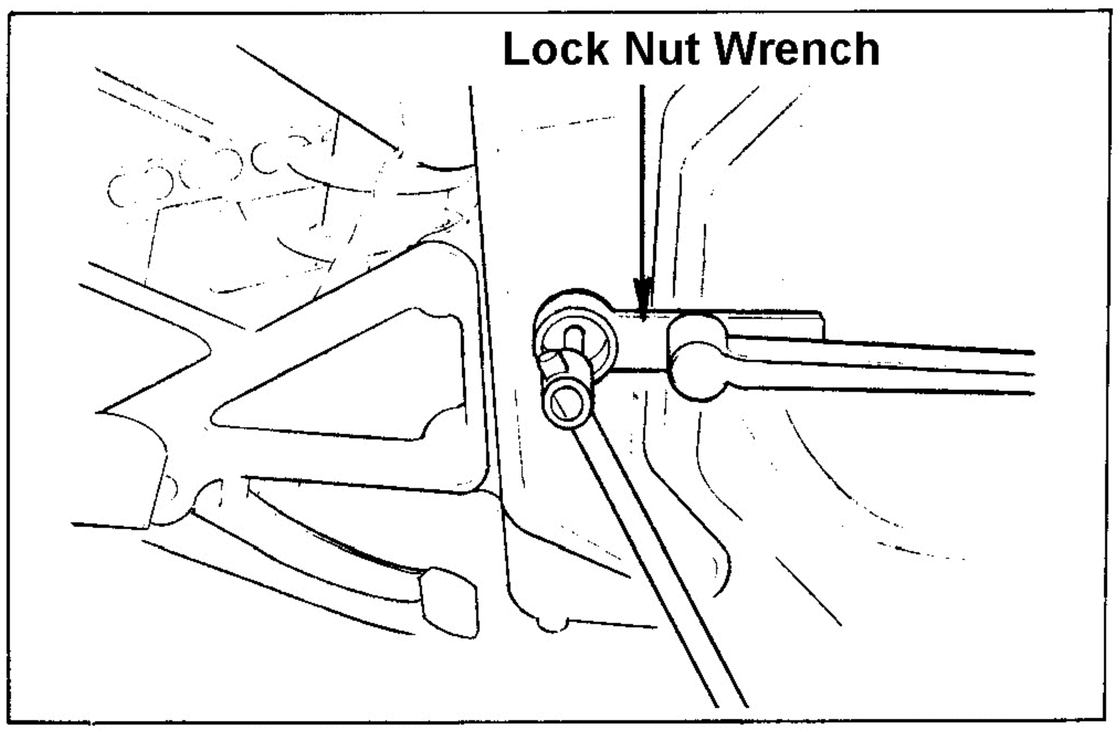
Torque: 1.0 ~ 2.0kg-m



Attach the lock nut and tighten.

Exc. tool

Lock nut wrench
07GMA-KT70200

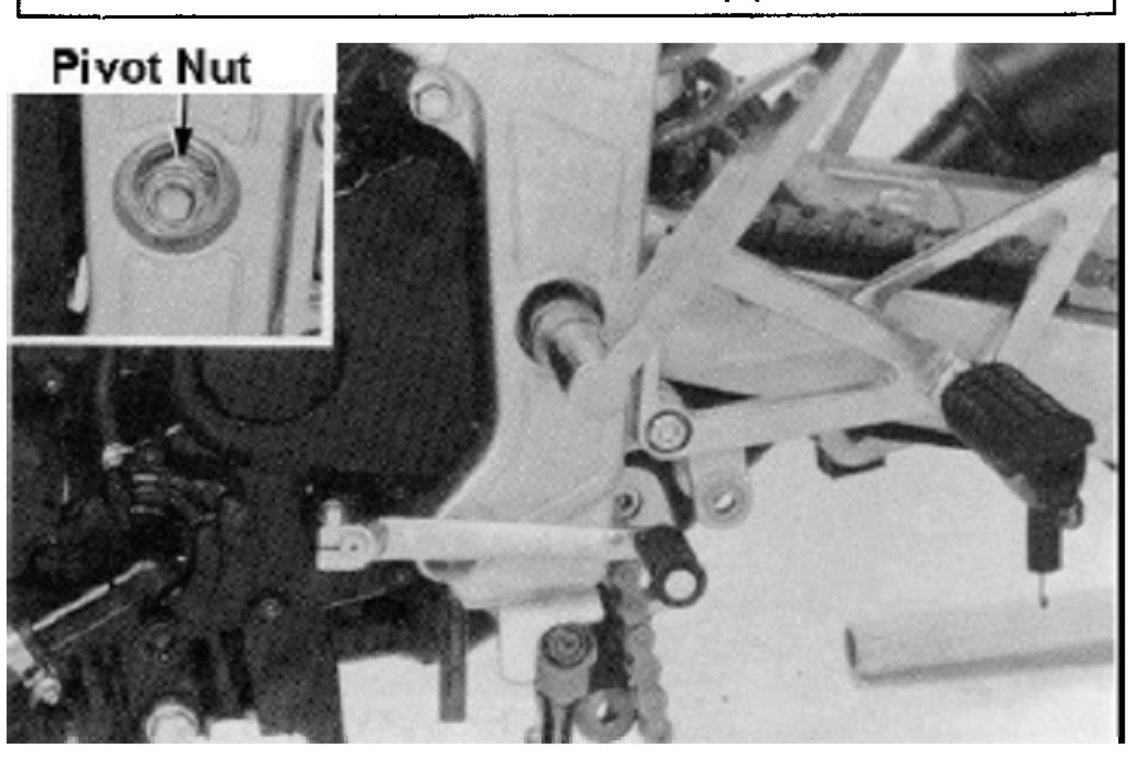


When tightening the lock nut, hold the pivot bolt in order to prevent an adjust bolt from spinning together.

Torque: 6.0 ~ 7.0kg-m

Attach and tighten the pivot nut.

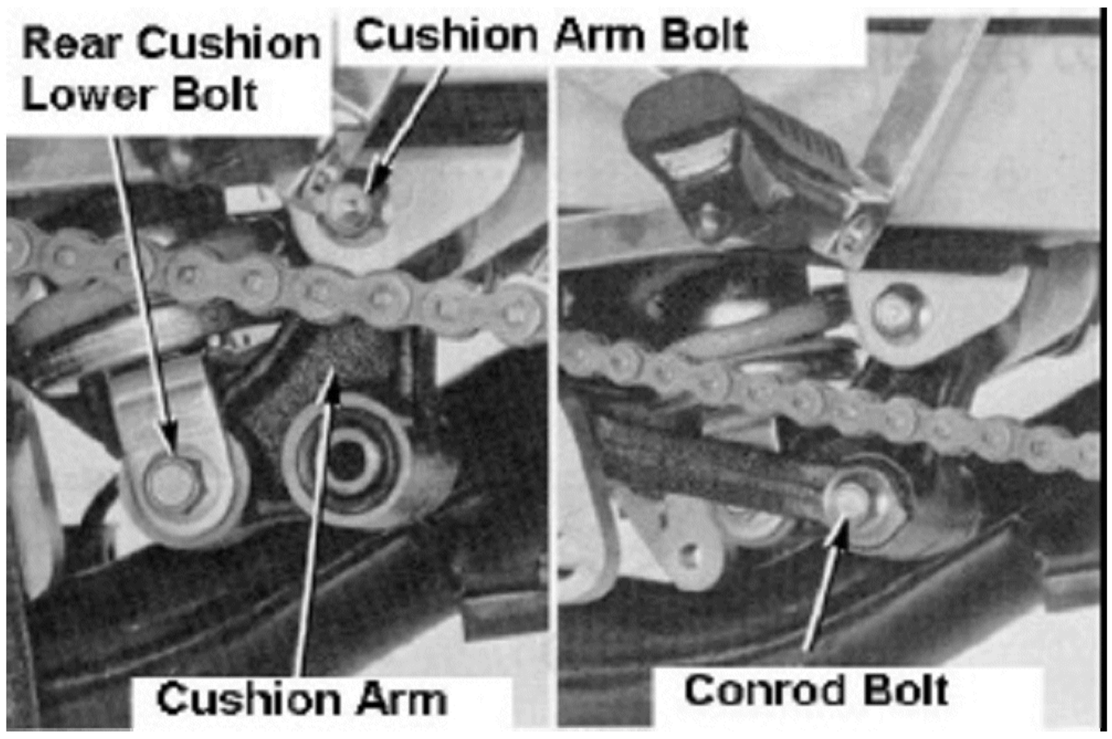
Torque: 6.0 ~ 7.0kg-m



Attach the cushion arm and tighten the bolt.

Torque:

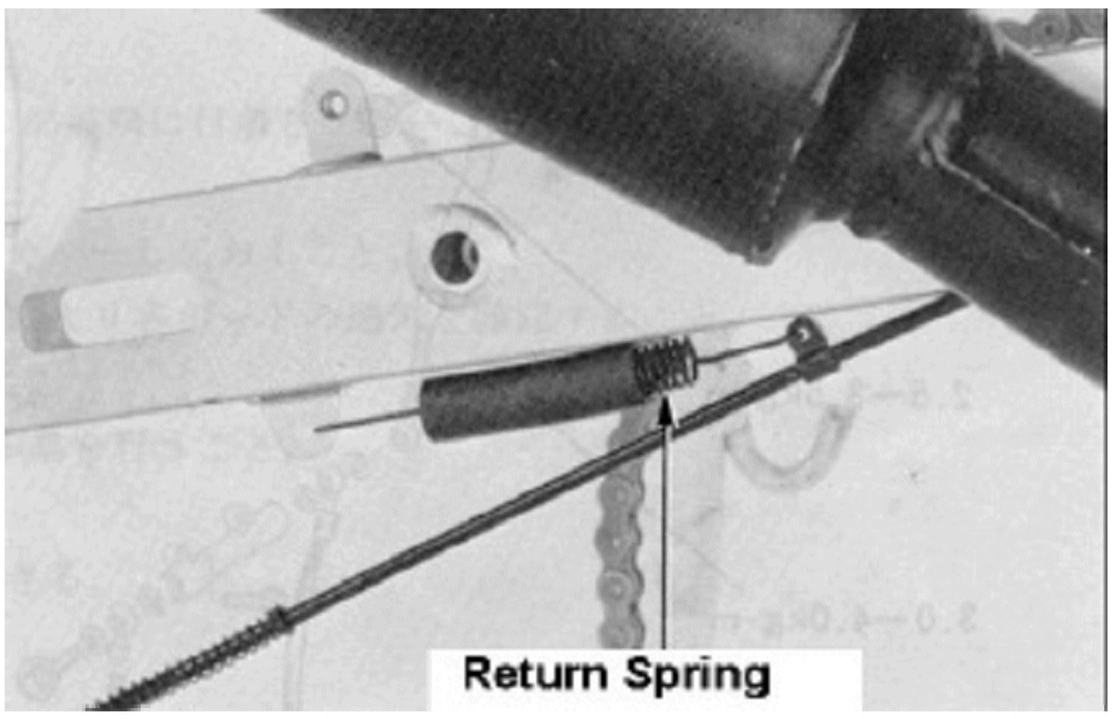
Cushion arm bolt	5.0 ~ 6.0kg-m
Rear cushion lower bolt	5.0 ~ 6.0kg-m
Conrod bolt (cushion arm side)	5.0 ~ 6.0kg-m



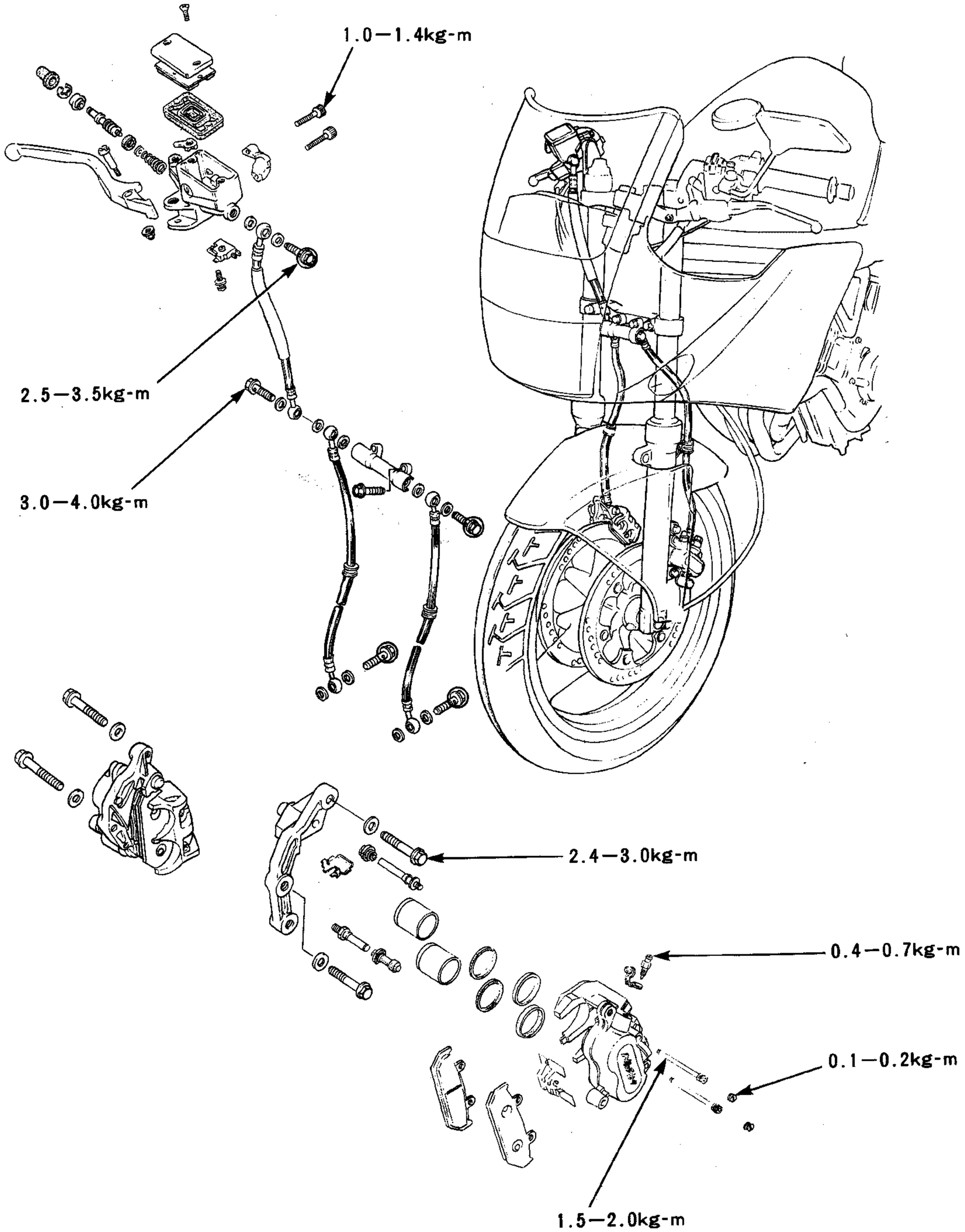
Attach the rear brake return spring to the rear fork.

Attach the rear fender chain guard (16-2)

Attach the rear wheel (14-7)



- Disassembly



Disassembly	15-0	Brake pad / disk	15-4
Service information	15-1	Master cylinder	15-6
Troubleshooting	15-2	Brake caliper	15-9
Brake fluid replacement / air bleed	15-3		

Service information

General caution

- When replacing brake fluid, keep away from debris and water.
- In order to avoid chemical reaction, do not mix different brands of brake fluids.
- Do not re-use the drained brake fluid.
- Keep the fluid away from other parts as the brake fluid will damage the paint, plastic or rubber surfaces.
- Split brake fluid should be wiped off with a cloth.
- Cover the joint on hoses to prevent brake fluid leaks.
- Clean the detached parts with brake fluid and check air passages with compressed air.
- Keep the detached parts away from dust or debris.
- Re-assemble the parts after checking they have no dust or debris attached.
- Do replace all of the designated parts.
- Brake pads can be replaced without disconnecting hoses.
- Bleed air from the system after disconnecting the brake hose.

Service standards

Item	Standard	Limit
Brake disk thickness	3.8-4.2	3.5
Brake disk deformation	-	0.3
Master cylinder inner diameter	14.000-14.043	14.055
Master piston outer diameter	13.957-13.984	13.945
Caliper cylinder inner diameter	27.000-27.050	27.06
Caliper piston outer diameter	26.918-26.968	26.91

Torque

Front caliper bracket	2.4~3.0kg-m	Brake hose attachment Bolt	2.5~3.5kg-m
Hanger pin	1.5~2.0kg-m	Brake hose tightening Bolt	3.0~4.0kg-m
Master cylinder Holder bolt	1.0~1.4kg-m	Bleeder valve	04~0.7kg-m
Hanger pin plug	0.1~0.2kg-m		

Tools

Exclusive tool

Snap ring pliers 07914-3230001

Troubleshooting

Poor brake performance

- Air in brake system
- Lack of brake fluid
- Brake fluid leak
- Brake pad wear
- Dirty pad / disk surface

Brake lever heavy or unable to release

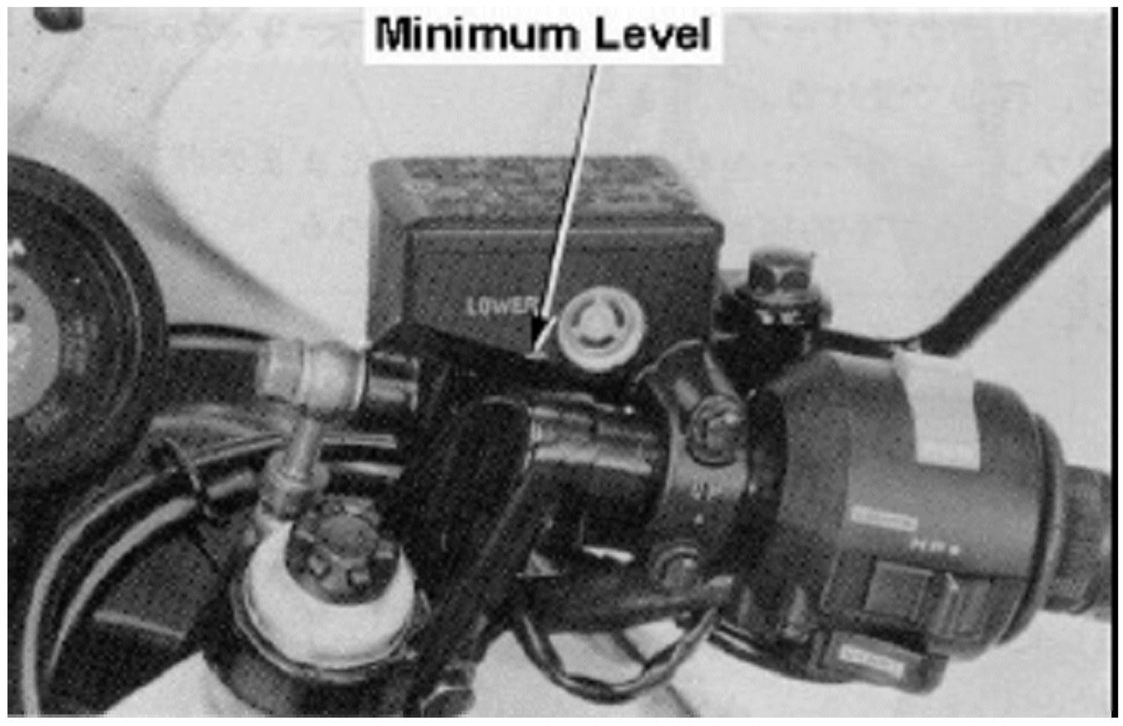
- Caliper piston fixed
- Brake system jammed
- Master piston jammed

Noise from brake

- Pad dirty / worn out
- Disk deflection / wear / dirt
- Poor caliper attachment
- Misalignment of the disk or the wheel
- Lack of lubrication at hanger pin – pad contact

Brake fluid replacement / air bleed

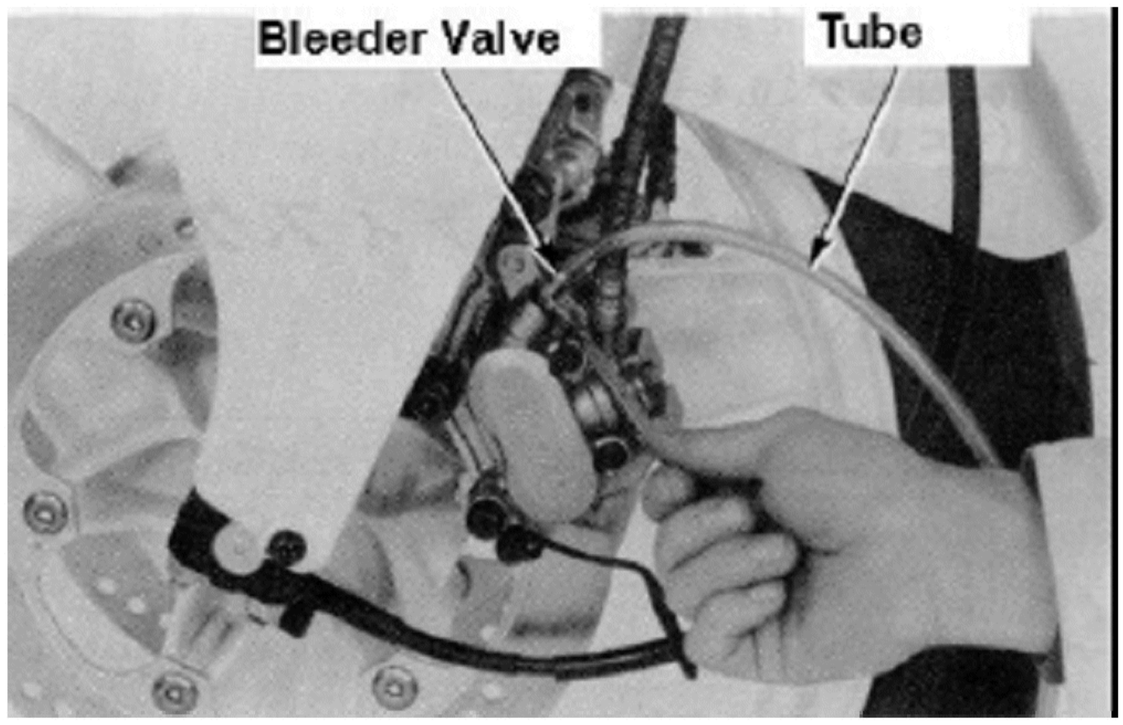
Place the master cylinder horizontally and check the brake fluid level.



- Watch out for debris/water when refilling the brake fluid.
- Do not mix different brands of brake fluids, it may cause change in quality.
- Keep the brake fluid away from painted, plastic and rubber surfaces.
- Use DOT3 or DOT4 brake fluid.

Brake fluid bleed

Remove the reservoir cap and the diaphragm.
Attach the transparent tube to the bleeder valve.
Loosen the bleeder valve on the caliper and pump the brake lever.
Repeat this until brake fluid stops coming out from the valve.

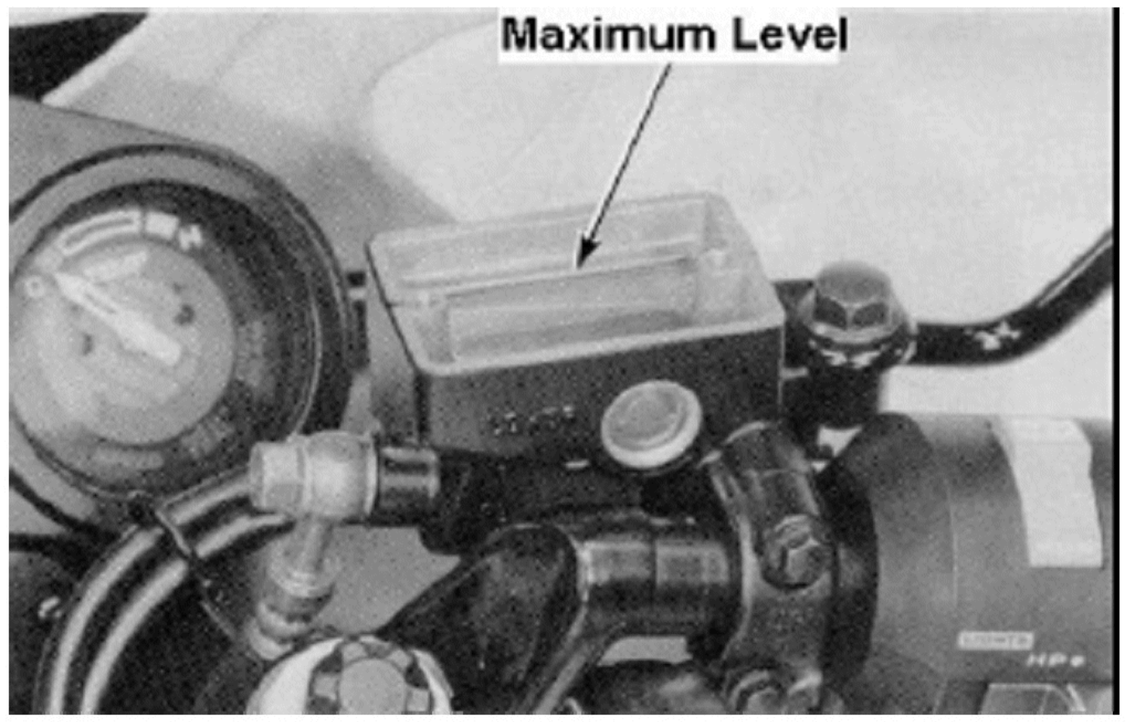


- Keep brake disks and pads clean or the braking performance may drop.
- If the pads are dirty, replace them, wipe dirt off from brake disks.

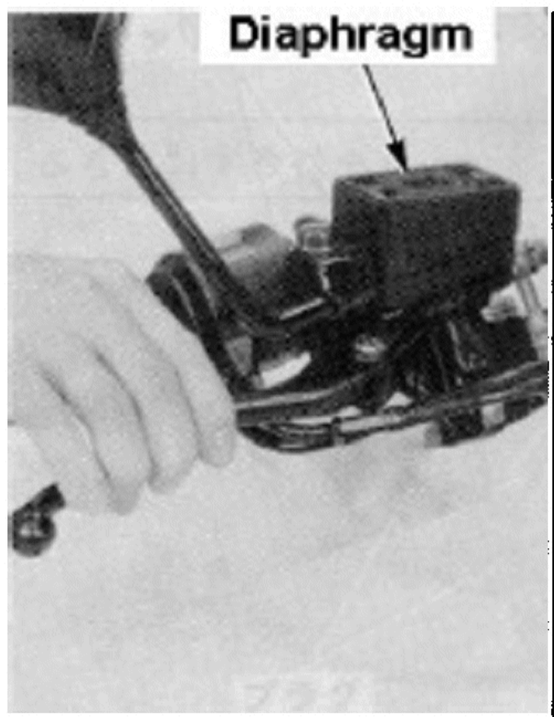
Air bleed

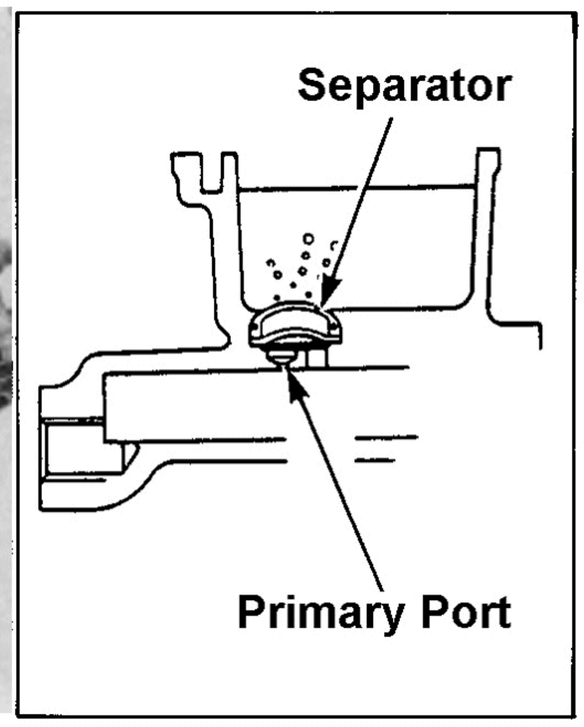
Keep monitoring the brake fluid level. If the level comes down to the minimum level, refill the fluid and resume the work.

Tighten the bleeder valve and refill the brake fluid in the master cylinder to the maximum level.



Attach the diaphragm.
Manipulate the brake lever and bleed air from the separator.
Repeat this until no more air comes out from the separator and the primary port (feel heavy on the lever).
Refill the fluid in the master cylinder to the maximum level.



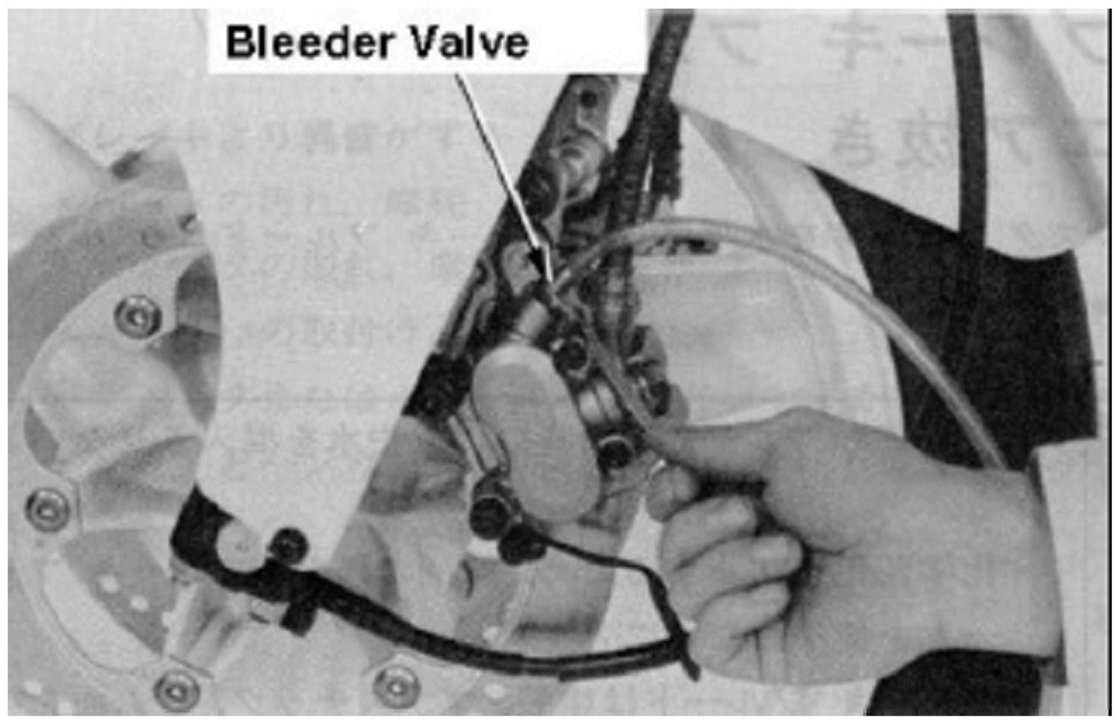


Attach a transparent tube to the bleeder valve on the caliper, and place a container underneath.

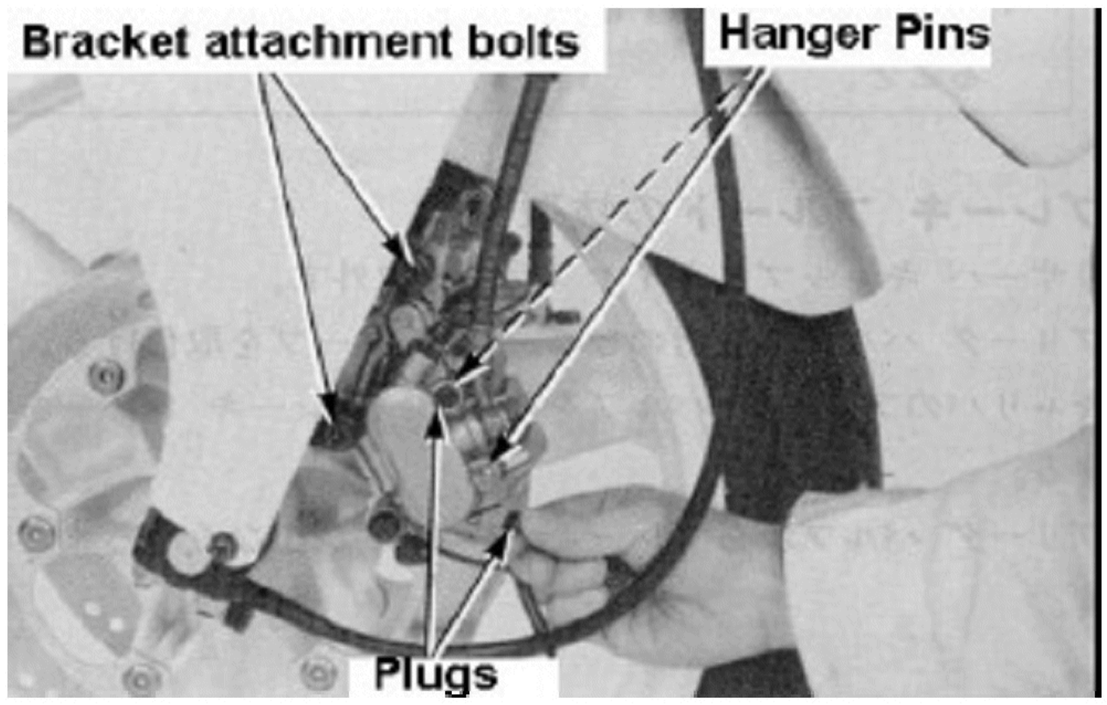
1. Pump the brake lever several times and loosen the bleeder valve for ½ turn while holding the lever, then tighten the valve.

• Do not release the brake lever until the bleeder valve is tightened.

2. Slowly release the brake lever. Leave it for a few seconds in loose position.



Repeat 1) and 2) until no more air comes out from the bleeder valve.
Refill the brake fluid to the maximum level.
Tighten the bleeder valve
Torque: 0.4 ~ 0.7kg-m

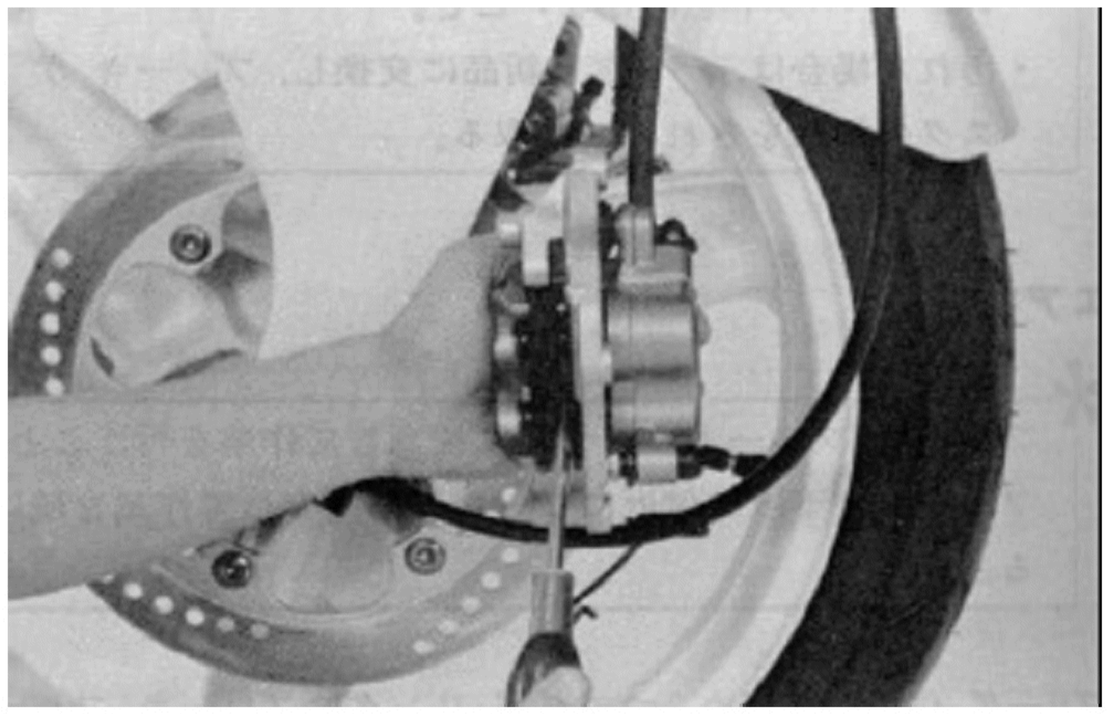


Brake Pad / Disk

Brake pad replacement

Do not disconnect brake hose when replacing the pads.

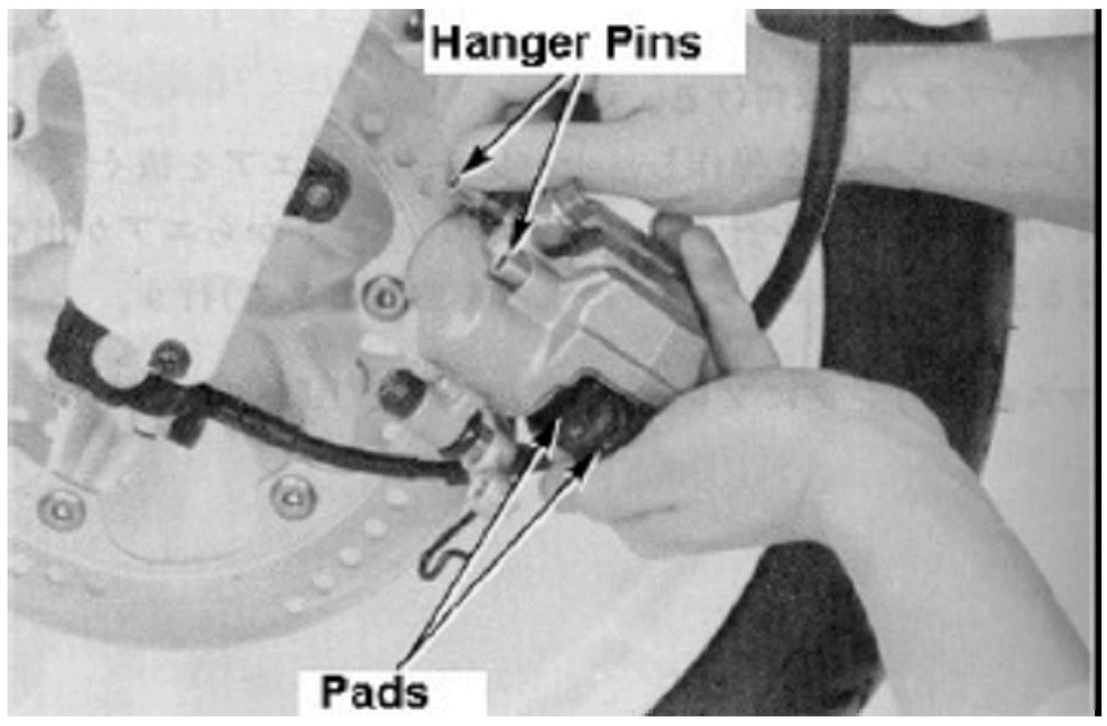
Disconnect plugs and loosen hanger pins.
Remove two bracket attachment bolts and disconnect the caliper bracket from the front fork.



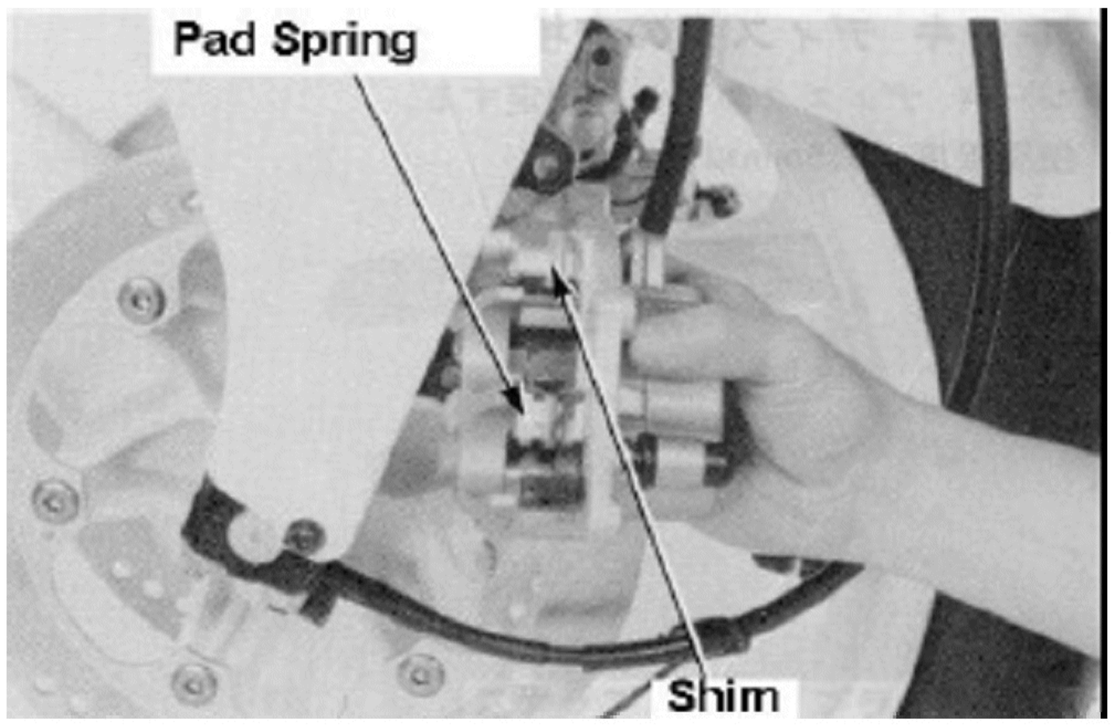
Push the caliper piston in so as to fit the new pad.

Pull hanger pins out and detach the pads.

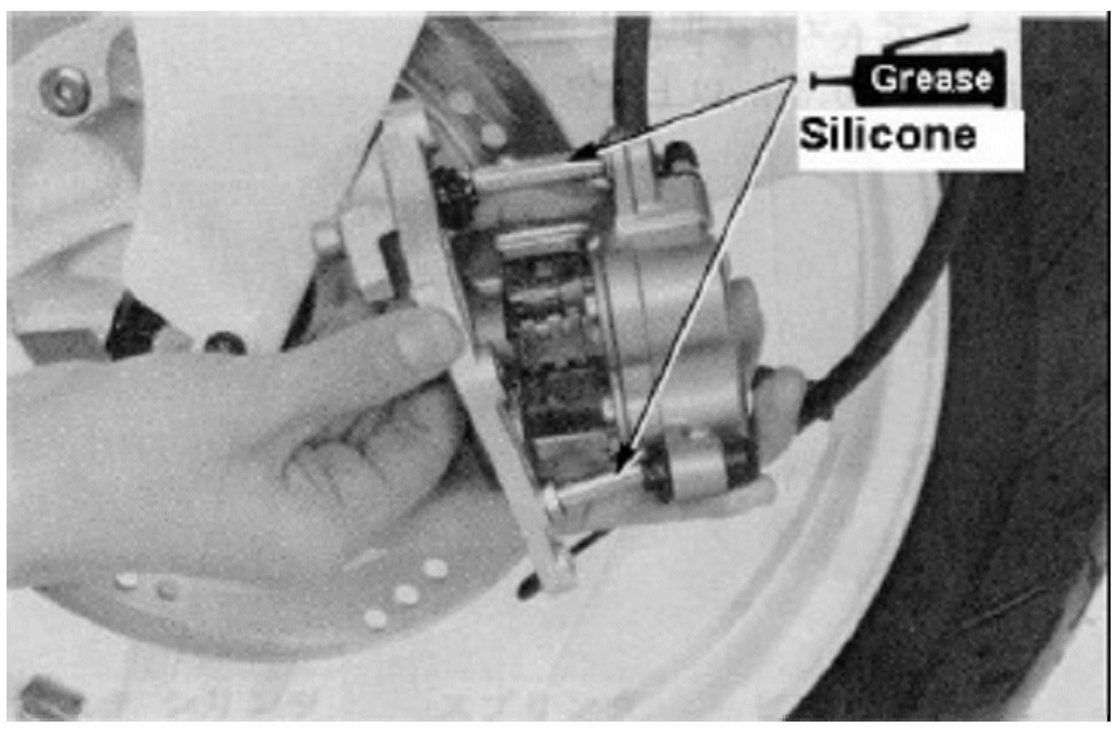
No need to detach the caliper bracket when replacing the pads.



Check the positions of the pad spring and the shim.



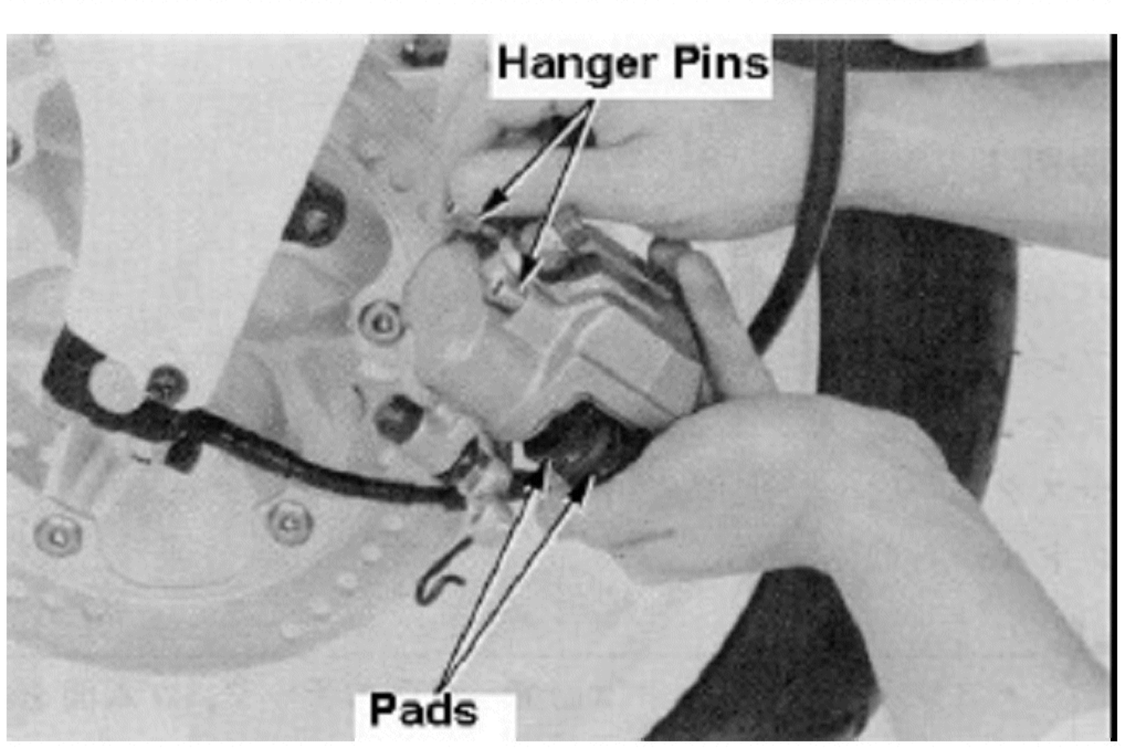
Apply silicone grease to the pin on the caliper bracket.



Attach new pads to the caliper.

Replace both pads at the same time.

Press the pads in. Align the pin holes on the pads and lightly tighten the hanger pins.

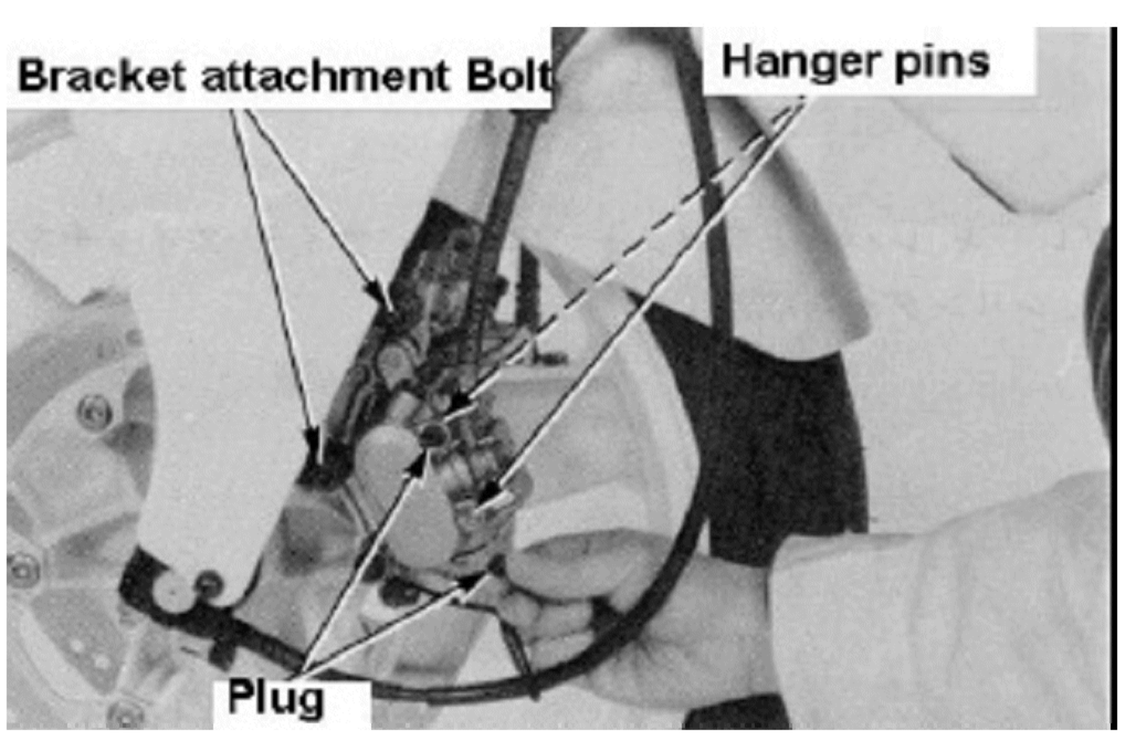


Attach the caliper to the front fork.

Tighten the bracket attachment bolt.
Torque: 2.4 ~ 3.0kg-m

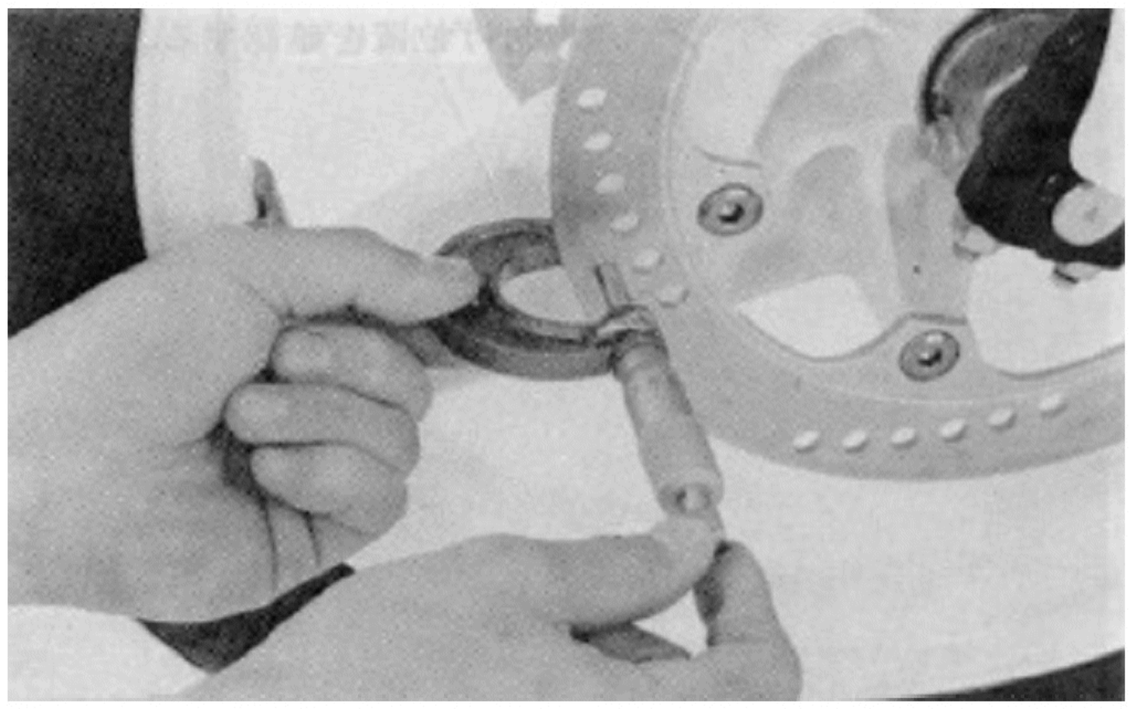
Tighten the hanger pins.
Torque: 1.5 ~ 2.0kg-m

Attach plugs
Torque: 0.1 ~ 0.2kg-m



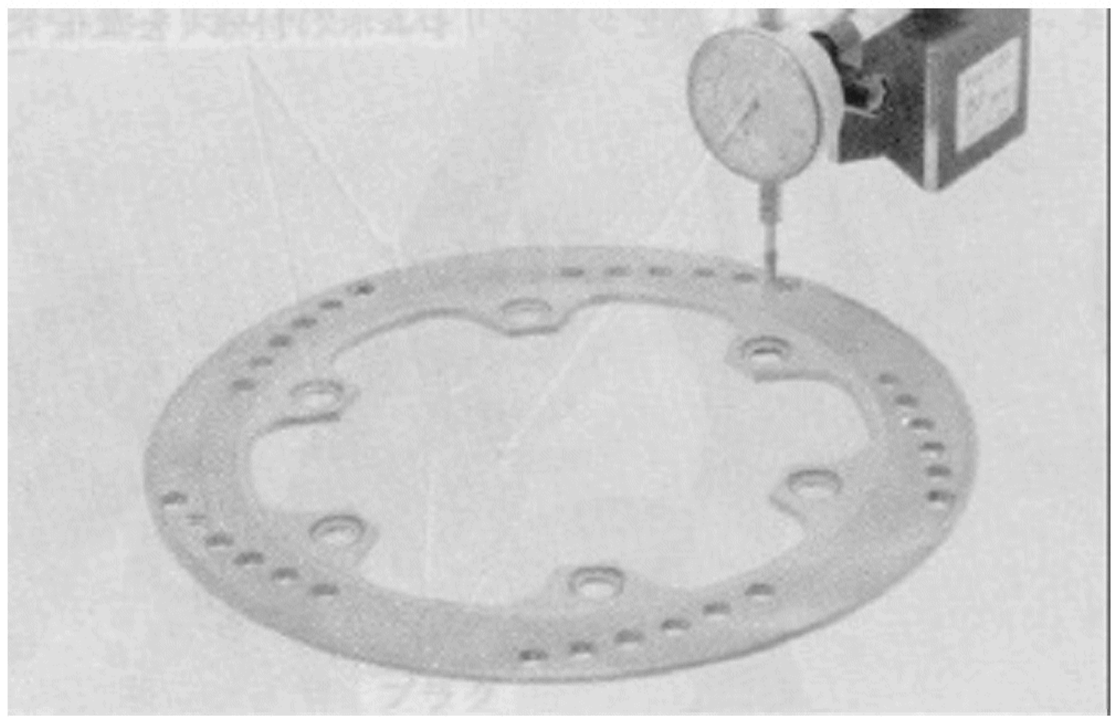
After replacing the pads, pump the brake lever to press the piston out.

Brake disk inspection



Measure the thickness of the brake disk
≦ 3.5mm → Replace

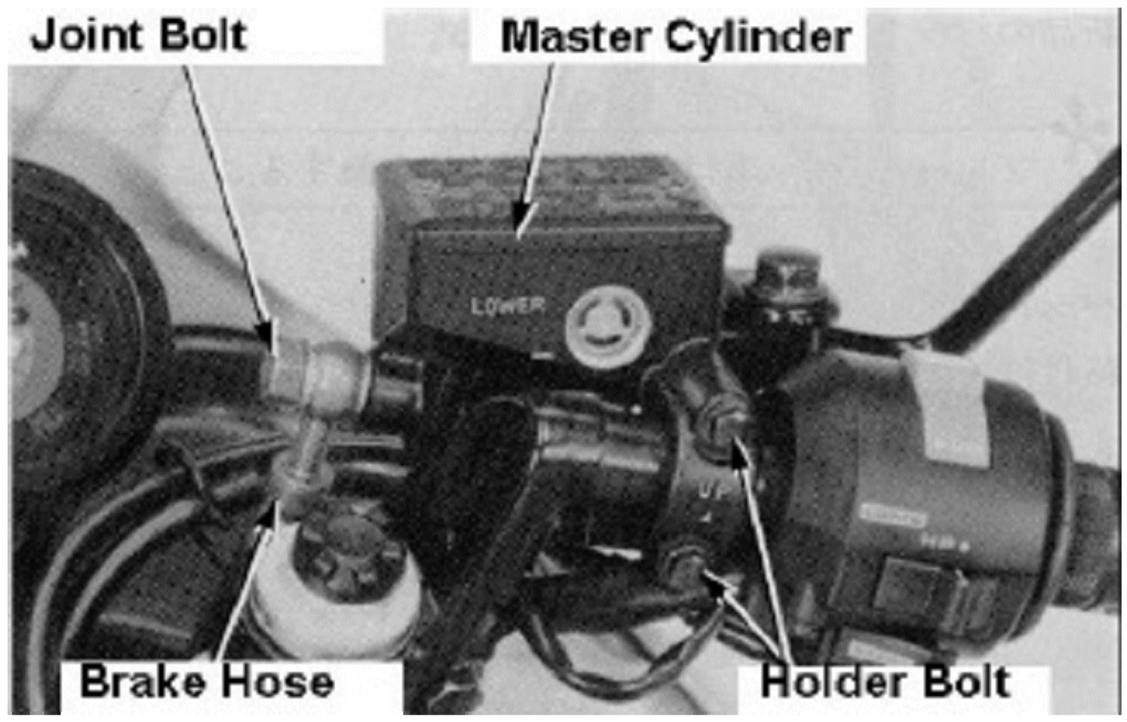
measure the deflection of the disk
≧ 0.3mm → Replace



Master cylinder

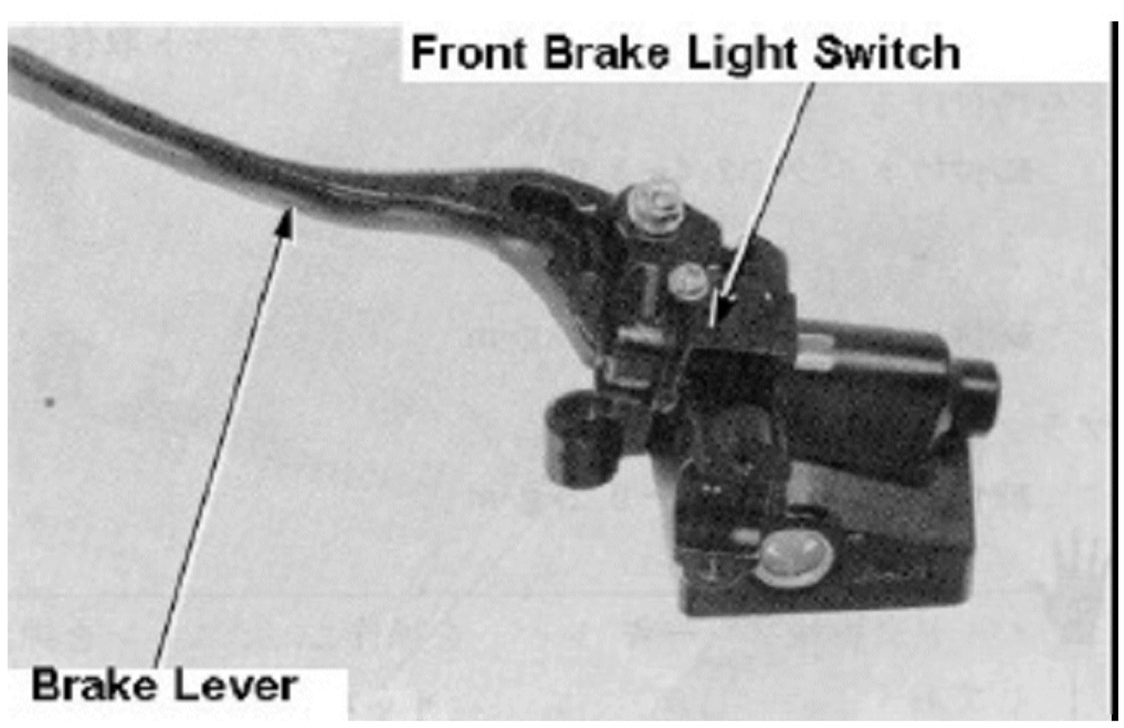
Detachment

Bleed the brake fluid (15-3)
Remove the rear view mirror.
Loosen the brake hose joint bolt and disconnect the brake hose from the master cylinder.
Remove the master cylinder holder bolt and detach the master cylinder from the steering handle.



- Keep the brake fluid away from painted, plastic and rubber surfaces.
- Cover the hose joint to prevent the brake fluid spilling.

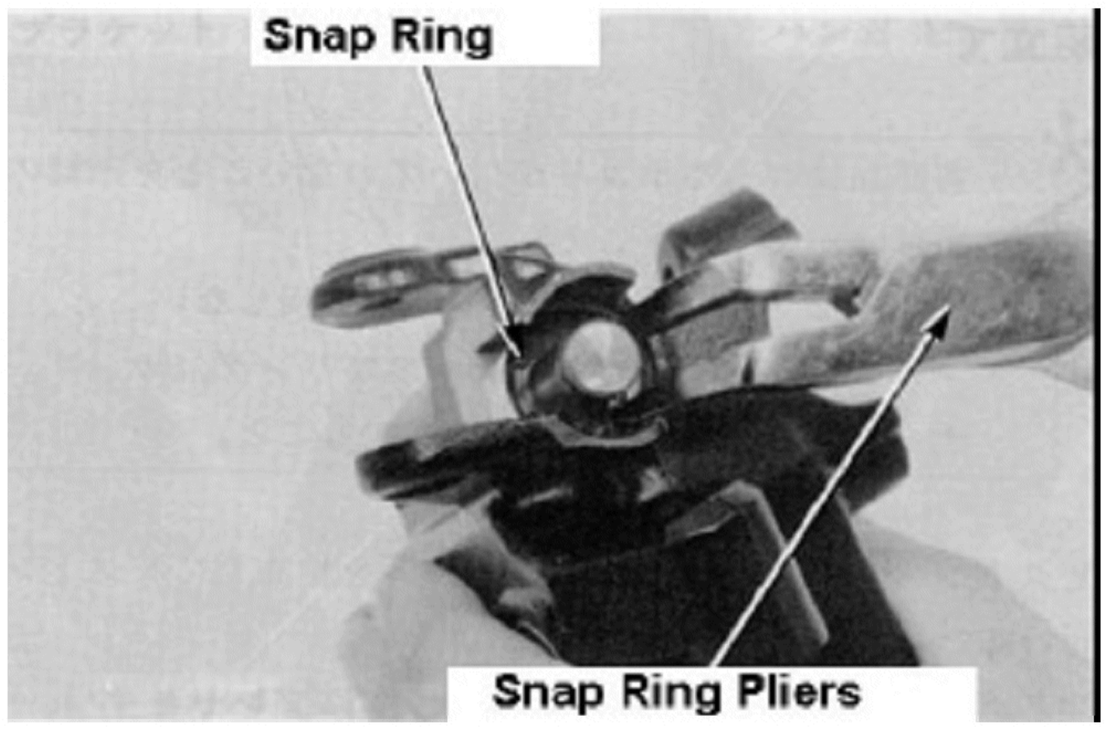
Detach the brake lever and the front brake light switch from the master cylinder.



Disassembly

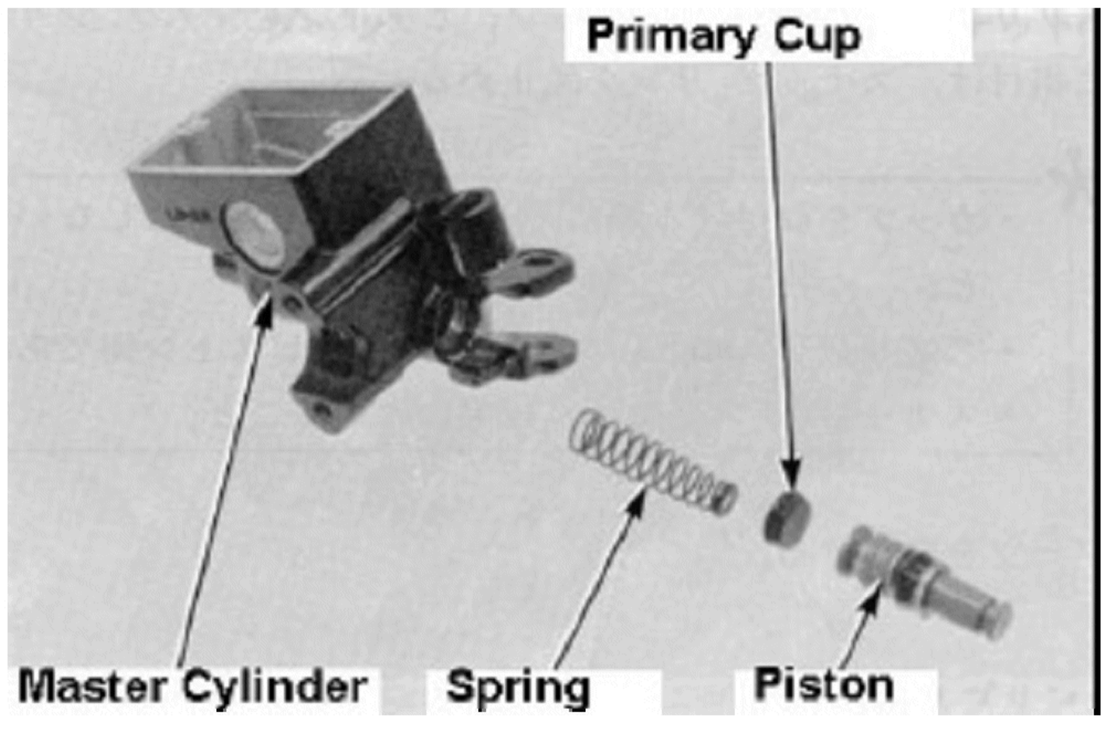
Remove the dust boot and then the snap ring.

Exc. tool	Snap ring pliers 07914-3230001



Remove piston, primary cup and the spring from the master cylinder and clean the master cylinder and reservoir with brake fluid.

- Clean each part with brake fluid and check air path by applying compressed air.
- Store all the detached parts to keep away from dust/debris.

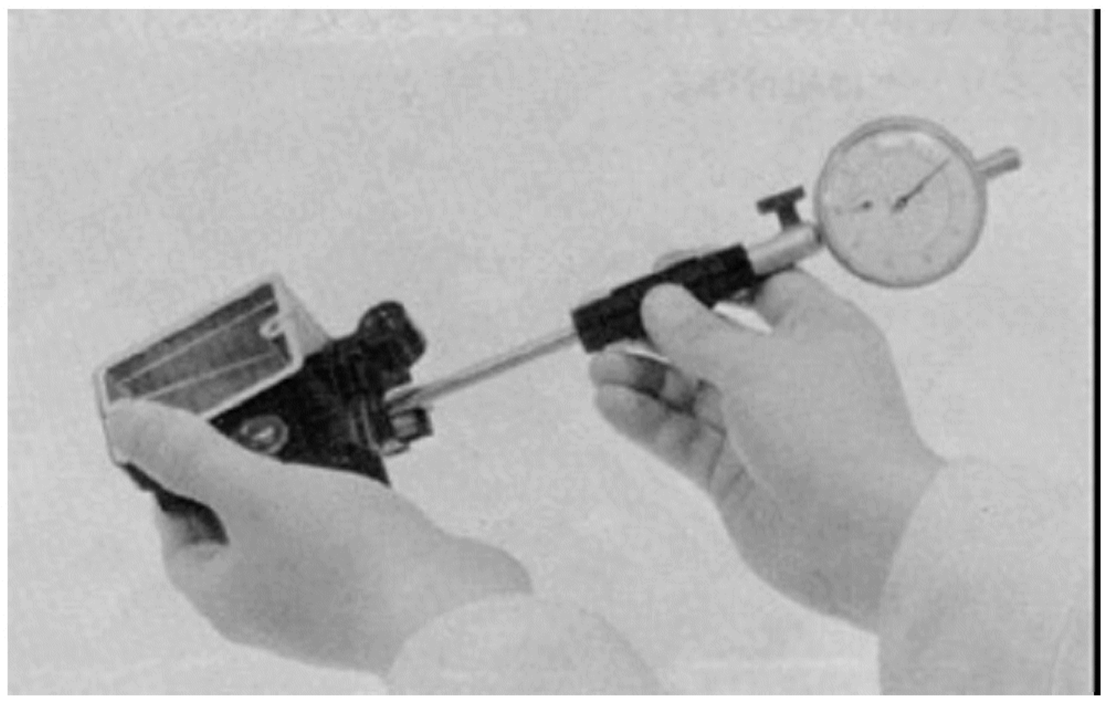


Inspection

Inspect the contact surface of the master cylinder (with master piston) for scratches and damage.

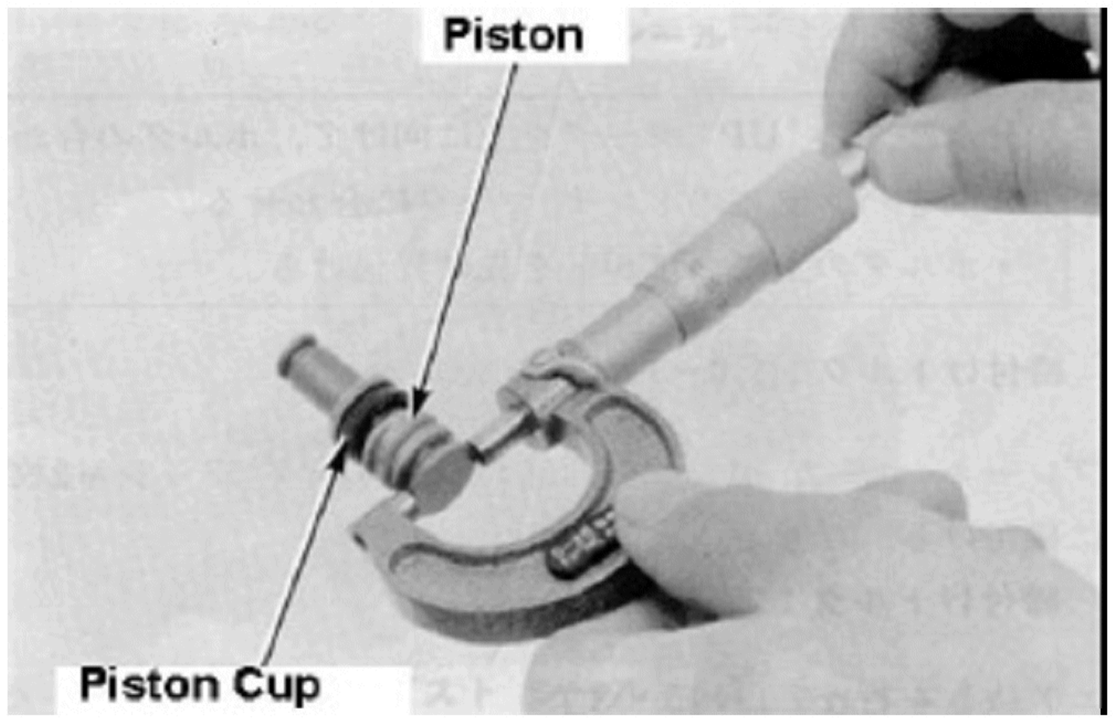
Measure the inner diameter of the master cylinder.

≧ 14.055mm → Replace



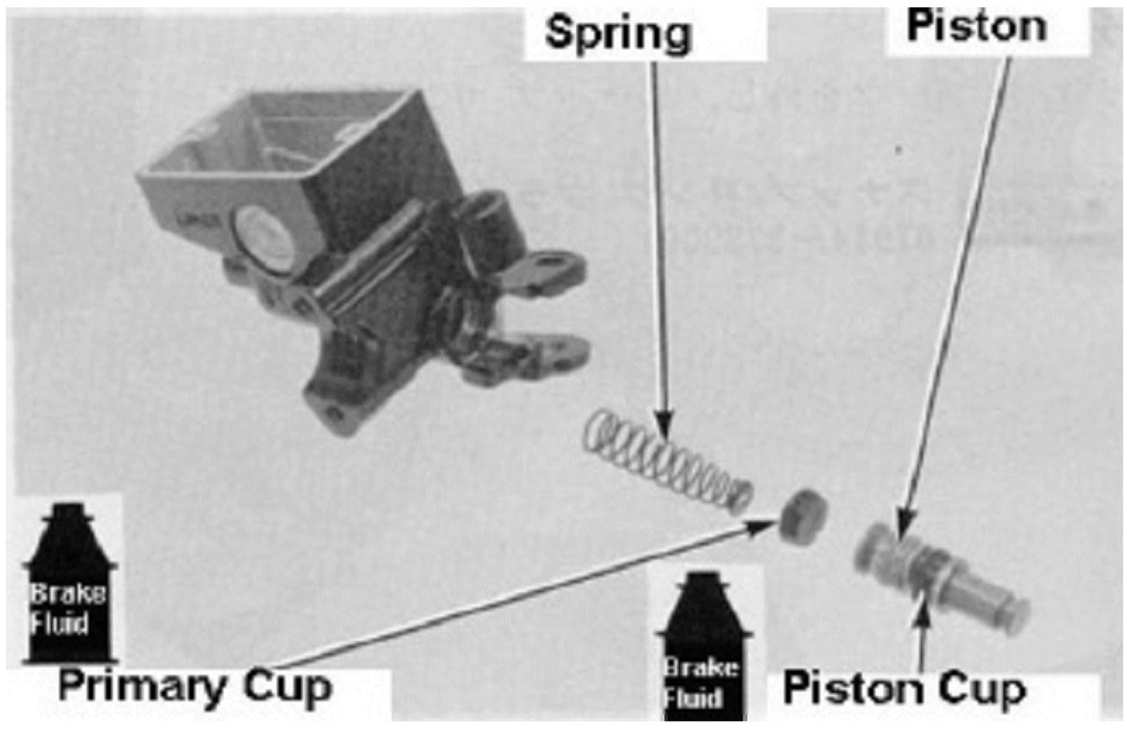
Inspect the surface of the master piston for damage and scratch.
Inspect the piston cup for wear/damage.
Measure the outer diameter of the master piston.

≦ 13.945mm → Replace



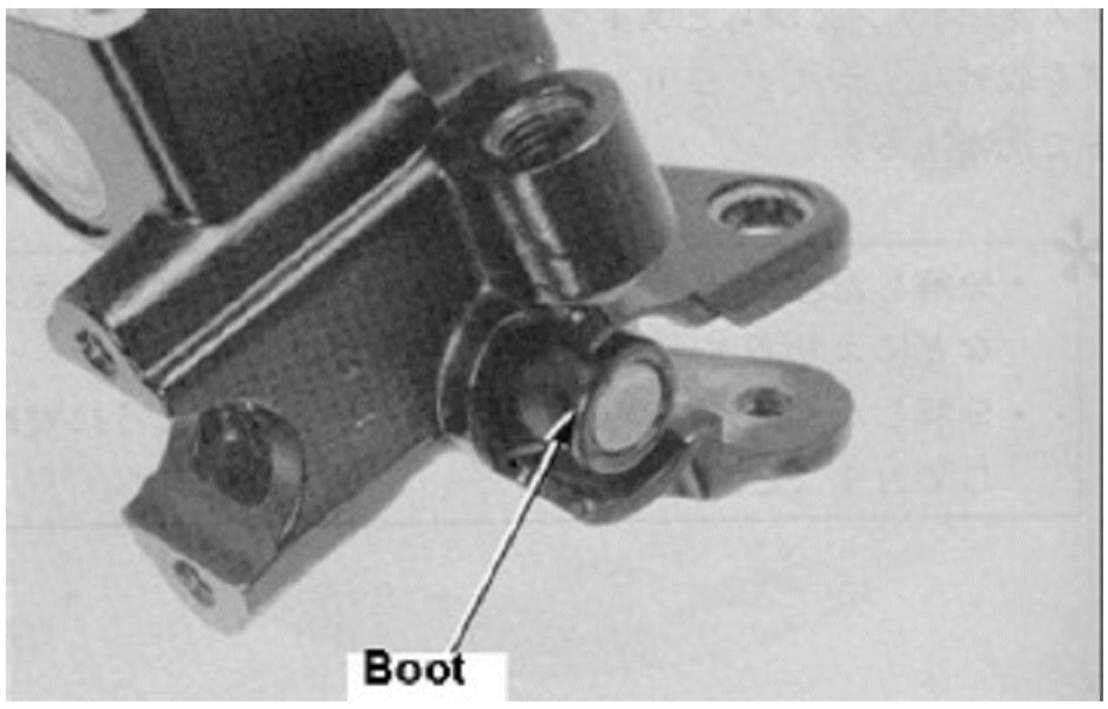
Assembly

- Check all the parts are free from dust/debris.
- Do not re-use drained brake fluid.
- Replace the master cylinder piston, springs cup and the snap ring altogether when replacing.



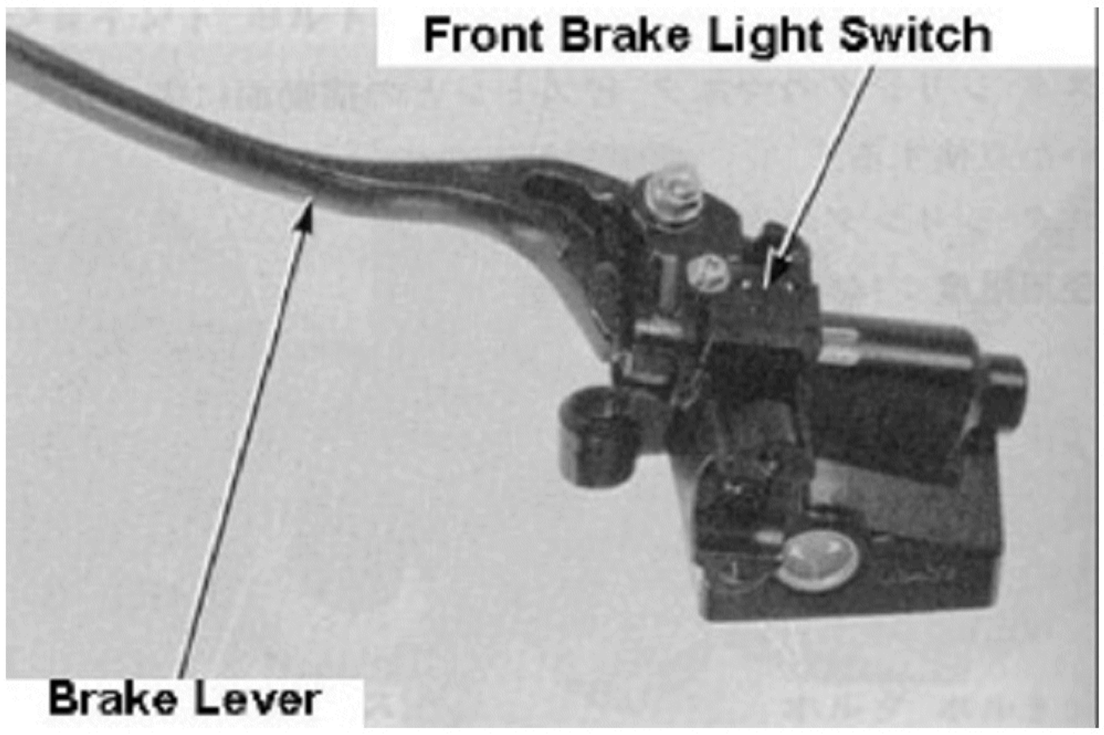
Apply brake fluid to the piston cup and attach it to the piston.
Apply brake fluid to the inner surface of the master cylinder and primary cup.
Attach spring, primary cup and the piston to the master cylinder and attach a snap ring.

- Do not turn the lip surface over when attaching the cup.
- The smaller diameter side of the spring comes to the piston side.
- Attach the snap ring firmly into the groove.



Attach the boot.

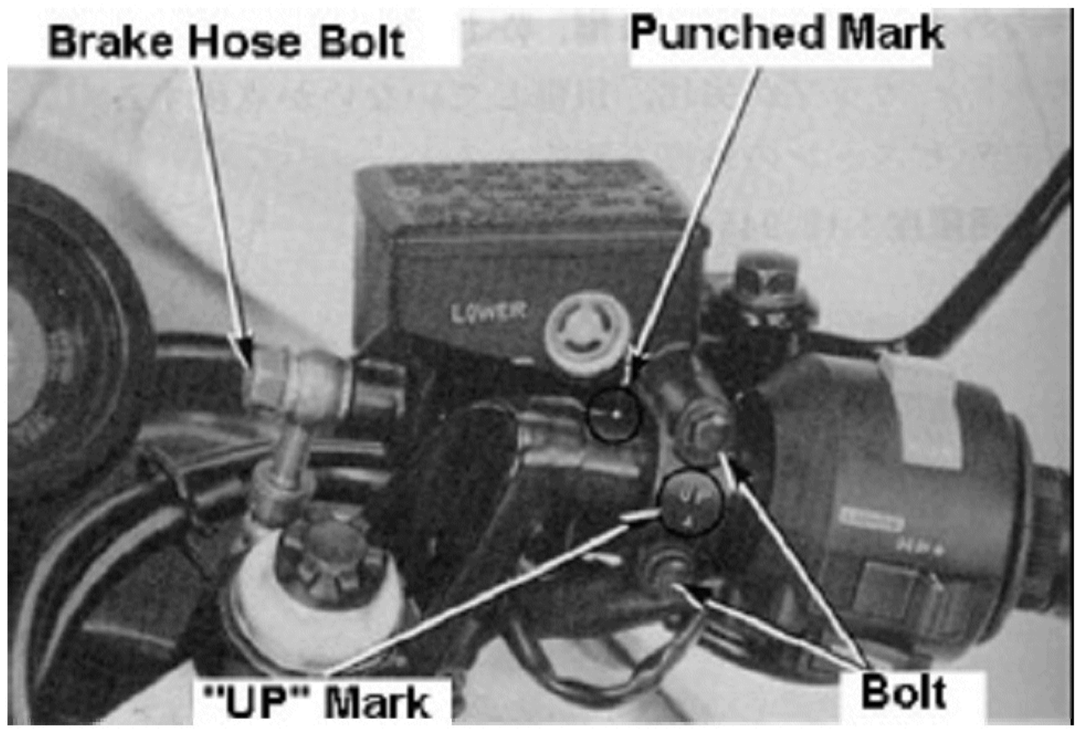
Attach brake lever and front brake light switch to the master cylinder.



Attachment

Attach the master cylinder to the steering handle.

- Face the “UP” mark of the holder upwards and align the holder with the punched mark on the steering handle.
- Tighten the upper bolt on the holder first.



Torque: 1.0 ~ 1.4kg-m

Tighten the brake hose bolt with two new sealing washers.

Torque: 2.5 ~ 3.5kg-m

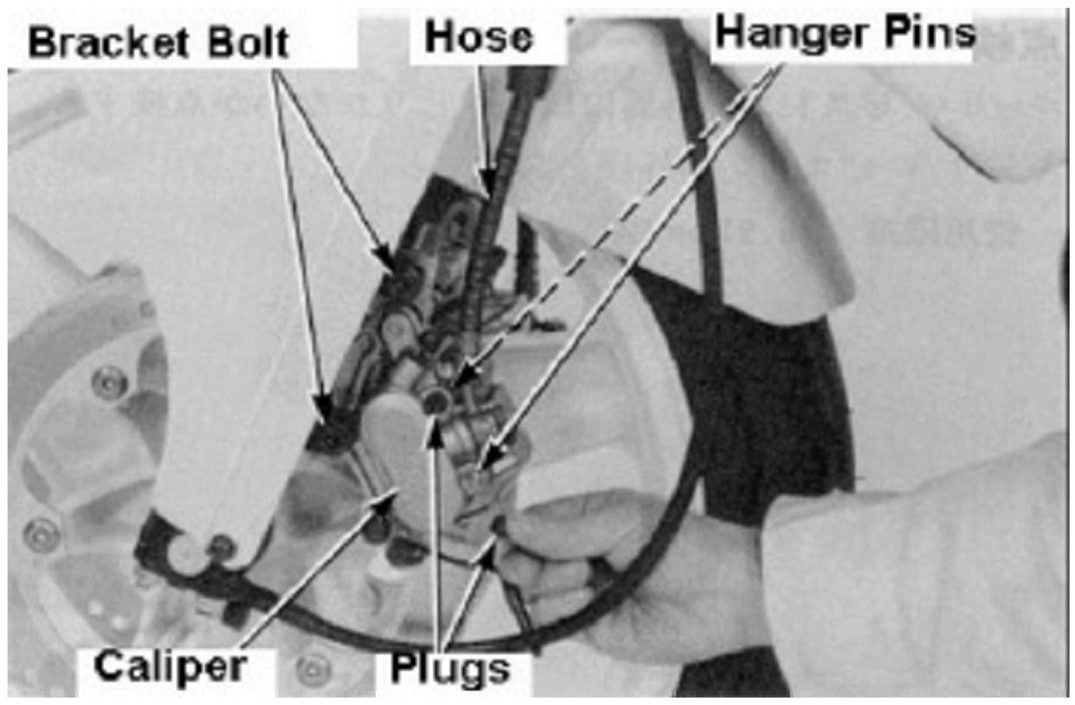
Bleed air (15-3)

Brake caliper

Detachment / disassembly

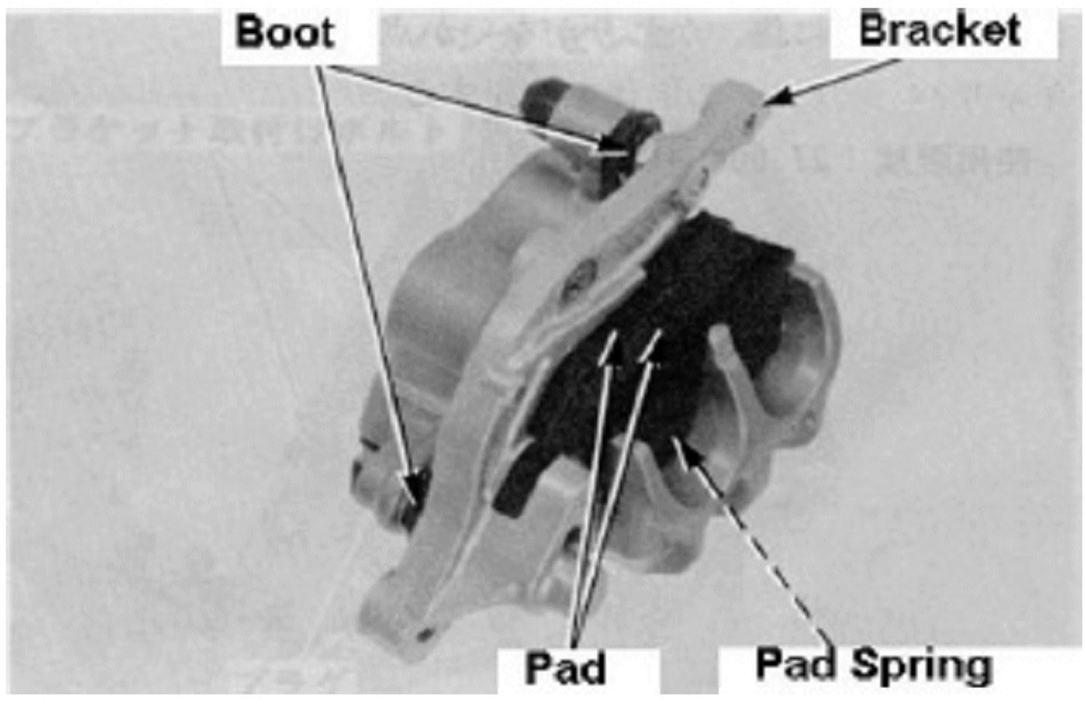
Keep brake fluid away from painted, plastic and rubber surfaces.

Remove plugs and loosen hanger pins.
Place clean oil pan underneath and disconnect the brake hose from caliper.
Remove two bracket attachment bolts and detach caliper from the front fork.



Detach the following parts from the caliper:

- Caliper bracket
- Pads, pad springs
- Boot



Hold the caliper with a cloth to prevent the piston and brake fluid coming out and tilt the piston downwards.

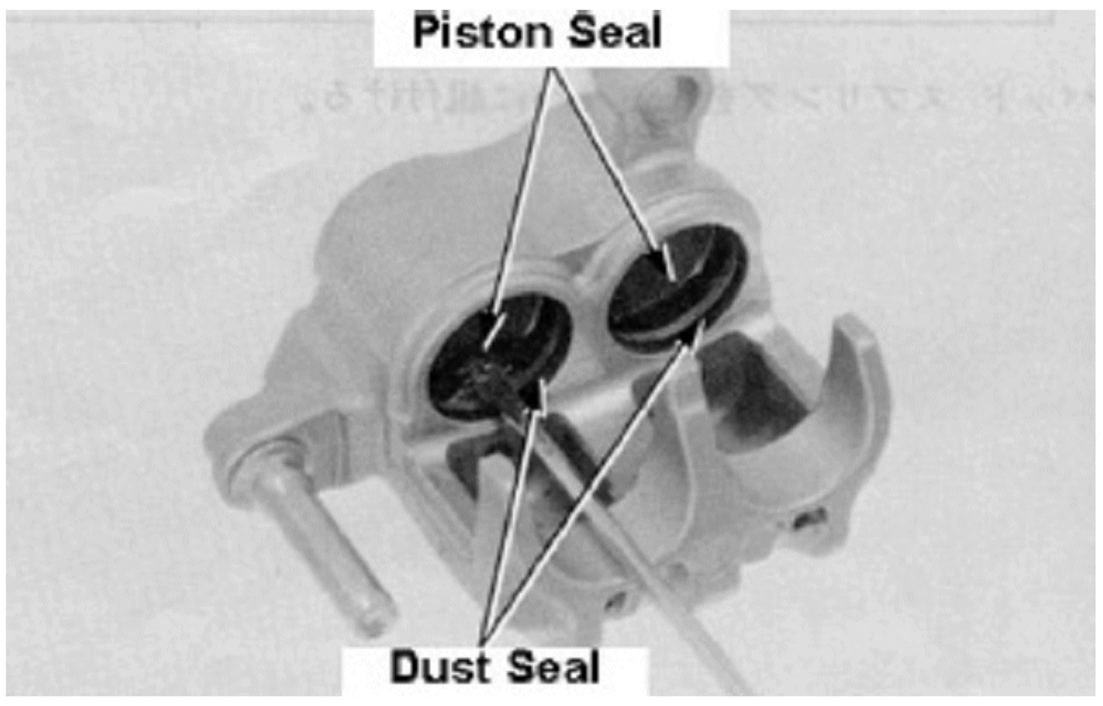
Gradually apply air (low pressure) to the brake hose attachment hole and detach the piston from the caliper.

- Do not use high pressure air and do not bring the air-gun too close.
- Do not insert your hand inside the caliper.

Detach piston seal and the dust seal by pushing them towards the bottom of the cylinder.

Do not damage inner surface of the caliper cylinder.

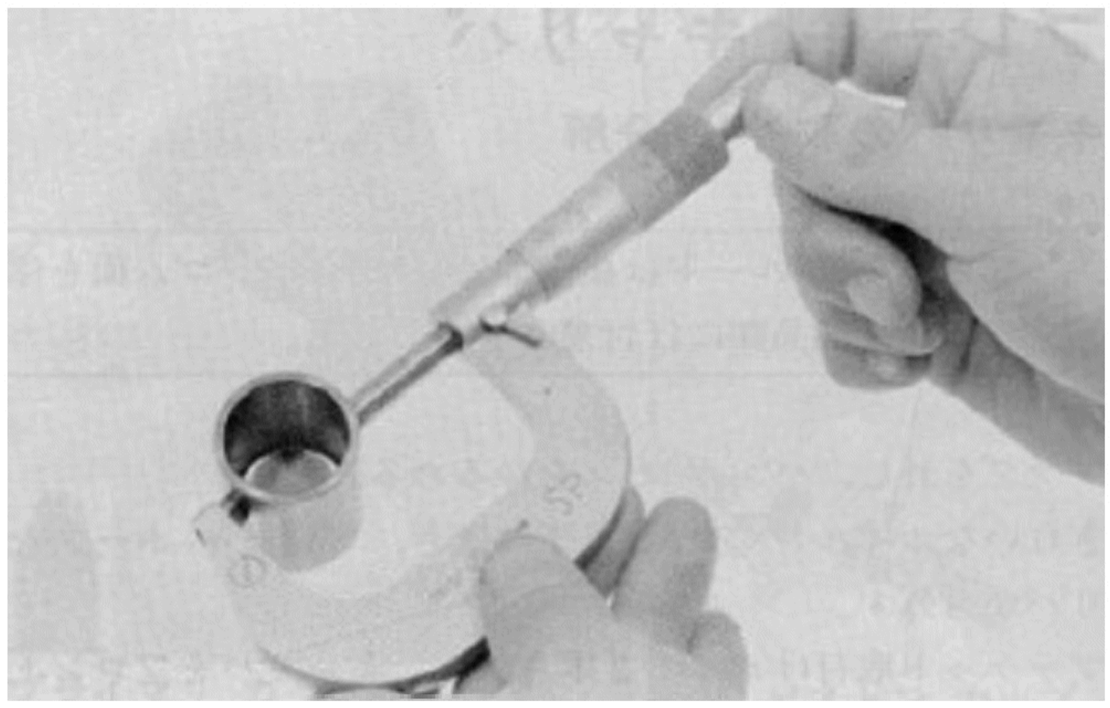
Clean inside of the caliper with brake fluid and remove dirt from grooves.



Inspection

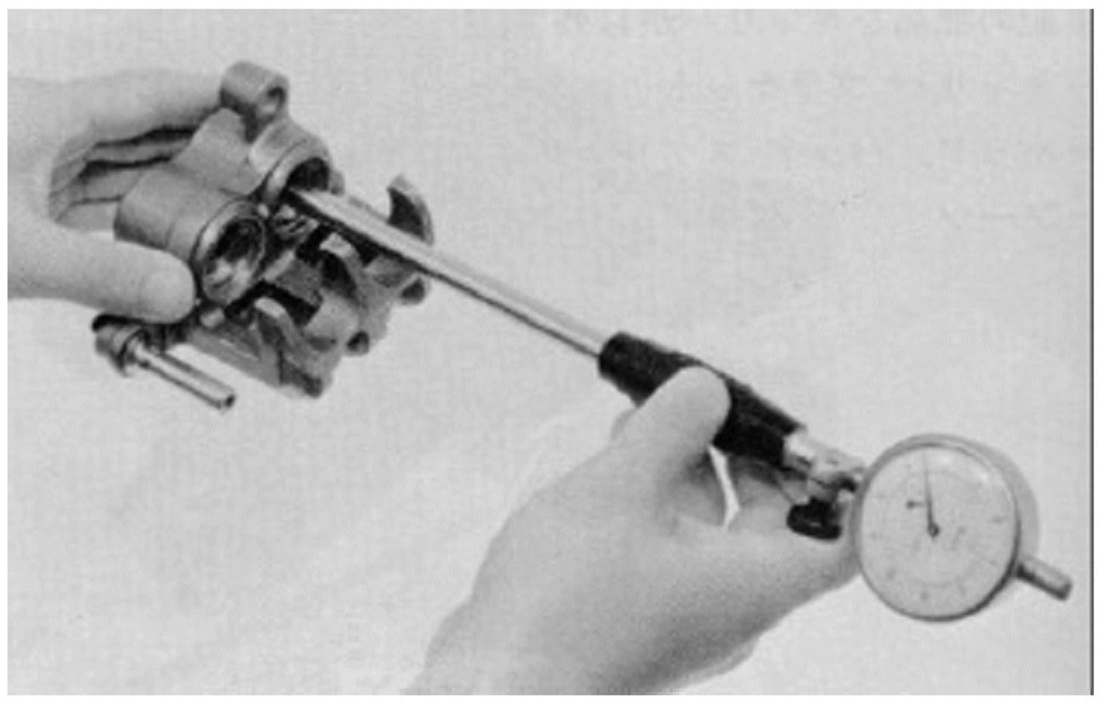
Inspect the exterior surface of the caliper piston for scratch/damage.

Measure the outside diameter of the piston.
≦ 26.91mm → Replace



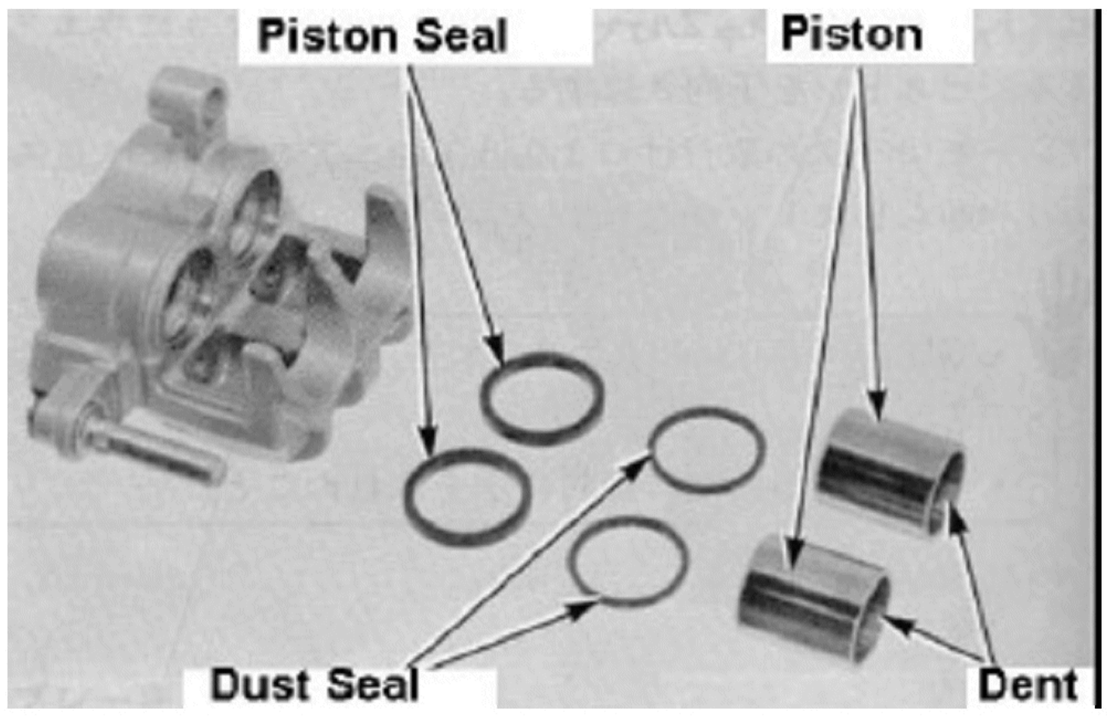
Inspect the inner surface of the cylinder for scratch/damage.

Measure the inner diameter of the cylinder.
≧ 27.06mm → Replace



Caliper assembly / attachment

- Make sure all parts are free from dust / debris before assembly.
- Do not re-use drained brake fluid.
- Replace piston seals and dust seals when disassembling the caliper.

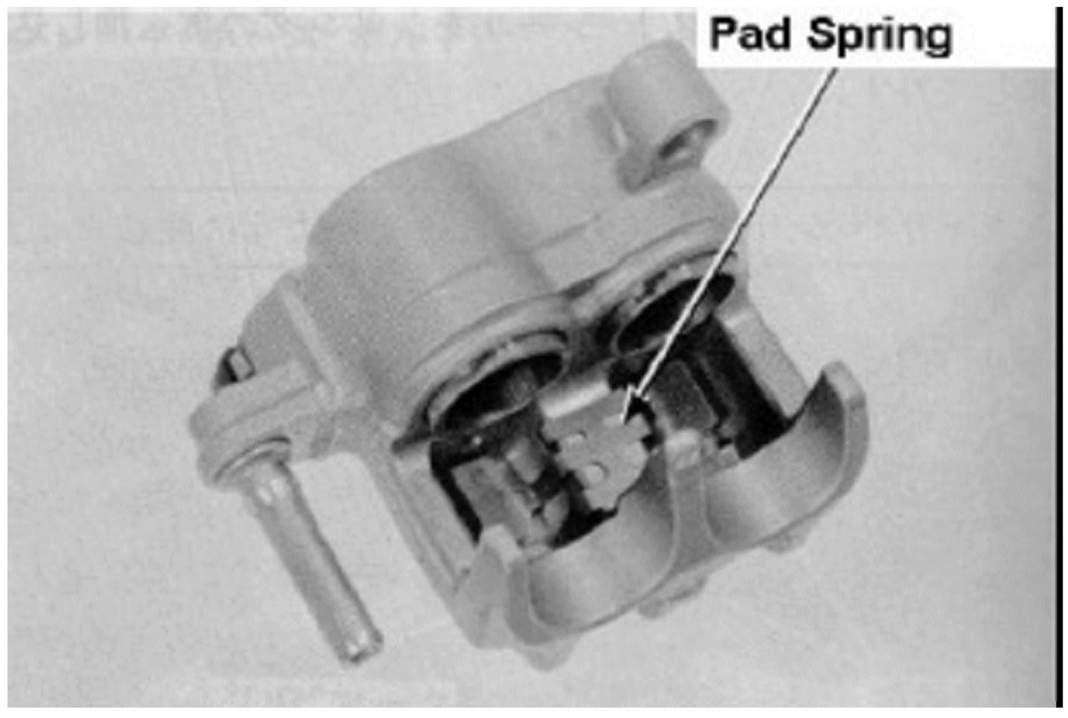


Apply silicone grease or brake fluid to all inner surfaces of seals and attach to the caliper.

Attach pistons to the caliper.

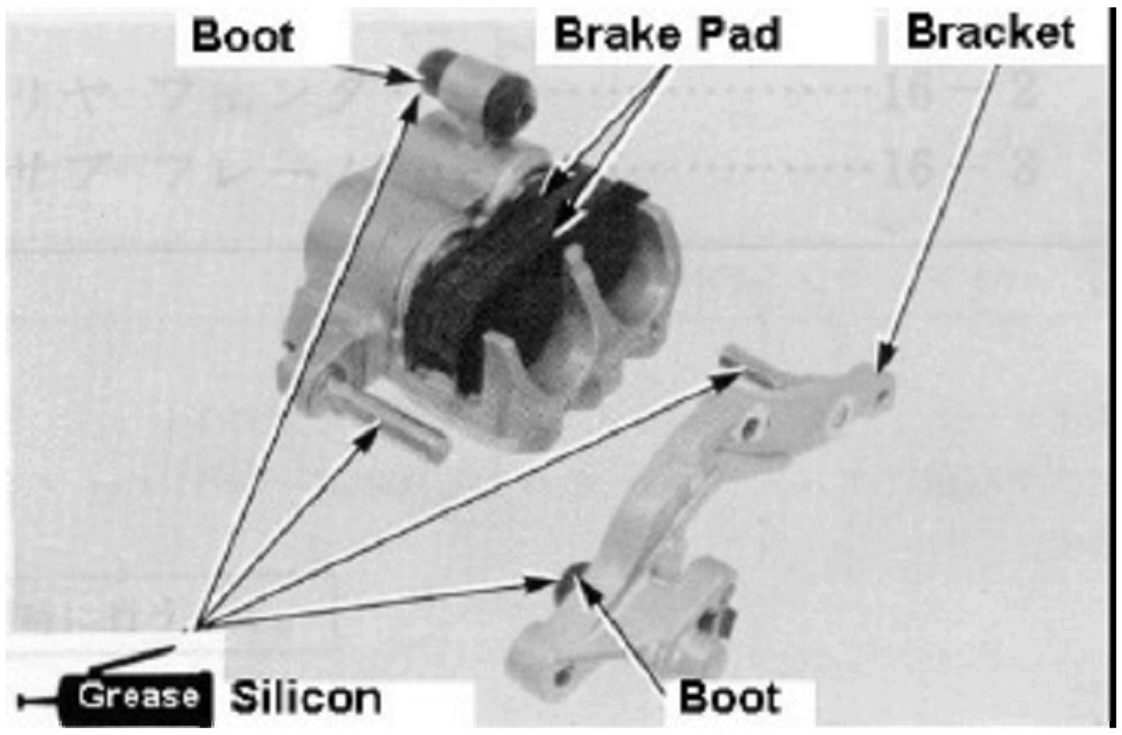
Face the open side of the piston towards brake pads.

Attach the pad spring to the caliper.



Attach brake pad, boot and the bracket to the caliper.

- Apply silicone grease to the boot and the pin on the caliper bracket.
- Firmly set the boot to the groove on the caliper.



Attach hanger pin.

Attach caliper bracket to the front fork and tighten the bolt.

Torque: 2.4 ~ 3.0kg~m

Fix the brake hose and new sealing washers (two) with the brake hose bolt.

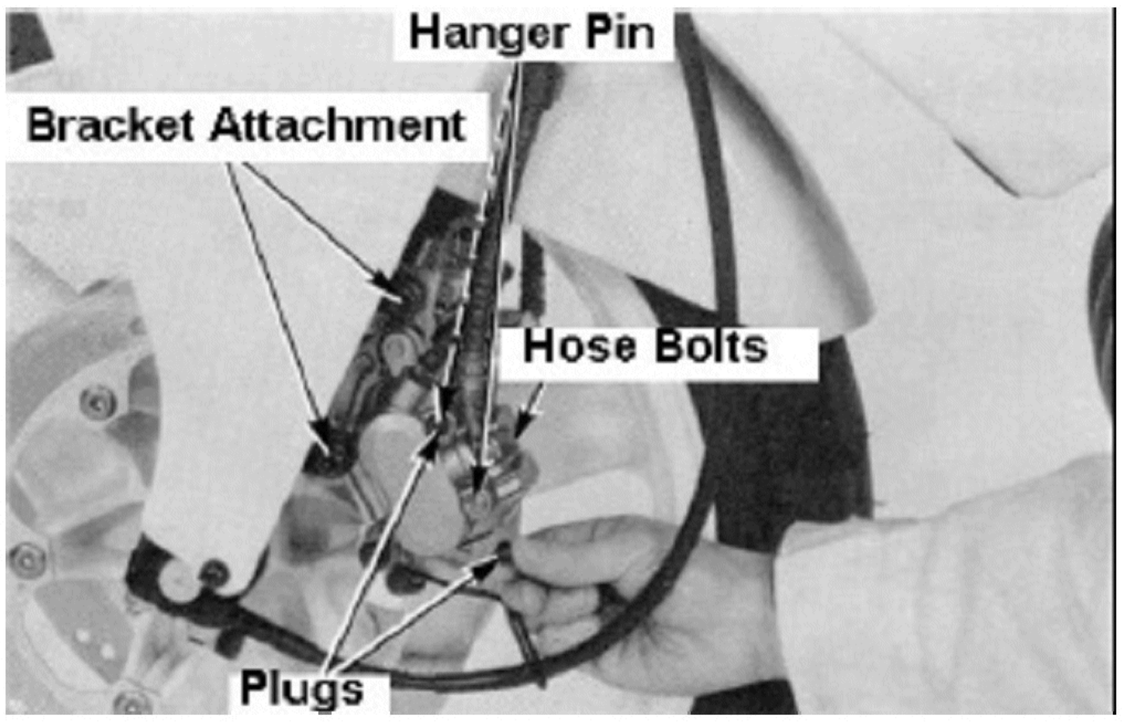
Torque: 2.5 ~ 3.5kg-m

Install hanger pin

Torque: 1.5 ~ 2.0kg-m

Install plugs

Torque: 0.1 ~ 0.2kg-m



Fill the master cylinder with brake fluid and bleed air (15-3).

Service information	16 - 1	Rear fender	16 - 2
Exhaust pipe	16 - 2	Sub-frame	16 - 3

Service Information

General Caution

Service the exhaust pipe and the muffler when they are cooled down.

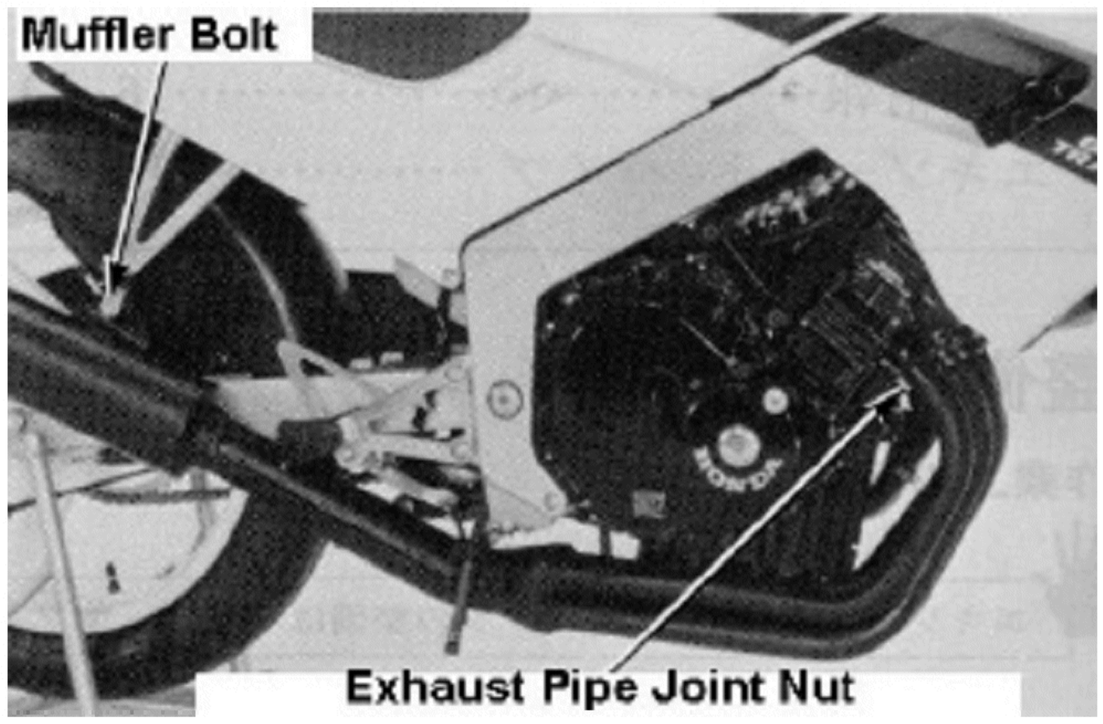
Torque

Exhaust pipe joint nut	0.8 – 1.2kg-m
Muffler attachment bolt	2.4 – 3.0kg-m
Rear fender A	0.7 – 1.1kg-m
Rear fender B	0.8 – 1.2kg-m
Tandem step holder	2.5 – 3.0kg-m
Sub-frame	4.5 – 5.5kg-m

Exhaust pipe

Detachment

Detach when the pipe and muffler are cool.



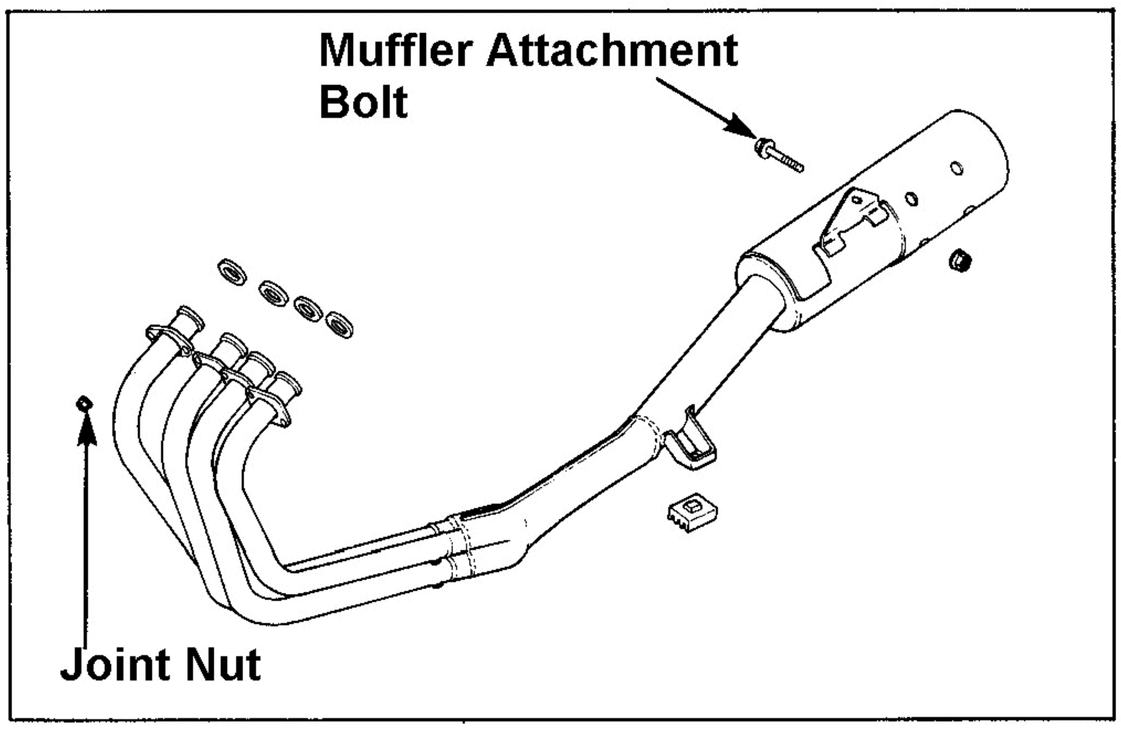
Remove the exhaust pipe joint nut.
Remove muffler attachment bolt and nut and detach exhaust pipe.

Attachment

Reverse the detachment procedure.

Torque:

Exhaust pipe joint nut	0.8 ~ 1.2kg-m
Muffler attachment bolt	2.4 ~ 3.0kg-m

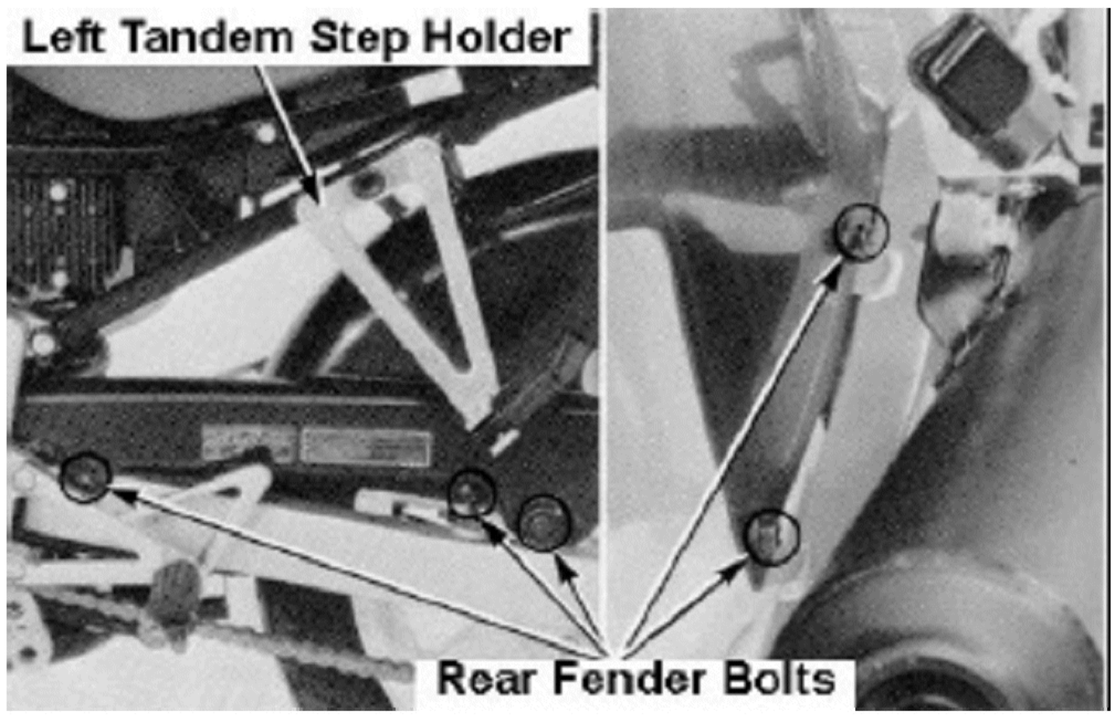


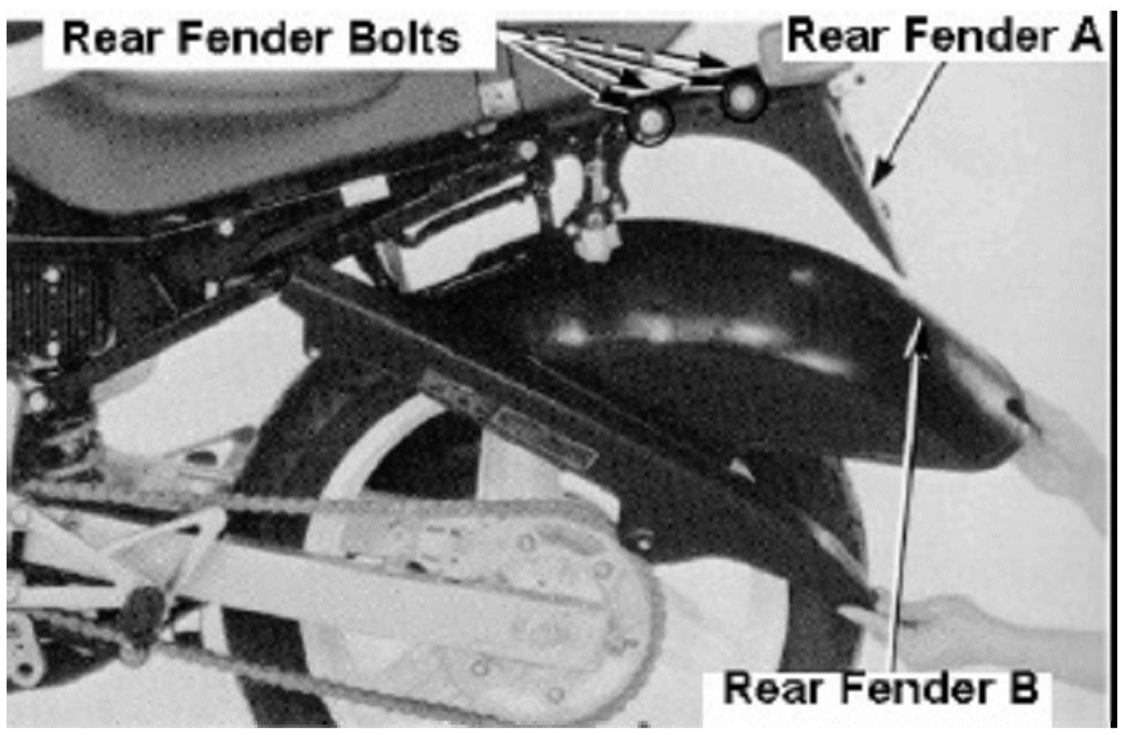
Rear Fender

Detachment

Remove the side cover.
Remove bolts and detach the left tandem step holder.
Remove five rear fender bolts.

Detach the rear fender B by pulling it towards the back and to the left.
Remove seat and the rear cowl and disconnect couplers for the tail / stoplight.
Remove four bolts and detach the rear fender A.





Attachment

Reverse the detachment procedure.

Torque:

Rear fender A	0.7 ~ 1.1kg-m
Rear fender B	0.8 ~ 1.2kg-m
Tandem step holder	2.5 ~ 3.0kg-m

Sub-frame

Detachment

Remove the following items to detach the sub-frame.

- Fuel tank (4-3)
- Rear cowl (20-2)
- Tail-light (20-2)
- Regulator / rectifier (17-5)
- Battery case (5-11)
- Reservoir tank (5-11)
- Rear Fender (16-2)
- Tandem step holder
- Sub-frame attachment bolt

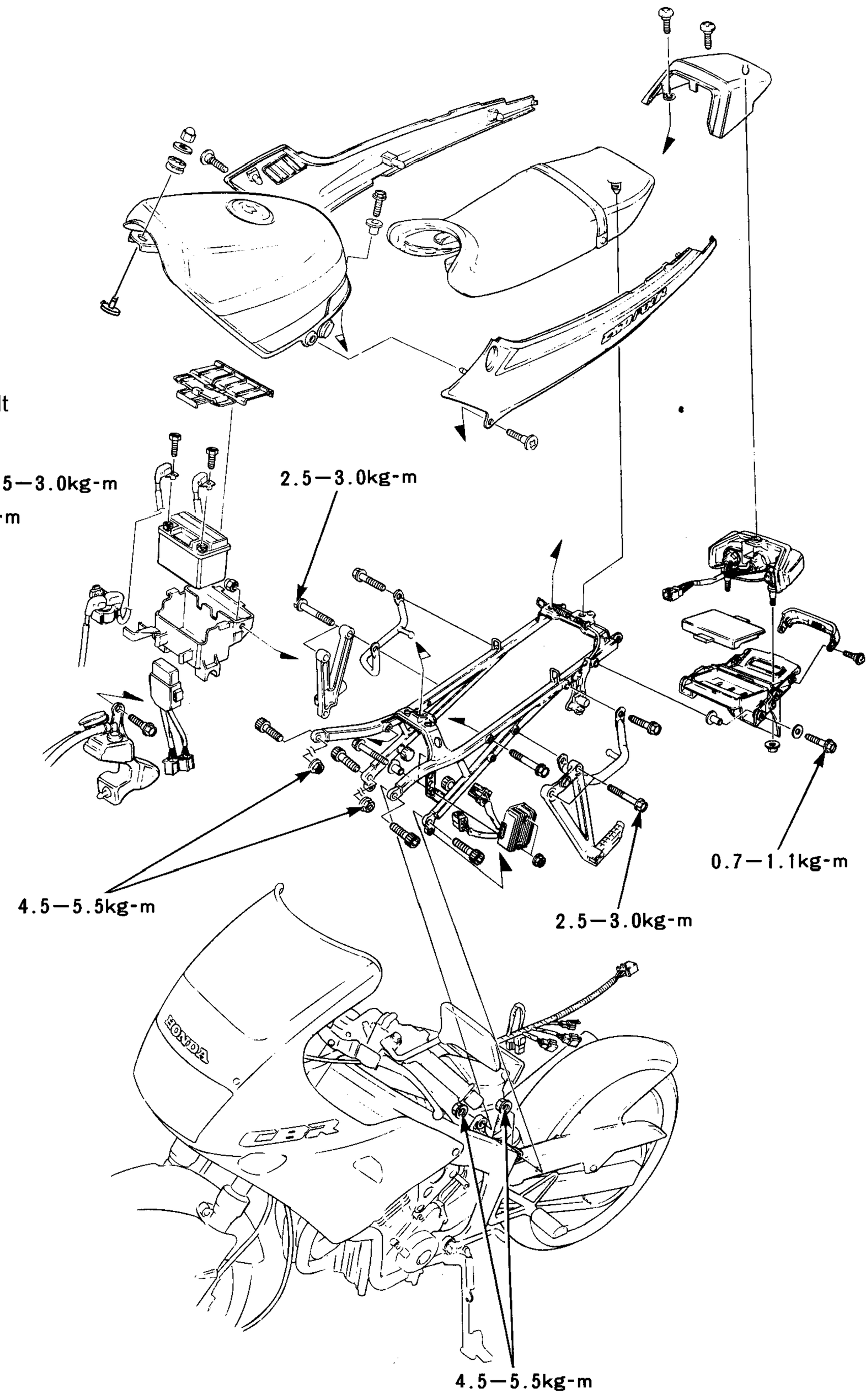
Attachment

Reverse the detachment procedure.

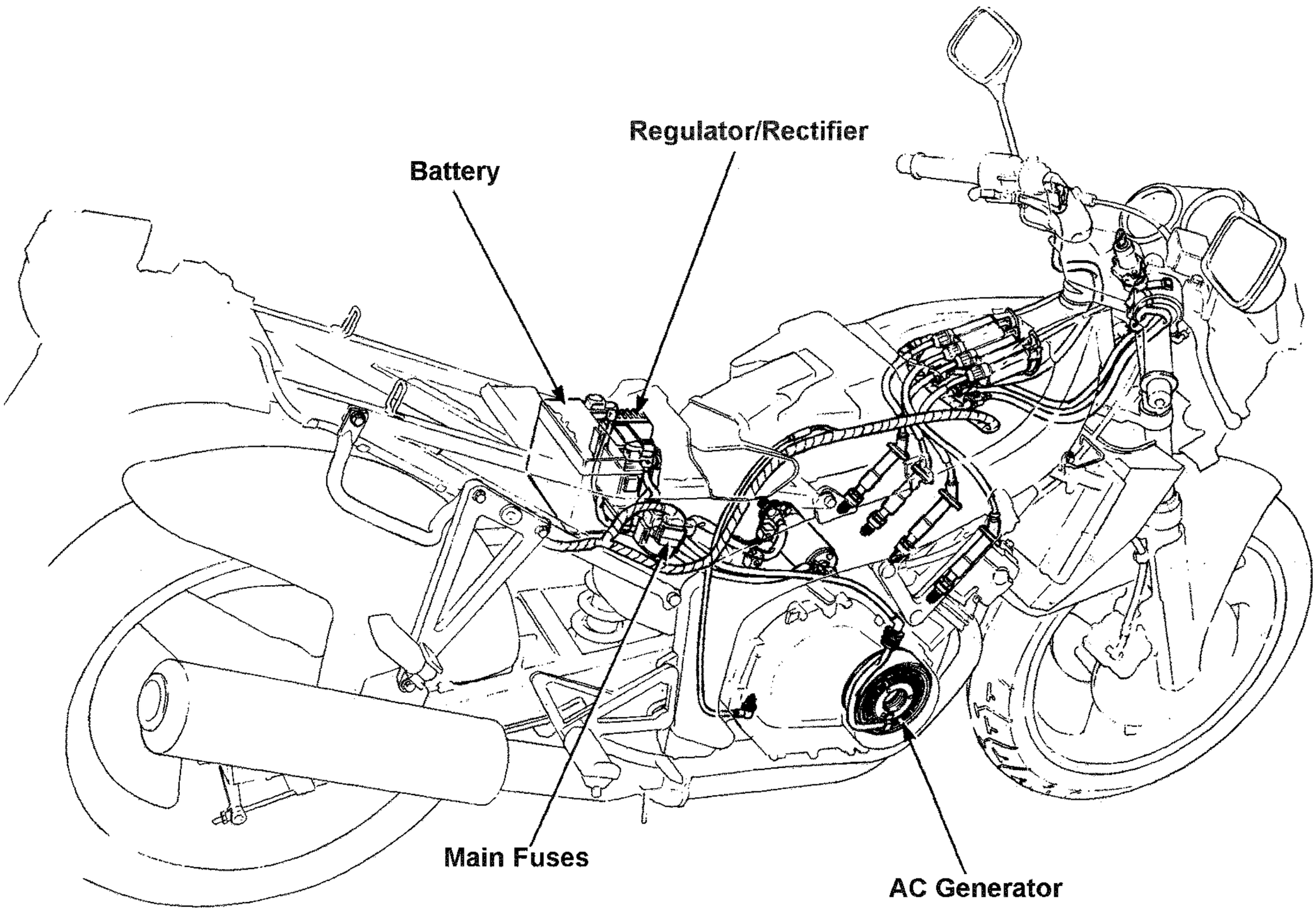
Torque:
Sub-frame
4.5 ~ 5.5kg-m

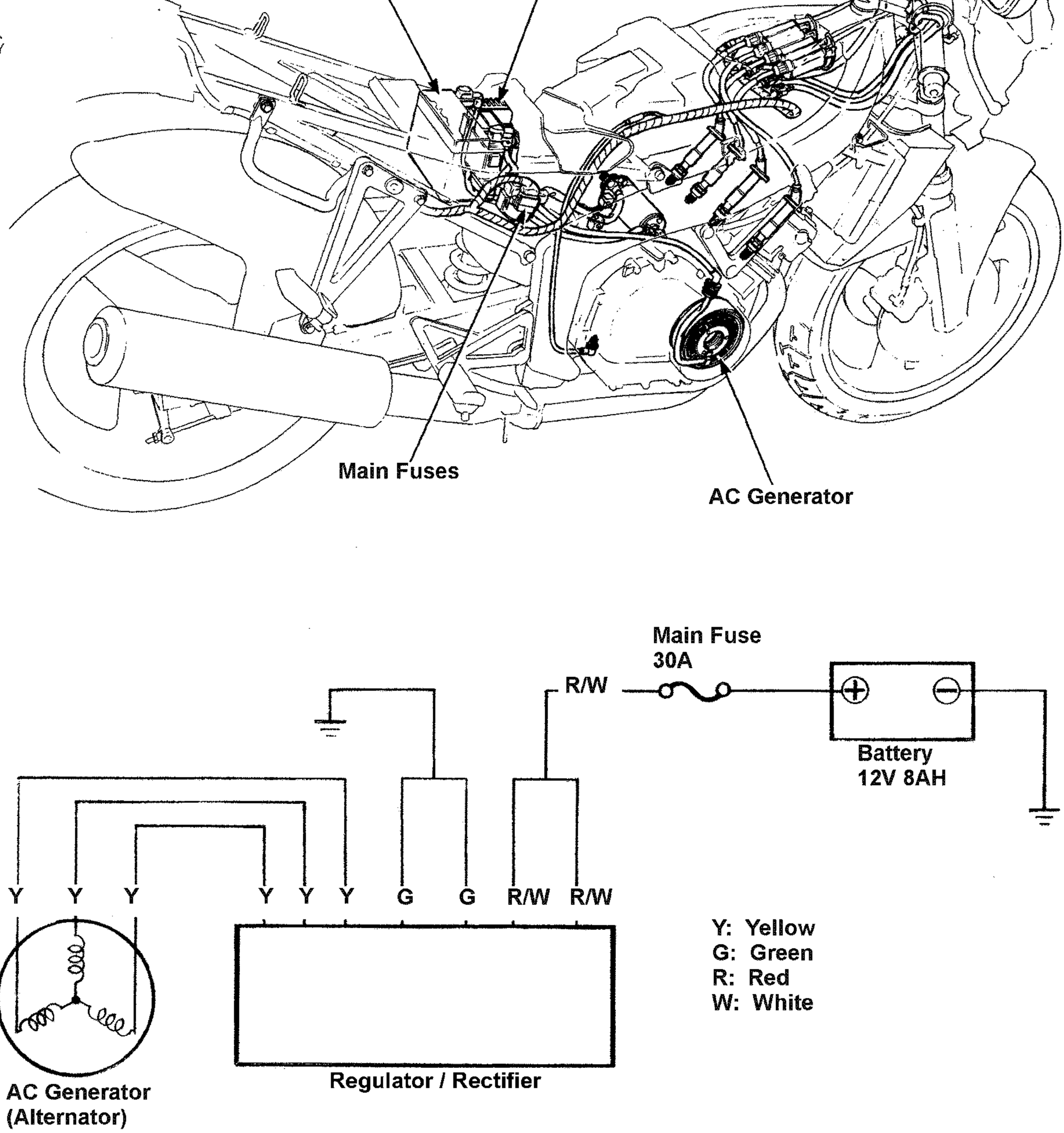
Tandem step holder
2.5 ~ 3.0kg-m

Rear fender A
0.7 ~ 1.1kg-m



- **Wiring**


Regulator/Rectifier
Battery
Main Fuses
AC Generator


Main Fuse
30A
R/W
Battery
12V 8AH
Y Y Y Y Y Y G G R/W R/W
AC Generator
(Alternator)
Regulator / Rectifier
Y: Yellow
G: Green
R: Red
W: White

Wiring	17-0	Battery	17-3
Service information	17-1	Regulator / rectifier	17-4
Troubleshooting	17-2	AC Generator (Alternator)	17-5

Service Information

General caution

- Both sides of couplers should be same colour.
- Measured values may differ from standard values depending on environment.
- Alternator detachment / attachment (Sec. 10)
- Refer to 1-27 for total system troubleshooting.
  <Maintenance Free Battery>
- Water level check is not required thus no need to refill.
- Detach the battery from the frame when re-charging. Do not remove the fluid filler caps.
- Do not make rapid charge unless it is an emergency.
- Always refer to charging current and time written on top of the battery.
- Use a digital volt meter for charged status inspection.
- Do not install conventional battery when replacing the original maintenance free battery.

Item		Standard
Battery	Capacity	12V 8 AH
	Charging current	0.9A
	Discharge voltage	13.0-13.2V 20°
Charging commencement rpm (headlight ON, Low-beam)		≦ 1900rpm
Regulator / rectifier	Type	Non-contact point
	Regulator voltage	14.0 – 15.0V
Alternator coil resistance		0.3 –0.4Ω (20°C)
Alternator performance		18.5A – 5.000rpm

Tools

Measuring tools

Digital circuit tester	(Kowa)	07411- 0020000
Circuit tester	(Sanwa)	07308- 0020000
	(Kowa)	Th – 5H

Troubleshooting

No current (with main switch ON)

- Battery discharge
  - Leak
  - Regulator / rectifier fault
  - AC generator fault
- Battery cables disconnected
- Fuses blown (inspect main fuses)
- Main switch fault
- Couplers disconnected / short circuit.

Re-charge system failure

- Connector or couplers disconnected / cut / short circuit between:
  - AC generator and regulator / rectifier (Y)
  - Regulator / rectifier and starter magnetic switches (R/W)
  - Starter magnetic switches and battery
- Regulator / rectifier fault
- AC generator fault

Low voltage

- Insufficient charging or discharging
- Regulator / rectifier fault
- AC generator fault

Intermittent current

- Battery cables connection fault
- Charging system connection fault
- Ignition system connection fault / short circuit

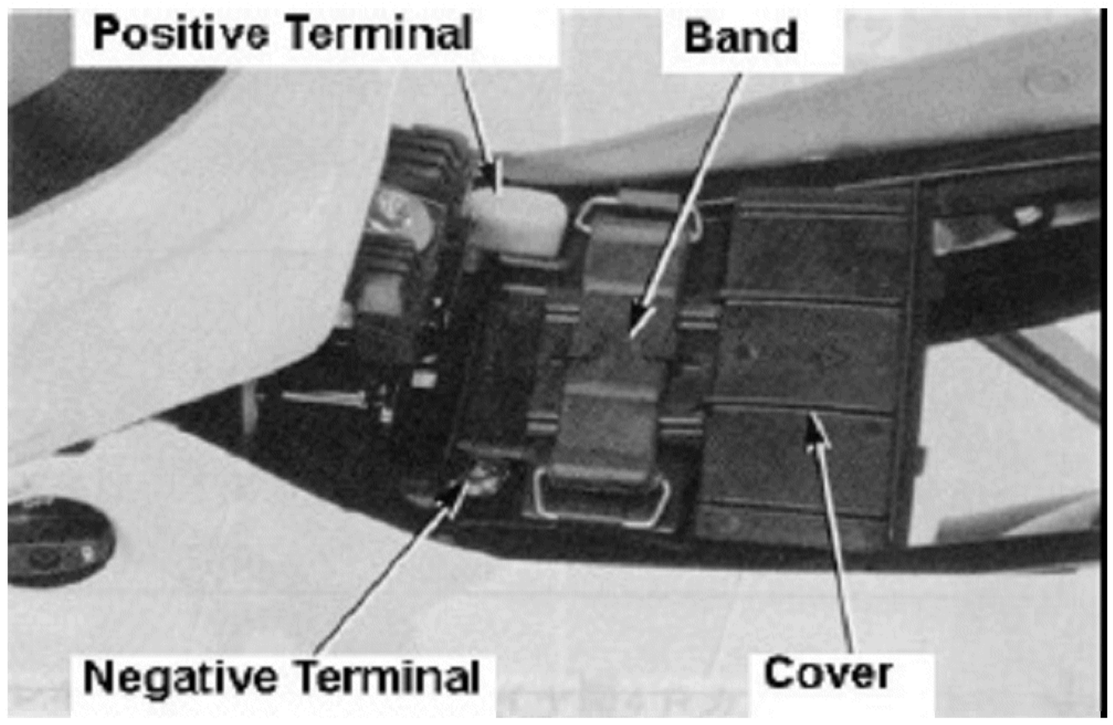
Battery Detach / attachment

Remove seat, battery holder band and the battery cover.

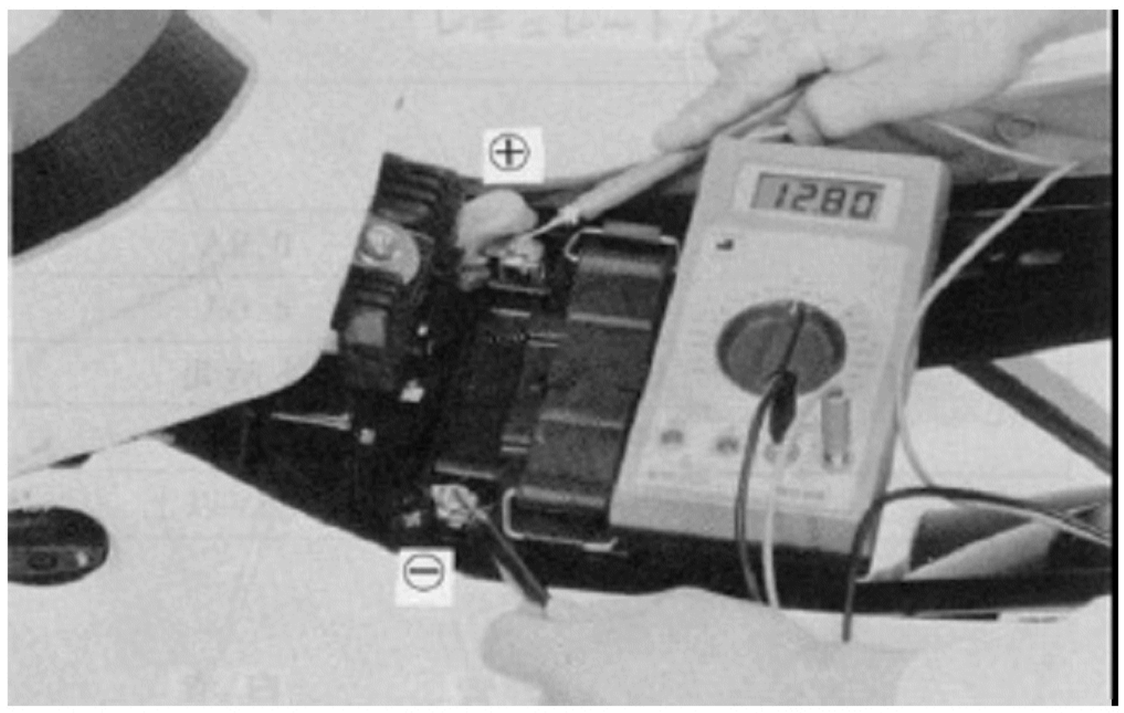
Disconnect cables from battery terminals.

Disconnect negative side first, then positive.

Detach the battery.
Attach by reversing the above procedure.



Apply a little grease to the terminals after attaching the battery.



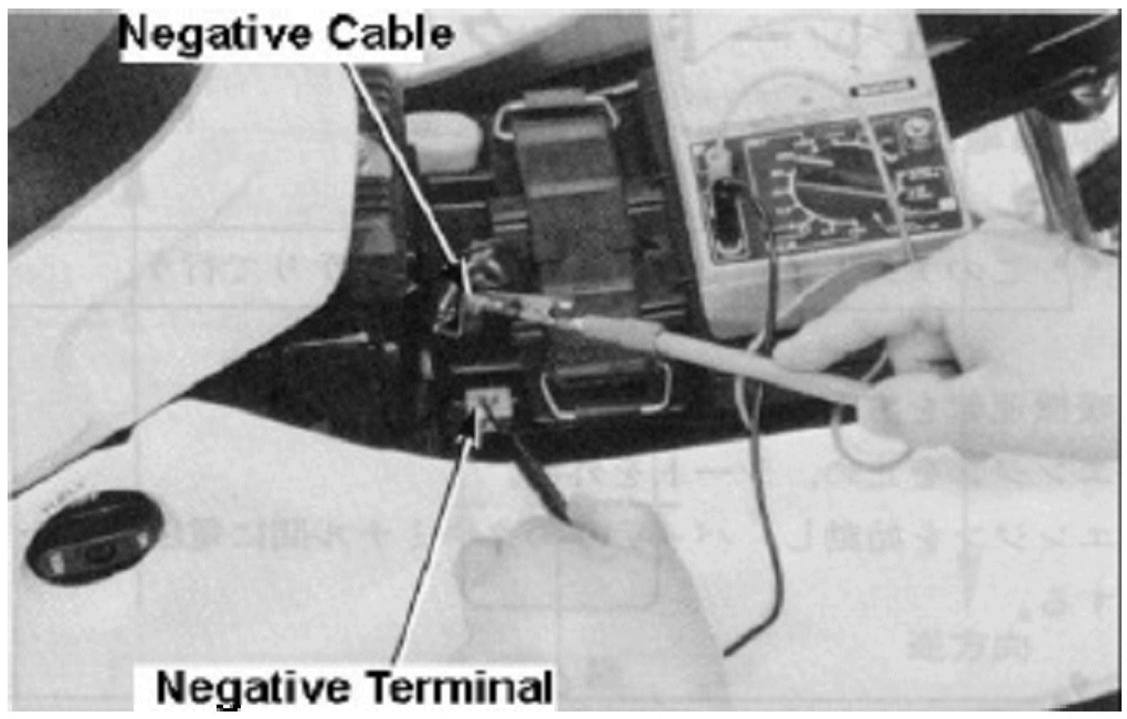
Inspection of charged status (discharging voltage)

Measure the battery voltage.
Fully charged: 13.0 ~ 13.2V (20°c)
Undercharged: ≦ 12.3V (20°c)

- Use a digital circuit tester
- Digital circuit tester: 07411-0020000
- Connect positive lead of the voltmeter to the positive terminal of a battery, negative lead to negative terminal.

Leak test

If the battery is undercharged, disconnect the couplers on the regulator/rectifier (17-5) and disconnect the negative cable from the battery. Set the current meter between the negative terminal and the battery earth cable and inspect for leak.
Leak current should be ≦ 0.1mA

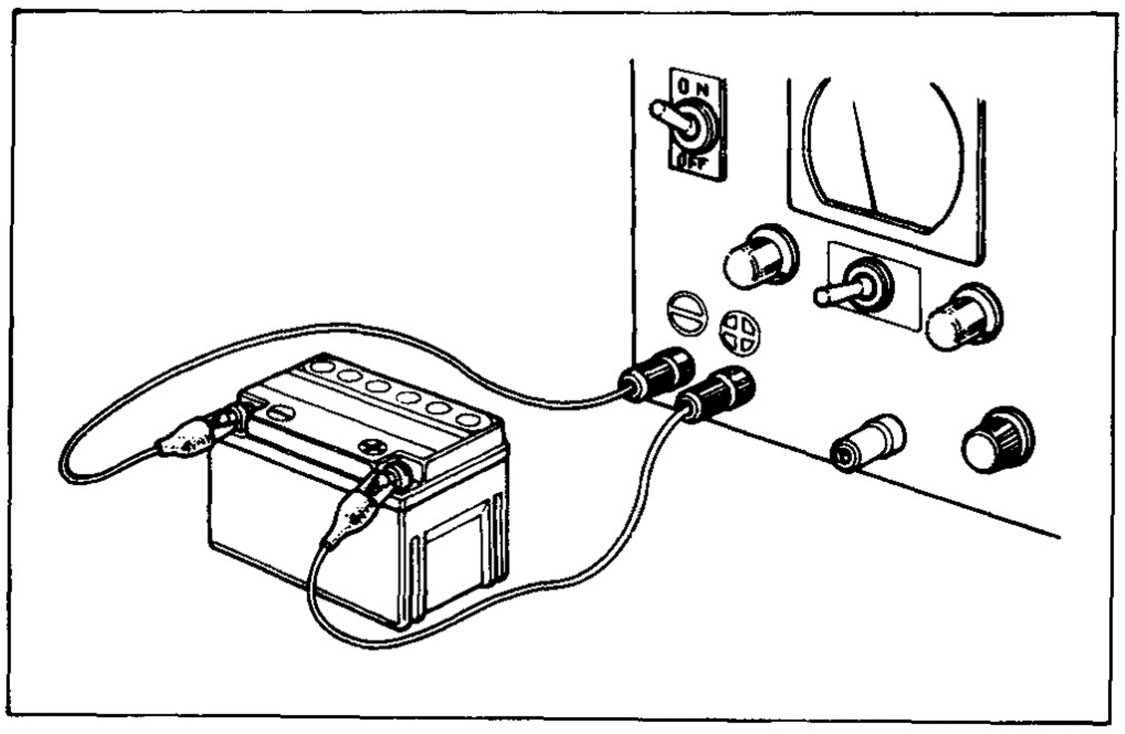


If the leak current is beyond the above value, inspect the regulator/rectifier and an alternator, and inspect wire harness, couplers and connectors for short circuit. Inspect the main switch for its operation (20-5).

If there is no leak or overcharged, measure the regulator voltage of the regulator / rectifier.

Charging

Connection: Charger (+) = Battery (+)
Charger (-) = Battery (-)



- Keep out of fire
- Use the charger switch to start/stop charging. Connecting /disconnecting at the terminal cause spark and it may create explosion.
- Always refer to charging current and time specified on top of the battery.

- Do not make rapid charge except in case of emergency.
- Measure the voltage 30 min. after charging.

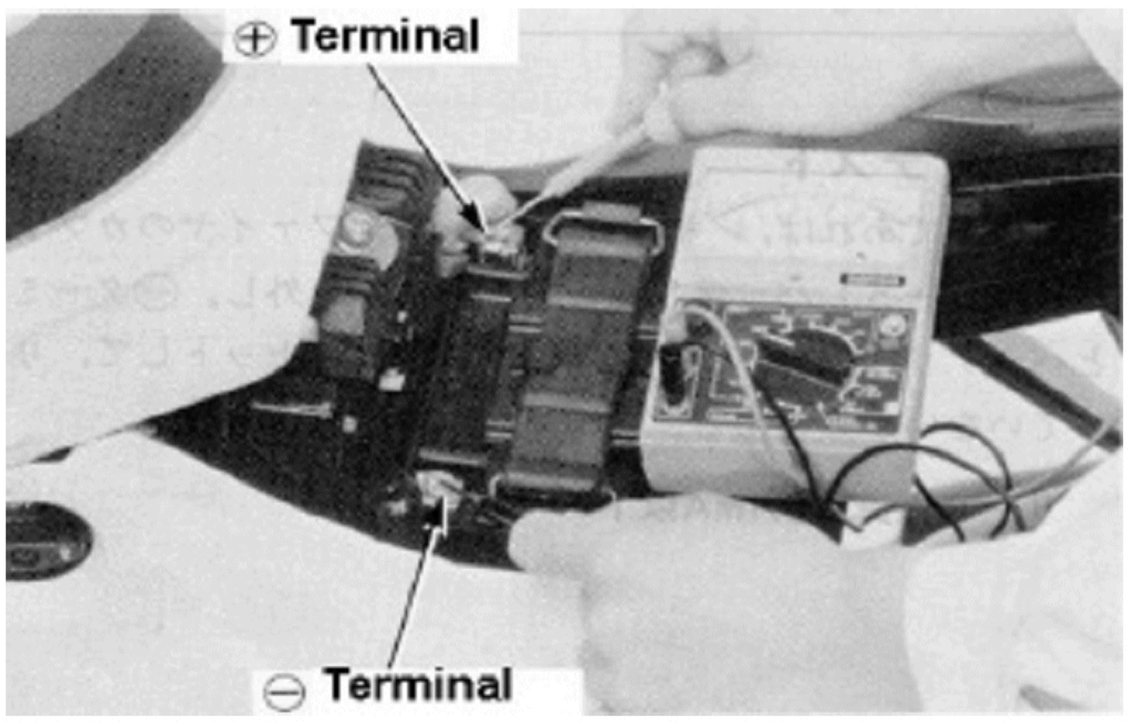
Charging current	Standard	0.9A
	Rapid	4.0A
Charging time	Standard	5 hours
	Rapid	1 hour
Fully charged voltage		13.0V

Regulator / rectifier

Regulator voltage inspection

- Inspect with fully charged battery

Warm up engine.
Stop the engine and remove a seat.
Start the engine and set a voltmeter between the battery terminals.



- Voltmeter (+) lead = (+) battery terminal
  (-) lead = (-) battery terminal

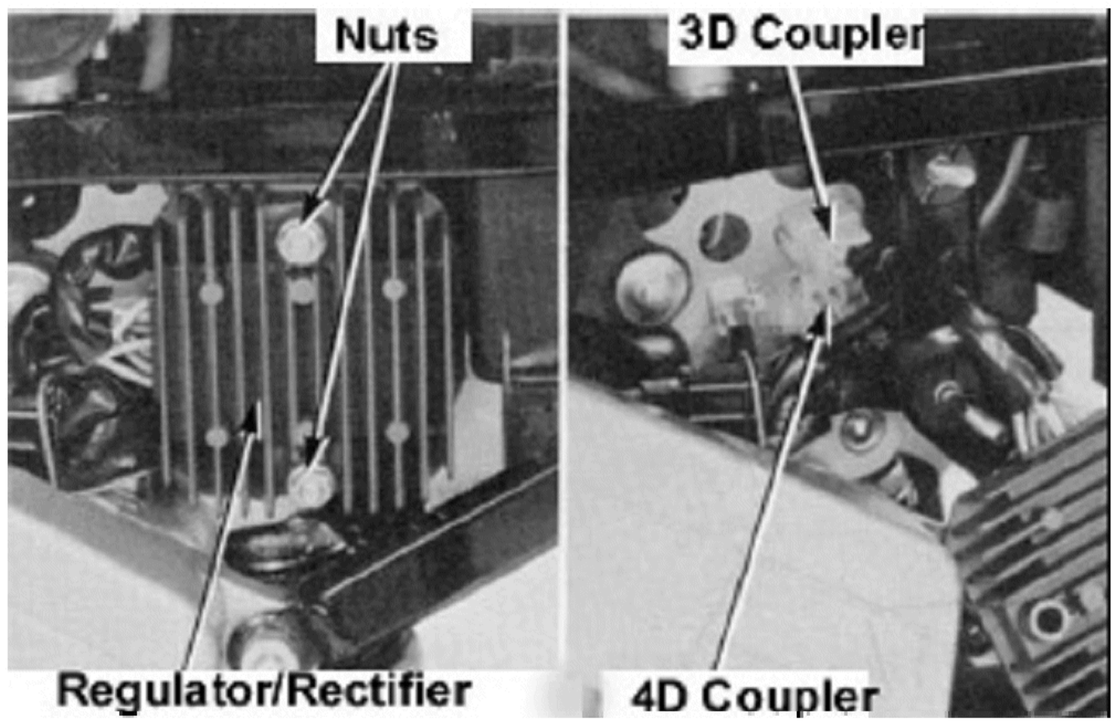
Do not short circuit

Regulated voltage: 14.0 ~ 15.0V
If the voltage was out of the above range, inspect wire harness and couplers between the alternator and the battery and measure again.

If the voltage is still out of range, inspect the regulator/rectifier for its resistance (17-5) and inspect the alternator (17-5).

Conduction inspection

Remove a seat and a left side cover.
Remove a regulator/rectifier attachment bolt.
Disconnect 4P and 3P couplers and detach the regulator/rectifier.

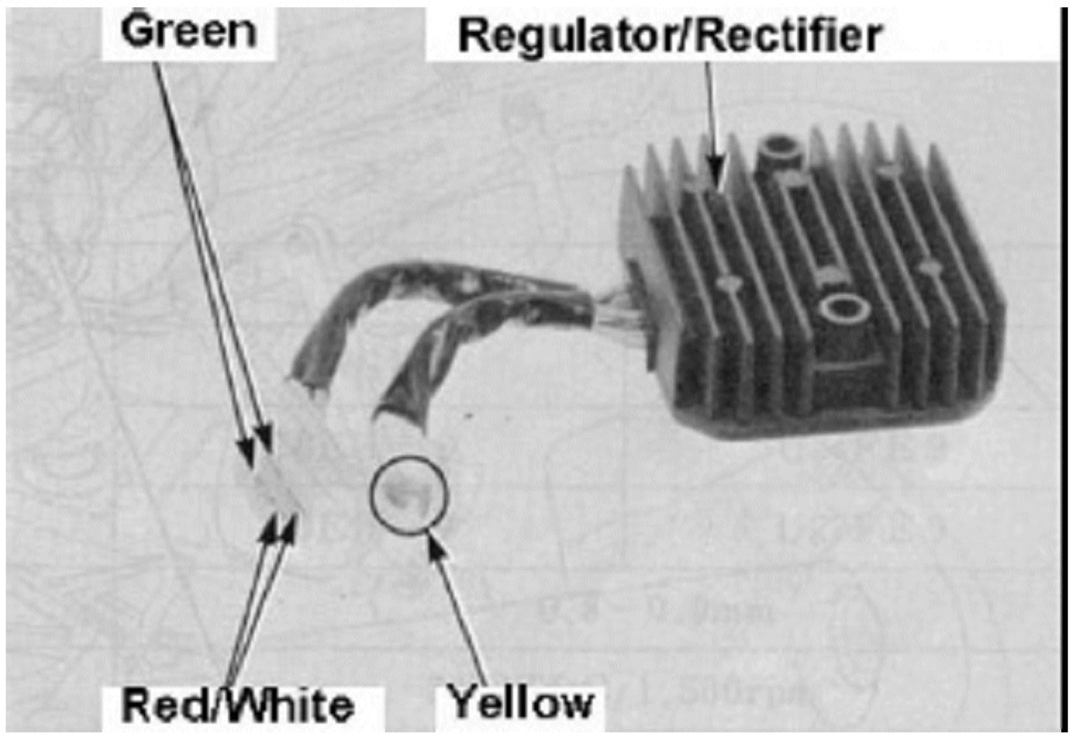


Test the conduction between each coupler on the table below.

If there is conduction in positive direction and no conduction in reverse direction, that part is ok.

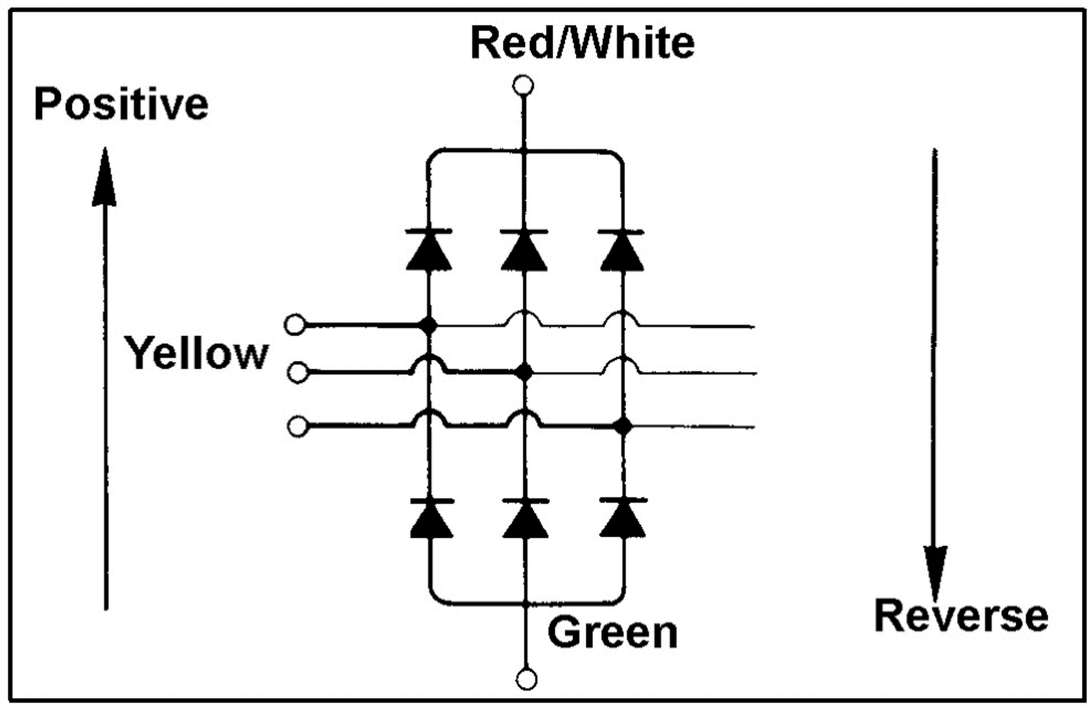
Positive Direction: Conduction

	(+)	(-)
I	Yellow	Green
II	Red / white	yellow



Reverse Direction: Conduction

	(+)	(-)
I	Green	Yellow
II	Yellow	Red / white



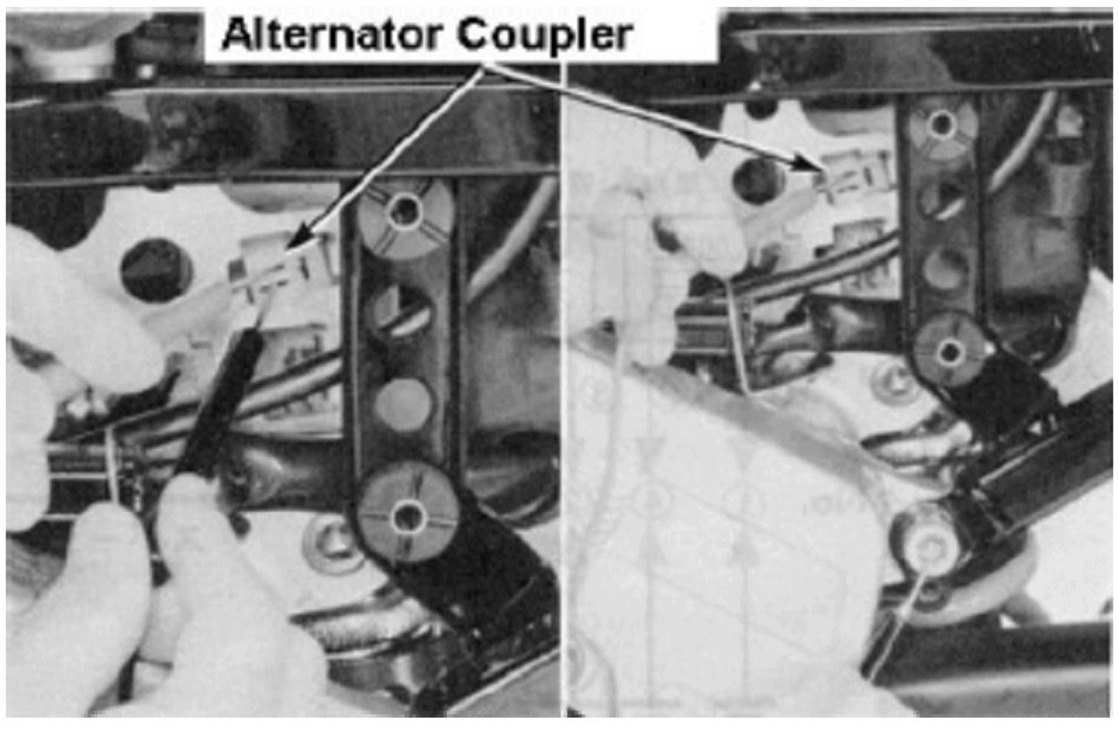
Alternator inspection

Detach a regulator/rectifier.
Measure the resistance between two yellow terminals on the alternator side.

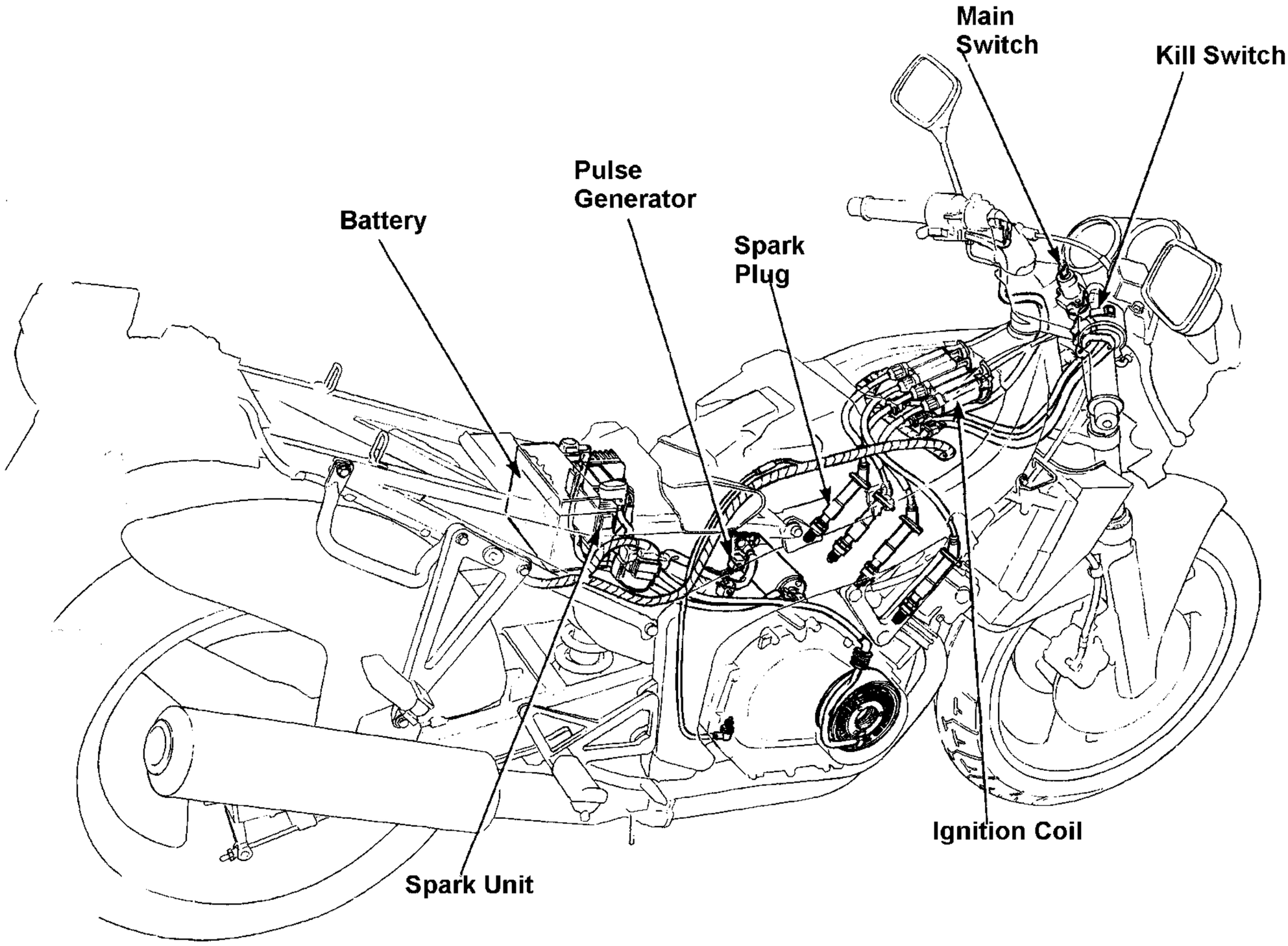
Standard: 0.3 ~ 0.4 Ω (20°c)

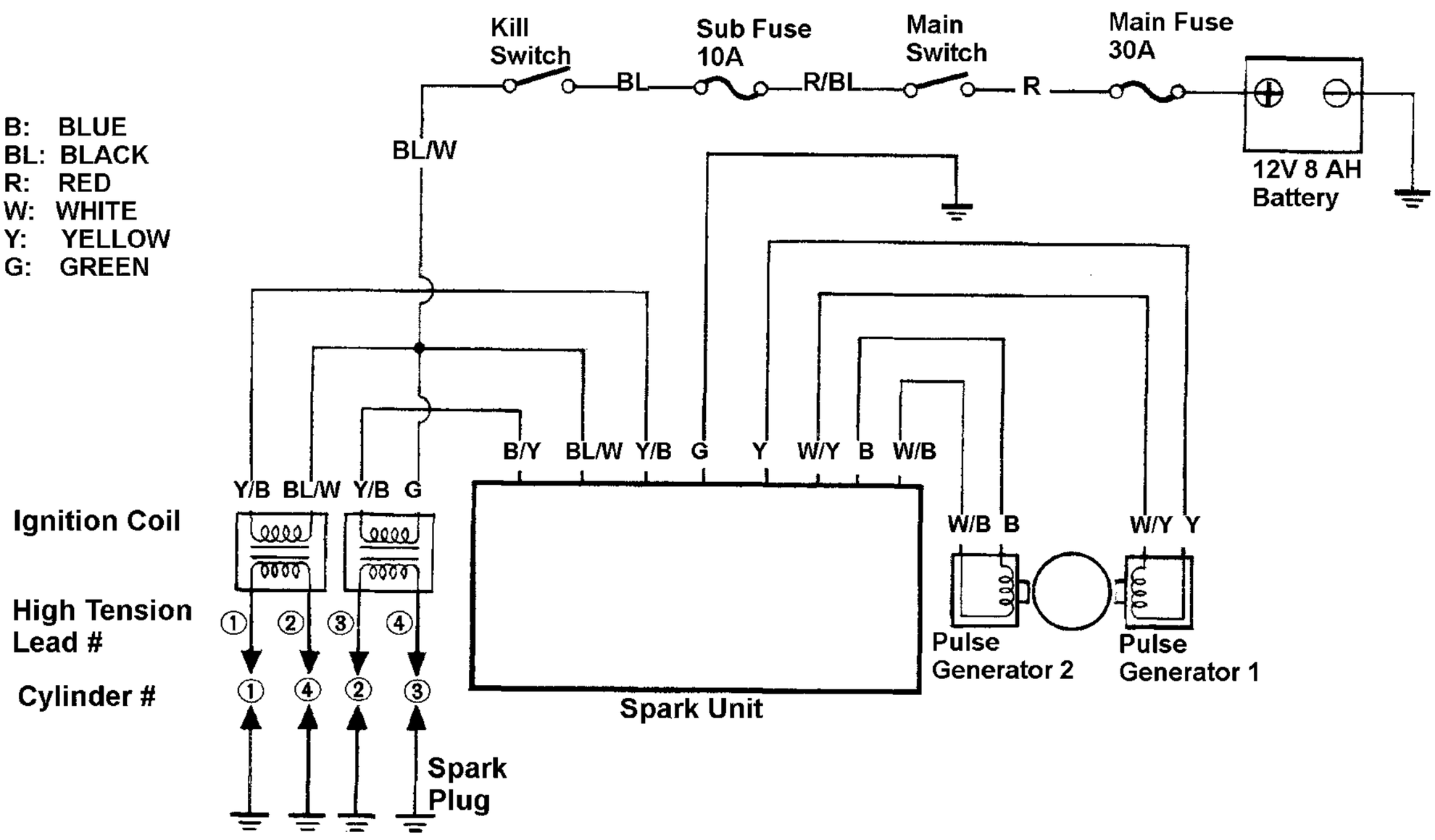
Confirm there is no conduction between each terminal on the alternator and ground earth. If the resistance is out of the range above or if there is any conduction between the terminals and ground earth, replace the alternator.

These measurements can be conducted while the alternator is mounted on the engine.



- **Wiring**


Main Switch
Kill Switch
Pulse Generator
Battery
Spark Plug
Spark Unit
Ignition Coil


B: BLUE
BL: BLACK
R: RED
W: WHITE
Y: YELLOW
G: GREEN
Kill Switch
Sub Fuse 10A
Main Switch
Main Fuse 30A
BL
R/BL
R
BL/W
12V 8 AH Battery
B/Y BL/W Y/B G Y W/Y B W/B
Y/B BL/W Y/B G
W/B B
W/Y Y
Ignition Coil
High Tension Lead #
Cylinder #
① ② ③ ④
① ④ ② ③
Spark Plug
Spark Unit
Pulse Generator 2
Pulse Generator 1

Wiring	18-0	Spark system inspection	18-3
Service information	18-1	Ignition coil	18-4
Troubleshooting	18-2	Pulse generator	18-5

Service information

General caution

- No adjustment is required as it is a transistor type ignition.
- Ignition timing (2-10)
- Spark plugs (2-9)
- Connect couplers with couplers of same colour.
- Resistance may vary with environment.

Service standard

Item			Standard	
Spark plug			NGK	ND
			C8EH – 9	U24FE9
			C9EH – 9	U27FE9
Spark plug clearance			0.8 - .09mm	
Timing	“F” marking		20°BTDC/1.500rpm	
Ignition coil resistance (20°)	Primary coil		2.6 – 3.2Ω	
	Secondary coil	With high tension lead	21 – 29k Ω	
		Without high tension lead	13 – 17k Ω	
Pulse generator coil resistance (20°			315 – 385 Ω	

Tools

Measuring tools

Digital circuit multimeter	(Kowa)	07411 - 0020000
Circuit multimeter	(Sanwa)	07308 – 0020000

Ignition system

Troubleshooting

No ignition spark from any of the plugs
- Kill switch is OFF
- Kill switch fault
- Main switch fault
- Pulse generator fault
- Spark unit fault
- Main fuse out
- Sub fuse out
- Wire connection fault / cutoff / short circuit between:
  - Starter magnetic switch and main switch (red)
  - Main switch and sub fuse (red/black)
  - Sub fuse and kill switch (black)
  - Kill switch and spark unit or ignition coil (black/white)
  - Ignition coil and spark unit (yellow/blue and blue/yellow)
  - Spark unit and earth (green)
  - Pulse generator and spark unit (white/blue and white/yellow)
- Battery undercharged

One particular plug does not give spark
- Plug fault
- High tension lead fault
- Ignition coil fault
- Wire connection fault / cutoff / short circuit between spark unit and ignition coil (blue/yellow, black/white and yellow/blue)
- Spark unit fault

- Rough / inadequate rpm
- Primary ignition circuit
  - Loose wiring
  - Kill switch fault
  - Main switch fault
  - Battery undercharged
  - Spark unit fault
  - Pulse generator fault
  - Pulse rotor fault

Secondary ignition circuit
Plug fault
High tension lead fault
High tension lead cap screw loose
Plug cap leak
Ignition coil fault

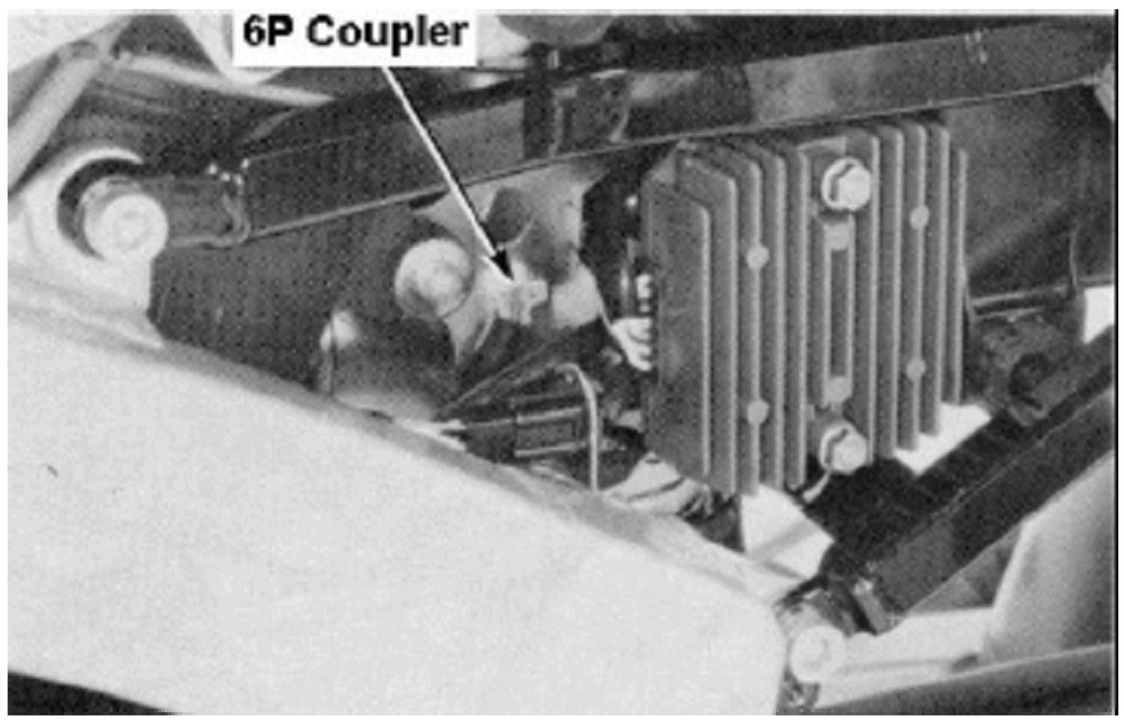
- Ignition timing
  - Spark unit fault
  - Pulse generator fault
  - Pulse rotor fault

Advance angle fault
Pulse generator fault
Spark unit fault
Pulse rotor fault

Spark system inspection

If there is no spark or weak spark, inspect the spark plug (2-9).
If the spark plugs are ok, inspect the following parts:

- Tightening of spark plug caps
- Battery status
- Main switch, kill switch, main fuse and sub fuse (Sec. 20).
- Corrosion of the starter magnetic switch coupler.



If the above items are fine, disconnect the 6P coupler from the spark unit and inspect the following items.

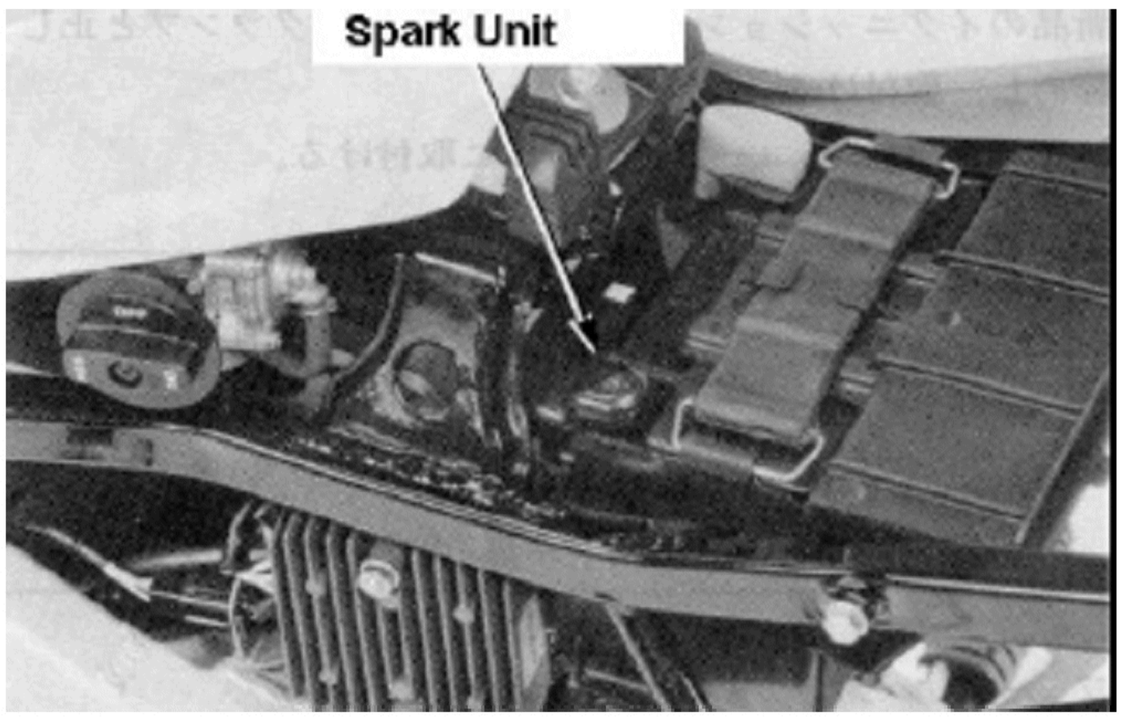
Loose, corrosion of spark unit coupler terminals.

If the above items are ok, inspect the conductivity and resistance of each male coupler terminal.

Terminals	Item	Standard
Black/white and yellow/blue Black/white and blue/yellow	Primary ignition coil	2.6 – 3.2 Ω 20°c
Black/white and green (main switch ON, kill switch RUN)	Battery voltage between main switch – kill switch – spark unit	Battery voltage Set the range to DC-V. It should indicate around 12V. Connect (+) lead from the voltmeter to Black/White, (-) lead to Green.

If any of the items above were out of standard range, inspect following items:

- Ignition coil (18-4)
- Pulse generator (18-5)



If the above items are ok, inspect/adjust/replace wire harness, couplers and connectors.

Spark unit inspection

Inspect pulse rotor (19-9) for deformation/damage on projections. If the timing is incorrect, replace the spark unit.

Inspect the timing again (2-10).

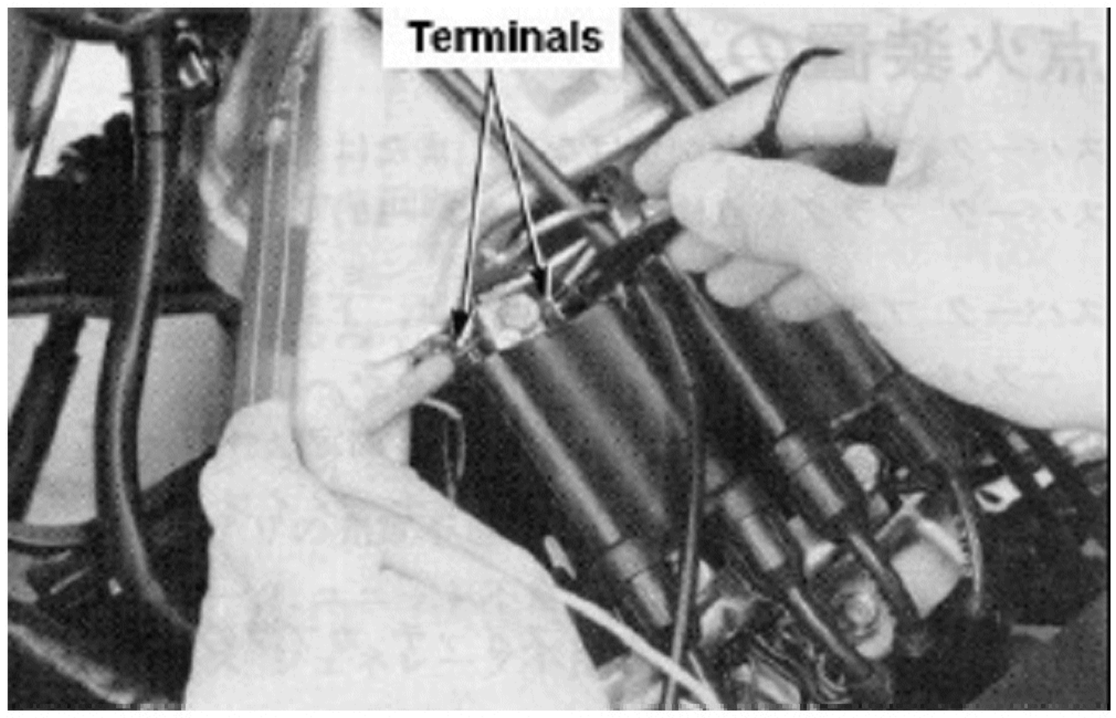
Ignition coil

Ignition coil inspection

Remove fuel tank (4-3).
Measure the resistance of the primary side of the ignition coil.

Resistance: 2.6 ~ 3.2Ω (20°c)

Inspect the conduction between the primary terminal and ground earth. No conduction should exist.



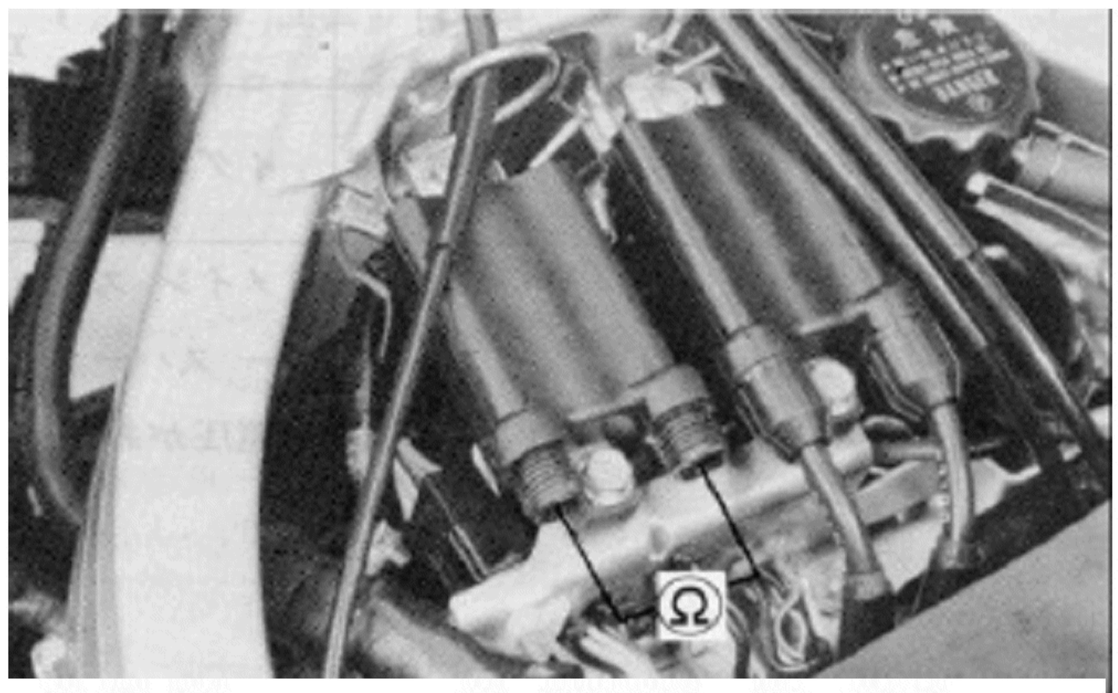
Remove plug caps from spark plugs and measure the resistance on the secondary side of the ignition coil.

Resistance: 21 ~ 29Ω (20°c)

If the resistance on the secondary side is out of the range, disconnect high tension leads and measure the resistance on the secondary coil.

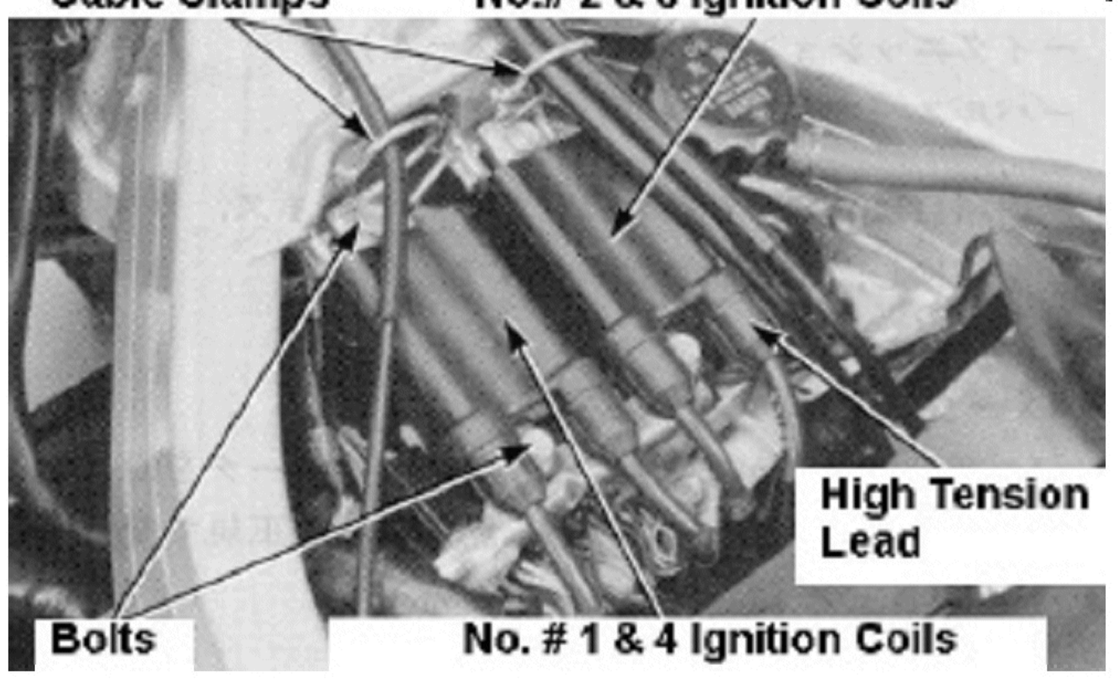
Resistance: 13 ~ 172Ω (20°c)

If the measured resistance is within the above range, replace the high tension leads.
If the resistance is out of the range, replace the ignition coil.



Ignition coil replacement

Disconnect high tension leads from ignition coils.
Remove ignition coil attachment bolts and remove the coils.
Tighten the new ignition coil together with clamps.
Connect high tension leads to the coils.



Primary terminal connection #1 and 4 coils: Green terminal - Yellow/Blue wire Black terminal - Black/White #2 and 3 coils: Green terminal - Blue/Yellow Black terminal - Black/White

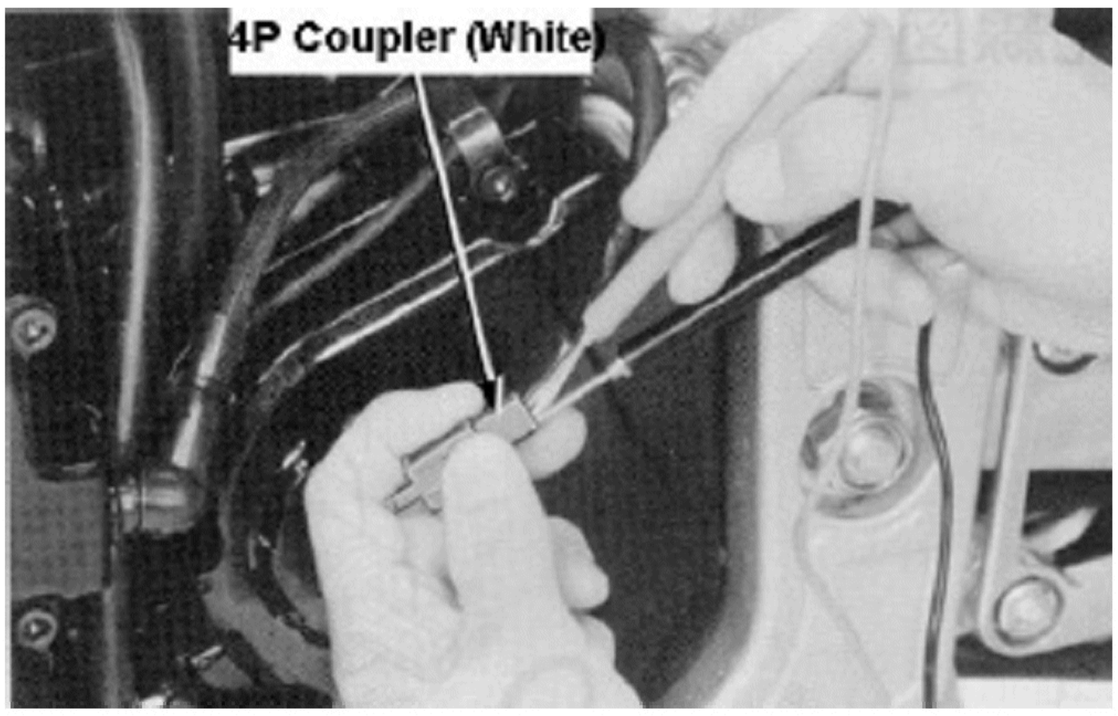
Install the fuel tank (4-3)

Pulse generator

Pulse generator coil inspection

Remove the left side cover.
Disconnect the 4P coupler (white) for pulse generator wires and measure the resistance between coupler terminals (White/Blue – Blue, White/Yellow – Yellow) on the engine side.

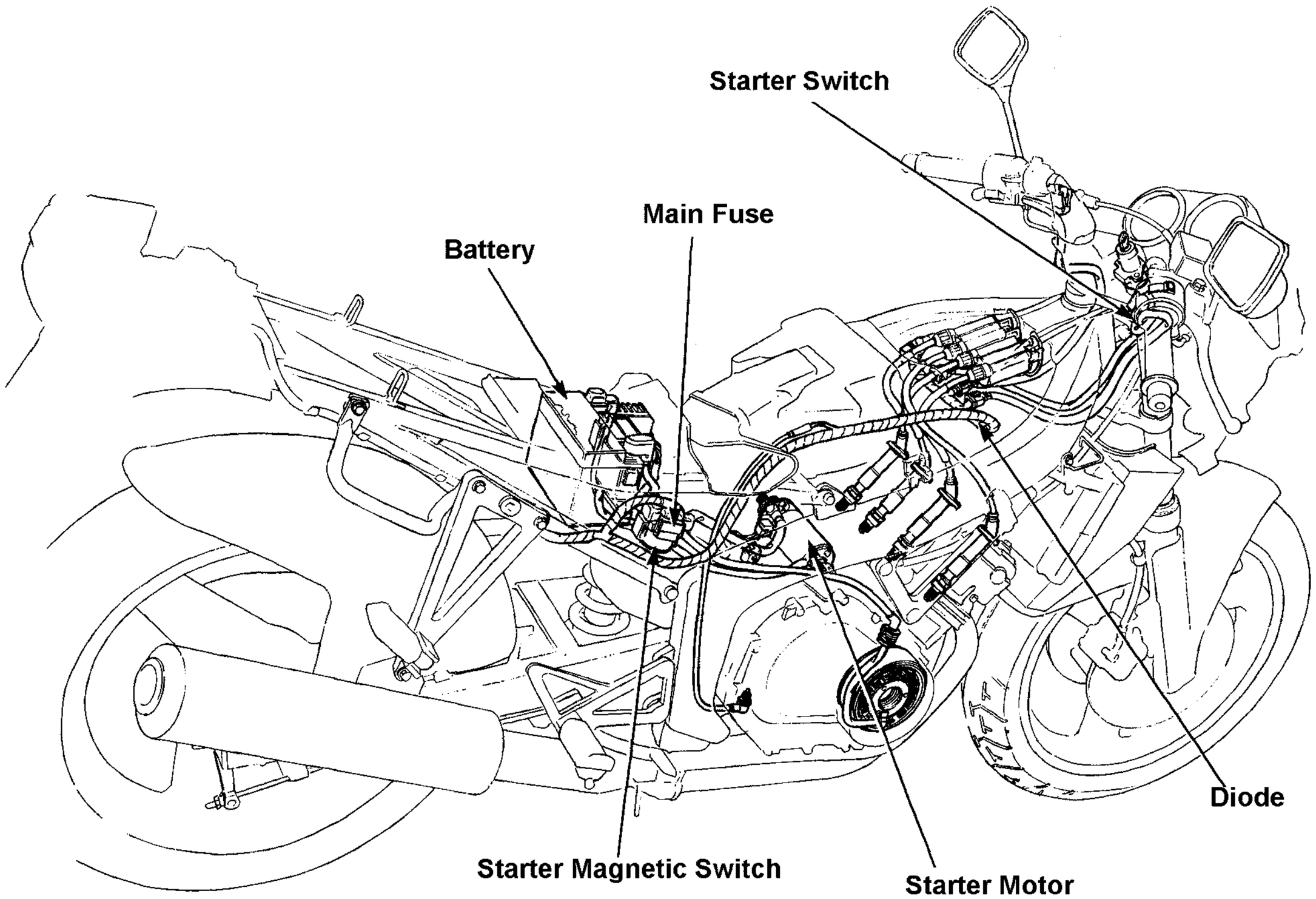
Standard: 315 ~ 385Ω (20°c)

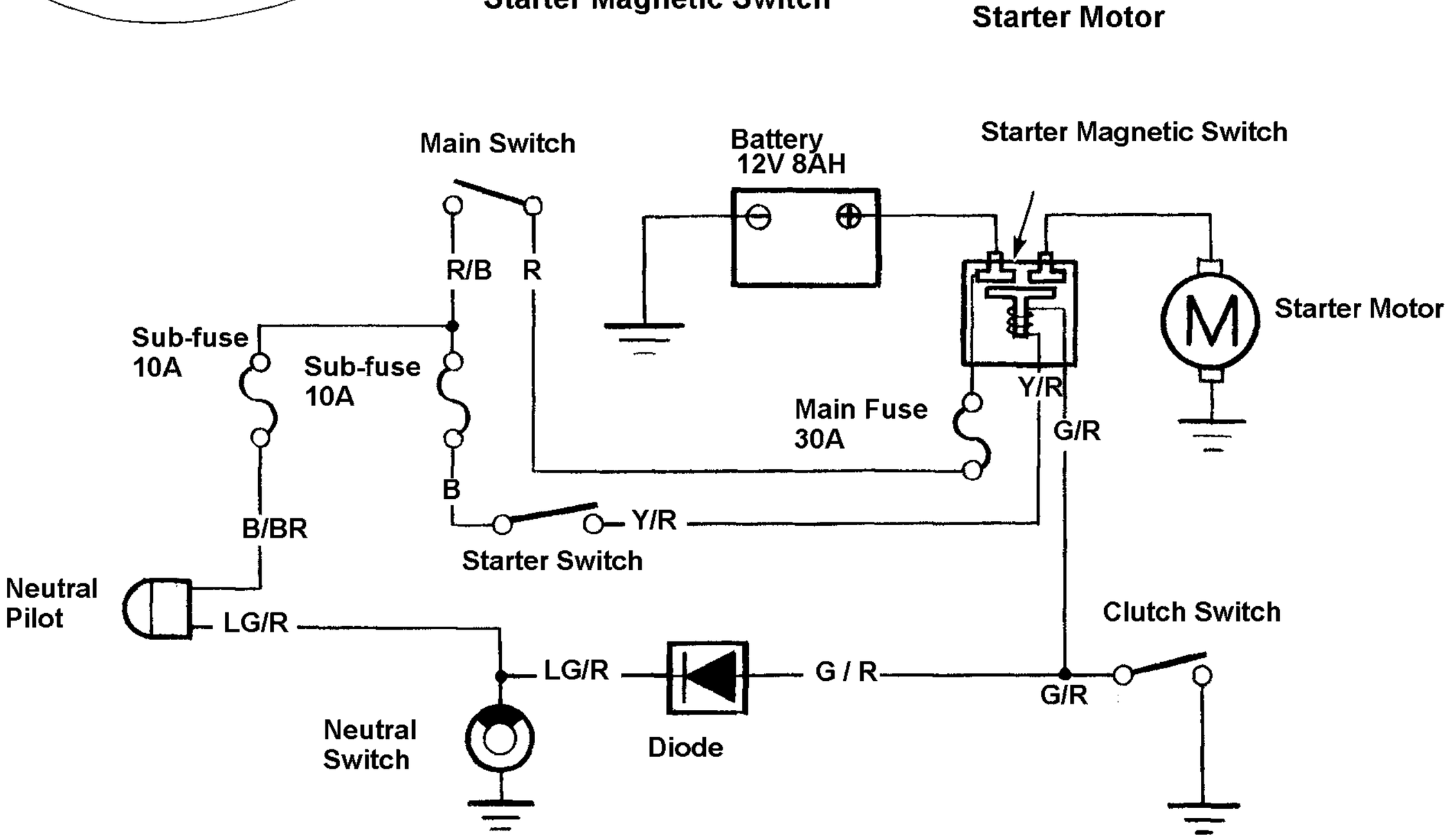


Check the conduction between each terminal and ground earth. No conduction should exist.

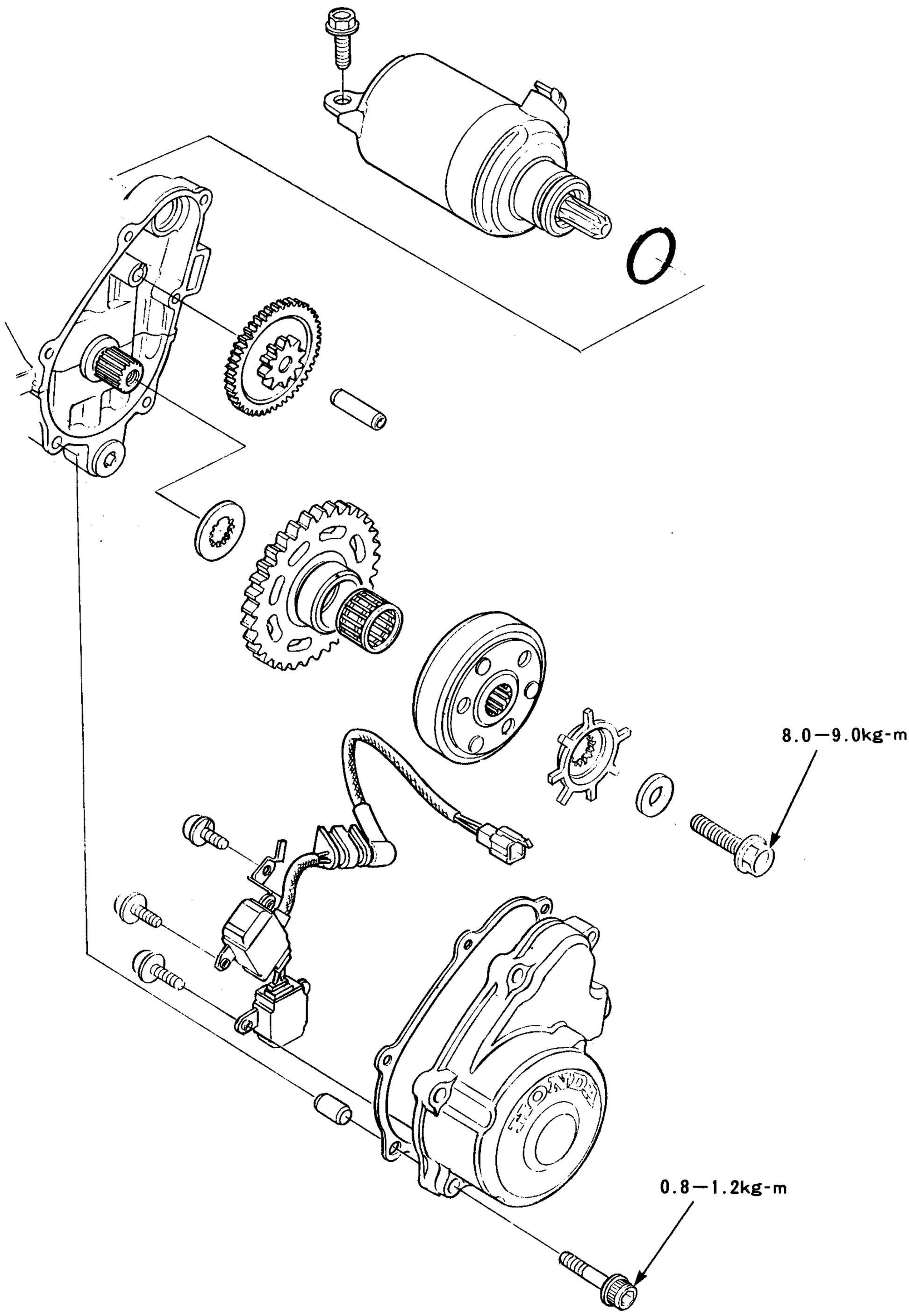
Refer to Sec.19 for pulse generator / rotor replacement.

- **Wiring**


Starter Switch
Main Fuse
Battery
Diode
Starter Magnetic Switch
Starter Motor


Main Switch
Battery
12V 8AH
Starter Magnetic Switch
R/B
R
Sub-fuse
10A
Sub-fuse
10A
Main Fuse
30A
Y/R
G/R
Starter Motor
B
B/BR
Y/R
Starter Switch
Neutral
Pilot
LG/R
Clutch Switch
LG/R
G / R
G/R
Neutral
Switch
Diode

- **Disassembly**



Wiring	19-0	Diode	19-7
Disassembly	19-1	Left crankcase cover removal	19-8
Service information	19-2	Starter clutch	19-9
Troubleshooting	19-3	Left crankcase cover installation	19-12
Starter motor	19-4		
Magnetic switch	19-7		

Service information

General caution

- The starter motor can be detached with the engine mounted.
- Pulse generator troubleshooting (Sec.18).

Service standard

Item	Standard	Standard	Limitation
Starter motor	Brush spring tension	630 –850g	-
	Brush length	11.00 – 11.05mm	4.5mm

Torque

Starter clutch	8.0 – 9.0kg-m
Left crankcase cover	0.8 – 1.2kg-m
Starter motor terminal cable	0.8 – 1.2kg-m

Troubleshooting

Starter does not work
- Undercharged battery
- Main switch fault
- Starter switch fault
- Neutral switch fault
- Starter magnetic switch fault
- Wire harness, coupler or connector connection or open circuit
- Clutch diode fault
- Clutch switch fault
- Fuse blown (inspect sub, then main)

Starter motor operates but the engine does not spin
- Starter clutch fault
- Starter drive gear fault
- Starter driven gear fault

Insufficient power on the starter motor
- Battery undercharged
- High resistance in the circuit
- Motor catching debris/obstruction

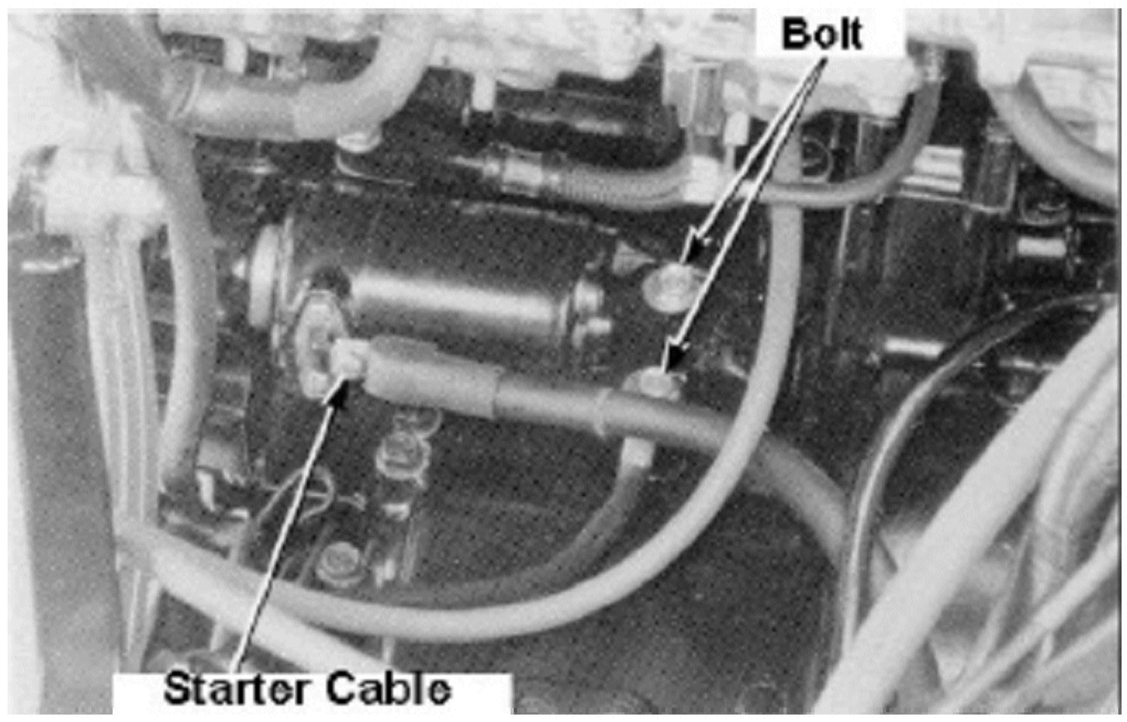
Both starter motor and the engine spins but does not start
- Ignition system fault (Sec.18)
- Engine fault

Starter motor

Removal

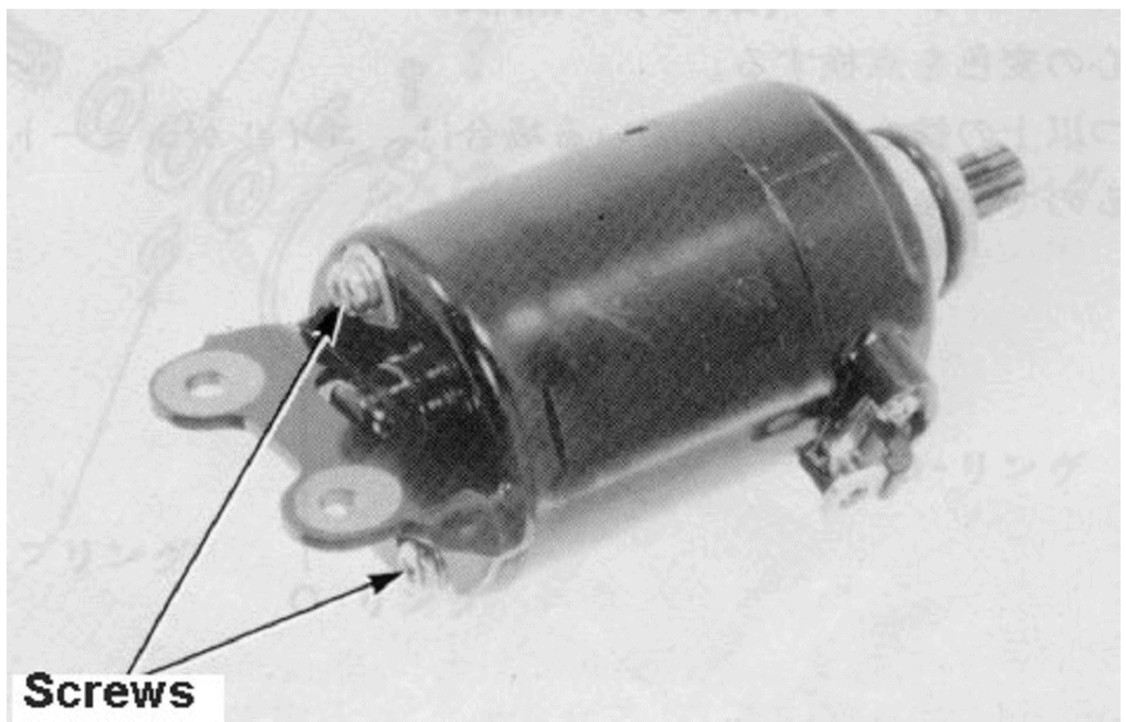
Disconnect negative terminal on the battery prior to starting the work.

Remove the seat and side covers.
Remove the fuel tank (4-3).
Remove the air cleaner case (4-6).
Remove screws and disconnect the starter cable from the motor.
Remove two attachment bolts to remove the starter motor.

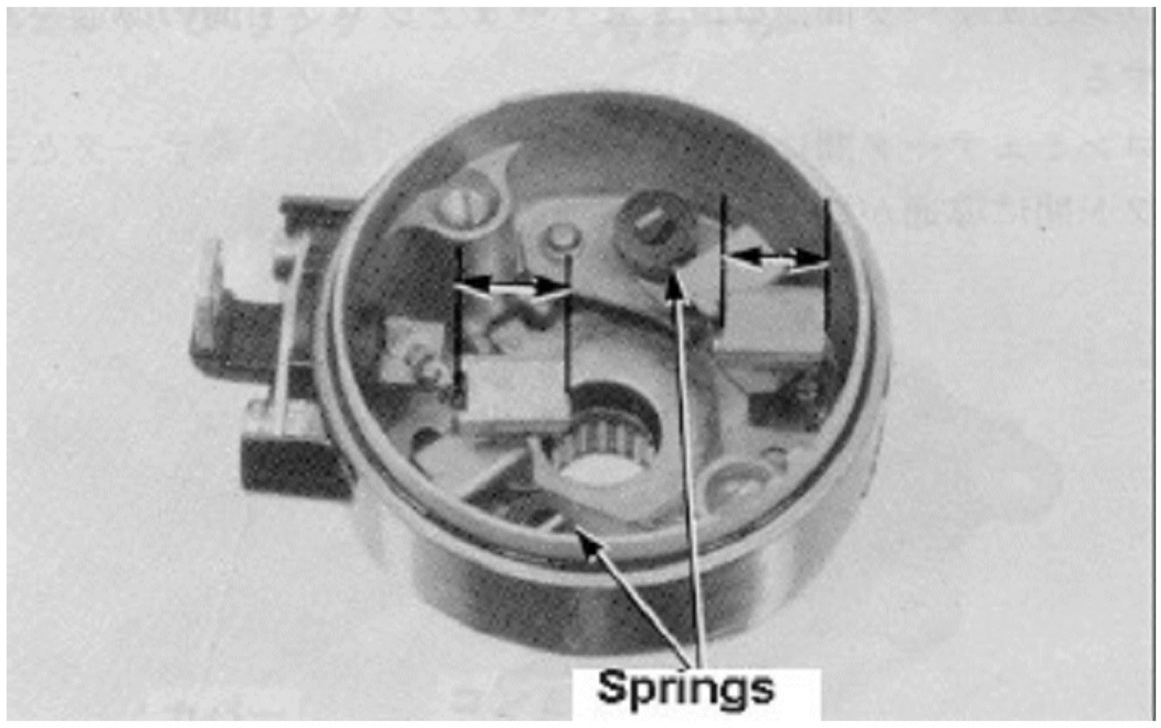


Disassembly

Remove screws on the motor case.
Remove the case cover.
Pull out the armature.



Check the number and position of shims

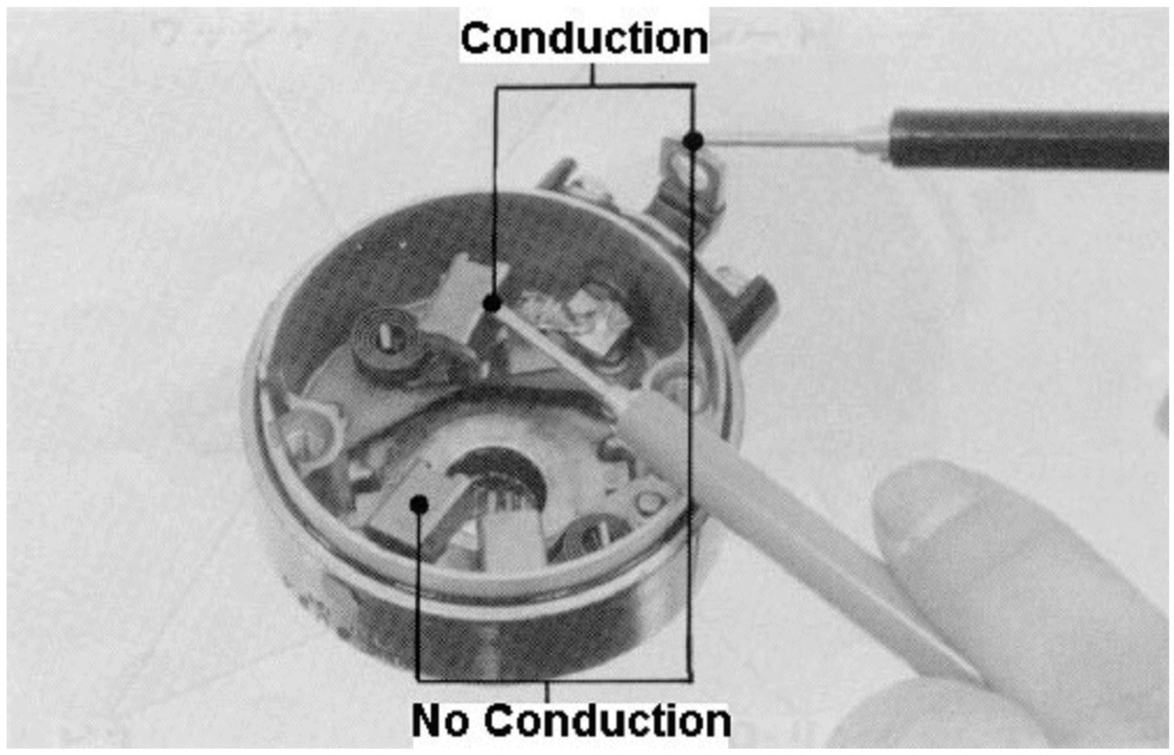


Brush inspection

Inspect the brush length and the spring tension.

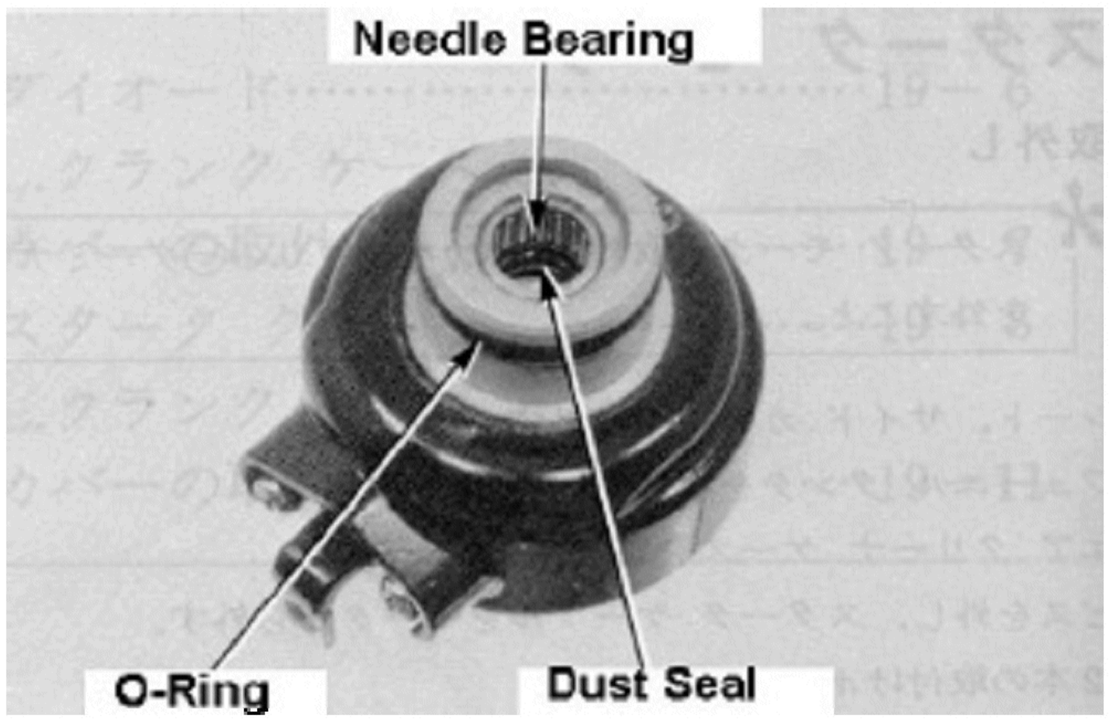
Brush length: ≦ 4.5mm → Replace

Inspect the conduction between terminals and the brush.



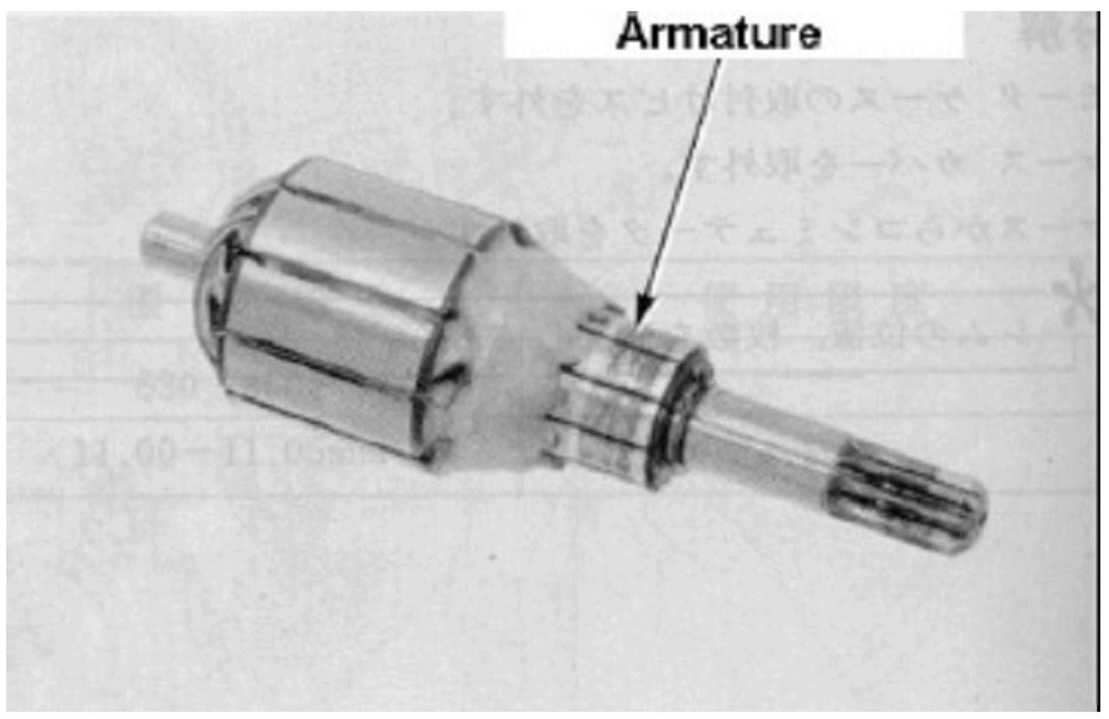
Needle bearing, dust seal and O-Ring inspection

Inspect the needle bearing for wear, damage and loose fit.
Inspect the dust seal for wear and apply small amount of grease.
Inspect the O-Ring for wear.

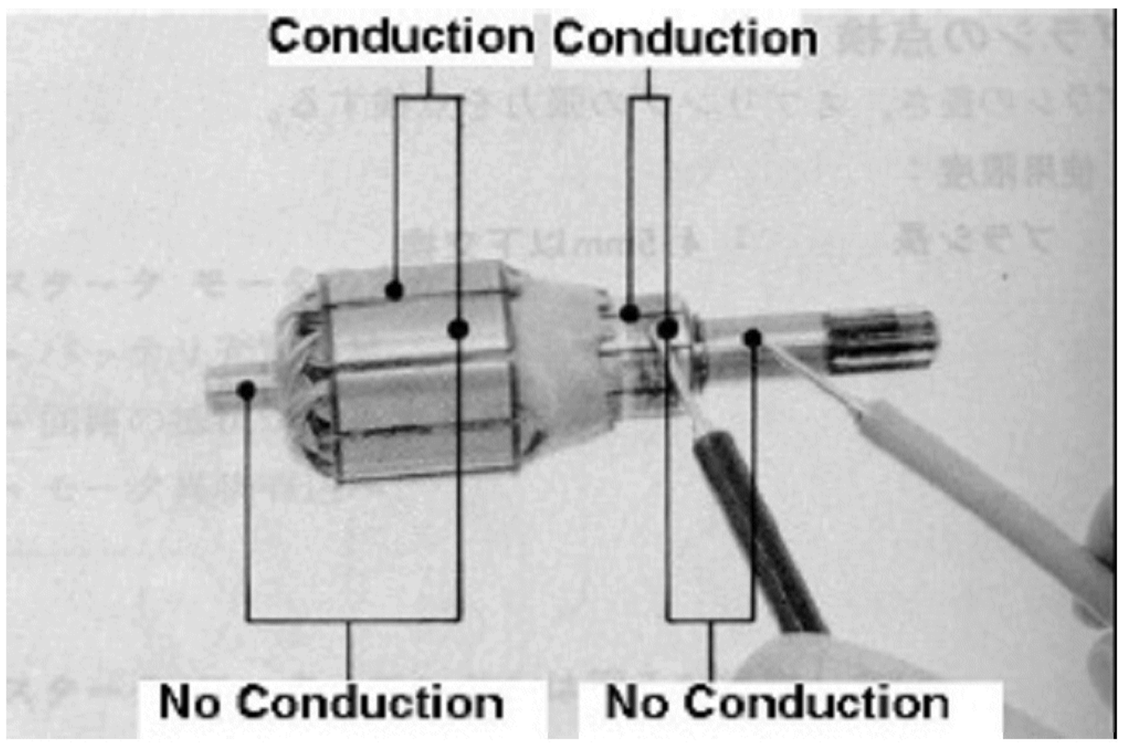


Armature inspection

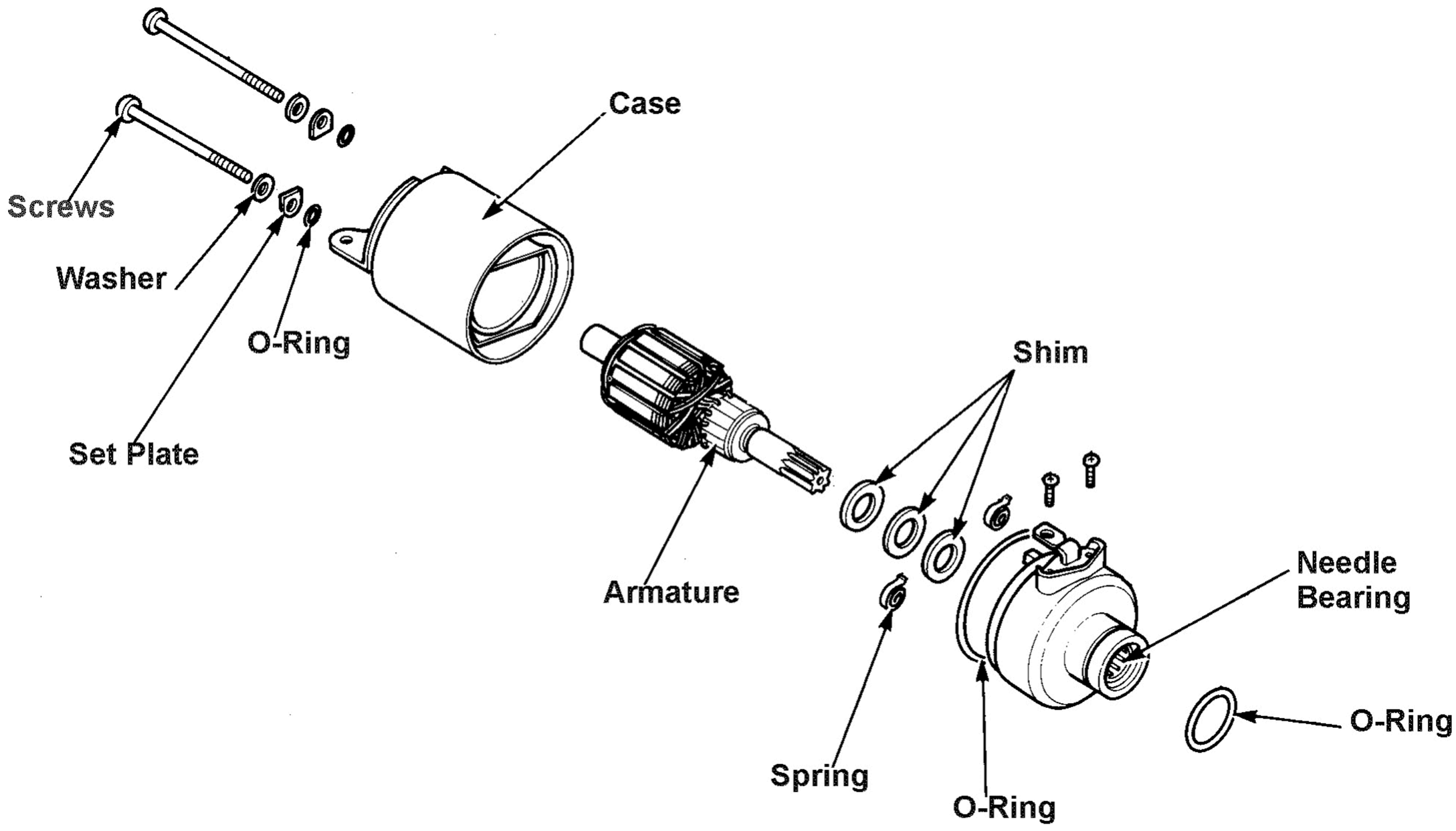
Check the colour of the cores.
If two or more cores are an irregular colour, replace them as they indicate the short circuit of the coil.



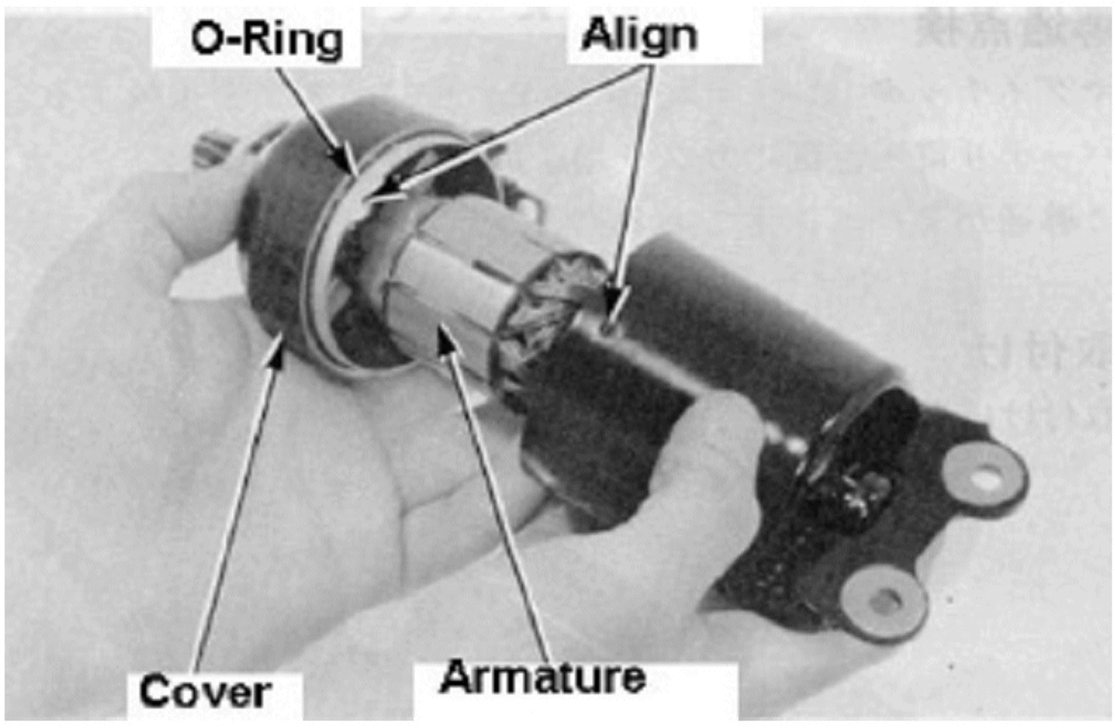
Check the conduction between armatures, between the armature and the shaft. It should have conduction between the armatures but not between the armature and the shaft.



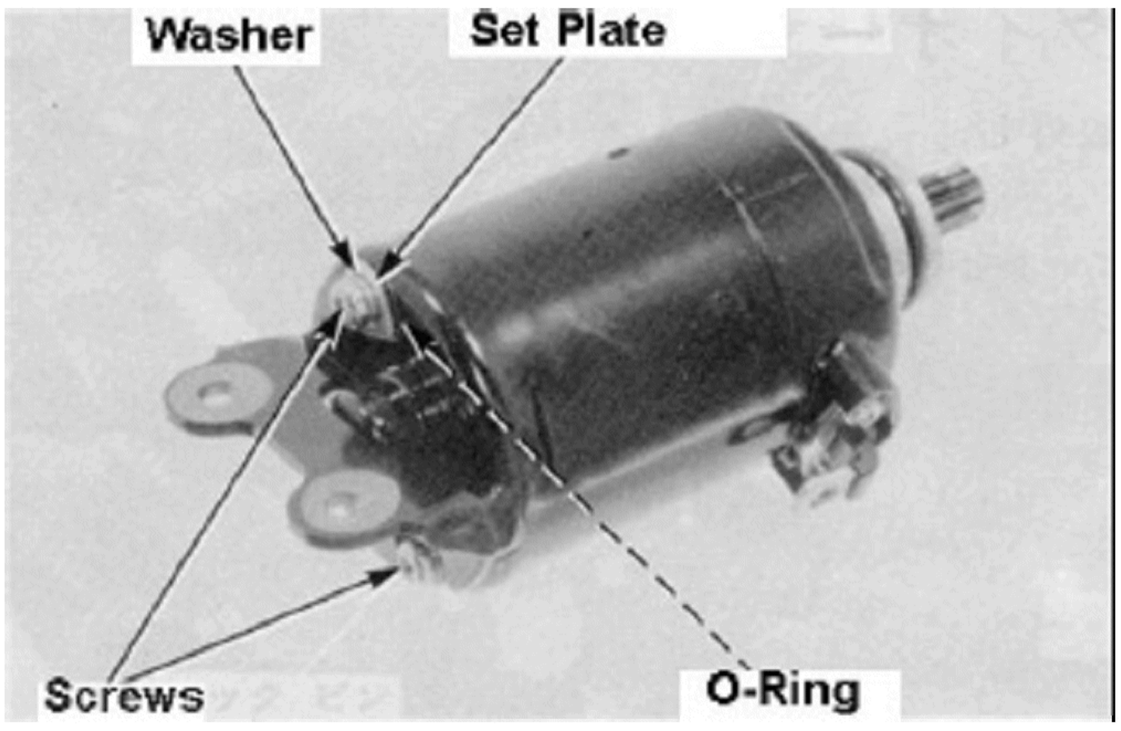
- **Assembly**



Inspect O-Rings for wear.
Set locking washers correctly to the slit on the cover and set shims in the order which was recorded when disassembling.
Set the brush and install the armature to the starter motor cover.
Align the slit on the cover and the punched mark on the case and attach the motor case.



Attach washers, set plates and O-Rings to screws and tighten them.



Installation

Install the starter motor to the crankcase and tighten the bolt.

Attach and tighten the earth cable.

Connect cables to terminals and tighten to specified torque.

.

Torque: 0.8 ~ 1.2kg-m

Clamp the starter cable.
Install the air cleaner case.
Install the fuel tank (4-3).
Install side covers and the seat.

Magnetic switch

Inspection

Turn the ignition switch “ON” and push the starter button. A click sound should be heard and the starter motor should work.

Removal

Disconnect the coupler from the magnetic switch.
Disconnect the cable from (-) terminal of the battery.
Pull out the magnetic switch and disconnect cables from terminals.

Conduction check

Connect a multimeter to the terminals of the magnetic switch.

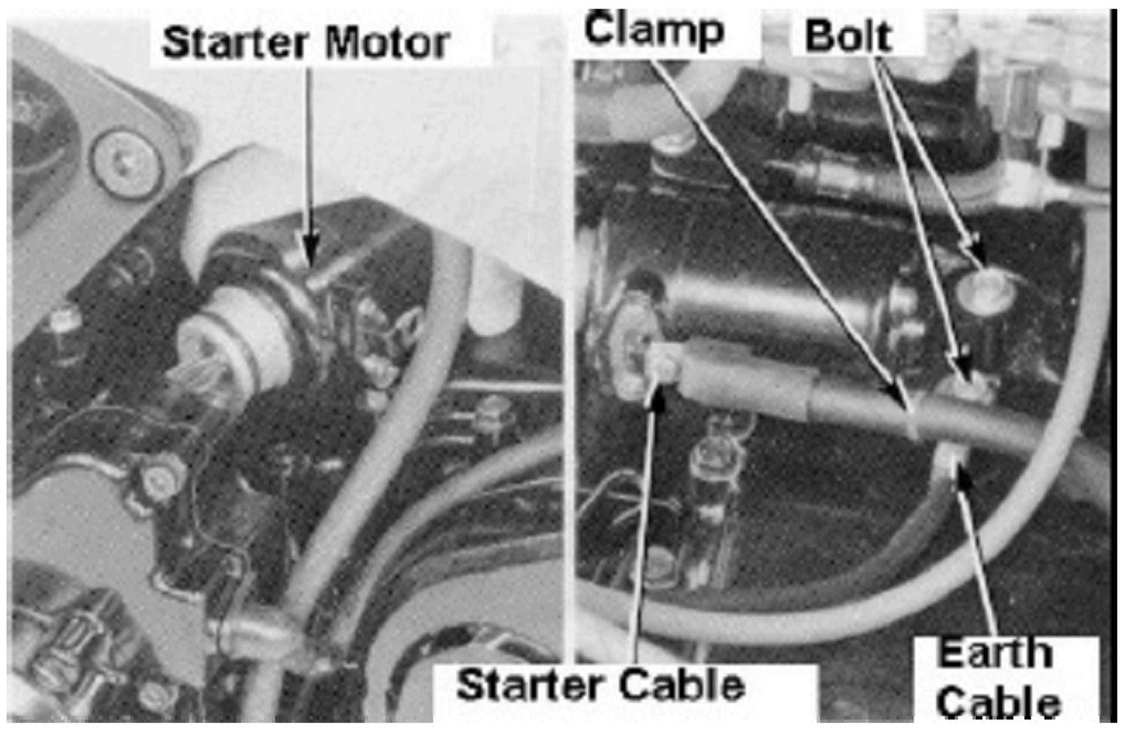
Installation

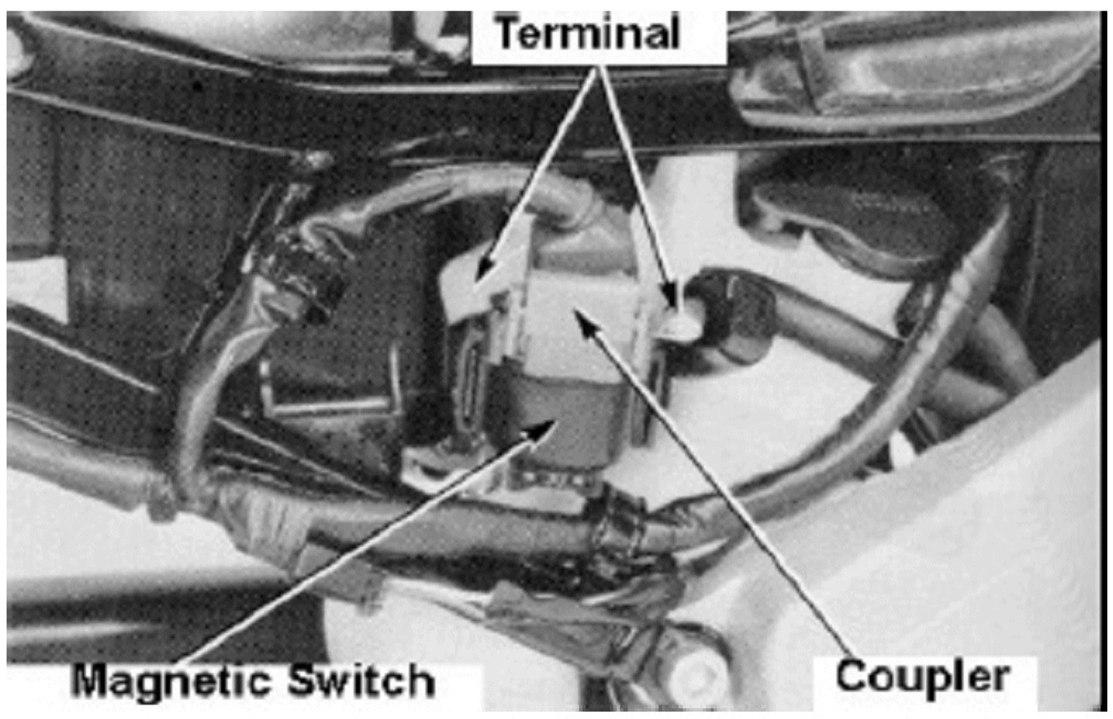
Reverse the procedure of removal.

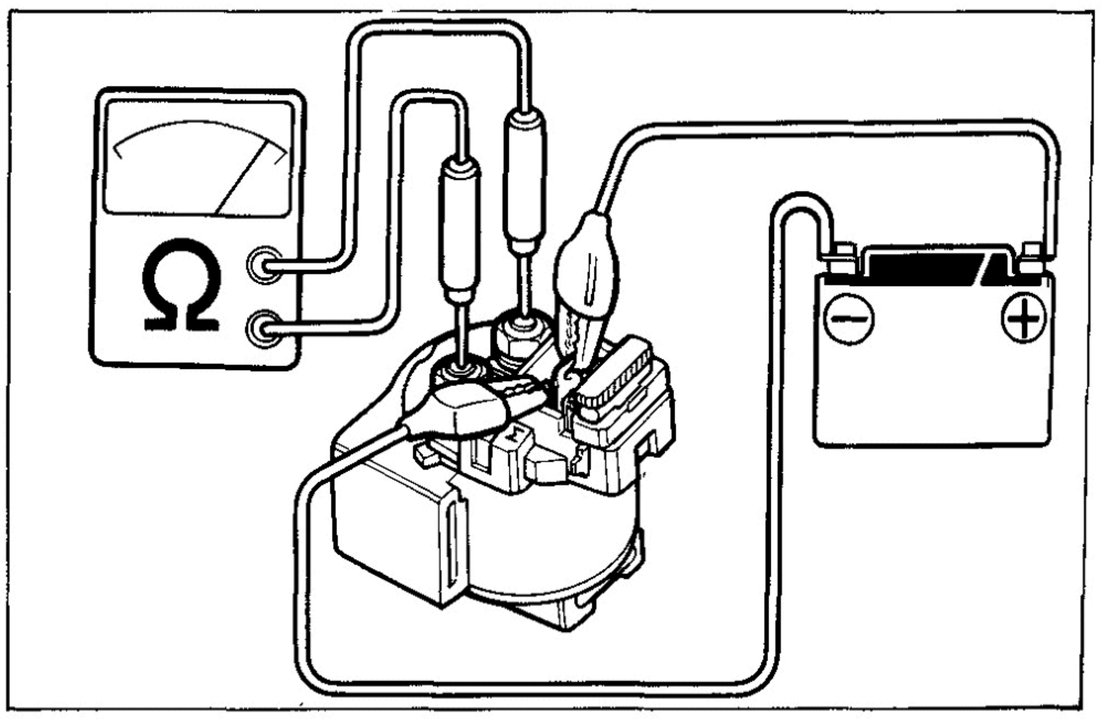
Diode

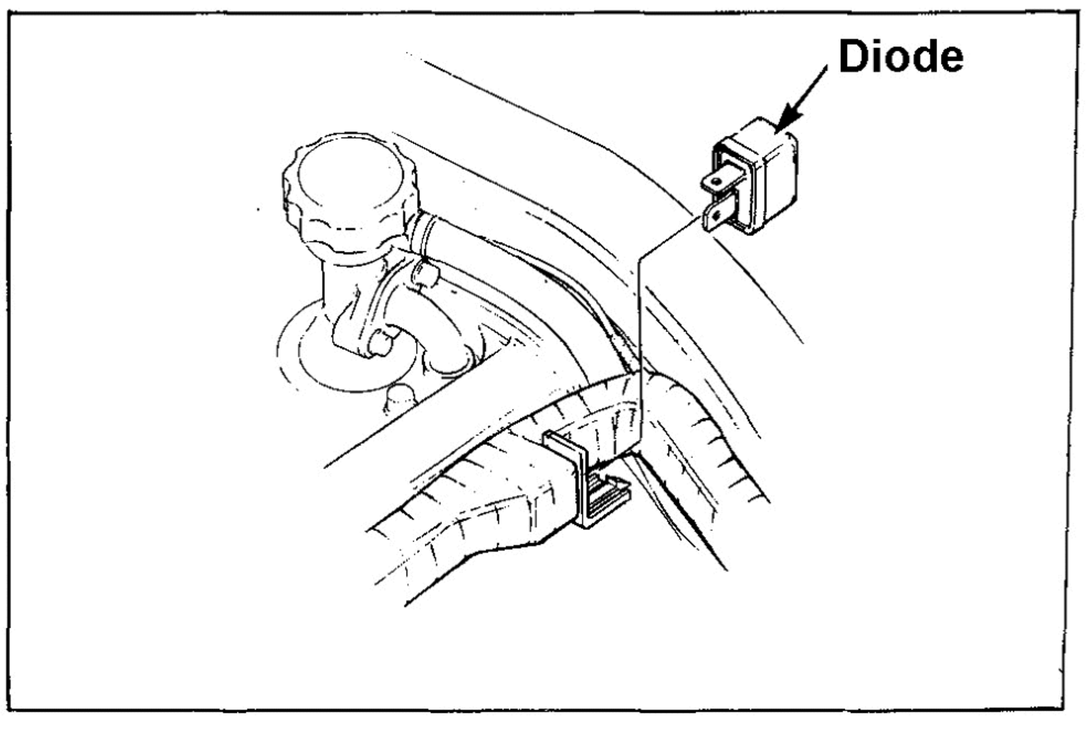
Removal

Remove the fuel tank and remove the diode attached to the wire harness.

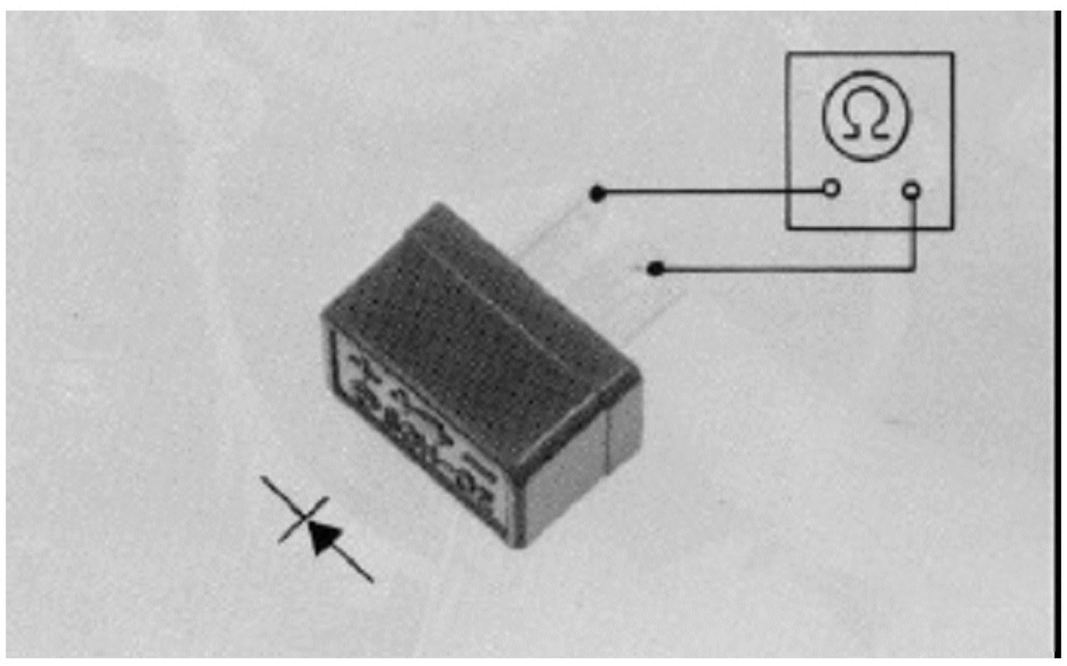








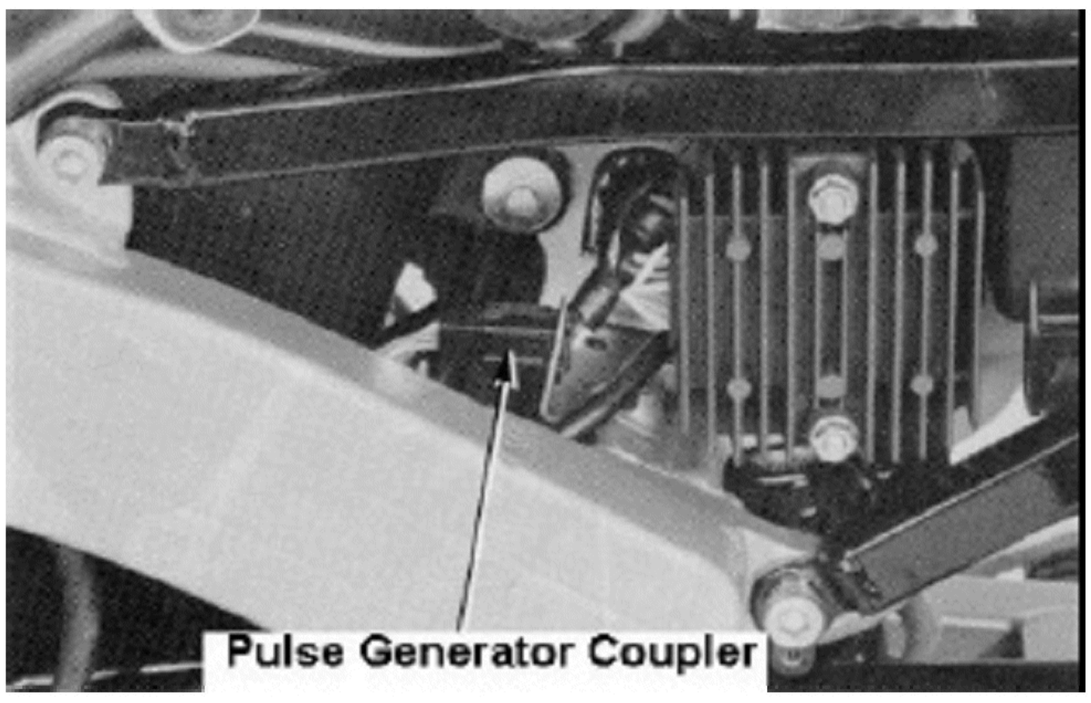
Inspection
Inspect the conductance with an ohmmeter.
Conduction occurs in one direction only.



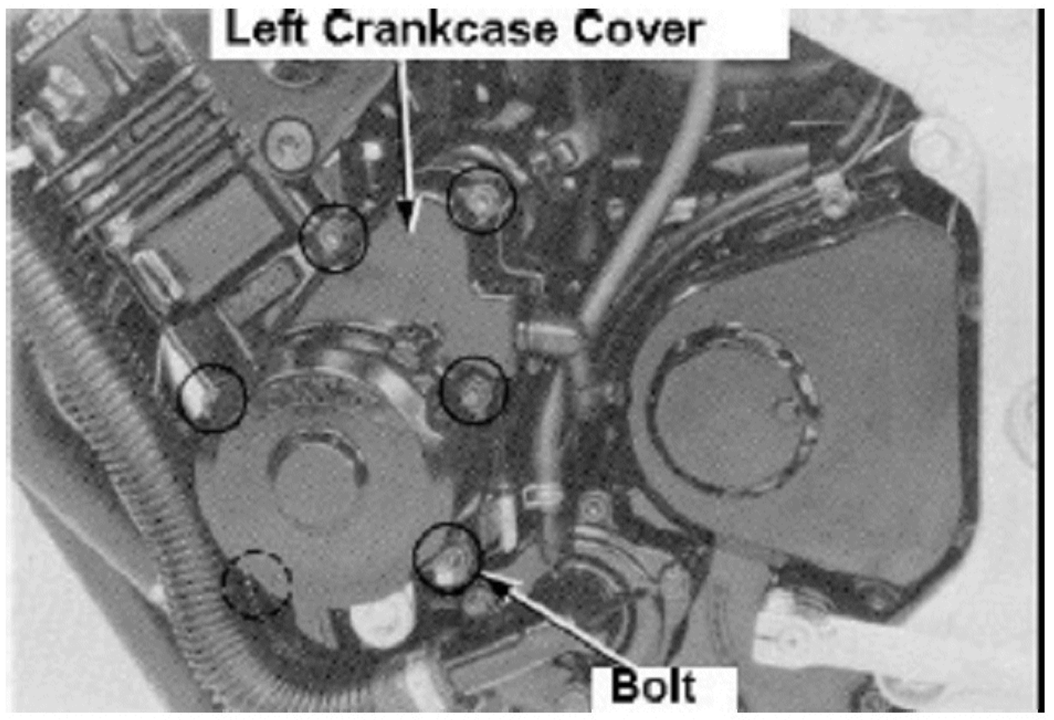
Installation
Reverse the removal procedure.

Left crankcase cover removal

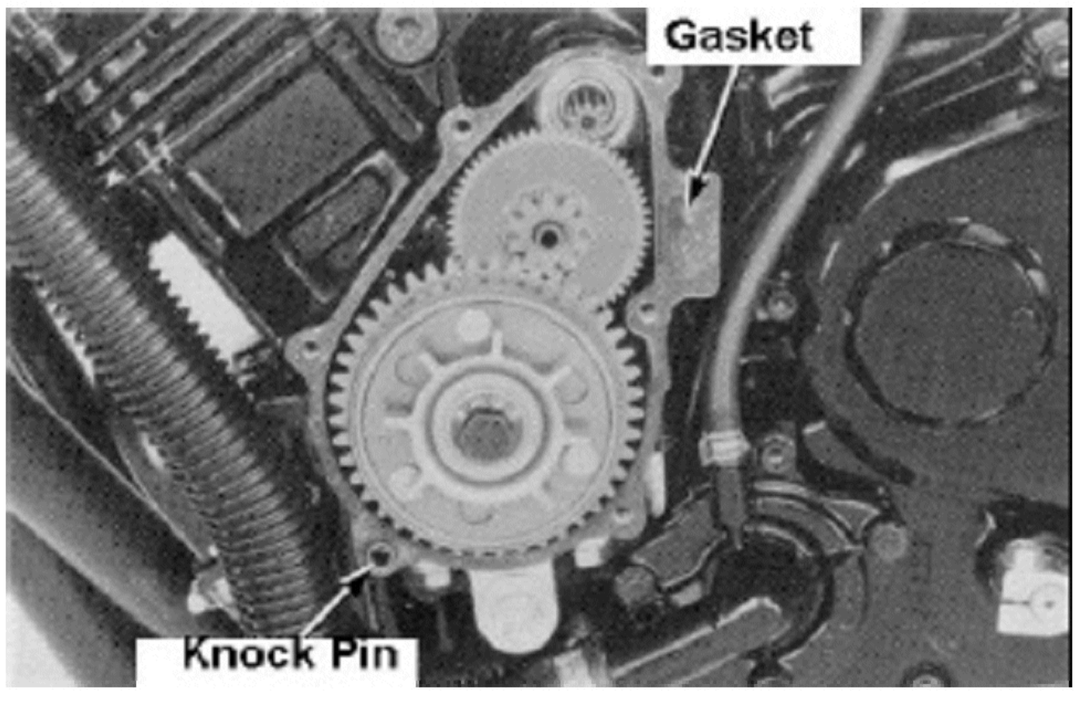
Drain engine oil (2-16).
Remove the seat.
Remove the left side cover.
Disconnect the pulse generator 4P coupler.



Remove bolts and remove the left crankcase cover.



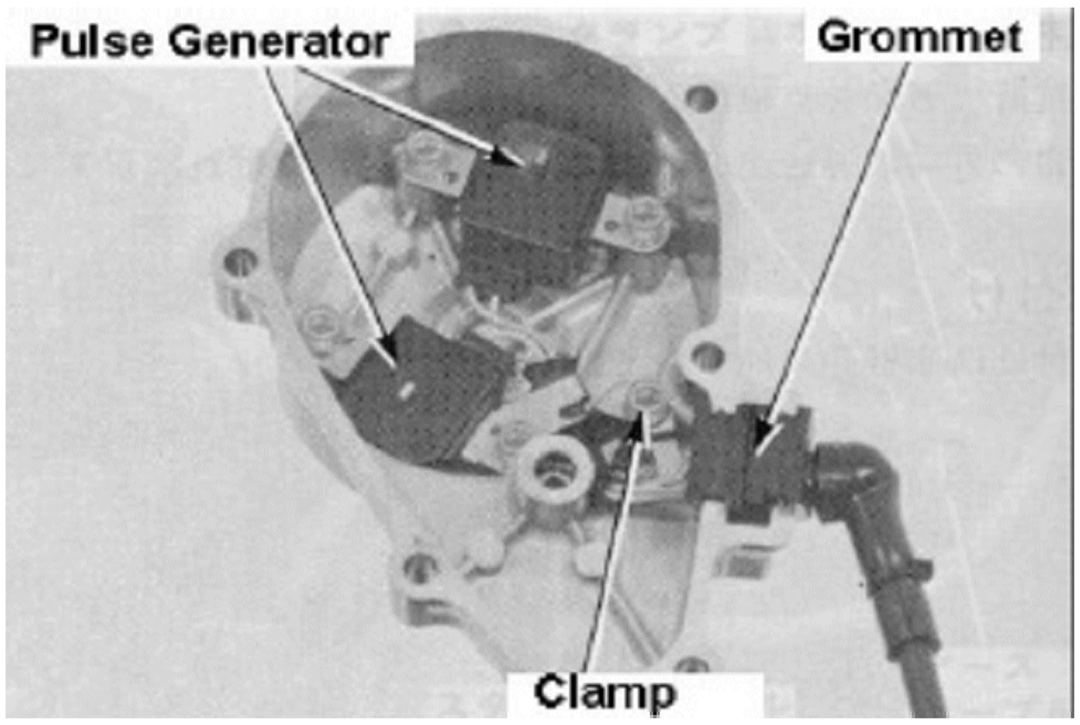
Remove the gasket and the knock pin.



Pulse generator removal

Remove the grommet.

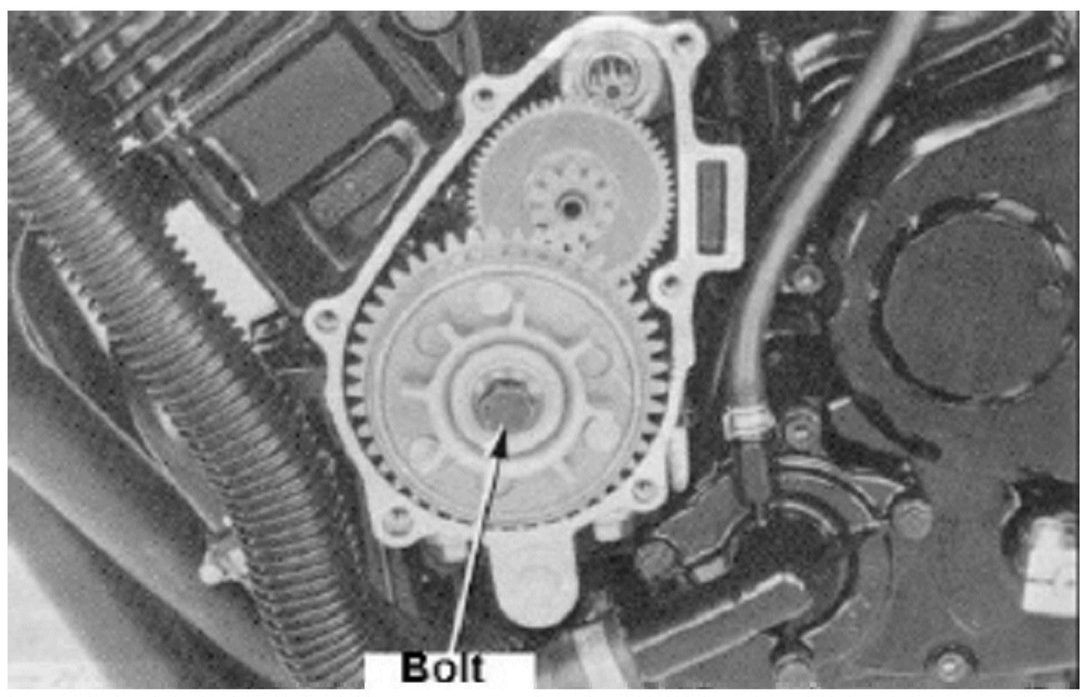
Remove five socket bolts and remove the wire clamp and the pulse generator.



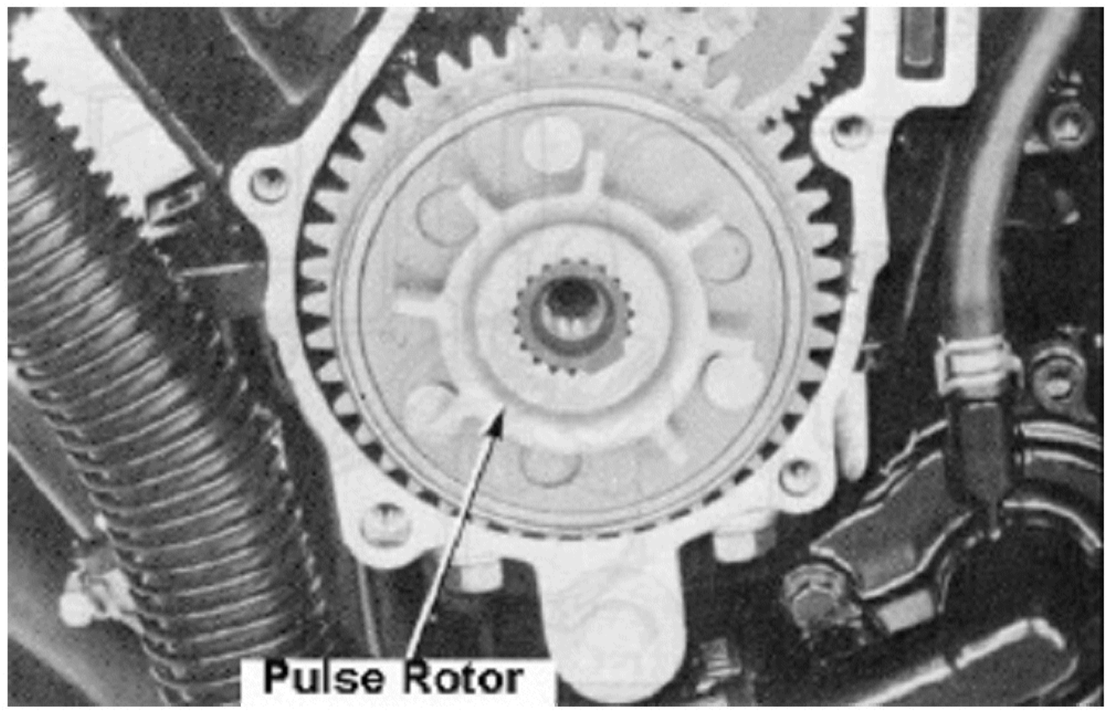
Starter clutch

Removal

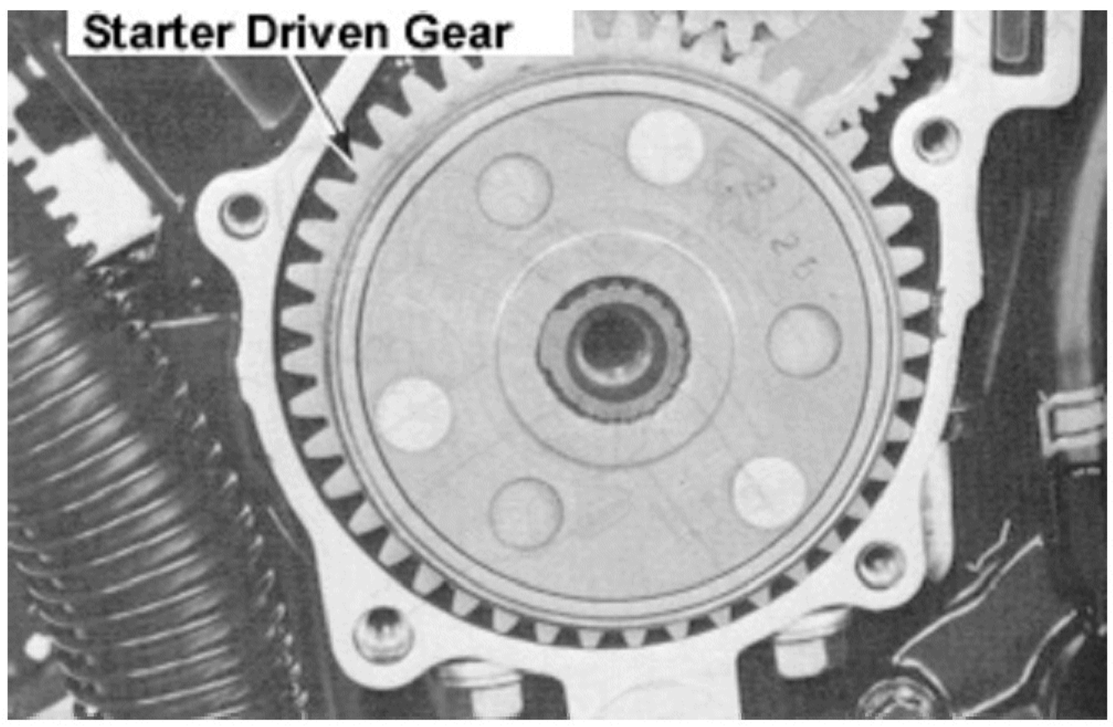
Remove starter clutch attachment bolt.



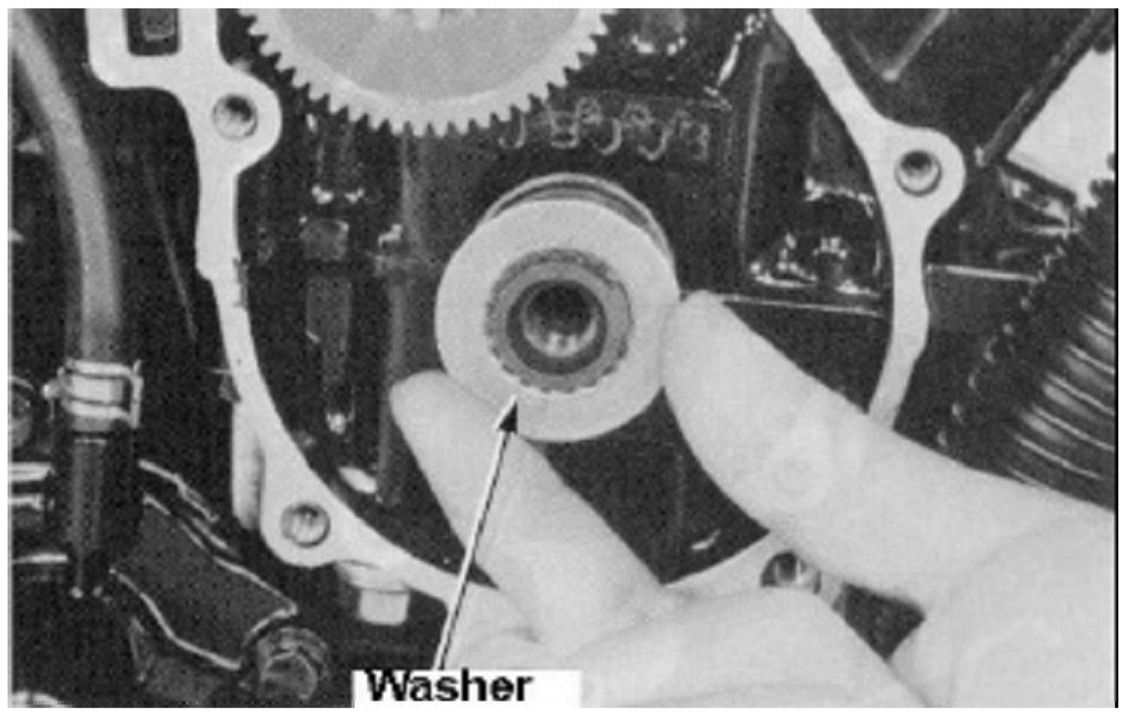
Remove pulse rotor.



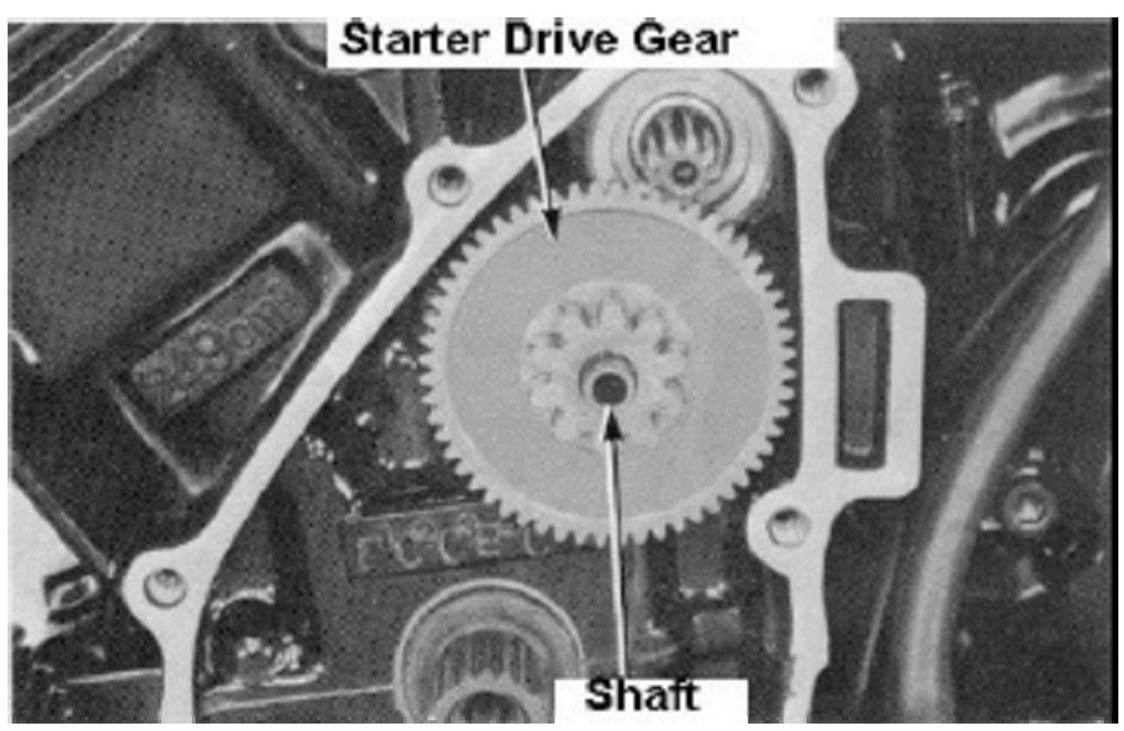
Remove starter driven gear with ASSY.



Remove washer.



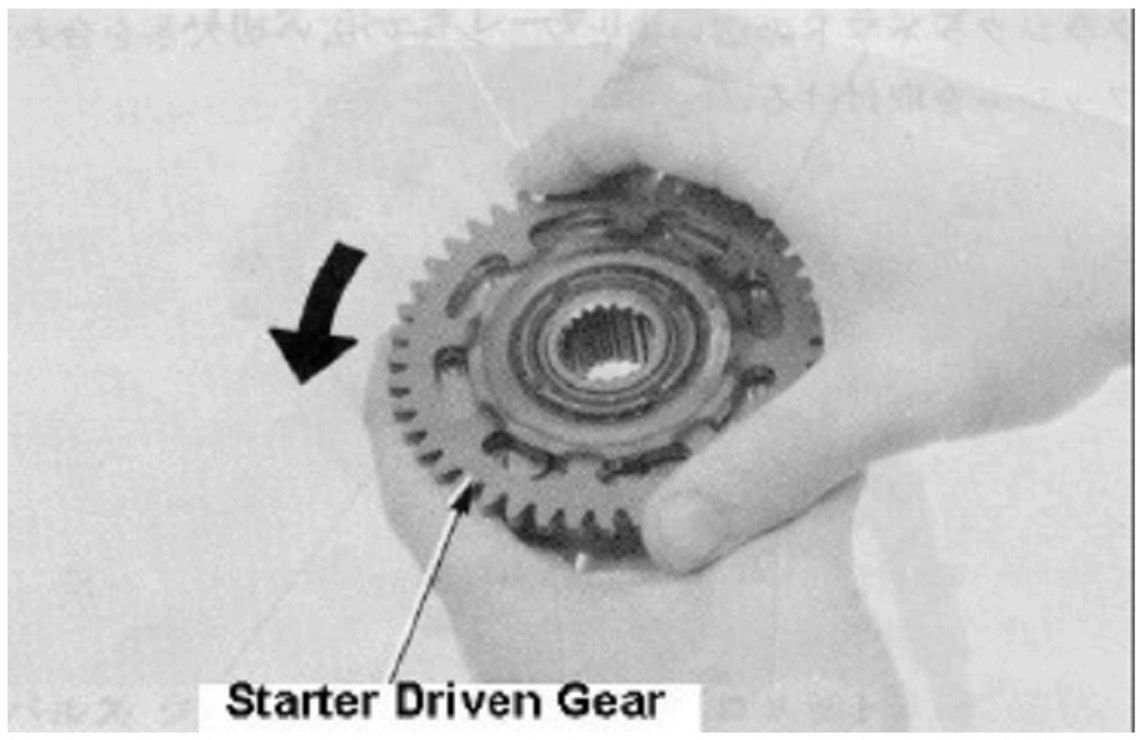
Remove starter drive gear and the shaft.



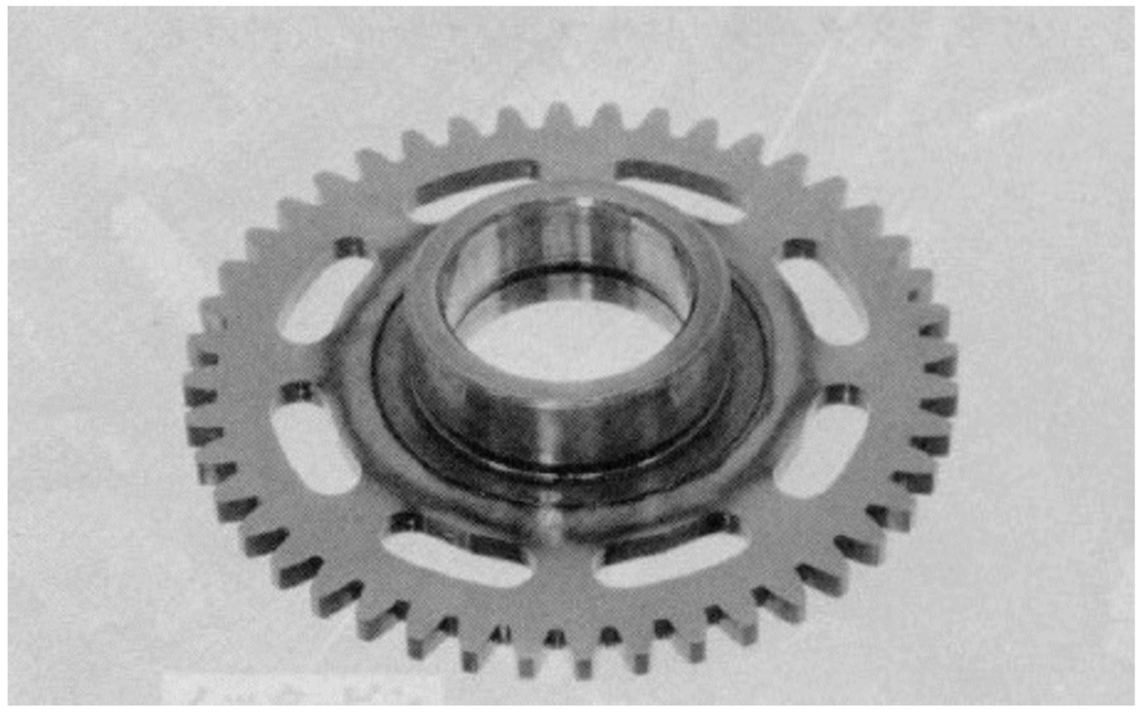
Disassembly / inspection

The starter driven gear should rotate only to the direction shown in the figure (counter-clockwise).

Detach the starter driven gear from one-way clutch.



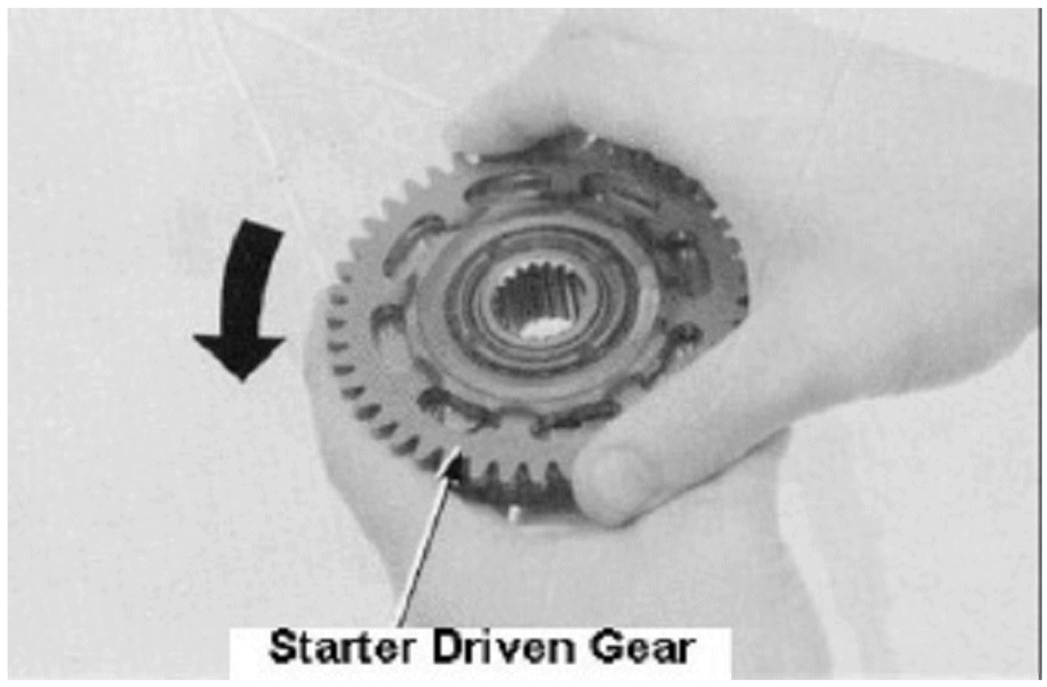
Inspect the starter driven gear for wear/damage.



Assembly

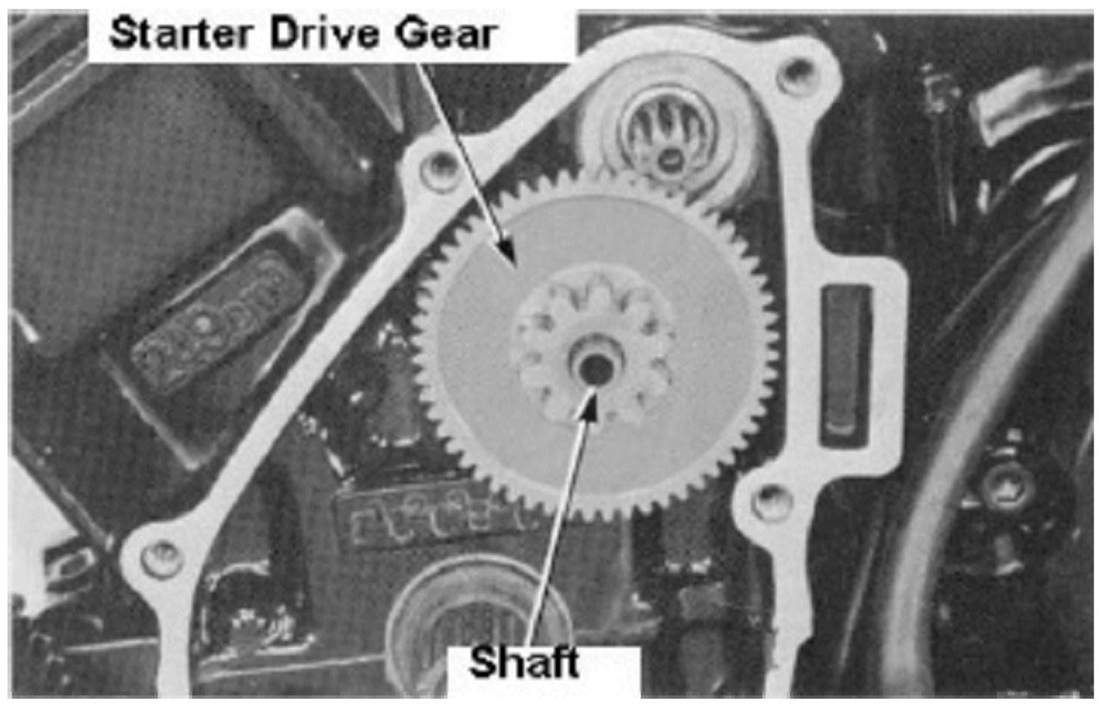
Install the starter driven gear to one-way clutch.

Install the gear by rotating it to the direction shown.

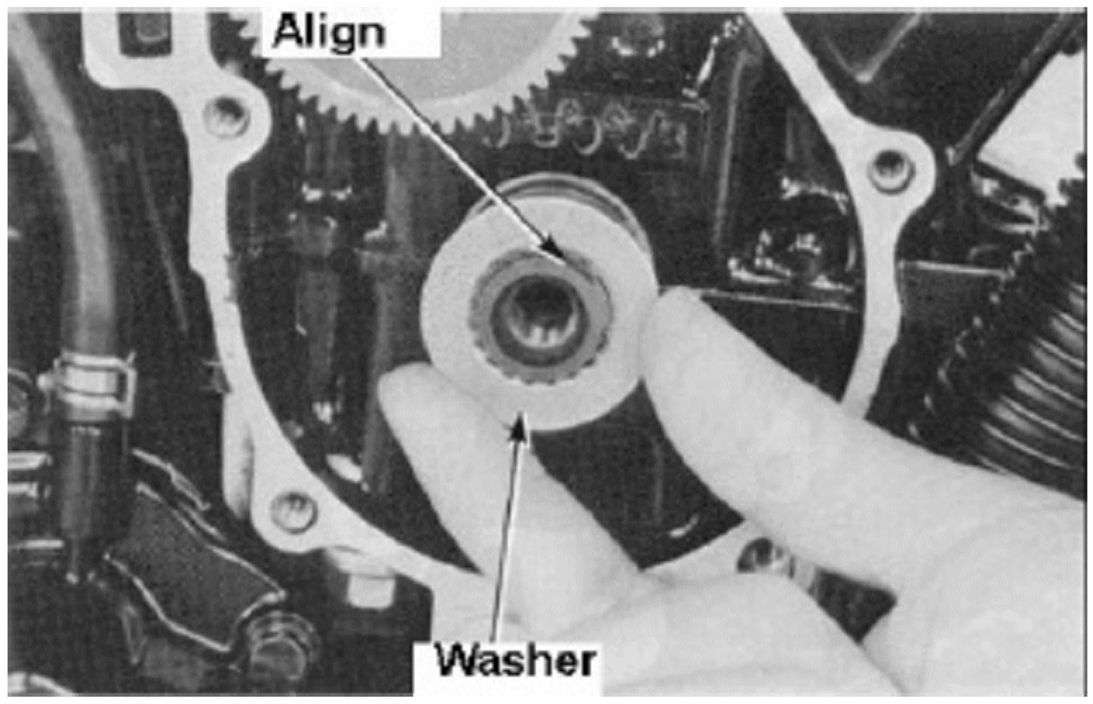


Installation

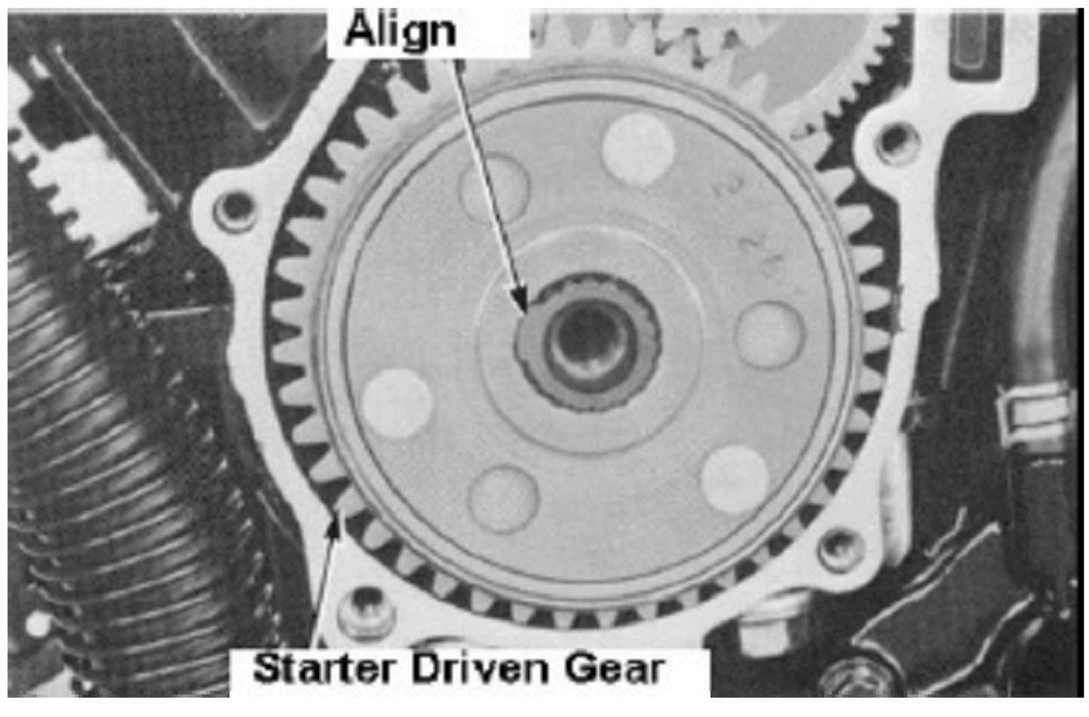
Attach the starter drive gear and the shaft.



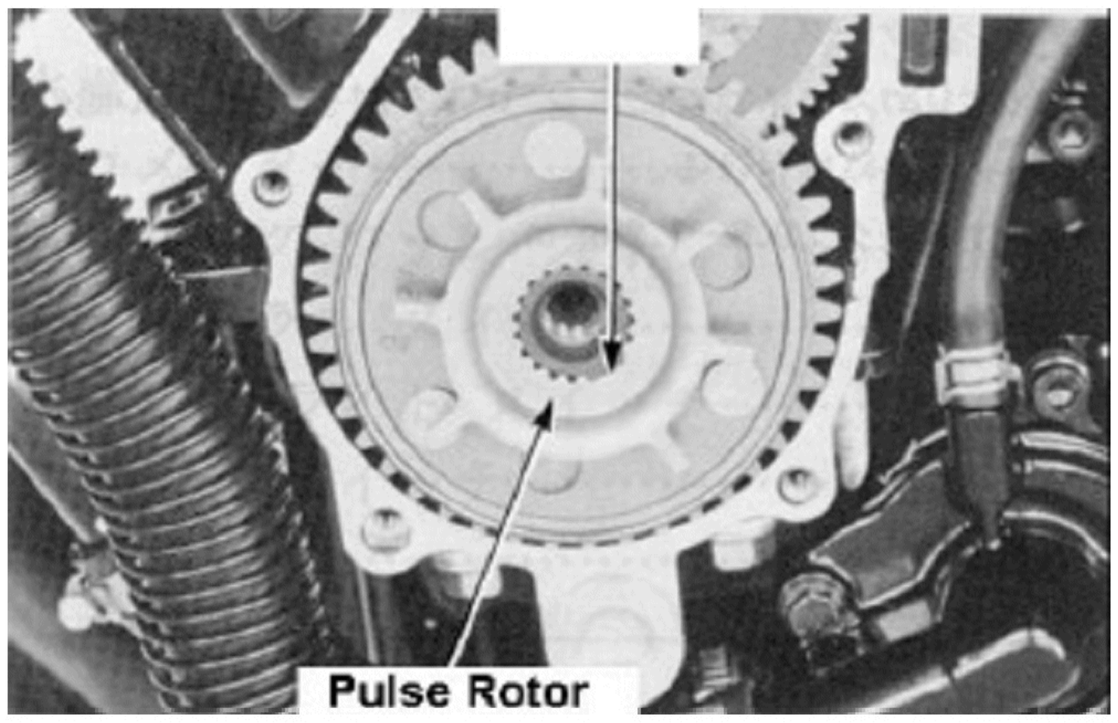
Align the wide gear on crankshaft with the wide slit on the washer and install the washer.



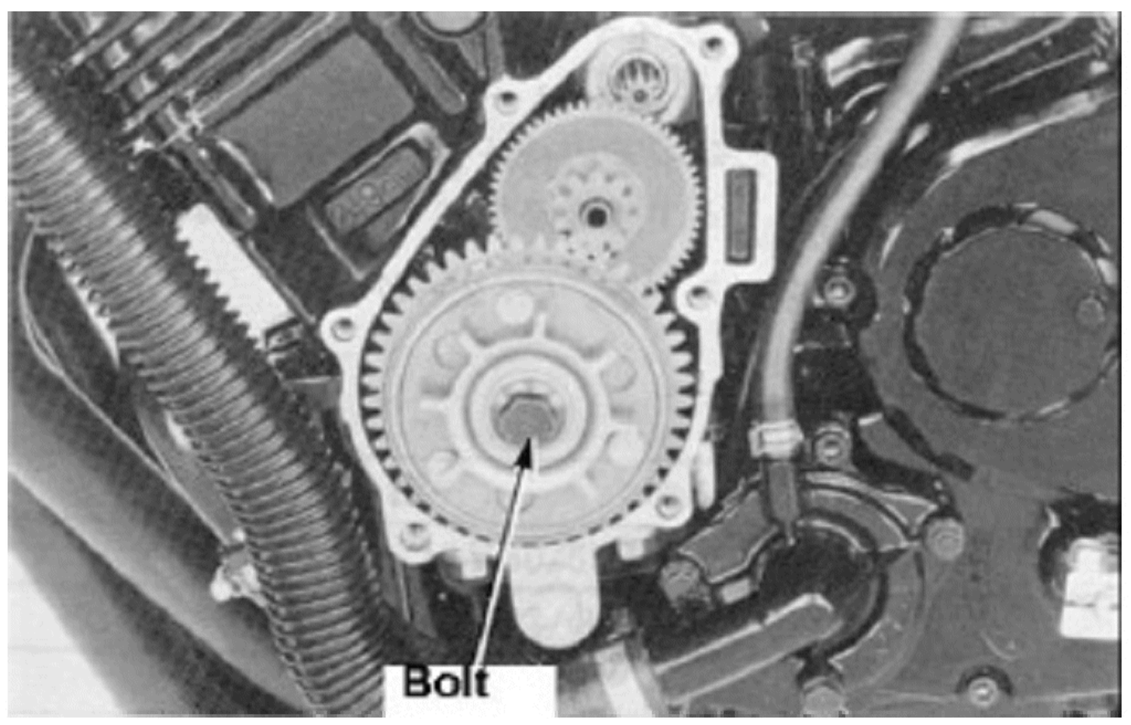
Align the wide gear on the crankshaft with wide slit on one-way clutch and install the starter driven gear.



Align the wide gear on the crankshaft with the wide slit on the pulse rotor and install the pulse rotor.



Install starter clutch attachment bolt and tighten with specified torque.
Torque: 8.0 ~ 9.0kg-m)

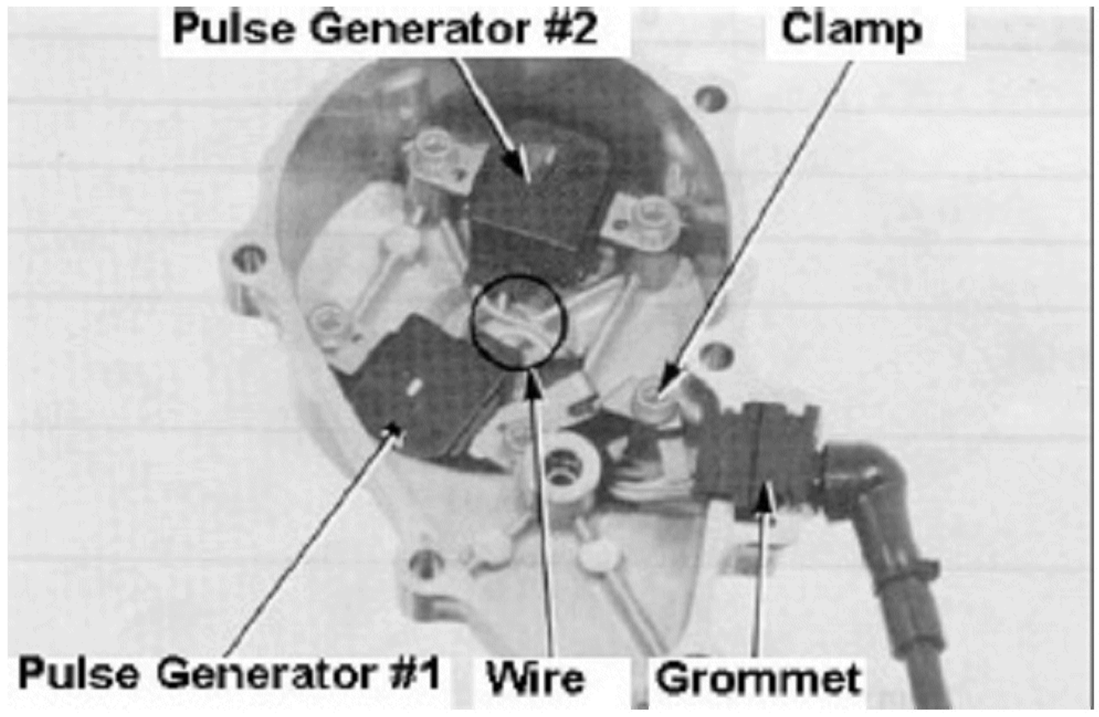


Left crankcase cover installation

Pulse generator installation

Correctly set pulse generators #1 and #2.
Set the pulse generator wire clamp.
Tighten five socket bolts.

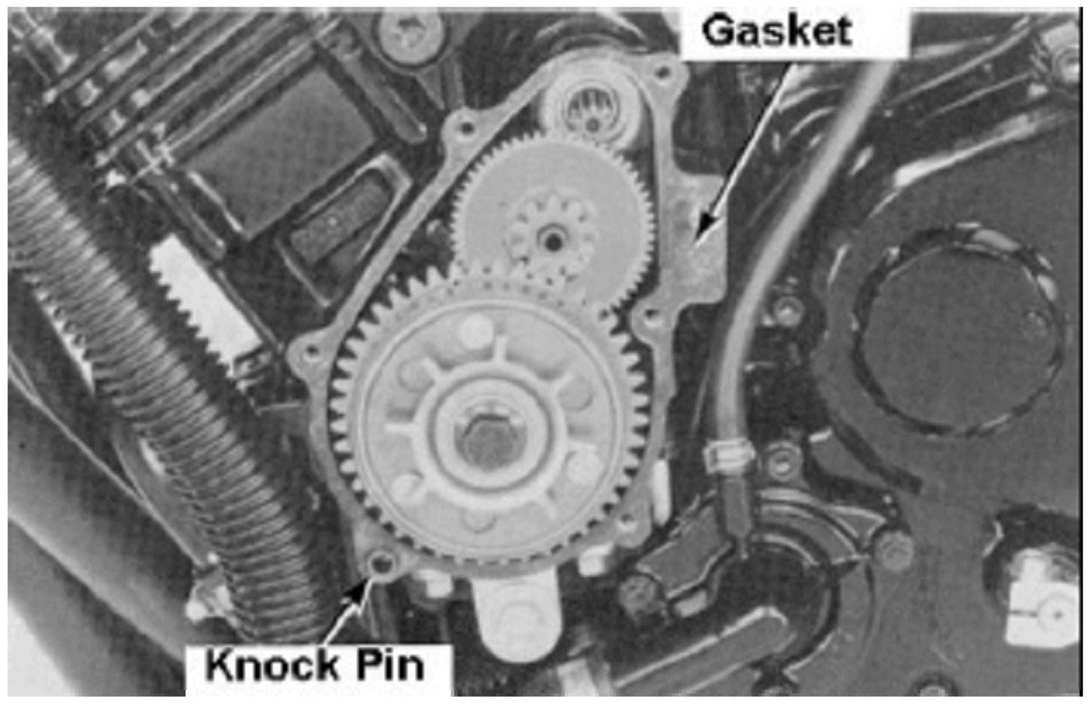
- Apply screw locker
- Set so as to have moderate looseness on wires.



Attach grommet.

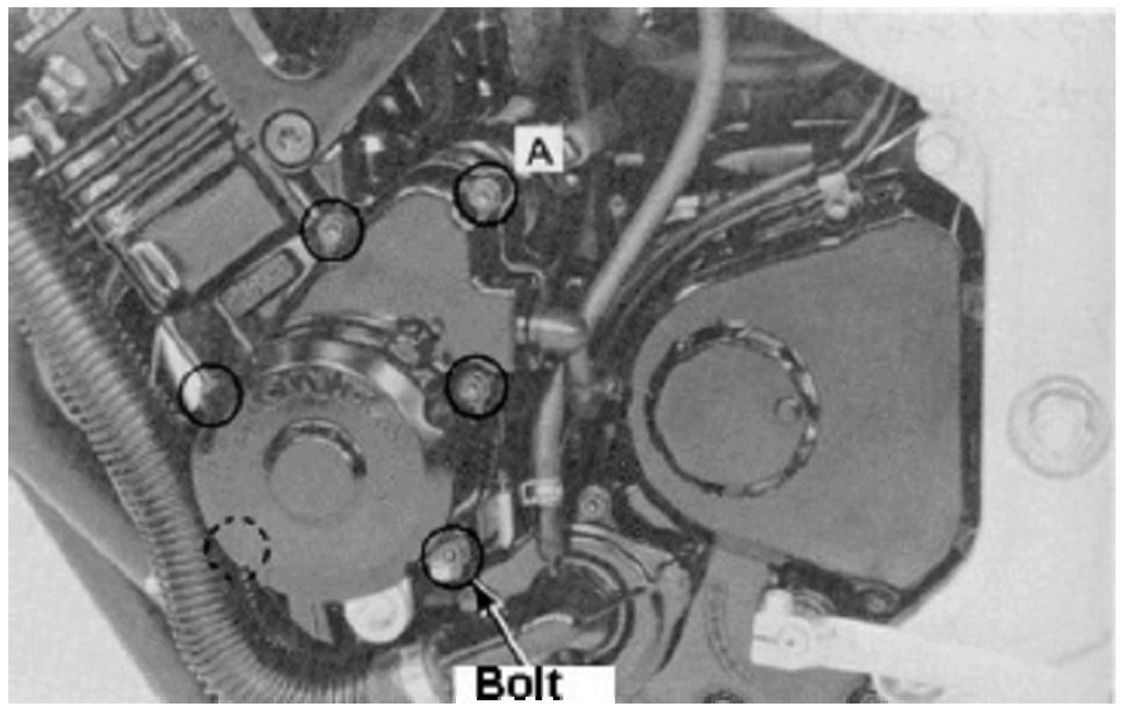
Starter clutch cover installation

Install new gasket and the knock pin.



Install the left crankcase cover.

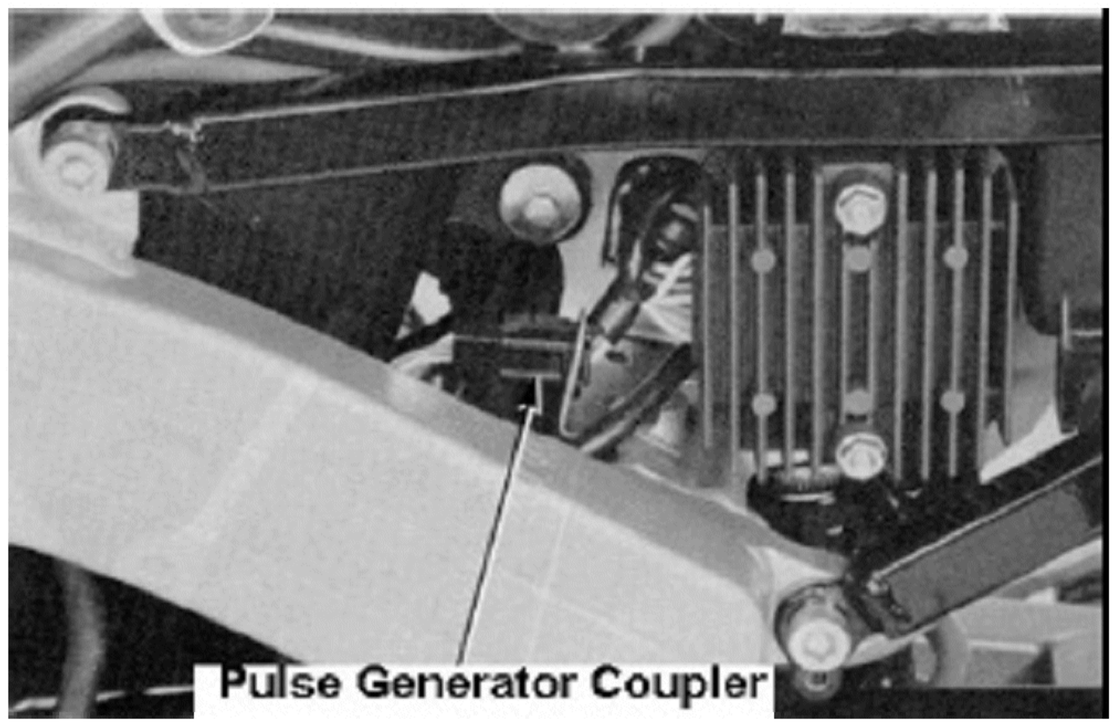
Apply screw locker only to bolt –A and tighten all bolts.
Torque: 0.8 ~ 1.2kg-m



Set pulse generator wires and connect them to the spark unit 4P coupler (1-22).

Install the left side cover and the seat.

Fill engine oil (2-17).



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Troubleshooting	20-1	Tachometer	20-8
Lens replacement	20-2	Cooling fan switch	20-8
Instruments	20-3	Neutral switch	20-9
Main switch	20-5	Brake light switch	20-9
Steering handle switches	20-6	Clutch	20-10
Oil pressure switches	20-7	Horn	20-10

Service information

General caution

- Connect same coloured leads. If colours are different on each side, there should be a coloured tube near the connector on one side. Connect couplers of same colours.
- Switch conduction test can be done without detaching from the vehicle.

Standard

Item	standard
Headlight bulb	12V 60 / 55W
Front turn signal bulb	12V 23 / 8W
Rear turn signal bulb	12V 23W
Stop / tail light bulb	12V 23 / 8W
Pilot lamps (excluding speed warning)	12V1.7W x 5
Speed warning light	12V 3W
Tacho, temperature gauge illuminator	12V 3.4W x 2
Speedometer illuminating light	12V3.4W. 12V 3W
Main fuse	30A
Turn signal, brakelight, horn, passing switch sub fuse	15A
Sub fuse other than the above	10A x 6

Torque

Ignition switch	2.5~3.0kg-m	Tail light	0.8~1.2kg-m
Headlight	0.3~0.5kg-m	Front turn signal	0.35~0.50kg-m
Instruments	0.8~1.2kg-m	Cooling fan switch	2.4~3.2kg-m

Troubleshooting

<u>Lights do not illuminate</u>

- Bulb out
- Switch fault
- Wires open circuit
- Fuse out (inspect a sub fuse under instruments before inspecting a main fuse).
- Battery discharged
- Wiring fault

<u>Lights too dark</u>

Battery discharged
Bulb fault

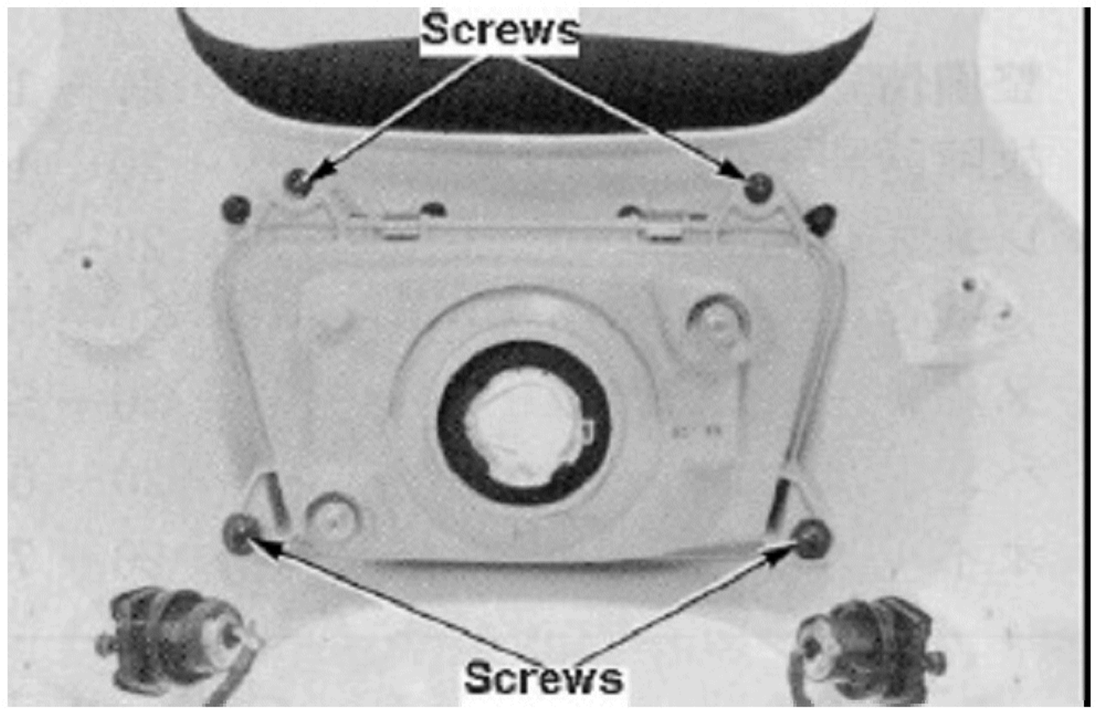
<u>Unable to switch Hi-Lo off a headlight</u>

Bulb fault
Dimmer switch fault
Wiring fault

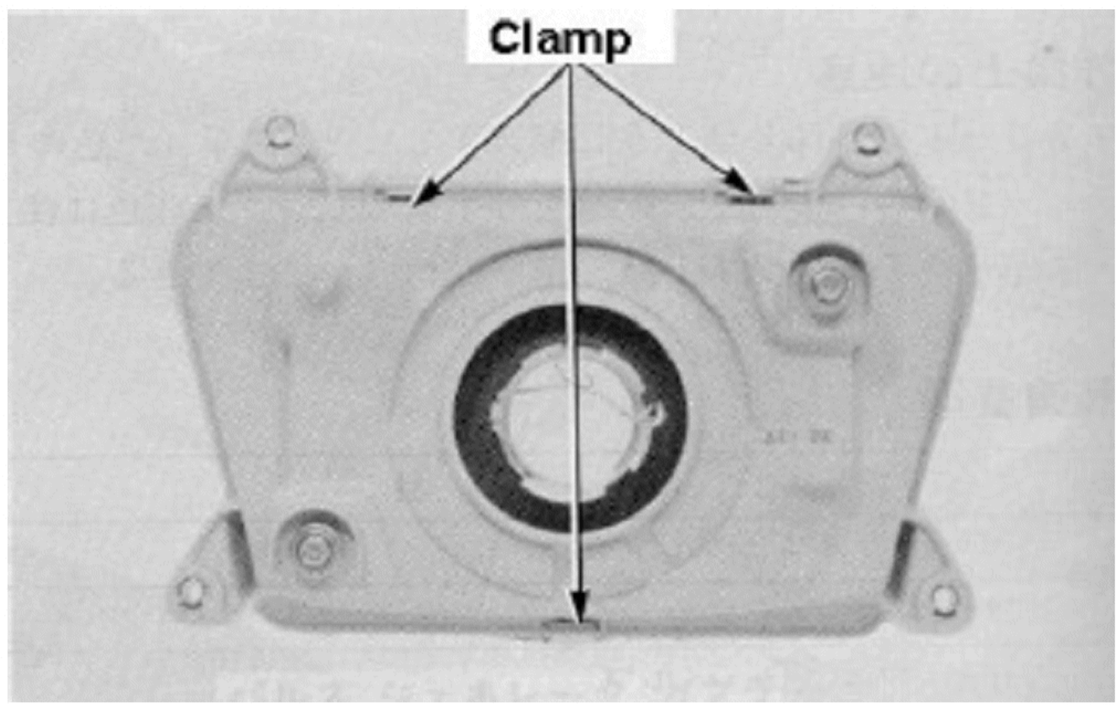
Lens replacement
Headlight
Remove the fairing (13-4)
Remove the bulb for the headlight

Do not touch the glass surface of the bulb by hand or a dirty glove or it may reduce the performance.

Remove four screws and remove a headlight case from the fairing.

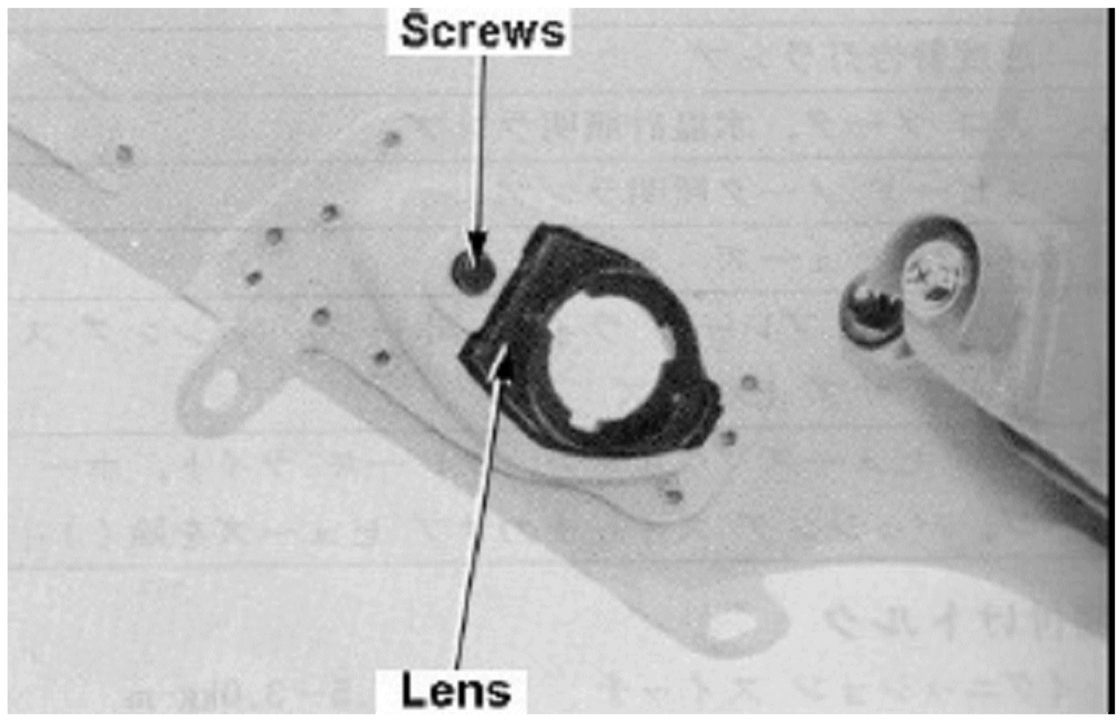


Detach lens attachment clamps and remove a headlight lens.



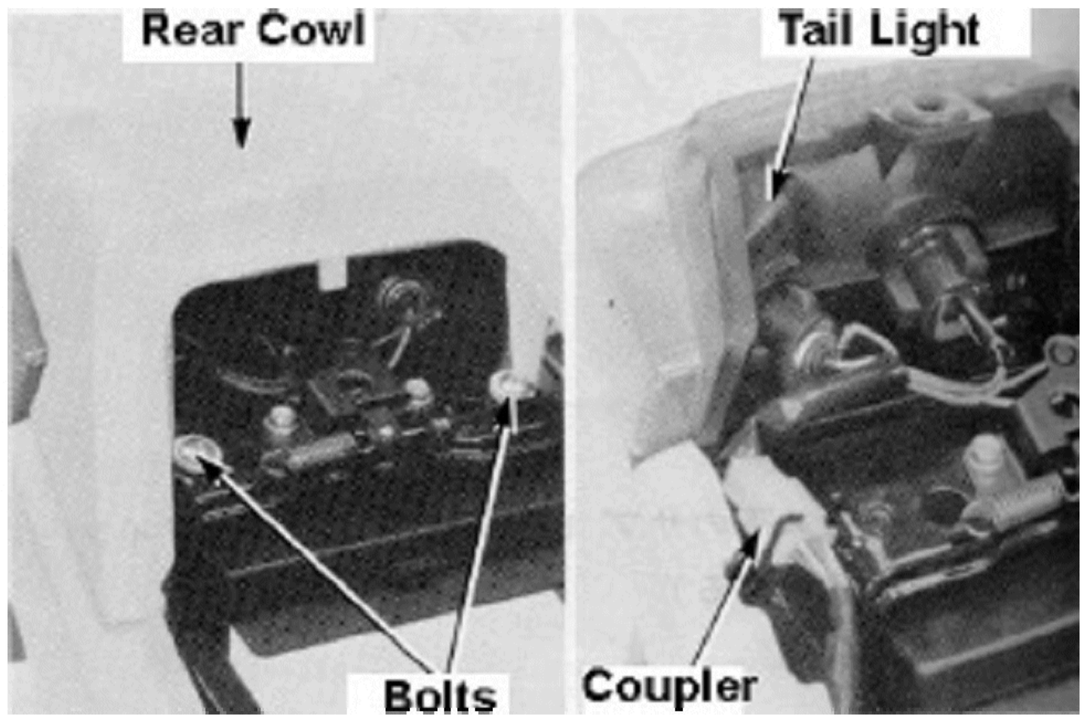
Reverse the above procedure for installation.
Torque: Headlight attachment vis:
0.3~0.5kg-m
Attach the dust cover so as to have “TOP” marking on top.

Front turn signals
Detach the fairing (13-4).
Remove turn signal lens attachment screws and remove the lens.
Reverse the procedure for installation.
Torque: 0.35 ~ 0.50kg-m



Tail light
Remove two screws and detach a rear cowl.
Disconnect the tail light coupler.
Remove two nuts underneath the rear fender A and remove the taillight.

Reverse the procedure for installation.
Torque: 0.8 ~ 1.2kg-m



Instruments

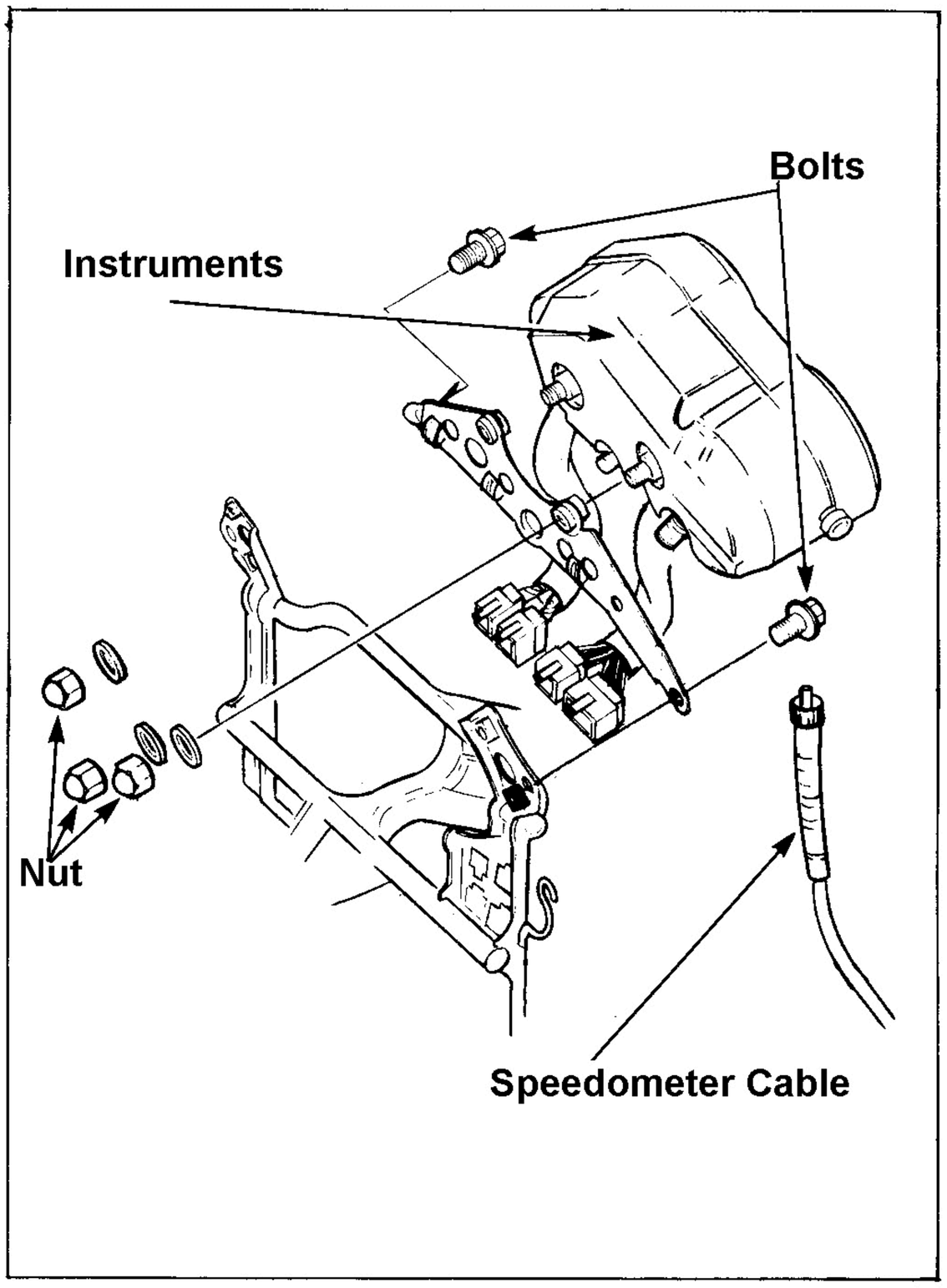
Removal

Remove instrument stay bolts.

Disconnect the speedometer cable.

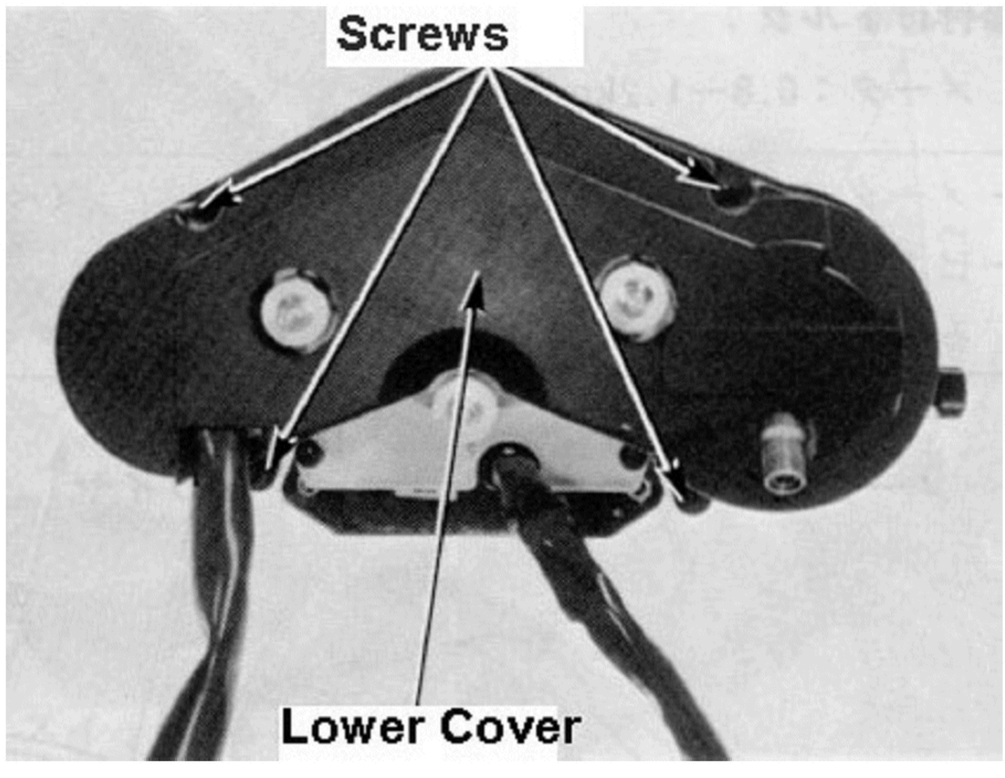
Disconnect instrument couplers.

Detach the wire harness from the clamper and remove instruments.

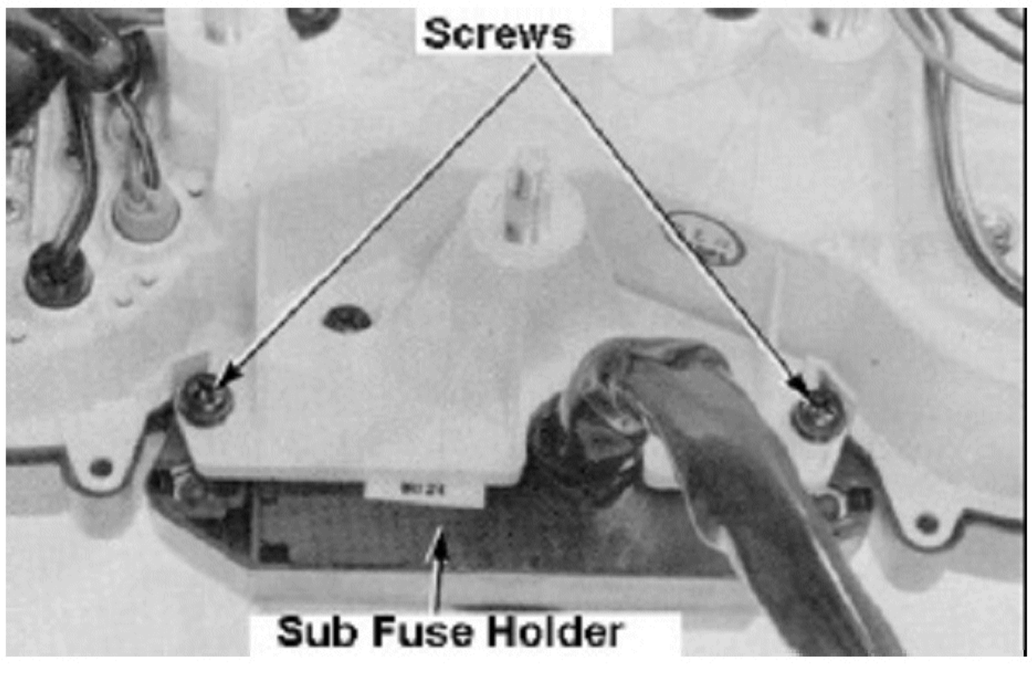


Disassembly

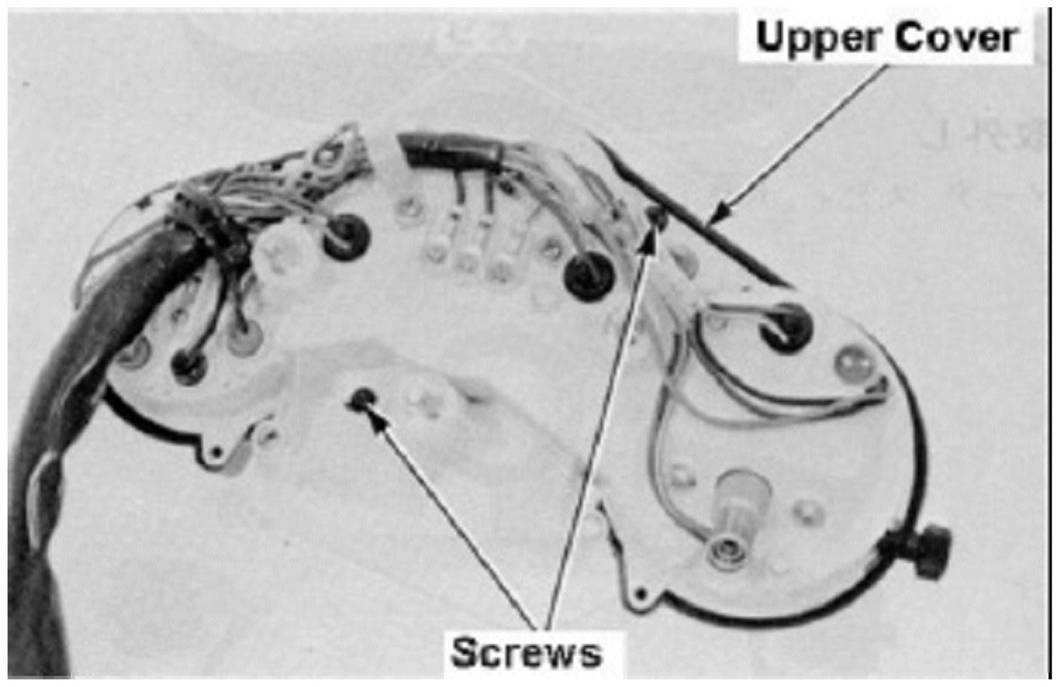
Remove four screws and remove the instrument lower cover.



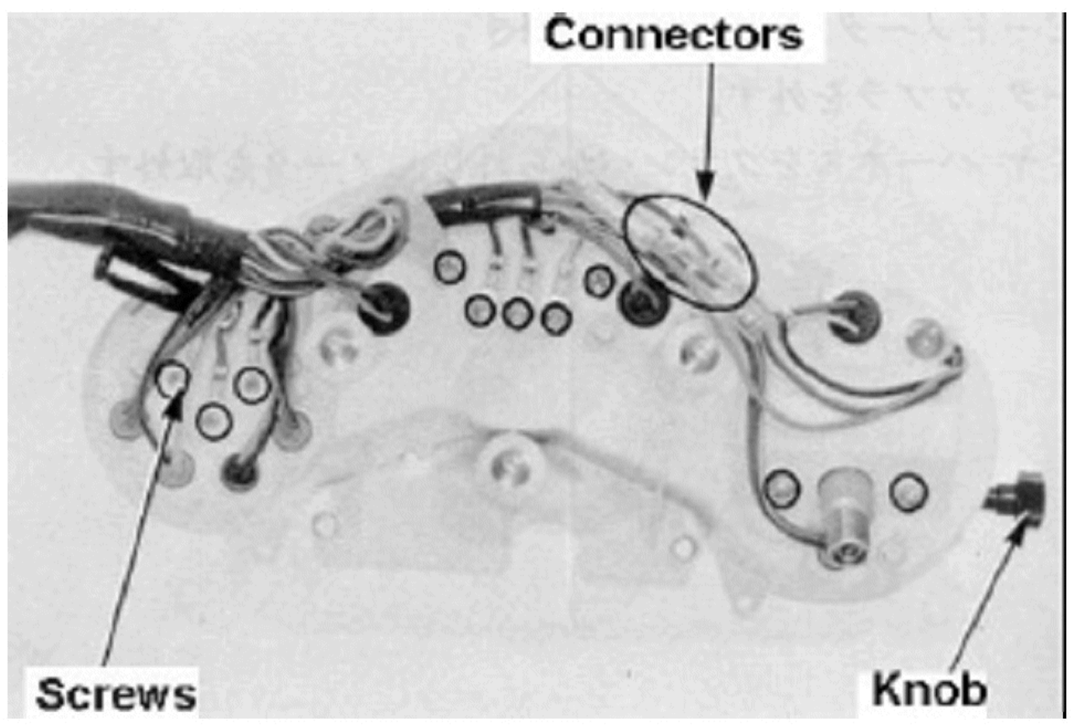
Remove two screws and detach the sub fuse holder.



Remove two screws and detach the instrument upper cover.



Detach connectors, bulb socket, trip meter reset knob and individual instruments attachment screws and separate the instruments.

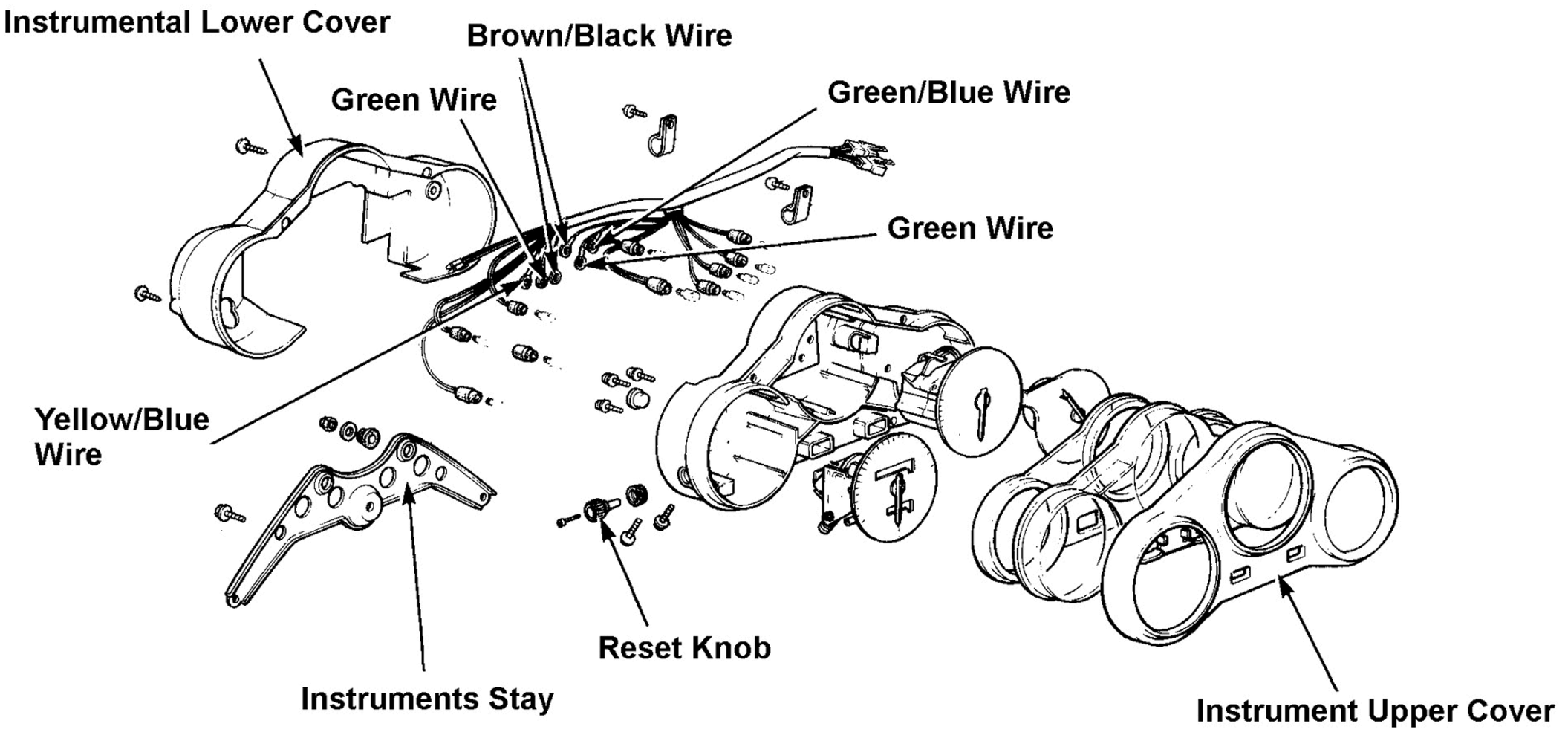


Assembly / installation

Reverse the removal / disassembly procedure.

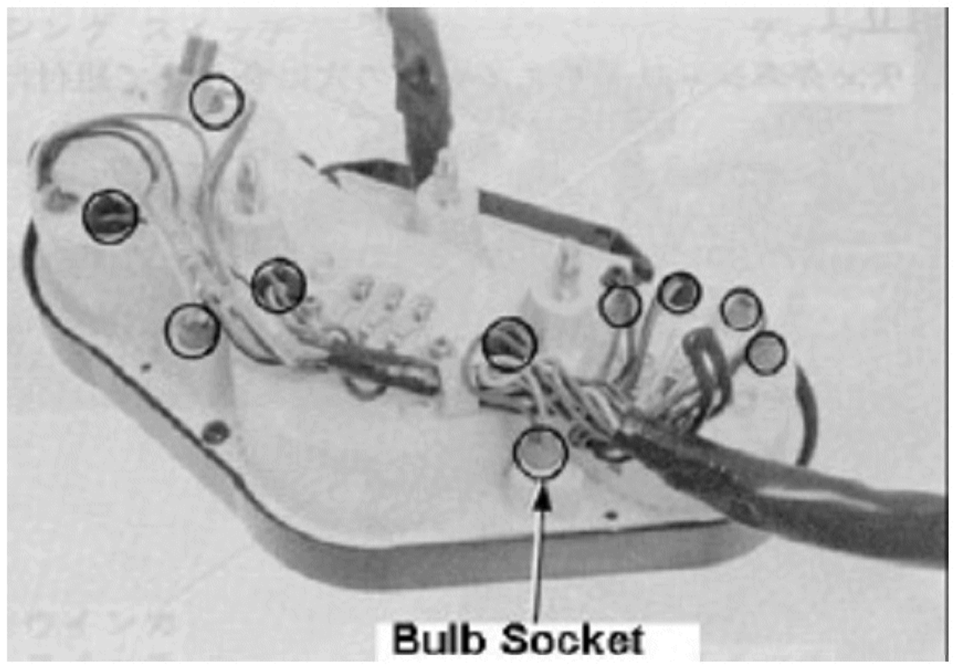
Torque: Instruments – 0.8 ~ 1.2kg-m

- Properly apply instrument wire harness (1-21).
- Connect the wires correctly to terminals check for security.



Bulb replacement

Remove instruments from the instrument stay and detach the lower cover (20-3).
Remove a bulb socket and replace the bulbs.

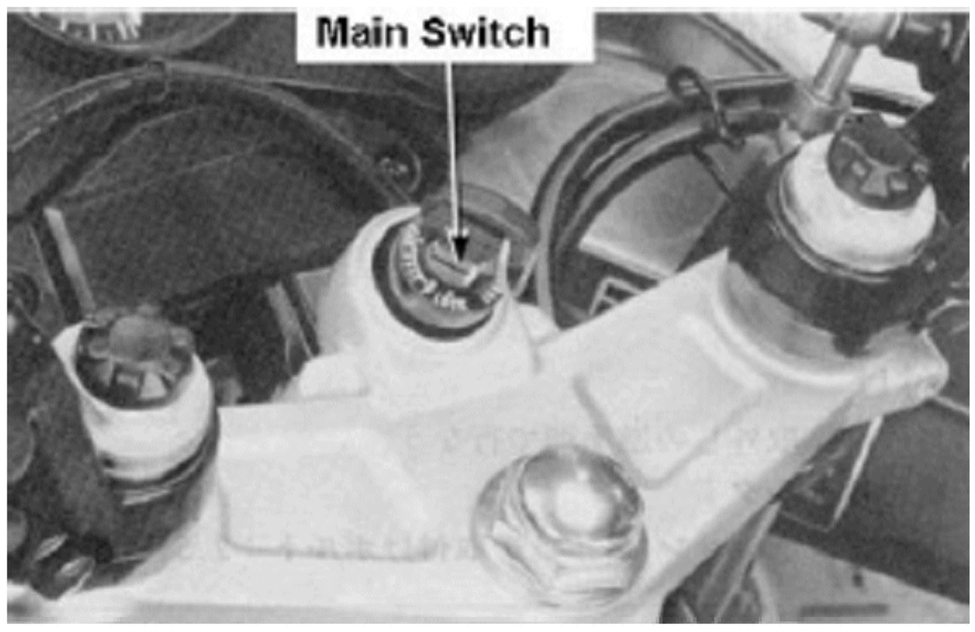


Main switch

Inspection

Remove the fuel tank and disconnect the coupler for the main switch.

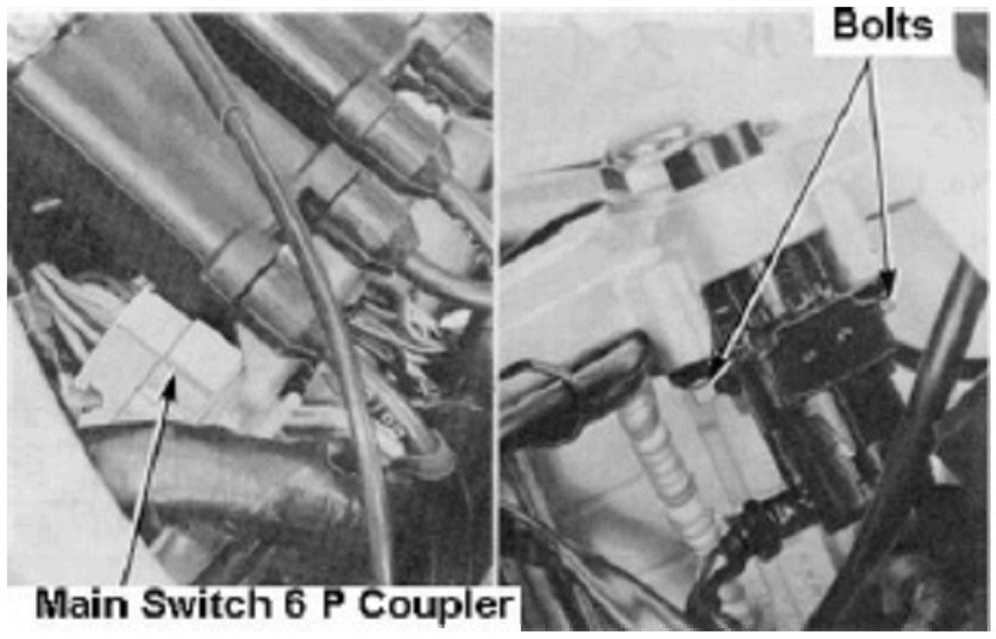
Conduction should exist between O-O symbols.



	BAT 1	IG	FAN	TL#1	TL#2	PA
	Red	Red / Black	Blue / Amber	Brown / White	Brown	Yellow /Black
ON	O	O	O	O	O	
OFF						
P.LOCK	O					O
LOCK						

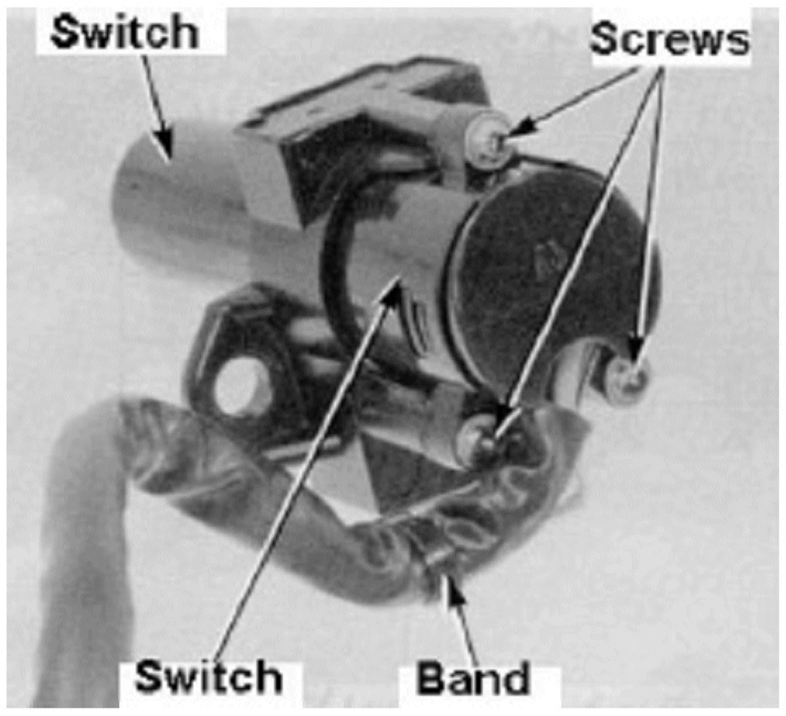
Removal

Remove the fuel tank and disconnect the main switch GP coupler.
Remove two main switch attachment bolts and remove the main switch.

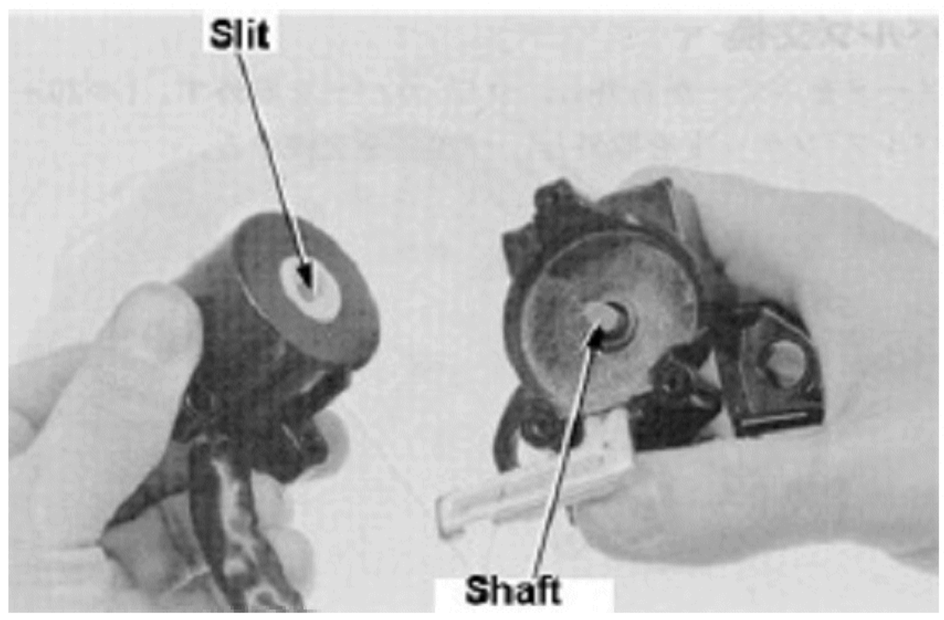


Disassembly

Cut the band and remove three screws.
Detach the switch from the switch cylinder.



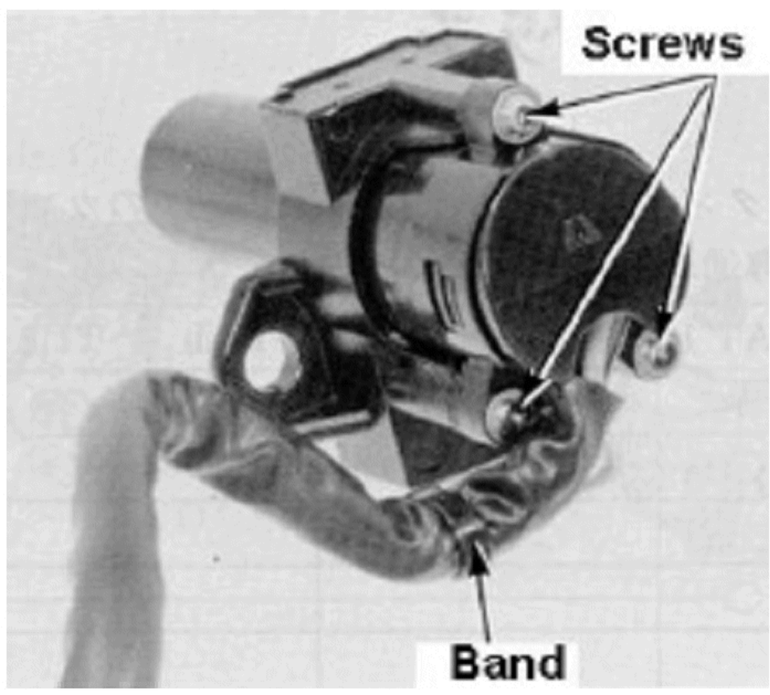
Assembly
Align the cylinder shaft to the slit on the switch and attach it.



Tighten three screws and clamp it with the band.

Firmly clamp it so as not to loosen the wires.

Cut off unnecessary band.
Check the switch conduction after assembly

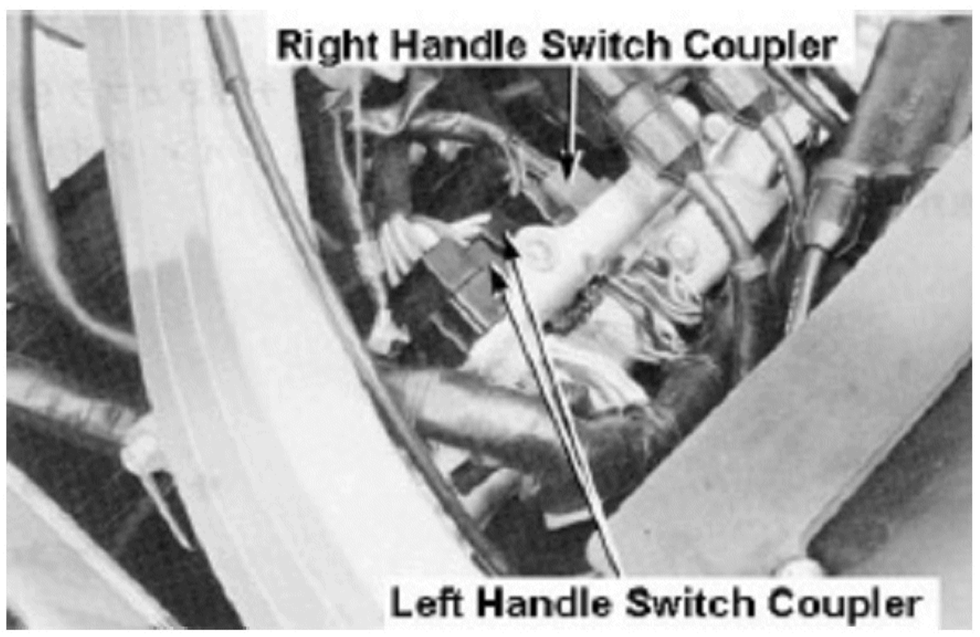


Installation

Reverse the removal procedure.
Torque: Ignition switch attachment bolt:
2.5 ~ 3.0kg-m

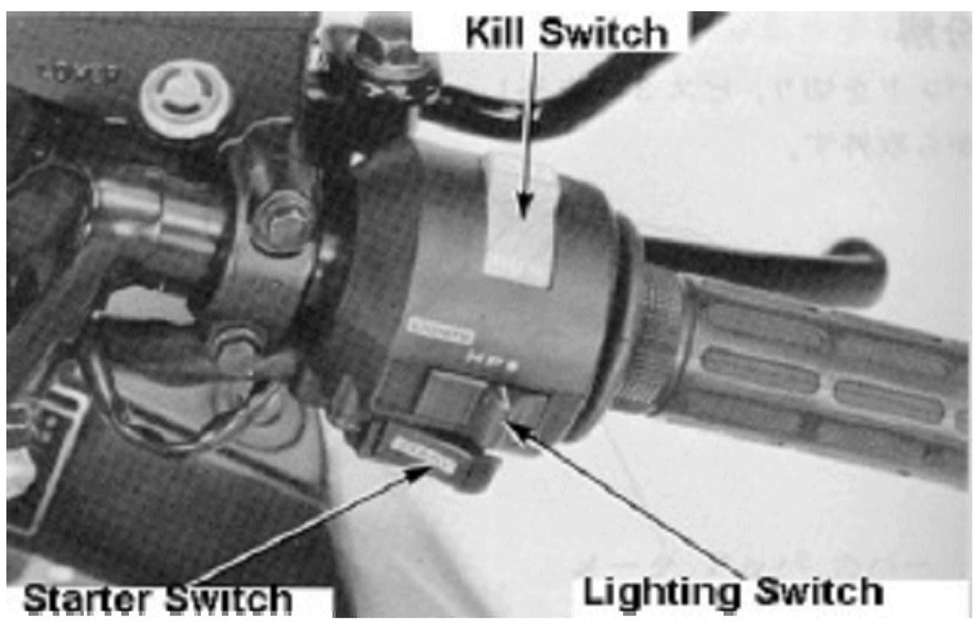
After installation, check the operation of the switch.

Steering handle switches
Remove fuel tank (4-3).
Disconnect #1, #4 ignition coil attachment bolts and terminals (18-4).
Remove harness for each switch and disconnect couplers.
Check conduction for 0-0 section



<Kill Switch>

	IG	BAT 2
	Black/White	Black
OFF		
RUN	O———	———O



<Starter Switch>

	BAT 2	ST
	Black	Yellow/Red
FREE		
PUSH	O———	———O

<Lighting Switch>

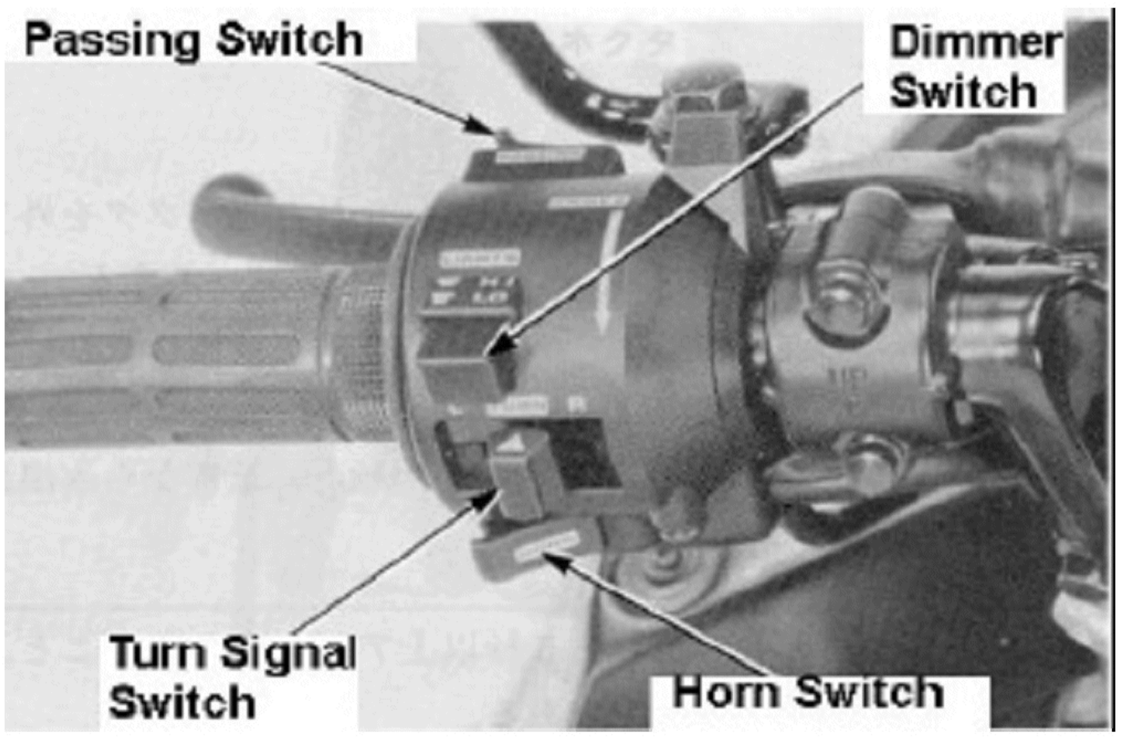
	BAT4	TL	BAT5	HL
	Brown/Blue	Brown/White	Black/Red	Blue/White
•				
P	O———	———O		
H	O———	———O	O———	———O

<Passing Switch>

	BAT3	HI
	White/Green	Blue
FREE		
PUSH	O———	———O

<Horn Switch>

	BAT3	HO
	White/Green	Light Green
FREE		
PUSH	O———	———O



	HL	LO	HI
	Blue/White	White	Blue
Lo	O———	———O	
(N)	O———	———O———	———O
Hi	O———		———O

	W	R	L	TL#1	PR	PL
	Grey	sky-blue	Amber	Brown	Sky Blue / White	Amber / White
R	O———	———O		O———		———O
N				O———	———O———	———O
L	O———		———O	O———	———O	

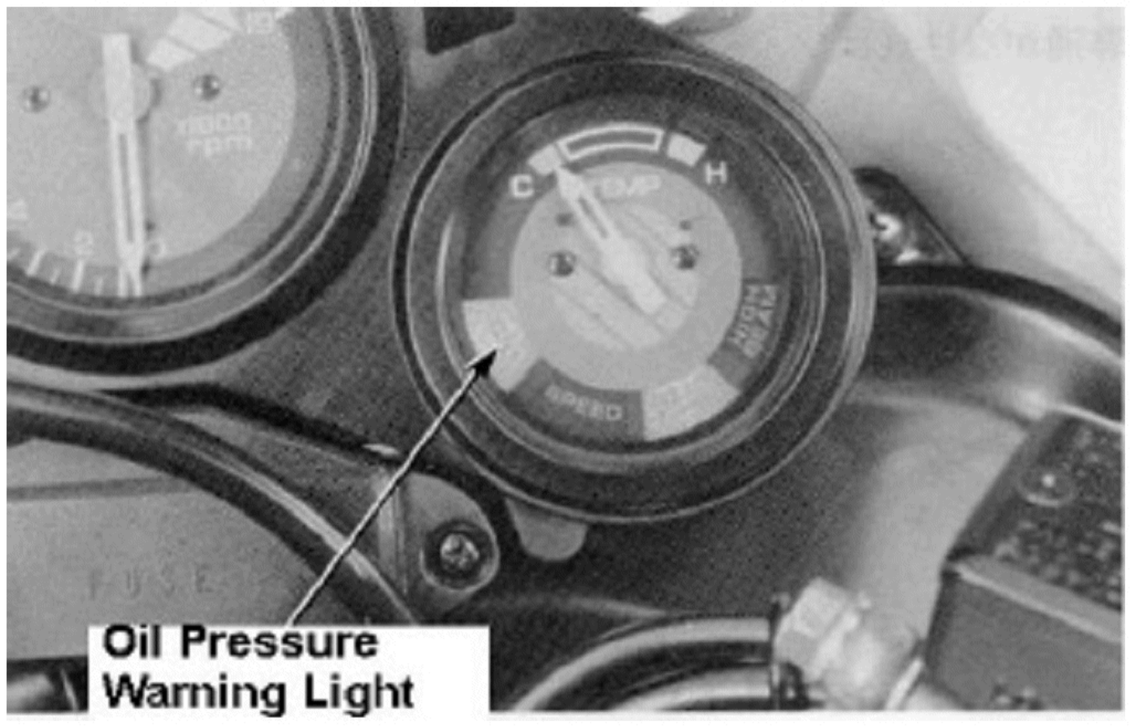
Oil Pressure Switch

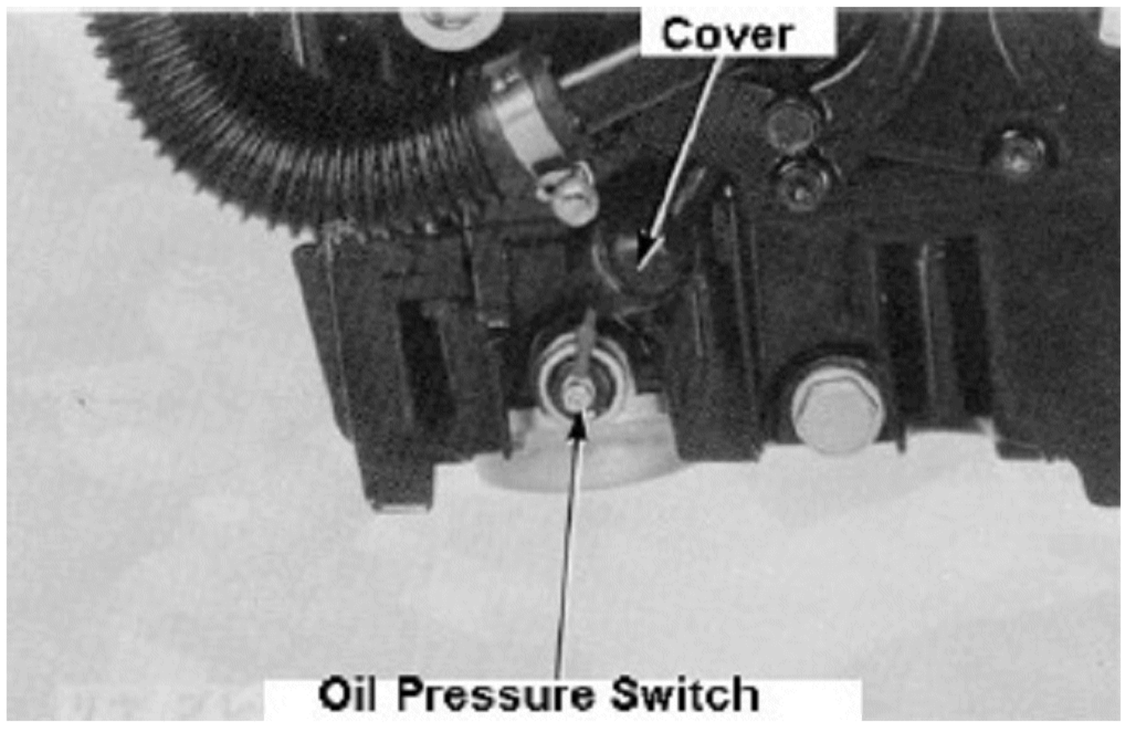
Turn the main switch ON and check the illumination of the oil pressure warning light on the indicator panel.

If it does not illuminate, disconnect oil pressure switch wires and earth the wire.

Turn the main switch ON and check the illumination.
If it does not illuminate, inspect the warning light for it's bulb, it's wire harness connection and the sub fuse.

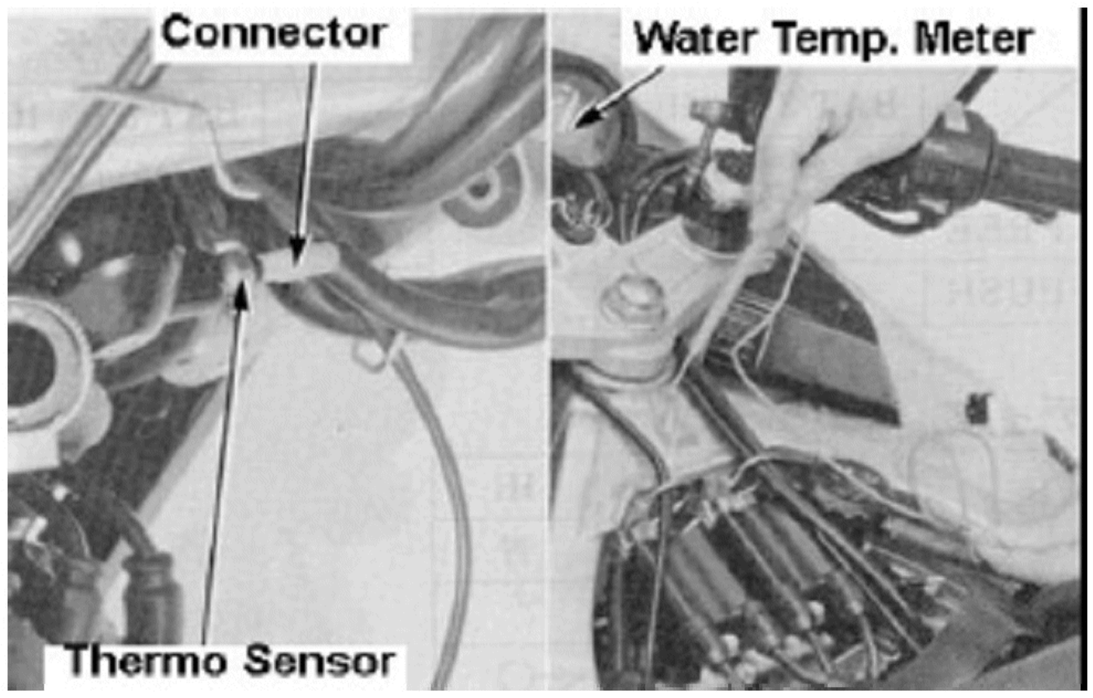
Start the engine and check the warning light is OFF. If it is ON, measure oil pressure (3-4).
If the oil pressure is normal, replace with new oil pressure switch (3-4).





Water temperature gauge

Remove the side cowl.
Disconnect the connector from thermo-sensor on the thermostat case.
Earth the connect terminal by using a jumper wire.
Turn the main switch ON and check the water temperature gauge fully deflects to its side.
Inspect the wire harness if it doesn't deflect.
Replace the gauge if wire harness is ok (20-4).

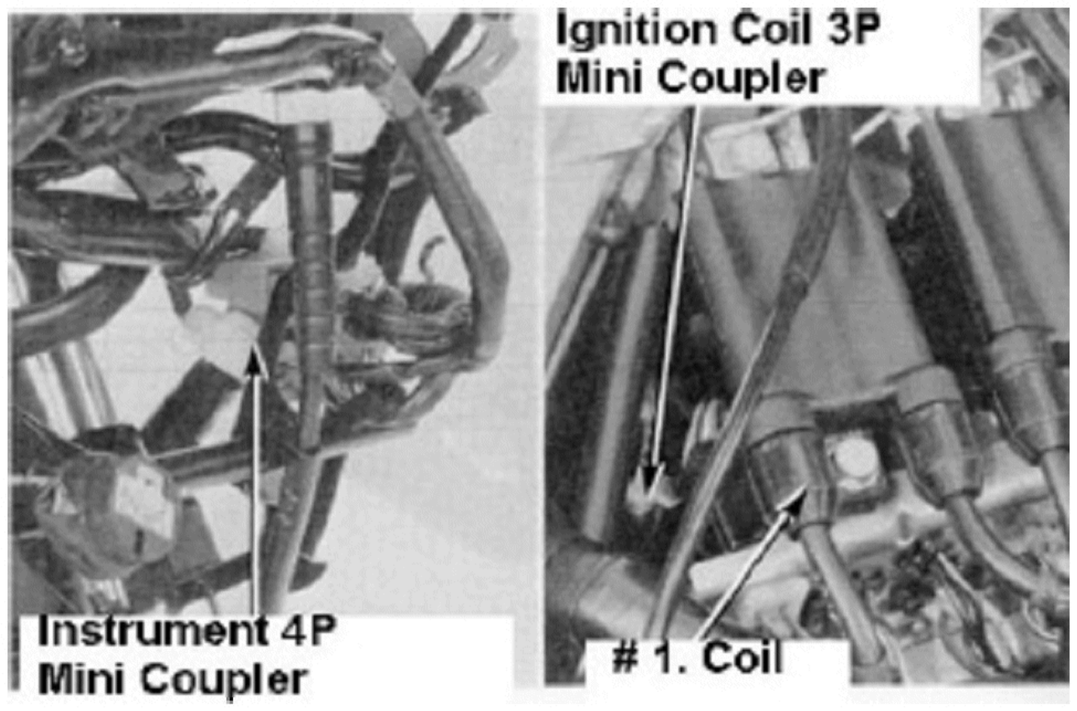


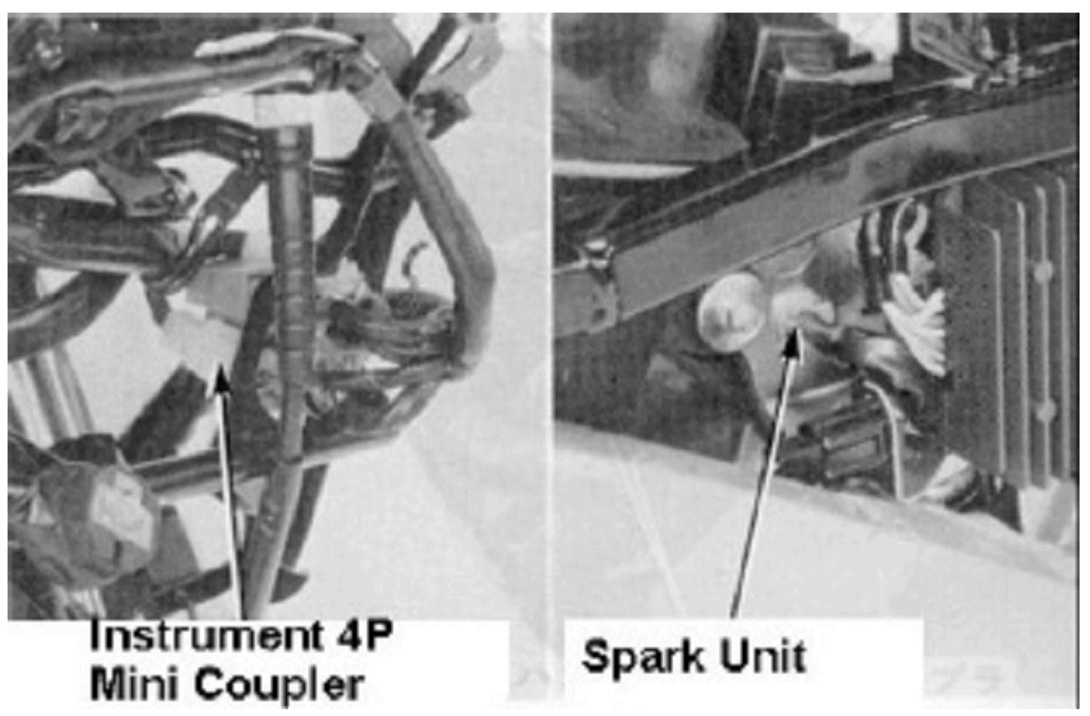
Do not earth the thermo-sensor for more than five seconds.

Tachometer

Inspect the following points if the tachometer is faulty.
Inspect No.1 coil for proper spark.
If there is no spark on the spark plug, inspect the ignition system (18-3).
If spark is ok, remove the fairing and the fuel tank.
Disconnect the 4P mini coupler for the instrument, Yellow/Blue wire for the ignition coil and spark unit 4P mini coupler and check the conduction of Yellow/Blue wire.

Conduction → replace the tachometer
No conduction → replace the wire harness

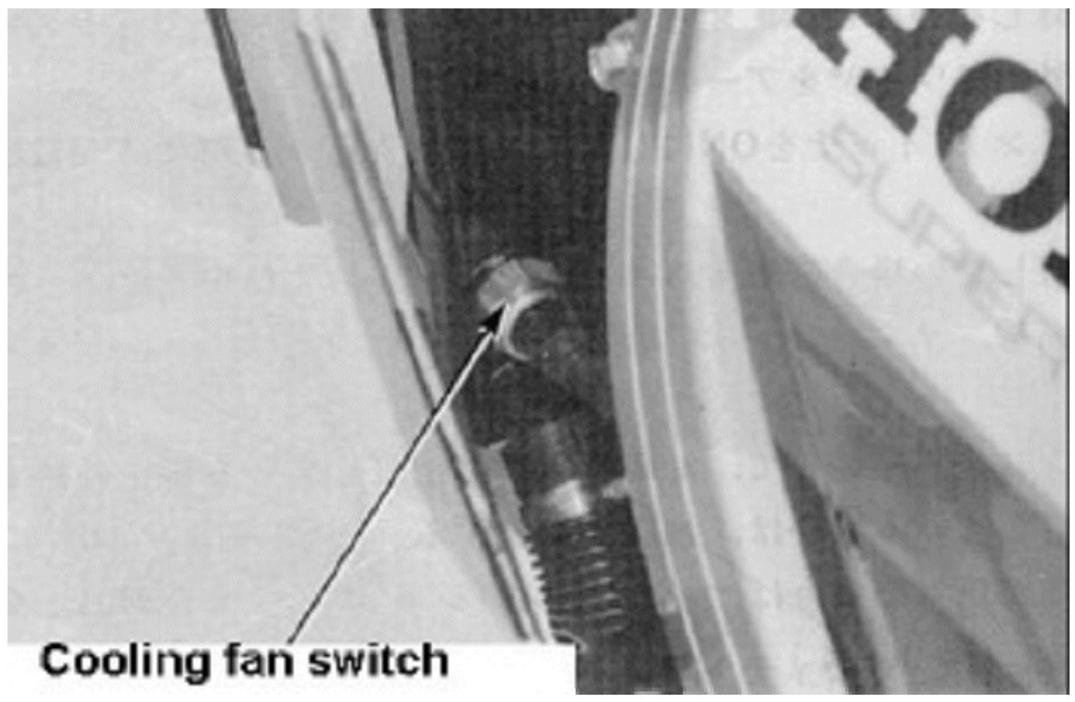




Cooling fan switch

The cooling fan activates when the cooling fan switch detects the radiator water temperature very high.

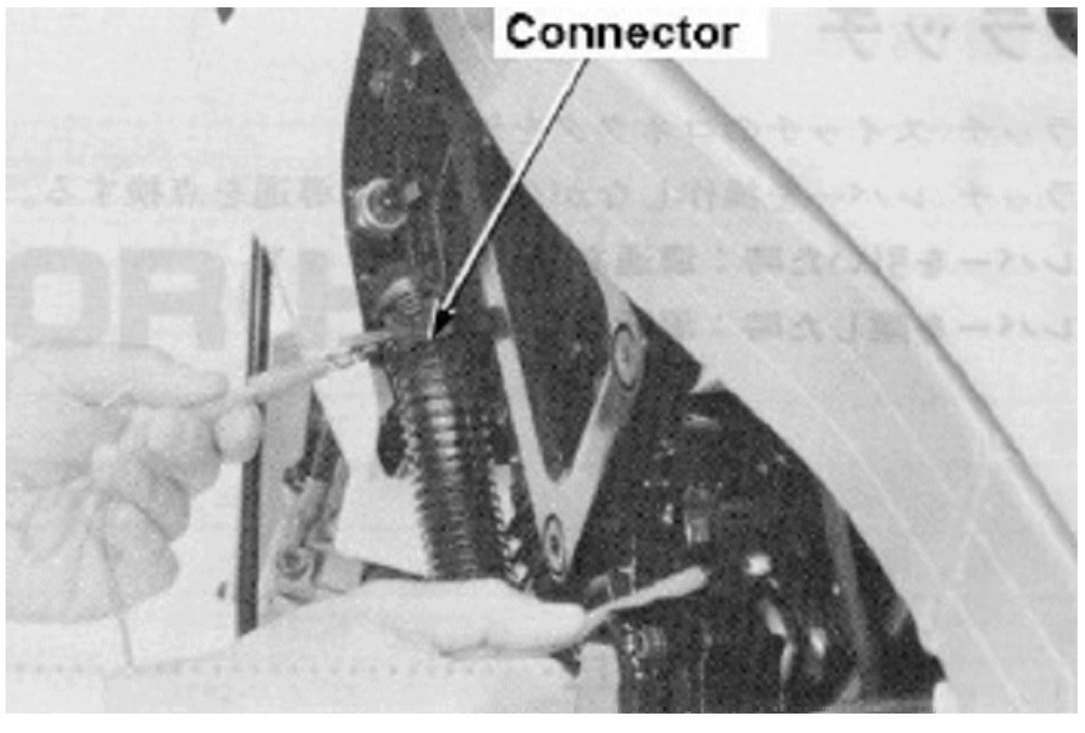
Run the engine until the radiator water temperature reaches 98°c ~ 102°c and check the operation of the fan motor.
Check the motor stops when the temperature comes down to 93 ~ 97°c.



If the fan motor does not work, remove the connector from the cooling fan switch and earth the connector by using jumper leads.
Turn the main switch ON. If the fan motor works, the cooling fan switch is faulty.
If the fan motor does not work, measure voltage between the connector terminal and ground earth.
If the voltage is zero, inspect the following items:

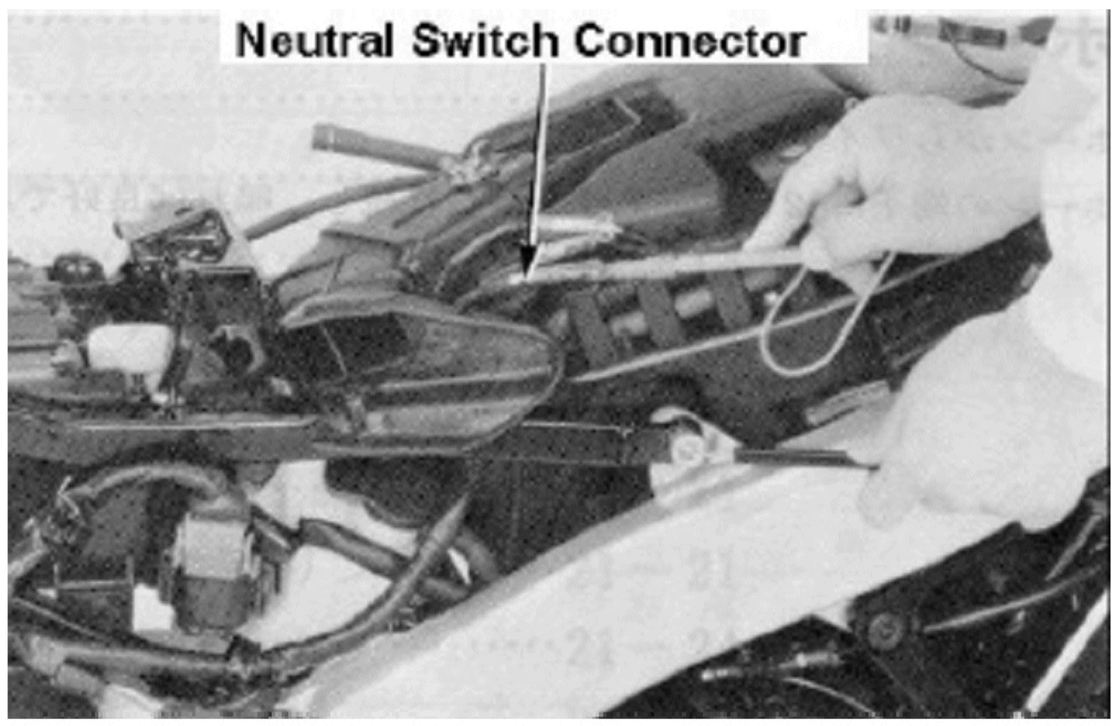
- sub fuse
- looseness of terminal / connector
- wire harness open / short circuit.

If sufficient voltage exists, the fan motor is faulty.



Neutral switch

Remove the fuel tank (4-3)
Disconnect the neutral switch connector and inspect conduction between light green/red wire and ground earth.
Conduction only exists when the transmission is set to neutral.

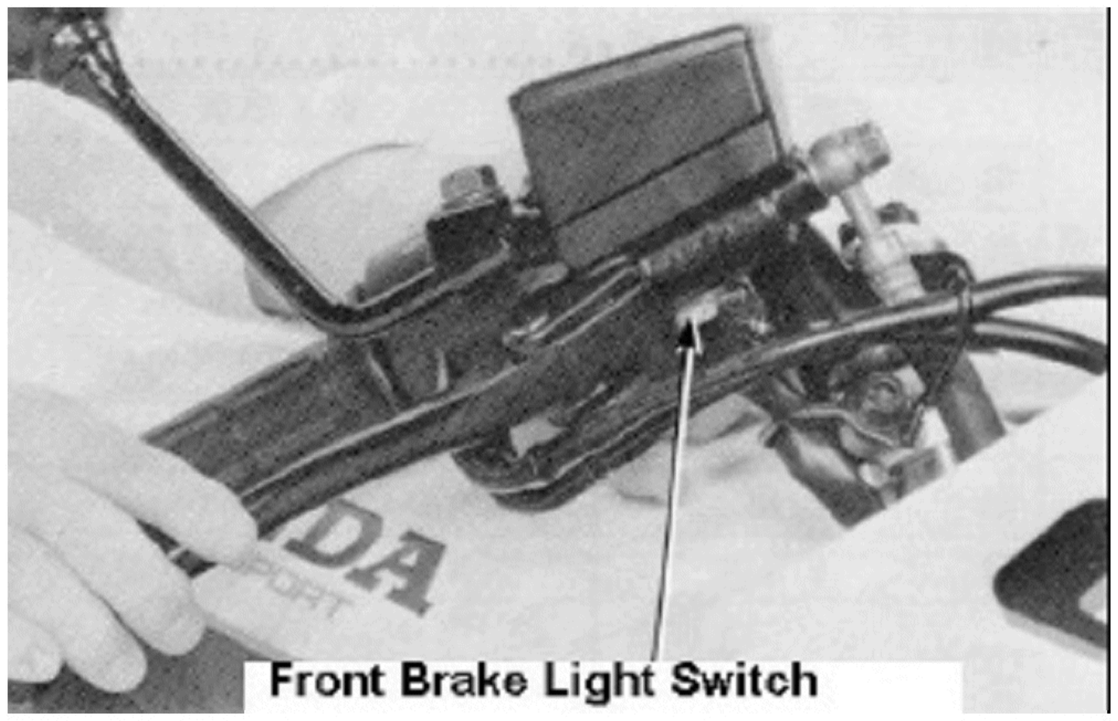


Brake light switch

Front

Disconnect the brake light switch connector.
Inspect the conduction by operating the brake lever.

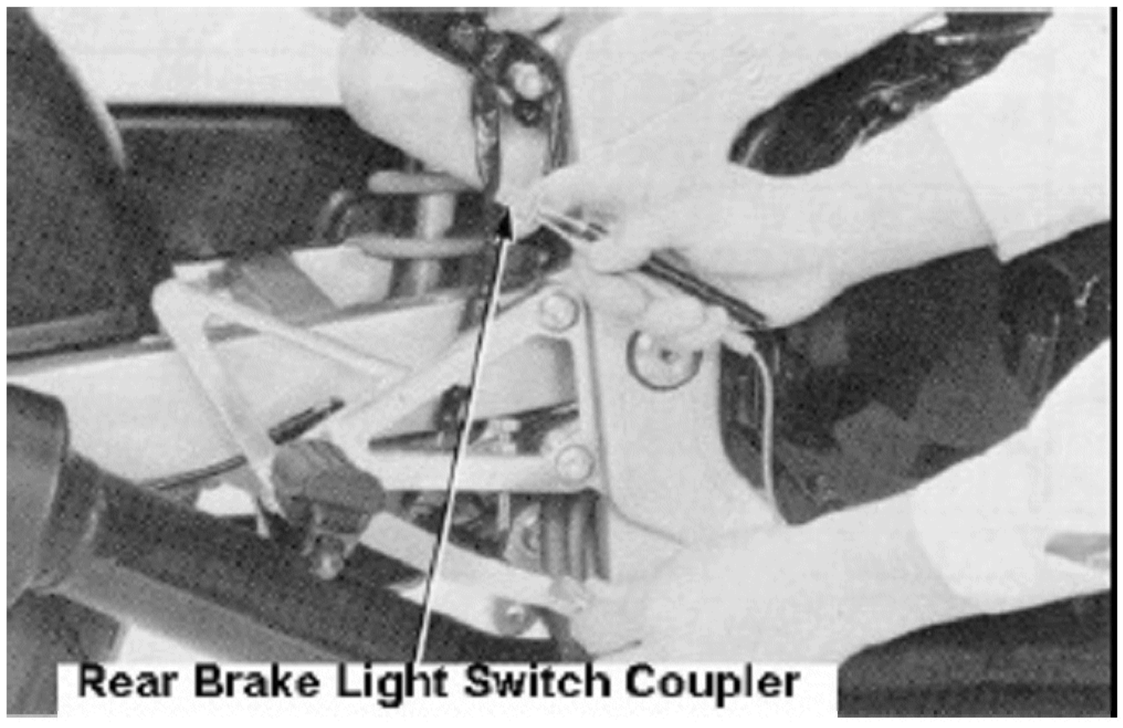
Lever pulled:	conduction
Lever released:	no conduction



Rear

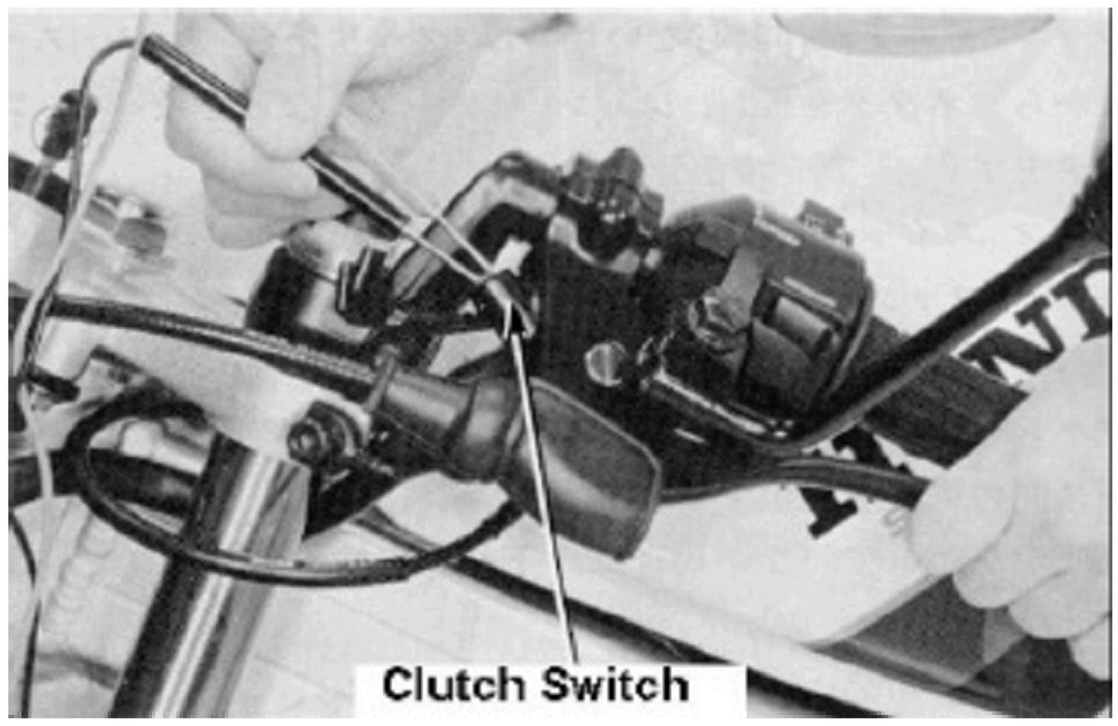
Remove the rear side cover and disconnect the rear brake light switch coupler.
Inspect the conduction by operating the brake pedal.

Pedal pushed in:	conduction
Pedal released:	no conduction



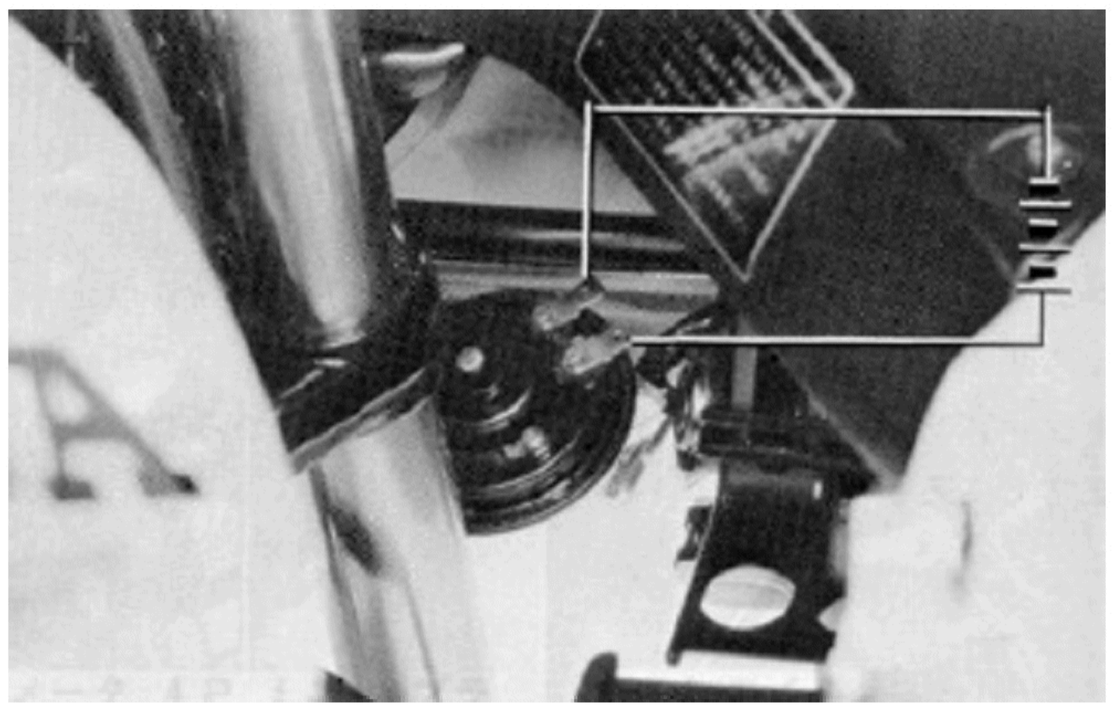
Clutch switch

Disconnect the clutch switch connector.
Operate the clutch switch and check conduction between terminals.
Lever pulled: conduction
Lever released: no conduction



Horn

Disconnect wires from the horn.
Connect a 12V battery directly to the horn.
The horn should work.



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Service Information

Specifications Thick-lined parts differ from CBR250FOUR

Name			MC17
Length			2.000m
Width			0.680m
Height			1.120m
Wheelbase			1.365m
Powerplant			MC14E
Displacement			0.249 l
Type of fuel			Unleaded Gasoline (petrol)
Weight	Front		78kg
	Rear		77kg
	Total		155kg
Max capacity			2
Max Weight	Front		98kg
	Rear		167kg
	Total		265kg
Tyre	Front		100 80-17 52H
	Rear		130 70-17 62H
Minimum clearance			0.140m
Performance	Stop distance (Initial speed)		14.0m 50km/h
	Min turning radius		2.7m
Starter			Self start
Type			Gasoline – 4 cycle
Cylinders			Direct four abreast
Combustion chamber			Pent Roof type
Valve system			Gear driven inlet 2 Valve exhaust 2 Valve
Bore x stroke			48.5x33.8mm
Compression ratio			11.0
Compression pressure			13.0kg cm² - 400rpm
Max. output power			45PS 15.000rpm
Max. torque			2.6kg-m 10,500rpm
Power plant	Valve Operation	Inlet Open	18'BTDC 1mm lifted
		Inlet Close	34' ABDC 1mm lifted
		exhaust Open	36' BBDC 1mm lifted
		exhaust close	11'ATDC 1mm lifted
	Valve clearance	Inlet	0.66mm (cool)
		exhaust	0.23mm (cool)
Unloaded rev.			1,00rpm
Lubrication	Type		Compress-spray type
	Pump type		Trocoid type
	Filter type		Total flow, filter net and paper
	Oil capacity		2.7 l
Cooling system			Water cooled

Fuel system	Air filter		Filter paper type
	Fuel tank capacity		14.0l
	Carburetor	Type	VG03
		Valve diameter	30mm
		Venturi diameter	27mm
Electrical system	Ignition	Type	Full transistor, Battery ignited
		Timing	20°BTDC/1500rpm
		Spark Plug NGK	C8EH-9 C9EH-9
		Spark Plug ND	U24FE9, U27FE9
		Clearance	0.8 – 0.9mm
	Battery Capacity		12V 8AH
Transmission	Clutch Type		Multiple wet Coil spring
	Operation		Mechanical
	Motor to transaxle ratio		2.966
	Type		Constant mesh
	Gear ratio	Gear Ratio Low	2.733
		Second	2.000
		Third	1.590
		Fourth	1.333
		Fifth	1.153
		Sixth	1.035
	Front Reduction	N0. 1 Gear type	Chain
		Reduction ratio	3.142
Wheels	Castor		26° 00
	Trail		97mm
	Tyre air Pressure	Front	2.00kg/cm²
		Rear	2.50kg/cm²
Steering angle			34°
			34°
Brake system		Front	Hydraulic disk brake
		Rear	Hydraulic disk brake
Suspension		Front	Telescopic
		Rear	Swing arm
Frame type			Diamond
Frame no.			JH2MC22UXXM000001~
Engine no.			MC14E – 1000001~

Torque settings (amended parts only)

Engine

Part		No.	Screw Dia (mm)	Torque (kg-m)	Notes
Crankcase bolt		10	10	2.1-2.4	Apply oil
Gear train holder bolt	8mm 7mm	2 2	8 7	1.8-2.2 2.2-2.5	
Cylinder head attachment bolt	7mm 8mm	5 1	7 8	2.2-2.5 2.4-2.7	Apply oil
	7mm 4cm outer side	4	7	1.7-2.1	

Frame

Part	No.	Screw Dia (mm)	Torque (kg-m)	Notes
Brake disk bolt	15	8	3.7-4.3	
Cushion arm pivot pinch bolt and nut	1	8	2.0-3.0	
Hanger pin	5	10	1.5-2.0	
Hanger pin plug	5	10	0.2-0.3	
Brake hose attachment bolt	6	10	2.5-3.5	
Rear master cylinder bolt	2	6	1.0-1.4	
Rear caliper attachment bolt	1	8	2.0-2.5	
Bleeder valve	3	7	0.4-0.7	
Fuel tank attachment bolt - 8mm 6mm	1 1	8 6	1.8-2.5	
Fairing	10	6	0.7-1.1	
Fairing inside cover	5	6	0.6-1.0	
Driven sprocket	6	8	3.4-3.8	Apply oil

Exclusive Tools (Amended parts only)

New exclusive tools

Tool name	Tool no.	Part
Valve guide driver	07HMD-KT70100	Valve guide replacement
Valve guide reamer	07HMH-KT70100	Valve guide cleaning and finishing

Existing exclusive tools

Bearing remover - Remover handle - - remover sliding weight	07936-3710300 07936-3710100 07741-0010201	Needle bearings on suspension linkage (except for the pivot bearing on a cushion arm with a rear fork), main shaft left bearing detachment.
Bearing remover (15mm) - remover ASSY (15mm) - - remover shaft (15mm) - remover head (15mm) - Remover sliding weight	07936-KC10000 07936-KC10500 07936-KC10100 07936-KC10200 07741-0010201	Rear fork right pivot bearing and a pivot bearing with a rear fork on a cushion arm.
Bearing driver attachment	07GMD-KV30100	Rear fork left pivot bearing attachment
Driver attachment (28x30)	07946-1870100 07946-1870100	Clutch lifter blade bearing installation Rear fork left pivot bearing detachment
Driver handle	07949-3710001	Rear fork left pivot bearing detachment

Common Tools

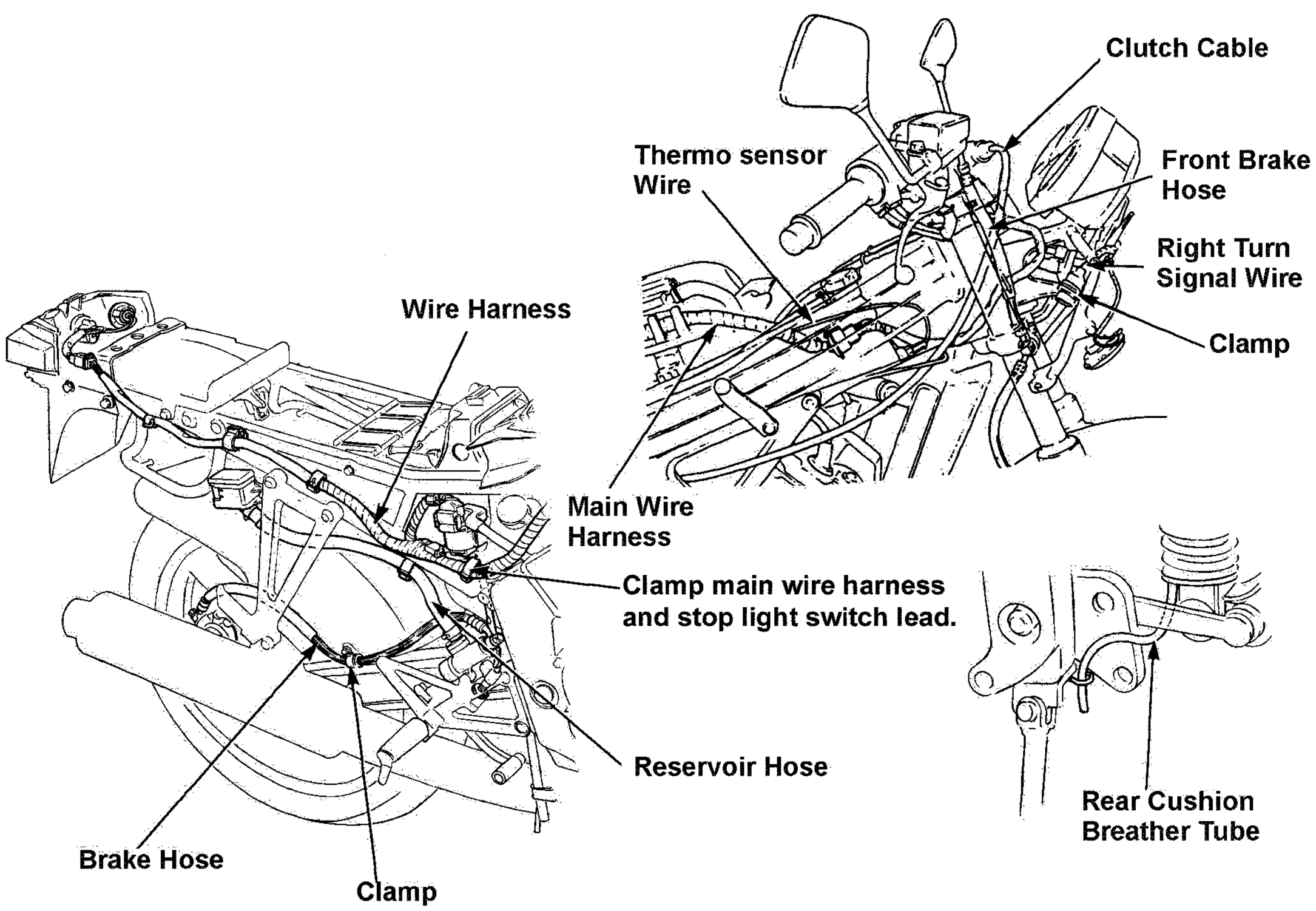
Tool name	Tool No.	Application
Pilot (15mm)	07746-0040300	Front wheel bearing, rear fork right pivot bearing, pivot bearing on a cushion arm with a rear fork.
Pilot (17mm)	07746-0040400	Rear wheel, suspension linkage (except for a pivot bearing on a cushion arm with a rear fork), driven sprocket and main shaft left bearing.
Pilot (12mm)	07746-0040200	Clutch filter plate bearing
Rear cushion compressor or Shock absorber compressor - compressor screw ASSY	07959-3290001 07GME-0010000 07GME-0010100	Rear cushion disassembly/assembly

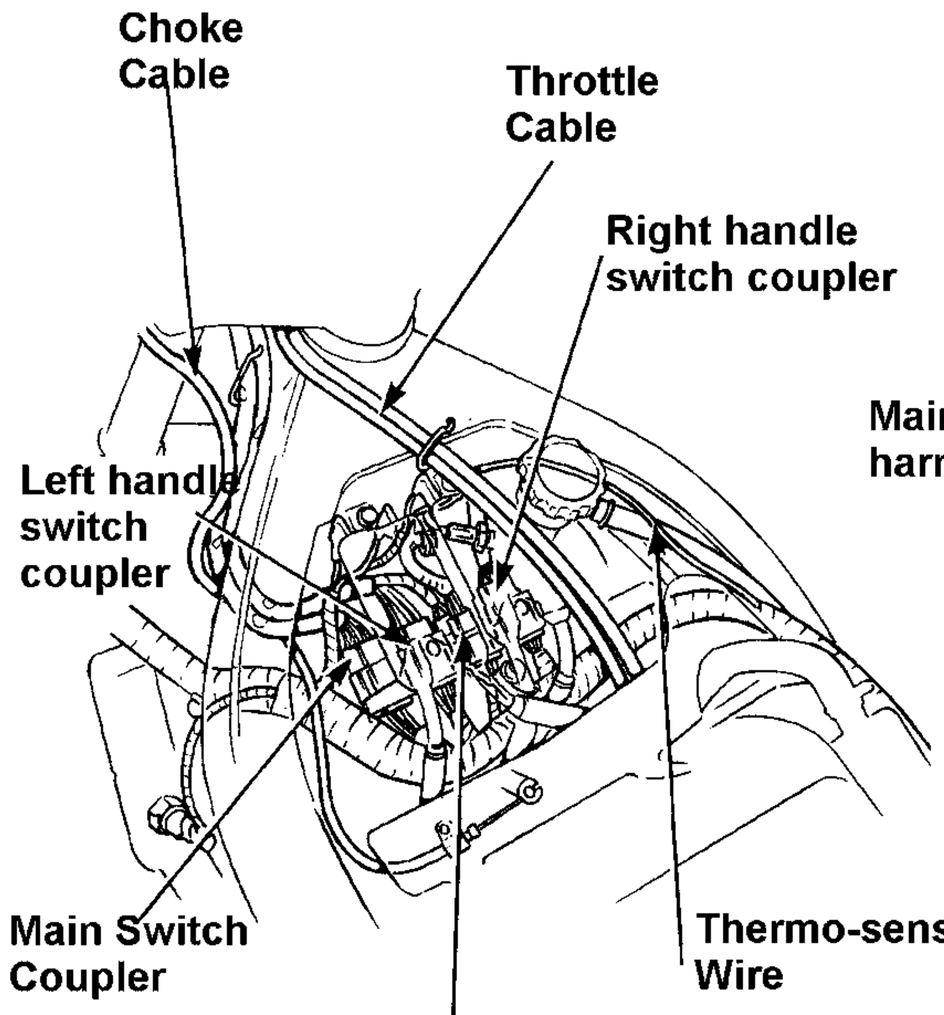
Valve seat cutter

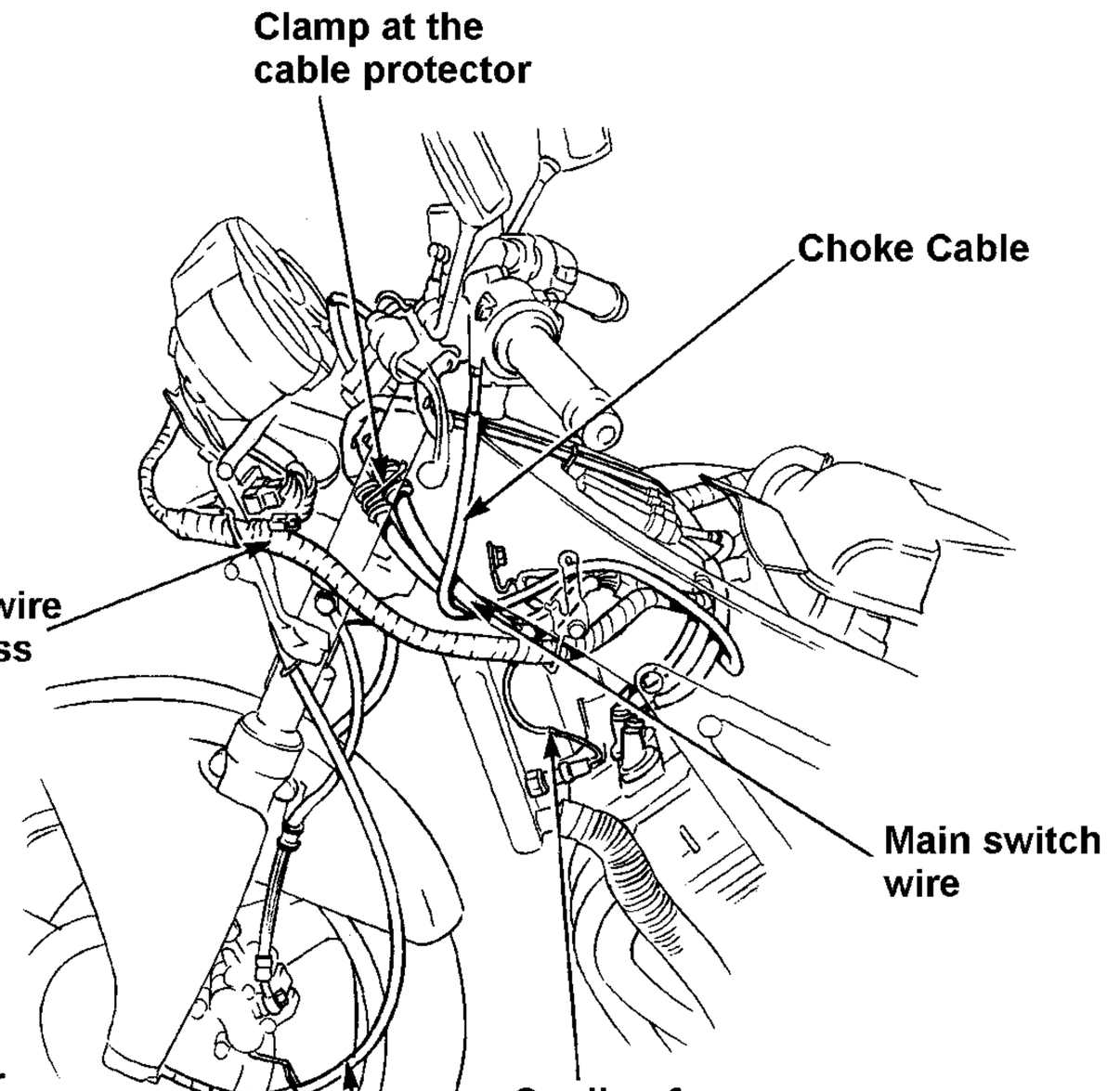
Tool name	Tool No.	Application
Cutter holder (3.5mm)	07HMH-KT70200	Attach a cutter and adjust the valve seat.

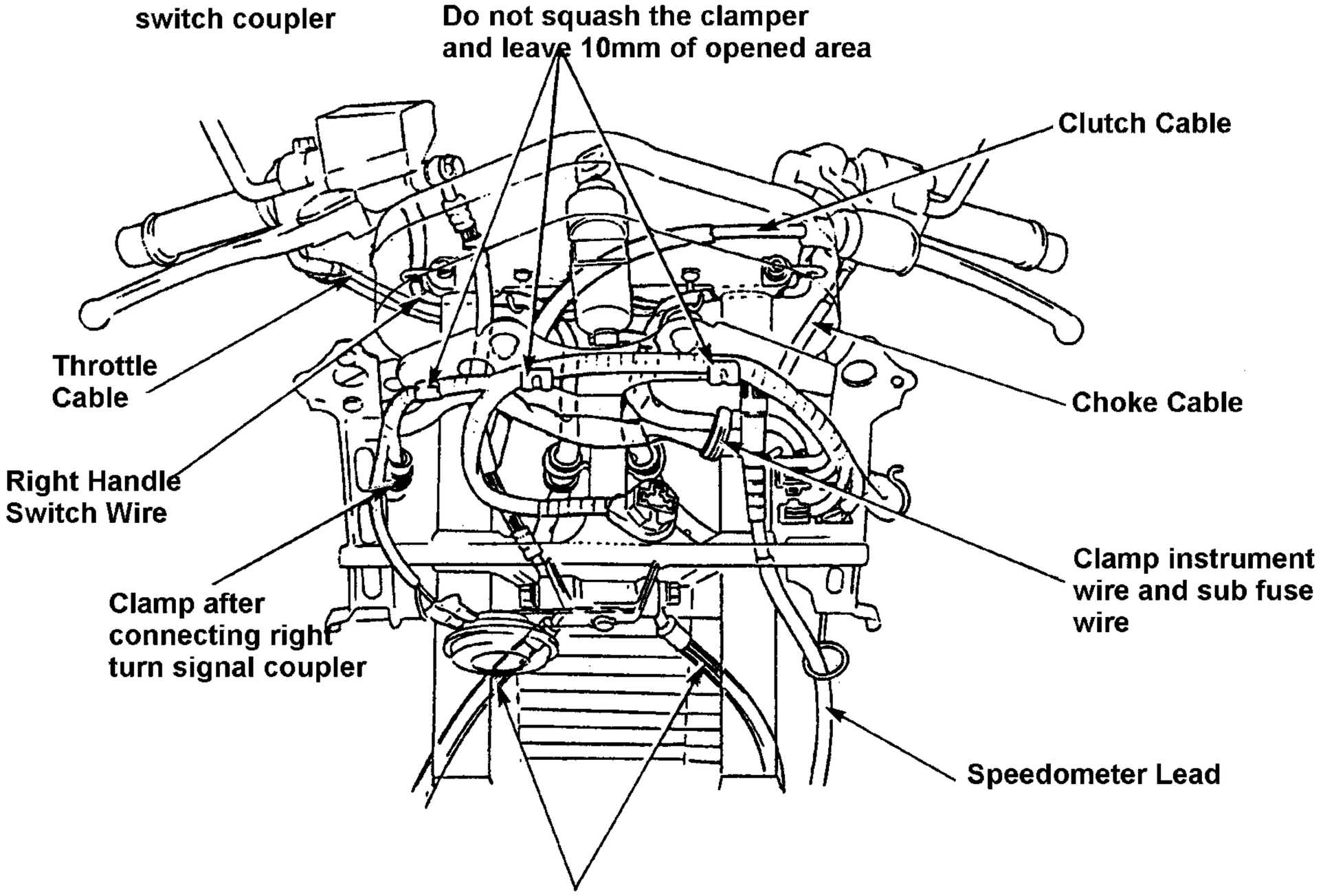
Newly established tool

- **Wiring**




Choke Cable
Throttle Cable
Right handle switch coupler
Left handle switch coupler
Main Switch Coupler
Thermo-sensor Wire
Top: Cooling fan coupler
Bottom: Left handle switch coupler


Clamp at the cable protector
Choke Cable
Main wire harness
Main switch wire
Cooling fan switch wire
Speedometer Cable


Clamp main wire harness.
Do not squash the clamper and leave 10mm of opened area
Clutch Cable
Throttle Cable
Choke Cable
Right Handle Switch Wire
Clamp instrument wire and sub fuse wire
Clamp after connecting right turn signal coupler
Speedometer Lead
Front Brake Hose

Inspection / adjustment - Procedure

1. Items for inspection include high speed driving inspection items.
2. (●) express compulsory inspection schedule and "O" mark is the recommendation of the manufacturer.
3. (●) indicates regular replacement.
   Replacement schedule is based on ordinary use. The schedule should be adjusted with operating condition.
4. "High speed" or "High speed driving" means driving at or above 80km/h.

Items to be serviced			Schedule				Notes
			Before driving	1 month	Kilometres 6 month	Kilometres 12 month	
Steering	Steering head bearings	Free play / looseness				●	
		Smoothness				●	
	Steering wheel	Turning (steering) angle				●	
	Steering fork	Damage			●	●	
		Fork, spindle attachment			●	●	Steering stem
		Fork, spindle bearing looseness				●	Steering stem
Brake pedal	Free play and clearance from ground when fully depressed.				●	●	Free play: Front brake lever edge 10~20mm Rear brake pedal 20~30mm
	Pedal travelling length and effectiveness		●				
	Braking effectiveness			O	●	●	
Hose /pipe	Leak, damage and attachment			O	●	●	
	Brake hose replacement						● Every four years
Braking System	Reservoir	Fluid level	●		●	●	Fluid level Front: at or above lowest level line Rear: between highest - lowest
	Master cylinder, wheel cylinder, disk caliper	Function wear and damage				●	
		Cups for the master/wheel cylinder, dust seal, rubber parts for disk caliper replacement					● Biennial
	Brake disk pad	Disk / pad clearance				●	
		Pad wear				●	Indicator
		Disk wear / damage				●	Standard: Front 4.0mm Thickness: Rear 5.0mm Limitation: Front 3.5mm Rear 4.0mm
	fluid	Brake fluid damage					● Annual
Wheels	Tyre air pressure		●		●	●	1 person / Normal / Unit: Front 2.00 / Rear 2.25 High speed / 2.00 / 2.25 2 people / Normal / 2.00 / 2.50 Tyre / Type / 100-80 / 130-70 17-52H / 17-62H

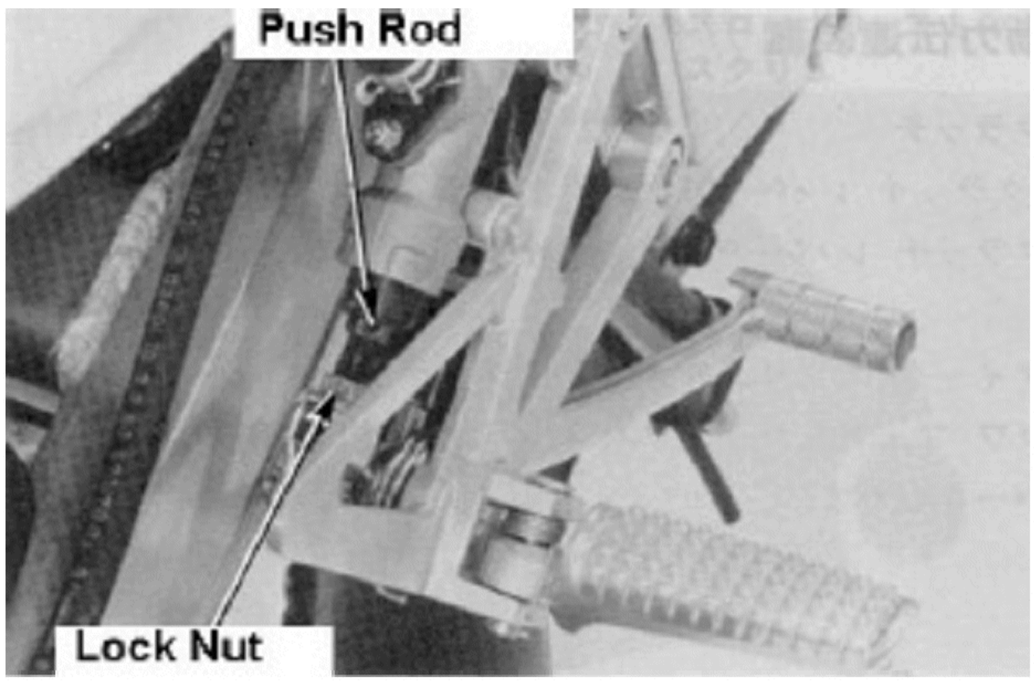
Items to be serviced			Schedule				Notes
			Before driving	1 month	Kilometres 6 month	Kilometres 12 month	
Wheels		Crack and damage on tyres	●		●	●	
		Depth of tread and wear	●		●	●	Tread front 0.8mm - rear 0.8mm
		Metal piece and other objects	●		●	●	
		Wheel nut and wheel bolt looseness			●	●	Axle nut, axle holder, front axle holder, torque 1.8~2.5kg-m front axle torque 5.5~6.5kg-m rear axle nut torque 8.0~10.0kg-m
		Rim, side ring and wheel disk damage				●	Wheel rim deflection at rim edge Front wheel rim 2.0mm 2.0mm Rear wheel rim..... .2.0mm 2.0mm
		Front wheel bearing looseness				●	
		Rear wheel bearing looseness				●	
Shock absorber Suspension arm spring - chassis		Damage				●	Cushion spring
		Looseness on the jointed arm damage					
Shock absorber		Oil leak and damage				●	
		Attachment / looseness				●	
Transaxle	clutch	Lever free play			●	●	Clutch lever free play 10-20mm
		Operation			●	●	
	transmission	Oil leak and oil level			●	●	Oil level bar gauge (dipstick) between min-max.
		Control system looseness				●	
	Chain and Sprocket	Chain tension			●	●	When using sidestand, at the centre of front / rear sprocket: max deflection 15~25mm
		Sprocket attachment and wear				●	
Electrical system	Ignition	Spark plug			●	●	Plug gap: 0.8 – 0.9mm
	Battery	Terminal connection					
	Wiring	Joint looseness / damage					
Powerplant	Main component	Starting and sound			●	●	
		Low speed and acceleration			●	●	Idling rpm 1.500 ± 100rpm
		Exhaust gas			●	●	
		Air cleaner element replacement					20,000km every
		Valve clearance				●	Inlet (cool): 0.13 – 0.19mm Exhaust (cool): 0.20 – 0.26mm

Items to be serviced			Schedule: Before driving	Schedule: 1 month	Schedule: Kilometres 6 month	Schedule: Kilometres 12 month	Notes
Power plant	Lubrication system	Oil dirty / quantity			●	●	Oil level Dipstick – between min - max
		Oil leak			●	●	
		Oil quantity	●				
		Engine oil change					Initial 1.000km, every 6000km after that
		Oil filter					Initial 13.000km, every 12,000km after that
	Fuel system	Fuel leak			●	●	
		Carburetor linkage system				●	
		Throttle valve and choke valve				●	
		Fuel filter				●	
		Fuel quantity	●				
		Fuel hose replacement					✯ Every four years
	Cooling system	Coolant level	●		●	●	Reservoir tank between min-max.
		Coolant leak	●			●	
		Radiator cap				●	0.95-1.25kg/cm² valve opening pressure
		Coolant replacement					Biannual
Exterior lights		Function			●	●	
		Illumination, dirt and damage	●				
Lock		Function				●	
Rear view mirror		Images	●				Only rearview mirrors
Reflector, registration plate/plate holder		Dirt and damage	●				
Instruments		Function				●	
Exhaust pipe & muffler		Looseness of attachment damage				●	
		Muffler function				●	
Body		Looseness and damage				●	
Previously Detected defects		Inspect the corresponding part	●				
Other		Greasing and lubrication of chassis			●	●	

Brake System

Brake pedal height adjustment

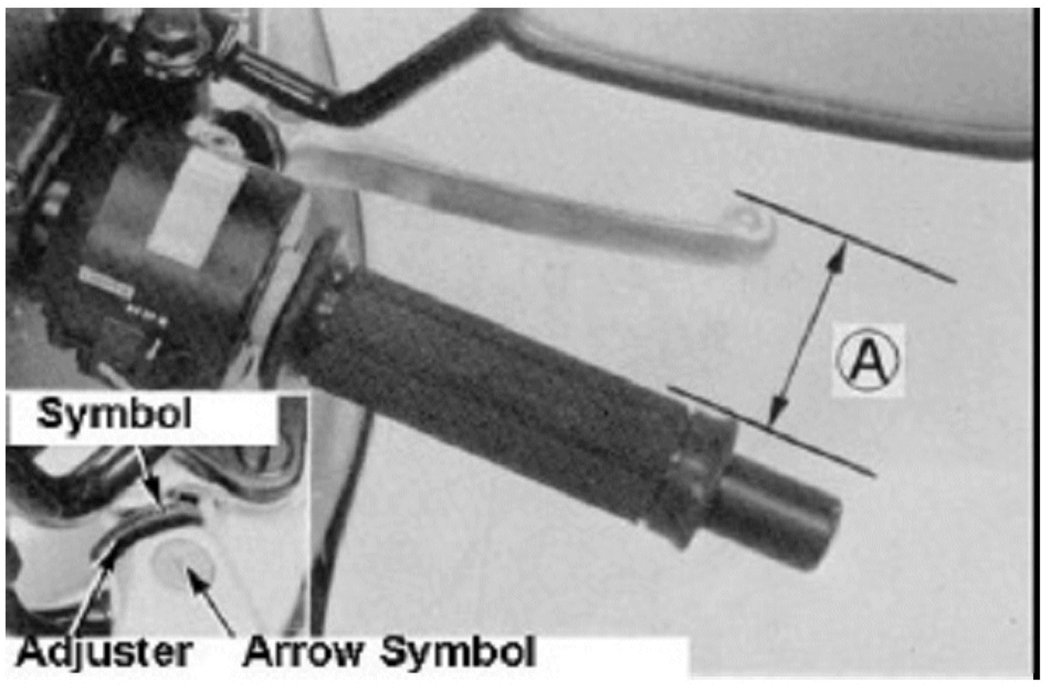
Loosen the rear master cylinder push rod's lock nut and rotate the push rod to adjust the height of the brake pedal. Check the rear stoplight switch function after adjusting. Adjust if required (2-20).



Brake lever adjustment

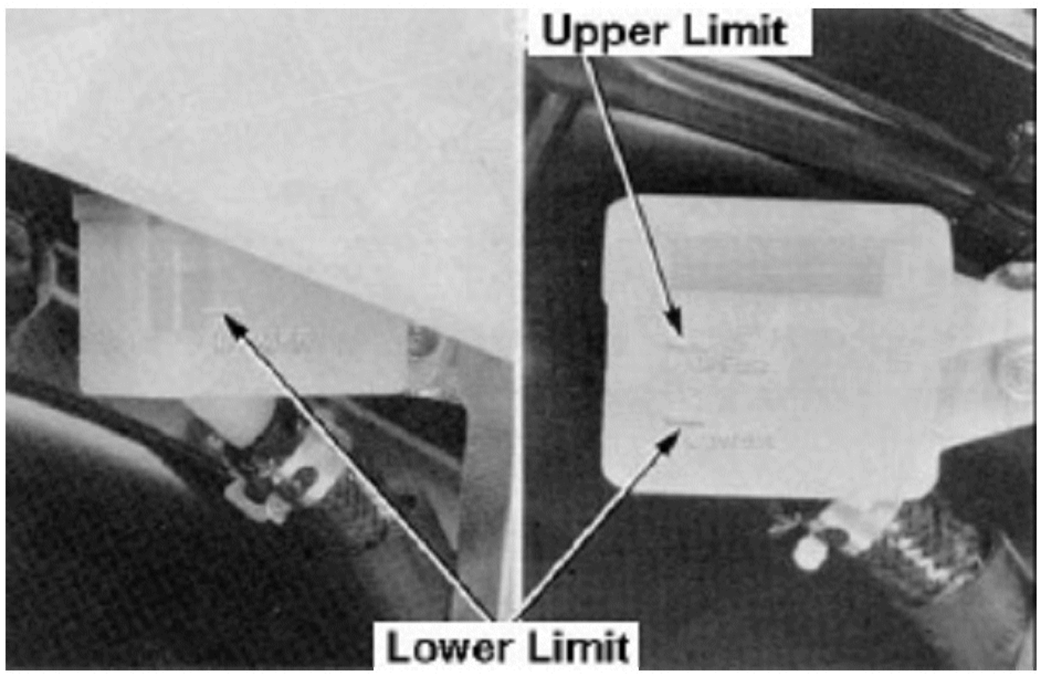
By rotating the adjuster, the distance (A) from the grip to the edge of the brake lever can be adjusted.

> Always align the symbol on the adjuster to the arrow symbol on the brake lever.



Rear brake fluid level

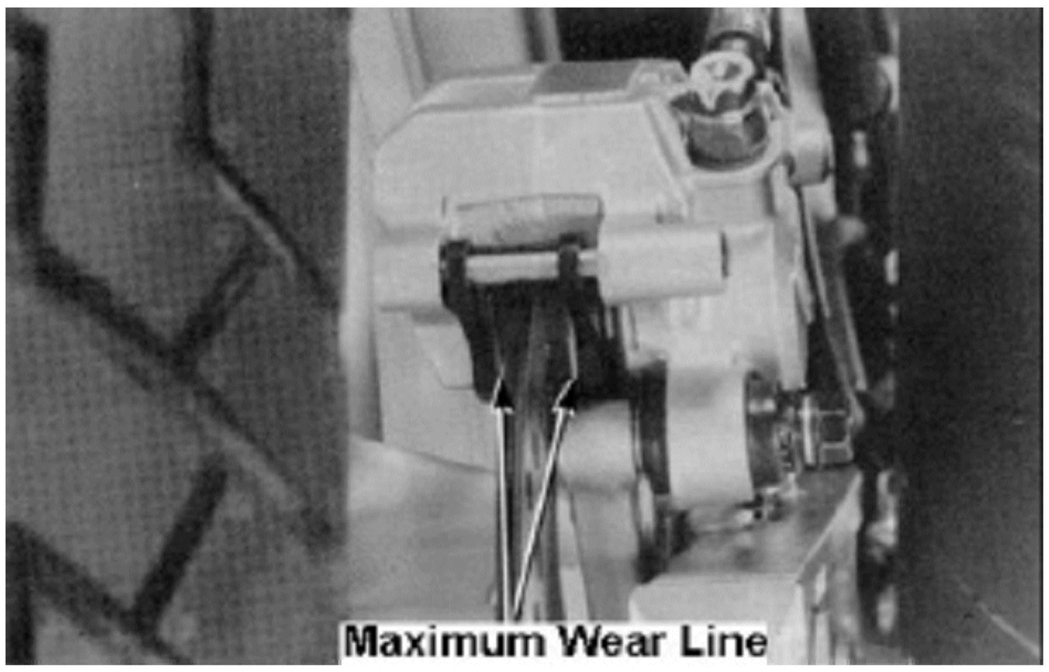
Check the brake fluid level.
Check for the fluid leak if the level is low.
Remove the right side cover.
Remove two reservoir cap attachments screws and remove the cap. Fill DOT 3 or DOT 4 standard brake fluid to the upper limit line.



- Do not mix different products of brake fluids.
- The top surface of the reservoir cap should be level when inspecting/refilling brake fluid.
- Keep the brake fluid away from dust/debris.
- Keep the fluid away from painted/plastic / rubber surfaces.

Rear brake pad wear

Fully depress the brake pedal and inspect wear of inner / outer brake pads.
Inspect the wear from back of the vehicle.
Replace pads if the pad is worn to the maximum wear line (21-33)



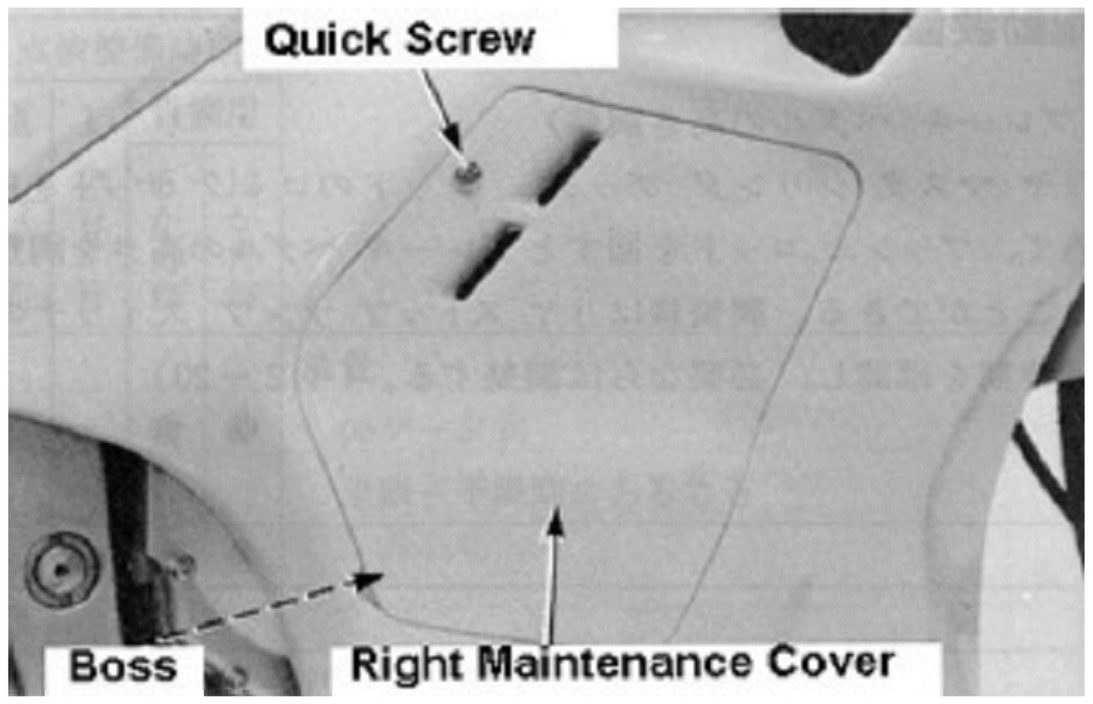
- Replace pads in a set.

Inspect the contact surface of the brake disk for unusual wear and damage (21-35).

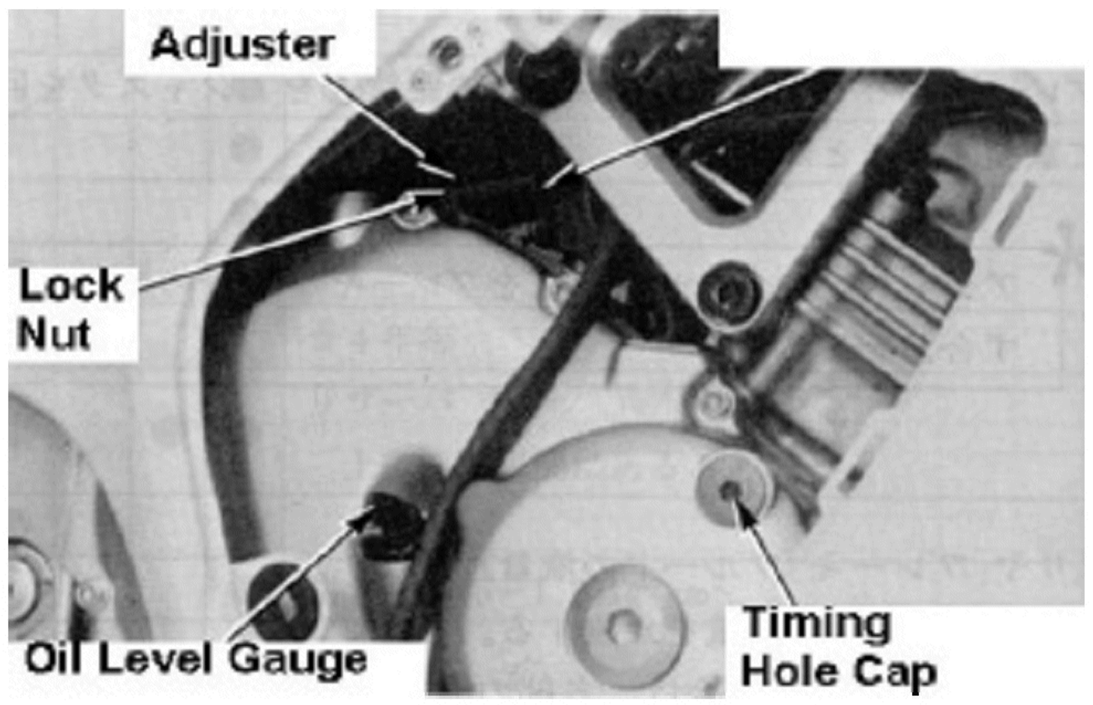
Transaxle system
Clutch

Clutch lever free play

Inspect the free play of the clutch lever (2-7).
Remove the quick screw and detach the right maintenance cover boss from a lower fairing grommet and detach the right maintenance cover.



Major adjustments can be done by loosening the lock nut and rotating the adjust nut.
Minor adjustments (2-7)

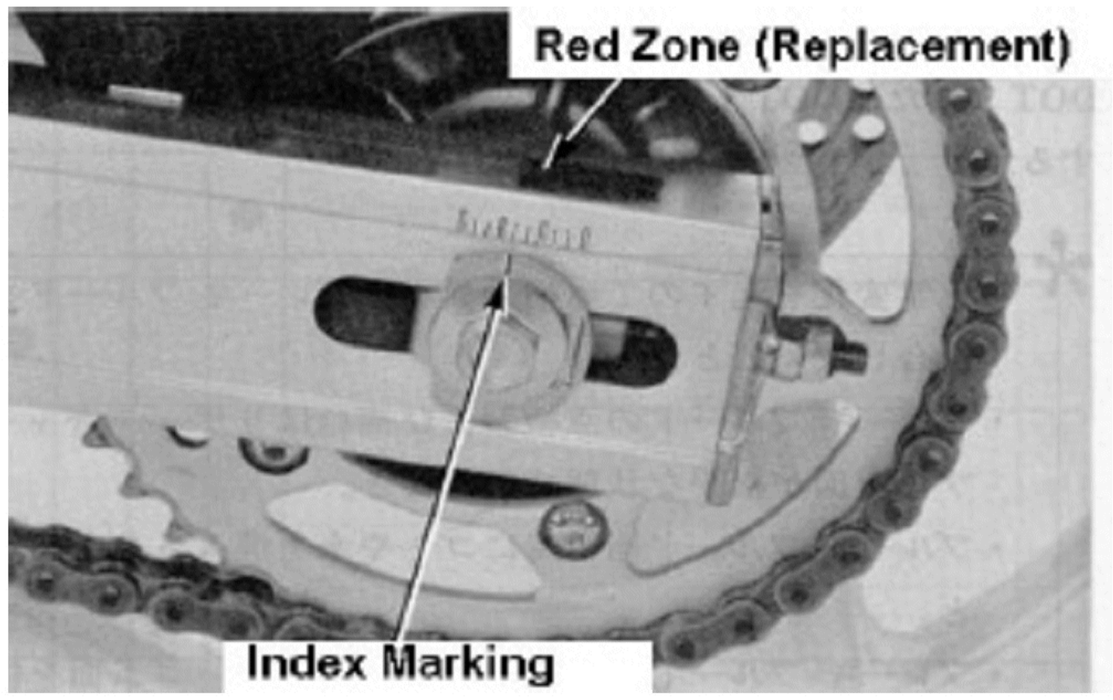


The following parts can be inspected by detaching the right maintenance cover.
- ignition timing (2-10)
- oil colour and quantity (2-15)

Chain and sprocket

Drive chain tension

Drive chain adjustment (2-8)



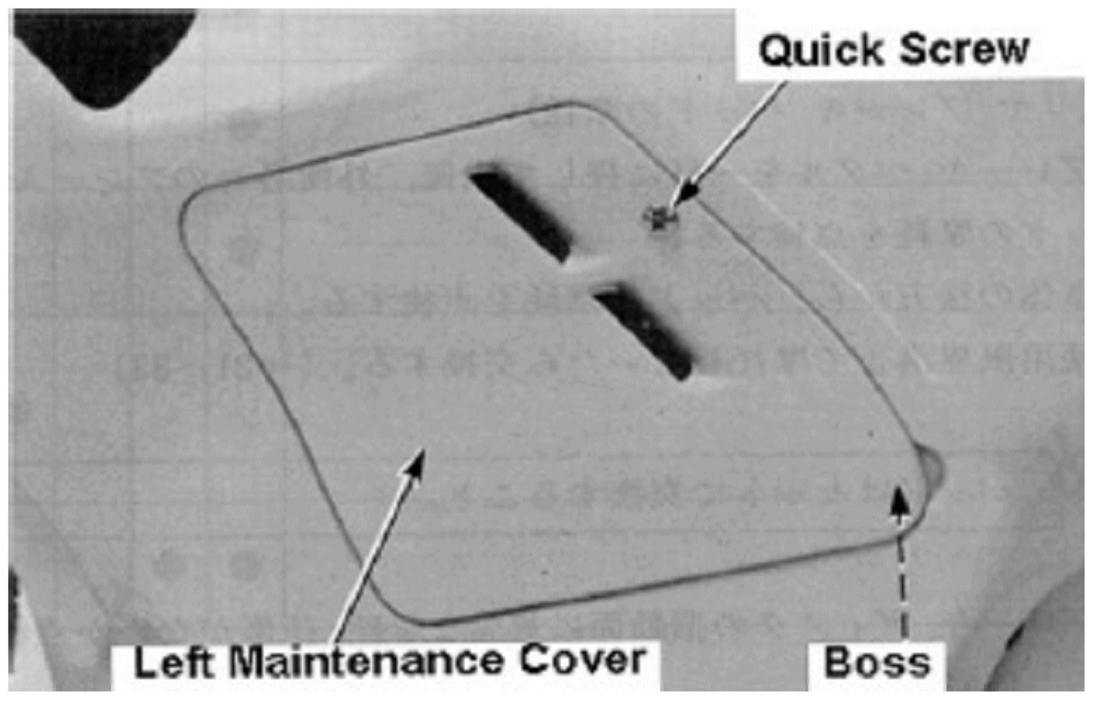
> Replace the drive chain if the index marking on the rear axle spacer is aligned with the red label on rear fork.

Powerplant

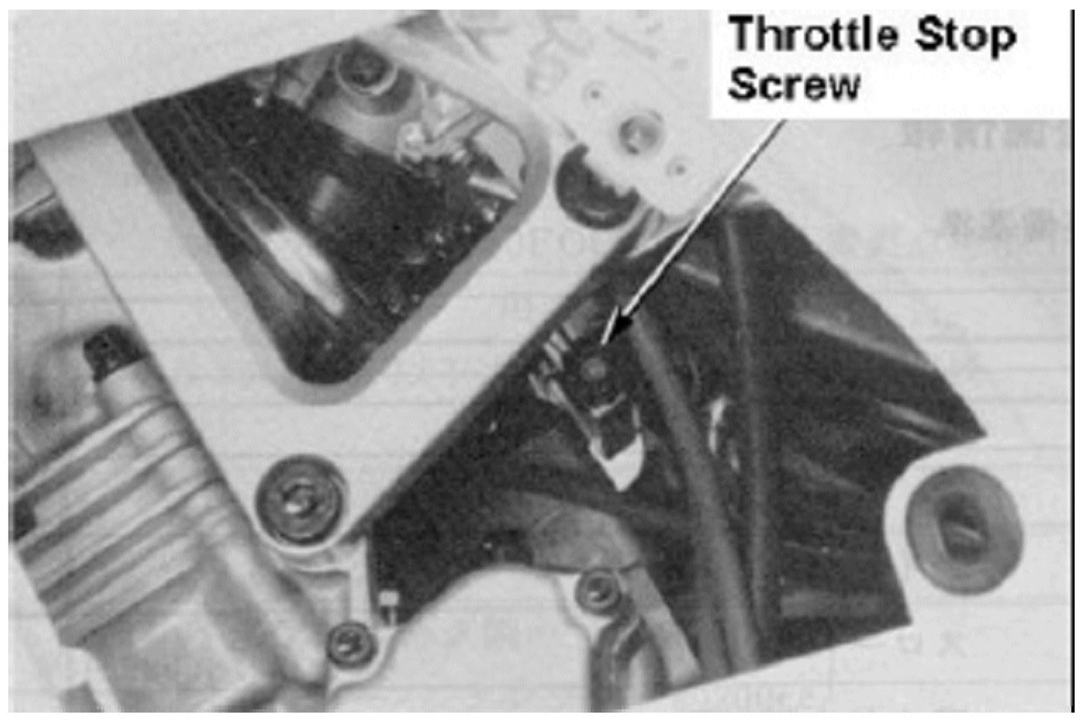
Main body

Idle speed adjustment

Remove the quick screw and detach the left maintenance cover boss from the left lower fairing grommet and detach the left maintenance cover.



Adjust to standard idling rpm by rotating the throttle stop screw (2-10).

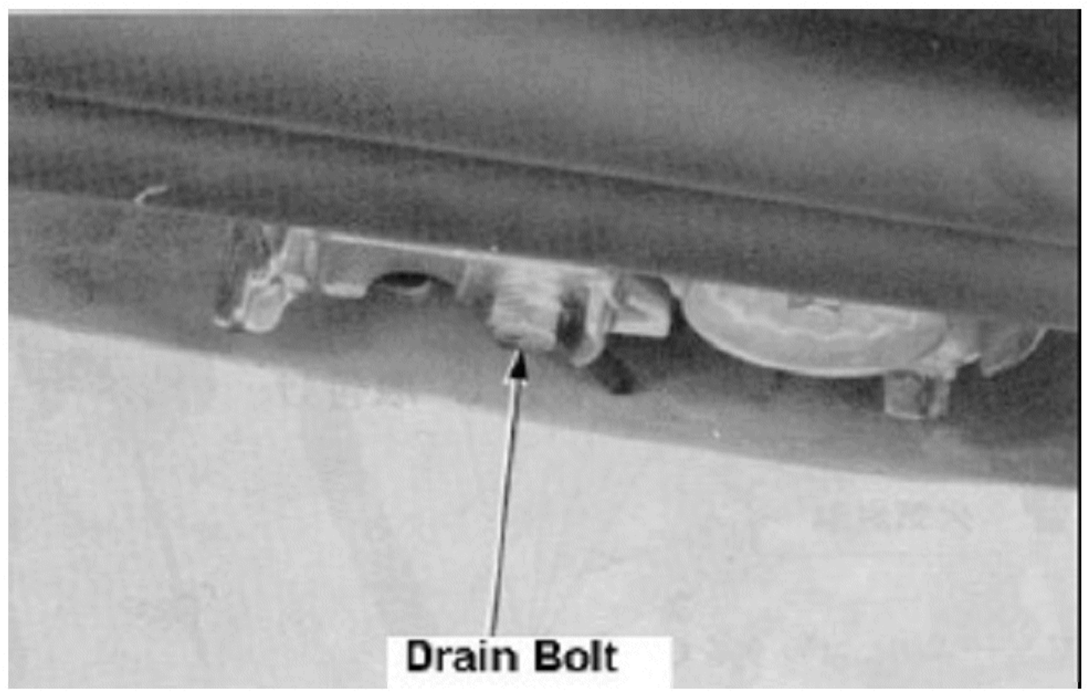


Lubrication

Engine oil drain

Warm up the engine before draining the oil.

Detach the oil level gauge.
Remove the drain bolt and drain the engine oil.
Turn the kill switch OFF and engage starter for a few seconds to drain remaining oil.
Attach the drain bolt after cleaning.
Torque: 3.0 ~ 4.0kg-m



Replace the sealing washer if damaged.

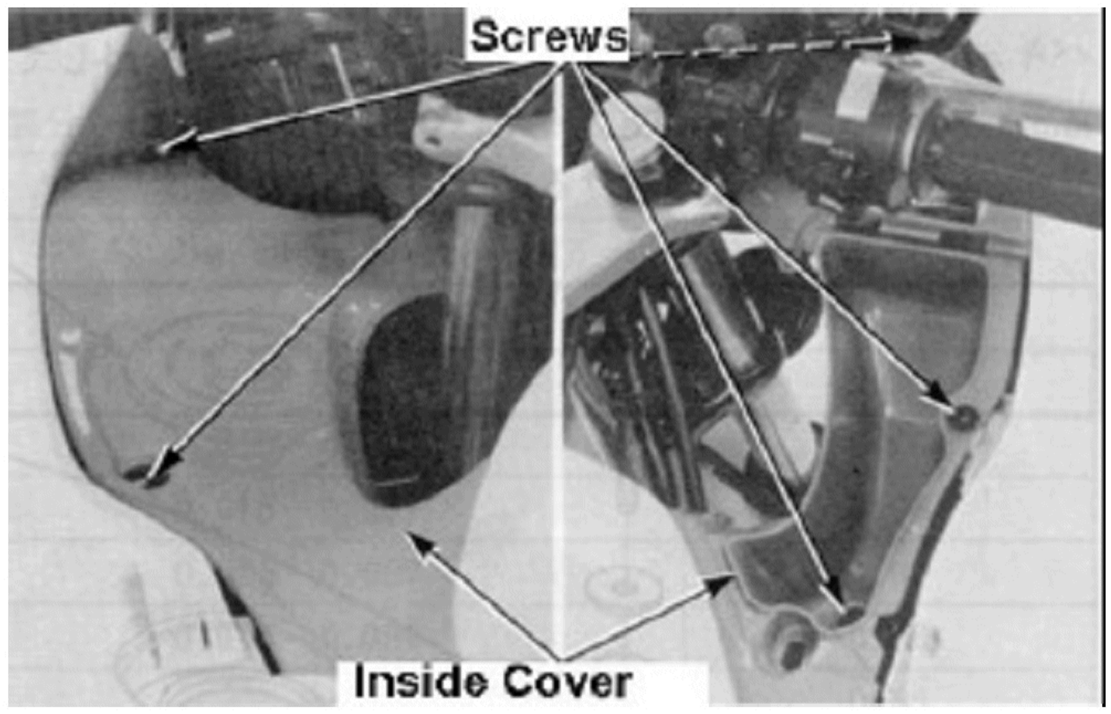
Fill with engine oil.

Others

Illumination

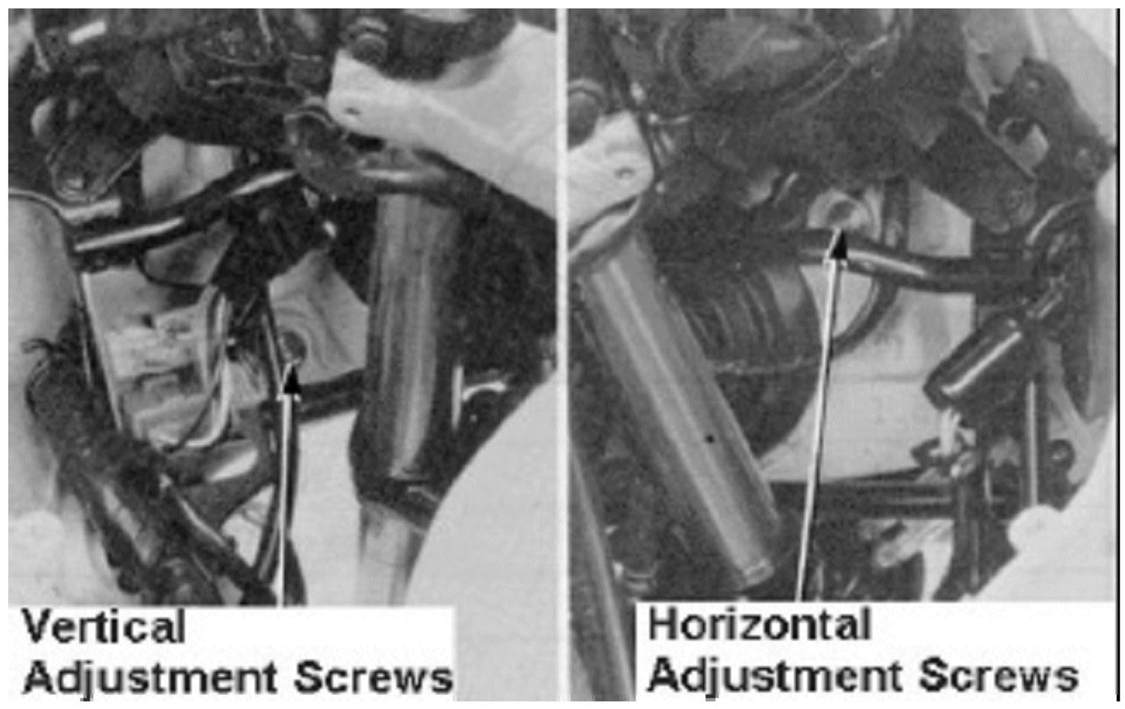
Front light

Remove upper fairing inside covers from both sides.



Adjust the vertical adjustment screws to (horizontal).

Adjust the (vertical / horizontal) beam path.



Fuel system

Service information

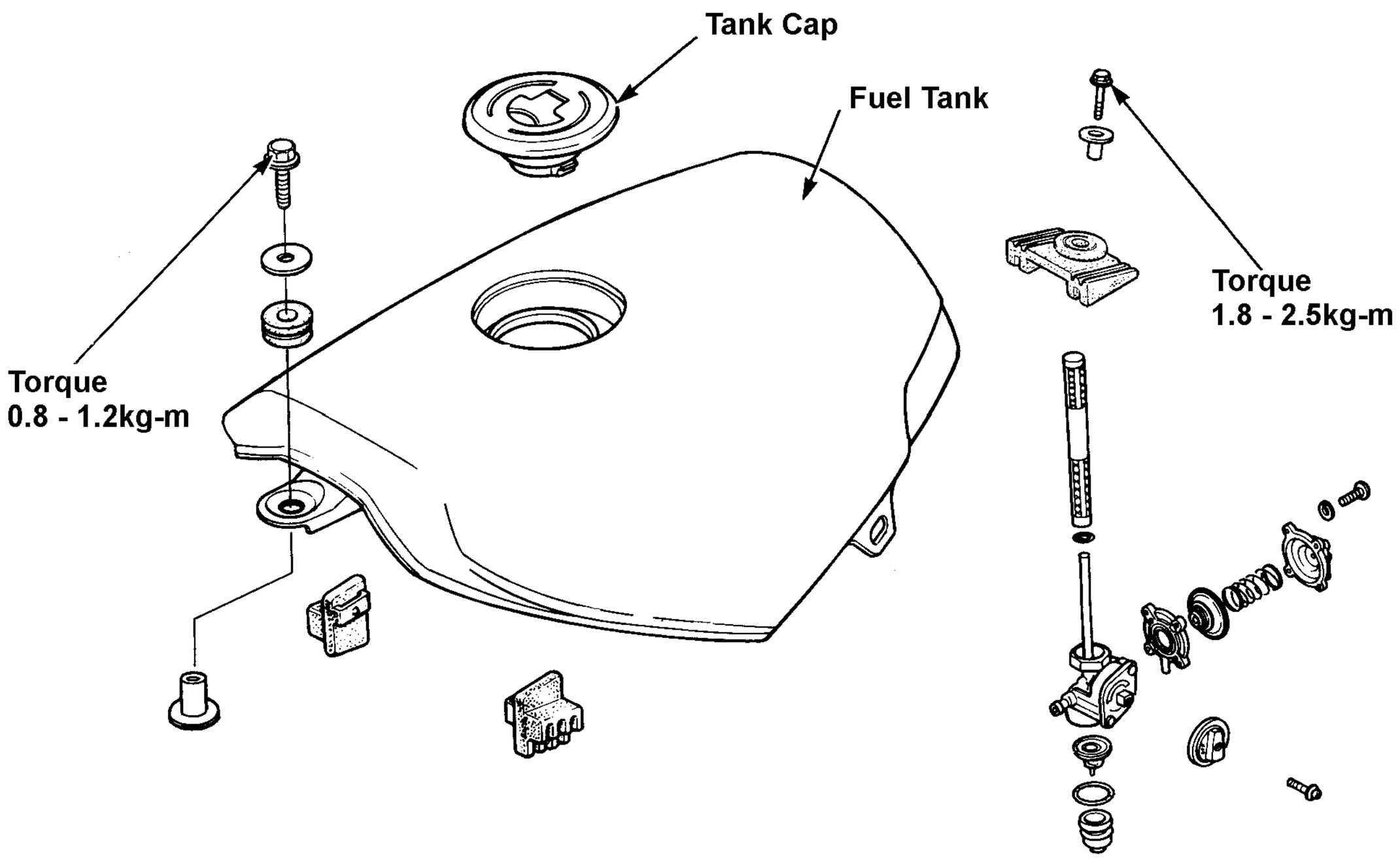
Standard **thick lined cells differ from CBR250 four.**

Venturi diameter		Primary: 9.8mm equivalent, Secondary: 27mm equivalent
Setting symbol		VG03A
Float level		7mm
Main jet		= 88
Slow jet		= 35
Idling the rpm		1,500 = 100rpm
Free play of the throttle grip		2 – 6mm
Pilot screw rewinding revs.		2-½ revs
Fuel tank capacity	Total	14 l
	Reserve	2.5 l

Fuel tank detachment / attachment

Keep out of fire

Turn off the fuel cock.
Remove the side cover and seat.
Remove two tank attachment bolts.
Disconnect the vacuum tube and the fuel tube and remove the fuel tank (4-3).
Attach the fuel tank.



Cooling system

Service information

Standard **Thick lined cells differ from CBR250 four.**

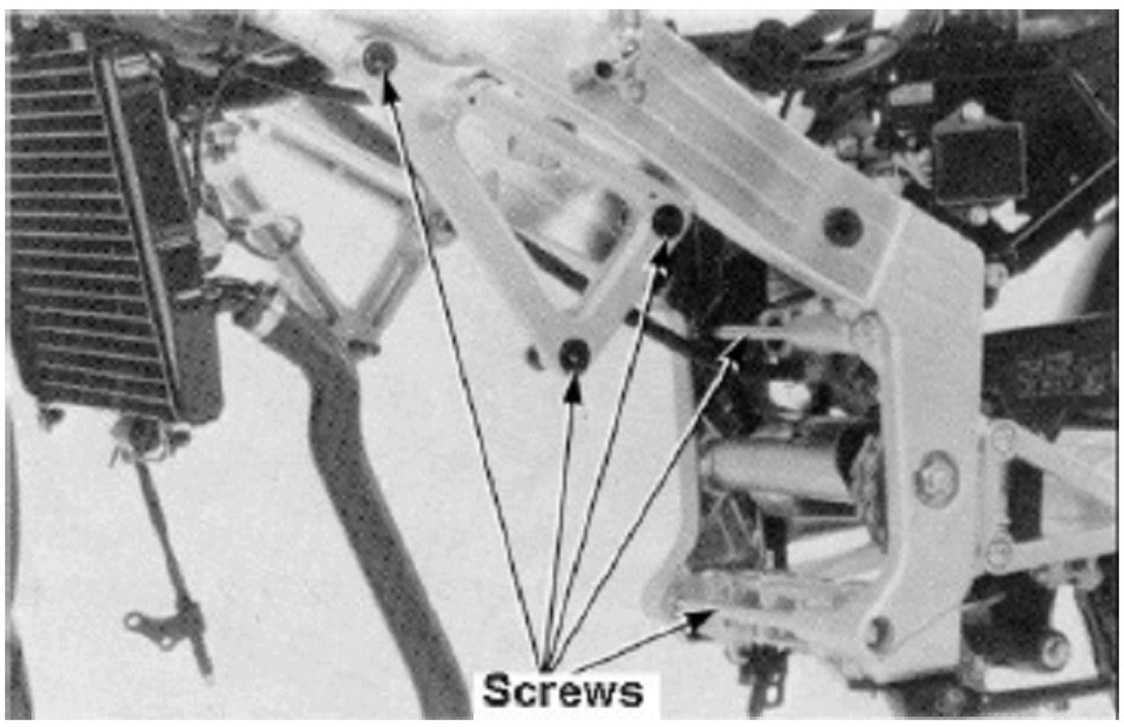
Item		Standard	Limitation
Radiator cap valve opening pressure		0.95-1.25kg/cm²	Replace if ≦ 0.95kg/cm² Or ≧ 1.25kg/cm²
Thermostat vale opening temperature	Start opening	80-84°c	-
	Full open	95°c	-
	Full open lift	≧ 8mm	-
Coolant capacity		Total	Radiator approx 1100cc
		Capacity approx 1.300cc	Reservoir tank approx 200cc

Engine mounting / dismounting

Remove the lower fairing (21-21)

Refer to Sec. 6 for engine attach/detachment.

Attach the lower fairing (21-23).



Cylinder head and valve

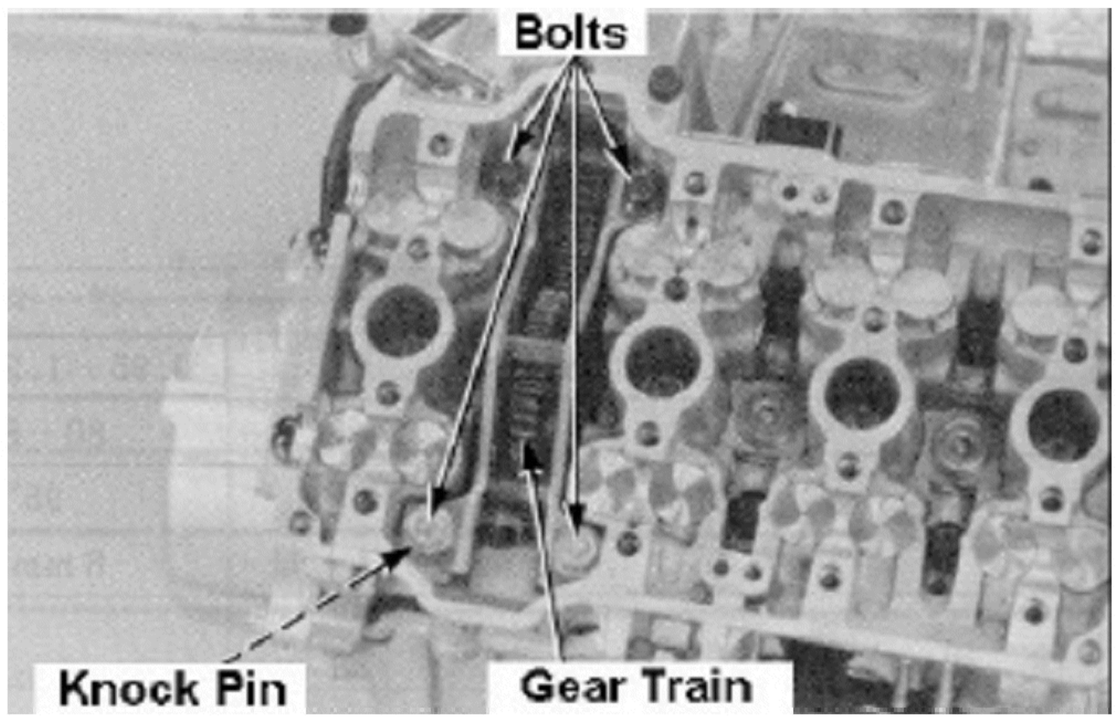
Service information

Standard **Thick lined cells differ from CBR250 four.**

Item			Standard	Limitation
Compression			13.0kg/cm²-400rpm	-
Cam shaft	Cam lift	IN		29.00
		EX		28.70
	Oil clearance	1	0.015-0.057	0.06
		2	0.015-0.057	0.06
		3	0.025-0.067	0.07
		4	0.015-0.057	0.06
	Deflection		-	0.05
Valve spring	Relaxed length		38.58	37.6
Valve, Valve guide	Valve stem Outer diameter	IN	3.478-3.492	3.473
		EX	3.460-3.475	3.445
	Valve stem Outer diameter	IN	3.500-3.512	3.565
		EX	3.500-3.512	3.565
	Stem / guide Clearance	IN	0.008-0.034	0.092
		EX	0.025-0.052	0.132
	Valve seat Contact width	IN	0.08	1.3
		EX	1.0	1.5
Valve lifter	Outer diameter		19.978-19.993	19.97
Cylinder head	Deflection		-	0.05
	Valve lifter contact part outer diameter		20.010-20.026	20.035

Cam gear train detachment

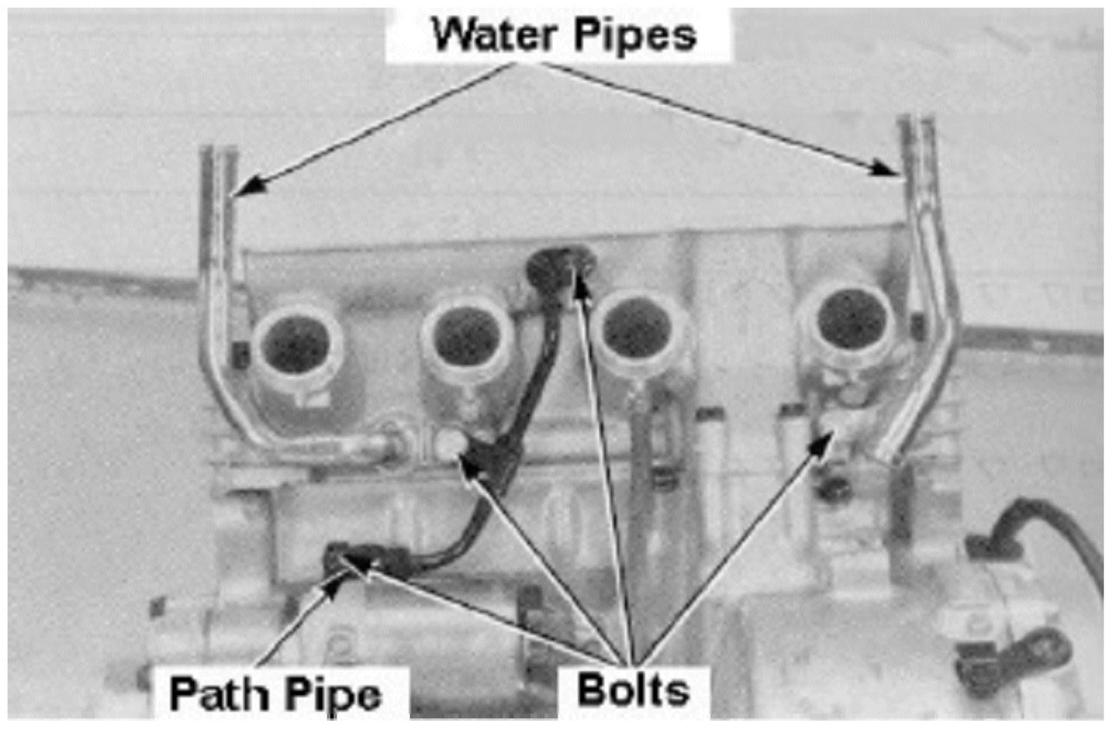
Remove the lower fairing (21-21).
Remove the cylinder head cover (7-3).
Remove the cam shaft (7-3).
Remove four bolts and detach the cam gear train.
Remove the knock pin.



Cylinder Head Detachment

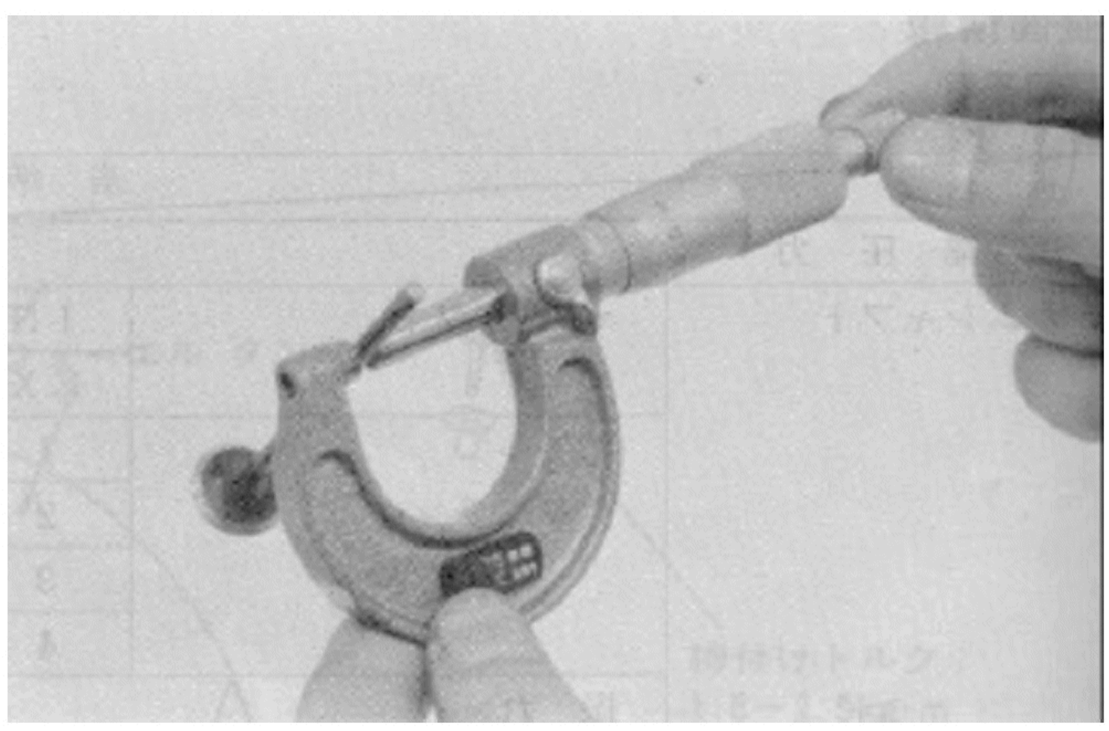
Remove the following parts:
- fuel tank (4-3)
- aircleaner case (4-6)
- carburetor (4-8)
- exhaust pipe (16-2)
- cam shaft (7-3)
- cam gear train

Disconnect the oil path pipe and remove O-Ring, knock pin and oil orifice.
Remove bolts and remove water pipes and O-Rings.



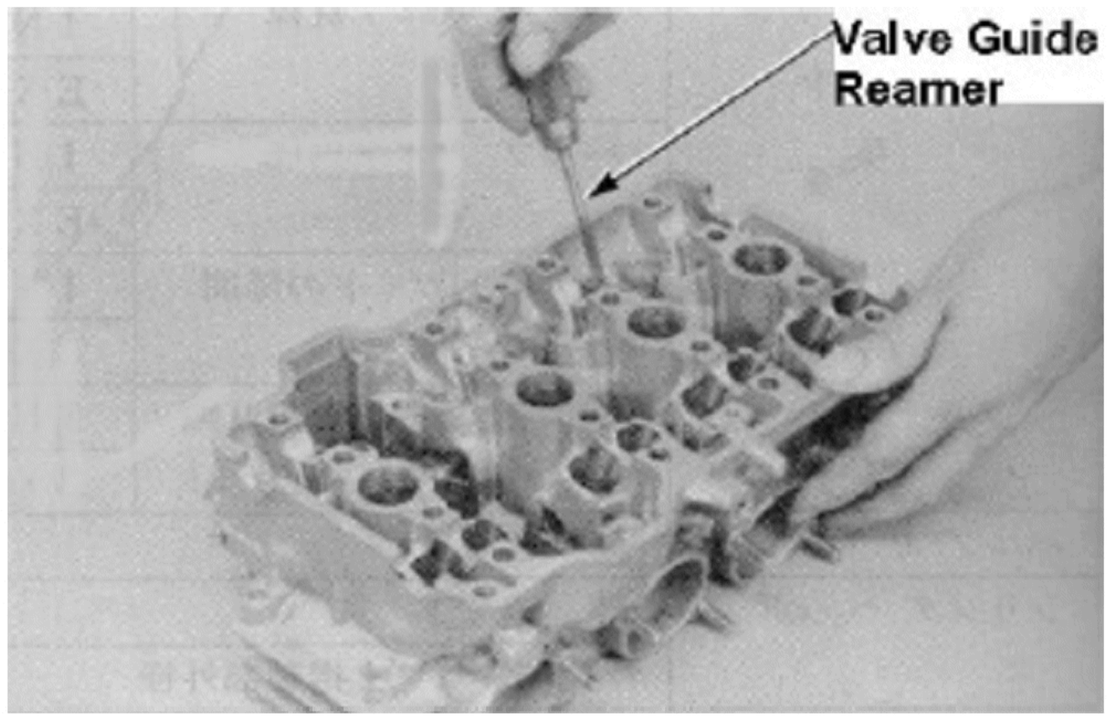
Valve stem and valve guide inspection

Disassemble the cylinder heads (7-6).
Inspect each valve for bent, burn, damage and unequal wear of the stem edges.
Insert the valve to the guide and check the smooth operation.



Measure the stem outer diameter for each valve.

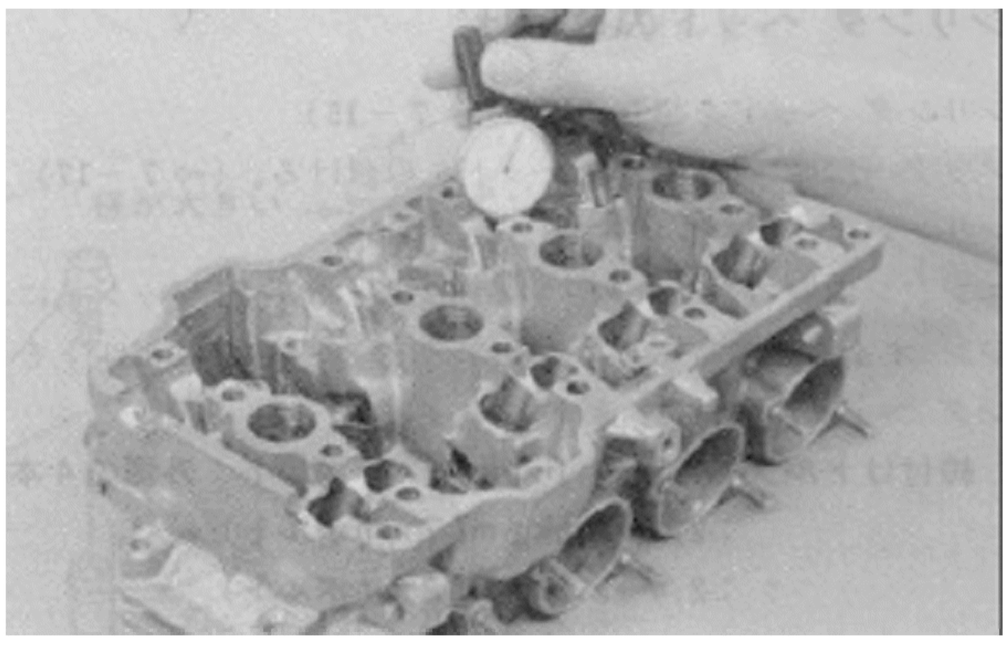
IN: ≦ 3.473mm → Replace
EX: ≦ 3.445mm → Replace



Apply the reamer through guides before the measurements to remove carbons.

Exc. tools Valve guide reamer
07HMH – KT70100

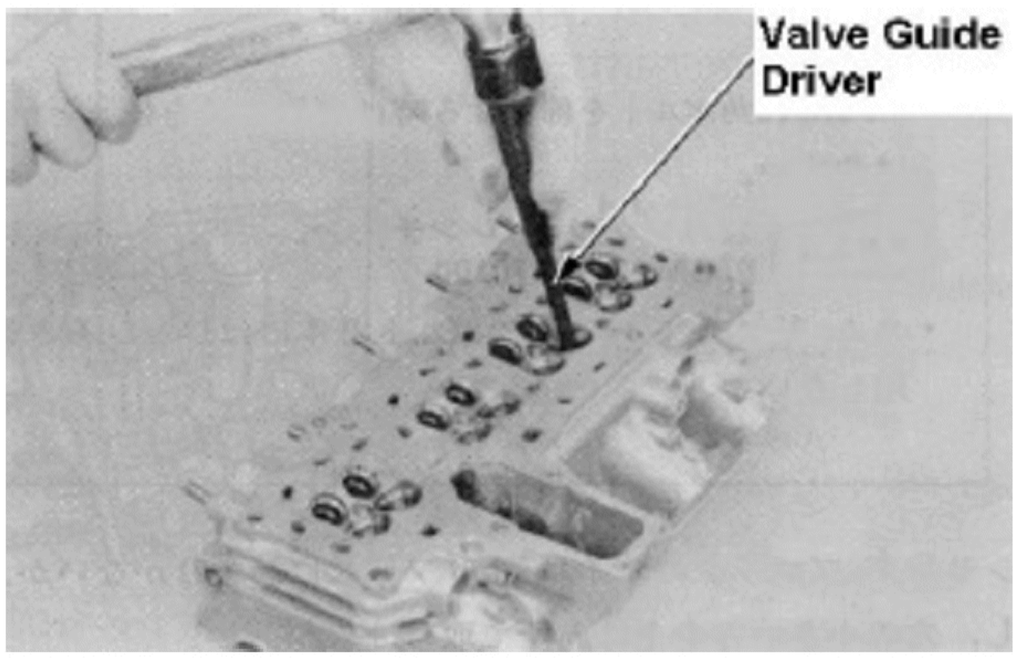
Measure inner diameter of each guide.
≧ 3.565mm → Replace
Valve stem guide clearance is the difference between each guides inner diameter and corresponding valve stem outside diameter.
Valve stem guide clearance:
IN: ≧ 0.092mm → Replace
EX: ≧ 0.132mm → Replace



Calculate the clearance before replacing with a new guide. If the calculated valve falls within the limits, replace the guide.

If the clearance will be out of the limits even replacing with new guides, replace the valve as well.

- When the guide is replaced, adjust the valve seat (7-10).
- Use 07HMH-KT70200 cutter holder.



Valve guide replacement

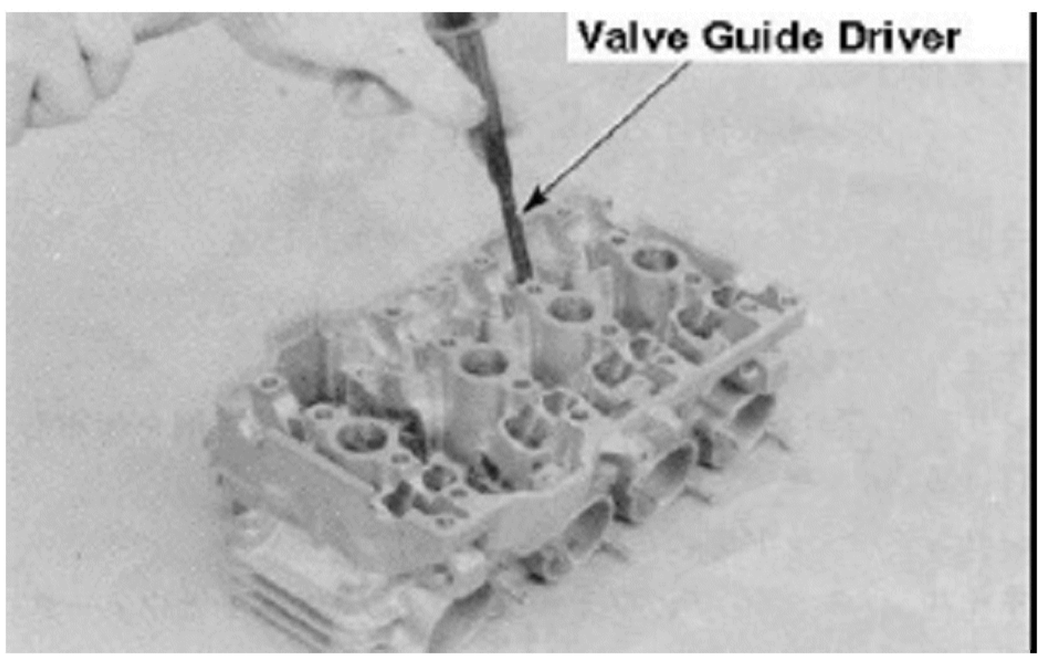
Gradually warm up the cylinder head to 100 - 150°c.

Do not use burners to avoid deformation of the cylinder heads.

Remove the valve guide.

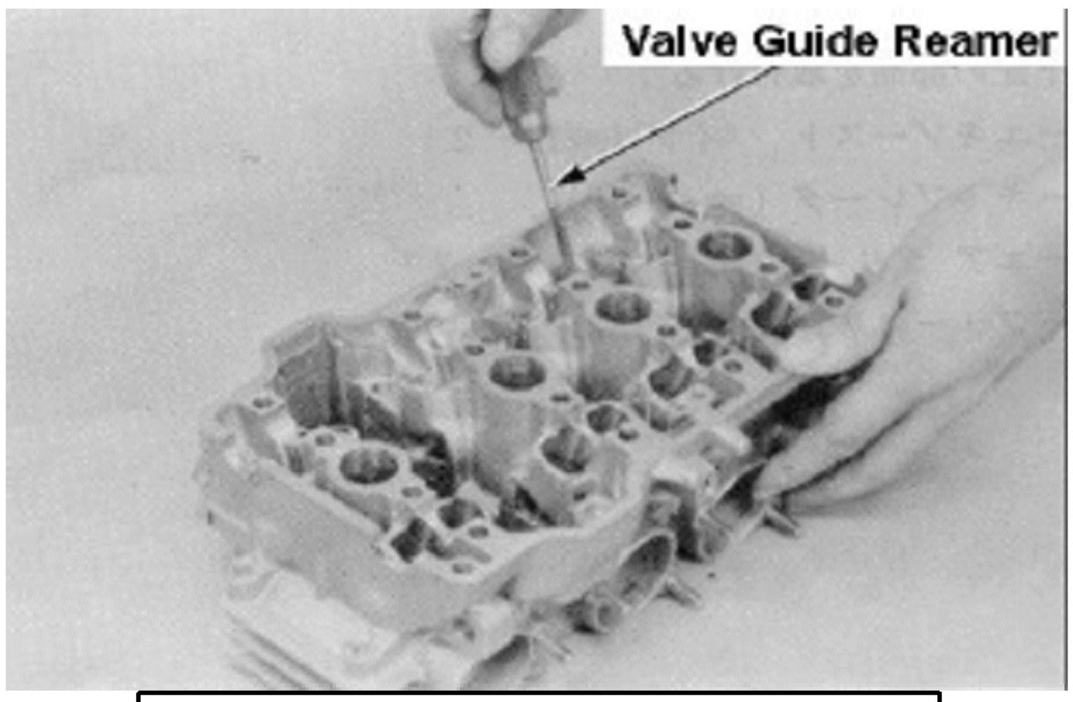
Wear safety gloves.

Exercise caution not to damage the cylinder head.



Exc. Tool Valve guide driver
07HMD – KT70100
Install oversized valve guide.

Wear safety gloves.



Exc Tool Valve guide driver
07HMD – KT70100
After installing, finish the valve guide with a reamer.
Exc Tool Valve guide driver
07HMD – KT70100

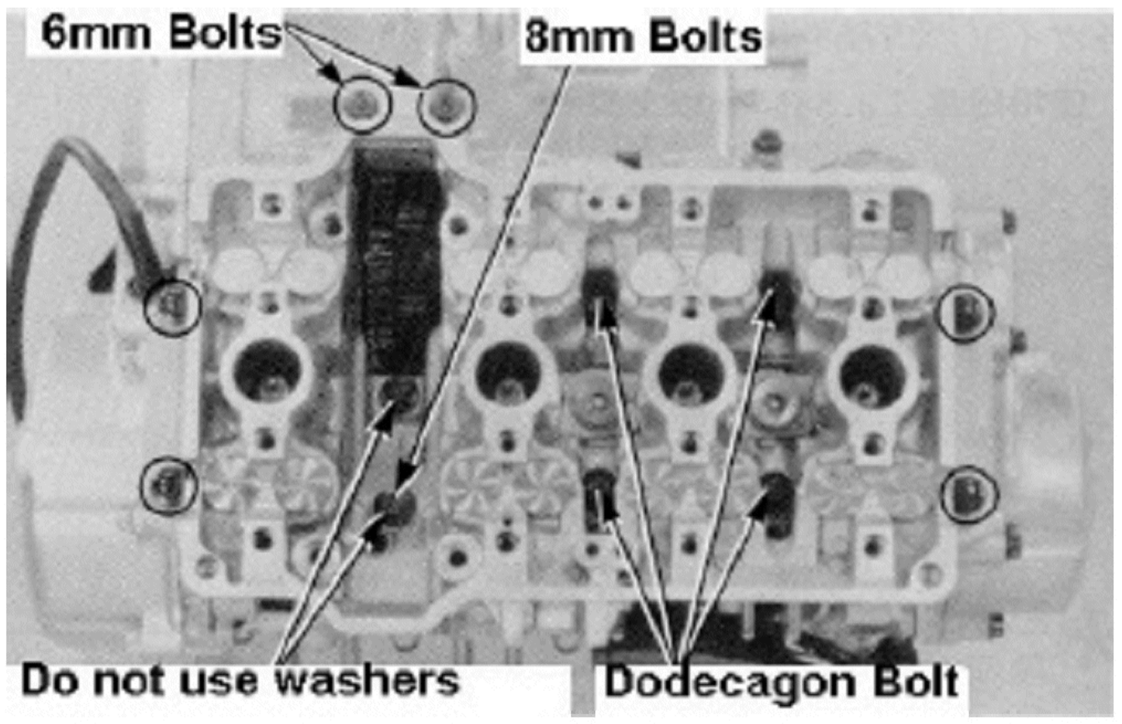
Use proper lubrication for reaming.

Wash the cylinder head to remove debris. Inspect /adjust the valve seat contact (7-10).

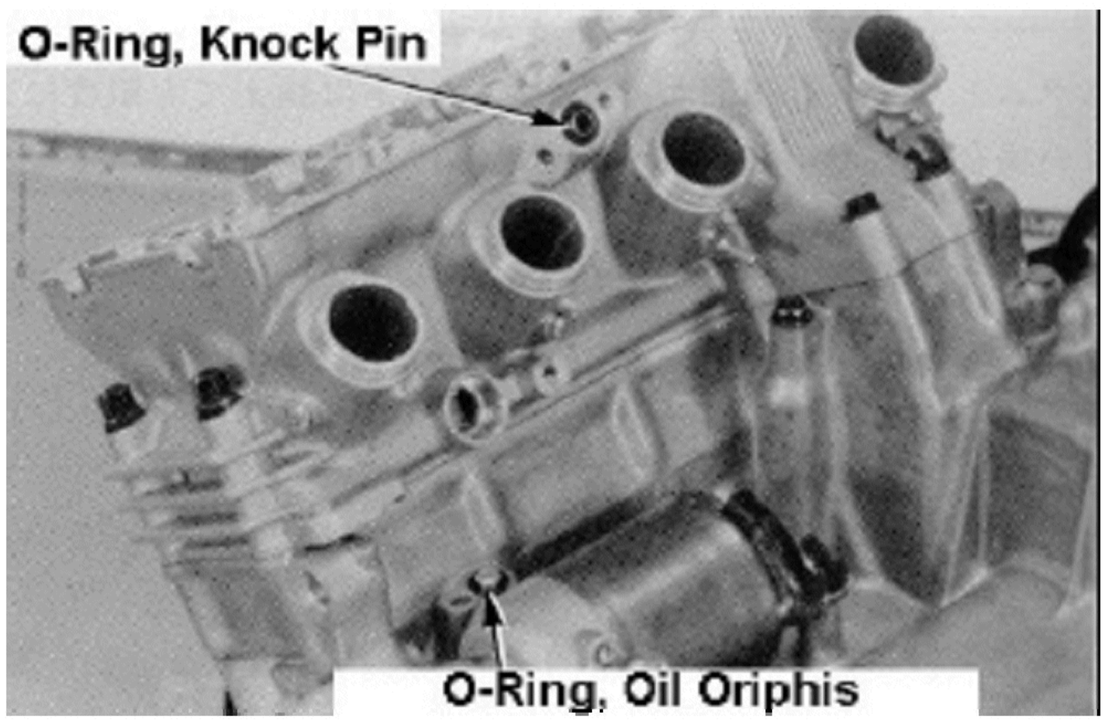
Use a cutter holder 07HMH-KT70200

Cylinder head attachment
Assemble the cylinder heads (7-15).
Attach knock pins, new gaskets (7-17).
Attach the cylinder heads.
Apply engine oil to the cylinder head attachment bolts and washers inside the engine. Set the bolts to the cylinder heads and tighten.

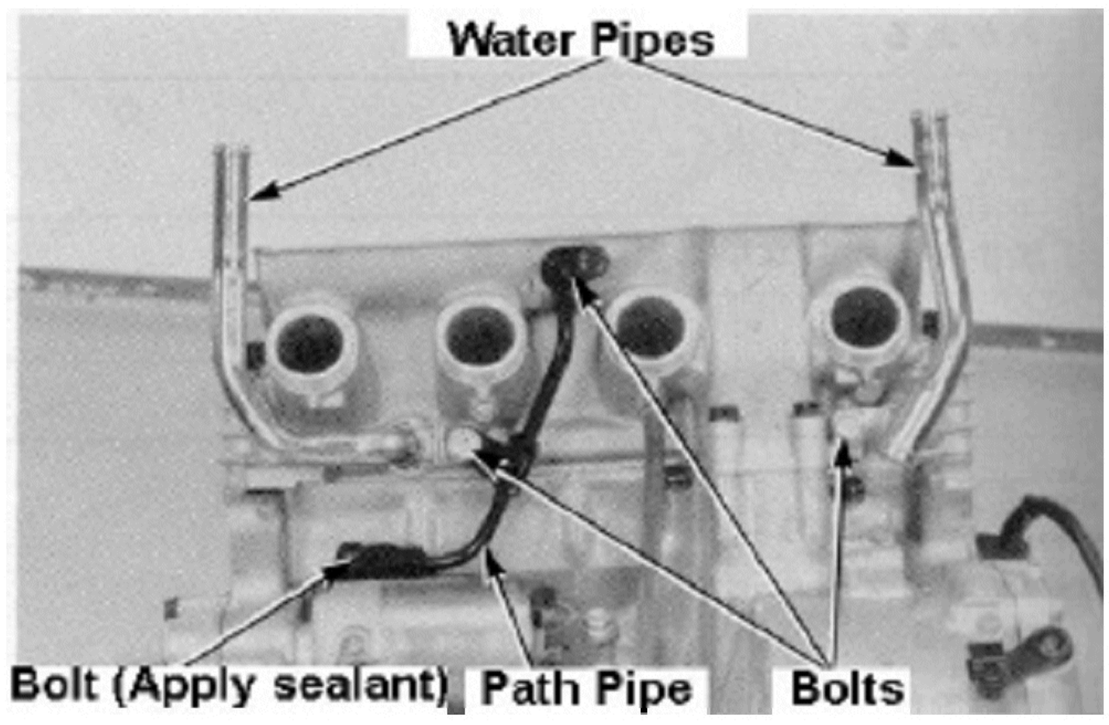
Torque: 1.7 ~ 2.1kg-m (7mm bolts: four on outside).
2.2 ~ 2.5kg-m (7mm bolts)
2.3 ~ 2.7kg-m (8mm bolts)



- Tighten the bolts from inner side towards outer side on opposite corners by repeating 2 ~ 3 times.
- Use of an exclusive tool is recommended to tighten dodecagon bolts.
- Exc. Bolt Tool – dodecagon socket wrench 07GMA-KT70100
- Do not use washer for two bolts underneath the cam gear train.



Inspect the oil orifice on the cylinder block for blockage and attach with the smaller hole facing upwards.
Apply engine oil to the new O-Ring and attach it.
Apply engine oil to the new O-Ring and attach it to the cylinder head.
Attach the knock pin.
Attach the new O-Ring to the water pipe.
Connect water pipes to the cylinder head.
Connect the oil path pipe.
Apply sealant to bolts on the cylinder block side and tighten the bolts.
Tighten the bolts on the cylinder head side.
Tighten the oil path pipe / water pipe bolts and water pipe bolts.

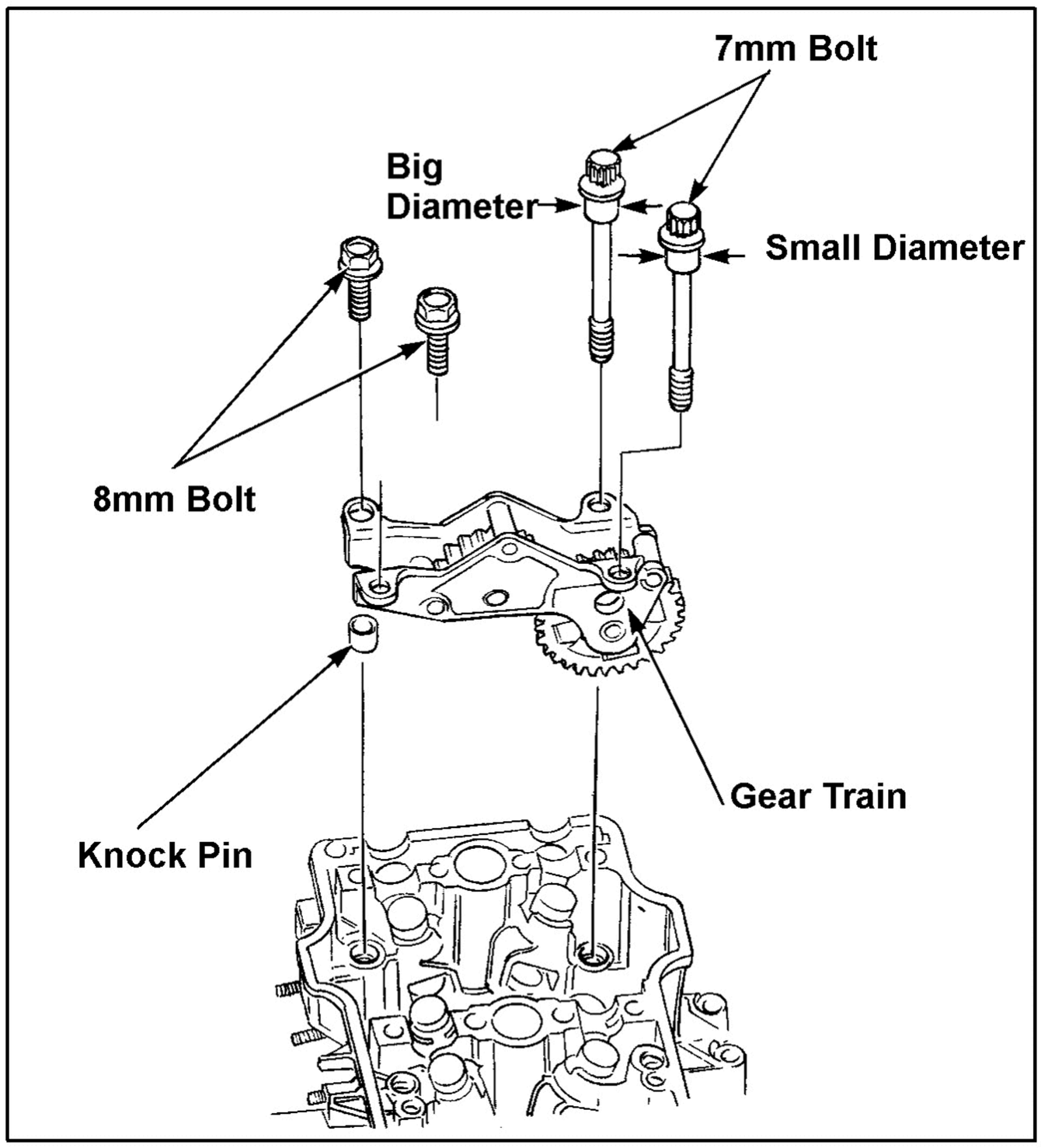


Attach the following parts:
- Exhaust pipe (16-2)
- Carburetor (4-18)
- Air cleaner case (4-7)
- Fuel tank (21-12)

Cam gear train attachment

Attach the knock pin to a cylinder head.

There are two different types of 7mm bolts.



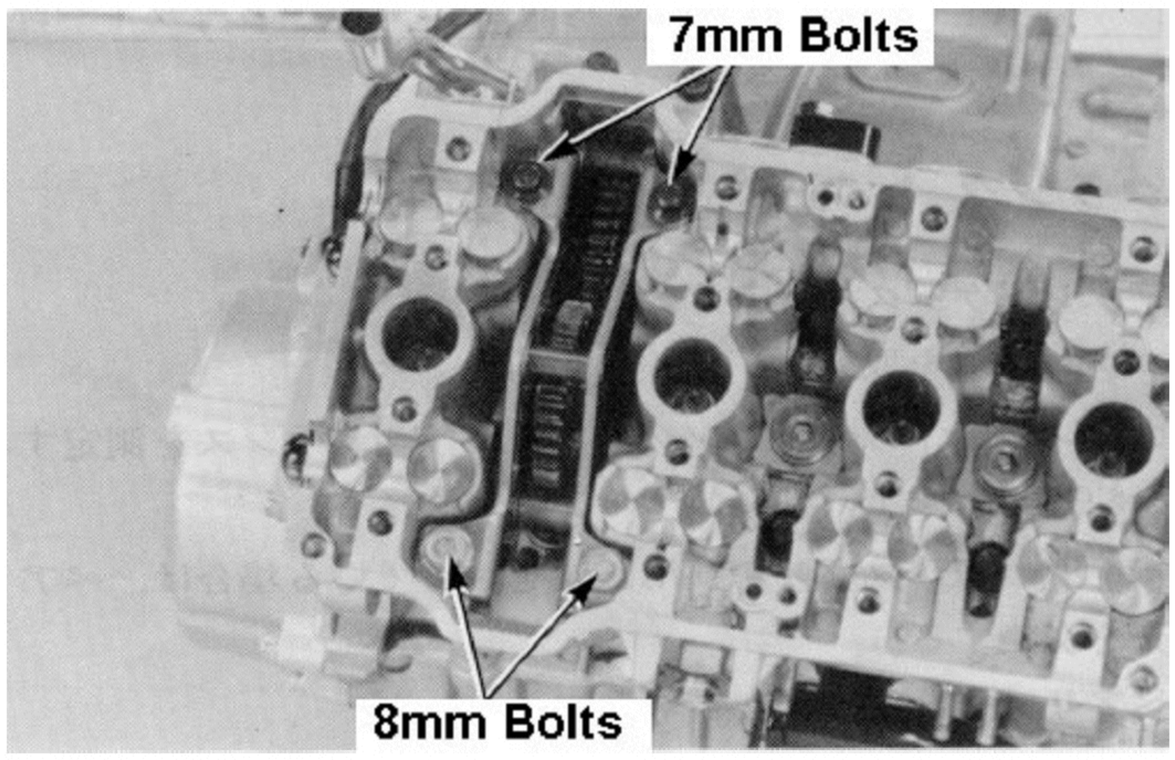
Attach the cam gear train and tighten the bolts.

Torque:	8mm bolts:	1.8 ~ 2.2kg-m
	7mm bolts:	2.2 ~ 2.5kg-m

Attach the camshaft (7-19)

Attach the cylinder head cover (7-21)

Attach the lower cowling (21-23)



Cylinder, piston and crankshaft

Service information

Standard **Thick lined cells differ from CBR250 four.**

Item			Standard	Limit
Crankshaft, Conrod	Conrod bigend side clearance		0.05-0.2	0.30
	Crankshaft deflection		-	0.05
	Crank pin oil clearance		0.028-0.046	0.05
	Main journal oil clearance		0.030-0.054	0.06
Cylinder	Inner diameter		48.500-48.510	48.60
	Top surface deformation		-	0.05
	Deflection from true circle		-	0.005
	Deflection from true cylinder		-	0.005
Piston ring	Ring Clearance	Top	0.015-0.050	0.10
		Second	0.015-0.050	0.10
	Ring slit Gap	Top	0.1-0.25	0.45
		Second	0.1-0.3	0.50
		Oil (side rail)	0.2-0.8	1.00
Piston	Piston outside diameter		48.47-48.49	48.35
	Piston / cylinder clearance		0.01-0.04	0.10
	Piston pin hole diameter		13.002-13.008	13.02
	Piston pin outside diameter		12.994-13.000	12.98
	Piston / piston pin clearance		0.002-0.014	0.04
	Conrod smaller edge inner diameter		13.016-13.034	13.05
	Piston pin / conrod clearance		0.016-0.040	0.06

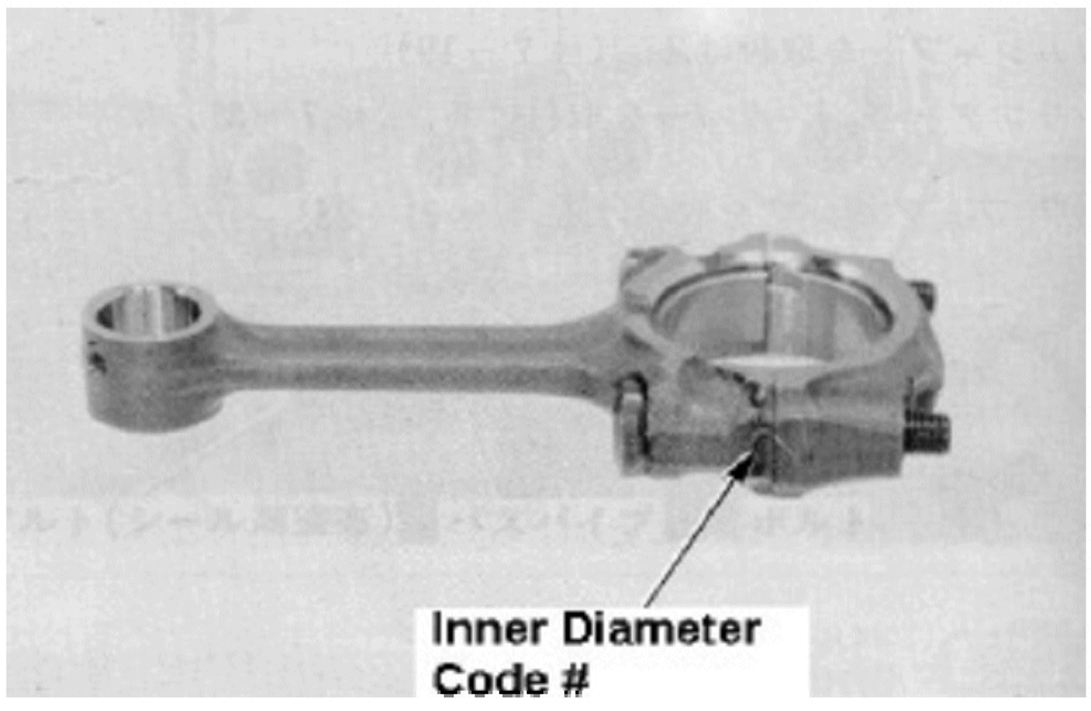
Crank pin bearing selection

Separate the crankcase (8-2).

Remove the conrod (9-3).

Measure the oil clearance of the crank pin bearing (9-6).

If the oil clearance is beyond the limit, replace the bearing.



Select the bearing in accordance with the following procedure.

Record the conrod inner diameter code #.

I, II or III on the conrod is the code #.

Record the outside diameter code # of the crankpins, or measure the outside diameter.

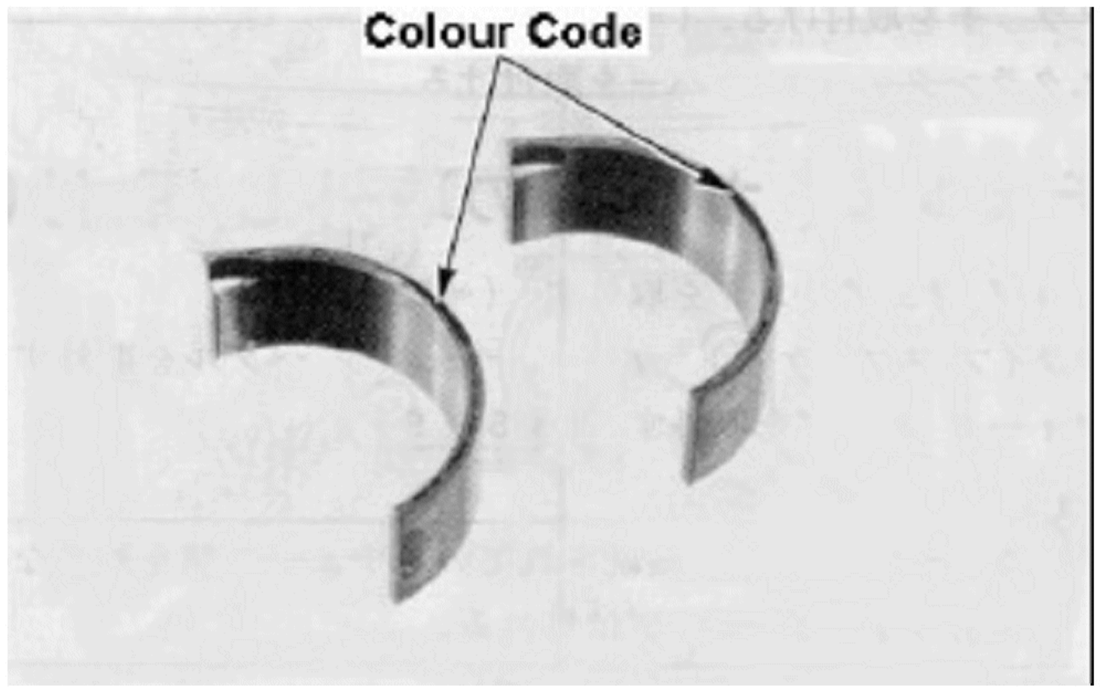
A, B or C on crank weights are the codes of the crankpins.

Find out the bearing colour from crankpin and conrod codes.

		1	2	3
		30.000 ~ 30.005mm	30.006 ~ 30.011mm	30.012 ~ 30.018mm
A	26.994 ~ 27.000mm	E (Yellow)	D (Green)	C (Brown)
B	26.988 ~ 26.993mm	D (Green)	C (Brown)	B (Black)
C	29.982 ~ 26.987mm	C (Brown)	B (Black)	A (Blue)

Bearing metal thickness:

A (Blue)	1.499 ~ 1.502
B (Black)	1.496 ~ 1.498
C (Brown)	1.493 ~ 1.495
D (Green)	1.490 ~ 1.492
E (Yellow)	1.487 ~ 1.489



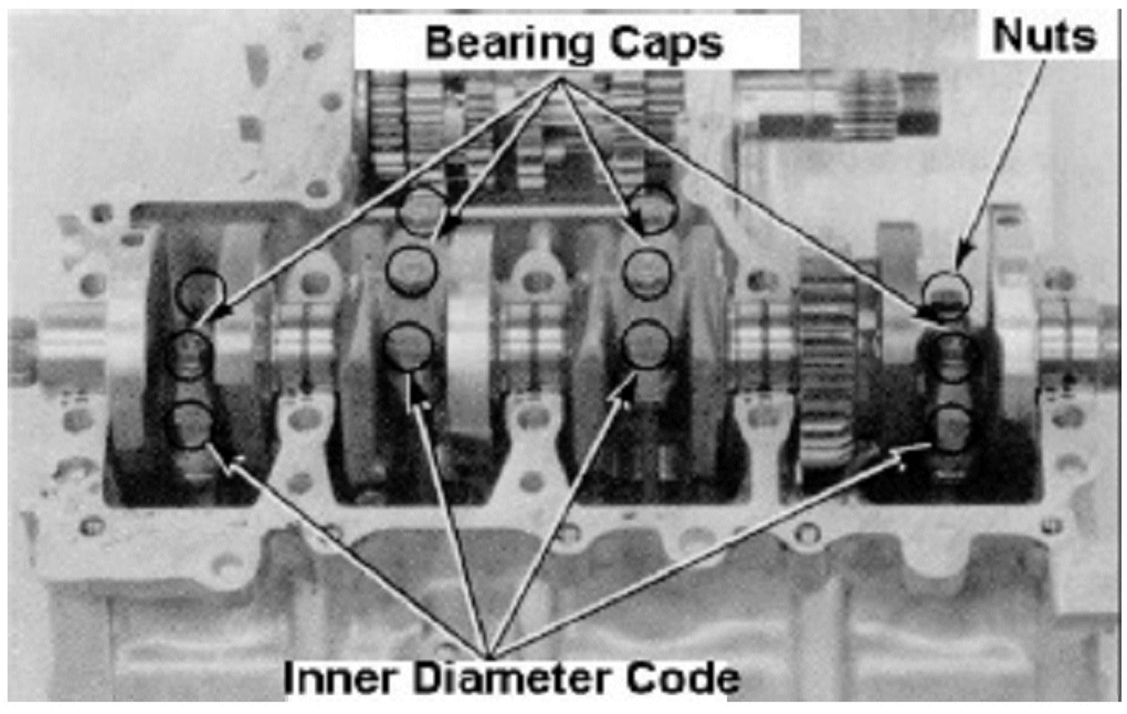
Piston, conrod and crankshaft installation

Install pistons and conrods (9-10).
Install the crankshaft (9-11).

Attach conrod bearing caps.

- Attach the cap to the same position it was detached.
- Inner diameter codes should face towards exhaust.

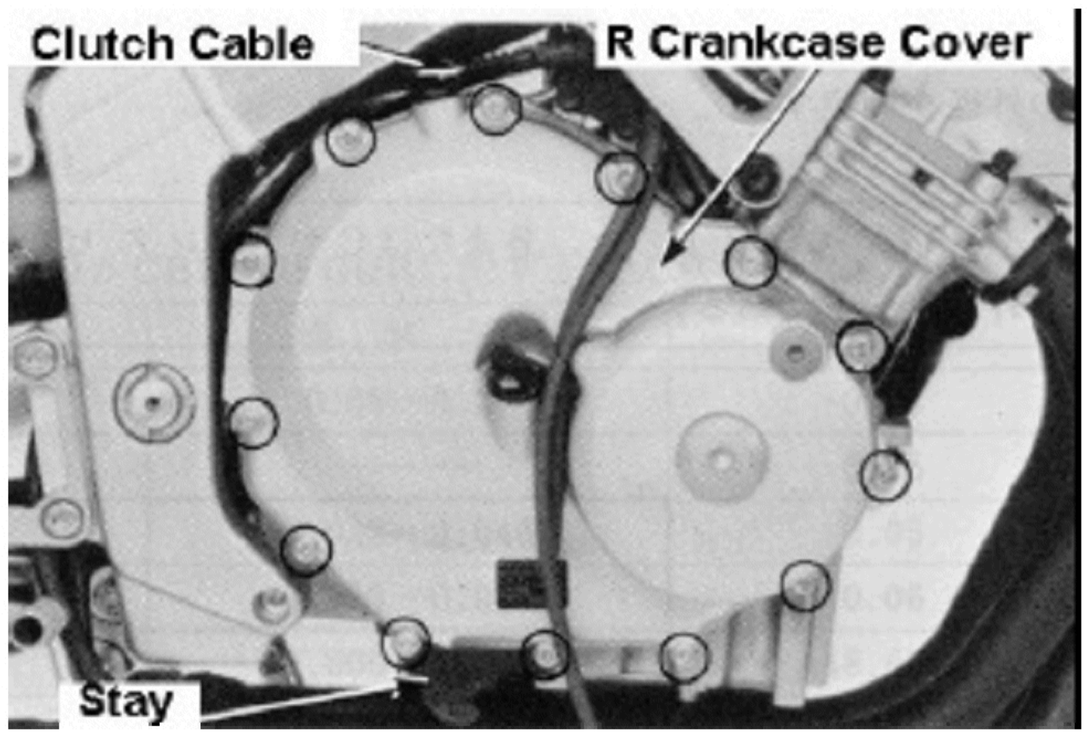
Tighten cap nuts (9-12).



Clutch

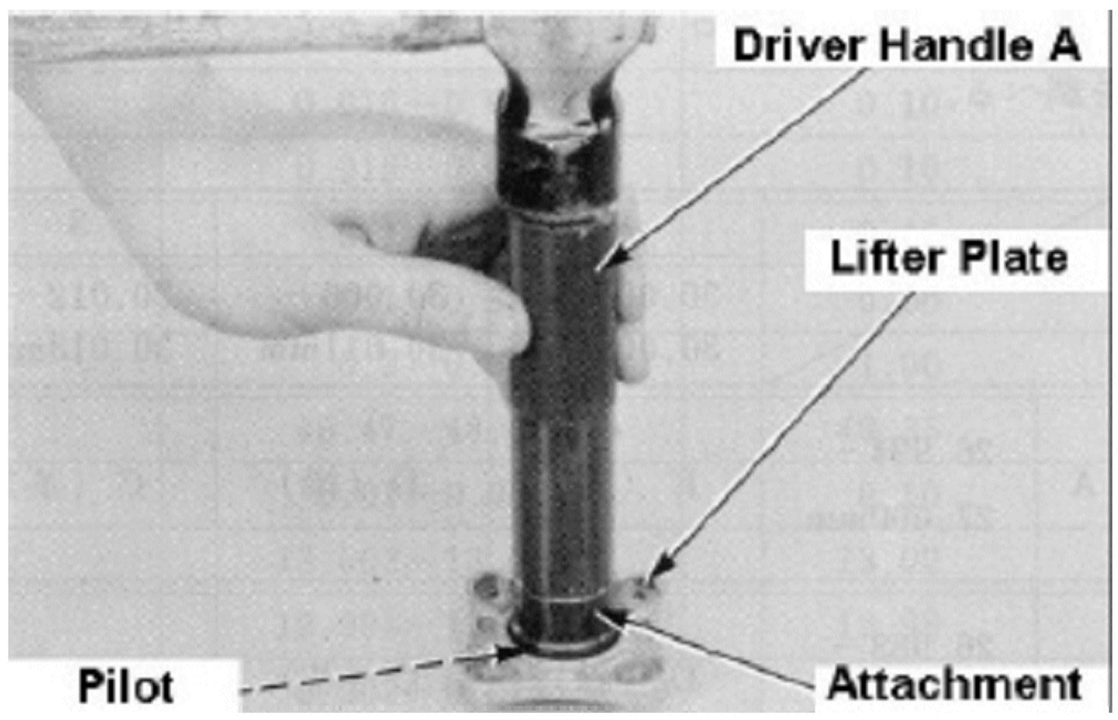
Right crankcase cover detachment / attachment

Drain engine oil (2-16).
Remove the left side cover.
Remove the regulate / rectifier.
Loosen the clutch cable, adjust nut and lock nut to disconnect the clutch cable.
Remove right crankcase cover attachment bolts and detach the right crankcase cover and the lower fairing stay.
Reverse the procedure for attachment.



Lifter plate bearing replacement

Disconnect the clutch (10-5).
Inspect the lifter plate bearing (10-7) and replace as required.
Detach the bearing.
Attach the new bearing to the lifter plate, facing marked surface outwards.



Exc. tool	Driver attachment (28 x 30mm) 07946 – 1870100

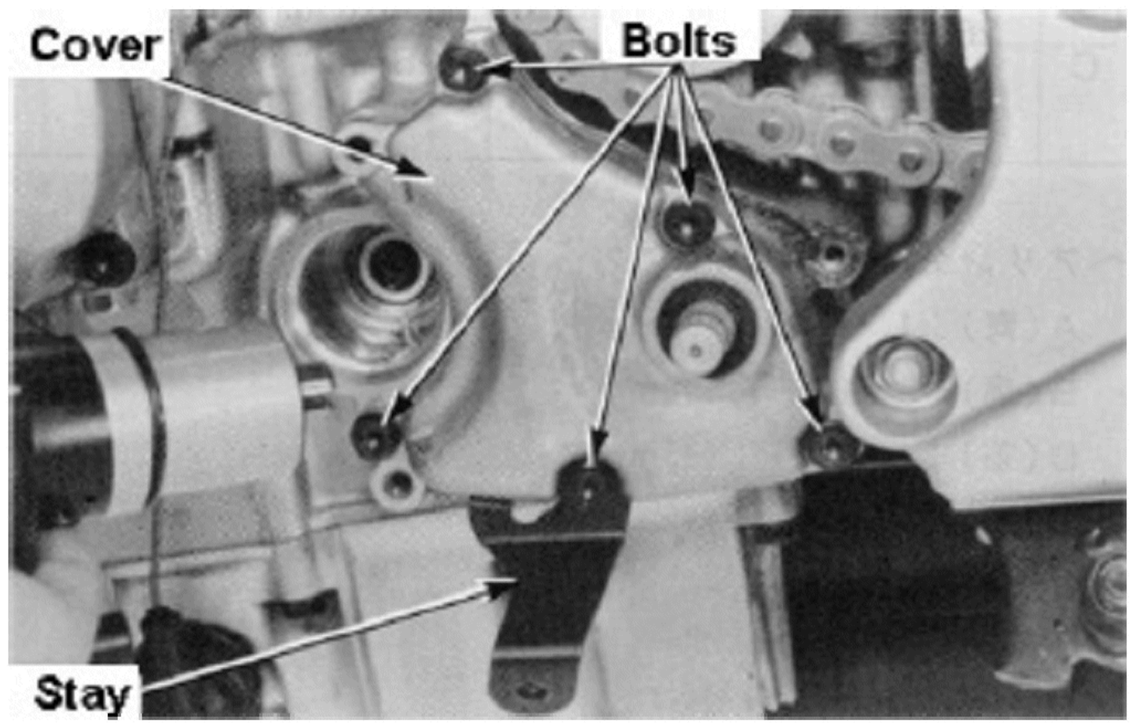
Common tools	Pilot (12mm)	07746-0040200
	Driver handle A	07749-0010000

Attach the clutch (10-10).
Attach the right crankcase cover.

Change cover attachment / detachment

Detach the left lower fairing (21-21).
Remove the drive sprocket cover and the change pedal.
Disconnect water pump (5-9).

> The water pump can be disconnected without disconnecting the tubes.



Remove five change cover attachment bolts.
By pushing the shift spindle in, detach the change cover and the lower fairing stay.
Remove the gasket and the knock pin.
Reverse the procedure for attachment.

Front wheel, Suspension and Steering

Service information

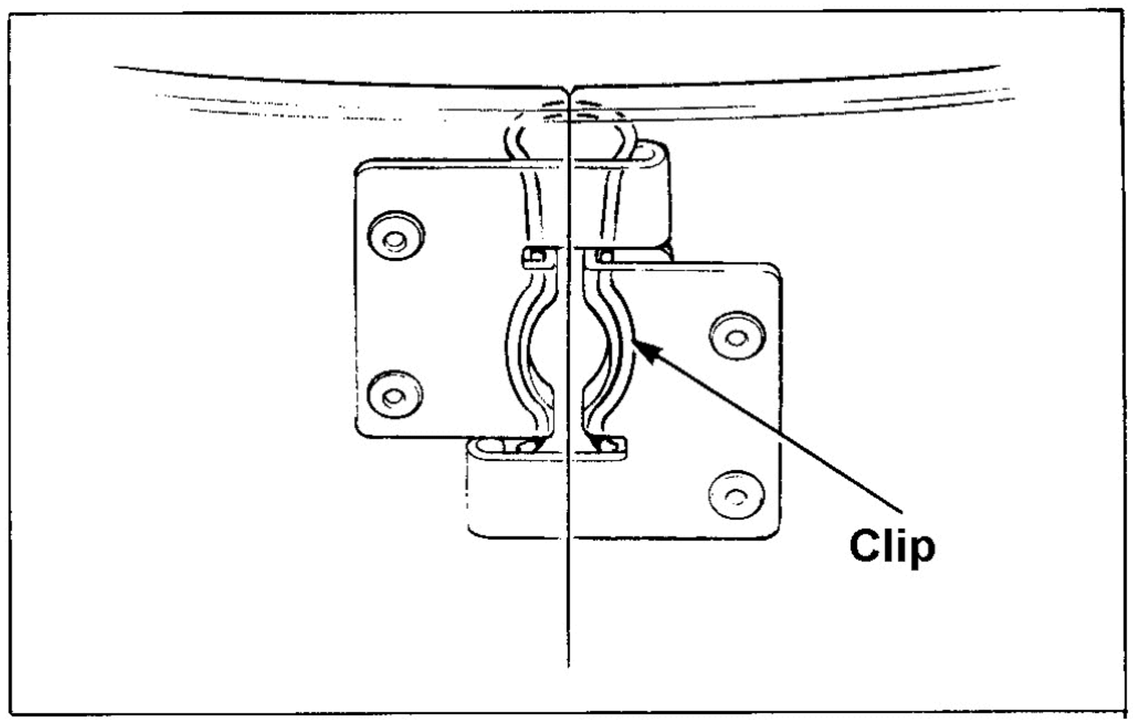
Standard **Thick lined cells differ from CBR250 four.**

Item		Standard	Limitation
Front axle bent		-	0.2mm
Front wheel rim deflection	Radial	-	2.0mm
	Sideways	-	2.0mm
Front cushion spring relaxed length		396.6mm	388mm
Front fork pipe bent		-	0.2mm
Front fork oil capacity	Standard	302 ± 2.5cc	-
	Fully compressed	100mm	-

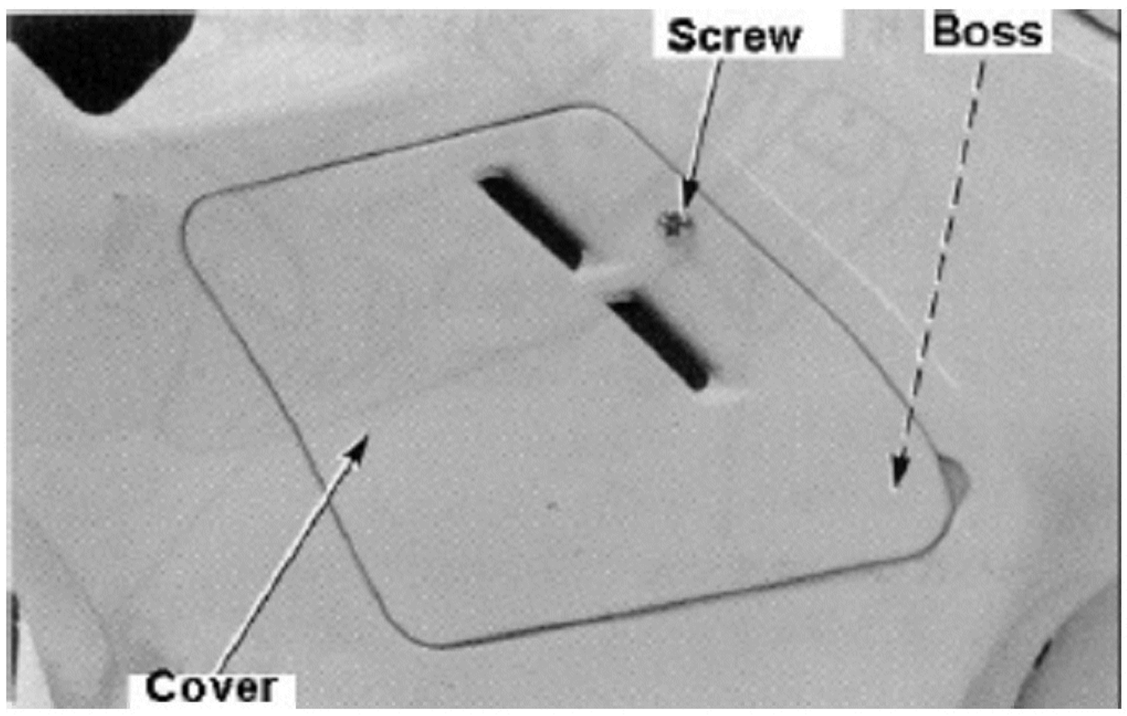
Fairing

Detachment

Disconnect the spring clip on the lower fairing.

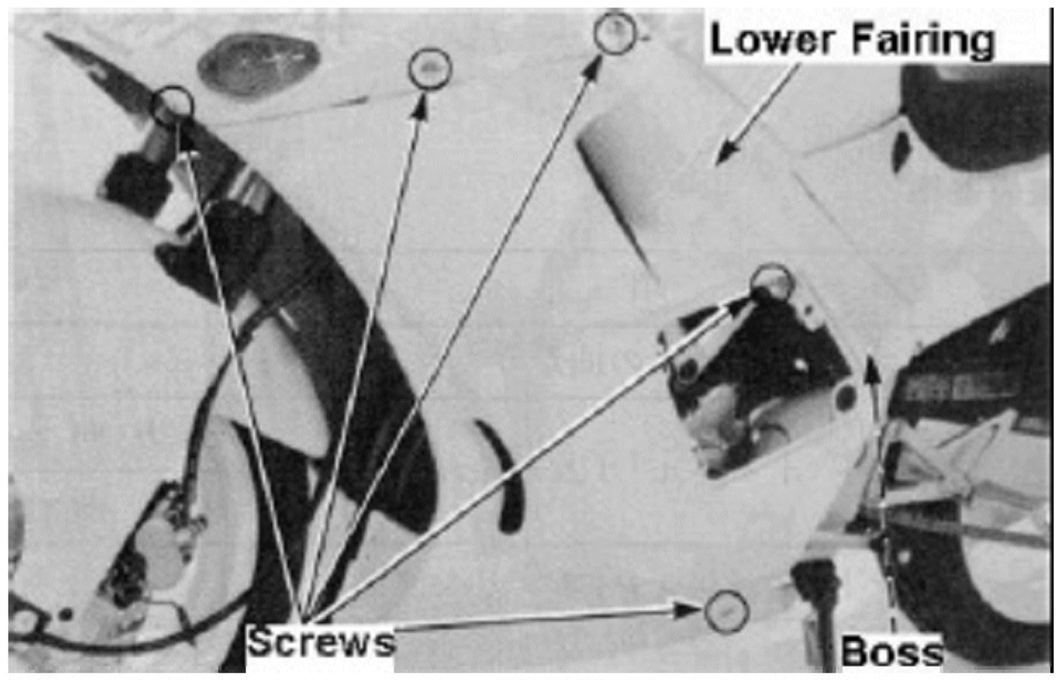


Remove the quick screw and detach the boss of the maintenance cover from the lower fairing grommet and detach the maintenance cover.

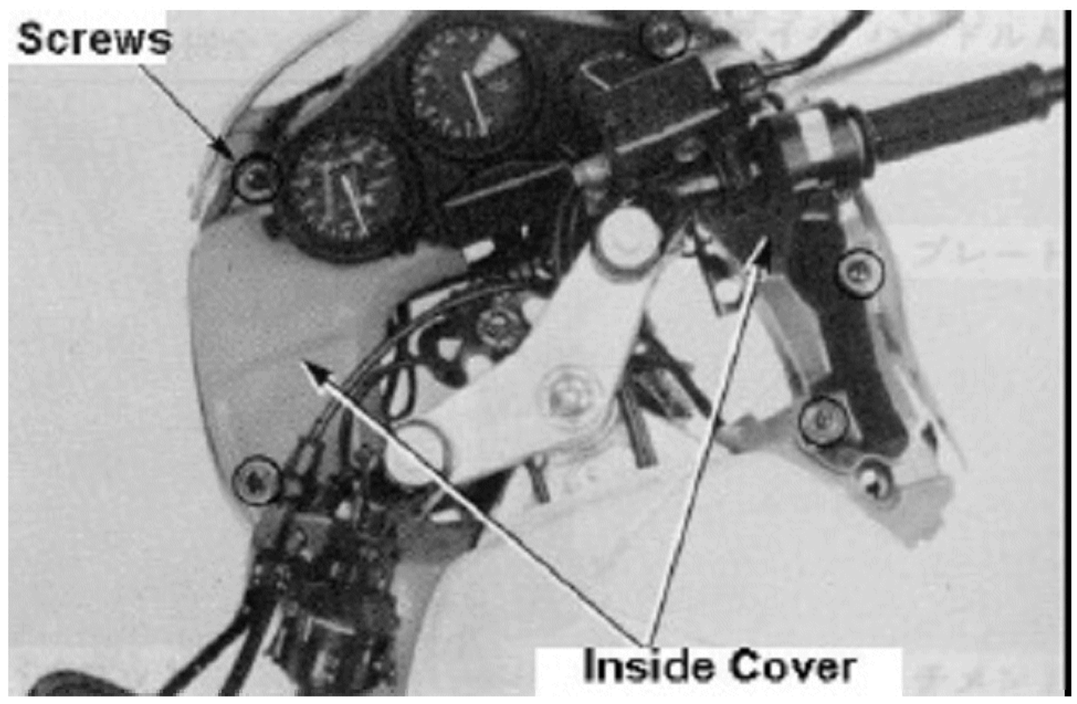


Remove screws

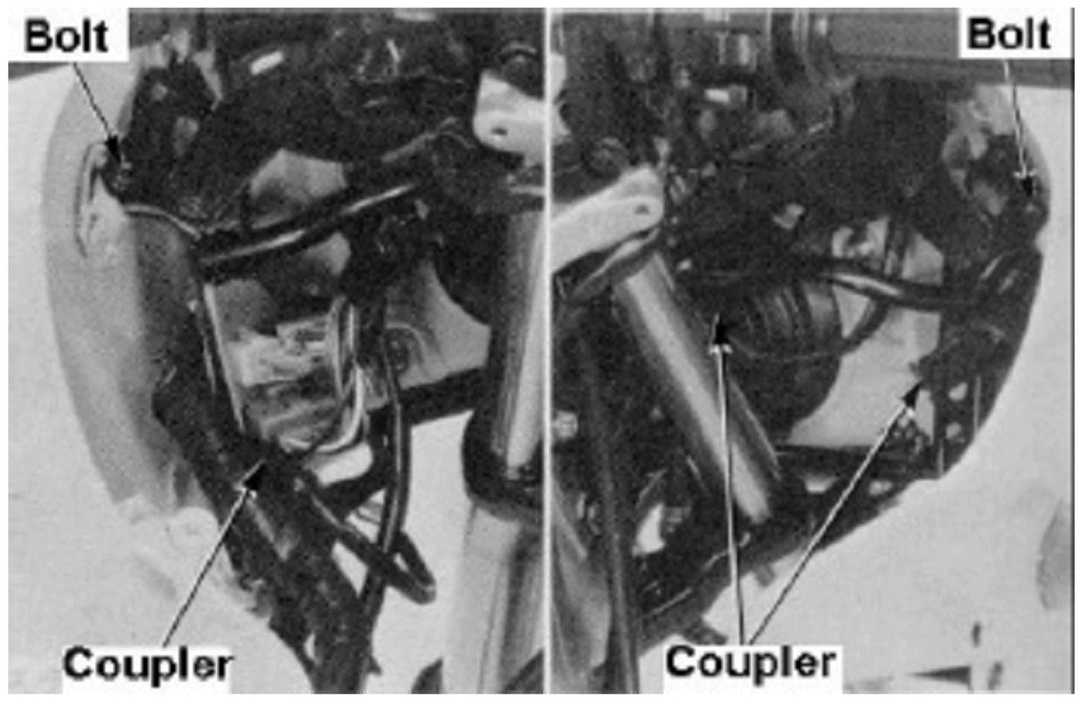
Detach the lower fairing boss from the frame grommet and detach the lower fairing.



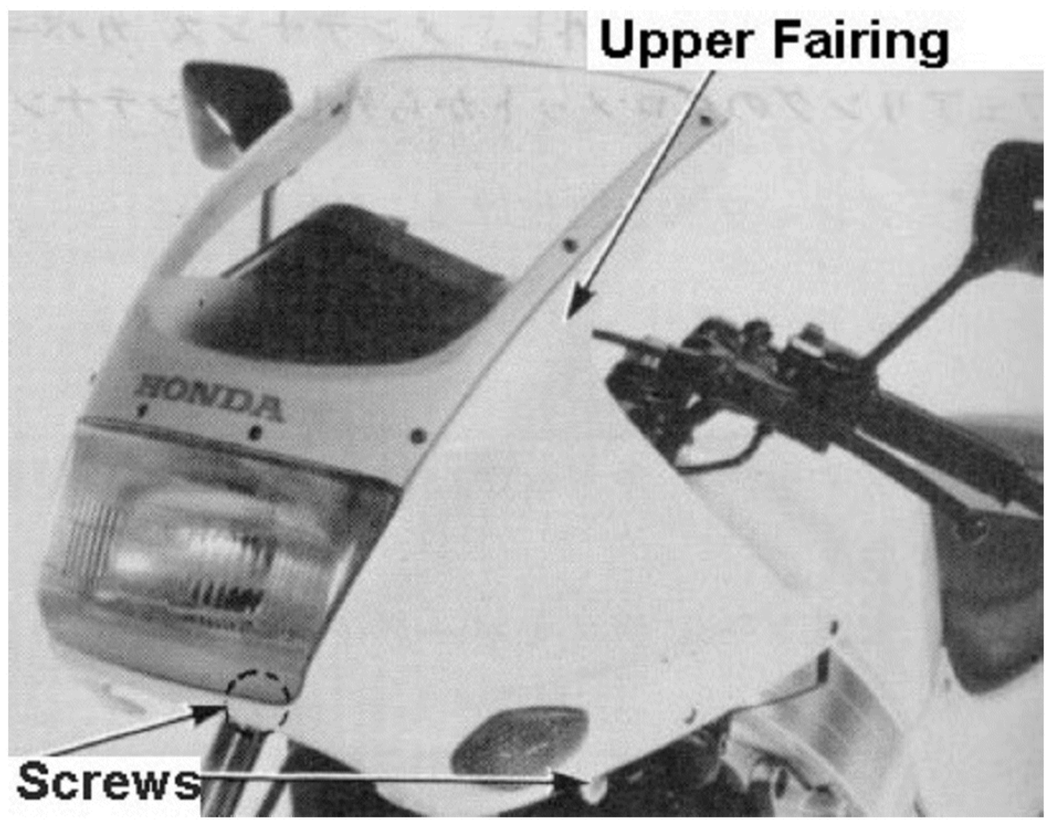
Remove screws and detach the upper fairing inside cover.



Disconnect the turn signal coupler.
Disconnect the head coupler.
Remove two bolts.



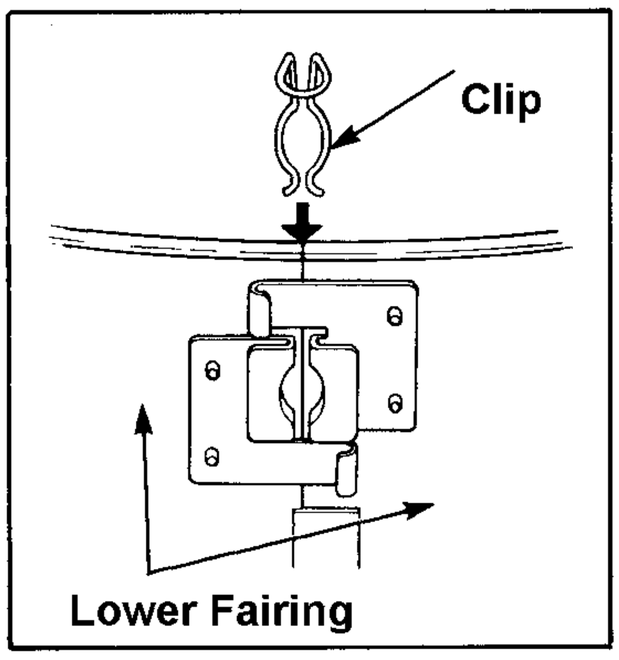
Remove two screws and detach the upper fairing.

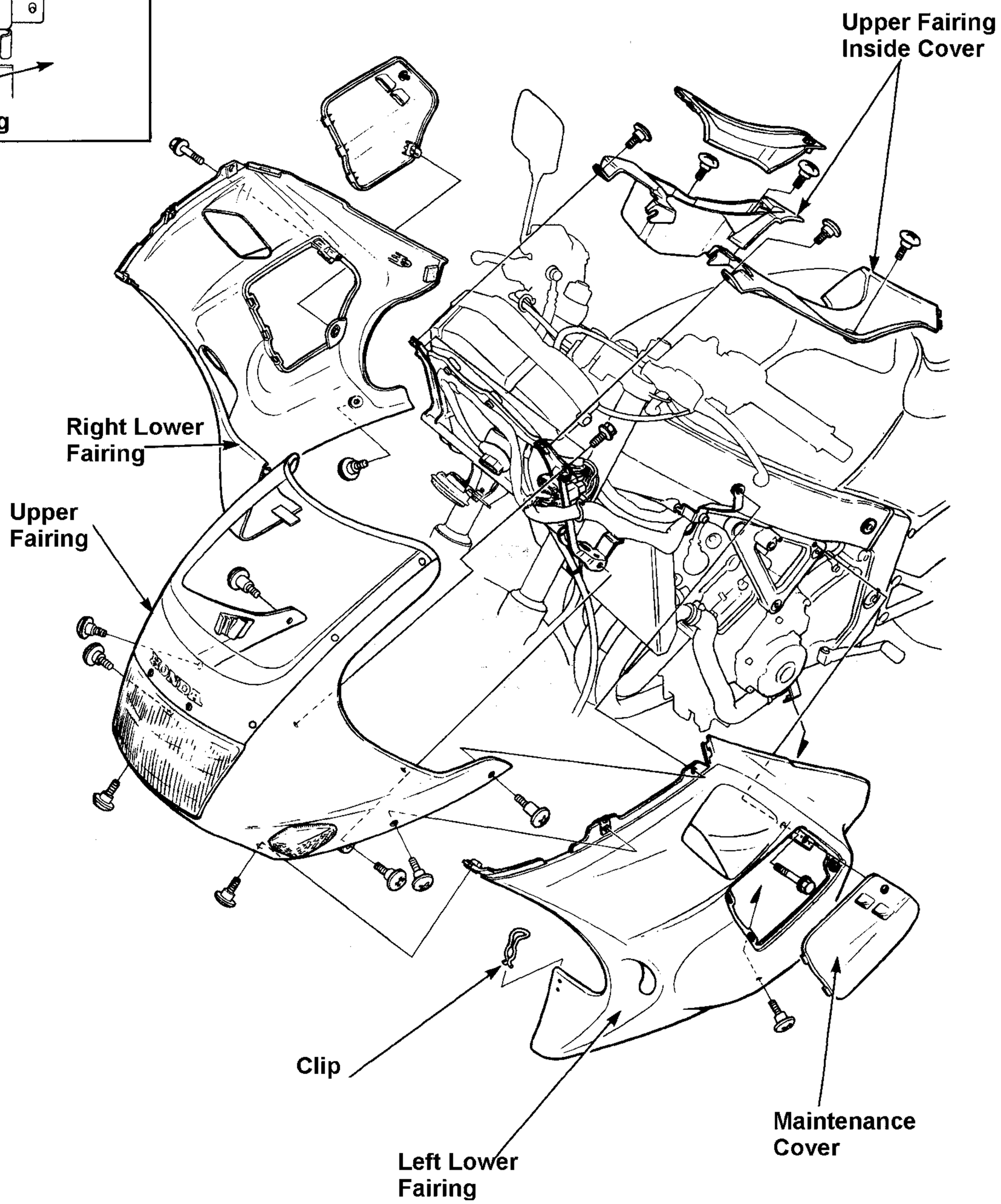


Attachment

Reverse the detachment procedure.

Set the spring clip as shown in the figure below.





Rear Wheel and Suspension
Service information

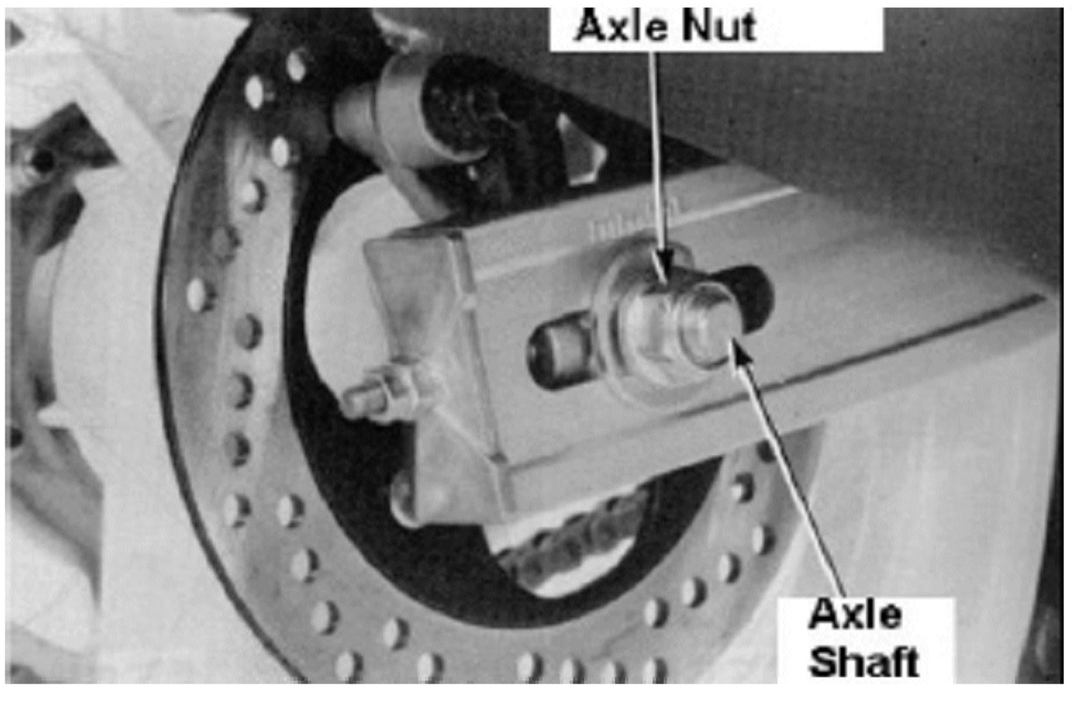
Standard **Thick lined cells differ from CBR250 four.**

Item		Standard	Limitation
Rear axle bent		-	0.2mm
Rear wheel rim deflection	Radial	-	2.0mm
	Sideways	-	2.0mm
Rear cushion damper compression		30.8 – 36.8kg	24.6kg
Rear cushion spring attachment length (spring adjuster set to second)		166.9mm	-
Rear cushion spring relaxed length		178.8mm	175.0mm

Rear wheel

Detachment / attachment

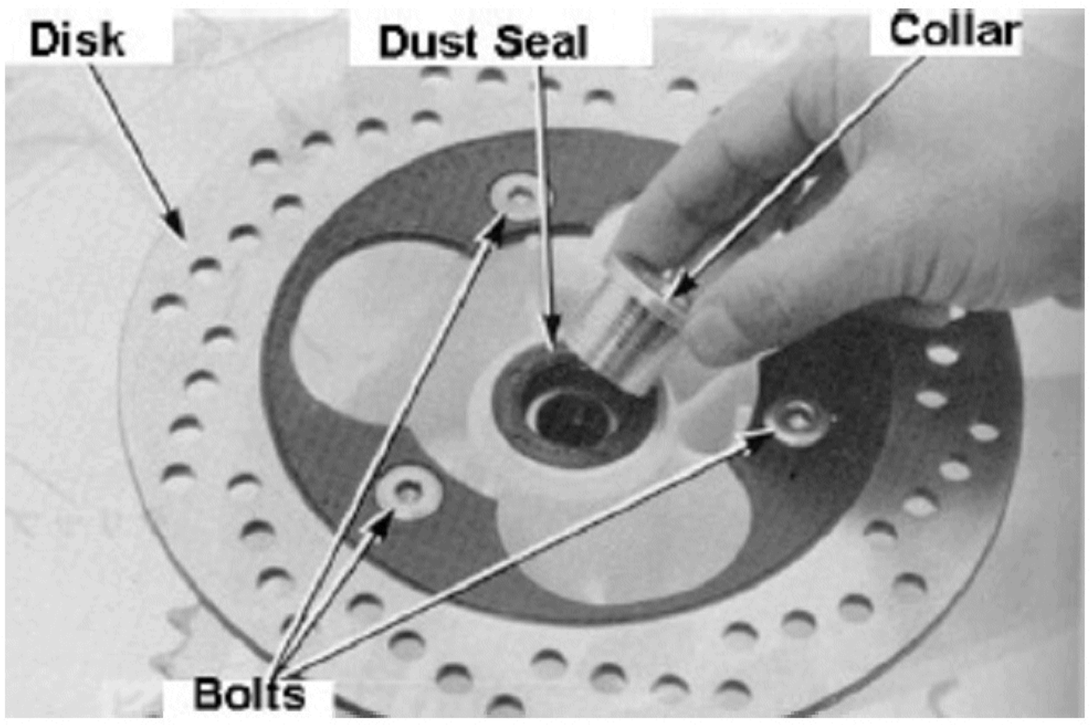
Support the frame and lift the rear wheel off the surface.
Remove the axle nut and remove the axle shaft.
Detach the rear wheel.
Reverse the procedure for attachment.



Exercise caution not to damage brake disk/pads when detaching / attaching the wheel.

Rear brake disk detachment

Remove the rear wheel.
Detach the right side collar and adjust seal if necessary.
Remove three bolts and detach the rear brake disk.

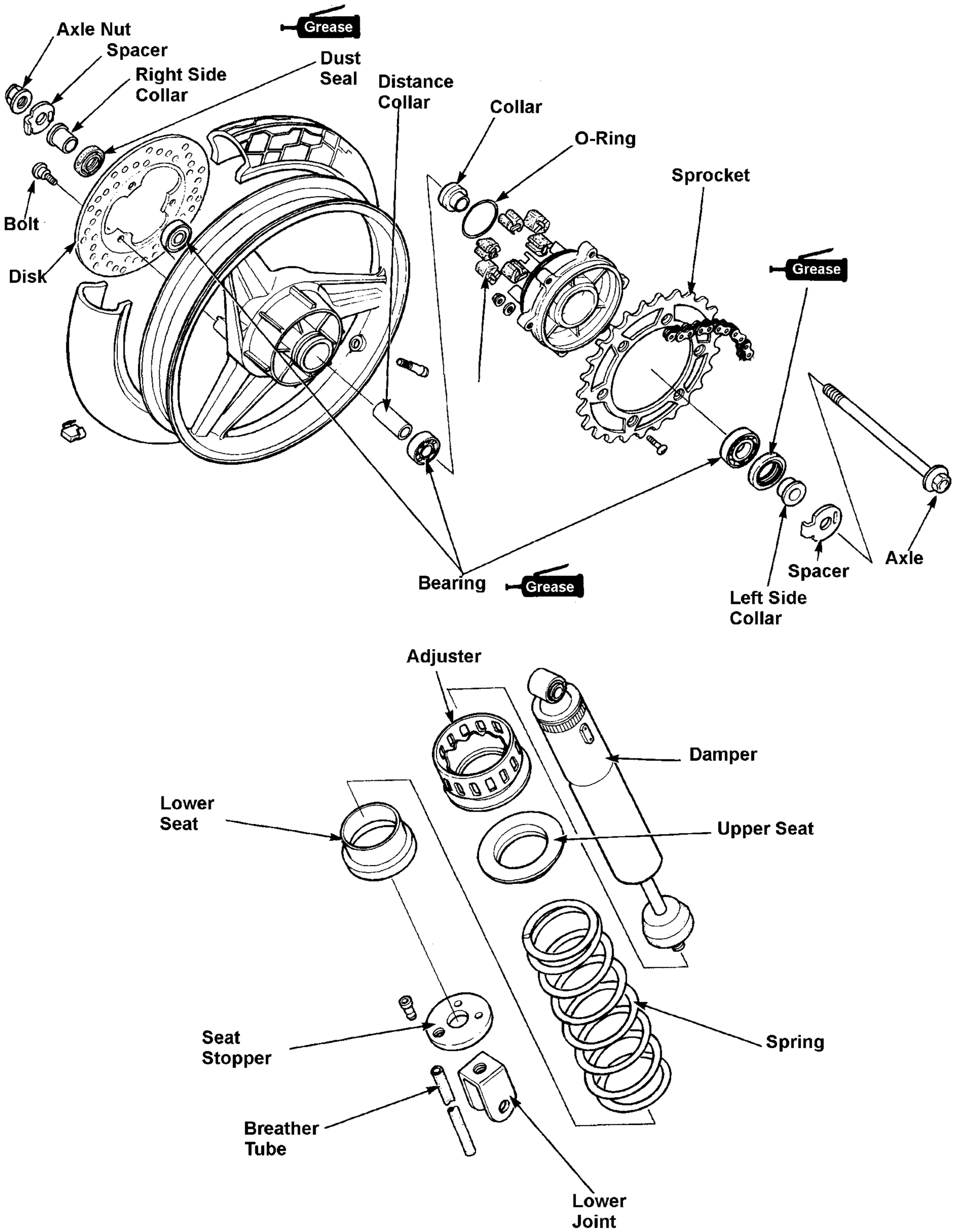


Rear brake disk attachment

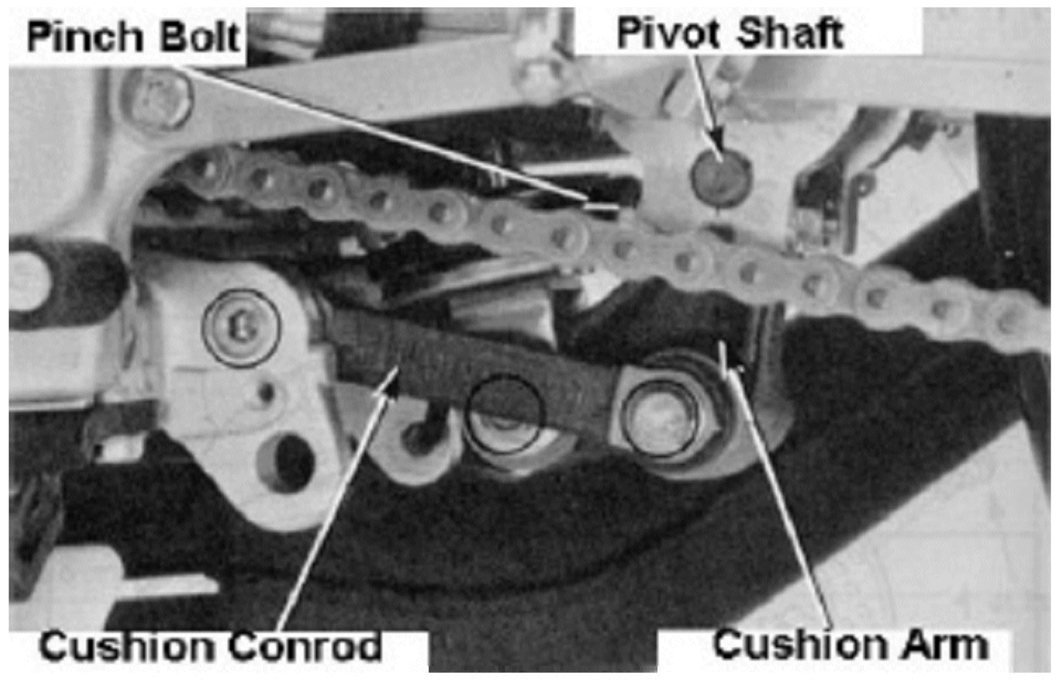
Attach the brake disk and tighten three bolts.
Torque: 3.7 ~ 4.3kg-m

If adjust seal was removed, replace with a new one and attach after applying grease to its lip.
Attach the right side collar.

Rear wheel disassembly

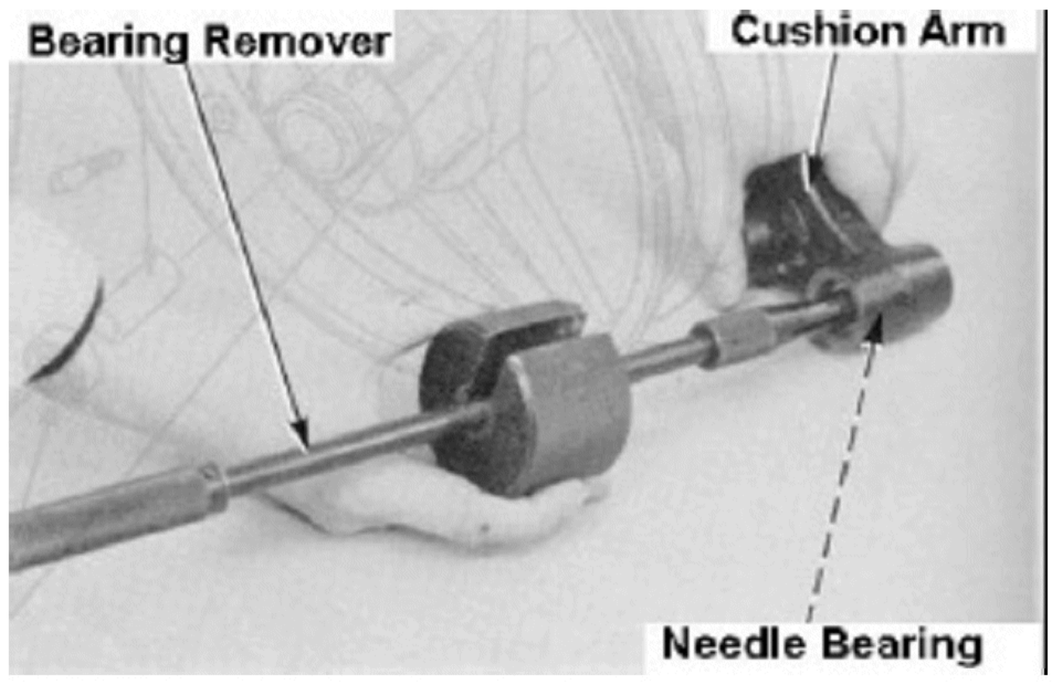


Suspension linkage



Detachment

Remove conrod bolts (frame and cushion sides) and remove the cushion conrod.
Remove the rear cushion lower bolt.
Remove the cushion arm – rear fork pivot pinch bolt.
Remove the pivot shaft and detach the cushion arm.
Cushion arm – rear fork pivot bearing replacement



Remove the dust seal.
Remove the needle bearing by using a bearing remover.

Exc. tools

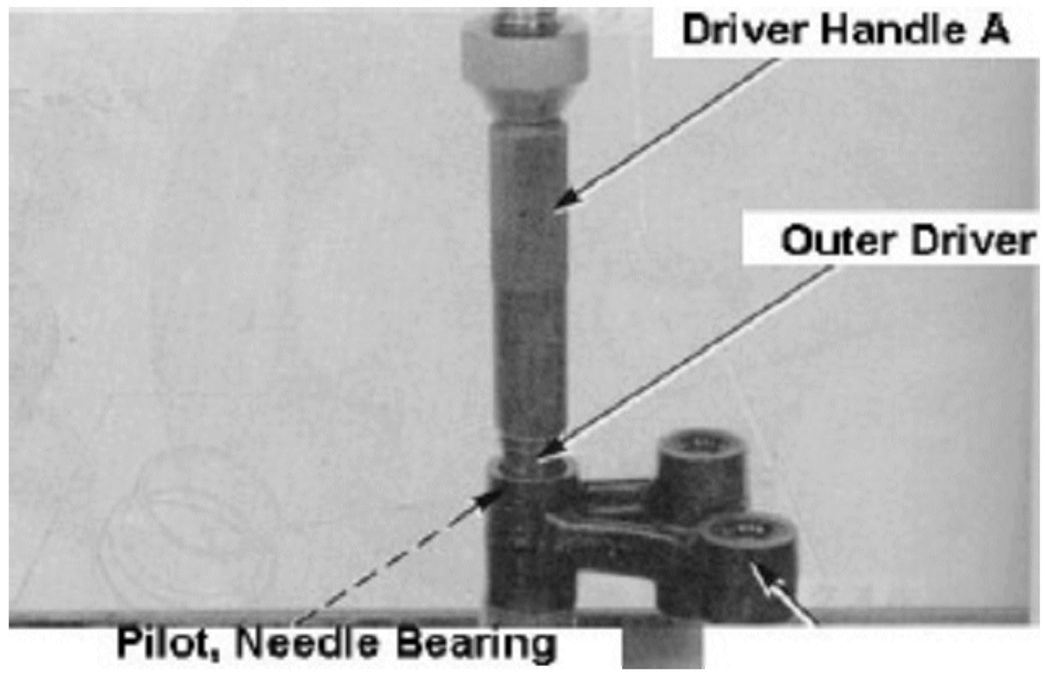
Bearing remover (15mm)	07936-KC10000
Remover ASSY	07936-KC10500
Remover shaft	07936-KC10100
Remover head	07936-KC10200
Remover sliding weight	07741-0010201

Fill grease to the needle bearing.
Attach the needle bearing to the cushion arm by using a hydraulic press machine.

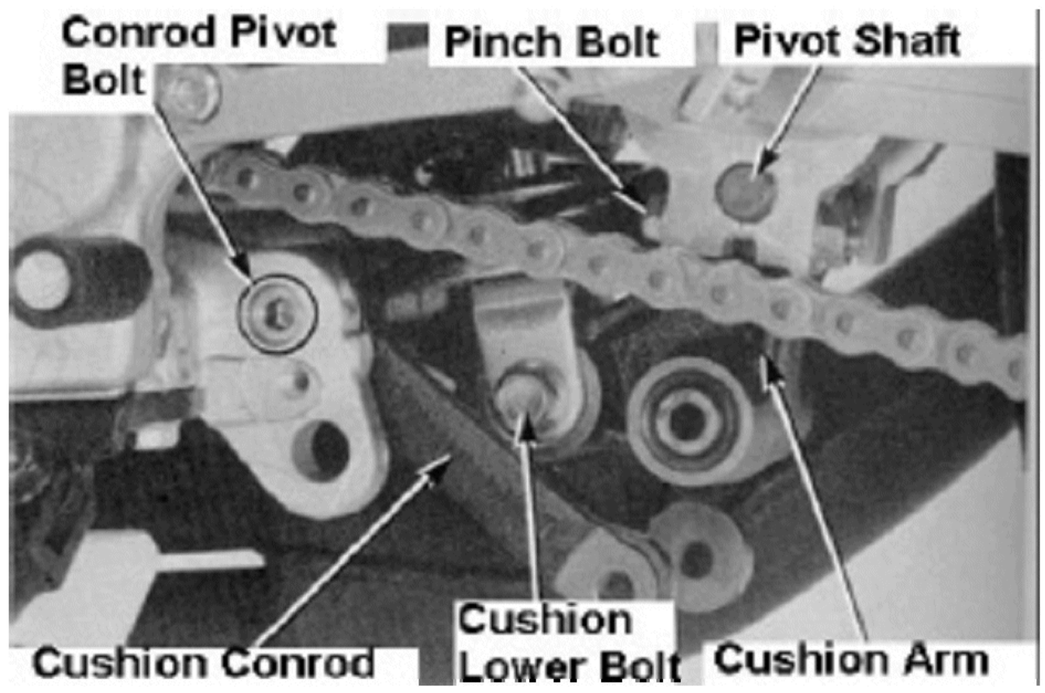
Common tools

Driver handle A	07749-0010000
Outer driver (24x26mm)	07746-0010700
Pilot (15mm)	07746-0040300

Press the marked surface in



Assemble the cushion arm (14-17).



Attachment

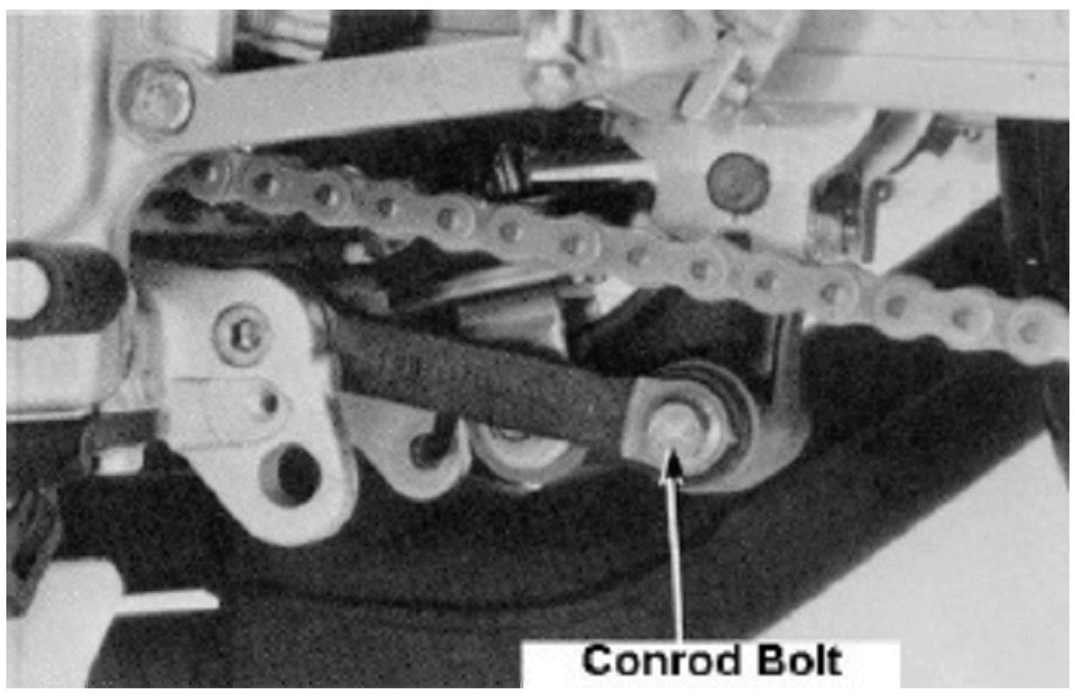
Attach the cushion arm and a cushion conrod.
Attach the cushion arm – rear fork pivot shaft.
Tighten each bolt with torque specified as follows:

Torque:

Cushion arm – rear fork pivot pinch bolt	2.0 ~ 3.0kg-m
Rear cushion lower bolt	5.0 ~ 6.0kg-m
Conrod bolt (frame side)	5.0 ~ 6.0kg-m

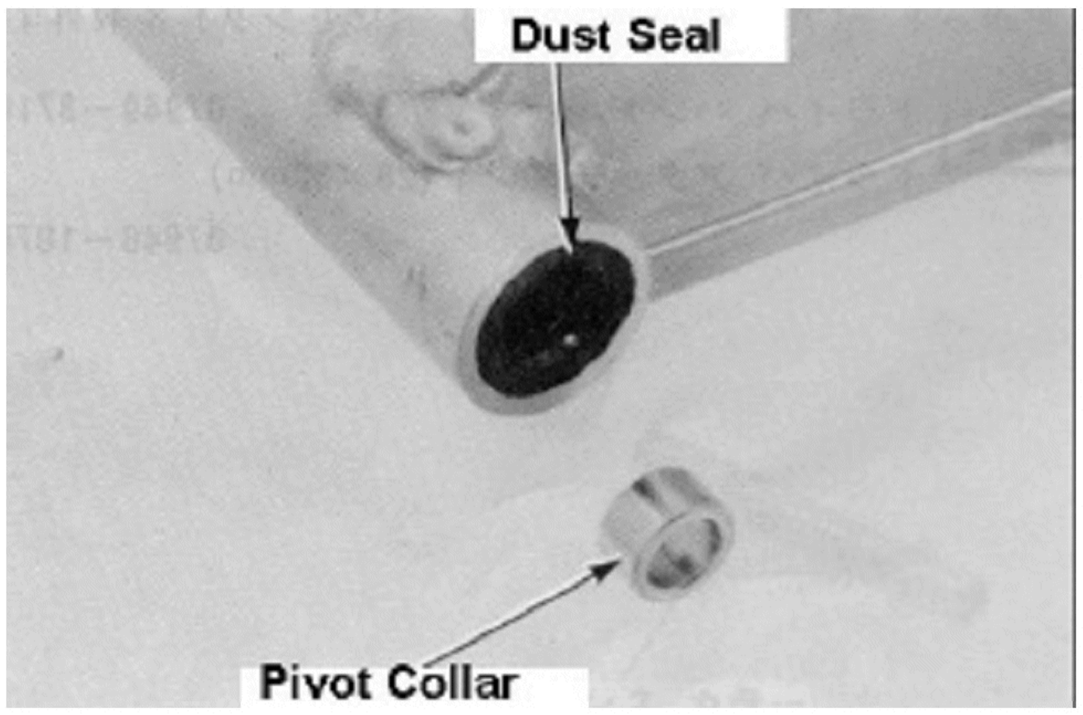
Tighten the conrod bolt (cushion arm side).

Torque: 5.0 ~ 6.0kg-m

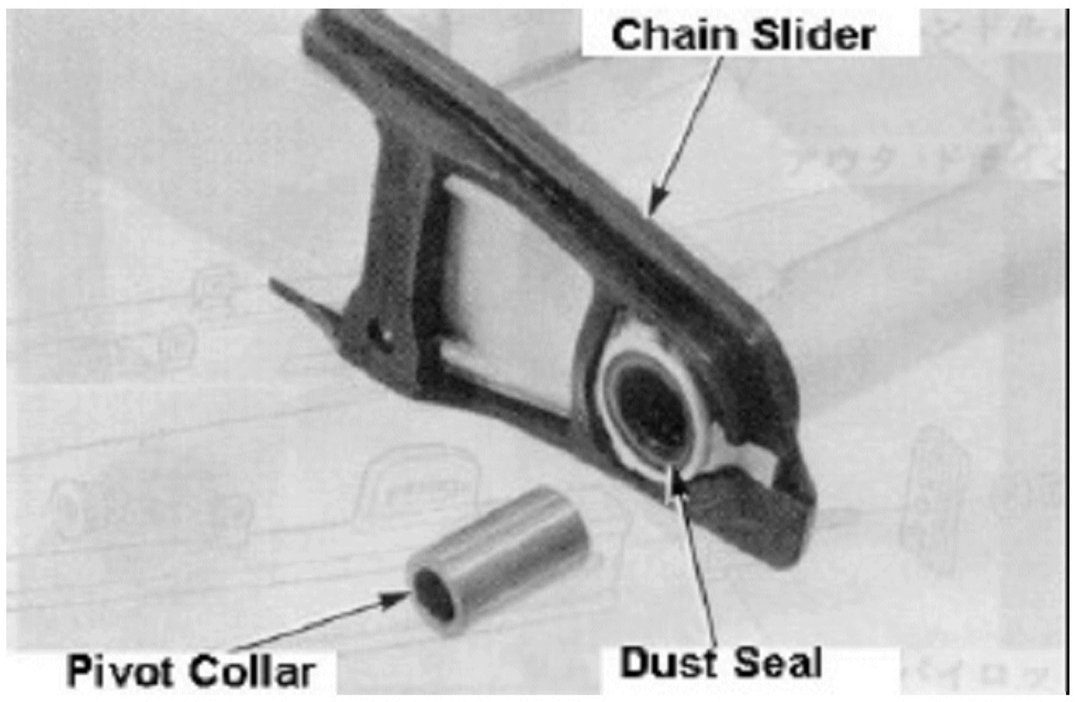


Rear fork bearing replacement

Detach the rear wheel (21-24)
Detach the rear fender B (16-2)
Detach the cushion arm (21-26)
Remove the rear fork (14-18)
Remove the right pivot collar and dust seal.



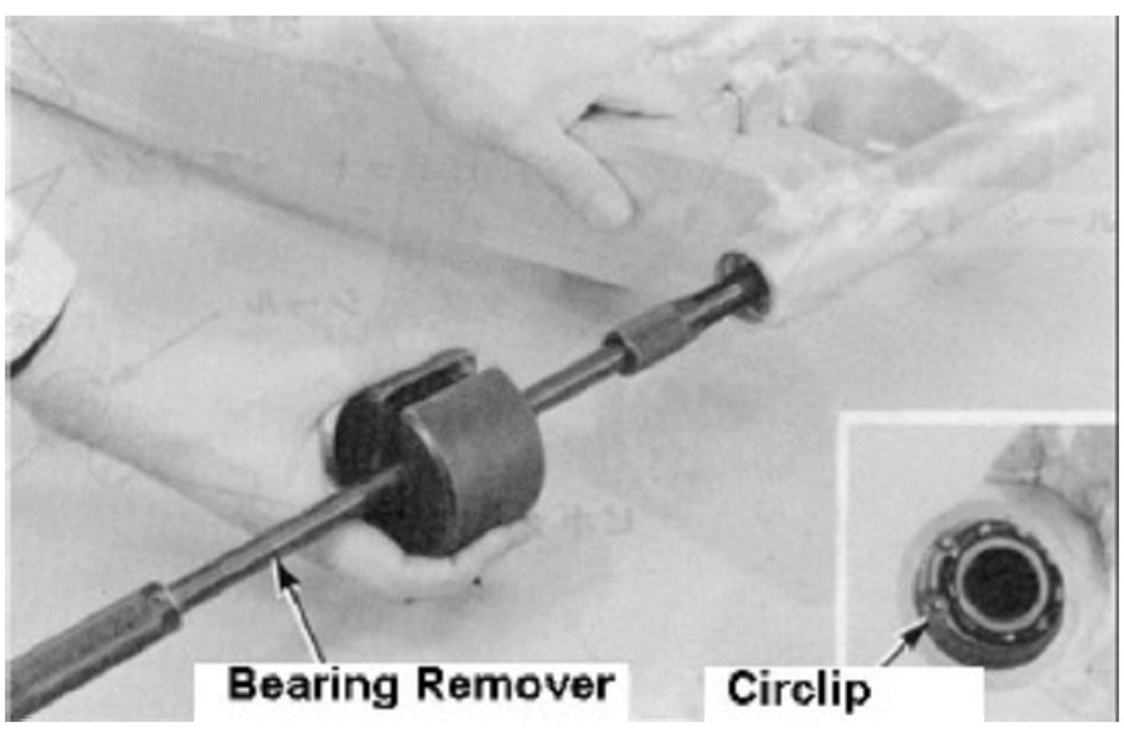
Remove the chain slider.
Remove the left pivot collar and the dust seal.



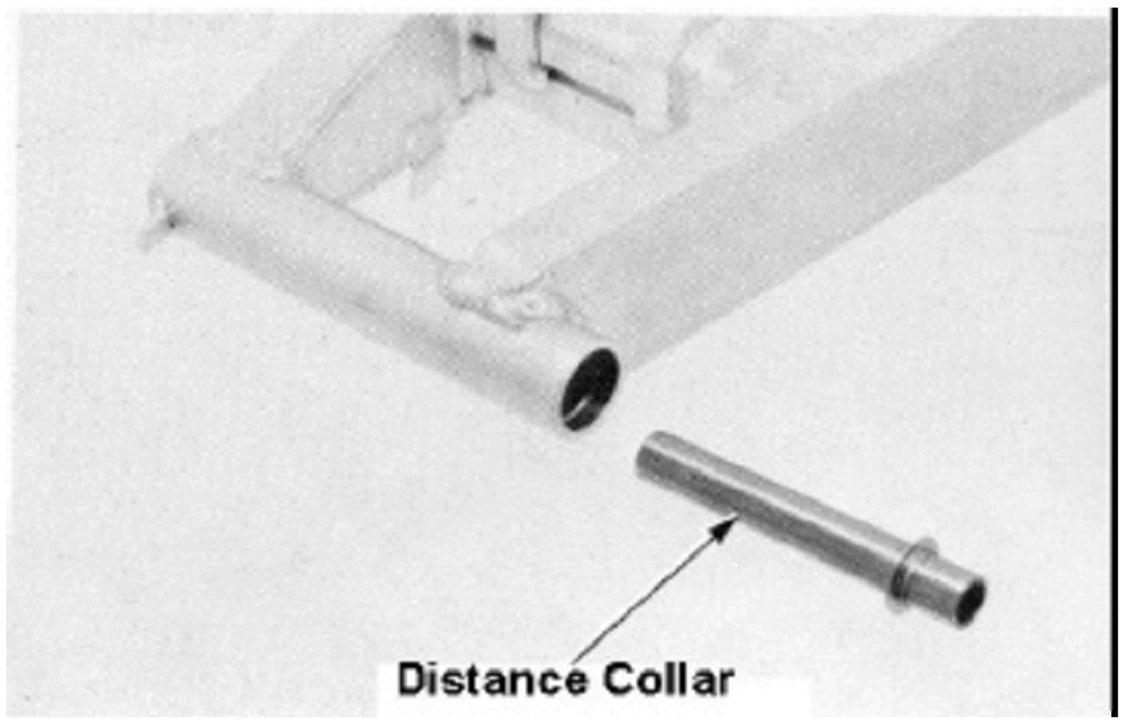
Remove the circlip.
By using a bearing remover, remove the right pivot bearing (ball-bearing).

Exc. tools

Bearing remover (15mm)
07936-KC10000
Remover ASSY (15mm)
07936-KC10500
Remover shaft (15mm)
07936-KC10100
Remover head (15mm)
07936-KC10200
Remover sliding weight
07741-0010201



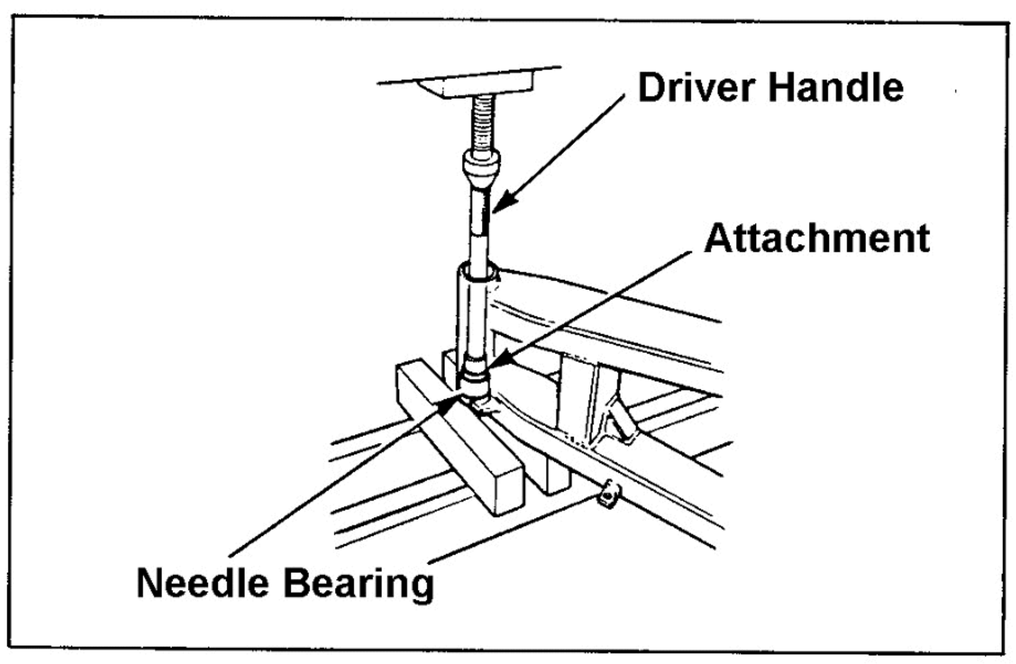
Remove the distance collar.

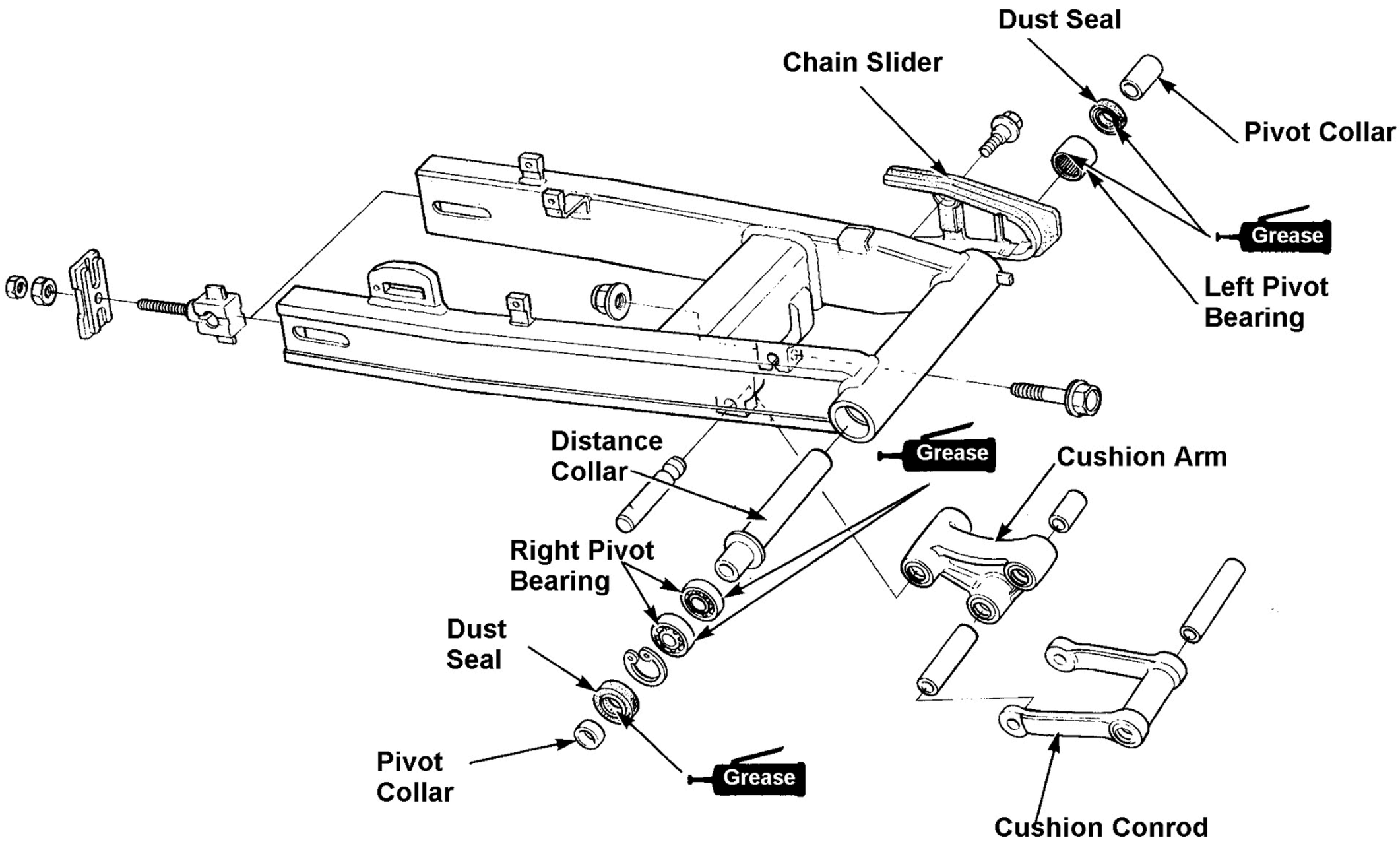


Remove the left pivot bearing (needle bearing).

Exc. tool

Driver handle	07949-3710001
Driver attachment	(28 x 30mm) 07946-1870100





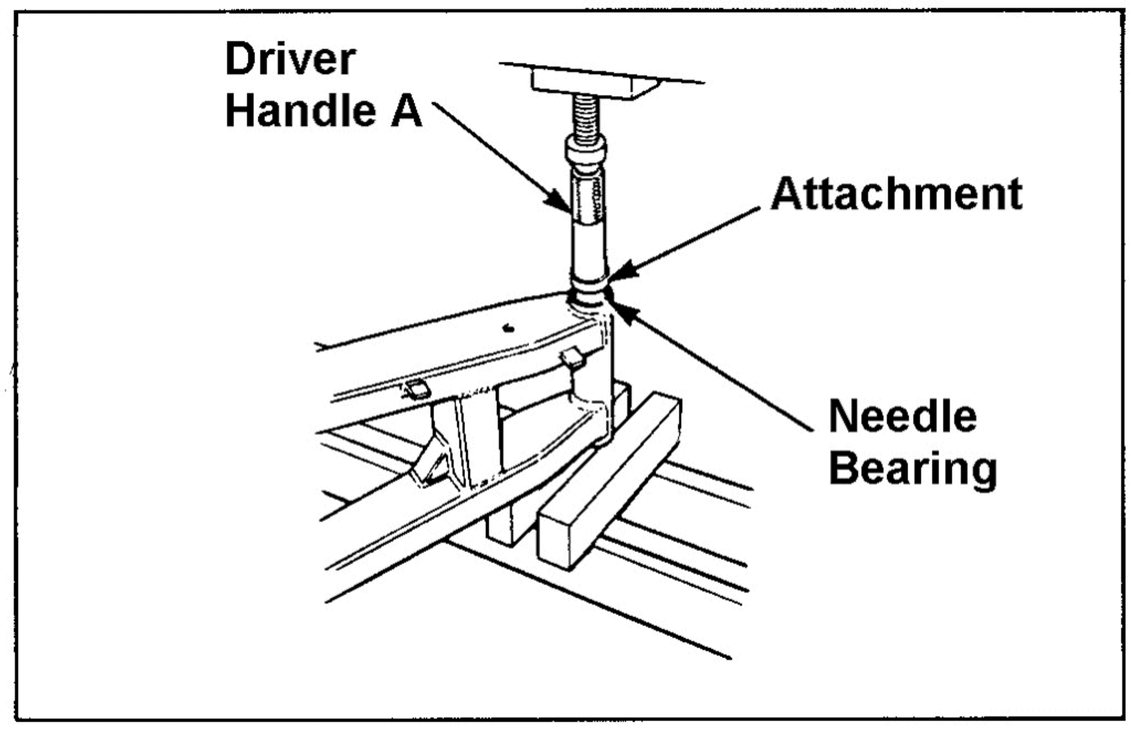
Fill grease to a roller of the needle bearing.
By using hydraulic press machine, insert the left pivot bearing (needle bearing).

Exc. tool

Needle bearing driver attachment
07HMD-KV30100

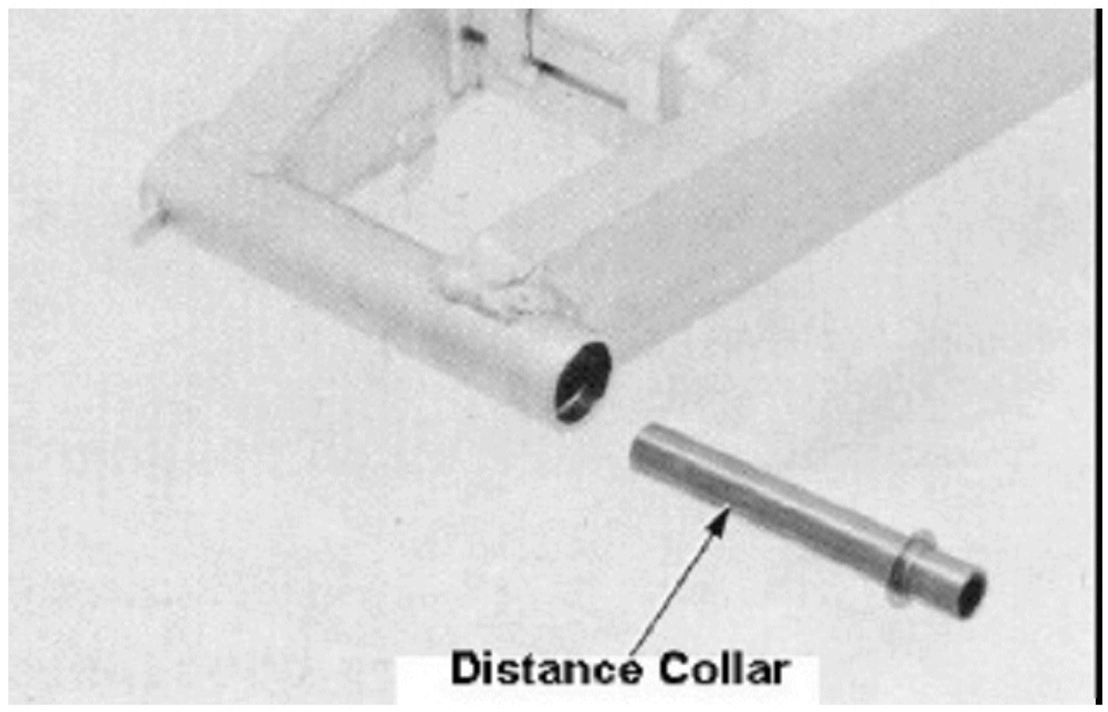
Common tool

Driver handle A 07749-0010000



Push the marked surface in.

Install the distance collar.

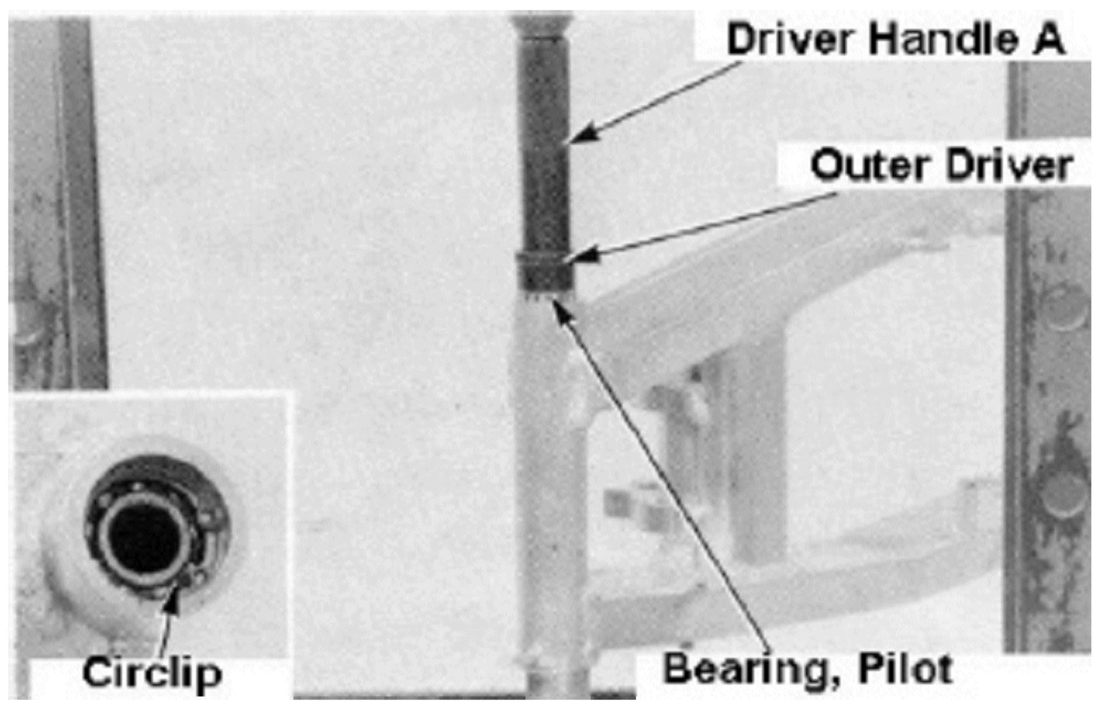


Fill the bearing with grease.
By using hydraulic press machine, insert the right pivot bearing (ball-bearing).

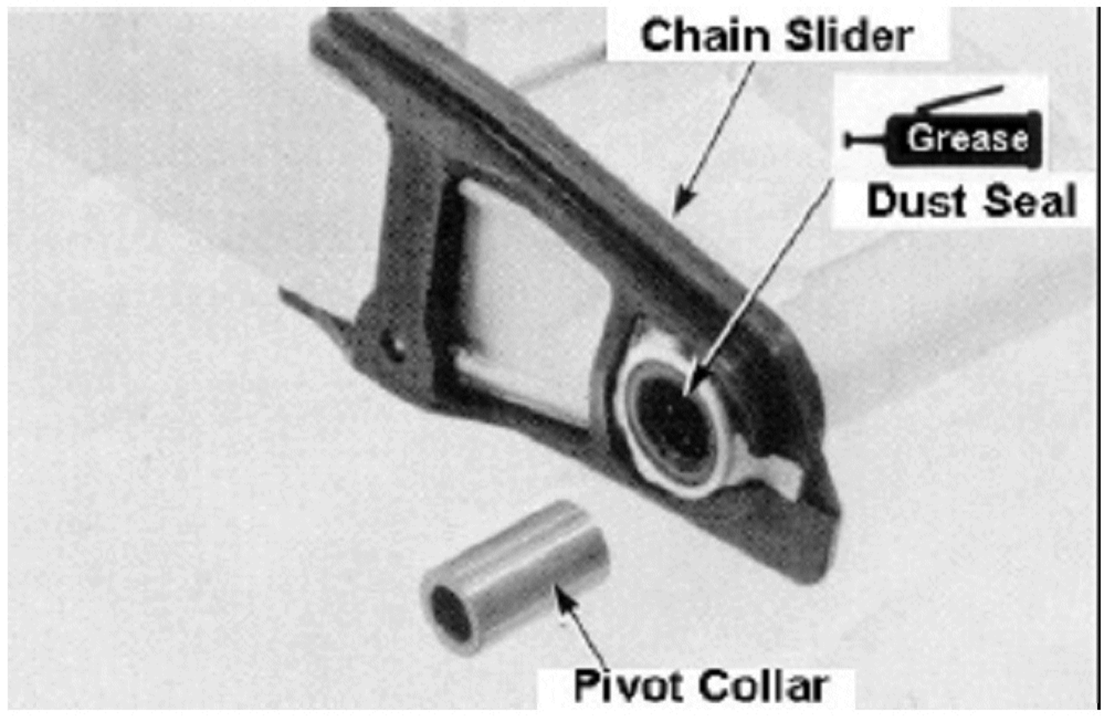
Common tools

Outer driver (32x35mm) 07746-0010100
Pilot (15mm) 07746-0040300
Driver handle A 07749-0010000

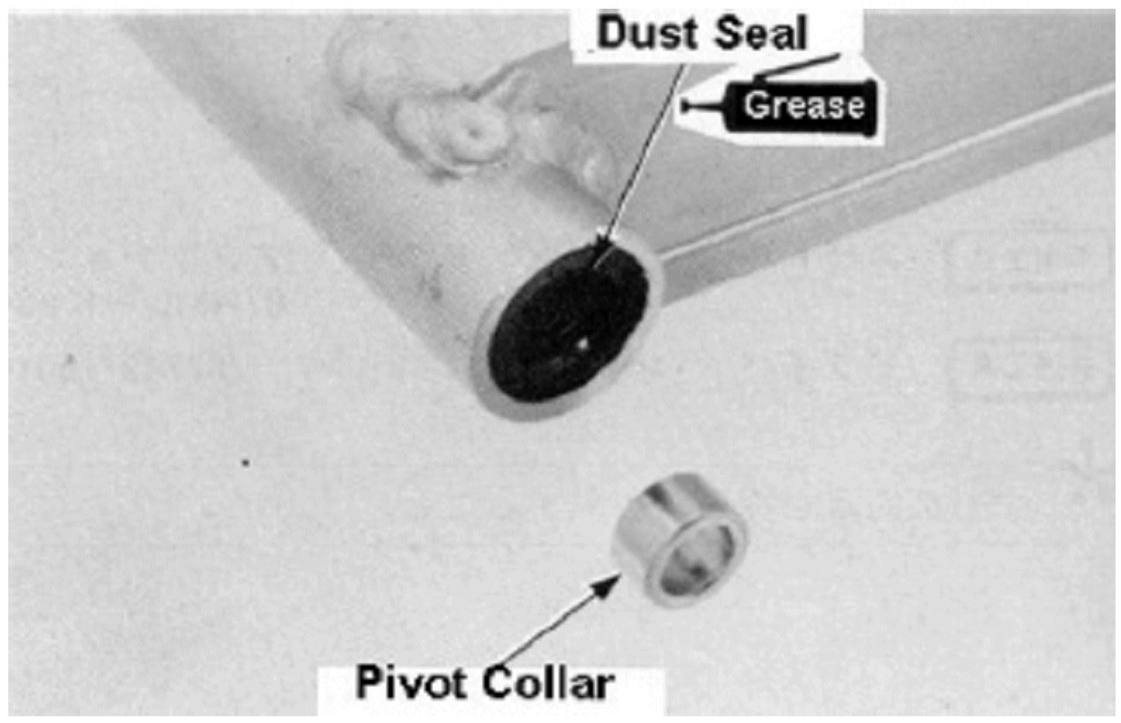
Press the marked surface in.



Firmly attach the circlip to the groove.
Apply grease to the lip of the left pivot dust seal and attach it.
Attach the left pivot collar.
Attach the chain slider.



Apply grease to the lip of the right pivot dust seal and attach it.



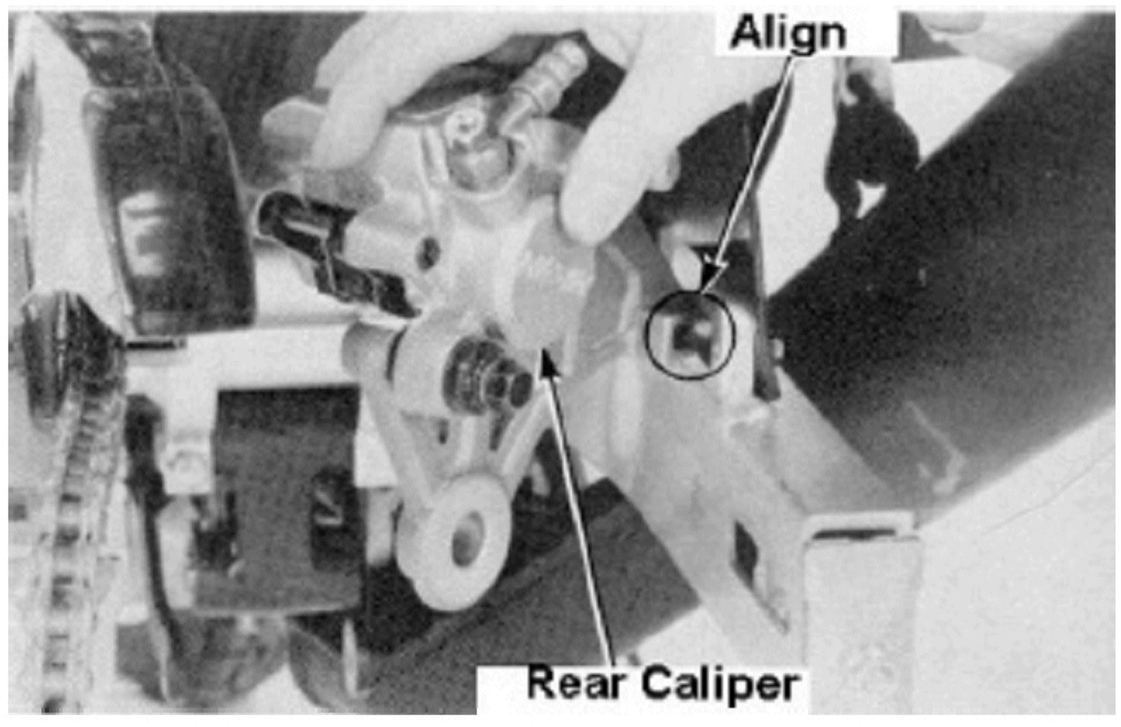
Attach the right pivot collar.

Attach the rear fork (14-22).

Attach the rear fender B (16-2).

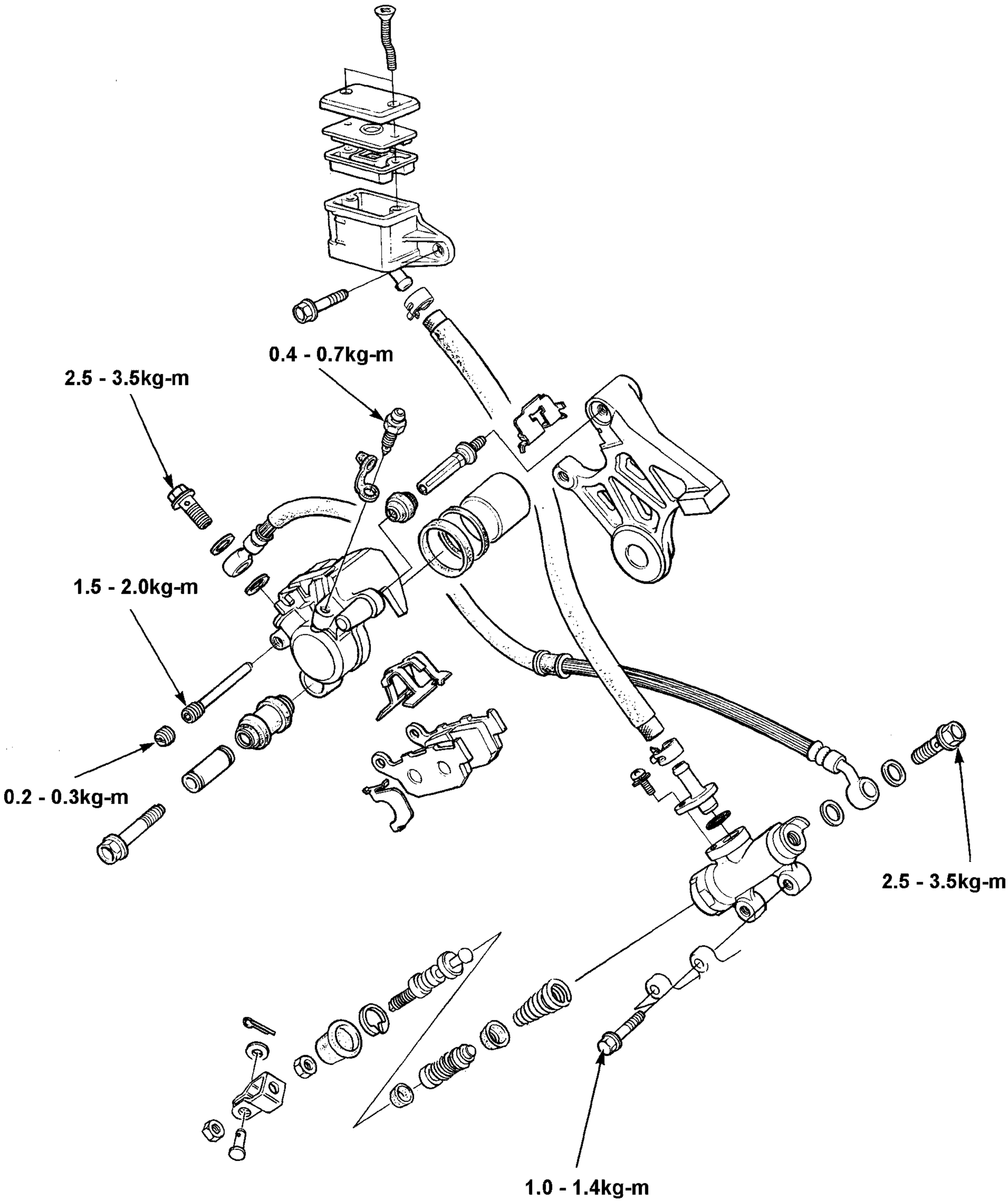
Attach the cushion arm (21-27).

Attach the rear caliper to a rear fork by aligning the projection on the caliper with the slit on the fork.



Attach the rear wheel (21-24).

Brake system (Disk Brake)



Service information

Standard **Thick lined cells differ from CBR250 four.**

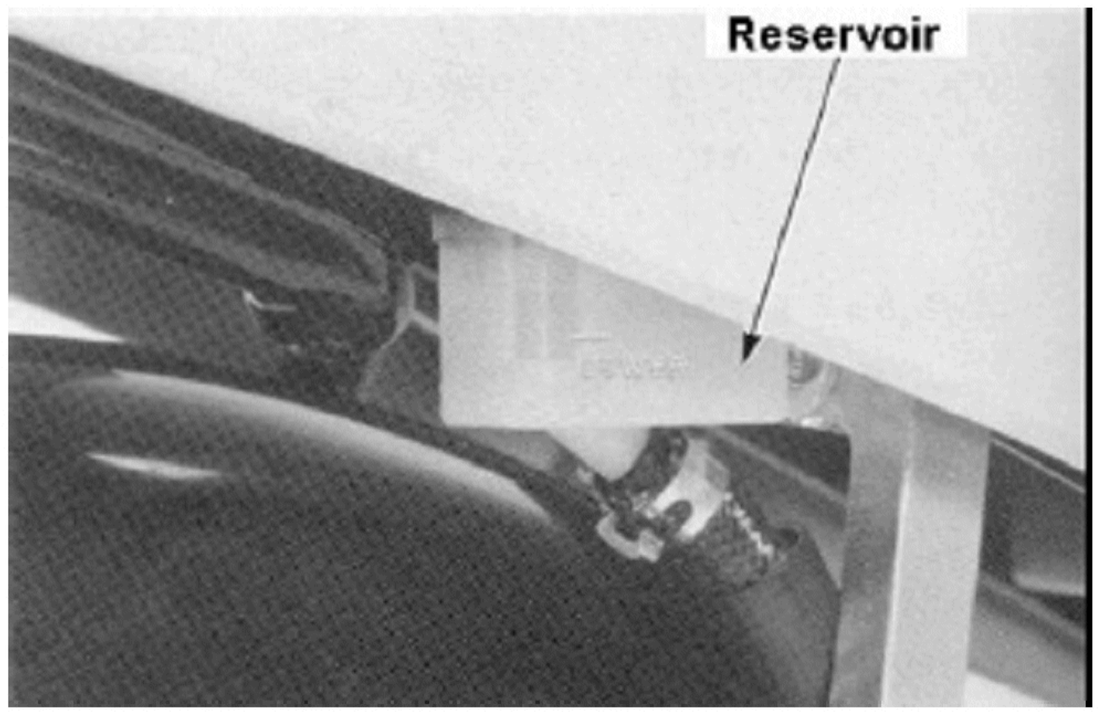
Item	Standard	Limitation
Rear brake disk thickness	4.8-5.2	4.0
Rear brake disk deflection	-	0.3
Rear master cylinder inner diameter	12.700-12.743	12.755
Rear master piston outside diameter	12.657-12.684	12.645
Rear caliper cylinder inner diameter	38.180-38.230	38.240
Rear caliper piston outside diameter	38.115-38.148	38.103

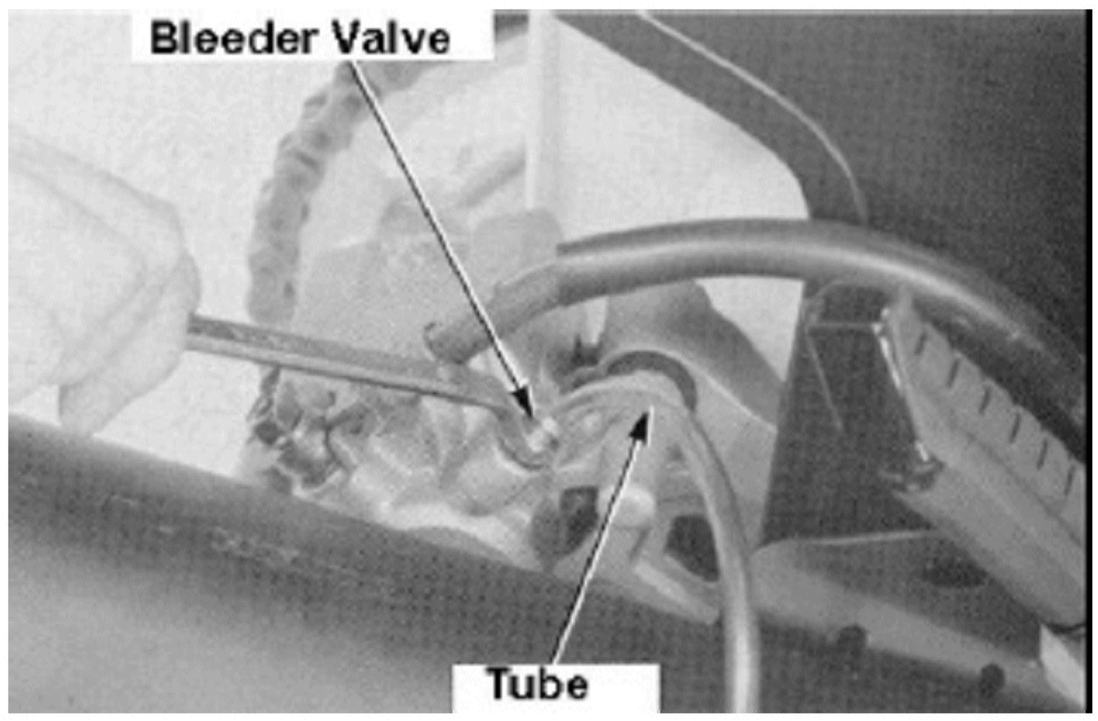
Brake fluid change / air bleeding

Refer to 15-3 for front brake fluid change / air bleeding.

Check the brake fluid level on the rear brake reservoir.

- Brake fluid check and refill should be done by placing the reservoir cap top surface horizontal.
- Keep out of debris and water when refilling the fluid.
- Do not mix different products of brake fluid.
- Keep the painted, plastic and rubber surfaces out of the brake fluid.
- Use DOT 3 or DOT 4 brake fluid.





Brake fluid bleeding

Remove the reservoir cap.
Connect the transparent tube to a bleeder valve.
Loosen the bleeder valve on the caliper and operate the brake pedal.
Repeat this until the brake fluid stops coming out from the bleeder valve.

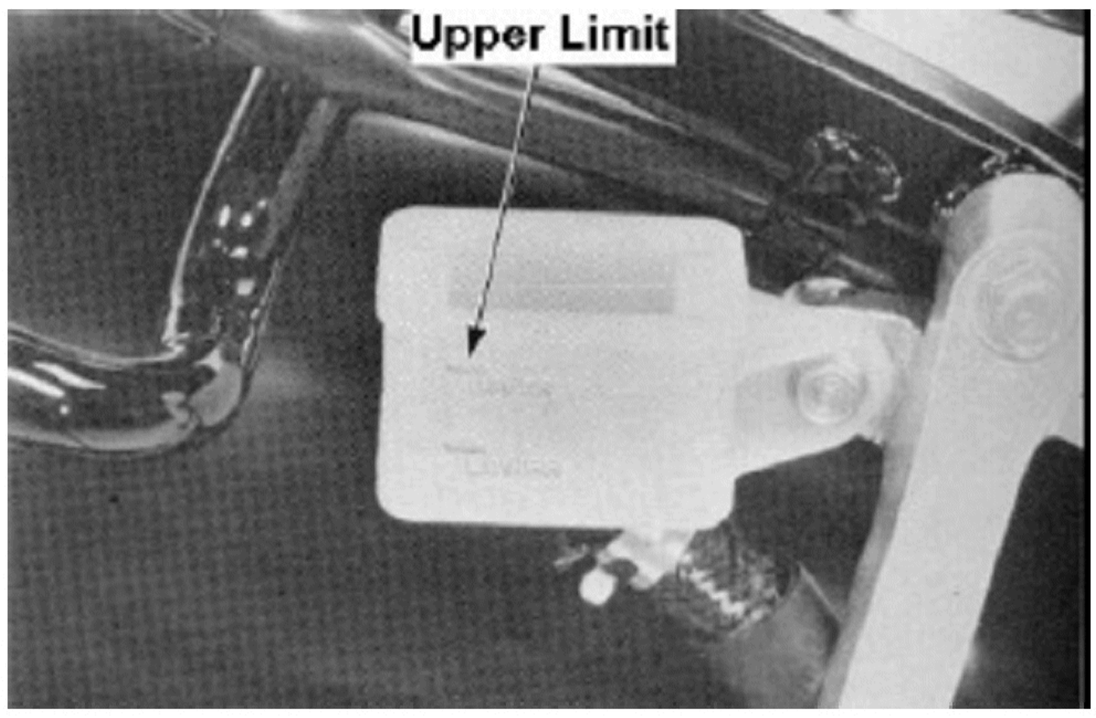
- Keep brake disk / pads clean to avoid lowering braking performance.
- If they become dirty, replace with new pads and wipe off dirt from the brake disk.

Air bleeding

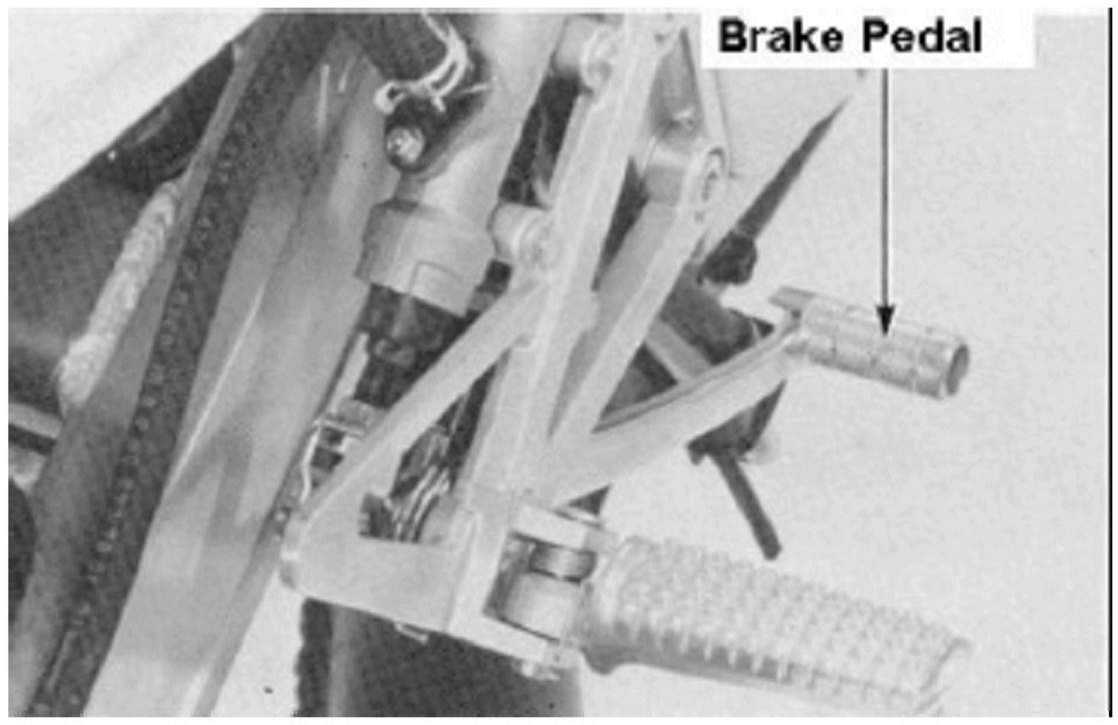
- Keep monitoring the brake fluid level.

Supply brake fluid if the fluid level comes down to the lower limit and resume work.

Tighten the bleeder valve and refill brake fluid to the upper limit line.



Operate the brake pedal and bleed air. Repeat this until no air comes out to the reservoir (until the brake pedal becomes heavy).

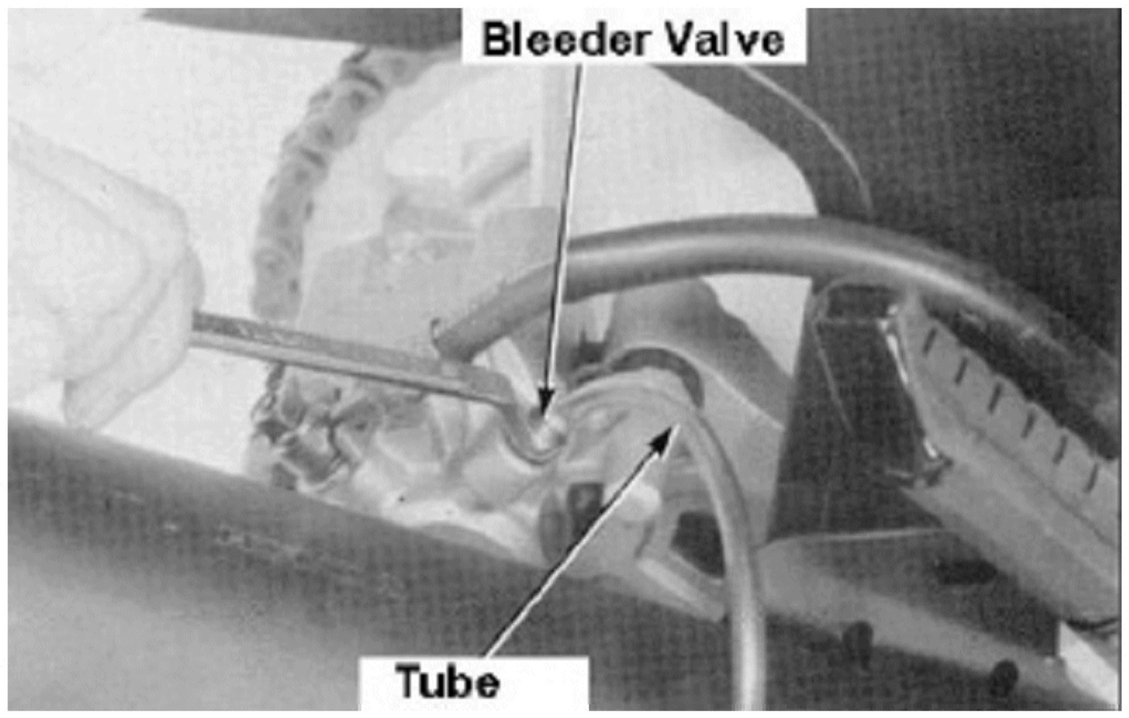


Refill brake fluid to the upper limit line.

Attach the transparent pipe to the bleeder valve on a caliper and place a container.

1) Operate the brake pedal several times and loosen the bleeder valve ½ rev, while holding the pedal depressed, and then re-tighten.

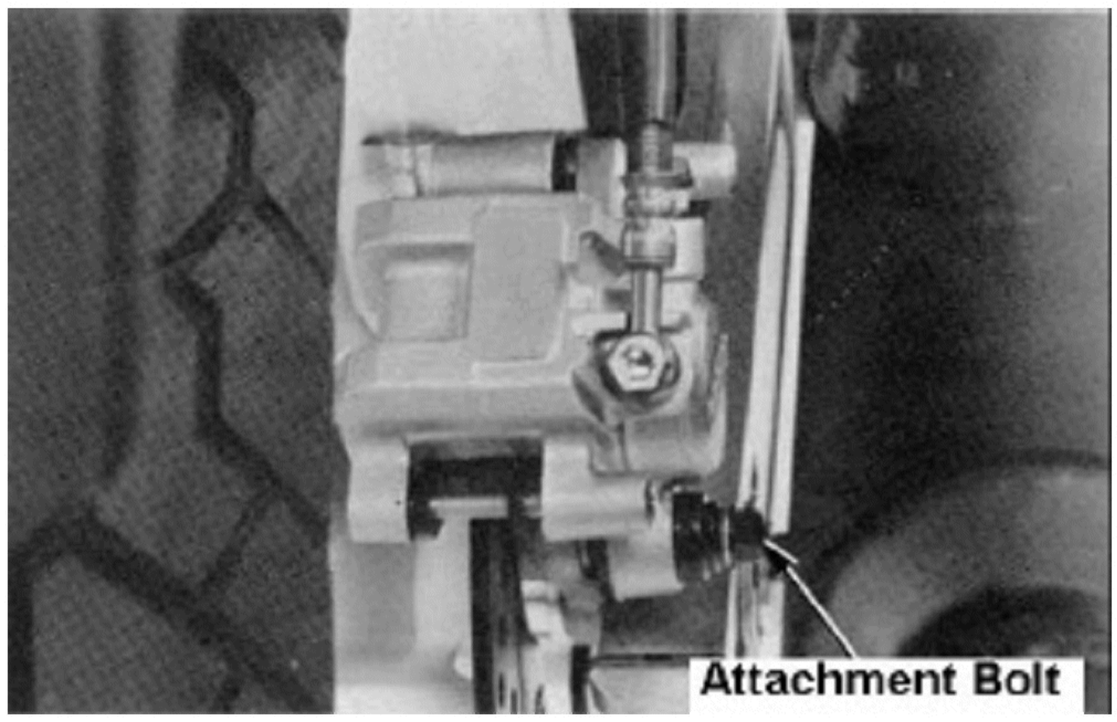
Do not release the pedal until you re-tightened the bleeder valve.



2) Slowly release the brake pedal and leave if for a few seconds in original position.

Repeat 1) and 2) until no air comes out from the bleeder valve.

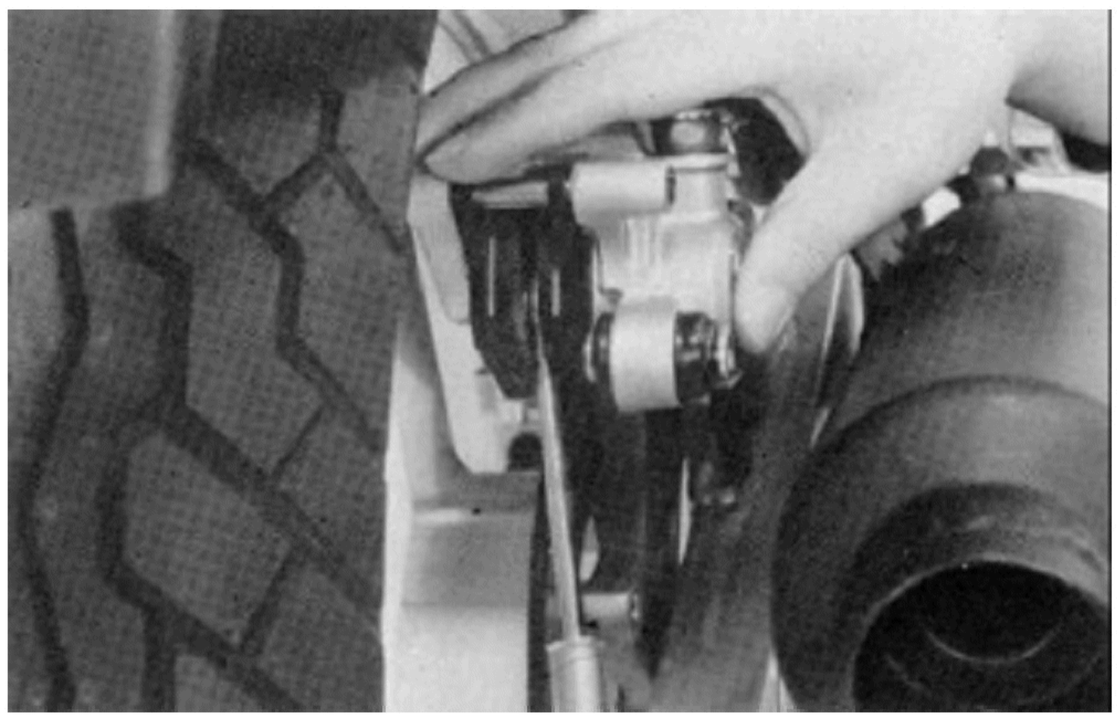
Refill brake fluid to the upper limit.
Tighten the bleeder valve.
Torque: 0.4 ~ 0.7kg-m



Brake pad / disk

Brake pad change

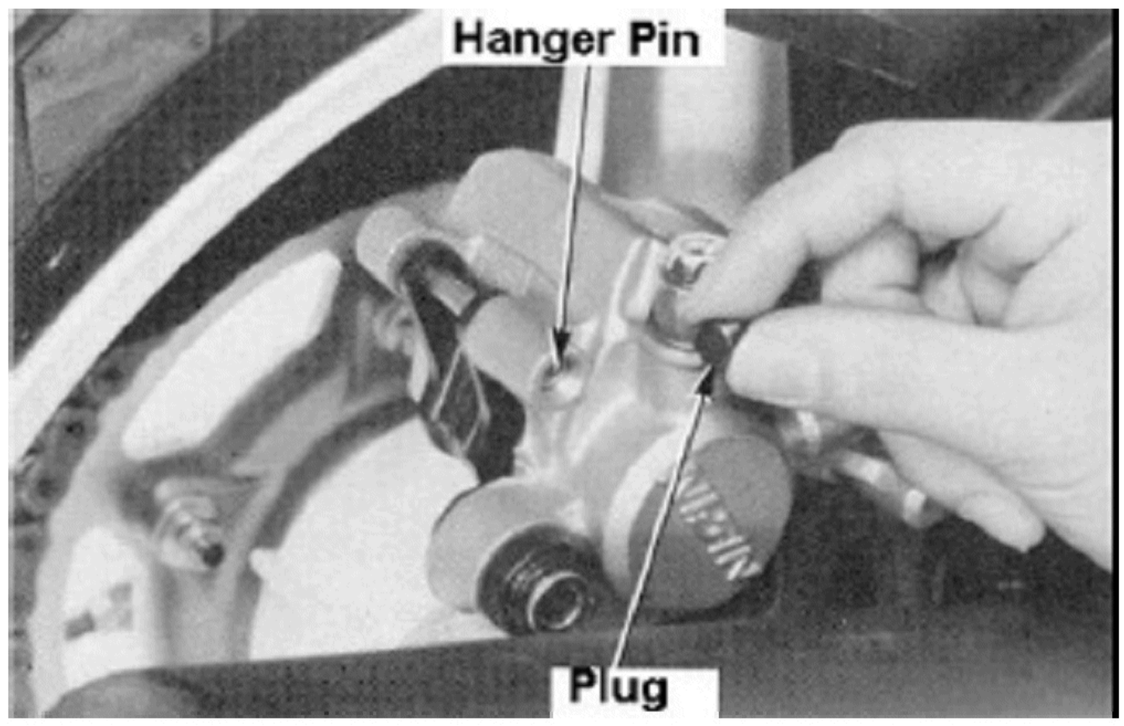
- Refer to 15-4 and 6 for front brake pad change and brake disk inspection.
- Do not disconnect brake hose



Remove the rear caliper attachment bolt.

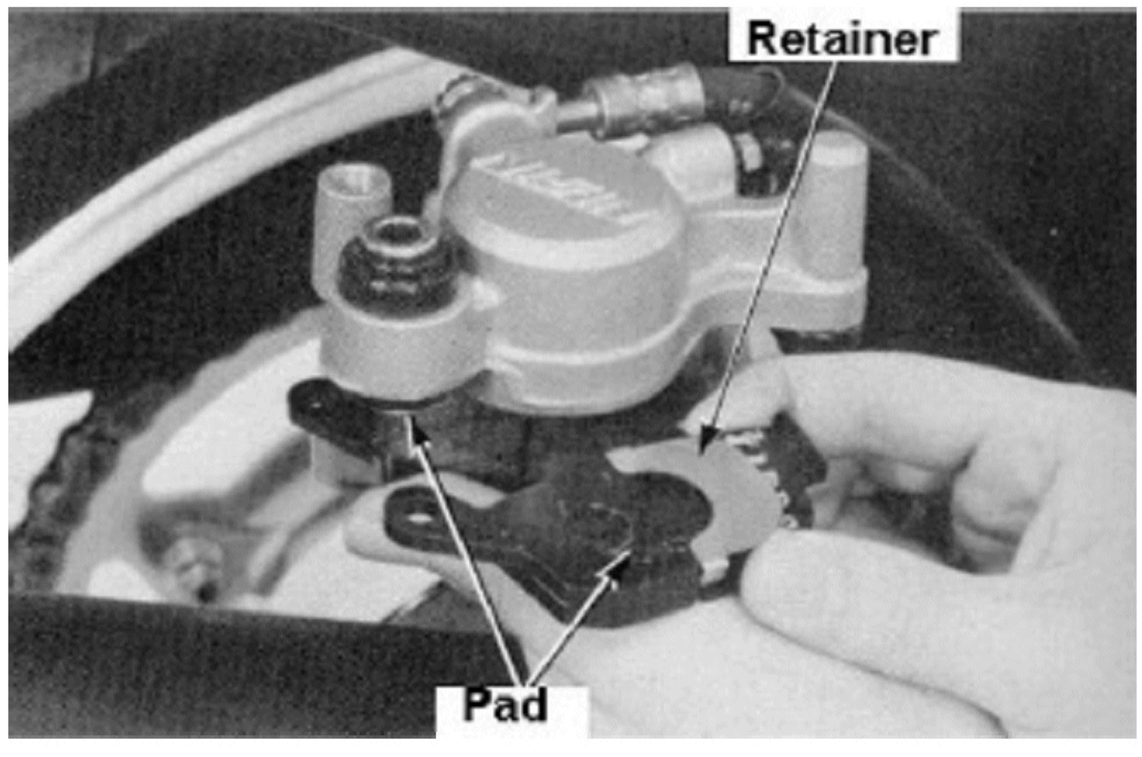
Push the caliper piston back to fit new pads.

Remove the plug and the hanger pin.



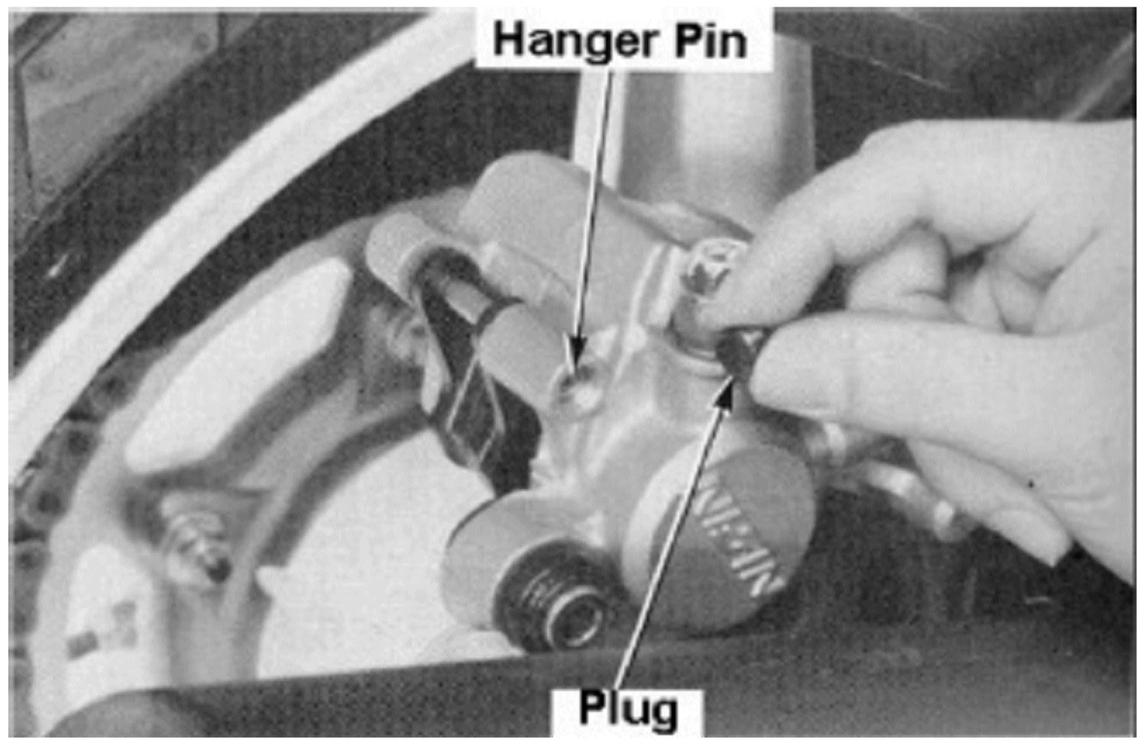
Detach the pads from the caliper.
Confirm the pad spring attachment position.
Attach new pads to the caliper.

- Replace brake pads in a pair.
- Attach the retainer-fitted pad to the piston side.



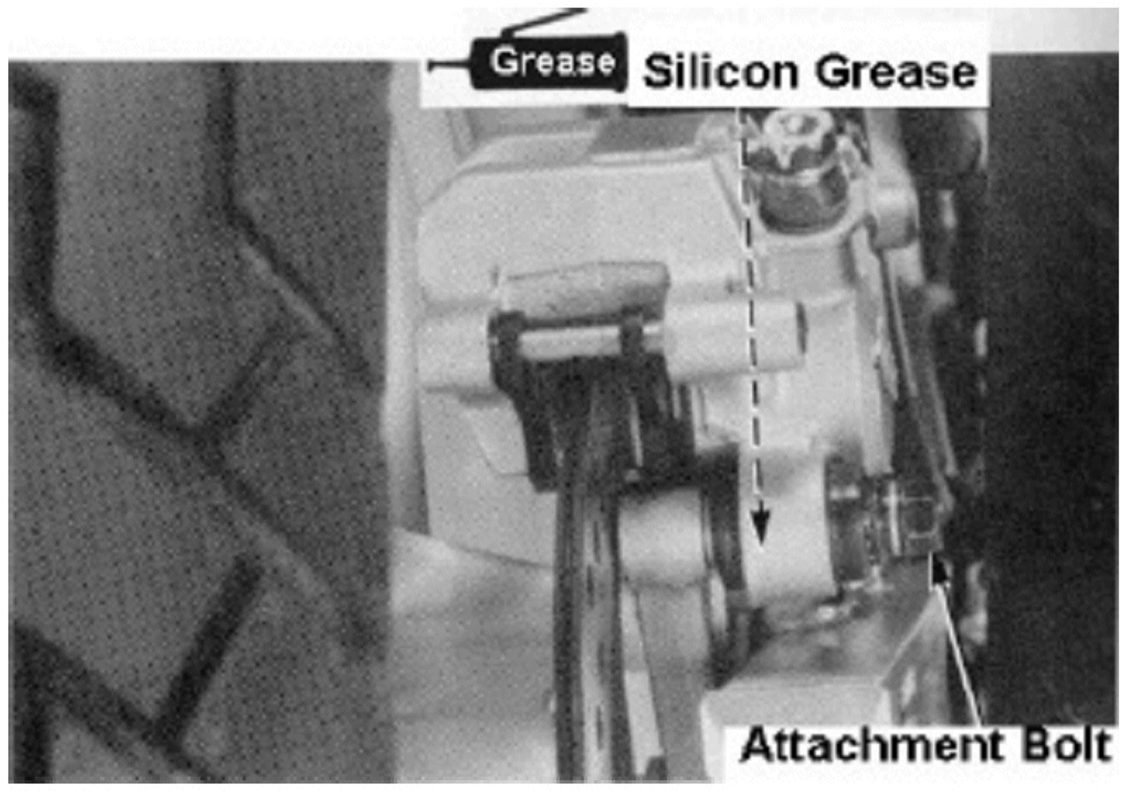
Attach the caliper to the caliper bracket and attach the hanger pin and tighten.
Torque: 1.5 ~ 2.0kg-m

Attach the hanger pin plug.
Torque: 0.2 ~ 0.3kg-m



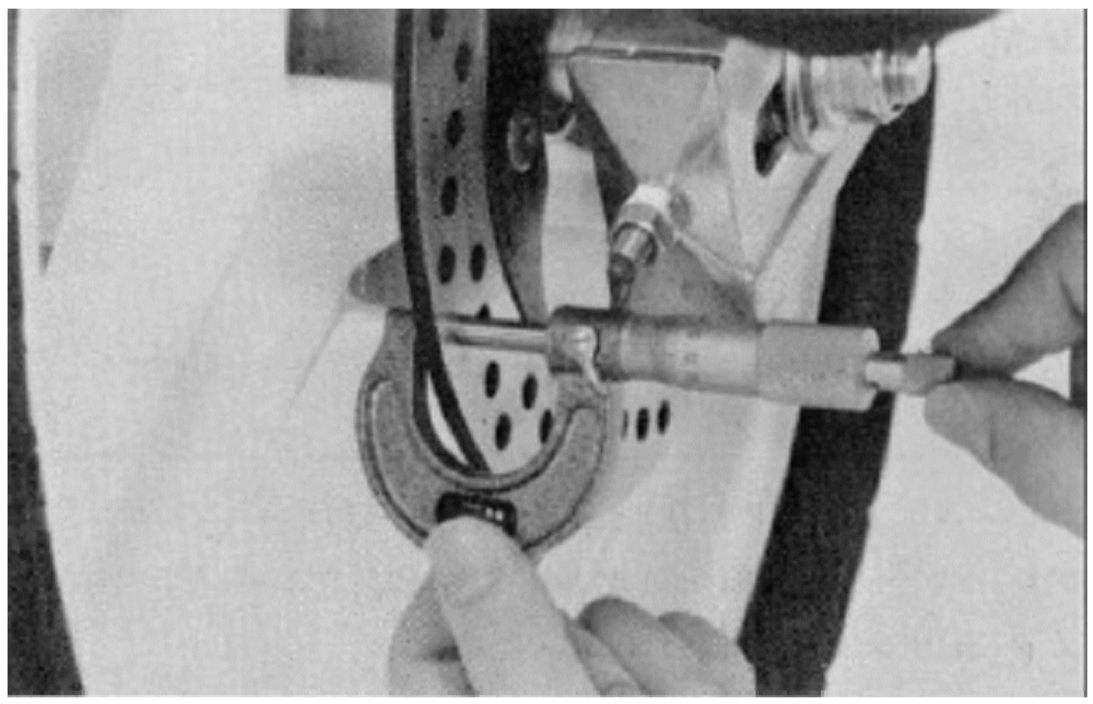
Apply silicone grease to the rear caliper attachment bolt and tighten it.
Torque: 2.0 ~ 2.5kg-m

Operate the brake pedal after replacing the pads to push the piston

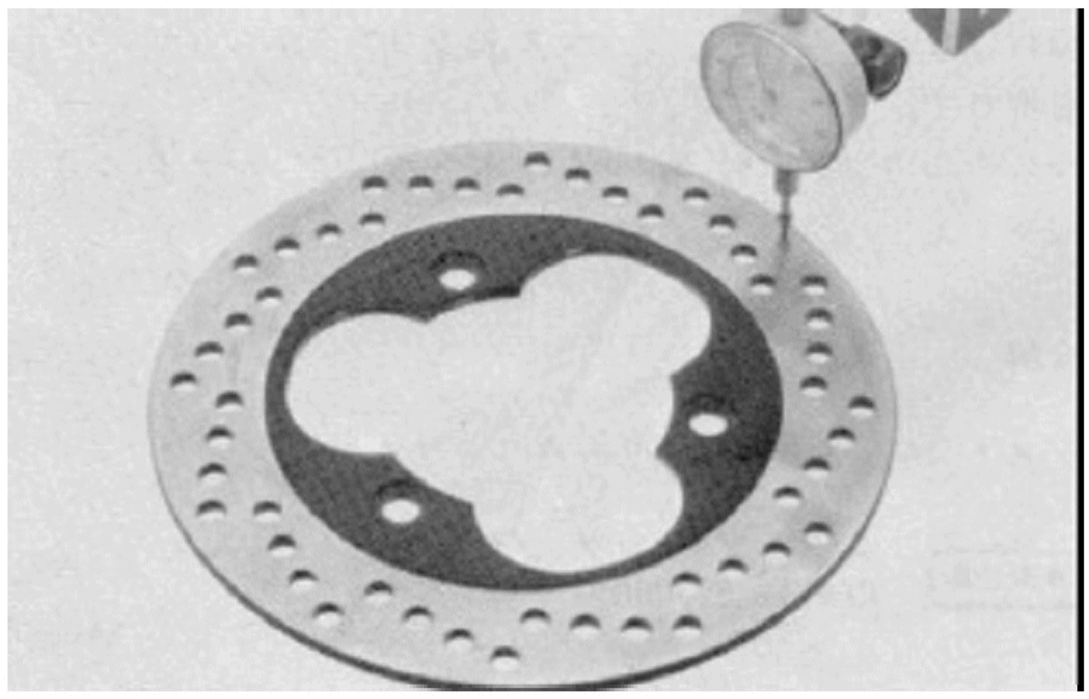


Brake disk inspection

Measure the brake thickness.
≦ 4.0mm → Replace



Measure the disk deflection.
≧ 0.3mm → Replace

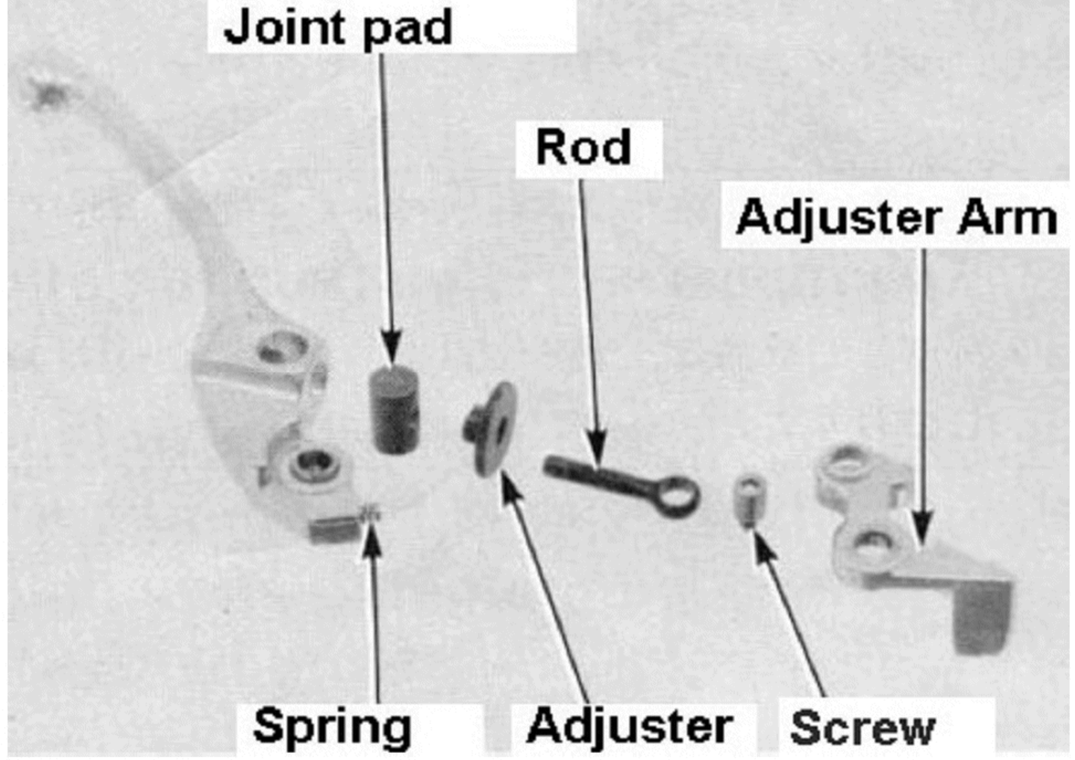


Master cylinder

Refer to 15-6, -7, -8 for front master cylinder.

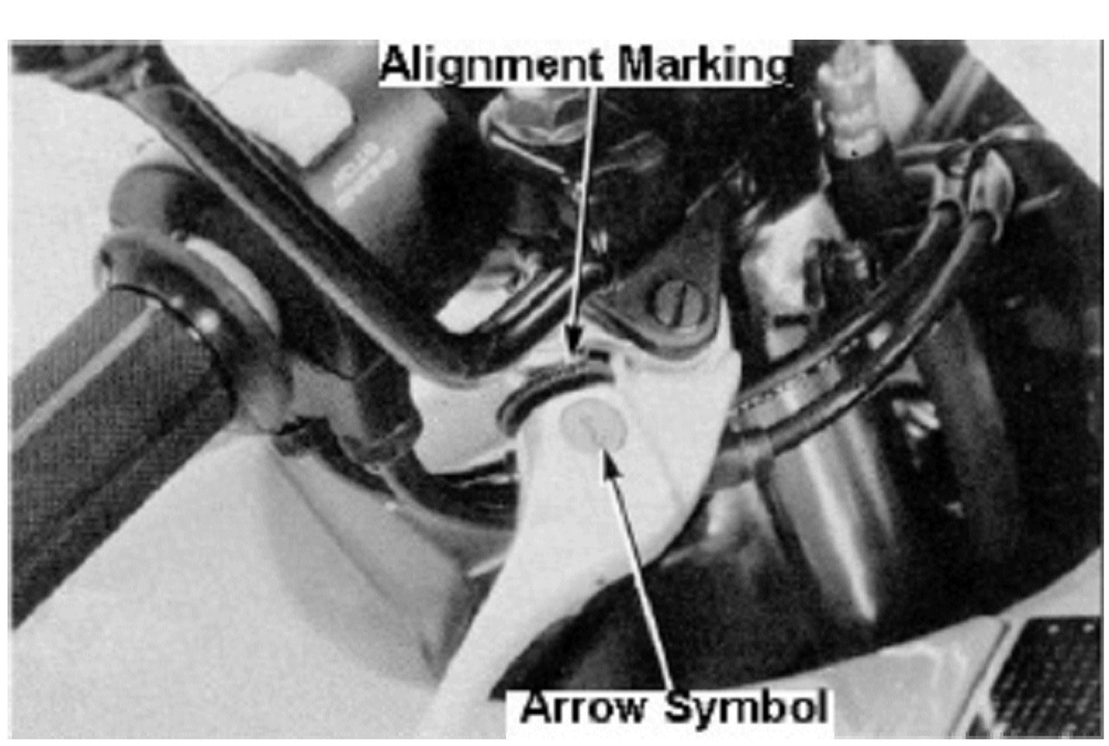
Front brake lever adjuster

Remove the front master cylinder (15-6).
Detach the brake lever from the master cylinder and remove screws, adjuster arm, rod, adjuster and the joint pin.
Inspect the spring for its tension.
Apply small amount of grease on the joint pin hole and attach it to the brake lever.
Attach the adjuster and a rod and attach them to the joint pin.
Attach the adjuster arm to the brake lever and tighten the screws.



Align the marking on the adjuster with the arrow symbol on the joint pin when attaching.

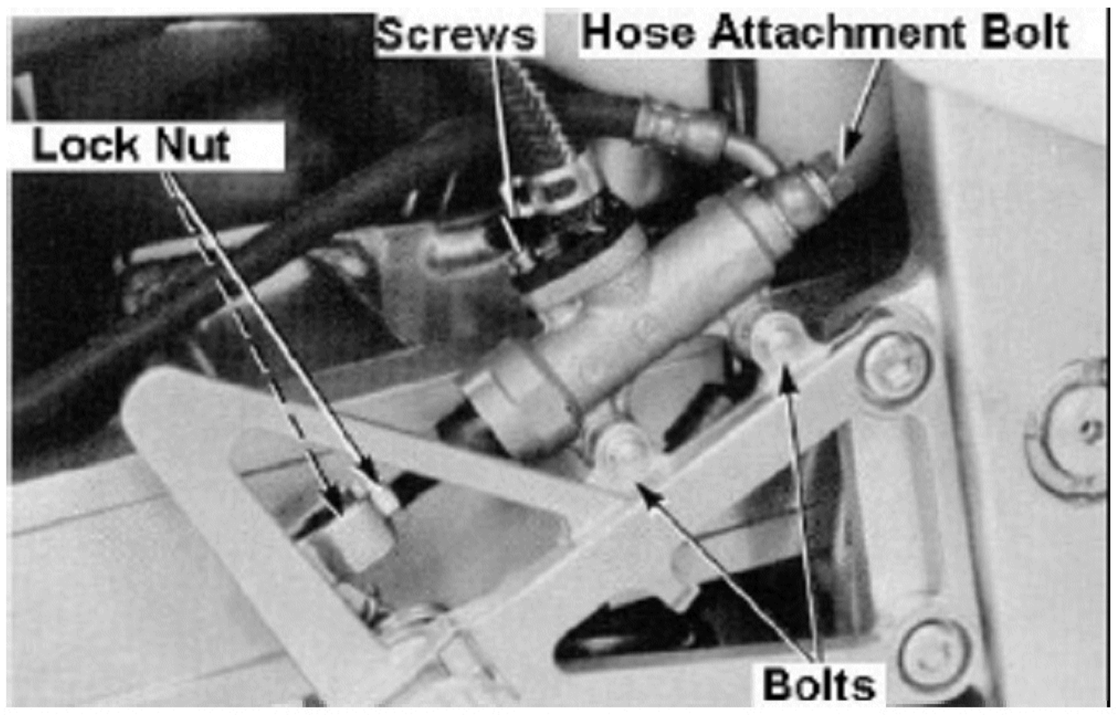
Attach the brake lever to the master cylinder and attach the front master cylinder (15-8).



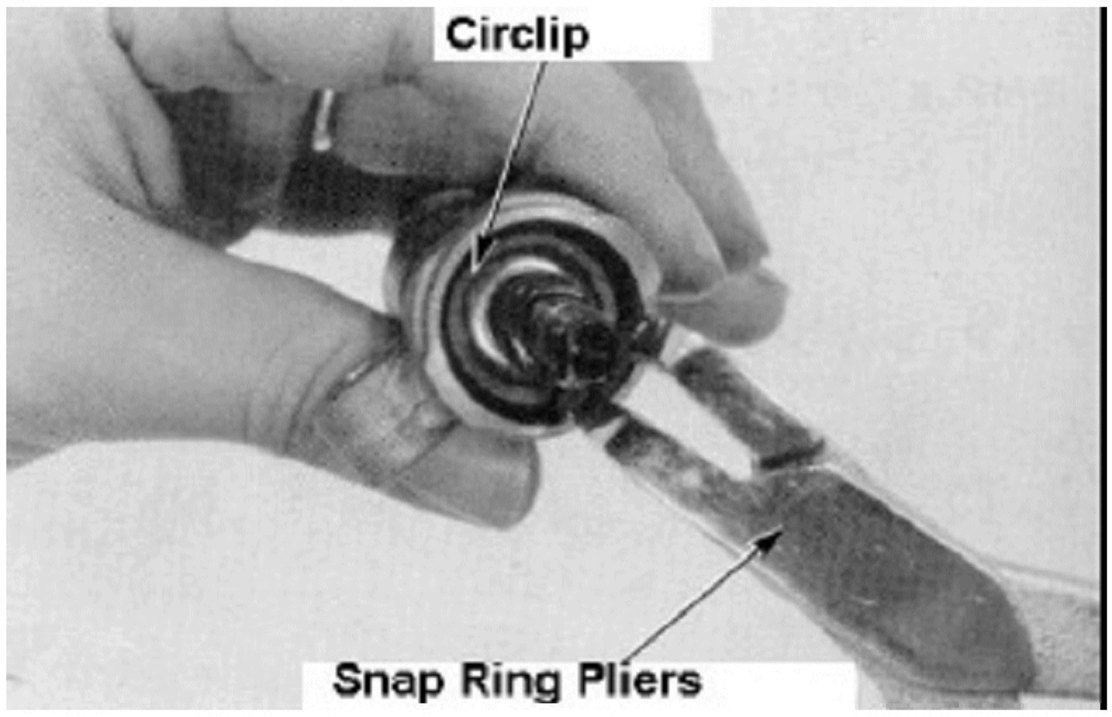
Rear master cylinder

Detachment

- Keep the painted, plastic and rubber surface away from brake fluid.
- Apply cover to the hose joint to prevent brake fluid leak.



Bleed brake fluid (21-32).
Remove the brake hose attachment bolt and disconnect the brake hose from the master cylinder.
Remove the lock nut and remove a push rod from a joint.
Remove one attachment screw and disconnect the reservoir hose from the master cylinder.
Remove two master cylinder attachment bolts and detach the master cylinder.

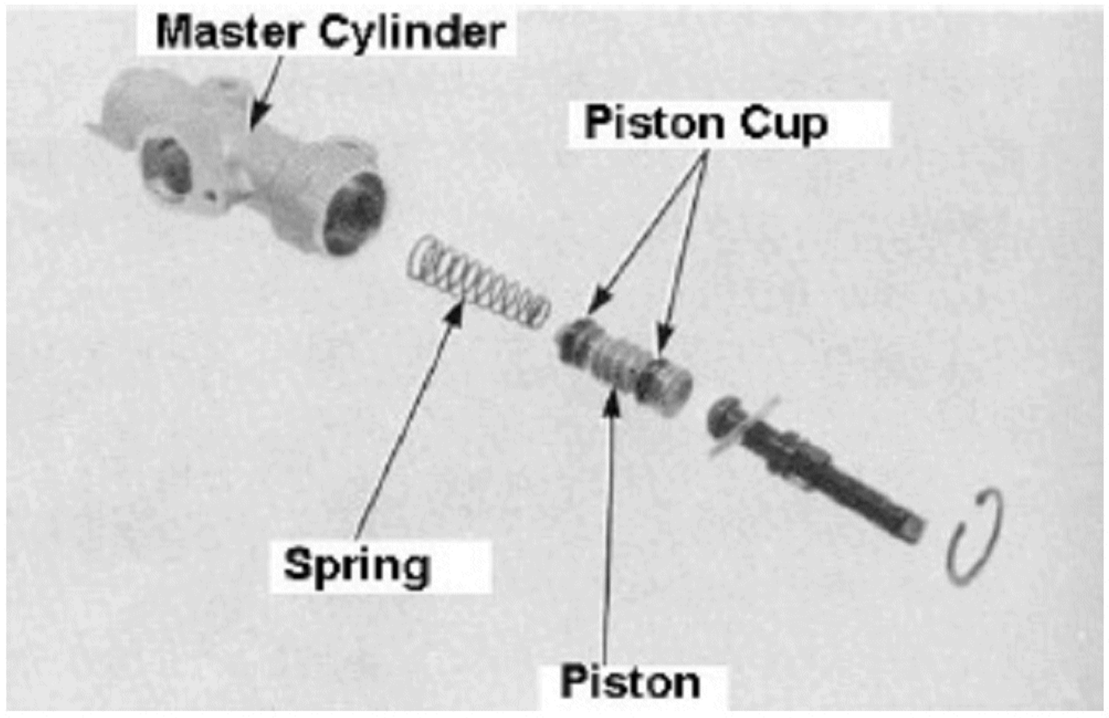


Disassembly

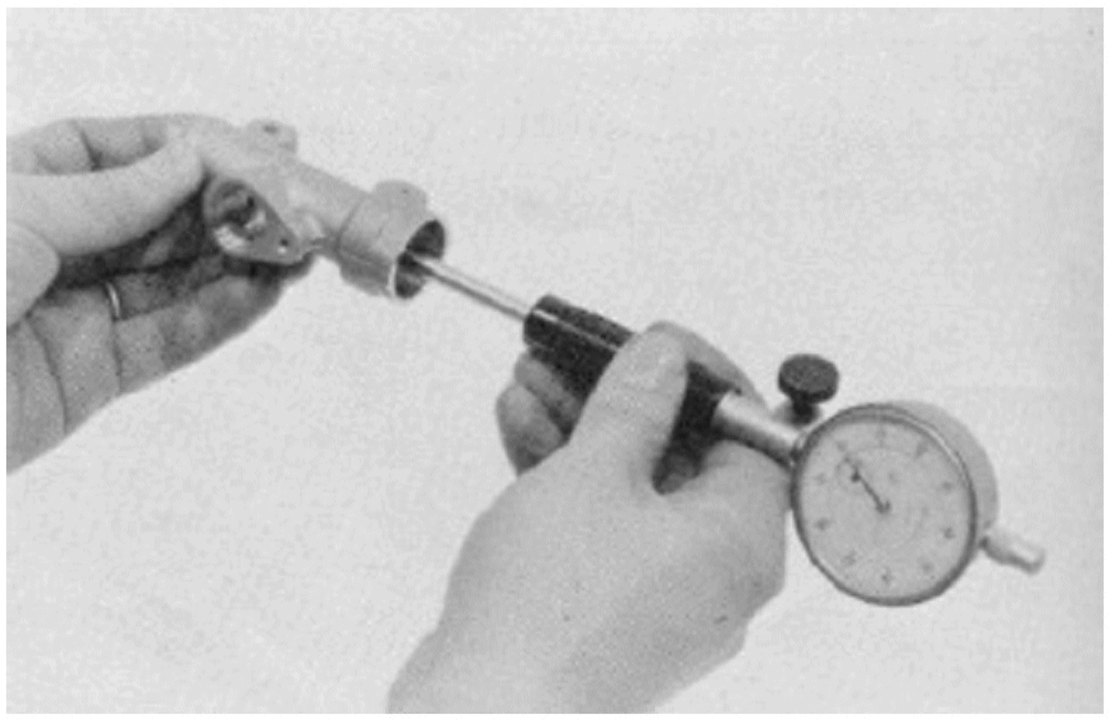
Remove the dust boot and remove the circlip.

Exc. tool	Snap ring pliers 07914-3230001

Remove the piston, piston cup and spring from the master cylinder and clean the inside of the cylinder with brake fluid.



- Clean the removed parts with brake fluid and check the path of each part with compressed air.
- Sort the parts to keep them away from dust and debris.



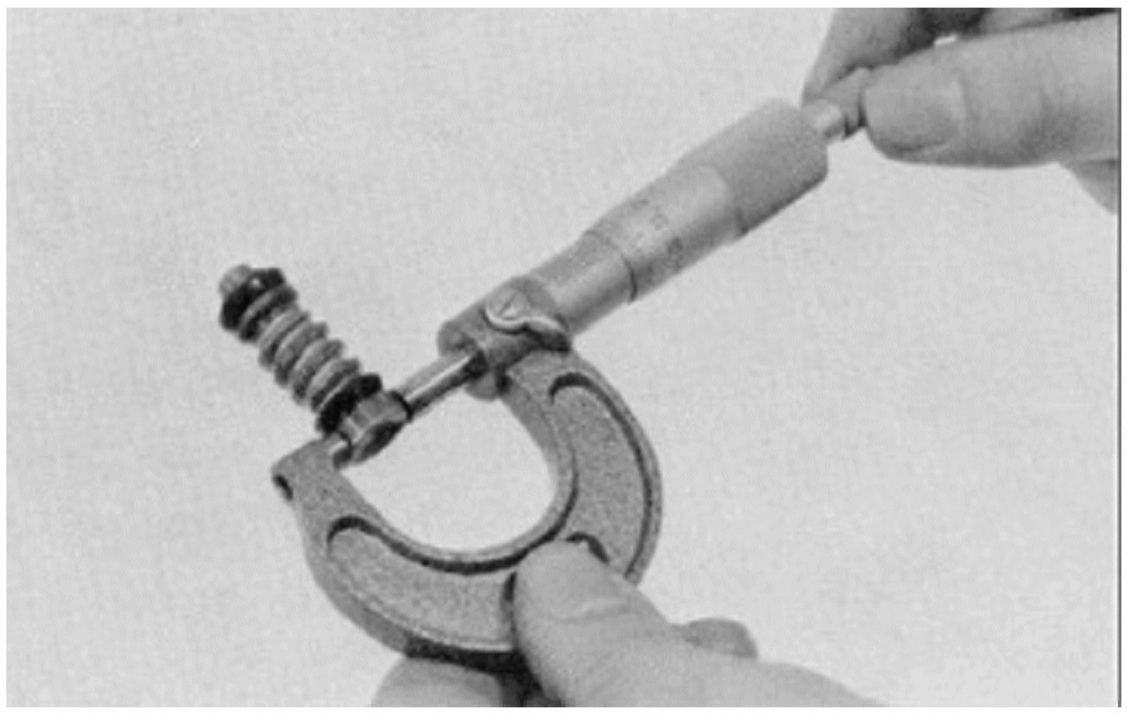
Inspection

Inspect the master pistons contact surface for damage or scratch.
Measure the inner diameter of the master cylinder.

≧ 12.755mm → Replace

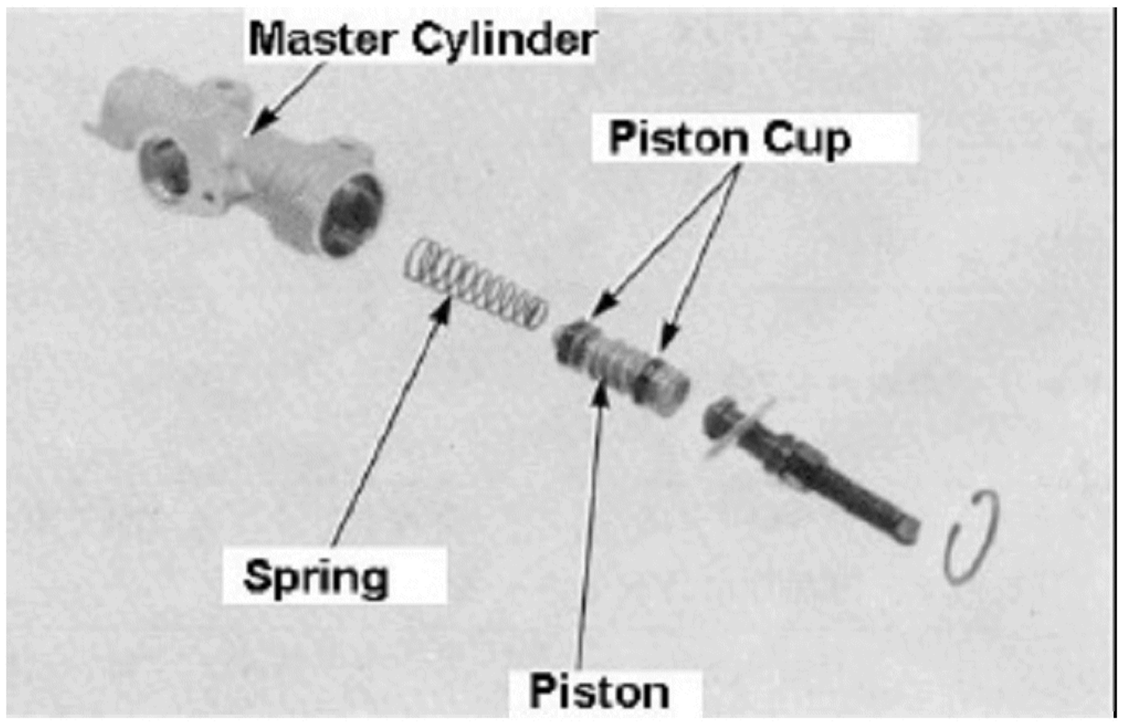
Inspect the surface of the master piston for damage and scratch.
Inspect the piston cup for wear and damage.
Measure the outside diameter of the master piston.

≦ 12.645mm → Replace



Assembly

- Make sure each part is clean before the assembly.
- Do not re-use old brake fluid.
- Replace the master cylinder piston, spring, cup and the circlip altogether.

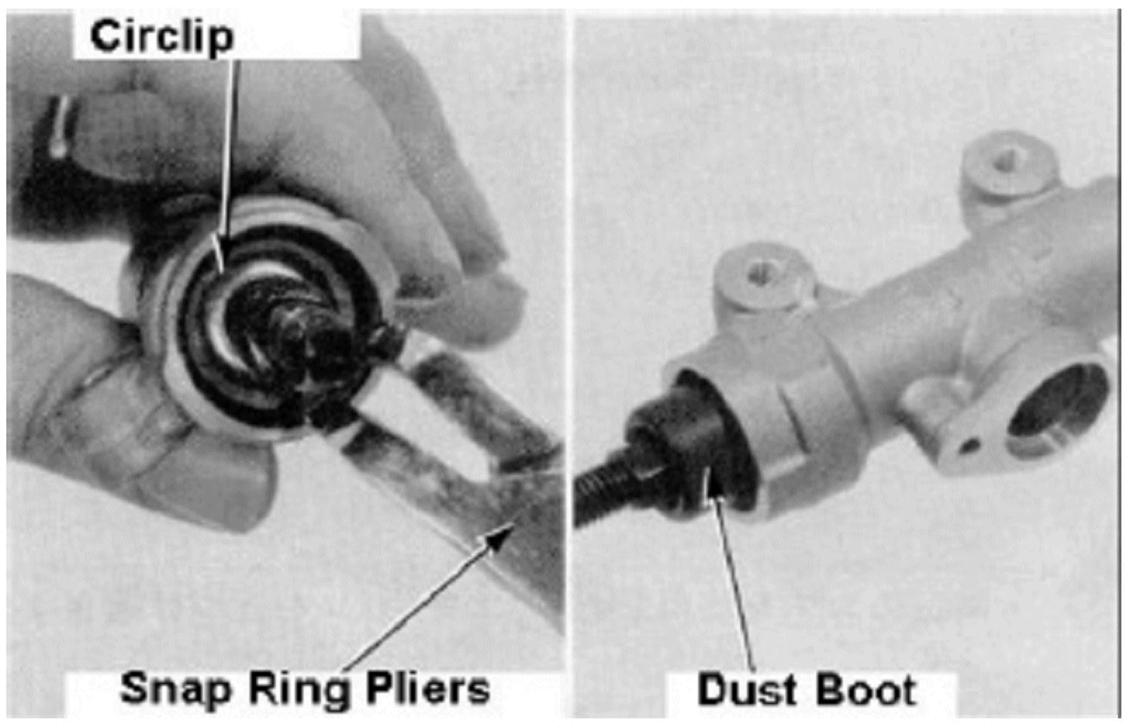


Apply brake fluid to the piston cup and attach it to the piston.
Apply brake fluid to the inner surface of the master cylinder.
Install the spring, primary cup and the piston to the master cylinder and hold with the circlip.

- Do not turn the lip over when installing the cup.
- The smaller coil diameter of the spring comes to the piston side.
- Firmly set the circlip into the groove.

Exc. tool

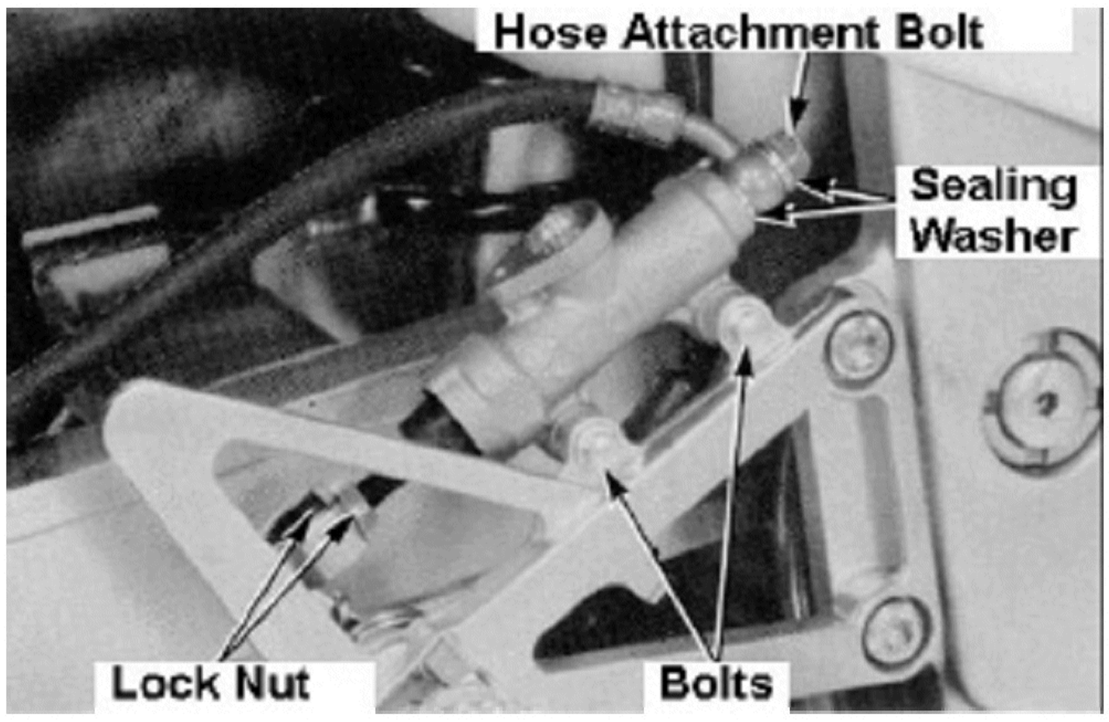
Snap ring pliers 07914-3230001



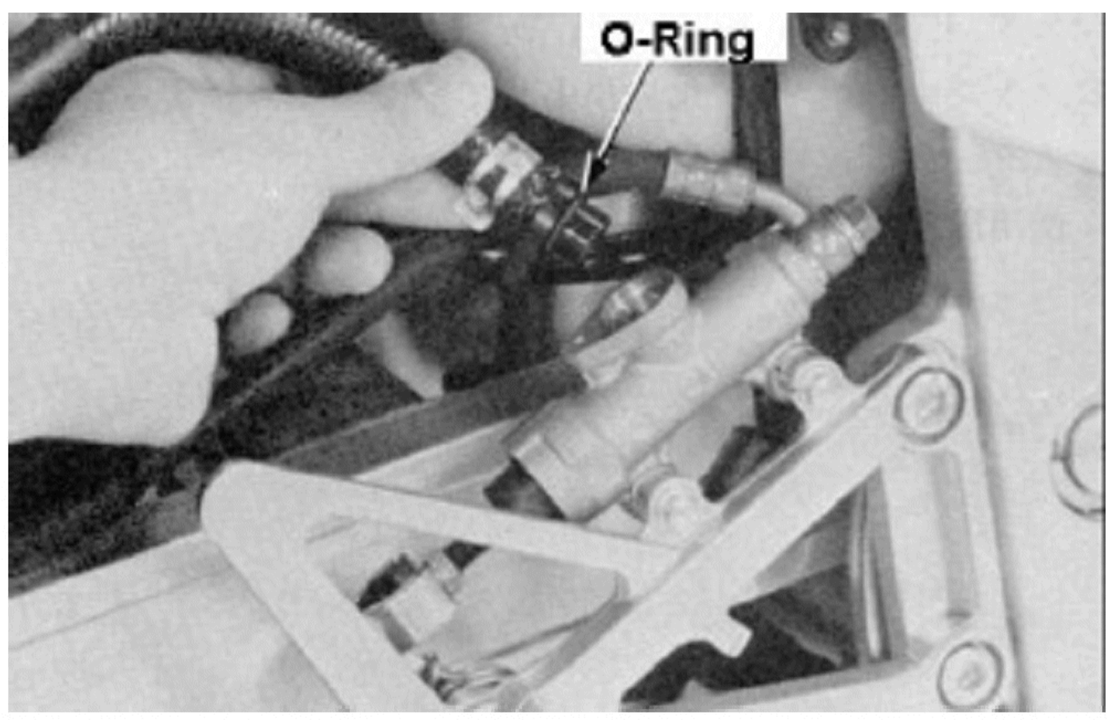
Attach the dust boot.

Install the push rod and the joint section.
Attach the master cylinder with two bolts.
Torque: 1.0 ~ 1.4kg-m

Attach the brake hose by using new sealing washers (two) and the brake hose attachment bolt.
Torque: 2.5 ~ 3.5kg-m



Attach an O-Ring to the reservoir hose and connect the hose to a master cylinder with attachment bolt.



Refill brake fluid and bleed air (21-32).

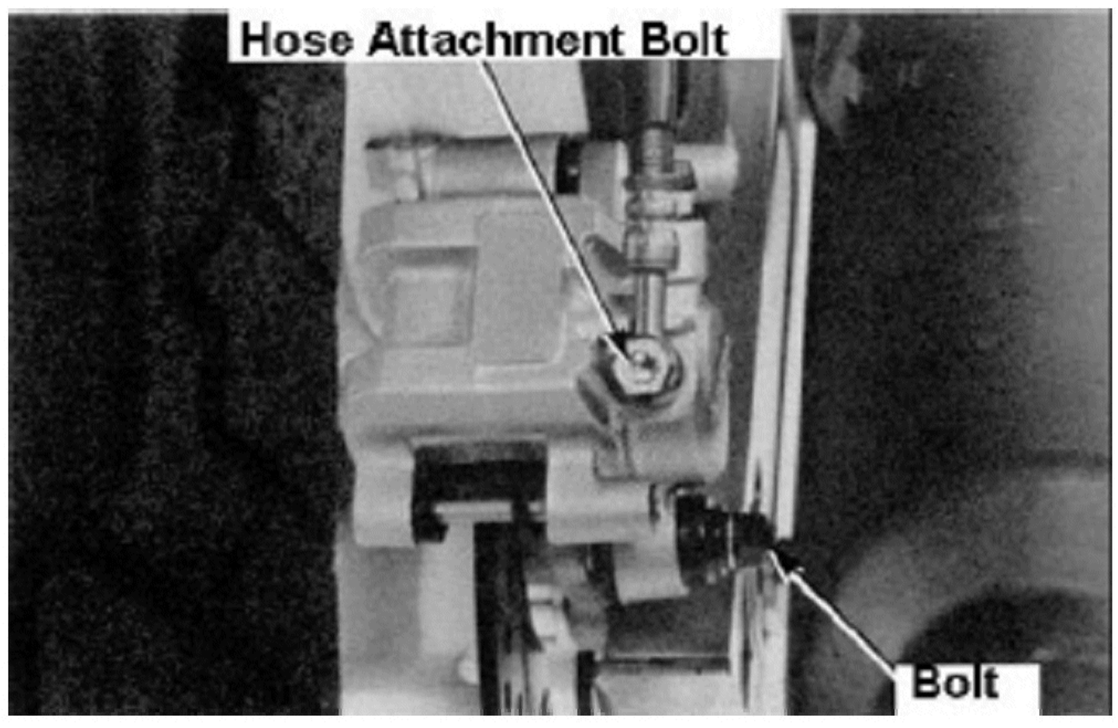
Brake caliper

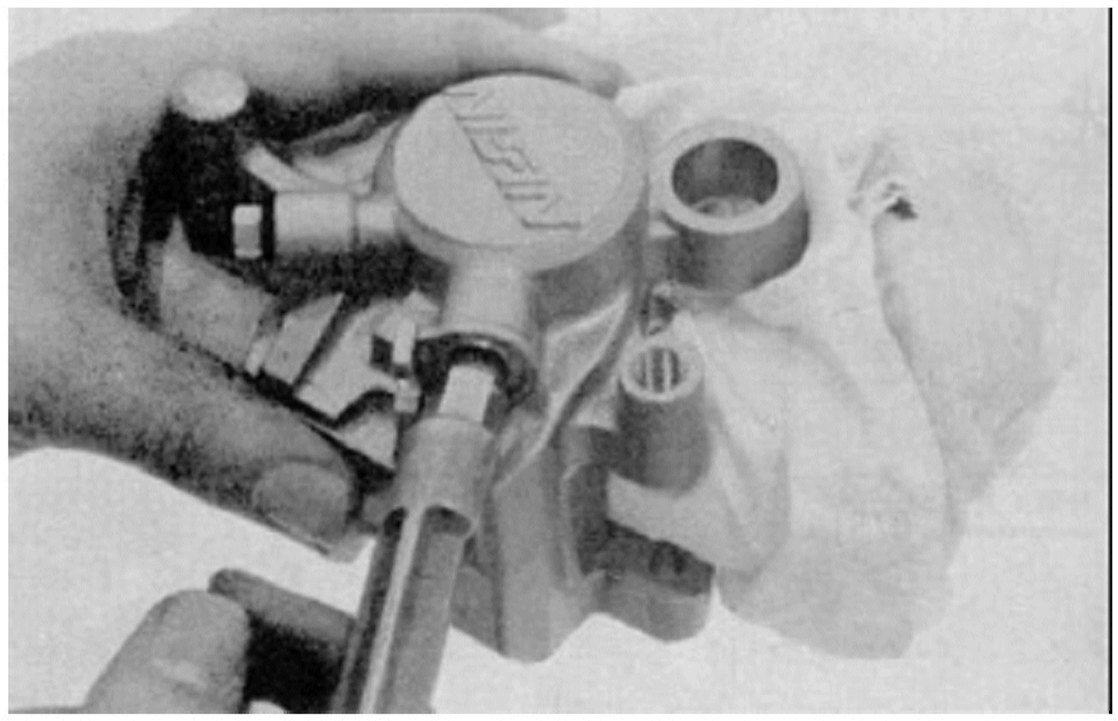
Refer to 15-9, -10, -11 for front brake caliper.

Caliper detachment / disassembly

Keep all parts away from brake fluid.

Bleed brake fluid (21-32).
Remove the brake hose attachment bolt and detach the brake hose from the master cylinder.
Remove the rear caliper attachment bolt and detach the rear caliper.
Remove the pad, pad spring, boot and the pivot collar from the caliper.
Wrap with the cloth to prevent piston and brake fluid coming out, and turn the piston downwards.
Gradually apply low pressure air from the brake hose attachment and remove the piston from the caliper.



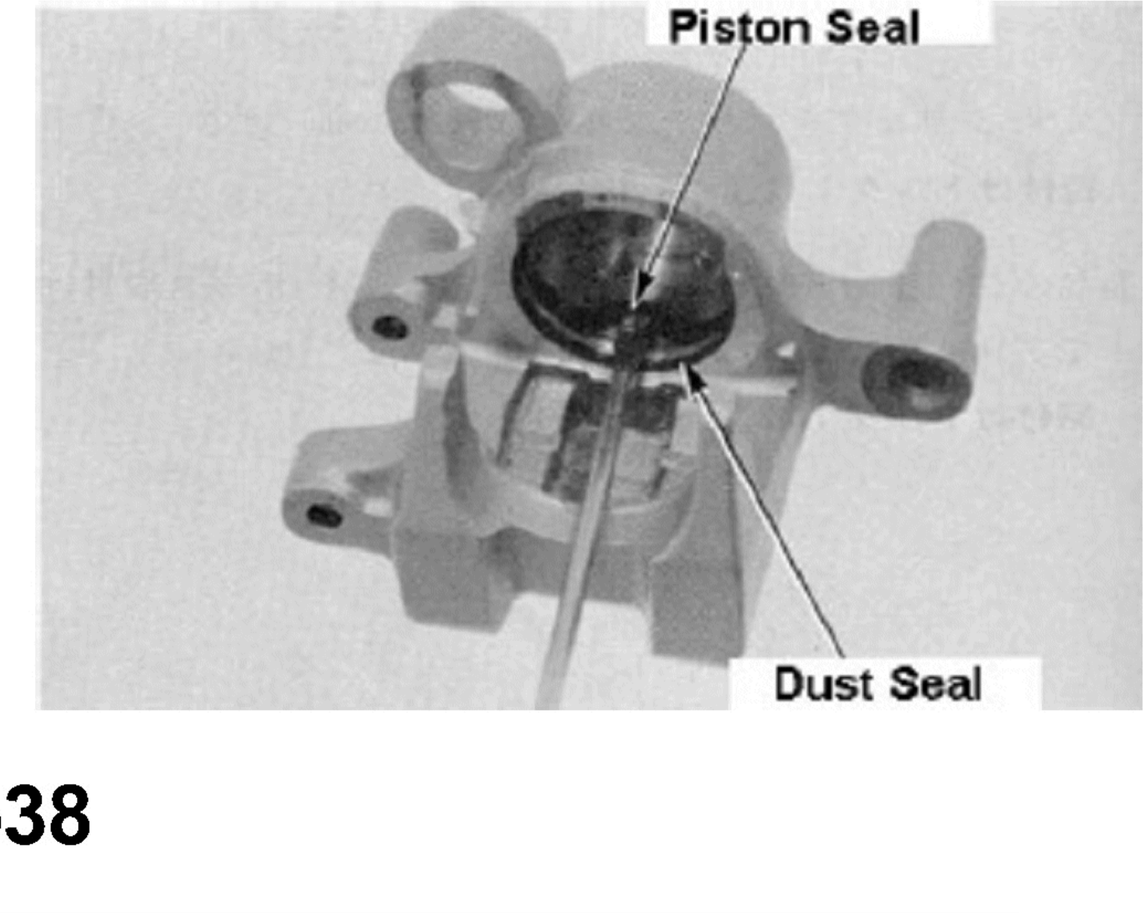


- Do not use high pressure air or bring the air gun too close.
- Do not insert your hand inside the caliper.

Remove the piston seal and adjust seal by pushing them into the piston.

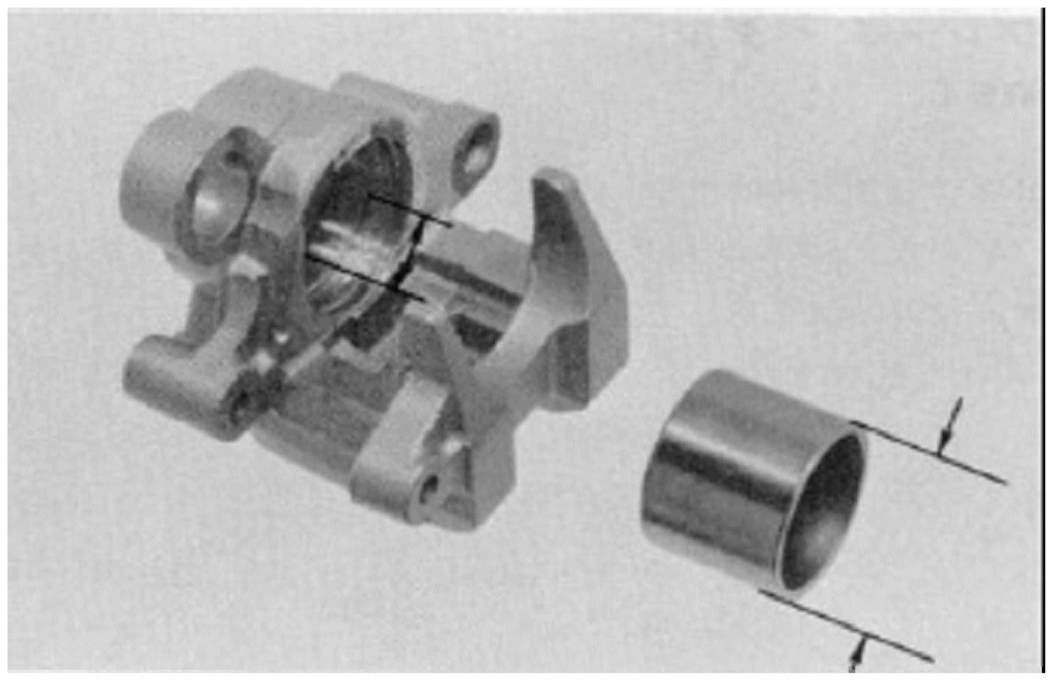
Exercise caution not to damage the inner surface of the caliper cylinder.

Clean the inner surface of the caliper with brake fluid and remove dirt from creeks.



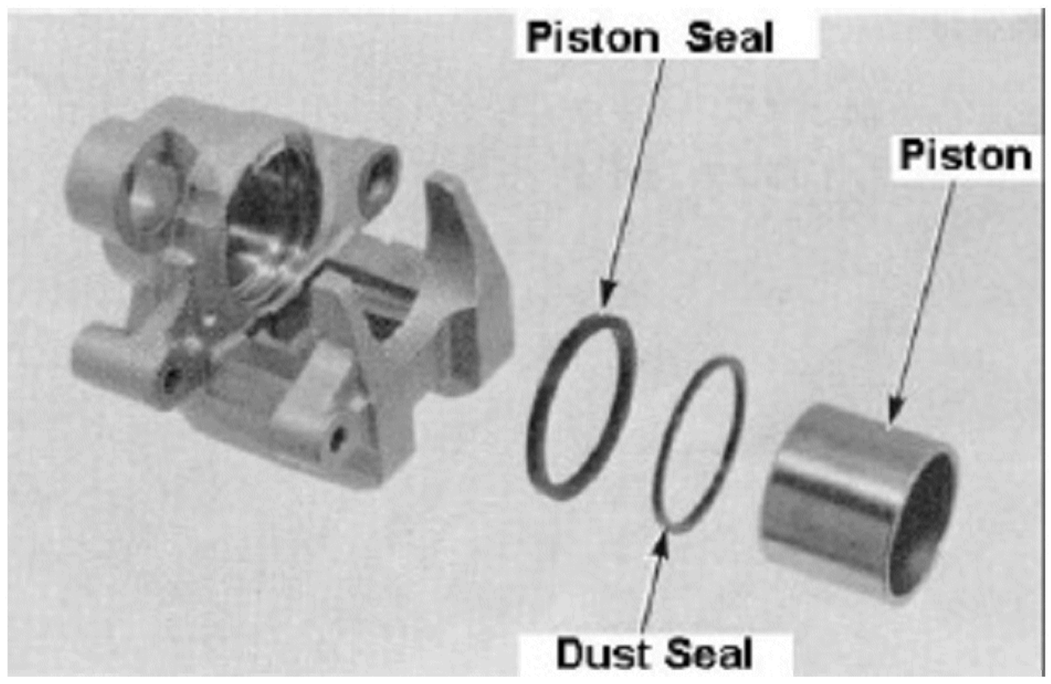
Inspection

Inspect the exterior surface of the caliper piston for damage and scratch.
Measure the outside diameter of the piston
≦ 38.105mm → Replace
Inspect the inner surface of the cylinder for damage scratches.
Measure the inner diameter of the caliper cylinder.
≧ 38.240mm → Replace



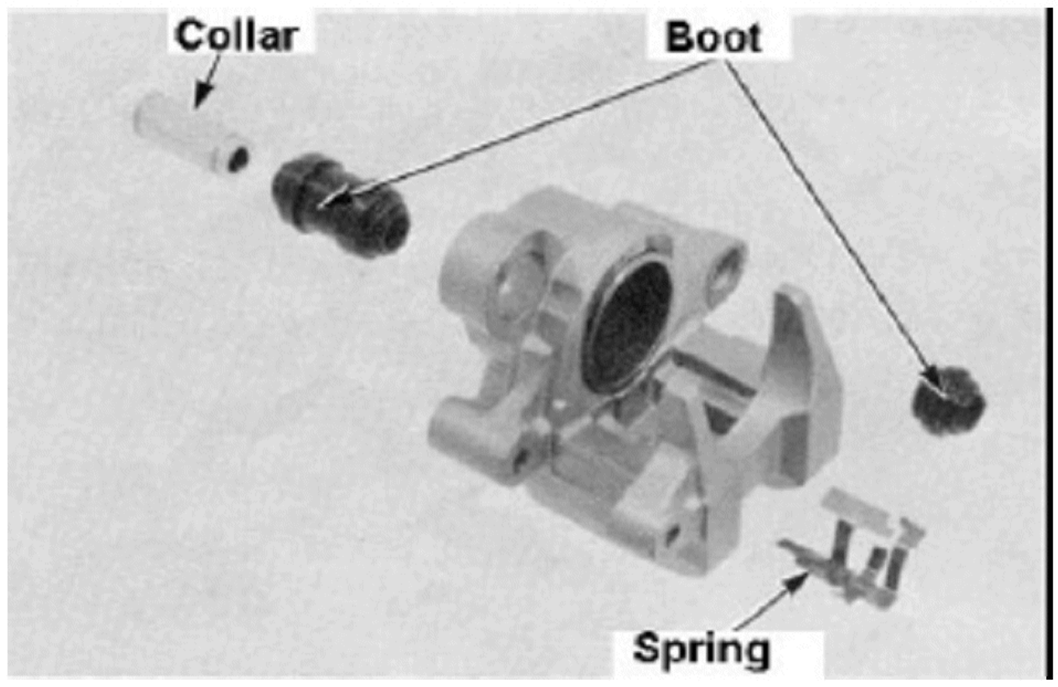
Caliper assembly / attachment

- Check all parts are clean before the assembly.
- Do not re-use old brake fluid.
- Replace the piston seal and the dust seal whenever the caliper is reassembled.



Apply brake fluid to new piston seal and dust seal and set them to the grooves on the caliper cylinder.
Install the piston to the caliper.
Attach the boot, collar and the pad spring.

- Apply silicone grease to the boot.
- Firmly set the boot to the groove on the caliper.

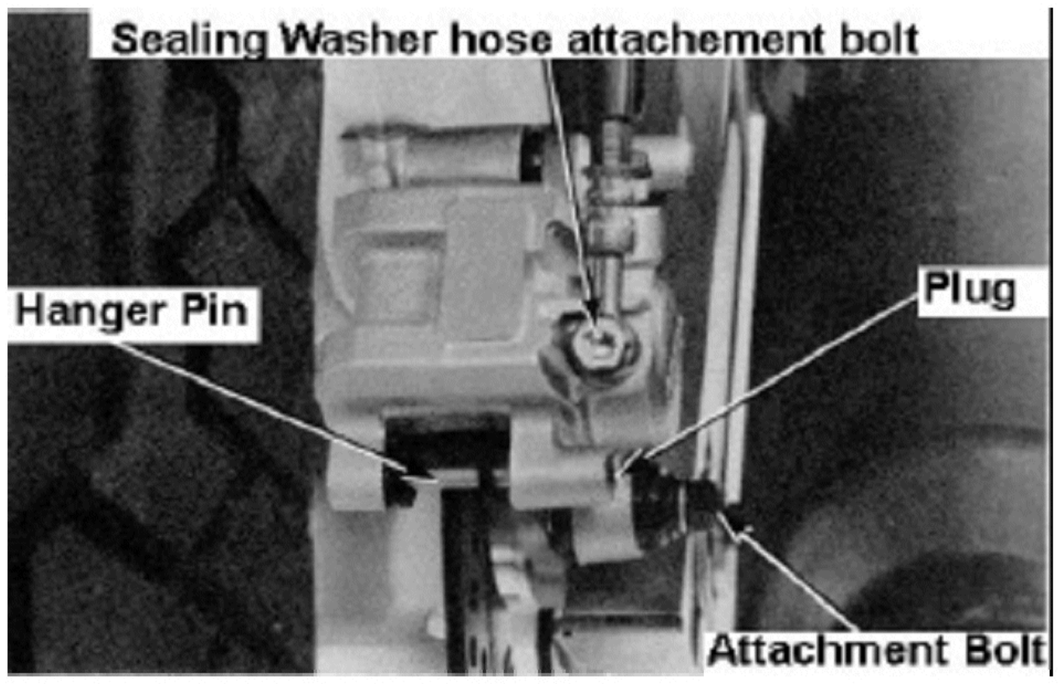


Attach brake pads to the caliper and attach the caliper to the bracket.
Set the rear caliper by tightening the attachment bolt.
Torque: 2.0 ~ 2.5kg-m

Attach the hanger pin to the caliper.
Torque: 1.5 ~ 2.0kg-m

Attach the hanger pin plug.
Torque: 0.2 ~ 0.3kg-m
Attach the brake hose with two new sealing washers and the brake hose attachment bolt.

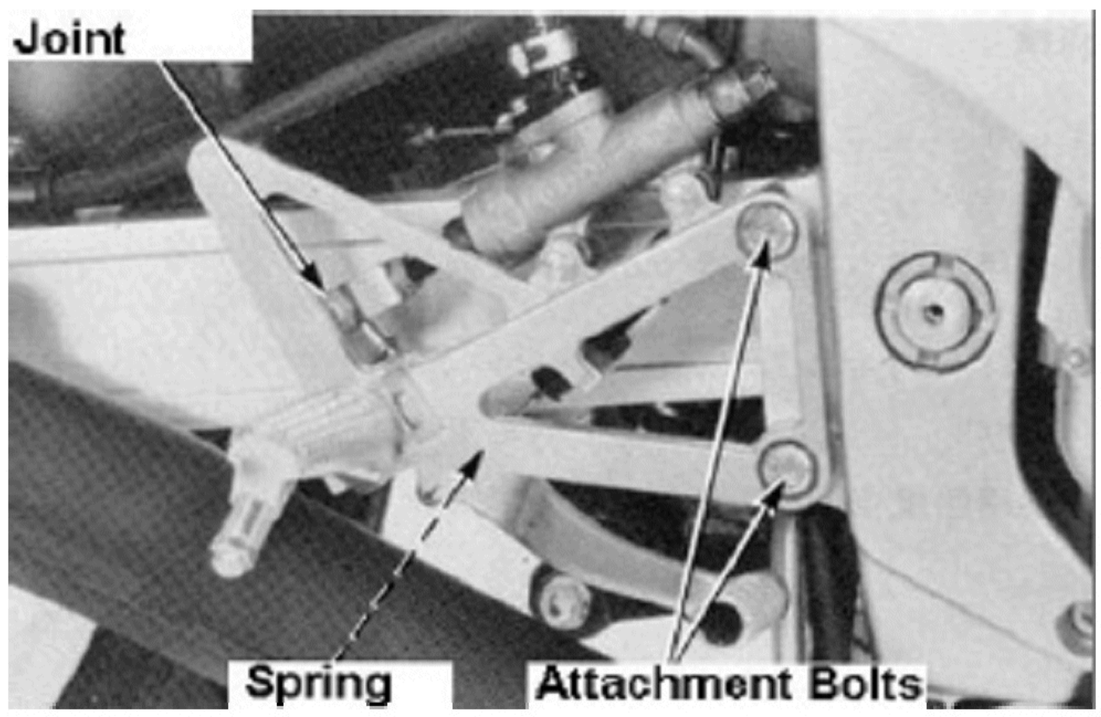
Set the hose to groove on a caliper.



Torque: 2.5 ~ 3.5kg-m
Fill brake fluid and bleed air (21-32).

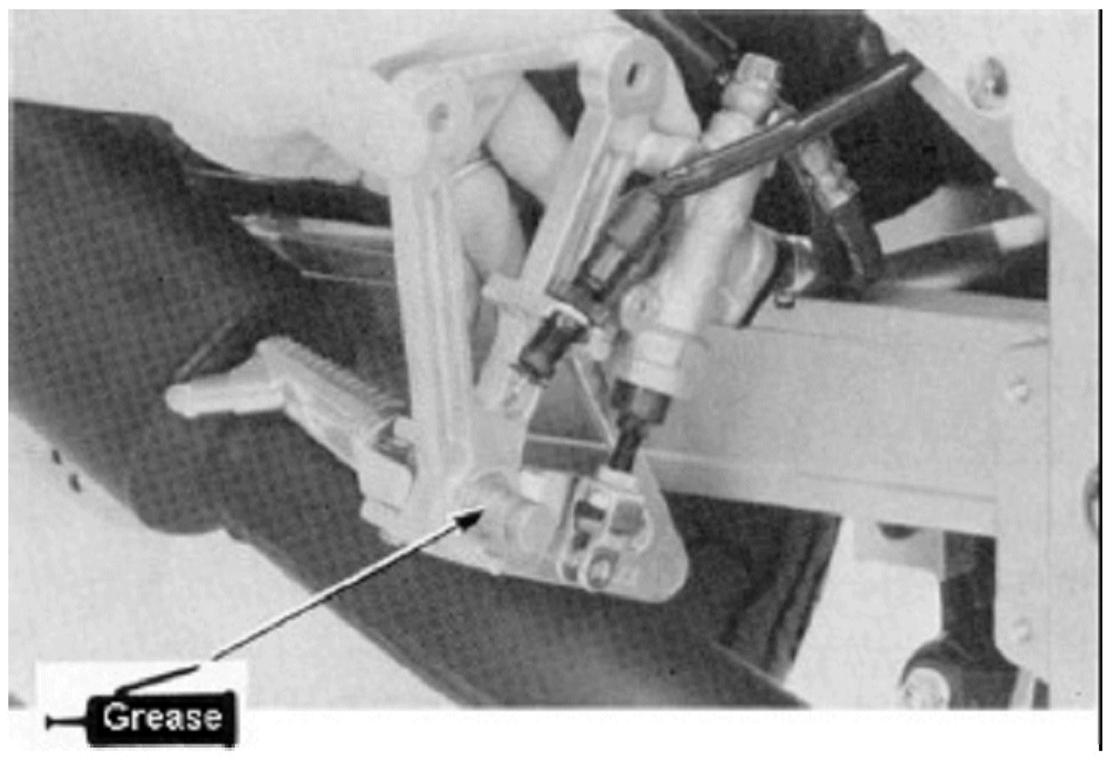
Brake Pedal
Detachment

Remove right step attachment bolts.
Remove the push rod joint from the brake pedal.
Remove the circlip and detach the pedal.
Remove the spring from the pedal.

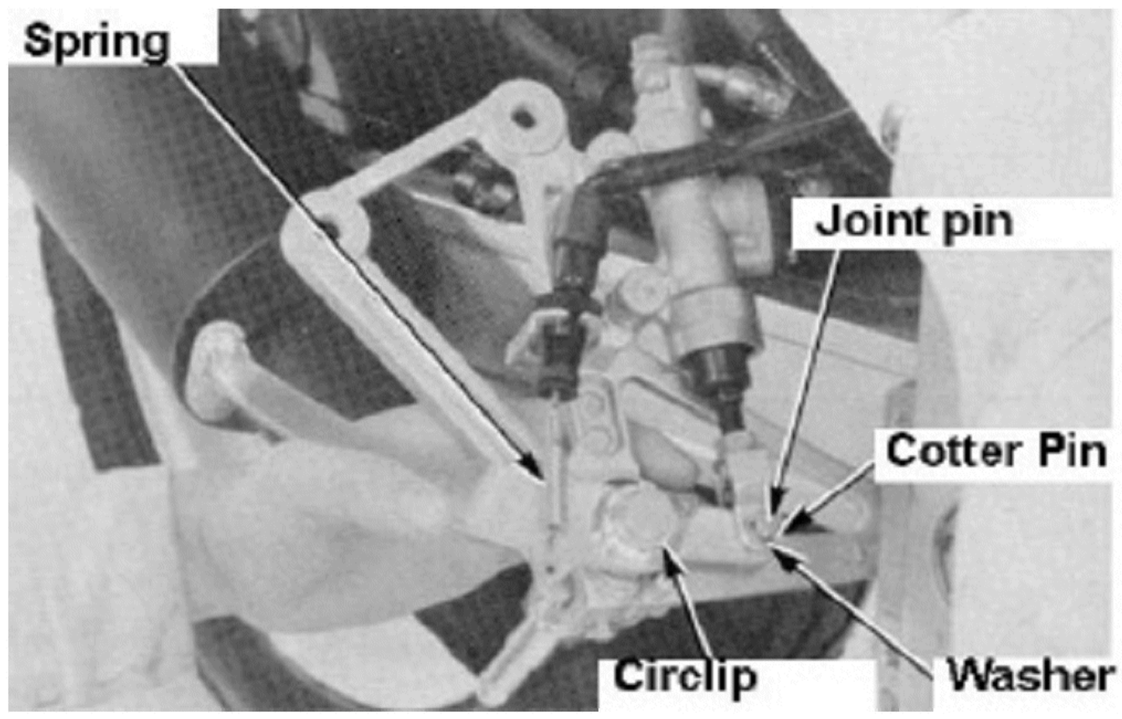


Attachment

Apply grease to the pivot and attach the brake pedal to the right step pivot.



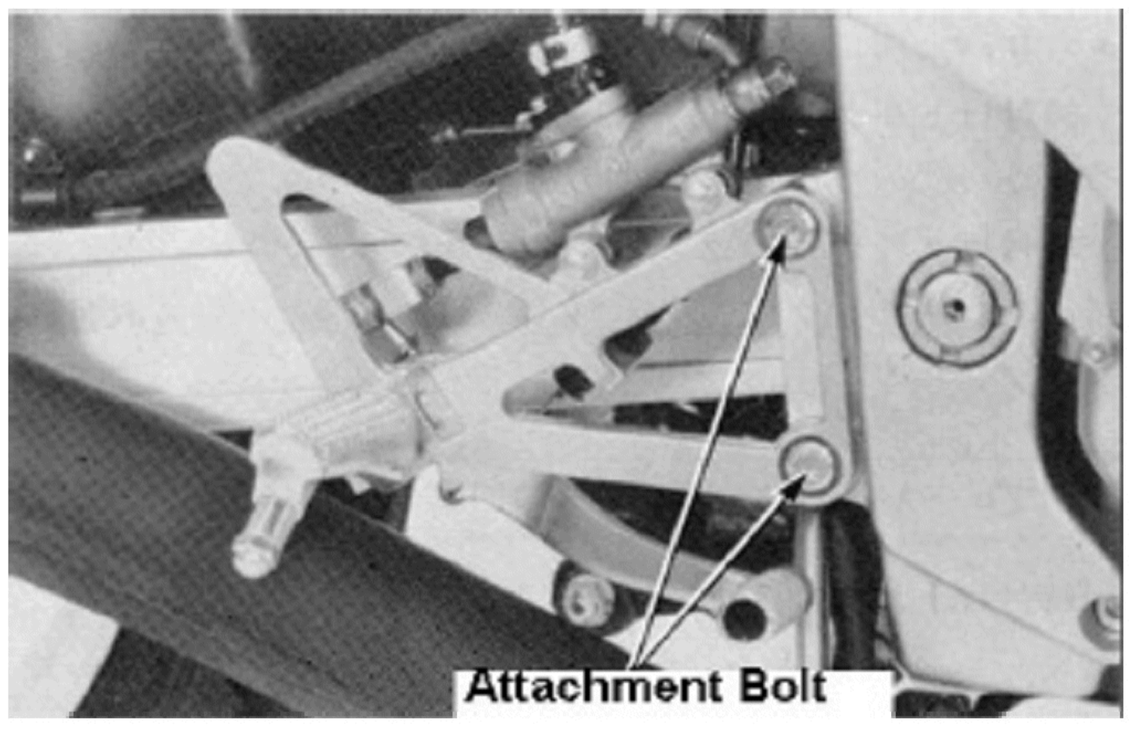
Install the spring to the brake pedal.
Install the circlip to the groove on the brake pedal pivot.
Connect the pedal and the push rod with the joint pin and attach the washer and the new cotter pin with the joint pin.



Attach the right step with two bolts.

Torque: 2.5 ~ 3.0kg-m

Adjust the height of the brake pedal (21-9).

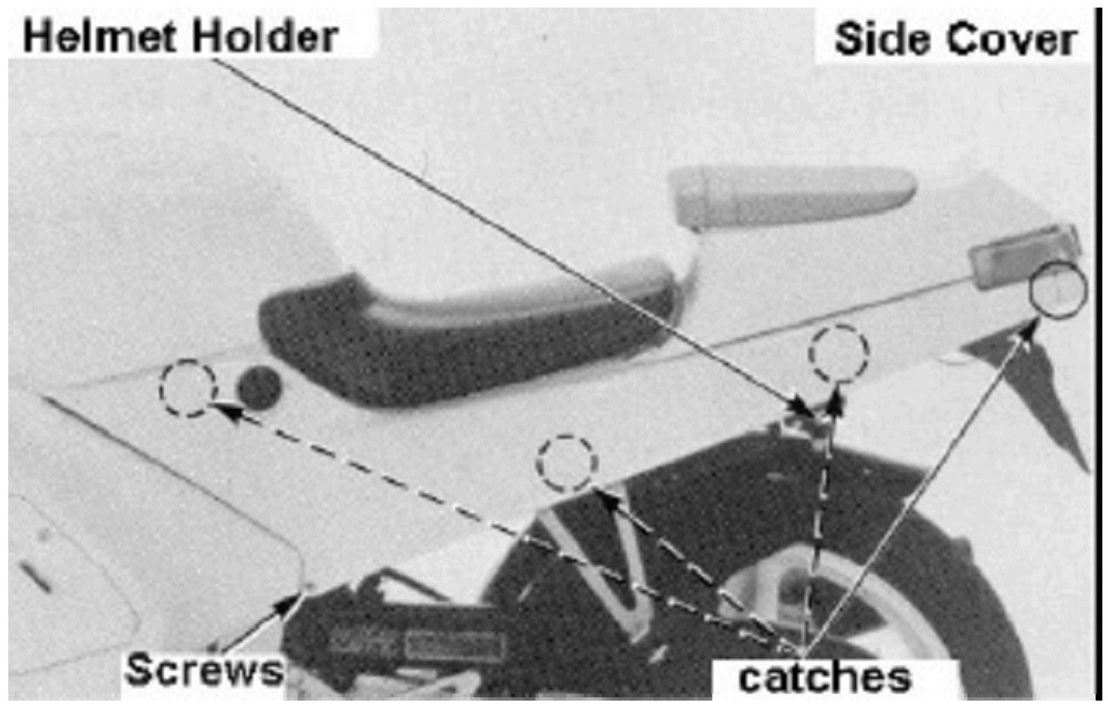


Seat Cowl

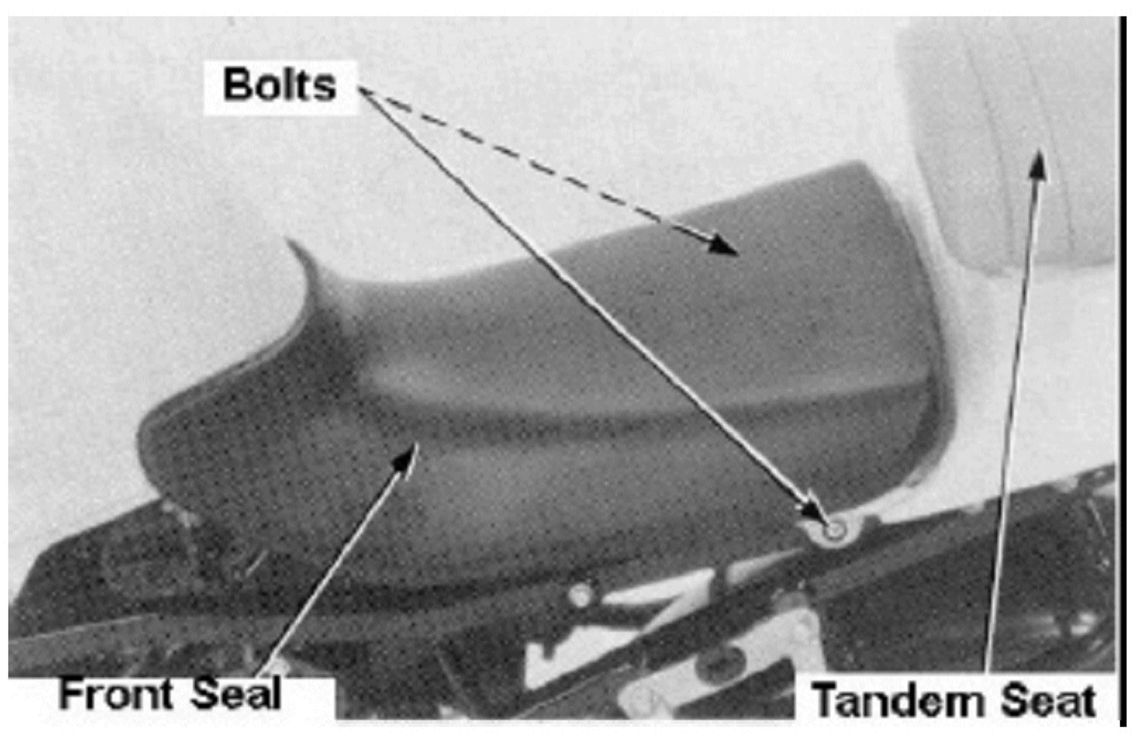
Detachment

It is not necessary to detach side covers and the front seat in order to detach only the seat cowl.

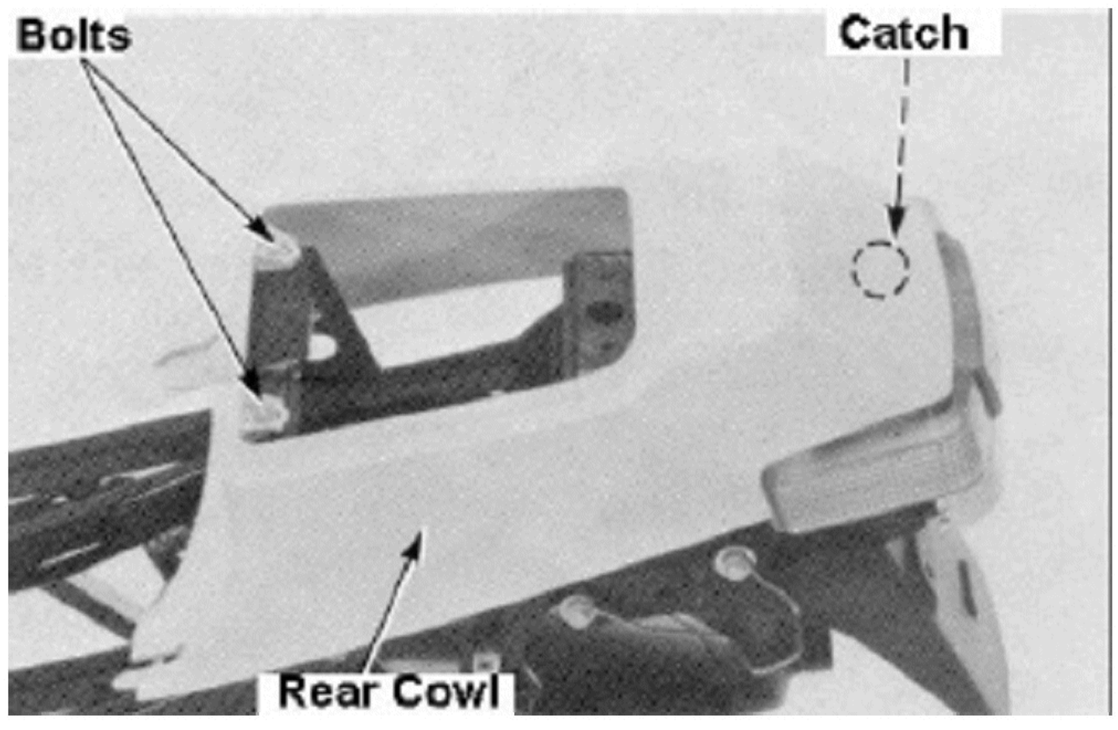
Remove side cover attachment screws.
Release four catches on the side cover and detach the side cover.



Remove two bolts and detach the front seat.
Release the lock of the helmet holder.
Lift and slide the tandem seat back.

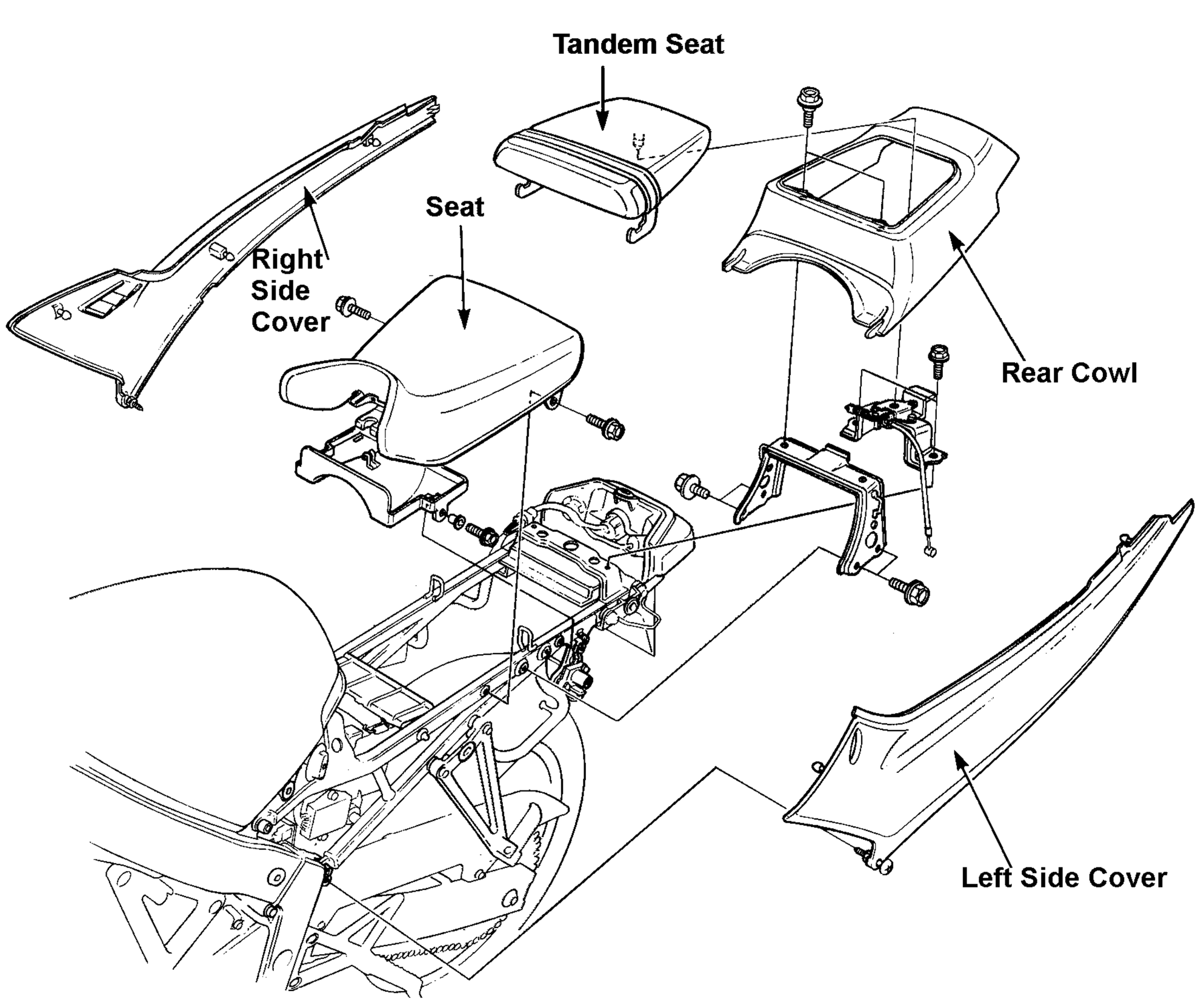


Remove two rear cowl attachment bolts and detach the rear cowl from the rear catch.



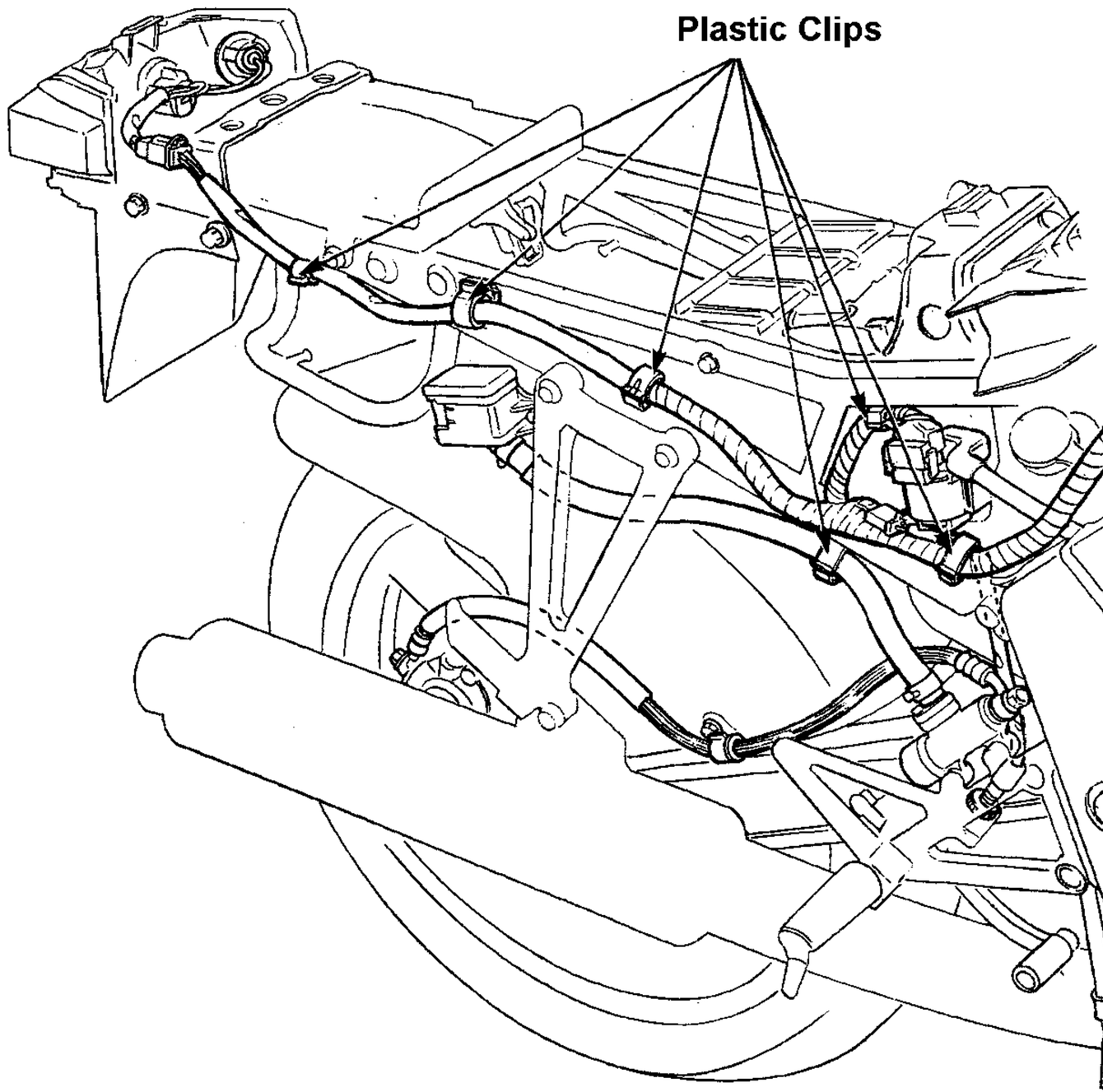
Attachment

Reverse the detachment procedure.

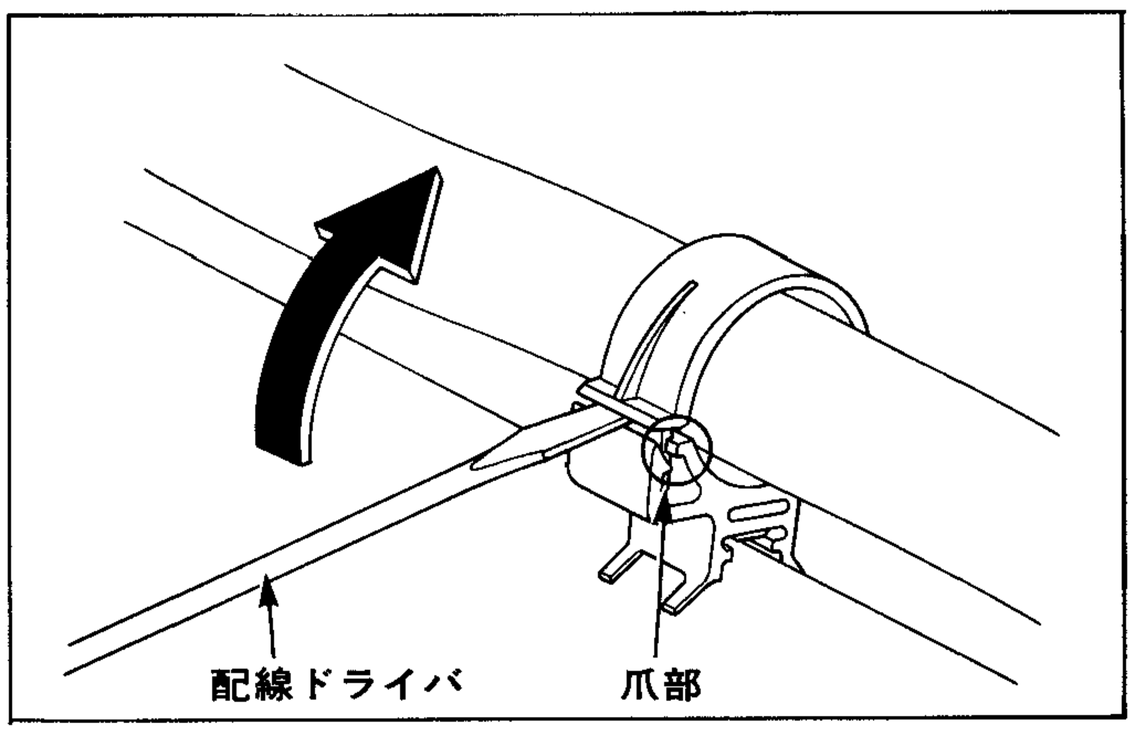


Sub Frame

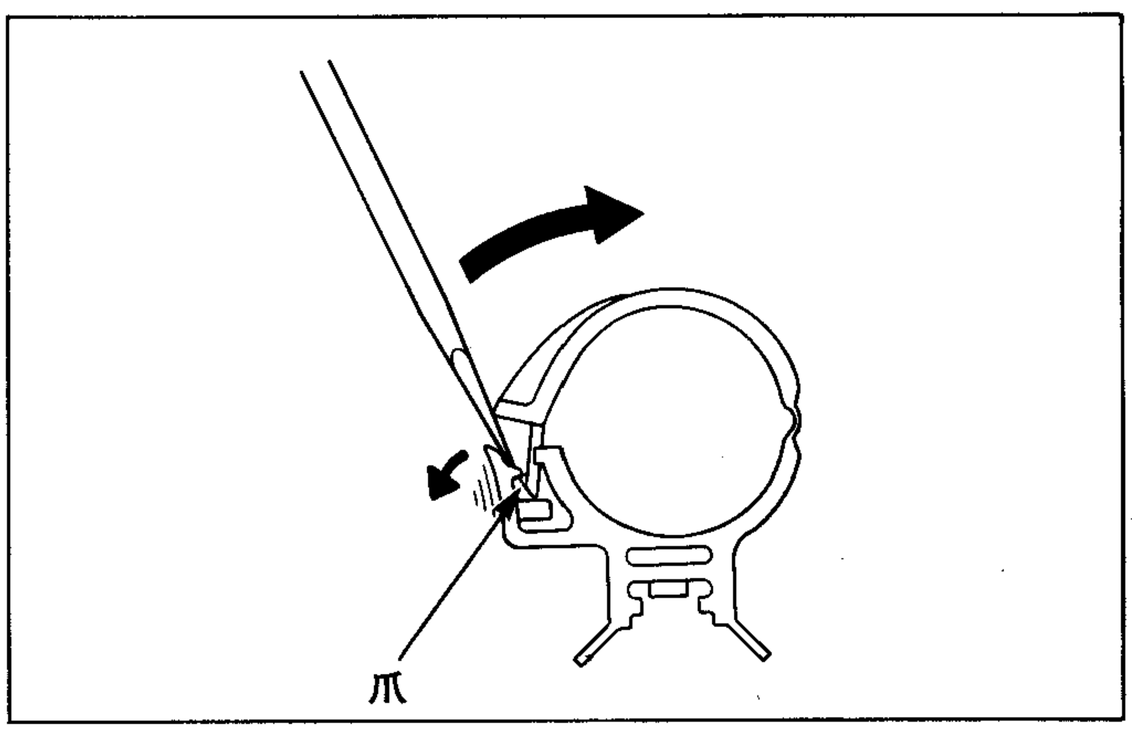
Plastic clips detachment / attachment



When detaching wire harness and hose, release the lock by opening the catch with a screwdriver.
Detach the harness and hose from the clip.
When attaching them to the clip, set them to the clip and push in until the catch is locked (“click” sound).



Replace with new clips whenever dismounted from the frame.



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CBR250R (J)

Specifications

Thick lined cells are different from CBR250FOUR / CBR250R

Type			Honda MC19
Length			2.020m
Width			0.685m
Height			1.075m
Wheelbase			1.365m
Type of powerplant			MC14E
Total displacement			0.249l
Type of fuel			Petrol
Vehicle weight	Front		77kg
	Rear		77kg
	Total		154kg
Maximum capacity			2
Gross weight	Front		94kg
	Rear		170kg
	Total		264kg
Tyres	Front		100/80 – 17 52H
	Rear		140/70 – 17 66H
Minimum clearance			0.135m
performance	Brake stop Distance (initial km/h)		14.0m (50km/h)
	Minimum Turning radius		2.9m
Powerplant	Engine start		Self start
	Type of engine		Petrol, 4 – cycle
	Cylinders		4 in-line sideways
	Combustion chamber		Pent roof type
	Valve system		DOHC gear driven Inlet 2, exhaust 2
	Bore x stroke		48.5 x 33.8mm
	Compression ratio		11.0
	Compression		13.0kg/cm² - 400rpm
	Max output		45PS / 15,000rpm
	Max torque		2.6kg-m / 10,500rpm
	Valve ops timing	IN Open	19° BTDC (1mm lifted)
		IN Close	33° ABDC (1mm lifted)
		EX Open	36° BBDC (1mm lifted)
		EX close	11° ATDC (1mm lifted)
	Valve clearance	IN	0.16mm (cooled)
		EX	0.23mm (cooled)
	Idle rpm		1,500rpm
	Lubrication	Type	Compress/splash
		Oil pump	Tocoloid
		Oil filter	Total flow filter. Net / paper filter
		Oil capacity	2.7l
Cooling			Water - cooled

Fuel system	Air cleaner			
	Fuel capacity			13 l
	Carburetor	Type		VG05
		Gas valve diameter		32mm
		Venturi diameter		28.5mm
Electrical system	Ignition	Type		Full transistor Battery ignition
		Timing		23° BTDC / 1500 rpm
		Spark plug	NGK	CR9EH-9, CR10EH-9
			ND	U27FER9, U31FER9
		Plug gap		0.8-0.9mm
	Battery capacity			12V6AH
Transmission	Clutch	Type		Multiple wet plate coil spring
		Operation		Mechanical
	Engine transmission reduction			2.966
	Gear ratio	Type		Constant Mesh
		Gear ratio	First	2.733
			Second	2.000
			Third	1.590
			Fourth	1.333
			Fifth	1.153
			Sixth	1.035
	Reduction gear	First	Gear type	
			Reduction ratio	3.176
Wheels	Front	Caster		25°00’
		Trail		89mm
	Tyre air pressure		Front	2.25kg/cm²
			Rear	2.50kg/cm²
Steering angle			Left	31°
			Right	31°
Braking system			Front	Hydraulic disk
			Rear	Hydraulic disk
Suspension System			Front	Telescopic
			Rear	Swing arm
Frame type				Backbone
Frame No.				MC19 – 1000001 ~
Engine No.				MC14E – 1000001 ~

Torque setting (only for amended parts)

Engine

Part	No.	Screw dia (mm)	Torque (kg-m)	Notes
Cylinder head (flange bolt)	12	7	2.7-3.0	
Spark plug	4	10	1.0-1.4	
Right crankcase cover cap bolt	1	14	0.8-1.2	

Frame

Part	No.	Screw dia (mm)	Torque (kg-m)	Notes
Side stand bracket	2	10	4.5-5.5	
Radiator reserve tank attachment bolt	2	6	1.0-1.4	
Fuel tank attachment bolt (front Rear)	2 1	6 8	1.0-1.4 2.4-3.0	
Air cleaner case attachment screw	6	5	0.35-0.5	
Air cleaner case attachment bolt	1	6	1.0-1.4	
Top bridge split bolt	2	8	2.0-2.5	
Front axle nut	1	14	5.5-6.5	
Front axle pinch bolt	4	8	1.8-2.5	
Front master cylinder holder bolt	2	6	1.0-1.4	
Rear cushion upper bolt	1	10	4.5-5.5	
Cushion conrod (frame side)	1	10	4.5-5.5	
Cushion arm side	1	10	4.5-5.5	
Cushion arm (rear cushion side)	1	10	4.5-5.5	
Lower cowl stay (top, R side)	1	6	0.7-1.1	
(top, L side)	1	6	1.0-1.4	
(Bottom)	4	6	0.7-1.1	
Change pedal attachment bolt	1	8	2.4-3.0	
Change arm	1	6	1.4-1.8	
Exhaust pipe joint nut	8	6	1.0-1.4	
Side cover attachment bolt	2	6	0.7-1.1	
Hook bolt	2	6	1.0-1.4	

Exclusive / common tools (amended part only)

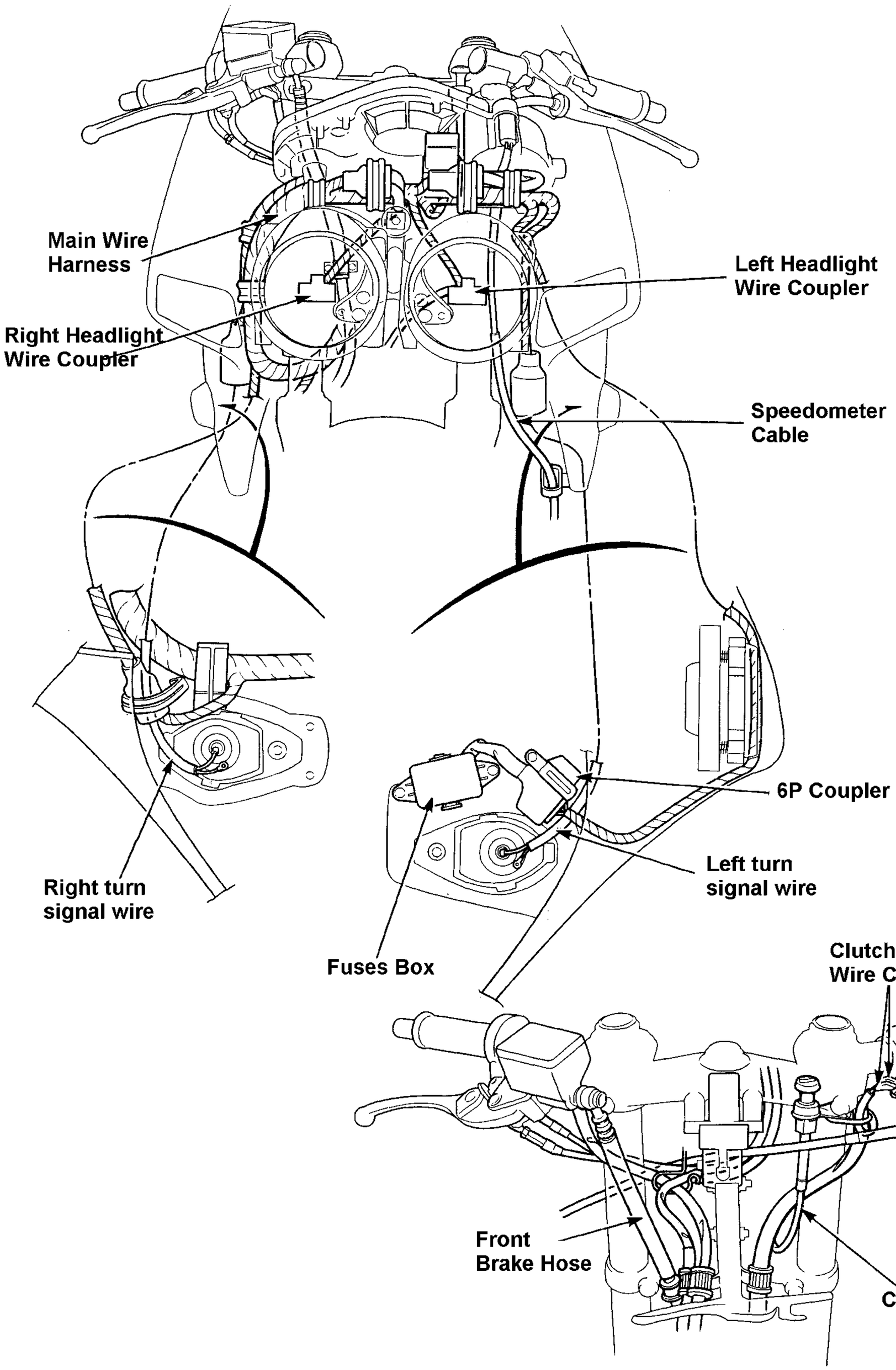
Existing exclusive tools

Tools	Tool no.	Part (Application)
Bush driver Assy	07GMD-KT80100	Rear cushion, cushion linkage swing arm
Ball lace remover set	07946-KM90001	Ball lace detach/attachment
Disassembly tool	07964-MB00200	Swing arm bearing detach/attachment

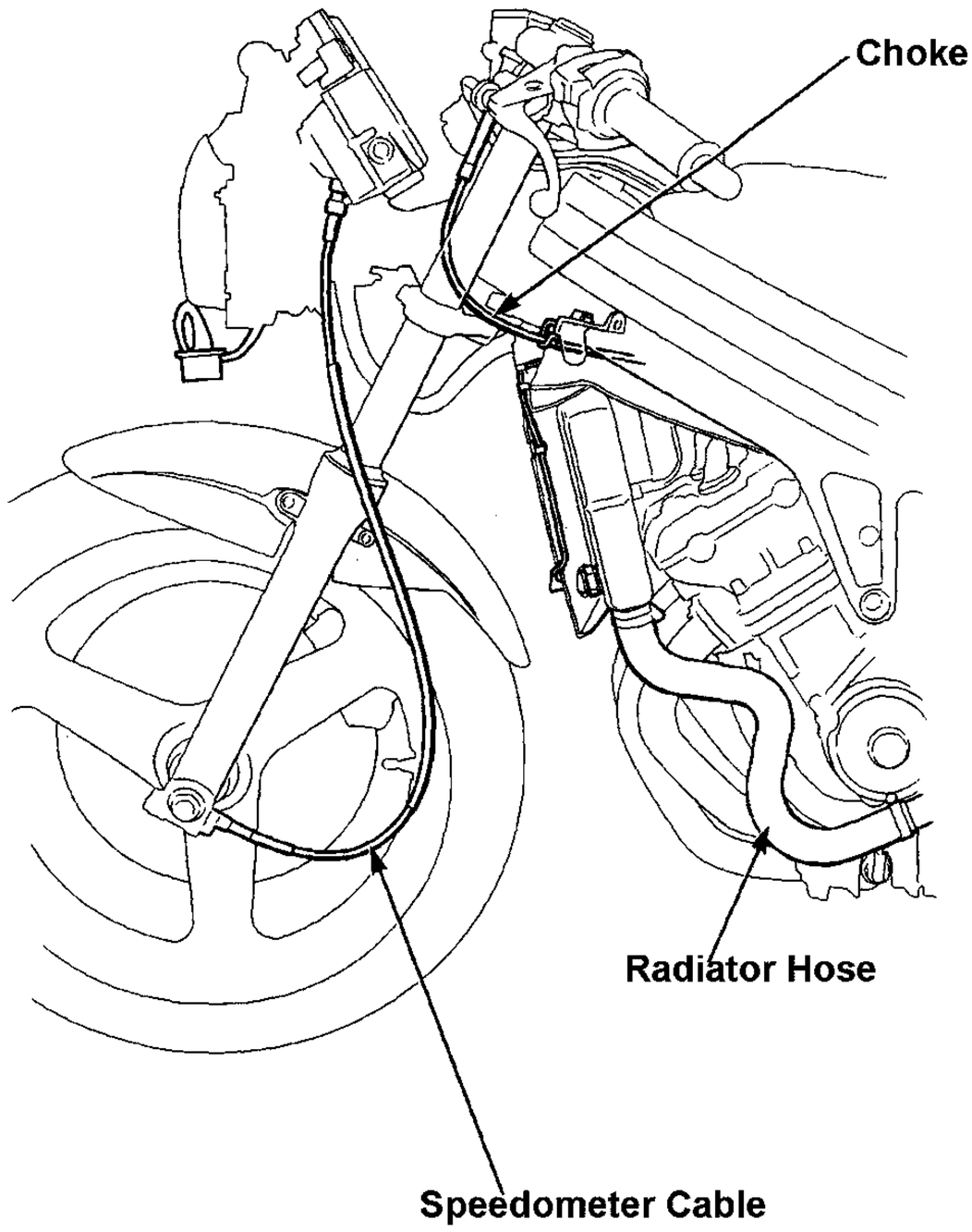
Common tools

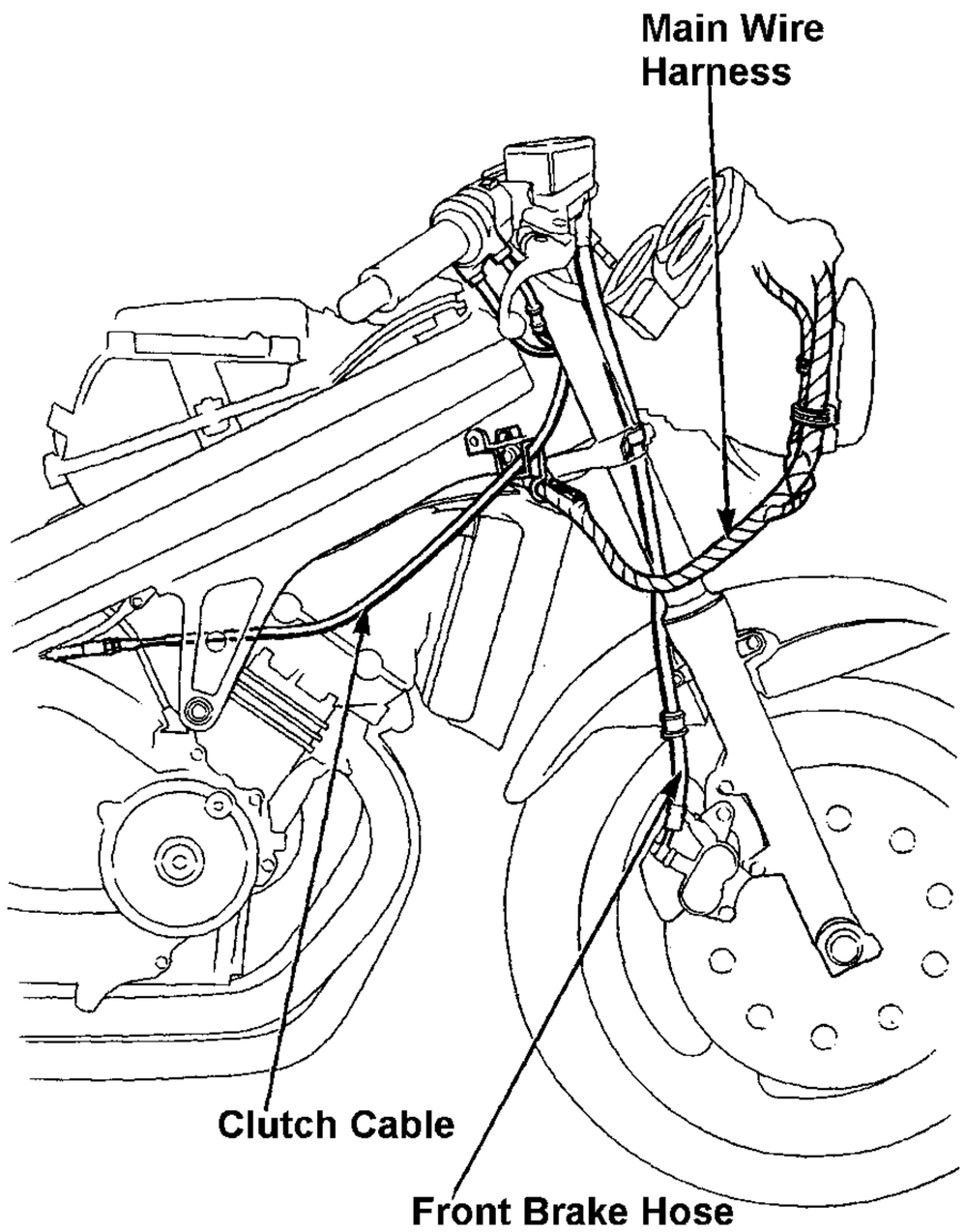
Tools	Tool no.	Part (Application)
Driver outer 42 x 47mm	07746-0010300	Front wheel R.L. bearing installation
Remover head (20mm)	07746-0050600	Front wheel R.L bearing removal
Fork seal driver attachment	07747-0010600	Front fork assembly

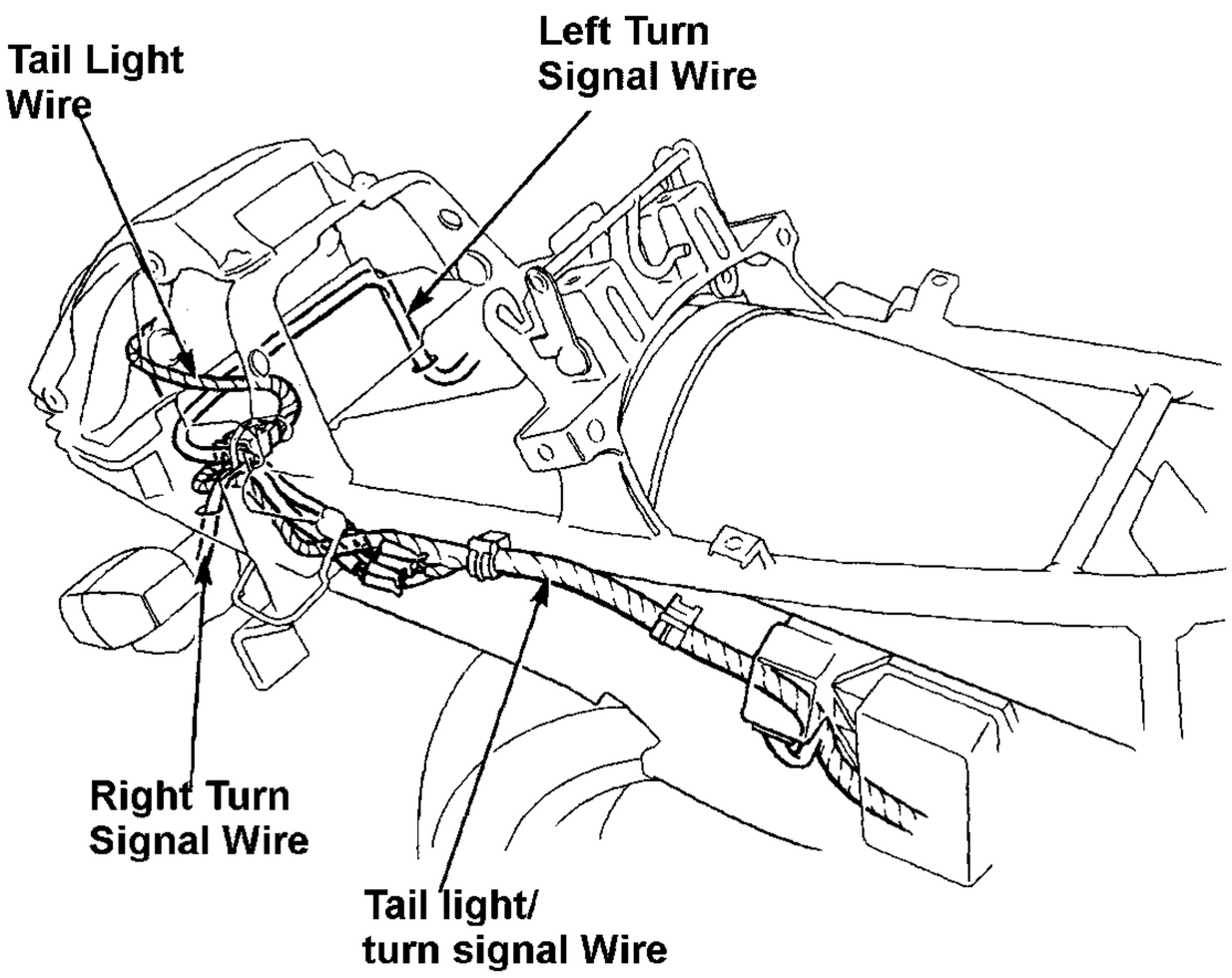
- **Wirings**


Main Wire Harness
Right Headlight Wire Coupler
Left Headlight Wire Coupler
Speedometer Cable
Right turn signal wire
6P Coupler
Left turn signal wire
Fuses Box
Clutch Switch Wire Connector
Clutch Cable
Front Brake Hose
Choke Cable

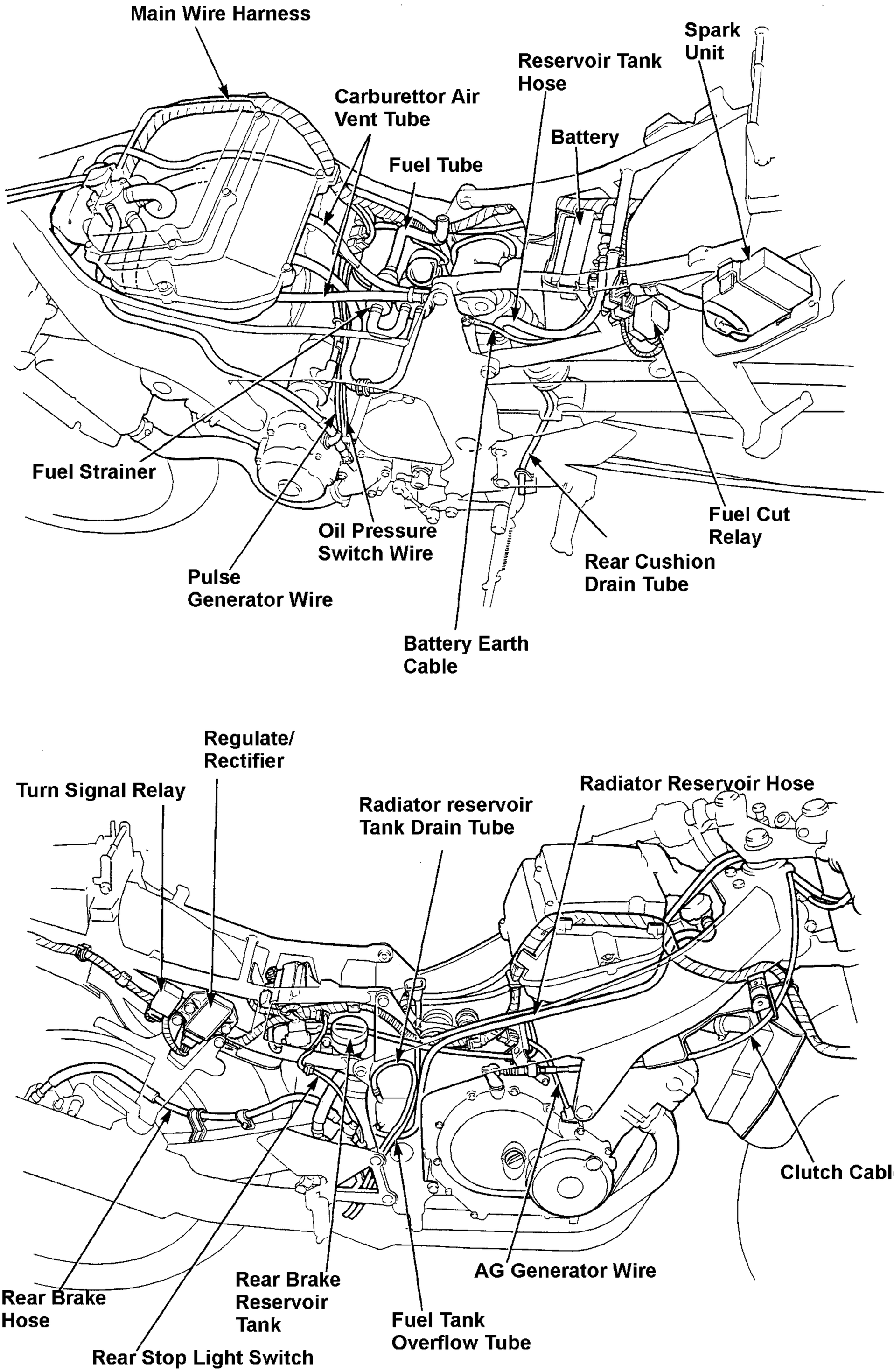
- **Wirings / Cables**



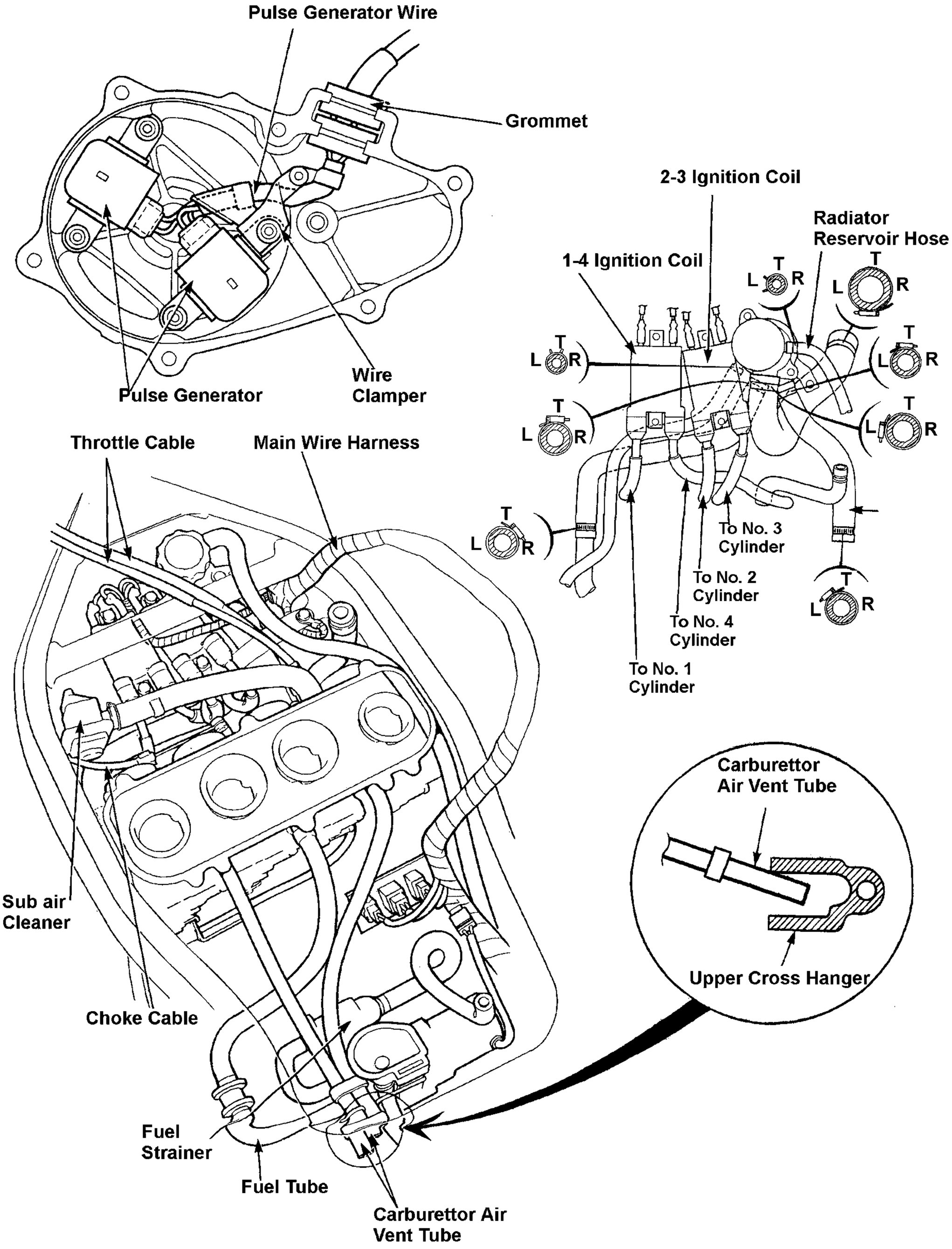




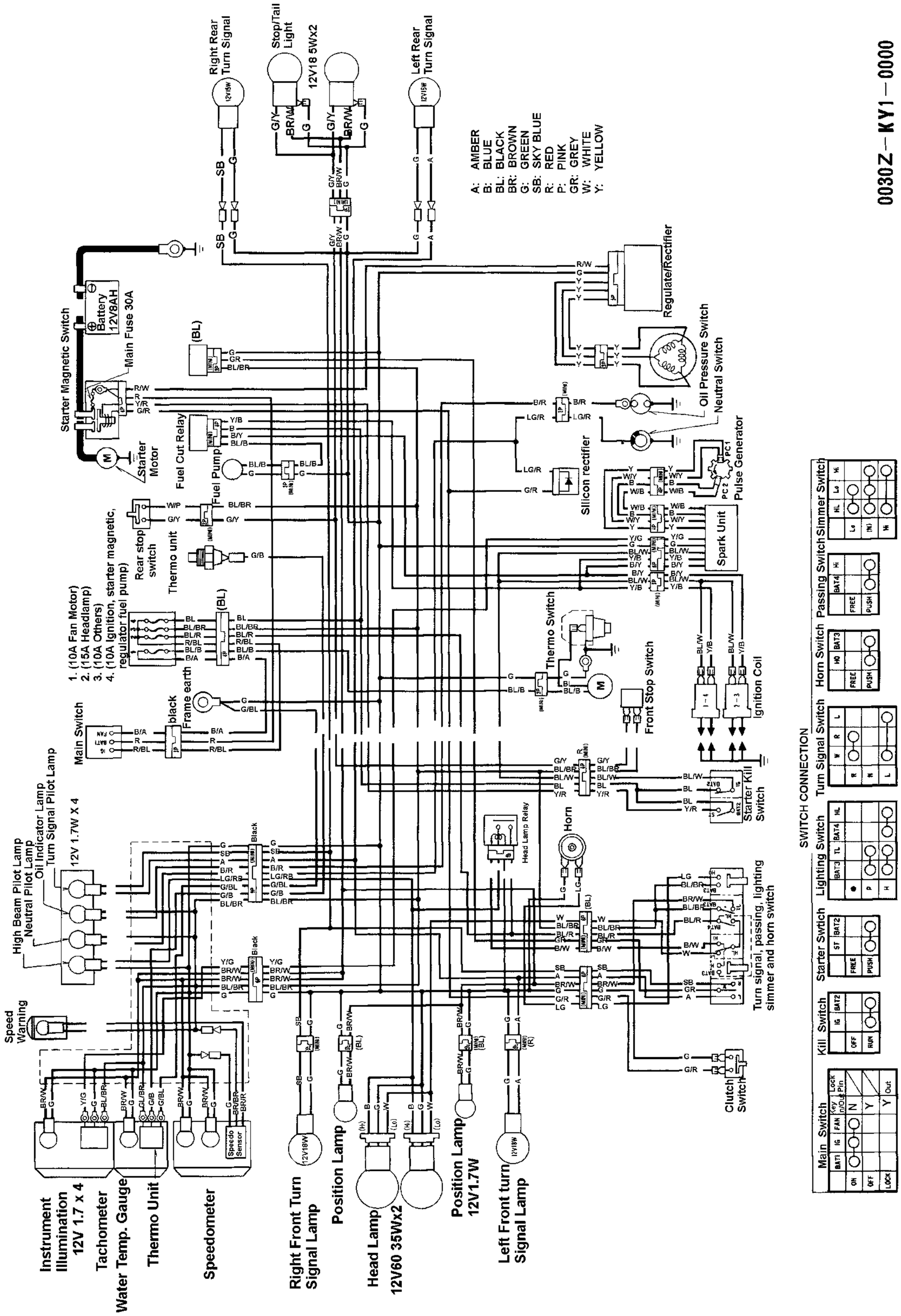
- **Wirings**


Main Wire Harness
Spark Unit
Reservoir Tank Hose
Carburettor Air Vent Tube
Battery
Fuel Tube
Fuel Strainer
Oil Pressure Switch Wire
Pulse Generator Wire
Fuel Cut Relay
Rear Cushion Drain Tube
Battery Earth Cable
Regulate/ Rectifier
Turn Signal Relay
Radiator Reservoir Hose
Radiator reservoir Tank Drain Tube
Clutch Cable
Rear Brake Hose
Rear Brake Reservoir Tank
AG Generator Wire
Fuel Tank Overflow Tube
Rear Stop Light Switch

- **Wirings**


Pulse Generator Wire
Grommet
Pulse Generator
Wire
Clamper
2-3 Ignition Coil
Radiator
Reservoir Hose
1-4 Ignition Coil
T
L
R
To No. 3
Cylinder
To No. 2
Cylinder
To No. 4
Cylinder
To No. 1
Cylinder
Throttle Cable
Main Wire Harness
Carburettor
Air Vent Tube
Upper Cross Hanger
Sub air
Cleaner
Choke Cable
Fuel
Strainer
Fuel Tube
Carburettor Air
Vent Tube

- **Wiring**


0030Z-KY1-0000
A: AMBER
B: BLUE
BL: BLACK
BR: BROWN
G: GREEN
SB: SKY BLUE
R: RED
P: PINK
GR: GREY
W: WHITE
Y: YELLOW
Right Rear Turn Signal
Stop/Tail Light
12V18 5W/x2
Left Rear Turn Signal
Battery 12V8AH
Main Fuse 30A
Starter Magnetic Switch
Starter Motor
Fuel Cut Relay
Fuel Pump
Rear stop switch
Thermo unit
1. (10A Fan Motor)
2. (15A Headlamp)
3. (10A Others)
4. (10A Ignition, starter magnetic, regulator fuel pump)
Frame earth
Main Switch
Regulater/Rectifier
Oil Pressure Switch
Neutral Switch
Silicon rectifier
Pulse Generator
Spark Unit
Thermo Switch
Front Stop Switch
Ignition Coil
Starter Kill Switch
Head Lamp Relay
Horn
Turn signal, passing, lighting simmer and horn switch
Clutch Switch
High Beam Pilot Lamp
Neutral Pilot Lamp
Oil Indicator Lamp
Turn Signal Pilot Lamp
12V 1.7W X 4
Speed Warning
Instrument Illumination 12V 1.7 x 4
Tachometer
Water Temp. Gauge
Thermo Unit
Speedometer
Right Front Turn Signal Lamp
Position Lamp
Head Lamp
12V60 35Wx2
Left Front turn Signal Lamp
SWITCH CONNECTION
Main Switch
Kill Switch
Starter Swtich
Lighting Switch
Horn Switch
Passing Switch
Simmer Switch
Turn Signal Switch

Service Data

Lubrication system

Item		Standard	Standard	limitation
Oil pump	Rotor tip clearance		0.15	0.20
	Pump body-outer rotor clearance		0.15-0.22	0.35
	Rotor-body clearance		0.02-0.07	0.10
	Pump out pressure		4.0-5.0kg/cm²(6.000rpm oil temp 60°c)	

Engine oil capacity	2.2l (oil changed). 2.4l (filter and oil changed). 2.7l (Total)
Designated engine oil	• Genuine Honda Ultra GP (4cycle motorcycle ASE10W-40 or SAE20W-50) Use the figure to find out the adequate oil viscosity level for your environment.

Fuel system

Item		Standard
Venturi diameter		Primary bore 9.1mm equivalent, Secondary bore 28.5mm
Setting mark		VG05A
Float level		8mm
Main jet		# 85
Slow jet		#35
Idling rpm		1.500 ± 100rpm
Throttle grip free play		2 – 6mm
Pilot screw re-winding		1 – 5/8 revs back
Fuel tank capacity	Total	13l
	Reserve	2l

Cooling system

Item		Standard	Limitation
Radiator cap valve opening pressure		0.95-1.25kg/cm²	0.95kg/cm² or less or 1.25kg/cm² or above →replace
Thermostat valve Opening temperature	Initial	80 - 84°c	-
	Full open	95°c	-
	Full open lift	8mm or more	-
Coolant capacity		Total 1.500cc	Radiator side 1.300cc Reservoir side 200cc

Engine Mount / Dismount

Engine weight (service)		Approx 49kg
Recommended Engine oil		Genuine Honda Ultra GP (4 cycle motor cycle SAE10W-40 or SAE20W-50 APC class SE or SF engine oil → See 3-2 for viscosity
Engine oil capacity	Total capacity	2.7l
	Oil changed	2.2l
	Oil / filter changed	2.4l

Cylinder Head, Valve

Item			Standard	Service Limit
Compression			13.0kg/cm²	-
Camshaft	Cam lift	IN	29.44-29.68	29.41
		EX	28.96-29.20	28.85
	Oil clearance	1	0.015-0.057	0.06
		2	0.015-0.057	0.06
		3	0.025-0.067	0.07
		4	0.015-0.057	0.06
	Deflection		-	0.05
Valve spring			37.3	36.3
Valve, Valve guide	Valve stem Outside diameter	IN	3.481-3.495	3.47
		EX	3.460-3.475	3.44
	Valve guide bore	IN	3.500-3.512	3.57
		EX	0.005-0.042	3.57
	Stem – guide clearance	IN	0.005-0.042	0.10
		EX	0.005-0.050	0.13
	Valve seat contact Length (span)	IN	0.8	1.3
		EX	1.0	1.5
Valve lifter	Diameter		20.010-20.026	20.035
Cylinder head	Deflection		-	0.05
	Valve lifter contact part diameter		19.978-19.993	19.970

Cylinder, Piston, Crankshaft

Item			Standard	Service Limit
Crankshaft, conrod	Conrod bigger end side clearance		0.05-.02	0.30
	Crankshaft deflection		-	0.05
	Crank pin oil clearance		0.028-0.046	0.05
	Main journal oil clearance		0.030-0.048	0.06
Cylinder	Bore		48.500-48.510	48.60
	Top surface distortion		-	0.05
	Round dimension (distortion from true circle)		-	0.005
	Cylinder distortion		-	0.005
Piston ring	Ring slit – ring clearance	Top	0.015-0.050	0.10
		Second	0.015-0.050	0.10
	Ring gap	Top	0.1-0.25	0.45
		Second	0.15-0.30	0.45
		Oil (side rail)	0.2-0.8	1.00
Piston	Piston diameter		48.47-48.49	48.35
	Piston – cylinder clearance		0.01-0.04	0.10
	Piston pin hole diameter		13.002-13.008	13.02
	Piston pin diameter		12.994-13.000	12.98
	Piston – piston pin clearance		0.002-0.014	0.04
	Conrod smaller edge bore		13.016-13.034	13.05
	Piston pin – conrod clearance		0.016-0.040	0.06

			B = Blue BR=Brown BL=Black Y=Yellow G=Green	Conrod Bore Code		
				1	2	3
				30.000-30.005mm	30.006-30.011mm	30.012-30.018mm
Crankpin	A	26.993.27.000mm		E (Y)	D (G)	C (BR)
	B	26.987-26.994mm		D (G)	C (BR)	B (BL)
	C	26.982-26.988mm		C (BR)	B (BL)	A (B)

Bearing Metal thickness

A (B) : 1.502-1.505mm
B (BL) : 1.499-1.502mm
C (BR) : 1.496-1.499mm
D (G) : 1.493-1.496mm
E (Y) : 1.490-1.493mm

			P = Pink	Case Bore		
				1	2	3
				31.000-31.005mm	31.006-31.011mm	31.012-31.018mm
Main Journal Diameter Code	A	26.993.27.000mm		E (P)	D (Y)	C (G)
	B	26.987-26.994mm		D (Y)	C (G)	B (BR)
	C	26.982-26.988mm		C (G)	B (BR)	A (BL)

Bearing Metal thickness

A : 1.508-1.511mm
B : 1.505-1.508mm
C : 1.502-1.505mm
D : 1.499-1.502mm
E : 1.496-1.499mm

Clutch AC Generator

Item		Standard	Standard	Limitation
Clutch	Clutch lever free play		10-20	-
	Clutch spring relaxed length		36	35
	Clutch disk thickness		2.9-3.0	2.6
	Clutch plate distortion		-	0.3
	Clutch outer guide bore		21.995-22.015	22.03
Oil pump drive sprocket bore			30.025-30.075	30.09
Oil pump drive gear collar		Bore	21.995-22.015	22.03
		Diameter	29.987-30.000	29.97
		Length	22.300-22.400	22.20
Main shaft diameter (clutch outer guide contact area)			21.980-21.990	21.97

Transmission

Item		Standard	Standard	Limitation
Transmission	Backlash		0.044-0.140	0.3
	Gear bore	M5	25.000-25.021	25.05
		M6	25.000-25.021	25.05
		C1	23.000-23.021	23.05
		C2	28.000-28.021	28.05
		C3	28.000-28.021	28.05
		C4	28.000-28.021	28.05
	Gear bush	M5 bore	21.985-22.006	22.07
		M6 diameter	24.959-24.980	24.92
		C1 diameter	22.959-22.980	22.92
		C1 bore	20.020-20.041	20.11
		C2 diameter	27.959-27.980	27.92
		C3 diameter	27.959-27.980	27.92
		C4 diameter	27.959-27.980	27.92
	Main shaft diameter	M5 area	21.963-21.977	21.93
		Clutch outer guide	21.980-21.990	22.20
	Counter shaft diameter	C1 area	19.987-20.000	19.77
	Gear and bush or shaft clearance	M5 – bush	-	0.10
		M5 bush-shaft	-	0.15
		M6 – bush	-	0.10
		C1 – bush	-	0.10
		C1 bush-shaft	-	0.15
		C2 – bush	-	0.10
		C3 – bush	-	0.10
		C4 – bush	-	0.10
	Shift Fork	Catch thickness	5.93-6.00	5.60
		Bore	12.000-12.021	12.04
	Shift fork shaft	Diameter	11.960-11.971	11.90

Front wheel, Suspension and Steering

Item		Standard	Limitation
Front axle runout		-	0.2mm
Front wheel rim deflection	Radial	-	2.0mm
	Side	-	2.0mm
Front cushion spring relaxed length		303mm	297mm
Front fork pipe bent		-	0.2mm
Front fork oil capacity	Standard	362±2.5cc	-
	Fully compressed	95±6mm	-
Front fork air pressure		0-0.4kg/cm²	-

Rear wheel, Brake, Suspension

Item		Standard	Limitation
Rear axle bent		-	0.2mm
Rear wheel rim deflection	Radial	-	2.0mm
	Side	-	2.0mm
Rear cushion damper compression		12.3-16.0kg	9.8kg
Rear cushion spring attachment length		162.3mm	-
Rear cushion spring relaxed length		172.1mm	168.7mm

Brake System (Disk Brake)

Item Standard	Standard	Limitation
Brake disk thickness	4.8-5.2	4.0
Brake disk deflection	-	3.0
Front master cylinder bore	11.000-11.043	11.055
Rear master cylinder bore	12.700-12.743	12.755
Front master piston diameter	10.957-10.984	10.945
Rear master piston diameter	12.657-12.684	12.645
Front caliper cylinder bore	27.00-27.05	27.06
Rear caliper cylinder bore	27.00-27.05	27.06
Front caliper piston diameter	26.918-26.968	26.91
Rear caliper piston diameter	26.918-26.968	26.91

Battery Alternator

Item		Standard
Battery	Capacity	12V 6AH
	Charging current	0.6A (10H)
	Discharging voltage	13.0 – 13.2V (20°c)
Charging commencement rpm (Headlamp – ON low beam selected)		1,900 RPM
Regulate / Rectifier	Type	= non-contact point
	Regulated voltage	14.0-15.0V
AC alternator coil resistance		0.3-0.4 Ω (20°c)
AC alternator performance		18.5A/5.000rpm

Ignition System

Item			Standard	
Spark plug			NGK	ND
			CR9EH-9	U27FER-9
			CR10EH-9	U31FER-9
Spark plug clearance			0.8-0.9mm	
Timing	" F " marking		23°c BTDC / 1.500rpm	
Ignition coil Resistance (20°c)	Primary coil		2.52 – 3.08 Ω	
	Secondary coil	With high tension lead	11.7k – 14.3k Ω	
		Without high tension lead	11.7k – 14.3k Ω	
Pulse generator coil resistance (20°c)			315 – 385 Ω	

Self Starter System

Item	Standard	Standard	Limitation
Starter Motor	Brush spring tension	630-850g	-
	Brush length	11.00-11.05mm	4.5mm

Lamp, Instruments and Switches

Item	Standard
Headlamp bulb	12V60/35W x 2
Front turn signal bulb	12V 18W
Rear turn signal bulb	12V / 5W
Stop / Tail lamp bulb	12V18 / 5W x 2
Pilot lamps (excluding the speed warning)	12V 1.7W x 4
Speed warning lamp	12V 3.4W
Tachometer, water temp gauge illuminator bulb	12V 1.7W x 2
Speedometer illuminator bulb	12V 1.7W x 2
Main fuse	30A
Headlamp sub fuse	15A
Other fuses	10A x 3

Inspection Adjustment
Service System

(Notes):
1. Inspection items include high speed operation.
2. (●) indicates the schedule set by regulation and (O) indicates manufacturer recommendation.
3. (✯) indicates security replacement.
   However, the schedule is set to ordinary vehicles. If the operating environment is significantly different, adjust the interval.
4. "High speed operation" is defined as approx 80km/h or higher.

Items to be serviced			Schedule: Before operation	Schedule: After 1 month	Schedule: Private 6 month	Schedule: Private 12 month	Notes
Steering System	Steering handle	Free play / fitting				●	
		Operation				●	
	Steering wheel	Steering angle				●	
	Steering fork	Damage			●	●	
		Fork, spindle attachment			●	●	Steering stem
		Fork, spindle bearing looseness				●	Steering stem
Brake pedal		Free play and clearance between mounting bracket			●	●	Free play: Front brake lever edge 10~20mm Rear brake pedal 10~20mm
		Pedal size and effectiveness	●				
		Brake effectiveness		O	●	●	
Hose /pipe		Leak, damage and attachment		O	●	●	
		Brake hose replacement					✯
Braking System	Reservoir tank	Quantity	●		●	●	Fluid level (min) Front: at least at the lowest level Rear: between min – max level
	Master, wheel cylinder caliper	Function wear and damage				●	
		Master cylinder, wheel cylinder cup, dust seal and disk caliper rubber parts					✯ Biannual replacement
	Brake disk pad	Disk / pad clearance			O	●	
		Pad wear				●	Indicator type
		Disk wear / damage				●	Standard: Front 5.0mm Thickness: Rear 5.0mm Limitation: Front 4.0mm Rear 4.0mm
	fluid	Brake fluid damage					✯ Annual
Wheels		Tyre air pressure	●		●	●	1 person / Normal: Front 2.25, Rear 2.25 1 person / High speed: Front 2.25, Rear 2.25 2 people / Normal: Front 2.25, Rear 2.50 Tyre / Type: Front 100-80 17-52H, Rear 140-70 17-66H

Items to be serviced			Schedule				Notes
			Before operation	1 month	Private 6 month	Private 12 month	
Wheels	Wheel	Tyre crack	●		●	●	
		Tyre markings and wear	●		●	●	Tread depth - Front 0.8mm - Rear 0.8mm
		Debris on tyres	●		●	●	
		Wheel nut / bolt			●	●	Axle nuts and holders Front axle holder, torque 1.8~2.5kg-m Front axle torque 5.5~6.5kg-m Rear axle nut torque 8.0~10.0kg-m
		Rim, side ring and wheel disk damage				●	Wheel rim deflection at rim end Front wheel rim side 2.0mm or less radial 2.0mm " Rear wheel rim..... side .2.0mm " radial 2.0mm "
		Front wheel bearing fit				●	
		Rear wheel bearing fit				●	
Shock Absorber	Cushion spring	Damages				●	Cushion spring
	Suspension arm	Joint fit and arm damage				●	
	Shock absorber	Oil leak and damage				●	
		Attachment fit				●	
Transmission	Clutch	Lever free play			●	●	Free play at lever end 10-20mm
		Operation		O	●	●	
	transmission	Oil leak and quantity			●	●	Dipstick type between min-max.
		Shift Lever fit				●	
	Chain and Sprocket	Chain tension			●	●	When using sidestand, between front / rear sprockets: 15~25mm
		Sprocket attachment and wear				●	
Electrical system	Ignition	Spark plug condition			●	●	Plug gap: 0.8 – 0.9mm
	Battery	Terminal connection				●	
	Wiring	Connectors fit and damage				●	
Powerplant	Main body	Starting and noise			●	●	
		Low speed and acceleration			●	●	Idling rpm 1.500 ± 100rpm
		Exhaust condition			●	●	
		Air cleaner element					Every 20,000km
		Valve clearance				●	Inlet (cooled): 0.13 – 0.19mm Exhaust (cooled: 0.20 – 0.26mm

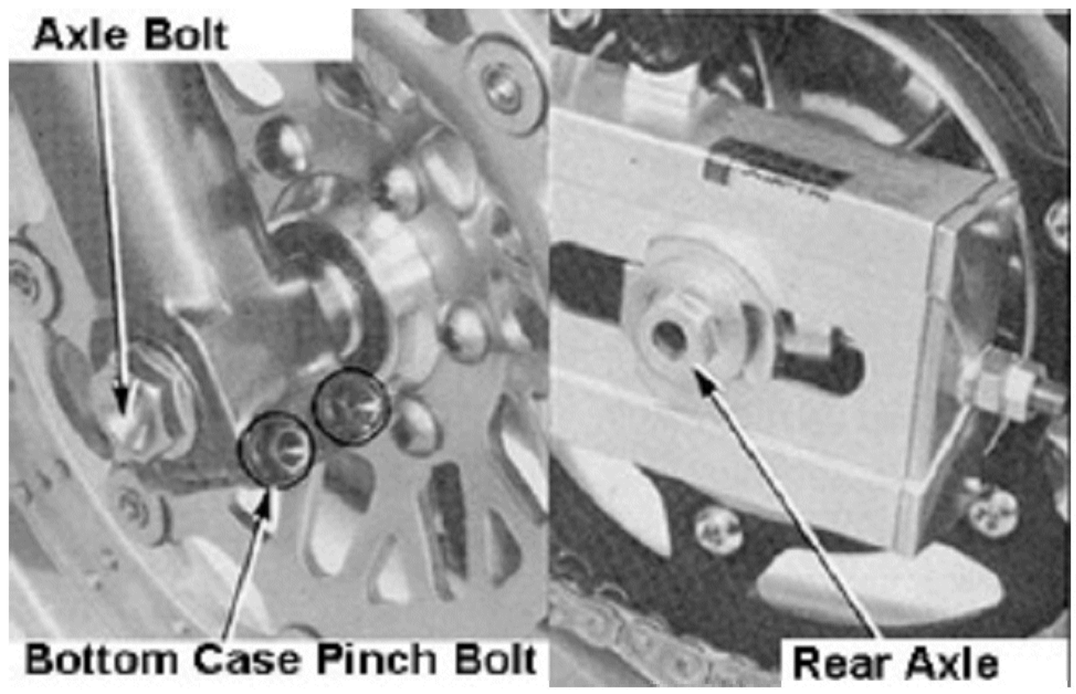
Items to be serviced			Schedule				Notes
			Before operation	After 1 month	Private		
					6 month	12 month	
Power plant	Lubrication system	Oil quantity and quality			●	●	Oil level Dipstick – between min – max lines
		Oil leak			●	●	
		Oil quantity	●				
		Engine oil change		O			Initial 1.000km, every 6000km after that
		Oil filter change					Initial 13.000km, every 12,000km after that
	Fuel system	Fuel leak			●	●	
		Carburetor linkage				●	
		Throttle valve and choke valve				●	
		Fuel filter				●	
		Fuel quantity	●				
		Fuel hose replacement					Every four years
	Cooling system	Coolant level	●		●	●	Reservoir tank between min-max lines.
		Coolant leak	●			●	
		Radiator cap function				●	0.95-1.25kg/cm² valve opening pressure
		Coolant change					Biannual
Lighting and turn signals		Operation			●	●	
		Brightness, flashing, dirt and damage	●				
Horn and lock		Operation				●	
Rear view mirror		Vision	●				Rearview mirrors only
Reflector, registration number plate		Dirt and damage	●				
Instruments		Operation				●	
Exhaust pipe & muffler		Attachment and damage				●	
		Muffler function				●	
Chassis & Body		Loose fit and damage				●	
Defects discovered on previous day		Inspect the specific item	●				
Other		Grease to the parts on chassis			●	●	

Wheel nut / bolt tightness

Inspect the front axle bolt and rear axle nut for tightness. Inspect the bottom case pinch bolt for tightness. Tighten as required.

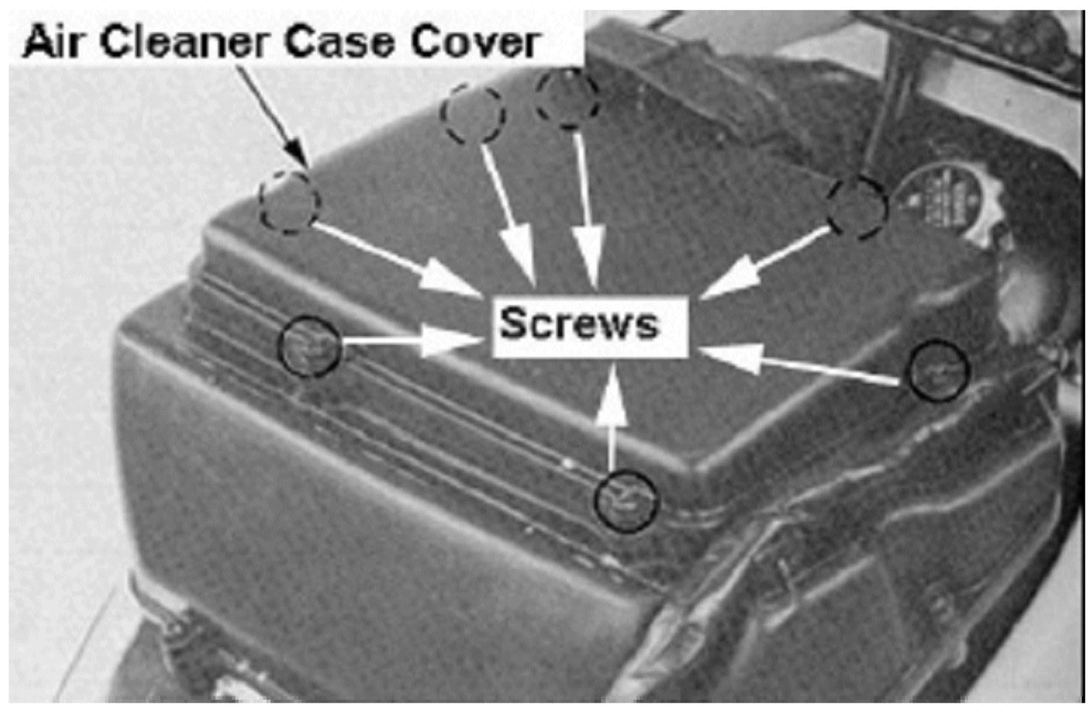
Torque:

Front axle	6.0kg-m
Bottom case pinch bolt	2.2kg-m
Rear axle	9.0kg-m

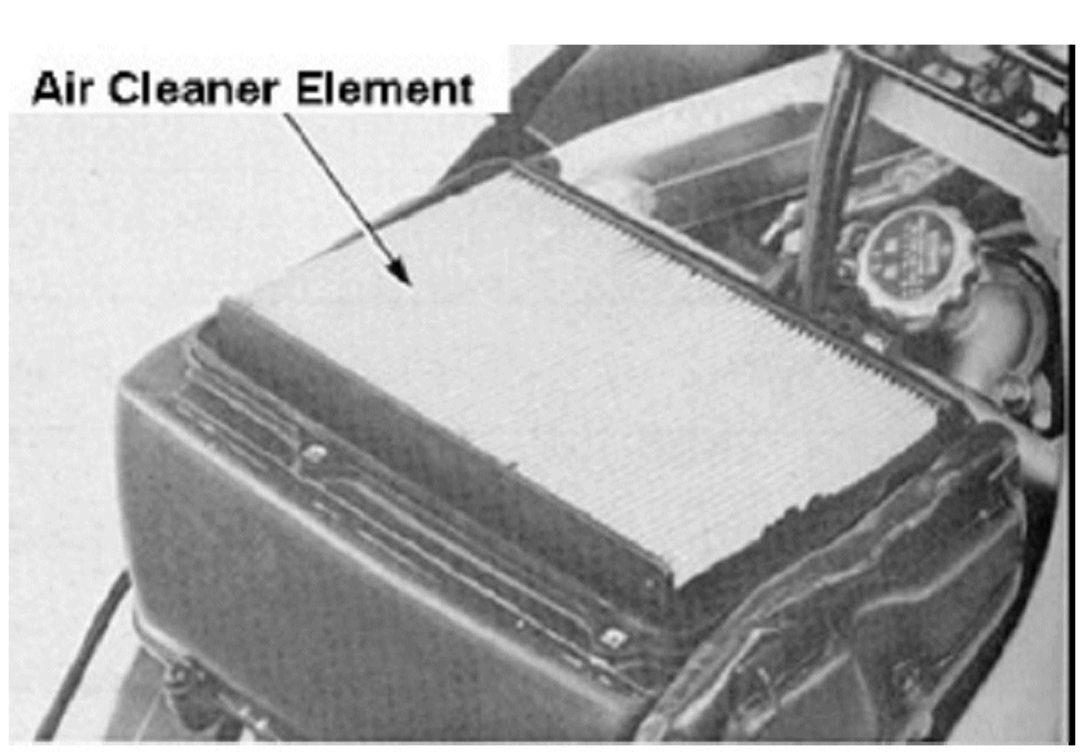


Air cleaner element change

Remove the fuel tank (22-19).
Remove screws and detach air cleaner case cover.



Inspect the element for dirt and damage.
Replace if dirt or damage is significant.



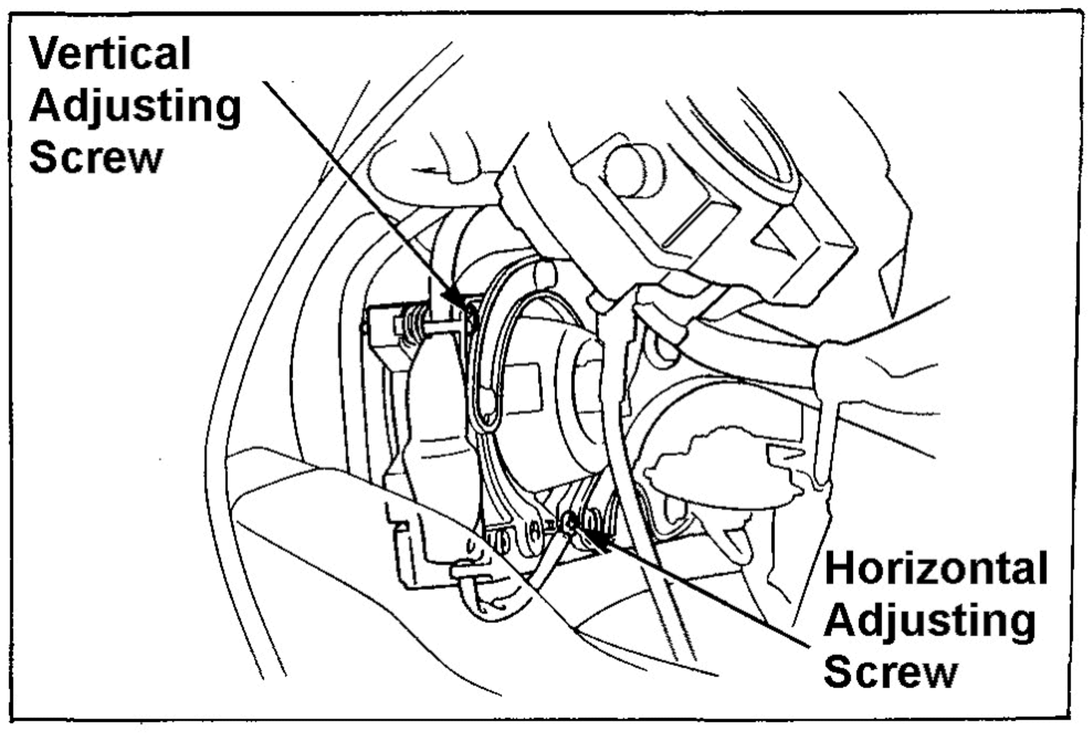
- Do not clean filter papers as they contain oil (viscous type).
- If the vehicle is operated under severe conditions, replace earlier than recommended.

Recommended interval: every 20,000km

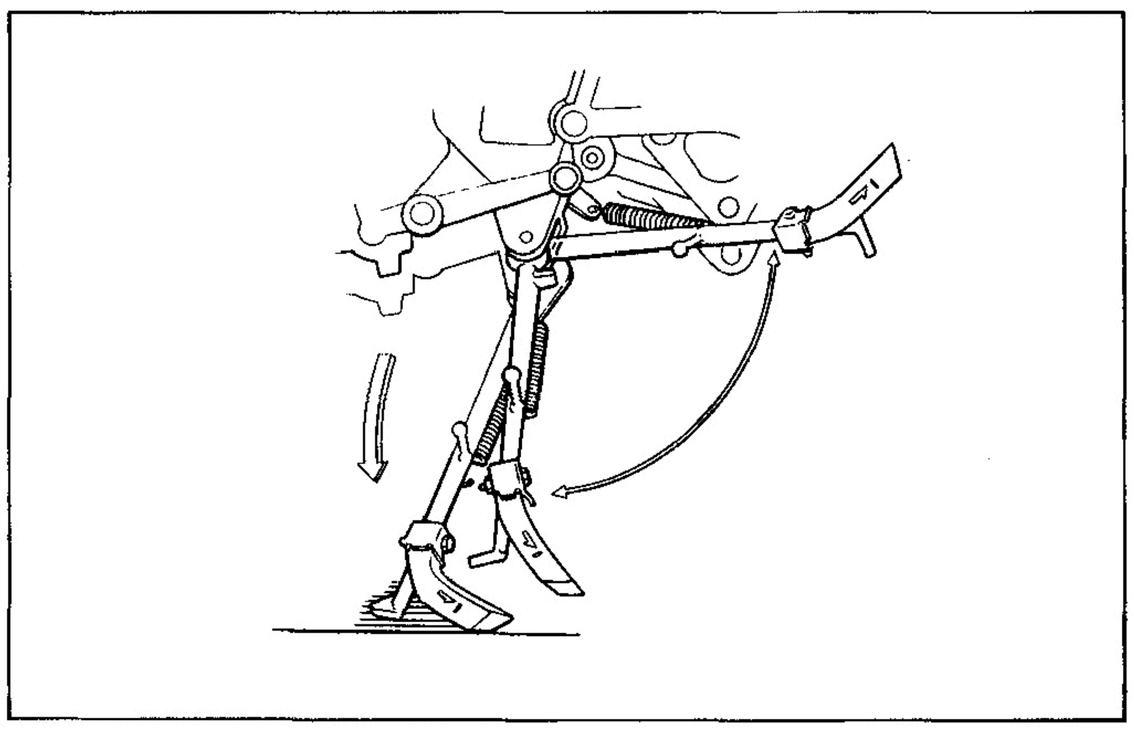
Reverse the above procedure for attachment.

Headlamp

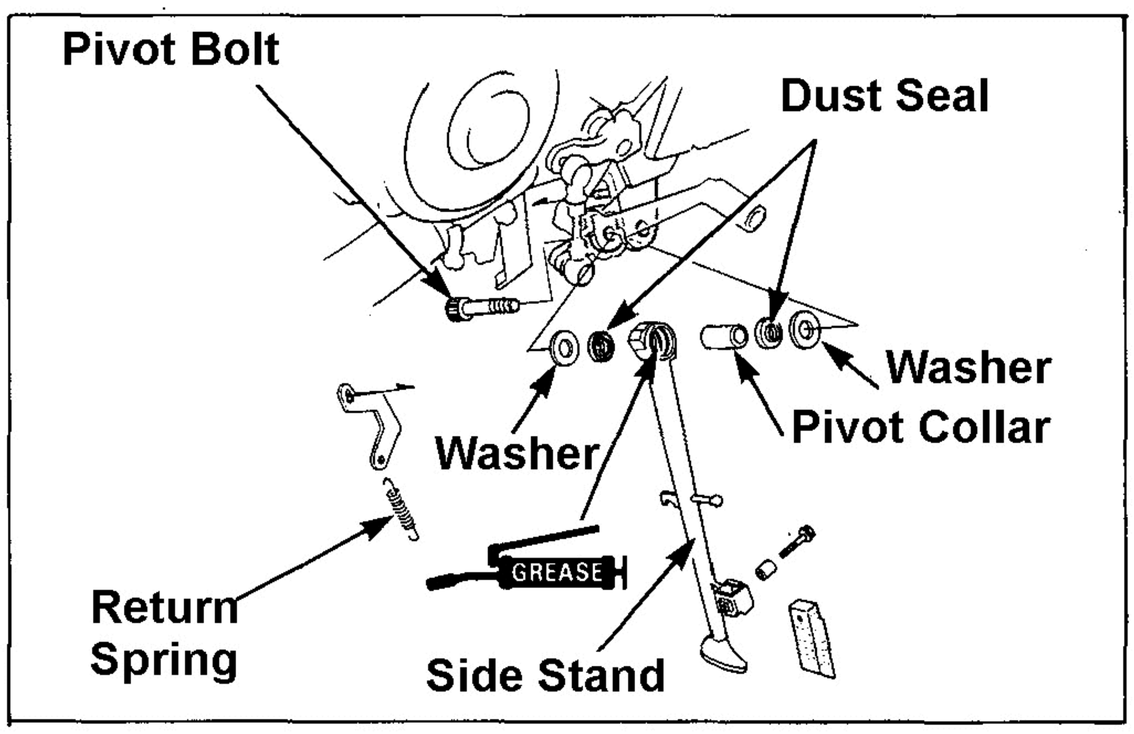
Rotate the vertical and horizontal adjusting screws to adjust the lamp direction.



Side Stand

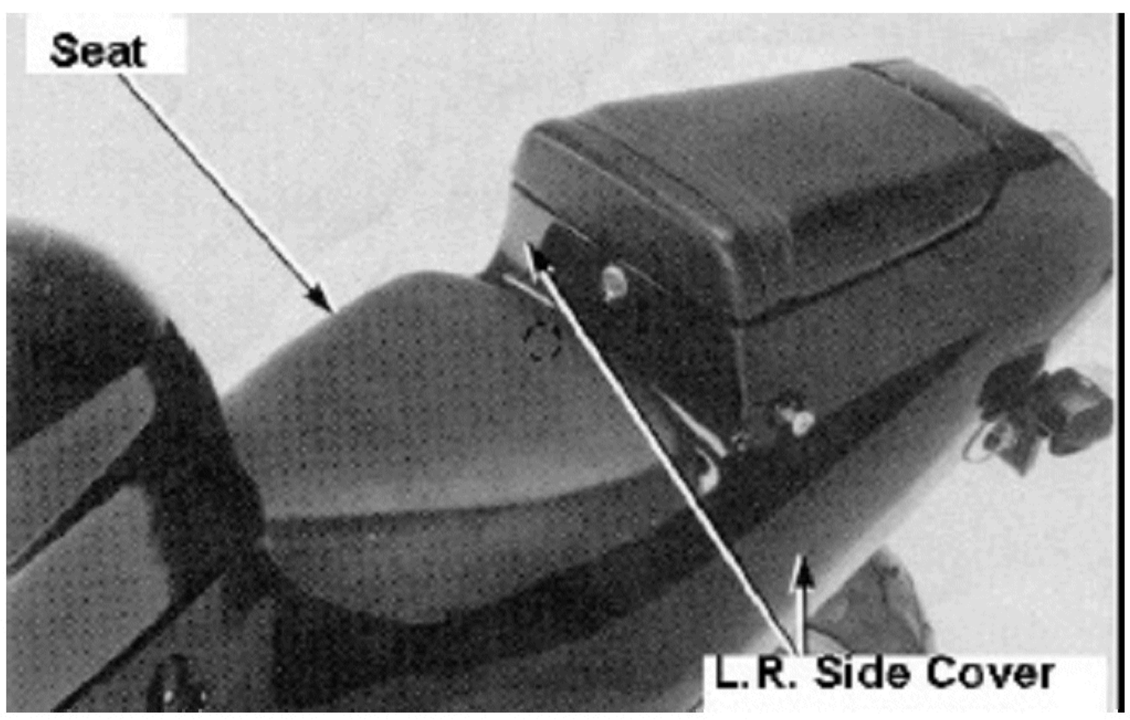


Inspect the side stand rubber for wear.
If the rubber is worn to the limit line, replace it.
Check the operation of the side stand.
When the stand stops at the first notch and the rubber contacts ground, the stand moves forward and supports the body.
When the body is stood up and the stand rubber comes off from the ground, the stand moves to the first notch and it should smoothly be retracted.



If the above operation is not smooth, disassemble and inspect the sidestand.
Remove the return spring at the retracted position.
Remove the pivot bolt and disassemble the side stand.
Inspect the pivot bore, pivot collar and dust seals for wear and damage. After the inspection, apply grease to the pivot and assembly the stand.

- Attach dust seals so as to have springs facing outward.
- Attach the side stand after confirming the dust seal spring is attached.



After the attachment, check its operation.

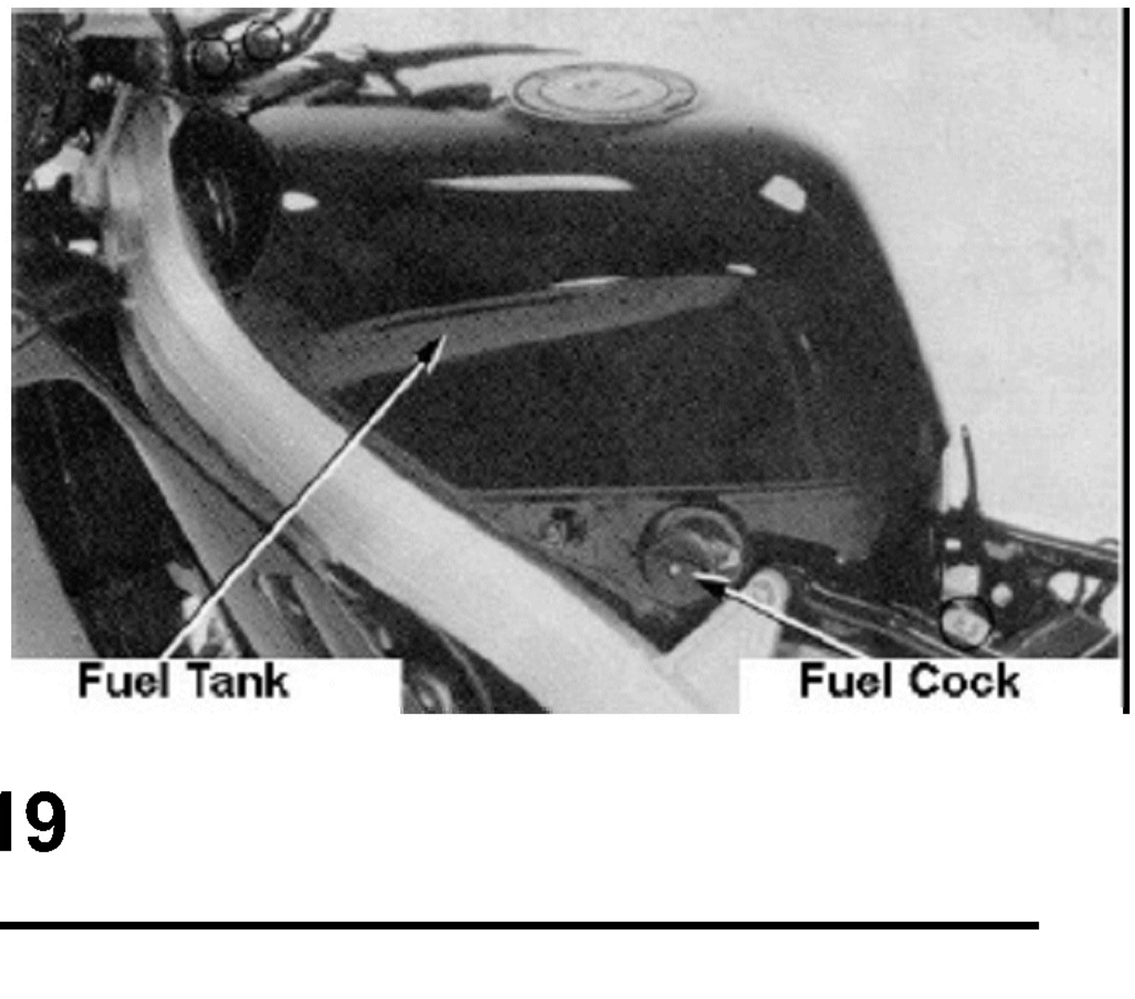
Fuel System

Fuel tank detachment / attachment

Remove bolts and detach the seat.
Detach left and right side covers (22-30).

Turn the fuel cock “OFF”.

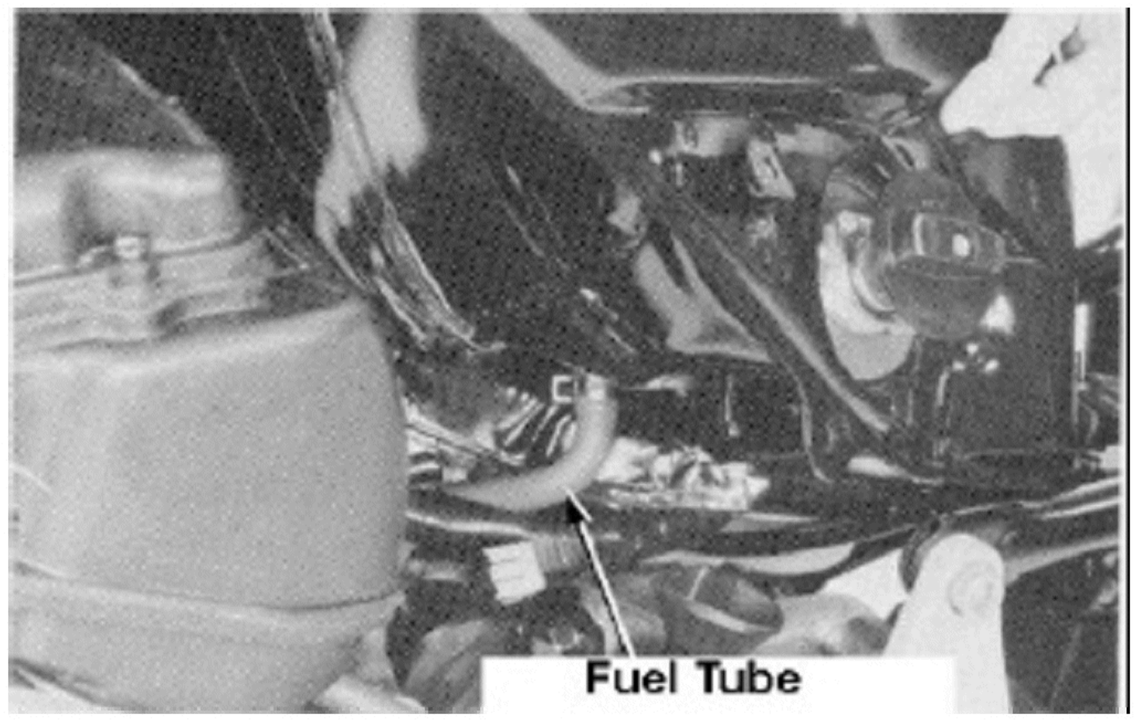
Remove three bolts.

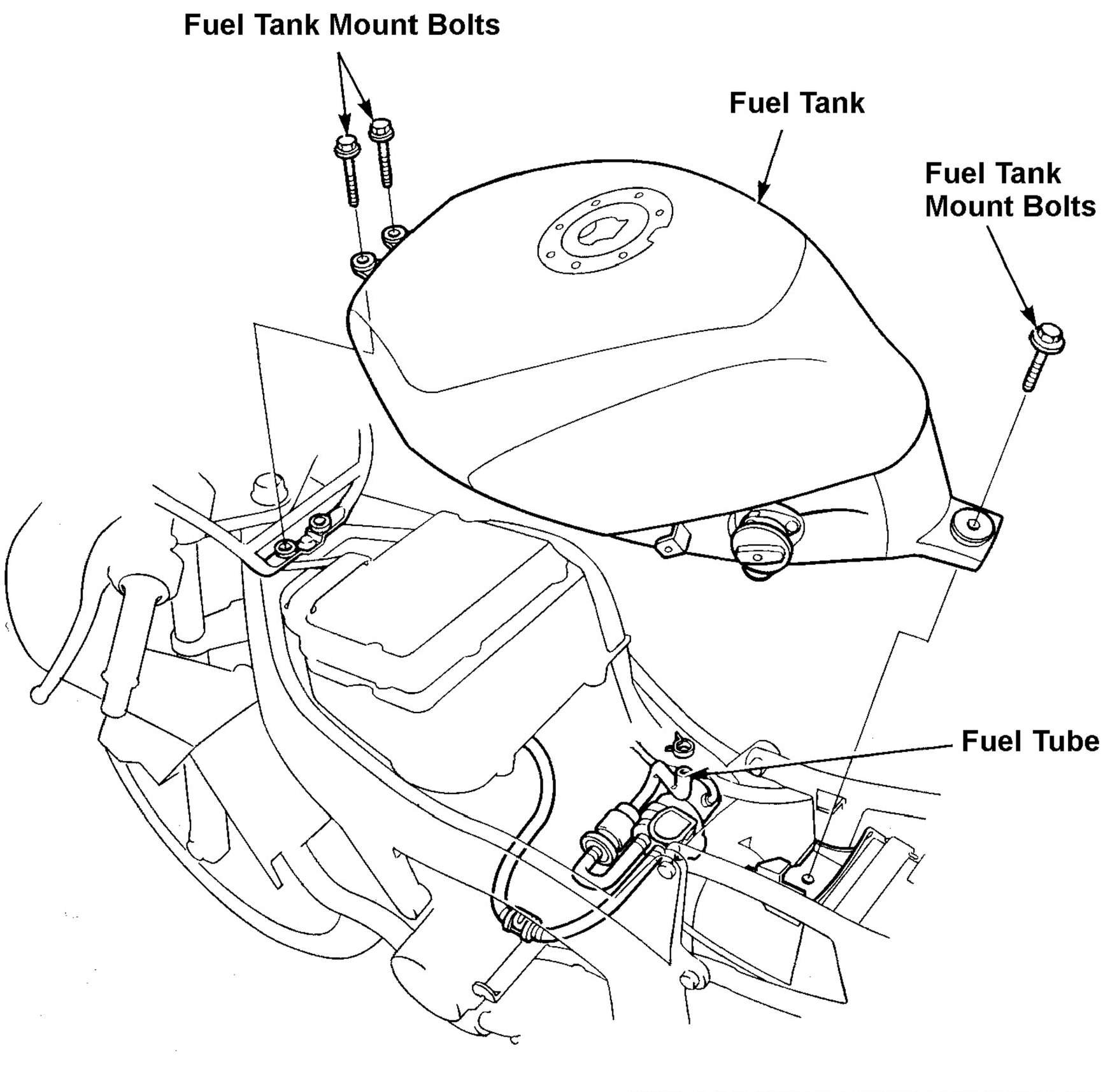


Lift the rear of the tank and disconnect the fuel tube.
Detach the fuel tank.

Reverse the procedure for attachment.

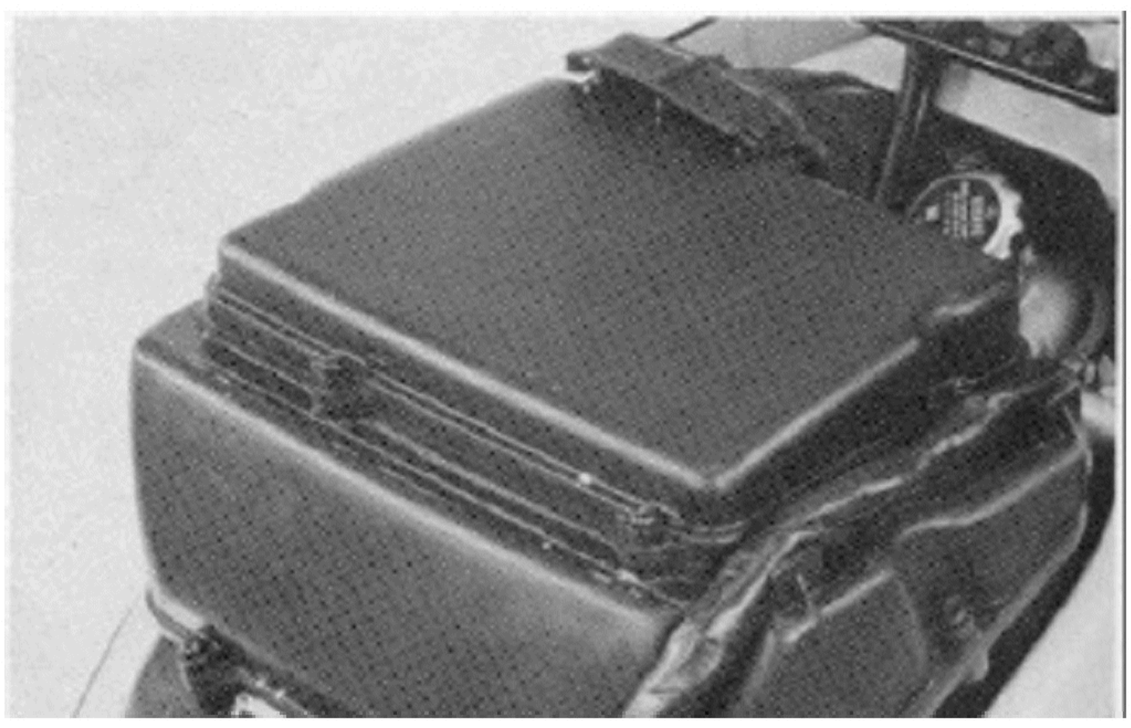
After the attachment, check for fuel leak.



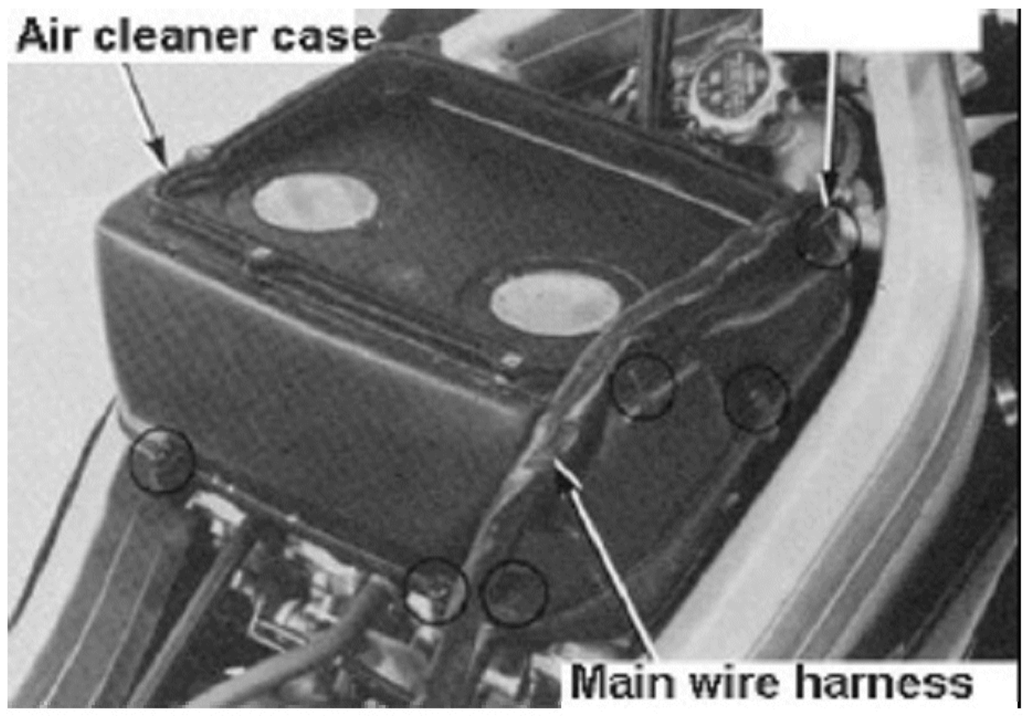


Air cleaner case attachment / detachment
Remove the seat and fuel tank (22-19).
Detach the air cleaner element (22-18).

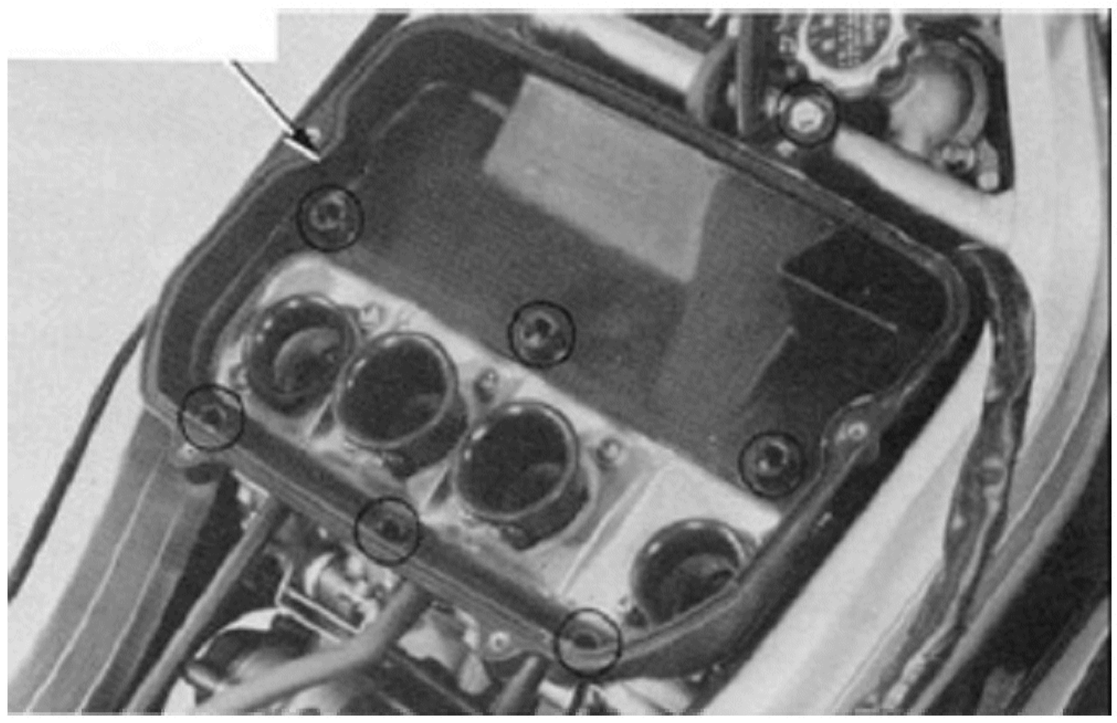
If the air cleaner case is not to be disassembled, the air cleaner does not have to be detached.



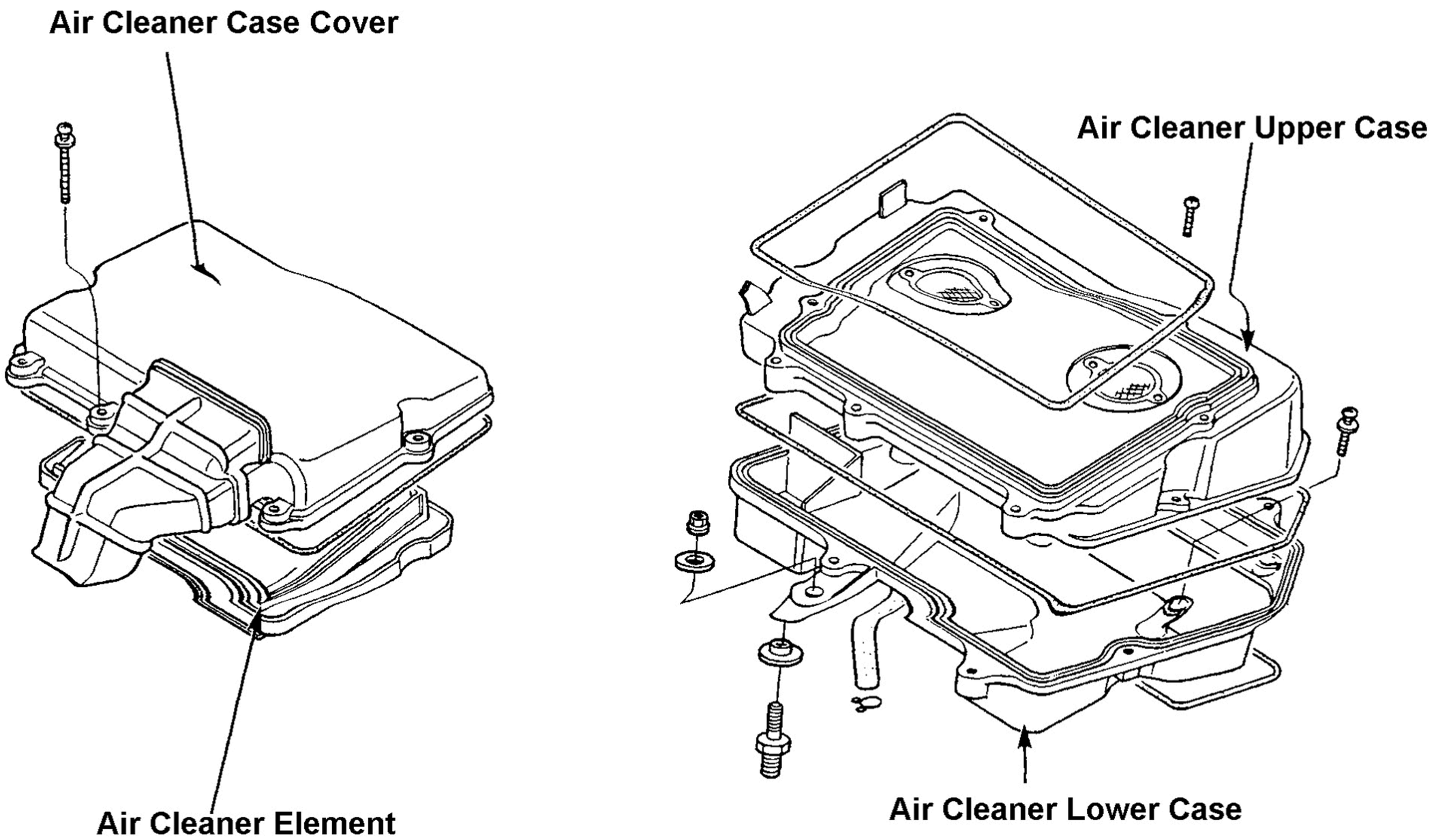
Detach the main wire harness from the clamp on the air cleaner case.
Remove air cleaner case attachment screws and detach the upper case.



Remove bolts and screws to detach the lower case.



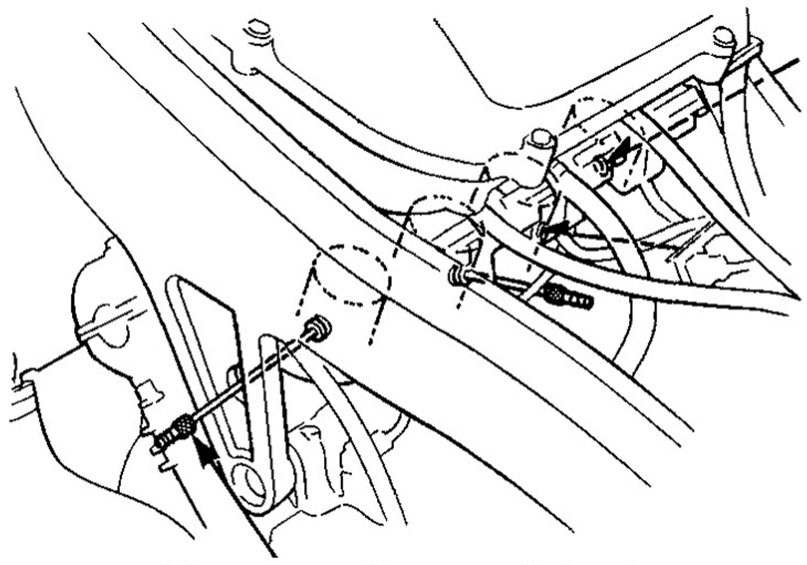
Reverse the above procedure for attachment.



Carburettor synchronisation adjustment

Adjust after warming up the engine.

Place the fuel tank at the rear while the tube is connected.
Remove plugs and washers from each cylinder head intake ports.
Connect the vacuum gauge adaptor to each plug hole.
Connect rubber tube of the vacuum gauge to the adaptor.

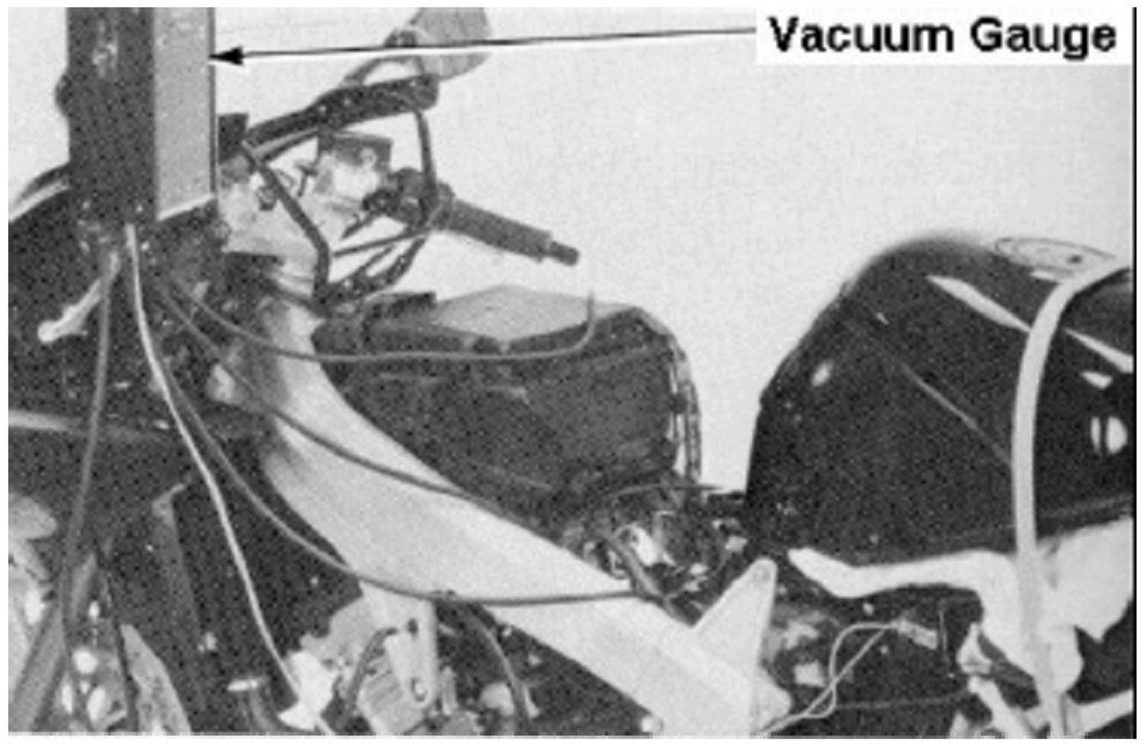

Vacuum Gauge Adaptor

Start the engine and set up the idling rpm.
Idling rpm: 1500 ± 100rpm

Measure the vacuum difference between the cylinders.
Vacuum difference: ± 20mmHg

Measuring tool

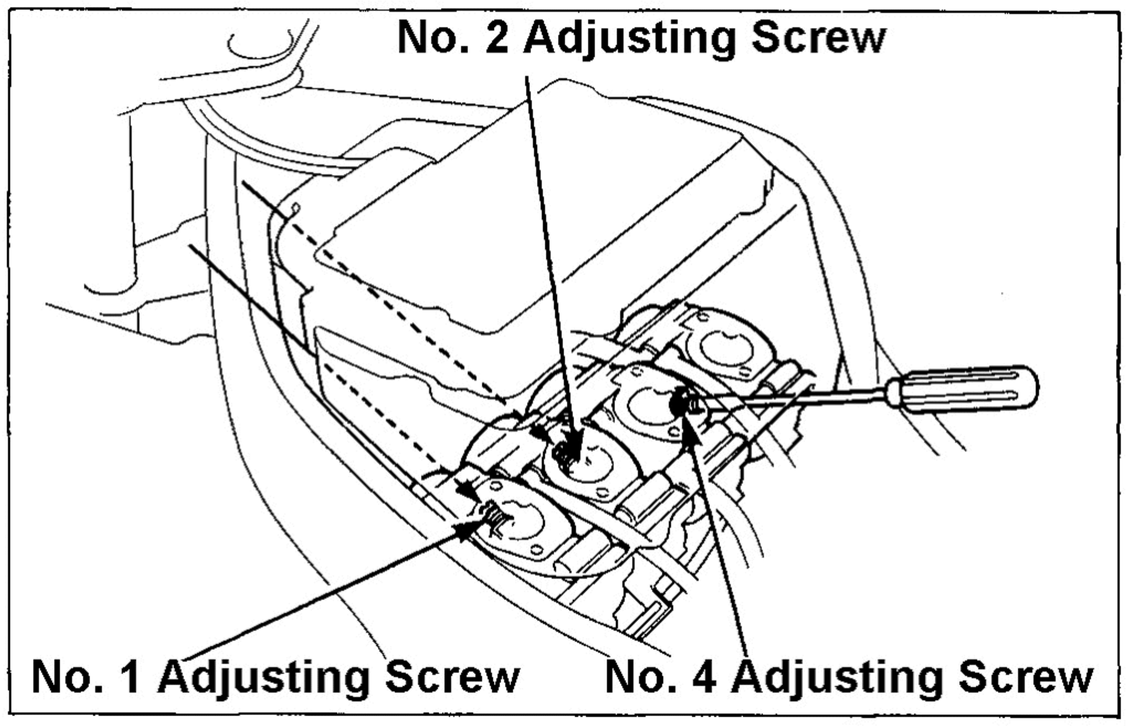
Vacuum gauge: 07404-0020000



Adjust in the following manner if the difference is exceeding the limit.

1) Check the position of pilot screws on the carburettor.
2) Adjust synchronisation by rotating the adjusting screw.

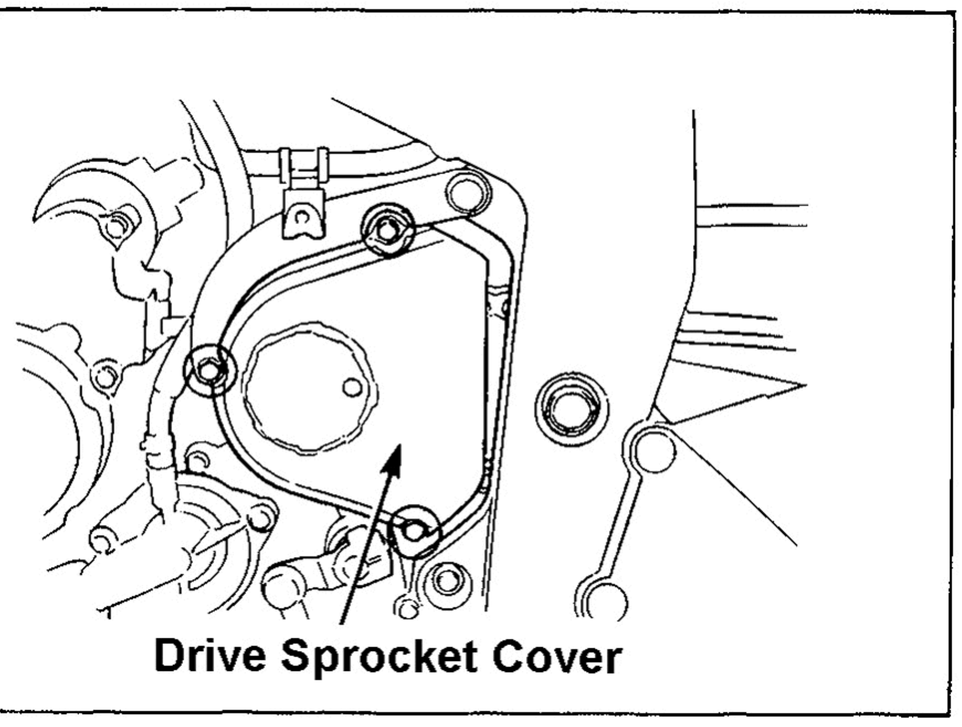
Use No. 3 carburettor as a standard.



* #1, 2 carburettor synchronisation >
Detach air cleaner case cover.
Rotate the adjust screw from front of the carburetor.

* #4 carburettor synchronisation >

Rotate the adjust screw from behind the air cleaner case.
After the adjustment, check the synchronisation and set to idle.
Attach each part by reversing the detachment procedure.

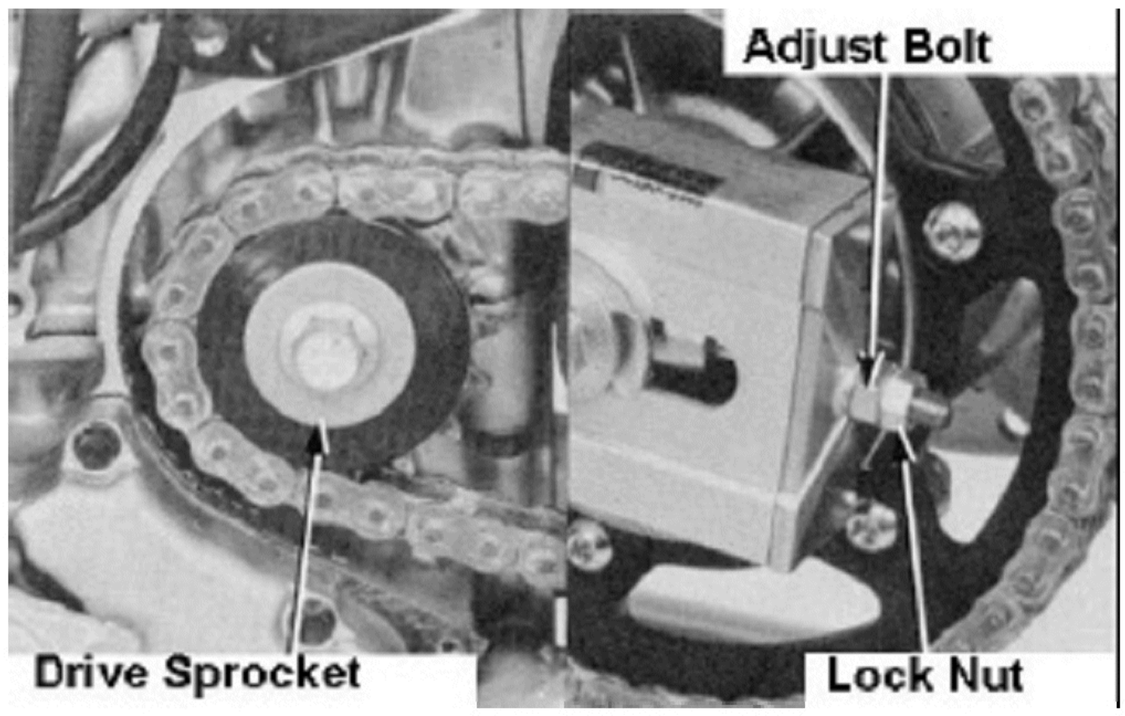

Drive Sprocket Cover

Engine Mount / Dismount

<Drive sprocket attachment / detachment>
Remove three bolts and detach the drive

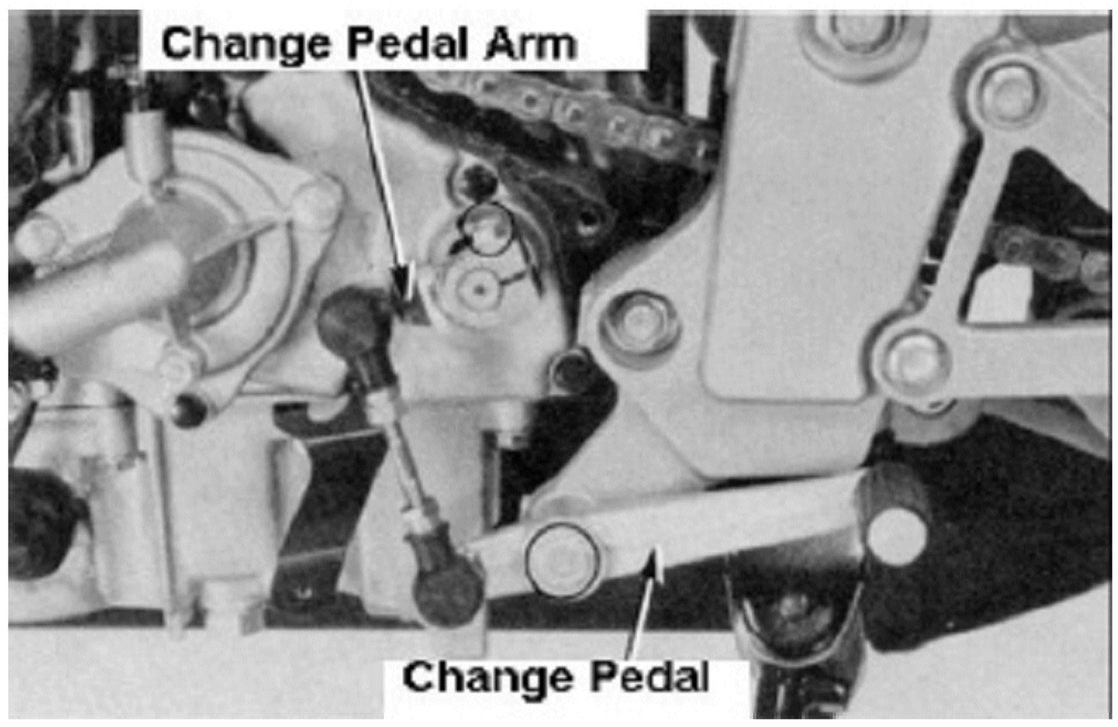
sprocket cover.
Loosen the rear axle nut, lock nut and chain adjusting nut and ease the tension of the drive chain.

Remove the bolt and detach the drive sprocket and the cushion rubber.



- **Change Pedal Detachment**

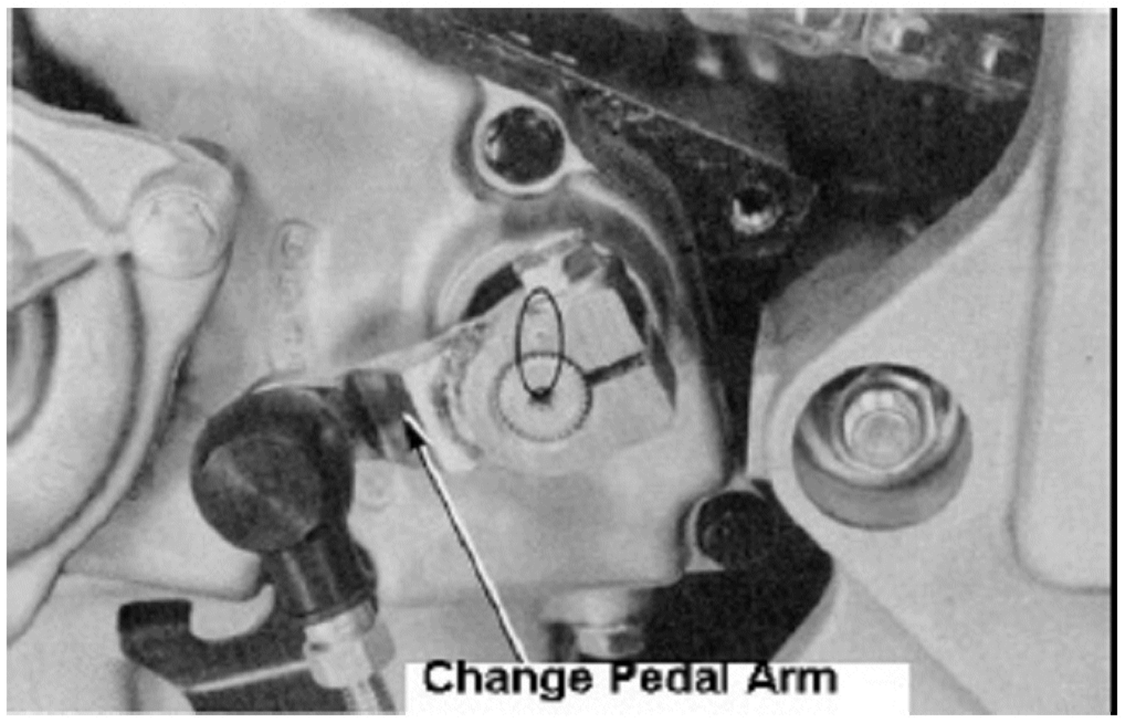
Remove the bolt and pull out the change pedal arm from the shaft.
Remove the bolt and detach the pedal.



Engine Attachment

Reverse the detachment procedure.

- When attaching the change pedal, align punched marks on the change shaft and the change arm.
- After installing the drive sprocket, set the cushion rubber and the set plate.

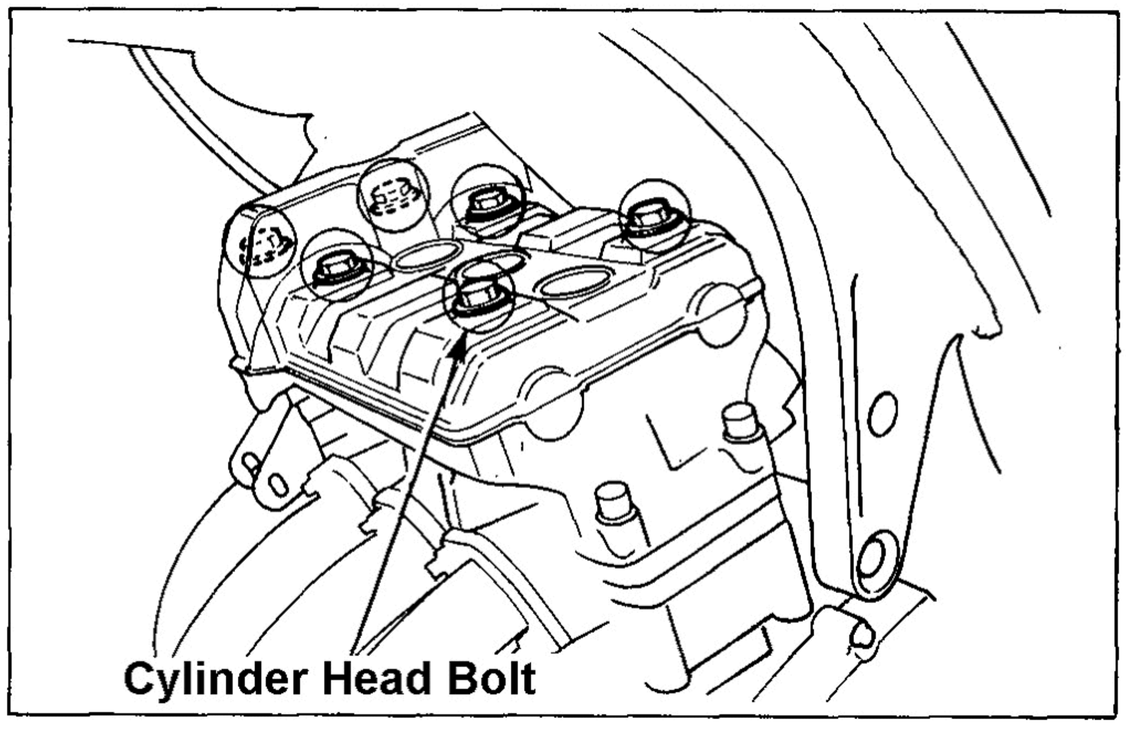


Torque:

Top engine mount bolt	4.5 ~ 5.5kg-m
Rear upper engine mount bolt	4.5 ~ 5.5kg-m
Rear lower engine mount bolt	4.5 ~ 5.5kg-m
Change arm bolt	1.4 ~ 1.8kg-m
Engine hanger bracket	3.5 ~ 4.5kg-m

Cylinder Head, Valve

Cylinder head cover attachment / detachment
Detach the lower cowl (22-31).
Detach the radiator (5-3).
Disconnect the breather tube from the cylinder head cover.
Remove plug caps.
Remove bolts to detach cylinder head covers.

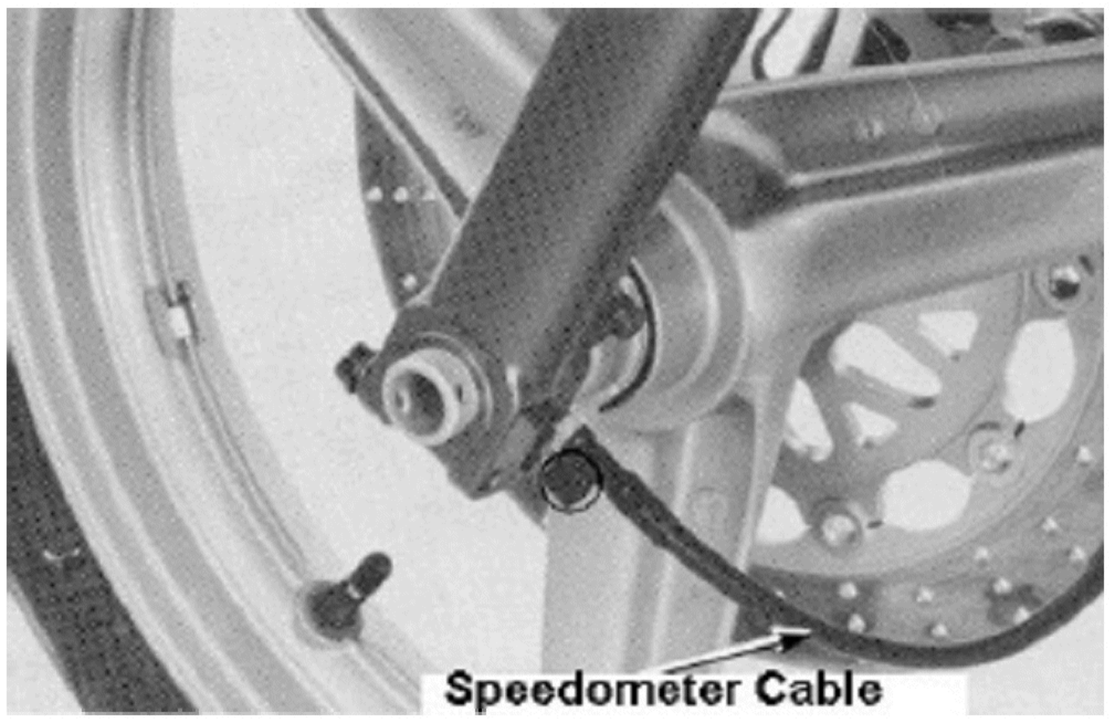


Reverse the procedure for the attachment.

Front Wheel Attachment / Detachment

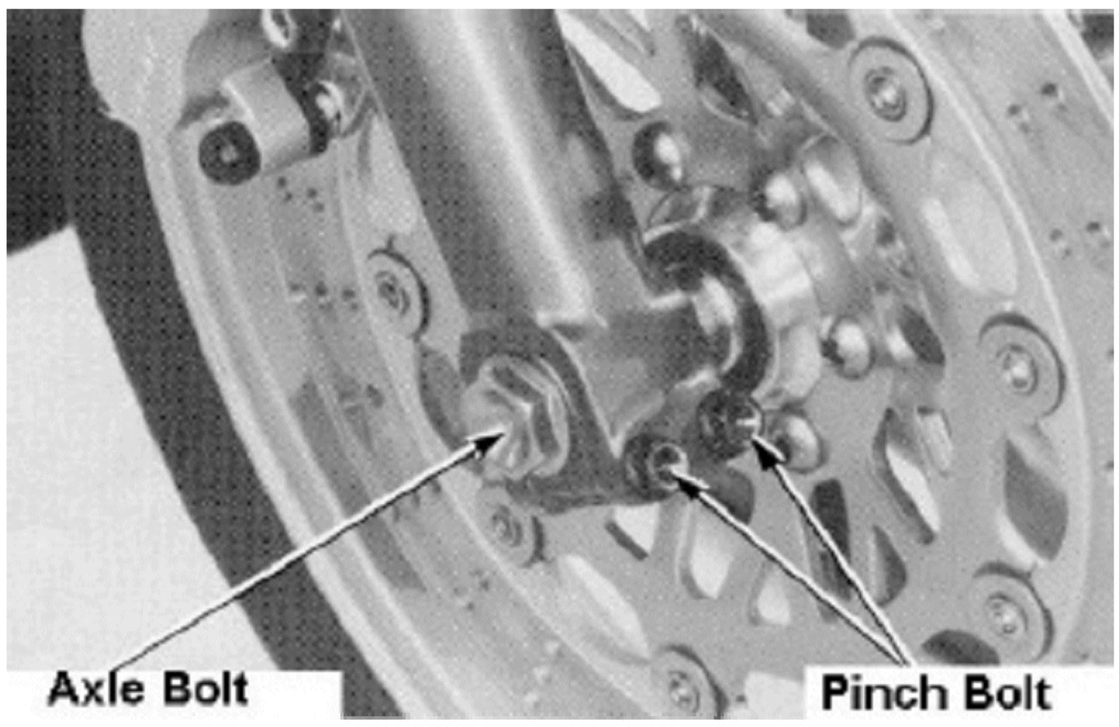
Detachment

Remove the screw and disconnect the speedometer cable.



Remove the axle bolt.
Loosen four bottom case pinch bolts.

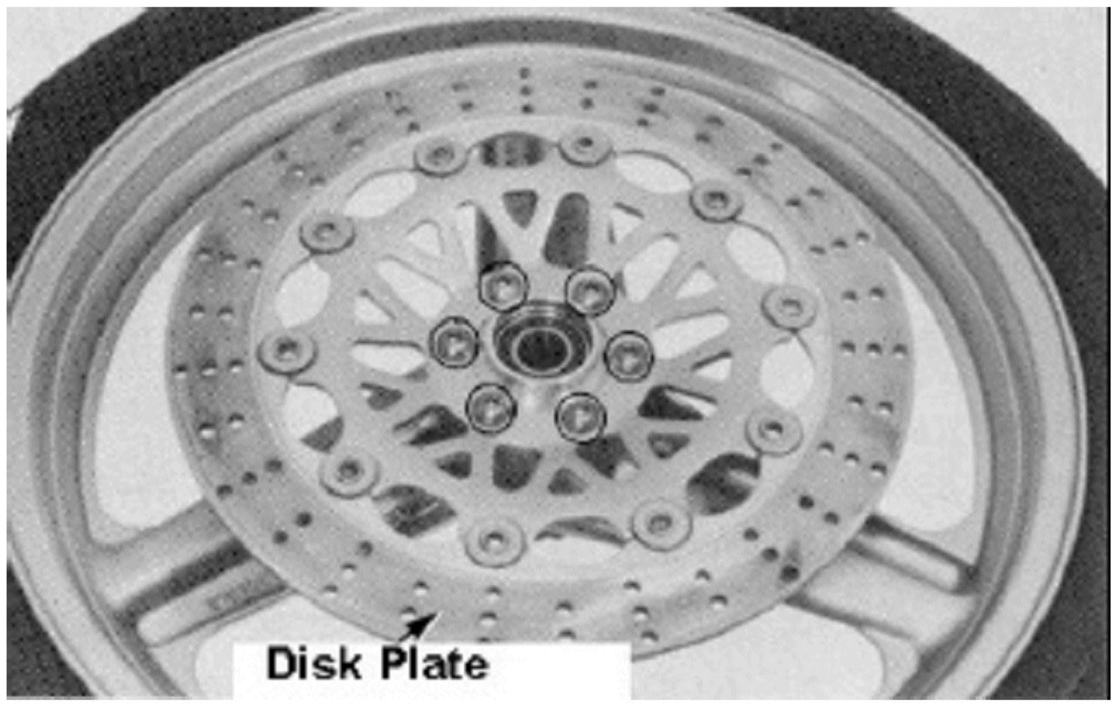
Pull the axle shaft towards the left and detach.



Disc Plate detachment

Remove socket bolts and detach the disk plate.

Do not disassemble after detaching the disc plate.

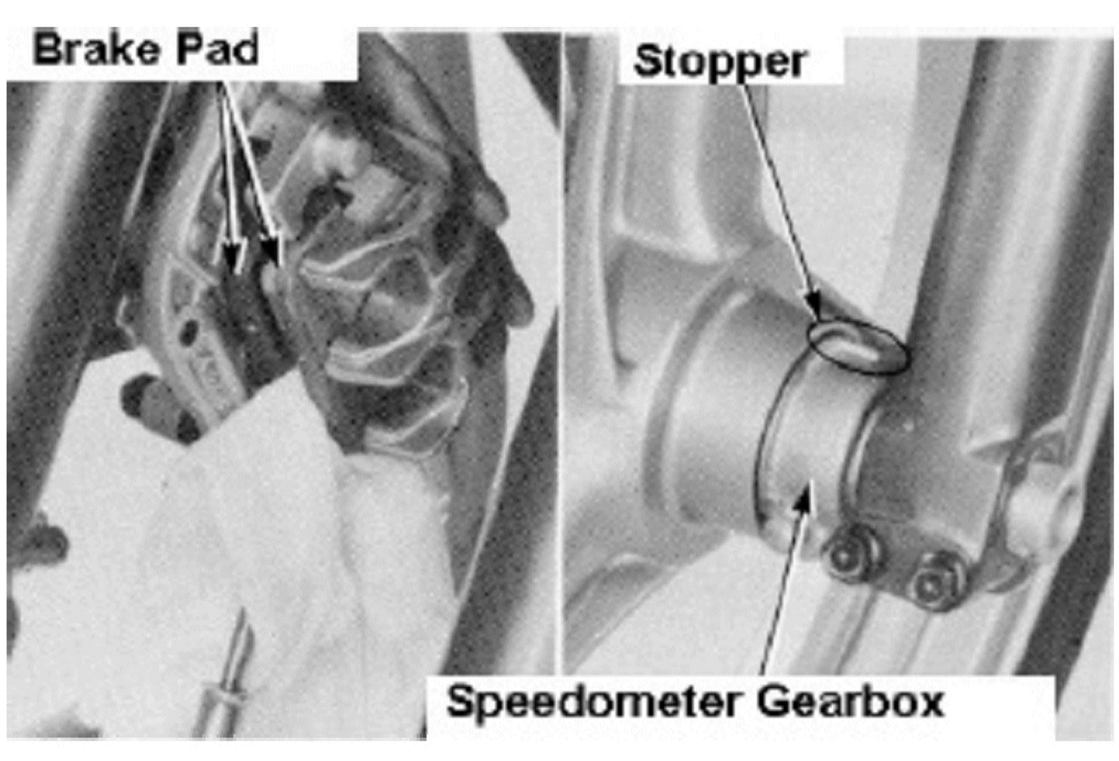


Attachment

Widen the brake pads separation with the screwdriver.

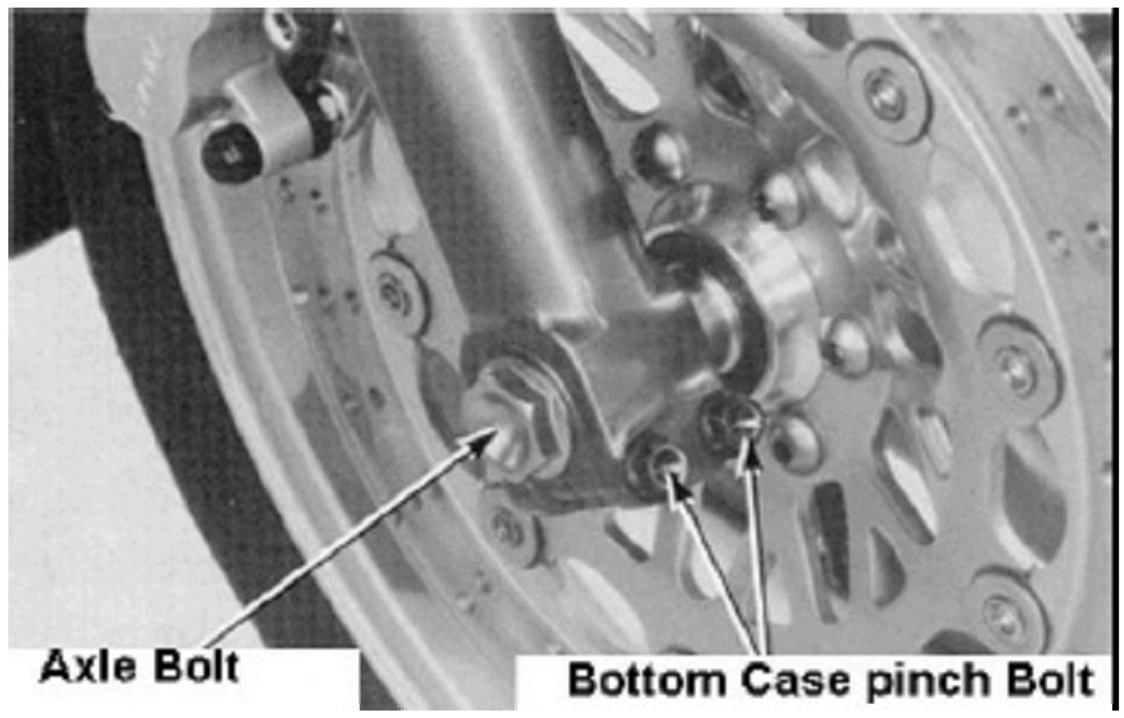
Align the speedometer gear box stopper with the back of the left fork bottom case stopper.

Install the axle shaft from left hand side.

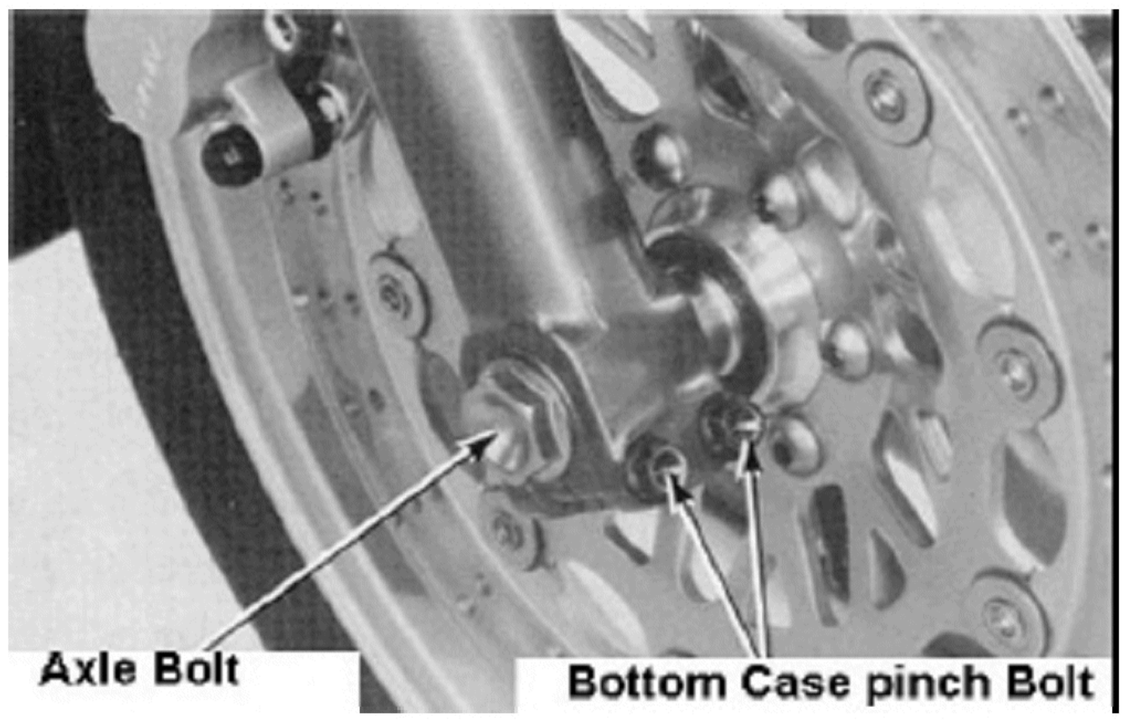


Tighten the axle bolt.
Torque: 6.0kg-m

Tighten the bottom case pinch bolt.
Torque: 2.2kg-m



Connect the speedometer cable.

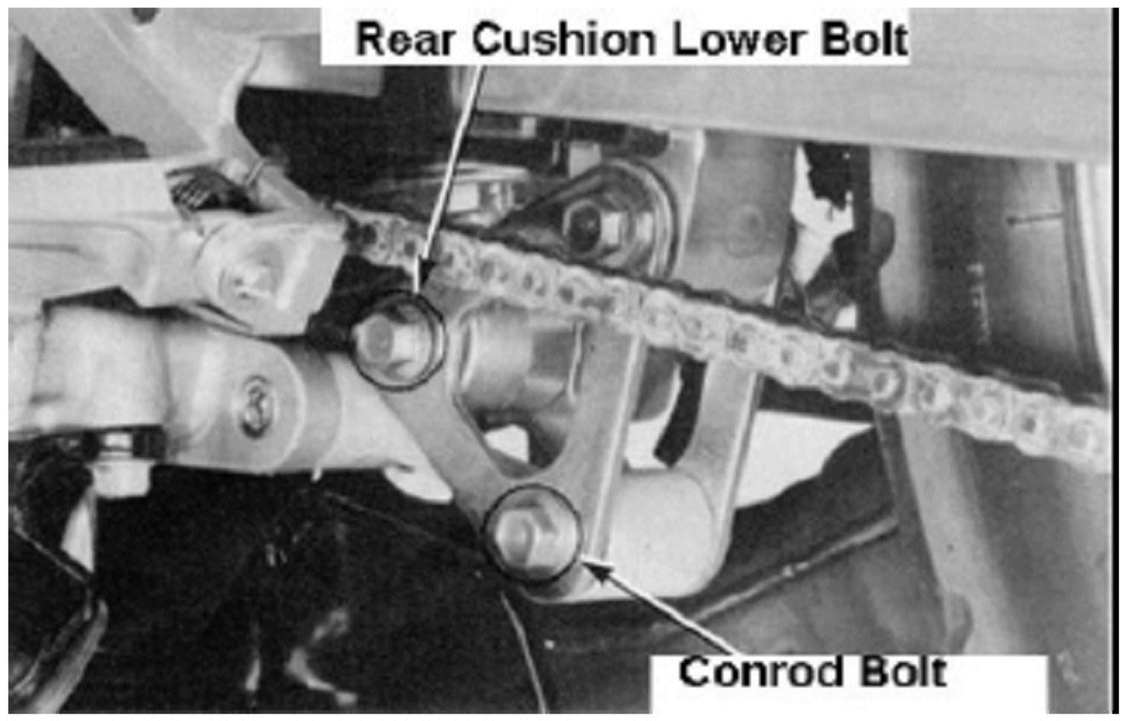


Rear Wheel, Suspension

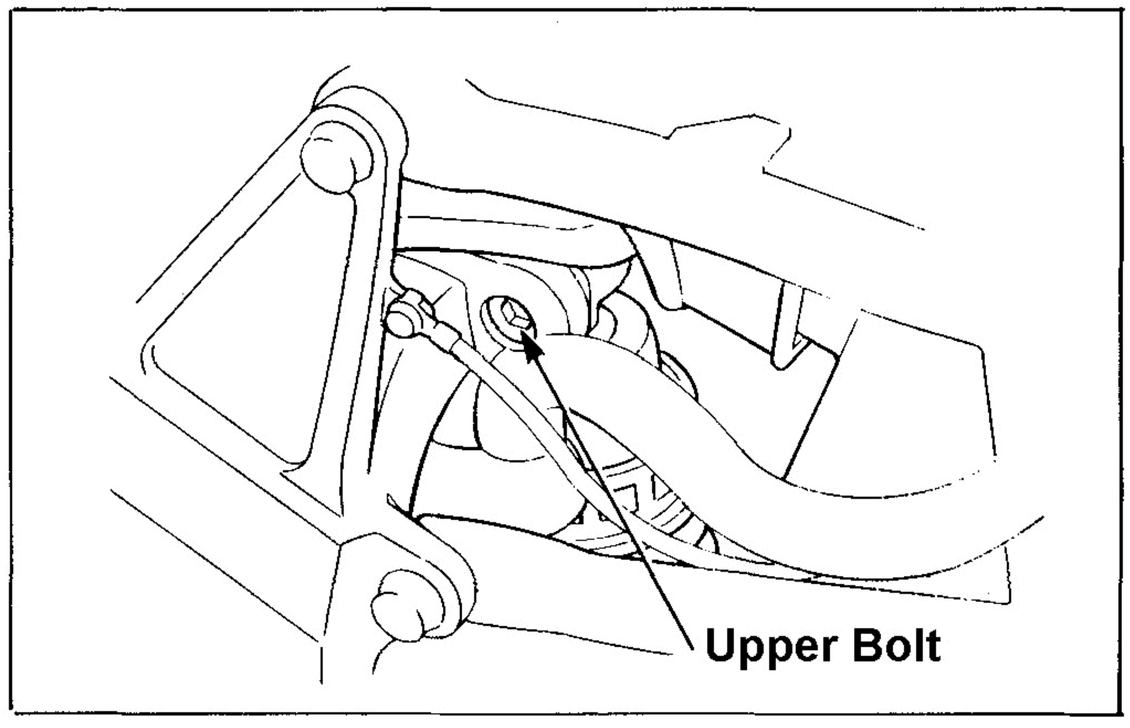
Rear cushion

Detachment

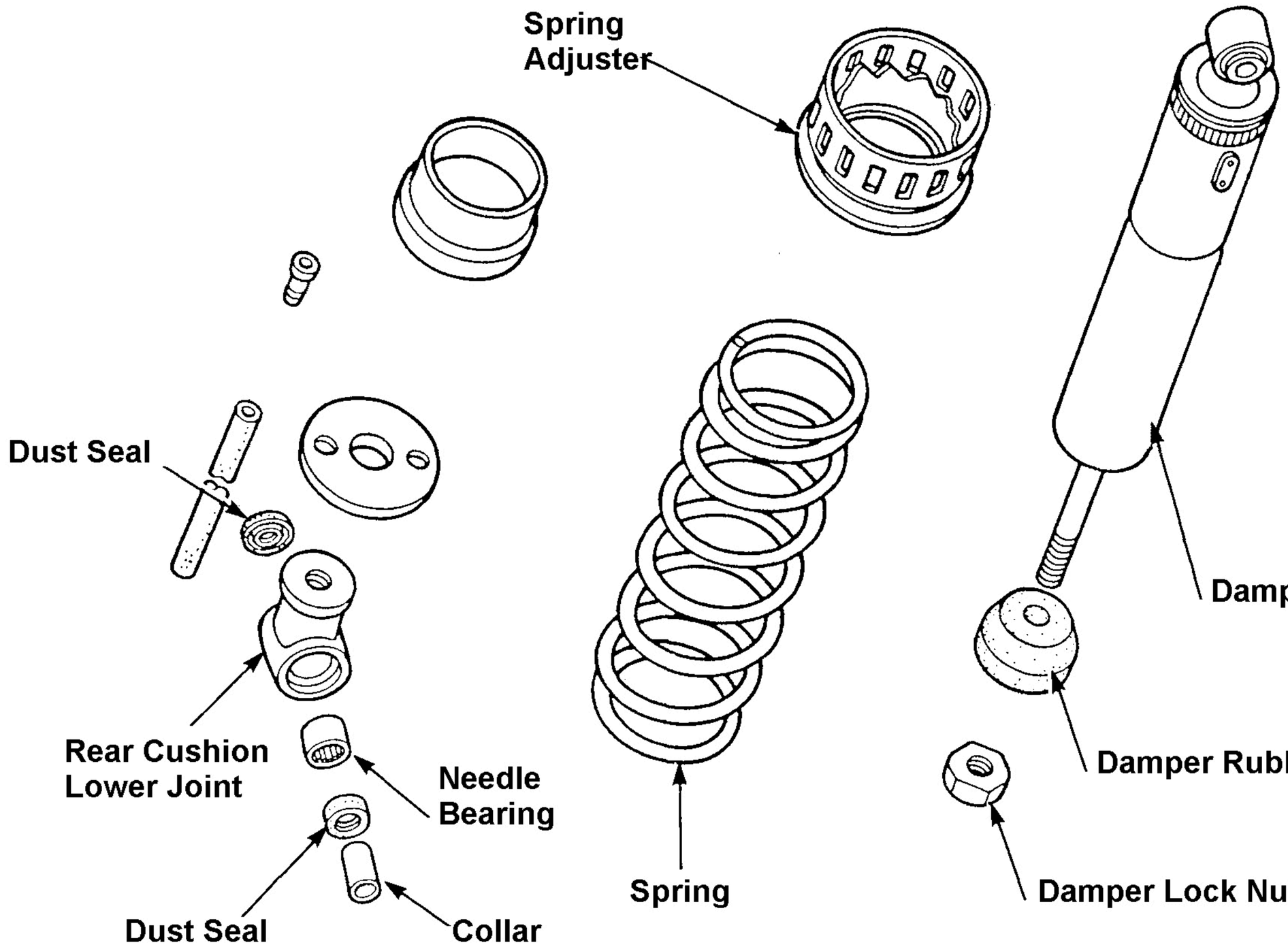
Support the frame and lift the rear wheel.
Detach the left side cover.
Remove the conrod bolt (cushion arm side).
Remove the rear cushion lower bolt.



Remove the rear cushion upper bolt and detach the rear cushion downwards.



- **Assembly/Disassembly**



Needle bearing replacement

Remove dust seals and the collar.
By using hydraulic press machine, remove the needle bearing from the rear cushion.

Exc. tool

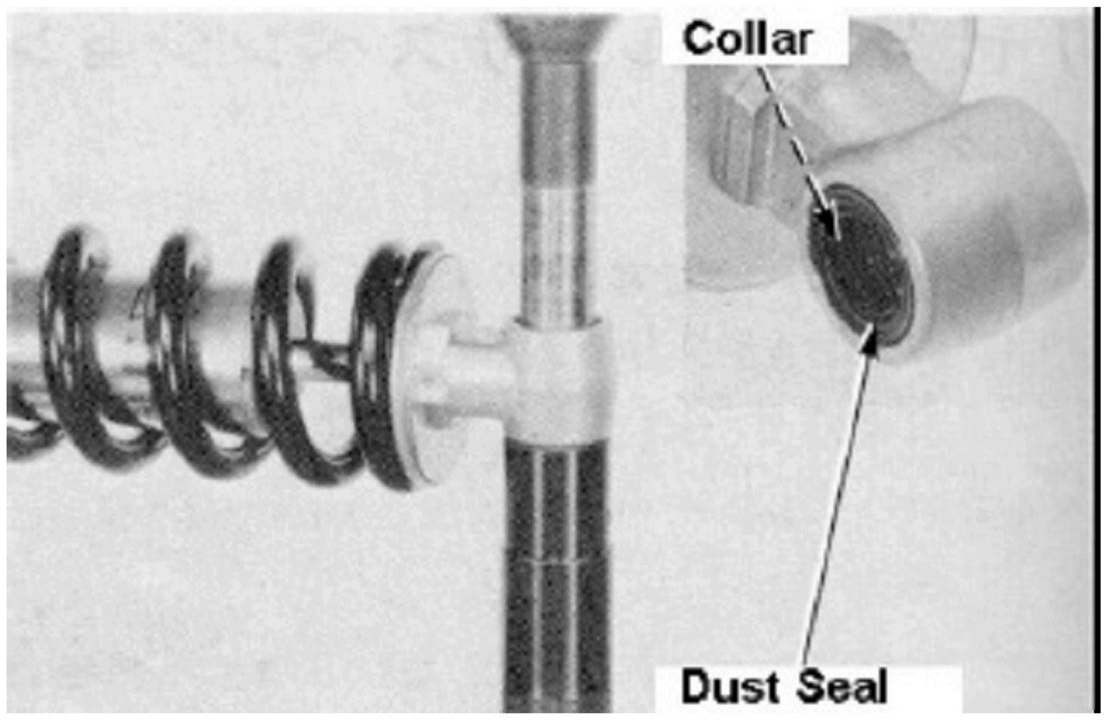
Bushdriver Assy 07GMD-KT80100

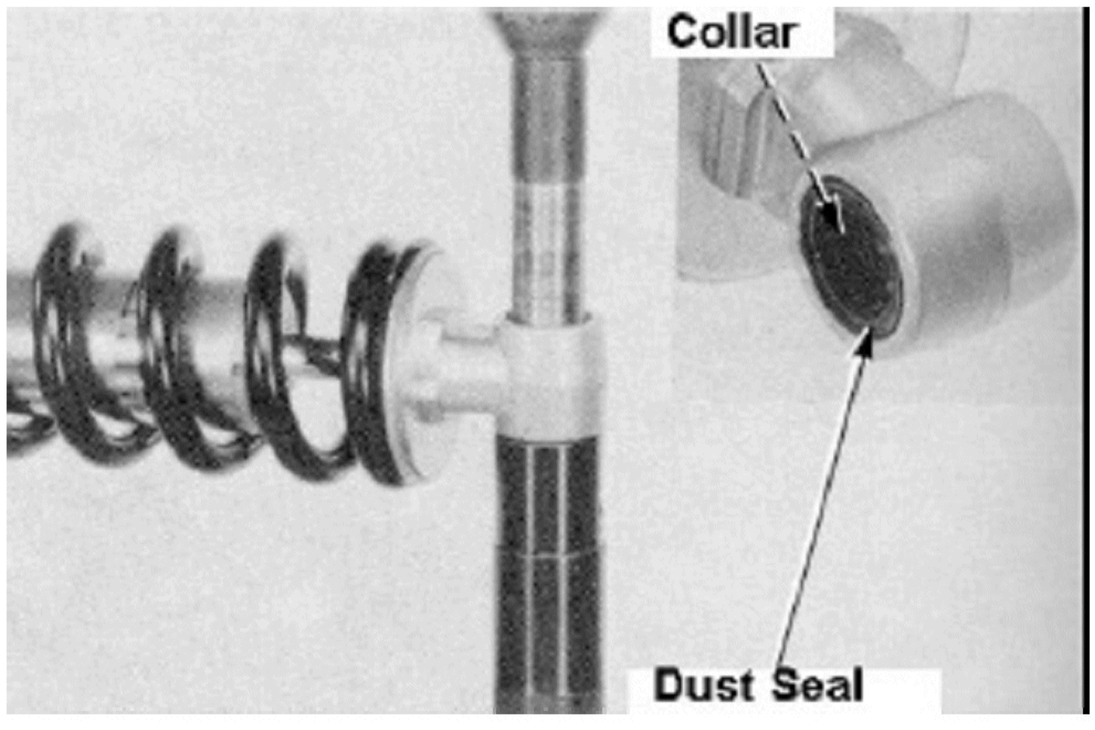
Install the new needle bearing to the rear cushion by using the press machine.

Exc. tool

Bushdriver Assy 07GMD-KT80100

After attaching it, apply grease to the bearing.
Install dust seals and the collar.





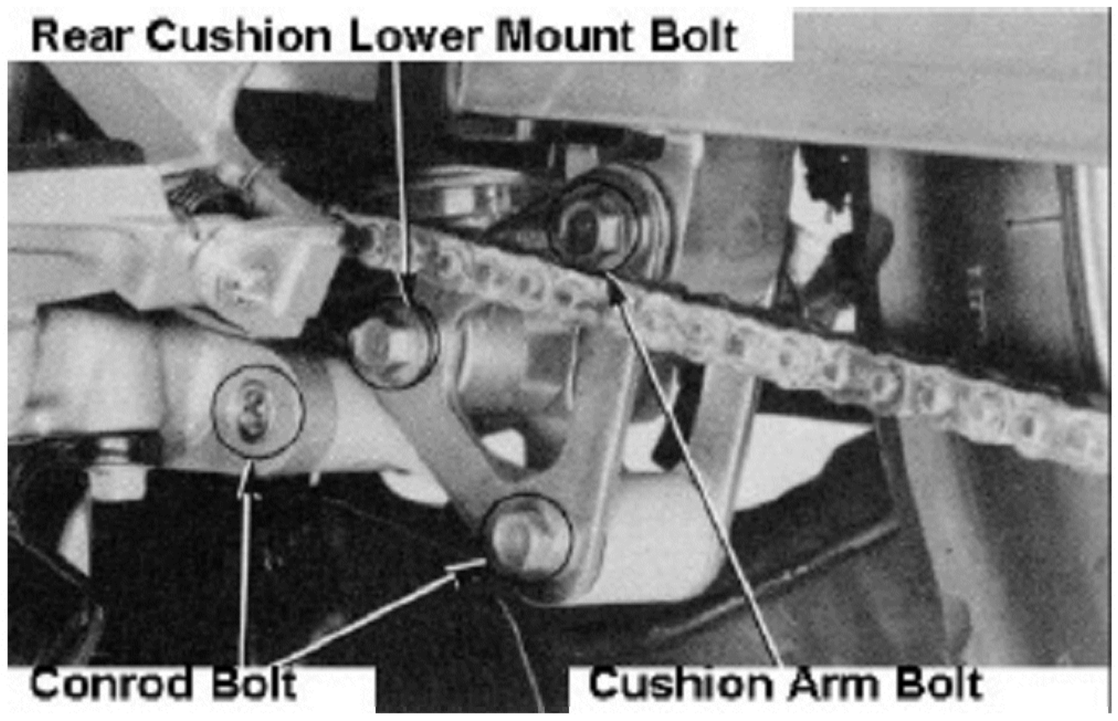
Attachment
Reverse the detachment procedure.

Tighten the rear cushion upper mount bolt after setting the lower mount bolt.

Suspension linkage

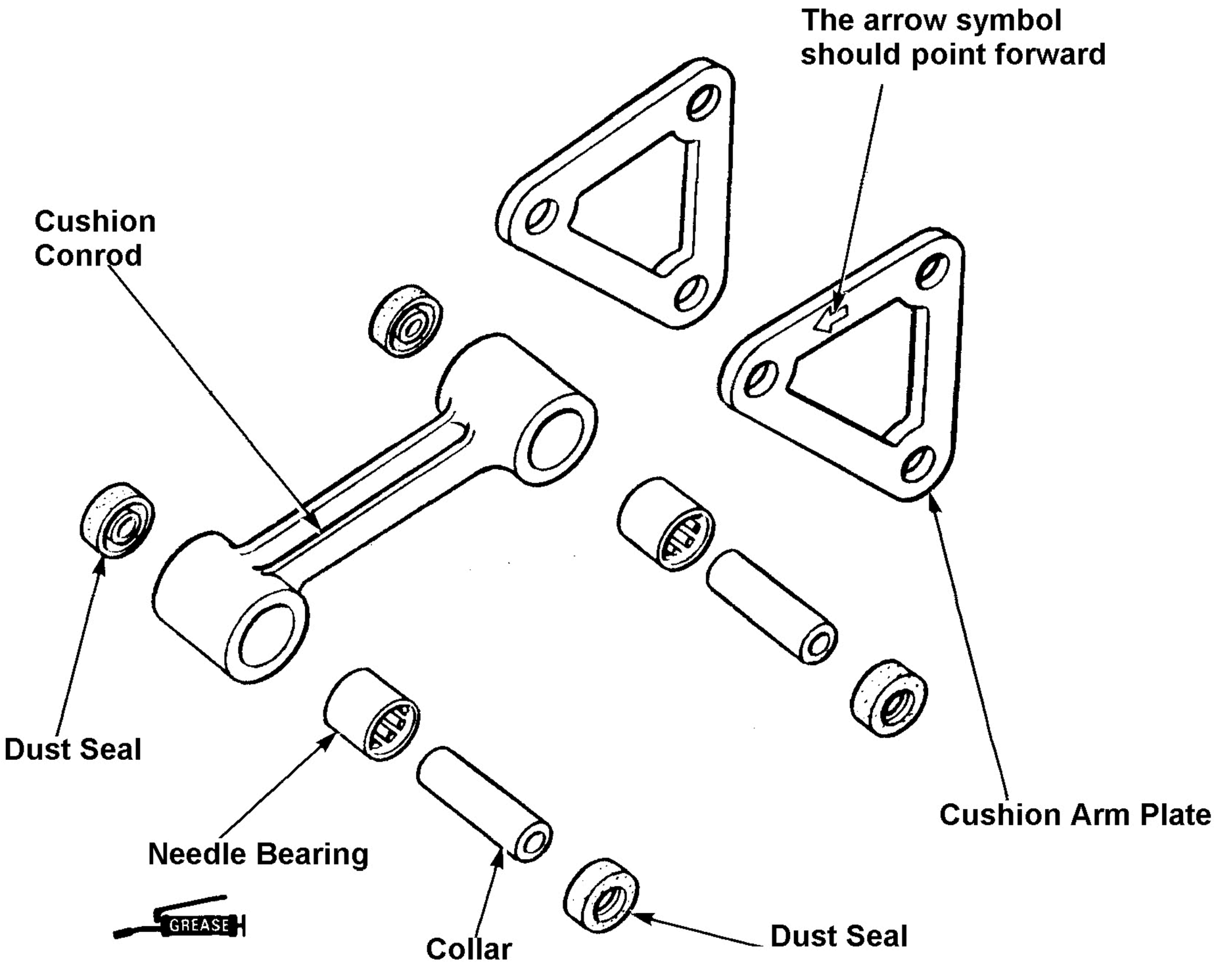
Detachment

Loosen the rear cushion upper mount bolt prior to detaching the suspension linkage.



Remove conrod bolts (frame side and the cushion arm side) and detach the cushion conrod.

Remove the rear cushion lower bolt and the cushion arm bolt and detach the cushion arm.

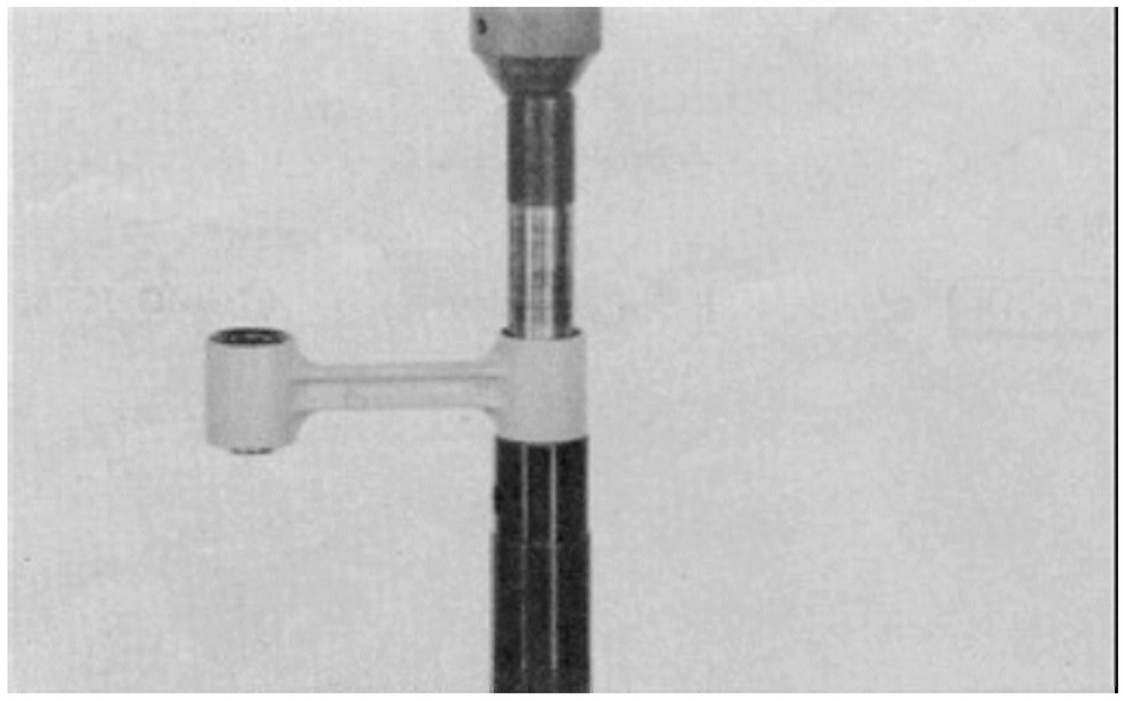


Needle bearing replacement

Remove dust seals and collars.
Detach the needle bearings from the conrod by using a hydraulic press machine.

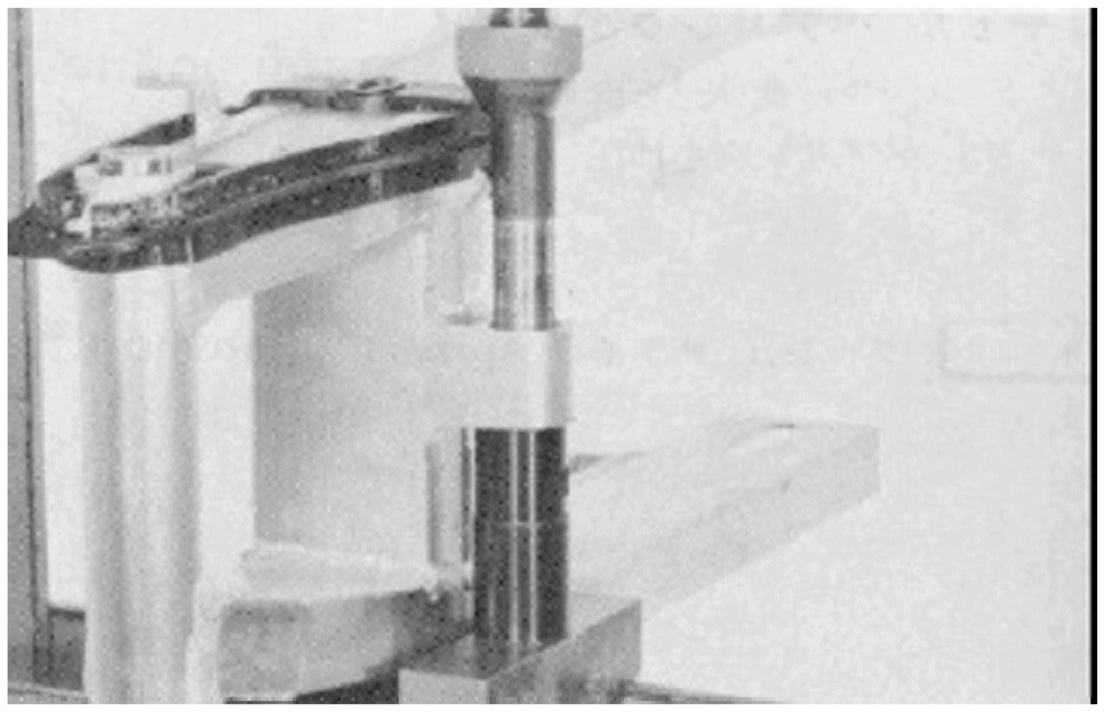
Exc. tool

Bushdriver Assy 07GMD-KT80100

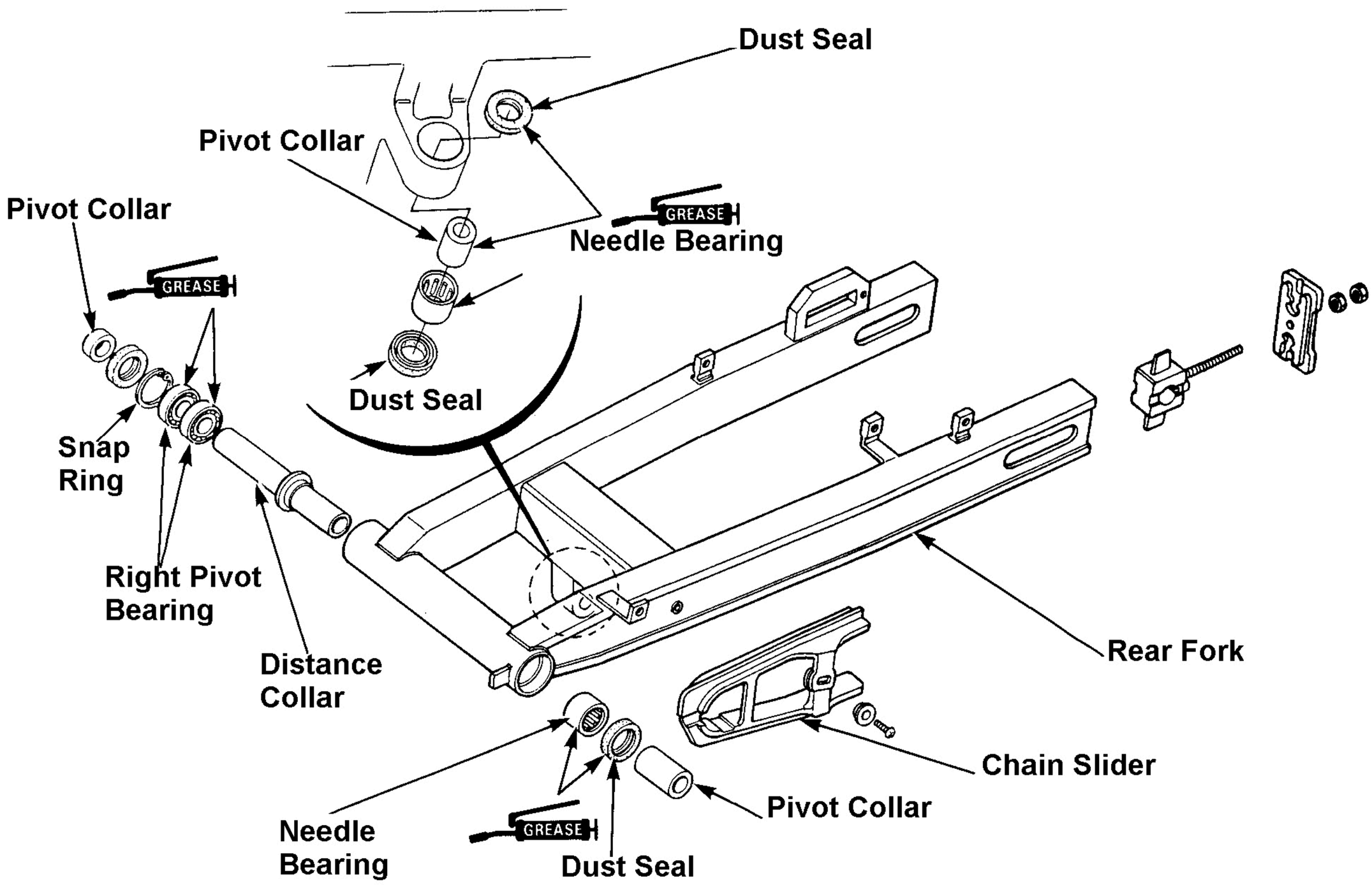


Install new needle bearing to the conrod by using a hydraulic press machine.
After the attachment, apply grease to the bearing.
Attach dust seals and collars.

Exc. tool	
Bushdriver Assy	07GMD-KT80100



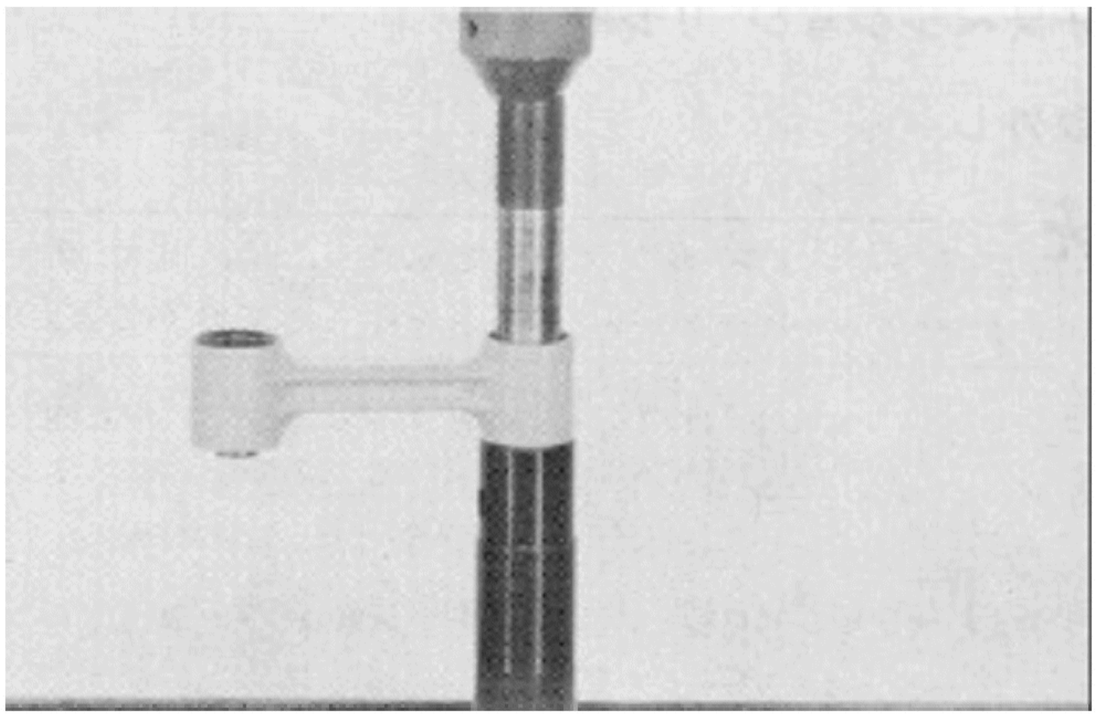
- **Rear Fork Assembly/Disassembly**



Needle bearing replacement (suspension linkage side)

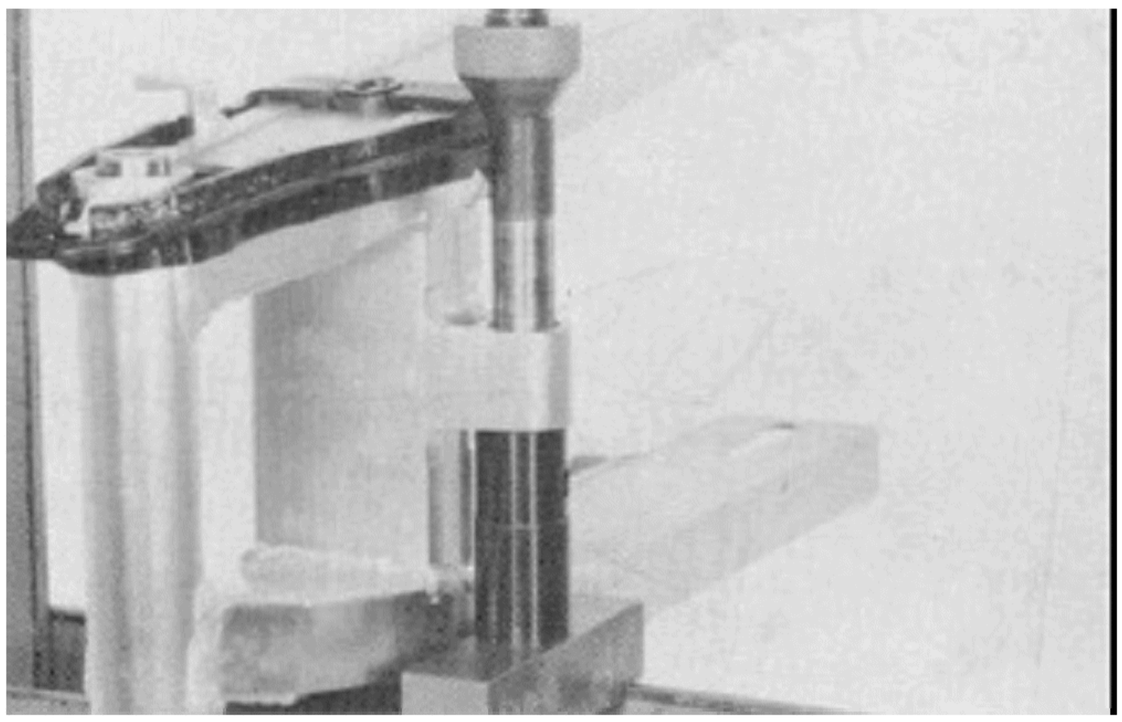
Remove dust seals and collars.
Remove the needle bearings from a rear fork by using a press machine.

Exc. tool	
Bushdriver Assy	07GMD-KT80100



Install the new needle bearings to the rear fork by using the press machine.
After installing them, apply grease to the bearings.
Install dust seals and collars.

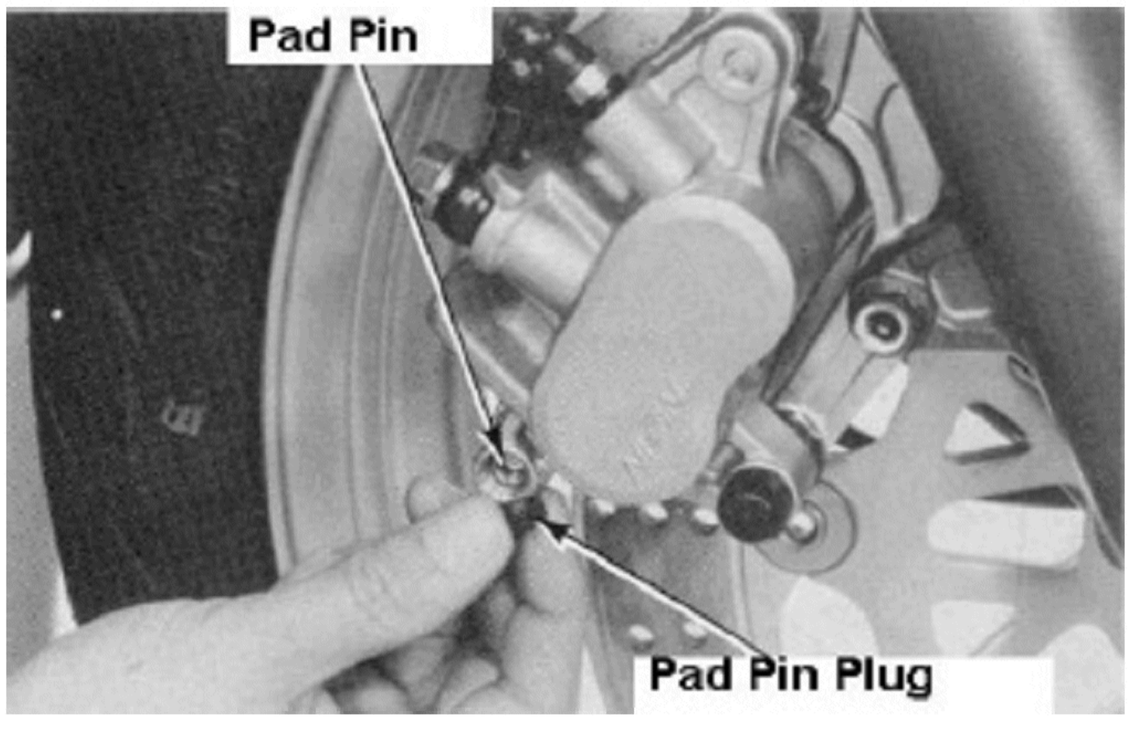
Exc. tool	
Bushdriver Assy	07GMD-KT80100



Brake System (Disk Brake)

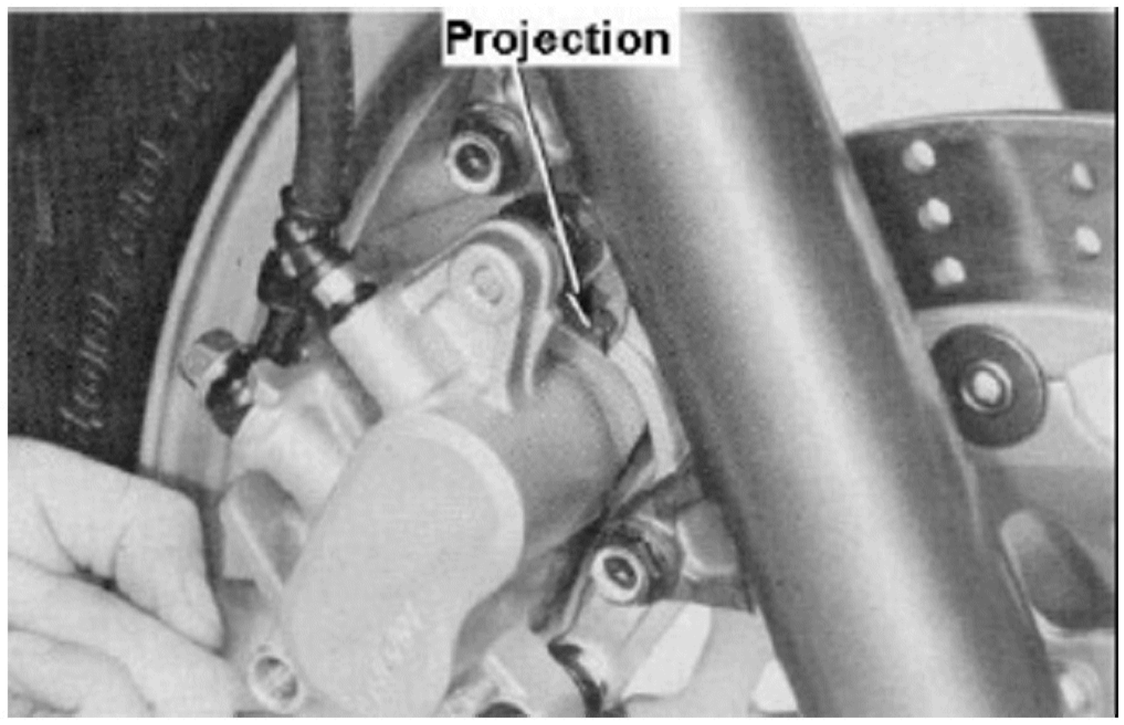
Front brake pad change

Remove the pad pin plug and the hanger pin.
Pull down the pad to remove.

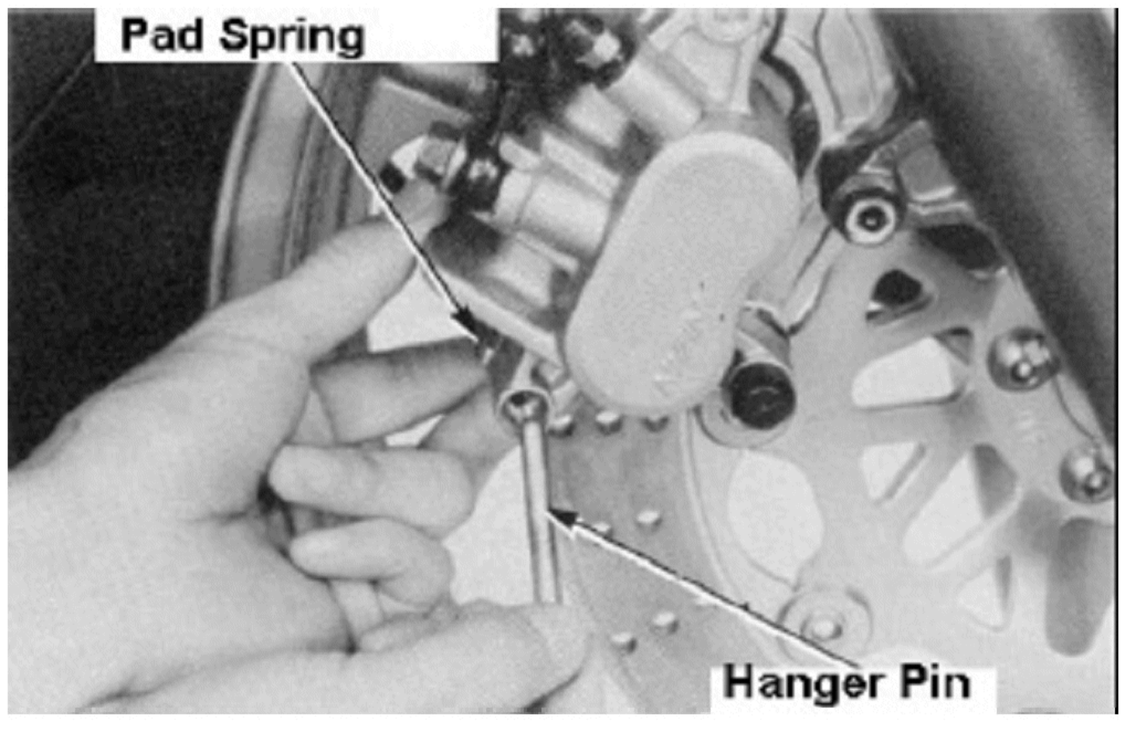


Attach the pad to the caliper by inserting the projection on the pad to the caliper dent.

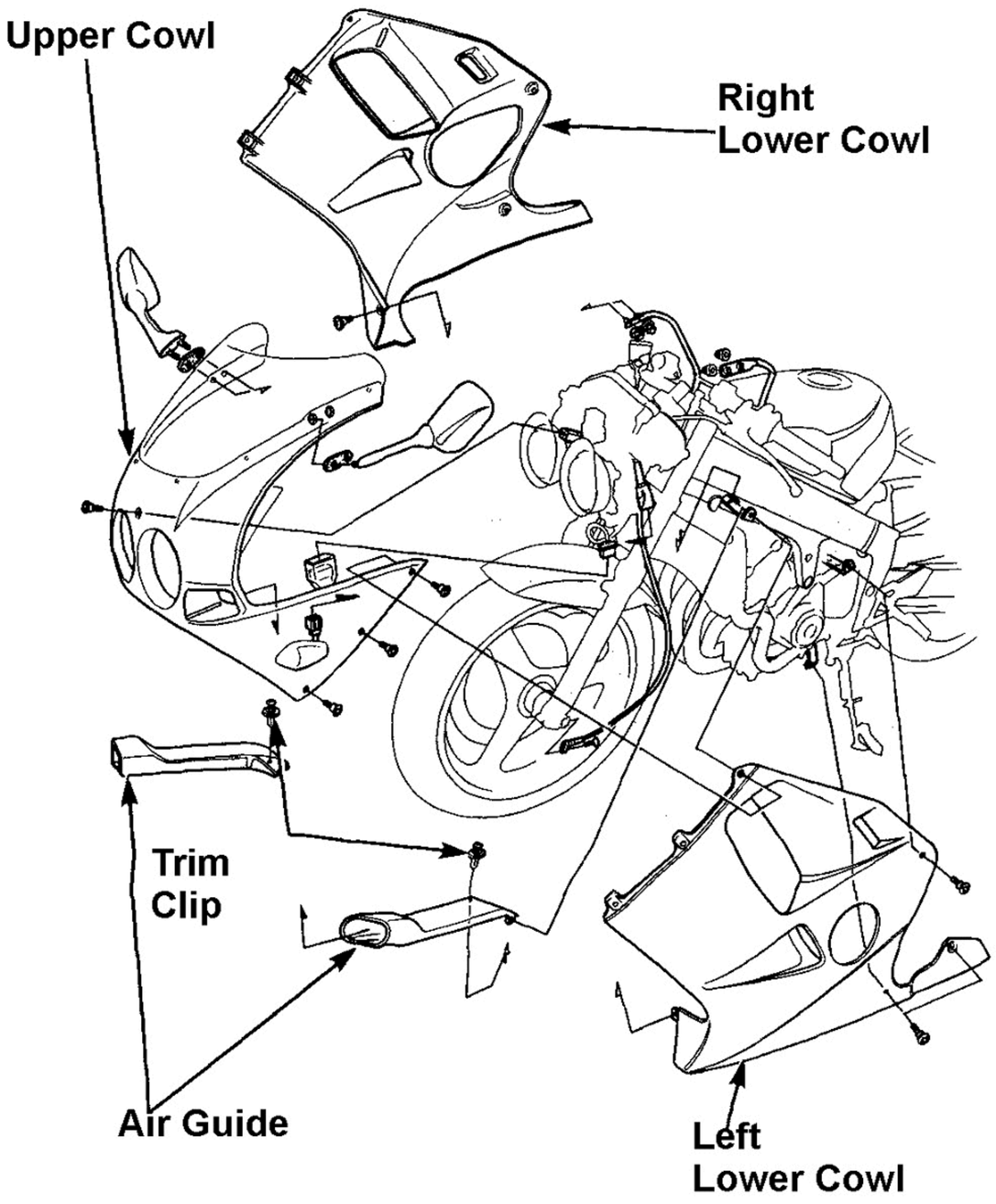
- Always change brake pads in a pair.
- Check the pad spring and pad retainer are set firmly before installing pads.

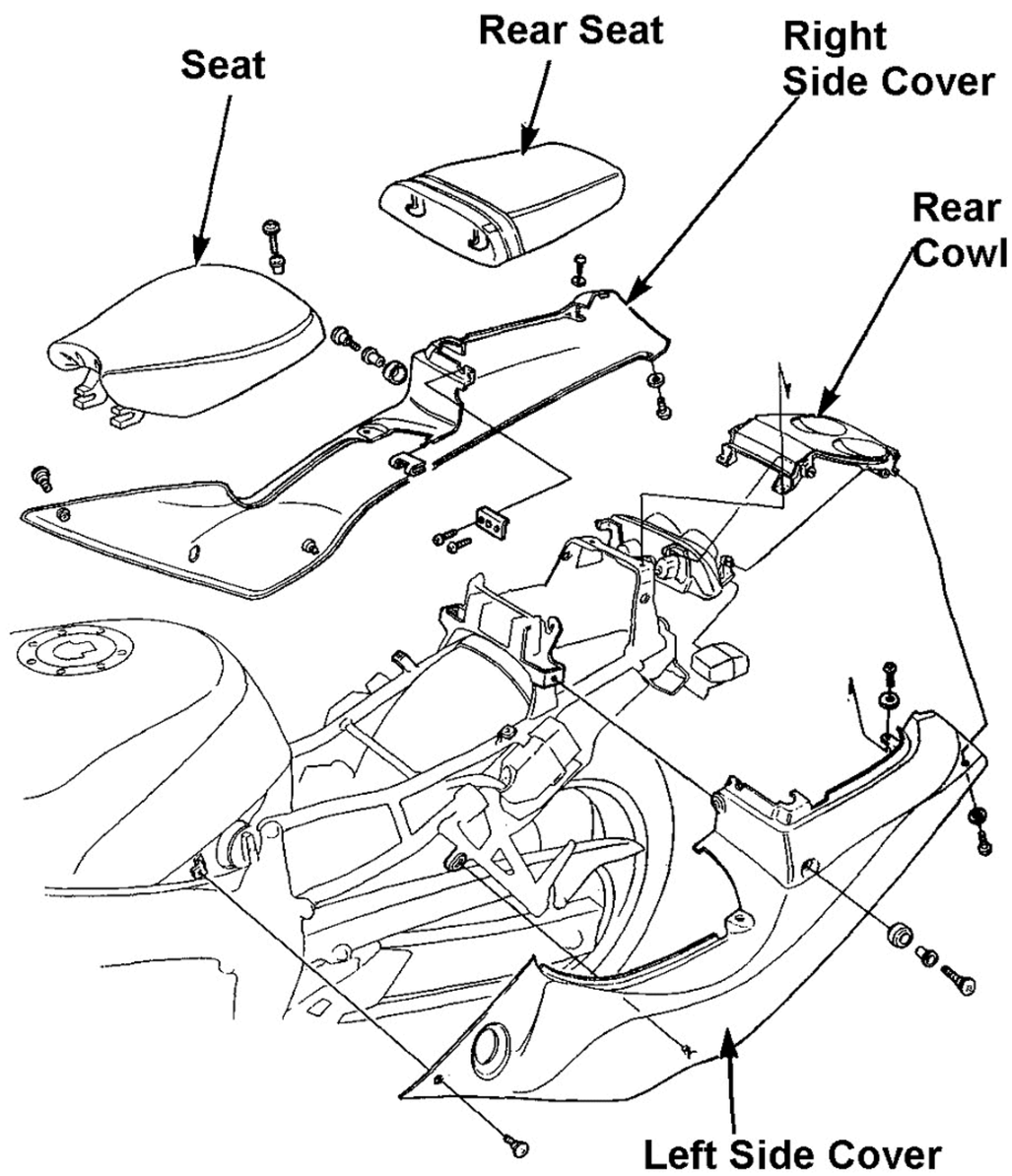


Push up the pad to compress the pad spring and install / tighten the hanger pin.



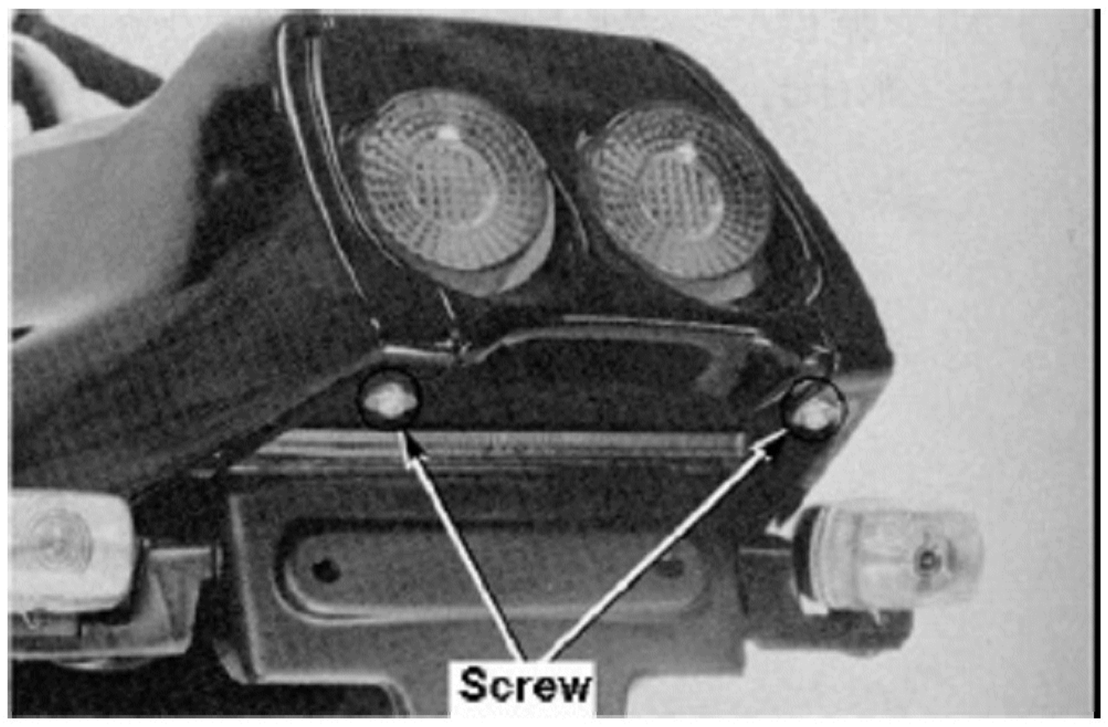
Fairing



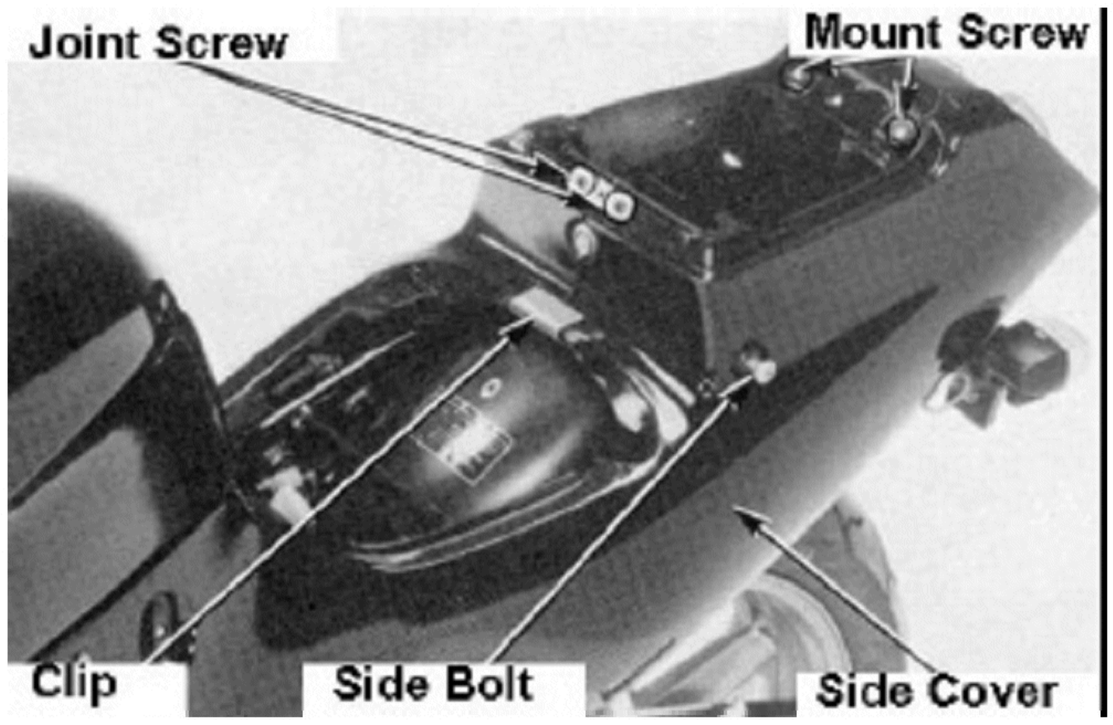


Side cover attachment / detachment

Remove the seat and the rear seat.
Remove screws underneath the rear cowl.



Remove joint screws and mount screws on lower part of the rear seat.
Remove two side bolts and detach side covers.

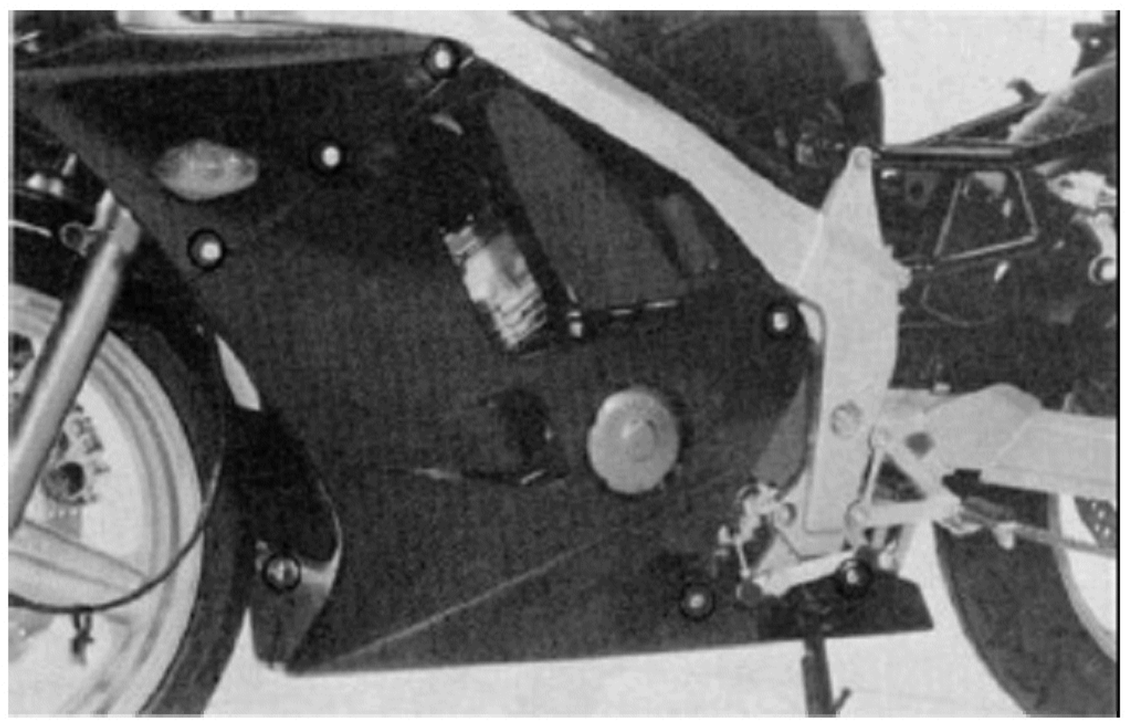


When detaching side covers, do not snap hooks.

Reverse the procedure for the attachment.

Lower Cowl Attachment / Detachment

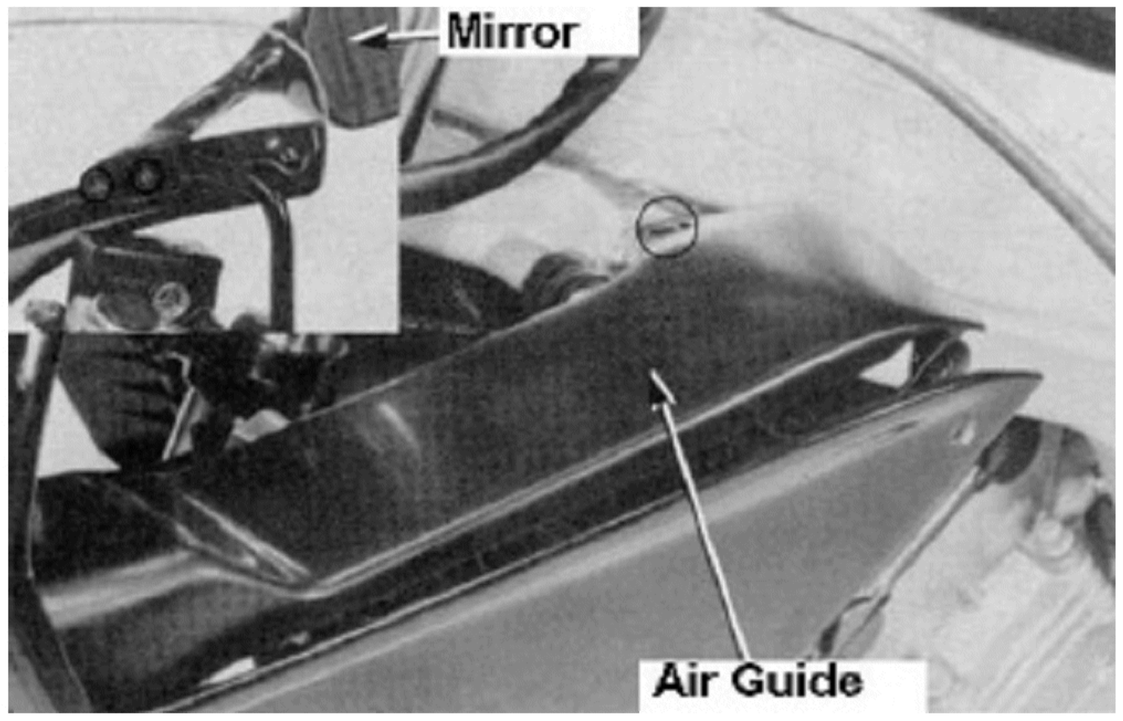
Remove the lower cowl joint bolt.
Remove seven bolts to detach the left lower cowl.
Remove six bolts to detach the right lower cowl.



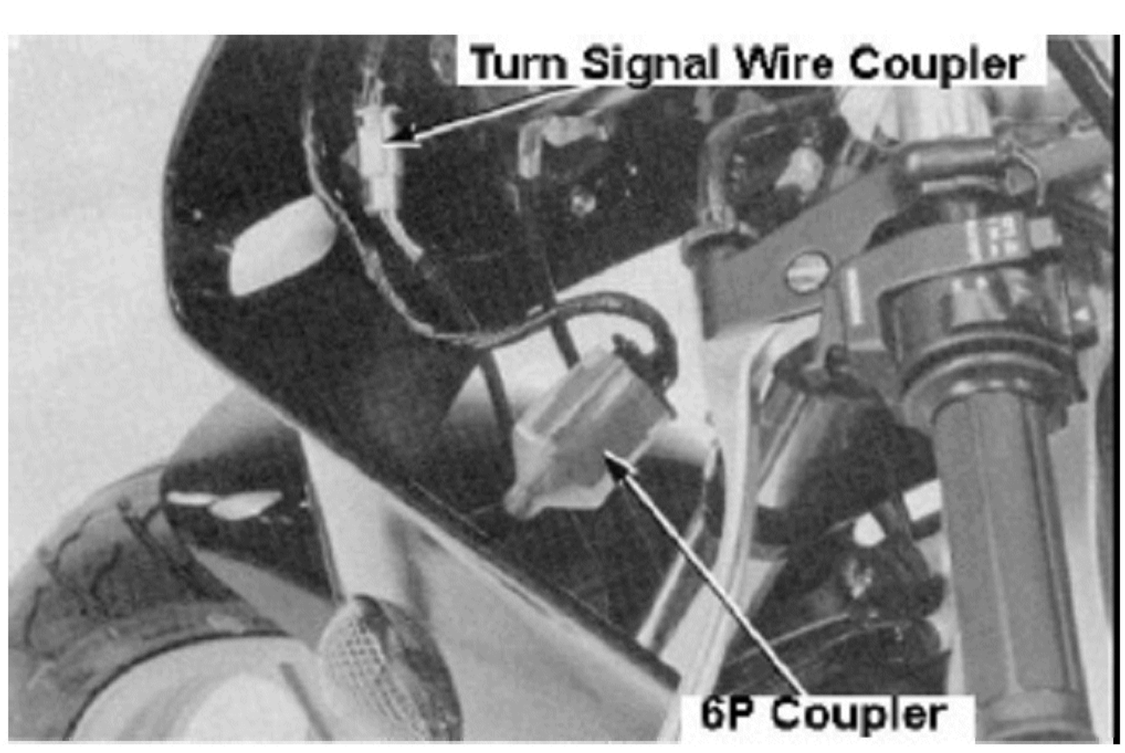
Reverse the procedure for the attachment.

Upper Cowl Attachment / Detachment

Detach lower cowls.
Detach rearview mirrors.
Remove the trim clip on the air guide to remove the air guide.

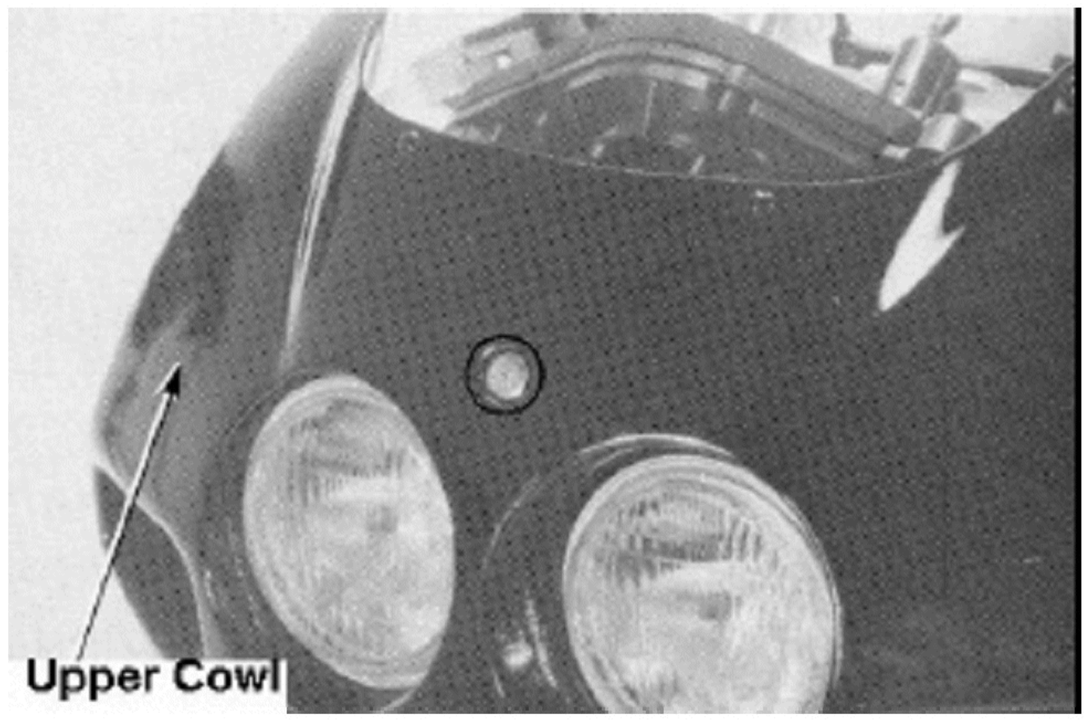


Disconnect left and right turn signal wire couplers.
Detach 6P coupler clamp on left hand side and disconnect the coupler.



Remove the upper cowl mount screw to detach the upper cowl.

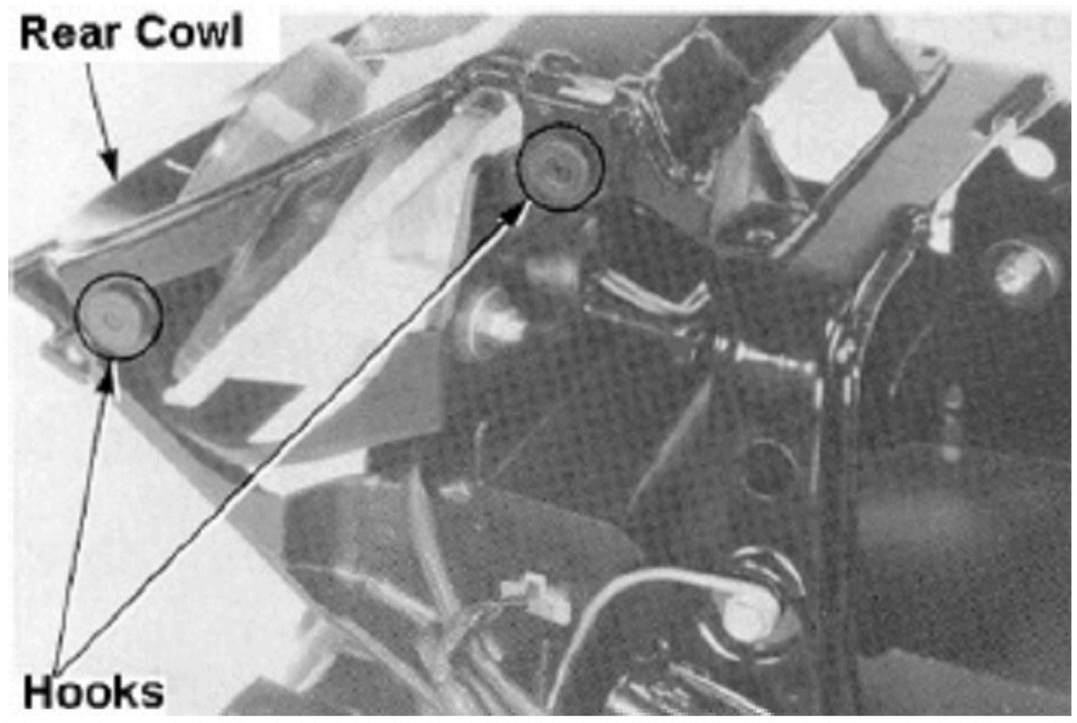
Reverse the procedure for the attachment.



Rear Cowl attachment / detachment

Remove side covers.
Disconnect four hooks and detach the rear cowl.

Reverse the procedure for the attachment.

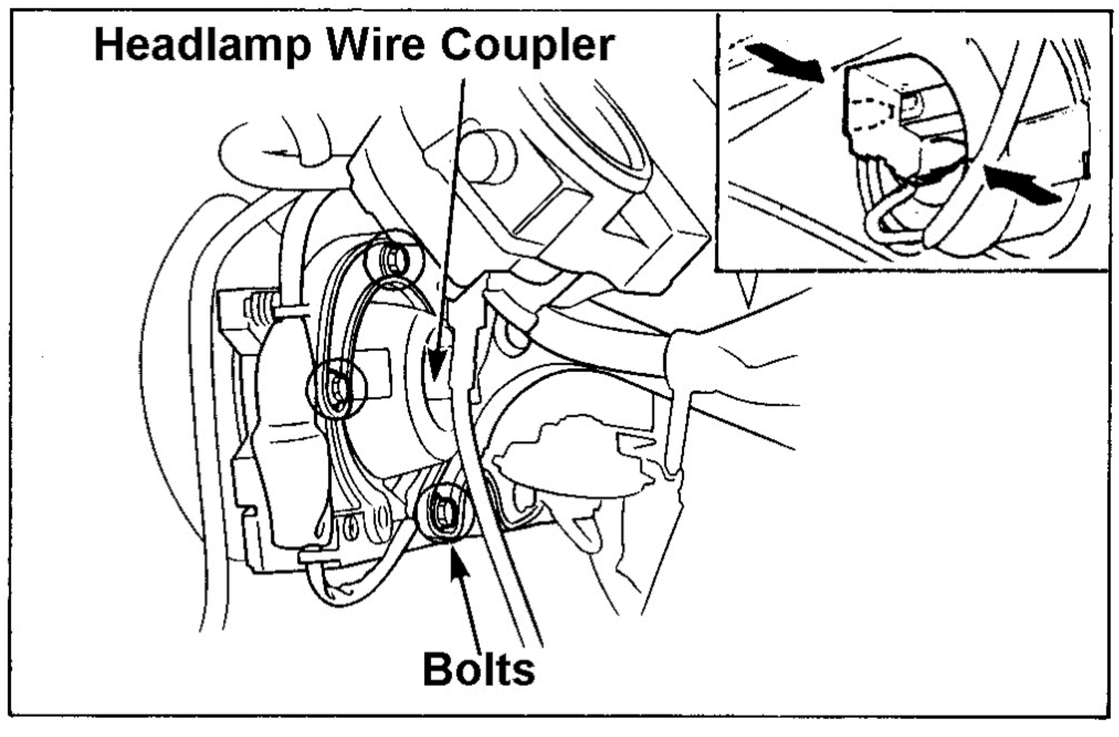


Lamps, Instruments and Switches

Headlamp case attachment/detachment

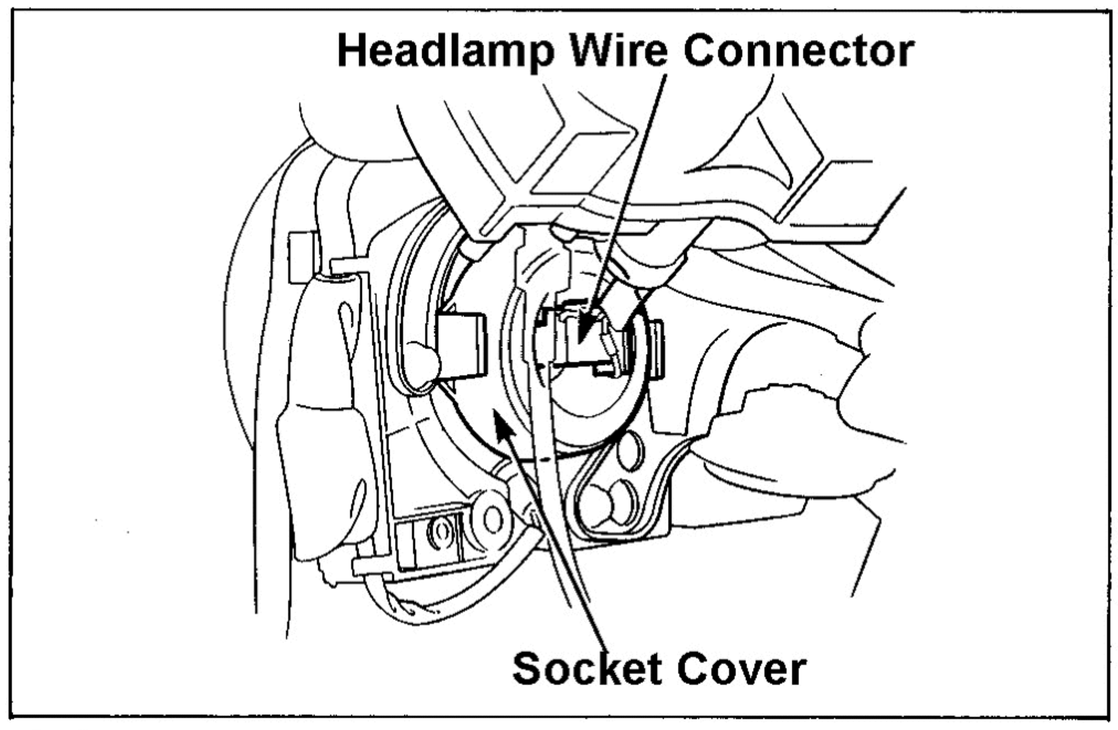
The headlamp can be detached individually.

Detach the upper cowl.
By pushing the catch of the headlamp wire connector, disconnect it.
Remove three bolts to detach the headlamp case.



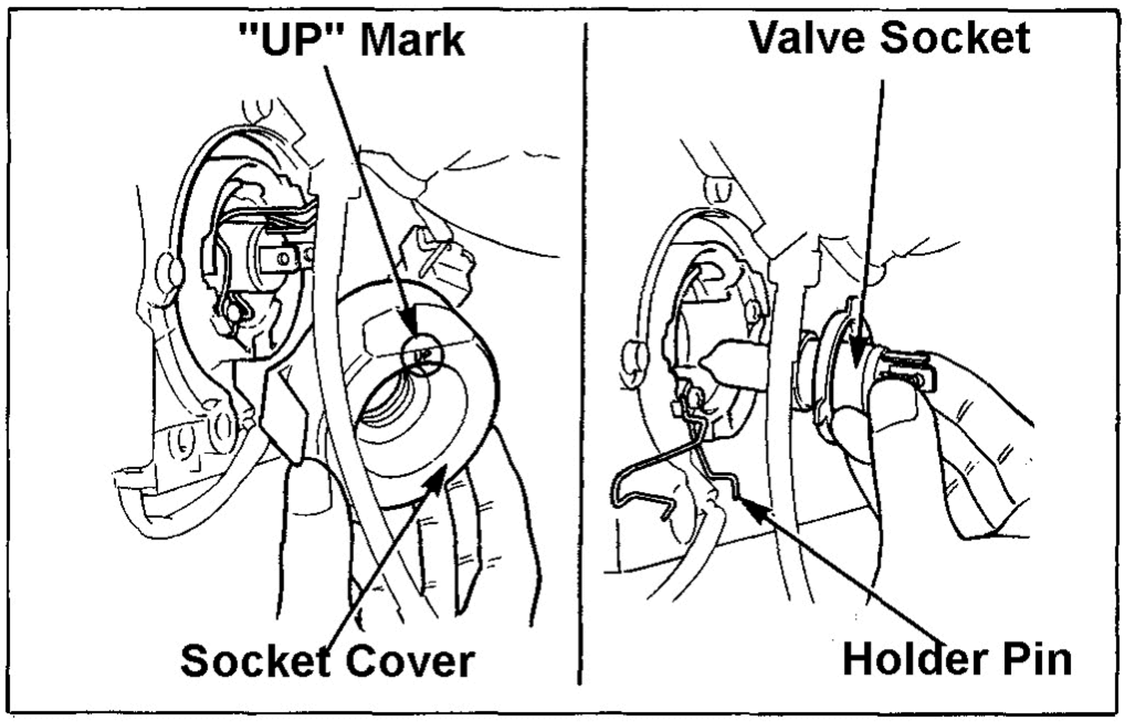
Headlamp light bulb change

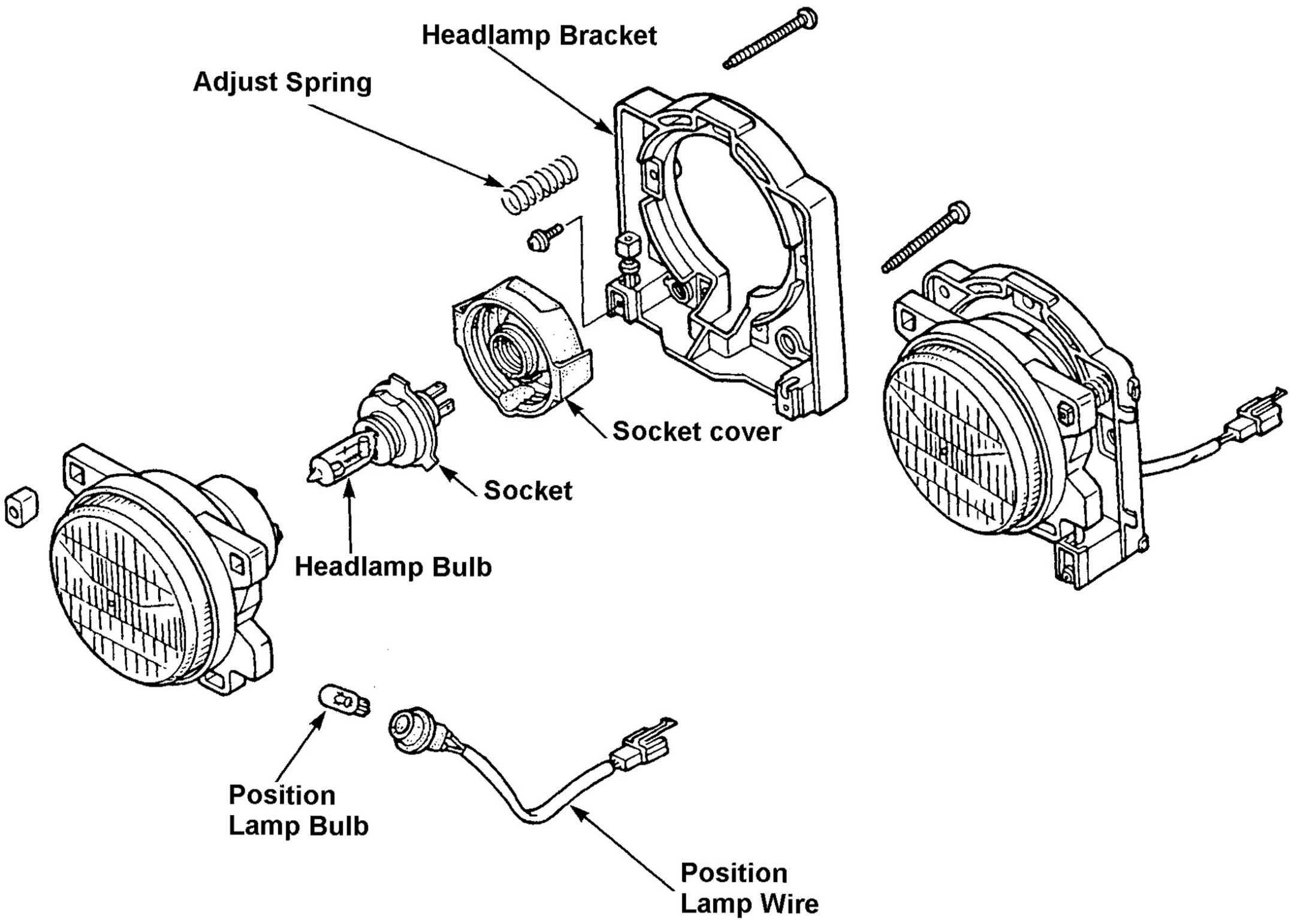
Detach the upper cowl (22-31).
By pushing the catch of the headlamp wire connector, disconnect it.
Remove the socket cover.



Detach the bulb socket and remove the bulb.
Reverse the procedure for the attachment.

Place the socket cover so as to have an "UP" marking at the top.

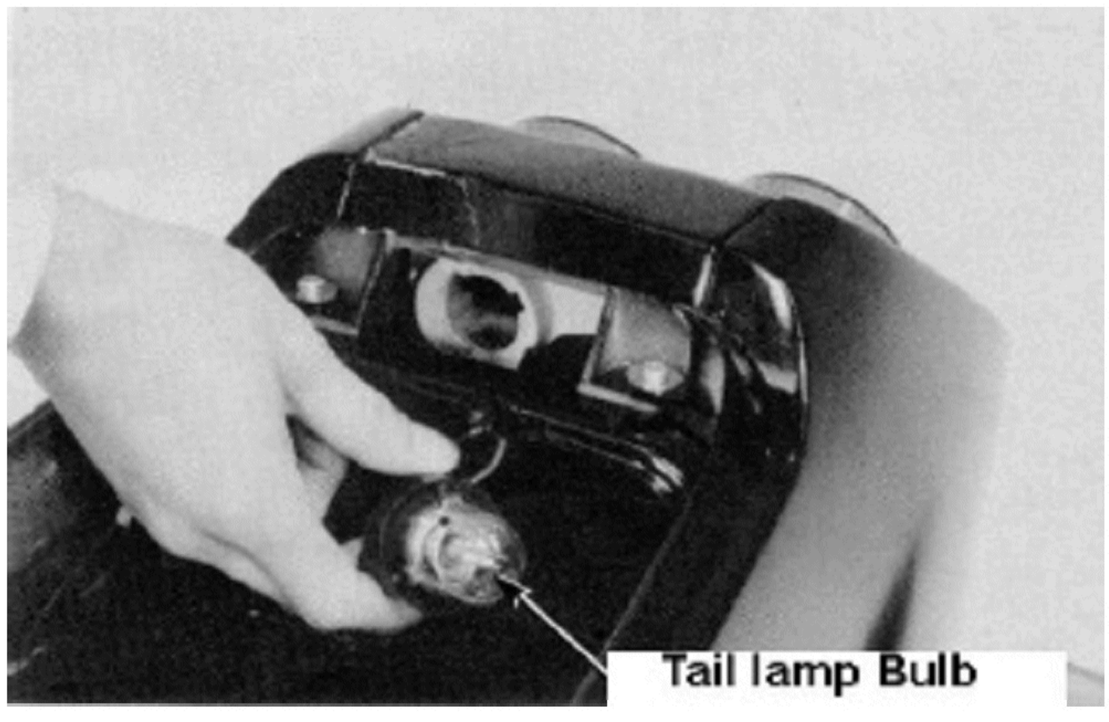




Tail lamp bulb change

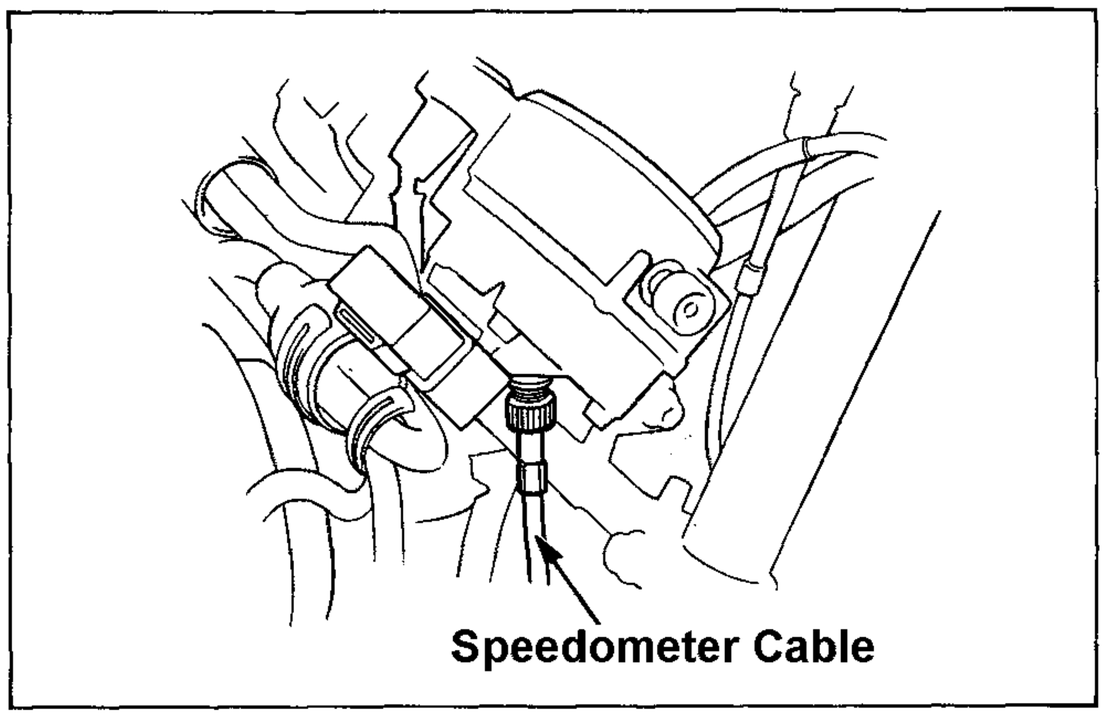
Detach the rear seat.
Turn the bulb socket counter clockwise and pull it out.
Remove the bulb.

Reverse the procedure for the attachment.

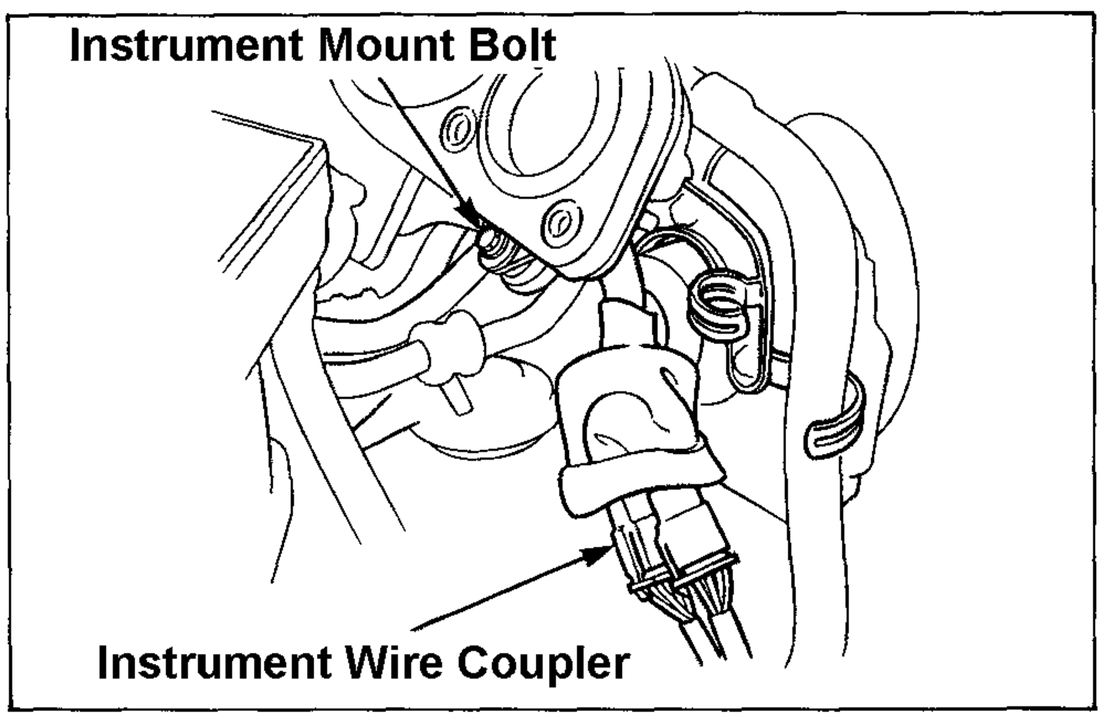


Instruments attachment / detachment

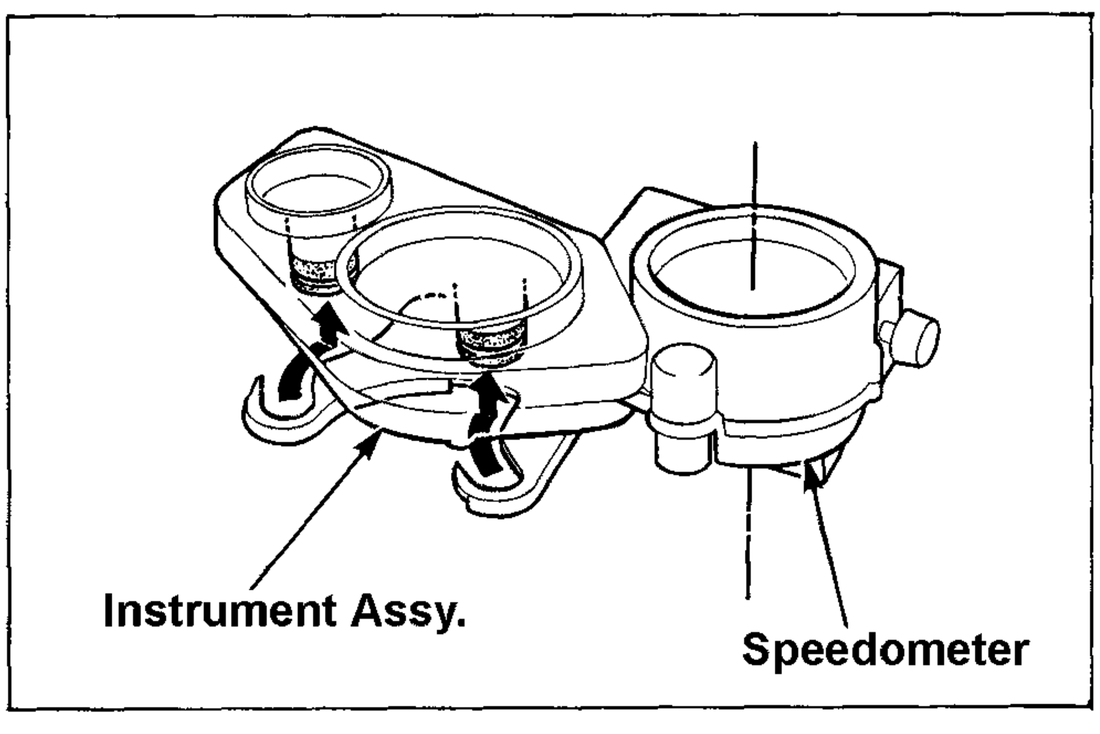
Disconnect the speedometer cable.



Disconnect the right air guide (22-31).
Disconnect instrument wire couplers.
Remove instrument mount bolt.

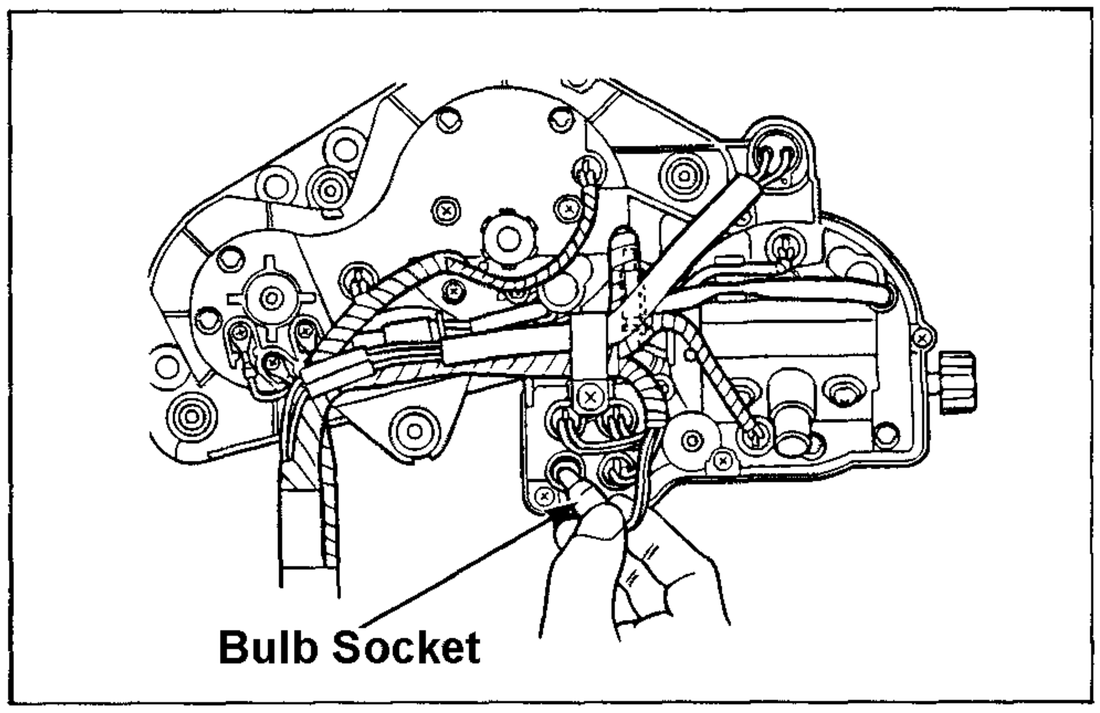


Instrument ASSY can be detached by rotating it clockwise around the speedometer and lifting it up.



Instrument bulb change

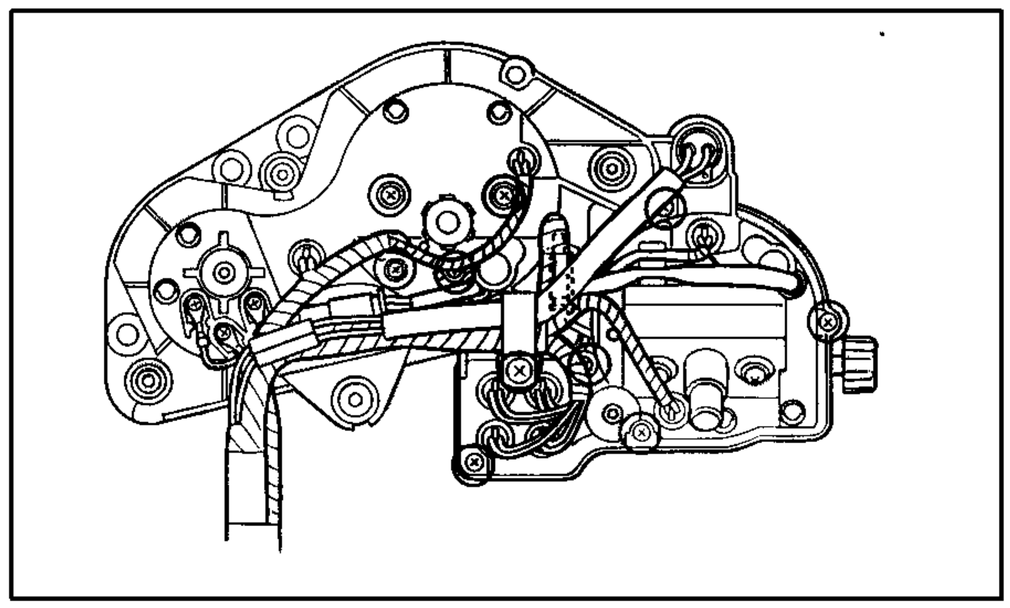
Detach the bulb socket and replace the bulb.



Instruments disassembly

Remove screws and detach the instrument lower cover.

Remove connectors, bulb socket, trip meter reset knobs and individual instruments mount screws and disassemble them.

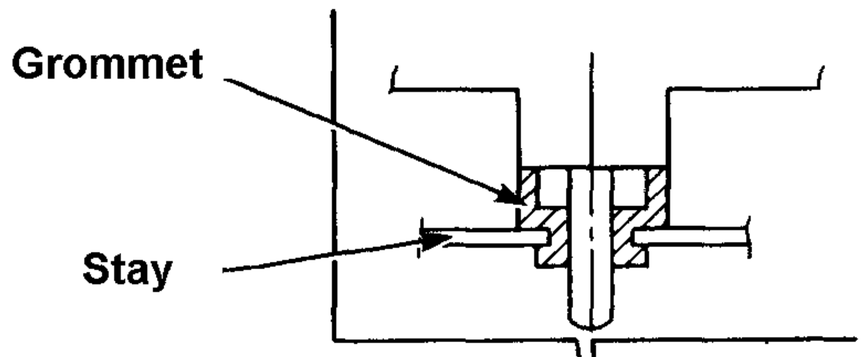


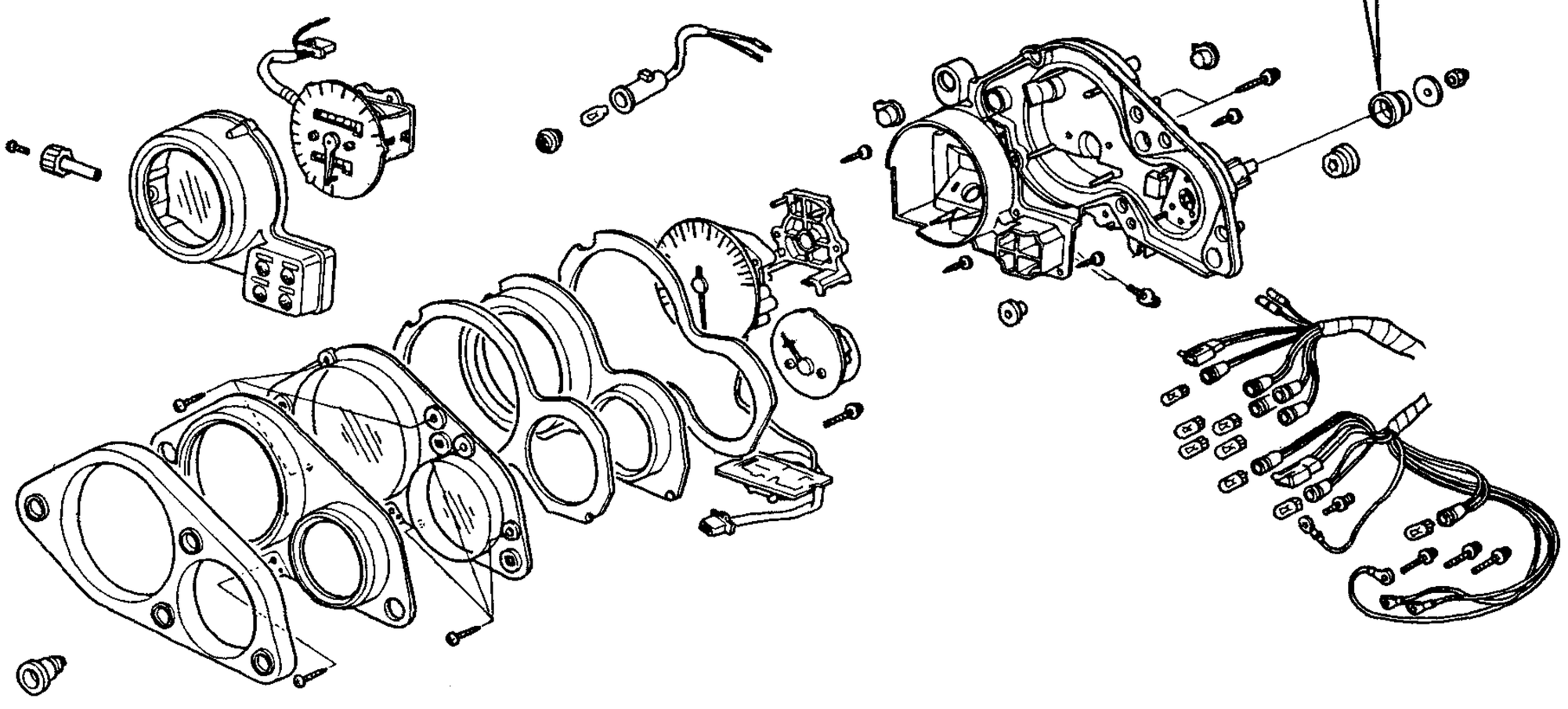
If you are removing screw tightening instrument wires, check the colour of the wires.

Instruments assembly / attachment

Reverse the detachment / disassembly procedure.

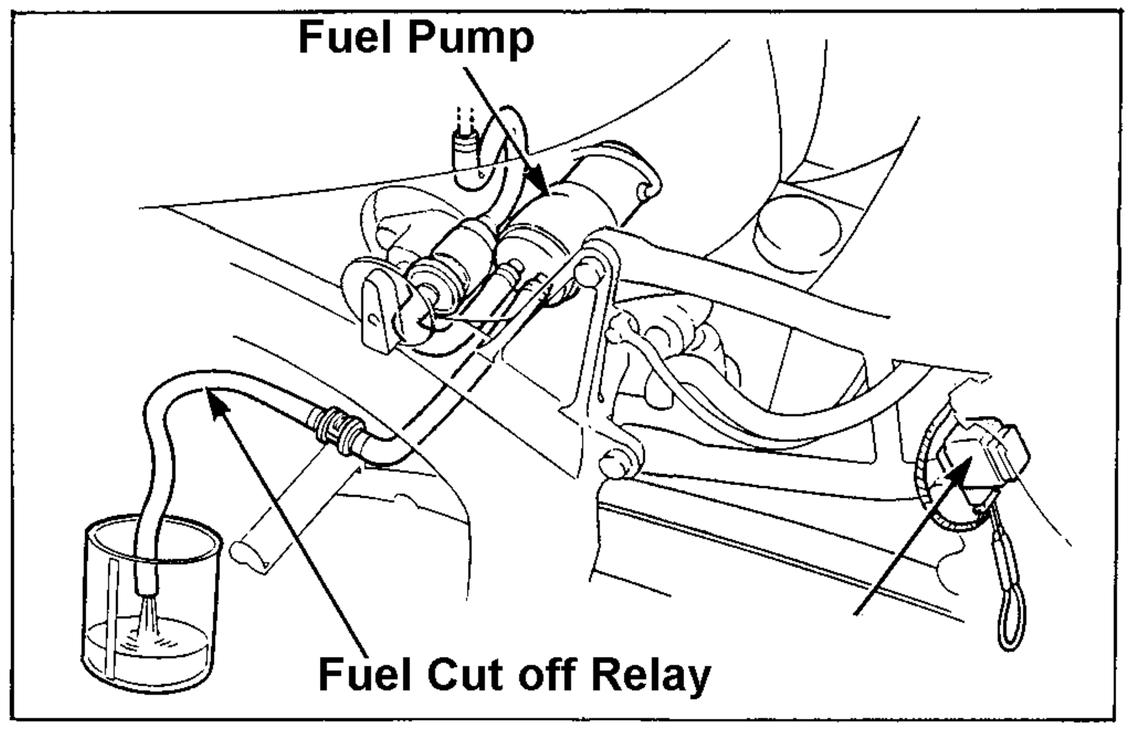
- Correctly apply instrument wire harness.
- Firmly connect the wires with screws to corresponding terminals.
- When installing instruments, firmly attach four grommets to the stay.





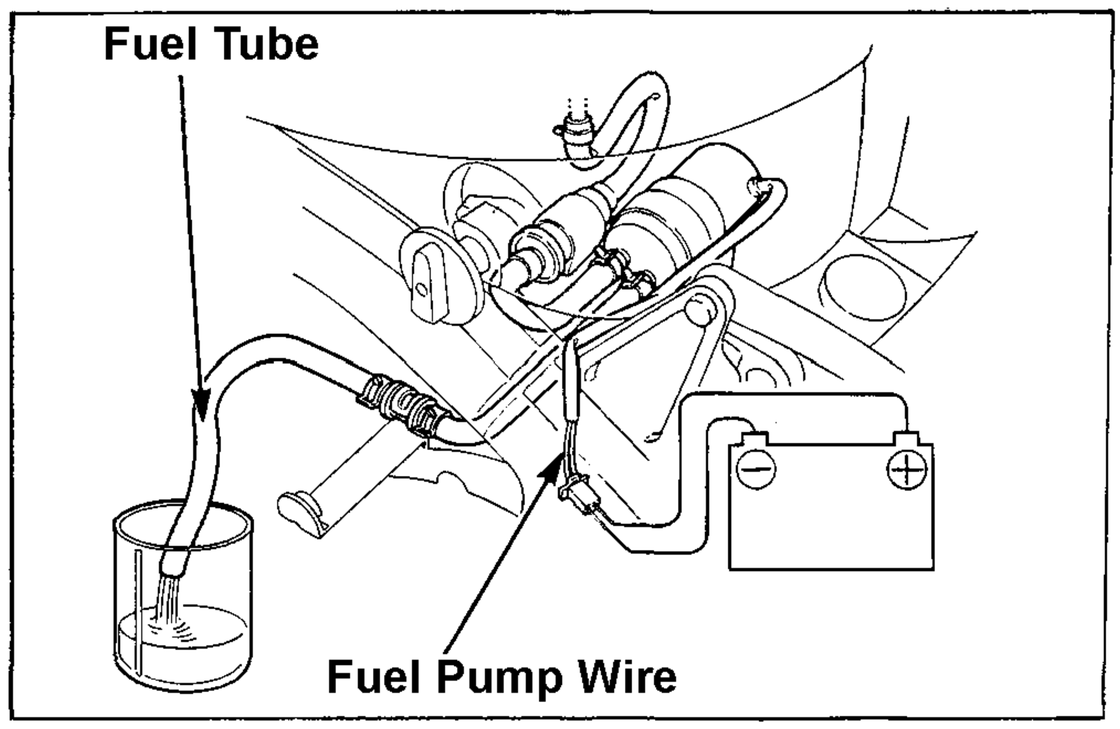
Fuel pump system check

Top off the fuel tank (13l).
Detach the left lower cowl and the left side cover.
Disconnect the fuel tube (fuel pump ~ carburettor) from the carburettor and put the end to the container.
Turn the ignition “ON”.
Disconnect the fuel cut relay wire coupler (Black/Blue – Black) and short circuit for 5 seconds.
From the amount of fuel coming out from the tube, calculate the fuel flow per minute.



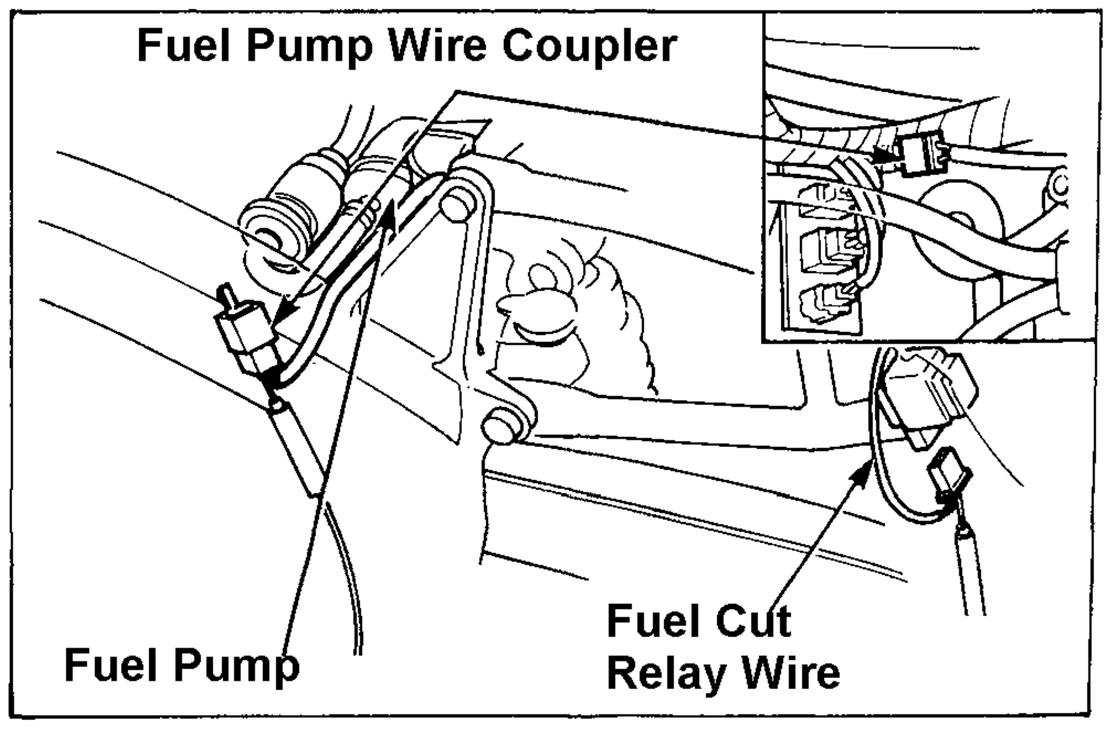
Standard: 1,800c.c. / min

If there is a significant difference with the standard, inspect the fuel cut-off relay.



Fuel pump inspection

Detach the fuel tank (22-19).
Disconnect the fuel pump wire coupler.
Disconnect the fuel tube from carburettor and pull the tube and the wire connector to the right side of the frame and re-attach the fuel tank (as shown in the figure).
Do not use pliers to disconnect the tube as they may damage the tube. A commercialised rubber tube remover may be an alternative.



Connect the battery to the fuel pump wire coupler and measure the fuel flow.
If the flow is far out of the standard, replace the fuel pump.
If the flow rate is ok, inspect the fuel cut off relay.

- Sparks may come out when connecting the battery. Exercise extreme caution so petrol does not catch fire.
- Check (+) (-) when connecting a battery. Reverse connection may end up with a fuel pump failure.

Fuel cut relay inspection

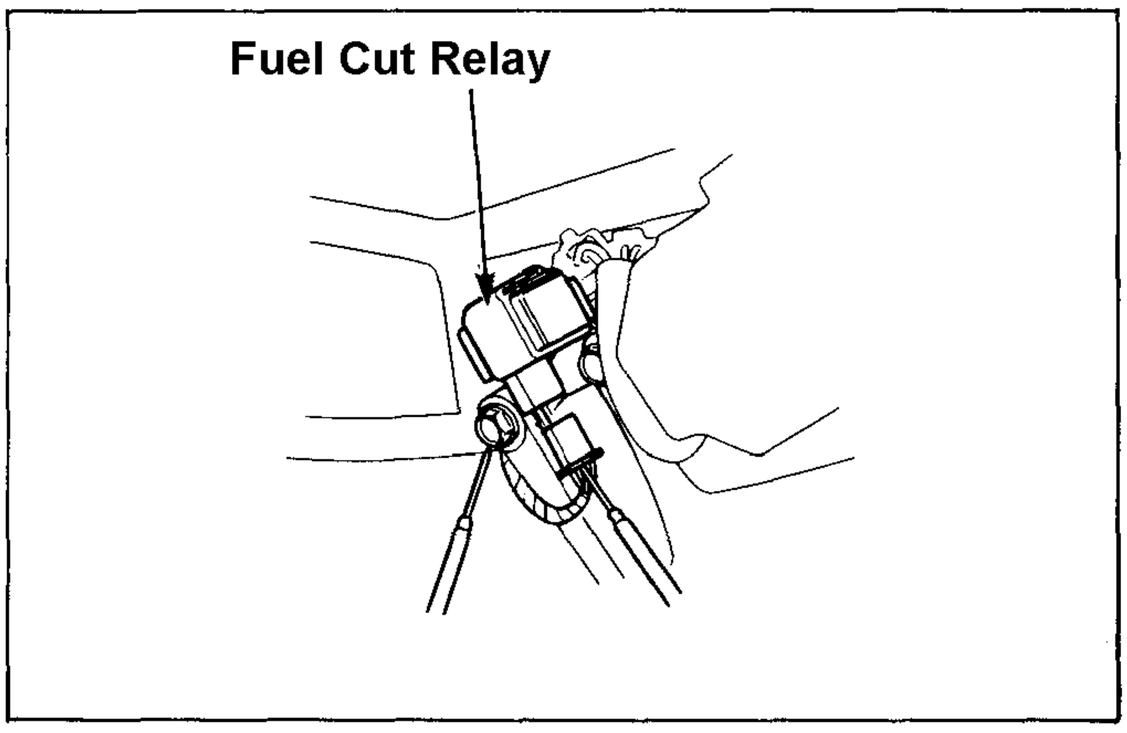
Remove the fuel tank (22-19).

Disconnect the fuel cut relay wire coupler.

Disconnect the fuel pump wire coupler.

Check the continuity of Black / Blue wires between each coupler harness.

If no continuity, replace the wire harness.



If there is no fault, conduct the following check on the fuel cut relay wire coupler (harness side).

Ignition "ON"
Measure the voltage between Black – ground earth.
Measure the voltage between Yellow - ground earth.

If the voltage indicate battery voltage, replace the fuel cut relay.

If there is no battery voltage, replace the wire harness.

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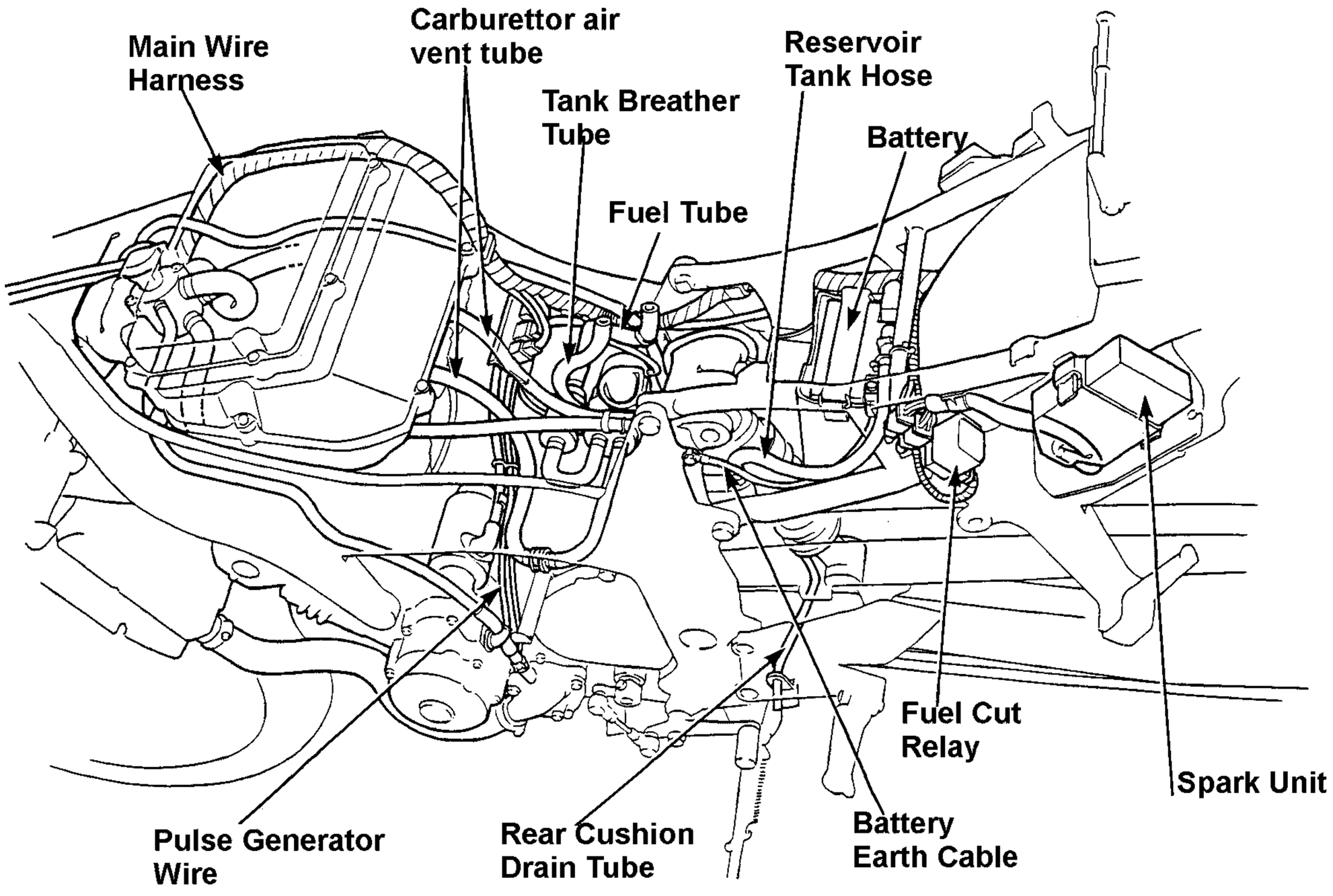
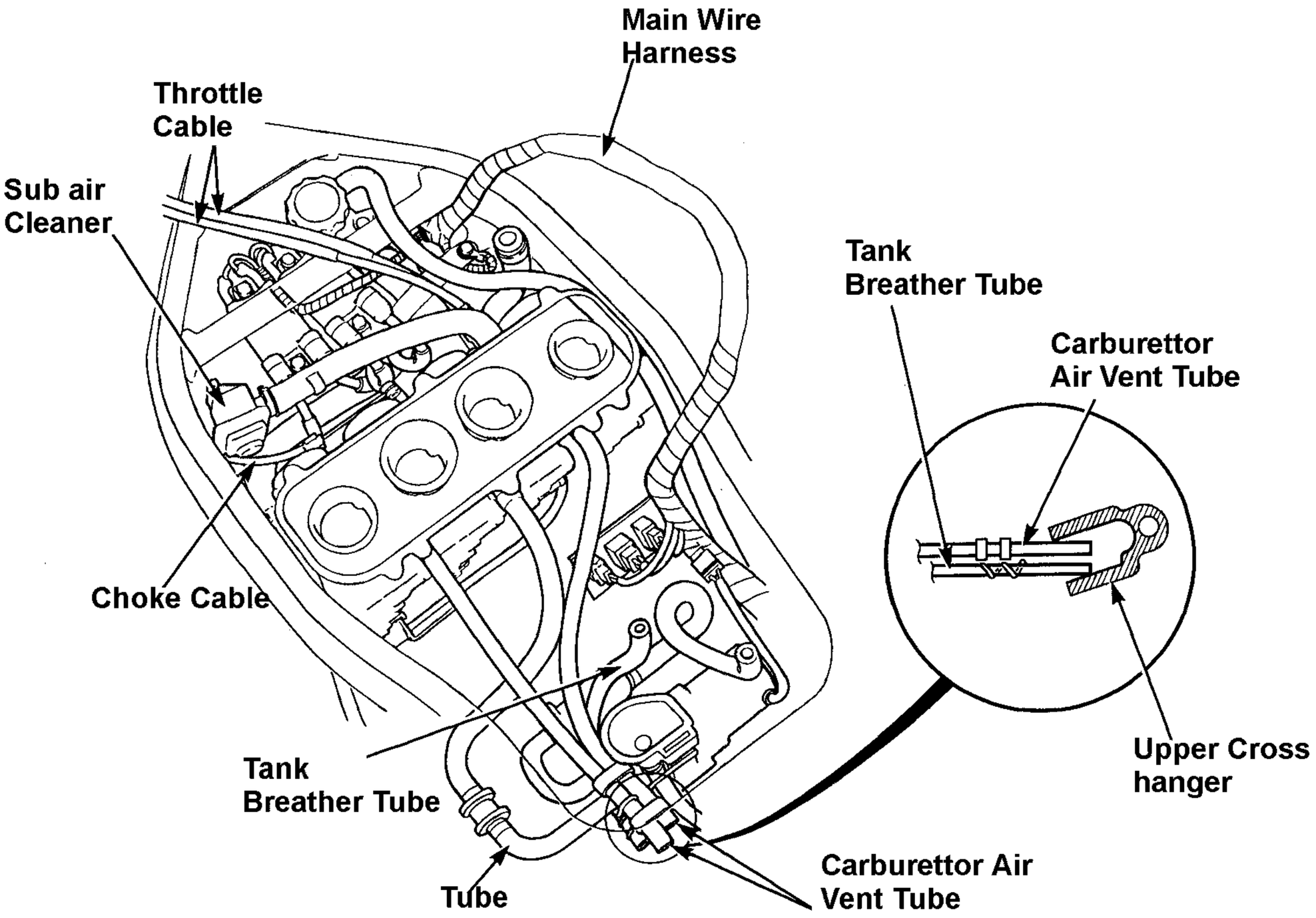
Circuit Wiring Diagram 23-3

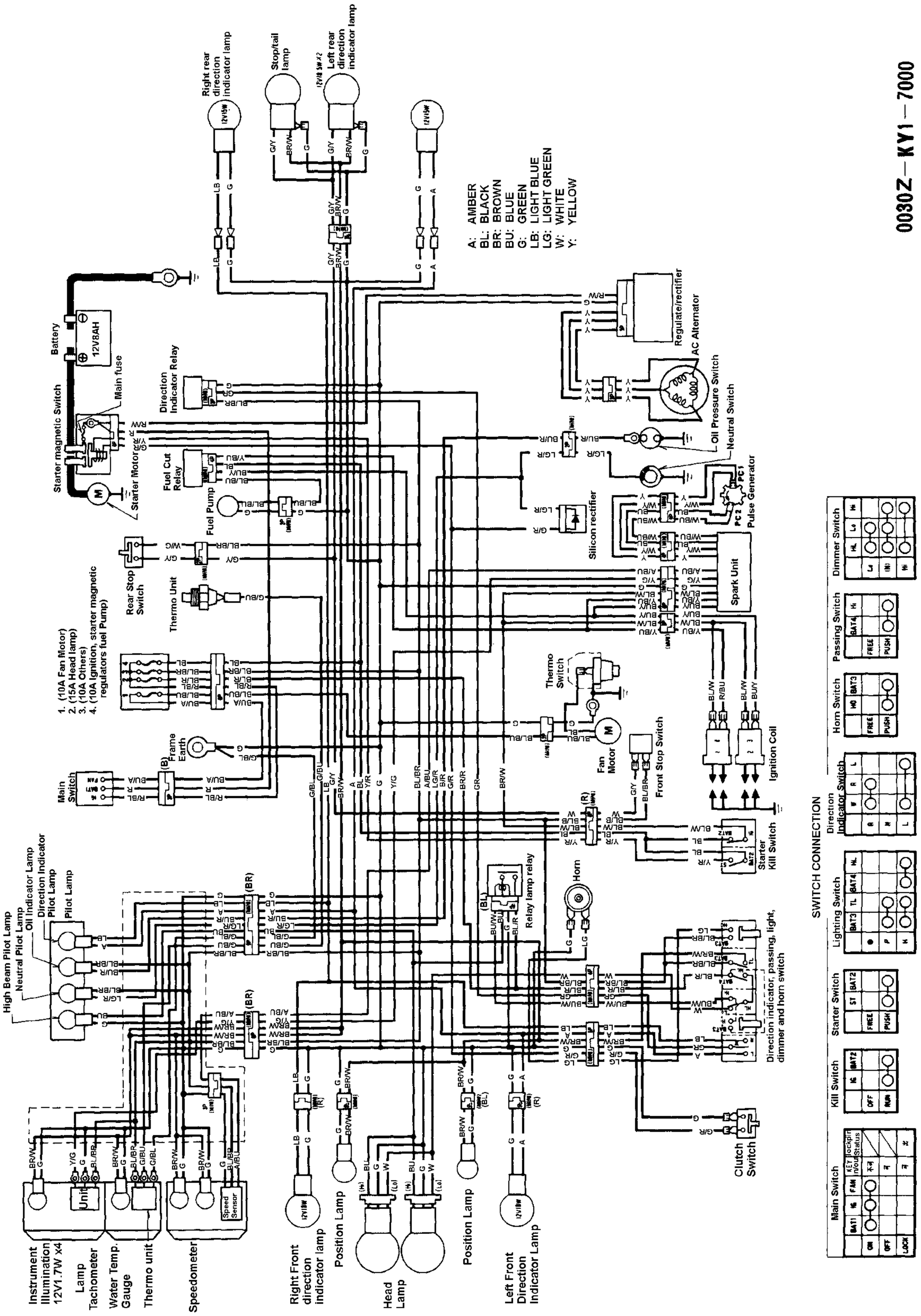
CRBR250R (K)

- **Wiring Diagram**





- **Circuit Wiring Diagram**



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CBR250RR (L)

Specifications

Thick lined cells are different from CBR250FOUR / CBR250R

Type			MC22
Length			1.975m
Width			0.675m
Height			1.080m
Wheelbase			1.345m
Powerplant			MC14E
Displacement			0.249l
Type of fuel			Petrol
Vehicle weight	Front		80kg
	Rear		77kg
	Total		157kg
Maximum capacity			2
Gross weight	Front		101kg
	Rear		166kg
	Total		267kg
Tyres	Front		110/70 – R17 54H
	Rear		140/60 – R17 63H
Minimum clearance			0.130m
performance	Brake stop Distance (initial km/h)		14.0m (50km/h)
	Minimum Turning radius		2.9m
Powerplant	Starting system		Electric start
	Type		Petrol, 4 – cycle
			In-line 4 cylinders
	Combustion chamber		Pent roof type
	Valves		DOHC gear driven 2 intake, 2 exhaust
	Bore x stroke		48.5 x 33.8mm
	Compression ratio		11.5
	Compression		13.0kg/cm²-400rpm
	Max horsepower		45PS / 15,000rpm
	Max torque		2.5kg-m / 12,000rpm
	Valve timing	IN Open	19° BTDC (1mm lifted)
		IN Close	33° ABDC (1mm lifted)
		EX Open	36° BBDC (1mm lifted)
		EX Close	11° ATDC (1mm lifted)
	Valve clearance	IN	0.16mm (cooled)
		EX	0.23mm (cooled)
	Unloaded max rpm		1,500rpm
	Lubrication	Type	Compress/splash
		Oil pump	Trochoid rotor type
		Oil filter	Total flow, screen / paper dual type
		Oil capacity	2.7l
Cooling system			Water cooled, electric fan

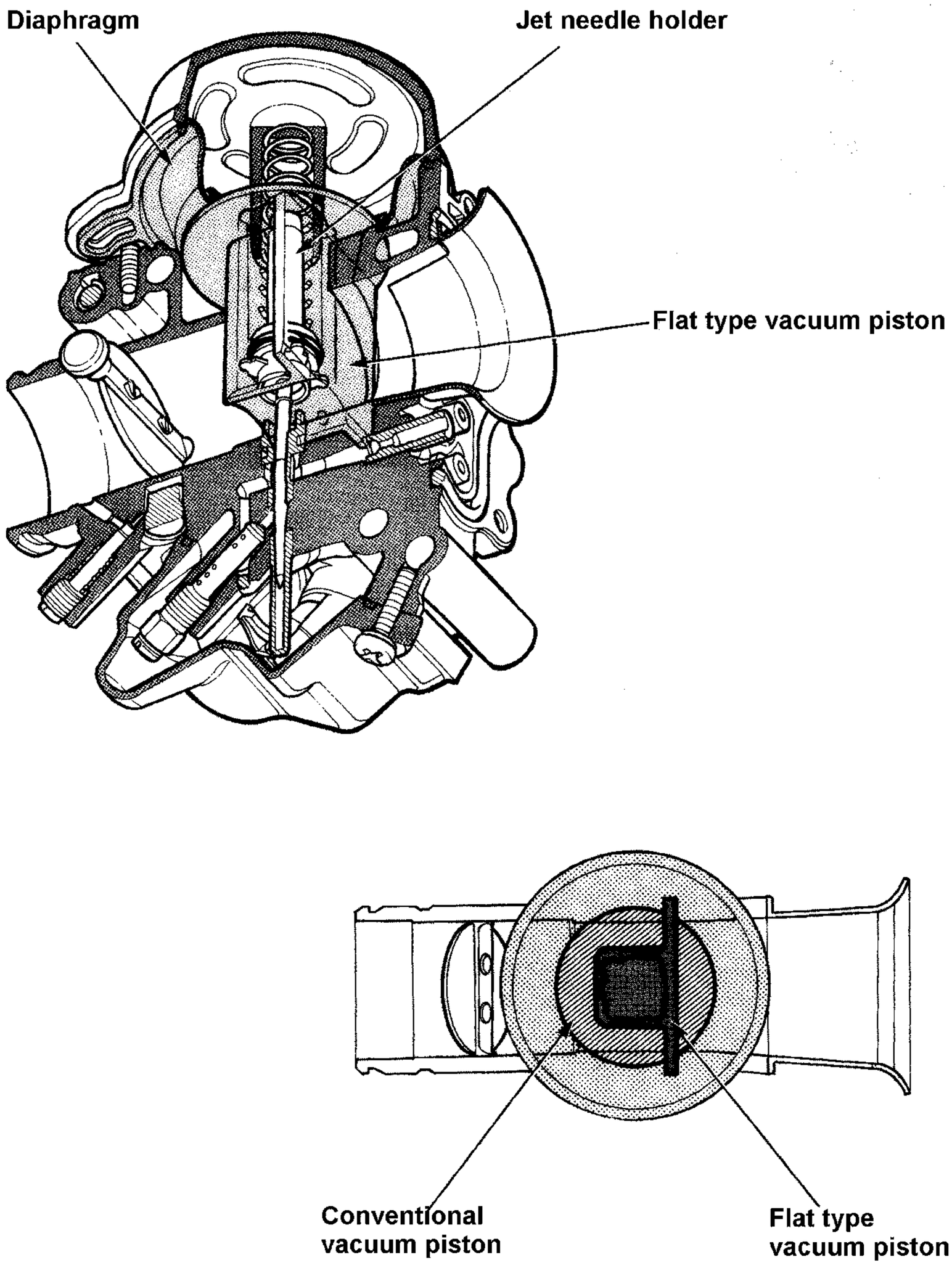
Fuel system	Air cleaner			Filter paper
	Fuel capacity			13l
	Carburetor	Type		VG20
		Gas valve dia		30mm
		Venturi diameter		29mm
Electrical system	Ignition	Type		
		Ignition Timing		23° BTDC/1500 rpm
		Spark plug	NGK	CR9EH-9, CR10EH-9
			ND	U27FER9, U31FER9
		Plug gap		0.8-0.9mm
	Battery capacity			12V6AH
Drive Train	Clutch	Type		Wet multi plate coil, spring type
		Operation		Mechanical
	Engine to transmission reduction ratio			2.966
	Gear ratio	Type		Constant Mesh
		Reduction ratio	1st	2.733
			2nd	2.000
			3rd	1.590
			4th	1.333
			5th	1.153
			6th	1.035
	Reduction	Primary	Gear type	Chain
			Reduction ratio	3.058
Wheels	Front	Caster		24°00’
		Trail		89mm
	Tyre Pressure		Front	2.25kg/cm²
			Rear	2.50kg/cm²
Steering angle			Left	31°
			Right	31°
Suspension system			Front	Telescopic
			Rear	Swing Arm
Brake System			Front	Hydraulic disk
			Rear	Hydraulic disk
Frame type				Backbone
Frame Serial No.				MC22 – 1000001 ~
Engine Serial No.				MC14E–1140001 ~

Description of the mechanism

VP carburetor

The CBR250RR is equipped with a VP type carburettor, which has a flat type vacuum piston. The bottom area of the piston was reduced from the area of the conventional circular cross-section piston. This reduces the downward force on the piston bottom (which resists the piston to lift), resulting in improved throttle control response.

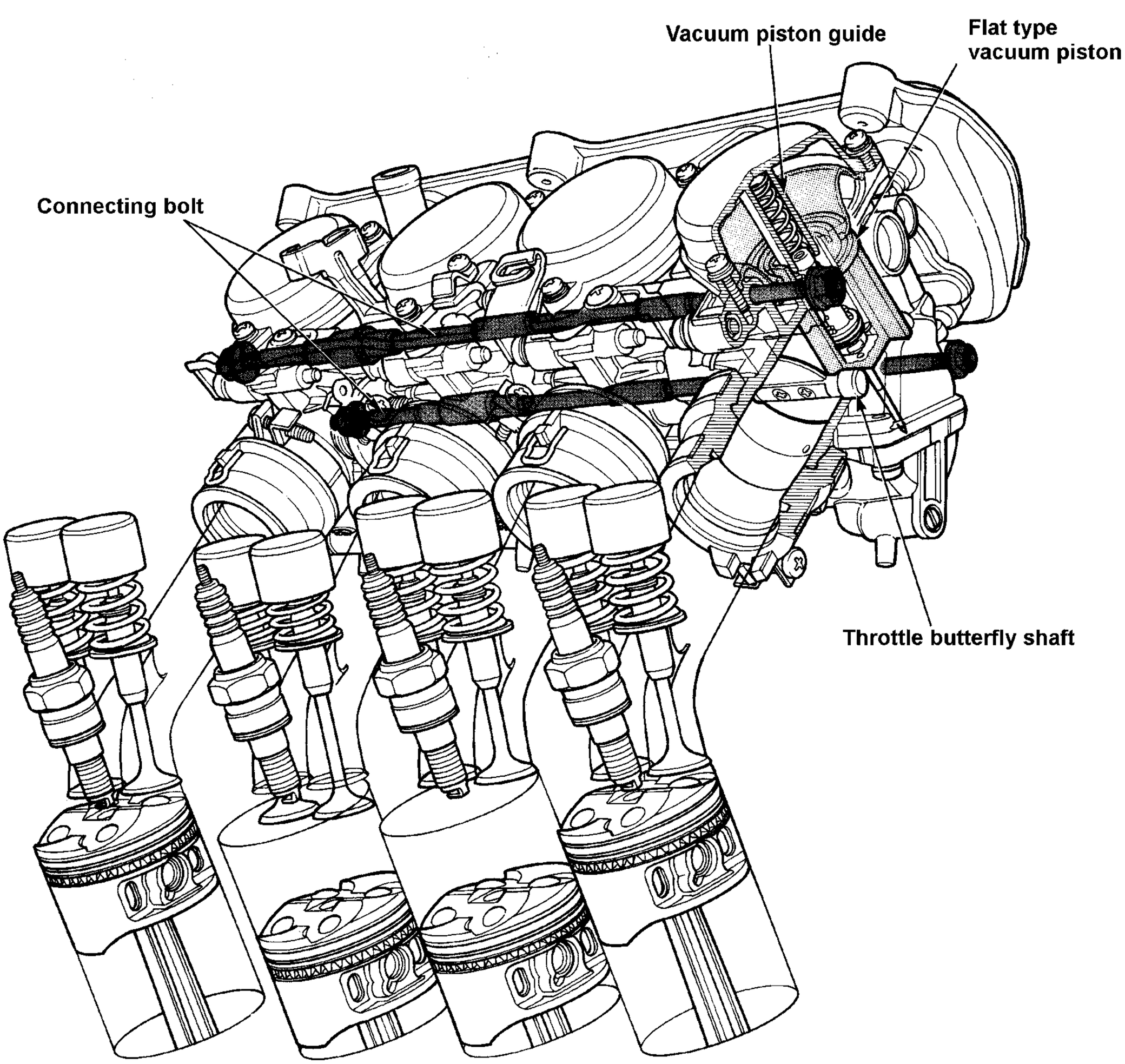
Moreover, the dead volume in the carburettor main bore (which is resisting the incoming airflow) is reduced and therefore the intake efficiency is improved.



CBR250RR (L)

Two connecting bolts and connecting collars are used to link the carburettors. By linking all #1 to #4 carburettor bodies with the connecting bolt, all carburettors are precisely synchronised.

Installation of the vacuum piston guide to the vacuum chamber cover enables to reduce the size of the piston guide on the carburettor body. Also with the application of the connecting bolts, the number of parts was reduced and the carburettor itself is more simple and compact.



Torque Settings

Engine

Item	Qty.	Screw Dia (mm)	Torque Setting (kg-m)	Notes
Connecting rod bearing cap nut	8	8	1.6 - 2.0	Apply oil to the thread and the seat (Molybdenum oil not permitted).
Lower case sealing bolt	1	18	4.0 - 5.0	Apply screw locker (right side only)

Item	Qty.	Screw Dia (mm)	Torque Setting (kg-m)	Notes
Rear upper engine mount bracket bolt	4	8	3.0 – 4.0	
Rear lower engine mount bracket bolt	2	10	4.5 – 5.5	
Sub frame upper bolt / lower bolt	4	10	4.5 – 5.5	
Side stand bracket bolt	2	10	4.5 – 5.5	
Bottom bridge bolt	2	10	3.0 – 4.0	
Brake hose mount bolt	5	10	3.0 – 4.0	
Rear cushion lower bolt	1	10	4.5 – 5.5	Alloc bolt
Cushion arm bolt	1	10	4.5 – 5.5	Alloc bolt
Rear cushion protection plate bolt	3	5	0.5 – 0.7	Apply screw locker
Change arm bolt	1	6	1.4 – 1.8	
Right / left step pivot bolt	2	8	3.5 – 4.5	Alloc bolt
Silencer bolt	3	6	1.6 – 2.0	Torx bolt
Ignition switch mount bolt	2	8	2.4 – 3.0	Alloc bolt
Ignition coil mount screw	4	6	0.7 – 1.1	Alloc bolt

Notes: replace with new ones when the alloc bolts are removed.

Special tools

Tool name	Tool No.	Qty.	Application
Drive chain staking tool	07HMH-MR10101	1	Drive chain replacement
Bearing remover attachment	07LMC-KV30200	1	Rear fork left pivot bearing removal
Ball race remover - bearing remover A	07946-KM90001 07946-KM90401	1 1	Ball race replacement (only the bearing remover A is different from 07946-KM90000).
Valve guide remover (3.5mm)	07HMH-KT70101	1	Valve guide clearing / finishing
Pilot screw wrench	07908-4220201	1	Pilot screw adjustment

Common Tools

Tool name	Tool No.	Qty.	Application
Pilot (20mm)	07746-0040500	1	Front wheel bearing, rear driven flange bearing installation
Torx bit: T-40	07703-0010100	1	Ignition switch removal/installation
Torx bit: T-30	07703-0010200	1	Muffler removal/installation
Torx bit: T-10H	-	1	Ignition switch disassembly/assembly (available in market)

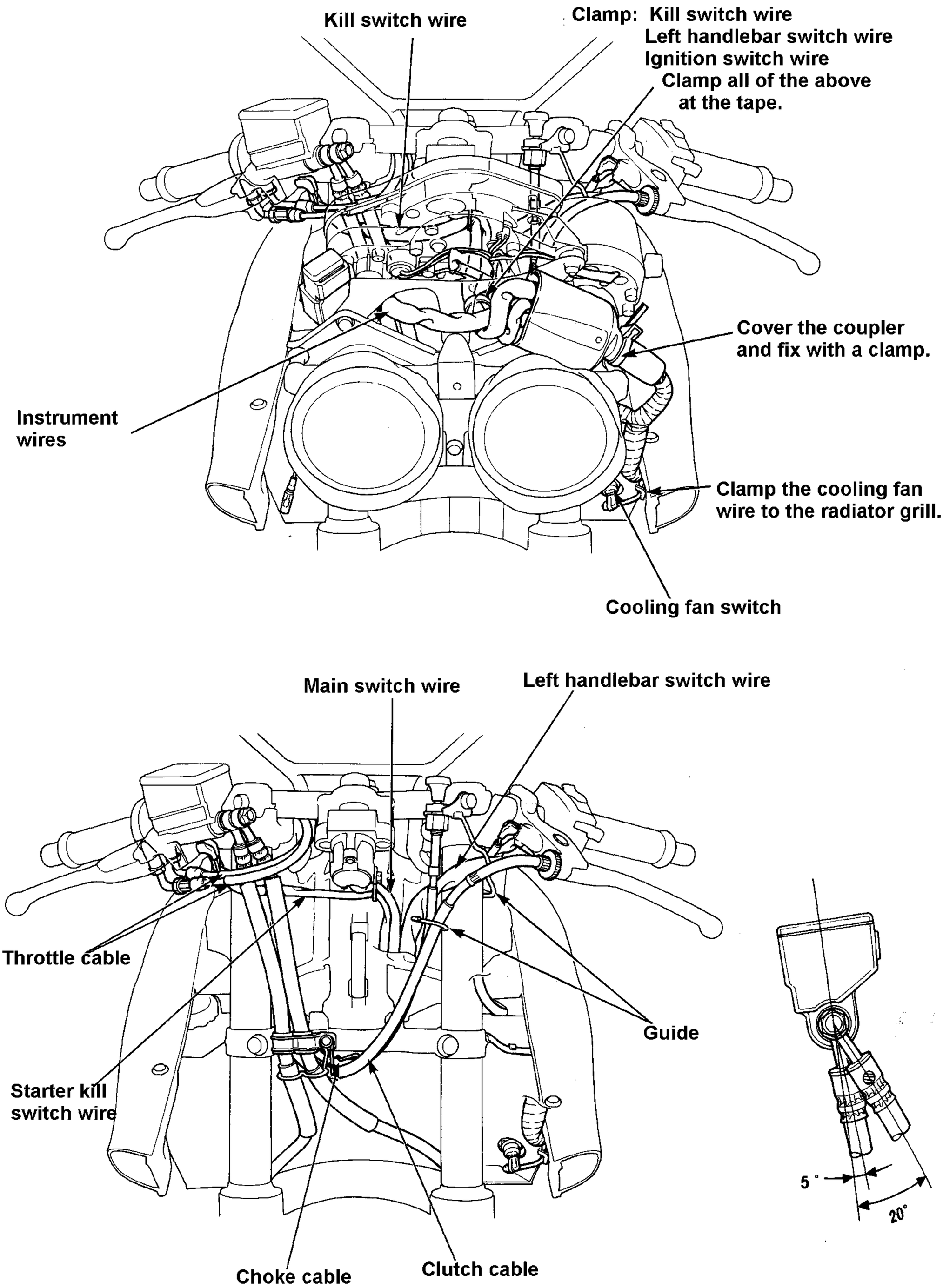
Measuring Tool

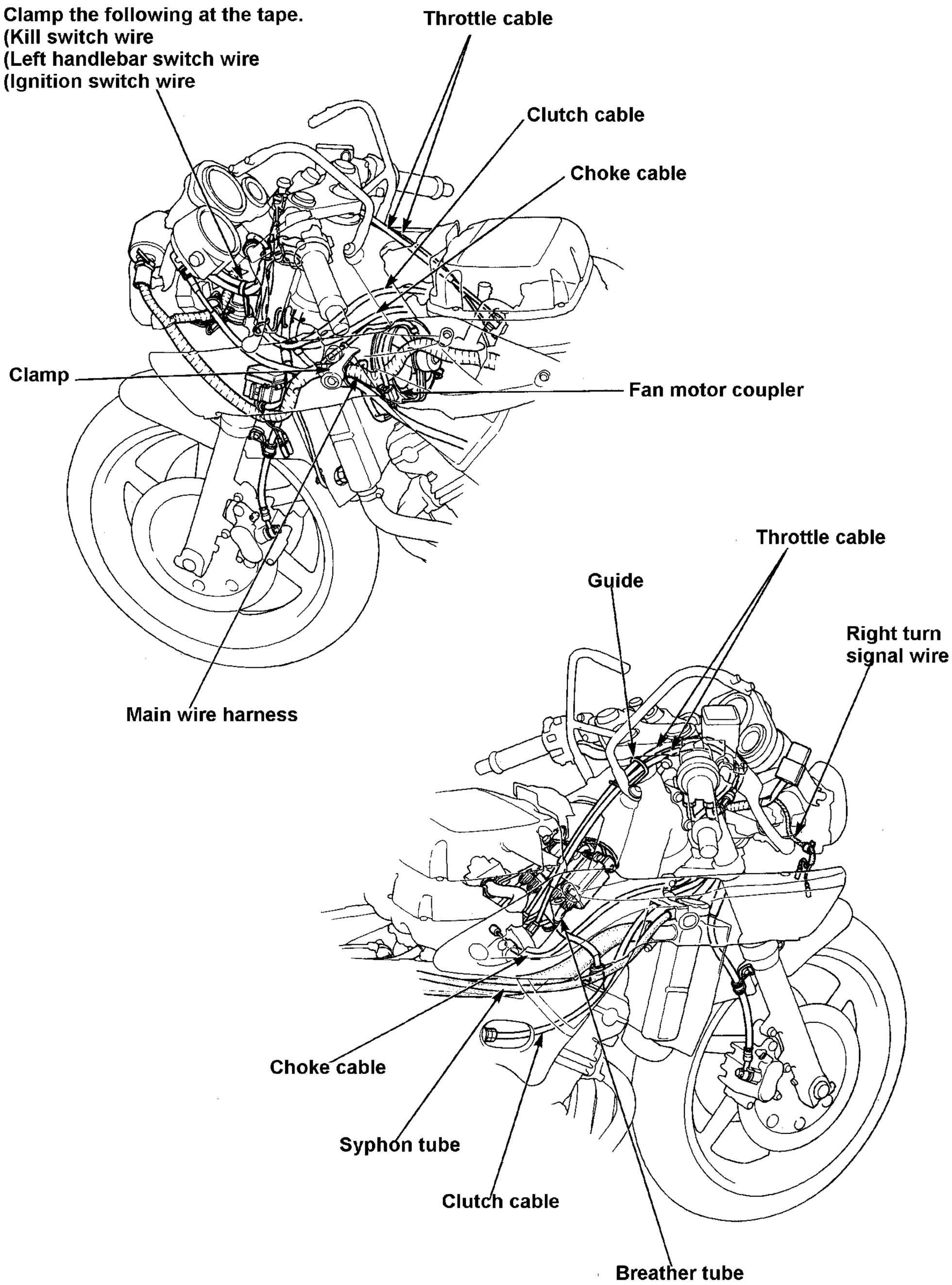
Tool name	Tool No.	Qty.	Application
Peak voltage adapter	07HGJ-0020100	1	Ignition inspection

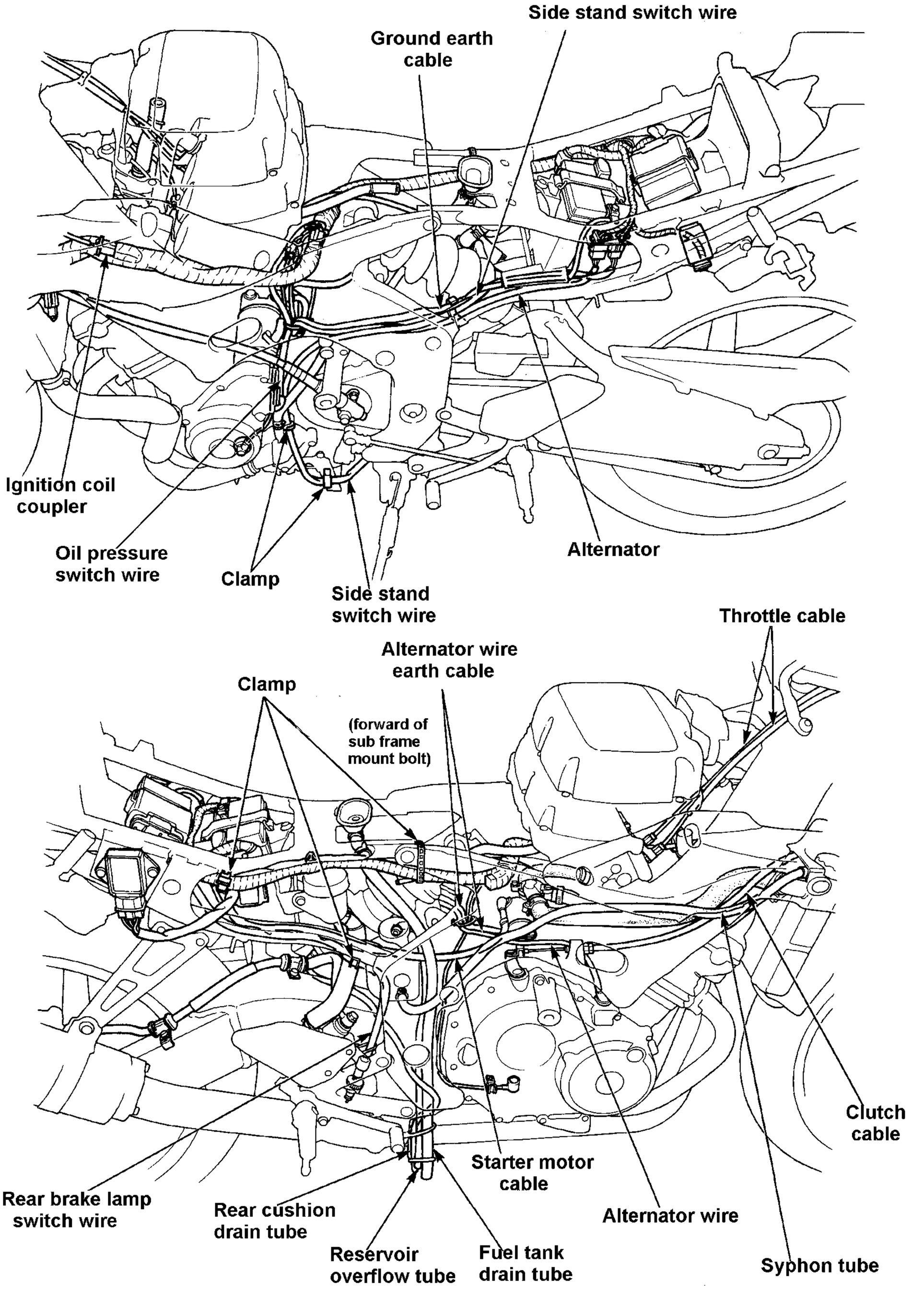
CBR250RR (L)

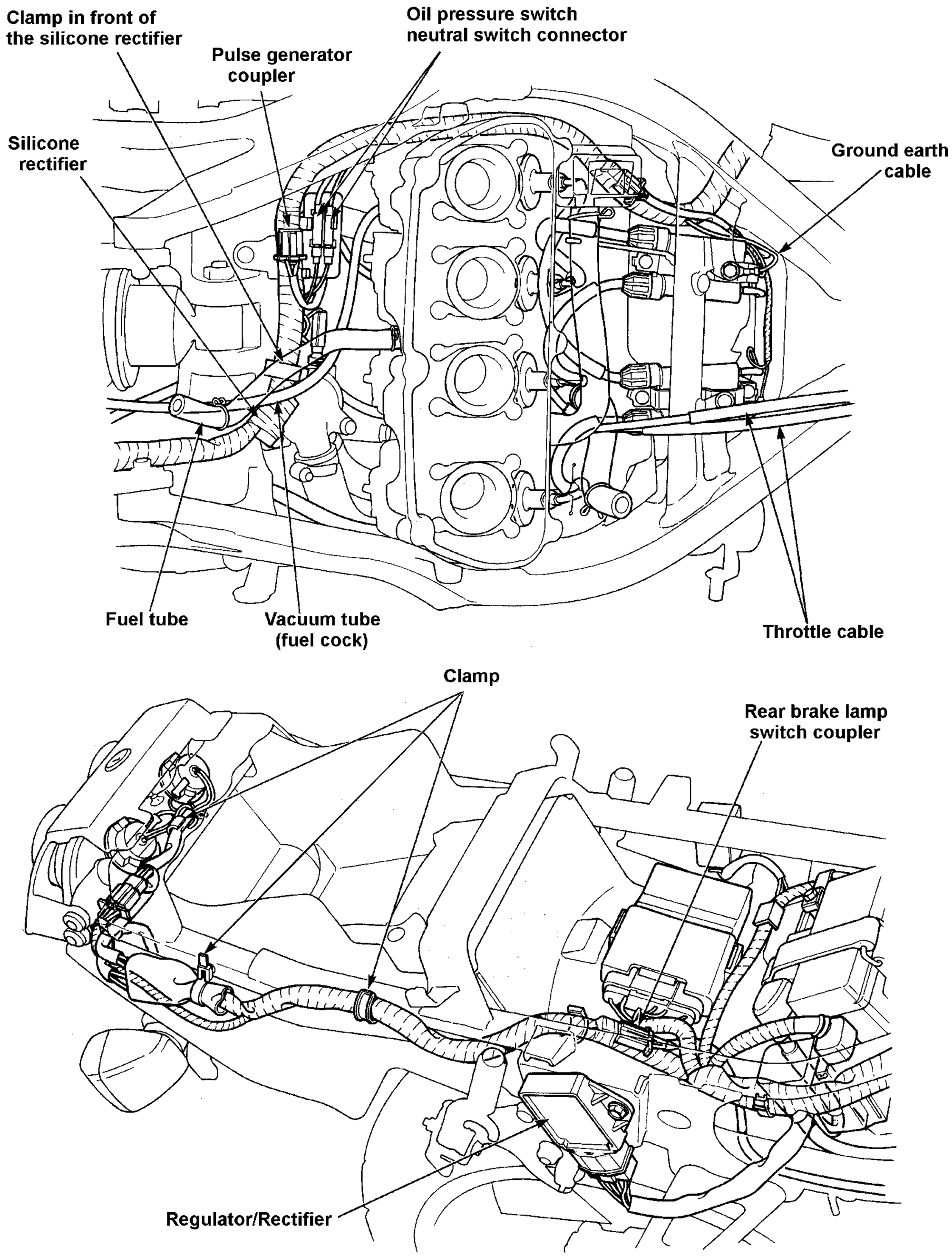
Routing

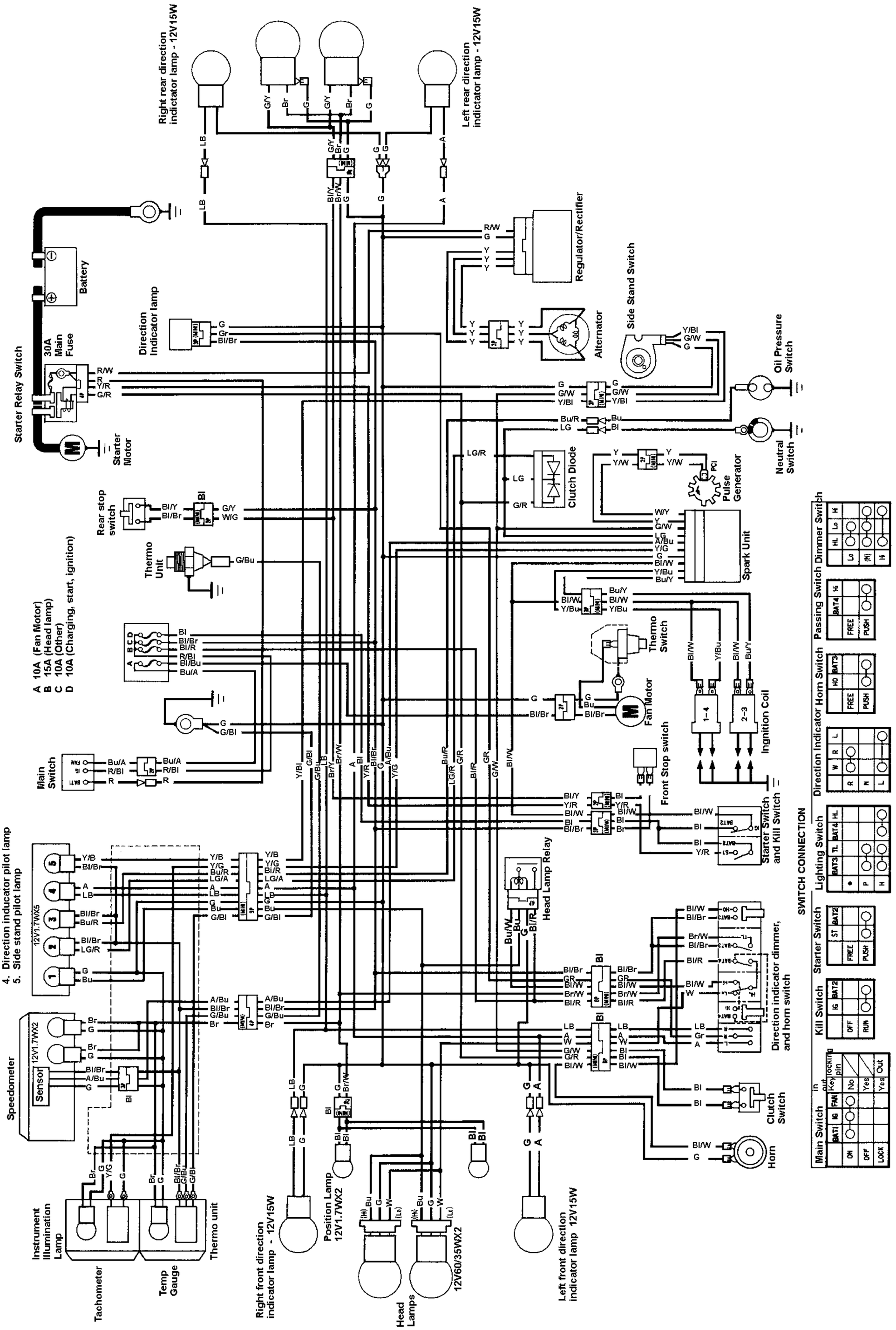
Diagram




Clamp the following at the tape.
(Kill switch wire
(Left handlebar switch wire
(Ignition switch wire
Throttle cable
Clutch cable
Choke cable
Clamp
Fan motor coupler
Main wire harness
Throttle cable
Guide
Right turn signal wire
Choke cable
Syphon tube
Clutch cable
Breather tube


Side stand switch wire
Ground earth cable
Ignition coil coupler
Oil pressure switch wire
Clamp
Side stand switch wire
Alternator
Throttle cable
Alternator wire earth cable
Clamp
(forward of sub frame mount bolt)
Clutch cable
Starter motor cable
Rear brake lamp switch wire
Rear cushion drain tube
Reservoir overflow tube
Fuel tank drain tube
Alternator wire
Syphon tube


Clamp in front of the silicone rectifier
Pulse generator coupler
Oil pressure switch neutral switch connector
Silicone rectifier
Ground earth cable
Fuel tube
Vacuum tube (fuel cock)
Throttle cable
Clamp
Rear brake lamp switch coupler
Regulator/Rectifier


Right rear direction indicator lamp - 12V15W
Left rear direction indicator lamp - 12V15W
Battery
30A Main Fuse
Starter Relay Switch
Starter Motor
Direction Indicator lamp
Regulator/Rectifier
Alternator
Side Stand Switch
Oil Pressure Switch
Neutral Switch
Clutch Diode
Pulse Generator
Spark Unit
Rear stop switch
Thermo Unit
Thermo Switch
Fan Motor
Front Stop switch
Ignition Coil
Starter Switch and Kill Switch
Head Lamp Relay
Direction indicator dimmer, and horn switch
Clutch Switch
Horn
Speedometer
Sensor
Instrument Illumination Lamp
Tachometer
Temp Gauge
Thermo unit
Main Switch
Right front direction indicator lamp - 12V15W
Position Lamp 12V1.7WX2
Head Lamps
12V60/35WX2
Left front direction indicator lamp 12V15W
A 10A (Fan Motor)
B 15A (Head lamp)
C 10A (Other)
D 10A (Charging, start, ignition)
1. High beam pilot lamp
2. Neutral pilot lamp
3. Oil Pressure lamp
4. Direction inducator pilot lamp
5. Side stand pilot lamp
SWITCH CONNECTION
Switch Dimmer
Passing Switch
Direction Indicator Horn Switch
Lighting Switch
Starter Switch
Kill Switch
Main Switch

Service Information

Specification

Fuel System

Item		Standard	
Venturi diameter		9.1mm equivalent	
Setting mark		VP20A	
Float level		13.7mm	
Main jet		No:1.4 : #105	No. 2.3: #102
Jet needle mark		J93B	
Pilot screw rewinding		1 – ¾ revs	
Slow jet		# 35	
Fuel tank capacity	Total	13 l	
	Reserve	1.6 l	

Cooling System

Item	Standard	Service limit
Radiator cap valve opening pressure	1.10 – 1.40kg/cm²	1.10kg/cm² or less / 1.40kg/cm² or more
Coolant capacity	Total : 1570cc (approx)	Radiator side: 1350cc approx Reservoir side: 220cc approx

Engine mounting / dismounting

Engine weight (service)	48.5kg (approx

Cylinder head / valve

Unit: mm

Item			Standard	Service limit
Cam shaft	Cam lift	IN	28.94 – 29.18	28.91
		EX	28.51 – 28.75	28.48
Valve spring	Relaxed length		37.65	36.65
Valve and valve guide	Valve stem external diameter	IN	3.481-3.495	3.476
		EX	3.465-3.480	3.460
	Stem guide clearance	IN	0.005-0.032	0.10
		EX	0.020-0.047	0.13
Valve lifter	External diameter		19.978-19.993	19.970
Cylinder head	Valve lifter contact area bore		20.010-20.026	20.035

Cylinder, Piston and Crankshaft

Unit: mm

Item			Standard	Service limit
Crankshaft and connecting rod	Connection rod big end	Side clearance	0.10 – 0.25	0.30
	Main journal	Side clearance	0.022 – 0.040	0.06
Piston Ring	Ring end gap	Second	0.21 – 0.36	0.45

			Connecting rod bore code		
			1	2	3
			30.000 – 30.006mm	30.006 – 30.012mm	30.012 – 30.018mm
Crankpin ext. dia code	A	27.494-27.500mm	E (Yellow)	D (Green)	C (Brown)
	B	27.488-27.494mm	D (Green)	C (Brown)	B (Black)
	C	27.482-27.488mm	C (Brown)	B (Black)	A (Blue)

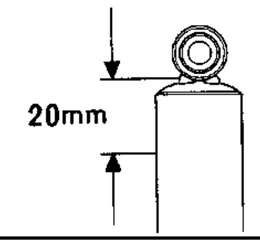
Bearing Metal Thickness:

A (Blue):	1.252-1.255mm
B (Black):	1.249-1.252mm
C (Brown):	1.246-1.249mm
D (Green):	1.243-1.246mm
E (Yellow):	1.240-1.243mm

Front Wheel and Suspension

Item		Standard	Service limit
Front fork oil quantity		383 ± 2.5cc	-
Oil level		83mm	-
Front fork oil brand		Honda Ultra Cushion Oil # 10	-
Front cushion spring	Relaxed length	252.1mm	247mm
	Installing direction	Tapered end to the bottom	

Rear Wheel and Suspension

Item	Standard	Service limit
Rear cushion damper compression (10mm compressed)	15.4kg	12.3kg
Rear cushion spring installation length	135mm	-
Rear cushion spring relaxed length	143.8mm	140.9mm
Damper unit gas releasing hole position	20mm from the damper case upper end 	

Brake System (Disc Brake)

Item		Standard	Service limit
Brake disc runout	Front	-	0.4
	Rear	-	0.3
Front master cylinder bore		12.700 – 12.743	12.755
Rear master cylinder bore		14.000 – 14.043	14.06
Front master piston external diameter		12.657 – 12.684	12.65
Rear master piston external diameter		13.957 – 13.984	13.95
Front caliper cylinder bore		25.400 – 25.450	25.46
Rear caliper cylinder bore		38.180 – 38.230	38.24
Front caliper piston external diameter		25.335 – 25.386	25.33
Rear caliper piston external diameter		38.098 – 38.148	38.09

Ignition System

Item			Standard
Ignition coil	Primary coil resistance (20°c)		2.0 – 3.5Ω
	Primary coil peak voltage		128V or above
	Secondary coil resistance (20°c)	With cap	23 – 37kΩ
		Without cap	13 – 17kΩ
Pulse generator	Coil resistance (20°c)		340 - 420Ω
	Peak voltage White / Yellow and Yellow		0.91V

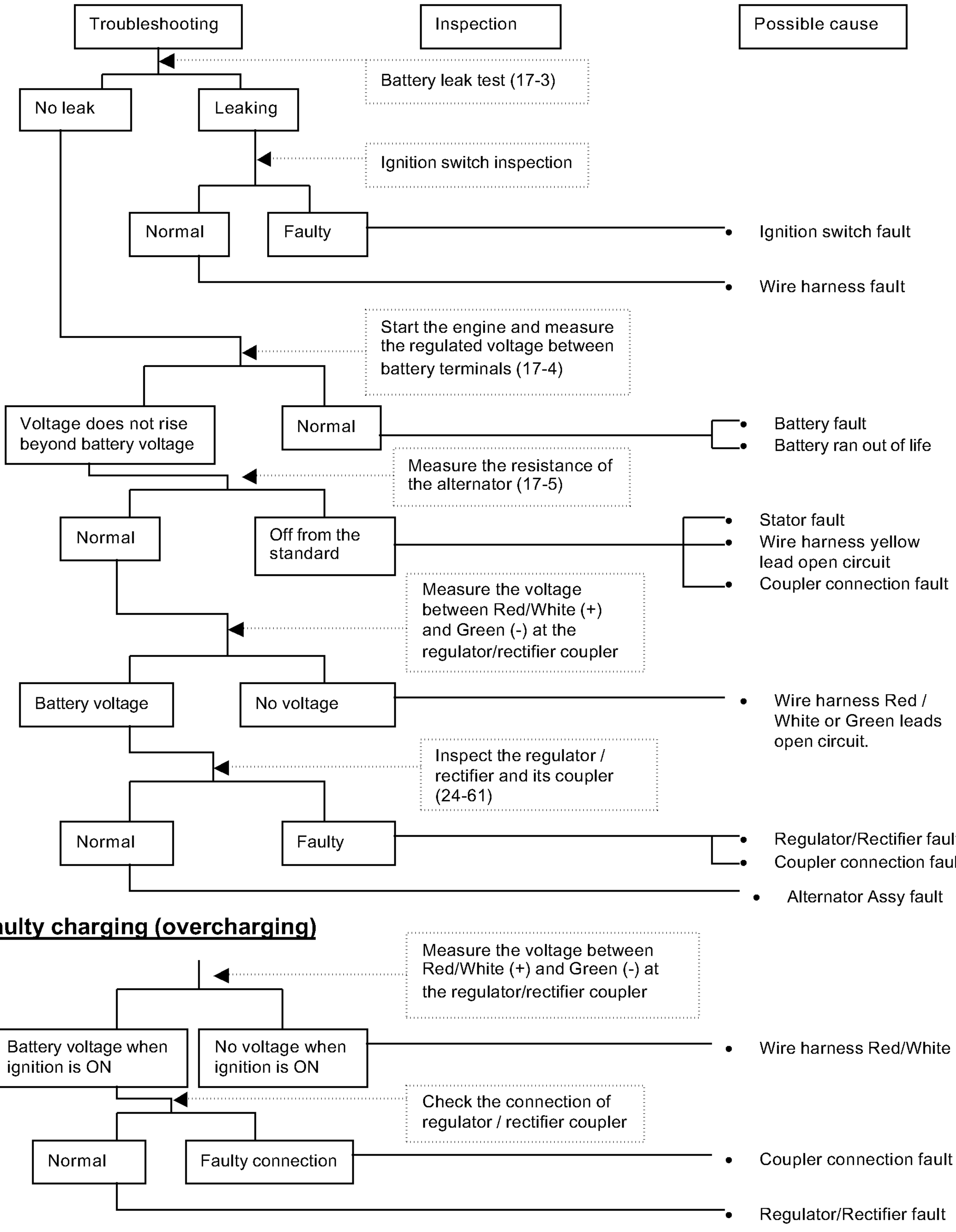
Charging System

Item	Standard
Alternator resistance (20°c)	0.1 – 0.5Ω
Alternator performance	270W / 5.000rpm
Charging commencement rpm (headlamp ON, low beam)	2,000rpm

Lamps, Instruments and Switches

Item	Standard
Pilot lamp and instrument illumination lamp	12V 1.7 W x 9
Front turn signal bulb	12V 15W x 2
Rear turn signal bulb	12V 15W x 2

Troubleshooting
Faulty charging (flat battery)



Faulty charging (overcharging)

No Spark on the Spark Plugs

- Before starting the troubleshooting, test with a good spark plug to eliminate the possibility of the spark plug fault. Also, make sure the connection of plug caps and high tension leads are fine and there is no secondary current leak from the ignition coil due to moisture.
- If a particular ignition coil does not generate spark, swap the ignition coil and test again. If the symptom is still the same, measure the primary voltage of the ignition coil. If spark is generated normally by swapping the ignition coils, the original coil is faulty.
- The "initial voltage" of the ignition coil primary voltage is the one measured when the ignition switch is turned ON with the kill switch ON (while the engine is not cranked).

Symptom		Suspected cause (check from ①)
Ignition coil primary voltage	No initial voltage when the ignition switch is ON and the kill switch is RUN, but other electrical accessories are operating normally.	① Faulty kill switch. ② Open circuit between the switch and the ignition coil. ③ Faulty connection/open circuit on the ignition primary voltage leads/coupler (measure the resistance of the primary voltage lines between spark unit terminals). ④ If the initial voltage is normal when the spark unit is removed, the spark unit is faulty.
	Initial voltage is normal. However, the voltage drops 2 ~ 4 volts when cranking.	① Peak voltage adapter misconnected. ② Battery almost flat (large voltage drop when cranking). ③ No voltage on Black/White lead on the spark unit, or the spark unit coupler connection fault. ④ Spark unit green lead open circuit or connection fault. ⑤ Ignition coil – spark unit (Yellow/Blue or Blue/Yellow leads) open circuit or coupler connection fault. ⑥ Ignition coil primary voltage lead short circuit. ⑦ Side stand switch or relevant (Green/White, Green lead, and couplers) parts fault. ⑧ Pulse generator fault (measure peak voltage). ⑨ Spark unit fault (if all of ① - ⑧ are normal).
	Initial voltage is normal, but very little or no peak voltage while cranking.	① Peak voltage adapter misconnected. ② Peak voltage adapter fault. ③ Spark unit fault (if all of ① - ② are normal).
	Initial voltage is normal but the peak voltage is low.	① Internal resistance of the multi meter is low. ② Too low cranking speed • Battery almost flat ③ Effect of the sampling time of the multi meter (measure few times). ④ Spark unit fault (if all of ① - ③ are normal and no spark on plugs).
	Both initial and peak voltage are normal but no spark.	① Spark unit fault or ignition coil secondary current leak. ② Faulty ignition coil.
Pulse Generator	Low peak voltage.	① Internal resistance (impedance) of the multi meter is low. ② Too low cranking speed • Battery almost flat ③ Effect of the sampling time of the multi meter (measure few times). ④ Pulse generator fault (if all of ① - ③ are normal).
	Little or no peak voltage	① Faulty peak voltage adapter. ② Faulty pulse generator.

Inspection / Adjustment - Service Schedule

Notes:

1. Service items include high speed operation service items.
2. (●) are mandatory service items, while (❍) are the manufacturers recommendation.
3. (☆) are regular replacement of security parts.
   However, regular intervals are designed to the vehicles operated in standard condition.
   The interval may be varied considering the vehicles specific operating environment.
4. High speed operation is such an operation at or above 80km/h.

Service Item			Schedule				Notes
			Regular	Initial 1 month or 1000km	Private 6 month	Private 12 month	
Steering System	Steering handle	Free play / loose fit				●	
		Controllability				●	
	Steering wheel	Steering angle of the wheel				●	
	Steering fork	Damage			●	●	
		Fork, spindle attachment			●	●	Steering stem
		Fork, spindle bearing				●	Steering stem
Braking System	Brake pedal	Clearance between the pedal and the floor when the pedal is fully depressed.			●	●	Free Play: Front brake (lever) at lever end: 20 – 30mm Rear brake (pedal): 10 – 20mm
		Free play and effectiveness	●				
		Braking performance		❍	●	●	
	Hose & Pipe	Leak, damage and attachment		❍	●	●	
		Brake hose replacement					☆ every four years
	Reservoir	Brake fluid level (quantity)	●		●	●	Reservoir brake fluid level: Front: Above minimum level Rear: Between min-max level
	Master/wheel cylinder and caliper	Function, wear and damage				●	
		Master / Wheel cylinder cup, dust seal and disc caliper rubber parts replacement.					☆ Bi-annual
	Disc / Pad	Disc pad clearance				●	
		Pad wear			❍	●	Indicator type
		Disc wear and damage				●	Standard thickness: Front 4.0mm Rear 5.0mm Service limit: Front 3.5mm Rear 4.0mm
	Fluid	Brake fluid change					☆ Annual
Driving System	Wheels	Tyre Pressure	●		●	●	(unit: kg/cm²) 1 person Normal: Front 2.25, Rear 2.25 1 person High speed: Front 2.25, Rear 2.25 2 people Normal: Front 2.25, Rear 2.50 Tyre specification: Front 110/70 R17 54H, Rear 140/60 R17 63H

CBR250RR (L)

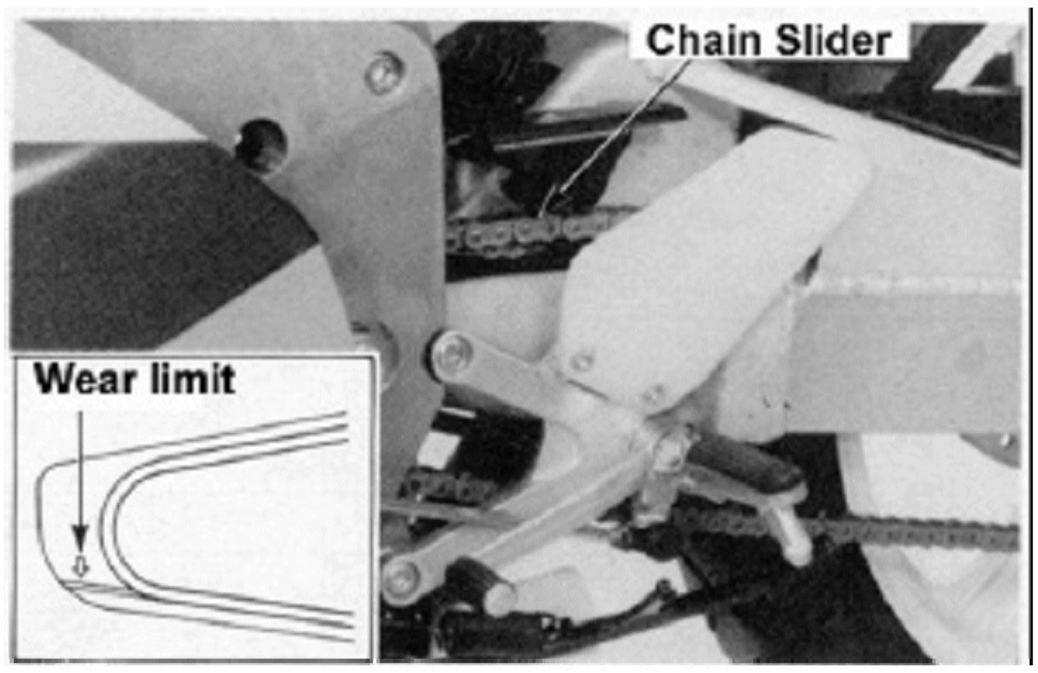
Service Item			Schedule				Notes
			Regular	Initial 1 month or 1000km	Private 6 month	Private 12 month	
Driving System	Wheels	Tyre crack and damage	●		●	●	
		Tyre tread and unusual wear	●		●	●	Tread = 0.8mm front, 0.8mm rear
		Debris etc.	●	●		●	
		Wheel nuts / bolts tightness			●	●	Axle bolts / nuts: Front axle holder torque: 1.8 – 2.5kg-m Front axle bolt torque: 5.5 – 6.5kg-m Rear axle nut torque: 8.0 – 10.0kg-m
		Rim, side ring and wheel disc damage		○		●	Wheel rim runout at rim edge: Front wheel rim: Axial 2.0mm Radial 2.0mm Rear wheel rim: Axial 2.0mm Radial 2.0mm
		Front wheel bearing fit				●	
		Rear wheel bearing fit				●	
Shock absorbing system	Chassis spring	Damage				●	Cushion spring
	Suspension arm	Joint looseness and arm damage				●	
	Shock absorber	Oil leak and damage				●	
		Mount fit				●	
Transmission System	Clutch	Lever free play			●	●	Free play at lever end: 10 – 20mm
		Operation		○	●	●	
	Transmission	Oil leak and level			●	●	Dipstick type: Between min – max lines
		Mechanical operation				●	
	Chain / sprocket	Chain slack		○	●	●	Side stand extended at the midpoint between two sprockets: 15 – 25mm maximum
		Sprocket attachment and wear				●	
Electrical system	Ignition system	Spark plug status			●	●	Plug gap: 0.8 – 0.9mm
	Battery	Terminal connection				●	
	Wiring	Connection, damage on cables				●	
Powerplant	Main component	Starting and noise			●	●	
		Low speed and acceleration		○	●	●	Idling rpm: 1,500 ± 100rpm
		Exhaust			●	●	
		Air filter change					Every 20,000km
		Valve clearance		○		●	Intake (cooled): 0.13 – 0.19mm Exhaust (cooled): 0.20 – 0.26mm

Service Item			Schedule				Notes
			Regular	Initial 1 month or 1000km	Private 6 month	Private 12 month	
Powerplant	Lubrication	Oil dirt and quantity			●	●	Dipstick type: Between min – max lines
		Oil leak			●	●	
		Oil level	●				
		Engine oil change		○			Initial 1,000km then every 6,000km
		Oil cleaner change					Initial 13,000km then every 12,000km
	Fuel System	Fuel leak			●	●	
		Carburettor link				●	
		Throttle valve and choke valve				●	
		Fuel filter				●	
		Fuel quantity	●				
		Fuel hose change					☆ every four years
	Cooling system	Coolant level	●		●	●	Reservoir between min – max lines
		Coolant leak	●			●	
		Radiator cap function				●	1.10 – 1.40kg/cm² valve opening pressure
		Coolant change					Bi-annually
Exterior lamps		Operation			●	●	
		Flashing, dirt and damage	●				
Horn and Lock		Operation				●	
Rearview mirror		Vision	●				Rearview mirrors only
Reflector and registration plate		Dirt and damage	●				
Instruments		Operation				●	
Exhaust pipe and muffler		Attachment and damage				●	
		Muffler function				●	
Frame		Attachment and damage				●	
Defects discovered on previous day		Being serviced and normal	●				
Others		Greasing to the vehicle			●	●	

Transmission System

< Chain slider wear >

Remove the drive sprocket cover (6-3).
Inspect the chain slider for wear damage.
Replace it if it is worn to the wear limit (24-49).



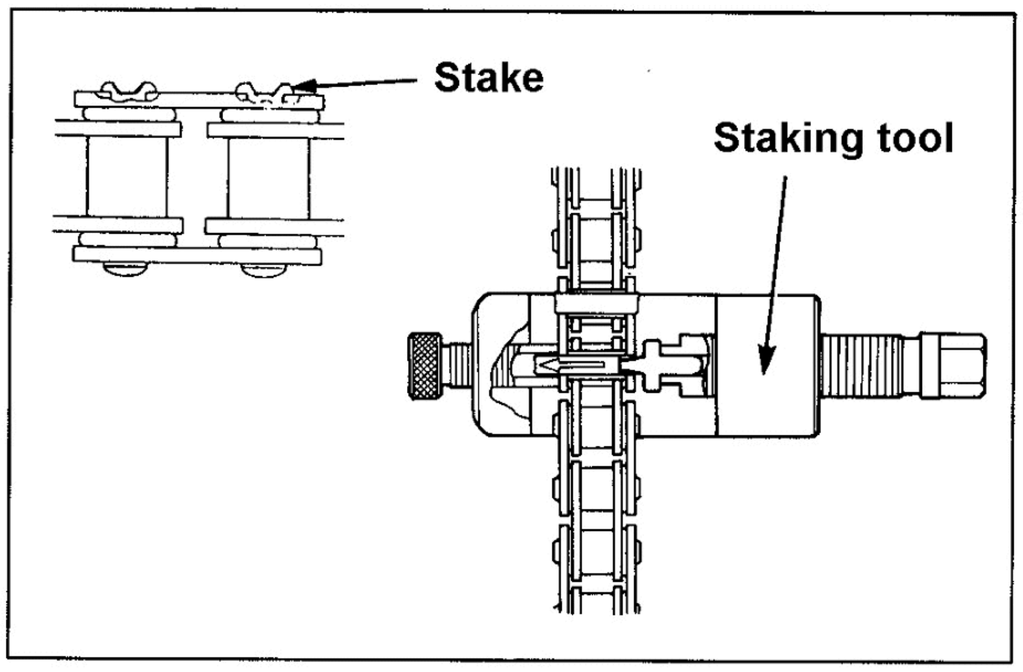
> Replace the slider as early as possible as it will prevent the chain contacting the rear fork, which may damage/wear the chain and the fork.

< Chain replacement >

> **Caution**
>
> Do not use any chain or tool other than the designated products.
> Never use a clip type chain.

Relax the chain to find out the staked part.
Set the tool to cut the stake.

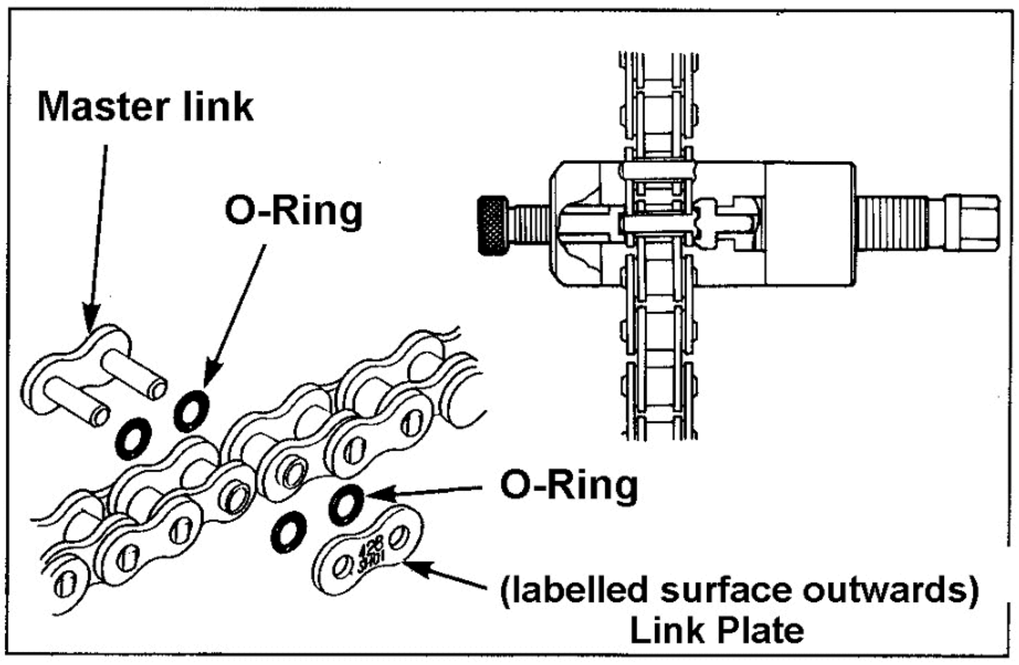
> Special tools



Drive chain staking tool: 07HMH-MR10101
or equivalent products available from the market.

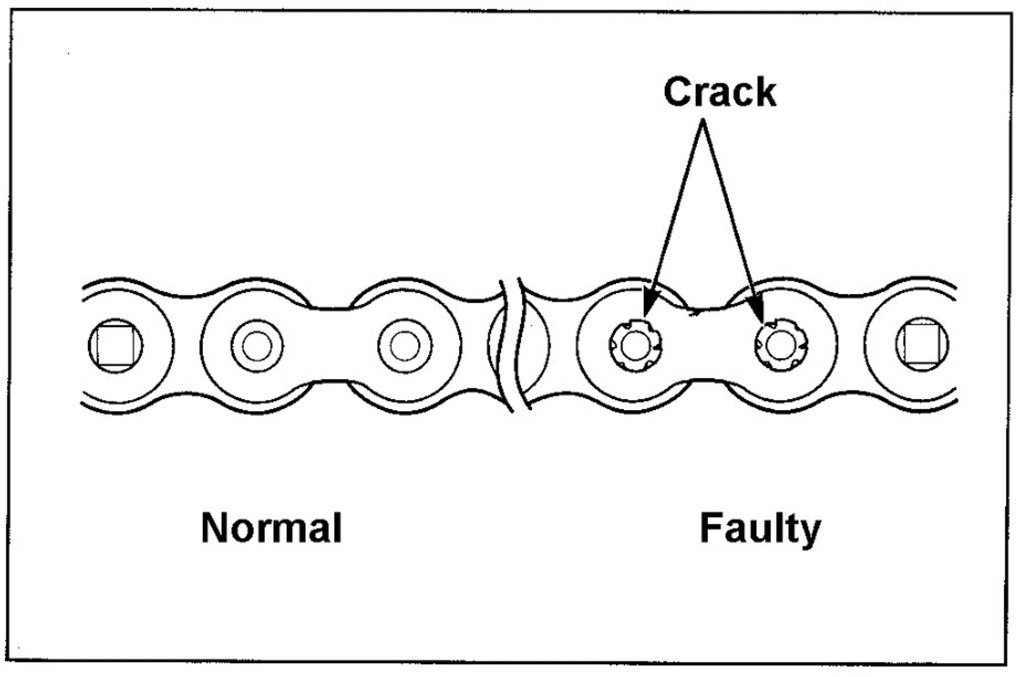
> - Read the instructions when using the staking tool.
> - Do not re-use the master link, O-Rings and the link plate.

Replace with a new chain.
Designated replacement chain: DID 428VS1
RK 428SH0Z1
Install O-Rings to the new master link.
Install the master link from the inner side of the chain.
Do not catch the O-Ring.
Install O-Rings and the link plate from the other side of the chain by using a special tool.
Stake the master link joint pins.



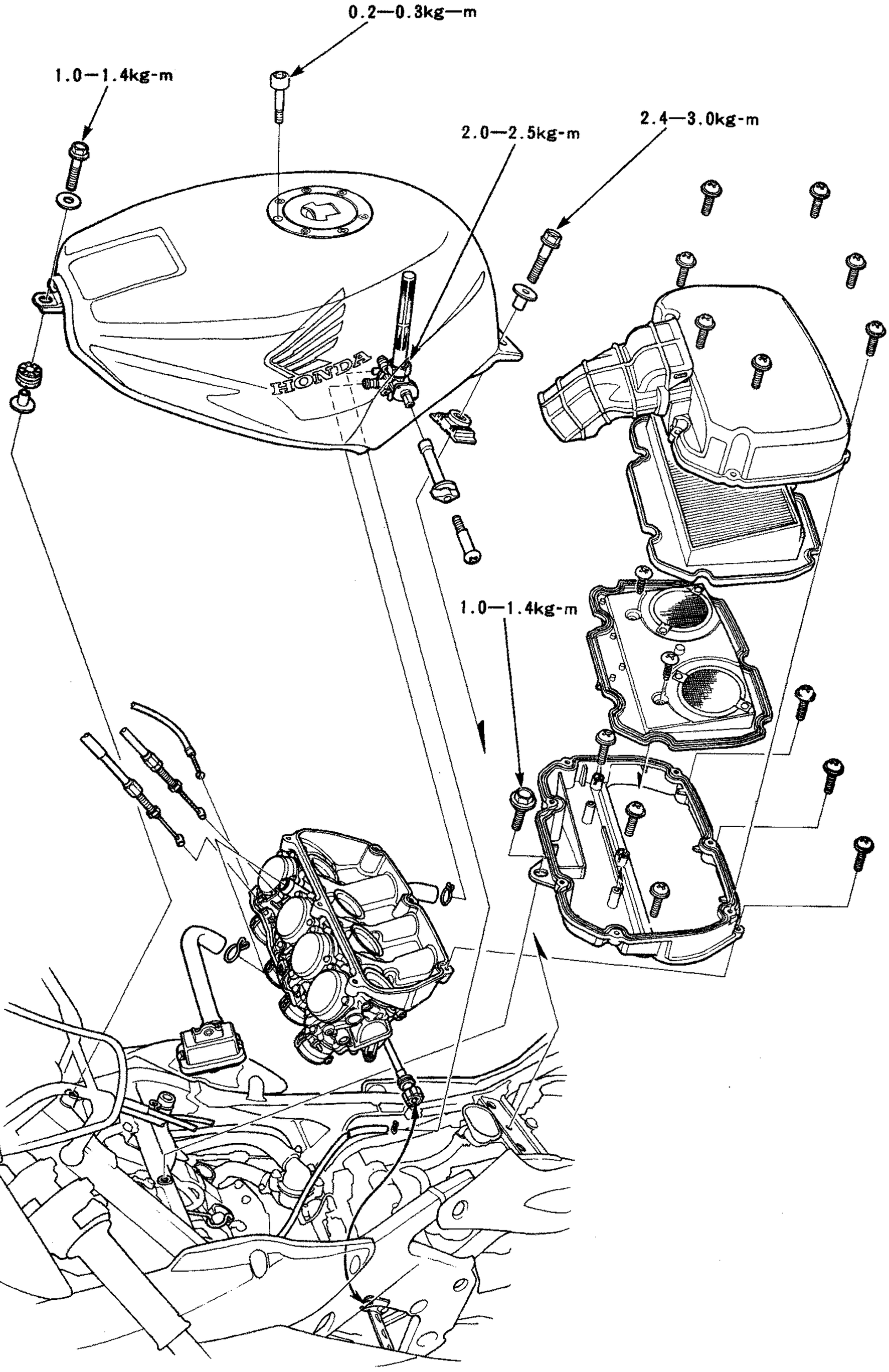
> - Face the labeled side of the master link plate outwards.
> - Do not catch O-Rings.

Make sure the staked parts are free from cracks.
If there is any crack, re-stake by using a new masterlink, a new link plate and O-Ring.

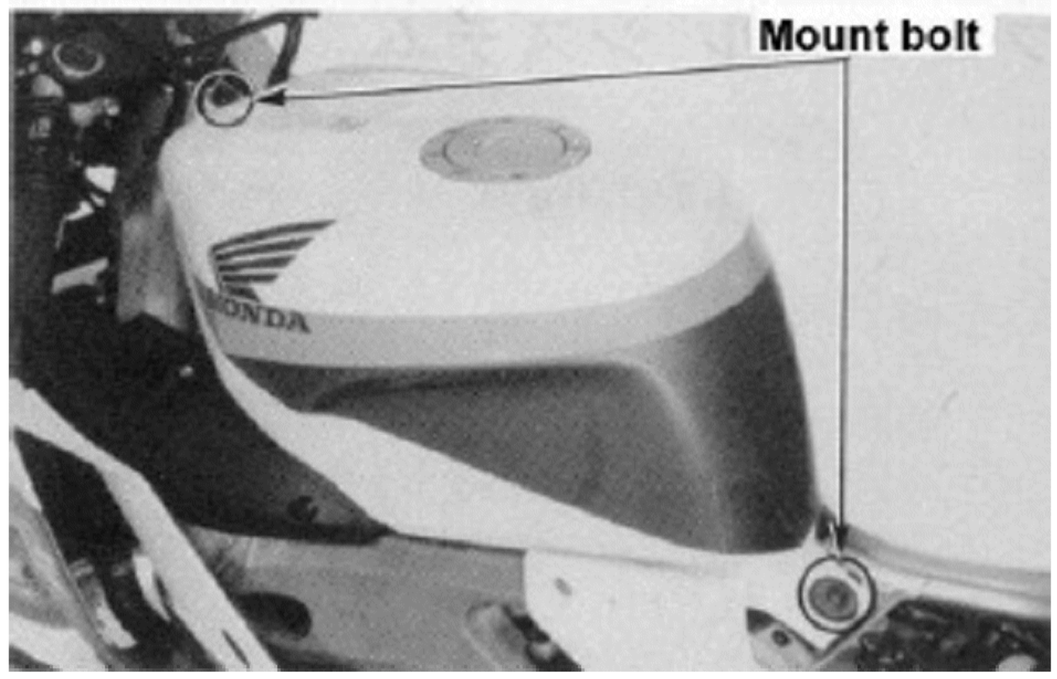


> **Caution** Do not use clip-type chain

Fuel System

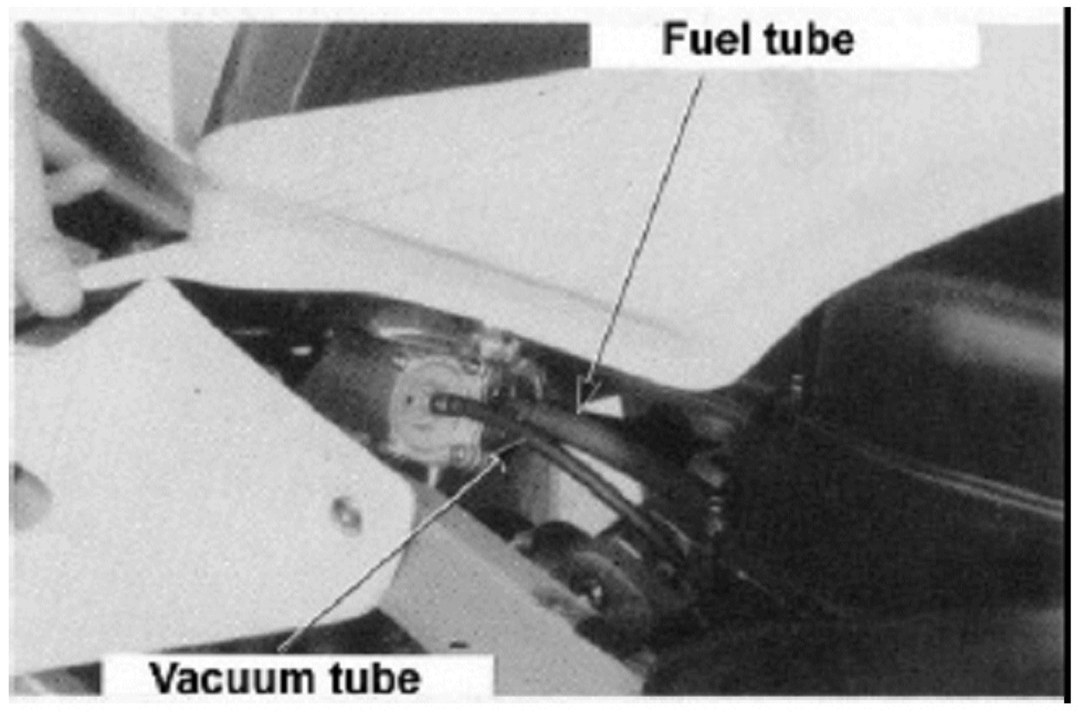


Fuel Tank Removal



Caution
- Highly flammable. Keep away from fire.
- Wipe off spilt fuel straight away.

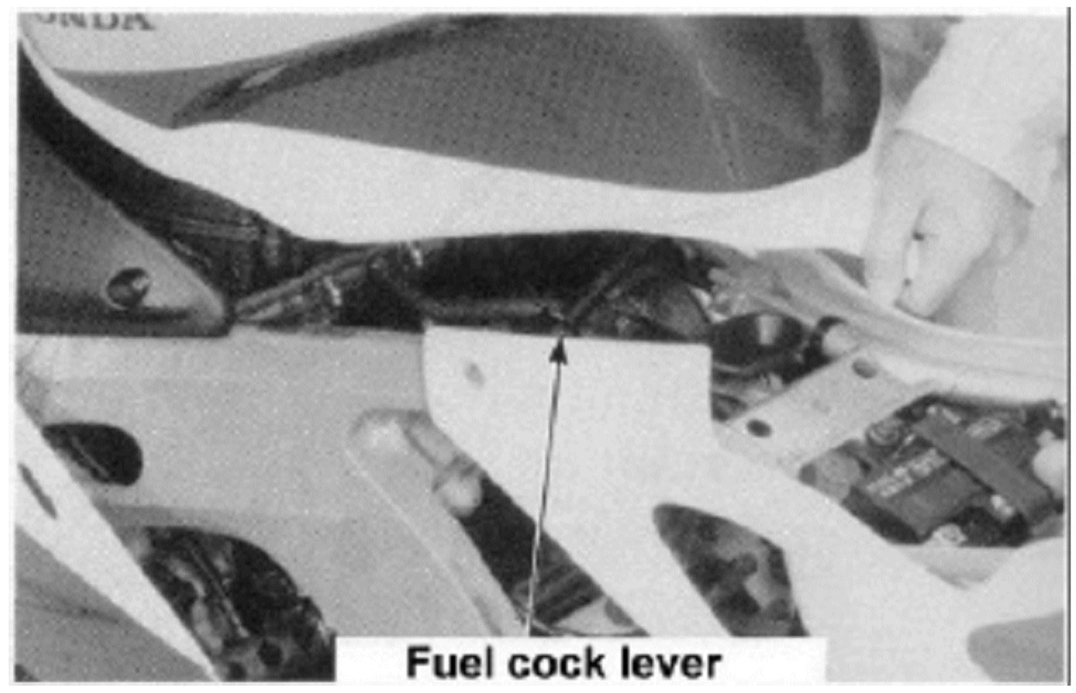
Remove the seat.
Turn the fuel cock “OFF”.
Unscrew fuel tank mount bolts.



Lift up the tank.
Disconnect the vacuum tube and the fuel tube from the fuel cock.

Lift up the front part of the tank first, and remove the tank to the right, upwards.

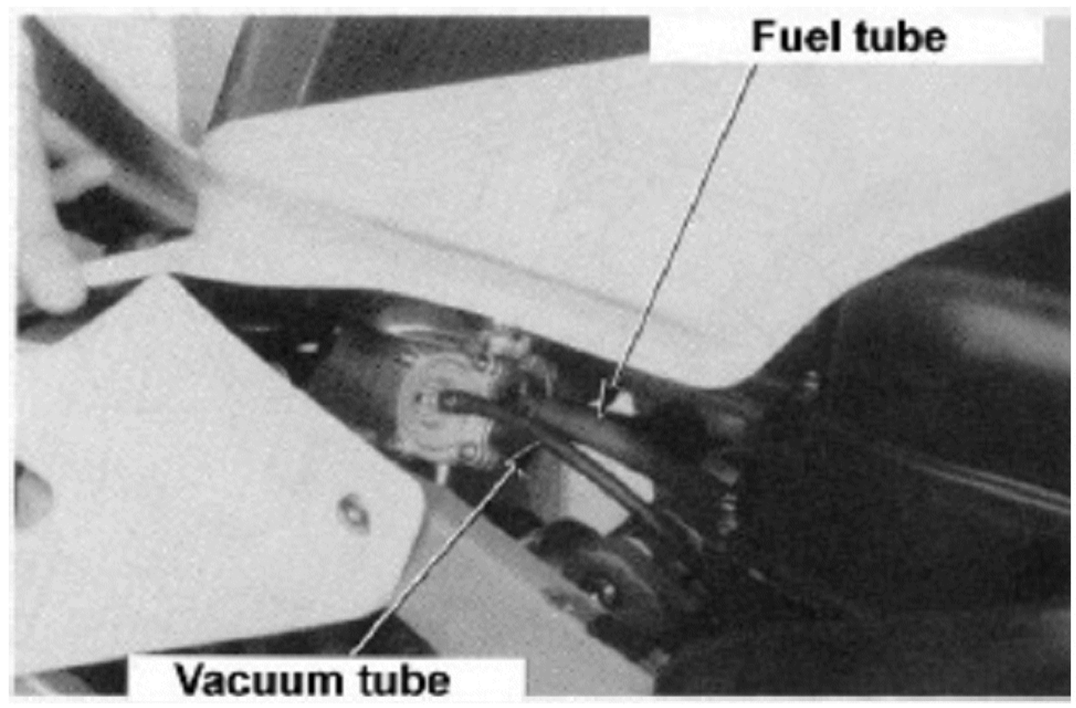
Do not bend the fuel cock lever.



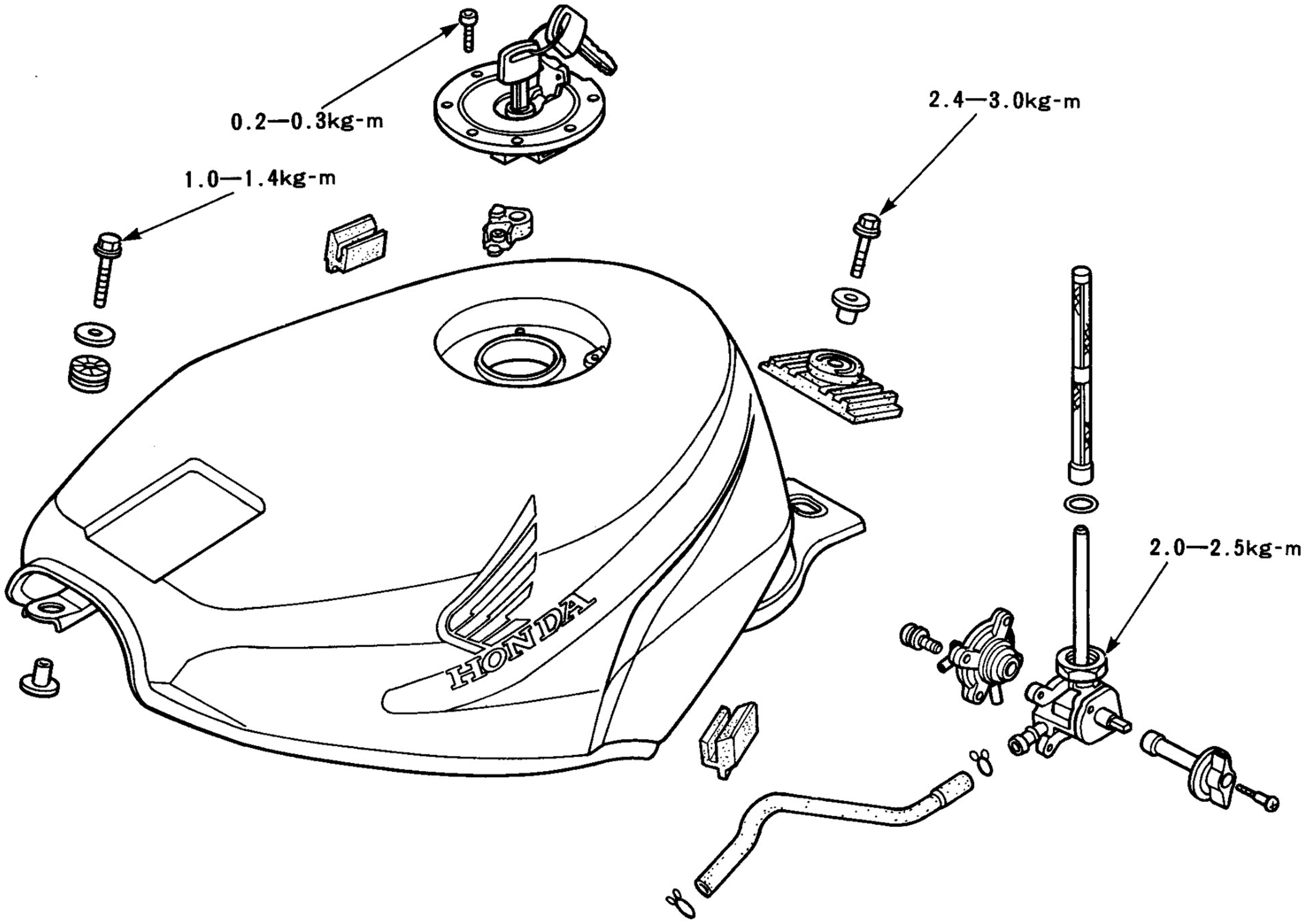
Fuel Tank installation

Follow the removal procedure in reverse order.

- Do not bend or squash the vacuum tube.
- Check for fuel leak after installation.

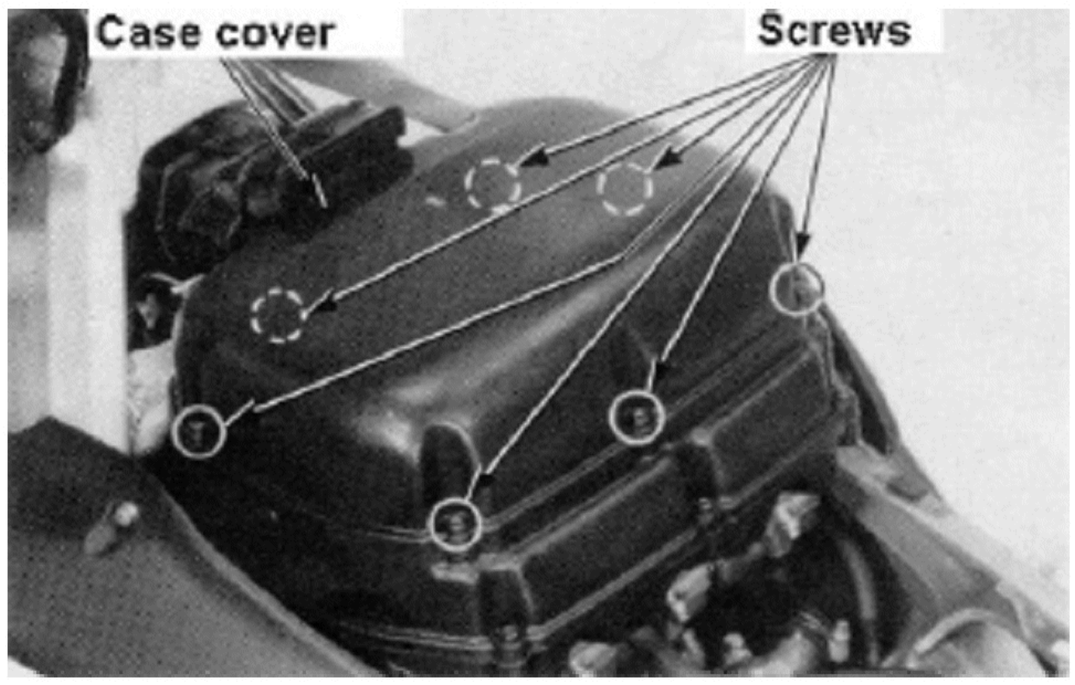


Torque Setting: Fuel tank mount bolt
Front: 1.0 ~ 1.4kg-m
Rear: 2.4 ~ 3.0kg-m

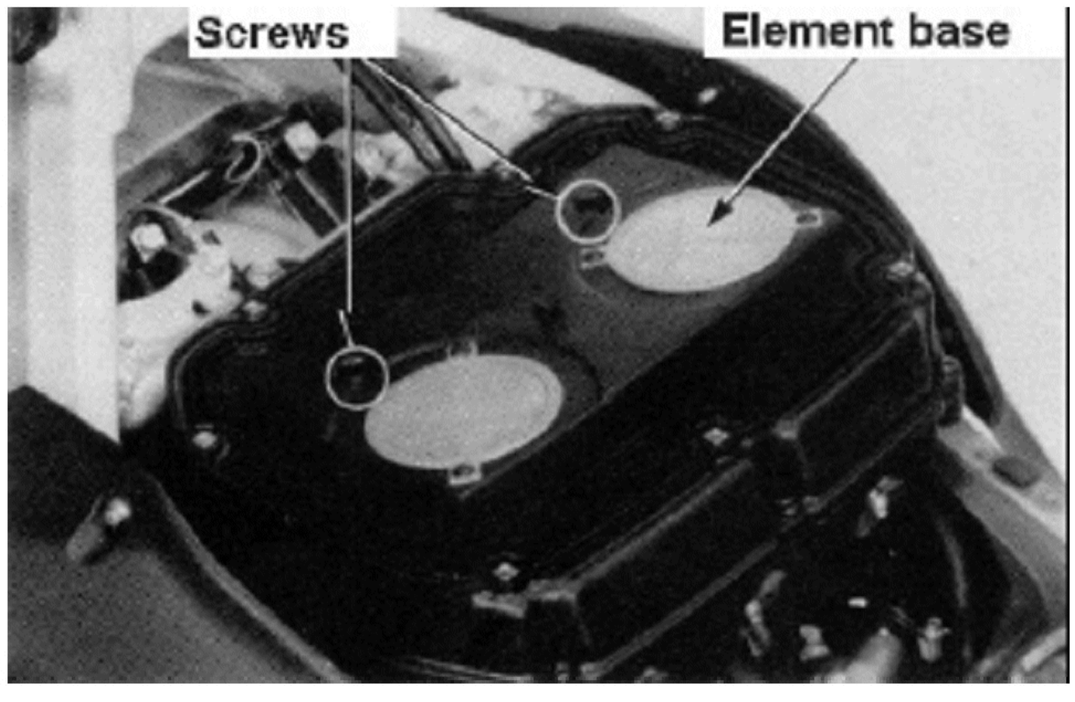


Air Filter Case Removal

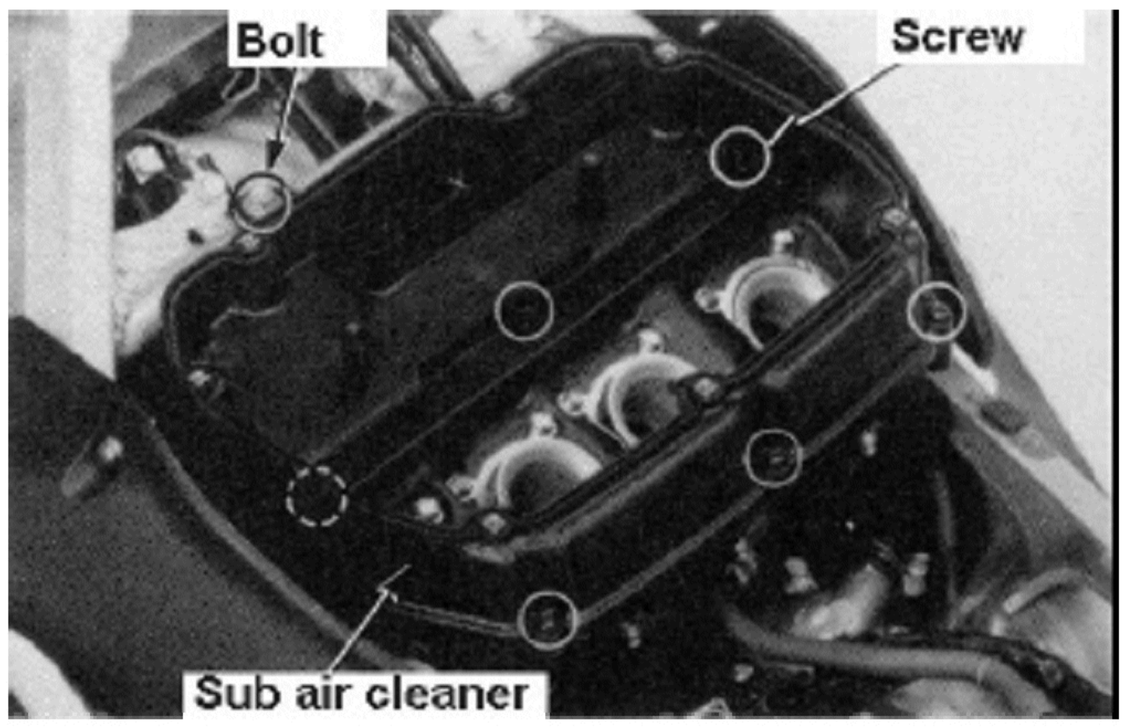
Remove the fuel tank (24-21).
Unscrew to remove the air filter case cover.



Remove the air filter element.
Unscrew to remove air filter element bases.

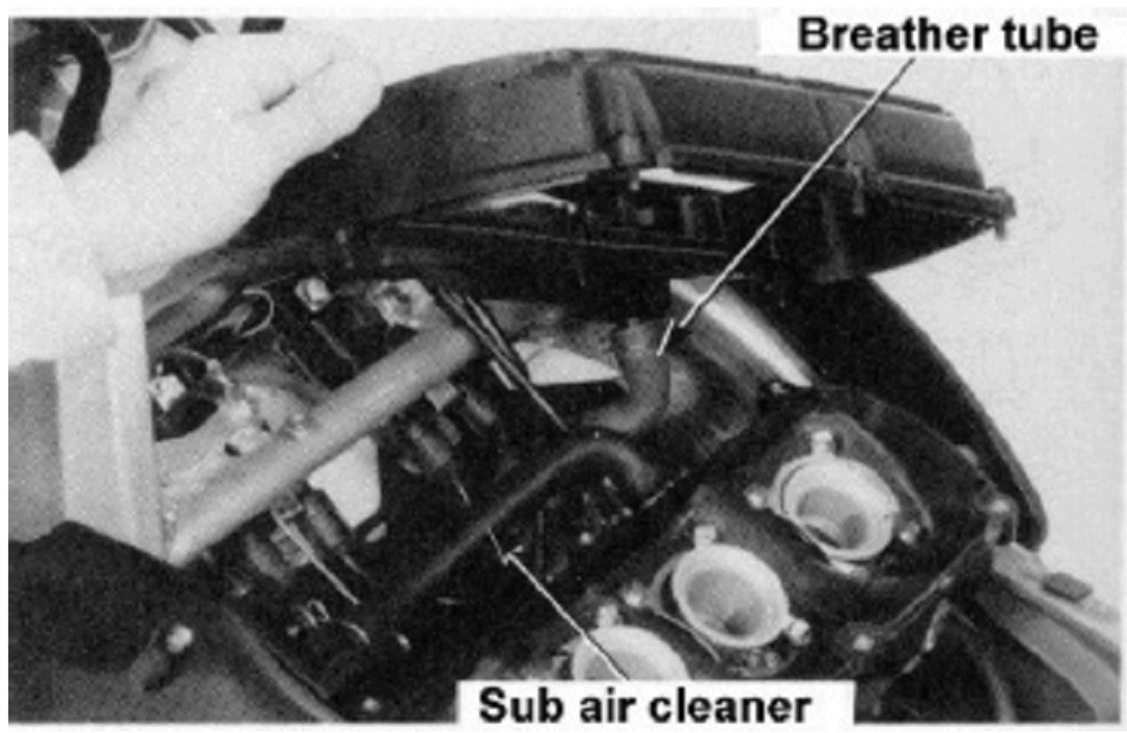


Loosen the air filter upper case mount screws and the bolt.



Lift up the air filter upper case to disconnect the breather tube.
Remove the air filter upper case.

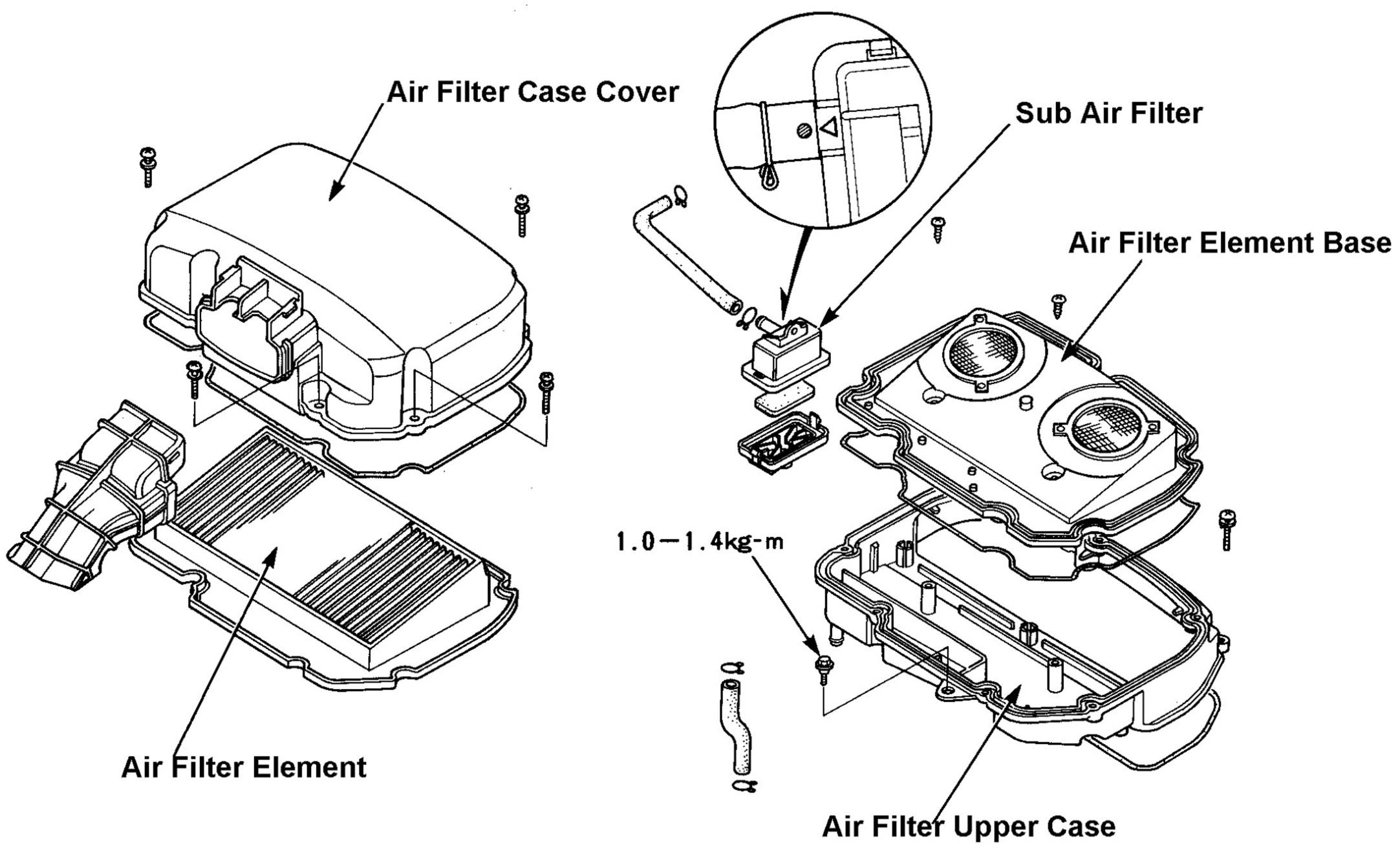
> Set an air filter lower case to the carburettor to remove/install the case.



Air Filter Case Installation

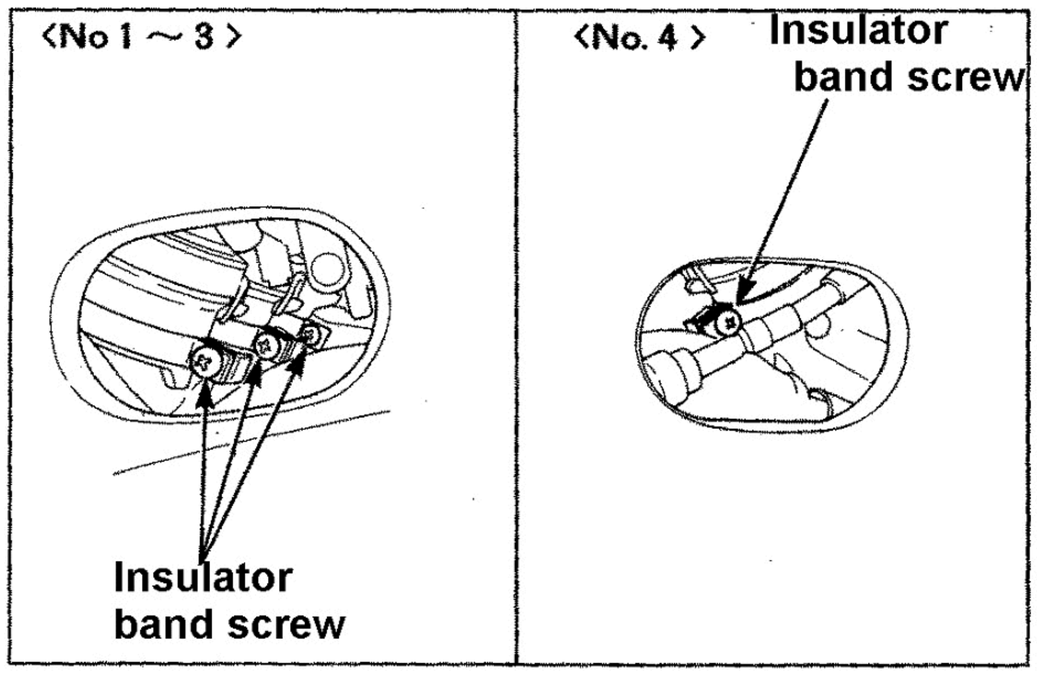
Follow the removal procedure in reverse order.

- Connect the breather tube to the air filter upper case.
- Firmly clamp the sub air filter tube.



Carburettor Removal

Remove the fuel tank (24-21).
Remove the air filter case (24-22).
Unscrew the drain plug to drain fuel in the carburettor.
Loosen four screws on the carburetor insulator band on the cylinder end.

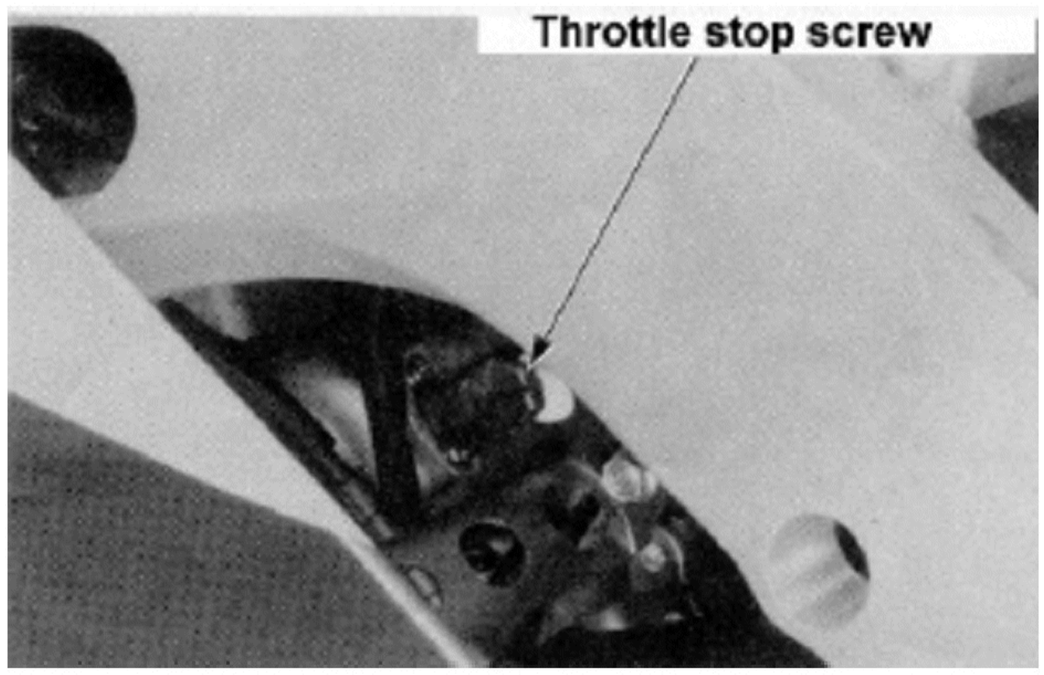


Caution

- Highly inflammable. Keep away from fire.
- Wipe off spilt fuel straight away.

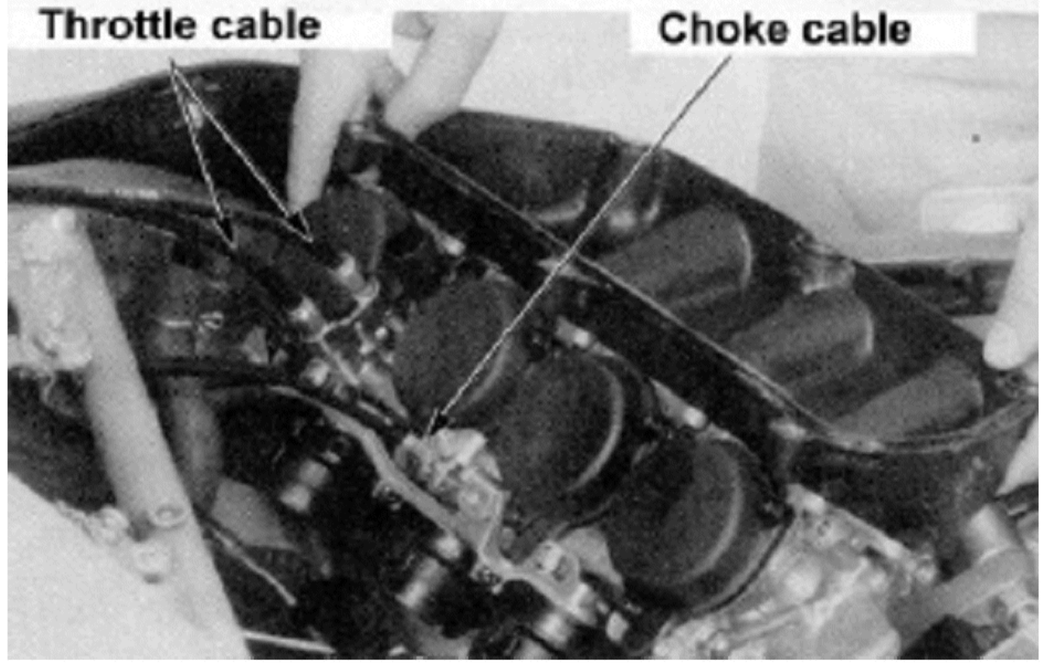
Set the carburetor insulator to the carburetor to remove/install it.

Remove the throttle stop screw from the clamp.



Disconnect the throttle cable and a choke cable.
Remove the carburetor.

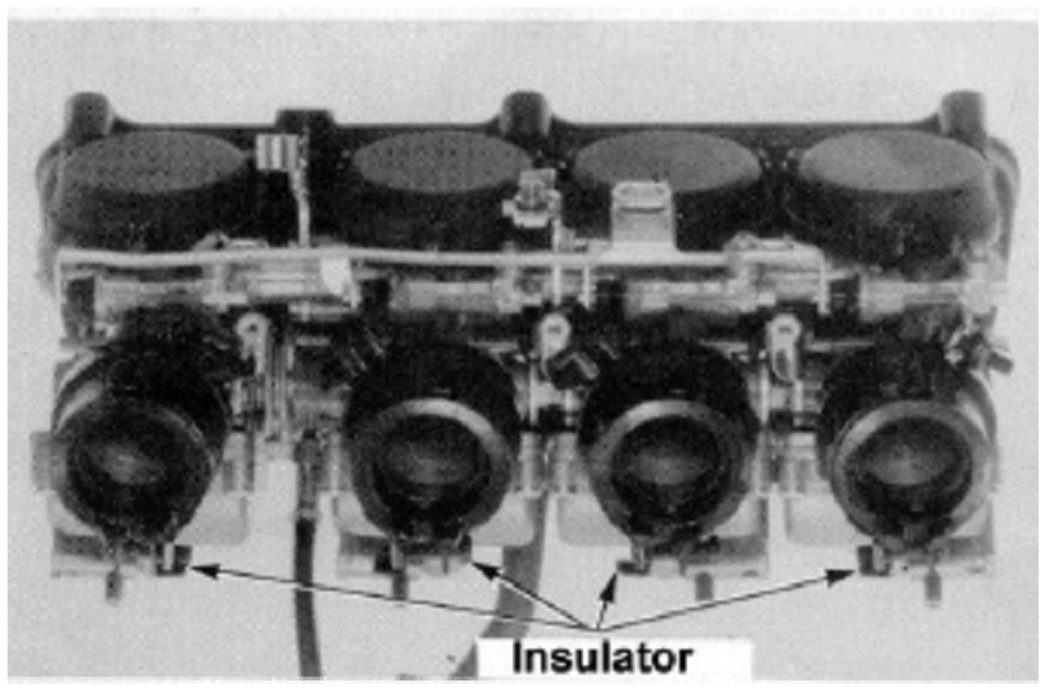
Seal the intake manifold with adhesive tape after removing the carburettor.



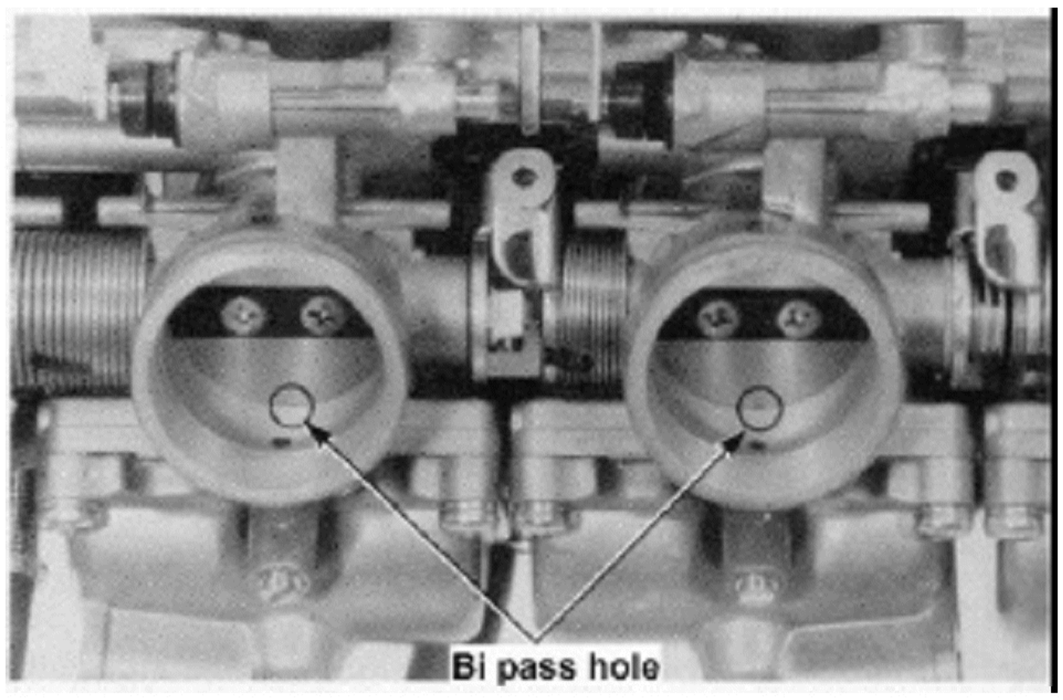
Disassembly

The carburettor need not be disassembled for the vacuum chamber / float chamber disassembly / assembly.

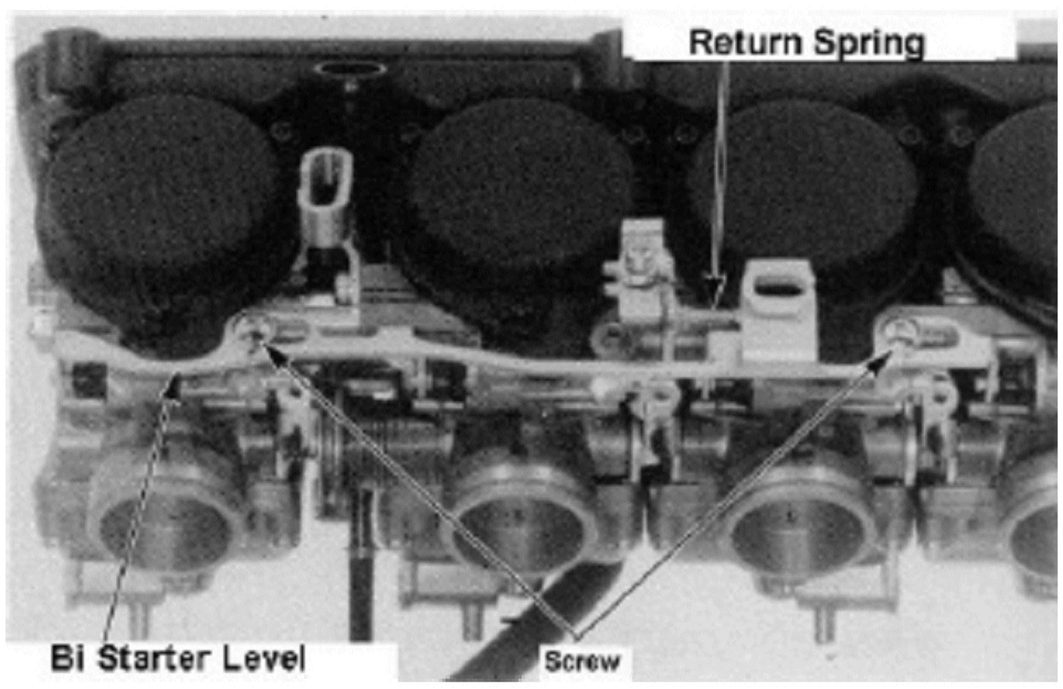
Remove the insulator from the carburettor.



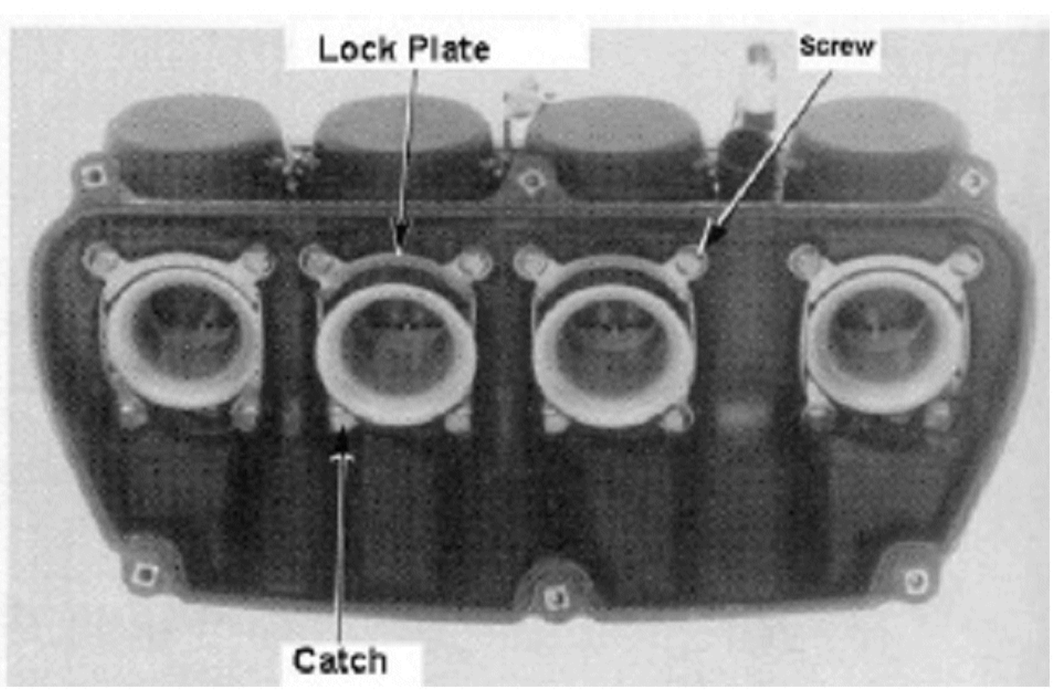
Wind the throttle stop screw to have all carburettor bi-pass holes visible.



Unscrew bi-starter lever mount screws to remove the washer and the bi-starter lever. Remove the return spring, spring collar, and the spring.



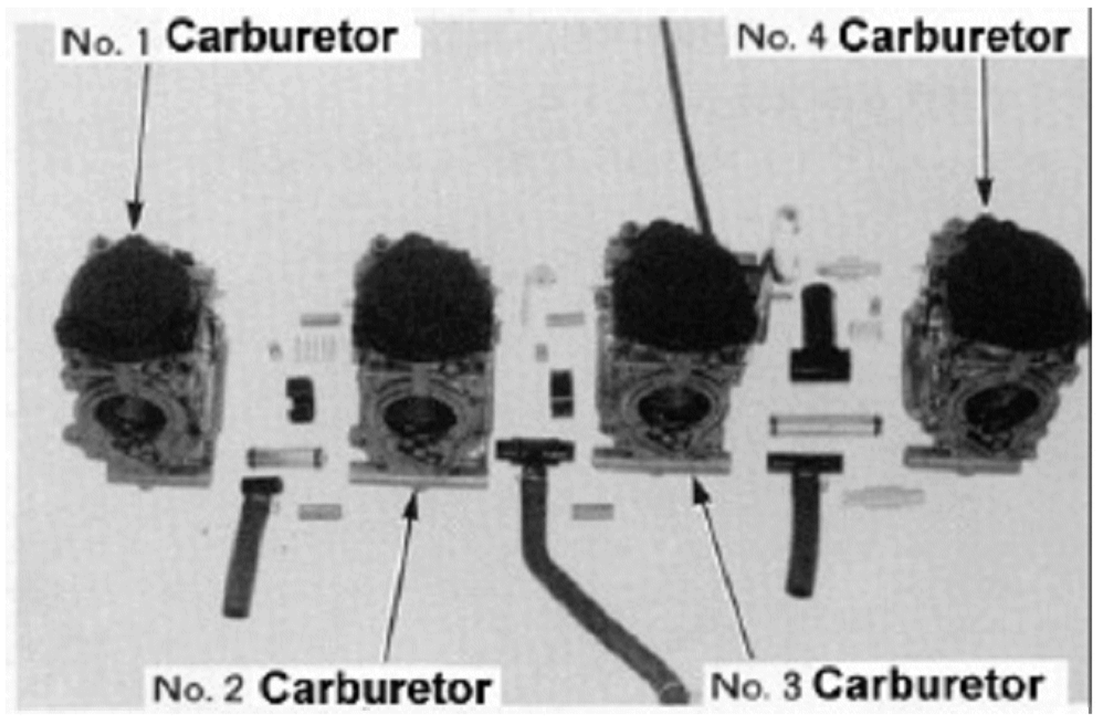
Lift a catch on the lock plate and unscrew the lock plate screws.



Remove the air filter lower case together with the air funnel.

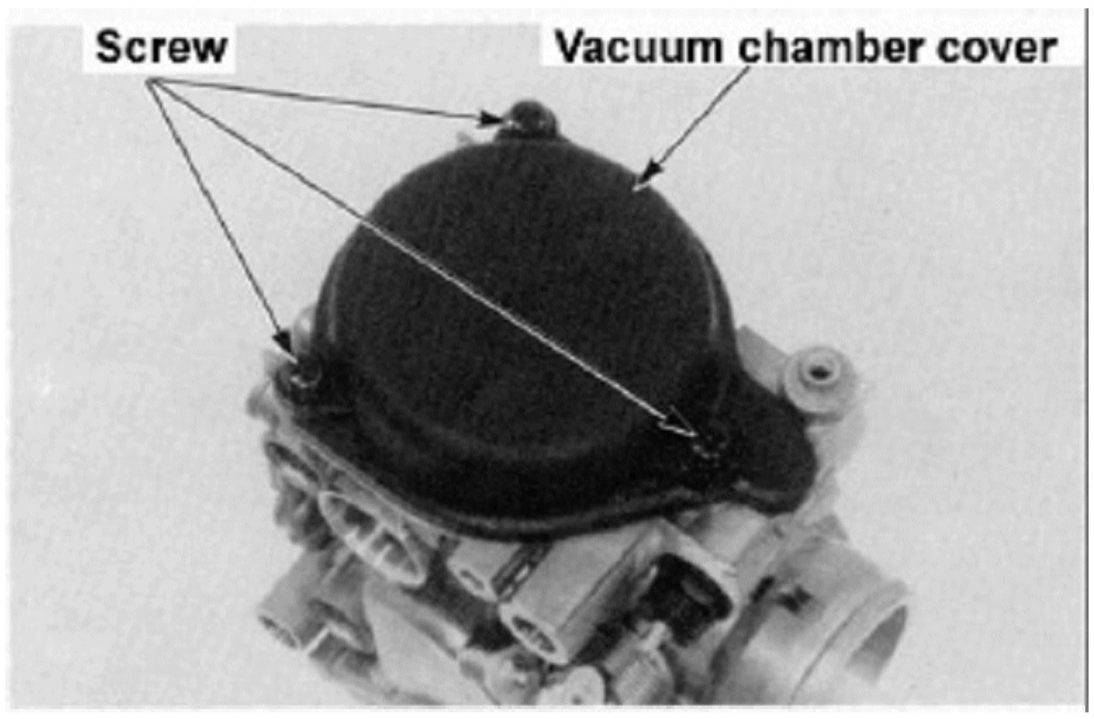
Remove O-Rings.

Unscrew carburettor nuts and remove nuts on the left hand side.
Pull carburettor connecting bolts out to the right.
Separate the carburettors.

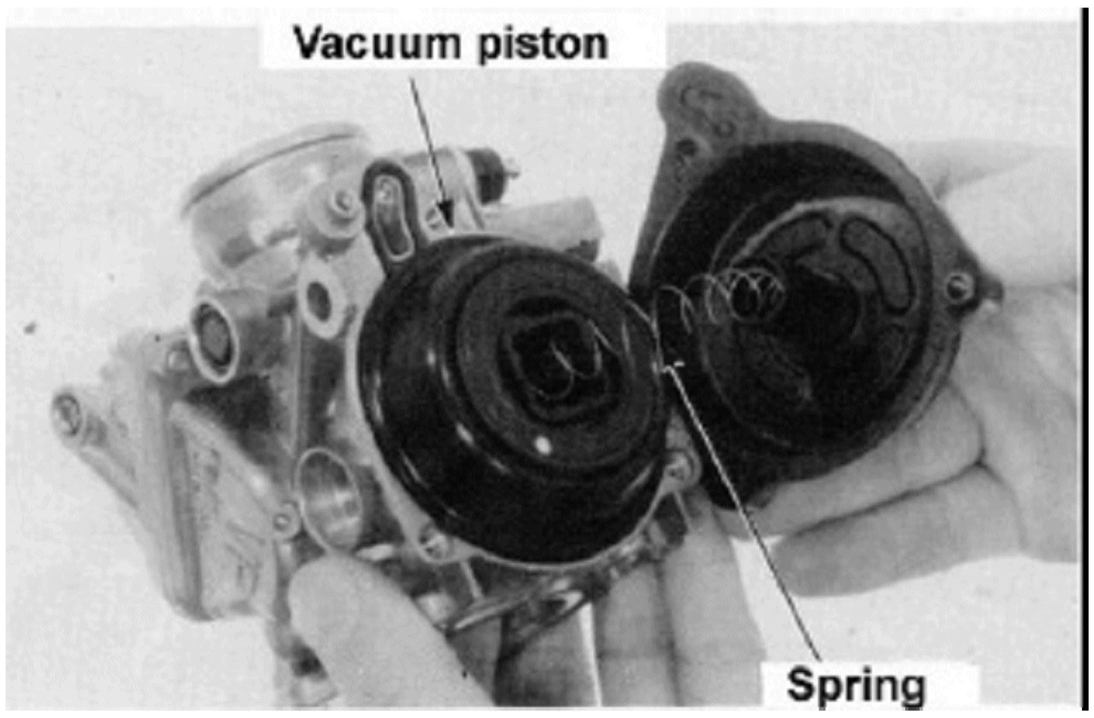


- Two carburettor thrust springs and three synchronisation adjust springs will come off at the same time. Do not lose them.
- Separate carburettors horizontally to avoid damaging the fuel joints and the air vent joints.

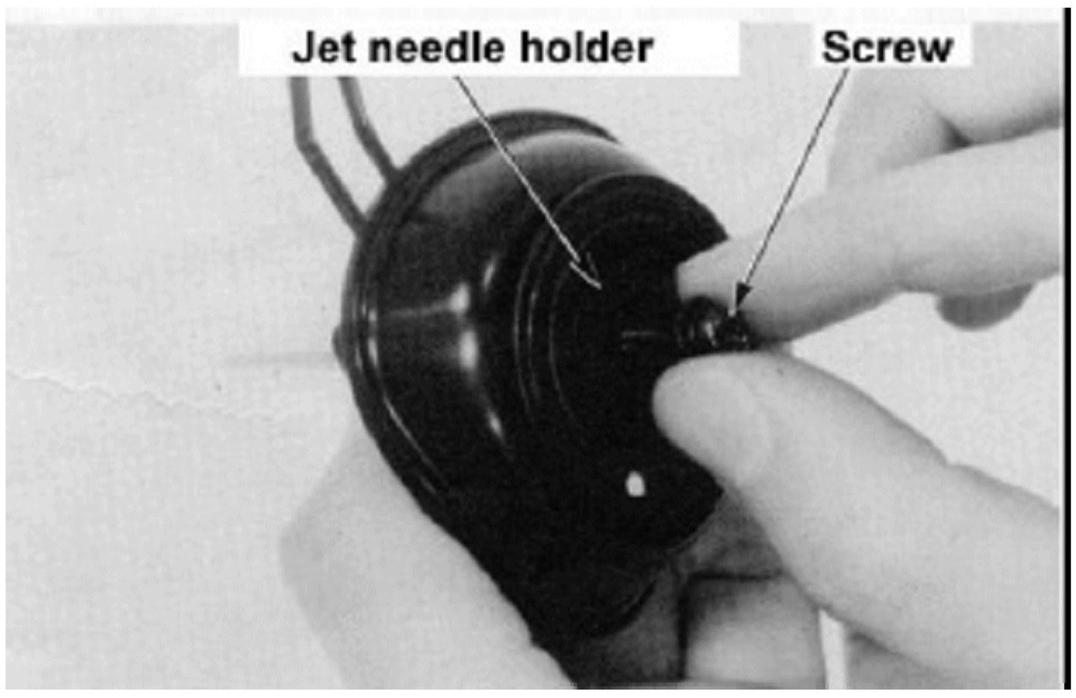
Unscrew vacuum chamber mount screws to remove the vacuum chamber cover.



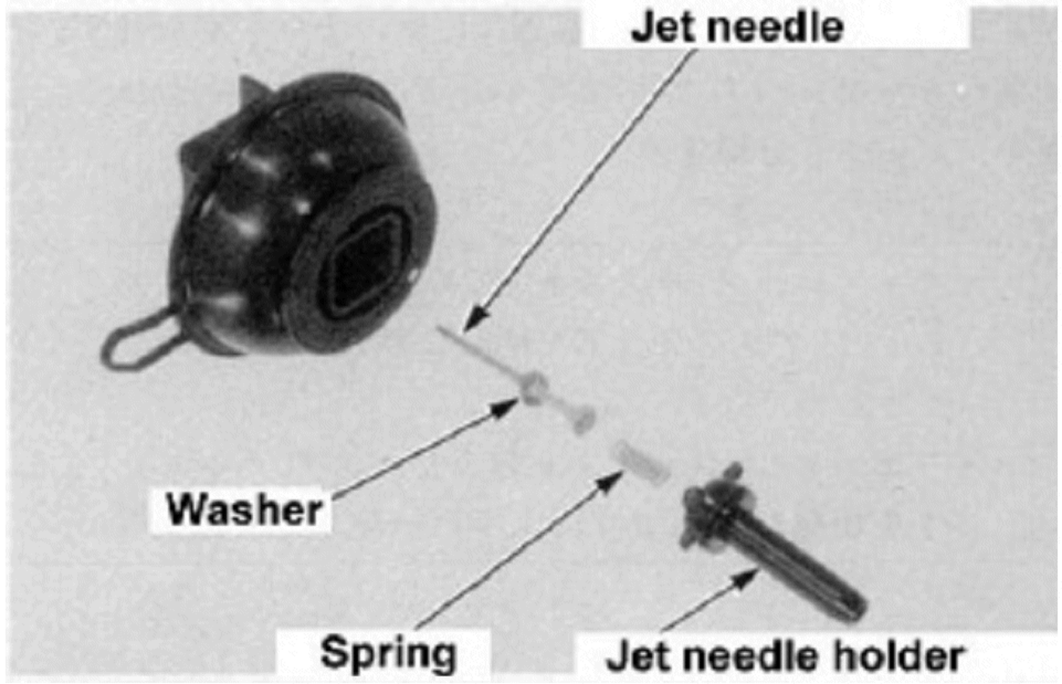
Remove the spring and the vacuum piston.
Check for the smooth operation of the piston in the chamber.



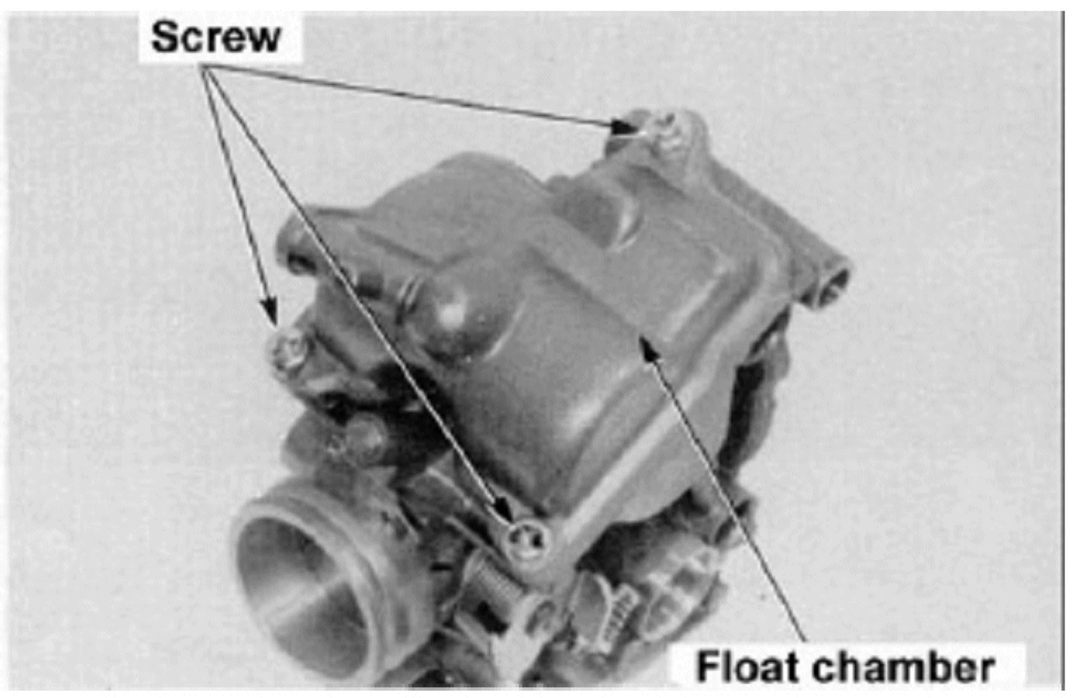
Screw the vacuum chamber cover mount bolt to the jet needle holder to pull the holder out.
Remove the spring, jet needle and the washer from the piston.



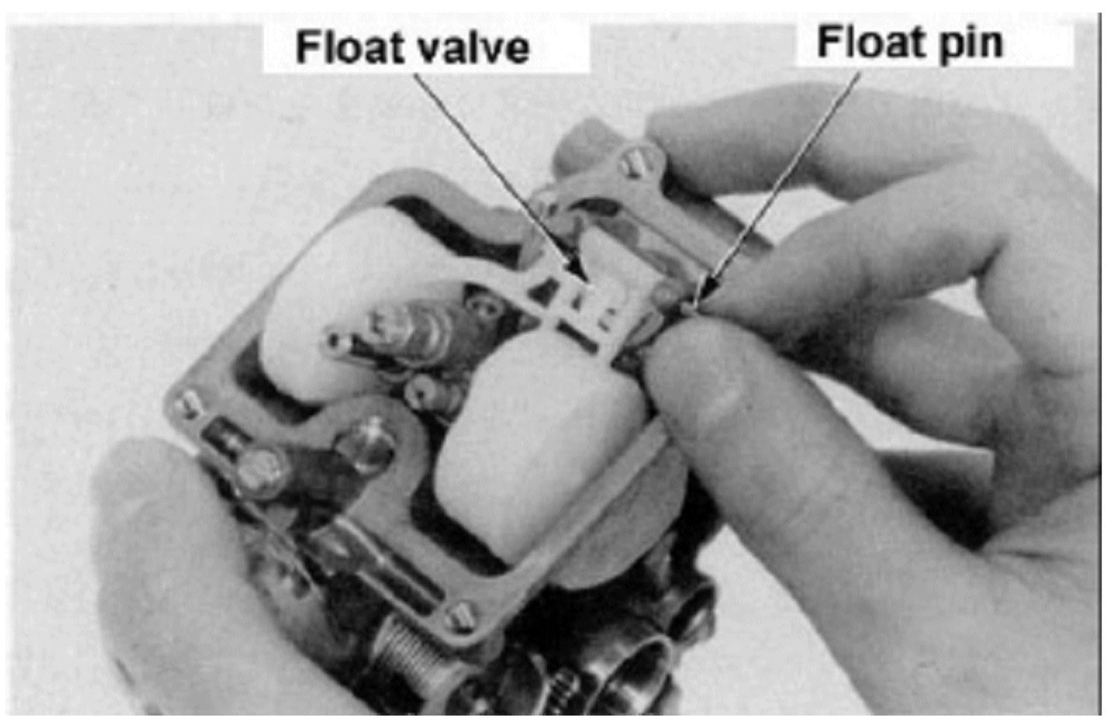
Inspect the jet needle tip for wear, twist and damage.
Inspect the diaphragm for damage.
Inspect the vacuum piston for wear and damage.



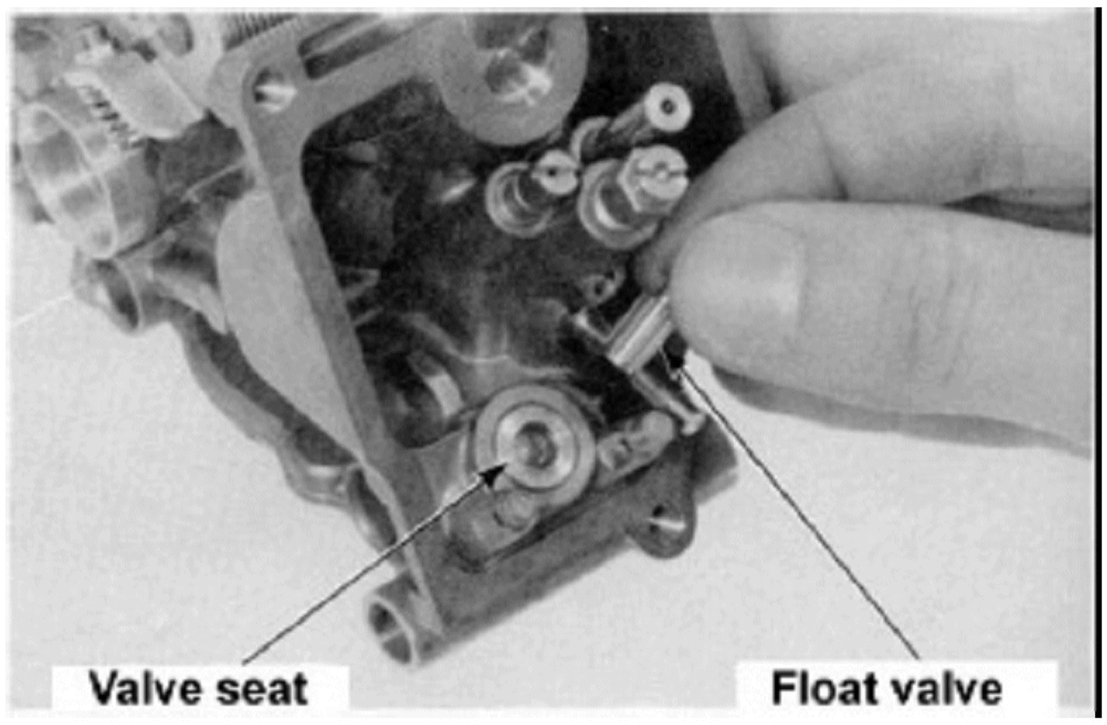
Unscrew float chamber mount screws.
Remove the float chamber.



Remove the float pin to remove the float valve.
Inspect the float.

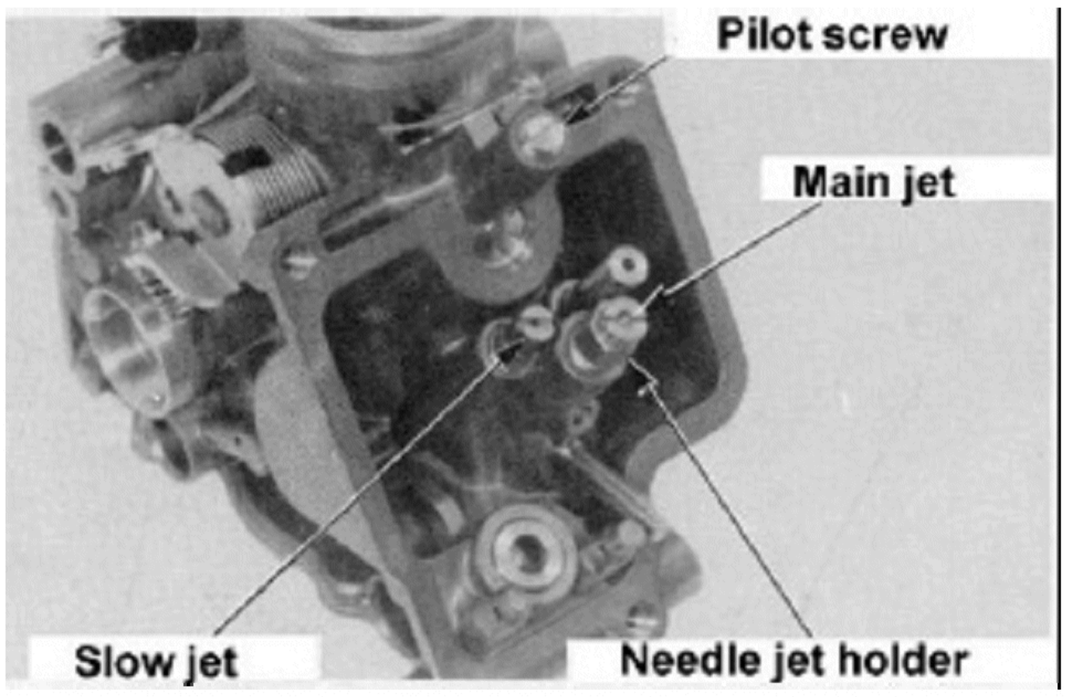


Inspect the float valve and the valve seat for blockages and damage.
Inspect the valve seat contact area for wear.



Remove the main jet, the needle jet holder and the slow jet.

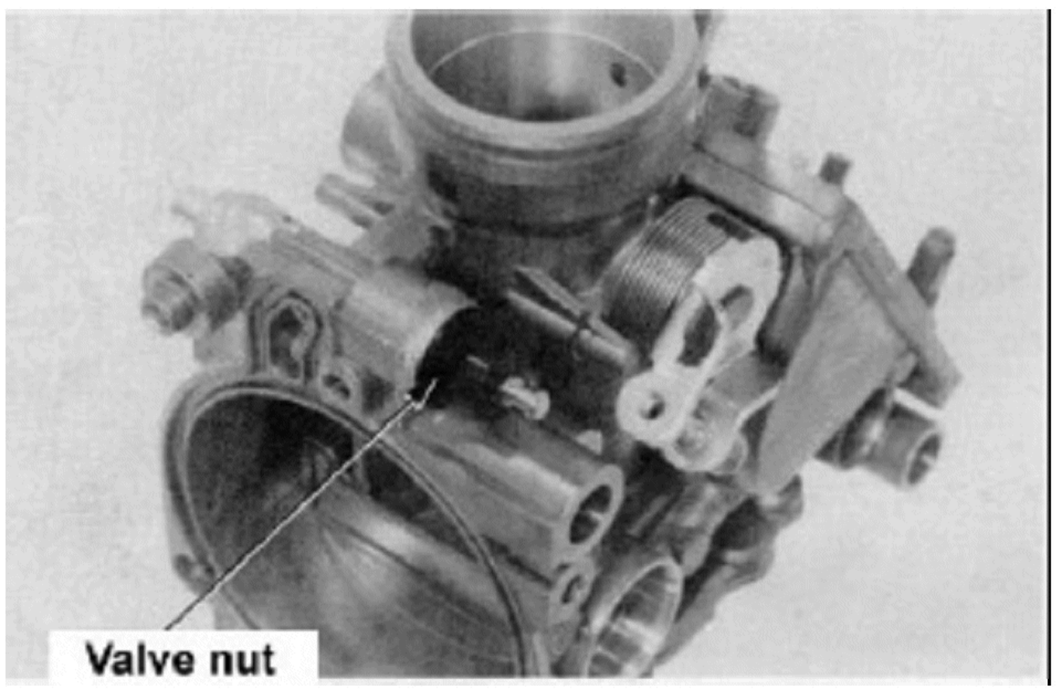
Record the number of winds to fully tighten the pilot screw, then unscrew.
Remove the spring, the washer and the O-Ring.



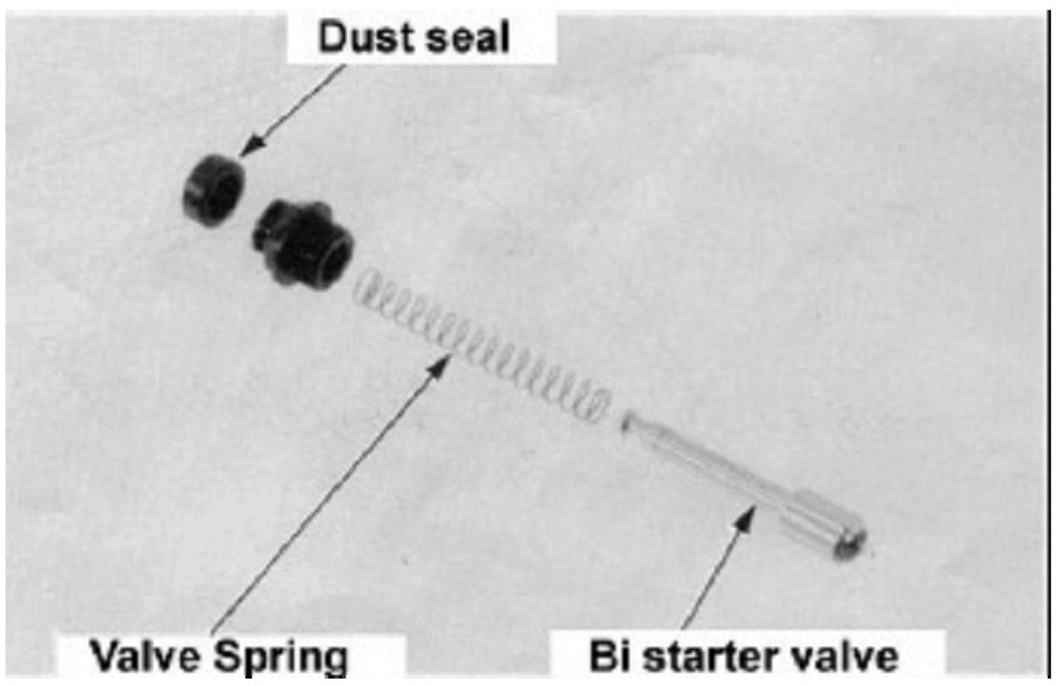
> Do not overtighten the pilot screw to avoid damaging the seat.

Clean the main / slow jets.

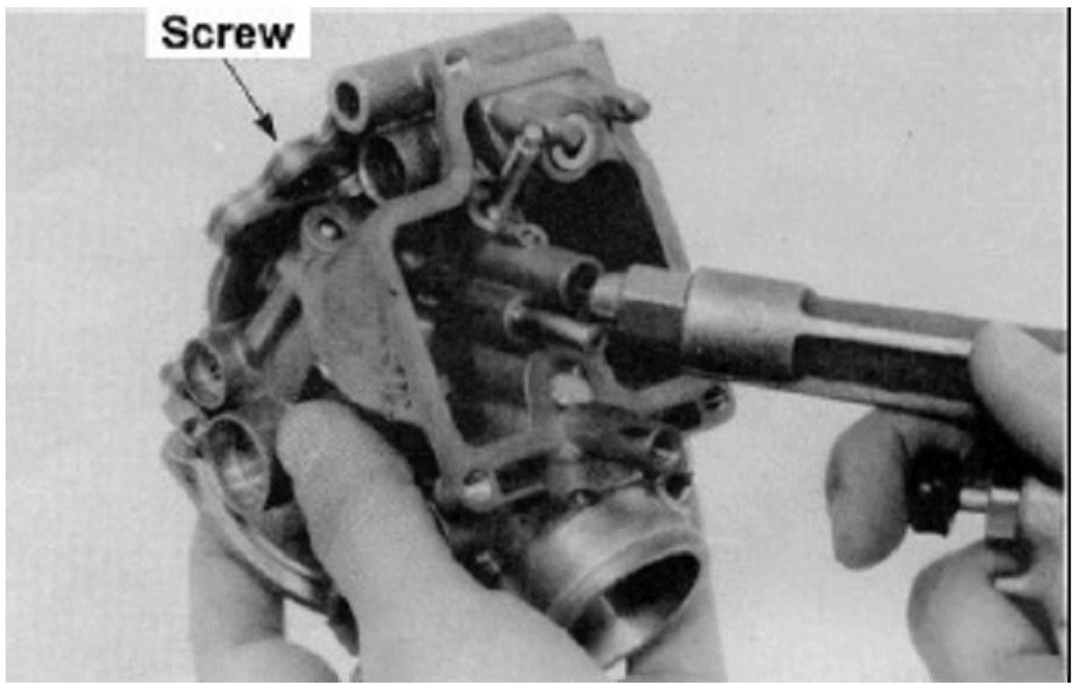
Loosen the bi-starter valve nut to remove valve spring and valve.



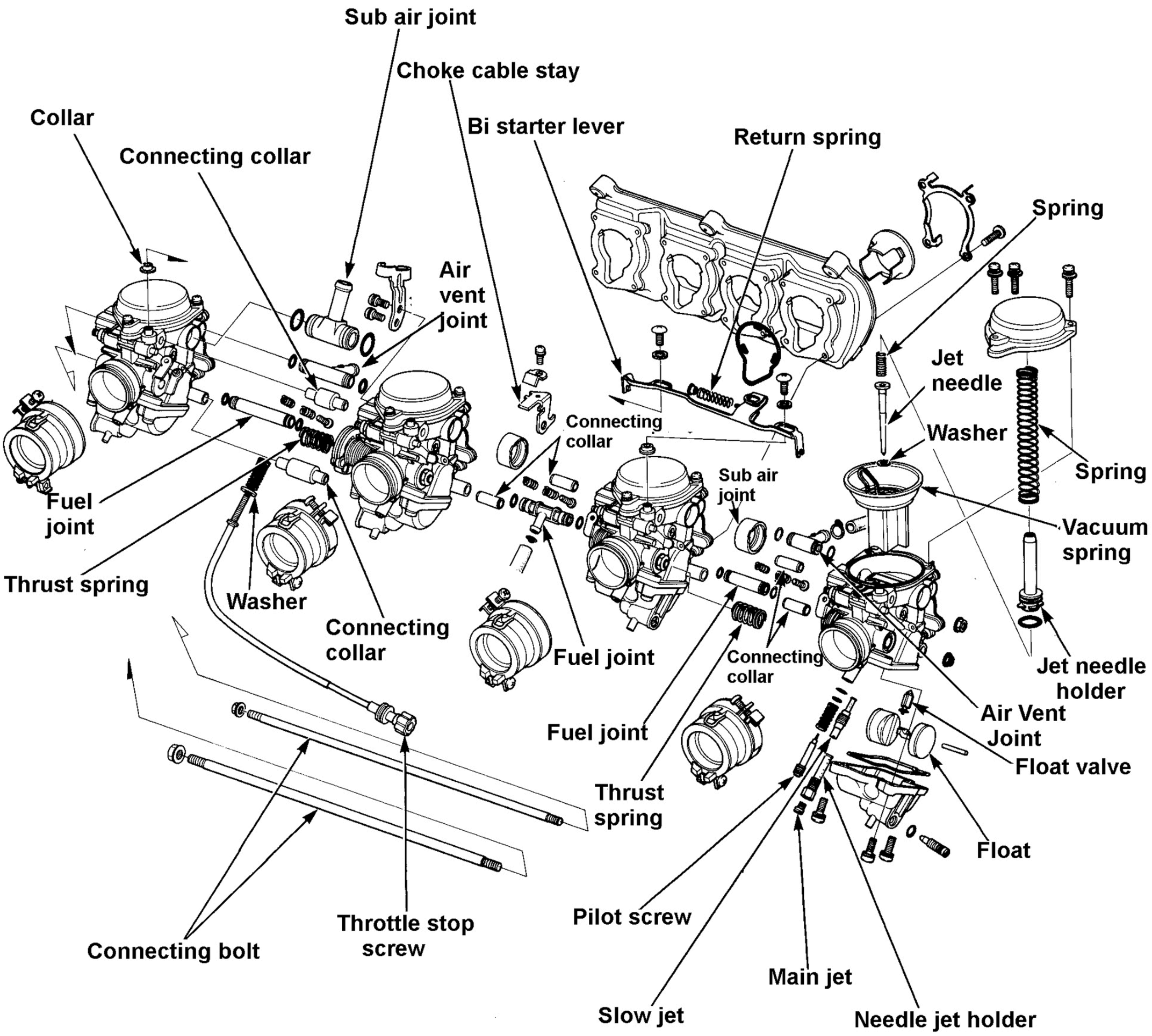
Insert the bi-starter valve to inspect , for unequal wear and damage.
Inspect the valve spring for deformation and damage.
Inspect the dust seal for damage.



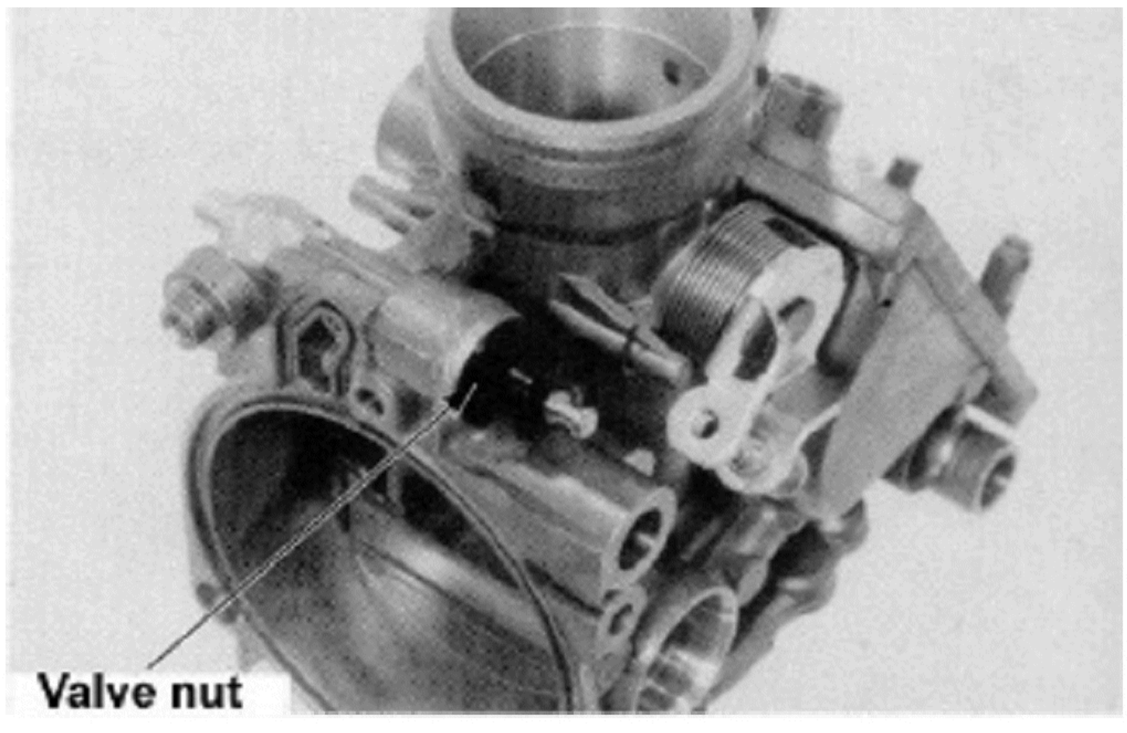
Clean the carburettor air passage with compressed air.
Clean the threaded part of the air filter lower case.
Clean the filter in a float valve seat with compressed air.



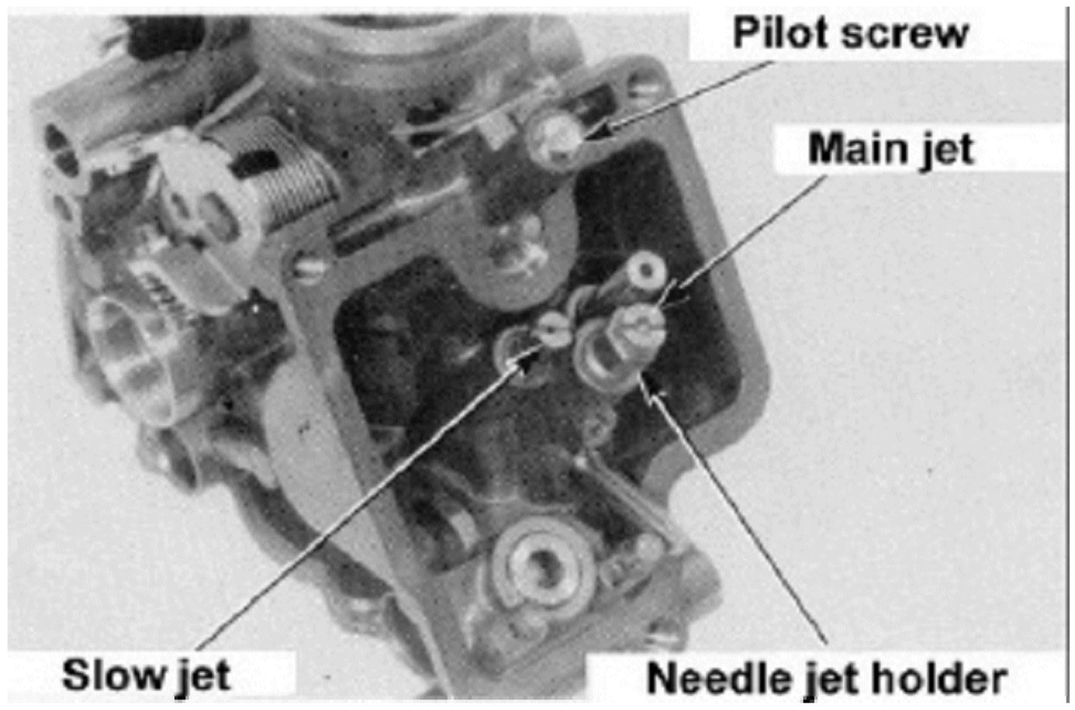
- Assembly



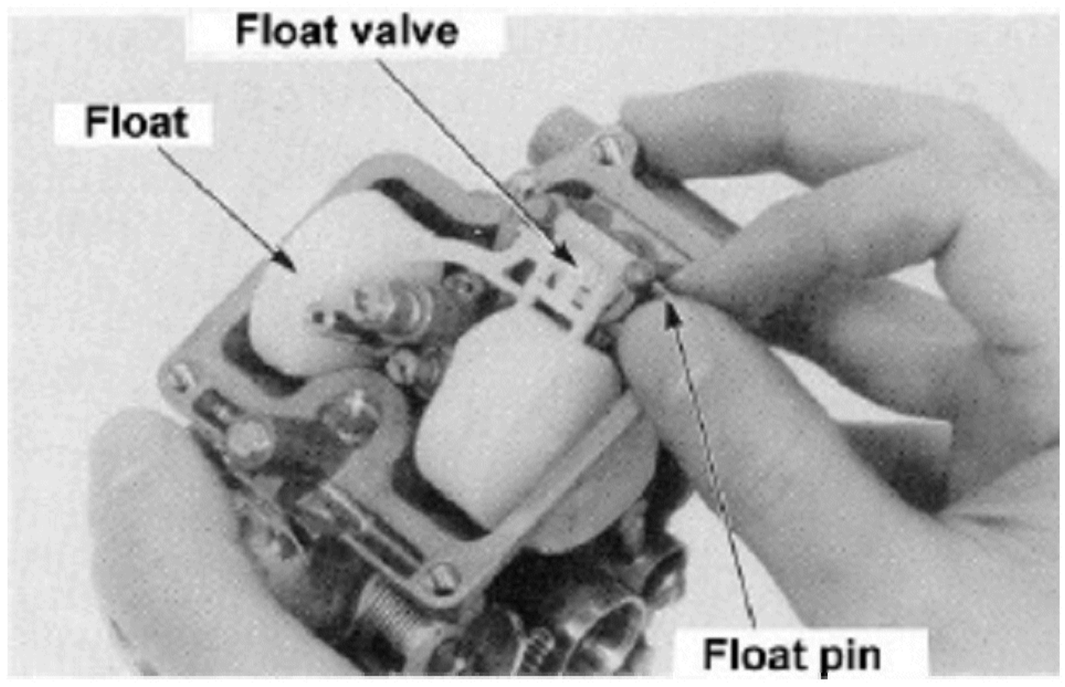
Install the bi-starter valve and the valve spring.
Tighten the bi-starter valve nut.



Install the needle jet holder, the main jet and the slow jet to the carburettor body.
Install a washer, an O-Ring and the pilot screw to the carburettor body.



Install the float and the float valve to the carburettor body with the float pin.

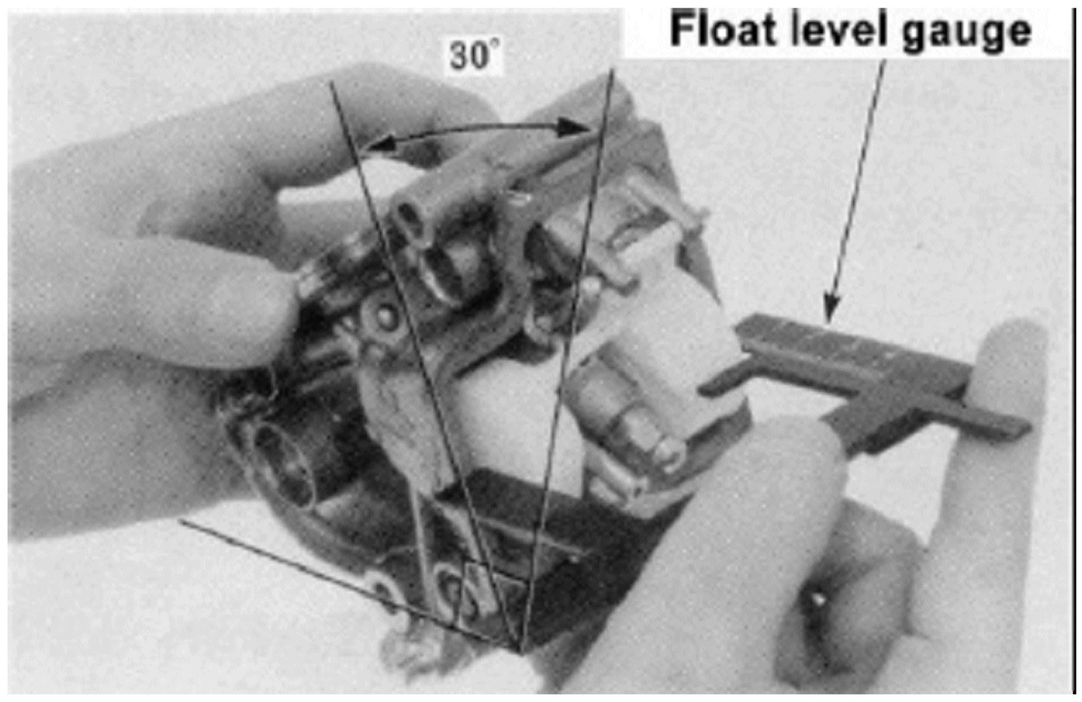


Float level check

Hold the float chamber mount surface vertical and tilt the carburettor 30° from that position. Measure the float level at the position where the float valve and the float arm contact.

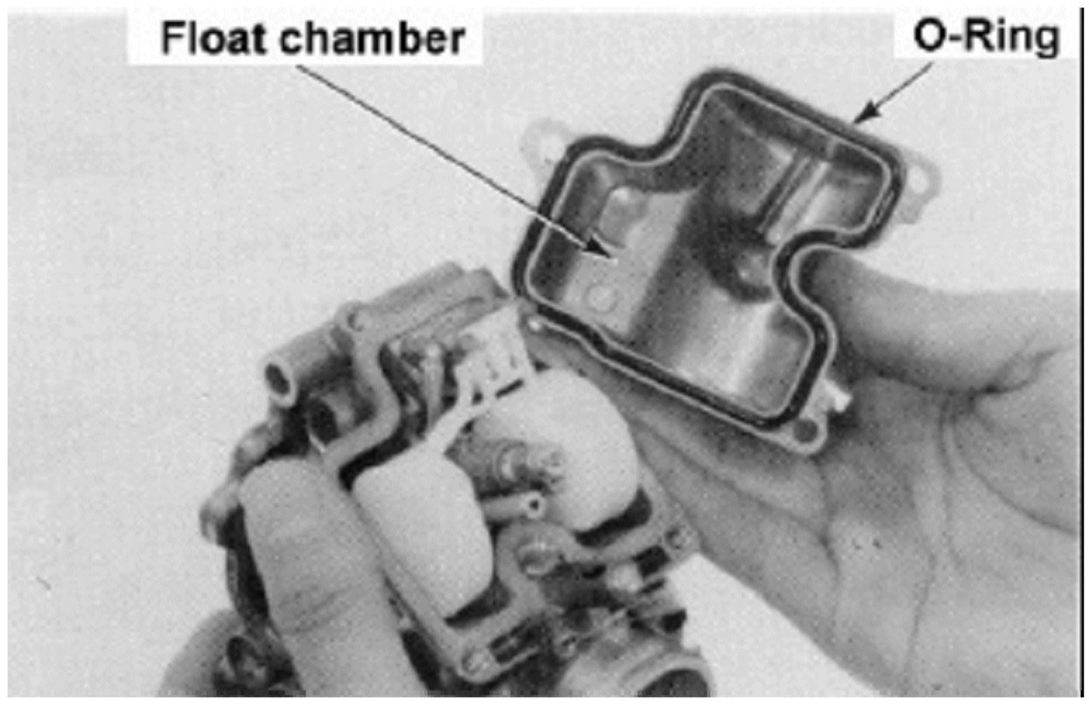
Standard float level: 13.7mm

Common Tools:
Float level gauge: 07401-0010000

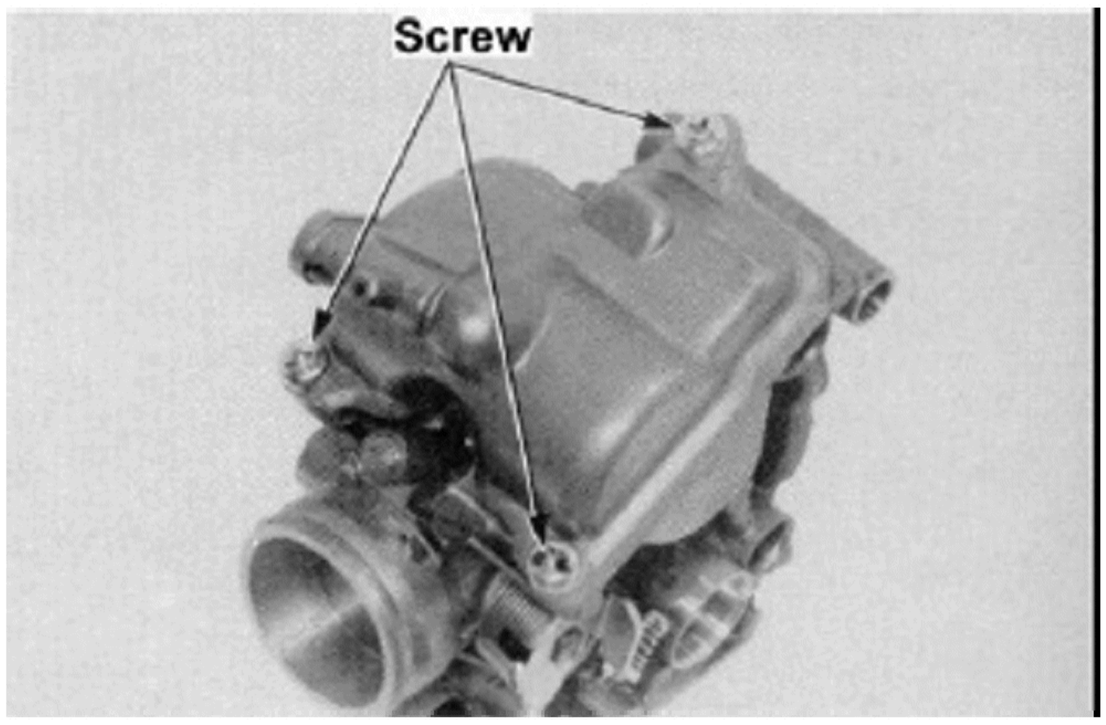


Place the gauge perpendicular to the float chamber mount surface at the main jet.

Install a new O-Ring to the float chamber and install the chamber.

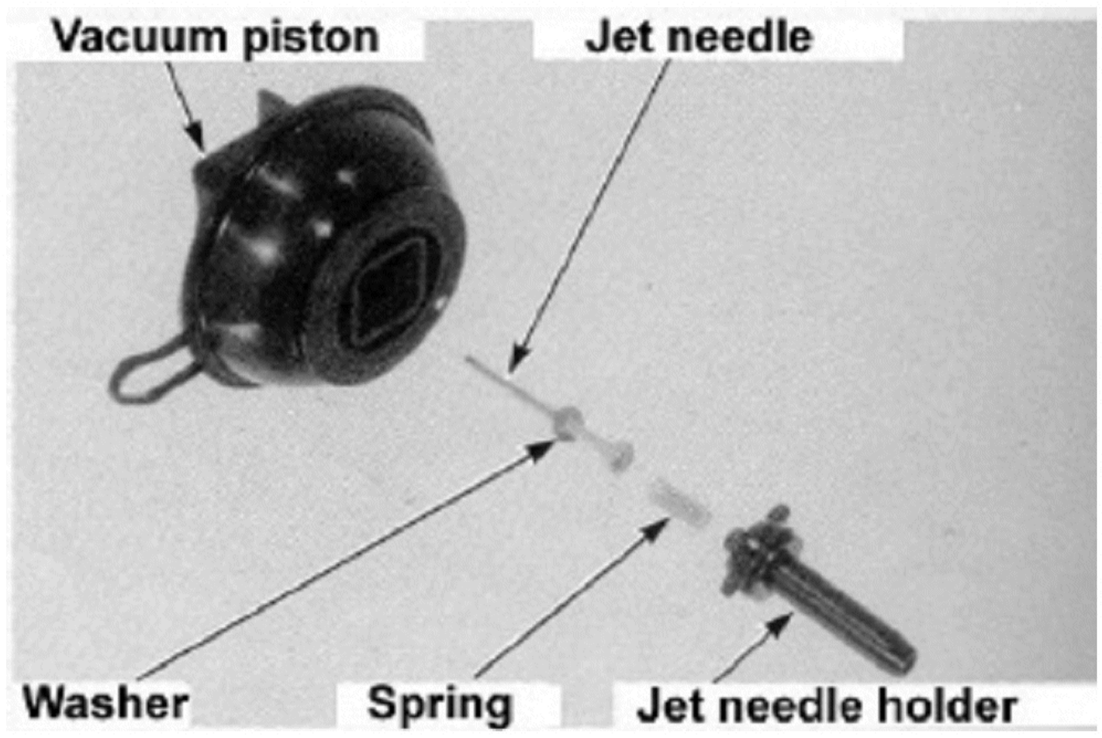


Firmly tighten the three screws.



Install the washer, jet needle and the spring to the vacuum piston and push the jet needle holder into the piston.

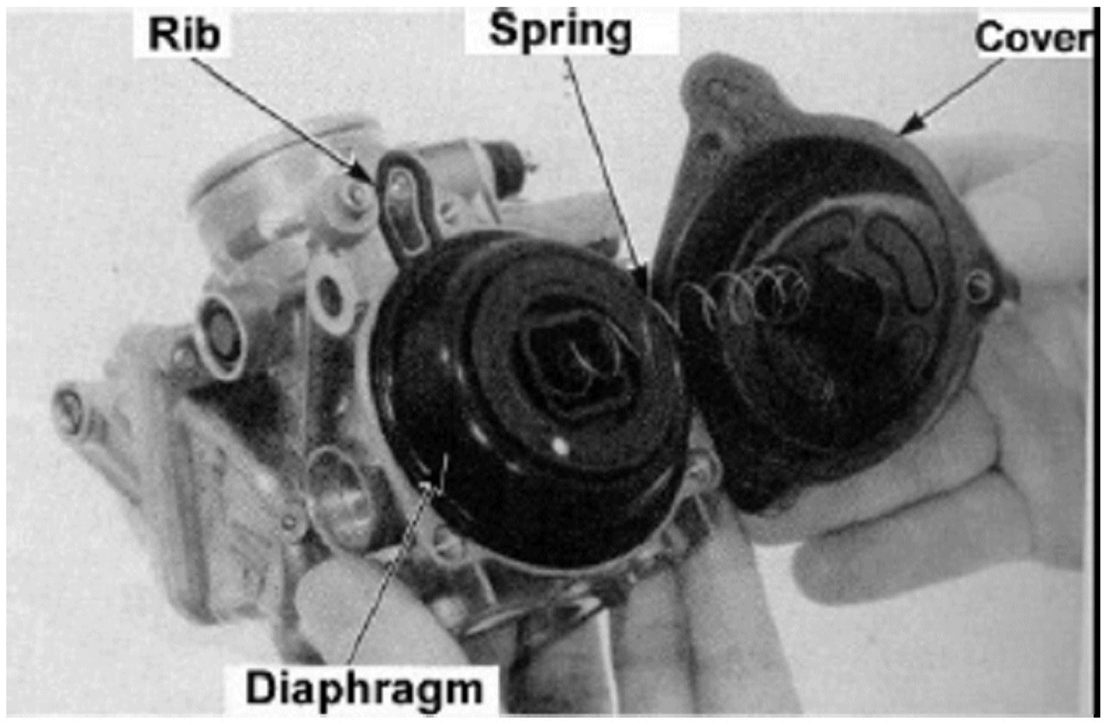
Push the holder in until you can feel the O-Ring set to the slit.



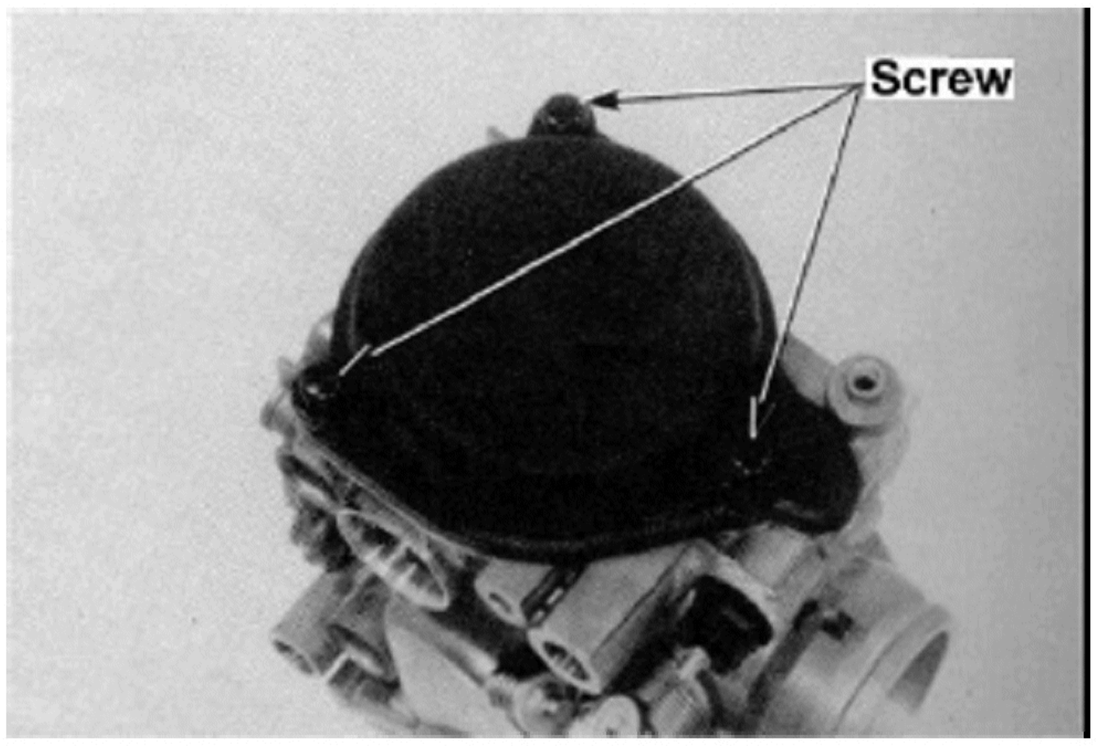
Push up the bottom of the vacuum piston toward the vacuum chamber (fully opened). Firmly set the rib of the diaphragm to the slit on the body.

Install the spring and the cover.

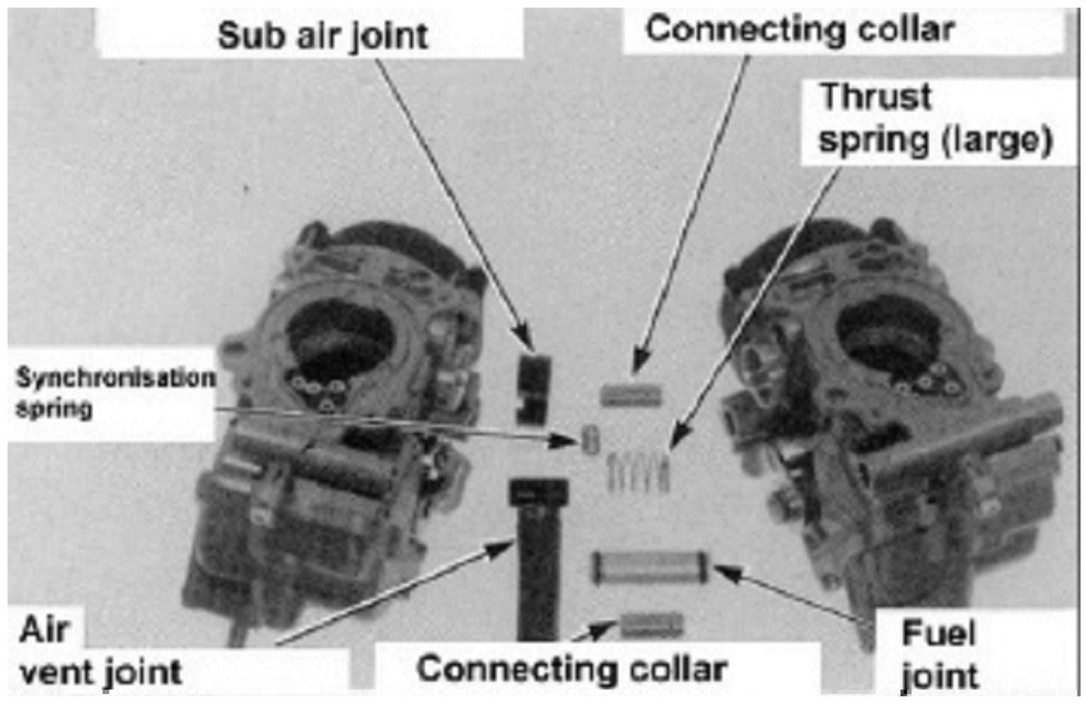
Do not catch the diaphragm.



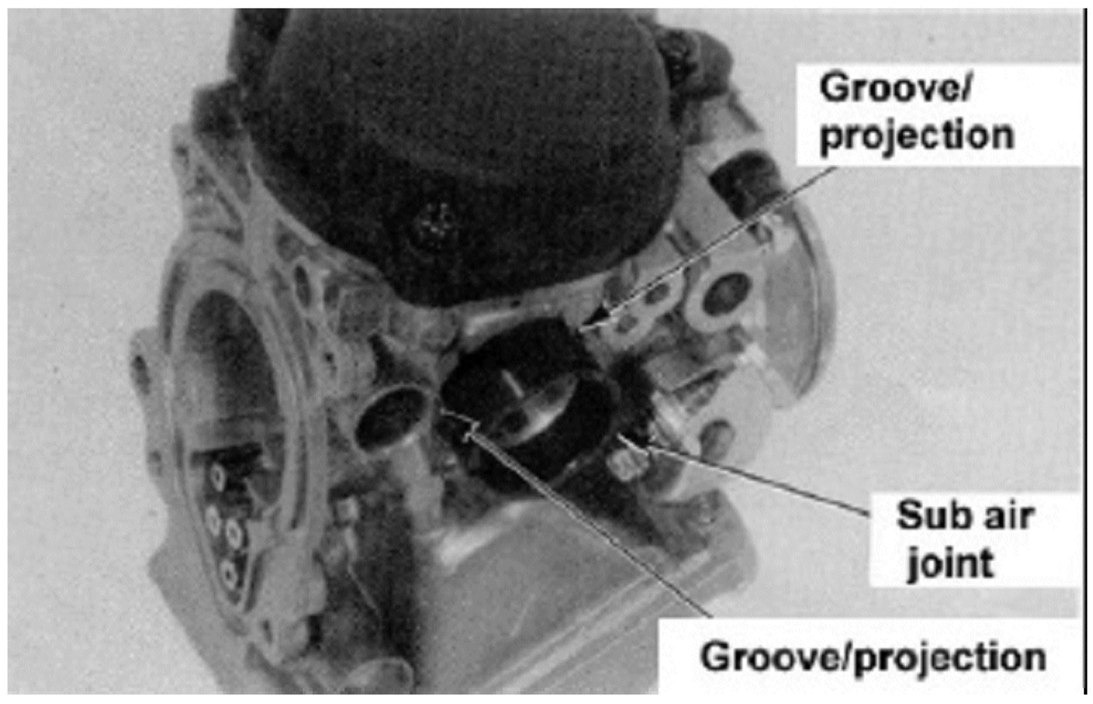
Firmly tighten the three screws.



Install #1 and #2 carburettors in the following manner.
Install new O-Rings to the air joint pipe and fuel joint pipe.
Joint the carburettors with a thrust spring, an air vent joint, a fuel joint and connecting collars.
Install a synchronization spring.

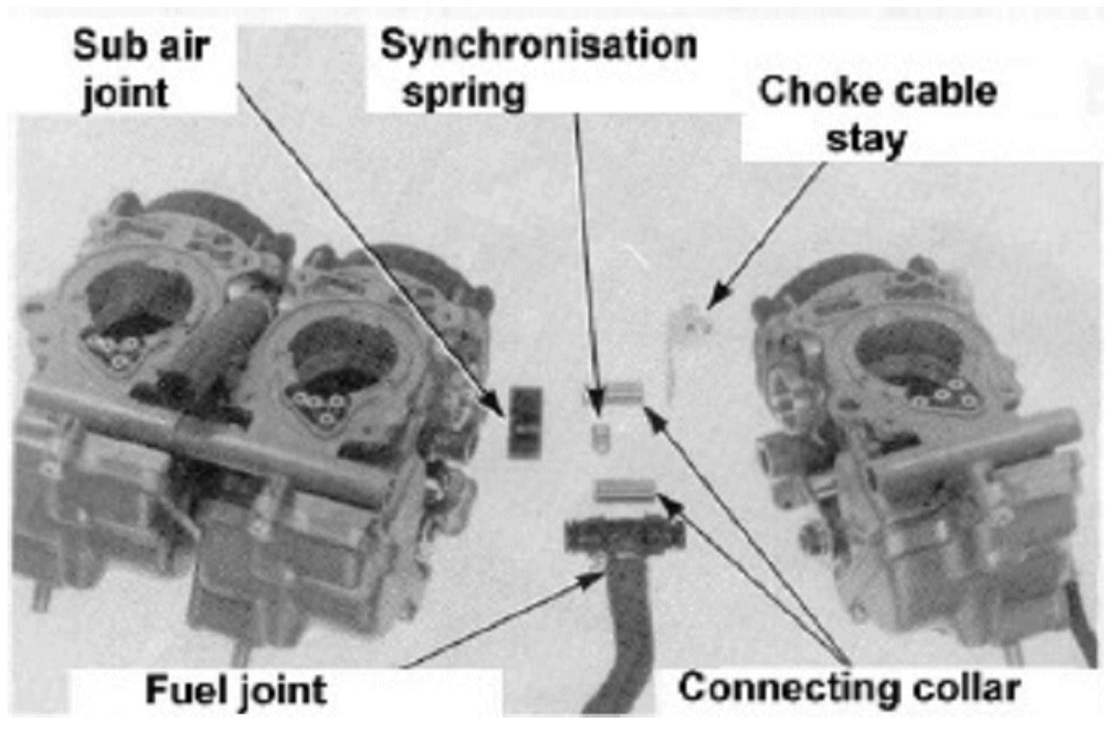


- When installing the sub air joint to #1 carburettor, set the joint slit to the body projection as shown in the photograph.
- Install the air vent joint so as to have its tube facing the air filter.
- Do not damage O-Rings when jointing parts.



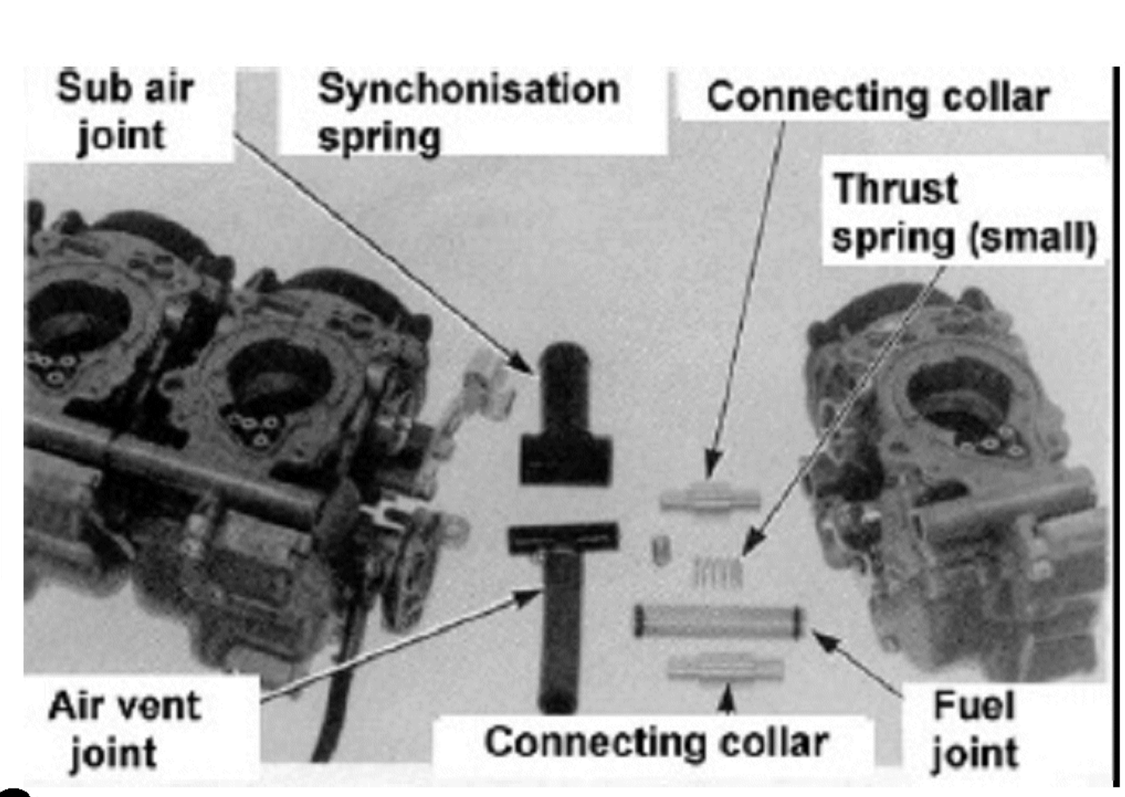
Install #3 carburettor in the same manner as #1 and #2.

- Do not use the thrust spring between #3 and #2 carburettors.
- Set a choke cable stay together with the top connecting collar.

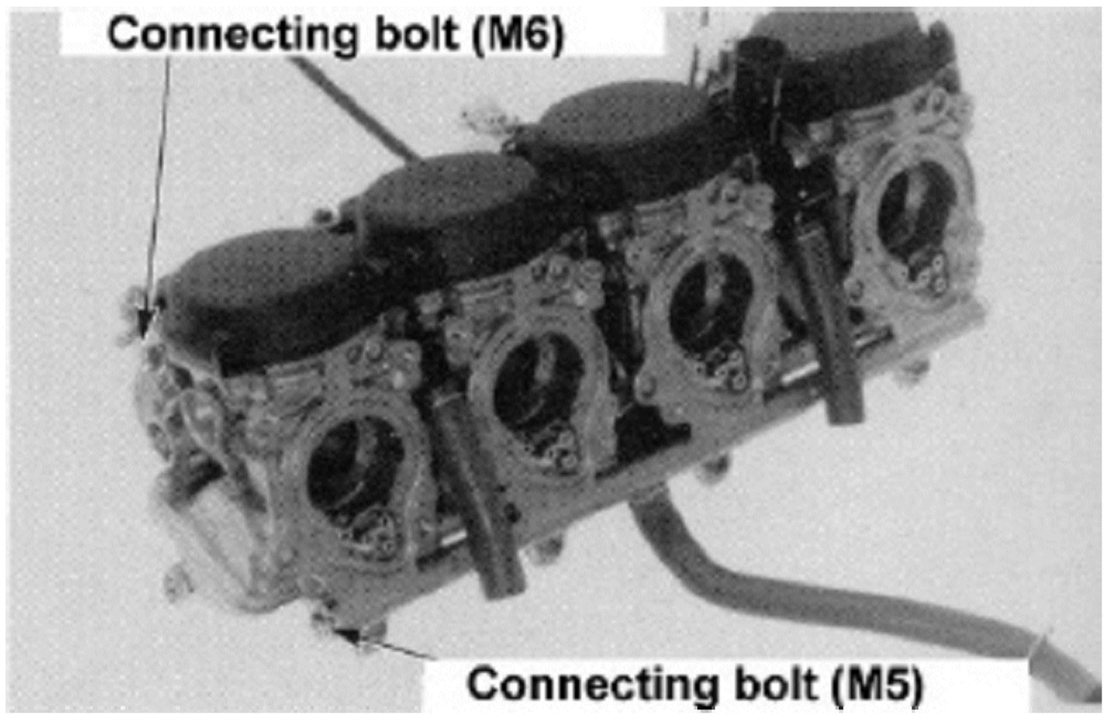


Install #4 carburettor in the same manner as #1 and #2.

Set the sub air joint so as to face it towards the vacuum chamber cover.



Install carburettor connecting bolts from the right side.
Secure nuts.
Torque: M5 : 0.45 ~ 0.6kg-m
M6 : 0.8 ~ 1.2kg-m

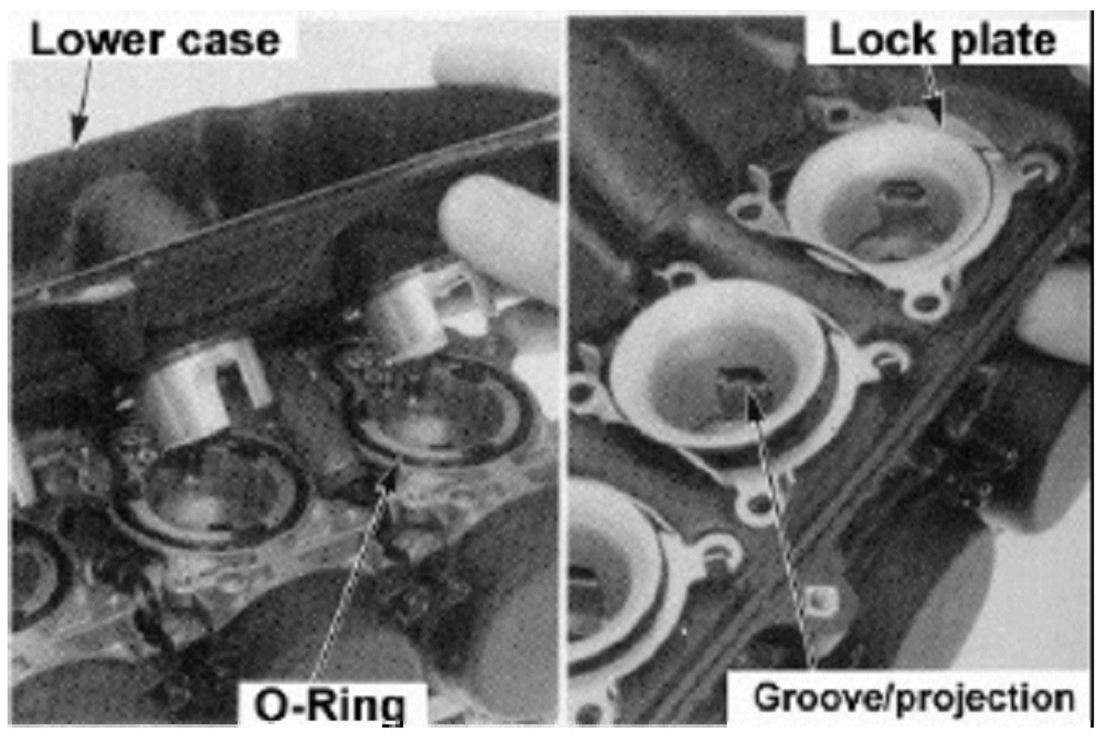


Caution

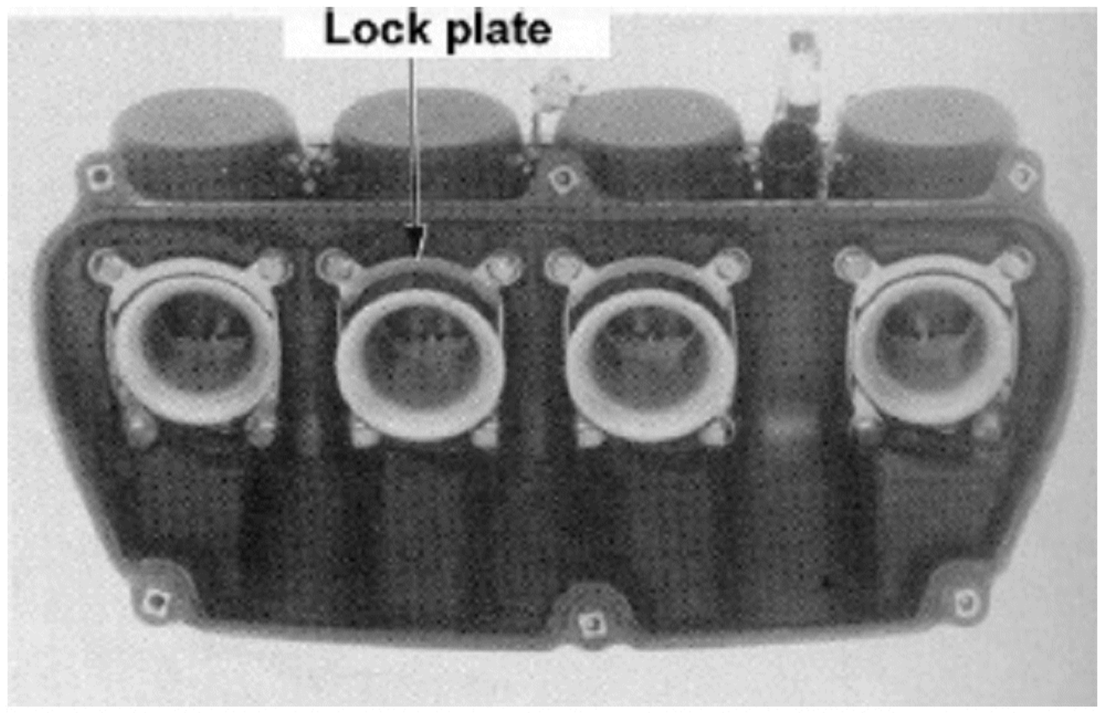
Strictly follow the torque setting.
Overtightening may alter the carburettors separation.

Inspect the O-Rings and replace if worn/damaged.
Install O-Rings to the carburettor bodies.
Install an air funnel together with the air filter lower case.

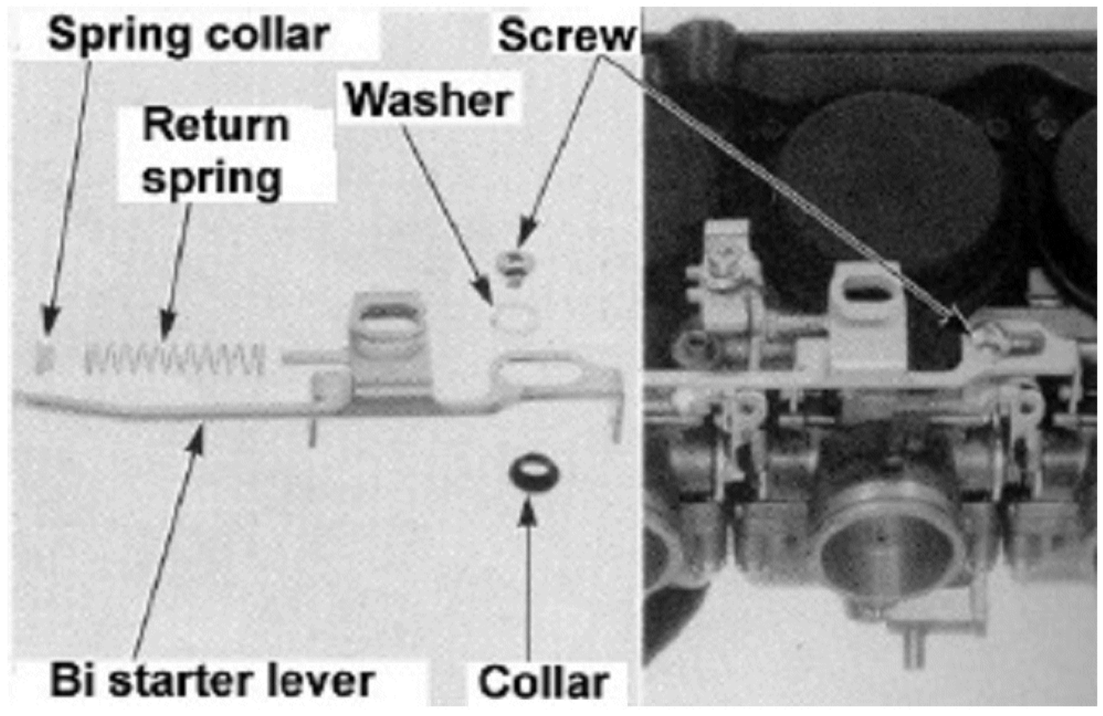
- Set new lock plates in advance.
- Set the slit of the air funnel to the projection on the carburettor.



Secure new screws and lock them by bending the catch of the lock plates.

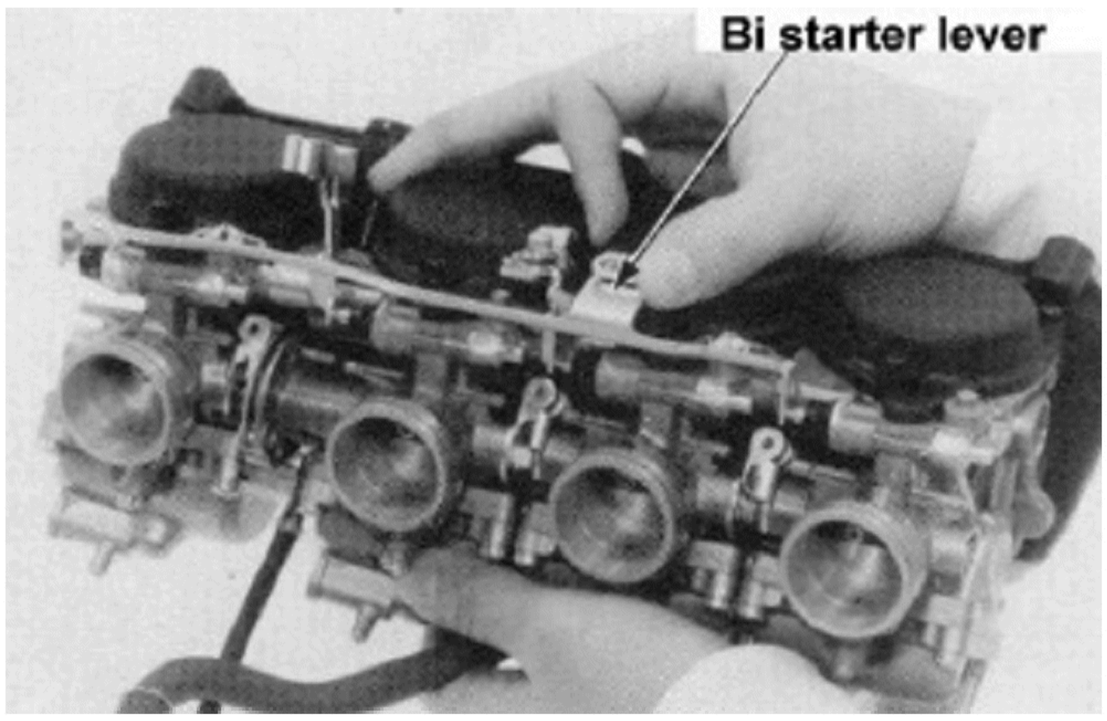


Install collars to the carburettor bodies.
Install the bi-starter lever to the bi-starter valve with the return spring and the spring collar.
Install the washer with the mount screw.

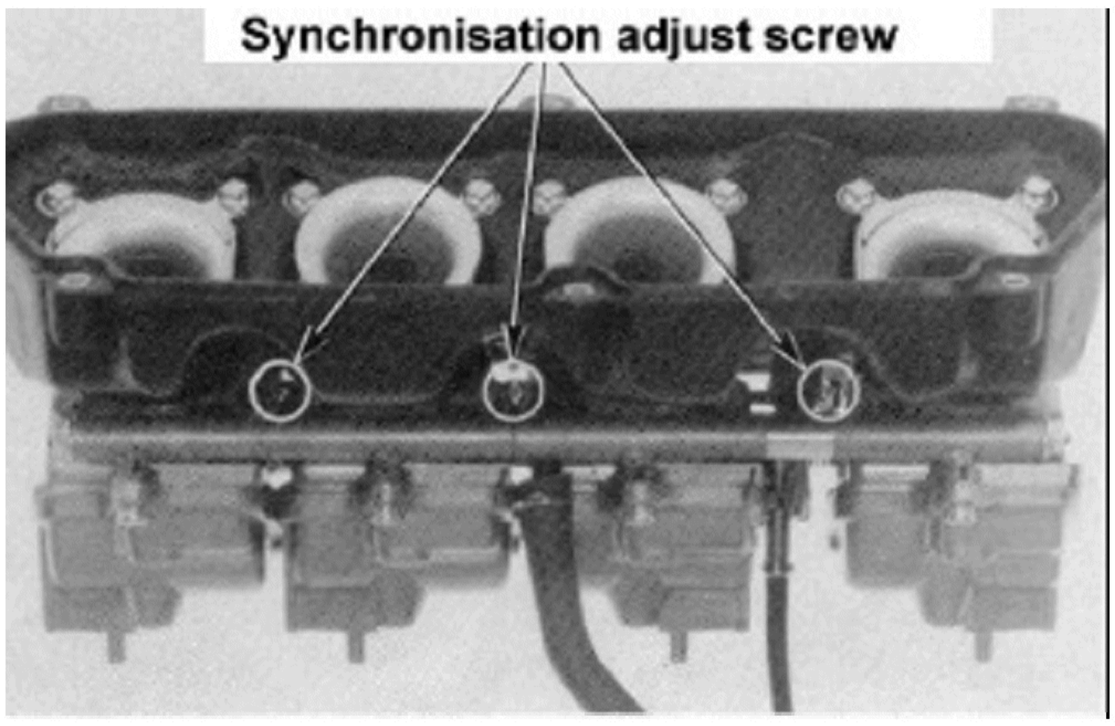


Move the bi-starter lever to check the valve operation.
Check the throttle operation with the following procedure.

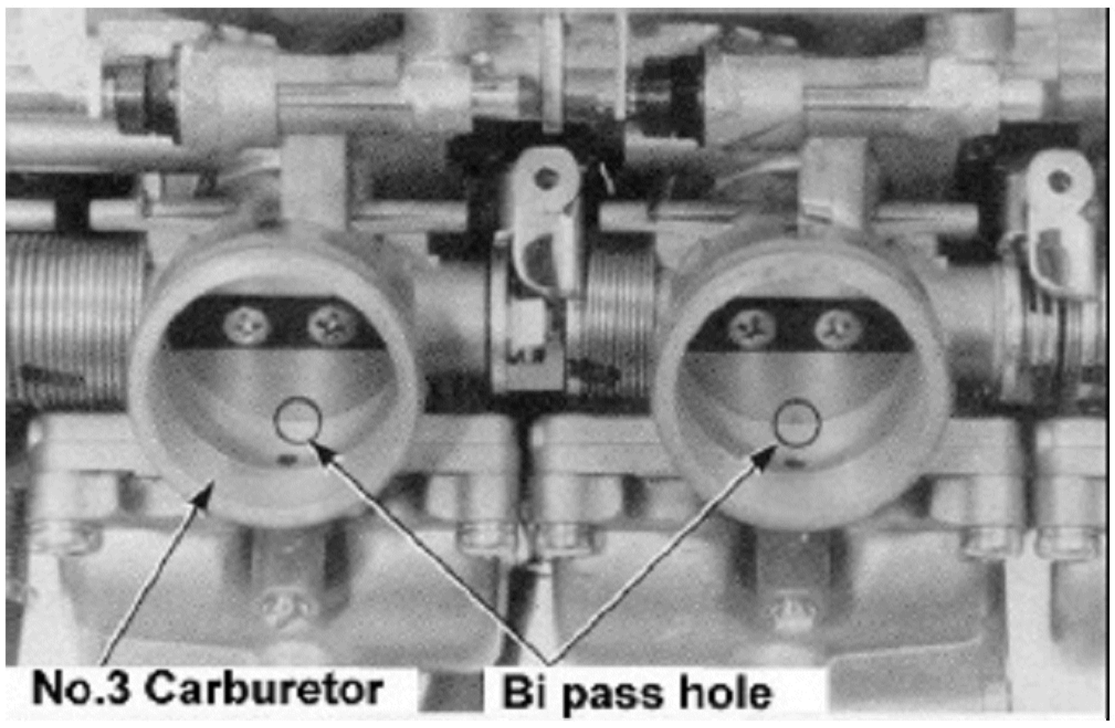
- Rotate the throttle drum to open the throttle a small amount. Check the smooth returning of the throttle.
- Open/close the throttle for its smooth operation.



Wind synchronization adjust screws to align bypass holes of all carburettors with the throttle valve position.

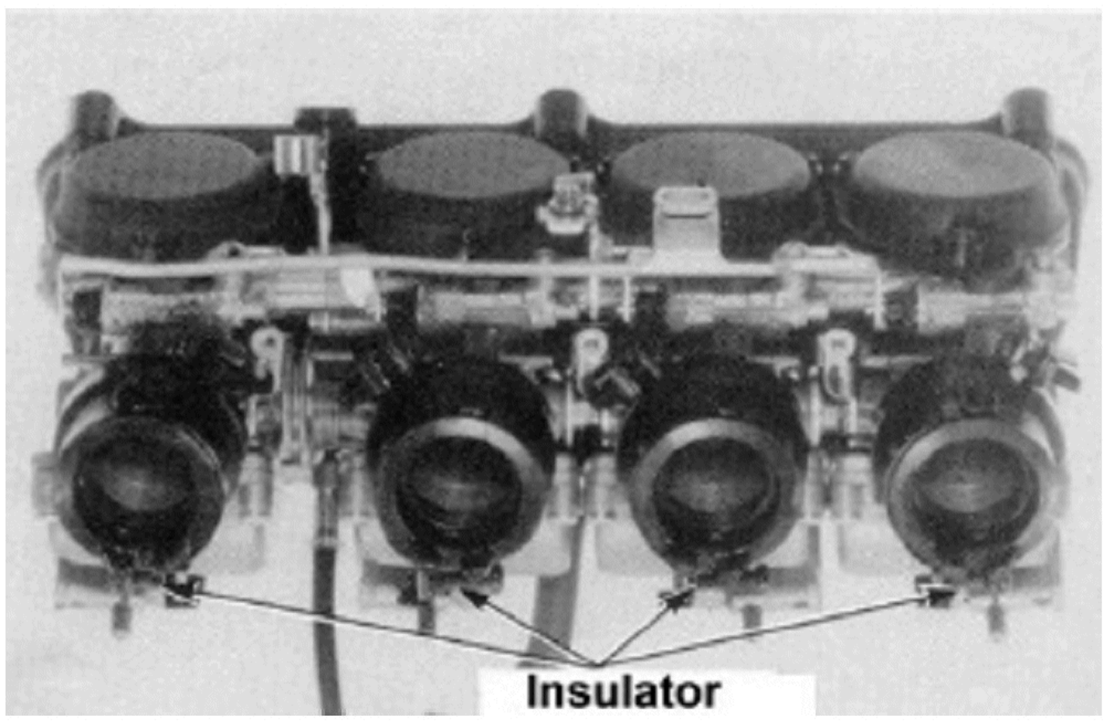


Use #3 carburettor as a reference.



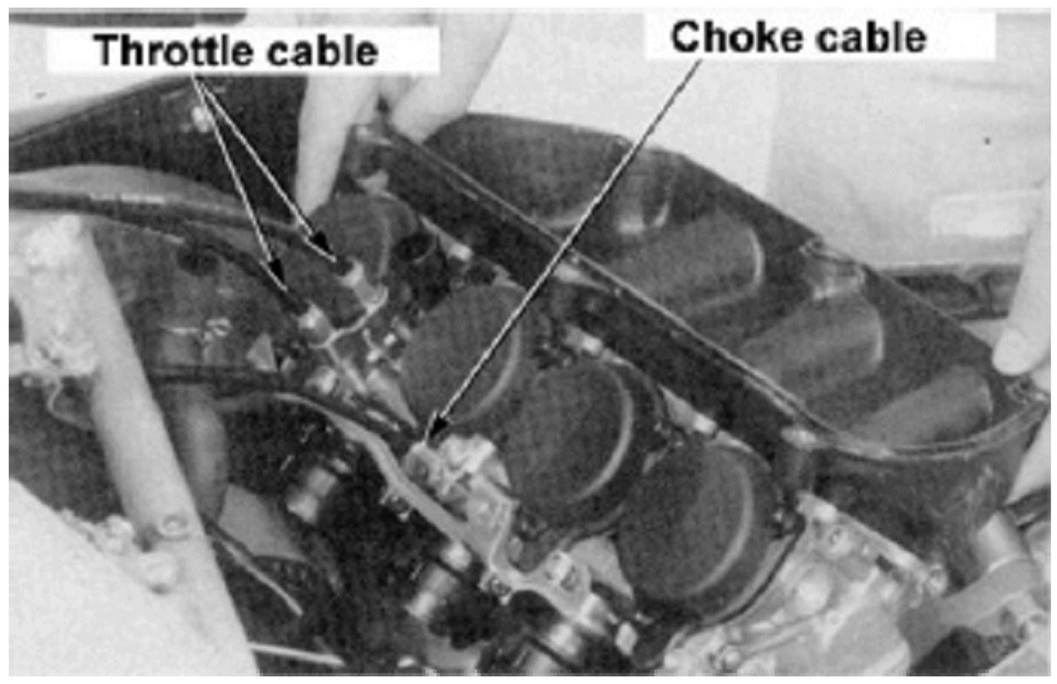
Install insulators to the carburettors.

Set the insulator strap screws correctly as shown in the photograph.



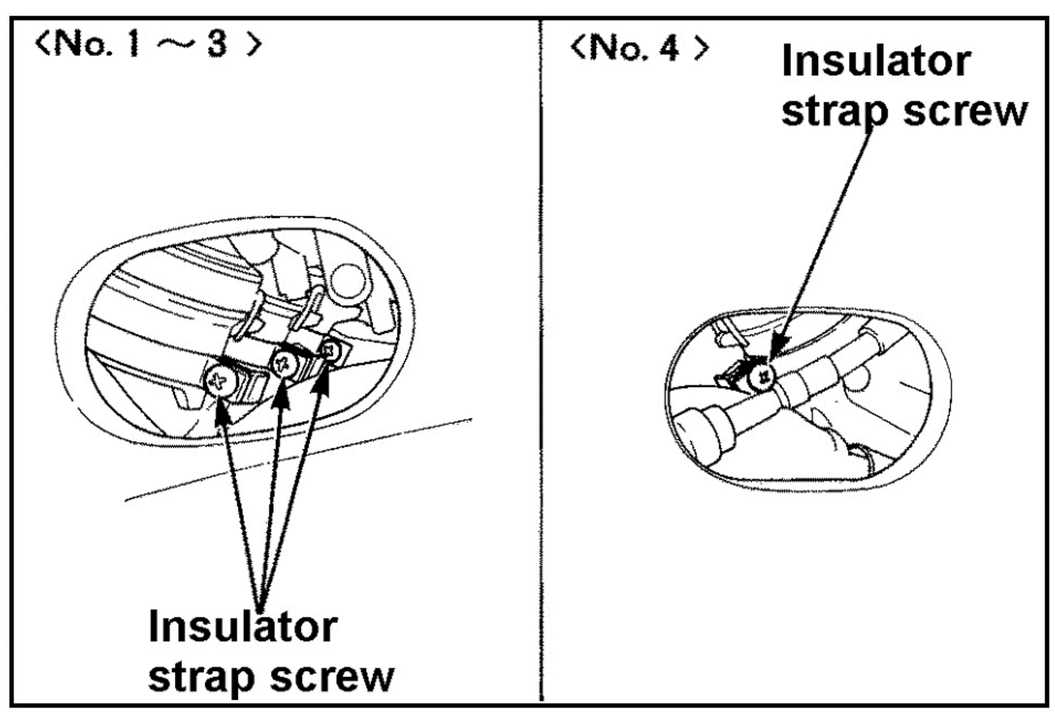
Carburettor Installation

Connect the choke cable and throttle cables.



Install carburettors to cylinder heads and secure the insulator straps with screws.
Install the air filter case (24-23).
Install the fuel tank (24-21).
After installation, adjust the following items:

- Pilot screw adjustment (24-35)
- Throttle grip free play (2-16)
- Carburettor synchronization (24-36)
- Idling speed (2-10)



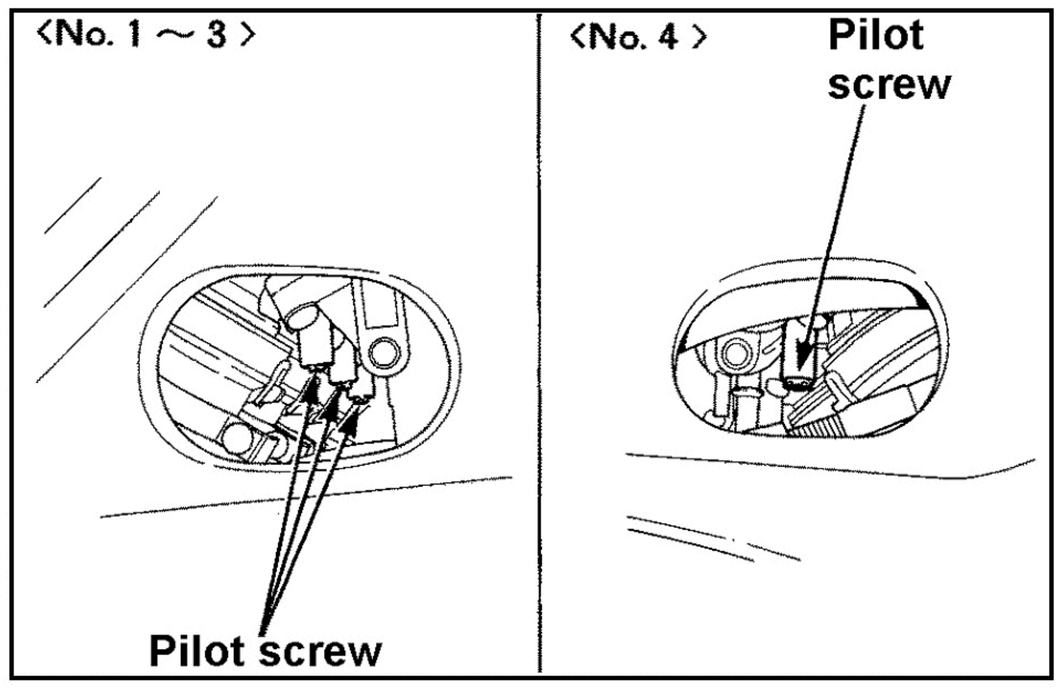
Pilot screw adjustment

Remove lower cowls.
By using the following tool, wind the pilot screw to the end and wind back as recorded when disassembled.

Special tool: Pilot screw wrench: 07908-4220201

If the pilot screw or the body was replaced, wind back to the standard setting.

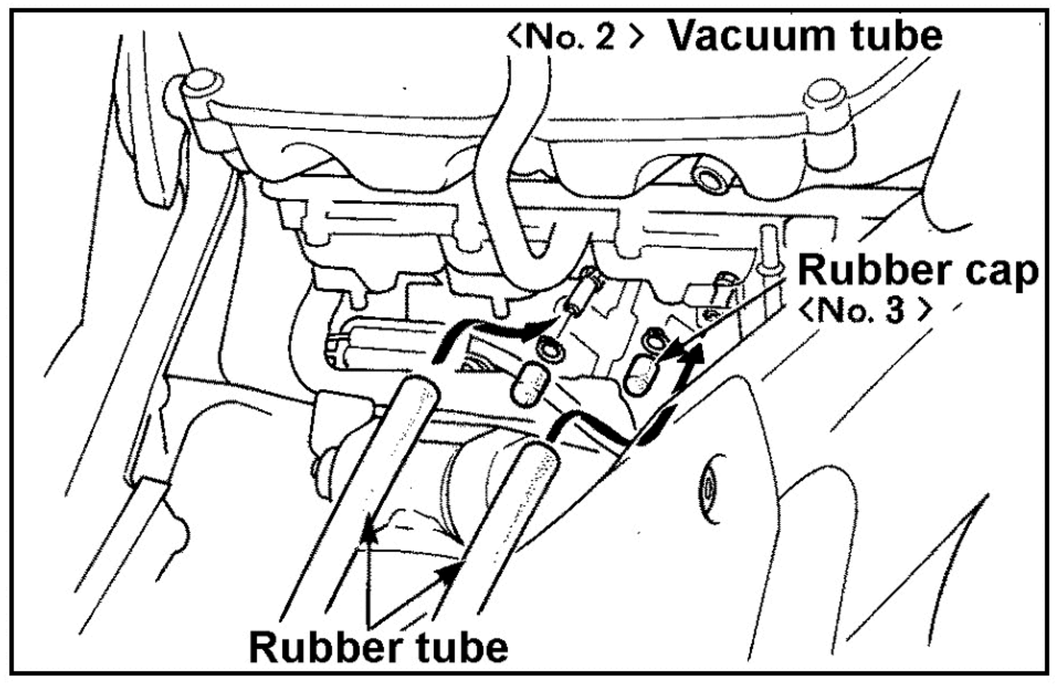
Standard setting: 1 – ¾ winds.



> Do not overtighten the pilot screw or it may damage the seat surface.

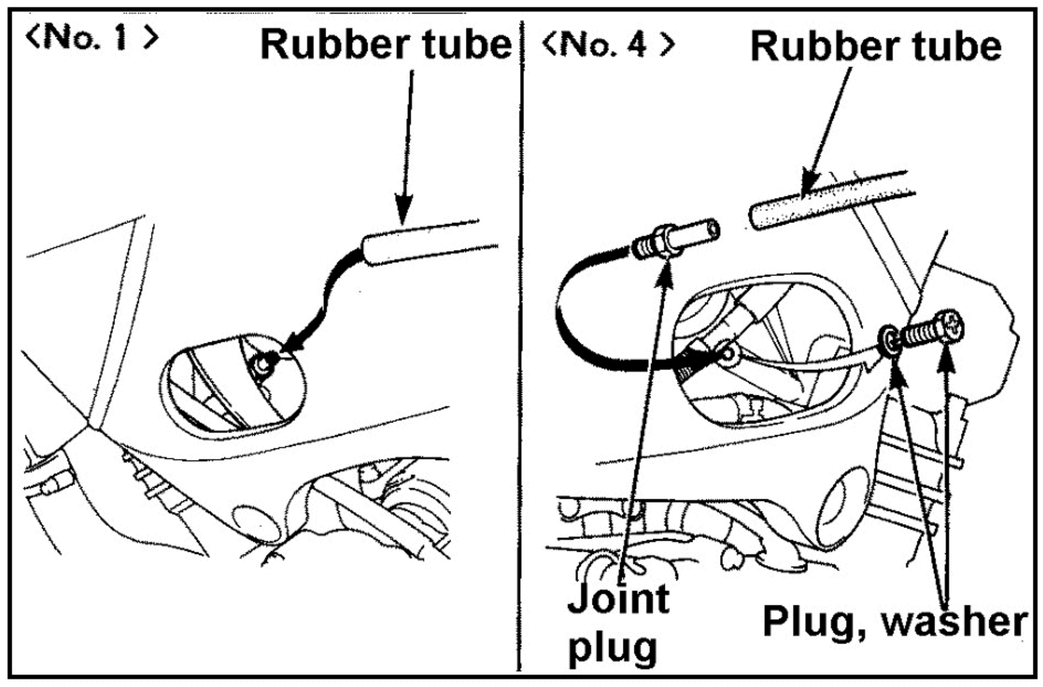
Carburettor synchronization

> Adjust the synchronization after warming up the engine.



Apply vacuum to the auto cock (4-19).
Remove the fuel tank (24-22).
Remove rubber caps from #2 and #3 cylinder head intake parts and directly connects the rubber tubes of a vacuum gauge.

Disconnect the vacuum tube from #1 cylinder head intake port and directly connect the rubber tube of a vacuum gauge.
Remove the plug and the washer from #4 cylinder head intake port and connect a genuine joint plug (part #16214-MBO-000).
Joint Plug: Genuine Honda 16214-MBO-000
Connect the rubber tube of the vacuum tube to the adapter.



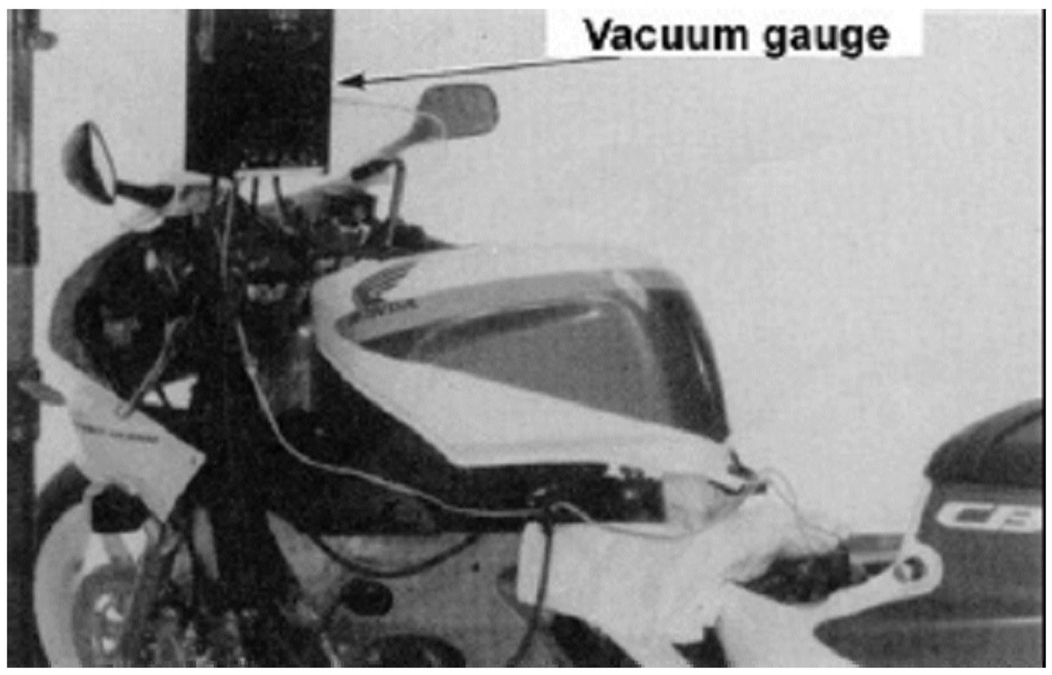
Start the engine and set it to the standard idling rpm.

Idling rpm: 1500 ± 100rpm

Measure the difference in vacuum between each cylinder.

Standard vacuum difference: 40mmHg

Measuring Tool:
Vacuum gauge: 07404-0020000

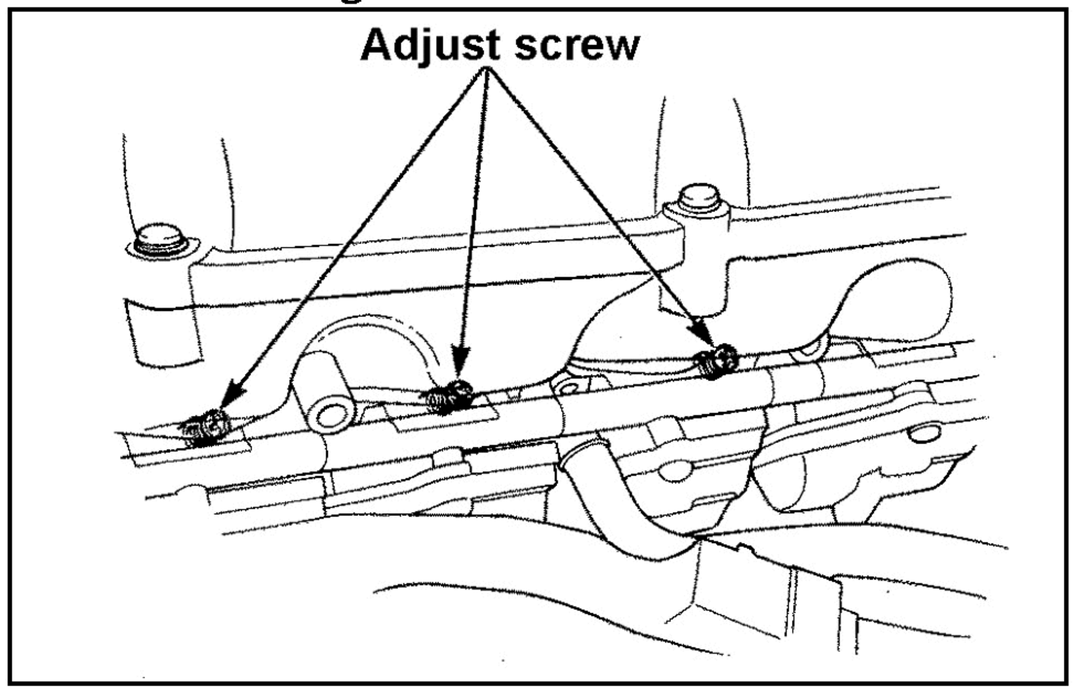


If the vacuum difference is above the standard, adjust in the following manner:

1) Confirm all pilot screws are rewound to the standard or recorded winds.
2) Wing adjust screws to adjust the synchronization.

Use #3 carburettor as a standard.

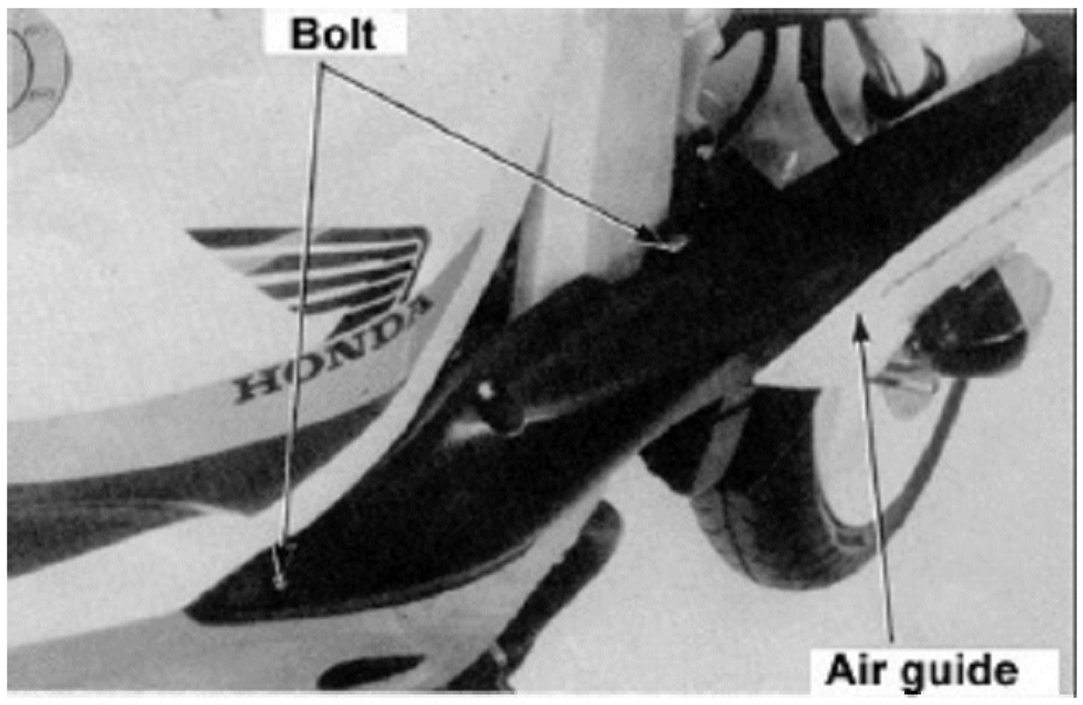
Re-check the synchronization and adjust the idling (24-35).
Install all parts by following the removal procedure in reverse order.



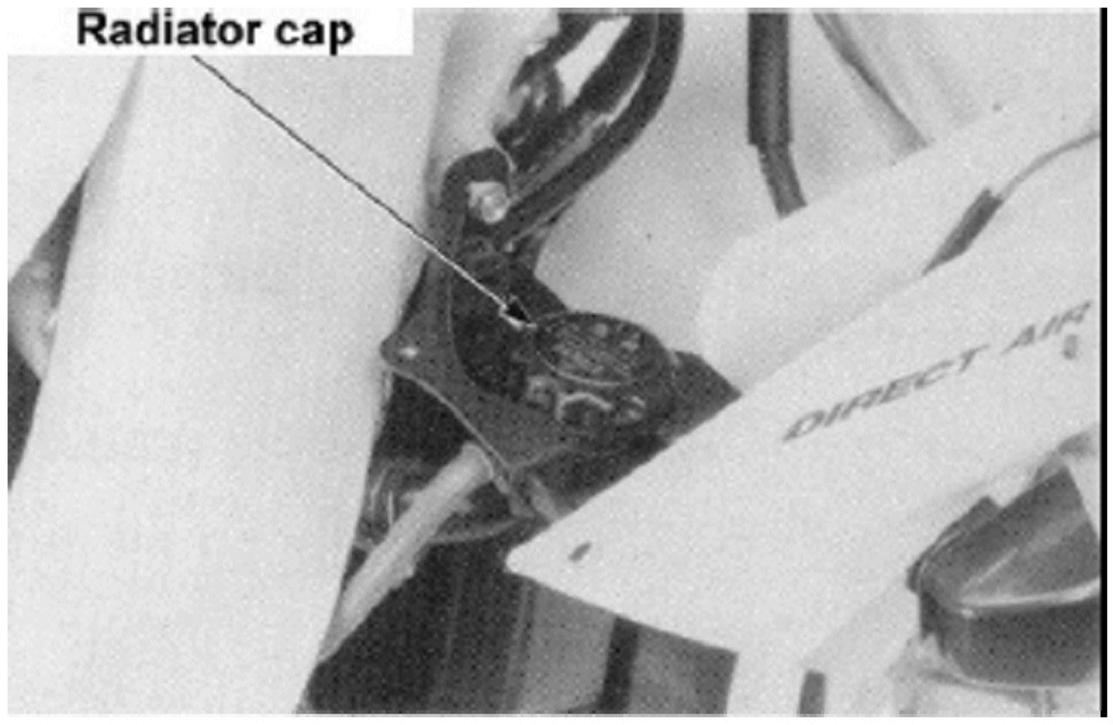
Cooling System

Thermostat removal

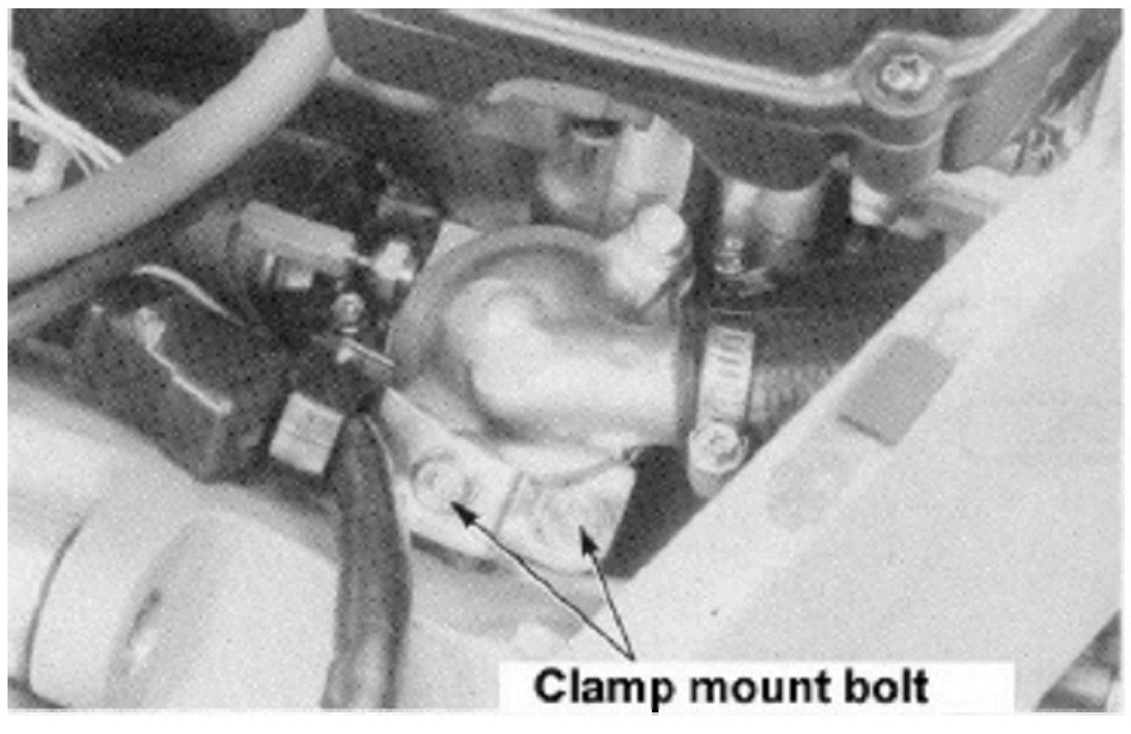
Remove lower cowls (24-59).
Drain radiator coolant by unscrewing the drain bolt.
Unscrew two bolts to remove the right air guide.



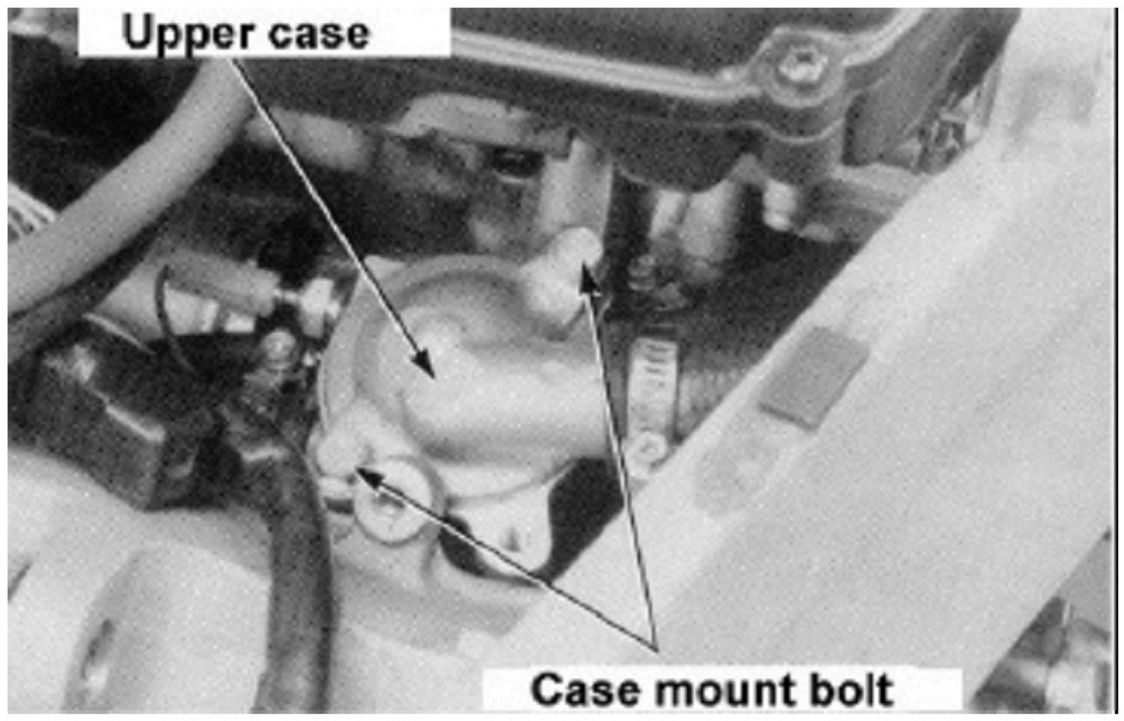
Remove the radiator cap to drain coolant (5-3).



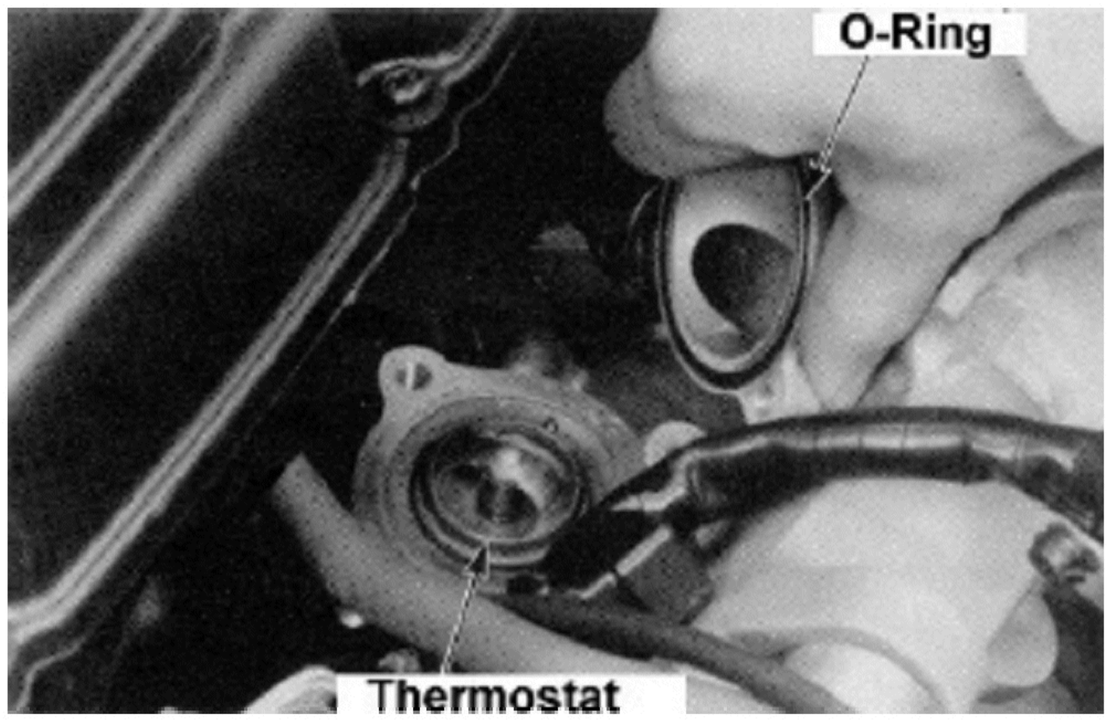
Unscrew two wire harness clamp mount bolts.



Unscrew two mount bolts to remove the thermostat upper case.



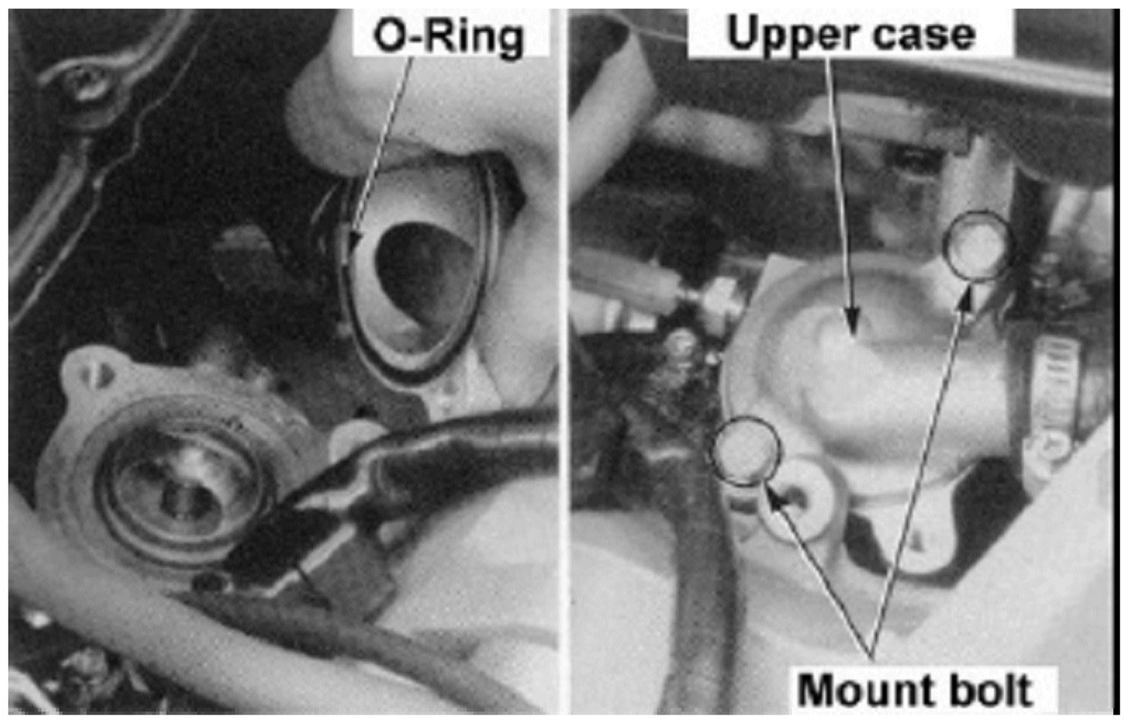
Remove the thermostat and the O-Ring.



Thermostat Installation

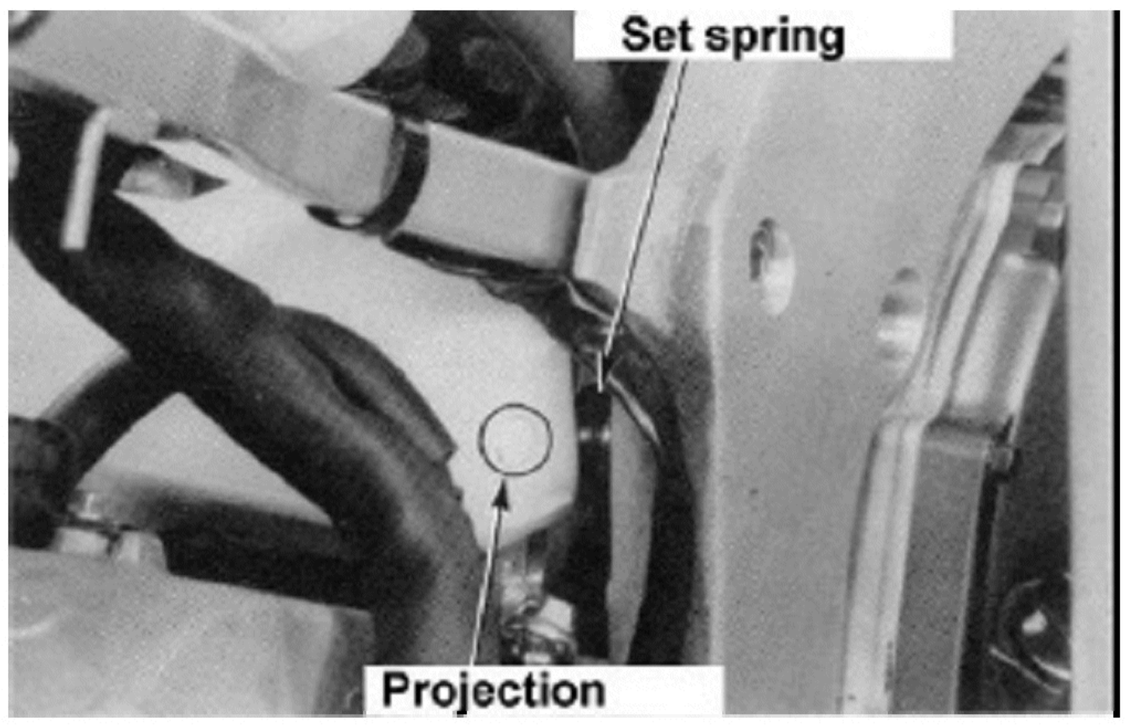
Install the new O-ring to the thermostat upper case.
Follow the removal procedure in reverse order for installation.

Torque:
Thermostat upper case: 1.0 ~ 1.4kg-m

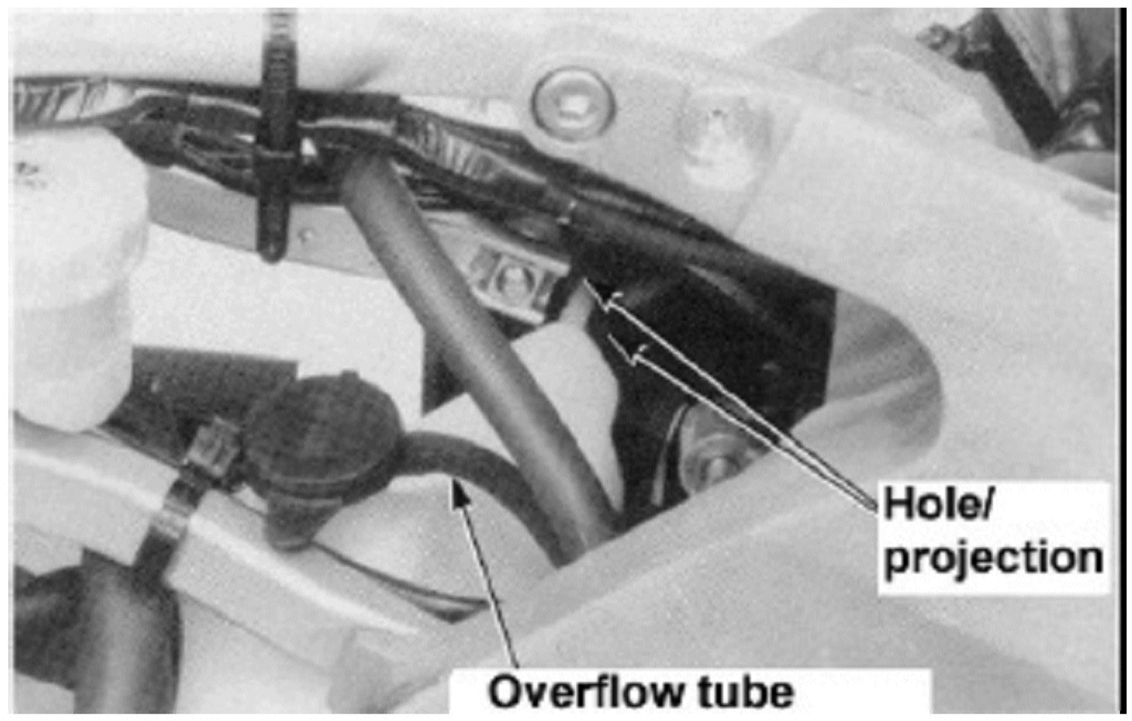


Reservoir removal

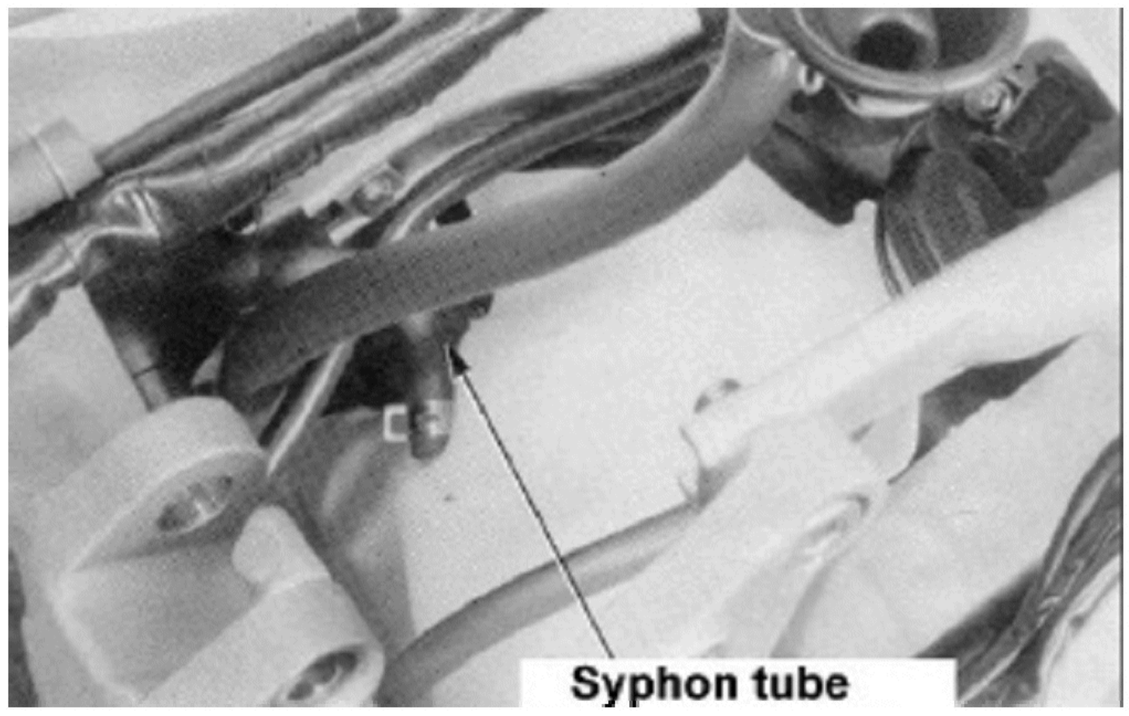
Remove the rear cushion (24-50).
Push the reservoir set spring and release the projection of the reservoir from the hole on the spring.
Pull the reservoir back to remove the set spring.



Release the projection on the left side of the reservoir from the hole on the frame.
Disconnect the overflow tube.



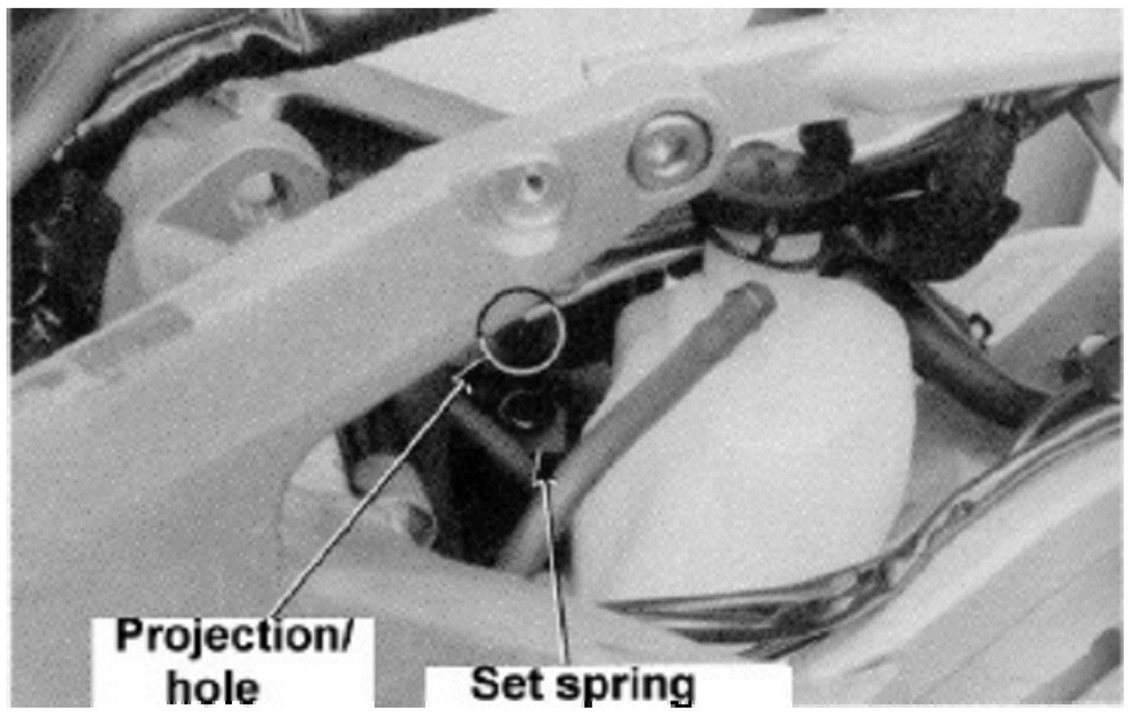
Disconnect the siphon tube.
Remove the reservoir.



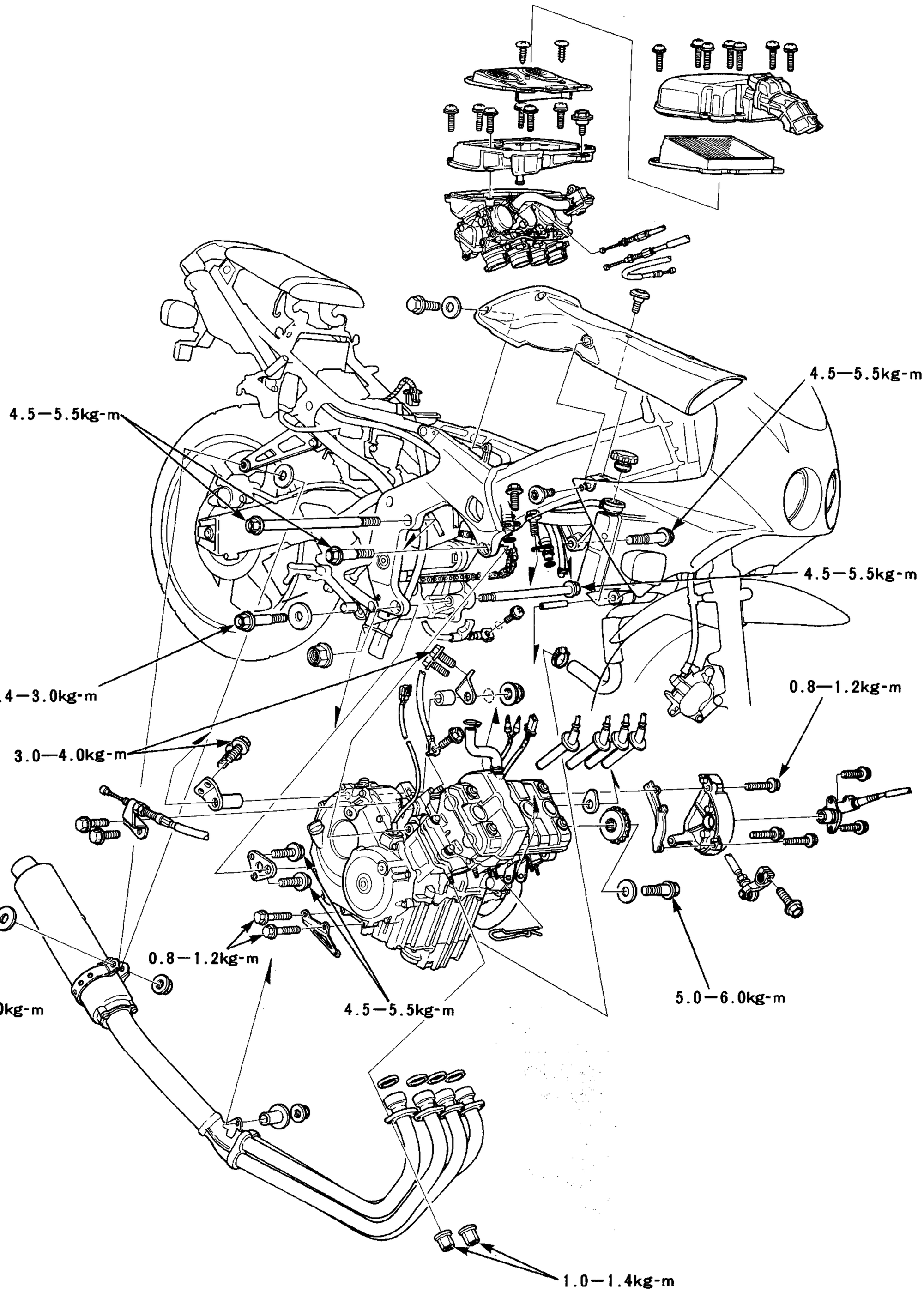
Reservoir Installation

Follow the removal procedure in reverse order for installation.

- Set the hole on the reservoir set spring to the projection on the frame.
- Refer to (24-8) for routing tubes.

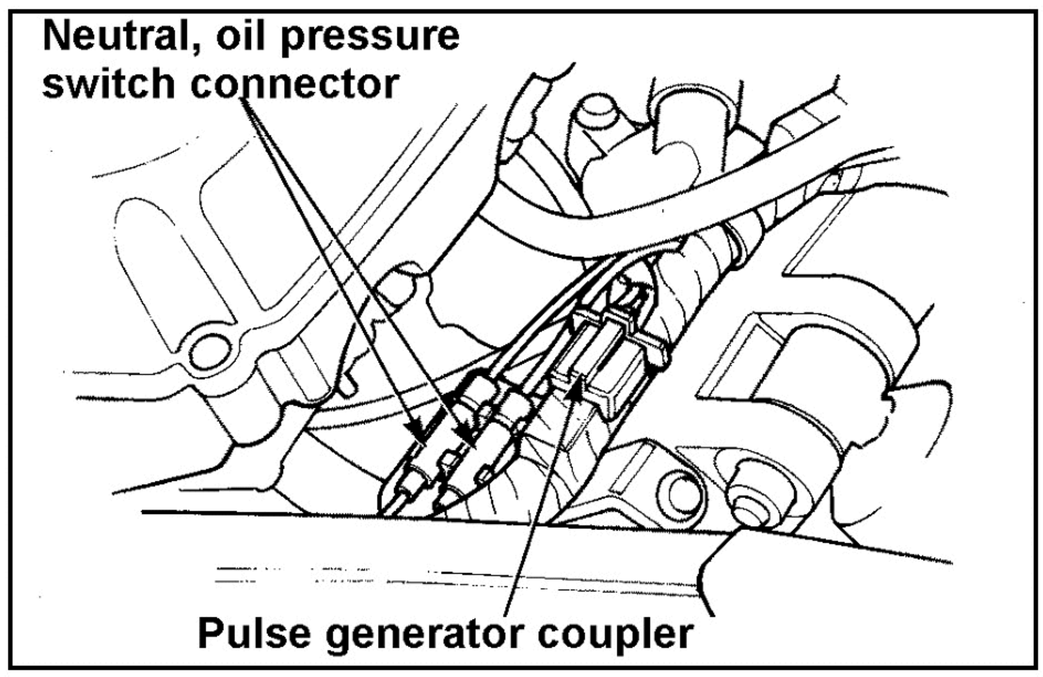


Engine Mounting / Dismounting



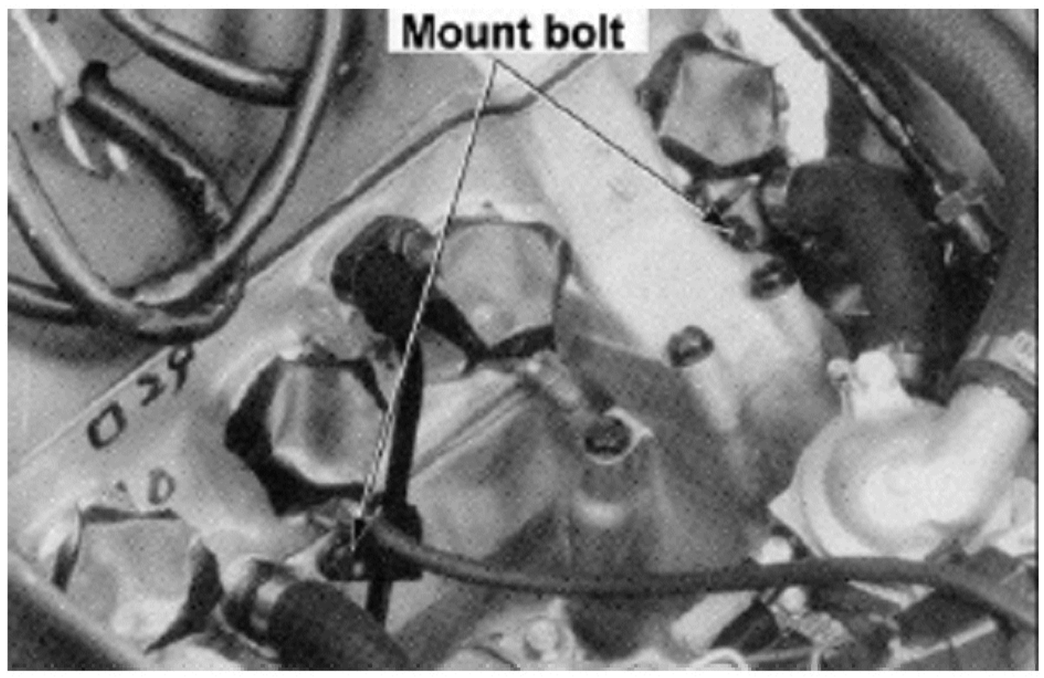
Engine Dismounting

Drain engine oil (2-16).
Drain radiator coolant (24-37).
Remove the fuel tank (24-21).
Disconnect the pulse generator coupler.
Disconnect the neutral switch and the oil pressure switch connector.
Remove carburettors (24-24).

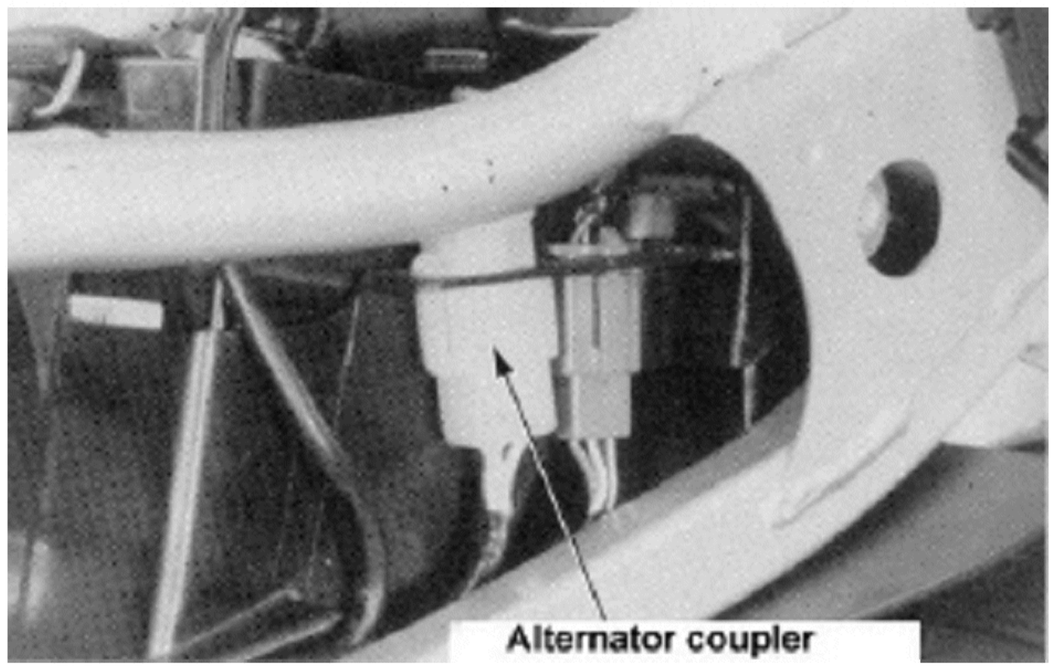


> Seal the intake manifold with adhesive tape.

Remove two water hose mount bolts and disconnect the water hose from cylinders.
Disconnect the earth cable and the terminal cable (6-2).

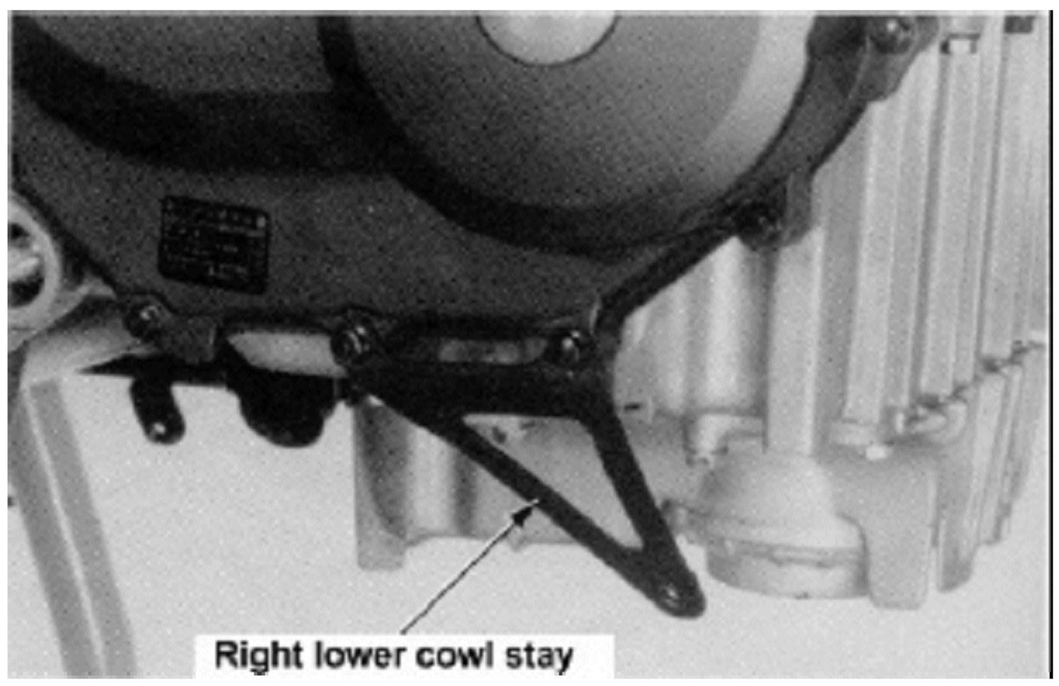


Disconnect the alternator coupler.
Disconnect the clutch cable (6-3).
Disconnect the exhaust pipe (24-60).

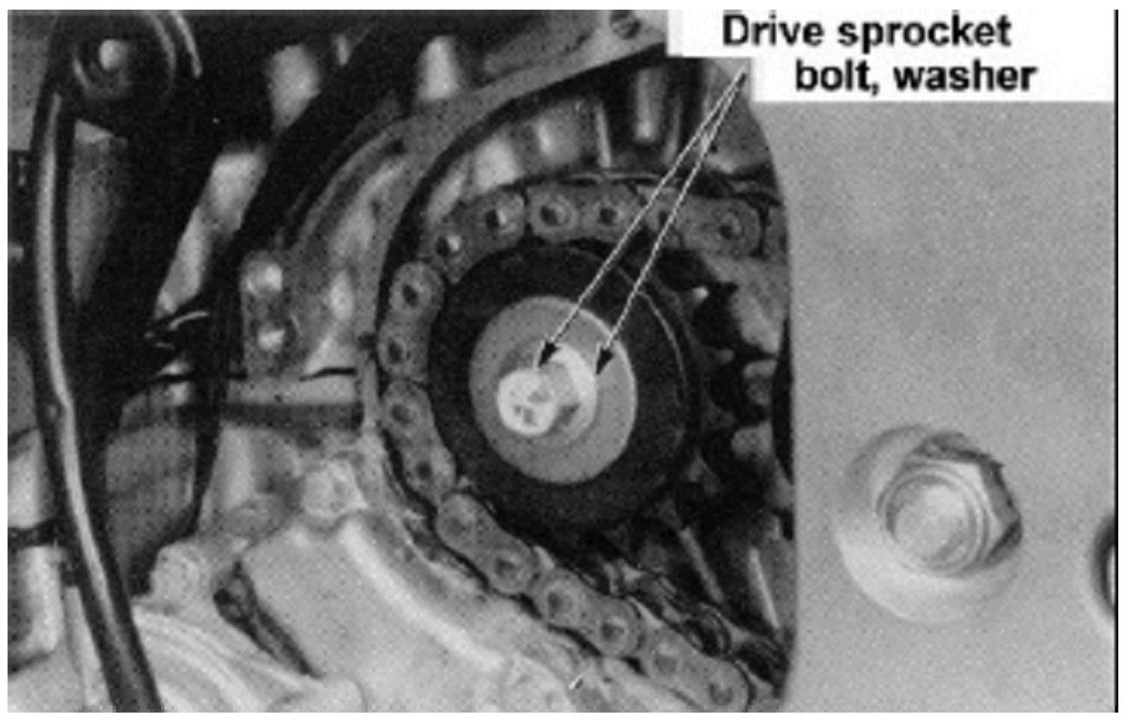


Remove the right lower cowl stay.

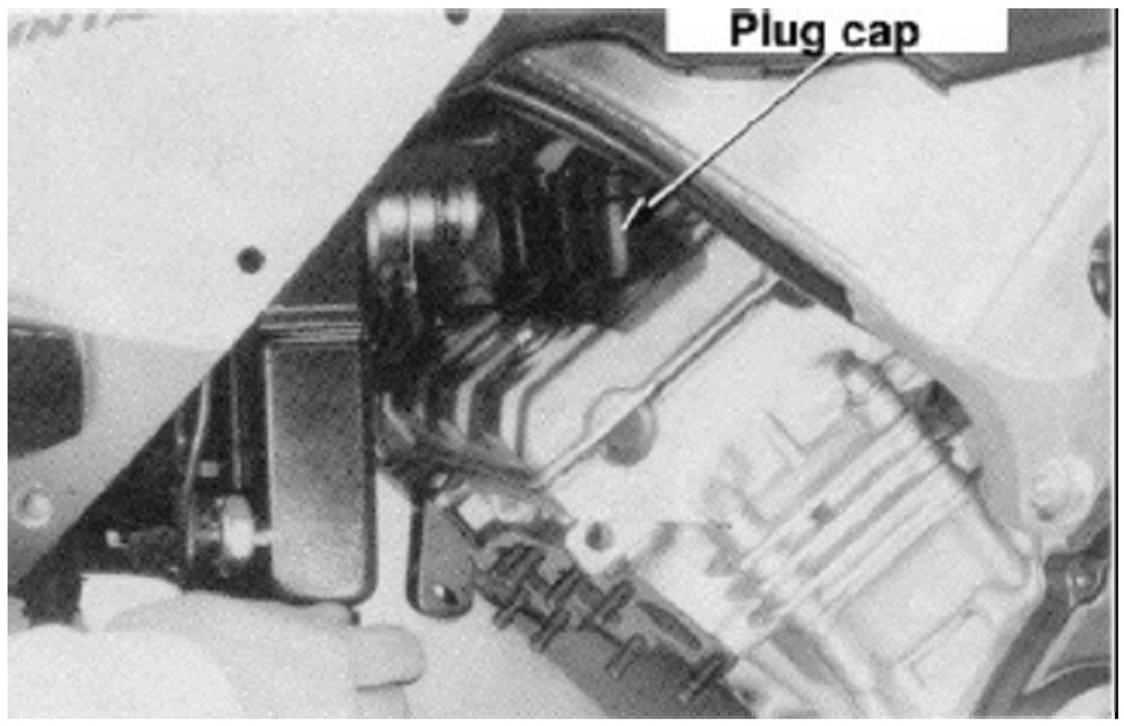
> When dismounting the engine without removing the right lower cowl stay, do not bend the cowl stay.



Unscrew the bolt to pull the gearshift pedal arm out from the gear shift spindle.
Remove the drive sprocket cover (6-3).
Loosen the drive chain and unscrew the bolt to remove the drive sprocket and the washer.
Disconnect the radiator hose and the bypass tube (6-3).



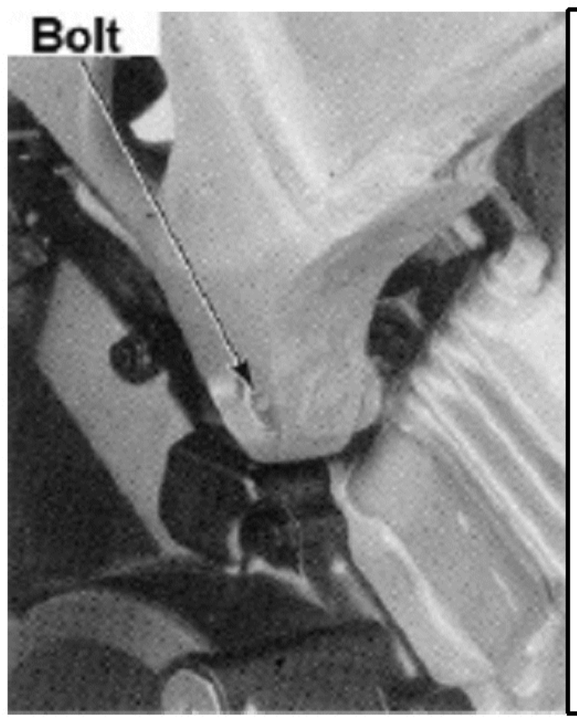
Remove the radiator set pin. Swing the radiator forward and fix it to the frame.
Remove four plug caps.

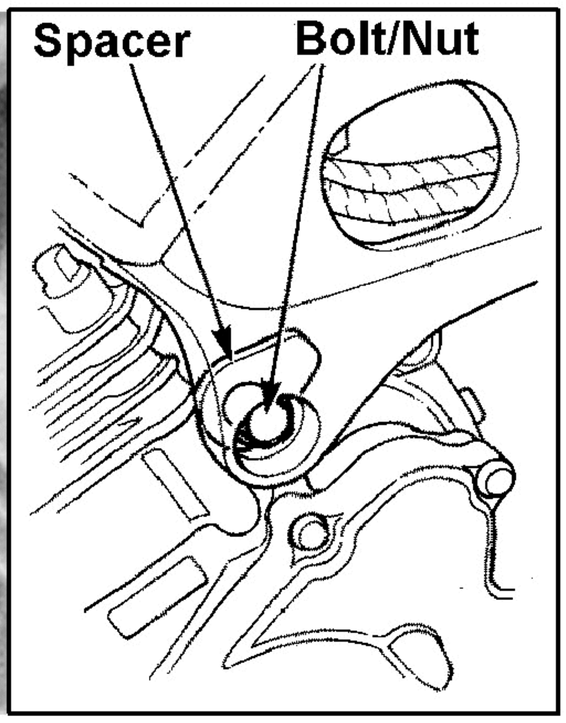


Unscrew the front engine mount bolt from the right side.
Remove the front engine mount bolt spacer and the nut from the left side.

Jack up the engine in advance.

Unscrew the rear upper engine mount bolt and the rear lower engine mount bolt to dismount the engine from the frame.

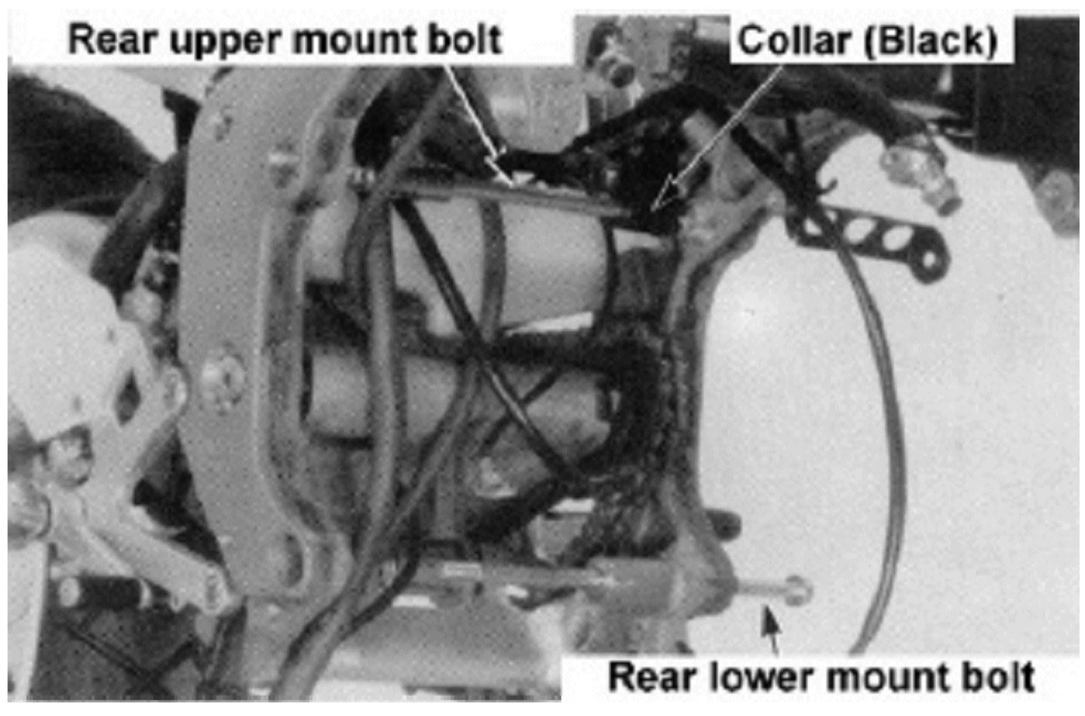




Engine Mounting

Follow the dismounting procedure in reverse order.

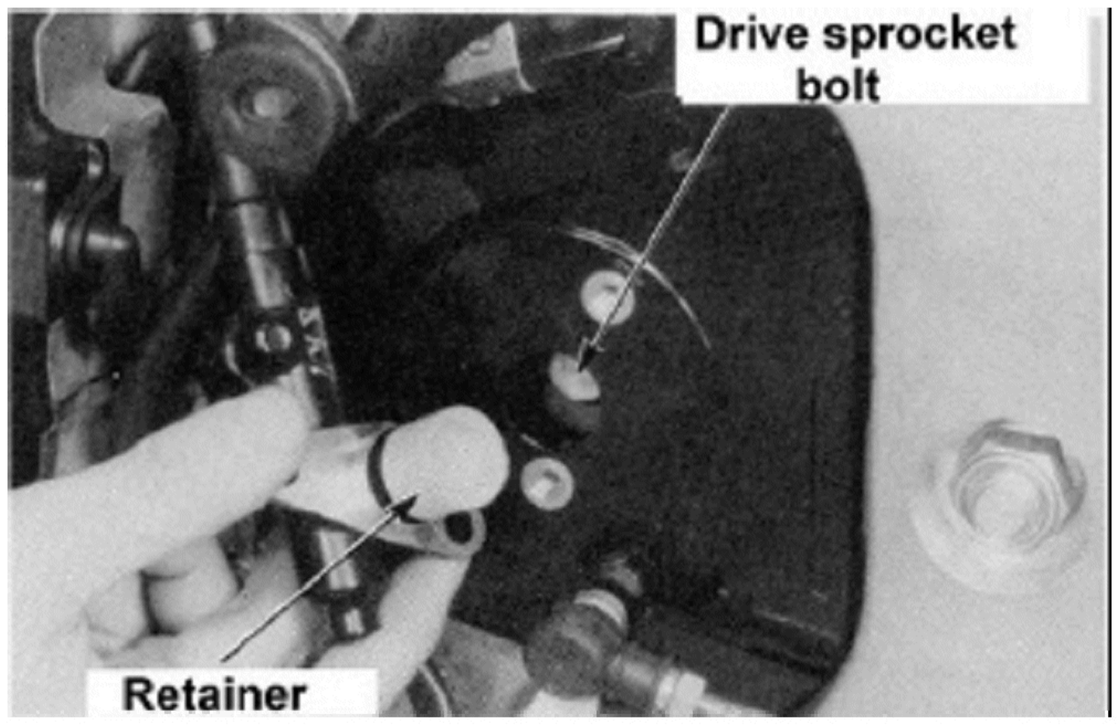
- Install the rear upper engine mount bolt from the right side.
- Install the rear lower engine mount bolt from the left side.



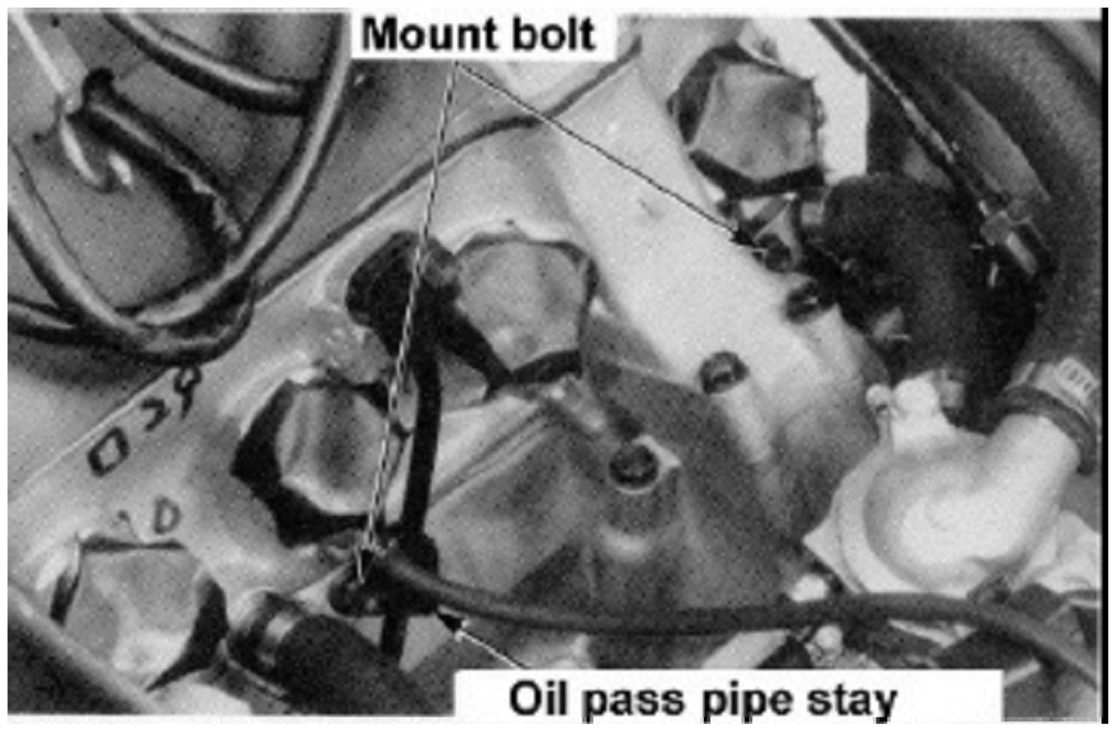
Torque:

Front engine mount bolt	4.5 – 5.5kg-m
Rear upper engine mount bolt	4.5 – 5.5kg-m
Rear lower engine mount bolt	4.5 – 5.5kg-m
Gear shift arm bolt	1.4 – 1.8kg-m
Drive sprocket bolt	5.0 – 6.0kg-m
Lower cowl stay bolt	0.8 – 1.2kg-m

Install the speedometer gearbox retainer by setting it to the drive sprocket bolt.



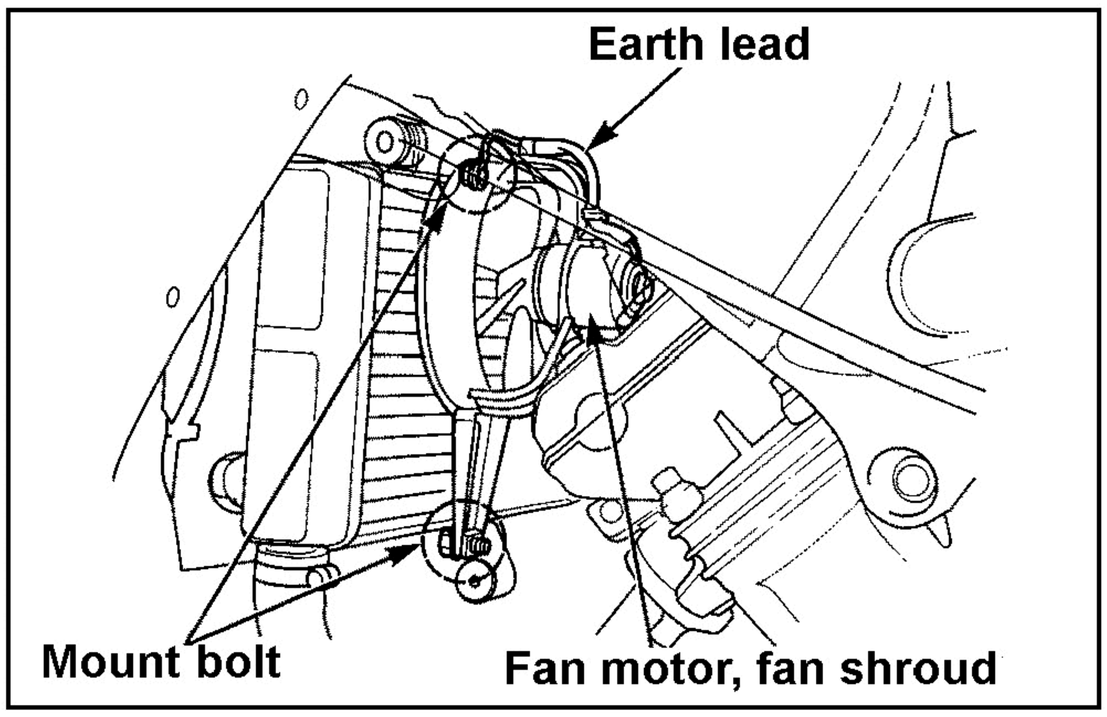
Install the new O-Ring to the hose joint and connect the water hose to cylinders.
Screw the mount bolt for the oil pass pipe stay.



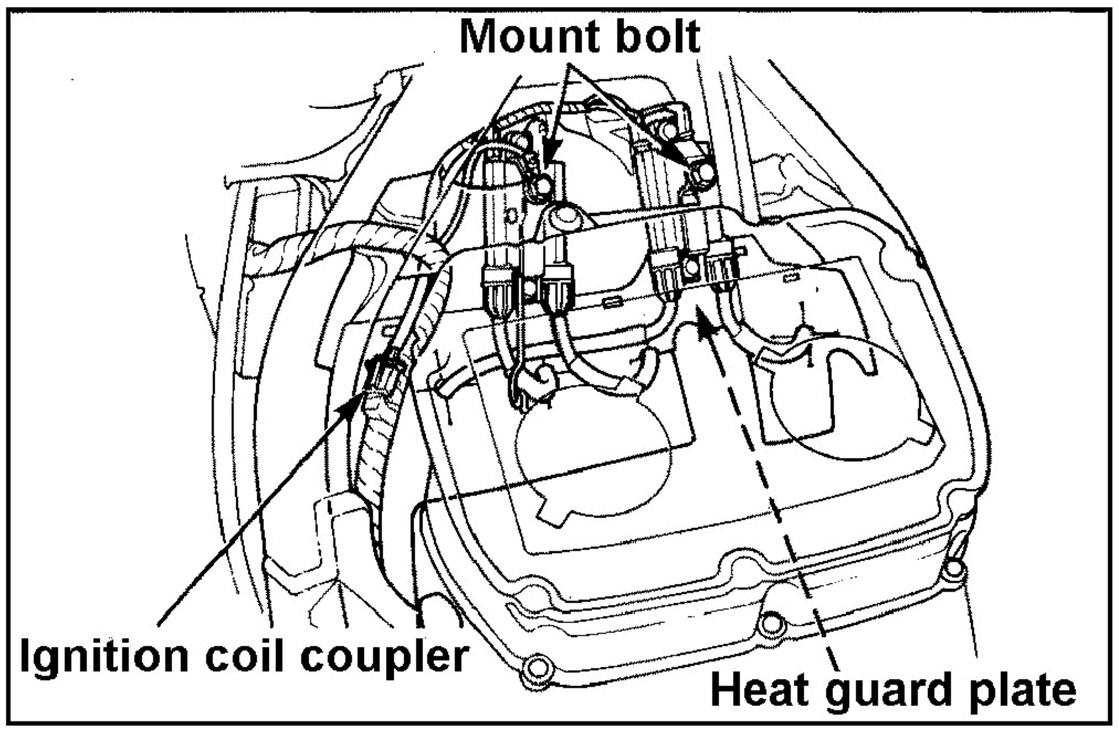
Cylinder Head & Valve

Cylinder head cover removal / installation

Remove both right and left lower cowls (24-59).
Remove both right and left lower guides (24-36).
Remove a radiator set pin and swing the radiator to the front.
Unscrew two mount bolts to remove the fan shroud and the fan motor in whole Assy.
Remove plug caps.

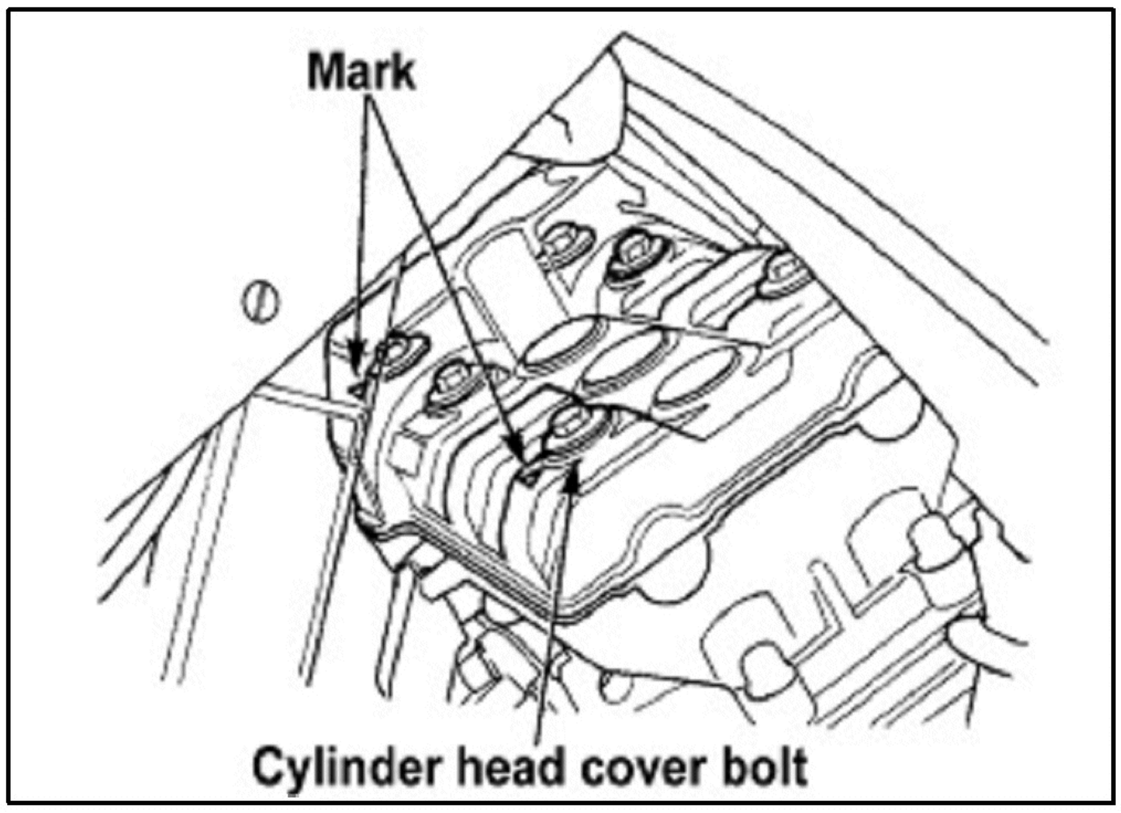


Remove the fuel tank (24-21).
Remove the air filter case cover (24-22).
Disconnect the ignition coil mount bolt to remove the ignition coil and the heat guard plate in whole Assy to the bottom.



Unscrew bolts to remove the cylinder head cover.
Follow the removal procedure in reverse order.

- Note there are “UP” marks on each washer.
- Tighten the top fan shroud mount bolt together with the earth lead.
- Screw the bolts at “▼” marks (two) on the head cover first, then the rest.
- When dismounting cylinder head / cylinder block, install the oil orifice so as to have smaller hole at the bottom.



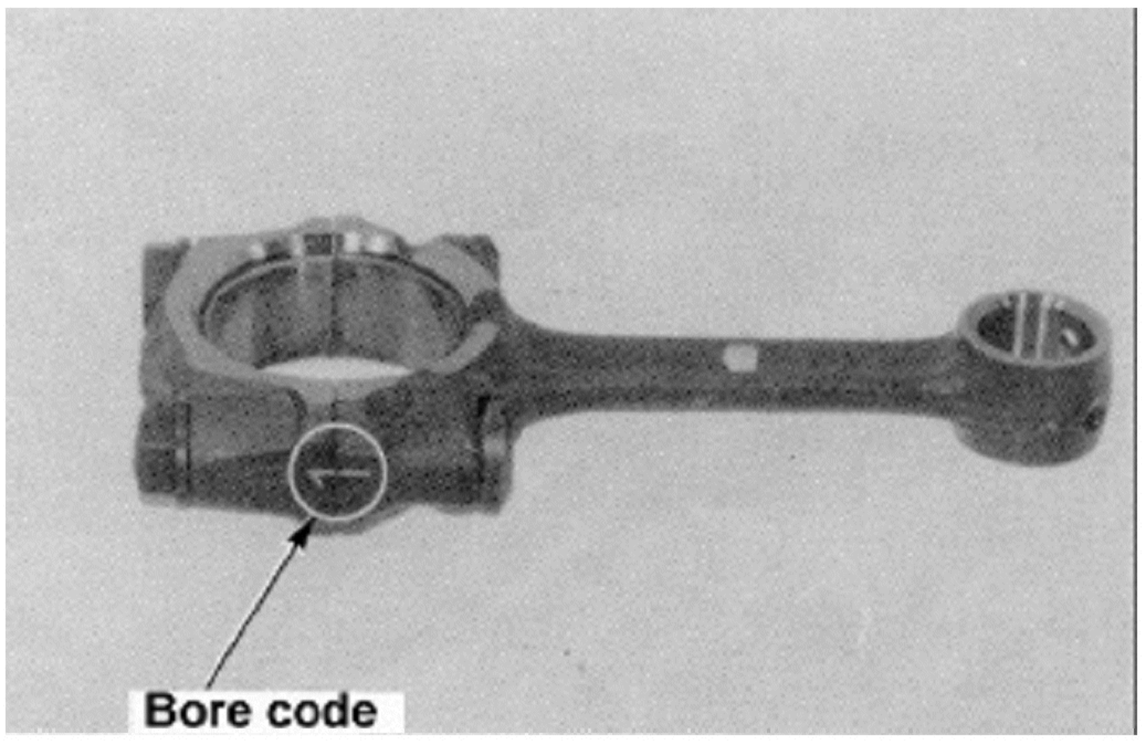
Cylinder head cover bolt

Torque:
Cylinder head mount bolt: 0.8 ~ 1.2kg-m

Cylinder, Piston and Crankshaft Bearing inspection and selection

- Crank pin bearing

Avoid the oil hole and place a plasticine gauge.
Install connecting rods and bearing caps to each crankpin.
Apply oil to threads and seats and screw nuts (9-6).
Torque: 1.6 ~ 2.0kg-m

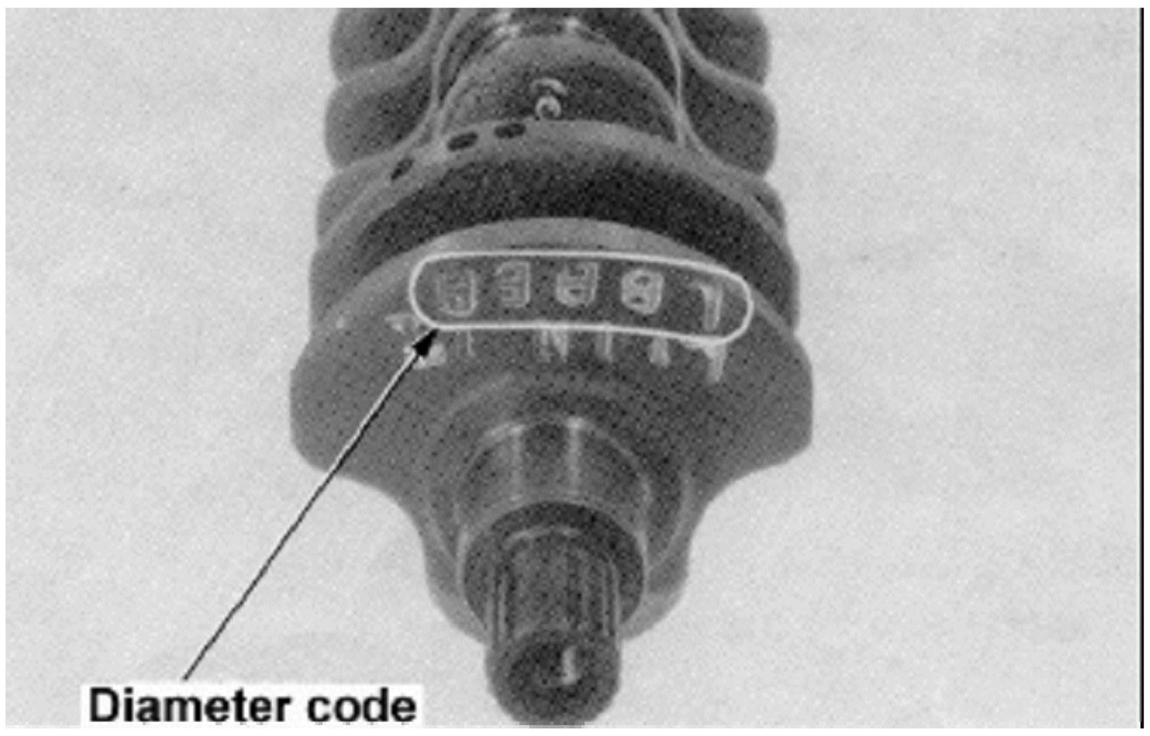


Do not rotate the crankshaft or the connecting rod while measuring.

Remove the bearing cap and select the plasticine size.

Oil clearance service limit:
0.05mm or above → replace.

Replace the bearing if the oil clearance is above the service limit (9-7).



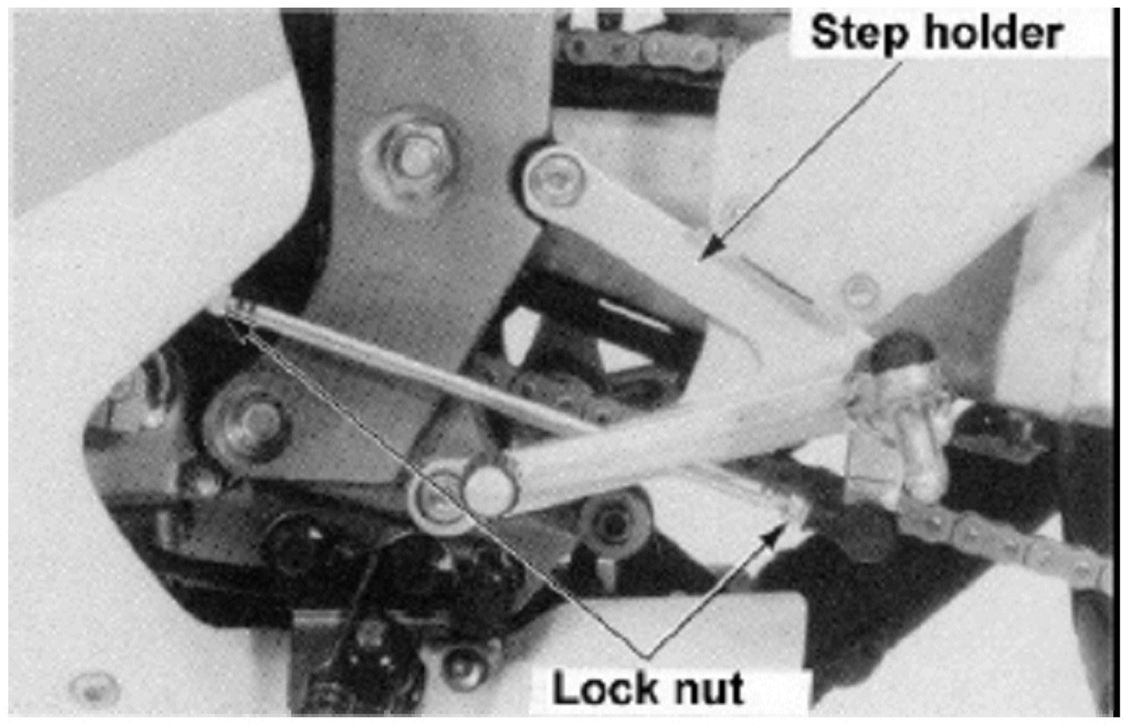
Find out the colour code of the bearing from the code numbers on the crankpin and the connecting rod.

			Connecting rod bore code		
Bearing metal thickness	A (Blue) B (Black) C (Brown) D (Green) E (Yellow)	Thick ↕ Thin	30.000 – 30.006	30.006 – 30.012	30.012 – 30.018
			1	2	3
Crankpin diameter code	27.500 – 27.494	A	E (Yellow)	D (Green)	C (Brown)
	27.494 – 27.488	B	D (Green)	C (Brown)	B (Black)
	27.488 – 27.482	C	C (Brown)	B (Black)	A (Blue)

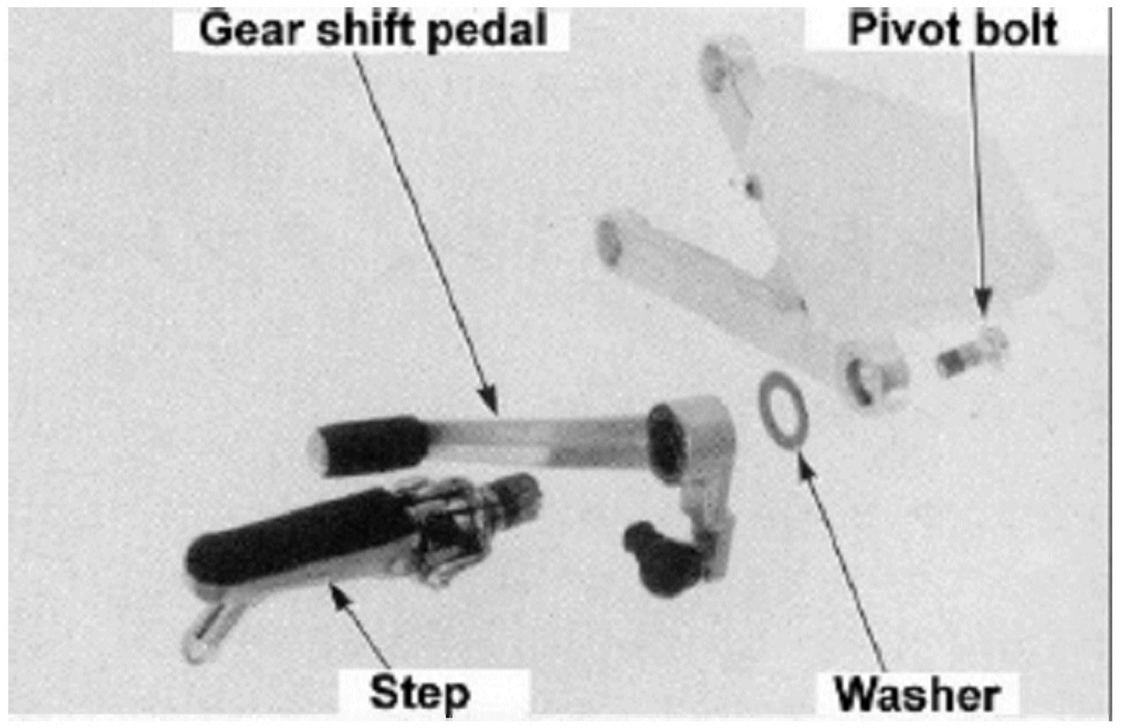
Gear shift Linkage

Gear shift pedal removal

Loosen the lock nut to remove the tie-rod bolt.
Unscrew the left step holder bolt to remove the left step holder.



Unscrew the step pivot bolt to remove the gear shift pedal, step and the thrust washer.



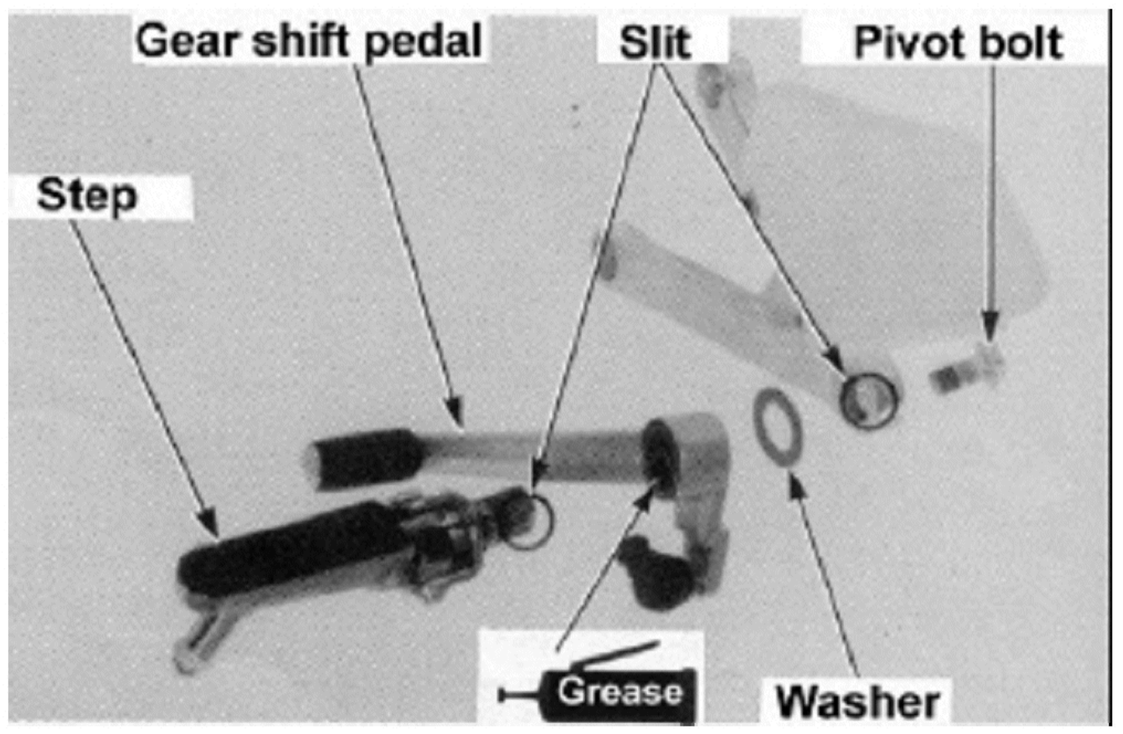
Gear shift pedal installation

If the step pivot bolt was removed, replace the bolt and clean the thread.

Apply grease to the interior surface of the gearshift pedal bush.

Install the pedal and the thrust washer to the step.
Set the step pivot to the slit on the step holder.
Screw the new step pivot bolt.

Torque: 3.5 – 4.5kg-m



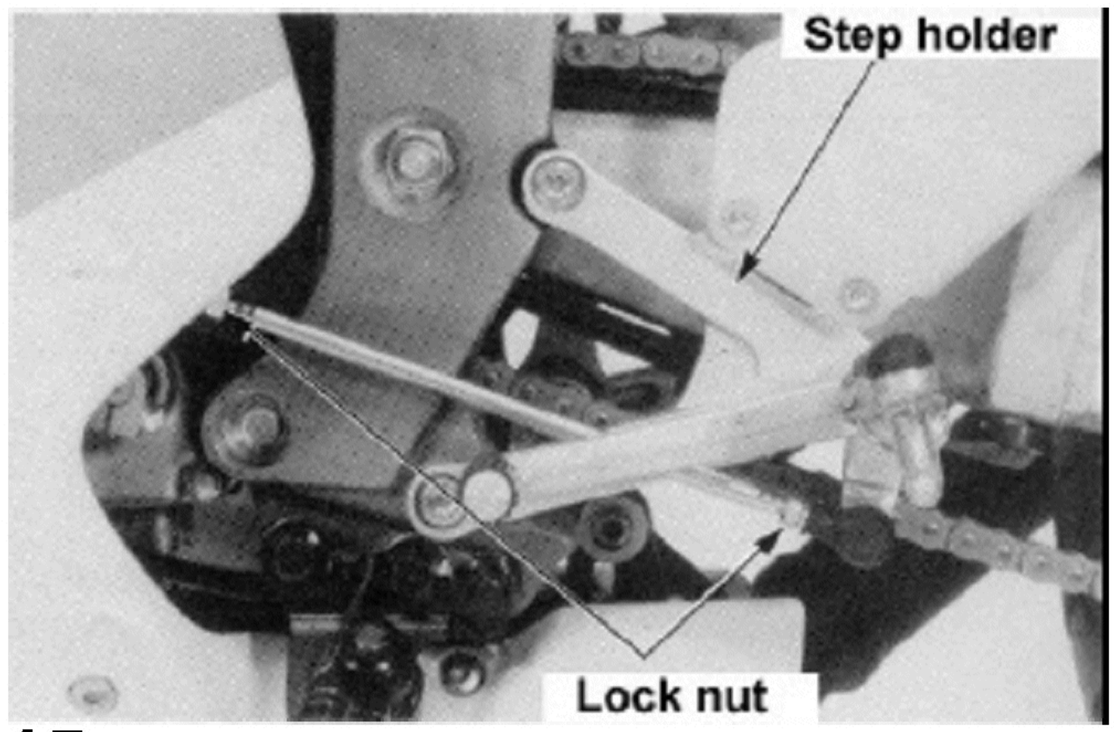
Install the left step holder and screw the holder bolt.

Torque: 2.4 – 3.0kg-m

Install the tie-rod bolt to adjust the height of the gearshift pedal.

Screw the lock nut.

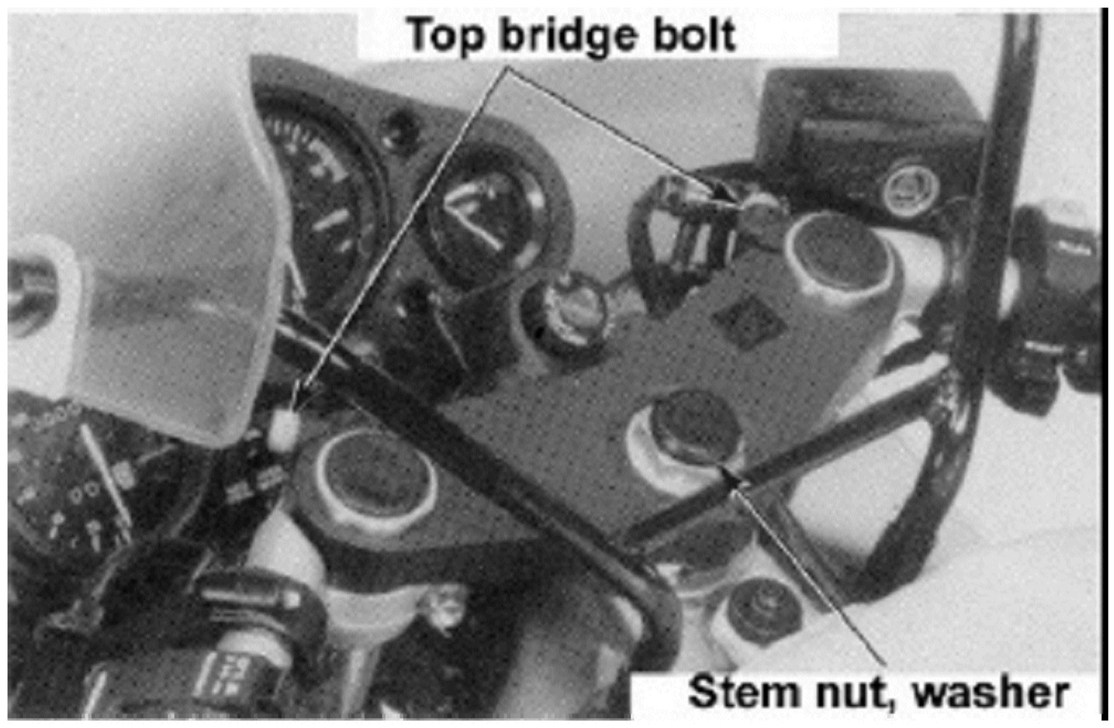
Torque: 0.08 – 0.1kg-m



Front Wheel, Suspension and Steering

Handlebar removal

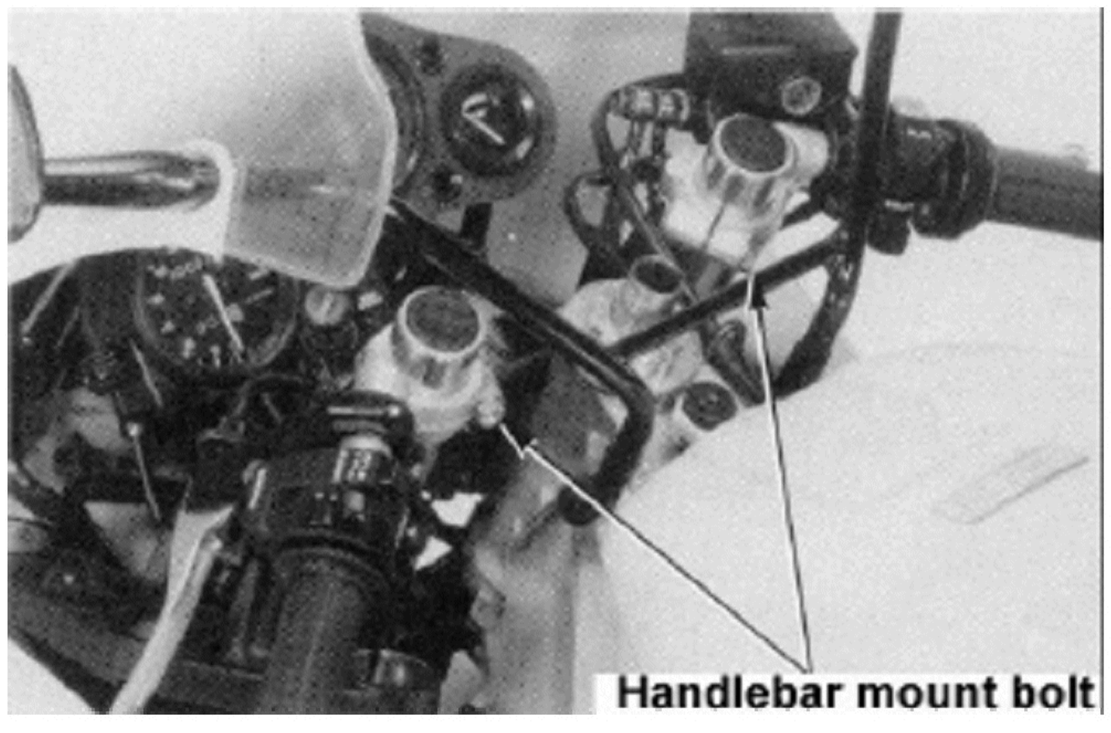
Loosen the right top bridge bolt.
Unscrew the left top bridge bolt.
Remove the steering stem nut and the washer.
Remove the top bridge.



> The ignition switch may be left installed.

Remove the following parts:
- Handlebar switch case
- Throttle grip
- Master cylinder
- Left handlebar lever bracket

Unscrew handlebar mount bolts to remove the handlebar from the fork pipes.



Handlebar Installation

Install the handlebar to the fork pipes.

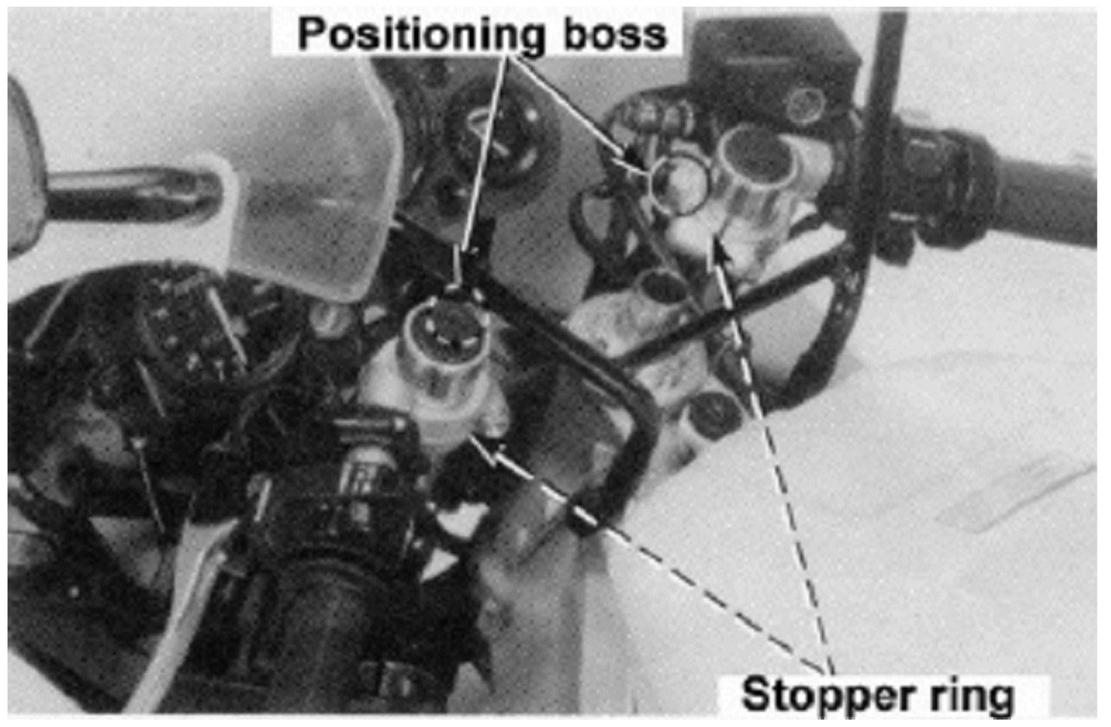
> Press the handlebar to the stopper rings on the fork pipes.

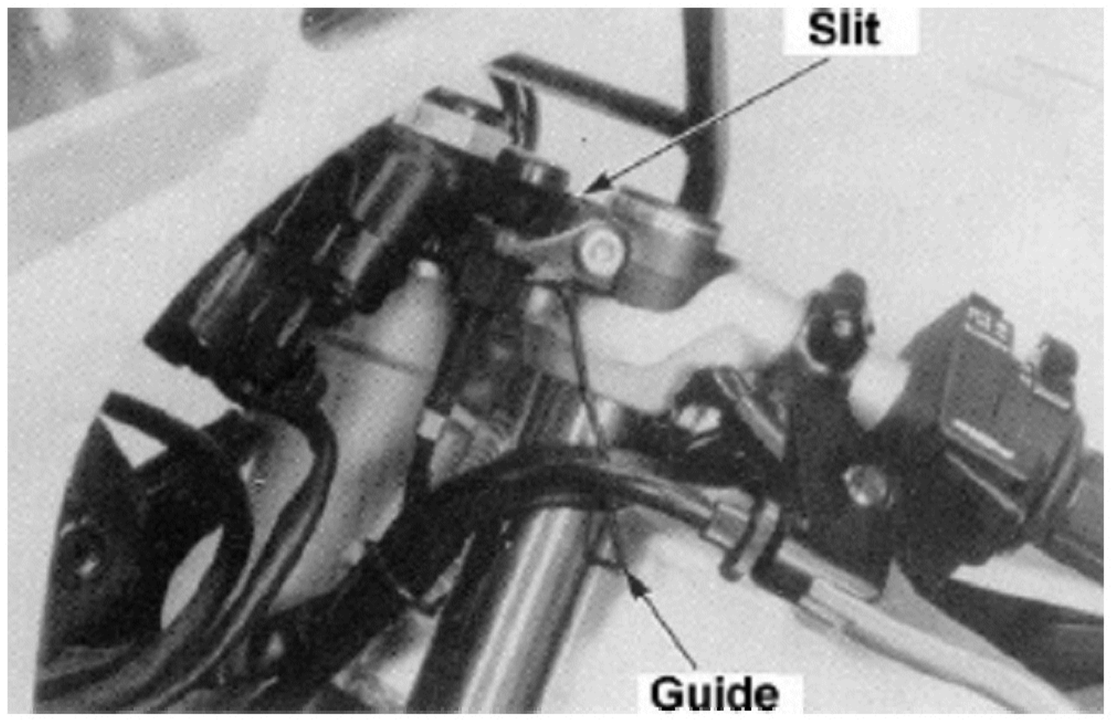
Install removed parts (13-7).
Install the top bridge.

> Set the positioning boss on the handlebar to the slits on the top bridge.

Install the steering stem nut and the washer.
Torque: 9 – 12kg-m
Screw the right top bridge bolt.
Screw the left top bridge bolt together with the choke cable guide.
Torque: 2.0 – 2.5kg-m
Screw the handlebar mount bolts.
Torque: 2.4 – 3.0kg-m

> Refer to (24-6) to route the choke cable.



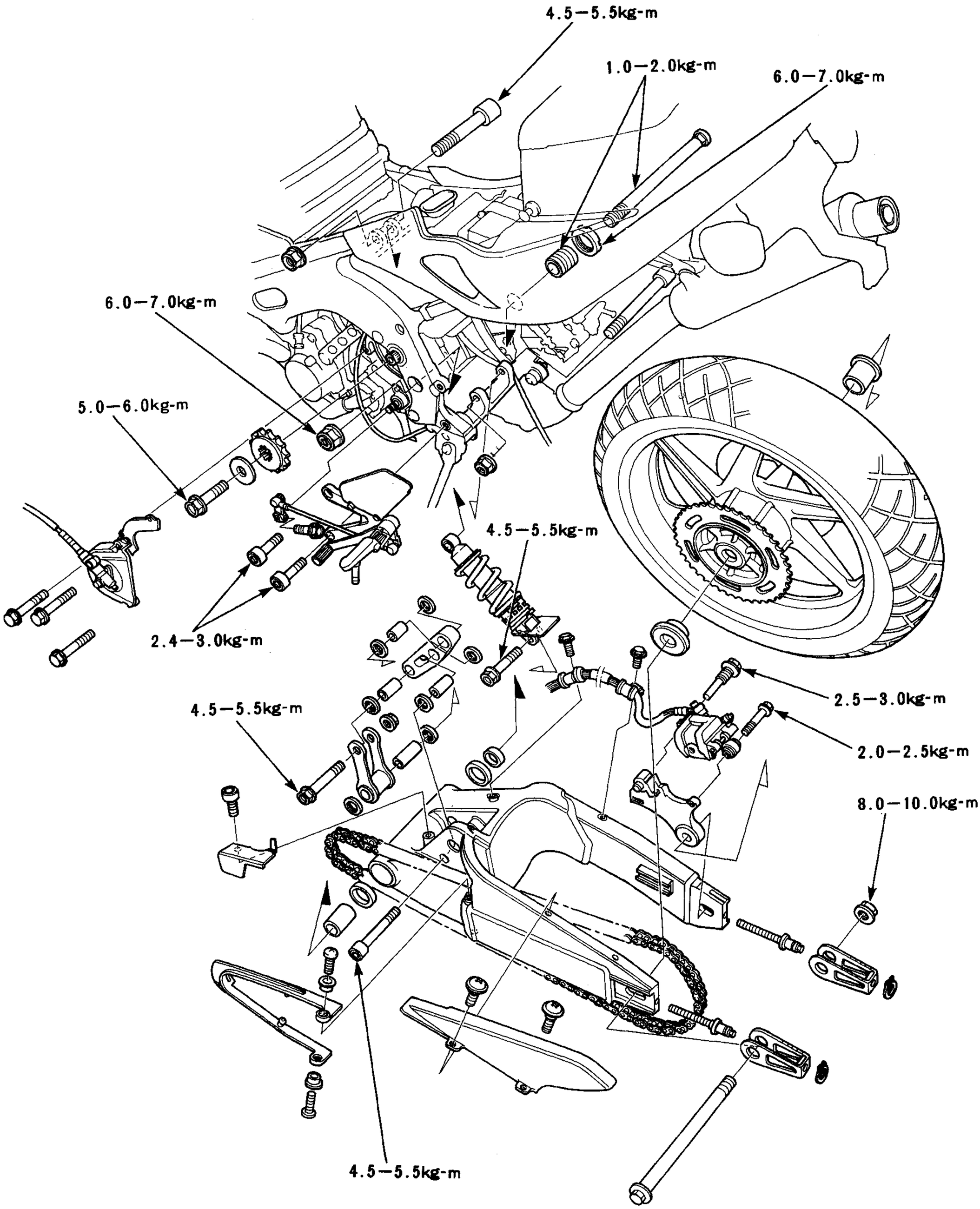


Cushion Spring Installation

Set the cushion spring so as to have its tapered end at the bottom

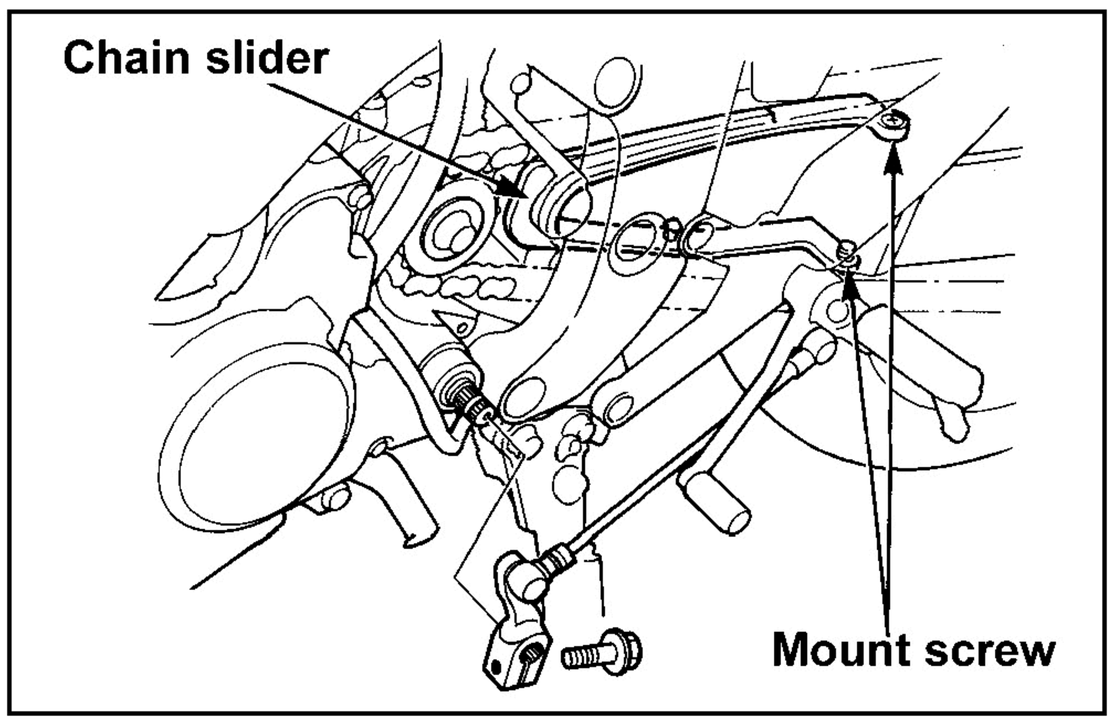
Wipe off all fork oil on the spring before installing.

Rear Wheel and Suspension

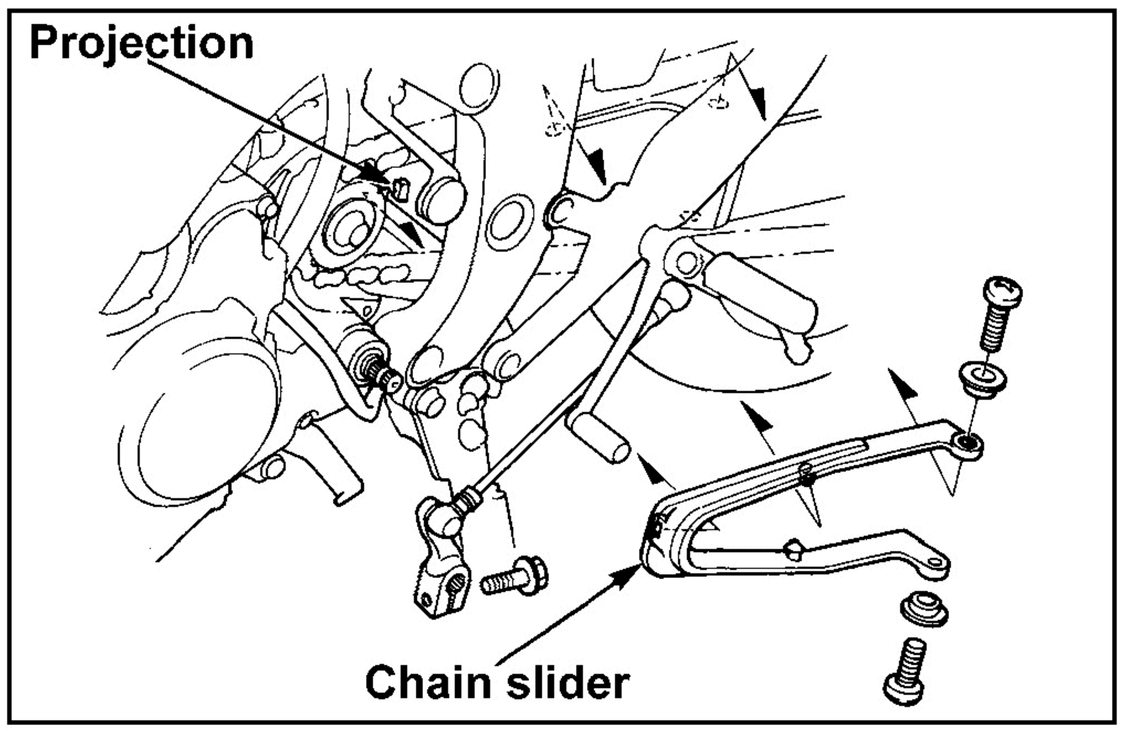


Drive Chain Replacement

Remove lower fairings (24-58).
Remove the drive sprocket cover (6-3).
Unscrew chain slider mount screws.



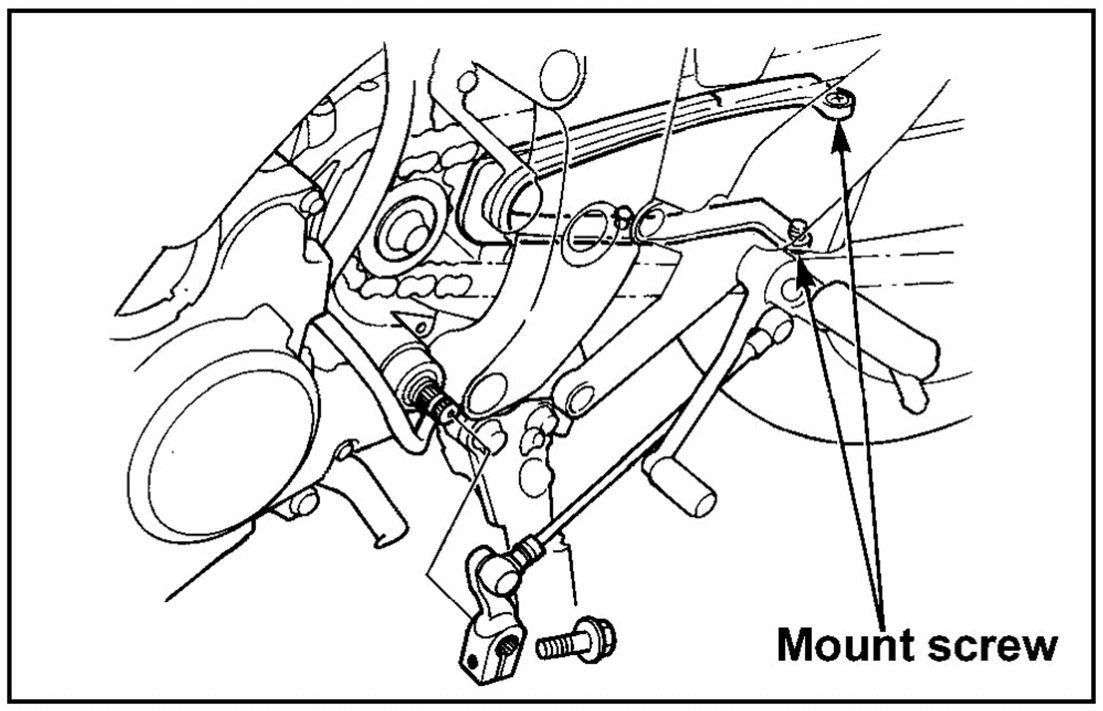
Remove the chain slider from the projection at the front part of the rear fork to replace.



Screw chain slider mount screws.
Install the drive sprocket cover (24-44).
Install lower fairings (24-59).

Rear Wheel Bearing Replacement

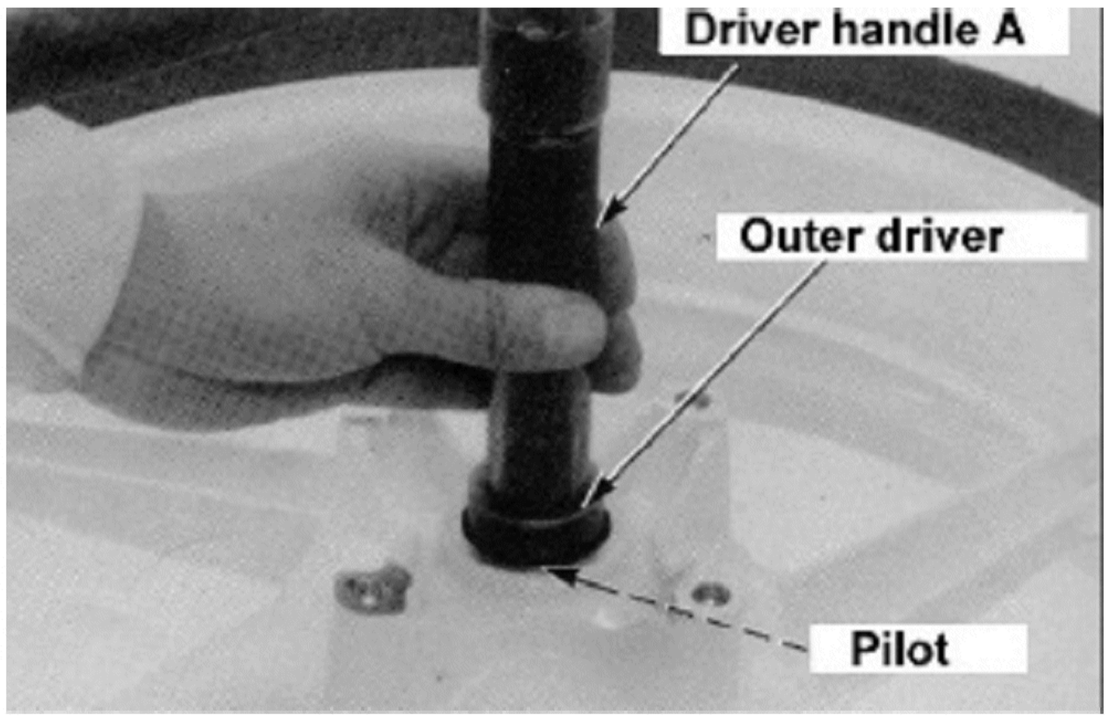
Remove wheel bearings (14-5).
Install the right bearing first.
Insert the distance collar.
Install the left bearing.



- Insert the right bearing to the stopper.
- Face the labeled surface of the bearing outward.

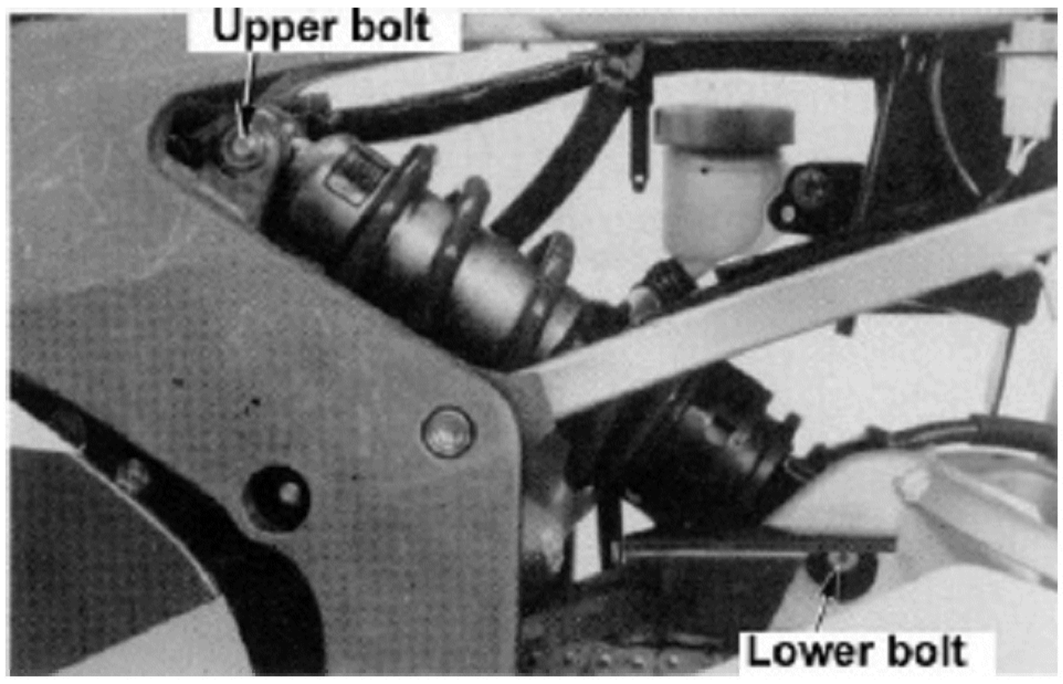
Common Tools:

Driver handle A	07749-0010000
Outer driver (37 x 40mm)	07746-0010200
Pilot (17mm)	07746-0040400



Rear cushion removal

Support the frame to lift the rear wheel.
Remove the fuel tank (24-21).
Unscrew the rear cushion lower bolt.
Unscrew the rear cushion upper bolt.
Remove the rear cushion.



Clean the female thread of the lower joint whenever the rear cushion is removed.

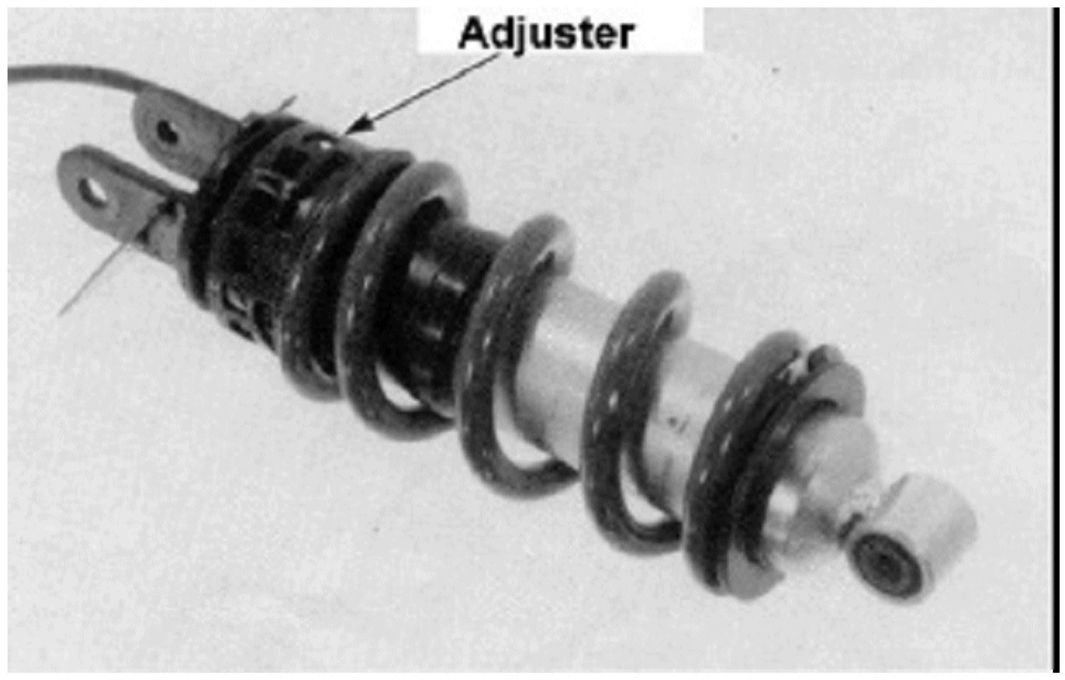
Disassembly

General Caution

Caution

- **The damper unit contains compressed Nitrogen gas. Strictly follow the instructions below:**
  - **Do not heat or disassemble the unit.**
  - **When disposing of the damper unit, bleed Nitrogen gas from the unit. Refer to (24-13).**

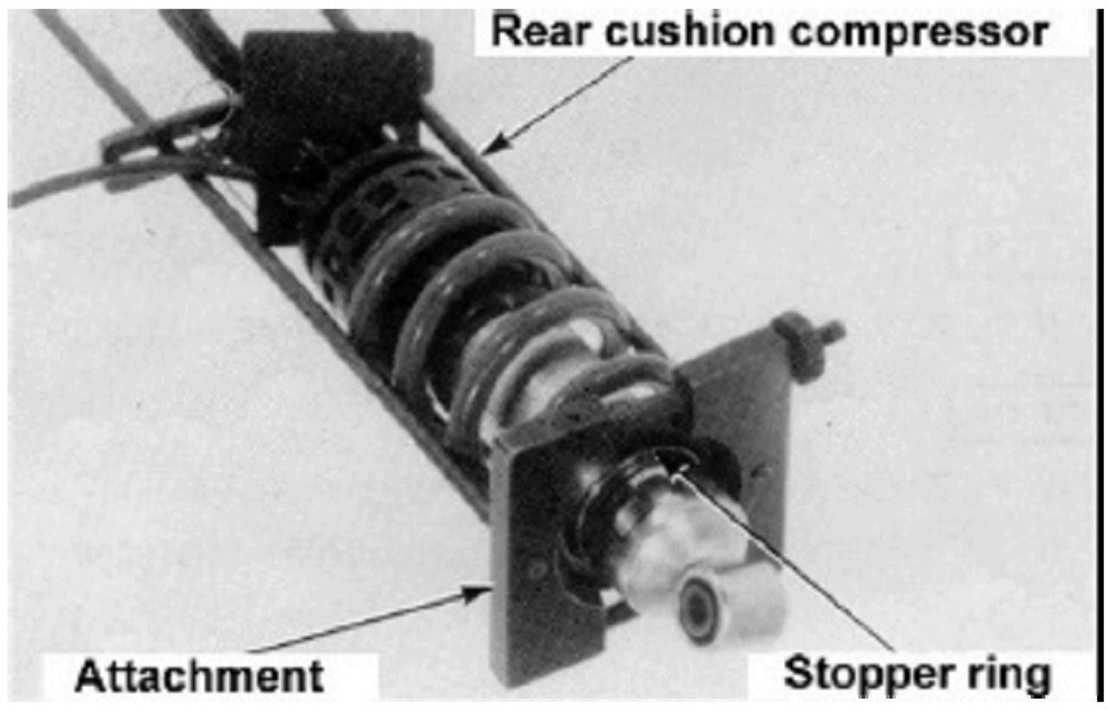
Pre-set the adjuster to the softest position prior to removing the rear cushion assembly.



Install the rear cushion compressor.

Common tool:
Rear cushion compressor
07GME-0010000

Special tool:
Rear cushion compressor attachment
07959-MB10000

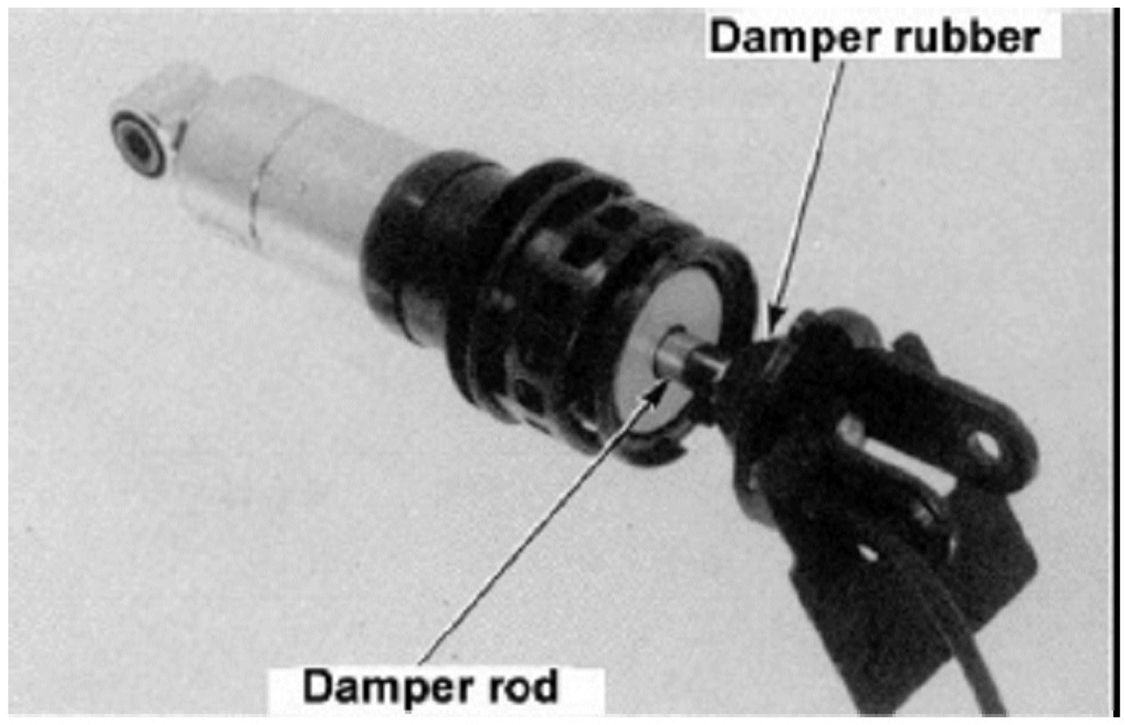


Compress the spring and remove the stopper ring.

Do not disassemble while the lock nut on the lower joint is loose.

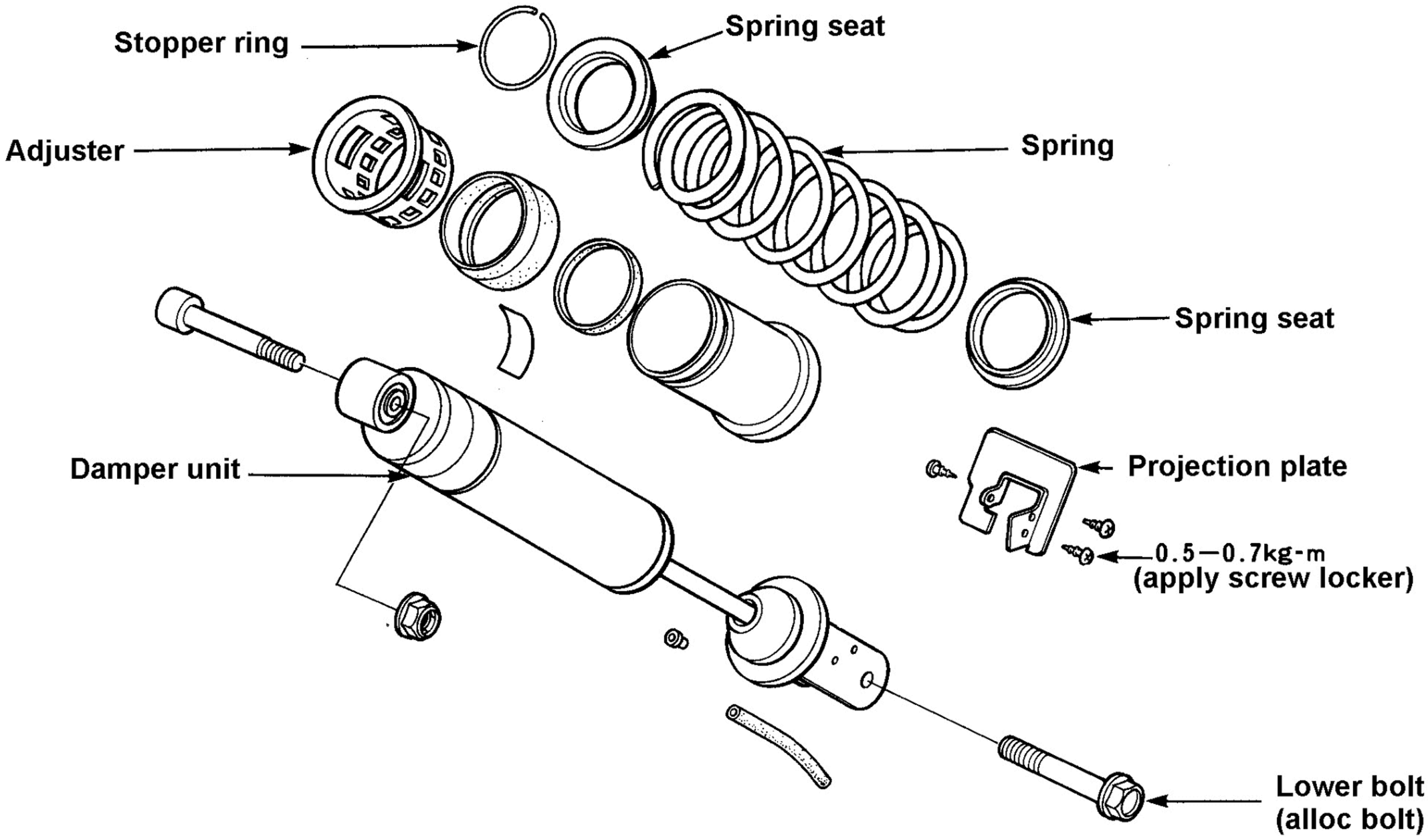
Remove the tool and remove the spring seat and the spring.

Inspect the damper seal for oil leak.
Inspect the damper rubber for wear / damage.

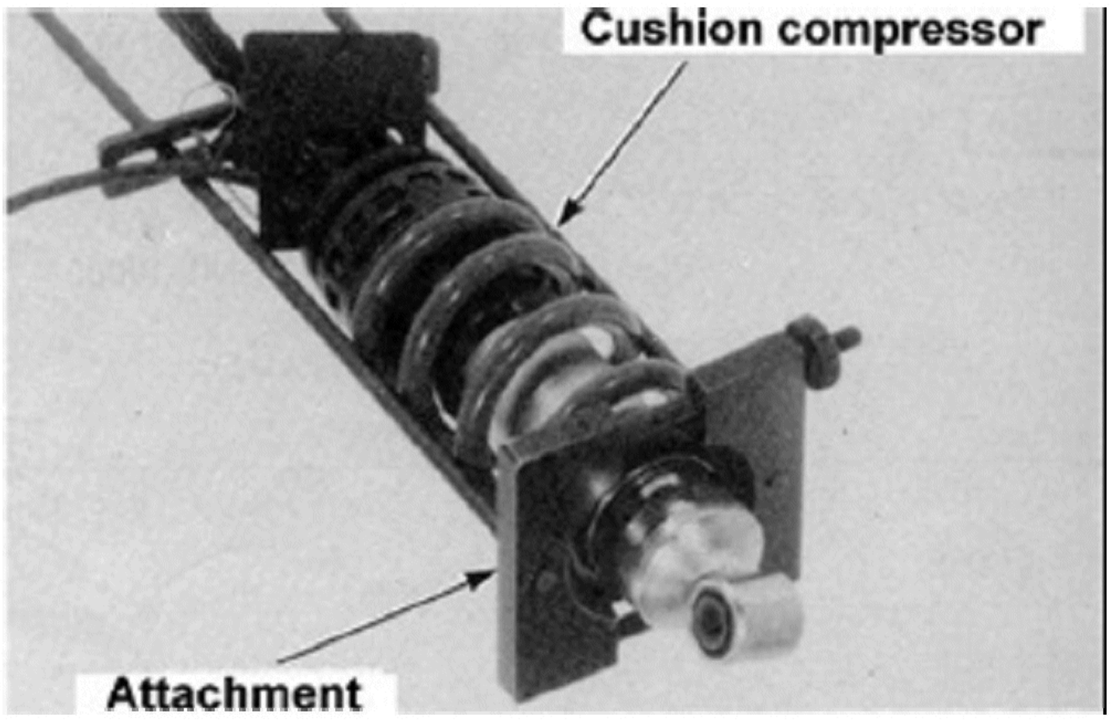


> Do not disassemble while the lock nut on the lower joint is loose.

Assembly



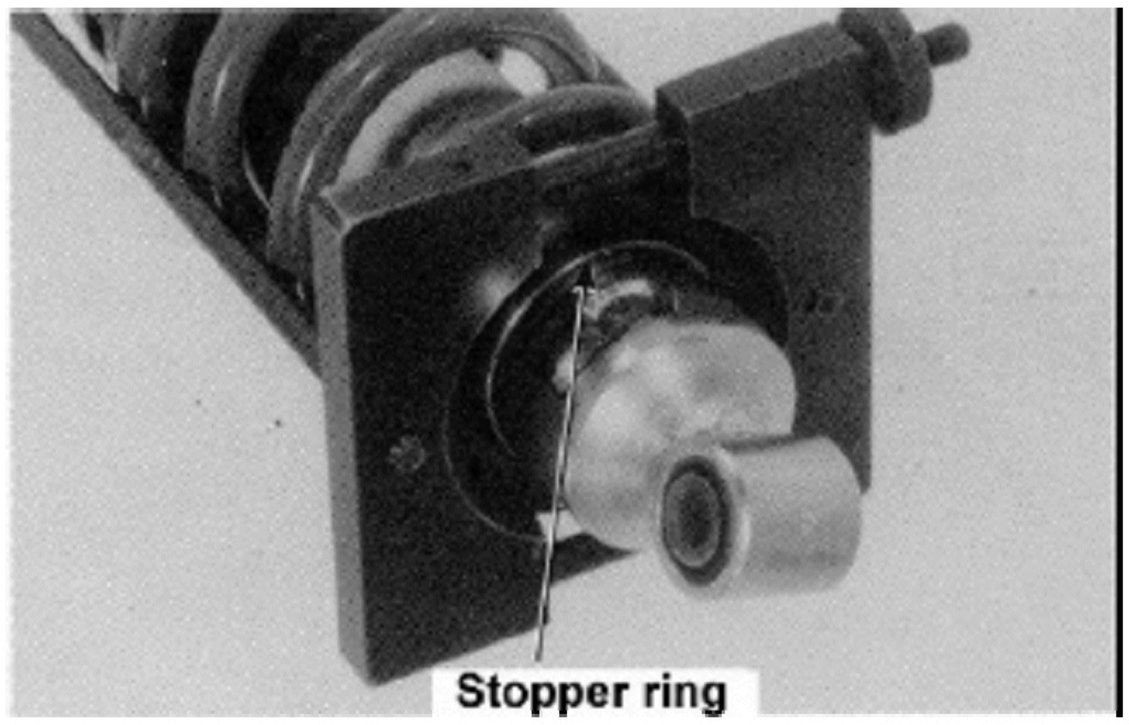
Install the spring and the spring seat to the damper.
Compress the spring by using the rear cushion compressor until the stopper ring can be installed.



Common tool:
Rear cushion compressor
07GME-0010000

Special tool:
Rear cushion compressor attachment
07959-MB10000

Install the stopper ring.
Remove the rear cushion compressor from the rear cushion.



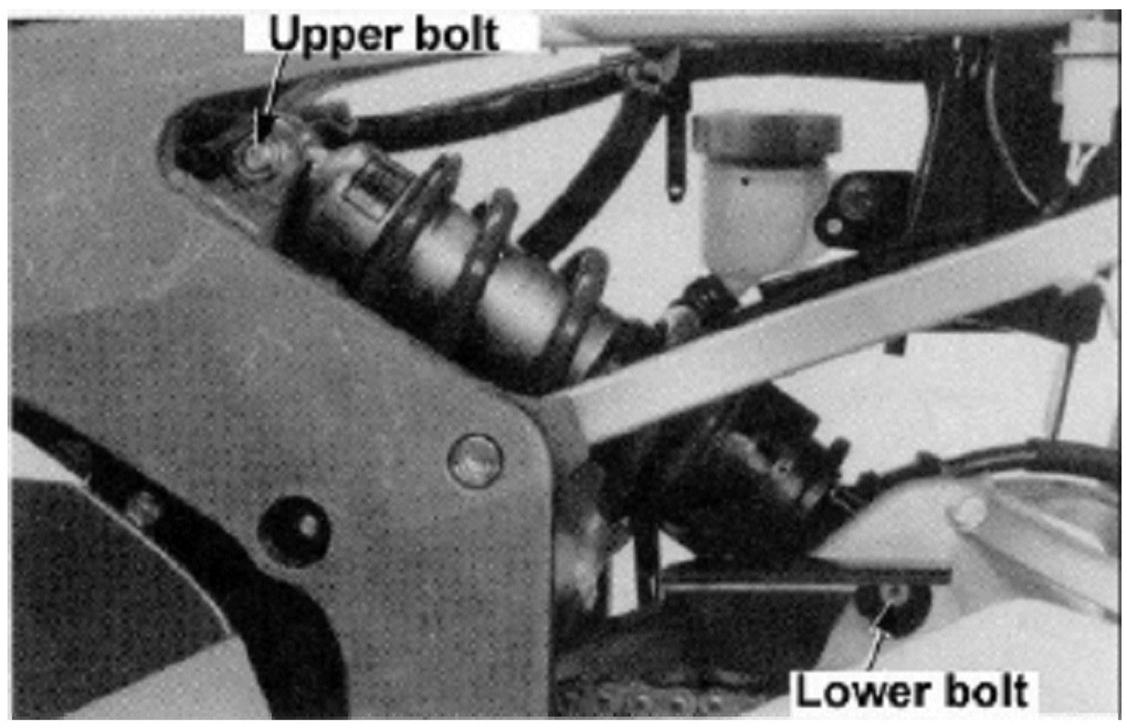
Rear cushion installation

Install the rear cushion.
Install an upper bolt and a nut.

Torque: 4.5 – 5.5kg-m

Install the new rear cushion lower bolt.

Torque: 4.5 – 5.5kg-m

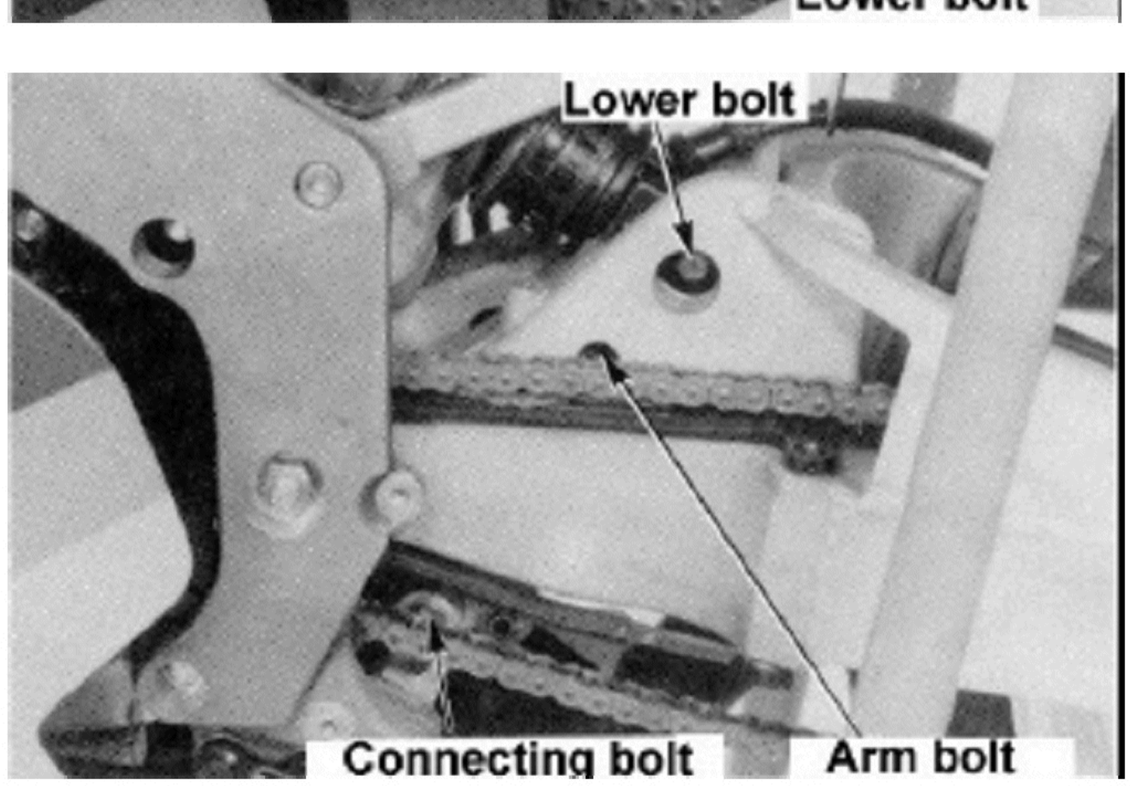


- Refer to (24-8) to route the rear drain tube.
- Replace the rear cushion lower bolt with a new one when removed.

Install the fuel tank (24-21).

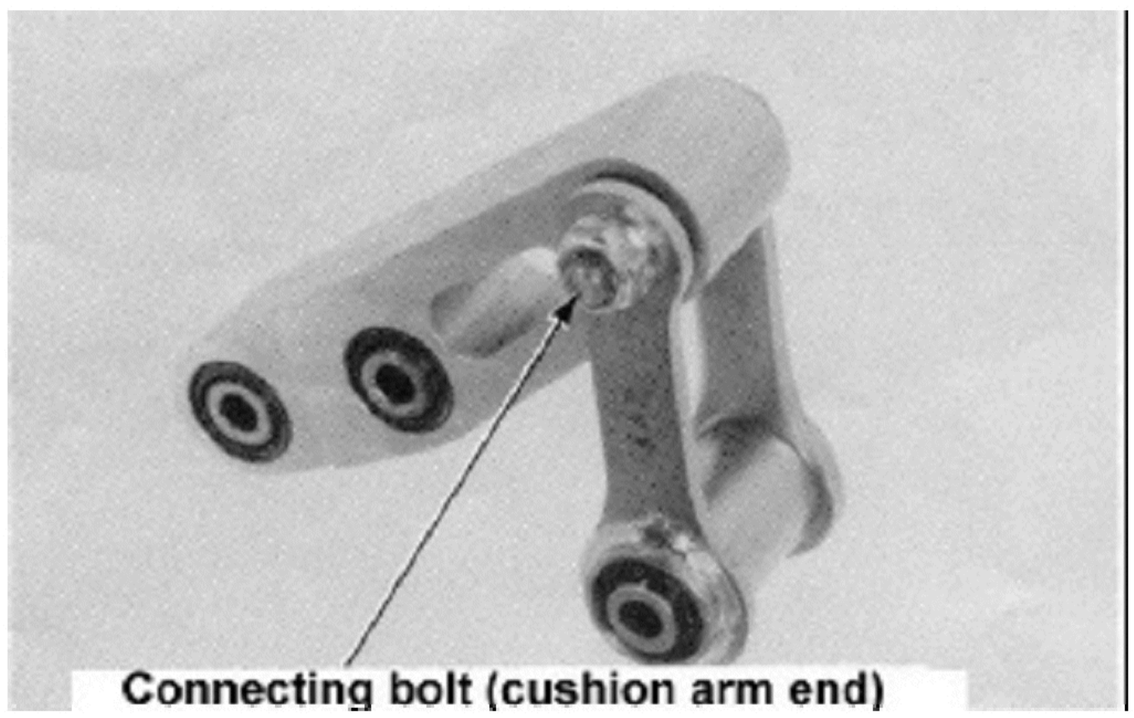
Suspension Linkage removal

Support the frame to lift the rear wheel.
Remove the left step holder (24-45).
Unscrew the connecting rod bolt (frame side).
Unscrew the rear cushion lower bolt and the cushion arm bolt.
Remove the suspension linkage in assy.



Disassembly

Unscrew the connecting rod bolt (cushion arm side) to separate the arm and the rod.

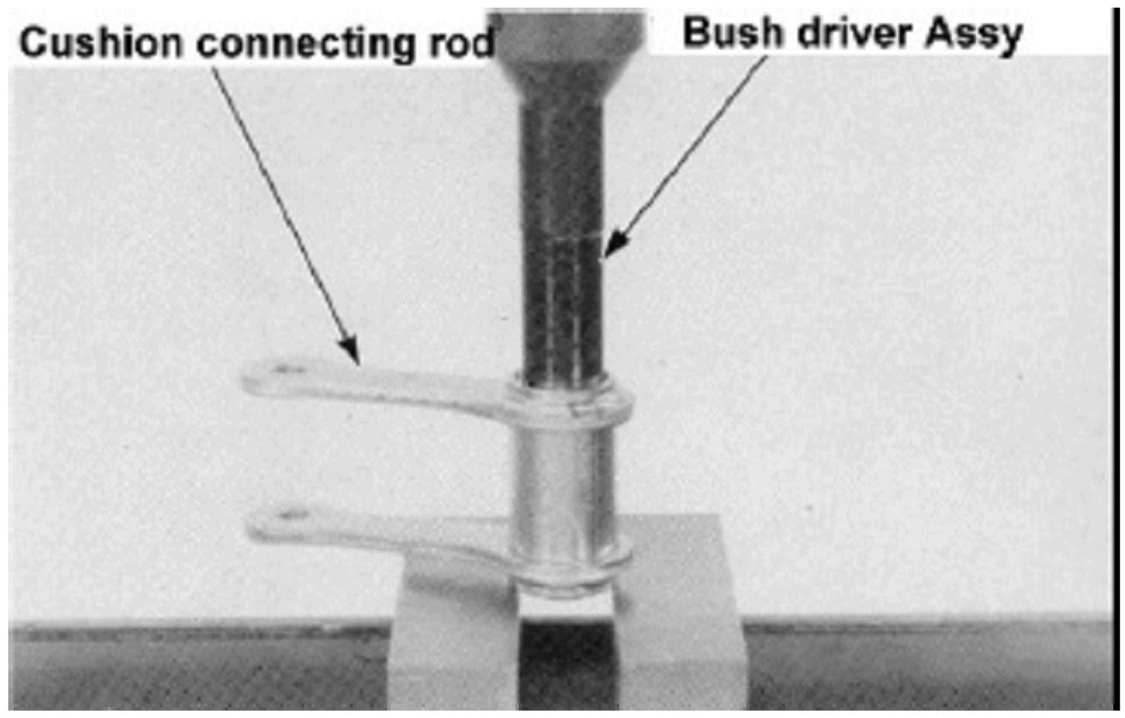


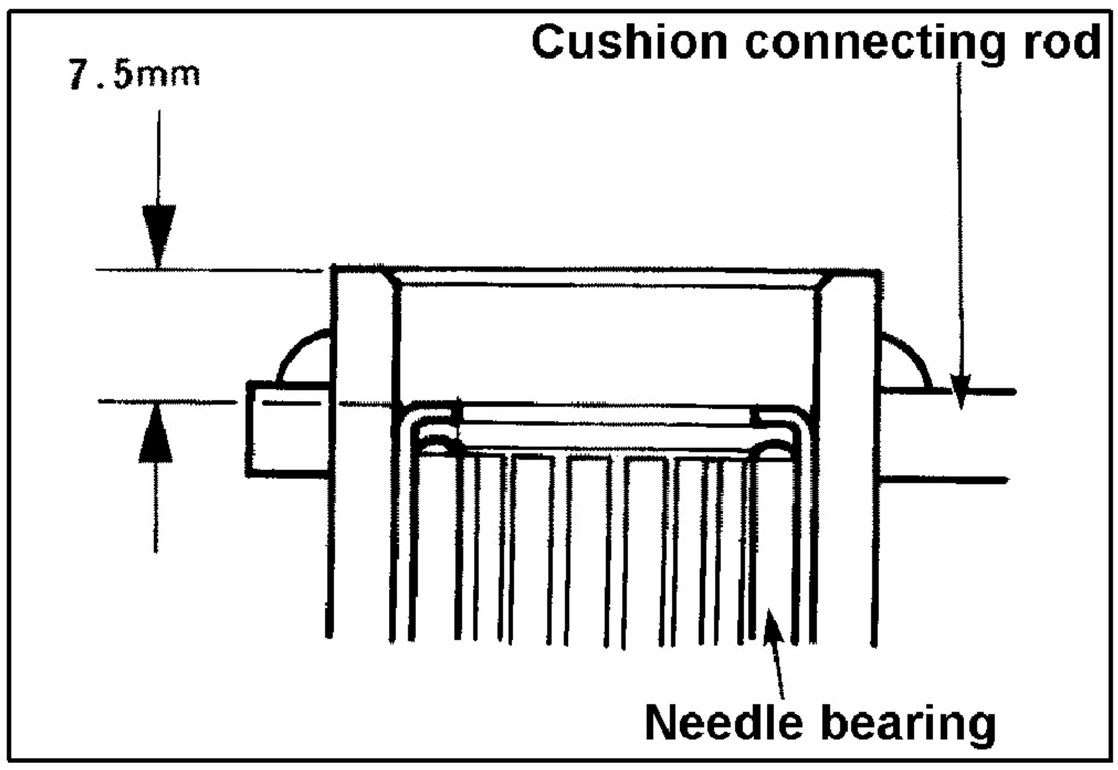
Needle bearing replacement

Remove the dust seal and the collar from the cushion connecting rod.
Replace the needle bearing by using a press machine.

Special tool:
Bush driver Assy 07GMD-KT80100

- Press the labeled side of the needle bearing in.
- Press in the needle bearing for 7.5mm from the connecting rod end.

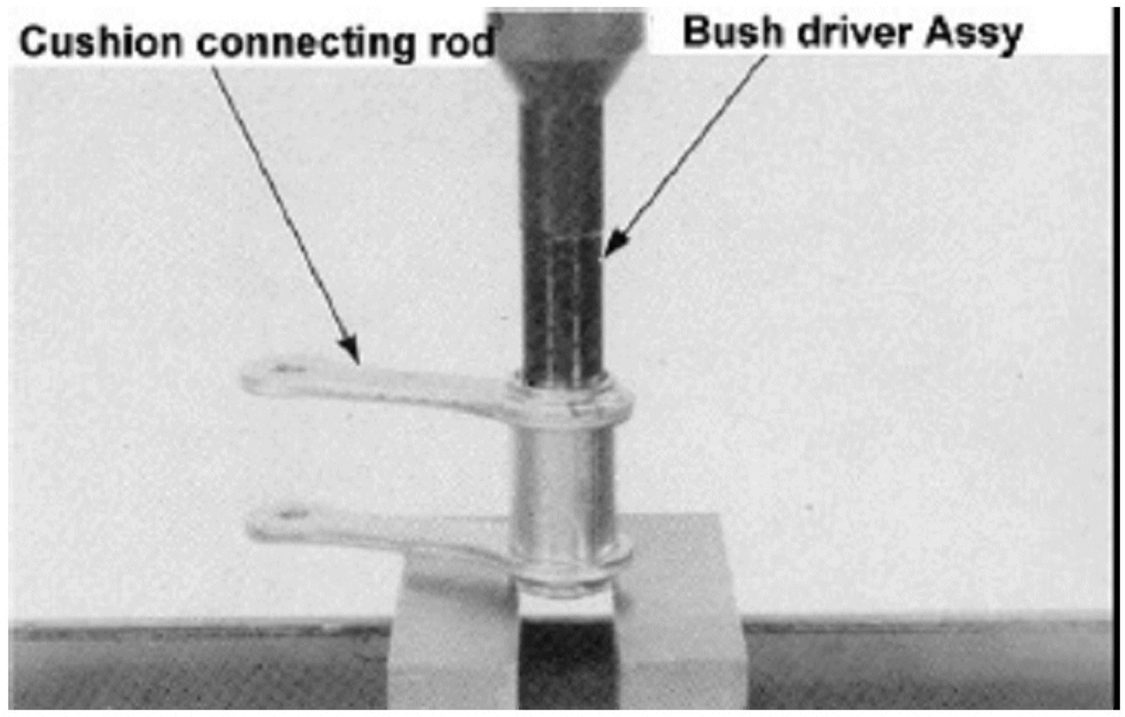


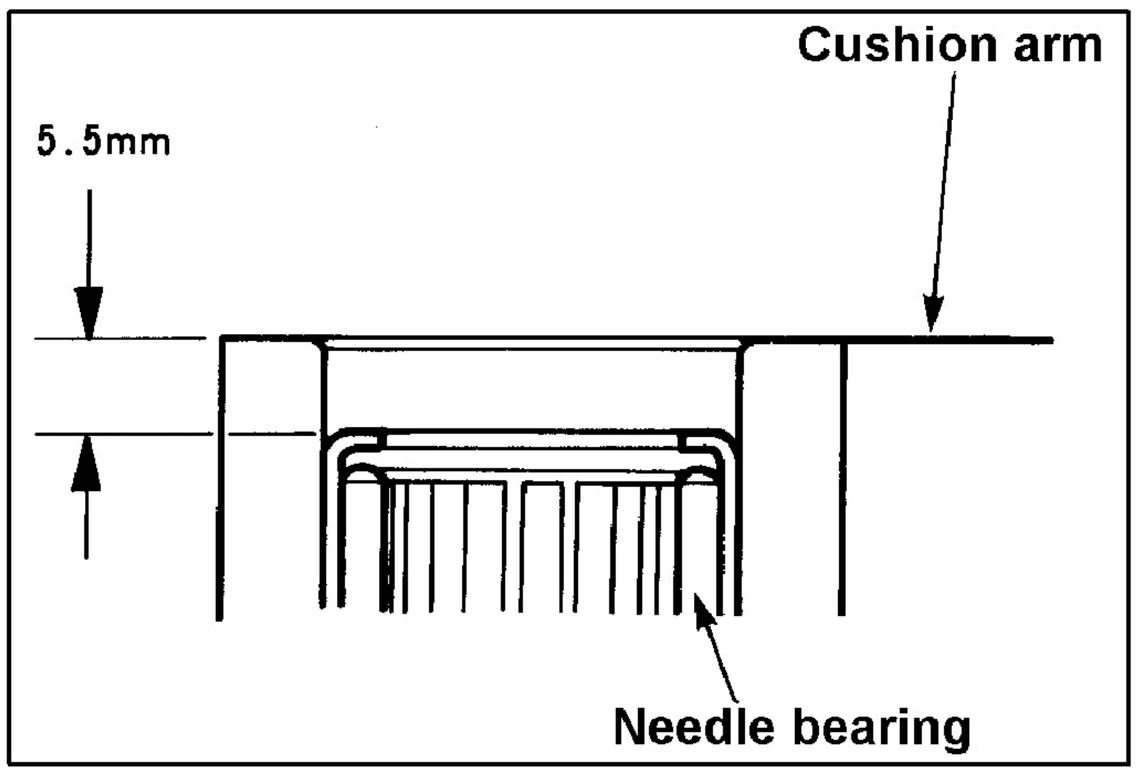


Remove the dust seal and the collar from the cushion arm.

Special tool:
Bush driver Assy
07GMD-KT80100

- Press the labeled side of the needle bearing in.
- Press in the needle bearing for 5.5mm from the cushion arm end.

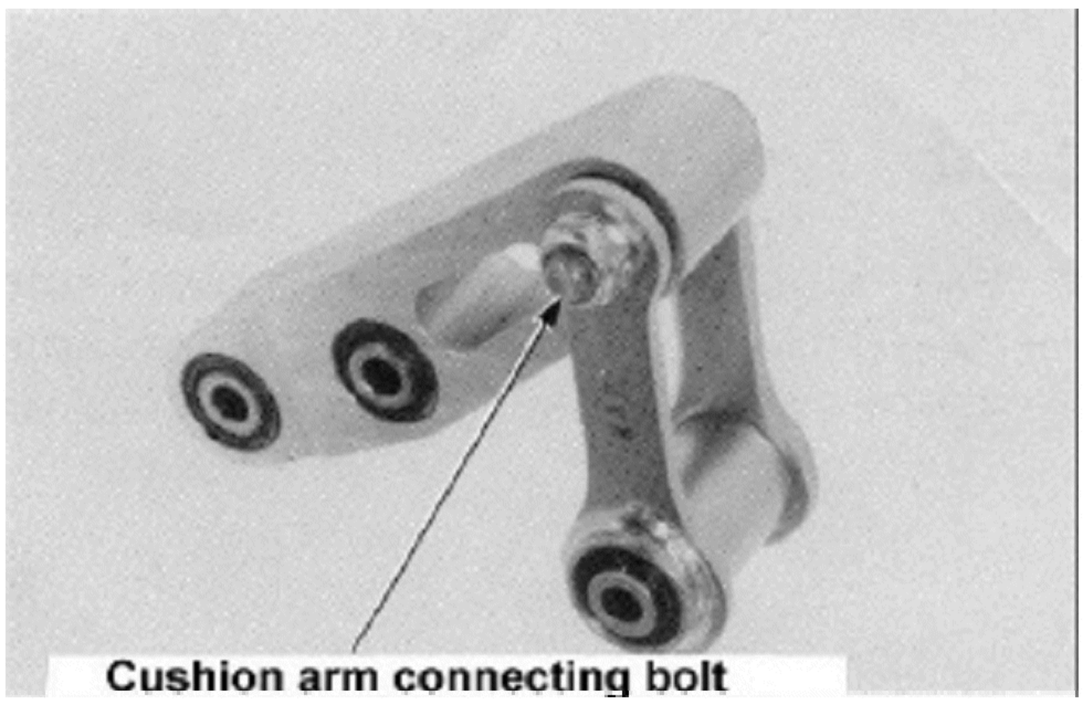




Assembly

Screw the cushion arm connecting rod bolt and assemble the arm and the connecting rod.

Torque: 4.5 – 5.5kg-m



Suspension Linkage Installation

Set the linkage to its mounting position.

Set the cushion arm mark (KA8↑ UP) upwards when installing.

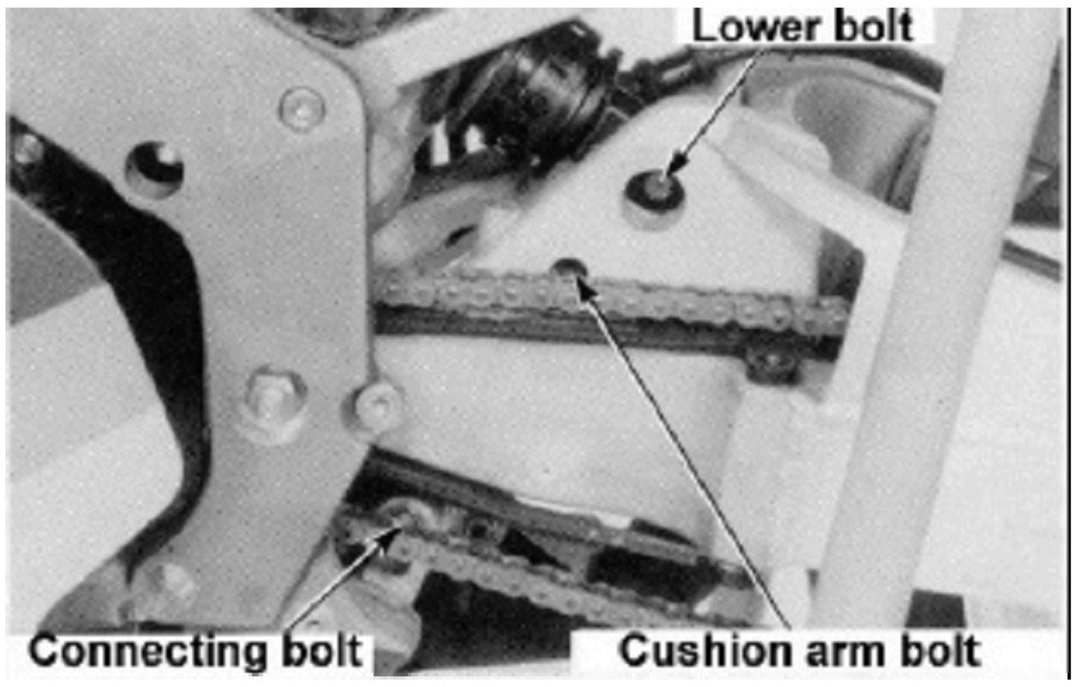
Install the new rear cushion lower bolt and the cushion arm bolt (24-52).

Torque: 4.5 – 5.5kg-m

Install the connecting rod bolt and the nut (frame side).

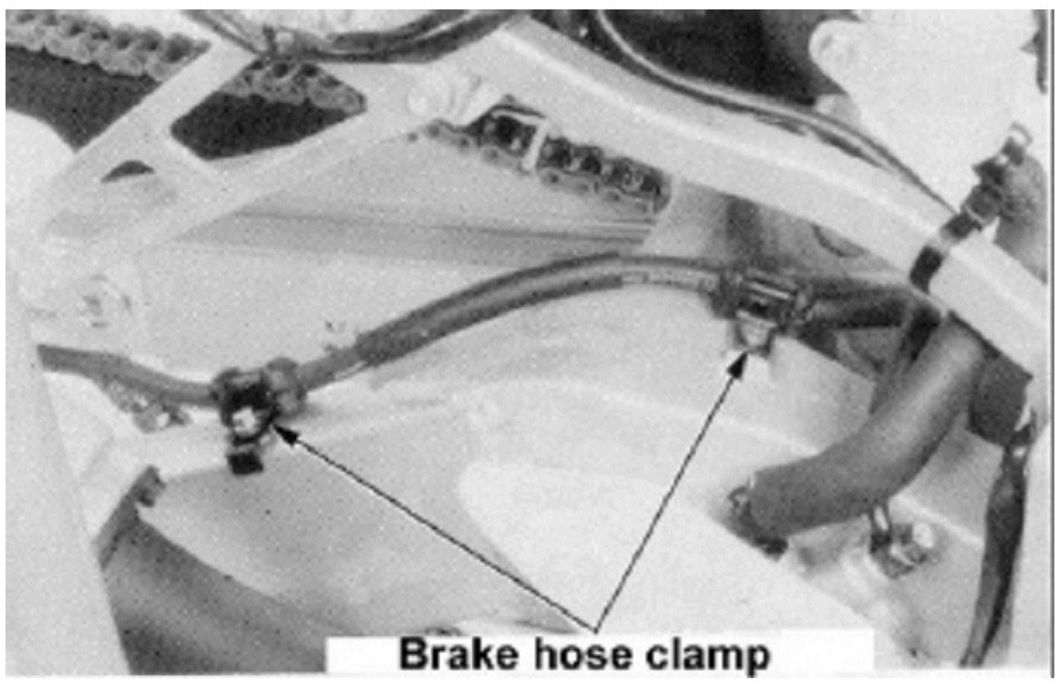
Torque: 4.5 – 5.5kg-m

Install the left step holder (24-45).



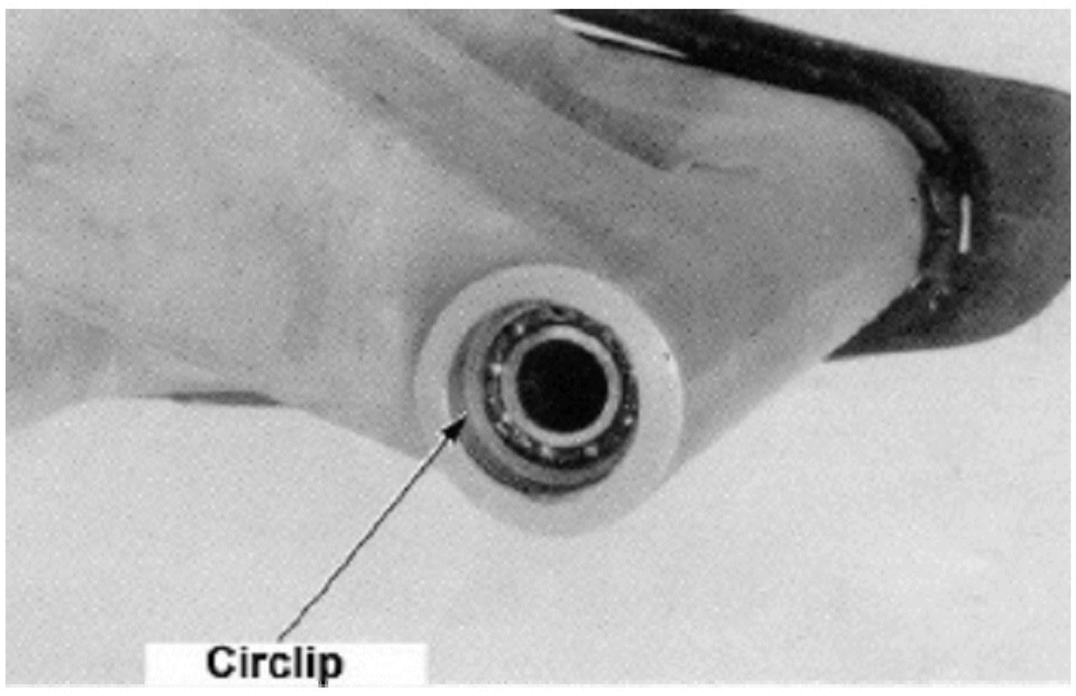
Rear fork removal

Support the frame to lift the rear wheel.
Remove the rear wheel (21-24).
Remove the lower fairings (24-58).
Remove the drive sprocket (24-42).
Remove the rear cushion (24-50).
Remove the suspension linkage (24-52).
Remove the rear hose clamp from the rear fork.
Unscrew the rear fork pivot bolt/nut to remove the rear fork (14-18).



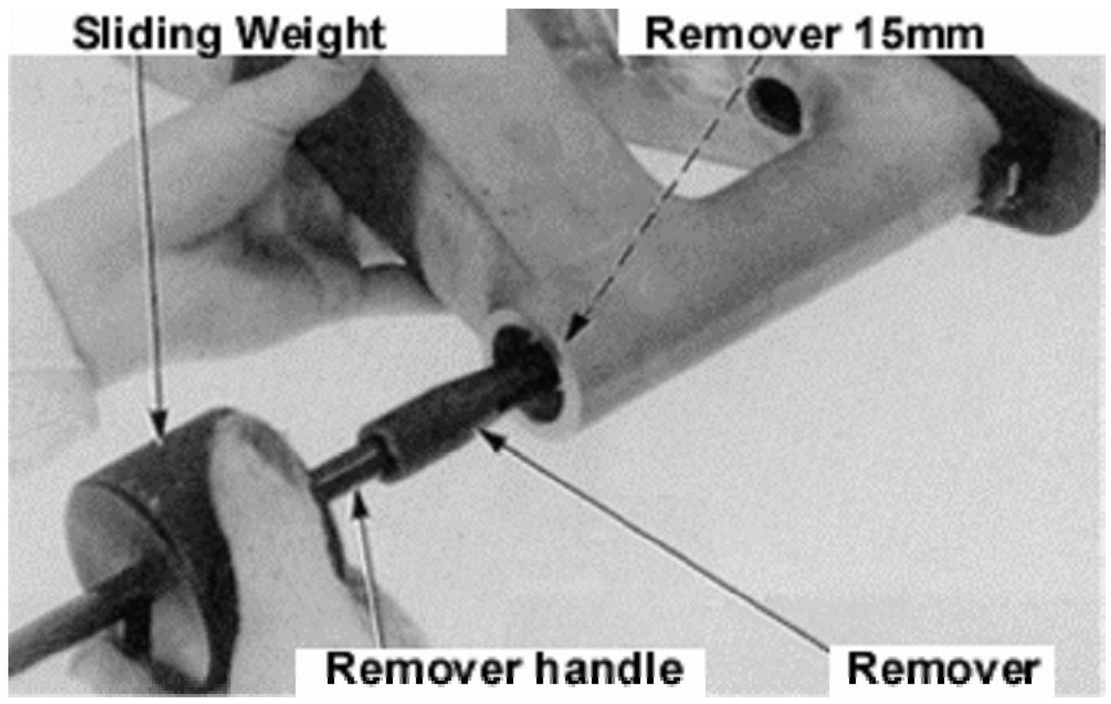
Pivot bearing replacement

Remove the right pivot collar and the dust seal (14-19).
Remove the left pivot collar and the dust seal (14-19).
Remove the distance collar from the rear fork pivot (14-19).
Remove the circlip.



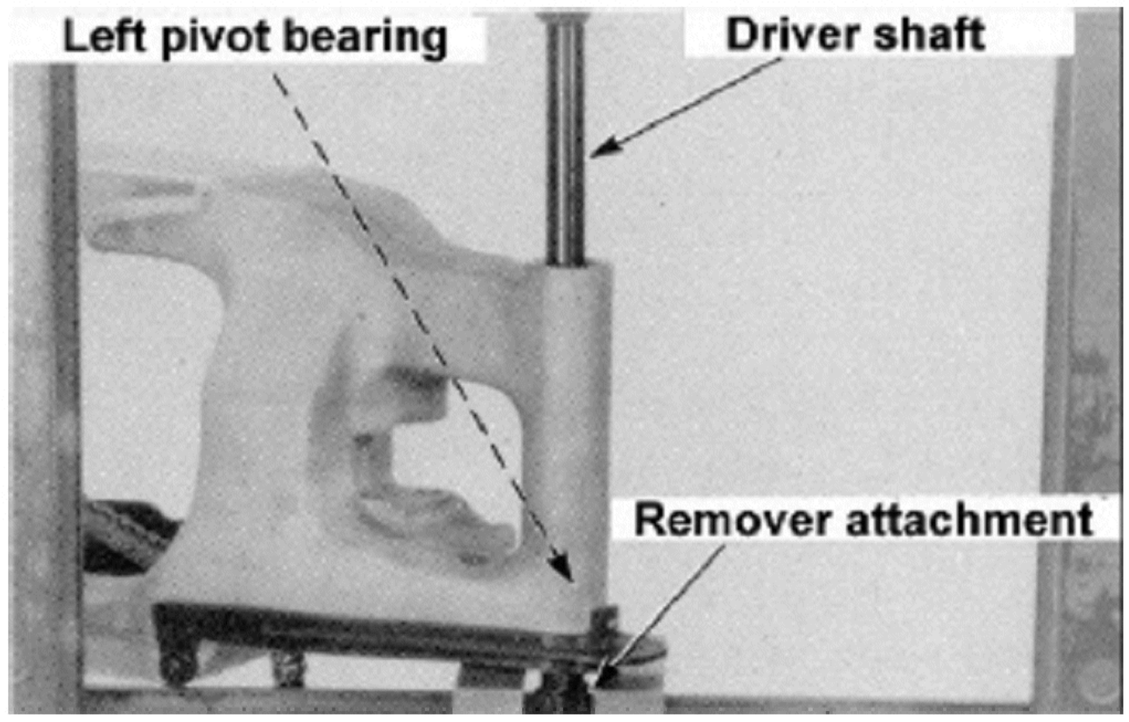
Remove the right pivot bearing (ballbearing).

Special tools:
- Bearing remover set 15mm
  07936-KC10000
- Remover handle 15mm
  07936-KC10100
- Remover 15mm
  07936-KC10200
- Sliding weight
  07741-0010201



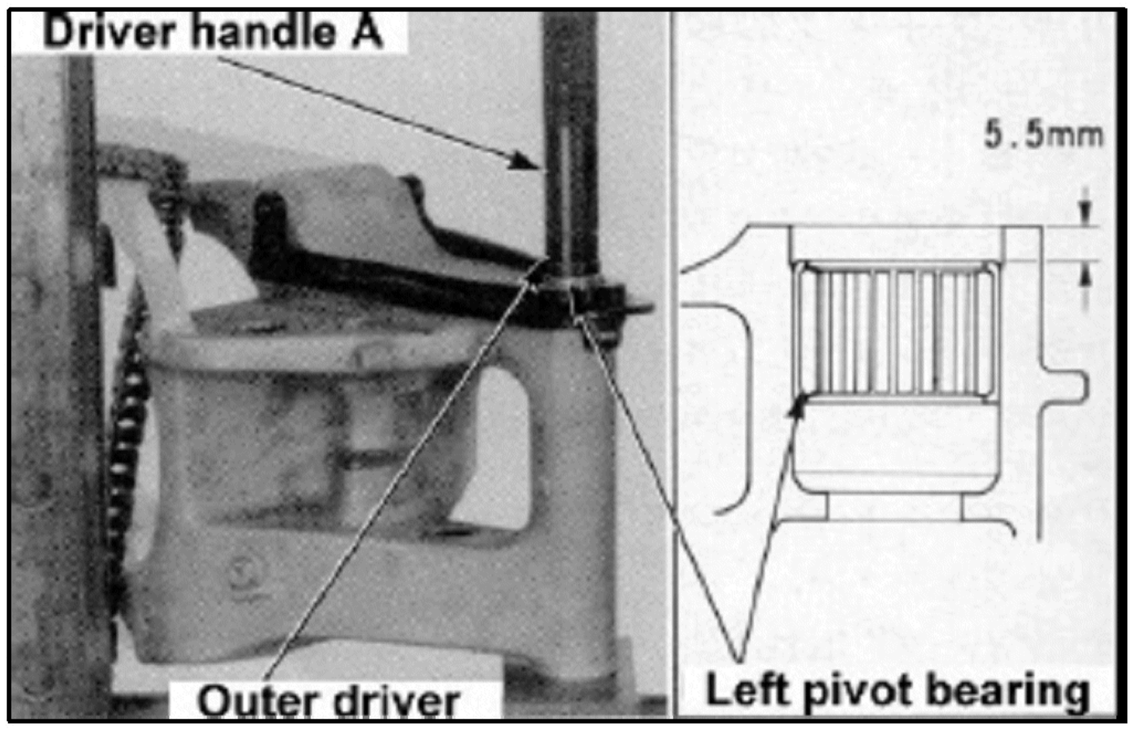
Remove the left pivot bearing.

Special tools:
Bearing remover attachment
  07LMC-KV30200
Driver shaft 07946-MJ00100



By using a press machine, press in the left pivot bearing to 5.5mm depth from the rear fork end.

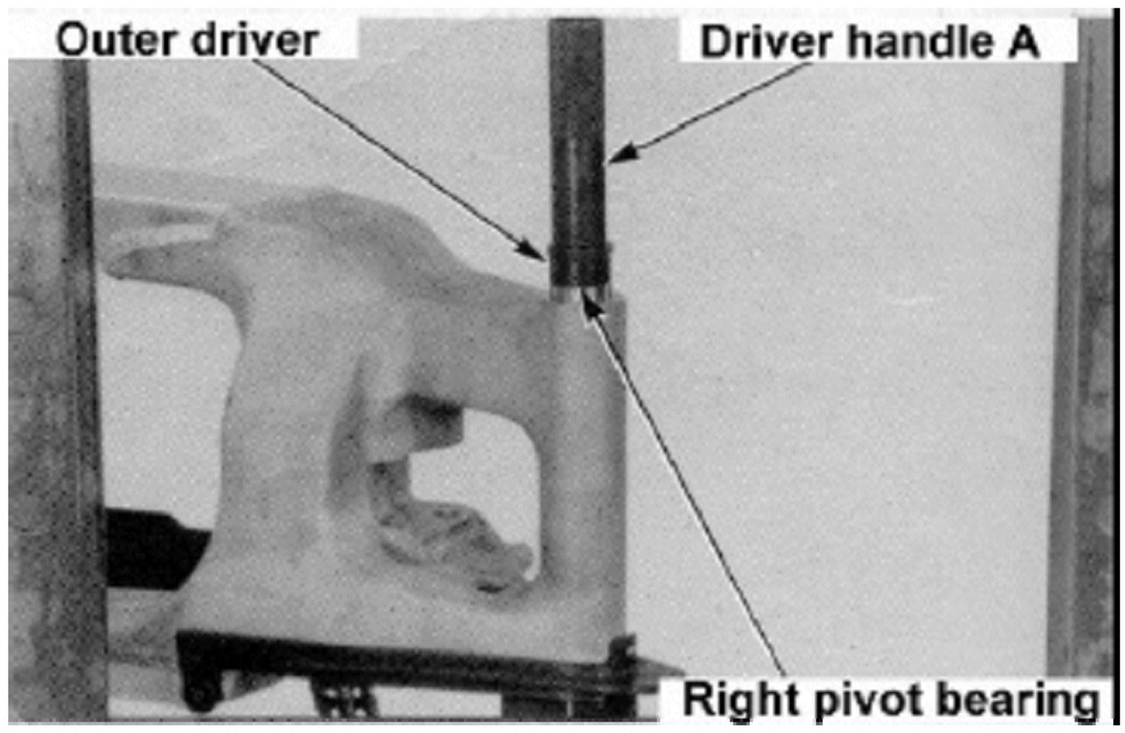
Common tools:
Driver handle A 07749-0010000
Outer driver (32 x 35mm) 07746-0010100



Press in the right pivot bearing.

Common tools:
Driver handle A 07749-0010000
Outer driver (32 x 35mm) 07746-0010100

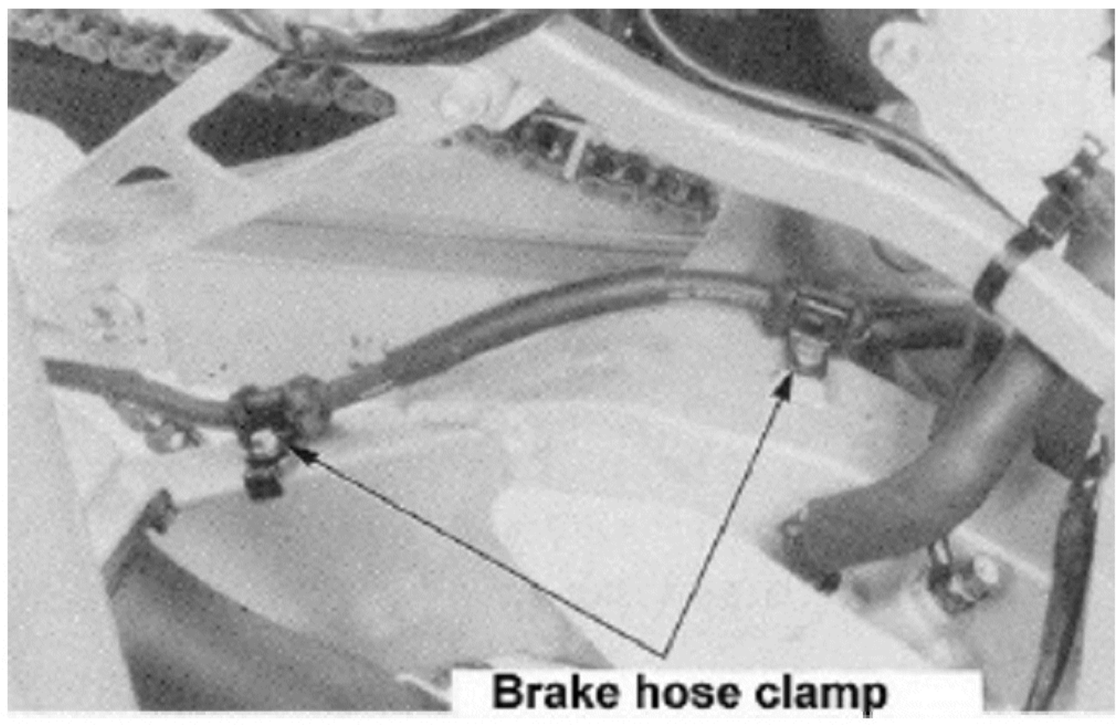
Press in the right pivot bearing until the stopper.



Install the circlip to the slit.
Install the distance collar to the rear fork pivot.
Install the dust seal and the right pivot collar (21-30).
Install the dust seal and the left pivot collar (21-29).

Rear fork installation

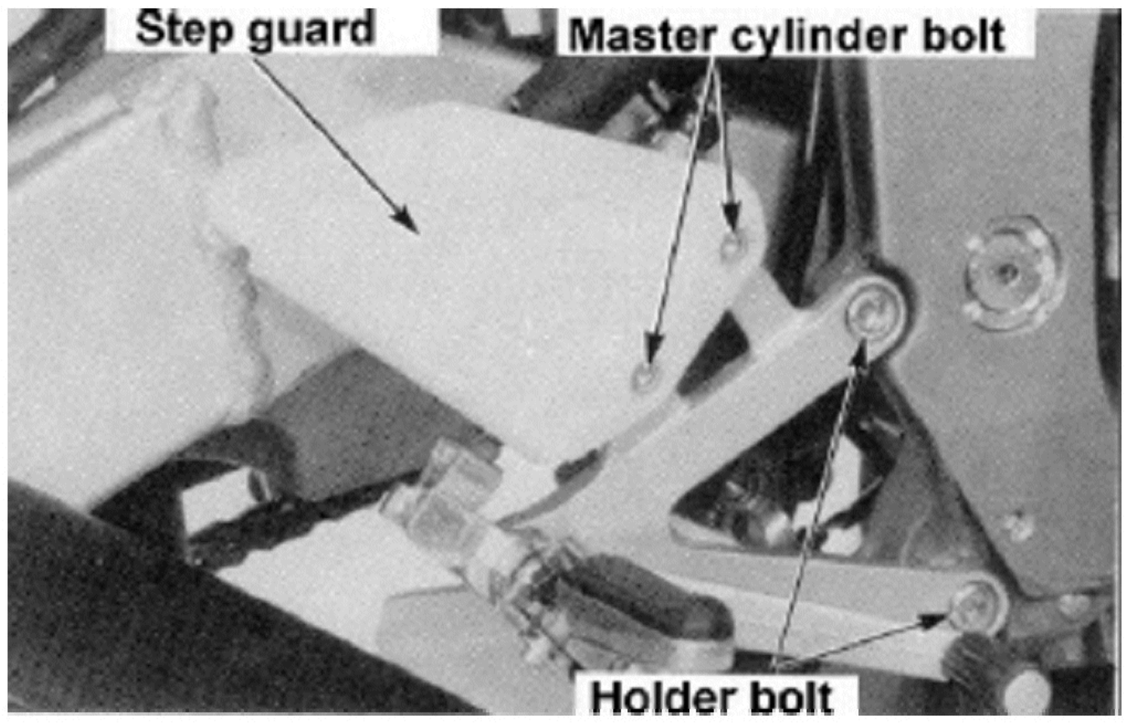
Install rear fork.
Clamp the rear brake hose to the rear fork.
Screw the pivot bolt, the lock nut and the pivot nut (14-22).
Install the rear cushion (24-52).
Install suspension linkage (24-54).
Install the rear wheel (21-24).
Install the drive sprocket (24-43).
Install the drive sprocket cover (6-3).
Install the lower fairings (24-58).



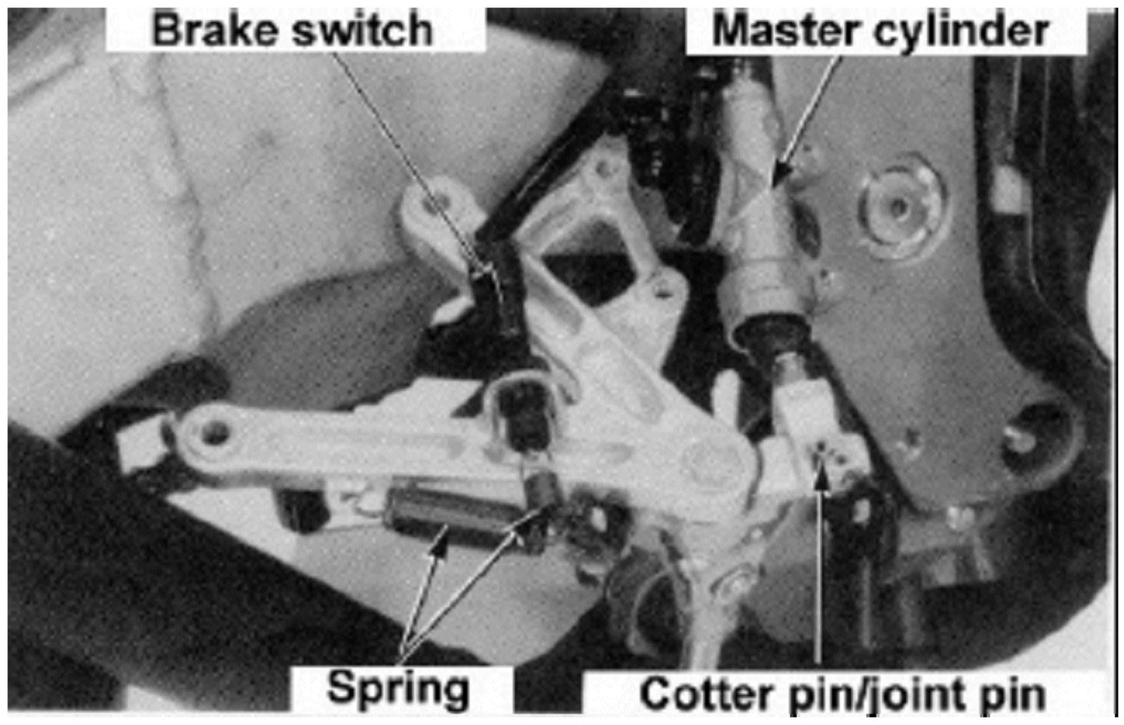
Braking System

Brake Pedal removal

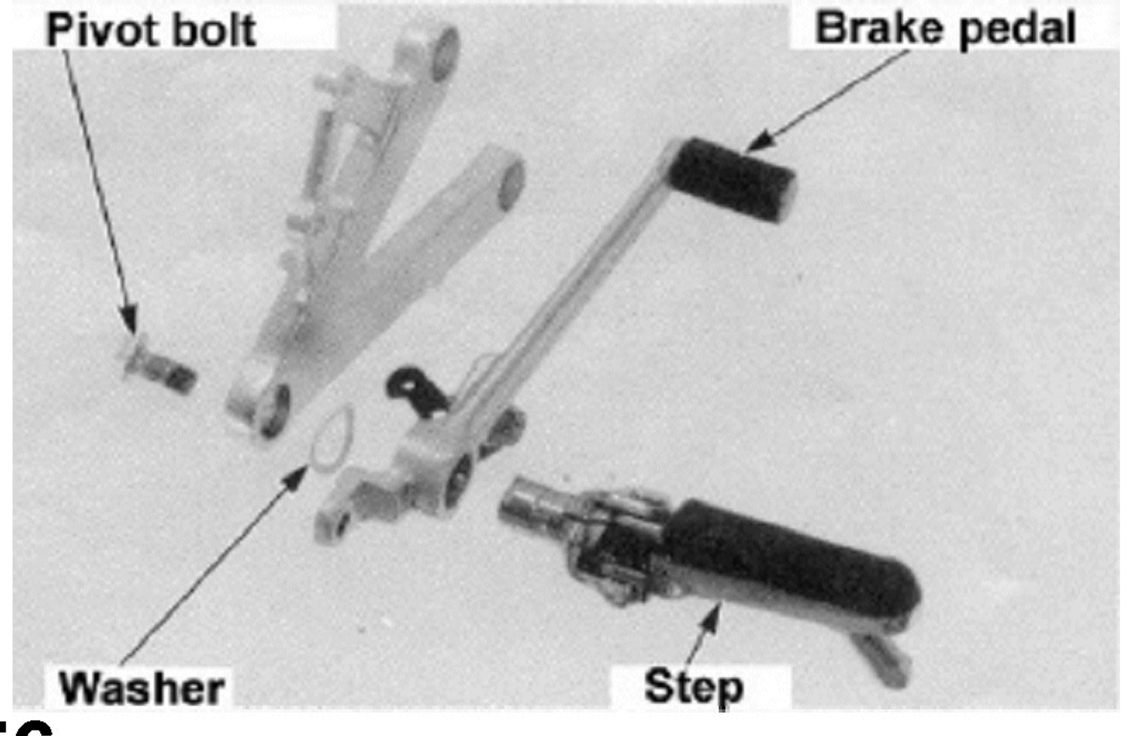
Unscrew rear master cylinder mount bolts to remove the right step guard.
Unscrew the right step holder bolt.



Remove the cotter pin and the joint pin to detach the master cylinder from the brake pedal.
Remove the brake switch spring to remove the brake switch.
Remove the return spring.



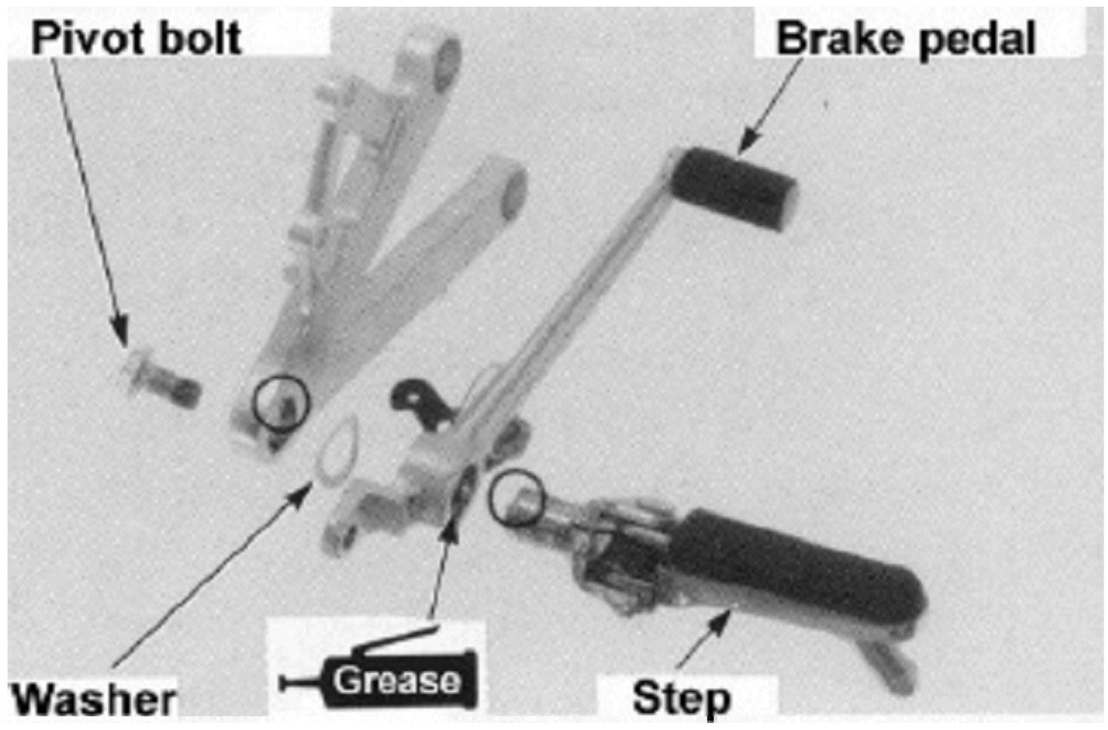
Unscrew the stop pivot bolt to remove the brake pedal, the step and the wave washer.



Installation

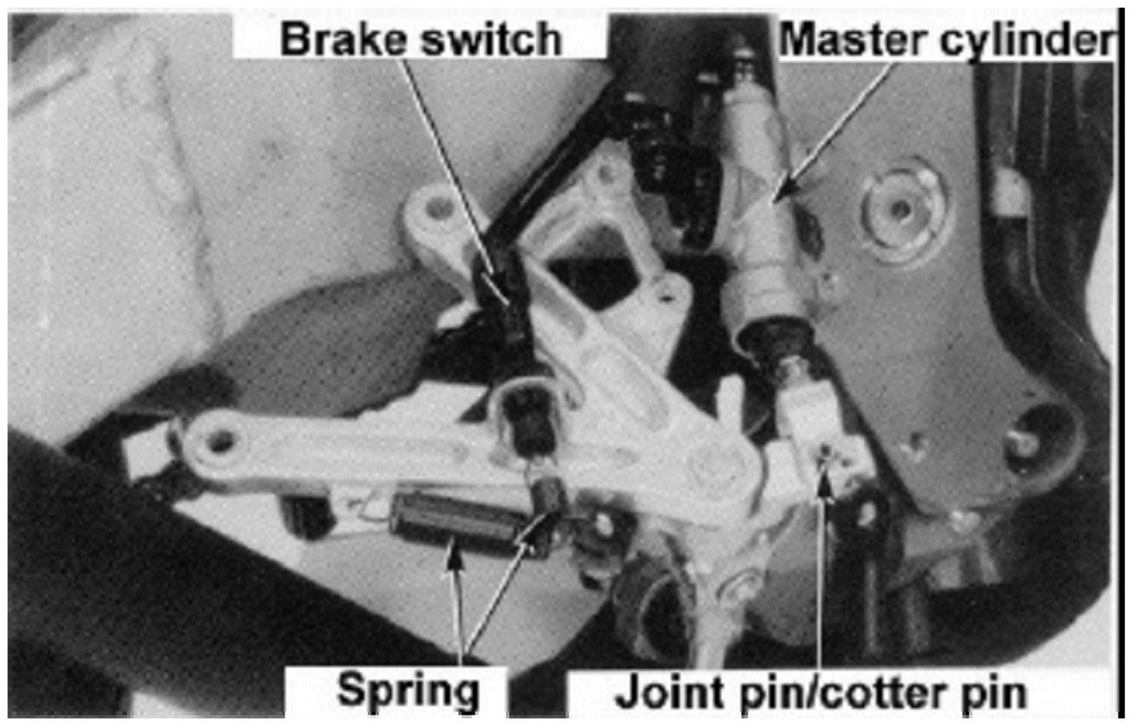
Replace the step pivot bolt whenever it is removed and clean the female thread.

Apply grease to the interior surface of the brake pedal bush.
Install the brake pedal and the wave washer to the step.
Set the slit on the step pivot to the slit on the step holder and screw the new step pivot bolt.



Torque: 3.5 – 4.5kg-m

Install the brake pedal and the master cylinder push rod with the joint pin.
Then install new cotter pin.
Install the brake switch and the brake switch spring.
Set the return spring.

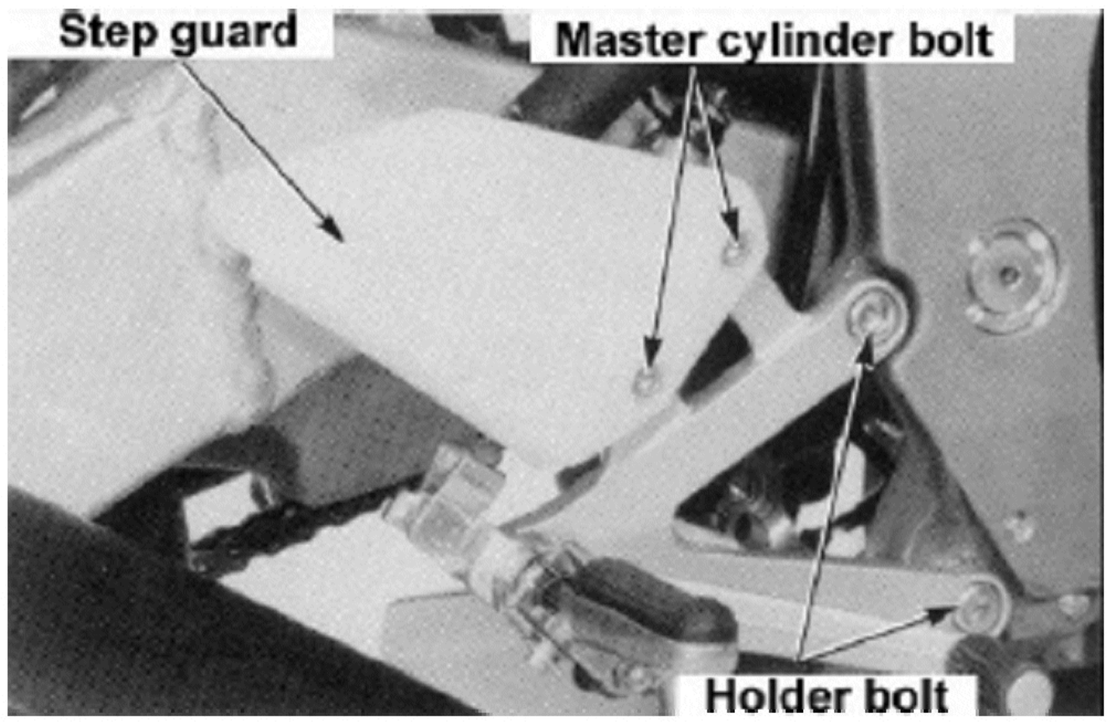


Install the rear master cylinder and the right step guard and temporarily screw the rear master cylinder mount bolts.
Install the right step holder and screw the holder bolts.

Torque: 2.4 – 3.0kg-m

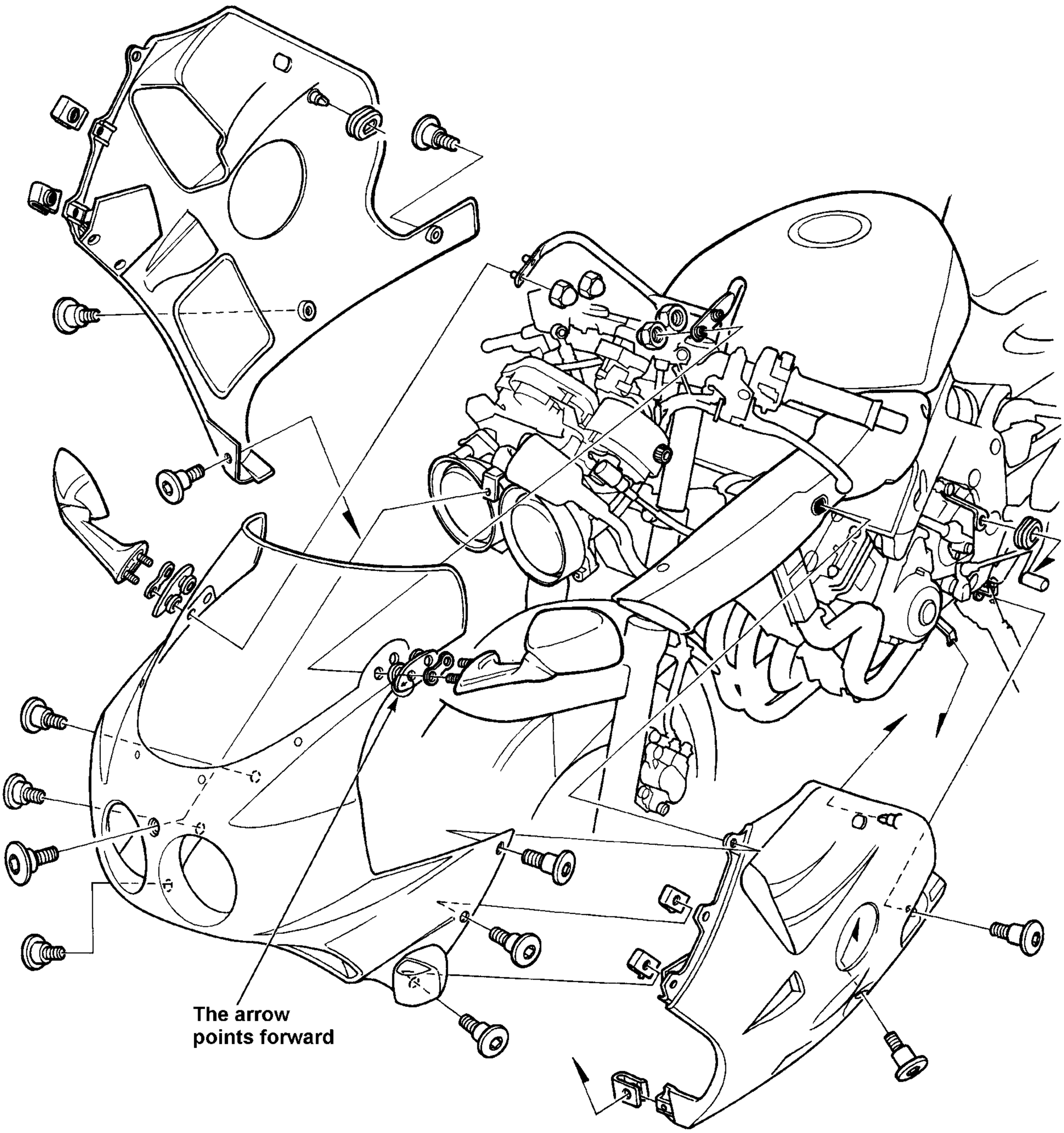
Screw the rear master cylinder mount bolts.

Torque: 1.0 – 1.4kg-m

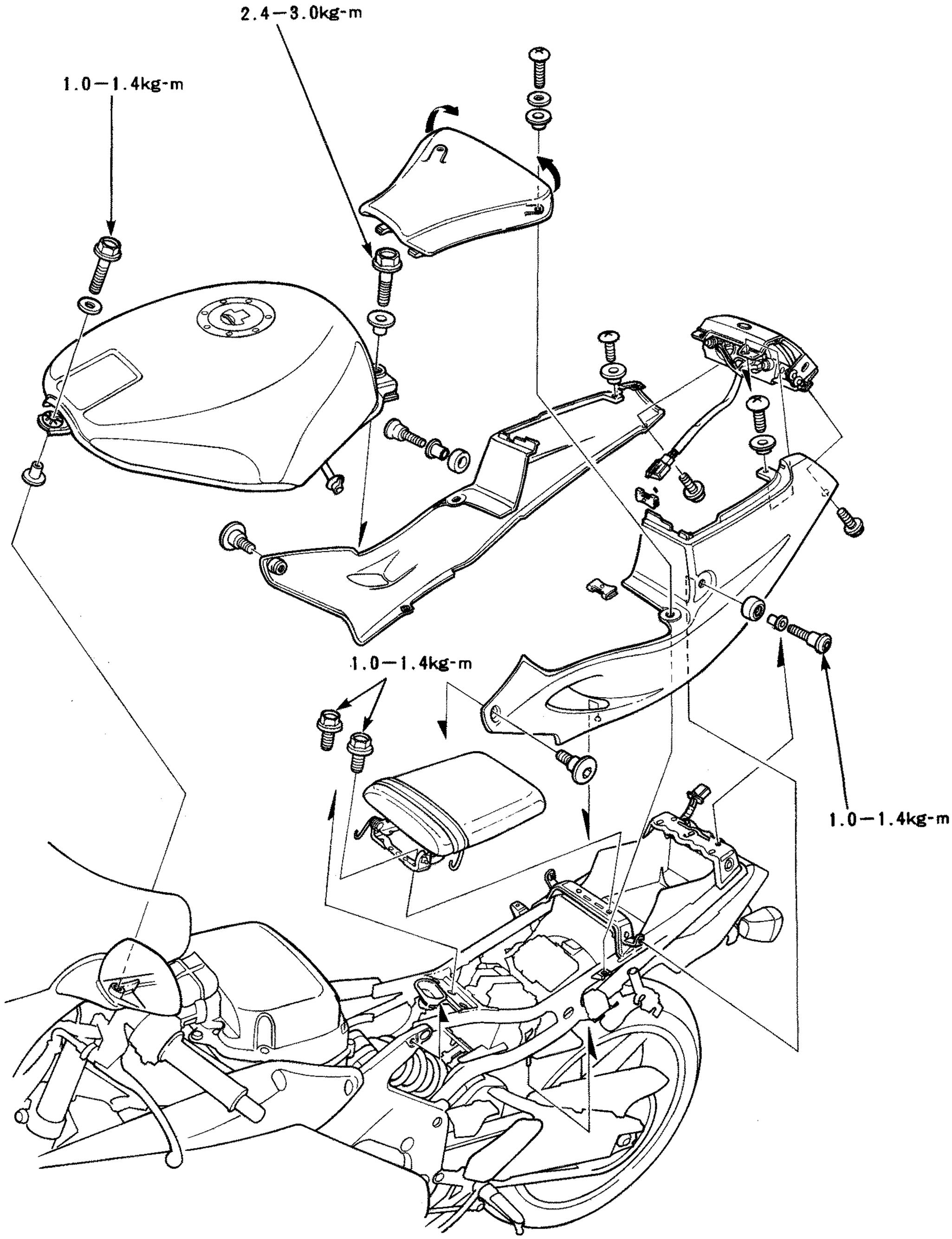


Fairing & Exhaust Pipe

Refer to (22-30) for removal / installation.



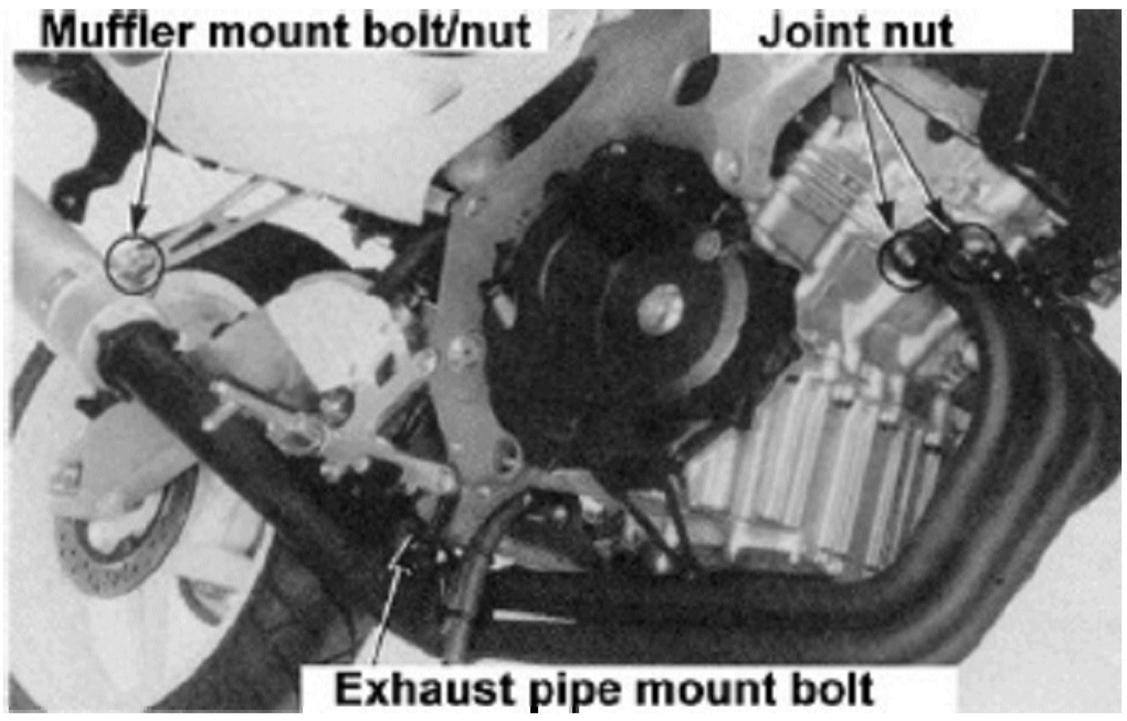
Refer to (22-30) for removal / installation.



Exhaust Pipe removal

Caution

Remove while the muffler and the pipe are cool.



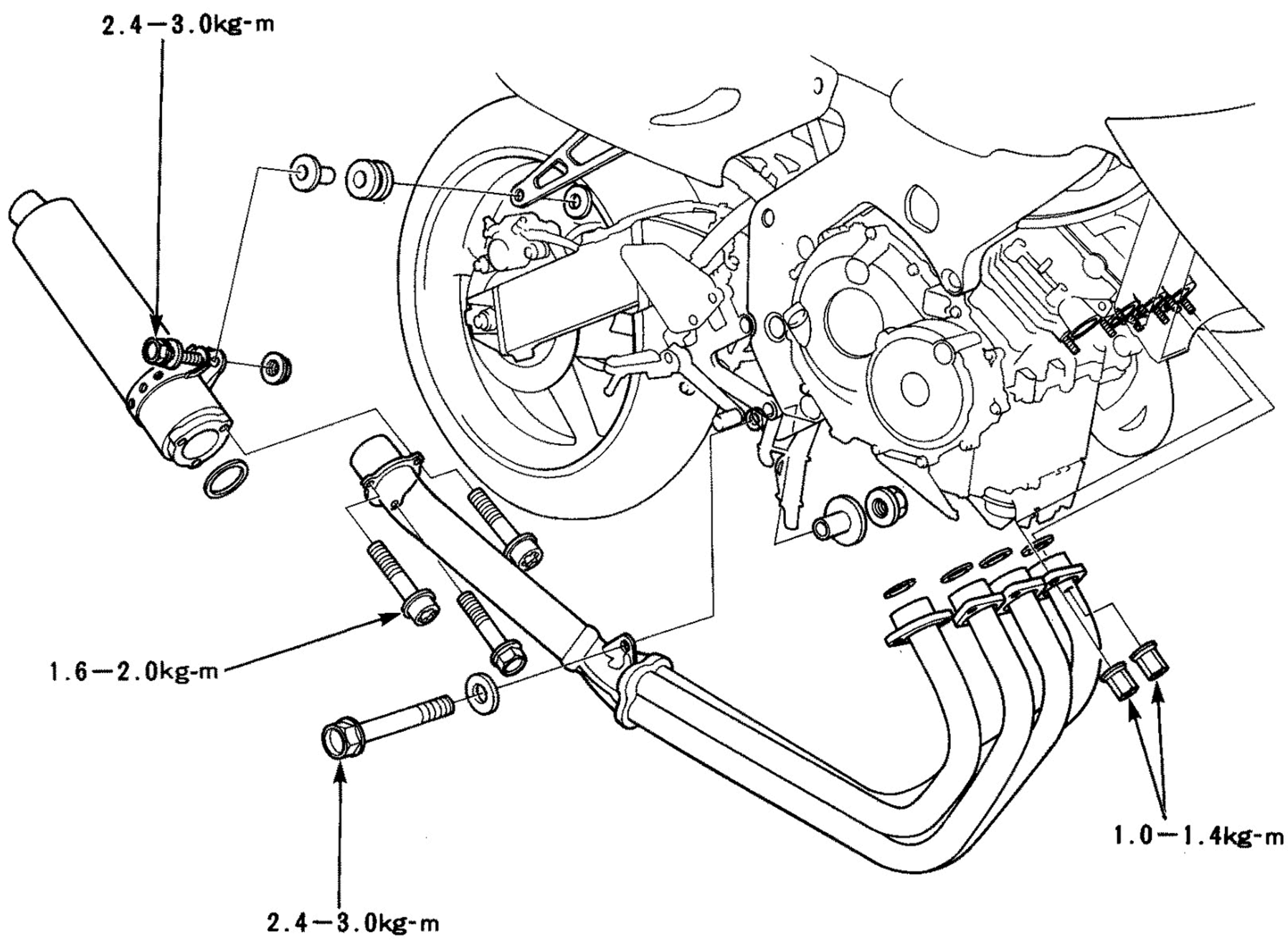
Remove lower cowls (24-59).
Unscrew exhaust pipe joint nuts.
Unscrew muffler mount bolt/nut.
Unscrew exhaust pipe mount bolt/nut to remove the exhaust pipe and the gasket.

Exhaust Pipe installation

Follow the removal procedure in reverse order.

Torque:

Exhaust Pipe joint nut	1.0 – 1.4kg-m
Muffler mount bolt	2.4 – 3.0kg-m
Exhaust pipe mount bolt	2.4 – 3.0kg-m



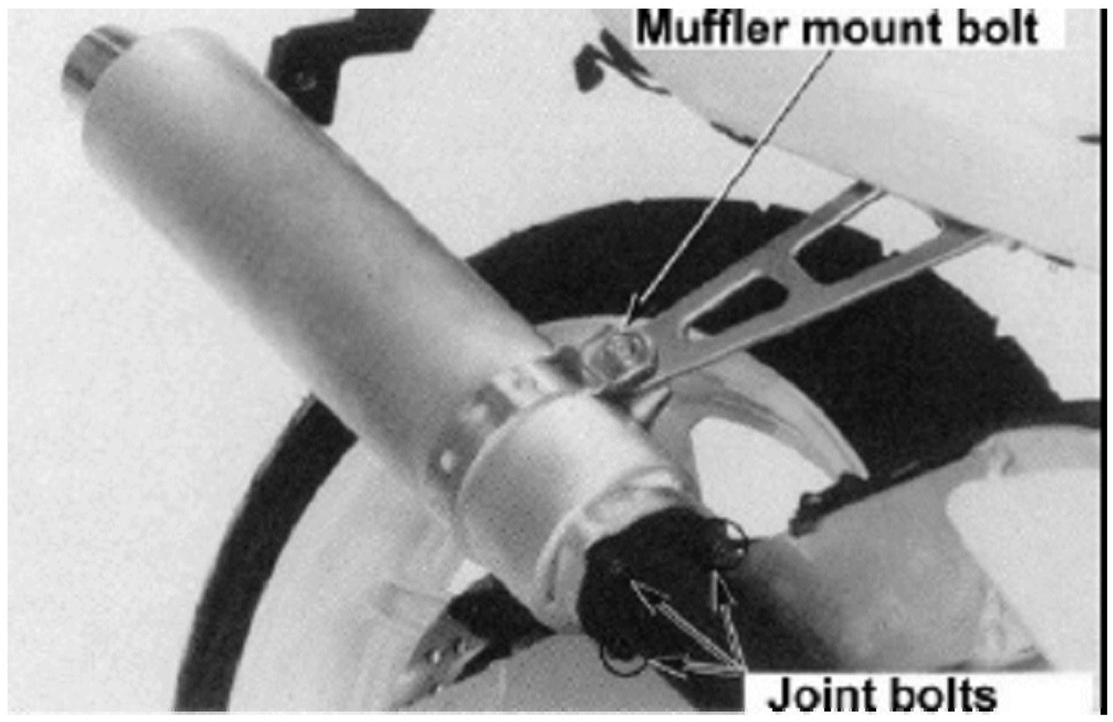
Muffler removal

Caution

Remove while the muffler and the pipe are cool.

Unscrew muffler joint bolts.

Common tools:
Torx bit (T30) 07703-0010200

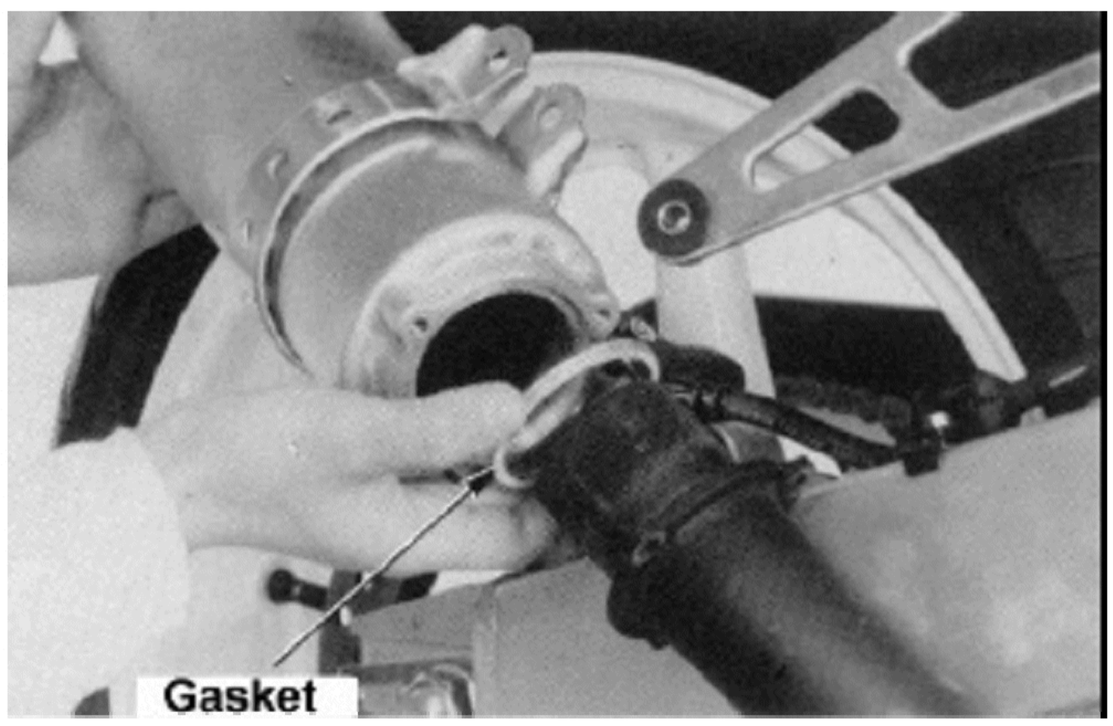


Unscrew the muffler mount bolt/nut to remove the muffler and gasket.

Muffler installation

Install the new gasket.
Follow the removal procedure in reverse order.

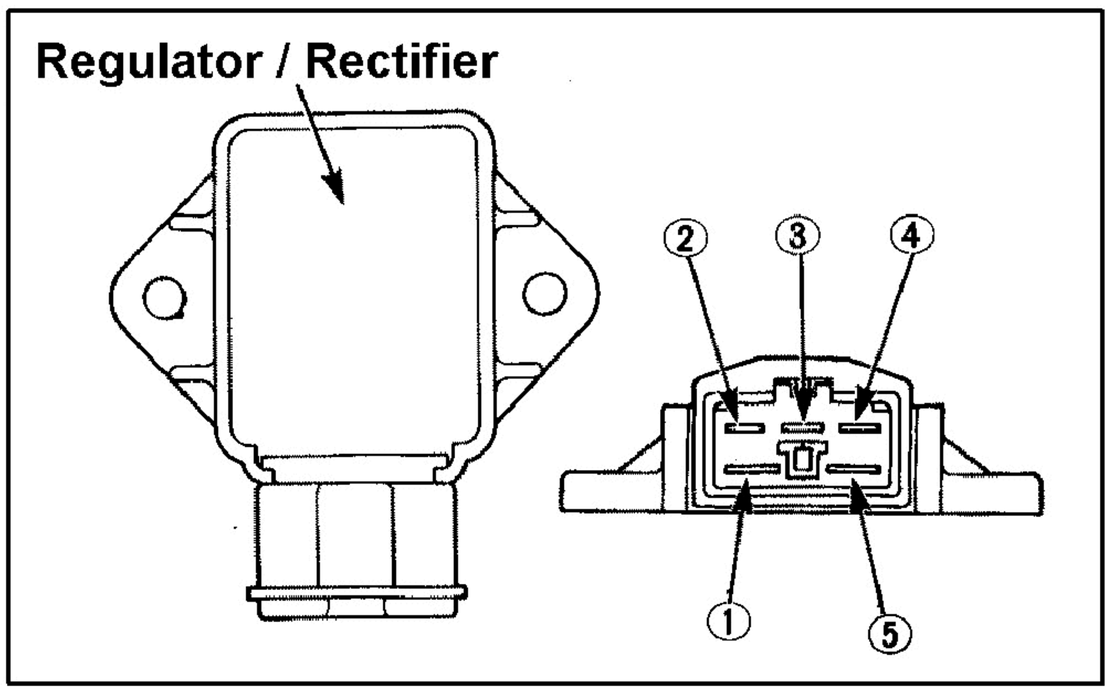
Torque:
Muffler joint bolt: 1.6 – 2.0kg-m
Muffler mount bolt 2.4 – 3.0kg-m



Battery & Charging System

Regulator / rectifier inspection

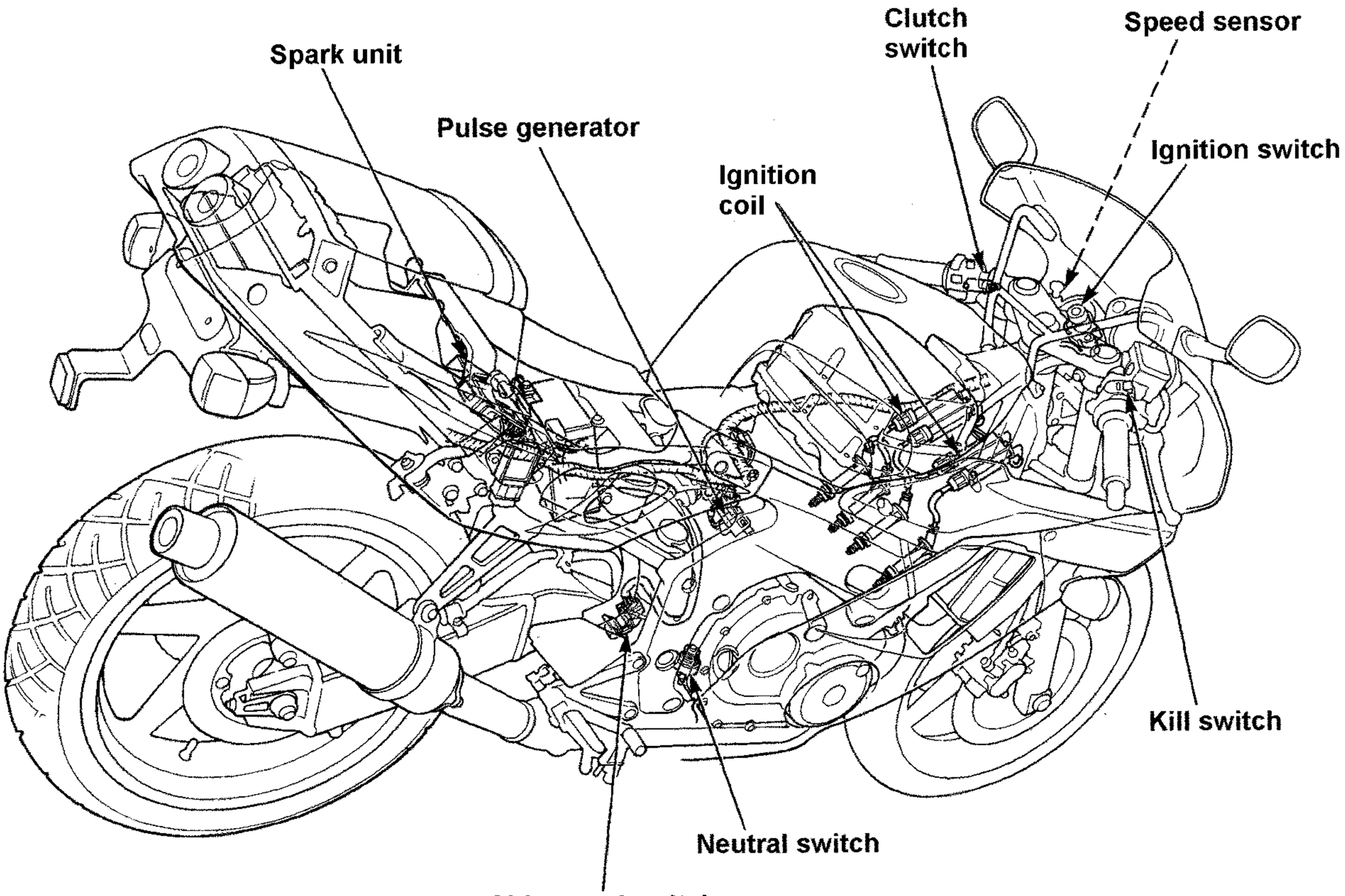
- Do not touch the probes while measuring.
- Use one of the following multi meters. Other products may indicate different resistance values.
  - KOWA 07411-0020000 digital multi meter
  - SANWA 07308-0020001 analogue multi meter
  - KOWA TH – 5H
- Set the range as follows:
  - SANWA k Ω range
  - KOWA Rx100Ω range (CDI Ω, Rx100 for digital multi meter)
- Multi meters may have false indication when their batteries are low. Check the battery first if the measured value is faulty.
- Multiply by 100 to the indicated value to obtain measured value in KOWA products.

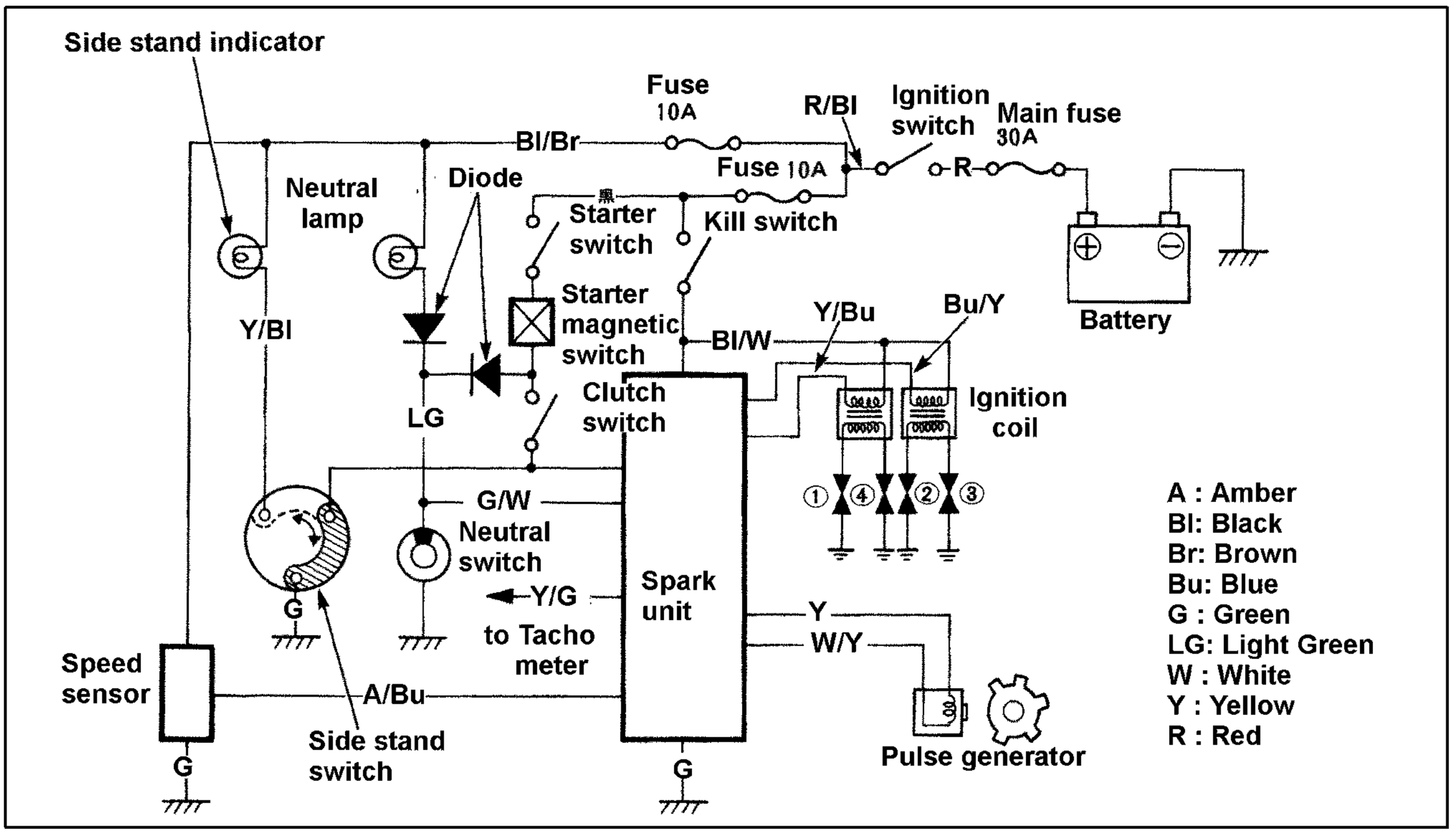


Unit: kΩ

⊖ \ ⊕	①	②	③	④	⑤
①		∞	∞	∞	∞
②	0.5－10		∞	∞	∞
③	0.5－10	∞		∞	∞
④	0.5－10	∞	∞		∞
⑤	0.7－15	0.5－10	0.5－10	0.5－10	

Ignition System





General Information

- Follow the troubleshooting chart (24-15) for the ignition system check.
- The ignition timing cannot be adjusted as the electrical advancing system is internally mounted in the unit.
- The ignition system unit is fragile. Handle with care. Whenever connecting / disconnecting the connectors or couplers, turn the ignition switch OFF beforehand.
- The majority of causes of the ignition trouble are connection problems. Inspect all connection.
- Use reasonably well charged battery. Low charged battery might not produce sufficient cranking and spark voltage.
- Use proper spark plugs. Improper spark plugs may cause engine trouble/damage.
- This section describes peak voltage inspection. Although the coil resistance inspection is also mentioned, it may not give correct idea.
- Refer to (20-9) for the neutral switch inspection and the locations of the switches / couplers.
- Refer to (20-6) for the ignition / kill switch inspection.
- This model is equipped with an ignition cut off style side stand. The system allows the ignition to activate when the gear is in neutral or the side stand is extended, or both.

Ignition system inspection

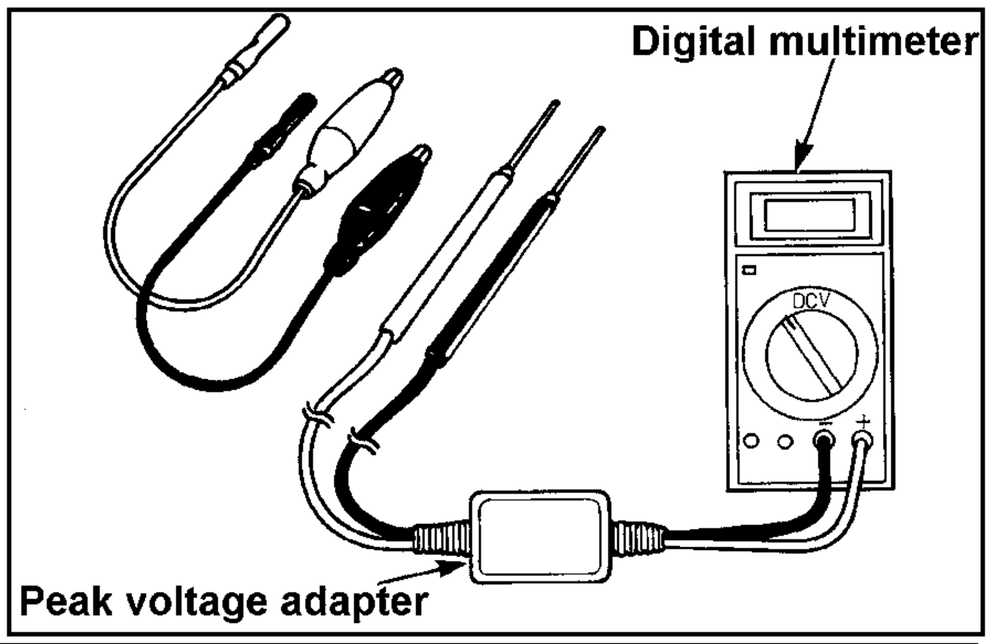
- If there is no spark, check all wiring connections and then measure the peak voltage.
- Use genuine multi meter or a model which has an impedance of 10MΩ / DCV or above.

Connect the peak voltage adapter to the multi meter.

Measuring tools:

Peak voltage adapter	07HGJ-0020100
Genuine KOWA multi meter	07411-0020000

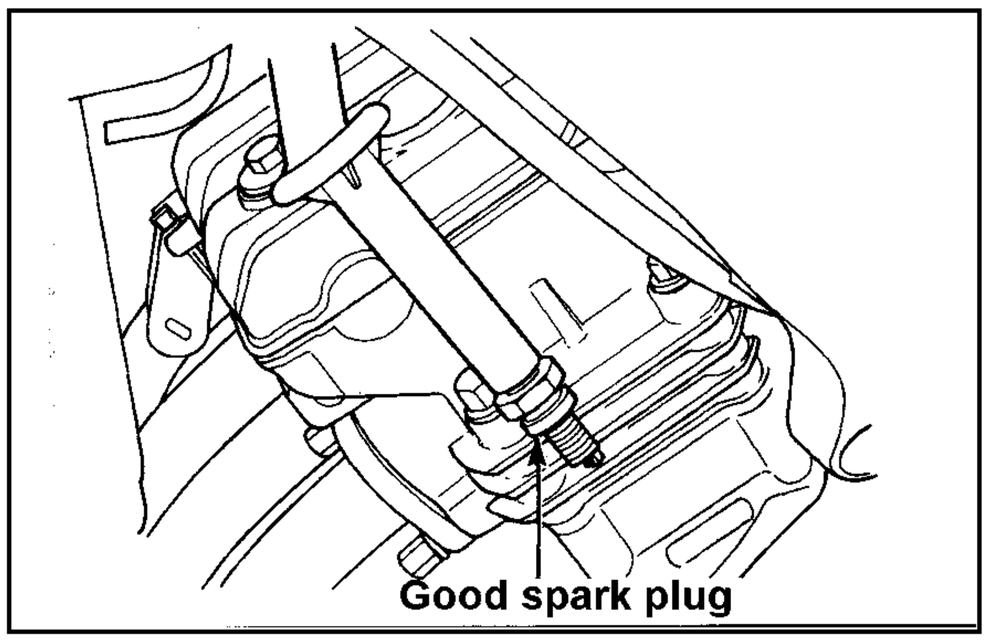
Or multi meter of 10MΩ/DCV or above impedance.



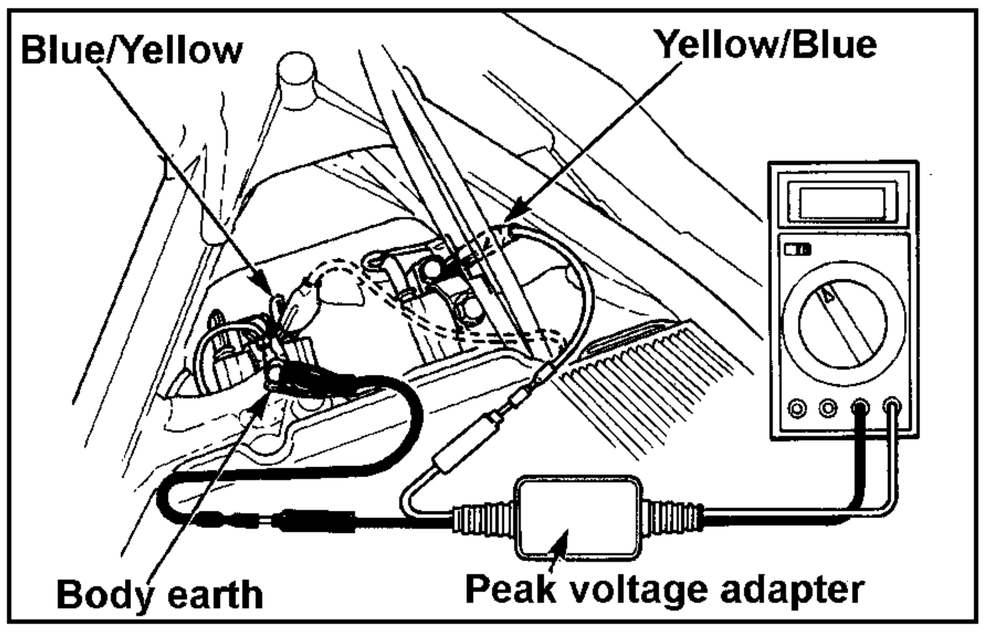
Ignition Coil primary voltage

- Check all wiring connections before measuring
- Measure the peak voltage while having cylinder compression and plugs/caps properly installed. If the plug caps were removed, the peak voltage may be over read.

If the engine ignites with normal spark, the cranking speed becomes unstable.
In the same manner as a normal spark test, leave the spark plug in the cylinder head and set new (good) spark plugs to each plug caps and earth to the engine.



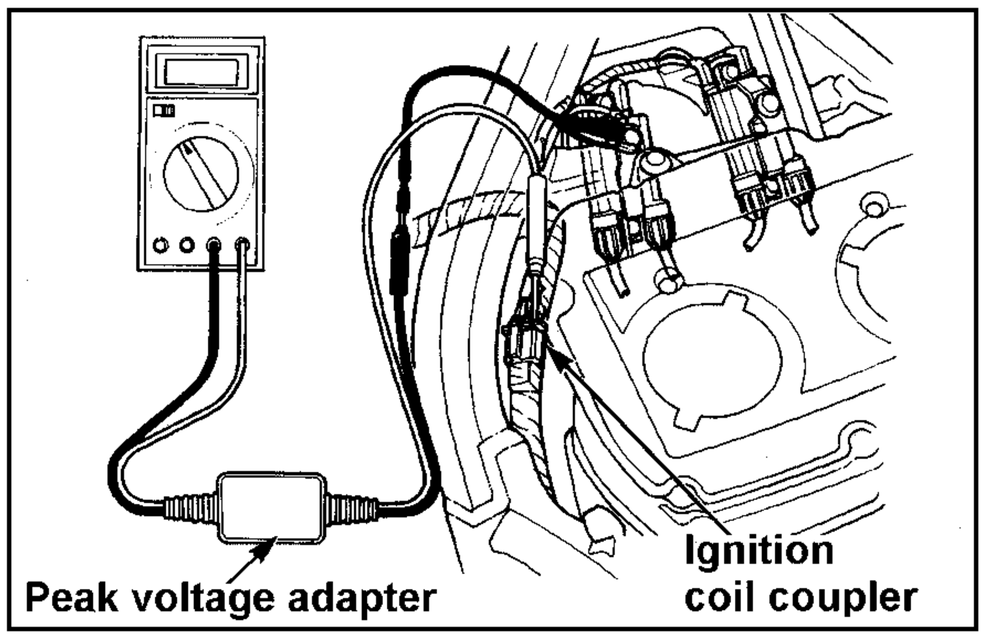
Remove the fuel tank (24-21).
Leave the leads connected to the ignition coil and connect the peak voltage adapter between the primary voltage terminal and the body earth.



Connection:
#1 and #4 ignition coils
Yellow/Blue (+) – body earth (-)
#2 and #3 ignition coils
Blue/Yellow (+) – body earth (-)
Turn the ignition switch ON and the kill switch RUN.
Monitor the initial voltage at this moment. It should be close to the battery voltage.
If there is no voltage, the ignition power circuit is faulty.
Refer to the troubleshooting to inspect the circuit before measuring the peak voltage.
Turn the ignition switch ON and the kill switch RUN.
Crank the engine with the starter motor and measure each peak voltage.
Peak Voltage: 128 volts or above

CAUTION: Do not touch the probe while measuring.

The measured peak voltages can be different between each ignition coil, as long as the values are at or above the standard.



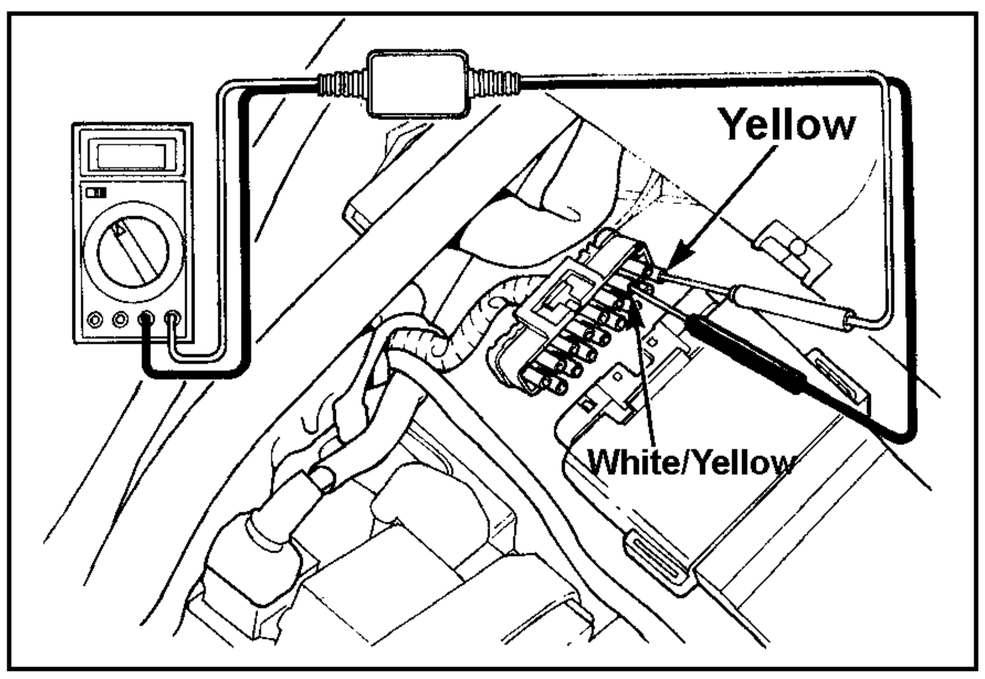
If the measured peak voltages are out of the range, connect the adapter to the ignition coil 3P-coupler terminal.
Re-measure the peak voltage and compare the result with the original value.

CAUTION: Do not touch the probe while measuring.

The measured peak voltages can be different between each ignition coil, as long as the values are at or above the standard.

Pulse Generator peak voltage

- Check the wiring connection.
- Measure the peak voltage with cylinder compression and plugs/caps properly installed. If the plug caps were removed, the peak voltage may be over read.

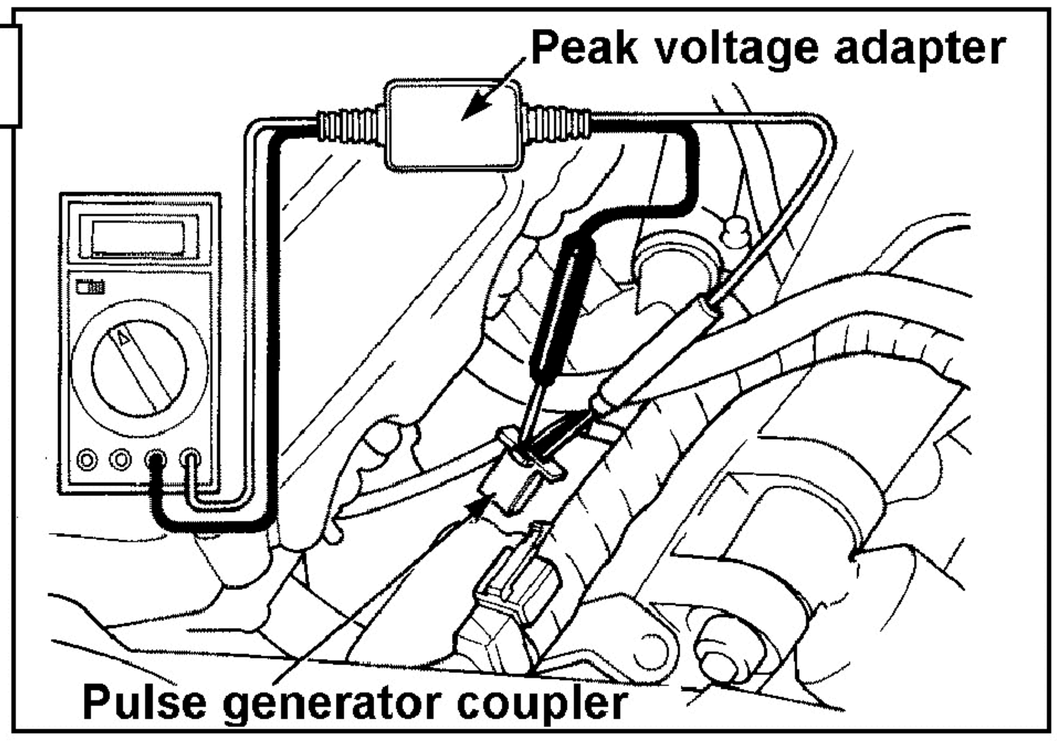


Remove the seat.
Disconnect a coupler on the spark unit.
Connect the peak voltage adapter probe to the following terminals on the harness end:
Connection: White / Yellow (-) – Yellow (+)
Turn the ignition on, the kill switch RUN.
Crank the engine and measure the peak voltage.
Peak Voltage: 0.91 volts or more

CAUTION: Do not touch the probe while measuring.

If the peak voltages at the spark unit coupler are faulty, disconnect the pulse generator 2P (White) coupler and re-measure the peak voltage between the above terminals.
Peak voltage: 0.91 volts or above

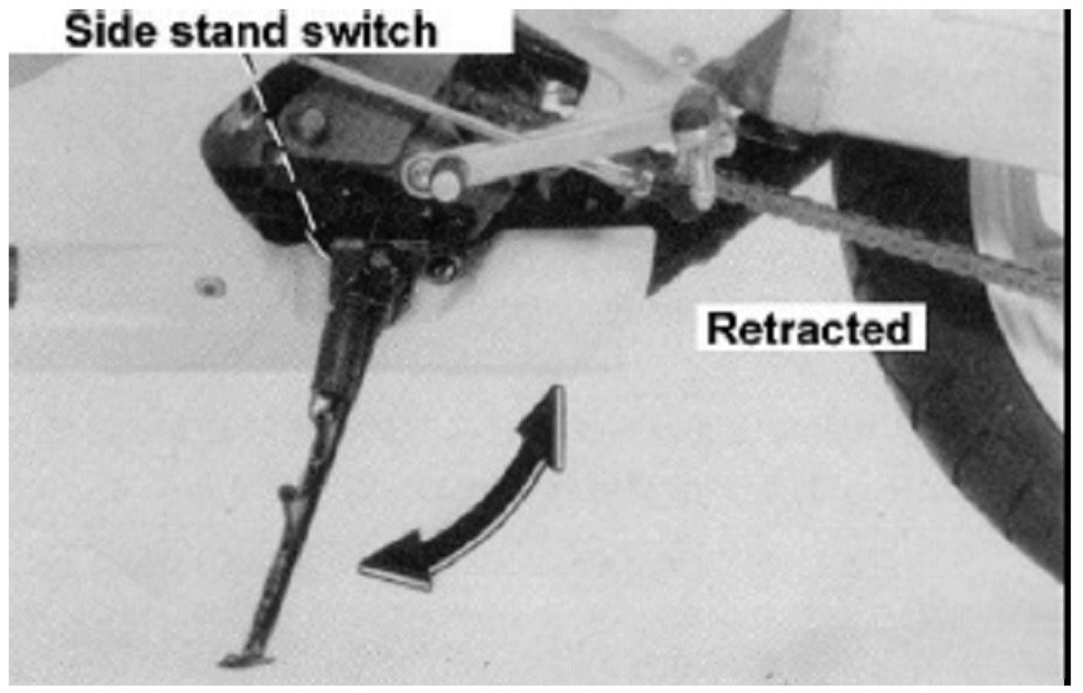
- If the values at the unit end are faulty and the ones at the pulse generator coupler are fine, check coupler connections and wire harness.
- If both values are faulty, follow the troubleshooting chart to check each item and judge the pulse generator is faulty.



Side Stand Switch

Operation

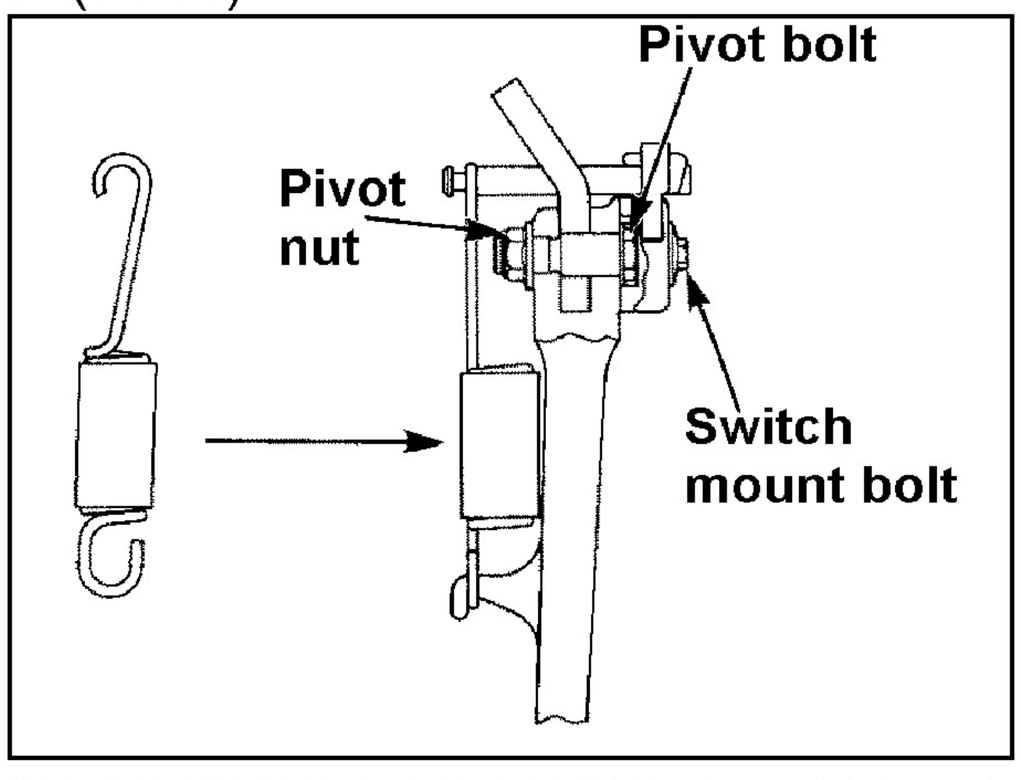
Move the side stand to check its operation.
Set the transmission neutral and start the engine with the side stand retracted.
Hold the clutch lever and select any gear position.
The engine should stop by extending the side stand.
If the engine does not stop, inspect the side stand switch (24-65).



Inspect the side stand switch attachment.

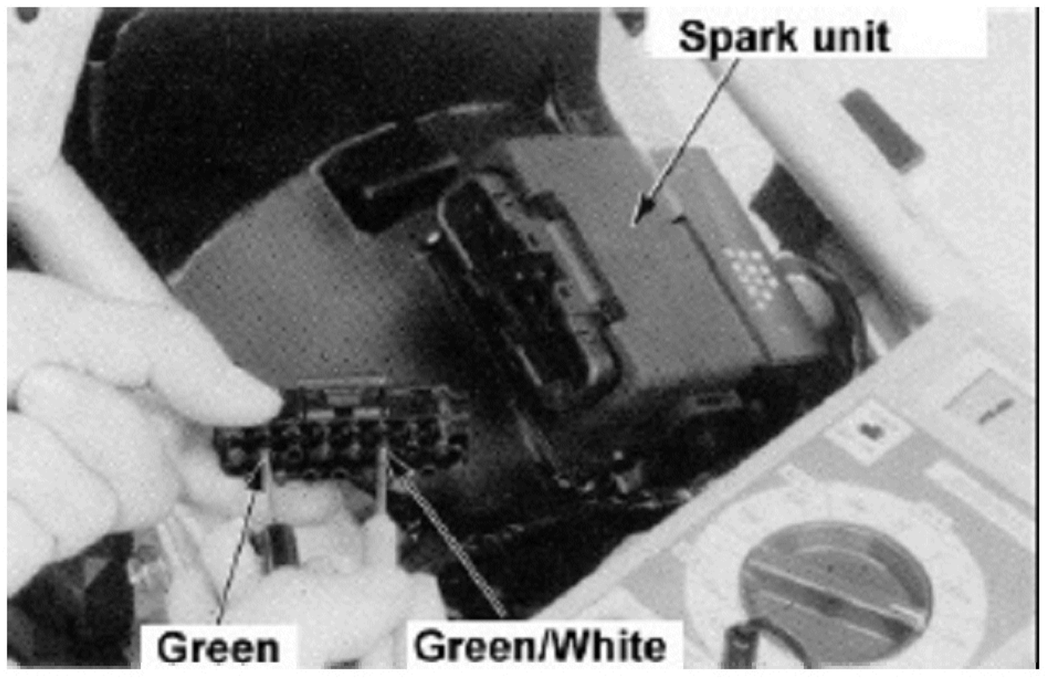
Torque:

Side stand pivot bolt	0.5 – 1.0kg-m
Side stand pivot nut	3.5 – 4.5kg-m
Side stand switch mount bolt	0.8 – 1.2kg-m



Inspection

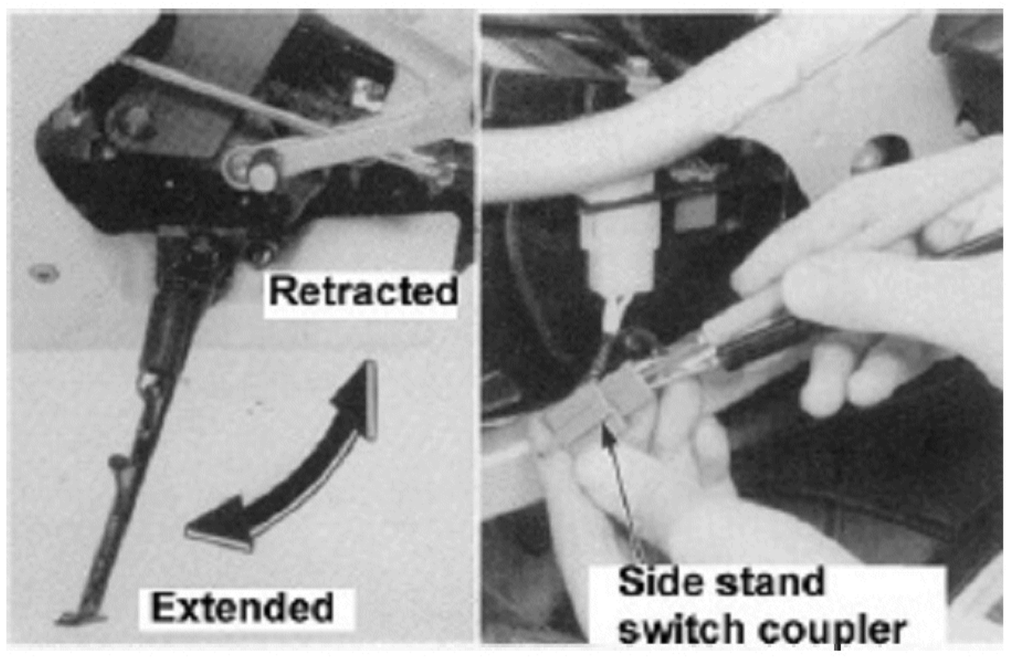
Turn the ignition “OFF”.
Remove the spark unit from the rear fender and disconnect its coupler.
Inspect continuity between the Green/White and Green terminals on the harness end coupler. The continuity should only exist when the side stand is retracted.
If the result is fault, inspect the wire harness and the side stand switch unit.



Side stand switch unit inspection

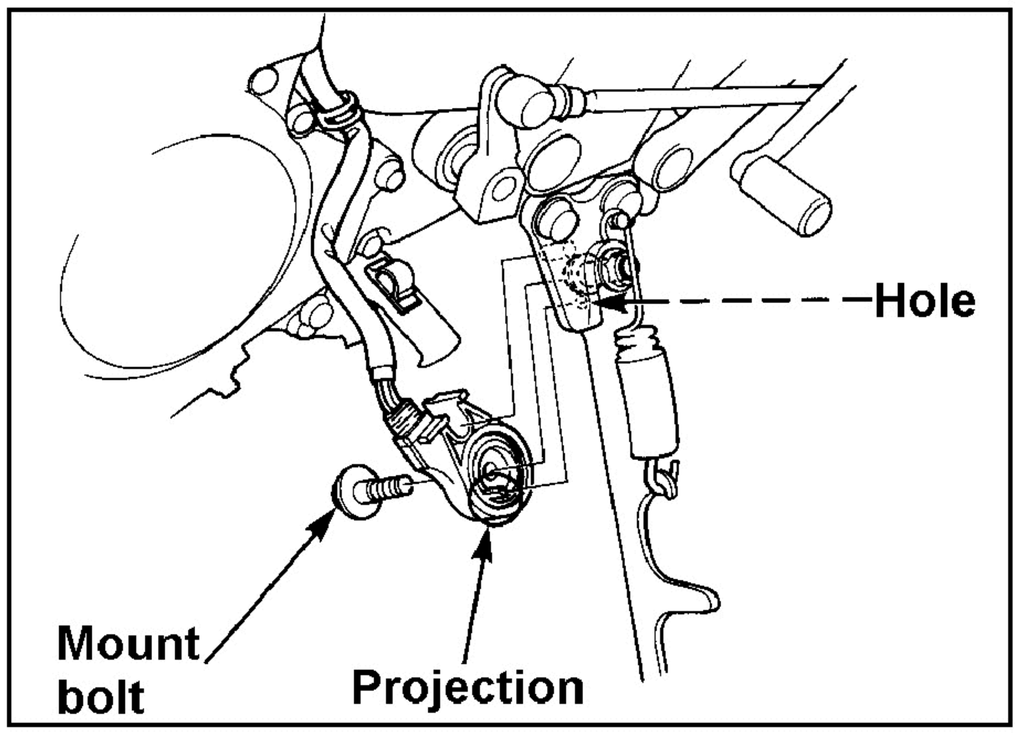
Disconnect the side stand switch 3P coupler and inspect its continuity by following the table below. Continuity should exist between O —O.

Lead colour	Green /White	Green	Yellow /Black
Side stand extended		O	O
Side stand retracted	O	O	



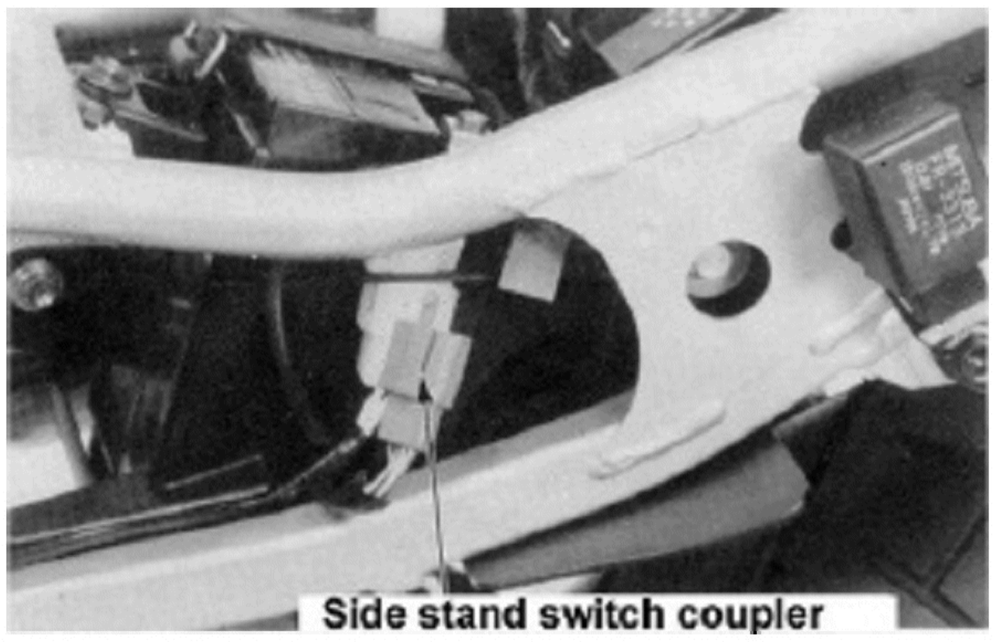
Side stand switch removal

Turn the ignition switch “OFF”.
Disconnect the side stand switch 3P coupler.
Unscrew the side stand switch mount bolt to remove the switch.



Side stand switch installation

Set the projection on the switch to the hole on the side stand to install the switch.
Screw the switch mount bolt.
Connect the 3P coupler.

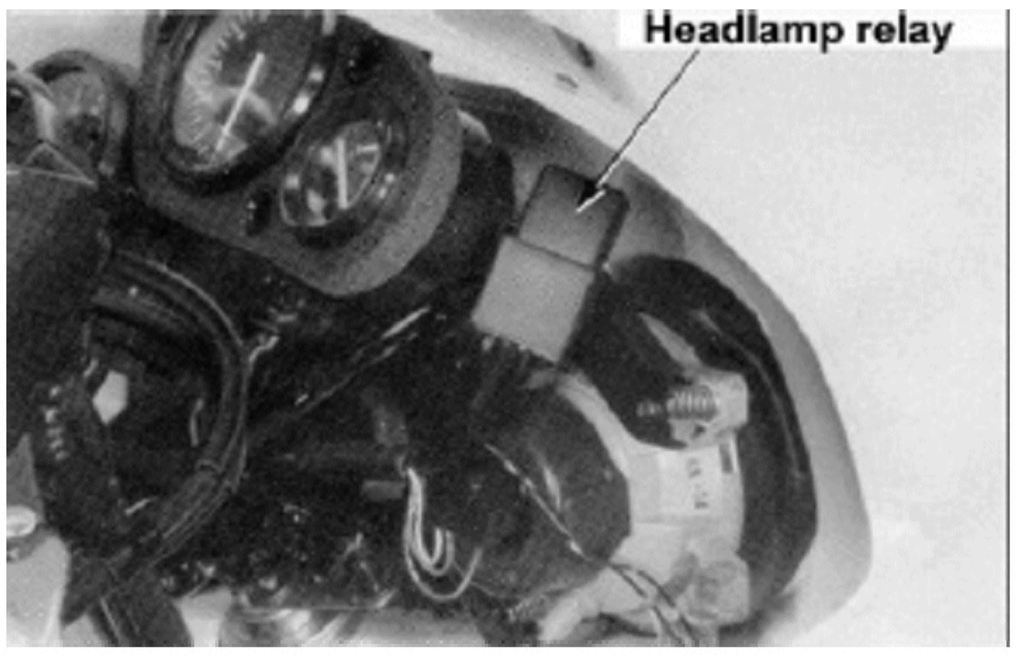


Lamps, Instruments and switches

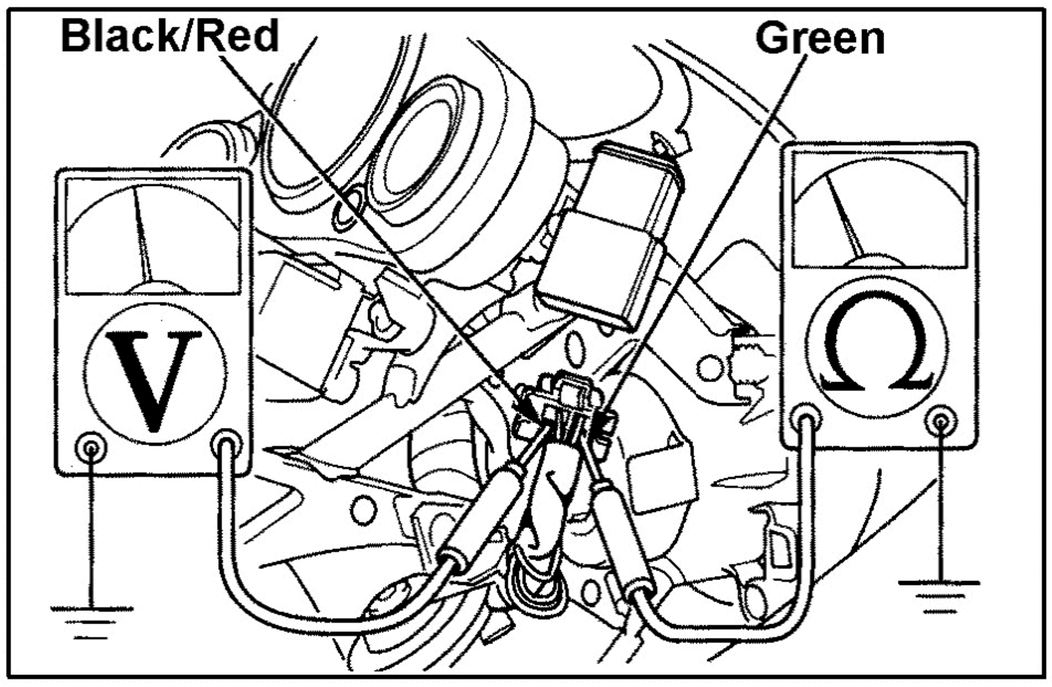
Headlamp relay

Unable to turn the headlamp “off”

Inspect the lighting switch and the dimmer switch (24-67).
If the lighting switch is fine, inspect the headlamp relay (refer to the next page).
If the relay is fine, inspect the wire harness for short circuit.



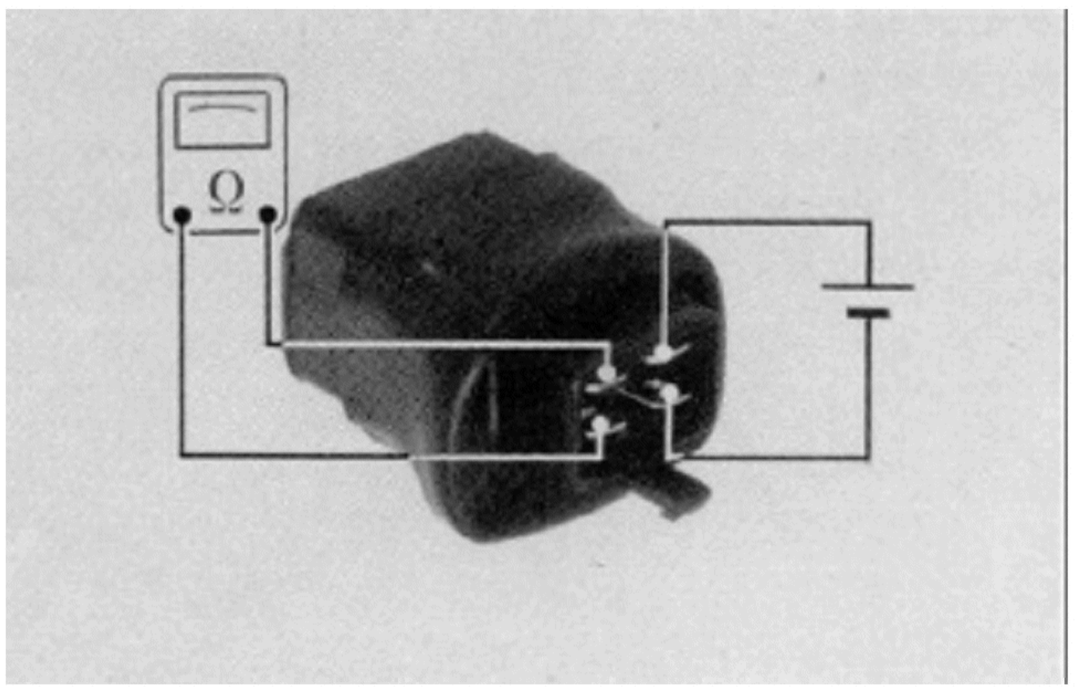
Headlamp and Switches



Inspect the headlamp bulb and the sub fuse (headlamp 15A).
Disconnect the headlamp relay coupler.
Conduct the following inspection:

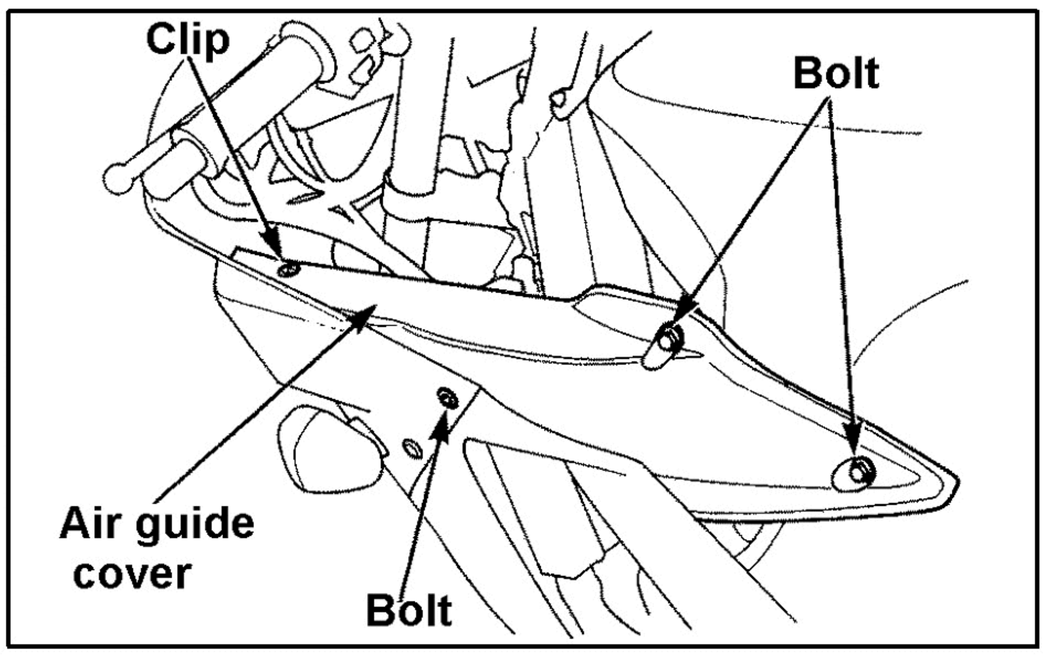
- Check the wiring connection
- Inspection continuity between the green terminal on the coupler and the body earth. If there is no continuity, repair or replace the wire harness. If there is continuity, turn the ignition ON and measure the voltage between black/red terminal and the body earth. It should have battery voltage.

If there is no voltage, the black/red lead between the headlamp relay and the fuse box has open circuit.
If the battery voltage exists, inspect the headlamp relay.
If the relay unit is fine, the leads between the headlamp relay and the headlamp coupler, or, between the headlamp relay and the lighting switch, have open circuit.
Replace the wire harness.



Headlamp Relay Inspection

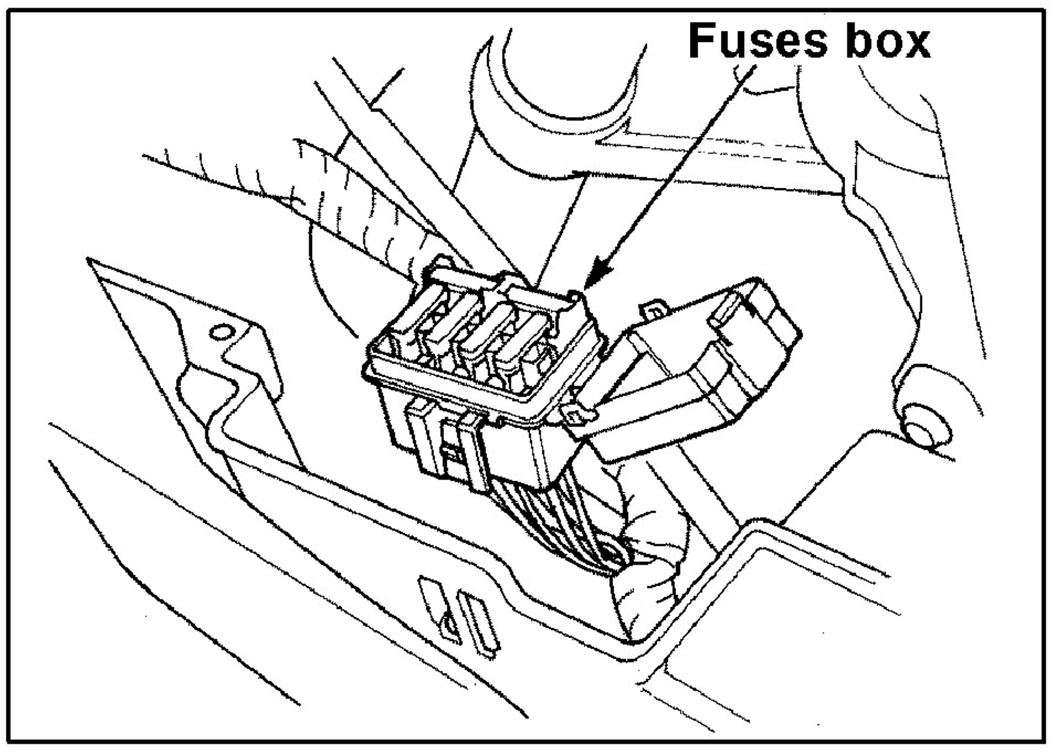
Remove the relay unit.
Connect the battery between the Blue/Yellow and Green terminals (equivalent).
Continuity should exist between Black/Red and Blue terminals (equivalent).



Sub Fuses replacement

Unscrew two left air guide mount bolts.
Unscrew the lower cowl mount bolt.
Remove the trim clip.

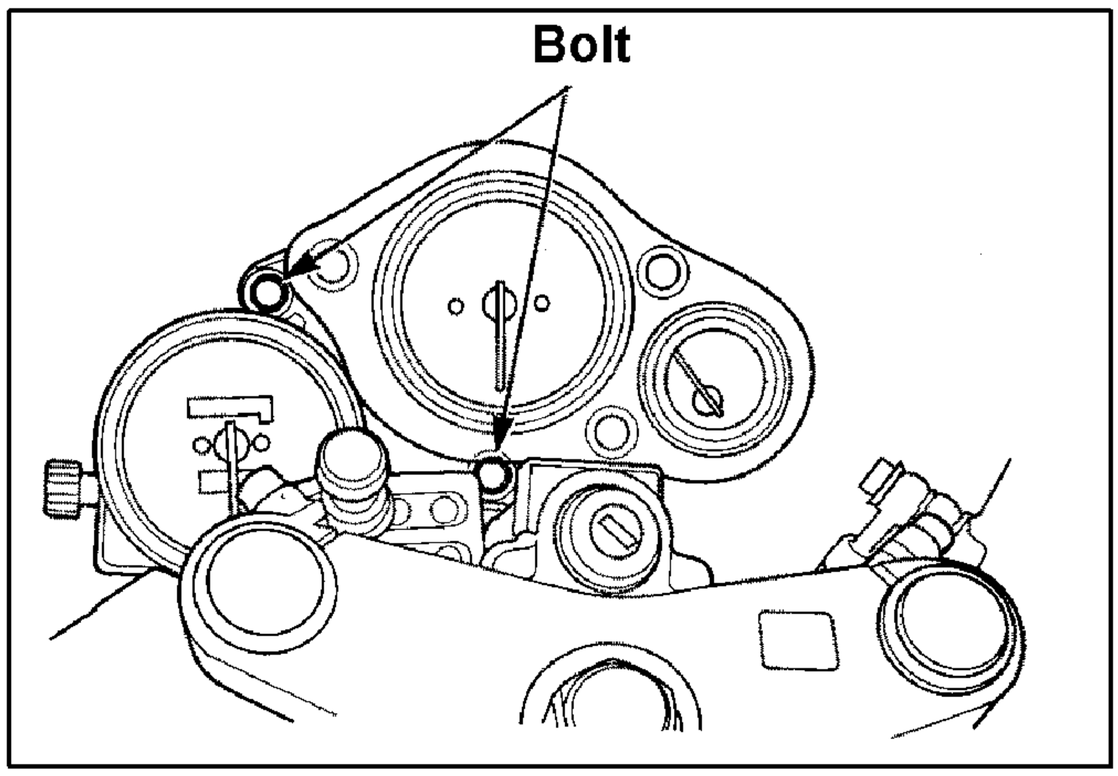
Remove the left air guide cover to replace sub fuses.



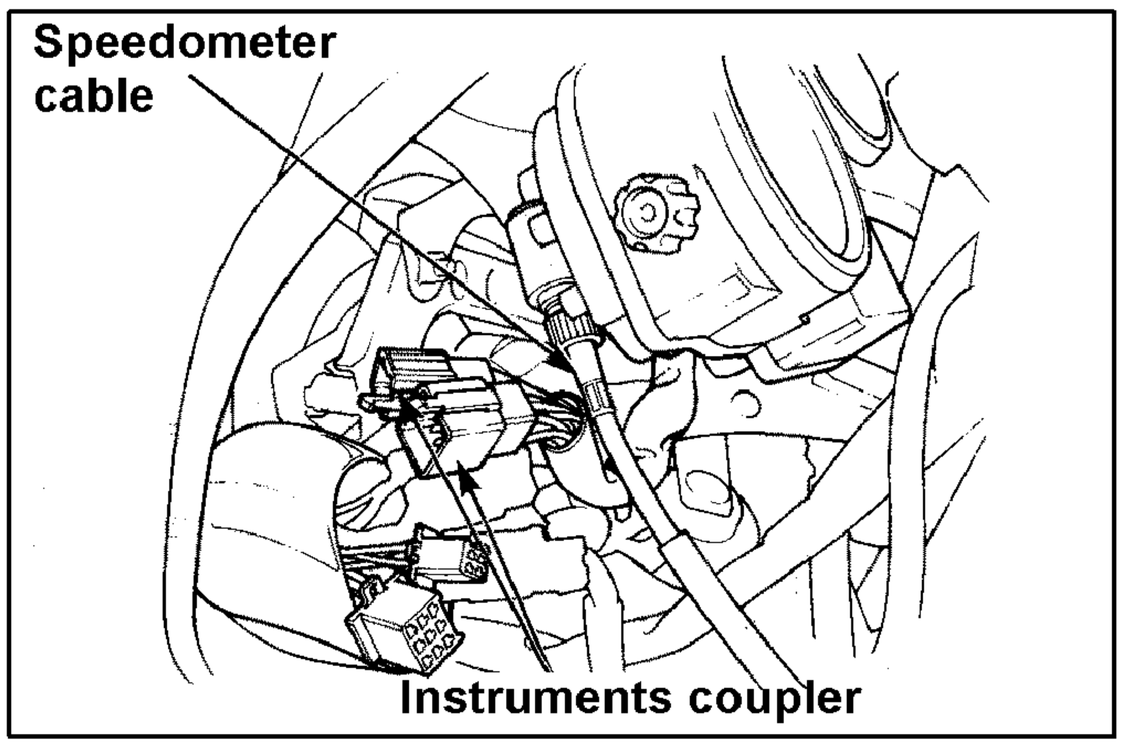
Instruments removal / installation

Unscrew two instruments mount bolts.

> The upper fairing may be left attached to remove/install instruments.



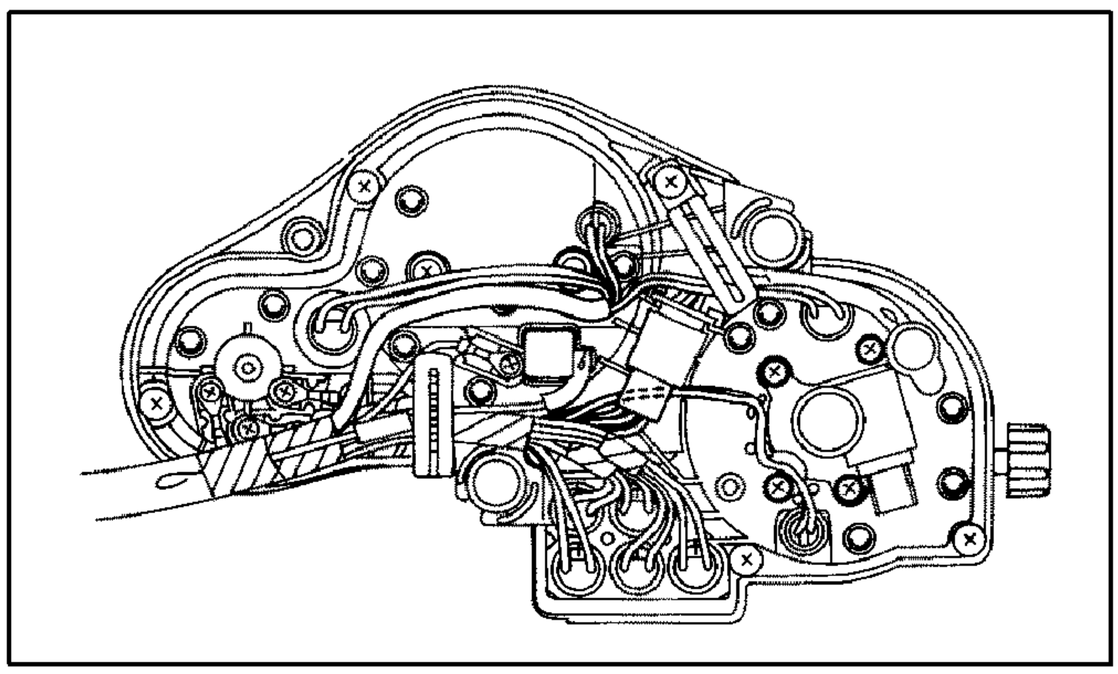
Disconnect the speedometer cable (22-34).
Lift up the instruments Assy to disconnect the wire coupler.
Remove the instruments Assy.



Instruments disassembly

Remove the trip meter reset knob.
Unscrew to remove the upper cover.
Disconnect all connectors, bulb sockets and unscrew individual instruments mount screws to disassemble the instruments.

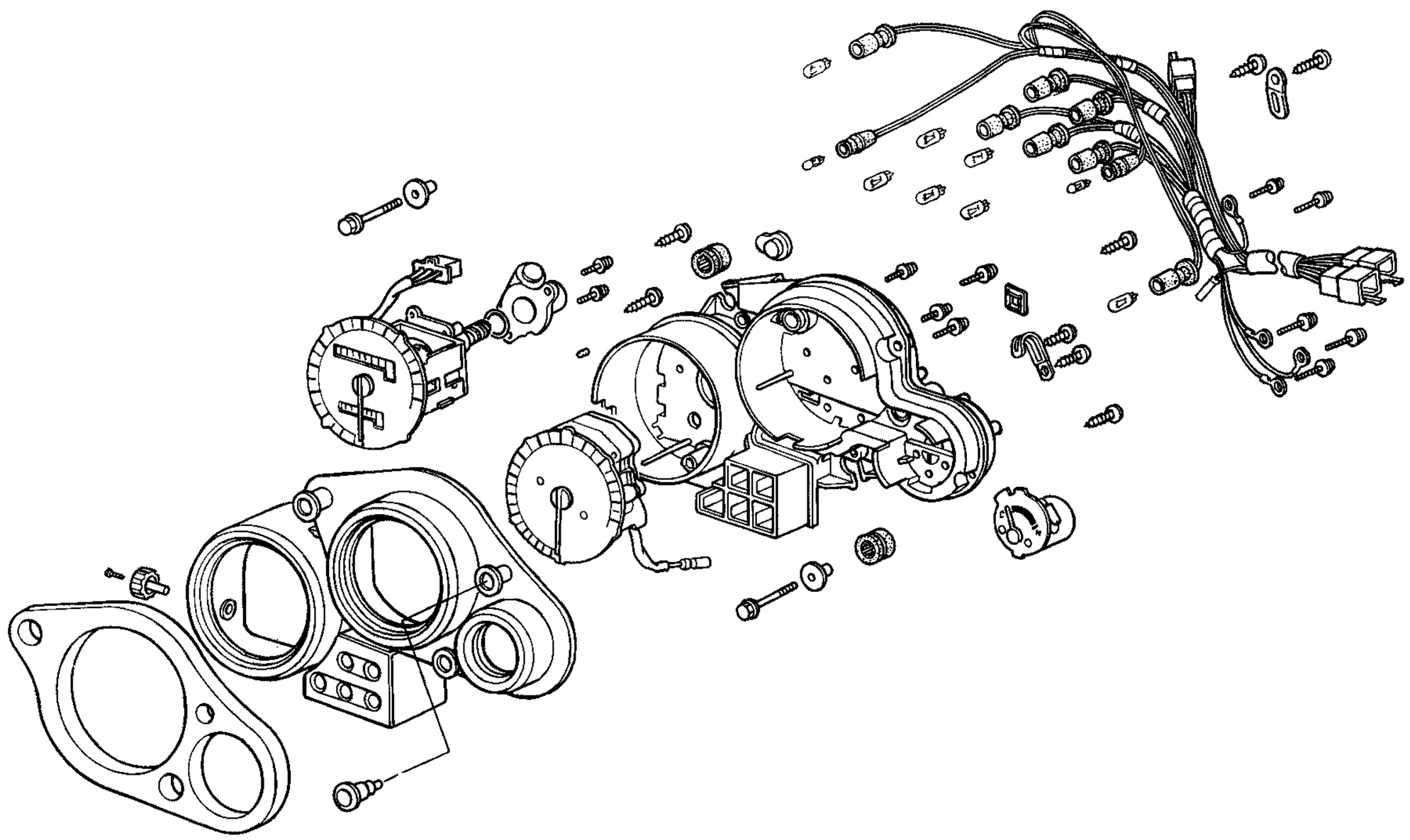
> Record the colour of leads if the screw is holding the lead before unscrewing.



Instruments Assembly / Installation

Follow the disassembly / removal procedure in reverse order.

- Correctly route wire harnesses.
- Install the instruments firmly to the grommets.



CBR250R (R)

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Specification

Name			Honda MC22
Length			1.975m
Width			0.675m
Height			1.080m
Wheel base			1.345m
Powerplant type			MC14E
Total displacement			0.249l
Type of fuel			Petrol
Vehicle weight		Front	81kg
		Rear	77kg
		Total	158kg
Maximum capacity			2
Vehicle gross weight		Front	102kg
		Rear	166kg
		Total	268kg
Tyres		Front	110/70R17 54H
		Rear	140/60R17 63H
Minimum clearance			0.130m
Performance	Brake stop distance (initial km/h)		14.0m (50km/h)
	Minimum turning radius		2.9m
Powerplant	Starting system		Electric
	Type		Petrol 4 cycle
	Cylinder layout		Inline 4 cylinder
	Combustion chamber		Pent Roof type
	Valve operation		DOHC gear driven, inlet 2, exhaust 2
	Bore x stroke		48.5 x 33.8mm
	Compression ratio		11.5
	Compression		13.0kg/cm² - 400rpm
	Maximum output		40PS/14,500rpm
	Maximum torque		2.4kg-m / 11,500rpm
	Valve Operation: Inlet	Open	20°BTDC (1mm lifted)
		Close	20°ABDC (1mm lifted)
	Valve Operation: Exhaust	Open	29°BBDC (1mm lifted)
		Close	3°BTDC (1mm lifted)
	Valve clearance	IN	0.16mm (cool)
		EX	0.23mm (cool)
	Unloaded rev		1,500rpm
	Lubrication: Type		Compress – spray
	Lubrication: Pump type		Trochoid
	Lubrication: Filter type		Total flow filtering Screen and paper
	Lubrication: Oil capacity		2.7l
Cooling system			Water cooled, electrical

Fuel System	Air filter type		Filter paper
	Fuel tank capacity		13.0l
	Carburettor: Type		VP20
	Carburettor: Throttle valve diameter		30mm
	Carburettor: Venturi diameter		29mm
Electrical System	Ignition system: Type		Full transistor, battery ignition
	Ignition system: Timing		20°BTDC / 1,500rpm
	Ignition system: Spark plug	NGK	CR 9 EH 9, CR10EH 9
		ND	U27FER-9, U31FER-9
	Ignition system: Plug gap		0.8 – 0.9mm
	Battery capacity		12V 6AH
Transmission	Clutch: Type		Multiple wet spring coil
	Clutch: Operation		Mechanical
	Motor to transaxle ratio		2.966
	Gear Reduction: Type		Constant Mesh
	Gear Ratio	Low	2.733
		Second	2.000
		Third	1.590
		Fourth	1.333
		Fifth	1.153
		Sixth	1.035
	Reduction: No 1	Gear type	Chain
		Reduction ratio	3.058
Wheels	Front: Caster		24°00’
	Front: Trail		89mm
	Tyre pressure	Front	2.25kg / cm²
		Rear	2.50kg/cm²
Steering angle		Front	31°
		Rear	31°
Brake system		Front	Hydraulic disc brake
		Rear	Hydraulic disc brake
Suspension		Front	Telescopic
		Rear	Swing arm
Frame type			Diamond
Frame number			MC22 – 1100001
Engine number			MC14E - 1400001

- **Torque Settings**

Engine

Part	Qty	Screw Dia (mm)	Torque (kg-m)	Notes
Cylinder head cover special bolt	6	6	0.8 – 1.2	
Camshaft holder flange bolt	16	6	1.2 – 1.6	
Cylinder head flange bolt 7mm 8mm	9 1	7 8	2.7 – 3.0 2.4 – 2.7	Apply oil Apply oil
Spark plug	4	10	1.0 – 1.4	
Connecting rod (connecting rod bolt / nut)	8	-	1.6 – 2.0	Apply oil
Gear train holder bolt	2	8	1.8 – 2.2	
Alternator flywheel	1	10	8.0 – 9.0	UBS
Starter clutch	1	10	8.0 – 9.0	UBS
Clutch centre lock nut	1	20	10.0–12.0	Stake
Oil pump driven sprocket flange bolt	1	6	1.3 – 1.7	Apply screw locker
Oil pressure switch	1	PT / 1/8	1.0 – 1.4	Apply sealant
Neutral switch	1	10	1.0 – 1.4	
Oil filter centre bolt	1	20	1.5 – 2.0	
Drain plug bolt	1	14	2.5 – 3.5	
Crankcase flange bolt 6mm 8mm	16 11	6 8	1.0 – 1.4 2.1 – 2.5	Apply oil Apply oil
Shift drum centre (shifter pin)	1	-	2.1 – 2.5	Apply screw locker
Gear shift return spring pin	1	8	2.1 – 2.5	
Centre shift fork lock bolt	1	7	1.6 – 2.5	
Lower crankcase	1	18	4.0 – 5.0	Apply screw locker
Timing hole cap	1	14	0.8 – 1.2	
Crankshaft hole cap	1	30	0.8 – 1.2	
Drive sprocket special bolt	1	10	5.0 – 6.0	
Carburetor synchronisation joint	4	5	0.2 – 0.3	

Frame

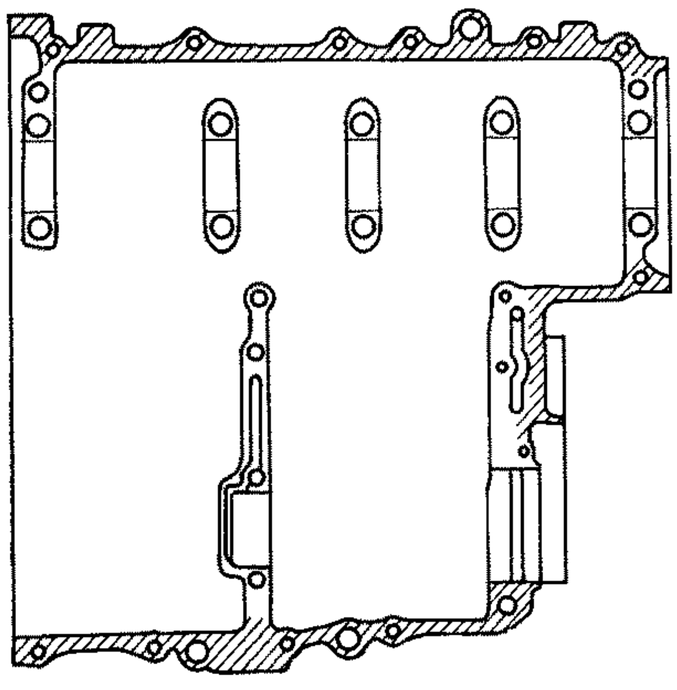
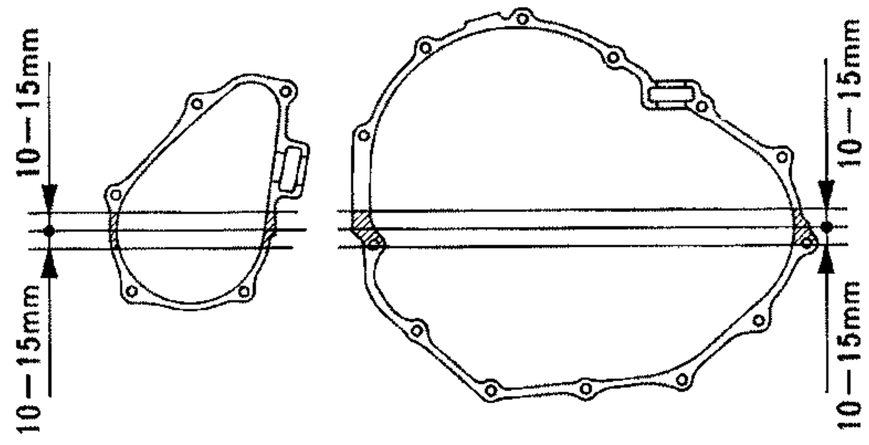
Part	Qty	Screw Dia (mm)	Torque (kg-m)	Notes
Engine mount Front right Front left Rear upper Rear lower Rear upper bracket Rear lower bracket	1 1 1 1 2 2	10 10 10 10 8 10	4.5 – 5.5 4.5 – 5.5 4.5 – 5.5 4.5 – 5.5 3.0 – 4.0 4.5 – 5.5	
Sub frame Upper Lower	2 2	10 10	4.5 – 5.5 4.5 – 5.5	
Side stand bracket bolt	2	10	4.5 – 5.5	
Side stand pivot bolt / nut	1/1	10	4.5 – 5.5	
Handlebar split bolt	2	8	2.4 – 3.0	
Handle weight mount screw	2	6	0.7 – 1.1	
Handle lever bracket bolt	4	6	0.7 – 1.1	
Radiator mount bolt upper Lower	2 1	6 6	1.0 – 1.4 1.0 – 1.4	
Fan motor switch	1	16	1.5 – 2.0	
Thermostat case mount bolt	2	6	1.0 – 1.4	
Water hose strap	-	-	0.1 – 0.2	
Fuel tank mount bolt Front Rear	1 1	6 8	1.0 – 1.4 2.4 – 3.0	
Fuel cock mount nut	1	22	3.0 – 4.0	
Fuel cock lever mount bolt	1	4	0.2 – 0.3	
Fuel cap socket bolt	3	4	0.2 – 0.3	

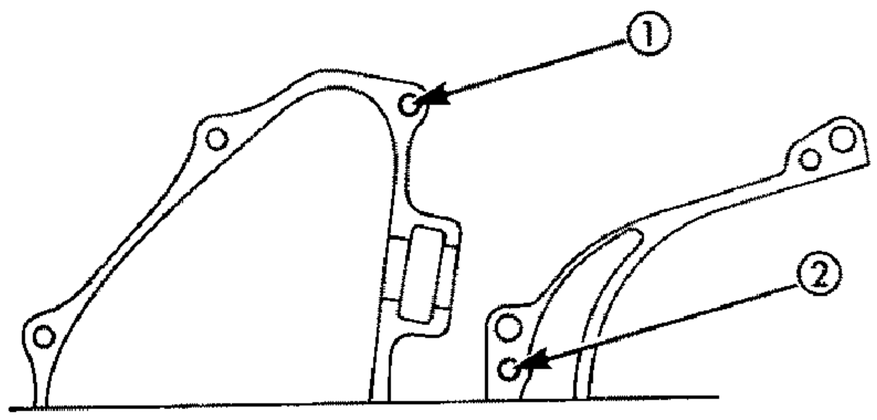
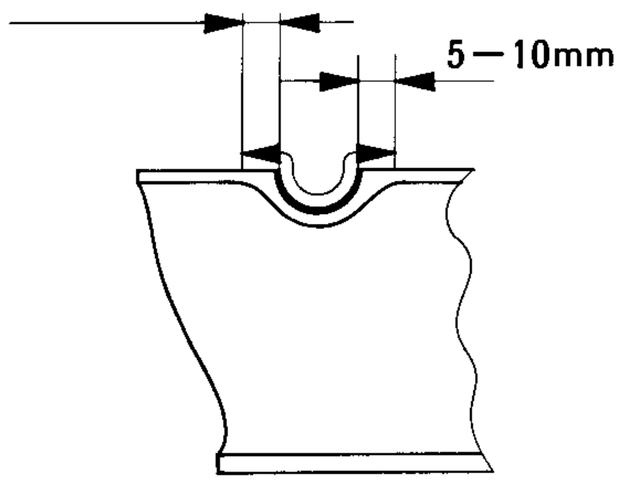
Part	Qty	Screw Dia (mm)	Torque (kg-m)	Notes
Air filter case screw	13	5	0.1 – 0.2	
Air filter case front stay bolt	1	6	1.0 – 1.4	
Upper cowl socket bolt	1	6	0.7 – 1.1	
Upper cowl stay A	2/2	8	2.4 – 3.0	
Instruments mount bolt	2	6	1.0 – 1.4	
Horn mount bolt	1	6	1.0 – 1.4	
Headlamp mount bolt	3	6	1.0 – 1.4	
Upper cowl stay B SH bolt	2	6	1.0 – 1.4	
Rearview mirror cap nut	4	6	0.8 – 1.2	
Upper cowl stay C	2	6	1.0 – 1.4	
Steering stem adjust nut	1	26	2.0 – 2.4	
Steering stem nut	1	24	9.0 – 12.0	
Bottom bridge split bolt	2	10	3.0 – 4.0	
Top bridge split bolt	2	8	2.0 – 2.5	
Rear axle nut	1	16	8.0 – 10.0	
Front axle bolt	1	14	5.5 – 6.5	
Axle holder split bolt	4	8	1.8 – 2.5	
Front brake disc bolt	12	8	4.0 – 4.5	
Driven sprocket nut	6	8	2.8 – 3.4	
Rear brake disc bolt	4	6	1.8 – 2.2	
Brake hose oil bolt	6	10	3.0 – 4.0	
Rear brake caliper slide pin - Main - Sub	1 1	12 8	2.5 – 3.0 2.0 – 2.5	
Hanger pin	3	10	1.5 – 2.0	
Hanger pin plug	3	10	0.2 – 0.3	
Brake bleeder valve	3	8	0.4 – 0.7	
Front brake caliper mount bolt	4	8	2.8 – 3.4	
Rear master cylinder hose joint screw	1	4	0.1 – 0.2	
Rear master cylinder push rod joint nut	1	8	1.5 – 2.0	
Front brake master cylinder cap screw	2	4	0.1 – 0.2	
Front brake switch screw	1	4	0.08 – 0.15	
Brake lever pivot bolt	1	6	0.05 – 0.15	
Brake lever pivot nut	1	6	0.5 – 0.7	
Front brake master cylinder holder nut	2	6	1.0 – 1.4	
Rear fork pivot nut	1	14	6.0 – 7.0	
Drive chain slider screw	2	6	0.45 – 0.60	
Rear fork pivot adjust bolt	1	26	1.0 – 2.0	
Rear fork adjust bolt lock nut	1	26	6.0 – 7.0	
Fork bolt	2	34	1.5 – 3.0	
Fork damper lock nut	2	8	1.5 – 2.5	
Rear cushion mount bolt Upper Lower	1 1	10 10	4.5 – 5.5 4.5 – 5.5	
Cushion connecting rod Frame end Cushion arm end	1 1	10 10	4.5 – 5.5 4.5 – 5.5	
Cushion arm Swing arm end	1	10	4.5 – 5.5	
Rear cushion plate screw	3	5	0.5 – 0.7	Apply screw locker
Lower cowl socket bolt	6	6	0.7 – 1.1	
Lower cowl stay Right upper Left upper Lower	1 1 2	6 6 6	0.7 – 1.1 1.0 – 1.4 0.7 – 1.1	
Change arm flange bolt	1	6	1.4 – 1.8	
Exhaust pipe joint nut	8	6	1.0 – 1.4	
Muffler mount bolt / nut	2/2	8	2.4 – 3.0	
Silencer mount bolt	3	6	1.6 – 2.0	
Step holder socket bolt	4	8	2.4 – 3.0	
Rear master cylinder mount bolt	2	6	1.0 – 1.4	

Part	Qty	Screw Dia (mm)	Torque (kg-m)	Notes
Pillion step holder flange bolt	4	8	2.4 – 3.0	
Pillion step lock lever bolt	2	6	1.0 – 1.4	
Rear fender mount bolt	4	6	1.0 – 1.4	
Rear turn signal screw	2	5	0.35 – 0.50	
Reflector nut	1	6	0.7 – 1.1	
Front fender mount bolt	4	6	0.7 – 1.1	
Side cover socket bolt	4	6	0.7 – 1.1	
Side cover joint screw	1	5	0.35 – 0.50	
Side cover hook socket bolt	2	6	1.0 – 1.4	
Seat cowl screw	2	5	0.3 – 0.4	
Seat screw	2	5	0.35 – 0.50	
Pillion seat catch	1	6	1.0 – 1.4	
Drive chain case bolt	1	6	0.8 – 1.2	
Throttle cable adjust nut (carburetor end)	1	6	0.8 – 1.2	
Throttle housing screw	2	5	0.35 – 0.50	
Clutch cable nut (engine side)	1	8	0.8 – 1.2	
Choke cable screw (carburetor side)	1	4	0.15 – 0.30	
Ignition coil bracket bolt	4	6	1.0 – 1.4	
Ignition coil screw	2	6	0.7 – 1.1	
Ignition switch socket bolt	2	8	2.4 – 3.0	
Tail lamp cap nut	2	6	0.8 – 1.2	

Lubrication & Sealant

Engine

Application	Notes	Type
Main journal bearing Connecting rod bearing Crankshaft journal Camshaft bearing and cam Transmission shift fork groove Intake / Exhaust valve stem Clutch primary driven gear / sub gear Clutch outer needle bearing Starter reduction gear shaft Connecting rod small end C1 gear collar Valve lifter Primary drive gear / sub gear 10 x 44mm pin		Molybdenum solution (engine oil: Molybdenum grease = 1:1)
Piston, piston ring and piston pin Pulse generator rotor mount bolt Cylinder head bolt (7mm) thread and seat Connecting rod nut thread and seat Clutch centre lock nut thread and seat Flywheel bolt thread and seat Starter one way clutch lock surface Clutch disc lining Clutch lifter pin Each gear / bearings Each O-Ring Other moving surface		Engine oil
Each oil seal lips Crankshaft wheel cap thread and seat		Multi purpose grease
Crankcase mating surface **Crankcase mating surface** 	Liquid sealant / adhesive (three bond 1207B or equivalent) **Liquid sealant/adhesive (Three-bond 1207B or equivalent)** 	

Application	Notes	Type
Oil pressure switch thread Thermo – sensor thread		sealant
Cylinder block sealing bolt thread Cylinder head sealing bolt thread Drive sprocket cover bolt thread (6 x 25mm) (1) Left crankcase cover mount bolt thread (2)  Breather plate bolt thread Lower crankcase sealing bolt thread Alternator lead clamp bolt thread Main bearing set plate bolt thread Oil pipe mount bolt thread/seat (block side) Left crankcase cover plate bolt thread Shift drum bearing set plate bolt thread Oil pump driven sprocket bolt thread Shift drum centre bolt thread Drive chain guide plate bolt thread Starter clutch outer bolt thread Pulse generator bolt thread		
Cylinder head camshaft plug half-round section **Cylinder head camshaft plug half-round section**  		Three bond #5211C or equivalent

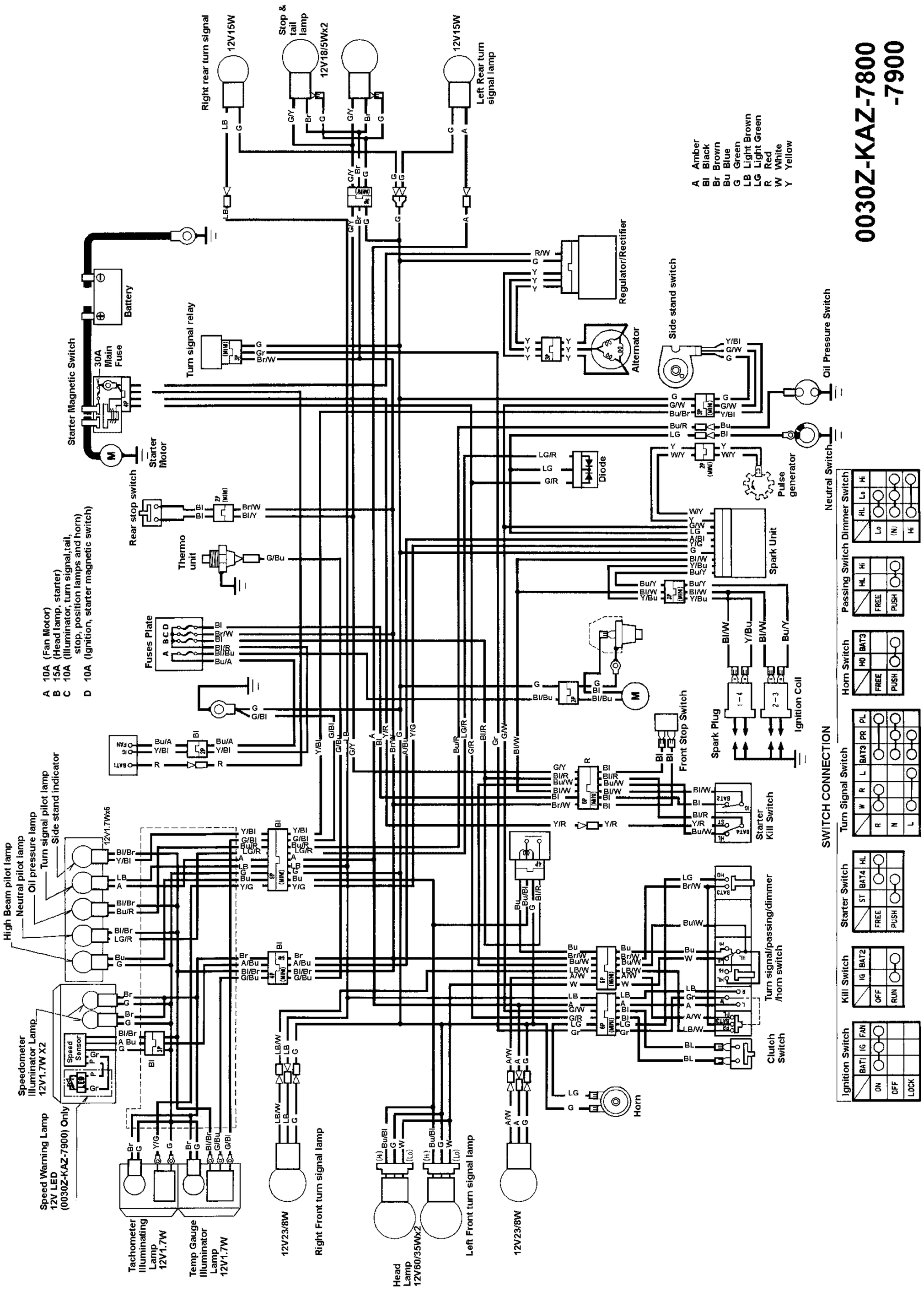
Frame

Application	Notes	Type
Rear brake pedal pivot Throttle grip pipe Left handle lever pivot Gear shift pedal pivot Seat catch hook Steering stem bearing Stem dust seal lip Pillion seat hinge		Multi purpose grease
Steering stem adjust nut thread		Engine oil
Side stand pivot		Molybdenum grease

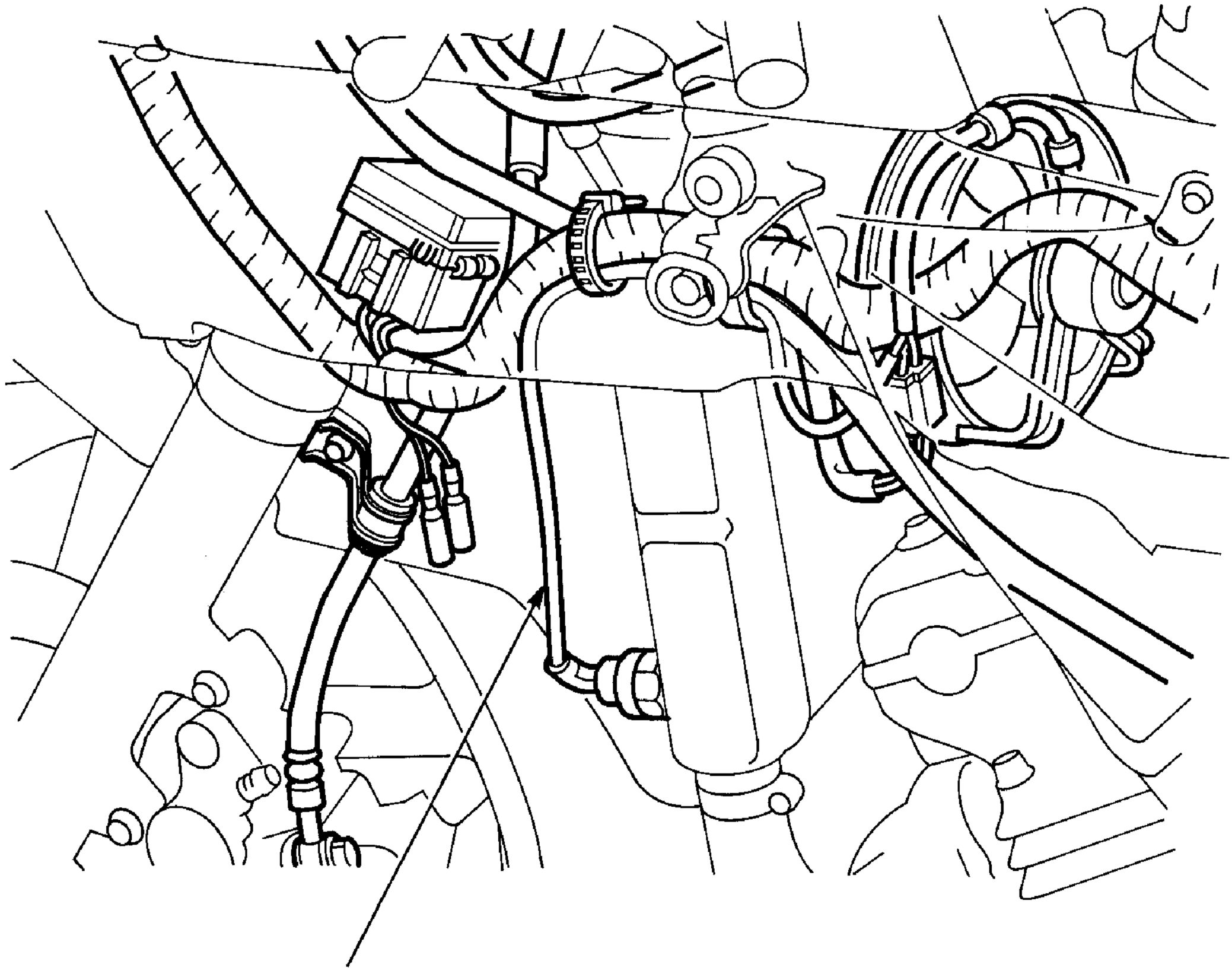
Special & Common Tools

Special Tool

Tool Name	Tool No.	Qty	Application
Drive chain staking tool	07HMH – MR10103	1	Drive chain replacement

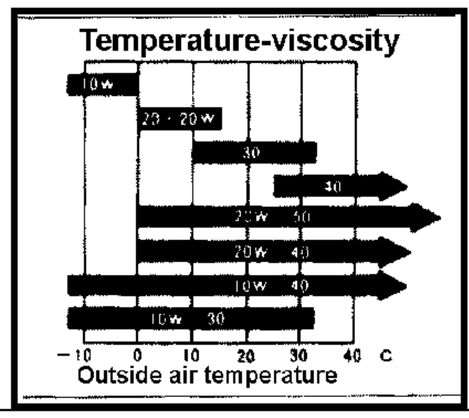

Right rear turn signal
12V15W
Stop & tail lamp
12V18/5Wx2
12V15W
Left Rear turn signal lamp
A Amber
Bl Black
Br Brown
Bu Blue
G Green
LB Light Brown
LG Light Green
R Red
W White
Y Yellow
003Z-KAZ-7800
-7900
Battery
Starter Magnetic Switch
30A Main Fuse
Starter Motor
Turn signal relay
Regulator/Rectifier
Alternator
Side stand switch
Oil Pressure Switch
Neutral Switch
Rear stop switch
Thermo unit
Diode
Pulse generator
Spark Unit
Fuses Plate
A 10A (Fan Motor)
B 15A (Head lamp, stop, position lamps and horn)
C 10A (Illuminator, tail, turn signal, starter)
D 10A (Ignition, starter magnetic switch)
Front Stop Switch
Spark Plug
Ignition Coil
Starter Kill Switch
Turn signal/passing/dimmer /horn switch
Clutch Switch
Horn
High Beam pilot lamp
Neutral pilot lamp
Oil pressure lamp
Turn signal pilot lamp
Side stand indicator
12V1.7Wx6
Speedometer Illuminator Lamp 12V1.7W X2
Speed Sensor
Speed Warning Lamp 12V LED (0030Z-KAZ-7900) Only
Tachometer Illuminating Lamp 12V1.7W
Temp Gauge Illuminator Lamp 12V1.7W
12V23/8W
Right Front turn signal lamp
Head Lamp 12V60/35Wx2
Left Front turn signal lamp
12V23/8W
SWITCH CONNECTION
Ignition Switch
Turn Signal Switch
Horn Switch
Starter Switch
Kill Switch
Passing Switch Dimmer Switch

Routing Diagram



Unit : mm

Item		Standard	Service Limit
Oil Pump	Rotor tip clearance	0.15	0.20
	Pump body – outer rotor gap	0.15 – 0.22	0.35
	Rotor – body gap	0.02 – 0.07	0.10
	Pressure	4.0 – 5.0kg/cm² (6,000 oil temp 60°c)	

Engine oil capacity	2.2L(oil change) 2.4L (oil & filter change) 2.7L (total capacity)
Designated engine oil	• Genuine Honda Ultra GP (4 cycle motorcycle, SAE 10W – 40 or SAE 20W – 50) Select proper oil based on operation temperature. 

Fuel System

Item		Standard	
Venturi Diameter		Primary bore 9.1mm equivalent, Secondary bore 29mm equivalent	
Setting mark		VP20B	
Float level		13.7mm	
Main jet		No. 1, 4 : #112	No. 2, 3 : #110
Slow jet		#35	
Idling rpm		1,500 ± 100rpm	
Throttle grip free play		2 – 6mm	
Pilot screw initial setting		2 1/8 turns out	
Fuel tank capacity	Total	13L	
	Reserve	Approx 1.6L	

Cooling System

Item		Standard	Service limit
Radiator cap valve opening pressure		1.10 – 1.40kg/cm²	Replace if out of the range: 1.10 ~ 1.40kg/cm²
Thermostat valve opening temperature	Opening temp	80 – 84°	-
	Full open	95°c	-
	Full open lift	8mm or above	-
Coolant capacity		Total approx: 1570cc (Radiator: 1350cc) (Reservoir: 220cc)	

Engine Mounting / Dismounting

Engine Weight (service)		Approx 48.5kg
Recommended engine oil		"Genuine Honda Ultra GP (4 cycle motorcycle, SAE 10W – 40 or SAE 20W 50)" • API classification SE, SF or SG grade oil (Refer to (3-2) for viscosity)
Engine oil capacity	Total capacity	2.7L
	Oil change	2.2L
	Oil and filter change	2.4L

Cylinder Head & Valve

Unit : mm

Item	Standard		Standard	Service Limit
Compression			13.0kg/cm² - 400rpm	-
Cam shaft	Cam lift	IN	28.72 – 28.80	28.69
		EX	28.51 – 28.75	28.48
	Oil clearance	1	0.015 – 0.057	0.06
		2	0.015 – 0.057	0.06
		3	0.025 – 0.067	0.07
		4	0.015 – 0.057	0.06
	Runout		-	0.05
Valve spring	Relaxed length		37.65	36.65
Valve & Valve guide	Valve stem diameter	IN	3.481 – 3.495	3.476
		EX	3.465 – 3.480	3.460
	Valve guide bore	IN	3.500 – 3.512	3.57
		EX	3.500 – 3.512	3.57
	Stem guide clearance	IN	0.005 – 0.032	0.10
		EX	0.020 – 0.047	0.13
	Valve seat contact width	IN	0.8	1.3
		EX	1.0	1.5
Valve lifter	Diameter		19.978 – 19.993	19.970
Cylinder head	Warpage		-	0.05
	Valve lifter contact area bore		20.010 – 20.026	20.035

Cylinder, Piston and Crankshaft

Unit: mm

Item			Standard	Service limit
Crankshaft and connecting rod	Connecting rod big end side clearance		0.10 – 0.25	0.30
	Crankshaft runout		-	0.05
	Crank pin oil clearance		0.028 – 0.046	0.05
	Main journal oil clearance		0.022 – 0.040	0.06
Cylinder	Bore		48.500 – 48.510	48.60
	Top warpage		-	0.05
	Out of round		-	0.005
	Taper		-	0.005
Piston Ring	Ring groove – ring clearance	Top	0.015 – 0.050	0.10
		Second	0.21 – 0.36	0.10
	Ring end gap	Top	0.1 – 0.25	0.45
		Second	0.15 – 0.30	0.45
		Oil (side rail)	0.2 – 0.8	1.00
Piston	Piston diameter		48.47 – 48.49	48.35
	Piston – cylinder clearance		0.01 – 0.04	0.10
	Piston pin hole diameter		13.002 – 13.008	13.02
	Piston pin diameter		12.994 – 13.000	12.98
	Piston – Piston pin clearance		0.002 – 0.014	0.04
	Connecting rod small end bore		13.016 – 13.034	13.05
	Piston pin – connecting rod clearance		0.016 – 0.040	0.06

			Connecting rod bore code		
			1	2	3
			30.000 – 30.006mm	30.006 – 30.012mm	30.012 – 30.018mm
Crankpin diameter code	A	27.494-27.500mm	E (Yellow)	D (Green)	C (Brown)
	B	27.488-27.494mm	D (Green)	C (Brown)	B (Black)
	C	27.482-27.488mm	C (Brown)	B (Black)	A (Blue)

Bearing Metal Thickness:
A (Blue): 1.252-1.255mm
B (Black): 1.249-1.252mm
C (Brown): 1.246-1.249mm
D (Green): 1.243-1.246mm
E (Yellow): 1.240-1.243mm

			Case bore		
			A	B	C
			31.000 – 31.005mm	31.006 – 31.011mm	31.012 – 31.018mm
Main journal dia code	1	27.993-28.000mm	E (Pink)	D (Yellow)	C (Green)
	2	27.987-27.994mm	D (Yellow)	C (Green)	B (Brown)
	3	27.982-27.988mm	C (Green)	B (Brown)	A (Blue)

Bearing Metal Thickness:
A (Blue): 1.508-1.511mm
B (Brown): 1.505-1.508mm
C (Green): 1.502-1.505mm
D (Yellow): 1.499-1.502mm
E (Pink): 1.496-1.499mm

Bl: Black
Br: Brown
Bu: Blue
G: Green
P: Pink
Y: Yellow

Clutch & Alternator

Item		Standard	Standard	Service Limit
Clutch		Clutch lever free play	10 – 20	-
		Clutch spring relaxed length	36	35
		Clutch disc thickness	2.9 – 3.0	2.6
		Clutch plate warpage	-	0.3
		Clutch outer guide bore	21.995 – 22.015	22.03
Oil pump drive sprocket bore			30.025 – 30.075	30.09
Oil pump drive gear collar		Bore	21.995 – 22.015	22.03
		Ex. dia	29.987 – 30.000	29.97
		Height	22.300 – 22.400	22.20
Main shaft diameter (at clutch outer guide)			21.980 – 21.990	21.97

Transmission

Unit : mm

Item		Standard	Standard	Service Limit
Transmission	Backlash		0.044 – 0.140	0.3
	Gear bore	M 5	25.000 – 25.021	25.05
		M 6	25.000 – 25.021	25.05
		C 1	23.000 – 23.021	23.05
		C 2	28.000 – 28.021	28.05
		C 3	28.000 – 28.021	28.05
		C 4	28.000 – 28.021	28.05
	Gear bush	M 5 bore	21.985 – 22.006	22.07
		M 5 diameter	24.959 – 24.980	24.92
		M 6 diameter	24.959 – 24.980	24.92
		C 1 diameter	22.959 – 22.980	22.92
		C 1 bore	20.020 – 20.041	20.11
		C 2 diameter	27.959 – 27.980	27.92
		C 3 diameter	27.959 – 27.980	27.92
		C 4 diameter	27.959 – 27.980	27.92
	Main shaft diameter	M 5 Clutch outer guide	21.963 – 21.977 21.980 – 21.990	21.93 22.20
	Counter shaft diameter	C 1	19.987 – 20.000	19.77
	Gear bush or shaft clearance	M 5 bush	-	0.10
		M 5 bush-shaft	-	0.15
		M 6 bush	-	0.10
		C 1 bush	-	0.10
		C 1 bush-shaft	-	0.15
		C2 bush	-	0.10
		C 3 bush	-	0.10
		C 4 bush	-	0.10
	Shift fork	Catch thickness	5.93 – 6.00	5.60
		Bore	12.000 – 12.021	12.04
	Shift fork shaft	Diameter	11.960 – 11.971	11.90

Front Wheel and Suspension

Item		Standard	Service limit
Front axle runout		-	0.2mm
Front wheel rim runout	Radial	-	2.0mm
	axial	-	2.0mm
Front cushion spring relaxed length		252.1	247mm
Front fork pipe runout		-	0.2mm
Front fork oil capacity	Standard	383 ± 2.5cc	-
	Fully compressed	83mm	-
Front fork air pressure		0 – 0.4kg/cm²	-

Rear Wheel and Suspension

Item		Standard	Service limit
Rear axle runout		-	0.2mm
Rear wheel rim runout	Radial	-	2.0mm
	Axial	-	2.0mm
Rear cushion damper compression (10mm compressed)		15.4kg	12.3kg
Rear cushion spring installation length		135mm	-
Rear cushion spring relaxed length		143.8mm	140.9mm

Brake System (Disc Brake)

Item		Standard	Service limit
Brake disc runout	Front	-	0.4
	Rear	-	0.3
Front master cylinder bore		12.700 – 12.743	12.755
Rear master cylinder bore		14.000 – 14.043	14.06
Front master piston diameter		12.657 – 12.684	12.65
Rear master piston diameter		13.957 – 13.984	13.95
Front caliper cylinder bore		25.400 – 25.450	25.46
Rear caliper cylinder bore		38.180 – 38.230	38.24
Front caliper piston diameter		25.335 – 25.386	25.33
Rear caliper piston diameter		38.098 – 38.148	38.09

Battery and Charging System

Item		Standard
Battery	Capacity	12V 6AH
	Charging Current	0.6A (10H)
	Discharging Voltage	13.0 – 13.2V (20°c)
Charging Start		2,000rpm
Regulator / Rectifier	Type	Non – contact type
	Regulated Voltage	14.0 – 15.0V
Alternator coil resistance (20°c)		0.1 – 0.5Ω
Alternator performance		270W / 5,000rpm

Ignition System

Item			Standard	
Spark Plug			NGK	ND
			CR9EH – 9	U27FER – 9
			CR10EH – 9	U31FER - 9
Plug gap			0.8 – 0.9mm	
Ignition timing “F” mark			20°BTDC / 1,500rpm	
Ignition coil	Primary coil resistance (20°c)		2.0 – 3.5Ω	
	Primary coil peak voltage		128V	
	Secondary coil resistance (20°c)	With cap	23 – 37kΩ	
		Without cap	13 – 17kΩ	
Pulse Generator	Coil resistance (20°c)		340 - 420Ω	
	Peak voltage		0.91 or above	

Self Starter

Item		Standard	Service Limit
Starter Motor	Brush spring tension	630 – 850g	-
	Brush length	11.00 – 11.05mm	4.5mm

Lamps, Instruments and Switches

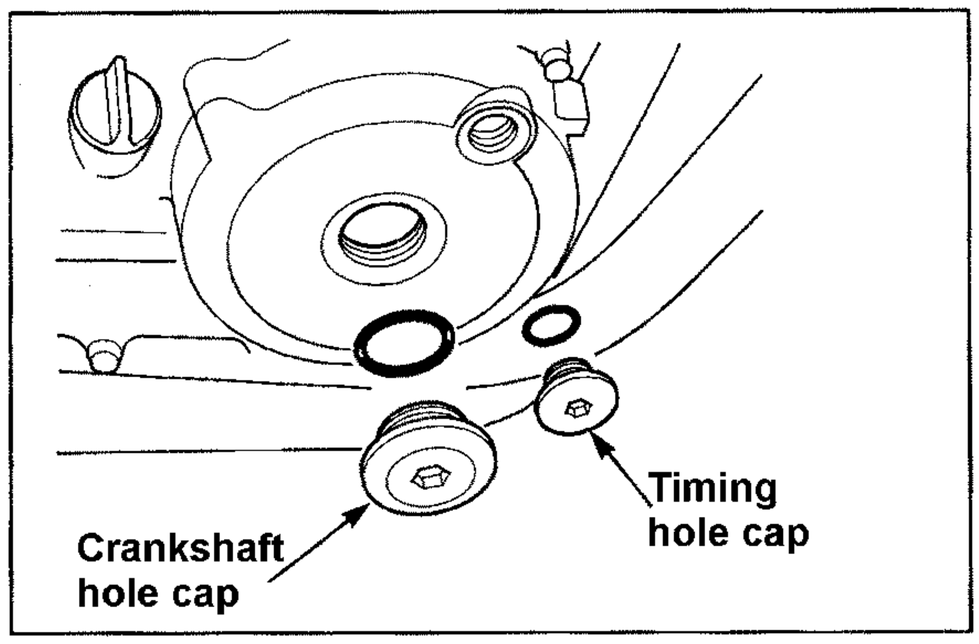
Item	Standard
Headlamp bulb	12V 60 / 35W x 2
Front turn signal bulb	12V 23 / 8 W x 2
Rear turn signal bulb	12V 15W x 2
Stop / Tail lamp bulb	12V 18 / 5 W x 2
Pilot lamps	12V 1.7 W x 4
Speed warning lamp (option)	LED
Tachometer, water temp gauge illuminator	12V 1.7 W x 2
Speedometer illuminator	12V 1.7 W x 2
Main fuse Headlamp fuse	30 A 15 A
Other fuses	10 A x 3

Valve Clearance

Inspection

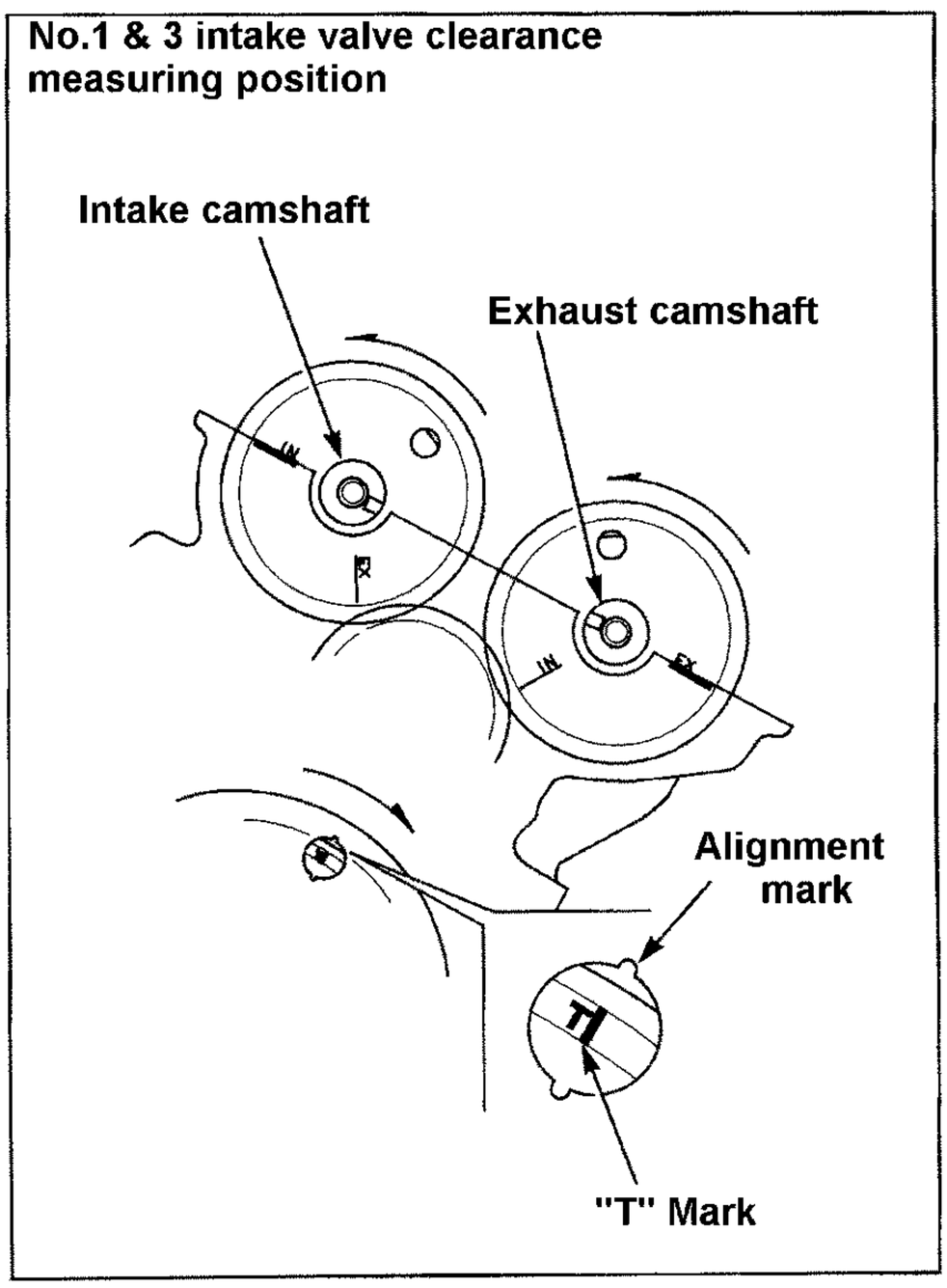
The valve clearance should be inspected when the engine is cool (35° c or less).

Remove the cylinder head cover (7-3).
Remove the crankshaft hole cap and the timing hole cap.



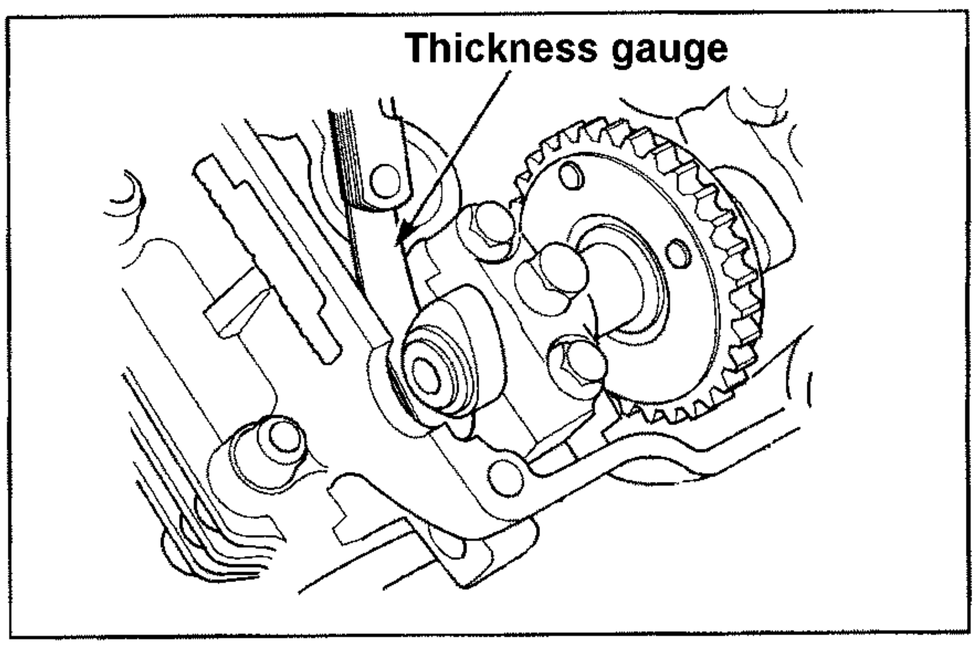
Rotate the crankshaft clockwise and align the "T" mark on the crankshaft to the mark on the right crankcase cover.
Make sure the "IN" and "EX" marks on cam gears are facing opposite directions (#1 cylinder TDC).

If the "IN" and "EX" marks are facing inwards, turn the crankshaft clockwise for one round.



Insert a thickness gauge between the camshaft and the valve lifter to measure the valve clearance on "IN" side of #1 & #3 cylinders.

Valve clearance: IN: 0.16 ± 0.03mm

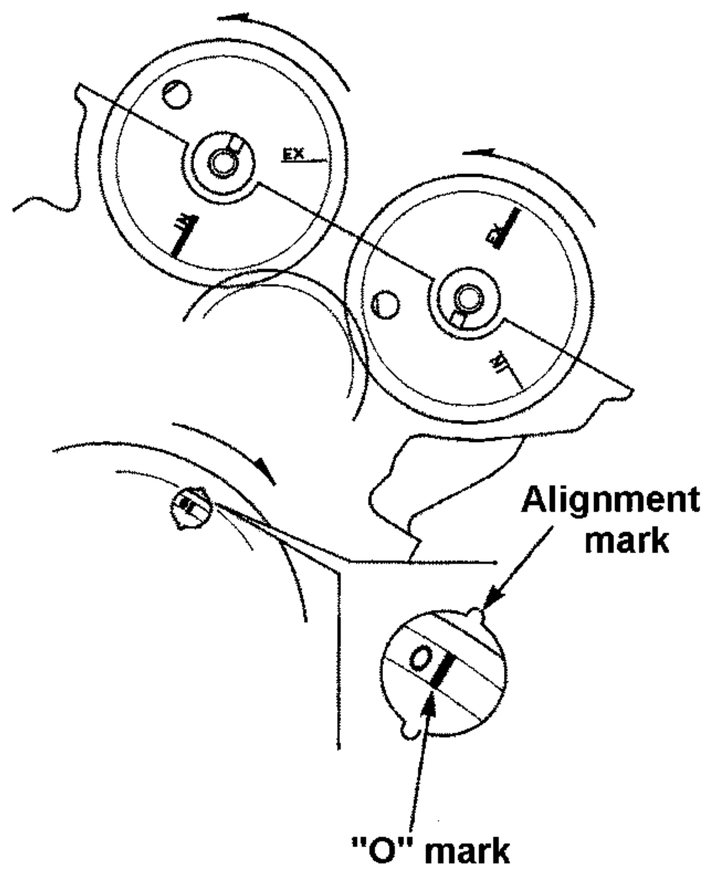


Turn the crankshaft 180° clockwise to align the “O” mark on the flywheel to the mark on the right crankcase cover.

Measure the valve clearance on “EX” sides of #2 & #4 cylinders.

Valve clearance: EX: 0.23 ± 0.03mm

No. 2 & 4 exhaust valve clearance measuring positioning

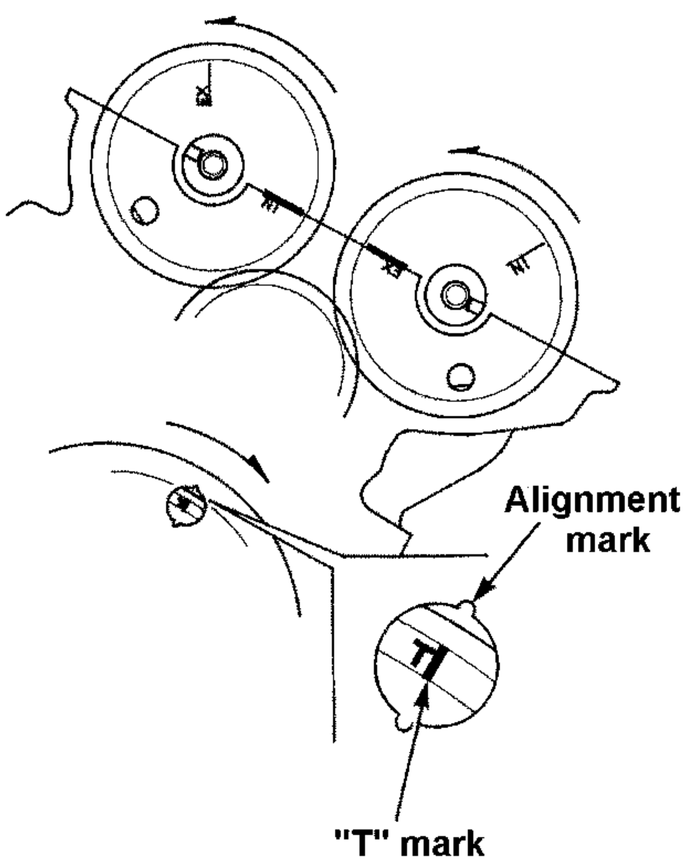


Turn the crankshaft clockwise to align the “T” mark on the flywheel to the mark on the right crankcase cover.

Measure the valve clearance on “IN” sides of #2 & #4 cylinders.

Valve clearance: IN: 0.16 ± 0.03mm

No. 2 & 4 intake valve clearance measuring positioning

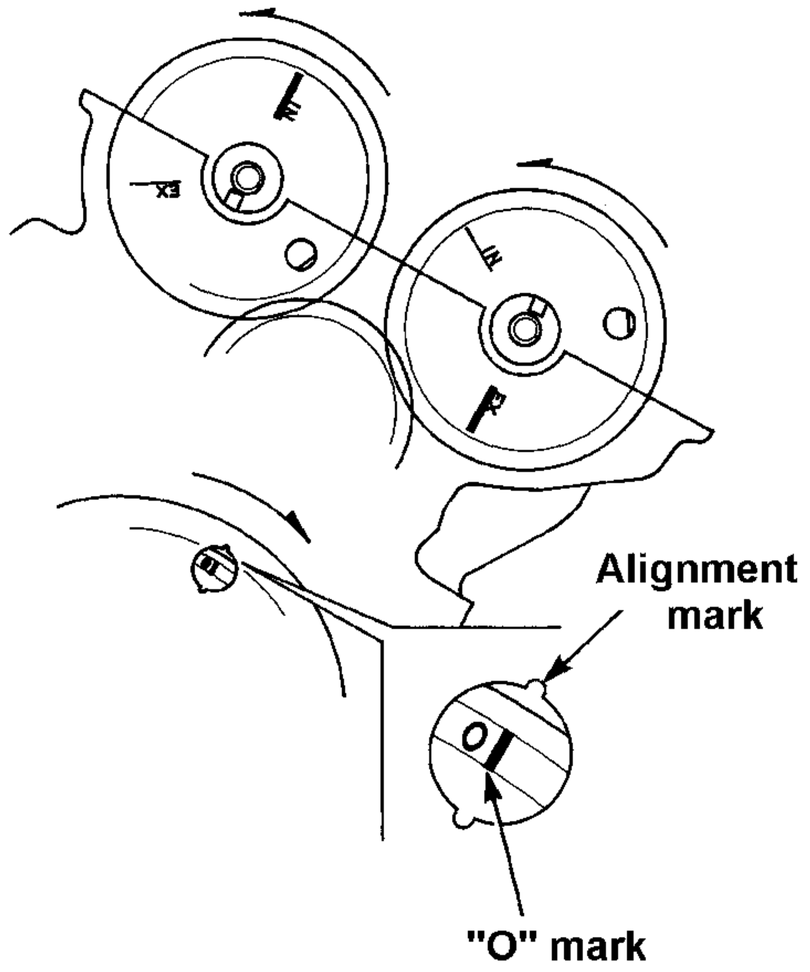


Turn the crankshaft 180° clockwise to align the "O" mark on the flywheel to the mark on the right crankcase cover.

Measure the valve clearance on "EX" sides of #1 & #3 cylinders.

Valve clearance: EX: 0.23 ± 0.03mm

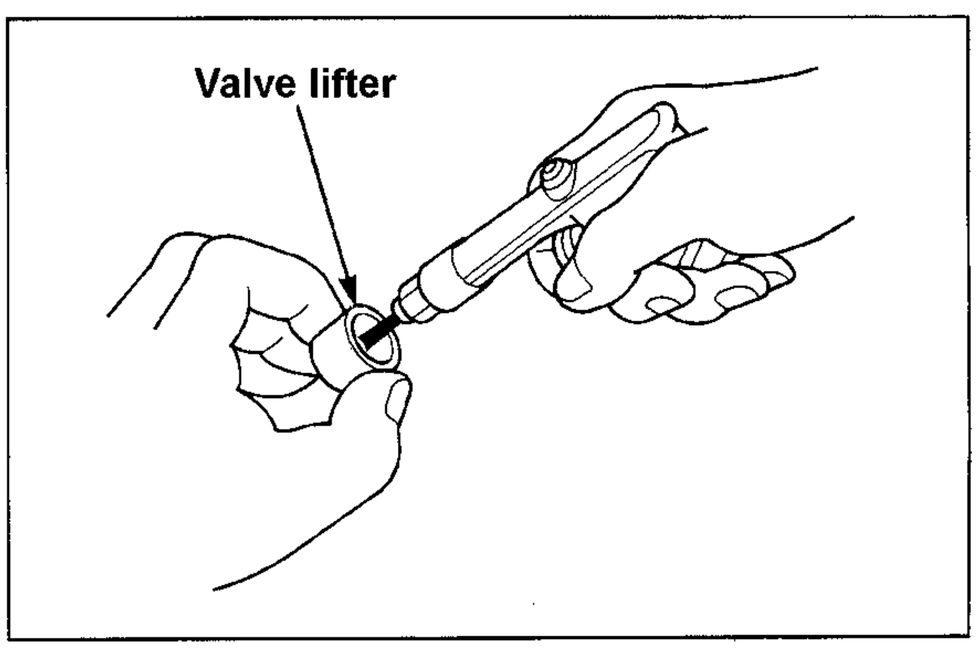
No. 1 & 3 exhaust valve clearance measuring position



Adjustment

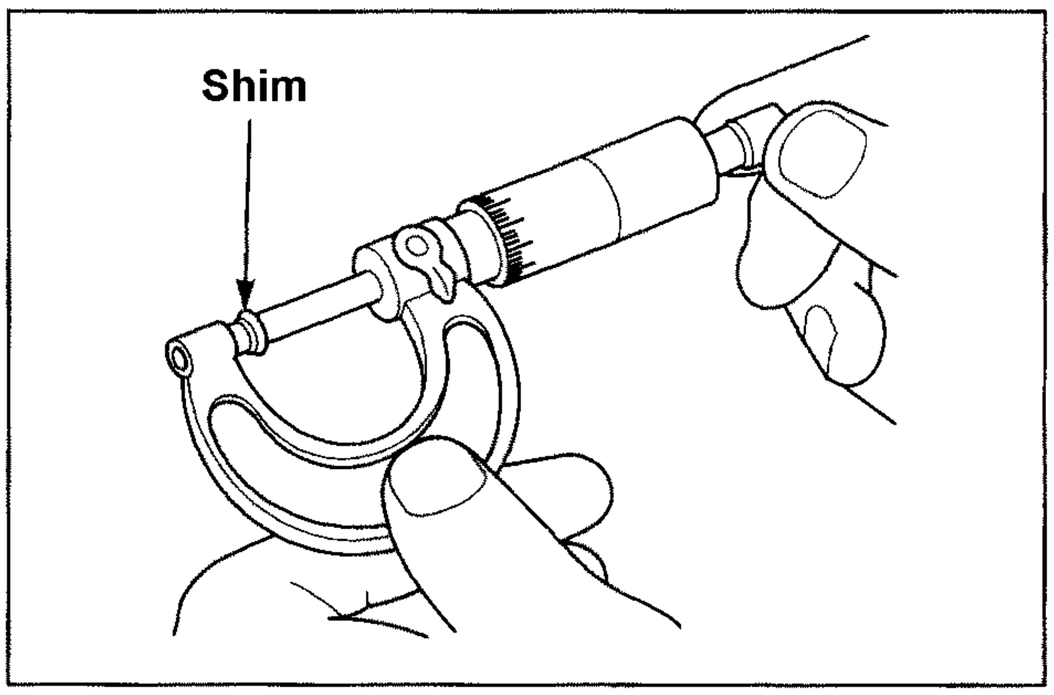
Remove the camshaft (7-3).
Remove valve lifters and shims.

- If the lifter is difficult to remove, use tools such as a valve wrapper.
- Shim may come out together with the valve lifter.
- If the shim is difficult to remove, use tweezers or a magnet.
- Re-install the lifters and the shims to the original position.
- Sort and store the lifters and shims.



Clean the valve lifter and the shim attachment with compressed air.

Wipe off oil on the shim and measure / record its thickness.



How to select a new shim

There are 65 different types of shims, ranging from 1.200mm to 2.800mm with 0.025mm step.

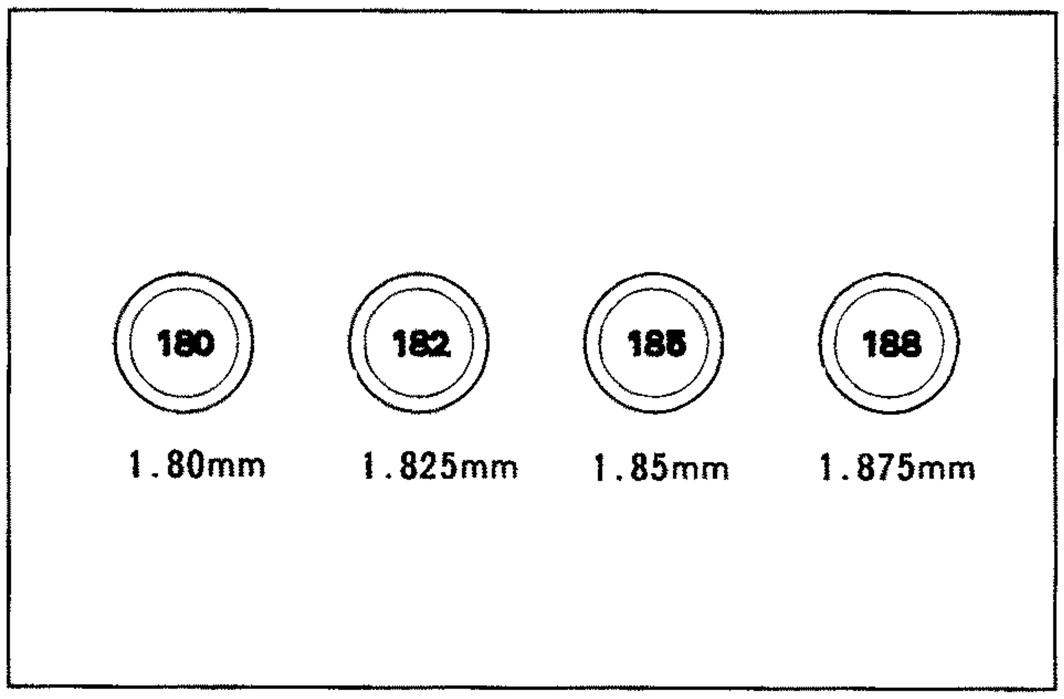
Select the proper size by using the following equation:

A = B – C + D

Where A: new shim thickness
B: measured valve clearance
C: standard valve clearance
D: removed (old) shim thickness

Example: Measured valve clearance: 0.16mm
Removed shim thickness: 1.725mm
Standard valve clearance: 0.21mm
A = (0.16-0.21) + 1.725 = 1.675mm

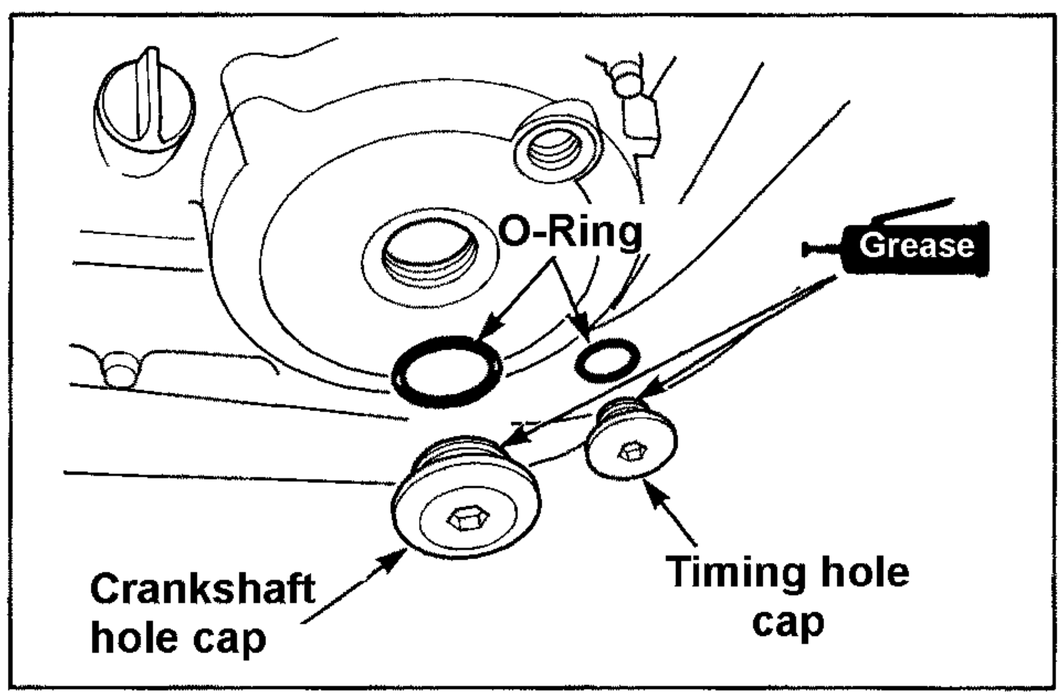
- Use a micrometer to measure new/old shim thickness accurately.
- If the required shim thickness is above 2.800mm remove built-up carbon on a valve seat to adjust it.



Install the selected shim to the valve spring retainer.
Apply Molybdenum dis-sulphide to the valve lifter and install the valve lifter.
Install the camshaft (7-19).
Turn the crankshaft several revolutions to ensure shim is settled.
Re-measure the valve clearance.
Install all removed parts by reversing the removal procedure.

Install the crankshaft hole cap and the timing hole cap.

- Inspect the O-Ring condition and replace if necessary.
- Apply grease to the cap thread.



Torque:
Crankshaft hole cap: 0.8 – 1.2kg-m

Timing hole cap: **0.8 – 1.2kg-m**

Drive Chain

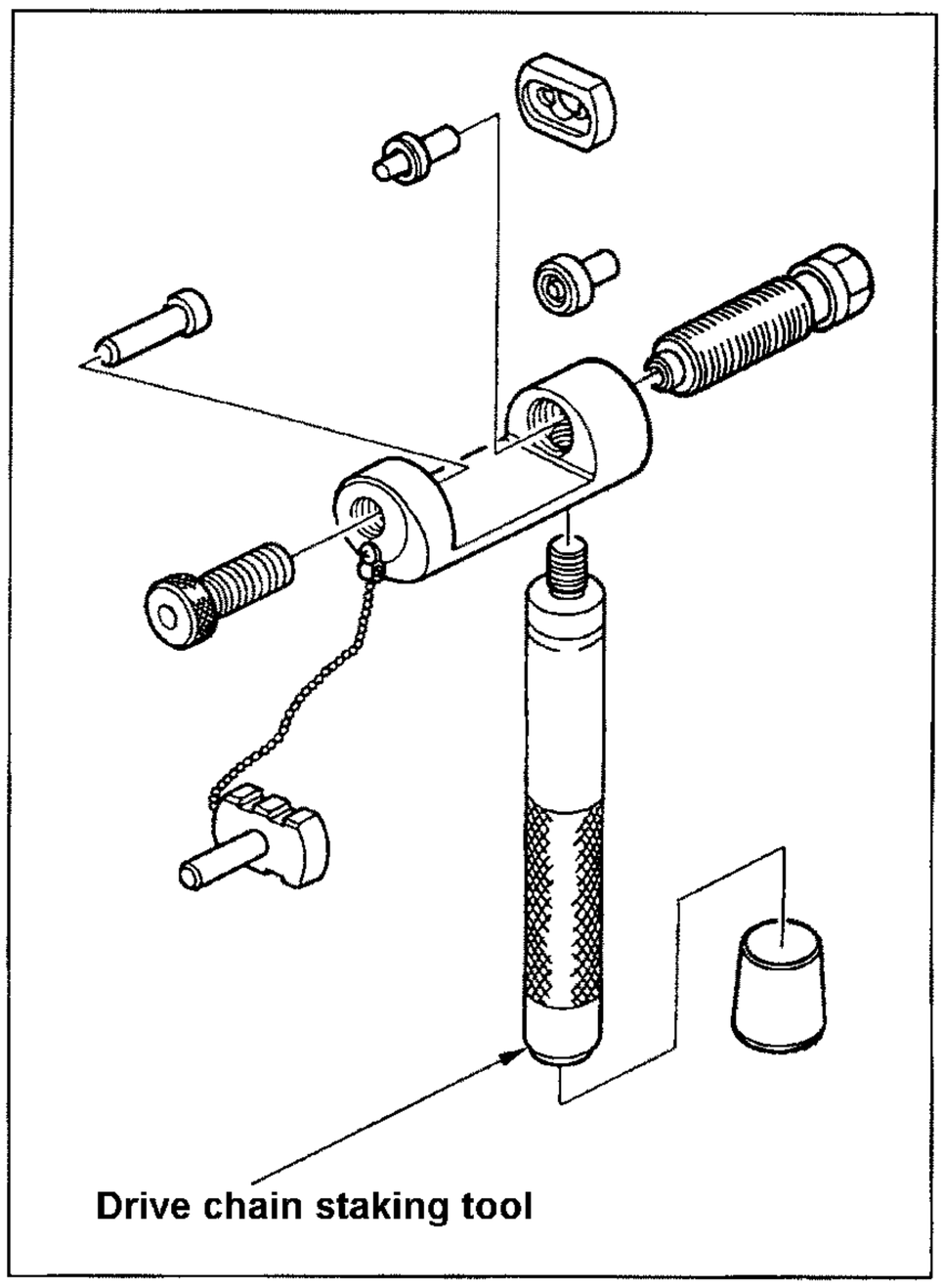
Replacement

- CAUTION
- Use a special tool and genuine replacement chain to replace the drive chain.
- Never use clip-type chain.

Loosen the drive chain.
Assemble the special tool.

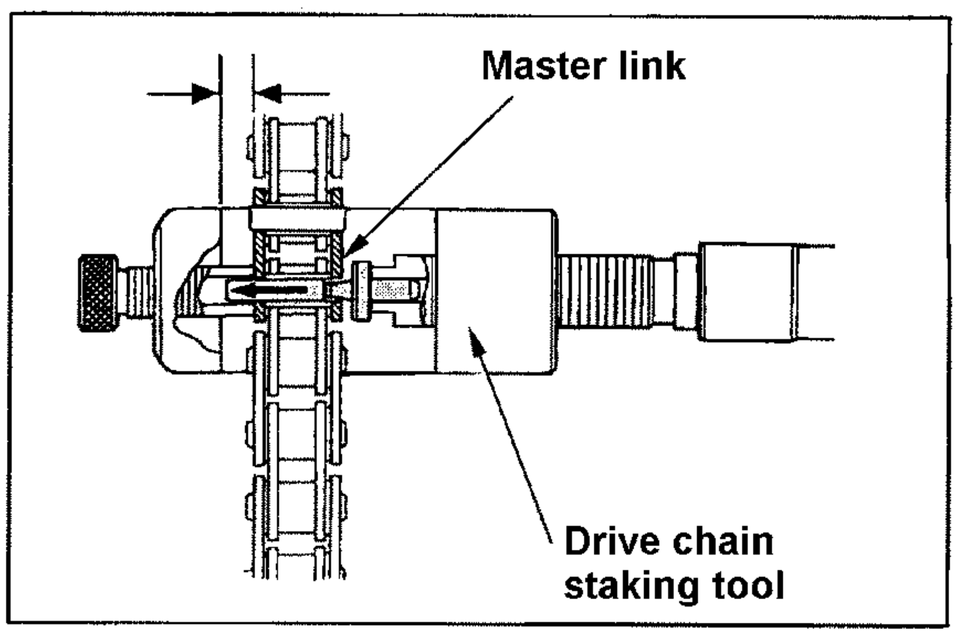
Special Tool:
Drive chain staking tool: 07HMH-MR10103

Read the instructions before using the staking tool.



Set the tool to the staked section of the drive chain and cut the staked section.

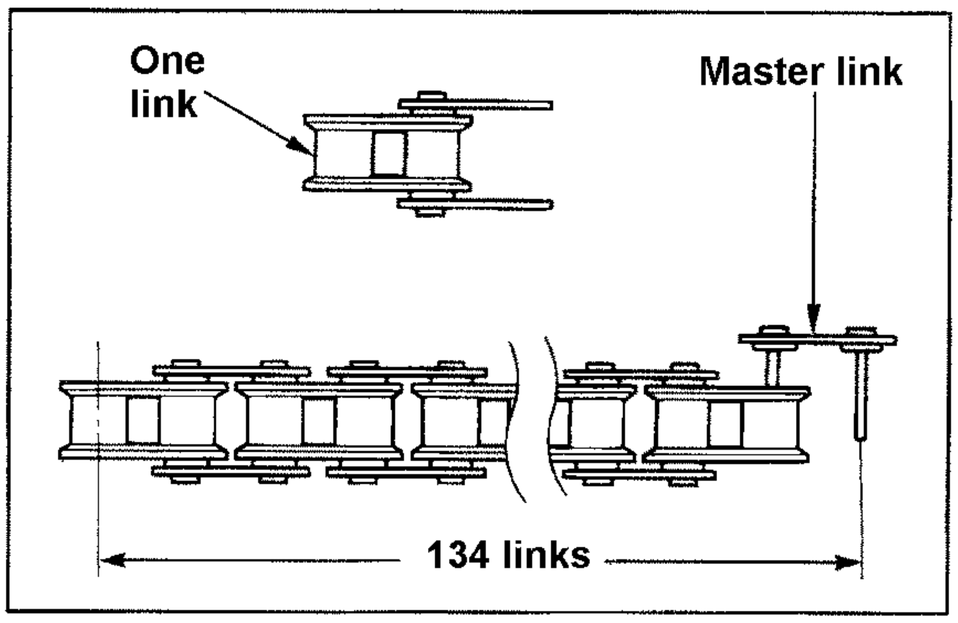
Special Tool:
Drive chain staking tool: 07HMH-MR10103



Adjust the number of links of the new drive chain by using the staking tool.

Include the master link to the number of links.

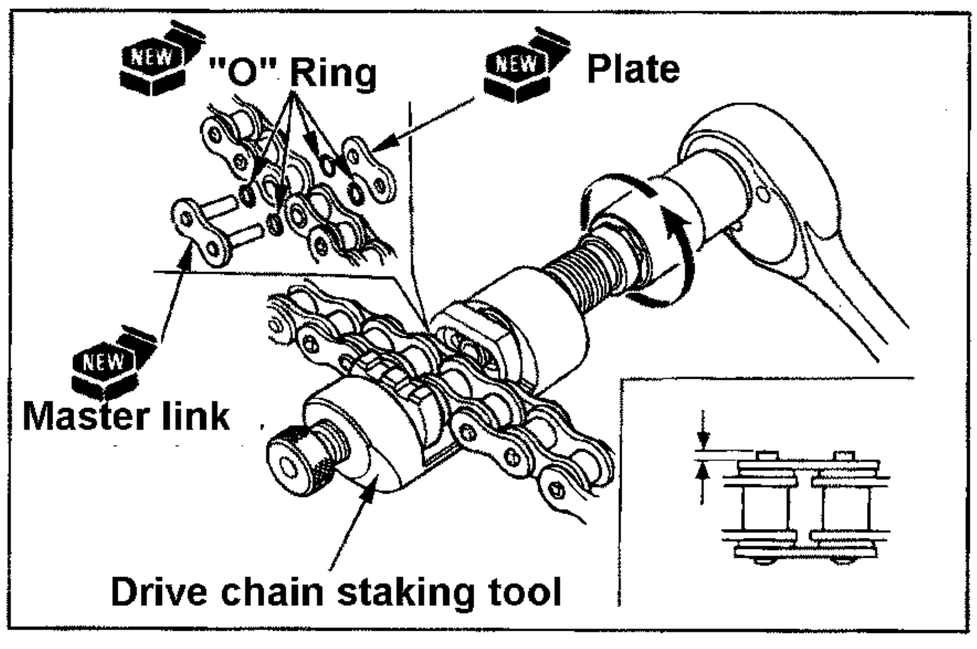
Standard links: **134 links**
Replacement drive chain: **DID 428 VS1**
RK 428 SHOZI



Do not re-use the master link, the O-Ring, and the link plate.

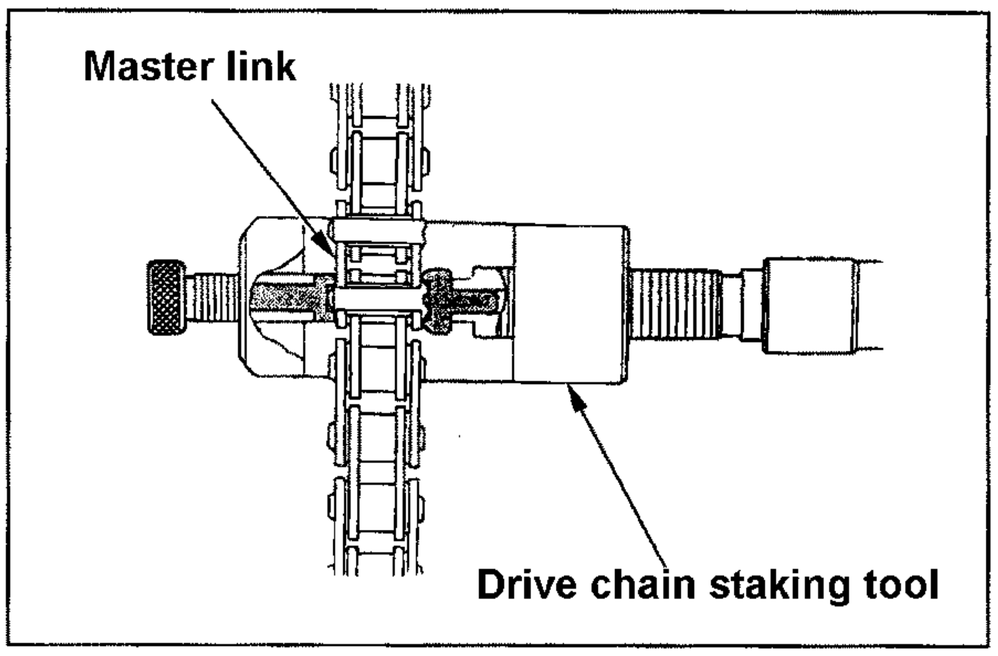
Install O-Rings to the new master link and set the master link from inside of the chain.

- Install the master link plate so as to face its labeled surface outwards.
- Do not catch O-Rings.



By using the staking tool, install O-Rings and the link plate to the link.
Confirm the end of the master link joint pins are coming out from the link plate.

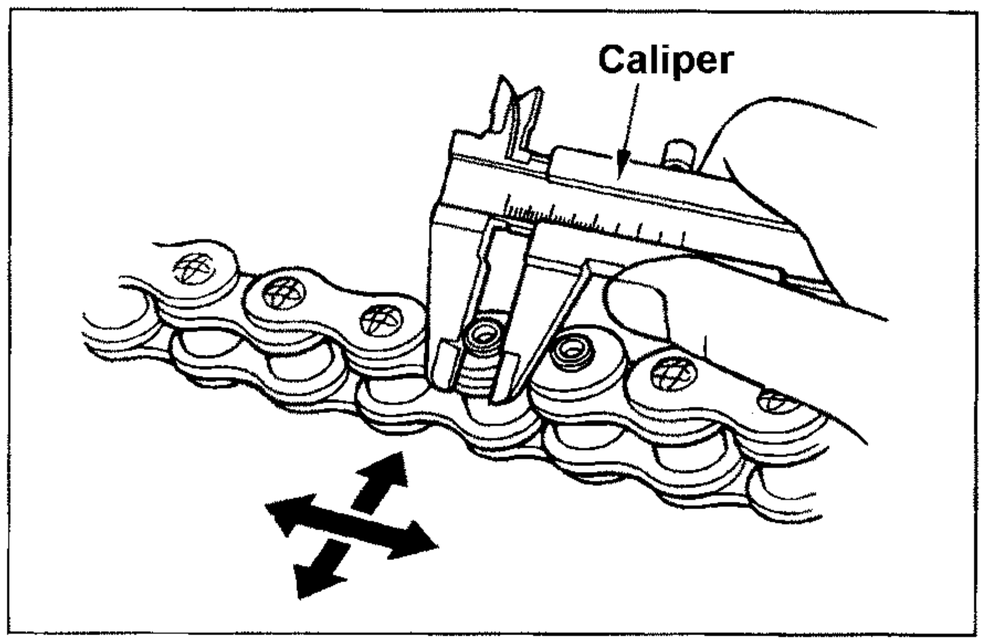
Standard: **RK – 1.0 ~ 1.2mm**
DID – 0.9 ~ 1.25mm



Stake the end of the joint pins.

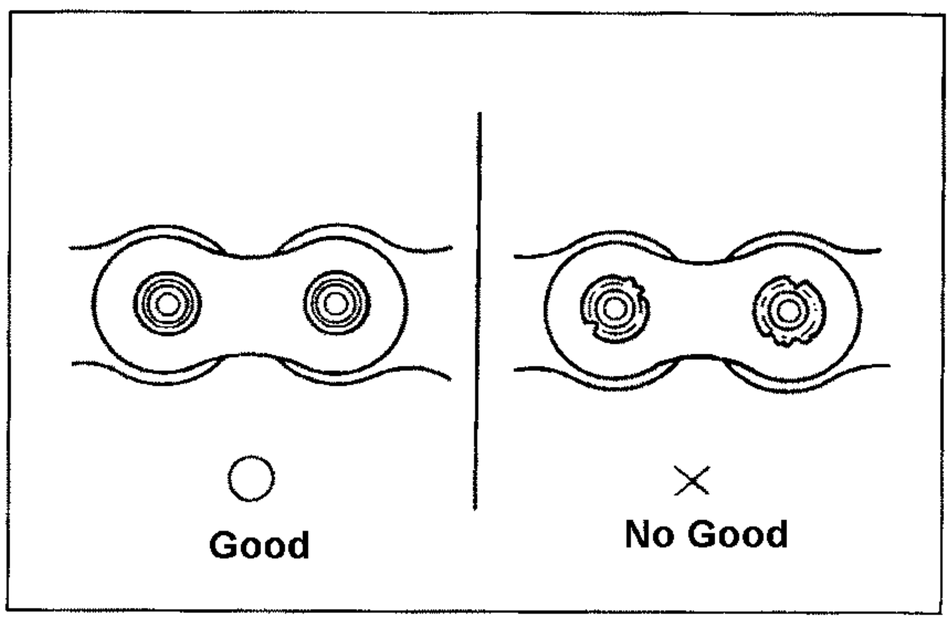
Measure the staked area with a caliper.

Staked area: **4.75 ~ 4.95mm**



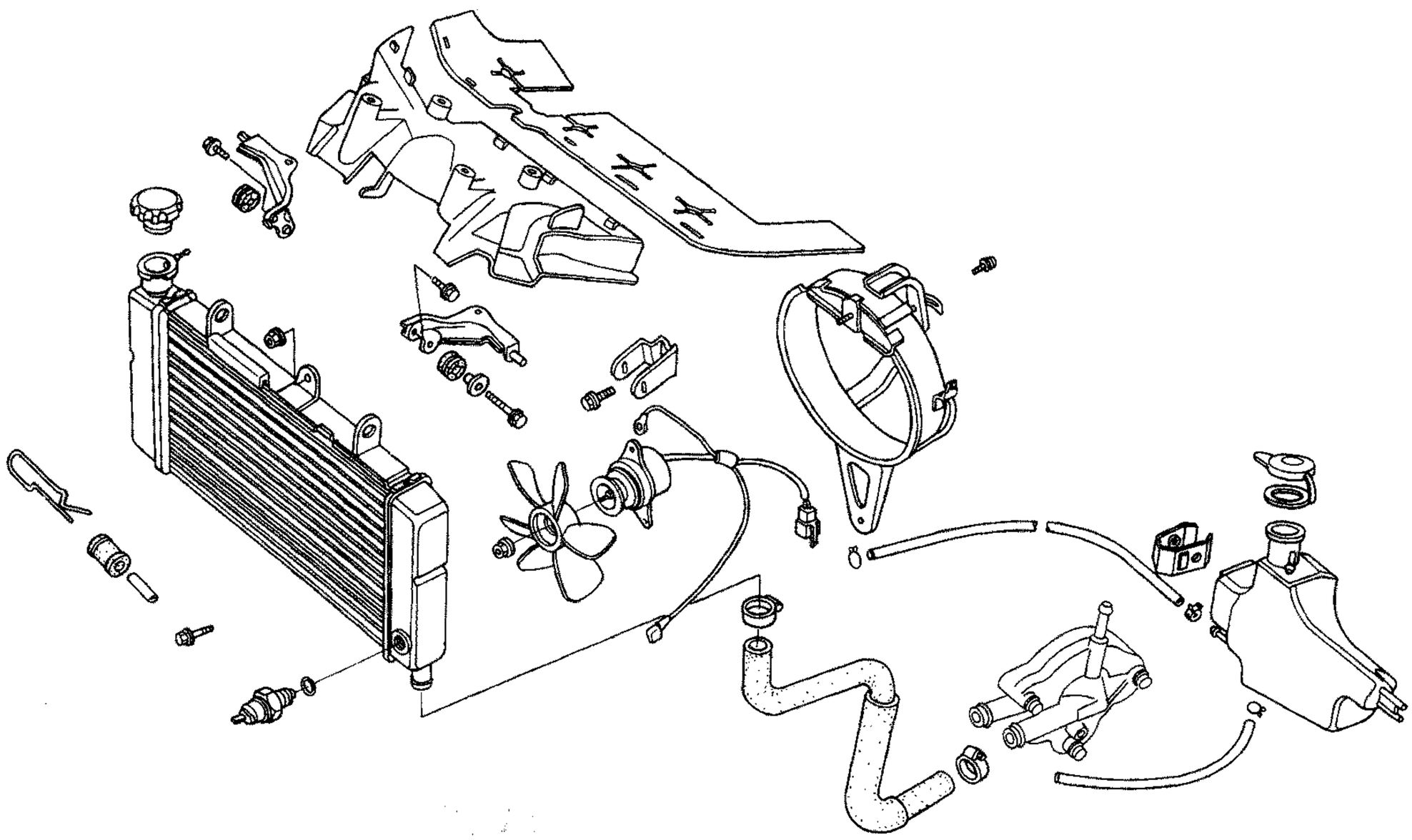
If the measured value is out of the above range, re-stake with a new master link, link plate and O-Rings.

Make sure there is no crack on the staked area.
If there is any crack, re-stake with the new master link, link plate and O-Rings.

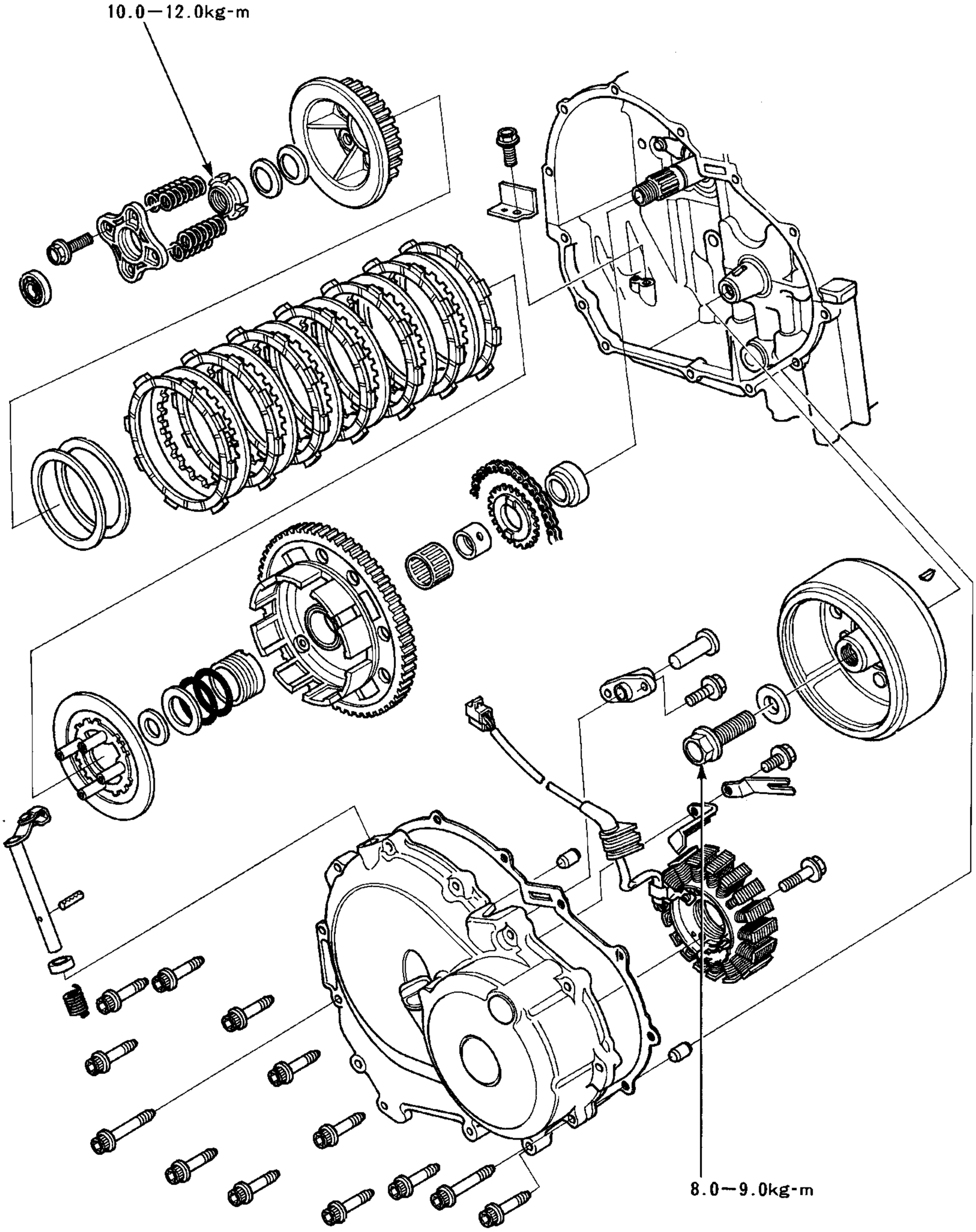


Caution : Never use clip-type chain.

Radiator Disassembly



Clutch Disassembly



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