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Introduction

This service manual describes the service procedures for the CBR1000F.

This Model Specific Manual includes every service procedure that is of a specific nature to this particular model. Basic service procedures that are common to other Honda Motorcycle/Motor Scooter/ATVs are covered in the Common Service Manual. This Model Specific Service Manual should be used together with the Common Service Manual in order to provide complete service information on all aspects of this motorcycle.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Sections 4 through 17 describe parts of the motorcycle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on the first page of the section.

Most sections describe the service procedure through system illustration. Refer to the next page for detail on how to use this manual.

If you are not familiar with this motorcycle, read Technical Feature in section 19.
If you don't know the source of the trouble, go to section 20 Troubleshooting.

HONDA MOTOR CO., LTD.
Service Publications Office

Contents

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Important Safety Notice

⚠ WARNING **Indicates a strong possibility of severe personal injury or death if instructions are not followed.**

CAUTION: **Indicates a possibility of personal injury or equipment damage if instructions are not followed.**

NOTE: Gives helpful information.

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains some warnings and cautions against some specific service methods which could cause PERSONAL INJURY to service personnel or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover all conceivable ways in which service, whether or not recommended by Honda, might be done or of the possibly hazardous consequences of each conceivable way, nor could Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda,must satisfy himself thoroughly that neither personal safety nor vehicle safety will be jeopardized by the service method or tools selected.

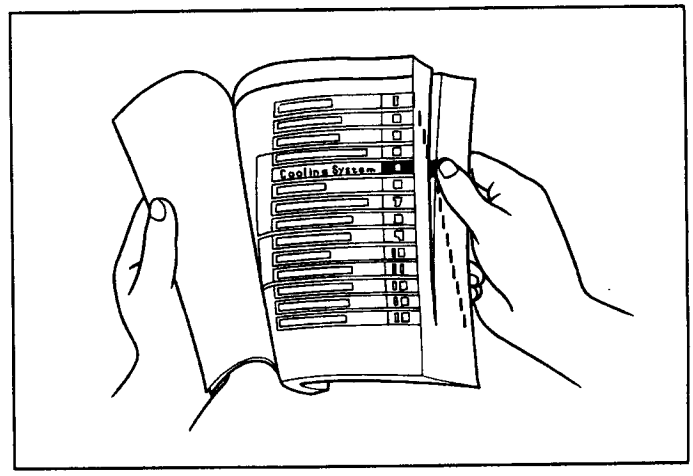
Type Codes

• Throughout this manual, the following abbreviations are used to identify individual model.

Code	Area Type
ED	European direct sales
E	U.K.
F	France
G (GI/GII)	Germany (Full power/Limited power)
U	Australia
ND	North Europe
SW	Switzerland
IT	Italy
H	Netherland
AR	Austria
SP	Spain

How To Use This Manual

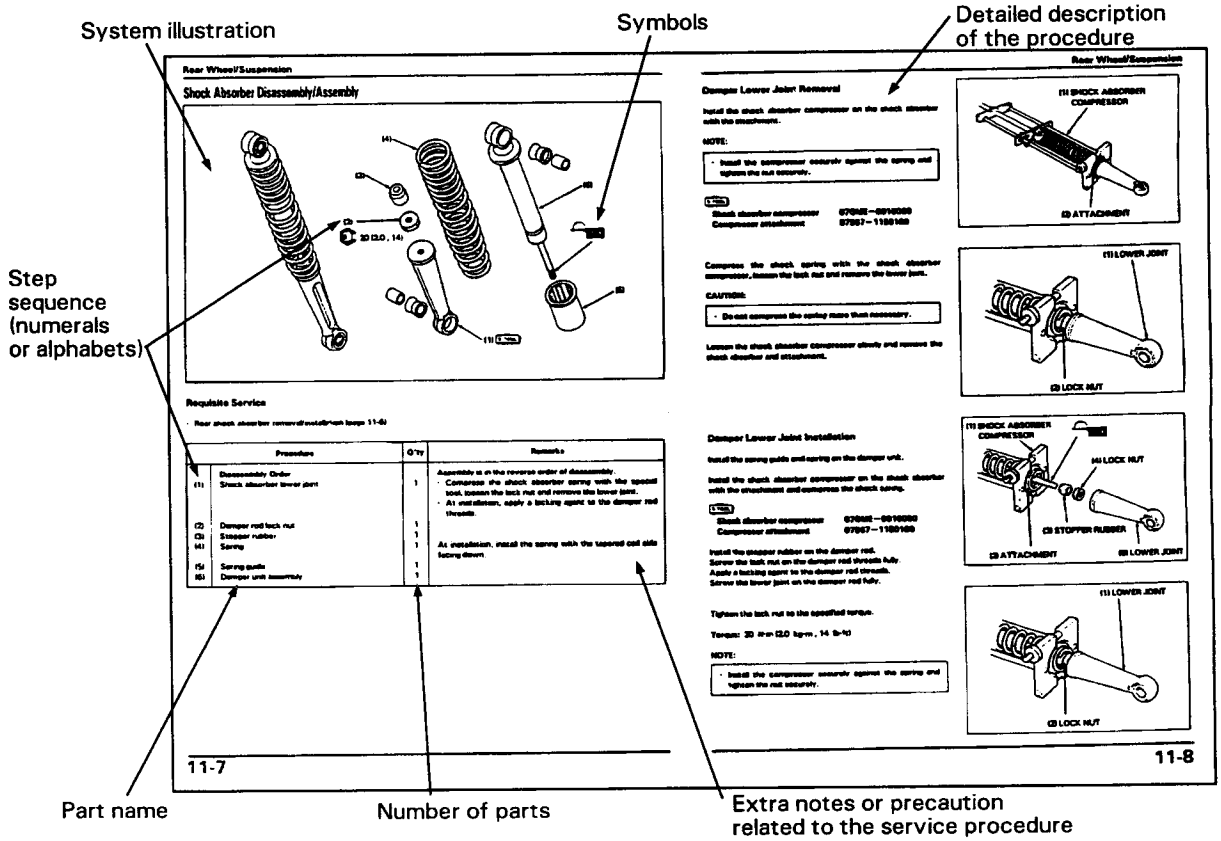
Finding The Information You Need



- This manual is devided into sections which cover each of the major components of the motorcycle.
  To quickly find the section you are interested in, the first page of each sections is marked with a black tab that lines up with one of the thumb index tabs before this page.
  The first page of each section lists the table of contents within the section.
  Read the service information and troubleshooting related to the section before you begin working.
- An index of the entire book is provided in the last chapter to directly locate the information you need.

Note On The Explanation Method Of This Manual

- The removal and installation of parts are for the most part illustrated by large and clear illustrations that should provide the reader with visual aid in understanding the major point for servicing.
- The system illustrations are augmented by call outs whose numbers or letters indicate the order in which the parts should be removed or installed.
- The sequence of steps represented numerically are differentiated from the ones represented alphabetically to notify the reader that they must perform these steps seperately.
  For example, if the steps prior and up to camshaft removal are performed with the engine installed, but the subsequent steps like cylinder head removal require engine removal, the callouts are grouped in numerical and alphabetical orders.
- The illustrations may contain symbols to indicate necessary service procedures and precautions that need to be taken.
  Refer to the next page for the meaning of each symbol.
- Also in the illustration is a chart that lists information such as the order in which the parts is removed/installed, the name of the part, and some extra notes that may needed.
- Step by step instructions are provided to supplement the illustrations when datailed explanation of the procedure is necessary or illustrations alone would not suffice.
- Service procedures required before or after the procedure described on that particular page, or inspection/adjustment procedures required following the installation of parts, are described under the title Requisite Service.
- Standard workshop procedures and knowledge covered in the Common Service Manual are abbreviated in this manual.



Symbols

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	Replace the part (s) with new one (s) before assembly.
	Use special tool.
	Use optional tool. These tools are obtained as you order parts.
 10 (1.0, 7)	Torque specification. 10 N•m (1.0 kg-m, 7 ft-lb)
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease with the ratio 1 : 1).
	Use multi-purpose grease (Lithium Based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning, U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use the agent of the middle strength, unless otherwise specified.
	Apply sealant.
	Use brake fluid DOT 4. Use the recommended brake fluid, unless otherwise specified.
	Use Fork or Suspension Fluid.

1. General Information

General Safety

Carbon Monoxide
If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.

⚠ WARNING

- **The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.**

Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

Gasoline
Work in a well ventilated area. Keep cigarettes, flames or sparks away from the work area or where gasoline is stored.

⚠ WARNING

- **Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.**

Hot Components

⚠ WARNING

- **Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.**

Used Engine/Transmission Oil

⚠ WARNING

- **Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. KEEP OUT OF REACH OF CHILDREN.**

Brake Dust
Never use an air hose or dry brush to clean brake assemblies.

⚠ WARNING

- **Inhaled asbestos fibers have been found to cause respiratory disease and cancer.**

Brake Fluid

CAUTION

- **Spilling fluid on pained, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced. KEEP OUT OF REACH OF CHILDREN.**

Coolant

Under some conditions, the ethylene glycol in engine coolant is combustible and its flame is not visible. If the ethylene glycol does ignite, you will not see any flame, but you can be burned.

⚠ WARNING

- **Avoid spilling engine coolant on the exhaust system or engine parts. They may be hot enough to cause the coolant to ignite and burn without a visible flame.**
- **Coolant (ethylene glycol) can cause some skin irritation and is poisonous if swallowed, KEEP OUT OF REACH OF CHILDREN.**
- **Keep out of reach of pets. Some pets are attracted to the smell and taste of coolant and can die if they drink it.**
- **Do not remove the radiator cap when the engine is hot. The coolant is under pressure and could scald you.**

If it contacts your skin, wash the affected areas immediately with soap and water. If it contacts your eyes, flush them thoroughly with fresh water and get immediate medical attention. If it is swallowed, the victim must be forced to vomit then rinse mouth and throat with fresh water before obtaining medical attention. Because of these dangers, always store coolant in a safe place, away from the reach of children. Recycle used coolant in an ecologically correct manner.

Nitrogen Pressure

For shock absorber with a gas-filled reservoir.

⚠ WARNING

- **Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.**
- **The shock absorber contains nitrogen under high pressure. Allowing fire or heat near the shock absorber could lead to and explosion that could result in serious injury.**
- **Failure to release the pressure from a shock absorber before disposing of it may lead to a possible explosion and serious injury if it is heated or pierced.**

To prevent the possibility of an explosion, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber reservoir.

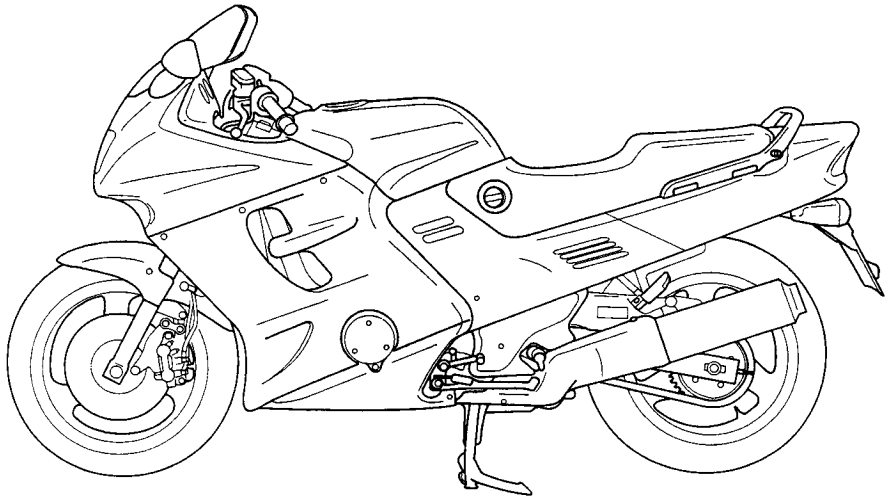
Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber.

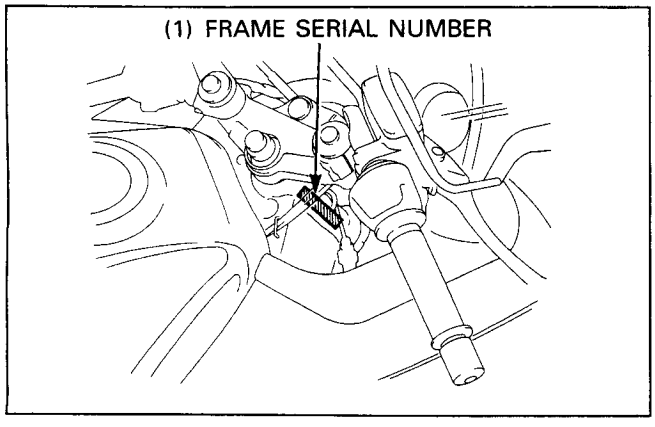
Battery Hydrogen Gas & Electrolyte

⚠ WARNING

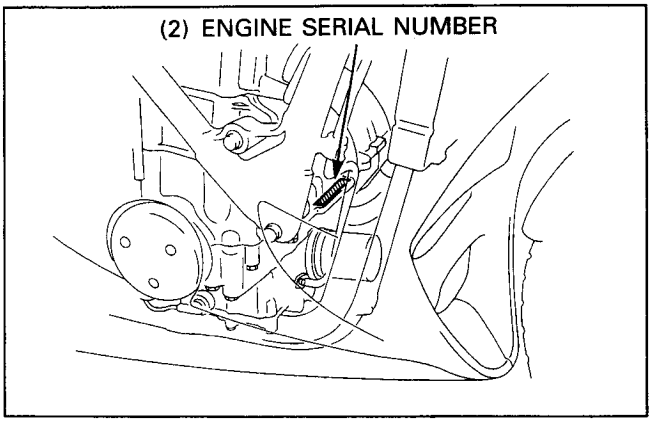
- **The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.**
- **The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.**
  - **If electrolyte gets on your skin, flush with water.**
  - **If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician.**
- **Electrolyte is poisonous.**
  - **If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.**

Model Identification

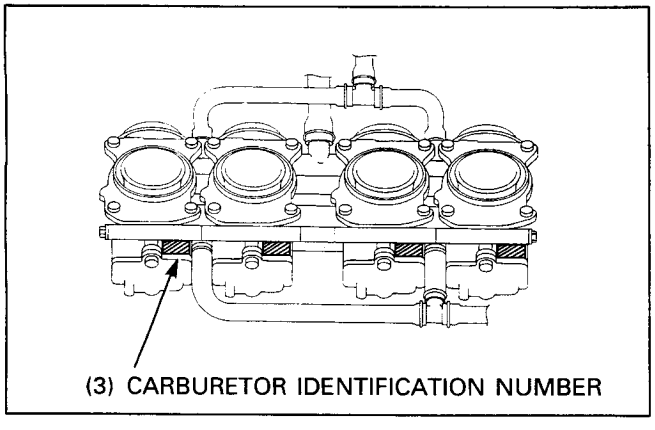




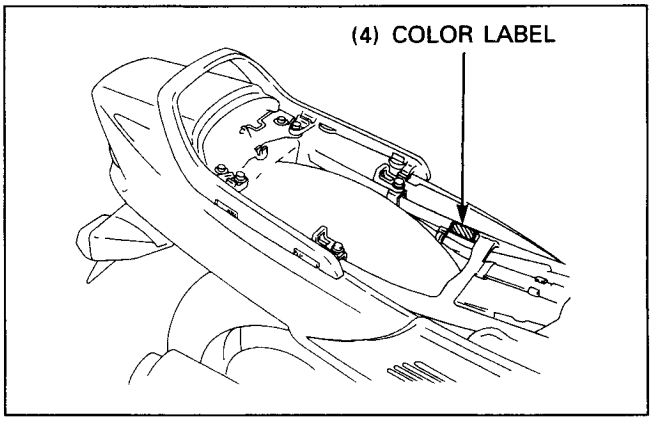
(1) The frame serial number is stamped on the right side of the steering head.



(2) The engine serial number is stamped on the front of the crankcase.



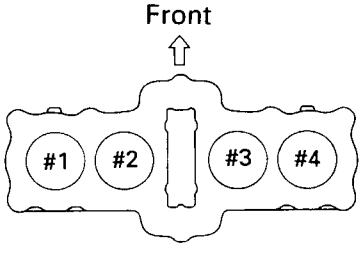
(3) The carburetor identification number is stamped on the rear side of each carburetor.



(4) The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

Specifications

General

Item		Specifications
Dimensions	Overall length (G, SW, IT, ND type) (ED, E, F, AR, SP, U type) Overall width Overall height Wheel base Seat height Footpeg height Ground clearance Dry weight Curb weight Maximum weight capacity	2,235 mm (88.0 in) 2,270 mm (89.4 in) 740 mm (29.1 in) 1,215 mm (47.8 in) 1,500 mm (59.1 in) 780 mm (30.7 in) 355 mm (14.0 in) 140 mm (5.5 in) 235 kg (518 lbs) 271 kg (597 lbs) 185 kg (408 lbs)
Frame	Frame type Front suspension Front wheel travel Rear suspension Rear wheel travel Rear damper Front tire size Rear tire size Tire brand (Bridgestone) FR/RR Tire brand (Dunlop) FR/RR Front brake Rear brake Caster angle Trail length Fuel tank capacity Fuel tank reserve capacity	Diamond Telescopic fork 130 mm (5.1 in) Swingarm 115 mm (4.5 in) Nitrogen gas filled damper 120/70 VR17–V270 170/60 VR17–V270 CYROX19E/CYROX16E (Except AR type) K510A/K510B Hydraulic double disc brake Hydraulic single disc brake 27° 110 mm (4.3 in) 22 liter (5.81 US gal, 4.84 Imp gal) 3.5 liter (0.91 US gal, 0.77 Imp gal)
Engine	Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1 mm lift Intake valve closes at 1 mm lift Exhaust valve opens at 1 mm lift Exhaust valve closes at 1mm lift Lubrication system Oil pump type Cooling system Air filtration Crankshaft type Engine weight Firing order Cylinder arrangement Cylinder number  	77.0 x 53.6 mm (3.03 x 2.11 in) 998 cm³ (60.9 cu-in) 10.5 : 1 Chain drive and DOHC 15° BTDC / 38° ABDC / 40° BBDC / 10° ATDC (E, G type) 0° BTDC / 40° ABDC / 40° BBDC / 0° ATDC (SW, AR type) 5° BTDC / 30° ABDC / 40° BBDC / 10° ATDC (F type) Forced pressure and wet sump Trochoid Liquid cooled Paper filter Unit type, 6 main journals 94.7 kg (209 lbs) 1 – 2 – 4 – 3 4 cylinder, inline

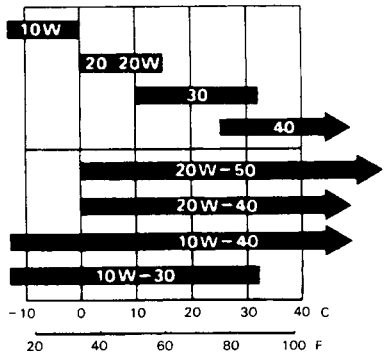
General (Cont'd)

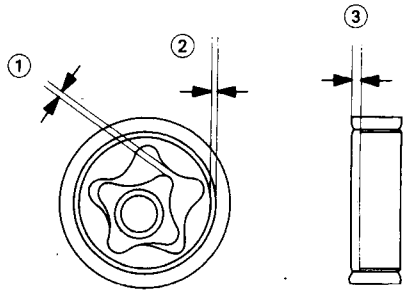
Item		Specifications
Carburetor	Carburetor type Throttle bore	CV (Constant Velocity) type, with flat valve 38 mm (1.5 in)
Drive Train	Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio 1st Gear ratio 2nd Gear ratio 3rd Gear ratio 4th Gear ratio 5th Gear ratio 6th Gearshift pattern	Multi-plate, wet Hydraulic operating 6-speeds constant mesh 1.785 (75/42) 2.470 (42/17) 2.750 (33/12) 2.066 (31/15) 1.647 (28/17) •1.368 (26/19) 1.173 (27/23) 1.045 (23/22) Left foot operated, return system 1 – N – 2 – 3 – 4 – 5 – 6
Electrical	Ignition system Starting system Charging system Regulator/rectifier type Lighting system	Full transistor digital ignition Electric starter motor Triple phase output alternator Transistor opened/triple phase, full-wave rectification Battery

Unit: mm (in)

Lubrication System

Item	Standard	Service Limit
Engine oil capacity at draining	3.6 liter (3.78 US qt, 3.17 Imp qt)	———
at disassembly	4.5 liter (4.76 US qt, 3.96 Imp qt)	———
at oil filter change	3.8 liter (4.02 US qt, 4.43 Imp qt)	———
Recommended engine oil	Use Honda 4-stroke oil or equivalent API Service Classification: SE, SF or SG viscosity: SAE 10W–40 Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.	———
Oil pressure at oil pressure switch	588–686 kPa (6.0–7.0kg/cm², 85–100 psi) at 5,000 min⁻¹ (rpm) (80°C/176°F)	———
Oil pump rotor tip clearance ①	0.15 (0.006)	0.20 (0.008)
body clearance ②	0.15–0.22 (0.006–0.009)	0.35 (0.014)
end clearance ③	0.02–0.07 (0.001–0.003)	0.10 (0.004)





Fuel System

Carburetor identification number		———
(G type)	VP83A	———
(ED, E, ND, SP, IT, U type)	VP83B	———
(F type)	VP83C	———
(SW type)	VP85A	———
(AR type)	VP85B	———
Main jet	#122	———
Slow jet (ED, E, F, ND, SP, IT, U type)	#42	———
(G, SW, AR type)	#40	———
Pilot screw initial opening (Except SW, AR type)	3 turns out	———
(SW type)	1-3/4 turns out	———
(AR type)	2-5/8 turns out	———
Float level	13.7 (0.54)	———
Carburetor vacuum difference	20 mm Hg (0.8 in Hg)	———
Base carburetor (For carburetor synchronization)	No.3	———
Idle speed (Except SW, AR type)	1,000 ± 100 min⁻¹ (rpm)	———
(SW type)	1,050 ± 50 min⁻¹ (rpm)	———
(AR type)	1,050 ± 100 min⁻¹ (rpm)	———
Throttle grip free play	2–6 (0.08–0.24)	———
Secondary air supply system (SW, AR type)	Reed valves are built into the ASV	———
Air injection control valve vacuum pressure (SW, AR type)	420 mm Hg (16.5 in Hg)	———

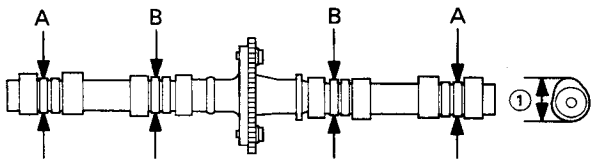
Unit: mm (in)

Cooling System

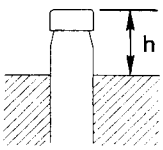
Item	Standard	Service Limit
Coolant capacity (Radiator and engine)	2.6 liter (2.75 US qt, 2.29 Imp qt)	———
(Reserve tank)	0.4 liter (0.42 US qt, 0.35 Imp qt)	———
Radiator cap relief pressure	108–137 kPa (1.1–1.4 kg/cm², 16–20 psi)	———
Thermostat begins to open	80°–84°C (176–183°F)	———
Thermostat fully open	95°C (203°F)	———
Thermostat valve lift	8.0 (0.32) minimun	———

Cylinder Head

Cylinder compression	1,050–1,450 kpa (10.5–14.4 kg/cm², 149–206 psi)/400 min⁻¹ (rpm)	———
Cylinder compression synchronization difference	40 mm Hg	———
Valve clearance IN	0.10 ± 0.02 (0.004 ± 0.001)	———
EX	0.18 ± 0.02 (0.007 ± 0.001)	———
Cylinder head warpage	———	0.07 (0.003)
Cam lobe height ① IN (ED, E, G, ND, SP, IT, U type)	35.668–35.748 (1.4042–1.4074)	35.62 (1.402)
IN (F type)	33.352–33.432 (1.3131–1.3162)	33.30 (1.311)
IN (SW, AR type)	34.907–34.987 (1.3743–1.3774)	34.85 (1.372)
EX (ED, E, G, ND, SP, IT, U type)	35.540–35.620 (1.3992–1.4024)	35.49 (1.397)
EX (F type)	35.540–35.620 (1.3992–1.4024)	35.49 (1.397)
EX (SW, AR type)	34.835–34.915 (1.3715–1.3746)	34.79 (1.370)
Camshaft runout	———	0.03 (0.001)
Camshaft oil clearane A	0.020–0.062 (0.0008–0.0024)	0.12 (0.005)
B	0.050–0.092 (0.0020–0.0036)	0.14 (0.006)



Camshshaft journal O.D A (Except F type)	27.959–27.980 (1.1007–1.1016)	———
A (F type)	27.459–27.480 (1.0811–1.0819)	———
B (Except F type)	27.929–27.950 (1.0996–1.1004)	———
B (F type)	27.421–27.450 (1.0796–1.0807)	———
Valve stem O.D. IN	5.475–5.490 (0.2156–0.2161)	5.47 (0.215)
EX	5.455–5.470 (0.2148–0.2154)	5.45 (0.215)
Valve guide I.D. IN	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
Stem-to-guide clearance IN	0.010–0.037 (0.0004–0.0015)	———
EX	0.030–0.057 (0.0012–0.0022)	———
Valve guide projection above cylinder head IN	17.8–18.0 (0.70–0.71)	———
EX	17.8–18.0 (0.70–0.71)	———

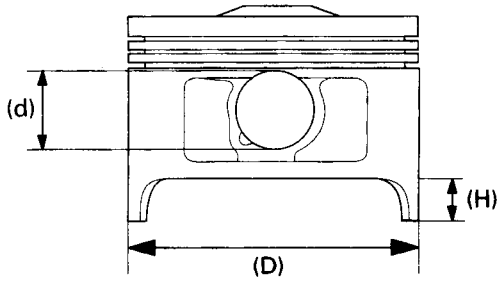


Before guide installation:
1. Chill the valve guides in the freezer section of the refrigerator for about an hour.
2. Heat the cylinder head to 100–150°C (212–300°F)

Valve seat width	0.9–1.1 (0.035–0.043)	1.5 (0.6)
Valve spring free length inner IN	43.15 (1.699)	41.8 (1.65)
inner EX	43.15 (1.699)	41.8 (1.65)
outer IN	47.08 (1.854)	45.7 (1.80)
outer EX	47.08 (1.854)	45.7 (1.80)

Unit: mm (in)

Cylinder/Piston

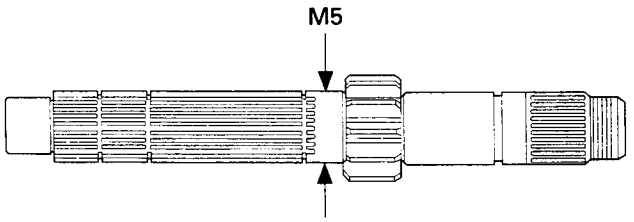
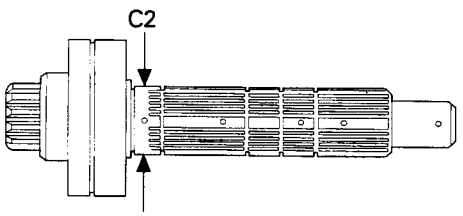
Item	Standard	Service Limit
Cylinder I.D.	77.000–77.010 (3.0315–3.0319)	77.10 (3.305)
Cylinder out of round	———	0.05 (0.002)
Cylinder taper	———	0.05 (0.002)
Cylinder warpage	———	0.05 (0.002)
Piston mark direction	"IN" mark facing toward the intake side	———
Piston O.D. (D)	76.970–76.990 (3.0303–3.0311)	76.87 (3.026)
Piston O.D. measurement point (H)	15 mm (0.6 in) from the bottom	———
Piston pin hole I.D. (d)	20.002–20.008 (0.7875–0.7877)	20.06 (0.790)
		
Cylinder-to-piston clearance	0.010–0.040 (0.0004–0.0016)	0.10 (0.004)
Piston pin O.D.	19.994–20.000 (0.7872–0.7874)	19.98 (0.787)
Piston-to-piston pin clearance	0.002–0.014 (0.0001–0.0006)	0.04 (0.002)
Connecting rod-to piston pin clearance	0.016–0.040 (0.0006–0.0016)	0.06 (0.002)
Top ring-to-ring groove clearance	0.025–0.055 (0.0010–0.0022)	0.09 (0.004)
Second ring-to-ring groove clearance	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
Top Ring end gap	0.250–0.400 (0.0100–0.0157)	0.58 (0.023)
Second Ring end gap	0.320–0.470 (0.0126–0.0185)	0.65 (0.026)
Oil ring (side rail) end gap	0.300–0.900 (0.0118–0.0354)	1.10 (0.043)
Top ring mark	Marking side facing up	———
Second ring mark	Marking side facing up	———

Clutch System

Recommended clutch fluid	DOT 4 brake fluid	———
Clutch master cylinder I.D.	14.000–14.043 (0.5512–0.5529)	14.06 (0.554)
Clutch master piston O.D.	13.957–13.984 (0.5495–0.5506)	13.94 (0.549)
Clutch outer I.D.	47.005–47.030 (1.8506–1.8516)	47.10 (1.854)
Clutch outer guide I.D.	27.995–28.012 (1.1022–1.1028)	28.08 (1.106)
Mainshaft O. D. at clutch outer guide	27.980–27.993 (1.1016–1.1021)	27.97 (1.101)
Clutch spring free length	46.7 (1.839)	44.7 (1.76)
Clutch disc thickness A	3.42–3.58 (0.135–0.141)	3.1 (0.12)
B	3.72–3.33 (0.146–0.153)	3.1 (0.12)
Clutch plate warpage	———	0.30 (0.012)

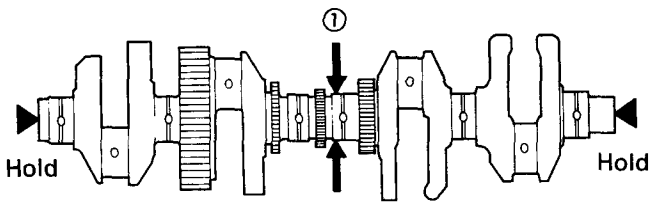
Transmission

Unit: mm (in)

Item	Standard	Service Limit
Transmission gear I.D. M5, M6	31.000–31.016 (1.2205–1.2211)	31.04 (1.222)
C2, C3, C4	33.000–33.016 (1.2992–1.2998)	33.04 (1.301)
Transmission gear bushing O.D. M5, M6	30.955–30.980 (1.2187–1.2197)	30.93 (1.218)
C2, C3, C4	32.955–32.980 (1.2976–1.2984)	32.93 (1.296)
Transmission gear bushing I.D. M5	27.985–28.006 (1.1018–1.1026)	28.02 (1.103)
C2	29.985–30.006 (1.1805–1.1813)	30.02 (1.182)
Gear-to-bushing clearance at M5, M6 gear	0.020–0.061 (0.0008–0.0024)	0.10 (0.004)
at C2, C3, C4 gear	0.020–0.061 (0.0008–0.0024)	0.10 (0.004)
Mainshaft O.D. at M5 gear	27.967–27.980 (0.1011–1.1016)	27.94 (1.100)
		
Countershaft O.D. at C2 gear	29.950–29.975 (1.1791–1.1801)	29.92 (1.178)
		
Gear bushing-to shaft clearance at M5 gear	0.005–0.039 (0.0002–0.0015)	0.06 (0.002)
at C2 gear	0.010–0.056 (0.0004–0.0022)	0.06 (0.002)
Shift fork claw thickness L	5.43–5.50 (0.214–0.217)	5.1 (0.20)
C	6.43–6.50 (0.253–0.256)	6.1 (0.24)
R	5.43–5.50 (0.214–0.217)	5.1 (0.20)
Shift fork I.D. L	14.000–14.018 (0.5112–0.5519)	14.04 (0.553)
C	14.000–14.018 (0.5112–0.5519)	14.04 (0.553)
R	14.000–14.018 (0.5112–0.5519)	14.04 (0.553)
Shift fork shaft O.D. L	13.957–13.968 (0.5495–0.5499)	13.90 (0.547)
C	13.957–13.968 (0.5495–0.5499)	13.90 (0.547)
R	13.957–13.968 (0.5495–0.5499)	13.90 (0.547)

Unit: mm (in)

Crankshaft

Item	Standard	Service Limit
Connecting rod small end I.D.	20.016–20.034 (0.7880–0.7887)	20.08 (0.791)
Connecting rod big end side clearance	0.05–0.20 (0.002–0.008)	0.3 (0.01)
Crankshaft runout ①	———	0.03 (0.001)
		
Crankpin oil clearance	0.028–0.052 (0.0011–0.0020)	0.08 (0.003)
Crankpin bearing selection	See page 10-21	———
Main journal oil clearance	0.021–0.045 (0.008–0.0018)	0.08 (0.003)
Main journal bearing selection	See page 10-20	———

Alternator

Alternator shaft collar spring free height	2.1 (0.08)	1.8 (0.07)

Unit: mm (in)

Wheels/Tires

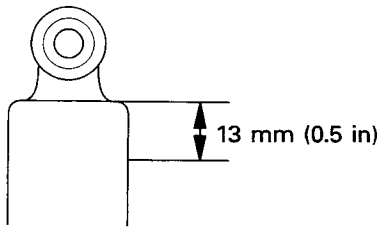
Item	Standard	Service Limit
Minimum tire tread depth (FR)	———	1.5 (0.06)
(RR)	———	2.0 (0.08)
Cold tire pressure Driver only (FR)	250 kPa (2.5 kg/cm², 36 psi)	———
Driver only (RR)	290 kPa (2.9 kg/cm², 42 psi)	———
Driver and passenger (FR)	250 kPa (2.5 kg/cm², 36 psi)	———
Driver and passenger (RR)	290 kPa (2.9 kg/cm², 42 psi)	———
Front and rear axle runout	———	0.2 (0.01)
Front and rear wheel rim runout (Radial)	———	2.0 (0.08)
(Axial)	———	2.0 (0.08)
Wheel balance weight (Front)	———	60 g (2.1 oz)
(Rear)	———	60 g (2.1 oz)
Drive chain slack	15–25 (0.6–1.0)	———
Drive chain size/link (DID)	DID50ZV/114	———
(RK)	RK50LFO/114	———

Front Suspension

Fork spring free length	446.3 (17.57)	437.4 (17.22)
Fork spring direction	Tapered wound coil facing down	———
Fork tube runout	———	0.2 (0.01)
Recommended fork oil	Fork fluid	———
Fork oil level	173 (6.8)	———
Fork oil capacity	418 cm³ (14.1 US oz, 11.8 Imp oz)	———
Steering bearing preload	1.1–1.6 kg (2.43–3.53 lb)	———

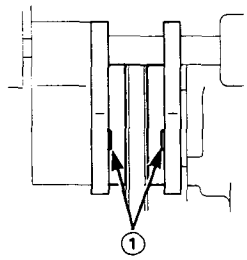
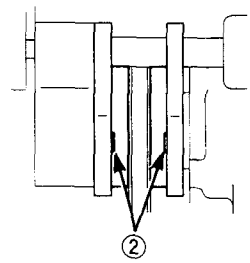
Rear Suspension

Damper compressed gas	Nitrogen	———
Damper drilling point	13 (0.5)	———



Unit: mm (in)

Brakes

Item		Standard	Service Limit
Front	brake fluid	DOT 4	———
	brake pad wear indicator ①	———	To the groove
			
	brake disc thickness	5.0 (0.20)	4.0 (0.16)
	brake disc runout	———	0.30 (0.012)
	master cylinder I.D.	12.700–12.743 (0.5000–0.5017)	12.76 (0.502)
	caliper piston O.D.	12.657–12.684 (0.4983–0.4994)	12.65 (0.498)
	caliper cylinder I.D. (22.6 mm bore)	22.650–22.700 (0.8917–0.8937)	22.710 (0.8941)
	(25.4 mm bore)	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
	(27.0 mm bore)	27.000–27.050 (1.0630–1.0650)	27.060 (1.0654)
	caliper piston O.D. (22.6 mm bore)	22.585–22.618 (0.8892–0.8905)	22.560 (0.8882)
	(25.4 mm bore)	25.318–25.368 (0.9968–0.9987)	25.310 (0.9965)
	(27.0 mm bore)	26.916–26.968 (1.0597–1.0617)	26.910 (1.0594)
	Secondary master cylinder I.D.	12.700–12.743 (0.5000–0.5017)	12.76 (0.502)
	Secondary master piston O.D.	12.657– 12.684 (0.4983–0.4994)	12.65 (0.498)
Rear	brake fluid	DOT 4	———
	brake pedal height	75 (3.0)	———
	brake pad wear indicator ②	———	To the groove
			
	brake disc thickness	5.0 (0.20)	4.0 (0.16)
	brake disc runout	———	0.30 (0.012)
	master cylinder I.D.	17.460–17.503 (0.6874–0.6891)	17.515 (0.6896)
	master piston O.D.	17.417–17.444 (0.6857–0.6868)	17.405 (0.6852)
	caliper cylinder I.D. (22.6 mm bore)	22.650–22.700 (0.8917–0.8937)	22.710 (0.8941)
	(25.4 mm bore)	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
	(27.0 mm bore)	27.000–27.050 (1.0630–1.0650)	27.060 (1.0654)
	caliper piston O.D. (22.6 mm bore)	22.585–22.618 (0.8892–0.8905)	22.560 (0.8882)
	(25.4 mm bore)	25.318–25.368 (0.9968–0.9987)	25.310 (0.9965)
	(27.0 mm bore)	26.916–26.968 (1.0597–1.0617)	26.910 (1.0594)

Battery/Charging System

Alternator/charging coil resistance (At 20°C/68°F)	0~1.0Ω	———
Alternator field coil resistance (At 20°C/68°F)	0~4.0Ω	———
Regulator/rectifier regulated voltage	12.6–15.0V/5,000 min^{-1} (rpm)	———
Battery capacity	12V–14Ah	———
Specified current leakage	0.1 mA max.	———
Battery specific gravity (Fully charging)	1.270–1.290	———
(Needs charging)	Below 1.260	———

Ignition System

Item	Standard	Service Limit
Spark plug (Standard : NGK)	DPR9EA-9	———
(Standard : NIPPONDENSO)	X27EPR-U9	———
Spark plug gap	0.8–0.9 mm (0.03–0.04 in)	———
Ignition timing "F"mark (Except SW, type)	10° BTDC/1,000 min^{-1} (rpm)	———
(SW, type)	5° BTDC/1,000 min^{-1} (rpm)	———
Full advance (Except G, F, SW, AR type)	40° BTDC/5,000 min^{-1} (rpm)	———
(G. F, SW, AR type)	37° BTDC/9,500 min^{-1} (rpm)	———
Ignition coil resistance (Primary: at 20°C/68°F)	2.5–3.2Ω	———
(Secondary with plug cap)	21–27kΩ	———
(Secondary without plug cap)	11–17kΩ	———
Pulse generator resistance (At 20°C/68°F)	460–580Ω	———

Starting System

Starter motor brush length	12.0–13.0 mm (0.47–0.51 in)	6.5mm (0.26 in)

Lights/Meters/Switches

Main fuse	30A	———
Fuse (Except G type)	10A x 5, 20A x 1	———
(G type)	10A x 6, 20A x 1	———
Headlight (High/low beam; E type)	12V–60/55W x 2	———
(High/low beam; Except E, IT, U, type)	12V–60/55W x 1, 12V60W x 1	———
(High/low beam; IT type)	12V–60/55W x 1	———
(High/low beam; U type)	12V–45/45W x 2	———
Tail/brake light	12V–5/21W x 2	———
Position light (Except U type)	12V–5W	———
Front turn signal light	12V–21W x 2	———
Rear turn signal light	12V–21W x 2	———
Instrument light	12V–1.7W x 4	———
Oil pressure warning indicator	12V–3.4W	———
Side stand warning indicator	12V–3.4W	———
High beam indicator	12V–3.4W	———
Turn signal indicator	12V–3.4W x 2	———
Neutral indicator	12V–3.4W	———
Fuel unit resistance (At full level)	10Ω	———
(At low level)	90Ω	———
Coolant temperature sensor resistance (50°C/122°F)	130–180Ω	———
(80°C/176°F)	45–60Ω	———
(120°C/248°F)	10–20Ω	———
Fan motor switch start to close (ON)	98–102°C (208–216°F)	———
stop opening	93–97°C (199–207°F)	———

Torque Values

Standard

Fasteners Type	Torque N • m (kg-m, ft-lb)	Fasteners Type	Torque N • m (kg-m, ft-lb)
5 mm hex bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	9 (0.9, 6.5)
10 mm hex bolt and nut	35 (3.5, 25)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
12 mm hex bolt and nut	55 (5.5, 40)	8 mm flange bolt and nut	27 (2.7, 20)
		10 mm flange bolt and nut	40 (4.0, 29)

Torque specifications listed below are for important fasteners. Others should be tightened to standard torque values listed above.

Notes: 1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surface.
4. Stake.
5. Apply oil to the threads and flange surface.
6. Apply clean engine oil to the O-ring.
7. Apply grease to the threads and flange surface.
8. UBS bolt.
9. U-nut.
10. ALOC bolt.

Engine

Item	Q'ty	Thread dia. (mm)	Torque N • m (kg-m, ft-lb)	Remarks
Maintenance:				
Timing hole cap	1	45	18 (1.8, 13)	Note 7
Spark plug	4	12	15 (1.5, 11)	
Lubrication System:				
Oil filter boss	1	20	18 (1.8, 13)	Note 2
Oil filter cartridge	1	20	10 (1.0, 7)	Note 5
Oil drain plug	1	14	30 (3.0, 22)	
Oil pass plate	3	6	12 (1.2, 9)	Note 2
Oil pipe C special bolt	2	6	12 (1.2, 9)	Note 2
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Note 2
Oil pump assembly flange bolt	3	6	13 (1.3, 9)	
Oil pressure switch	1	PT 1/8	12 (1.2, 9)	Note 1
Oil pressure switch connector bolt	1	4	2.2 (0.22, 1.6)	
Fuel System:				
Carburetor connecting nut, 6 mm	2	6	10 (1.0, 7)	
5 mm	2	5	5.2 (0.52, 3.8)	
Cooling System:				
Water pump flange bolt	2	6	13 (1.3, 9)	
Water pipe D flange bolt	2	6	13 (1.3, 9)	

Engine (Cont'd)

Item	Q'ty	Thread dia. (mm)	Torque N • m (kg-m, ft-lb)	Remarks
Cylinder Head/Valves:				
Cylinder head flange cap nut	4	10	45 (4.5, 33)	Note 5
Cylinder head flange nut	8	10	45 (4.5, 33)	Note 5
Cylinder head socket bolt	4	8	26 (2.6, 19)	
Cylinder head sealing bolt	1	18	32 (3.2, 23)	Note 2
Vacuum port socket bolt	1	5	3 (0.30, 2.2)	
Camshaft holder flange bolt	16	6	14 (1.4, 10)	
Cylinder head cover bolt	8	6	10 (1.0, 7)	
Boost joint	3	5	2.5 (0.25, 1.8)	
Cam sprocket bolt	4	7	20 (2.0, 14)	Note 2, 8
Valve adjuster screw lock nut	16	7	23 (2.3, 17)	Note 5
Cam chain tensioner bracket bolt	4	6	14 (1.4, 10)	
Rocker arm guide bolt	16	6	12 (1.2, 9)	Note 8
Clutch /Gearshift Linkage:				
Clutch center lock nut	1	25	128 (12.8, 93)	Note 5
Clutch spring bolt	5	6	12 (1.2, 9)	
Clutch slave cylinder bleeder screw	1	8	8 (0.8, 5.8)	
Shift fork shaft stopper plate bolt	2	6	12 (1.2, 9)	Note 2
Shift drum center bolt	1	8	23 (2.3, 17)	Note 2
Gearshift spindle return spring pin	1	8	22 (2.2, 16)	
Drive sprocket special bolt	1	10	54 (5.4, 39)	
Clutch slave cylinder oil bolt	1	10	35 (3.5, 25)	
Crankshaft/Transmission:				
Crankcase main journal bolt	12	9	37 (37, 27)	Note 8
Crankcase flange bolt	10	1	39 (3.9, 28)	
	8	17	24 (2.4, 17)	
Crankcase sealing bolt	20	1	30 (3.0, 22)	
	10	1	12 (1.2, 9)	
Connecting rod nut	8	8	35 (3.5, 25)	Note 5
Balancer shaft holder flange bolt	1	6	12 (1.2, 9)	
Charging System/Alternator:				
Alternator base flange bolt	3	8	25 (2.5, 18)	Note 1
Alternator assembly flange socket bolt	3	6	8 (0.8, 5.8)	Note 2
Alternator shaft flange nut	1	12	49 (4.9, 35)	Note 5
Ignition System:				
Pulse generator rotor flange bolt	1	10	49 (4.9, 35)	Note 2
Lights/Meters/Switches:				
Neutral switch	1	10	12 (1.2, 9)	
Neutral switch terminal nut	1	4	2.2 (0.22, 1.6)	
Other:				
General torque: SH flange bolt	–	6	10 (1.0, 7)	
SHF flange bolt	–	6	12 (1.2, 9)	

Frame

Item	Q'ty	Thread dia. (mm)	Torque N • m (kg-m, ft-lb)	Remarks
Frame/Body Panels/Exhaust System:				
Exhaust pipe joint nut	8	7	17 (1.7, 12)	
Muffler band bolt	4	8	22 (2.2, 16)	
Muffler stay flange nut	3	8	22 (2.2, 16)	
Step holder bolt	4	8	33 (3.3, 24)	
Center stand bolt	1	10	50 (5.0, 36)	
Side stand pivot bolt	1	10	8 (0.8, 5.8)	
Side stand pivot lock nut	1	10	40 (4.0, 29)	Note 9
Side stand bracket bolt	3	10	65 (6.5, 47)	
Grub rail mounting bolt	4	8	35 (3.5, 2.5)	
Lubrication System:				
Oil cooler pipe joint	4	6	9 (0.9, 6.5)	
Fuel System:				
Fuel valve	1	6	10 (1.0, 7)	
Fuel tank cap	7	4	3 (0.30, 2.2)	
Fuel unit	4	6	10 (1.0, 7)	Note 9
Fuel tank mounting bolt	2	6	10 (1.0, 7)	
Fuel tank pivot nut	1	6	10 (1.0, 7)	Note 9
Cooling System:				
Fan motor switch	1	16	18 (1.8, 13)	Note 1
Water hose joint	1	6	9 (0.9, 6.5)	
Water hose band			1.0-1.5 (0.10-0.15, 0.7-1.1)	
Engine Mounting:				
Front engine hanger bolt/nut (Upper)	2	10	45 (4.5, 33)	
Front engine hanger bolt/nut (Lower)	2	10	45 (4.5, 33)	
Rear engine hanger bolt/nut (Upper)	1	12	55 (5.5, 40)	
Rear engine hanger bolt/nut (Lower)	1	12	55 (5.5, 40)	
Engine hanger adjusting bolt	1	20	8 (0.8, 5.8)	
Engine hanger adjusting bolt lock nut	1	20	25 (2.5, 18)	
Clutch/Gearshift Linkage:				
Clutch master cylinder holder bolt	2	6	12 (1.2, 9)	
Clutch master cylinder cap screw	2	4	1.5 (0.15, 1.1)	
Clutch lever pivot bolt	1	6	0.8 (0.08, 0.6)	
Clutch lever pivot nut	1	6	5.9 (0.59, 4.3)	
Clutch switch screw	1	4	1.2 (0.12, 0.8)	
Gearshift pedal arm pinch bolt	1	6	16 (1.6, 12)	
Gearshift pedal arm pivot bolt	1	8	27 (2.7, 20)	
Wheels:				
Front axle bolt	1	14	59 (5.9, 43)	
Front axle holder bolt	4	8	22 (2.2, 16)	
Front brake disc bolt	12	8	42 (4.2, 30)	Note 10
Rear axle nut	1	18	93 (9.3, 67)	
Rear brake disc bolt	6	8	42 (4.2, 30)	Note 10
Driven sprocket nut	5	12	110 (11.0, 78)	Note 9
Front Suspension:				
Steering stem nut	1	24	103 (10.3, 96)	
Top thread A	1	26	25 (2.5, 18)	See page 11-18
Top thread B	1	26	—	
Top bridge pinch bolt	2	8	23 (2.3, 17)	
Bottom bridge pinch bolt	2	10	49 (4.9, 35)	
Handlebar pivot pinch bolt	2	8	27 (2.7, 20)	
Handlebar weight mounting screw	2	6	10 (1.0, 7)	

Frame (Cont'd)

Item	Q'ty	Thread dia. (mm)	Torque N · m (kg-m, ft-lb)	Remarks
Fork:				
Fork oil drain bolt	2	6	8 (0.8, 5.8)	
Fork socket bolt	2	8	20 (2.0, 14)	
Fork cap bolt	2	37	23 (2.3, 17)	
Fork damper rod lock nut	2	10	20 (2.0, 14)	
Secondary master cylinder link rod bracket bolt	2	8	27 (2.7, 20)	Note 10
Rear Suspension:				
Swingarm pivot nut	1	14	108 (10.8, 78)	Note 9
Drive chain adjuster lock nut	2	8	22 (2.2, 16)	
Rear shock absorber mounting bolt/nut	2	10	42 (4.2, 30)	Note 9
Shock link bolt (Frame side)	1	10	59 (5.9, 43)	Note 9
Shock link bolt (Shock arm side)	1	10	42 (4.2, 30)	Note 9
Shock arm bolt (Swingarm side)	1	10	42 (4.2, 30)	
Brake System:				
Front brake master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake master cylinder cap screw	2	4	1.5 (0.15, 1.1)	
Front brake lever pivot bolt	1	6	0.8 (0.08, 0.6)	
Front brake lever pivot nut	1	6	5.9 (0.59, 4.3)	
Front brake lever adjuster socket bolt	1	5	3.9 (0.39, 2.9)	
Front brake switch screw	1	4	1.2 (0.12, 0.8)	
Right front brake caliper mounting bolt	2	8	27 (2.7, 20)	Note 10
Left front brake caliper lower mounting bolt	1	8	27 (2.7, 20)	Note 10
Caliper body B mounting bolt	9	8	32 (3.2, 23)	Note 10
Brake caliper main slide pin	3	12	27 (2.7, 20)	
Brake caliper slide pin	3	8	23 (2.3, 17)	
Pad pin	3	10	23 (2.3, 17)	
Caliper bleeder screw	6	8	5.4 (0.54, 4.0)	
Secondary master cylinder mounting bolt	2	6	12 (1.2, 9)	
Secondary master cylinder push rod joint nut	1	8	18 (1.8, 13)	
Secondary master cylinder orifice bolt	1	8	5.4 (0.54, 4.0)	
Brake link arm bolt/nut	2	8	27 (2.7, 20)	Note 10
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear master cylinder reservoir	1	6	12 (1.2, 9)	
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	
Rear master cylinder reservoir joint screw	1	4	1.5 (0.15, 1.1)	
Brake hose oil bolt	12	10	35 (3.5, 25)	
Brake pipe bolt	8	10	17 (1.7, 12)	Note 5
Brake hose joint mounting bolt	5	6	12 (1.2, 9)	
Brake hose clamp mounting bolt	6	6	12 (1.2, 9)	
Other Fasteners:				
Ignition switch torx bolt	2	8	25 (2.5, 18)	Note 10

Tools

Special

The marked "*" is newly designed tool.

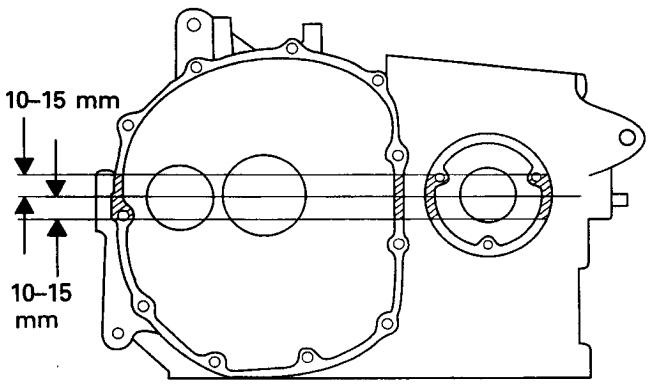
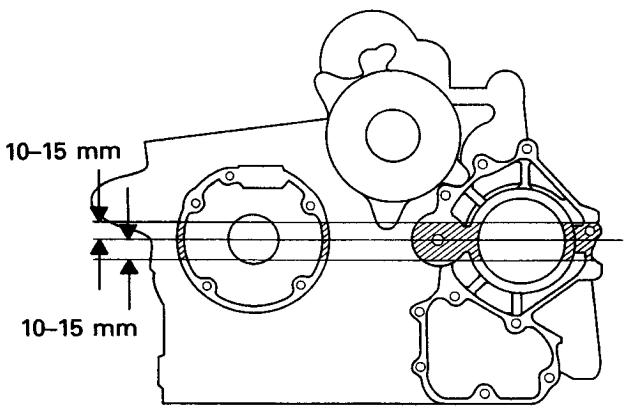
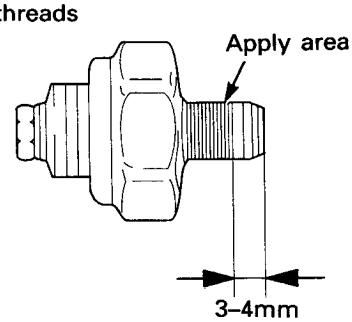
Description	Tool Number	Applicability
Maintenance:		
Oil filter wrench	07HAA–PJ70100	
Lock wrench	07GMA–ML70120	
Drive chain cutter	07HMH–MR10102	
*– Link plate holder	07PMH–MZ20110	
Fuel System:		
Pilot screw wrench	07908–4220201	Except SW type
Pilot crew wrench	07KMA–MS60101	SW type
Cylinder Head/Valves:		
Valve guide reamer, 5.510 mm	07984–2000001	
Cylinder/Piston:		
*Piston ring compressor	07PME–MZ20100	Two required
Piston base	07958–250001	Two required
Front Wheel/Suspension/Steering:		
Oil seal driver	07947–KA50100	
Oil seal driver attachment	07947–KF00100	
Steering stem socket	07916–3710101	
Bearing race remover	07946–3710500	
Steering stem driver	07946–MB00000	
Ball race remover	07953–MJ10000	
– Remover attachment	07953–MJ10100	
– Remover handle	07953–MJ10200	
Rear Wheel/Suspension:		
Bearing remover set	07936–3710300	
– Remover handle	07936–3710100	
– Sliding weight	07741–0010201	
Driver shaft	07946–MJ00100	
Bearing remover attachment	07GMD–KT70200	
Driver attachment, 28 x 30 mm	07946–1870100	
Driver pin	07GMD–KT80100	
Brake System:		
Snap ring pliers	07914–3230001	
Electrical Equipment:		
Peak voltage adaptor	07HGJ–0020100	

Common

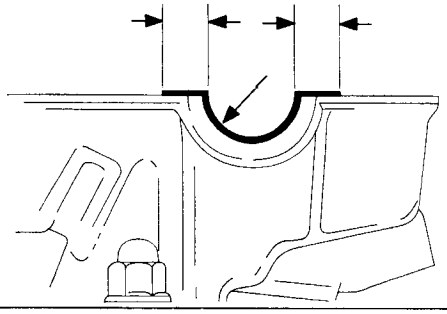
Description	Tool Number	Applicability
Lubrication System:		
Oil pressure gauge	07506–3000000	
Oil pressure gauge attachment	07510–4220100	
Fuel System:		
Float level Gauge	07401–0010000	
Cylinder Head/Valves:		
Valve spring compressor	07757–0010000	
Valve guide remover, 5.5 mm	07742–0010100	
Valve guide driver	07743–0020000	
Valve seat cutter		
Seat cutter, 33 mm (45° IN)	07780–0010800	
Seat cutter, 27.5 mm (45° IN)	07780–0010200	
Flat cutter, 33 mm (32° IN)	07780–0012900	
28 mm (32° EX)	07780–0012100	
Interior cutter, 30 mm (60° IN/EX)	07780–0014000	
Cutter holder, 5.5 mm	07781–0010101	
Clutch/Gearshift Linkage:		
Clutch center holder	07724–0050001	
Extension bar	07716–0020500	
Crankshaft/Transmission:		
Universal bearing puller	07631–0010000	
Attachment, 37 x 40 mm	07746–0010200	
Inner driver C	07746–0030100	
Attachment, 25 mm	07746–0030200	
Pilot, 17 mm	07746–0040400	
Front Wheel/Suspension/Steering:		
Bearing remover head, 20 mm	07746–0050600	
Bearing remover shaft	07746–0050000	
Driver	07749–0010000	
Attachment 42 x 47 mm	07746–0010300	
Attachment, 52 x 55 mm	07746–0010400	
Pilot, 20 mm	07746–0040500	
Extension bar	07716–0020500	
Rear Wheel/Suspension:		
Bearing remover head, 20 mm	07746–0050600	
Bearing remover shaft	07746–0050000	
Driver	07749–0010000	
Attachment, 32 x 35 mm	07746–0010100	
Attachment, 37 x 40 mm	07746–0010200	
Attachment, 52 x 55 mm	07746–0010400	
Attachment, 62 x 68 mm	07746–0010500	
Pilot, 15 mm	07746–0040300	
Pilot, 17 mm	07746–0040400	
pilot, 20 mm	07746–0040500	
Pilot, 22 mm	07746–0041000	
Pilot, 25 mm	07746–0040600	
Driver attachment outer, 24 x 26 mm	07746–0010700	
Electrical Equipment:		
Torx driver bit (T40)	07703–0010100	or equivalent commercially available
Digital multimeter (KOWA)	07411–0020000	
Analogue tester	07308–00200001 (SANWA) or TH-5H (KOWA)	

Lubrication & Seal Points

Engine

Location	Material	Remarks
Crankcase mating surface  	Liquid sealant (Three-Bond 1207B or equivalent)	• Wipe off the excess sealant • Do not apply sealant to near the bearing
Oil pressure switch threads 		Apply only to the area shown
Alternator base tightening bolt threads Drive chain guide plate bolt threads		
Main bearing surface Connecting rod bearing surface Crankshaft thrust surface Camshaft bearing surface and thrust surface Rocker arm slipper surface, guide area Rocker arm spherical bearing surface M3/4 gear, C5, C6 gear shift fork groove Valve stem (valve guide sliding surface) Primary driven gear surface Starter reduction shaft sliding surface	Molybdenum disulfide oil (A mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	

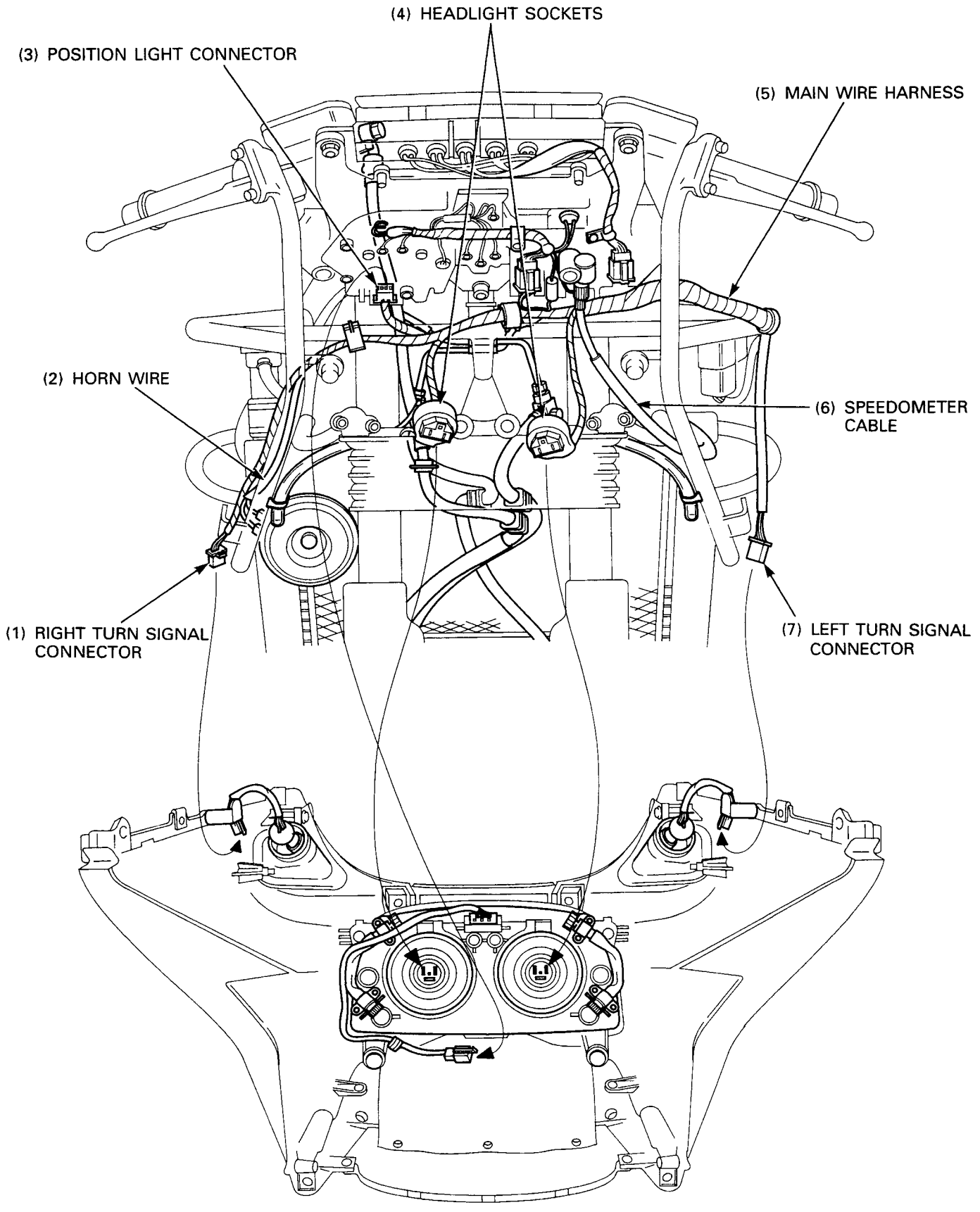
Engine (Cont'd)

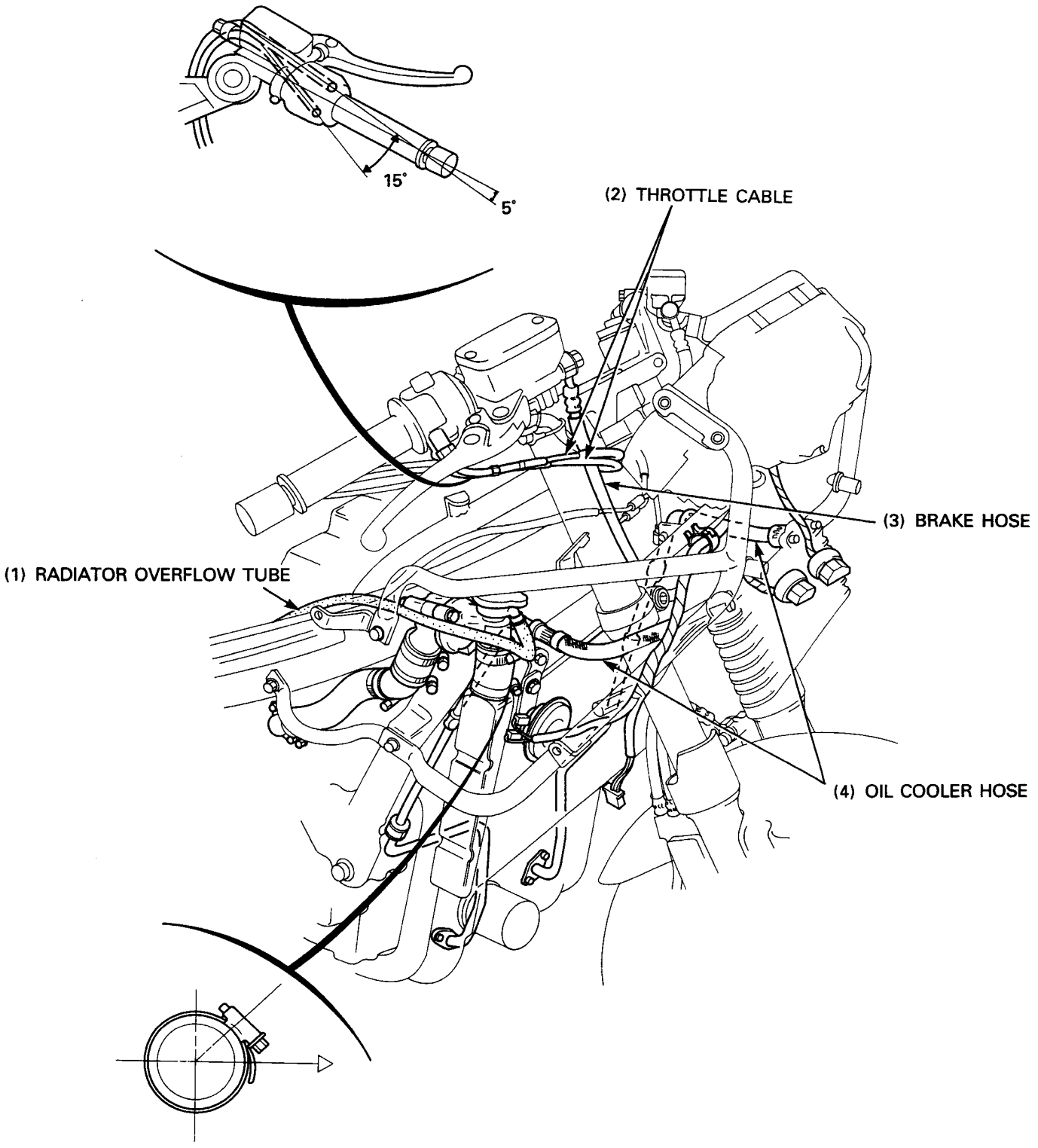
Location	Material	Remarks
Ignition pulse generator grommet Cylinder head semi-circular cut-out 	Sealant	
Cylinder head cover breather plate bolt threads Cylinder head sealing bolt threads Cam sprocket bolt threads Shift drum bearing set plate bolt threads Lower crankcase sealing bolt threads (10 mm/20 mm) Ignition pulse generator rotor bolt threads Alternator chain guide bolt threads Alternator chain tensioner mounting bolt threads Oil pump chain guide bolt threads Oil pass plate bolt threads Oil pump driven sprocket bolt threads Oil pipe C mounting bolt threads Shift fork shaft stopper plate bolt threads Oil filter boss Shift fork shaft stopper plate bolt threads Drive chain guide plate bolt threads	Locking agent	Clean and apply to the threads 6.5 ± 1 mm
Clutch disc surface Piston sliding surface and piston pin bore Piston rings and ring grooves Oil pass plate seal Cylinder head nut threads and seating surface Connecting rod nut threads and seating surface Main journal UBS bolt threads and seating surface Oil filter cartridge O-ring Clutch center lock nut threads and seating surface Valve adjusting screw threads Starter one-way clutch sliding lock surface Alternator damper spline area Alternator shaft nut threads and seating surface Clutch joint piece Each gear teeth and rotating surface Oil strainer packing O-rings Each bearings	Engine oil	
Oil seal lips Balancer damper rubber fitting area Timing hole cap threads	Multi-purpose grease	
Clutch slave cylinder piston seal	DOT 4 brake fluid	

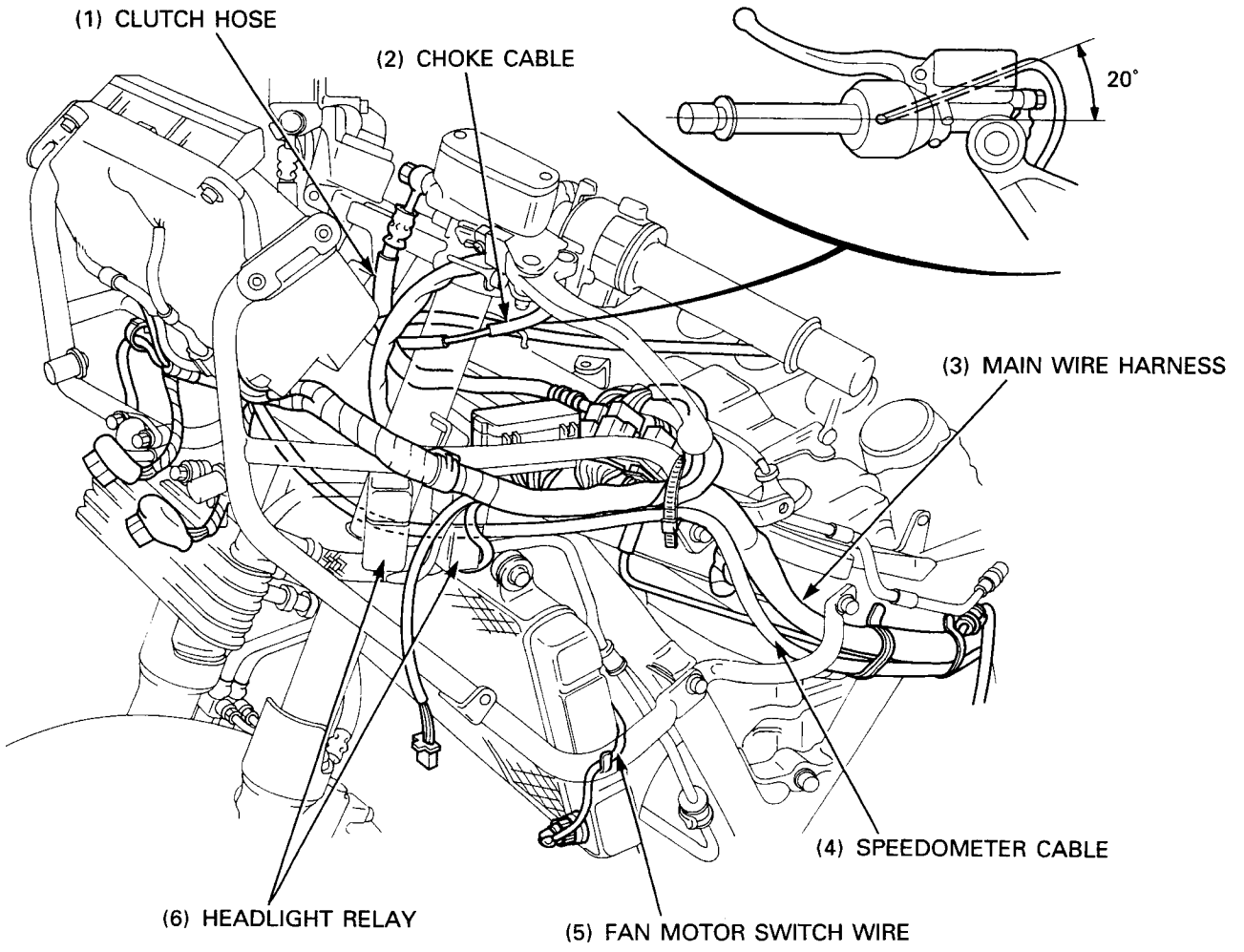
Frame

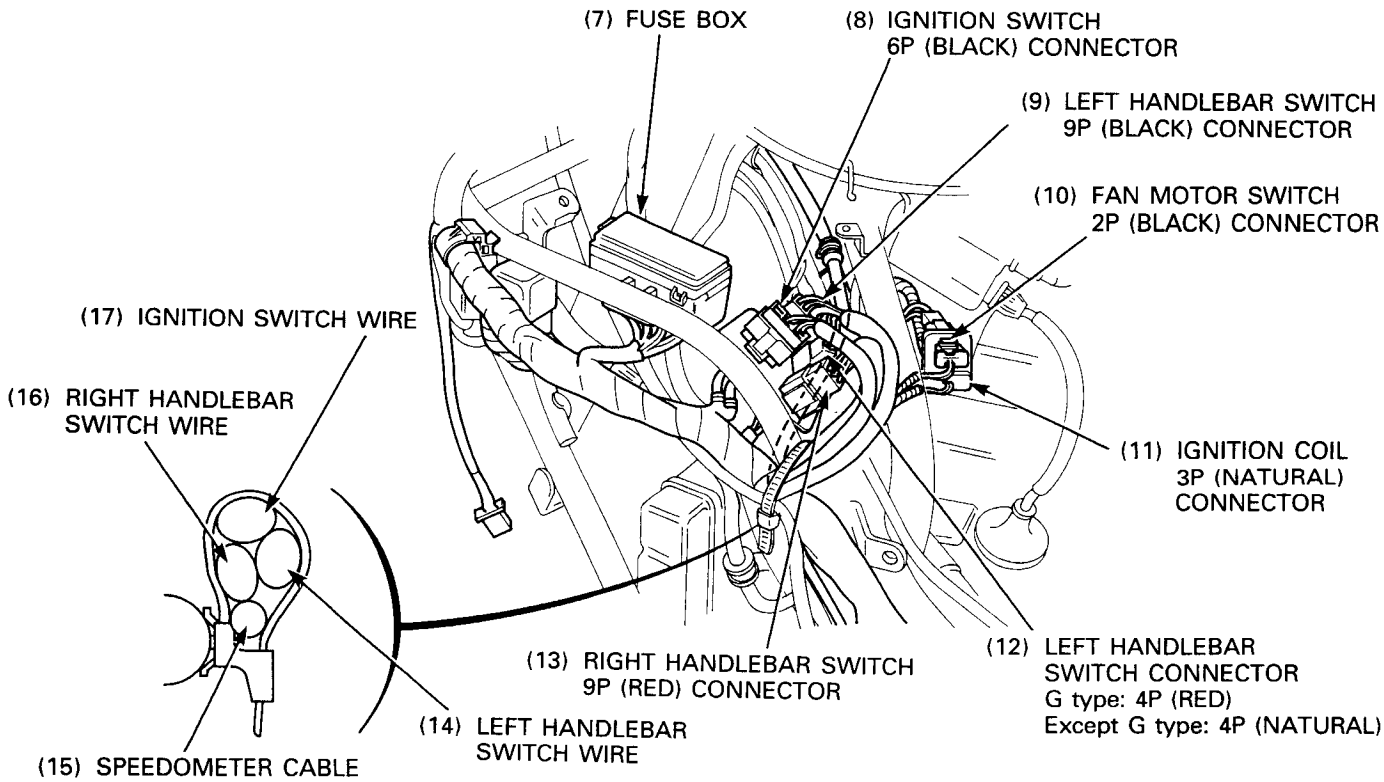
Location	Material	Remarks
Steering stem bearing and dust seal lips Left second master cylinder link needle bearings and oil seal Wheel bearing dust seal lips Fork bottom case needle bearings Secondary master cylinder arm bearings Secondary master cylinder arm oil seals Swingarm pivot nut seating surface Shock arm/shock link bearing and oil seal Rear wheel and driven flange sliding area Swingarm pivot bearing/dust seal Wheel axle and swingarm outer surface Throttle cable end Center stand pivot surface Side stand pivot surface Brake pedal pivot Gearshift pedal pivot Seat lock striker Dust seal lips	Multi-purpose grease	Apply thin coat of grease
Handlebar (throttle grip sliding surface) Swingarm pivot dust seal lips Swingarm pivot needle bearings Shock arm pivot needle bearings/dust seal lips Shock link pivot needle bearings/dust seal lips Shock absorber lower mount dust seal lips Shock absorber lower mount needle bearing Side stand pivot sliding surface	Molybdenum disulfide grease	
Rear shock absorber upper metal bushing	Molybdenum paste	
Steering stem top threads Brake flare pipe threads	Engine oil	
Handle grip inside surface	Honda Bond A	
Brake lever pivot and piston contact area Brake caliper slide pin and boot inside Caliper dust seal Rear master cylinder push rod tips/boot inside Secondary master cylinder push rod tips/boot inside	Silicone grease	
Brake caliper slide pin threads Fork socket bolt threads	Locking agent	
Fork cap O-ring Fork oil seal lips	Fork fluid	
Brake master cylinder piston and cup Clutch master cylinder piston and cup Brake caliper piston and seal	DOT 4 breake fluid	
Fan motor switch threads	Sealant	

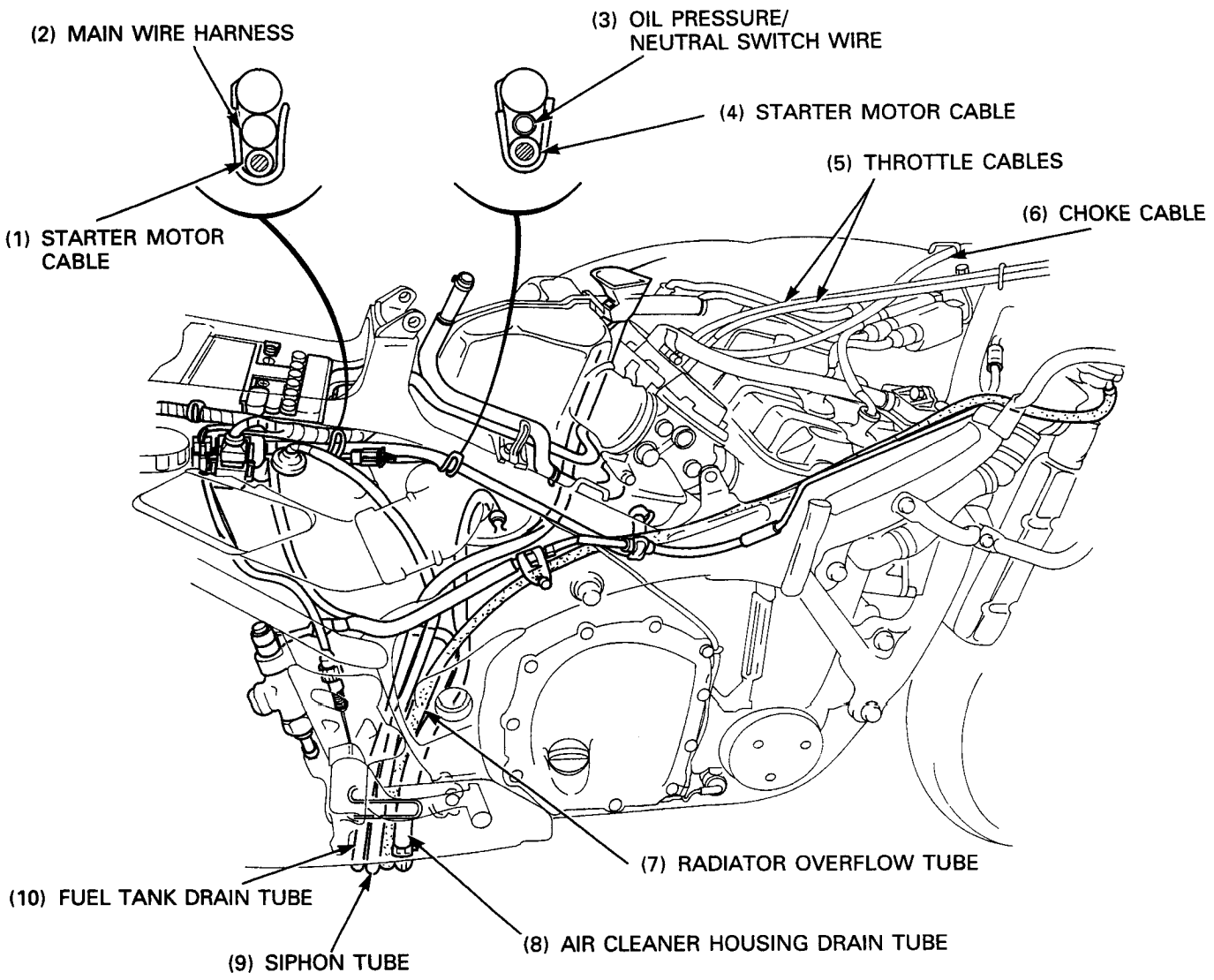
Cable & Harness Routing

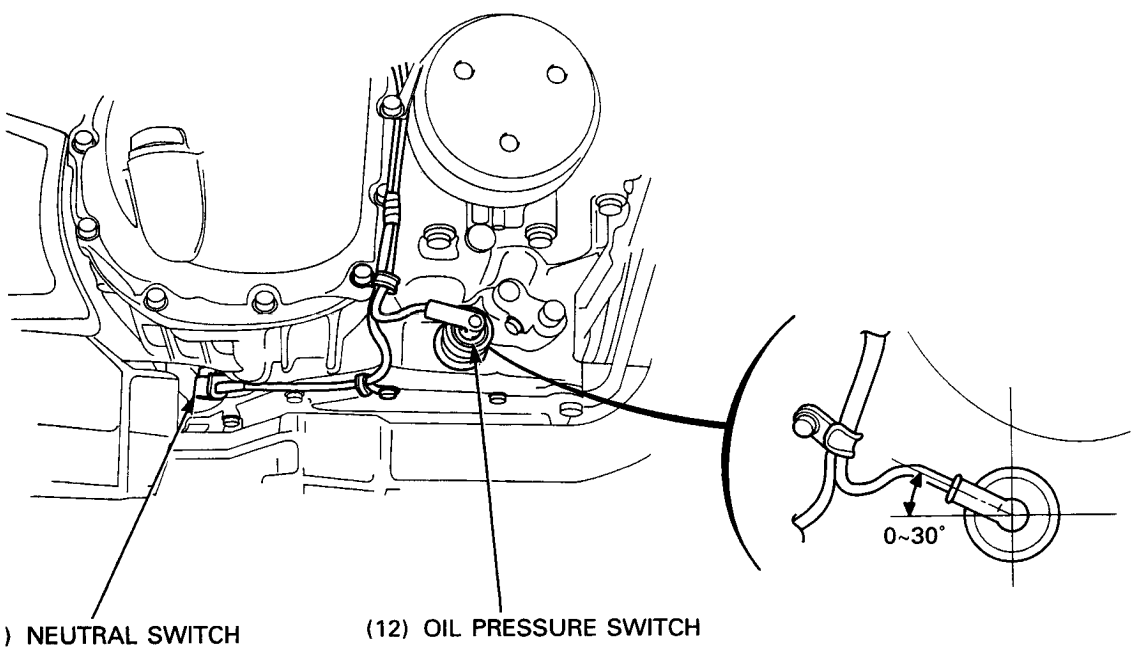


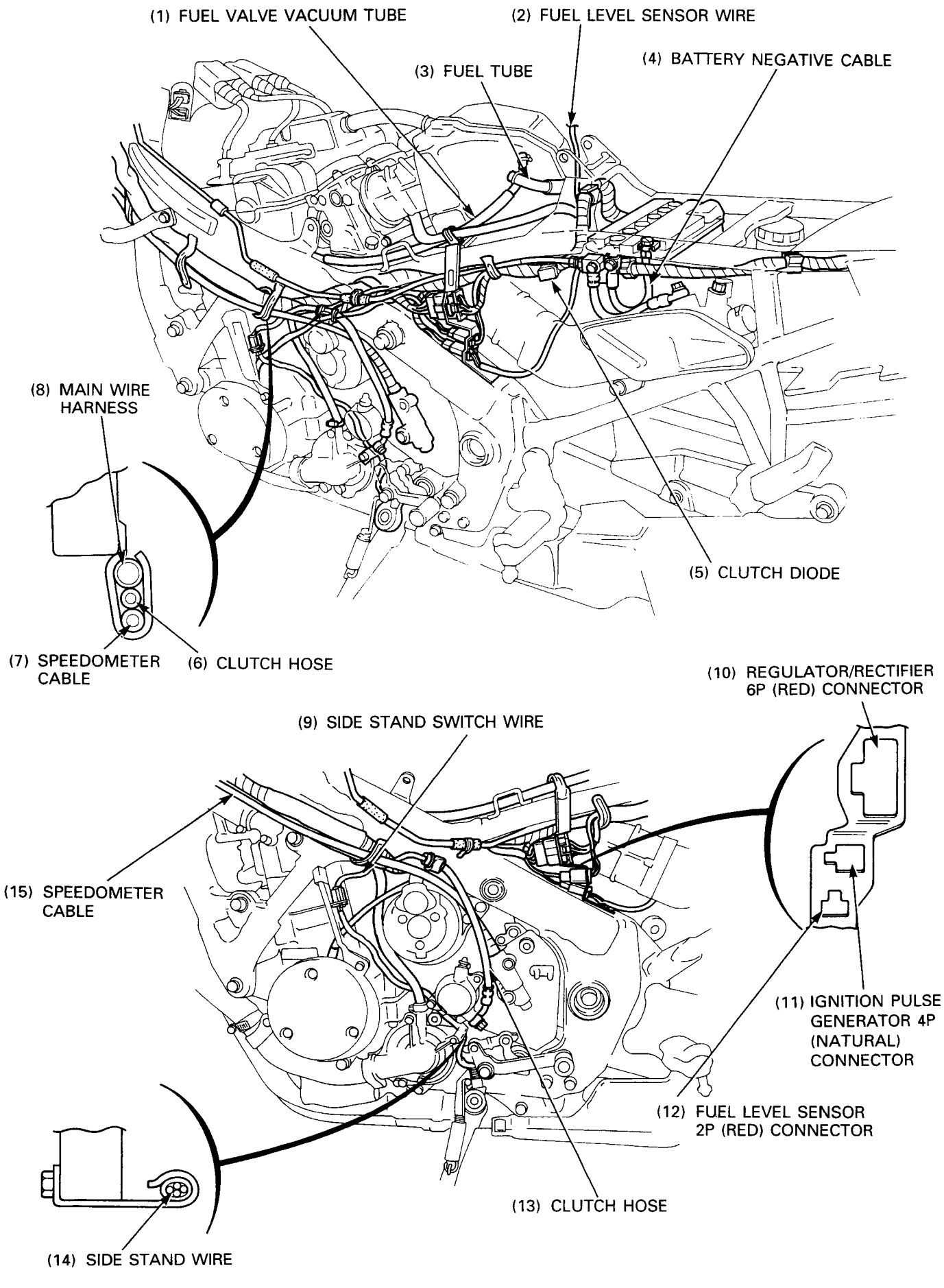

15°
5°
(2) THROTTLE CABLE
(3) BRAKE HOSE
(1) RADIATOR OVERFLOW TUBE
(4) OIL COOLER HOSE

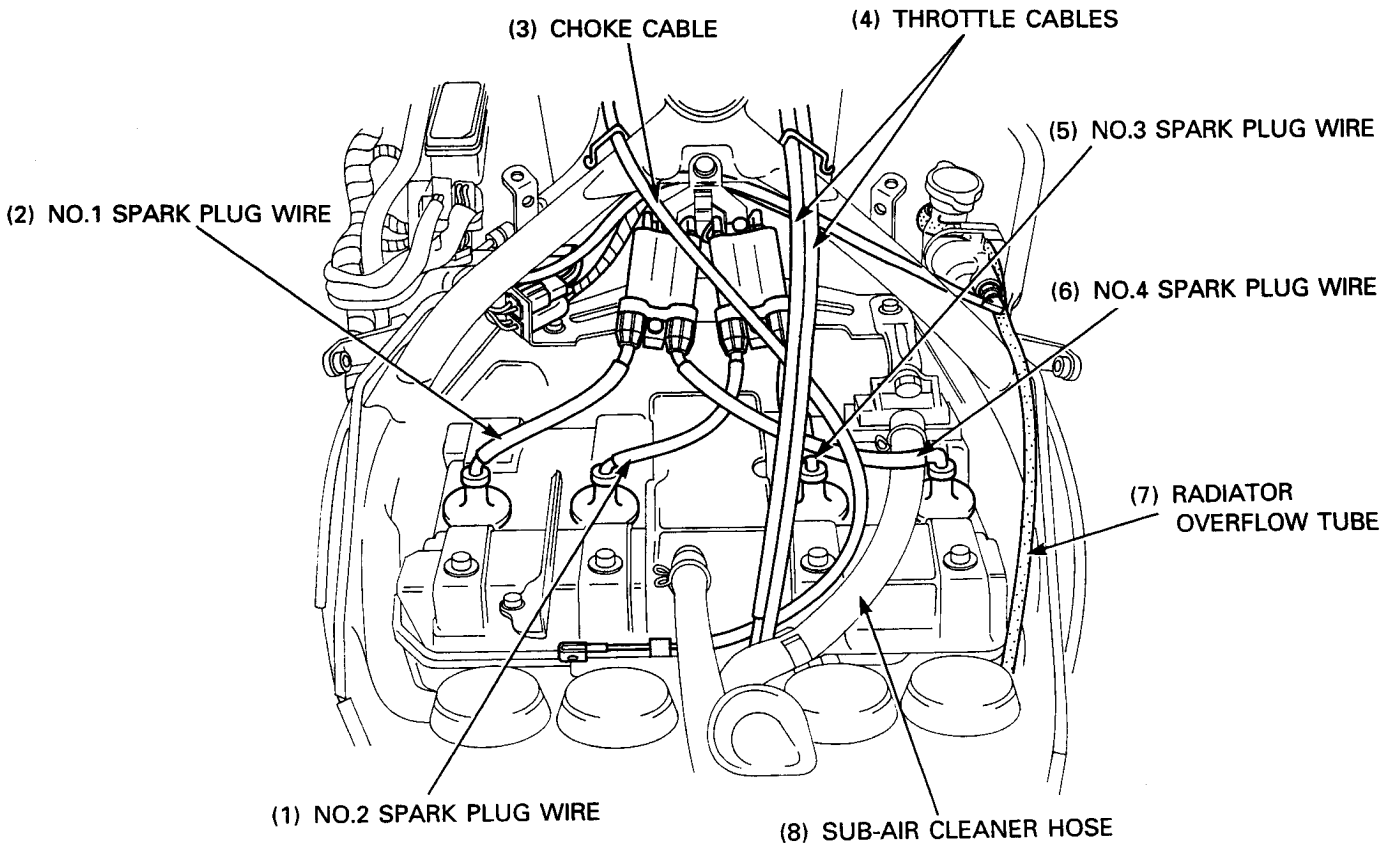

(1) CLUTCH HOSE
(2) CHOKE CABLE
20°
(3) MAIN WIRE HARNESS
(4) SPEEDOMETER CABLE
(5) FAN MOTOR SWITCH WIRE
(6) HEADLIGHT RELAY

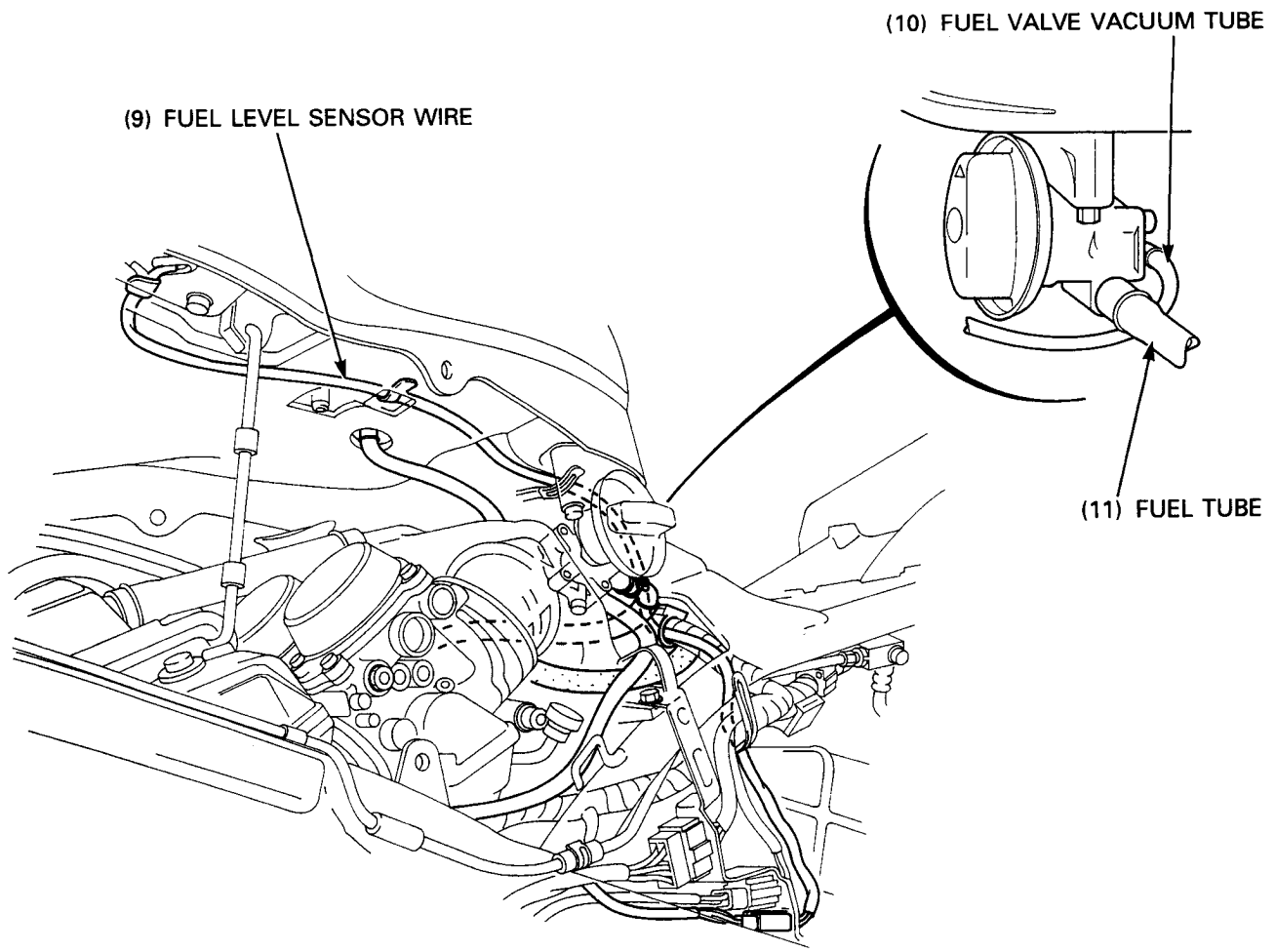

(7) FUSE BOX
(8) IGNITION SWITCH 6P (BLACK) CONNECTOR
(9) LEFT HANDLEBAR SWITCH 9P (BLACK) CONNECTOR
(10) FAN MOTOR SWITCH 2P (BLACK) CONNECTOR
(11) IGNITION COIL 3P (NATURAL) CONNECTOR
(12) LEFT HANDLEBAR SWITCH CONNECTOR
G type: 4P (RED)
Except G type: 4P (NATURAL)
(13) RIGHT HANDLEBAR SWITCH 9P (RED) CONNECTOR
(14) LEFT HANDLEBAR SWITCH WIRE
(15) SPEEDOMETER CABLE
(16) RIGHT HANDLEBAR SWITCH WIRE
(17) IGNITION SWITCH WIRE

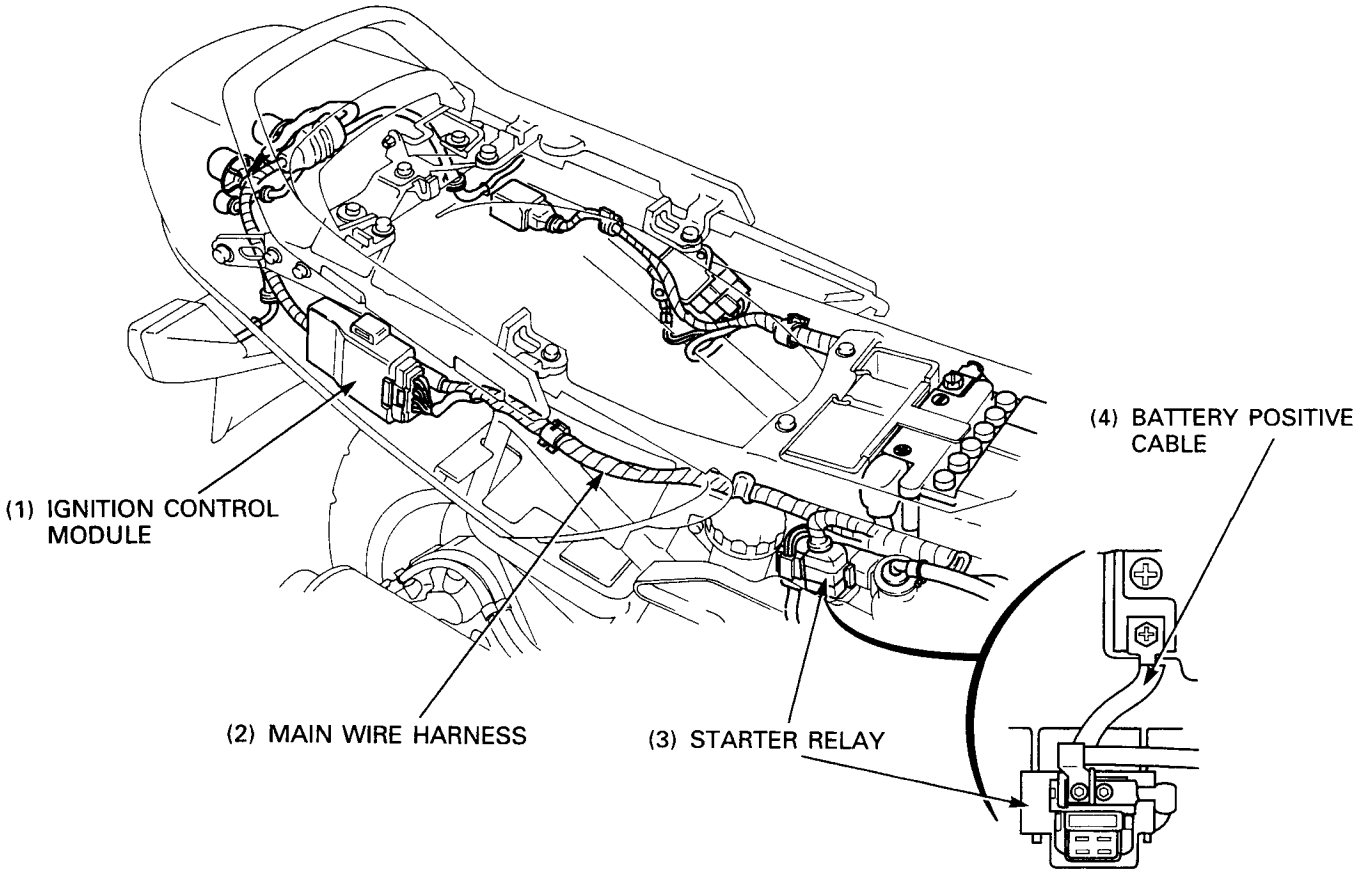

(2) MAIN WIRE HARNESS
(3) OIL PRESSURE/
NEUTRAL SWITCH WIRE
(4) STARTER MOTOR CABLE
(5) THROTTLE CABLES
(6) CHOKE CABLE
(1) STARTER MOTOR
CABLE
(7) RADIATOR OVERFLOW TUBE
(10) FUEL TANK DRAIN TUBE
(8) AIR CLEANER HOUSING DRAIN TUBE
(9) SIPHON TUBE

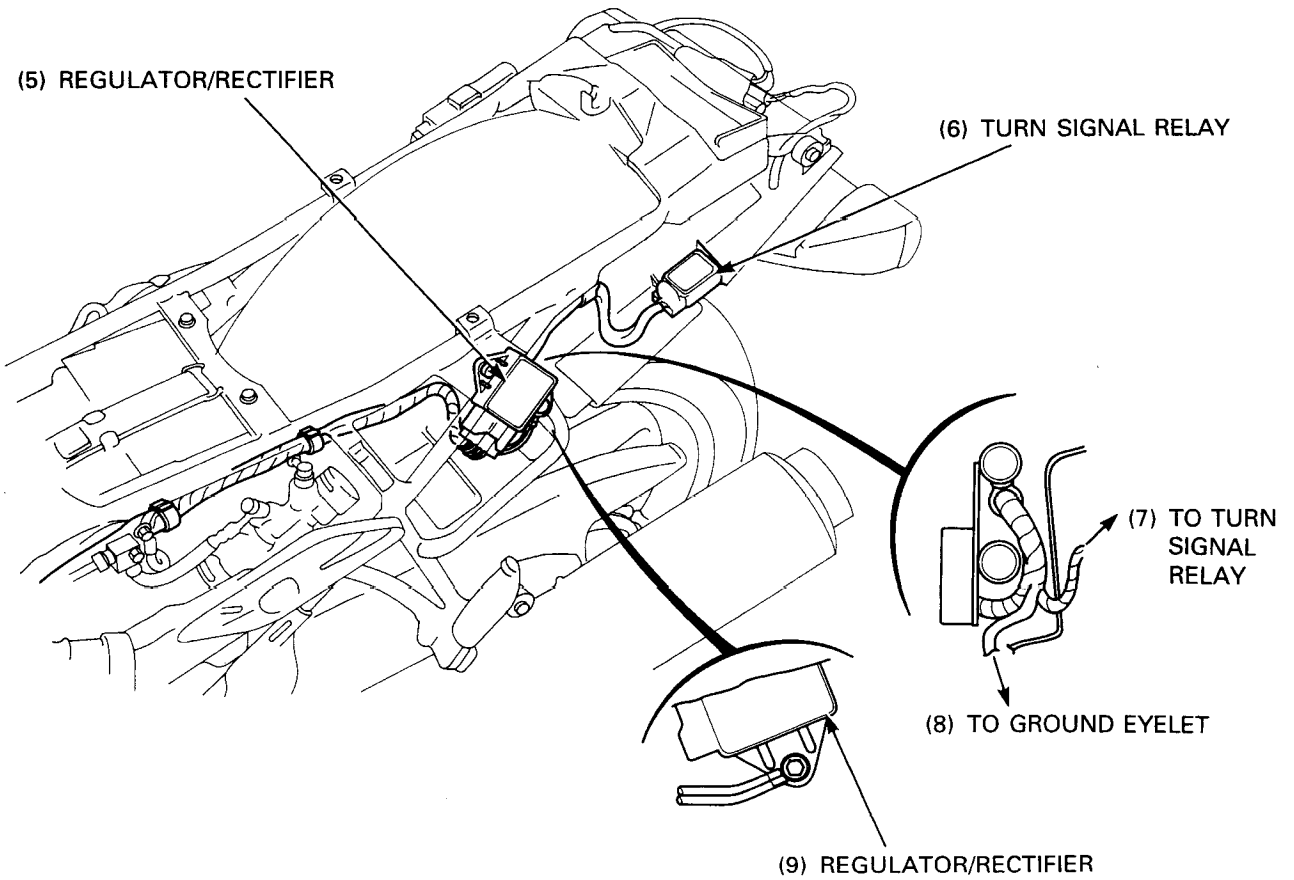

0~30°
(11) NEUTRAL SWITCH
(12) OIL PRESSURE SWITCH

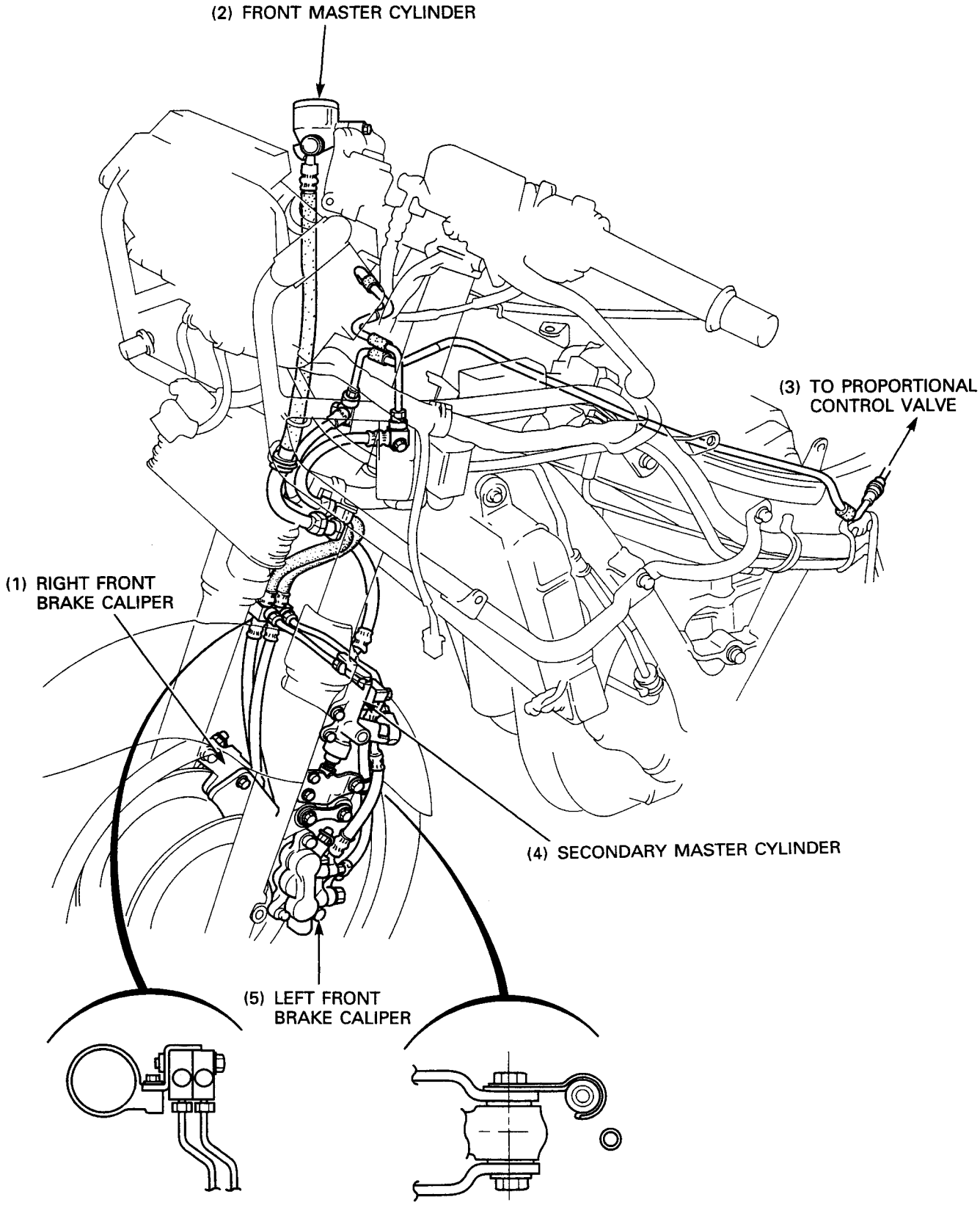

(1) FUEL VALVE VACUUM TUBE
(2) FUEL LEVEL SENSOR WIRE
(3) FUEL TUBE
(4) BATTERY NEGATIVE CABLE
(5) CLUTCH DIODE
(6) CLUTCH HOSE
(7) SPEEDOMETER CABLE
(8) MAIN WIRE HARNESS
(9) SIDE STAND SWITCH WIRE
(10) REGULATOR/RECTIFIER 6P (RED) CONNECTOR
(11) IGNITION PULSE GENERATOR 4P (NATURAL) CONNECTOR
(12) FUEL LEVEL SENSOR 2P (RED) CONNECTOR
(13) CLUTCH HOSE
(14) SIDE STAND WIRE
(15) SPEEDOMETER CABLE

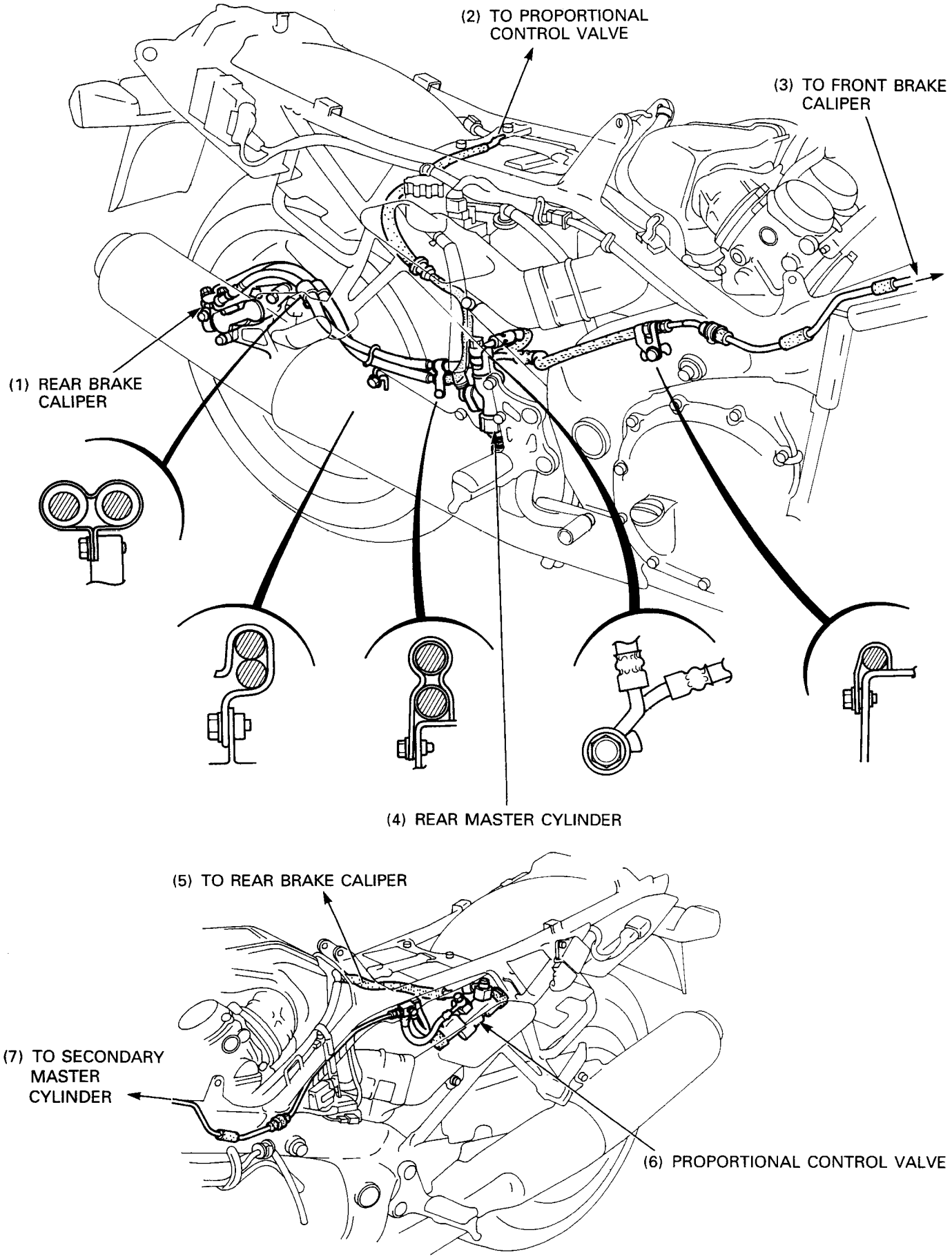

(3) CHOKE CABLE
(4) THROTTLE CABLES
(5) NO.3 SPARK PLUG WIRE
(2) NO.1 SPARK PLUG WIRE
(6) NO.4 SPARK PLUG WIRE
(7) RADIATOR OVERFLOW TUBE
(1) NO.2 SPARK PLUG WIRE
(8) SUB-AIR CLEANER HOSE


(10) FUEL VALVE VACUUM TUBE
(9) FUEL LEVEL SENSOR WIRE
(11) FUEL TUBE

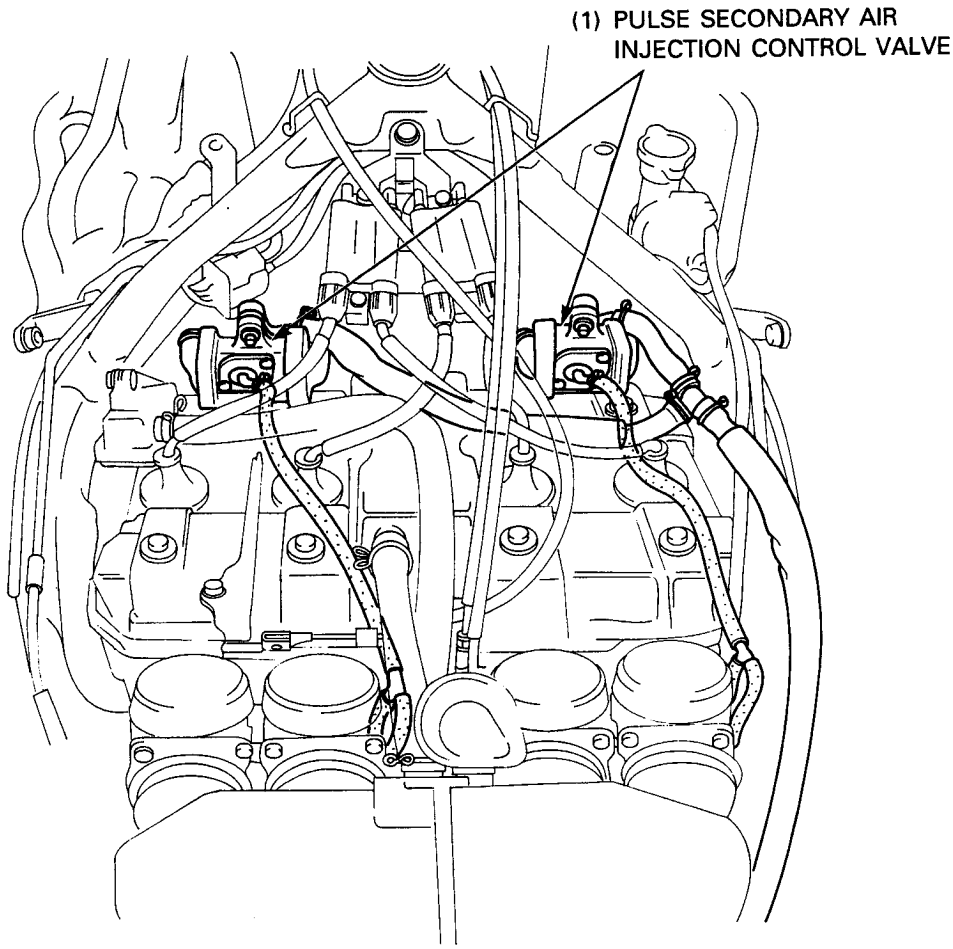

(1) IGNITION CONTROL MODULE
(2) MAIN WIRE HARNESS
(3) STARTER RELAY
(4) BATTERY POSITIVE CABLE

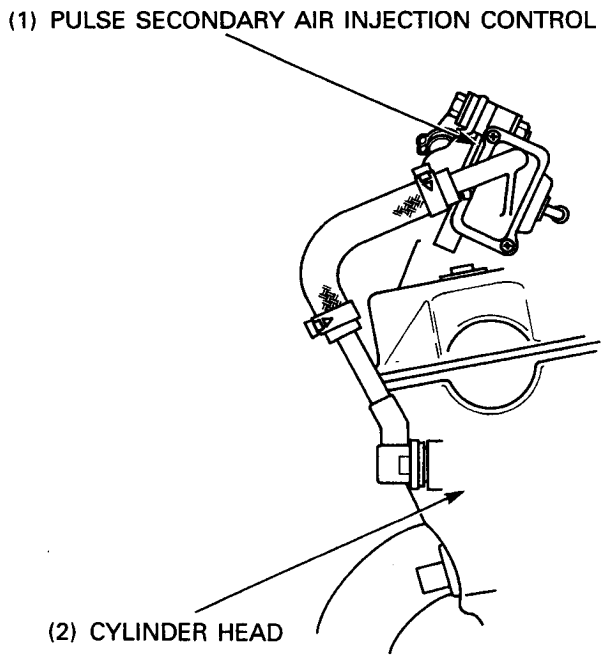

(5) REGULATOR/RECTIFIER
(6) TURN SIGNAL RELAY
(7) TO TURN SIGNAL RELAY
(8) TO GROUND EYELET
(9) REGULATOR/RECTIFIER


(2) FRONT MASTER CYLINDER
(3) TO PROPORTIONAL CONTROL VALVE
(1) RIGHT FRONT BRAKE CALIPER
(4) SECONDARY MASTER CYLINDER
(5) LEFT FRONT BRAKE CALIPER


(2) TO PROPORTIONAL CONTROL VALVE
(3) TO FRONT BRAKE CALIPER
(1) REAR BRAKE CALIPER
(4) REAR MASTER CYLINDER
(5) TO REAR BRAKE CALIPER
(7) TO SECONDARY MASTER CYLINDER
(6) PROPORTIONAL CONTROL VALVE

Secondary Air Supply System Routing (SW, AR type)





2. Frame/Body Panels/Exhaust System

Service Information

⚠ WARNING

- **Gasoline is extremely flammable and is explosive under certain conditions.**
- **Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.**

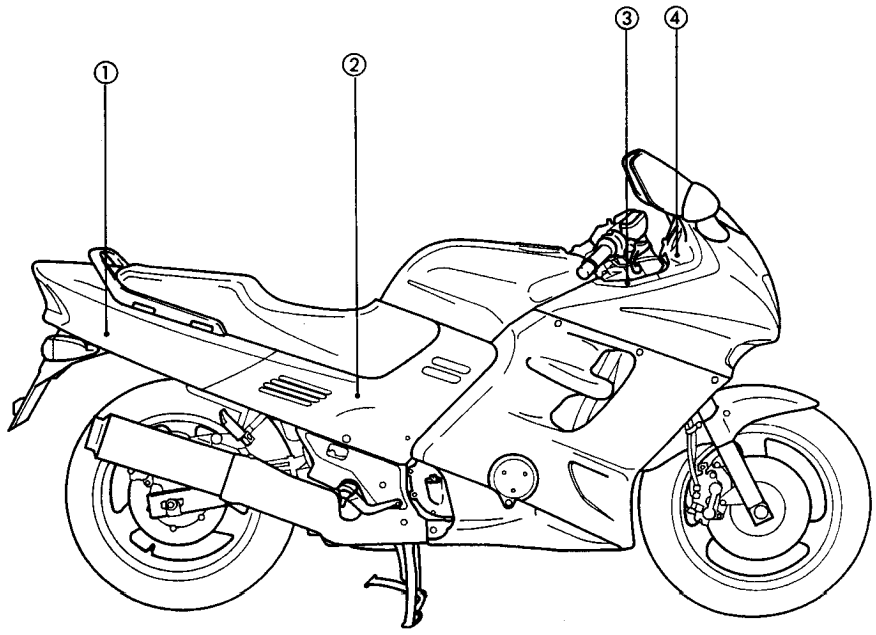
- Work in a well ventilated area. Smoking or allowing flames or sparks in the working area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the frame body panels, fuel tank and exhaust system.
- Always replace the exhaust pipe gaskets when removing the exhaust pipe from the engine.
- When installing the exhaust pipe, install the all fasteners loosely. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

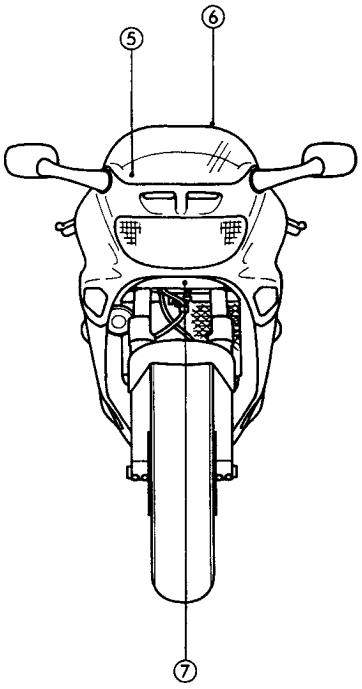
Troubleshooting

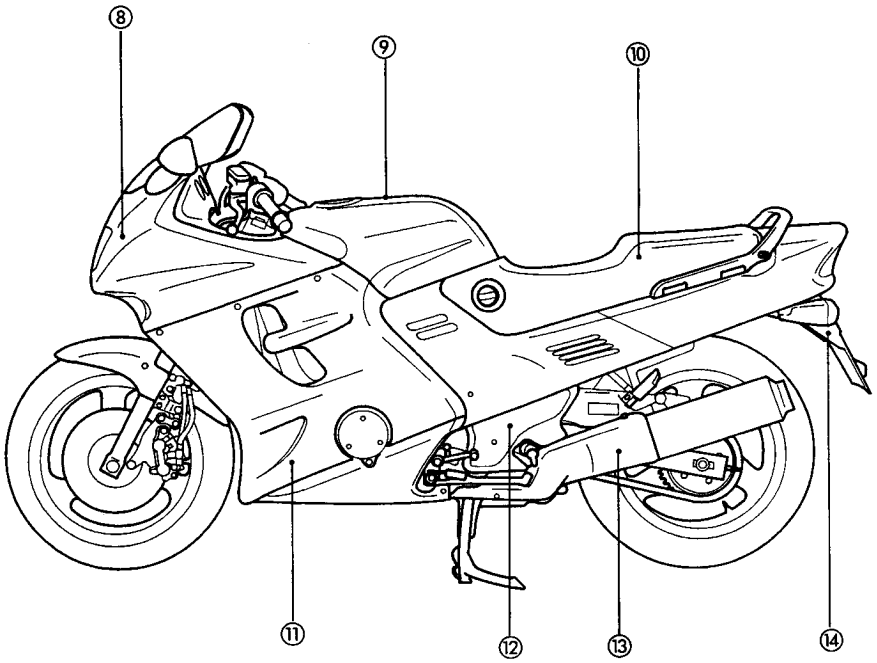
Excessive Exhaust Noise
- Broken exhaust system
- Exhaust gas leak

Poor Performance
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

Body Panel Locations







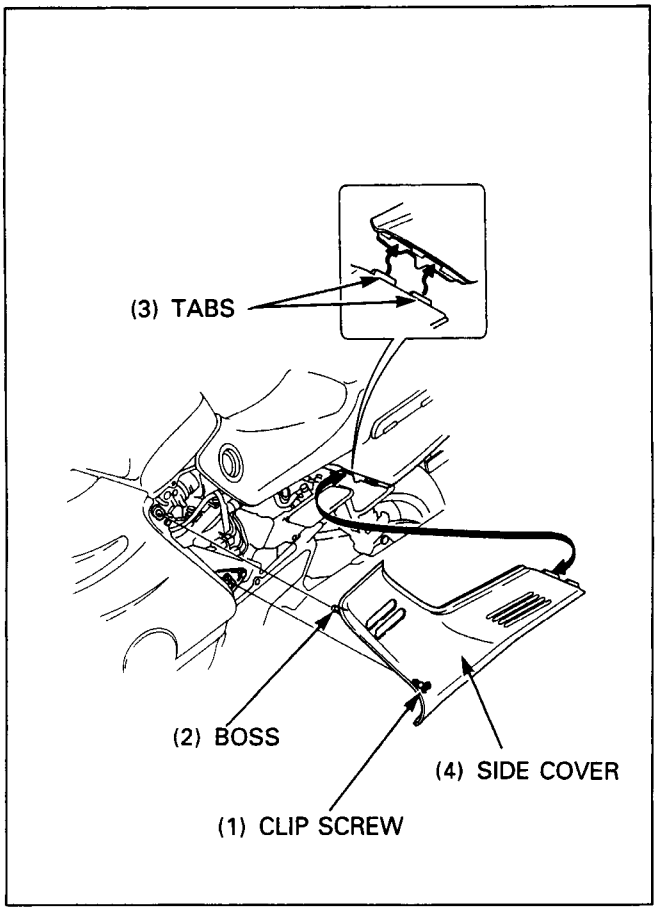
① SEAT COWL
② SIDE COVER
③ INNER COVER
④ INSTRUMENT PANEL
⑤ UPPER COWL INNER
⑥ WINDSCREEN
⑦ MAINTENANCE LID
⑧ UPPER FAIRING
⑨ FUEL TANK
⑩ SEAT
⑪ LOWER FAIRING
⑫ PIVOT COVER
⑬ PIVOT UNDER COVER
⑭ REAR FENDER A

Side Cover

Removal/Installation

Release the clip screw by turning it counterclockwise.
Pull the front of the side cover out, then release the boss from the lower fairing rubber grommet.
Release the tabs from the seat cowl, then remove the side cover.

Installation is in the reverse order of removal.



Seat

Removal

Unlock the seat using the ignition key.
Release the two hooks from the fuel tank.

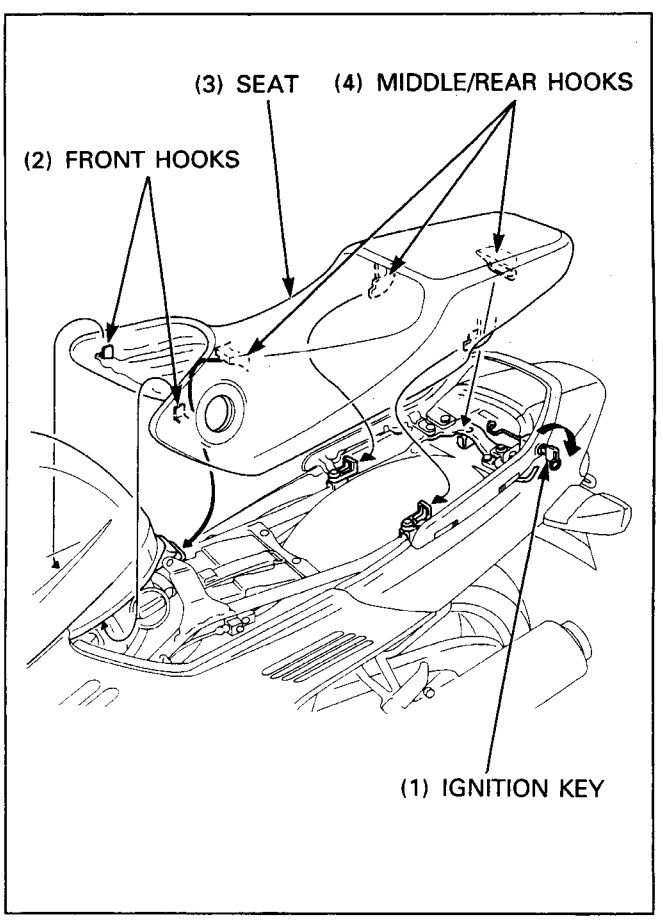
Pull the seat rearward and remove it.

Installation

Installation is in the reverse order of removal

NOTE

- At installation, first install the front hooks into the fuel tank, then install the middle and rear hooks into the catches of the grab rail.

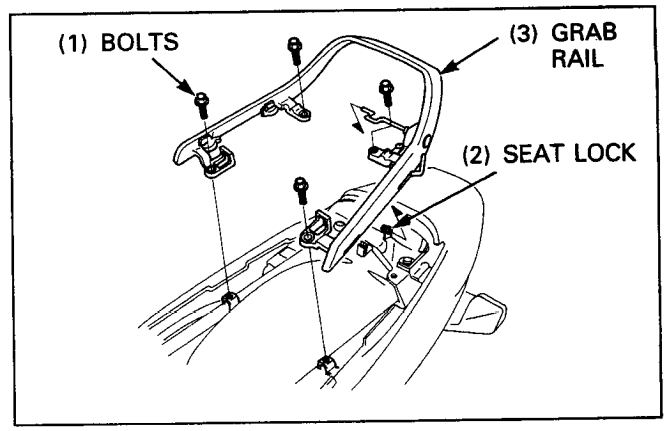


Seat Cowl

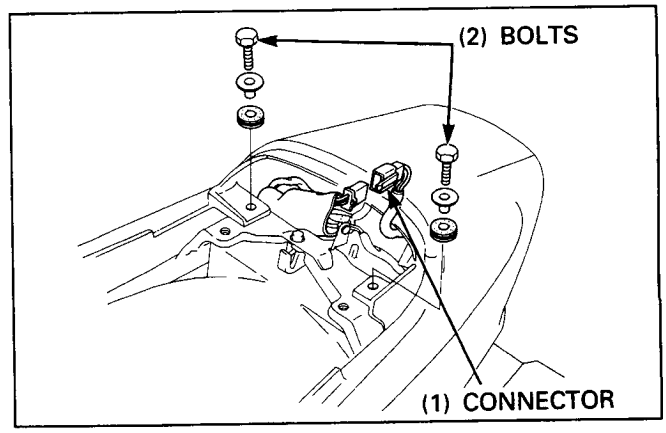
Removal

Remove the seat (page 2-3).

Remove the four grab rail mounting bolts.
Remove the grab rail while releasing the seat lock link from the seat lock.

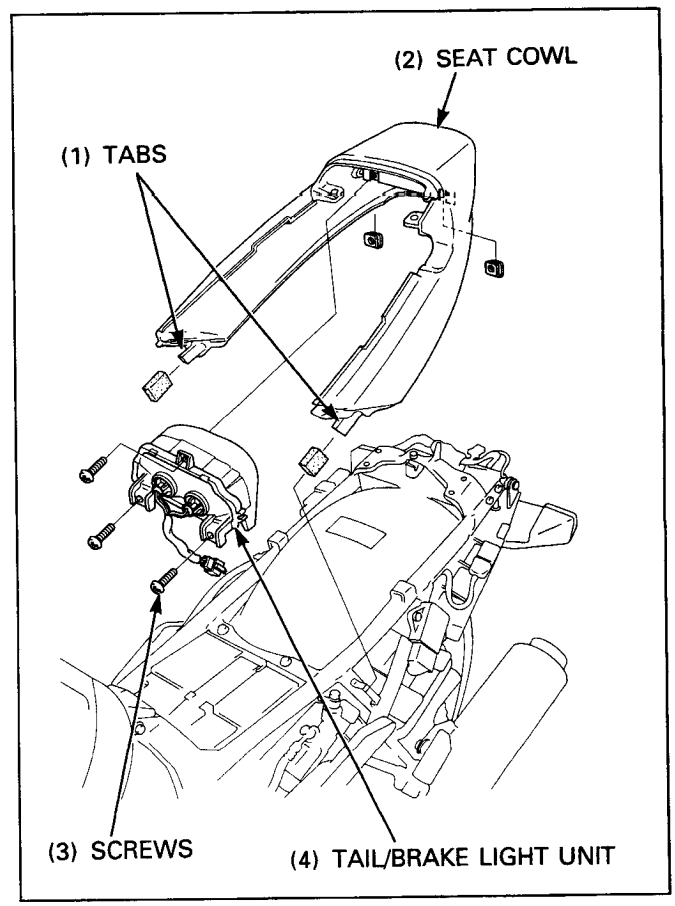


Disconnect the tail/brake light connector.
Remove the seat cowl mounting bolts and collars.



Release the tabs from the frame hooks while pulling the seat cowl backward, then remove the seat cowl.
Remove the hook rubbers.

Remove the three screws and tail/brake light unit.



Installation

Installation is in the reverse order of removal.

NOTE

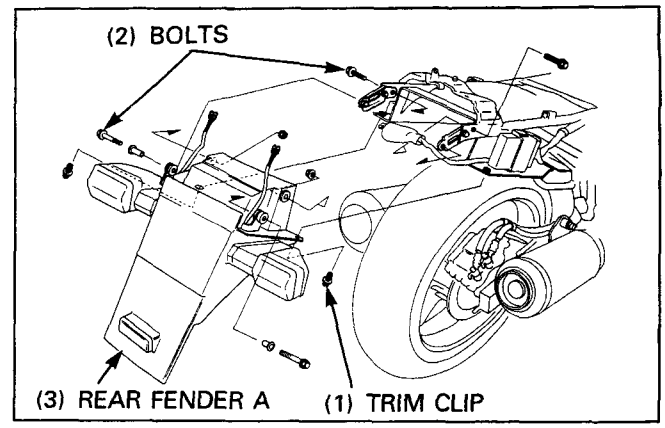
- At installation, install the hook rubbers securely onto the tabs of the seat cowl.

Rear Fender

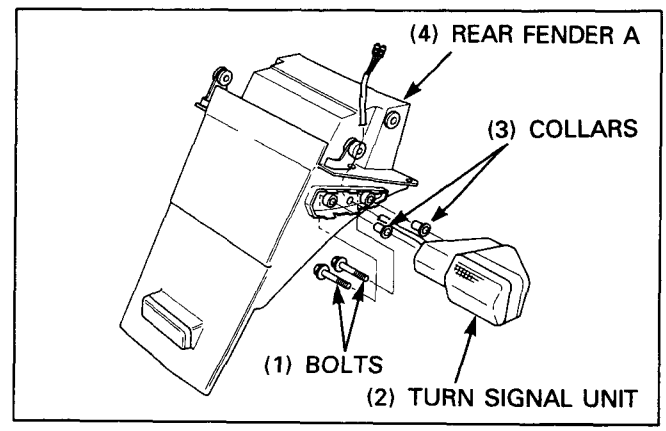
Removal

Remove the seat cowl (page 2-4).
Disconnect the turn signal connectors.

Remove the trim clips.
Remove the rear fender mounting bolts and nuts, then remove the rear fender A assembly.



Remove the following:
- Bolts
- Turn signal unit
- Setting collars



Remove the ignition control module and turn signal relay from the bracket on the rear fender B.

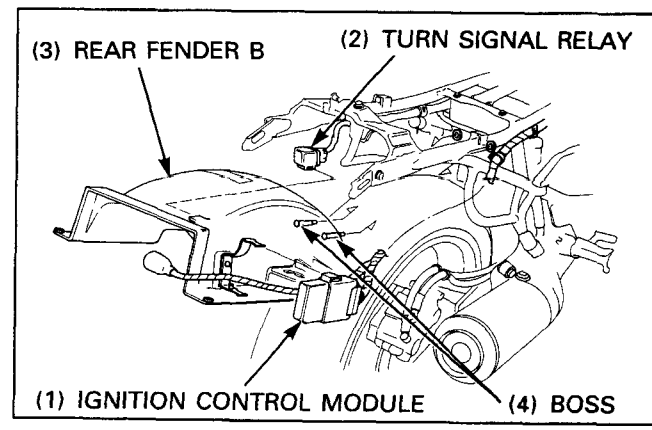
Pull the rear fender B out of the frame.

Installation

Installation is in the reverse order of removal.

NOTE

- At installation of the rear fender B, align the boss on the rear fender B with the grommet holes in the battery case.



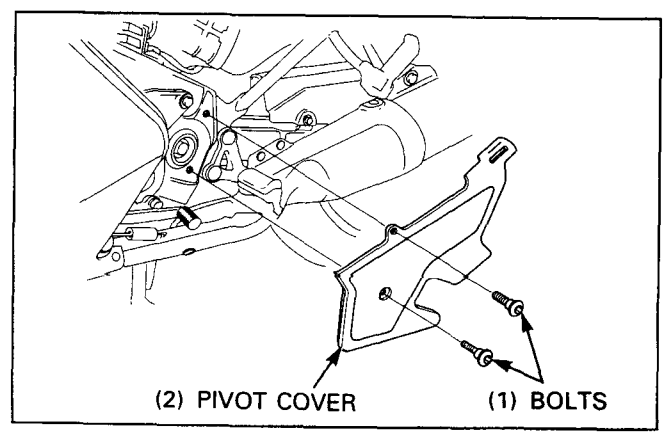
Pivot Cover

Removal/Installation

Remove the side cover (page 2-3).

Remove the two socket bolts.
Release the hook from the frame, then remove the pivot cover.

Installation is in the reverse order of removal.



Pivot Under Cover

Removal/Installation

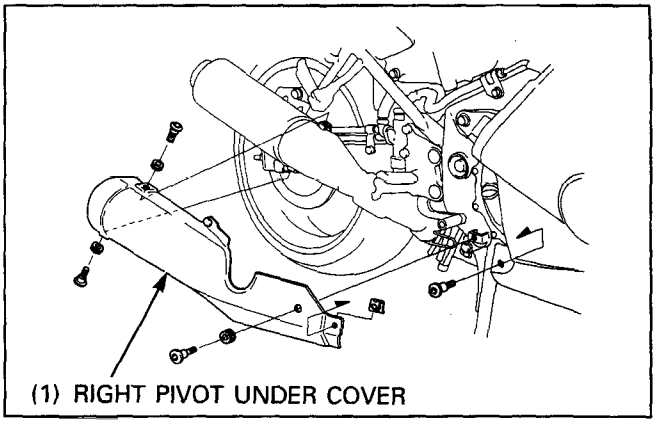
⚠ WARNING

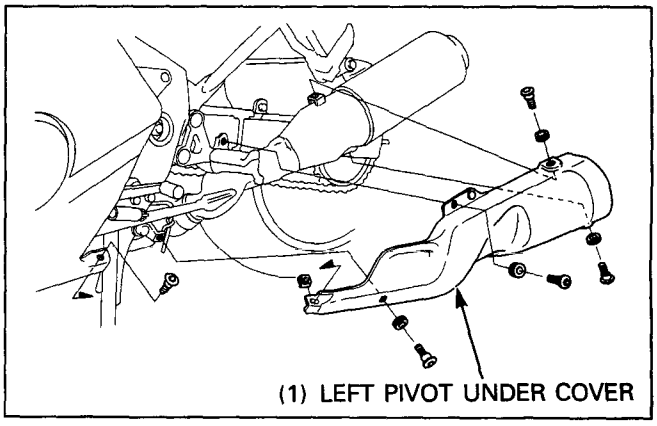
- **Do not remove the pivot under cover while the exhaust system is hot.**

Remove the pivot covers (page 2-5).

Remove the socket bolts, and pivot under cover.

Installation is in the reverse order of removal.



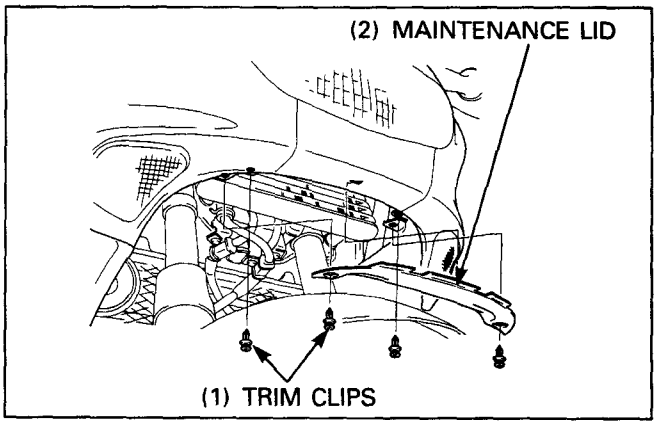


Lower Fairing

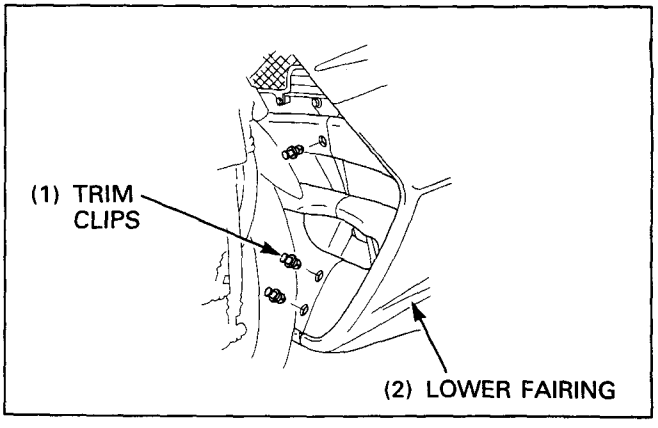
Removal

Remove the trim clips and maintenance lid.

Remove the trim clips securing the lower fairing and upper



Remove the trim clips connecting the both lower fairings.



Remove the side bumper protector.
Remove the protector cover (page 3-5).
Remove the lower fairing mounting socket bolts and flange bolts.

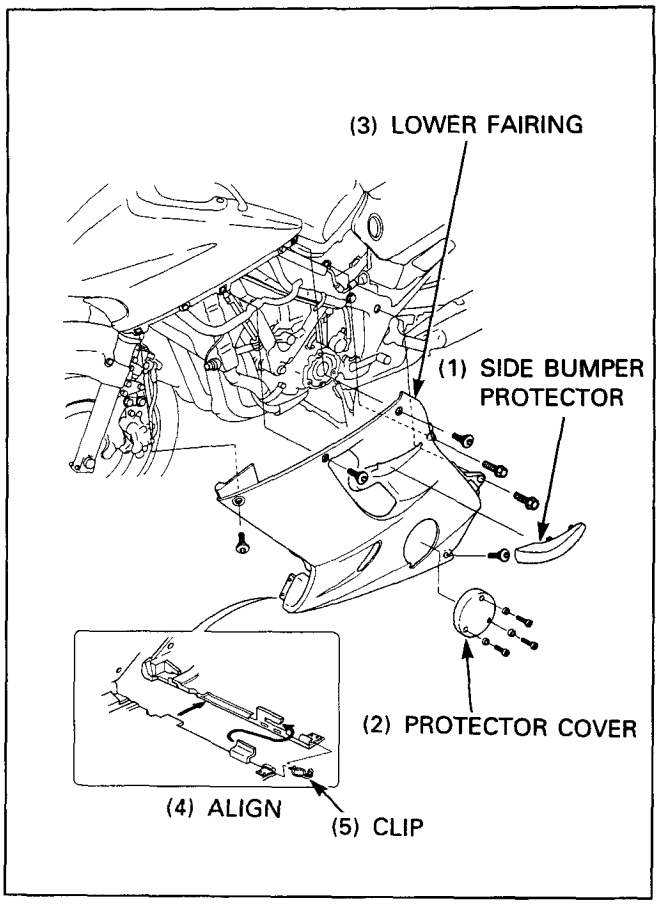
Remove the retaining clip.
Disconnect the lower hooks then separate and remove the lower fairings.

Installation

Installation is in the reverse order of removal.

NOTE

- *Be careful not to damage the hooks.*

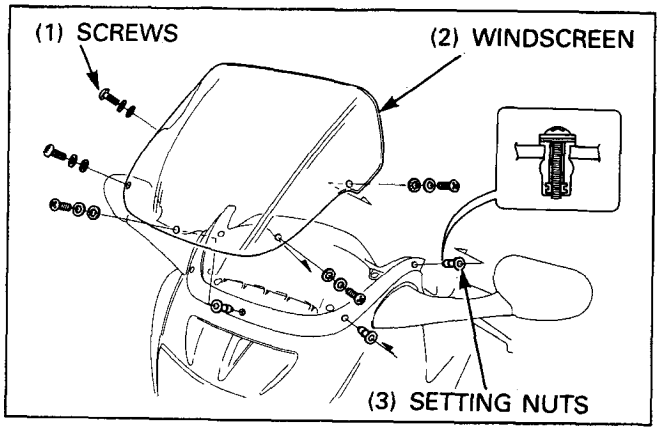


Upper Fairing

Removal

Remove the lower fairing.

Remove the screws, plastic washers, rubber washer and windscreen.
Remove the windscreen setting nut.

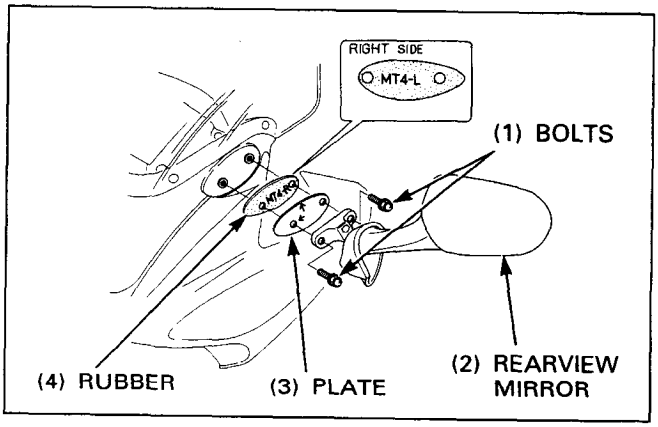


Remove the rearview mirror boot.

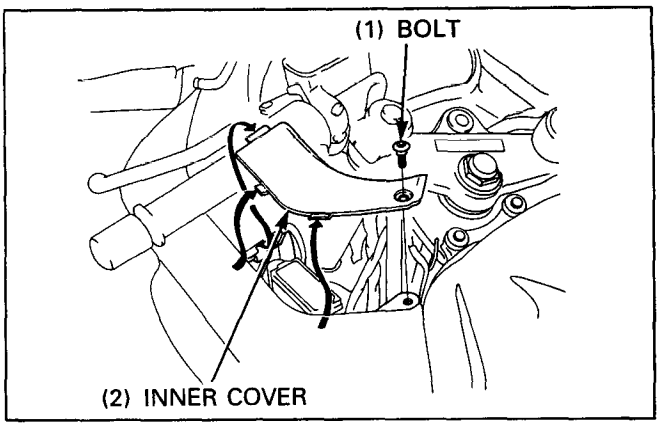
Remove the following:
- Bolts
- Rearview mirror
- Setting plate
- Setting rubber

NOTE

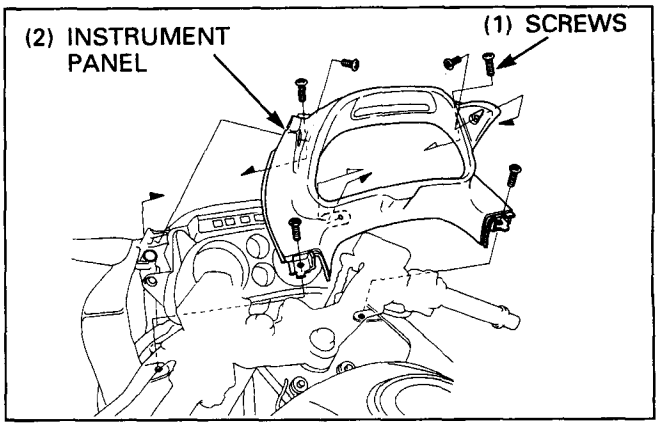
- At installation, install the setting rubber with its mark facing outward.
- At installation, install the setting plate with its arrow facing out and forward as shown.



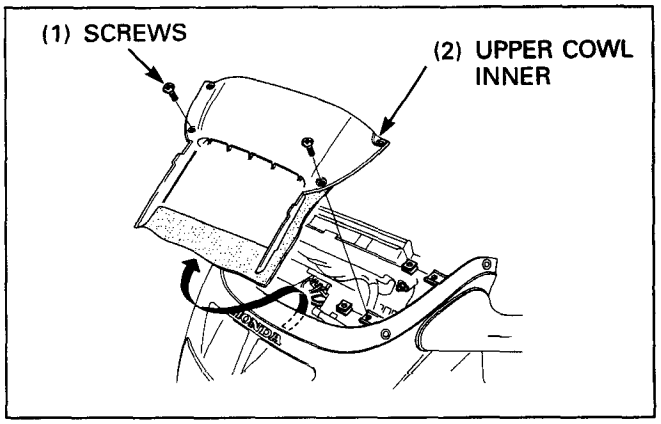
Remove the socket bolt on each side.
Release the tabs and remove the inner covers.



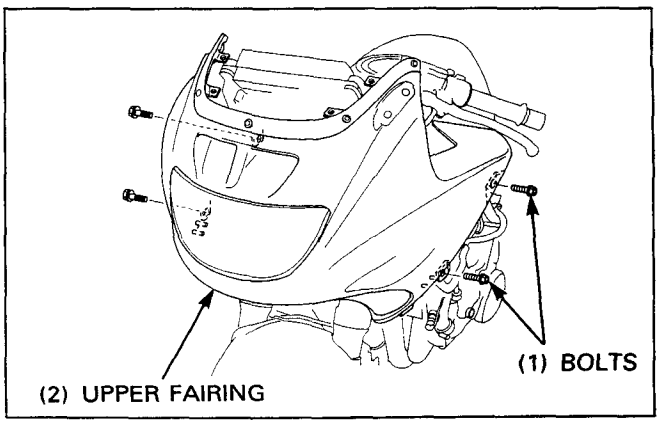
Remove the screws and instrument panel.



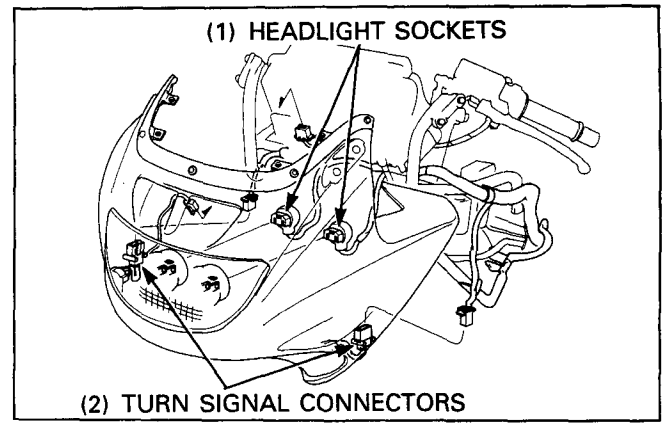
Remove the screws and upper cowl inner.



Remove the upper fairing mounting bolts.



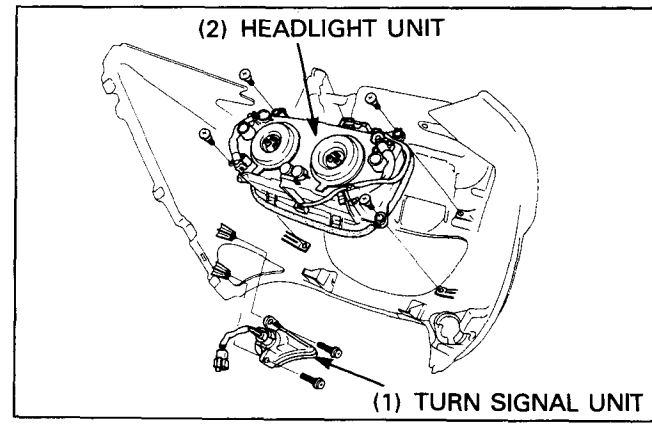
Disconnect the headlight sockets and turn signal connectors.
Remove the upper faining from the frame.



Remove the screws and turn signal unit.
Remove the bolts and headlight unit.

Installation

Installation is in the reverse order of removal.



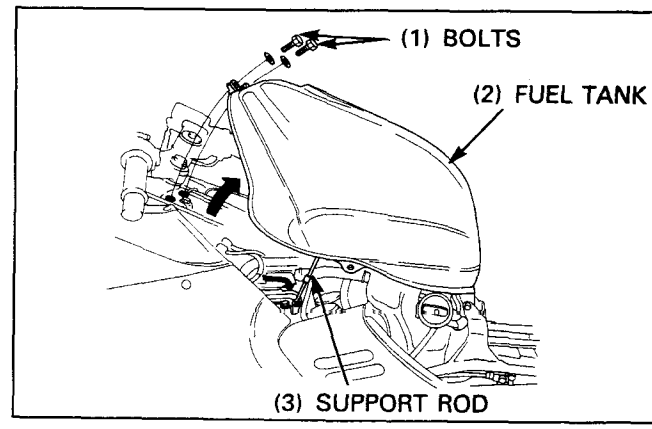
Fuel Tank

⚠ WARNING

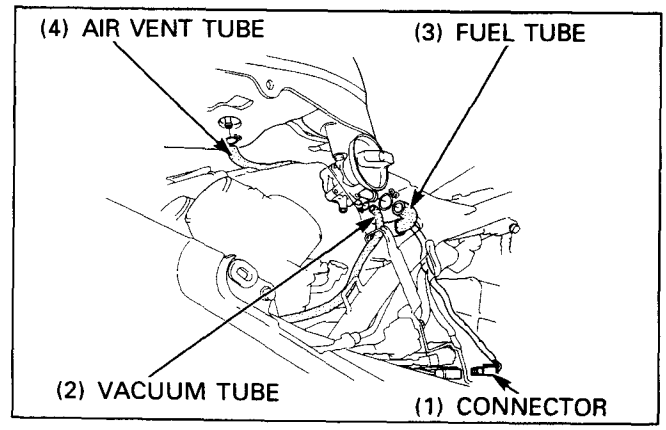
- **Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.**

Remove the seat and both side covers (page 2-3)

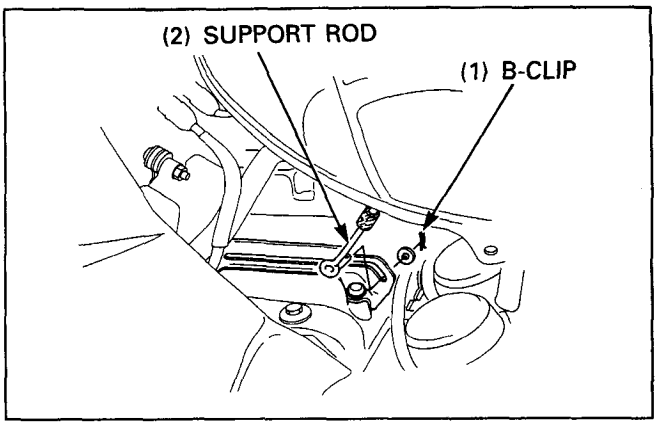
Remove the fuel tank front mounting bolts and washers.
Open the fuel tank and support the tank using the support rod.



Disconnect the fuel level sensor wire connector.
Disconnect the fuel valve vacuum tube and fuel tube.
Disconnect the fuel tank air vent tube.



Remove the B-clip and washer from the support rod.



Remove the pivot bolt/nut and the fuel tank.

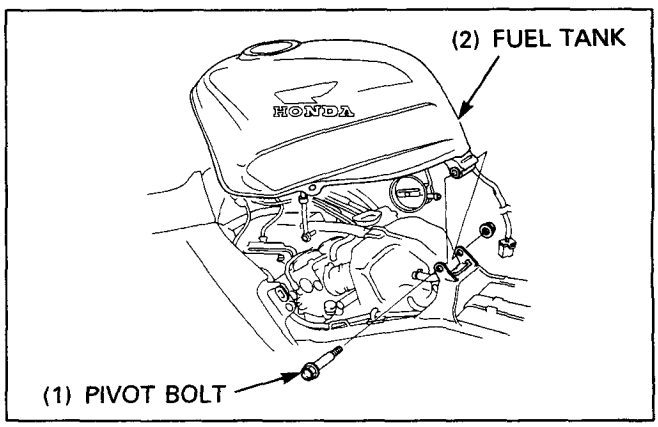
Installation

Installation is in the reverse order of removal.

Torque:
Fuel tank pivot nut: 10 N•m (1.0 Kg-m, 7 ft-lb)
Fuel tank mounting bolt: 10 N•m (1.0 Kg-m, 7 ft-lb)

NOTE

- After installation, make sure there are not fuel leaks.



Exhaust System

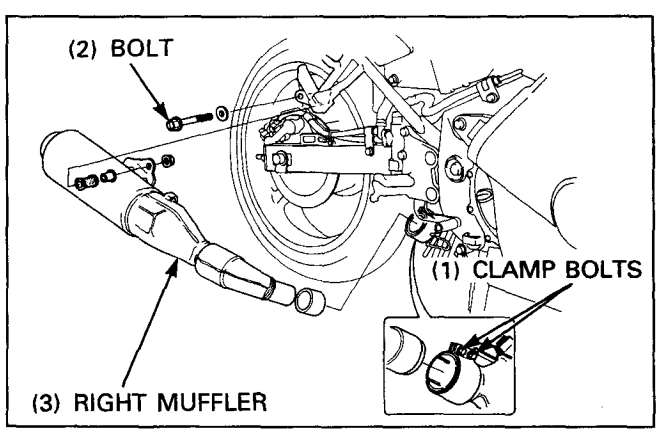
⚠ WARNING

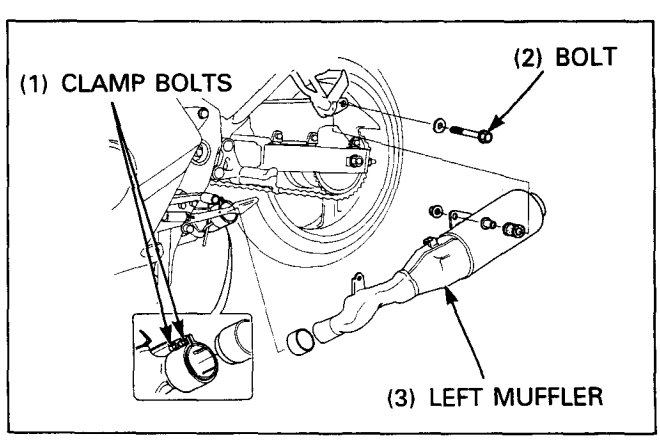
- **Do not service the exhaust system while it is hot.**

Muffler Removal

Remove the pivot covers and pivot under covers (page 2-5, 6).

Loosen the muffler clamp bolts.
Remove the muffler mounting bolts/nuts, then remove the muffler.
Remove the gasket.





Exhaust Pipe Removal

Remove the following:
- Lower fairing (page 2-6)
- Radiator (page 6-4)
- Mufflers

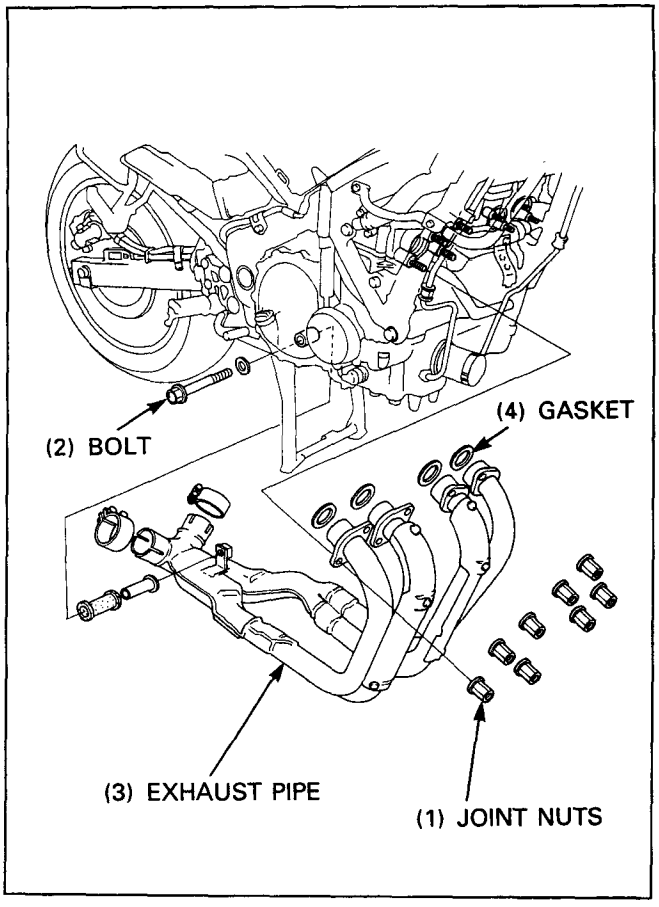
Remove the exhaust pipe joint nuts.
Remove the exhaust pipe mounting bolt and exhaust pipe.
Remove the gaskets.

Install the exhaust pipe and mufflers in the reverse order of removal.

NOTE

- Always replace the exhaust pipe gaskets and muffler gaskets with new ones.
- At installation, loosely install all fasteners, and tighten the exhaust pipe joint nuts first, then tighten the muffler clamp bolts and the mounting bolts.

Torque:
Exhaust pipe joint nut: 17 N·m (1.7 kg-m, 12 ft-lb)
Muffler clamp bolt: 22 N·m (2.2 kg-m, 16 ft-lb)
Muffler/exhaust pipe mounting bolt: 22 N·m (2.2 kg-m, 16 ft-lb)



3. Maintenance

Service Information

- Refer to Common Service Manual for items not included in this manual.
- Refer to specifications (Section 1) for maintenance data.

Service Access Guide

- The follwing shows the locations of the parts that must be removed for the maintenance items listed below. Refer to the Common Service Manual for items not included in this manual.
- Refer to section 2 (Frame/Body Panels /Exhaust System), for the parts that must be removed for service.
  For example: Air Cleaner (Contamination, clogging, replacement): Parts
  - Fuel tank ———— The part required must be removed for service.

(1) Radiator Reserve Tank
- Seat
- Side cover

(2) Brake Reservoir
(Level check, fluid replacement)
- Seat
- Side cover

(3) Brake Hose
(Leakage, deterioration, damage)

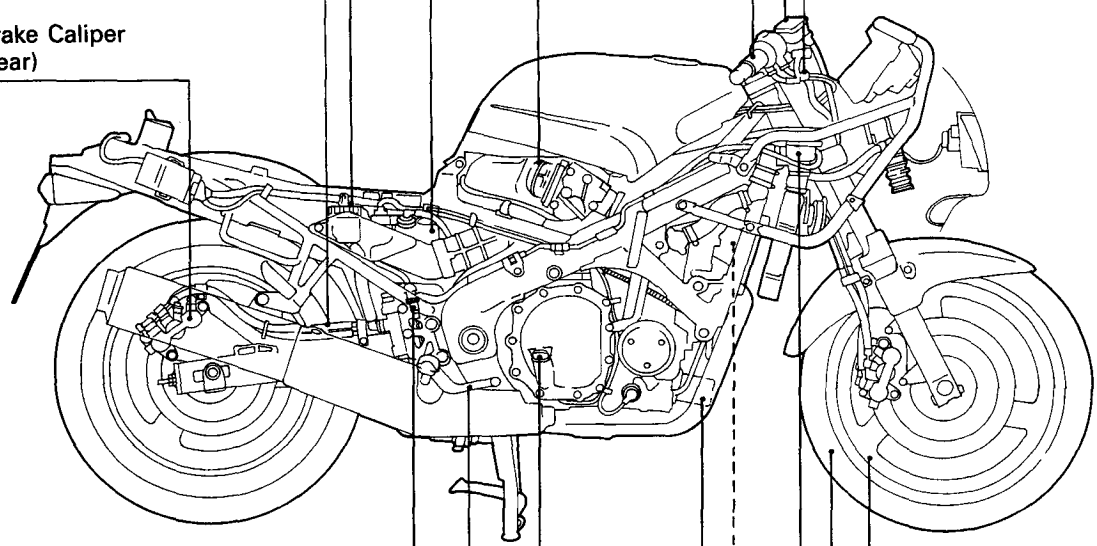
(4) Rear Brake Caliper
(Pad wear)

(5) Air Cleaner
(Contamination, clogging, replacement; page 3-5)
- Fuel tank

(6) Throttle Grip (Operation, free play)

(7) Master Cylinder
(Level check, fluid replacement)

(8) Brake Lever (Air in system)



(9) Brake Light Switch (Operation)

(10) Brake Pedal (Air in system)

(11) Oil Filler Cap/Level Gauge
(Level check, replacement)

(12) Wheel
(Damage, runout, corrosion)

(13) Tire
(Wear, damage, air pressure)

(14) Radiator Filler Cap
(Coolant replacement)
- Right inner cover

(15) Secondary Air Supply System
(SW, AR type only; Air leaks, deterioration, damage)
- Lower fairing

(16) Oil Filter (Replacement)
- Lower fairing

(1) Spark Plug (Wear, damage, coloration)
• Fuel tank

(2) Carburetor Choke (Operation)

(3) Steering Head Bearing (Damage)

(4) Clutch Master Cylinder (Level check, fluid replacement)

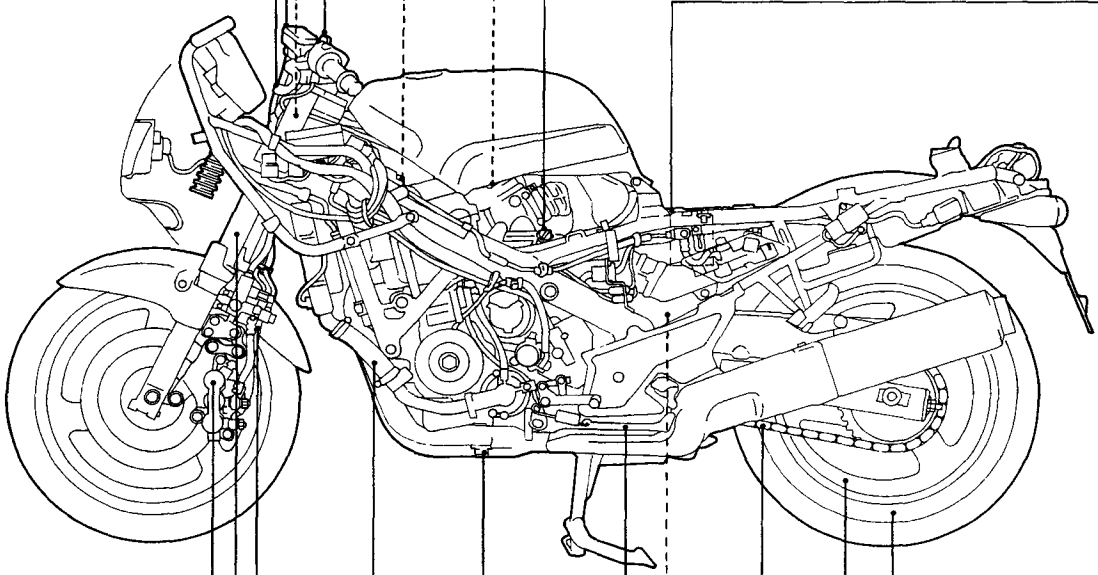
(5) Clutch Lever (Free play)

(6) Valve Clearance (Inspection/Adjustment; page 3-5)
• Fuel tank
• Lower fairing

(7) Synchronization Adjusting Screw (Carburetor synchronization; page 3-8)
• Fuel tank
• Lower fairing

(8) Throttle Stop Screw

(9) Battery (Fluid level)
• Seat



(10) Front Brake Caliper (Pad wear)

(11) Front Suspension (Loose, wear, damage)

(12) Brake Hose (Leakage, deterioration, damage)

(13) Radiator Hose (Leakage, deterioration, damage)
• Lower fairing

(14) Tire (Wear, damage, air pressure)

(15) Wheel (Damage, runout, corrosion)

(16) Drive Chain (Free play, lubrication, replacement; page 3-10)

(17) Rear Suspension (Loose, wear, damage)

(18) Side Stand (Operation)

(19) Engine Oil Drain Bolt (Oil replacement)

Maintenance Schedule

Perform the Pre-Ride Inspection in the Owner's Manual at each scheduled maintenance period.
I: Inspect and clean, Adjust, Lubricate, or Replace if necessary.
C: Clean, R: Replace, A: Adjust, L: Lubricate
The following items require some mechanical knowledge. Certain items (particularly those marked *and **) may require more technical information and tools. Consult their authorized Honda dealer.

	Item \ Frequency	Whichever Comes First ⇩	⇨ Odometer Reading (Note 1)								Refer to page
			X1,000km	1	6	12	18	24	30	36	
			X1,000mi	0.6	4	8	12	16	20	24	
			Months		6	12	18	24	30	36	
*	Fuel Line					I		I		I	Note 6
*	Throttle Operation					I		I		I	Note 6
*	Carburetor Choke					I		I		I	Note 6
	Air Cleaner	Note 2					R			R	3-5
	Crankcase Breather	Note 3			C	C	C	C	C	C	Note 6
	Spark Plug				I	R	I	R	I	R	Note 6
*	Valve Clearance			I		I		I		I	3-5
	Engine Oil			R		R		R		R	Note 6
	Engine Oil Filter			R		R		R		R	Note 6
*	Carburetor Synchronization					I		I		I	3-8
*	Carburetor Idle speed			I	I	I	I	I	I	I	Note 6
	Radiator Coolant	Note 4				I		I		R	Note 6
*	Cooling System					I		I		I	Note 6
*	Secondary Air Supply System	Note 5				I		I		I	Note 6
	Drive Chain			Every 1,000km (600mi) I, L							3-10
	Drive Chain Slider					I		I		I	Note 6
	Battery				I	I	I	I	I	I	Note 6
	Brake Fluid	Note 4			I	I	R	I	I	R	3-13
	Brake Pad Wear				I	I	I	I	I	I	3-12
	Brake System			I		I		I		I	3-13
*	Brake Light Switch					I		I		I	Note 6
*	Headlight Aim					I		I		I	3-14
	Clutch System					I		I		I	Note 6
	Clutch Fluid	Note 4			I	I	R	I	I	R	Note 6
	Side Stand					I		I		I	Note 6
*	Suspension					I		I		I	Note 6
*	Nuts, Bolts, Fasteners			I		I		I		I	1-14
**	Wheels/Tires					I		I		I	Note 6
**	Steering Head Bearing			I		I		I		I	Note 6

* Should be serviced by your authorized Honda dealer, unless the owner has the proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommended these items be serviced only by your authorized Honda dealer.

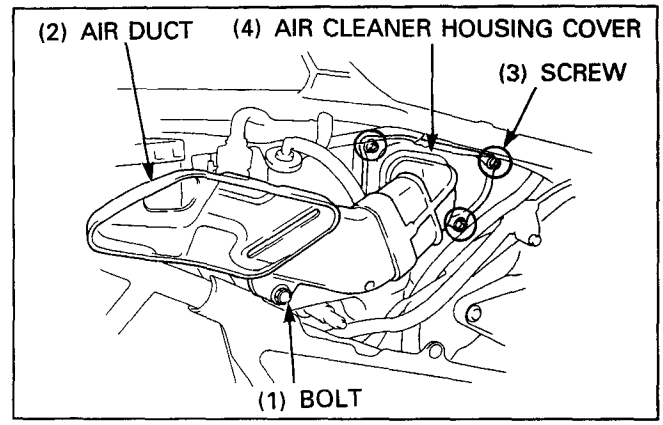
Notes: 1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Replace every 2 years, or at indicated odometer interval, whichever cames first. Replacement requires mechanical skill.
5. Switzerland and Austria type only.
6. Refer to Common Service Manual.

Air Cleaner

Remove the right side cover (page 2-3).

Remove the bolt and intake air duct.

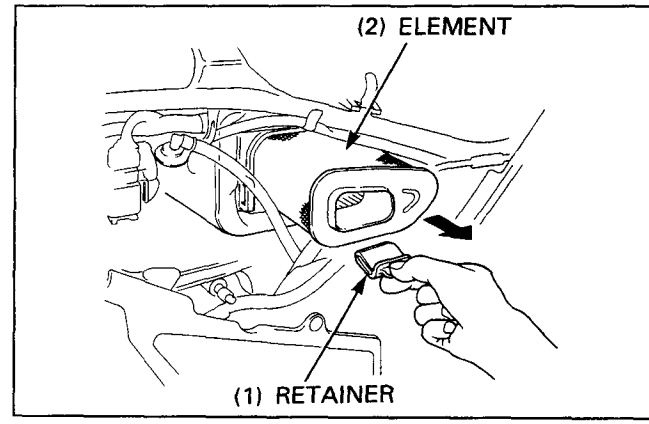
Remove the three screws and air cleaner housing cover.



Remove the retainer and air cleaner element.

Replace the element in accordance with the maintenance schedule (page 3-4).
Also, replace the element any time it is excessively dirty or damaged.

Install a new air cleaner element and secure it with the retainer.
Install the removed parts in the reverse order of removal.



Valve Clearance

Inspection

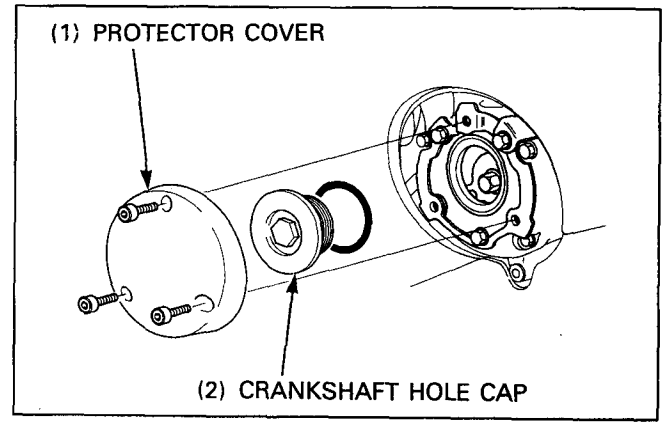
NOTE

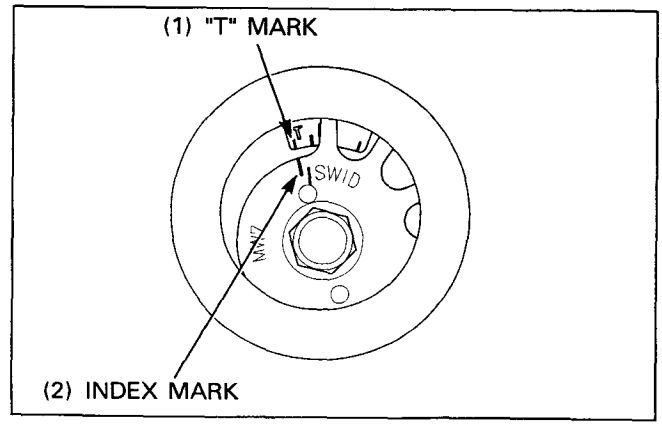
- Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).
- The special 3 mm hexagon socket wrench is required for valve clearance adjustment. Modify a commercially available hexagon socket wrench as shown in the illustration.

Remove the following:
- Fuel tank (page 2-10)
- Cylinder head cover (page 8-2)

Remove the left crankcase protector cover.
Remove the crankshaft hole cap.

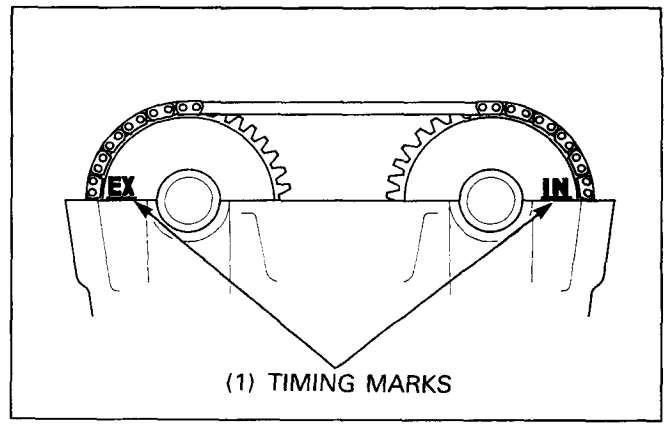
Rotate the crankshaft counterclockwise and align the index mark on the ignition pulse generator rotor with the "T" mark on the crankcase.



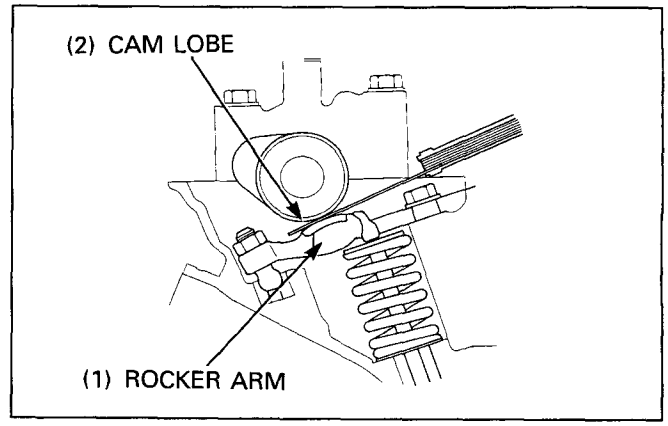


The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks on the cam sprockets are facing inward, turn the crankshaft clockwise one full turn and realign the timing marks with the cylinder head surface so they are facing outward.

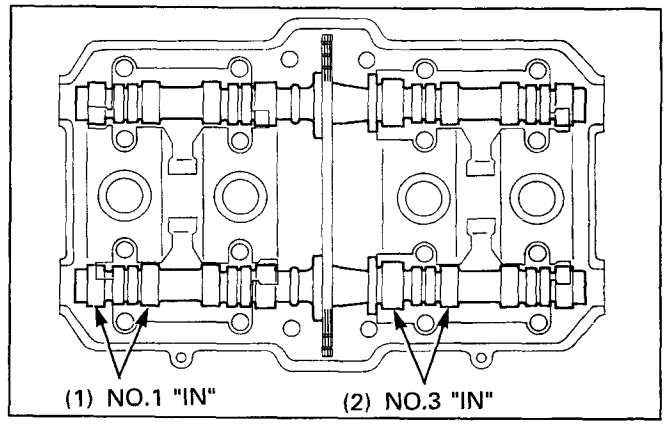


Insert the feeler gauge between the rocker arm slipper surface and the cam lobe.

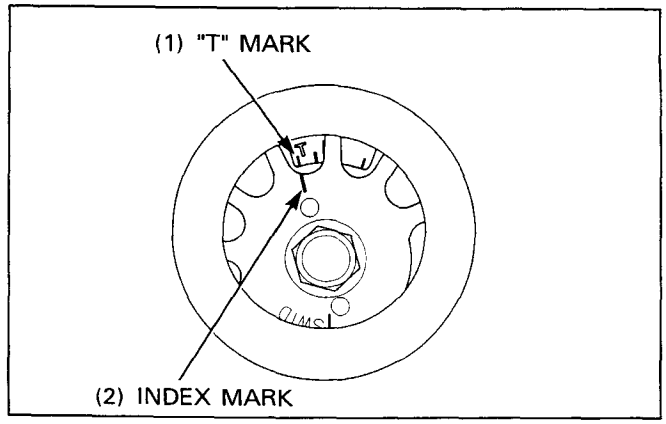


Check the valve clearance for the No.1 and No.3 cylinder intake valves using the feeler gauge.

Valve clearance : IN: 0.10 ± 0.02 mm (0.004 ± 0.001 in)

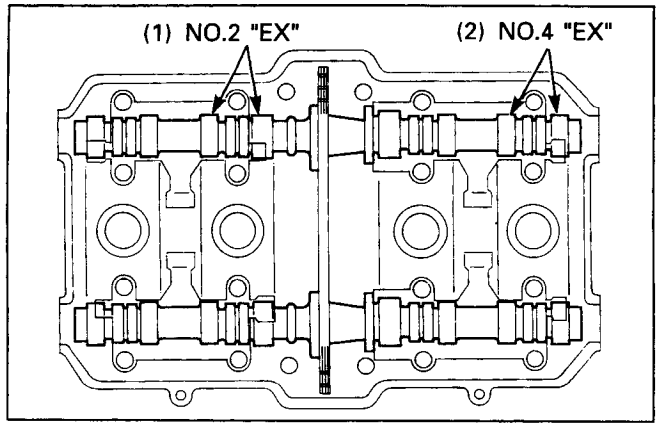


Potate the crankshaft counterclockwise 1/2 turn, align the index mark on the ignition pulse generator with the "T" mark on the crankcase.

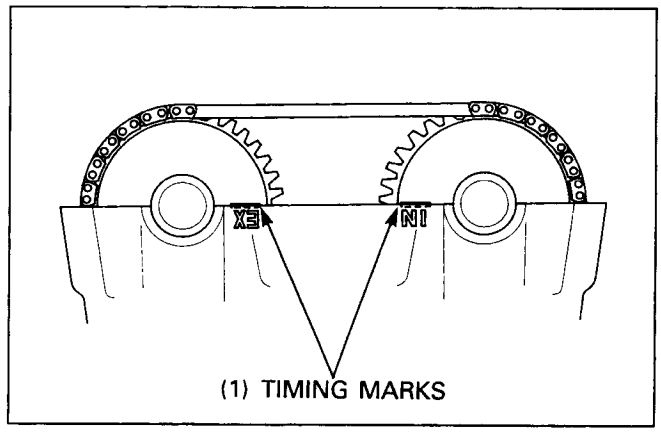


Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

Valve clearance : EX: 0.18 ± 0.02 mm (0.007 ± 0.001 in)

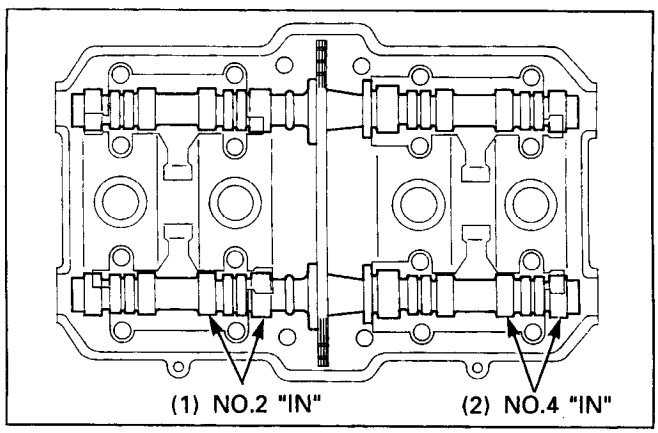


Turn the crankshaft counterclockwise 1/2 turn, align the timing marks on the cam sprockets are facing inward and flush with the cylinder head surface.

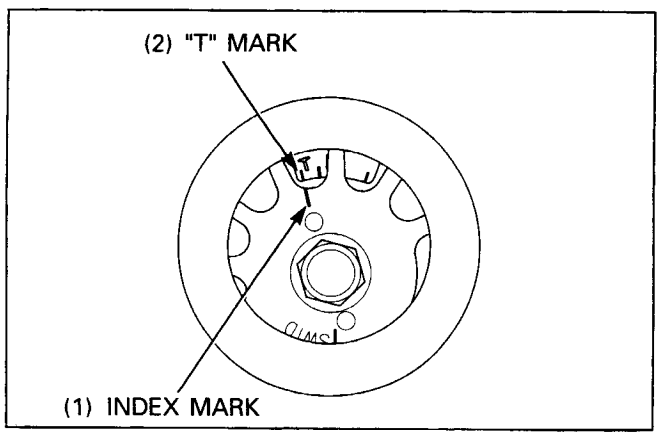


Check the valve clearance for the No.2 and No.4 cylinder intake valves using a feeler gauge.

Valve clearance: IN: 0.10 ± 0.02 mm (0.004 ± 0.001 in)

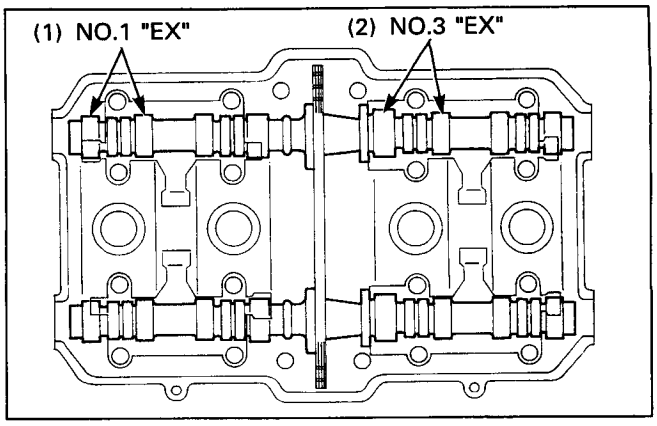


Turn the crankshaft counterclockwise 1/2 turn, align the Index mark on the igniton pulse generator with the "T" mark on the crankcase.



Check the valve clearance for the No.1 and No.3 cylinder exhaust valves using a feeler gauge.

Valve clearance: EX: 0.18 ± 0.02 mm (0.007 ± 0.001 in)



Adjustment

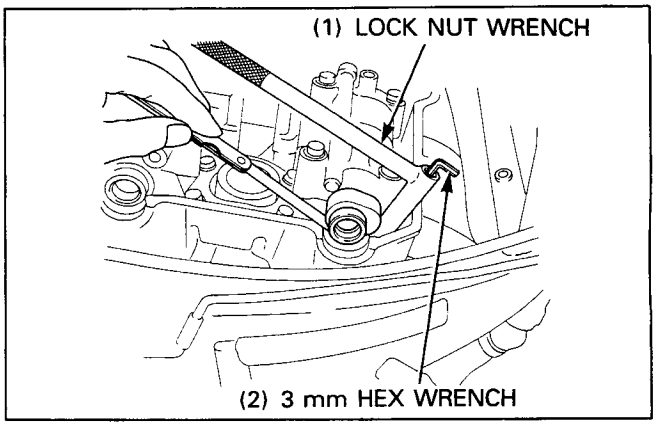
Loosen the valve adjusting screw lock nut and turn the adjusting screw with the modified 3 mm hexagon socket wrench until there is a slight drag on the feeler gauge.

S. TOOL

Lock nut wrench **07GMA–ML70120 or**
Lock nut wrench **07GMA–KT80120**

Hold the adjusting screw with the hexagon wrench and tighten the lock nut.

Torque: 23 N•m (2.3 kg-m, 17 ft-lb)



CAUTION

- **The lock nuts will come loose if the proper torque is not applied.**

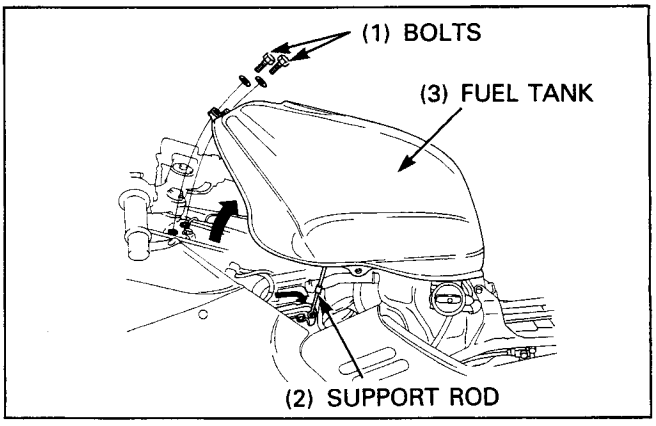
Install the following:
– Cylinder head cover (page 8-2)
– Fuel tank (page 2-10)

Carburetor Synchronization

NOTE

- Refer to section 2 of the Common Service Manual for caburetor synchronization procedure.
- Synchronize the carburetors with the engine at normal operating temperature,transmission in neutral and the motorcycle supported securely on a level surface.

Remove the fuel tank mounting bolts, raise the fuel tank and support it with the support rod (page 2-10).

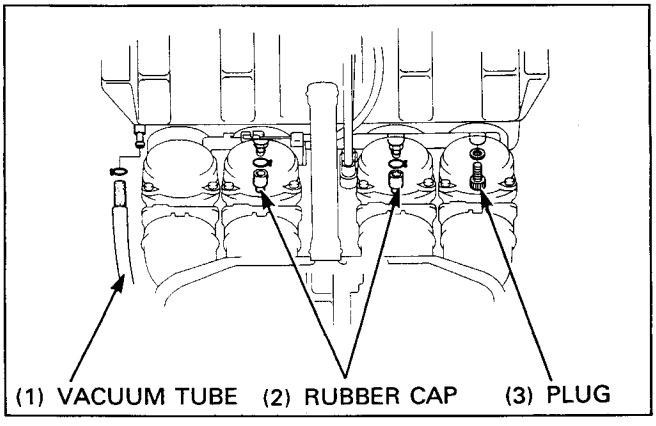


Disconnect the fuel valve vacuum tube from the No.1 intake port.
Remove the No.2, 3 cylinder intake port rubber cap.

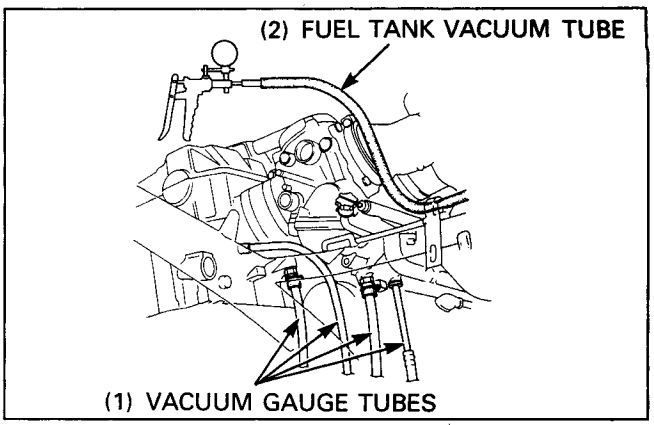
NOTE

- Remove the No.2, 3 intake port rubber cap by pinching the end of the cap. Do not pinch the cap body or it will be damaged.

Remove the No.4 vacuum plug from the cylinder head intake port.



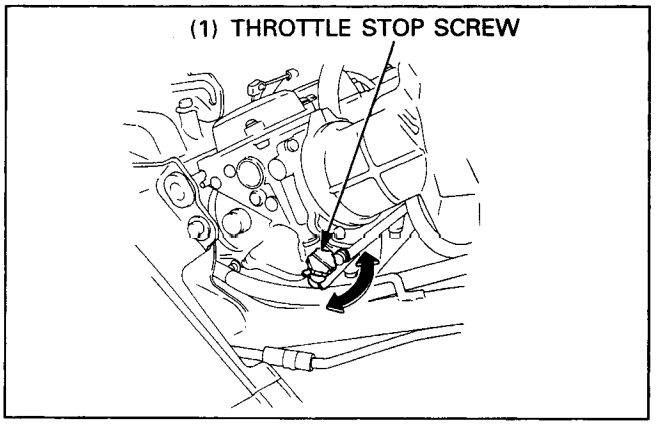
Screw the adaptors in the No.4 intake port vacuum holes.
Connect the vacuum gauge tubes to the No.2, 3 intake ports.
Connect the vacuum gauge tube to the No.1 intake port
Connect the vacuum pump to the fuel tank vacuum tube.
Operate the pump and open the fuel valve.



Start the engine and adjust the idle speed using the throttle stop screw.

Idle speed: 1,000 ± 100 min^{-1} (rpm) (Except SW, AR type)
1,050 ± 50 min^{-1} (rpm) (SW type)
1,050 ± 100 min^{-1} (rpm) (AR type)

Check the each carburetor intake vacuum pressure is within 20 mm (0.8 in) Hg of the base carburetor.



Synchronize the carburetors by turning the adjusting screws.

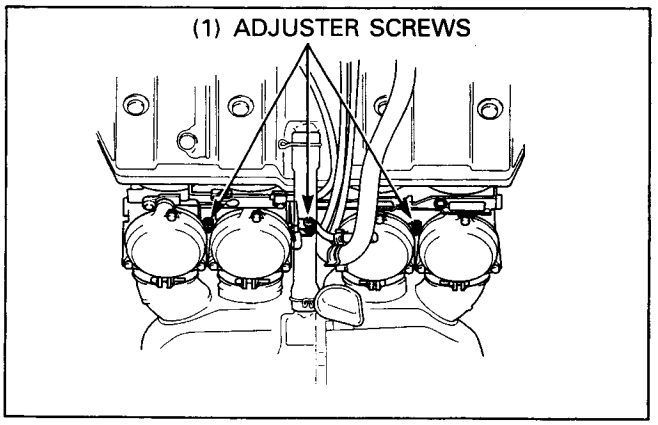
NOTE

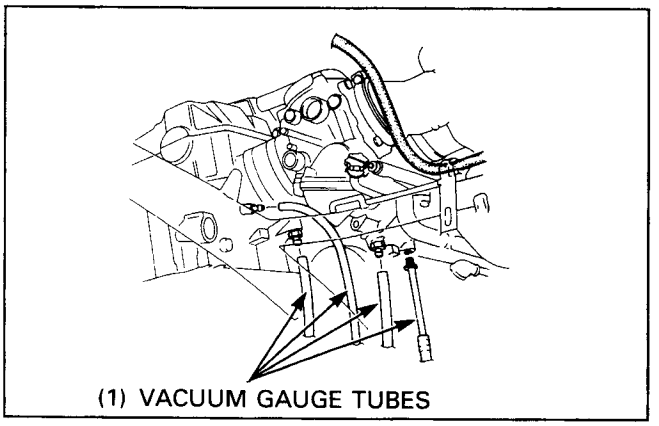
- The No.3 carburetor cannot be adjusted; it is the base carburetor.
- The No.3 cylinder intake vacuum pressure is the base vacuum pressure.

Synchronize to specification by turning the adjusting screw with the phillips screwdriver as shown.

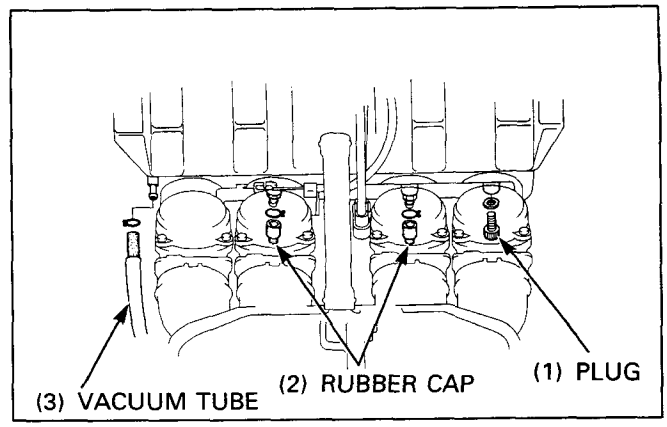
Recheck the idle speed and each cylinder intake vacuum pressure so it is within 20 mm (0.8 in) Hg of the base carburetor reading after snapping the throttle grip 3-4 times.

Remove the vacuum gauge tubes.





Install the vacuum plug and rubber caps.
Connect a fuel valve vacuum tube to the No.1 cylinder intake port.



Drive Chain

Replacement

NOTE

- The CBR1000F uses a drive chain with a staked master link.

Loosen the drive chain.

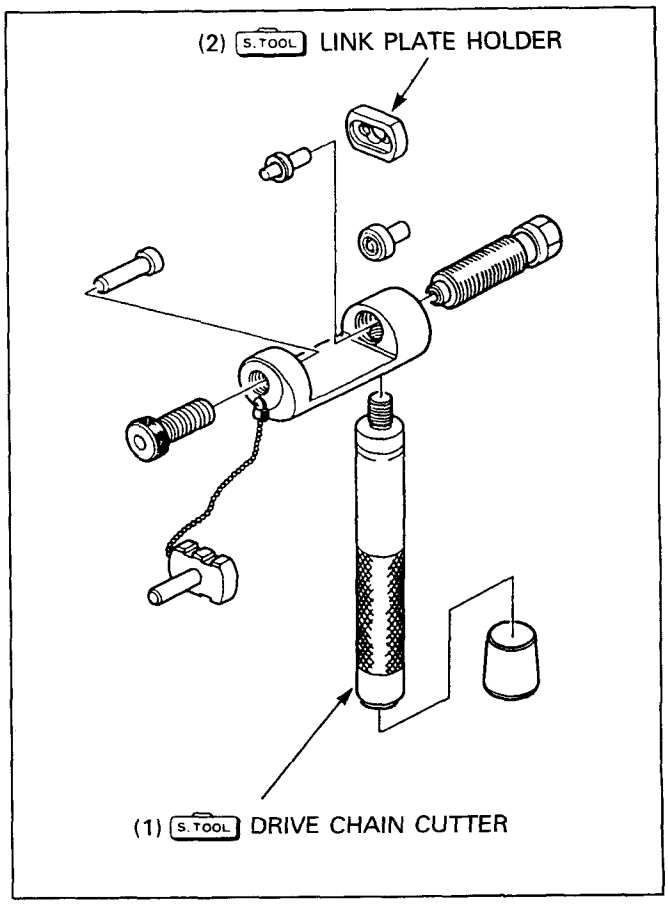
Assemble the special tool.

S.TOOL

Drive chain cutter	**07HMH-MR10102**
– Link plate holder	**07PMH-MZ20110**

NOTE

- When using the special tool, follow the manufacturer's operating instructions.

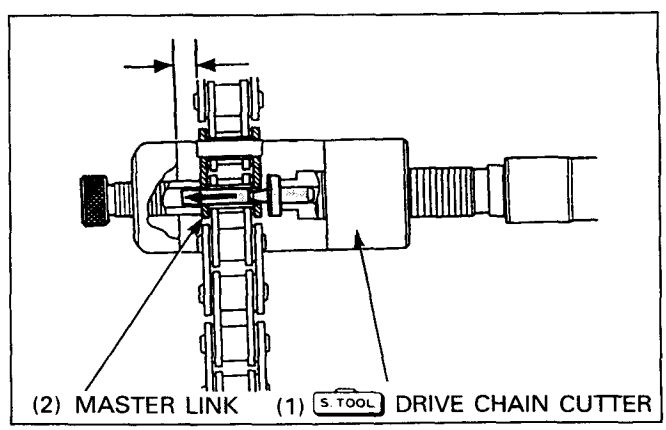


Locate the crimped pin ends of the master link from the outside of the chain and remove the link with the chain cutter.

S.TOOL

Drive chain cutter	**07HMH-MR10102**

Remove the drive chain.



Remove exceeded drive chain link from the new drive chain using the drive chain cutter.

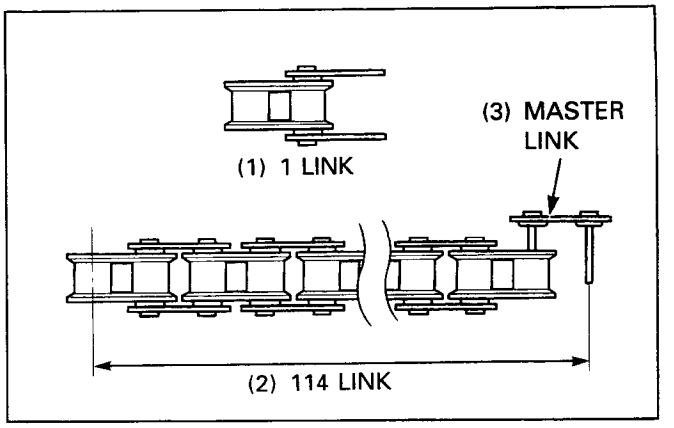
NOTE

- Include the master link when you count the drive chain links.

Replacement chain: DID.: 50ZV-120ZB
RK: 50LRO-120LJ-FZ

Specified links: 114 links

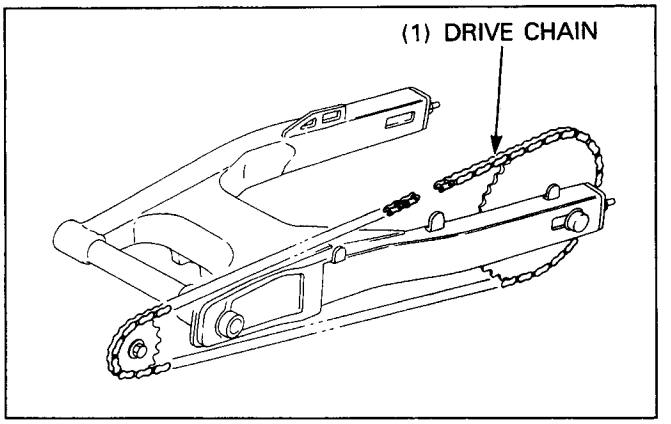
S.TOOL
Drive chain Cutter **07HMH-MR10102**



CAUTION

- **Never reuse the old drive chain, master link, master link plate and O-rings.**

Install the new drive chain as shown.



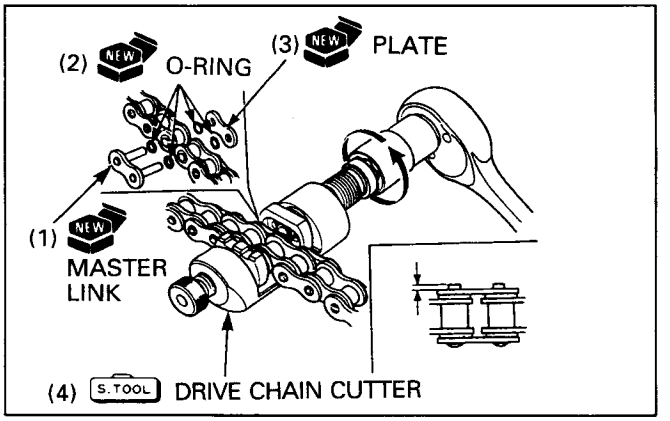
Assemble the new master link, O-rings and plate.

CAUTION

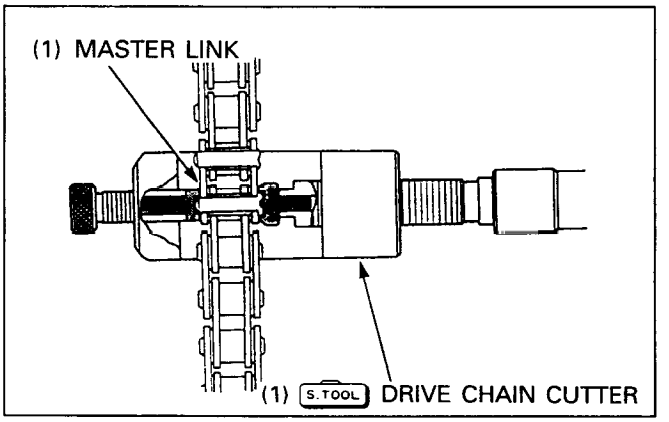
- **Insert the master link from the inside of the drive chain and install the plate with the identification mark facing the outside.**

Assemble and set the drive chain cutter.
Check that the master link pins are installed propely by measuring the master link pin length projected from the plate.

Projection: DID: 1.15–1.55 mm (0.045–0.061 in)
RK: 1.2–1.4 mm (0.05–0.06 in)

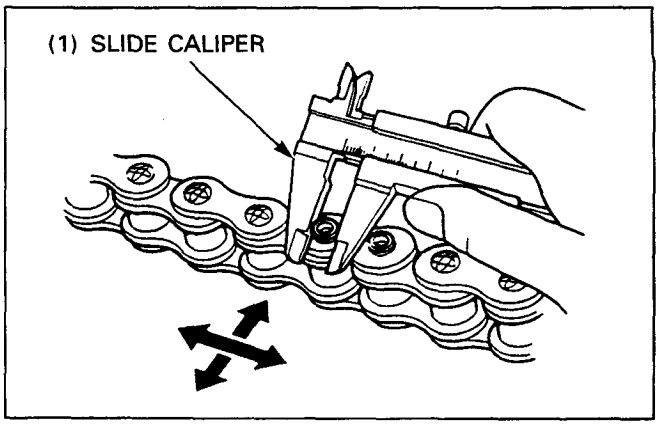


Stake the master link pins.



Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide calipers.

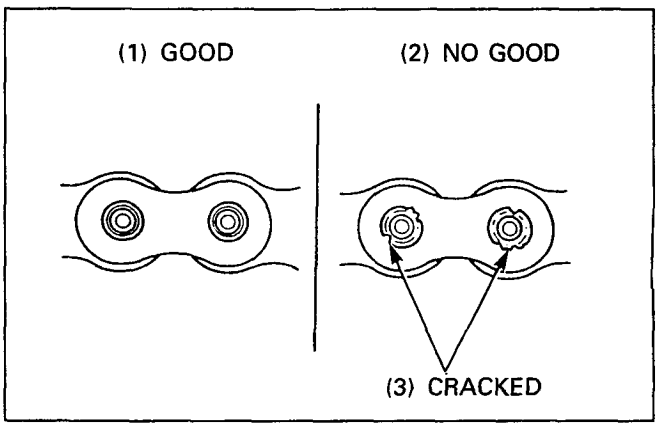
Diameter of the staked area:
DID: 5.5–5.8 mm (0.22–0.23 in)
RK: 5.55–5.85 mm (0.219–0.230 in)



After staking, check the staked area of the master link for cracks.
In there is any cracking, replace the master link, O-rings and plate.

CAUTION

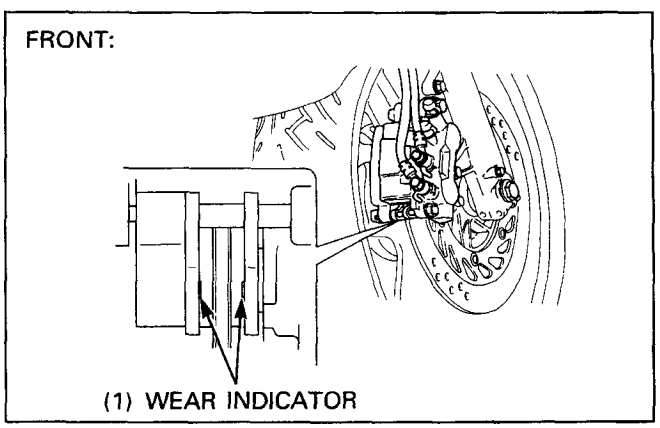
- **Drive chain with clip-type master link must not be used.**

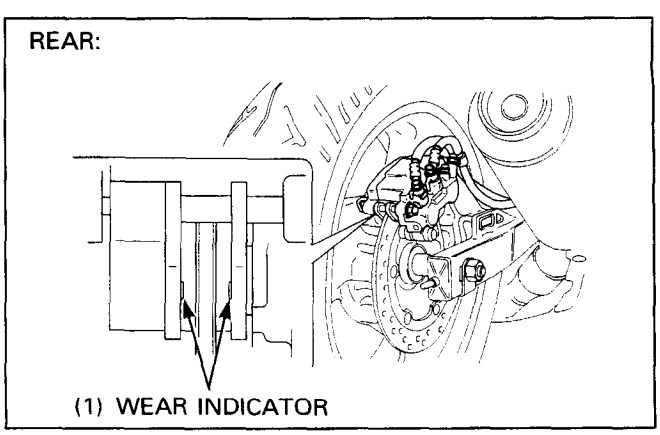


Brake Pad Wear

Visually inspect the brake pad wear.

Replace the brake pads if either pad is worm to the bottom of the wear grooves.





Brake System

NOTE

- The CBR1000F is equipped with the Dual Conbined Brake System.
- Check the front and rear brake operation as follows.

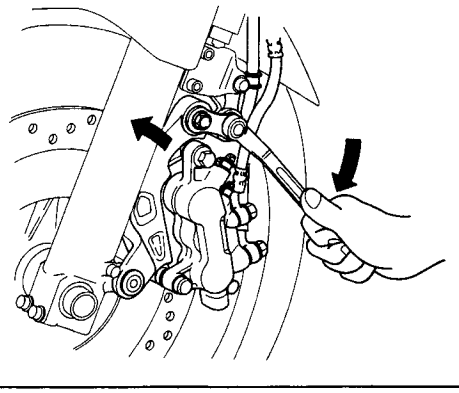
Place the motorcycle on its center stand and shift the transmission into neutral.

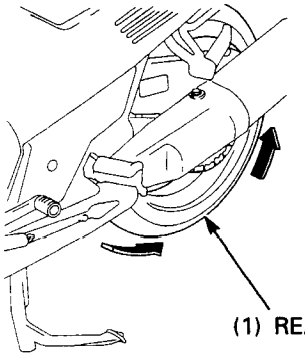
Turn the front brake link 8 mm bolt clockwise using a wrench.
Make sure the rear wheel does not turn while the front brake link is turned clockwise.

CAUTION

- **Do not turn the brake link 8 mm bolt counterclockwise or the bolt may be loosened.**

Also check the smooth operation of the brake link.

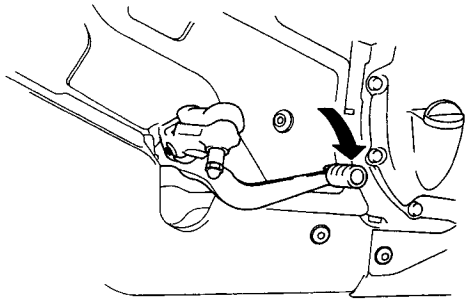


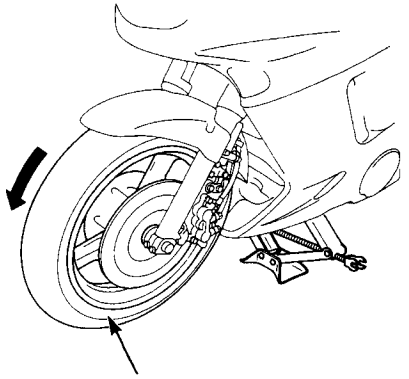


(1) REAR WHEEL

Jack-up the motorcycle and the front wheel off the ground.

Apply rear brake pedal.
Make sure the front wheel does not turn while the rear brake pedal is applied.





(1) FRONT WHEEL

Headlight Aim

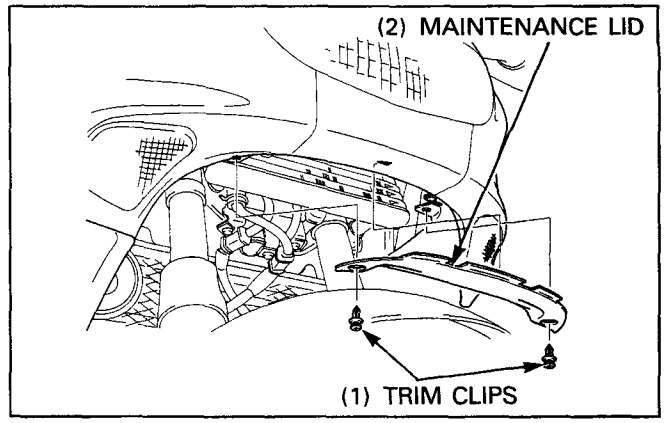
⚠ WARNING

- **An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the load for a safe distance.**

NOTE

- Adjust the headlight beam as specified by local laws and regulations.

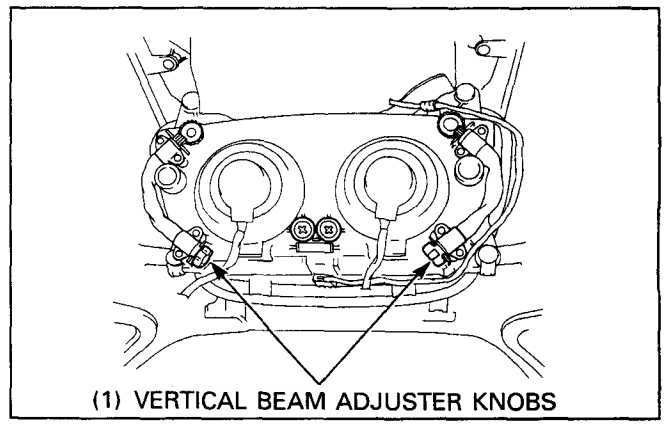
Remove the trim clips and maintenance lid.



Vertical Beam Adjustment

Adjust the vertical beam with the adjusting knobs.

Turn the adjuster knob clockwise, beam moves down.
Turn the adjuster knob counterclockwise, beam moves up.

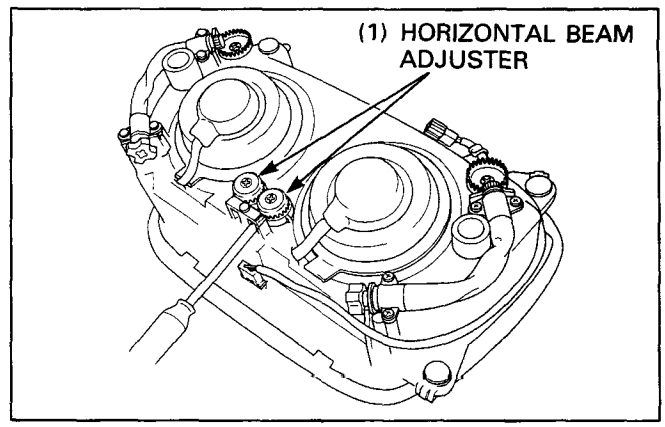


Horizontal Beam Adjustment

Adjust the horizontal beam, turning the adjuster using a pillips screwdriver as shown.

Left headlight:
Turn the adjuster screw clockwise, headlight beam moves to the left side.
Turn the adjuster screw counterclockwise, beam moves to the right side.

Right headlight:
Turn the adjusting screw clockwise, beam moves to the right side.
Turn the adjusting screw counterclockwise, beam moves to the left side.



4. Lubrication System

Service Information

⚠ WARNING

- **If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.**
- **Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.**

- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed check that there are no oil leaks and that oil pressure is correct.

Troubleshooting

Oil Level Low
- Oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal

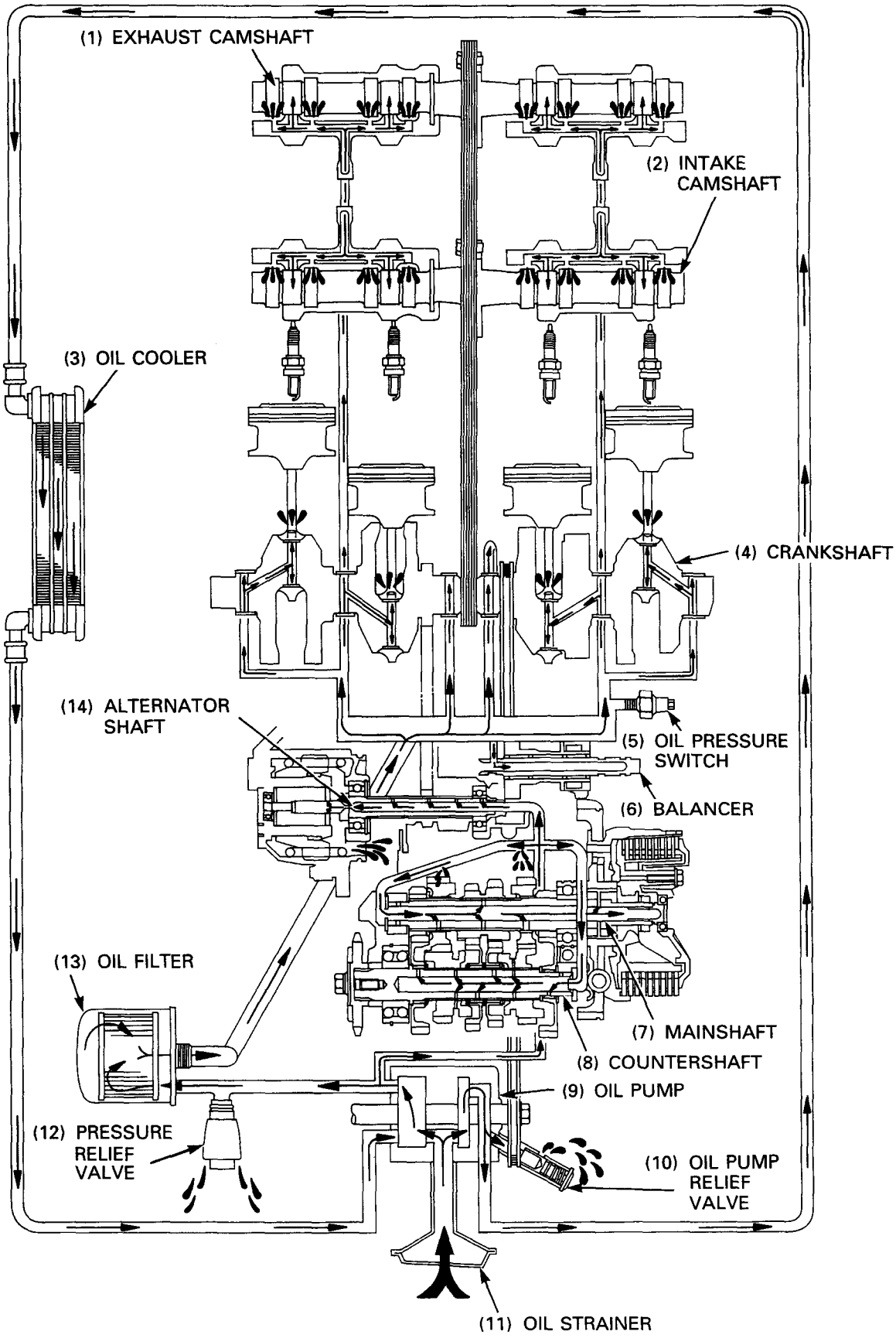
Low Or No Oil Pressure
- Clogged oil orifice
- Incorrect oil being used

No Oil Pressure
- Oil level too low
- Oil pump drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leaks

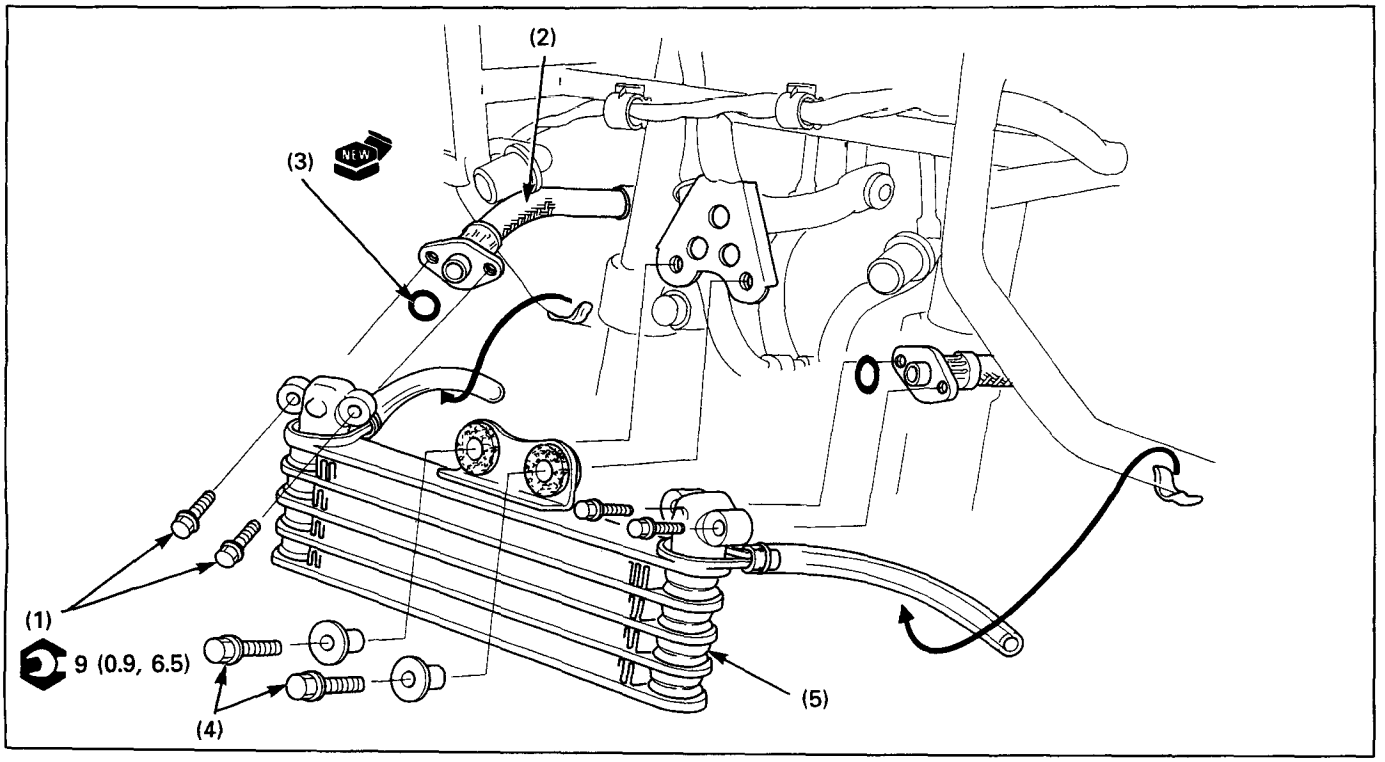
Low Oil Pressure
- Clogged oil strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Low oil level

High Oil Pressure
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

Lubrication System Diagram



Oil Cooler Removal/Installation



NOTE

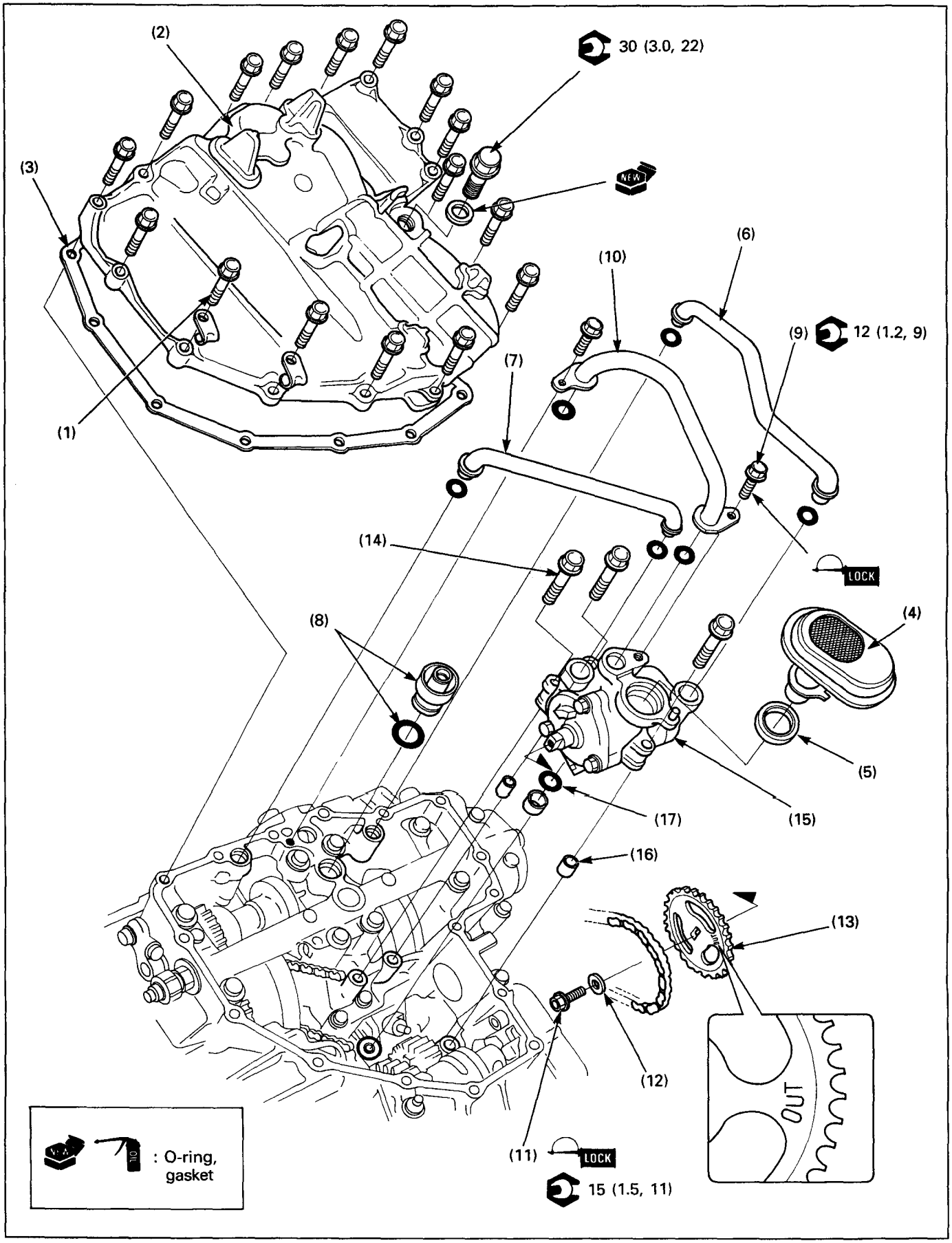
- Use care not allow dust and dirt to enter the engine.
- After installation, check that there are no oil leaks.

Requisite Service

- Engine oil draining/refilling
- Lower fairing removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil pipe bolt	4	
(2)	Oil pipe	2	
(3)	O-ring	2	
(4)	Oil cooler bolt/collar	2/2	
(5)	Oil cooler	1	

Oil Pump Removal/Installation



NOTE

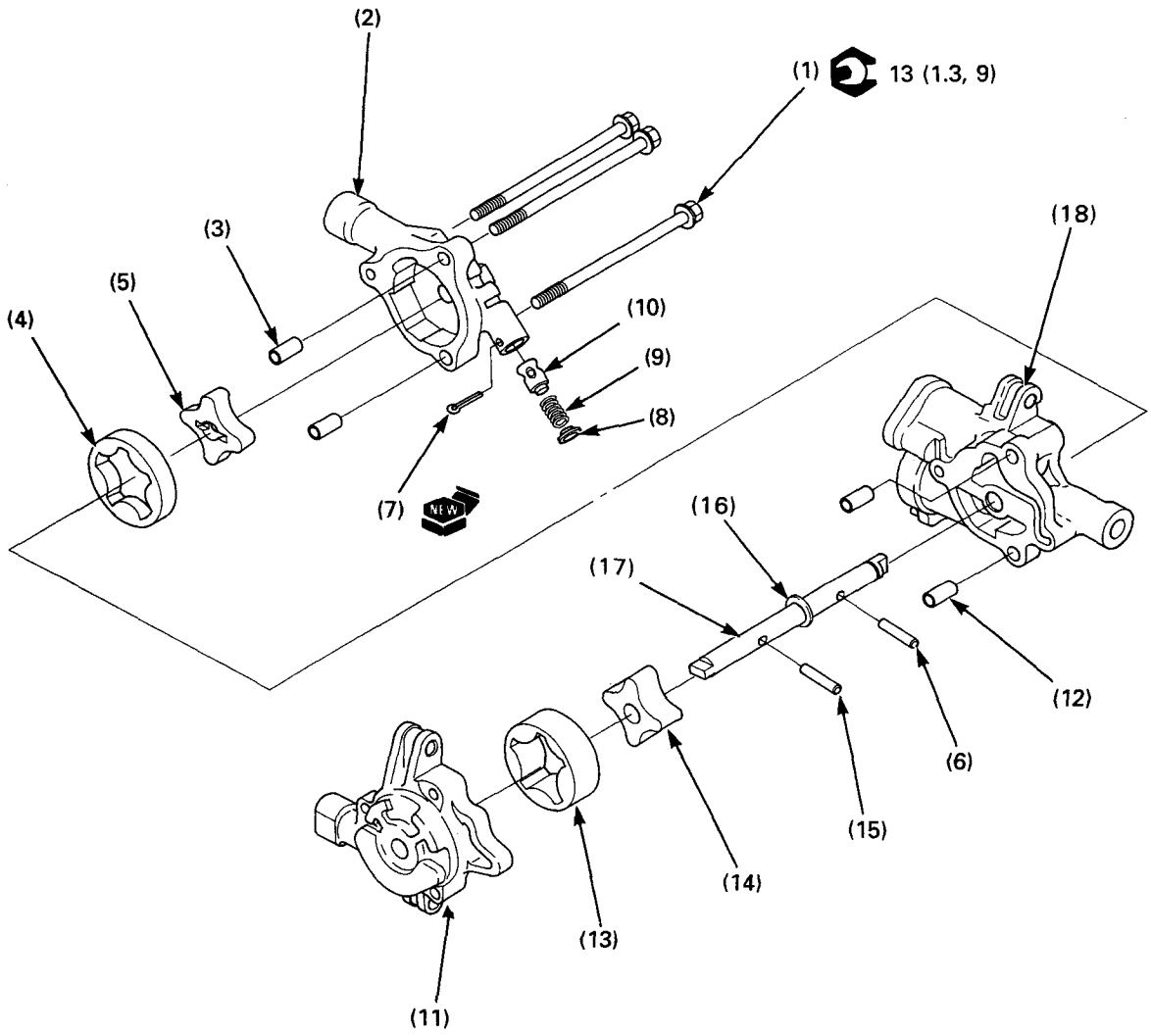
- Use care not allow dust and dirt to enter the engine.
- After installation, check that there are no oil leaks.

Requisite Service

- Engine oil draining/refilling
- Lower fairing removal/installation (page 2-6)
- Exhaust pipe removal/installation (page 2-10)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil pan bolt/clamp	16/2	NOTE • At installation, tighten the bolts in a gradual, crisscross pattern.
(2)	Oil pan	1	
(3)	Gasket	1	
(4)	Oil strainer screen	1	NOTE • Clean with the non-flammable solvent.
(5)	Oil strainer packing	1	
(6)	Oil pipe A/O-ring	1/2	
(7)	Oil pipe B/O-ring	1/2	
(8)	Oil pressure relief valve/O-ring	1/1	
(9)	Oil pipe bolt	2	
(10)	Oil pipe C/O-ring	1/2	
(11)	Oil pump driven sprocket bolt	1	NOTE • Apply a locking agent to the tip of the threads.
(12)	Washer	1	
(13)	Oil pump driven sprocket	1	NOTE • At installation, install the driven sprocket with the "OUT" mark facing the clutch.
(14)	Oil pump bolt	3	
(15)	Oil pump	1	
(16)	Dowel pin	3	
(17)	O-ring	1	

Oil Pump Disassembly/Assembly



NOTE

- If any portion of the oil pump is worn beyond the specified service limit, replace the oil pump as an assembly.
- Before assembling them, clean all disassembled parts thoroughly with clean engine oil.
- Refer to section 4 of the Common Service Manual for inspection information.
- Refer to page 1-6 for specification.

Requisite Service

- Oil pump removal/installation (page 4-4)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Oil pump cover bolt	3	
(2)	Cooler pump cover	1	
(3)	Dowel pin	2	
(4)	Cooler pump outer rotor	1	
(5)	Cooler pump inner rotor	1	
(6)	Drive pin	1	
(7)	Cotter pin	1	
(8)	Retainer	1	
(9)	Spring	1	
(10)	Valve	1	
(11)	Feed pump cover	1	
(12)	Dowel pin	2	
(13)	Feed pump outer rotor	1	
(14)	Feed pump inner rotor	1	
(15)	Drive pin	1	
(16)	Washer	1	
(17)	Oil pump shaft	1	
(18)	Oil pump body	1	

5. Fuel System

Service Information

⚠ WARNING

- **Gasoline is extremely flammable and is explosive under certain conditions.**
- **Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.**

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

CAUTION

- **Be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.**

- Refer to section 2 for fuel tank removal and installation.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place the suitable container under the carburetor drain tube loosen the bolt and drain the carburetor.
- After removing the carburetor, wrap the intake ports of the engine with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.

NOTE

- If the vehicle is to be stored for more than one month, drain the float bowls. Fuel left in the float bowls may cause clogged jets resulting in hard starting or poor driveability.

Troubleshooting

Engine Won't Start
- Too much fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetors
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
  - Fuel strainer clogged
  - Fuel tube clogged
  - Fuel valve stuck
  - Fuel pump malfunction
  - Float level misadjusted
  - Fuel tank breather tube clogged

Lean Mixture
- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air bent tube clogged
- Intake air leak
- Fuel pump malfunction
- Throttle valve faulty
- Vacuum piston faulty

Rich Mixture
- Starting enrichment valve in ON position
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor

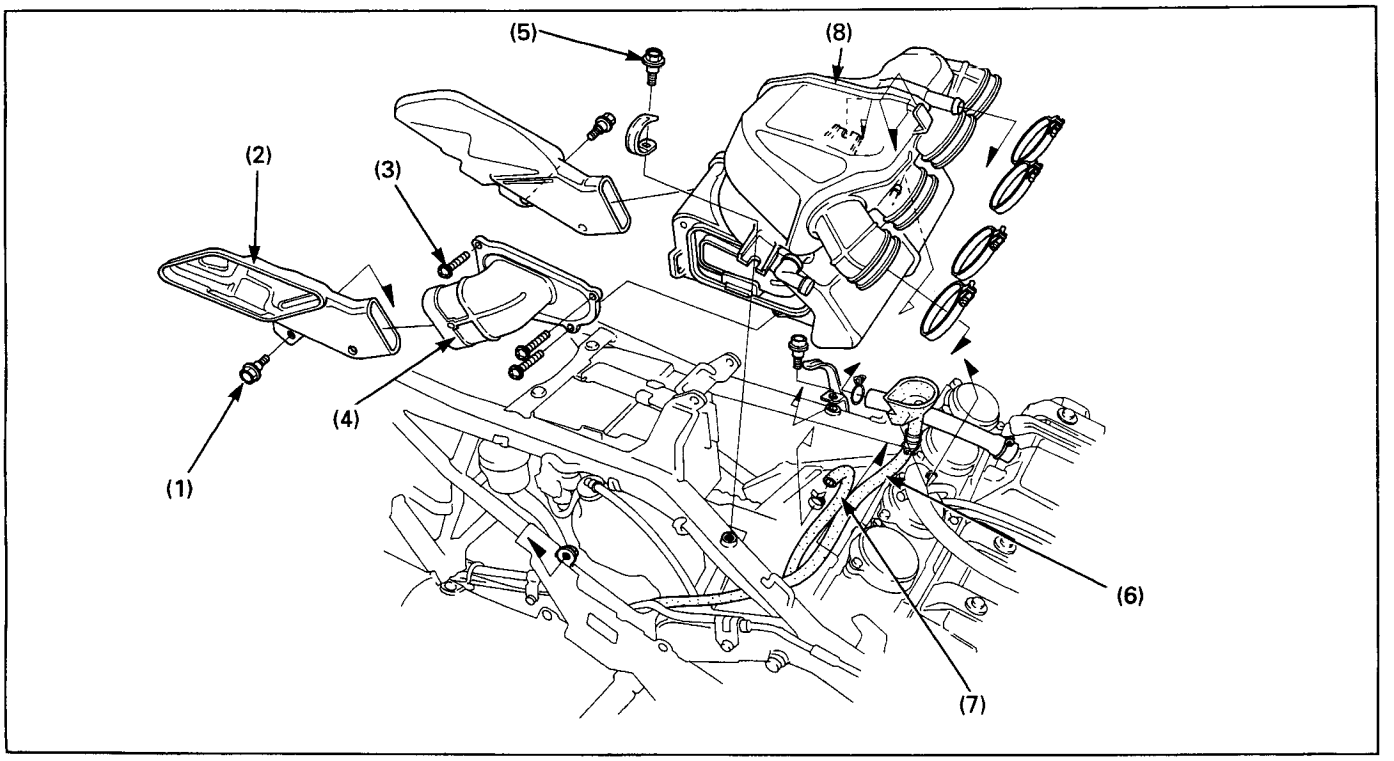
Engine Stall, Hard To Start, Rough Idling
- Fuel line restricted
- Ignition malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather tube clogged
- Fuel pump malfunction
- Pilot screw misadjusted
- Slow circuit or bystarter circuit clogged
- Emission control system is malfunction (SW, AR type only)

Afterburn When Engine Braking Is Used
- Lean mixture in slow circuit
- Air cut-off valve malfunction (SW,AR type only)
- Emission control system is malfunction (SW, AR type only)
  - Secondary air supply system faulty
  - Loose, disconnected or deteriorated hoses of the emission control system

Backfiring Or Misfiring During Acceleration
- Ignition system malfunction
- Fuel mixture too lean

Poor Performance (Driveability) And Poor Fuel Economy
- Fuel system clogged
- Ignition system malfunction
- Emission control system is malfunction (SW, AR type only)
  - Secondary air supply system faulty
  - Loose, disconnected or deteriorated hoses of the emission control system

Air Cleaner Housing Removal/Installation

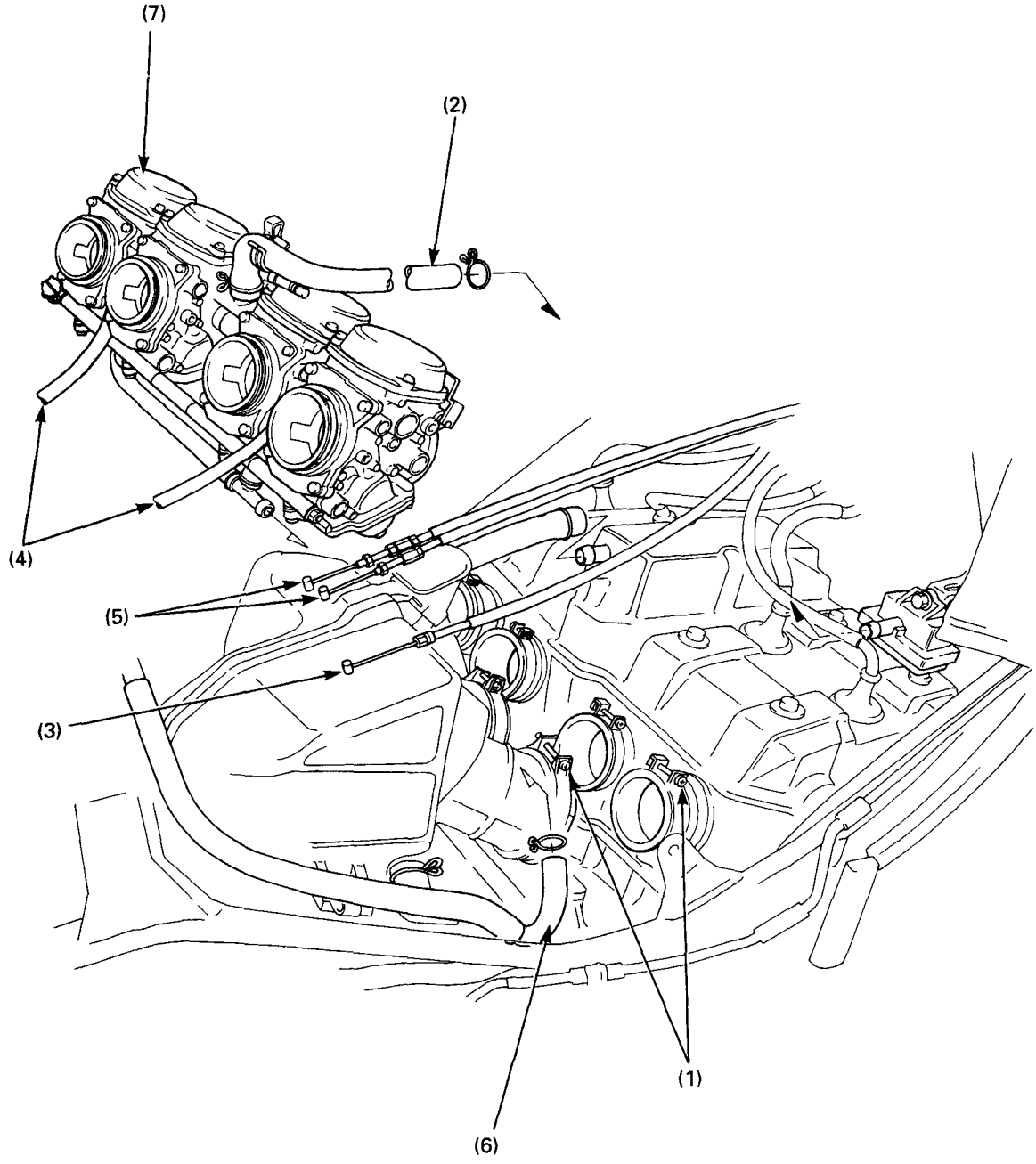


Requisite Service

- Carburetor removal/installation (page 5-4)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Intake duct bolt	2	
(2)	Intake duct	2	
(3)	Element cover screw	3	
(4)	Element cover	1	
(5)	Air cleaner housing bolt/clamp	2/1	
(6)	Air hose	1	
(7)	Breather tube	1	
(8)	Air cleaner housing	1	

Carburetor Removal/Installation



⚠ WARNING

- **Gasoline is extremely flammable and is explosive under certain conditions.**

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area where gasoline is stored can cause a fire or explosion.

NOTE

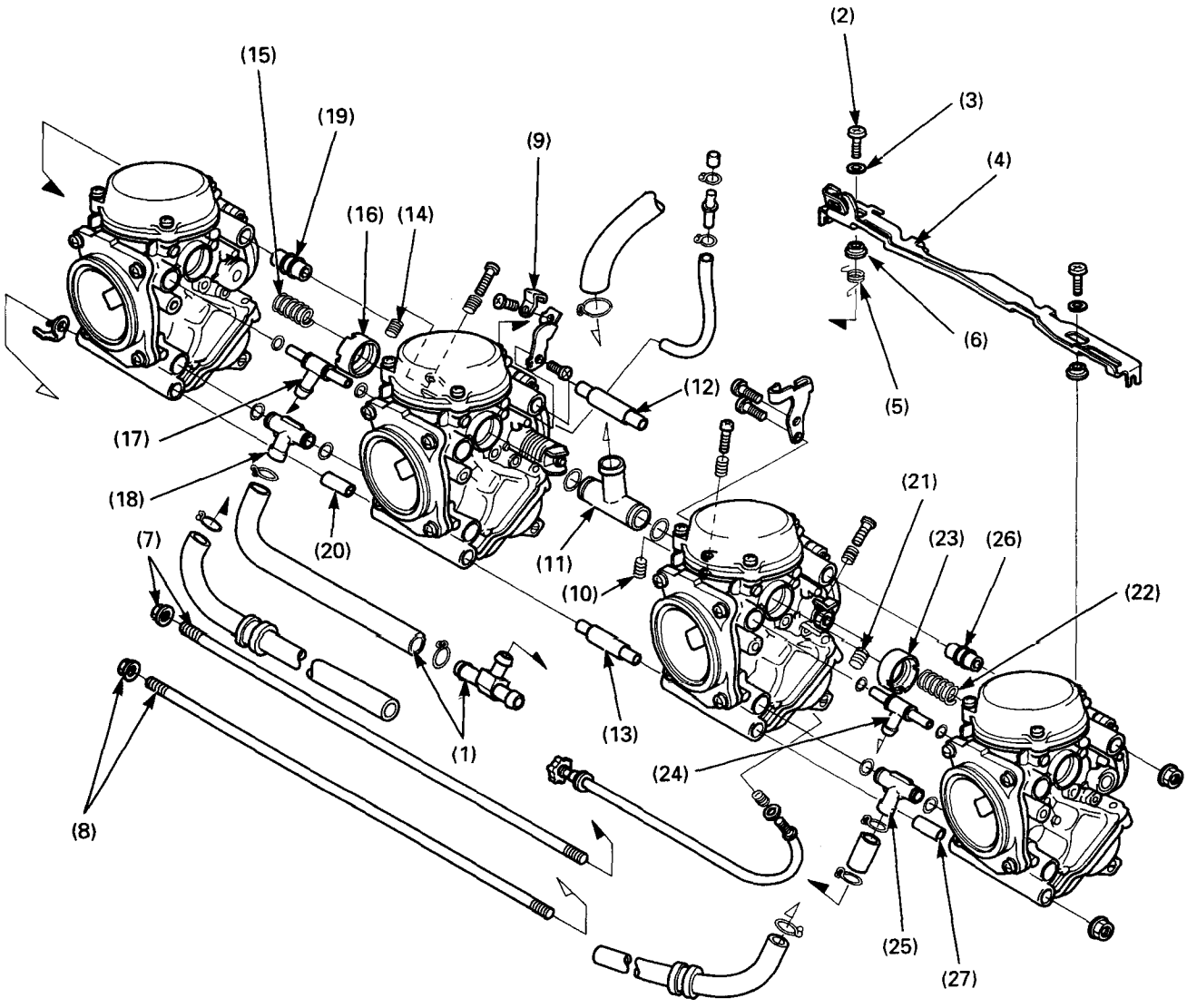
- Route the drain and fuel tubes correctly (page 1-23)

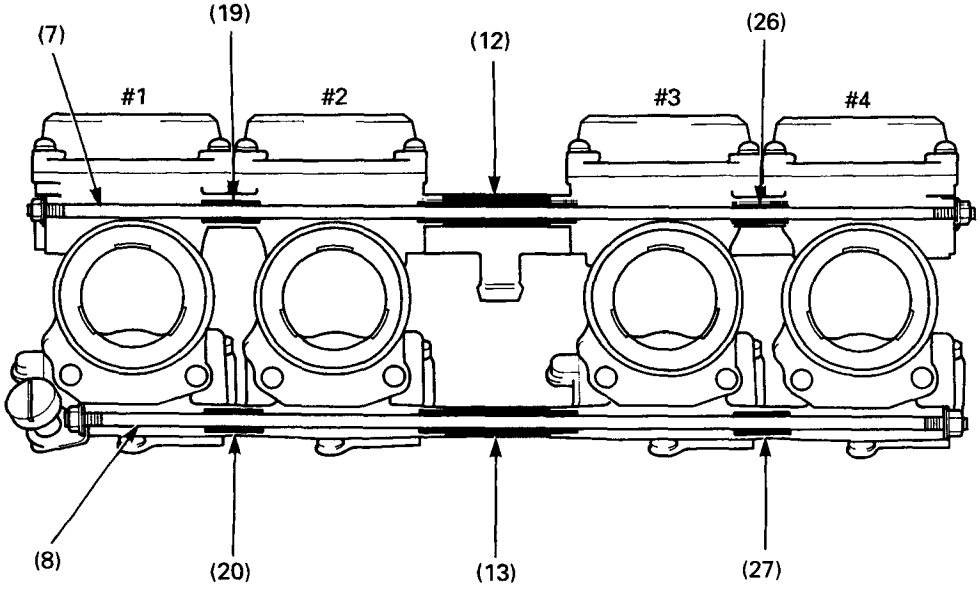
Requisite Service

- Fuel tank removal/installation (page 2-9)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Insulator band screw	8	Only loosen.
(2)	Air hose	1	
(3)	Choke cable	1	
(4)	Air bent tube	2	
(5)	Throttle cable	2	
(6)	Fuel tube	1	
(7)	Carburetor assembly	1	NOTE • Remove the carburetor assembly from the insulator. • After removing the carburetor assembly, do not place it up side down or the air intake might be deformed.

Carburetor Separation



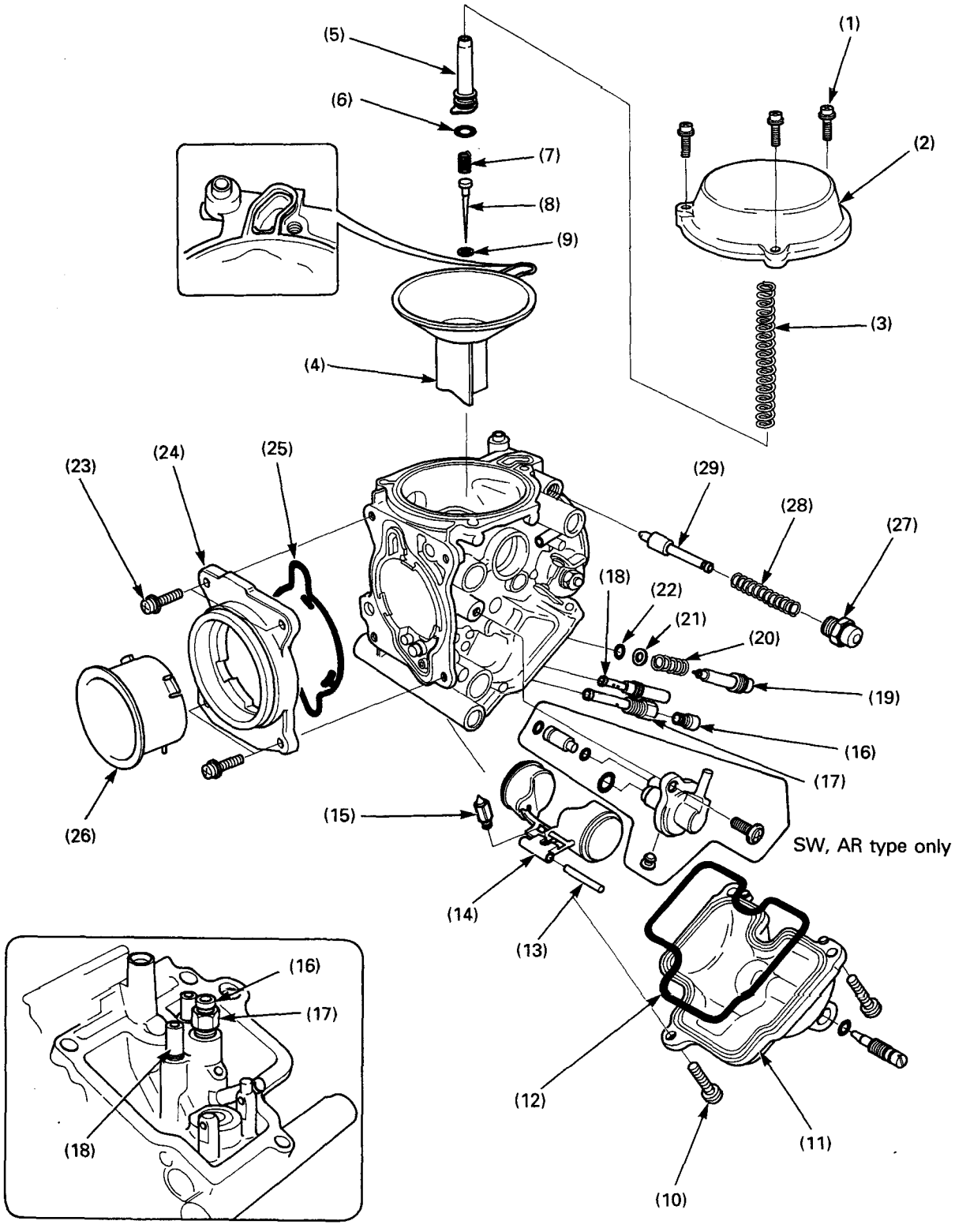


Requisite Service

- Carburetor removal/installation (page 5-4)

	Procedure	Q'ty	Remarks
	Separate No.3/4 carb. from No.1/2 carb.		
(1)	Fuel tube/joint	1	
(2)	Starting enrichment valve arm screw	2	
(3)	Plastic washer	2	
(4)	Starting enrichment valve arm	1	
(5)	Thrust spring	1	
(6)	Plastic collar	2	
(7)	Carburetor connecting nut/bolt, 6mm	2/1	
(8)	Carburetor connecting nut/bolt, 5mm	2/1	
(9)	Starting enrichment valve cable holder	1	
(10)	No.2 carburetor synchronization spring	1	
(11)	Air joint pipe (3-way joint)/O-ring	1/2	
(12)	Dowel pin (6mm bolt side)	1	
(13)	Distance collared dowel pin (5mm bolt side)	1	
	Separate No.1 carb. from No.2 carb.		
(14)	No.1 carburetor synchronization spring	1	
(15)	Thrust spring	1	
(16)	Air joint rubber pipe	1	
(17)	Air vent joint pipe/O-ring	1/2	
(18)	Fuel joint pipe (3-way joint)/O-ring	1/2	
(19)	Dowel pin (6mm bolt side)	1	
(20)	Dowel pin (5mm bolt side)	1	
	Separate No.3 carb. from No.4 carb.		
(21)	No.4 carburetor synchronization spring	1	
(22)	Thrust spring	1	
(23)	Air joint rubber pipe	1	
(24)	Air vent joint pipe/O-ring	1/2	
(25)	Fuel joint pipe (3-way joint)/O-ring	1/2	
(26)	Dowel pin (6mm bolt side)	1	
(27)	Dowel pin (5mm bolt side)	1	

Carburetor Disassembly/Assembly



NOTE

- Vacuum chamber, float chamber and jets can be serviced without separating the carburetors.
- Note the location of the each carburetor parts so they can be back in their original locations.

Requisite Service

- Carburetor separation (page 5-6)
- Carburetor combination (page 5-12)

	Procedure	Q'ty	Remarks
	Disassembly Order **Vacuum Chamber Disassembly Order**		Assembly is in the reverse order of disassembly.
(1)	Vacuum chamber cover screw	3	
(2)	Vacuum chamber cover	1	
(3)	Diaphragm spring	1	NOTE • At installation, be careful not to damage the spring.
(4)	Diaphragm/vacuum piston	1	NOTE • At installation, align the tab of the diaphragm with the carburetor body groove.
(5)	Jet needle holder	1	Removal/installation (page 5-10)
(6)	O-ring	1	
(7)	Jet needle holder spring	1	
(8)	Jet needle	1	
(9)	Washer	1	
	Float Chamber Disassembly		
(10)	Float chamber cover screw	3	
(11)	Float chamber cover	1	
(12)	O-ring	1	
(13)	Float pin	1	
(14)	Float	1	
(15)	Float valve	1	
(16)	Main jet	1	
(17)	Needle jet holder	1	
(18)	Slow jet	1	
(19)	Pilot scerw	1	Adjustment (page 5-14)
(20)	Spring	1	
(21)	Washer	1	
(22)	O-ring	1	
	Air Funnel Disassembly Order		
(23)	Air funnel holder screw	4	
(24)	Air funnel holder	1	
(25)	O-ring	1	NOTE • At installation, install the O-ring into the carburetor groove securey . • Replace the O-ring if necessary.
(26)	Air funnel	1	
	Starting Enrichment Valve Disassembly Order		
(27)	Valve nut	1	
(28)	Spring	1	
(29)	Starting enrichment valve	1	

Jet Needle Removal/Installation

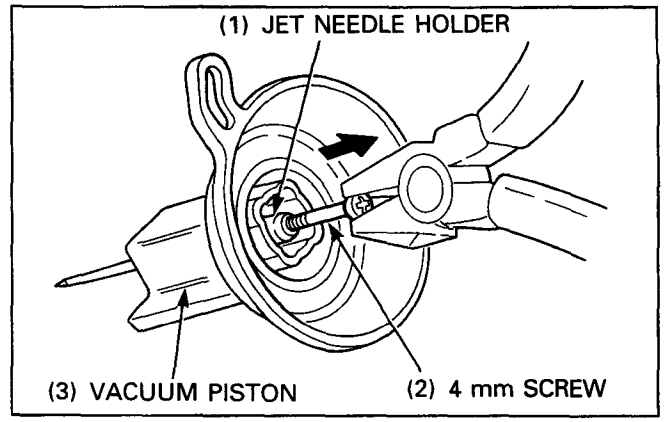
Removal

Remove the vacuum piston (page 5-8)

Temporarily install the 4mm screw or equivalent (Example; vacuum chamber screw).
Pull the screw and remove the jet needle holder.

CAUTION

- **Be careful not to damage the diaphragm.**
- **Do not remove the jet needle holder by pushing the jet needle.**

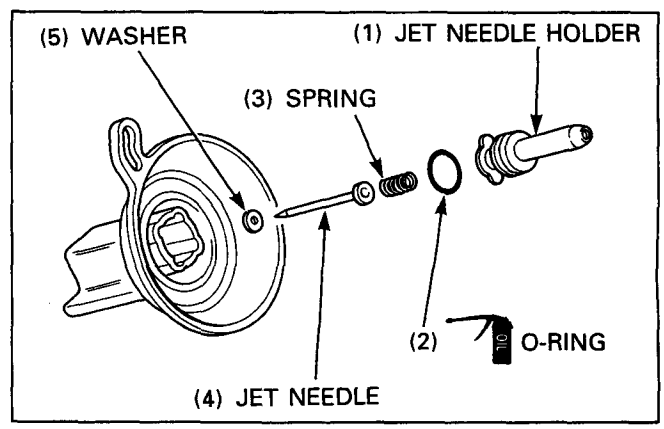


Installation

Check the O-ring on the jet needle holder is in good condition and replace if necessary.

Apply oil to the O-ring.
Install the jet needle holder into the vacuum piston until you felt the click so that the O-ring is installed into the groove in the vacuum piston.

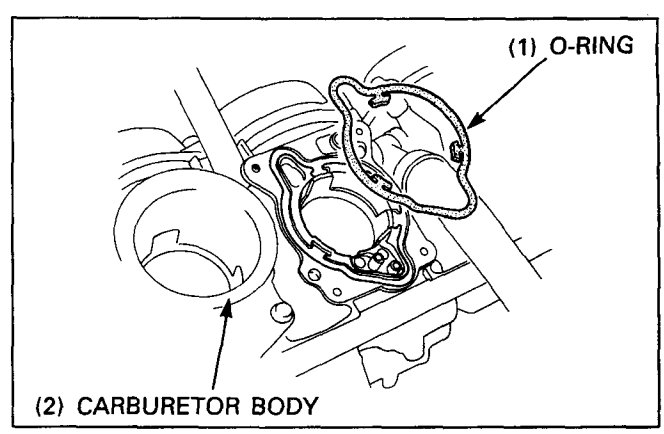
Install the vacuum piston (page 5-8).



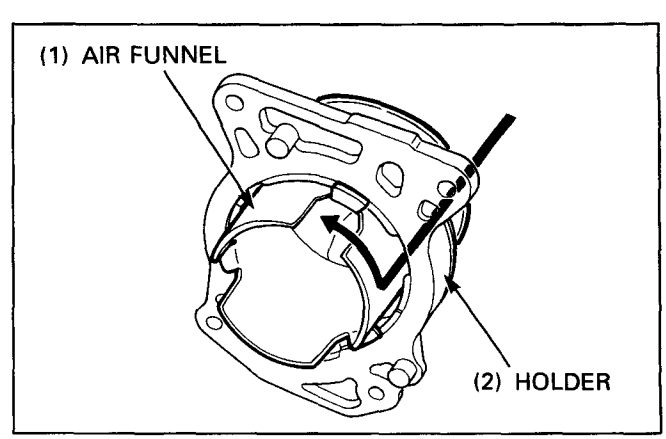
Air Funnel Installation

Check the O-ring is in good condition and replace if necessary.

Install the O-ring into the carburetor body groove.

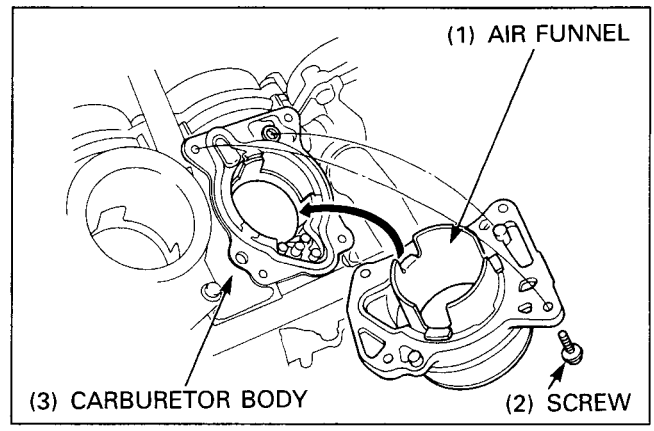


Install the air funnel into the holder.



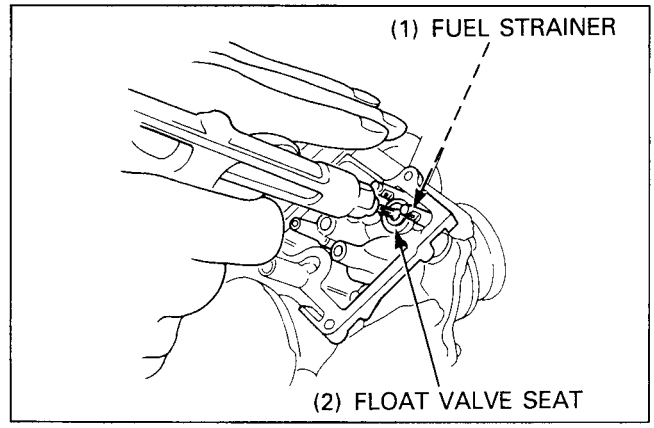
Align the cut out on the air funnel with the groove in the carburetor body, then install the air funnel/holder.

Install and tighten the air funnel holder screws.

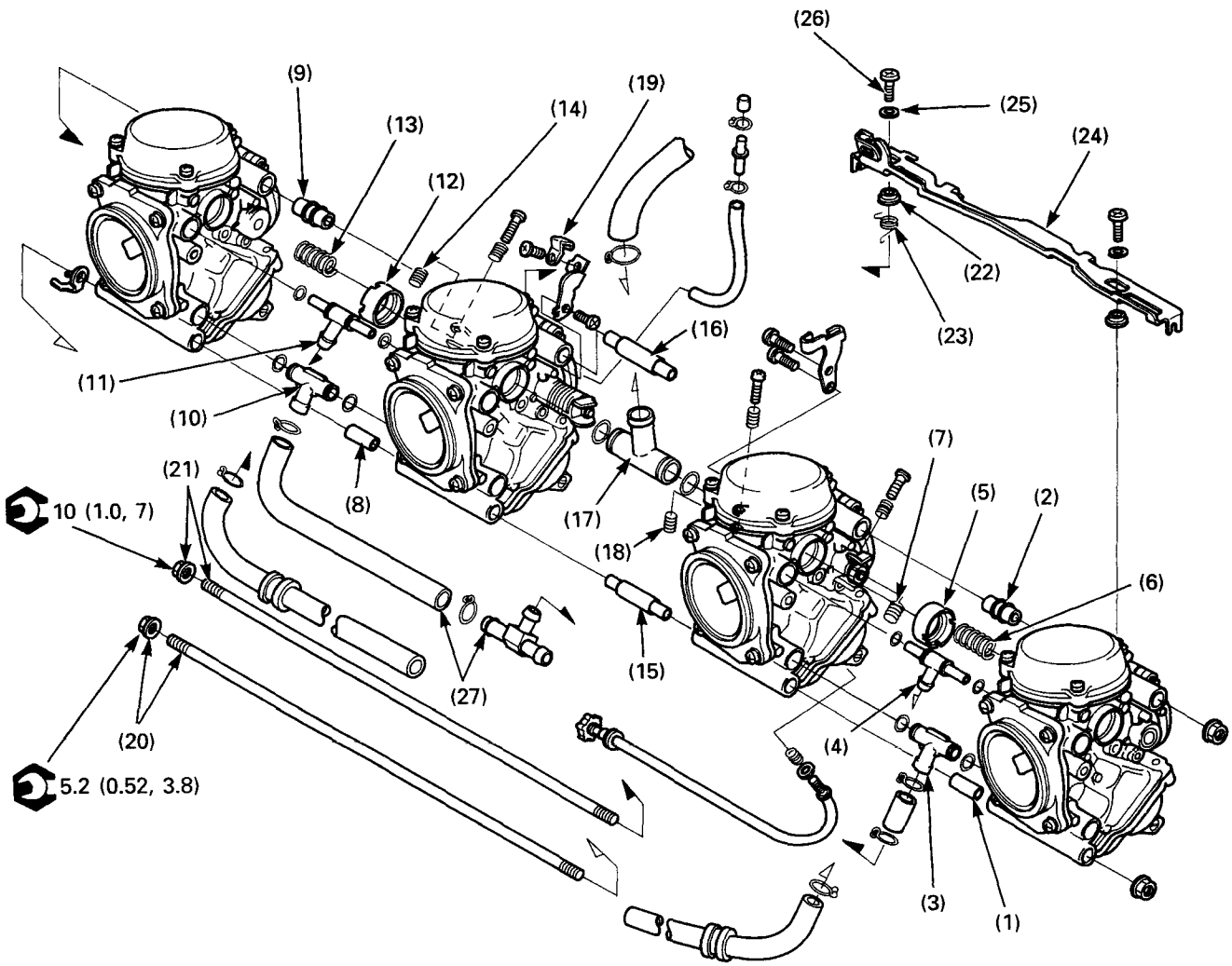


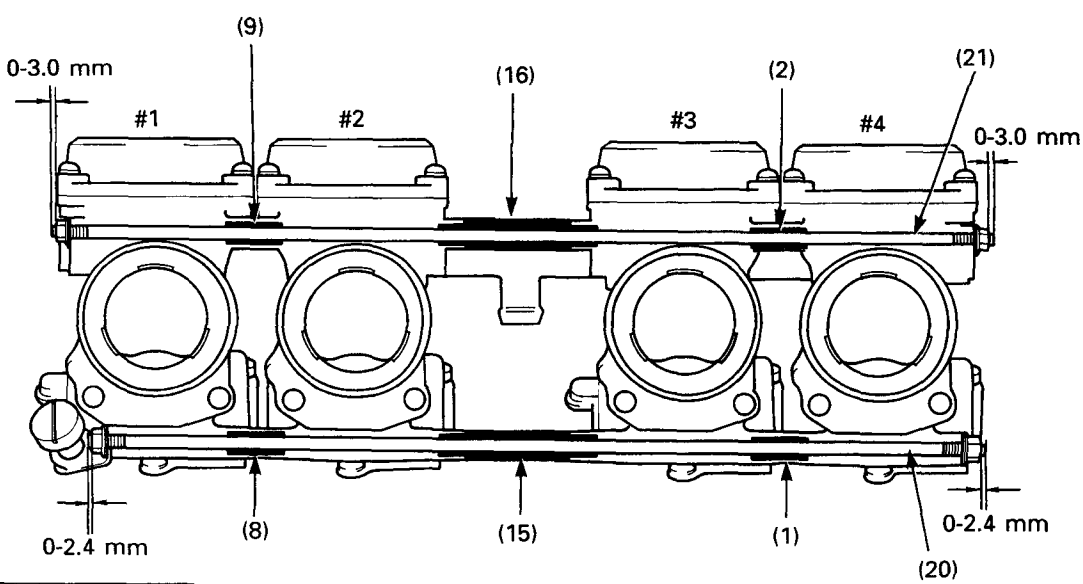
Carburetor Body Cleaning

Clean the fuel strainer in the float valve using the compressed air from the float valve seat side.



Carburetor Combination





: Gasket, O-ring

NOTE

- No.3 carburetor is the base carburetor.
- Before tightening the carburetor connecting bolt/nut, check that not clearance between the each carburetor joints.
- Tighten the each connecting bolts/nuts gradually and alternately, be sure the bolt thread projections are equal height. Hold the nut and tighten the other side nut.

Requisite Service

- Carburetor disassembly (page 5-8)
- Carburetor installation (page 5-4)
- Carburetor synchronization (page 3-8)

	Procedure	Q'ty	Remarks
	Assemble No.3 carb. with No.4 carb.		
(1)	Dowel pin (5mm bolt side)	1	
(2)	Dowel pin (6mm bolt side)	1	
(3)	Fuel joint pipe (3-way joint)/O-ring	1/2	Always replace the O-rings with new ones.
(4)	Air vent joint pipe/O-ring	1/2	
(5)	Air joint rubber pipe	1	
(6)	Thrust spring	1	
(7)	No.4 carburetor synchronization spring	1	
	Assemble No.1 carb. with No.2 carb.		
(8)	Dowel pin (5mm bolt side)	1	
(9)	Dowel pin (6mm bolt side)	1	
(10)	Fuel joint pipe (3-way joint)/O-ring	1/2	Always replace the O-rings with new ones.
(11)	Air vent joint pipe/O-ring	1/2	
(12)	Air joint rubber pipe	1	
(13)	Thrust spring	1	
(14)	No.1 carburetor synchronization spring	1	
	Assemble No.3/4 carb. with No.1/2 carb.		
(15)	Distance collared dowel pin(5mm bolt side)	1	
(16)	Dowel pin (6mm bolt side)	1	
(17)	Air joint pipe (3-way joint)/O-ring	1/2	Always replace the O-rings with new ones.
(18)	No.2 carburetor synchronization spring	1	
(19)	Starting enrichment valve cable holder	1	
(20)	Carburetor connecting nut/bolt, 5mm	2/1	**CAUTION**
(21)	Carburetor connecting nut/bolt, 6mm	2/1	• **Tighten each nuts gradually and alternately with the above procedure. Do not over tighten the nuts.**
(22)	Plastic collar	2	
(23)	Thrust spring	1	
(24)	Starting enrichment valve arm	1	
(25)	Plastic washer	2	
(26)	Starting enrichment valve arm screw	2	
(27)	Fuel tube/joint	1	

Pilot Screw Adjustment

Idle Drop Procedure

⚠ WARNING

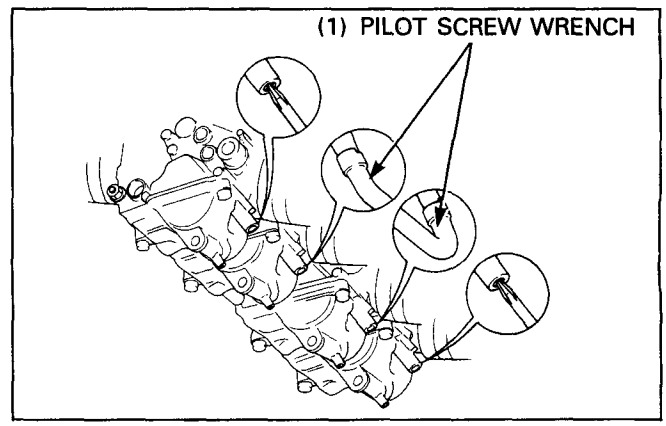
- **If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.**

NOTE

- Make sure the carburetor synchronization is within specification before pilot screw adjustment (page 1 -6).
- The pilot screw is factory pre-set and no adjustment can be done unless it is replaced.
- The engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduation of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rp m) change.

1. Turn each pilot screw clockwise until it seats lightly and then back it out to the specification.

Initial Opening: Except SW,AR type: 3turns out
SW type: 1-3/4 turns out
AR type: 2-5/8 tunrs out



CAUTION

- **Damage the pilot screw seat will occur if the pilot screw is tightened against the seat.**

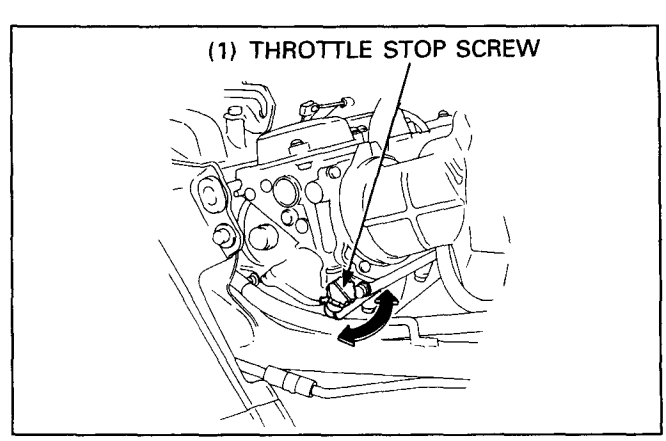
2. Warm up the engine to operating temperature.
3. Stop the engine and attach the tachometer according to the manufacturer's instruction .
4. Start the engine and adjust the idle speed with the throttle stop screw.

Idle Speed: Except SW,AR type: 1,100 ± 100 min^{-1} (rpm)
SW type: 1,050 ± 50 min^{-1} (rpm)
AR type : 1,050 ± 100 min^{-1} (rpm)

5. Turn all pilot screws 1/2 turns counterclockwise from the initial setting.

S TOOL

Pilot screw wrench **07908-4220201 (Except SW type)**
07KMA-MS60101 (SW type)



6. If the engine speed increase by 50 min^{-1} (rpm) or more, turn all pilot screws out by successive 1/2 turn increments until engine speed does not increase.
7. Adjust the idle speed with the throttle stop screw.
8. Turn the No.3 carburetor pilot screw in until the engine speed drops 50 min^{-1} (rpm).
9. Then turn the No.3 pilot screw counterclockwise 1 (G, SW, AR type : 3/4) turn from the position obtained in step 8.
10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8, 9 and 10 for the No.1, 2 and 4 carburetor pilot screw.

6. Cooling System

Service Information

⚠ WARNING

- **Wait until the engine is cool before slowly removing the radiator cap. Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding.**
- **Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.**
  - **If any coolant gets in your eyes, rinse them water and consult a doctor immediately.**
  - **If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.**
  - **If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.**
- **KEEP OUT OF REACH OF CHILDREN.**

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 25 of the Common Service Manual for fan motor switch and thermo sensor inspection.

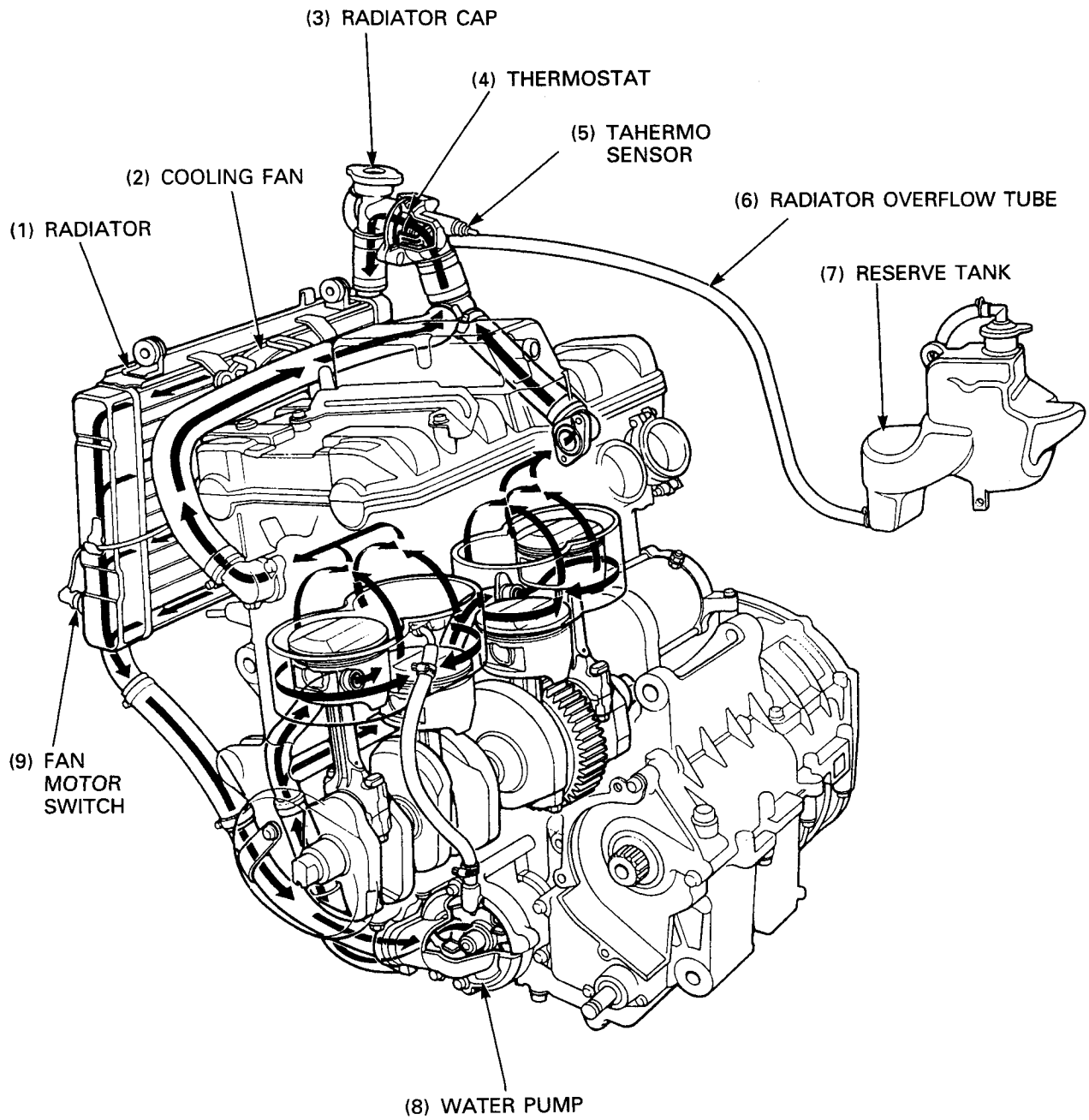
Troubleshooting

Engine Temperature Too High
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty water pump
- Thermostat stuck closed
- Faulty temperature gauge or thermo sensor
- Faulty cooling fan motor
- Faulty fan motor switch

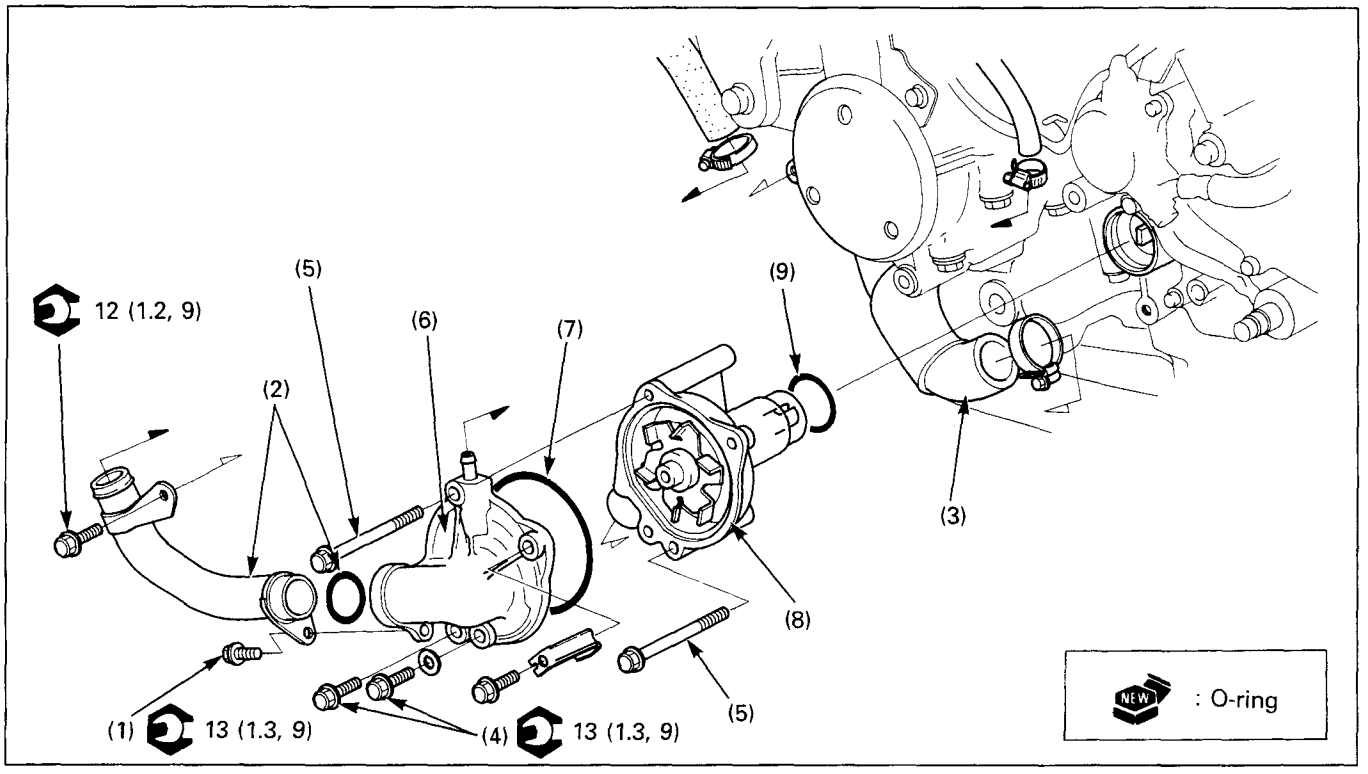
Engine Temperature Too Low
- Faulty temperature gauge or gauge sensor
- Thermostat stuck open
- Faulty cooling fan motor switch

Coolant Leaks
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Damaged or deteriorated gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose

System Flow Pattern



Water Pump Removal/Installation

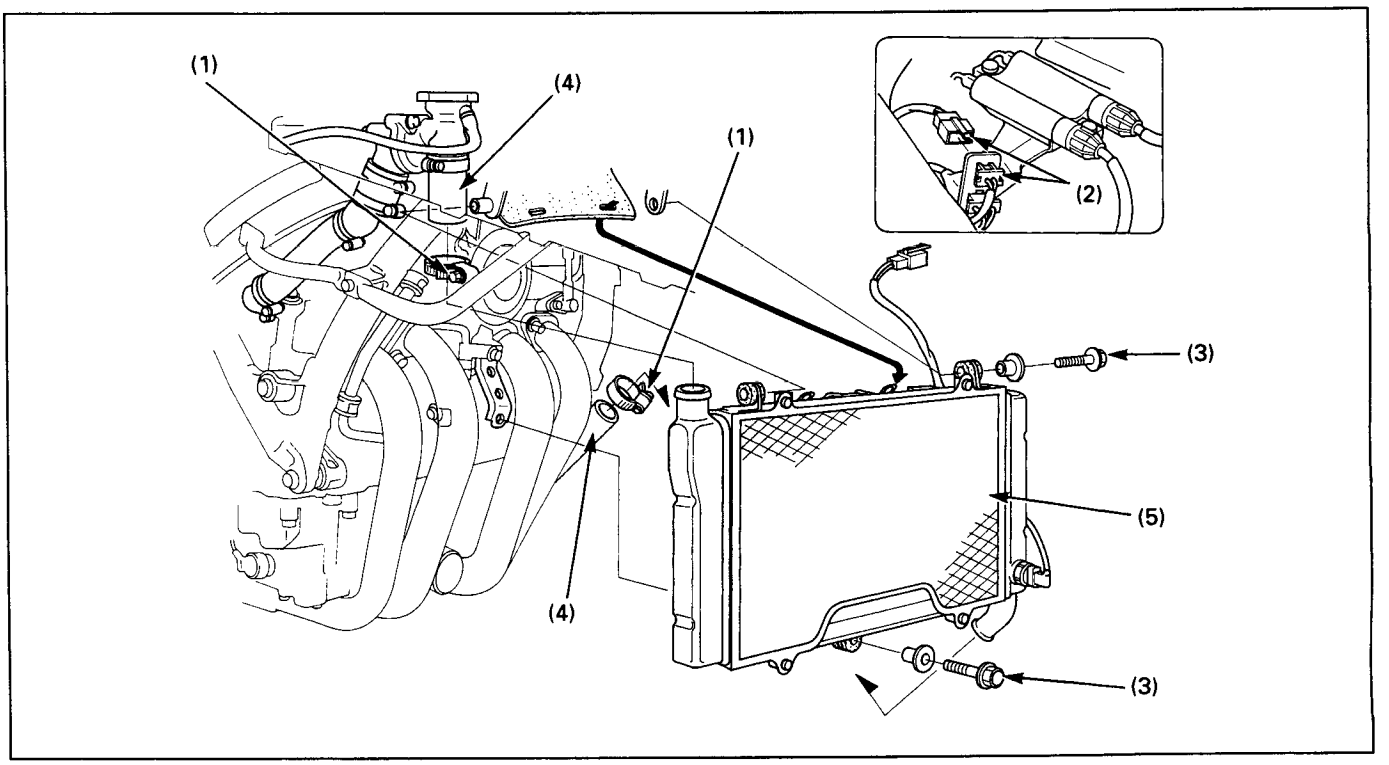


Requisite Service

- Coolant draining/refilling
- Engine oil draining
- Gearshift spindle joint removal/installation (7-2)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Water pump-to-radiator pipe bolt	2	
(2)	Water pump-to-radiator pipe/O-ring	1/1	
(3)	Water pump-to-cylinder head hose	1	
(4)	Water pump cover bolt/clamp	2/1	
(5)	Water pump mounting bolt	2	
(6)	Water pump cover	1	
(7)	O-ring	1	
(8)	Water pump body	1	At installation, align the cut-out of the water pump shaft with the oil pump shaft.
(9)	O-ring	1	

Radiator Removal/Installation

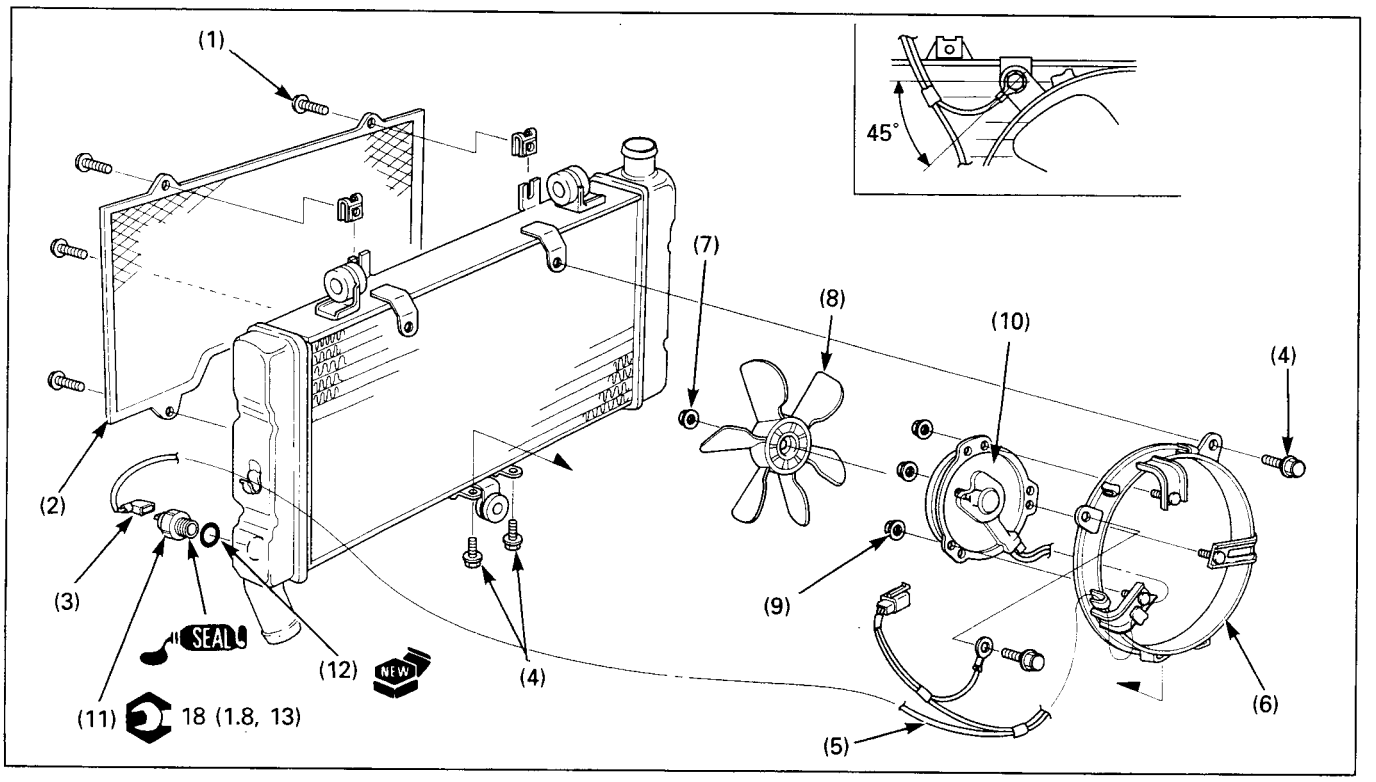


Requisite Service

- Coolant draining/refilling
- Lower fairing removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Radiator hose band	2	Only loosen.
(2)	Cooling fan wire connector	1	
(3)	Radiator mounting bolt	2	
(4)	Radiator hose	2	
(5)	Radiator assembly	1	**CAUTION** • **During removal and installation, be careful not to damage the radiator core.** NOTE • At installation, align the grommet hole with the boss on the frame.

Radiator Disassembly/Assembly

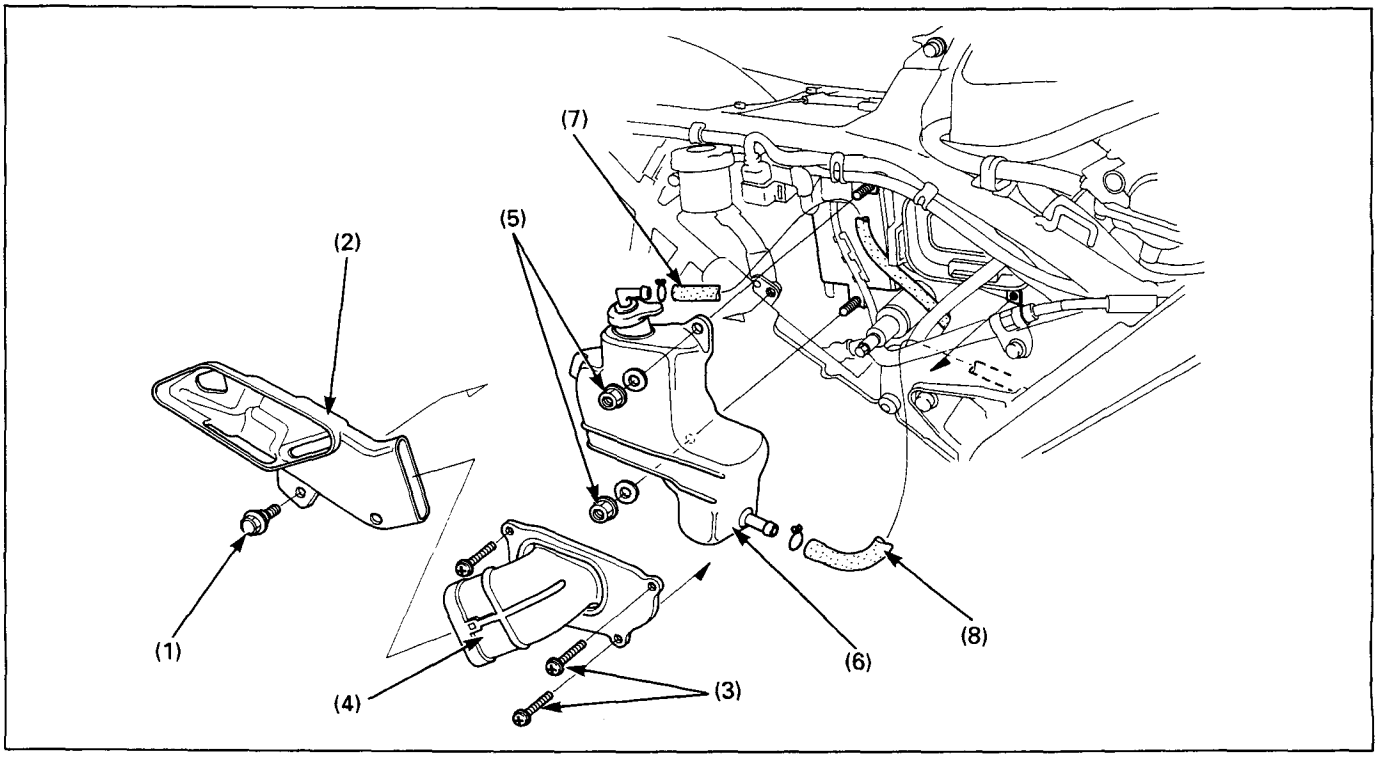


Requisite Service

- Radiator removal/installation (page 6-4)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Radiator grill screw	4	
(2)	Radiator grill	1	
(3)	Fan motor switch connector	1	
(4)	SH bolt	4	At installation, attach the ground wire as shown.
(5)	Fan motor wire harness	1	
(6)	Shroud	1	
(7)	Cooling fan nut	1	
(8)	Cooling fan	1	At installation, align the fan motor groove with the fan motor shaft.
(9)	Fan motor nut	3	
(10)	Fan motor	1	
(11)	Fan motor switch	1	
(12)	O-ring	1	

Reserve Tank Removal/Installation

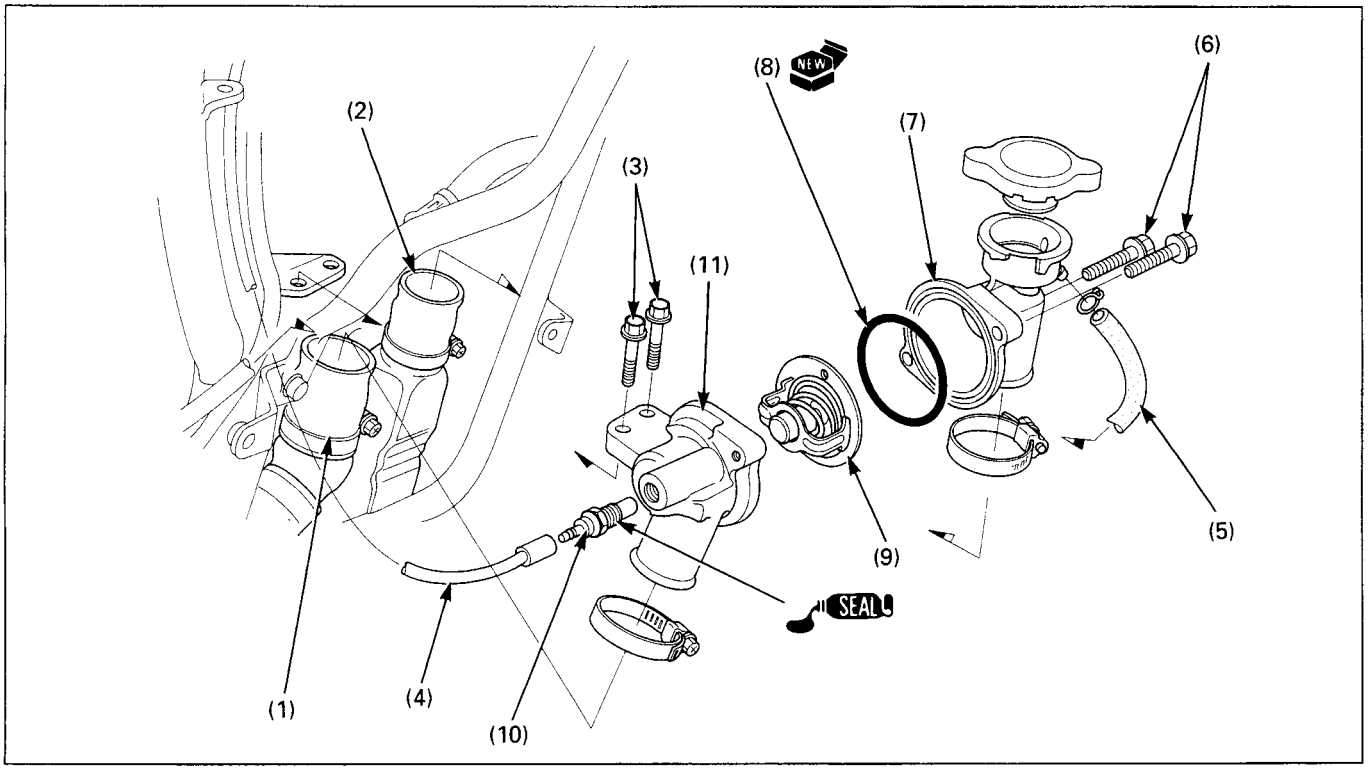


Requisite Service

- Coolant draining/refilling
- Side cover removal/installation (page 2-3)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Intake duct bolt	1	
(2)	Intake duct	1	
(3)	Element cover screw	3	
(4)	Element cover	1	
(5)	Reserve tank nut	2	
(6)	Reserve tank	1	
(7)	Reserve tank breather tube	1	
(8)	Siphon tube	1	

Thermostat Removal/Installation



Requisite Service

- Coolant draining/refilling
- Upper fairing removal/installation (page 2-7)
- Lower fairing removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Cylinder head-to-thermostat hose	1	Loosen the hose band, then disconnect it.
(2)	Radiator-to-thermostat hose	1	
(3)	Thermostat housing bolt	2	
(4)	Water temperature sensor connector	1	
(5)	Siphon tube	1	
(6)	Thermostat housing cover bolt	2	
(7)	Thermostat housing cover	1	
(8)	O-ring	1	
(9)	Thermostat	1	NOTE • Install the thermostat with its hole facing up and fit it properly in the housing.
(10)	Water temperature sensor	1	
(11)	Thermostat housing	1	

7. Engine Removal/Installation

Service Information

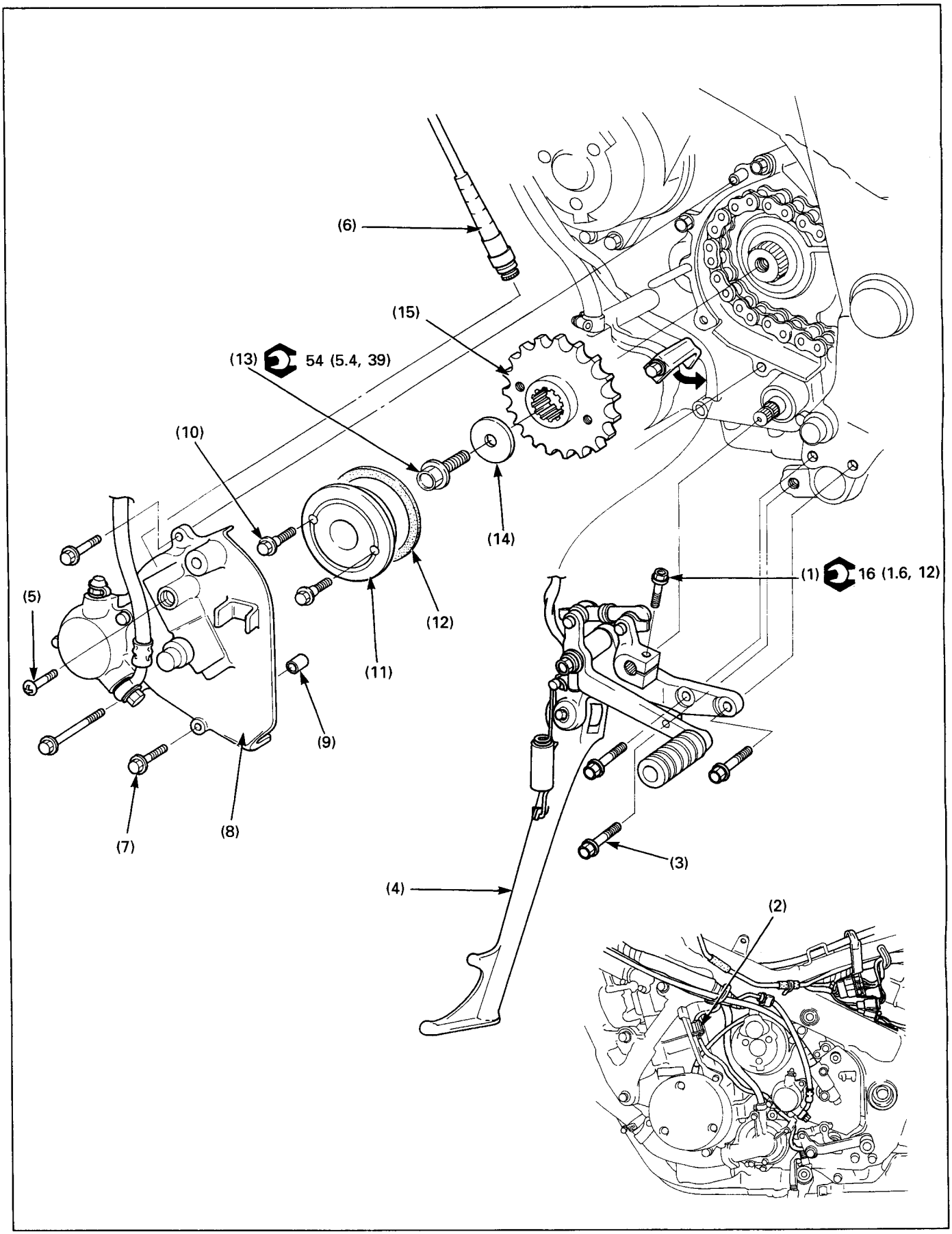
- During removal and installation, support the motorcycle using a safety stand or hoist.

⚠ WARNING

- **Do not support the engine using the oil filter.**

- The following components can be serviced with the engine installed in the frame.
  - Alternator (Section 14)
  - Clutch/gearshift linkage (Section 9)
  - Cylinder haed/valves (Section 8)
  - Oil cooler (Section 4)
  - Oil pump (Section 4)
  - Water pump (Section 6)
- The following components require engine removal for service.
  - Crankshaft/transmission (Section 10)
  - Shift forks/shift drum (Section 10)

Drive Sprocket Removal/Installation



NOTE

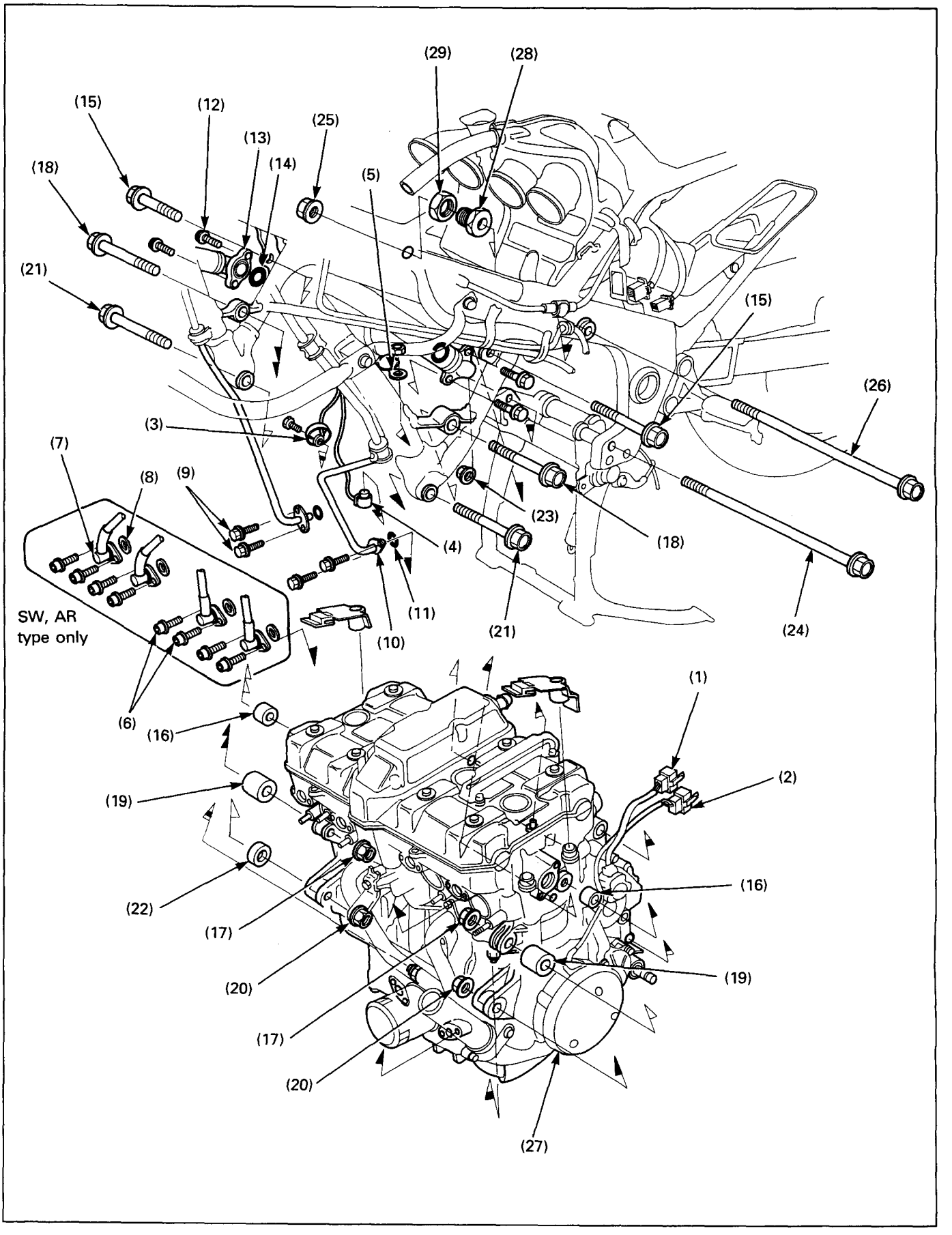
- Support the motorcycle using the center stand.

Requisite Service

- Lower fairing removal/installation (page 2-6)
- Carburetor removal/installation (page 5-4)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Gearshift linkage bolt	1	
(2)	Side stand switch 3P connector	1	Remove the side stand switch wire from the clamp, then disconnect the 3P connector.
(3)	Side stand bracket bolt	3	
(4)	Side stand bracket assembly	1	
(5)	Screw	1	
(6)	Speedometer cable	1	
(7)	Drive sprocket cover bolt	3	
(8)	Drive sprocket cover	1	
(9)	Dowel pin	1	
(10)	Guide ring bolt	2	
(11)	Guide ring	1	
(12)	Damper ring	1	
(13)	Drive sprocket bolt	1	
(14)	Washer	1	
(15)	Drive sprocket	1	

Engine Removal



⚠ WARNING

- **Do not support the engine using the oil filter.**

NOTE

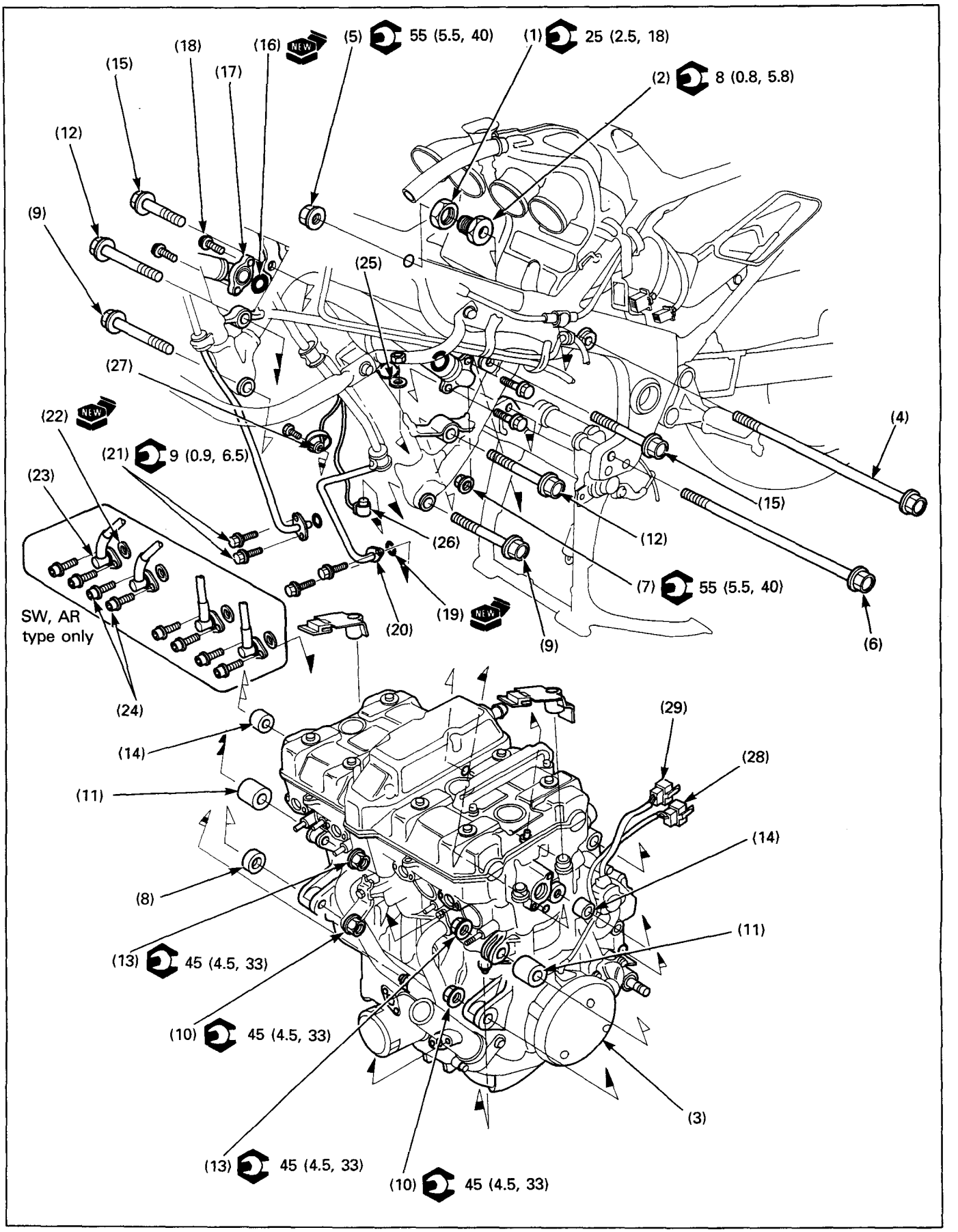
- Support the motorcycle using safety stand or a hoist.
- A floor jack or other adjustable support is required to support and maneuver the engine. The jack height must be continually adjusted to relieve stress for ease of bolt removal.
- Turn the ignition switch OFF and disconnect the battery ground (–) terminal.

Requisite Service

- Fuel tank removal (page 2-9)
- Lower fairing removal (page 2-6)
- Carburetor removal (page 5-4)
- Muffler removal (page 2-10)
- Radiator removal (page 6-4)
- Clutch hose removal (page 9-2)
- Dnive sprocket removal (page 7-2)
- Engine oil draining

	Procedure	Q'ty	Remarks
	Removal Order		
(1)	Alternator connector	1	
(2)	Ignition pulse generator 2P connector	1	
(3)	Oil pressure switch connector	1	
(4)	Neutral switch connector	1	
(5)	Starter motor cable	1	
(6)	Pulse secndary air injection control valve socket bolt	8	SW, AR type only
(7)	Pulse secndary air injection control valve	4	
(8)	Sealing washer	4	
(9)	Oil pipe bolt	4	
(10)	Oil pipe	2	
(11)	O-ring	2	
(12)	Water hose bolt	4	
(13)	Water hose	2	
(14)	O-ring	2	
(15)	Engine mounting bolt (front/upper)	2	
(16)	Collar (ø22×24.3mm)	2	
(17)	Front engine hanger nut (upper)	2	
(18)	Front engine hanger bolt (upper)	2	
(19)	Collar (ø25/ø18×16mm)	2	
(20)	Front engine hanger nut (lower)	2	
(21)	Front engine hanger bolt (lower)	2	
(22)	Collar (ø24×10mm)	1	
(23)	Rear engine hanger nut (lower)	1	
(24)	Rear engine hanger bolt (lower)	1	
(25)	Rear engine hanger nut (upper)	1	
(26)	Rear engine hanger bolt (upper)	1	
(27)	Engine assembly	1	
(28)	Engine hanger adjusting bolt	1	
(29)	Engine hanger adjusting bolt lock nut	1	

Engine Installation



NOTE

- Note the direction of the engine mounting bolts.
- All engine mounting bolts and nuts loosely install, then tighten the nuts specified torque.
- Route the wire harnesses and tubes properly (page 1-23).

Requisite Service

- Fuel tank installation (page 2-9)
- Lower fairing installation (page 2-6)
- Carburetor installation (page 5-4)
- Muffler installation (page 2-10)
- Clutch hose installation (page 9-2)
- Drive sprocket installation (page 7-2)
- Engine oil refilling
- Radiator installation (page 6-4)

	Procedure	Q'ty	Remarks
	Installation Order		
(1)	Engine hanger adjusting bolt lock nut	1	
(2)	Engine hanger adjusting bolt	1	
(3)	Engine assembly	1	
(4)	Rear engine hanger bolt (upper)	1	
(5)	Rear engine hanger nut (upper)	1	
(6)	Rear engine hanger bolt (lower)	1	
(7)	Rear engine hanger nut (lower)	1	
(8)	Collar (ø24×10mm)	1	
(9)	Front engine hanger bolt (lower)	2	
(10)	Front engine hanger nut (lower)	2	
(11)	Collar (ø25/ø18×16mm)	2	
(12)	Front engine hanger bolt (upper)	2	
(13)	Front engine hanger nut (upper)	2	
(14)	Collar (ø22×24.3mm)	2	
(15)	Engine mounting bolt (front/upper)	2	
(16)	O-ring	2	
(17)	Water hose	2	
(18)	Water hose bolt	4	
(19)	O-ring	2	
(20)	Oil pipe	2	
(21)	Oil pipe bolt	4	
(22)	Sealing washer	4	SW, AR type only
(23)	Pulse secondary air injection control valve	4	
(24)	Pulse secondary air injection control valve socket bolt	8	
(25)	Starter motor cable	1	
(26)	Neutral switch connector	1	
(27)	Oil pressure switch connector	1	
(28)	Ignition pulse generator 2P connector	1	
(29)	Alternator connector	1	

8. Cylinder Head/Cylinder/Piston

Service Information

- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head.
- Clean all disassembled parts with clean solvent and dry them by blowing them off with compressed air before inspection.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their proper locations.

Troubleshooting

- Engine top-end problem usually affect engine performance. These can be diagnosed by a compression or leak down test, or by tracing noises to the top-end with a sounding rod or stethoscope.
- If performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky, check for a seized piston ring.

Compression Too Low, Hard Starting Or Poor Performance At Low Speed
- Valves
  - Incorrect valve adjustment
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Cylinder, piston
  - Leaking cylinder head gasket
  - Loose spark plug
  - Worn, stuck or broken piston ring
  - Worn or damaged cylinder and piston

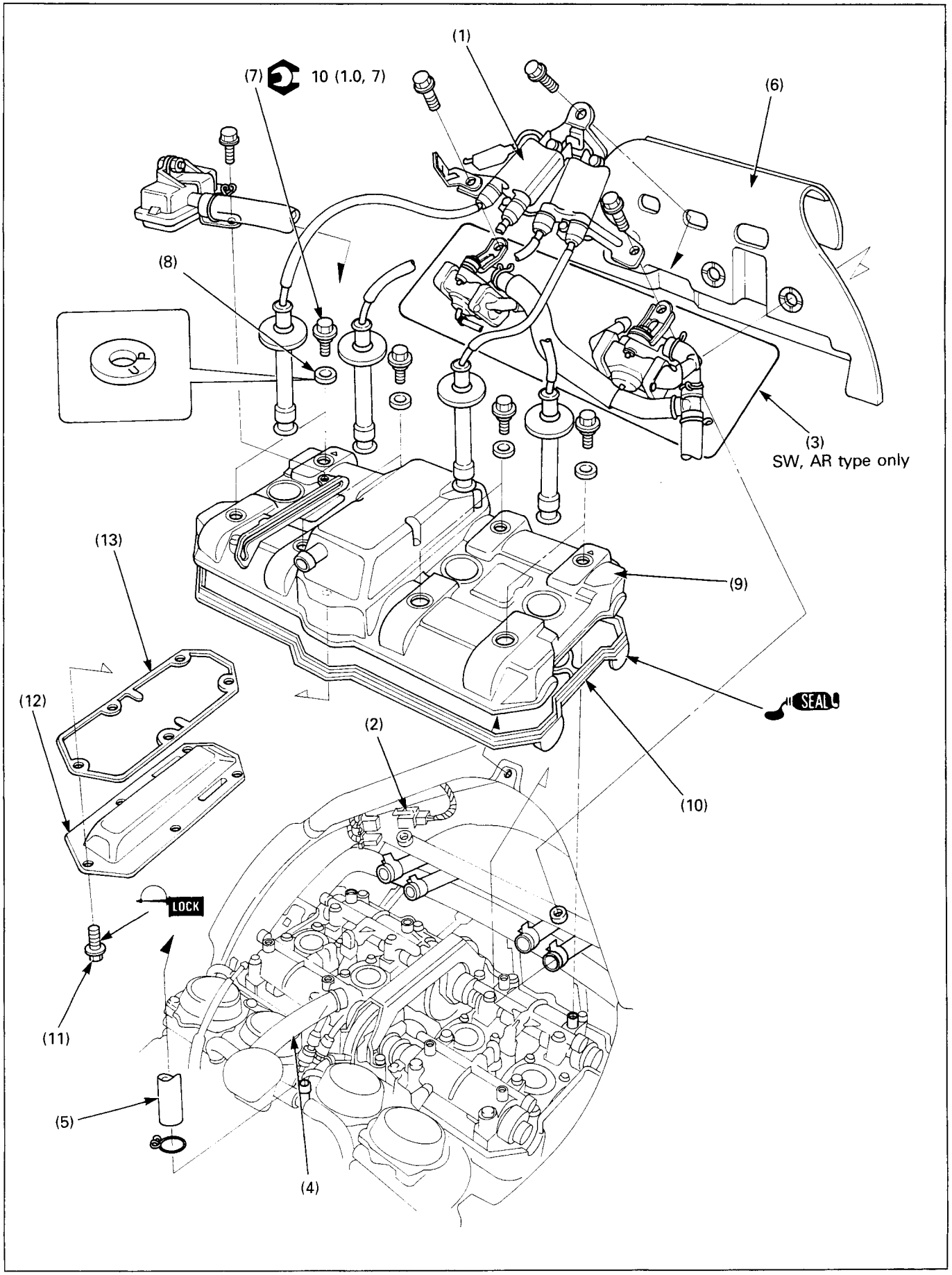
Compression Too High, Overheating Or Knocking
- Excessive carbon build-up in cylinder head or on top of piston

Excessive Smoke
- Cylinder head
  - Worn valve stem or valve guide
  - Damaged stem seal
- Cylinder, piston
  - Worn cylinder, piston, or piston rings
  - Improper installation of piston rings
  - Scored or scratched piston or cylinder wall

Excessive Noise
- Cylinder head
  - Incorrect valve adjustment
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
- Cylinder, piston
  - Worn cylinder and piston
  - Worn piston pin and piston pin hole

Rough Idle
- Low cylinder compression

Cylinder Head Cover Removal/Installation

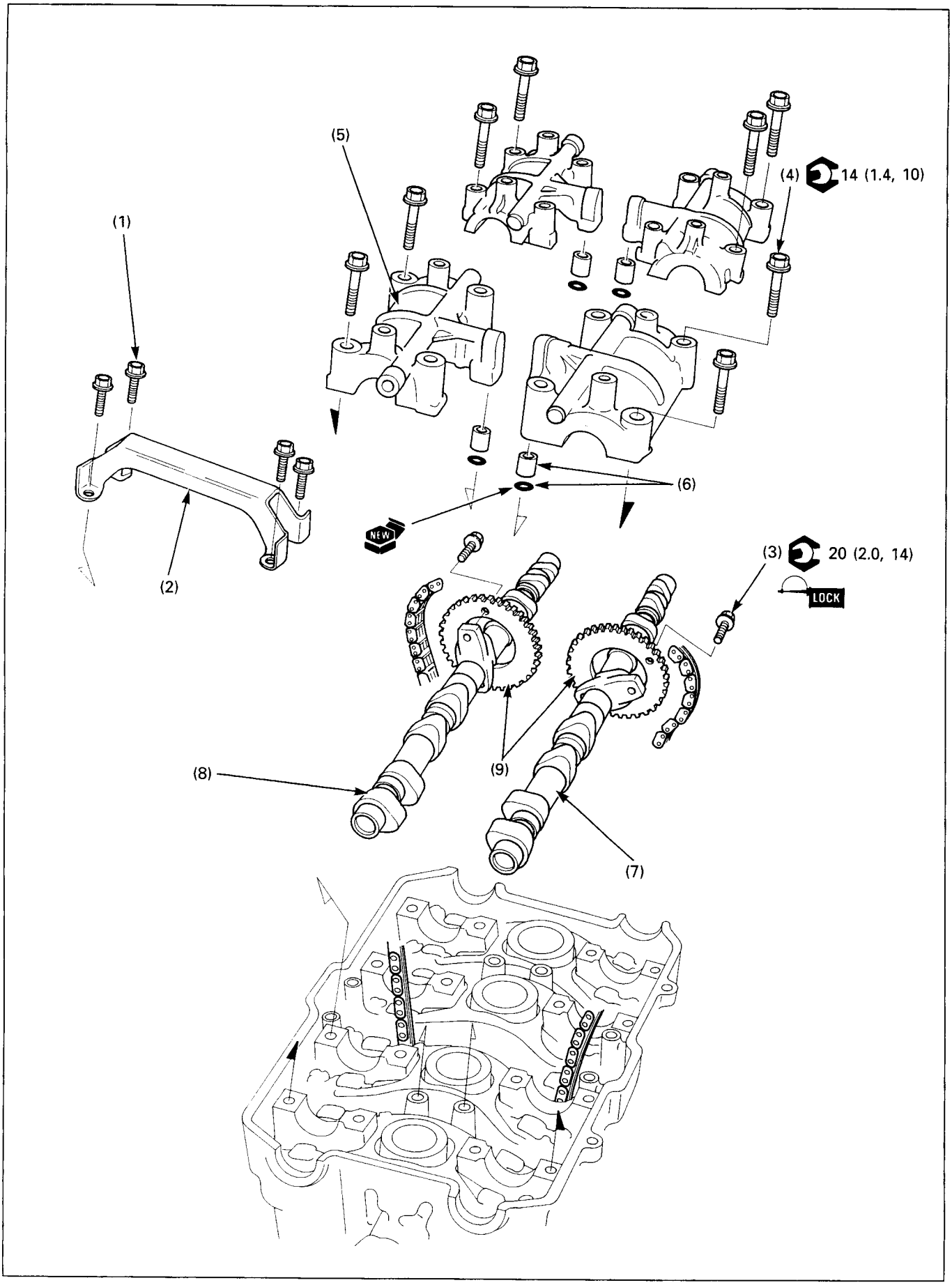


Requisite Service

- Fuel tank removal/installation (page 2-9)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Ignition coil assembly	1	Removal/installation (page 15-9)
(2)	Radiator fan motor connector	1	
(3)	Pulse secondary air injection control valve assembly	1	SW, AR type only.
(4)	Breather tube	1	Disconnect the breather tube from the cylinder head side.
(5)	Air vent tube	1	
(6)	Insulator	1	
(7)	Cylinder head cover bolt	8	At installation, tighten the "▲" mark side bolts first, then other side bolts.
(8)	Washer	8	At installation, install them with the "UP" marks facing up.
(9)	Cylinder head cover	1	At installation, install the cover with the "F ↑ " mark facing forward.
(10)	Gasket	1	
(11)	Breather case cover bolt	5	
(12)	Breather case cover	1	
(13)	Gasket	1	

Camshaft Removal/Installation



NOTE

- It is not necessary to remove the cam sprocket from the camshaft except replacing the camshaft or sprocket.

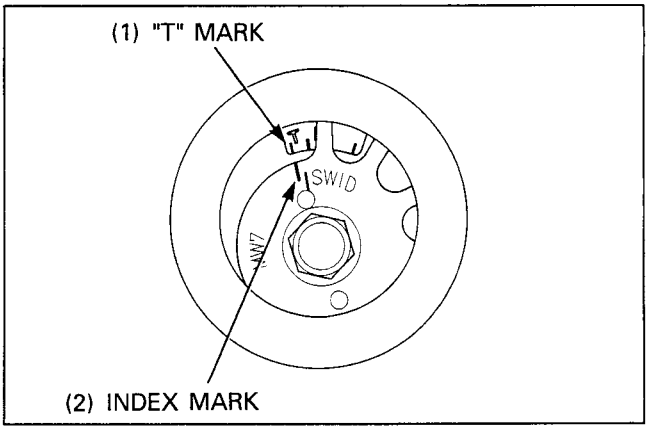
Requisite Service

- Cylinder head cover removal/installation (page 8-2)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Cam chain guide bolt	4	
(2)	Cam chain guide	1	
(3)	Cam sprocket bolt	4	NOTE • It is not necessary to remove the cam sprocket from the camshaft except replacing the camshaft or sprocket. • Be careful not to drop the bolts into the engine.
(4)	Camshaft holder bolt	16	**CAUTION** • **From outside to inside, loosen the bolts in a crisscross pattern in several steps or camshaft holder might break.**
(5)	Camshaft holder	4	
(6)	Dowel pin (8×8mm)/O-ring	4/4	
(7)	Exhaust camshaft	1	
(8)	Intake camshaft	1	
(9)	Cam sprocket	2	

Camshaft Installation

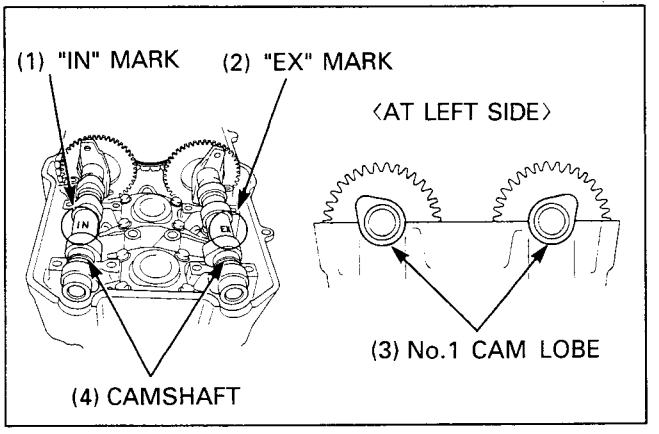
Remove the timing hole cap (page 3-5).
Turn the crankshaft counterclockwise and align the index mark on the ignition pulse generator rotor with the "T" mark on the crankcase cover.



NOTE

- The camshaft has an "IN" mark for intake, or an " EX" mark for exhaust.

Apply molybdenum disulfide oil to the camshaft journals of the cylinder head and camshaft holder.
Position the cam sprockets onto the camshaft with the timing marks facing left of the engine.
Place the intake and exhaust camshaft onto the cylinder head with the No.1 cylinder cam lobe as shown.



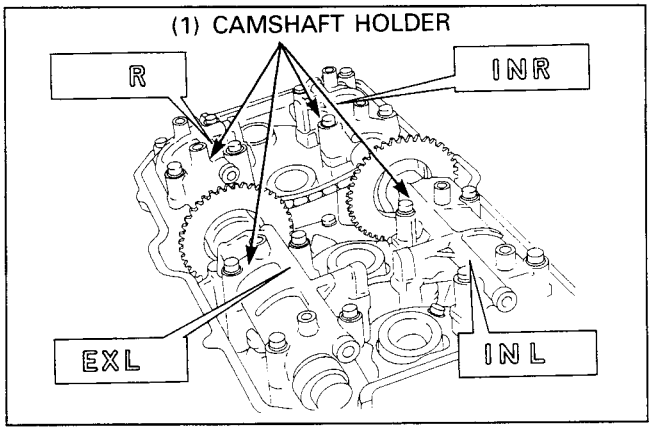
Apply molybdenum disulfide grease to the journal of the holders.

Install each camshaft holder on its original position.

NOTE

- The camshaft holders have their location marks.
  "IN R": Intake right
  "IN L": Intake left
  "R": Exhaust right
  "EX L": Exhaust left

Tighten the camshaft holder bolts to the specified torque in a crisscross pattern in 2-3 steps.

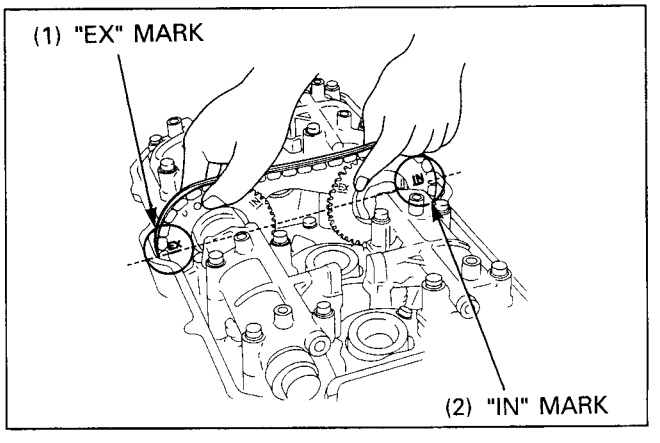


Torque: 14 N • m (1.4 kg-m, 10 ft-lb)

Align the "IN" marks on the intake cam sprocket and "EX" mark on the exhaust cam sprocket with the cylinder head upper surface.

CAUTION

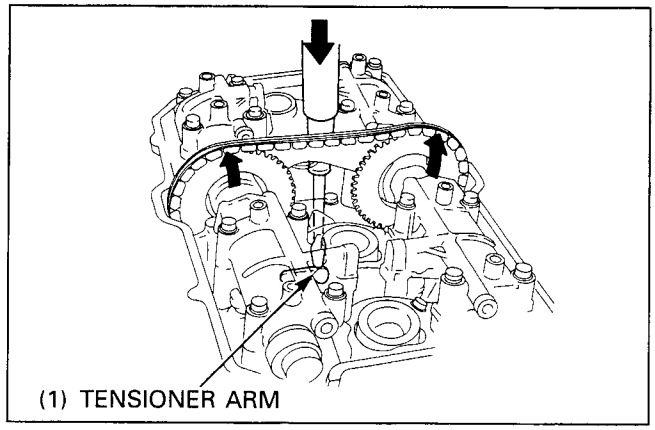
- **Tighten the camshaft holder bolts on only one-side might cause a camshaft holder to break.**



Install the cam chain over the cam sprocket.
Install the cam sprockets onto the camshaft flange shoulders while depressing the cam chain tensioner arm with a screwdriver.

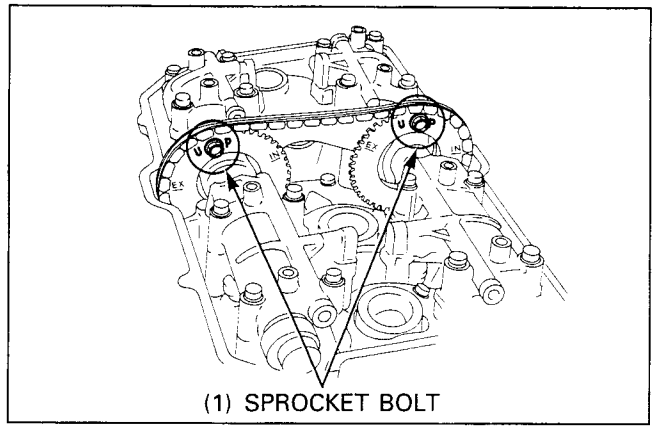
NOTE

- Make sure that the cam chain is engaged on the sprocket of the crankshaft.

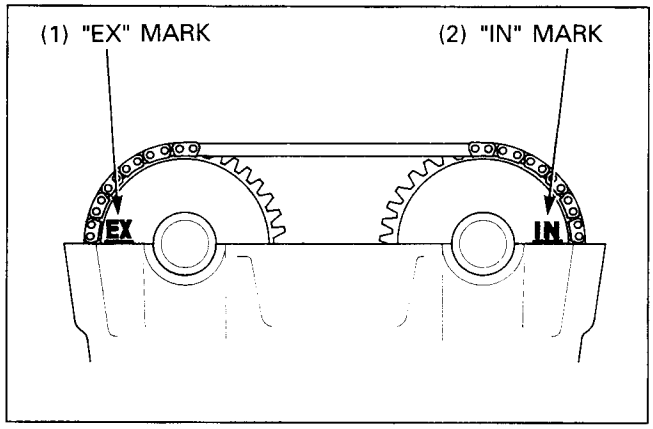


Apply a locking agent to the threads of the sprocket bolts.
Align the cam sprocket bolt holes by turning the camshaft slightly and install the cam sprocket bolts.
Tighten the sprocket bolts, rotate the crankshaft one revolution and tighten the other bolts.

Torque: 17 N • m (1.7 kg-m, 12 lb-ft)

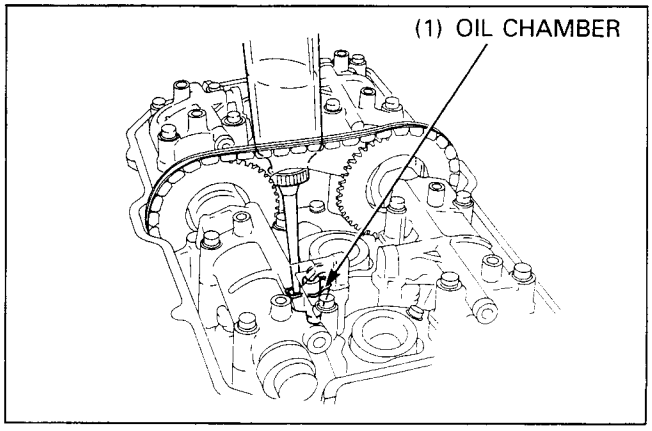


Realign the index mark on the ignition pulse generator rotor with the "T" mark on the crankcase.
Make sure that the "IN" and "EX" marks on the sprockets align with the cylinder head upper surface.

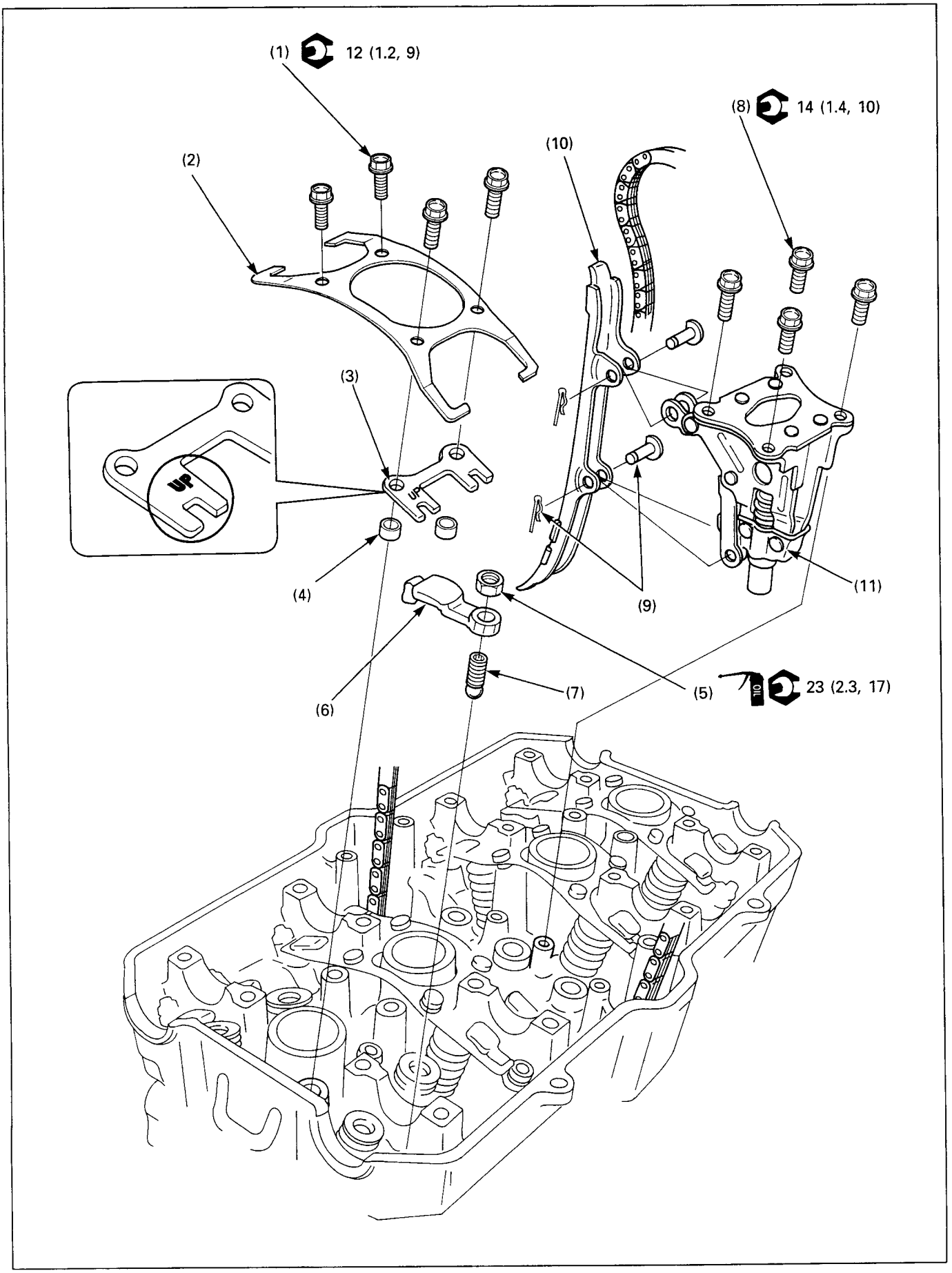


Fill the cam chain tensioner oil chamber with clean engine oil .

Recheck valve timing.



Rocker Arm/Cam Chain Tensioner Removal/Installation

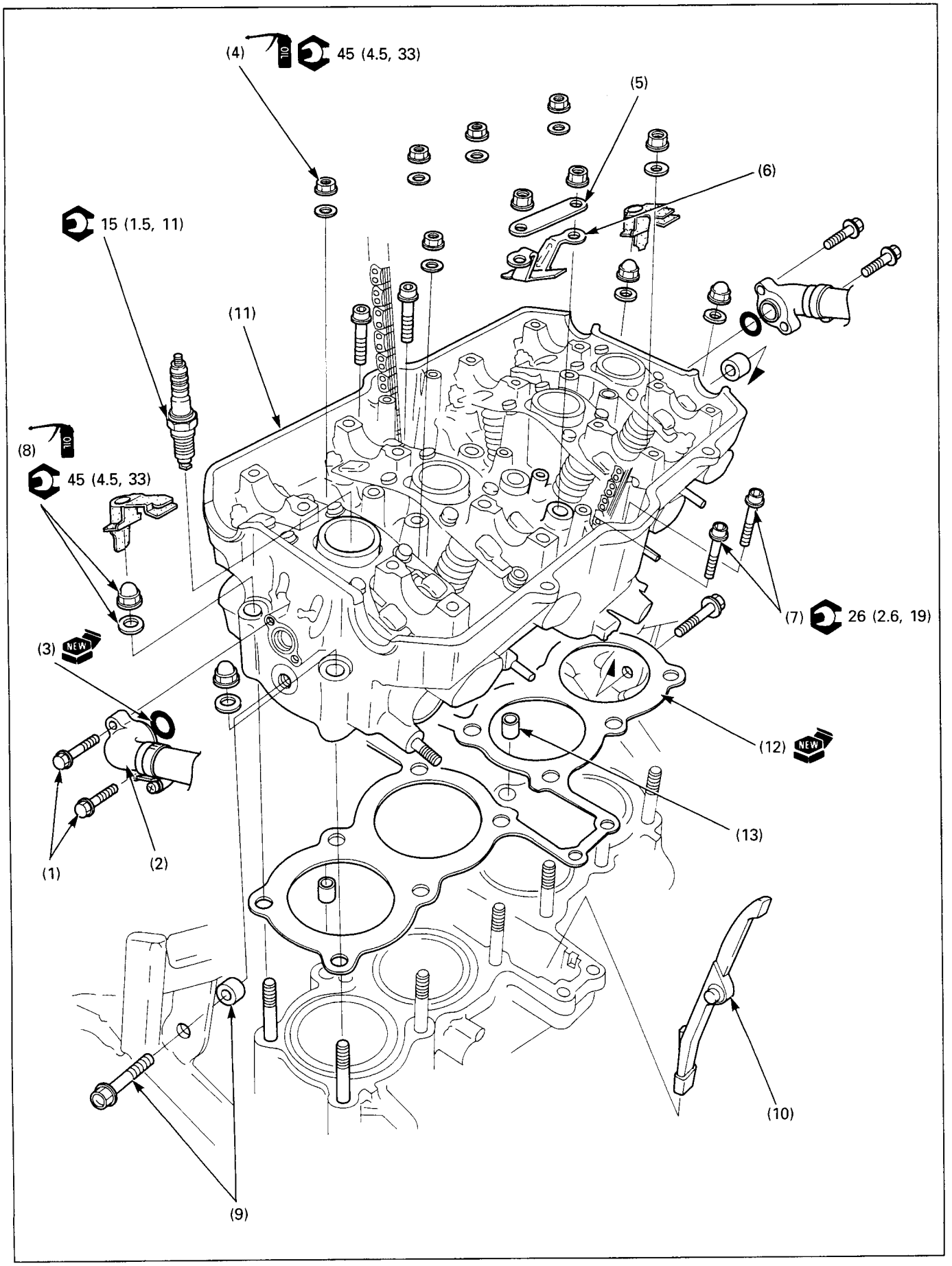


Requisite Service

- Camshaft removal/installation (page 8-4)

	Procedure	Q'ty	Remarks
	Rocker Arm Removal Order		Installation is in the reverse order of removal.
(1)	Rocker arm spring bolt	16	
(2)	Rocker arm spring	4	
(3)	Rocker arm holder	8	
(4)	Dowel pin	16	
(5)	Adjuster lock nut	16	
(6)	Rocker arm	16	
(7)	Adjuster screw	16	
	Cam Chain Removal Order		
(8)	Cam chain tensioner bolt	4	NOTE
(9)	Joint pin/clip	2/2	• Be careful not to drop them into the crankcase.
(10)	Chain slider	1	
(11)	Cam chain tensioner	1	

Cylinder Head Removal/Installation

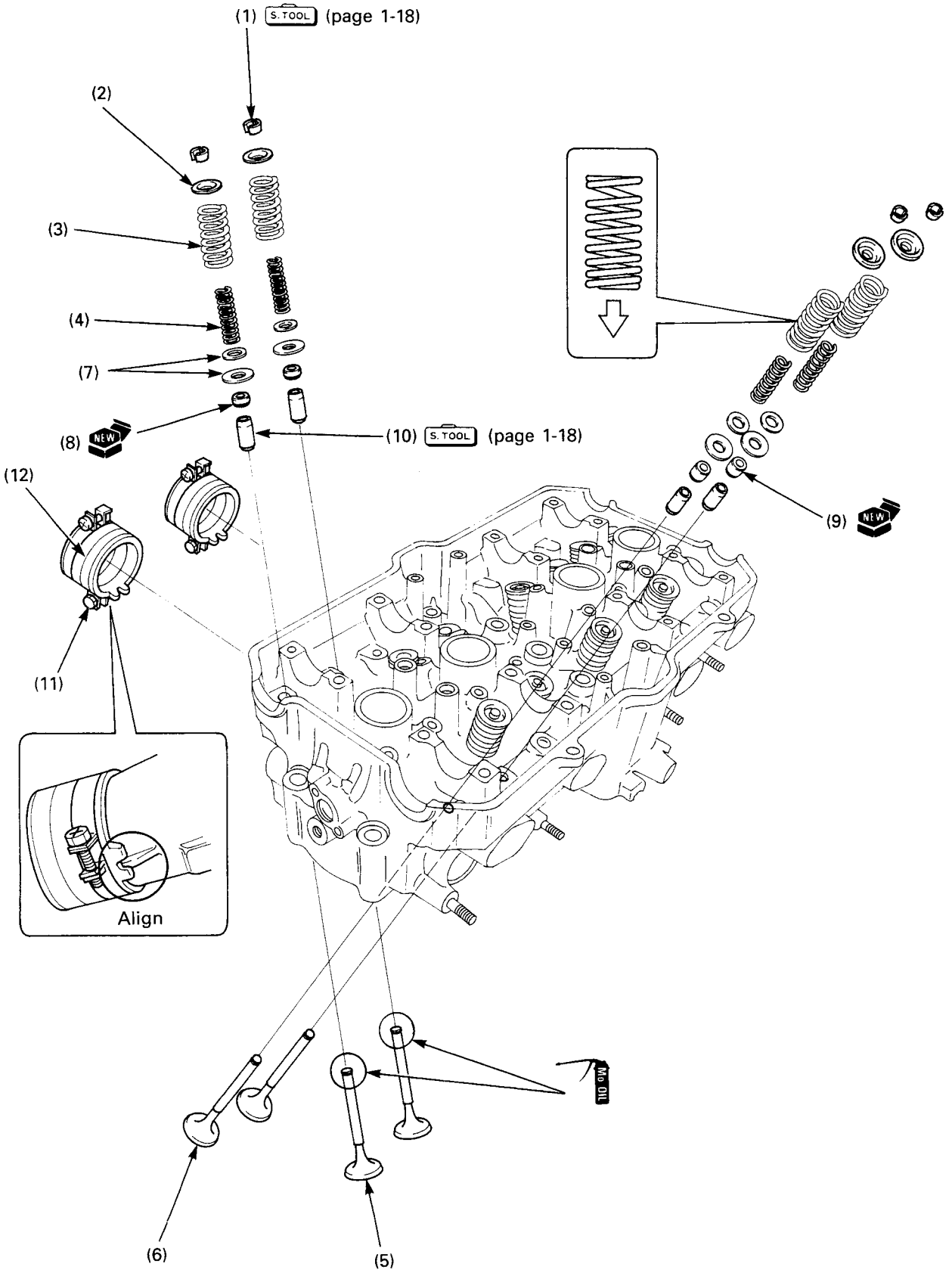


Requisite Service

- Exhaust system removal/installation (page 2-10)
- Carburetor removal/installation (page 5-4)
- Camshaft removal/installation (page 8-4)
- Cam chain tensioner removal/installation (page 8-8)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Water hose bolt	4	
(2)	Water hose	2	
(3)	O-ring	2	
(4)	Cylinder head nut/washer	8/6	
(5)	Oil guide setting plate	1	
(6)	Oil guide plate	1	NOTE • Attach the piece of wire to the cam chain to prevent it from being dropped into the crankcase, then remove it.
(7)	Cylinder head socket bolt	4	
(8)	Cylinder head cap nut/washer	4/4	
(9)	Engine mounting bolt (front/upper)/collar	2/2	
(10)	Cam chain slider	1	Raise the cylinder head a little and pry off the cam chain slider from the cylinder groove.
(11)	Cylinder head assembly	1	Disassembly/assembly (page 8-12)
(12)	Gasket	1	
(13)	Dowel pin	2	

Cylinder Head Disassembly/Assembly



NOTE

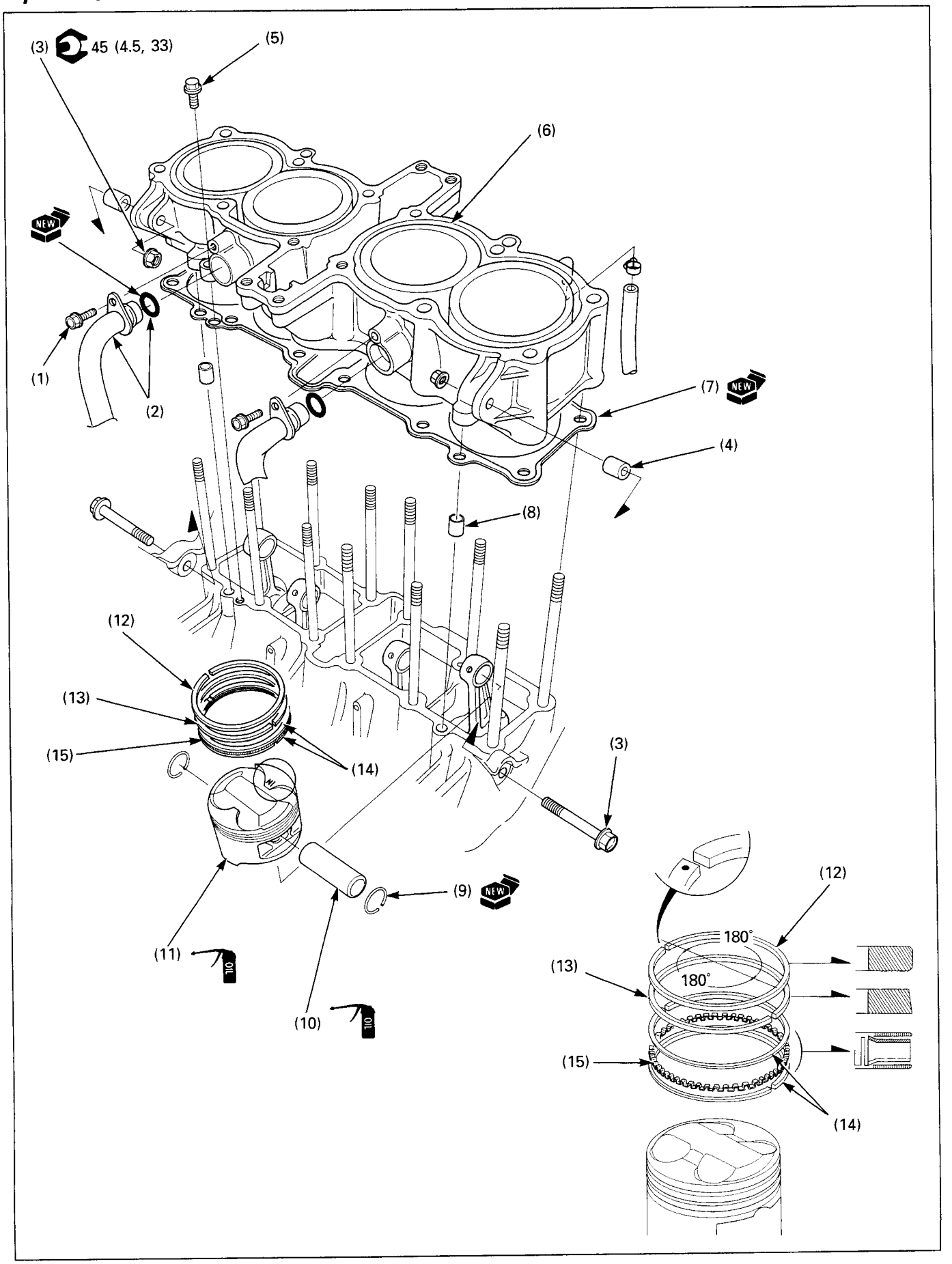
- Mark all parts during disassembly so they can be placed back their original position.
- Remove carbon deposits from the combustion chamber and clean off the head gasket surface, before assembly.
  - Avoid damaging the gasket surface.
  - Gaskets will come off easier soaked in solvent.
- Valve guide replacement see section 9 of the Common Service Manual.

Requisite Service

- Cylinder head removal/installation (page 8-10)

	Procedure	O'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Valve cotter	32	
(2)	Valve retainer	16	
(3)	Outer valve spring	16	At installation, install the spring with the narrow pitch end facing down.
(4)	Inner valve spring	16	
(5)	Intake valve	8	NOTE • Before installation, lubricate each valve stem with molybdenum disulfide oil and insert the valve into the valve guide. • To avoid damage to stem seal, turn the valve slowly when installing.
(6)	Exhaust valve	8	
(7)	Spring seat	16	
(8)	Stem seal (IN)	8	
(9)	Stem seal (EX)	8	
(10)	Valve guide	16	
(11)	Screw	4	Only loosen.
(12)	Carburetor insulator	4	At installation, align the insulator groove with cylinder head lug.

Cylinder/Piston Removal/Installation



Requisite Service

- Cylinder head removal/installation (page 8-10)

	Procedure	O'ty	Remarks
	Cylinder Removal Order		Installation is in the reverse order of removal.
(1)	Water pipe bolt	2	
(2)	Water pipe/O-ring	2	
(3)	Front engine hanger bolt/nut	2/2	
(4)	Collar (ϕ25/ϕ18 x 16 mm)	2	
(5)	Cylinder bolt	1	
(6)	Cylinder assembly	1	
(7)	Gasket	1	
(8)	Dowel pin	2	
	Piston Disassembly Order		
(9)	Piston pin clip	8	
(10)	Piston pin	4	
(11)	Piston assembly	4	At installation, install the piston with the "IN" mark facing to the intake side.
(12)	Top ring	4	At installation, install the top and second rings with the markings facing up.
(13)	Second ring	4	
(14)	Side rail	8	
(15)	Spacer	4	

9. Clutch/Gearshift Linkage

Service Information

- Clutch and gearshift linkage maintenance can be done with the engine in the frame.
- Transmission oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the vehicle creeps with clutch disengaged, inspect the transmission oil level before servicing the clutch system.

Troubleshooting

Hard To Shift
- Incorrect clutch adjustment
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

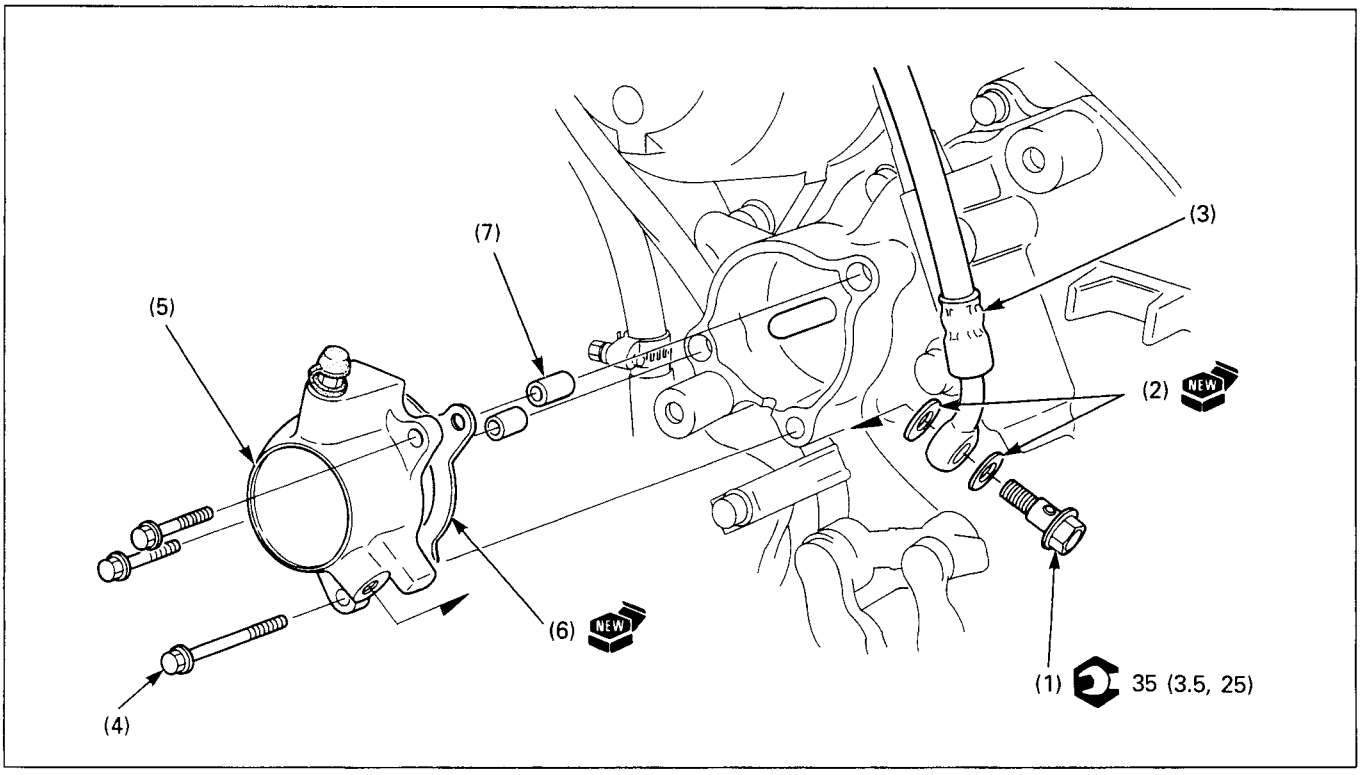
Transmission Jumps Out Of Gear
- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt

Gearshift Pedal Will Not Return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

Clutch Slips When Accelerating
- Worn clutch discs
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additive

Motorcycle Creeps With The Engine Idling
- Clutch plates warped
- Faulty clutch lifter
- Incorrect engine oil weight

Clutch Slave Cylinder Removal/Installation

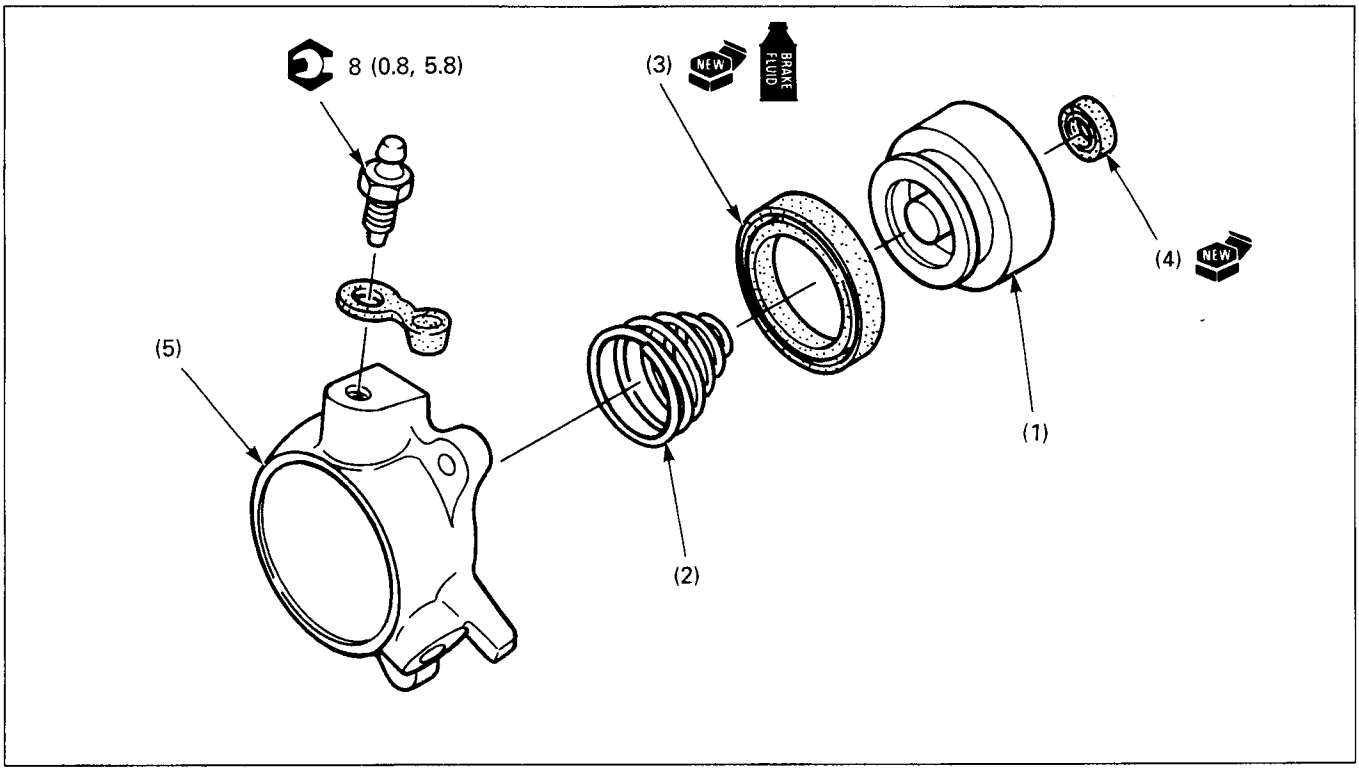


Requisite Service

- Clutch fluid draining/refilling
- Clutch system air bleeding
- Lower fairing removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	1	
(2)	Sealing washer	2	
(3)	Oil hose	1	
(4)	Bolt	3	
(5)	Slave cylinder assembly	1	
(6)	Gasket	1	
(7)	Dowel pin	2	

Clutch Slave Cylinder Disassembly/Assembly

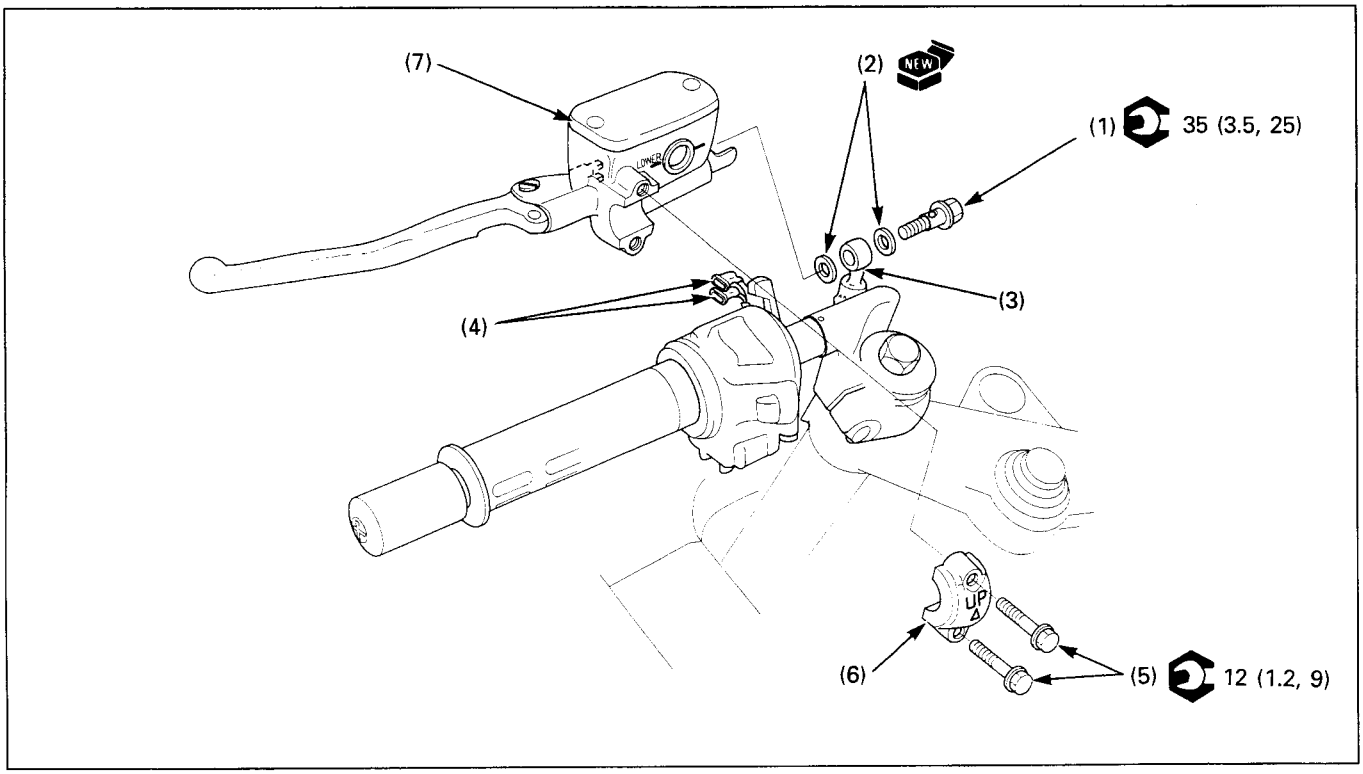


Requisite Service

- Clutch slave cylinder removal/installation (page 9-2)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Slave cylinder piston assembly	1	
(2)	Spring	1	
(3)	Piston seal	1	At installation, install the piston seal with groove side facing to the slave cylinder body.
(4)	Oil seal	1	At installation, install the oil seal with groove side facing to the slave cylinder piston.
(5)	Slave cylinder body	1	

Clutch Master Cylinder Removal/Installation



CAUTION

- **Avoid spilling fluid on painted, plastic,or rubber parts. Place a rag over these parts whenever the system is serviced.**
- **When removing the oil bolt, cover the end of the clutch hose to prevent contamination.**
- **Do not allow the foreign material to enter the system.**

NOTE

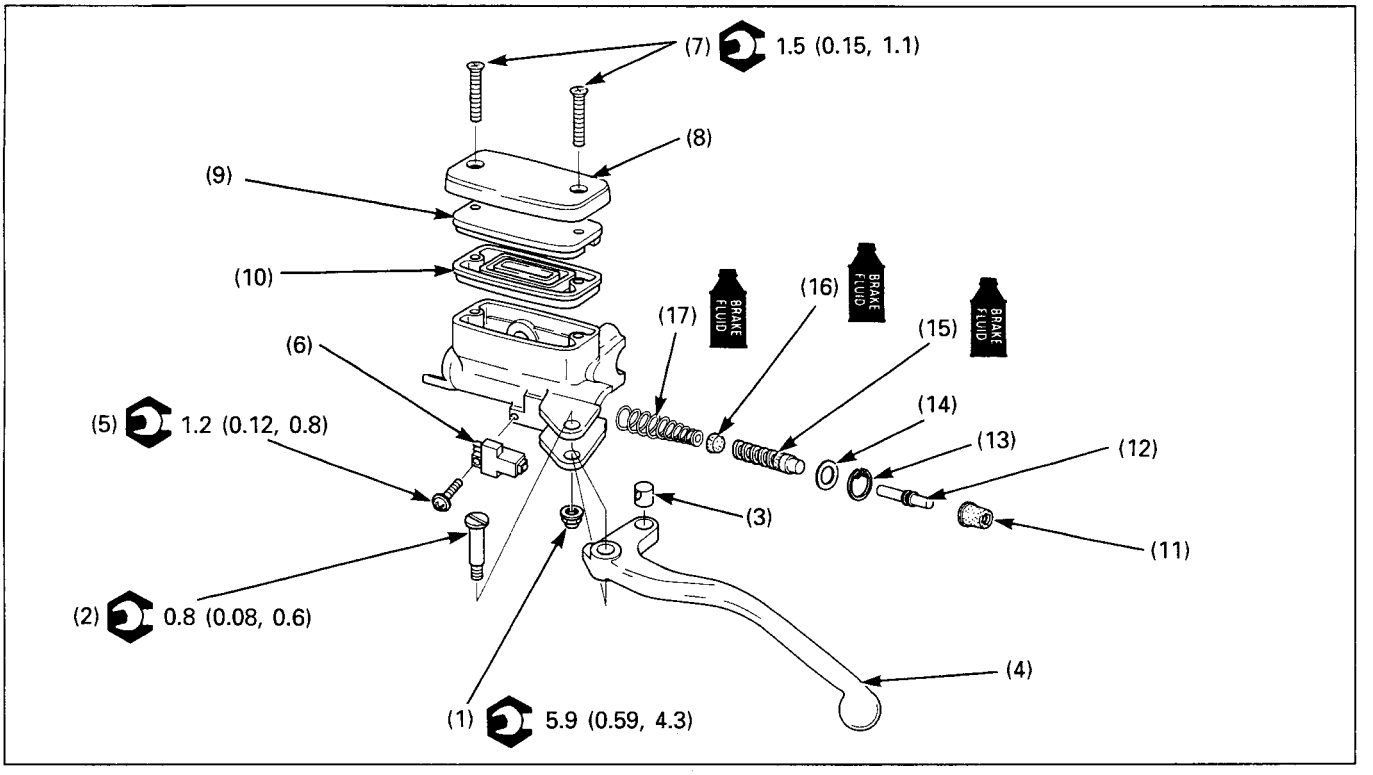
- Use DOT 4 brake fluid from a sealed container.

Requisite Service

- Clutch fluid draining/refilling
- Clutch system air bleading

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Clutch oil bolt	1	
(2)	Sealing washer	2	
(3)	Clutch hose eyelet joint	1	At installation, press the eyelet joint against the stopper while tightening the oil bolt.
(4)	Clutch switch connector	2	
(5)	Clutch master cylinder holder bolt	2	At installation, tighten the upper bolt first, then the lower bolt.
(6)	Clutch master cylinder holder	1	At installation, install the holder with its "UP" mark facing up.
(7)	Clutch master cylinder	1	At installation, align the mating surface with the punch mark on the handlebar.

Clutch Master Cylinder Disassembly/Assembly



NOTE

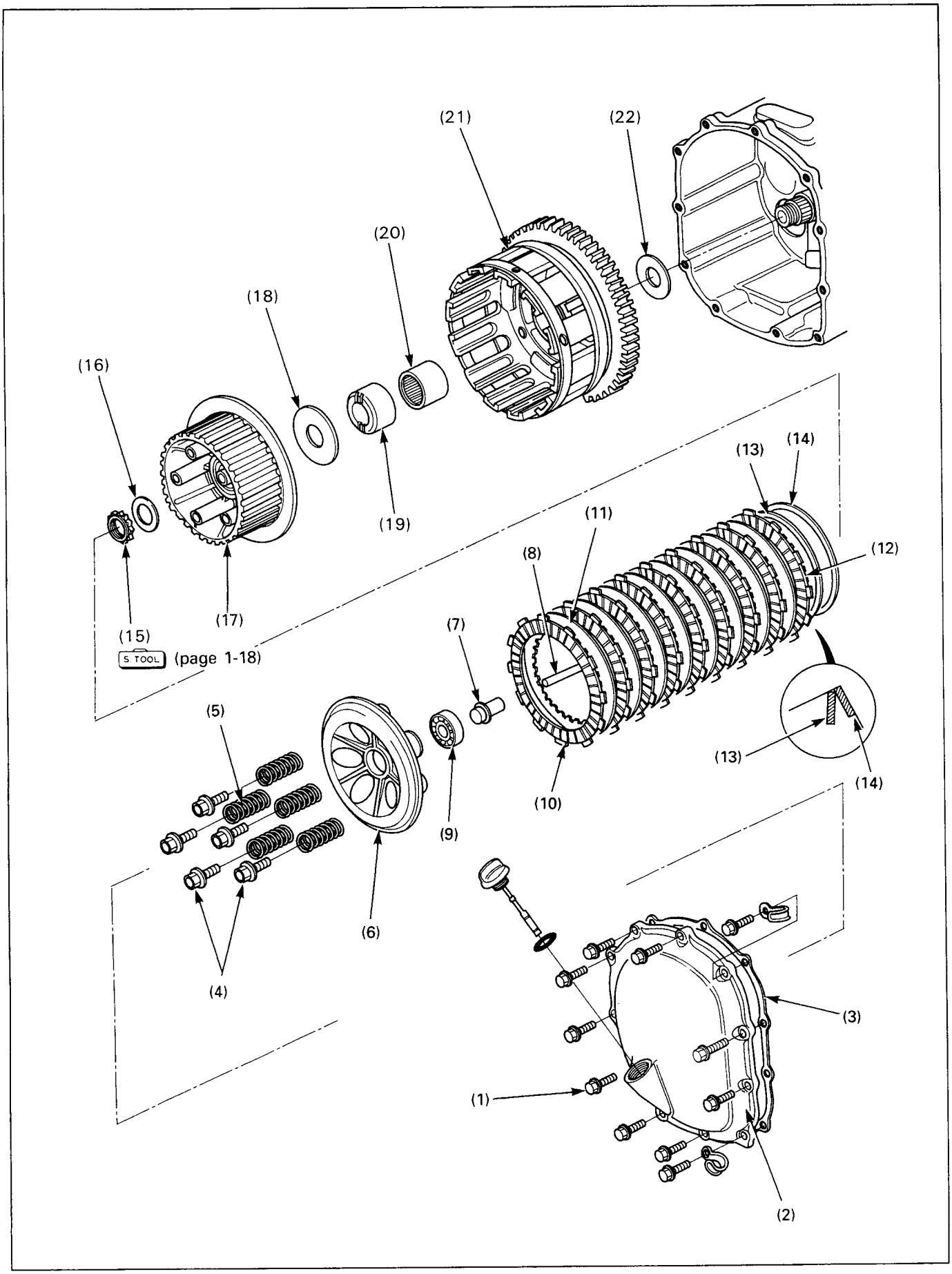
- Replace the master piston, spring, cups, snap ring and boot as a set.
- The master piston, cups and spring must be installed as a set.

Requisite Service

- Clutch master cylinder removal/installation (page 9-4)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Clutch lever pivot nut	1	
(2)	Clutch lever pivot bolt	1	
(3)	Joint piece	1	
(4)	Clutch lever	1	
(5)	Clutch switch screw	1	
(6)	Clutch switch	1	
(7)	Master cylinder cover screw	2	
(8)	Master cylinder cover	1	
(9)	Diaphragm plate	1	
(10)	Diaphragm	1	
(11)	Boot	1	
(12)	Push rod	1	
(13)	Snap ring	1	
(14)	Washer	1	
(15)	Master piston assembly	1	
(16)	Primary cup	1	
(17)	Spring	1	Install the spring with the small coil end facing the piston.

Clutch Removal



NOTE

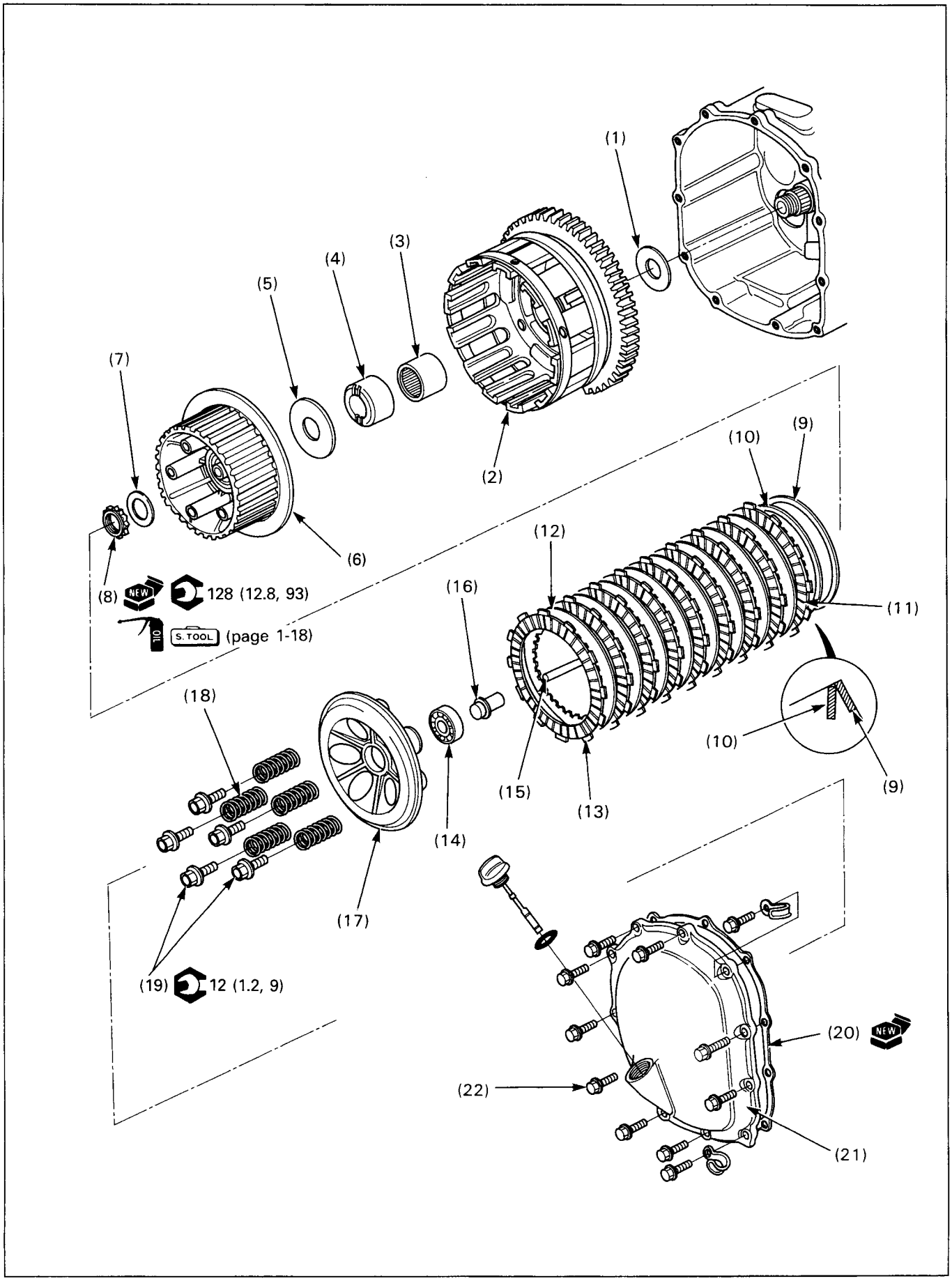
- At clutch outer removal, remove the clutch outer turning the crankshaft until the primary drive gear clears the crank weight.

Requisite Service

- Engine oil draining
- Lower fairing removal (page 2-6)

	Procedure	O'ty	Remarks
	Removal Order		
(1)	Clutch cover bolt	11	
(2)	Clutch cover	1	
(3)	Gasket	1	
(4)	Clutch lifter plate bolt	5	
(5)	Clutch spring	5	
(6)	Clutch lifter plate	1	
(7)	Lifter guide	1	
(8)	Lifter rod	1	
(9)	Lifter bearing	1	
(10)	Clutch disc A	8	
(11)	Clutch plate	8	
(12)	Clutch disc B	1	
(13)	Judder spring	1	
(14)	Spring seat	1	
(15)	Clutch center lock nut	1	Removal (page 9-10)
(16)	Lock washer	1	
(17)	Clutch center	1	
(18)	Washer	1	
(19)	Clutch outer guide	1	
(20)	Needle bearing	1	
(21)	Clutch outer	1	
(22)	Washer	1	

Clutch Installation



NOTE

- At clutch outer installation, install the clutch outer turning the crankshaft until the primary drive gear clears the crank weight.

Requisite Service

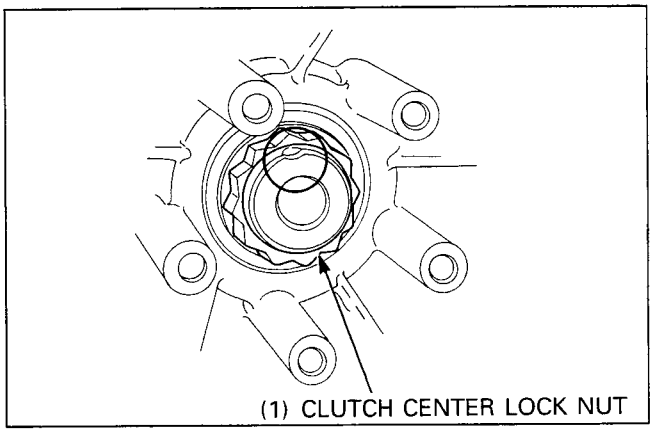
- Engine oil refilling
- Lower fairing installation (page 2-6)

	Procedure	Q'ty	Remarks
	Installation Order		
(1)	Washer	1	
(2)	Clutch outer	1	Install the clutch outer while aligning the primary drive gear and crankshaft gear using the screwdriver.
(3)	Needle bearing	1	
(4)	Clutch outer guide	1	
(5)	Washer	1	
(6)	Clutch center	1	
(7)	Lock washer	1	At installation, install the lock washer with the "OUT SIDE" mark facing out side.
(8)	Clutch center lock nut	1	NOTE • Never re-use the removed nut. • Installation (page 9-10)
(9)	Spring seat	1	
(10)	Judder spring	1	
(11)	Clutch disc B	1	
(12)	Clutch plate	8	
(13)	Clutch disc A	8	
(14)	Lifter bearing	1	
(15)	Lifter rod	1	
(16)	Lifter guide	1	
(17)	Clutch lifter plate	1	
(18)	Clutch spring	5	
(19)	Clutch lifter plate bolt	5	
(20)	Gasket	1	
(21)	Clutch cover	1	
(22)	Clutch cover bolt	11	

Clutch Center Lock Nut Removal/Installation

Lock Nut Removal

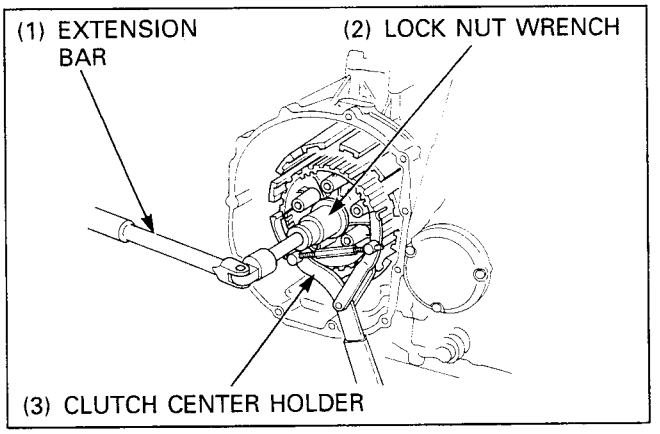
Unstake the clutch center lock nut.



Attach the clutch center holder to the clutch center.
Remove the lock nut using the special tools.

S. TOOL

Clutch center holder	**07724-0050001**
Lock nut wrench, 30 x 32 mm	**07716-0020400**
Extension bar	**07716-0020500**

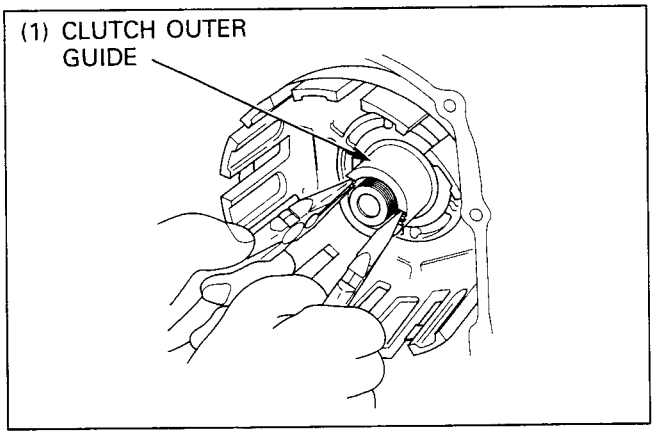


Clutch Outer Removal

Remove the lock washer and clutch center.

Pull the clutch outer guide with needle nose pliers.

Remove the needle bearing.

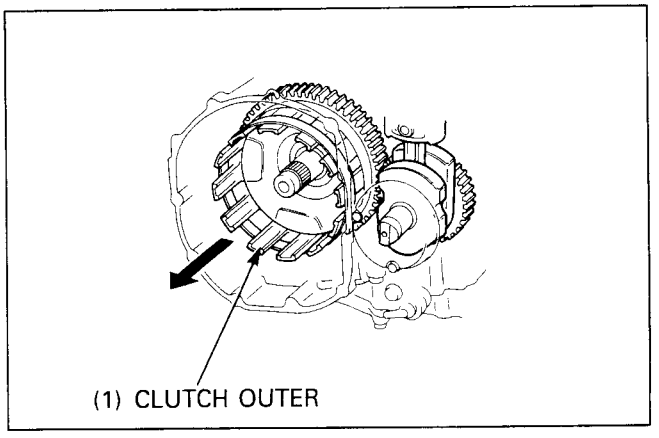


Remove the clutch outer from the mainshaft.

Remove the washer.

NOTE

- At clutch outer removal, remove the clutch outer turning the crankshaft until the primary drive gear clears the crank weight.



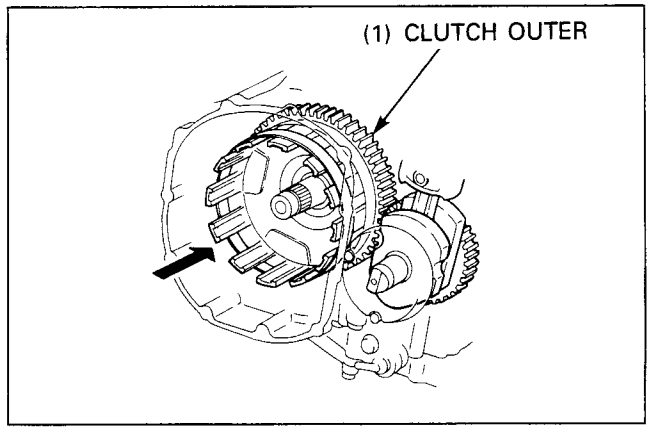
Clutch Outer Installation

Install the washer.

Install the clutch outer to the mainshaft.

Install the needle bearing.

Align the primary drive gear and crankshaft teeth with the screw driver, and install the clutch outer guide.



Lock Nut Installation

Install the washer, clutch center and lock washer.

Hold the clutch center with the clutch center holder.

S. TOOL

Clutch center holder **07724-0050001**

Install a new lock nut and tighten it.

NOTE

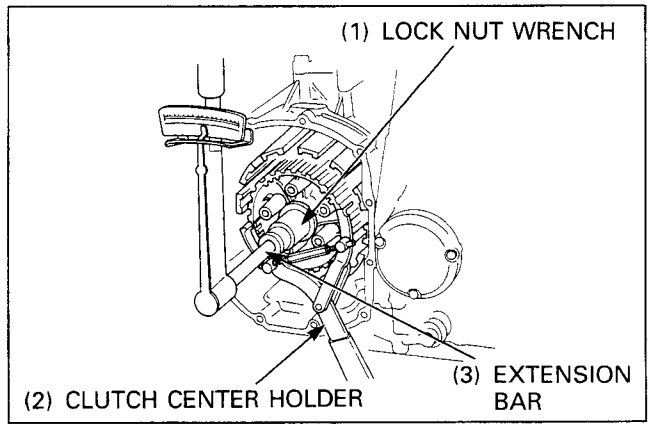
- Never re-use the removed nut.

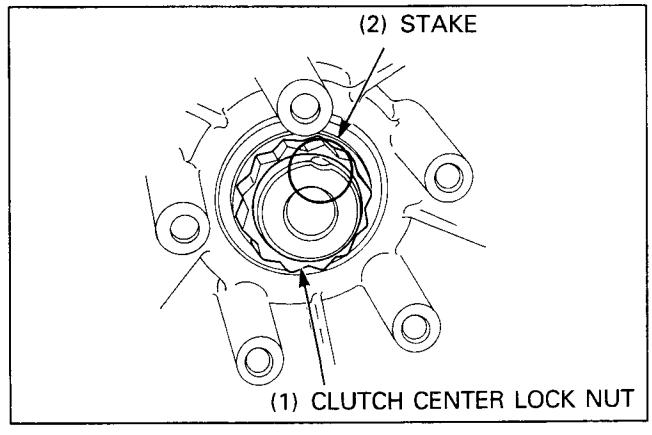
S. TOOL

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

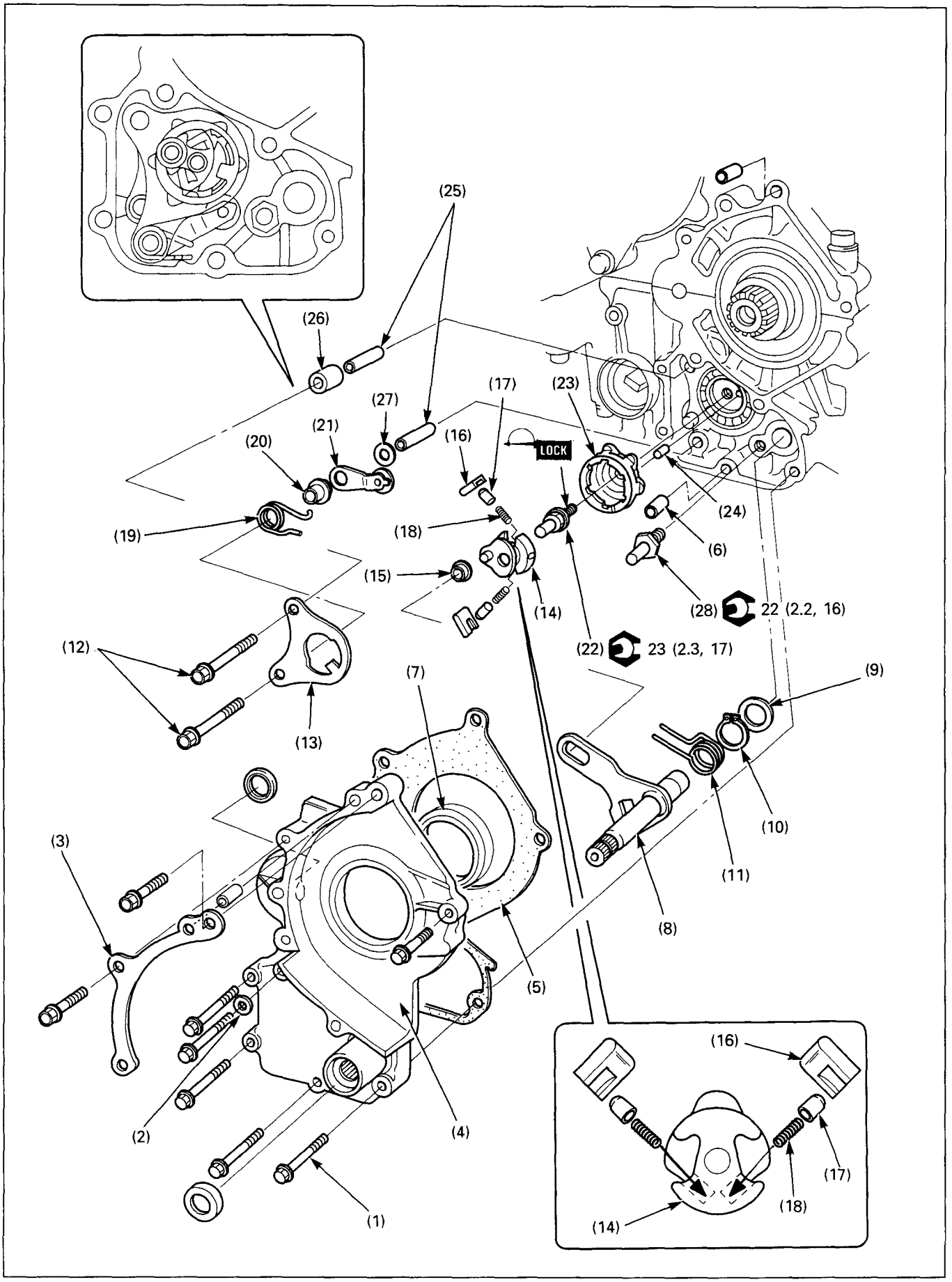
Torque: 128 N • m (12.8 kg-m, 93 ft-lb)

Stake the lock nut into the mainshaft end groove, as shown.





Gearshift Linkage Removal/Installation



NOTE

- After installation, check the gearshift linkage can be operated properly.

Requisite Service

- Engine oil draining/refilling
- Drive sprocket removal/installation (page 7-2)
- Water pump removal/installation (page 6-3)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Gearshift linkage cover bolt	8	
(2)	Washer	1	
(3)	Chain guide	1	
(4)	Gearshift linkage cover	1	
(5)	Gasket	1	
(6)	Dowel pin	2	
(7)	Oil seal	2	
(8)	Gearshift spindle	1	
(9)	Washer	1	
(10)	Snap ring	1	
(11)	Return spring	1	
(12)	Guide plate bolt	2	At installation, install the dowel pins securely, then tighten the guide plate bolt.
(13)	Guide plate	1	
(14)	Shifter drum	1	
(15)	Collar	1	
(16)	Ratchet pawl	2	At installation, install the ratchet pawl to original position.
(17)	Plunger	2	
(18)	Spring	2	
(19)	Drum stopper spring	1	
(20)	Drum stopper collar	1	
(21)	Drum stopper arm	1	
(22)	Shift drum center bolt	1	
(23)	Shift drum center	1	At installation, align the drum center groove with the shift drum pin on the shift drum.
(24)	Shift drum pin	1	
(25)	Guide plate dowel pin	2	
(26)	Collar	1	
(27)	Washer	1	
(28)	Gearshift spindle return spring pin	1	

10. Crankshaft/Transmission

Service Information

- The crankcase must be separated to service the crankshaft and transmission.
- The following parts must be removed before disassembling the crankcase.
  - Oil pump (page 4-4)
  - Cylinder head/Cylinder/Piston (Section 8)
  - Clutch slave cylinder (page 9-2)
  - AC generator cover (page 14-9)
  - Starter motor (page 16-7)
  - Water pump (page 6-3)
  - Clutch (page 9-6)
  - Gearshift linkage (page 9-12)
  - Pulse generator/rotor (Section 15)
- Be careful not to damage the crankshaft main journal bearing while removing or installing the crankshaft.
- All bearing inserts are select fitted and are identified by color code. Select replacement bearings from the selection table (page 10-20).
- After installing new bearings, recheck them with plastigauge to verify clearance.
- Apply molybdenum disulfide oil to the main journals and crankpins during assembly.

Troubleshooting

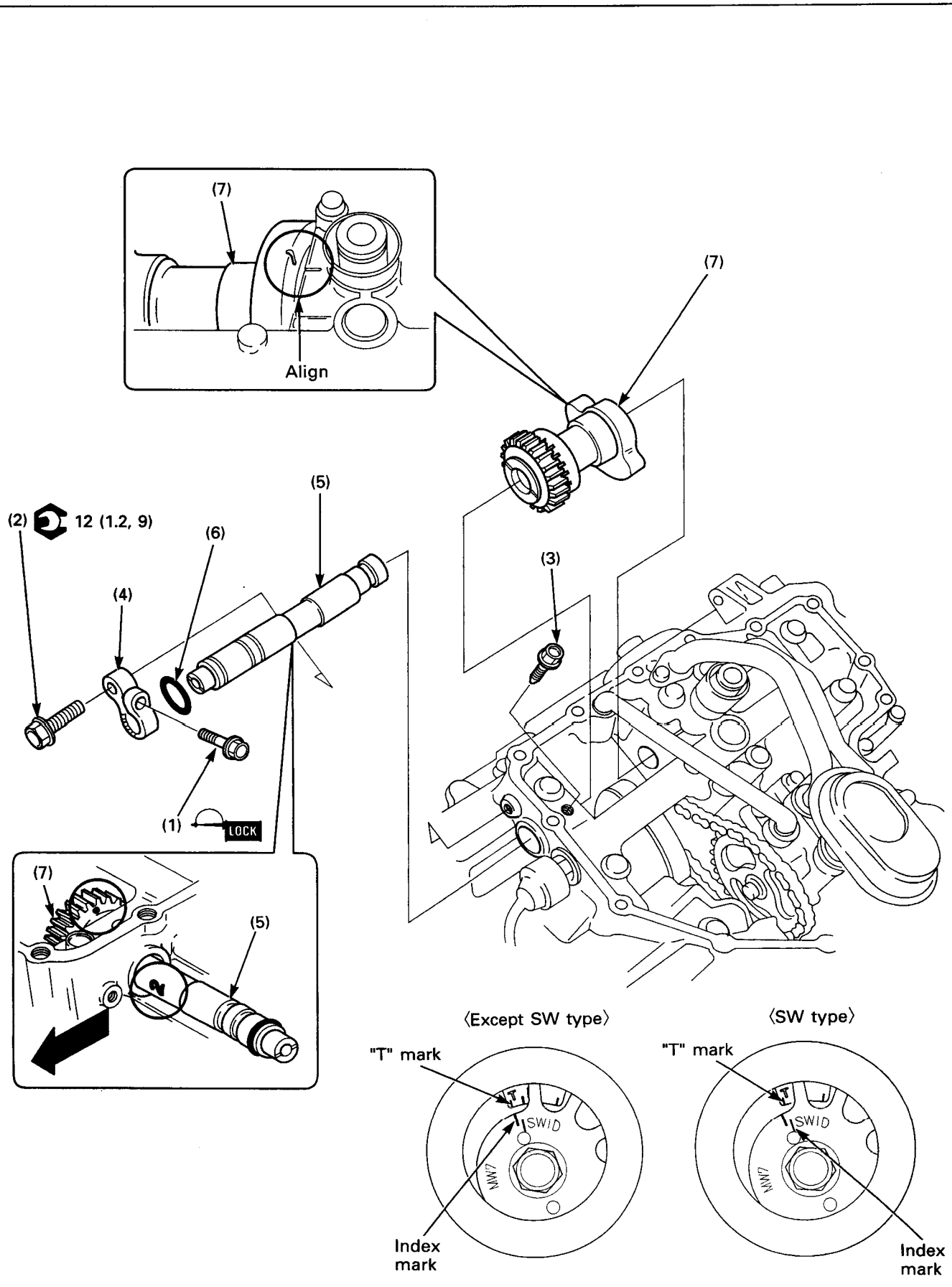
Excessive Noise
- Worn connecting rod big-end bearing
- Bent connecting rod
- Worn crankshaft main bearing
- Worn transmission bearing

Hard To Shift
- Improper clutch operation
- Incorrect transmission oil weight
- Incorrect clutch adjustment
- Bent shift fork
- Bent fork shaft
- Bent fork claw
- Damaged shift drum cam grooves
- Bent shift spindle

Transmission Jumps Out Of Gear
- Worn gear dogs or slots
- Bent fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken shift linkage return spring

Engine Vibration
- Excessive crankshaft runout

Balancer Removal/Installation



NOTE

- Replace the weight, shaft and needle bearings as a set.
- After installation, adjust the balancer backlash (page 10-4).

Requisite Service

- Oil pan removal/installation (page 4-4)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Balancer shaft holder pinch bolt	1	
(2)	Balancer shaft holder bolt	1	
(3)	Balancer shaft lock bolt	1	
(4)	Balancer shaft holder	1	
(5)	Balancer shaft	1	NOTE • At installation, check for align the index mark on the weight with the punch mark on the gear (page 10-5) and install the the balancer shaft with the I.D. code number facing forward with the punch mark on the balancer gear facing to oil pan.
(6)	O-ring	1	
(7)	Balancer weight assembly	1	NOTE • The balancer assembly will only come out from one particular position. Rotate it until it comes out easily; do not force it out. • At installation,rotate the crankshaft counterclockwise and align the index mark on the pulse generator rotor with "T" mark on the crankcase. • At installation, align the index mark on the weight with index mark on the crankcase.

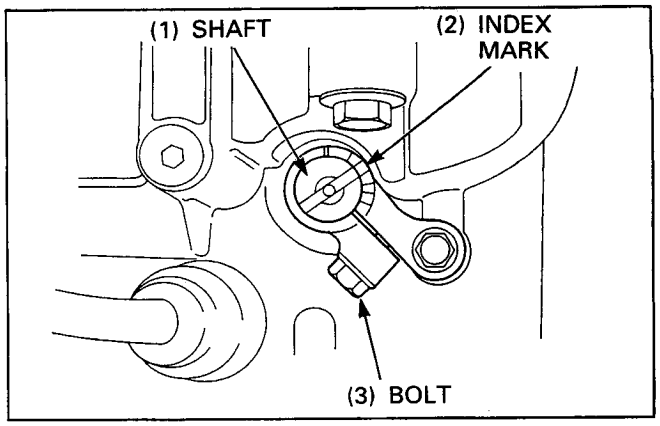
Backlash Adjustment

NOTE

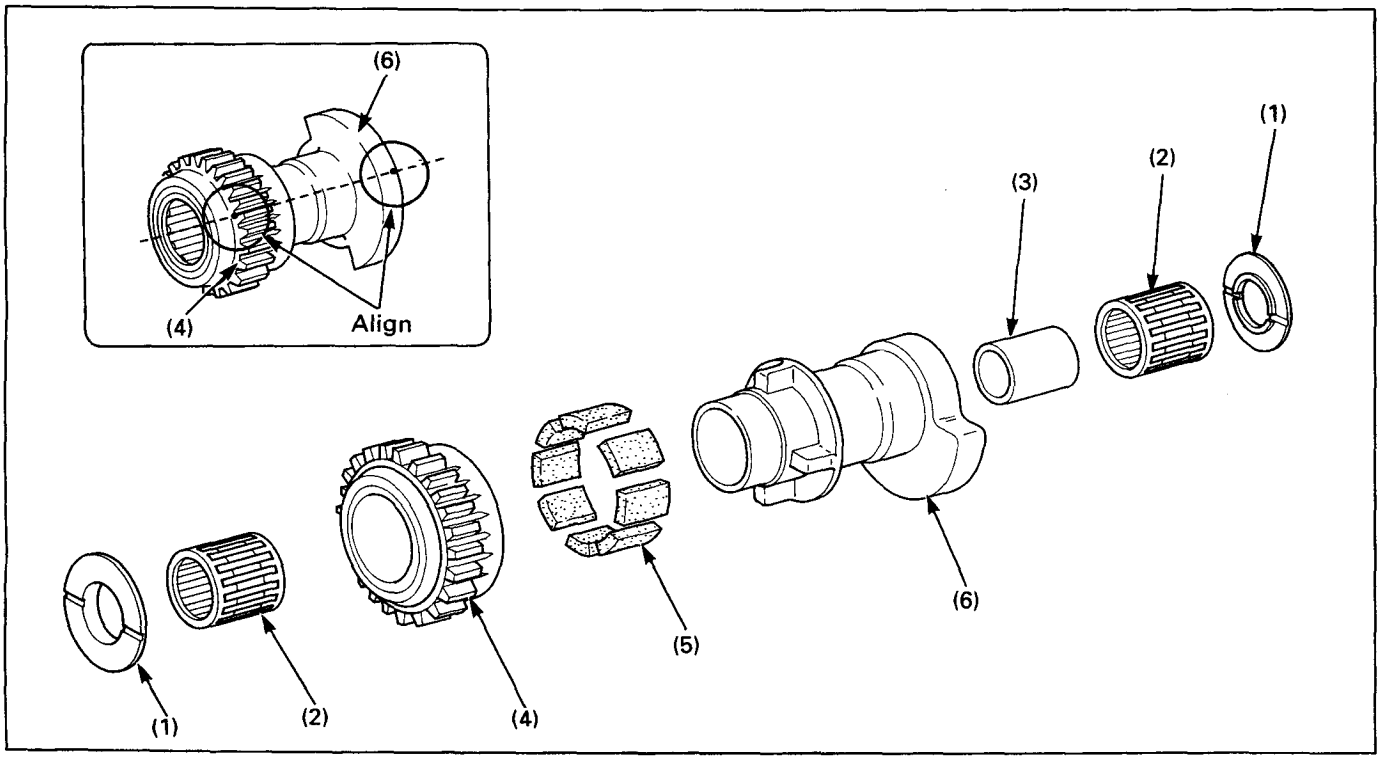
- Adjust the backlash while the engine is cold (below 35°C/95°F) and stopped.

Loosen the pinch bolt and turn the shaft counterclockwise up to dead end and back off by one graduation.

Apply locking agent to the threads of the pinch bolt and tighten it securely.



Balancer Disassembly/Assembly



NOTE

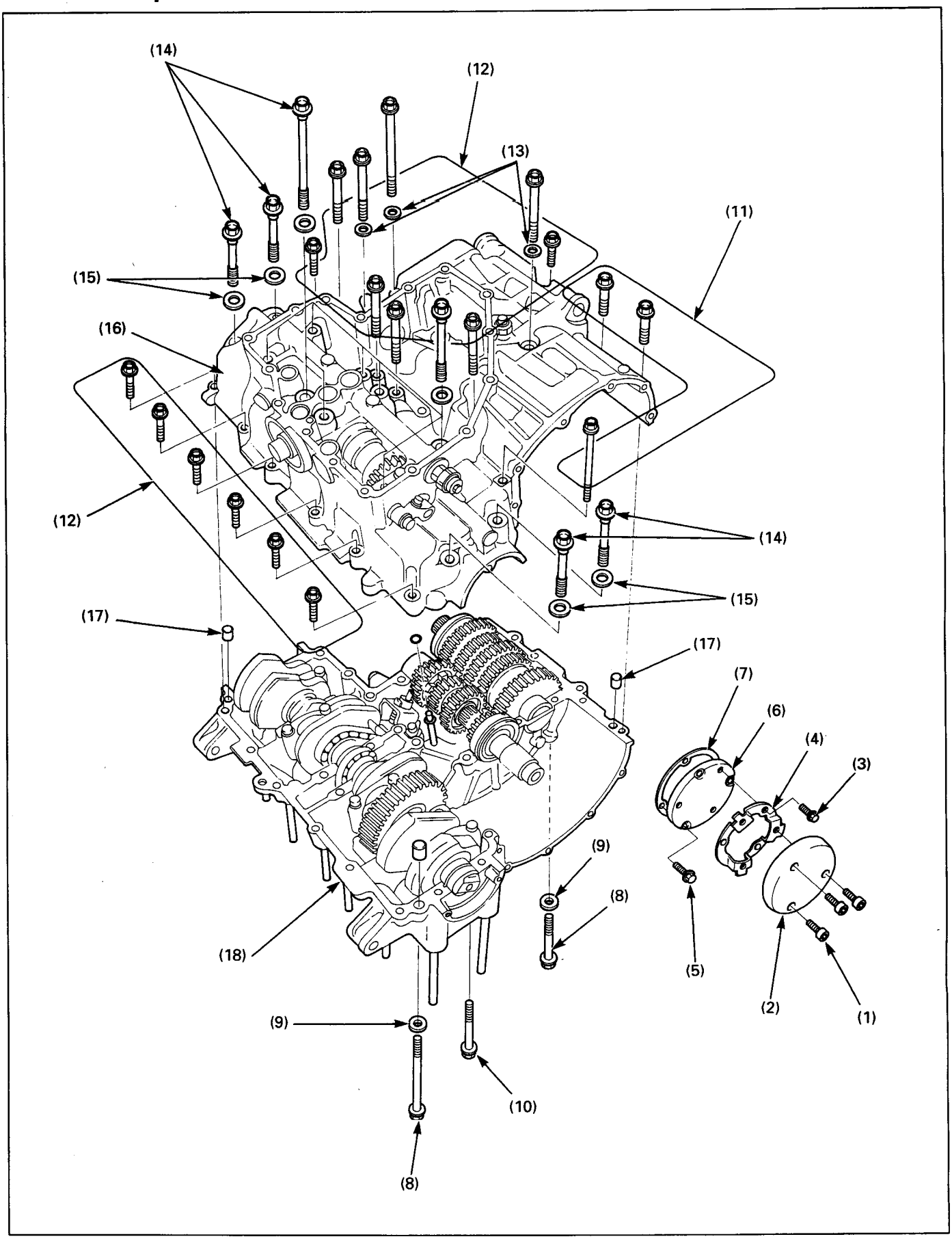
- Replace the weight, shaft and needle bearings as a set.

Requisite Service

- Balancer removal/installation (page 10-2)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Washer	2	
(2)	Needle bearing	2	
(3)	Collar	1	
(4)	Balancer gear	1	NOTE • Assemble the balancer weight aligning the index mark on the weight with the punch mark on the gear.
(5)	Damper	8	
(6)	Weight	1	

Crankcase Separation

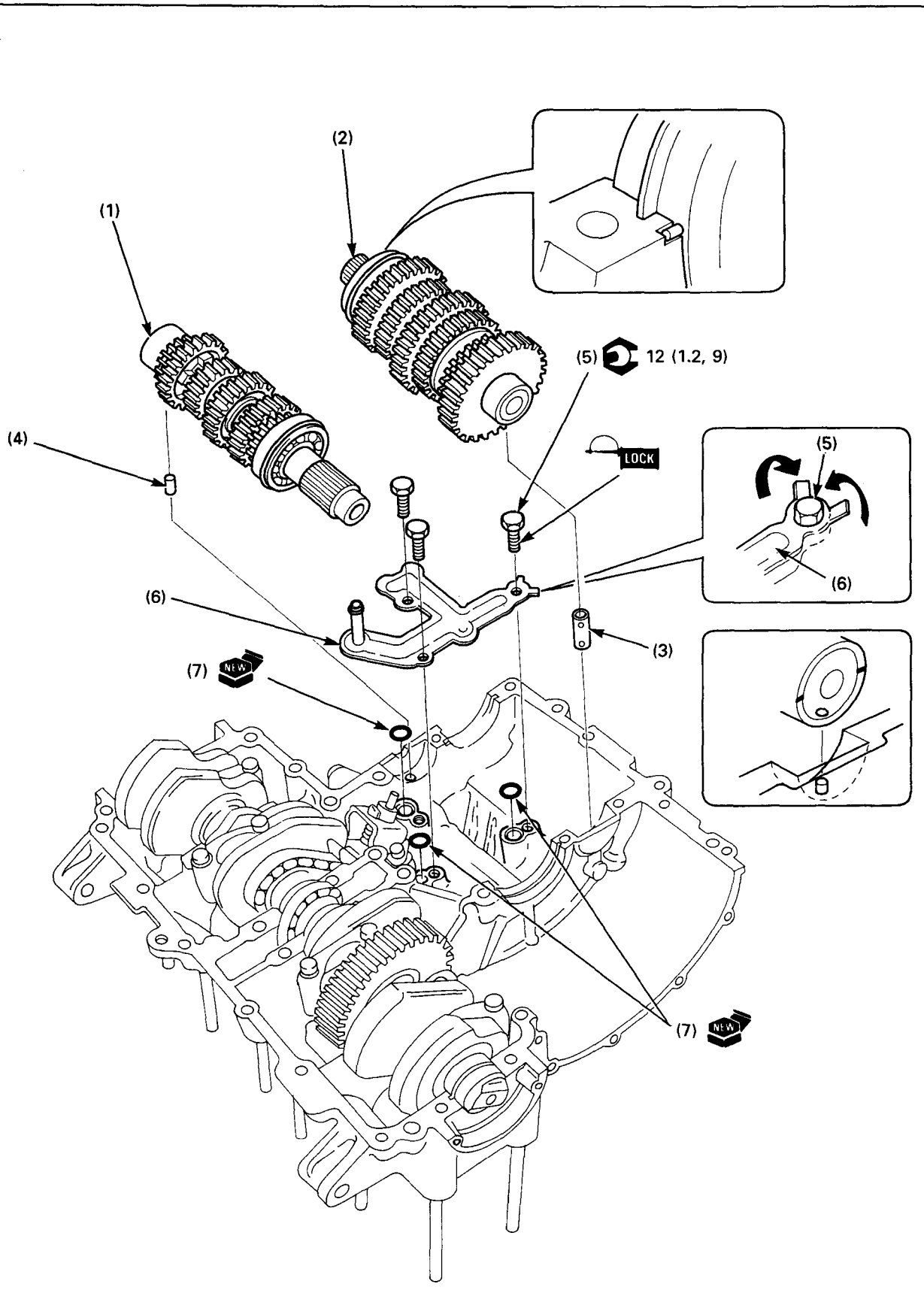


NOTE

- Refer to Service Information (page 10-1) for removal of necessary parts separating the crankcase.
- From the outside to inside, loosen the bolts in a crisscross pattern in several steps.

	Procedure	Q'ty	Remarks
	Separation Order		
(1)	Socket bolt	3	
(2)	Right crank cover	1	
(3)	Bolt	3	
(4)	Bracket	1	
(5)	Right crankcase cover bolt	3	
(6)	Right crankcase cover	1	
(7)	Gasket	1	
(8)	Upper crankcase bolt (8 mm)	2	
(9)	Sealing washer	2	
(10)	Upper crankcase bolt (10 mm)	1	
(11)	Lower crankcase bolt (6 mm)	3	
(12)	Lower crankcase bolt (8mm)	15	
(13)	Sealing washer	3	
(14)	Main journal bolt (9 mm)	12	
(15)	Sealing washer	12	
(16)	Lower crankcase	1	
(17)	Dowel pin	3	
(18)	Upper crankcase	1	

Transmission Removal/Installation

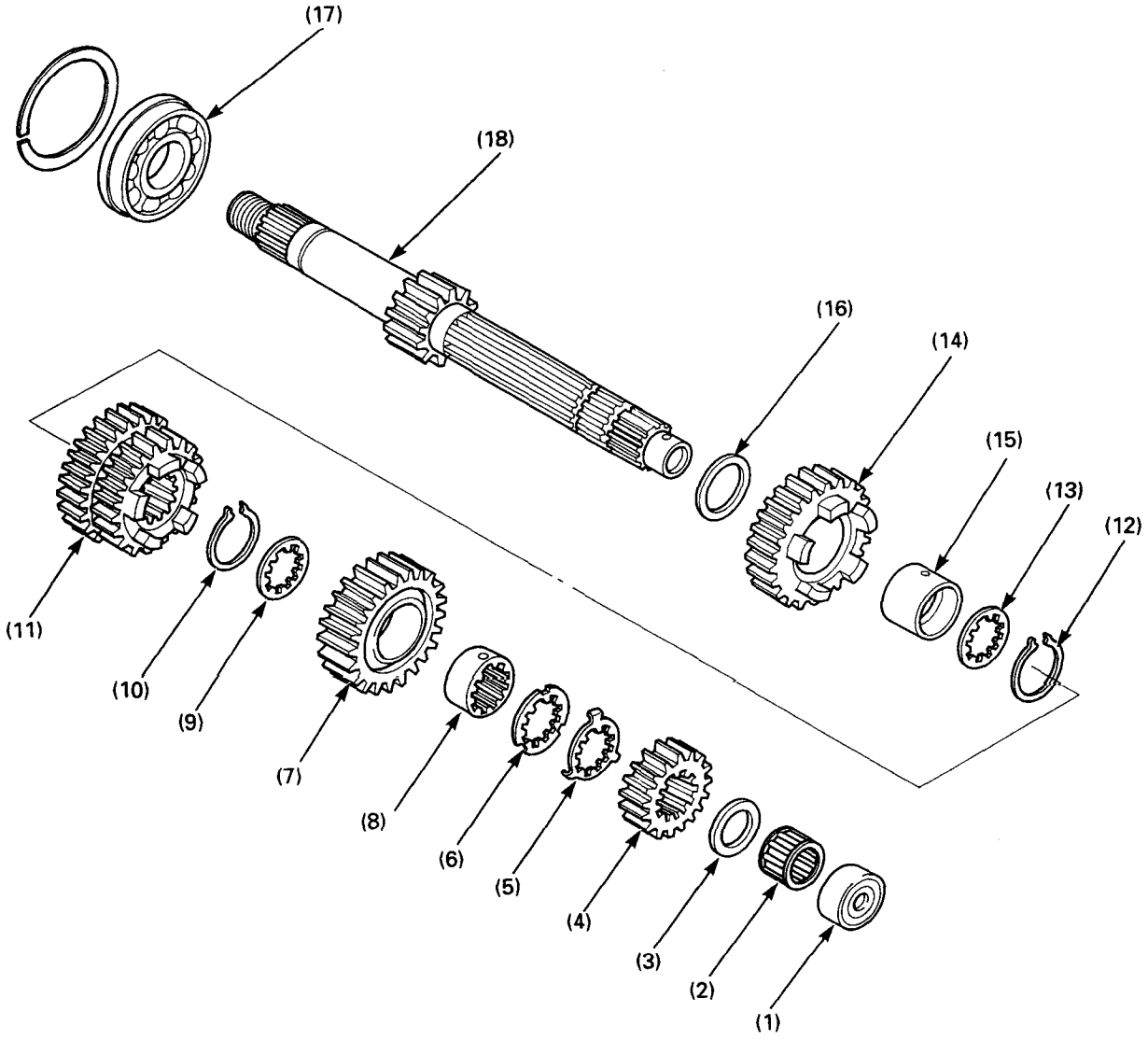


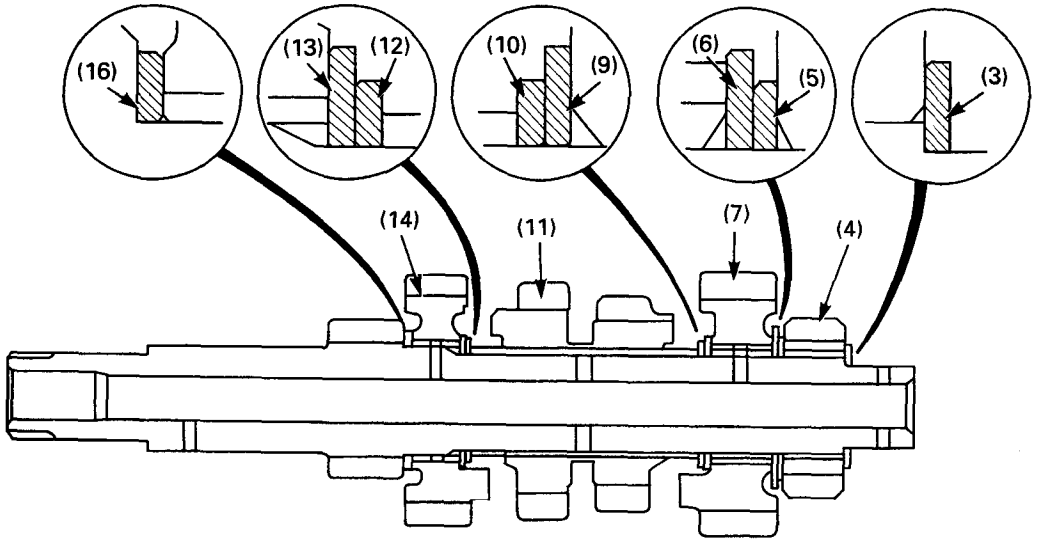
Requisite Service

- Crankcase separation (page 10-6)
- Crankcase combination (page 10-22)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Mainshaft assembly	1	• At installation, align the holes in the needle bearing case with the pins on the crankcase. • At installation, align the goove on the needle bearing case with the crankcase mating surface.
(2)	Countersharft assembly	1	At installation, align the holes in the needle bearing case with the orifice and groove on the crankcase.
(3)	Oil orifice	1	
(4)	Pin	1	
(5)	Oil pass pipe plate bolt	3	NOTE • Unstake the tab for enough to enable bolt removal. The tabs can break easily. Install a new oil pass pipe plate on assembly.
(6)	Oil pass pipe plate	1	
(7)	O-ring	4	

Mainshaft Disassembly/Assembly





NOTE

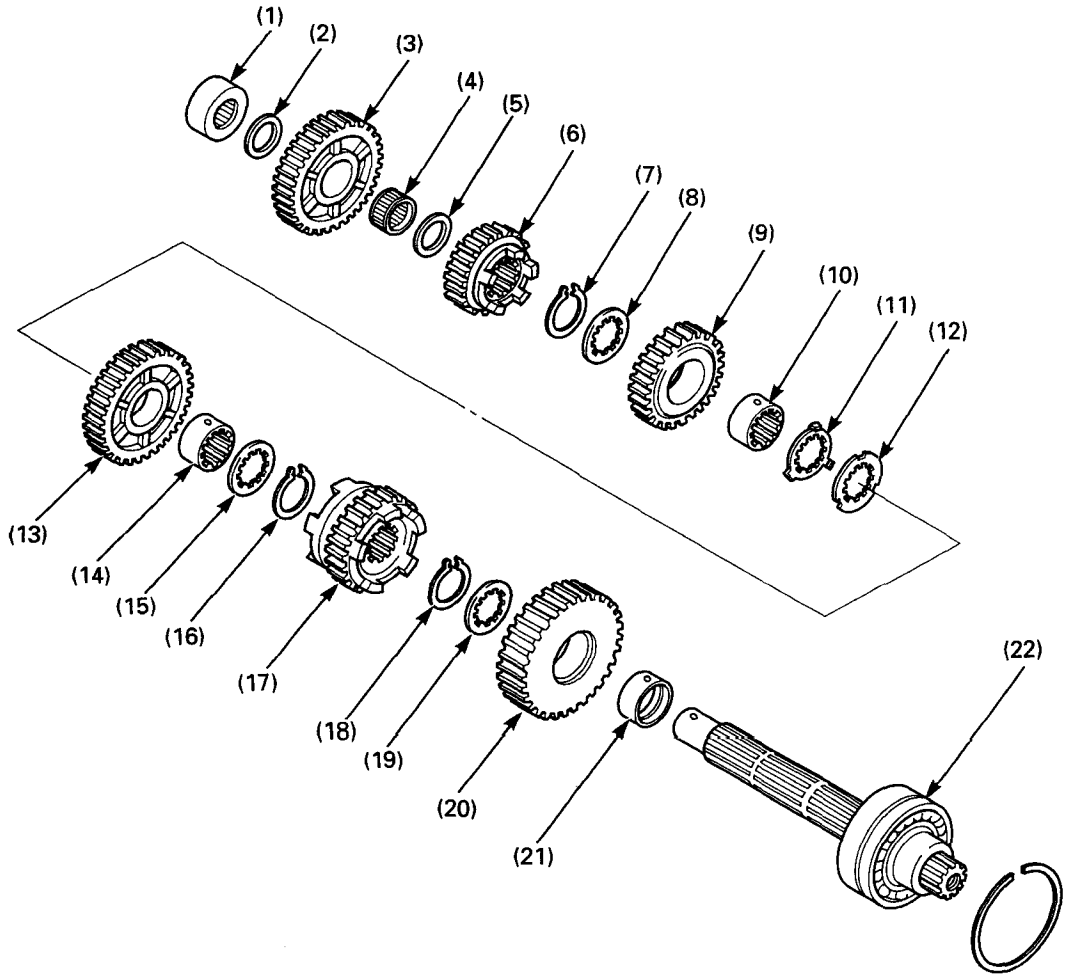
- Apply molybdenum oil to the shifter gear grooves.
- Always install the thrust washers and snap rings with the chamfered (rolled) edge facing away from the thrust load.
- After installing a snap ring, slightly open the ring and rotate it in its groove to be sure it is fully seated.
- Do not use worn snap rings which could easily spin in the groove. They may be too loose to properly seat in the groove.
- Align the gap in the snap ring with the groove of spline.

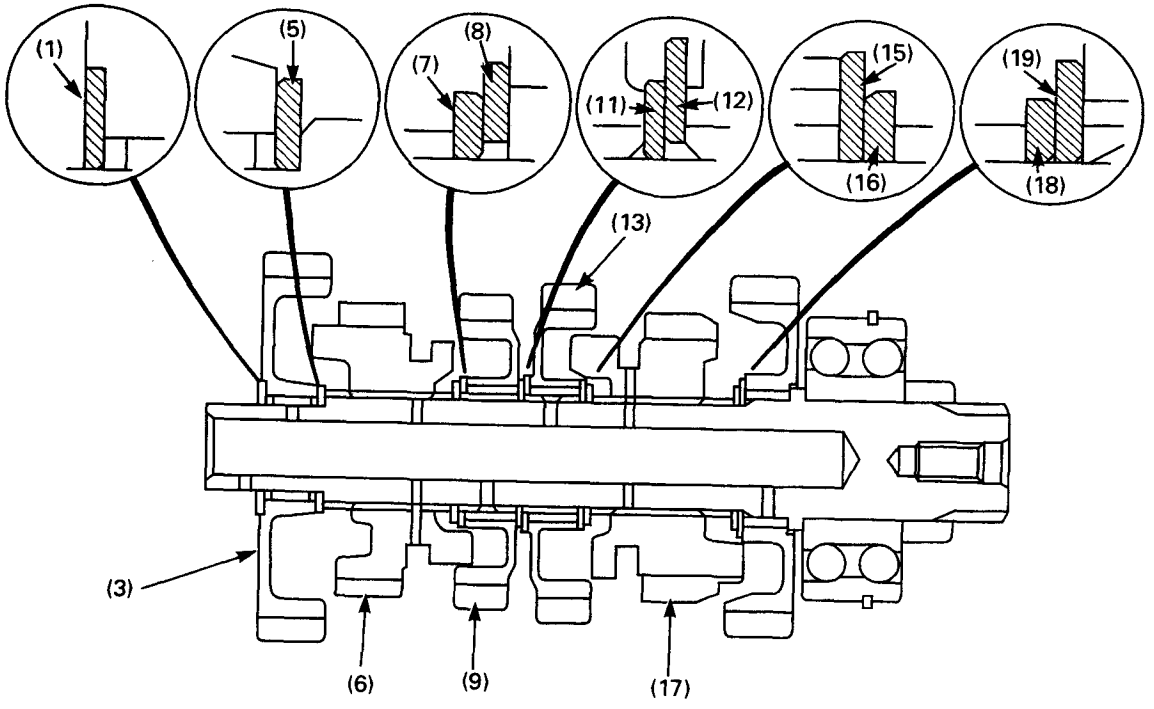
Requisite Service

- Transmission removal/installation (page 10-8)

	Procedure	Q'ty	Remarks
	Mainshaft Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Needle bearing outer case	1	
(2)	Needle bearing	1	
(3)	Washer	1	
(4)	M2 gear (15T)	1	
(5)	Lock plate	1	
(6)	Lock washer	1	At installation, align the tabs on the plate with cut out of the washer.
(7)	M6 gear (22T)	1	
(8)	M6 gear spline bushing	1	
(9)	Spline washer	1	
(10)	Snap ring	1	
(11)	M3/M4 gear (17/19T)	1	
(12)	Snap ring	1	
(13)	Spline washer	1	
(14)	M5 gear (23T)	1	
(15)	M5 gear bushing	1	
(16)	Washer	1	
(17)	Mainshaft bearing	1	At installation, install it with bearing stopper on the outside.
(18)	Mainshaft/M1 gear	1	

Countershaft Disassembly/Assembly





NOTE

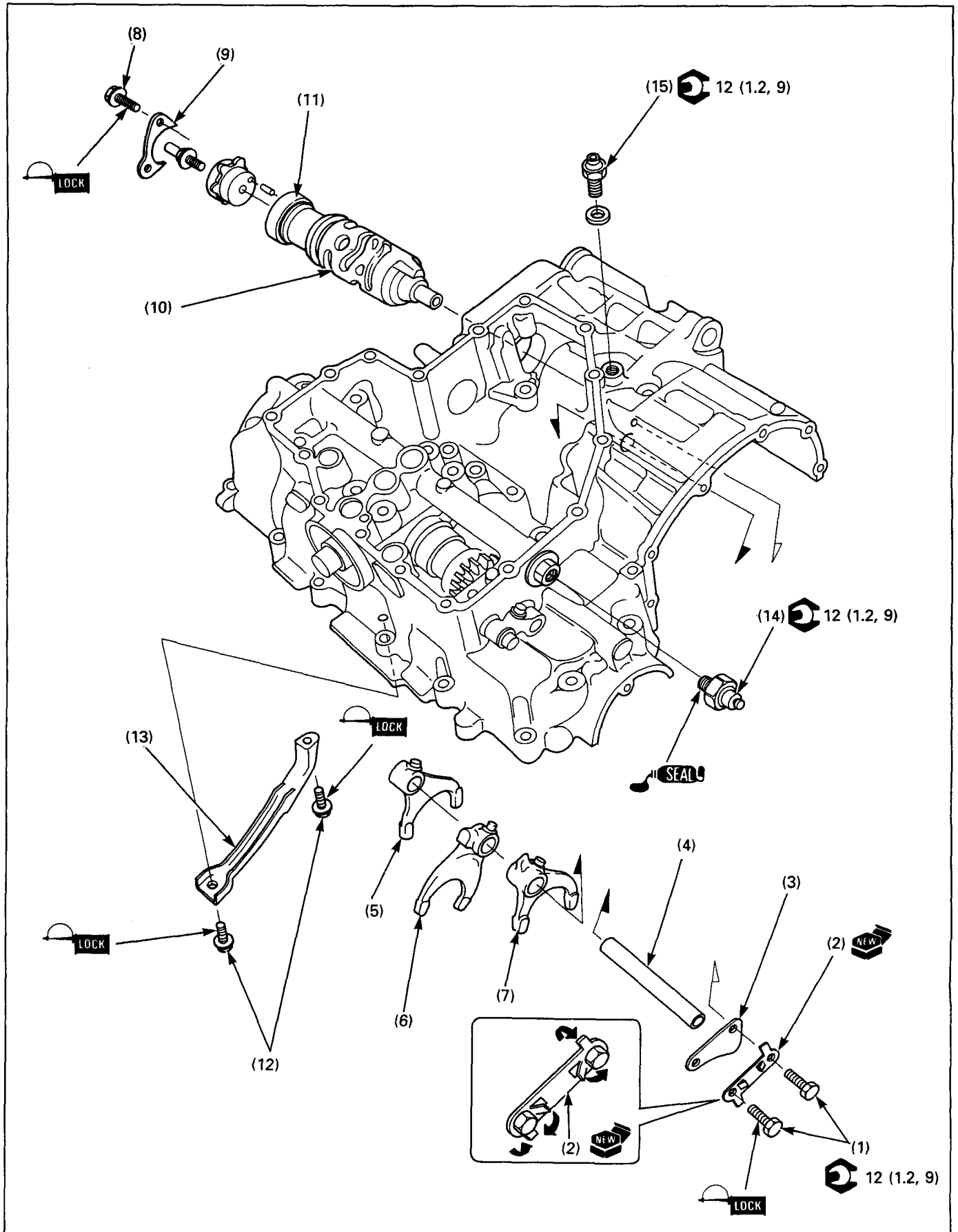
- Apply molybdenum oil to the shifter gear grooves.
- Always install the thrust washers and snap rings with the chamfered(rolled) edge facing away from the thrust load.
- After installing a snap ring, slightly open the ring and rotate it in its groove to be sure it is fully seated.
- Do not use worn snap rings which could easily spin in the groove. They may be too loose to properly seat in the groove.
- Align the gap in the snap ring with the groove of spline.

Requisite Service

- Transmission removal/installation (page 10-8)

	Procedure	Q'ty	Remarks
	Countershaft Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Needle bearing	1	
(2)	Washer	1	
(3)	C1 gear (33T)	1	
(4)	Needle bearing	1	
(5)	Washer	1	
(6)	C6 gear (23T)	1	
(7)	Snap ring	1	
(8)	Spline washer	1	
(9)	C4 gear (26T)	1	
(10)	C4 gear spline bushing	1	
(11)	Lock plate	1	At installation, align the tabs on the plate with the cut outs of the washer.
(12)	Lock washer	1	
(13)	C3 gear (28T)	1	
(14)	C3 gear spline bushing	1	
(15)	Spline washer	1	
(16)	Snap ring	1	
(17)	C5 gear (27T)	1	
(18)	Snap ring	1	
(19)	Spline washer	1	
(20)	C2 gear (31T)	1	
(21)	C2 gear bushing	1	
(22)	Countershaft	1	

Shift Drum Removal/Installation

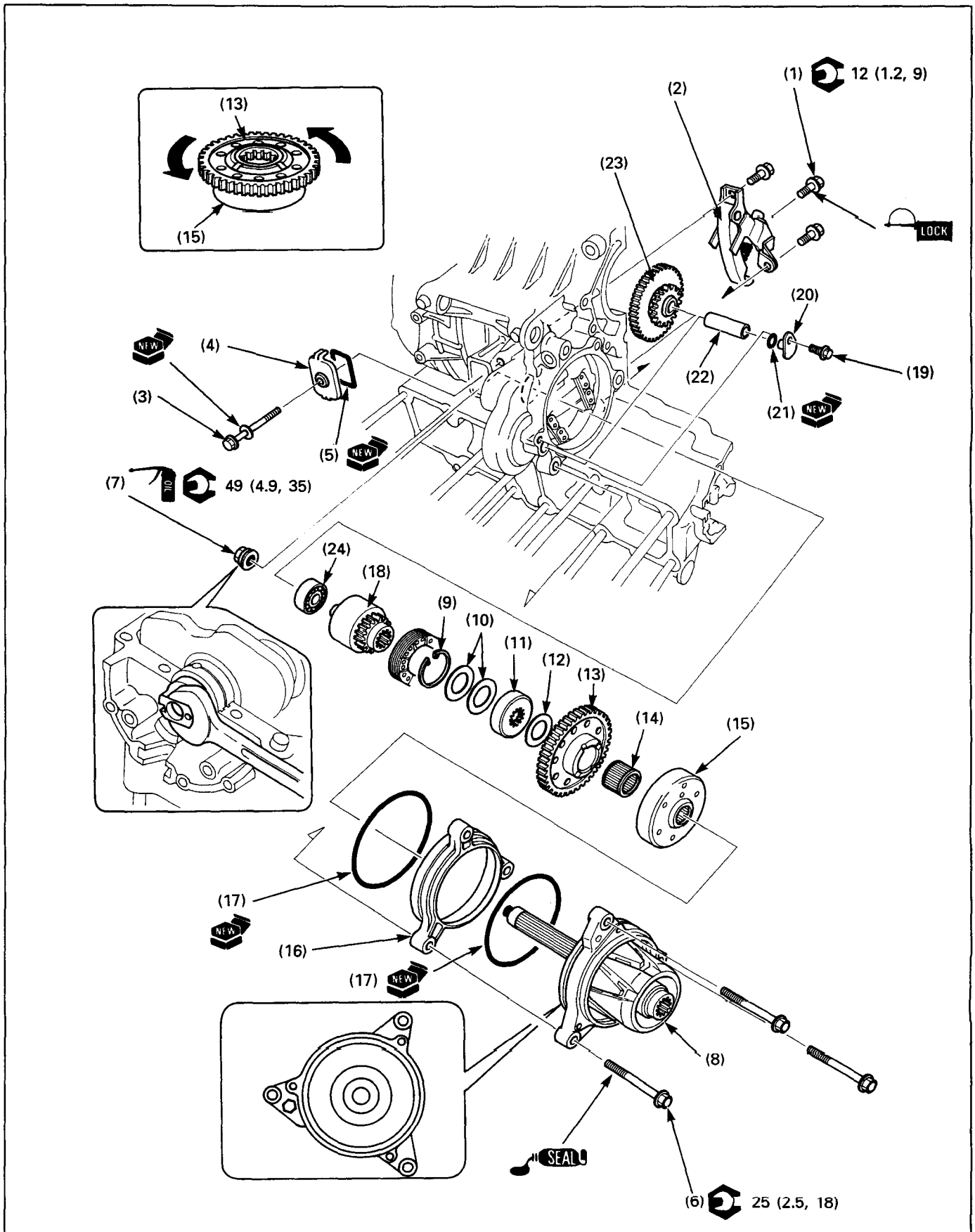


Requisite Service

- Crankcase separation (page 10-6)
- Crankcase combination (page 10-22)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Bolt	2	NOTE • At installation, clean and apply a locking agent to the threads. • Remove after bending down the lock plate tab. When installing bend the new lock plate tabs against the bolt heads.
(2)	Lock plate	1	
(3)	Stopper plate	1	
(4)	Shift fork shaft	1	
(5)	Left shift fork	1	
(6)	Center shift fork	1	
(7)	Right shift fork	1	
(8)	Bolt	2	NOTE • At installation, clean and apply a locking agent to the threads.
(9)	Bearing stopper plate	1	
(10)	Shift drum	1	
(11)	Shift drum bearing	1	
(12)	Alternator drive chain slider bolt	2	
(13)	Alternator drive chain slider	1	
(14)	Oil pressure switch	1	
(15)	Neutral switch	1	

Alternator Shaft Removal/Installation



Requisite Service

- Crankcase separation (page 10-6)
- Transmission removal (page 10-8)

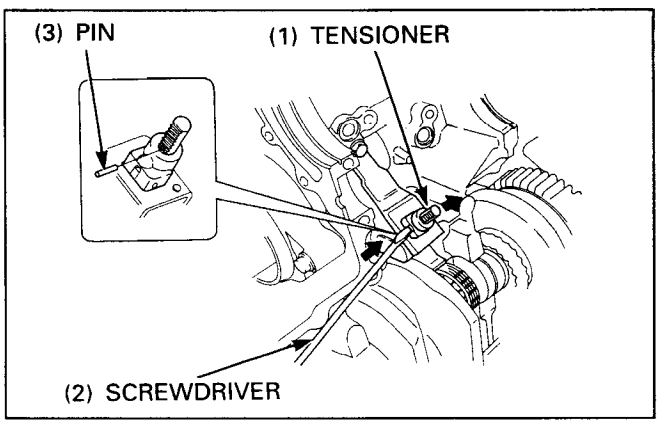
	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Tensioner bolt	3	
(2)	Chain tensioner	1	Installation (See below)
(3)	Alternator shaft cover bolt	1	
(4)	Alternator shaft cover	1	
(5)	O-ring	1	
(6)	Alternator base bolt	3	
(7)	Alternator shaft nut	1	Hold the crankshaft as shown.
(8)	Alternator shaft assembly	1	
(9)	Snap ring	1	
(10)	Collar spring	2	
(11)	Shaft collar	1	
(12)	Washer	1	
(13)	Starter driven gear	1	Assemble the starter driven gear in the starter clutch by turning the starter driven gear counterclockwise.
(14)	Needle bearing	1	
(15)	Starter clutch outer	1	
(16)	Alternator base	1	
(17)	O-ring	2	
(18)	Damper	1	
(19)	Setting plate bolt	1	
(20)	Shaft setting plate	1	
(21)	O-ring	1	
(22)	Reduction gear shaft	1	
(23)	Starter reduction gear	1	
(24)	Bearing	1	At installation, install the sealed side facing to nut side.

Chain Tensioner Installation

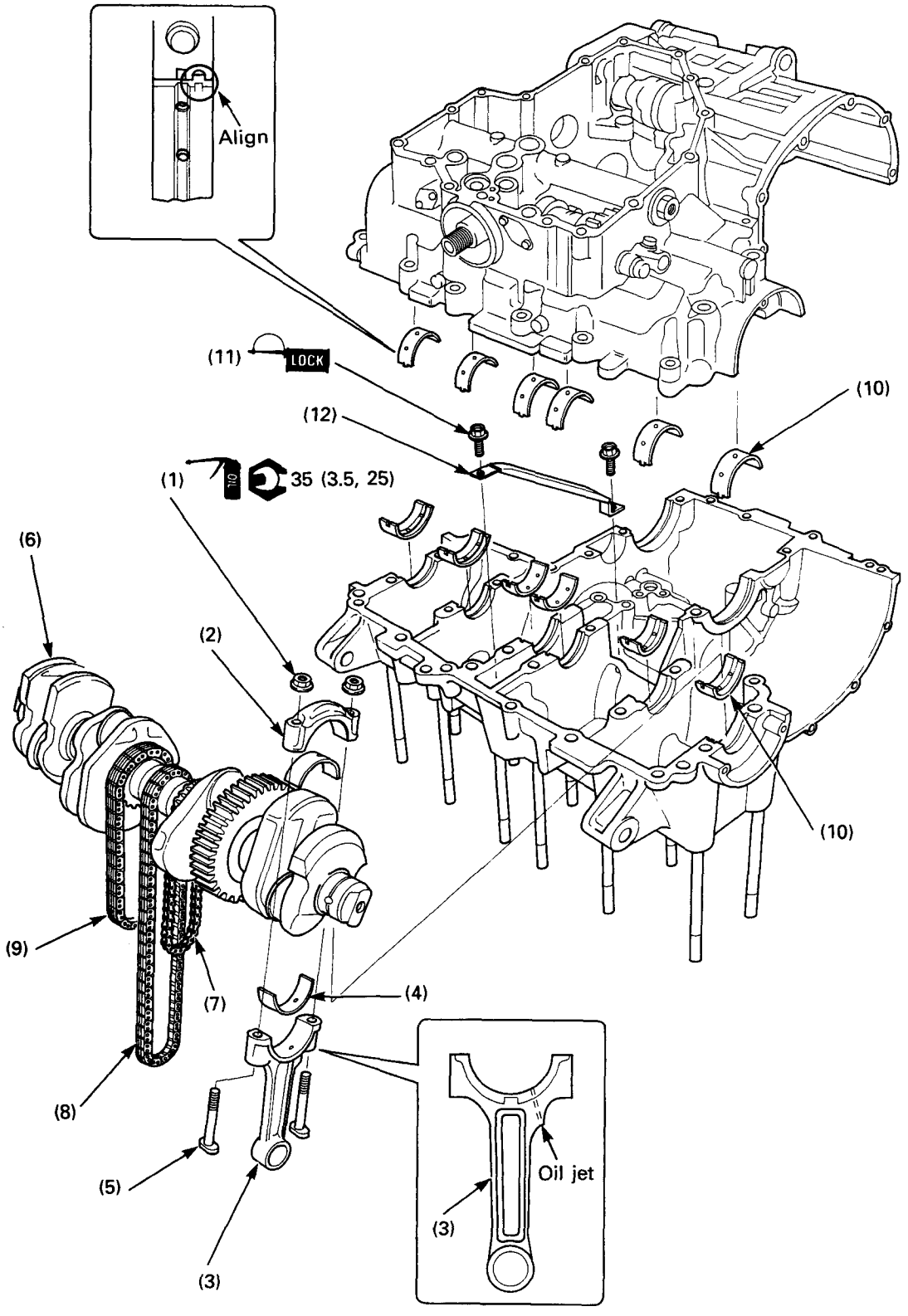
Push the notch on the chain tensioner with a screwdriver and push the tensioner rod until hole on the rod appears.
Insert a pin or equivalent into the hole to lock the tensioner.
Install the tensioner to the crankcase.
Apply a locking agent to the threads of the bolts.
Tighten the bolts to the specified torque.

Torque: 12 N • m (1.2 kg-m, 9ft-lb)

Remove the pin from the hole of the tensioner rod.



Crankshaft Removal/Installation



NOTE

- Mark all parts during disassembly so they can be replaced in their original locations.
- All bearing inserts are select fitted and are identified by color code. Select replacement bearings from the code table (page 10-20). After installing new bearings, recheck them with plastigauge to verify the clearance.
- Apply molybdenum disulfide oil to the connecting rod/main journal bearings, main journal and crankpin.

Requisite Service

- Transmission removal/installation (page 10-8)
- Alternator shaft removal/installation (page 10-16)

	Procedure	Q'ty	Remarks
	Removal Order		
(1)	Connecting rod bearing cap nut	8	
(2)	Connecting rod bearing cap	4	
(3)	Connecting rod	4	
(4)	Connecting rod bearing	8	Replacement (page 10-21)
(5)	Connecting rod bolt	8	Do not remove them unless necessary.
(6)	Crankshaft	1	
(7)	Oil pump drive chain	1	
(8)	Cam chain	1	
(9)	Alternator drive chain	1	
(10)	Main journal bearing	12	Replacement (page 10-20)
(11)	Slider bolt	2	
(12)	Chain slider	1	
	Installation Order		
(12)	Chain slider	1	
(11)	Slider bolt	2	
(10)	Main journal bearing	12	NOTE • Wipe all oil from the bearing seating area. • Align the tab on the bearing with the groove on the crankcase.
(9)	Alternator drive chain	1	
(8)	Can chain	1	
(7)	Oil pump drive chain	1	
(6)	Crankshaft	1	
(5)	Connecting rod bolt	8	
(4)	Connecting rod bearing	8	NOTE • Wipe all oil from the bearing seating area. • Align the tab on the bearing with the goove on the crankcase. • Align the hole on the bearing with the hole on the connecting rod.
(3)	Connecting rod	4	NOTE • Install the connecting rod with it oil hole side facing the intake side.
(2)	Connecting rod bearing cap	4	
(1)	Connecting rod bearing cap nut	8	

Crankshaft Bearing Replacement

Main Journal Bearing Selection

Record the crankcase I.D. letters from the pad on the left side of the crankcase.

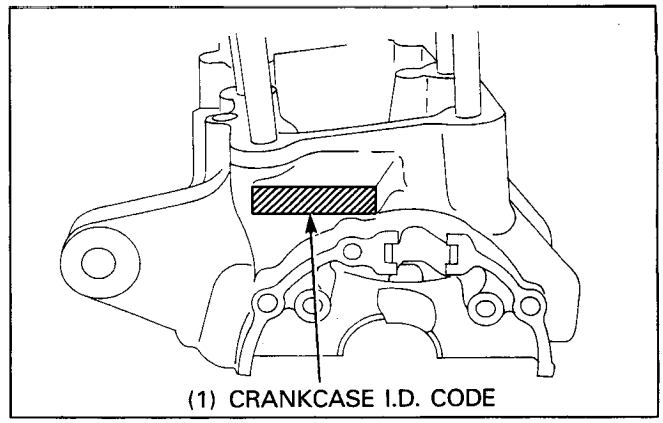
NOTE

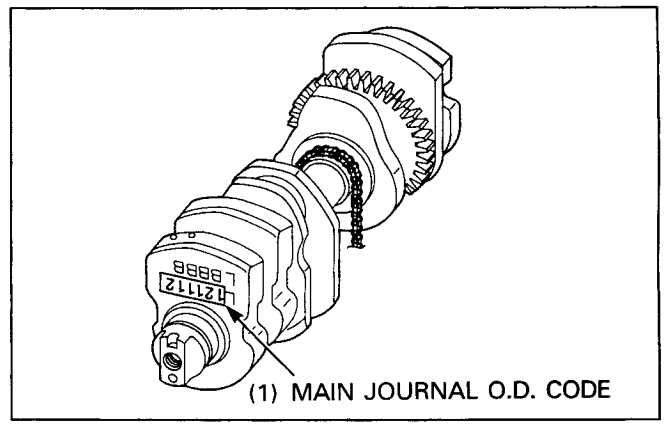
- Letters (A, B or C) on the upper crankcase are the codes for the main journal I.D.s from the left.

Record the corresponding main journal O.D. code numbers from the crank weight.

NOTE

- Numbers (1 or 2) on the crank weight are the codes for the main journal O.D.s from the left.



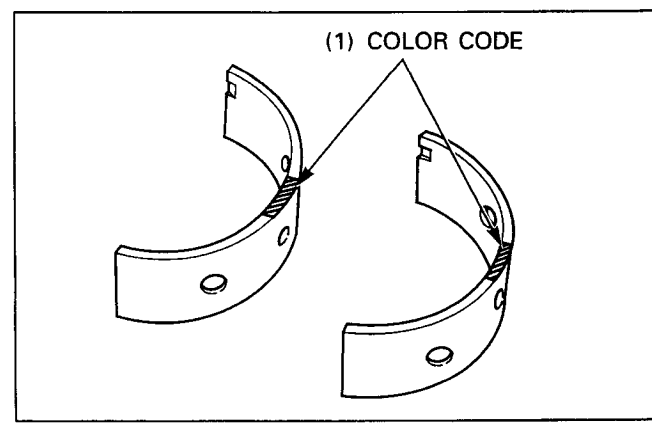


Cross reference the case and journal codes to determine the replacement bearing color code.

Main Journal Bearing Selection Table

Crankshaft O.D. Code	Crankcase I.D Code	A	B	C
		39.000-39.007 (1.5354-1.5357)	39.008-39.015 (1.5357-1.5360)	39.016-39.024 (1.5360-1.5363)
1	35.992-36.000 (1.4170-1.4173)	Pink	Yellow	Green
2	35.984-35.991 (1.4166-1.4169)	Yellow	Green	Brown

Bearing thickness:
Blown: 1.508-1.512mm
(0.0593-0.0595in)
Green: 1.504-1.507mm
(0.0592-0.0593in)
Yellow: 1.500-1.503mm
(0.0590-0.0591in)
Pink: 1.496-1.499mm
(0.0589-0.0590in)



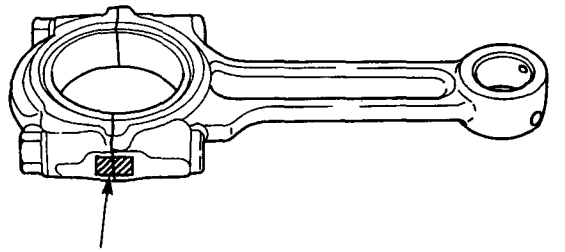
Connecting Rod Bearing Selection

Inspect the connecting rod bearing and crankpin oil clearance (See section 14 of the Common Service Manual).

Record the connecting rod I.D. code number (1 or 2) or measure the I.D. with the bearing cap installed without bearing insert.

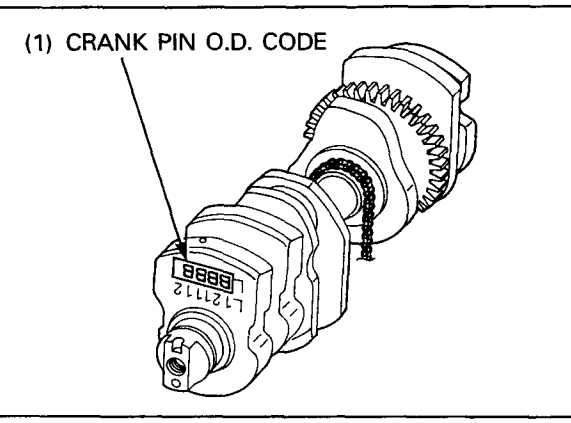
If you replace the crankshaft, record corresponding crankpin O.D. code number (A or B).

Reuse crankshaft, measure the crankpin O.D. with the micrometer.



NOTE

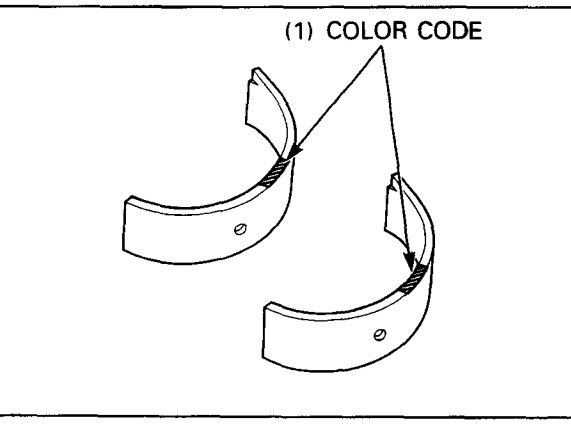
- Numbers (A or B) on the crank weight are the codes for the crank pin O.D.s. from the left.



Cross-reference the crankpin and rod codes to determine the replacement bearing color.

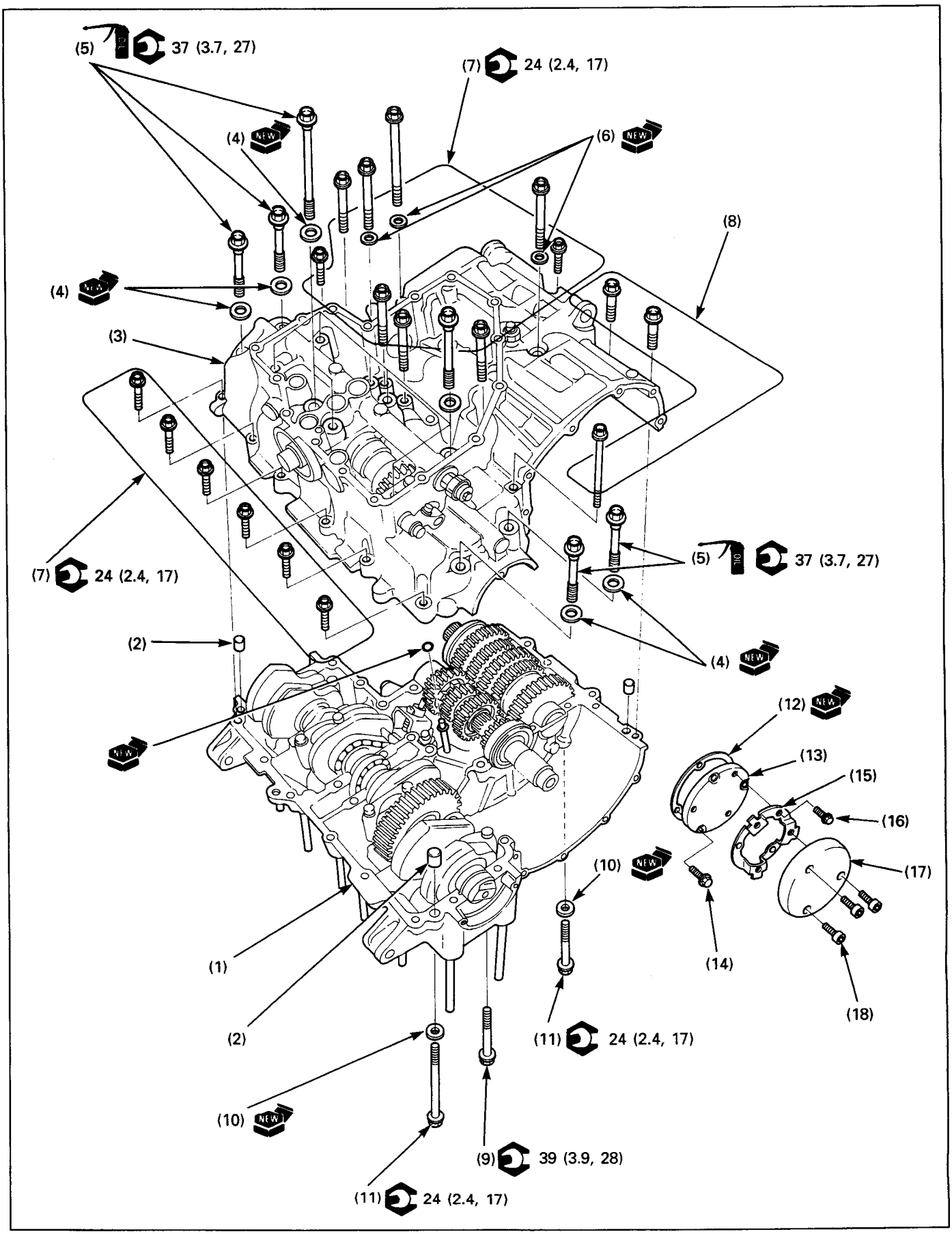
Connecting Rod Bearing Selection Table:

Crankpin O.D. code / Connecting rod I.D. code		A	B
		39.955-40.003 (1.5730-1.5749)	39.987-39.994 (1.5742-1.5745)
1	43.000-43.007 (1.6929-1.6931)	Yellow	Green
2	43.008-43.016 (1.6932-1.6935)	Green	Brown



Bearing thickness:
Brown: 1.492-1.496mm
(0.0587-0.0588in)
Green: 1.488-1.491mm
(0.0585-0.0587in)
Yellow: 1.484-1.487mm
(0.0584-0.0585in)

Crankcase Combination



NOTE

- Refer to page 10-24 for crankcase sealant area and detail of the bolt location.
- Install the sealing washers to the bolts indicated "▼" marks on the crankcase.
- From the inside to outside, tighten the bolts in a crisscross pattern in several steps.

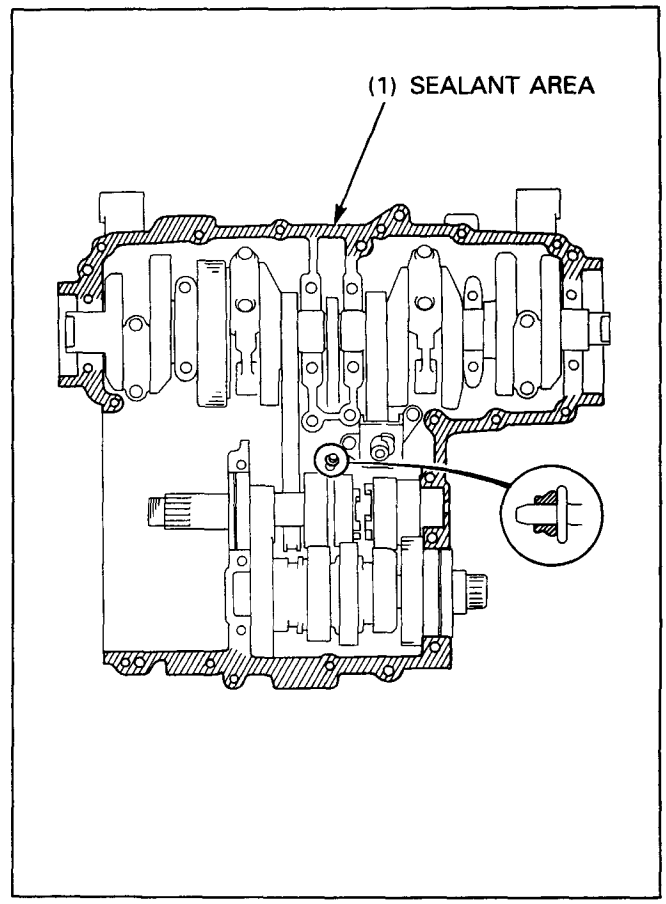
Requisite Service

- Crankcase separation (page 10-6)

	Procedure	Q'ty	Remarks
	Combination Order		
(1)	Upper crankcase	1	**CAUTION** • **Do not apply sealant around oil passage area and main bearing journal area.** Refer to page 10-24 for detail for apply area.
(2)	Dowel pin	3	
(3)	Lower crankcase	1	
(4)	Sealing washer	12	Tightening order (page 10-24)
(5)	Main journal bolt (9mm)	12	
(6)	Sealing washer	3	
(7)	Lower crankcase bolt (8mm)	15	
(8)	Lower crankcase bolt (6mm)	3	
(9)	Upper crankcase bolt (10mm)	1	
(10)	Sealing washer	2	
(11)	Upper crankcase bolt (8mm)	2	
(12)	Gasket	1	
(13)	Right crankcase cover	1	
(14)	Right crankcase cover bolt	3	
(15)	Bracket	1	
(16)	Bolt	3	
(17)	Right crank cover	1	
(18)	Socket bolt	3	

Liquid Sealant Apply Area

Apply a light but through coating of sealant to the upper crankcase mating surface except to the main bearing journal bolt areas and the oil passage area as shown.



Crankcase Bolt Location

Clean the crankcase bolts thoroughly with solvent and blow dry.

Apply clean engine oil to the crankcase bolt threads and seating surface and install them.

NOTE

- The sealing washer locations are indicated on the upper crankcase using the "▼" mark.

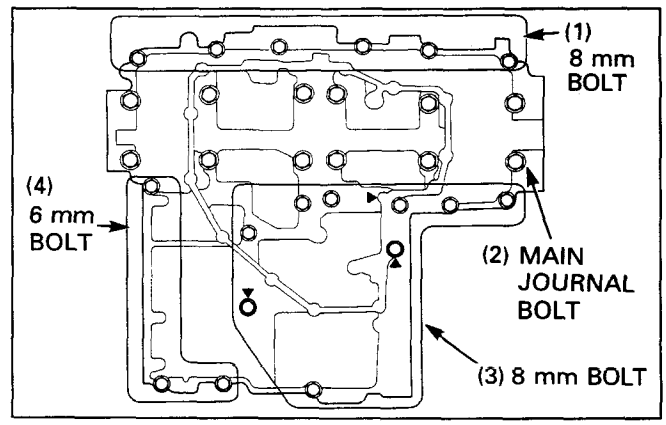
Loosely install the all lower crankcase bolt.
Make sure the upper and lower crankcase are seated securely.

From inside to outside, tighten the main journal bolts in a crisscross pattern in 2 or 3 steps.

Torque: 37 N • m (3.7 kg-m, 27 ft-lb)

Tighten the 8mm bolt, and then tighten the 6mm bolt securely.

Torque: 8mm bolt: 24 N • m (2.4 kg-m, 17 ft-lb)

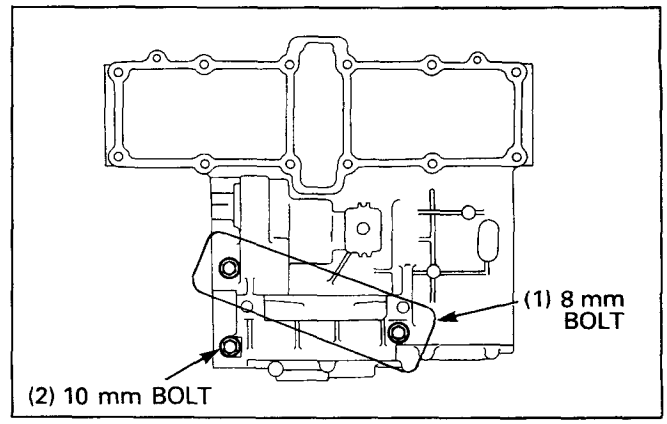


Install the upper crankcase bolts and the sealing washers.

NOTE

- The sealing washer locations are indicated on the upper crankcase using the "▼" mark.

Torque: 10mm bolt: 39 N • m (3.9 kg-m, 28 ft-lb)
8mm bolt: 24 N • m (2.4 kg-m, 17 ft-lb)



11. Front Wheel/Suspension/Steering

Service Information

⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

- When servicing the front wheel, support the motorcycle securely with a jack or other support under the engine.
- Refer to the section 13 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".

Troubleshooting

Hard Steering
- Faulty steering head bearings
- Damaged steering head bearings
- Insufficient tire pressure
- Steering head bearing adjustment nut too tight

Steers To One Side Or Does Not Track Straight
- Unevenly adjusted right and left forks
- Bent fork
- Bent axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot components

Front Wheel Wobbling
- Bent rim
- Worn front wheel bearings
- Faulty tire
- Unbalanced tire and wheel

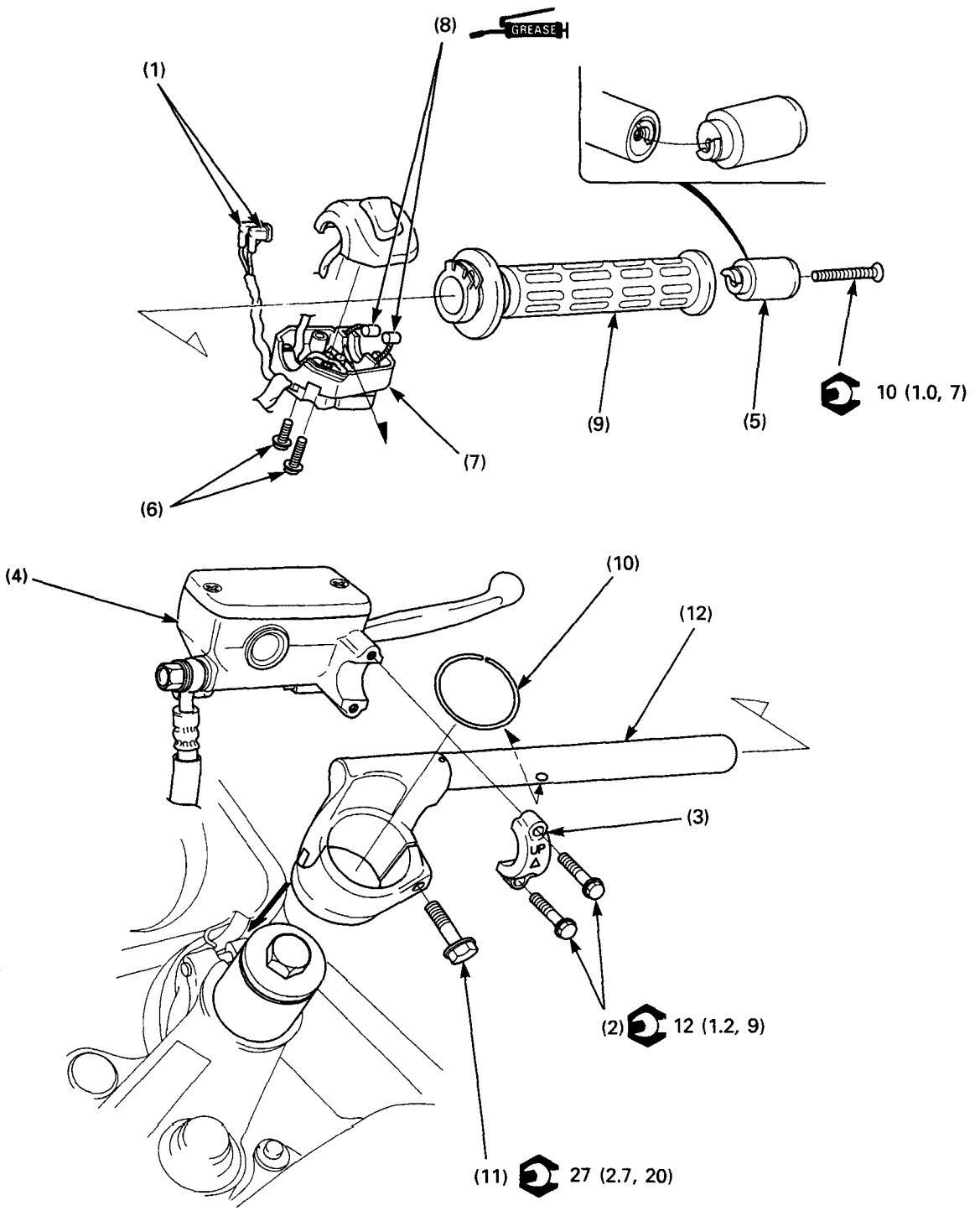
Wheel Turns Hard
- Faulty wheel bearing
- Bent front axle
- Brake drag

Soft Suspension
- Insufficient fluid in fork
- Weak fork springs
- Low tire pressure

Hard Suspension
- Incorrect fluid weight
- Bent fork tubes
- Clogged fork fluid passage
- High tire pressure

Front Suspension Noisy
- Insufficient fluid in fork
- Loose fork fasteners

Right Handlebar Removal/Installation



⚠ WARNING

- **Contaminants in the system may cause a reduction or loss of braking ability.**

CAUTION

- **Spilling brake fluid will damage painted, plastic, or rubber parts.**

NOTE

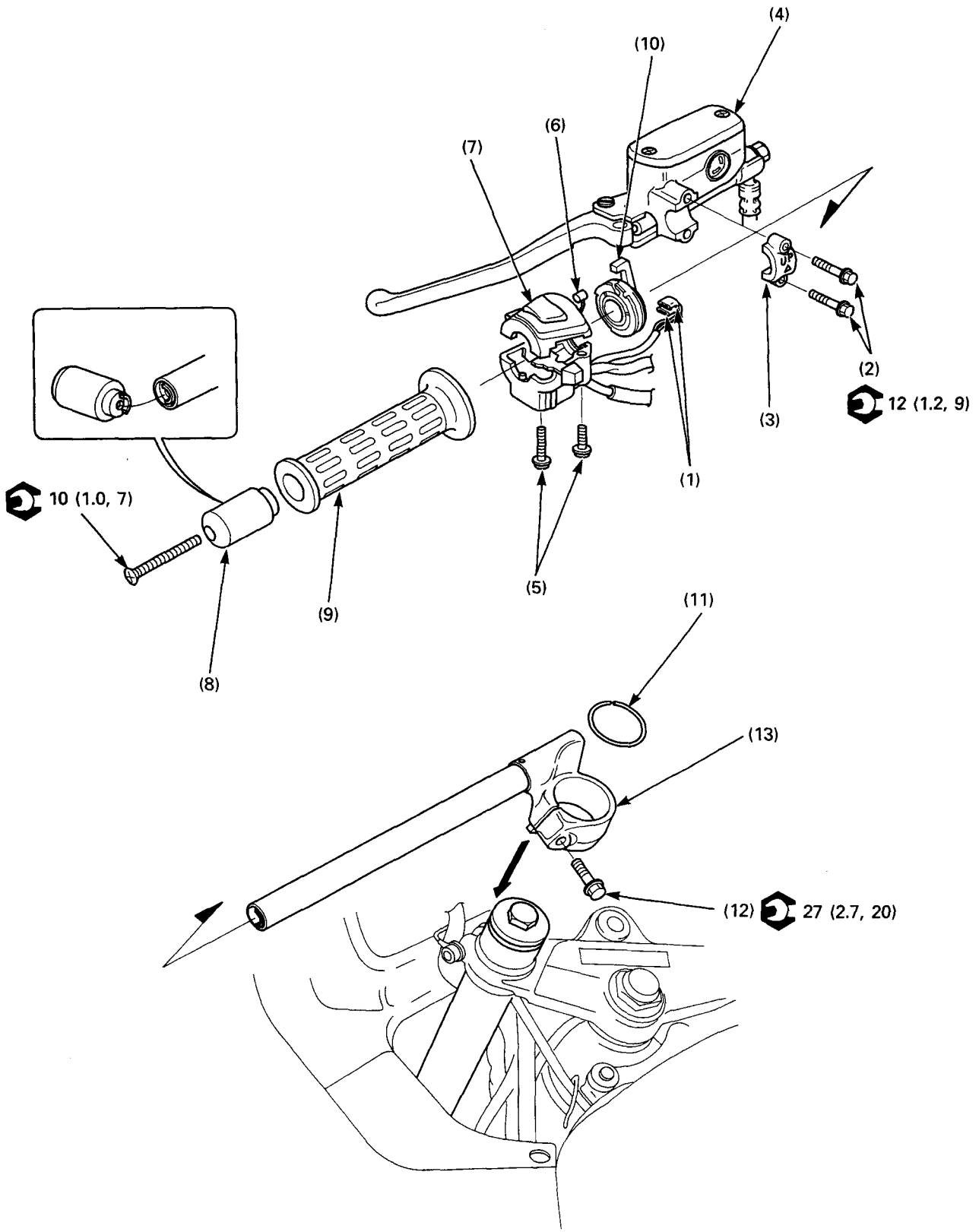
- Using wires, hang the front brake master cylinder at least as high as the position it was originally installed at to prevent air from getting into the master cylinder. Do not twist the brake hose.
- Route the cables and wire harnesses properly.

Requisite Service

- Throttle grip free play adjustment (Section 2 of the Common Service Manual)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Brake switch connector	2	
(2)	Master cylinder holder bolt	2	At installation, tighten the upper bolt first.
(3)	Master cylinder holder	1	• At installation, align the mating surface of the master cylinder and holder with the punch mark on the handlebar. • Install the holder with its "UP" mark facing up.
(4)	Master cylinder assembly	1	
(5)	Handlebar weight	1	
(6)	Right handle switch screw	2	
(7)	Right handle switch housing	1	At installation, align the locating pin the engine stop switch with the hole on the handlebar.
(8)	Throttle cable	2	
(9)	Throttle pipe	1	
(10)	Stop ring	1	
(11)	Right handlebar pinch flange bolt	1	
(12)	Right handlebar	1	At installation, align the stopper on the handlebar with the groove in the top bridge.

Left Handlebar Removal/Installation



CAUTION

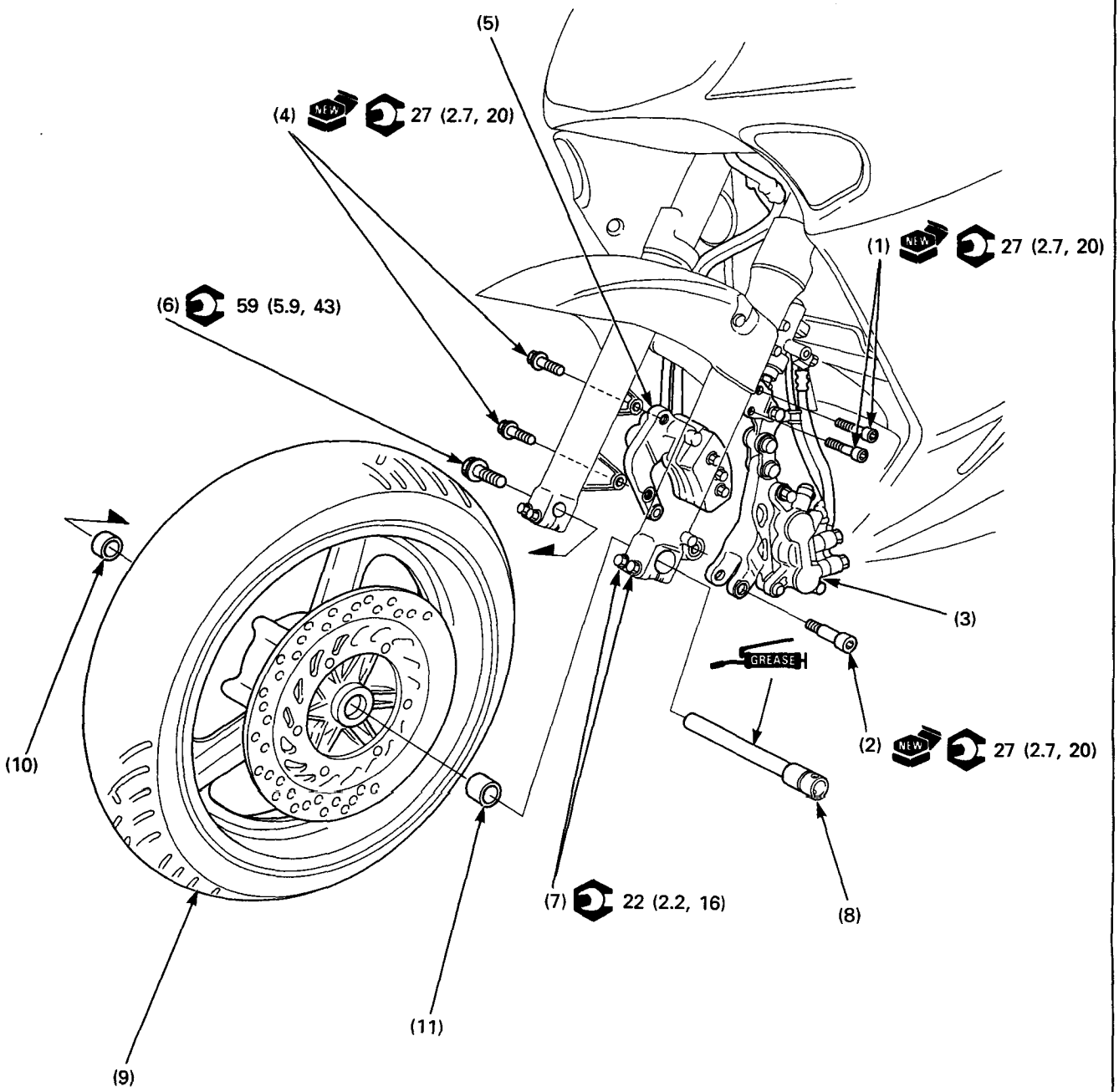
- **Spilling drake fluid will damage painted, plastic, or rubber parts.**

NOTE

- Using wires, hang the clutch master cylinder at lest as high as the position it was originally installed at to prevent air from getting into the master cylinder. Do not twist the clutch hose.
- Route the cables and wire harnesses properly.

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Clutch switch connector	2	
(2)	Clutch master cylinder holder bolt	2	At installation, tighten the upper bolt first.
(3)	Clutch master cylinder holder	1	• At installation, align the mating surface of the master cylinder and holder with the punch mark on the handlebar. • Install the holder with its "UP" mark facing up.
(4)	Clutch master cylinder assembly	1	
(5)	Left handlebar switch screw	2	At installation, tighten the front screw first, then the rear screw.
(6)	Choke cable	1	
(7)	Left handlebar switch housing	1	At installation, align the locating pin in the throttle housing with the hole on the handlebar.
(8)	Handlebar weight	1	
(9)	Handle grip	1	
(10)	Choke lever	1	
(11)	Stop ring	1	
(12)	Left handlebar pinch flange bolt	1	
(13)	Left handlebar	1	At installation, align the stopper on the handlebar with the groove in the top bridge.

Front Wheel Removal/Installation



⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality degreasing agent.**

CAUTION

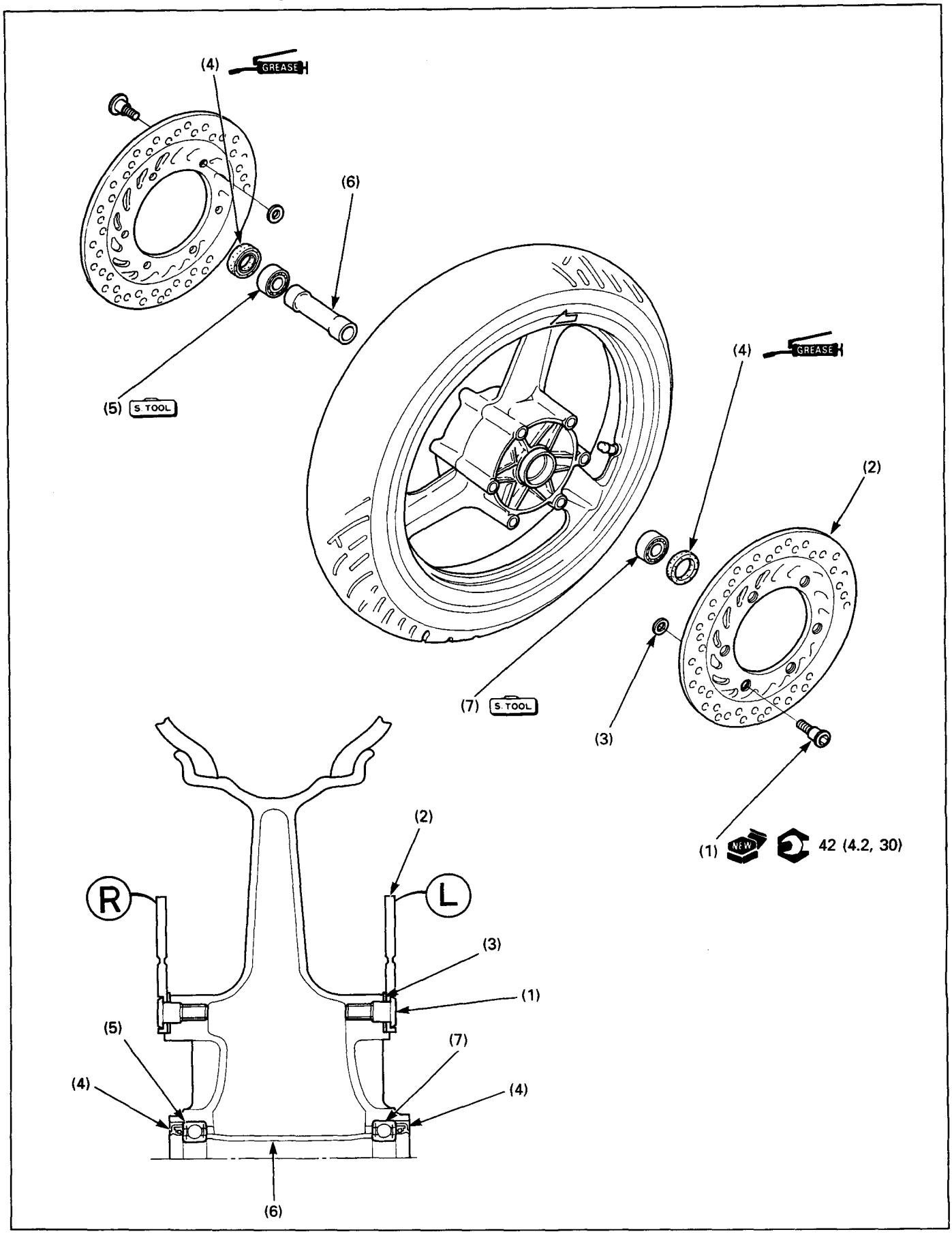
- **Do not jack up the motorcycle using the oil filter.**
- **Do not suspend the brake caliper using the brake hose. Do not twist the brake hose more than necessary.**
- **Do not twist the secondary master cylinder push rod more than necessary.**

NOTE

- When servicing the front wheel, place a jack or other adjustable support under engine .
- Do not operate the brake lever or pedal after the wheel is removed.
- Apply thin layer of grease to the front axle surface.
- Check the clearance between the brake disc and caliper bracket on each side after installation. The clearance should be at least 0.7mm (0.03in).
- After installation, operate the brake lever and pedal, and check the brake operation.

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Secondary master cylinder link plate bolt	2	
(2)	Left brake caliper lower socket bolt	1	
(3)	Left brake caliper assembly	1	Remove the left brake caliper from the brake disc.
(4)	Right brake caliper mounting bolt	2	
(5)	Right brake caliper	1	
(6)	Axle bolt	1	
(7)	Axle pinch bolt	4	Only loosening the bolts.
(8)	Front axle	1	
(9)	Front wheel assembly	1	Disassembly (11-8)
(10)	Right side collar	1	
(11)	Left side collar	1	

Front Wheel Disassembly/Assembly



⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

NOTE

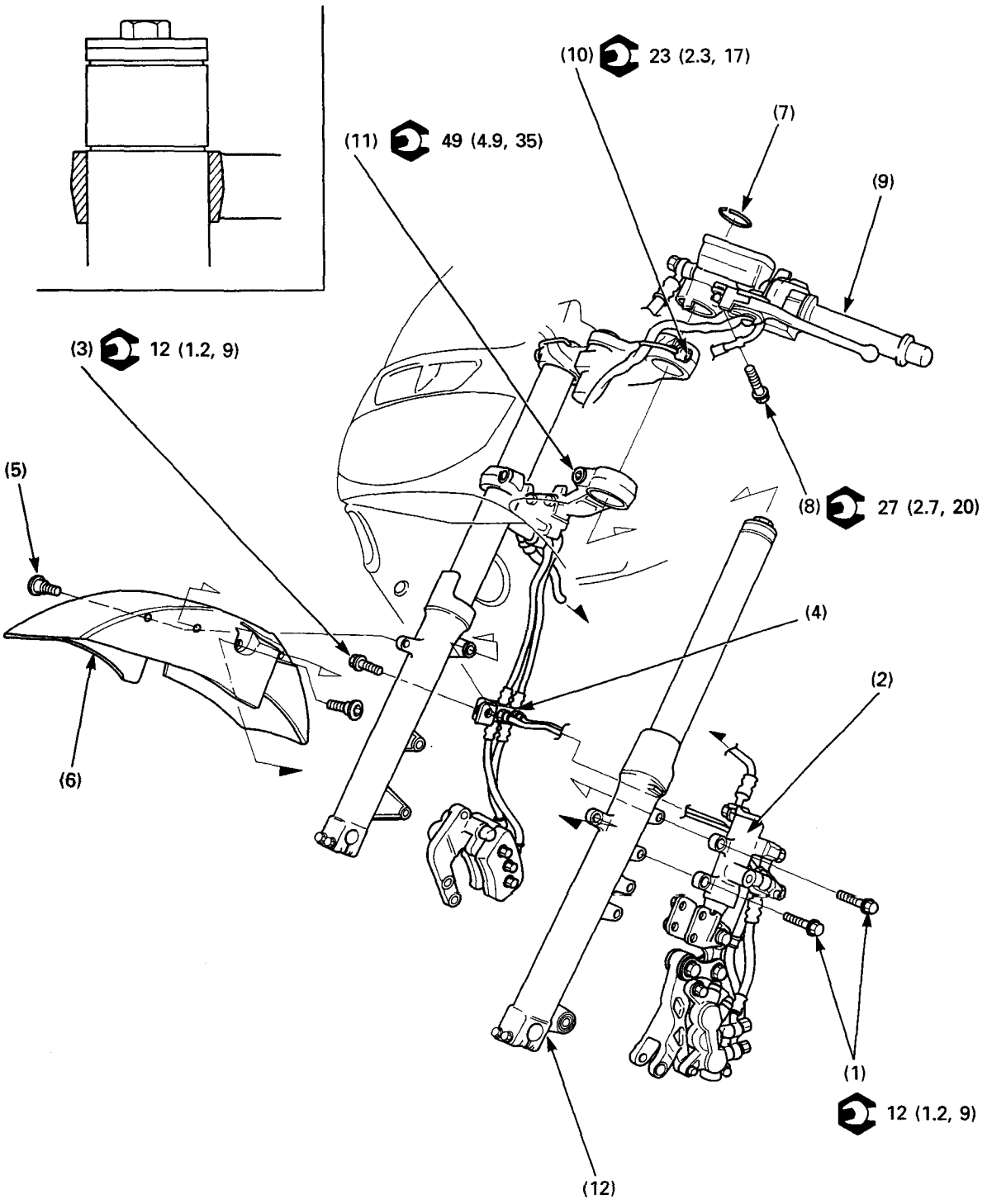
- Replace the bearings in pairs.
- Do not add more than 60 grams of the balance weight to the wheel.

Requisite Service

- Front wheel *removal/installation (page 11-6)*

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of removal.
(1)	Brake disc mounting bolt	12	
(2)	Brake disc	2	NOTE • At installation, install each disc with their stamped side facing out.
(3)	Shim	12	
(4)	Dust seal	2	
(5)	Right wheel bearing (6004)	1	
(6)	Distance collar	1	
(7)	Left wheel bearing (6004)	1	NOTE • At assembly, drive in the left side bearing first, then the right side bearing.

Fork Removal/Installation



CAUTION

- **Do not suspend the brake caliper using the brake hose. Do not twist the brake hose more than necessary.**
- **Do not suspend the secondary master cylinder using the brake caliper. Do not twist the brake brake hose more than necessary.**
- **Do not twist the secondary master cylinder push rod more than necessary.**

NOTE

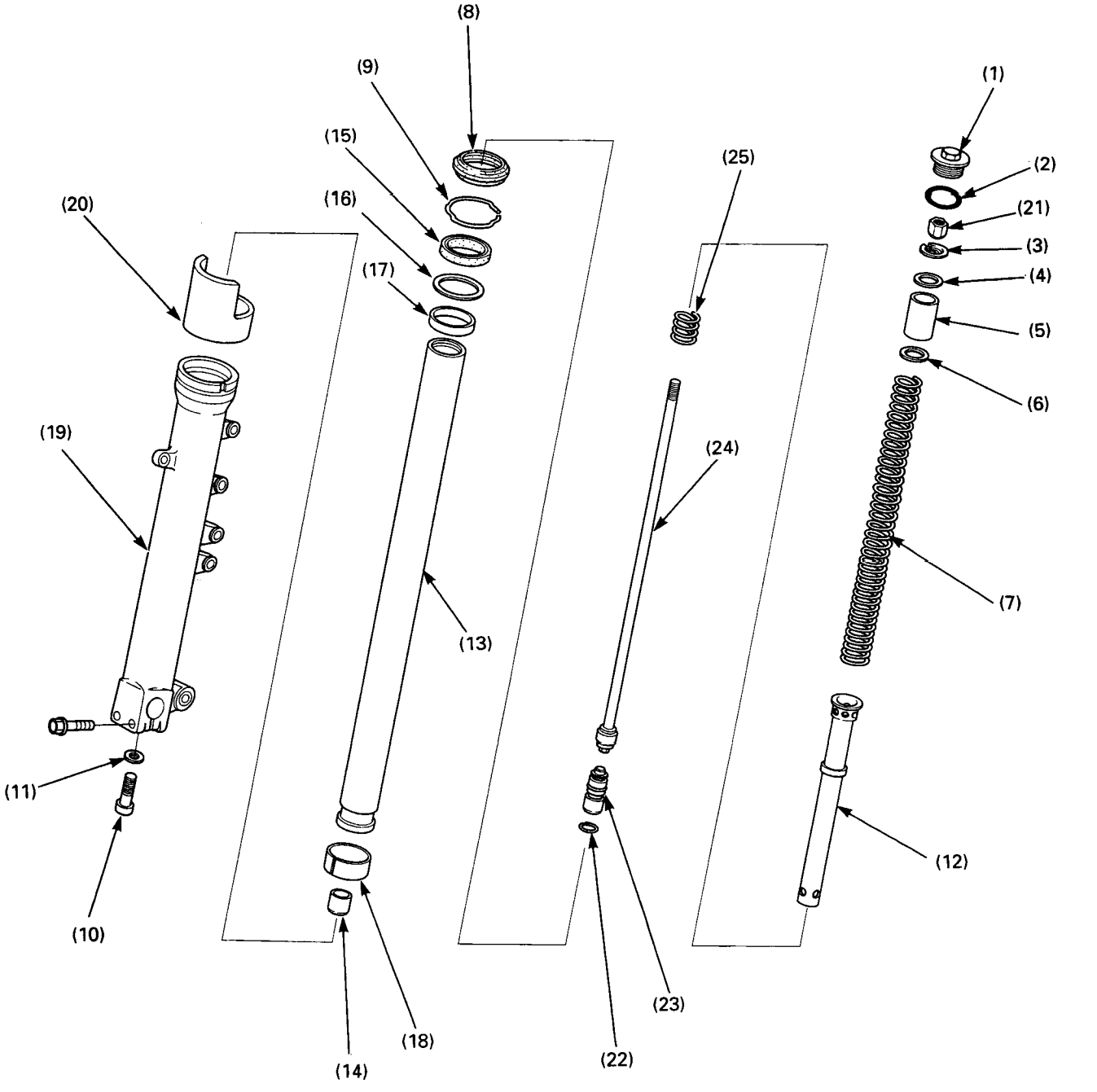
- If the fork legs will be disassembled, loosen the fork cap before removing the fork legs.

Requisite Service

- Front wheel removal/installation (page 11-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Secondary master cylinder mounting bolt	2	
(2)	Secondary master cylinder	1	
(3)	Brake hose joint mounting bolt	1	
(4)	Brake hose joint	1	
(5)	Front fender mounting socket bolt	2	
(6)	Front fender	1	
(7)	Stop ring	2	
(8)	Handlebar pinch flange bolt	2	
(9)	Handlebar assembly	2	
(10)	Fork top pinch socket bolt	2	• Only loosen. • If the fork leg will be disassembled, loosen the fork cap before removing the fork legs.
(11)	Fork bottom pinch socket bolt	2	
(12)	Fork leg	2	At installation, align the fork groove with the top bridge upper surface.

Fork Disassembly



⚠ WARNING

- **The fork cap is under spring pressure. Use care when removing it and wear eye and face protection.**

NOTE

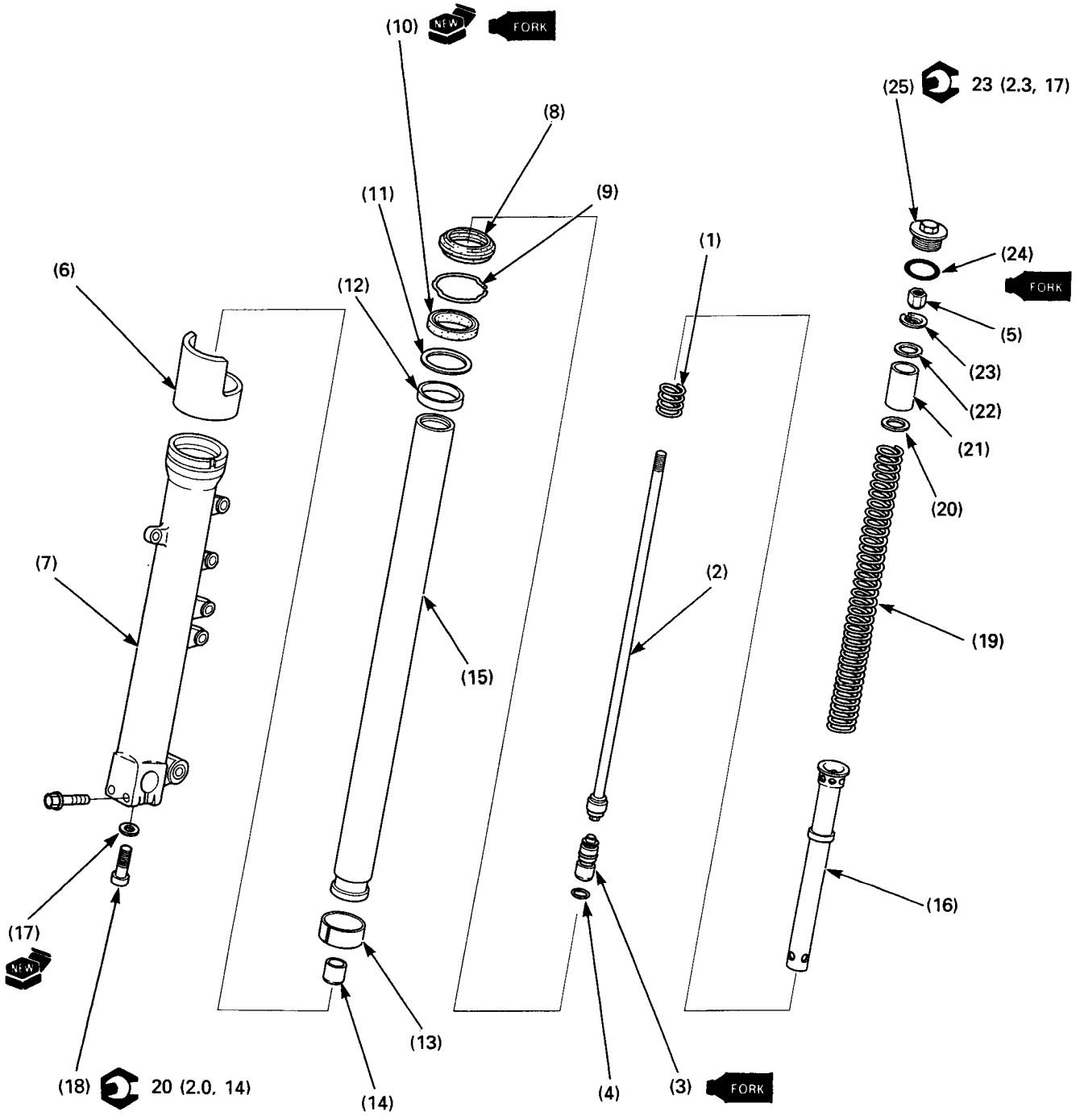
- Temporarily install the fork spring and fork cap, if the socket bolt turns together with the fork piston.
- Always replace oil seal with a new one.

Requisite Service

- Fork removal/installation (page 11-10)

	Procedure	Q'ty	Remarks
	Disassembly Order		
(1)	Fork tube cap	1	Hold the fork damper rod look nut, then remove the fork cap.
(2)	O-ring	1	
(3)	Seat stopper	1	
(4)	Spring seat	1	
(5)	Spring collar	1	
(6)	Spring seat	1	
(7)	Fork spring	1	Pour out the fork oil after removing the fork spring.
(8)	Dust seal	1	
(9)	Stopper ring	1	**CAUTION:** • **Do not scratch the inner fork tube sliding surface.**
(10)	Fork socket bolt	1	
(11)	Sealing washer	1	
(12)	Fork damper assembly	1	
(13)	Fork tube	1	
(14)	Oil lock piece	1	
(15)	Oil seal	1	Remove them from the fork tube.
(16)	Back-up ring	1	
(17)	Slider guide bushing	1	
(18)	Fork tube bushing	1	Do not remove it, unless it is necessary to replace with a new one.
(19)	Fork slider	1	
(20)	Protector	1	
	Fork Damper Disassembly Order		
(21)	Damper rod look nut	1	
(22)	Stopper ring	1	
(23)	Bottom piece	1	
(24)	Damper rod	1	
(25)	Rebound spring	1	

Fork Assembly



NOTE

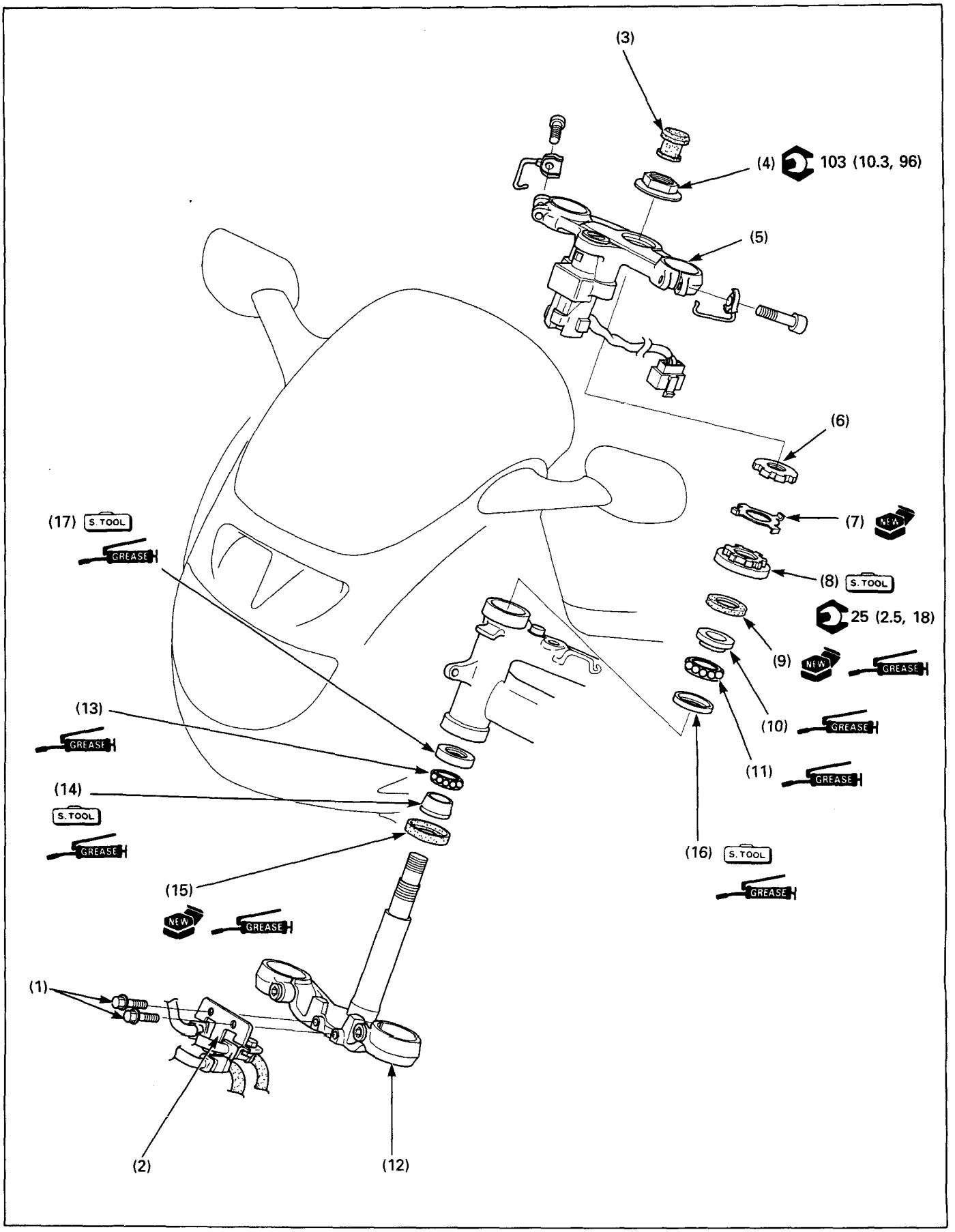
- Always replace the oil seal with a new one.
- Coat a new oil seal with the recommended fork oil and install with its seal mark facing up.
- After installing the fork legs, torque the fork cap.

Requisite Service

- Fork disassembly (page 11-12)
- Fork installation (page 11-10)

	Procedure	Q'ty	Remarks
	Fork Damper Assembly Order		
(1)	Rebound spring	1	
(2)	Damper rod	1	
(3)	Bottom piece	1	
(4)	Stopper ring	1	NOTE • Seat the bottom piece against the stop ring by pushing the piston rod gradually. **CAUTION** • **Do not tap the piston rod end, or the piston rod and bottom piece may damaged.**
(5)	Damper rod lock nut	1	NOTE • Screw the lock nut with its chamfered side facing down. • Screw the lock nut, but do not tighten it.
	Fork Assembly Order		
(6)	Protector	1	
(7)	Fork slider	1	
(8)	Dust seal	1	• Install them onto the fork tube. • Install the back-up ring with its chamfered side facing down. • Use fork seal driver (07947-KA50100) and attachment (07947-KF00100) for fork seal installation.
(9)	Stopper ring	1	
(10)	Oil seal	1	
(11)	Back-up ring	1	
(12)	Fork tube bushing	1	
(13)	Slider guide bushing	1	
(14)	Oil lock piece	1	
(15)	Fork tube	1	
(16)	Fork damper	1	
(17)	Sealing washer	1	
(18)	Fork socket bolt	1	If the fork socket bolt turns together with the fork piston, temporarily install the fork spring and fork cap.
(19)	Fork spring	1	Install the fork spring with the tapered end facing down.
(20)	Spring seat	1	
(21)	Spacer	1	
(22)	Spring seat	1	
(23)	Seat stopper	1	
(24)	O-ring	1	Apply oil to the new O-ring.
(25)	Fork tube cap	1	NOTE • Make sure the distance between the lock nut and the top of the damper rod 1.5mm (0.14in). • Screw the fork cap until it seats on the damper rod lock nut, then hold the lock nut and tighten the fork cap to the specified torque. **CAUTION** • **Be careful not to cross-thread the fork tube cap.** • **Screw in the fork cap, but do not tighten yet.**

Steering Stem Removal/Installation



NOTE

- Replace the bearings and races as a set.
- At installation, apply grease to all bearing area.

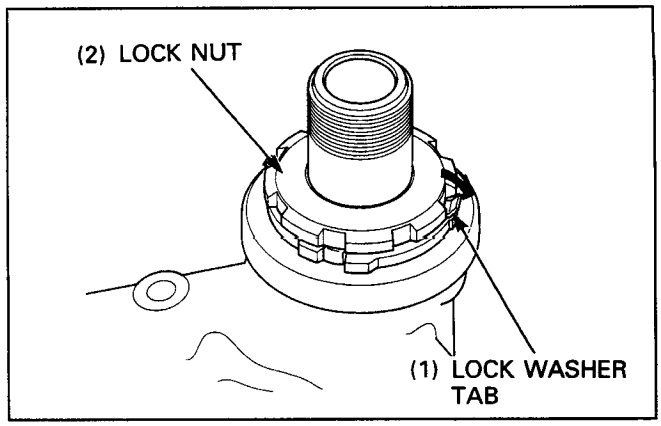
Requisite Service

- Fork removal/installation (page 11-10)
- Handlebar removal/installation (page 11-2,4)

	Procedure	Q'ty	Remarks
	Removal Order		
(1)	Brake hose bracket mounting bolt	2	
(2)	Brake hose bracket assembly	1	
(3)	Stem nut cap	1	
(4)	Stem nut	1	
(5)	Top bridge	1	
(6)	Lock nut	1	Bend straight the tabs of the look washer, then remove.
(7)	Lock washer	1	
(8)	Bearing adjustment nut	1	Removal/installation (page 11-18)
(9)	Dust seal	1	
(10)	Upper bearing inner race	1	
(11)	Upper bearing	1	
(12)	Steering stem	1	
(13)	Lower bearing	1	
(14)	Lower bearing inner race	1	
(15)	Dust seal	1	
(16)	Upper bearing outer race	1	Use ball race remover (07953-MJ10000).
(17)	Lower bearing outer race	1	Use bearing race remover (07946-3710500).
	Installation Order		
(17)	Lower bearing outer race	1	Use driver (07749-0010000) and attachment 52×55mm (07746-0010400).
(16)	Upper bearing outer race	1	Use driver (07749-0010000) and attachment 42×47mm (07746-0010300).
(15)	Dust seal	1	
(14)	Lower bearing inner race	1	Use steering stem driver (07946-MB00000) for installation.
(13)	Lower bearing	1	
(12)	Steering stem	1	
(11)	Upper bearing	1	
(10)	Upper bearing inner race	1	
(9)	Dust seal	1	
(8)	Bearing adjustment nut	1	See page 11-18 for tightening procedure.
(7)	Lock washer	1	
(6)	Lock nut	1	
(5)	Top bridge	1	
(4)	Stem nut	1	Temporarily install the fork legs and torque the nut.
(3)	Stem nut cap	1	
(2)	Brake hose bracket assembly	1	
(1)	Brake hose bracket mounting bolt	2	

Bearing Adjustment Nut Removal

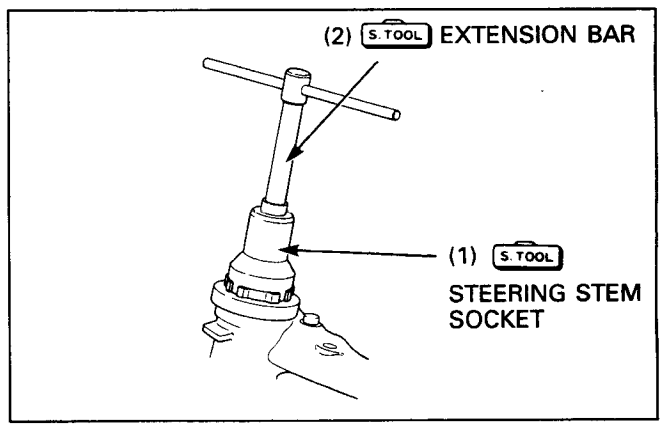
Bend the tabs of the lock washer straight and then remove the lock nut and lock washer.



Remove the steering stem adjustment nut.

S.TOOL

Steering stem socket	**07916-3710101**
Extension bar	**07716-0020500**



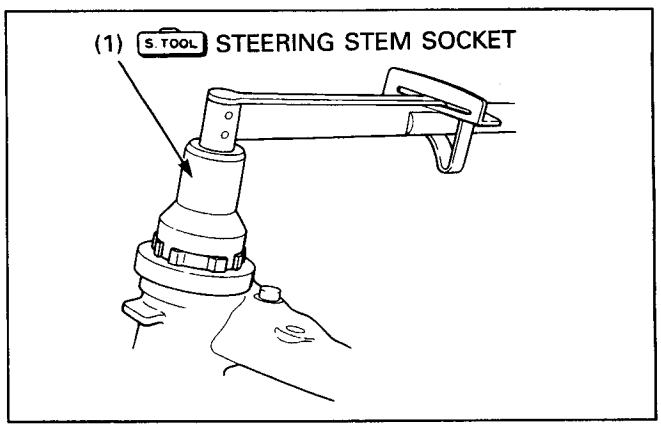
Bearing Adjustment Nut Installation

Apply clean engine oil to the bearing adjustment nut threads.
Install and tighten the adjustment nut to the specified torque.

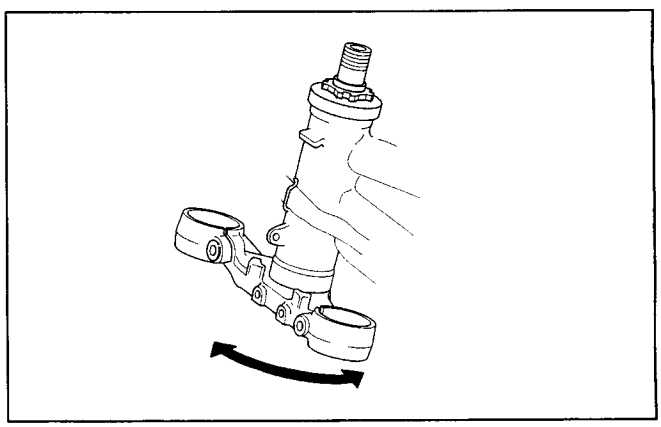
S.TOOL

Steering stem socket	**07916-3710101**

Torque: 25 N• m (2.5 kg-m, 18 ft-lb)

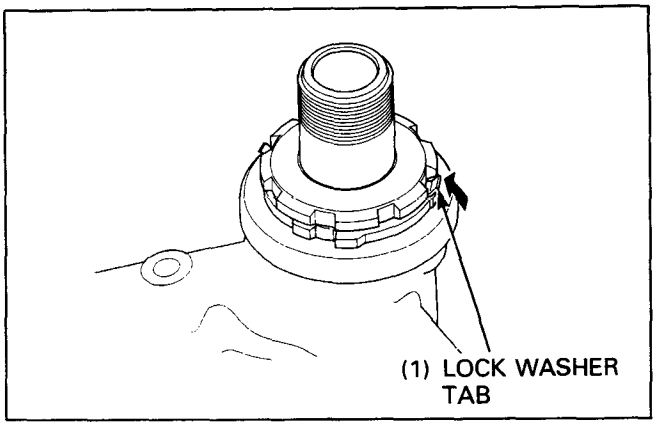


Turn the steering stem lock to lock at lease five times, then retighten the steering adjustment nut to the specified torque.



Install the new lock washer onto the steering stem.
Align the tabs of the lock washer with the grooves in the adjustment nut and bend two opposite tabs (shorter) down into the adjustment nut groove.

Install and finger tighten the lock nut.
Hold the lock nut and further tighten the lock nut within 1/4 turn (90°) enough to align its grooves with the lock washer tabs.
Bend the lock washer tabs up into the lock nut grooves.



12. Rear Wheel/Suspension

Service Information

⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

- When servicing the rear wheel, place the motorcycle on its center stand.
- Refer to the section 13 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".

Troubleshooting

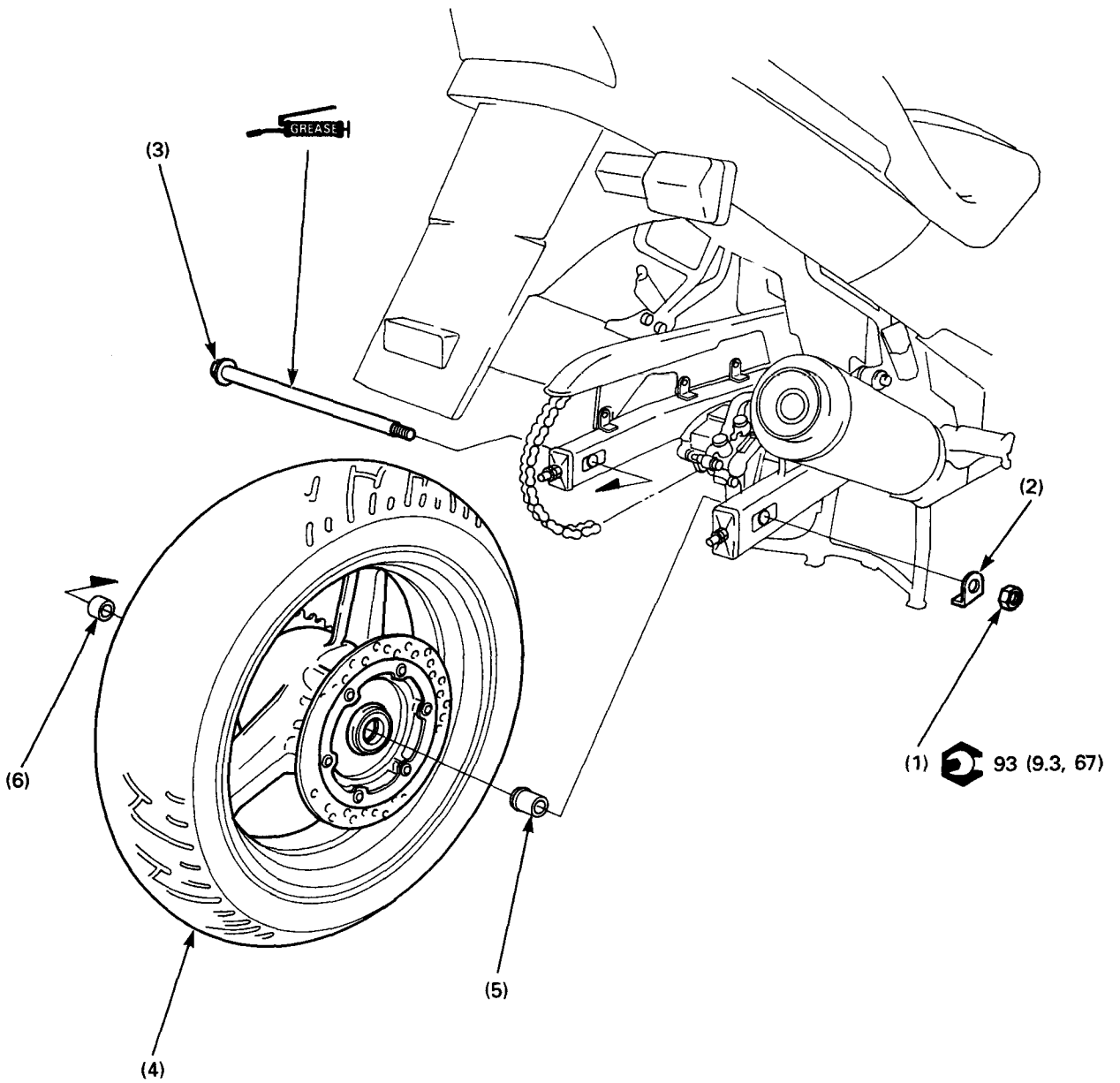
Soft Suspension
- Weak shock absorber spring
- Oil leakage from damper unit
- Low tire pressure

Hard Suspension
- Damaged shock absorber mount bushing
- Bent damper rod
- Damaged swingarm pivot bearings
- Bent swingarm pivot
- High tire pressure

Steers To One Side Or Dose Not Track Straight
- Bent rear axle.
- Axle alignment/chain adjustment not equal on both sides

Rear Wheel Wobbling
- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Low tire pressure
- Faulty swingarm pivot bearing(s)

Rear Wheel Removal/Installation



⚠ WARNING

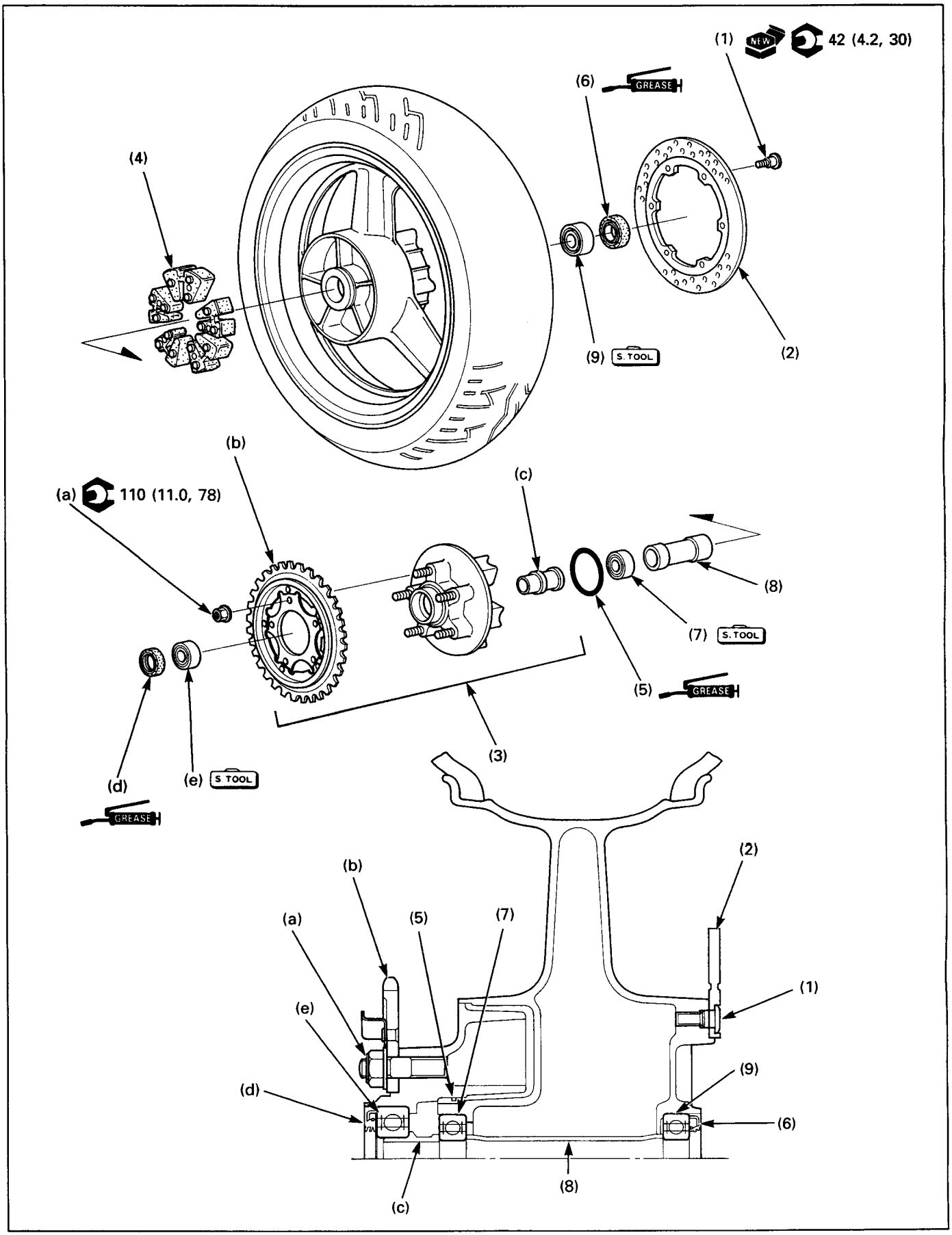
- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

NOTE

- When servicing the rear wheel, place the motorcycle on its center stand.
- Do not operate the brake pedal or lever after the rear wheel is removed.
- Adjust the drive chain free play after installing the wheel.

	Procedure	O'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Rear axle nut	1	• Loosen the drive chain adjuster fully, then remove the axle nut. • Move the rear wheel forward, and derail the drive chain from the driven sprocket.
(2)	Rear axle washer	1	
(3)	Rear axle	1	
(4)	Rear wheel	1	
(5)	Right side collar	1	
(6)	Left side collar	1	

Rear Wheel Disassembly/Assembly



⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

NOTE

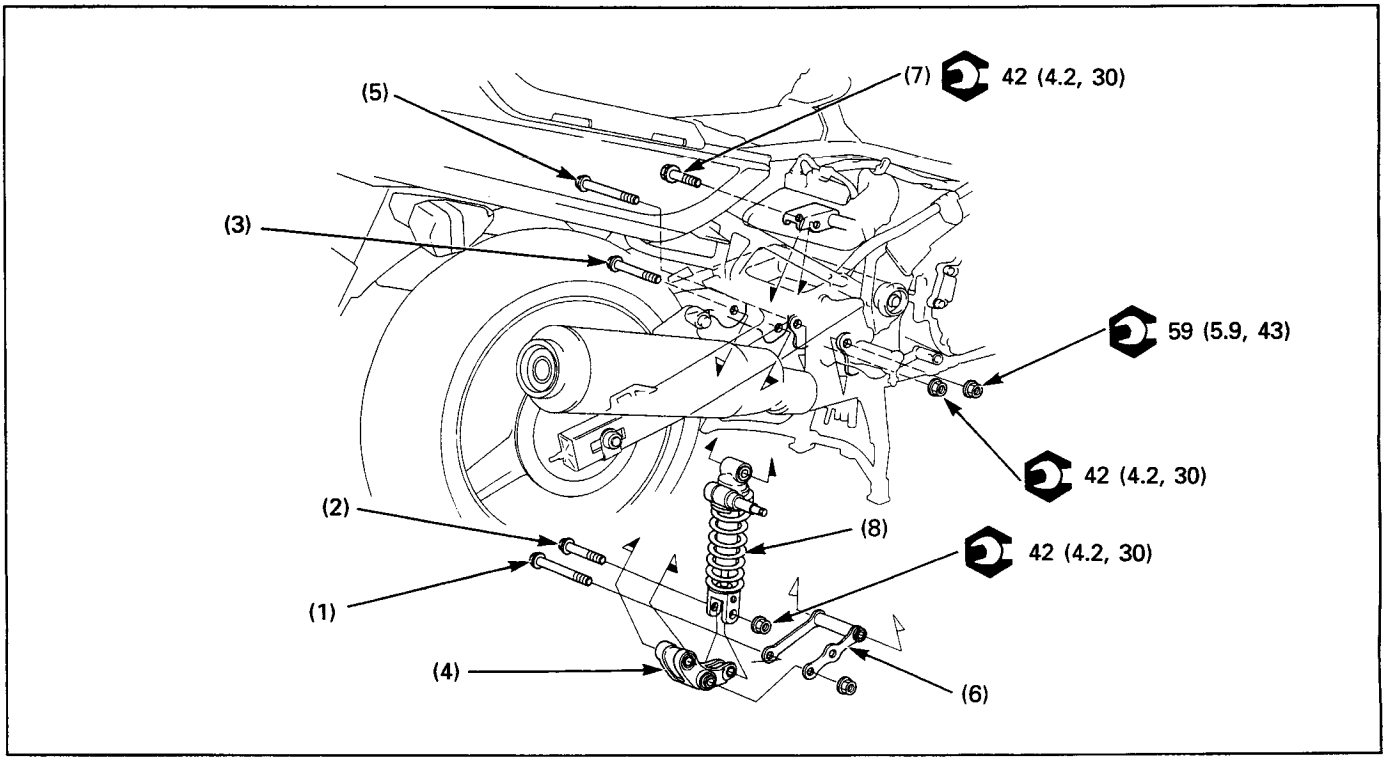
- Replace the wheel bearings in pairs.
- Do not add more than 60 grams of balance weight to the wheel.

Requisite Service

- Rear wheel removal/installation (page 12-2)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Brake disc mounting bolt	6	
(2)	Brake disc	1	At installation, install the disc with its "⇨DRIVE" mark facing out.
(3)	Driven flange assembly	1	
	Driven Flange Disassembly Order		
(a)	Driven sprocket nut	5	Temporarily install the driven flange into the wheel hub, then remove the nuts.
(b)	Driven sprocket	1	
(c)	Rear axle sleeve	1	
(d)	Dust seal	1	
(e)	Driven flange bearing (62/22)	1	
(4)	Damper rubber	5	
(5)	O-ring, 69 x 2 mm	1	
(6)	Right dust seal	1	
(7)	Left wheel bearing (6304 UU)	1	
(8)	Distance collar	1	
(9)	Right wheel bearing (6304 UU)	1	NOTE • Drive in the right side bearing first, then the left side bearing.

Suspension Linkage/Shock Absorber Removal/Installation



NOTE

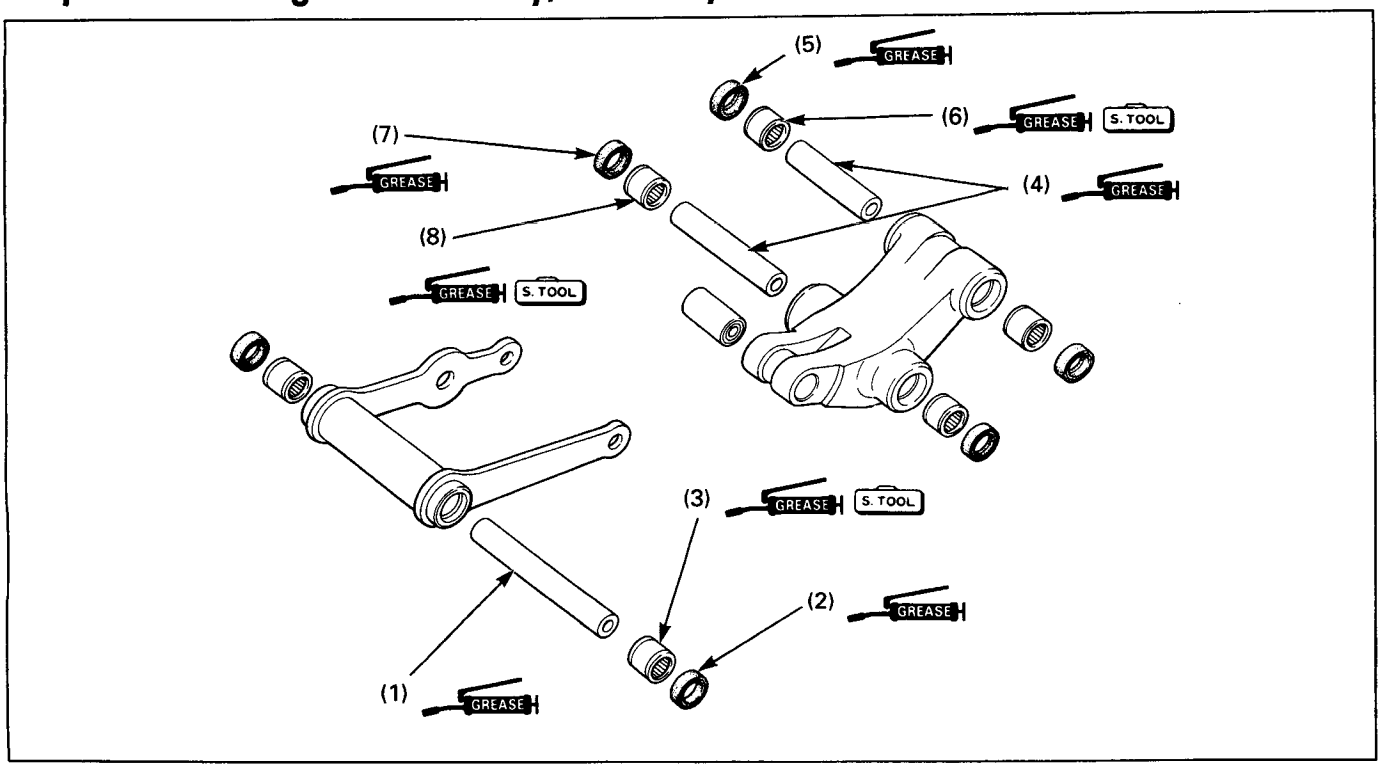
- When removing the shock linkage and shock absorber, place the motorcycle on its center stand.

Requisite Service

- Side cover removal/installation (page 2-3)
- Pivot under cover removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Shock link-to-shock arm bolt/nut	1/1	
(2)	Shock absorber lower mounting bolt/nut	1/1	
(3)	Shock arm-to-swingarm bolt/nut	1/1	
(4)	Shock arm	1	
(5)	Shock link-to-frame bolt/nut	1/1	
(6)	Shock link	1	
(7)	Shock absorber upper mounting bolt	1	
(8)	Shock absorber	1	**CAUTION** • **Do not disassemble the shock absorber.**

Suspension Linkage Disassembly/Assembly



Requisite Service

- Suspension linkage removal/installation (page 12-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Shock link pivot collar	1	
(2)	Oil seal, 17 x 27 x 5 mm	2	
(3)	Needle bearing, 17 x 24 x 25 mm	2	
(4)	Shock arm pivot collar	2	
(5)	Oil seal, 17 x 27 x 5 mm	2	
(6)	Needle bearing, 17 x 24 x 20 mm	2	
(7)	Dust seal	2	
(8)	Needle bearing	2	

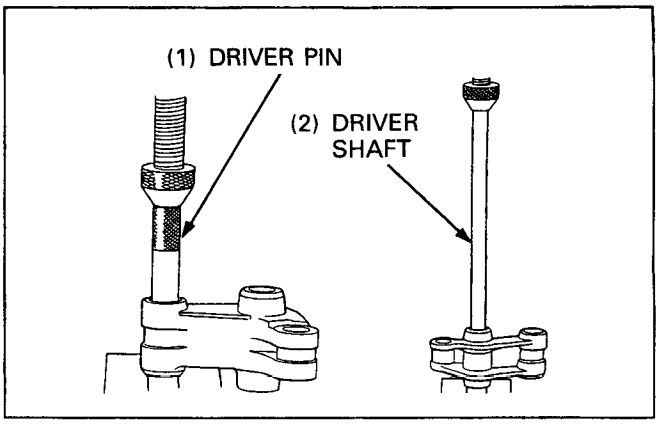
Shock Arm Needle Bearing Replacement

Removal

Press the needle bearing out of the shock arm using the special tools.

S. TOOL

Swingarm side:	
Driver pin	**07GMD–KT80100**
Shock link side:	
Driver shaft	**07946–MJ00100**



Installation

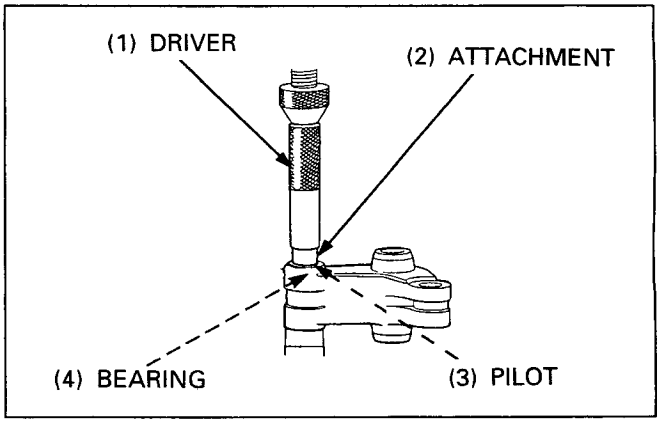
Apply grease to the new needle bearings.
Press the needle bearings into the shock arm using the special tools.

S. TOOL

Driver	**07749–0010000**
Attachment, 24 x 26 mm	**07746–0010700**
Pilot, 17 mm	**07746–0040400**

NOTE

- Press the needle bearing into the shock arm with the marked side facing out.



Shock Link Needle Bearing Replacement

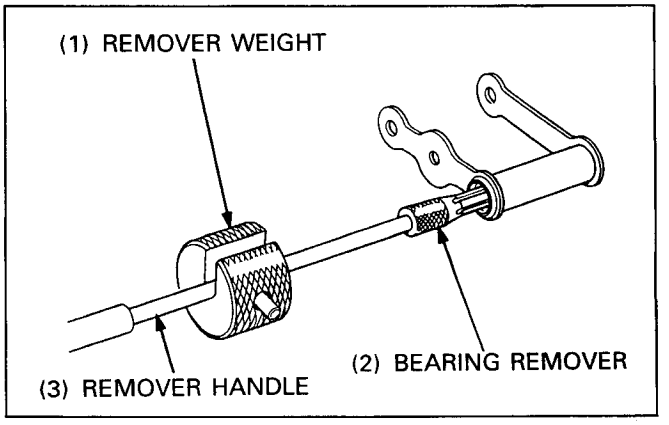
Removal

Remove the pivot collars and dust seals.

Remove the needle bearing using the special tools.

S. TOOL

Bearing remover	**07936–3710300**
– Remover handle	**07936–3710100**
– Remover weight	**07741–0010201**



Installation

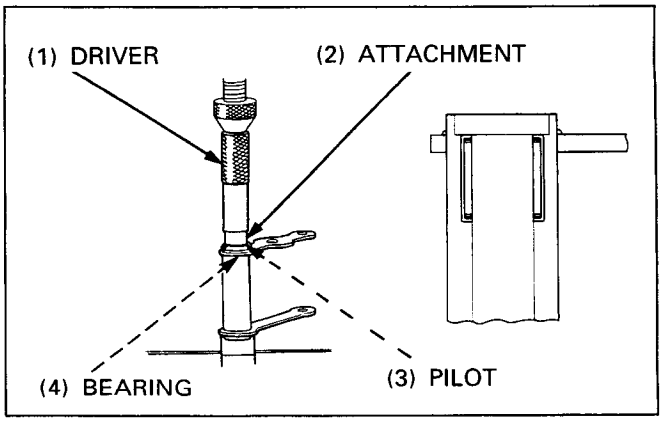
Apply grease to the new needle bearings.
Press new needle bearings into the shock link.

S. TOOL

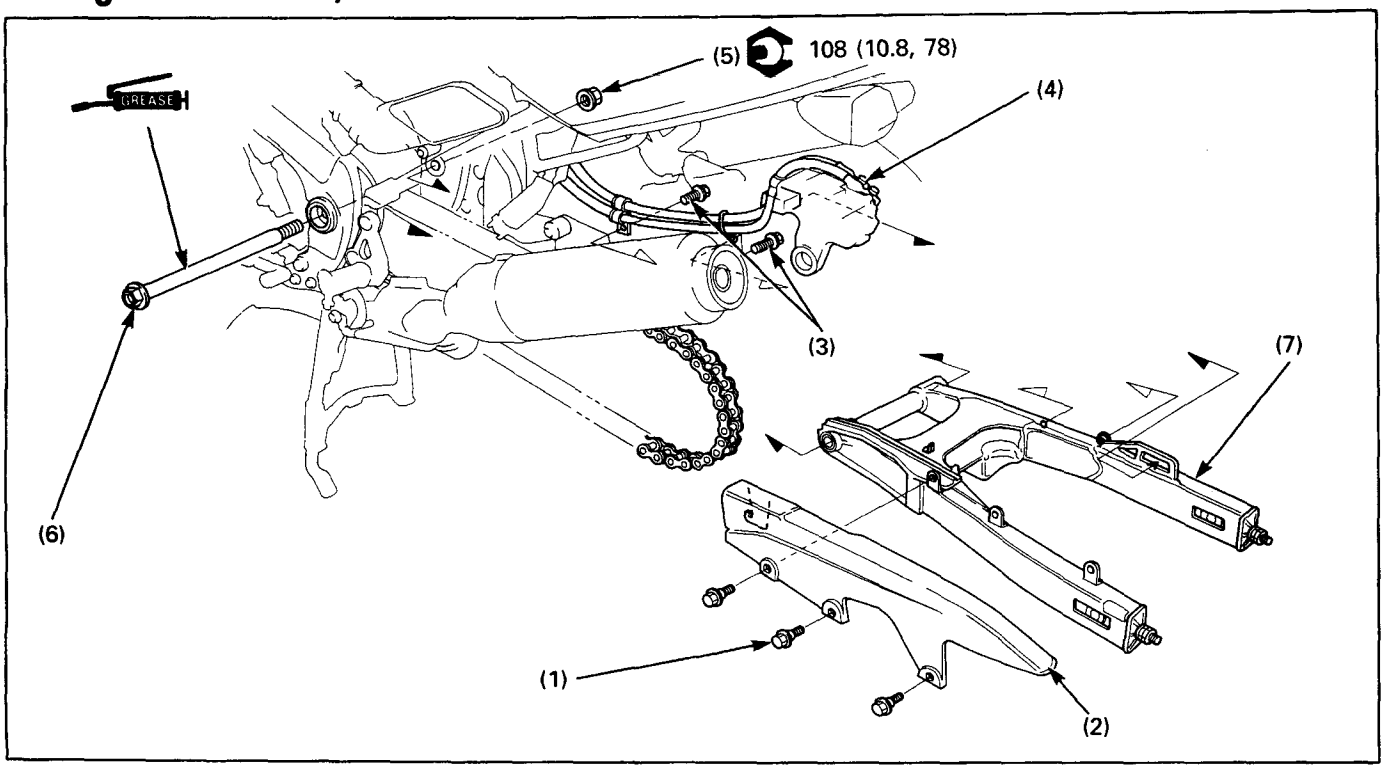
Driver	**07749–0010000**
Attachment, 24 x 26 mm	**07746–0010700**
Pilot, 17 mm	**07746–0040400**

NOTE

- Press the needle bearing into the shock link with the marked side facing out.



Swingarm Removal/Installation



NOTE

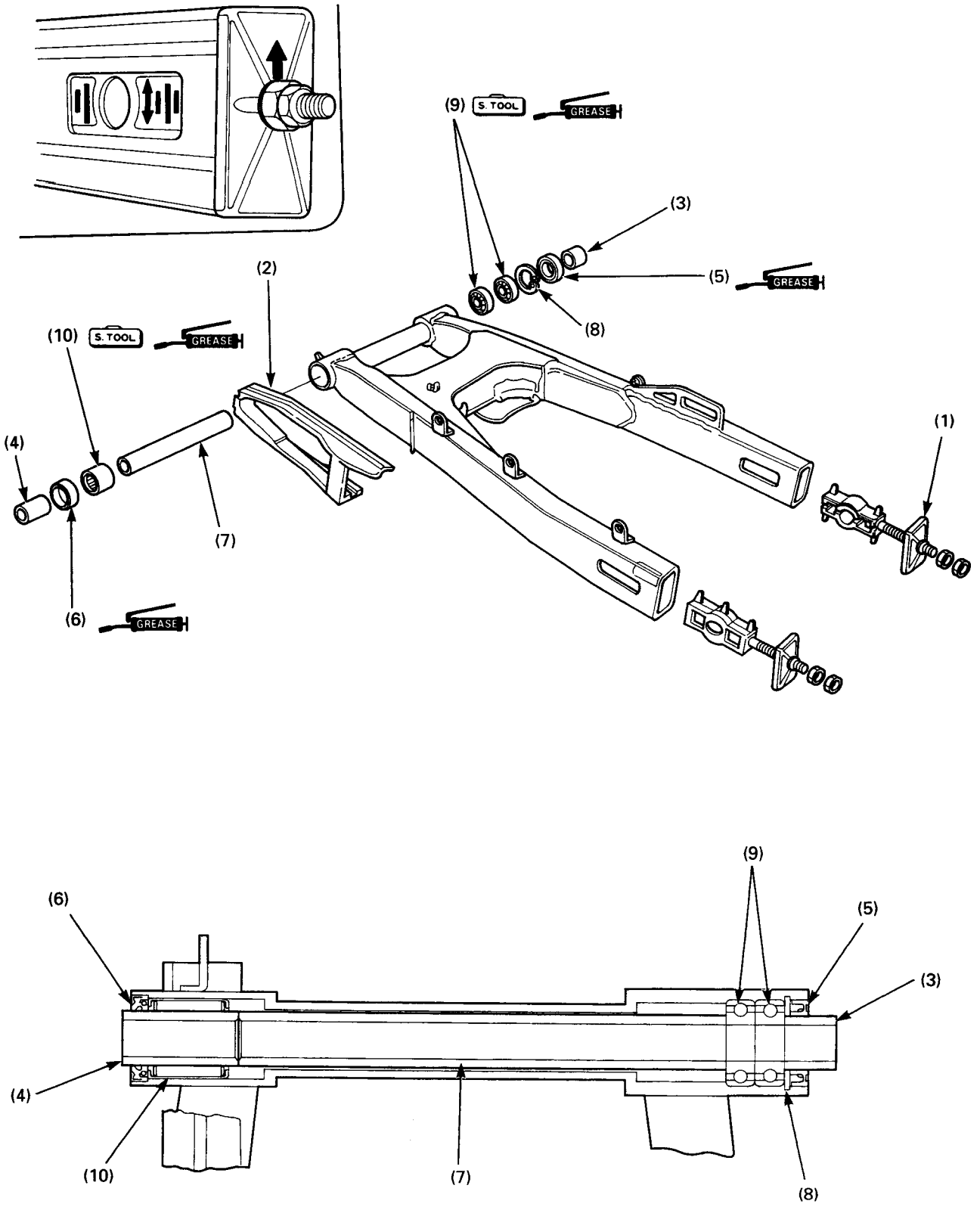
- Apply thin layer of grease to the swingarm pivot surface.

Requisite Service

- Rear wheel removal/installation (page 12-2)
- Shock absorber removal/installation (page 12-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Drive chain case bolt	3	
(2)	Drive chain case	1	
(3)	Brake hose clamp bolt	2	
(4)	Brake hose/brake caliper	1	
(5)	Swingarm pivot nut	1	
(6)	Swingarm pivot bolt	1	
(7)	Swingarm	1	

Swingarm Disassembly/Assembly



Requisite Service

- Swingarm removal/installation (page 12-9)

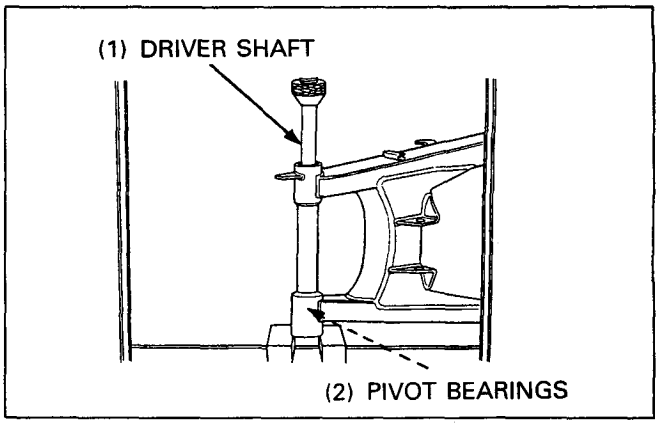
	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Drive chain adjuster	1	NOTE • Install the adjuster with its "UP" mark facing up and the index mark facing out.
(2)	Drive chain slider	1	
(3)	Right pivot collar	1	
(4)	Left pivot collar	1	
(5)	Right dust seal, 22 x 35 x 7 mm	1	
(6)	Left dust seal, 22 x 31 x 5 mm	1	
(7)	Distance collar	1	
(8)	Snap ring	1	
(9)	Radial bearing (6202)	2	Refer to page 12-12 for replacement.
(10)	Needle bearing	1	

Swingarm Pivot Bearing Replacement

Press the right pivot bearings (radial ball bearing) out of the swingarm.

S. TOOL

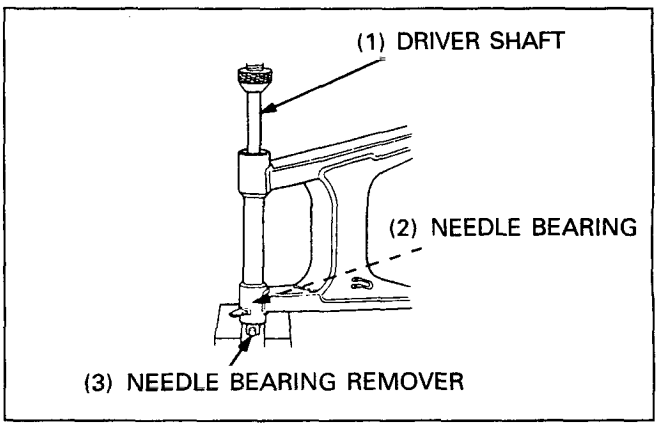
Driver shaft	**07946-MJ00100**



Press the left pivot bearings (needle bearing) out of the swingarm.

S. TOOL

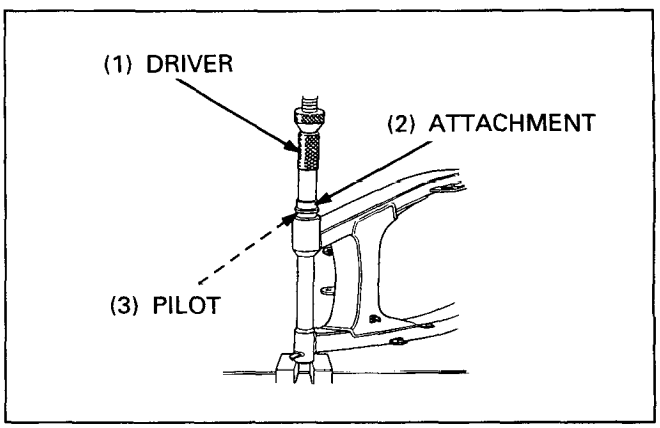
Needle bearing remover	**07GMD-KT70200**
Driver shaft	**07946-MJ00100**



Apply grease to the new needle bearing.
Press a new needle bearing into the left swingarm pivot.

S. TOOL

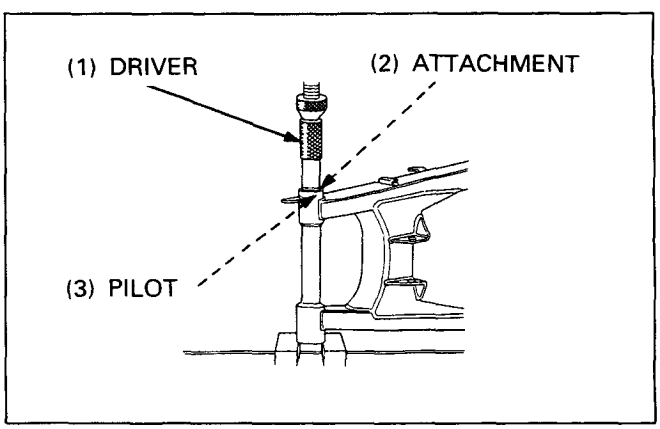
Driver	**07749-0010000**
Attachment, 28 x 30 mm	**07946-1870100**
Pilot, 22 mm	**07746-0041000**



Pack all bearing cavity with grease.
Press new right pivot bearings into right swingarm pivot.

S. TOOL

Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot,15 mm	**07746-0040300**



13. Brake System

Service Information

⚠ WARNING

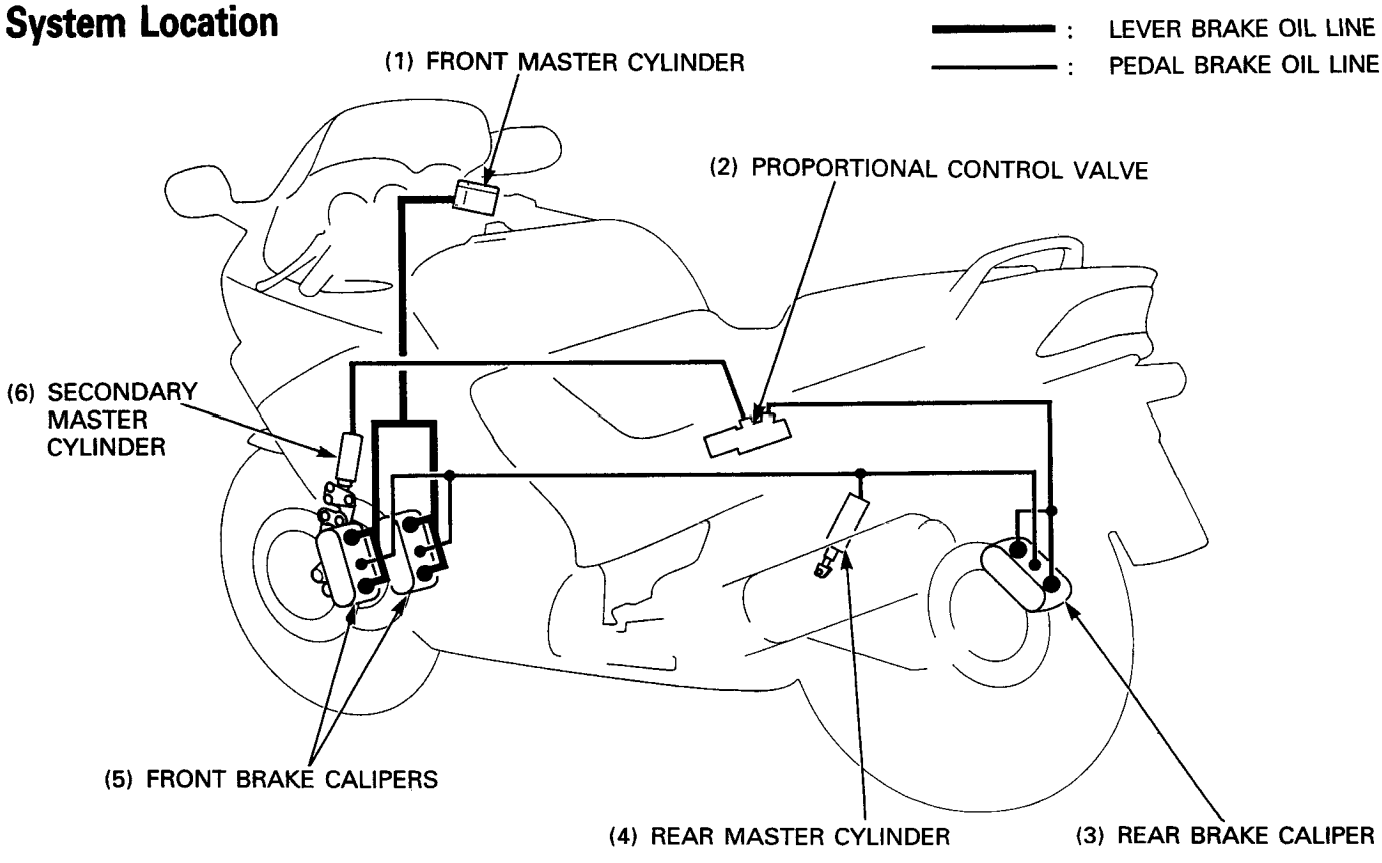
- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

CAUTION

- **The CBR1000F equipped Dual Combined Brake System. Must be follow the system air bleeding procedure (page 13-25) if you disconnect or service the any brake hydraulic system.**
- **Do not disassemble the secondary master cylinder push rod or the correct brake performance is not obtained.**

- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap: make sure the front reservoir is horizontal first.
- Never allow contaminations (dirt, water, etc.) to get into and open reservoir.
- Once the hydraulic system has been opened, or if the brake feel spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle.

System Location

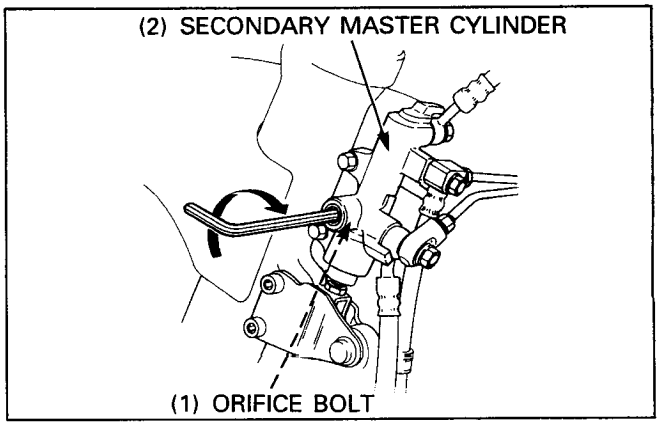


Troubleshooting

CAUTION

- **The Dual Combined Brake System simultaneously engage both front and rear brakes when either the front brake lever or rear brake pedal is applied. Always follow the troubleshooting procedures when you starting troubleshooting.**

Check the following items before you start troubleshooting.
1. No problem in suspension components.
2. System air bleeding is completely done.
3. After air bleeding, secondary master cylinder orifice bolt is tightened securely.



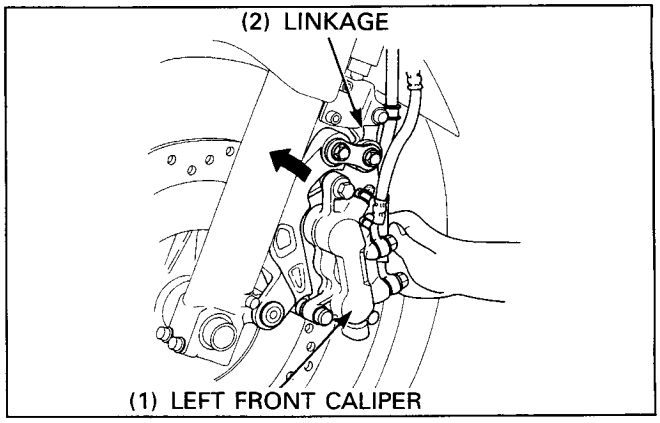
CAUTION

- **If the orifice bolt is loosened, feel vibration when you start applying the brake pedal.**

4. Check that the secondary master cylinder link operation.

Push the left front brake caliper by hand, check the smooth operation.

If the link is not smooth or excessive play, inspect the following:
- Worn or damaged link bearing
- Loose linkage mounting bolt
- Sticking or damaged secondary master cylinder piston



Poor Lever/Pedal Brake Performance
- Air in hydraulic system
- Low fluid level
- Leaking hydraulic system
- Improper break-in front and rear brake discs or pads
- Clogged fluid passage
- Contaminated brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Worn or damaged brake pad/disc
- Worn caliper piston seal
- Worn master cylinder cups
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Warped/deformed brake disc
- Damaged wheel
- Caliper not sliding properly
- Bent brake lever/pedal

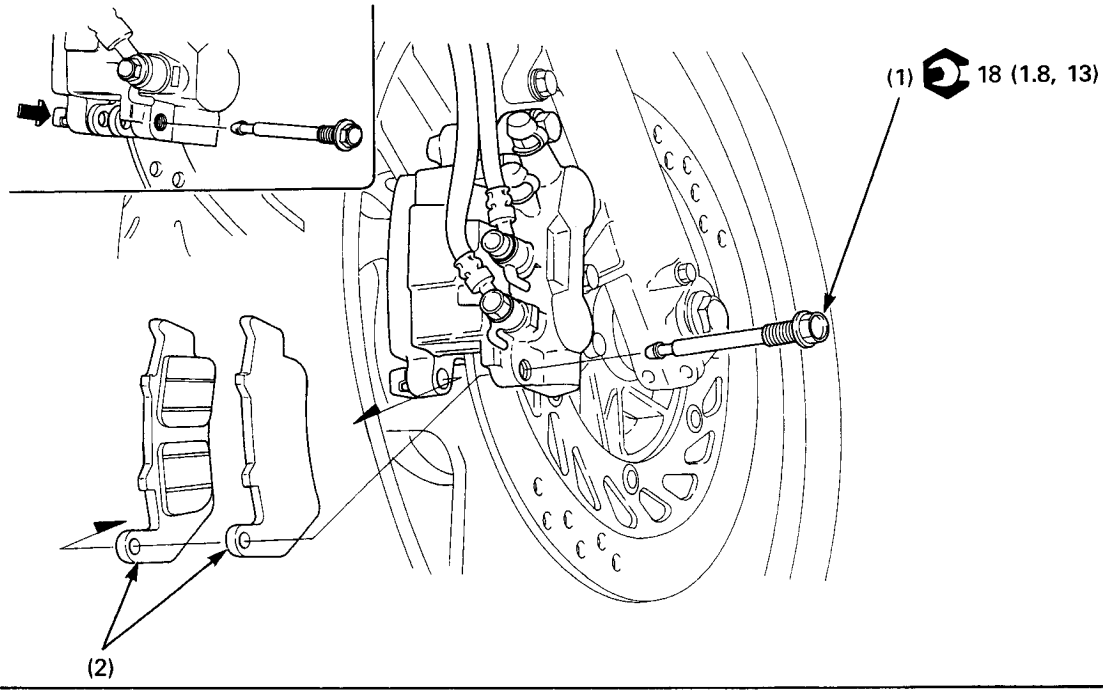
Above items are normal but still poor performance, check for nose dive during braking. If the nose dive eccessive, check for secondary master cylinder hydraulic system.

Brake Lever/Pedal Hard
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal
- Sticking/worn brake lever or brake pedal pivot

Brake Drags
- Contaminated brake pad/disc
- Misaligned wheel
- Worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Improper secondary master cylinder push rod installed length
- Clogged/restricted brake hydraulic system
- Clogged secondary master cylinder oil orifice (rear wheel drags)
- Sticking/worn caliper piston
- Clogged master cylinder port

First locking the rear wheel when only the brake lever is applied/ First locking the front wheel when only the brake pedal is applied (In the case that all items are normal in "Poor Lever/Pedal Brake Performance")
- Improper secondary master cylinder push rod installed length
- Faulty PCV (Proportional Control Valve)

Front Brake Pad Replacement



⚠ WARNING

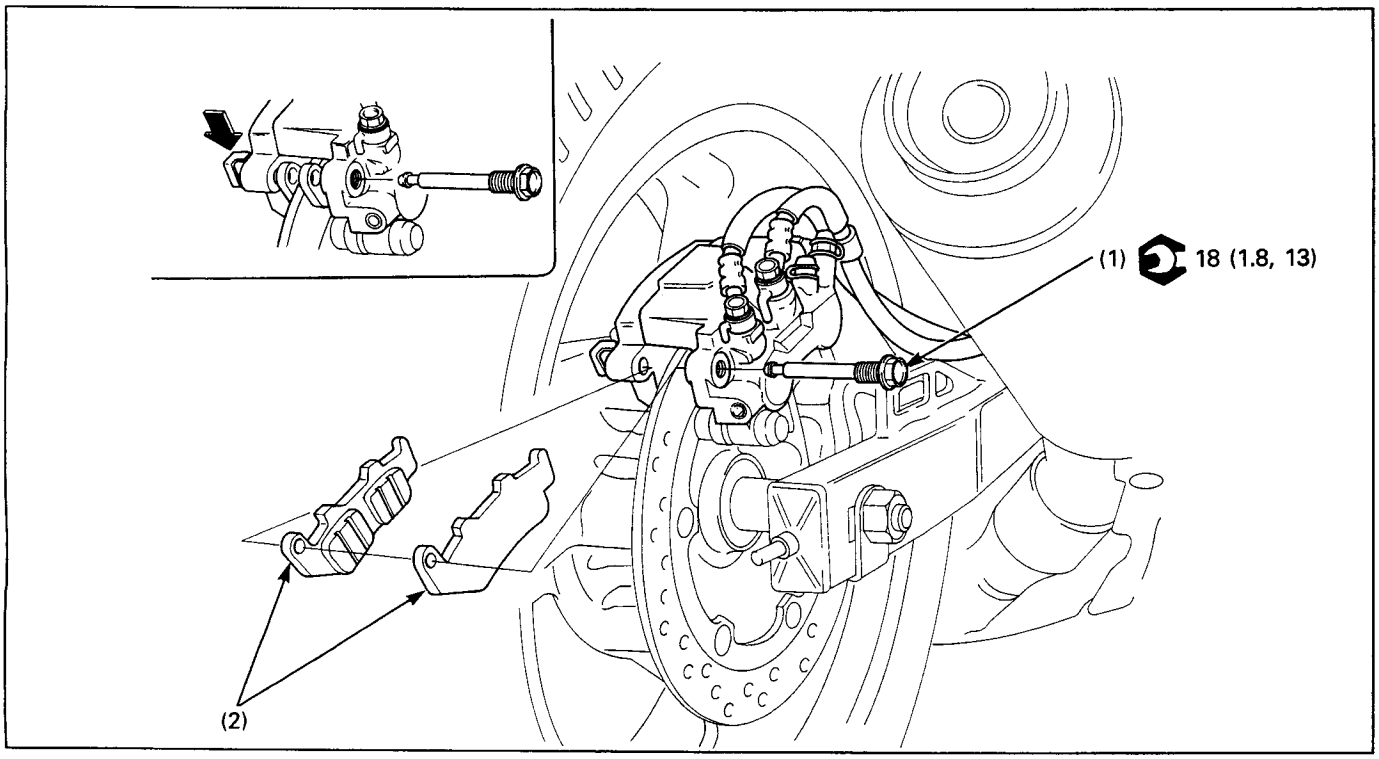
- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**
- **Check the brake system by applying the brake lever and pedal after pad replacement.**

NOTE

- The brake pad replacement can be serviced without disconnecting the hydraulic system.
- Clean the caliper inside especially around the caliper pistons before installing the brake pads.
- Always replace the brake pads in pairs to assure even disc pressure.
- Operate the brake lever and pedal to seat the caliper pistons against the pads after the pad replacement.

	Procedure	O'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Pad pin bolt	1	At removal, remove the pad pin while pushing the retainer.
(2)	Brake pad	2	

Rear Brake Pad Replacement



⚠ WARNING

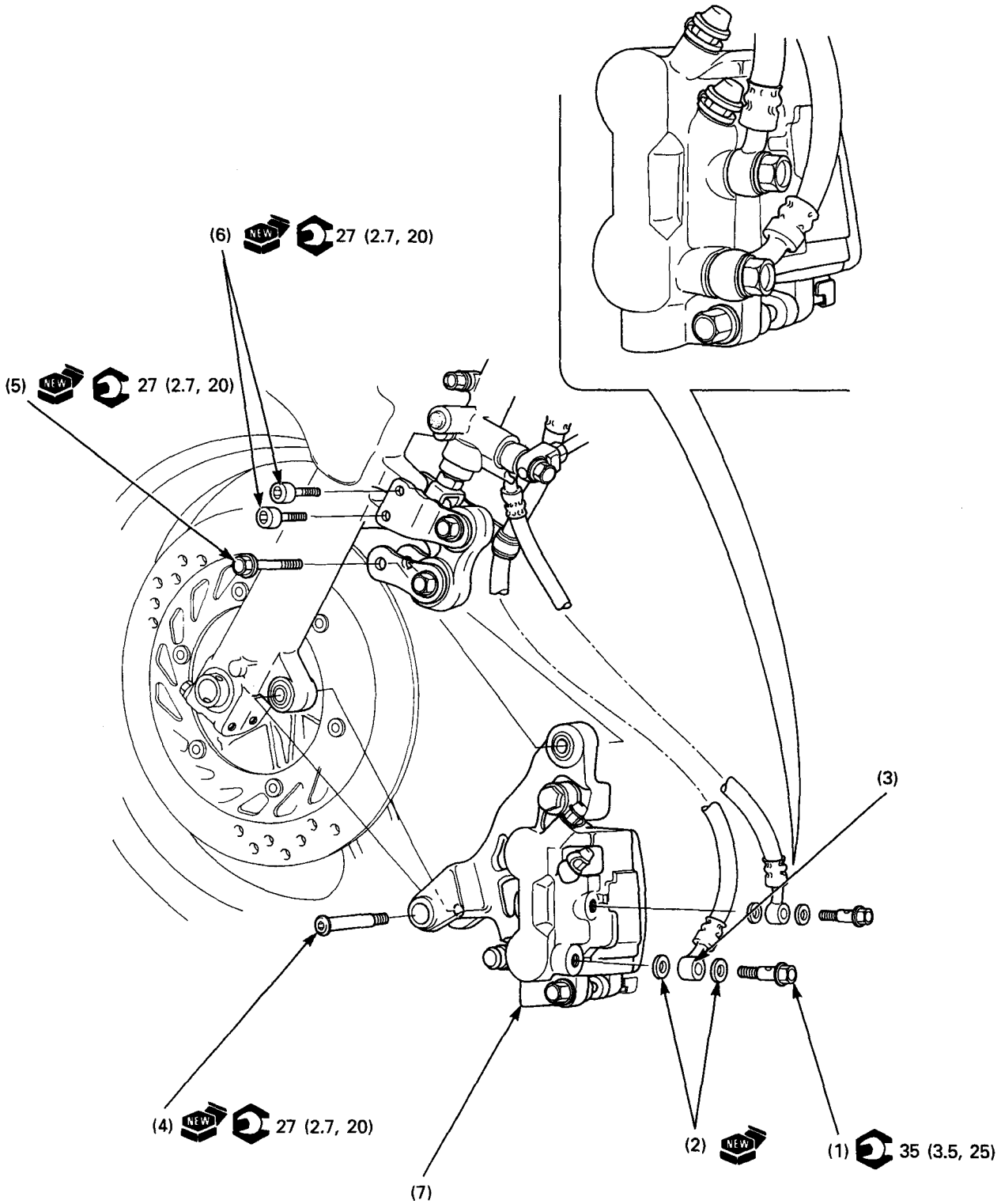
- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**
- **Check the brake system by applying the brake pedal after pad replacement.**

NOTE

- The brake pad replacement can be serviced without disconnecting the hydraulic system.
- Clean the caliper inside especially around the caliper pistons before installing the brake pads.
- Always replace the brake pads in pairs to assure even disc pressure.
- Operate the brake pedal to seat the caliper piston against the pads after the pad replacement.

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Pad pin bolt	1	At removal, remove the pad pin while pushing the retainer.
(2)	Brake pad	2	

Left Front Brake Caliper Removal/Installation



⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

CAUTION

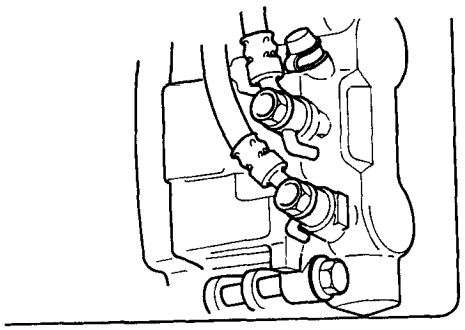
- **Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.**

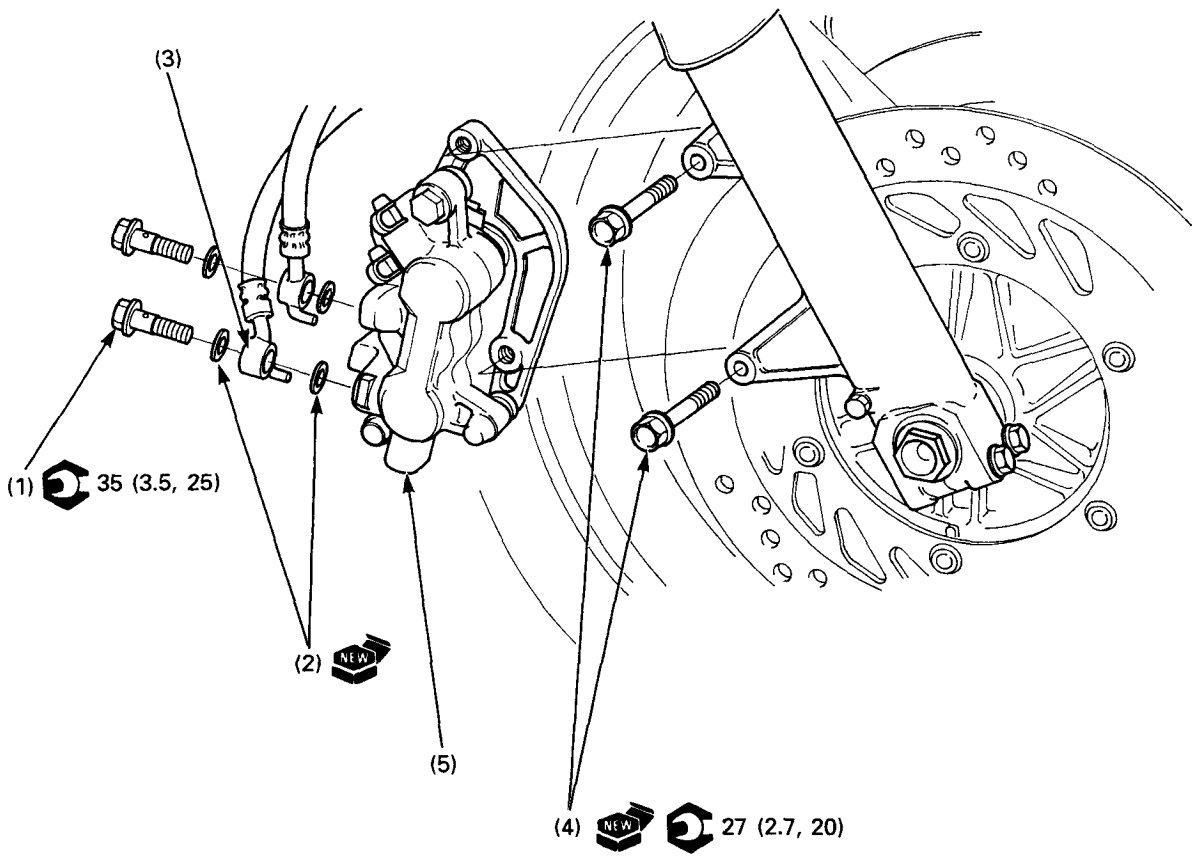
Requisite Service

- Front brake pad replacement (page 13-4)
- Brake system air bleeding (page 13-25)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	2	
(2)	Sealing washer	4	
(3)	Brake hose eyelet joint	2	At installation, press the eyelet joint against the stopper while tightening the oil bolt.
(4)	Caliper lower mounting socket bolt	1	
(5)	Caliper upper mounting flange bolt	1	
(6)	Secondary master cylinder bracket bolt	2	
(7)	Left front brake caliper assembly	1	

Right Front Brake Caliper Removal/Installation





⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

CAUTION

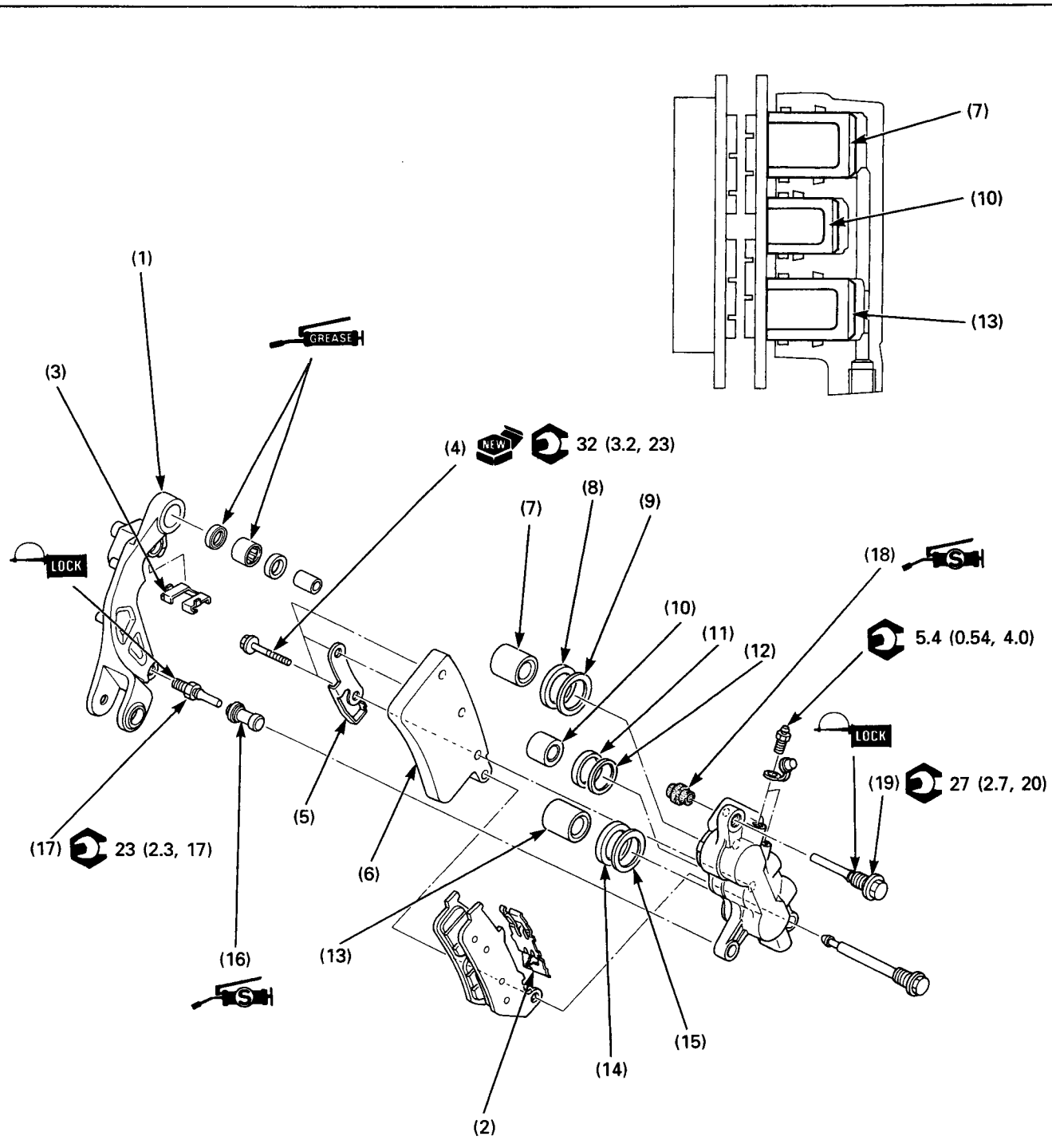
- **Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.**

Requisite Service

- Front brake pad replacement (page 13-4)
- Brake system air bleeding (page 13-25)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	2	
(2)	Sealing washer	4	
(3)	Brake hose eyelet joint	2	At installation, press the eyelet joint stopper pin against the caliper body while tightening the oil bolt.
(4)	Caliper mounting flange bolt	2	
(5)	Right front brake caliper assembly	1	

Front Brake Caliper Disassembly/Assembly



NOTE

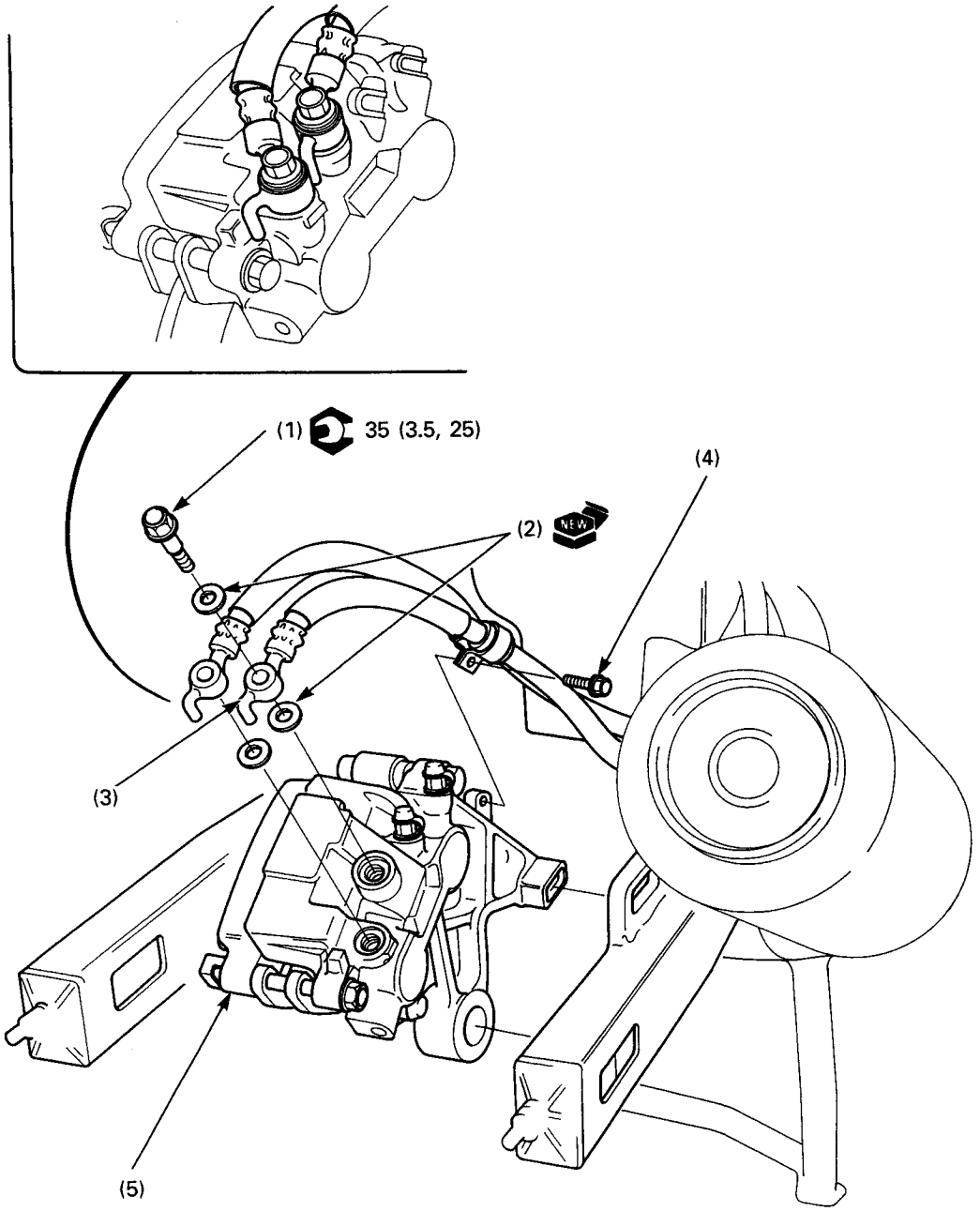
- Note the location and direction of the caliper pistons, dust seals and piston seals.
- Replace the caliper piston seals and dust seals as a set.

Requisite Service

- Left front brake caliper removal/installation (page 13-6)
- Right front brake caliper removal/installtion (page13-8)

	Procedure	O'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Caliper bracket	1	
(2)	Brake pad spring	1	
(3)	Brake pad retainer	1	
(4)	Caliper body B mounting bolt	3	
(5)	Retainer	1	
(6)	Caliper body B	1	
(7)	Caliper piston (O.D. 27.0 mm)	1	
(8)	Dust seal	1	Apply silicone grease to the new dust seals.
(9)	Piston seal	1	
(10)	Caliper piston (O.D. 22.6 mm)	1	
(11)	Dust seal	1	
(12)	Piston seal	1	
(13)	Caliper piston (O.D. 25.4 mm)	1	
(14)	Dust seal	1	
(15)	Piston seal	1	
(16)	Bracket pin boot	1	
(17)	Bracket pin bolt	1	
(18)	Caliper pin boot	1	
(19)	Caliper pin bolt	1	

Rear Brake Caliper Removal/ Installation



⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.**

CAUTION

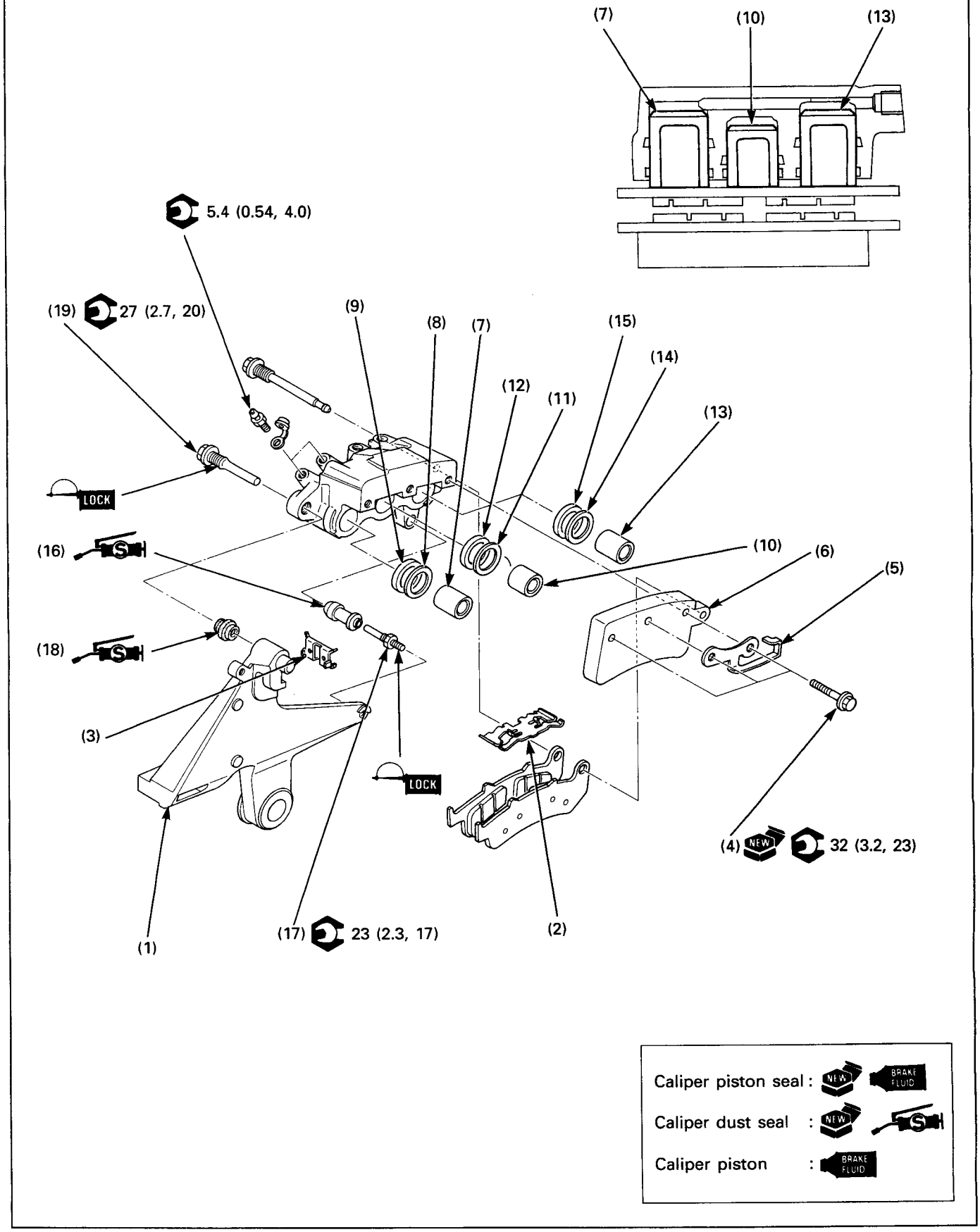
- **Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.**

Requisite Service

- Rear brake pad replacement (page 13-5)
- Brake system air bleeding (page 13-25)
- Rear wheel removal/installation (page 12-2)

	Procedure	O'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	2	
(2)	Sealing washer	4	
(3)	Brake hose eyelet joint	2	At installation, press the eyelet joint stopper pin against the caliper body while tightening the oil bolt.
(4)	Brake hose clamp bolt	1	
(5)	Rear brake caliper/bracket assembly	1	

Rear Brake Caliper Disassembly/Assembly



NOTE

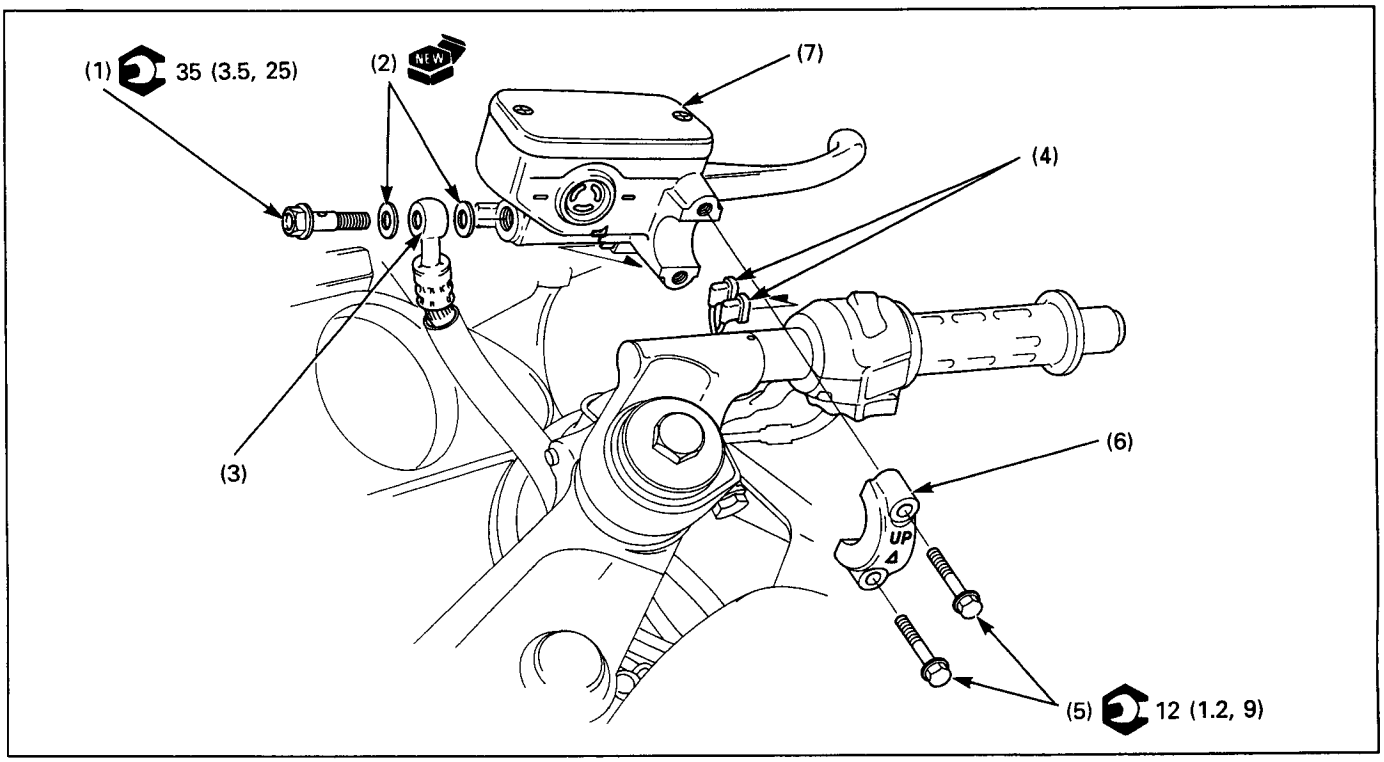
- Note the location and direction of the caliper pistons, dust seals and piston seals.
- Replace the caliper piston seals and dust seals as a set.

Requisite Service

- Rear brake caliper removal/installation (page 13-12)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Caliper bracket	1	
(2)	Brake pad spring	1	
(3)	Brake pad retainer	1	
(4)	Caliper body B mounting bolt	3	
(5)	Retainer	1	
(6)	Caliper body B	1	
(7)	Caliper piston (O.D. 27.0 mm)	1	
(8)	Dust seal	1	Apply silicone grease to the new dust seals.
(9)	Piston seal	1	
(10)	Caliper piston (O.D. 22.6 mm)	1	
(11)	Dust seal	1	
(12)	Piston seal	1	
(13)	Caliper piston (O.D. 25.4 mm)	1	
(14)	Dust seal	1	
(15)	Piston seal	1	
(16)	Bracket pin boot	1	
(17)	Bracket pin bolt	1	
(18)	Caliper pin boot	1	
(19)	Caliper pin bolt	1	

Front Master Cylinder Removal/Installation



CAUTION

- **Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.**
- **When removing the oil bolt, cover the end of the brake hose to prevent contamination.**
- **Do not allow foreign material to enter the system.**

NOTE

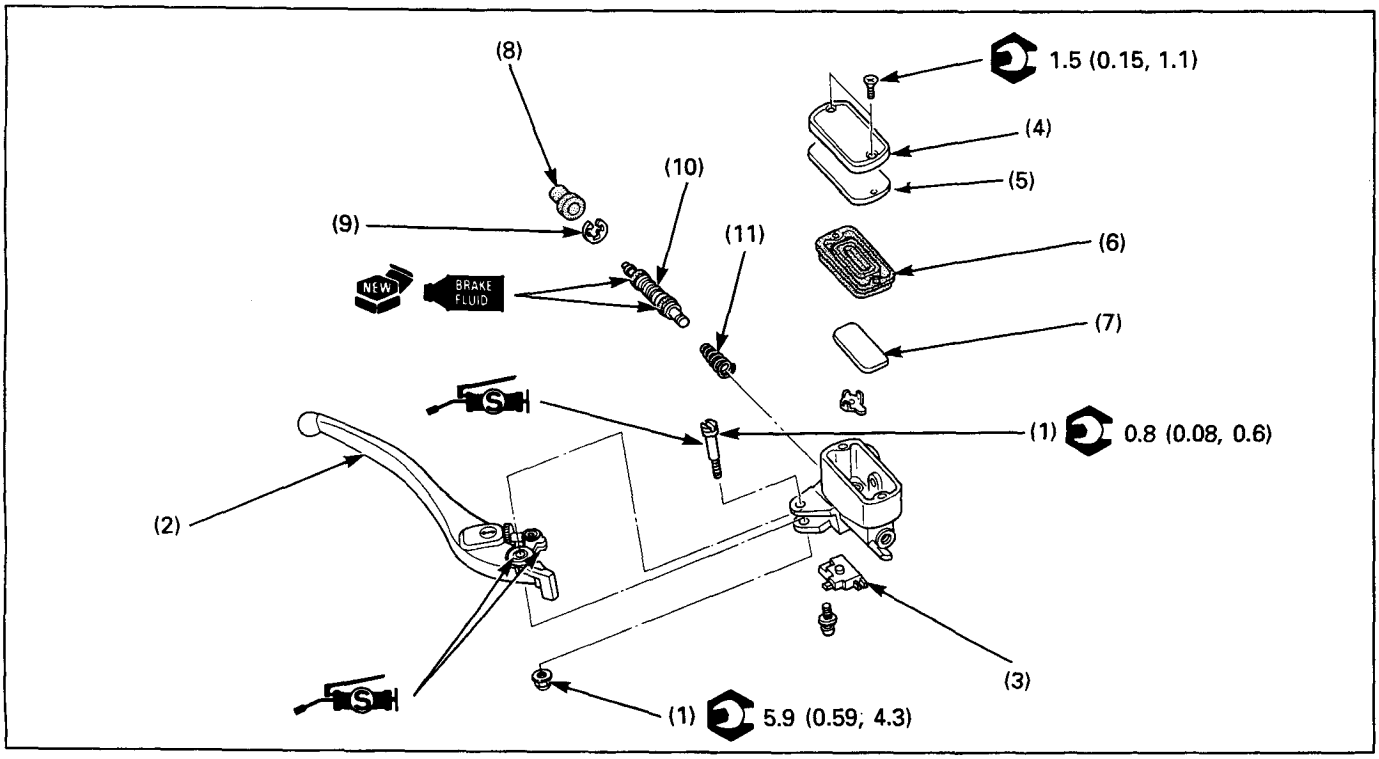
- Use DOT 4 brake fluid from a sealed container.

Requisite Service

- Brake system air bleeding (page 13-25)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	1	
(2)	Sealing washer	2	
(3)	Brake hose eyelet joint	1	At installation, press the eyelet joint against the stopper while tightening the oil bolt.
(4)	Brake light switch connector	2	
(5)	Master cylinder holder bolt	2	At installation, tighten the upper bolt first, then the lower bolt.
(6)	Master cylinder holder	1	At installation, install the holder with its "UP" mark facing up.
(7)	Master cylinder	1	At installation, align the mating surface with the punch mark on the handlebar.

Front Master Cylinder Disassembly/Assembly



NOTE

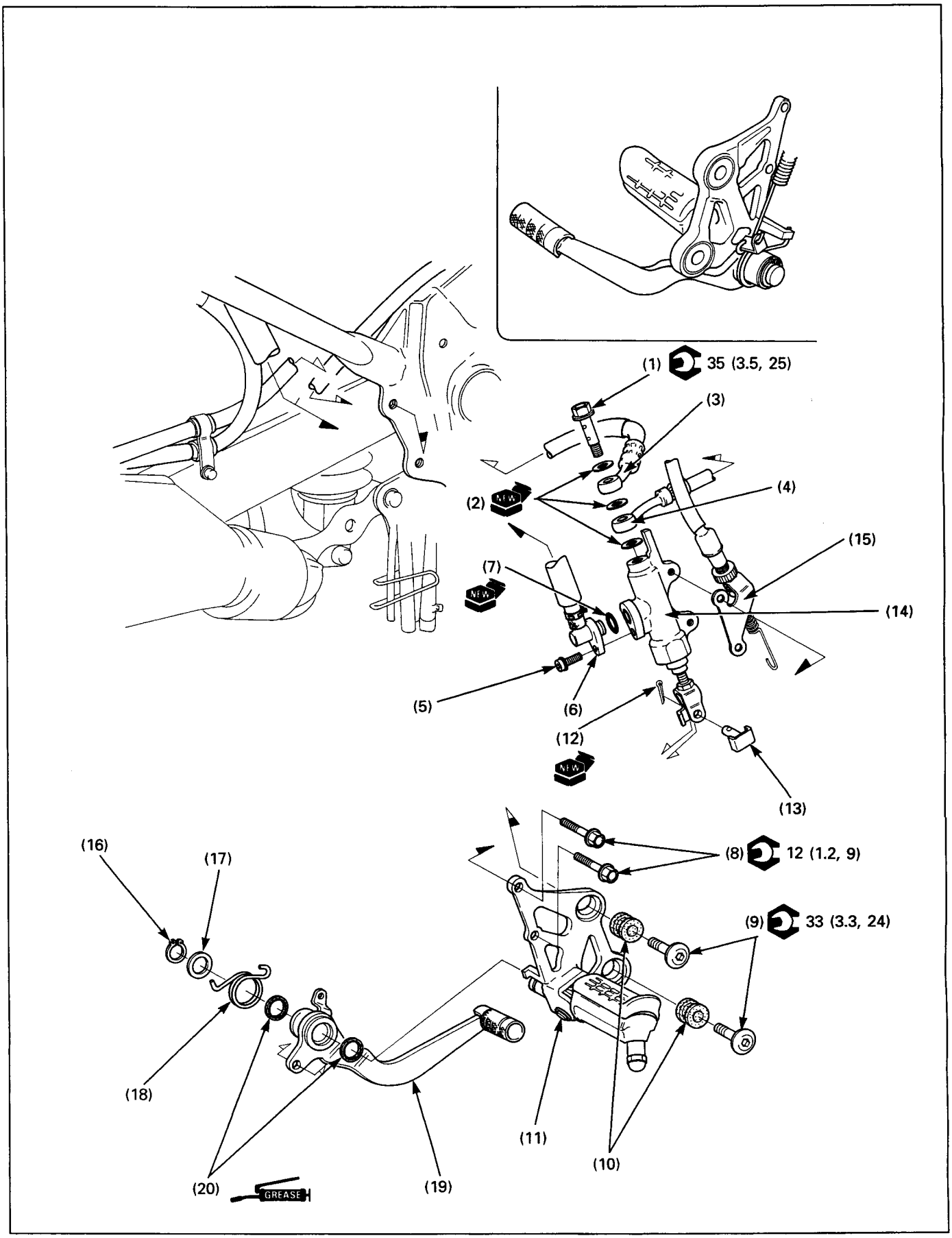
- Replace the master piston, spring, cups, stopper plate, snap ring and boot as a set.
- The master piston, cups and spring must be installed as a set.

Requisite Service

- Front brake master cylinder removal/installation (page 13-16)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Brake lever pivot bolt/nut	1/1	
(2)	Brake lever assembly	1	
(3)	Brake light switch	1	
(4)	Reservoir cover	1	
(5)	Diaphragm plate	1	
(6)	Diaphragm	1	
(7)	Float	1	
(8)	Boot	1	
(9)	Snap ring	1	**CAUTION** **• Be certain the snap ring is fully seated in the groove.**
(10)	Master piston assembly	1	
(11)	Spring	1	Install the spring with the small coil end facing to the piston.

Rear Master Cylinder Removal/Installation



CAUTION

• Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

NOTE

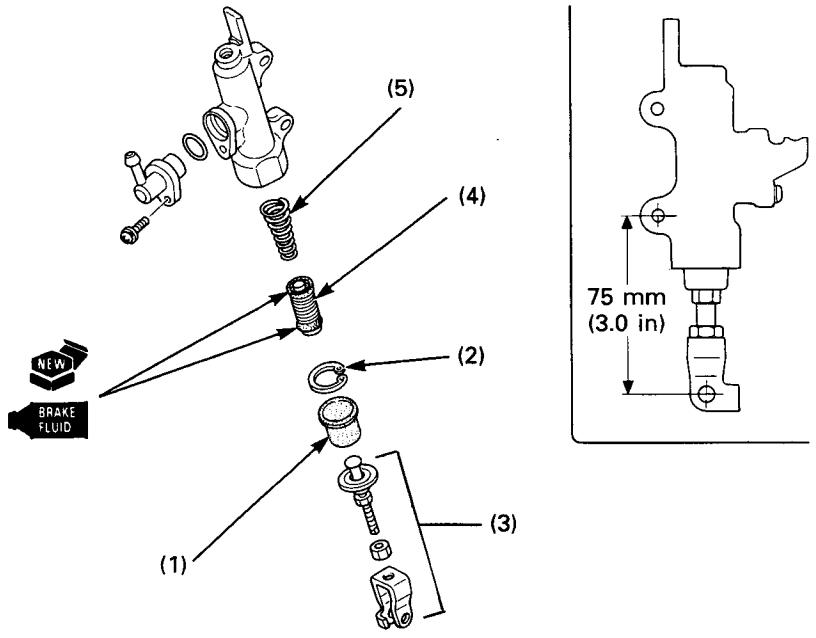
• Use DOT 4 brake fluid from a sealed container.

Requisite Service

• Brake system air bleeding (page 13-25)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	1	
(2)	Sealing washer	3	
(3)	Brake hose eyelet joint (To rear caliper)	1	
(4)	Brake hose eyelet joint (To front caliper)	1	
(5)	Screw	1	
(6)	Reserve tank hose joint	1	
(7)	O-ring	1	
(8)	Master cylinder mounting bolt	2	
(9)	Step holder bolt	2	
(10)	Step holder rubber	2	
(11)	Step holder assembly	1	
(12)	Cotter pin	1	
(13)	Joint pin	1	
(14)	Master cylinder	1	
(15)	Brake light switch bracket	1	
(16)	Snap ring	1	
(17)	Washer	1	
(18)	Return spring	1	
(19)	Brake pedal	1	
(20)	Dust seal	2	

Rear Master Cylinder Disassembly/Assembly



NOTE

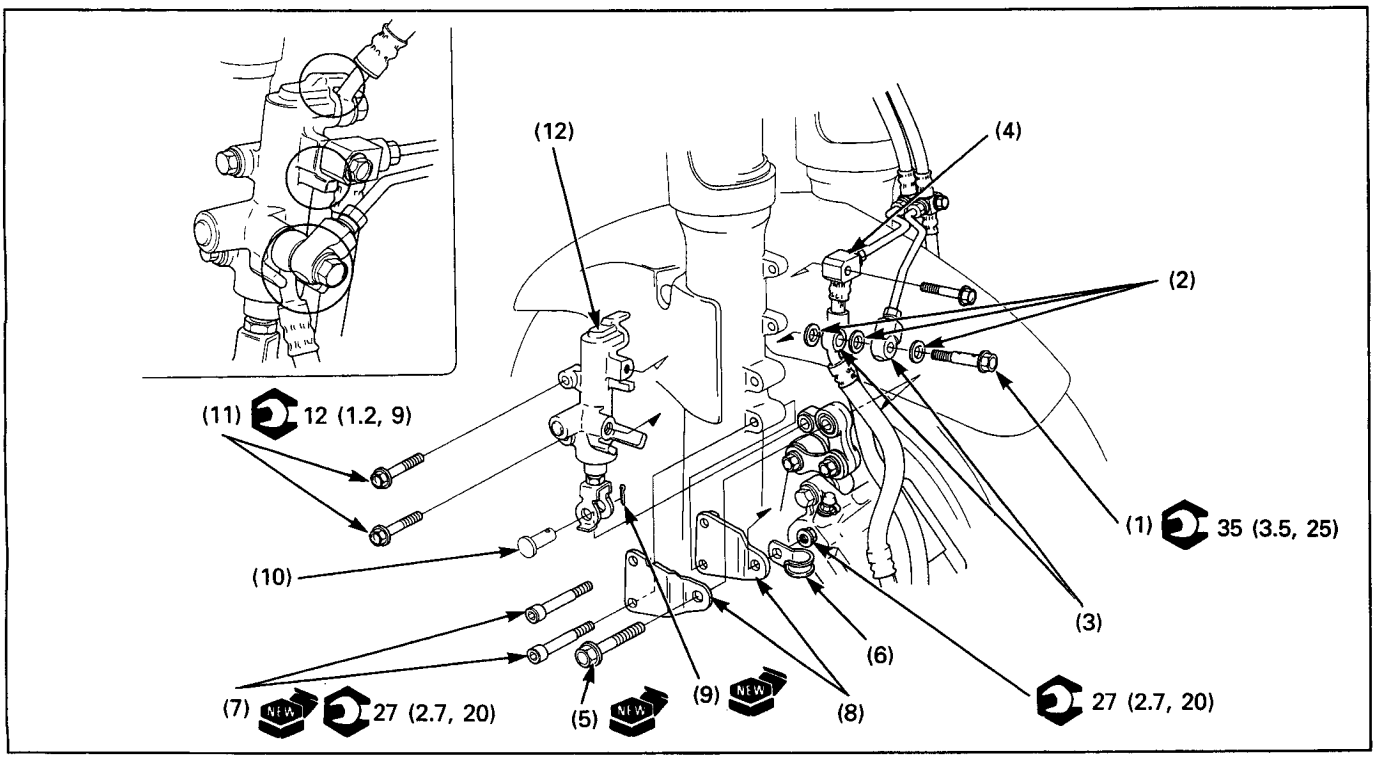
- Replace the master piston, spring, cups, snap ring and boot as a set.
- The master piston, cups and spring must be installed as a set.

Requisite Service

- Rear master cylinder removal/installation (page 13-18)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Boot	1	
(2)	Snap ring	1	**CAUTION** **• Be certain the snap ring is fully seated in the groove.**
(3)	Push rod assembly	1	Adjust the push rod joint install length as shown.
(4)	Master piston	1	
(5)	Spring	1	Install the spring with the small coil end facing the piston.

Secondary Master Cylinder Removal/Installation



CAUTION

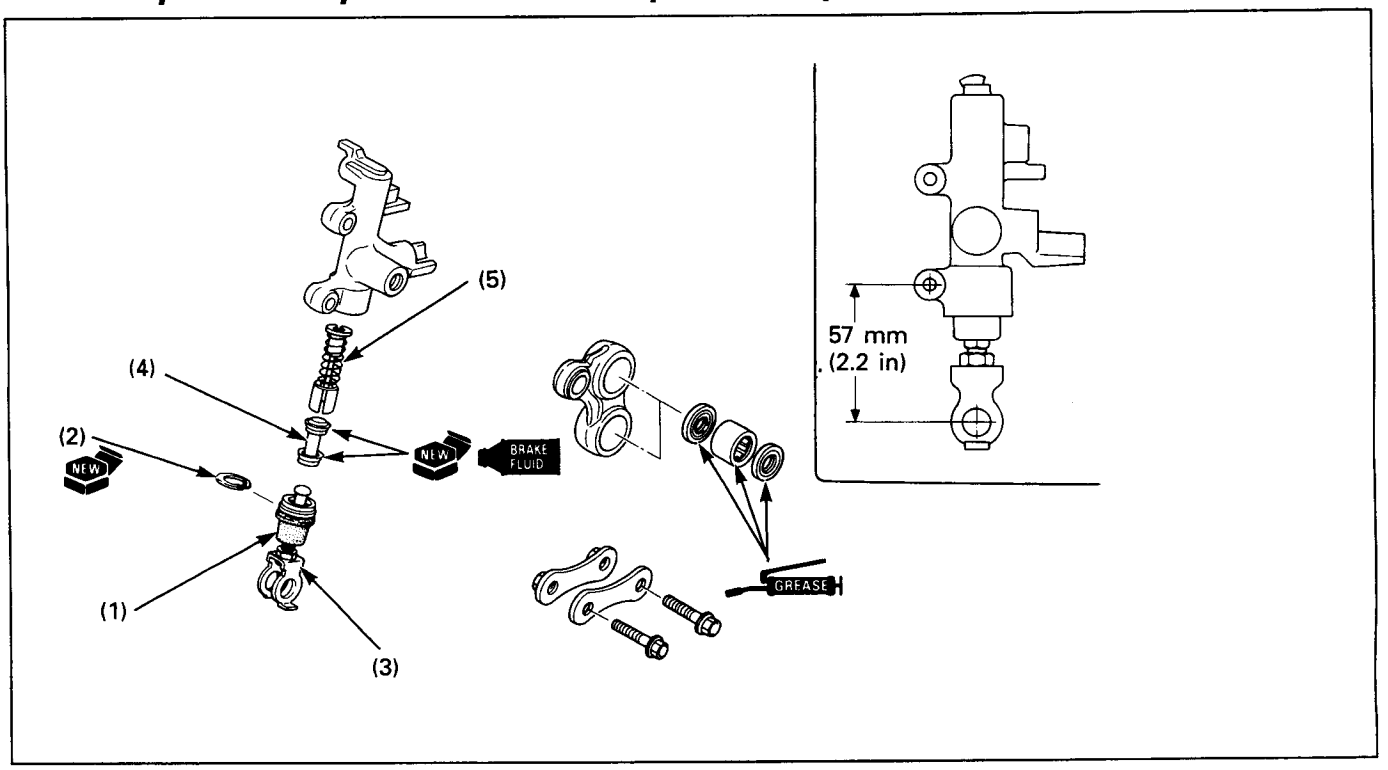
- **Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.**
- **When removing the oil bolt, cover the end of the brake hose to prevent contamination.**
- **Do not allow foreign material to enter the system.**

Requisite Service

- Brake system air bleeding (page 13-25)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	1	
(2)	Sealing washer	3	
(3)	Brake hose eyelet joint/brake pipe joint	1/1	
(4)	Brake pipe joint	1	
(5)	Brake link bolt/nut	1/1	
(6)	Brake hose clamp	1	
(7)	Brake link bracket bolt	2	
(8)	Brake link bracket	2	
(9)	Cotter pin	1	
(10)	Joint pin	1	
(11)	Secondary master cylinder mounting bolt	2	
(12)	Secondary master cylinder	1	

Secondary Master Cylinder Disassembly/Assembly



NOTE

- Replace the master piston, spring, cups, snap ring and boot as a set.
- The master piston, cups and spring must be installed as a set.

Requisite Service

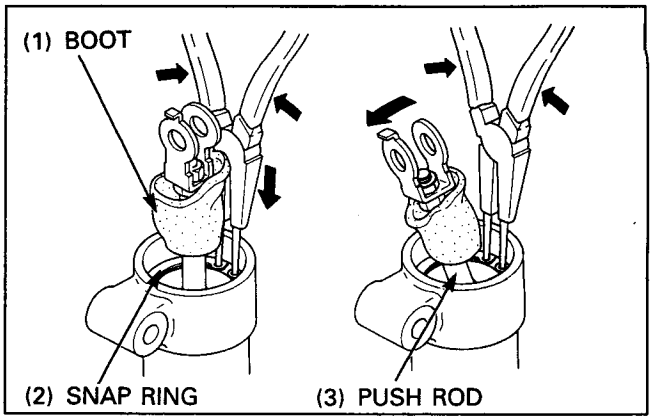
- Secondary master cylinder removal/installation (page 13-21)

	Procedure	Q'ty	Remarks
	Disassembly Order		Assembly is in the reverse order of disassembly.
(1)	Boot	1	
(2)	Snap ring	1	**CAUTION** • **Be certain the snap ring is fully seated in the groove.**
(3)	Push rod assembly	1	Removal/installation (page 13-23) **CAUTION** • **Do not disassemble the secondary master cylinder push rod or the correct brake performance is not obtained.**
(4)	Master piston	1	
(5)	Spring assembly	1	

Push Rod Removal/Installation

Remove the boot from the secondary master cylinder.

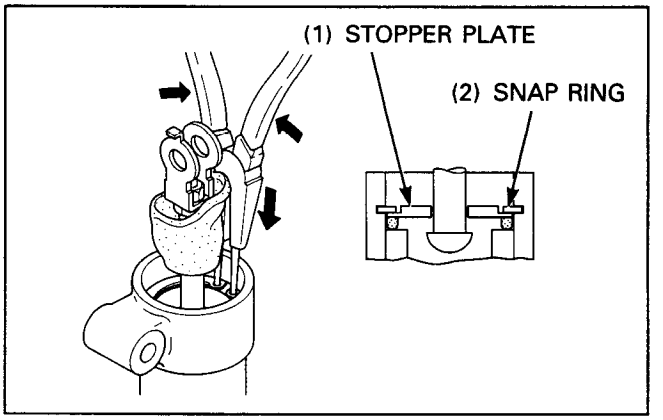
Set the snap ring pliers to the snap ring.
Hold the snap ring pliers and tilt the push rod, then remove the push rod assembly from the master cylinder.



Install the new snap ring onto the push rod.

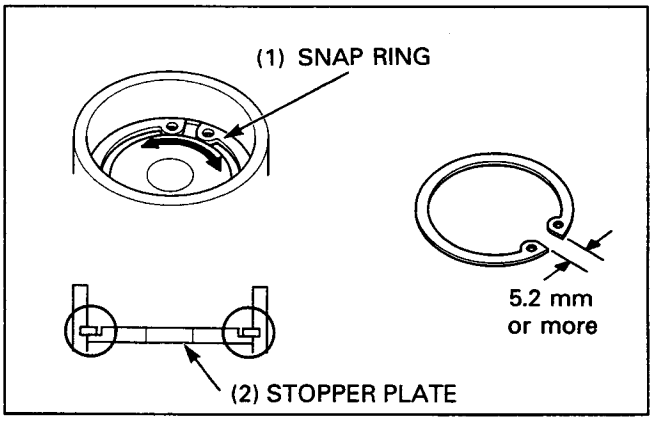
Install the push rod assembly into the master cylinder.
Install the snap ring into the master cylinder groove securely.

Make sure the snap ring is seated into the master cylinder groove and stopper plate as shown.

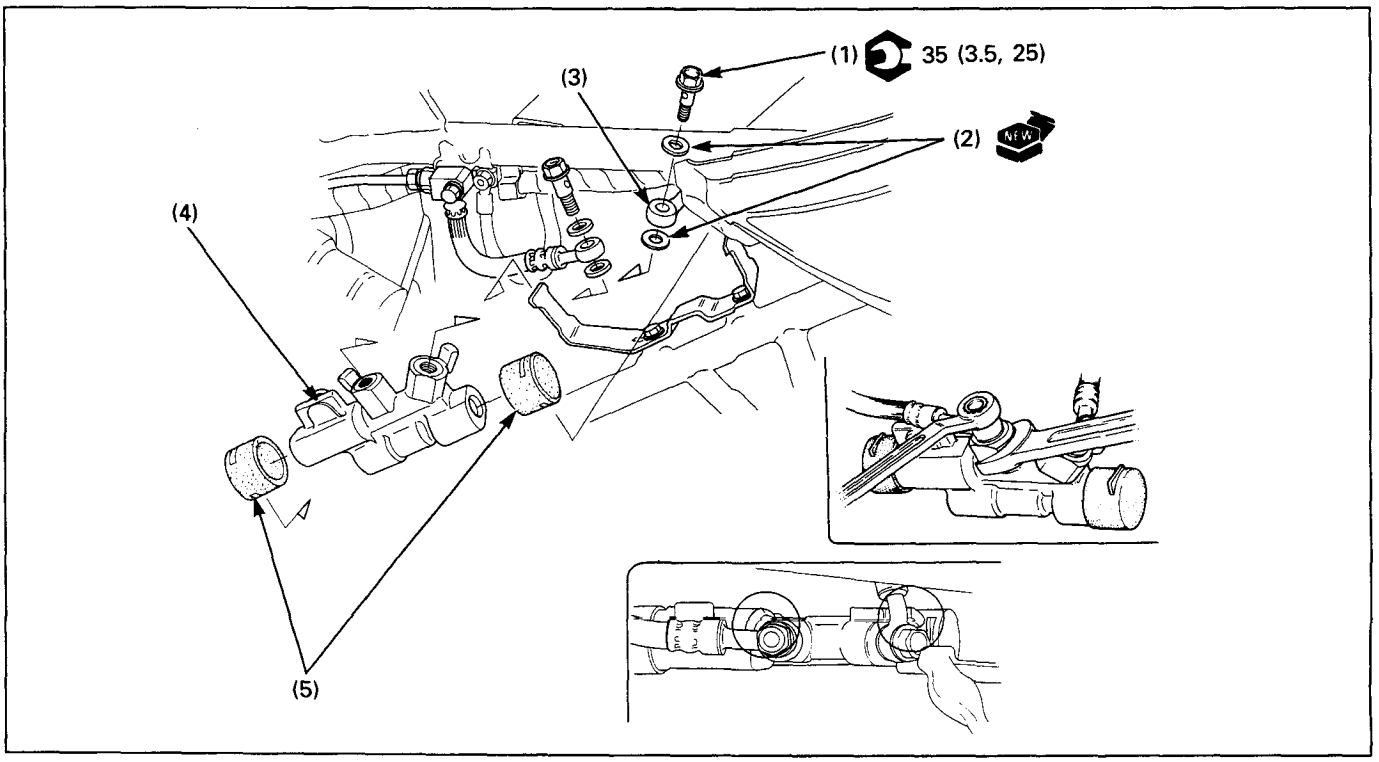


Check that the snap ring is rotated freely into the groove.

Measure the snap ring end gap is 5.2 mm or more.



Proportional Control Valve Removal/Installation



CAUTION

- **Avoid spilling brake fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.**
- **When removing the oil bolt, cover the end of the brake hose to prevent contamination.**
- **Do not disassemble the proportional control valve.**

Requisite Service

- Seal cowl removal/installation (page 2-4)
- Brake system air bleeding (page 13-25)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Oil bolt	2	Hold the proportional control valve using a open end wrench, then loosen or tightening the bolts.
(2)	Sealing washer	4	
(3)	Brake hose eyelet joint	2	
(4)	Proportional control valve assembly	1	
(5)	Rubber suspension	2	

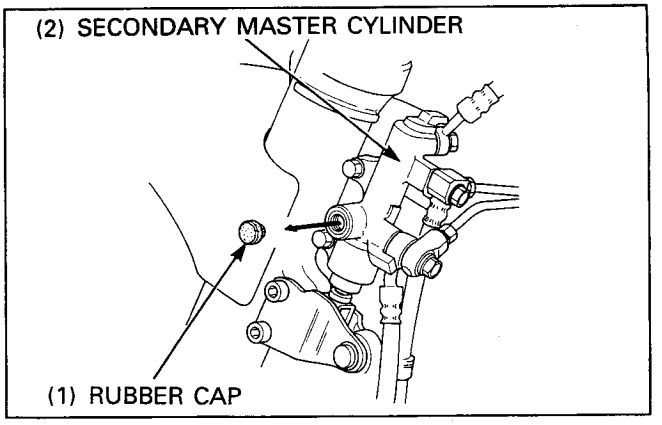
System Air Bleeding

⚠ WARNING

- **A contaminated brake disc or pad reduces stopping power.**

NOTE

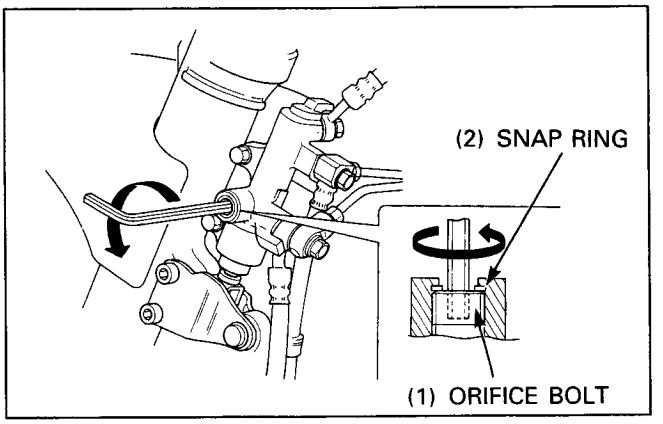
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- When using a commercially available brake bleeder, follow the manufacturer's operating instructions.



Support the motorcycle on its center stand.

Remove the secondary master cylinder orifice bolt rubber cap.

Loosen the orifice bolt fully until its seats on the snap ring.

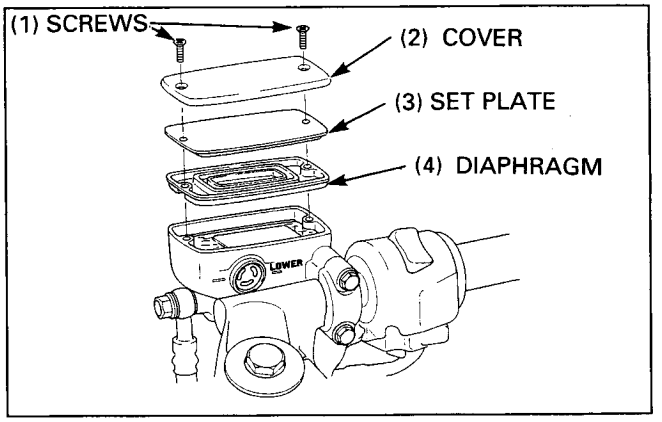


NOTE

- Make sure that the secondary master cylinder orifice bolt is loosened before you starting the air bleeding procedure, or it may be difficult to bleed the air completely.
- After air bleeding, tighten the orifice bolt securely. If the orifice bolt is not tightened, correct brake performance is not obtained.
- It it not necessary to loosen the orifice bolt when you bleed the air from the lever brake line only.

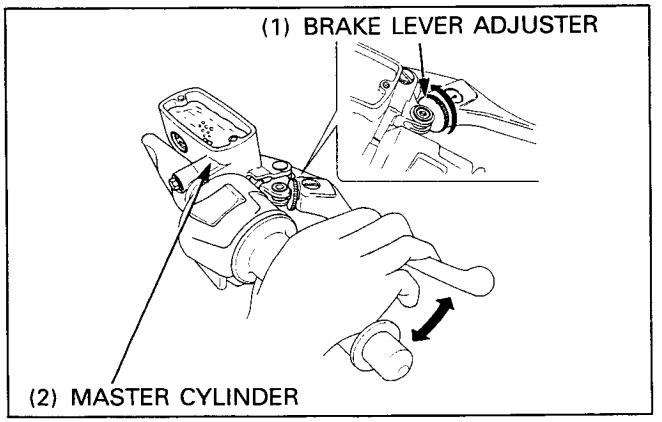
Lever Brake Line Air Bleeding

Remove the following:
- Screws
- Reservoir cover
- Set plate
- Diaphragm



Turn the brake lever adjuster so that the lever is further away from the handlebar.

Operate the brake lever several times (about 8-10 times), bleed the air from the master cylinder.



Connect a commercially available Brake Bleeder to the *front* brake caliper outer bleed valve.

NOTE

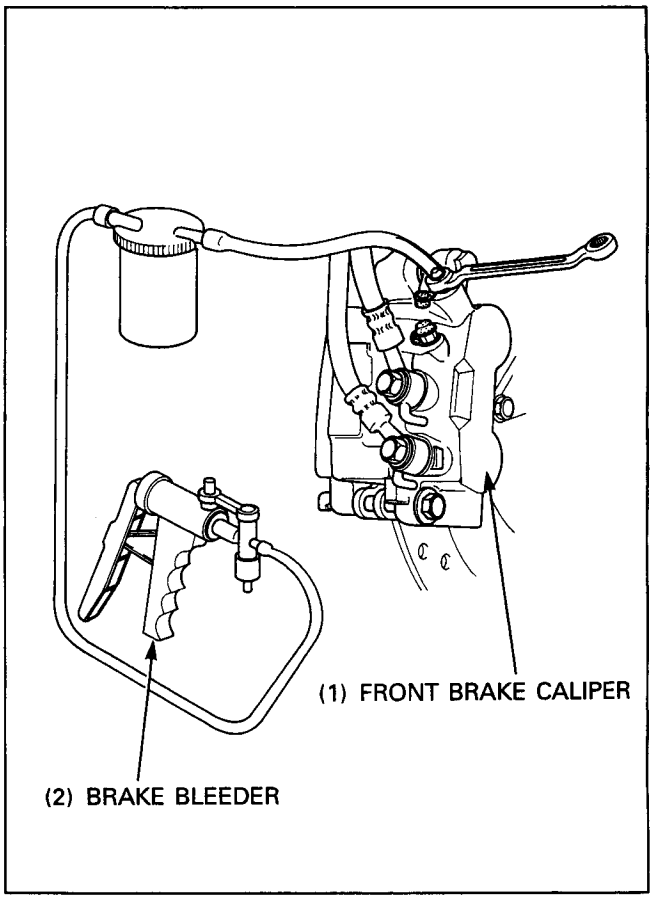
- When using a brake bleeder, follow the manufacturer's operating instructions.

Pump the brake bleeder and loosen the bleed valve.

Add DOT 4 brake fluid when the fluid level in the master cylinder is low.
Repeat the above procedures until not air bubbles appear in the tube.

NOTE

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- Use only DOT 4 brake fluid from a sealed container.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.



If the brake bleeder is not available, perform the following procedures.

Connect the transparent bleeder tube to the bleed valve and place the outer end of the hose in a container.

1. Loosen the bleed valve 1/4 turn and pump the brake lever until the brake fluid flow out. Pump the brake lever 5-10 times, then pull in the brake lever all the way and loosen the bleed valve.

NOTE

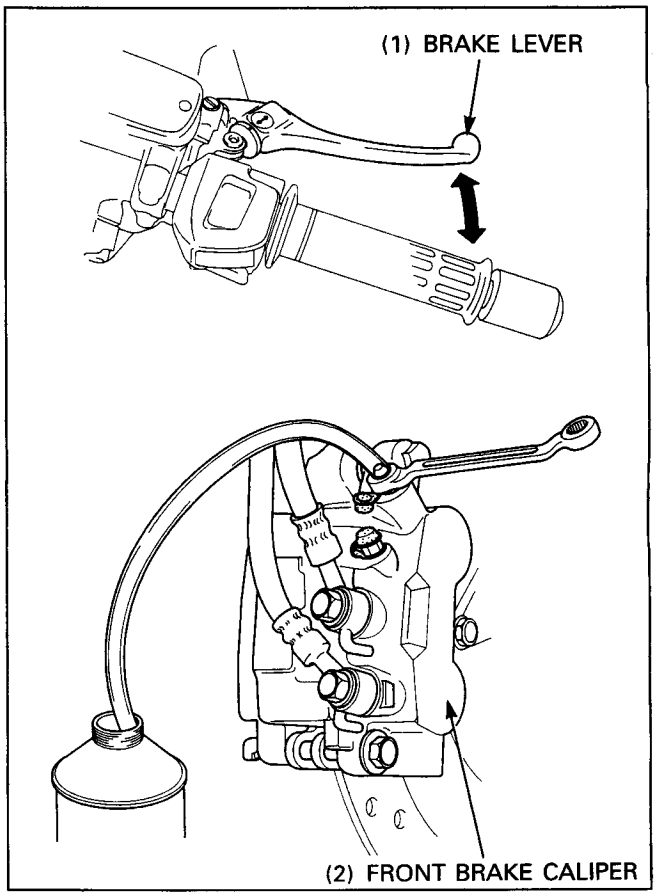
- Do not release the brake lever while opening the bleed valve.

Close the bleed valve.

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
3. Repeat above step 1 and 2 until bubbles cease to appear in the fluid at the end of the bleed tube and lever resistance is felt.

Tighten each bleed valve to the specified torque.

Torque: 5.4 N•m (0.54 kg-m, 3.9 ft-lb)

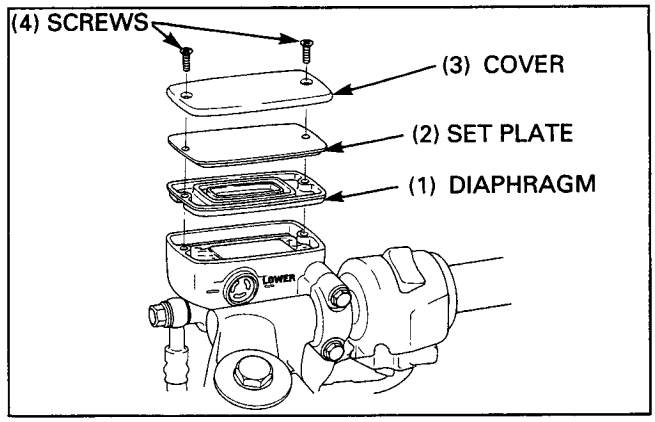


Fill the reservoir up to the "UPPER" level.

Specified brake fluid: DOT 4 brake fluid

Install the following:
- Diaphragm
- Set plate
- Reservoir cover
- Screws

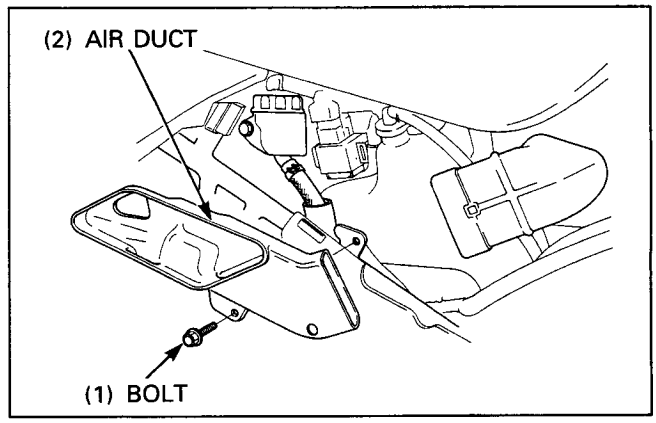
Turn the adjuster, adjust the brake lever position.



Pedal Brake Line Air Bleeding

NOTE

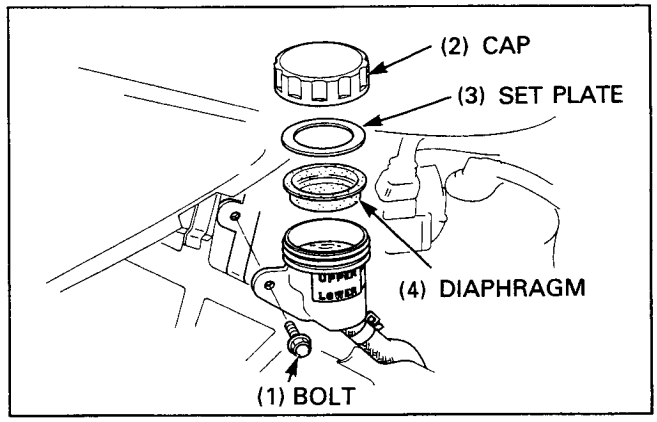
- For correct air bleeding, comprehend the pedal brake line referring to the Technical Feature in section 19.
- Make sure the secondary master cylinder orifice bolt is loosened fully until it seats on the snap ring.
- Bleed the air from the pedal brake line in the sequence as follow:
  1. Right front brake caliper center bleeder
  2. Left front brake caliper center bleeder
  3. Rear brake caliper center bleeder
  4. Rear brake caliper outer bleeder



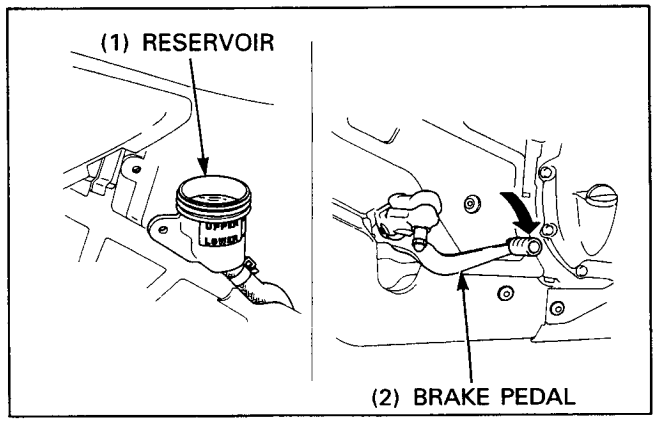
Remove the right side cover (page 2-3).
Remove the bolt and intake air duct.

Remove the rear master cylinder reservoir tank mounting bolt.

Remove the following:
- Reservoir cap
- Set plate
- Diaphragm



Fill the reservoir DOT 4 brake fluid.
Pump the brake pedal while filling the brake fluid and feed fluid into the master cylinder.



1. Connect a commercially available Brake Bleeder to the *right* front brake caliper center bleed valve.

NOTE

- When using a brake bleeder, follow the manufacturer's operating instructions.

Pump the brake bleeder and loosen the bleed valve.
Operate the brake bleeder and feed the brake fluid until fluid flow out from the bleeder valve.
Close the bleeder valve.

2. Feed the brake fluid at the left front brake caliper center bleeder valve as same procedures in step 1.
3. Feed the brake fluid at the rear brake caliper center bleeder valve as same procedures in step 1.
4. Feed the brake fluid at the rear brake caliper outer bleeder valve as same procedures in step 1.
5. Repeat step 1-4 until the pedal resistance is felt.

Next bleed the air from the system without using a brake bleeder tool.

Connect the transparent bleeder tube to the bleed valve and place the outer end of the hose in a container.

1. Pump the brake pedal 5-10 times, then release the pedal. Loosen the bleed valve, then pushing down the brake pedal all the way.

NOTE

- Do not release the brake pedal while opening the bleed valve.

Close the bleed valve.

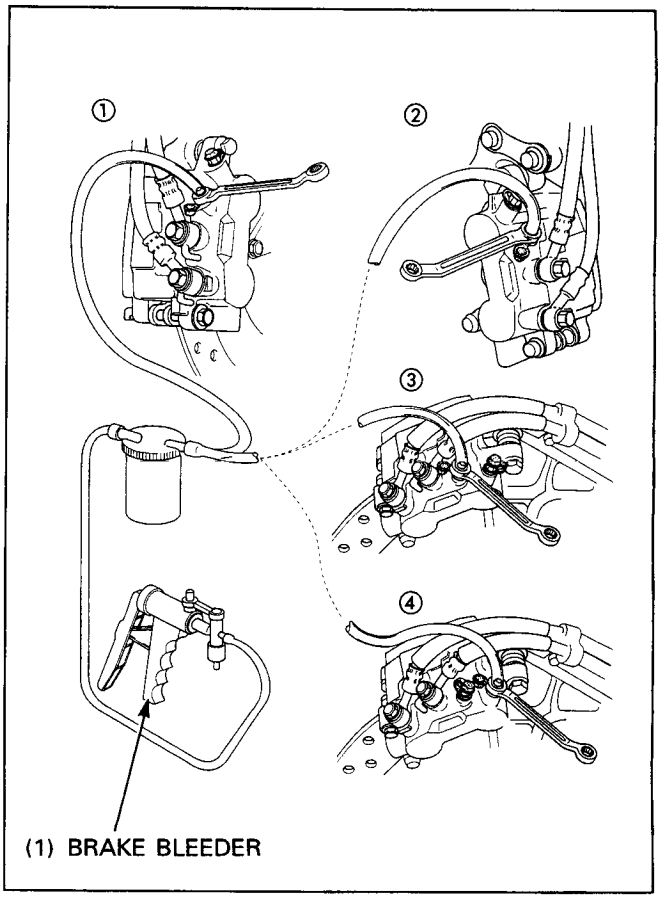
2. Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat above step 1 and 2 until bubbles cease to appear in the fluid at the end of the bleed tube and pedal resistance is felt.

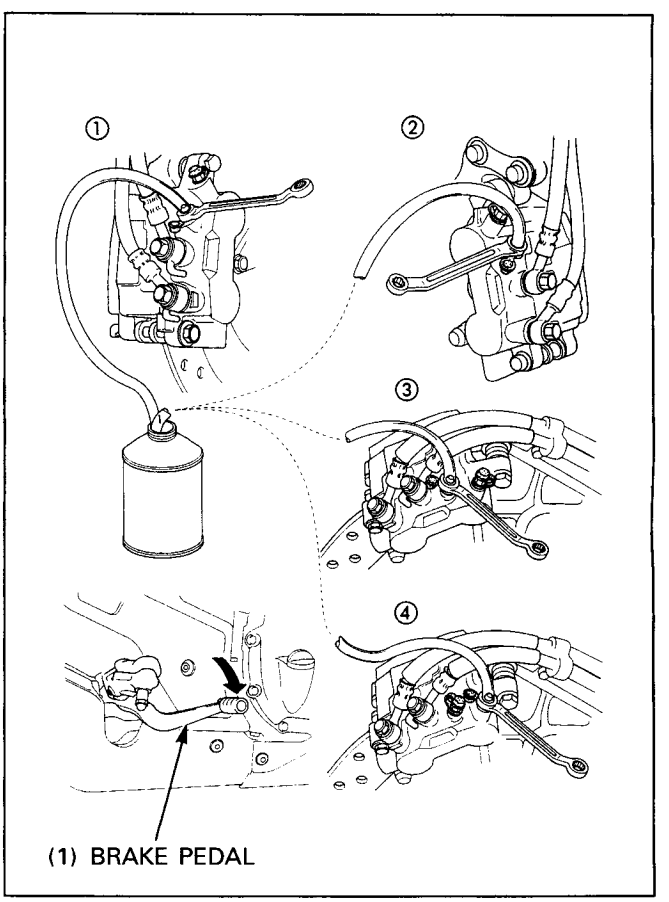
NOTE

- After the bubbles cease to appear in the fluid, repeat air bleeding procedure about 2-3 times.
- Elaborately bleed the air from the rear brake caliper outer bleeder valve (From secondary master cylinder -to- Proportional control valve -to- rear caliper line).

Tighten the each bleed valve to the specified torque.

Torque: 5.4 N·m (0.54 kg-m, 3.9 ft-lb)

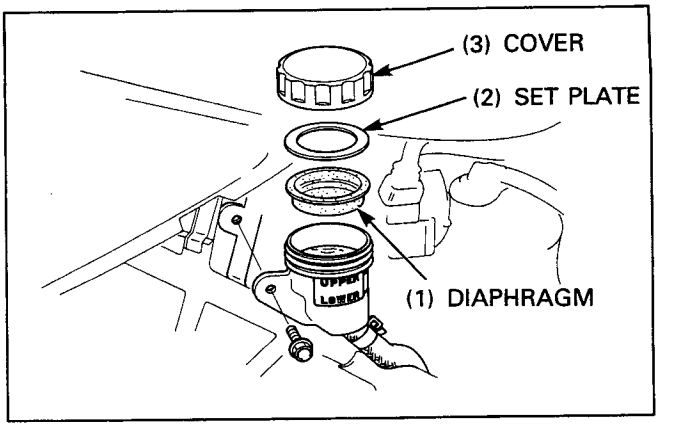




Fill the reservoir up to the "UPPER" level.

Specified brake fluid: DOT 4 brake fluid

Install the following:
- Diaphragm
- Set plate
- Reservoir cover

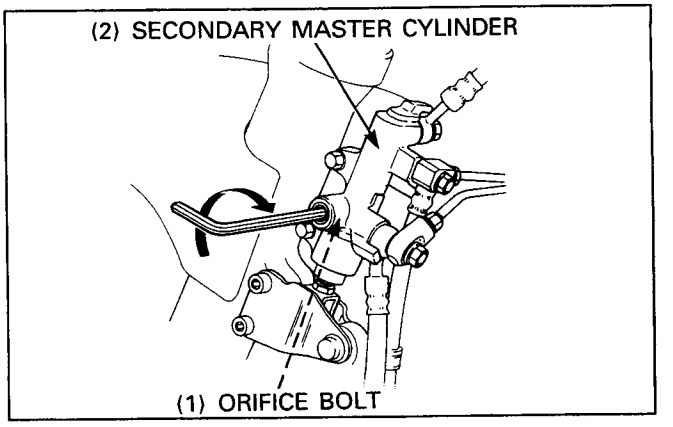


Tighten the secondary master cylinder orifice bolt to the specified torque.

Torque: 5.4 N•m (0.54 kg-m, 4.0 ft-lb)

NOTE

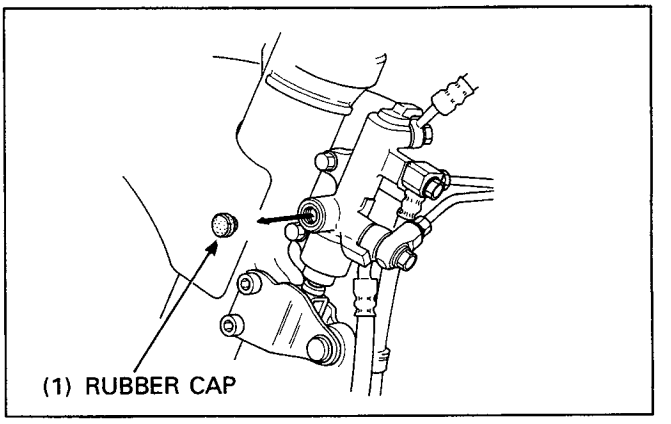
- After air bleeding, tighten the orifice bolt securely. If the orifice bolt is not tightened, correct brake performance is not obtained.



Install the secondary master cylinder orifice bolt rubber cap.

Check the brake system operation (page 3-13).

Install the removed parts the reverse order of removal.



14. Charging System/Alternator

Service Information

⚠ WARNING

- **The battery gives off explosive gases; keep sparks, frames, and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.**
- **The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.**
  - **If electrolyte gets on your skin, flush with water.**
  - **If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.**
- **Electrolyte is poisonous. If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.**

- Always turn off the ignition switch before disconnecting any electrical component.

CAUTION

- **Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.**

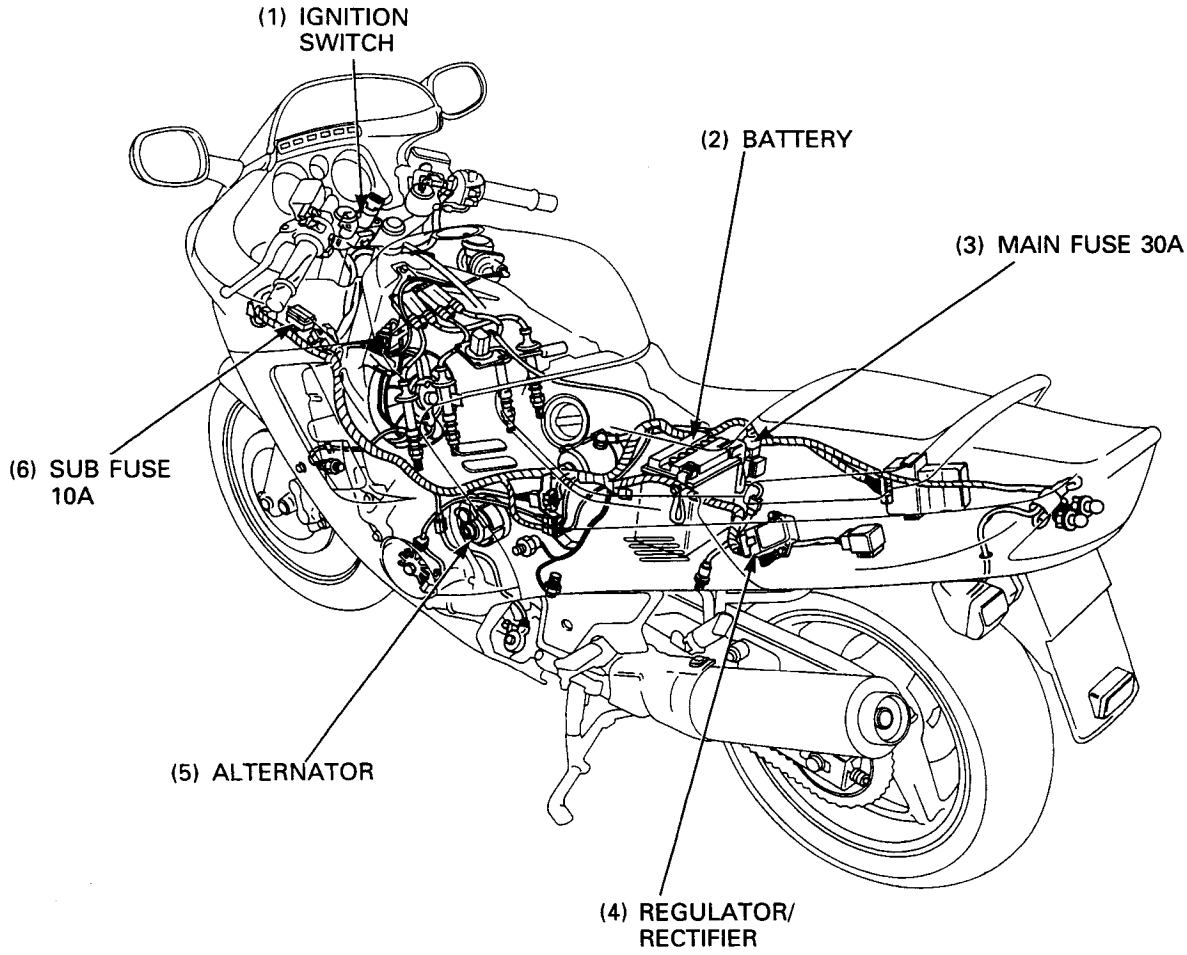
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- Use only distilled water in the battery.

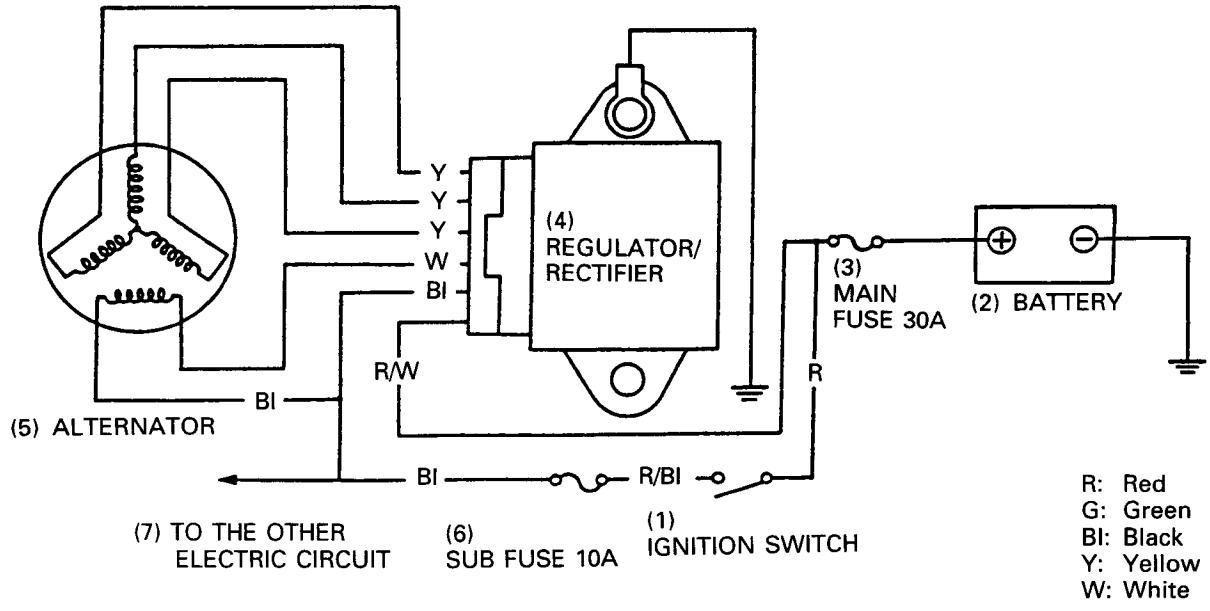
CAUTION

- **Avoid filling the battery above the UPPER LEVEL line to prevent an electrolyte overflow which could corrode the engine or nearby parts.**

- Battery can be damaged if over charged or undercharged, or if left to discharge for long periods. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of battery deteriorates after 2-3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected to be the problem. Battery overcharge often result eventually problems in the battery itself, which may appear to be an overcharge symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check the proper use and maintenance of the battery. Check if the battey is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not is use. For this reason, charge the battery every two weeks to prevent sulfation from forming.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initial-charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-3).
- For battery testing/charging, refer to section 22 of the Common Service Manual.
- For charging system location, see page 15-2.

System Location





Troubleshooting

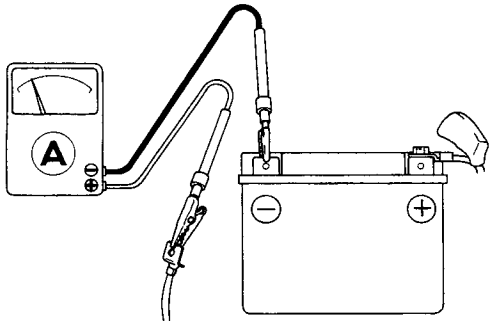
Battery Overcharging
- Faulty regulator/rectifier

Battery Undercharging

NOTE

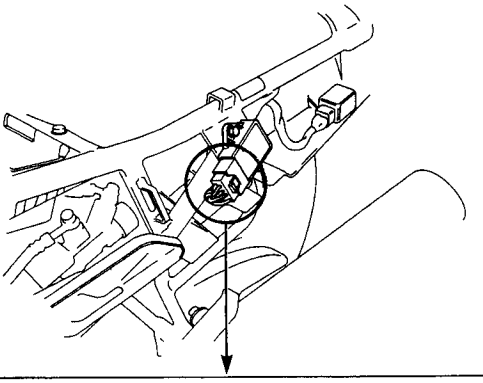
- In order to obtain accurate test reading when charging system, the battery specific gravity must be greater than 1.27 (20°C/68°F) and in good condition. Common Service Manual section 22 for check the battery condition.

Measure the battery current leakage ampere (leak test: page 14-6).

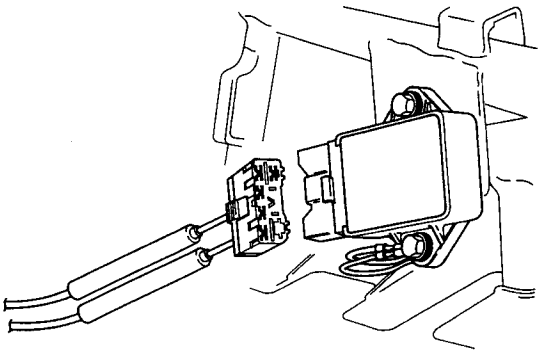


Standard : 0.1 mA max.

Incorrect →



Check the regulator/rectifier (page 14-7).



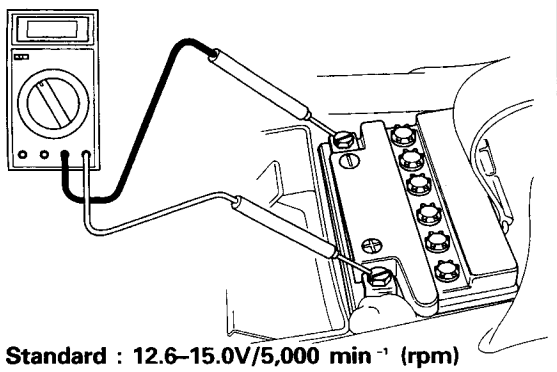
Correct →

Incorrect →
- Shorted wire harness
- Faulty ignition switch

Correct →
- Faulty regulator/rectifier

Correct

Inspect the regulated voltage (page 14-6).



Standard : 12.6–15.0V/5,000 min⁻¹ (rpm)

Charging →

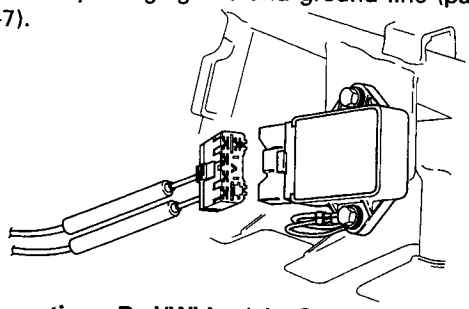
Check the battery using the battery tester.

Incorrect →
- Electric system over loading
- Faulty battery

Correct →
- Open circuit in wire harness
- Poorly connected connectors

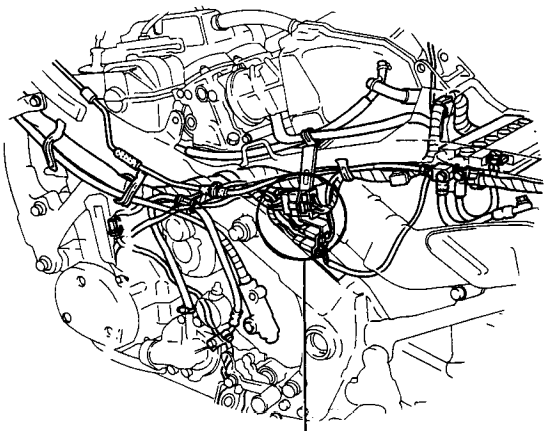
Not charging

Check the voltage between the regulator/rectifier battery charging line and ground line (page 14-7).



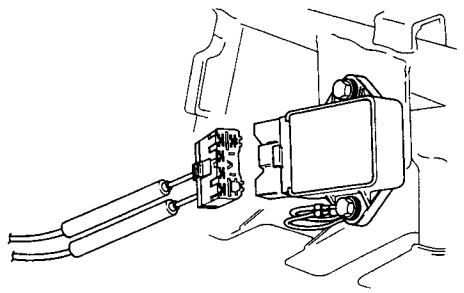
Connection : Red/White (+) – Green (–)
Standard : Battery voltage

Abnormal →
- Open circuit in wire harness
- Poorly connected connectors



Normal ↓

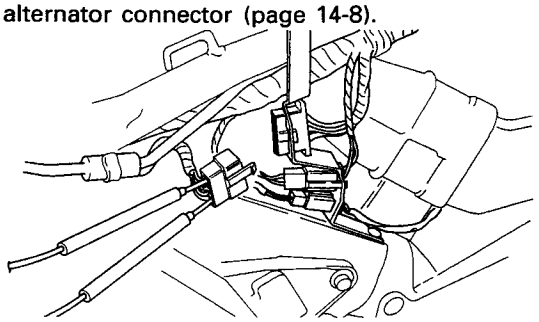
Check the alternator (charging coil) resistance at the regulator/rectifier connector (page 14-7).



Connection : Yellow–Yellow
Standard : 0–1.0Ω

Abnormal →

Check the charging coil resistance at the alternator connector (page 14-8).



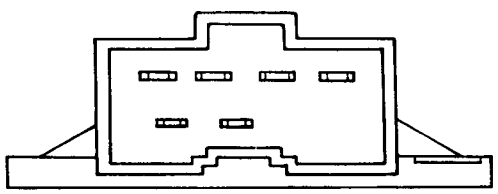
Connection : Yellow–Yellow
Standard : 0–1.0Ω

Abnormal →
- Faulty alternator

Normal →
- Poorly connected alternator connector
- Open or short circuit in Yellow wire

Normal ↓

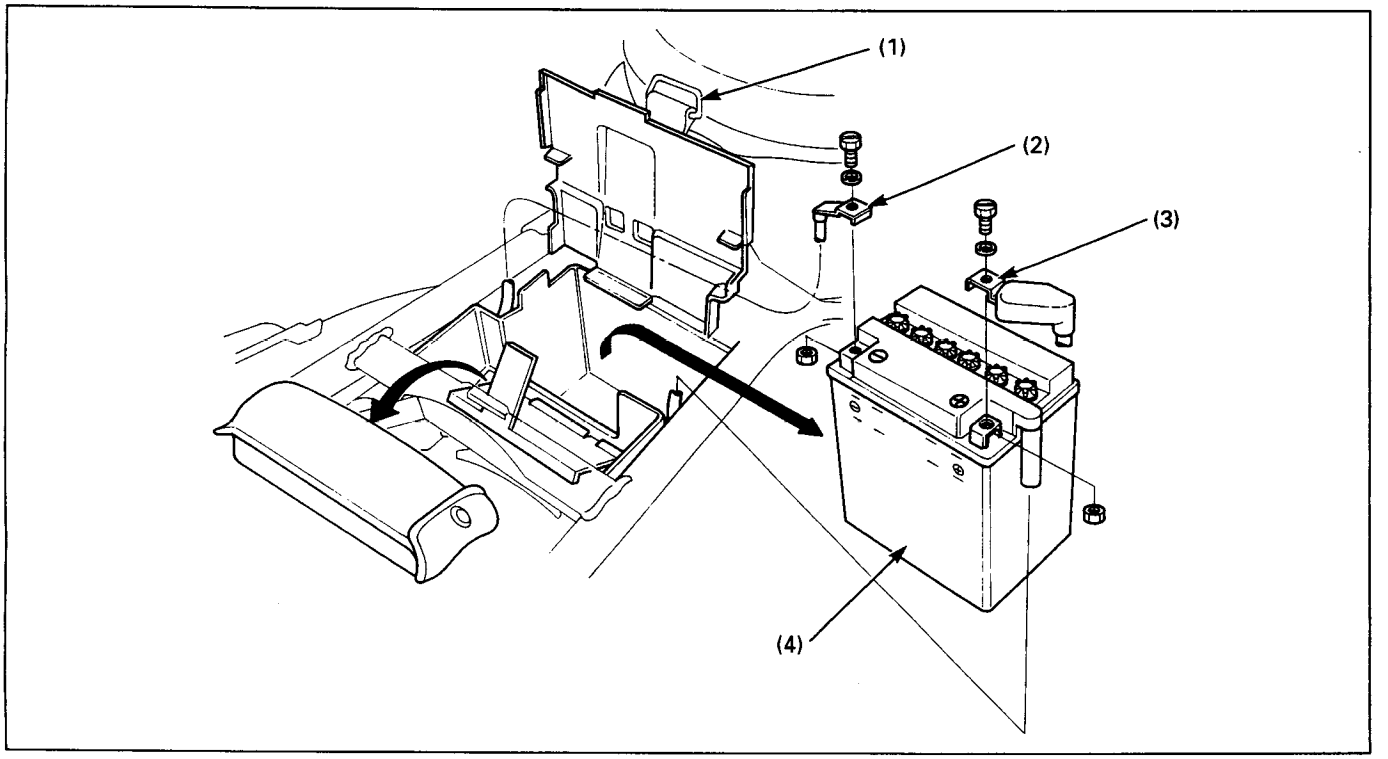
Check the regulator/rectifier unit (page 14-8).



Abnormal →
- Faulty regulator/rectifier

Normal →
- Faulty battery

Battery Removal/Installation



NOTE

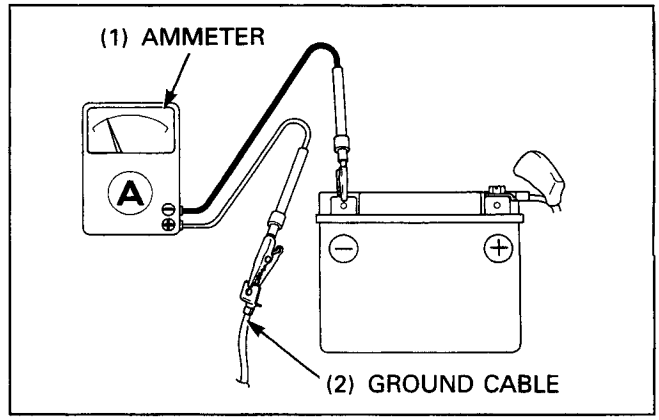
- Always turn the ignition switch OFF before removing or installing the battery.

Requisite Service

- Seat removal/installation (page 2-3)

	Procedure	O'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Battery holder band	1	Remove the hook from the battery cover, then open the battery cover.
(2)	Negative terminal	1	After installation, apply clean grease to the terminal.
(3)	Positive terminal	1	
(4)	Battery	1	

Charging System Inspection



Leakage Test

Turn the ignition switch off, and disconnect the ground (–) cable from the battery.

Connect the ammeter (+) probe to the ground cable and the ammeter (–) probe to the battery (–) terminal.
With the ignition switch off, check for current leakage.

NOTE

- When measuring the current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow larger than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

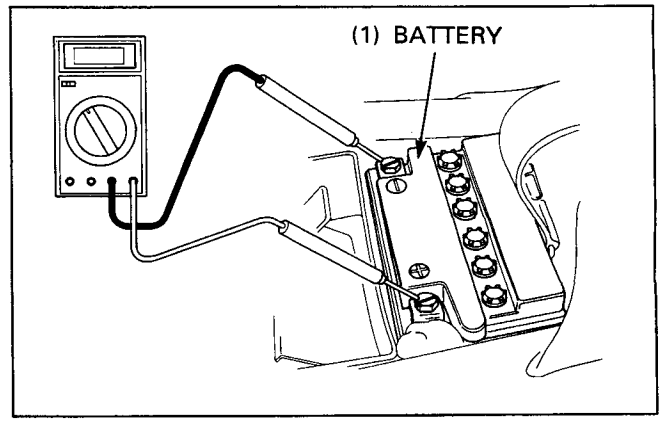
Specified Current Leakage: 0.1 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Regulated Voltage Inspection

NOTE

- Before performing this test, be sure the battery is fully charged and that its specific gravity is greater than 1.27 (20°C/68°F).



Start the engine and warm it to operating temperature, then turn the ignition switch OFF.

Connect the multimeter between the battery terminals.

S.TOOL

Digital multimeter	**07411–0020000**
Analogue tester	**07308–0020001**

⚠ WARNING

- **If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.**
- **The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.**

Start the engine and increase the engine speed gradually and check that the voltage is regulated.

CAUTION

- **Be careful not to short any tester probes.**

Regulated Voltage: 12.6–15.0V/5,000 min^{-1} (rpm)

Regulator/Rectifier

System Inspection

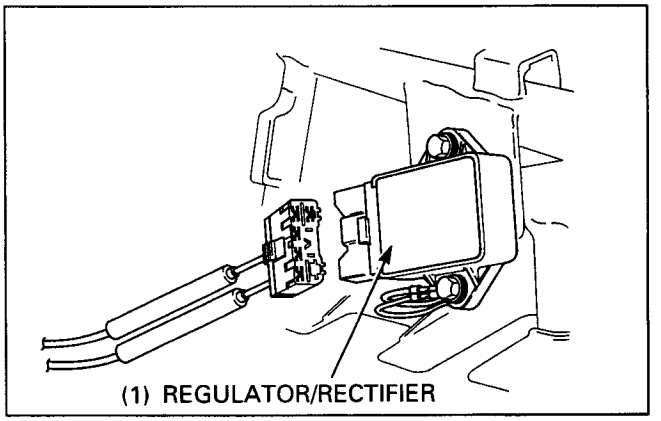
Remove the seat cowl (page 2-4).

Disconnect the regulator/rectifier 6P connector.
Check the connectors for loose or corroded terminal.

Measure the following between connector terminal of the wire harness side.

Item	Terminals	Specification
Battery charging line	Red/White (+) and Green (–)	Battery voltage should register.
Ground line	Green and ground	Continuity exist.
Charging coil line	Yellow and Yellow	0–1.0Ω (20°C/68°F)

If the charging coil line reading is out of specification, check the alternator (page 14-8).



(1) REGULATOR/RECTIFIER

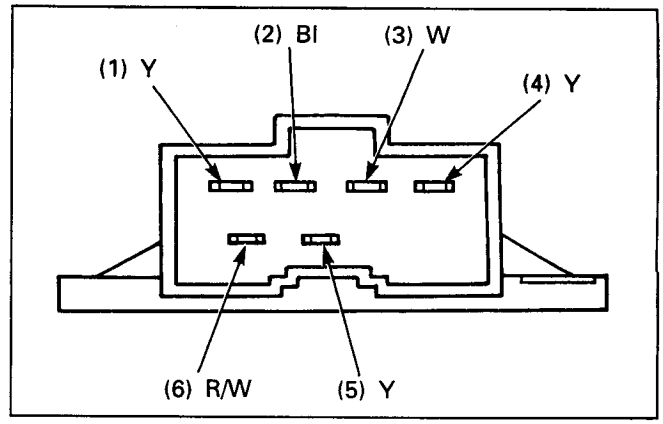
Unit Inspection

Provided the circuit on the wire harness side is normal and there are no loose connections at the connector, inspect the regulator/rectifier unit by measuring the resistance between the terminals.

NOTE

- You'll get false readings if the probes touch you fingers.
- Use the specified multimeters. Using other equipment may no allow you to obtain the correct results. This is due to the characteristic of semiconductors, which have different values depending on the applied voltage.
  Specific Multimeter:
  – 07411–0020000 (KOWA Digital type)
  – 07308–0020001 (SANWA Analogue type)
- Select the following range:
  SANWA: x kΩ
  KOWA: x 100
- An old battery stored in the multimeter could cause inaccurate readings. Check the battery if the multimeter resistance incorrectly.
- When using the KOWA multimeter, remember value that all readings should be multiplied by 100.

Replace the regulator/rectifier unit if the resistance value between the terminals is abnormal.



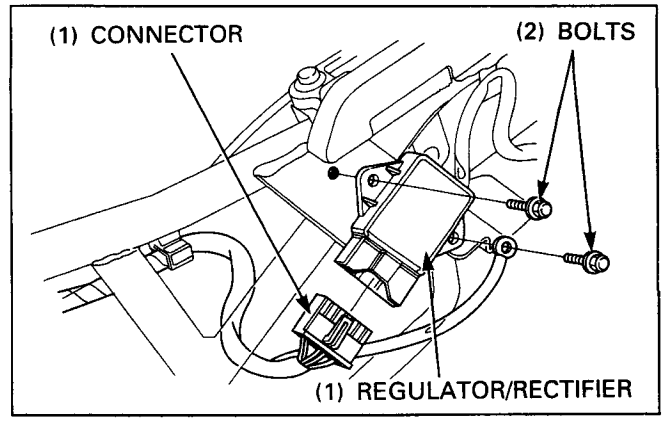
Unit : kΩ

⊖ \ ⊕	R/W	Y	Y	Y	Bl	W
R/W		∞	∞	∞	∞	∞
Y	0.5-50		∞	∞	∞	∞
Y	0.5-50	∞		∞	∞	∞
Y	0.5-50	∞	∞		∞	∞
Bl	1-70	1-70	1-70	1-70		1-30
W	1.5-100	1.5-100	1.5-100	1.5-100	0.5-30	

Removal

Disconnect the regulator/rectifier 6P connector.
Remove the mounting bolt and regulator/rectifier unit.

Installation is in the reverse order of removal.



Alternator

NOTE

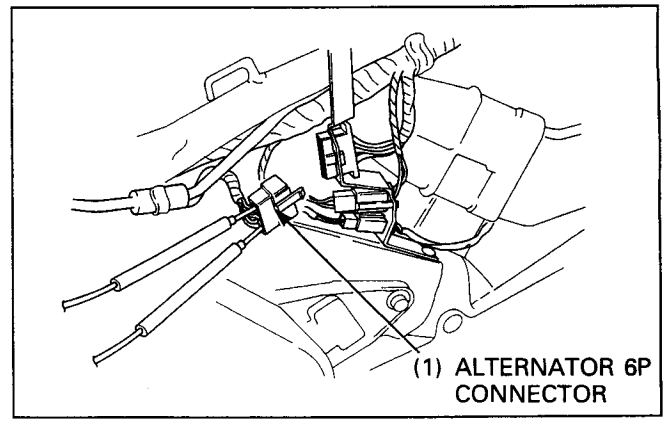
- It is not necessary to remove the stator to make this test.

Remove the lower fairing (page 2-6).
Disconnect the alternator 6P connector.

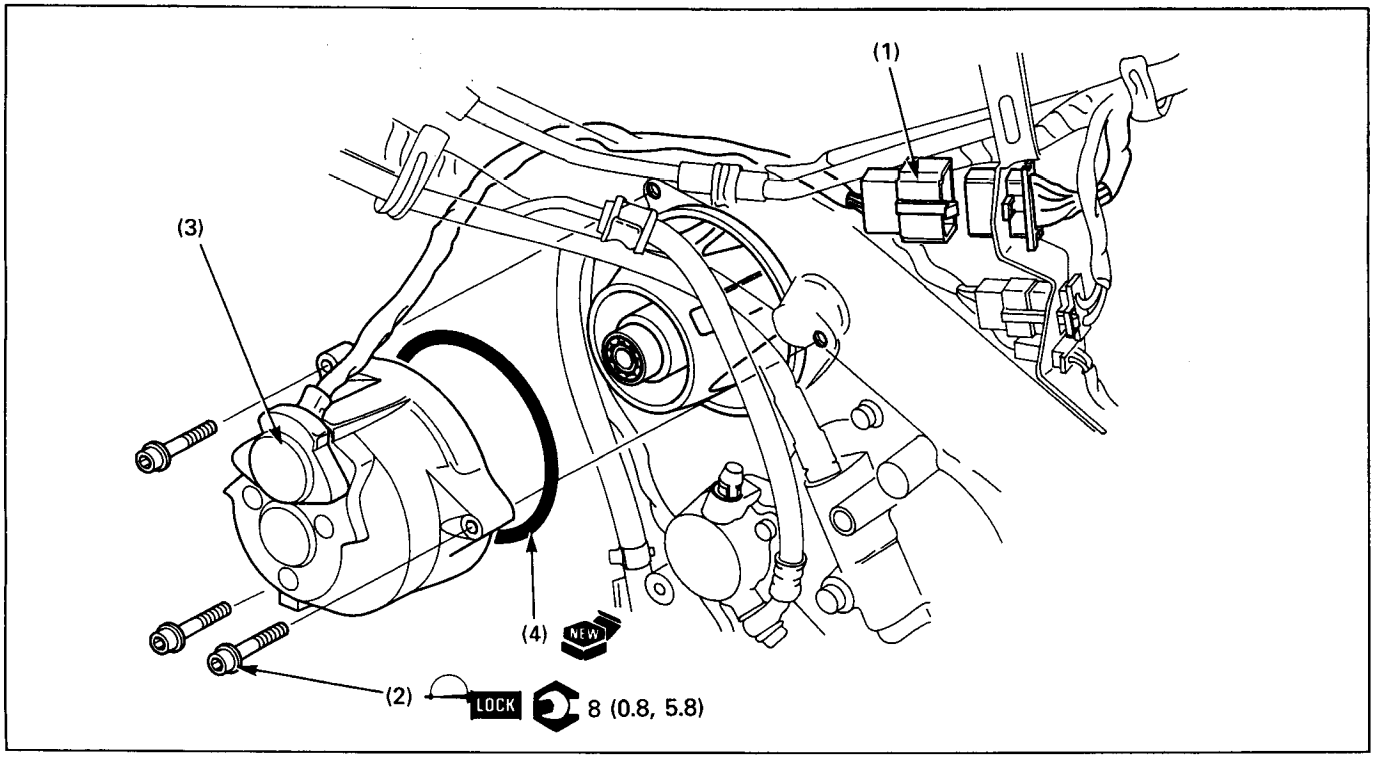
Measure the resistance between the Yellow wire terminals and check for no continuity between each terminal and body ground.

Standard:
Yellow–Yellow: 0–0.1Ω (20°C/68°F)
Yellow–body groud: No continuity

Replace the alternator if the resistance is out of specification or if there is continuity between Yellow wire terminal and ground.



AC Generator Cover Removal/Installation



Requisite Service

- Left lower fairing removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	AC generator 6P connector	1	
(2)	AC generator cover bolt	3	
(3)	AC generator cover	1	
(4)	O-ring	1	

15. Ignition System

Service Information

⚠ WARNING

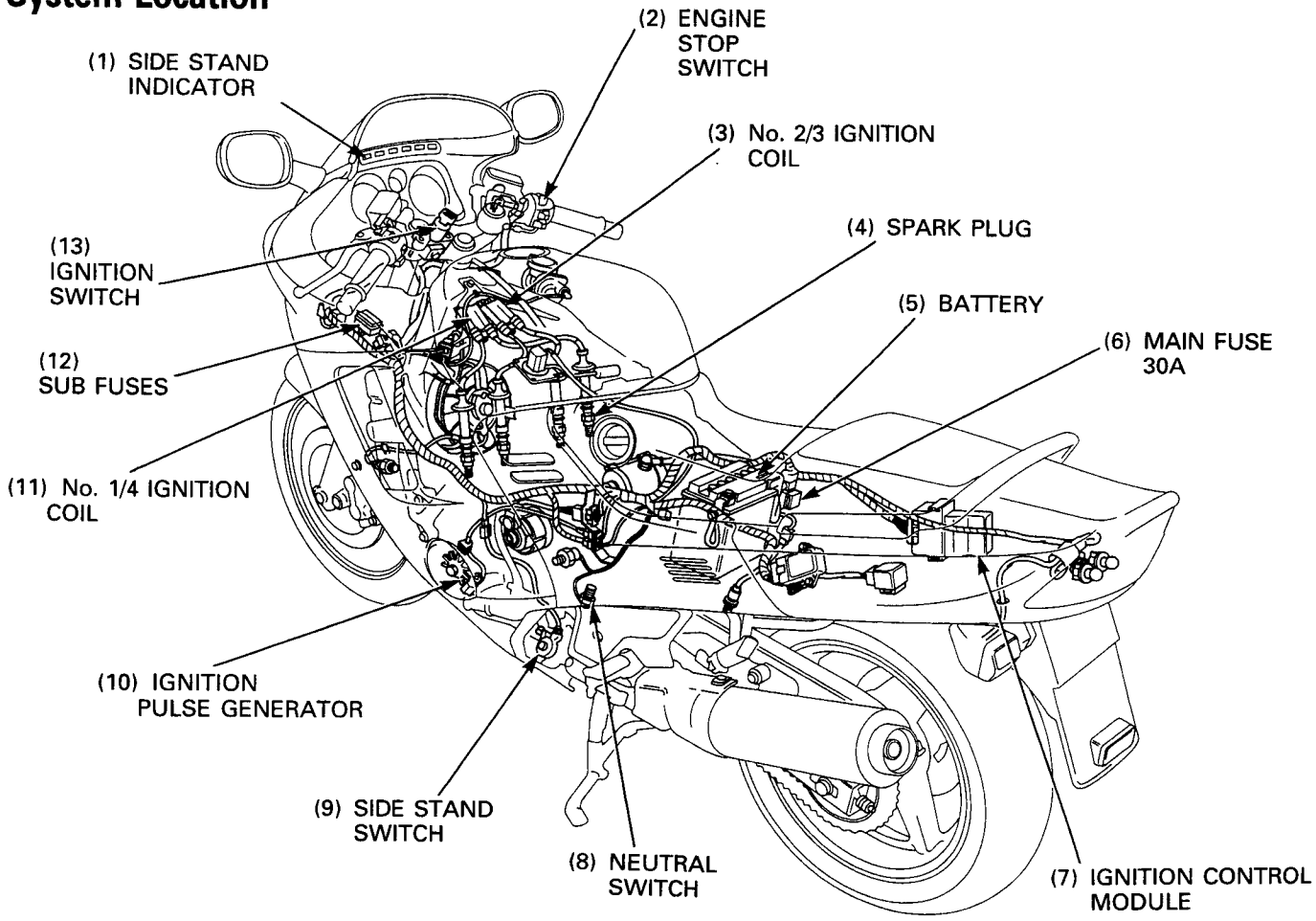
- **If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.**

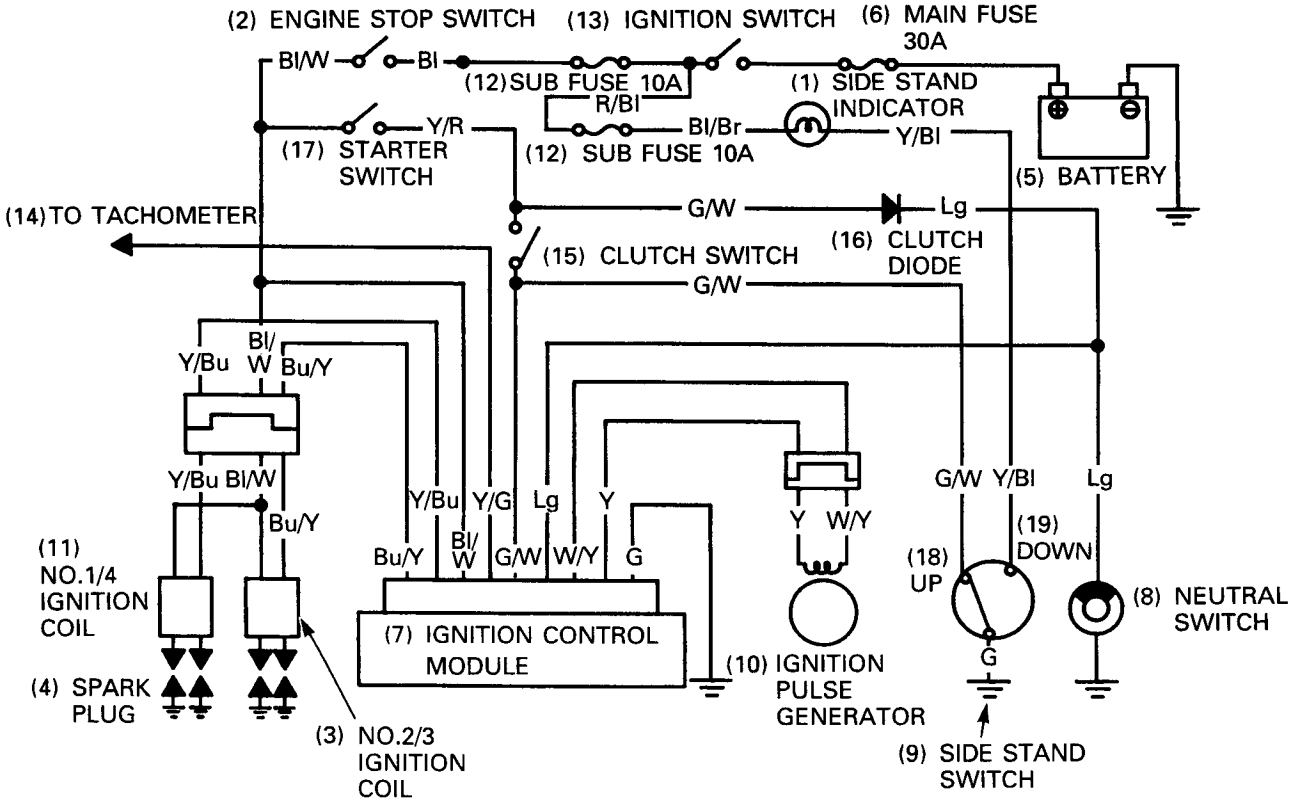
CAUTION

- **Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.**

- When checking the ignition system, always follow the steps in the troubleshooting flow chart (page 15-3).
- The ignition control module may be damaged if dropped. Also, if the connector is disconnected when current is present, the excessive voltage may damage the unit. Always turn off the ignition switch before servicing.
- Ignition timing cannot be adjusted since the ignition control module is non-adjustable. If ignition timing is incorrect, check the system components and replace any faulty parts.
- A faulty ignition system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- Use spark plugs of the correct heat range. Using spark plugs with an incorrect heat range can damage the engine. Refer to section 2 of the Common Service Manual.
- For neutral switch inspection, refer to section 25 of the Common Service Manual. For switch location, see page 15-2 of this manual (System Location).
- For alternator removal and installation, see section 14.
- For side stand switch, engine stop switch and ignition switch inspection, check for continuity chart of the Wiring Diagram, page 18-1. Disconnect the ignition and engine stop switch connectors in the upper fairing (page 1-23), side stand switch connector under the lower fairing and check it.

System Location

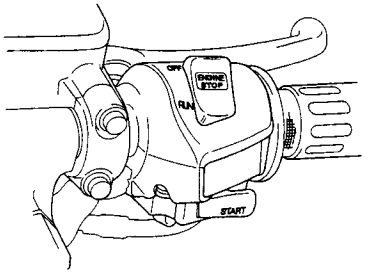




Troubleshooting

- Inspect the followings before diagnosing the system.
  - Loose spark plug caps or spark plug wire connections.
  - Water got into the spark plug cap. (Leaking the ignition secondry voltage)
  - Loose or poor contact of ignition system connectors.

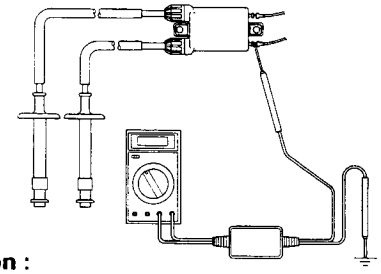
Check the starter motor operation (page 16-3).



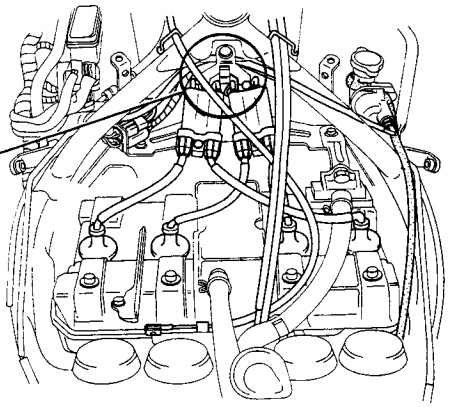
Abnormal →
- Faulty battery
- Inspect the starter system

Normal ↓

Inspect the ignition coil initial voltage (page 15-6).



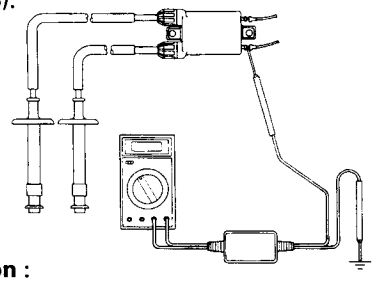
Connection :
No, 1/4 coil : Black/White (+) – Ground (–)
No, 2/3 coil : Black/White (+) – Ground (–)
Standard : Battery voltage



Abnormal →
- Faulty ignition switch
- Faulty engine stop switch
- Faulty ignition control module
- Short or open circuit in black/white wire

Normal ↓

Inspect the ignition coil primary peak voltage (page 15-6).

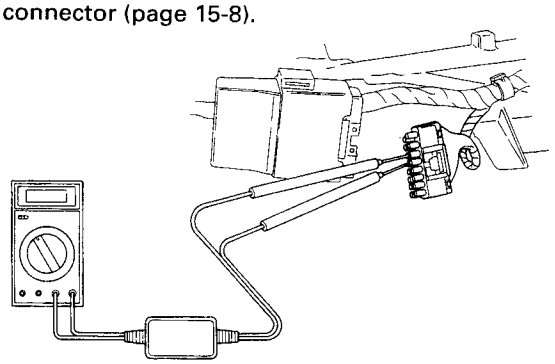


Connection :
No, 1/4 coil : Black/White (+) – Ground (–)
No, 2/3 coil : Black/White (+) – Ground (–)
Standard : 100V minimum

100V minimum →
- Faulty spark plug leaking ignition coil secon dary current ampere
- Faulty ignition coil

0V or battery voltage (below 100V) ↓

Inspect the ignition pulse generator peak voltage at the ignition control module multi-connector (page 15-8).

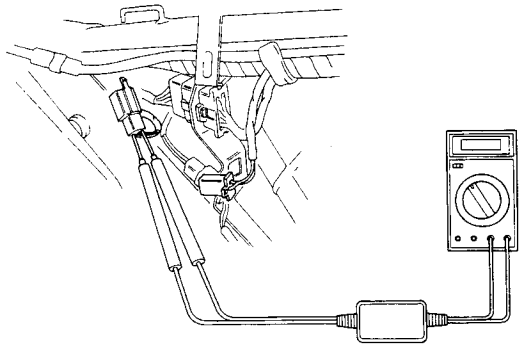


Connection : Yellow (+) – White/Yellow (–)
Standard : 0.7V minimum

Normal → • Faulty ignition control module

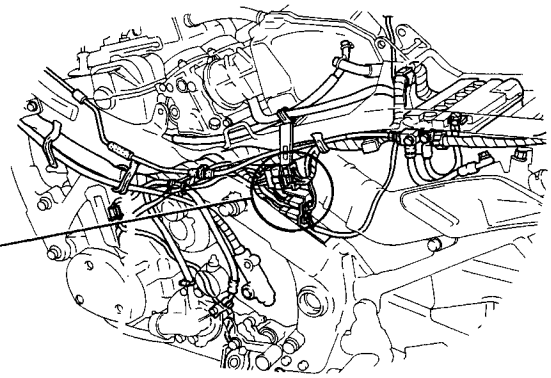
Abnormal

Inspect the ignition pulse generator peak voltage at the ignition pulse generator 4P connector (page 15-8).



Connection : Yellow (+) – White/Yellow (–)
Standard : 0.7V minimum

Abnormal → • Faulty ignitoin pulse generator



Normal

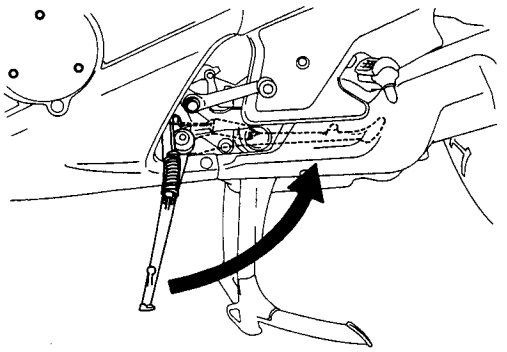
- Short or open circuit in white/yellow wire
- Short or open circuit in yellow wire

Engine Starts, But Side Stand Switch Does Not Function At All

NOTE

The side stand switch should function follows:
- When the transmission is shifted into a gear from neutral with the side stand down, the ignition shouts off and the engine stops.
- When in neutral, the neutral switch line (a) of the ignition control module is connected to ground via the side stand switch. When the side stand is up, the side stand switch line (b) of the ignition control module passes to ground via the side stand switch. The ignition control module monitors lines (a) and (b), and provides spark only when one or both of those lines is connected to ground via the neutral switch or the side stand switch.

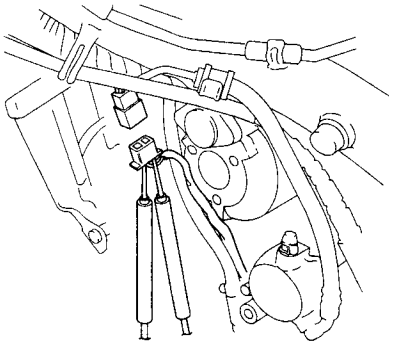
Check the side stand indicator function.



Normal → • Open circuit in Green/White wire

Abnormal ↓

Check for continuity between each terminals of side stand switch as follow.

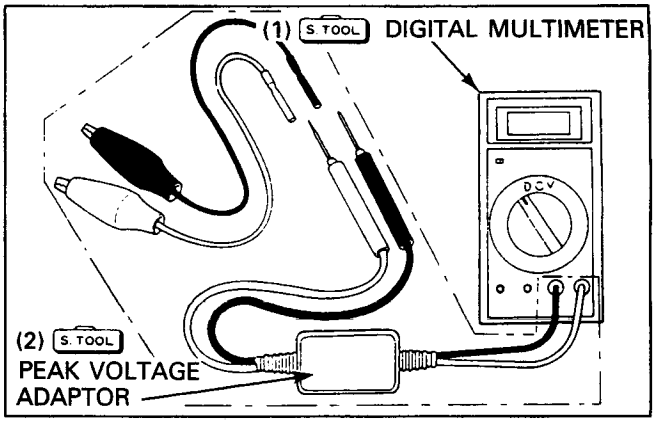


Side stand up : Green/White – Green
Side stand down : Yellow/Black – Green

Normal → • Loose or poor contact of related connectors
• Open circuit in Green/White wire
• Burnt indicator bulb

Abnormal → • Faulty side stand switch

System Inspection



NOTE

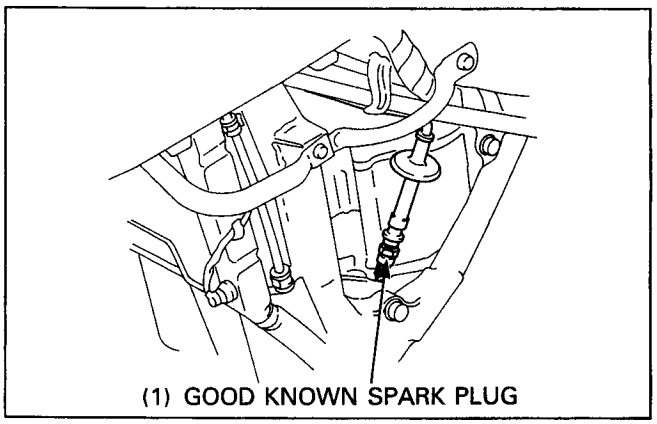
- If no spark at all plugs, check all connections for loose or poor contact before measuring each peak voltage.
- Use genuine digital tester or commercially available digital multitester impedance: 10 MΩ/DCV minimum.
- The display value differs depending upon the initial impedance of the multitester.
- If using Imrie diagnostic tester (model 625), follow the manufacture's instruction.

Connect the peak voltage adaptor to the digital multitester.

S. TOOL

Imrie diagnostic tester (model 625) made in Austria or
Peak voltage adaptor 07HGJ-0020100 with
Digital multitester 07411-0020000

Ignition Coil Primary Voltage Inspection



NOTE

- Check all system connections before this inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check all cylinder compression at each cylinder and spark plugs and caps are installed correctly in all cylinders. If the peak voltage is measured with the cylinder compression being low, the measurement will be higher than the standard voltage.

Support the motorcycle using the center stand.

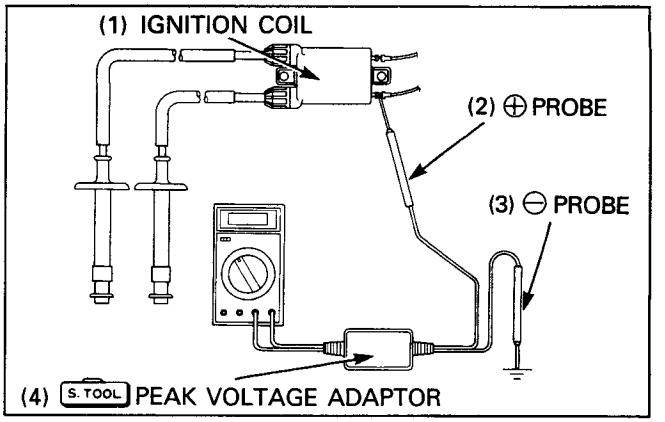
Disconnect all spark plug caps from the spark plug.

Connect good known spark plugs on each spark plug cap, then ground the spark plugs to the cylinder as done in a spark test.

Connect the peak voltage adaptor probes between the primary ignition terminals with the connectors remained connected.

Connection:
No.1/4 coil : Black/White (+) and Body ground (–)
No.2/3 coil : Black/White (+) and Body ground (–)

Turn the ignition switch is ON and engine stop switch to RUN.
Check for initial voltage at this time.
The battery voltage should be measured.



If the initial voltage is not measured, check power supply circuit referring the troubleshooting (page 15-3).

Crank the engine with the starter motor and read each ignition coil primary peak voltage.

Connection:
No.1/4 coil : Black/White (+) and Body ground (–)
No.2/3 coil : Black/White (+) and Body ground (–)

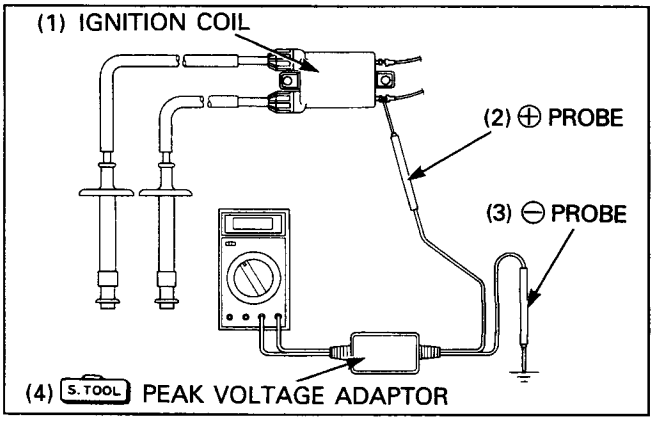
Peak voltage : 100 V minimum

⚠ WARNING

- **Avoid touching the spark plugs and tester probes to prevent electric shock.**

NOTE

- Although measured values are different for each igni tion coil, they are normal as long as each voltage is higher than the specified voltage.



Ignition Pulse Generator Peak Voltage Inspection

NOTE

- Measure the peak voltage with the cylinder compression is applied. Leave all spark plugs in the cylinder head.

Remove the seat cowl (page 2-4).

Remove the ignition control module multi-connector. Connect the peak voltage adaptor probes to the ignition pulse generator terminals of ignition control module multi-connector.

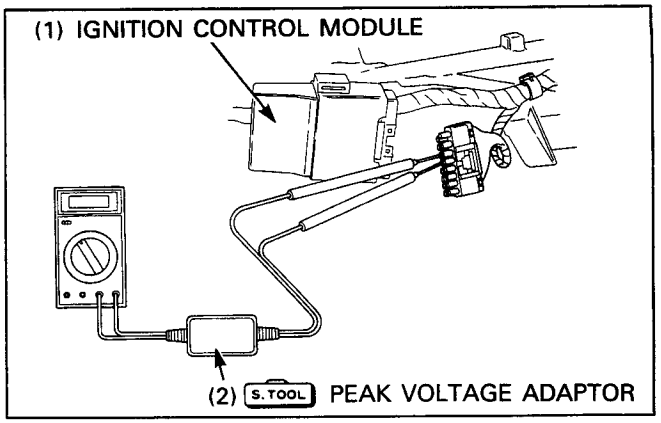
Connection: Yellow (+) and White/Yellow (–)

Crank the engine with the starter motor and read the ignition pulse generator peak voltage.

Peak voltage: 0.7 V minimum

⚠ WARNING

- **Avoid touching the tester probes to prevent electric shock.**



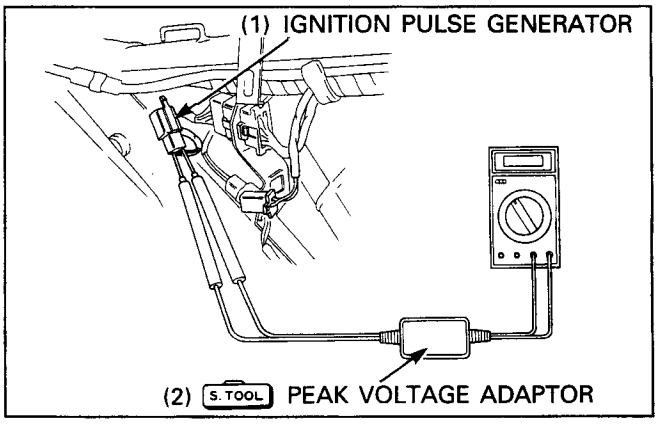
If the measured value is out of specification, measure the peak voltage at the ignition pulse generator 4P connector using the same procedure as for the previous measurement.

⚠ WARNING

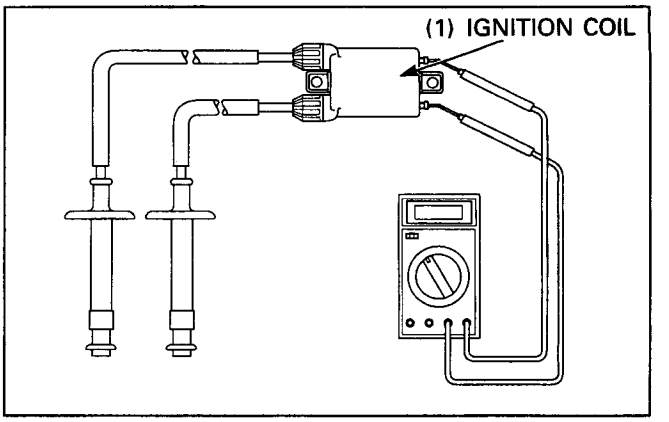
- **Avoid touching the tester probes to prevent electric shock.**

If the peak voltage is within the specification, check for and open or short circuit in White/Yellow and Yellow wires.

If the peak voltage is out of the specification, replace the ignition pulse generator (page 15-11).



Ignition Coil



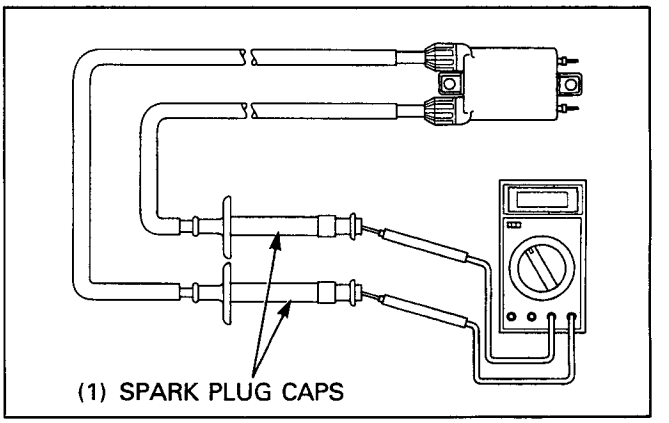
Inspection

Measure the primary coil resistance between the terminals.

Standard: 2.5 – 3.2 Ω (20°C/68°F)

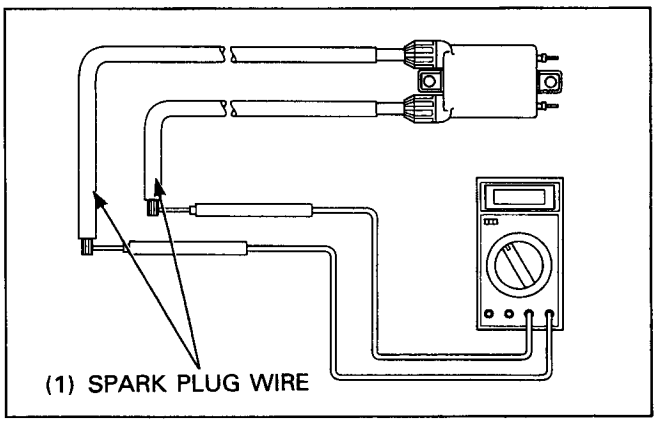
Measure the resistance between the spark plug caps.

Standard: 21 – 27 kΩ (20°C/68°F)



If the measured value out of the specification, remove the spark plug caps from the spark plug wires and measure the resistance between the spark plug wires.

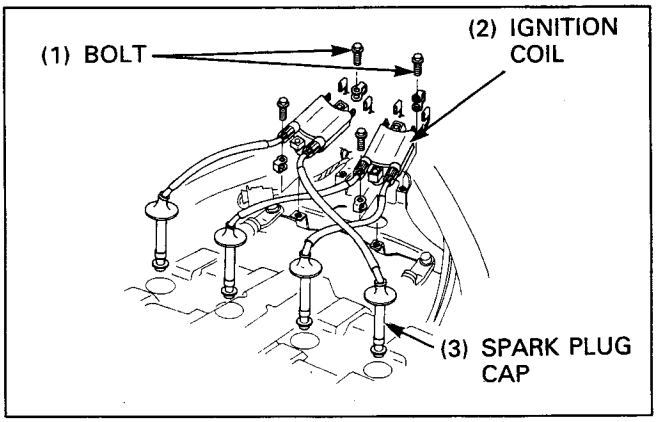
Standard: 11 – 17 kΩ (20°C/68°F)



Removal/Installation

Disconnect the spark plug cap from the cylinder head.
Remove the ignition coil mounting bolts.
Disconnect the primary wires and remove the ignition coil.

Installation is in the reverse order of removal.



Ignition Pulse Generator Inspection

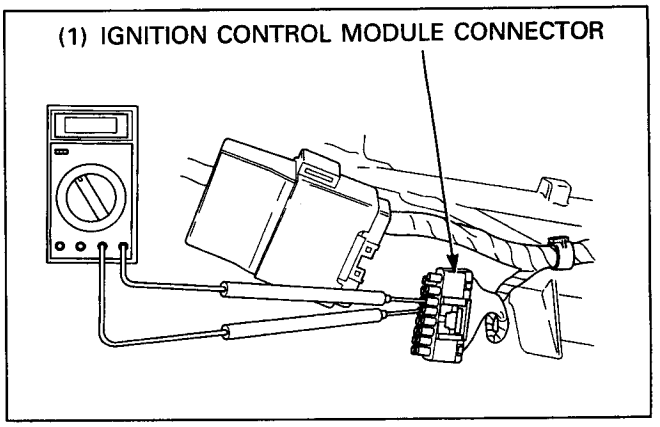
NOTE

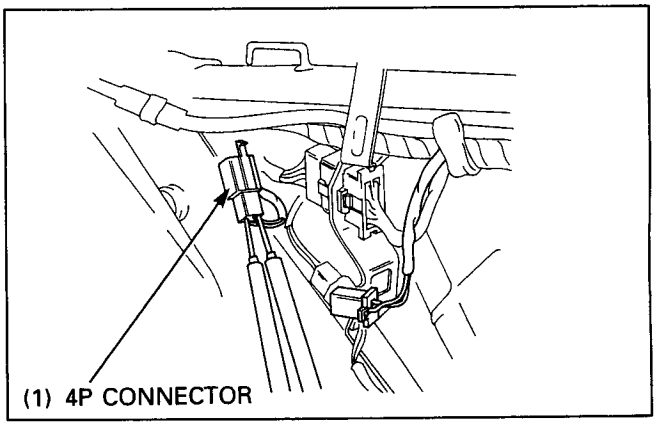
- It is not necessary to remove the ignition pulse generator from the engine.

Remove the seat cowl (page 2-4).
Disconnect the ignition control module multi-connector.
Measure the resistance between the White/Yellow and Yellow terminals.

Standard: 460 – 580 Ω (20°C/68°F)

If the measured value is out of specification, measure the resistance at the ignition pulse generator 4P connector using the same procedure as for the previous measurement.





Ignition Timing

NOTE

- The ignition control module system is factory pre-set and cannot be adjusted. Ignition timing inspection procedures are given to inspect the function of the ignition control module components.
- Connect the timing light to the other spark plug wire if you see that the ignition timing is incorrect, and you might be able to see the timing is correct.

Warm up the engine to operating temperature.

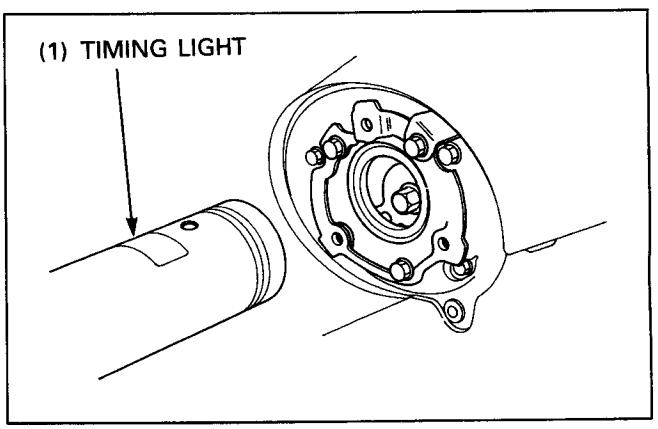
⚠ WARNING

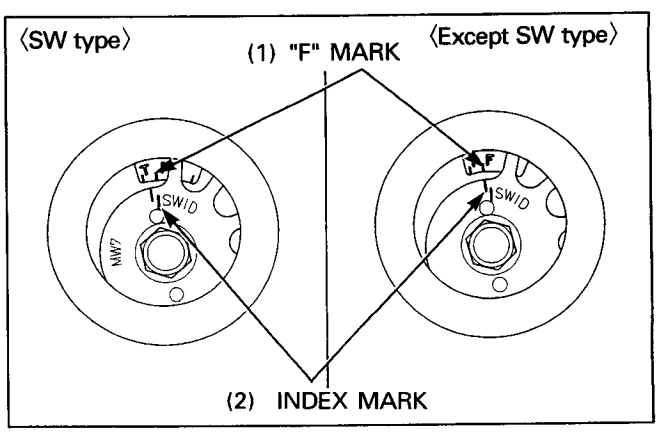
- **If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.**
- **The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.**

Stop the engine and remove the crankshaft hole cap.
Connect a timing light to the spark plug wire.
Start the engine and let it idle.

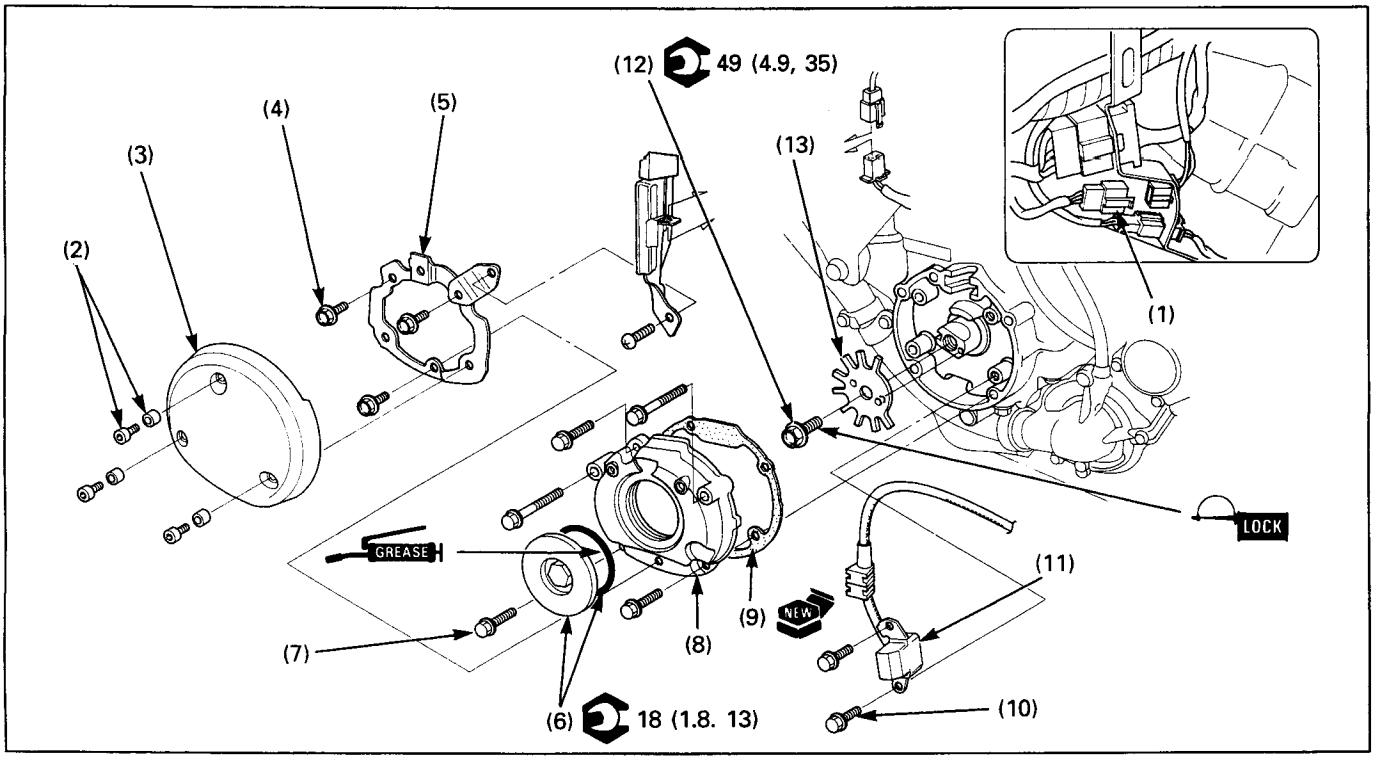
The timing is correct if the "F" mark on the ignition pulse generator rotor aligns with the index mark on the crankcase.

Increase the engine speed by rotating the throttle stop screw and make sure the "F" mark begins to move counterclockwise at approximately 1,600 min^{-1} (rpm).





Ignition Pulse Generator Rotor Removal/Installation



NOTE

- If you plan to remove the ignition pulse generator, remove the right crankcase cover and hold the crankshaft.

Requisite Service

- Lower fairing removal/installation (page 2-6)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Ignition pulse generator 2P connector	1	After removal, remove the ignition pulse generator wire from the clamps.
(2)	Socket bolt/collar	3/3	
(3)	Left crank cover	1	
(4)	Bolt	3	
(5)	Bracket	1	
(6)	Timing hole cap/O-ring	1/1	
(7)	Ignition pulse generator cover bolt	5	
(8)	Ignition pulse generator cover	1	
(9)	Gasket	1	
(10)	Ignition pulse generator bolt	2	
(11)	Ignition pulse generator	1	At removal, remove the grommet from the crankcase.
(12)	Ignition pulse generator rotor bolt	1	
(13)	Ignition pulse generator rotor	1	At installation, align the projections on the rotor with cut out and on the crankshaft.

16. Electric Starter

Service Information

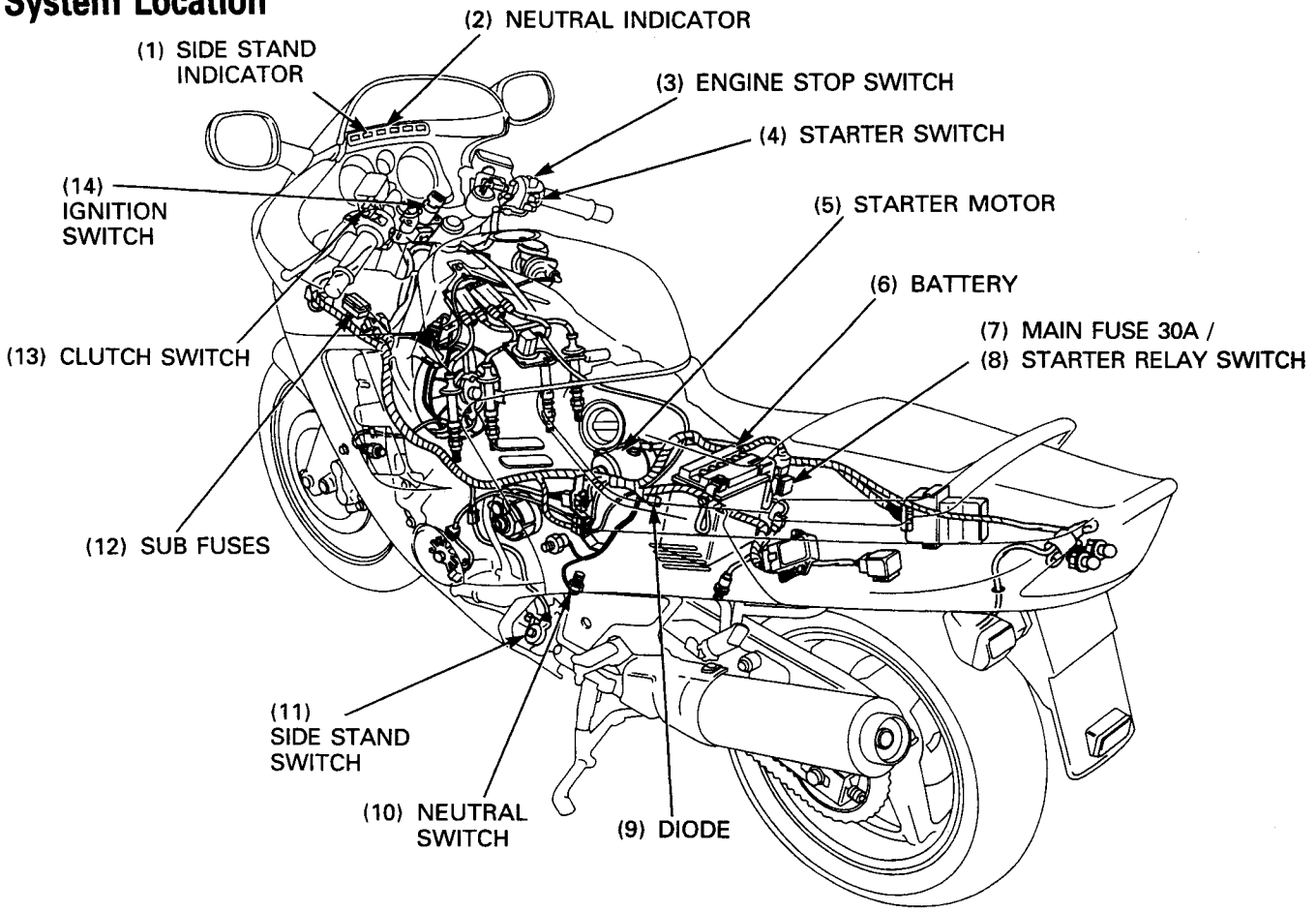
⚠ WARNING

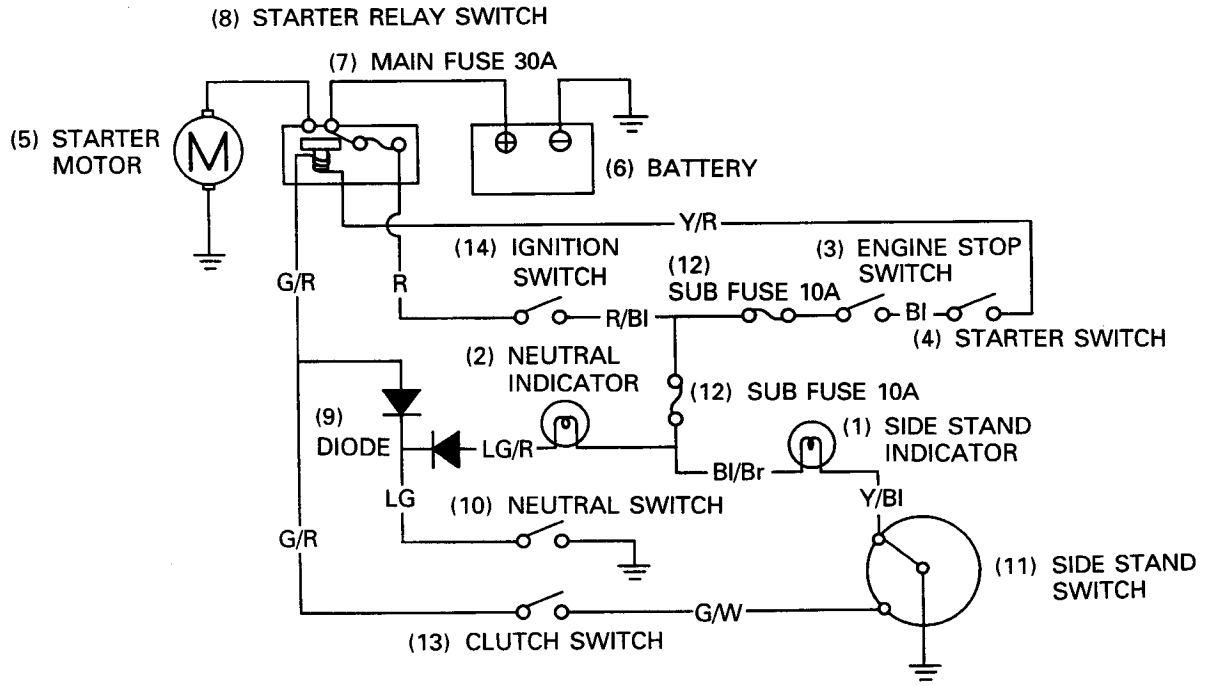
- **Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.**

- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- For the following components inspections, refer to the following pages; for the parts locations, see page 16-3 of this manual (System Location).

Component	Inspection method	Remarks
Clutch switch diode	Section 24 of the Common Service Manual	
Starter motor	Section 24 of the Common Service Manual	
Clutch switch	Section 25 of the Common Service Manual	
Neutral switch	Section 25 of the Common Service Manual	Torque : 18 N • m (1.8 kg-m, 13, ft-lb)
Ignition switch	Check for continuity on the continuity chart of the Wiring Diagram, page 18-1.	
Side stand switch	Section 25 of the Common Service Manual	

System Location





Troubleshooting

NOTE

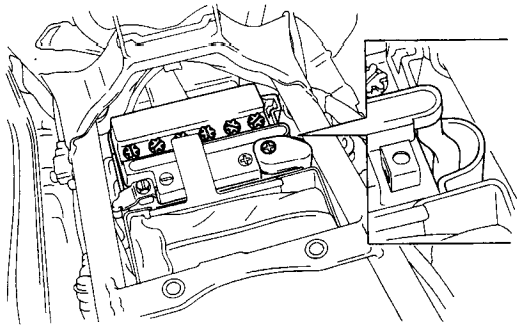
- Check for the following before troubeshooting the system.
  - Blown main fuse (30A) or sub fuse (10A).
  - Loose battery and starter motor cable.
  - Discharged battery.

- The starter motor does not turn when the engine stop switch is OFF.
- The starter motor should turn when the transmission is in neutral.
- The starter motor should turn when the transmission is in any gear with relative circuit satisfied, indicated below chart.

Gear Position	Side Stand	Clutch Lever	Starter Motor
In Any Gear	Up (Retracted)	Pulled in	Turn
		Free	Does Not Turn
	Down	Pulled in	Does Not Turn
		Free	Does Not Turn

Starter motor will not turn

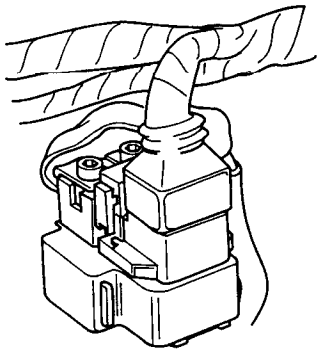
Check for loose or poorly contacted battery terminals and opened or shorted battery cable.



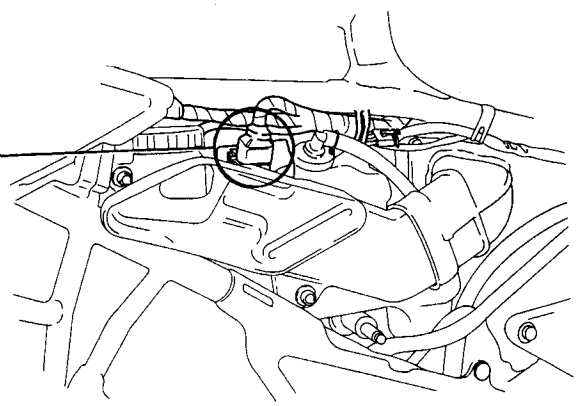
Abnormal → • Poorly connected battery terminals
• Open or short circuit in battery cable

Normal ↓

Check for loose or poorly connected starter relay switch terminals of 4P connector.

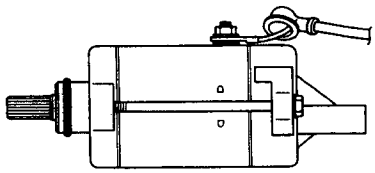


Abnormal → • Poorly connected terminals of 4P connector



Normal ↓

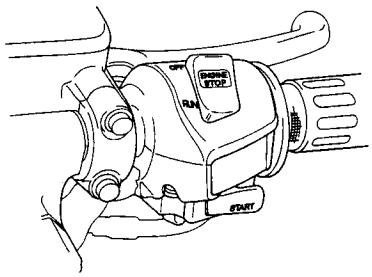
Check for loose or poorly connected starter motor cable, and opened cable.



Abnormal →
- Poorly connected battery terminals
- Open circuit in motor cable

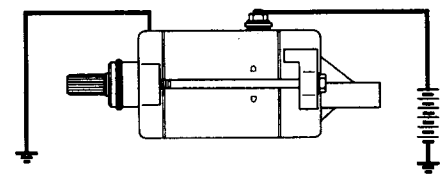
Normal ↓

With the ignition switch "ON" push the starter switch and check for a "Click" sound from the starter relay switch.



Clicks →

Connect the starter motor terminal to the bettery positive terminal directly.
(Because a large amount of current flows, do not use thin wires)



Starter motor turns ↓

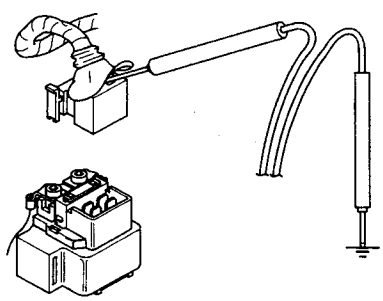
- Loose or disconnected starter motor cable
- Faulty starter relay switch

Starter motor does not turn ↓

- Faulty starter motor

No click ↓

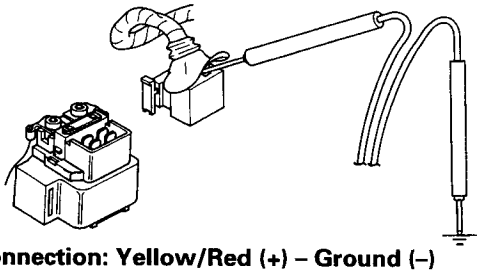
Disconnect starter relay switch connector, and check the relay coil ground line as below for continuity:
1. Green/Red terminal-to-clutch switch diode-to-neutral switch line (with transmission into neutral and clutch lever released).
2. Green/Red terminal-to-clutch switch-to-side stand switch line (in any gear except neutral, and with the clutch lever pulled in and the side stand up).



No continuity →
- Faulty neutral switch
- Faulty clutch switch
- Faulty side stand switch
- Loose or poor contact of connector
- Open circuit in wire harness

Continuity ↓

Connect the stater relay switch connector. With the ignition switch ON and the starter switch pushed, measure the starter relay voltage at the starter switch connector.

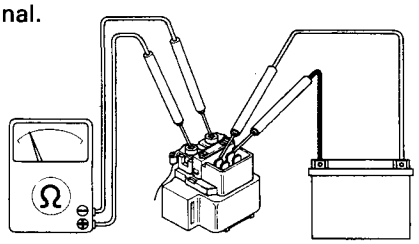


Connection: Yellow/Red (+) – Ground (–)
Standard: Battery Voltage

No voltage →
- Faulty ignition switch
- Faulty starter switch
- Blown out main or sub fuses
- Loose or poor contact of connector
- Open circuit in wire harness

Voltage appeared

Remove the starter relay switch.
Connect a fully charged 12V battery to the starter relay switch.
Check the continuity between the switch large terminal.



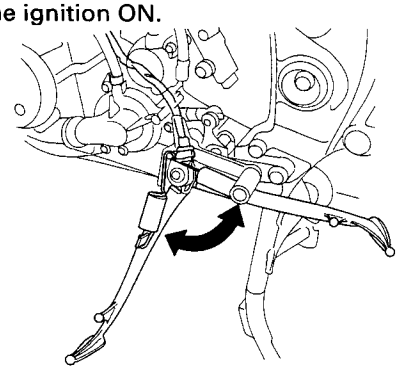
Connection: Yellow/Red (+) – Green/Red (–)
Standard: Continuity

Normal →
- Loose or poor contact of the starter relay switch connector

Abnormal →
- Faulty starter relay switch

Starter motor turns when the transmission is in neutral, but does not turn with transmission in any position except neutral, with the side stand up and the clutch lever pulled in.

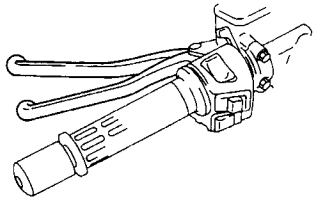
Check the side stand switch is properly operated with the ignition ON.



Abnormal →
- Faulty side stand switch
- Burnt bulb
- Open circuit in wire harness

Normal

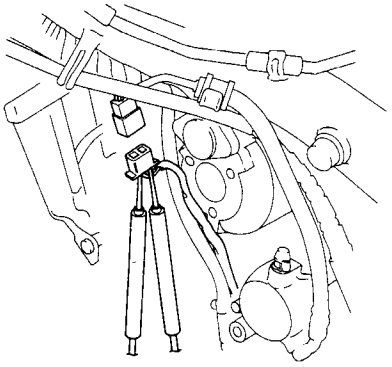
Check the clutch switch operation (Section 19).



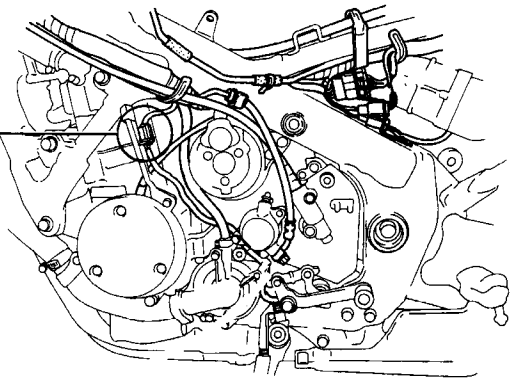
Abnormal → • Faulty clutch switch

Normal

Check the side stand switch.



Abnormal → • Faulty side stand switch



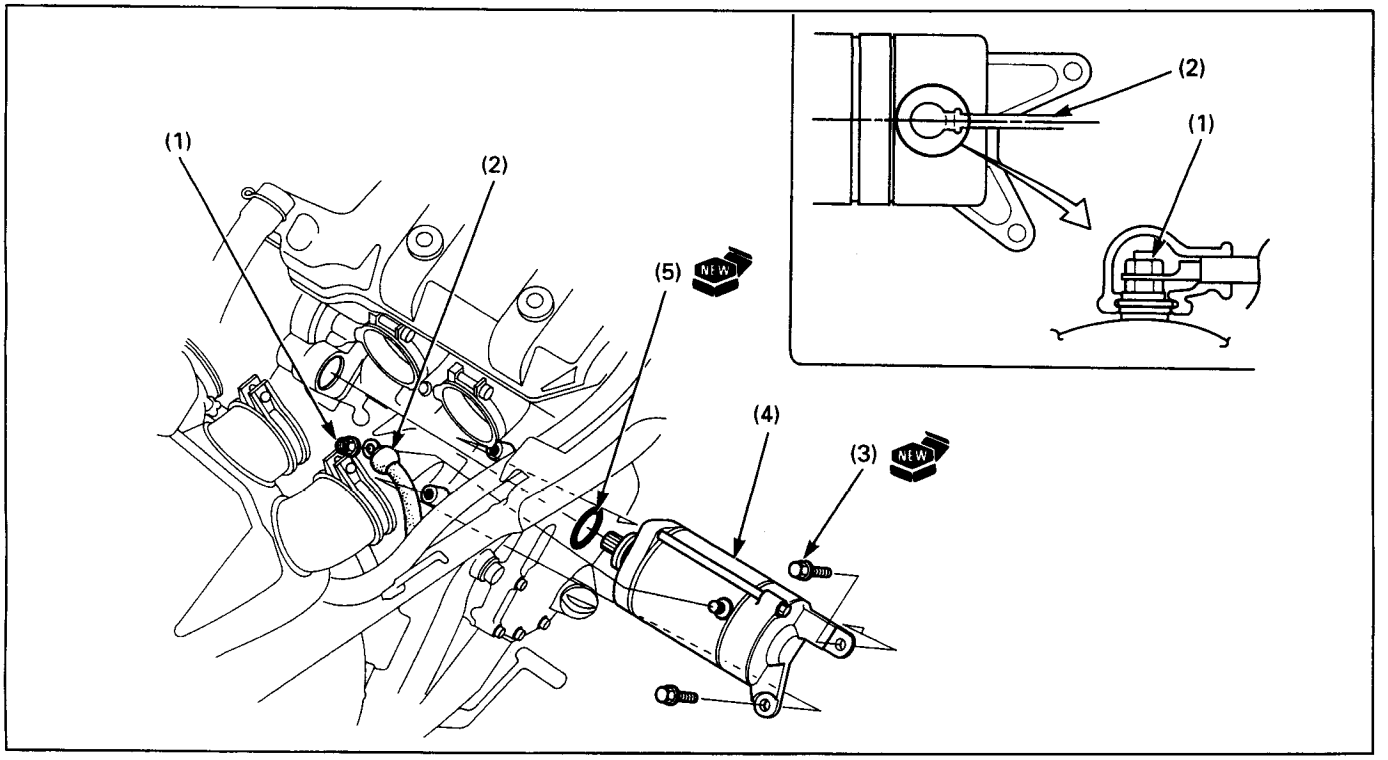
Normal → • Open circuit wire harness
• Loose or poor contact of connector

Starter motor turns slowly
- Low specific gravity in battery (or dead battery)
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor

Starter motor turns, but engine does not turn
- Starter motor is running backward
  - Case assembled improperly
  - terminals connected improperly
- Faulty starter clutch
- Damaged reduction gear
- Damaged starter idle gear

Starter relay switch "click", but engine does not turn over
- Crankshaft does not turn due to engine problem
- Excessive reduction gear friction

Starter Motor Removal/Installation



⚠ WARNING

- **With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.**

NOTE

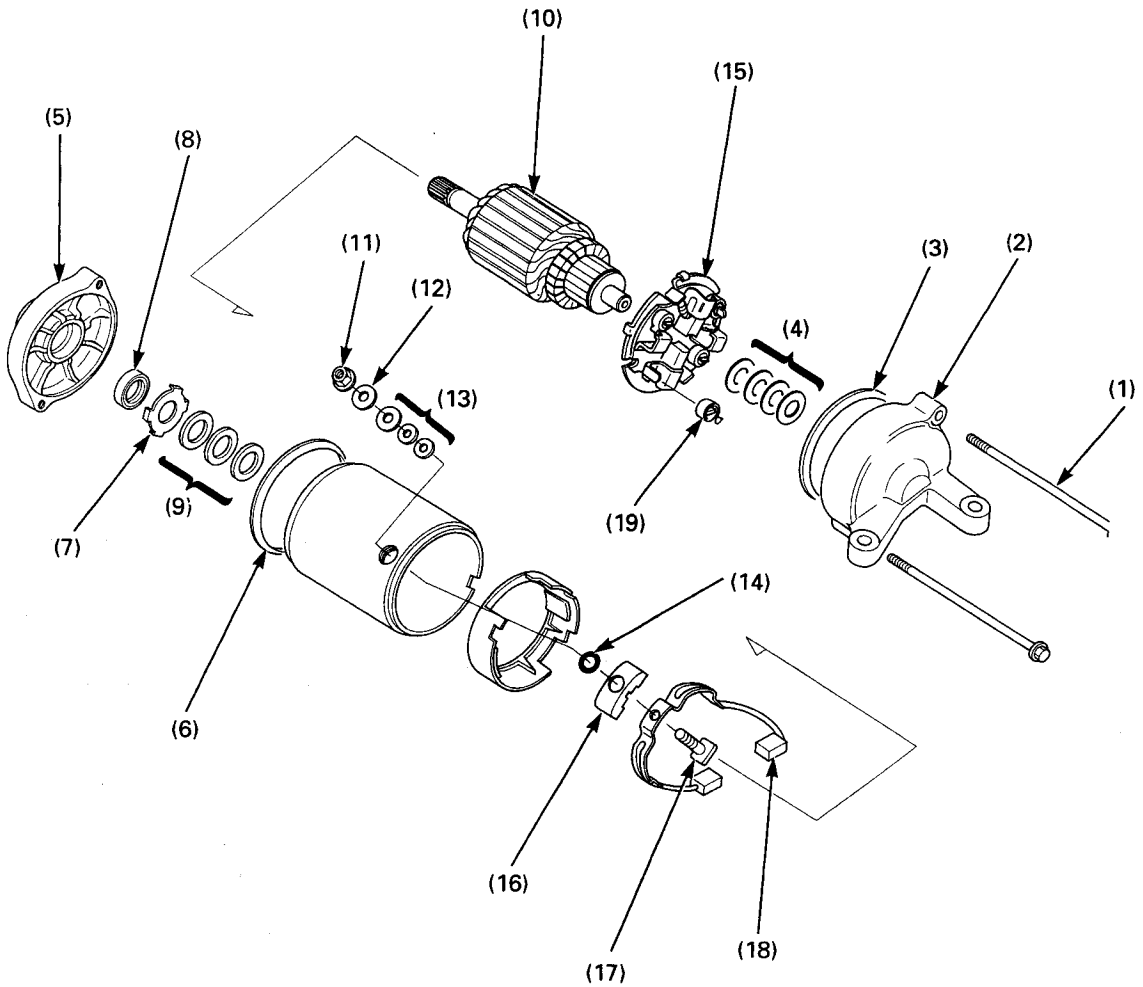
- Route the wire and cables properly (page 1-23)
- The starter motor can be removed easily after removing the carburetor.

Requisite Service

- Lower fairing removal/installation (page 2-6)
- Carburetor removal/installation (page 5-4)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Terminal nut	1	
(2)	Starter motor cable eyelet	1	
(3)	Starter motor mounting bolt	2	
(4)	Starter motor assembly	1	Disassembly/assembly (page 16-8)
(5)	O-ring	1	

Starter Motor Disassembly/Assembly



NOTE

- Note the location and number of thrust washers when disassembling.

Requisite Service

- Starter motor removal/installation (page 16-7)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Flange bolt	2	
(2)	Rear cover	1	At installation, align tabs in the rear cover with the projection of the brush holder plate.
(3)	O-ring	1	
(4)	Shim	–	Note the location and number of shims.
(5)	Front cover	1	
(6)	O-ring	1	
(7)	Lock washer	1	
(8)	Dust seal	1	
(9)	Washer	–	Note the location and number of washers.
(10)	Armature	1	
(11)	Terminal nut	1	
(12)	Washer	1	
(13)	Insulated washer	3	
(14)	O-ring	1	
(15)	Brush holder assembly	1	
	Brush Holder Disassembly Order		Assembly is in the reverse order of disassembly.
(16)	Terminal bolt supporter	1	At installation, install the supporter with its tab facing the blush holder.
(17)	Terminal bolt	1	
(18)	Motor brush	1	
(19)	Brush spring	4	

17. Lights/Meters/Switches

Service Information

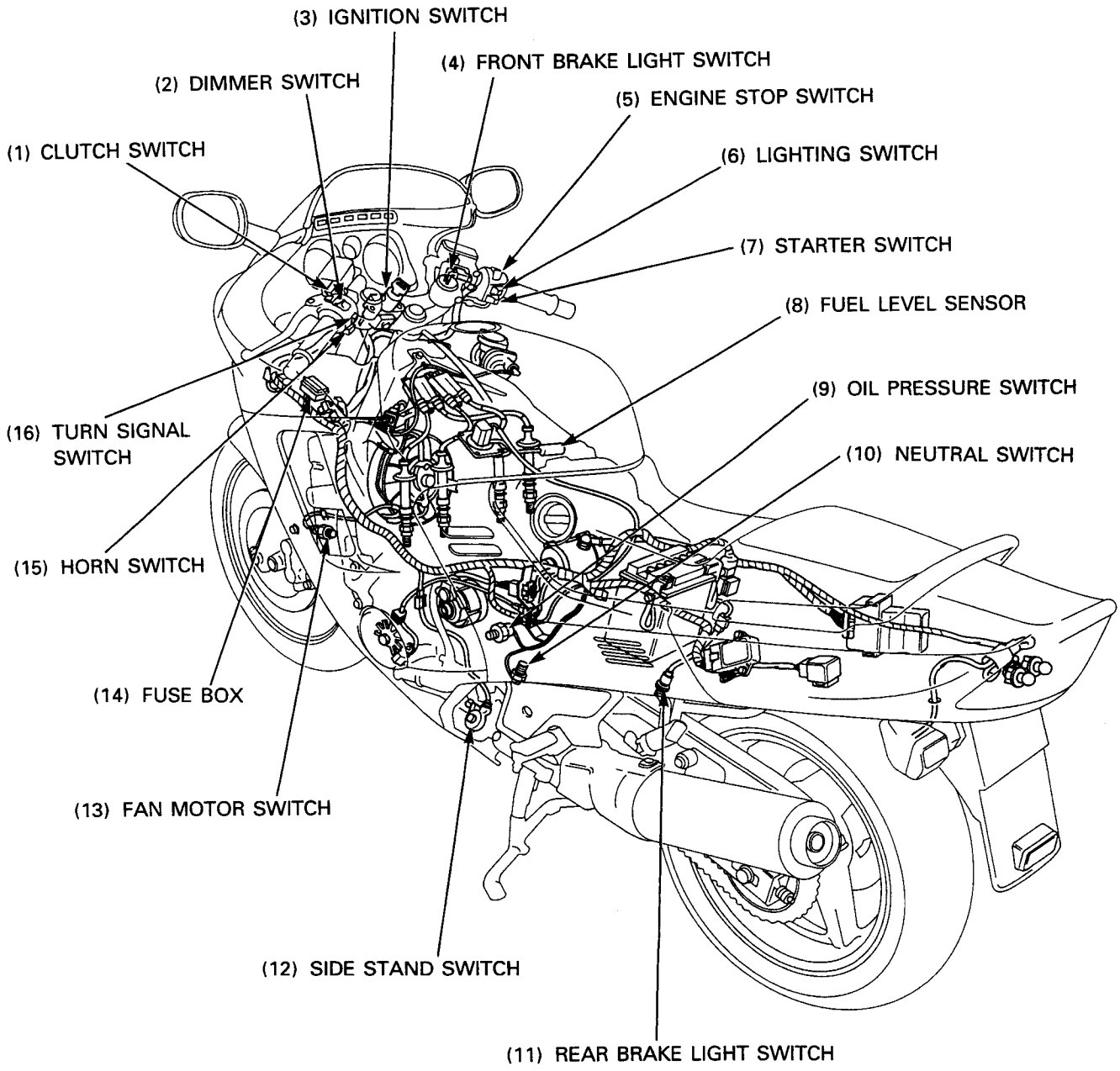
⚠ WARNING

- **A halogen headlight bulb becomes very hot while the headlight is ON , and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.**
- **Use a flame and heated water/coolant mixture for the thermo sensor inspection. Keep all flammable materials away from the burner. Wear protective clothing, gloves and eye protection.**

- Note the following when replacing the halogen headlight bulb.
  - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
  - If you touch the bulb with your bare hands, clean it cloth moistened with alcohol to prevent its early failure.
  - Be sure to install the dust cover after replacing the bulb.
- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- Always turn off the ignition switch before disconnecting any electrical component.
- A continuity test can be made with switches installed on the motorcycle.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- For the following component locations see 17-2 of this manual (System Location); for inspections refer to the applicable pages.

Component	Inspection method	Remarks
Front brake switch	Section 25 of the Common Service Manual	
Horn	Section 25 of the Common Service Manual	
Handlebar switch	Check for continuity on the continuity chart of the Wiring Diagram, page 18-1	
Ignition switch		
Neutral switch	Section 25 of the Common Service Manual	Torque : 12 N • m (1.2 kg-m, 9, ft-lb)
Oil pressure switch/ warning light	Section 25 of the Common Service Manual	Oil pressure check: Section 4 of the Common Service Manual Oil pressure switch torque : 12 N • m (1.2 kg-m, 9, ft-lb) Apply sealant to the threads.
Rear brake switch	Section 25 of the Common Service Manual	
Turn signal lights	Section 25 of the Common Service Manual	

System Location



Bulb Replacement

Headlight Bulb

⚠ WARNING

- **Halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.**

Remove the maintenance lid (2-6).

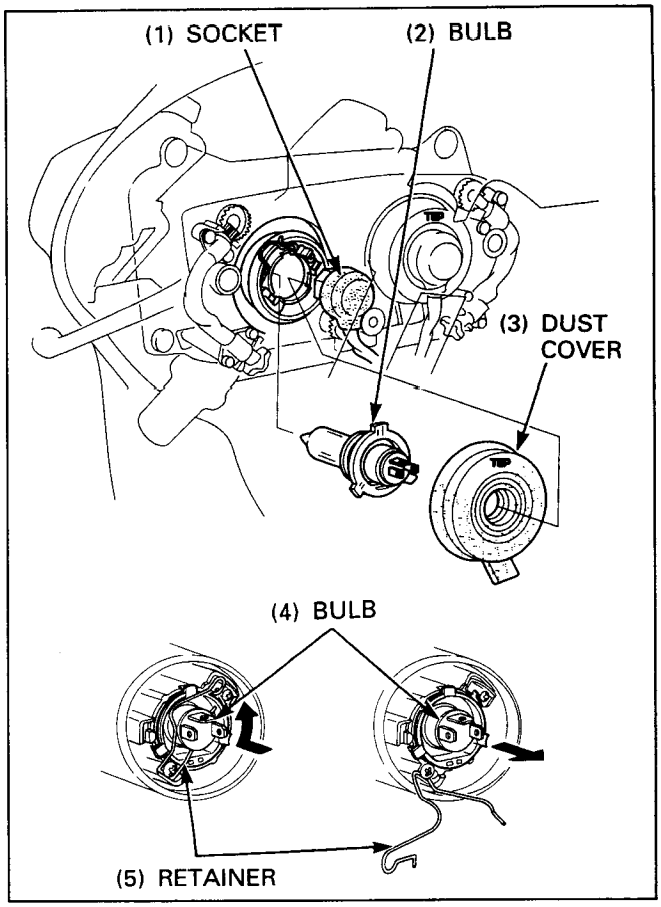
Remove the headlight bulb socket and dust cover.
Push the retaining tabs.

Unhook the bulb retainer and remove the headlight bulb.

Installation is in the reverse order of removal.

NOTE

- Install the dust cover with its "TOP" mark facing up.

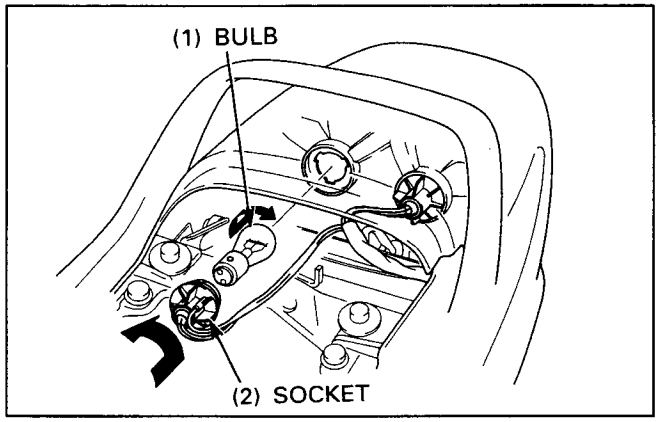


Tail/Brake Light

Remove the seat (page 2-3).

Remove the tail/brake light bulb and socket as an assembly by turning it counterclockwise.

Replace a new bulb and install it in the reverse order of removal.



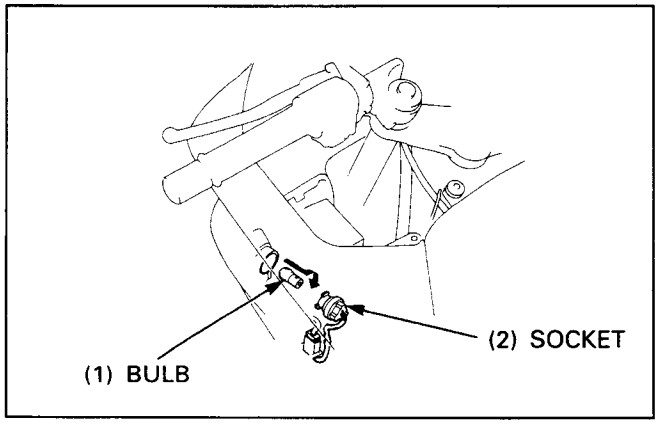
Turn Signal Bulb

Front

Remove the inner cover (page 2-8).

Remove the front turn signal bulb and socket as an assembly by turning it counterclockwise.

Replace a new bulb and install it in the reverse order of removal.



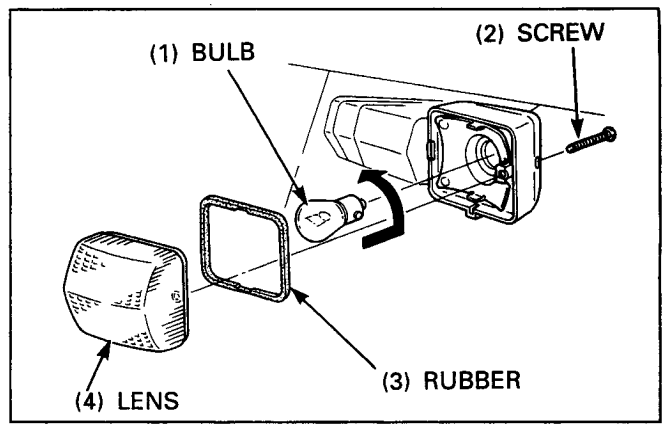
Rear

Remove the screw, lens and rubber.
Remove the rear turn signal bulb by turning it counter-clockwise.

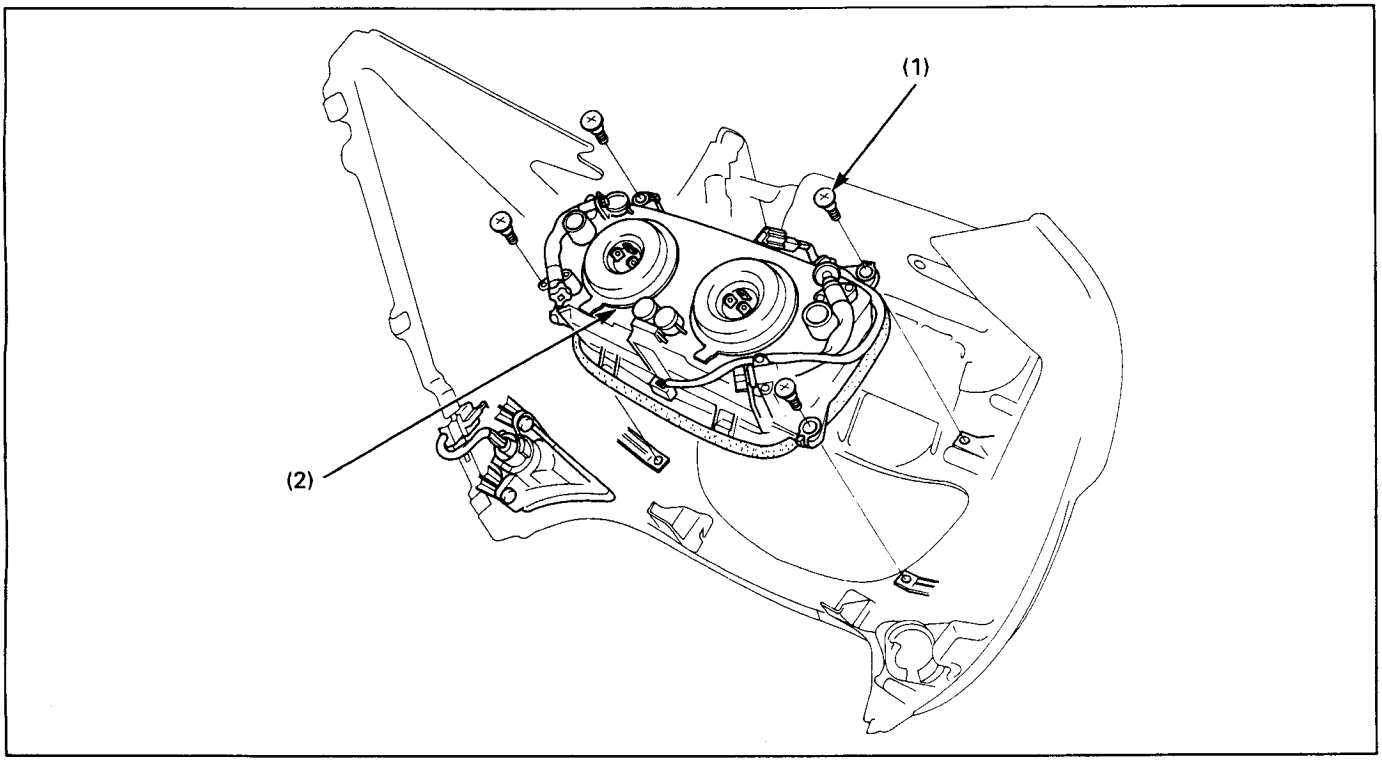
Replace a new bulb and install it in the reverse order of removal.

NOTE

- Align the lug on the lens with the slot in the light case properly.



Headlight Removal/Installation



⚠ WARNING

- **An improperly adjusted headlight may blind on-coming drivers, or it may fail to light the road for a safe distance.**

NOTE

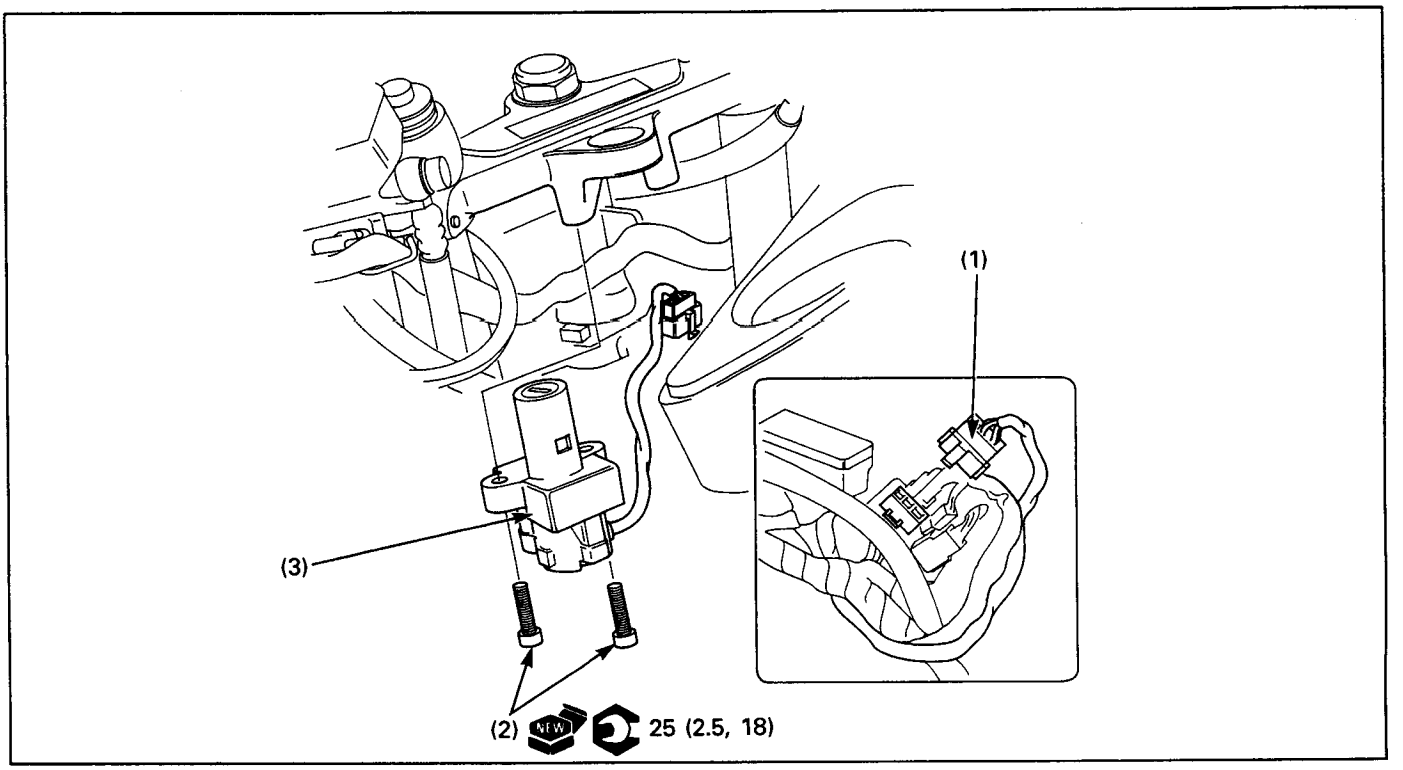
- Adjust the headlight beam as specified by local laws and regulations.
- After installation, route the wires and cable properly (page 1-23).

Requisite Service

- Upper fairing removal/installation (page 2-7)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Screw	4	
(2)	Headlight assembly	1	At installation, install the headlight sealed rubber securely as shown.

Ignition Switch Removal/Installation



NOTE

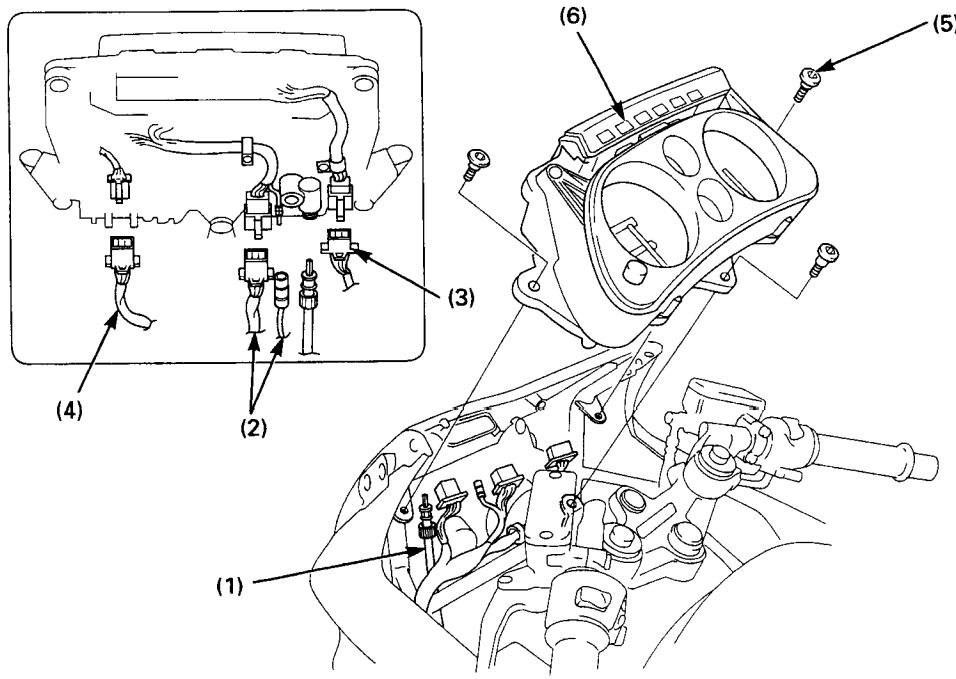
- Route the ignition switch wire properly (page 1-23).

Requisite Service

- Upper fairing removal/installation (page 2-7)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Ignition switch 6P connector	1	Disconnect it at the connector holder.
(2)	Ignition switch mounting bolt	2	
(3)	Ignition switch	1	

Combination Meter Removal/Installation



NOTE

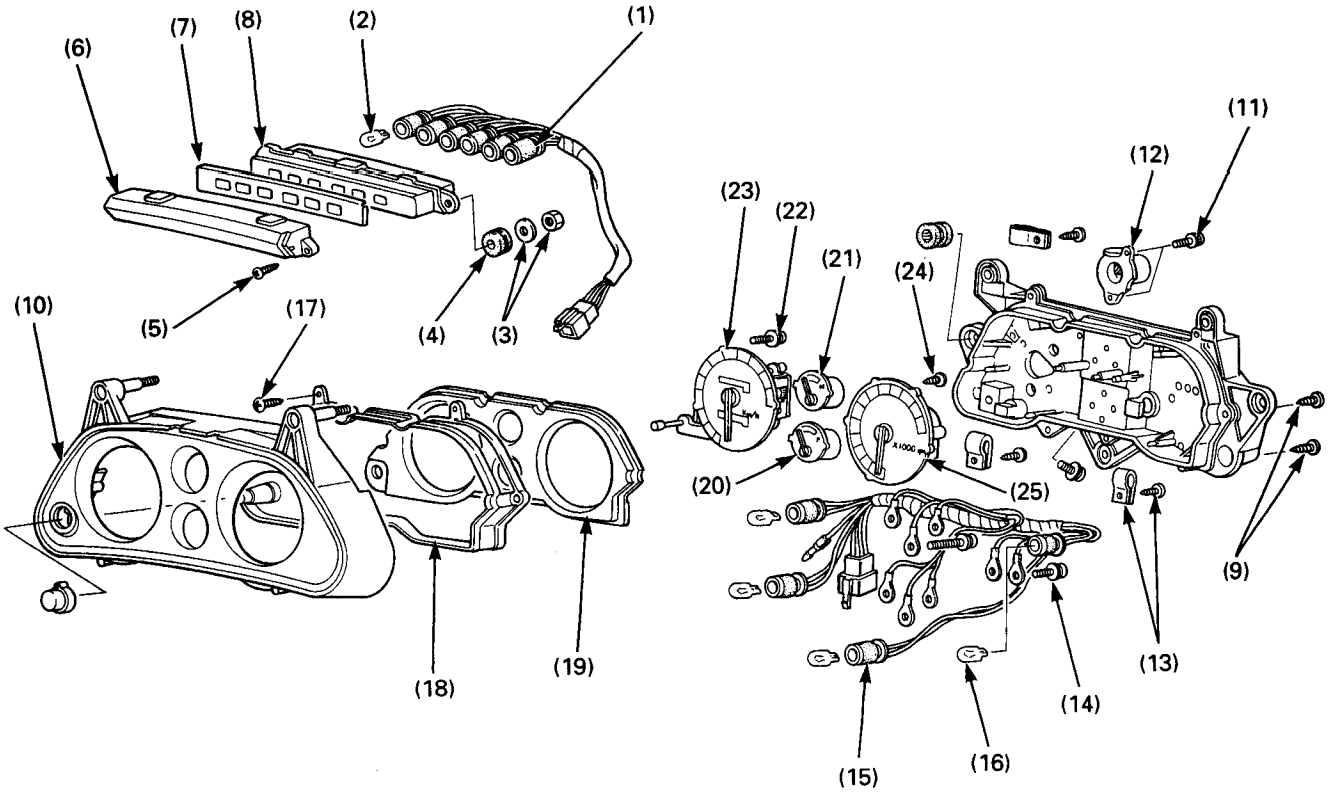
- Route the wires and cable properly (page 1-23).

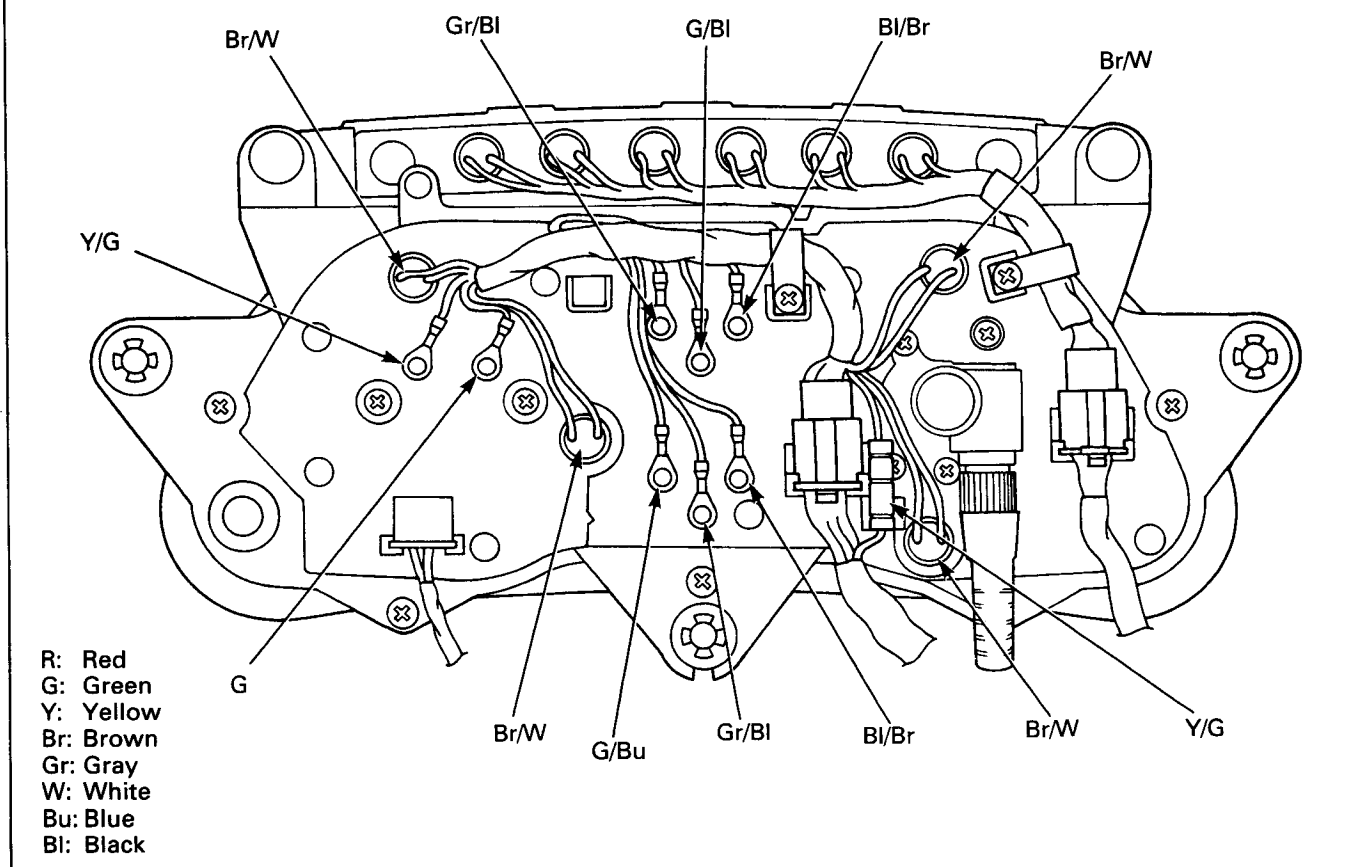
Requisite Service

- Windscreen removal/installation (page 2-7)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Speedometer meter cable	1	
(2)	Combination meter 9P connector/ connector	1/1	
(3)	Combination meter 3P connector	1	
(4)	Position light 3P connector	1	Except U type
(5)	Combination meter mounting bolt	3	
(6)	Combination meter assembly	1	Disassembly (page 17-8)

Combination Meter Disassembly/Assembly





NOTE

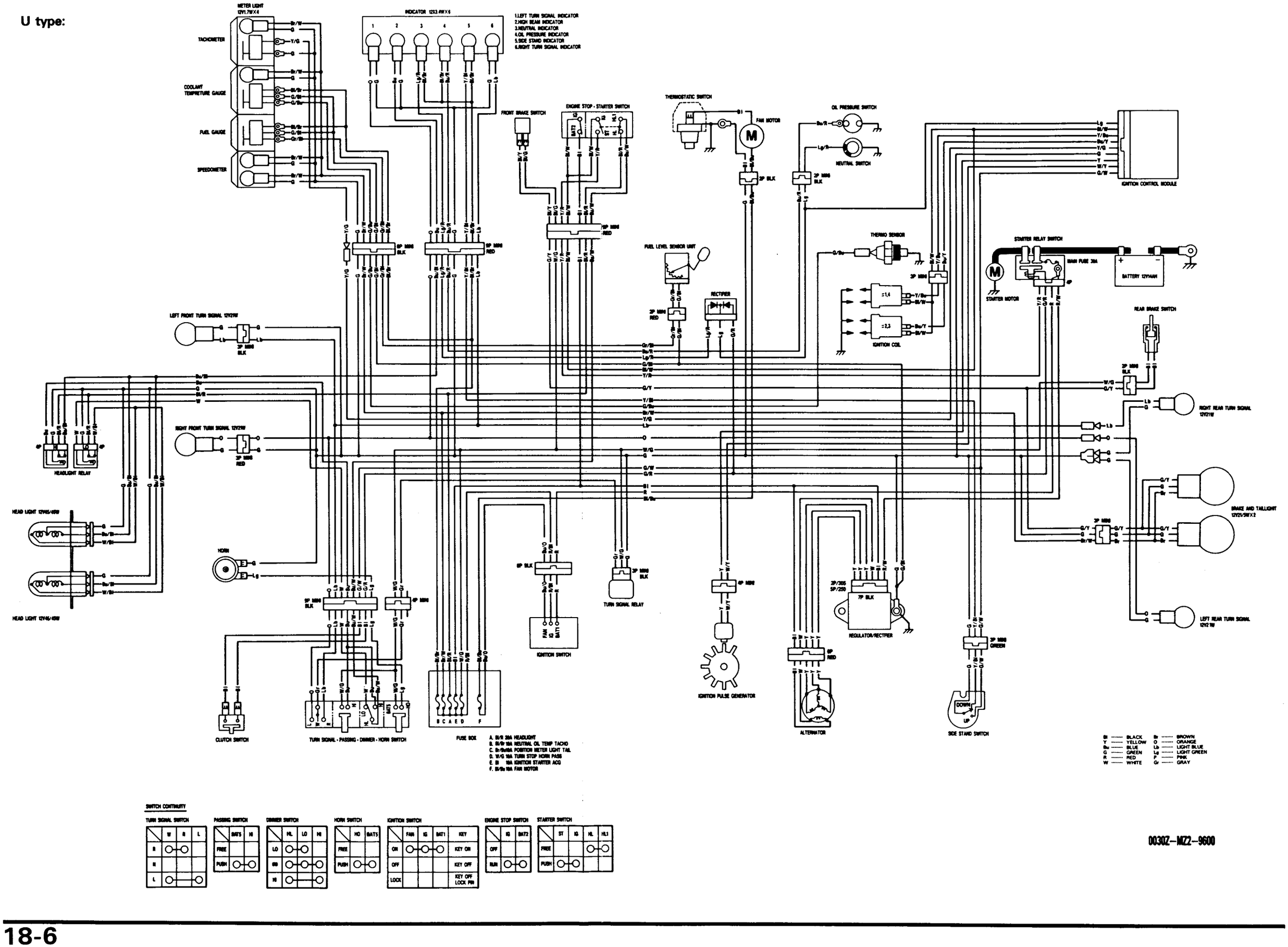
- Connect the terminals and install the sockets are according to the color codes indicated on the lower case.
- Route the sub-harness an illustration shown.

Requisite Service

- Combination meter removal/installation (page 17-7)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Indicator box socket	6	
(2)	Indicator bulb	6	
(3)	Indicator box mounting nut/washer	2	
(4)	Rubber mount	2	
(5)	Indicator box lens mounting screw	2	
(6)	Indicator box lens	1	
(7)	Indicator panel	1	
(8)	Indicator box	1	
(9)	Front cover mounting screw	8	
(10)	Front cover	1	
(11)	Speedometer gearbox mounting screw	3	
(12)	Speedometer gearbox	1	
(13)	Wire clamp/screw	2/2	
(14)	Wire eyelet screw	8	
(15)	Indicator socket	4	
(16)	Indicator bulb	4	
(17)	Combination meter lens screw	2	
(18)	Combination meter lens	1	
(19)	Combination meter panel	1	
(20)	Fuel gauge	1	
(21)	Coolant temperature gauge	1	
(22)	Speedometer mounting screw	1	
(23)	Speedometer	1	
(24)	Tachometer mounting screw	2	
(25)	Tachometer	1	

U type:



SWITCH CONTINUITY

TURN SIGNAL SWITCH

	W	R	L
R	○	○	
N			
L	○		○

PASSING SWITCH

	BAT3	HI
FREE		
PUSH	○	○

DIMMER SWITCH

	HL	LO	HI
LO	○	○	
HI	○		○

HORN SWITCH

	HO	BAT5
FREE		
PUSH	○	○

IGNITION SWITCH

	FAN	IG	BAT1	KEY
ON	○	○	○	KEY ON
OFF				KEY OFF
LOCK				KEY OFF LOCK PIN

ENGINE STOP SWITCH

	IG	BAT2
OFF		
RUN	○	○

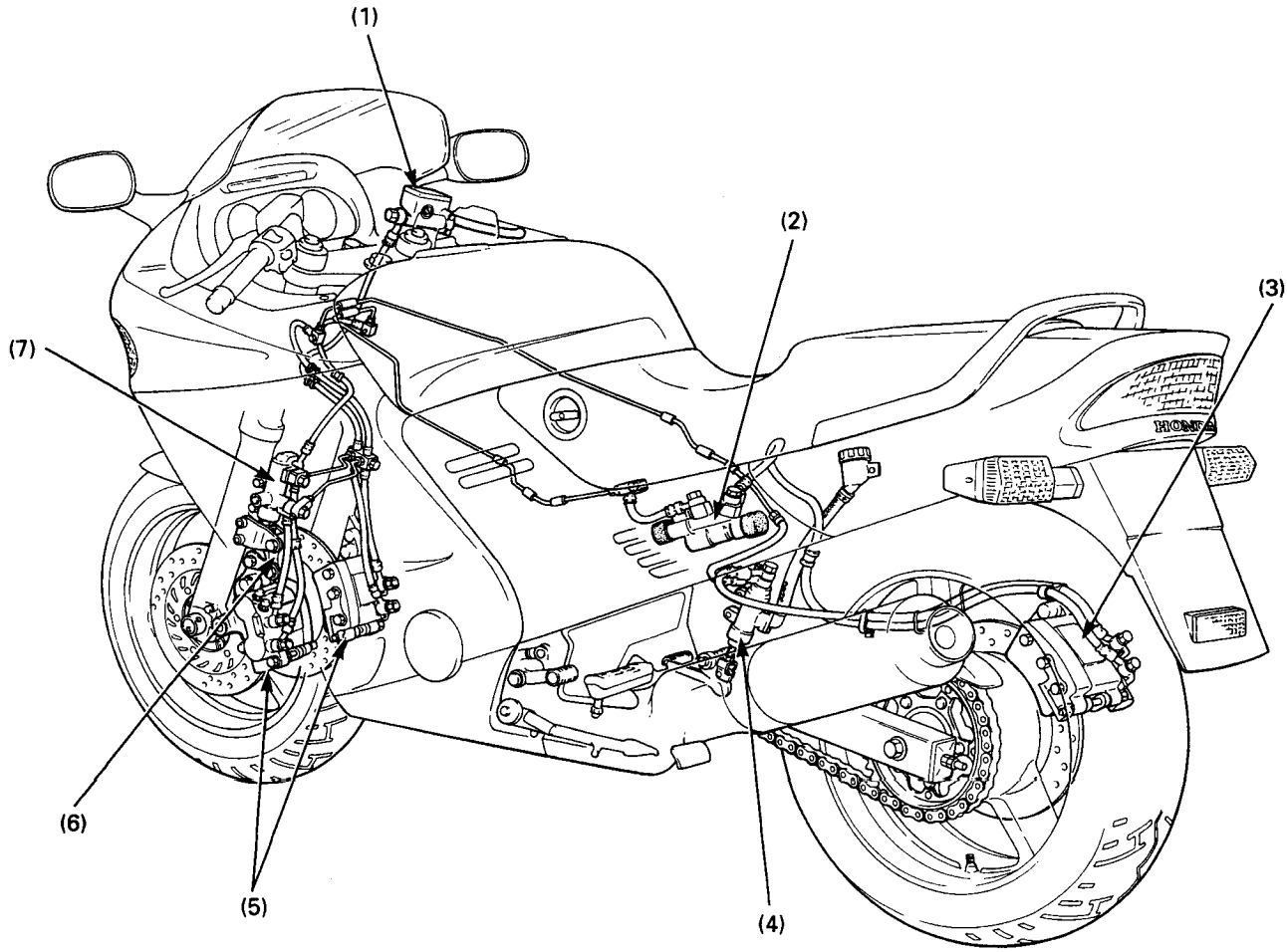
STARTER SWITCH

	ST	IG	HL	HL1
FREE			○	○
PUSH	○	○		

00302-MZ2-9600

19. Technical Feature

Dual Combined Brake System



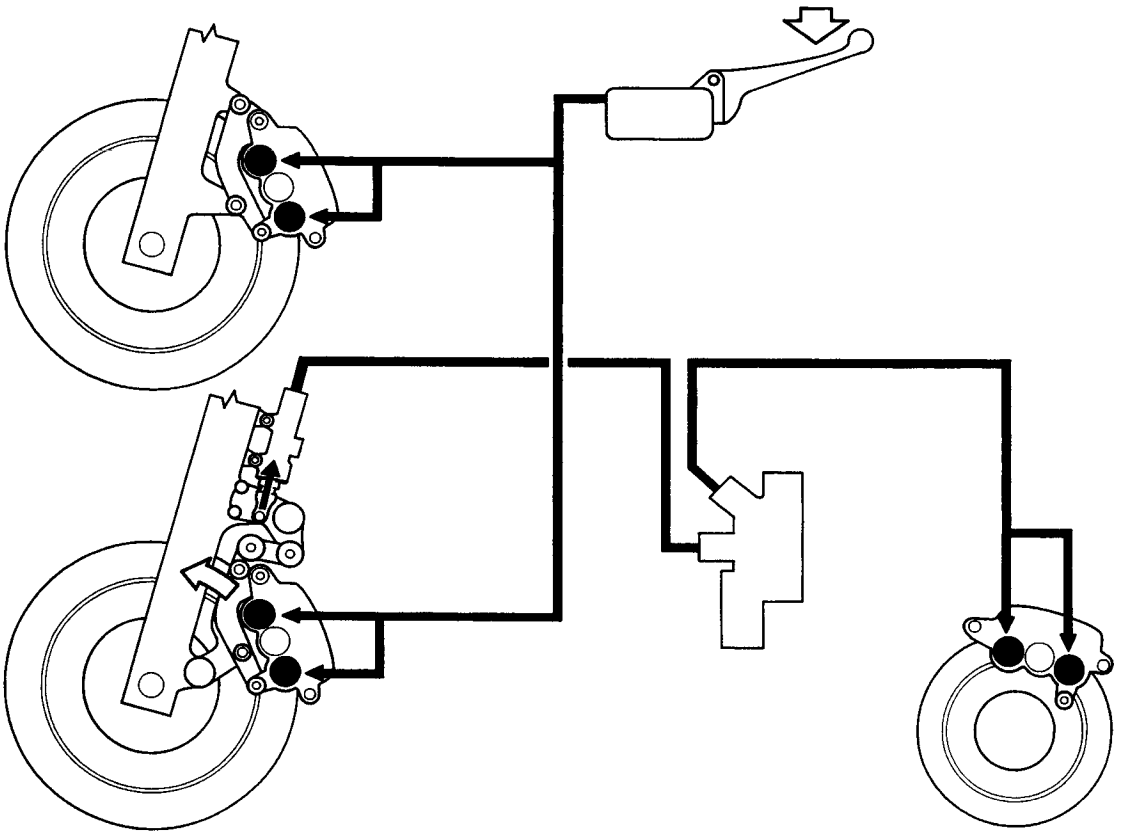
(1) FRONT MASTER CYLINDER
(2) PCV (PROPORTIONAL CONTROL VALVE)
(3) REAR BRAKE CALIPER
(4) REAR MASTER CYLINDER
(5) FRONT BRAKE CALIPER
(6) LINK MECHANISM
(7) SECONDARY MASTER CYLINDER

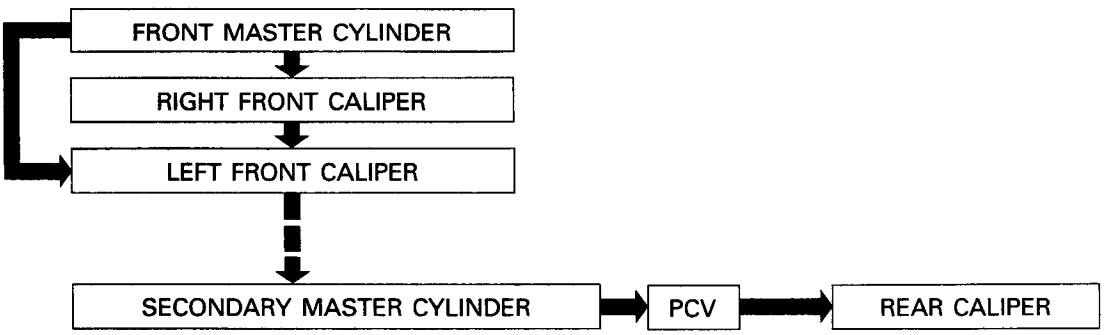
The Dual Combined Brake System was designed to simultaneously engage both front and rear brakes when either the front brake lever or rear brake pedal is applied.

The Dual Combined Brake System in fact is operated in the same way as a conventional brake system, but simplifies braking operations, increases braking performance and gives the rider a greater feeling of confidence without requiring special practice or training.

Operating Principles

Hand Brake

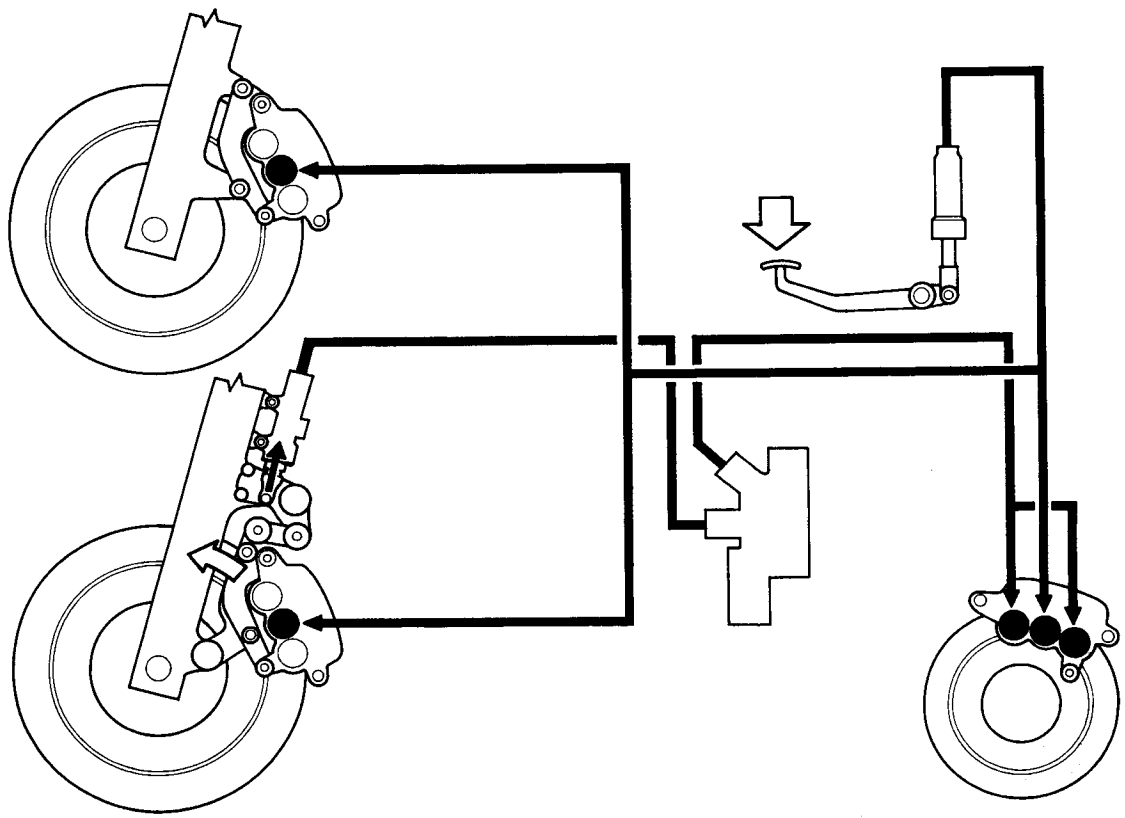


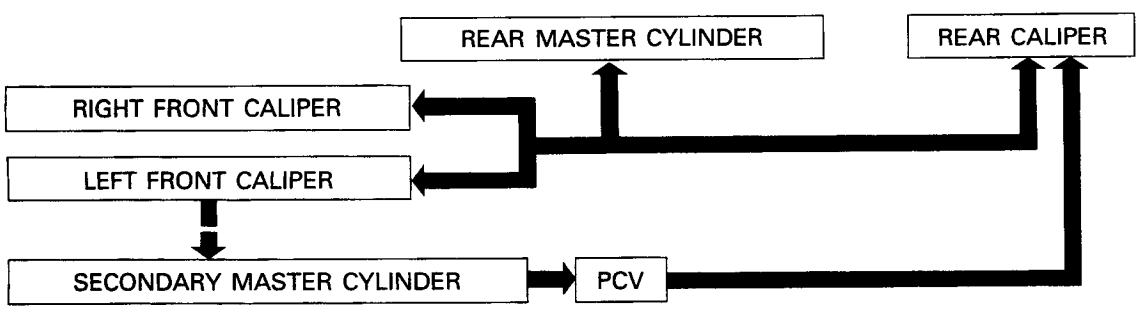


On initial operation, the hand brake works like any conventional motorcycle front brake system. A squeeze on the front brake lever pressurizes the master cylinder which transmits its increased hydraulic pressure to the two outer pistons of the front calipers, causing a corresponding braking force to be applied to the front wheel.

In response to the braking force applied by the front caliper onto the spinning brake rotor, the caliper is pulled in the direction of wheel rotation, around its lower linkage pivot. This forward caliper motion also acts on one end of a pivoting "L" angle link, the other end of which is connected to the secondary master cylinder. This direct pressure on the secondary master cylinder is then transmitted to the outer pistons of the rear caliper by way of the in-line proportional control valve.

Foot Brake

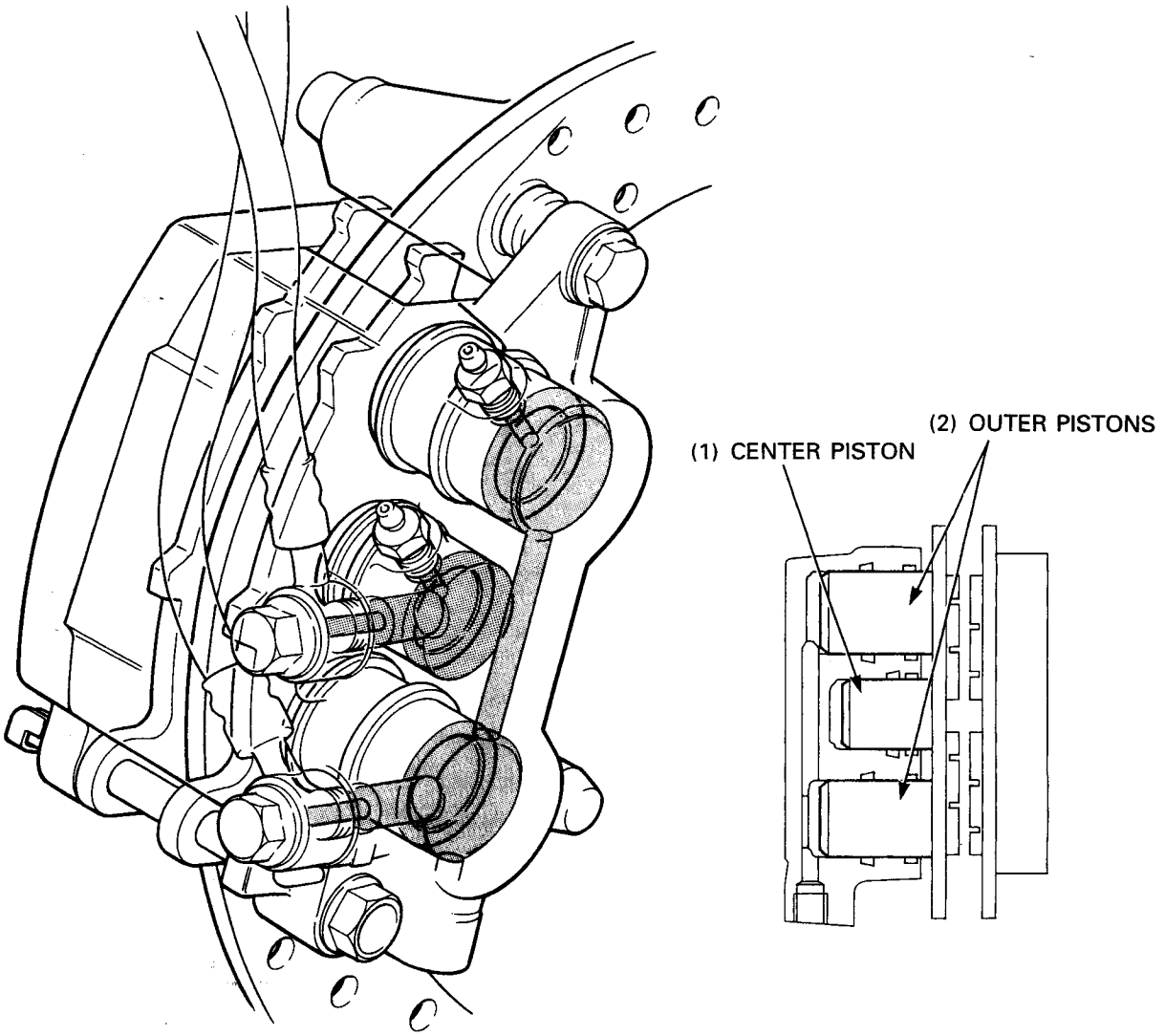




When the rear brake pedal is pressed, hydraulic pressure from the rear master cylinder is routed through two lines. One connects directly to the rear caliper and acts on the center piston. The outer line runs to the center pistons of the two front calipers.

As during hand brake operation, hydraulic pressure from the secondary master cylinder passes through the PCV (Proportional Control Valve), and acts on the outer pistons of the rear brake caliper. Because hydraulic pressure from the foot brake master cylinder is also being applied by the rear caliper's center piston, the braking force applied to the rear wheel is greater than that applied when using the hand brake lever only.

3-Piston Caliper



The Dual Combined Brake System 3-piston caliper is controlled by two independent hydraulic systems. The two outer pistons are connected by an internal passage and operated by either the lever-actuated master cylinder or, in case of the rear brake caliper, by the secondary master cylinder. The center piston of all three calipers is connected to the pedal-actuated hydraulic system and controlled by its master cylinder. These three pistons act on each caliper's active brake pad and allow it to be controlled by either or both of the two separate hydraulic systems.

PCV (Proportional Control Valve)

The PCV (Proportional Control Valve) controls three distinct steps in the braking curve.

Figure 1

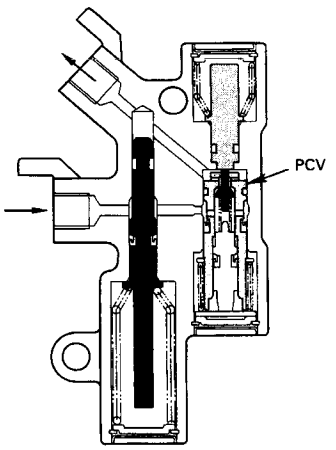
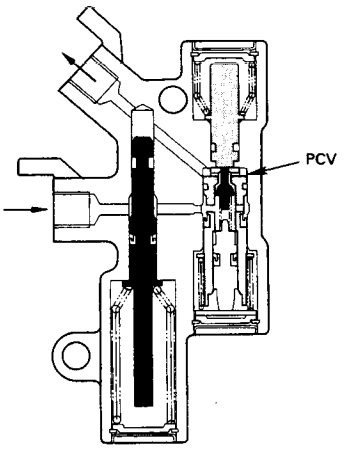


Figure 2



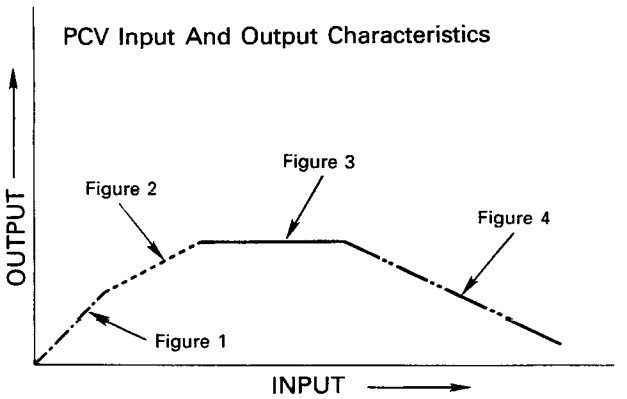


Figure 1: Without PCV
Figure 2: Conventional PCV
Figure 3: Effect of cut piston
Figure 4: Effect of decompression piston

Figure 3

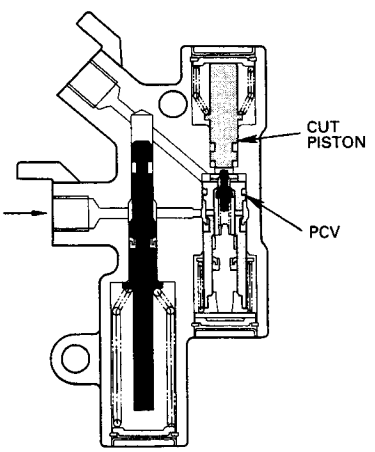
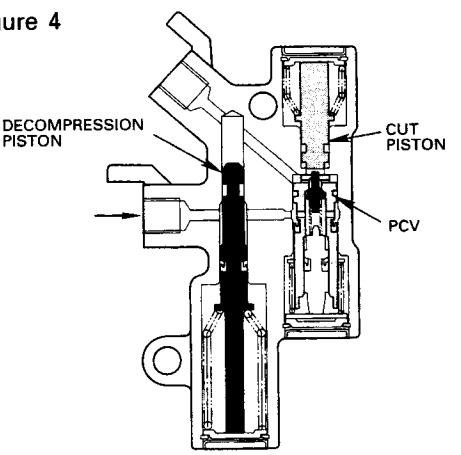


Figure 4



Initially, the PCV's output pressure increases in direct proportion to the increasing input pressure originating from the secondary master cylinder (Fig. 1). Following this, the automobile-type PCV causes the output pressure to increase at a slower rate than the input pressure, resulting in the first change in the pressure curve (Fig. 2).

As input pressure continues to increase, the cut piston activates, closing the valve and causing the output pressure to hold at a constant value (Fig. 3).

A further increase in input pressure forces the decompression piston down, which expands a sub-camber that draws pressure off the output side of the PCV (Fig. 4).

20. Troubleshooting

Engine Does Not Start Or Is Hard To Start

		Possible Cause
1. Check the fuel flow to carburetor	Not Reaching Carburetor	• Clogged fuel tube or fuel strainer screen • Sticking float valve • Clogged fuel tank breather • Disconnected or faulty auto fuel valve vacuum tube
Reaching Carburetor ↓		
2. Perform a spark test	Weak Or No Spark	• Faulty spark plug • Fouled spark plug • Faulty ignition control module • Broken or shorted spark plug wire • Broken or shorted ignition coil • Faulty ignition switch • Faulty ignition pulse generator • Faulty engine stop switch • Loose or disconnected ignition system wires
Good Spark ↓		
3. Test cylinder compression	Low Compression	• Improper valve clearance • Valve stuck open • Worn cylinder or piston • Damaged cylinder head gasket • Seized valve • Improper valve timing • Improper valve and seat contact
Compression Normal ↓		
4. Start by following normal procedure	Engine Starts But Stops	• Improper choke operation • Carburetor incorrectly adjusted • Intake pipe leaking • Improper ignition timing (Faulty ignition coil or ignition pulse generator) • Fuel contaminated
Engine Does Not Fire ↓		
5. Remove and inspect spark plug	Wet Plug	• Flooded carburetor • Choke closed • Throttle valve open • Air cleaner dirty

Engine Lacks Power

		Possible Cause
1. Raise wheels off the ground and spin by hand	Wheels Do Not Spin Freely	• Brake dragging • Worn or damaged wheel bearings • Drive chain too tight • Axle nut excessively tight
Wheel Spins Freely		
2. Check tire pressure	Pressure Low	• Faulty tire valve
Pressure Normal		
3. Accelerate rapidly from low to second	Engine Speed Not Changed When Clutch Is Released	• Clutch slipping • Worn clutch discs/plates • Warped clutch discs/plates • Weak clutch spring
Engine Speed Lowered When Clutch is Released		
4. Accelerate lightly	Engine Speed Does Not Increase	• Carburetor choke closed • Clogged air cleaner • Restricted fuel flow • Clogged muffler • Pinched fuel tank breather
Engine Speed Increases		
5. Check ignition timing	Incorrect	• Faulty ignition control module • Faulty ignition pulse generator
Correct		
6. Check valve clearance	Incorrect	• Improper valve adjustment • Worn valve seat
Correct		
7. Test cylinger compression	Incorrect	• Valve stuck open • Worn cylinder and piston rings • Leaking head gasket • Improper valve timing • Improper valve and seat contact • Seized valve
Normal		
8. Check carburetor for clogging	Clogged	• Carburetor not serviced frequently enough
Not clogging		
9. Remove spark plug	Fouled Or Discolored	• Plug not serviced frequntly enough • Spark plug is incorrect heat range
Not fouled Or Discolored		
10. Check oil level and condition	Incorrect	• Oil level too high • Oil level too low • Contaminated oil
Correct		

		Possible Cause
11. Remove cylinder head cover and inspect lubrication	Valve Train Not Lubricate Properly	• Clogged oil passage • Clogged oil control orifice • Faulty oil pump
Valve Train Lubricate Properly		
12. Check for engine overheating	Overheating	• Coolant level low • Fan motor not working (Faulty fan motor switch) • Thermostat stuck closed • Excessive carbon build-up in combustion chamber • Use of poor quality fuel • Clutch slipping • Lean fuel mixture
Not Overheating		
13. Accelerate or run at high speed	Engine Knocks	• Worn piston and cylinder • Wrong type of fuel • Excessive carbon build-up in combustion chamber • Ignition timing too advanced (Faulty ignition control module) • Lean fuel mixture
Engine Does Not Knock		

Poor Performance At Low And Idle Spped

		Possible Cause
1. Check ignition timing	Incorrect	• Improper valve clearance • Improper ignition timing (Faulty ignition control module)
Correct		
2. Check carburetor pilot screw adjustment	Incorrect	• See section 5
Correct		
3. Check for leaking intake pipe	Leaking	• Loose insulator clamp • Damaged insulator
No Leak		
4. Perform spark test	Weak or Intermittent Spark	• Faulty, carbon or wet fouled spark plug • Faulty ignition control module • Faulty ignition coil • Broken or shorted spark plug wires • Faulty engine stop switch • Faulty ignition pulse generator • Faulty ignition switch • Loose or disconnected ignition system wires
Good Spark		

Poor Performance At High Speed

		Possible Cause
1. Check ignition timing	Incorrect	• Improper valve clearance • Faulty ignition control module • Faulty ignition pulse generator
Correct ↓		
2. Disconnect fuel tube at carburetor	Fuel Flow Restricted	• Clogged fuel line • Clogged fuel tank breather • Clogged fuel strainer screen • Clogged fuel valve
Fuel Flows Freely ↓		
3. Remove carburetor and check for clogged jets	Clogged	• Clean
Not Clogged ↓		
4. Check valve timing	Incorrect	• Cam sprocket not installed properly
Correct ↓		
5. Check valve spring	Weak	• Faulty spring
Not Weakened		

Poor Handling

	Possible Cause
1. If steering is heavy	• Steering stem adjustment nut too tight • Damaged steering head bearings • Bent steering stem
2. If either wheel is wobbling	• Excessive wheel bearing play • Bent rim • Swingarm pivot bearing excessively worn • Bent frame
3. If the motorcycle pulls to one side	• Incorrect drive chain adjustment • Front and rear wheel not aligned • Bent fork legs • Bent swingarm • Bent frame

Index

How To Use This Manual

This addendum contains information for the CBR1000F(S). Refer to the CBR1000F shop manual (62MZ200) for service procedures and data not included in this addendum.

HONDA MOTOR CO., LTD.
Service Publication Office

Contents

Important Safety Notice

⚠WARNING **Indicates a strong possibility of severe personal injury or death if instructions are not followed.**

CAUTION: **Indicates a possibility of personal injury or equipment damage if instructions are not followed.**

NOTE: Gives helpful information.

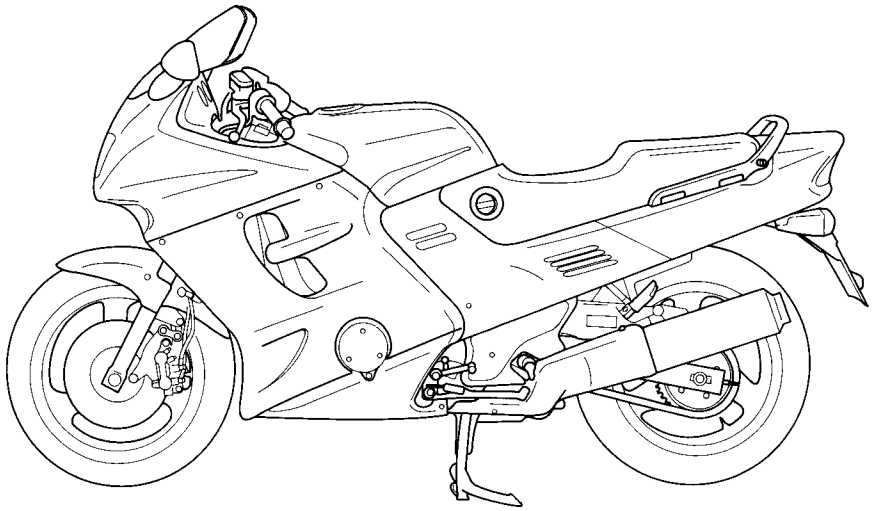
Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains some warnings and cautions against some specific service methods which could cause PERSONAL INJURY to service personnel or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover all conceivable ways in which service, whether or not recommended by Honda, might be done or of the possibly hazardous consequences of each conceivable way, nor could Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda,must satisfy himself thoroughly that neither personal safety nor vehicle safety will be jeopardized by the service method or tools selected.

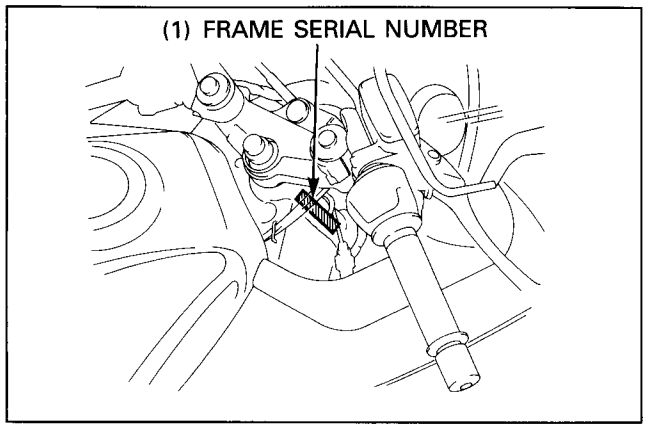
Type Codes

• Throughout this manual, the following abbreviations are used to identify individual model.

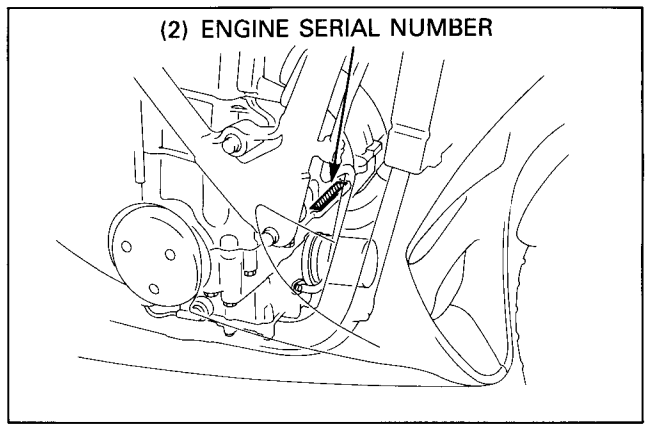
Code	Area Type
ED	European direct sales
E	U.K.
F	France
G (GI/GII)	Germany (Full power/Limited power)
U	Australia
ND	North Europe
SW	Switzerland
IT	Italy
H	Netherland
AR	Austria
SP	Spain

Model Identification

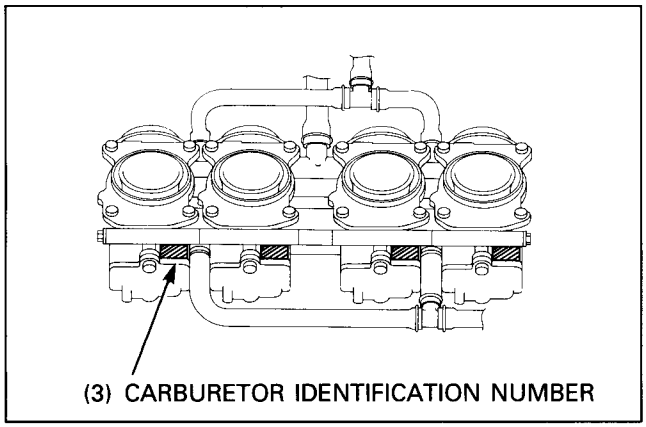




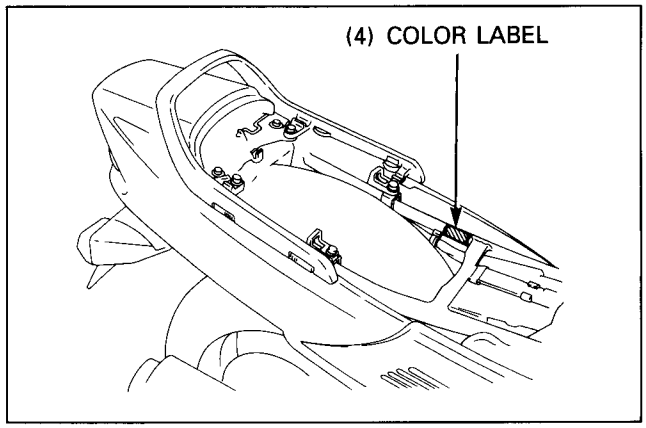
(1) The frame serial number is stamped on the right side of the steering head.



(2) The engine serial number is stamped on the front of the crankcase.



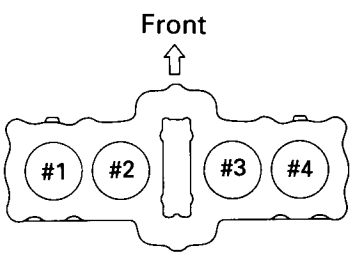
(3) The carburetor identification number is stamped on the rear side of each carburetor.



(4) The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

Specifications

General

Item		Specifications
Dimensions	Overall length (G, SW, IT, ND type) (ED, E, F, AR, SP, U type) Overall width Overall height Wheel base Seat height Footpeg height Ground clearance Dry weight Curb weight Maximum weight capacity	2,235 mm (88.0 in) 2,270 mm (89.4 in) 740 mm (29.1 in) 1,215 mm (47.8 in) 1,500 mm (59.1 in) 780 mm (30.7 in) 355 mm (14.0 in) 140 mm (5.5 in) 235 kg (518 lbs) 271 kg (597 lbs) 185 kg (408 lbs)
Frame	Frame type Front suspension Front wheel travel Rear suspension Rear wheel travel Rear damper Front tire size Rear tire size Tire brand (Bridgestone) FR/RR Tire brand (Dunlop) FR/RR Front brake Rear brake Caster angle Trail length Fuel tank capacity Fuel tank reserve capacity	Diamond Telescopic fork 130 mm (5.1 in) Swingarm 115 mm (4.5 in) Nitrogen gas filled damper 120/70 VR17–V270 170/60 VR17–V270 CYROX19E/CYROX16E (Except AR type) K510A/K510B Hydraulic double disc brake Hydraulic single disc brake 27° 110 mm (4.3 in) 22 liter (5.81 US gal, 4.84 Imp gal) 3.5 liter (0.91 US gal, 0.77 Imp gal)
Engine	Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1 mm lift Intake valve closes at 1 mm lift Exhaust valve opens at 1 mm lift Exhaust valve closes at 1mm lift Lubrication system Oil pump type Cooling system Air filtration Crankshaft type Engine weight Firing order Cylinder arrangement Cylinder number  	77.0 x 53.6 mm (3.03 x 2.11 in) 998 cm³ (60.9 cu-in) 10.5 : 1 Chain drive and DOHC 15° BTDC / 38° ABDC / 40° BBDC / 10° ATDC (E, G type) 0° BTDC / 40° ABDC / 40° BBDC / 0° ATDC (SW, AR type) 5° BTDC / 30° ABDC / 40° BBDC / 10° ATDC (F type) Forced pressure and wet sump Trochoid Liquid cooled Paper filter Unit type, 6 main journals 94.7 kg (209 lbs) 1 – 2 – 4 – 3 4 cylinder, inline

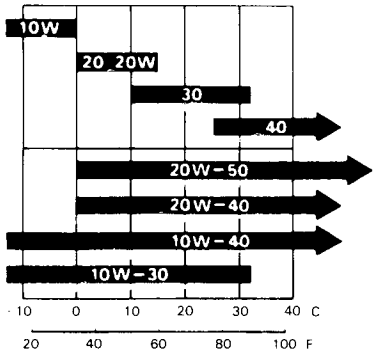
General (Cont'd)

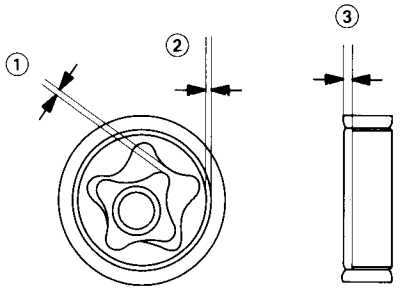
Item		Specifications
Carburetor	Carburetor type	CV (Constant Velocity) type, with flat valve
	Throttle bore	38 mm (1.5 in)
Drive Train	Clutch system	Multi-plate, wet
	Clutch operation system	Hydraulic operating
	Transmission	6-speeds constant mesh
	Primary reduction	1.785 (75/42)
	Final reduction	2.470 (42/17)
	Gear ratio 1st	2.750 (33/12)
	Gear ratio 2nd	2.066 (31/15)
	Gear ratio 3rd	1.647 (28/17)
	Gear ratio 4th	1.368 (26/19)
	Gear ratio 5th	1.173 (27/23)
	Gear ratio 6th	1.045 (23/22)
	Gearshift pattern	Left foot operated, return system
		1 – N – 2 – 3 – 4 – 5 – 6
Electrical	Ignition system	Full transistor digital ignition
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier type	Transistor opened/triple phase, full-wave rectification
	Lighting system	Battery

Lubrication System

Unit: mm (in)

Item	Standard	Service Limit
Engine oil capacity at draining	3.6 liter (3.78 US qt, 3.17 Imp qt)	———
at disassembly	4.5 liter (4.76 US qt, 3.96 Imp qt)	———
at oil filter change	3.8 liter (4.02 US qt, 4.43 Imp qt)	———
Recommended engine oil	Use Honda 4-stroke oil or equivalent API Service Classification: SE, SF or SG viscosity: SAE 10W–40 Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.	———
Oil pressure at oil pressure switch	588–686 kPa (6.0–7.0kg/cm², 85–100 psi) at 5,000 min⁻¹ (rpm) (80°C/176°F)	———
Oil pump rotor tip clearance ①	0.15 (0.006)	0.20 (0.008)
body clearance ②	0.15–0.22 (0.006–0.009)	0.35 (0.014)
end clearance ③	0.02–0.07 (0.001–0.003)	0.10 (0.004)





Fuel System

Carburetor identification number		———
(G type)	VP83A	———
(ED, E, ND, SP, IT, U type)	VP83B	———
(F type)	VP83C	———
(SW type)	VP85A	———
(AR type)	VP85B	———
Main jet	#122	———
Slow jet (ED, E, F, ND, SP, IT, U type)	#42	———
(G, SW, AR type)	#40	———
Pilot screw initial opening (Except SW, AR type)	3 turns out	———
(SW type)	1-3/4 turns out	———
(AR type)	2-5/8 turns out	———
Float level	13.7 (0.54)	———
Carburetor vacuum difference	20 mm Hg (0.8 in Hg)	———
Base carburetor (For carburetor synchronization)	No.3	———
Idle speed (Except SW, AR type)	1,000 ± 100 min⁻¹ (rpm)	———
(SW type)	1,050 ± 50 min⁻¹ (rpm)	———
(AR type)	1,050 ± 100 min⁻¹ (rpm)	———
Throttle grip free play	2–6 (0.08–0.24)	———
Secondary air supply system (SW, AR type)	Reed valves are built into the ASV	———
Air injection control valve vacuum pressure (SW, AR type)	420 mm Hg (16.5 in Hg)	———

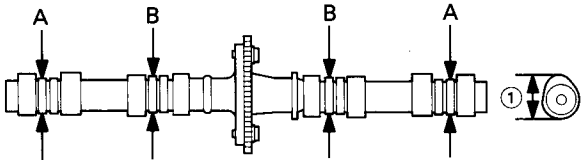
Unit: mm (in)

Cooling System

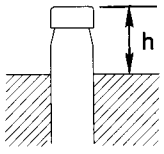
Item	Standard	Service Limit
Coolant capacity (Radiator and engine)	2.6 liter (2.75 US qt, 2.29 Imp qt)	———
(Reserve tank)	0.4 liter (0.42 US qt, 0.35 Imp qt)	———
Radiator cap relief pressure	108–137 kPa (1.1–1.4 kg/cm²,16–20 psi)	———
Thermostat begins to open	80°–84°C (176–183°F)	———
Thermostat fully open	95°C (203°F)	———
Thermostat valve lift	8.0 (0.32) minimun	———

Cylinder Head

Cylinder compression	1,050–1,450 kpa (10.5–14.4 kg/cm², 149–206 psi)/400 min⁻¹ (rpm)	———
Cylinder compression synchronization difference	40 mm Hg	———
Valve clearance IN	0.10 ± 0.02 (0.004 ± 0.001)	———
EX	0.18 ± 0.02 (0.007 ± 0.001)	———
Cylinder head warpage	———	0.07 (0.003)
Cam lobe height ① IN (ED, E, G, ND, SP, IT, U type)	35.668–35.748 (1.4042–1.4074)	35.62 (1.402)
IN (F type)	33.352–33.432 (1.3131–1.3162)	33.30 (1.311)
IN (SW, AR type)	34.907–34.987 (1.3743–1.3774)	34.85 (1.372)
EX (ED, E, G, ND, SP, IT, U type)	35.540–35.620 (1.3992–1.4024)	35.49 (1.397)
EX (F type)	35.540–35.620 (1.3992–1.4024)	35.49 (1.397)
EX (SW, AR type)	34.835–34.915 (1.3715–1.3746)	34.79 (1.370)
Camshaft runout	———	0.03 (0.001)
Camshaft oil clearane A	0.020–0.062 (0.0008–0.0024)	0.12 (0.005)
B	0.050–0.092 (0.0020–0.0036)	0.14 (0.006)



Camshshaft journal O.D A (Except F type)	27.959–27.980 (1.1007–1.1016)	———
A (F type)	27.459–27.480 (1.0811–1.0819)	———
B (Except F type)	27.929–27.950 (1.0996–1.1004)	———
B (F type)	27.421–27.450 (1.0796–1.0807)	———
Valve stem O.D. IN	5.475–5.490 (0.2156–0.2161)	5.47 (0.215)
EX	5.455–5.470 (0.2148–0.2154)	5.45 (0.215)
Valve guide I.D. IN	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
Stem-to-guide clearance IN	0.010–0.037 (0.0004–0.0015)	———
EX	0.030–0.057 (0.0012–0.0022)	———
Valve guide projection above cylinder head IN	17.8–18.0 (0.70–0.71)	———
EX	17.8–18.0 (0.70–0.71)	———



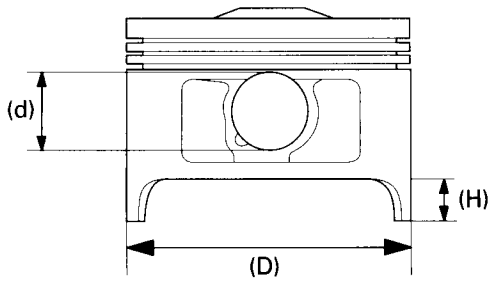
Before guide installation:
1. Chill the valve guides in the freezer section of the refrigerator for about an hour.
2. Heat the cylinder head to 100–150°C (212–300°F)

Valve seat width	0.9–1.1 (0.035–0.043)	1.5 (0.6)
Valve spring free length inner IN	43.15 (1.699)	41.8 (1.65)
inner EX	43.15 (1.699)	41.8 (1.65)
outer IN	47.08 (1.854)	45.7 (1.80)
outer EX	47.08 (1.854)	45.7 (1.80)

Unit: mm (in)

Cylinder/Piston

Item	Standard	Service Limit
Cylinder I.D.	77.000–77.010 (3.0315–3.0319)	77.10 (3.305)
Cylinder out of round	———	0.05 (0.002)
Cylinder taper	———	0.05 (0.002)
Cylinder warpage	———	0.05 (0.002)
Piston mark direction	"IN" mark facing toward the intake side	———
Piston O.D. (D)	76.970–76.990 (3.0303–3.0311)	76.87 (3.026)
Piston O.D. measurement point (H)	15 mm (0.6 in) from the bottom	———
Piston pin hole I.D. (d)	20.002–20.008 (0.7875–0.7877)	20.06 (0.790)
Cylinder-to-piston clearance	0.010–0.040 (0.0004–0.0016)	0.10 (0.004)
Piston pin O.D.	19.994–20.000 (0.7872–0.7874)	19.98 (0.787)
Piston-to-piston pin clearance	0.002–0.014 (0.0001–0.0006)	0.04 (0.002)
Connecting rod-to piston pin clearance	0.016–0.040 (0.0006–0.0016)	0.06 (0.002)
Top ring-to-ring groove clearance	0.025–0.055 (0.0010–0.0022)	0.09 (0.004)
Second ring-to-ring groove clearance	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
Top Ring end gap	0.250–0.400 (0.0100–0.0157)	0.58 (0.023)
Second Ring end gap	0.320–0.470 (0.0126–0.0185)	0.65 (0.026)
Oil ring (side rail) end gap	0.300–0.900 (0.0118–0.0354)	1.10 (0.043)
Top ring mark	Marking side facing up	———
Second ring mark	Marking side facing up	———

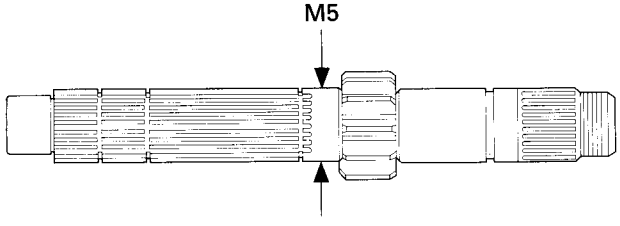
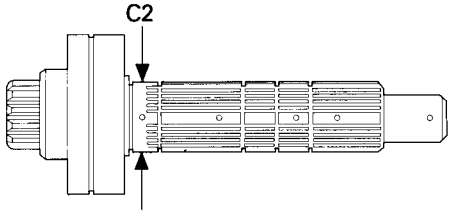


Clutch System

Recommended clutch fluid	DOT 4 brake fluid	———
Clutch master cylinder I.D.	14.000–14.043 (0.5512–0.5529)	14.06 (0.554)
Clutch master piston O.D.	13.957–13.984 (0.5495–0.5506)	13.94 (0.549)
Clutch outer I.D.	47.005–47.030 (1.8506–1.8516)	47.10 (1.854)
Clutch outer guide I.D.	27.995–28.012 (1.1022–1.1028)	28.08 (1.106)
Mainshaft O. D. at clutch outer guide	27.980–27.993 (1.1016–1.1021)	27.97 (1.101)
Clutch spring free length	46.7 (1.839)	44.7 (1.76)
Clutch disc thickness A	3.42–3.58 (0.135–0.141)	3.1 (0.12)
B	3.72–3.33 (0.146–0.153)	3.1 (0.12)
Clutch plate warpage	———	0.30 (0.012)

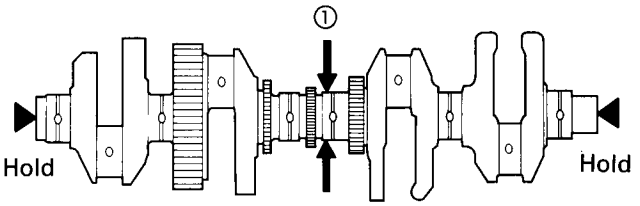
Unit: mm (in)

Transmission

Item	Standard	Service Limit
Transmission gear I.D. M5, M6	31.000–31.016 (1.2205–1.2211)	31.04 (1.222)
C2, C3, C4	33.000–33.016 (1.2992–1.2998)	33.04 (1.301)
Transmission gear bushing O.D. M5, M6	30.955–30.980 (1.2187–1.2197)	30.93 (1.218)
C2, C3, C4	32.955–32.980 (1.2976–1.2984)	32.93 (1.296)
Transmission gear bushing I.D. M5	27.985–28.006 (1.1018–1.1026)	28.02 (1.103)
C2	29.985–30.006 (1.1805–1.1813)	30.02 (1.182)
Gear-to-bushing clearance at M5, M6 gear	0.020–0.061 (0.0008–0.0024)	0.10 (0.004)
at C2, C3, C4 gear	0.020–0.061 (0.0008–0.0024)	0.10 (0.004)
Mainshaft O.D. at M5 gear	27.967–27.980 (0.1011–1.1016)	27.94 (1.100)
		
Countershaft O.D. at C2 gear	29.950–29.975 (1.1791–1.1801)	29.92 (1.178)
		
Gear bushing-to shaft clearance at M5 gear	0.005–0.039 (0.0002–0.0015)	0.06 (0.002)
at C2 gear	0.010–0.056 (0.0004–0.0022)	0.06 (0.002)
Shift fork claw thickness L	5.43–5.50 (0.214–0.217)	5.1 (0.20)
C	6.43–6.50 (0.253–0.256)	6.1 (0.24)
R	5.43–5.50 (0.214–0.217)	5.1 (0.20)
Shift fork I.D. L	14.000–14.018 (0.5112–0.5519)	14.04 (0.553)
C	14.000–14.018 (0.5112–0.5519)	14.04 (0.553)
R	14.000–14.018 (0.5112–0.5519)	14.04 (0.553)
Shift fork shaft O.D. L	13.957–13.968 (0.5495–0.5499)	13.90 (0.547)
C	13.957–13.968 (0.5495–0.5499)	13.90 (0.547)
R	13.957–13.968 (0.5495–0.5499)	13.90 (0.547)

Unit: mm (in)

Crankshaft

Item	Standard	Service Limit
Connecting rod small end I.D.	20.016–20.034 (0.7880–0.7887)	20.08 (0.791)
Connecting rod big end side clearance	0.05–0.20 (0.002–0.008)	0.3 (0.01)
Crankshaft runout ①	——	0.03 (0.001)
		
Crankpin oil clearance	0.028–0.052 (0.0011–0.0020)	0.08 (0.003)
Crankpin bearing selection	See page 10-21	——
Main journal oil clearance	0.021–0.045 (0.008–0.0018)	0.08 (0.003)
Main journal bearing selection	See page 10-20	——

Alternator

Alternator shaft collar spring free height	2.1 (0.08)	1.8 (0.07)

Unit: mm (in)

Wheels/Tires

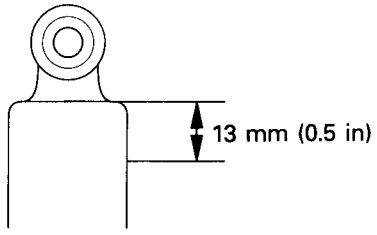
Item	Standard	Service Limit
Minimum tire tread depth (FR)	———	1.5 (0.06)
(RR)	———	2.0 (0.08)
Cold tire pressure Driver only (FR)	250 kPa (2.5 kg/cm², 36 psi)	———
Driver only (RR)	290 kPa (2.9 kg/cm², 42 psi)	———
Driver and passenger (FR)	250 kPa (2.5 kg/cm², 36 psi)	———
Driver and passenger (RR)	290 kPa (2.9 kg/cm², 42 psi)	———
Front and rear axle runout	———	0.2 (0.01)
Front and rear wheel rim runout (Radial)	———	2.0 (0.08)
(Axial)	———	2.0 (0.08)
Wheel balance weight (Front)	———	60 g (2.1 oz)
(Rear)	———	60 g (2.1 oz)
Drive chain slack	15–25 (0.6–1.0)	———
Drive chain size/link (DID)	DID50ZV/114	———
(RK)	RK50LFO/114	———

Front Suspension

Fork spring free length	446.3 (17.57)	437.4 (17.22)
Fork spring direction	Tapered wound coil facing down	———
Fork tube runout	———	0.2 (0.01)
Recommended fork oil	Fork fluid	———
Fork oil level	173 (6.8)	———
Fork oil capacity	418 cm³ (14.1 US oz, 11.8 Imp oz)	———
Steering bearing preload	1.1–1.6 kg (2.43–3.53 lb)	———

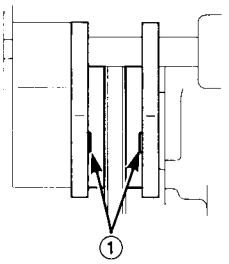
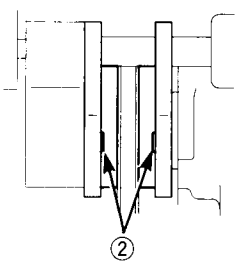
Rear Suspension

Damper compressed gas	Nitrogen	———
Damper drilling point	13 (0.5)	———



Brakes

Unit: mm (in)

Item		Standard	Service Limit
Front	brake fluid	DOT 4	———
	brake pad wear indicator ①	———	To the groove
			
	brake disc thickness	5.0 (0.20)	4.0 (0.16)
	brake disc runout	———	0.30 (0.012)
	master cylinder I.D.	12.700–12.743 (0.5000–0.5017)	12.76 (0.502)
	caliper piston O.D.	12.657–12.684 (0.4983–0.4994)	12.65 (0.498)
	caliper cylinder I.D. (22.6 mm bore)	22.650–22.700 (0.8917–0.8937)	22.710 (0.8941)
	(25.4 mm bore)	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
	(27.0 mm bore)	27.000–27.050 (1.0630–1.0650)	27.060 (1.0654)
	caliper piston O.D. (22.6 mm bore)	22.585–22.618 (0.8892–0.8905)	22.560 (0.8882)
	(25.4 mm bore)	25.318–25.368 (0.9968–0.9987)	25.310 (0.9965)
	(27.0 mm bore)	26.916–26.968 (1.0597–1.0617)	26.910 (1.0594)
	Secondary master cylinder I.D.	12.700–12.743 (0.5000–0.5017)	12.76 (0.502)
	Secondary master piston O.D.	12.657– 12.684 (0.4983–0.4994)	12.65 (0.498)
Rear	brake fluid	DOT 4	———
	brake pedal height	75 (3.0)	———
	brake pad wear indicator ②	———	To the groove
			
	brake disc thickness	5.0 (0.20)	4.0 (0.16)
	brake disc runout	———	0.30 (0.012)
	master cylinder I.D.	17.460–17.503 (0.6874–0.6891)	17.515 (0.6896)
	master piston O.D.	17.417–17.444 (0.6857–0.6868)	17.405 (0.6852)
	caliper cylinder I.D. (22.6 mm bore)	22.650–22.700 (0.8917–0.8937)	22.710 (0.8941)
	(25.4 mm bore)	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
	(27.0 mm bore)	27.000–27.050 (1.0630–1.0650)	27.060 (1.0654)
	caliper piston O.D. (22.6 mm bore)	22.585–22.618 (0.8892–0.8905)	22.560 (0.8882)
	(25.4 mm bore)	25.318–25.368 (0.9968–0.9987)	25.310 (0.9965)
	(27.0 mm bore)	26.916–26.968 (1.0597–1.0617)	26.910 (1.0594)

Battery/Charging System

Alternator/charging coil resistance (At 20°C/68°F)	0~1.0Ω	———
Alternator field coil resistance (At 20°C/68°F)	0~4.0Ω	———
Regulator/rectifier regulated voltage	12.6–15.0V/5,000 min^{-1} (rpm)	———
Battery capacity	12V–14Ah	———
Specified current leakage	0.1 mA max.	———
Battery specific gravity (Fully charging)	1.270–1.290	———
(Needs charging)	Below 1.260	———

Ignition System

Item	Standard	Service Limit
Spark plug (Standard : NGK)	DPR9EA-9	———
(Standard : NIPPONDENSO)	X27EPR-U9	———
Spark plug gap	0.8–0.9 mm (0.03–0.04 in)	———
Ignition timing "F"mark (Except SW, type)	10° BTDC/1,000 min^{-1} (rpm)	———
(SW, type)	5° BTDC/1,000 min^{-1} (rpm)	———
Full advance (Except G, F, SW, AR type)	40° BTDC/5,000 min^{-1} (rpm)	———
(G. F, SW, AR type)	37° BTDC/9,500 min^{-1} (rpm)	———
Ignition coil resistance (Primary: at 20°C/68°F)	2.5–3.2Ω	———
(Secondary with plug cap)	21–27kΩ	———
(Secondary without plug cap)	11–17kΩ	———
Pulse generator resistance (At 20°C/68°F)	460–580Ω	———

Starting System

Starter motor brush length	12.0–13.0 mm (0.47–0.51 in)	6.5mm (0.26 in)

Lights/Meters/Switches

Main fuse	30A	———
Fuse	10A x 5, 20A x 1	———
Headlight (High/low beam; E type)	12V–60/55W x 2	———
(High/low beam; Except E, IT, U, type)	12V–60/55W x 1, 12V60W x 1	———
(High/low beam; IT type)	12V–60/55W x 1	———
(High/low beam; U type)	12V–45/45W x 2	———
Tail/brake light	12V–5/21W x 2	———
Position light (Except U type)	12V–5W	———
Front turn signal light	12V–21W x 2	———
Rear turn signal light	12V–21W x 2	———
Instrument light	12V–1.7W x 4	———
Oil pressure warning indicator	12V–3.4W	———
Side stand warning indicator	12V–3.4W	———
High beam indicator	12V–3.4W	———
Turn signal indicator	12V–3.4W x 2	———
Neutral indicator	12V–3.4W	———
Fuel unit resistance (At full level)	10Ω	———
(At low level)	90Ω	———
Coolant temperature sensor resistance (50°C/122°F)	130–180Ω	———
(80°C/176°F)	45–60Ω	———
(120°C/248°F)	10–20Ω	———
Fan motor switch start to close (ON)	98–102°C (208–216°F)	———
stop opening	93–97°C (199–207°F)	———

Torque Values

Standard

Fasteners Type	Torque N • m (kg-m, ft-lb)	Fasteners Type	Torque N • m (kg-m, ft-lb)
5 mm hex bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	9 (0.9, 6.5)
10 mm hex bolt and nut	35 (3.5, 25)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
12 mm hex bolt and nut	55 (5.5, 40)	8 mm flange bolt and nut	27 (2.7, 20)
		10 mm flange bolt and nut	40 (4.0, 29)

Torque specifications listed below are for important fasteners. Others should be tightened to standard torque values listed above.

Notes: 1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surface.
4. Stake.
5. Apply oil to the threads and flange surface.
6. Apply clean engine oil to the O-ring.
7. Apply grease to the threads and flange surface.
8. UBS bolt.
9. U-nut.
10. ALOC bolt.

Engine

Item	Q'ty	Thread dia. (mm)	Torque N • m (kg-m, ft-lb)	Remarks
Maintenance:				
Timing hole cap	1	45	18 (1.8, 13)	Note 7
Spark plug	4	12	15 (1.5, 11)	
Lubrication System:				
Oil filter boss	1	20	18 (1.8, 13)	Note 2
Oil filter cartridge	1	20	10 (1.0, 7)	Note 5
Oil drain plug	1	14	30 (3.0, 22)	
Oil pass plate	3	6	12 (1.2, 9)	Note 2
Oil pipe C special bolt	2	6	12 (1.2, 9)	Note 2
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Note 2
Oil pump assembly flange bolt	3	6	13 (1.3, 9)	
Oil pressure switch	1	PT 1/8	12 (1.2, 9)	Note 1
Oil pressure switch connector bolt	1	4	2.2 (0.22, 1.6)	
Fuel System:				
Carburetor connecting nut, 6 mm	2	6	10 (1.0, 7)	
5 mm	2	5	5.2 (0.52, 3.8)	
Cooling System:				
Water pump flange bolt	2	6	13 (1.3, 9)	
Water pipe D flange bolt	2	6	13 (1.3, 9)	

Engine (Cont'd)

Item	Q'ty	Thread dia. (mm)	Torque N • m (kg-m, ft-lb)	Remarks
Cylinder Head/Valves:				
Cylinder head flange cap nut	4	10	45 (4.5, 33)	Note 5
Cylinder head flange nut	8	10	45 (4.5, 33)	Note 5
Cylinder head socket bolt	4	8	26 (2.6, 19)	
Cylinder head sealing bolt	1	18	32 (3.2, 23)	Note 2
Vacuum port socket bolt	1	5	3 (0.30, 2.2)	
Camshaft holder flange bolt	16	6	14 (1.4, 10)	
Cylinder head cover bolt	8	6	10 (1.0, 7)	
Boost joint	3	5	2.5 (0.25, 1.8)	
Cam sprocket bolt	4	7	20 (2.0, 14)	Note 2, 8
Valve adjuster screw lock nut	16	7	23 (2.3, 17)	Note 5
Cam chain tensioner bracket bolt	4	6	14 (1.4, 10)	
Rocker arm guide bolt	16	6	12 (1.2, 9)	Note 8
Clutch /Gearshift Linkage:				
Clutch center lock nut	1	25	128 (12.8, 93)	Note 5
Clutch spring bolt	5	6	12 (1.2, 9)	
Clutch slave cylinder bleeder screw	1	8	8 (0.8, 5.8)	
Shift fork shaft stopper plate bolt	2	6	12 (1.2, 9)	Note 2
Shift drum center bolt	1	8	23 (2.3, 17)	Note 2
Gearshift spindle return spring pin	1	8	22 (2.2, 16)	
Drive sprocket special bolt	1	10	54 (5.4, 39)	
Clutch slave cylinder oil bolt	1	10	35 (3.5, 25)	
Crankshaft/Transmission:				
Crankcase main journal bolt	12	9	37 (37, 27)	Note 8
Crankcase flange bolt	10	1	39 (3.9, 28)	
	8	17	24 (2.4, 17)	
Crankcase sealing bolt	20	1	30 (3.0, 22)	
	10	1	12 (1.2, 9)	
Connecting rod nut	8	8	35 (3.5, 25)	Note 5
Balancer shaft holder flange bolt	1	6	12 (1.2, 9)	
Charging System/Alternator:				
Alternator base flange bolt	3	8	25 (2.5, 18)	Note 1
Alternator assembly flange socket bolt	3	6	8 (0.8, 5.8)	Note 2
Alternator shaft flange nut	1	12	49 (4.9, 35)	Note 5
Ignition System:				
Pulse generator rotor flange bolt	1	10	49 (4.9, 35)	Note 2
Lights/Meters/Switches:				
Neutral switch	1	10	12 (1.2, 9)	
Neutral switch terminal nut	1	4	2.2 (0.22, 1.6)	
Other:				
General torque: SH flange bolt	–	6	10 (1.0, 7)	
SHF flange bolt	–	6	12 (1.2, 9)	

Frame

Item	Q'ty	Thread dia. (mm)	Torque N · m (kg-m, ft-lb)	Remarks
Frame/Body Panels/Exhaust System:				
Exhaust pipe joint nut	8	7	17 (1.7, 12)	
Muffler band bolt	4	8	22 (2.2, 16)	
Muffler stay flange nut	3	8	22 (2.2, 16)	
Step holder bolt	4	8	33 (3.3, 24)	
Center stand bolt	1	10	50 (5.0, 36)	
Side stand pivot bolt	1	10	8 (0.8, 5.8)	
Side stand pivot lock nut	1	10	40 (4.0, 29)	Note 9
Side stand bracket bolt	3	10	65 (6.5, 47)	
Grub rail mounting bolt	4	8	35 (3.5, 2.5)	
Lubrication System:				
Oil cooler pipe joint	4	6	9 (0.9, 6.5)	
Fuel System:				
Fuel valve	1	6	10 (1.0, 7)	
Fuel tank cap	7	4	3 (0.30, 2.2)	
Fuel unit	4	6	10 (1.0, 7)	Note 9
Fuel tank mounting bolt	2	6	10 (1.0, 7)	
Fuel tank pivot nut	1	6	10 (1.0, 7)	Note 9
Cooling System:				
Fan motor switch	1	16	18 (1.8, 13)	Note 1
Water hose joint	1	6	9 (0.9, 6.5)	
Water hose band			1.0-1.5 (0.10-0.15, 0.7-1.1)	
Engine Mounting:				
Front engine hanger bolt/nut (Upper)	2	10	45 (4.5, 33)	
Front engine hanger bolt/nut (Lower)	2	10	45 (4.5, 33)	
Rear engine hanger bolt/nut (Upper)	1	12	55 (5.5, 40)	
Rear engine hanger bolt/nut (Lower)	1	12	55 (5.5, 40)	
Engine hanger adjusting bolt	1	20	8 (0.8, 5.8)	
Engine hanger adjusting bolt lock nut	1	20	25 (2.5, 18)	
Clutch/Gearshift Linkage:				
Clutch master cylinder holder bolt	2	6	12 (1.2, 9)	
Clutch master cylinder cap screw	2	4	1.5 (0.15, 1.1)	
Clutch lever pivot bolt	1	6	0.8 (0.08, 0.6)	
Clutch lever pivot nut	1	6	5.9 (0.59, 4.3)	
Clutch switch screw	1	4	1.2 (0.12, 0.8)	
Gearshift pedal arm pinch bolt	1	6	16 (1.6, 12)	
Gearshift pedal arm pivot bolt	1	8	27 (2.7, 20)	
Wheels:				
Front axle bolt	1	14	59 (5.9, 43)	
Front axle holder bolt	4	8	22 (2.2, 16)	
Front brake disc bolt	12	8	42 (4.2, 30)	Note 10
Rear axle nut	1	18	93 (9.3, 67)	
Rear brake disc bolt	6	8	42 (4.2, 30)	Note 10
Driven sprocket nut	5	12	110 (11.0, 78)	Note 9
Front Suspension:				
Steering stem nut	1	24	103 (10.3, 96)	
Top thread A	1	26	25 (2.5, 18)	See page 11–18
Top thread B	1	26	—	
Top bridge pinch bolt	2	8	23 (2.3, 17)	
Bottom bridge pinch bolt	2	10	49 (4.9, 35)	
Handlebar pivot pinch bolt	2	8	27 (2.7, 20)	
Handlebar weight mounting screw	2	6	10 (1.0, 7)	

Frame (Cont'd)

Item	Q'ty	Thread dia. (mm)	Torque N • m (kg-m, ft-lb)	Remarks
Fork:				
Fork oil drain bolt	2	6	8 (0.8, 5.8)	
Fork socket bolt	2	8	20 (2.0, 14)	
Fork cap bolt	2	37	23 (2.3, 17)	
Fork damper rod lock nut	2	10	20 (2.0, 14)	
Secondary master cylinder link rod bracket bolt	2	8	27 (2.7, 20)	Note 10
Rear Suspension:				
Swingarm pivot nut	1	14	108 (10.8, 78)	Note 9
Drive chain adjuster lock nut	2	8	22 (2.2, 16)	
Rear shock absorber mounting bolt/nut	2	10	42 (4.2, 30)	Note 9
Shock link bolt (Frame side)	1	10	59 (5.9, 43)	Note 9
Shock link bolt (Shock arm side)	1	10	42 (4.2, 30)	Note 9
Shock arm bolt (Swingarm side)	1	10	42 (4.2, 30)	
Brake System:				
Front brake master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake master cylinder cap screw	2	4	1.5 (0.15, 1.1)	
Front brake lever pivot bolt	1	6	0.8 (0.08, 0.6)	
Front brake lever pivot nut	1	6	5.9 (0.59, 4.3)	
Front brake lever adjuster socket bolt	1	5	3.9 (0.39, 2.9)	
Front brake switch screw	1	4	1.2 (0.12, 0.8)	
Right front brake caliper mounting bolt	2	8	32 (3.2, 23)	Note 10
Left front brake caliper lower mounting bolt	1	8	32 (3.2, 23)	Note 10
Caliper body B mounting bolt	9	8	32 (3.2, 23)	Note 10
Brake caliper main slide pin	3	12	27 (2.7, 20)	
Brake caliper slide pin	3	8	23 (2.3, 17)	
Pad pin	3	10	23 (2.3, 17)	
Caliper bleeder screw	6	8	5.4 (0.54, 4.0)	
Secondary master cylinder mounting bolt	2	6	12 (1.2, 9)	
Secondary master cylinder push rod joint nut	1	8	18 (1.8, 13)	
Secondary master cylinder orifice bolt	1	8	5.4 (0.54, 4.0)	
Brake link arm bolt/nut	2	8	27 (2.7, 20)	Note 10
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear master cylinder reservoir	1	6	12 (1.2, 9)	
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	
Rear master cylinder reservoir joint screw	1	4	1.5 (0.15, 1.1)	
Brake hose oil bolt	12	10	35 (3.5, 25)	
Brake pipe bolt	8	10	17 (1.7, 12)	Note 5
Brake hose joint mounting bolt	5	6	12 (1.2, 9)	
Brake hose clamp mounting bolt	6	6	12 (1.2, 9)	
Other Fasteners:				
Ignition switch torx bolt	2	8	25 (2.5, 18)	Note 10