HONDA

SERVICE MANUAL

XLR200R / XR200R

1

HONDA MOTORS JAPAN

FOREWORD

This service manual explains the checking and maintenance for the main parts of Honda XLR200.
This manual utilizes drawings and symbol marks for easy comprehension and reference. When necessary, detailed explanations and illustrations are used to make this manual easy to use.
Chapter 1 summarizes all maintenance figures, values and other information which will become necessary throughout the manual.
Chapter 2 indicates the removal and installation specifications for frequently replaced parts.
Chapter 3 discusses the methods for checking and maintenance in order to assure vehicle safety and to maintain the functions of each part. Checking and maintenance specific to this vehicle model are also indicated.
From Chapter 4 onwards, each part discusses specific parts - Engine, Frame, Electrical Parts. and so on focusing on their specific functions and maintenance specifications.

- Written specifications and contents may change without prior notice due to improvements on the vehicle.
- This manual is designed for those with basic knowledge and skills with regard to Honda Motorcycle.
  For those without these basic knowledge and skills, do not. attempt to make repair what is specified in this Manual. Make sure to consult with your Honda Distributor or Dealer.

TABLE OF CONTENTS

SYMBOLS / MARK

These symbols are used throughout this manual to indicate caution regarding procedures.

SYMBOL/ MARK	CAUTION	SYMBOL/ MARK	CAUTION
⚠CAUTION	Indicates danger. Serious injury can result from not paying close attention.	!CAUTION	Indicates important procedure. Slight injury or damage to parts can result from not paying attention.
		•CAUTION	Indicates general caution. Introduces points to pay attention to in conducting procedures, handling or needs specials skills.

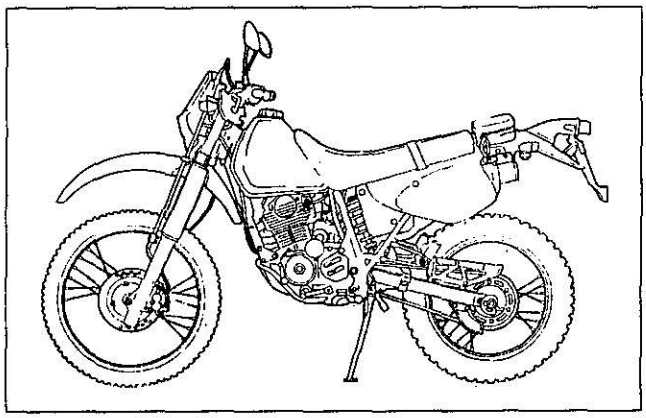
The following symbols / marks indicate the necessary lubricants, parts or tools needed in conducting the procedure.

SYMBOL/ MARK	CAUTION	SYMBOL/ MARK	CAUTION
OIL	Indicates need for oil. If brand name is not indicated, use specified or suggested engine oil.	SEAL	Indicates need for sealing agent.
Mo OIL	Indicates need for molybden fluid. Molybden is a 1:1 mixture of engine oil and molybden grease.	NEW	Indicates that part must be replaced each time it is disassembled.
GREASE	Indicates need for multi-purpose grease. (Similar to NLGI#2 which is lithium soap based). Equivalent brand: Shell Albania EP-2 of Show Shell.	BRAKE FLUID	Indicate need for brake fluid. Use DOT3 or DOT4 standard.
M	Indicates need for molybden grease. (Similar to NLGI#2 which includes more than 3% molybden dioxide). Equivalent brands: Mitsubishi Multi Purpose M2 (Mitsubishi Oil), Molycoat BR-2Plus (Dow Corning), and others.	クッションオイル	Indicates need for suggested cushion oil.
MP	Indicates need for molybden paste. (Similar to NLGI#2 which includes more than 40% molybden dioxide). Equivalent brands: Low Cor Paste (lubricant), Moricoat G-n Paste (dow Corning) and others.	S TOOL	Indicates specialized tool.
S	Indicates need for silicon grease. Equivalent brands: Silicon Grease G-40M (Nobukoshi Chemicals)	O P TOOL	Indicates optional tool. This tool is considered as part; refer to parts list for tool number.
LOCK	Indicates need for screw lock. If not specified, use medium strength.	(⇨3 - 1)	Indicates reference page. In this example, refer to item 3-1.

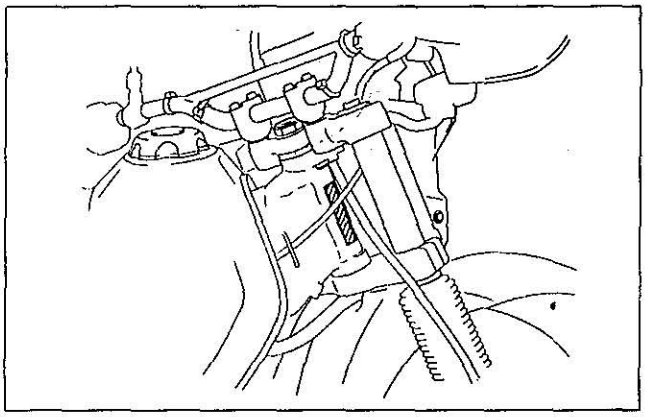
Specialized grease not indicated in above are referred to by name.

1. MAINTENANCE INFORMATION

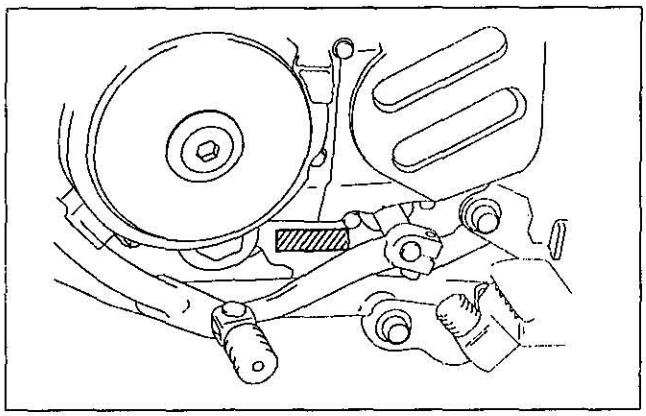
MACHINE NUMBER LOCATION, COLOR LABEL

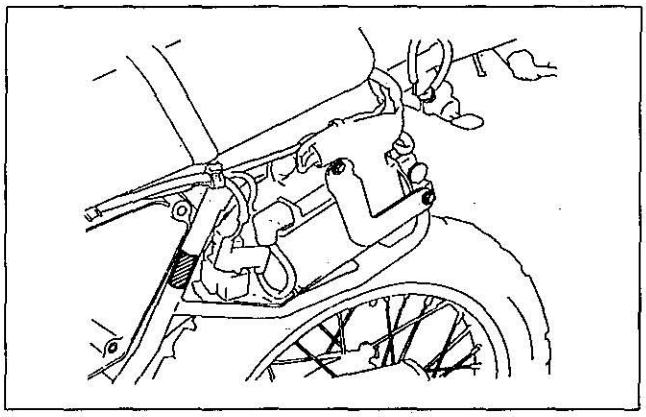


Engine Number Location



Color Label Location





Always use the model name and color code indicated in the label when ordering colored parts.

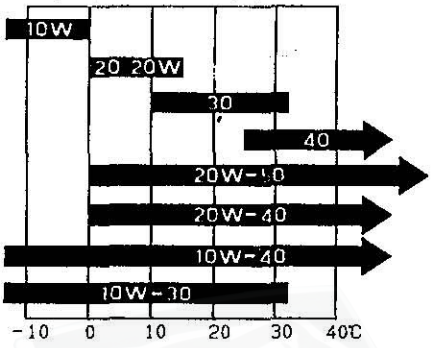
MAJOR SPECIFICATIONS

Vehicle Name		Honda KCN	Cooling System		Air-cooled
Length		2,130mm	Starting System		Cell
Width		850mm	Engine Type		Gasoline 4-stroke
Height		1,170mm	No. of cylinders/position		1, Horizontal
Wheel Base		1,375mm	Valve System		OHC, chain
Engine Serial		MD29E	Bore and Stroke		63.5 x 62.2 mm
Displacement		196.9 cc	Compression ratio		9.0
Fuel		Gasoline	Maximum Output		17.2 PS / 8,000 rpm
Vehicle Weight	Front	56.58 kg	Maximum Torque		1.7 kg-m / 6,500 rpm
	Rear	66.42 kg	Primary Reduction	Type	Gear
	Total	123 kg		Deceleration Ratio	3.090
No. of passengers		2	Gear Shift		Constant Mesh
Vehicle Gross Weight	Front	86 kg	Gear Ratio	1st	2.769
	Rear	147 kg		2nd	1.722
	Total	233 kg		3rd	1.263
Foot peg Height		295 mm		4th	1.000
Caster		26°		5th	0.838
Trail		96 mm	Final Reduction	Type	Chain
Frame Type		Semi-double cradle		Deceleration Ratio	3.230 (42 / 13)
Braking Distance		14.5 (50 km/h initial speed)	Frame Serial Number		F / No KCN00-97Y-000001
Minimum Turning radius		2,000 mm	Engine Serial Number		E / No MD29E-000001

MAINTENANCE DATA

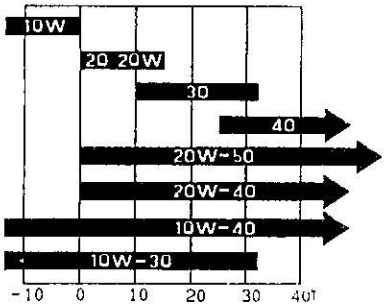
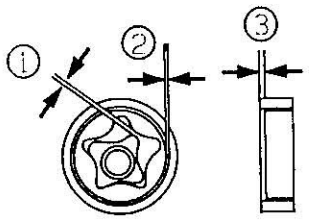
The data contained here are chosen for being the most frequently used in checking, maintenance, and adjustments. Refer to maintenance Specifications for items not included in this data.

ITEM	STANDARD	MAXIMUM
Lubricating system		
Engine Oil Total Vol.	1.2 liters	———
Replace	1.0 liter	———
Recommended Engine Oil		———
(Use the appropriate oil for the ambient temperature in your area)	• SAE 40 • SE, SF or SG-type enine oil under API classification	———
Relationship between Temperature and Viscosity		

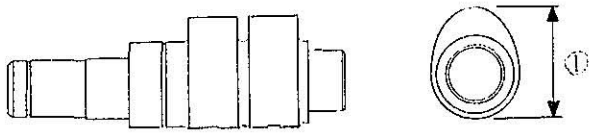


ITEM				STANDARD	MAXIMUM
Fuel System					
Fuel Tank	Capacity			9.0 liters	———
Air Cleaner Format				Paper (Viscous Type)	———
Carburetor	Type			PD3C A	———
	Seting Mark			PD3CA A	———
	Throttle Valve Diameter			22 mm	———
	Venturi Diameter			24 mm (Approx.)	———
	Pilot Screw Opening			1-5 / 8 Turns out	———
	Float Level			14.0 mm	———
	Idle Speed			1,400 ± 100 rpm	———
Throttle Grip Free Play (Grip Plunge)				3-5 mm	———
Cylinder Head Valve					
No. of Cylinders / Position				1 / Horizontal	———
Valve Clearance	IN			0.10 ± 0.02 mm	———
	EX			0.10 ± 0.02 mm	———
Cylinder Head Compression Pressure					
	Standard Value			13.5 kg/cm² / 600 rpm	———
Clutch					
Lever Free Play				10-20 mm	———
Front & Rear Wheels					
Wheel	Rim Vibration		Vertical	———	2.0mm
			Horizontal	———	2.0mm
	Axle turn			———	0.2mm
Tires	Tire Pressure	Single Rider	Front	1.75 kg/cm²	———
			Rear	1.50 kg/cm²	———
		Two Rider	Front	1.75 kg/cm²	———
			Rear	1.50 kg/cm²	———
	Tire Size		Front	2.75-21 45P	———
			Rear	4.10-18 59P	———
	Tire Type		Front	Fuji Tire Wing 2000 Trailsports	———
			Rear	Fuji Tire Wing 2000 Trailsports	———
Drive Chain	Slack (Using Sidestand)			25-35 mm	———
	Size / link number		D.I.D.	520VC5/106	———
			RK	520MOZ9/106	———
	Chain for Replacement		D.I.D.	520VC5	———
			RK	520MOZ9	———
Front suspension					
Fork	Oil Level			125 mm	———
	Volume			391 cc	———
	Oil Type			Honda Ultra Cushion Oil #10	———
Rear Suspension					
Rear Cushion	Standard Spring Length			181 mm	———
Braking System					
Front Brake	Lever Free Play			10-20 mm	———
	Brake Fluid			DOT4	———
	Brake Pad Thickness			———	Until max.
	Disc Thickness			3.5 mm	3.0 mm
	Disc Vibration			———	0.30 mm
Rear Brake	Pedal Slack			20-30 mm	———
	Lining Thickness			4.0 mm	3.5 mm
	Drum Inner Diameter			110 mm	111 mm

ITEM			STANDARD	MAXIMUM
Charging System. AC Generator				
Regulator/Rectifier	Format		3-phase SCR System	———
	Voltage		14-14.8V/5,000 rpm	———
	Current		0-0.5A/5,000 rpm	———
Battery	Capacity		12V-6Ah	———
	Charging Current (Std)		0.7A/5-10h	———
Ignition system				
Spark Plugs				
	Standard	NGK	DPR8EA9	———
		Nippondenso	X24EPR-U9	———
	Plug Gap		0.8-0.9 mm	———
Ignition Timing	F mark		BTDC 15°/1,400 rpm	———
Lights, Meters and Switches				
Light Bulbs	Headlight (HI/Lo beam)		12V-35/36.5W	———
	Stop / Tail lights		12V-18/5W	———
	Front Signal Light		12V-15W	———
	Rear Signal Lights		12V-15W	———
	Speedometer Lamp		12V-3.4W	———
	Highbeam Indicator		12V-1.7W	———
	Neutral Lamp		12V-3.4W	———
	Signal Pilot Lamp		12V-3.4W	———
Fuse	Main Fuse		15A	———
	Sub Fuse		10Ax2	———

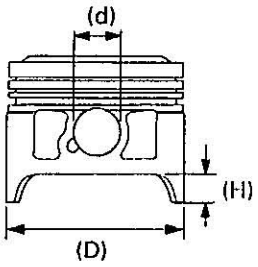
ITEM	STANDARD	MAXIMUM
Lubricating System		
Engine Oil Volume Total	1.2 liters	———
Replacement	1.0 liter	———
Recommended engine oil	SAE 40	———
(Viscosity will depend on the ambient temperature, refer to table below.)	SE, SF or SG-class API type	
Relationship Between Temperature And Oil Viscosity		
		
(Ambient temperature)		
Lubricating System		———
Oil Filtration	Forced pressure and wet sump.	———
Oil Pump	Trocoide Pump	———
		
Format		
1. Chip Clearance	0.15 mm	0.20 mm
2. Body Clearance	0.15-0.21 mm	0.35 mm
3. Side Clearance	0.03-0.12 mm	0.15 mm
Fuel System		
Fuel Tank Capacity	9.0 liters	———
Air Cleaner Format	Viscous Type	———
Carburetor Format	PD3C A	———
Setting Mark	PD3CA A	———
Throttle Valve Diameter	22 mm	———
Venturi Diameter	24 mm (Approx.)	———
Pilot Screw Opening	1-5 / 8 Turns Out	———
Float Level	14.0 mm	
Idling rpm	1,400 +-100 rpm	———
Jet Needle Clip Setting Position	3rd Groove	———
Main Jet	#102	———
Slow Jet	#45	———
Throttle Grip slack (Grip flange)	3-5 mm	———

ITEM			STANDARD	MAXIMUM
Cylinder Head, Valve				
Valve Train System			Chain drive OHC	———
Valve Clearance	IN:		0.10 +-0.02 mm	———
	EX:		0.10 +-0.02 mm	———
Cylinder Head Comp. Pressure Std			13.5 kg/cm² / 600 rpm	———
Cylinder Head Warpage			———	0.10 mm
Cam Shaft	1. Cam Height	IN:	31.579-31.739	31.30 mm
		EX:	31.419-31.579 mm	31.20 mm
	2. Run Out (Journal)		———	0.03 mm

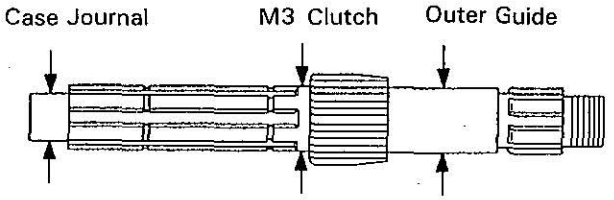


Valve, Valve Guide				
	Valve Seat Width	IN, EX	1.1-1.3 mm	1.5 mm
	Valve Stem Outside Diameter	IN:	5.450 - 5.465 mm	5.42 mm
		EX:	5.430 - 5.445 mm	5.40 mm
	Valve Guide Inner Diameter	IN:	5.475 - 5.485 mm	5.50 mm
		EX:	5.475 - 5.485 mm	5.50 mm
	Valve Stem-to-Guide Clearance	IN:	0.010 -0.035 mm	0.06 mm
		EX:	0.030 - 0.055 mm	0.08 mm
	Valve Spring Free Length (Inner)	IN:	39.2 mm	38.0 mm
		EX:	39.2 mm	38.0 mm
	(Outer)	IN:	44.9 mm	43.5 mm
		EX:	44.9 mm	43.5 mm
	Direction for Attachment		Install the valve springs with the tightly wound coils facing the cylinder head	———
Rocker Arm Inside Diameter		IN:	12.000 - 12.018 mm	12.05 mm
		EX:	12.000 - 12.018 mm	12.05 mm
	Shaft Outside Dia.	IN:	11.966 - 11.984 mm	11.93 mm
		EX:	11.966 - 11.984 mm	11.93 mm
	Rocker Arm to Shaft Clearance		0.016 - 0.052 mm	0.08 mm

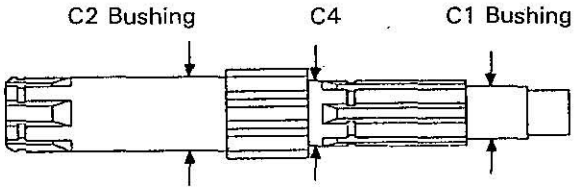
ITEM			STANDARD	MAXIMUM
Cylinder, Piston				
Cylinder	Inner Diameter		63.500-63.500 mm	63.60 mm
	Warpage Across Top		———	0.08 mm
	Out of Round		———	0.05 mm
	Taper		———	0.05 mm
Piston	Outside Diameter (H)		14 mm from Skirt Bottom	———
	Measuring Position		0.010-0.040 mm	0.15 mm
	Assembly Indicator		Point "IN" to Intake Side	———
	Outside Diameter (D)		63.470-63.490 mm	63.42 mm
	Piston Hole Diameter (d)		15.002-15.008 mm	15.04 mm
Piston Pin Outside Diameter			14.994-15.000 mm	14.960 mm
Piston-to-Pin Clearance			0.002-0.014 mm	0.07 mm
Connecting Rod Small End Inside Diameter			15.010-15.028 mm	15.06 mm
Piston Ring	Piston Ring-to-Ring Groove Clearance	Top:	0.025-0.055 mm	0.09 mm
		Second:	0.015-0.045 mm	0.09 mm
	Opening	Top:	0.20-0.35 mm	0.50 mm
		Second:	0.35-0.50 mm	0.70 mm
		Oil (Siderail)	———	0.90 mm
	Assembly Indicator	Top:	"R"	———
		Second:	"RN"	———
Clutch, Gearshift Linkage				
Clutch	Operation Format		Wire Type	———
	Lever Free Play		10-20 mm	———
	Format		Wet Multi-Plate Coilspring	———
	Disc Thickness	(A)	3.62-3.70 mm	3.3 mm
		(B)	2.90-3.00 mm	2.6 mm
	Plate Warpage		———	0.2 mm
	Spring Free Length		34.7 mm	31.7 mm
	Outer Guide	Inner Diameter	19.983-19.996 mm	20.02 mm
		Outer Diameter	27.959-27.980 mm	27.93 mm
Main Shaft Outer Diameter (Clutch Outer Guide)			19.967-19.980 mm	19.92 mm



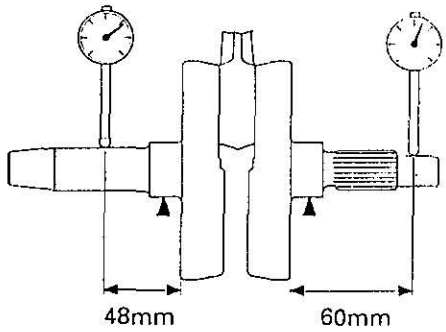
ITEM		STANDARD	MAXIMUM
Transmission			
Format		Constant Mesh 5 Speed Return	———
Gearshift Pattern		1 - N - 2 - 3 - 4 - 5	———
Gear Inside Diameter	M3:	20.020-20.041 mm	20.07 mm
	M5:	23.020-23.041 mm	23.07 mm
	C1:	19.520-19.541 mm	19.57 mm
	C2:	23.020-23.041 mm	23.07 mm
	C4:	20.020-20.041 mm	20.07 mm
Gear Bush Outside Diameter	M5:	22.984-23.005 mm	22.93 mm
	C1:	19.479-19.500 mm	19.43 mm
	C2:	22.979-23.000 mm	22.93 mm
Gear Bush Inside Diameter	M5:	20.020-20.041 mm	20.10 mm
	C1:	16.516-16.534 mm	16.60 mm
	C2:	20.000-20.021 mm	20.10 mm
Gear and Bush Clearance	M5	0.015-0.057 mm	0.10 mm
	C1, C2;	0.020-0.062 mm	0.10 mm
Bush and Shaft Clearance	C1:	0.032-0.065 mm	0.10 mm
	C2:	0.013-0.047 mm	0.10 mm
Main Shaft Outer Diameter	M3, Clutch Outer Guide	19.959-19.980 mm	19.91 mm
	Case Journal	14.978-14.989 mm	14.91 mm



Countershaft Outer Diameter	C2 Bushing, C4	19.974-19.987 mm	19.91 mm
	C1 Bushing	16.469-16.484 mm	16.41 mm



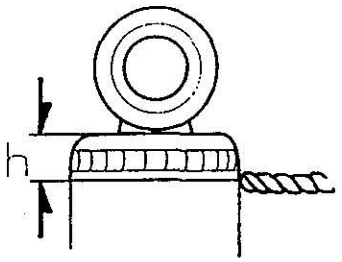
Shift Fork	Thickness	4.93-5.00 mm	4.5 mm
	Inside Diameter	12.000-12.018 mm	12.05 mm
	Shaft Outer Diameter	11.976-11.994 mm	11.90 mm

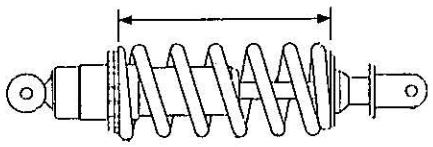
ITEM				STANDARD	MAXIMUM
Crankshaft					
Format				Forged Assemble Crankshaft	———
Bearing Format				Ball Bearing	———
Big End Side Clearance				0.05-0.30 mm	0.50 mm
Radial Clearance				0-0.008 mm	0.05 mm
Runout				———	0.10 mm
 48mm 60mm					

FRAME

ITEM				STANDARD	MAXIMUM
Front, Rear Wheel					
Wheel	Rim Vibration		Vertical	———	2.0 mm
			Horizontal	———	2.0 mm
	Axle Bend			———	0.2 mm
Tire	Air Pressure	1 pass	Front	1.75 kg/cm²	———
			Rear	1.50 kg/cm²	———
		2 pass	Front	1.75 kg/cm²	———
			Rear	1.50 kg/cm²	———
	Tire Size		Front	2.75-21 45P	———
			Rear	4.10-18 59P	———
	Tire Brand		Front	Fuji Tire Wing-2000/Trail Sports	———
			Rear	Fuji Tire Wing-2000/Trail Sports	———
Drive Chain	Slack (Using Sidestand)			25-35 mm	———
	Size/No. of Links		D.I.D.	520VC5/106	———
			RK	520MOZ9/106	———
	Replacement Chain		D.I.D.	520VC5	———
			RK	520MOZ9	———
Front Suspension					
Fork	Type			Telescopic	———
	Stroke			250 mm	———
	Pipe Diameter			37 mm	———
	Oil Level			125 mm	———
		Volume		391 cc	———
		Oil Type		Honda Ultra Cushion Oil #10	———
	Spring Free Length	A:		70.2 mm	68.8 mm
		B:		505.5 mm	495.4 mm
		Installation Procedure		Tapered Part To Face Down	———
	Pipe Bending			———	0.2 mm
Steering Head Bearing Type				Ball Bearing With Retainers	———
Steering Load				0.1-0.15 kg	———

ITEM		STANDARD	MAXIMUM
Rear Suspension			
Rear Suspension	Type	Pro-link, Swing-arm	———
	Stroke	225 mm	———
Rear Cushion	Damper Type	Prepressured Damper	———
	Gas Type	Nitrogen Gas	———
	Pressure	10 kg/cm²	———
	Damper Rod Resistance (at 10mm pressure)	15.4 kg	———
	Gas Hole Open Location (h)	Below 15 mm from Damper	———
	Spring Free Length	184.4 mm	180.3 mm
	Spring Standard Assembly Length	181 mm	———
Braking System			
Front Brake	Lever Free Play	10-20 mm	———
	Brake Fluid	DOT 4	———
	Brake Pad Thickness	———	Until Totally Worn Out
	Disc Thickness	3.5 mm	3.0 mm
	Vibration	———	0.30 mm
	Master Cylinder Inside Diameter	12.700-12.743 mm	12.76 mm
	Master Piston Outside Diameter	12.657-12.684 mm	12.64 mm
	Caliper Cylinder Inside Diameter	27.00-27.05 mm	27.10 mm
	Caliper Piston Outside Diameter	26.90-26.95 mm	26.84 mm
Rear Brake	Pedal Free Play	20-30 mm	———
	Lining Thickness	4.0 mm	3.5 mm
	Drum Inside Diameter	110 mm	111 mm
Recharging System, AC Generator			
AC Generator	Format	3 Phase Alternating	———
	Output	200W/5,000rpm	———
	Charging Coil Resistance (20°)	0.1-1.0Ω	———
Regulator/Rectifier			———
	Type	Regulator/Rectifier 3 Phase SCR System	———
	Voltage	14-14.8V/5,000rpm	———
	Current	0-0.5A/5,000rpm	———
Battery	Capacity	12V-6Ah	———
	Recharging Current	0.7A/5-10h	———
	Leak Current	Below 0mA	———





ITEM			STANDARD	MAXIMUM
Ignition System				
Ignition Type			CDI Type Battery Ignition	———
Spark Plug	Standard	NGK	DPR8EA 9	———
		Nippon Denso	X24EPR-U9	———
	Plug gap		0.8-0.9 mm	———
Ignition Timing	F Mark		BTDC15°/1,400rpm	———
	Advance start rpm		1,725±150rpm	———
	Advance finish rpm		3,300±150rpm	———
	Full Advance Angle		30°	———
Ignition Coil				
Type			MP14	———
Resistance (20°)	Primary coil		0.20-0.22Ω	———
	Secondary coil	(with plug cap)	7.8-8.4kΩ	———
		(without plug cap)	2.8-3.4kΩ	———
Peak Voltage			More than 100V	———
Pulse Generator				
Resistance (20°)			293-358Ω	———
Peak Voltage			More than 0.7V	———
Lights, Meters and Switches				
Lights, bulbs	Headlight (Hi/Lo Beam)		12V-35/36.5 W	———
	Stop/Tail Lights		12V-18/5W	———
	Front Signal Light		12V-15W	———
	Rear Signal Light		12V-15W	———
	Speedometer Lamp		12V-3.4W	———
	Hi-beam Indicator		12V-1.7W	———
	Neutral Lamp		12V-3.4W	———
	Signal Pilot Lamp		12V-3.4W	———
Fuse	Main Fuse		15A	———
	Sub-fuse		10AX2	———

TORQUE VALUES

STANDARD TORQUES

TYPE	TIGHTENING TORQUE	TYPE	TIGHTENING TORQUE
5mm bolt/nut	0.5 kg-m	5mm screw	0.4 kg-m
6mm bolt/nut	1.0 kg-m	6mm screw, SH bolt	0.9 kg-m
8mm bolt/nut	2.2 kg-m	6mm flange bolt/nut	1.2 kg-m
10mm bolt/nut	3.5 kg-m	8mm flange bolt/nut	2.7 kg-m
12mm bolt/nut	5.5 kg-m	10m flange bolt/nut	4.0 kg-m

Use standard torque values unless specified in table below.

Note
1. Apply screw lock to screw
2. Apply sealant to screw
3. Apply oil to screw and nut
4. Apply molybden to screw and nut
5. Apply oil to O-ring
6. Lock screw
7. Caulking
8. UBS bolt
9. Lock bolt (replace with new one if removed)
10. U-nut

ENGINE-RELATED ITEMS

TIGHTENING POINT	QTY	THREAD DIA.	TIGHTENING TORQUE	NOTE
Lubrication System:				
Oil Filter Rotor Lock Nut	1	16	8.5	Caution 3
Oil Pump Screw	2	6	0.9	
Cylinder Head, Valve:				
Spark Plug	1	12	1.8	
Tappet Hole Cap	2	36	1.5	Caution 5
Tappet Adjusting Nut	2	6	1.4	Caution 3
Cylinder Head Cover Nut	4	8	2.7	Caution 3
Bolt	4	6	1.2	
Cylinder Head Bolt	1	6	1.0	
Cam Sprocket Bolt	2	6	1.2	
Chain Tensioner Socket Bolt	2	6	1.2	
Sealing Screw	1	6	0.4	
Cam Chain Tensioner Slider Bolt	1	8	1.0	
Clutch Gearshift Linkage:				
Clutch Center Lock Nut	1	16	8.5	Caution 3,7
Shift Stopper Arm Bolt	1	6	1.2	
Gearshift Pedal Bolt	1	6	1.6	Caution 9
Crankshaft, Transmission:				
Bearing Set Plate Bolt	2	6	1.2	Caution 1
Alternator:				
Flywheel Bolt	1	10	7.5	Caution 3
Stator Bolt	3	6	1.0	
Ignition System:				
Timing Hole Cap	1	14	0.6	Caution 5
Crankshaft Hole Cap	1	30	0.8	Caution 5
Pulse Generator Socket Bolt	2	5	0.5	Caution 1
Starting Mechanism:				
One-way Clutch Torque Bolt	6	6	1.6	Caution 1

ATTACHEMENTS, MUFFLER

TIGHTENING POINT	QTY	THREAD DIA.	TIGHTENING TORQUE	NOTE
ENGINE-RELATED ITEMS				
Attachements, Muffler:				
Muffler Bolt (front)	1	8	3.3	
(rear)	1	8	3.3	
Muffler Band Bolt	1	8	2.0	
Exhaust Pipe Joint Nut	2	6	1.0	
Exhaust Pipe Protector Bolt	2	6	1.8	
Fuel System:				
Fuel Cock	1	18	2.7	
Engine Mount:				
Engine Head Hanger Nut (Frame Side)	2	8	3.5	
Engine Head Hanger Nut (Engine Side)	1	8	3.5	
Rear Upper Engine Hanger Nut	1	10	6.0	
Rear Lower Engine Hanger Nut	1	10	6.0	
Front Upper Engine Hanger Nut (frame side)	2	8	3.5	
Front Upper Hanger Nut (Engine Side)	1	8	3.5	
Front Lower Engine Nut	1	8	3.5	
Front Suspension:				
Steering Stem Nut	1	24	10.5	
Steering Top Thread	1	26	0.5	
Handle Bar Lower Holder Nut	2	10	2.6	
Front Fork Top Bridge Bolt	4	8	2.8	
Front Fork Bottom Bridge Bolt	4	8	3.3	
Front Axle Holder Nut	4	6	1.2	Caution 10
Fork Cap	2	34	2.2	
Fork Socket Bolt	2	8	2.0	Caution 1
Wheel:				
Front Axle	1	12	6.5	
Rear Axle Nut	1	16	9.5	Caution 10
Brake Disc Bolt	4	6	2.0	
Driven Sprocket Nut	6	8	3.7	Caution 3,10
Rear Suspension:				
Swing Arm Pivot Nut	1	14	9.0	Caution 10
Chain Slider Screw	1	5	0.6	
Rear Cushion Upper Nut	1	10	4.5	Caution 10
Rear Cushion Lower Nut	1	10	4.5	Caution 10
Cushion Arm Nut (Swing Arm Side)	1	12	10.5	Caution 10
Cushion Conrod nut (Cushion Arm Side)	1	10	4.5	Caution 10
(Frame Side)	1	10	4.5	Caution 10
Braking System:				
Brake Lever Pivot Bolt	1	6	0.6	
Nut	1	6	0.6	
Brake Arm Nut	1	6	1.0	
Master Cylinder Cover Screw	2	4	0.15	
Front Stoplight Switch Screw	1	4	0.11	
Caliper Pin Bolt	1	8	1.3	Caution 1
Bracket Pin Bolt	1	8	2.3	Caution 1
Pad Pin Plug	1	10	0.25	
Pad Pin	1	10	1.8	
Breather Bolt	1	8	0.55	
Caliper Bolt	2	8	3.0	Caution 9
Oil bolt	2	10	3.5	
Others:				
Sidestands Pivot Bolt	1	10	1.0	
Nut	1	10	4.0	Caution 10
Step Arm Bolt	4	10	6.0	Caution 9
Main Switch Bolt	2	8	2.7	Caution 9

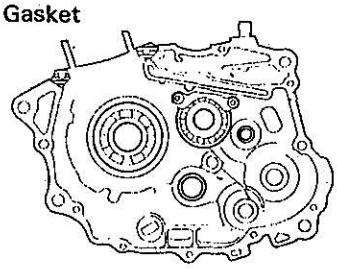
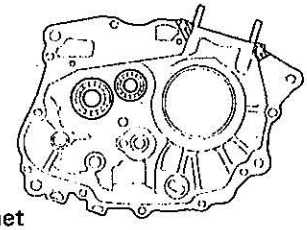
SPECIALIZED TOOLS

TYPE	TOOL NOS.	POINT OF USAGE	QTY
Wrench 20X24 Extension Bar Gear Holder	07716-0020100 07716-0020500 07724-0010200	Oil filter rotor lock nut removal	4
Float Level Gauge Pilot Screw Wrench	07401-0010000 07908-4730001		5
Valve Guide Reamer (5.485 mm) V. Sprg. Compressor Valve Seat Cutter 45° Finish Cutter (27.5 mm) 45° Finish Cutter (33 mm) 32° Flat Cutter (30 mm) 32° Flat Cutter (33 mm) 60° Inner Cutter (30 mm) Cutter Holder, 5.5 mm V. Guide Remover, 5.5 mm Wrench, 10X1.2 mm Tappet Adj. Wrench	07984-0980001 07757-0010000 07780-0010200 07780-0010800 07780-0012200 07780-0012900 07780-0014000 07781-0010101 07742-0010100 07708-0030200 07708-0030300		7
Clutch Center Holder Wrench, 20X24 mm Ext. Bar Pin Driver, 3.0 mm	07GMB-KT0100 07716-0010100 07716-0020500 07744-0010200		9
Outer Driver, 72X75 mm Pilot, 28 mm Driver Handle A Universal Brg. Puller Driver Handle C Inner Driver, 25 mm Driver Handle C Inner Driver, 30 mm Brg. Remover, 15 mm Remover Shaft, 15 mm Remover Head, 15 mm Sliding Weight Outer Driver, 28X30 mm Pilot, 15 mm Driver Handle A Outer Driver, 37X40 mm Pilot, 20 mm Driver Handle A Outer Driver, 52X55 mm Pilot, 20 mm Driver Handle A Outer Driver, 32X35 mm Pilot, 15 mm Driver Handle A	07746-0010600 07746-0041100 07749-0010000 07631-0010000 07746-0030100 07746-0030200 07746-0030100 07746-0030300 07936-KC10000 07936-KC10100 07936-KC10200 07741-0010201 07946-1870100 07746-0040300 07749-0010000 07746-0010200 07746-0010200 07749-0010000 07746-0010400 07746-0040500 07749-0010000 07746-0010100 07746-0040300 07749-0010000		10

TYPE	TOOL NOS.	POINT OF USAGE	QTY
Fork Seal Driver	07947-3710101		
Socket Wrench	07916-KA50100		
Ballrace Remover	07953-MJ10000		
Driver Attach	07953-MJ10200		
Driver Handle	07953-MJ10200		
Outer Driver, 42X47 mm	07746-0010300		
Driver Handle A	07749-0010000		
Strg. Stem Driver	07946-4300101		
Spanner 5.8 X 6.1 mm	07701-0020300		
Remover Head, 15 mm	07746-0050400		
Remover Shaft	07746-0050100		
Outer Driver, 32X35 mm	00746-0010100		
Pilot, 15 mm	07746-0040300		
Driver Handle A	07749-0010000		
Drive Chain Cutter	07HMH-MR10102		12
Needle Brg. Remover	07931-MA70000		
Outer Driver, 28X30 mm	07946-1870100		
Pilot, 20 mm	07746-0040500		
Driver Handle A	07749-0010000		
Helical Brg. Remover	07946-KA30200		
Driver Shaft	07946-MJ00100		
Spanner C, 5.8X6.1 mm	07701-0020300		
Remover Head, 17 mm	07746-0050500		
Remover Shaft	07746-0050100		
Outer Driver, 37X40 mm	07746-0010200		
Pilot, 17 mm	07746-0040400		
Driver Handle A	07749-0010000		
Outer Driver, 42X47 mm	07746-0010300		
Pilot, 17 mm	07746-0040400		
Driver Handle A	07749-0010000		
Snap Ring Pliers (IN)	07914-3230001		13
Flywheel Holder	07725-0040000		14
Rotor Puller	07733-0020001		
Flywheel Holder	07725-0040000		16
Torque Bit	07733-0020001		
Circuit Tester (SANNP)	07308-0020001		14
Circuit Tester (KOWA)	TH - 5H		15
Peak Voltage Adaptor	07HGJ-0020100		16
			17

LUBRICATION AND SEAL POINTS

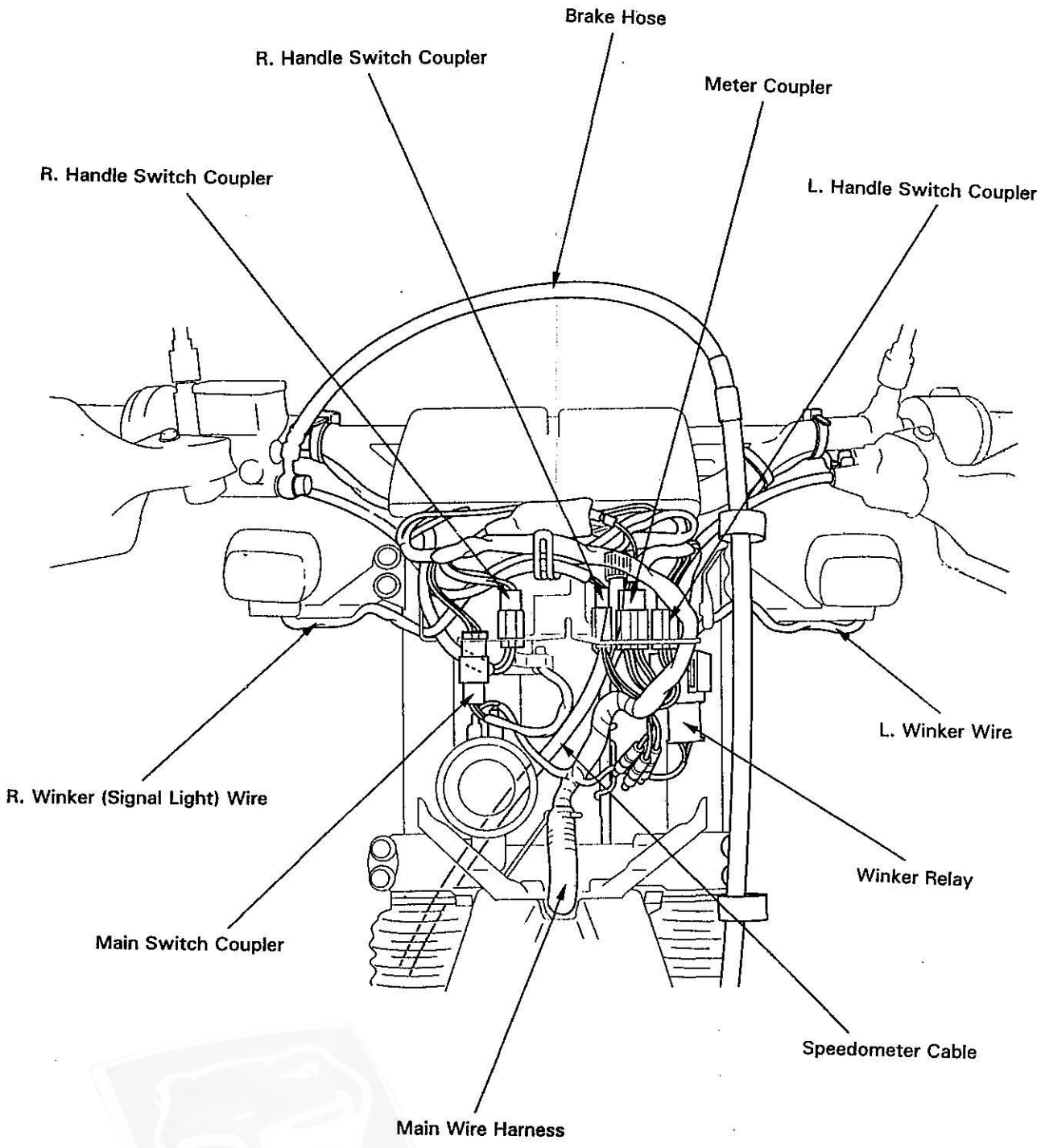
ENGINE

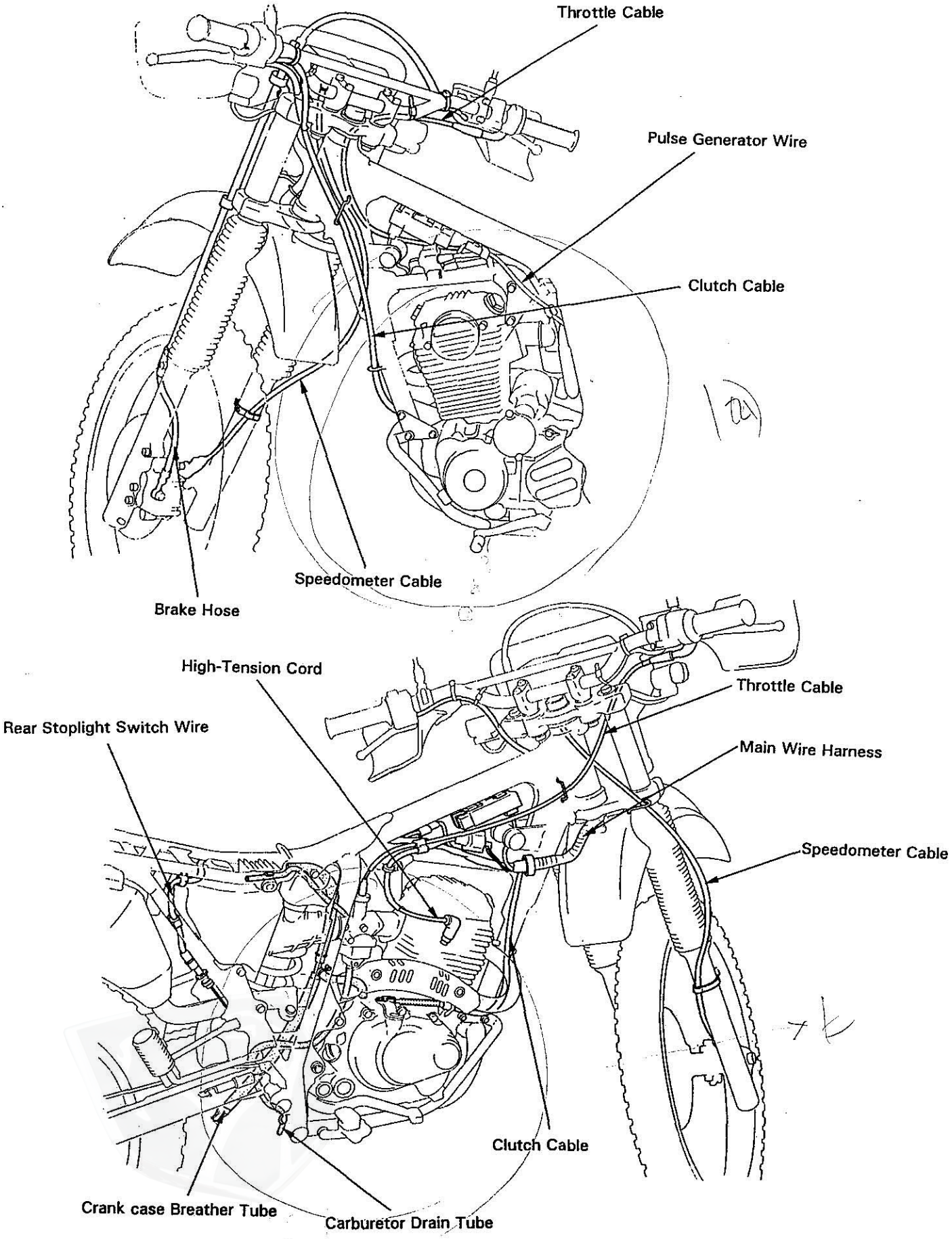
LOCATION	REMARKS	MATERIAL
Cylinder Head Cover Seating Surface	Do Not Cover Oil Canal	3 Bond #1215 or Similar
Crank Case Gasket   Stator Grommet		3 Bond #1141 or Similar
Cam Shaft Bearing, Cam Piston Pin Intake Valve, Exhaust Valve Stem M3, M5 Gear Inside Surface C1, C2, C4 Gear Inside Surface Clutch Outer Guide		Molybden (Mixture of Engine Oil and Molybden Grease at 1:1 Ratio)
Flywheel Bolt Screw Clutch Center Lock Nut Screw Cylinder Head Cover Nut Screw Tappet Adjuster Lock Nut Screw Oil Filter Rotor Lock Nut Screw Rocker Arm Shaft Piston Skirt and Ring Cylinder Wall Crankshaft Moving Part Reduction Gear/Shaft Idling Gear Shaft Clutch Disc Oil Pump Inner Rotor Starter Clutch Cam Chain Cylinder Stud Bolt Screw Each Oil Seal Lips Each Bearing Moving Parts All O-Rings		• Honda - Ultra-U (4 Stroke MC Use) SAE 10W30 • API Class SE, SF or SG Engine Oil
Bearing Set Plate Bolt Screw One-way Clutch Torque Bolt Screw Pulse Generator Socket Bolt Screw Drive Sprocket Set Plate Bolt Screw		Screw Lock

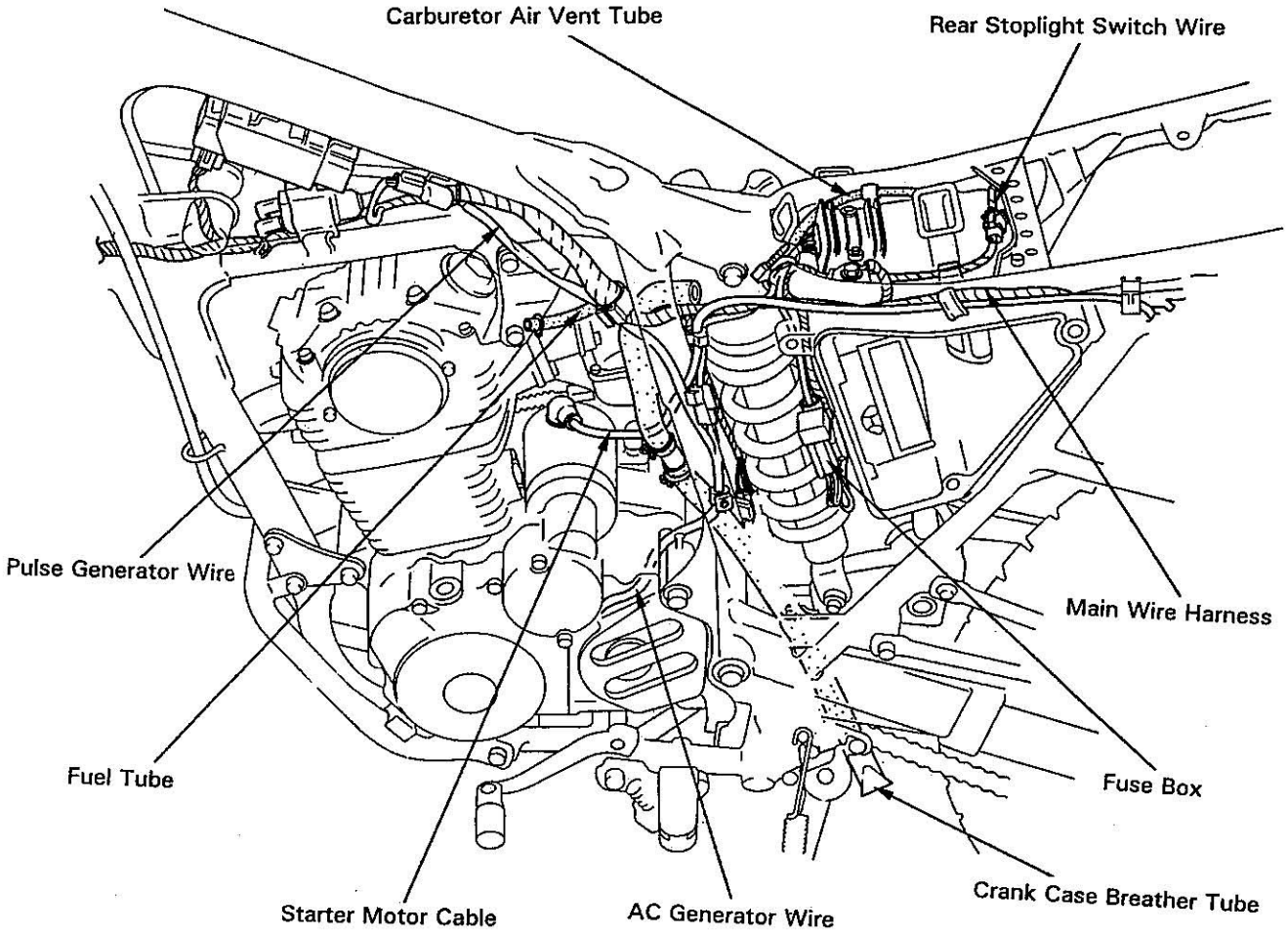
FRAME

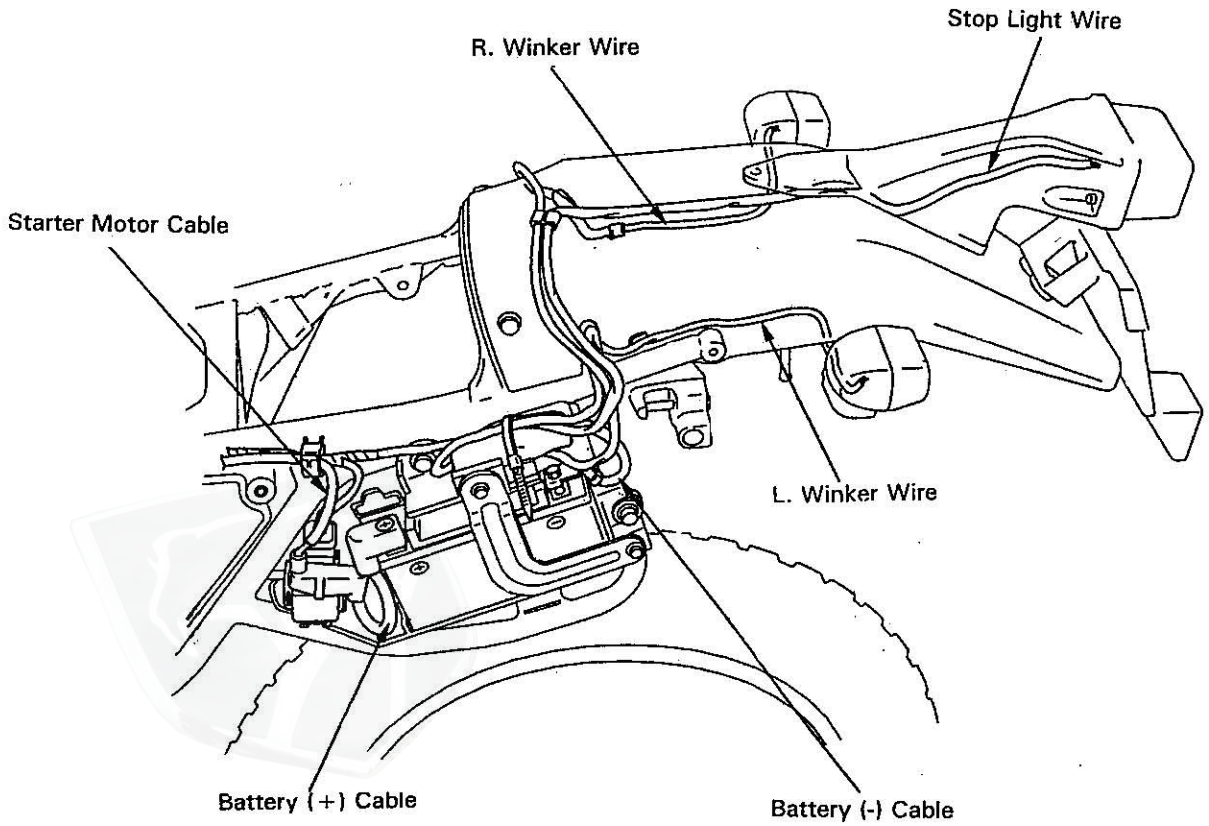
LOCATION	REMARKS	MATERIAL
Steering Head Bearings Sliding Surface Dust Seal Lips Front Wheel Dust Seal Lips Rear Wheel Dust Seal Lips Swing-arm Needle Bearing Dust Seal Cap Lip Pivot Collar Outer Portion Cushion Arm Needle Bearing Dust Seal Lip Cushion Conrod Needle Bearing Dust Seal Lip		Multi-Purpose Grease
Driven Sprocket Nut Screw		• Honda - Ultra-U • API Class SE, SF or SG engine oil
Front Brake Master Piston, Lever Brake Lever Part, Piston Caliper Pin Bolt Bracket Pin Bolt		Brake Grease
Front Master Piston Cap Front Brake Caliper Dust Seal Piston Seal		DOT4 Brake Fluid
Front Master Piston Cap Front Brake Caliper Dust Seal Piston Seal		
Rear Brake Cam Anchor Pin		Dafni Eponex #2
Speedometer Gearbox Pinion Gear		Dafni Eponex #0
Handle Grip Inner Surface		Honda Bond A
Front Fork Dust Seal Lip Oil Seal Lip		Liquid O-ring #400 or Similar
Fork Socket Bolt Screw Bracket Pin Bolt Screw Caliper Pin Bolt Screw		Screw Lock

MAIN WIRE HARNESS





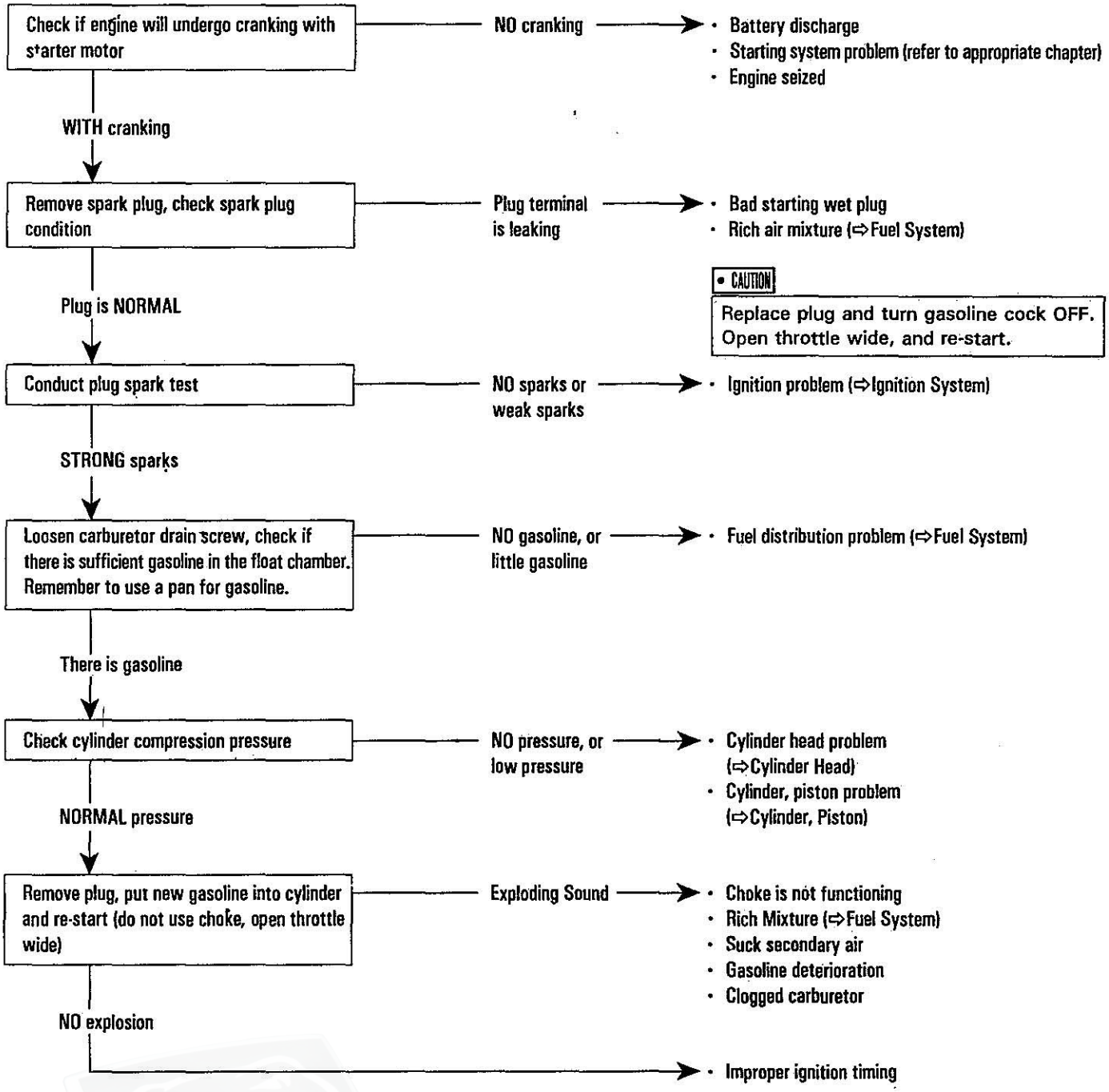




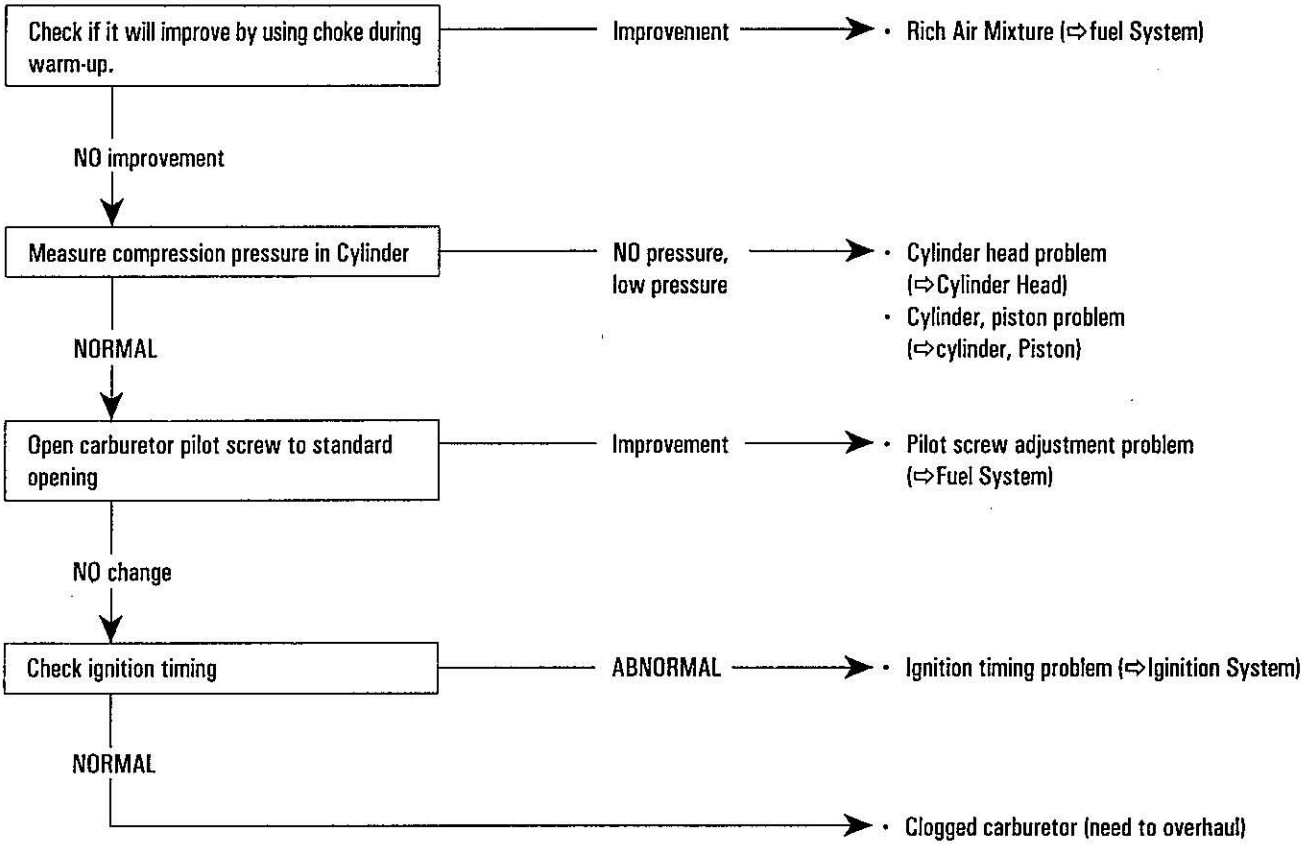
TROUBLESHOOTING

Major troubles affecting the entire engine are explained in this section. Those not explained in this section are discussed in the appropriate chapters.

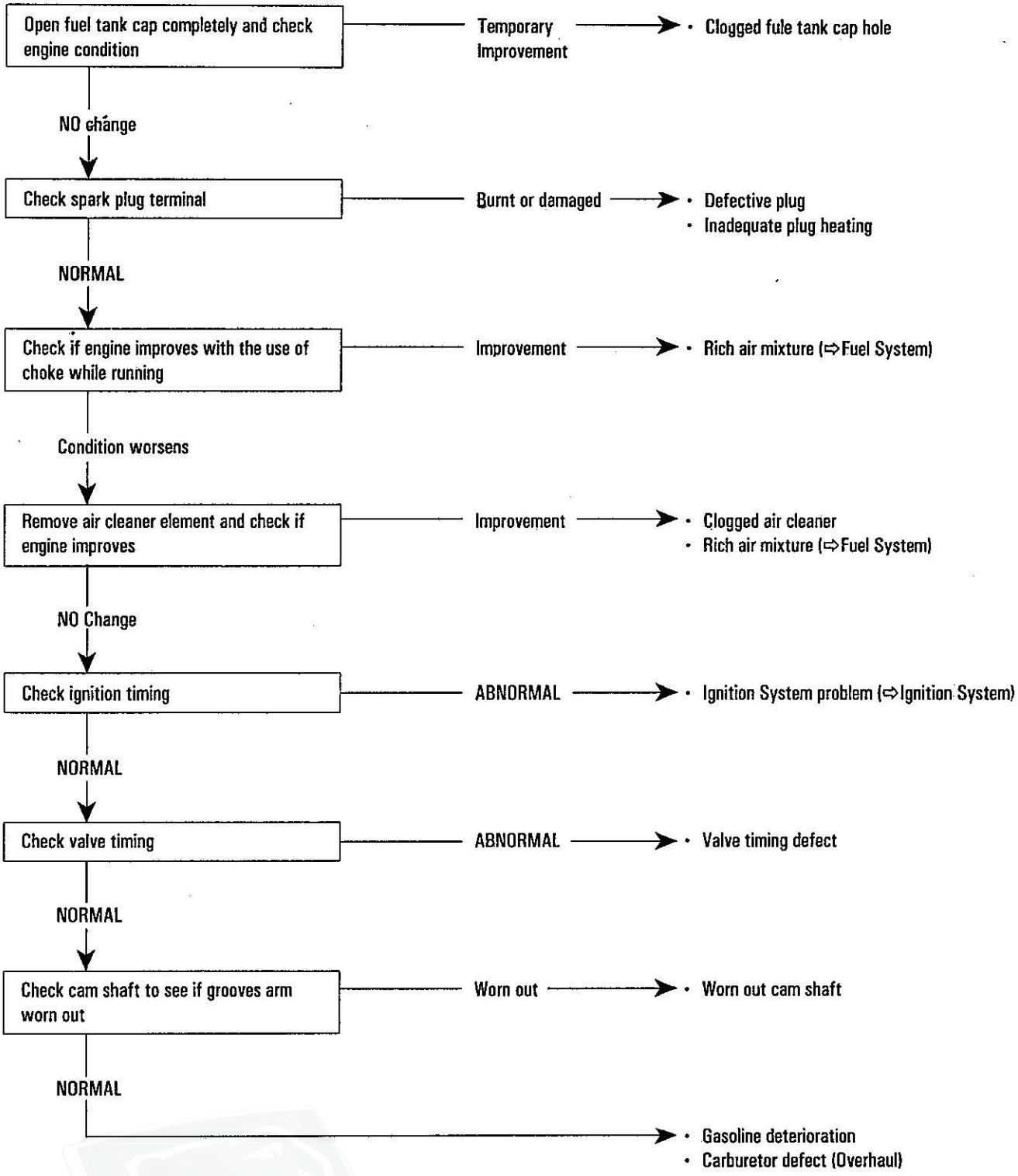
ENGINE WILL NOT START OR HARD STARTING



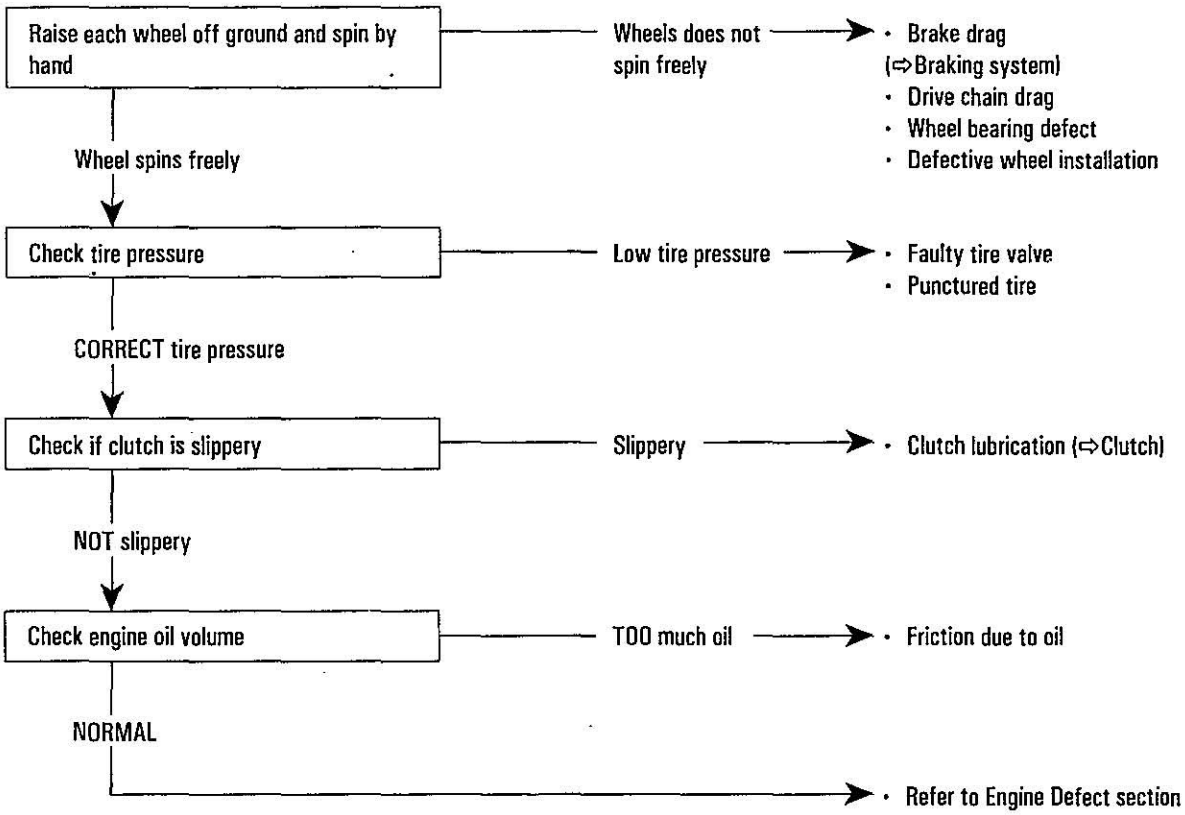
POOR PERFORMANCE DURING IDLING REVOLUTION, LOW SPEED



ENGINE TROUBLE AT MID- AND HIGH-REVOLUTION



LOCKS POWER/SPEED AT HIGH RPM



MEMO

2. INSTALLATION / MUFFLERS

SERVICE INFORMATION

⚠CAUTION

- Because gasoline is highly combustible, there should be no fire or fire sources in the work area. Be careful not only of open fires but also of electric sparks. Gasoline may also explode, make sure that there is good ventilation in your work area.
- Mufflers must be handled when already cold.

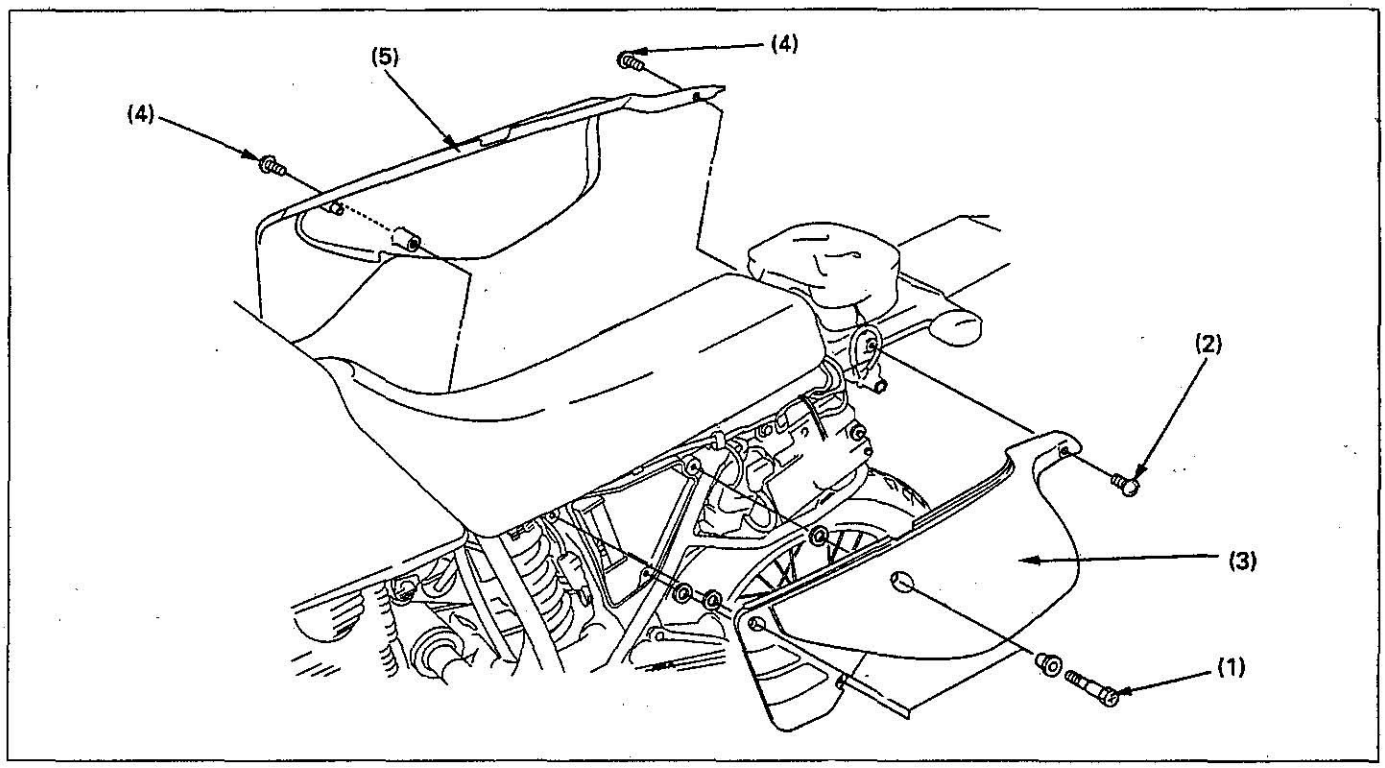
- In this chapter, we explain the removal and attachment of accessories, fuel tank and muffler.
- Tubes and cables must correctly attached following the wiring diagrams (⇨1-18)
- When removing and installing muffler, replace gaskets with new ones.
- When installing exhaust pipe and muffler, attach exhaust pipe joint nut first then attach muffler bolt.
- After installing muffler, make sure that there is no exhaust leakage.

TROUBLESHOOTING

Excessive Exhaust Noise
- Muffler damage
- Exhaust gas leakage

Inadequate Power
- Muffler dented
- Exhaust gas leakage
- Clogged muffler

SIDE COVER REMOVAL AND INSTALLATION



• CAUTION

Make sure that the side cover tongue or nail is not damaged.

	WORK / PART NAME	NO.	NOTES
	Removal Procedure		Installation is reverse order of removal.
	L. Side Cover		
(1)	Bolt	3	
(2)	Screw	1	
(3)	L. Side Cover	1	
	R. Side Cover		
(4)	Screw	2	
(5)	R. Side Cover	1	At installation, align side cover grommet on the frame boss.

SEAT REMOVAL AND INSTALLATION

Removal Procedure

Remove side cover (refer to 2-2)

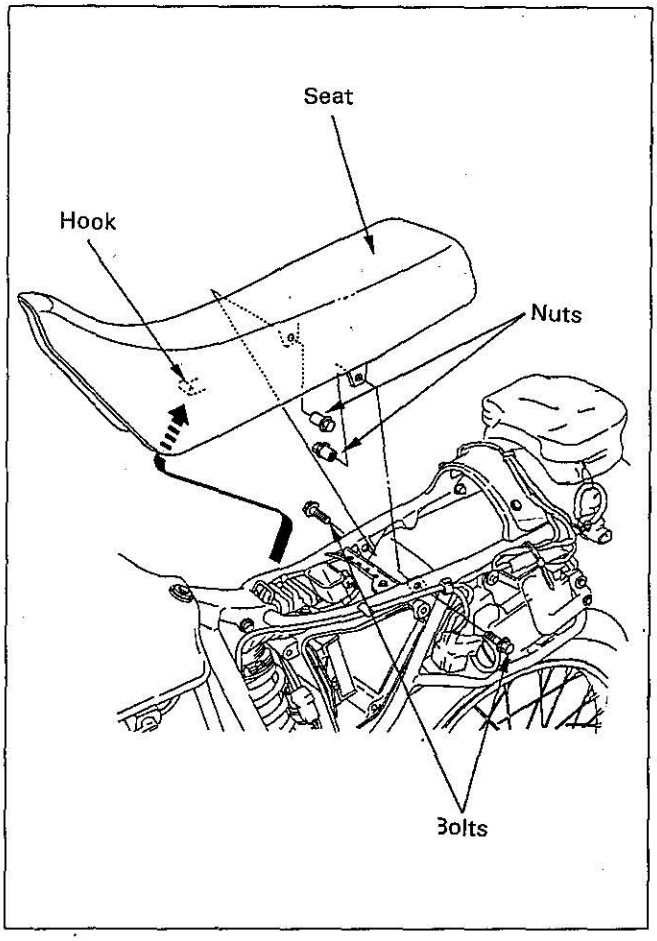
Remove nut and bolt, then remove seat

Installation Procedure

Reverse removal procedure

• CAUTION

When installing, align seat hook to frame.



FRONT FENDER REMOVAL AND INSTALLATION

Removal Procedure

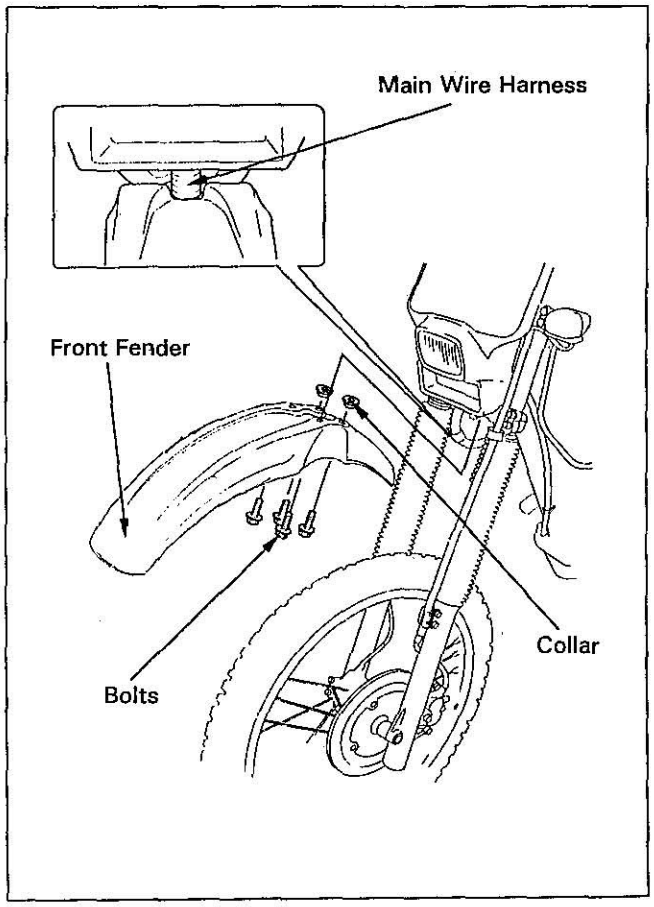
Remove bolt and collar, then remove front fender

Installation Procedure

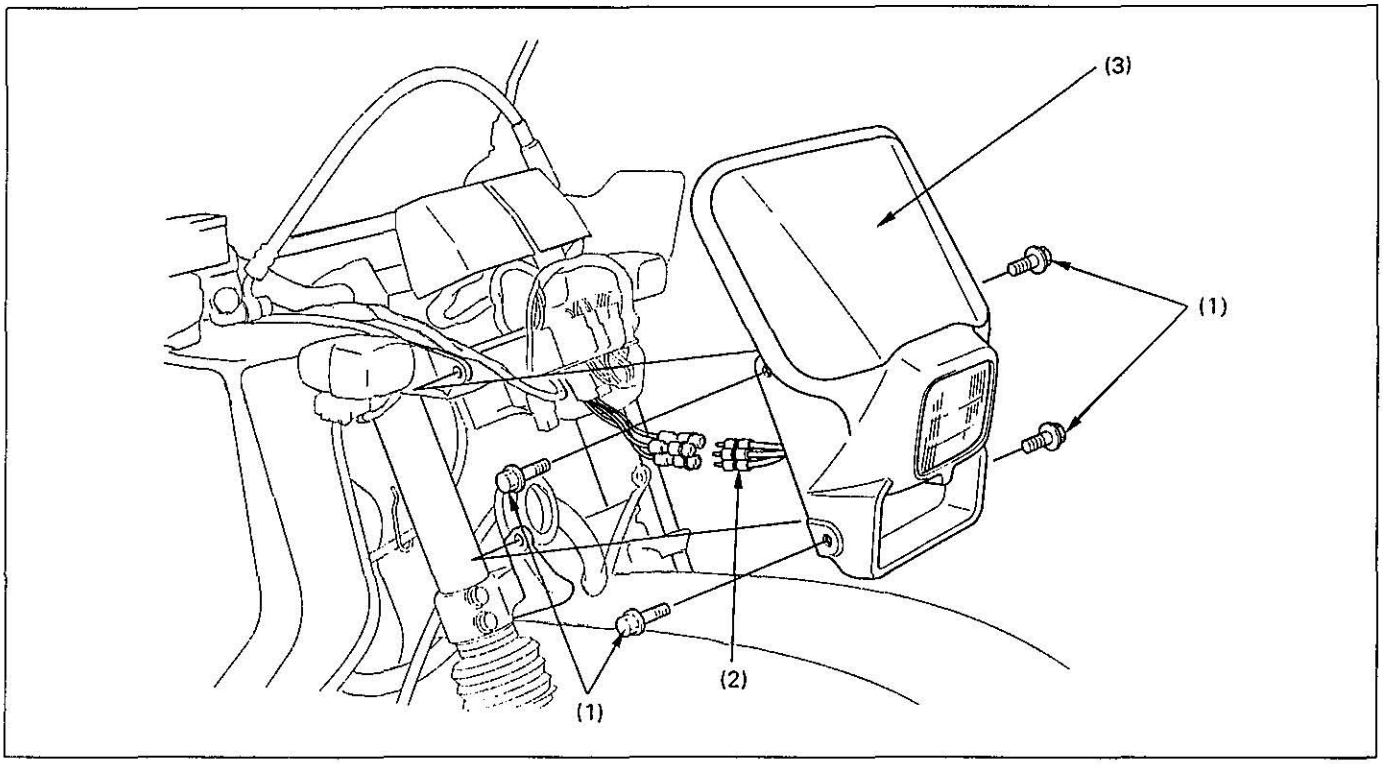
Reverse removal procedure

• CAUTION

When installing front fender, attach main wire harness properly following the drawing on the right.

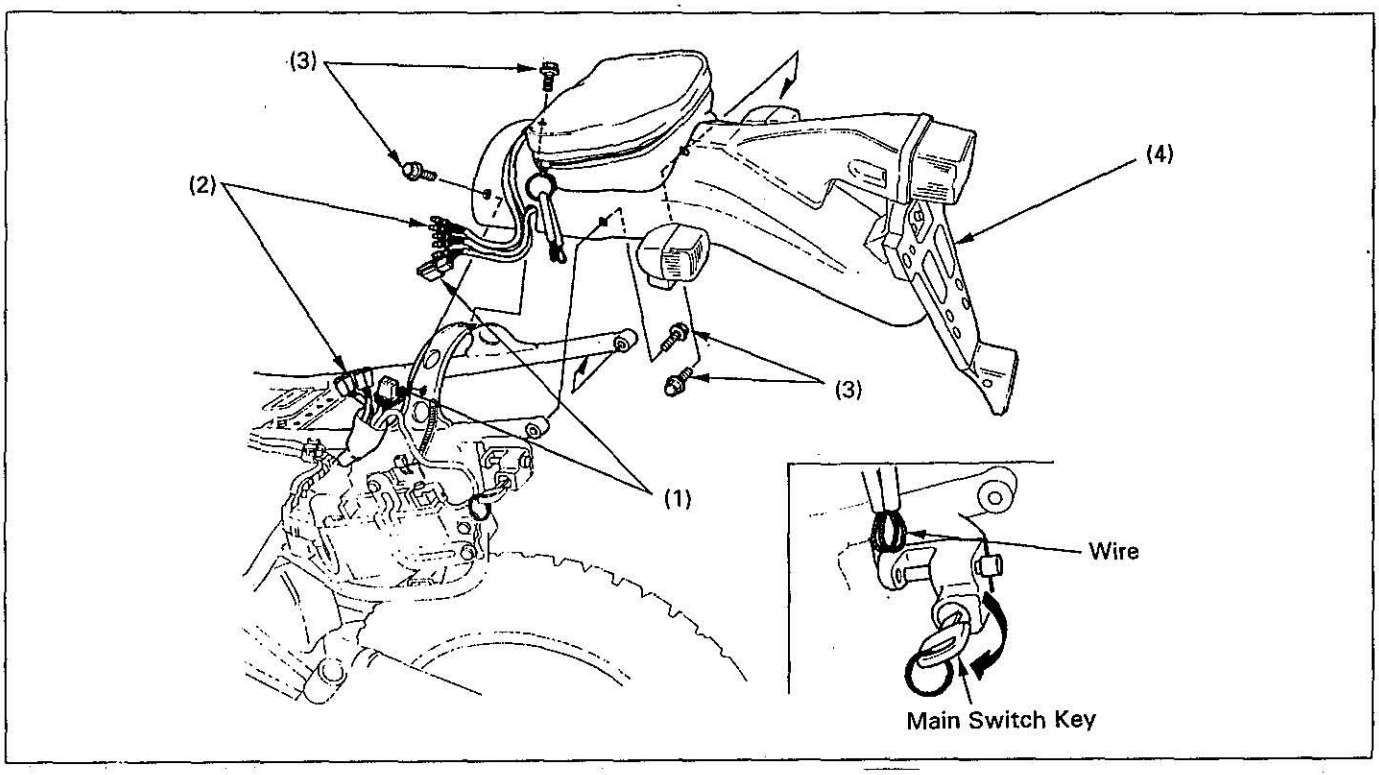


FRONT COVER REMOVAL AND INSTALLATION



	WORK / PART NAME	NO.	NOTES
	Removal Procedure		Installation procedure is reverse of removal.
(1)	Bolt	4	
(2)	Headlight Connector	3	
(3)	Front cover	1	

REAR FENDER REMOVAL AND INSTALLATION

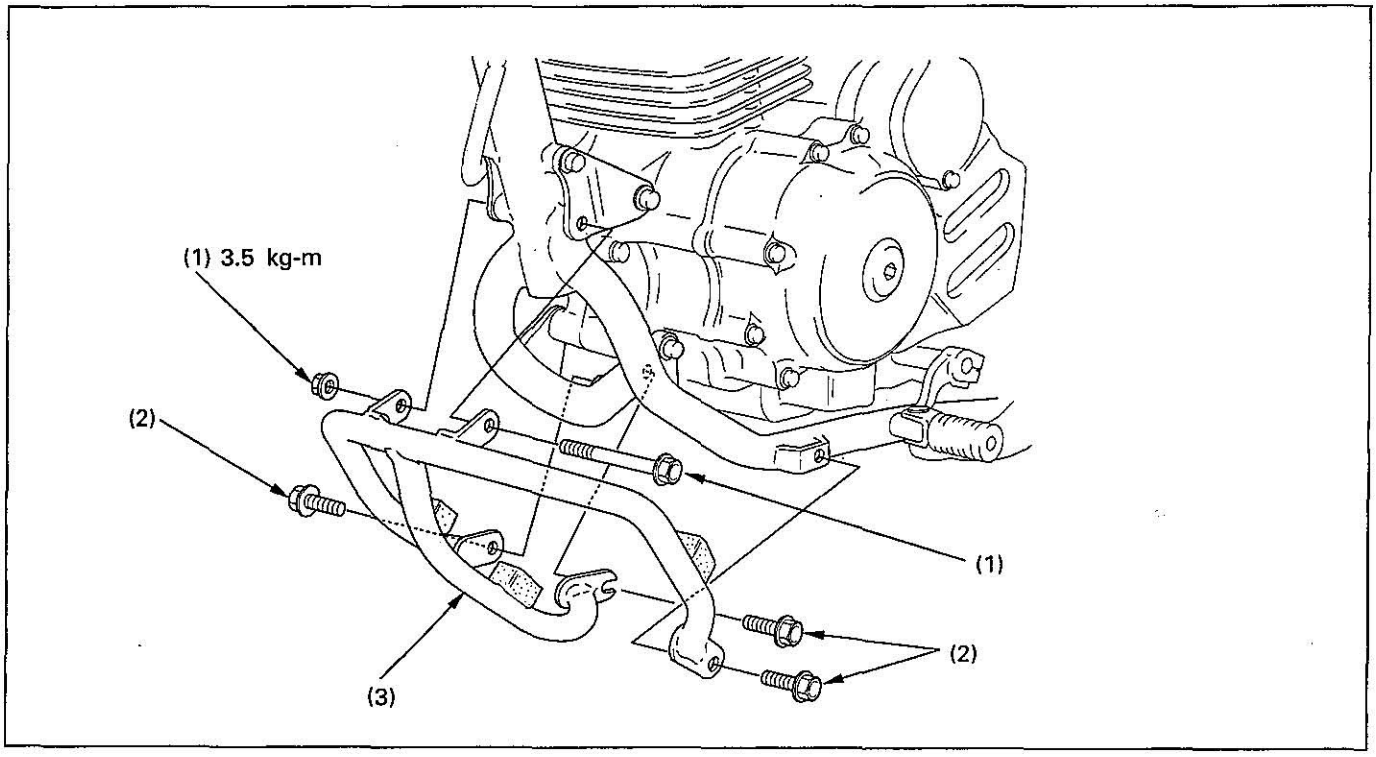


RELATED WORK

- Side Cover Removal (⇨2-2)
- Seat Removal (⇨2-3)

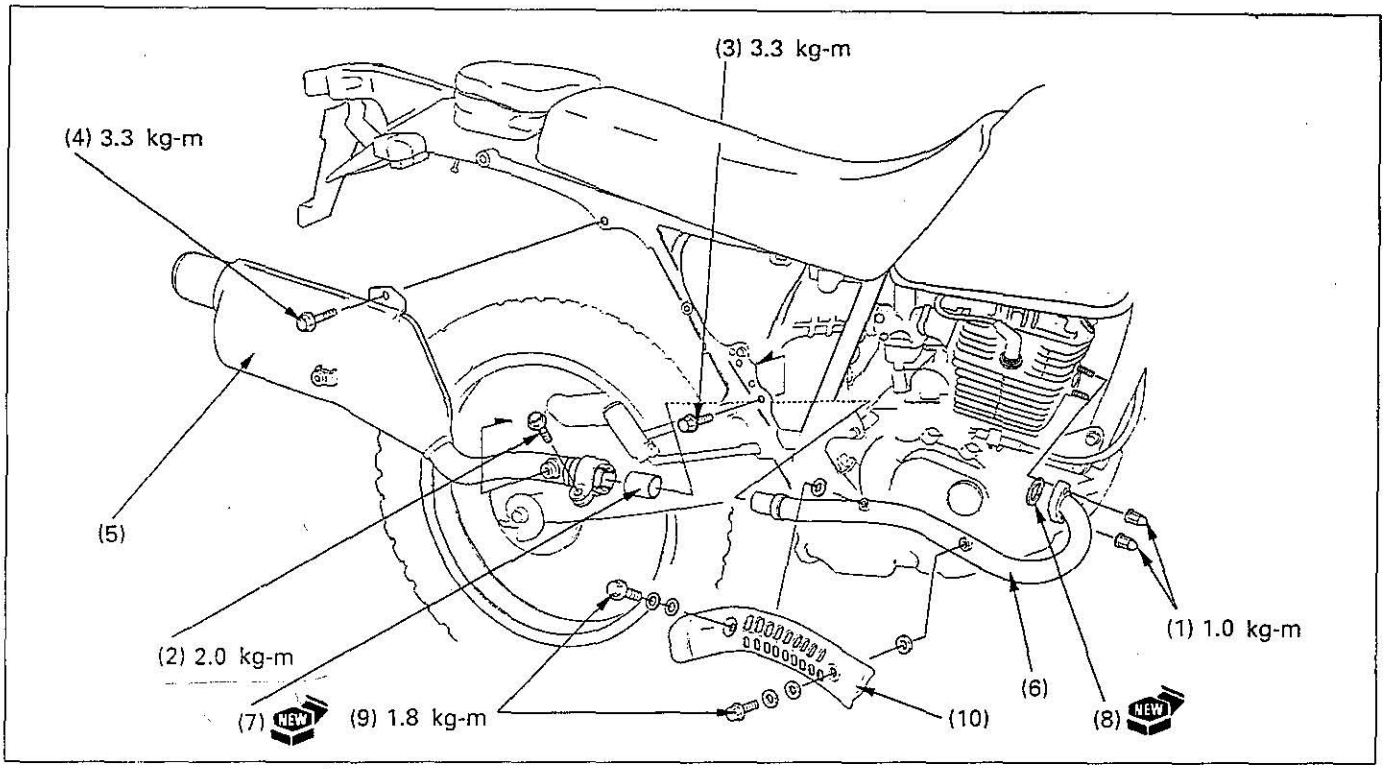
	WORK / PART NAME	NO.	NOTES
	Removal Procedure		Installation procedure is reverse of removal.
(1)	Tail/Stoplight Coupler	1	
(2)	Winker Connector	5	
(3)	Bolt	4	
(4)	Rear Fender	1	Before removing, use main switch key to remove helmet holder and wire.

UNDER PIPE REMOVAL AND INSTALLATION



	WORK / PART NAME	NO.	NOTES
	Removal Procedure		Installation is reverse order of removal.
(1)	Front Upper Engine Hanger Nut/ Bolt (Frame Side)	1/1	
(2)	Bolt	3	
(3)	Skid Pipe	1	

EXHAUST PIPE, MUFFLER REMOVAL AND ATTACHMENT



RELATED WORK

- Side Cover Removal (⇨2-2)
- Seat Removal (⇨2-3)

	WORK / PART NAME	NO.	NOTES
	Removal procedure		Installation is reverse order of removal.
(1)	Exhaust Pipe Joint Nut	2	
(2)	Muffler Band Bolt	1	Loosen only.
(3)	Muffler Bolt (Front)	1	
(4)	Muffler Bolt (Rear)	1	
(5)	Muffler	1	
(6)	Exhaust Pipe	1	
(7)	Packing Muffler	1	
(8)	Exhaust Pipe Gasket	1	
(9)	Exhaust Pipe Protector Bolt	2	
(10)	Exhaust Pipe Protector	1	

FUEL TANK REMOVAL AND INSTALLATION

Removal Procedure

⚠ CAUTION

Avoid fire sources.

• CAUTION

- Turn fuel cock to "OFF" before working.
- After finishing work, turn fuel cock to "ON" and make sure there is no fuel leak.

Remove Seat (⇨2-3)

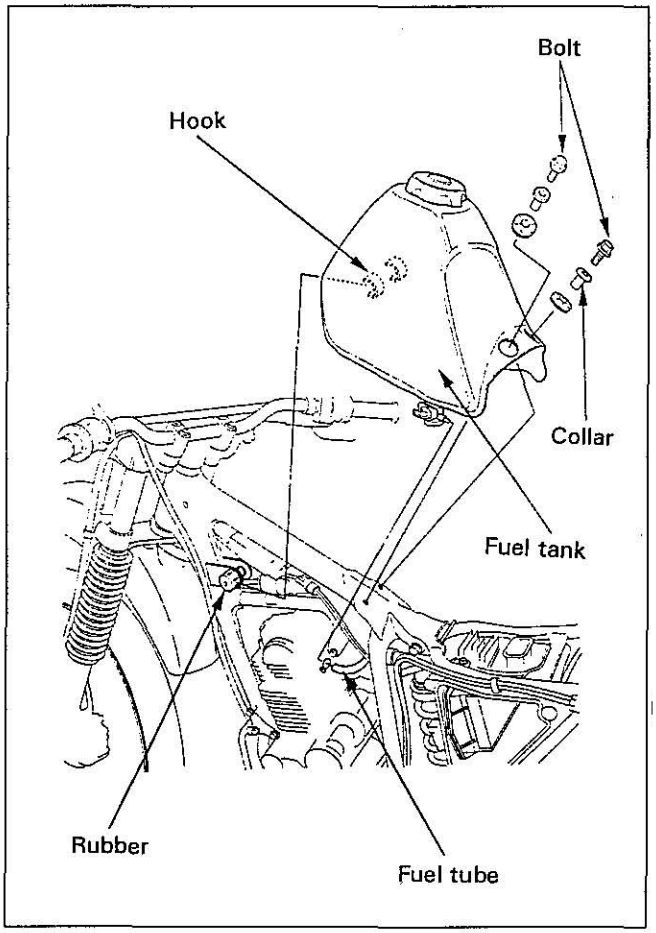
Turn fuel cock to "OFF", remove fuel tube.
Remove fuel tank bolt and collar.
Raise fuel tank rear portion, and pull to the rear to remove.

Installation Procedure

Reverse of removal procedure

• CAUTION

At installation, match tank hook to frame rubber.



MEMO

3. CHECKING AND ADJUSTMENT

CHECKING AND ADJUSTMENT METHODS

(Note) (1) [○] indicates frequency of check
(2) [×] indicates item is not applicable
(3) [☆] indicates periodic replacement for parts
This periodic replacement was decided based in data from various vehicles. For vehicles with significantly different driving conditions, replace parts accordingly.

		ITEMS FOR CHECKING / ADJUSTMENTS	FREQUENCY: BEFORE DRIVING	FREQUENCY: ONE MONTH OR 1000 KMS	FREQUENCY: PRIVATE USE EVERY 6 MONTHS	FREQUENCY: PRIVATE USE EVERY 12 MONTHS	NOTES
BRAKING SYSTEM	BRAKE HOSE	Replacement of brake hose					☆ Every 4 years
	MASTER CYLINDER WHEEL CYLINDER DISK CALIPER	Replacement of cap and dust seal of master cylinder and wheel cylinder, and rubber parts of disc caliper.					☆ Every two years
	BRAKE PAD	Brake Pad wear out			○		Refer to page 3-3
	LUBRI CANIS	Replacement of brake fluid					Every year
MOTOR	ENGINE	Replacement of air Cleaner element					Every 20,000 kms
	LUBRICATION SYSTEM	Replacement of engine oil		○			After one month or 1,000 kms for the first change oil, then every 3,000 kms thereafter
	FUEL SYSTEM	Replacement of fuel hose					☆ Every 4 years

		ITEMS FOR CHECKING / ADJUSTMENTS	FREQUENCY: BEFORE DRIVING	FREQUENCY: EVERY MONTH OR 1000 KMS	FREQUENCY: PRIVATE USE EVERY 6 MONTHS	FREQUENCY: PRIVATE USE EVERY 12 MONTHS	STANDARD FOR MAKING DECISION	NOTES
STEERING SYSTEM	STEERING HANDLE & STEERING WHEEL	Slack, loosening, rickety				○		
		Operating conditions				○		
		Turning angle on left and right				○		
	STEERING HAWK	Damage			○	○		
		Front Suspension • Spindle condition			○	○		Show steering stem
		Front Suspension • Spindle Freeplay				○		Show steering stem
BRAKING SYSTEM	BRAKE PEDAL	Slack and gap when stepped on			○	○	Slack Pedal :20~30 mm Lever At tip of lever :10~20 mm	
		Operation stroke and efficiency	○					
		Braking effectiveness		○	○	○		
	RODS & CABLE	Looseness, rickety, damage		○		○		
	HOSES & PIPES	Leaks, damage and assembly conditions		○	○	○		
	RESERVER TANK	Fluid volume	○		○	○	Fluid surface level Front wheel: greater than lower level	
	MASTER CYLINDER WHEEL CYLINDER DISK CALIPER	Function, wear out, and damage				○		
	BRAKE DRUM & BRAKE SHOE	Gap between drum and lining			○	○		
		Shoe moving parts and lining wear out				○		Indicator
		Drum wear out and damage				○	Standard diameter : rear wheel : 110 mm Maximum usable : rear wheel : 111 mm	

		ITEMS FOR CHECKING / ADJUSTMENTS	FREQUENCY: BEFORE DRIVING	FREQUENCY: ONCE A MONTH OR 1000 KMS	FREQUENCY: PRIVATE USE EVERY 6 MONTHS	FREQUENCY: PRIVATE USE EVERY 12 MONTHS	STANDARD FOR MAKING DECISION	NOTES
BRAKING SYSTEM	BRAKE DISK AND PAD	Gap between disc and pad				○		
		Pad wear out				○		Indicator
		Disc wear out and damage				○	Standard thickness Front wheel: 3.5 mm Maximum usable Front wheel: 3.0 mm	
WHEEL SYSTEM	WHEEL	Tire air pressure	○		○	○	(Unit kg/cm²) One rider, Regular roads: Front wheel 1.75, Rear wheel 1.50 One rider, Highway: Front wheel —, Rear wheel — Two riders, Regular roads: Front wheel 1.75, Rear wheel 1.50 Tire specifications: Front wheel 2. 75-21 45 P, Rear wheel 4. 10-18 59 P	
		Tire cracks and damage	○		○	○		
		Tire groove depth and abnormal wear out	○		○	○	Tread Front wheel : 0.8 mm up to Rear wheel : 0.8 mm up to	
		Tire metal fixtures, stones and other foreign objects	○		○	○		
		Loose wheel nuts and bolts			○	○	Front axle holder clamping torque: 1.0~1.4 kg-m Front axle clamping torque: 5.0~8.0 kg-m Rear axle nut clamping torque: 8.0~11.0 kg-m	Show axle nut, axle holder
		Rim, side ring and wheel disc damage		○		○	Wheel rim vibration, at rim edge Fr. horizontal vibration : less than 2.00 mm vertical vibration : less than 2.00 mm Rr. horizontal vibration : less than 2.00 mm vertical vibration : less than 2.00 mm	
		Rickety front wheel bearing				○		

ITEMS FOR CHECKING / ADJUSTMENTS			FREQUENCY				STANDARD FOR MAKING DECISION	NOTES
			BEFORE DRIVING	ONE MONTH OR 1000 KMS	PRIVATE USE: EVERY 6 MONTHS	PRIVATE USE: EVERY 12 MONTHS		
TRAVELLING SYSTEM	WHEEL	Sticking rear wheel bearing				○		
SUSPENSION SYSTEM	FRAME & SPRING	Damage				○		Show cushion spring
	SUSPENSION ARM	Sticking at connections and damage at arm				○		
	SHOCK ABSORBER	Oil leak and damage				○		
		Sticking at connections				○		
TRANSMISSION SYSTEM	CLUTCH	Lever free play			○	○	Slack Lever type At lever edge: 10-20 mm	
		Performance		○	○	○		
	TRANSMISSION	Oil leak and oil volume			○	○	Oil Volume Stick gauge type Between MAX and MIN levels	
		Sticking of operation system				○		
	CHAIN & SPROCKET	Chain slack		○	○	○	When using sidestand, at front and rear sprocket center Maximum: 25-35 mm	
		Sprocket assembly condition and wear out				○		

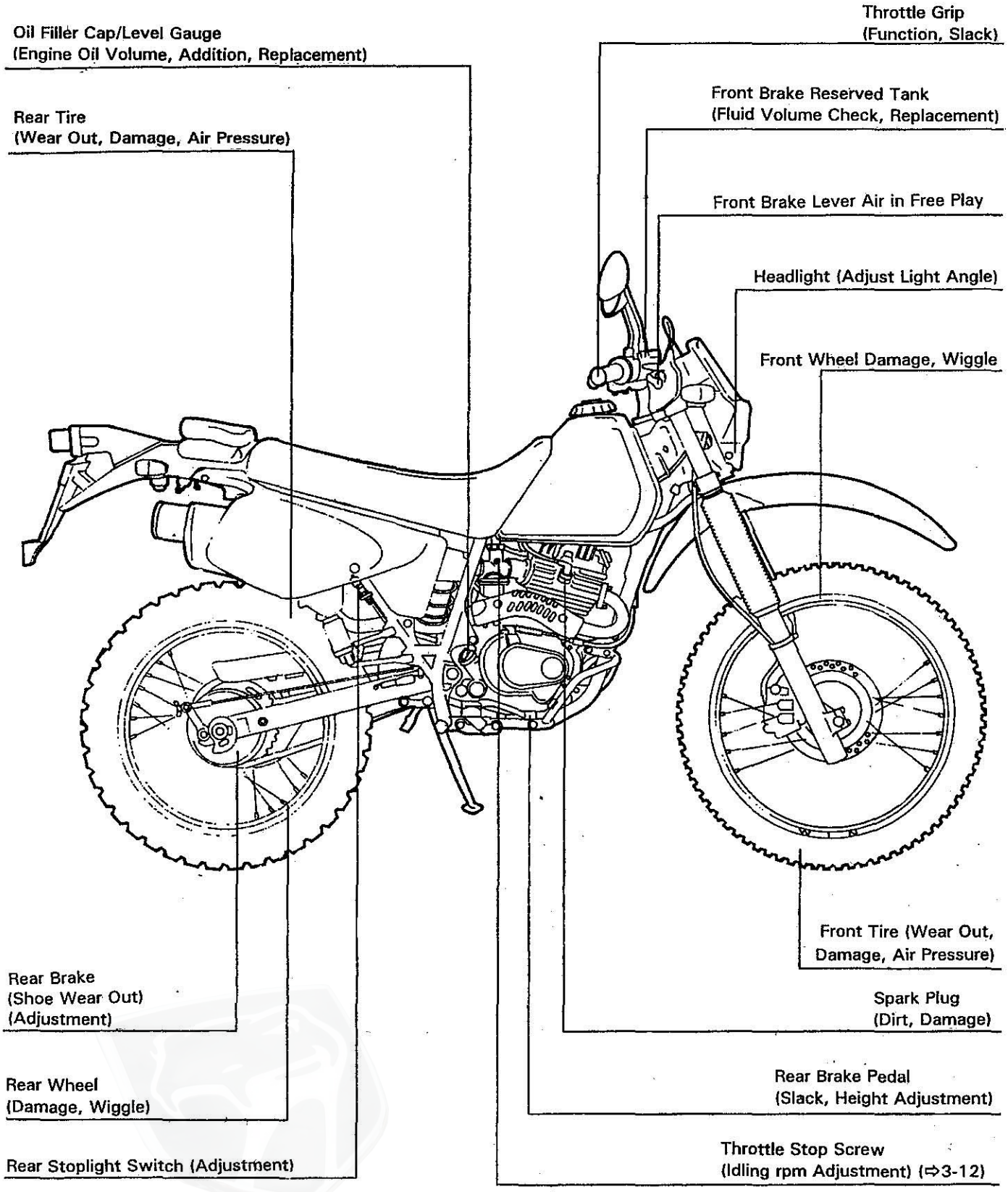
		ITEMS FOR CHECKING / ADJUSTMENTS	FREQUENCY				STANDARD FOR MAKING DECISION	NOTES
			BEFORE DRIVING	ONE MONTH OR 1000 KMS	PRIVATE USE: EVERY 6 MONTHS	PRIVATE USE: EVERY 12 MONTHS		
ELECTRICAL SYSTEM	IGNITION SYSTEM	Spark plug condition			○	○	Spart plug gap: 0.8~0.9 mm	
		Ignition timing			○	○		No need for checking
		Advancer function				○		Electrical system (No required service)
	BATTERY	Fluid volume			○	○		Electrical system (No required service)
		Fluid specific gravity				○		Electrical system (No required service) (MF Battery)
		Condition of connection terminal				○		
	ELECTRICAL WIRING	Looseness of connections and damage				○		
MOTOR	MAIN UNIT	Starting condition and abnormal noises			○	○		
		Low speed and accelaration condition		○	○	○	Idling rpm: 1,400±100rpm	
		Exhaust gas condition			○	○		
		Air cleaner element condition			○	○		Electrical system No checking needed if viscous type (No required service)

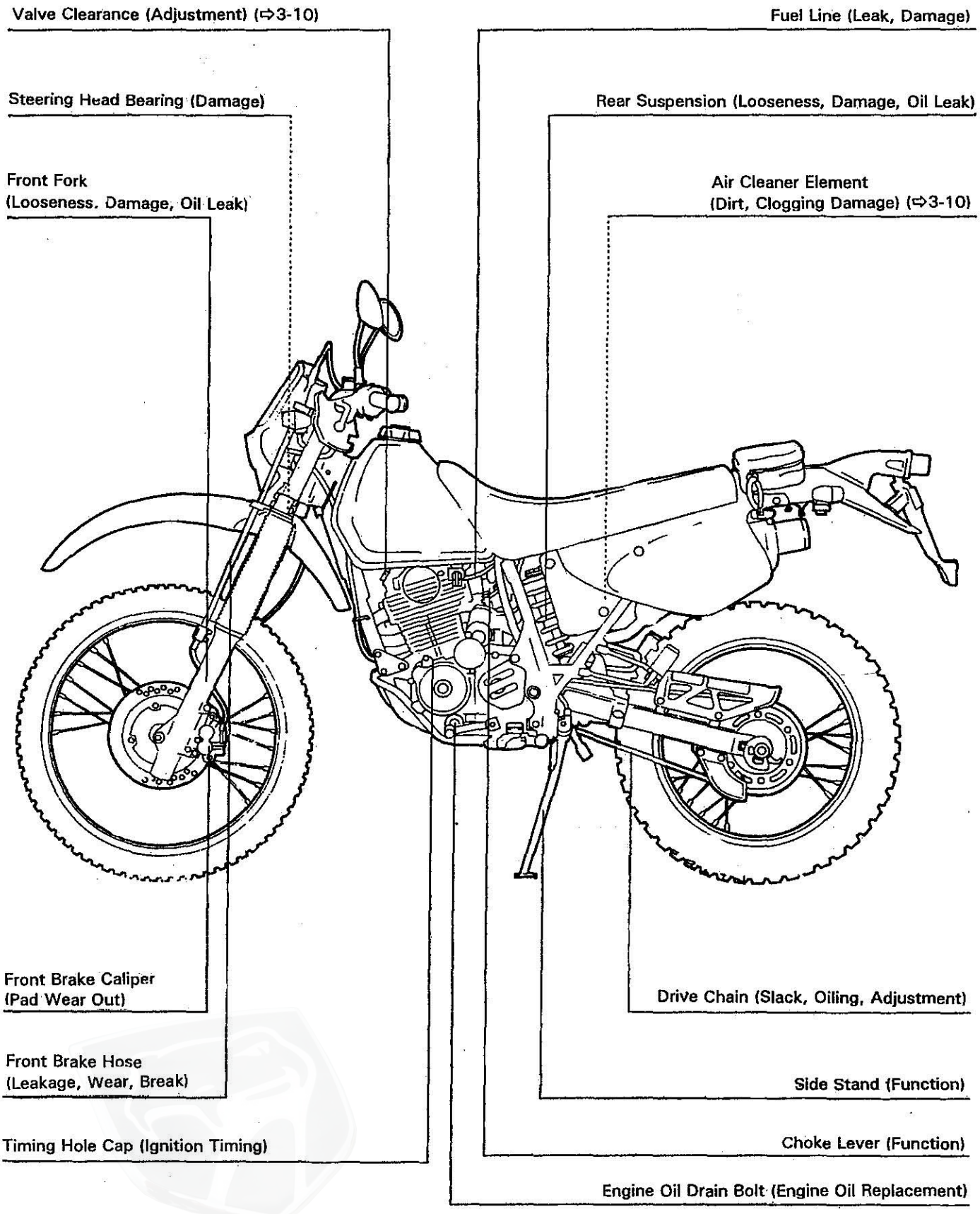
ITEMS FOR CHECKING / ADJUSTMENTS			FREQUENCY				STANDARD FOR MAKING DECISION	NOTES
			BEFORE DRIVING	ONE MONTH OR 1000 KMS	PRIVATE USE: EVERY 6 MONTHS	PRIVATE USE: EVERY 12 MONTHS		
MOTOR	MAIN UNIT	Valve clearance		○		○	Cold Condition INTAKE: 0.08~0.12 mm EXHAUST: 0.08~0.12 mm	
MOTOR	LUBRICATION SYSTEM	Oil impurities and volume			○	○	Oil Volume Dip Stick gauge type: Between MAX and MIN Volume	
MOTOR	LUBRICATION SYSTEM	Oil leak			○	○		
MOTOR	LUBRICATION SYSTEM	Oil volume	○					
MOTOR	LUBRICATION SYSTEM	Clogged oil filter				○		
MOTOR	FUEL SYSTEM	Fuel leak			○	○		
MOTOR	FUEL SYSTEM	Carburetor link mechanism condition				○		X
MOTOR	FUEL SYSTEM	Throttle valve and choke valve condition				○		
MOTOR	FUEL SYSTEM	Clogged fuel filter				○		
MOTOR	FUEL SYSTEM	Fuel Volume	○					
LIGHTING - SIGNALING SYSTEM		Operation			○	○		
LIGHTING - SIGNALING SYSTEM		Blinking, dirt and damage	○					
HORN & KEY SYSTEM		Operation				○		

ITEMS FOR CHECKING / ADJUSTMENTS		FREQUENCY				STANDARD FOR MAKING DECISION	NOTES
		BEFORE DRIVING	ONE MONTH OR 1000 KMS	PRIVATE USE: EVERY 6 MONTHS	PRIVATE USE: EVERY 12 MONTHS		
REAR VIEW MIRROR & REFLECTOR	Check reflecting mechanism	○					Rear-view mirror only
REFLECTORS & MOTOR REGISTRATION NO & BODY NUMBER	Dirt and damage	○					
METERS	Function				○		
EXHAUST PIPE & MUFFLER	Looseness in assembly and damage				○		
	Muffler condition				○		
FRAME & BODY	Looseness and damage				○		
PLACES WHERE ABNORMALITIES WERE NOTED IN PREVIOUS DAY	Check for abnormalities	○					
OTHERS	Check oiling condition in various parts of chassis			○	○		

LOCATION OF MAINTENANCE PARTS

Shows the location of main parts related to maintenance (checking and adjustment).





AIR CLEANER

Remove L. Side Cover (⇨2-2)

Remove nut, remove air cleaner element.

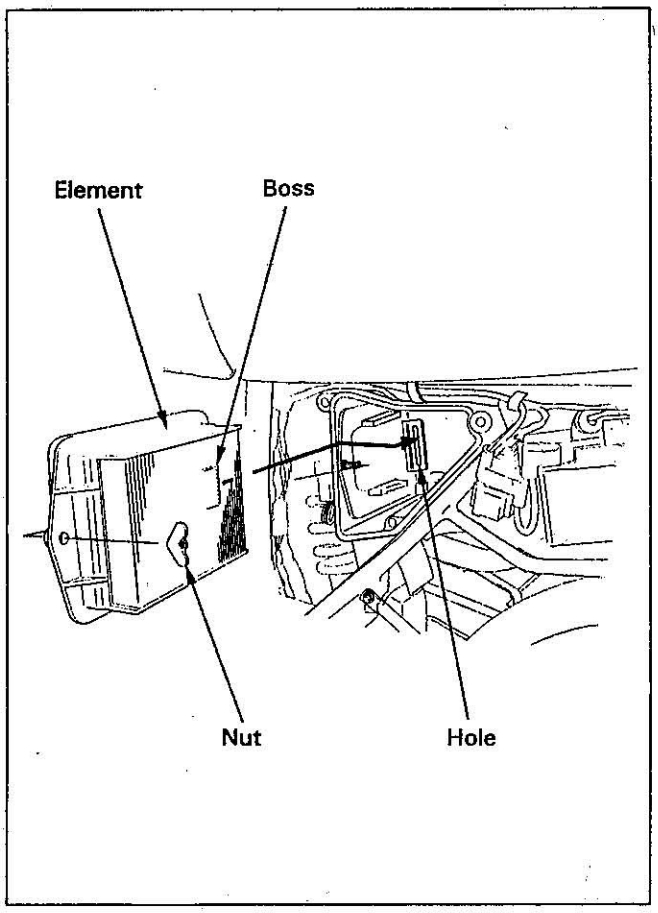
Check element for dirt and damage

Replacement Period: every 20,000 kms

If the vehicle driving conditions are extreme, replace earlier.

Install air cleaner element boss into air cleaner case hole.

Installation is the reverse of removal procedure.



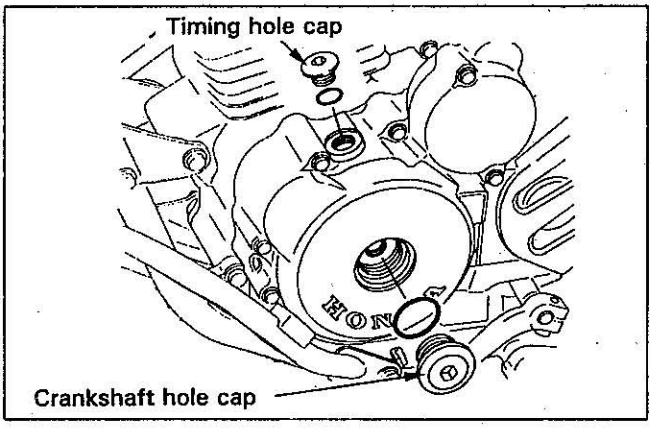
VALVE CLEARANCE

Checking

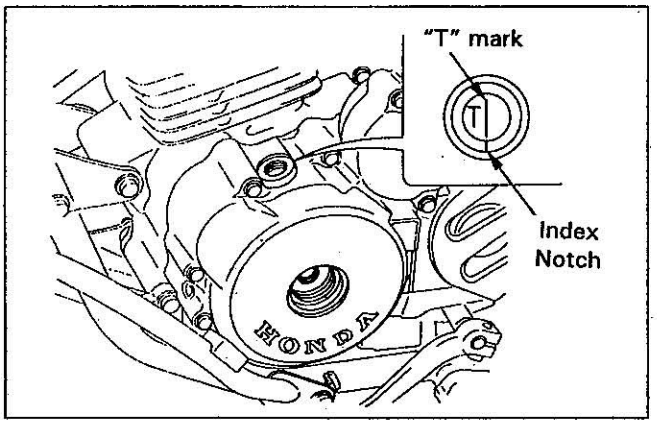
• CAUTION

Valve clearance checking and adjustment should be conducted when the engine is cold (35 degrees or below)

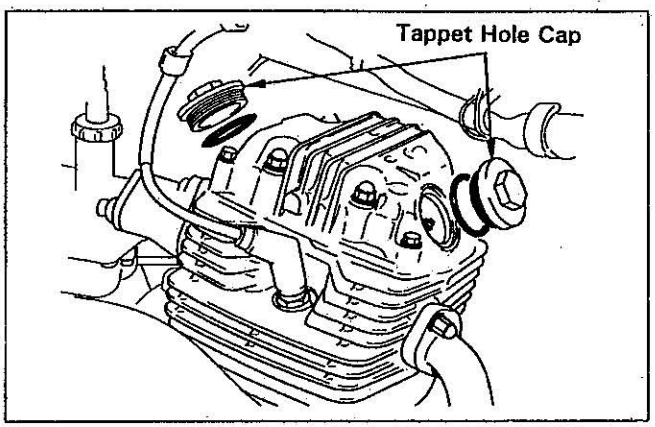
Remove fuel tank (⇨2-8)
Remove timing hole cap and crankshaft hole cap.



Rotate flywheel counterclockwise to align the "T" mark with the index notch on the left crankcase cover. Make sure the piston is at Top Dead Center.

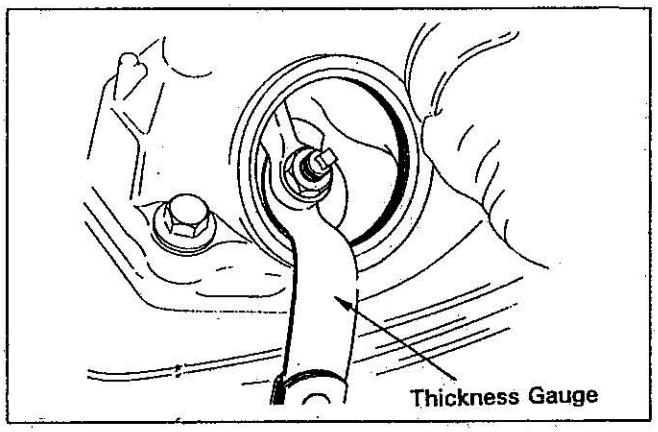


Remove tappet hole cap.



Insert thickness gauge between valve stem and adjuster screw to check valve clearance.

Valve clearance (while cold: below 35 °C)
IN: 0.10±0.02 mm
EX: 0.10±0.02 mm



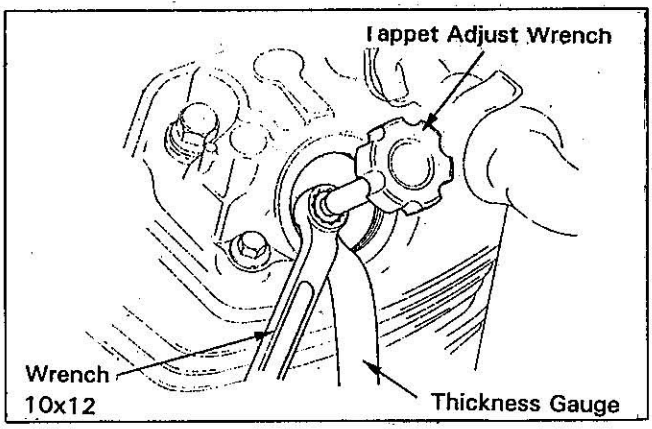
Adjustment

When adjustment is necessary, loosen lock nut and turn adjuster screw, insert standard thickness gauge of medium thickness, and adjust clearance.

Fix adjust screw and tighten lock nut.

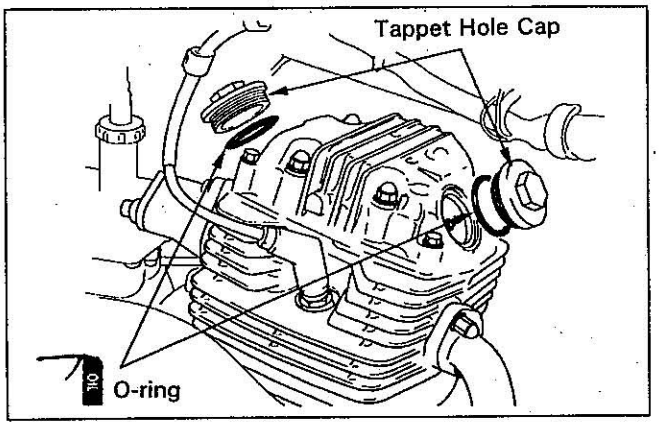
Torque: 1.4 kg-m

Tappet Adjuster / Wrench	**07708-0030300**
Wrench 10 x 12 mm	**07708-0030200**



Check condition of tappet hole cap O-ring, replace if damaged apply engine oil to O-ring, and attach tappet hole cap to cylinder head cover.

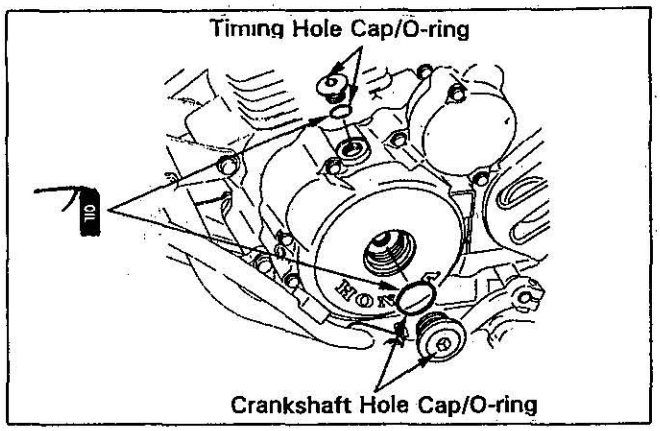
Torque: 1.5 kg-m



Check the condition of O-ring of timing hole cap and crankshaft hole cap, if damaged replace with new ones. Apply engine oil to timing hole cap and crackshaft hole cap, then attach.

Torque : Timing Hole Cap : 0.6 kg-m
: Crankshaft Hole Cap : 0.8 kg-m

Install by reversing removal procedure

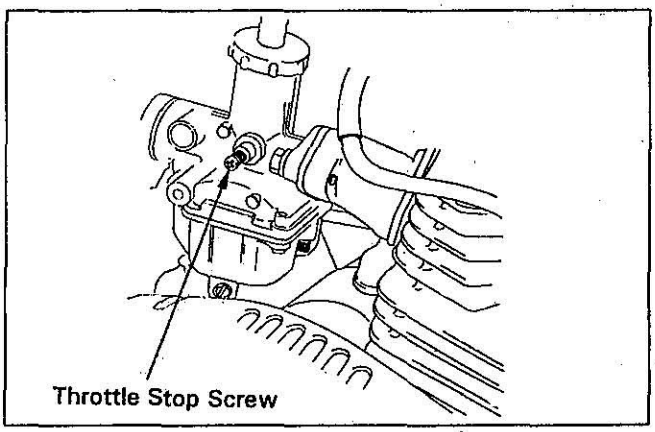


IDLING ADJUSTMENT

• CAUTION

- Idling adjustment should be done after warming up the engine
- After carburetor overhaul, adjust idling after pilot screw adjustment.

Put side stand up and make sure the vehicle is supported adequately.
Put in neutral gear, start on warm up.
Turn throttle stop screw and adjust idling.
Idling rpm: 1,400 ± 100rpm



DRIVE CHAIN

Replacement

⚠CAUTION

- The drive chain uses master link joint pin type. When replacing chain, use specialized tools and replacement chain.
- Never use clip type chain.

• CAUTION

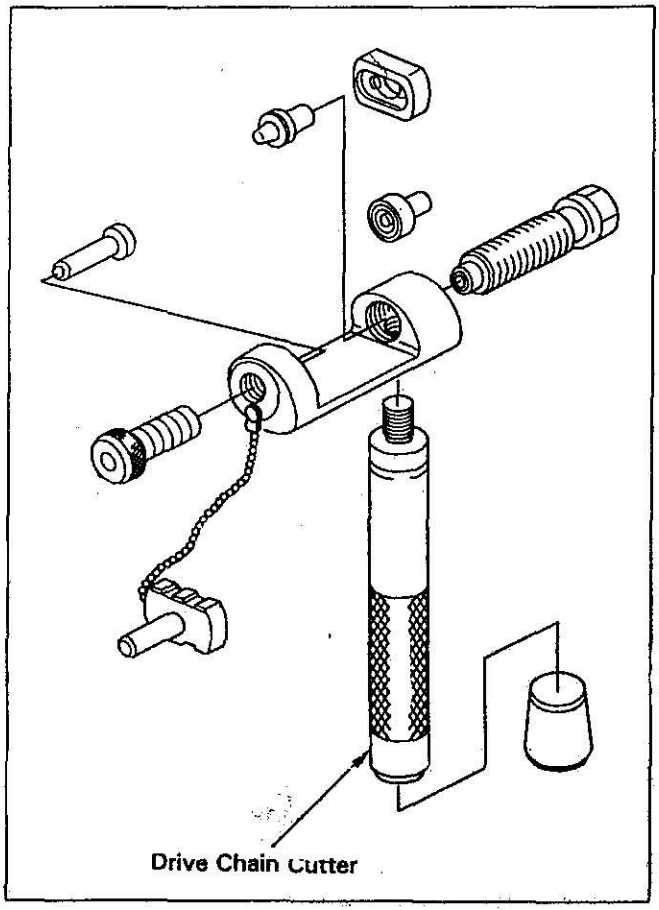
- Drive chain is of the endless type. Use chain cutter when replacing.
- When abnormality is seen in drive chain, check sprocket as well. If there is abnormality in sprocket, replace both.

Loosen drive chain assemble tools.

Drive Chain Cutter 07HMH-MR10102

• CAUTION

Before using any of the specialized tools, make sure you read the instructions manuals.



MEMO

4. LUBRICATION SYSTEM

SERVICE INFORMATION

- Oil pump adjustment can be done while engine is on frame.
- When oil pump has reached its limit, replace as an assembly.
- Make sure that foreign objects do not get into engine when removing and assembling the oil pump
- Check that there is no oil leak after installing the oil pump.

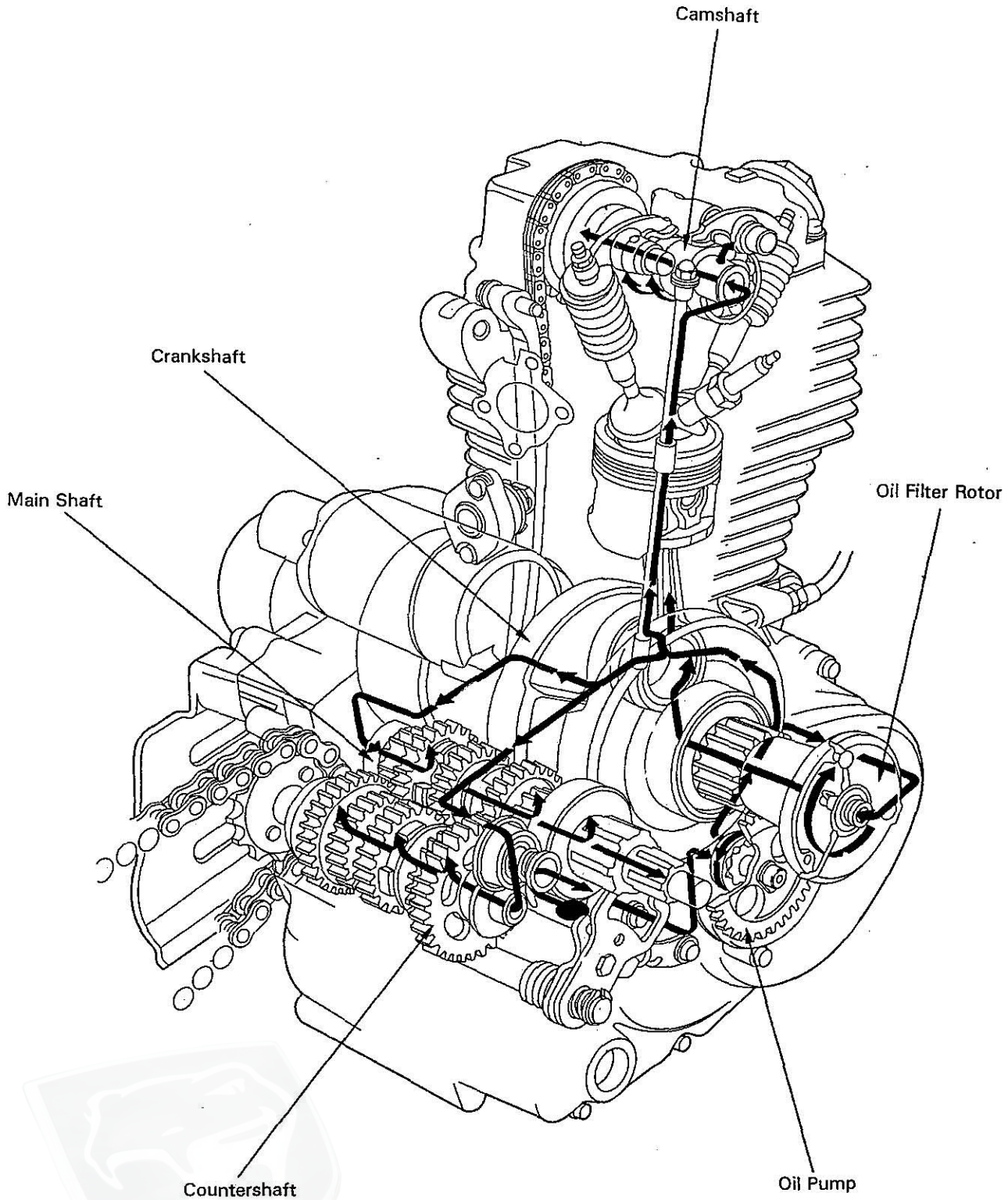
TROUBLESHOOTING

Low Oil Volume
- Oil consumption
- Oil leak
- Worn out piston ring or incorrect piston ring installation
- Worn out valve guide or seal
- Worn out cylinder

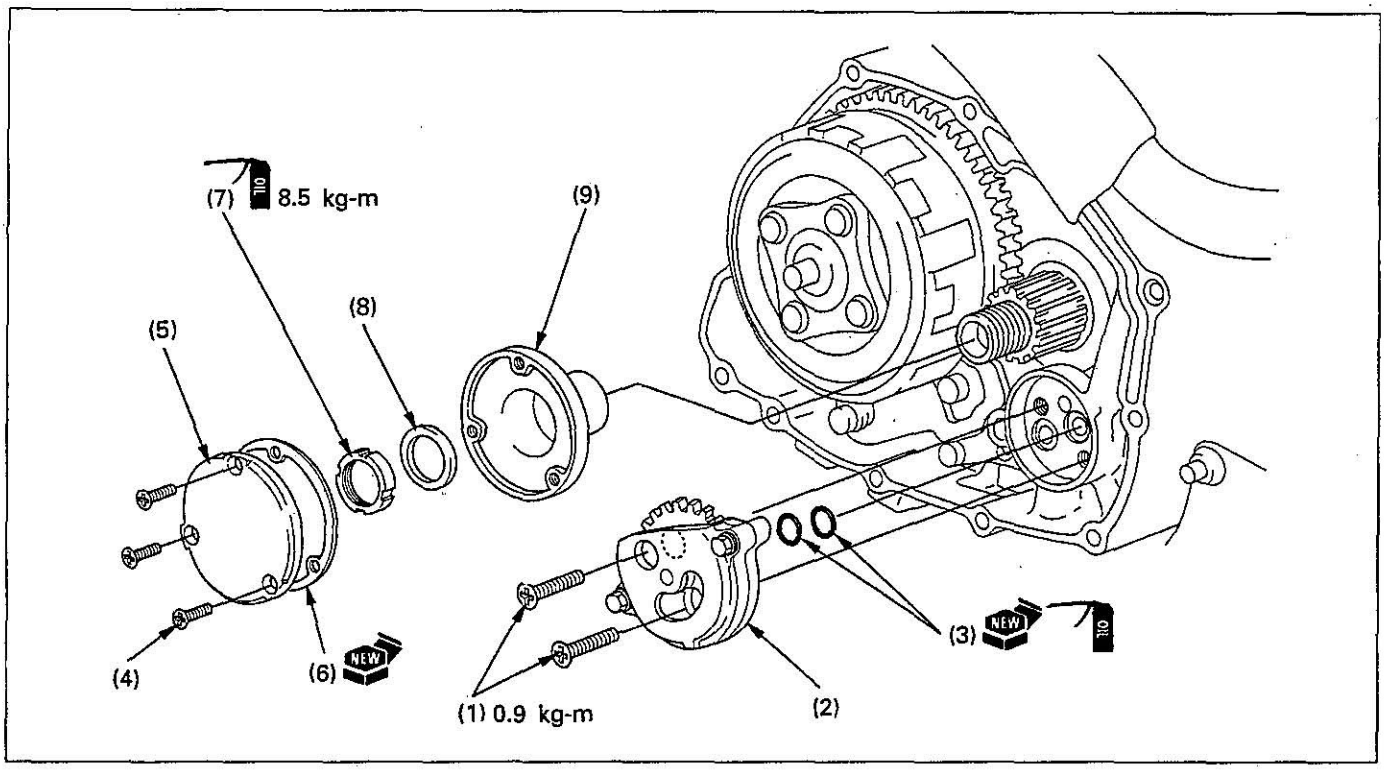
Dirt in Oil
- Oil or filter have not been replaced
- Worn out piston ring

Engine Stock-up
- Deffective oil pump
- Clogged oil filter
- Correct oil is not being used

OIL LUBRICATION FLOW



OIL PUMP, OIL FILTER ROTOR REMOVAL AND INSTALLATION



• CAUTION

- Make sure that foreign object do not get into the engine when removing and installing the oil pump.
- Make sure that there are no leaks after installation.

Related Work

- Removal and Installation of Right Crank Case Cover (⇨9-2)

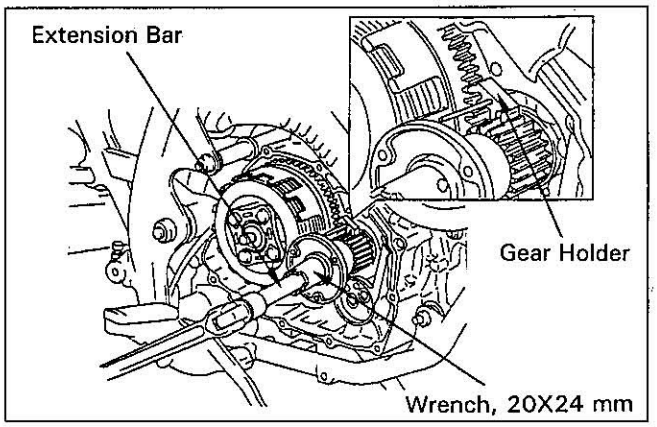
	WORK / PART NAME	NO.	NOTES
	Removal Procedure		Installation is reverse order of removal procedure.
	Oil Pump		
(1)	Oil Pump Screw	2	
(2)	Oil Pump Assy.	1	
(3)	O-ring	2	
	Oil filter rotor		
(4)	Oil Filter Rotor Cover Screw	3	
(5)	Oil Filter Rotor Cover	1	
(6)	Gasket	1	
(7)	Oil Filter Rotor Lock Nut	1	• Removal and attachment (4-4) • When installing, face nut side edge to primary drive gear.
(8)	Washer	1	
(9)	Oil Filter Rotor Comp.	1	

OIL FILTER ROTOR LOCK NUT

Removal Procedure

Attach gear holder between clutch outer gear (Primary driven gear) and primary drive gear. Remove oil filter rotor lock nut.

Gear Holder	07724-0010200
Wrench, 20 x 24 mm	07716-0020100
Extension Bar	07716-0020500

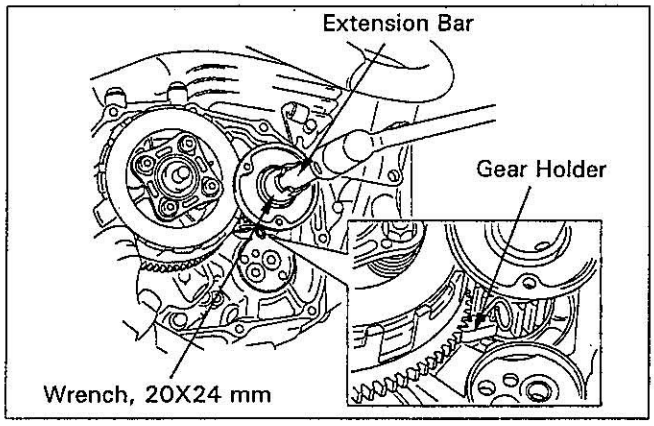


Assembly

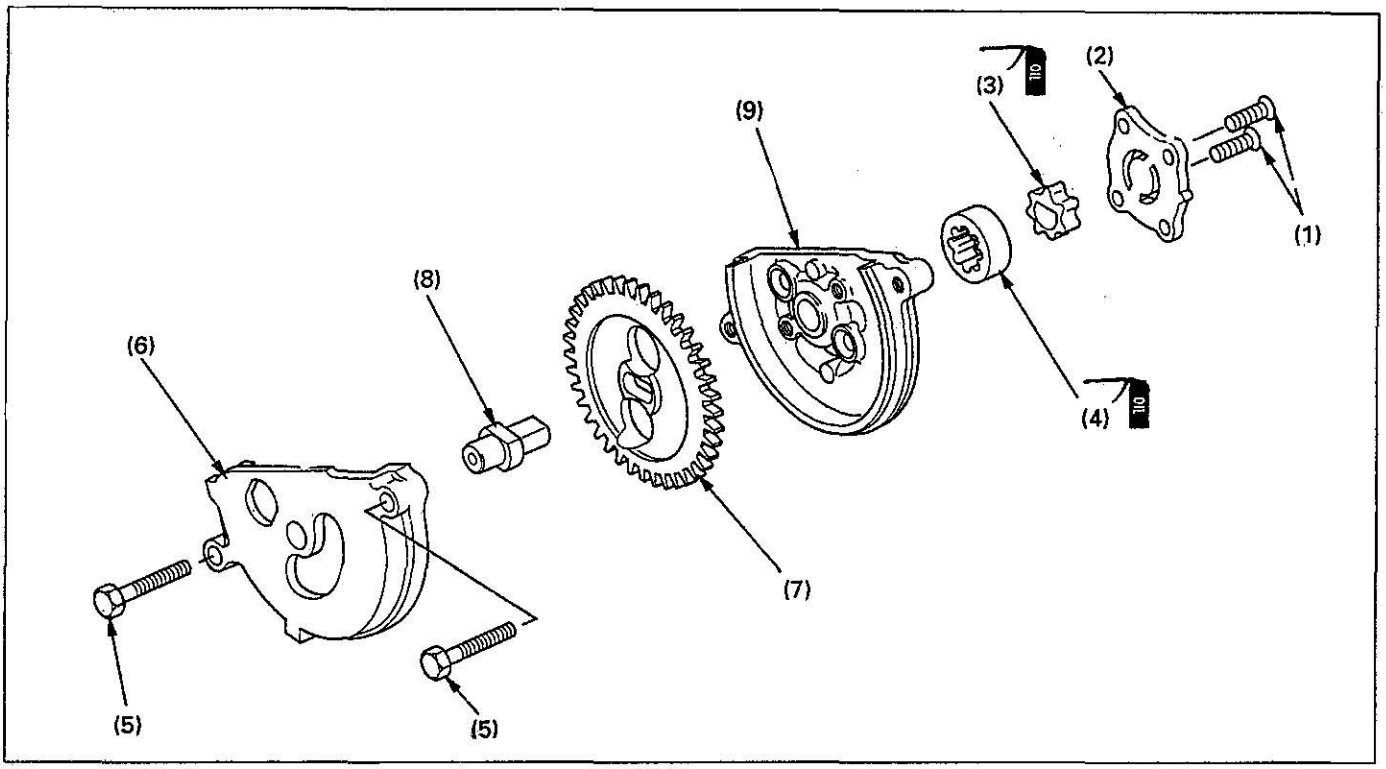
Apply engine oil to screw part of oil filter rotor lock nut, and attach facing primary drive gear.
Insert gear holder between clutch outer gear (Primary driven gear) and primary drive gear. Tighten oil filter rotor lock nut.

Torque: 8.5 kg-m

Gear Holder	07724-0010200
Wrench, 20 x 24 mm	07716-0020100
Extension Bar	07716-0020500



OIL PUMP DISASSEMBLY AND ASSEMBLY



• CAUTION

If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.

Related Work

- Oil Pump Removal and Installation (⇨4-3)

	WORK / PART NAME	NO.	NOTES
	Disassembly		Assembly is reverse of disassembly.
(1)	Oil Pump Plate Screw	2	
(2)	Oil Pump Plate	1	
(3)	Inner Rotor	1	When assembling, match the notch of the pump shaft with the notch of the inner rotor.
(4)	Outer Rotor	1	
(5)	Oil Pump Gear Cover Bolt	2	
(6)	Oil Pump Gear Cover	1	
(7)	Oil Pump Drive Gear	1	
(8)	Oil Pump Shaft	1	
(9)	Oil Pump Body	1	

MEMO

5. FUEL SYSTEM

SERVICE INFORMATION

⚠ CAUTION

Because gasoline is highly flammable, all flames and heat sources are not allowed in the work area. These include not only open flames but electrical sparks as well. Compressed gasoline is liable to explode. The work area must therefore be well-ventilated.

- Do not bend or twist the control cables. Damaged control cable will not operate smoothly and may stick or bind.
- Pay close attention to O-ring locations. When reassembling, replace with new ones.
- Before disassembly, loosen the float chamber drain screw, and remove excess gasoline from the carburetor into pan.
- After removing the carburetor, prevent dirt and other foreign objects from getting into engine intake by covering the port with either a rag or tape.
- When storing for long periods of one month or longer always remove the gasoline from the carburetor float chamber. The gasoline in the float chamber may deteriorate, clogging the slow-jet with gum-like substance which results in idling defects.

TROUBLESHOOTING

Will Not Start
- No fuel in tank
- No fuel in carburetor
- Too much fuel getting to cylinder
- No sparks from spark plug
- Clogged air cleaner
- Suction secondary air
- Fuel deterioration
- Clogged slow jet
- Defective choke valve
- Throttle cable defect

Unstable Idling, Stops Immediately After Starting
- Clogged slow jet
- Ignition system malfunction
- Fuel deterioration
- Suction secondary air
- Defective idling rpm adjustment
- Defective adjustment of pilot screw
- Float level misadjusted
- Cylinder compression too low
- Rich/lean air mixture
- Restricted fuel line

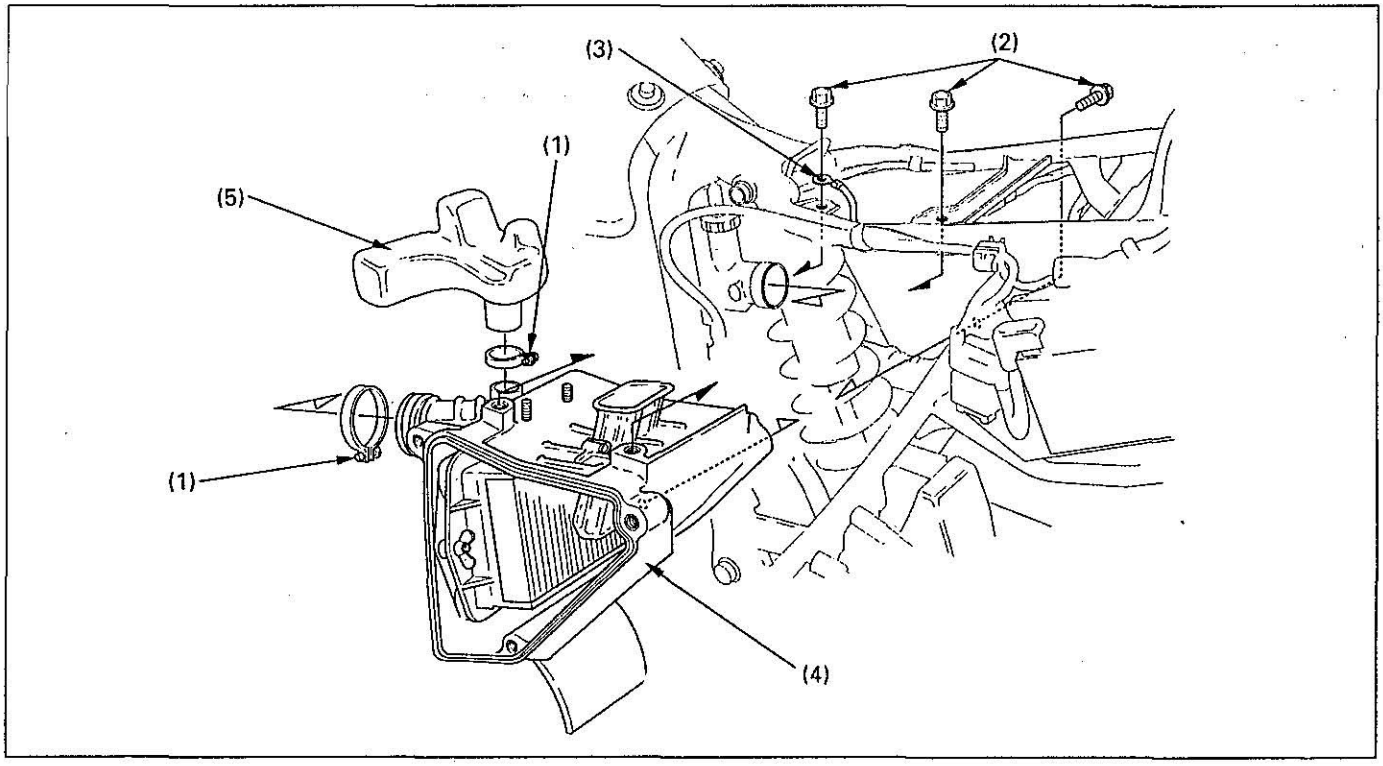
Lean Air Mixture
- Clogged carb main
- Float valve faulty
- Float level too low
- Clogged fuel distribution line
- Fuel cap vent blocked
- Clogged carburetor air vent tube
- Suction secondary air

Rich Air Mixture
- Choke valve in ON position
- Float valve faulty
- Float level too high
- Dirty air cleaner element

Backfire, Misfire During Acceleration
- Defect in ignition
- Fuel mixture too lean

After Burn When Engine Brake
- Lean mixture in slow circuit

AIR CLEANER CASE REMOVAL AND INSTALLATION

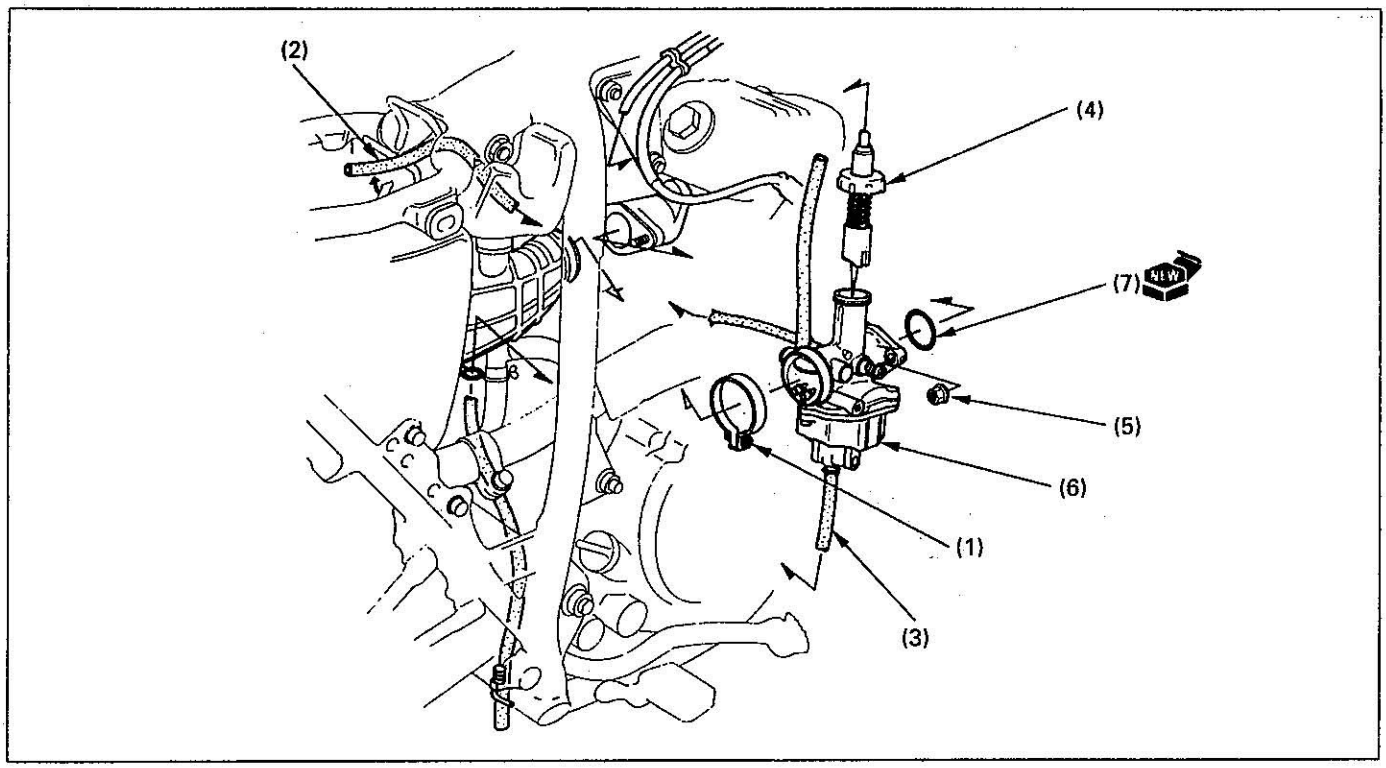


Related Work

- Side Cover Removal and Installation (⇨2-2)
- Seat Removal and Installation (⇨2-3)
- Regulator/Rectifier Removal and Installation (⇨14-7)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse of removal.
(1)	Connecting Tube Band Screw	2	Loosen only.
(2)	Air Cleaner Case Bolt	3	
(3)	Ground Cable	1	Tighten together with one air cleaner case bolt.
(4)	Air Cleaner Case	1	
(5)	Resonator	1	

CARBURETOR REMOVAL AND INSTALLATION



⚠ CAUTION

Fire source strictly prohibited

• CAUTION

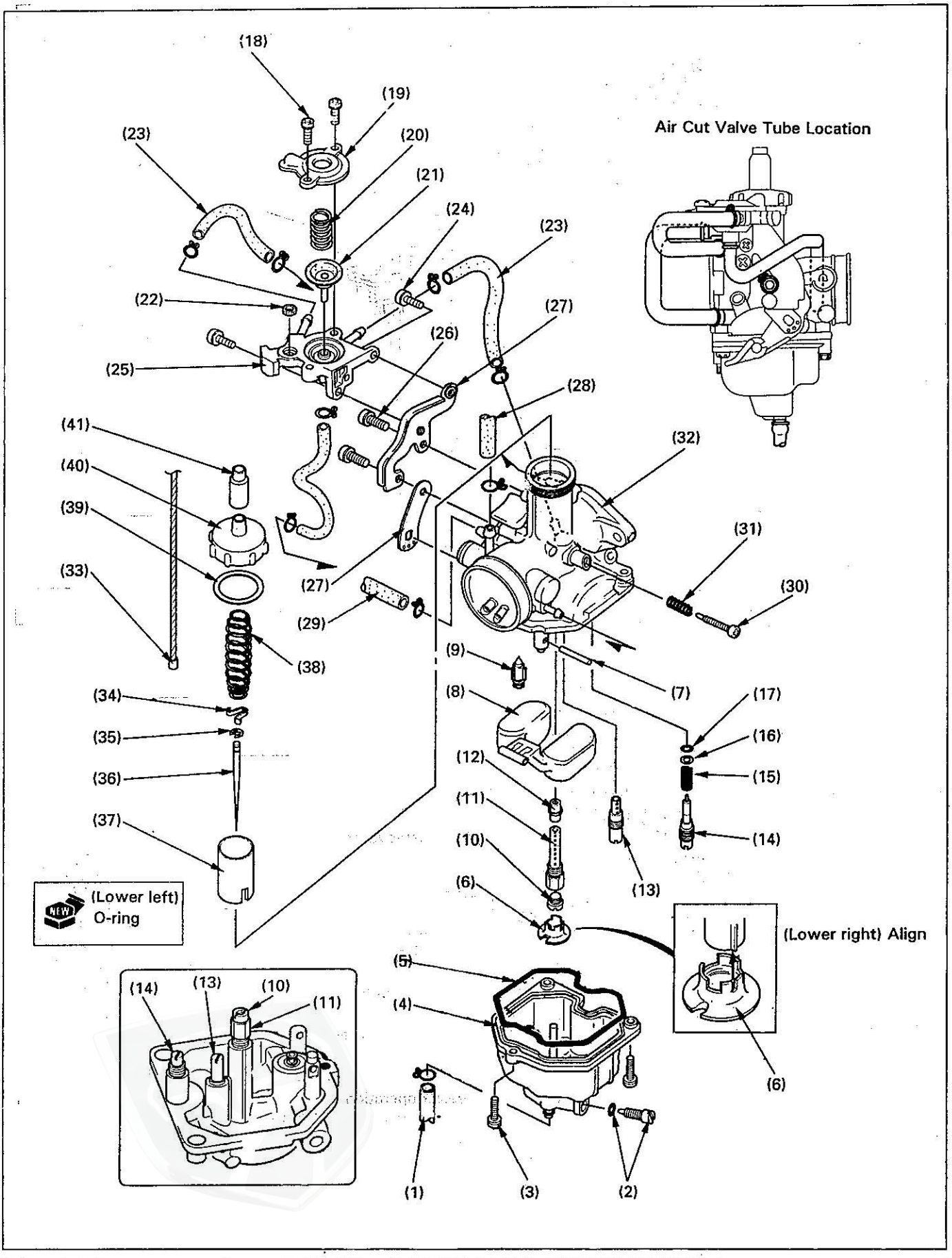
- Carburetor tubes should be put in their proper place. Follow wiring diagrams (⇨1-18)
- Before starting work, loosen drain screw, remove gasoline from float chamber.

Related Work

- Side Cover Removal and Installation (⇨2-2)
- Fuel Tank Removal and Installation (⇨2-8)
- Seat Removal and Installation (⇨2-3)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse of removal
(1)	Connecting Tube Band Screw	1	
(2)	Carburetor Air Vent Tube	1	Remove from frame clamp
(3)	Carburetor Drain Tube	1	
(4)	Throttle Valve	1	When installing, set cutaway to air cleaner case side
(5)	Nut	2	
(6)	Carburetor	1	• Loosen air cleaner case bolt, then move the case for easier operation • Disassembly/assembly (⇨5-4)
(7)	O-ring	1	

CARBURETOR DISASSEMBLY AND ASSEMBLY



• CAUTION

- If adjusting float chamber and jets, there is no need to disassemble the carburetor.
- The pilot screw has been correctly adjusted in the factory, there is no need for further adjustment UNLESS the pilot screw or carburetor body are replaced. When disassembling, loosen for the recorded number of turns.

Related work

- Carburetor Removal (⇨5-3)

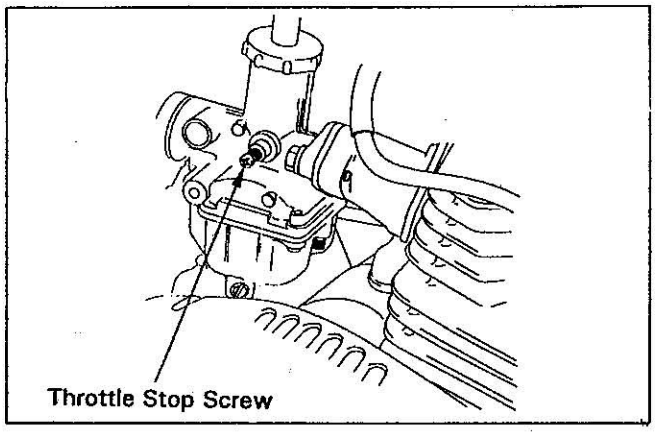
	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order of removal
	Float Chamber		
(1)	Drain Tube	1	
(2)	Drain Screw/O-ring	1/1	
(3)	Float Chamber Screw	3	
(4)	Float Chamber	1	
(5)	O-ring	1	
(6)	Baffle Plate	1	
(7)	Float Pin	1	
(8)	Float	1	
(9)	Float Valve	1	
(10)	Main Jet	1	
(11)	Needle Jet Holder	1	
(12)	Needle Jet	1	
(13)	Slow Jet	1	
	Pilot Screw		
(14)	Pilot Screw	1	• When disassembling, record number of screw turns. Adjustments (⇨5-6)
(15)	Spring	1	
(16)	Washer	1	
(17)	O-ring	1	
	Air Cut Valve		
(18)	Screw	2	
(19)	Air Cut Valve Cover	1	
(20)	Spring	1	
(21)	Diaphragm	1	
(22)	O-ring	1	
(23)	Air Cut Valve Tube	3	
(24)	Screw	2	
(25)	Air Cut Valve Body	1	
(26)	Screw	2	
(27)	Plate	2	
	Carburetor Body		
(28)	Fuel Tube	1	
(29)	Carburetor Air Vent Tube	1	
(30)	Throttle Stop Screw	1	
(31)	Spring	1	
(32)	Carburetor Body	1	
	Throttle Valve		
(33)	Throttle Cable	1	
(34)	Retainer	1	
(35)	Jet Needle Clip	1	
(36)	Jet Needle	1	
(37)	Throttle Valve	1	
(38)	Valve Spring	1	
(39)	Washer	1	
(40)	Carburetor Top	1	
(41)	Dust Cover	1	

PILOT SCREW ADJUSTMENT

IDLE DROP METHOD

• CAUTION

- The pilot screw has already been adjusted at the factory. There is no need for further adjustment UNLESS the pilot screw or carburetor body have been replaced. It is sufficient to loosen to the number of turns recorded during dissasembly.
- Work should be conducted under safe conditions, with the sidestand supporting the vehicle body.



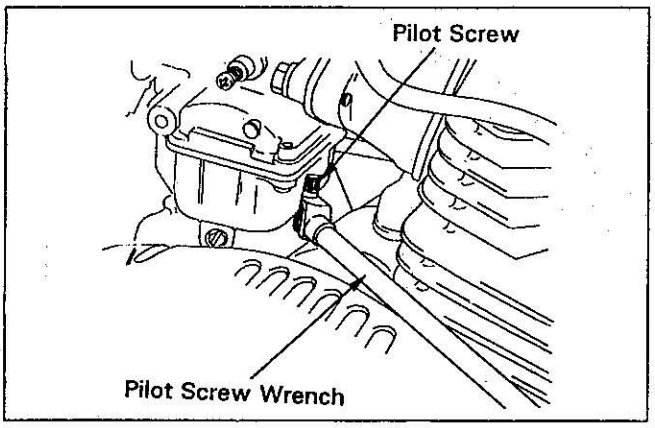
①. Turn screw clockwise until it seats lightly, then back it out to the specification given.

Standard Turns: 1 - 5/8 Turns

Pilot Screw Wrench **07908-4730001**

• CAUTION

Damaged to the pilot screw seat will occur if the pilot screw is tightened against the seat.



②. Warm up engine
③. Stop engine, connect tachometer
④. Start engine, use throttle stop screw to adjust to standard engine rpm.

Idling rpm: 1,400 ± 100rpm

⑤. Turn carburetor pilot screw ½ turn increment until you reach highest idling rpm.
⑥. After several light snaps, match idling rpm to standard value.
⑦. Gradually tighten the carburetor pilot screw, set the pilot screw to 50 rpm below standard idling rpm, then open pilot screw to standard opening.

Number of Turns for Pilot Screw
Return from Idle Top: 1 - 5/8 Turns

⑧. Adjust idling rpm

If there are irregularities after adjustment, repeat process from number ①.

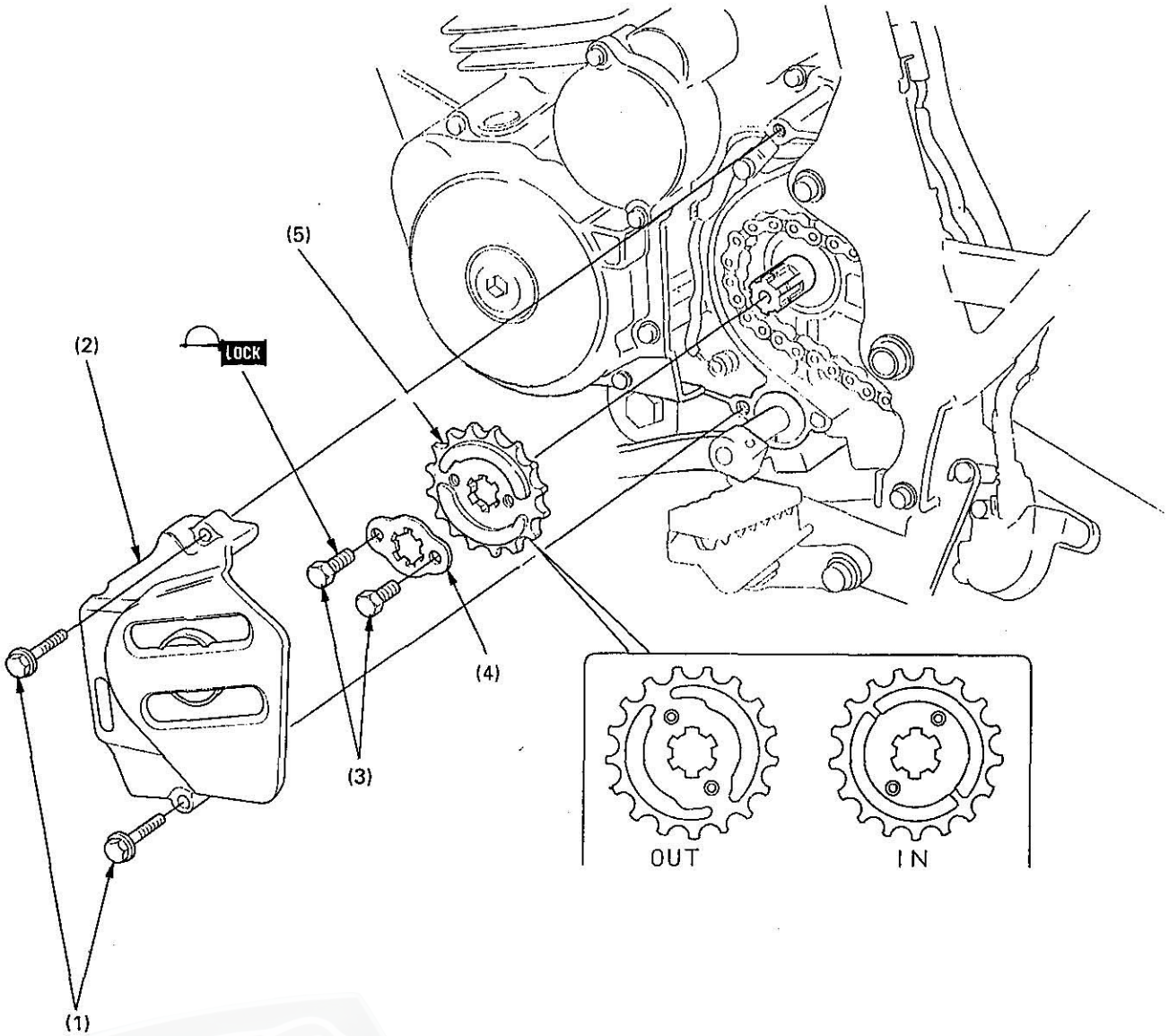
MEMO

6. ENGINE REMOVAL AND INSTALLATION

SERVICE NOTES

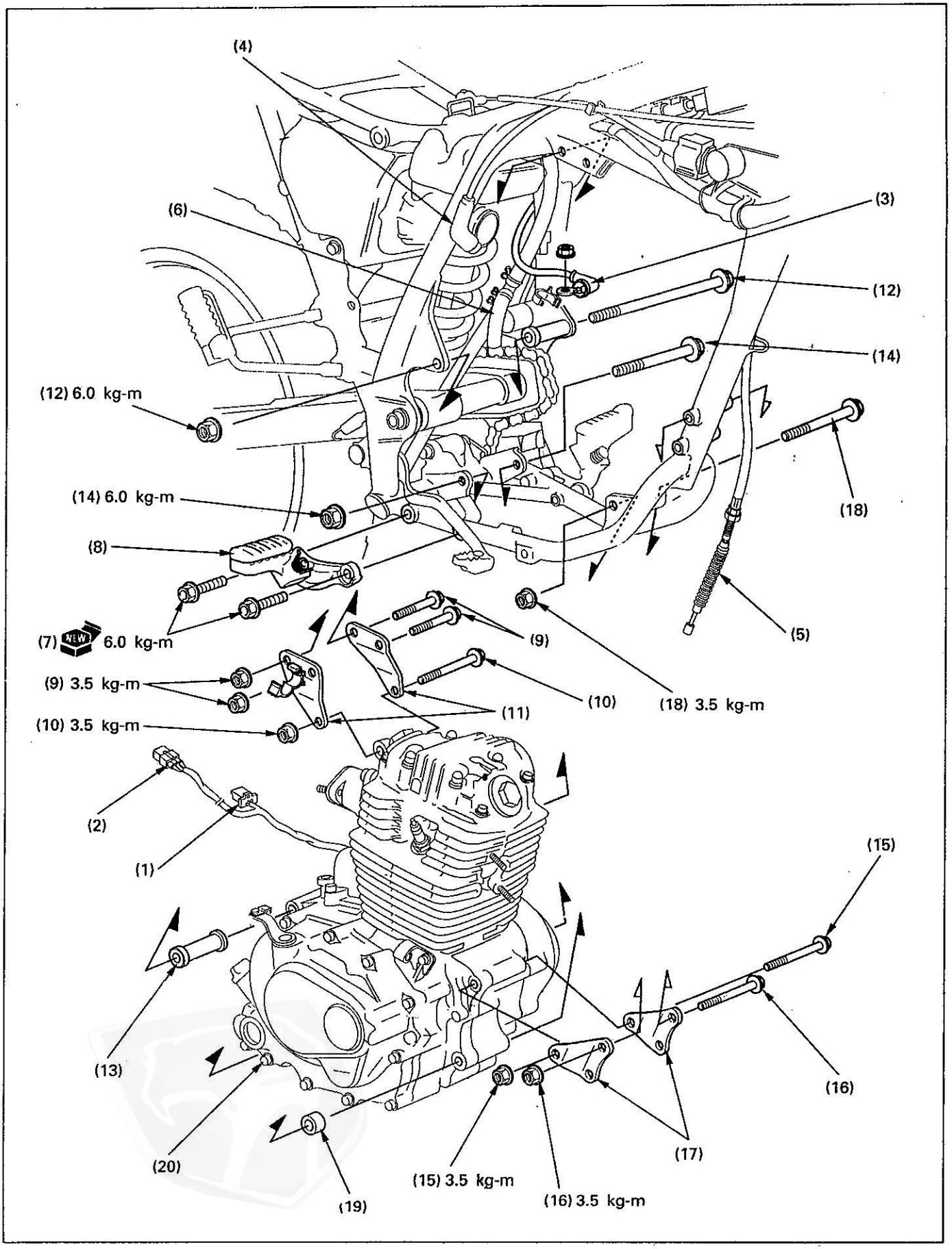
- When removing and installing engine, make sure that the vehicle is properly supported with a jack. Check that frame, engine cables and harness are not damaged in the process.
- When following procedures and installing the engine, protect the frame with tape.
- The following components can be serviced with the engine installed in the frame.
  - –AC Generator (⇨14)
  - –Clutch (⇨9)
  - –Gearshift Linkage (⇨9)
  - –Pulse Generator (⇨15)
  - –Carburetor (⇨5)
  - –Starter Clutch (⇨16)
  - –Starter Motor (⇨16)
- The following components require engine removal for service.
  - –Connecting Rod (⇨10)
  - –Cylinder Head (⇨7)
  - –Shift Drum (⇨10)
  - –Crankshaft (⇨10)
  - –Cylinder, Piston (⇨8)
  - –Transmission (⇨10)

DRIVE SPROCKET REMOVAL AND INSTALLATION



	WORK / PART NAME	NO.	NOTES
	Removal procedure		Installation is reverse of removal.
(1)	Drive Sprocket Cover Bolt	2	
(2)	Drive Sprocket Cover	1	
(3)	Drive Sprocket Set Plate Bolt	2	
(4)	Drive Sprocket Set Plate	1	When installing, attach plate to countershaft, align plate and sprocket bolt hole, then assemble.
(5)	Drive Sprocket	1	• Loosen rear axle, adjust chain slack to maximum, then remove. • When installing, pay attention not to interchange front and rear portions.

ENGINE REMOVAL AND INSTALLATION



• CAUTION

- Turn main switch OFF, remove battery (-) cable.
- Use jack to support vehicle body and raise rear wheel.
- When removing engine, DO NOT insert wire harness between engine and frame
- Work will be made easier if the brake pedal return spring and stoplight switch spring are removed.
- Pay close attention to the direction of the engine mount bolt when attaching.
- Attach all engine mount bolts and nuts, then tighten to the standard torque.
- For wire harness, follow the Wiring Diagrams (refer to 1:18) to install in their proper location.

Related Work

- Engine Oil Removal and Addition
- Fuel Tank Removal and Installation (⇨2-8)
- Under Pipe Removal and Installation (⇨2-6)
- Exhaust Pipe and Muffler Removal and Installation (⇨2-7)
- Carburetor Removal and Installation (⇨5-3)
- Drive Sprocket Removal and Installation (⇨7-2)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	AC Generator Coupler	1	Pay attention to clamp location
(2)	Pulse Generator Coupler	1	
(3)	Starter Motor Cable	1	
(4)	Spark Plug Cap	1	
(5)	Clutch Cable	1	
(6)	Crankcase Breather Tube	1	
(7)	R. Step Arm Bolt	2	
(8)	R. Step	1	
(9)	Engine Head Hanger Bolt/ Nut (Frame Side)	2/2	
(10)	Engine Head Hanger Bolt/ Nut (Engine Side)	1/1	
(11)	Engine Head Hanger Plate	2	
(12)	Rear Upper Engine Hanger Bolt/Nut	1/1	
(13)	Collar	1	Engine right side
(14)	Rear Lower Engine Hanger Bolt/Nut	1/1	
(15)	Front Upper Engine Bolt/ Nut (Engine Side)	1/1	
(16)	Front Upper Engine Bolt/ Nut (Frame Side)	1/1	
(17)	Front Upper Engine Hanger Plate	1	
(18)	Front Lower Engine Hanger Bolt/Nut	1/1	
(19)	Collar	1	Engine right side
(20)	Engine Assembly	1	

MEMO

7. CYLINDER HEAD, VALVES

SERVICE INFORMATION

- Cylinder head maintenance should be done after the engine has been removed from the frame.
- When removing the cylinder head, do not damage the fins or the surfaces with your screwdriver.
- During assembly, apply molybden on camshaft bearing and cam lobe surfaces for initial lubrication.
- The engine oil for cam shaft lubrication passes through the cylinder head oil canal. When assembling the cylinder head, clean the oil passage.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.

TROUBLESHOOTING

- Most cylinder head defects can be detected generally by measuring compression pressure or by listening to the sound of the engine top end.
- When encountering starting defects or defects at low speed, check the crankcase breather tube for smoke. If there is smoke, this is an indication of piston ring wear out, damage or stick.
- Valve-related parts should be adjusted to fit to their standard setting.

Compression Pressure is Too Low
- Incorrect valve adjustment
- Burnt or worn-out valve
- Incorrect valve timing
- Broken valve spring
- Valve seat adherence defect
- Blown-out cylinder head gasket
- Cylinder head warping or cracking
- Improperly installed spark plug

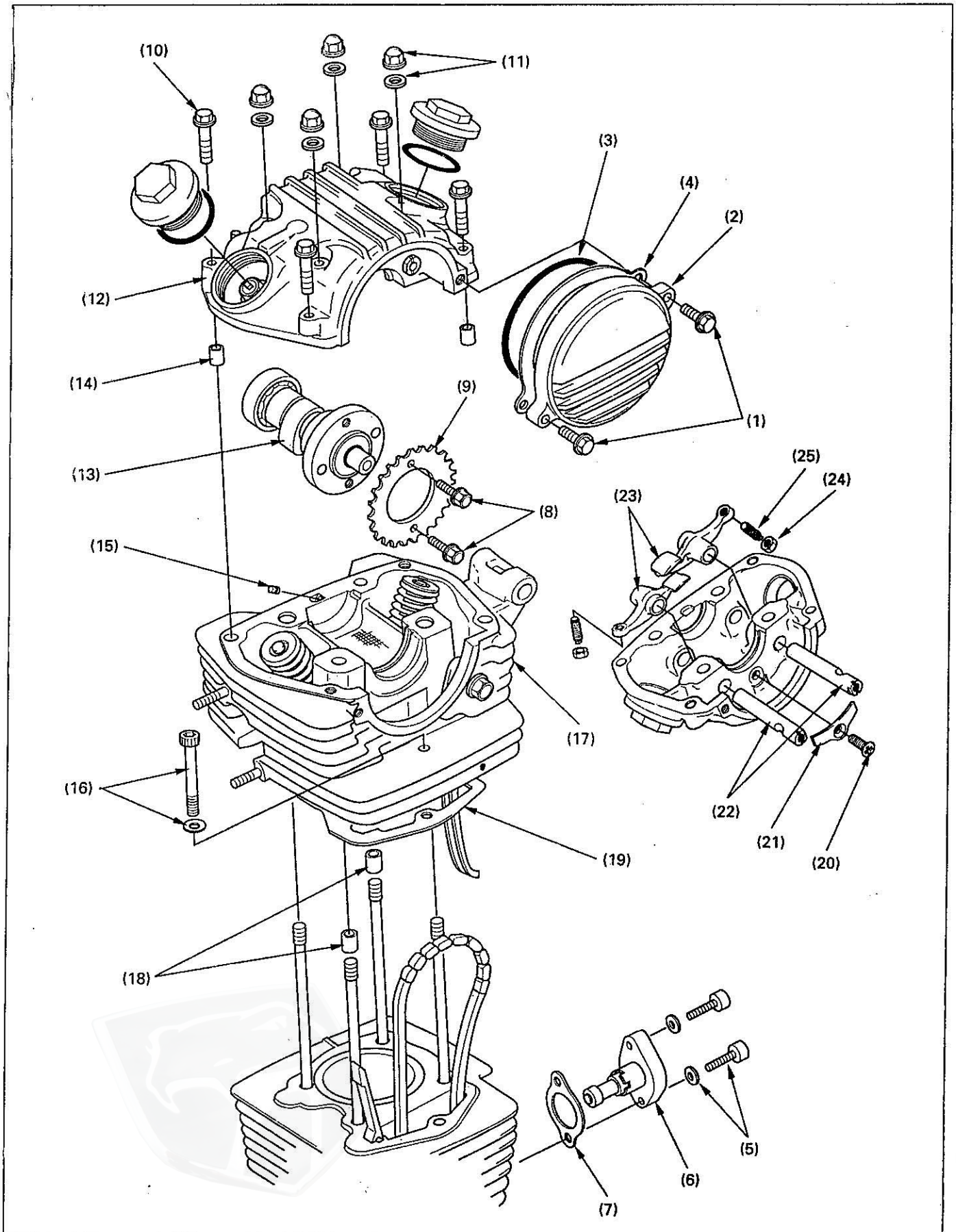
Compression Pressure is Too High
- Excessive carbon build-up on piston head or combustion chamber

White Smoke from Muffler
- Valve guide or valve stem wear out
- Valve stem seal damage

Abnormal Noise
- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Camshaft worn or damage
- Cylinder, piston damage

Poor Idling
- Low compression pressure

CYLINDER HEAD REMOVAL



Related Work

- Engine Removal (⇨6-4)
- Starter Motor Removal (⇨16-7)

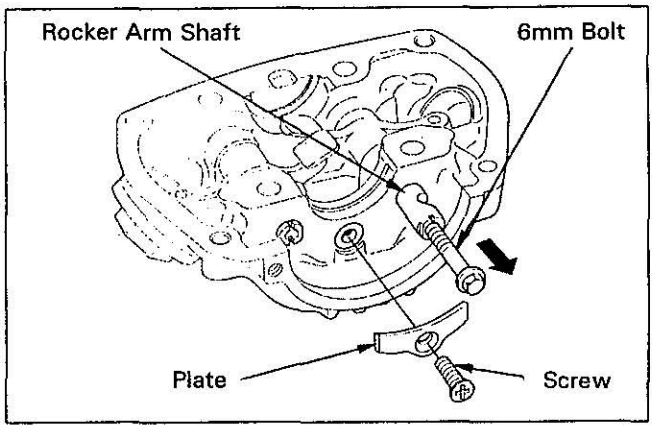
	WORK / PART NAME	NO.	NOTES
	Removal		
(1)	Cam Sprocket Cover Bolt	2	
(2)	Cam Sprocket Cover	1	
(3)	O-ring	1	
(4)	Gasket	1	
(5)	Cam Chain Tensioner Socket/ Sealing Washer	2/2	
(6)	Cam Chain Tensioner Lifter	1	Removal (⇨7-8)
(7)	Gasket	1	
(8)	Cam Sprocket Bolt	2	
(9)	Cam Sprocket	1	After removal, suspend the cam chain with a piece of wire to prevent it from falling into the crankcase
(10)	Cylinder Head Cover Bolt	4	
(11)	Cylinder Head Cover Nut/ Sealing Washer	4/4	
(12)	Cylinder Head Cover Assembly	1	
(13)	Cam Shaft	1	
(14)	Dowel Pin	2	
(15)	Oil Seal Rubber	1	
(16)	Cylinder Head Bolt/Washer	1/1	
(17)	Cylinder Head	1	Disassembly/Assembly (⇨7-5)
(18)	Dowel Pin	2	
(19)	Gasket	1	
	Cylinder Head Cover Disassembly		
(20)	Rocker Arm Shaft Plate Screw	1	
(21)	Rocker Arm Shaft Plate	1	
(22)	Rocker Arm Shaft	2	Installation (⇨7-4)
(23)	Rocker Arm	2	
(24)	Tappet Adjust Screw Lock Nut	2	
(25)	Tappet Adjust Screw	2	

ROCKER ARM SHAFT REMOVAL AND INSTALLATION

Remove cylinder head cover (⇨7-2)

Remove rocker arm shaft plate screw, then remove rocker arm shaft plate.

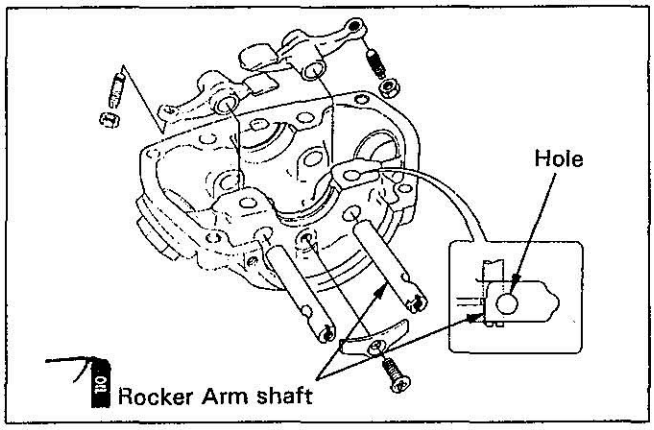
Temporarily attach the rocker arm shaft using the appropriate 6mm bolt (cylinder head cover bolt or similar). Pull 6mm bolt, remove rocker arm shaft.



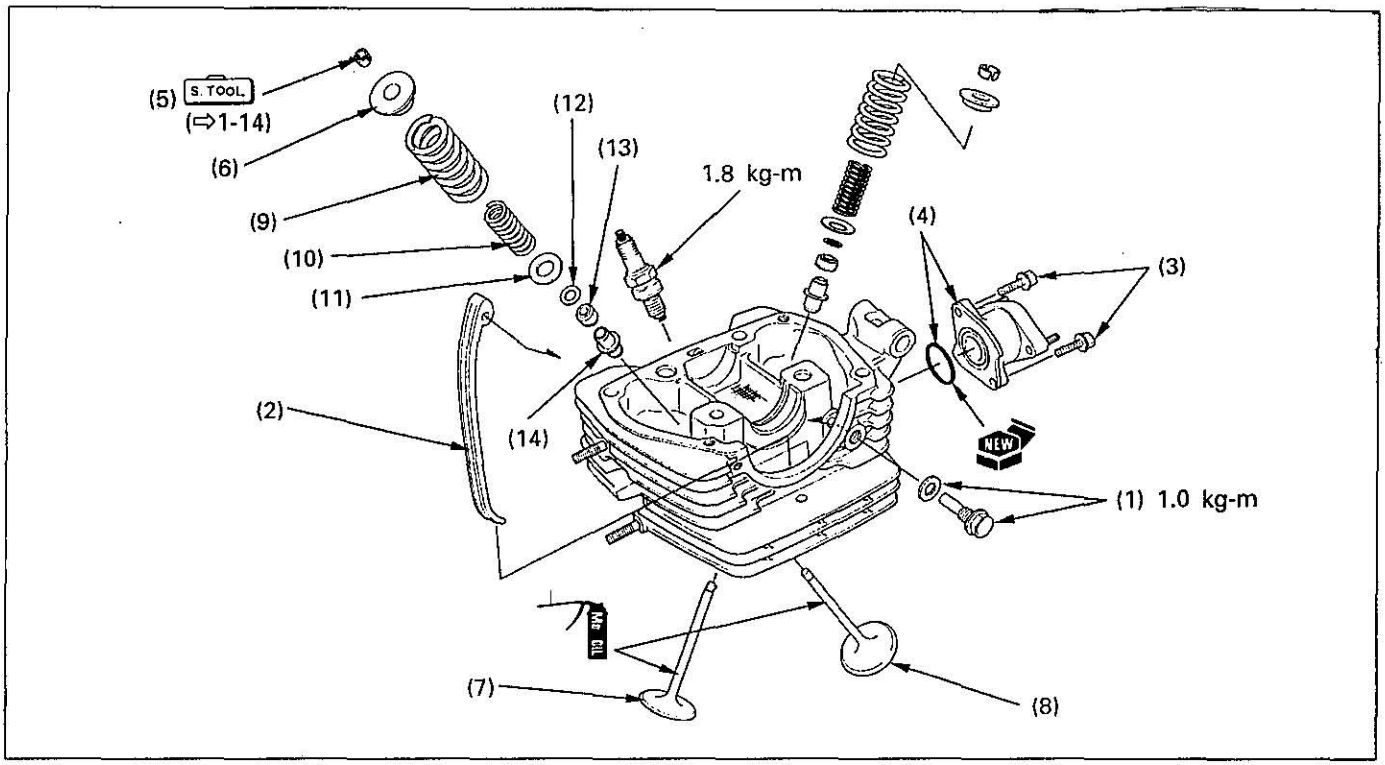
Installation is reverse order of removal.

• CAUTION

When installing, align the holes of rocker arm shaft and the cylinder head cover hole.



CYLINDER HEAD DISASSEMBLY AND ASSEMBLY



• CAUTION

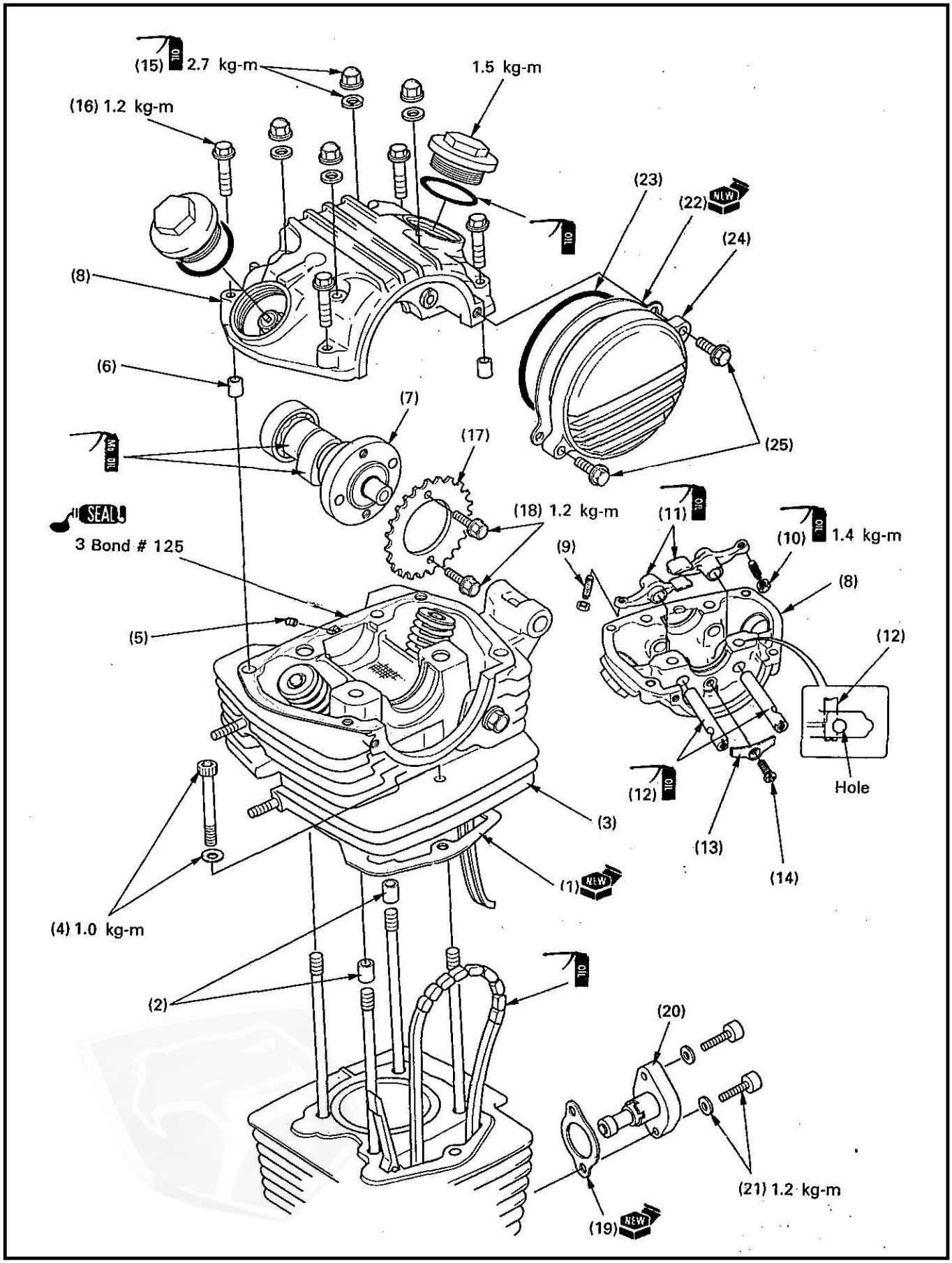
- To prevent loss of tension, do not compress the valve spring more than necessary.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- Mark all parts during disassembly so they can be placed back in their original position.

Related Work

Cylinder Head Removal (⇨7-2)

	WORK / PART NAME	NO.	NOTES
	Disassembly		Installation is reverse order of removal.
(1)	Cam Chain Tensioner Slider Bolt/Washer	1/1	
(2)	Cam Chain Tensioner Slider	1	
(3)	Carburetor Insulator Socket Bolt	2	
(4)	Carburetor Insulator/O-ring	1/1	
(5)	Valve Cotter	4	
(6)	Spring Retainer	2	
(7)	Intake Valve	1	
(8)	Exhaust Valve	1	
(9)	Outer Spring	2	Fine coil should face downward.
(10)	Inner Spring	2	
(11)	Outer Spring Washer	2	
(12)	Inner Spring Washer	2	
(13)	Stem Seal	2	Intake Side: Brown Exhaust Side: Black
(14)	Valve Guide	2	

CYLINDER HEAD INSTALLATION



Related Work

- Starter Motor Installation (⇨16-7)
- Engine Installation (⇨6-4)

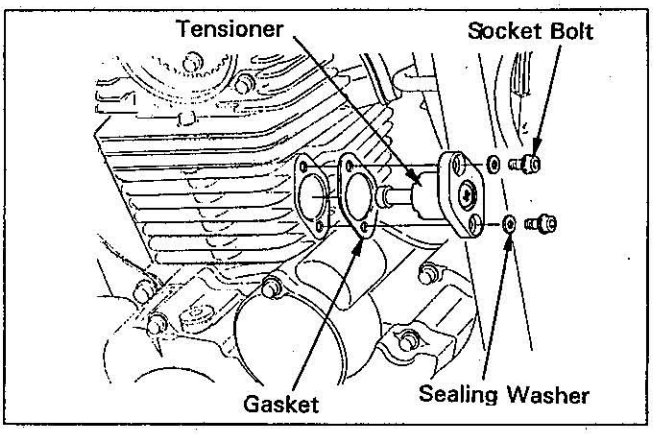
	WORK / PART NAME	NO.	NOTES
	Installation		Installation is reverse of removal.
(1)	Gasket	1	
(2)	Dowel Pin	2	
(3)	Cylinder Head	1	Apply threebond #1215 (or equivalent) to cylinder head surface. Make sure that oil canal is not clogged.
(4)	Cylinder Head Bolt/Washer	1/1	
(5)	Oil Seal Rubber	1	Make sure to install correctly.
(6)	Dowel Pin	2	
(7)	Camshaft	1	Installation (⇨7-8)
(8)	Cylinder Head Cover Assy.	1	
(9)	–Tappet Adjust Screw	2	
(10)	–Tappet Adjust Screw Lock Nut	2	
(11)	–Rocker Arm	2	
(12)	–Rocker Arm Shaft	2	Installation (⇨7-4)
(13)	–Rocker Arm Shaft Plate	1	
(14)	–Rocker Arm Shaft Plate Screw	1	
(15)	Cylinder Head Cover Nut/Sealing Washer	4/4	
(16)	Cylinder Head Cover Bolt	4	
(17)	Cam Sprocket	1	Put cam chain on sprocket and attach to cam shaft.
(18)	Cam Sproket Bolt	2	
(19)	Gasket	1	
(20)	Cam Chain Tensioner Lifter	1	Installation (⇨7-8)
(21)	Cam Chain Tensioner Socket Bolt/ Sealing Washer	2/2	
(22)	Gasket	1	
(23)	O-ring	1	
(24)	Cam Sprocket Cover	1	
(25)	Cam Sprocket Cover Bolt	2	

CAM CHAIN TENSIONER REMOVAL AND INSTALLATION

Removal

Remove starter motor (⇨16-7)

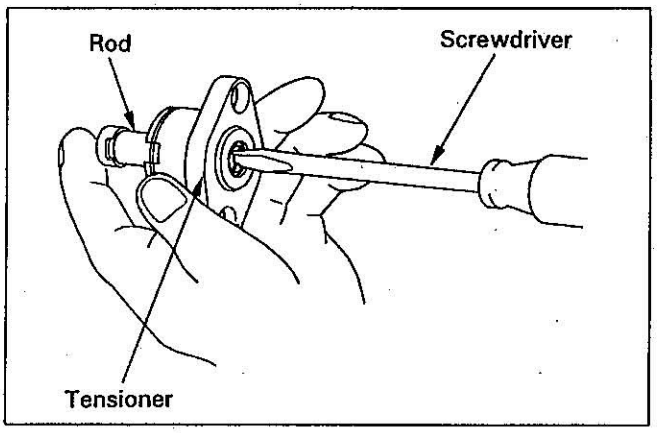
Remove cam chain tensioner socket bolt and sealing washer.
Remove cam chain tensioner and gasket.



Installation

Remove cam chain tensioner sealing screw and o-ring.

–Use screwdriver as shown on illustration.
–Turn screwdriver clockwise to insert tensioner rod fully into tensioner body.



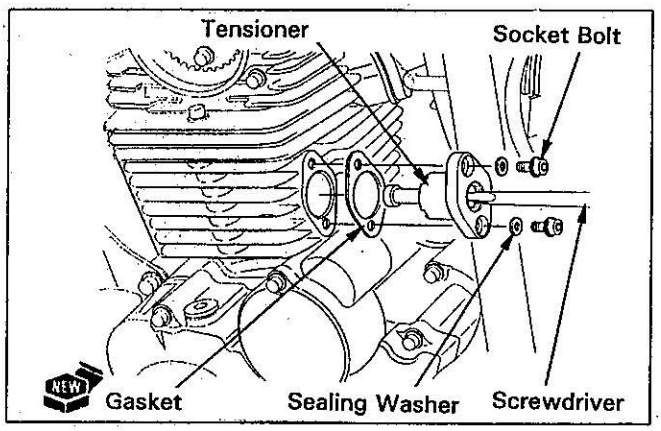
–Use screwdriver to install cam chain tensioner and gasket while in lock position.
Install sealing washer and cam chain tensioner socket bolt, then tighten to specified torque.

Torque:1.2 kg-m

–Remove screwdriver, attach o-ring and sealing screw, then tighten to specified torque.

Torque: 0.4 kg-m

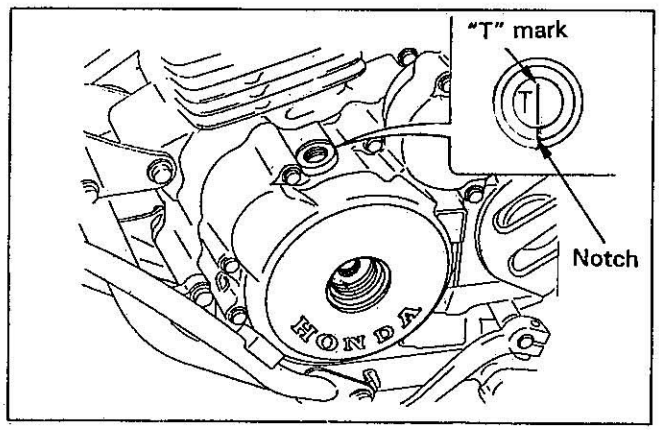
Install starter motor (⇨16-7)



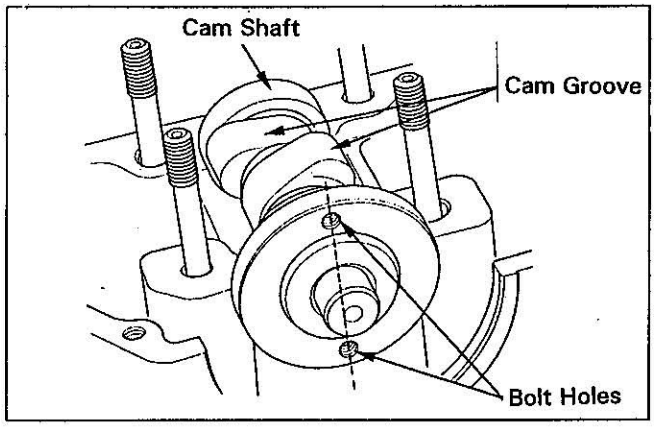
Camshaft Installation

Remove timing hole cap, crankshaft hole cap.

Align flywheel "T" mark to left crankcase cover notch.



Attach cam shaft to cylinder head.

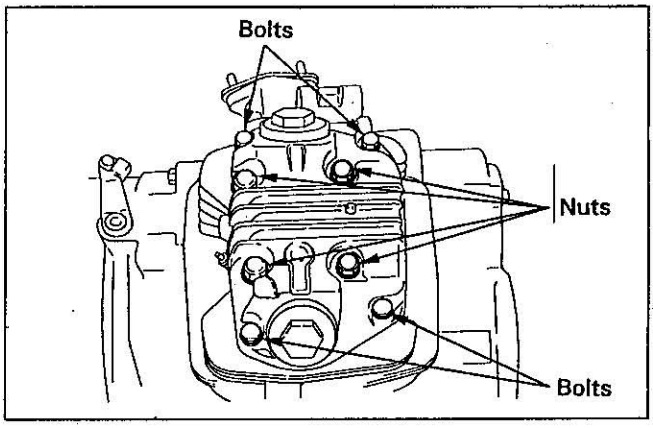


• CAUTION

- Attach cam shaft groove facing upwards.
- Attach the cam shaft so that its bolt hole is vertical relative to cylinder head surface.

Install cylinder head cover (⇨7-6). Tighten the nuts and bolts to specified torque.

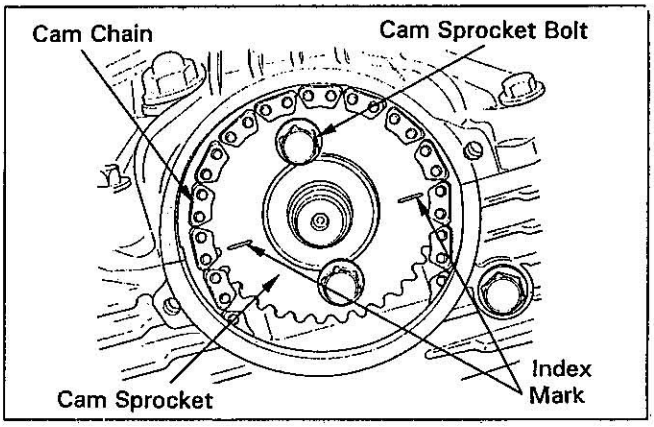
Torque: Cylinder Head Cover Nut : 2.7 kg-m
Cylinder Head Cover Bolt : 1.2 kg-m



Put cam chain onto cam sprocket.
While aligning the cam sprocket index mark to the cylinder head cover, attach cam sprocket to the cam shaft.
Attach cam sprocket bolt and tighten to the specified torque.

Torque: 1.2 kg-m

Check that the cam sprocket index mark is aligned with the cylinder head cover when the flyweel "T" mark is also aligned with the notch on left crankcase cover. Adjust valve clearance (⇨3-10).



MEMO

8. CYLINDER AND PISTON

SERVICE INFORMATION

- Cylinder and piston maintenance must be done after removing the engine from the frame.
- Take care not to damage the cylinder wall and piston.
- When removing the cylinder, make sure that the surfaces are not scratched by the screwdriver, and that the fins are not hit too hard as to cause damage.
- Parts should be cleaned, then dried adequately using compressed air, prior to inspection.

TROUBLESHOOTING

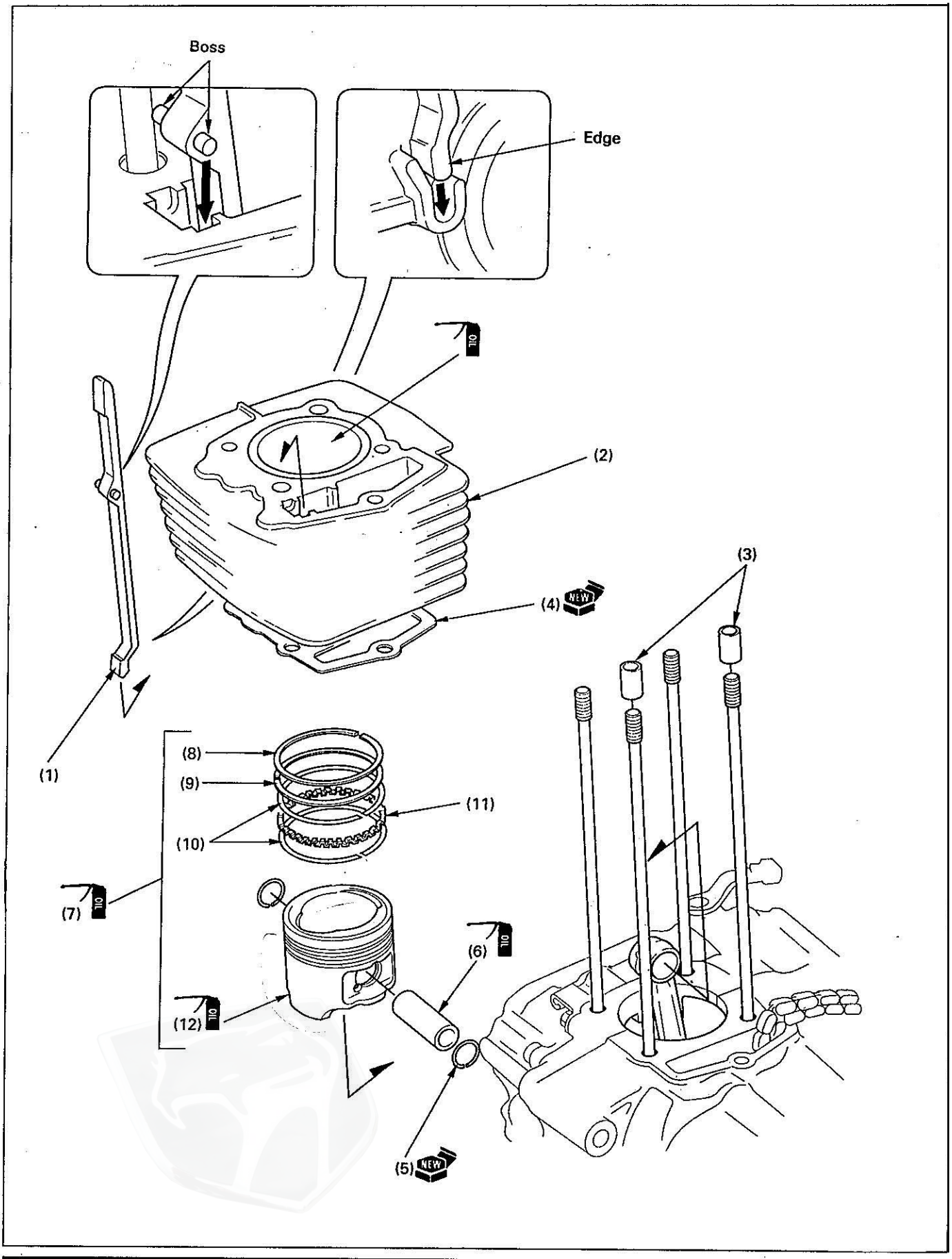
Compression Pressure is Too Low
- Broken or worn out piston ring
- Worn out piston or cylinder

Compression Pressure is Too High
- Excessive carbon build-up on piston crown or combustion chamber wall

Piston Knock
- Worn out cylinder, piston, piston ring
- Worn out piston pin hole or piston pin
- Worn out connecting rod small end

Abnormal Noise
- Damaged cylinder, piston

CYLINDER, PISTON REMOVAL AND INSTALLATION



• CAUTION

Use rags or similar material to stuff the case opening to prevent the piston pin clip from falling inside the crankcase.

Related Work

- Cylinder head removal and installation (⇨7-2,6)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse of removal
(1)	Cam Chain Guide	1	• When installing, align edge to crankcase groove. • When installing, align boss to cylinder groove.
(2)	Cylinder	1	
(3)	Dowel Pin	2	
(4)	Gasket	1	
(5)	Piston Pin Clip	2	
(6)	Piston Pin	1	
(7)	Piston Assy	1	When installing, face "IN" mark in the intake side
	Piston Ring Removal		Installation is reverse order of removal.
(8)	Top Ring	1	• Avoid piston and piston ring damage during installation. • Install the piston rings with the marking facing up.
(9)	Second Ring	1	
(10)	Side Rail	2	
(11)	Spacer	1	
(12)	Piston	1	

MEMO

9. CLUTCH, GEARSHIFT LINKAGE

SERVICE INFORMATION

- Clutch and gearshift linkage maintenance can be done without removing the engine from the frame.
- Engine oil viscosity and volume have an effect on clutch function. When clutch does not function properly, or when the vehicle moves forward even when the clutch is pressed, check oil viscosity and volume.
- Clean off gasket on the crankcase cover mating surfaces.
- When servicing, make sure that the case surface is not damaged.
- Make sure that no dirt or foreign materials falls into the engine.
- Crankcase must be dismantled before maintenance can be conducted on the transmission, shift drum, shift fork.

TROUBLESHOOTING

Clutch Lever Too Hard
- Damaged, kinked or dirty clutch cable
- Damaged clutch lifter mechanism
- Damaged clutch lifter plate bearing
- Clutch cable is improperly routed

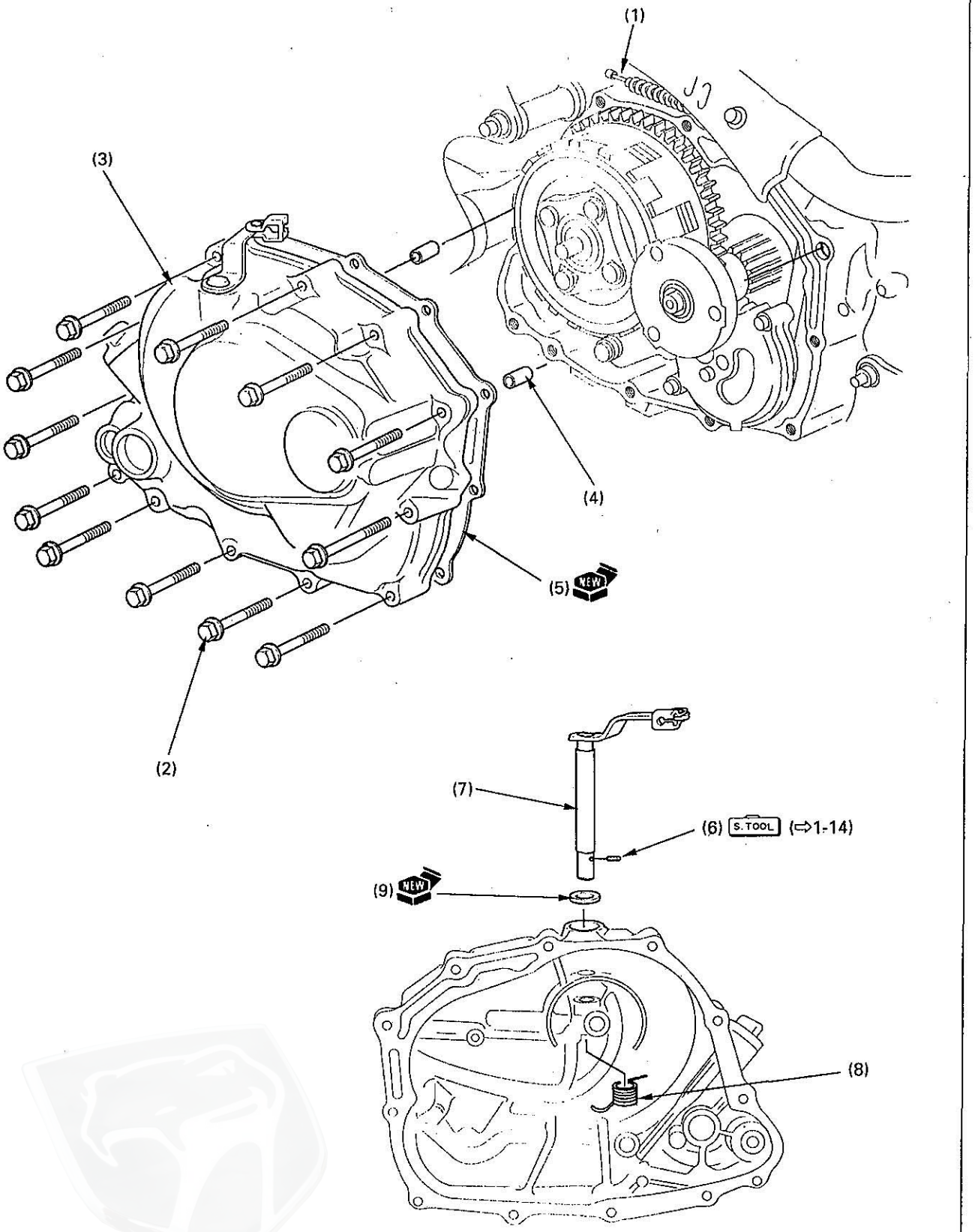
Clutch Will Not Disengage or Motorcycle Creeps With Clutch Disengage
- Too much clutch lever free play
- Warped clutch plate
- Loose clutch center lock nut
- Oil level too high, improper oil viscosity

Clutch Slips During Acceleration
- Clutch lifter sticking
- Worn out clutch discs
- Weakened clutch spring
- No clutch lever free play

Difficulty in Shifting Gears
- Incorrect clutch lever slack adjustment
- Damaged or bent shift fork
- Bent shift fork shaft
- Damaged gear shift spindle
- Defective transmission

Gear Slip
- Damaged or bent shift fork
- Bent shift fork shaft
- Damaged shift drum stopper
- Defective transmission

RIGHT CRANKCASE COVER REMOVAL AND INSTALLATION



• CAUTION

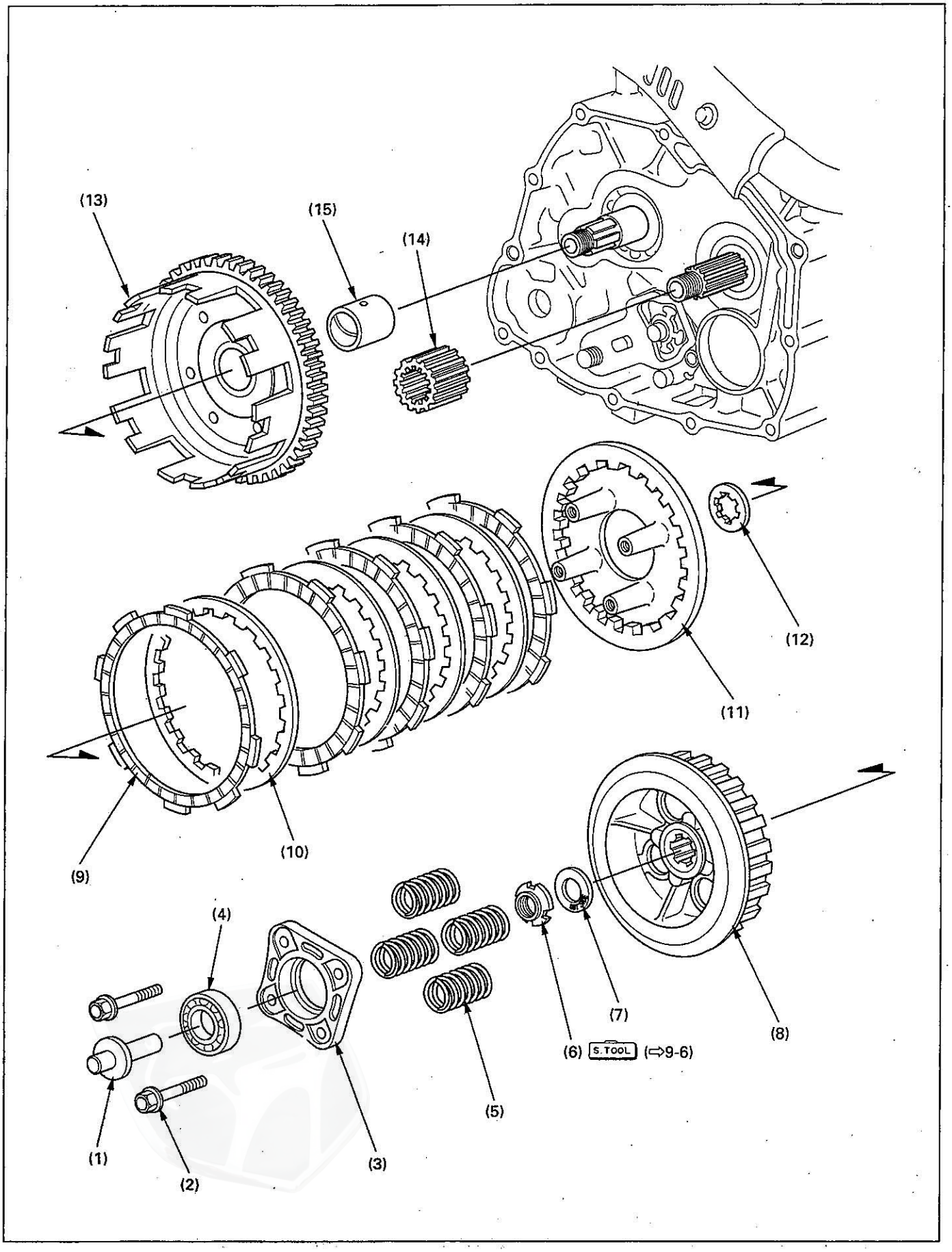
- When removing the R. crankcase cover, put vehicle on its side stand in order to minimize engine oil outflow.
- When removing, put a clean pan beneath the engine to receive engine oil. After work is finished, replenish engine oil to correct level.

Related Work

- Engine Oil Removal and Replenishment
- Under Pipe Removal and Installation (⇨2-6)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Clutch Cable	1	
(2)	R. Crankcase Cover Bolt	12	
(3)	R. Crankcase Cover Assy.	1	
(4)	Dowel Pin	2	
(5)	Gasket	1	
	Disassembly		Assembly is reverse of disassembly.
(6)	Special Pin	1	
(7)	Clutch Lifter Arm	1	
(8)	Return Spring	1	
(9)	Oil Seal	1	

CLUTCH REMOVAL

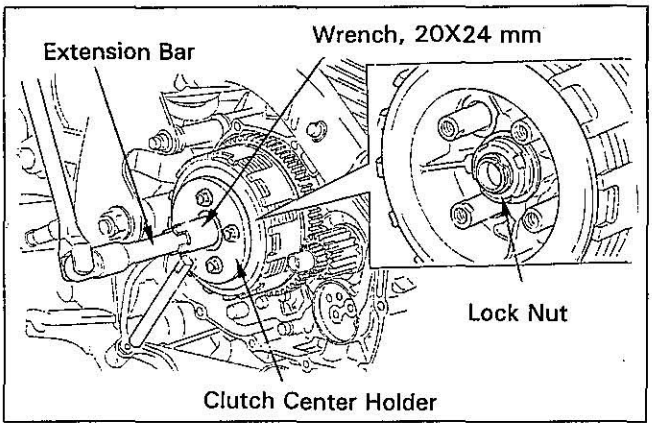


Related Work

- Right Crankcase Cover Removal (⇨9-2)
- Oil Filter Rotor Removal (⇨4-3)

	WORK / PART NAME	NO.	NOTES
	Removal		
(1)	Clutch Lifter Rod	1	
(2)	Clutch Lifter Plate Bolt	4	
(3)	Clutch Lifter Plate	1	
(4)	Clutch Lifter Plate Bearing	1	
(5)	Clutch Spring	4	
(6)	Clutch Center Lock Nut	1	Removal (⇨9-6)
(7)	Lock Washer	1	
(8)	Clutch Center	1	Remove whole assy.
(9)	Judder Spring	1	
(10)	Spring Seat	1	
(11)	Clutch Disc A	1	Internal Diameter: Large
(12)	Clutch Disc B	4	
(13)	Clutch Plate	4	
(14)	Pressure Plate	1	
(15)	Spline Washer	1	Align mainshaft groove and washer spline then remove.
(16)	Clutch Outer	1	
(17)	Primary Drive Gear	1	
(18)	Clutch Outer Guide	1	

CLUTCH CENTER LOCK NUT REMOVAL AND INSTALLATION



Removal

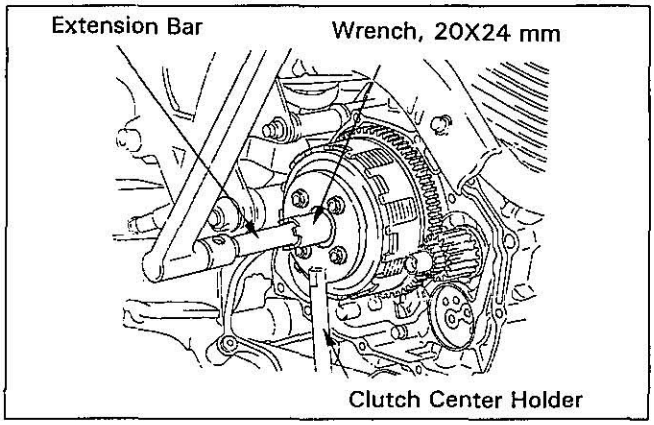
Remove lock nut sealant.

• CAUTION

Be careful not to damage the mainshaft threads.

Fix clutch center using clutch center holder, then loosen lock nut.
Remove clutch center holder, then remove lock nut.

Clutch Center Holder	**07GMB-KT70100**
Wrench, 20 x 34	**07716-0020100**
Extension Bar	**07716-0020500**



Installation

Attach lock nut to main shaft.
Fix clutch center using clutch center holder, then tighten lock nut.

Torque: 8-5 kg-m

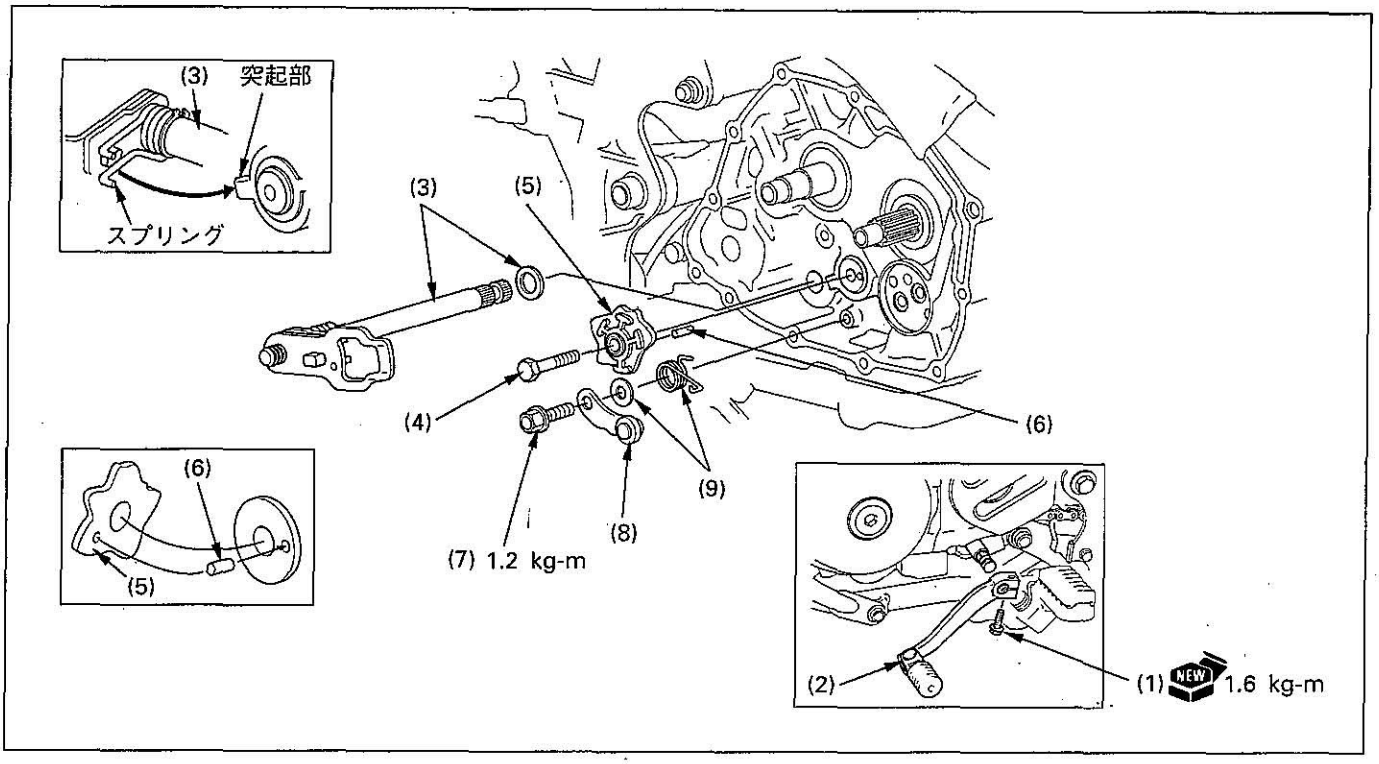
Clutch Center Holder	**07GMB-KT70100**
Wrench, 20 x 34	**07716-0020100**
Extension Bar	**07716-0020500**

Caulk lock nut collar to main shaft notch.

• CAUTION

Be careful not to damage the mainshaft threads.

GEARSHIFT LINKAGE REMOVAL AND INSTALLATION



• CAUTION

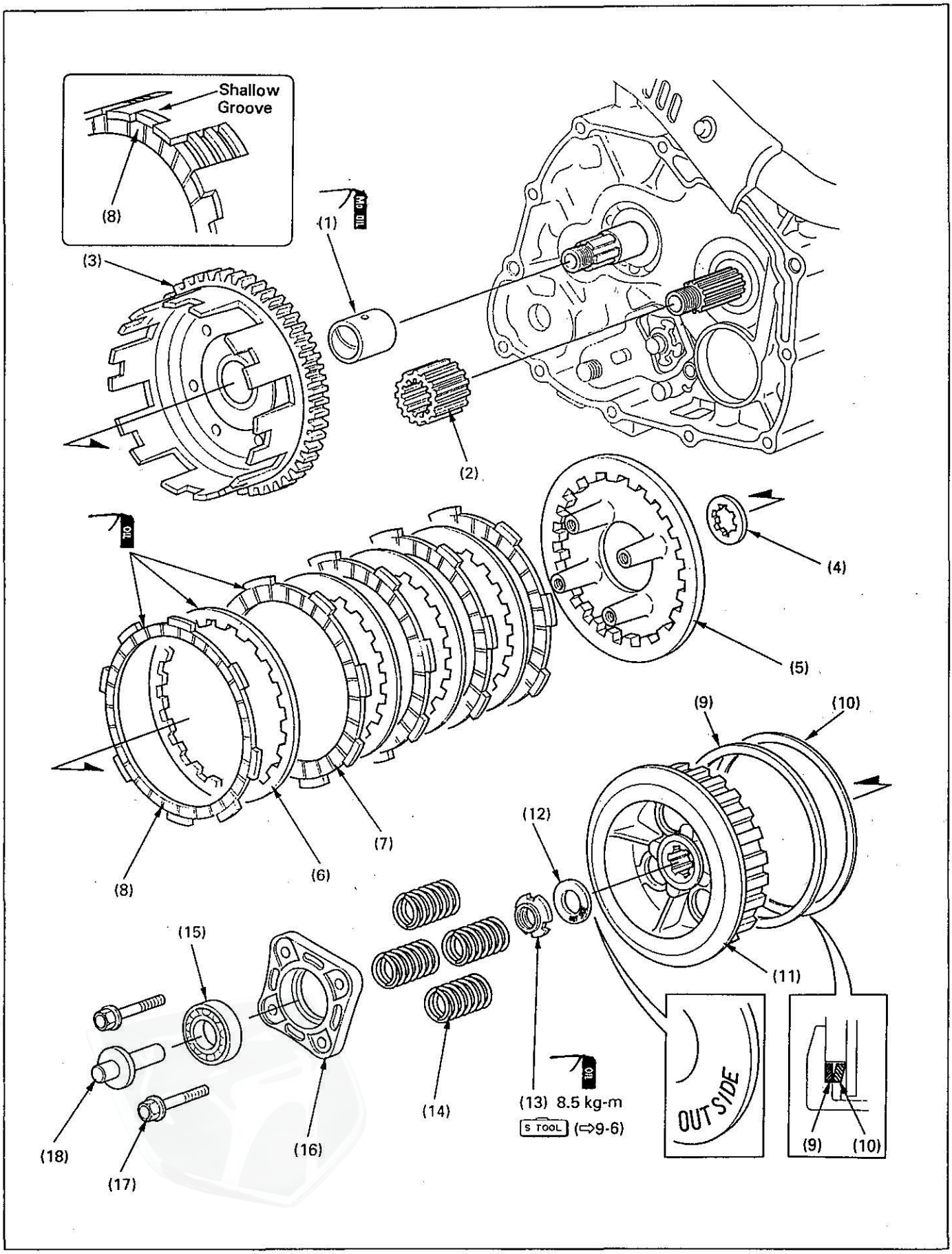
- Put gear in neutral before installation or removal.
- After installing check if the gear shift linkage is functioning porperly.

Related Work

- Clutch removal and installation (⇨9-4,8)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse of removal.
(1)	Change Pedal Bolt	1	
(2)	Change Pedal	1	
(3)	Gear Shift Spindle/Washer	1/1	When installing, align spindle spring boss in case.
(4)	Shift Drum Stopper Plate Bolt	1	
(5)	Shift Drum Stopper Plate	1	When installing, align plate hole with dowel pin.
(6)	Dowel Pin	1	
(7)	Shift Stopper Arm Bolt	1	
(8)	Shift Stopper Arm	1	
(9)	Shift Stopper Arm Return Spring/Washer	1/1	

CLUTCH INSTALLATION



Related Work

- Right Crankcase Cover Installation (⇨9-3)
- Oil Filter Rotor Installation (⇨4-3)

	WORK / PART NAME	NO.	NOTES
	Installation		
(1)	Clutch Outer Guide	1	
(2)	Primary Drive Gear	1	
(3)	Clutch Outer	1	
(4)	Spline Washer	1	Align mainshaft groove to washer notch, attach, then lock.
(5)	Pressure Plate	1	
(6)	Clutch Plate	4	Install as a whole assy.
(7)	Clutch Disc B	4	
(8)	Clutch Disc A	1	Attach clutch disc A boss to shallow groove of clutch outer.
(9)	Judder Spring Seat	1	
(10)	Judder Spring	1	
(11)	Clutch Center	1	
(12)	Lock Washer	1	Attach with "OUTSIDE" mark facing out.
(13)	Clutch Center Lock Nut	1	Install (⇨9-6)
(14)	Clutch Spring	4	
(15)	Clutch Lifter Plate Bearing	1	
(16)	Clutch Lifter Plate	1	
(17)	Clutch Lifter Plate Bolt	4	
(18)	Clutch Lifter Rod	1	

MEMO

10. CRANKSHAFT, TRANSMISSION

SERVICE INFORMATION

- Crankshaft and transmission maintenance must be done after crankcase dismantling.
- The following parts must be removed before separating the crankcase
  - –Clutch, Primary Drive Gear (⇨9)
  - –Flywheel (⇨14-8)
  - –Cylinder Head (⇨7)
  - –Gearshift Linkage (⇨9-7)
  - –Cylinder, Piston (⇨8)
  - –Starter Motor (⇨16-7)
- When removing the crankshaft, make sure not to scratch or damage the main bearing.
- During assembly, apply engine oil to main bearing.

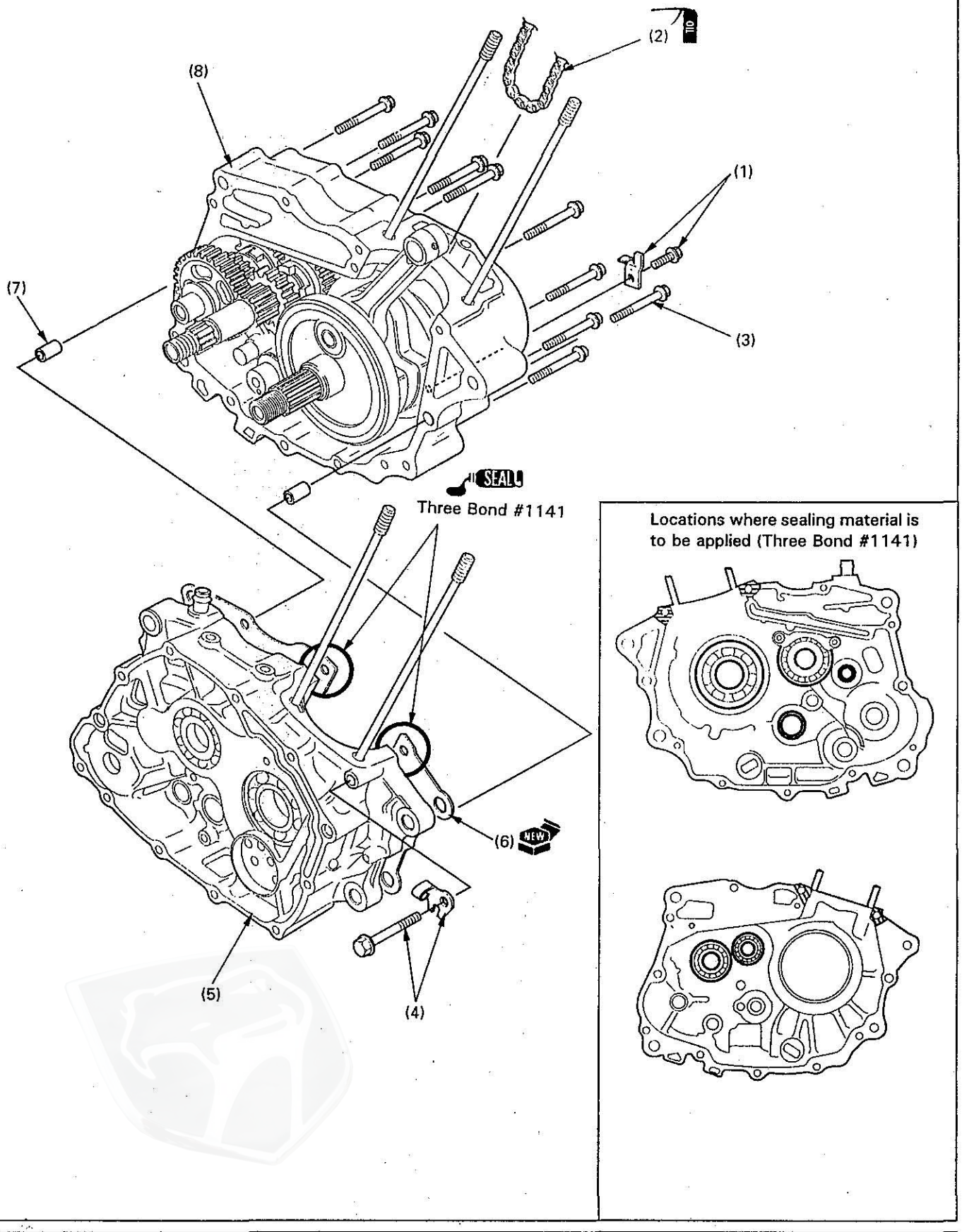
TROUBLESHOOTING

Engine Noise
- Worn out crankshaft main bearing
- Worn out connecting rod big end bearing
- Bent connecting rod
- Worn out transmission gear

Hard to Shift
- Defective clutch adjustment (too much slack)
- Bent shift fork
- Bent shift fork shaft
- Damaged gearshift spindle
- Worn out shift drum guide
- Damaged shift fork guide pin

Transmission Jumps Out of Gear
- Worn gear dogs or slots
- Bent shift fork shaft
- Damaged shift drum stopper arm
- Damaged shift drum guide groove
- Worn out shift fork groove

CRANKCASE DISMANTLING AND ASSEMBLY



• CAUTION

- Following Service Information (10-1), finish all necessary preliminary work.
- When removing crankshaft, make sure the main bearing is not damaged or scratched.

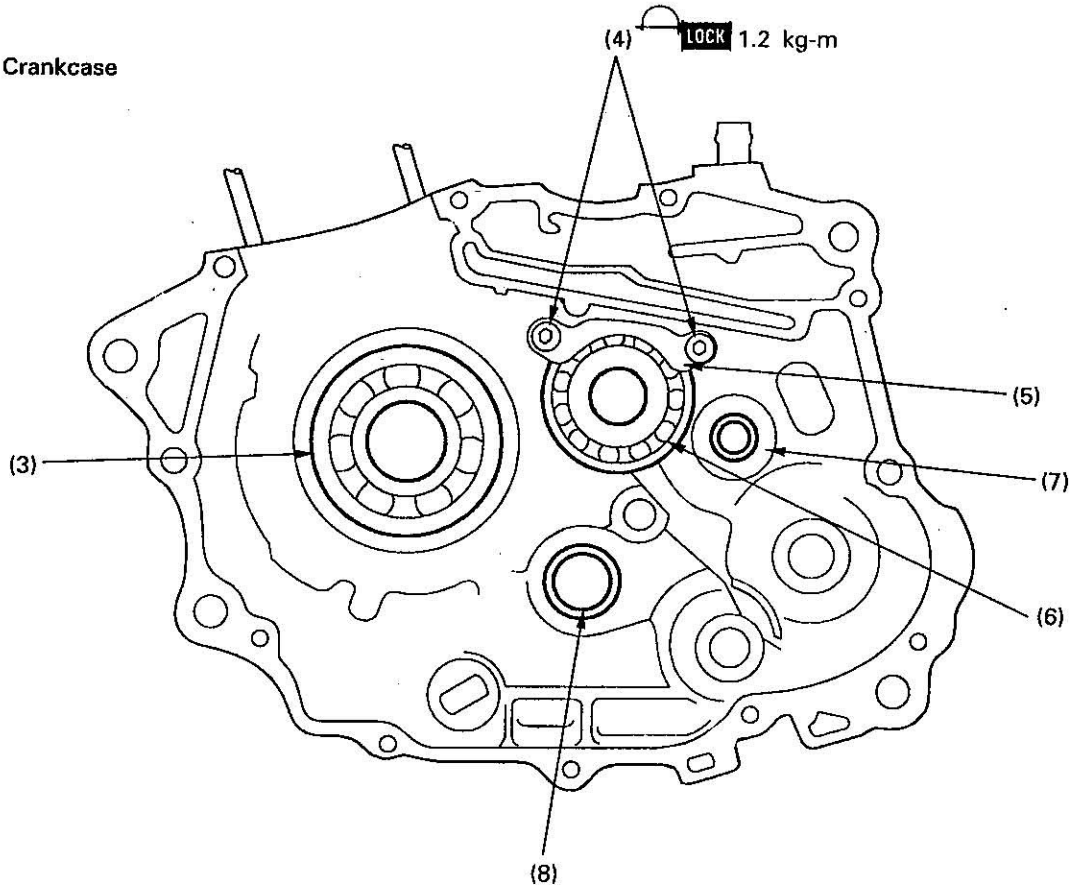
Related Work

- Engine Oil Removal/Replacement

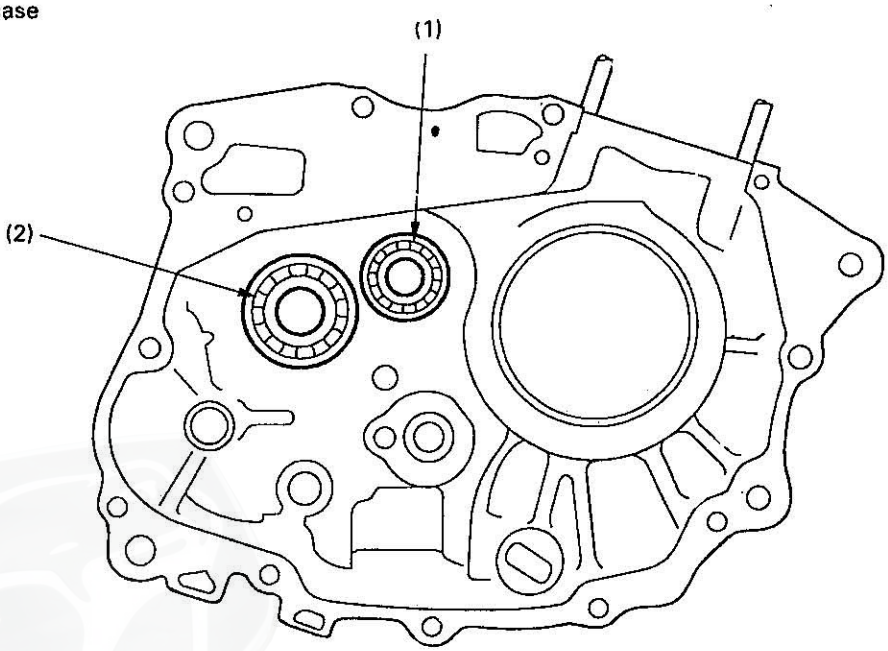
	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order of removal.
(1)	Cam Chain Guide Plate/Bolt	1/1	
(2)	Cam Chain	1	
(3)	Left Crankcase Bolt	10	When installing, check that the crankcase is tightly attached before tightening bolt.
(4)	Clutch Cable Holder/Bolt	1/1	
(5)	Right Crankcase	1	
(6)	Gasket	1	When assembling, refer to illustration, and apply three bond #1141 (or similar) on appropriate locations.
(7)	Dowel Pin	2	
(8)	Left Crankcase	1	

CRANKCASE BEARING

Right Crankcase



Left Crankcase

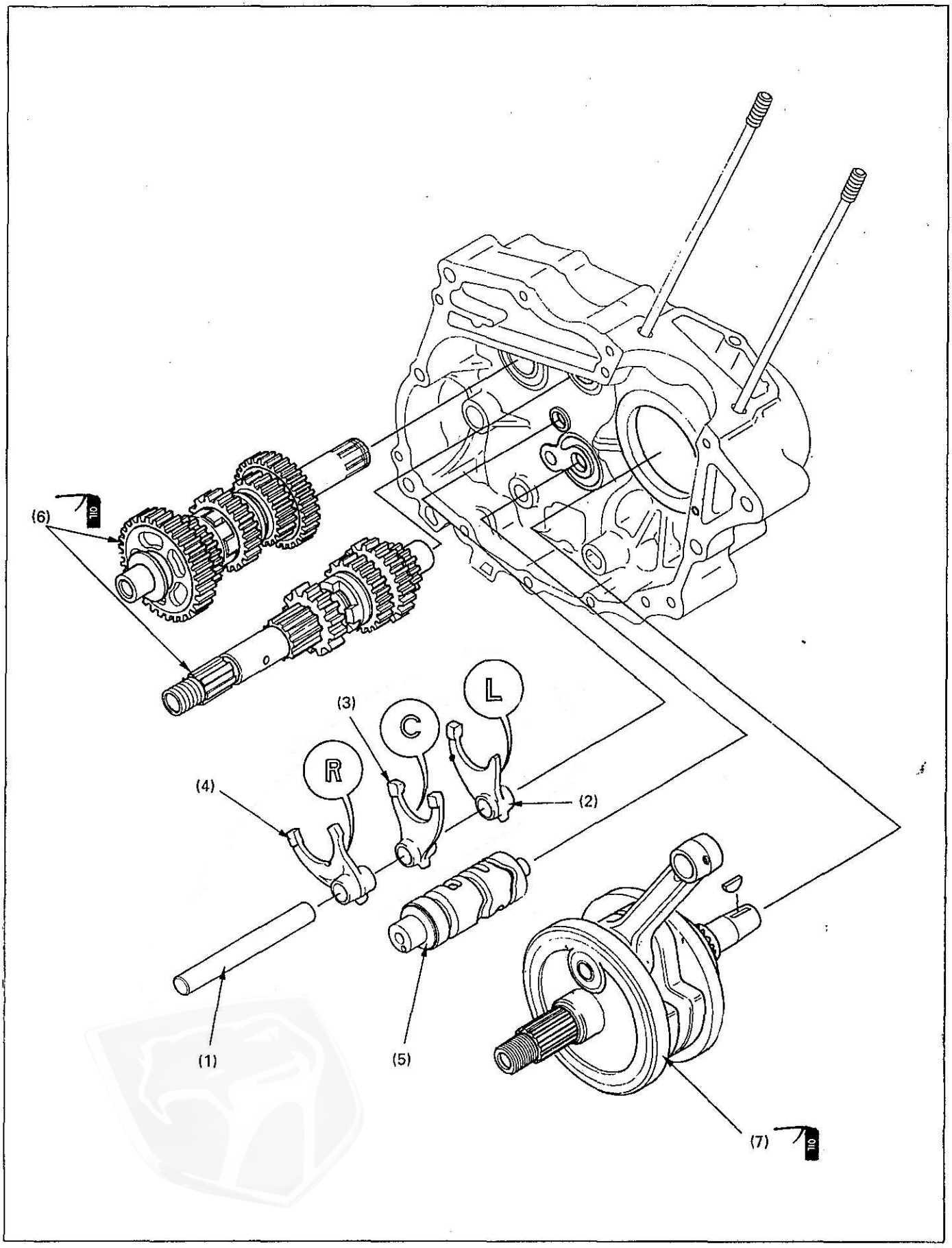


Related Work

- Crankcase Dismantling and Assembly (⇨10-2)
- Crankshaft, Transmission Removal and Installation (⇨10-6)

	WORK / PART NAME	NO.	NOTES
	Left Crankcase		
(1)	Main Shaft Bearing	1	
(2)	Countershaft Bearing	1	
	Right Crankcase		
(3)	Crankshaft Bearing	1	
(4)	Bearing Set Plate Bolt	2	
(5)	Bearing Set Plate	1	
(6)	Main Shaft Bearing	1	
(7)	Countershaft Needle Bearing (15 mm)	1	
(8)	Shift Drum Needle Bearing (21 mm)	1	

CRAKSHAFT, TRANSMISSION REMOVAL AND INSTALLATION



• CAUTION

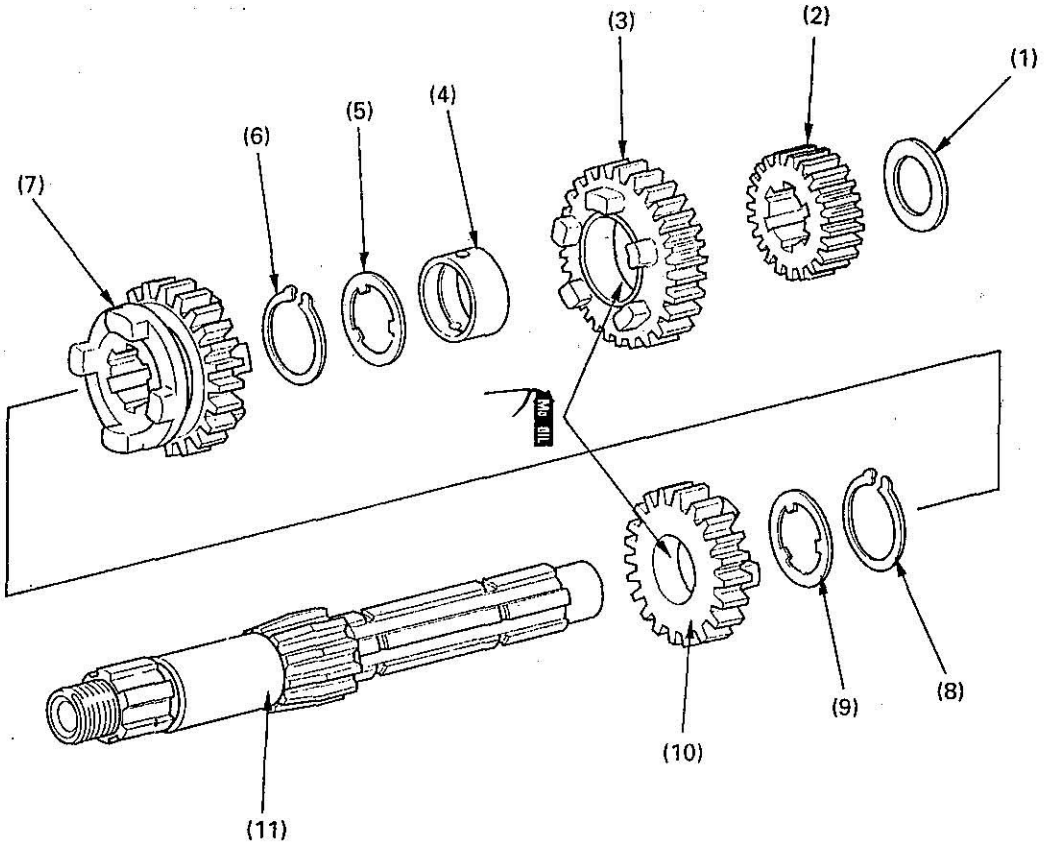
- After assembly, turn main shaft countershaft, and check if gear shifting is smooth.
- After finishing work, turn transmission while applying adequate engine oil

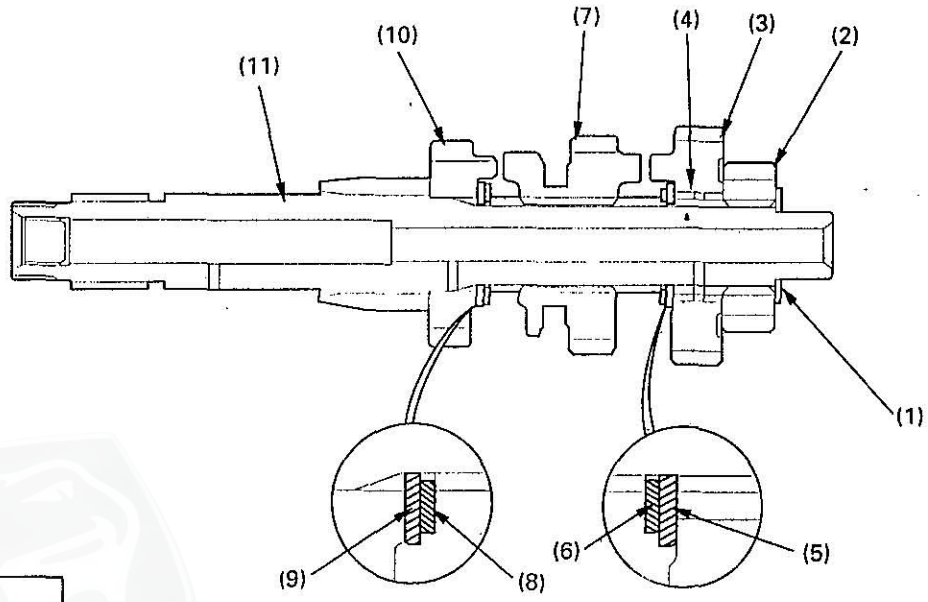
Related work

- Crankcase Dismantling and Assembly (⇨10-2)

	WORK / PART NAME	NO.	NOTES
	Removal		Assembly is reverse of removal.
(1)	Shift Fork Shaft	1	
(2)	Left Shift Fork	1	Attach with "L" mark facing L. crankcase.
(3)	Center Shift Fork	1	Attach with "C" mark facing L. crankcase.
(4)	Right Shift Fork	1	Attach with "R" mark facing L. crankcase.
(5)	Shift Drum	1	
(6)	Main Shaft/Countershaft Assy.	1/1	
(7)	Crankshaft Assy.	1	

MAIN SHAFT DISMANTLING AND ASSEMBLY





Mo OIL ALL SHIFT GEAR GROOVES

OIL ALL GEAR MOVING PARTS

• CAUTION

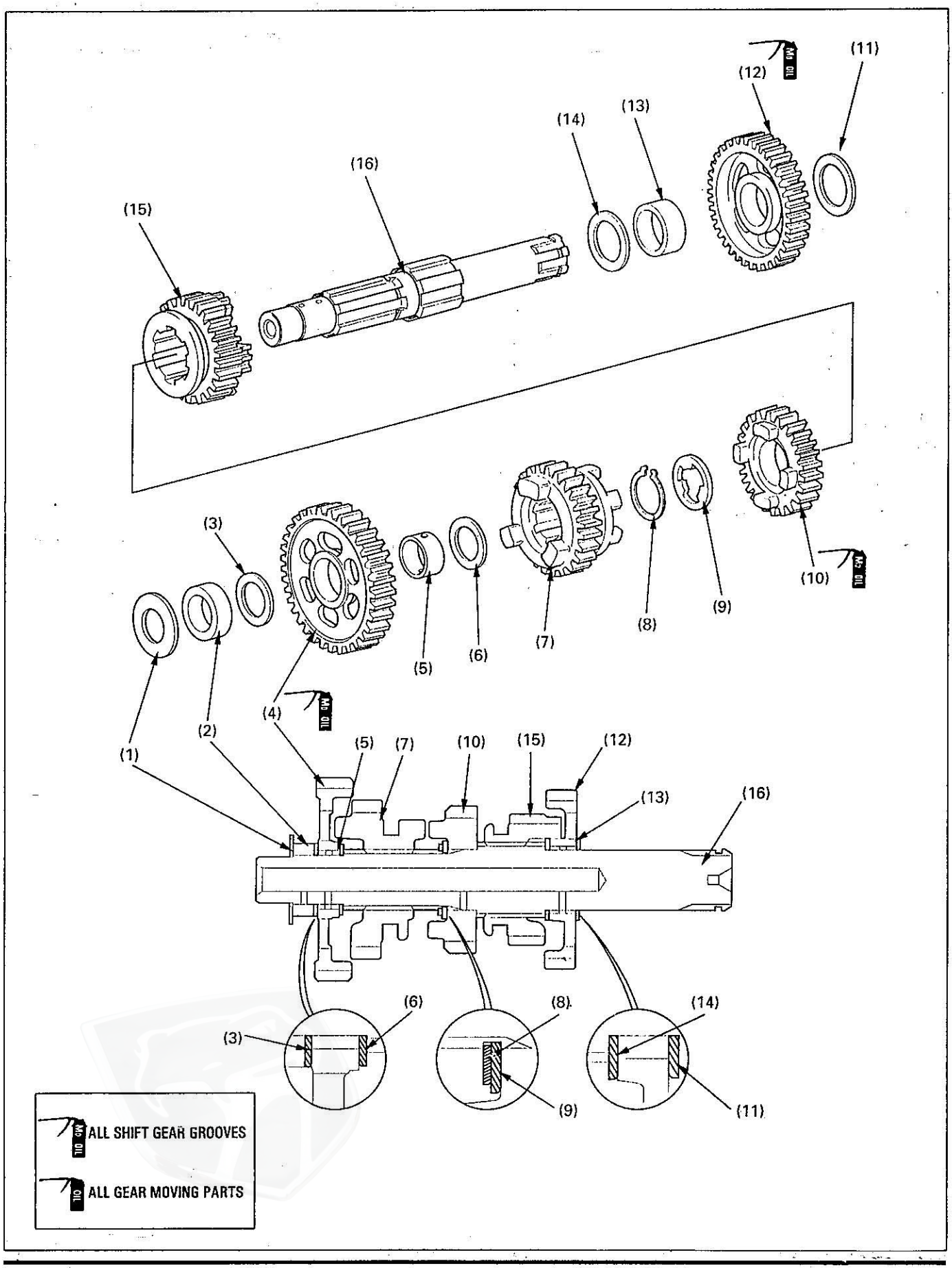
- When assembling, apply molybdenum to shift fork grooves surfaces and spline bush sliding surfaces. Also apply engine oil to all moving parts and notches.
- Washers which are in contact with the rotating parts should be attached with their beveled surfaces facing the turning part.
- The beveled surface of the snap ring should be attached facing the direction of the side with load.

Related Work

· Transmission Removal and Installation (⇨10-6)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order of removal.
(1)	Washer	1	
(2)	M2 Gear (18T)	1	
(3)	M5 Gear (31T)	1	
(4)	M5 Bush	1	
(5)	Spline Washer	1	
(6)	Snap Ring	1	
(7)	M4 Gear (22T)	1	
(8)	Snap Ring	1	
(9)	Spline Washer	1	
(10)	M3 Gear (19T)	1	
(11)	Main Shaft/M1 (13T)	1	

COUNTERSHAFT DISMANTLING AND ASSEMBLY



• CAUTION

- When assembling, apply molybdenum to shift fork grooves moving parts and spline bush sliding surfaces. Also apply engine oil to all moving parts and notches.
- Washers which are in contact with the rotating parts should be attached with their beveled surfaces facing the turning part.
- The beveled surface of the snap ring should be attached facing the direction of the side with load.

Related Work

- Transmission Removal and Installation (⇨10-6)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order of removal.
(1)	Washer	1	
(2)	Collar	1	
(3)	Washer	1	
(4)	C1Gear (36T)	1	
(5)	C1 Bush	1	
(6)	Washer	1	
(7)	C3 Gear (24T)	1	
(8)	Snap Ring	1	
(9)	Spline Washer	1	
(10)	C4 Gear (22T)	1	
(11)	Washer	1	
(12)	C2 Gear (31T)	1	
(13)	C2 Bush	1	
(14)	Washer	1	
(15)	C5 Gear (26T)	1	
(16)	Countershaft	1	

MEMO

11. FRONT WHEEL, SUSPENSION, STEERING

SERVICE INFORMATION

⚠CAUTION

Do not allow oil to get in contact with disc and pads because this can cause loss of stopping power. If oil is applied by accident, replace brake pads and degrease brake disc.

- When repairing wheels, work on a flat surface with the motorcycle firmly supported.
- Refer to Chapter 13 for braking system maintenance and checking.
- Refer to Chapter 17 for light, meter, and switch maintenance and checking.
- Do not stand on wheels. Do not exert unnecessary pressure on the wheels. Handle wheels with care.
- When removing the tire from the rim, use tire lever and rim protector in order to protect the rim from damage.

11

TROUBLESHOOTING

Hard Steering
- Steering stem nut too tight
- Damaged steering stem bearing
- Damaged or worn out inner and outer stem race
- Worn out tire
- Insufficient tire pressure

Steers To One Side
- Faulty steering head bearing
- Unevenly adjusted right and left forks
- Bent front axle, flat tires
- Worn out tires
- Worn wheel bearing

Front Wheel Wobbling
- Bent rim
- Worn front wheel bearing
- Faulty tire
- Unbalance tire and wheel

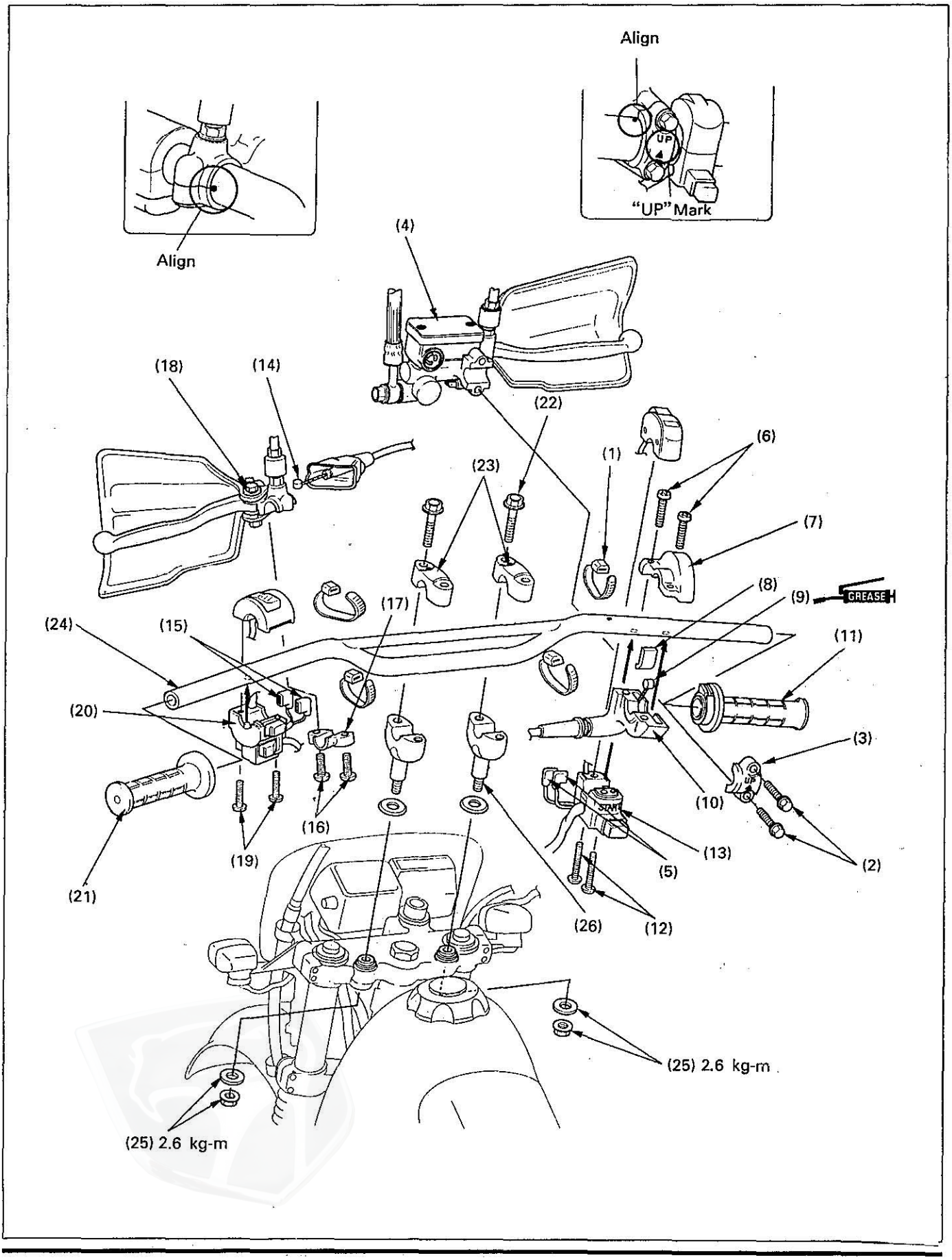
Wheels Turns Hard
- Faulty wheel bearings
- Bent front axle
- Brake drag (⇨13)

Soft Front Suspension
- Weak fork spring
- Inadequate fork oil
- Oil deterioration
- Low oil viscosity
- Low tire air pressure

Hard Front Suspension
- Bent fork tube
- High fluid level in fork
- High oil viscosity
- Clogged fluid passage
- High tire air pressure

Front Suspension Noise
- Fork tube and fork slider binding
- Insufficient fluid in fork
- Loose front fork fasteners

HANDLE BAR REMOVAL AND INSTALLATION

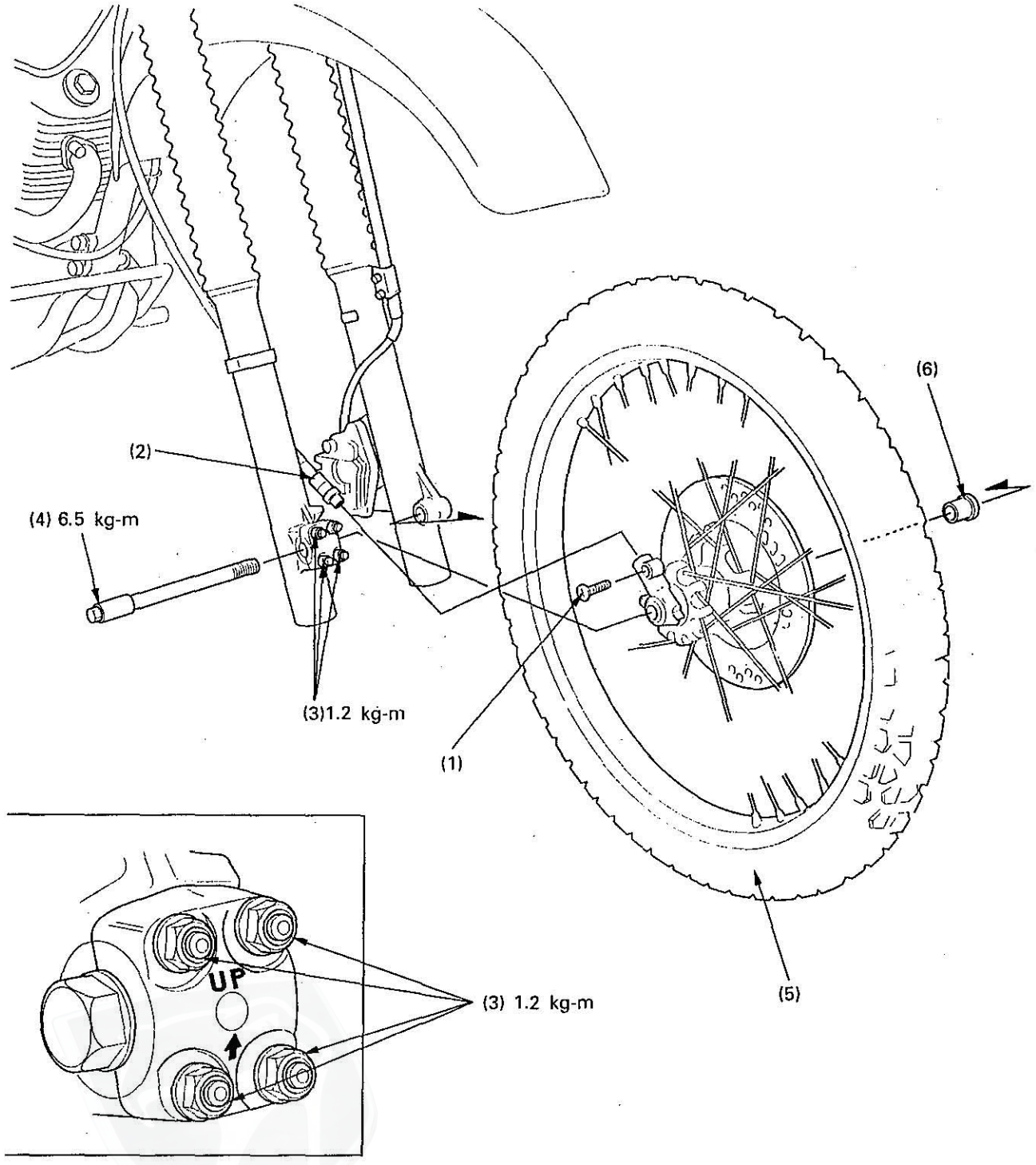


• CAUTION

- Use a piece of string to tie the master cylinder and to keep it vertical in order to prevent entry of air into braking mechanism.
- Follow wiring diagram (1-18) to keep all wires and harness in their proper location.
- Check function of all parts after work and adjust if necessary.

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order or removal.
(1)	Wire Band	4	
(2)	Front Master Cylinder Holder Bolt	2	Attach from the top portion.
(3)	Front Master Cylinder Holder	1	• Pull "UP" mark on top. • Align handle punch mark.
(4)	Front Master Cylinder	1	Attach string to keep vertical and to prevent entry of air.
(5)	Front Stoplight Switch Connector	2	
(6)	Throttle Housing Screw	2	Attach from top.
(7)	Throttle Housing Cover	1	Align handle punch mark.
(8)	Throttle Cable Guide	1	
(9)	Throttle Cable	1	
(10)	Throttle Housing	1	
(11)	Throttle Grip	1	
(12)	Right Handle Switch Screw	2	Attach from front part.
(13)	Right Handle Switch	1	Align switch boss to handle bar hole.
(14)	Clutch Cable	1	
(15)	Clutch Switch Connector	2	
(16)	Clutch Lever Holder Screw	2	
(17)	Clutch Lever Holder	1	Align handle punch mark.
(18)	Clutch Lever Bracket	1	
(19)	Left Handle Switch Screw	2	Attach from front part.
(20)	Left Handle Switch	1	Align switch boss to handle bar hole.
(21)	Left Handle Grip	1	Apply Honda bond A to inside surfaces.
(22)	Handle Bar Holder Bolt	4	Attach from front part.
(23)	Handle Bar Holder	2	Face punch mark to front side.
(24)	Handle Bar	1	Align handle bar punch mark to handle bar lower holder surface.
(25)	Handle Bar Lower Holder Nut/Washer	2/2	
(26)	Handle Bar Lower Holder	2	

FRONT WHEEL REMOVAL



⚠ CAUTION

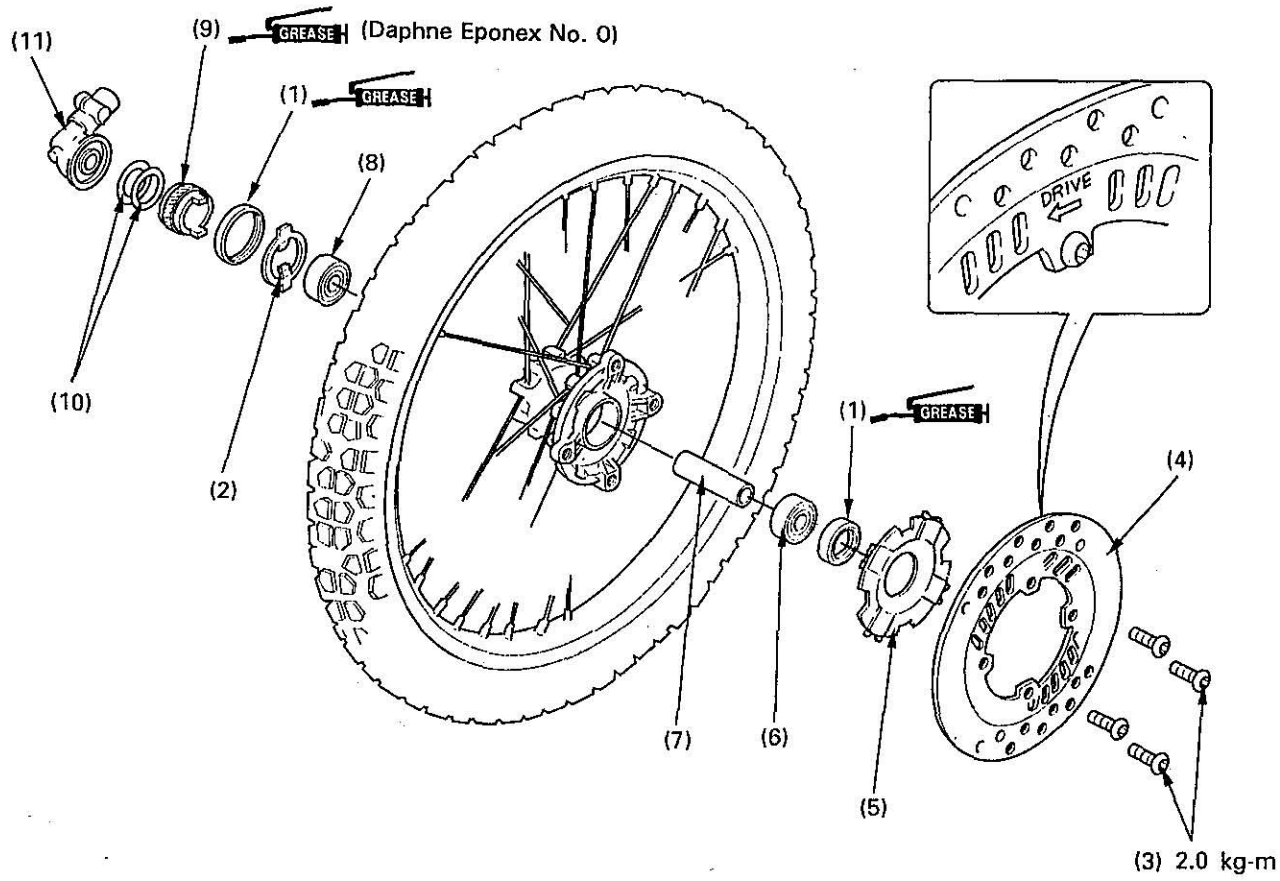
Do not allow oil to get in contact with disc and pads because this can cause loss of braking functions. If oil is applied by accident, replace brake pads and degrease brake disc.

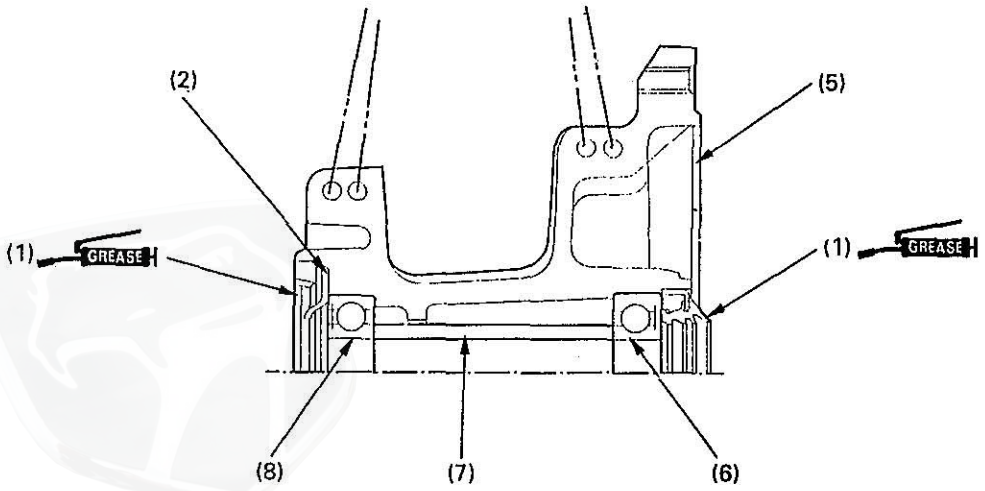
• CAUTION

- Support the vehicle frame with a jack firmly, raising the wheel before work.
- After removing wheels, DO NOT operate brake lever.
- After installing, operate brake lever and push out the piston caliper.

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Speedometer Cable Screw	1	
(2)	Speedometer Cable	1	
(3)	Front Axle Holder Nut	4	• Loosen only. • Tighten axle first. • Press front brake, let fork expand and contract several times, attach from top. • Face "UP" mark to top then attach.
(4)	Front Axle	1	
(5)	Front Wheel Assy.	1	• Dismantling, assembly (⇨11-6). • Align speedometer gear box with fork stopper.
(6)	Side Collar	1	

FRONT WHEEL DISMANTLING AND ASSEMBLY





• CAUTION

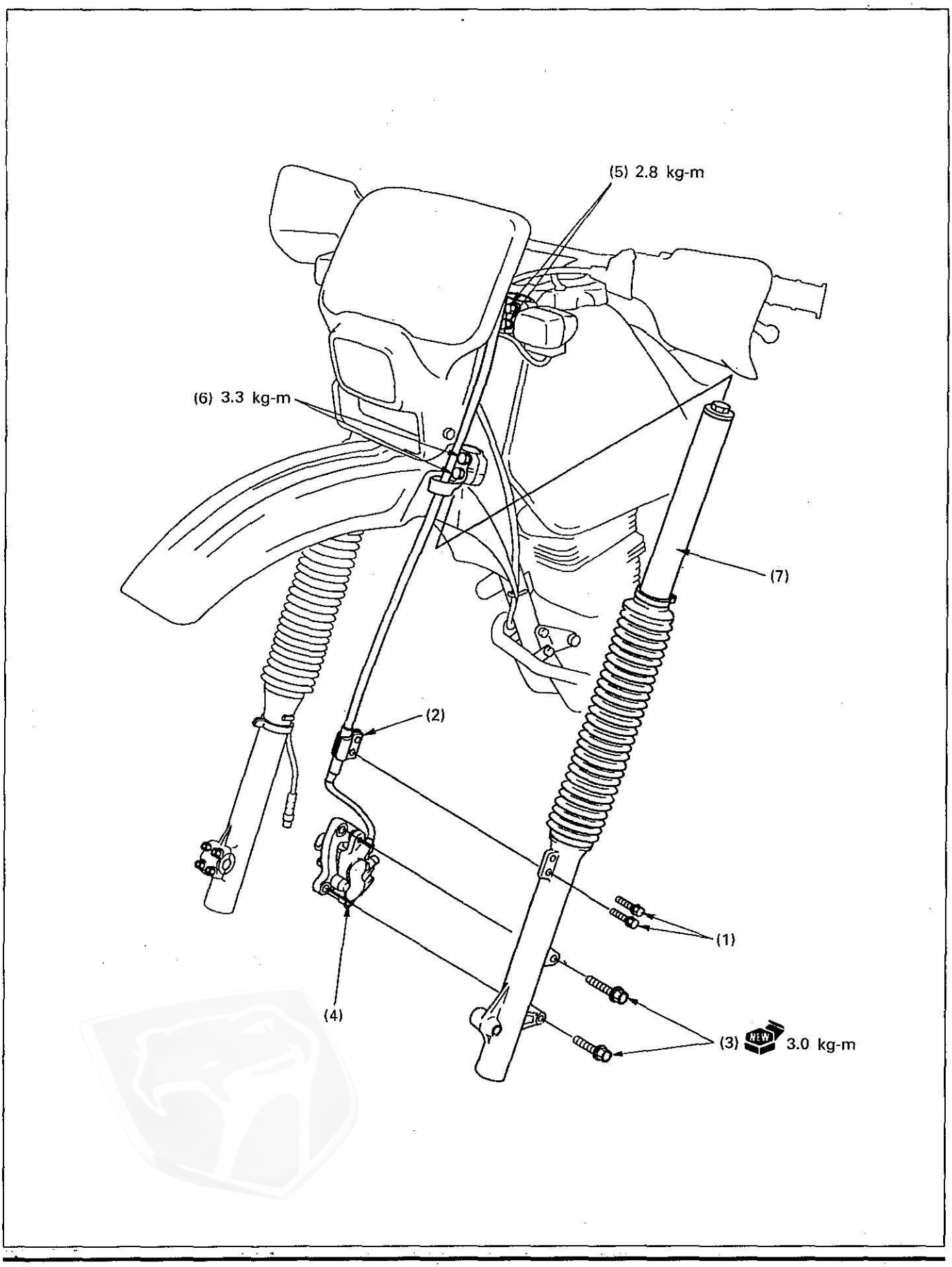
The wheel bearings must be replaced as a set.

Related Work

Front Wheel Removal and Installation (⇨11-4)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order of removal.
(1)	Dust Seal	2	
(2)	Speedometer Gear Retainer	1	
(3)	Brake Disc Bolt	4	
(4)	Brake Disc	1	Install with mark facing out.
(5)	Hub Cap	1	
(6)	Left Wheel Bearing (6202)	1	
(7)	Distance Collar	1	
(8)	Right Wheel Bearing (6202)	1	Install first when assembling.
(9)	Speedometer Gear	1	
(10)	Washer	2	
(11)	Speedometer Gear Box	1	

FORK REMOVAL AND INSTALLATION



⚠CAUTION

Do not suspend the brake caliper from the brake hose.

• CAUTION

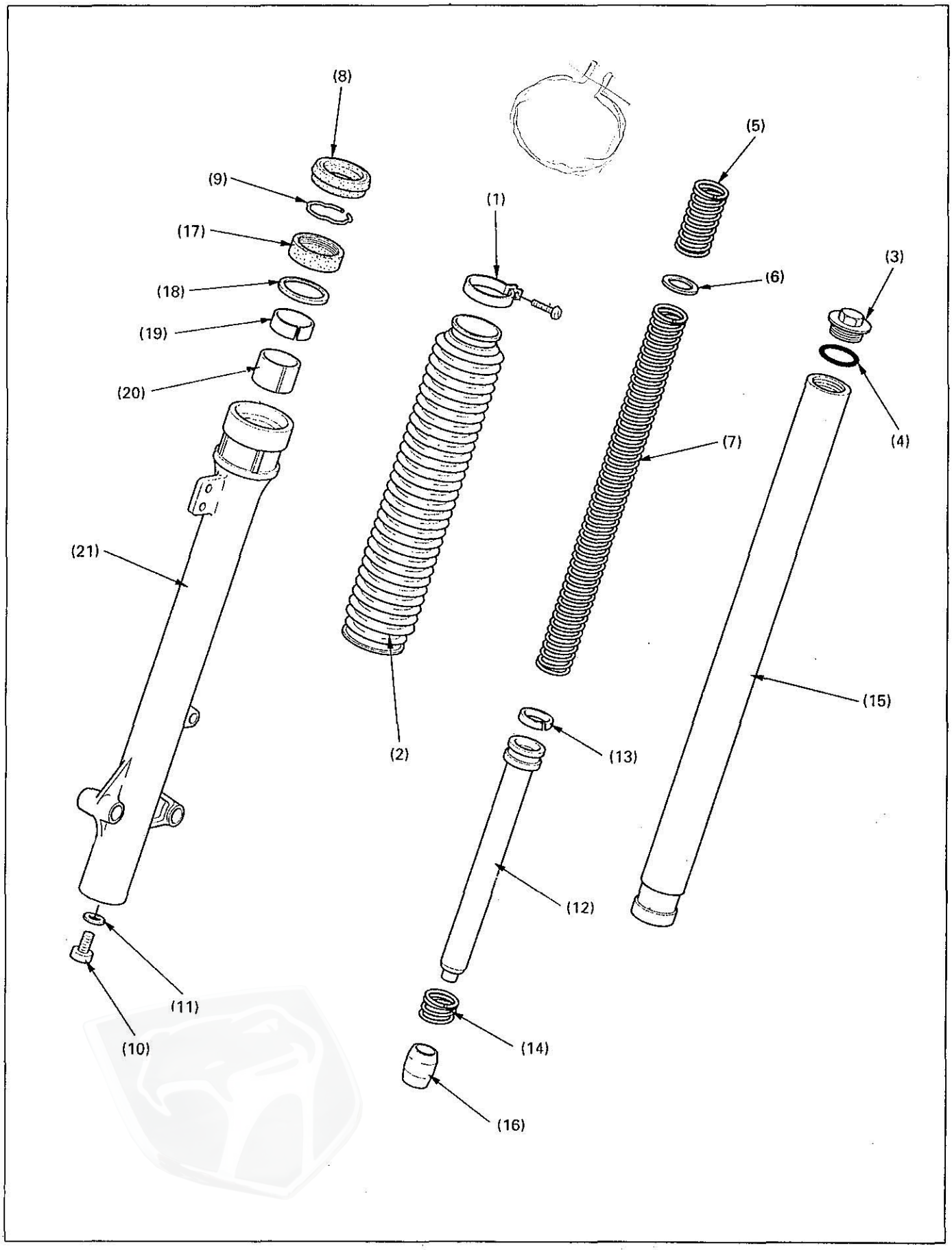
Before dismantling fork, loosen fork top bolt first, then loosen fork cap.

Related Work

- Front Wheel Removal and Installation (⇨11-4)

	WORK / PART NAME	NO.	NOTES
	Removal		
(1)	Brake Hose Clamp Bolt		
(2)	Brake Hose Clamp		Left side only.
(3)	Caliper Bolt		
(4)	Front Brake Caliper		After removing caliper, do not suspend caliper from hose.
(5)	Fork Top Bolt		Loosen only.
(6)	Fork Bottom Bolt		Loosen while supporting fork.
(7)	Fork		• Dismantling/assembly (11-10,12) • Align fork tube top edge with top bridge edge, then attach. • After installing, raise fork boots until they bit the steering stem, then tighten.

FORK DISMANTLING



⚠CAUTION

The fork cap is under spring pressure. Use care when removing.

• CAUTION

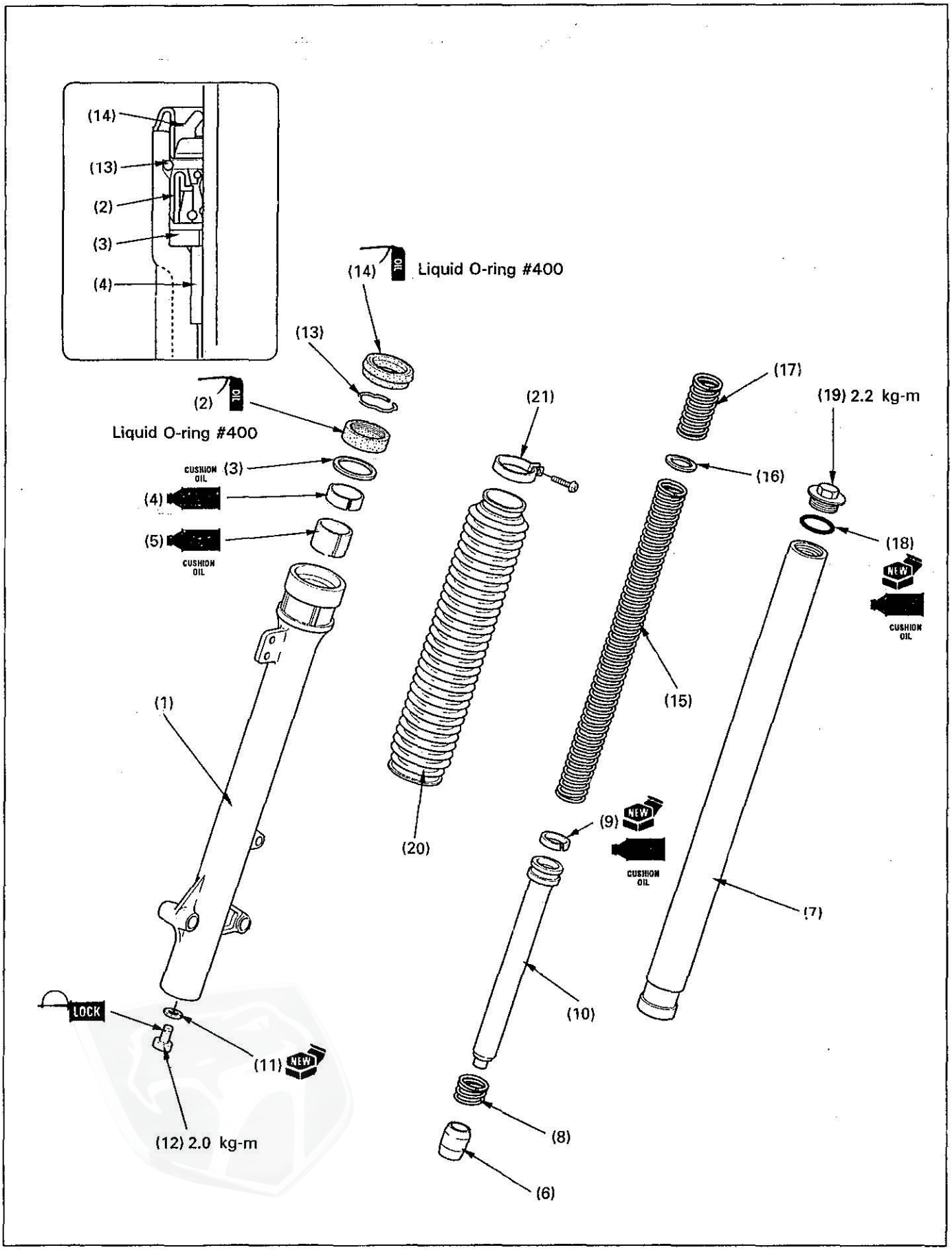
When loosening the socket bolt, attach fork spring A,B, spring seat and fork cap temporarily.

Related Work

- Fork Removal (⇨11-8)

	WORK / PART NAME	NO.	NOTES
	Removal		
(1)	Fork Boots Band	1	
(2)	Fork Boots	1	
(3)	Fork Cap	1	
(4)	O-ring	1	
(5)	Fork Spring A	1	
(6)	Spring Seat	1	
(7)	Fork Spring B	1	Remove fork oil along with spring.
(8)	Dust Seal	1	
(9)	Stopper Ring	1	⚠CAUTION Do not scratch fork tube surface.
(10)	Fork Socket Bolt	1	
(11)	Sealing Washer	1	
(12)	Fork Piston	1	
(13)	Fork Piston Ring	1	Do not remove except when replacing.
(14)	Rebound Spring	1	
(15)	Fork Tube	1	
(16)	Oil Lock Piece	1	
(17)	Oil Seal	1	Remove from fork tube
(18)	Backup Ring	1	
(19)	Slider Bush	1	
(20)	Fork Tube Bush	1	Do not remove except when replacing.
(21)	Fork Slider	1	

FORK ASSEMBLY



• CAUTION

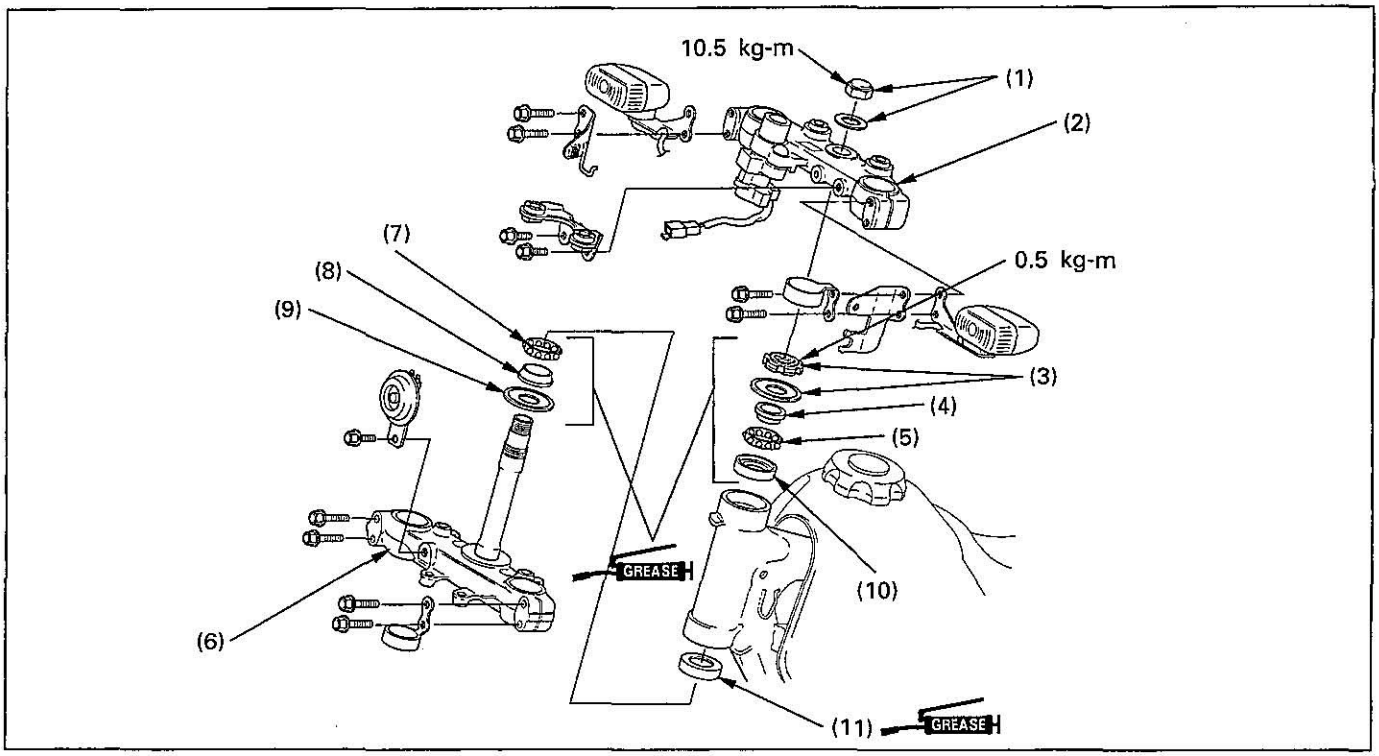
- Oil and dirt must be removed from all parts prior to asembly.
- Oil seal and dust seal must be replaced as a set.
- Attach fork cap temporarily, then tighten only after fixing the fork using the bottom bridge bolt.

Related Work

- Fork Installation (⇨11-8)

	WORK / PART NAME	NO.	NOTES
	Assembly		
(1)	Fork Slider	1	
(2)	Oil Seal	1	• Attach to fork tube.
(3)	Backup Ring	1	• Attach oil seal with markings on top.
(4)	Fork Tube Bush	1	• Do not damage oil seal lip.
(5)	Slide Bush	1	
(6)	Oil Lock Piece	1	
(7)	Fork Tube	1	
(8)	Rebound Spring	1	
(9)	Fork Piston Ring	1	
(10)	Fork Piston	1	
(11)	Sealing Washer	1	
(12)	Fork Socket Bolt	1	If the fork piston turns with the socket bolt, temporarily install the fork spring A, B, spring spacer and fork cap.
(13)	Stopper Ring	1	
(14)	Dust Seal	1	
(15)	Fork Spring B	1	Attached with tapered facing down.
(16)	Spring Seat	1	
(17)	Fork Spring A	1	
(18)	O-ring	1	
(19)	Fork Cap	1	⚠CAUTION • Do not damage screw portion. • Temporarily attach fork to steering stem then tighten.
(20)	Fork Boots	1	Turn the fork boot with its breather holes facing in.
(21)	Fork Boots Band	1	After attaching fork to steering stem, fix boots to the stem using screw.

STEERING STEM REMOVAL AND INSTALLATION



• CAUTION

- Refer to wiring diagram (⇨1-18) for proper location of wires and harness.
- Bearing and bearing race must be relaced as a set.

Related Work

- Handle Bar Removal (⇨11-2)
- Front Fender Removal (⇨2-3)
- Fork Removal (⇨11-8)
- Meter Removal (⇨17-5)

	WORK / PART NAME	NO.	NOTES
	Removal		Assembly is reverse order of removal.
(1)	Steering Stem Nut/Washer	1/1	Install with fork attached.
(2)	Top Bridge	1	Disconnect from main switch connector.
(3)	Steering Top Thread/Dust Seal	1/1	
(4)	Upper Inner Race	1	
(5)	Upper Bearing	1	
(6)	Steering Stem	1	
(7)	Lower Bearing	1	
(8)	Lower Inner Race	1	
(9)	Dust Seal	1	
(10)	Upper Outer Race	1	
(11)	Lower Outer Race	1	

MEMO

12. REAR WHEEL, SUSPENSION

SERVICE INFORMATION

⚠CAUTION

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.
- The damper unit contains nitrogen under pressure. Follow these rules in handling.
  –Do not heat or dismantle the damper unit under any circumstances because it may explode or spray oil.
  –Remove the gas from the damper unit before disposal. Location of hole (refer to 1-10).
  –Do not remove gas except when disposing of the cushion unit.

- Refer to chapter 13 for braking system checking and maintenance.
- Use only genuine replacement bolts and nuts for all suspension pivot and mounting points.
- Do not step on wheel, nor exert unnecessary pressure and weight on the wheel. Make sure not to damage the wheels.
- Use tire lever and rim protector when removing tire from the wheel to prevent damage to the rim

12

TROUBLESHOOTING

Rear Wheel Wobbling or Vibration
- Bent wheel rim
- Loose wheel bearing
- Damaged tire
- Defective tightening/installation of axle nut
- Low tire air pressure
- Defective swing arm pivot bearing
- Defective cushion linkage bearing
- Incorrect wheel balance

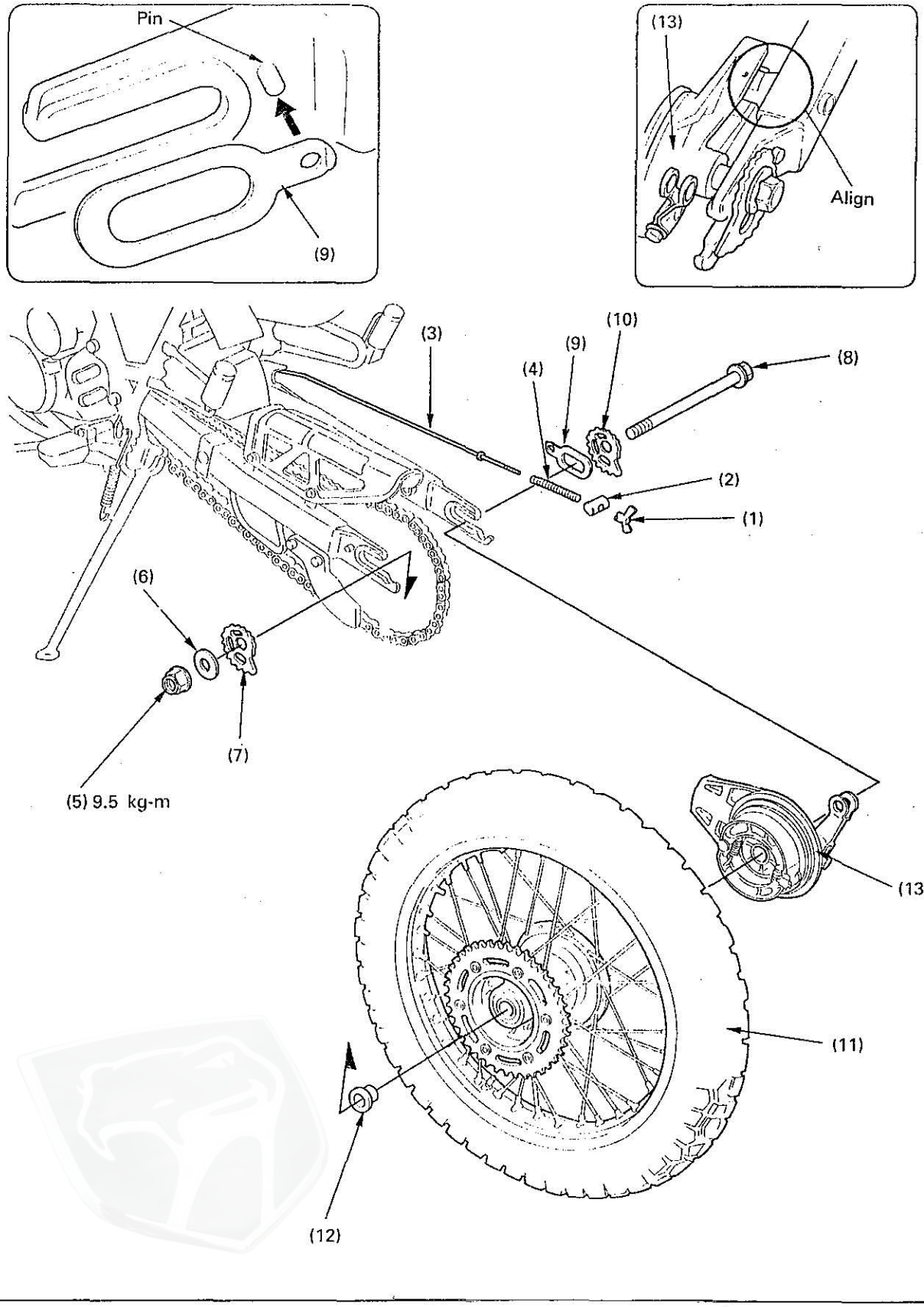
Wheel Turns Hard
- Defective wheel bearing
- Bent rear axle
- Brake drag (refer chapter 13)

Soft Suspension
- Weak cushion spring
- Incorrect rear cushion spring length
- Weak rear cushion, oil leak

Hard Suspension
- Bent damper rod
- Damaged swing arm pivot bearing
- Incorrect rear cushion spring length
- High tire air pressure
- Defective pivot and moving parts, oil has run out
- Defective cushion linkage bearing

Abnormal Noise in Rear Cushion
- Cushion case binding
- Loose fasteners

REAR WHEEL REMOVAL AND INSTALLATION



⚠ CAUTION

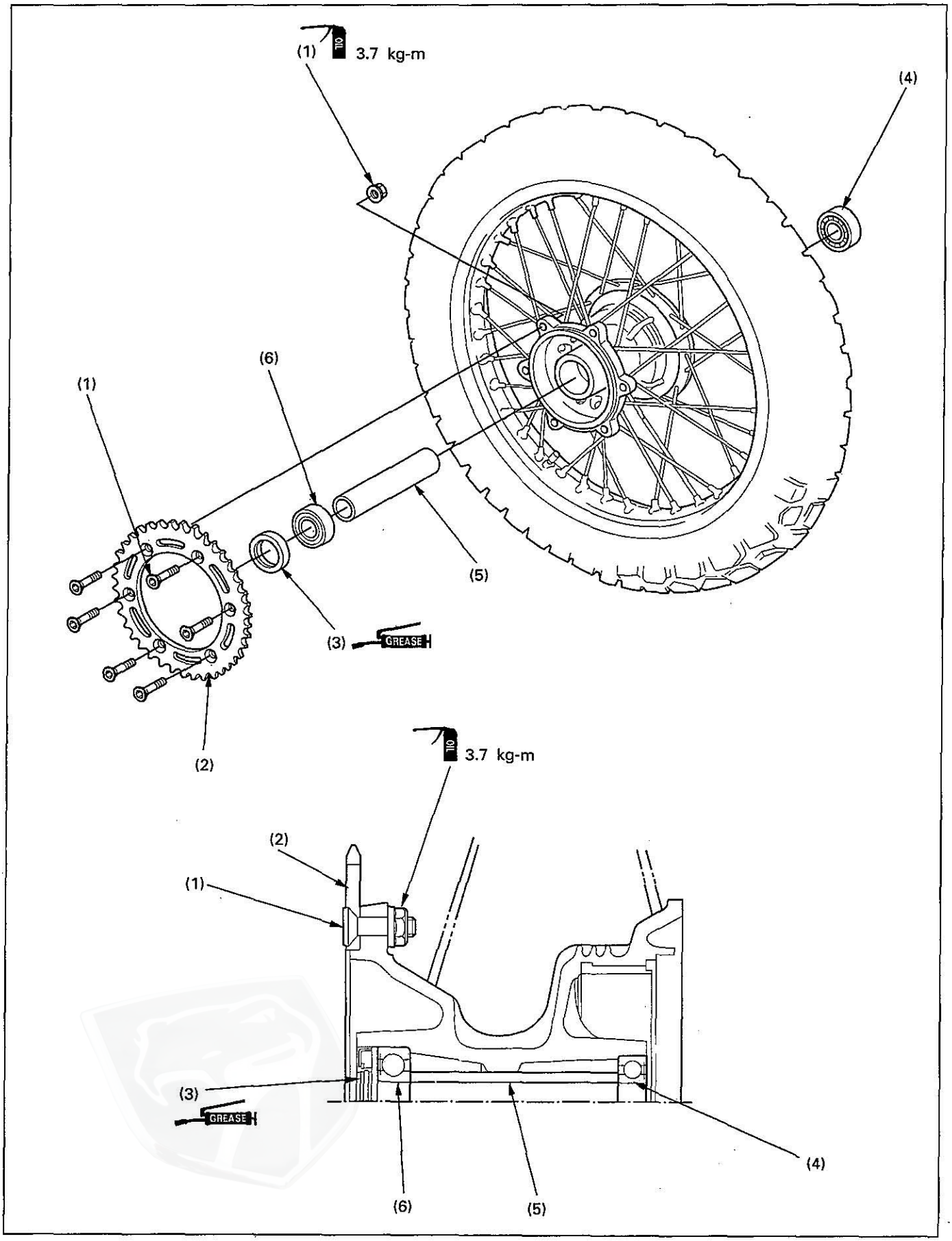
A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality degreasing agent.

• CAUTION

- Support frame adequately using jack, raise rear wheel before operating.
- After installation, adjust drive chain slack.

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Brake Adjuster	1	
(2)	Brake Arm Pin	1	
(3)	Brake Rod	1	
(4)	Spring	1	
(5)	Rear Axle Nut	1	Loosen axle nut, loosen chain adjuster completely, remove chain from driven sprocket.
(6)	Washer	1	
(7)	Left Chain Adjuster	1	
(8)	Rear Axle	1	
(9)	Stopper Plate	1	Align plate hole to swing arm stopper pin when installing.
(10)	Right Chain Adjuster	1	
(11)	Rear Wheel	1	Dismantling/Assembly (⇨12-4)
(12)	Rear Wheel Collar	1	
(13)	Brake Drum	1	Align drum groove and swing arm boss when installing.

REAR WHEEL DISMANTLING/ASSEMBLY



⚠CAUTION

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

• CAUTION

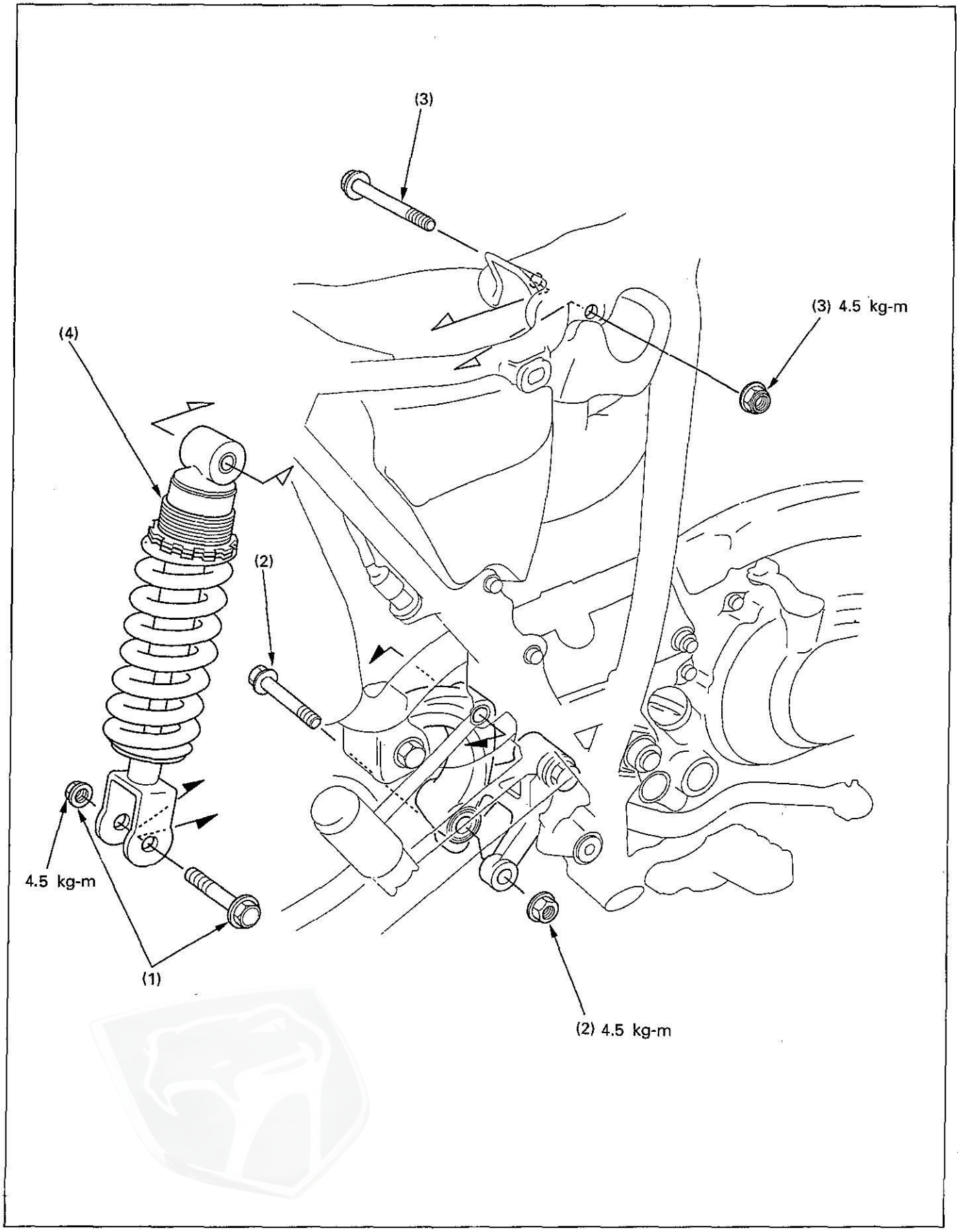
Wheel bearings must be replaced as a set.

Related Work

- Rear Wheel Removal/Installation (⇨12-2)

	WORK / PART NAME	NO.	NOTES
	Removal		Attachment is reverse order of removal.
(1)	Driven Sprocket Nut/Bolt	6/6	
(2)	Driven Sprocket	1	
(3)	Dust Seal	1	
(4)	Right Wheel Bearing (6203)	1	
(5)	Distance Collar	1	
(6)	Left Wheel Bearing (6203)	1	Attach first when installing.

REAR CUSHION REMOVAL AND INSTALLATION



⚠CAUTION

The damper unit contains nitrogen under pressure. Follow these rules in handling.
–Do not heat or dismantle the damper unit under any circumstances because it may explode or spray oil.
–Remove the gas from the damper unit before disposal. Location of hole (⇨1-10).
–Do not remove gas except when disposing of the cushion unit.

• CAUTION

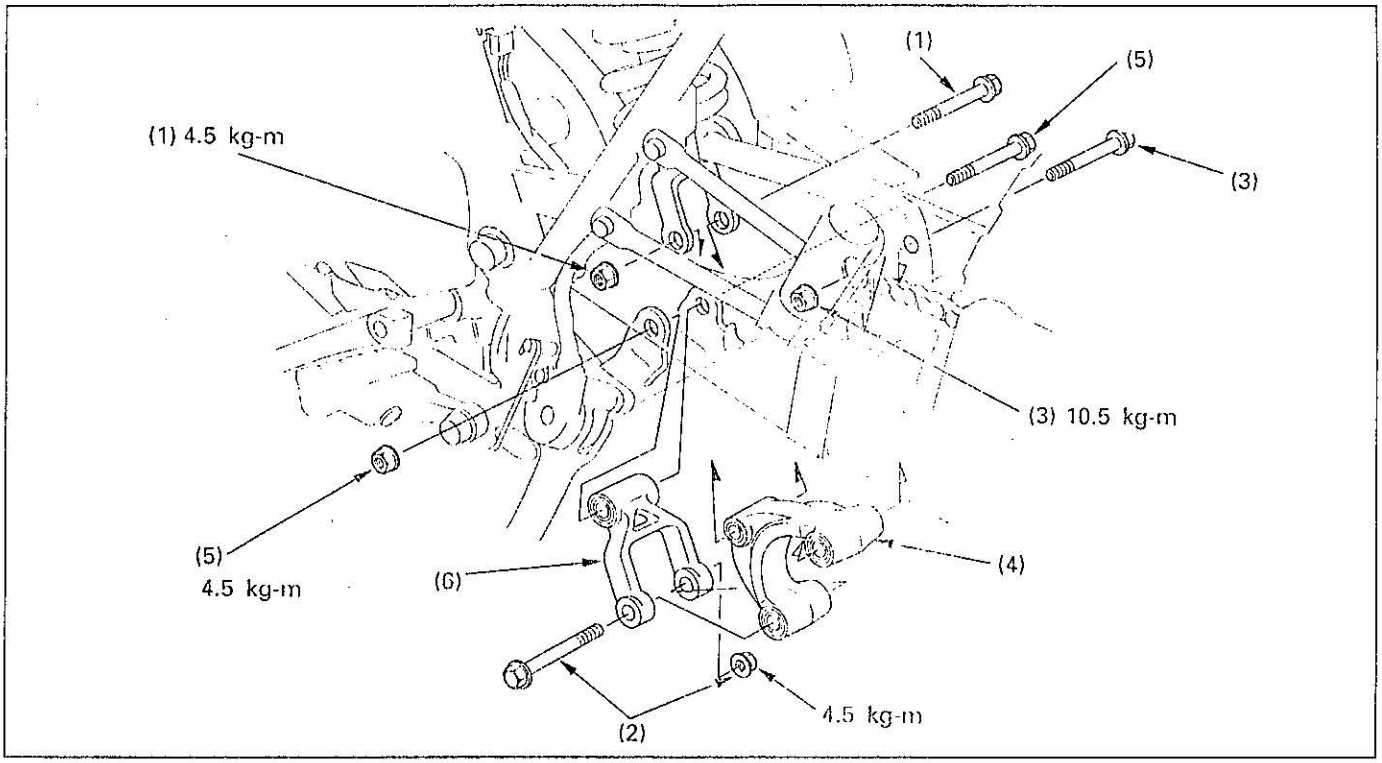
- Support frame adequately using jack, raise rear wheel before operating.
- Use genuine bolts and nuts for installing cushions.

Related Work

- Seat removal and installation (⇨3-3)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Rear Cushion Lower Bolt/Nut	1/1	
(2)	Cushion Conn. Rod Bolt/ Nut (Cushion Arm Side)	1/1	
(3)	Rear Cushion Upper Bolt/Nut	1/1	
(4)	Rear Cushion Assy.	1	

CUSHION LINKAGE REMOVAL AND INSTALLATION

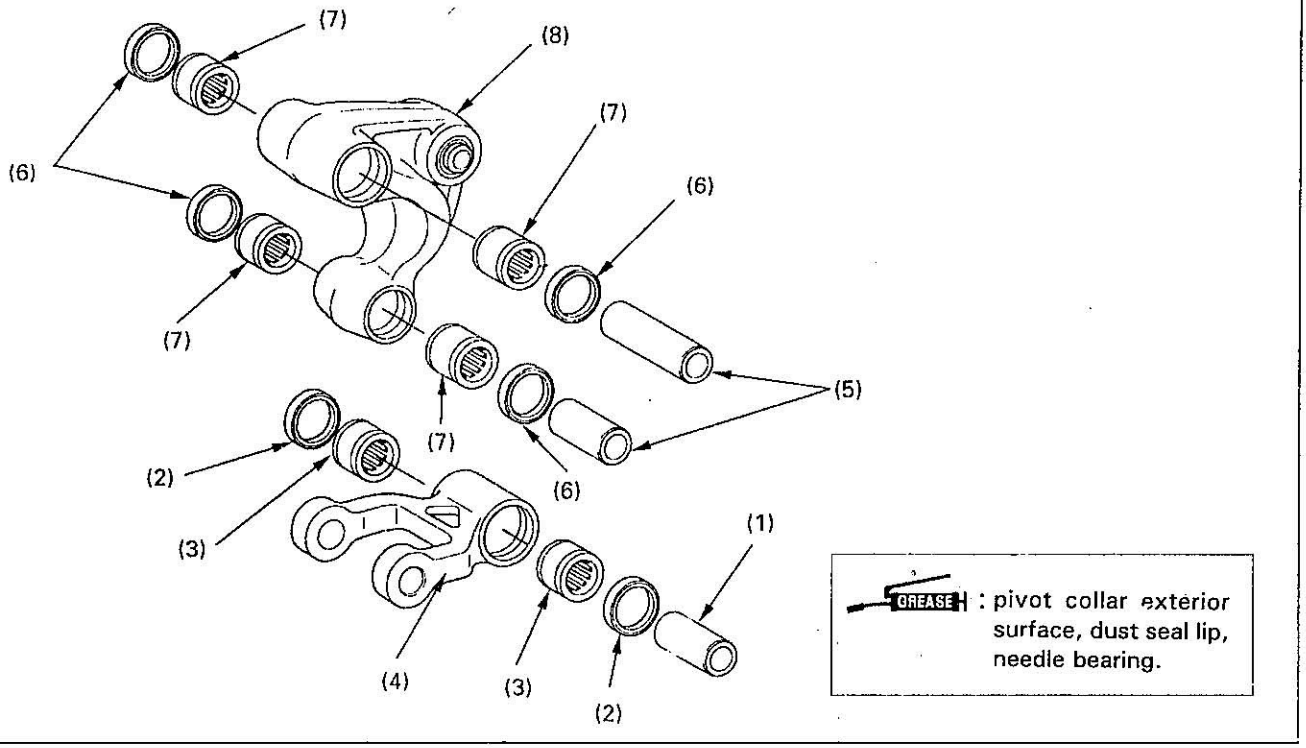


• CAUTION

- Support frame adequately using a jack, raise rear wheel before operating.
- Use genuine bolts and nuts for installing cushion linkage.

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse of removal.
(1)	Rear Cushion Lower Bolt/Nut	1/1	
(2)	Cushion Conn. Rod Bol/t Nut (Cushion Arm Side)	1/1	
(3)	Cushion Arm Bolt/ Nut (Swing Arm Side)	1/1	
(4)	Cushion Arm	1	
(5)	Cushion Conn. Rod Bolt/ Nut (Frame Side)	1/1	
(6)	Cushion Conn. Rod	1	

CUSHION LINKAGE DISMANTLING AND ASSEMBLY



• CAUTION

Apply grease to needle bearing, pivot collar and dust seal lip when assembling.

Related work

- Cushion Linkage Removal and Installation (⇨12-8)

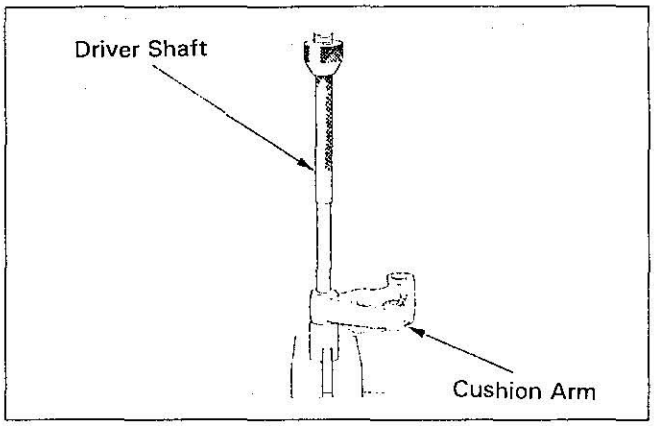
	WORK / PART NAME	NO.	NOTES
	Removal		Assembly is reverse of removal.
(1)	Cushion Control Pivot Collar	1	
(2)	Dust Seal	2	
(3)	Needle Bearing	2	Replacement (⇨12-11)
(4)	Cushion Conrod	1	
(5)	Cushion Arm Pivot Collar	2	
(6)	Dust Seal	4	
(7)	Needle Bearing	4	Replacement (⇨12-10)
(8)	Cushion Arm	1	

REPLACEMENT OF CUSHION ARM BEARING

Cushion Conn. Rod Side

Use hydraulic press to remove needle bearings.

Driver Shaft 07946-MJ00100



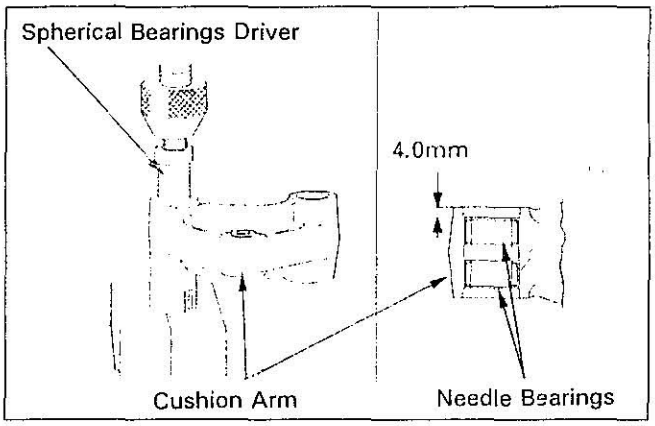
Insert new needle bearings into the specified depth.

Specified Depth: 4.0 mm

Spherical Bearing Driver 07946-KA30200

• CAUTION

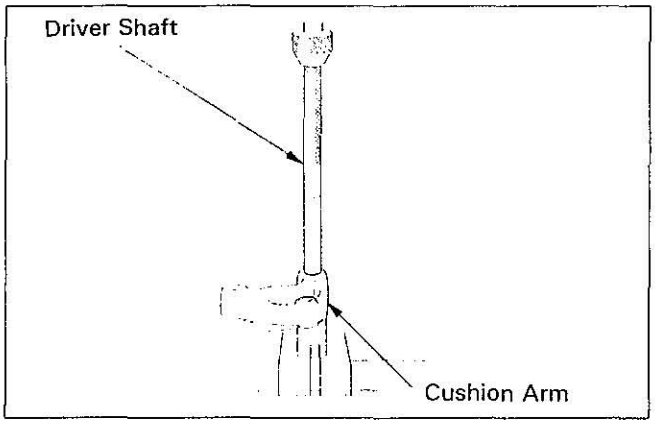
Insert the bearing by pushing on the side with markings.



Swing Arm Side

Use hydraulic press to remove needle bearings.

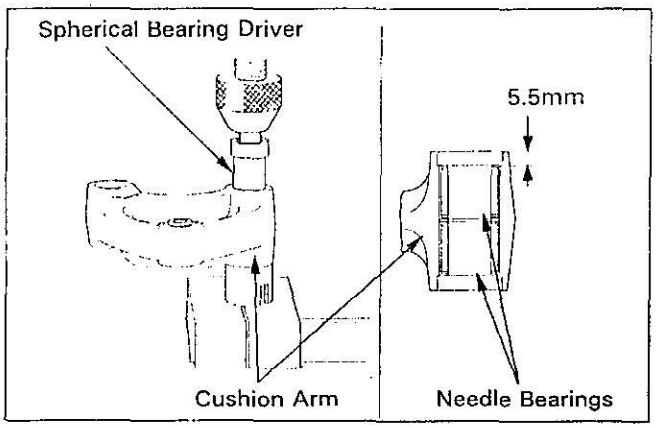
Driver Shaft 07946-MJ00100



Insert the new needle bearing into the specified depth.

Specified Depth: 5.5 mm

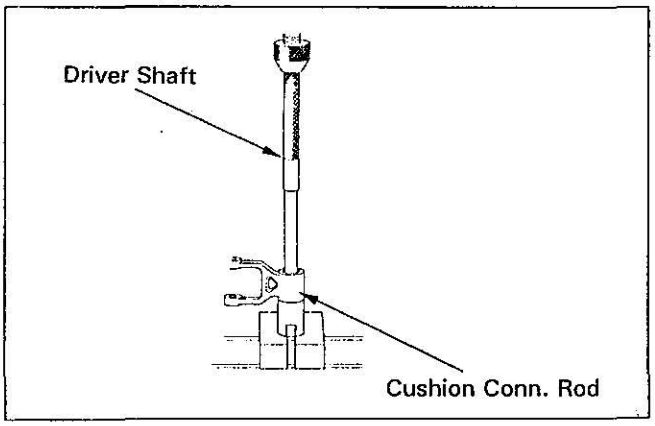
Spherical Bearing Driver 07946-KA30200



REPLACEMENT OF CUSHION CONN. ROD BEARING

Remove the needle bearings using a hydraulic press.

Driver Shaft **07946-MJ00100**



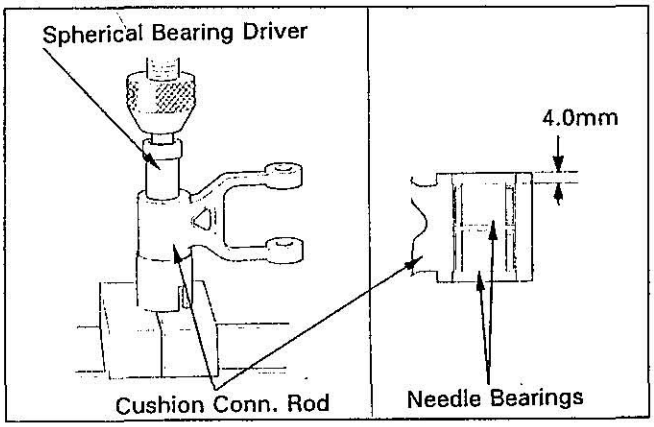
Insert new needle bearings into the specified depth.

Specified Depth: 4.0 mm

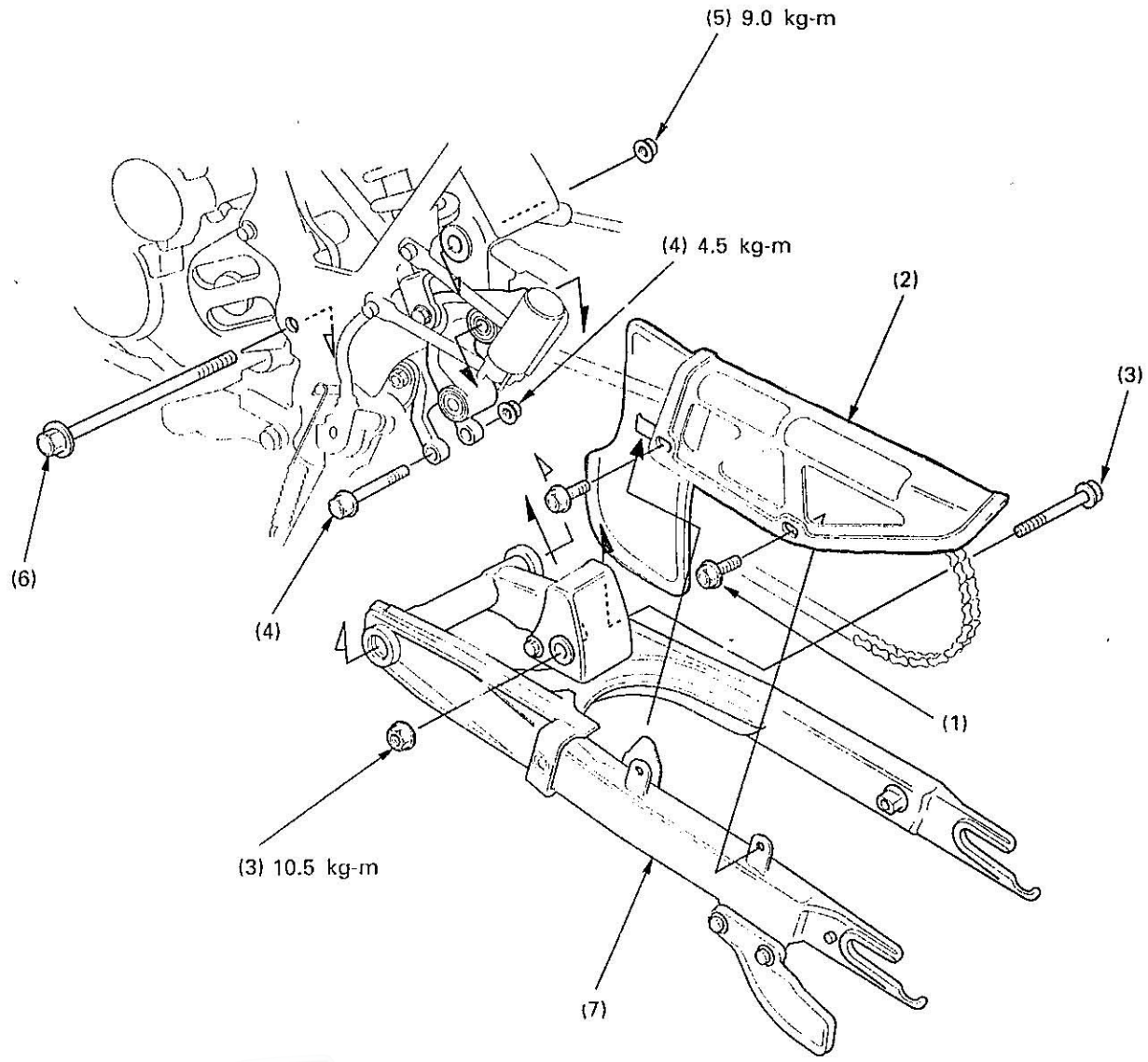
Spherical Bearing Driver **07946-KA30200**

• CAUTION

Push on the side with markings to insert bearings.



SWING ARM REMOVAL AND INSTALLATION



• CAUTION

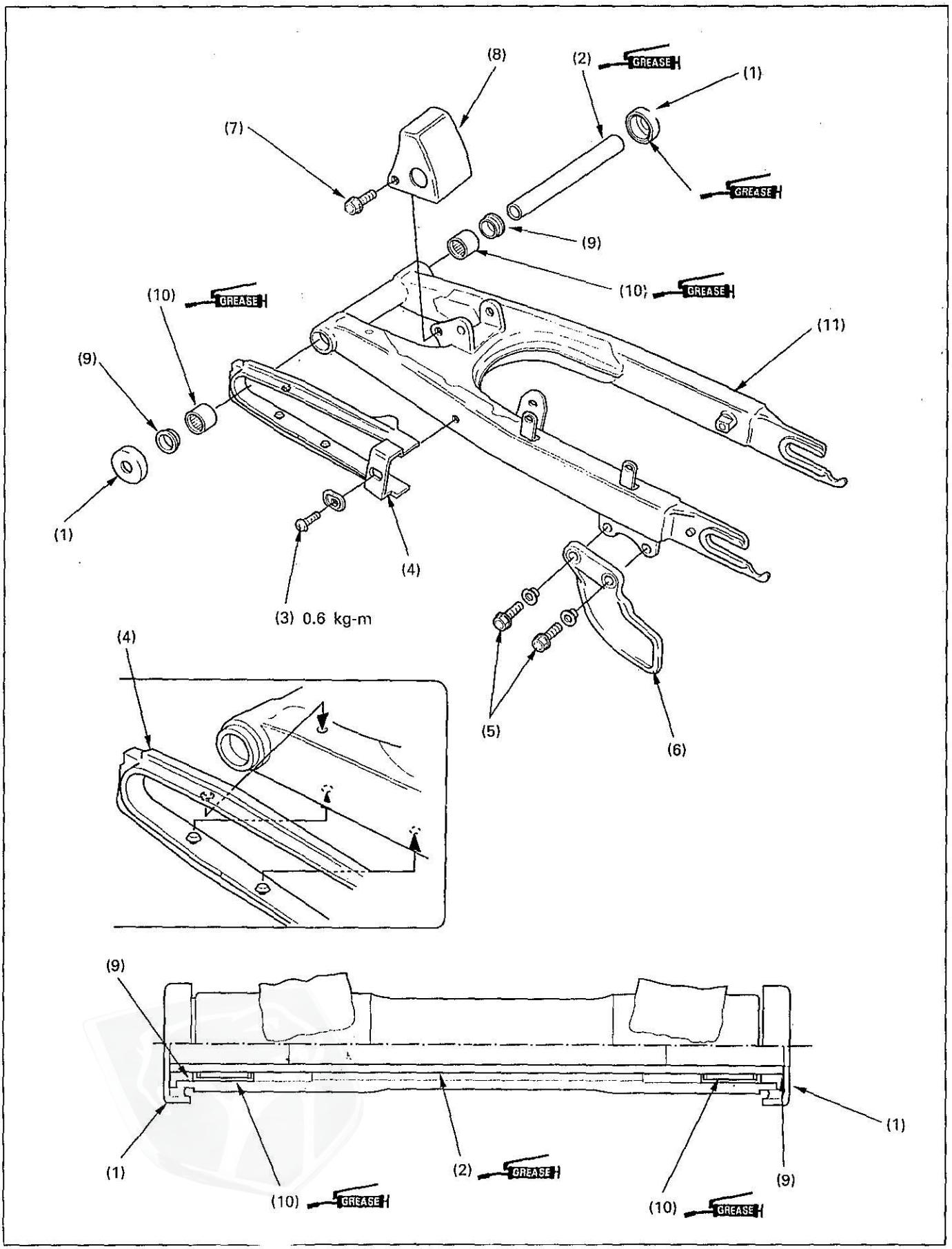
- Support frame adequately using the jack, raise rear wheel before operating.
- If swing arm is difficult to remove, loosen engine mount bolt near swing arm.

Related Work

- Rear Wheel Removal and Installation (⇨12-12)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Chain Cover Bolt	2	
(2)	Chain Cover	1	
(3)	Cushion Arm Bolt/ Nut (Swing Arm Side)	1/1	
(4)	Cushion Conn, Rod Bolt/ Nut (Cushion Arm Side)	1/1	
(5)	Swing Arm Pivot Nut	1	
(6)	Swing Arm Pivot Bolt	1	
(7)	Swing Arm Assy.	1	

SWING ARM DISMANTLING AND ASSEMBLY



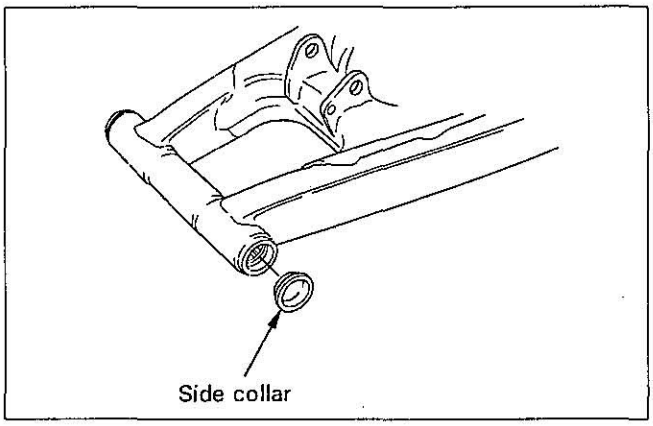
Related Work

- Swing arm removal and installation (⇨12-12)

	WORK / PART NAME	NO.	NOTES
	Dismantling	2	Assembly is reverse order of removal.
(1)	Dust Seal Cap	1	
(2)	Pivot Collar	1	
(3)	Chain Slider Screw	1	
(4)	Chain Slider	1	Align boss to swing arm hole during assembly.
(5)	Driven Sprocket Guard Plate Bolt	2	
(6)	Driven Sprocket Guard Plate	1	
(7)	Cushion Arm Cover Bolt	1	
(8)	Cushion Arm Cover	1	
(9)	Side Collar	2	
(10)	Needle bearing	2	Replacement (⇨12-16)
(11)	Swing Arm	1	

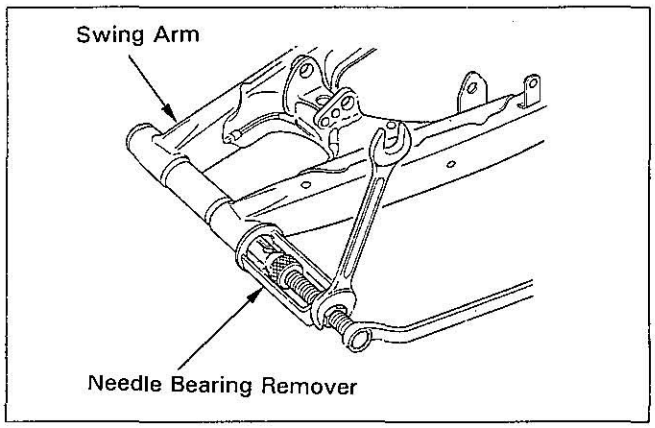
REPLACEMENT OF PIVOT BEARINGS

Remove side collar using a screwdriver or similar tool.



Attach special tool to swing arm, and remove needle bearings.

Needle Bearing Remover **07931-MA70000**

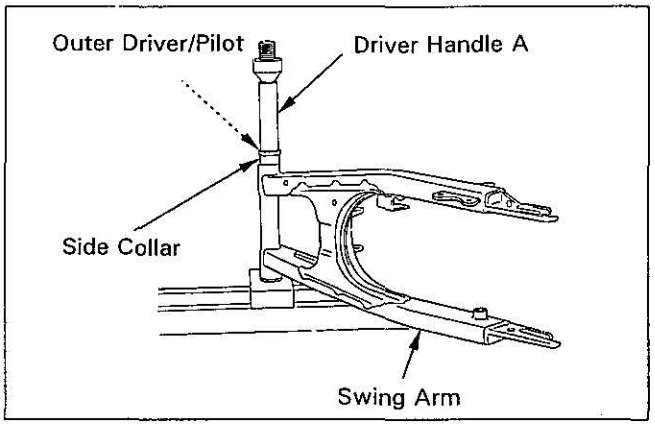


Insert new needle bearings and side collar until the side collar hits swing arm.

Outer Driver, 28 x 30 mm	**07946-1870100**
Pilot, 20 mm	**07746-0040500**
Driver Handle A	**07749-0010000**

• CAUTION

Press on the side with markings to insert bearings.



MEMO

13. BRAKING SYSTEM

SERVICE INFORMATION

⚠CAUTION

- Do not allow oil or oil products to come in contact with the disc and pad because this can reduce braking functions. In the event of such contact, replace pads and degrease brake disc.
- Do not allow oil or oil products to come in contact with the brake drum interior or lining surfaces. In the event of such contact, clean and degrease the brake drum, and replace brake shoe.

- When adding brake fluid, do not allow dirt or water to contaminate the reservoir.
- Do not use/mix various brands of brake fluids in order to pevent chemical reactions.
- Do not re-use brake fluid removed from the cylinder.
- The brake fluid can damage the paint finish, plastic and rubber surfaces. Do not allow brake fluid to corne in contact with parts.
- Do not re-use sealing washers.
- Clean parts removed using brake fluid, pass compressed air through port to check for clogging.
- Once the hydraulic system has been operated or it has been disassembled, the system must be bleed.
- Brake pad and shoe should be replaced as a set.

TROUBLESHOOTING

HYDRAULIC DISC BRAKE

Brake Does Not Function Properly
- Air in the hydraulic system
- Brake fluid deterioration due to moisture absorption
- Dirty brake pads and disc.
- Worn out master cylinder piston seal
- Worn out brake pad
- Contaminated caliper
- Caliper not sliding properly
- Uneven wear out of brake pad, disc
- Inadequate brake fluid
- Clogged brake fluid passage
- Warped, deformed brake disc
- Worn out, sticking caliper piston
- Worn out disc
- Contaminated master cylinder
- Bent brake lever

Brake Lever is Heavy, Does Not Return Easily
- Clogged/restricted brake system
- Sticking, worn out caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking, worn master cylinder piston
- Bent lever

Brake Drag
- Dirty brake pad, disc
- Misaligned wheels
- Uneven wear of brake pad, disc
- Warped, deformed brake disc
- Caliper not sliding properly
- Clogged dirt in hydraulic system

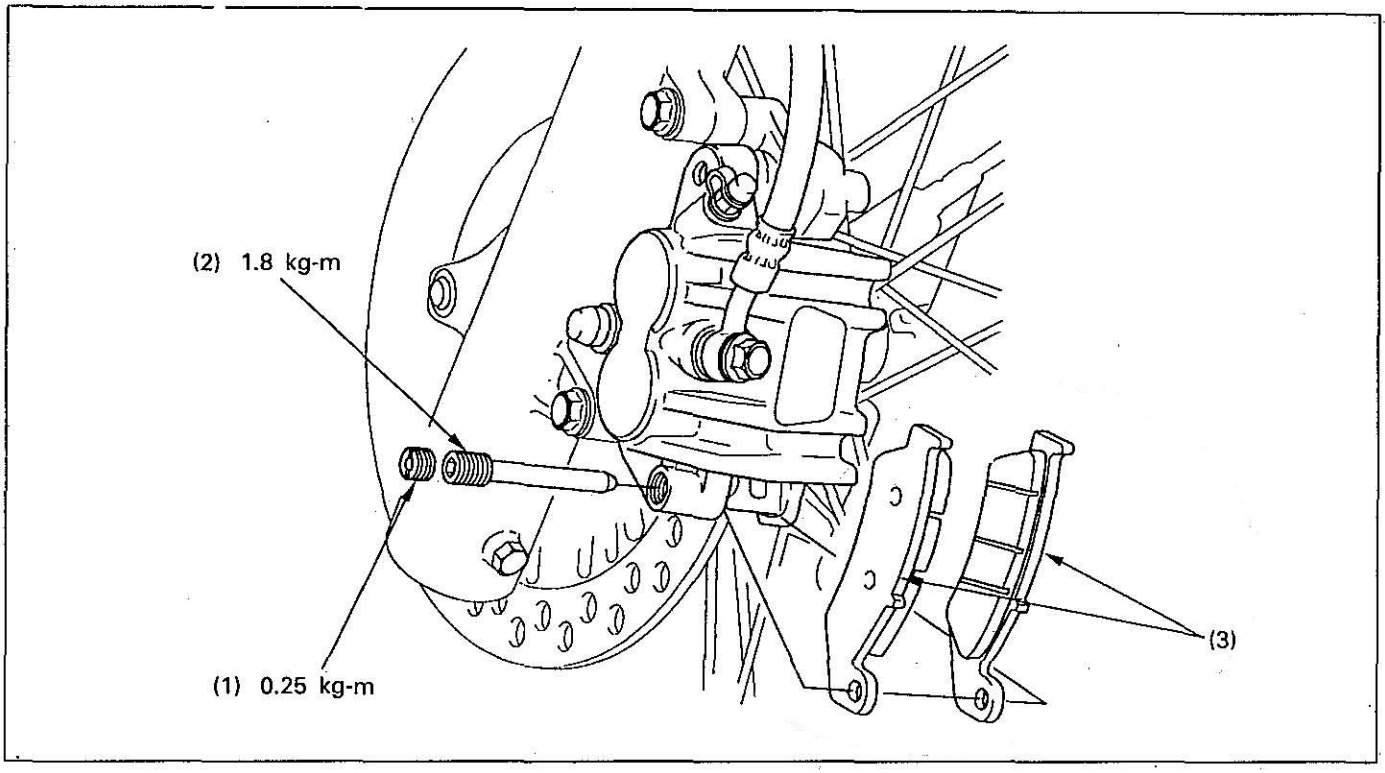
DRUM BRAKE

Brake does Not Function Properly
- Improper brake adjustment
- Worn out brake lining
- Worn out brake drum
- Worn out brake cam
- Defective installation of brake shoe
- Uneven wear out of brake lining
- Dirty brake lining
- Dirty brake drum
- Brake shoes worn at cam contact area
- Brake arm serrations improperly engage

Brake Pedal Does Not Return Easily
- Weak or broken return spring
- Improper brake adjustment
- Sticking caused by dirt in brake drum
- Brake shoes worn at cam contact area
- Sticking caused by dirt in brake lining
- Worn out, stuck brake cam
- Defective installation of brake shoe

Abnormal Noise From Brakes
- Defective brake lining
- Worn out brake drum
- Uneven wear out of brake lining
- Dirty brake lining
- Dirty brake drum

REPLACEMENT OF FRONT BRAKE PAD



⚠ CAUTION

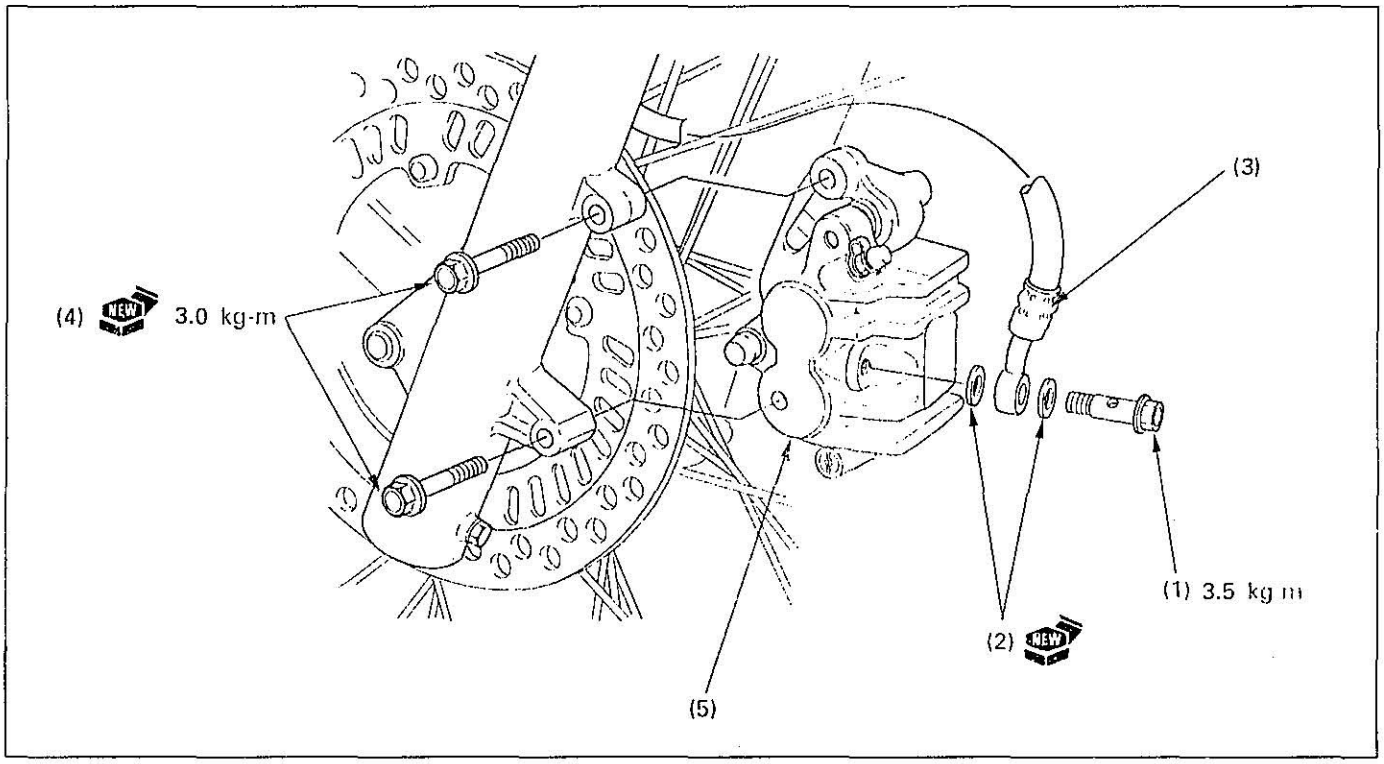
A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality degreasing agent.

• CAUTION

- Brake pads must be replaced as a set.
- Do not operate brake lever while replacing brake pads.
- After replacing, operate brake lever to push out pads.

	WORK / PART NAME	NO.	NOTES
	Removal	1	Installation is reverse of removal.
(1)	Pad Pin Plug		
(2)	Pad Pin	1	• Before removing, use pad to push the pistons into the caliper. • When installing, attach with the pad spring pushing against the pad.
(3)	Brake Pad	2	Before installing, make sure that the pad spring is firmly installed in position.

FRONT BRAKE CALIPER REMOVAL AND INSTALLATION



⚠ CAUTION

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

• CAUTION

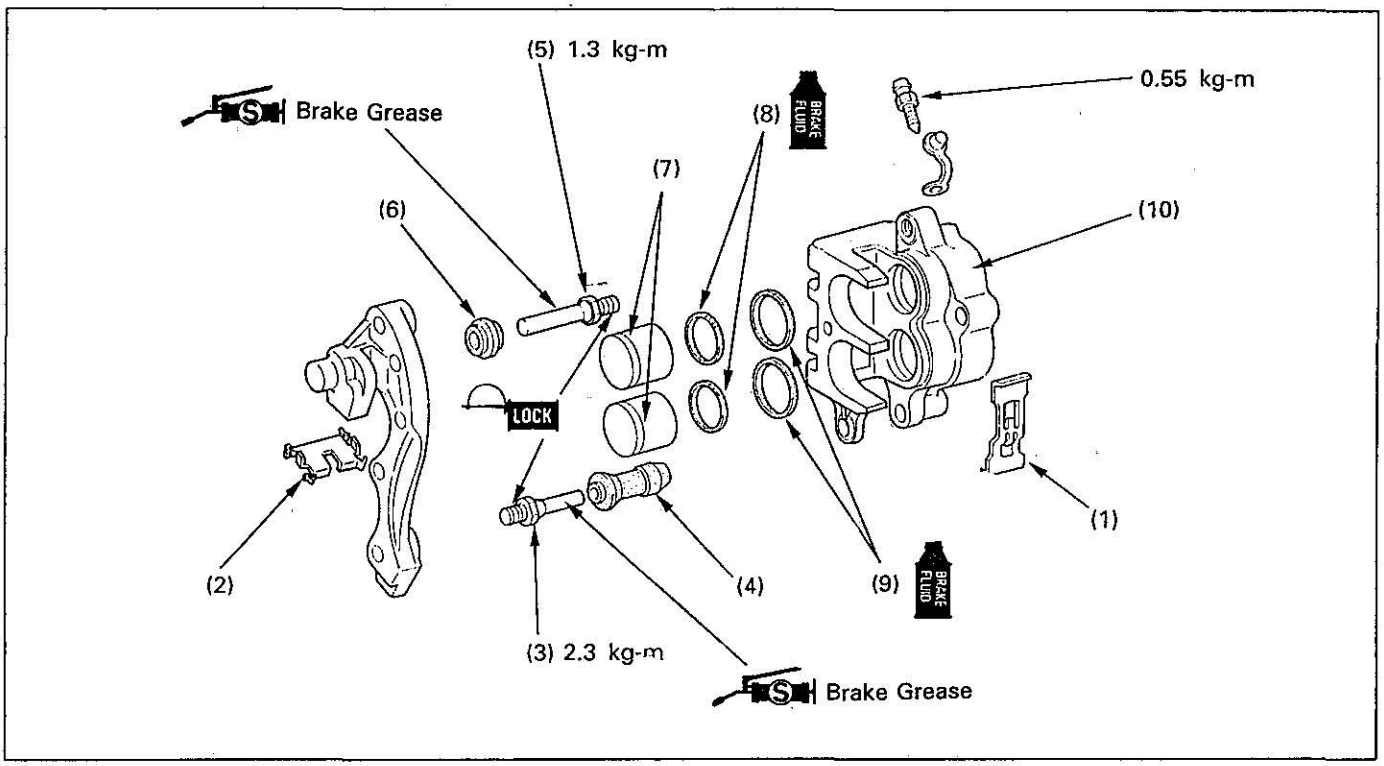
When removing the caliper piston, remove first the brake pad, then push out the the caliper piston using the lever before draining the brake fluid.

Related Work

- Front Brake Pad Removal and Installation (⇨13-3)
- Brake Fluid Replacement/Air Bleeding

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Oil Bolt	1	When installing insert brake hose into caliper hose stopper, then tighten bolt.
(2)	Sealing Washer	2	
(3)	Brake Hose Eyelet Joint	1	
(4)	Caliper Bolt	2	
(5)	Brake Caliper Assy.	1	

FRONT BRAKE CALIPER DISMANTLING AND ASSEMBLY

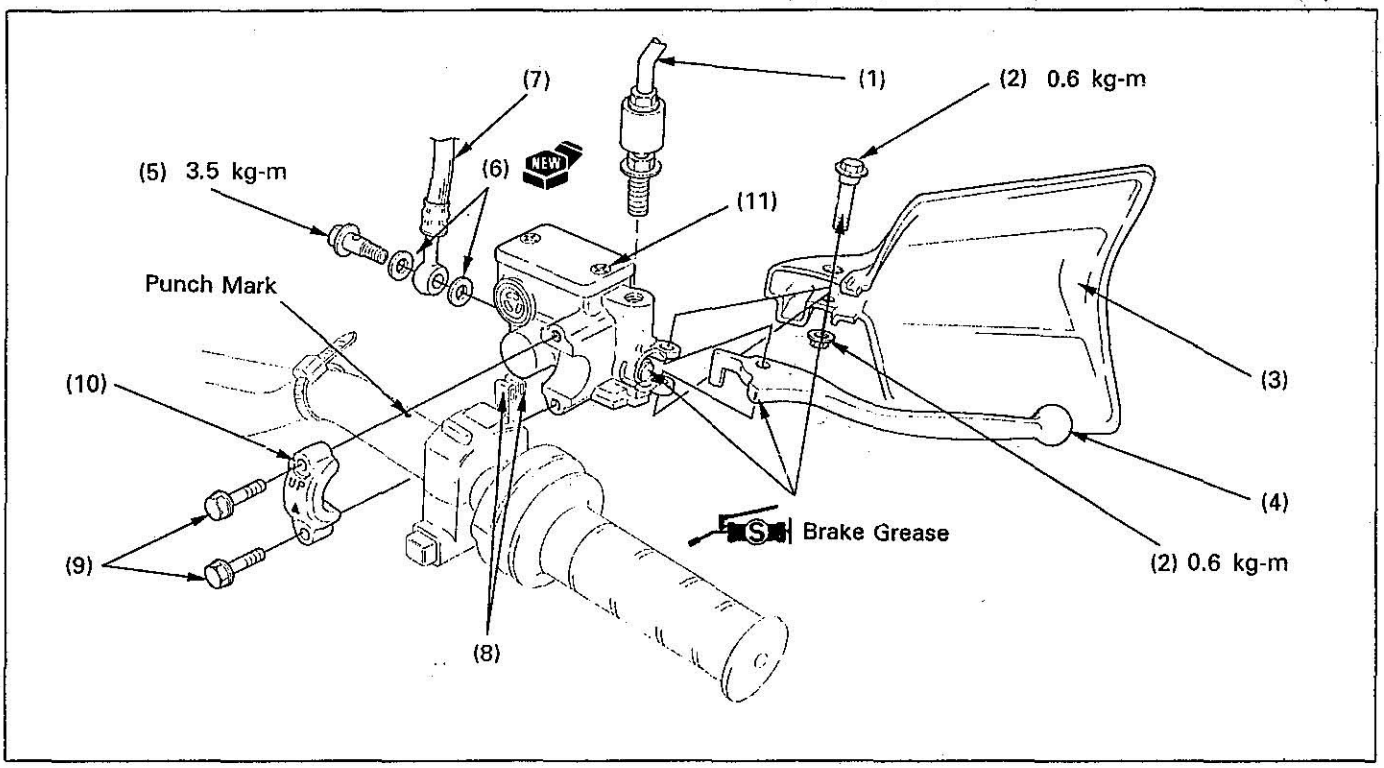


Related Work

- Front Brake Caliper Removal and Installation (⇨13-4)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order of removal.
(1)	Pad Spring	1	
(2)	Pad Retainer	1	
(3)	Bracket Pin Bolt	1	Do not remove unless necessary.
(4)	Bracket Pin Bolt Boots	1	
(5)	Caliper Pin Bolt	1	Do not remove unless necessary.
(6)	Caliper Pin Bolt Boots	1	
(7)	Caliper Piston	2	
(8)	Dust Seal	2	⚠CAUTION
(9)	Piston Seal	2	• Do not scratch caliper cylinder interior. • DO NOT re-use.
(10)	Caliper Body	1	

FRONT MASTER CYLINDER REMOVAL AND INSTALLATION

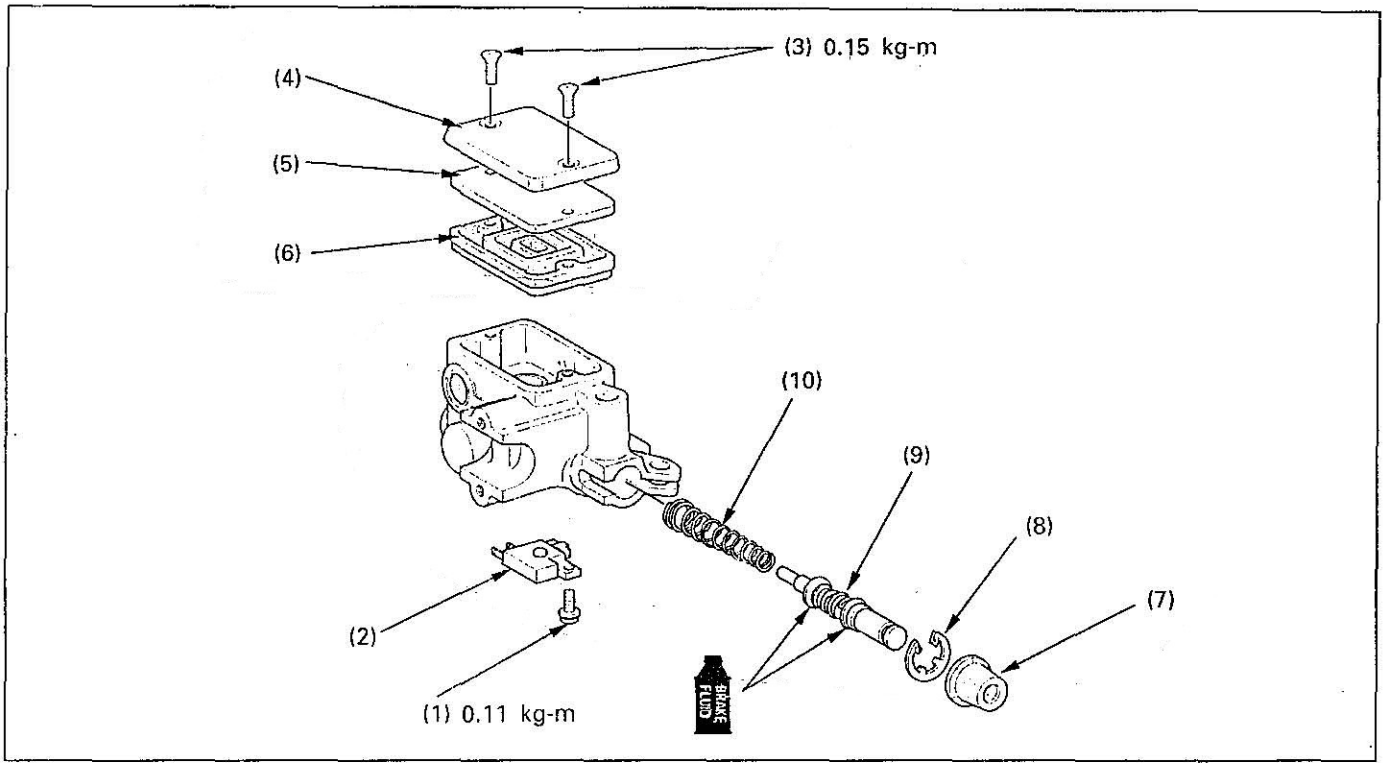


Related Work

- Brake Fluid Replacement/Air Removal (⇨Chapter 13 of Common Manual)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse of removal.
(1)	Right Rear View Mirror	1	
(2)	Brake Lever Pivot Bolt/Nut	1/1	
(3)	Knuckle Guard	1	
(4)	Brake Lever	1	
(5)	Oil Bolt	1	
(6)	Sealing Washer	2	
(7)	Brake Hose	1	
(8)	Front Stoplight Switch Connector	2	
(9)	Master Cylinder Holder Bolt	2	Attach upper side bolt first when installing.
(10)	Master Cylinder Holder	1	Face "UP" mark when installing.
(11)	Master Cylinder Assy.	1	Align surface to handle bar punch mark when installing.

FRONT MASTER CYLINDER DISMANTLING AND ASSEMBLY



• CAUTION

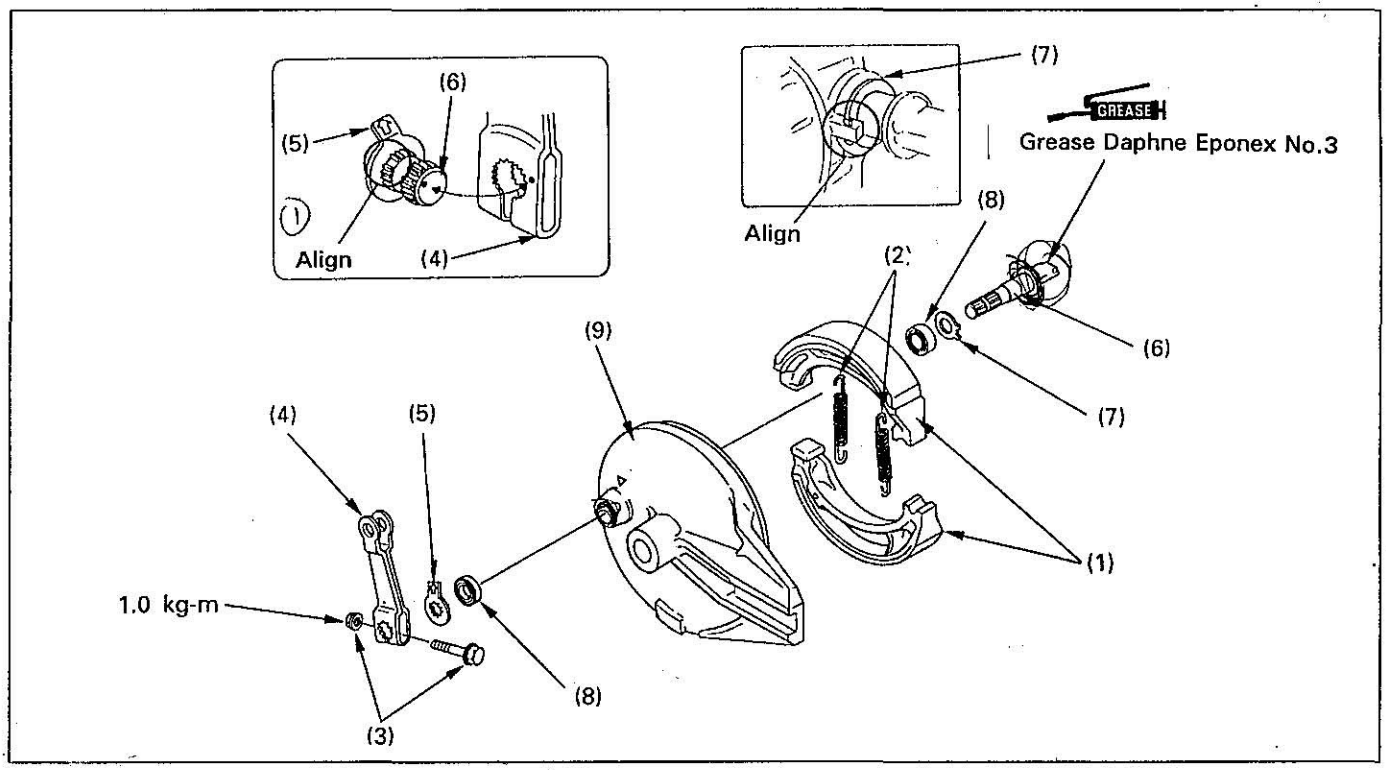
- Replace piston, spring, snap ring, and rubber boots as a set.
- Attach piston and spring as one set inside master cylinder.

Related Work

- Front Master Cylinder Removal and Installation (⇨13-6)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse of dismantling.
(1)	Front Stoplight Switch Screw	1	
(2)	Front Stoplight Switch	1	
(3)	Master Cylinder Cover Screw	2	
(4)	Master Cylinder Cover	1	
(5)	Diaphragm Plate	1	
(6)	Diaphragm	1	
(7)	Rubber Boots	1	
(8)	Snap Ring	1	⚠CAUTION Be careful of parts that may fly out.
(9)	Master Piston Assy.	1	
(10)	Spring	1	Face smaller coil to master piston, then attach.

REAR BRAKE PANEL DISMANTLING AND ASSEMBLY



⚠CAUTION

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

•CAUTION

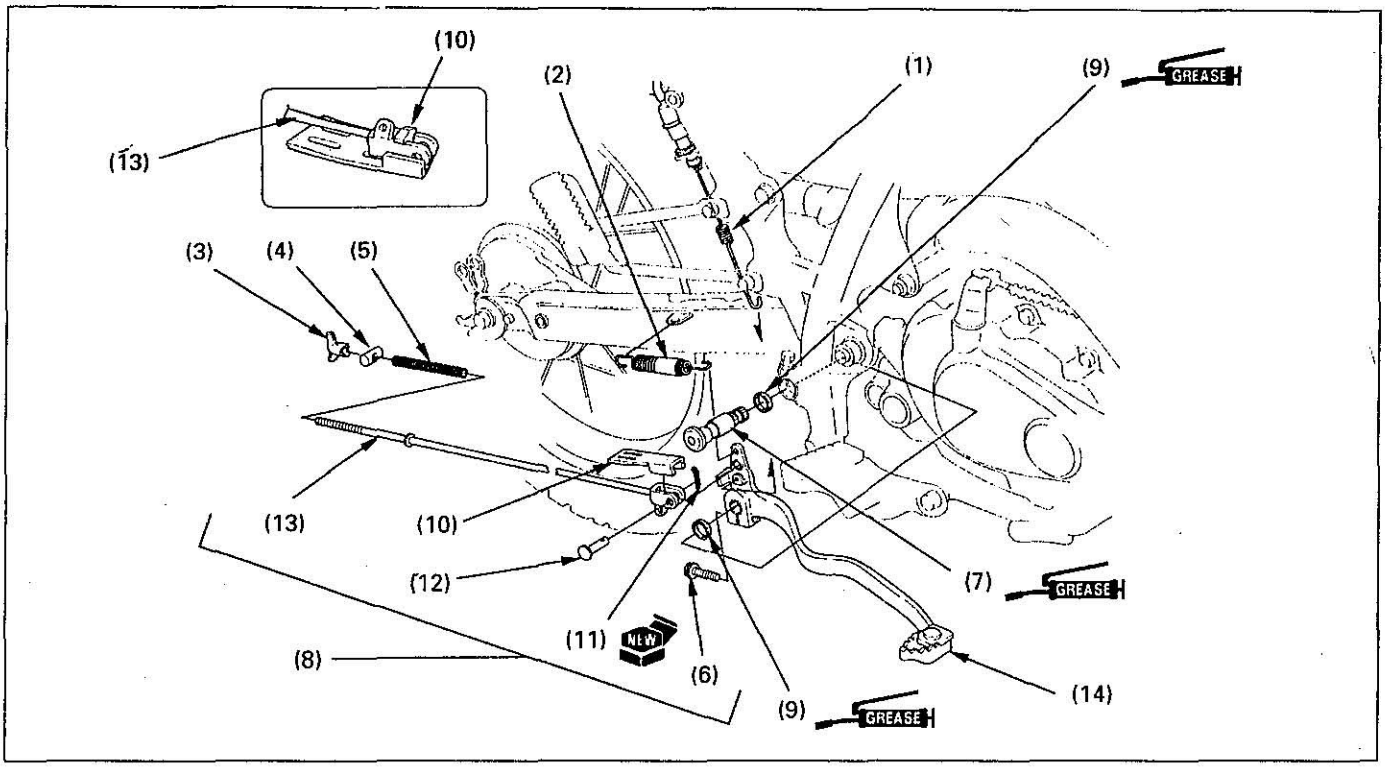
Brake shoes must be replaced as a set.

Related Work

- Rear wheel removal and installation (⇨12-2)

	WORK / PART NAME	NO.	NOTES
	Dismatling		Assembly is reverse of dismantling.
(1)	Brake Shoe	2	
(2)	Brake Shoe Spring	2	
(3)	Brake Arm Bolt/Nut	1/1	
(4)	Brake Arm	1	Align arm punch mark with brake cam punch mark when installing.
(5)	Wear Indicator Plate	1	Align the wide notch of the plate with the wide groove of the brake cam.
(6)	Brake Cam	1	
(7)	Brake Cam Plate	1	Match plate boss with brake panel boss when installing.
(8)	Dust Seal	2	
(9)	Brake Panel	1	

BRAKE PEDAL REMOVAL AND INSTALLATION



• CAUTION

Adjust brake pedal height after installation.

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Rear Stoplight Switch Spring	1	
(2)	Rear Brake Return Spring	1	
(3)	Brake Adjuster	1	
(4)	Brake Arm Pin	1	
(5)	Spring	1	
(6)	Brake Pedal Bolt	1	
(7)	Brake Pedal Pivot	1	
(8)	Brake Pedal Assy.	1	
(9)	Dust Seal	2	
	Dismantling		Assembly is reverse order of dismantling.
(10)	Dust Cover	1	Attach securely to brake rod groove during assembly.
(11)	Cotter Pin	1	
(12)	Brake Rod Joint	1	
(13)	Brake Rod	1	
(14)	Brake Pedal	1	

MEMO

14. ELECTRICAL SYSTEM, AC GENERATOR

SERVICE INFORMATION

⚠CAUTION

- In case of overcharging hydrogen gas maybe generated. Keep away from fire and sparks.
- Battery contains poisonous substance which is sulfuric acid. Contact with clothing, skin and eyes may cause severe burns or blindness. Wash away plenty of water in case of contact. If liquid gets in contact with eyes, wash away plenty of water, and call a physician immediately. In case the liquid gets in contact with clothing, take clothing off immediately and wash off the battery liquid.

⚠CAUTION

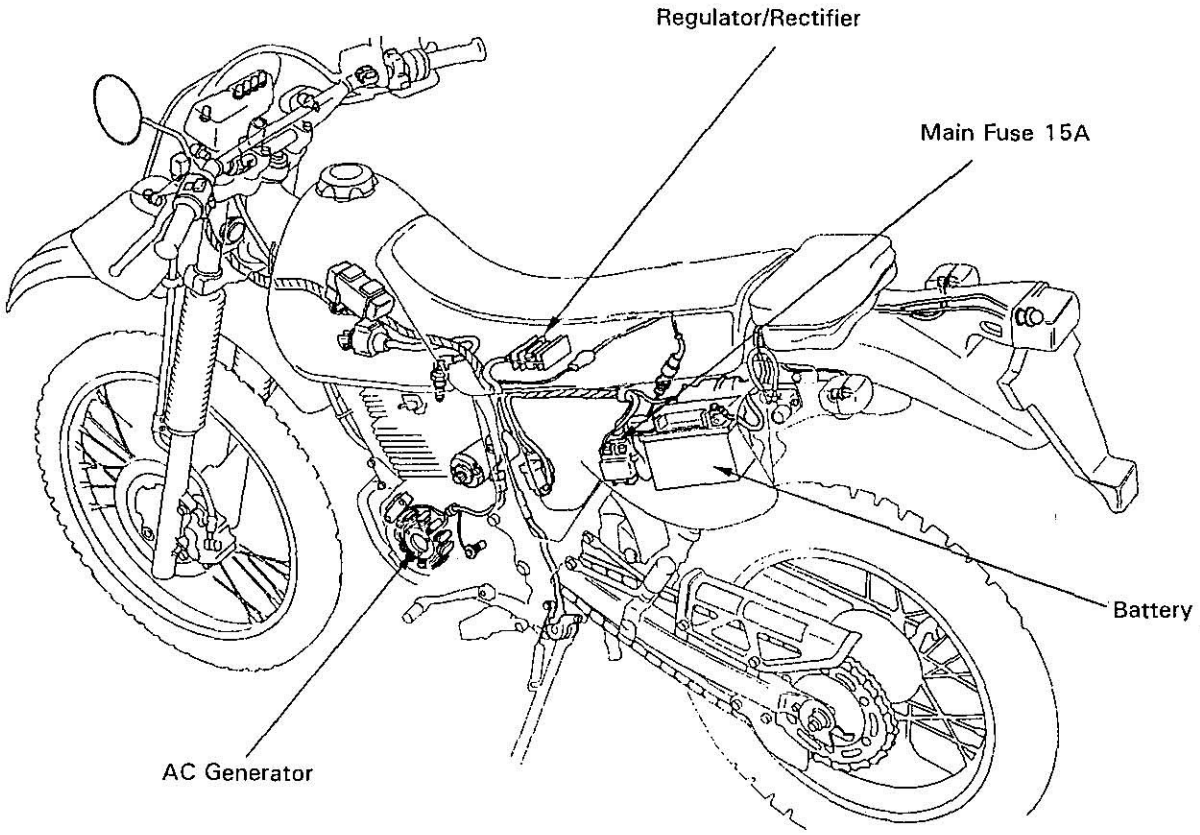
- When electrical current is running in the electrical system, and terminal and coupler ON/OFF is done, excess current may occur which can damage the regulator/rectifier as well as other electronic components.
- This vehicle use maintenance-free (MF) battery. MF and conventional batteries have different recharging characteristics and are NOT INTERCHANGEABLE.
- During battery recharging, remove battery from the frame. Do not remove battery caps.

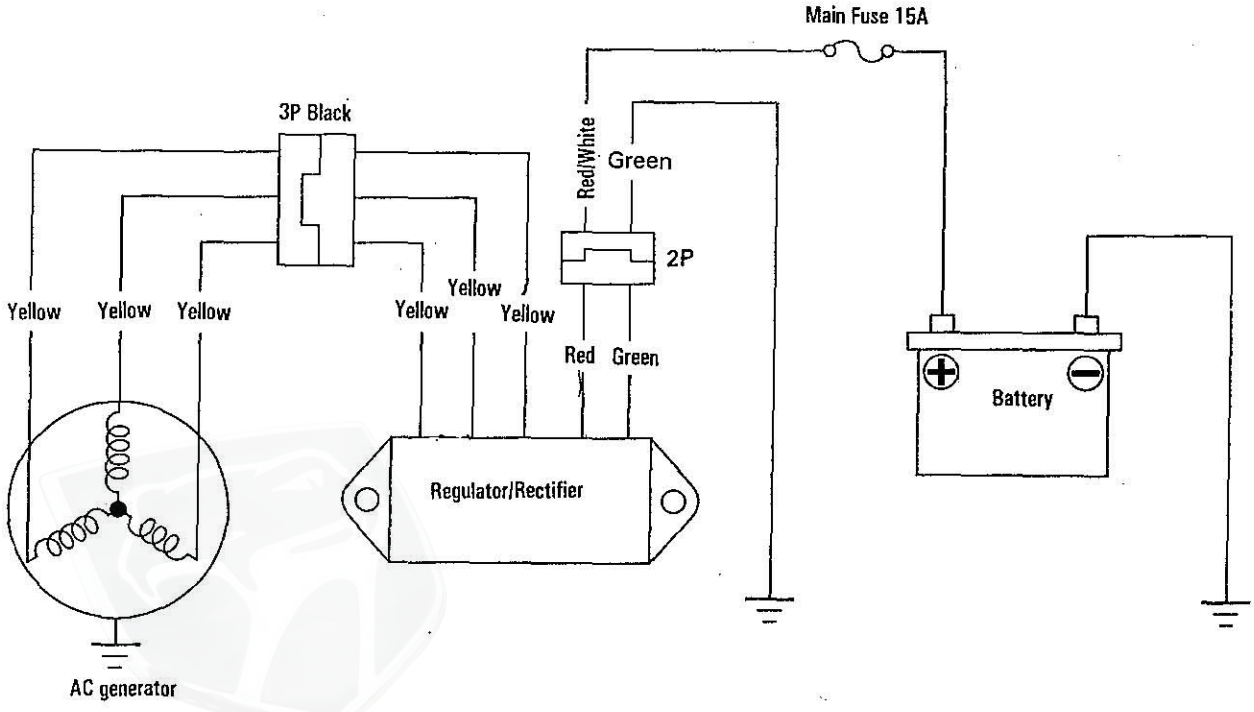
• CAUTION

Replace MF battery when it reaches its maximum service life.

- Turn the main switch off before disconnecting electrical components.
- When the machine will not be use for a long period of time disconnect the negative cable.
- Accelerated recharging is for emergency situations only. This can shorten the battery's useful life.
- If cycles of complete discharge and full recharge are repeated, or if battery is allowed to discharge continously, the battery may be damaged, shortening its useful life and lowering its effectiveness. Even with normal use, battery performance will deteriorates in 2-3 yèars. Battery which has already lost effectiveness may still be recharged, but under heavy load, battery voltage will drop quickly and eventually die out..
- Battery overcharge often results from problems of battery itself. If one of the battery cell is shorted and battery voltage does not increase, the regulator/rectifier supplies·excess voltage to the battery. Under these condition, the electrolyte level will experience faster liquid loss.
- Battery will self-discharge if stored for long period. Make sure to recharge stored batteries every three months.
- Depending on storage conditions, it is sometimes not enough to simply add battery liquid for the new MF battery to function. Under the following conditions, recharge the battery after adding battery liquid.
  –Ten mins. after adding battery liquid, voltage is below 12.4V: conduct normal recharging until battery voltage reaches 12.8V.
  –If battery liquid temperature is below 0 °C, recharge for 2-3 hours under standard recharging current.
- Conduct checking of electrical system following the steps shown in the troubleshooting (⇨14-3).
- Refer to illustration on 14-2 for location of electrical system component parts.

LOCATION OF ELECTRICAL SYSTEM COMPONENTS





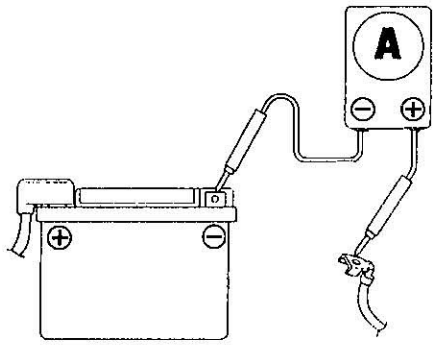
TROUBLESHOOTING

• CAUTION

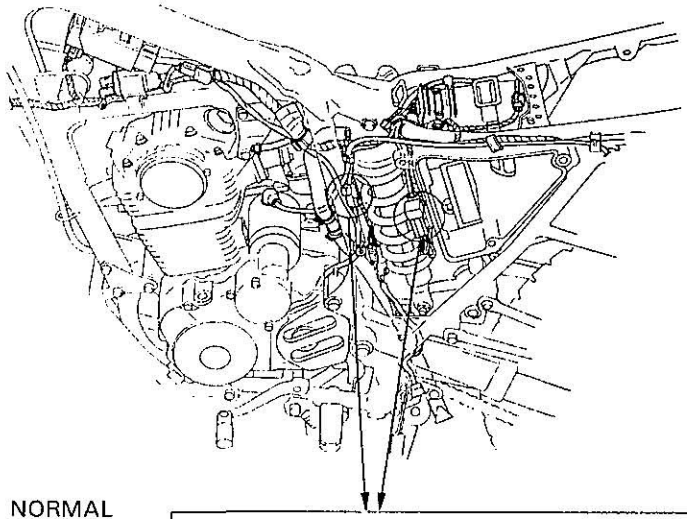
Battery overcharging can cause regulator/rectifier defect.

Defective Charging (Battery Discharge)

Measure battery leak current. (⇨14-6)

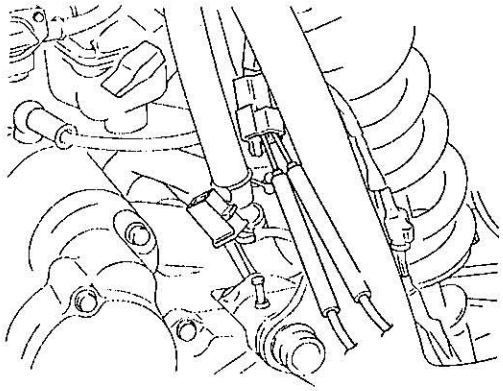


Standard Value: 0 mA or below



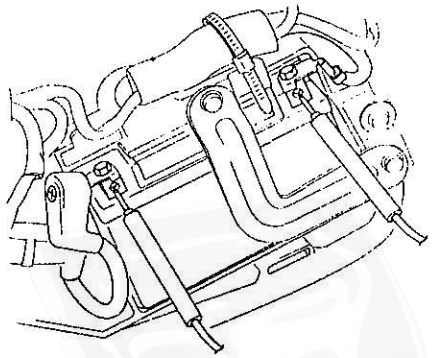
NORMAL →

Check the regulator/rectifier unit. (⇨17-4)



NORMAL ↓

Start engine, and measure electic current between the terminals (⇨14-6)



Standard Value: 14-14V/5,000rpm

NORMAL →

- Battery defect, battery useful life is over

ABNORMAL ↓

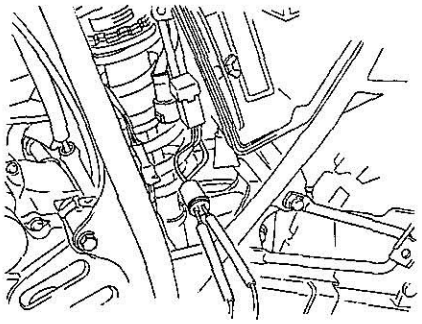
ABNORMAL ↓

- Defective regulator/rectifier

NORMAL ↓

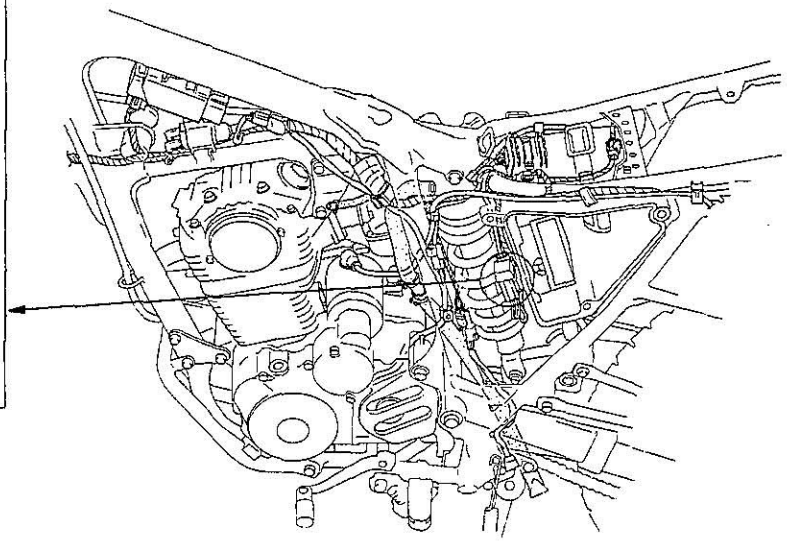
- Shorted harness
- Defective main switch

Turn main switch ON.
Measure electrical voltage of battery line to regulator/rectifier coupler.



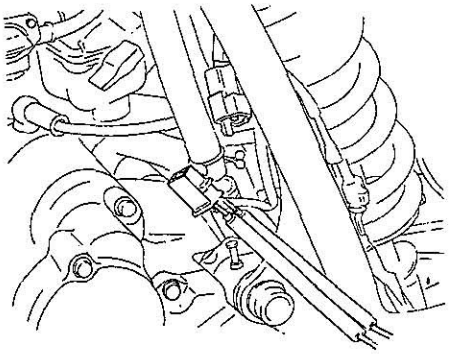
Terminal connection: red white (+) green (-)
Standard value: battery voltage

ABNORMAL →
- Shorted wire harness
- Defective connection in coupler



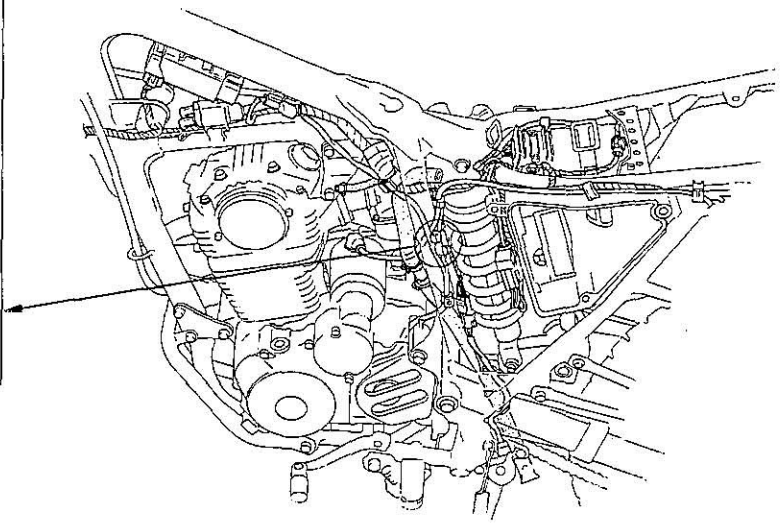
NORMAL ↓

Check resistance at AC generator. (⇨14-10)



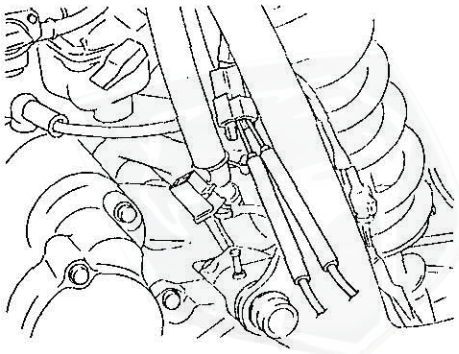
Terminal connection: yellow to yellow
Standard value: 0.1 to 1.0 Ω (20 °C)

ABNORMAL →
- Defective AC generator



NORMAL ↓

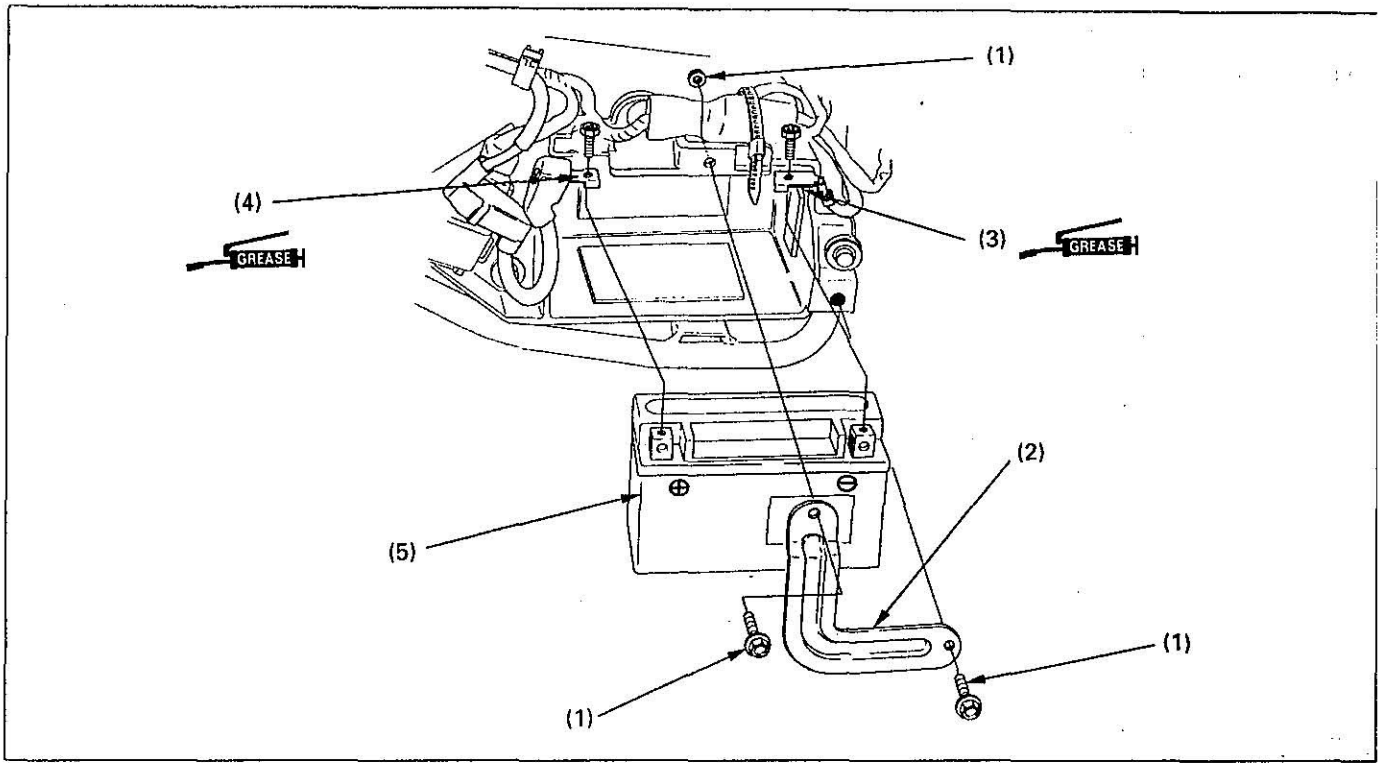
Check regulator/rectifier unit. (⇨14-7)



ABNORMAL →
- Defective/regulator/rectifier

NORMAL →
- Battery life span is over

BATTERY REMOVAL AND INSTALLATION



⚠ CAUTION

Battery contains poisonous substance which is sulfuric acid. Contact with clothing, skin and eyes may cause severe burns or blindness. Wash away plenty of water in case of contact. If liquid gets in contact with eyes, wash away plenty of water, and call a physician immediately. In case the liquid gets in contact with clothing, take clothing off immediately and wash off the battery liquid.

• CAUTION

Always turn off the ignition switch before disconnecting any electrical components.

Related Work

- Side Cover Removal and Installation (⇨2-2)

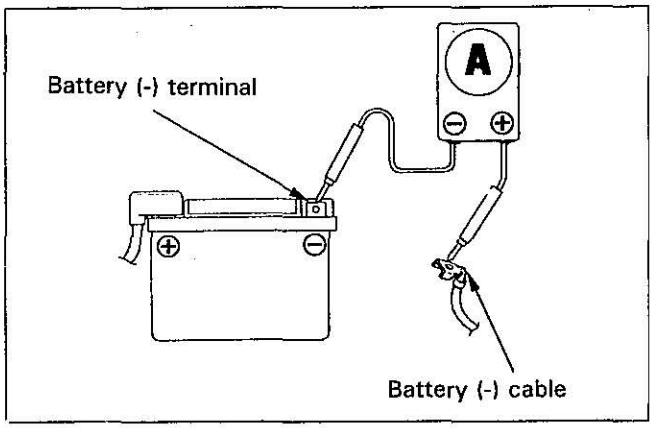
	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Battery Holder Bolt/Nut	2/2	
(2)	Battery Holder	1	
(3)	Battery (-) Cable	1	Apply clean grease to terminals after installation.
(4)	Battery (+) Cable	1	
(5)	Battery	1	

CHECKING THE ELECTRICAL SYSTEM

LEAK TEST

Turn main switch off, disconnect (-) cable from battery;
Connect ammeter to battery (-) terminal and (-) cable.

With the ignition switch off, check for current leakage.



⚠CAUTION

- If the measured current is above the specified range, tester fuse may be shorted. Meaure by switching from large to small range.
- While measuring current, DO NOT turn the ignition switch on. If the tester is set in mA or small range and large current comes in, the tester fuse may short.

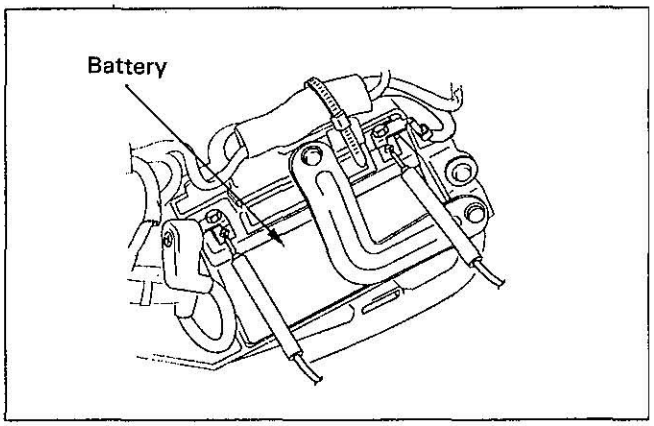
Leak Current: below 0 mA

If the leak current is greater than the standard value, it is possible that there is a short in the circuit.
Look for the shorted area by disconnecting from the coupler and connector while continuously measuring the current.

Checking Recharging Condition

• CAUTION

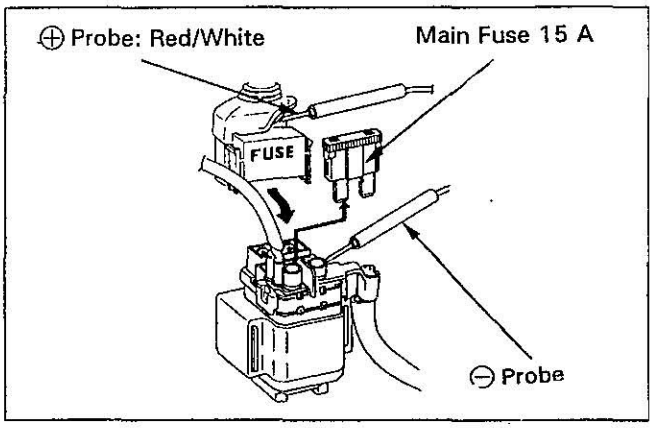
Be sure the battery is in good condition before performing this test. Required voltage should be more than 13 V.



Warm up engine.
Install a fully-charged battery.
Connect digital circuit tester between battery terminals.
Remove starter relay switch coupler, remove main fuse.
Attach coupler to switch.
Connect ammeter following the illustration.

⚠CAUTION

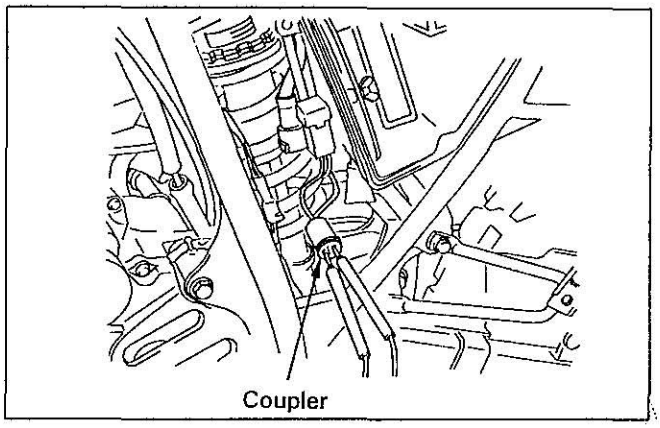
- Make sure that you do not short the circuit during measurement.
- Current may aslo be measured by connecting ammeter to battery terminal and (+) cord but when started using self-starter, large current will damage the tester.
- Always turn the main switch off before any operation. If tester or circuit OFF/ON is done while there is current in the circuit, excess current may be discharged causing damage to the tester and other electrical components.



Start engine, turn headlight to hi-beam
Slowly turn engine revolution UP, then measure recharging electrical pressure and current at the specified rpm.

Operating Voltage/Current: 14.0-14.8V/0.0.5.A (5,000rpm)

REGULATOR/RECTIFIER



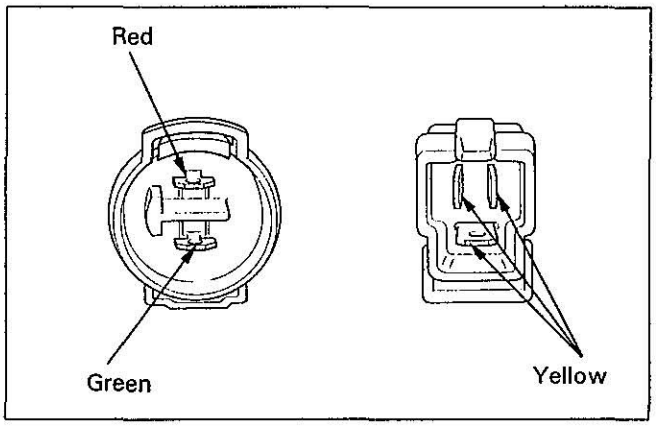
SYSTEM CHECK

Remove Seat (⇨2-3)

Remove connection for regulator/rectifier 2P, 3P coupler. Conduct the following tests on the harness side terminal of the regulator/rectifier.

Item	Judgement
Battery line (red/white)	Battery current between red/white (+) and green (-).
Ground line (green)	Theres is continuity between green and body ground line.
Charging coil line (yellow)	There is resistance of 0.1 - 1.0 Ω (20 °C)

If all checks on the harness side are normal, check the connection of the regulator/rectifier coupler. If all is normal, check the regulator/rectifier unit itself for defects.



CHECKING THE REGULATOR/RECTIFIER UNIT

Remove regulator/rectifier unit

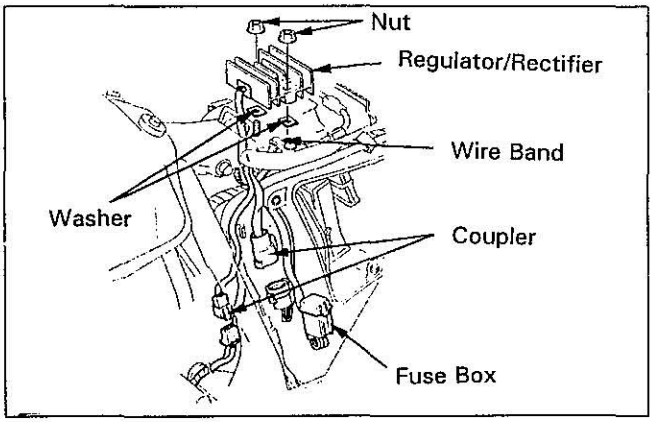
• CAUTION

- Do not touch the metal part of the tester probe while testing. Touching may indicate resistance from your body.
- Use the following specified testers. Use of other than specified testers may cause display of abnormal resistance values, making it difficult to conduct testing properly.
  –Sanwa Genuine Tester (07308-0020001 analog type)
  –Kowa Tester (TH-5H analog type)
- Use the following ranges.
  –Sanwa k Ω range
  –Kowa R X 100 Ω range
  (for digital type: CDI ohm. R x 100)
- Even with genuine testers, if the battery installed is dissipated, the resistance value displayed might be different. If abnormal indication is displayed, check the batteries.

Unit: Ω

	Red	Yellow	Yellow	Yellow	Green
Red		∞	∞	∞	∞
Yellow	500-15k		∞	∞	∞
Yellow	500-15k	∞		∞	∞
Yellow	500-15k	∞	∞		∞
Green	500-20k	500-15k	500-15k	500-15k	

If the resistance value is abnormal, replace the regulator/rectifier unit.

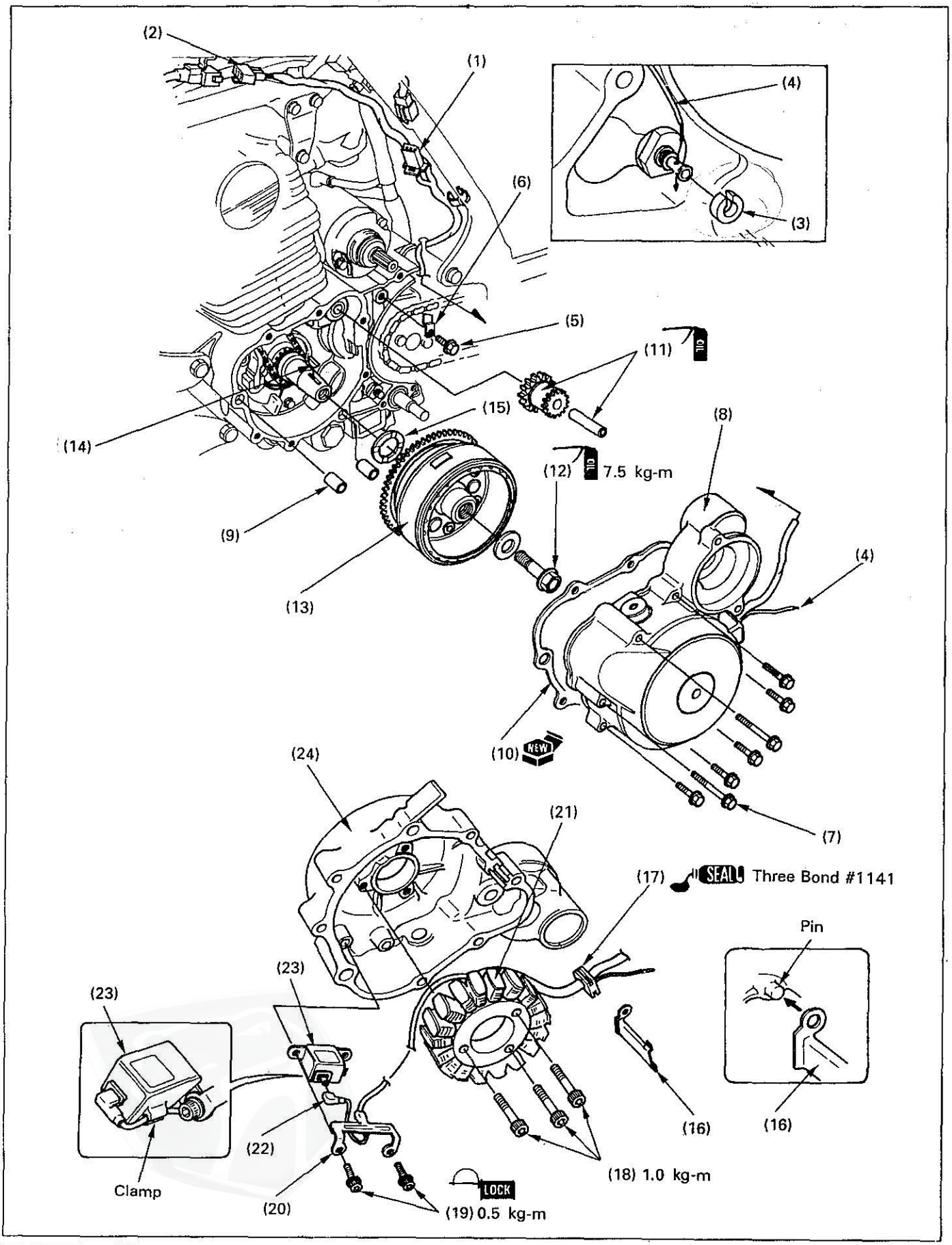


Removal and installation

Remove wire band.
Remove fuse box.
Remove regulator/rectifier 2P,3P coupler connection.
Remove nut and washer, then take out regulator/rectifier unit.

Installation is reverse of removal procedure.

AC GENERATOR REMOVAL AND INSTALLATION



• CAUTION

- When left crankcase cover is removed, engine oil will flow out. Put a clean pan under the engine to receive the oil.
- Follow the wiring diagram (⇨1-18) to make sure all wires and cords are in their proper position.

Related Work

- Fuel Tank Removal and Installation (⇨2-8)
- Side Cover Removal and Installation (⇨2-2)
- Drive Sprocket Cover Removal and Installation (⇨6-2)
- Starter Reduction Gear Removal and Installation (⇨16-10)

	WORK / PART NAME	NO.	NOTES
	Flywheel Removal		Installation is reverse order of removal.
(1)	AC Generator 3P Coupler	1	Follow illustration for proper installation.
(2)	Pulse Generator 3P Coupler	1	
(3)	Neutral Switch Cap	1	
(4)	Neutral Switch Cord	1	
(5)	Cord Clamp Bolt	1	
(6)	Cord Clamp	1	
(7)	Left Crankcase Cover Bolt	7	
(8)	Left Crankcase Cover Assy.	1	
(9)	Dowel Pin	2	
(10)	Gasket	1	
(11)	Starter Idle Gear/Shaft	1/1	
(12)	Flywheel Bolt	1	
(13)	Flywheel	1	When installing, remove grease from crankshaft and flywheel mating surfaces. Starter Clutch Removal (⇨16-11)
(14)	Woodruff Key	1	
(15)	Washer	1	
	Left Crankcase Cover Dismantling		
(16)	Cord Clamp	1	When installing, align clamp hole to cover boss, then insert into cover groove.
(17)	Stator Grommet	1	Apply threebond #1141 or equivalent to half-moon surfaces when installing.
(18)	Stator Bolt	3	
(19)	Pulse Generator Socket Bolt	2	
(20)	Cord Guide	1	
(21)	Stator	1	
(22)	Pulse Generator Connector	1	Attach to pulse generator clamps when installing.
(23)	Pulse Generator	1	
(24)	Left Crankcase Cover	1	

AC GENERATOR

CHECKING THE CHARGING COIL

• CAUTION

The testing can be done without disconnecting the AC generator from the engine.

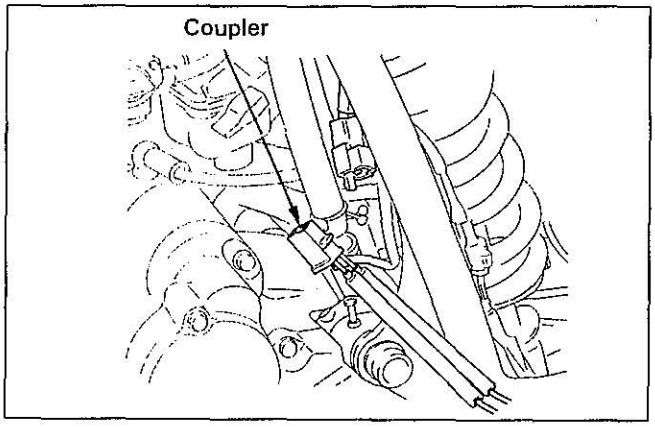
Remove left side cover. (⇨2-2)
Disconnect AC generator from 3P coupler.

Measure resistance of the yellow terminal of coupler on the engine side.

Terminal Connection: yellow to yellow
Standard Value: 0.1 to 1.0 Ω (20 °C)

If resistance value is abnormal, replace the stator. (⇨14-8)

If there is continuity between yellow terminal and body ground, replace stator. (⇨14-8)



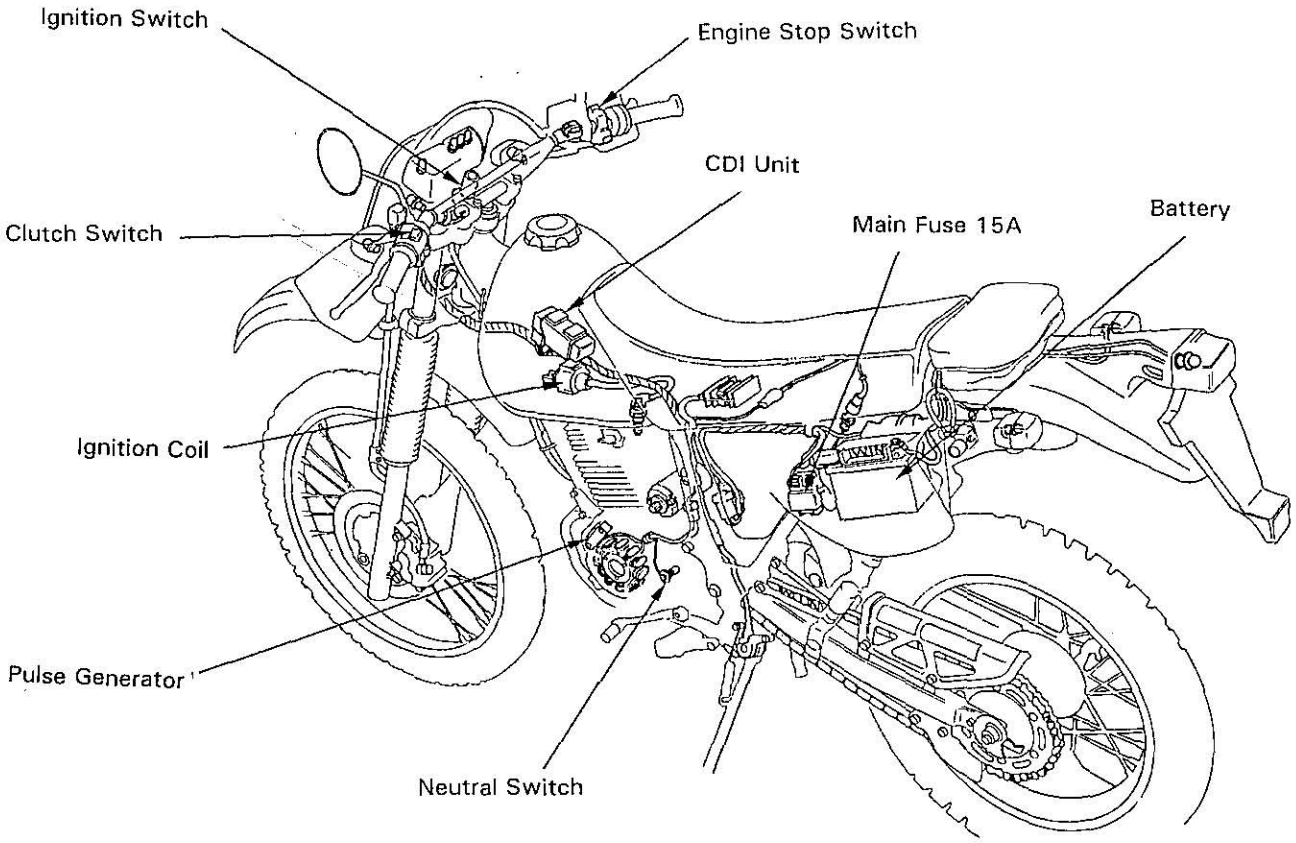
MEMO

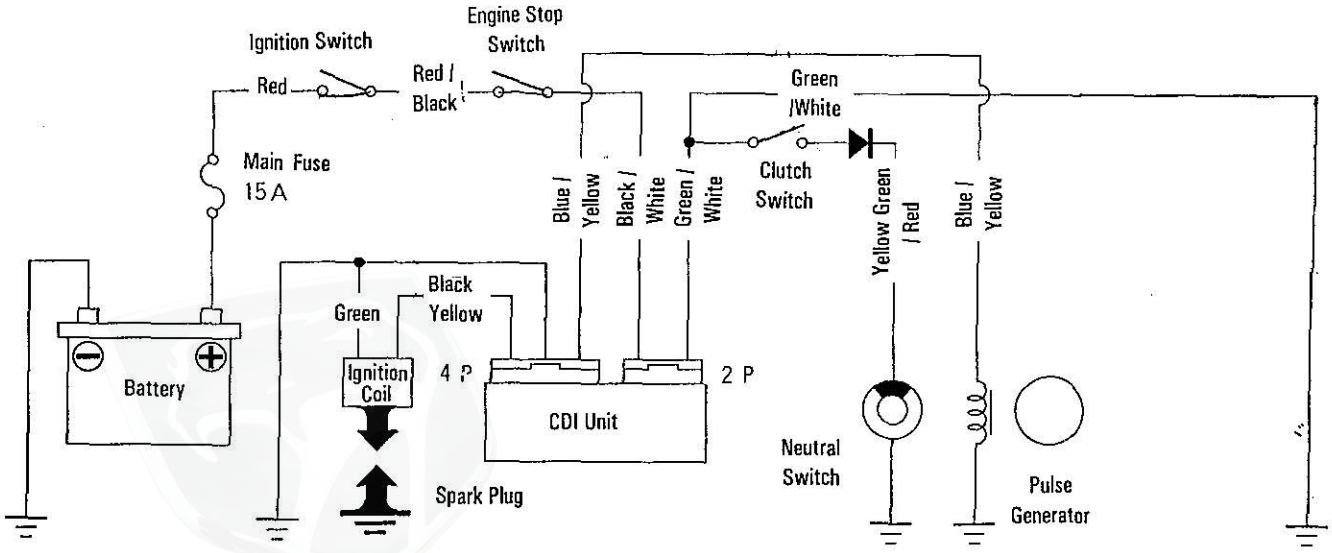
15. IGNITION SYSTEM

SERVICE INFORMATION

- Follow the steps shown in the troubleshooting procedure.
- Refer to 15-2 illustration for location of ignition system parts.
- The ignition system has a built in electrical mechanism. Ignition timing can not be adjusted.
- Be careful in handling the ignition system unit. Dropping or exerting undue force can damage the unit. Always turn the ignition switch off before any operation. Turning the connector or coupler ON/OFF while a current is flowing the circuit produce excess voltage and may damage the unit.
- Most ignition system defects are caused by improper connection of couplers and connectors. Check those connections before proceeding.
- Check using a properly charged battery. When the self-starter is used with an inadequately charged battery, cranking speed may be low, and no sparks may be achieved.
- Use spark plugs with correct heat range. Use of improper spark plugs can cause poor engine performances, and may even damage the engine.
- This manual explains tests to be done at peak voltage. Information on coil resistance values are also included but there may be cases when it would not be possible to decide correctly.
- Neutral switch location are shown in 15-2.
- Engine stop switch and ignition switch testing are to be conducted using the continuity diagram.

LOCATION OF IGNITION SYSTEM COMPONENTS



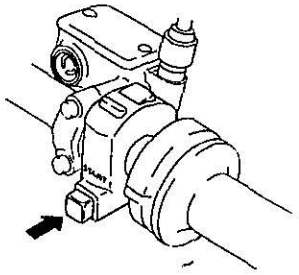


TROUBLESHOOTING

Inspect the following before diagnosing the system
-Spark plug cap, high tension cord connections defect
-Water in the spark plug cap
-Ignition system coupler connections defect

No sparks in spark plug

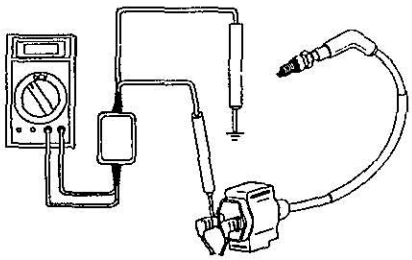
Check starter motor function. (⇨16-3)



ABNORMAL → • Defective battery, discharged battery
• Faulty starting system

NORMAL

Measure primary voltage at ignition coil. (⇨15-6)

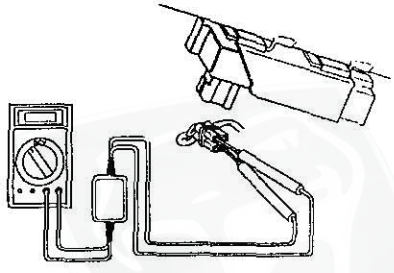


Terminal connection: black/yellow (+) to body ground (-)
Standard value: more than 100 V

ABNORMAL → • Defective spark plug or leak in secondary current of ignition coil
• Defective ignition coil

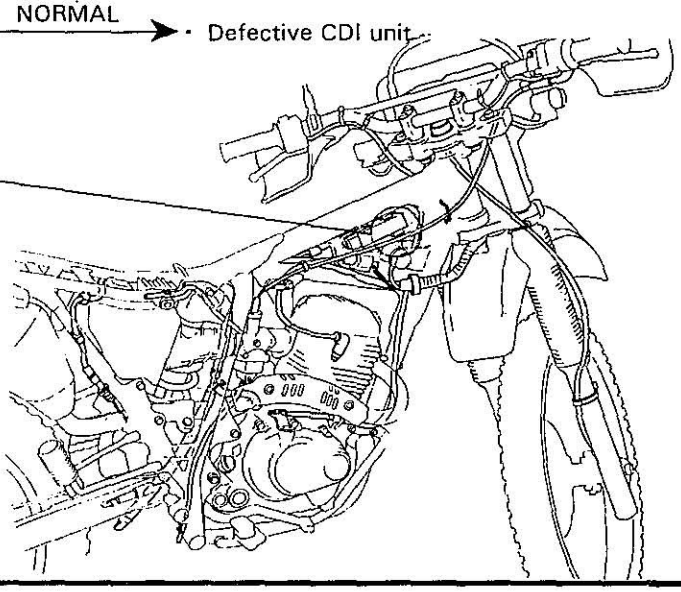
NORMAL

Remove CDI unit coupler connection.
Measure pulse generator peak voltage at CDI unit coupler harness side. (⇨15-7)



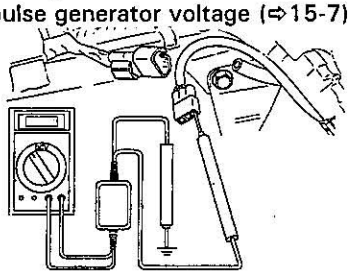
Terminal connection: blue/yellow (+) to green (-)
Standard value: 0.7V or greater

NORMAL → • Defective CDI unit



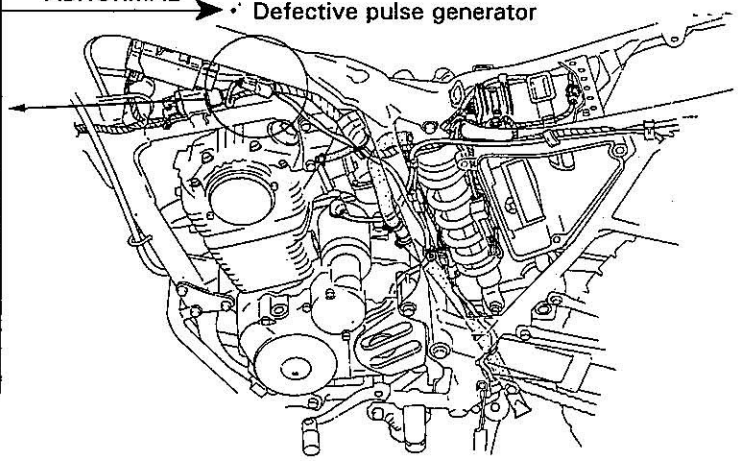
ABNORMAL

Remove pulse generator coupler connection
Measure pulse generator voltage (⇨15-7)



Terminal connection: blue/yellow (+) to body ground (-)
Standard value: more than 0.7 V

ABNORMAL → • Defective pulse generator



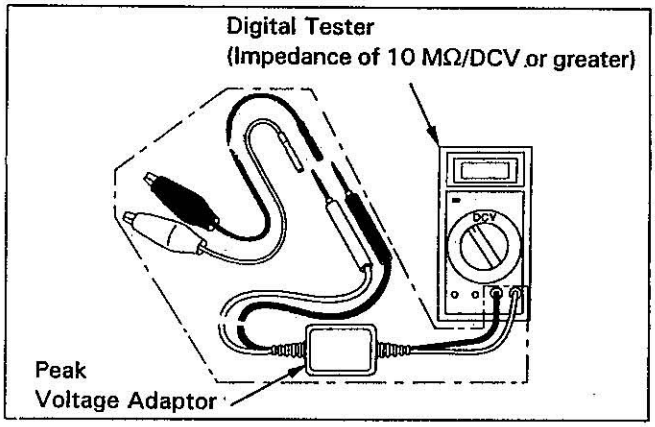
NORMAL → • Cut or shorted blue/yellow terminal cord
• Cut or shorted green terminal cord

CHECKING THE IGNITION SYSTEM

• CAUTION

- If there are no sparks from the spark plug, check each part for loose or poor connections, then measure peak voltage.
- Input resistance varies depending on the type of tester used, resulting in incorrect reading and measurement. Use digital tester with input impedance of 10 MΩ/DC V or more.

Connect peak voltage adaptor to digital tester.



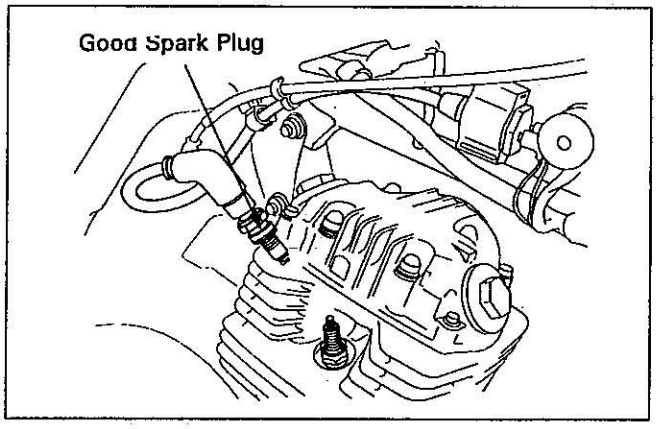
Peak Voltage Adaptor **07HGJ-0020100**

IGNITION COIL PRIMARY VOLTAGE

• CAUTION

- Measure after proper connection of all electrical lines. Correct reading and measurement can not be achieved if lines are not properly connected.
- Since there is cylinder pressure, check with the plug and cap in normal position. If spark plug is removed and tested by itself, peak voltage tends to be higher.

Leave the spark plug in the cylinder head, attach good spark plug to the cap, then ground to engine.

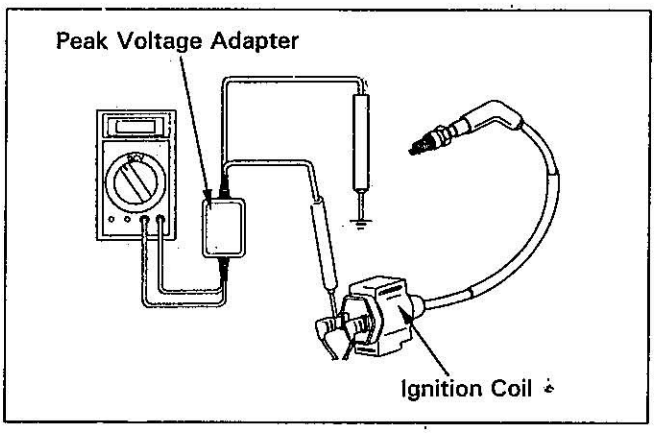


Remove fuel tank (⇨2-8)

Keeping the cord attached to the ignition coil, attach peak voltage adapter between the primary cord terminal and the body ground.

Connection Method: black/yellow cord terminal (+) to body ground (-)

Turn ignition switch ON, and RUN engine stop switch. Crank the engine, measure peak voltage.



Peak Voltage: more than 100V

⚠ CAUTION

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

PULSE GENERATOR PEAK VOLTAGE

• CAUTION

- Make sure all electrical connections are in place. Correct readings can not be made if connections are not properly installed.
- Check spark plug and cap in their normal position. High peak voltage reading may be obtained if spark plug is installed correctly.

Remove fuel tank. (⇨2-8)

Remove CDI unit coupler connection.
Connect peak voltage adapter tester probe to the terminal in the harness indicated below.

Connection Method: blue/yellow cord terminal (+) to green (-)

Turn ignition switch ON, engine stop switch to RUN.
Crank the engine, then measure peak voltage.

Peak Voltage: 0.7V or greater

⚠CAUTION

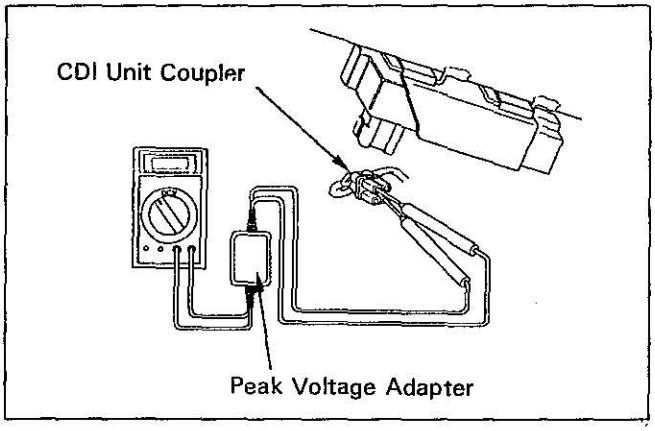
Avoid touching the spark plugs and tester probes to prevent electric shock.

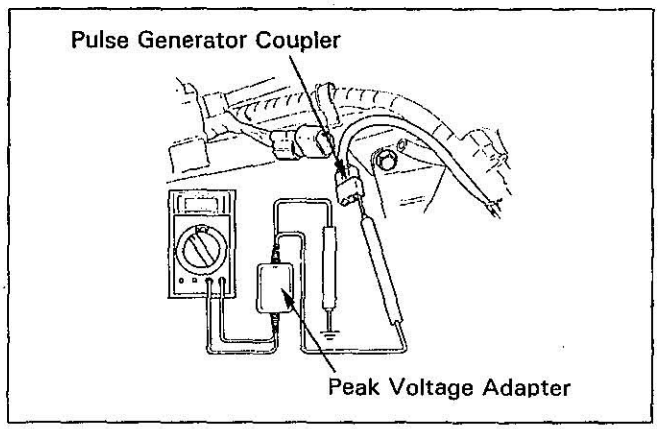
If the peak voltage measured at CDI unit coupler terminal is abnormal, connect adapter to pulse generator coupler. Measure peak voltage again, and compare with previous result.

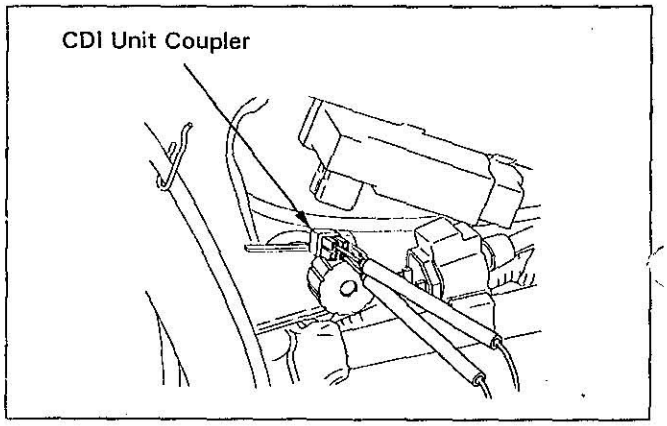
Connection Method: blue/yellow cord terminal (+) to body ground (-)

If peak voltage at pulse generator coupler is abnormal, replace pulse generator. (⇨14-8)

If peak voltage reading is normal, check for cut wires in pulse generator, or loose connectors or couplers.







IGNITION COIL

Checking

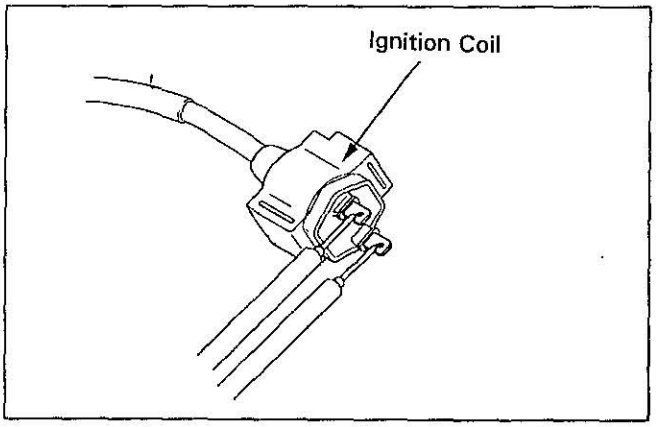
Remove fuel tank. (⇨2-8)
Remove CDI unit coupler connection.
Measure resistance at the primary ignition coil side at the CDI unit coupler terminal.

Connection Method: black/yellow cord terminal to green cord terminal
Standard Value: 0.20 - 0.22 Ω (20 °C)

If value is abnormal, check ignition coil independently.

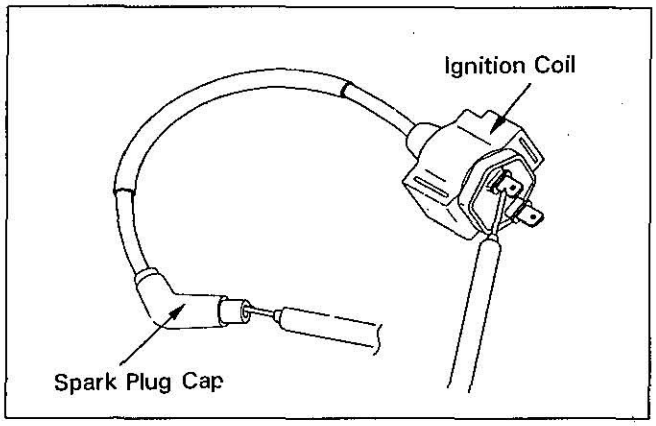
Disconnect primary side cord from ignition coil.
Measure primary side resistance of the ignition coil from the primary side terminal

Standard Value: 0.20 -0.22 Ω (20 °C)



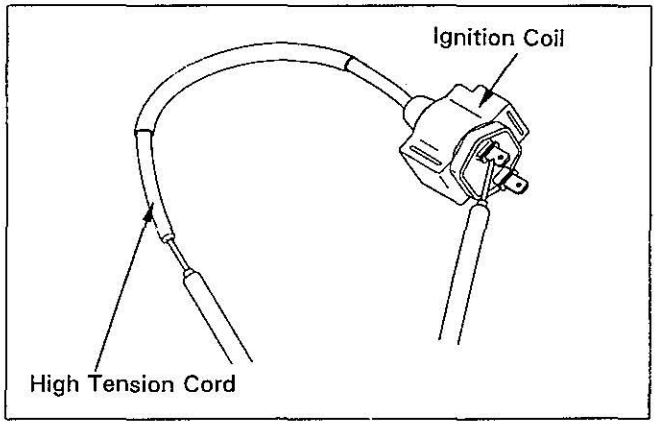
Remove spark plug cap from spark plug.
Measure ignition coil secondary side resistance between ignition coil green terminal and spark plug cap.

Standard Value: 7.8 - 8.4 Ω (20 °C)



Remove spark plug cap from high tension cord.
Measure ignition coil secondary side resistance between ignition cord green terminal and high tension cord.

Standard Value: 2.8 - 3.4 k Ω (20 °C)

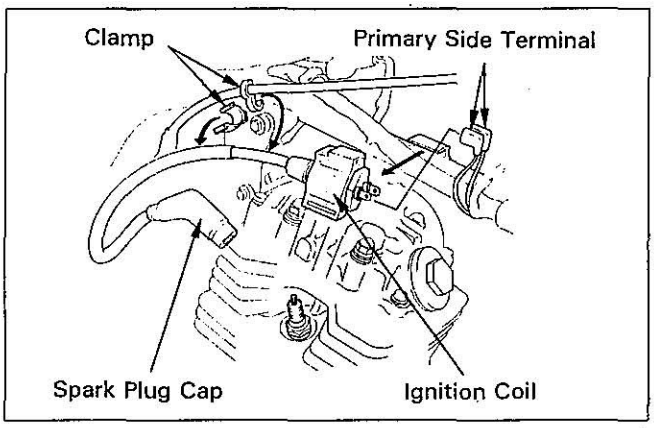


Removal and Installation

Remove fuel tank (⇨2-8)

Remove spark plug cap from plug.
Remove high tension cord from clamp.
Disconnect ignition coil primary side terminal cord.
Remove ignition coil.

Installation is reverse order of removal.

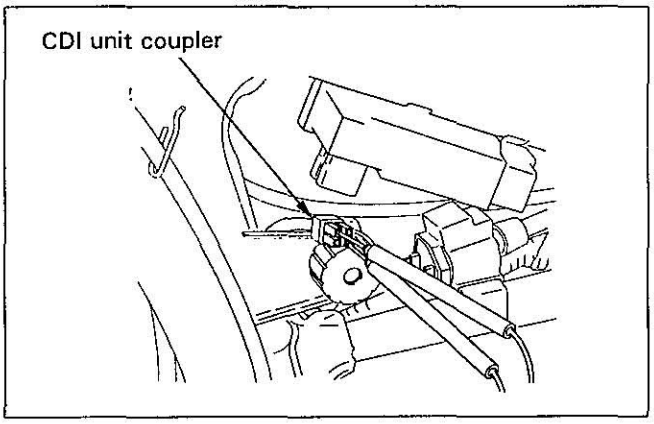


CHECKING PULSE GENERATOR

Remove fuel tank. (⇨2-8)
Disconnect CDI unit coupler.
Measure pulse generator resistance at CDI unit coupler terminal.

Connection Method: blue/yellow cord terminal to green cord terminal
Standard Value: 293 - 358 Ω (20 °C)

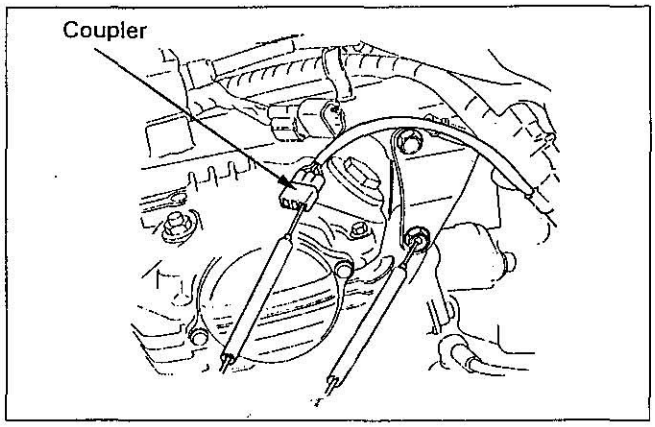
If reading is abnormal, check pulse generator independently.



Disconnect pulse generator coupler, measure pulse generator resistance.

Connection Method: blue/yellow cord terminal to body earth.
Standard Value: 293 - 358 Ω (20 °C)

If reading is abnormal, replace pulse generator. (⇨14-8)



CHECKING IGNITION TIMING

• CAUTION

- Conduct check after warming up the engine.
- Since CDI ignition system is being utilized, ignition timing adjustment is not possible.
- If ignition timing is incorrect, check CDI unit and pulse generator and replace if defective.

Warm up engine.
Stop engine, support with side stand.

Remove timing hole cap
Connect timing light to high tension cord.

Start engine:During idling, if the flywheel "F" mark is aligned with the notch on the left crankcase cover, condition is normal.

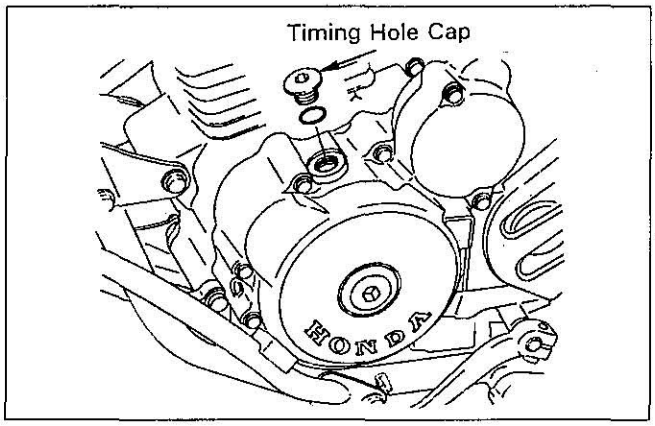
Idling rpm: 1,400 ± 100 rpm

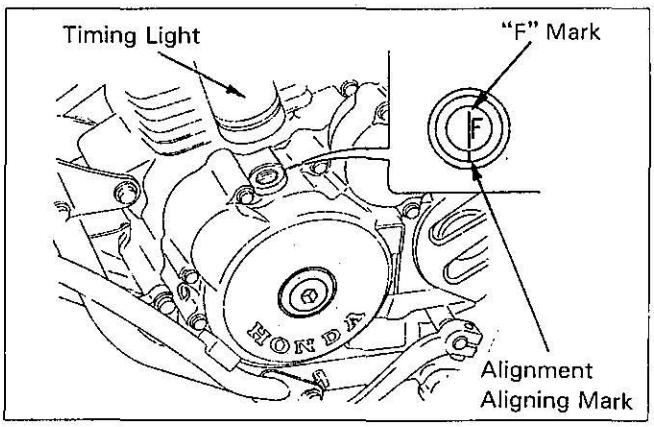
Gradually increase engine rpm, check to see that the flywheel advance mark matches the left crankcase cover notch.

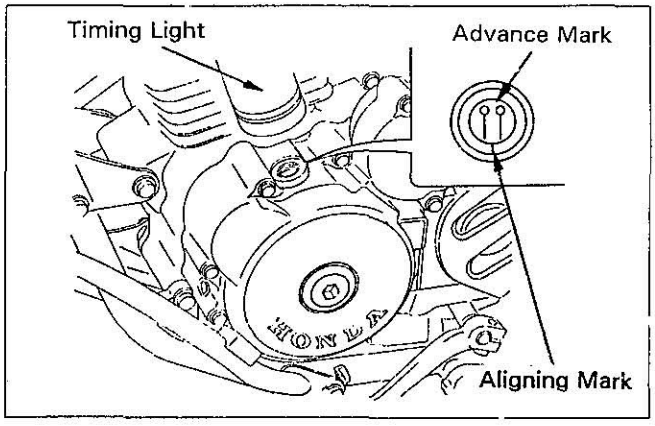
Check to see that there is no damage to the o-ring of the timing hole cap. Replace if damaged.

Apply engine oil to the o-ring of the timing hole cap, attach, then tighten timing hole cap to the specified torque.

Torque: 0.6 kg-m







MEMO

16. STARTING MECHANISM, STARTER CLUTCH

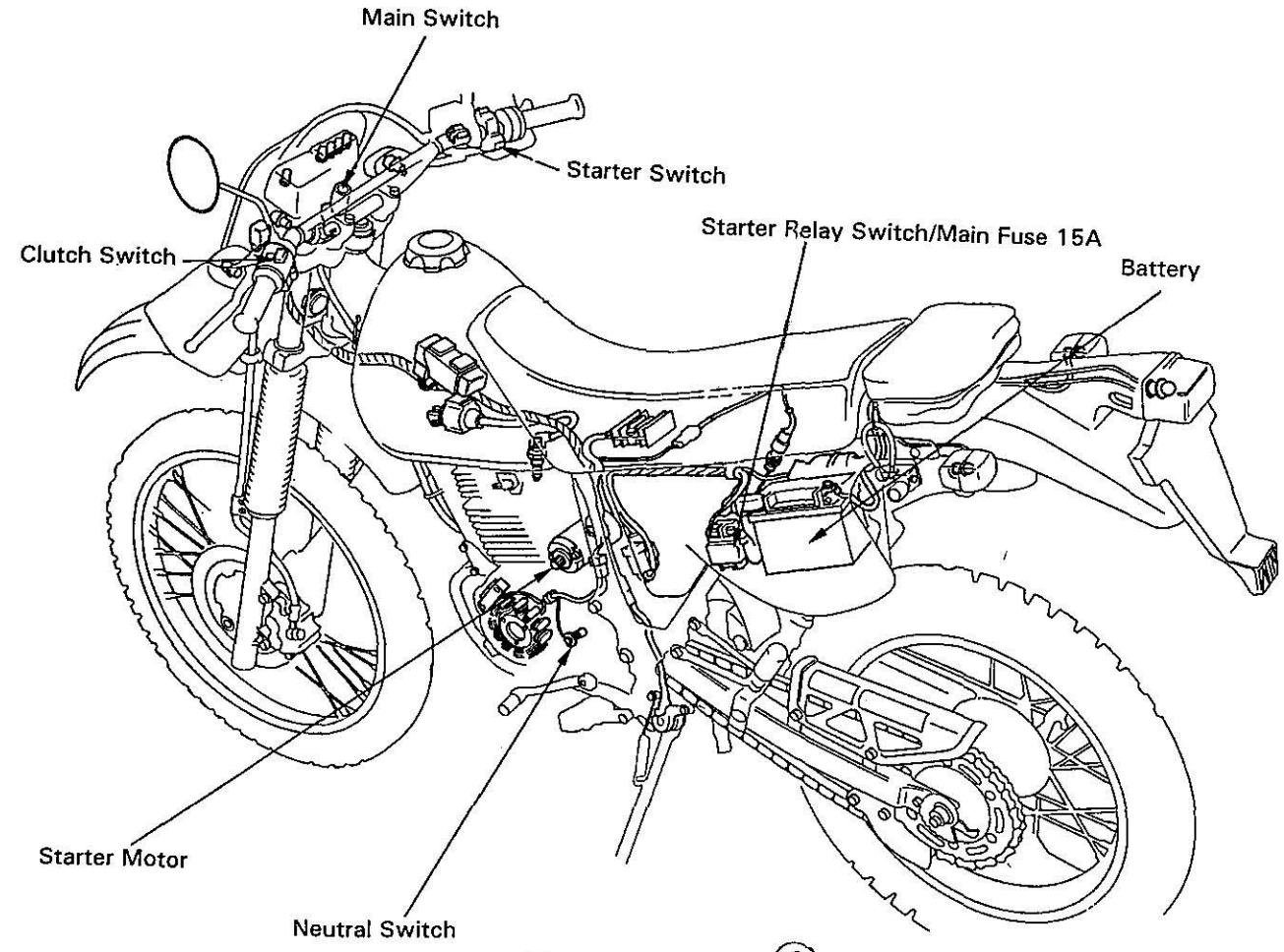
SERVICE INFORMATION

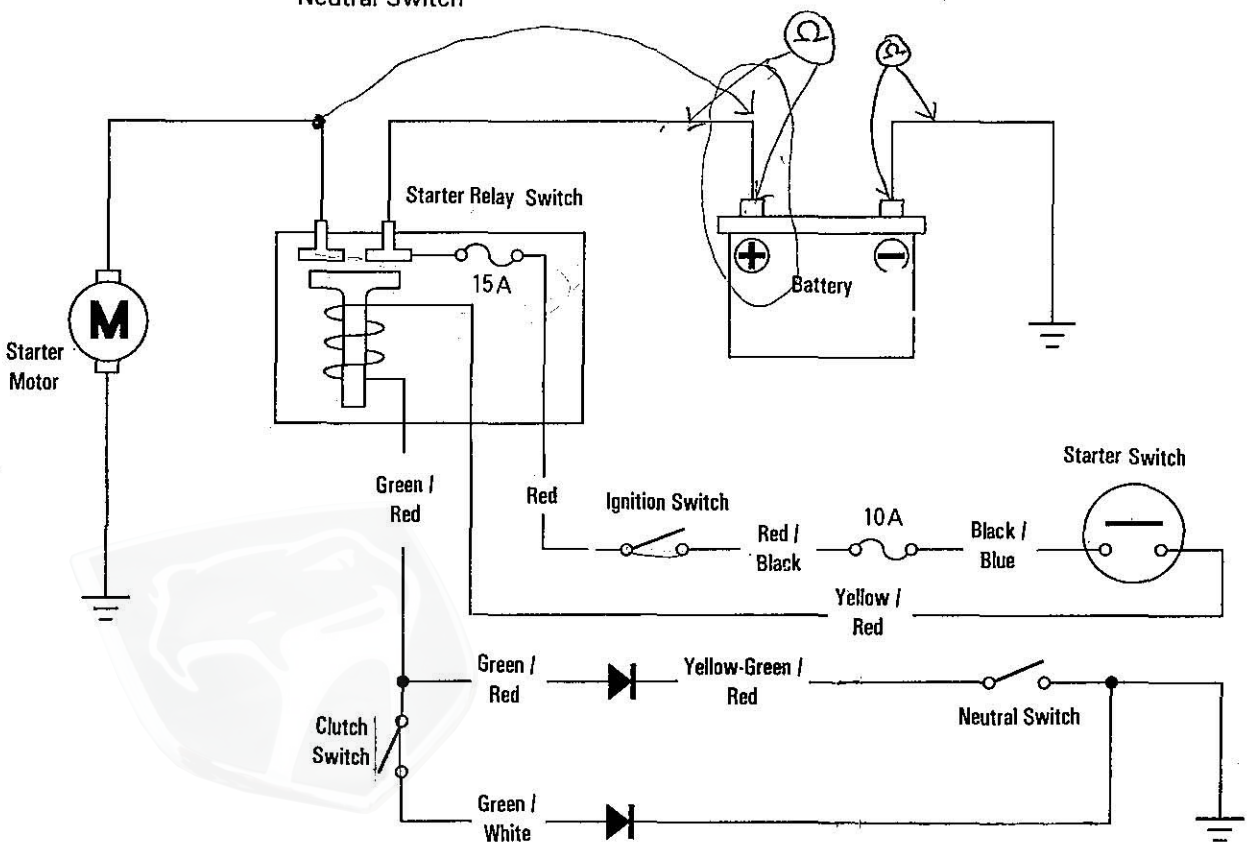
⚠CAUTION

When conducting repair and maintenance of the starter motor and related parts, make sure that the ignition switch is OFF. If the switch is left ON, the starter motor may operate unexpectedly causing injury to operator.

- Checking of the starting mechanism, should be done following the troubleshooting chart (refer 16-3) in the correct procedure.
- Refer to 16-2 illustration for location of starting mechanism parts.
- When the battery is discharged, the starter motor will not turn and engine cranking will not be possible. When starting mechanism does not function properly, check if the battery is discharged by attaching a functioning battery.
- When engine cranking is not possible, and too many attempts are made to start the starter motor, too much current may enter the motor and damage the coil of the starter motor.

STARTING MECHANISM LOCATION





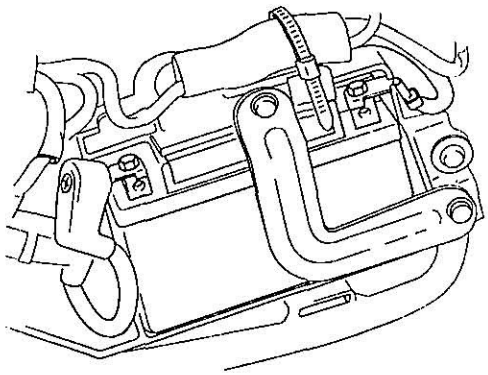
TROUBLESHOOTING

- Check first if main fuse (15A) or sub-fuse (10A) are in normal condition.
- Check if there is any disconnection or looseness in battery and starter motor connection.
- When the battery is discharged, the starter motor will not turn and engine cranking will not be possible. When starting mechanism does not function properly, check if the battery is discharged by attaching a functioning battery.
- Before checking starter motor, Inspect that the transmission gear location are in starting position.
  –If gear is in neutral, the starter motor will turn regardless of clutch switch condition.
  –If gear is in a position other than neutral, refer to the following table.

	Clutch Lever	Starter Motor
Gear Position (Other than neutral)	Gripped	Turn
	Ungripped	Not Turn

Starter Motor Will Not Turn

Check if there are any connection defects or short in the battery terminal.

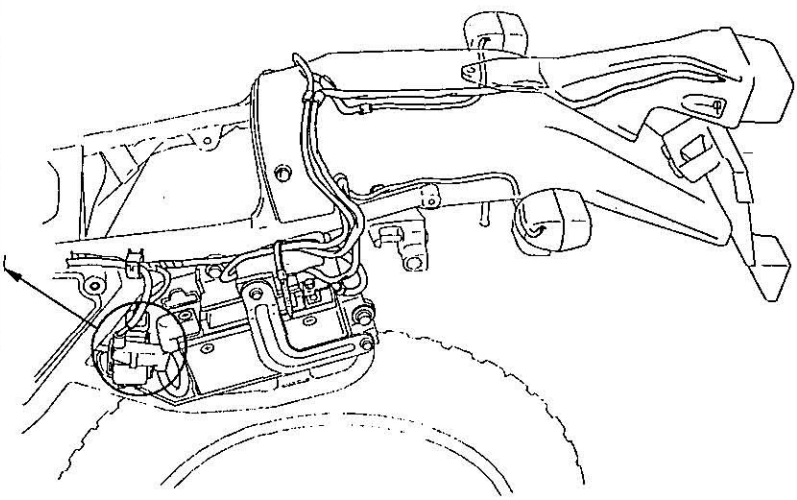


ABNORMAL → • Battery cable terminal defective connection

NORMAL

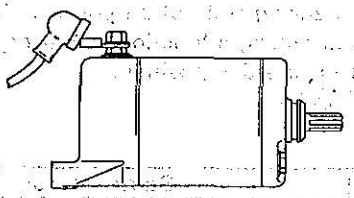
Check if there are any connection defects in the starter relay switch 4P coupler.

ABNORMAL → • Starter relay switch 4P coupler defective connection



NORMAL

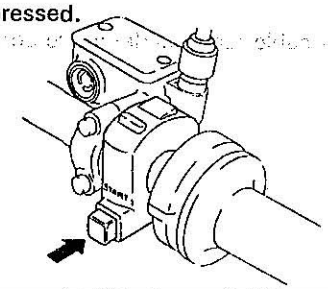
Check to see if there are any connection defects in the starter motor cable terminal.



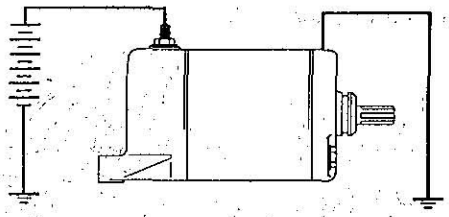
ABNORMAL → • Starter motor cable defective connection or cut wire

NORMAL

Turn ignition switch ON, and RUN engine stop switch, then check if the starter relay switch will make a clicking sound when the starter switch button is pressed.



There is a Sound → Remove starter motor's + cable then check if the motor will turn when you attach cable to the battery's "+" terminal. (Large current will pass through; DO NOT use a thin cord.)



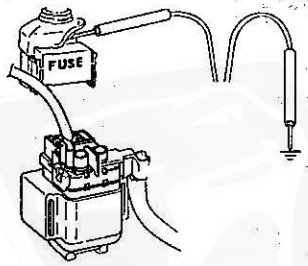
Turns
- Starter motor cable connection defect
- starter relay switch malfunction

Does not Turn
- Defective starter motor

There is no Sound

Remove starter relay switch 4P coupler, then check ground line.

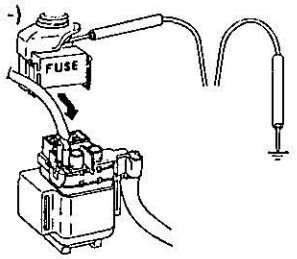
1. Green/red terminal and neutral switch ground line (do not grip clutch lever, while gear is in neutral position).
   Terminals to connect: green/red (-) to body ground (+)
   Standard value: circuit continuity
2. Green/red terminal and sidestand switch ground line (grip clutch lever, check with gear in a position other than neutral).
   Terminals to connect: green/red (-) to body ground (+)
   Standard value: circuit continuity



No Circuit Continuity
- Defective neutral switch
- Defective clutch switch diode
- Defective clutch switch
- Loose or poor contact of connector
- Open circuit in wire harness

With Circuit Continuity

Connect starter relay 4P coupler. Turn ignition switch ON, and RUN engine stop switch. Check starter relay voltage at starter relay switch coupler while pushing starter switch. (Yellow/red to +, body ground to -)

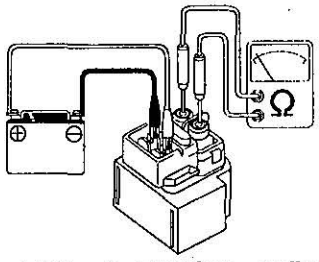


Terminals to be Connected: yellow/red (+) to body ground (-)
Standard Value: battery voltage

No Voltage →
- Defective ignition switch or starter switch
- Loose or poor contact of connector
- Cut wire of starter switch
- Open circuit in wire harness

Battery Voltage Register

Remove starter relay switch. Connect a fully charged battery to the starter relay switch as shown in drawing below. While it is connected to battery, check circuit connection between terminals.

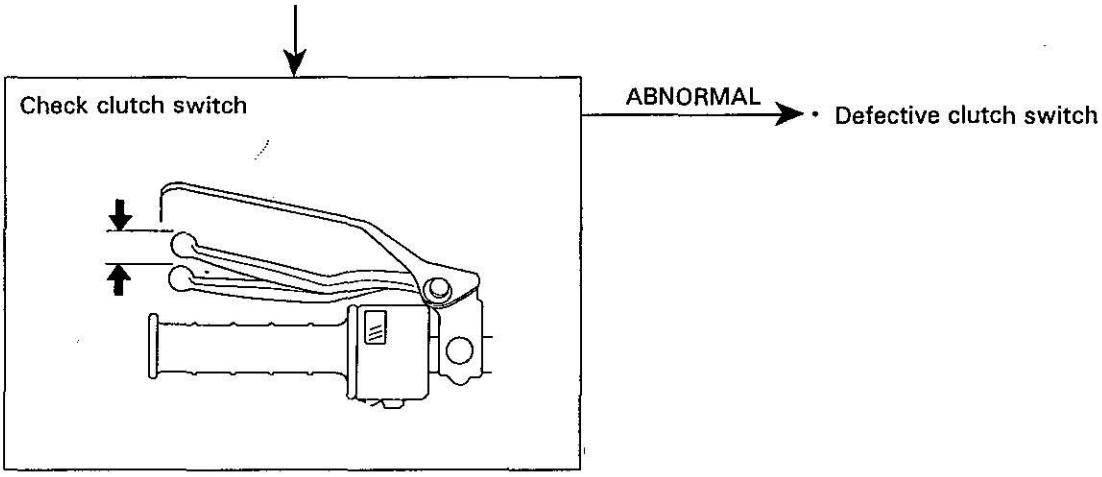


Battery Connection to Terminals: yellow/red (+) to green/red (-)
Standard Value: circuit continuity

NORMAL →
- Connection defect of starter relay switch 4P coupler

ABNORMAL →
- Defective starter relay switch

The starter motor will turn if gear is in neutral position. However, if gear is not in neutral position, the starter motor will also turn when the clutch lever is gripped.

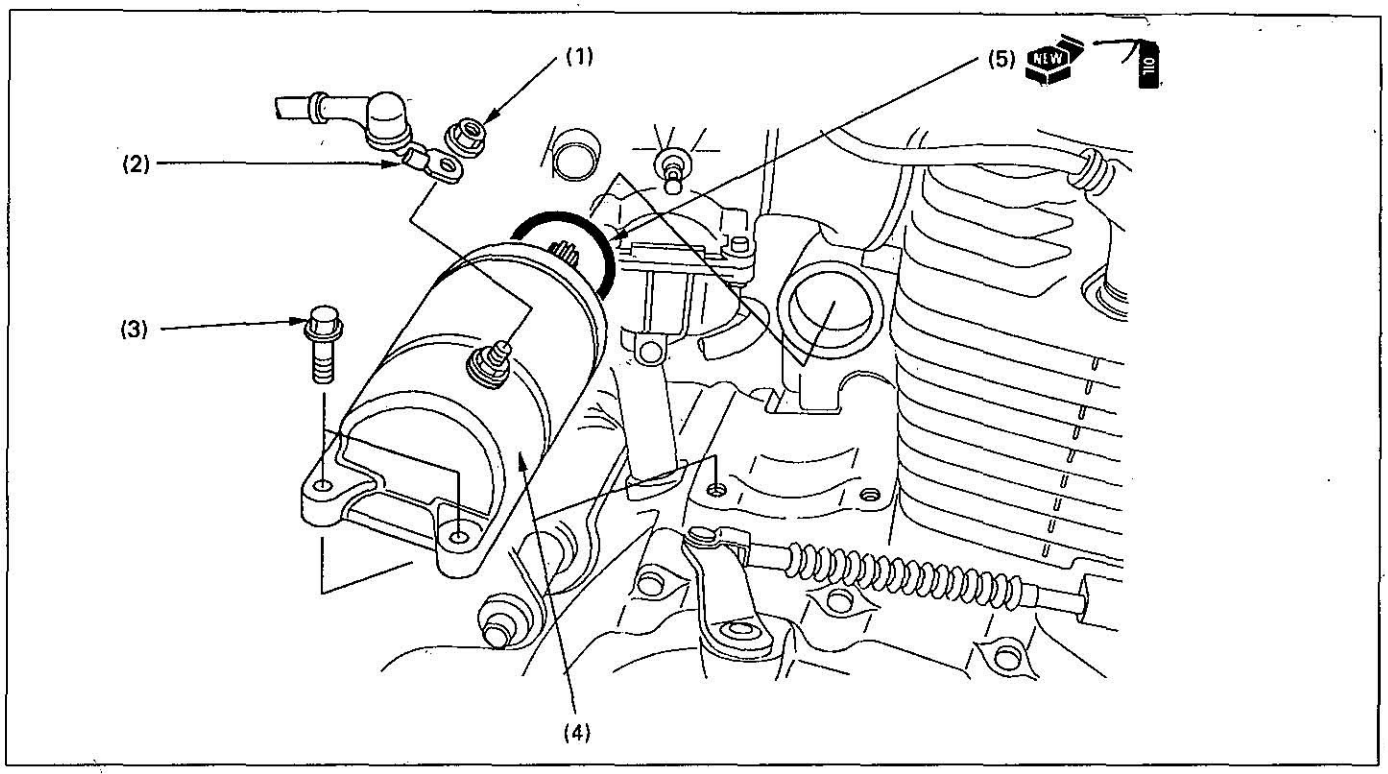


Inadequate Power in Starter Motor (Cranking not Possible)
- Inadequate battery power (discharged battery)
- Defective connection of battery terminal cable
- Defective connection of starter motor cable
- Faulty starter motor
- Wear or damaged starter motor brush

Starter Motor Turns, But Engine Does Not Turn
- Starter motor is running backward
  - –Case assembled improperly
  - –Terminals connected improperly
- Faulty starter clutch

Starter Motor is Normal but Cranking not Possible
- Crankshaft does not turn due to engine problem
- Faulty starter reduction gear
- Damaged starter idle gear

STARTER MOTOR REMOVAL AND INSTALLATION



⚠ CAUTION

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

• CAUTION

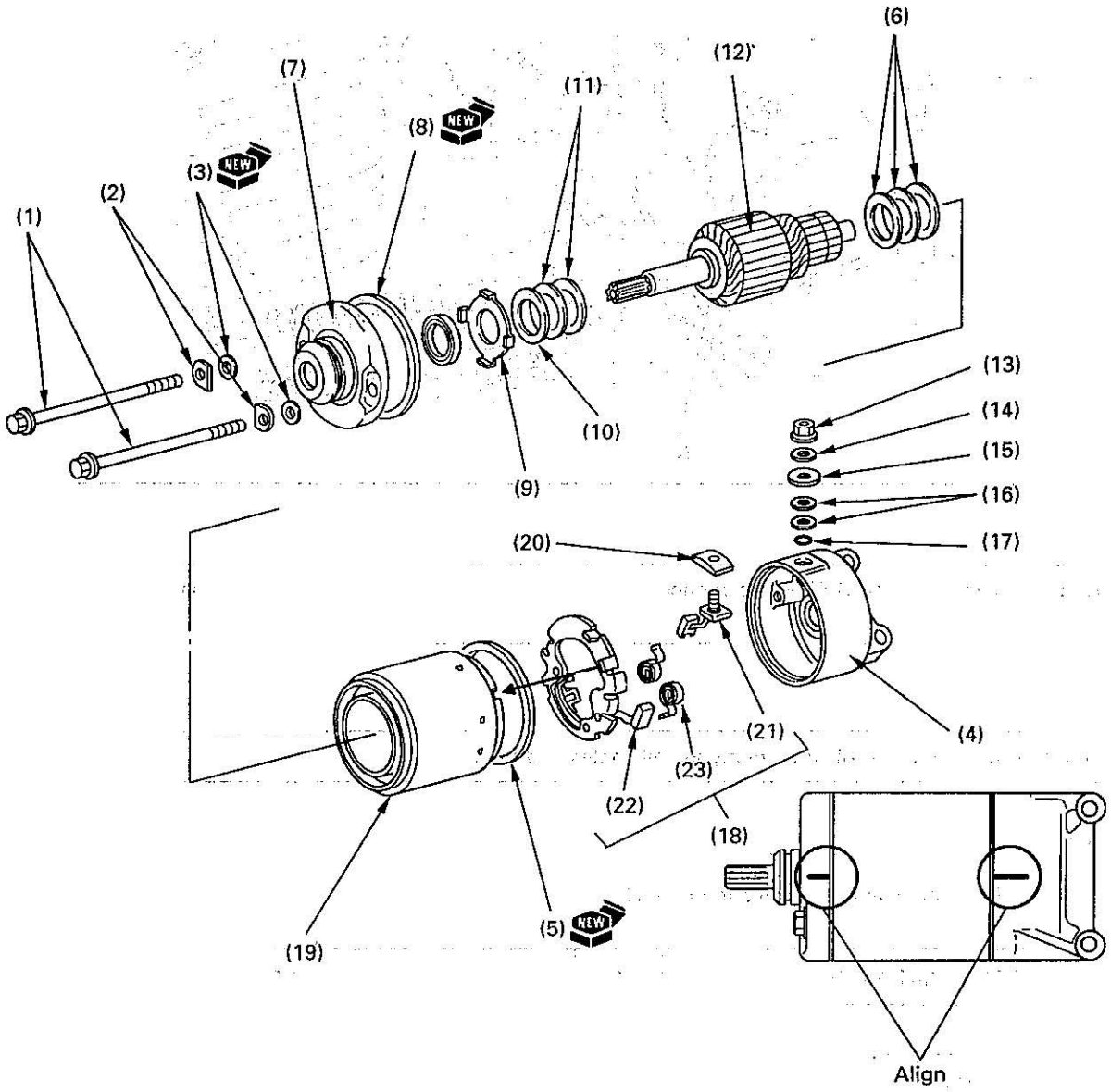
Refer to wiring Diagrams (⇨1-18) to correctly install cables and wires.

Related Work

- Exhaust Pipe, Muffler Removal and Installation (⇨2-7)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Starter Motor Cable Nut	1	
(2)	Starter Motor Cable	1	After installing, make sure to attach rubber cap
(3)	Starter Motor Bolt	2	
(4)	Starter Motor Assy.	1	Disassembly (⇨16-8)
(5)	O-ring	1	

STARTER MOTOR DISMANTLING AND ASSEMBLY



• CAUTION

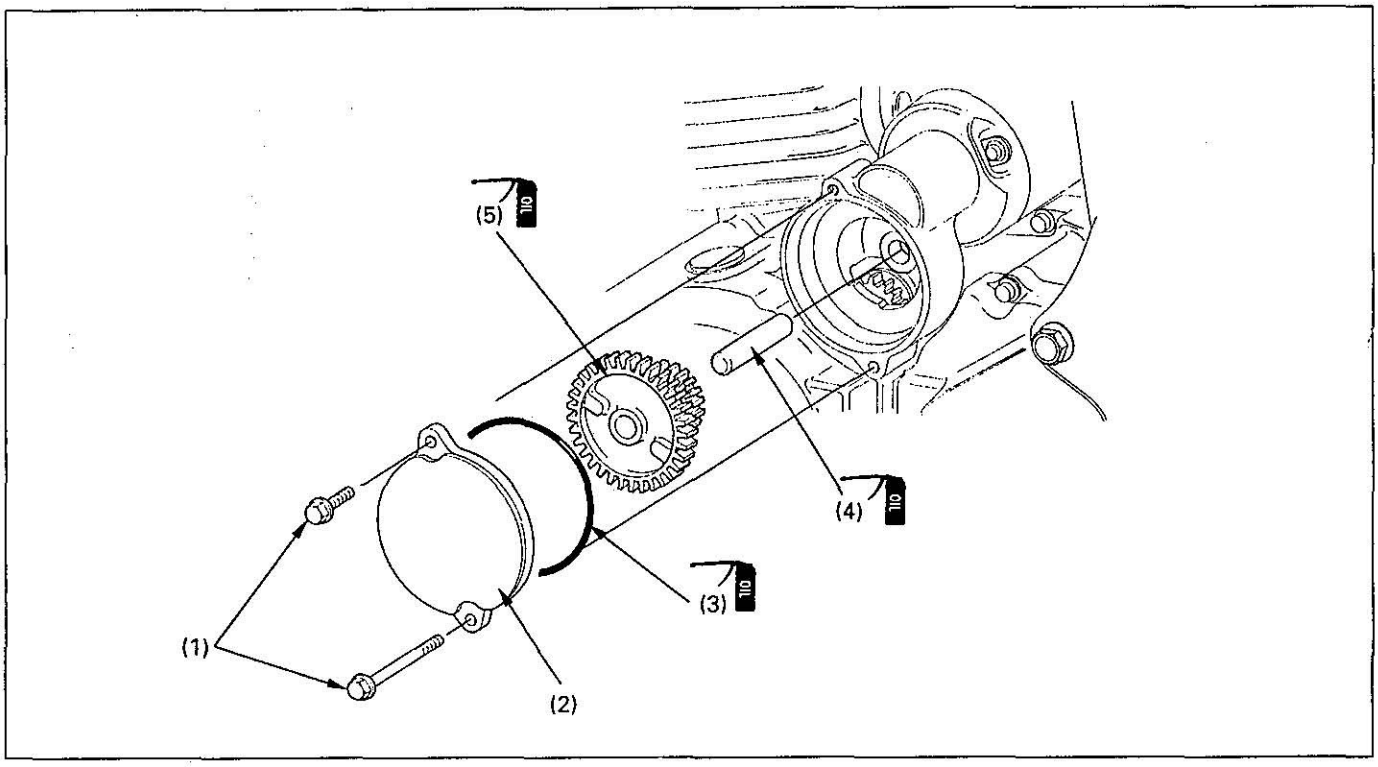
For shims and washers, record the location and number of pieces during disassembly so that it will be easier to re-assemble in the correct order and number later on.

Related Work

- Starter Motor Removal and Installation (⇨16-7)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Assembly is reverse order or removal.
(1)	Flange Bolt	2	
(2)	Plate	2	
(3)	O-ring	2	
(4)	Rear Cover	1	During assembly, align notch with starter motor case marking.
(5)	O-ring	1	
(6)	Thrust Washer	–	Record order and number for easy assembly.
(7)	Front Cover	1	During assembly, align notch with starter motor case marking.
(8)	O-ring	1	
(9)	Lock Washer	1	
(10)	Insulation Washer	1	
(11)	Shims	–	Record order and number for easy assembly.
(12)	Armature	1	
(13)	Terminal Nut	1	
(14)	Washer	–	Record order and number for easy assembly.
(15)	Insulation Washer	1	
(16)	Shims	–	Record order and number for easy assembly.
(17)	O-ring	1	
(18)	Brush Holder Assy.	1	Align holder boss to rear cover groove during assembly.
(19)	Starter Motor Case	1	
	Brush Holder Dismantling		Assembly is reverse of dismantling.
(20)	Terminal Bolt Stopper	1	Pay attention to orientation during assembly.
(21)	Terminal Bolt	1	
(22)	Motor Brush	1	
(23)	Brush Spring	2	

STARTER REDUCTION GEAR REMOVAL AND INSTALLATION

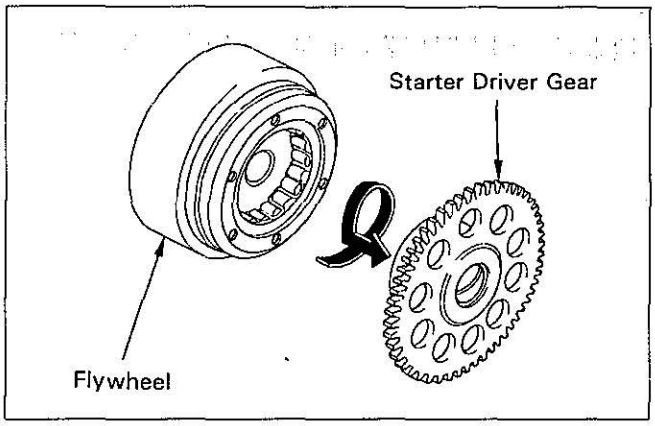


• CAUTION

When starter reduction gear cover is removed, engine oil will flow out. Prepare a clean oil pan and place it under the engine to receive the oil.

	WORK / PART NAME	NO.	NOTES
	Removal		Assembly is reverse of removal.
(1)	Starter Reduction Gear Cover Bolt	2	
(2)	Starter Reduction Gear Cover	1	
(3)	O-ring	1	
(4)	Starter Reduction Gear Shaft	1	
(5)	Starter Reduction Gear	1	

STARTER CLUTCH REMOVAL & INSTALLATION



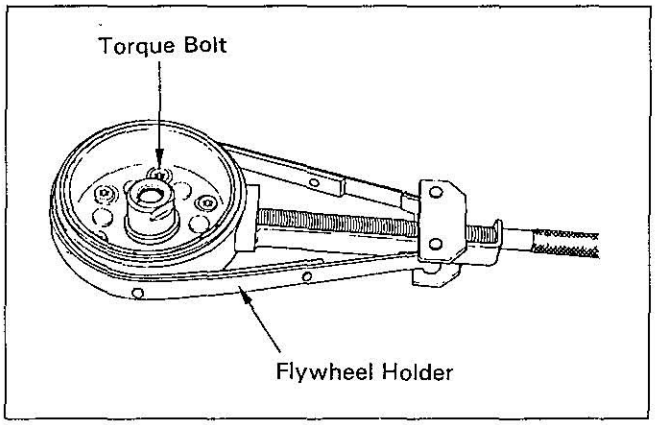
Removal

Remove flywheel. (⇨14-8)

Remove starter driven gear by turning counter-clockwise.

Hold the flywheel using flywheel holder, then remove one-way clutch torque bolt.

Fly Wheel Holder	**07725-0040000**
Torque Bit	**07703-0010100**



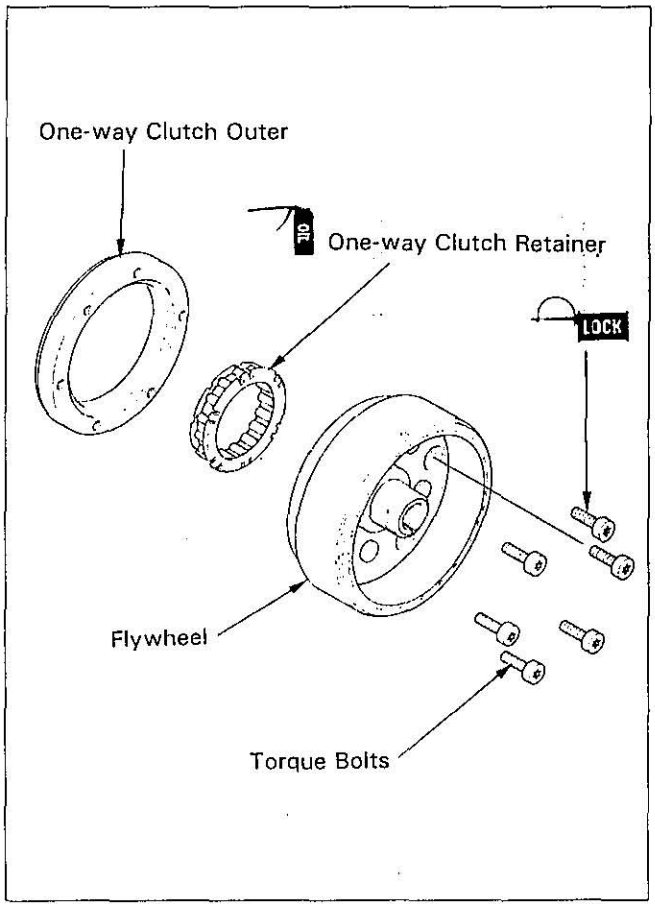
Remove one-way clutch outer, one way clutch.

Installation

Wash one-way clutch, apply clean engine oil into one-way clutch retainer

Face one-way clutch flange side to flywheel, then attach one-way clutch outer.

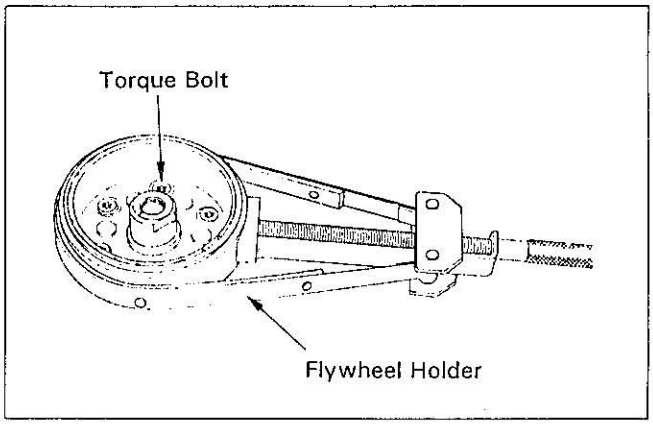
Attach one-way clutch assy. to flywheel.



Clean the one-way clutch torque bolts, and apply screw lock to the screws.
Hold the flywheel using the flywheel holder, insert torque bolts, then screw firmly.

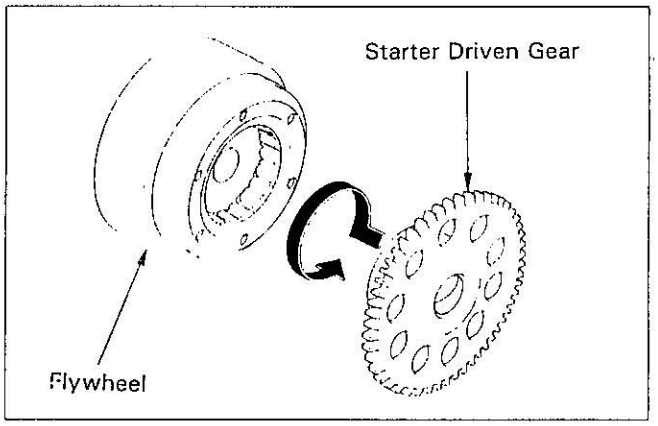
Torque: 1.6 kg-m

Flywheel Holder	07725-0040000
Torque Bit	07703-0010100



Attach starter driven gear by turning counter-clockwise.

Attach Flywheel. (⇨14-8)



MEMO

17. LIGHTS, METERS, SWITCHES

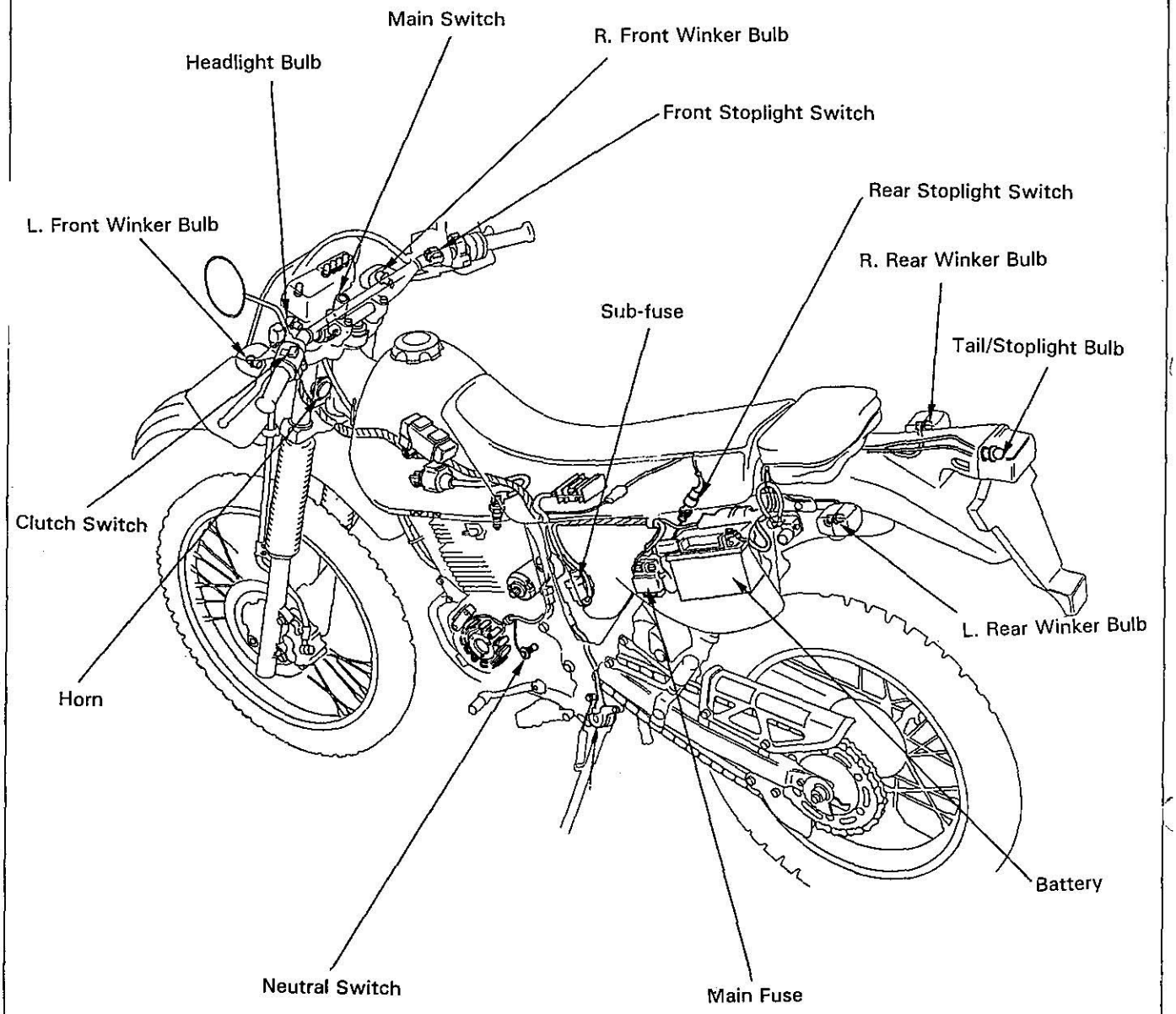
SERVICE INFORMATION

⚠CAUTION

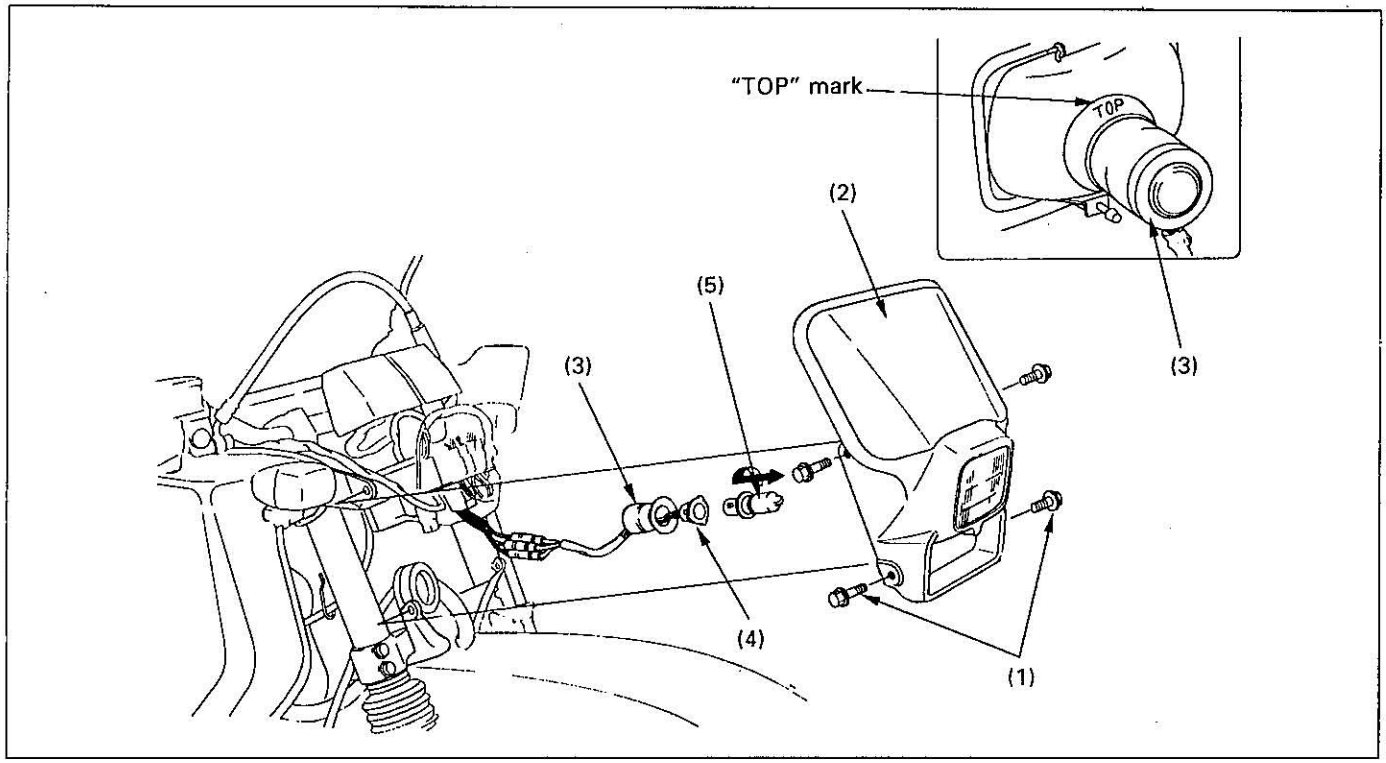
The halogen headlight bulb gets very hot while the headlight is ON. Do not touch the bulb immediately with bare hands after turning off. Start work only when the bulb has sufficiently cooled.

- The halogen light bulb gets very hot when ON. If the bare hands or a dirty glove get in touch with the bulb during replacement, this will leave grease or oil on the bulb surface. This will then become a "hot spot" which can cause cracking on or damage to the bulb surface. Pay careful attention to the following when replacing the bulb.
  - –Do not replace while bulb is ON. Always turn the main switch OFF, and wait for the bulb to cool.
  - –Use clean gloves when replacing the bulb, and make sure that no oil grease adheres to bulb surface.
  - –If the grease or oil adheres to bulb surfaces, use alcohol or thinner with clean cloth to remove the grease or oil.
  - –After replacing bulb, re-attach the dust cover.
- If battery will be used in testing, make sure that the battery is not defective.
- Continuity tests for switches may be done while switches are attached on the vehicle (no need to remove or dismantle).

LOCATION OF LIGHTS, METERS AND SWITCHES



HEADLIGHT REMOVAL AND ATTACHMENT

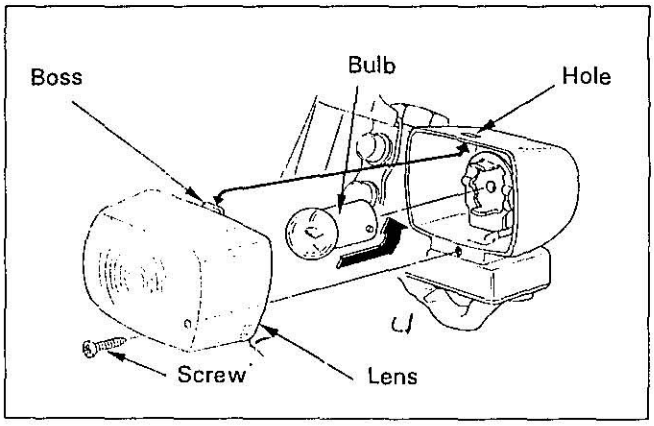


⚠CAUTION

The halogen headlight bulb becomes very hot while the headlight is ON. Do not touch the bulb with bare hands after turning off. Start work only when the bulb has sufficiently cooled.

	WORK / PART NAME	NO.	NOTES
	Removal		Attachment is reverse order of removal.
(1)	Bolt	4	
(2)	Front Cover	1	
(3)	Dust Cover	1	When attaching, place "TOP" mark on top.
(4)	Bulb Socket	1	Remove socket by turning counter-clockwise.
(5)	Headlight Bulb	1	When attaching, turn bulb counter-clockwise to remove.

BULB REPLACEMENT



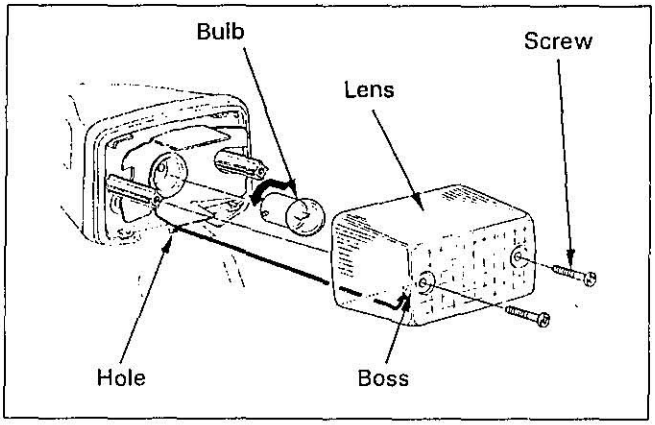
WINKER BULB

Remove screw, then remove lens.
Remove bulb by turning counter-clockwise.

Attachment is reverse of removal procedure.

• CAUTION

When attaching, align lens boss hole in case.



TAIL / STOPLIGHT BULB

Remove screw, then remove lens.

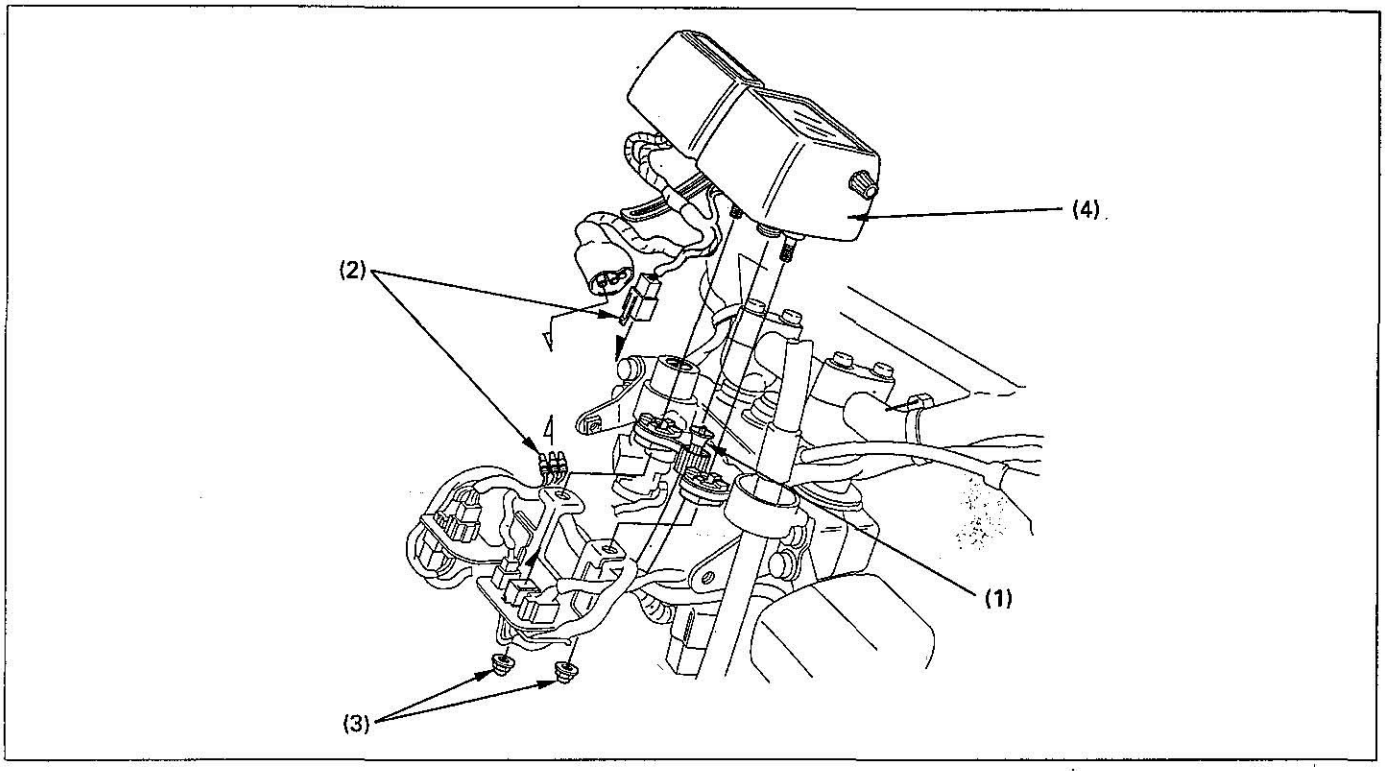
Remove bulb by turning counter-clockwise.

Attachment is reverse of removal procedure.

• CAUTION

When attaching, align lens boss to hole in case.

METER REMOVAL AND ATTACHMENT



• CAUTION

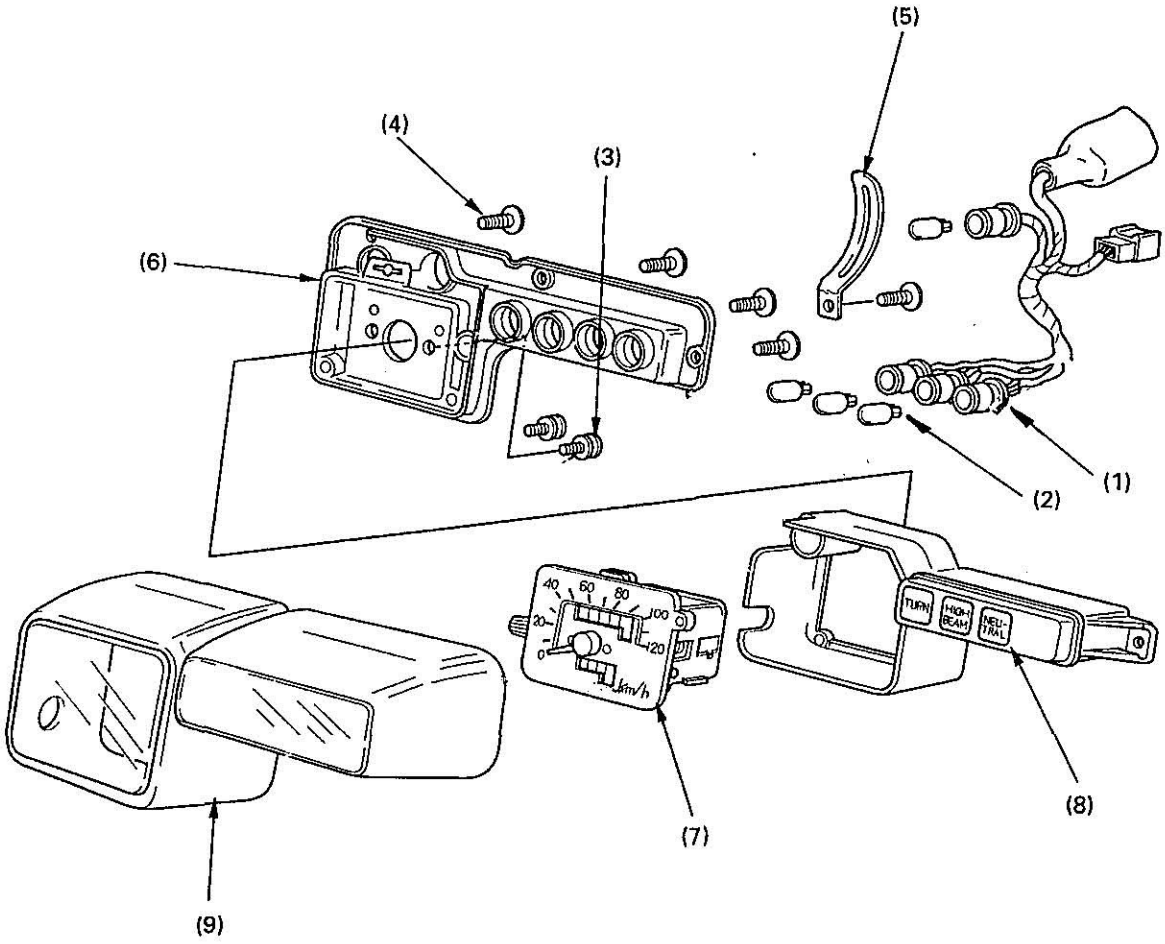
Follow the wiring diagram (⇨1-18) to correctly install wires and cables.

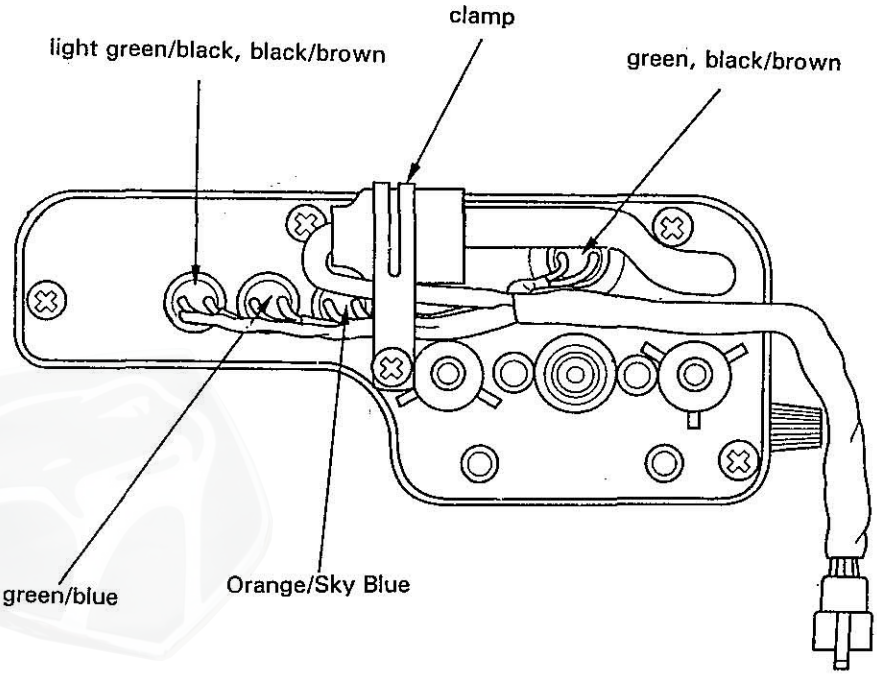
Related Work

- Front Cover Removal and Installation (⇨2-4)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Speedometer Cable		
(2)	Meter Coupler/Connector		
(3)	Nut		
(4)	Meter Assy.		Disassembly (⇨17-6)

METER DISASSEMBLY AND ASSEMBLY





• CAUTION

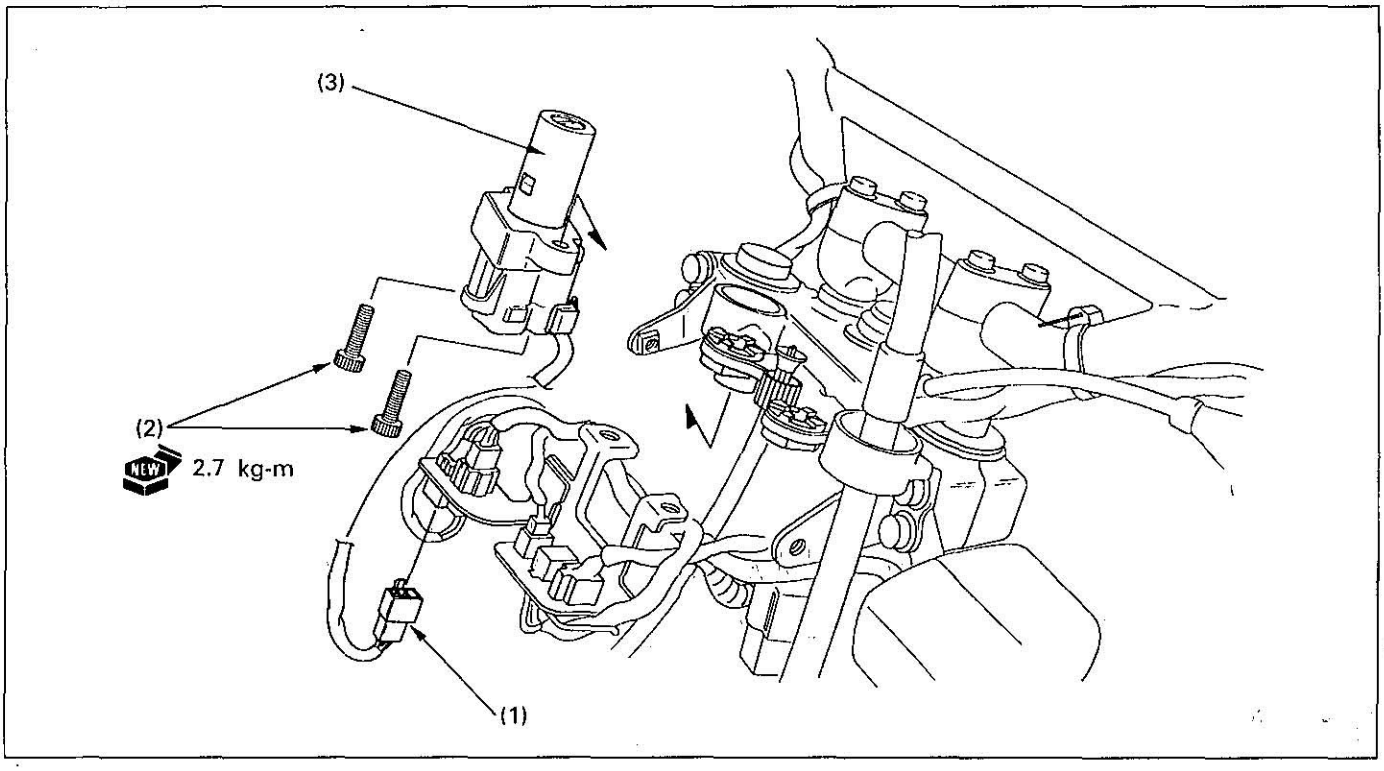
Follow the ilustration to correctly attach the bulb socket, cable clamp.

Related Work

- Meter Removal and Installation (⇨17-5)

	WORK / PART NAME	NO.	NOTES
	Dismantling		Installation is reverse order of removal.
(1)	Bulb Socket	4	
(2)	Bulb	4	
(3)	Speedometer Screw	2	
(4)	Lower Cover Screw	5	
(5)	Clamp	1	
(6)	Lower Cover	1	
(7)	Speedometer	1	
(8)	Inner Panel	1	
(9)	Upper Cover	1	

MAIN SWITCH REMOVAL AND INSTALLATION



• CAUTION

Follow the wiring diagram (1-18) to correctly install wires and cables.

Related Work

- Front Cover Removal and Installation (⇨2-4)
- Meter Removal and Installation (⇨17-5)

	WORK / PART NAME	NO.	NOTES
	Removal		Installation is reverse order of removal.
(1)	Main Switch Coupler	1	Remove from coupler holder.
(2)	Main Switch Bolt	2	Replace with new one if removed.
(3)	Main Switch	1	