YAMAHA

DT230 L

4TP3-AE1

SERVICE MANUAL

EAS00000

DT230L
SERVICE MANUAL

EAS00002

NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:
Designs and specifications are subject to change without notice.

EAS00004

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person checking or repairing the motorcycle.

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.

NOTE: A NOTE provides key information to make procedures easier or clearer.

EAS00007

HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to "SYMBOLS".

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 ("PERIODIC CHECKS AND ADJUSTMENTS"), where the sub-section title(-s) appears.

③ Sub-section titles appear in smaller print than the section title.

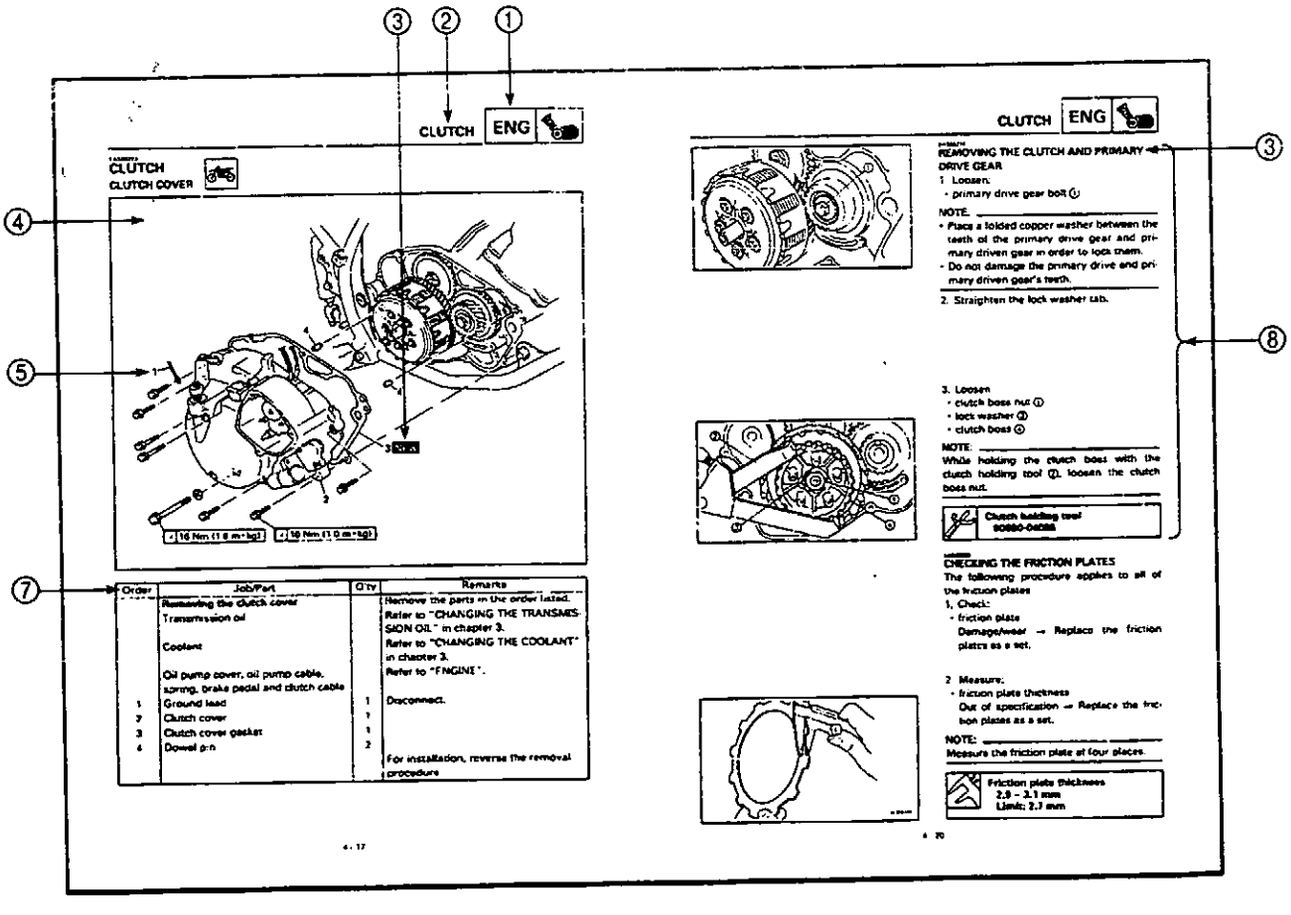
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

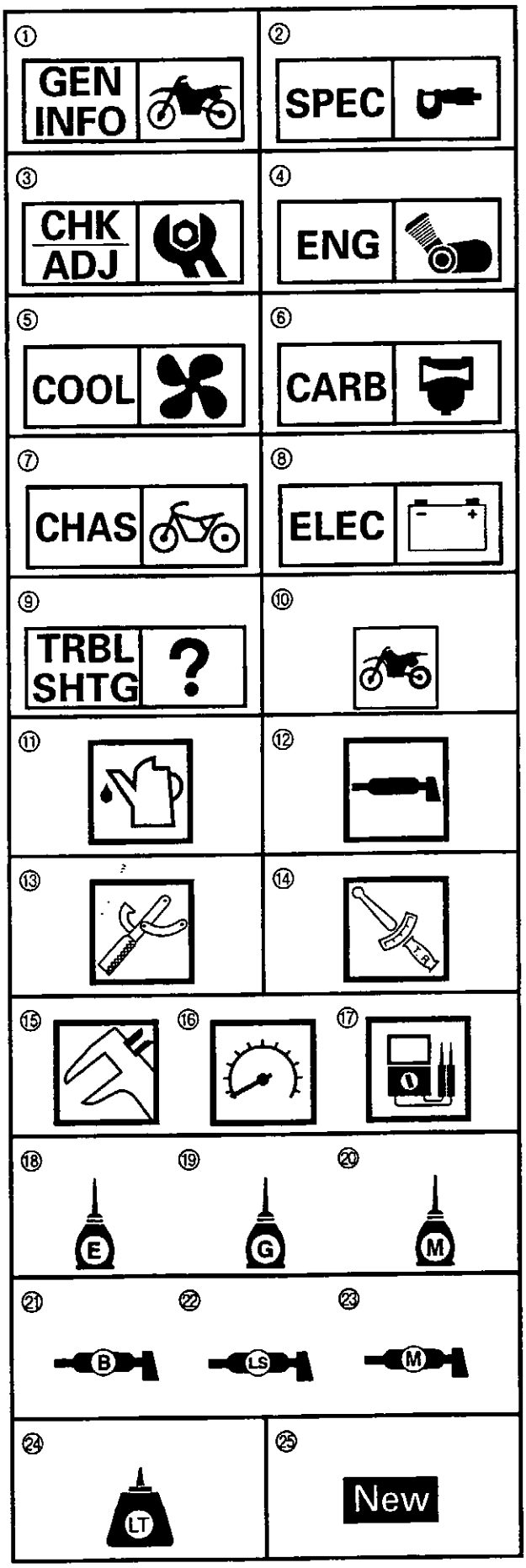
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

⑥ Symbols indicate parts to be lubricated or replaced.
Refer to "SYMBOLS".

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.





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SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

① General information
② Specifications
③ Periodic checks and adjustments
④ Engine
⑤ Cooling system
⑥ Carburetor(-s)
⑦ Chassis
⑧ Electrical system
⑨ Troubleshooting

Symbols ⑩ to ⑰ indicate the following.

⑩ Serviceable with engine mounted
⑪ Filling fluid
⑫ Lubricant
⑬ Special tool
⑭ Tightening torque
⑮ Wear limit, clearance
⑯ Engine speed
⑰ Electrical data

Symbols ⑱ to ㉓ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum disulfide oil
㉑ Wheel bearing grease
㉒ Lithium soap base grease
㉓ Molybdenum disulfide grease

Symbols ㉔ to ㉕ in the exploded diagrams indicate the following.

㉔ Apply locking agent (LOCTITE®)
㉕ Replace the part

EAS00010

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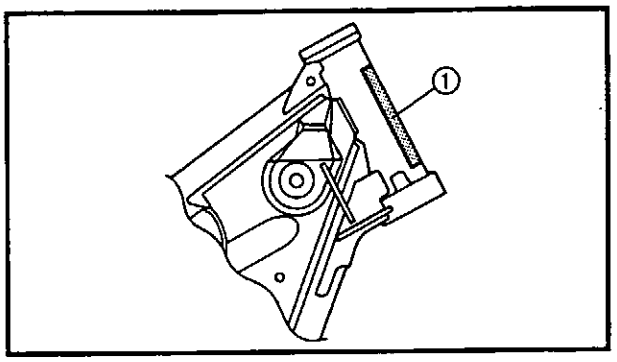
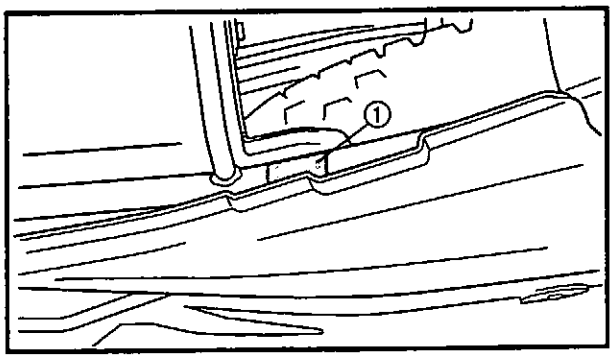
GENERAL INFORMATION





EAS00014
GENERAL INFORMATION
MOTORCYCLE IDENTIFICATION

EAS00017
VEHICLE IDENTIFICATION NUMBER
The vehicle identification number ① is stamped into the right side of the steering head pipe.

EAS00018
MODEL CODE
The model code label ① is affixed to the frame. This information will be needed to order spare parts.

EAS00019
FEATURES

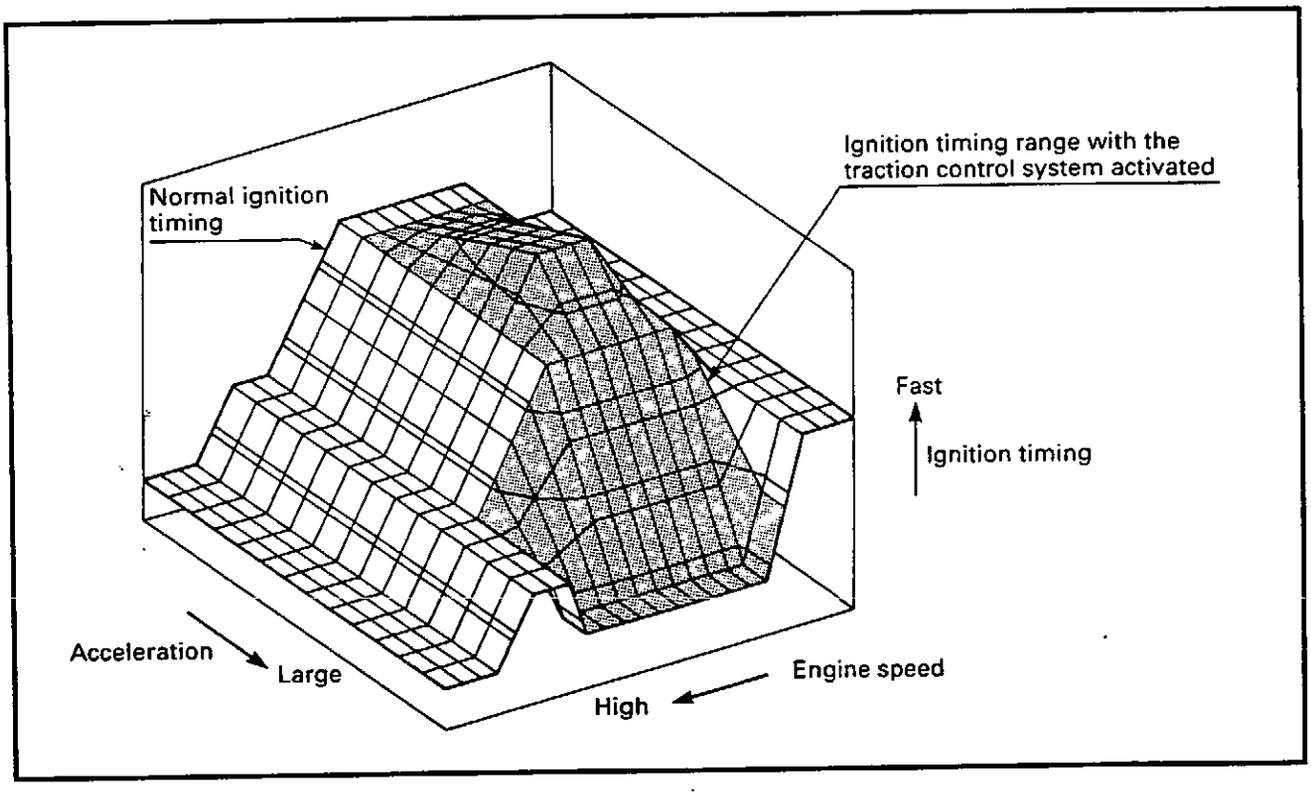
3-DIMENSIONAL TRACTION CONTROL SYSTEM

This motorcycle is equipped with an original Yamaha eight-bit microcomputer "traction control system", which improves the traction of the rear tire by influencing the ignition timing.

Changes in engine speed and acceleration are analyzed by the eight-bit microcomputer to detect when the rear tire is slipping (the wheel spins without gripping). The engine speed and acceleration are then controlled by the ignition timing in a three-dimensional matrix to improve rear wheel traction, and thus maneuverability.

When the CDI unit senses that the engine speed has risen suddenly as a result of the rear tire spinning freely, it controls the ignition timing by instantly retarding or advancing the signal to the ignition coil. This restores a proper driving force and maintains good traction of the rear tire.

The traction control system operates at engine speeds between 3,000 and 8,000 r/min.

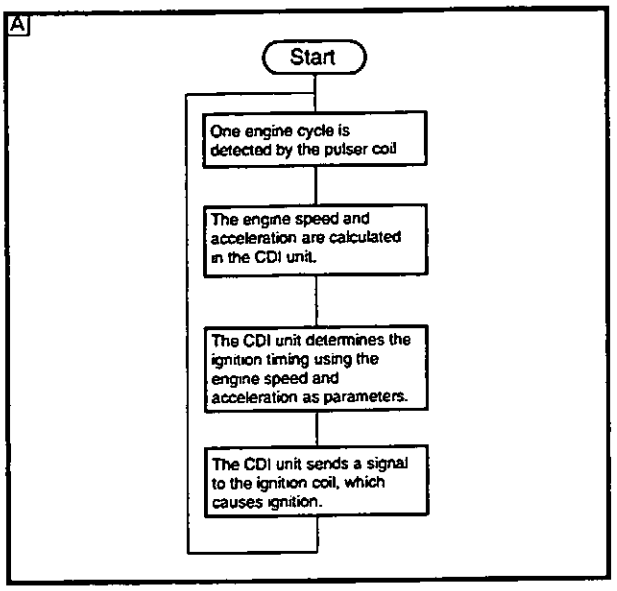


TRACTION CONTROL SYSTEM

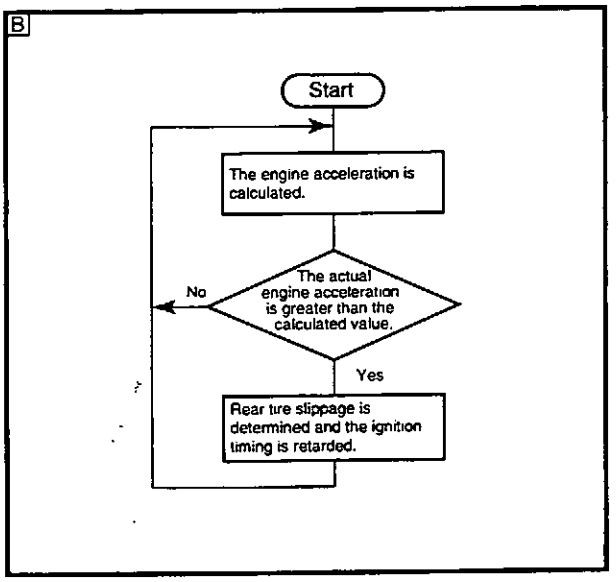
1. Flowcharts
   - This system was designed to help control traction without diminishing the enjoyment of riding on slippery off-road tracks.
   - Soft acceleration needed for good traction and riding on muddy surfaces is supported by this system.
   - Moderate traction adjustments help meet road and riding conditions.
   - This system does not produce any noticeable power jerks while achieving better traction.

A Ignition timing calculation method
B Tire slippage detection method

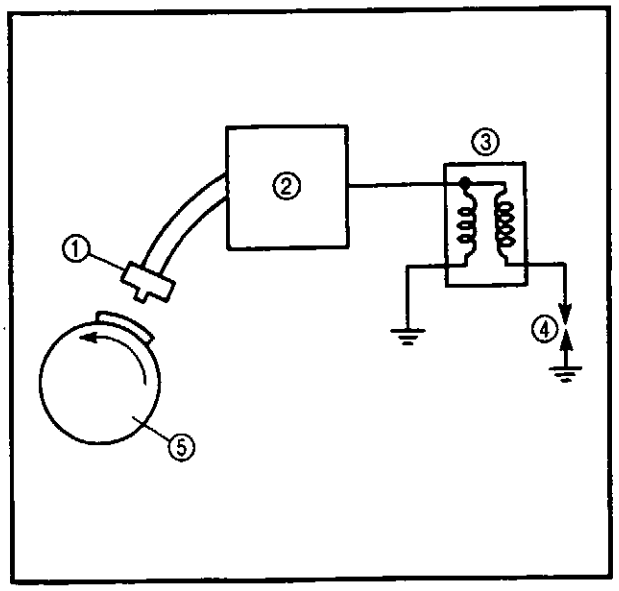
A



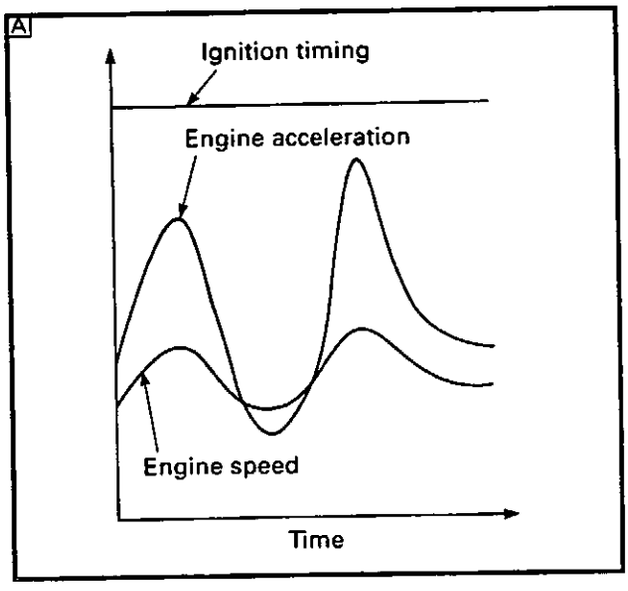
B

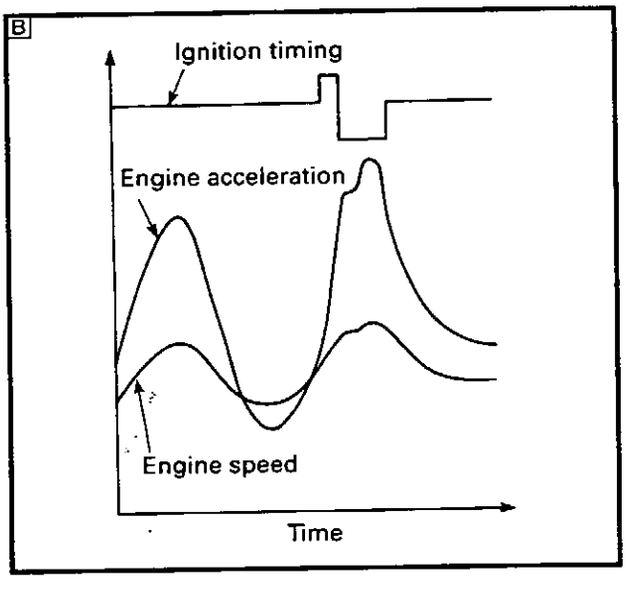


2. Diagram

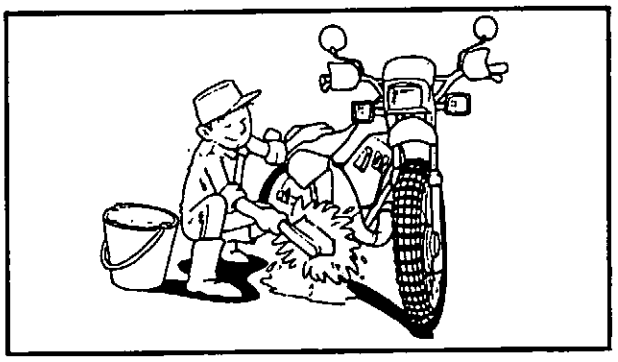


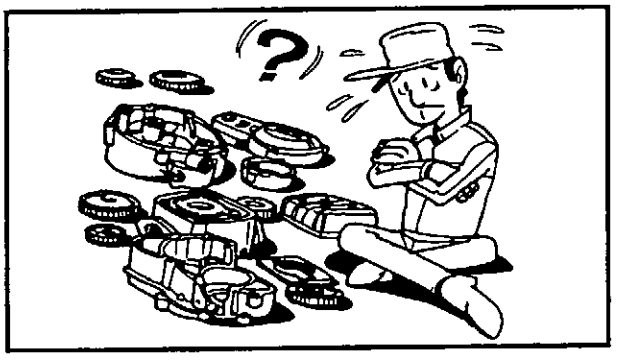
① Pulser coil
② CDI unit
③ Ignition coil
④ Spark plug
⑤ CDI magnet

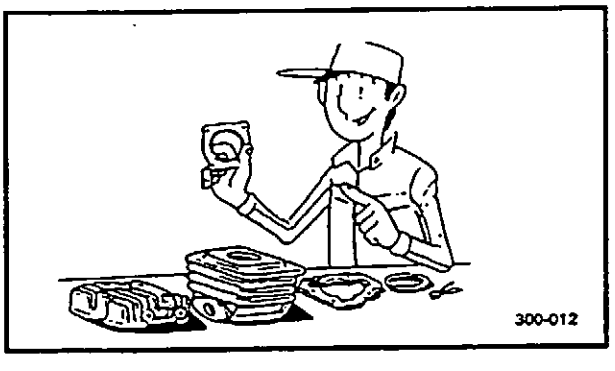




3. Comparison of ignition timing with and without traction control
[A] Without traction control
[B] With traction control







EAS00020
IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

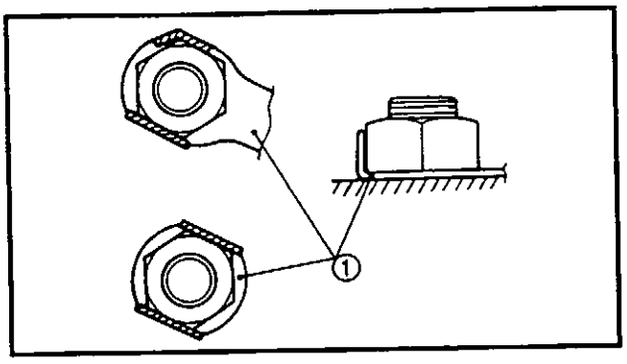
1. Before removal and disassembly, remove all dirt, mud, dust, and foreign material.
2. Use only the proper tools and cleaning equipment.
   Refer to "SPECIAL TOOLS".
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS00021
REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

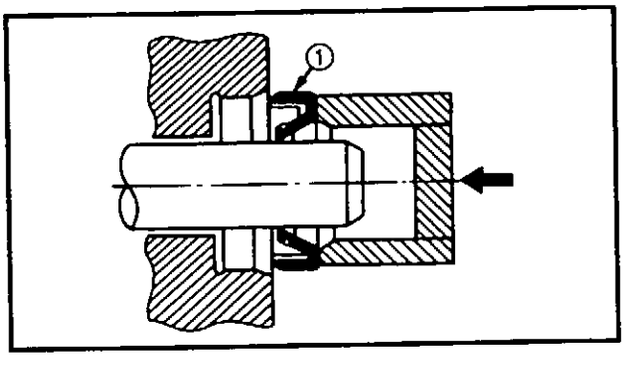
EAS00022
GASKETS, OIL SEALS AND O-RINGS

1. When overhauling the engine, replace all gaskets, seals, and O-rings. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



EAS00023
LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates ① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock washer tabs and the cotter pin ends along a flat of the bolt or nut.



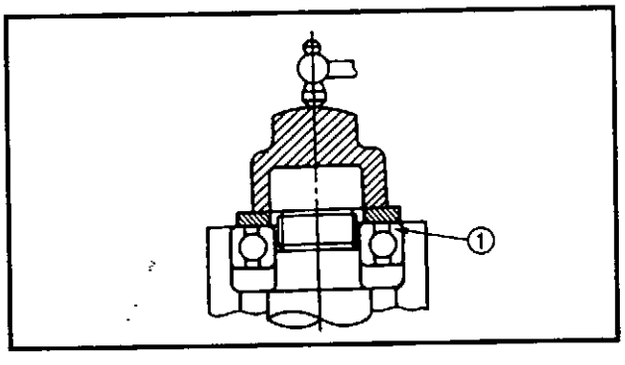
EAS00024
BEARINGS AND OIL SEALS

1. Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium soap base grease. Oil bearings liberally when installing, if appropriate.

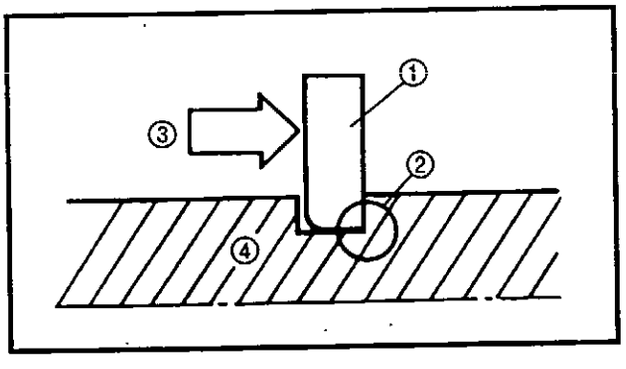
①Oil seal

CAUTION:

Do not spin the bearing with compressed air because this will damage the bearing surfaces.



①Bearing



EAS00025
CIRCLIPS

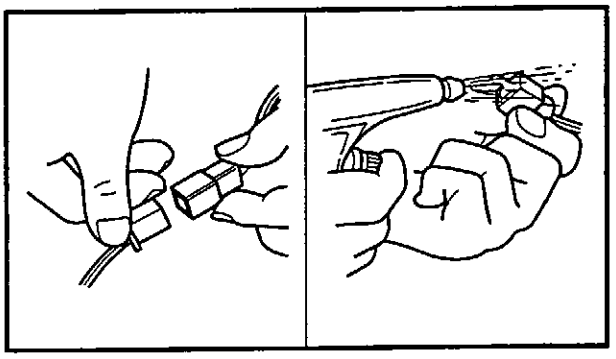
Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④Shaft

EAS00026
CHECKING THE CONNECTIONS

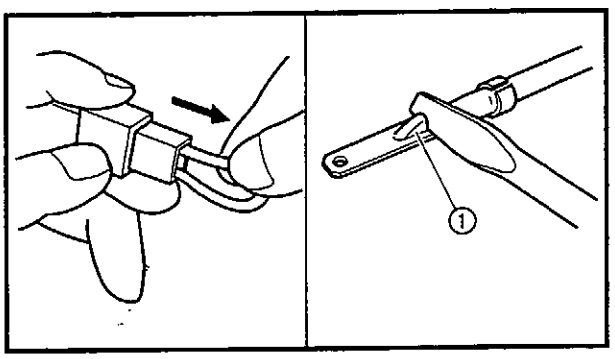
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - lead
   - coupler
   - connector



2. Check:
   - lead
   - coupler
   - connector

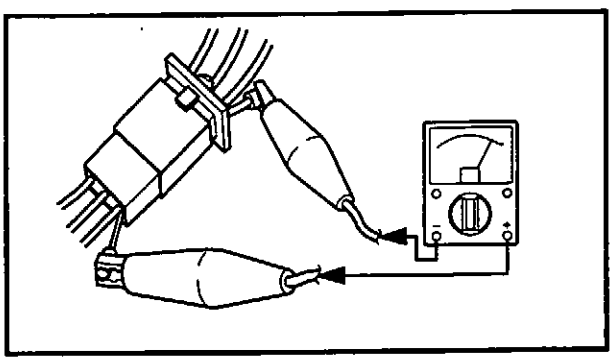
   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.



3. Check:
   - all connections

   Loose connection → Connect properly.

NOTE:
If the pin ① on the terminal is flattened, bend it up.

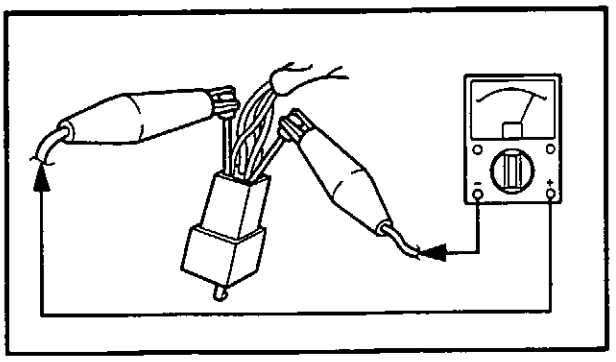


4. Connect:
   - lead
   - coupler
   - connector

NOTE:
Make sure all connections are tight.

5. Check:
   - continuity

   (with the pocket tester)

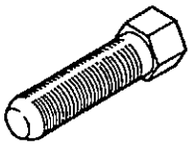
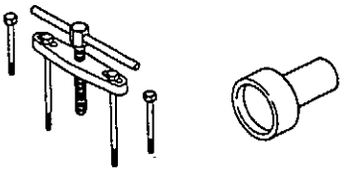
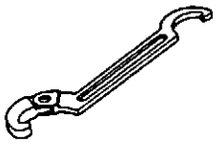
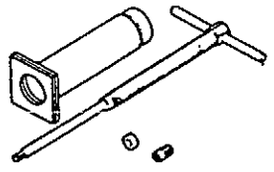
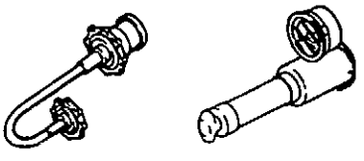
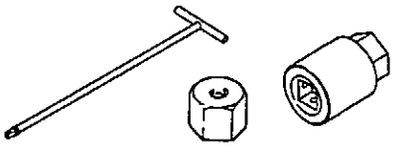


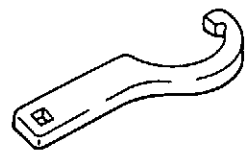
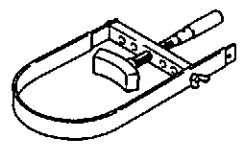
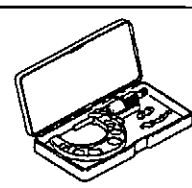
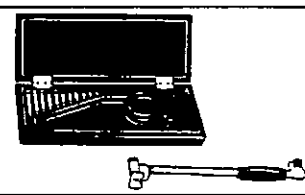
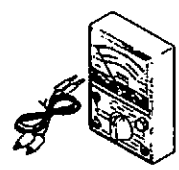
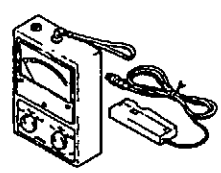
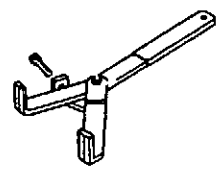
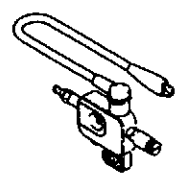
	Pocket tester **90890-03112**

NOTE:
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.

EAS00027
SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers, or both may differ depending on the country.
When placing an order, refer to the list provided below to avoid any mistakes.

Tool No.	Tool name/Function	Illustration
90890-01080	Flywheel puller This tool is used to remove the generator rotor.	
Crankcase separating tool 90890-01135 Crankshaft protector 90890-01382	Crankcase separating tool Crankshaft protector These tools are used to separate the crankcase and to remove the crankshaft.	
90890-01268	Ring nut wrench This tool is used to loosen the stering stem ring nut.	
Crankshaft installer pot 90890-01274 Crankshaft installer bolt 90890-01275 Adaptor (M10) 90890-01383	Crankshaft installer pot Crankshaft installer bolt Adaptor (M10) These tools are used to install the crankshaft.	
90890-01304	Piston pin puller set This tool is used to remove the piston pins.	
90890-01312	Fuel level gauge This tool is used to measure the fuel level in the float chamber.	
Radiator cap tester 90890-01325 adapter 90890-01352	Radiator cap tester Radiator cap tester adapter These tools are used to check the cooling system.	
T-handle 90890-01326 Damper rod holder (27 mm) 90890-01388 Damper rod holder (14 mm) 90890-04085	T-handle Damper rod holder (27 mm) Damper rod holder (14 mm) These tools are used to hold the damper rod assembly when loosening or tightening the damper	

Tool No.	Tool name/Function	Illustration
Fork seal driver weight 90890-01367 Fork seal driver attachment 90890-01381	Fork seal driver weight Fork seal driver attachment These tools are used to install the front fork's oil seal and dust seal.	
90890-01403	Steering nut wrench This tool is used to tighten the steering stem ring nut.	
90890-01701	Sheave holder This tool is used to hold the generator rotor when loosening or tightening the generator rotor bolt.	
90890-03008	Micrometer (50 ~ 75 mm) This tool is used to measure the piston skirt diameter.	
90890-03017	Cylinder bore gauge (50 ~ 100 mm) This tool is used to measure the cylinder bore.	
90890-03112	Pocket tester This tool is used to check the electrical system.	
90890-03113	Engine tachometer This tool is used to check engine speed.	
90890-04086	Clutch holding tool This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
90890-06754	Ignition checker This tool is used to check the ignition system components.	

Tool No.	Tool name/Function	Illustration
90890-85505	Yamaha bond No. 1215 This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	

CONTENTS
SPECIFICATIONS

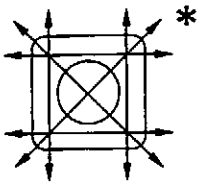
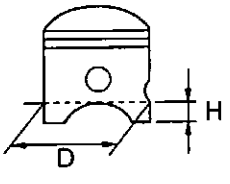
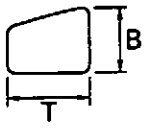
SPECIFICATIONS

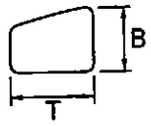
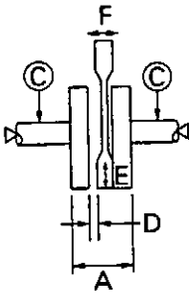
GENERAL SPECIFICATIONS

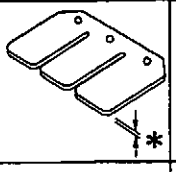
Item	Standard	Limit
Dimensions		
Overall length	2,225 mm	----
Overall width	800 mm	----
Overall height	1,200 mm	----
Seat height	865 mm	----
Wheelbase	1,410 mm	----
Minimum ground clearance	300 mm	----
Minimum turning radius	2,100 mm	----
Weight		
Wet (with oil and a full fuel tank)	133 kg	----
Dry (without oil and fuel)	121 kg	----
Maximum load (total of cargo, rider, passenger, and accessories)	180 kg	----

ENGINE SPECIFICATIONS

Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 2-stroke	----
Displacement	224 cm^3	----
Cylinder arrangement	Forward-inclined, single cylinder	----
Bore × stroke	66.8 × 64.0 mm	----
Compression ratio	6.5:1	----
Engine idling speed	1,300 ~ 1,400 r/min	----
Standard compression pressure (at sea level)	820 kPa (8.2 kgf/cm^2) at 700 r/min	----
Fuel		
Recommended fuel	Regular gasoline Unleaded fuel only (for AUS)	----
Fuel tank capacity		
Total (including reserve)	11 L	----
Reserve only	2 L	----
Lubrication system	Separate lubrication	----
Oil type or grade		
Engine oil	Air cooled 2-stroke engine oil	----
Oil tank capacity	1.3 L	----
Transmission oil	Yamaha gear oil (SAE 10W30 SE)	----
Periodic oil change	0.80 L	----
Total amount	0.85 L	----
Cooling system		
Radiator capacity	1.26 L	----
Radiator cap opening pressure	95 ~ 125 kPa (0.95 ~ 1.25 kgf/cm^2)	----
Radiator core		
Width	103.8 mm	----
Height	280.0 mm (left)/180.0 mm (right)	----
Depth	27.0 mm	----
Coolant reservoir capacity	0.36 L	----
Water pump		
Water pump type	Single-suction centrifugal pump	----
Reduction ratio	24/21 (1.143)	----
Max. impeller shaft tilt	----	0.15 mm
Starting system type	Electric starter	----
Spark plug		
Model (manufacturer) × quantity	BR9ES (NGK) × 1	----
Spark plug gap	0.7 ~ 0.8 mm	----

Item	Standard	Limit
Cylinder head		
Max. warpage	----	0.03 mm
		
Cylinder		
Cylinder arrangement	Forward-inclined, single cylinder	----
Bore × stroke	66.8 × 64.0 mm	----
Compression ratio	6.5:1	----
Bore	66.800 ~ 66.818 mm	----
Max. taper	----	0.01 mm
Max. out-of-round	----	0.025 mm
Piston		
Piston-to-cylinder clearance	0.045 ~ 0.050 mm	0.10 mm
Diameter D	66.752 ~ 66.767 mm	----
		
Height H	10 mm	----
Piston pin bore (in the piston)		
Diameter	16.004 ~ 16.015 mm	16.045 mm
Offset	0.5 mm	----
Offset direction	Intake side	----
Piston pins		
Outside diameter	15.995 ~ 16.000 mm	15.975 mm
Piston-pin-to-piston-pin-bore clearance	0.004 ~ 0.020 mm	0.065 mm
Piston rings		
Top ring		
		
Ring type	Keystone	----
Dimensions (B × T)	1.2 × 2.8 mm	----
End gap (installed)	0.3 ~ 0.5 mm	0.7 mm
Ring side clearance	0.020 ~ 0.060 mm	0.1 mm

Item	Standard	Limit
2nd ring 		
Ring type	Keystone	----
Dimensions (B × T)	1.2 × 2.4 mm	----
End gap (installed)	0.3 ~ 0.5 mm	0.7 mm
Ring side clearance	0.030 ~ 0.065 mm	0.1 mm
Crankshaft 		
Width A	58.90 ~ 58.95 mm	----
Max. runout C	----	0.02 mm
Big end side clearance D	0.2 ~ 0.7 mm	1.0 mm
Big end radial clearance E	0.027 ~ 0.039 mm	----
Small end free play F	0.8 ~ 1.0 mm	2.0 mm
Clutch		
Clutch type	Wet, multiple disc	----
Clutch release method	Rack and pinion (pull rod type)	----
Clutch release method operation	Cable operation	----
Operation	Left-hand	----
Clutch cable free play (at the end of the clutch lever)	10 ~ 15 mm	----
Friction plates		
Thickness	2.9 ~ 3.1 mm	2.7 mm
Plate quantity	7	----
Clutch plates		
Thickness	1.05 ~ 1.35 mm	----
Plate quantity	6	----
Max. warpage	----	0.05 mm
Clutch springs		
Free length	33 mm	31 mm
Spring quantity	5	----

Item	Standard	Limit
Transmission		
Transmission type	Constant mesh, 6-speed	----
Primary reduction system	Helical gear	----
Primary reduction ratio	54/21 (2.571)	----
Secondary reduction system	Chain drive	----
Secondary reduction ratio	55/16 (3.437)	----
Operation	Left-foot operation	----
Gear ratios		
1st gear	33/12 (2.750)	—
2nd gear	30/16 (1.875)	—
3rd gear	24/17 (1.411)	—
4th gear	24/21 (1.142)	—
5th gear	22/23 (0.956)	—
6th gear	18/22 (0.818)	—
Max. main axle runout	----	0.08 mm
Max. drive axle runout	----	0.08 mm
Shifting mechanism		
Shift mechanism type	Cam drum and guide bar	----
Max. shift fork guide bar bending	----	0.1 mm
Air filter type	Wet element	----
Carburetor		
Model (manufacturer) × quantity	TM30 (MIKUNI) × 1	----
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm	----
ID mark	4TP00	----
Main jet	#165	----
Main air jet	0.8	----
Jet needle	6DHY40-4	----
Needle jet	O-0	----
Pilot outlet	0.6	----
Pilot jet	#22.5	----
Bypass 1	0.9	----
Pilot screw turns out	1-1/4	----
Valve seat size	3.0	----
Starter jet 1	#60	----
Power jet	#70	----
Float height	12.4 ~ 13.4 mm	----
Read valve 		
Thickness * reed valve	0.42 mm	----
Valve stopper height	9 mm	----
Valve bending limit	----	1.5 mm
Autolube pump		
Plunger diameter	3.5 mm	----
Minimum stroke	0.20 ~ 0.24 mm	----
Maximum stroke	2.71 ~ 2.85 mm	----

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Semi double cradle	----
Caster angle	27°	----
Trail	114 mm	----
Front wheel		
Wheel type	Spoke wheel	----
Rim		
Size	1.60 × 21	----
Material	Aluminum	----
Wheel travel	250 mm	----
Wheel runout		
Max. radial wheel runout	----	1 mm
Max. lateral wheel runout	----	0.5 mm
Rear wheel		
Wheel type	Spoke wheel	----
Rim		
Size	2.15 × 18	----
Material	Aluminum	----
Wheel travel	240 mm	----
Wheel runout		
Max. radial wheel runout	----	1 mm
Max. lateral wheel runout	----	0.5 mm
Front tire		
Tire type	With tube	----
Size	3.00-21 51P	----
Model (manufacturer)	GP-21F (INOUE) M-6033 (CHENG SHIN)	----
Tire pressure (cold)		
0 ~ 88 kg	125 kPa (1.25 kgf/cm^2, 1.25 bar)	----
88 ~ 180 kg	150 kPa (1.5 kgf/cm^2, 1.5 bar)	----
High-speed riding	150 kPa (1.5 kgf/cm^2, 1.5 bar)	----
Min. tire tread depth	----	1.6 mm
Rear tire		
Tire type	With tube	----
Size	4.60-18 63P	----
Model (manufacturer)	GP-22R (INOUE) M-6034 (CHENG SHIN)	----
Tire pressure (cold)		
0 ~ 88 kg	150 kPa (1.5 kgf/cm^2, 1.5 bar)	----
88 ~ 180 kg	175 kPa (1.75 kgf/cm^2, 1.75 bar)	----
High-speed riding	175 kPa (1.75 kgf/cm^2, 1.75 bar)	----
Min. tire tread depth	----	1.6 mm

Item	Standard	Limit
Front brake		
Brake type	Single-disc brake	----
Operation	Right-hand operation	----
Brake lever free play (at the end of the brake lever)	2 ~ 5 mm	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	245 × 3.5 mm	----
Min. thickness	----	3.0 mm
Max. deflection	----	0.5 mm
Brake pad lining thickness	4.2 mm	1.0 mm
		
Master cylinder inside diameter	11 mm	----
Caliper cylinder inside diameter	27 mm and 27 mm	----
Rear brake		
Brake type	Single-disc brake	----
Operation	Right-foot operation	----
Brake pedal position (from the top of the brake pedal to the bottom of the rider footrest bracket)	15 mm	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	220 × 4.5 mm	----
Min. thickness	----	4.0 mm
Max. deflection	----	0.5 mm
Brake pad lining thickness	5.6 mm	1.0 mm
		
Master cylinder inside diameter	12.7 mm	----
Caliper cylinder inside diameter	30.23 mm	----
Front suspension		
Suspension type	Telescopic fork	----
Front fork type	Coil spring/oil damper	----
Front fork travel	250 mm	----
Spring		
Free length	478 mm	----
Installed length	459.5 mm	----
Spring rate (K1)	3.4 N/mm (0.35 kgf/mm)	----
Spring stroke (K1)	0 ~ 120 mm	----
Optional spring available	No	----

Item	Standard	Limit
Fork oil		
Recommended oil	Suspension oil "01" or equivalent	----
Quantity (each front fork leg)	542 cm^3	----
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	120 mm	----
Compression damping adjusting positions		
Minimum*	17	----
Standard*	14	----
Maximum*	1	----
* from the fully turned-in position		
Steering		
Steering bearing type	Angular and taper roller bearings	----
Rear suspension		
Suspension type	Swingarm (new monocross)	----
Rear shock absorber assembly type	Coil-gas spring/oil damper	----
Rear shock absorber assembly travel	86 mm	----
Spring		
Free length	256 mm	----
Installed length	244 mm	----
Spring rate (K1)	58.8 N/mm (6 kgf/mm)	----
Spring stroke (K1)	0 ~ 86 mm	----
Optional spring available	No	----
Standard spring preload gas/air pressure	1,500 kPa (15 kgf/cm^2)	----
Spring preload adjusting length		
Minimum	252 mm	----
Standard	244 mm	----
Maximum	234 mm	----
Rebound damping adjusting positions		
Minimum*	16	----
Standard*	9	----
Maximum*	1	----
* from the fully turned-in position (clockwise)		
Compression damping adjusting positions		
Minimum*	5	----
Standard*	8	----
Maximum*	22	----
* from the fully turned-in position (counter clockwise)		

Item	Standard	Limit
Swingarm		
Free play (at the end of the swingarm)		
Radial	----	1 mm
Axial	----	1 mm
Drive chain		
Model (manufacturer)	428VS3 (DAIDO)	----
Link quantity	132	----
Drive chain slack	40 ~ 60 mm	----
Maximum ten-link section	----	120.0 mm

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	----
Ignition system		
Ignition timing (B.T.D.C.)	14°BTDC at 1,350 r/min	----
Advancer type	Electrical	----
CDI		
Magneto-model (manufacturer)	F4TP (YAMAHA)	----
Source coil 1 resistance/color	600 ~ 900 Ω at 20 °C / B/R – G/W	----
Source coil 2 resistance/color	472 ~ 708 Ω at 20 °C / G/L – G/W	----
Pickup coil resistance/color	656 ~ 984 Ω at 20 °C / W/R – W/L	----
CDI unit-model (manufacturer)	4TP (YAMAHA)	----
Ignition coil		
Model (manufacturer)	2JN (YAMAHA)	----
Minimum ignition spark gap	6 mm	----
Primary coil resistance	0.18 ~ 0.28 Ω	----
Secondary coil resistance	6.3 ~ 9.5 kΩ	----
Spark plug cap		
Material	Resin	----
Resistance	5 kΩ	----
CDI magneto		
Nominal output	14 V / 12 A at 5,000 r/min	----
Rectifier/regulator		
Regulator type	Semiconductor-short circuit	----
Model (manufacturer)	SH629A-12 (SHINDENGEN)	----
No-load regulated voltage	14.1 ~ 14.9 V	----
Rectifier capacity	10 A	----
Withstand voltage	200 V	----
Battery		
Battery (manufacturer)	GT6B-3 (GS)	----
Battery voltage/capacity	12 V / 6AH	----
Headlight type	Halogen bulb	----
Bulbs (voltage/wattage × quantity)		
Headlight	12 V 60 W / 55 W × 1	----
Tail/brake light	12 V 5 W / 21 W × 1	----
Turn signal light	12 V 21 W × 4	----
License plate light	12 V 5 W × 2	----
Neutral indicator light	12 V 3 W × 1	----
High beam indicator light	12 V 3 W × 1	----
Turn indicator light	12 V 3 W × 1	----
Oil level/coolant temperature indicator light	LCD × 1	----

Item	Standard	Limit
Electric starting system		
System type	Constant mesh	----
Starter motor		
Model (manufacturer)	4TP (YAMAHA)	----
Power output	0.3 kW	----
Brushes		
Overall length	10 mm	3.5 mm
Spring force	5.52 ~ 8.28 N (563 ~ 844 gf)	----
Commutator resistance	0.031 ~ 0.037 Ω	----
Commutator diameter	22 mm	21 mm
Mica undercut	1.5 mm	----
Starter relay		
Model (manufacturer)	MS5F-561 (JIDECO)	----
Amperage	180 A	----
Coil resistance	4.18 ~ 4.62 Ω	----
Horn		
Horn type	Plain	----
Model (manufacturer) × quantity	GF-12 (NIKKO) × 1	----
Max. amperage	1.5 A	----
Turn signal relay		
Relay type	Full-transistor	----
Model (manufacturer)	FE246BH (DENSO)	----
Self-cancelling device built-in	No	----
Turn signal blinking frequency	75 ~ 95 cycles/min.	----
Wattage	21 W × 2 + 3.4 W	----
Oil level switch model (manufacturer)	3XP (ASTI)	----
Temperature sender		
Model (manufacturer)	2YK (NIPPON SEIKI)	----
Resistance	47.5 ~ 56.8 Ω at 80 °C 16.5 ~ 20.5 Ω at 11.5 °C	----
Fuses (amperage × quantity)		
Main fuse	30 A × 1	----

EB201000
CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.
Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

METRIC		MULTIPLIER		IMPERIAL
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

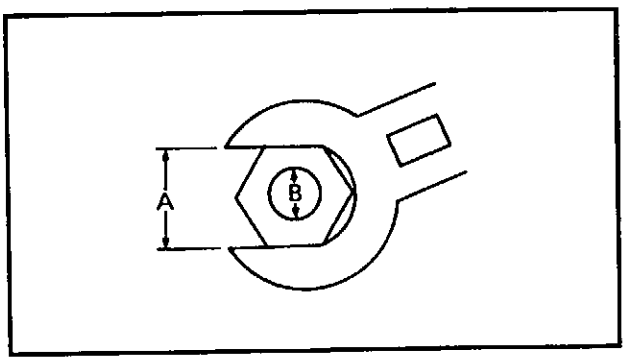
CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Tightening torque	m·kg m·kg cm·kg cm·kg	7.233 86.794 0.0723 0.8679	ft·lb in·lb ft·lb in·lb
Weight	kg g	2.205 0.03527	lb oz
Speed	km/hr	0.6214	mph
Distance	km m m cm mm	0.6214 3.281 1.094 0.3937 0.03937	mi ft yd in in
Volume/ Capacity	cc (cm³) cc (cm³) lt (liter) lt (liter)	0.03527 0.06102 0.8799 0.2199	oz (IMP liq.) cu·in qt (IMP liq.) gal (IMP liq.)
Misc.	kg/mm kg/cm² Centigrade (°C)	55.997 14.2234 9/5+32	lb/in psi (lb/in²) Fahrenheit (°F)

EB202001
TIGHTENING TORQUES

GENERAL TIGHTENING TORQUES

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A: Width across flats
B: Thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

ENGINE TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m·kgf	
Spark plugs	–	M14 × 1.25	1	20	2.0	
Cylinder head	Nut	M8 × 1.25	5	22	2.2	
Cylinder	Bolt	M8 × 1.25	4	28	2.8	
YPVS valve cover	Bolt	M5 × 0.8	2	7	0.7	
YPVS pulley cover	Bolt	M5 × 0.8	2	7	0.7	
YPVS pulley	Bolt	M6 × 1.0	1	10	1.0	
Balance weight gear	Nut	M10 × 1.0	1	45	4.5	
Water pump cover	Bolt	M6 × 1.0	3	10	1.0	
Water hose joint (cylinder head)	Screw	M6 × 1.0	3	6	0.6	
Radiator	Bolt	M6 × 1.0	2	10	1.0	
Carburetor heater hose	Bolt	M6 × 1.0	1	8	0.8	
Water hose joint (frame)	Bolt	M6 × 1.0	2	10	1.0	
Oil pump	Screw	M × 0.8	2	5	0.5	
Intake manihold	Bolt	M6 × 1.0	4	10	1.0	
Air cleaner case	Bolt	M6 × 1.0	3	6	0.6	
Exhaust pipe stay	Bolt	M6 × 1.0	2	8	0.8	
Exhaust pipe	Nut	M8 × 1.25	2	18	1.8	
Exhaust pipe and stay	Bolt	M6 × 1.0	2	8	0.8	
Silencer	Bolt	M28 × 1.25	2	40	4.0	
Silencer joint band	Bolt	M8 × 1.25	1	12	1.2	
Crankcase	Bolt	M6 × 1.0	12	10	1.0	
Oil seal retainer	Screw	M8 × 1.25	1	16	1.6	◎
Screw (capped connector)	Screw	M8 × 1.25	1	16	1.6	◎
Generator rotor cover	Bolt	M6 × 1.0	6	10	1.0	
Drive sprocket cover	Bolt	M6 × 1.0	2	10	1.0	
Clutch cover	Bolt	M6 × 1.0	7	10	1.0	
Oil pump cover	Bolt	M6 × 1.0	3	8	0.8	
Plate	Screw	M6 × 1.0	3	8	0.8	◎
Idle gear plate	Screw	M6 × 1.0	1	8	0.8	◎
Starter clutch	Bolt	M8 × 1.25	3	30	3.0	◎
Presser plate	Bolt	M5 × 0.8	5	6	0.6	
Primary drive gear	Bolt	M10 × 1.25	1	70	7.0	
Clutch boss	Nut	M12 × 1.0	1	90	9.0	
Push lever axle	Bolt	M6 × 1.0	1	7	0.7	
Drive sprocket	Nut	M16 × 1.0	1	60	6.0	
Bearing cover plate (main axle)	Screw	M6 × 1.0	1	8	0.8	◎
Stopper lever assembly	Bolt	M6 × 1.0	1	10	1.0	◎
Shift pedal assembly	Bolt	M6 × 1.0	1	15	1.5	
Generator rotor	Bolt	M10 × 1.25	1	60	6.0	
Stator coil	Bolt	M6 × 1.0	3	10	1.0	◎
Pickup coil	Bolt	M6 × 1.0	2	10	1.0	◎

TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m·kgf	
Drain bolt	Bolt	M8 × 1.25	1	16	1.6	
Ignition coil	Screw	M6 × 1.0	2	10	1.0	
Neutral switch	–	M10 × 1.25	1	20	2.0	
Thermo unit	–	PT 1/8	1	15	1.5	
Servomotor pulley	Bolt	M5 × 0.8	1	7	0.7	
Servomotor assembly	Bolt	M6 × 1.0	3	8	0.8	
Starter motor lead plate	Screw	M6 × 1.0	3	6	0.6	
Starter motor	Bolt	M6 × 1.0	2	10	1.0	
Speed sensor	Screw	M6 × 1.0	2	6	0.6	

CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening torque		Remarks
		Nm	m·kgf	
Engine mounting				
Front mounting bolt	M10	69	6.9	
Rear mounting bolt	M8	33	3.3	
Upper mounting bolts	M8	33	3.3	
Pivot shaft nut	M16	92	9.2	
Rear arm and connecting arms	M14	59	5.9	
Relay arm and connecting arms	M14	59	5.9	
Relay arm and frame	M10	59	5.9	
Rear shock absorber and frame	M10	34	3.4	
Rear shock absorber and relay arm	M10	34	3.4	
Rear arm end bolt	M6	3	0.3	
Steering stem nut	M22	138	13.8	
Upper bracket pinch bolts	M8	23	2.3	
Lower bracket pinch bolts	M8	23	2.3	
Handlebar upper bracket	M8	23	2.3	
Lower ring nut	M25	4	0.4	See NOTE.
Front brake hose holder	M6	7	0.7	
Front brake master cylinder	M6	7	0.7	
Fuel cock	M6	7	0.7	
Fuel tank	M6	10	1.0	
Front brake disc	M6	12	1.2	
Front wheel axle	M14	58	5.8	
Front wheel axle holder	M6	10	1.0	
Front brake caliper and front fork	M10	30	3.0	
Brake hose union bolt	M10	30	3.0	
Front brake caliper bleed screw	M7	6	0.6	
Rear brake disc	M6	12	1.2	
Rear wheel sprocket and rear wheel drive hub	M8	35	3.5	
Rear wheel axle nut	M18	104	10.4	
Rear brake caliper bleed screw	M7	6	0.6	
Rear brake master cylinder	M8	10	1.0	
Rear brake caliper protector	M6	10	1.0	

NOTE:
1. First, tighten the ring nut to approximately 38 Nm (3.8 m • kg) with a torque wrench, then loosen the ring nut completely.
2. Retighten the ring nut to specification.

EAS00031
LUBRICATION POINTS AND LUBRICANT TYPES
ENGINE LUBRICATION POINTS AND LUBRICANT TYPES

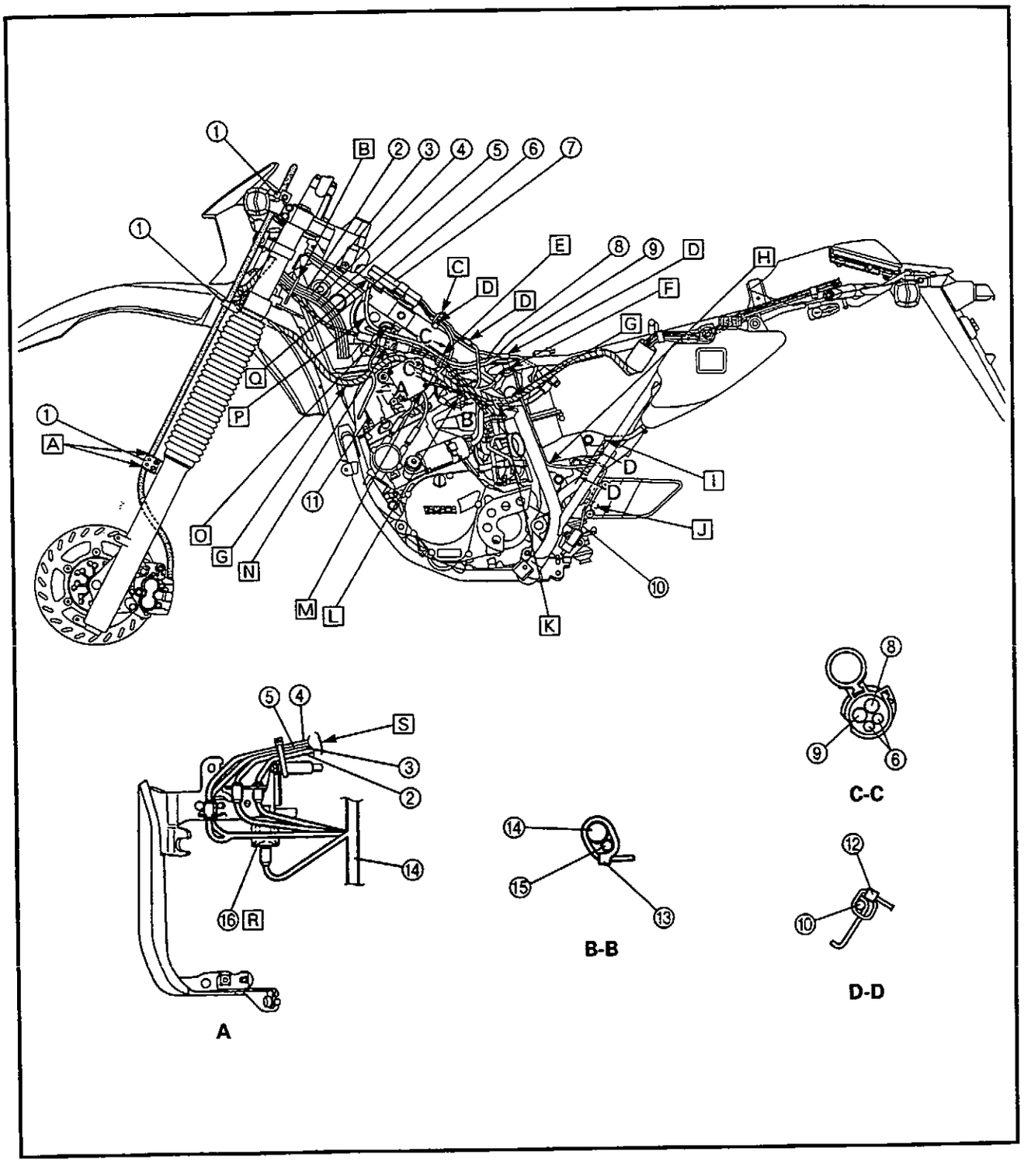
Lubrication point	Lubricant
Oil seal lips	LS
O-rings	LS
Crankshaft bearings	E
Connecting rod small end bearing	E
Balancer shaft bearing	G
Main axle bearing	G
Drive axle bearing	G
Shift drum bearing	G
Push rod bearing	G
Push lever axle bearing	G
Starter motor bearing	LS
Idle gear bearing	LS
YPVS shaft	LS
Crankshaft big end thrust washer	E
Piston surface and piston pin bore	E
Piston pin	E
Piston ring	E
Water pump impeller shaft	G
Oil pump drive shaft and drive gear	G
Starter clutch assembly	M
Primary driven gear	G
Push lever axle gear	G
Transmission slide gears	G
Transmission idle gears	M
Shift drum	G
Shift forks and shift fork guide bars	G
Shift shaft	G
Crankcase mating surface	Yamaha bond No.1215

EAS00032
CHASSIS LUBRICATION POINTS AND LUBRICANT TYPES

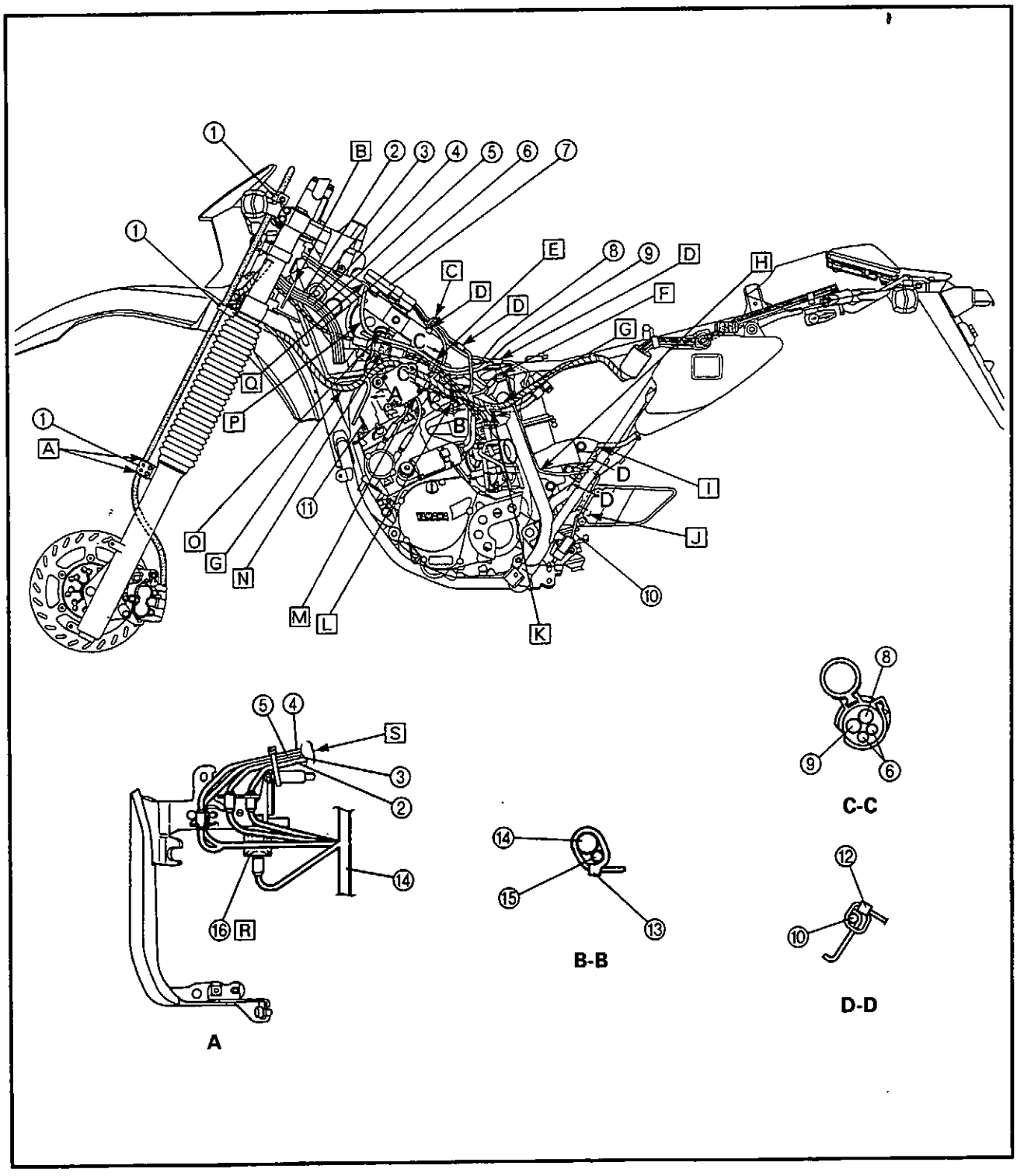
Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	LS
Steering bearing race cover	LS
Pivot shaft	M
Rear arm pivot oil seal	M
Rear arm pivot bearing and bushing	M
Rear arm pivot spacer	M
Rear arm link bushing and oilseal	M
Rear arm link spacer and bolt	M
Relay arm bearing and bushing	M
Relay arm oilseal	M
Relay arm and connecting rod spacer and bolt	M
Rear shock absorber assembly bearing and oilseal	M
Throttle cable housing and cable end	LS
Clutch cable end	LS
Brake and clutch lever pivoting point and metal-to-metal moving parts	LS
Front wheel oil seal	LS
Rear wheel oil seal	LS
Rear brake pedal	LS
Sidestand pivoting point and metal-to-metal moving parts	LS
Tensioner bushings	LS

EAS00035
CABLE ROUTING

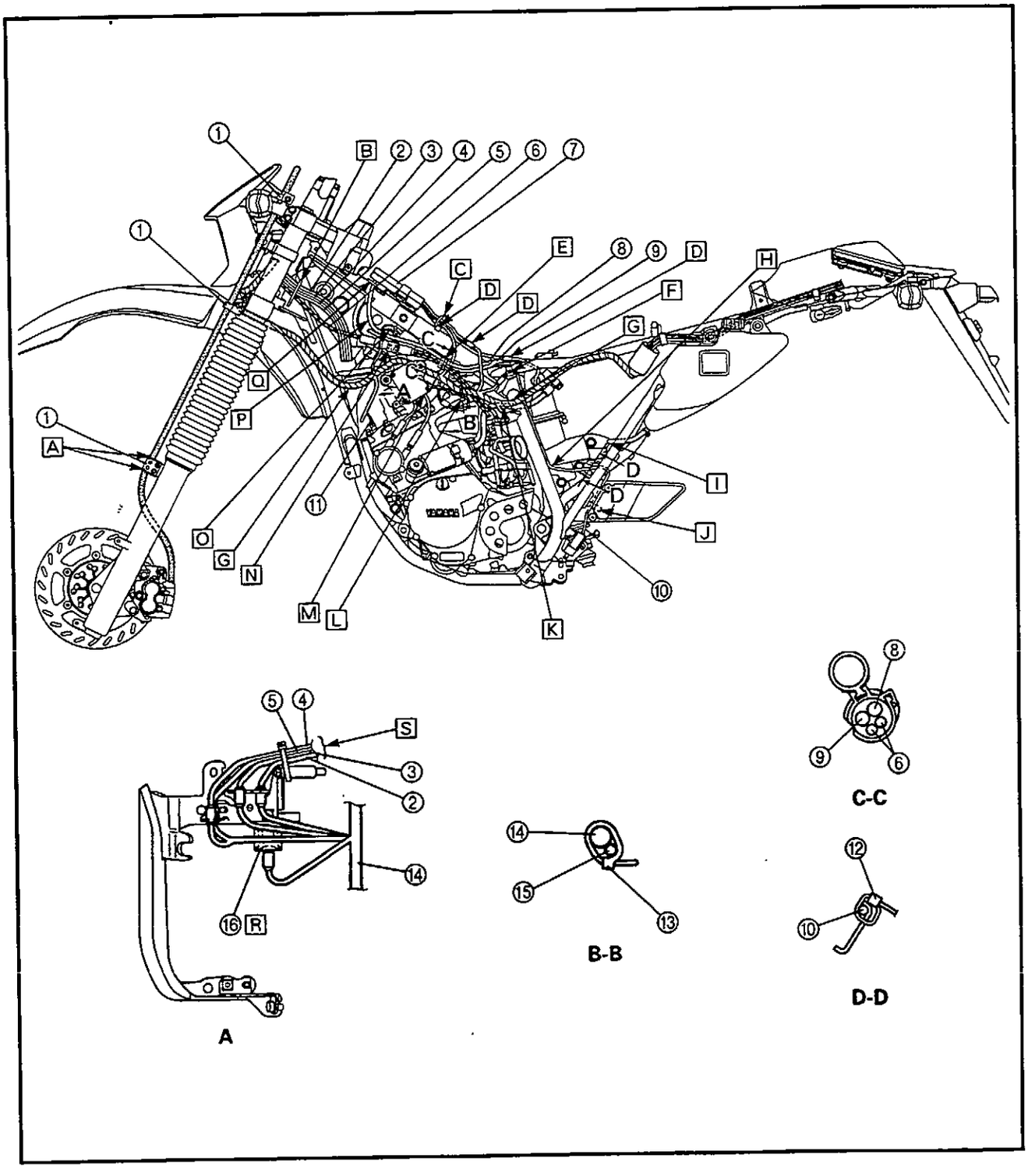
① Cable holder
② Right handlebar switch lead
③ Left handlebar switch lead
④ Clutch switch lead
⑤ Front brake light switch lead
⑥ Throttle cable
⑦ CDI unit
⑧ Coolant reservoir breather hose
⑨ Coolant reservoir hose
⑩ Sidestand switch lead
⑪ Thermo unit
⑫ Plastic locking tie
⑬ Plastic band
⑭ Wire harness
⑮ YPVS leads
⑯ Starting circuit cutoff relay



[A] Fasten the front brake hose between the points marked with paint.
[B] Pass the right handlebar switch lead, left handlebar switch lead, clutch switch lead, front brake light switch lead and throttle cable through the cable guide.
[C] To fasten the CDI unit leads, pass the plastic locking tie through the coupler stay with its end on the right side.
[D] Insert the CDI unit couplers into the coupler stay on the frame.
[E] When fastening the coolant reservoir breather hose, coolant reservoir hose and throttle cables, position the opening of the plastic clamp so that it faces upward.
[F] Fasten the sidestand switch lead with a cable holder.
[G] Hook the wire harness onto the frame.
[H] Push in the sidestand switch lead so that it is hidden by the air filter case.
[I] Fasten the oil hose with the clamp below the battery box on the right side of the motorcycle.

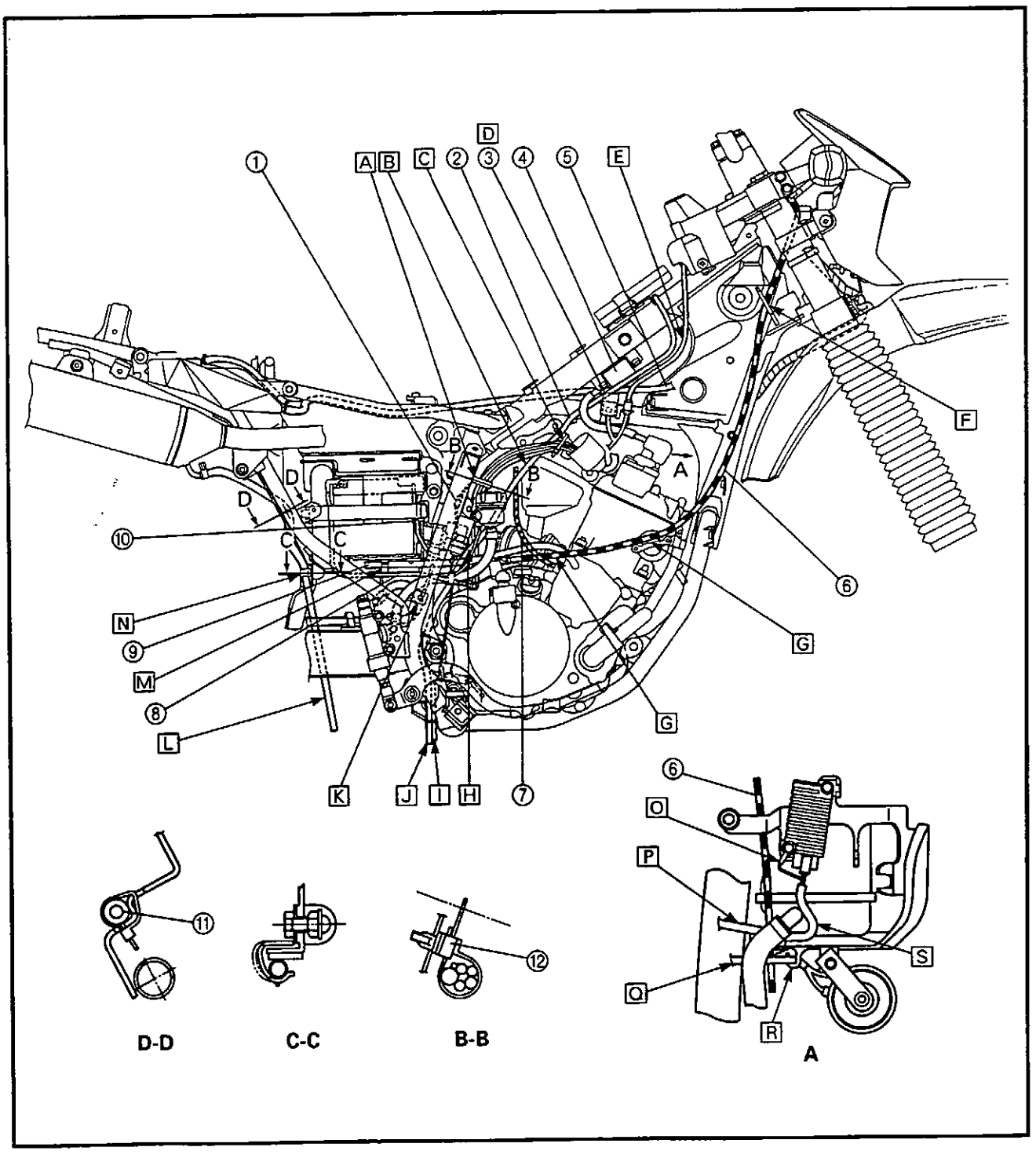


[J] Fasten the sidestand switch lead into place with the cable holder.
[K] Pass the rear brake light switch lead over the rear shock absorber gas cylinder hose.
[L] After fastening the wire harness and YPVS leads, cut off any excess from the plastic locking tie end.
[M] Insert the YPVS leads into the YPVS servo motor.
[N] Fasten the throttle cable with the cable holder.
[O] Fasten the ground lead to the ignition coil with the bolt.
[P] Pass the coolant reservoir breather hose under radiator hose 4.
[Q] Pass the coolant reservoir breather hose through the hose guide.
[R] Insert the starter circuit cutoff relay into the stay.
[S] Pass the right handlebar switch lead, left handlebar switch lead, clutch switch lead and front brake right switch lead between the frame and the left radiator.

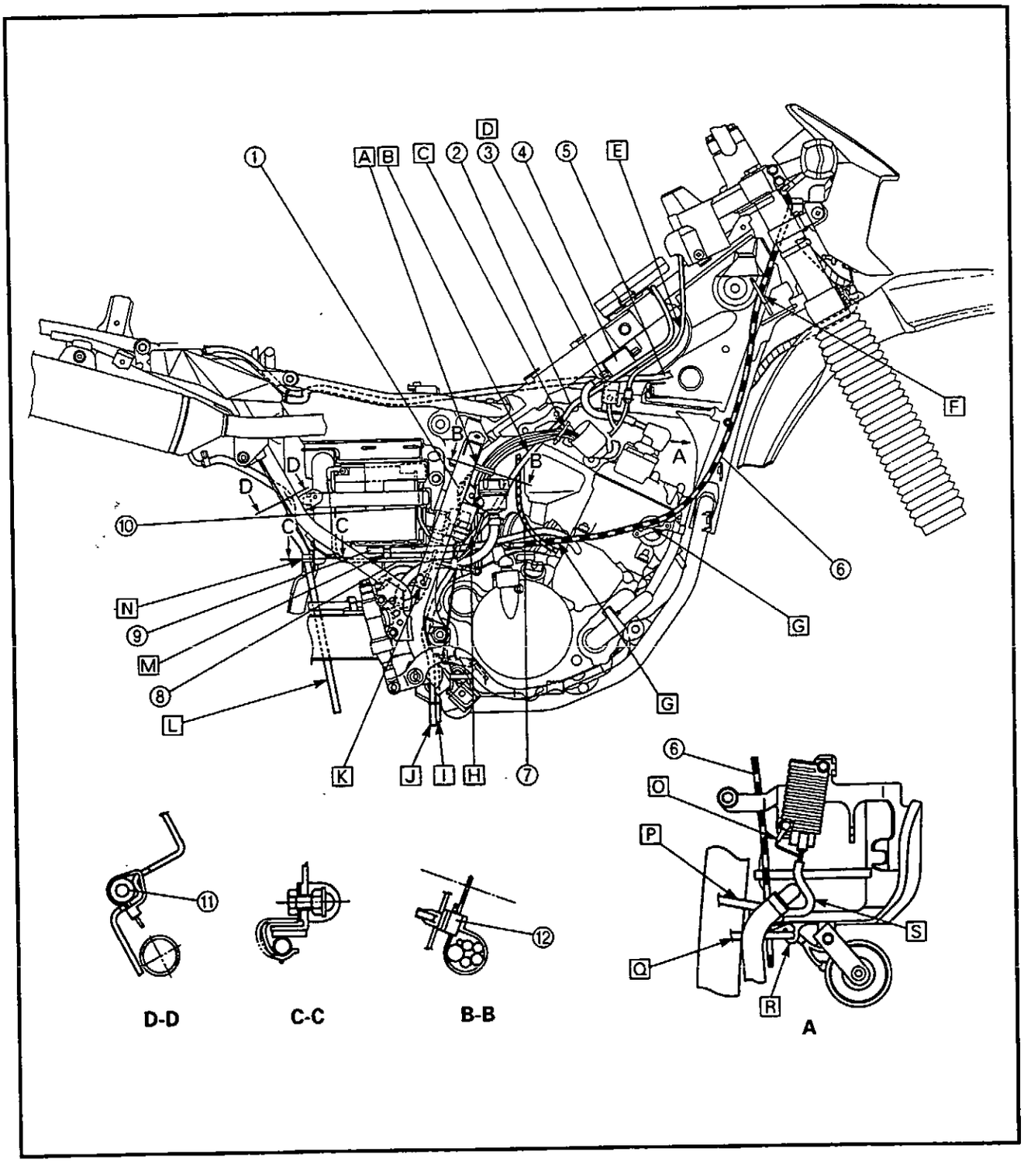


① Rear brake switch lead
② Coolant reservoir breather hose
③ Turn signal relay
④ Ignition coil
⑤ Coolant reservoir hose
⑥ Clutch cable
⑦ Oil pump cable
⑧ Battery negative lead
⑨ Oil hose
⑩ Battery positive lead
⑪ Silencer breather hose
⑫ Plastic band

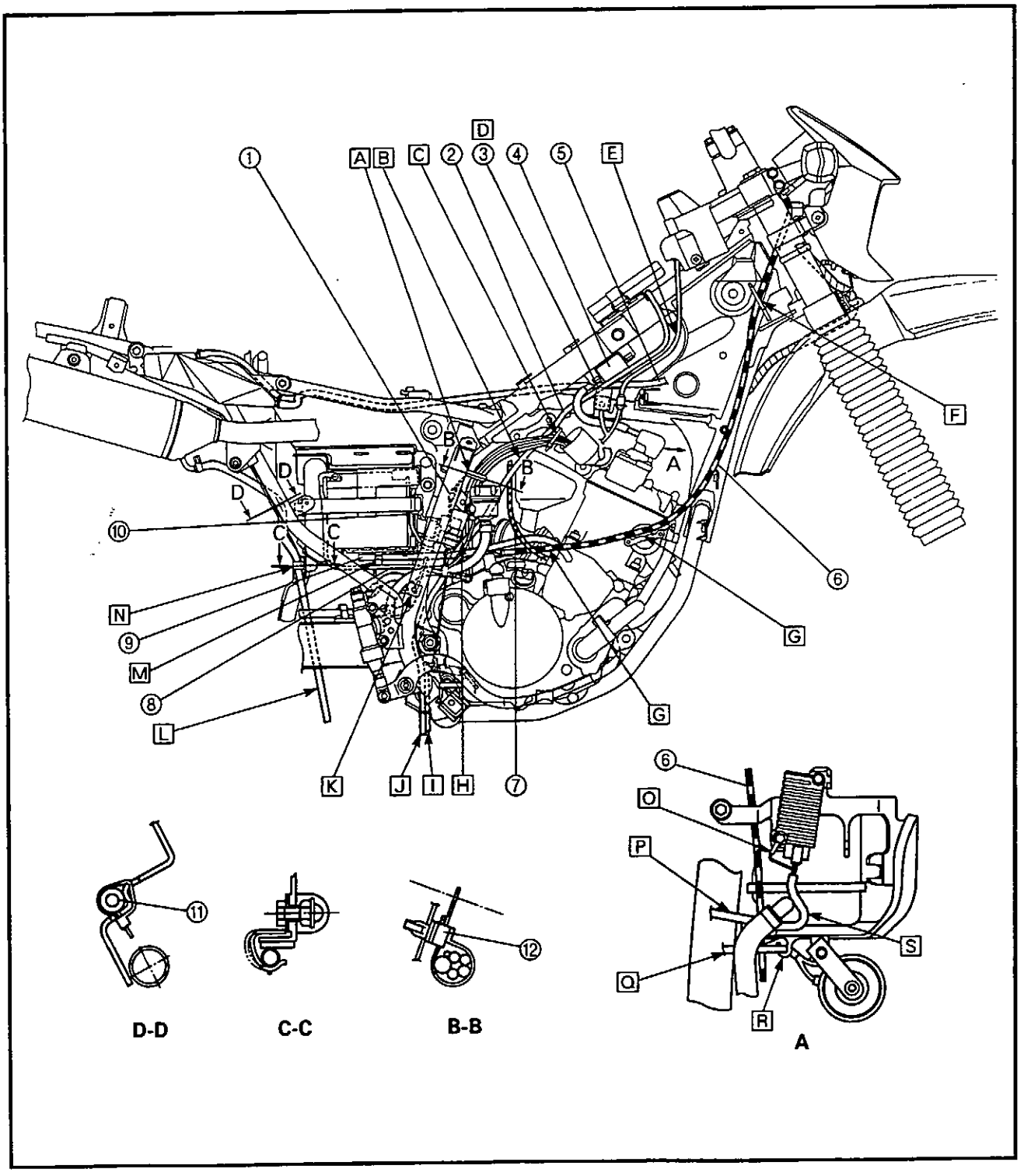
[A] Insert the projection on the plastic band fastening the rear brake light switch leads, CDI magneto leads, speed sensor leads and neutral switch lead into the hole in the frame.
[B] Pass the coolant reservoir breather hose behind the engine bracket.
[C] After fastening the CDI magneto leads, speed sensor leads and neutral switch lead in front of the engine bracket, cut off any excess from the plastic locking tie.
[D] Insert the turn signal relay into the stay.
[E] Pass the main switch leads toward the inside of radiator hose 4.
[F] Pass the clutch cable through the cable guide.



[G] Pass the clutch cable through the cable holder.
[H] Pass the coolant reservoir breather hose behind the oil hose.
[I] Pass the carburetor overflow hose between the rear shock absorber and swingarm.
[J] Pass the coolant reservoir breather hose between the rear shock absorber and the swingarm.
[K] Pass the battery negative lead and brake hose through the hose guide.
[L] Pass the silencer breather hose between the rear shock absorber and swingarm.
[M] Fasten the oil hose with the cable holder.
[N] Place the silencer breather hose on top of the insulator and securely fasten it with the cable holder.
[O] Fasten the ground lead with the rectifier/regulator bolt.
[P] Pass the rectifier/regulator leads between radiator hose 6 and the frame, and then connect them to the wire harness on the left side of the motorcycle.

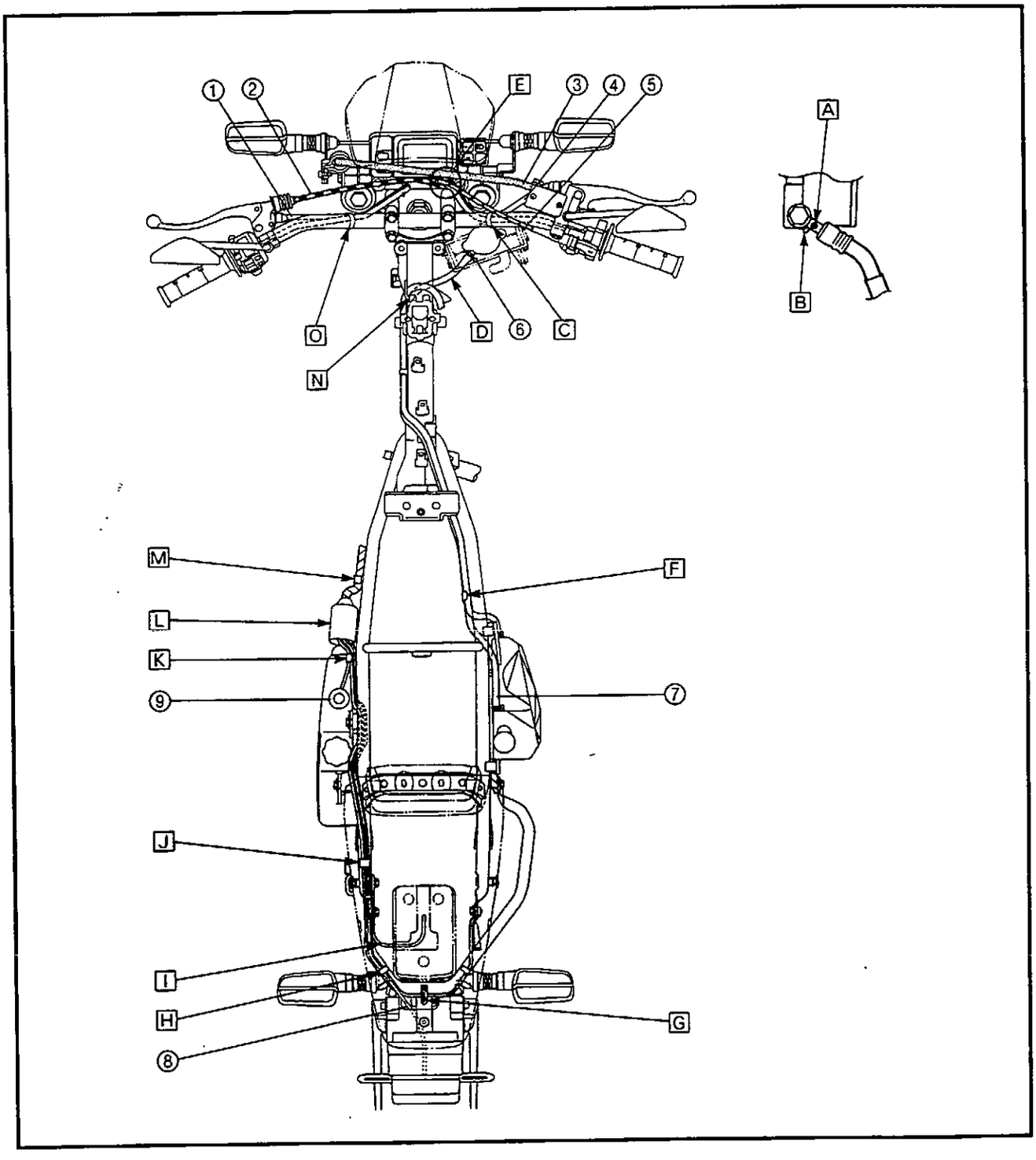


[Q] Pass the horn leads between radiator hose 6 and the frame, and then connect them to the wire harness on the left side of the motorcycle.
[R] Pass the horn leads through the cable guide of the radiator bracket.
[S] Pass the horn switch leads in front of the radiator hose joint.

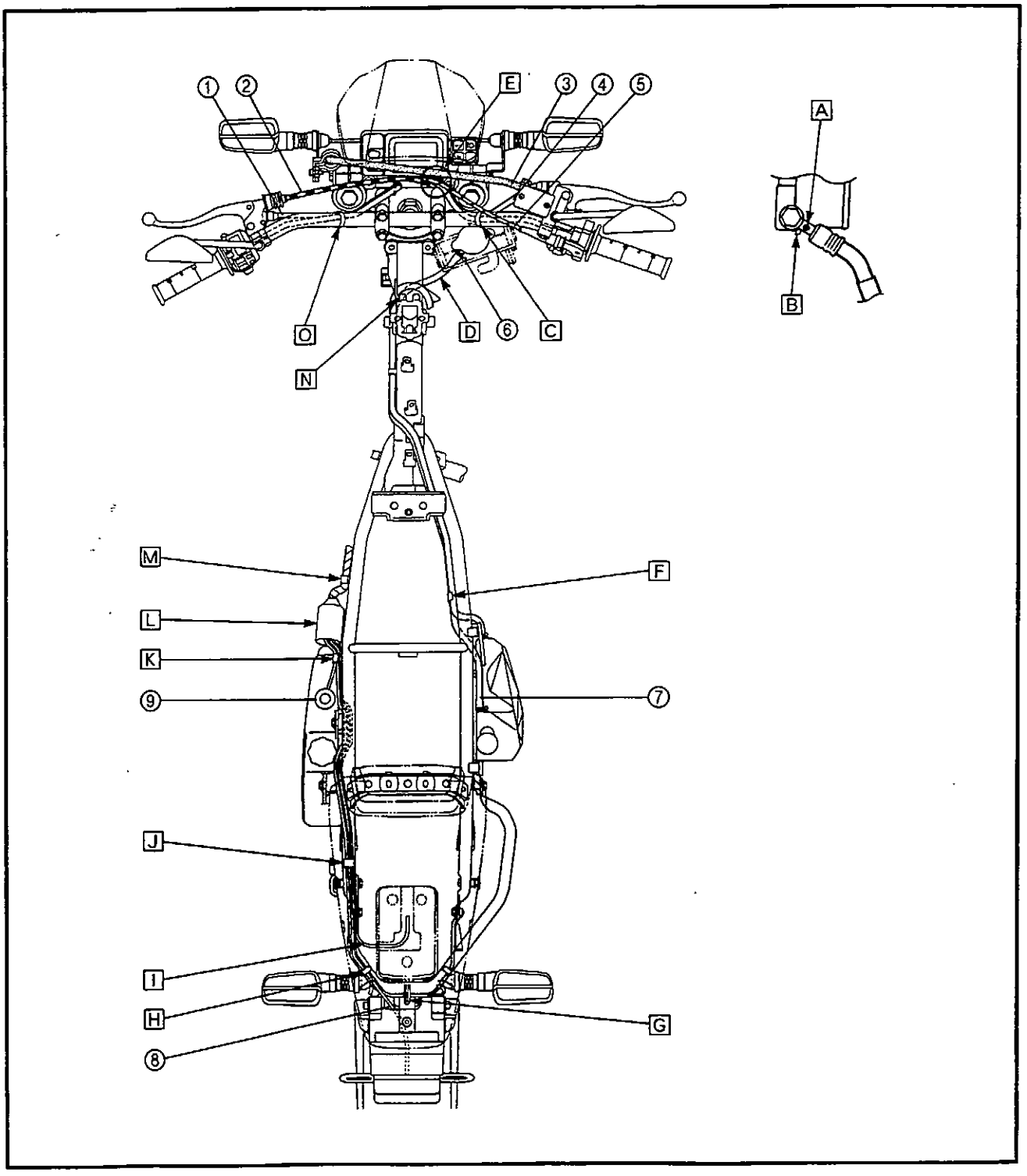


① Clutch switch lead
② Clutch cable
③ Front brake hose
④ Front brake light switch lead
⑤ Throttle cable
⑥ Coolant reservoir hose
⑦ Coolant reservoir breather hose
⑧ Licence plate light lead
⑨ Oil level switch

[A] Install the brake hose in front of the paint mark.
[B] The brake hose should contact the projection on the brake master cylinder.
[C] Fasten the right handlebar switch lead and front brake light right switch lead with a plastic band.
[D] Pass the coolant reservoir hose in front of radiator hose 4.
[E] Pass the clutch cable along the inside, pass the throttle cable above it, and then pass the front brake right switch lead and the right handlebar switch lead along the outside.
[F] Fasten the coolant reservoir hose and coolant reservoir breather hose with a cable holder.

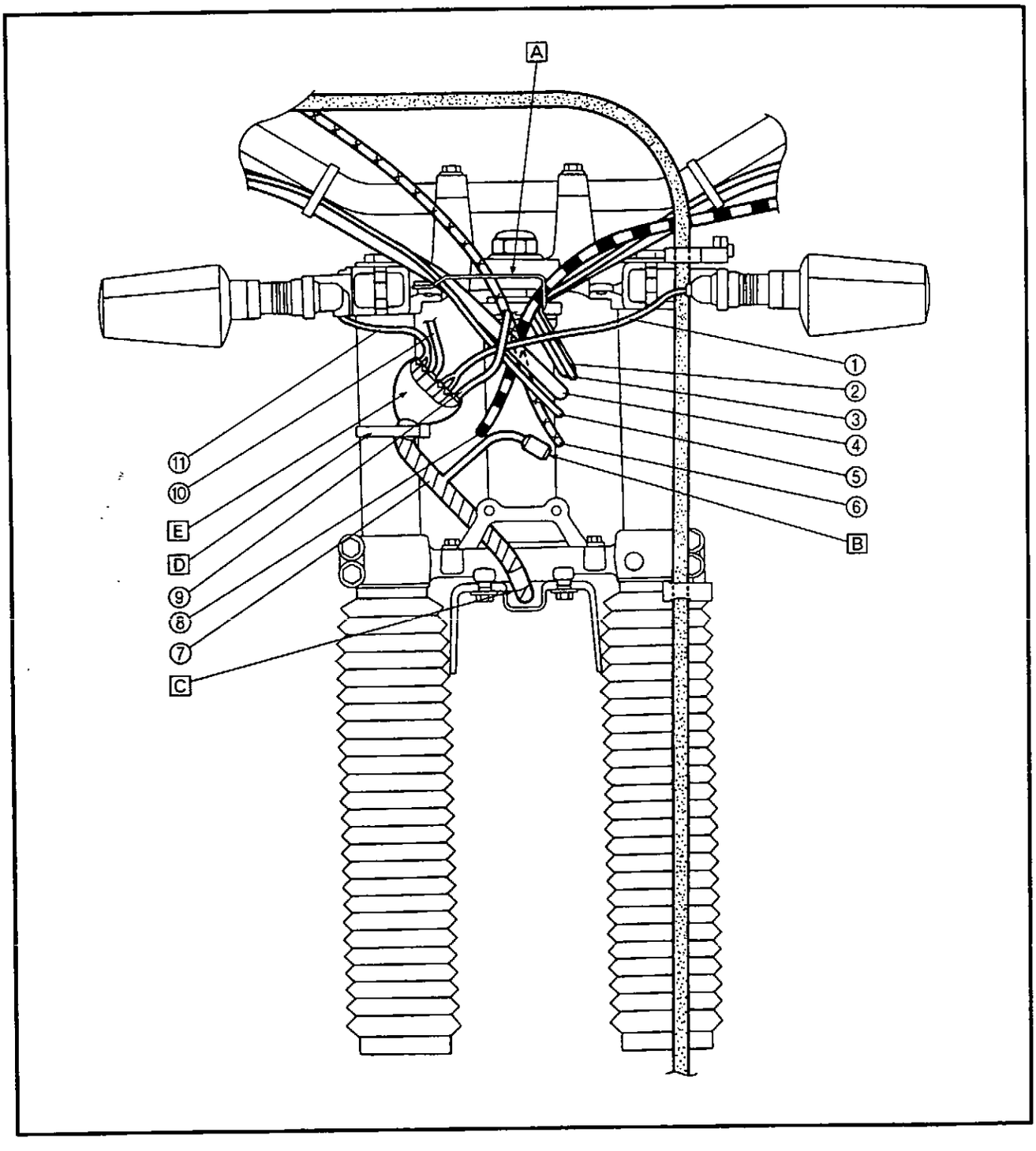


[G] Pass the rear turn signal light lead (right) through the cable guide.
[H] Fasten the rear turn signal light lead and license plate light lead so that the opening of the plastic clamp faces inward.
[I] Pass the tail/brake light lead through the hole in the rear fender.
[J] Fasten the rear turn signal light leads, license plate light leads and tail/brake light leads with a cable holder.
[K] Fasten the rear turn signal light leads, license plate light leads, tail/brake light leads and oil level switch leads with a cable holder.
[L] Cover the rear turn signal light connectors, license plate light connectors, tail/brake light connectors and oil level switch coupler.
[M] Fasten the wire harness with a cable holder.
[N] Pass the coolant reservoir breather hose through the cable guide.
[O] Fasten the left handlebar switch lead and clutch switch lead with a plastic band.



① Left turn signal lead
② Left handlebar switch lead
③ Clutch switch lead
④ Right handlebar switch lead
⑤ Front brake light switch lead
⑥ Throttle cable
⑦ Wire harness
⑧ Clutch cable
⑨ Combination meter leads
⑩ Indicator light leads
⑪ Right turn signal lead

[A] Pass the throttle cable, clutch cable, right handlebar switch leads, front brake light switch lead, left handlebar switch leads and clutch switch lead through the cable guide.
[B] To the headlight.
[C] Align the bottom of the tape on the wire harness with the bottom of the lower bracket.
[D] After fastening the wire harness so that the lock is positioned toward the inside, cut off any excess from the plastic locking tie end.
[E] After connecting the left turn signal light connectors, combination meter coupler, indicator light coupler and right turn signal light connectors, cover them and insert the covers in the space between the headlight unit and headlight cover so that they do not protrude from the back.



CONTENTS
PERIODIC CHECKS AND ADJUSTMENTS

EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

EAS00037

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

No.		ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL (1,000 km)	EVERY	
					6,000 km or 6 months (whichever comes first)	12,000 km or 12 months (whichever comes first)
1	*	Fuel line	• Check fuel hoses for cracks or damage. • Replace if necessary.		√	√
2		Spark plug	• Check condition. • Clean, regap or replace if necessary.	√	√	√
3		Air filter	• Clean or replace if necessary.		√	√
4		Clutch	• Check operation. • Adjust or replace cable.	√	√	√
5	*	Front brake	• Check operation, fluid level and vehicle for fluid leakage. (See NOTE on page 3-2.) • Correct accordingly. • Replace brake pads if necessary.	√	√	√
6	*	Rear brake	• Check operation, fluid level and vehicle for fluid leakage. (See NOTE on page 3-2.) • Correct accordingly. • Replace brake pads if necessary.	√	√	√
7	*	Wheels	• Check balance, runout, spoke tightness and for damage. • Tighten spokes and rebalance, replace if necessary.		√	√
8	*	Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√
9	*	Wheel bearings	• Check bearing for looseness or damage. • Replace if necessary.		√	√
10	*	Swingarm	• Check swingarm pivoting point for play. • Correct if necessary.		√	√
11		Drive chain	• Check chain slack. • Adjust if necessary. Make sure that the rear wheel is properly aligned. • Clean and lubricate.	**Every 500 km and after washing the motorcycle or riding in rain**		
12	*	Steering bearings	• Check bearing play and steering for roughness. • Correct accordingly. • Lubricate with lithium soap base grease every 24,000 km or 24 months (whichever comes first).		√	√
13	*	Chassis fasteners	• Make sure that all nuts, bolts and screws are properly tightened. • Tighten if necessary.		√	√
14		Sidestand	• Check operation. • Lubricate and repair if necessary.		√	√
15	*	Sidestand switch	• Check operation. • Replace if necessary.	√	√	√

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

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No.		ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL (1,000 km)	EVERY	
					6,000 km or 6 months (whichever comes first)	12,000 km or 12 months (whichever comes first)
16	*	Front fork	• Check operation and for oil leakage. • Correct accordingly.		√	√
17	*	Rear shock absorber assembly	• Check operation and shock absorber for oil leakage. • Replace shock absorber assembly if necessary.		√	√
18	*	Rear suspension relay arm and connecting arm pivoting points	• Check operation. • Lubricate with lithium soap base grease.		√	√
19	*	Carburetor	• Check engine idling speed and starter operation. • Adjust if necessary.	√	√	√
20	*	Autolube pump	• Check operation. • Correct if necessary. • Bleed if necessary.	√	√	√
21		Transmission oil	• Check oil level and vehicle for oil leakage. • Correct accordingly. • Change oil at initial 1,000 km and thereafter every 24,000 km or 24 months (whichever comes first).	√	√	√
22	*	Cooling system	• Check coolant level and vehicle for coolant leakage. • Correct if necessary. • Change coolant every 24,000 km or 24 months (whichever cones first).		√	√

* Since these items require special tools, data and technical skills, they should be serviced by a Yamaha dealer.

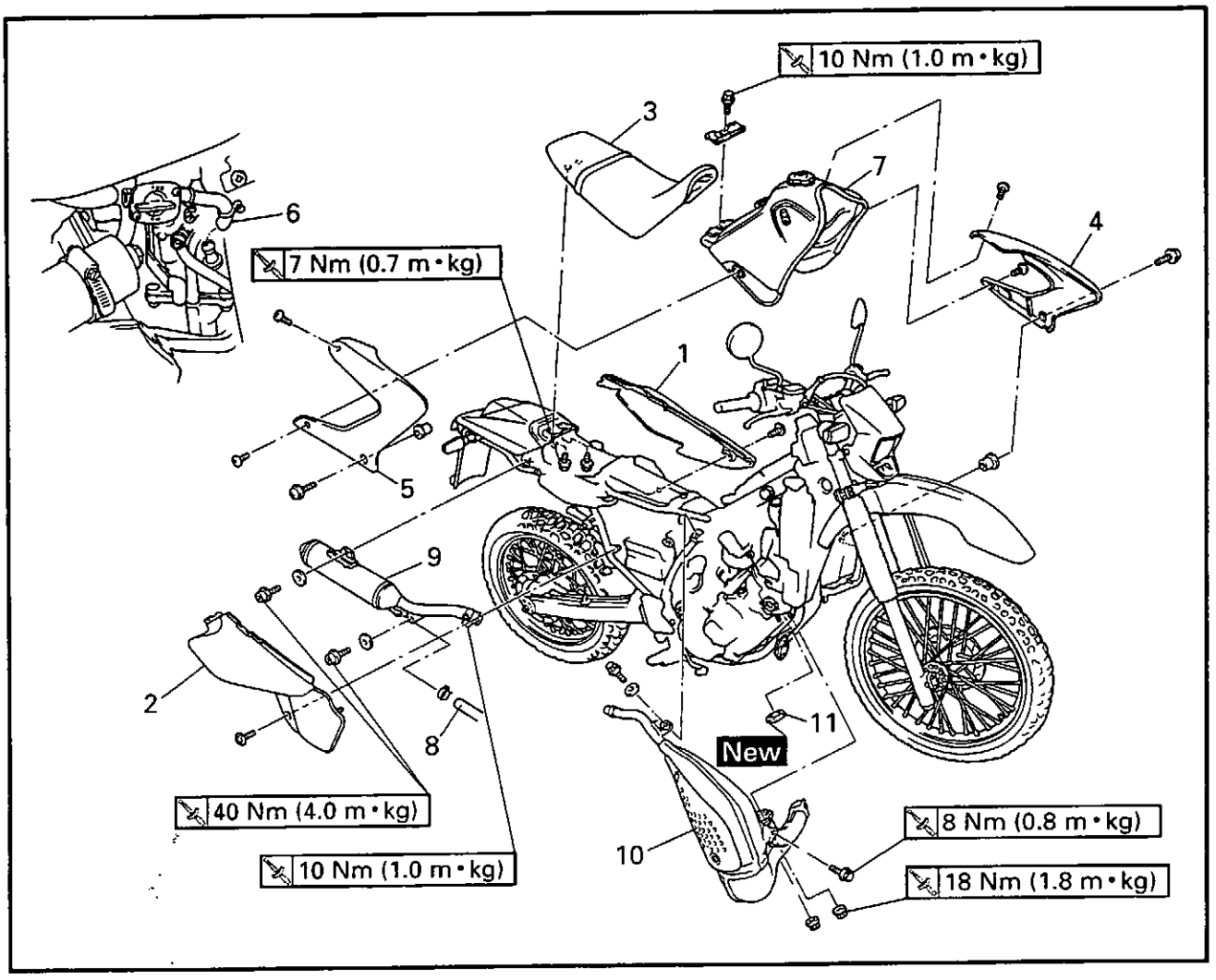
NOTE:

The air filter element needs more frequent service if you are riding in unusually wet or dry areas.

1.Hydraulic brake system

- Replace the brake fluid after disassembling the master cylinder or caliper cylinder.
- Check the brake fluid level and add fluid as required.
- Replace the master cylinder and caliper cylinder oil seals every two years.
- Replace the brake hoses every four years or if cracked or damaged.

AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER



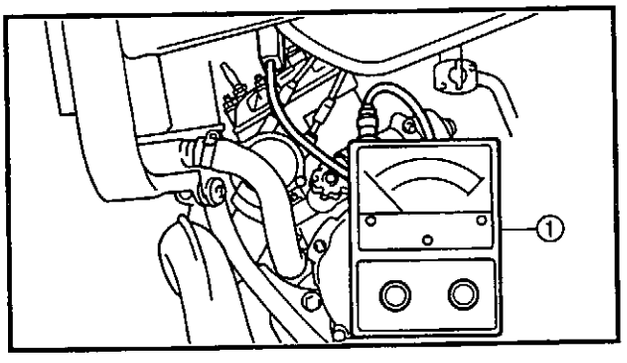
Order	Job/Part	Q'ty	Remarks
	Removing the air scoop, side covers, seat, fuel tank and muffler		Remove the parts in the order listed.
1	Left side cover	1	
2	Right side cover	1	
3	Seat	1	
4	Left air scoop	1	
5	Right air scoop	1	
6	Fuel hose	1	**NOTE:** Before disconnecting the fuel hose, set the fuel cock to "OFF".
7	Fuel tank	1	
8	Silencer breather hose	1	Disconnect.
9	Silencer	1	
10	Exhaust pipe	1	
11	Exhaust gasket	1	
			For installation, reverse the removal procedure.

ENGINE

ADJUSTING THE ENGINE IDLING SPEED

NOTE:

Prior to adjusting the engine idling speed, the air filter element should be clean and the engine should have adequate compression.

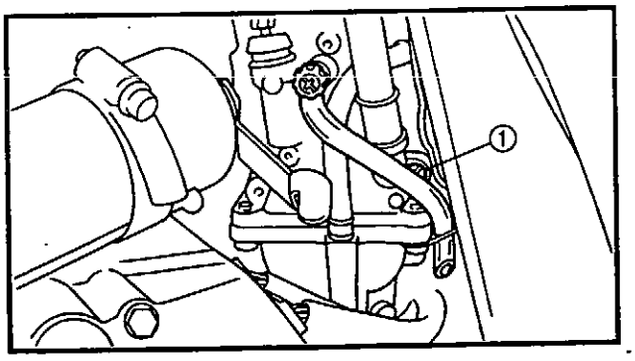


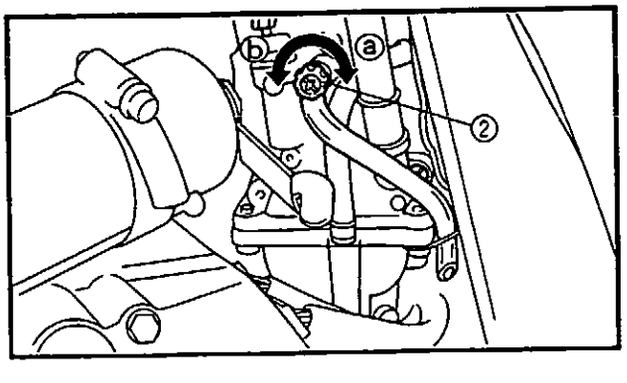
1. Start the engine and let it warm up for several minutes.
2. Install:
   - engine tachometer ①
     (onto the spark plug lead of cylinder #1)

	Engine tachometer 90890-03113

3. Measure:
   - engine idling speed
     Out of specification → Adjust.

	Engine idling speed 1,300 ~ 1,400 r/min





4. Adjust:
   - engine idling speed

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a. Turn the pilot screw ① in until it is lightly seated.

b. Turn the pilot air screw out the specified number of turns.

	Pilot air screw setting 1-1/4 turns out

c. Turn the throttle stop screw ② in direction ⓐ or ⓑ until the specified engine idling speed is obtained.

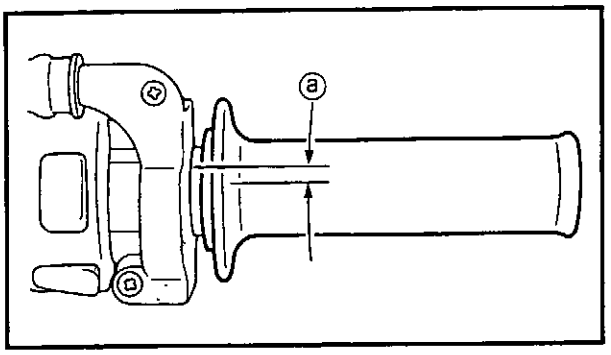
Direction ⓐ	**Engine idling speed is increased.**
Direction ⓑ	**Engine idling speed is decreased.**

5. Adjust:
   • throttle cable free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY".

	Throttle cable free play (at the flange of the throttle grip) **3 ~ 5 mm**

ADJUSTING THE THROTTLE CABLE FREE PLAY

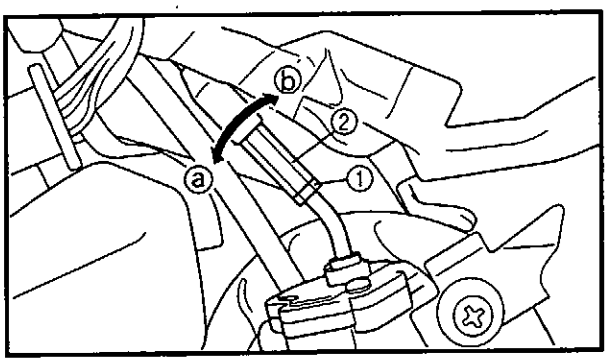
NOTE:
Prior to adjusting the throttle cable free play, the engine idling speed should be adjusted.



1. Measure:
   • throttle cable free play ⓐ
   Out of specification → Adjust.

	Throttle cable free play (at the flange of the throttle grip) **3 ~ 5 mm**

2. Remove:
   • fuel tank



3. Adjust:
   • throttle cable free play

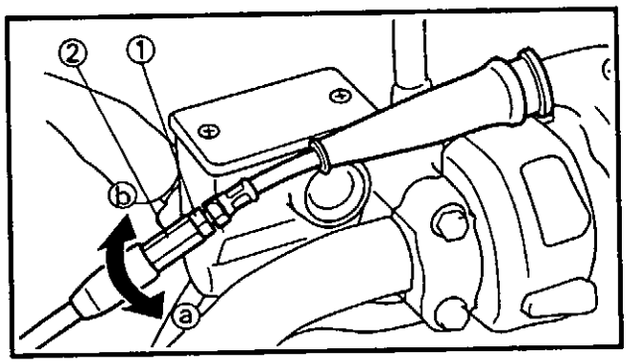
Carburetor side

a. Loosen the locknut ① on the throttle cable.
b. Turn the adjusting nut ② in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.

Direction ⓐ	**Throttle cable free play is increased.**
Direction ⓑ	**Throttle cable free play is decreased.**

c. Tighten the locknuts.

NOTE:
If the specified throttle cable free play cannot be obtained on the carburetor side of the cable, use the adjusting nut on the handlebar side.



Handlebar side

a. Loosen the locknut ①.

b. Turn the adjusting nut ② in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.

Direction ⓐ	**Throttle cable free play is increased.**
Direction ⓑ	**Throttle cable free play is decreased.**

c. Tighten the locknut.

⚠ WARNING

After adjusting the throttle cable free play, start the engine and turn the handlebar to the right and to the left to ensure that this does not cause the engine idling speed to change.

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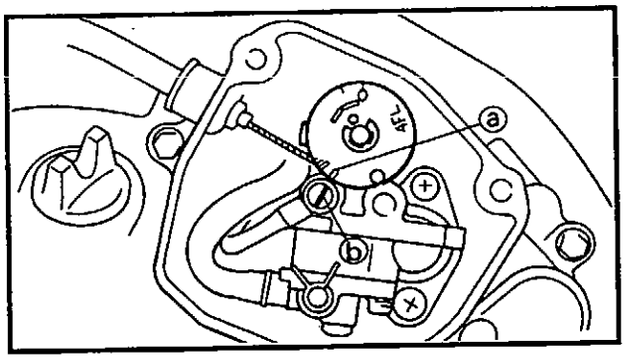
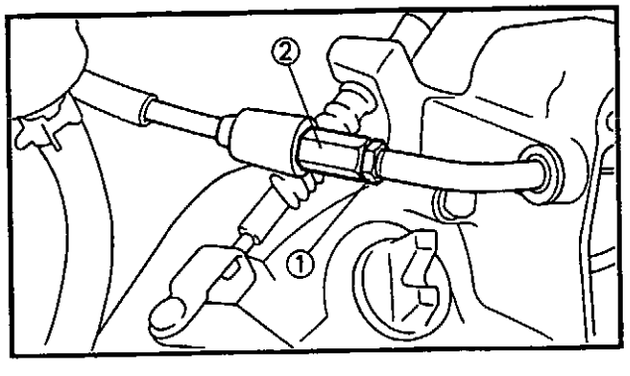
4. Install:
   • seat





ADJUSTING THE OIL PUMP CABLE

1. Remove:
   • oil pump cover
2. Check:
   • oil pump mark
     Out of aligned → Adjust.

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a. Throttle grip is fully open.

b. Check that the align mark ⓐ on the pulley with the mark ⓑ on the oil pump body.

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3. Adjust:
   • oil pump align mark

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a. Loosen the locknut ①.

b. Turn the adjusting nut ② in or out until the oil pump align mark is aligned.

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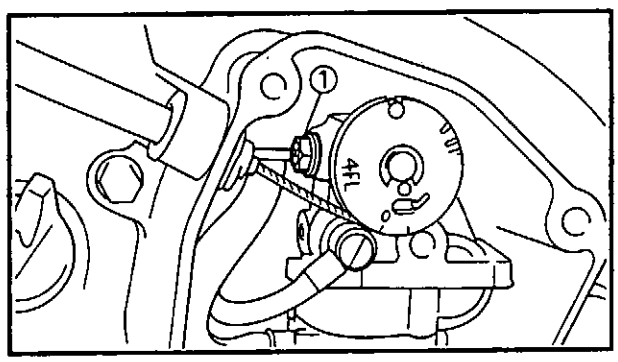
4. Install:
   • oil pump cover



BLEEDING THE OIL PUMP

CAUTION:

Bleed the oil pump whenever:
- **the oil pump was disassembled,**
- **a oil hose was disconnected,**
- **the engine oil was emptied.**

1. Remove:
   - oil pump cover
2. Bleed:
   - oil pump

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a. Fill the oil tank to the proper level with the recommended engine oil.

b. Remove the bleed bolt ①.

c. Keep the oil running out until air bubbles disappear.

d. Install the bleed bolt.

NOTE:
- Place the rag under the oil pump to catch the engine oil.
- Wipe off any oil spilled on the crankcase.

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3. Install:
   - oil pump cover

EAS00060
CHECKING THE SPARK PLUG

1. Disconnect:
   - spark plug cap
2. Remove:
   - spark plug

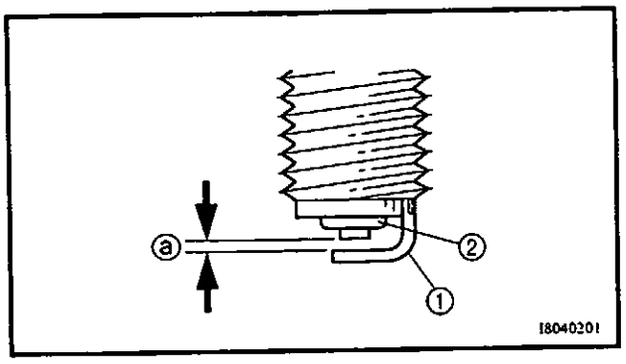
CAUTION:

Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

3. Check:
   - spark plug type

   Incorrect → Change.

Spark plug
Model (manufacturer)
BR9ES (NGK)



4. Check:
   - electrodes ①
     Damage/wear → Replace the spark plug.
   - insulator ②
     Abnormal color → Replace the spark plug.
     Normal color is medium-to-light tan.
5. Clean:
   - spark plug
     (with a spark plug cleaner or wire brush)
6. Measure:
   - spark plug gap ⓐ
     (with a wire gauge)
     Out of specification → Regap.

Spark plug gap
0.7 ~ 0.8 mm

7. Install:
   - spark plug — **20 Nm (2.0 m · kg)**

NOTE:
Before installing the spark plug, clean the spark plug and gasket surface.

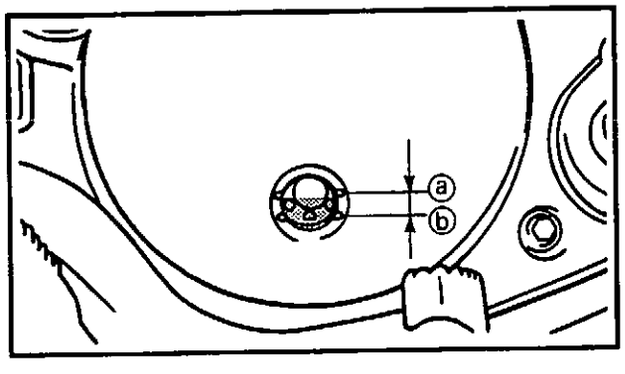
8. Connect:
   - spark plug cap

CHECKING THE TRANSMISSION OIL LEVEL

1. Stand the motorcycle on a level surface.

NOTE:
- Place the motorcycle on a suitable stand.
- Make sure the motorcycle is upright.

2. Start the engine, warm it up for several minutes, and then turn it off.



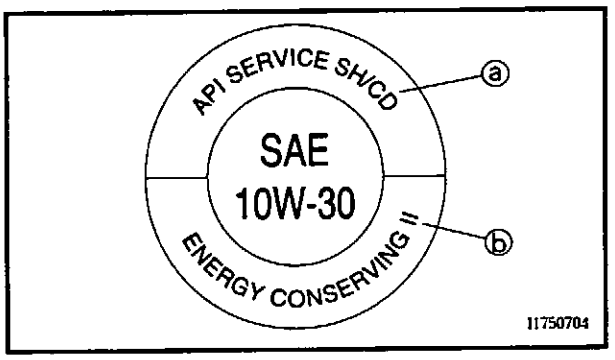
3. Check:
   - transmission oil level

NOTE:
Before checking the transmission oil level, wait a few minutes until the oil has settled.

The transmission oil level should be between the maximum level mark ⓐ and minimum level mark ⓑ.

Below the minimum level mark → Add the recommended transmission oil to the proper level.

Recommended oil
Yamaha gear oil
(SAE 10W30 SE)



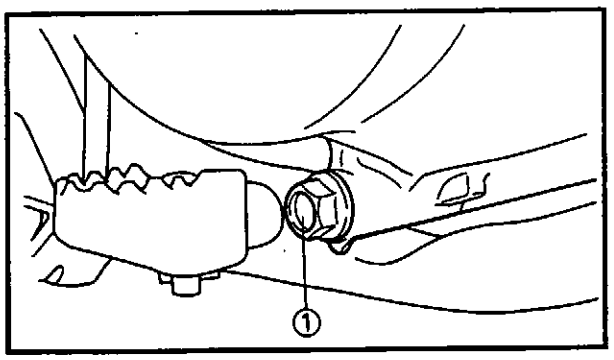
CAUTION:

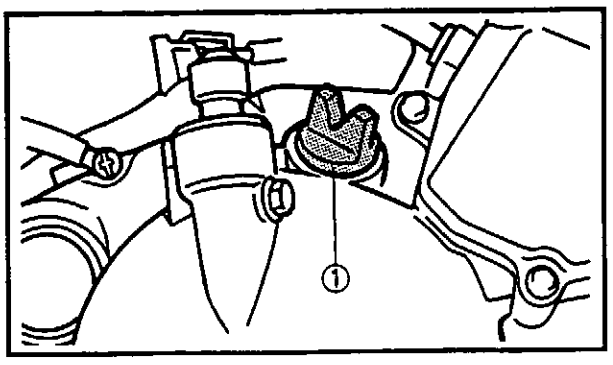
- **Transmission oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use motor oils with a grade of CD ⓐ or higher and do not use oils labeled "ENERGY CONSERVING II" ⓑ or higher.**
- **Do not allow foreign materials to enter the crankcase.**

4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the transmission oil level again.

NOTE:

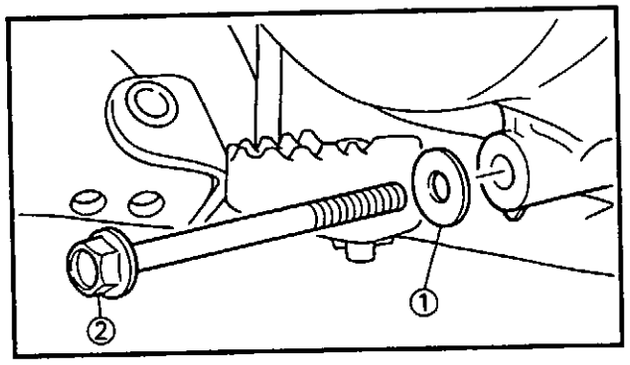
Before checking the transmission oil level, wait a few minutes until the oil has settled.





CHANGING THE TRANSMISSION OIL

1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the transmission oil drain bolt.
3. Remove:
   - transmission oil drain bolt ①
     (along with the gasket)
4. Remove:
   - transmission oil filler cap ①
5. Drain:
   - transmission oil
     (completely from the crankcase)



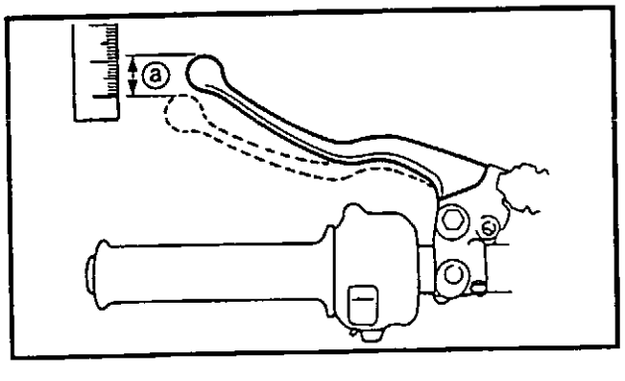
6. Install:
   - gasket ① New
   - transmission oil drain bolt ②

   16 Nm (1.6 m · kg)

7. Fill:
   - crankcase
     (with the specified amount of the recommended transmission oil)

Quantity
Total amount
0.85 L
Periodic oil change
0.80 L

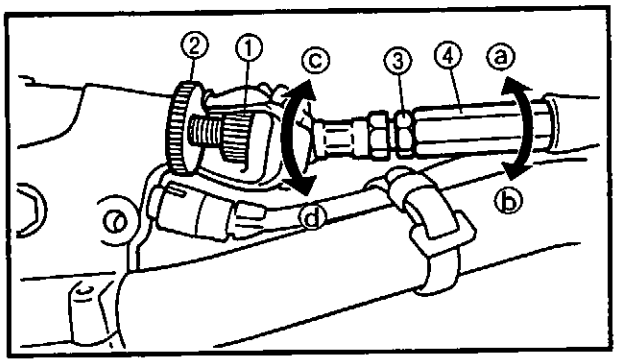
8. Install:
   - transmission oil filler cap
9. Start the engine, warm it up for several minutes, and then turn it off.
10. Check:
    - engine
      (for transmission oil leaks)
11. Check:
    - transmission oil level
      Refer to "CHECKING THE TRANSMISSION OIL LEVEL".



ADJUSTING THE CLUTCH CABLE FREE PLAY

1. Measure:
   - clutch cable free play ⓐ
     Out of specification → Adjust.

Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm



2. Adjust:
   • clutch cable free play

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a. Make sure the adjusting nut ① and locknut ② are fully tightened.

b. Loosen the locknut ③.

c. Turn the adjusting nut ④ in direction ⓐ or ⓑ until the specified clutch cable free play is obtained.

Direction ⓐ	**Clutch cable free play is increased.**
Direction ⓑ	**Clutch cable free play is decreased.**

d. Tighten the locknut ③.

NOTE:

If the specified clutch cable free play cannot be obtained as described above, perform the following adjustment procedure described below.

e. Loosen the locknut ②.

f. Turn the adjusting nut ① in direction ⓒ or ⓓ until the specified clutch cable free play is obtained.

Direction ⓒ	**Clutch cable free play is increased.**
Direction ⓓ	**Clutch cable free play is decreased.**

g. Tighten the locknut ②.

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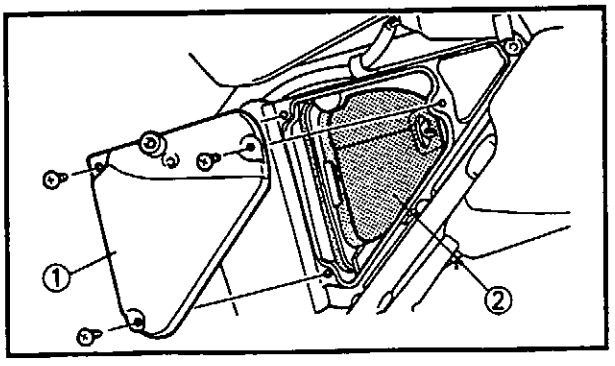
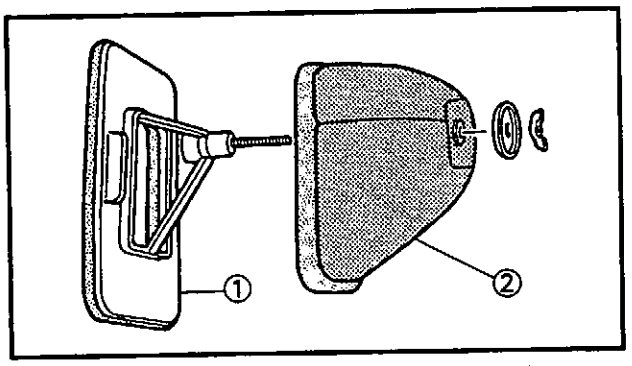


CLEANING THE AIR FILTER ELEMENT

1. Remove:
   • left side cover
   • air filter case cover ①
   • air filter element assembly ②

CLEANING THE AIR FILTER ELEMENT

CHK ADJ



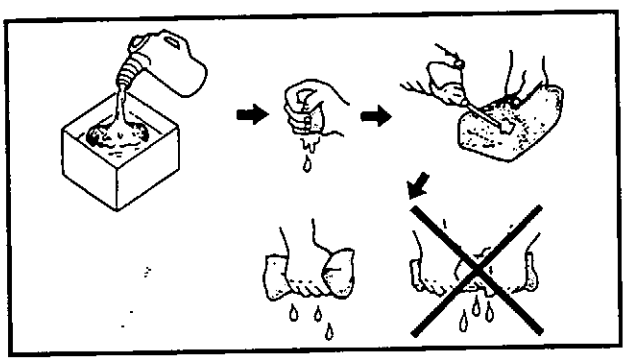
2. Remove:
   - air filter element holder ①
   - air filter element ②
3. Check:
   - air filter element
     Damage → Replace.
4. Clean:
   - air filter element
     (with solvent)

⚠ WARNING

Never use low flash point solvents, such as gasoline, to clean the air filter element. Such solvents may cause a fire or an explosion.

NOTE:

After cleaning, gently squeeze the air filter element to remove the excess solvent.



CAUTION:

Do not twist the air filter element when squeezing it.

5. Apply the recommended oil to the entire surface of the air filter element and squeeze out the excess oil. The air filter element should be wet but not dripping.

Recommended oil
Foam air filter oil or SAE 10W30 SE

6. Install:
   - air filter element
   - air filter element holder

CAUTION:

Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect the carburetor tuning, leading to poor engine performance and possible overheating.

7. Install:
   - air filter element assembly
   - air filter case cover
   - left side cover

EAS00094
CHECKING THE CARBURETOR JOINT AND INTAKE MANIFOLD

1. Check:
   - carburetor joint
   - intake manifold

   Cracks/damage → Replace.
   Refer to "CARBURETOR" in chapter 6.

CHECKING THE FUEL HOSES

The following procedure applies to all of the fuel hoses.

1. Check:
   - fuel hose

   Cracks/damage → Replace.

EAS00098
CHECKING THE CRANKCASE BREATHER HOSE

1. Check:
   - crankcase breather hose

   Cracks/damage → Replace.
   Loose connection → Connect properly.

CAUTION:

Make sure the crankcase breather hose is routed correctly.

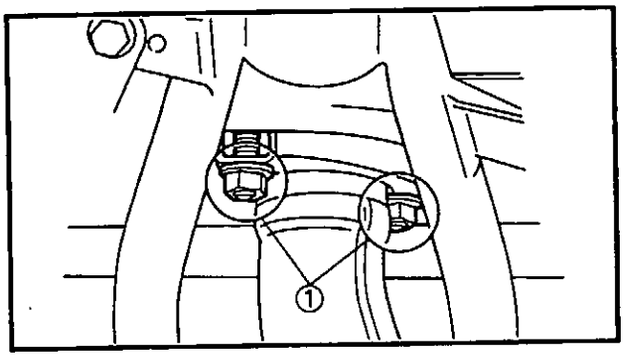
CHECKING THE EXHAUST SYSTEM

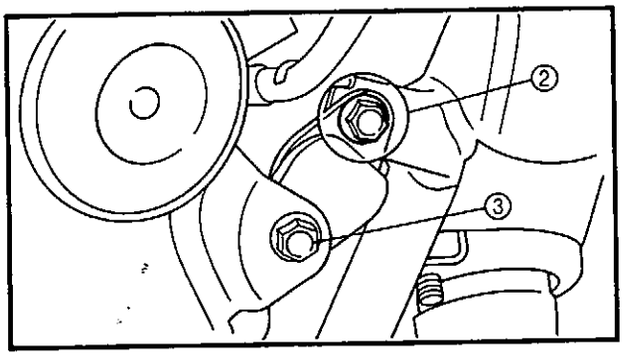
The following procedure applies to all of the exhaust pipe, silencer and gasket.

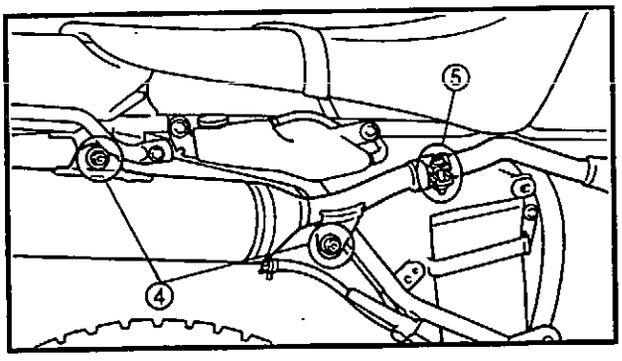
CAUTION:

Do not touch the exhaust system when the engine is hot.

1. Check:
   - exhaust pipe
   - silencer
     Cracks/damage → Replace.
   - gasket
     Exhaust gas leaks → Replace.







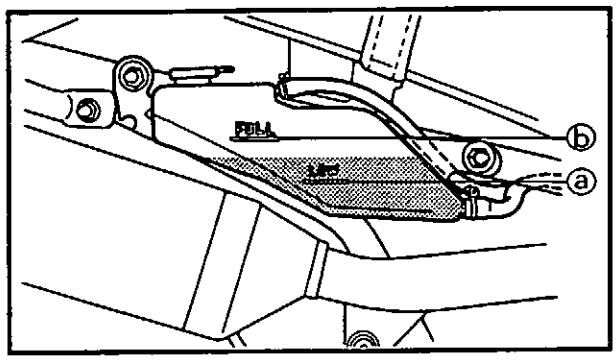
2. Measure:
   - tightening torque

Exhaust pipe nut ①
18 Nm (1.8 m • kg)
Exhaust pipe stay ②
8 Nm (0.8 m • kg)
Exhaust pipe and stay ③
8 Nm (0.8 m • kg)
Silencer ④
40 Nm (4.0 m • kg)
Silencer joint band ⑤
12 Nm (1.2 m • kg)

EAS00102
CHECKING THE COOLANT LEVEL

1. Stand the motorcycle on a level surface.

NOTE:
- Place the motorcycle on a suitable stand.
- Make sure the motorcycle is upright.



2. Check:
   • coolant level
   The coolant level should be between the minimum level mark ⓐ and maximum level mark ⓑ.
   Below the minimum level mark → Add the recommended coolant to the proper level.

CAUTION:

- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, soft water may be used if distilled water is not available.**

3. Start the engine, warm it up for several minutes, and then turn it off.
4. Check:
   • coolant level

NOTE:

Before checking the coolant level, wait a few minutes until the coolant has settled.

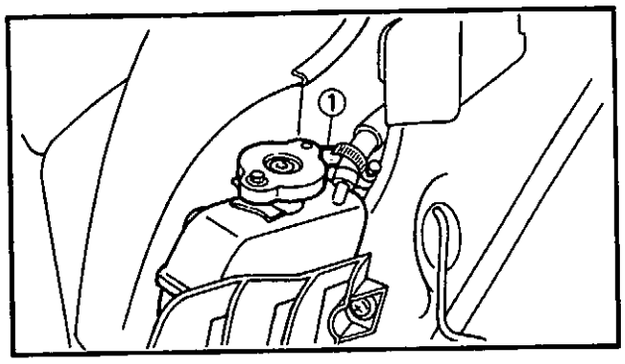
EAS00105
CHANGING THE COOLANT

⚠ WARNING

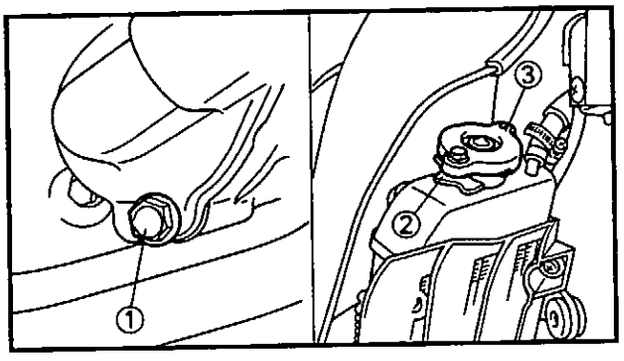
A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, turn the radiator cap counterclockwise while pressing down on it and then remove it.

CHANGING THE COOLANT

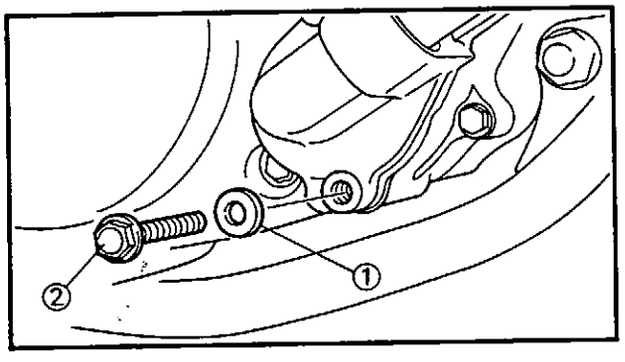
CHK ADJ



1. Remove:
   - right side cover
   - fuel tank
2. Disconnect:
   - coolant reservoir hose ①
3. Drain:
   - coolant
     (from the coolant reservoir)

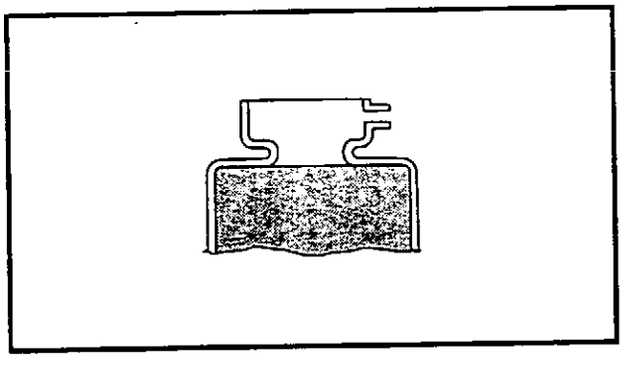


4. Remove:
   - drain bolt ①
   - radiator cap stopper ②
   - radiator cap ③
5. Drain:
   - coolant
     (from the engine and radiator)



6. Install:
   - copper washer ① New
   - coolant drain bolt ②

     10 Nm (1.0 m · kg)
7. Connect:
   - coolant reservoir hose



8. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)

Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Quantity
Total amount
1.26 L
Coolant reservoir capacity
0.36 L

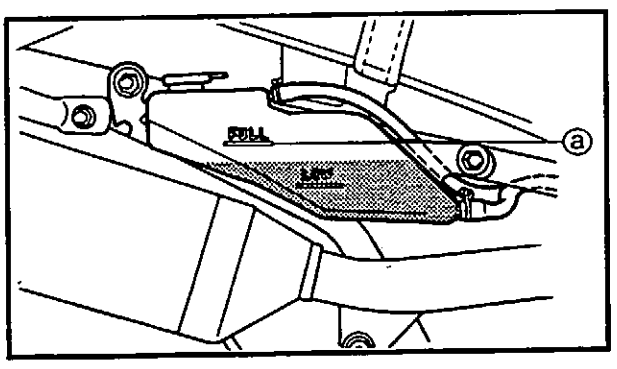
Handling notes for coolant
Coolant is potentially harmful and should be handled with special care.

⚠ WARNING

- **If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.**
- **If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.**
- **If coolant is swallowed, induce vomiting and get immediate medical attention.**

CAUTION:

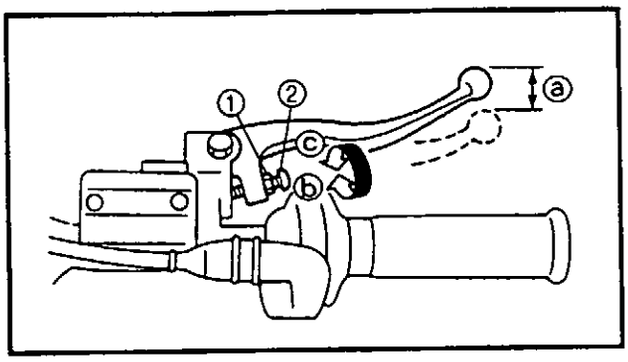
- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, soft water may be used if distilled water is not available.**
- **If coolant comes into contact with painted surfaces, immediately wash them with water.**
- **Do not mix different types of antifreeze.**



9. Install:
   - radiator cap
   - radiator cap stopper
   - coolant reservoir hose
   - fuel tank
10. Fill:
   - coolant reservoir
     (with the recommended coolant to the maximum level mark ⓐ)
11. Install:
   - coolant reservoir cap
12. Start the engine, warm it up for several minutes, and then turn it off.
13. Check:
   - coolant level
     Refer to "CHECKING THE COOLANT LEVEL".

NOTE:
Before checking the coolant level, wait a few minutes until the coolant has settled.

14. Install:
   - right side cover



EAS00108
CHASSIS

ADJUSTING THE FRONT BRAKE

1. Measure:
   • brake lever free play ⓐ
   Out of specification → Adjust.

Brake lever free play (at the end of the brake lever)
2 ~ 5 mm

2. Adjust:
   • brake lever free play

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a. Loosen the locknut ①.

b. Turn the adjusting bolt ② in direction ⓑ or ⓒ until the specified brake lever free play is obtained.

Direction ⓑ	**Brake lever free play is increased.**
Direction ⓒ	**Brake lever free play is decreased.**

c. Tighten the locknut.

⚠ WARNING

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.

CAUTION:

After adjusting the brake lever free play, make sure there is no brake drag.

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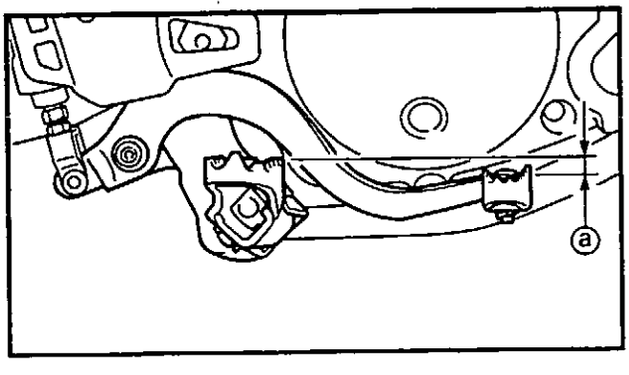
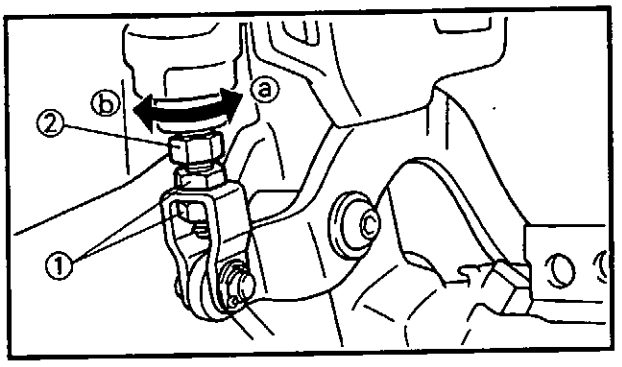
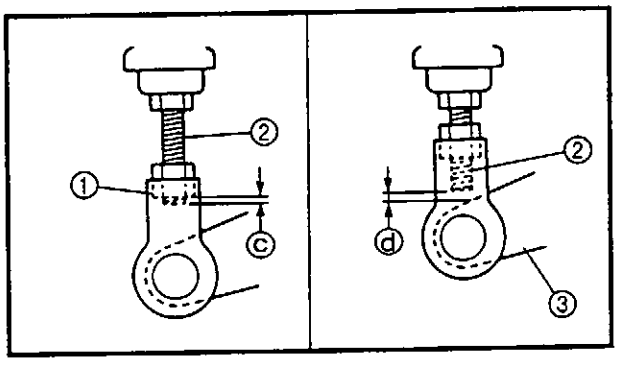


EAS00111
ADJUSTING THE REAR BRAKE

1. Measure:
   • brake pedal position
   (distance ⓐ from the top of the rider footrest to the top of the brake pedal)
   Out of specification → Adjust.

Brake pedal position (below the top of the rider footrest)
15 mm





2. Adjust:
   • brake pedal position

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a. Loosen the locknuts ①.

b. Turn the adjusting bolt ② in direction ⓐ or ⓑ until the specified brake pedal position is obtained.

Direction ⓐ	**Brake pedal is raised.**
Direction ⓑ	**Brake pedal is lowered.**

⚠ WARNING

After adjusting the brake pedal height, check that the end of the adjusting bolt ② protrudes ⓒ from the bottom of the locknut ①, also that the end of the adjusting bolt ② is more than 2 mm above ⓓ the brake pedal ③.

c. Tighten the locknuts ①.

⚠ WARNING

A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.

CAUTION:

After adjusting the brake pedal position, make sure there is no brake drag.

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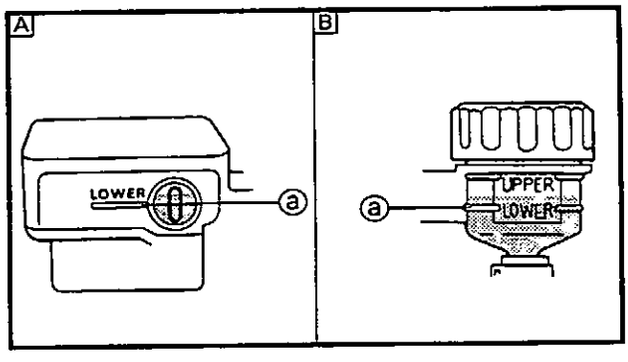
3. Adjust:
   • rear brake light switch
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH".

EAS00115
CHECKING THE BRAKE FLUID LEVEL

1. Stand the motorcycle on a level surface.

NOTE:
- Place the motorcycle on a suitable stand.
- Make sure the motorcycle is upright.



2. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.

	Recommended brake fluid **DOT 4**

A Front brake
B Rear brake

⚠ WARNING

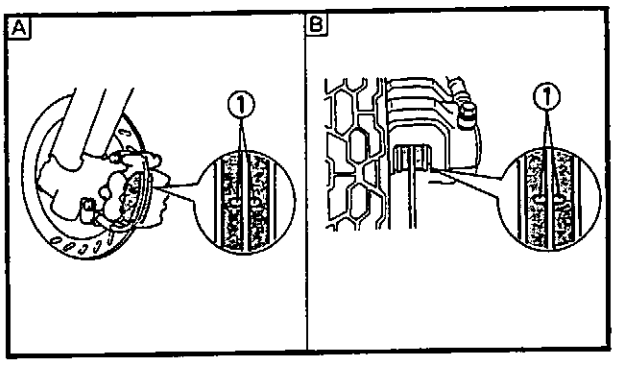
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

NOTE:

In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.



EAS00122
CHECKING THE BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
   - front brake pad
   - rear brake pad

   Wear indicator groove ① almost disappeared → Replace the brake pads as a set.

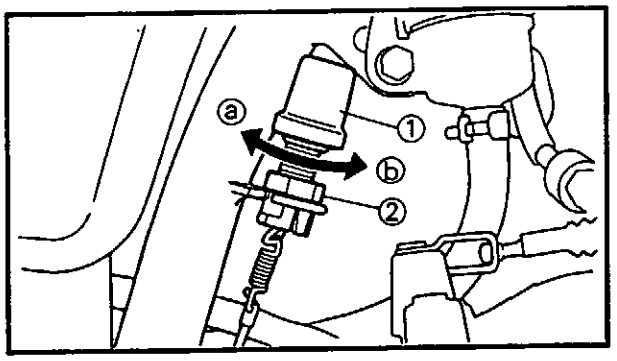
   Refer to "FRONT AND REAR BRAKES" in chapter 7.

Ⓐ Front brake
Ⓑ Rear brake

EAS00128
ADJUSTING THE REAR BRAKE LIGHT SWITCH

NOTE:

The rear brake light switch is operated by movement of the brake pedal.
The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.



1. Check:
   - rear brake light operation timing

   Incorrect → Adjust.
2. Adjust:
   - rear brake light operation timing

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a. Hold the main body ① of the rear brake light switch so that it does not rotate and turn the adjusting nut ② in direction ⓐ or ⓑ until the rear brake light comes on at the proper time.

Direction ⓐ	**Brake light comes on sooner.**
Direction ⓑ	**Brake light comes on later.**

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EAS00131
CHECKING THE BRAKE HOSES

The following procedure applies to all of the brake hoses and brake hose clamps.

1. Check:
   - brake hose
     Cracks/damage/wear → Replace.
2. Hold the motorcycle upright and apply the brake several times.
3. Check:
   - brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to "FRONT AND REAR BRAKES" in chapter 7.

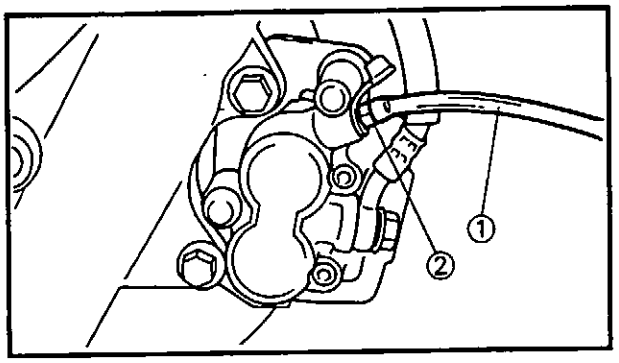
EAS00134
BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠ WARNING

Bleed the hydraulic brake system whenever:
- **the brake system was disassembled,**
- **a brake hose was loosened, disconnected, or replaced,**
- **the brake fluid level is very low,**
- **brake operation is faulty.**

1. Remove:
   - brake fluid reservoir cap
   - brake fluid reservoir diaphragm

NOTE:
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.



2. Bleed:
   • hydraulic brake system

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a. Fill the brake fluid reservoir to the proper level with recommended brake fluid.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Connect a clear plastic hose ① tightly to the bleed screw ②.
d. Place the other end of the hose into a container.
e. Slowly apply the brake several times.
f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
g. Loosen the bleed screw.

NOTE:
Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip or the brake pedal to fully extend.

h. Tighten the bleed screw and then release the brake lever or brake pedal.
i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
j. Tighten the bleed screw to specification.

	Bleed screw **6 Nm (0.6 m • kg)**

k. Fill the brake fluid reservoir to the proper level with recommended brake fluid.
   Refer to "CHECKING THE BRAKE FLUID LEVEL".

⚠ WARNING

After bleeding the hydraulic brake system, check the brake operation.

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ADJUSTING THE DRIVE CHAIN SLACK

NOTE:
The drive chain slack must be checked at the tightest point on the chain.

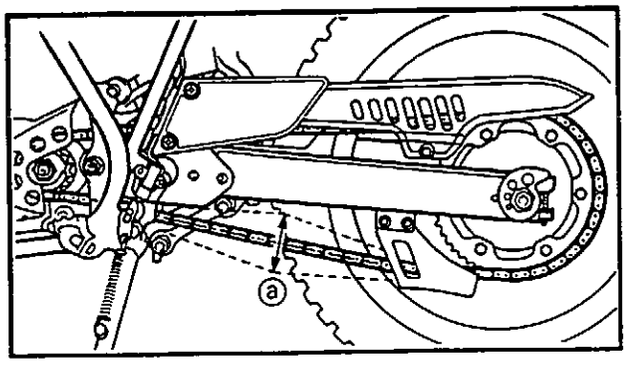
CAUTION:
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the motorcycle on a level surface.

⚠ WARNING
Securely support the motorcycle so that there is no danger of it falling over.

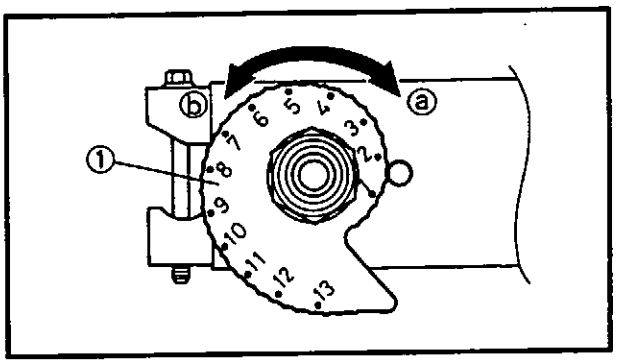
NOTE:
Both wheels should be on the ground without a rider on the motorcycle.

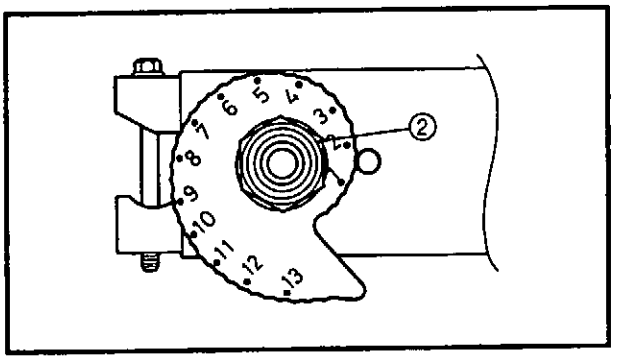
2. Rotate the rear wheel several times and check the drive chain to locate its tightest point.



3. Measure:
   - drive chain slack ⓐ
     Out of specification → Adjust.

	Drive chain slack **40 ~ 60 mm**





4. Adjust:
   • drive chain slack

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a. Loosen the wheel axle nut.

b. Turn the chain pullers ① in direction ⓐ or ⓑ until the specified drive chain slack is obtained.

Direction ⓐ	**Drive chain slack is reduced.**
Direction ⓑ	**Drive chain slack is increased.**

NOTE:
To maintain the proper wheel alignment, adjust both sides evenly.

c. Tighten the wheel axle nut ② to specification.

	Wheel axle nut **104 Nm (10.4 m • kg)**

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EAS00142
LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out rapidly. Therefore, the drive chain should be serviced, especially when the motorcycle is used in dusty areas. This motorcycle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains.

Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.

Recommended lubricant
Engine oil or chain lubricant suitable for O-ring chains

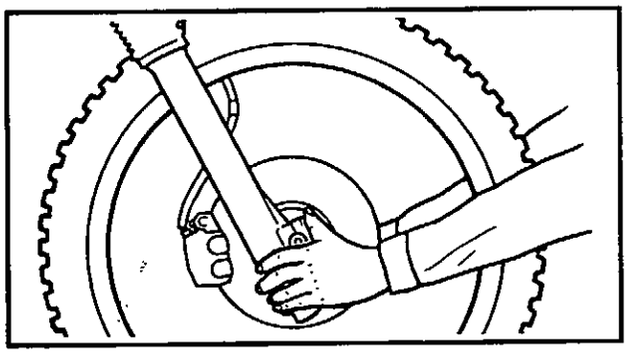
CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the motorcycle on a level surface.

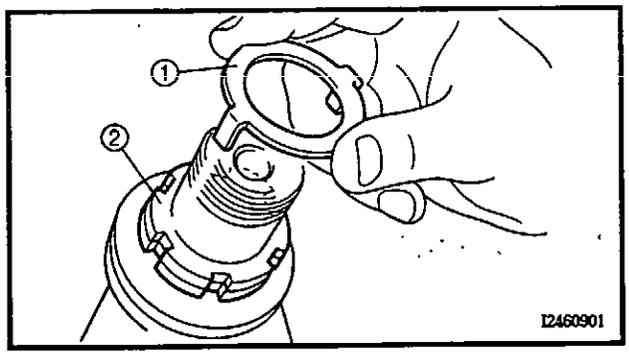
⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

NOTE:
Place the motorcycle on a suitable stand so that the front wheel is elevated.



2. Check:
   - steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Binding/looseness → Adjust the steering head.
3. Remove:
   - handlebar
     Refer to "HANDLEBAR" in chapter 7.
   - upper bracket
     Refer to "STEERING HEAD" in chapter 7.
4. Adjust:
   - steering head



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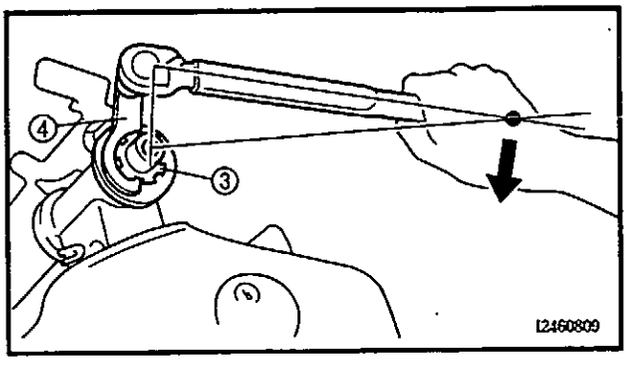
a. Remove the lock washer ①, the upper ring nut ②, and the rubber washer.

b. Loosen the lower ring nut ③ and then tighten it to specification with a ring nut wrench ④.



NOTE:
Set the torque wrench at a right angle to the ring nut wrench.

Ring nut wrench
90890-01403

Lower ring nut (initial tightening torque) 38 Nm (3.8 m • kg)

c. Loosen the lower ring nut completely, then tighten it to specification.

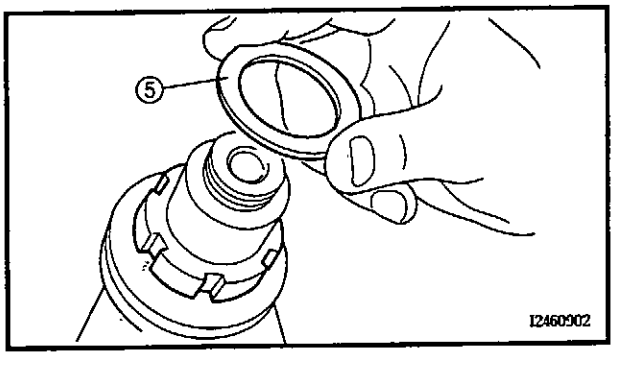
⚠ WARNING

Do not overtighten the lower ring nut.

Lower ring nut (final tightening torque) 4 Nm (0.4 m • kg)

d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.

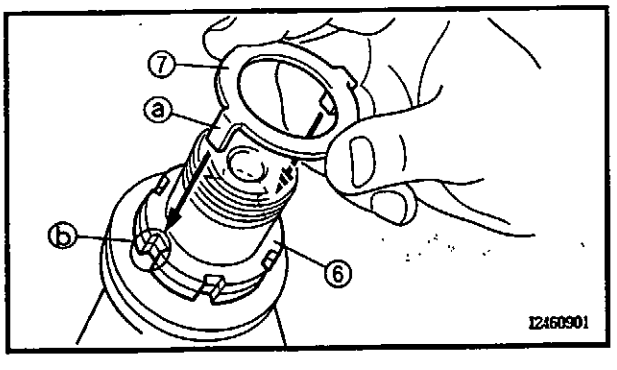
Refer to "HANDLEBAR" and "STEERING HEAD" in chapter 7.



e. Install the rubber washer ⑤.

f. Install the upper ring nut ⑥.

g. Finger tighten the upper ring nut, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.



h. Install the lock washer ⑦.

NOTE:

Make sure the lock washer tabs ⓐ sit correctly in the ring nut slots ⓑ.

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5. Install:
   - Steering stem nut — 138 Nm (13.8 m · kg)
   - Upper bracket pinch bolt — 23 Nm (2.3 m · kg)
   - Handlebar holder bolt — 23 Nm (2.3 m · kg)

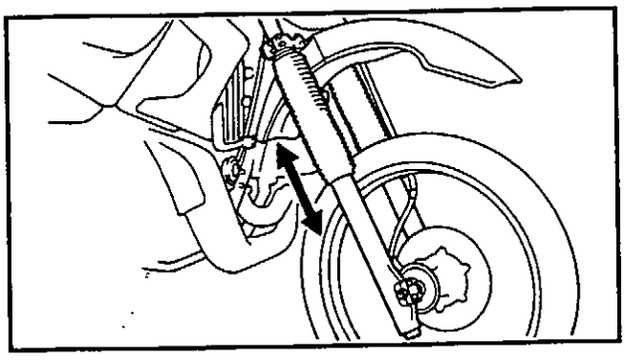
EAS00149
CHECKING THE FRONT FORK

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

2. Check:
   - inner tube
     Damage/scratches → Replace.
   - oil seal
     Oil leakage → Replace.
3. Hold the motorcycle upright and apply the front brake.



4. Check:
   - front fork operation
     Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
     Rough movement → Repair.
     Refer to "FRONT FORK" in chapter 7.

ADJUSTING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

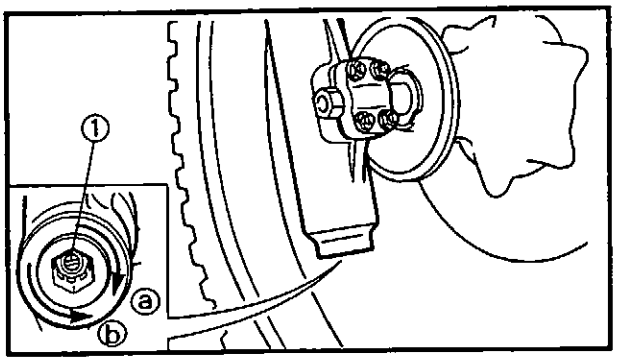
⚠ WARNING

- **Always adjust both front fork legs evenly. Uneven adjustment can result in poor handling and loss of stability.**
- **Securely support the motorcycle so that there is no danger of it falling over.**

Compression damping

CAUTION:

Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   • compression damping

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a. Turn the adjusting screw ① in direction ⓐ or ⓑ.

Direction ⓐ	**Compression damping is increased (suspension is harder).**
Direction ⓑ	**Compression damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 17 clicks out*
Standard: 14 clicks out*
Maximum: 1 clicks out*

*** from the fully turned-in position**

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ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

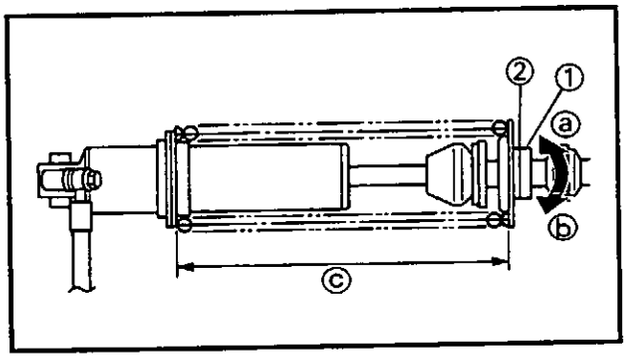
Spring preload

CAUTION:

Never go beyond the maximum or minimum adjustment positions.

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

CHK ADJ



1. Adjust:
   • spring preload

NOTE:
Adjust the spring preload with the special wrench and extension bar included in the owner's tool kit.

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a. Loosen the locknut ①

b. Turn the adjusting ring ② in direction ⓐ or ⓑ.

Direction ⓐ	**Spring preload is increased (suspension is harder).**
Direction ⓑ	**Spring preload is decreased (suspension is softer).**

Adjusting length ⓒ
Minimum: 252 mm
Standard: 244 mm
Maximum: 234 mm

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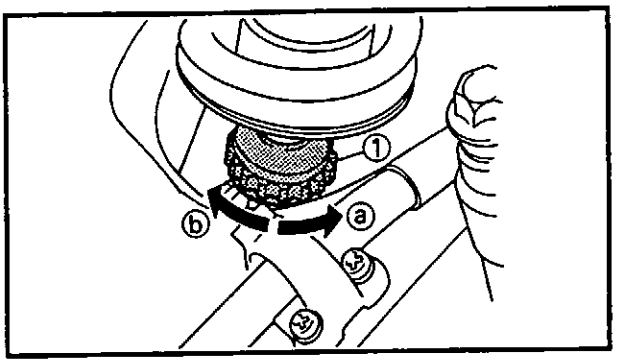
Rebound damping

CAUTION:
Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   • rebound damping

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a. Turn the adjusting knob ① in direction ⓐ or ⓑ.

Direction ⓐ	**Rebound damping is increased (suspension is harder).**
Direction ⓑ	**Rebound damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 16 clicks out*
Standard: 9 clicks out*
Maximum: 1 clicks out*

*** from the fully turned-in position**

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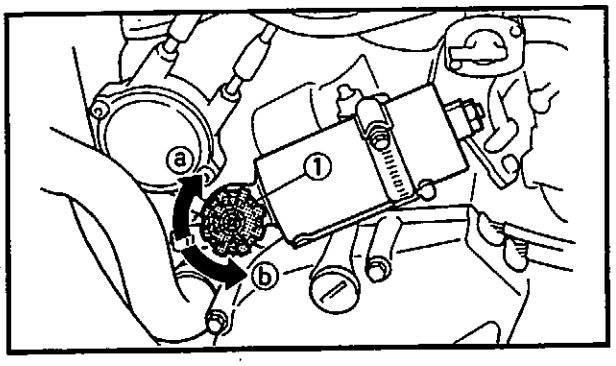
Compression damping

CAUTION:

Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   • compression damping

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a. Turn the adjusting screw ① in direction ⓐ or ⓑ.

Direction ⓐ	**Compression damping is increased (suspension is harder).**
Direction ⓑ	**Compression damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 5 clicks in*
Standard: 8 clicks in*
Maximum: 22 clicks in*

*** from the fully turned-out position**

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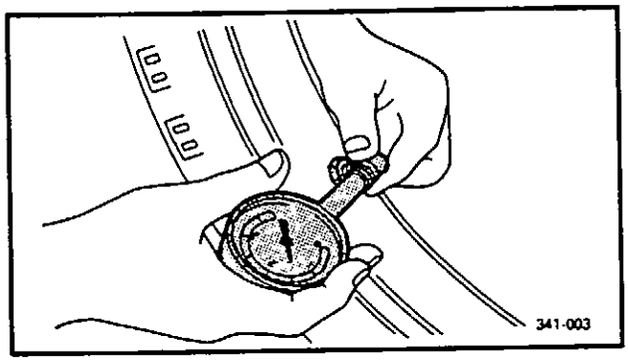


EAS00162
CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Measure:
   - tire pressure
     Out of specification → Regulate.

⚠ WARNING

- **The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.**
- **The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.**
- **Operation of an overloaded motorcycle could cause tire damage, an accident, or an injury.**

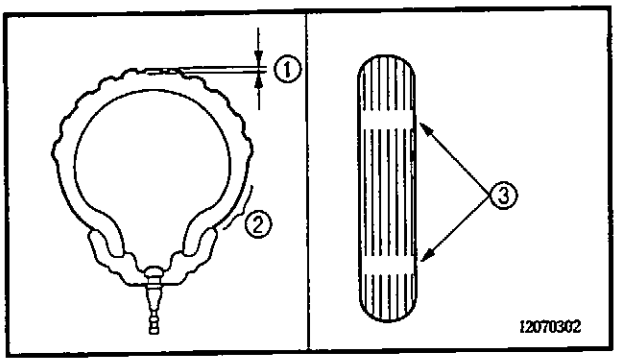
NEVER OVERLOAD THE MOTORCYCLE.

Basic weight (with oil and a full fuel tank)	133 kg	
Maximum load*	180 kg	
Cold tire pressure	Front tire	Rear tire
Up to 90 kg load*	125 kPa (1.25 kgf/cm², 1.25 bar)	150 kPa (1.50 kgf/cm², 1.50 bar)
90 kg ~ maximum load*	150 kPa (1.50 kgf/cm², 1.50 bar)	175 kPa (1.75 kgf/cm², 1.75 bar)
High-speed riding	150 kPa (1.50 kgf/cm², 1.50 bar)	175 kPa (1.75 kgf/cm², 1.75 bar)

* total of cargo, rider, passenger and accessories

⚠ WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.



2. Check:
   • tire surfaces
   Damage/wear → Replace the tire.

	Minimum tire tread depth 1.6 mm

①Tire tread depth
②Side wall
③Wear indicator

⚠ WARNING

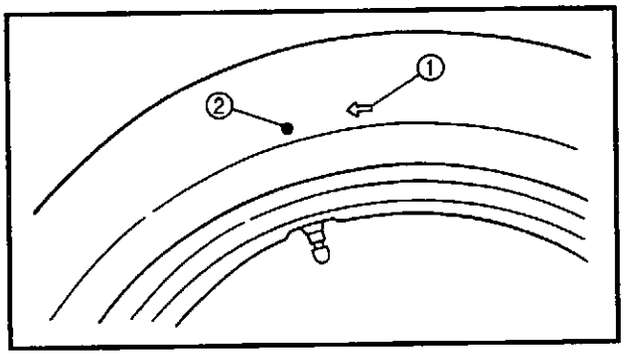
- **Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.**
- **When using a tube tire, be sure to install the correct tube.**
- **Always replace a new tube tire and a new tube as a set.**
- **To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.**
- **Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.**

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

- **After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this motorcycle.**

Front tire

Manufacturer	Model	Size
INOUE	GP-21F	3.00-21 51P
CHENG SHIN	M-6033	3.00-21 51P



Rear tire

Manufacturer	Model	Size
INOUE	GP-22R	4.60-18 63P
CHENG SHIN	M-6034	4.60-18 63P

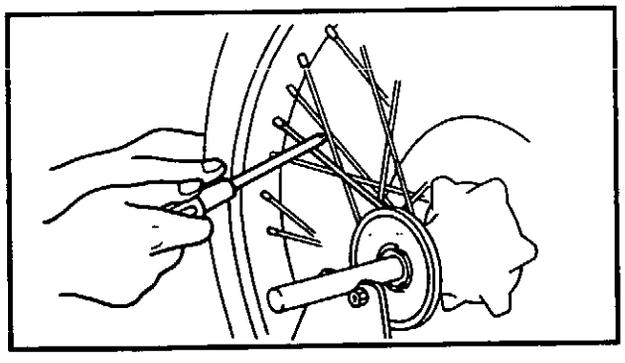
⚠ WARNING

After mounting a new tire, ride conservatively for a while to become accustomed to the "feel" of the new tire and to allow the tire to seat itself properly in the rim. Failure to do so could lead to an accident with possible injury to the rider or damage to the motorcycle.

NOTE:

For tires with a direction of rotation mark ①:

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ② with the valve installation point.



EAS00169

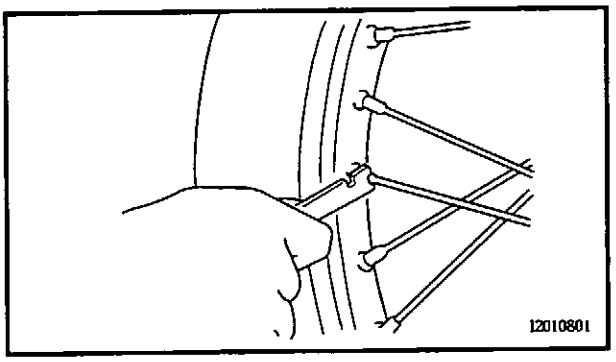
CHECKING AND TIGHTENING THE SPOKES

The following procedure applies to all of the spokes.

1. Check:
   - spoke
     Bends/damage → Replace.
     Loose → Tighten.
     Tap the spokes with a screwdriver.

NOTE:

A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.



2. Tighten:
   • spoke
     (with a spoke wrench)

NOTE:
Be sure to tighten the spokes before and after break-in.

Spoke nipple
3 Nm (0.3 m • kg)

EAS00170
CHECKING AND LUBRICATING THE CABLES

The following procedure applies to all of the cable sheaths and cables.

⚠ WARNING

Damaged cable sheaths may cause the cable to corrode and interfere with its movement. Replace damaged cable sheaths and cables as soon as possible.

1. Check:
   • cable sheath
     Damage → Replace.
2. Check:
   • cable operation
     Rough movement → Lubricate.

Recommended lubricant
Engine oil or a suitable cable lubricant

NOTE:
Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubing device.

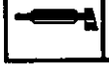
EAS00171
LUBRICATING THE LEVERS AND PEDALS

Lubricate the pivoting point and metal-to-metal moving parts of the levers and pedals.

	**Recommended lubricant** **Engine oil**

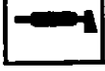
EAS00172
LUBRICATING THE SIDESTAND

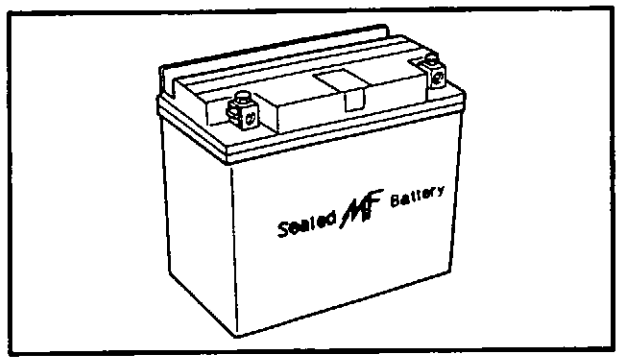
Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.

	**Recommended lubricant** **Engine oil**

EAS00174
LUBRICATING THE REAR SUSPENSION

Lubricate the pivoting point and metal-to-metal moving parts of the rear suspension.

	**Recommended lubricant** **Molybdenum disulfide grease**



EAS00178
ELECTRICAL SYSTEM

CHECKING AND CHARGING THE BATTERY

⚠ WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**

FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL

- **Skin – Wash with water.**
- **Eyes – Flush with water for 15 minutes and get immediate medical attention.**

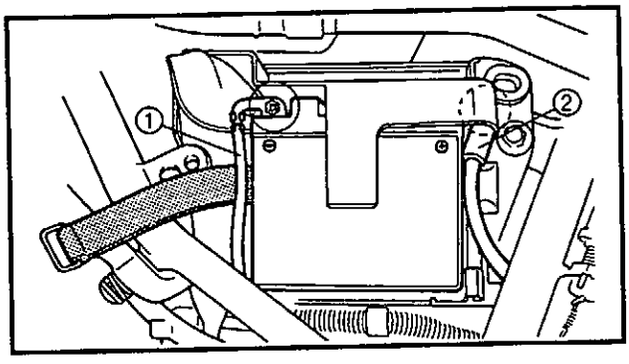
INTERNAL

- **Drink large quantities of water or milk followed with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

CAUTION:

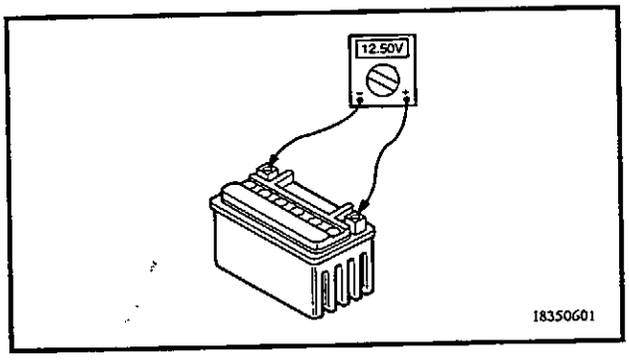
- **This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.**
- **Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**

NOTE:
Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.



1. Remove:
   - right side cover
2. Disconnect:
   - battery leads
     (from the battery terminals)

CAUTION:
First, disconnect the negative battery lead ①, then the positive battery lead ②.



3. Remove:
   - battery
4. Measure:
   - battery charge

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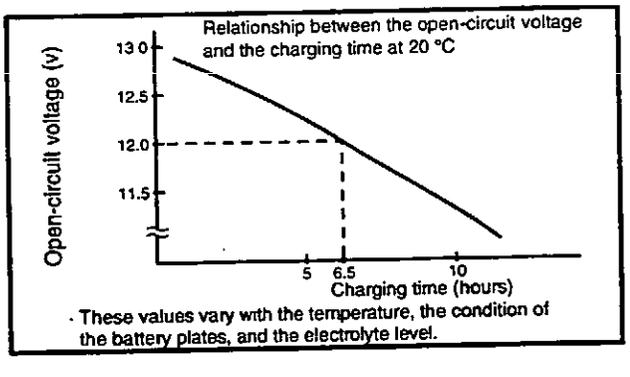
a. Connect a pocket tester to the battery terminals.

Positive tester probe →
positive battery terminal
Negative tester probe →
negative battery terminal



NOTE:
- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

b. Check the charge of the battery, as shown in the charts and the following example.

Example
Open-circuit voltage = 12.0 V
Charging time = 6.5 hours
Charge of the battery = 20 ~ 30%

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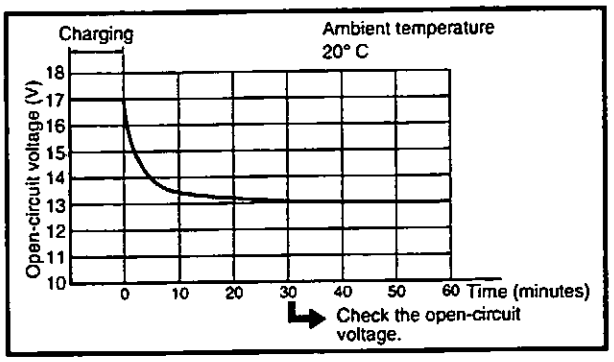
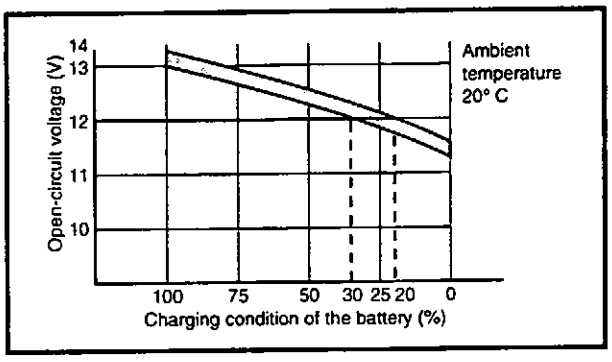




5. Charge:
   - battery
     (refer to the appropriate charging method illustration)

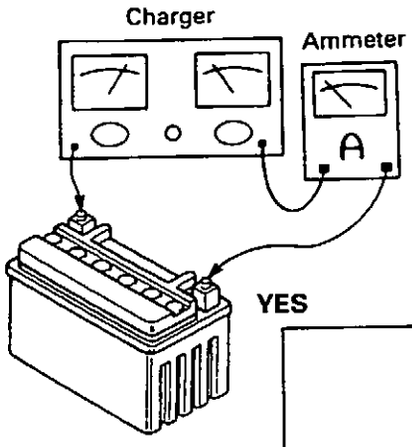
⚠ WARNING

Do not quick charge a battery.

CAUTION:

- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.**
- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **When charging a battery, be sure to remove it from the motorcycle. (If charging has to be done with the battery mounted on the motorcycle, disconnect the negative battery lead from the battery terminal.)**
- **To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.**
- **Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.**
- **Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.**
- **If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!**
- **As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.**

Charging method using a variable voltage charger



Measure the open-circuit voltage prior to charging.

NOTE:
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

Connect a charger and ammeter to the battery and start charging.

NOTE:
Set the charging voltage to 16 ~ 17 V. (If the charging voltage is lower, charging will be insufficient, if it is higher, the battery will be over-charged.)

Is the amperage higher than the standard charging amperage written on the battery?

YES

NO

Adjust the charging voltage to 20 ~ 25 V.

Monitor the amperage for 3 ~ 5 minutes. Is the standard charging amperage exceeded?

YES

NO

Adjust the voltage to obtain the standard charging amperage.

If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.

Set the timer to the charging time determined by the open -circuit voltage.
Refer to "CHECKING AND CHARGING THE BATTERY."

If the required charging time exceeds 5 hours, it is advisable to check the charging amperage after 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging amperage.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.
12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.
Under 12.0 V → Replace the battery.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

NOTE:
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

YES

Charge the battery until the charging voltage reaches 15 V.

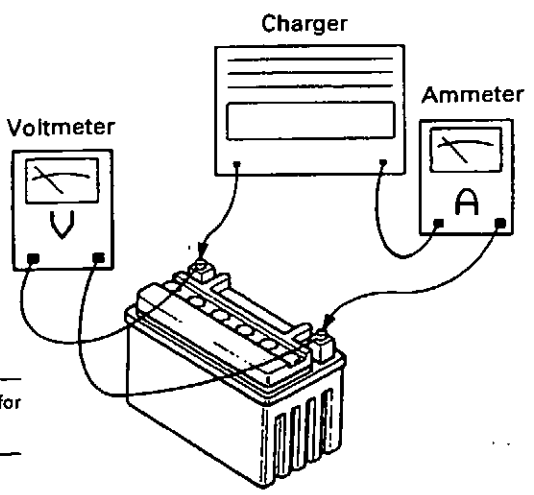
NOTE:
Set the charging time to a maximum of 20 hours.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.
12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.
Under 12.0 V → Replace the battery.

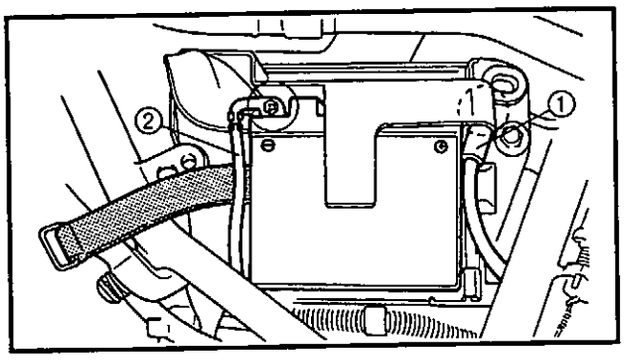
CAUTION:
Constant amperage chargers are not suitable for charging MF batteries.

NO

This type of battery charger cannot charge an MF battery. A variable-voltage charger is recommended.



6. Install:
   • battery



7. Connect:
   • battery leads
     (to the battery terminals)

CAUTION:

First, connect the positive battery lead ①, then the negative battery lead ②.

8. Check:
   • battery terminals
     Dirt → Clean with a wire brush.
     Loose connection → Connect properly.
9. Lubricate:
   • battery terminals

	Recommended lubricant **Dielectric grease**

10. Install:
    • right side cover

EAS00181
CHECKING THE FUSES

The following procedure applies to all of the fuses.

CAUTION:

To avoid a short circuit, always set the main switch to "OFF" when checking or replacing a fuse.

1. Remove:
   • right side cover
2. Check:
   • continuity

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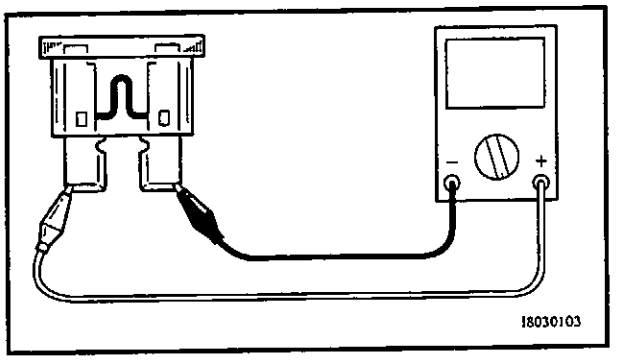
a. Connect the pocket tester to the fuse and check the continuity.

NOTE:
Set the pocket tester selector to "Ω × 1".



	Pocket tester **90890-03112**

b. If the pocket tester indicates "∞", replace the fuse.

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3. Replace:
   • blown fuse

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a. Set the main switch to "OFF".

b. Install a new fuse of the correct amperage.

c. Set the main switch to "ON" and verify if the electrical circuit is operational.

d. If the fuse immediately blows again, check the electrical circuit.

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Item	Amperage	Q'ty
Main fuse	30 A	1
Reserve fuse	30 A	1

⚠ WARNING

Never use a fuse with an amperage other than that specified. Improvising or using a fuse with the wrong amperage may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

4. Install:
   • right side cover

EAS00182
REPLACING THE HEADLIGHT BULB

1. Remove:
   • headlight cover
2. Disconnect:
   • headlight lead
3. Remove:
   • headlight bulb cover
   • headlight bulb

⚠ WARNING

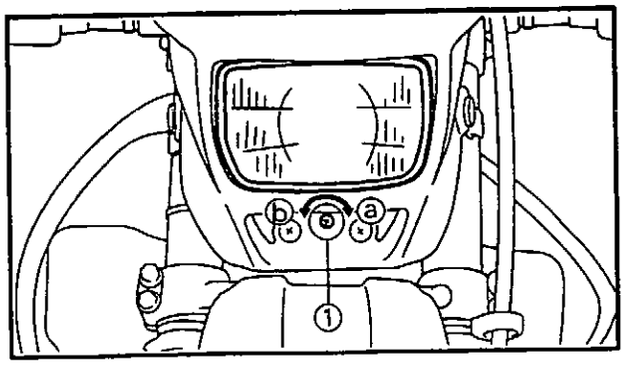
Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

4. Install:
   • headlight bulb New
   Secure the new headlight bulb with the headlight bulb holder.

CAUTION:

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

5. Install:
   • headlight bulb cover
6. Connect:
   • headlight lead
7. Install:
   • headlight cover



EAS00186
ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
   • headlight beam (vertically)

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a. Turn the adjusting screw ① in direction ⓐ or ⓑ.

Direction ⓐ	**Headlight beam is raised.**
Direction ⓑ	**Headlight beam is lowered.**

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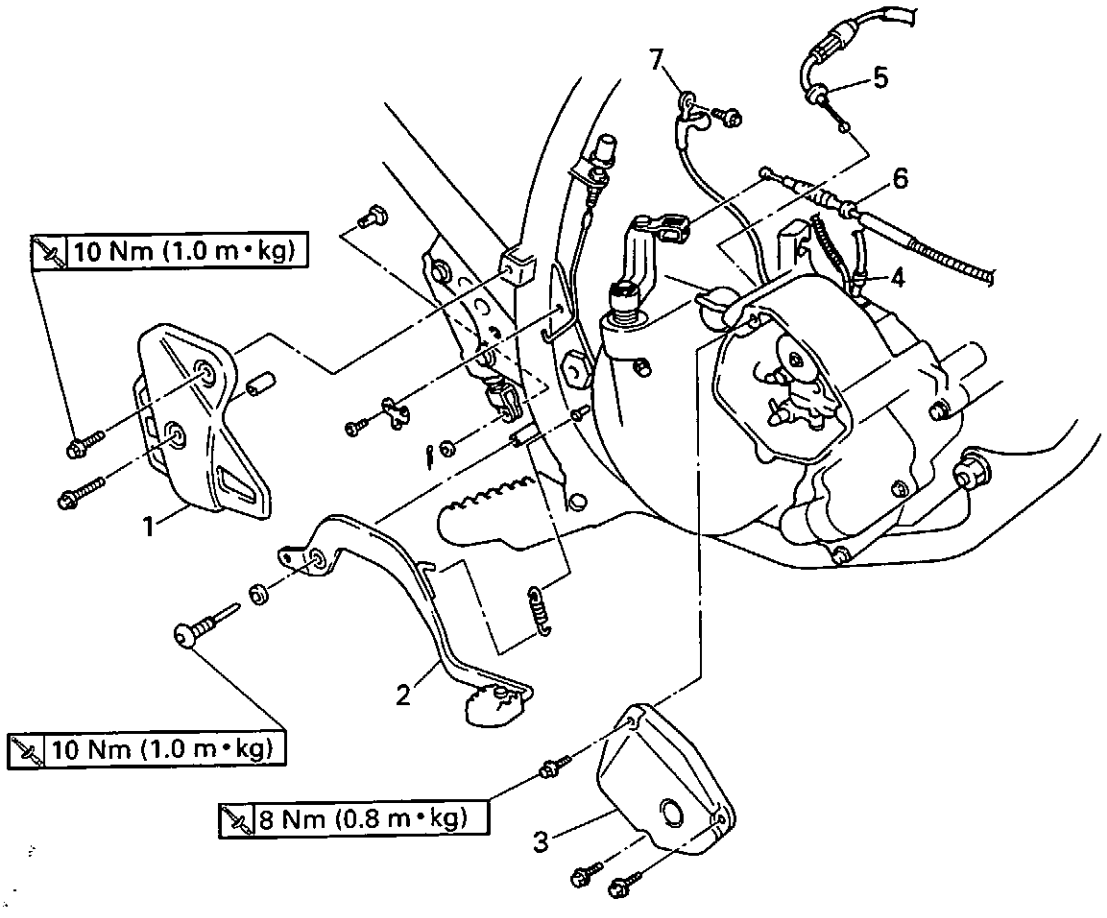
OVERHAULING THE ENGINE

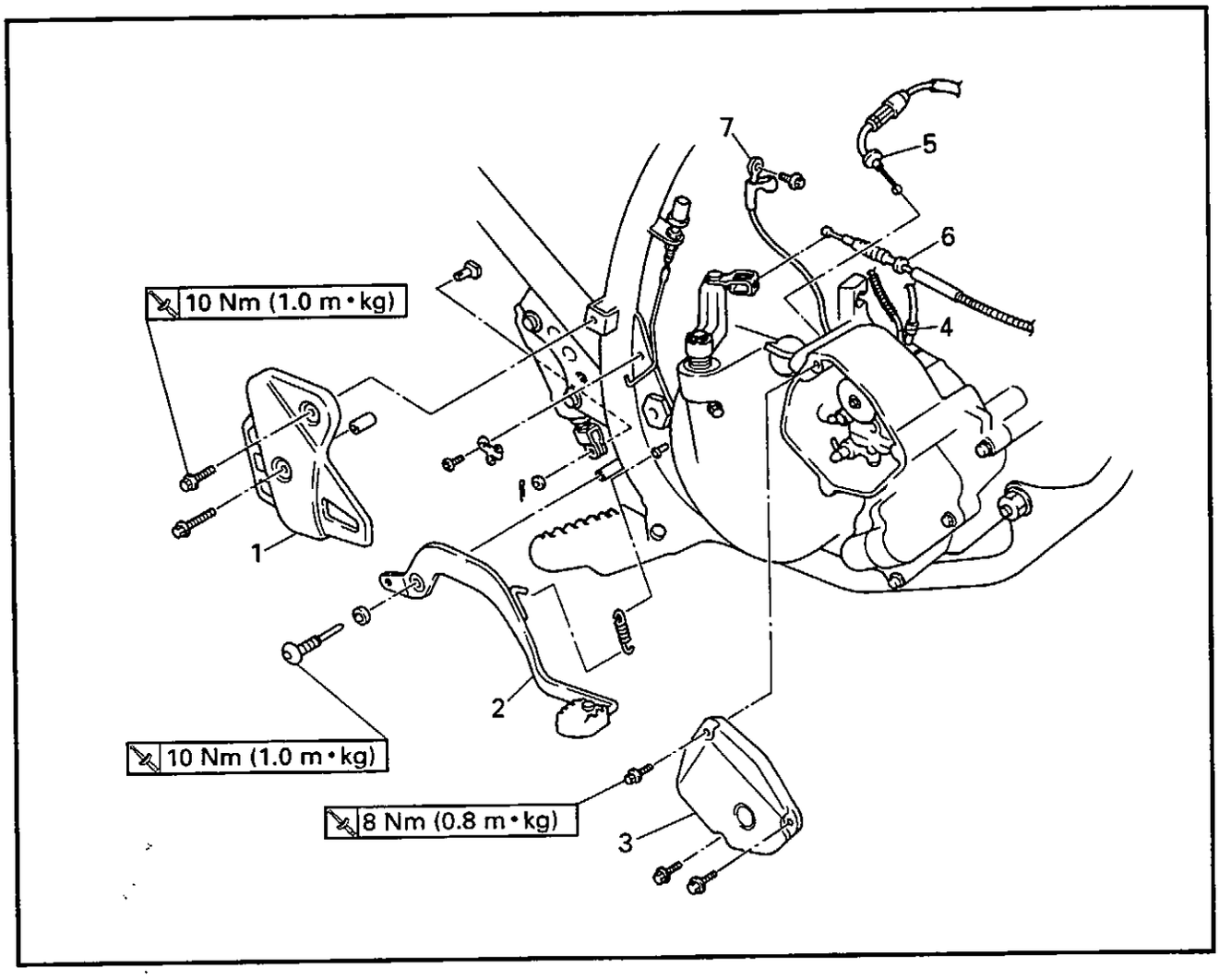
OVERHAULING THE ENGINE

ENGINE

CABLES AND BRAKE PEDAL

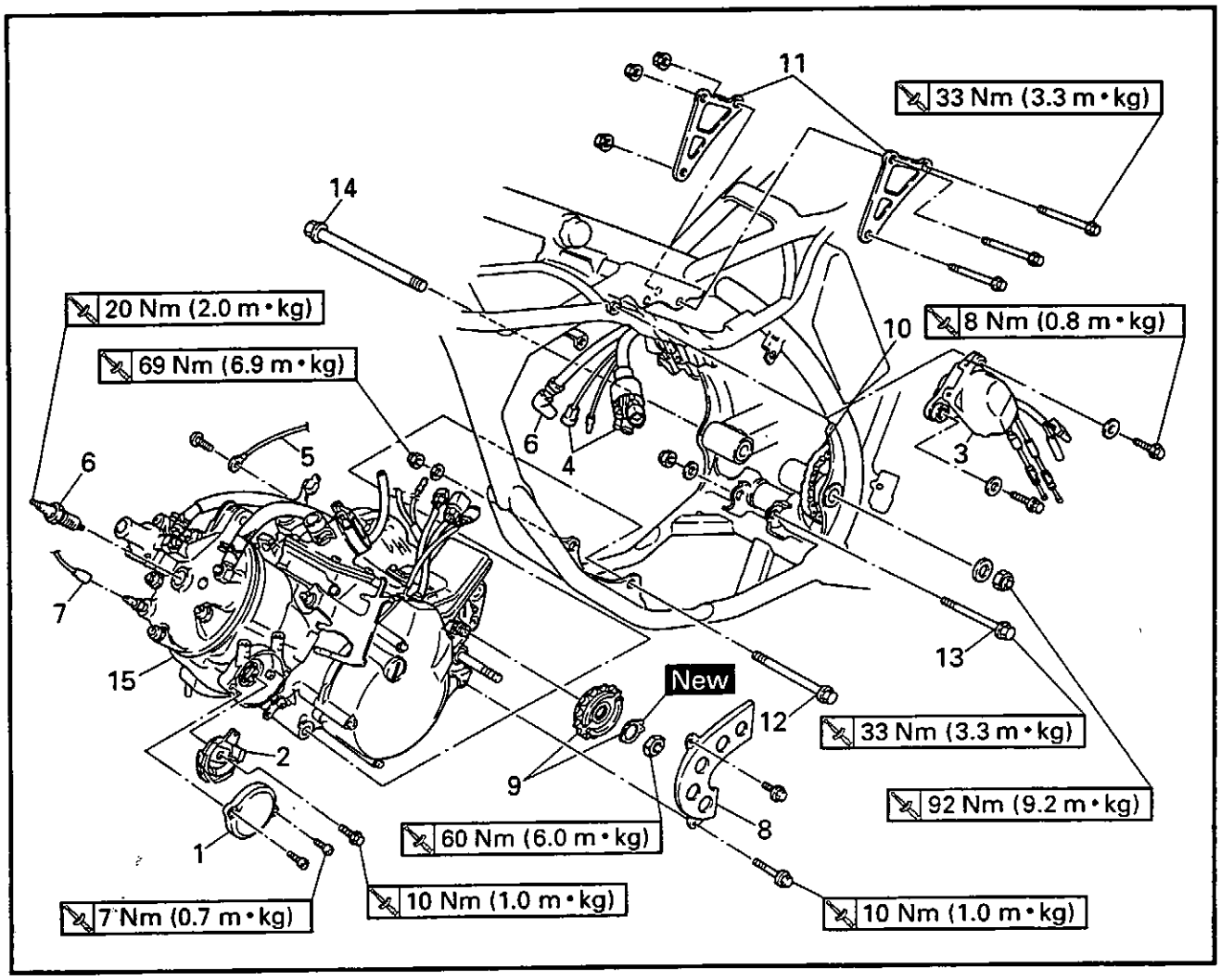


Order	Job/Part	Q'ty	Remarks
	Removing the cables and brake pedal		Remove the parts in the order listed.
	Air scoop, side cover, seat, fuel tank and muffler		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
	Coolant		Refer to "CHANGING THE COOLANT" in chapter 3.
	Radiators		Refer to "RADIATORS" in chapter 5.
	Carburetor assembly		Refer to "CARBURETOR" in chapter 6.
1	Rear master cylinder cover	1	
2	Brake pedal	1	
3	Oil pump cover	1	
4	Oil hose	1	
5	Oil pump cable	1	
6	Clutch cable	1	

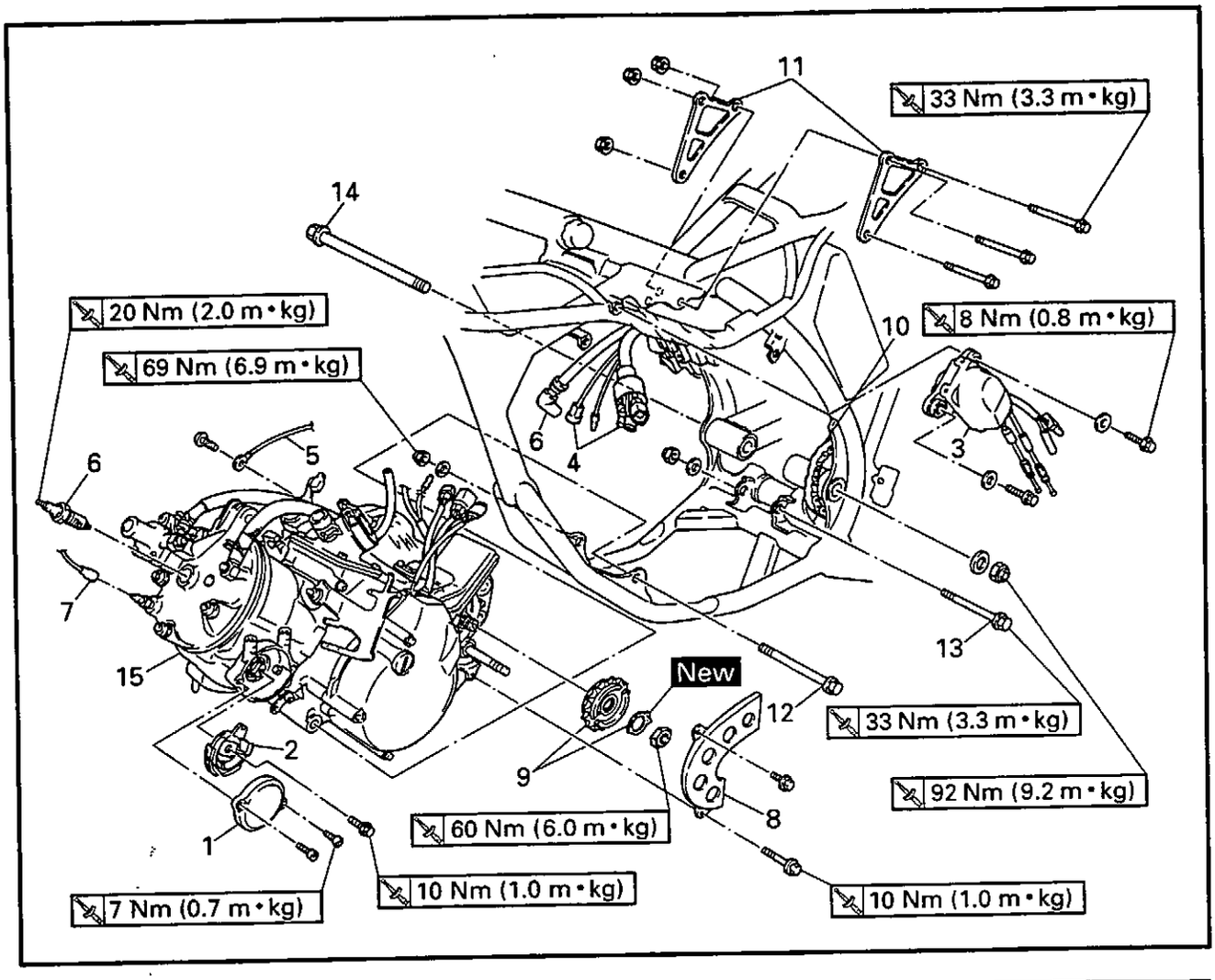


Order	Job/Part	Q'ty	Remarks
7	Starter motor lead	1	Disconnect the lead from the starter relay side. For installation, reverse the removal procedure.

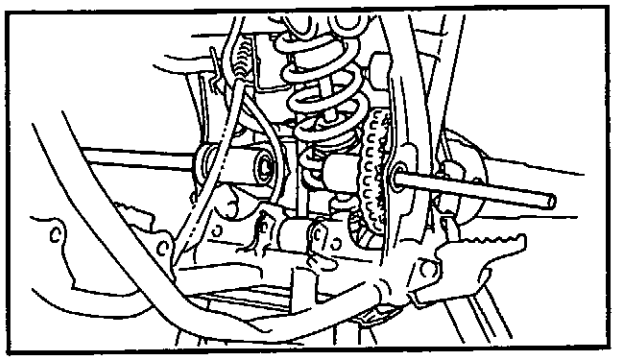
SERVOMOTOR, DRIVE SPROCKET, LEADS AND ENGINE



Order	Job/Part	Q'ty	Remarks
	Removing the servomotor, drive sprocket, leads and engine		Remove the parts in the order listed. **NOTE:** Place a suitable stand under the frame and engine.
1	YPVS pulley cover	1	
2	YPVS pulley	1	
3	YPVS servomotor	1	
4	CDI magneto lead couplers and speed sensor lead coupler	1	Disconnect.
5	Ground lead	1	Disconnect.
6	Spark plug cap/spark plug	1/1	
7	Thermo unit lead	1	Disconnect.
8	Drive sprocket cover	1	
9	Lock washer/drive sprocket	1/1	
10	Drive chain	1	



Order	Job/Part	Q'ty	Remarks
11	Engine bracket	2	
12	Front engine mounting bolt	1	
13	Rear engine mounting bolt	1	
14	Pivot shaft	1	
15	Engine assembly	1	For installation, reverse the removal procedure.

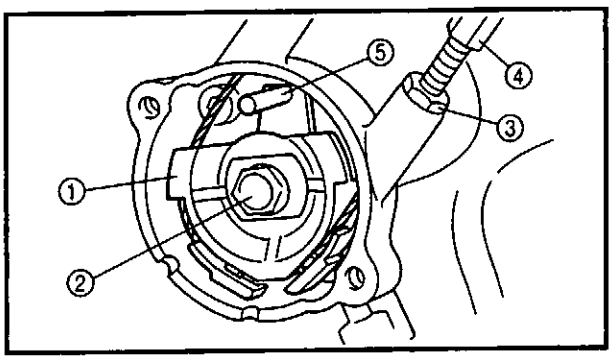


REMOVING THE PIVOT SHAFT

1. Remove:
   • pivot shaft

CAUTION:

Do not completely the pivot shaft to prevent the swingarm assembly from falling.



INSTALLING THE ENGINE

1. Install:
   • YPVS servomotor
2. Install:
   • YPVS pulley ①
   • bolt ② 10 Nm (1.0 m · kg)
3. Adjust:
   • YPVS servomotor cable

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a. Loosen the locknut ③ and turn in the adjusting bolt ④.

b. Install the ø4 pin ⑤ through the aligning indent in the pulley and into the hole to lock the pulley.

c. Turn the adjusting bolt in or out until the 1.5 mm cable free play is obtain.

d. Tighten the locknut.

e. Remove the ø4 pin.

f. Turn on to the main switch and check that the alignment mark is aligned.

g. If not aligned, repeat the above steps.

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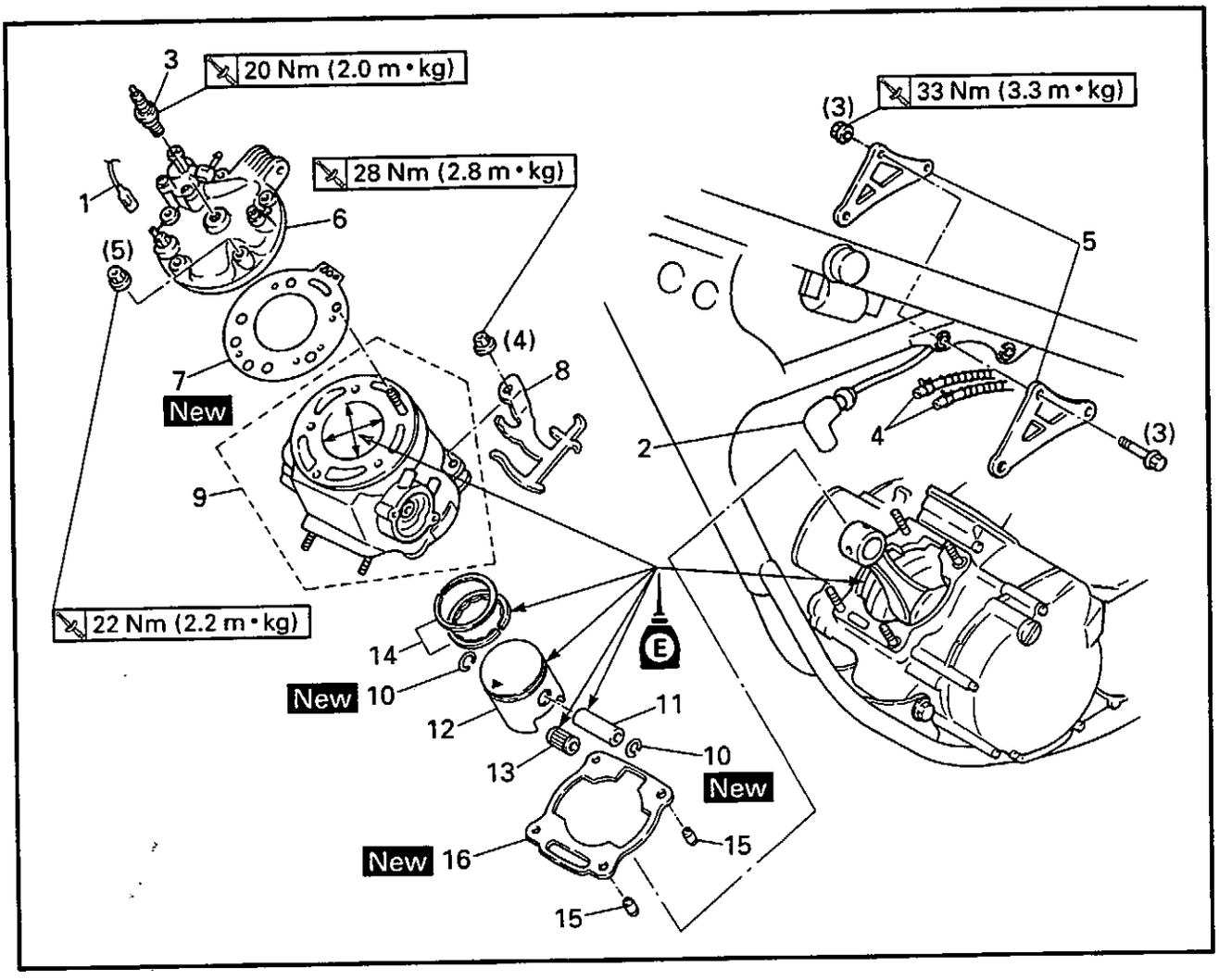
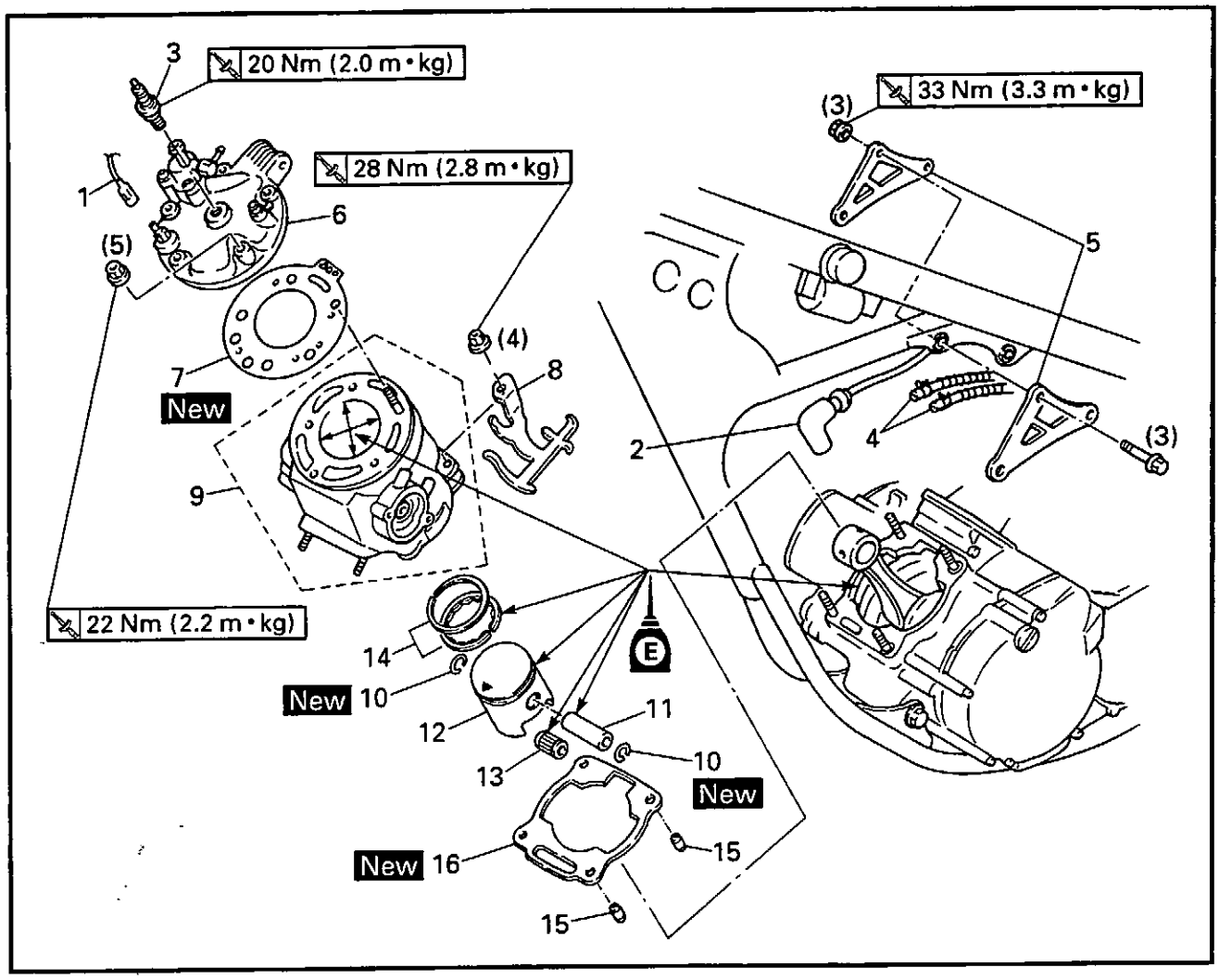
CYLINDER HEAD, CYLINDER, PISTON AND YPVS VALVE

CYLINDER HEAD, CYLINDER AND PISTON

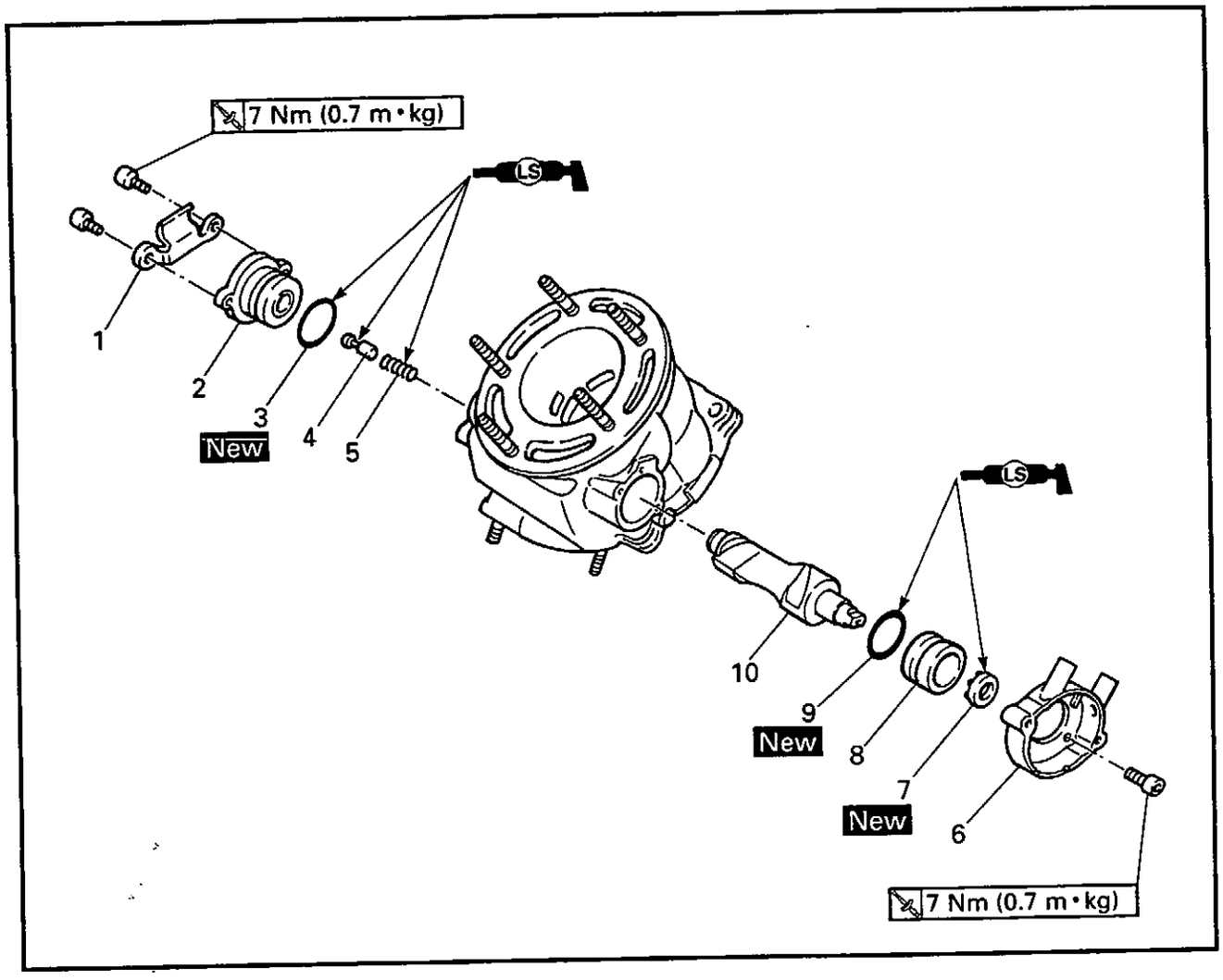


Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head, cylinder and piston		Remove the parts in the order listed.
	Side cover, seat, fuel tank and muffler		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
	Coolant		Refer to "CHANGING THE COOLANT" in chapter 3.
	YPVS servomotor		Refer to "ENGINE".
	Radiator hoses		Refer to "RADIATORS" in chapter 5.
	Carburetor assembly		Refer to "CARBURETOR" in chapter 6.
1	Thermo unit lead	1	Disconnect.
2	Spark plug cap	1	
3	Spark plug	1	
4	Carburetor heater hose	2	Disconnect.
5	Engine bracket	2	
6	Cylinder head	1	
7	Cylinder head gasket	1	

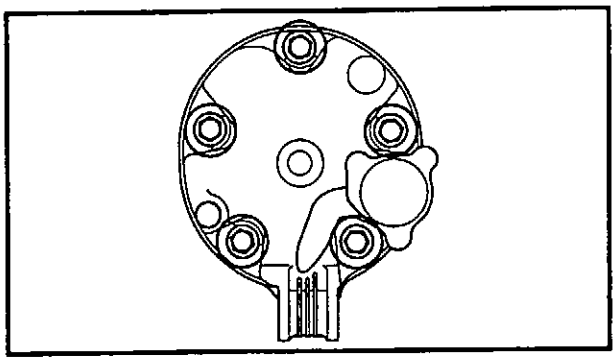


Order	Job/Part	Q'ty	Remarks
8	Rear shock absorber gas cylinder bracket	1	
9	Cylinder	1	
10	Piston pin clip	2	
11	Piston pin	1	
12	Piston	1	
13	Bearing	1	
14	Piston ring kit	1	
15	Dowel pin	2	
16	Cylinder gasket	1	
			For installation, reverse the removal procedure.

YPVS VALVE



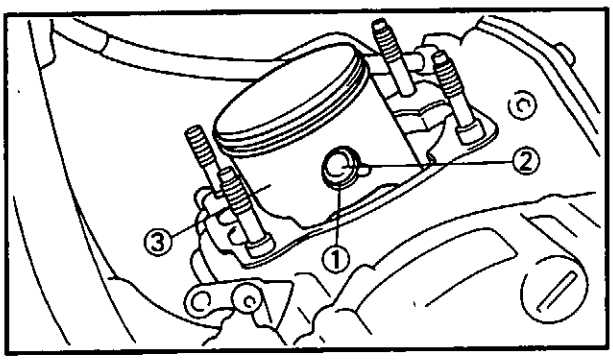
Order	Job/Part	Q'ty	Remarks
	Removing the YPVS valve		Remove the parts in the order listed.
1	Clutch cable holder	1	
2	Right YPVS valve cover	1	
3	O-ring	1	
4	Pin	1	
5	Spring	1	
6	YPVS pulley cover	1	
7	Oil seal	1	
8	Holder	1	
9	O-ring	1	
10	YPVS valve	1	
			For installation, reverse the removal procedure.



EAS00222
REMOVING THE CYLINDER HEAD

1. Remove:
   • cylinder head nuts

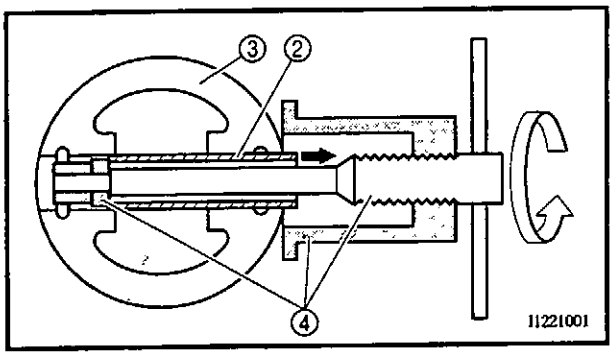
NOTE:
Loosen each nut 1/2 of a turn at a time. After all of the nuts are fully loosened, remove them.



EAS00253
REMOVING THE CYLINDER AND PISTON

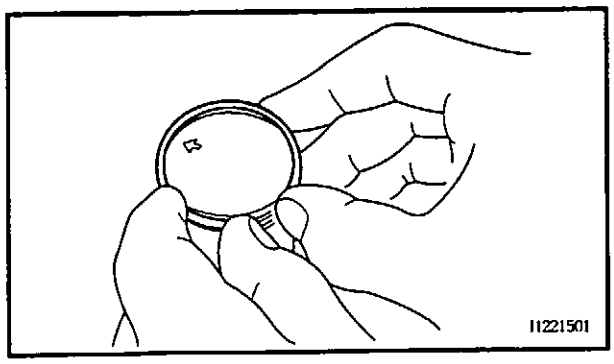
1. Remove:
   • piston pin clip ①
   • piston pin ②
   • piston ③

CAUTION:
Do not use a hammer to drive the piston pin out.



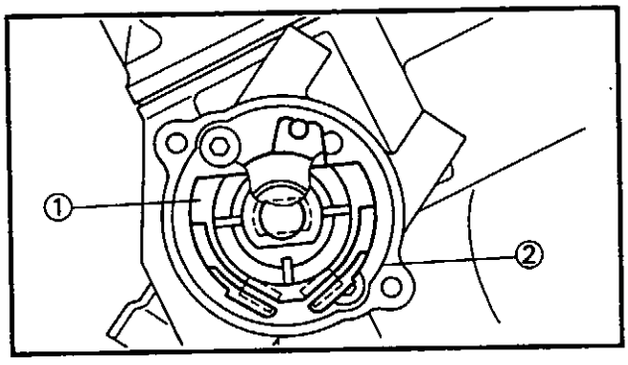
NOTE:
- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller ④.

	Piston pin puller set **90890-01304**



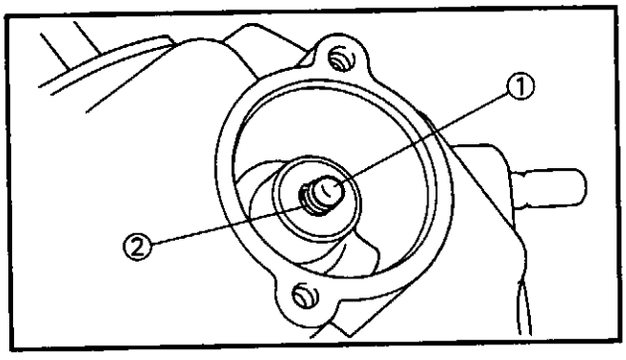
2. Remove:
   • top ring
   • 2nd ring

NOTE:
When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

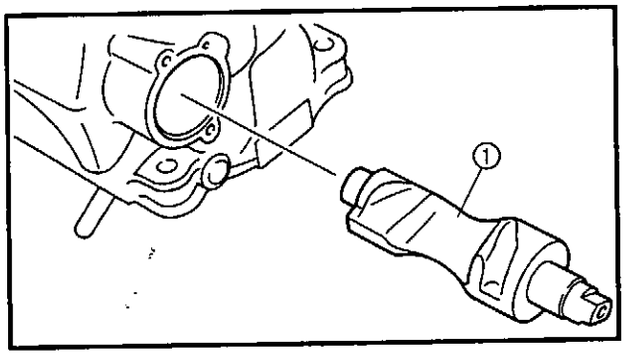


REMOVING THE YPVS VALVE

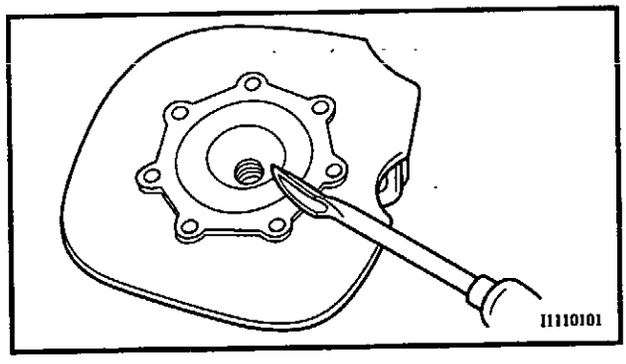
1. Remove:
   - YPVS pulley ①
   - YPVS pulley cover ②



2. Remove:
   - right YPVS valve cover
   - pin ①
   - spring ②



3. Remove:
   - YPVS valve ①

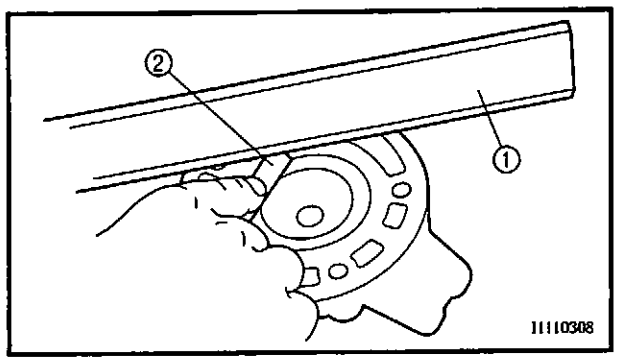


EAS00229
CHECKING THE CYLINDER HEAD

1. Eliminate:
   - combustion chamber carbon deposits (with a rounded scraper)

NOTE:
Do not use a sharp instrument to avoid damaging or scratching:
- spark plug bore threads

2. Check:
   - cylinder head
     Damage/scratches → Replace.
   - cylinder head water jacket
     Mineral deposits/rust → Eliminate.



3. Measure:
   • cylinder head warpage
   Out of specification → Resurface the cylinder head.

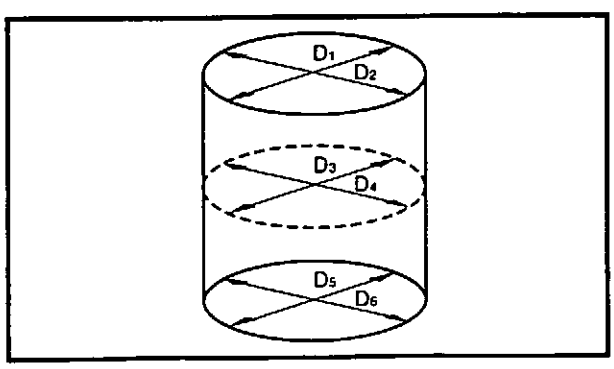
Maximum cylinder head warpage
0.03 mm

a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
b. Measure the warpage.
c. If the limit is exceeded, resurface the cylinder head as follows.
d. Place a 400 ~ 600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE:
To ensure an even surface, rotate the cylinder head several times.

EAS00255
CHECKING THE CYLINDER AND PISTON

1. Check:
   • piston wall
   • cylinder wall
   Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   • piston-to-cylinder clearance



a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE:
Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

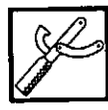
Cylinder bore gauge (50 ~ 100 mm)
90890-03017

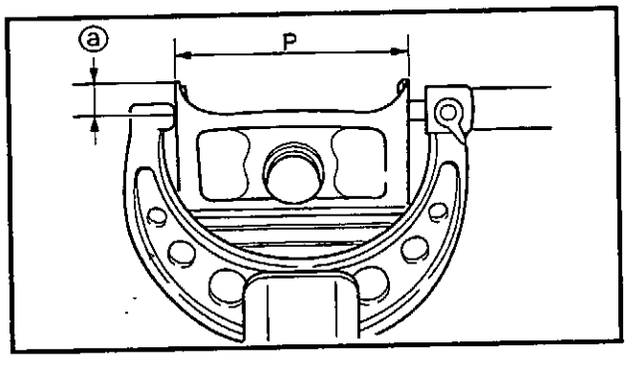
Cylinder bore "C"	66.800 ~ 66.818 mm
Maximum taper "T"	0.01 mm
Out-of-round "R"	0.025 mm

"C" = maximum of D_1 ~ D_6
"T" = maximum of D_1 or D_2 – maximum of D_5 or D_6
"R" = maximum of D_1, D_3 or D_5 – minimum of D_2, D_4 or D_6

b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

c. Measure piston skirt diameter "P" with the micrometer.

	Micrometer (50 ~ 75 mm) 90890-03008



ⓐ 10 mm from the bottom edge of the piston

	Piston size "P"
Standard	66.752 ~ 66.767 mm

d. If out of specification, replace the piston and piston rings as a set.

e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance = Cylinder bore "C" – Piston skirt diameter "P"

	Piston-to-cylinder clearance 0.045 ~ 0.050 mm Limit: 0.10 mm

f. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

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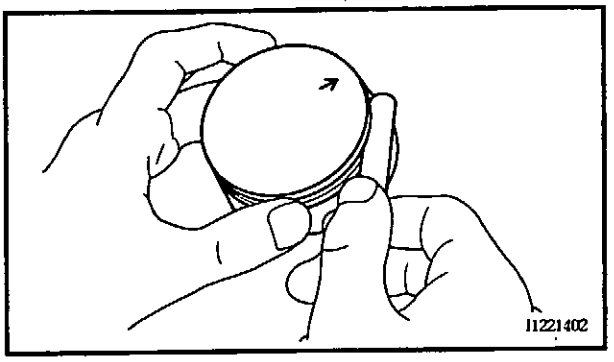
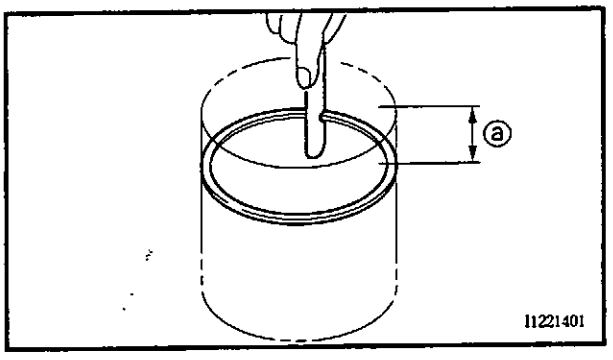


CHECKING THE PISTON RINGS

1. Measure:
   - piston ring side clearance
     Out of specification → Replace the piston and piston rings as a set.

NOTE:
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Piston ring side clearance
Top ring
0.02 ~ 0.06 mm
Limit: 0.1 mm
2nd ring
0.030 ~ 0.065 mm
Limit: 0.1 mm



2. Install:
   - piston ring
     (into the cylinder)

NOTE:
Level the piston ring in the cylinder with the piston crown.

ⓐ 10 mm

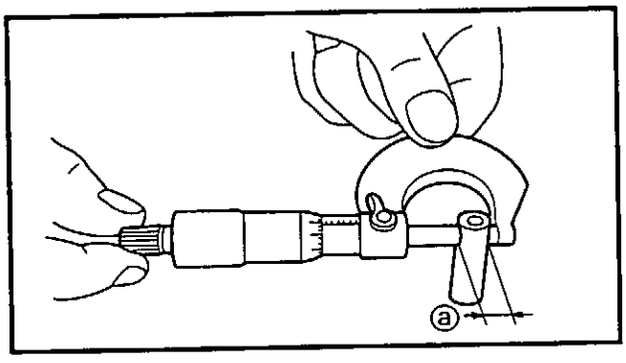
3. Measure:
   - piston ring end gap
     Out of specification → Replace the piston ring.

NOTE:
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring end gap
Top ring
0.3 ~ 0.5 mm
Limit: 0.7 mm
2nd ring
0.3 ~ 0.5 mm
Limit: 0.7 mm

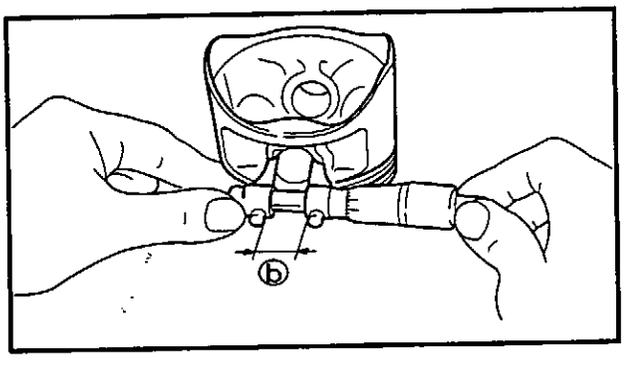
EAS00265
CHECKING THE PISTON PIN

1. Check:
   - piston pin
     Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.



2. Measure:
   - piston pin outside diameter ⓐ
     Out of specification → Replace the piston pin.

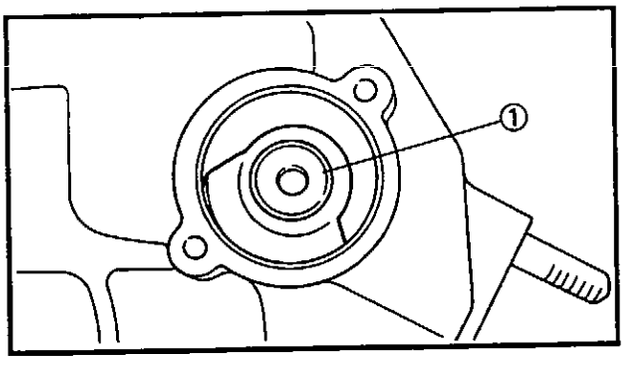
Piston pin outside diameter
15.995 ~ 16.000 mm
Limit: 15.975 mm



3. Calculate:
   - piston-pin-to-piston-pin-bore clearance
     Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston-pin-bore clearance =
Piston pin bore diameter ⓑ −
Piston pin outside diameter ⓐ

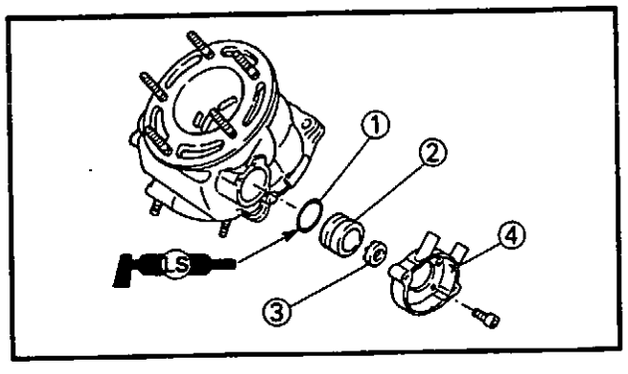
Piston-pin-to-piston-pin-bore clearance
0.009 ~ 0.015 mm
Limit: 0.065 mm



INSTALLING THE YPVS VALVE

1. Install:
   - YPVS valve ①

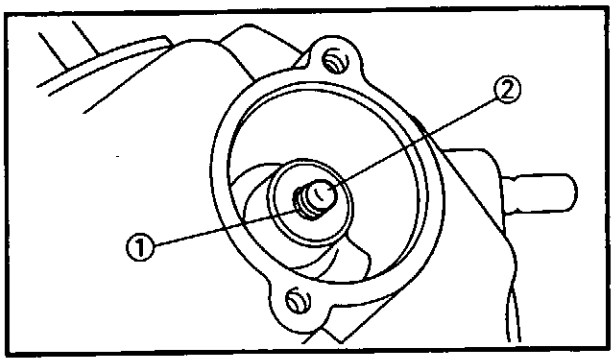
NOTE:
When installing the YPVS valve from the right side of the cylinder position it as shown.



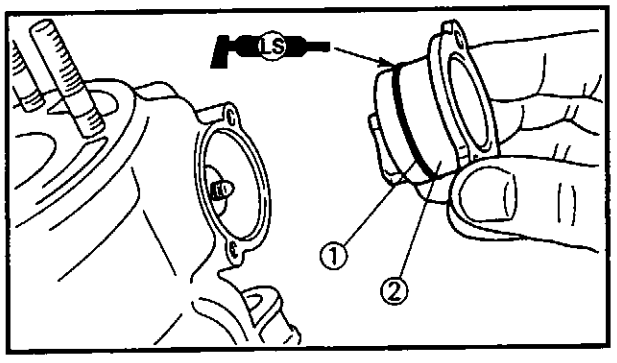
2. Install:
   - O-ring ①
   - holder ②
   - oil seal ③ New
   - YPVS pulley cover ④

7 Nm (0.7 m · kg)

Recommended lubricant
Lithium soap base grease



3. Install:
   - spring ①
   - pin ②



4. Install:
   - O-ring ①
   - right YPVS valve cover ②

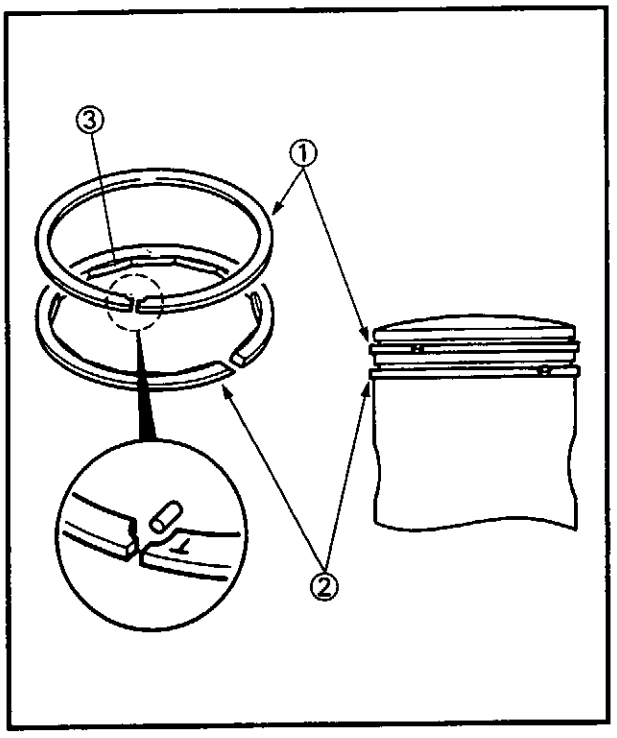
	7 Nm (0.7 m · kg)

NOTE:

Do not drop the spring and pin into the cylinder.

	Recommended lubricant **Lithium soap base grease**

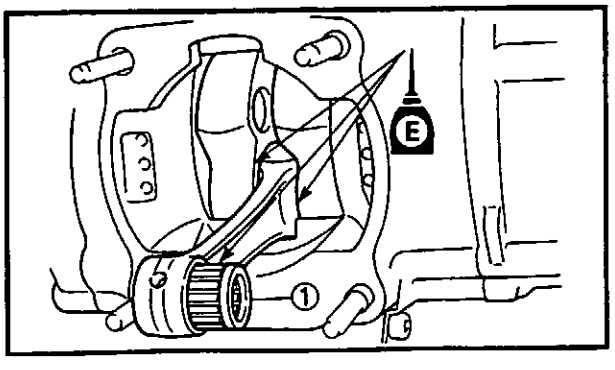
EAS00267
INSTALLING THE PISTON AND CYLINDER



1. Install:
   - top ring ①
   - 2nd ring ②
   - expander ③

NOTE:

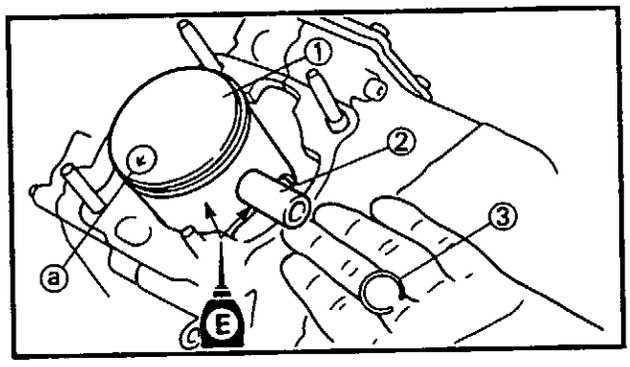
- Be sure to install the piston rings so that the manufacturer's marks or numbers face up.
- Algin the piston ring end with the knock pin.

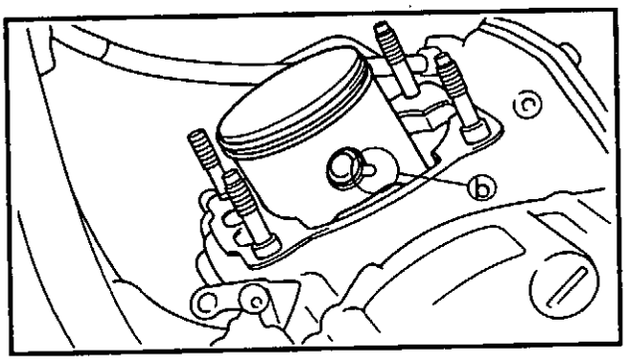


2. Install:
   - small end bearing ①
3. Lubricate:
   - small end bearing
   - big end bearing

   (with the recommended lubricant)

	Recommended lubricant **Engine oil**





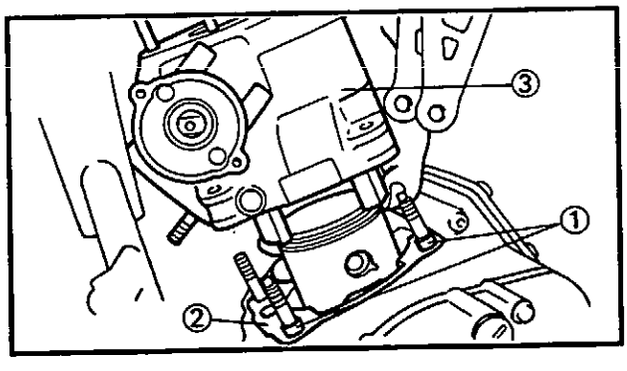
4. Install:
   - piston ①
   - piston pin ②
   - piston pin clip ③ New

NOTE:
- Lubricate the piston pin with engine oil.
- Make sure the arrow mark ⓐ on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.
- Make sure the clip gap does not align with the piston pin slot ⓑ.

5. Lubricate:
   - piston
   - piston rings
   - cylinder

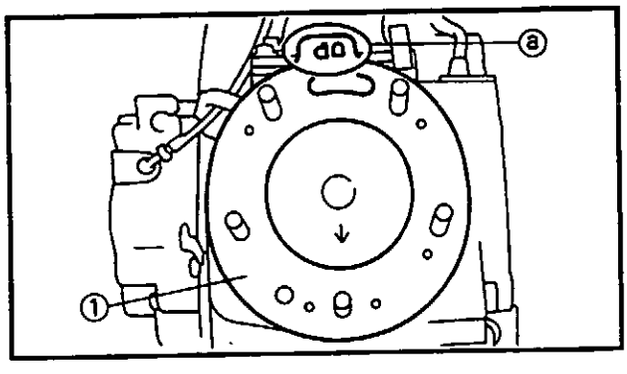
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**



6. Install:
   - dowel pins ①
   - gasket ② New
   - cylinder ③

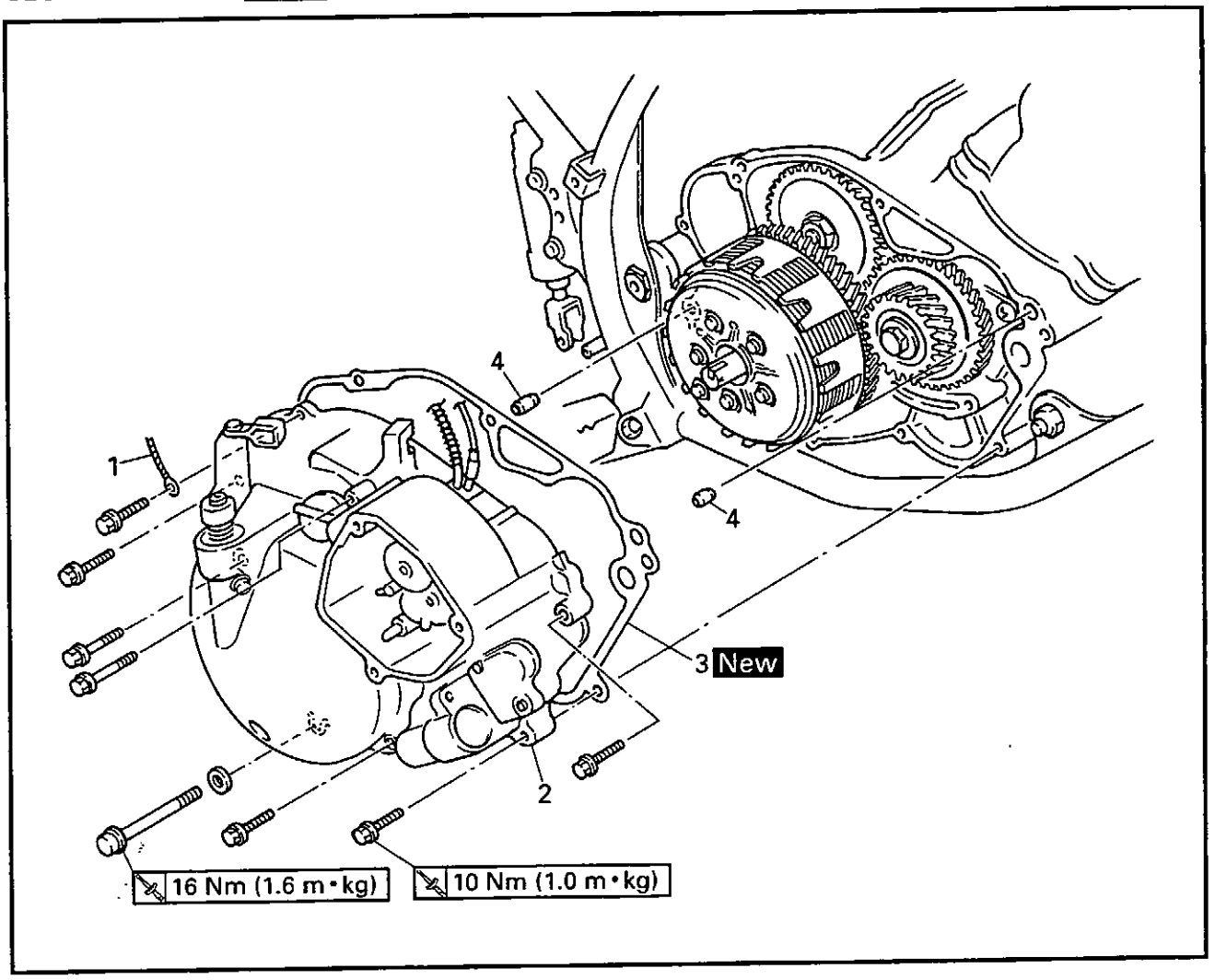
NOTE:
- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.



7. Install:
   - cylinder head gasket ① New

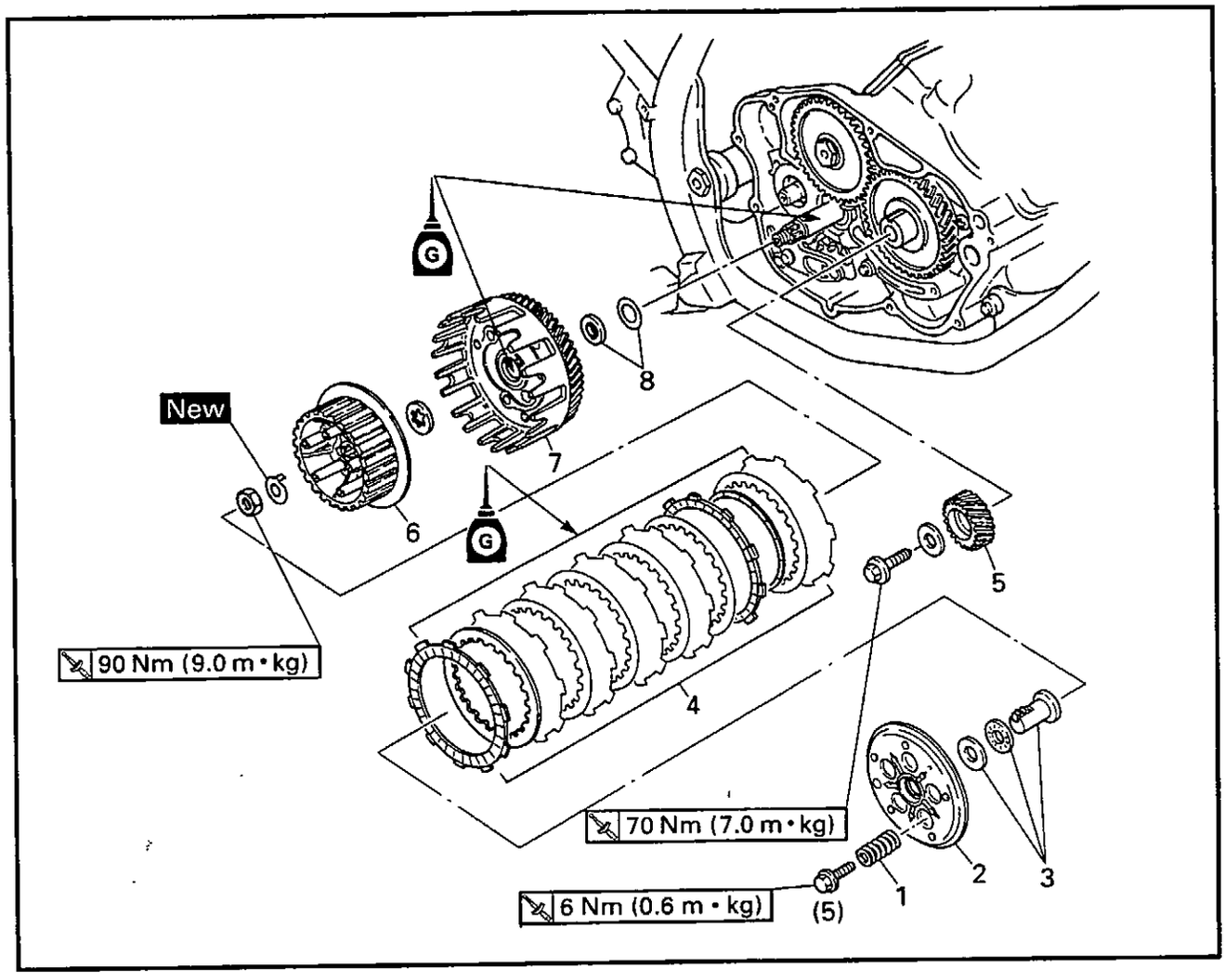
NOTE:
Install the "UP" mark ⓐ on the cylinder head gasket facing up.

EAS00273
CLUTCH
CLUTCH COVER



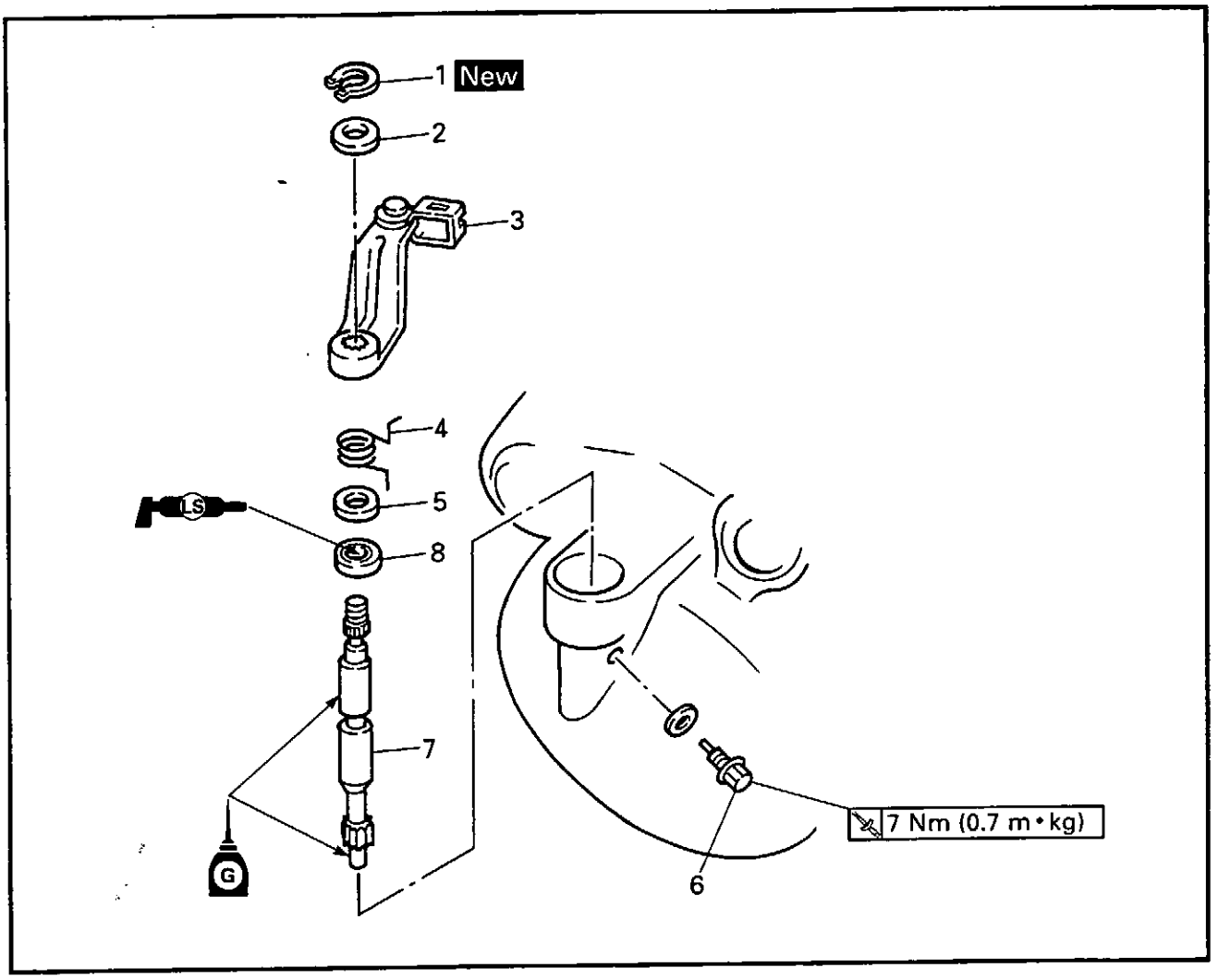
Order	Job/Part	Q'ty	Remarks
	Removing the clutch cover		Remove the parts in the order listed.
	Transmission oil		Refer to "CHANGING THE TRANSMISSION OIL" in chapter 3.
	Coolant		Refer to "CHANGING THE COOLANT" in chapter 3.
	Oil pump cover, oil pump cable, spring, brake pedal and clutch cable		Refer to "ENGINE".
1	Ground lead	1	Disconnect.
2	Clutch cover	1	
3	Clutch cover gasket	1	
4	Dowel pin	2	
			For installation, reverse the removal procedure.

EAS00274
CLUTCH

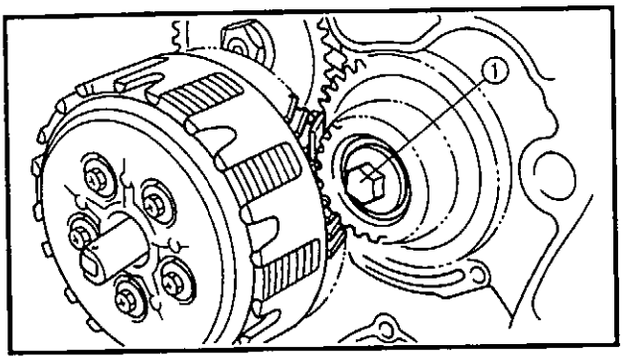


Order	Job/Part	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
1	Clutch spring	5	
2	Pressure plate	1	
3	Pull rod assembly	1	
4	Friction plate/clutch plate	7/6	
5	Primary drive gear	1	
6	Clutch boss	1	
7	Clutch housing	1	
8	Washer/conical washer	1/1	
			For installation, reverse the removal procedure.

PULL LEVER



Order	Job/Part	Q'ty	Remarks
	Removing the pull lever		Remove the parts in the order listed.
1	Circlip	1	
2	Washer	1	
3	Pull lever	1	
4	Spring	1	
5	Washer	1	
6	Bolt	1	
7	Pull lever shaft	1	
8	Oil seal	1	
			For installation, reverse the removal procedure.

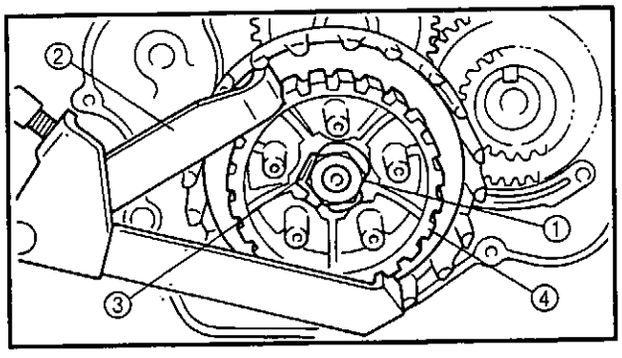


EAS00278
REMOVING THE CLUTCH AND PRIMARY DRIVE GEAR

1. Loosen:
   - primary drive gear bolt ①

NOTE:
- Place a folded copper washer between the teeth of the primary drive gear and primary driven gear in order to lock them.
- Do not damage the primary drive and primary driven gear's teeth.

2. Straighten the lock washer tab.



3. Loosen:
   - clutch boss nut ①
   - lock washer ③
   - clutch boss ④

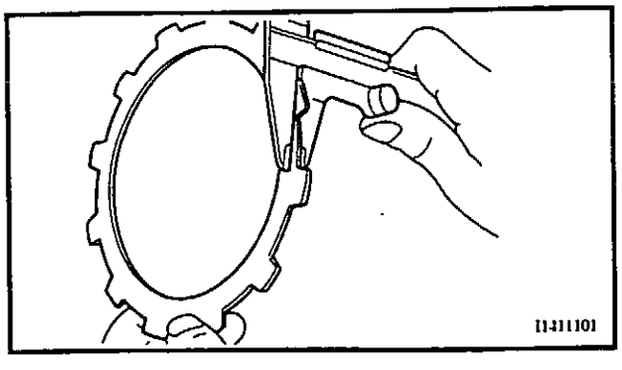
NOTE:
While holding the clutch boss with the clutch holding tool ②, loosen the clutch boss nut.

	Clutch holding tool **90890-04086**

EAS00280
CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:
   - friction plate
     Damage/wear → Replace the friction plates as a set.



2. Measure:
   - friction plate thickness
     Out of specification → Replace the friction plates as a set.

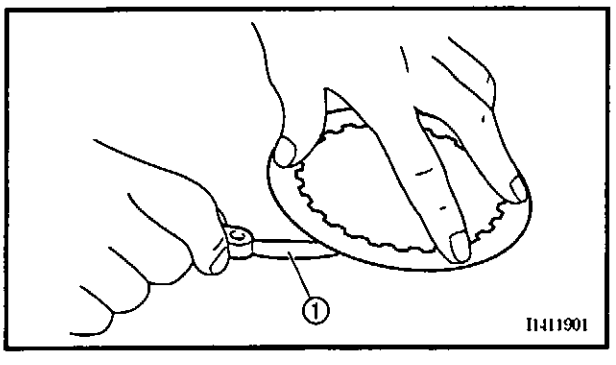
NOTE:
Measure the friction plate at four places.

	Friction plate thickness **2.9 ~ 3.1 mm** **Limit: 2.7 mm**

EAS00281
CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:
   - clutch plate
     Damage → Replace the clutch plates as a set.



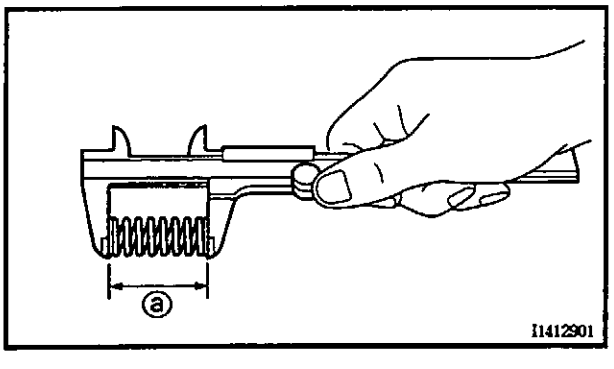
2. Measure:
   - clutch plate warpage
     (with a surface plate and thickness gauge ①)
     Out of specification → Replace the clutch plates as a set.

Maximum clutch plate warpage
0.05 mm

EAS00282
CHECKING THE CLUTCH SPRINGS

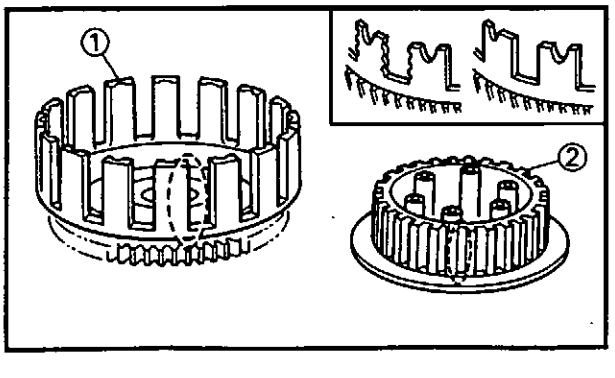
The following procedure applies to all of the clutch springs.

1. Check:
   - clutch spring
     Damage → Replace the clutch springs as a set.



2. Measure:
   - clutch spring free length ⓐ
     Out of specification → Replace the clutch springs as a set.

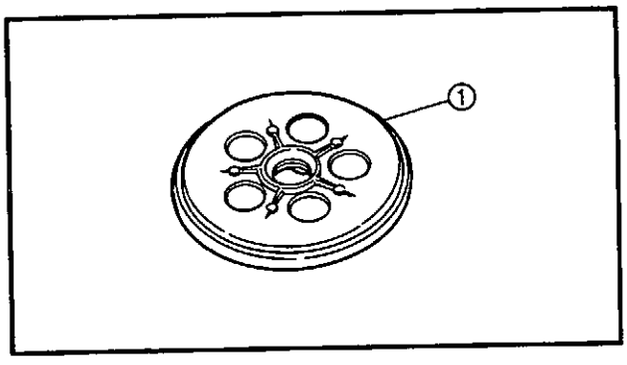
Clutch spring free length
33 mm
Limit: 31 mm

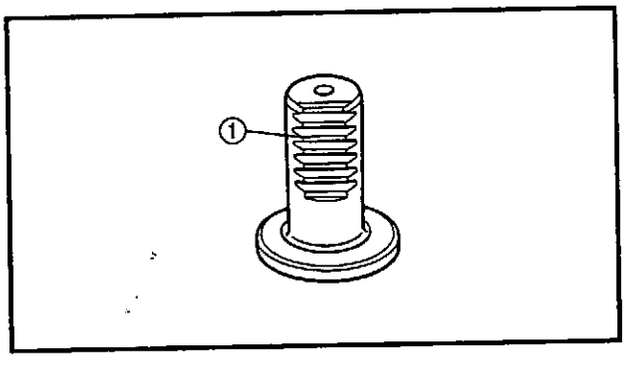


CHECKING THE CLUTCH HOUSING AND CLUTCH BOSS

1. Check:
   - clutch housing dogs ①
     Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.
   - clutch boss splines ②
     Damage/pitting/wear → Replace the clutch boss.

NOTE:
Pitting on the clutch housing dogs or clutch boss splines will cause erratic clutch operation.





EAS00286
CHECKING THE PRESSURE PLATE

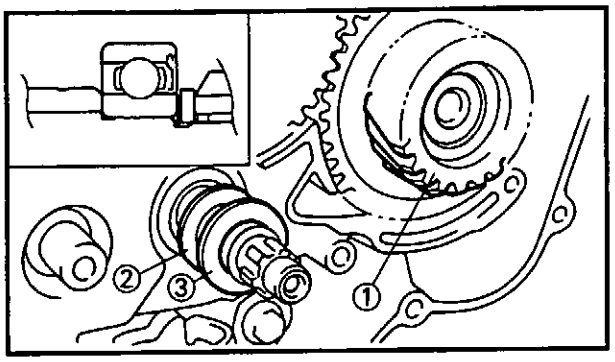
1. Check:
   - pressure plate ①
     Cracks/damage → Replace.
   - bearing
     Damage/wear → Replace.

EAS00287
CHECKING THE PULL LEVER SHAFT AND PULL ROD

1. Check:
   - pull lever shaft pinion gear teeth
   - pull rod teeth ①
     Damage/wear → Replace the pull lever shaft and pull rod as a set.
2. Check:
   - pull rod bearing
     Damage/wear → Replace.

EAS00292
CHECKING THE PRIMARY DRIVE

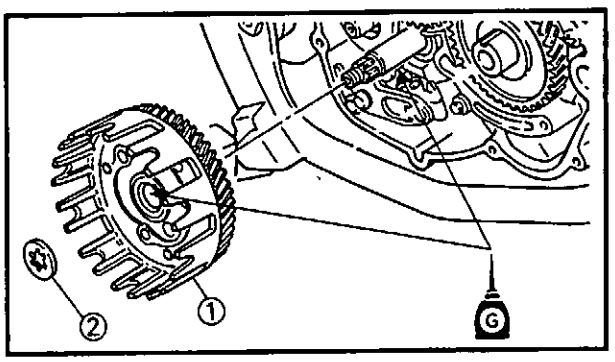
1. Check:
   - primary drive gear
   - primary driven gear
     Damage/wear → Replace the primary drive and primary driven gears as a set.
     Excessive noise during operation → Replace the primary drive and primary driven gears as a set.
2. Check:
   - primary-drive-gear-to-primary-driven-gear free play
     Free play exists → Replace the primary drive and primary driven gears as a set.



INSTALLING THE CLUTCH

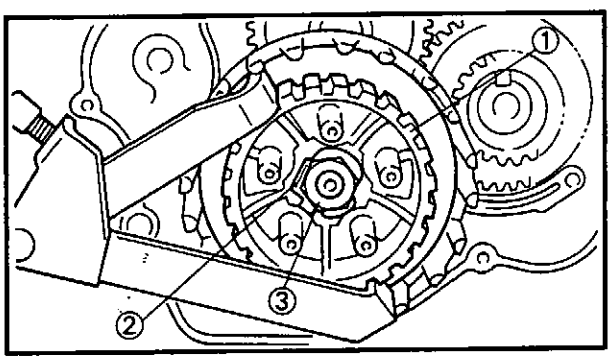
1. Install:
   - primary drive gear ①
   - conical washer ②
   - washer ③

NOTE:
Install the conical washer as shown.

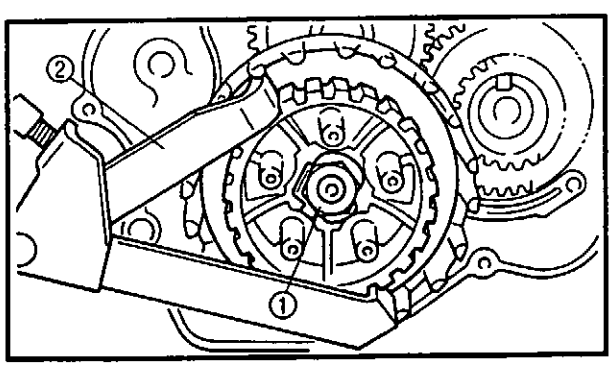


2. Install:
   - clutch housing ①
   - thrust washer ②

	Recommended lubricant **Gear oil**



3. Install:
   - clutch boss ①
   - lock washer ② New
   - clutch boss nut ③



4. Tighten:
   - clutch boss nut ①

	90 Nm (9.0 m · kg)

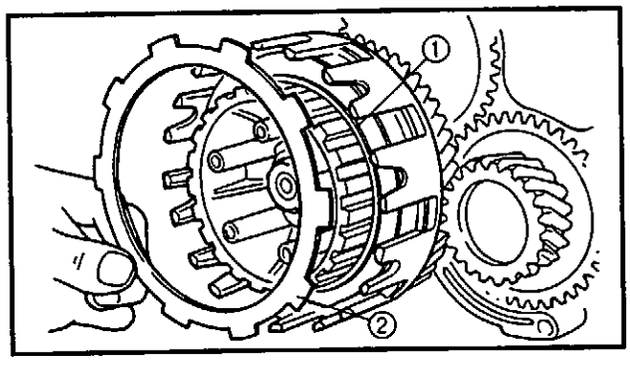
NOTE:
While holding the clutch boss with the clutch holding tool ②, tighten the clutch boss nut.

	Clutch holding tool **90890-04086**

5. Bend the lock washer tab along a flat side of the nut.
6. Lubricate:
   - friction plates
   - clutch plates

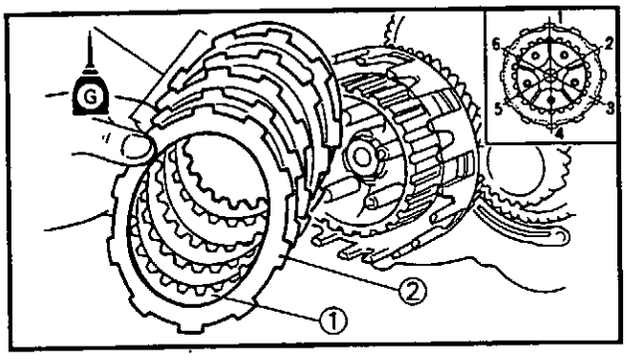
   (with the recommended lubricant)

	Recommended lubricant **Gear oil**



7. Install:
   - friction plate
   - clutch plate
   - cushion ring ①
   - friction plate (large diameter) ②

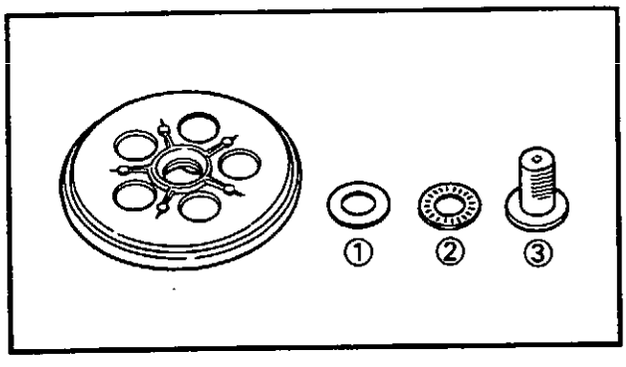
NOTE:
Before installing the cushion ring, install the friction plate and clutch plate and then install the large diameter friction plate.



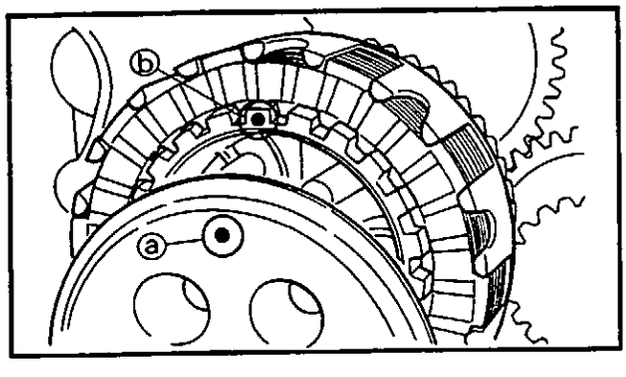
8. Install:
   - clutch plates ①
   - friction plates ②

NOTE:
Alternate between clutch plates and friction plates so that the plates are equal, as shown.

	Recommended lubricant **Gear oil**

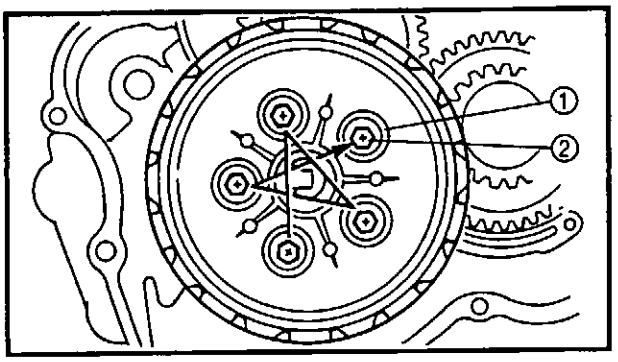


9. Install:
   - washer ①
   - bearing ②
   - pull rod ③



10. Install:
   - pressure plate

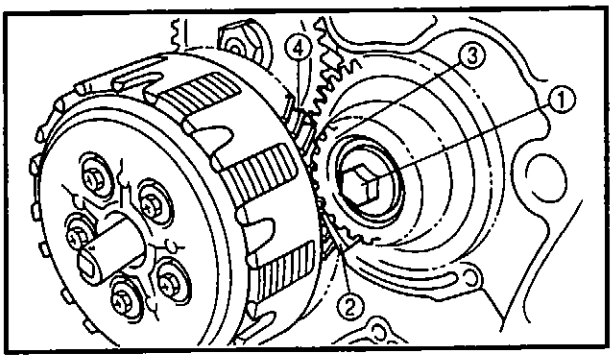
NOTE:
Align the punch mark ⓐ in the pressure plate with the punch mark ⓑ in the clutch boss.



11.Install:
- clutch springs ①
- clutch spring bolts ②

6 Nm (0.6 m · kg)

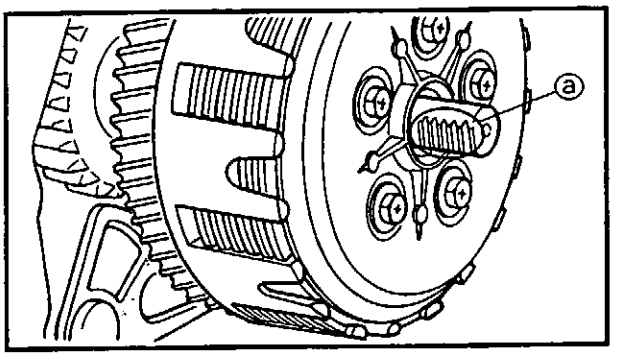
NOTE:
Tighten the clutch spring bolts in stages and in a crisscross pattern.



12.Install:
- bolt ①

70 Nm (7.0 m · kg)

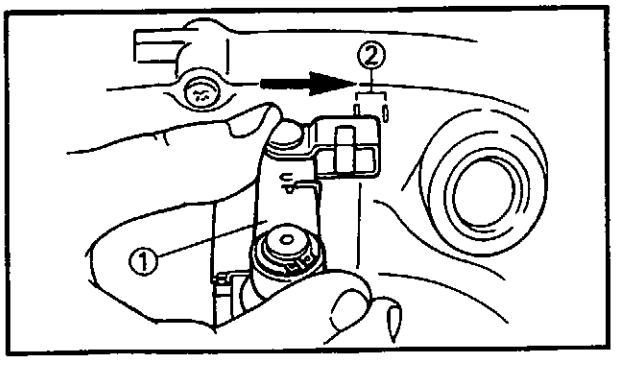
NOTE:
- Place a folded copper washer ② between the teeth of the primary drive gear ③ and primary driven gear ④ in order to lock them.
- Do not damage the primary drive and primary driven gear's teeth.



13.Install:
- dowel pins
- gasket New
- clutch cover
- clutch cover bolt

10 Nm (1.0 m · kg)

NOTE:
- Install the pull rod so that the teeth ⓐ face towards the rear of the motorcycle. Then, install the clutch cover.
- Make sure to align the oil pump driven gear and water pump driven gear teeth.
- Tighten the clutch cover bolts in stages and in a crisscross pattern.



14.Check:
- pull lever position
  Not aligned → Adjust.

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a. Push the pull lever ① to the arrow direction.

b. Check if the pull lever end is aligned with the match mark ② on the clutch cover.

c. If not aligned reinstall.

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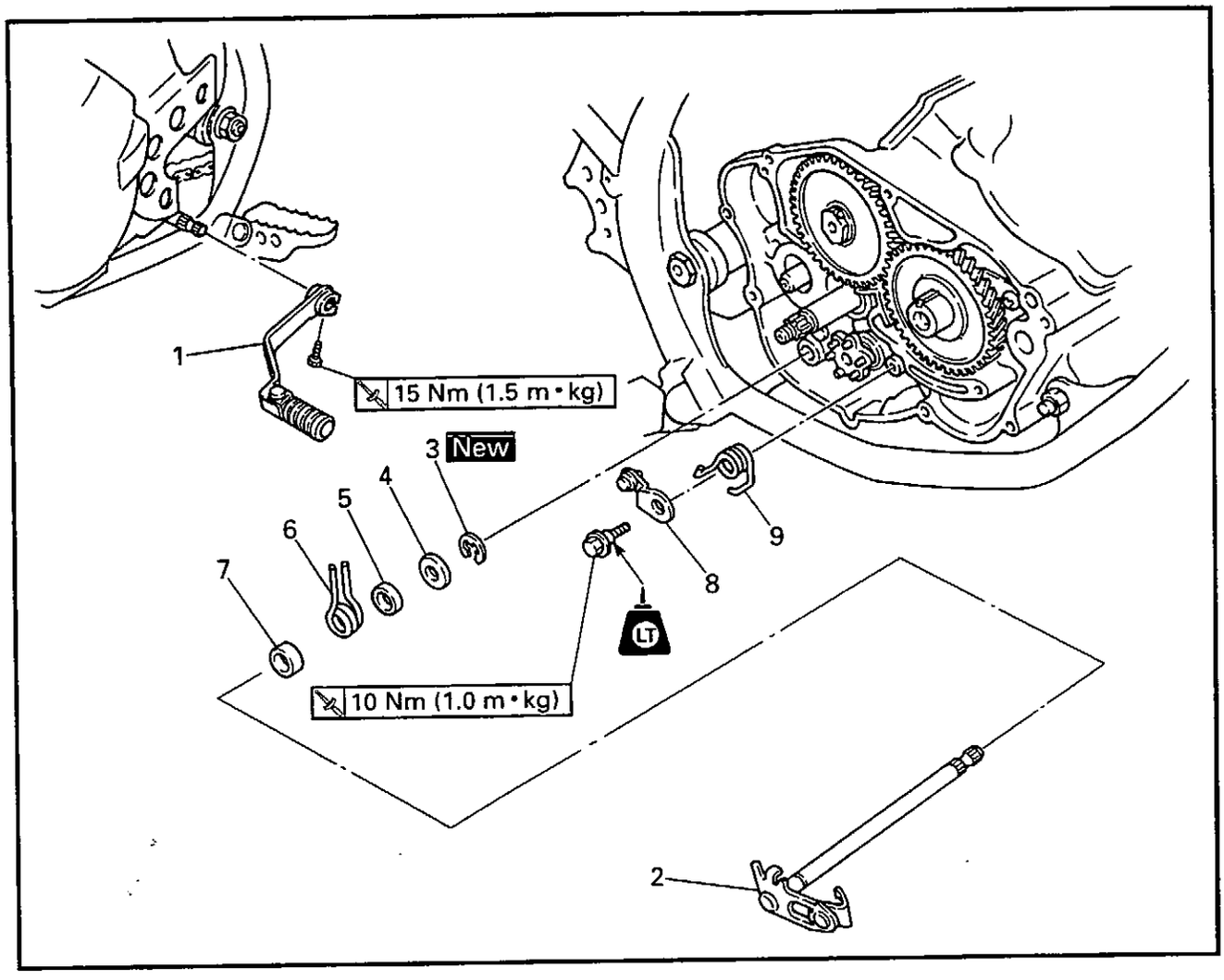
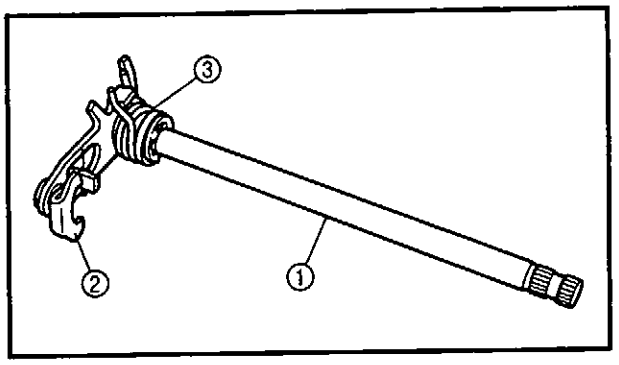
SHIFT SHAFT

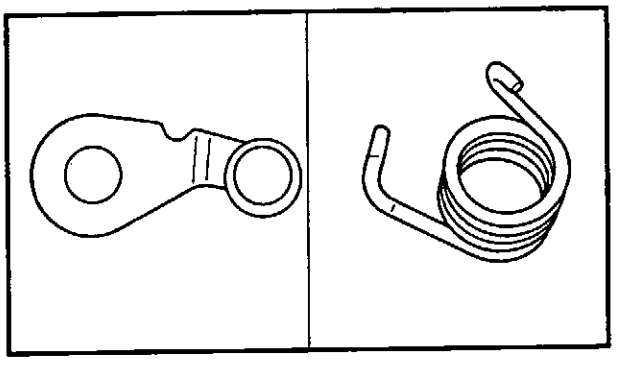


Order	Job/Part	Q'ty	Remarks
	Removing the shift shaft		Remove the parts in the order listed.
	Clutch		Refer to "CLUTCH".
1	Shift pedal	1	
2	Shift shaft	1	
3	Circlip	1	
4	Washer	1	
5	Spacer	1	
6	Shift shaft spring	1	
7	Spacer	1	
8	Stopper lever	1	
9	Stopper lever spring	1	
			For installation, reverse the removal procedure.



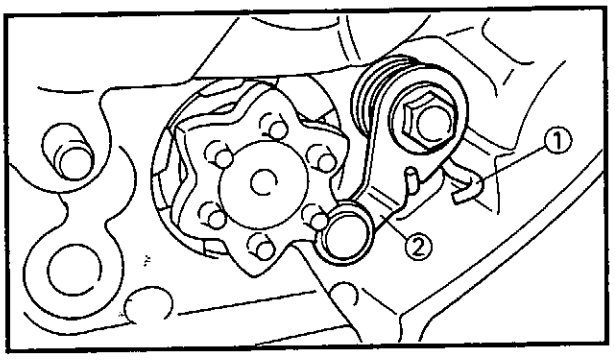
EAS00328
CHECKING THE SHIFT SHAFT

1. Check:
   - shift shaft ①
   - shift lever ②
     Bends/damage/wear → Replace.
   - shift shaft spring ③
     Damage/wear → Replace.



EAS00330
CHECKING THE STOPPER LEVER

1. Check:
   - stopper lever
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.
   - stopper lever spring
     Damage/wear → Replace.



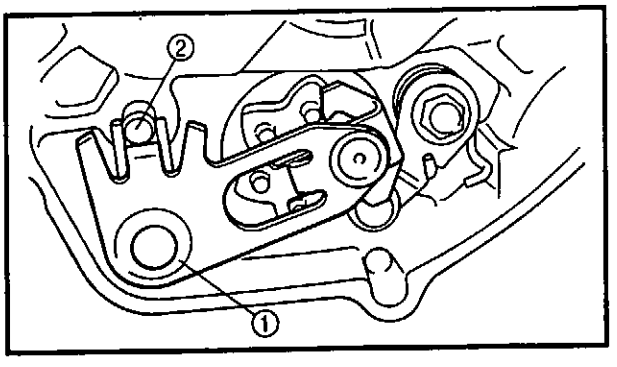
EAS00331
INSTALLING THE SHIFT SHAFT

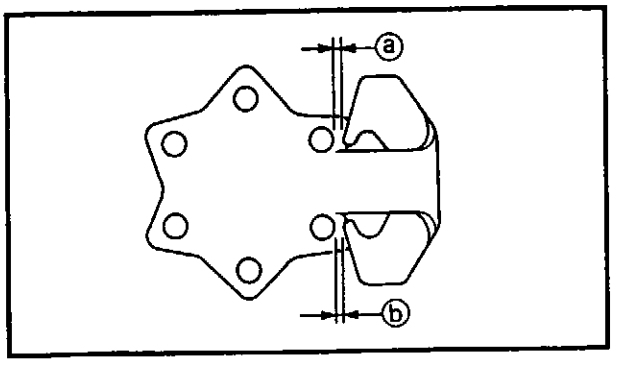
1. Install:
   - stopper lever spring ①
   - stopper lever ② | 10 Nm (1.0 m · kg)

NOTE:
- Install the ends of the stopper lever spring onto the stopper lever and the crankcase.
- Mesh the stopper lever with the shift drum segment assembly.

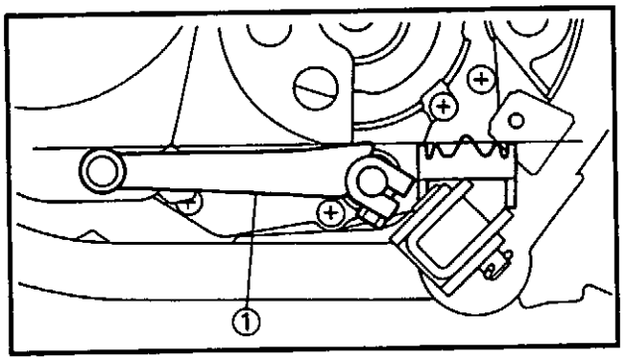
2. Install:
   - shift shaft ①

NOTE:
- Lubricate the oil seal lips with lithium soap base grease.
- Install the end of the shift shaft spring onto the shift shaft spring stopper ②.





3. Check:
   - shift lever position
     Gaps ⓐ and ⓑ are not equal → Replace the defective parts.



INSTALLING THE SHIFT PEDAL

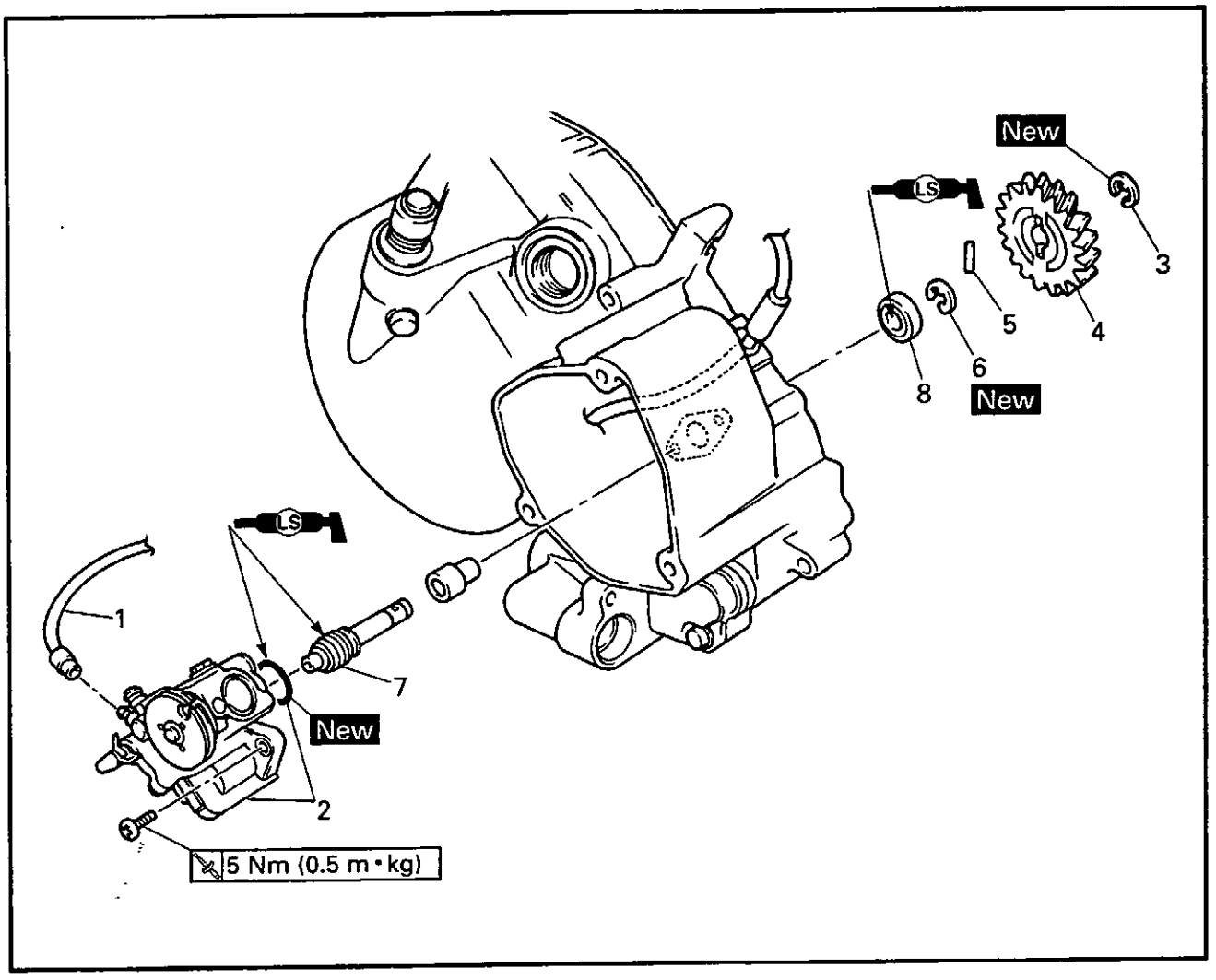
1. Install:
   - shift pedal ①

15 Nm (1.5 m · kg)

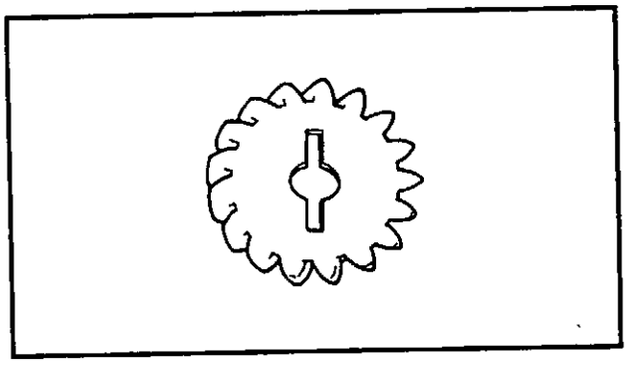
NOTE:

Install the shift pedal so that it is horizontal to the footrest.

OIL PUMP AND OIL PUMP DRIVE GEAR

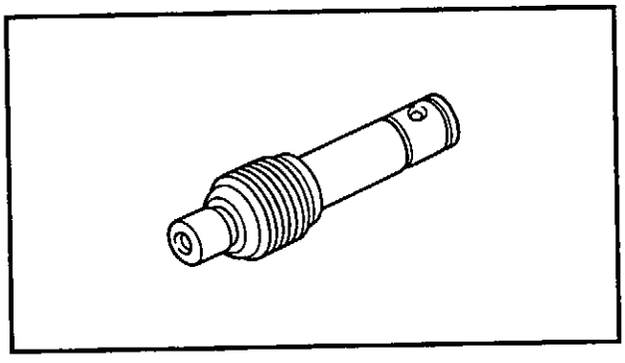


Order	Job/Part	Q'ty	Remarks
	Removing the oil pump and oil pump drive gear		Remove the parts in the order listed.
	Clutch cover		Refer to "CLUTCH".
1	Oil hose	1	Plug the oil hose to prevent the engine oil from flowing out.
2	Oil pump/O-ring	1/1	
3	Circlip	1	
4	Oil pump drive gear	1	
5	Pin	1	
6	Circlip	1	
7	Worm shaft	1	
8	Oil seal	1	
			For installation, reverse the removal procedure.



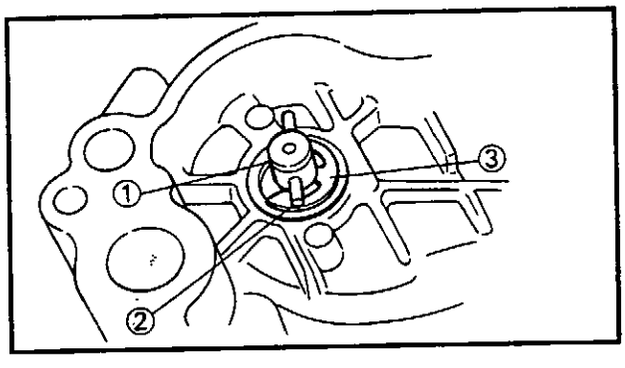
CHECKING THE OIL PUMP DRIVE GEAR

1. Check:
   - oil pump drive gear
     Cracks/damage/wear → Replace.



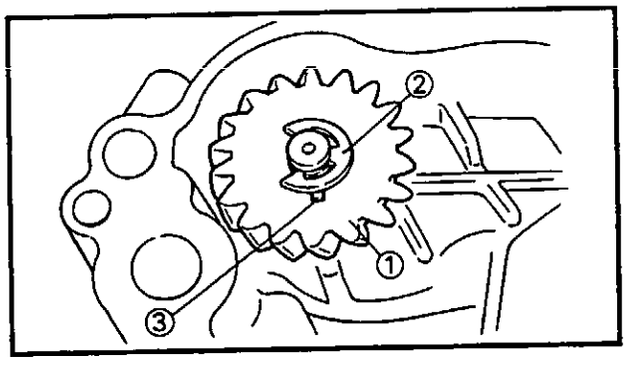
EAS00330
CHECKING THE WORM SHAFT

1. Check:
   - worm shaft
     Damage/wear → Replace.



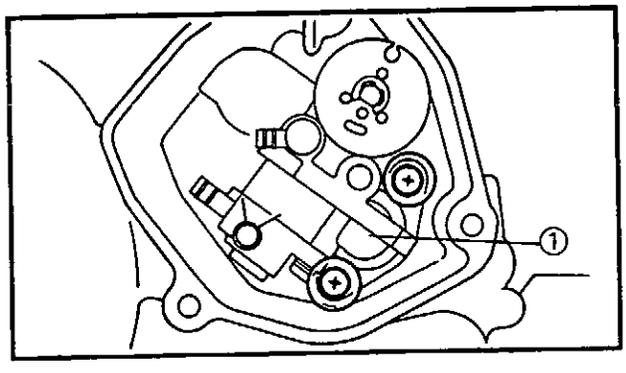
EAS00331
INSTALLING THE OIL PUMP

1. Install:
   - worm shaft ①
   - pin ②
   - circlip ③ New



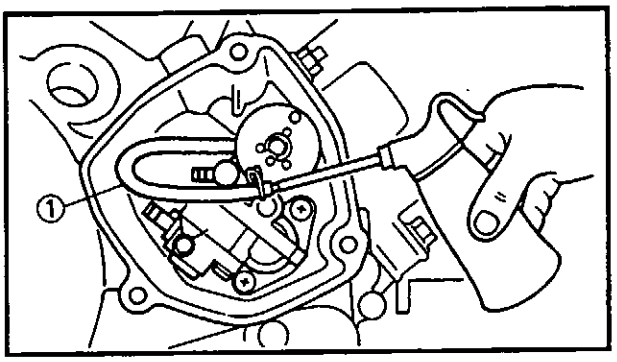
2. Install:
   - oil pump drive gear ①
   - circlip ② New

NOTE:
Align the gloove on the oil pump drive gear with the pin ③.



3. Install:
   - O-ring New
   - oil pump ①

5 Nm (0.5 m · kg)

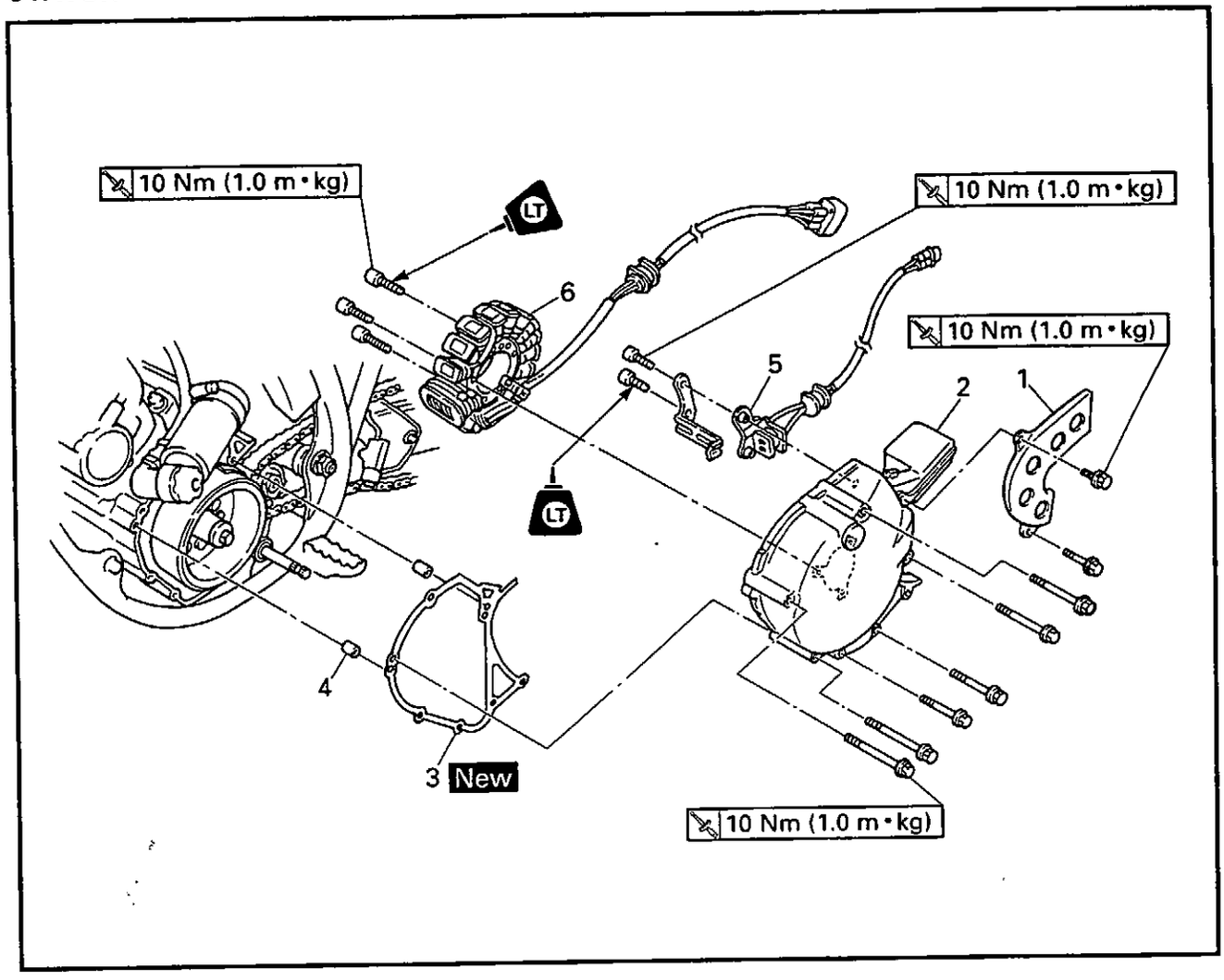


4. Apply:
   • engine oil
   (to oil delivery hose ①)

CAUTION:

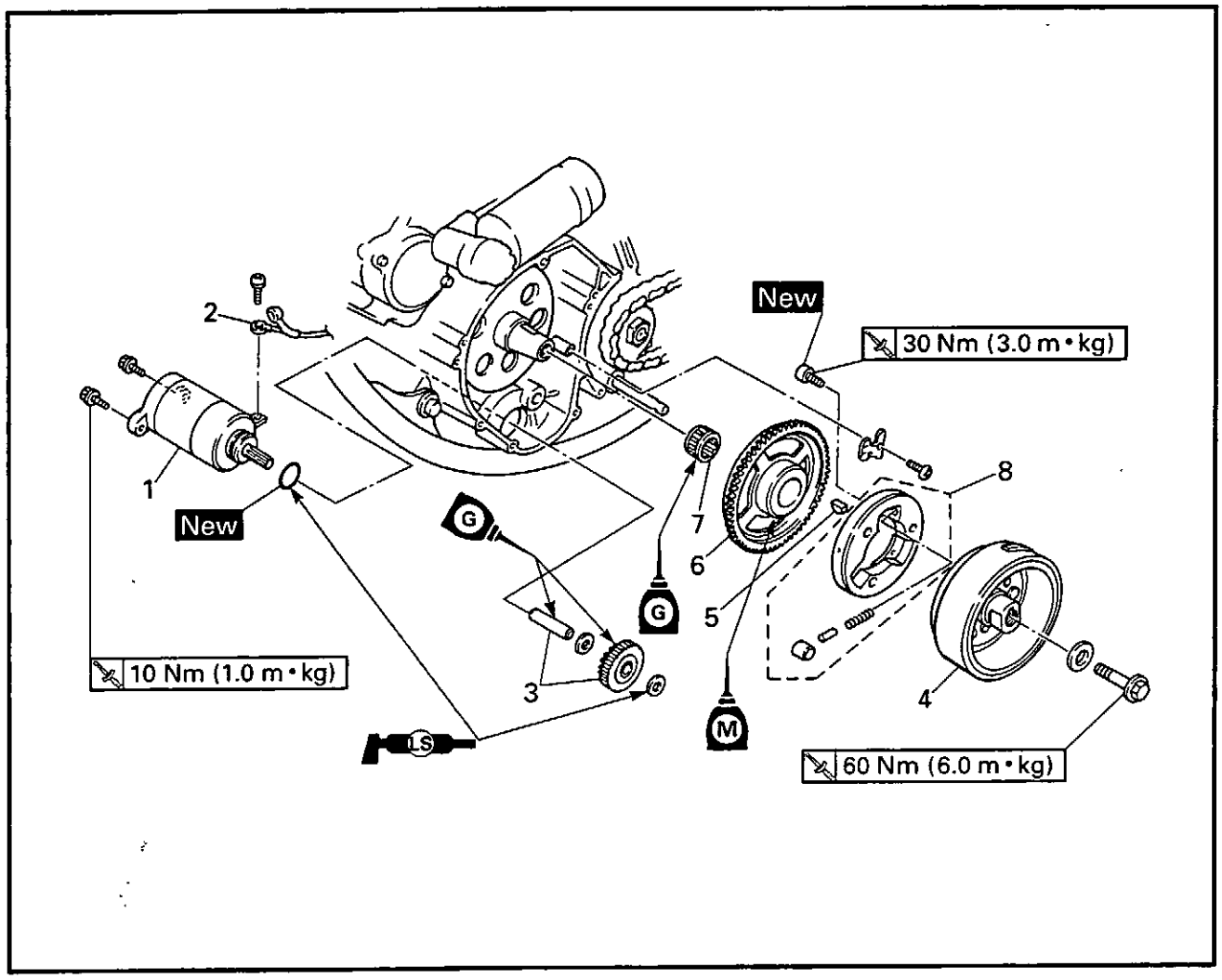
After bleeding the air from the oil delivery hose, bleed the air from the oil pump.

EAS00341
STARTER CLUTCH AND CDI MAGNETO
STATOR

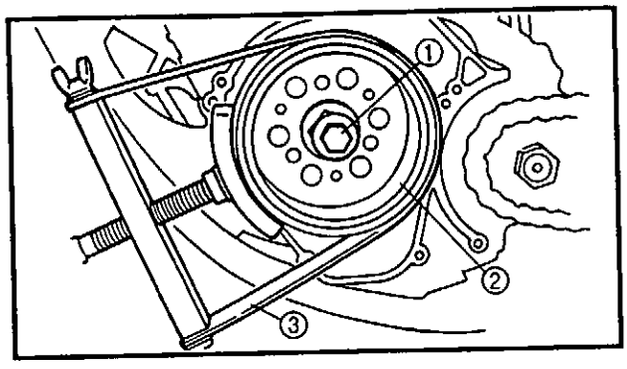


Order	Job/Part	Q'ty	Remarks
	Removing the stator		Remove the parts in the order listed.
	Side cover, seat and fuel tank		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
	CDI magneto lead couplers		Refer to "ENGINE".
1	Drive sprocket cover	1	
2	Generator cover	1	
3	Gasket	1	
4	Dowel pin	2	
5	Pickup coil	1	
6	Stator	1	
			For installation, reverse the removal procedure.

ROTOR AND STARTER CLUTCH



Order	Job/Part	Q'ty	Remarks
	Removing the rotor and starter clutch		Remove the parts in the order listed.
1	Starter motor	1	
2	Starter motor lead	1	Disconnect.
3	Starter idle gear/idle gear shaft	1/1	
4	Rotor	1	
5	Woodruff key	1	
6	Starter clutch gear	1	
7	Bearing	1	
8	Starter clutch assembly	1	
			For installation, reverse the removal procedure.



EAS00346
REMOVING THE ROTOR

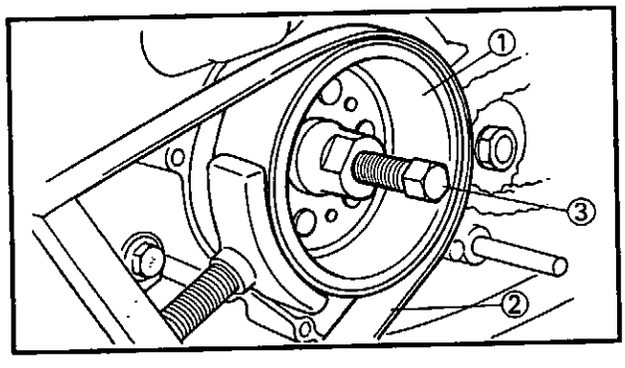
1. Remove:
   - rotor bolt ①
   - washer

NOTE:
- While holding the rotor ② with the sheave holder ③, loosen the rotor bolt.
- Do not allow the sheave holder to touch the projection on the rotor.

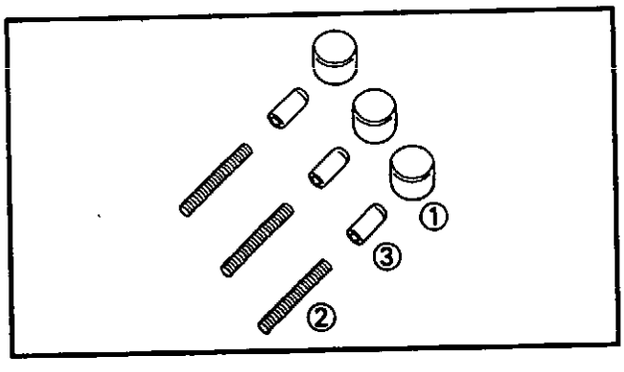
	Sheave holder **90890-01701**

2. Remove:
   - rotor ①

NOTE:
- While holding the rotor with the sheave holder ②, remove the rotor with the flywheel puller ③.
- Do not allow the sheave holder to touch the projection on the rotor.



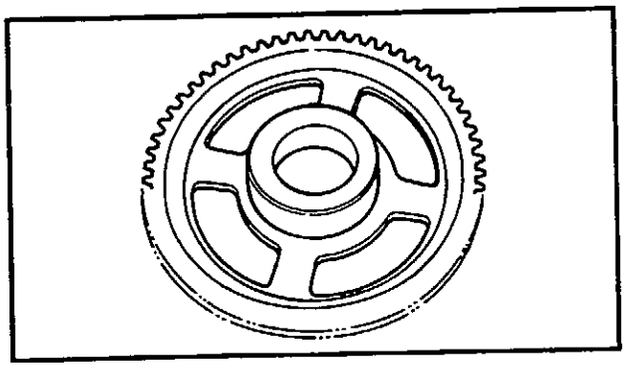
	Sheave holder **90890-01701** **Flywheel puller** **90890-01080**



CHECKING THE STARTER CLUTCH

1. Check:
   - starter clutch rollers ①
   - spring ②
   - spring cap ③

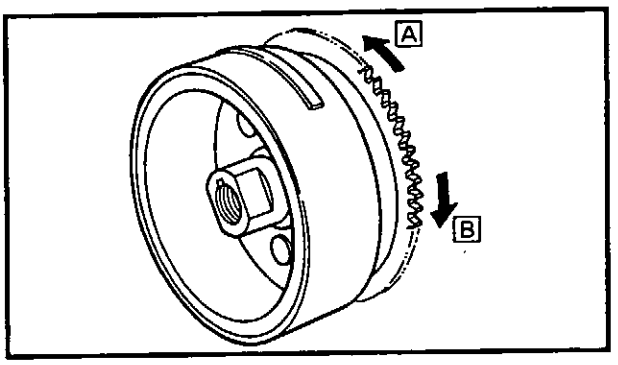
   Damage/wear → Replace.



2. Check:
   - starter clutch gear

   Chips/pitting/roughness/wear → Replace the defective part(-s).
3. Check:
   - starter clutch gear's contacting surfaces

   Damage/pitting/wear → Replace the starter clutch gear.



4. Check:
   • starter clutch operation

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a. Install the starter clutch gear onto the starter clutch and hold the starter clutch.

b. When turning the starter clutch drive gear clockwise [A], the starter clutch and the starter clutch gear should engage, otherwise the starter clutch is faulty and must be replaced.

c. When turning the starter clutch gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.

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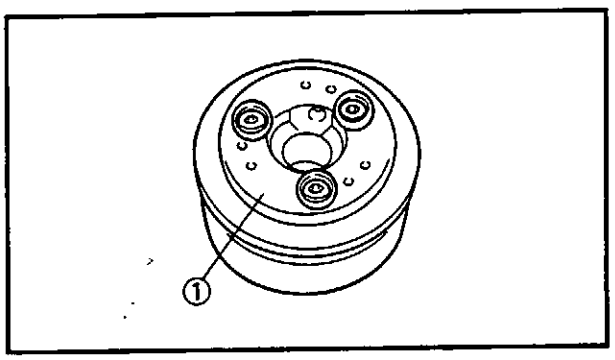
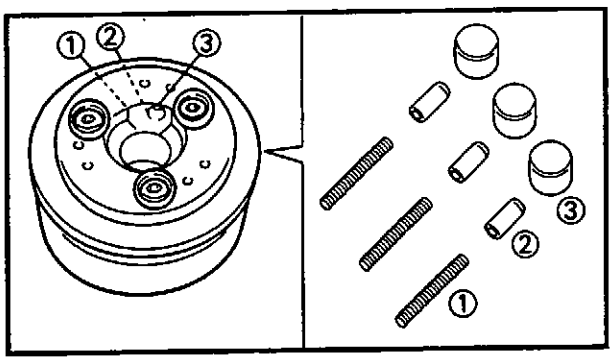


INSTALLING THE STARTER CLUTCH

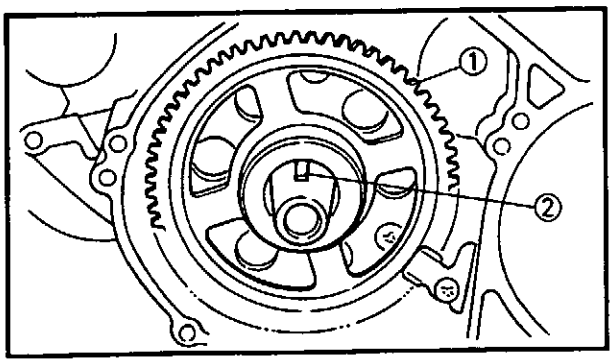
1. Install:
   • starter clutch ①
   • starter clutch bolt New

	30 Nm (3.0 m · kg)

NOTE:
Stake the bolt head with punch to prevent loosen it.



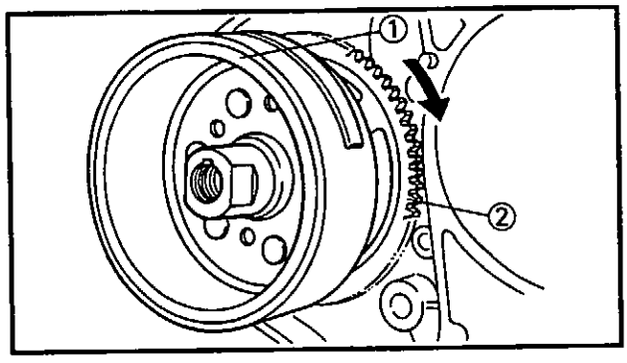
2. Install:
   • springs ①
   • spring caps ②
   • starter clutch rollers ③



INSTALLING THE ROTOR

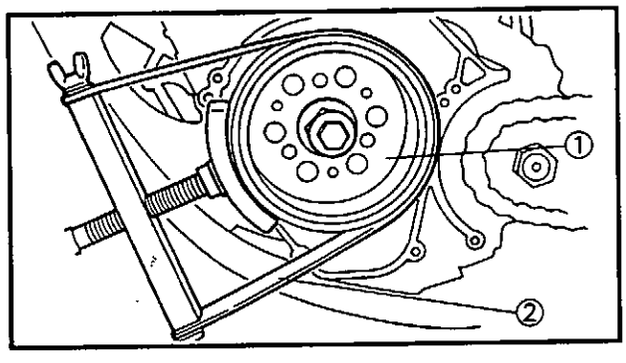
1. Install:
   • bearing
   • starter clutch gear ①
   • woodruff key ②

NOTE:
Befor installing the woodruff key, install the starter clutch gear.



2. Install:
   • rotor ①

NOTE:
- Clean the tapered portion of the crankshaft and rotor hub.
- When installing the rotor, make sure the woodruff key is properly seated in the key way of the crankshaft.
- When installing the rotor, turn the starter clutch gear ② clockwise.



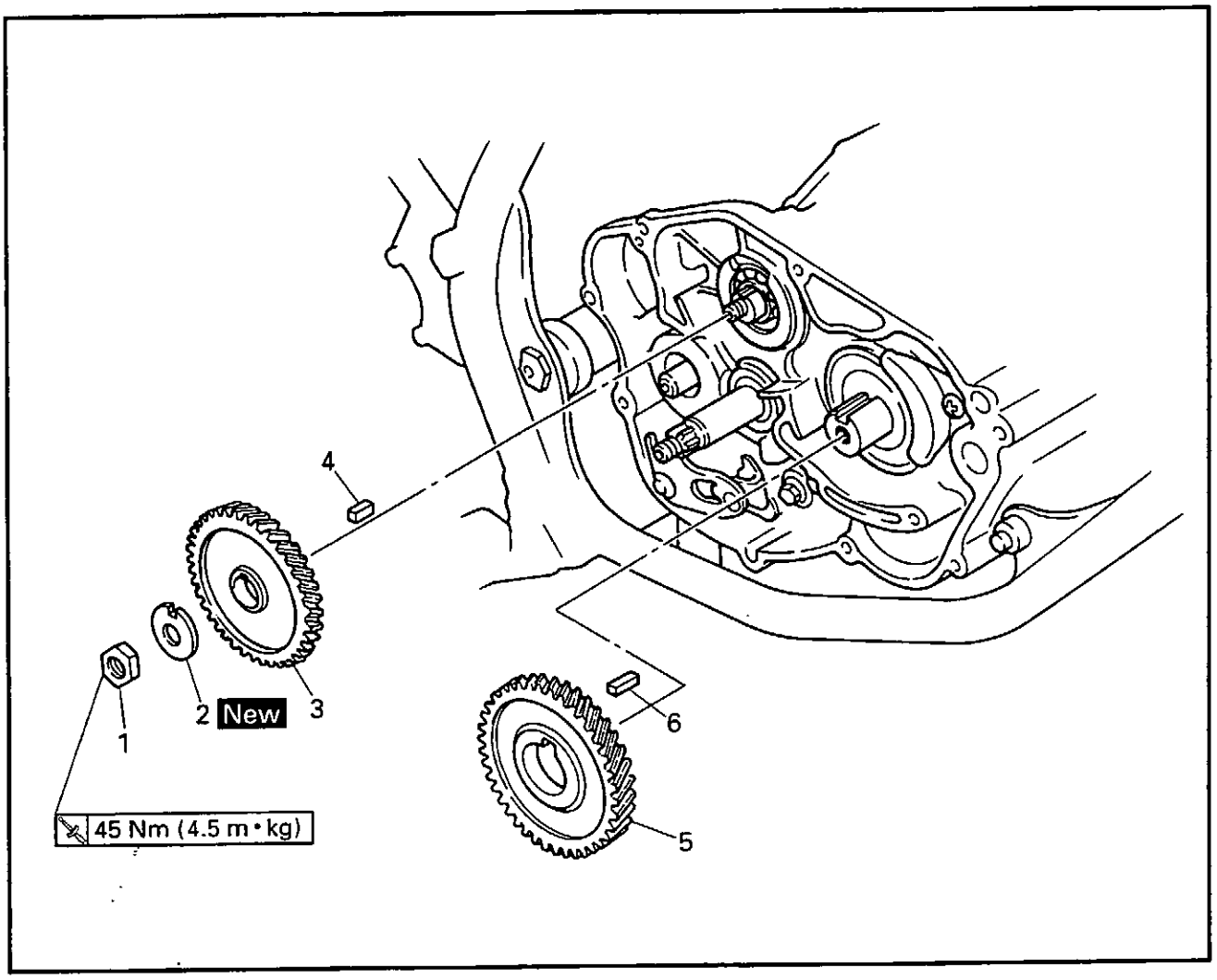
3. Tighten:
   • rotor bolt

60 Nm (6.0 m · kg)

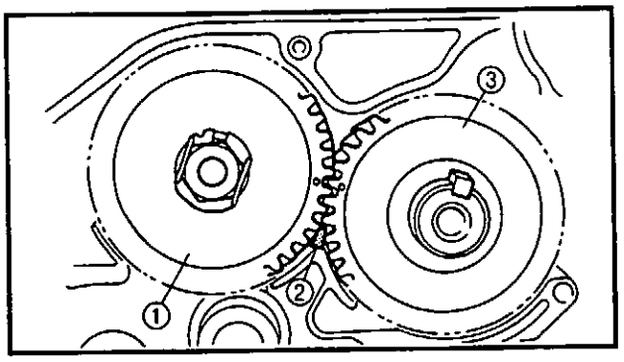
NOTE:
- While holding the rotor ① with the sheave holder ②, tighten the rotor bolt.
- Do not allow the sheave holder to touch the projection on the rotor.

	Sheave holder **90890-01701**

BALANCER WEIGHT GEARS



Order	Job/Part	Q'ty	Remarks
	Removing the balancer weight gears		Remove the parts in the order listed.
	Clutch		Refer to "CLUTCH".
1	Nut	1	
2	Lock washer	1	
3	Balancer weight driven gear	1	
4	Straight key	1	
5	Balancer weight drive gear	1	
6	Straight key	1	
			For installation, reverse the removal procedure.

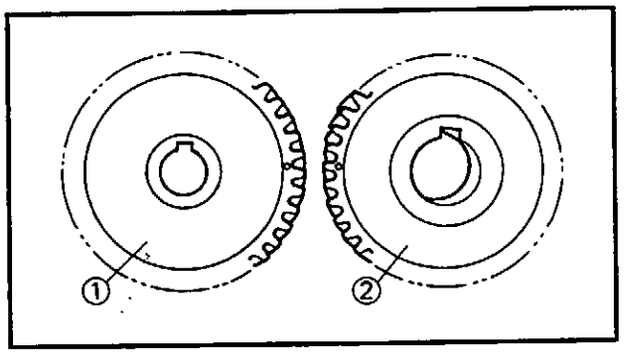


REMOVING THE BALANCER WEIGHT GEARS

1. Straighten:
   - lock washer tab
2. Remove:
   - balancer weight driven gear ①

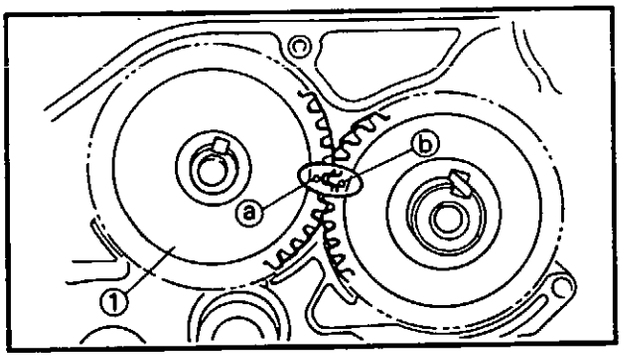
NOTE:

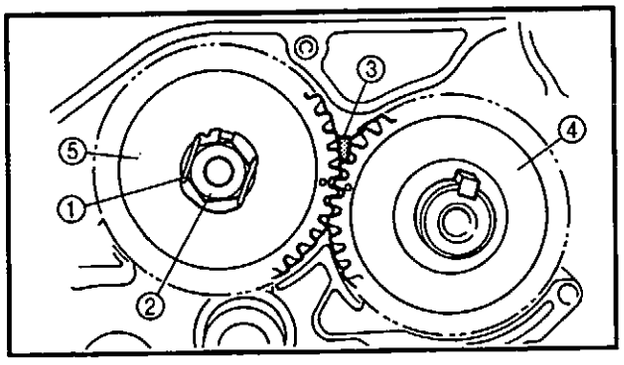
- Place a folded copper washer ② between the teeth of the balancer weight drive gear ③ and balancer weight driven gear in order to lock them.
- Do not damage the balancer weight drive and balancer weight driven gear's teeth.



CHECKING THE BALANCER WEIGHT GEARS

1. Check:
   - balancer weight driven gear ①
   - balancer weight drive gear ②
     Chips/pitting/wear → Replace.





INSTALLING THE BALANCER WEIGHT GEARS

1. Install:
   - balancer weight driven gear ①

NOTE:

Algin the punch mark ⓐ on the balancer weight driven gear with the punch mark ⓑ on the balancer weight drive gear.

2. Install:
   - lock washer ① New
   - nut ② 45 Nm (4.5 m · kg)

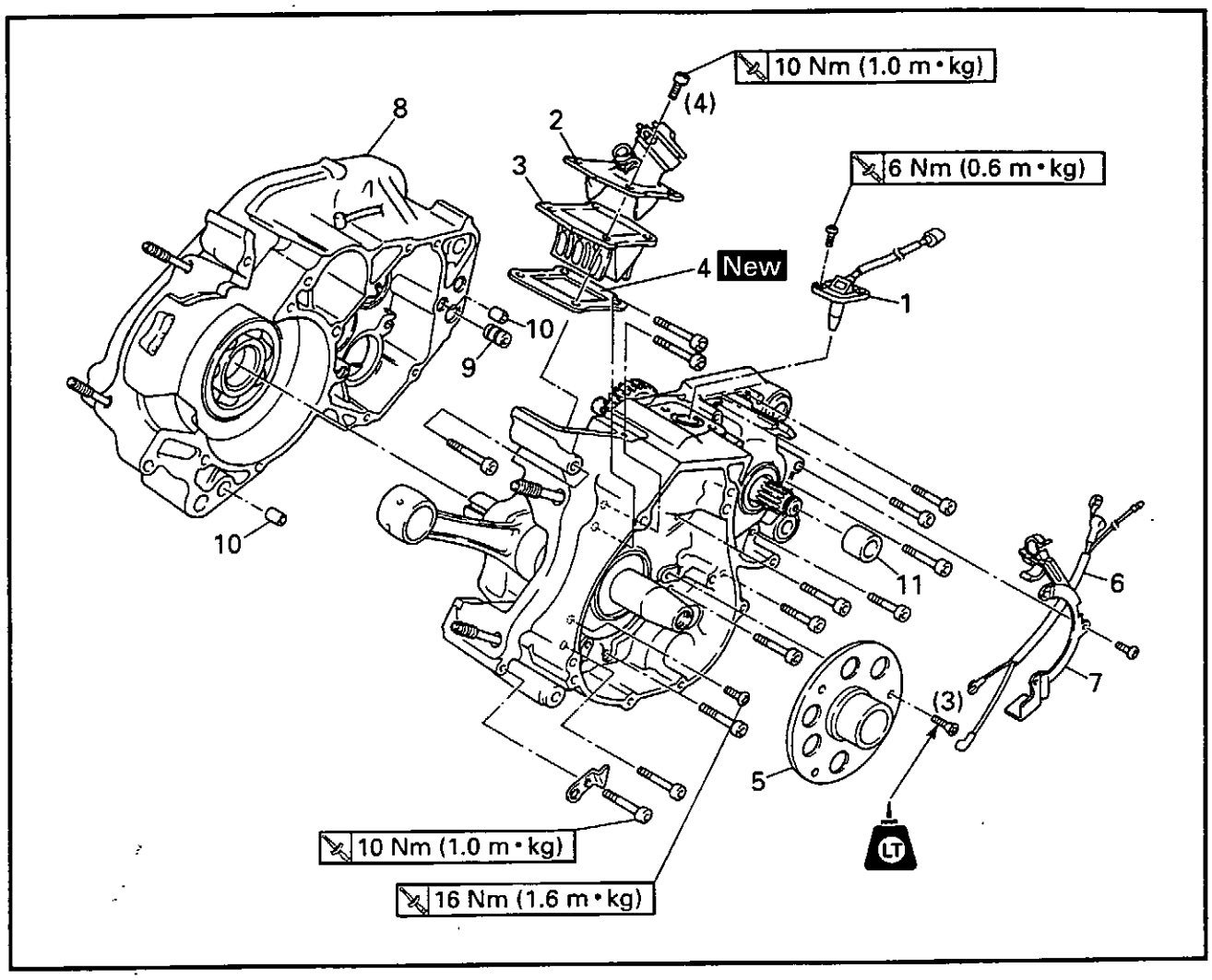
NOTE:

- Place a folded copper washer ③ between the teeth of the balancer weight drive gear ④ and balancer weight driven gear ⑤ in order to lock them.
- Do not damage the balancer weight drive and balancer weight driven gear's teeth.

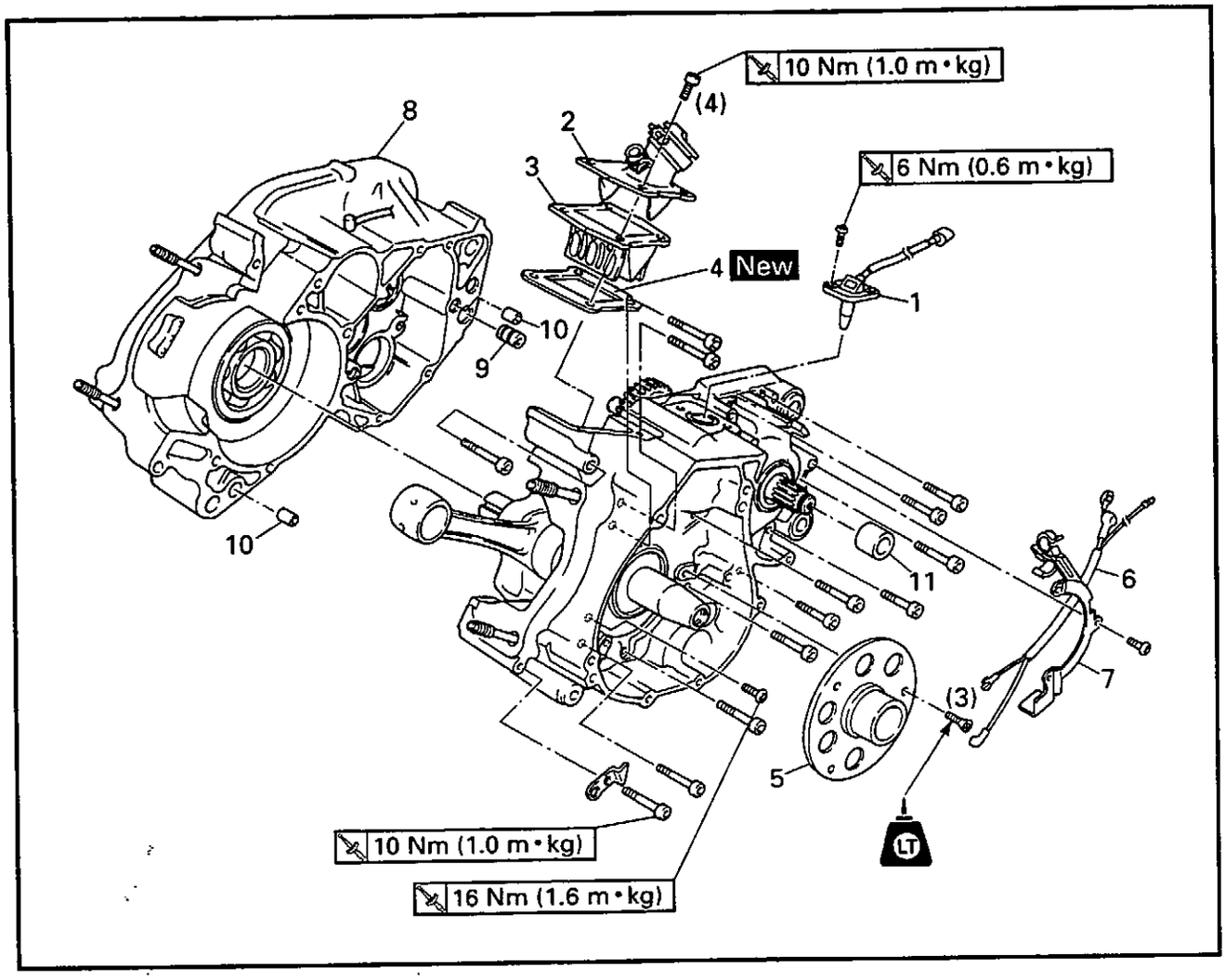
3. Bend:
   - lock washer tab

CRANKCASE AND CRANKSHAFT

CRANKCASE

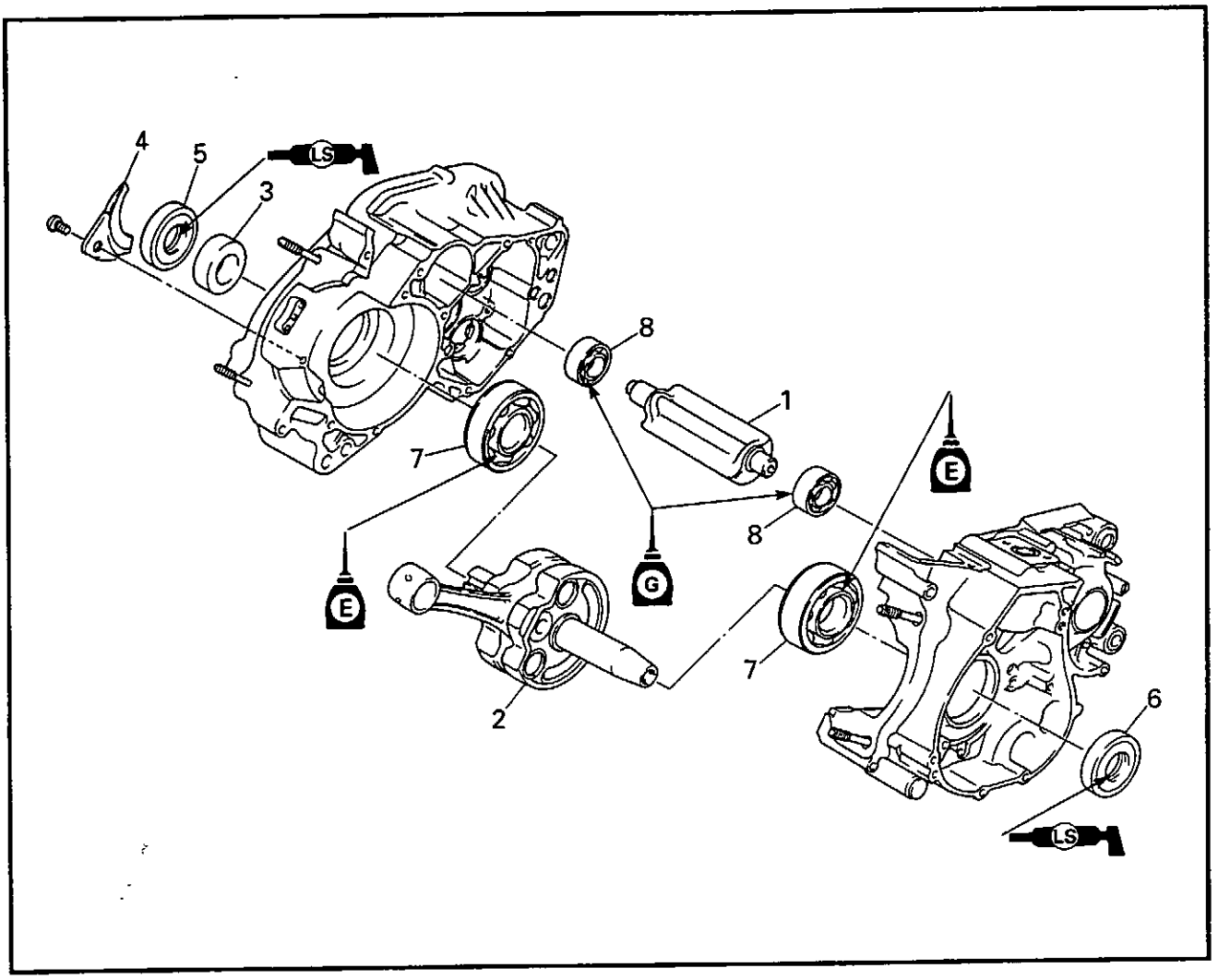


Order	Job/Part	Q'ty	Remarks
	Separating the crankcase		Remove the parts in the order listed.
	Engine		Refer to "ENGINE".
	Cylinder head, cylinder and piston		Refer to "CYLINDER HEAD, CYLINDER AND PISTON AND YPVS VALVE".
	Clutch		Refer to "CLUTCH".
	Shift shaft		Refer to "SHIFT SHAFT".
	CDI magneto and starter clutch		Refer to "STARTER CLUTCH AND CDI MAGNETO".
	Balancer weight gears		Refer to "BALANCER WEIGHT GEARS".
1	Speed sensor	1	
2	Intake manifold	1	
3	Reed valve assembly	1	
4	Gasket	1	
5	Oil seal retainer	1	
6	Neutral switch lead	1	
7	Lead holder	1	

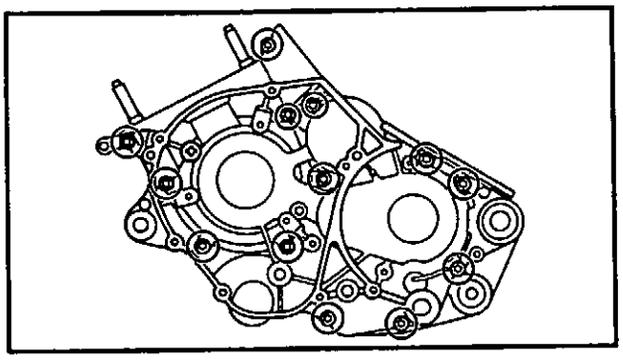


Order	Job/Part	Q'ty	Remarks
8	Right crankcase	1	
9	Dumper spacer	1	
10	Dowel pin	2	
11	Spacer	1	
			For installation, reverse the removal procedure.

BALANCER WEIGHT AND CRANKSHAFT ASSEMBLY



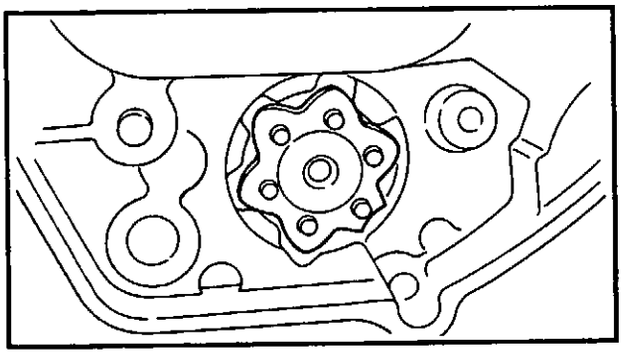
Order	Job/Part	Q'ty	Remarks
	Removing the balancer weight and crankshaft assembly		Remove the parts in the order listed.
	Crankcase		Separate.
1	Balancer weight	1	
2	Crankshaft assembly	1	
3	Spacer	1	
4	Oil seal retainer	1	
5	Oil seal	1	
6	Oil seal	1	
7	Crankshaft bearing	2	
8	Balancer weight bearing	2	
			For installation, reverse the removal procedure.



DISASSEMBLING THE CRANKCASE

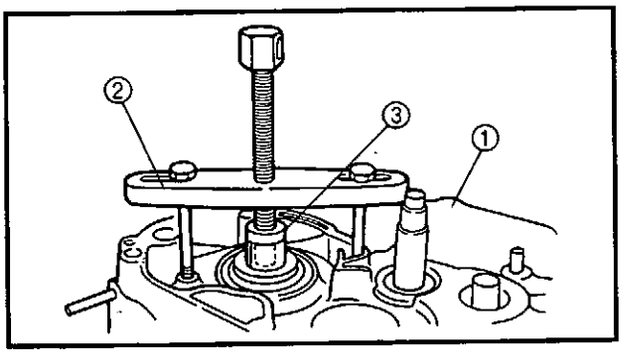
1. Remove:
   • crankcase screws

NOTE:
Loosen each screw 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the screws are fully loosened, remove them.



2. Turn:
   • shift drum segment

NOTE:
Turn the shift drum segment to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase separation.

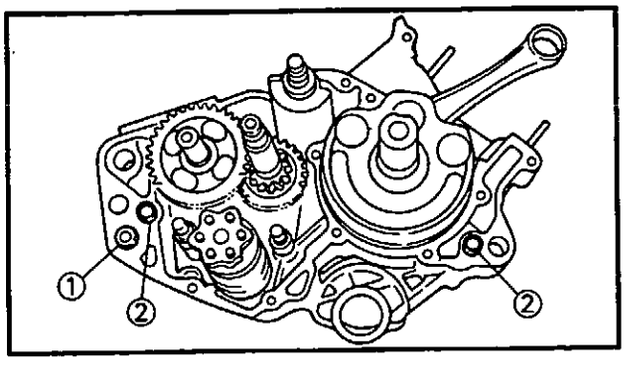


3. Remove:
   • right crankcase ①

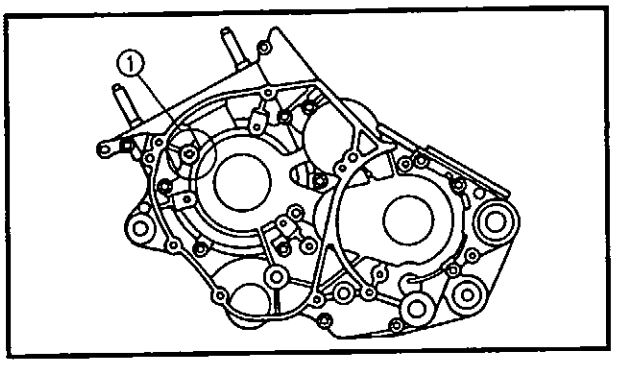
CAUTION:
First check that the shift drum segment's teeth is properly positioned, and then remove the right crankcase.

NOTE:
- Remove the right crankcase with the crankcase separating tool ② and crankshaft protector ③.
- Make sure the crankcase separating tool is centered over the crankshaft assembly.

Crankcase separating tool
90890-01135
Crankshaft protector
90890-01382



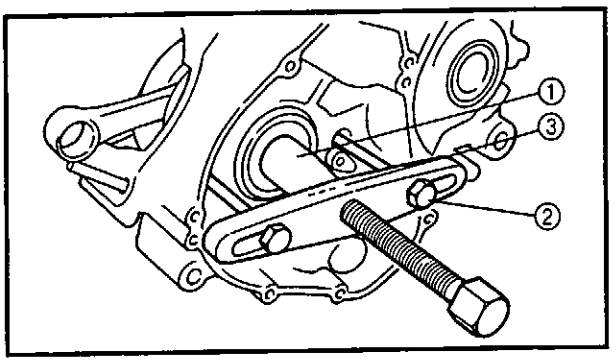
4. Remove:
   • damper spacer ①
   • dowel pins ②



EAS00388
REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
   • screw ①

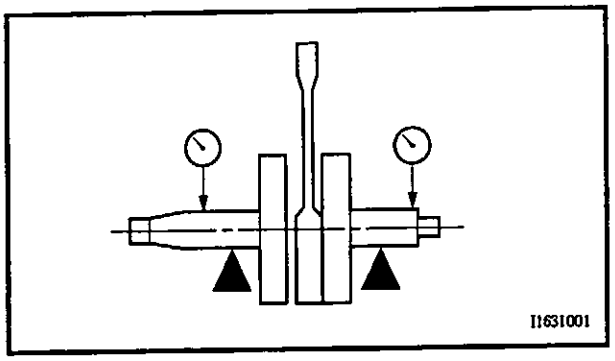
NOTE:
Make sure to remove the screw, before using the crankcase separating tool.



2. Remove:
   • crankshaft assembly ①

NOTE:
- Remove the crankshaft assembly with the crankcase separating tool ② and crankshaft protector ③.
- Make sure the crankcase separating tool is centered over the crankshaft assembly.

Crankcase separating tool
90890-01135
Crankshaft protector
90890-01382

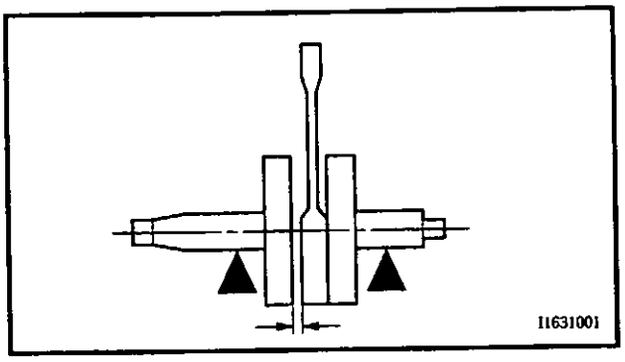


CHECKING THE CRANKSHAFT AND CONNECTING ROD

1. Measure:
   • crankshaft runout
   Out of specification → Replace the crankshaft, bearing, or both.

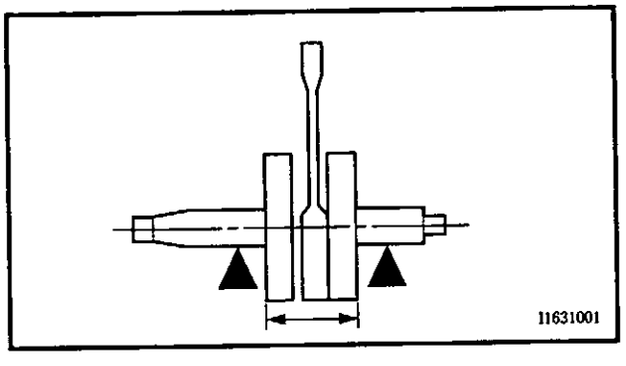
NOTE:
Turn the crankshaft slowly.

Maximum crankshaft runout
0.02 mm



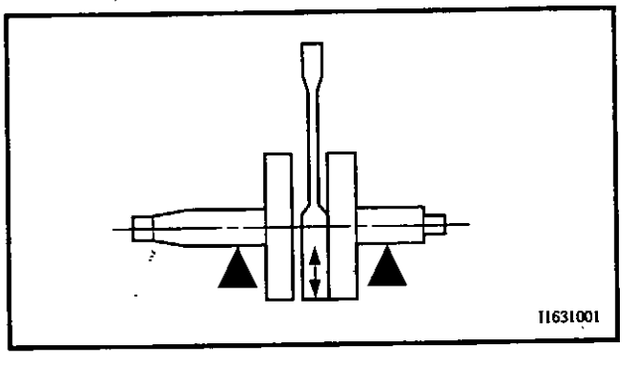
2. Measure:
   • big end side clearance
   Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.

Big end side clearance
0.2 ~ 0.7 mm
Limit: 1.0 mm



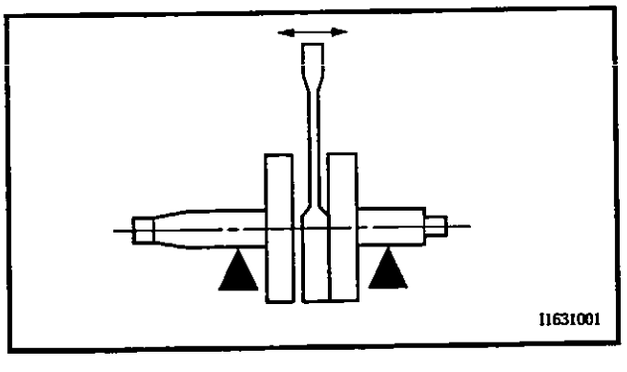
3. Measure:
   • crankshaft width
   Out of specification → Replace the crankshaft.

Crankshaft width
58.90 ~ 58.95 mm



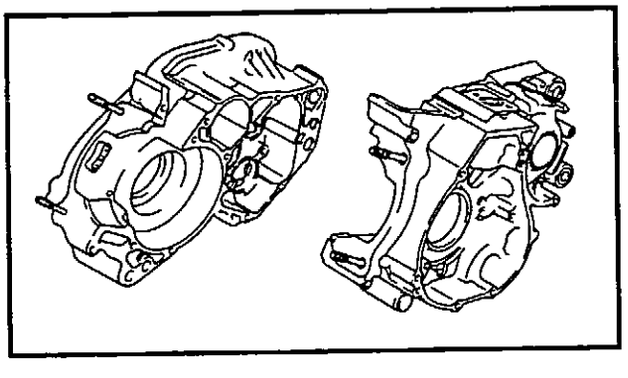
4. Measure:
   • big end radial clearance
   Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.

Big end radial clearance
0.027 ~ 0.039 mm



5. Measure:
   • small end free play
   Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.

Small end free play
0.8 ~ 1.0 mm
Limit: 2.0 mm



CHECKING THE CRANKCASE

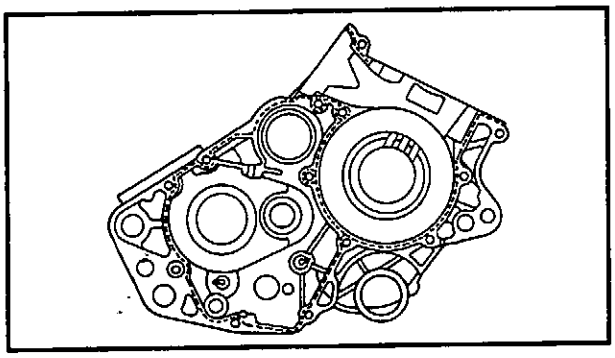
1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
   • crankcase
   Cracks/damage → Replace.

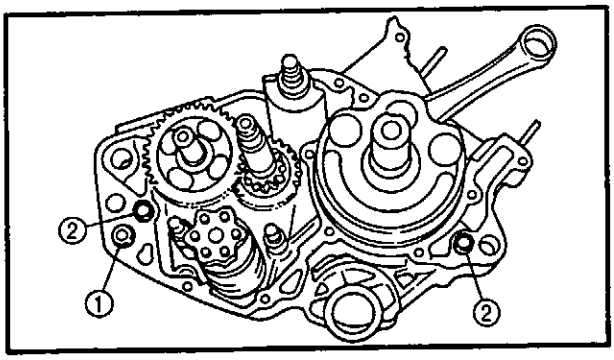
CAUTION:

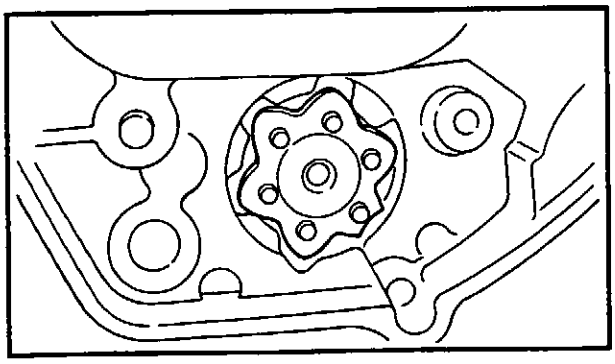
To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with grease and each bearing with engine oil or gear oil.

NOTE:

Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installing tool with the other. Turn the crankshaft installing tool until the crankshaft assembly bottoms against the bearing.







ASSEMBLING THE CRANKCASE

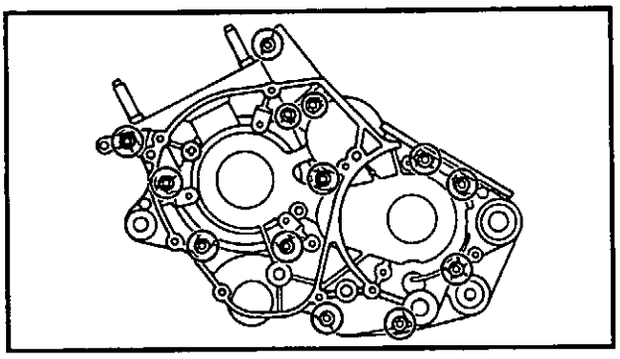
1. Apply:
   - sealant
     (onto the crankcase mating surfaces)

	Yamaha bond No. 1215 **90890-85505**

2. Install:
   - balancer weight
   - damper spacer ①
   - dowel pins ②
3. Install:
   - right crankcase
     (onto the left crankcase)

NOTE:

- Tap lightly on the left crankcase with a softface hammer.
- Turn the shift drum segment to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase installation.



4. Install:
   • crankcase bolts

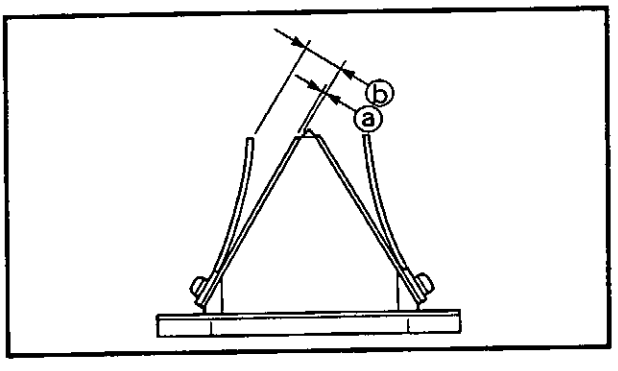
	Crankcase bolts **10 Nm (1.0 m • kg)**

NOTE:
Tighten the crankcase tightening bolts in stage, using a crisscross pattern.

5. Check:
   • crankshaft operation
   Rough movement → Repair.

CHECKING THE REED VALVE

1. Check:
   • reed valve
   Cracks/damage/wear → Replace.

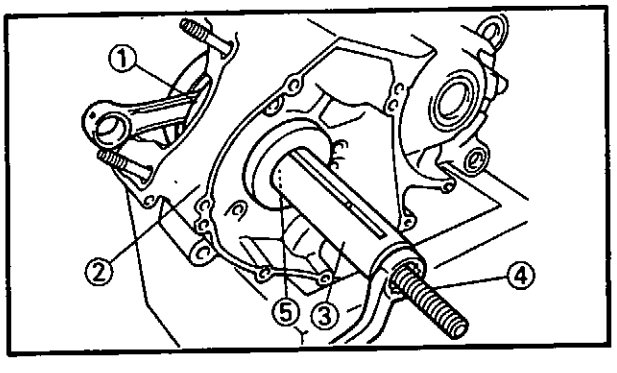


2. Check:
   • reed valve bending limit ⓐ
   • reed valve stopper height ⓑ
   Out of specification → Replace.

Reed valve bending limit
1.5 mm
Reed valve stopper height
9 mm

EAS00401
CHECKING THE BEARINGS AND OIL SEALS

1. Check:
   • bearings
   Clean and lubricate the bearings, then rotate the inner race with your finger.
   Rough movement → Replace.
2. Check:
   • oil seals
   Damage/wear → Replace.



EAS00408
INSTALLING THE CRANKSHAFT

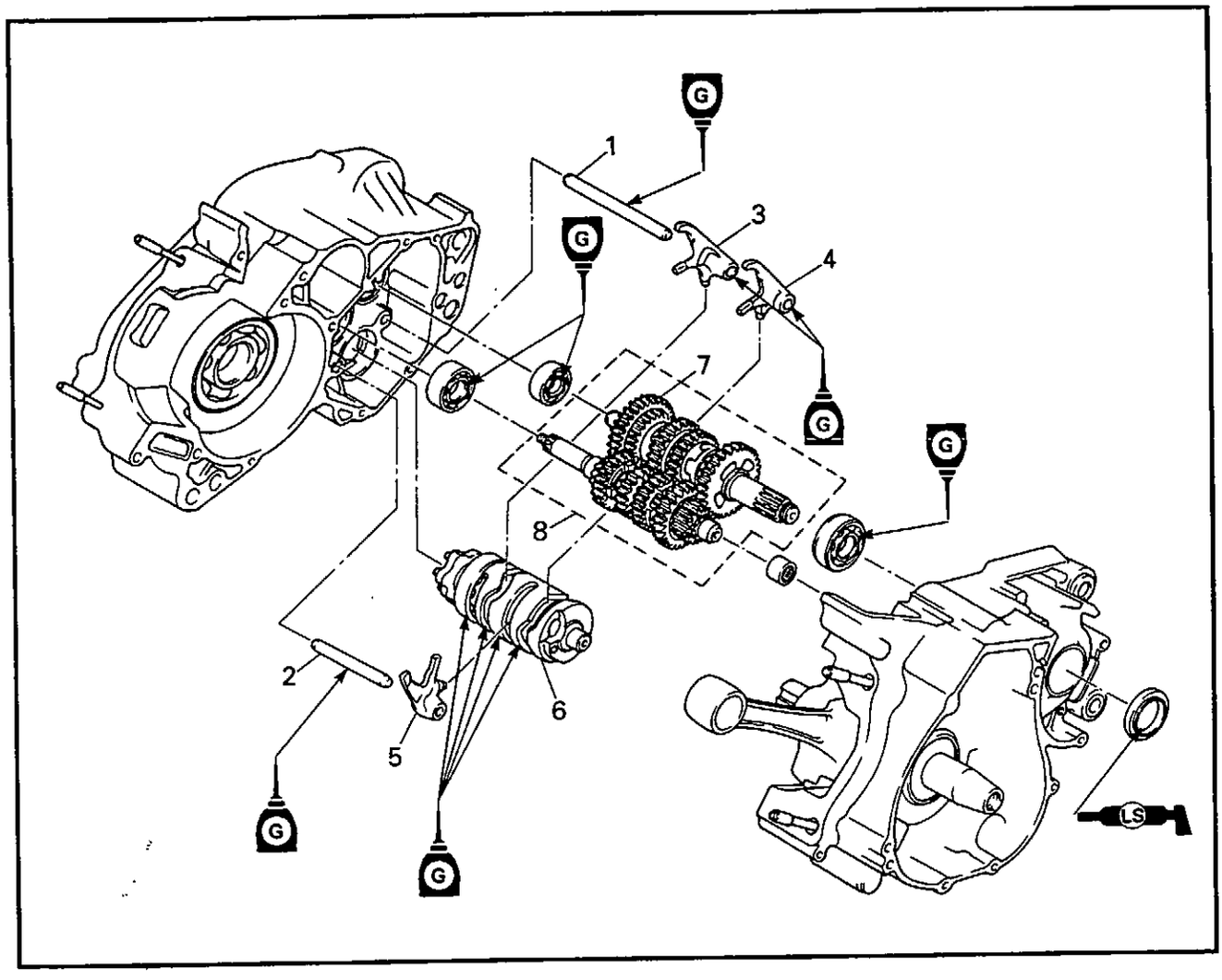
1. Install:
   • crankshaft ①
   • left crankcase ②

NOTE:
Install the crankshaft with the crankshaft installer pot ③, crankshaft installer bolt ④ and adapter ⑤.

Crankshaft installer pot
90890-01274
Crankshaft installer bolt
90890-01275
Adapter (M10)
90890-01383

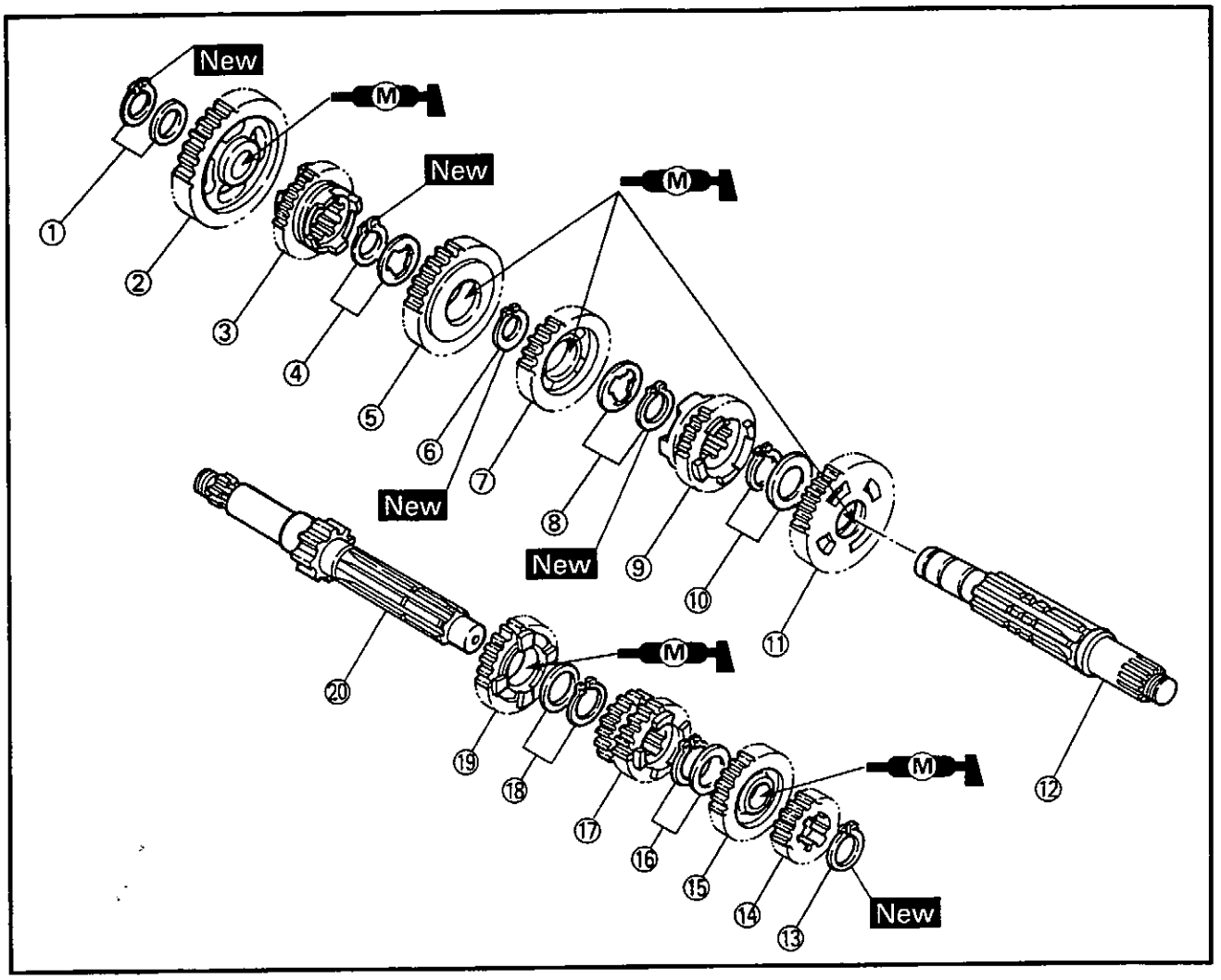
TRANSMISSION, SHIFT CAM AND SHIFT FORK

TRANSMISSION, SHIFT CAM AND SHIFT FORK

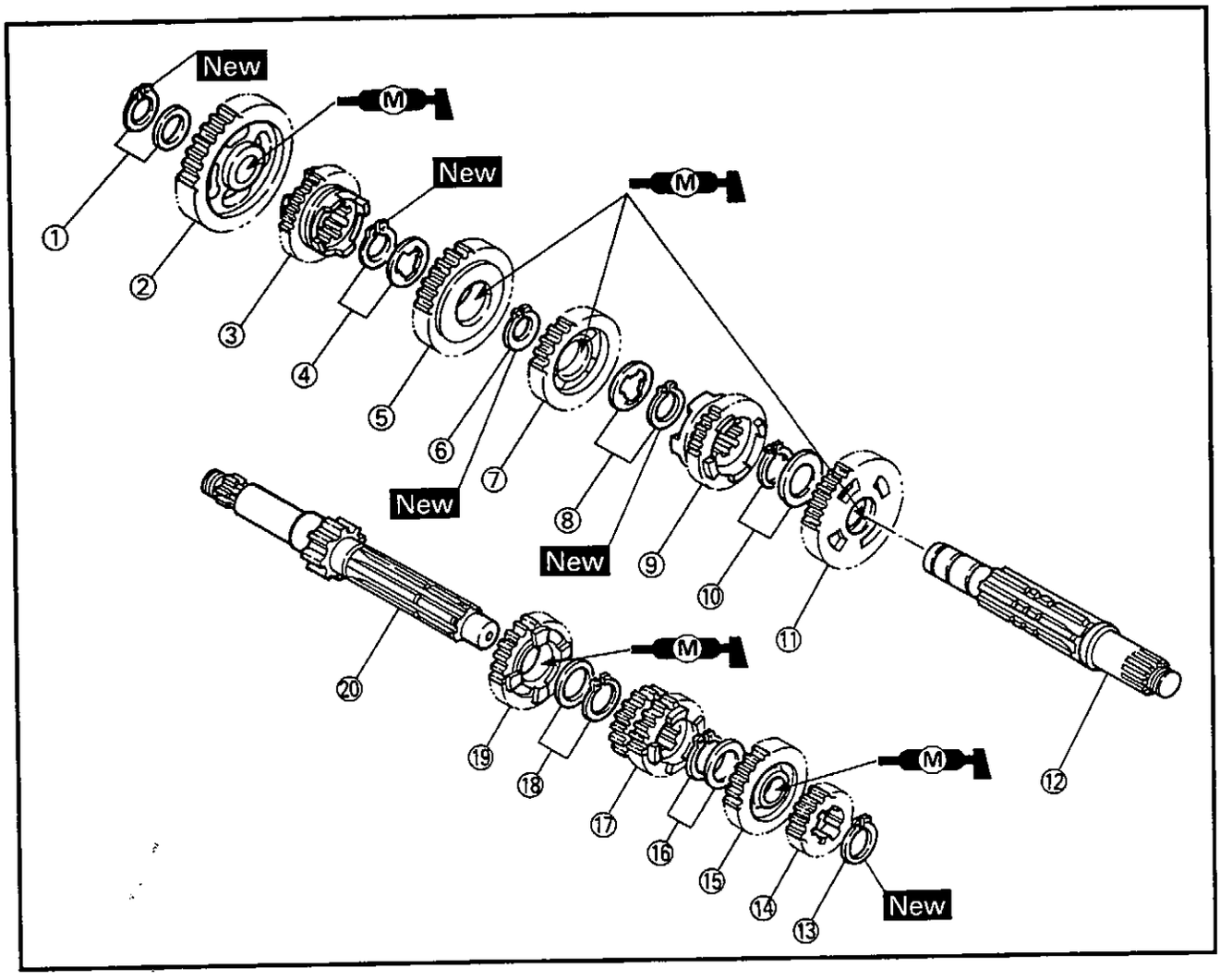


Order	Job/Part	Q'ty	Remarks
	Removing the transmission, shift cam and shift fork		Remove the parts in the order listed.
	Crankcase		Refer to "CRANKCASE AND CRANKSHAFT".
1	Shift fork guide bar 1	1	
2	Shift fork guide bar 2	1	
3	Shift fork "3"	1	
4	Shift fork "1"	1	
5	Shift fork "2"	1	
6	Shift drum	1	
7	Drive axle assembly	1	
8	Main axle assembly	1	
			For installation, reverse the removal procedure.

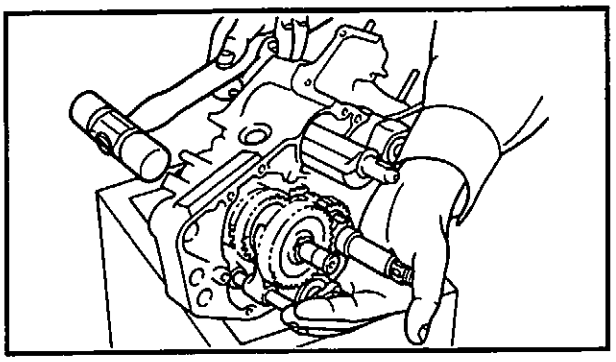
DRIVE AXLE AND MAIN AXLE ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Disassembling the drive axle and main axle assembly		
①	Circlip/plain washer	1/1	
②	1st wheel gear	1	
③	5th wheel gear	1	
④	Circlip/special washer	1/1	
⑤	3rd wheel gear	1	
⑥	Circlip	1	
⑦	4th wheel gear	1/1	
⑧	Circlip/special washer	1	
⑨	6th wheel gear	1/1	
⑩	Circlip/plain washer	1	
⑪	2nd wheel gear	1	
⑫	Drive axle	1	
⑬	Circlip	1	



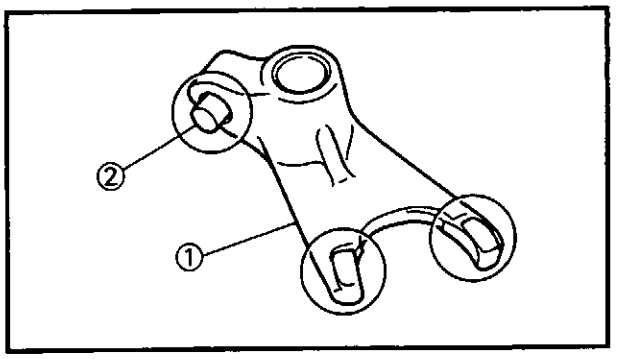
Order	Job/Part	Q'ty	Remarks
⑭	2nd pinion gear	1	
⑮	6th pinion gear	1	
⑯	Circlip/plain washer	1/1	
⑰	3rd pinion gear/4th pinion gear	1	
⑱	Circlip/plain washer	1/1	
⑲	5th pinion gear	1	
⑳	Main axle	1	For assembly, reverse the disassembly procedure.



EAS00420
REMOVING THE TRANSMISSION

1. Remove:
   - shift forks
   - shift cam
   - main axle assembly
   - drive axle assembly

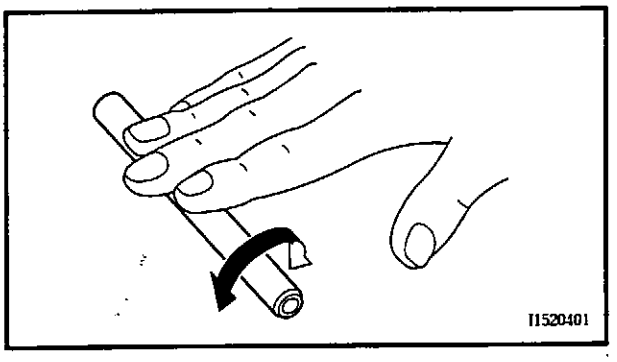
NOTE:
Tap lightly on the transmission drive axle and shift cam with a soft hammer to remove.



EAS00421
CHECKING THE SHIFT FORKS

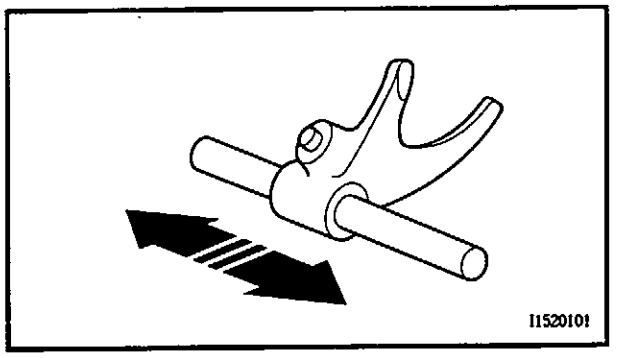
The following procedure applies to all of the shift forks.

1. Check:
   - shift fork cam follower ①
   - shift fork pawl ②
     Bends/damage/scoring/wear → Replace the shift fork.

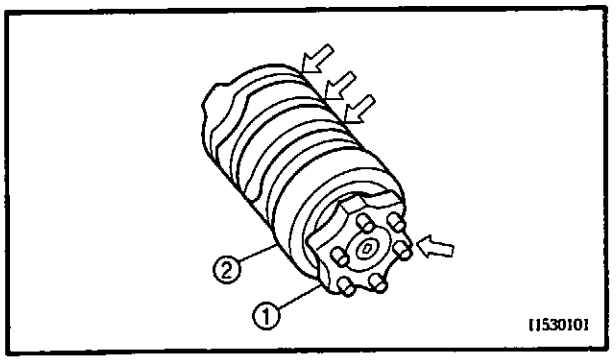


2. Check:
   - shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

⚠ WARNING
Do not attempt to straighten a bent shift fork guide bar.

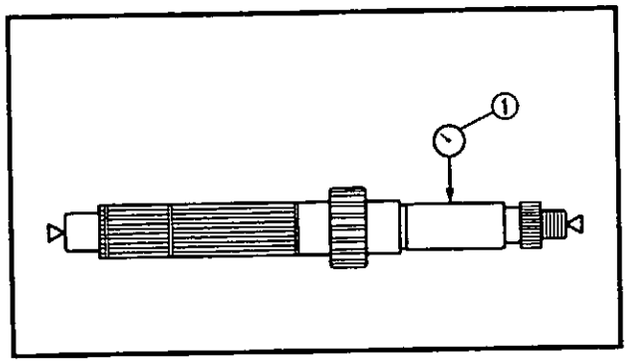


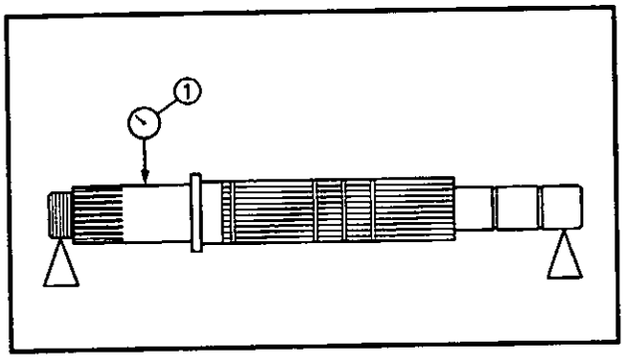
3. Check:
   - shift fork movement
     (along the shift fork guide bar)
     Rough movement → Replace the shift fork(-s) and shift fork guide bar as a set.

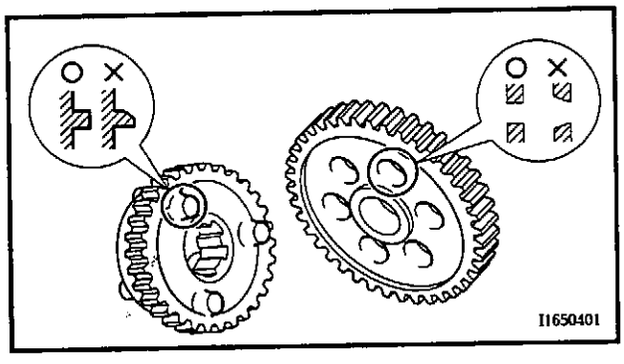


EAS00422
CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
   - shift drum grooves
     Damage/scratches/wear → Replace the shift drum assembly.
   - shift drum segment ①
     Damage/wear → Replace the shift drum assembly.
   - shift drum bearing ②
     Damage/pitting → Replace the shift drum assembly.







EAS00425
CHECKING THE TRANSMISSION

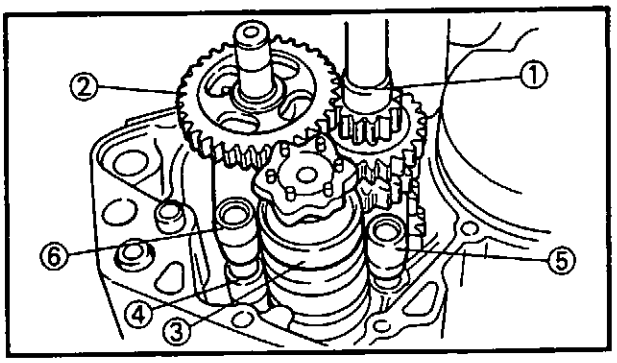
1. Measure:
   • main axle runout
   (with a centering device and dial gauge ①)
   Out of specification → Replace the main axle.

Max. main axle runout
0.08 mm

2. Measure:
   • drive axle runout
   (with a centering device and dial gauge ①)
   Out of specification → Replace the drive axle.

Max. drive axle runout
0.08 mm

3. Check:
   • transmission gears
   Blue discoloration/pitting/wear → Replace the defective gear(-s).
   • transmission gear dogs
   Cracks/damage/rounded edges → Replace the defective gear(-s).
4. Check:
   • transmission gear engagement
   (each pinion gear to its respective wheel gear)
   Incorrect → Reassemble the transmission axle assemblies.
5. Check:
   • transmission gear movement
   Rough movement → Replace the defective part(-s).
6. Check:
   • circlips
   Bends/damage/looseness → Replace.



EAS00427
INSTALLING THE TRANSMISSION

1. Install:
   - main axle assembly ①
   - drive axle assembly ②
   - shift drum ③
   - shift fork "1" ④
   - shift fork "2" ⑤
   - shift fork "3" ⑥

NOTE:

- Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install the shift fork in the direction of the embossed number on the CDI magnet side.
- Install shift fork "2" into the groove in the 3rd and 4th pinion gear on the main axle.
- Install shift fork "1" into the groove in the 6th wheel gear and shift fork "3" into the groove in the 5th wheel gear on the drive axle.
- Make sure that the drive axle bearing circlip is inserted into the grooves in the upper crankcase.

2. Check:
   - transmission
     Rough movement → Repair.

NOTE:

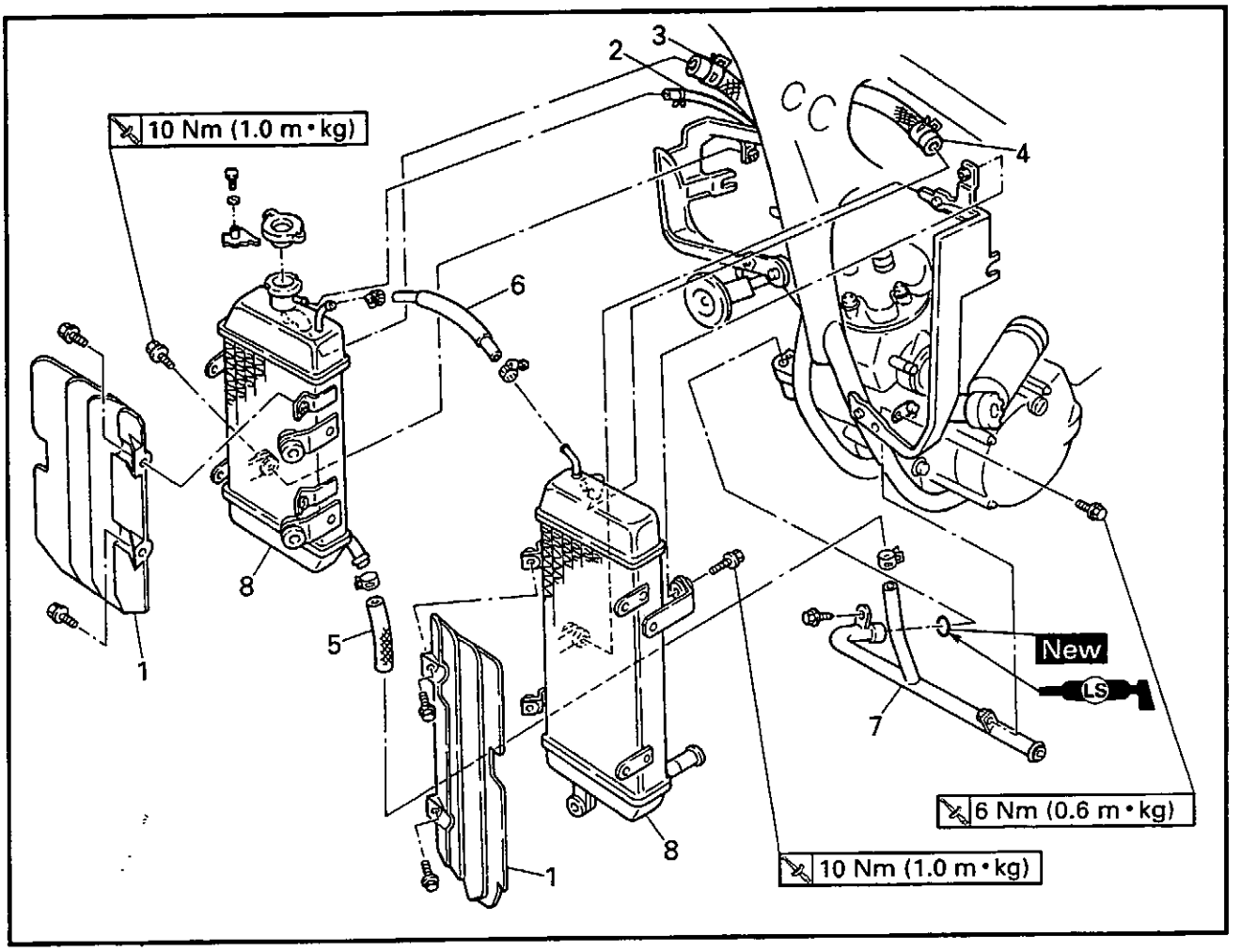
Oil each gear, shaft, and bearing thoroughly.

CONTENTS
COOLING SYSTEM

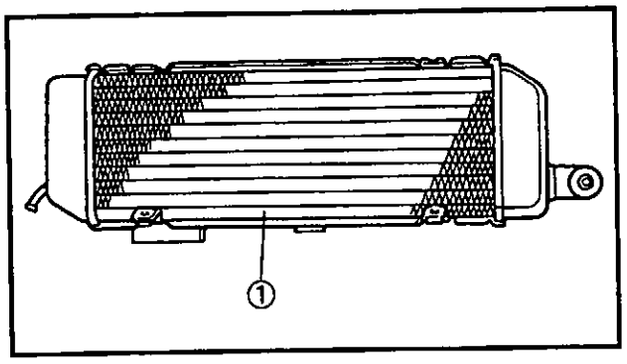
EAS00454

COOLING SYSTEM

RADIATORS



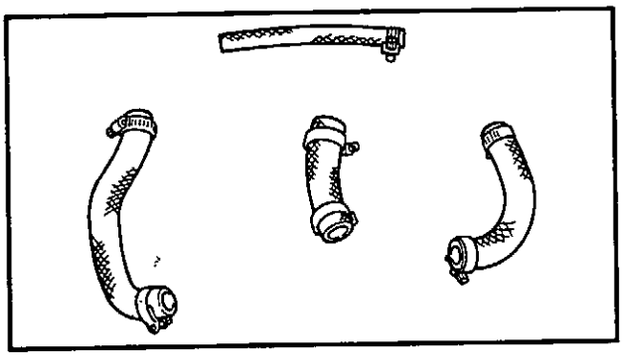
Order	Job/Part	Q'ty	Remarks
	Removing the radiators		Remove the parts in the order listed.
	Air scoop, side covers, seat, fuel tank and muffler		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator covers	2	
2	Coolant reservoir hose	1	Disconnect.
3	Radiator hose 5	1	Disconnect.
4	Radiator hose 4	1	Disconnect.
5	Radiator hose 6	1	
6	Radiator hose 1	1	
7	Radiator hose joint pipe	1	
8	Radiators	2	
			For installation, reverse the removal procedure.



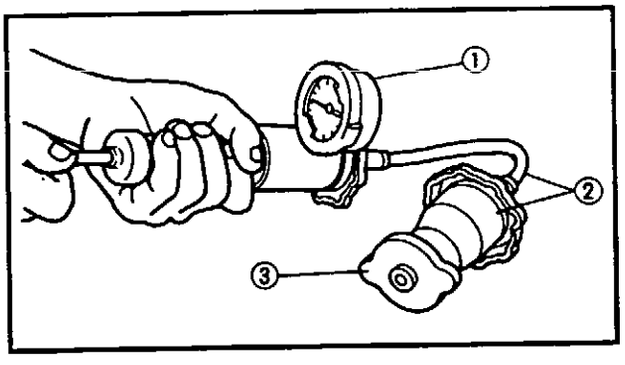
EAS00455
CHECKING THE RADIATOR

1. Check:
   - radiator fins ①
     Obstruction → Clean.
     Apply compressed air to the rear of the radiator.
     Damage → Repair or replace.

NOTE:
Straighten any flattened fins with a thin, flat-head screwdriver.



2. Check:
   - radiator hoses
   - radiator hose joint pipe
     Cracks/damage → Replace.



3. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.

Radiator cap opening pressure
95 ~ 125 kPa (0.95 ~ 1.25 kgf/cm², 0.95 ~ 1.25 bar)

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Install the radiator cap tester ① and adapter ② onto the radiator cap ③.

Radiator cap tester
90890-01325
Radiator cap tester adapter
90890-01352

b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.

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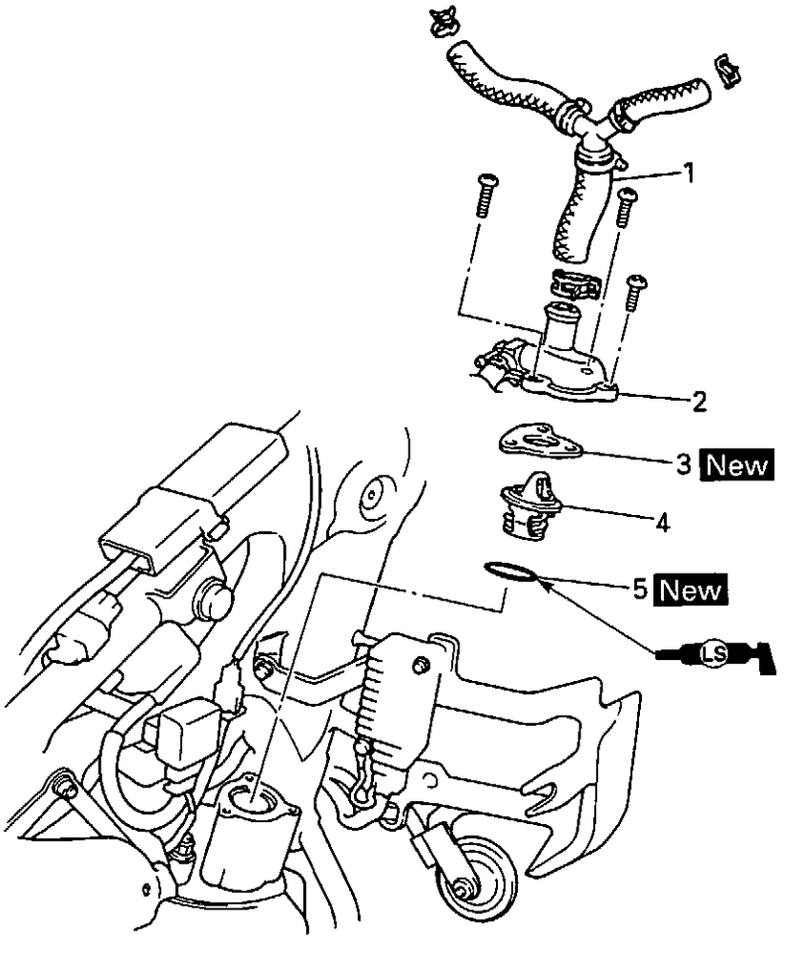
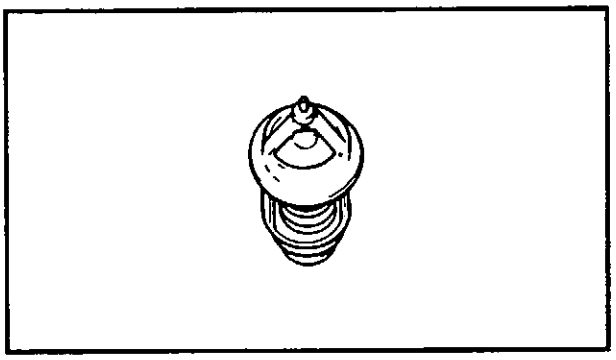
EAS00456
INSTALLING THE RADIATOR

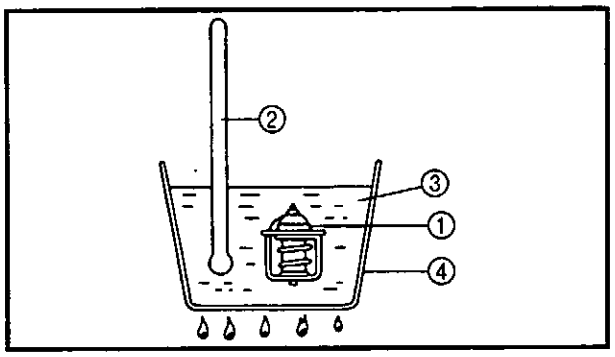
1. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT " in chapter 3.
2. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
3. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to "CHECKING THE RADIATOR".

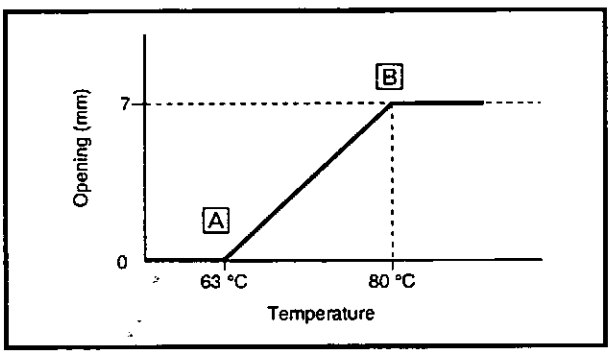
EAS00460
THERMOSTAT ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Removing the thermostat assembly		Remove the parts in the order listed.
	Side covers, seat, fuel tank and muffler		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator hose 3	1	
2	Thermostat cover	1	
3	Gasket	1	
4	Thermostat	1	
5	O-ring	1	
			For installation, reverse the removal procedure.







EAS00462
CHECKING THE THERMOSTAT

1. Check:
   - thermostat ①
     Does not open at 63 ~ 80 °C → Replace.

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a. Suspend the thermostat in a container filled with water.

b. Slowly heat the water.

c. Place a thermometer in the water.

d. While stirring the water, observe the thermostat and thermometer's indicated temperature.

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①Thermostat
②Thermometer
③Water
④Container
[A]Fully closed
[B]Fully open

NOTE:

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

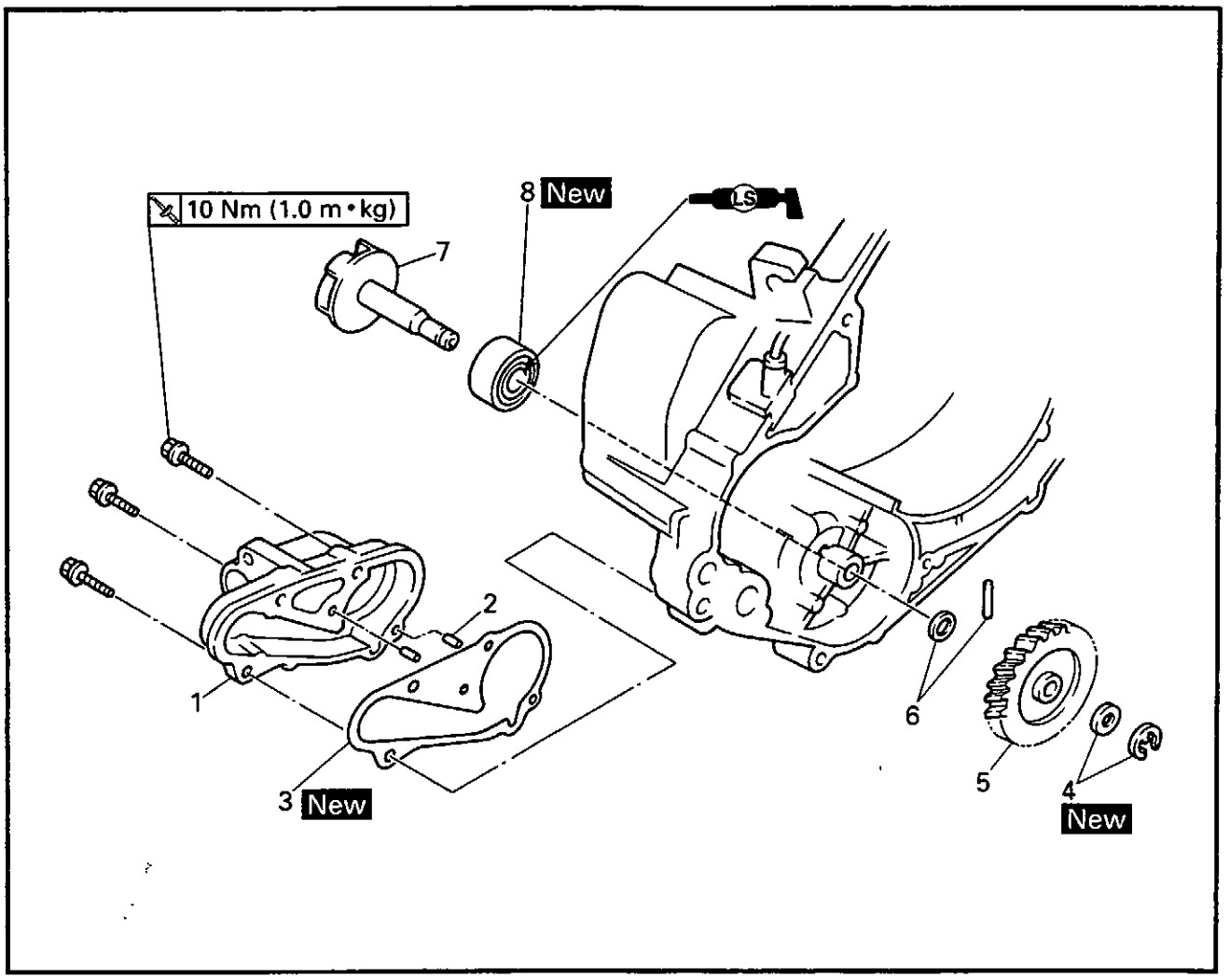
2. Check:
   - thermostat cover
     Cracks/damage → Replace.

EAS00466
INSTALLING THE THERMOSTAT ASSEMBLY

1. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT " in chapter 3.

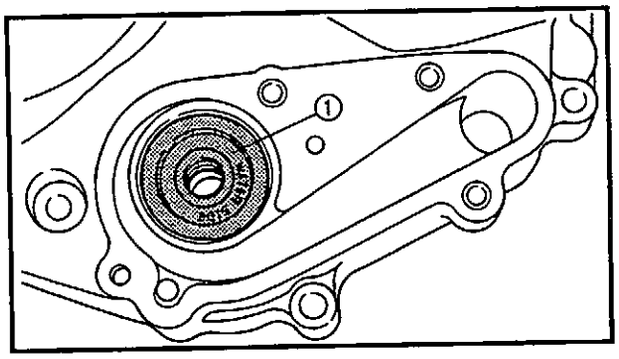
2. Check:
   • cooling system
   Leaks → Repair or replace any faulty part.
3. Measure:
   • radiator cap opening pressure
   Below the specified pressure → Replace the radiator cap.
   Refer to "CHECKING THE RADIATOR".

EAS00468
WATER PUMP



Order	Job/Part	Q'ty	Remarks
	Removing the water pump		Remove the parts in the order listed.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Clutch cover		Refer to "CLUTCH" in chapter 4.
1	Water pump cover	1	
2	Dowel pin	2	
3	Gasket	1	
4	Circlip/washer	1/1	
5	Water pump drive gear	1	
6	Pin/washer	1/1	
7	Impeller shaft	1	
8	Mechanical seal	1	
			For installation, reverse the removal procedure.

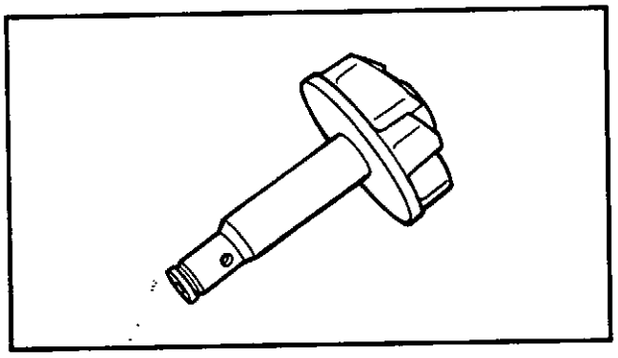
NOTE:
- It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
- Replace the water pump assembly if necessary.



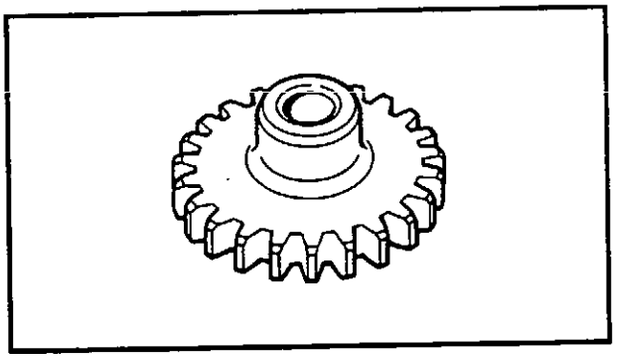
CHECKING THE WATER PUMP

1. Check:
   - mechanical seal ①
     Damage/wear → Replace.

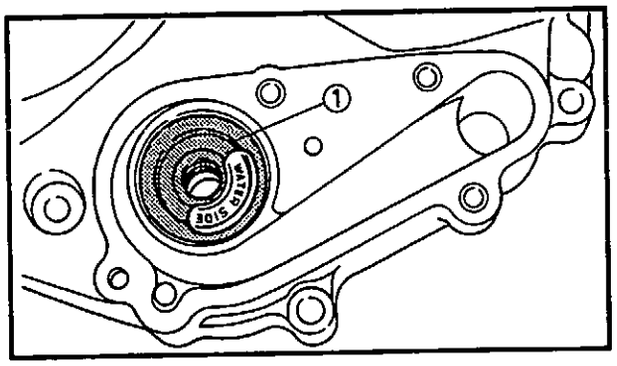
NOTE:
Replace the mechanical seal when removing it.



2. Check:
   - impeller shaft
     Cracks/damage/wear → Replace.



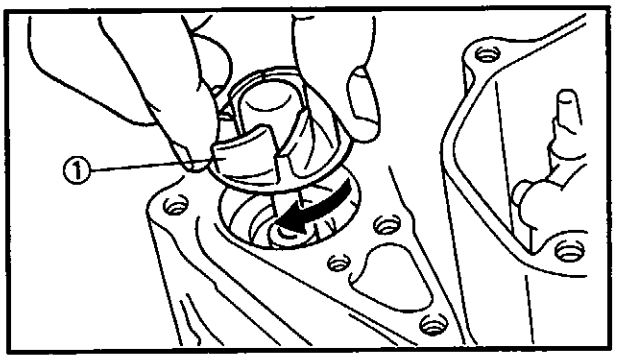
3. Check:
   - water pump drive gear
     Pitting/wear → Replace.



INSTALLING THE WATER PUMP

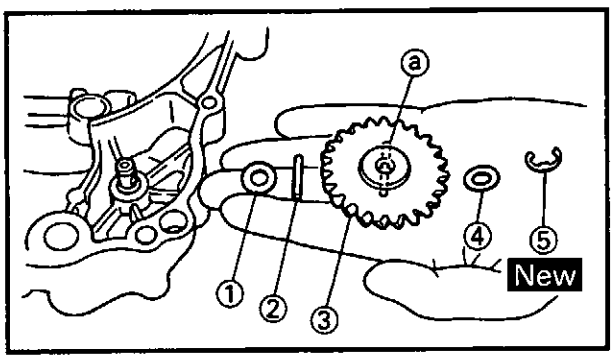
1. Install:
   - mechanical seal ①

NOTE:
- When installing the mechanical seal "WATER SIDE" mark face outward.
- Make sure the mechanical seal does not come out of the clutch cover.
- Apply the oil to the outside of the mechanical seal.



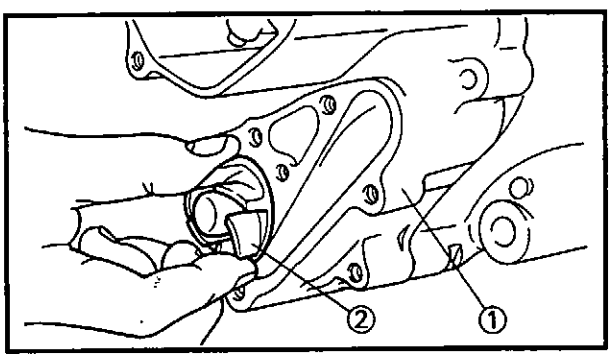
2. Install:
   • Impeller shaft ①

NOTE:
- Apply the lightweight lithium base grease to the impeller shaft and mechanical seal lip.
- When installing the impeller shaft turn it to prevent damage to the mechanical seal lip.



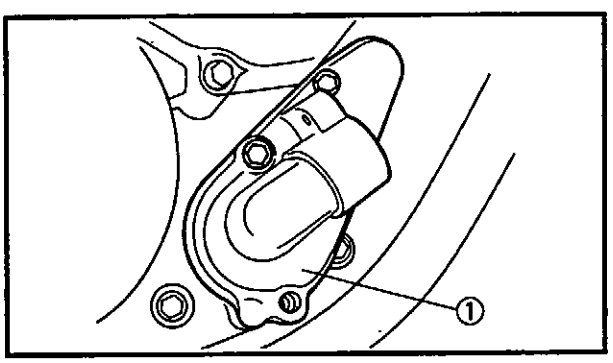
3. Install:
   • washer ①
   • pin ②
   • water pump drive gear ③
   • washer ④
   • circlip ⑤ New

NOTE:
Align the slot ⓐ in the water pump drive gear with the pin.



4. Install:
   • dowel pin
   • gasket New
   • clutch cover ①

NOTE:
When installing the clutch cover turn the impeller shaft ② with your finger to align the water pump drive gear to the primary drive gear.



5. Install:
   • gasket New
   • water pump cover ①

10 Nm (1.0 m · kg)

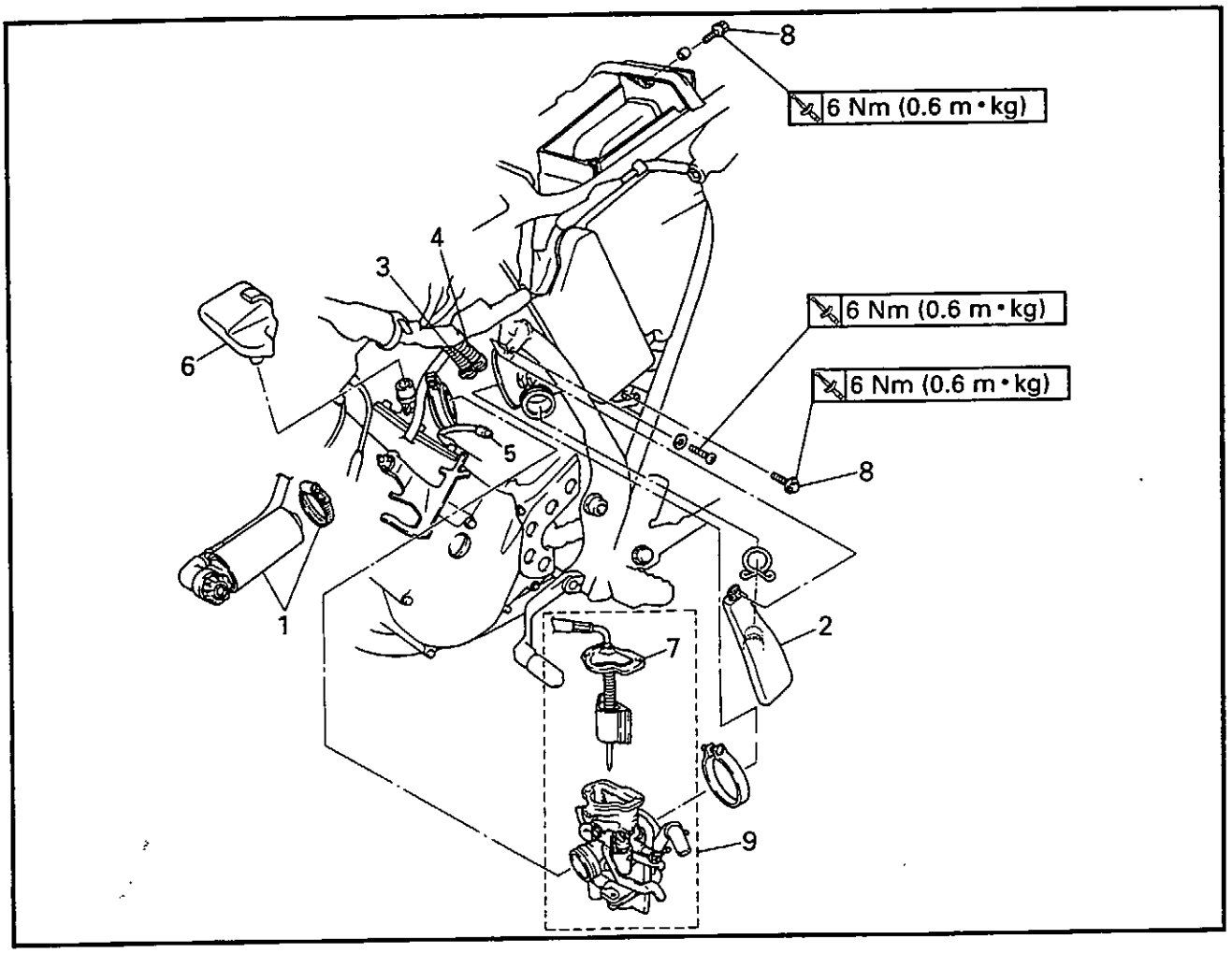
6. Fill:
   • cooling system
   (with the specified amount of the recommended coolant)
   Refer to "CHANGING THE COOLANT" in chapter 3.
7. Check:
   • cooling system
   Leaks → Repair or replace the faulty part.

CONTENTS
CARBURETOR

EAS00480

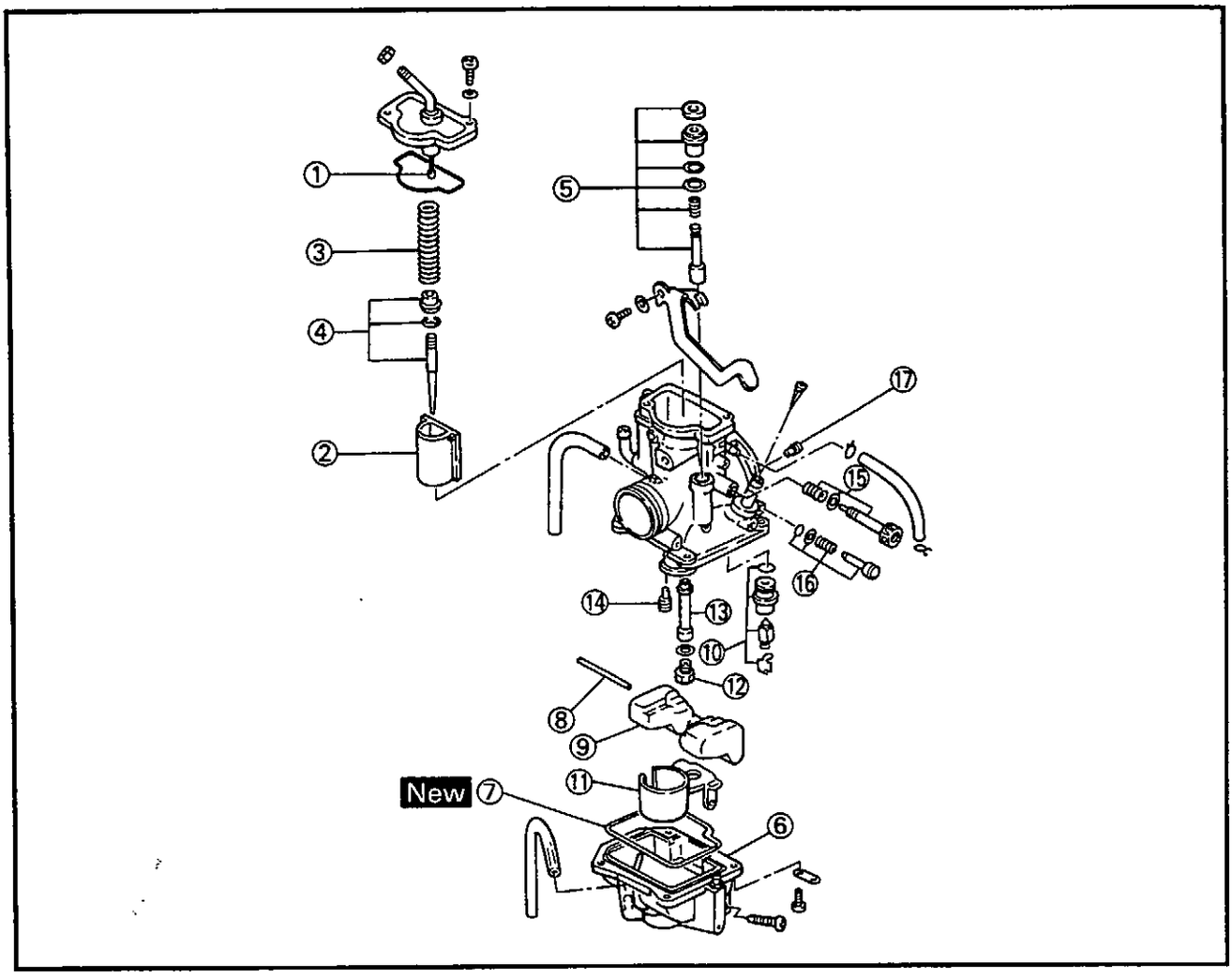
CARBURETOR

CARBURETOR

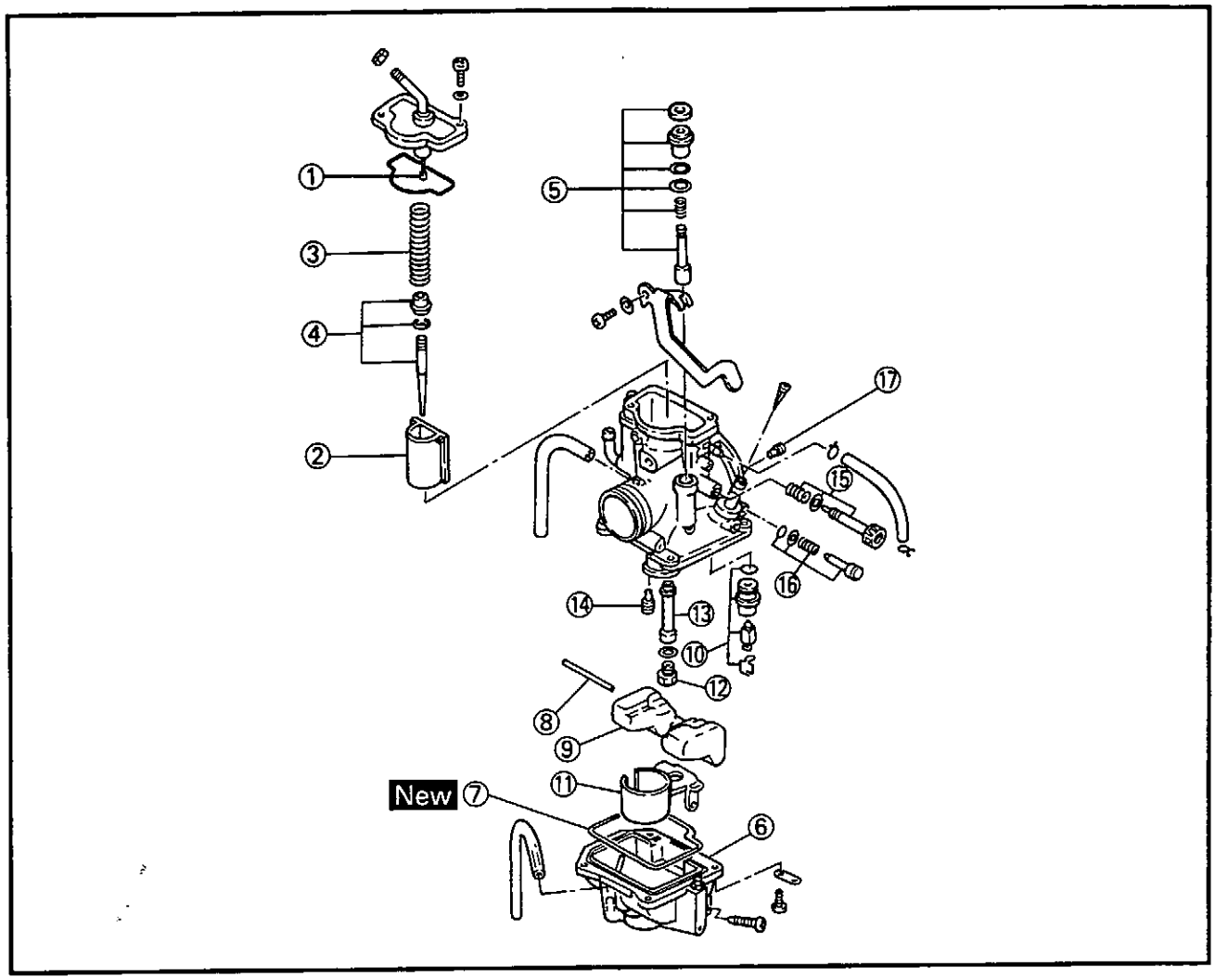


Order	Job/Part	Q'ty	Remarks
	Removing the carburetor		Remove the parts in the order listed.
	Side covers, seat, fuel tank		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
1	Rear shock absorber gas compartment	1	From the stay.
2	Air chamber	1	
3	Carburetor heater hose 1	1	Disconnect.
4	Carburetor heater hose 2	1	Disconnect.
5	Oil delivery hose	1	Disconnect.
6	YPVS chamber	1	
7	Carburetor top	1	
8	Air cleaner case bolt	2	Move the air cleaner case back.
9	Carburetor assembly	1	
			For installation, reverse the removal procedure.

EAS00483



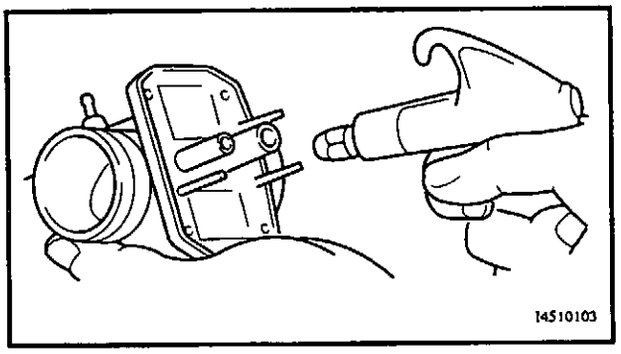
Order	Job/Part	Q'ty	Remarks
	Disassembling the carburetor		Remove the parts in the order listed.
①	Throttle cable	1	
②	Throttle valve	1	
③	Throttle valve spring	1	
④	Jet needle kit	1	
⑤	Starter plunger kit	1	
⑥	Float chamber	1	
⑦	Float chamber rubber gasket	1	
⑧	Float pin	1	
⑨	Float	1	
⑩	Needle valve kit	1	
⑪	Main jet cover	1	
⑫	Main jet	1	
⑬	Needle jet	1	
⑭	Pilot jet	1	
⑮	Throttle stop screw kit	1	



Order	Job/Part	Q'ty	Remarks
⑯	Pilot air screw kit	1	
⑰	Pilot air jet	1	
			For assembly, reverse the disassembly procedure.

EAS00485
CHECKING THE CARBURETOR

1. Check:
   - carburetor body
   - float chamber
     Cracks/damage → Replace.



2. Check:
   - fuel passages
     Obstruction → Clean.

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a. Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solution.

b. Blow out all of the passages and jets with compressed air.

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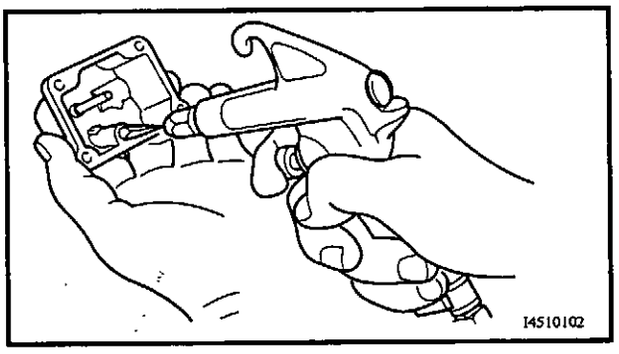
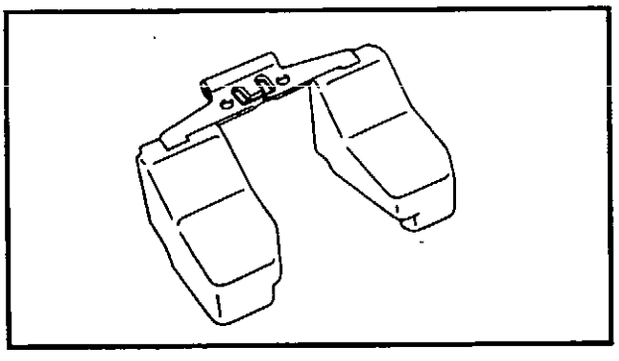
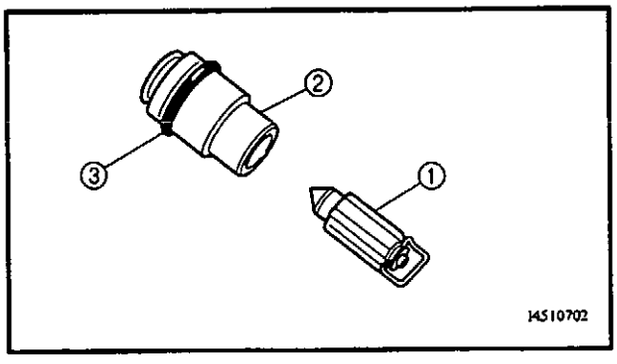


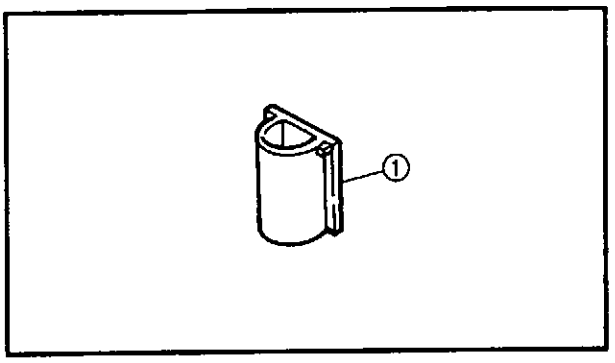
3. Check:
   - float chamber body
     Dirt → Clean.



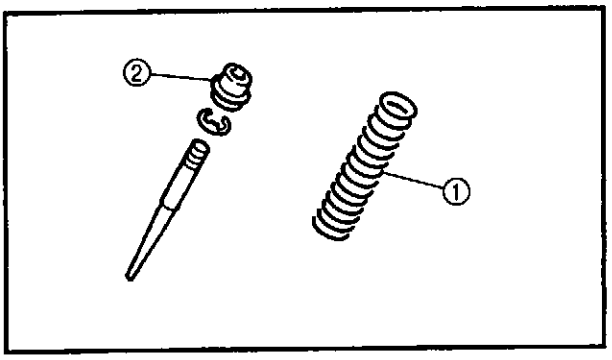
4. Check:
   - float chamber rubber gasket
     Cracks/damage/wear → Replace.
5. Check:
   - float
     Damage → Replace.



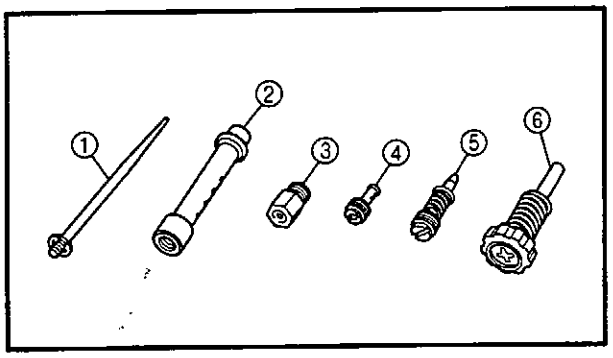
6. Check:
   - needle valve ①
   - needle valve seat ②
     Damage/obstruction/wear → Replace the needle valve, needle valve seat and O-ring as a set.
   - O-ring ③
     Damage/wear → Replace the needle valve, needle valve seat and O-ring as a set.



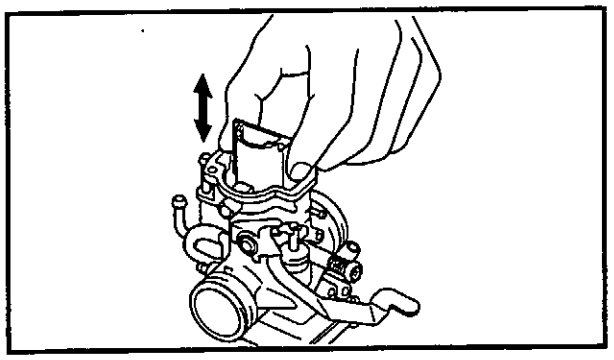
7. Check:
   • throttle valve ①
   Damage/scratches/wear→ Replace.



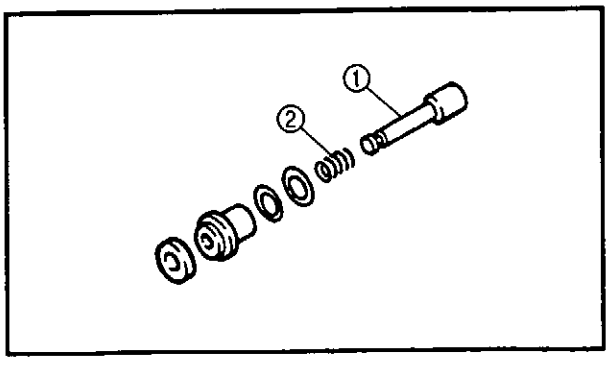
8. Check:
   • throttle valve spring ①
   • jet needle holder ②
   Cracks/damage → Replace.



9. Check:
   • jet needle kit ①
   • needle jet ②
   • main jet ③
   • pilot jet ④
   • pilot air screw ⑤
   • throttle stop screw ⑥
   Bends/damage/wear → Replace.
   Obstruction → Clean.
   Blow out the jets with compressed air.



10. Check:
   • piston valve movement
   Insert the piston valve into the carburetor body and move it up and down.
   Tightness → Replace the piston valve.

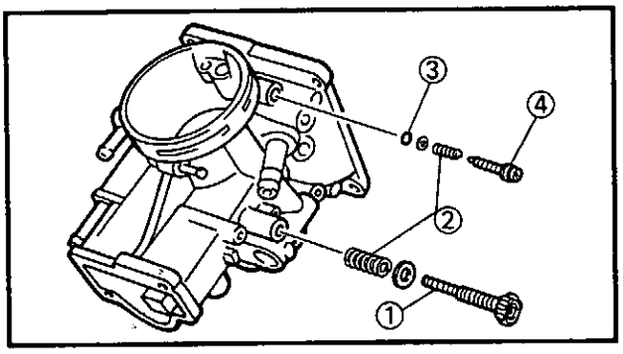


11. Check:
   • starter plunger ①
   • starter plunger spring ②
   Bends/cracks/damage → Replace.

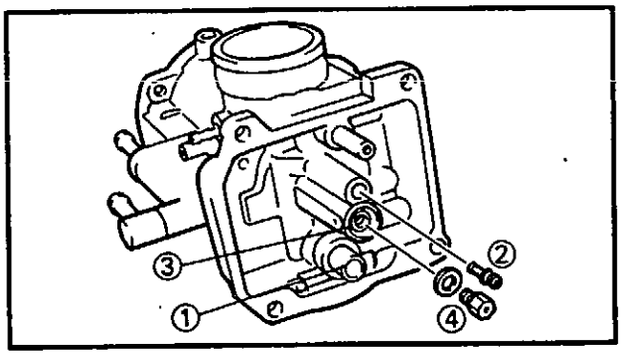
12.Check:
- fuel hose
- oil delivery hose
  Cracks/damage/wear → Replace.
  Obstruction → Clean.
  Blow out the hoses with compressed air.

EAS00487
ASSEMBLING THE CARBURETOR

CAUTION:
- **Before assembling the carburetor, wash all of the parts in a petroleum-based solvent.**
- **Always use a new gasket.**

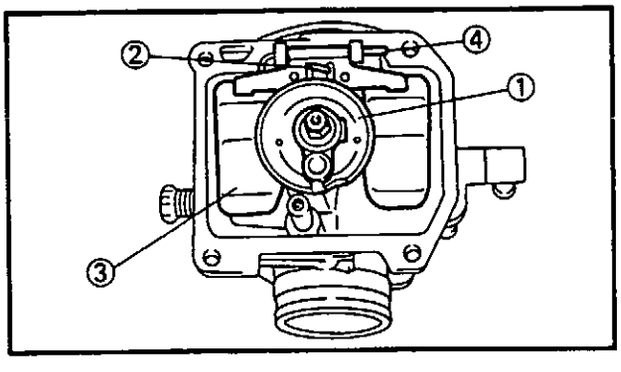


1. Install:
   - throttle stop screw ①
   - spring ②
   - O-ring ③
   - pilot air screw ④



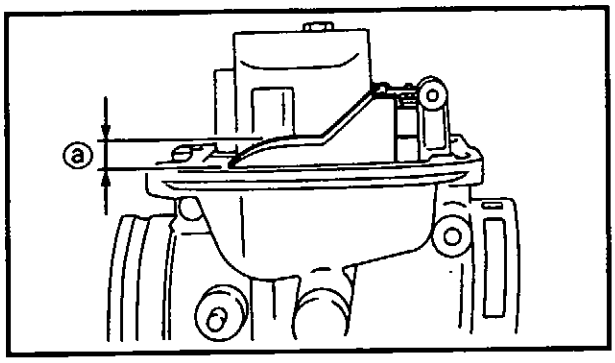
2. Install:
   - needle valve seat ①
   - pilot jet ②
   - needle jet ③
   - main jet ④

NOTE:
Align the projection on the carburetor body with the slot in the needle jet.



3. Install:
   - main jet cover ①
   - needle valve ②
   - float ③
   - float pin ④

NOTE:
Install the needle valve to the float and then install the float to the carburetor body.



4. Measure:
   • float height ⓐ
   Out of specification → Adjust.

	Float height **12.4 ~ 13.4 mm**

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a. Hold the carburetor upside down.

b. Measure the distance from the mating surface of the float chamber (with the gasket removed) to the top of the float.

NOTE:

The float arm should rest on the needle valve without depressing it.

c. If the float height is not within specification, check the needle valve seat and needle valve.

d. If either the needle valve seat or needle valve is worn, replace them both.

e. If both the needle valve seat and needle valve are fine, adjust the float height by bending the float tang ①.

f. Check the float height again.

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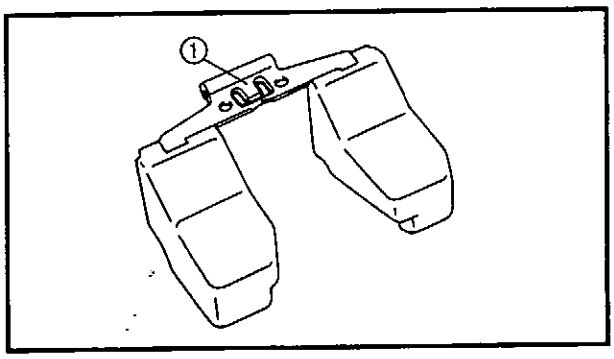
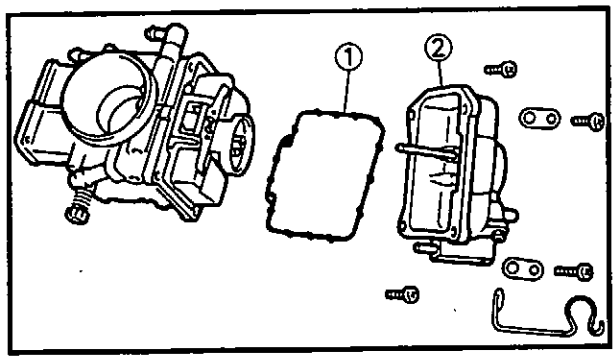
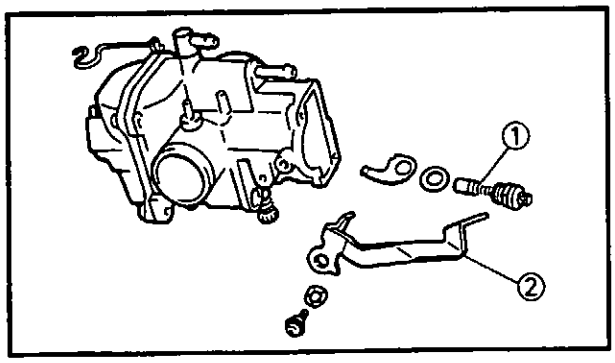
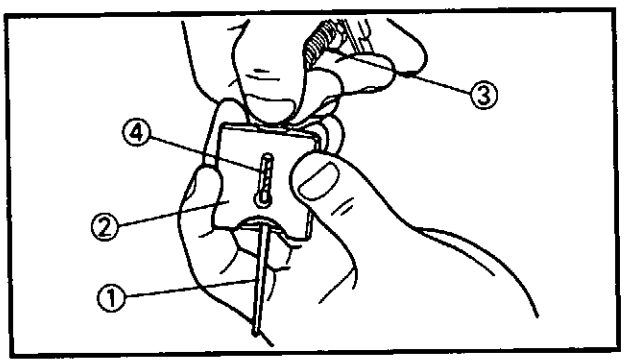




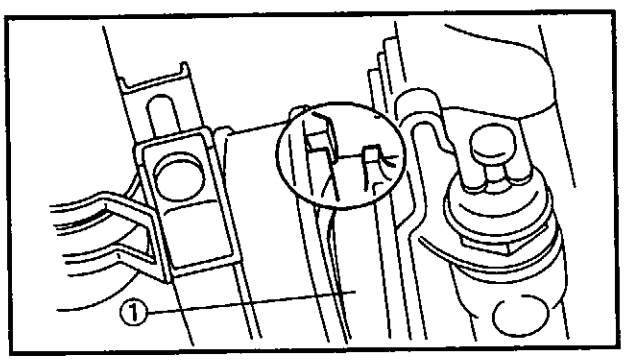
5. Install:
   • float chamber rubber gasket ①
   • float chamber ②



6. Install:
   • starter plunger kit ①
   • starter lever ②



7. Install:
   - jet needle ①
   - piston valve ②
   - throttle valve spring ③
   - throttle cable ④



EAS00492
INSTALLING THE CARBURETOR

1. Install:
   - carburetor assembly ①

NOTE:
Align the groove of the carburetor joint with the projection of the carburetor body.

2. Adjust:
   - engine idling speed

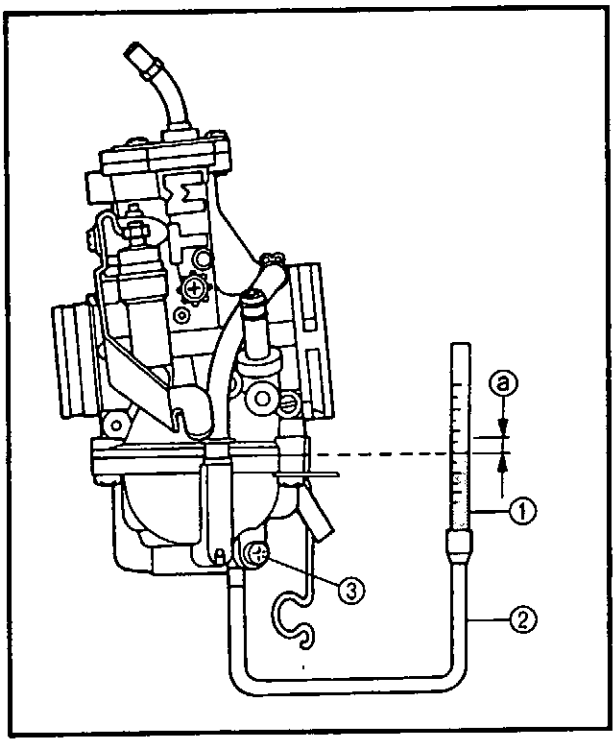
	Engine idling speed **1,300 ~ 1,400 r/min**

Refer to "ADJUSTING THE ENGINE IDLING SPEED" in chapter 3.

3. Adjust:
   - throttle cable free play

	Throttle cable free play (at the flange of the throttle grip) **3 ~ 5 mm**

Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.



EAS00498
MEASURING AND ADJUSTING THE FUEL LEVEL

1. Measure:
   • fuel level ⓐ
   Out of specification → Adjust.

	Fuel level (above the float chamber mating surface) **3 mm**

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a. Stand the motorcycle on a level surface.

b. Place the motorcycle on a suitable stand to ensure that the motorcycle is standing straight up.

c. Install the fuel level gauge ① onto the fuel drain pipe ②.

	Fuel level gauge **90890-01312**

d. Loosen the fuel drain screw ③.

e. Measure the fuel level ⓐ.

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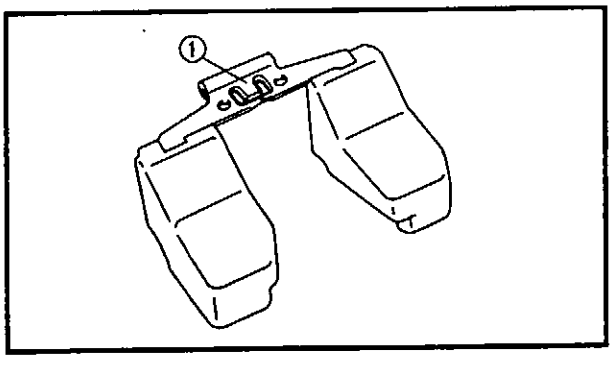

2. Adjust:
   • fuel level

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a. Remove the carburetor.

b. Check the needle valve seat and needle valve.

c. If either is worn, replace them as a set.

d. If both are fine, adjust the float level by slightly bending the float tang ①.

e. Install the carburetor.

f. Measure the fuel level again.

g. Repeat steps (a) to (f) until the fuel level is within specification.

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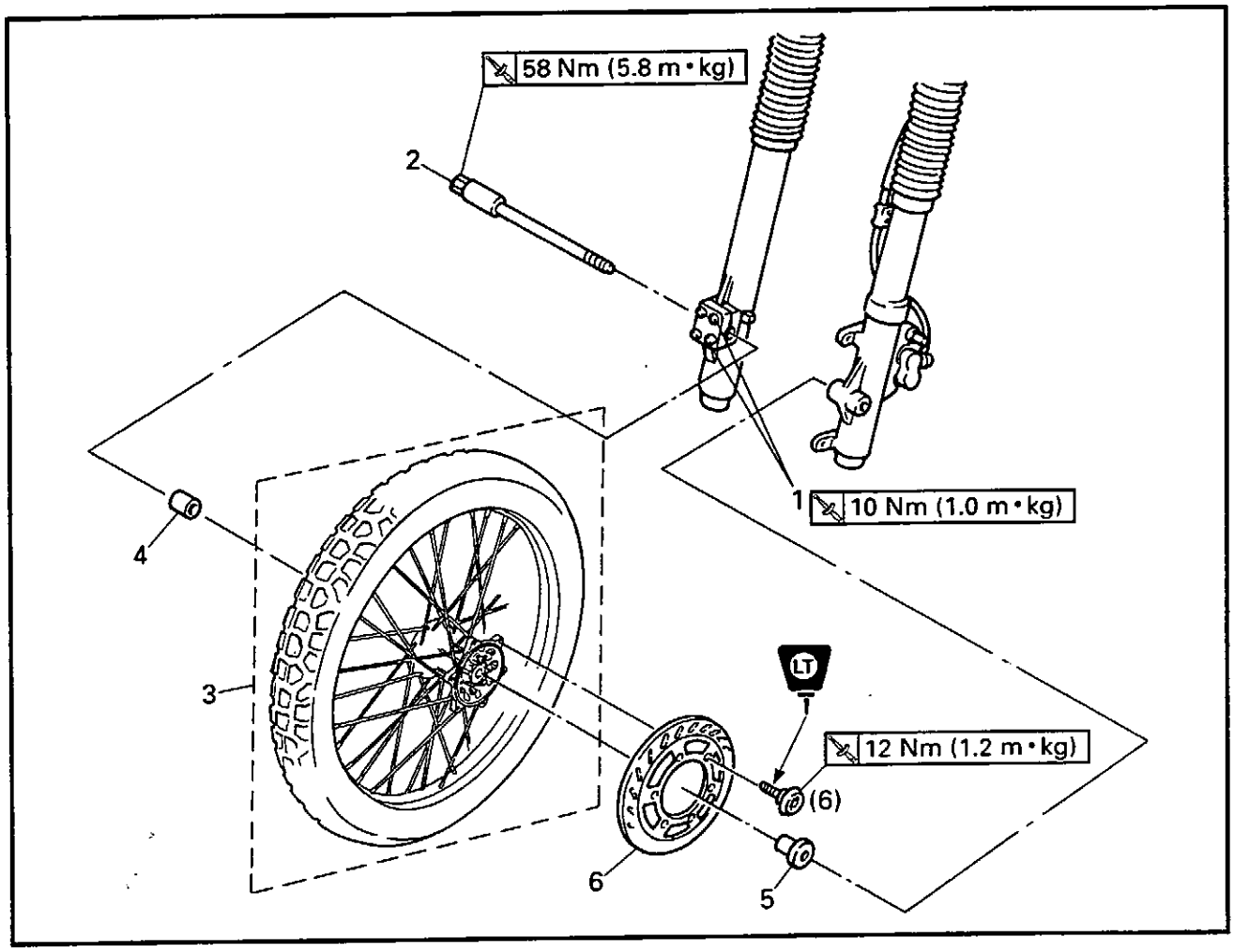
CONTENTS
CHASSIS

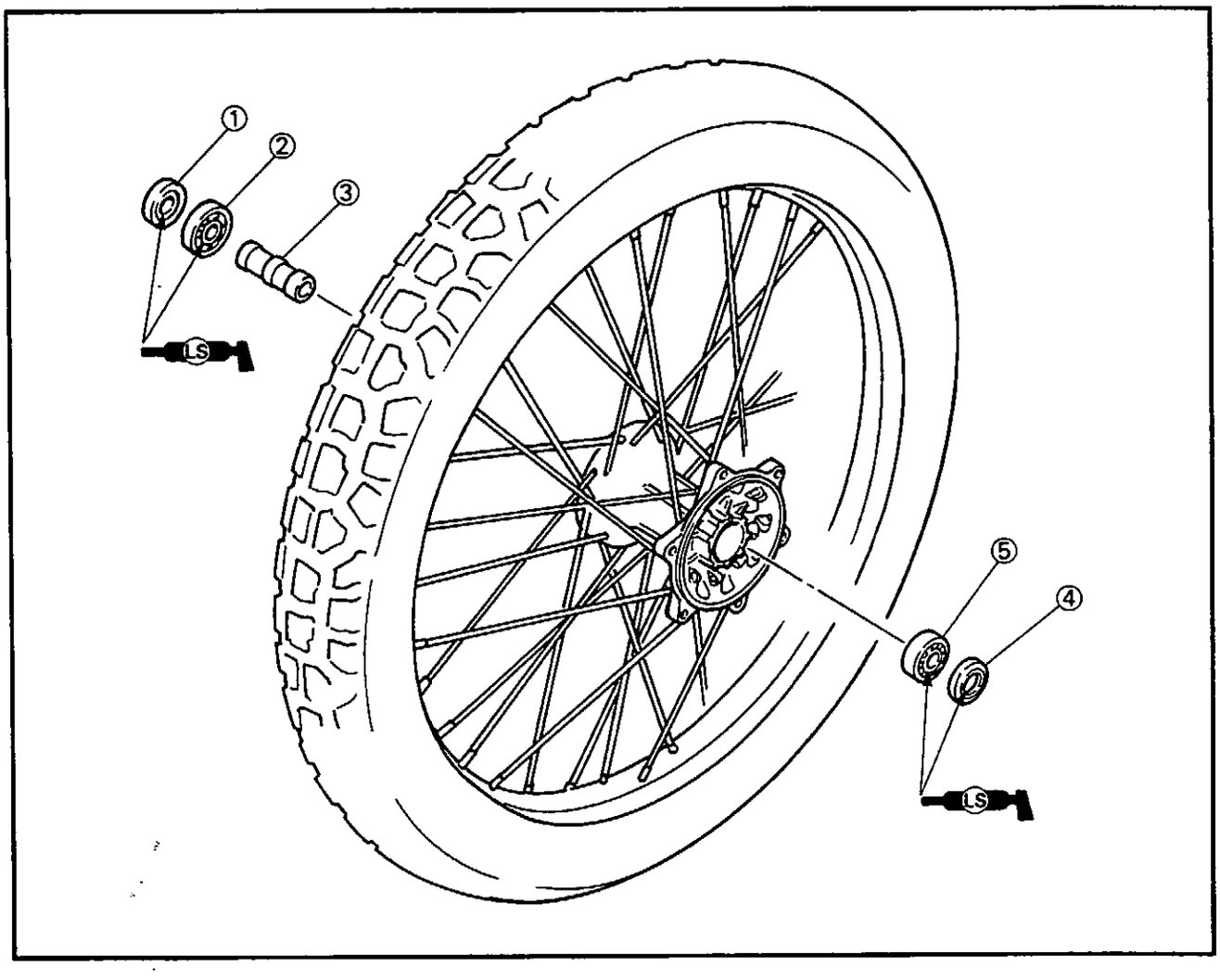
EAS00512

CHASSIS

FRONT WHEEL AND BRAKE DISC



Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake disc		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the front wheel is elevated.
1	Front wheel axle holder nut	4	Loosen.
2	Front wheel axle	1	
3	Front wheel	1	
4	Spacer	1	
5	Collar	1	
6	Brake disc	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Remove the parts in the order listed.
①	Oil seal	1	
②	Bearing	1	
③	Spacer	1	
④	Oil seal	1	
⑤	Bearing	1	
			For assembly, reverse the disassembly procedure.

EAS00519
REMOVING THE FRONT WHEEL

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

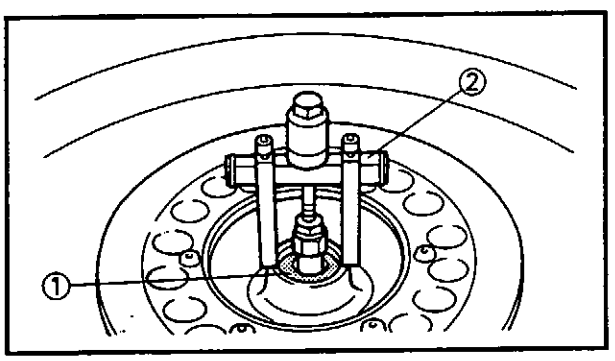
NOTE:

Place the motorcycle on a suitable stand so that the front wheel is elevated.

2. Remove:
   - front wheel

NOTE:

Do not squeeze the brake lever when removing the front wheel.



DISASSEMBLING THE FRONT WHEEL

1. Remove:
   - wheel bearing ①
   - spacer

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a. Clean the outside of the front wheel hub.

b. Remove the wheel bearings with a general bearing puller ②.

⚠ WARNING

Be careful that the front wheel does not fall over; it may damage the brake disc. It the brake disc is damaged, replace it.

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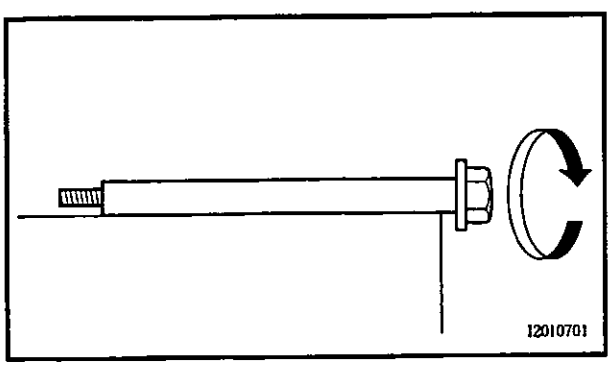


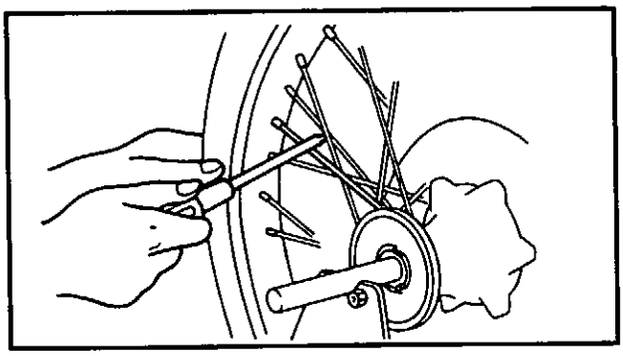
CHECKING THE FRONT WHEEL

1. Check:
   - front wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent wheel axle.

2. Check:
   • tire
   • front wheel
   Damage/wear → Replace.
   Refer to "CHECKING THE TIRES" in chapter 3.

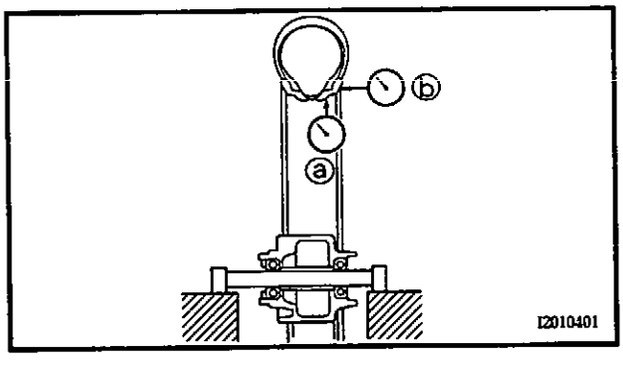


3. Check:
   • spokes
   Bends/damage → Replace.
   Loose → Tighten.
   Tap the spokes with a screwdriver.

NOTE:
A tight spoke will emit a clear, ringing tone, a loose spoke will sound flat.

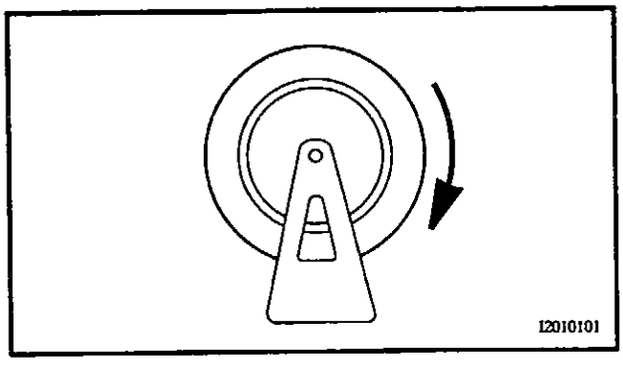
4. Tighten:
   • spokes — 3 Nm (0.3 m · kg)

NOTE:
After tightening the spokes, measure the front wheel runout.

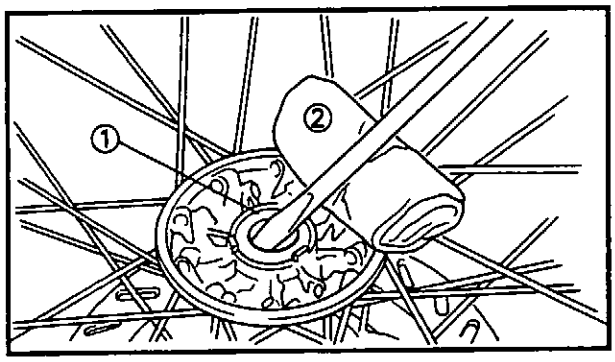


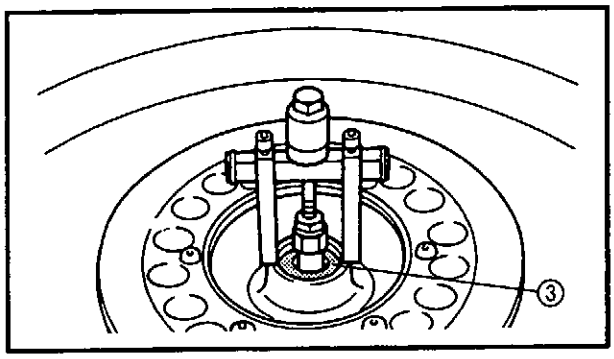
5. Measure:
   • radial wheel runout ⓐ
   • lateral wheel runout ⓑ
   Over the specified limits → Replace.

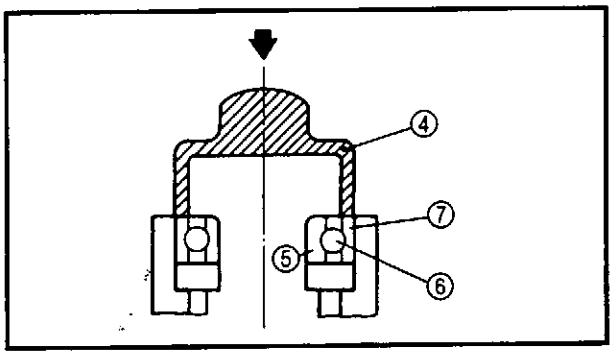
Maximum radial wheel runout
1 mm
Maximum lateral wheel runout
0.5 mm

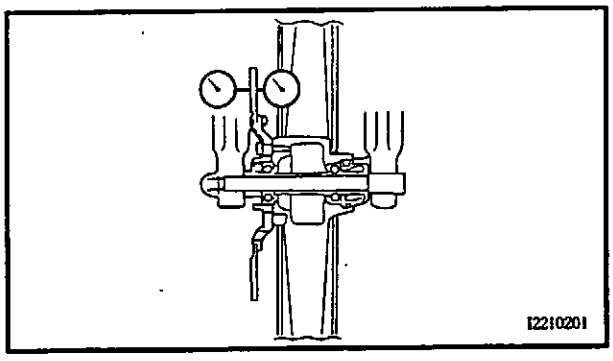


6. Check:
   • wheel bearings
   Front wheel turns roughly or is loose → Replace the wheel bearings.
   • oil seals
   Damage/wear → Replace.









7. Replace:
   - wheel bearings New
   - oil seals New

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a. Clean the outside of the front wheel hub.

b. Remove the oil seals ① with a flat-head screwdriver.

NOTE:

To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.

c. Remove the wheel bearings ③ with a general bearing puller.

d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

CAUTION:

Do not contact the wheel bearing inner race ⑤ or balls ⑥. Contact should be made only with the outer race ⑦.

NOTE:

Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

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EAS00531

CHECKING THE BRAKE DISCS

The following procedure applies to all of the brake discs.

1. Check:
   - brake disc
     Damage/galling → Replace.
2. Measure:
   - brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.

Maximum brake disc deflection
Front: 0.15 mm
Rear: 0.15 mm

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a. Place the motorcycle on a suitable stand so that the wheel is elevated.

b. Before measuring the front brake disc deflection, turn the handlebar to the left

or right to ensure that the front wheel is stationary.

c. Remove the brake caliper.

d. Hold the dial gauge at a right angle against the brake disc surface.

e. Measure the deflection 2 ~ 3 mm below the edge of the brake disc.

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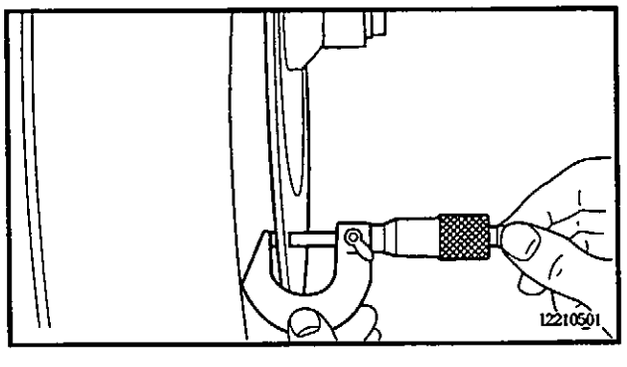
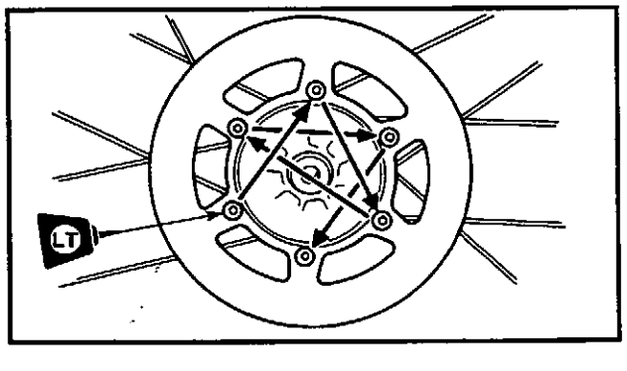


3. Measure:
• brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.

Minimum brake disc thickness
Front: 3.5 mm
Rear: 4.5 mm



4. Adjust:
• brake disc deflection

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a. Remove the brake disc.

b. Rotate the brake disc by one bolt hole.

c. Install the brake disc.

NOTE:
Tighten the brake disc bolts in stages and in a crisscross pattern.

Brake disc bolt
12 Nm (1.2 m • kg)
LOCTITE®

d. Measure the brake disc deflection.

e. If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.

f. If the brake disc deflection cannot be brought within specification, replace the brake disc.

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EAS00539
ASSEMBLING THE FRONT WHEEL

1. Install:
   - wheel bearings
   - oil seals New

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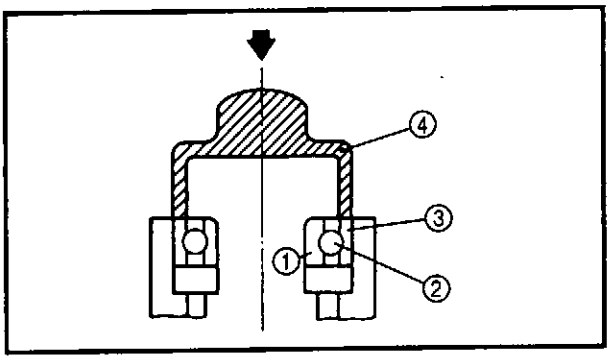
a. Install the new wheel bearings and oil seals in the reverse order of disassembly.



CAUTION:

Do not contact the wheel bearing inner race ① or balls ②. Contact should be made only with the outer race ③.

NOTE:

Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

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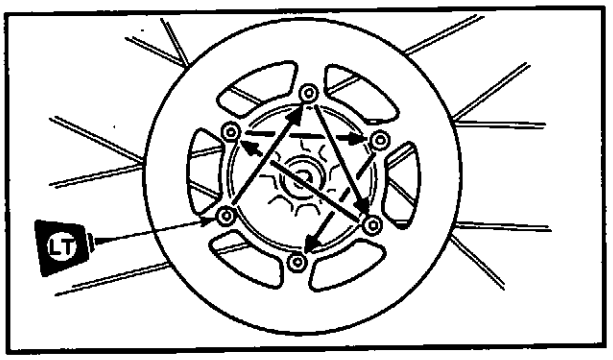
EAS00546
INSTALLING THE FRONT WHEEL

1. Lubricate:
   - wheel bearings
   - oil seal lips

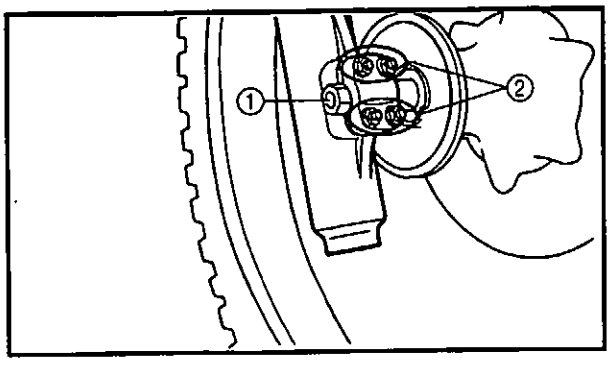
	Recommended lubricant Lithium soap base grease



2. Install:
   - brake disc — **12 Nm (1.2 m · kg)**

NOTE:

- Apply LOCTITE® 648 to the threads of the brake disc bolts.
- Tighten the brake disc bolts in stages and in a crisscross pattern.



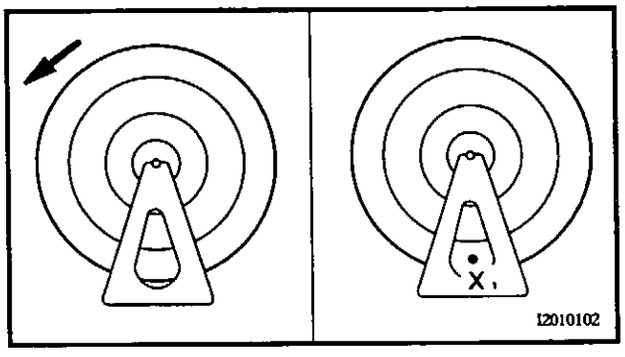
3. Tighten:
   - front wheel axle ① — **58 Nm (5.8 m · kg)**
   - front wheel axle holder nut ② — **10 Nm (1.0 m · kg)**

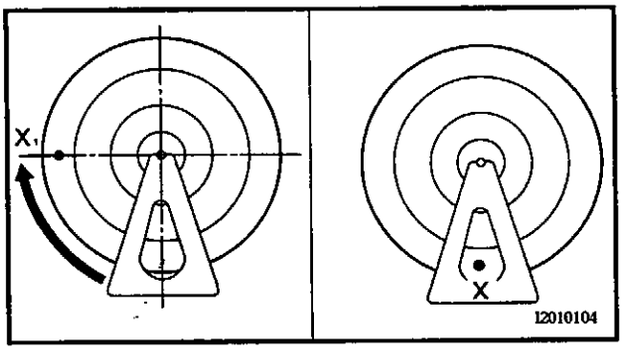
CAUTION:

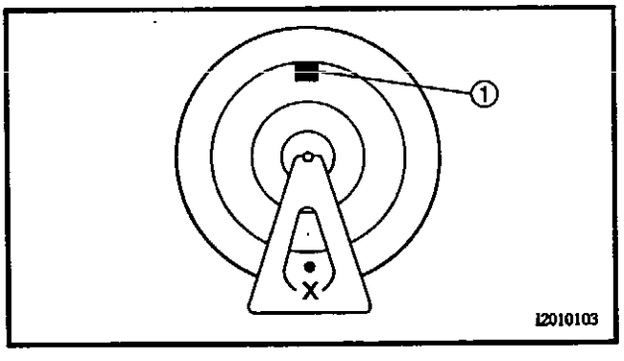
Before tightening the wheel axle nut, push down hard on the handlebar several times and check if the front fork rebounds smoothly.

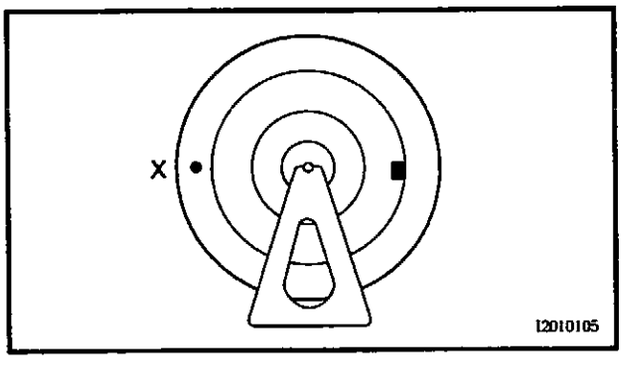
EAS00548
ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel, or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.









1. Remove:
   - balancing weight(-s)
2. Find:
   - front wheel's heavy spot

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a. Place the front wheel on a suitable balancing stand.

b. Spin the front wheel.

c. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.

d. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.

e. Release the front wheel.

f. When the wheel stops, put an "X_2" mark at the bottom of the wheel.

g. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.

h. The spot where all the marks come to rest is the front wheel's heavy spot "X".

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3. Adjust:
   - front wheel static balance

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a. Install a balancing weight ① onto the rim exactly opposite the heavy spot "X".

NOTE:
Start with the lightest weight.

b. Turn the front wheel 90° so that the heavy spot is positioned as shown.

c. If the heavy spot does not stay in that position, install a heavier weight.

d. Repeat steps (b) and (c) until the front wheel is balanced.

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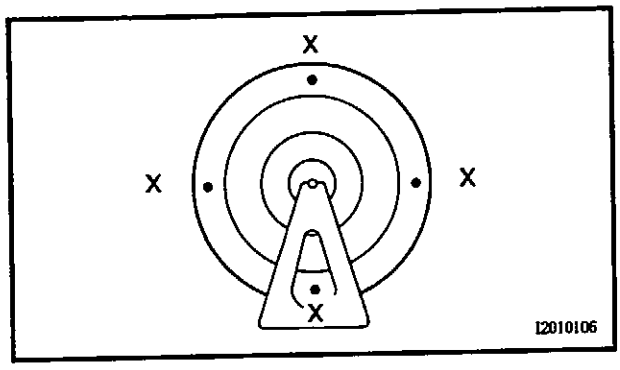

4. Check:
   • front wheel static balance

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a. Turn the front wheel and make sure it stays at each position shown.

b. If the front wheel does not remain stationary at all of the positions, rebalance it.

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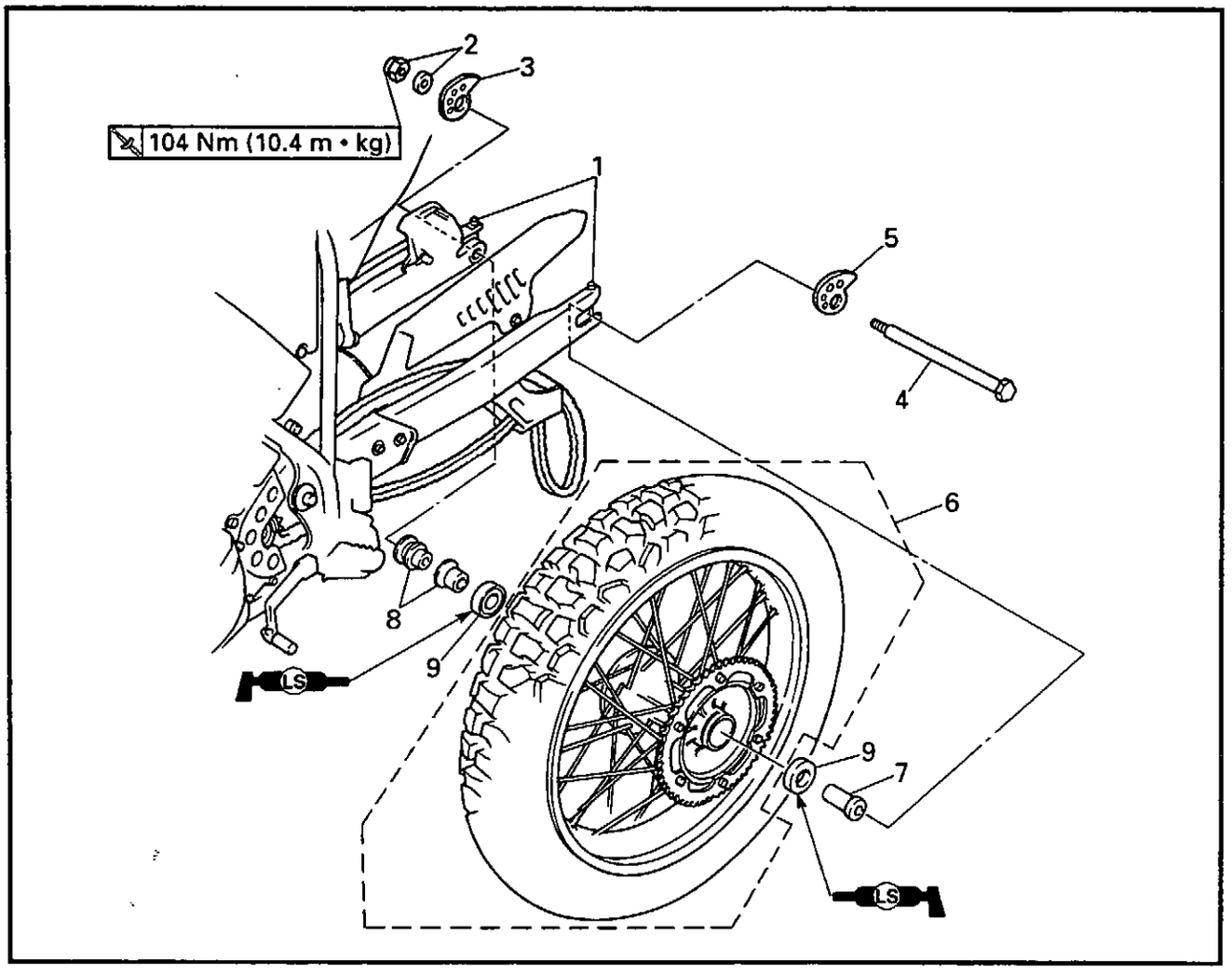
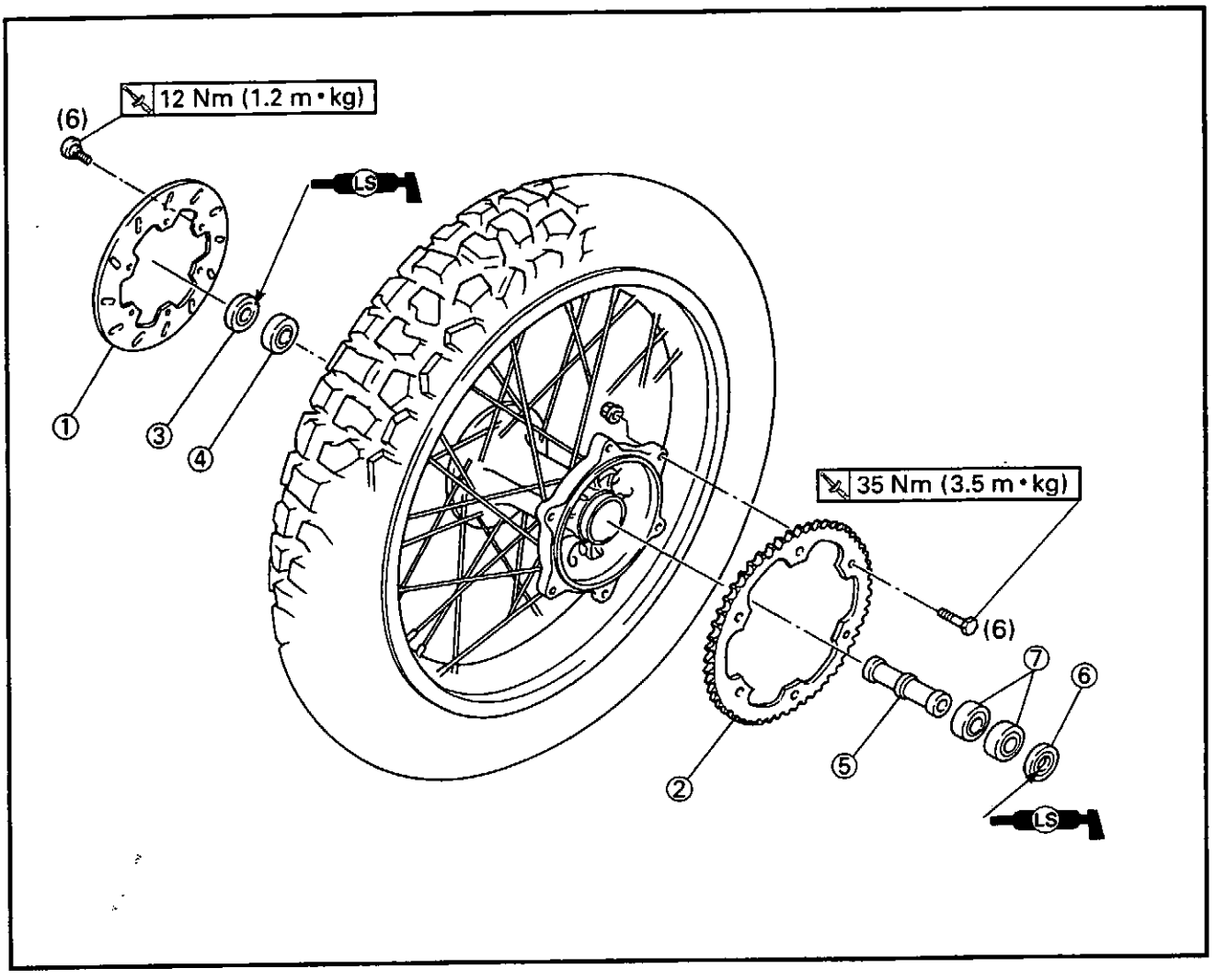
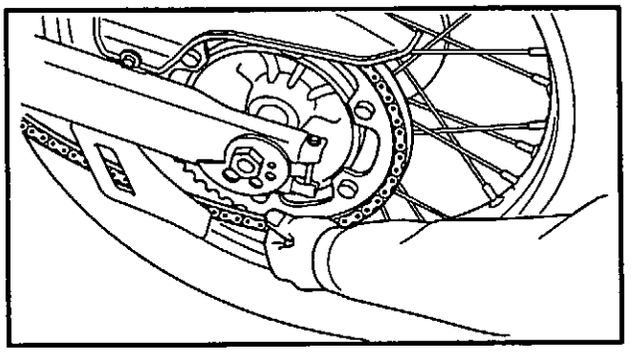
EAS00550
REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed.
			NOTE: Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Rear arm end bolt	2	Loosen.
2	Rear wheel axle nut/washer	1/1	
3	Right chain puller	1	
4	Rear wheel axle	1	
5	Left chain puller	1	
6	Rear wheel	1	
7	Collar	1	
8	Collar	2	
9	Oil seal cover	2	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear wheel		Remove the parts in the order listed.
①	Rear brake disc	1	
②	Rear wheel sprocket	1	
③	Oil seal	1	
④	Bearing	1	
⑤	Spacer	1	
⑥	Oil seal	1	
⑦	Bearing	2	
			For assembly, reverse the disassembly procedure.



REMOVING THE REAR WHEEL

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

NOTE:

Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - rear wheel axle nut/washer
   - right chain puller
   - rear wheel axle
   - left chain puller
   - rear wheel

NOTE:

- Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.
- Do not depress the brake pedal when removing the brake caliper.

EAS00566

CHECKING THE REAR WHEEL

1. Check:
   - rear wheel axle
   - rear wheel
   - wheel bearings
   - oil seals

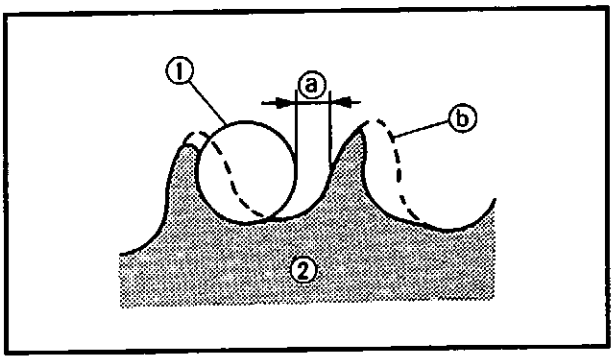
   Refer to "FRONT WHEEL AND BRAKE DISC".

2. Check:
   - tire
   - rear wheel

   Damage/wear → Replace.
   Refer to "CHECKING THE TIRES" in chapter 3.
3. Check:
   - spokes

   Refer to "FRONT WHEEL AND BRAKE DISC".

4. Measure:
   • radial wheel runout
   • lateral wheel runout
   Refer to "FRONT WHEEL AND BRAKE DISC".



EAS00568
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:
   • rear wheel sprocket
   More than 1/4 tooth ⓐ wear → Replace the rear wheel sprocket.
   Bent teeth → Replace the rear wheel sprocket.

ⓑ Correct
① Drive chain roller
② Rear wheel sprocket

2. Replace:
   • rear wheel sprocket

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a. Remove the self-locking nuts and the rear wheel sprocket.
b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
c. Install the new rear wheel sprocket.

	Rear wheel sprocket bolt **35 Nm (3.5 m • kg)**

NOTE:
Tighten the self-locking nuts in stages and in a crisscross pattern.

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INSTALLING THE REAR WHEEL

1. Lubricate:
   • wheel bearings
   • oil seal lips

	Recommended lubricant **Lithium soap base grease**

2. Install:
   • rear wheel
3. Adjust:
   • drive chain slack

Drive chain slack
40 ~ 60 mm

Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in chapter 3.

4. Tighten:
   • rear wheel axle nut/washer

104 Nm (10.4 m · kg)

   • rear arm end bolt

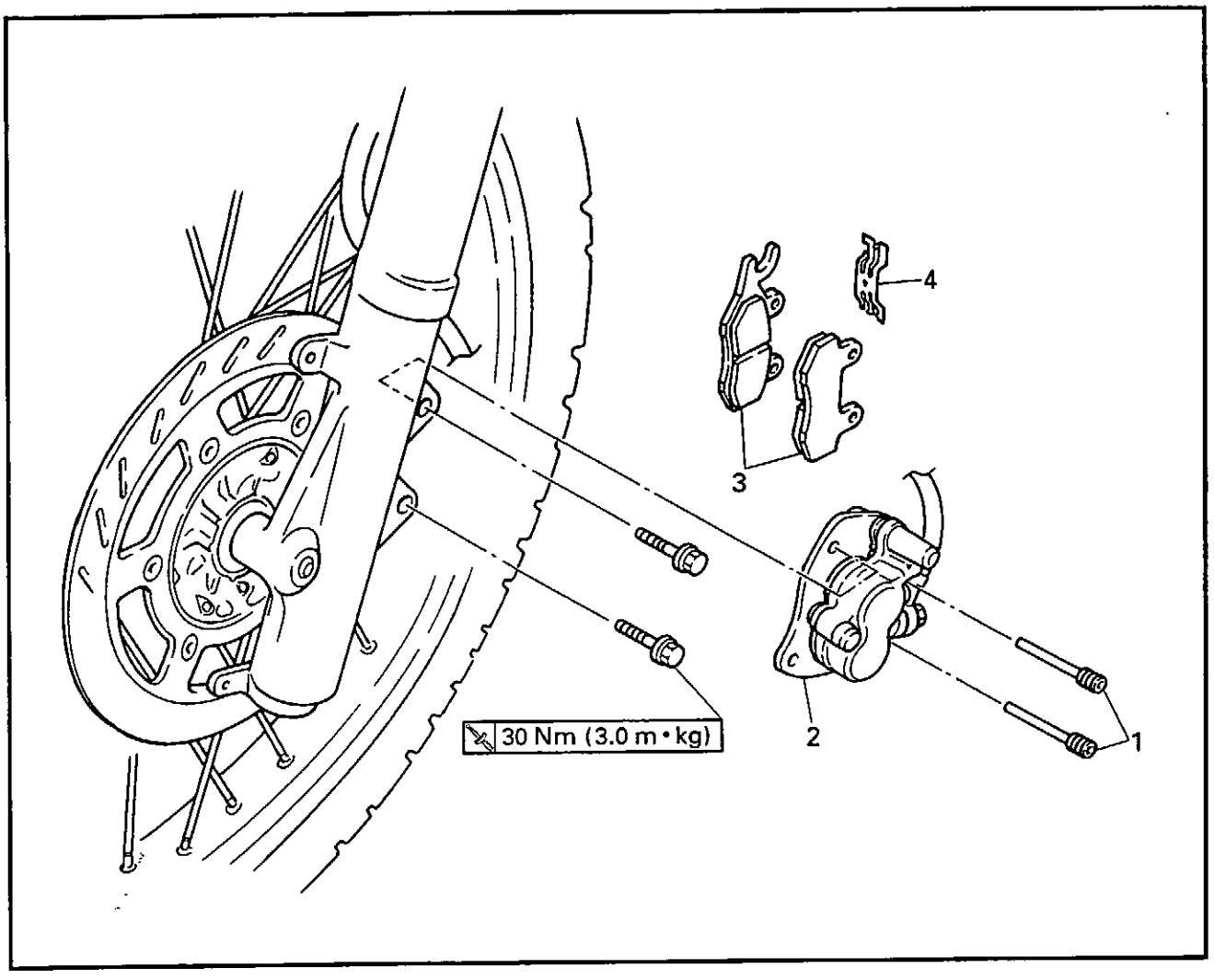
3 Nm (0.3 m · kg)

EAS00575
ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel, or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.

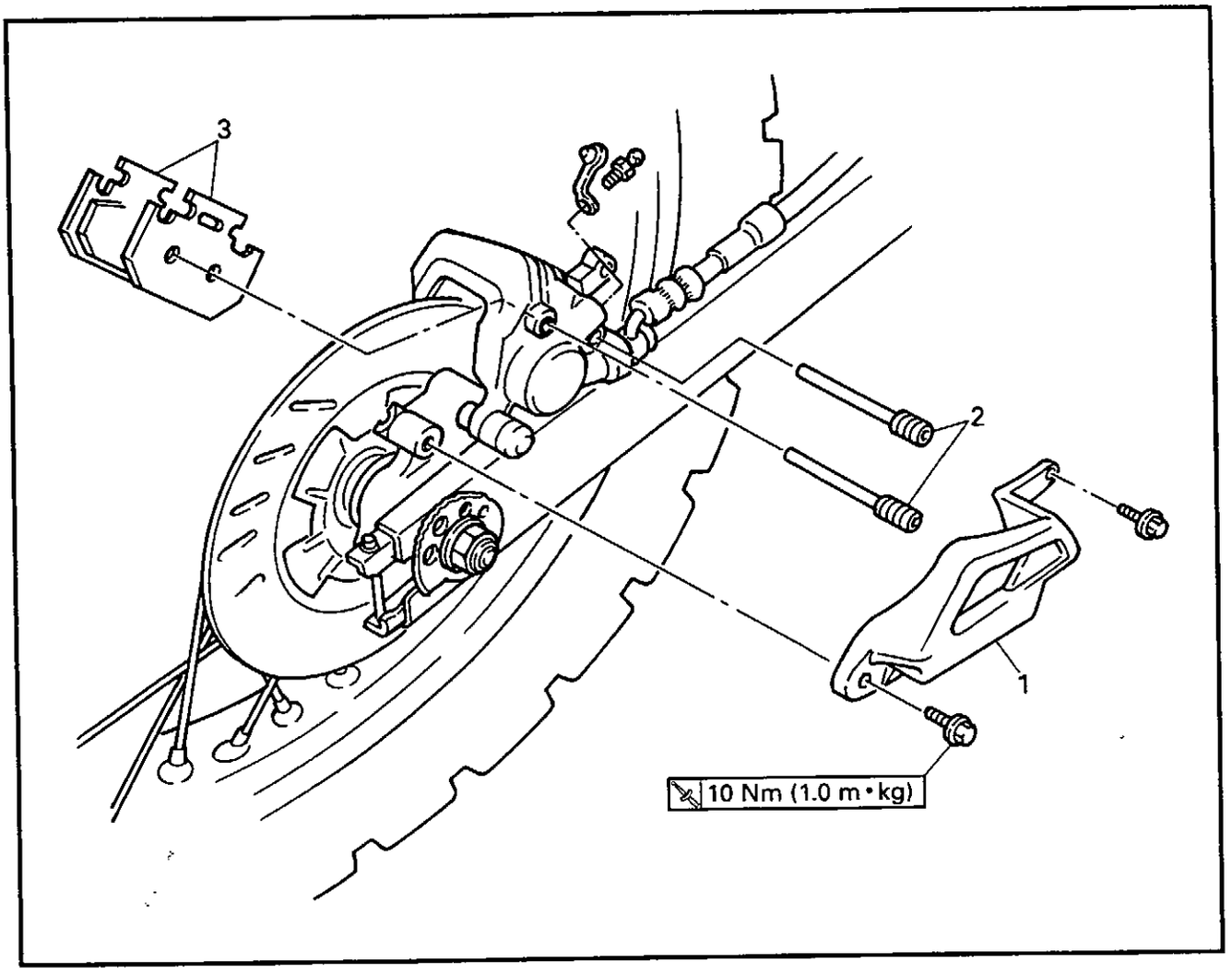
1. Adjust:
   • rear wheel static balance
   Refer to "FRONT WHEEL AND BRAKE DISC".

EAS00577
FRONT AND REAR BRAKES
FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed.
1	Brake pad pin	2	
2	Brake caliper	1	
3	Brake pad	2	
4	Brake pad spring	1	
			For installation, reverse the removal procedure.

EAS00578
REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		Remove the parts in the order listed.
1	Brake caliper protector	1	
2	Brake pad pin	2	
3	Brake pad	2	
			For installation, reverse the removal procedure.

EAS00579

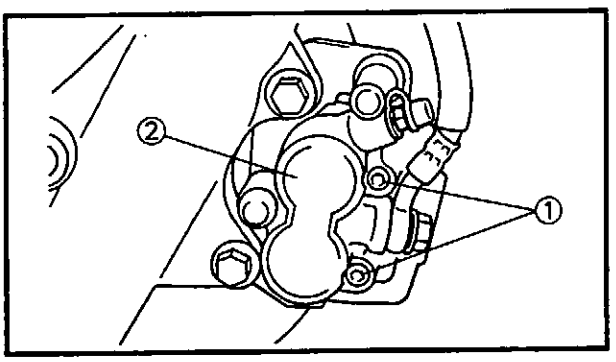
CAUTION:

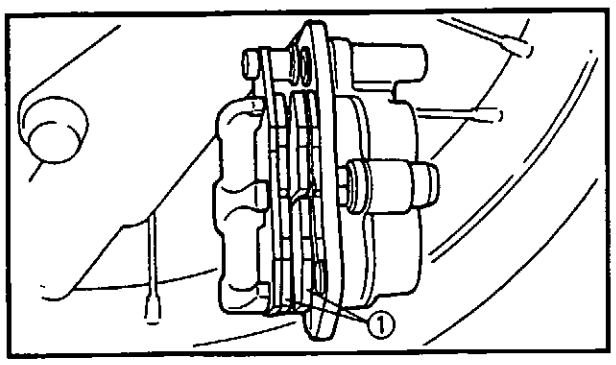
Disc brake components rarely require disassembly.
Therefore, always follow these preventive measures:

- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.**
- **Never use solvents on internal brake components.**
- **Use only clean or new brake fluid for cleaning brake components.**
- **Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.**
- **Avoid brake fluid coming into contact with the eyes as it can cause serious injury.**

FIRST AID FOR BRAKE FLUID ENTERING THE EYES:

- **Flush with water for 15 minutes and get immediate medical attention.**





REPLACING THE FRONT BRAKE PADS

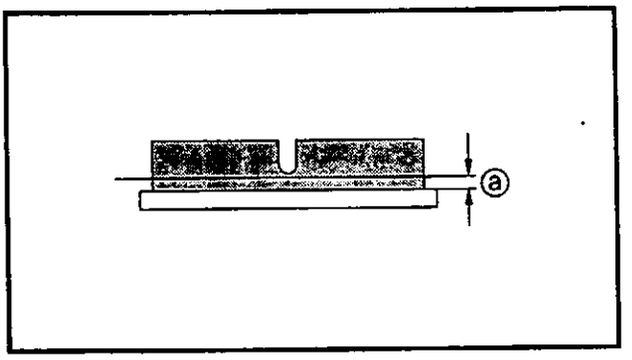
NOTE:

When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Loosen:
   - brake pad pins ①
   - brake caliper bolt
   - brake caliper ②
2. Remove:
   - brake pads ①
   - brake pad spring

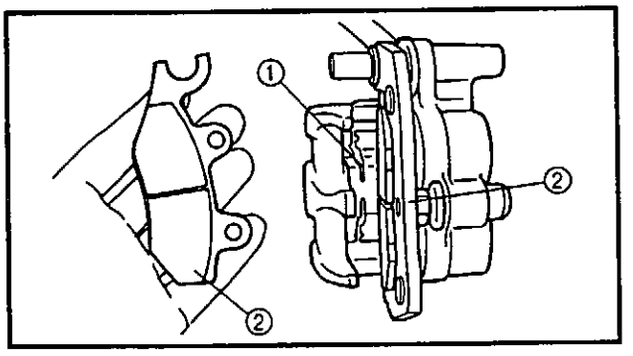
NOTE:

Do not squeeze the brake lever when removing the brake pads.



3. Measure:
   • brake pad thickness ⓐ
   Out of specification → Replace the brake pads as a set.

Minimum brake pad thickness
1.0 mm



4. Install:
   • brake pad spring ①
   • brake pads ②

NOTE:
Always install new brake pads and a new brake pad spring as a set.

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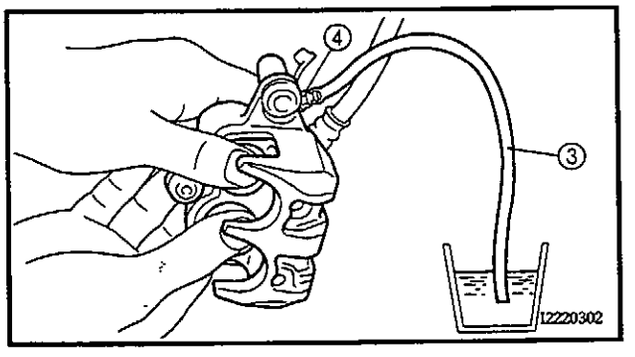
a. Connect a clear plastic hose ③ tightly to the bleed screw ④. Put the other end of the hose into an open container.

b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.

c. Tighten the bleed screw.



Bleed screw
6 Nm (0.6 m • kg)

NOTE:
• Install the inner brake pad so that portion ⓐ is aligned with the projection ⓑ of the brake caliper.
• Make sure the brake pad spring is installed correctly as shown.

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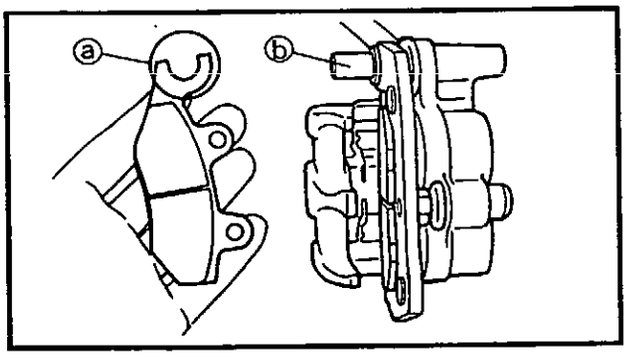
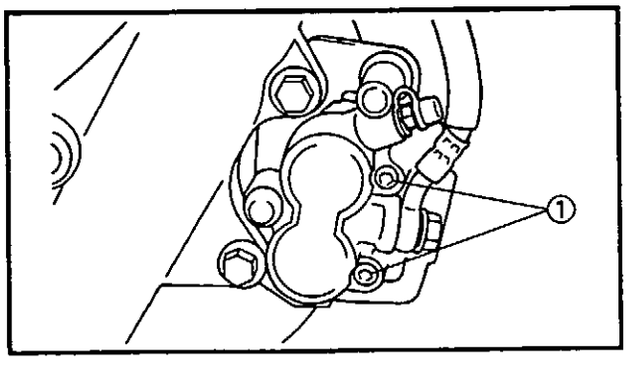
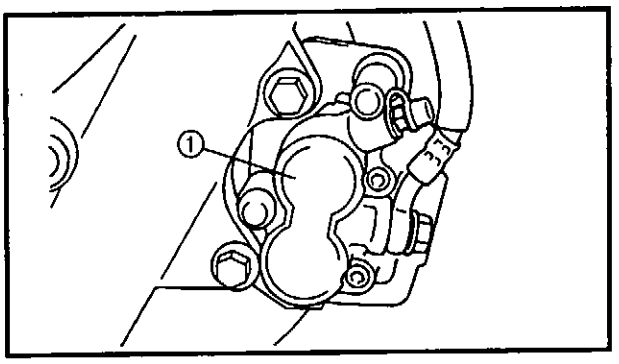
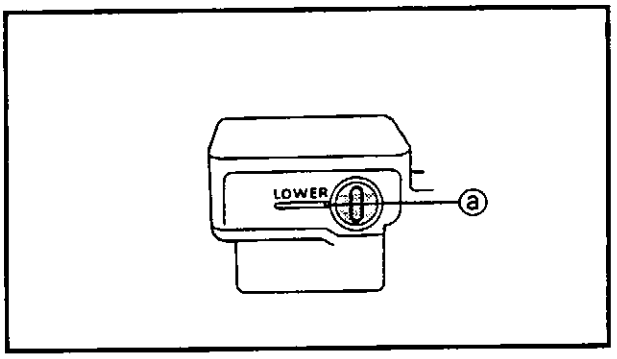




5. Install:
   • brake pad pins ①

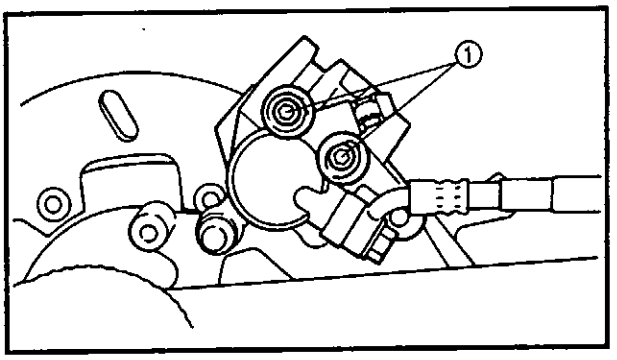


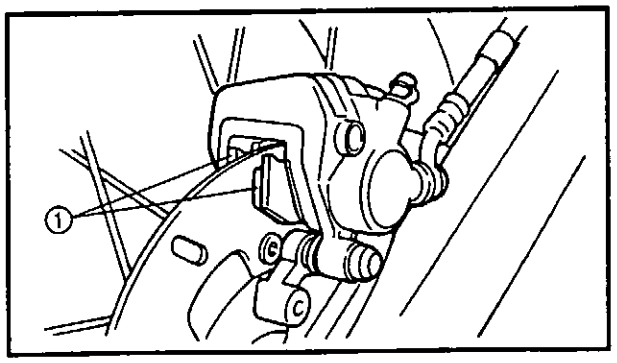
6. Install:
   • brake caliper ① 30 Nm (3.0 m · kg)



7. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

8. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.





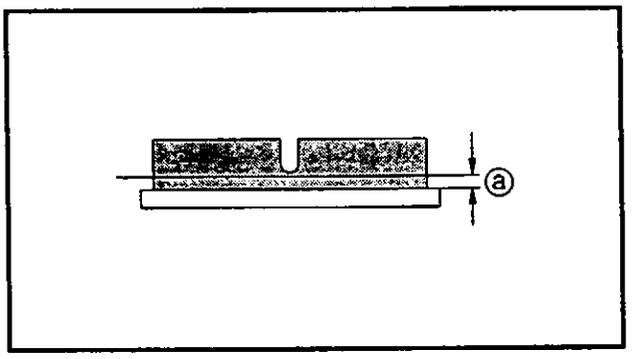
EAS00583
REPLACING THE REAR BRAKE PADS

NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Remove:
   • brake caliper protector
   • brake pad pins ①

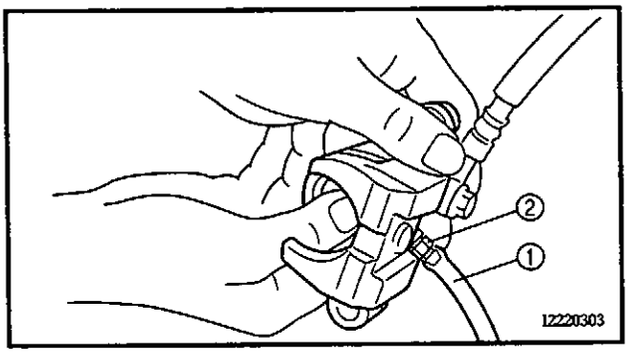
2. Remove:
   • brake pads ①

NOTE:
Do not depress the brake pedal when removing the brake pads.



3. Measure:
   • brake pad thickness ⓐ
   Out of specification → Replace the brake pads as a set.

Minimum brake pad thickness
1.0 mm



4. Install:
   • brake pads

NOTE:
Always install new brake pads, and a brake pad spring as a set.

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a. Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.

b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.

c. Tighten the bleed screw.

Bleed screw
6 Nm (0.6 m • kg)

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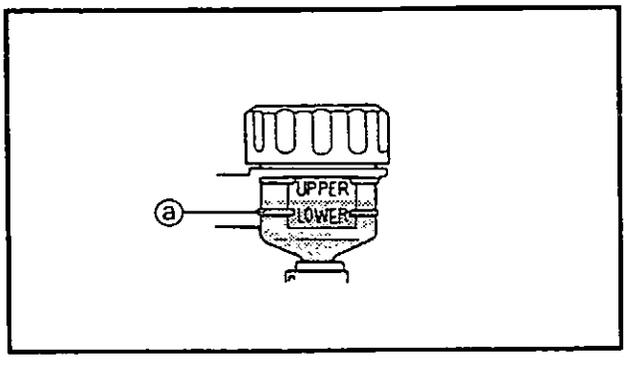
5. Install:
   • brake pad pins
   • brake caliper protector

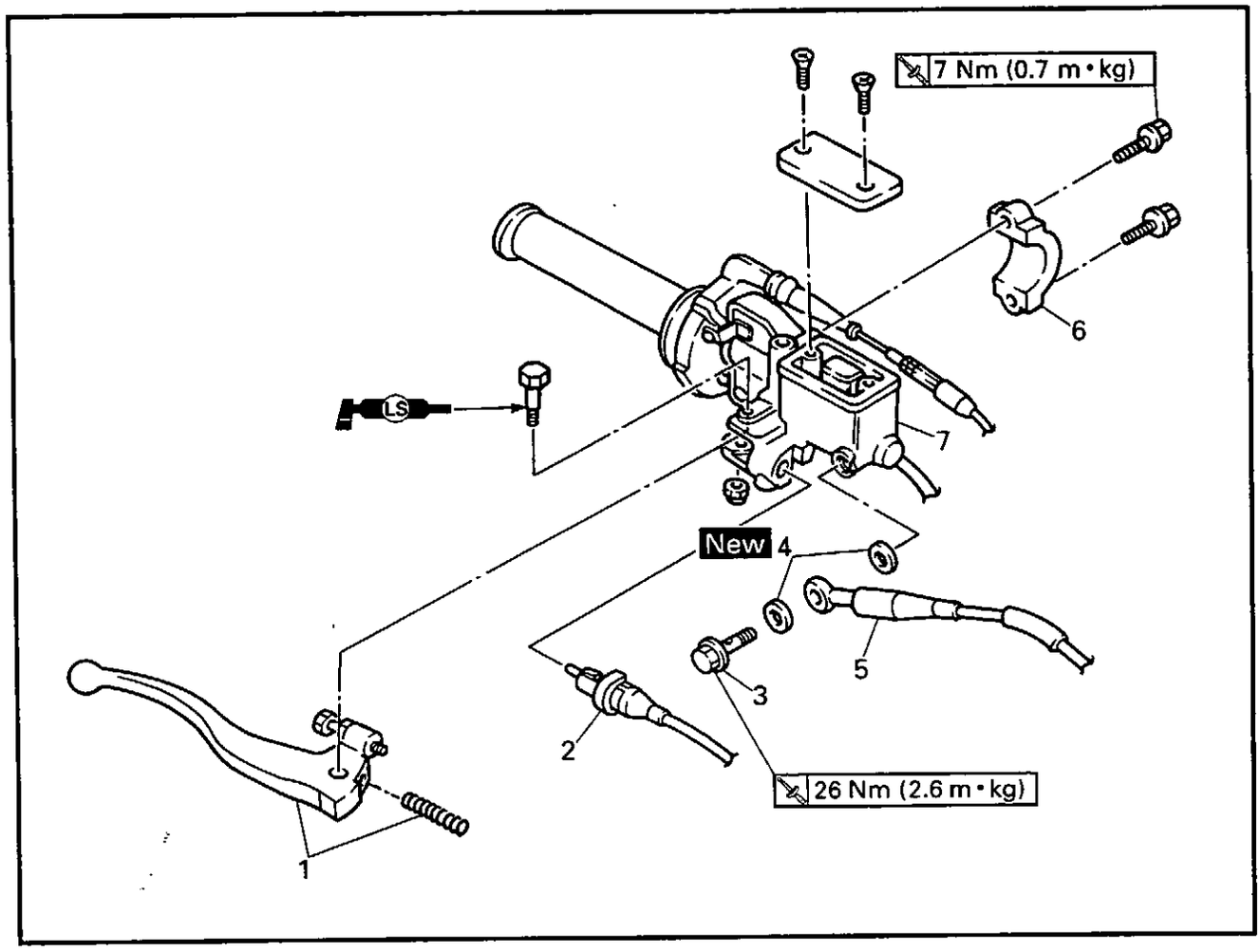
10 Nm (1.0 m • kg)



6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

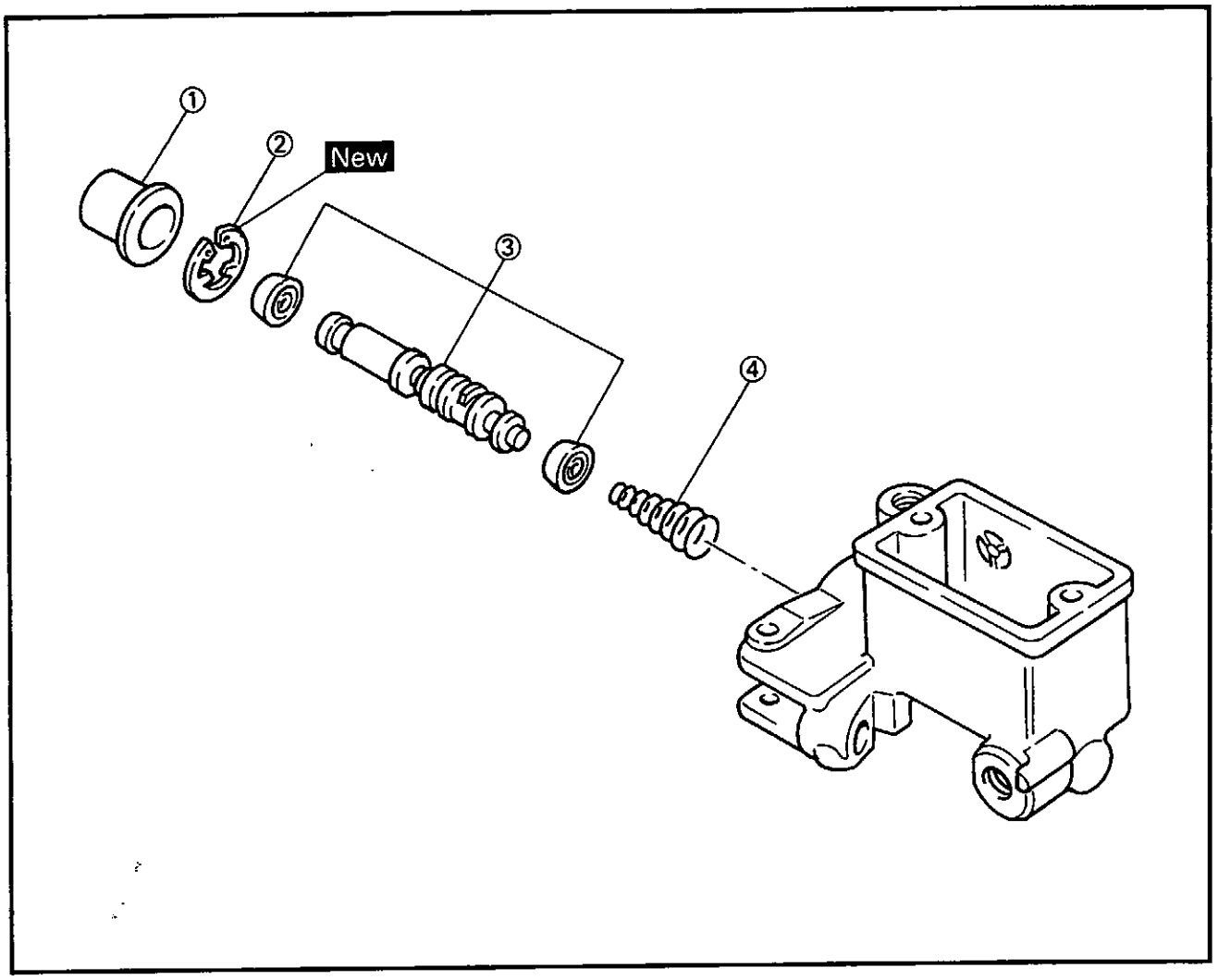
7. Check:
   • brake pedal operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

EAS00584
FRONT BRAKE MASTER CYLINDER



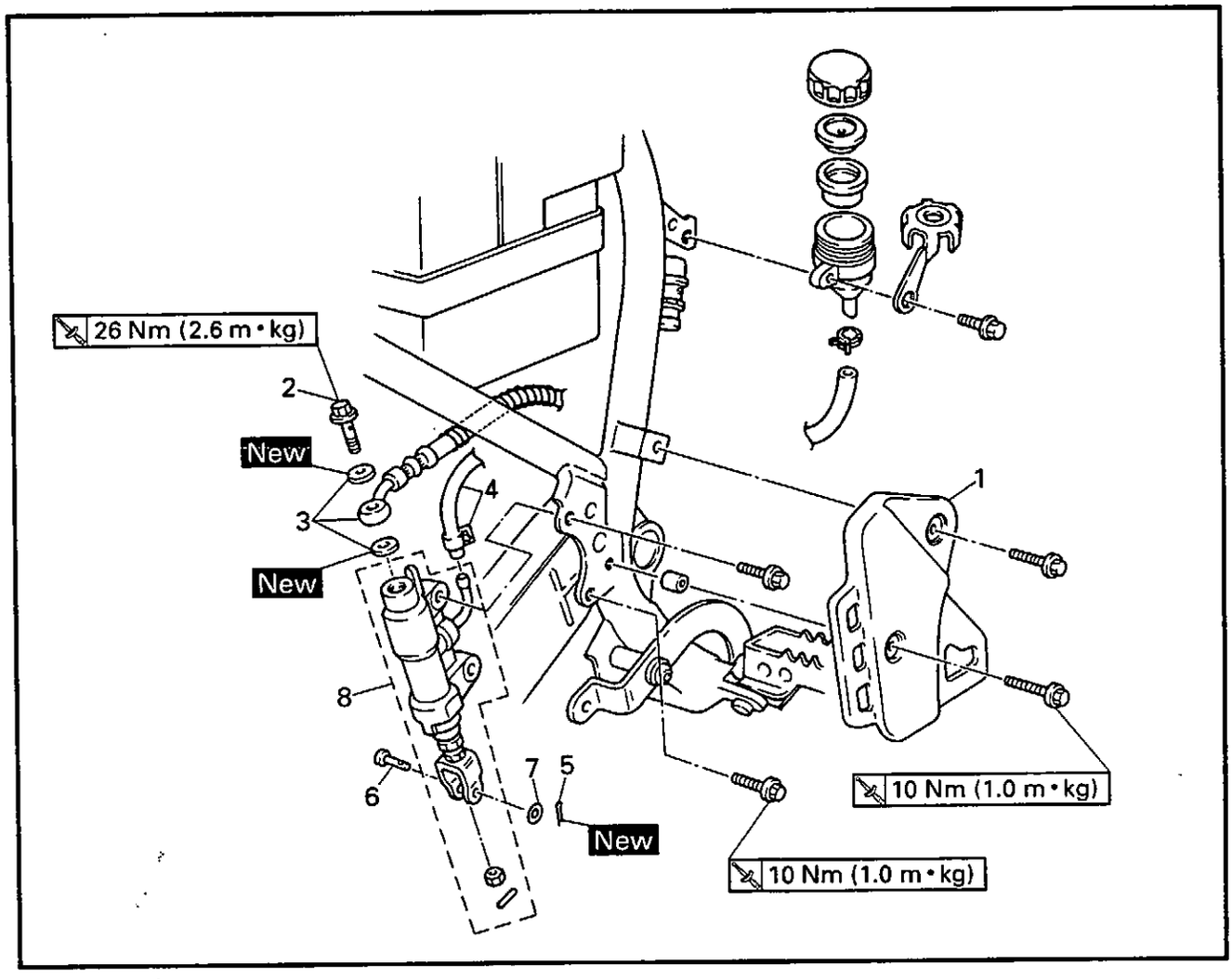
Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake lever/spring	1/1	
2	Front brake switch	1	
3	Union bolt	1	
4	Copper washer	2	
5	Brake hose	1	
6	Brake master cylinder holder	1	
7	Brake master cylinder	1	
			For installation, reverse the removal procedure.

EAS00585



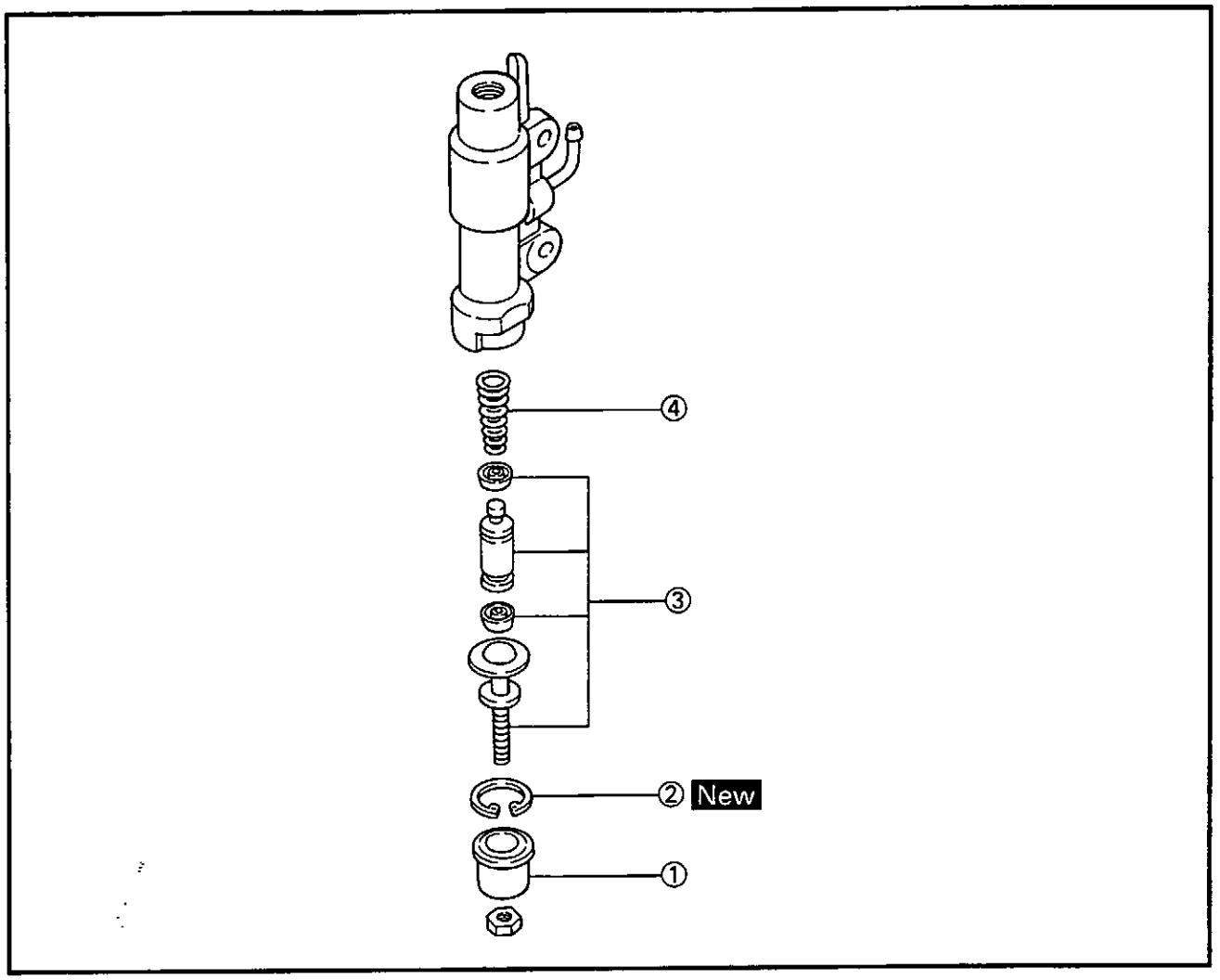
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Brake master cylinder kit	1	
④	Spring	1	
			For assembly, reverse the disassembly procedure.

EAS00586
REAR BRAKE MASTER CYLINDER

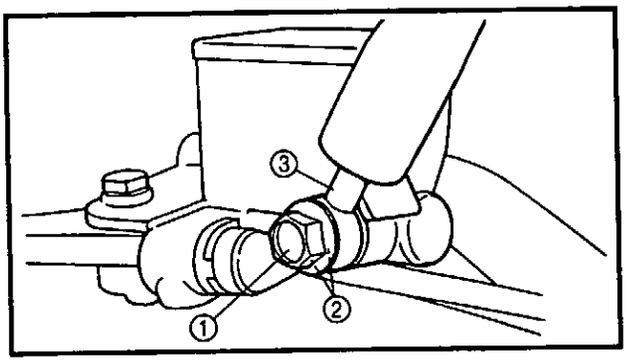


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Rear brake master cylinder cover	1	
2	Union bolt	1	
3	Copper washer/brake hose	2/1	
4	Clip/brake fluid reservoir hose	1/1	
5	Cotter pin	1	
6	Clevis pin	1	
7	Washer	1	
8	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

EAS00587



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Brake master cylinder kit	1	
④	Spring	1	
			For assembly, reverse the disassembly procedure.

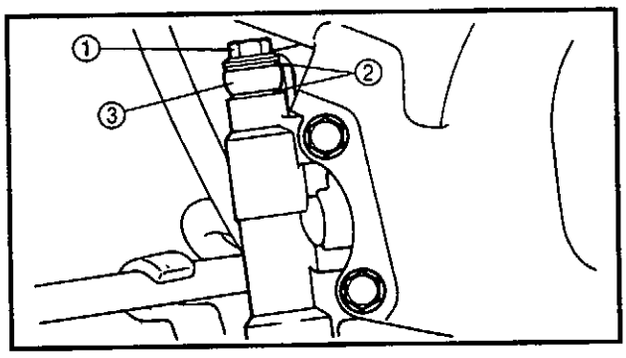


REMOVING THE FRONT BRAKE MASTER CYLINDER

NOTE:
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

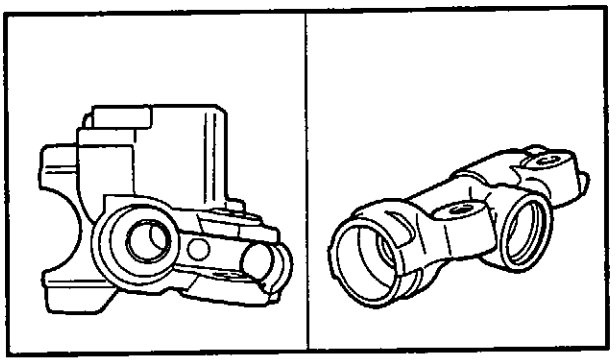


REMOVING THE REAR BRAKE MASTER CYLINDER

NOTE:
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

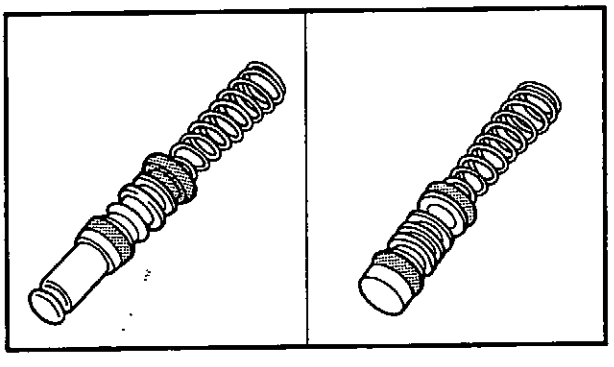


EAS00592
CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

The following procedure applies to the both of the brake master cylinders.

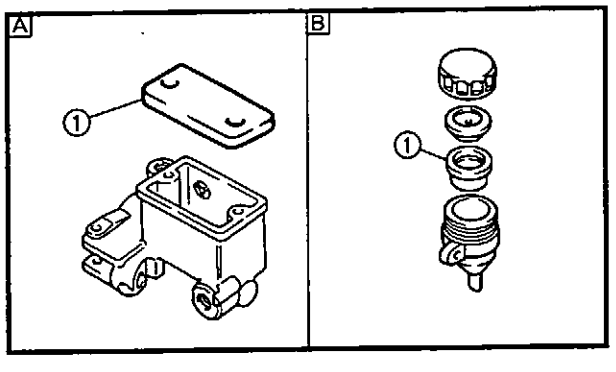
1. Check:
   - brake master cylinder
     Damage/scratches/wear → Replace.
   - brake fluid delivery passages
     (brake master cylinder body)
     Obstruction → Blow out with compressed air.

[A] Front
[B] Rear



2. Check:
   - brake master cylinder kit
     Damage/scratches/wear → Replace.

[A] Front
[B] Rear



3. Check:
   - front brake master cylinder reservoir
   - rear brake fluid reservoir
     Cracks/damage → Replace.
   - brake fluid reservoir diaphragms ①
     Cracks/damage → Replace.

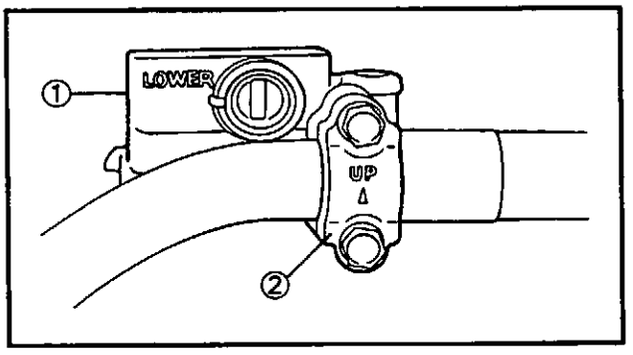
[A] Front
[B] Rear

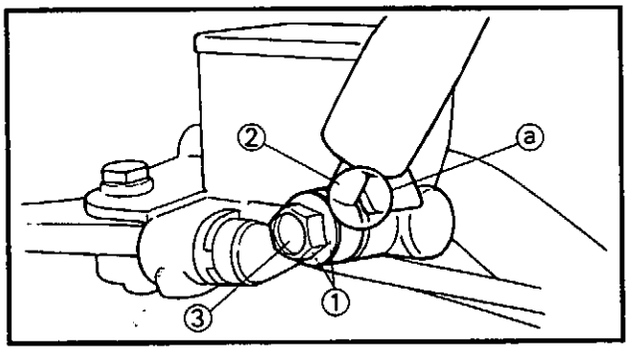
4. Check:
   - brake hoses
     Cracks/damage/wear → Replace.

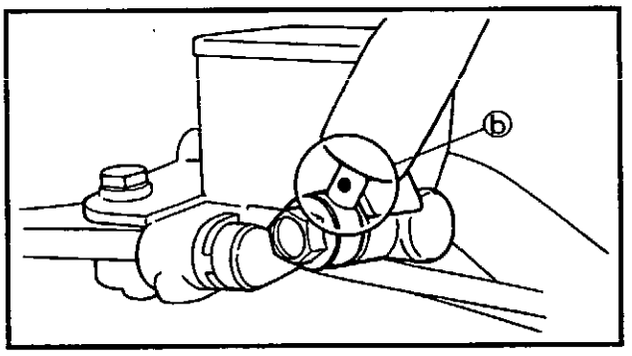
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**







Recommended brake fluid
DOT 4

1. Install:
   - brake master cylinder ①
   - brake master cylinder holder ②

   7 Nm (0.7 m · kg)

NOTE:
Install the brake master cylinder holder with the "UP" mark facing up.

2. Install:
   - copper washers ① New
   - brake hose ②
   - union bolt ③ **26 Nm (2.6 m · kg)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".

CAUTION:

When installing the brake hose onto the brake master cylinder, make sure that the brake pipe touches the projection ⓐ as shown.

NOTE:
- Install the brake hose in front of the point mark ⓑ.
- Turn the handlebar to the left and to the right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.

3. Fill:
   - brake master cylinder reservoir (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

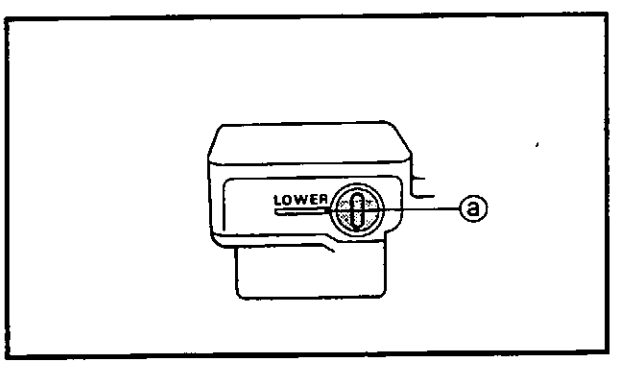
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

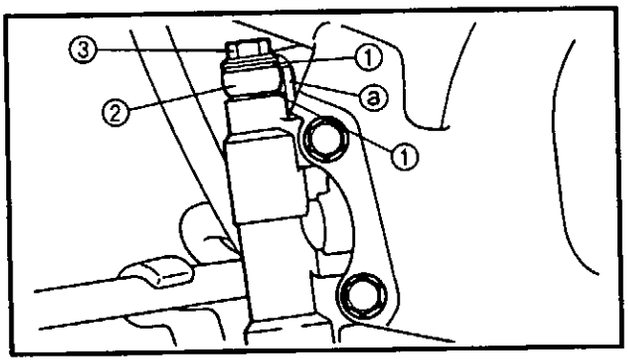
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:
   - brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



5. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

6. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



ASSEMBLING THE REAR BRAKE MASTER CYLINDER

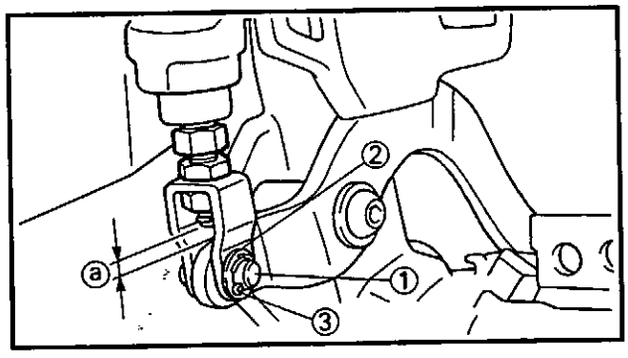
1. Install:
   - copper washers ① New
   - brake hose ②
   - union bolt ③ 26 Nm (2.6 m · kg)

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".

CAUTION:

When installing the brake hose onto the brake master cylinder, make sure the brake pipe touches the projection ⓐ as shown.



2. Install:
   - Clevis pin ①
   - Washer ②
   - Cotter pin ③ New

NOTE:

When installing the master cylinder make sure that the lod end length ⓐ is in 3 ~ 5 mm.

3. Fill:
   - brake fluid reservoir
     (with the specified amount of the recommend brake fluid)

Recommended brake fluid
DOT 4

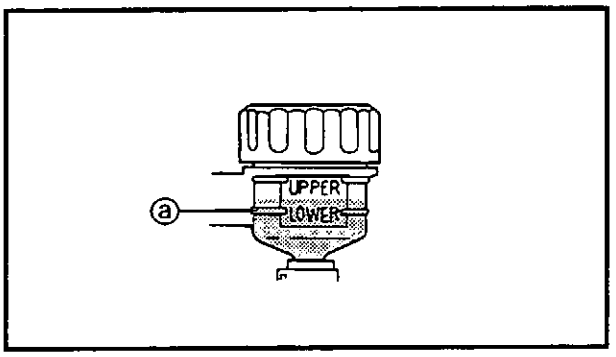
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

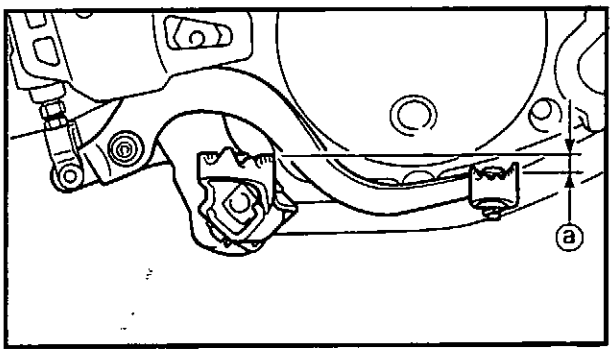
CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



5. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

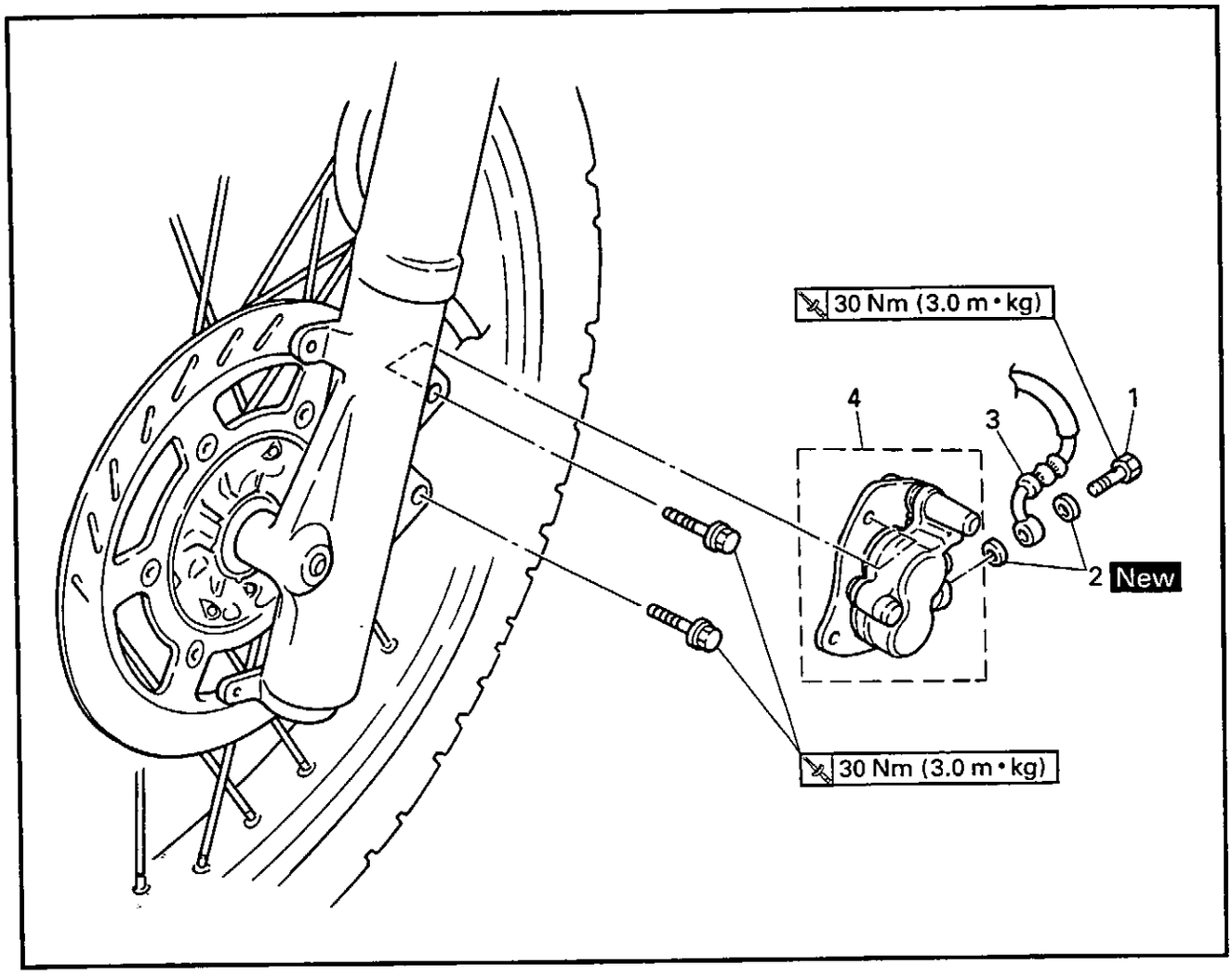


6. Adjust:
   • brake pedal position ⓐ
   Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.

Brake pedal position (below the top of the rider footrest)
15 mm

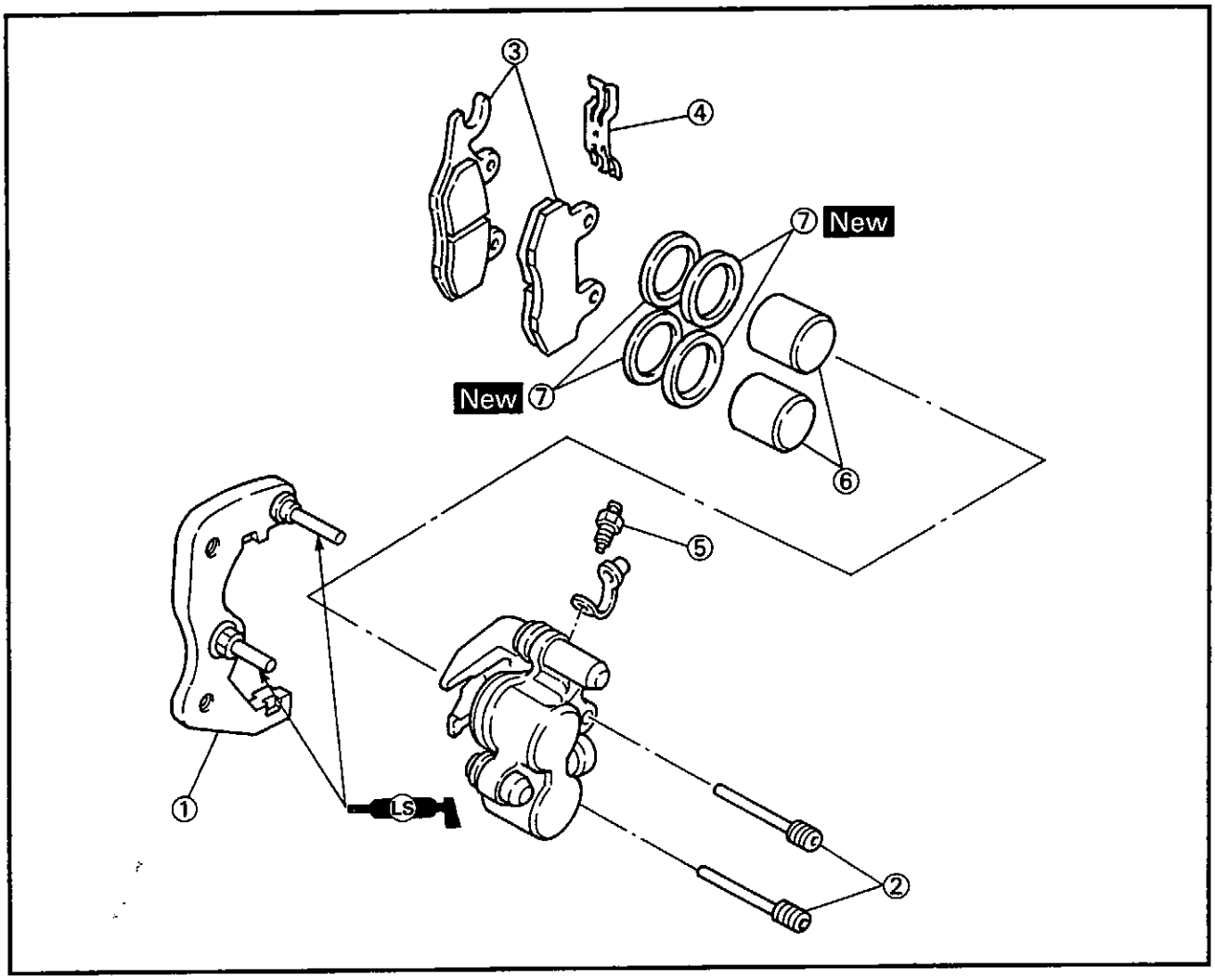
7. Adjust:
   • rear brake light operation timing
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" in chapter 3.

EAS00612
FRONT BRAKE CALIPER



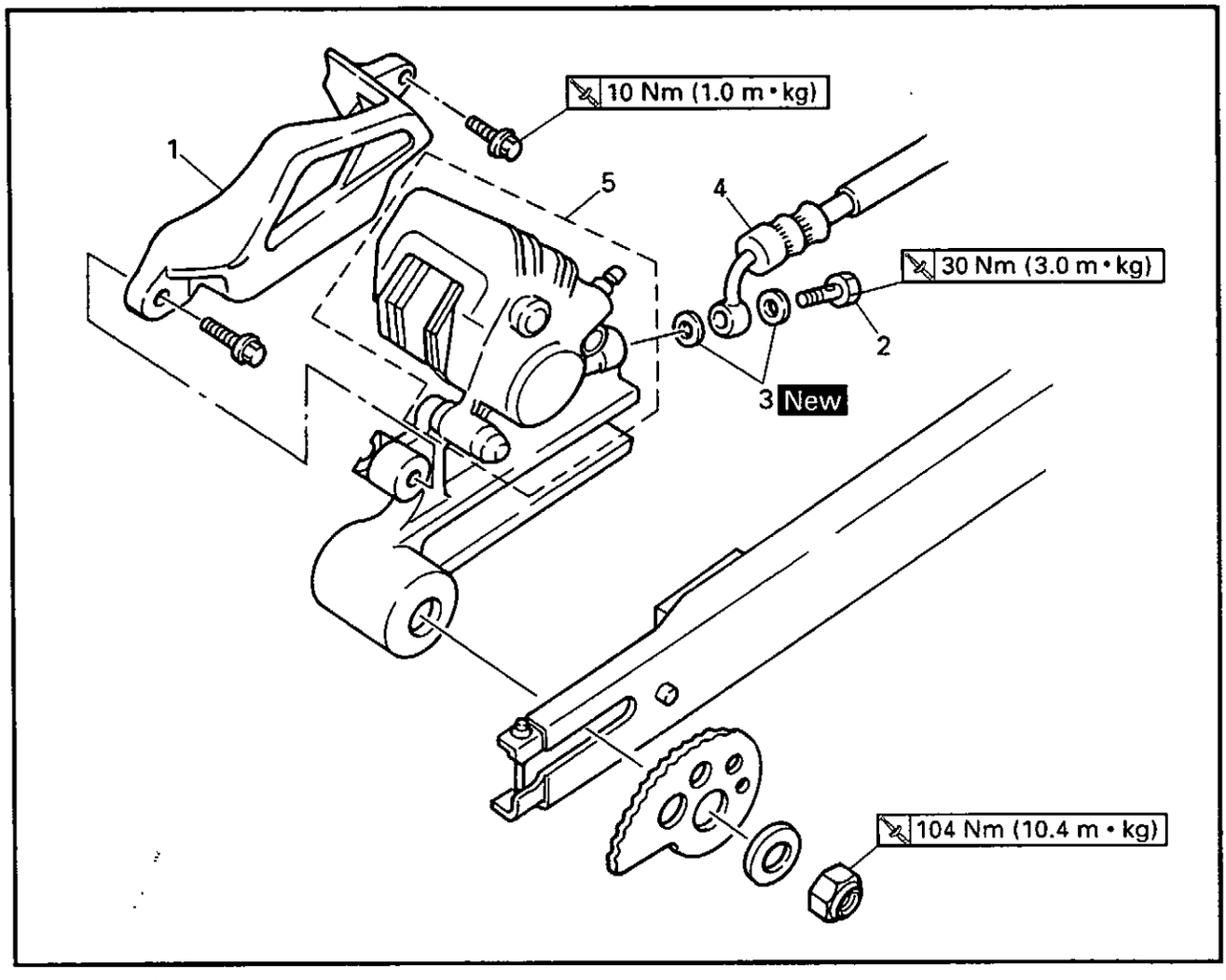
Order	Job/Part	Q'ty	Remarks
	Removing the front brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	
			For installation, reverse the removal procedure.

EAS00614



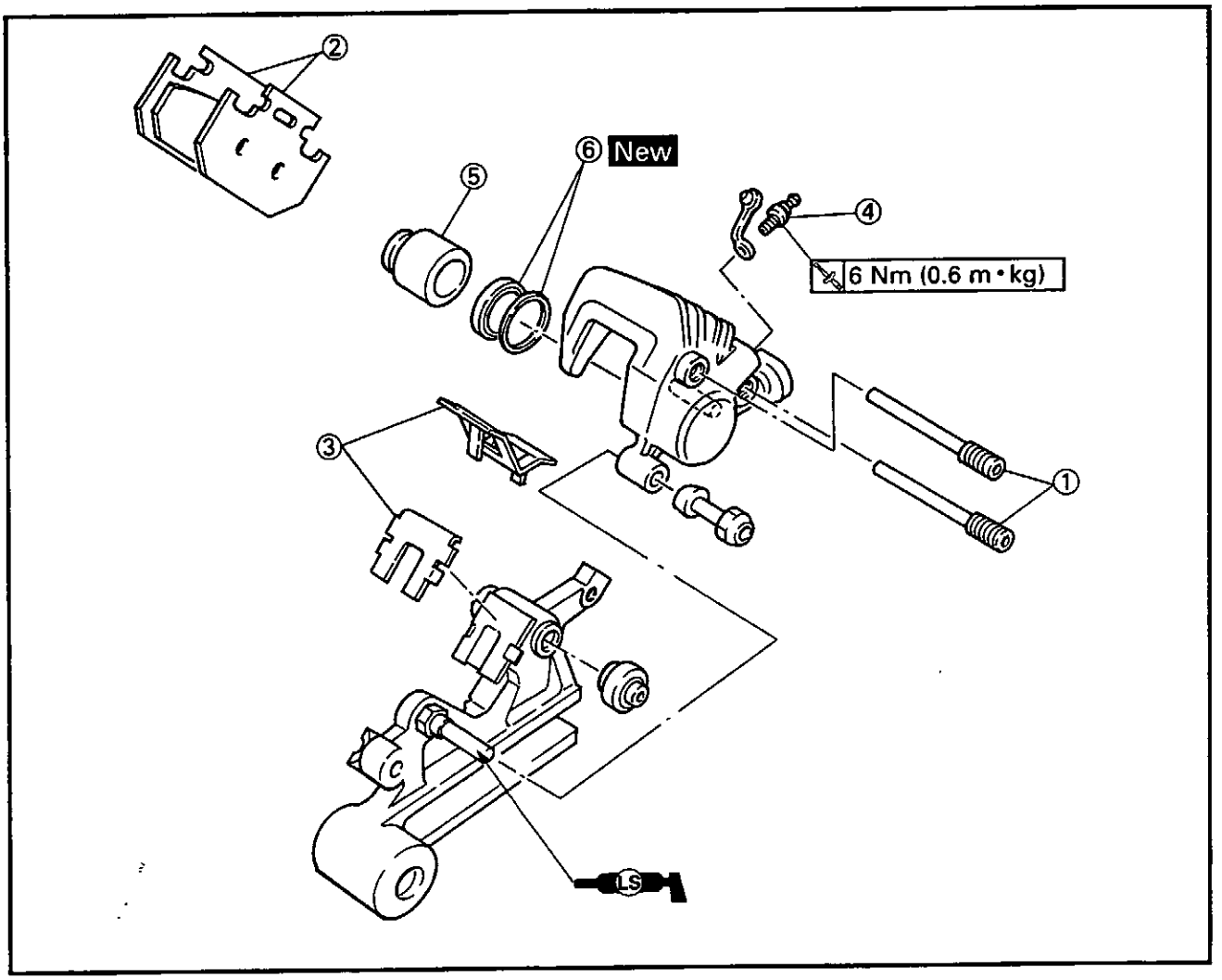
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake caliper		Remove the parts in the order listed.
①	Brake caliper bracket	1	
②	Brake pad pin	2	
③	Brake pad	2	
④	Brake pad spring	1	
⑤	Bleed screw	1	
⑥	Brake caliper piston	2	
⑦	Brake caliper piston seal	4	
			For assembly, reverse the disassembly procedure.

EAS00616
REAR BRAKE CALIPER

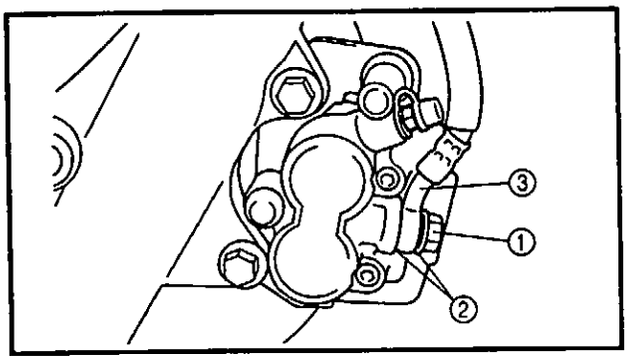


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain.
	Rear wheel		Refer to "REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET".
1	Brake caliper protector	1	
2	Union bolt	1	
3	Copper washer	2	
4	Brake hose	1	
5	Brake caliper	1	
			For installation, reverse the removal procedure.

EAS00617



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Remove the parts in the order listed.
①	Brake pad pin	2	
②	Brake pad	2	
③	Brake pad spring	2	
④	Bleed screw	1	
⑤	Brake caliper piston	1	
⑥	Brake caliper piston seal	2	
			For assembly, reverse the disassembly procedure.

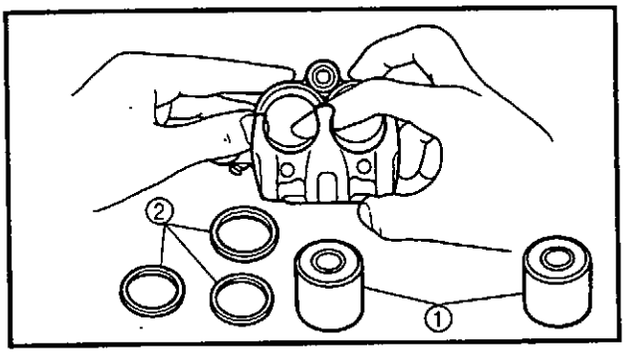


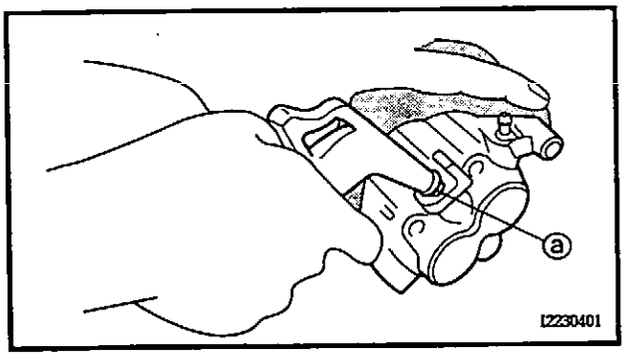
EAS00619
DISASSEMBLING THE FRONT BRAKE CALIPER

NOTE:
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
Put the end of the brake hose into a container and pump out the brake fluid carefully.





2. Remove:
   - brake caliper pistons ①
   - brake caliper piston seals ②

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a. Blow compressed air into the brake hose joint opening ⓐ to force out the pistons from the brake caliper.

⚠ WARNING

- **Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**

b. Remove the brake caliper piston seals.

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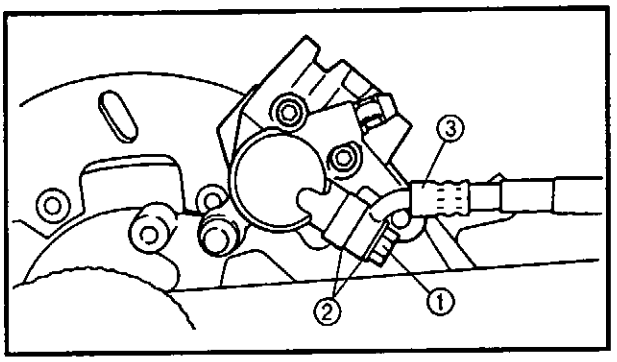
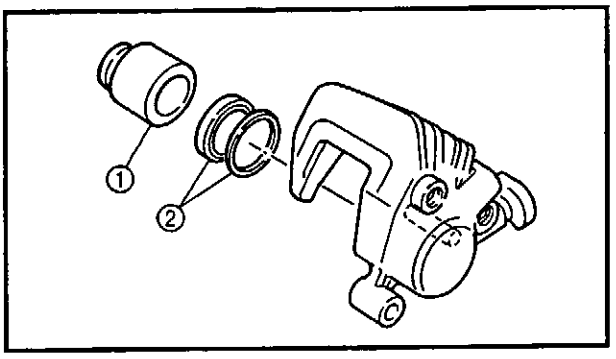
EAS00626
DISASSEMBLING THE REAR BRAKE CALIPER

NOTE:
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
Put the end of the brake hose into a container and pump out the brake fluid carefully.



2. Remove:
   - brake caliper piston ①
   - brake caliper piston seals ②

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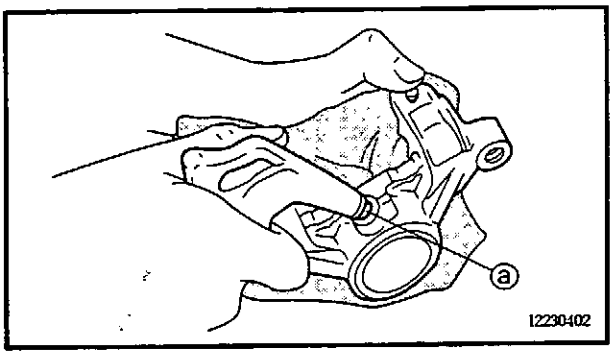
a. Blow compressed air into the brake hose joint opening ⓐ to force out the piston from the brake caliper.

⚠ WARNING

- **Cover the brake caliper piston with a rag. Be careful not to get injured when the piston is expelled from the brake caliper.**
- **Never try to pry out the brake caliper piston.**



b. Remove the brake caliper piston seals.

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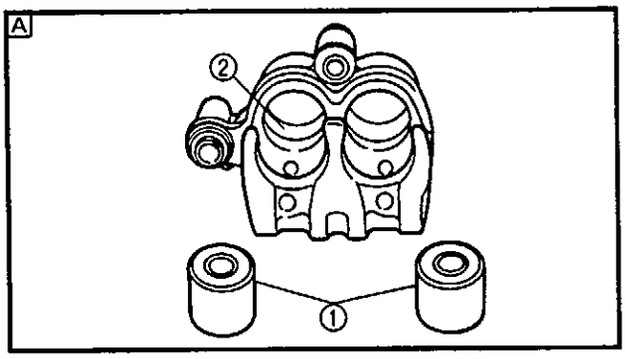
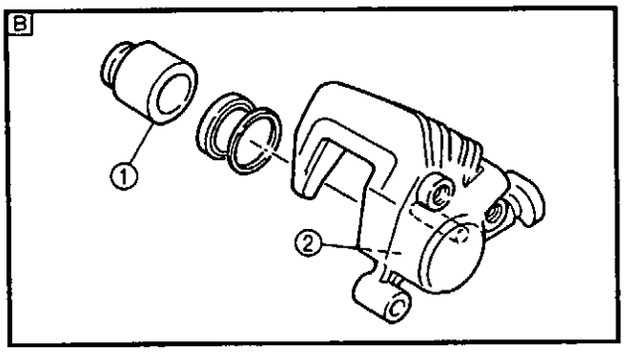
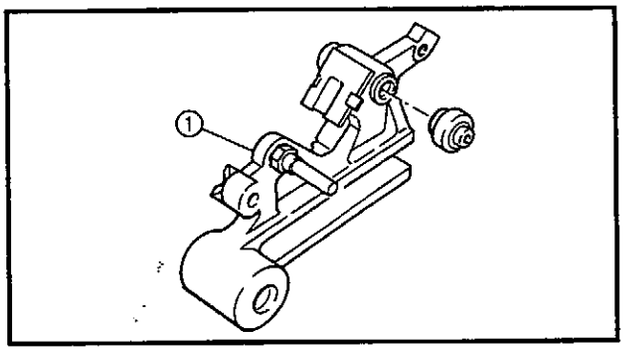
EAS00633
CHECKING THE FRONT AND REAR BRAKE CALIPERS

Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seals	Every two years
Brake hoses	Every two years
Brake fluid	Every two years and whenever the brake is disassembled







1. Check:
   - brake caliper pistons ①
     Rust/scratches/wear → Replace the brake caliper.
   - brake caliper cylinders ②
     Scratches/wear → Replace the brake caliper.
   - brake calipers
     Cracks/damage → Replace.
   - brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.

⚠ WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston seals.

A Front
B Rear

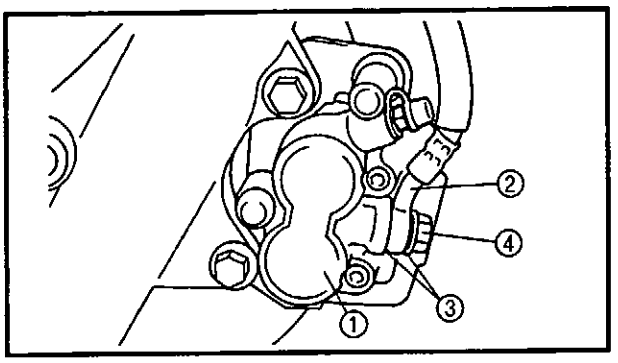
2. Check:
   - brake caliper brackets ①
     Cracks/damage → Replace.

EAS00634
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

	Recommended brake fluid **DOT 4**



1. Install:
   - brake caliper ① 30 Nm (3.0 m · kg)
   - copper washers ② New
   - brake hose ③
   - union bolt ④ 30 Nm (3.0 m · kg)

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".

CAUTION:

When installing the brake hose onto the brake caliper ①, make sure the brake pipe touches the brake caliper body.

2. Fill:
   - brake master cylinder reservoir
     (with the specified amount of the recommended brake fluid)

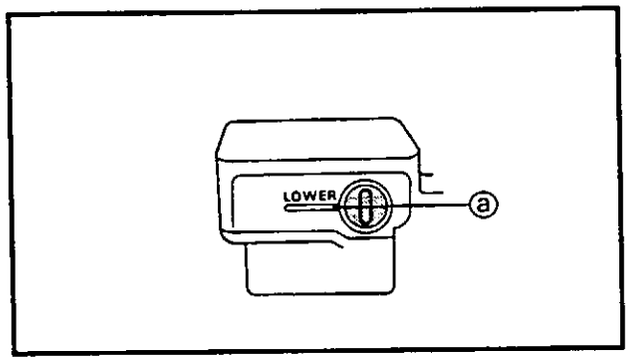
Recommended brake fluid
DOT 4

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.



3. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
4. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
5. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

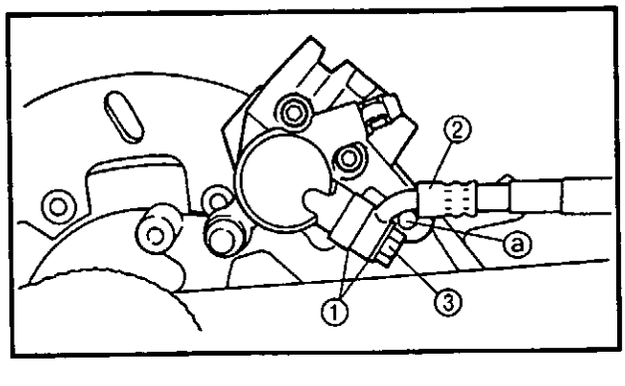
ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

Recommended brake fluid
DOT 4

1. Install:
   • copper washers ① New
   • brake hose ②
   • union bolt ③ **30 Nm (3.0 m · kg)**



⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".

CAUTION:

When installing the brake hose onto the brake caliper, make sure the brake pipe touches the projection ⓐ on the brake caliper.

2. Fill:
   • brake fluid reservoir
   (with the specified amount of the recommended brake fluid)

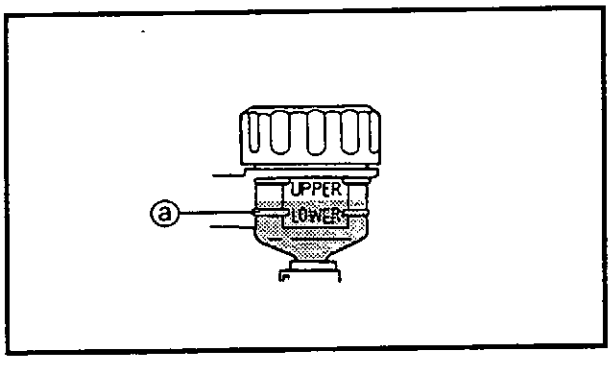
	Recommended brake fluid **DOT 4**

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

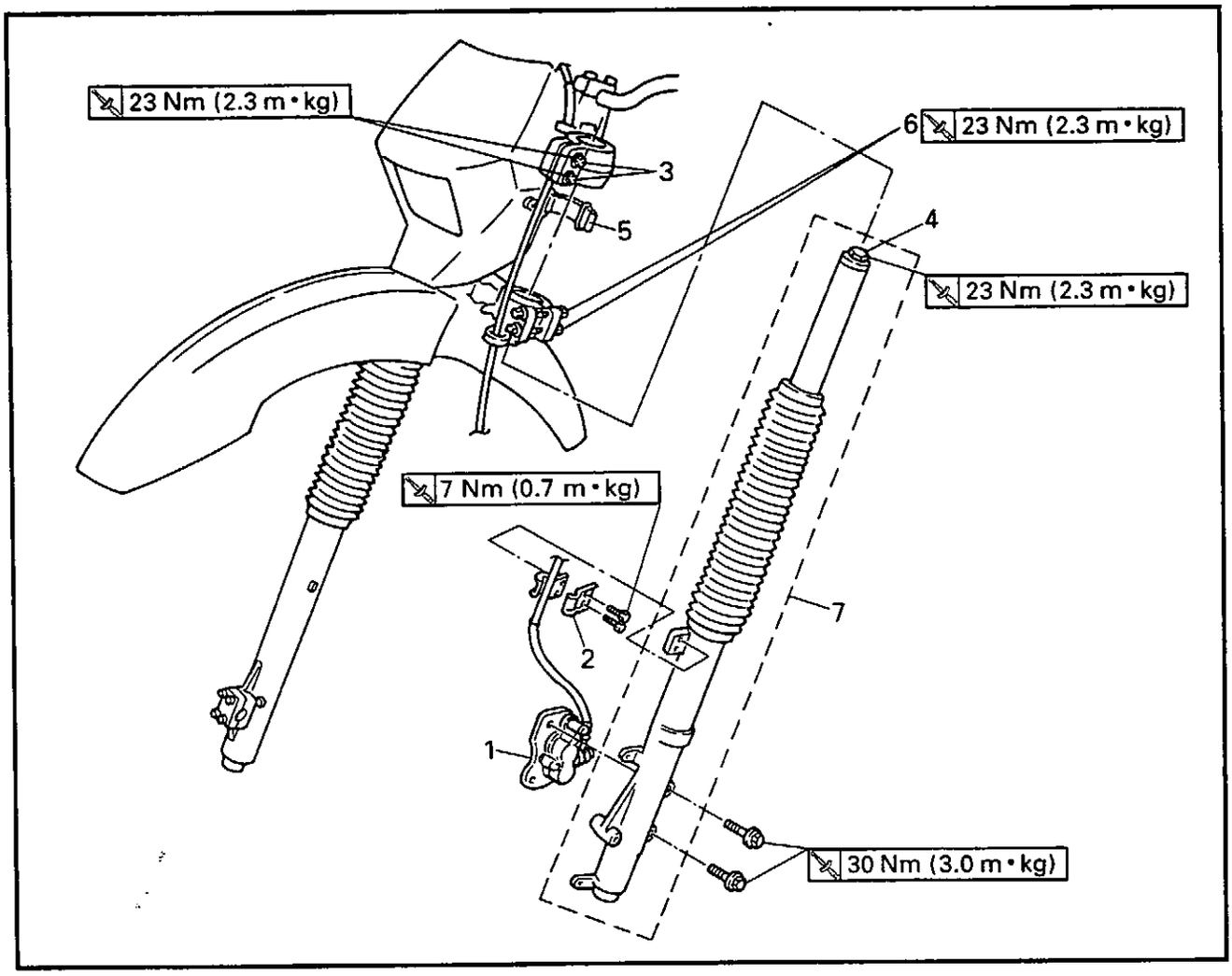
CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.



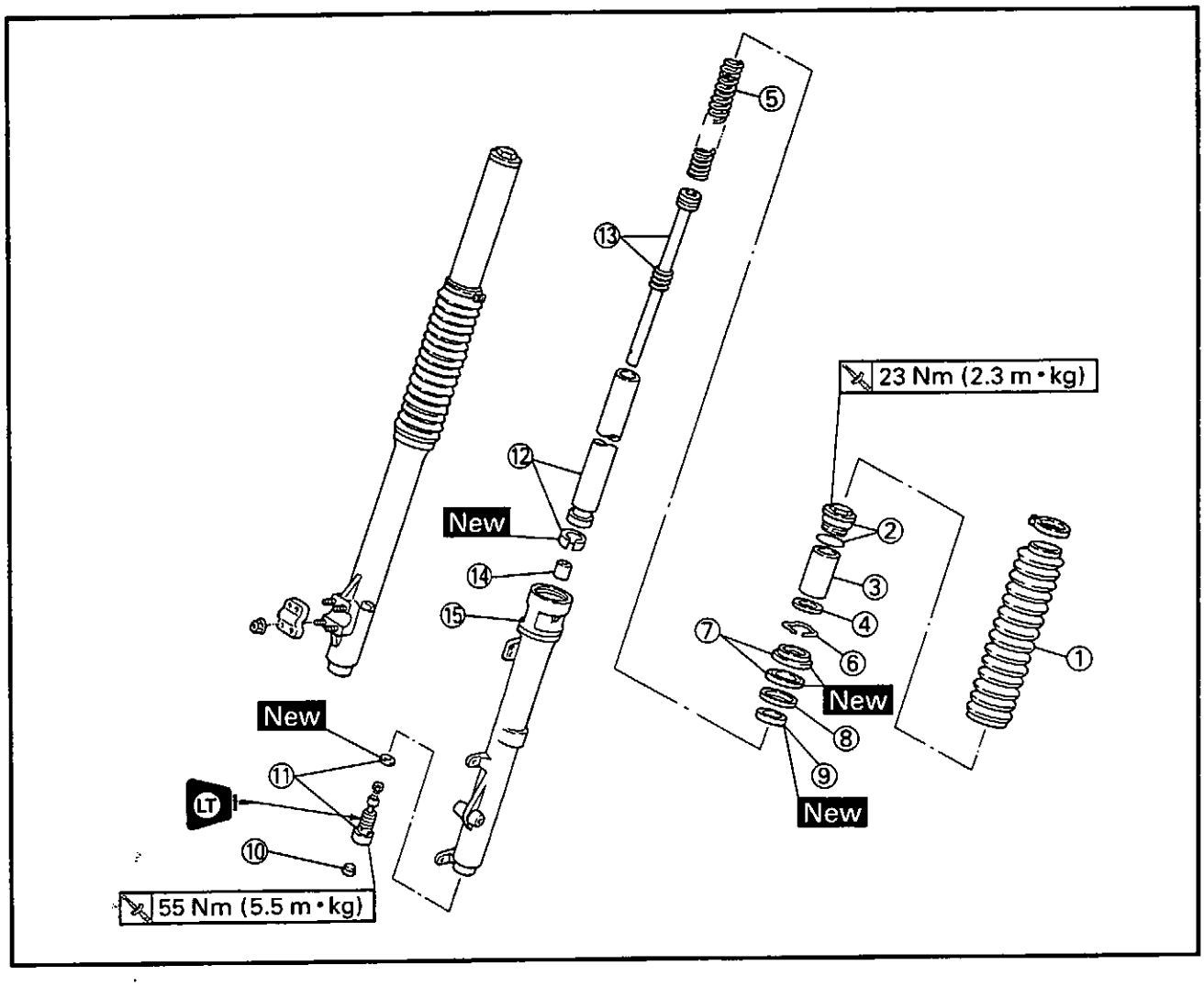
3. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
4. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
5. Check:
   • brake pedal operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

EAS00646
FRONT FORK

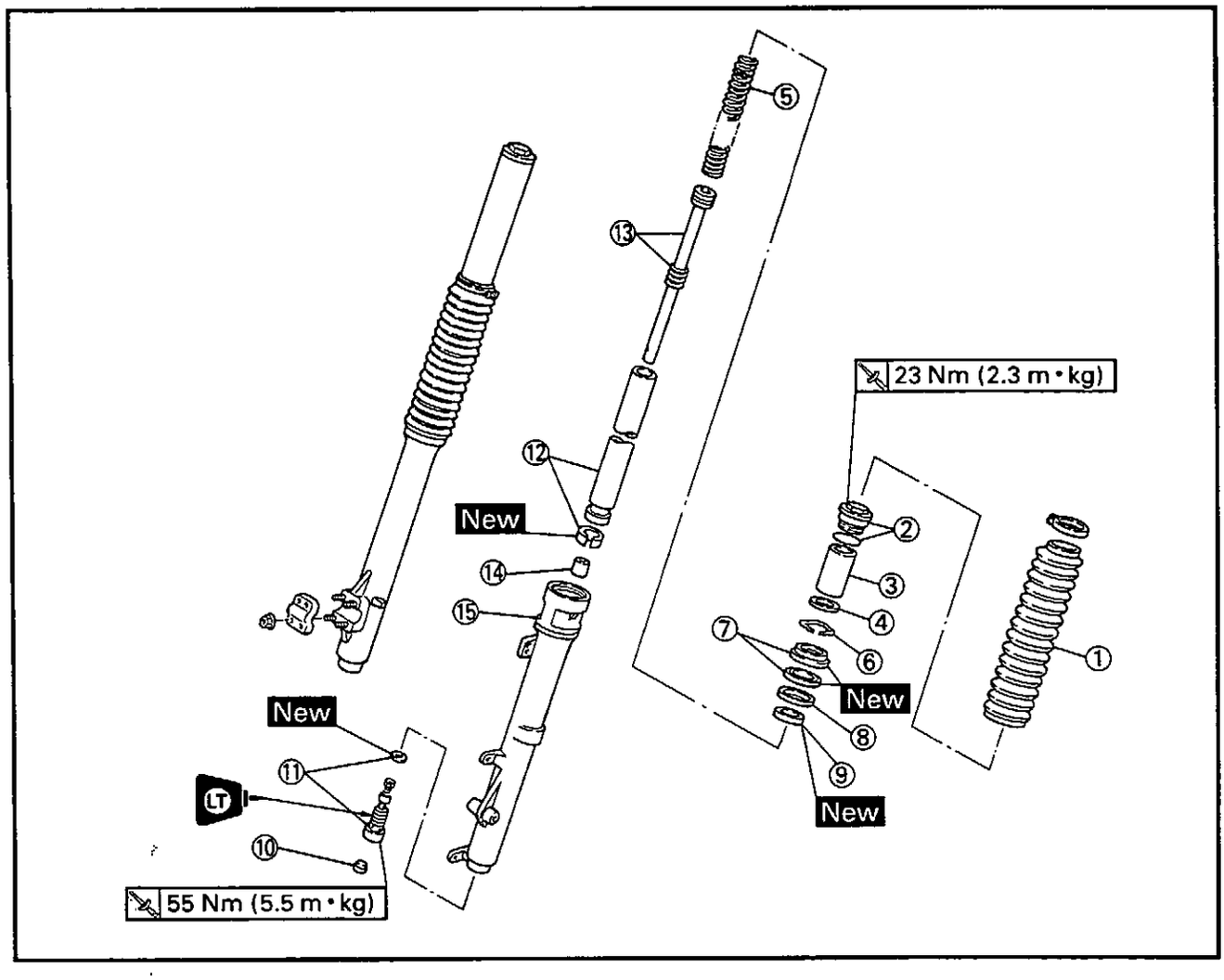


Order	Job/Part	Q'ty	Remarks
	Removing the front fork		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
1	Front brake caliper	1	Left front fork only.
2	Brake hose holder	1	Left front fork only.
3	Upper bracket pinch bolt	2	Loosen.
4	Cap bolt	1	
5	Band	1	Unfasten.
6	Lower bracket pinch bolt	2	Loosen.
7	Front fork leg	1	For installation, reverse the removal procedure.

EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
①	Boot	1	
②	Cap bolt/O-ring	1/1	
③	Spacer	1	
④	Washer	1	
⑤	Fork spring	1	
⑥	Oil seal clip	1	
⑦	Dust seal/oil seal	1/1	
⑧	Washer	1	
⑨	Outer tube bushing	1	
⑩	Cap	1	
⑪	Base valve/gasket	1/1	
⑫	Inner tube/inner tube bushing	1/1	
⑬	Damper rod	1	



Order	Job/Part	Q'ty	Remarks
⑭	Oil flow stopper	1	
⑮	Outer tube	1	For assembly, reverse the disassembly procedure.

EAS00649
REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

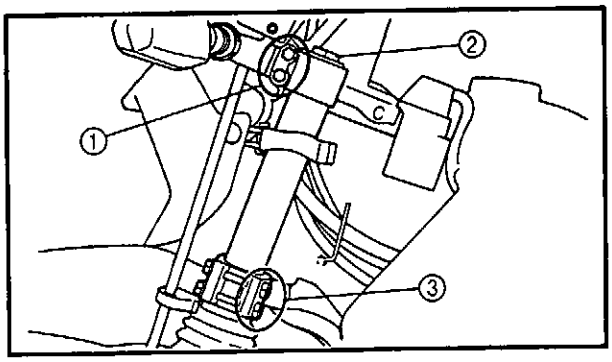
1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

NOTE:

Place the motorcycle on a suitable stand so that the front wheel is elevated.



2. Loosen:
   - upper bracket pinch bolt ①
   - cap bolt ②
   - lower bracket pinch bolt ③

⚠ WARNING

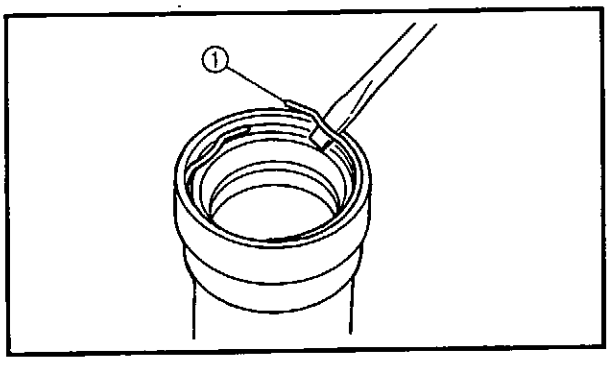
Before loosening the upper and lower bracket pinch bolts, support the front fork leg.

3. Remove:
   - front fork leg

DISASSEMBLING THE FRONT FORK LEGS

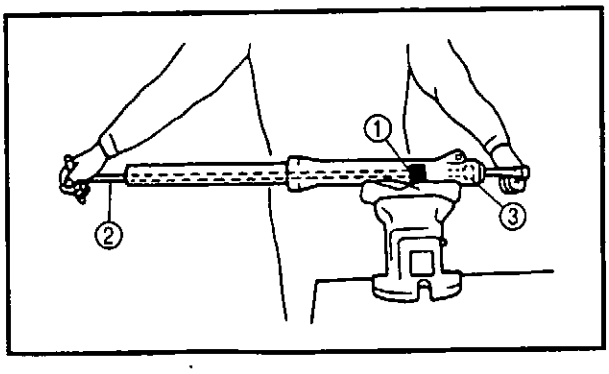
The following procedure applies to both of the front fork legs.

1. Remove:
   - oil seal clip ①
     (with a flat-head screwdriver)



CAUTION:

Do not scratch the inner tube.

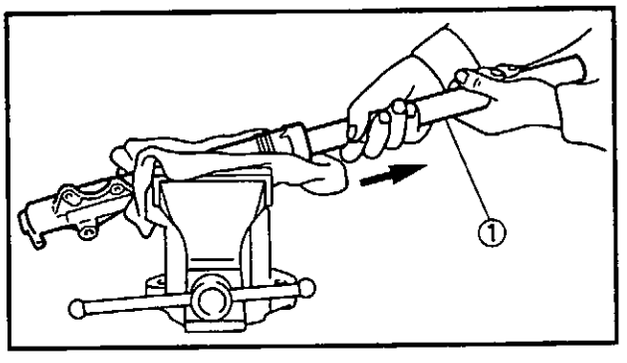


2. Remove:
   - base valve

NOTE:

While holding the damper rod assembly with the damper rod holder ① and T-handle ②, loosen the base valve with damper rod holder ③.

Damper rod holder (27 mm)
90890-01388
T-Handle
90890-01326
Damper rod holder (14 mm)
90890-04085



3. Remove:
   • inner tube ①

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a. Hold the front fork leg horizontally.
b. Securely clamp the outer tube in a vise with soft jaws.
c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

CAUTION:

- **Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.**
- **Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.**

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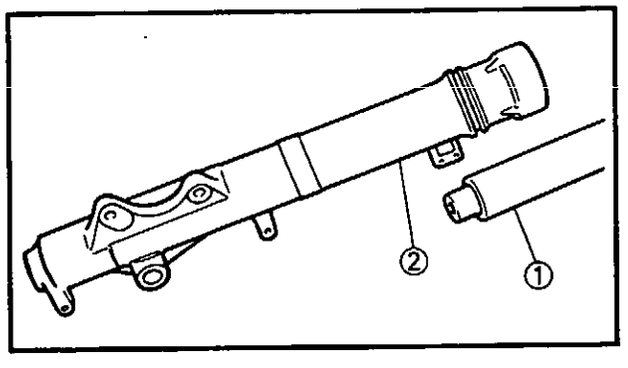


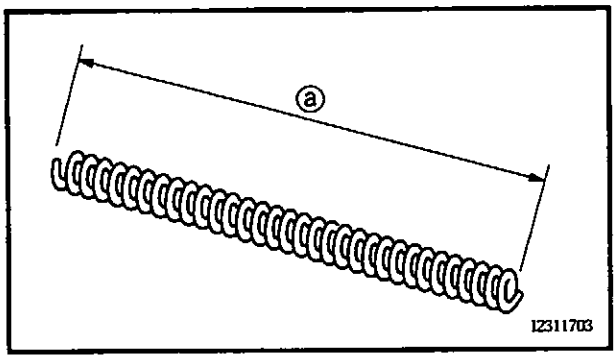
EAS00656
CHECKING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Check:
   • inner tube ①
   • outer tube ②
   Bends/damage/scratches → Replace.

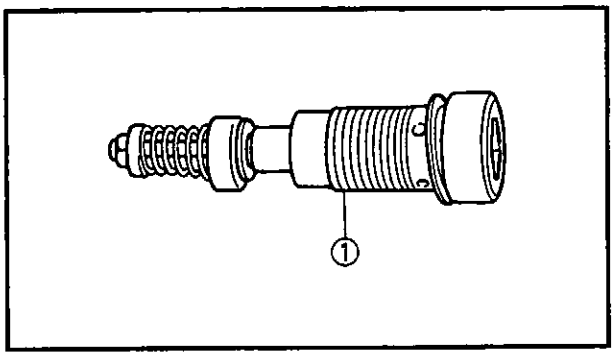
⚠ WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

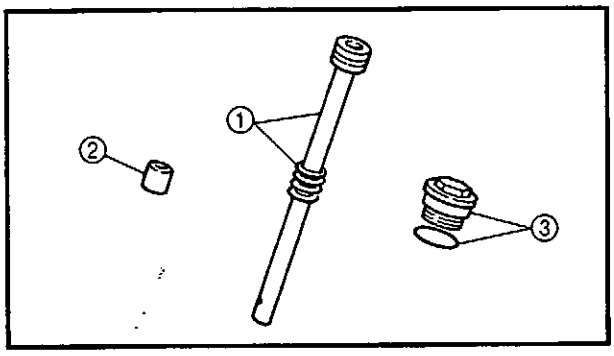


2. Measure:
   • spring free length ⓐ
   Out of specification → Replace.

Spring free length limit
464 mm



3. Check:
   • base valve ①
   Damage/wear → Replace.
   Obstruction → Blow out all of the oil passages with compressed air.



4. Check:
   • damper rod ①
   • oil flow stopper ②
   Damage → Replace.
   • cap bolt O-ring ③
   Damage/wear → Replace.

ASSEMBLING THE FRONT FORK LEGS

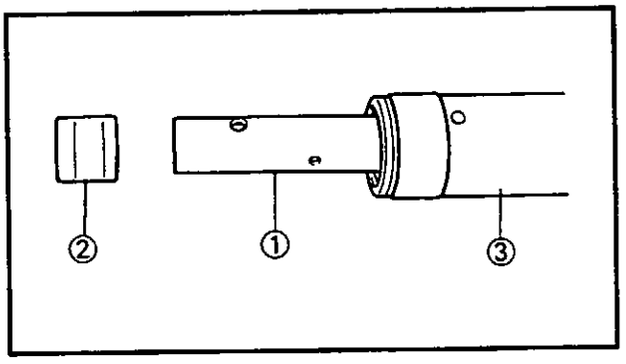
The following procedure applies to both of the front fork legs.

⚠ WARNING

- **Make sure the oil levels in both front fork legs are equal.**
- **Uneven oil levels can result in poor handling and a loss of stability.**

NOTE:

- When assembling the front fork leg, be sure to replace the following parts:
  -inner tube bushing
  -outer tube bushing
  -oil seal
  -dust seal
- Before assembling the front fork leg, make sure all of the components are clean.



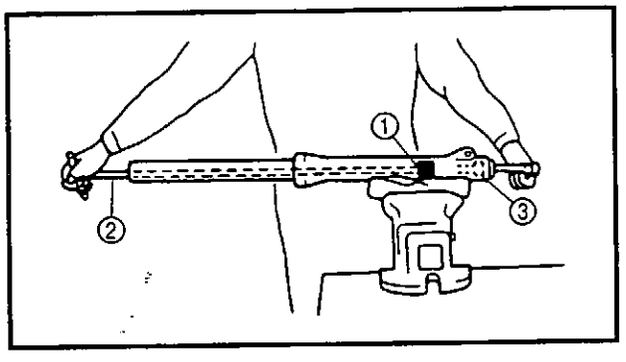
1. Install:
   - damper rod assembly ①
   - oil flow stopper ②

CAUTION:

Allow the damper rod assembly to slide slowly down the inner tube ③ until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

2. Lubricate:
   - inner tube's outer surface

	Recommended lubricant **Fork oil 10W or equivalent**

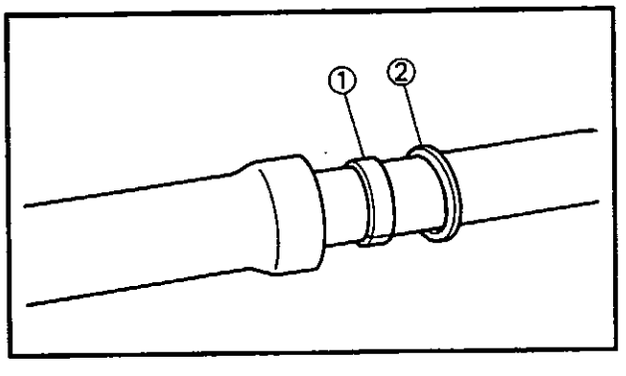


3. Tighten:
   - base valve — 55 Nm (5.5 m · kg)

NOTE:

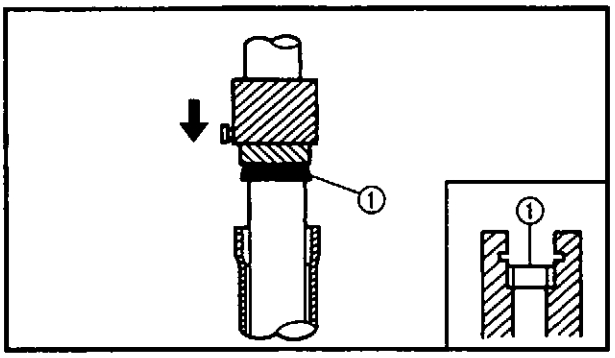
- Apply LOCTITE® to the threads of the base valve.
- While holding the damper rod assembly with the damper rod holder ① and T-handle ②, tighten the base valve with the damper rod holder ③.

	Damper rod holder (27 mm) **90890-01388** **T-Handle** **90890-01326** **Damper rod holder (14 mm)** **90890-04085**



4. Install:
   - outer tube bushing ① New
   - washer ②
     (with the fork seal driver weight and fork seal driver attachment)

	Fork seal driver weight **90890-01367** **Fork seal driver attachment** **90890-01381**

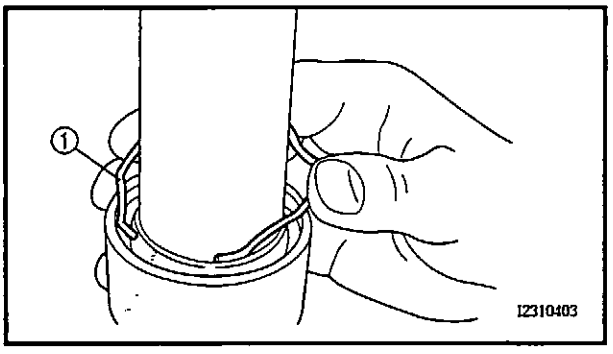


5. Install:
   - oil seal ① New
   - dust seal
     (with the fork seal driver weight and fork seal driver attachment)

Fork seal driver weight
90890-01367
Fork seal driver attachment
90890-01381

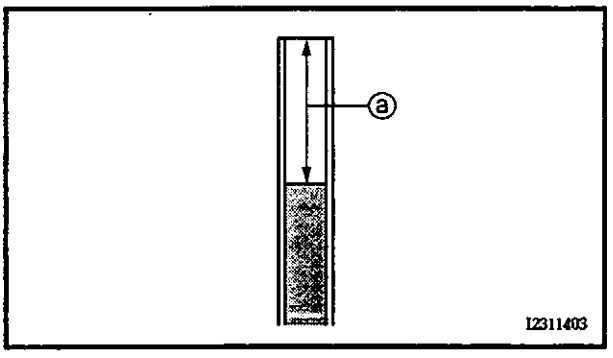
CAUTION:
Make sure the numbered side of the oil seal faces up.

NOTE:
- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.



6. Install:
   - oil seal clip ①

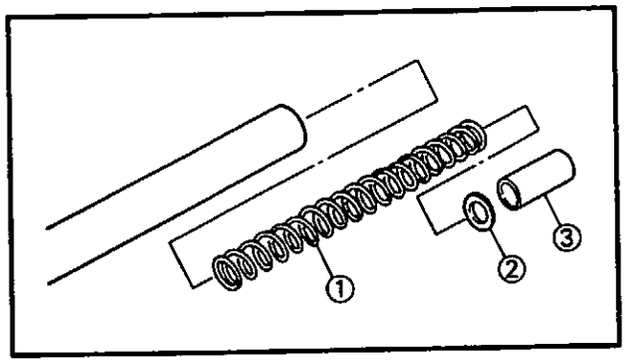
NOTE:
Adjust the oil seal clip so that it fits into the outer tube's groove.

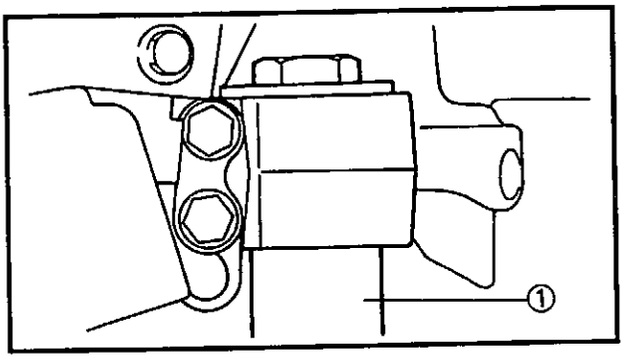


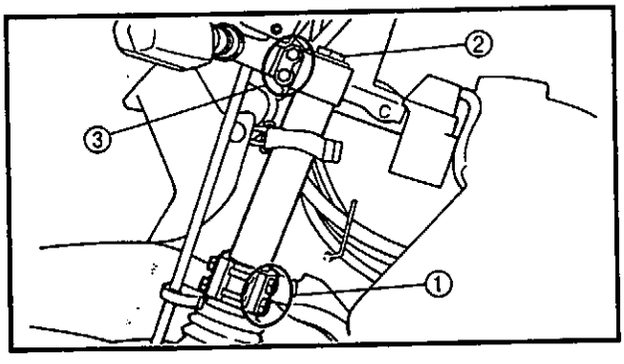
7. Fill:
   - front fork leg
     (with the specified amount of the recommended fork oil)

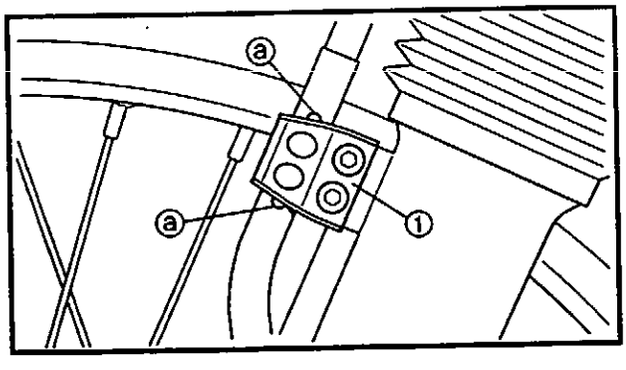
Quantity (each front fork leg)
0.542 L
Yamaha fork and shock oil 10W or equivalent.
Front fork leg oil level ⓐ (from the top of the inner tube, with the inner tube fully compressed and without the fork spring)
120 mm

NOTE:
- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.









8. Install:
   - spring ①
   - washer ②
   - spacer ③
   - cap bolt

NOTE:
- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.

EAS00662
INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Install:
   - front fork leg ①
     Temporarily tighten the upper and lower bracket pinch bolts.

NOTE:
Make sure the inner fork tube is flush with the top of the handlebar holder.

2. Tighten:
   - lower bracket pinch bolt ① — 23 Nm (2.3 m · kg)
   - cap bolt ② — 23 Nm (2.3 m · kg)
   - upper bracket pinch bolt ③ — 23 Nm (2.3 m · kg)

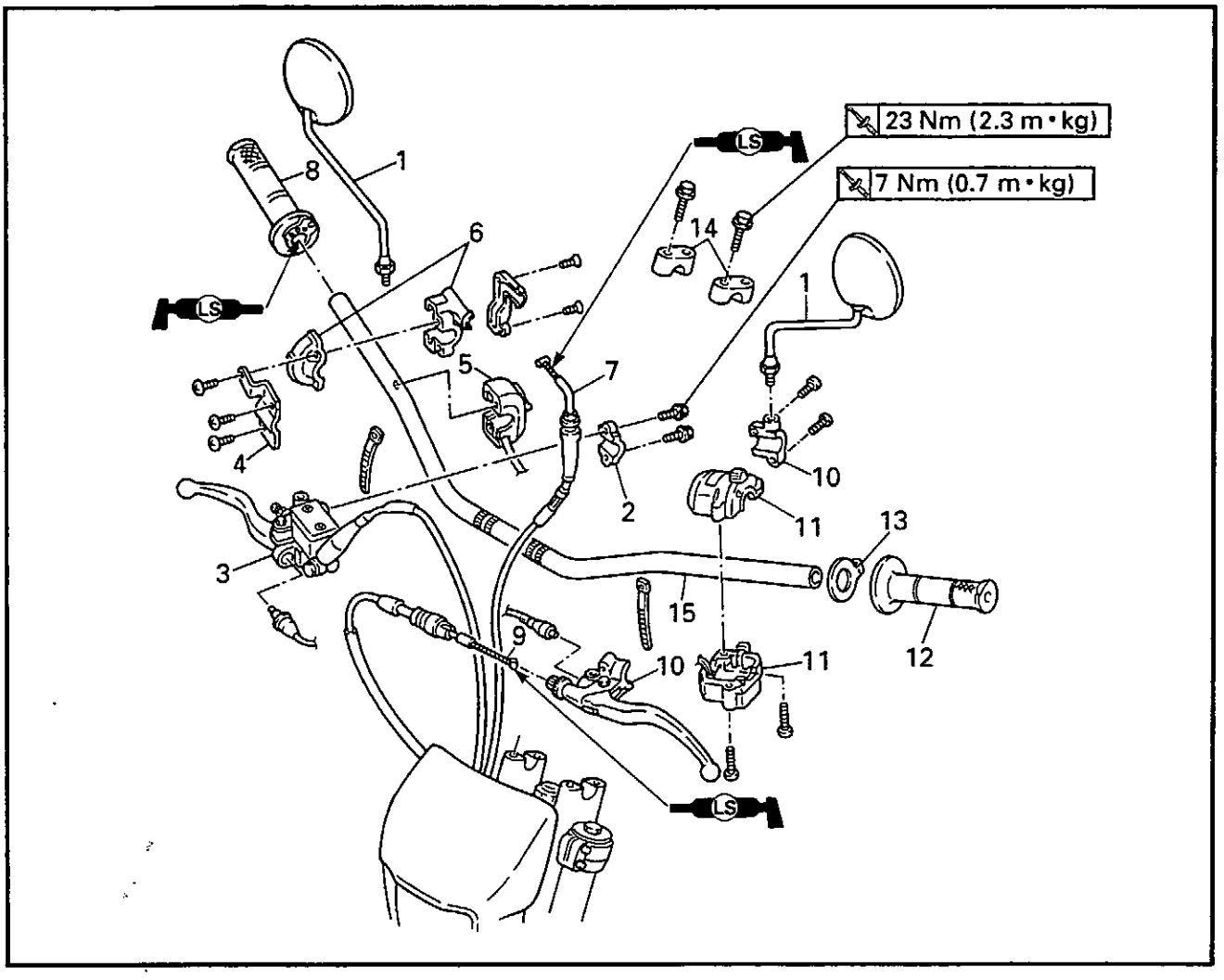
⚠ WARNING
Make sure the brake hoses are routed properly.

3. Install:
   - brake hose holder ①

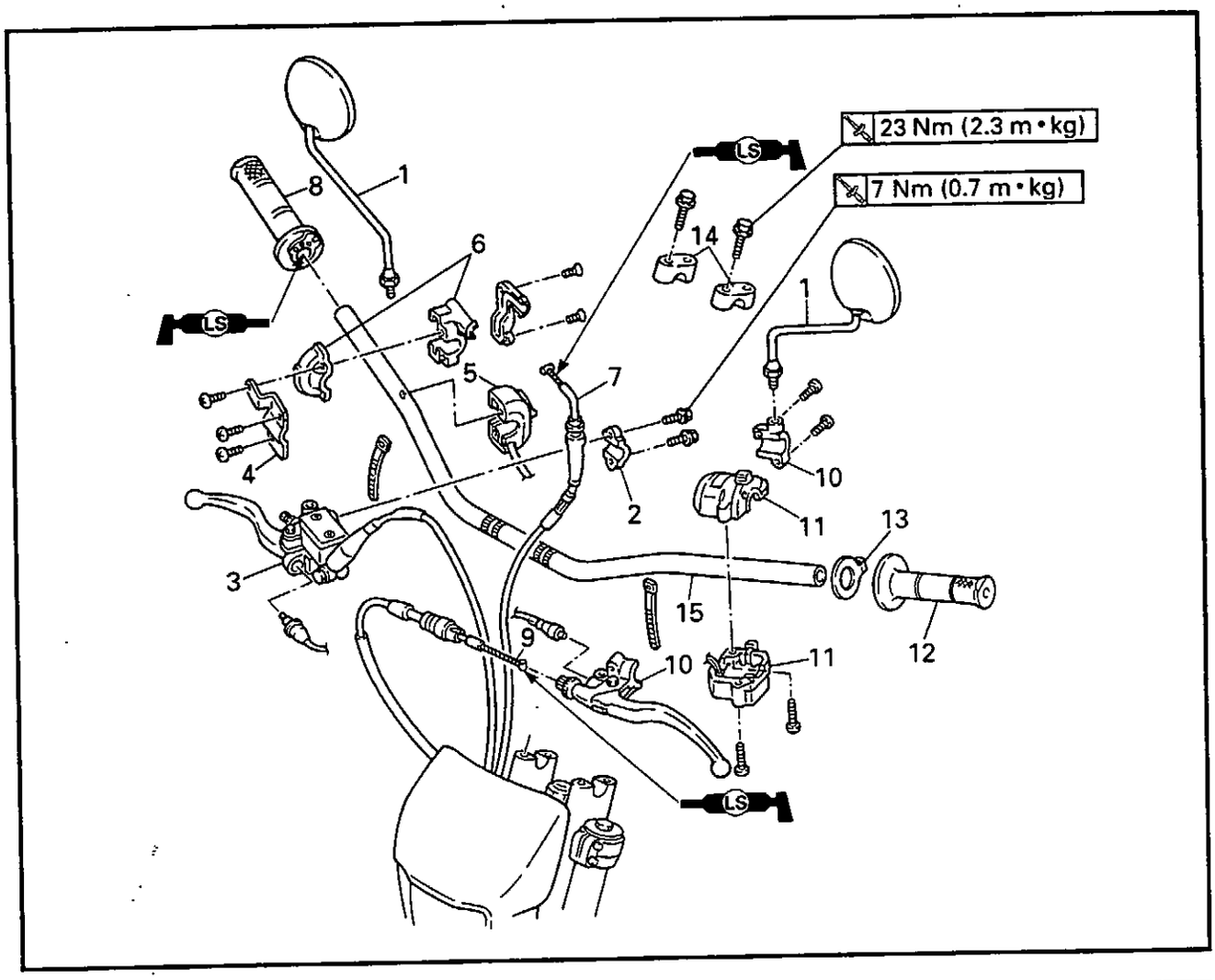
NOTE:
Fasten the front brake hose between the points marked with paint ⓐ.

4. Adjust:
   - compression damping
     Refer to "ADJUSTING THE FRONT FORK" in chapter 3.

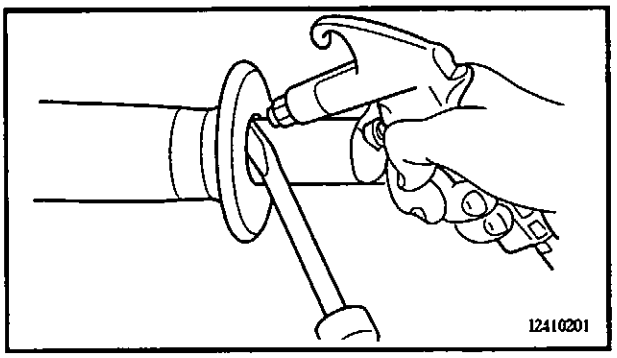
EAS00664
HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
1	Rear view mirror (left and right)	1/1	
2	Brake master cylinder holder	1	
3	Brake master cylinder	1	
4	Right handlebar switch holder	1	
5	Right handlebar switch	1	
6	Throttle cable housing	1	
7	Throttle cable	1	Disconnect.
8	Throttle grip	1	
9	Clutch cable	1	Disconnect.
10	Clutch lever holder	1	
11	Left handlebar switch	1	
12	Handlebar grip	1	



Order	Job/Part	Q'ty	Remarks
13	Special washer	1	
14	Upper handlebar holder	2	
15	Handlebar	1	For installation, reverse the removal procedure.



EAS00666
REMOVING THE HANDLEBAR

1. Stand the motorcycle on a level surface.

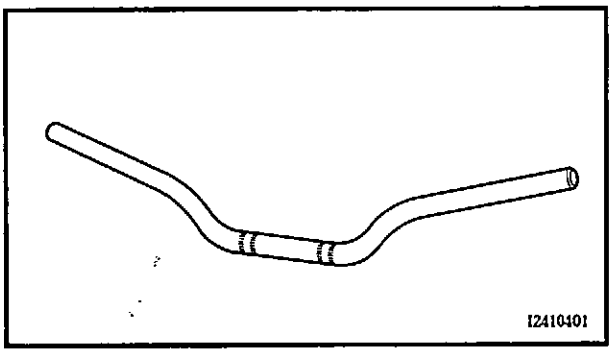
⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

2. Remove:
   - handlebar grip

NOTE:

Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.

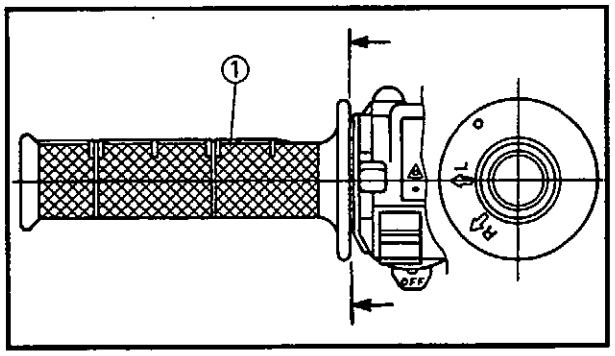


EAS00668
CHECKING THE HANDLEBAR

1. Check:
   - handlebar
     Bends/cracks/damage → Replace.

⚠ WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken it.



INSTALLING THE HANDLEBAR

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

2. Install:
   - handlebar grip ①

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Apply a thin coat of rubber adhesive onto the left end of the handlebar.

b. Slide the handlebar grip over the left end of the handlebar.

c. Wipe off any excess rubber adhesive with a clean rag.

NOTE:

Install the handlebar grip with the arrow mark "L" facing up.

⚠ WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

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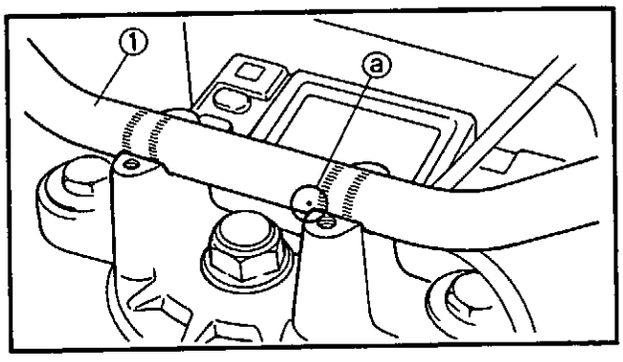
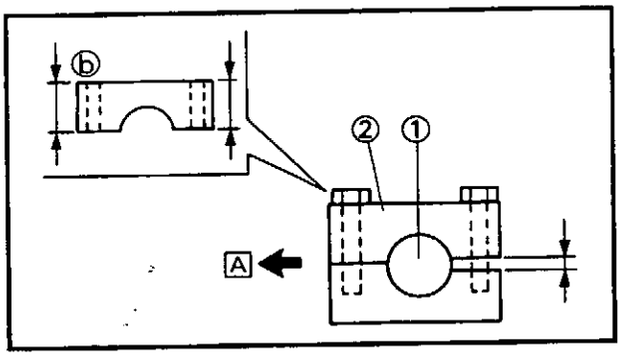


3. Install:
   - handlebar ①
   - upper handlebar holders ②

   23 Nm (2.3 m · kg)

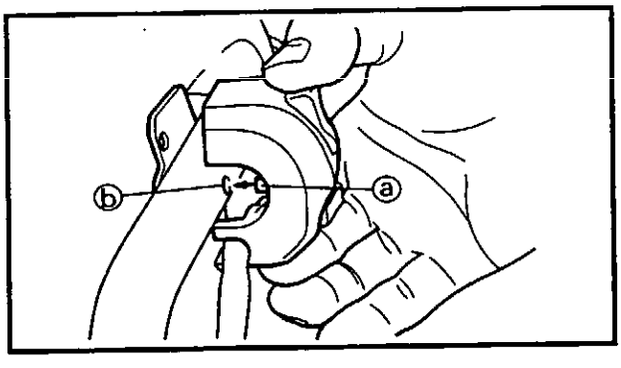
CAUTION:

- **First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.**
- **Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.**



NOTE:

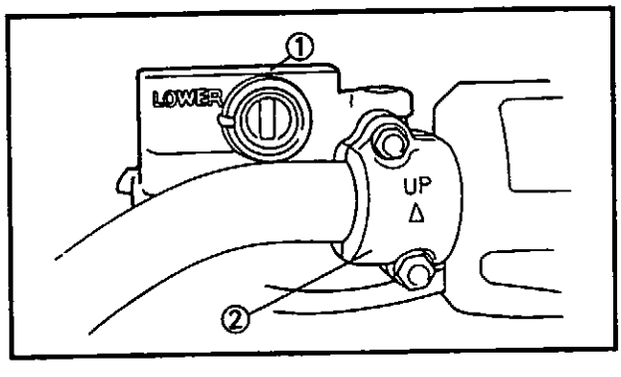
- Align the match marks ⓐ on the handlebar with the upper surface of the lower handlebar holders.
- The upper handlebar holders should be installed with the longer side ⓑ facing forward A.



4. Install:
   - left handlebar switch
   - right handlebar switch

NOTE:

Align the projections ⓐ on the handlebar switches with the holes ⓑ in the handlebar.



5. Install:
   - brake master cylinder ①
   - brake master cylinder holder ②

   7 Nm (0.7 m · kg)

NOTE:

Install the brake master cylinder holder with the "UP" mark facing up.

6. Adjust:
   • clutch cable free play
   Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.

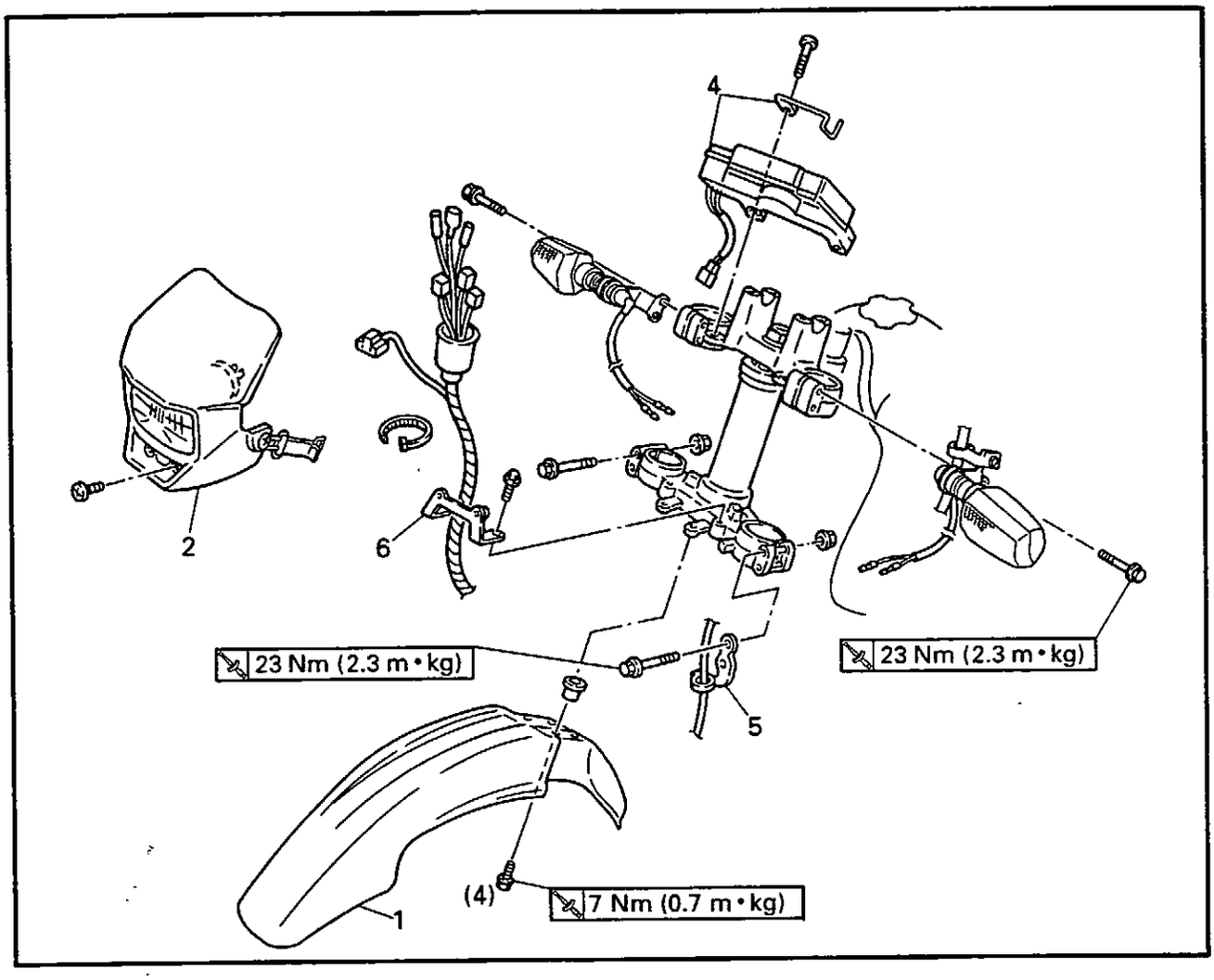
Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm

7. Adjust:
   • throttle cable free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm

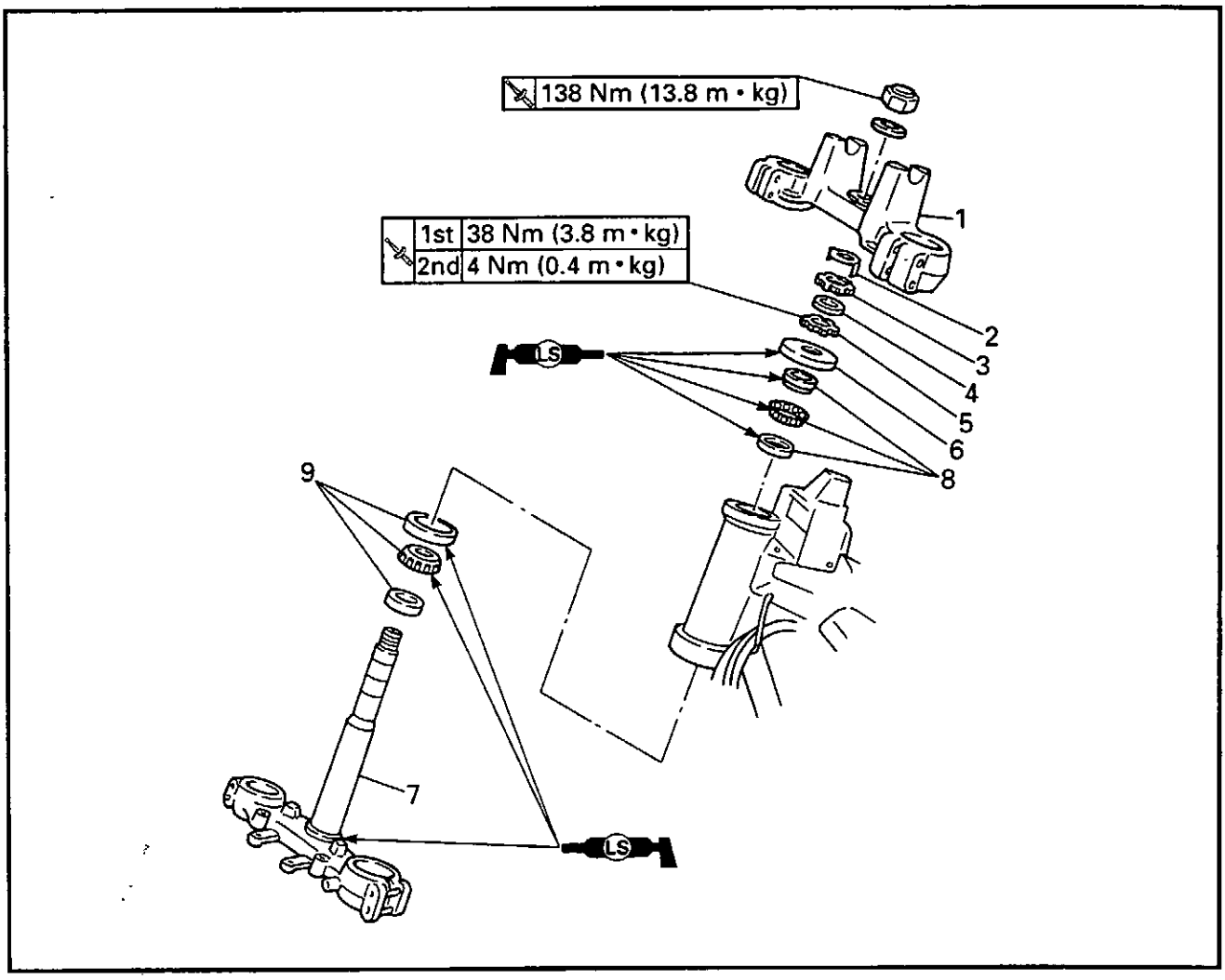
STEERING HEAD

FRONT FENDER, HEADLIGHT AND METER



Order	Job/Part	Q'ty	Remarks
	Removing the front fender, headlight and meter		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
	Front fork		Refer to "FRONT FORK".
	Handlebar		Refer to "HANDLEBAR".
1	Front fender	1	
2	Headlight	1	
3	Front turn signal light (left and right)	2	
4	Meter assembly	1	
5	Cable holder	1	
6	Wire harness holder	1	
			For installation, reverse the removal procedure.

LOWER BRACKET



Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket		Remove the parts in the order listed.
1	Upper bracket	1	
2	Lock washer	1	
3	Upper ring nut	1	
4	Rubber washer	1	
5	Lower ring nut	1	
6	Bearing cover	1	
7	Lower bracket	1	
8	Bearing	1	
9	Bearing	1	
			For installation, reverse the removal procedure.

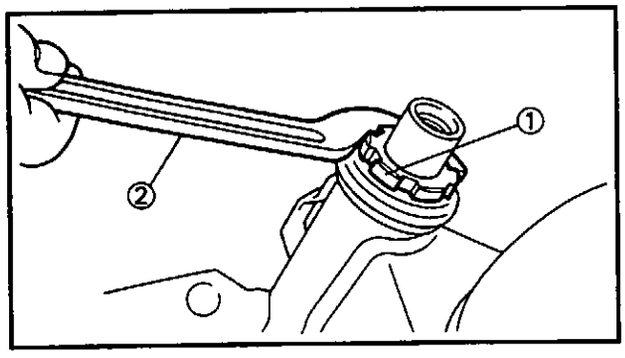
EAS00677
REMOVING THE LOWER BRACKET

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

2. Remove:
   - lower ring nut ①
     (with the special tool ②)



	Ring nut wrench **90890-01268**

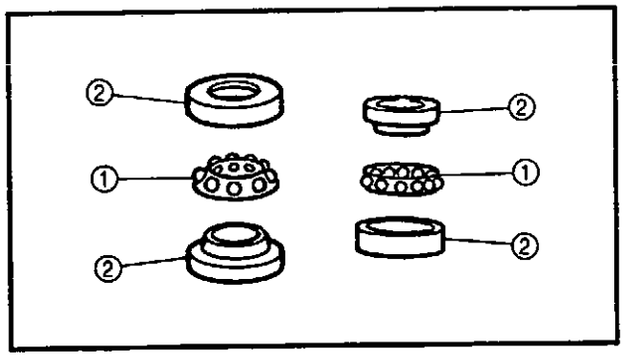
⚠ WARNING

Securely support the lower bracket so that there is no danger of it falling.

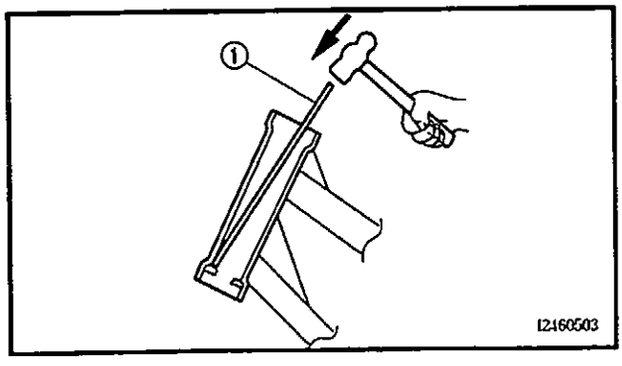
EAS00682
CHECKING THE STEERING HEAD

1. Wash:
   - bearing balls
   - bearing races

	Recommended cleaning solvent **Kerosene**



2. Check:
   - bearing balls ①
   - bearing races ②
     Damage/pitting→ Replace.



3. Replace:
   - bearing balls
   - bearing races

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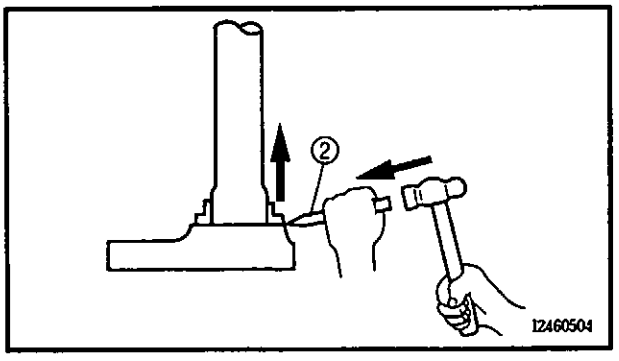
a. Remove the bearing races from the steering head pipe with a long rod ① and hammer.



b. Remove the bearing race from the lower bracket with a floor chisel ② and hammer.

c. Install a new dust seal and new bearing races.

CAUTION:

If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE:

- Always replace the bearing balls and bearing races as a set.
- Whenever the steering head is disassembled, replace the dust seal.

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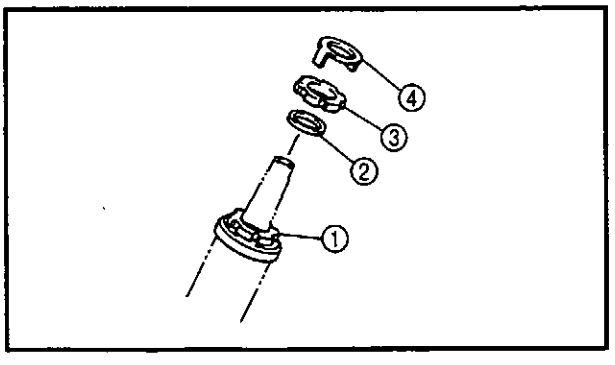
4. Check:
   - upper bracket
   - lower bracket
   (along with the steering stem)
   Bends/cracks/damage → Replace.

EAS00683
INSTALLING THE STEERING HEAD

1. Lubricate:
   - upper bearing
   - lower bearing
   - bearing races

	Recommended lubricant **Lithium soap base grease**



2. Install:
   - lower ring nut ①
   - rubber washer ②
   - upper ring nut ③
   - lock washer ④
   Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" in chapter 3.

3. Install:
   - upper bracket
   - steering stem nut

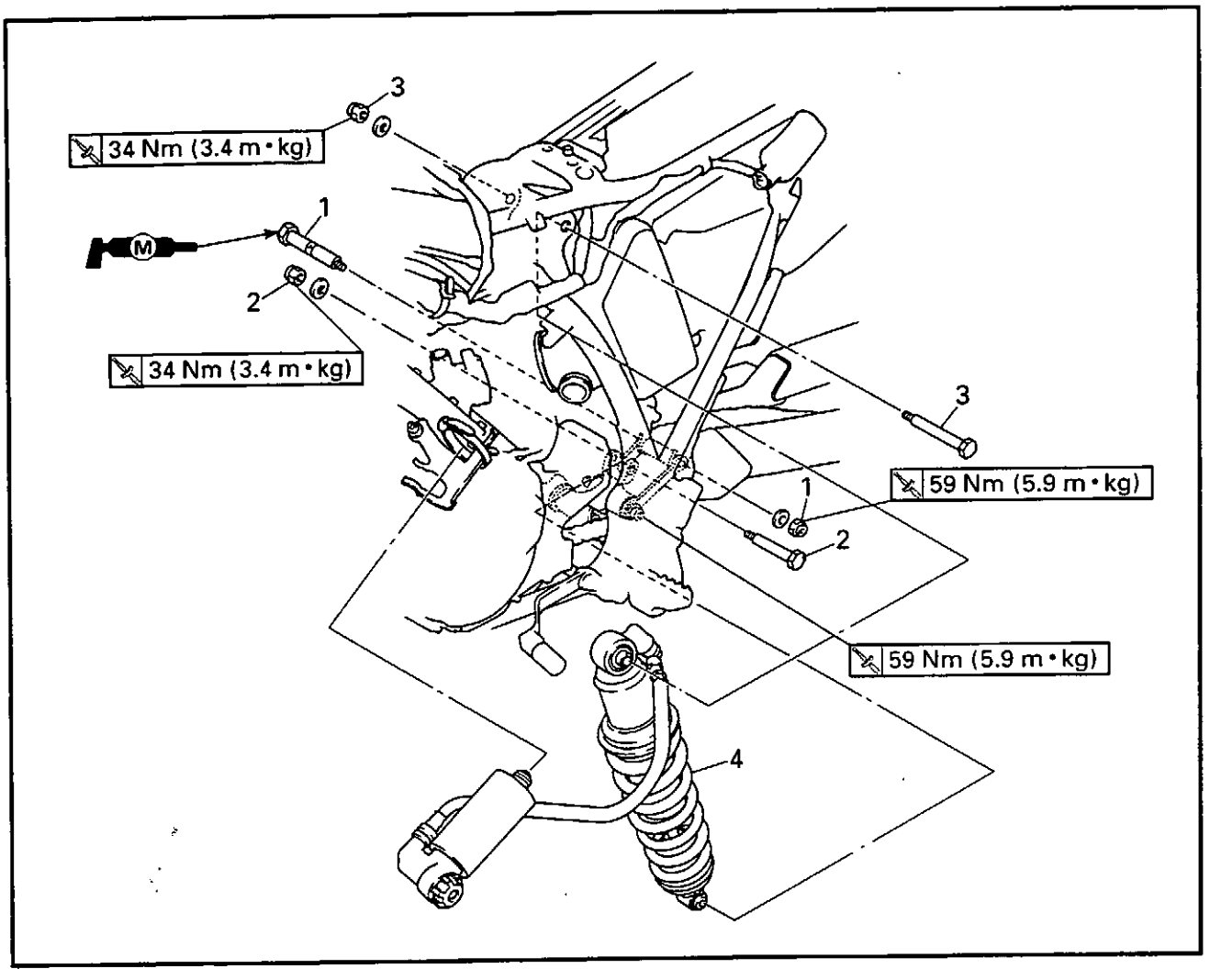
NOTE:
Temporarily tighten the steering stem nut.

4. Install:
   - front fork legs
     Refer to "FRONT FORK".

NOTE:
Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:
   - steering stem nut
     138 Nm (13.8 m · kg)
   - lower bracket pinch bolt
     23 Nm (2.3 m · kg)
   - upper bracket pinch bolt
     23 Nm (2.3 m · kg)

EAS00685
REAR SHOCK ABSORBER ASSEMBLY



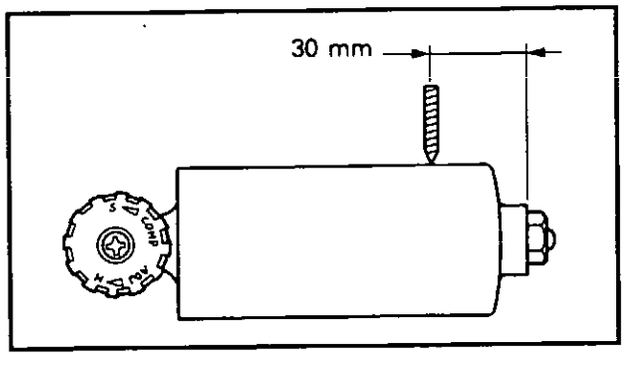
Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assembly		Remove the parts in the order listed.
	Side cover, seat and fuel tank		Refer to "AIR SCOOP, SIDE COVERS, SEAT, FUEL TANK AND MUFFLER" in chapter 3.
	Carburetor assembly		Refer to "CARBURETOR" in chapter 6.
	Rear wheel		Refer to "REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET".
1	Connecting arm bolt/nut	1/1	
2	Lower shock absorber bolt/nut	1/1	
3	Upper shock absorber bolt/nut	1/1	
4	Rear shock absorber assembly	1	
			For installation, reverse the removal procedure.

EAS00687
HANDLING THE REAR SHOCK ABSORBER AND GAS CYLINDER

⚠ WARNING

This rear shock absorber and gas cylinder contain highly compressed nitrogen gas. Before handling the rear shock absorber or gas cylinder, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber and gas cylinder.

- **Do not tamper or attempt to open the rear shock absorber or gas cylinder.**
- **Do not subject the rear shock absorber or gas cylinder to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.**
- **Do not deform or damage the rear shock absorber or gas cylinder in any way. If the rear shock absorber, gas cylinder, or both are damaged, damping performance will suffer.**



EAS00689
DISPOSING OF A REAR SHOCK ABSORBER AND GAS CYLINDER

Gas pressure must be released before disposing of a rear shock absorber and gas cylinder. To release the gas pressure, drill a 2 ~ 3-mm hole through the gas cylinder at a point 30 mm from its end as shown.

⚠ WARNING

Wear eye protection to prevent eye damage from released gas or metal chips.

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

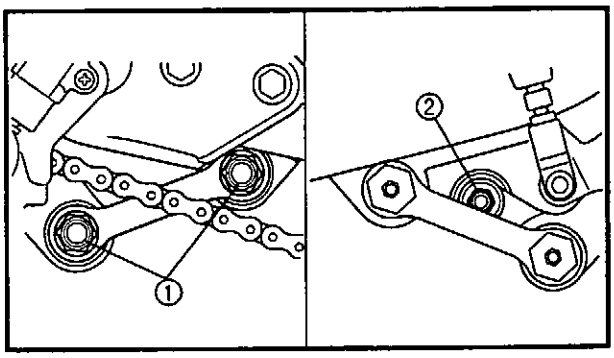
1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

NOTE:

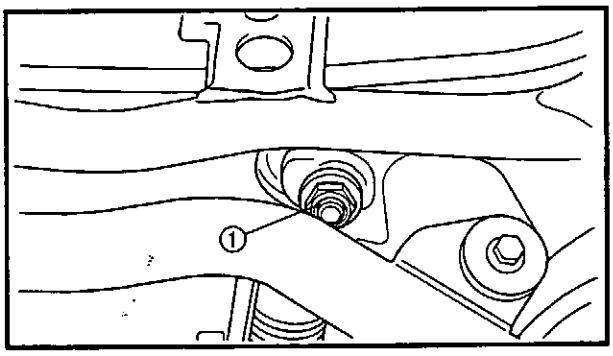
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



2. Remove:
   - connecting arm bolt ①
   - rear shock absorber assembly lower bolt ②

NOTE:

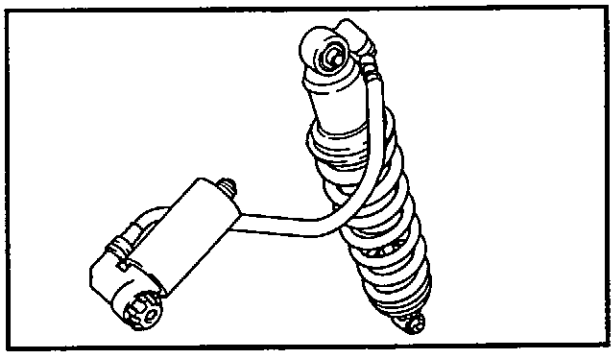
While removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



3. Remove:
   - rear shock absorber assembly upper bolt ①
   - rear shock absorber assembly

NOTE:

Lower the swingarm and then remove the rear shock absorber assembly.



EAS00696

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY AND GAS CYLINDER

1. Check:
   - rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - rear shock absorber
     Gas leaks/oil leaks → Replace the rear shock absorber assembly.
   - spring
     Damage/wear → Replace the rear shock absorber assembly.
   - gas cylinder
     Damage/gas leaks → Replace.
   - bushings
     Damage/wear → Replace.
   - dust seals
     Damage/wear → Replace.
   - bolts
     Bends/damage/wear → Replace.

EAS00697
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   • connecting arm bolt

	Recommended lubricant **Lithium soap base grease**

2. Install:
   • rear shock absorber assembly
3. Tighten:
   • rear shock absorber assembly upper nut

	34 Nm (3.4 m · kg)

   • rear shock absorber assembly lower nut

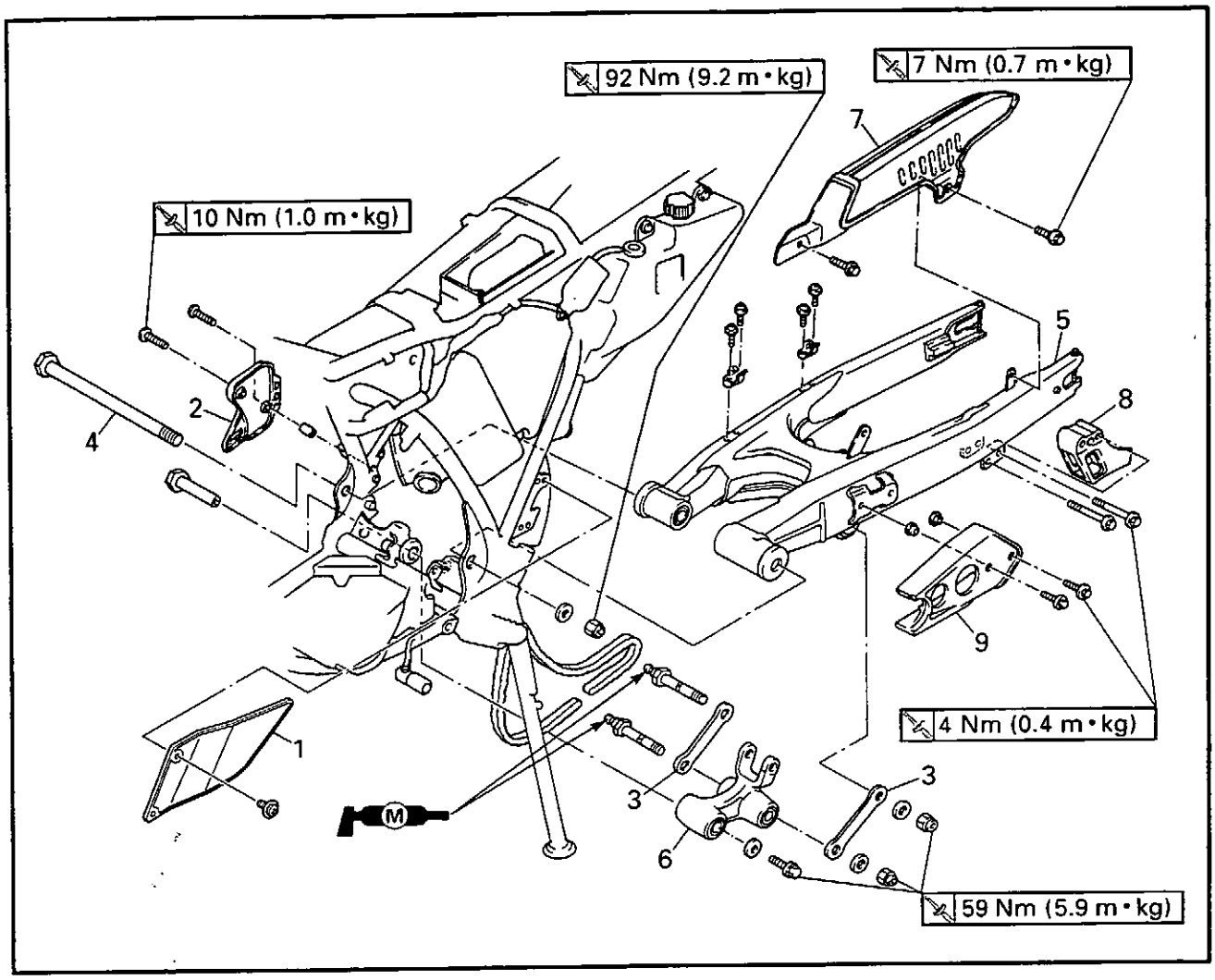
	34 Nm (3.4 m · kg)

   • connecting arm nut

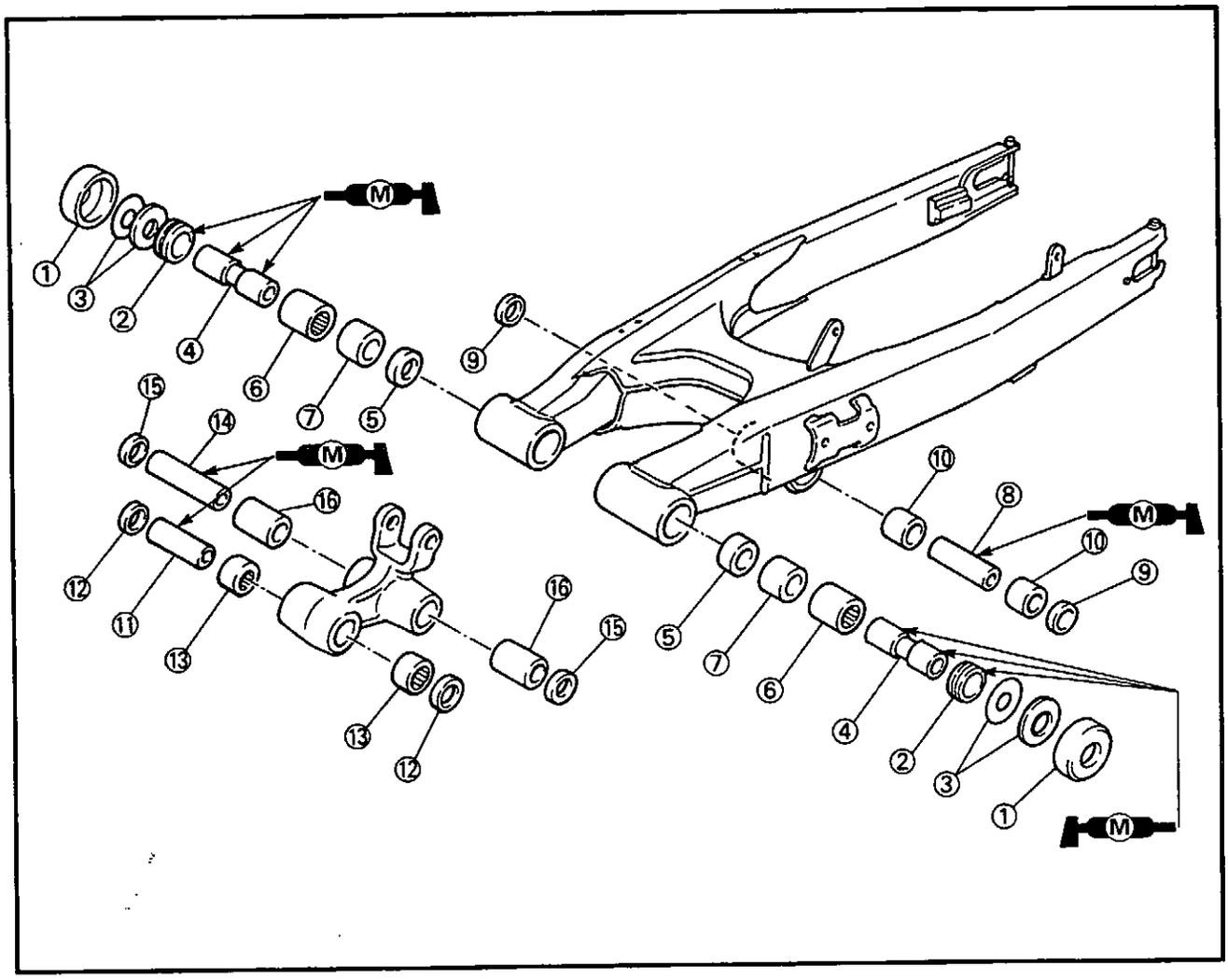
	59 Nm (5.9 m · kg)

NOTE:
When installing the rear shock absorber assembly, lift up the swingarm.

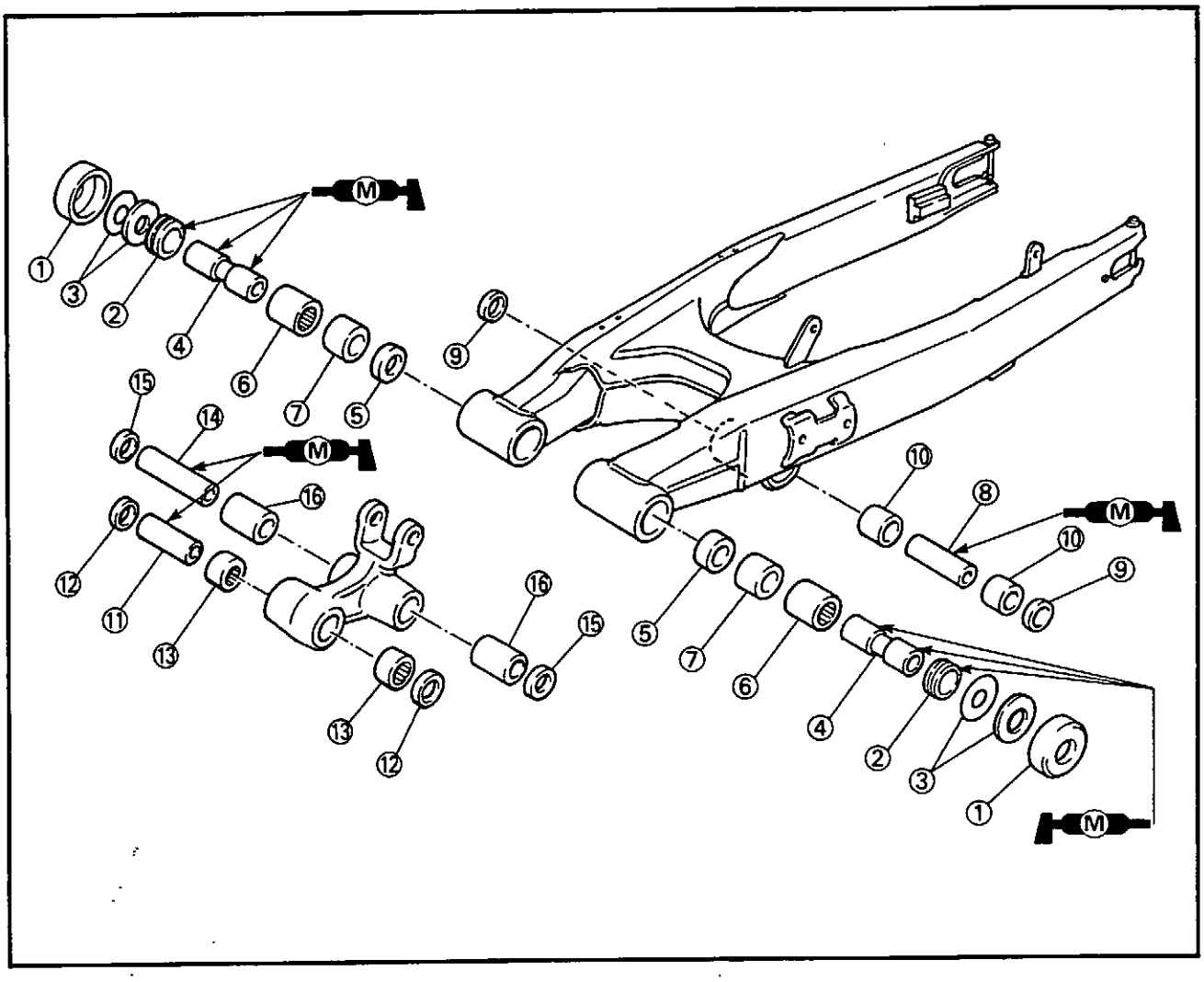
SWINGARM



Order	Job/Part	Q'ty	Remarks
	Removing the swingarm		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET".
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY".
	Rear brake caliper		Refer to "FRONT AND REAR BRAKES".
1	Drive chain guard 2	1	
2	Rear brake master cylinder cover	1	
3	Connecting arm	2	
4	Pivot shaft	1	
5	Swingarm assembly	1	
6	Relay arm	1	
7	Drive chain guard 1	1	
8	Rear drive chain guide	1	
9	Front drive chain guide	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the swingarm		Remove the parts in the order listed.
①	Dust cover	2	
②	Oil seal	2	
③	Washer	4	
④	Bushing	2	
⑤	Oil seal	2	
⑥	Bearing	2	
⑦	Bushing	2	
⑧	Spacer	1	
⑨	Oil seal	2	
⑩	Bushing	2	
⑪	Spacer	1	
⑫	Oil seal	2	
⑬	Bearing	2	
⑭	Spacer	1	
⑮	Oil seal	2	



Order	Job/Part	Q'ty	Remarks
⑯	Bushing	2	For assembly, reverse the disassembly procedure.

EAS00703
REMOVING THE SWINGARM

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

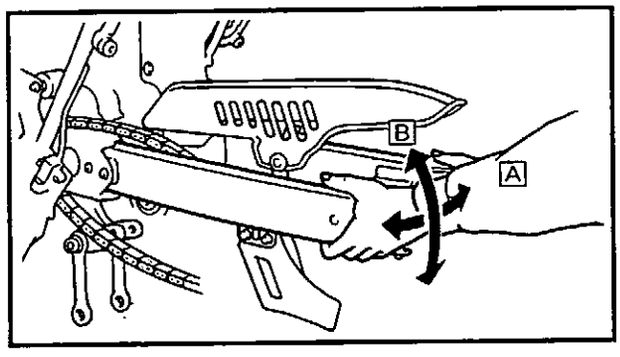
NOTE:

Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - connecting arm bolt
   - rear shock absorber assembly lower bolt

NOTE:

When removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



3. Measure:
   - swingarm free play
   - swingarm vertical movement

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a. Measure the tightening torque of the pivot shaft nut.

Pivot shaft nut
92 Nm (9.2 m • kg)

b. Measure the swingarm free play [A] by moving the swingarm from side to side.

c. If the swingarm free play is out of specification, check the spacers, bearings, washers, and dust covers.

Swingarm free play (at the end of the swingarm)
1.0 mm

d. Check the swingarm vertical movement [B] by moving the swingarm up and down.

If swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, washers, and dust covers.

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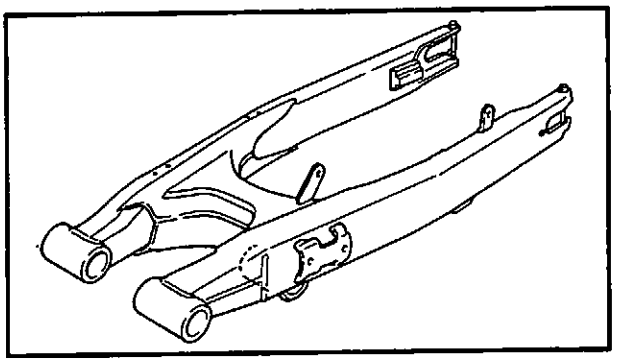
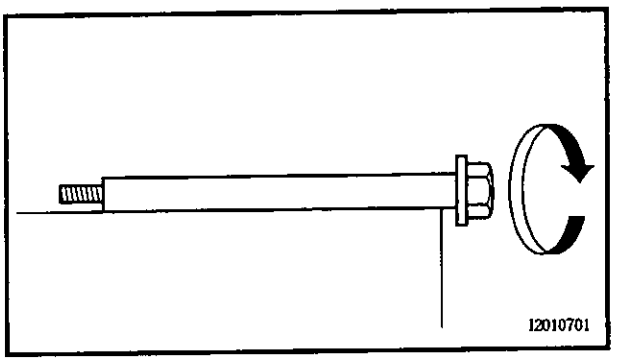


EAS00707
CHECKING THE SWINGARM

1. Check:
   • swingarm
   Bends/cracks/damage → Replace.



2. Check:
   • pivot shaft
   Roll the pivot shaft on a flat surface.
   Bends → Replace.

⚠ WARNING

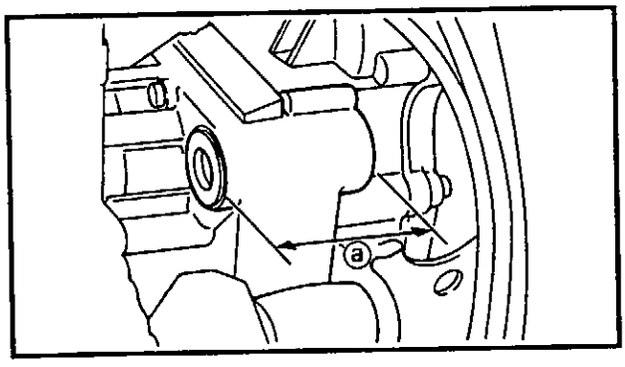
Do not attempt to straighten a bent pivot shaft.

3. Wash:
   • pivot shaft
   • dust covers
   • spacer
   • washers
   • bearings

Recommended cleaning solvent
Kerosene

4. Check:
   • dust covers
   • spacer
   • washers
   • oil seals
   Damage/wear → Replace.
   • bearings
   Damage/pitting → Replace.

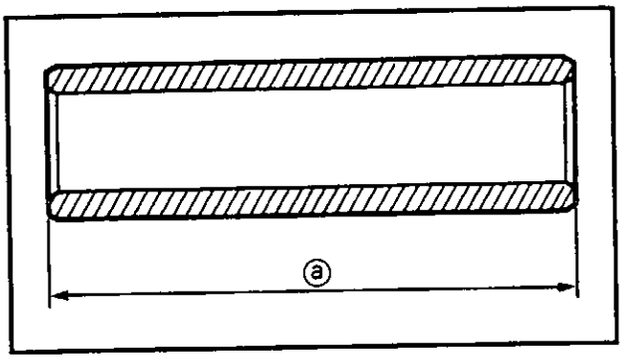
5. Check:
   • connecting arms
   • relay arm
   Damage/wear → Replace.
   • bearings
   • oil seals
   Damage/pitting → Replace.
   • spacers
   Damage/scratches → Replace.



ADJUSTING THE SIDE CLEARANCE

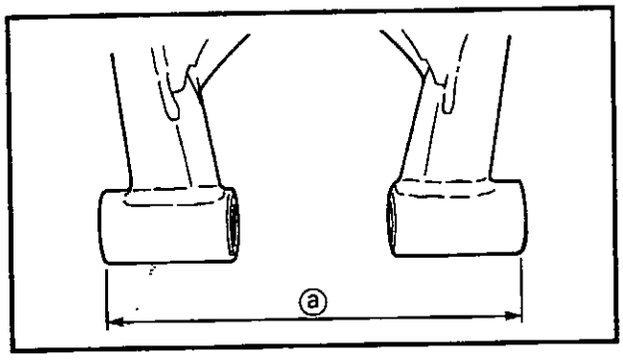
1. Measure:
   • engine mounting boss width ⓐ

Engine mounting boss width
71.30 ~ 71.34 mm

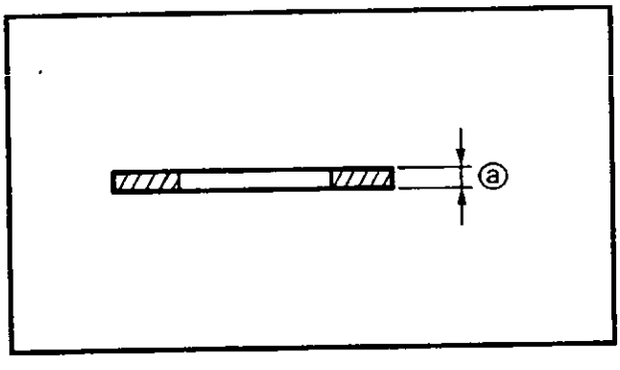


2. Measure:
   • bushing length (left and right) ⓐ
   Out of specification → Replace.

Bushing length (left and right)
66.60 ~ 66.75 mm



3. Measure:
   • swingarm pivot width ⓐ



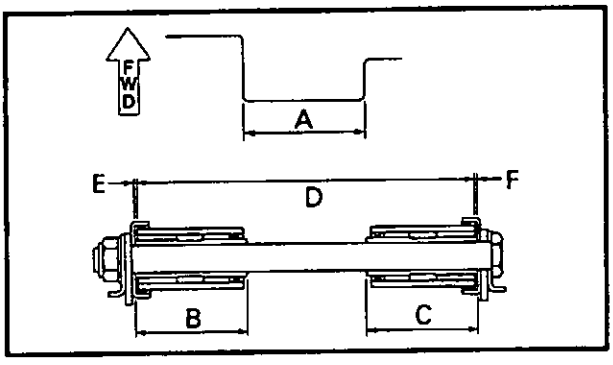
4. Measure:
   • washer thickness (left and right) ⓐ
   Out of specification → Replace.

Washer thickness (left and right)
0.7 ~ 0.9 mm

5. Check:
   • swingarm side clearance
   Out of specification → Adjust.

Swingarm side clearance
0.4 ~ 0.7 mm

a. Calculate the swingarm side clearance by using the formula given below.



Swingarm side clearance =
(A + B + C) – (D + E + F)

A: Engine mounting boss width
B, C: Bushing length (left and right)
D: Swingarm pivot width
E, F: Washer thickness

Example:
A: 71.32 mm B: 66.60 mm C: 66.60 mm
D: 202.2 mm E: 0.7 mm F: 0.8 mm
Swingarm side clearance =
(71.32 + 66.60 + 66.60) – (202.2 + 0.7 + 0.8)
= 0.82 mm
Then install the one shim.

NOTE:
When installing the shim on the right side only.

Shim thickness
0.3 mm

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EAS00711
INSTALLING THE SWINGARM

1. Lubricate:
   - bearings
   - spacers
   - dust covers
   - pivot shaft

Recommended lubricant
Molybdenum disulfide grease

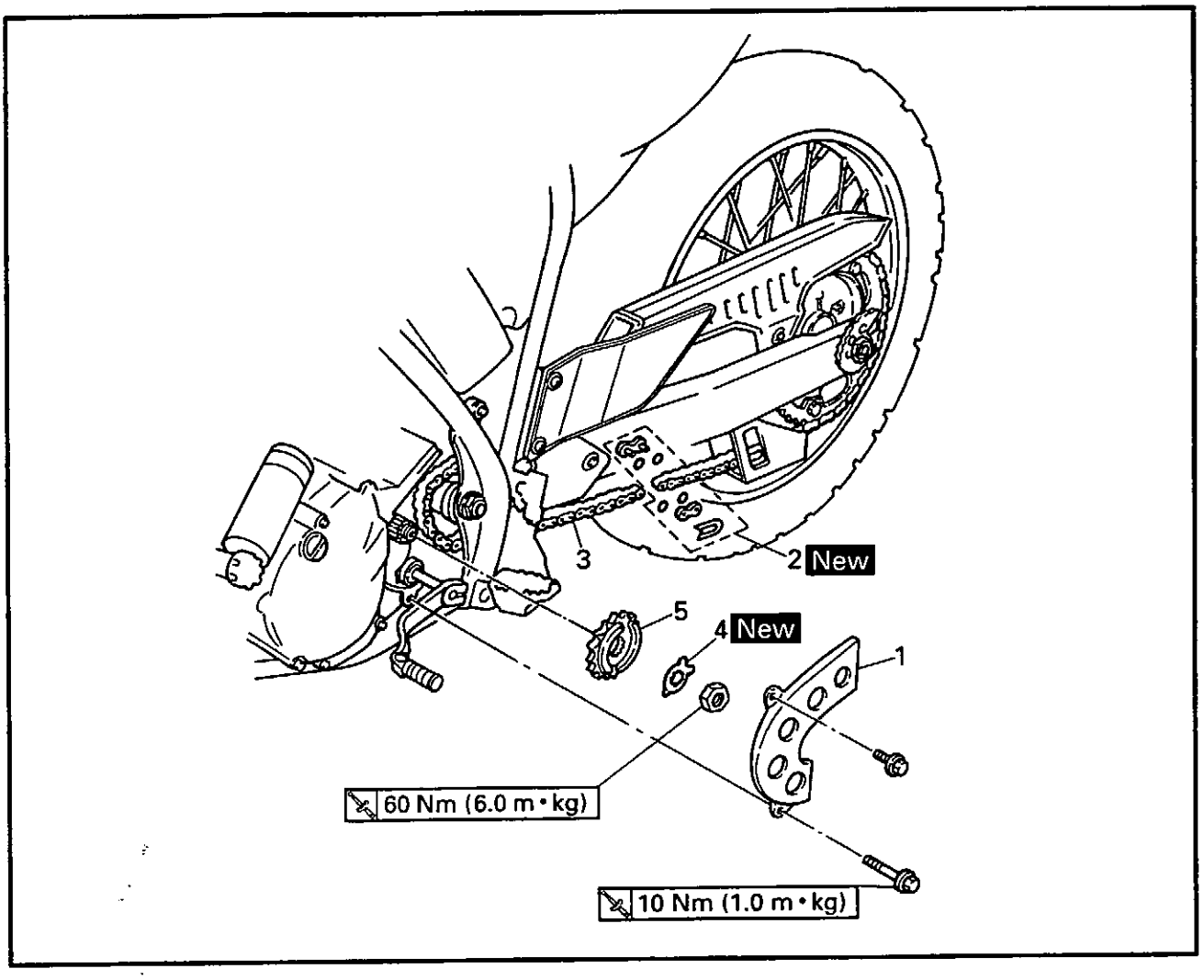
2. Install:
   - relay arm — **59 Nm (5.9 m · kg)**
   - connecting arms — **59 Nm (5.9 m · kg)**
3. Install:
   - rear shock absorber assembly
   - rear wheel

   Refer to "REAR SHOCK ABSORBER ASSEMBLY" and "REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET".

4. Adjust:
   • drive chain slack
   Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in chapter 3.

Drive chain slack
40 ~ 60 mm

DRIVE CHAIN



Order	Job/Part	Q'ty	Remarks
	Removing the drive chain		Remove the parts in the order listed.
1	Drive sprocket cover	1	
2	Master link kit	1	
3	Drive chain	1	
4	Lock washer	1	
5	Drive sprocket	1	
			For installation, reverse the removal procedure.

EAS00705
REMOVING THE DRIVE CHAIN

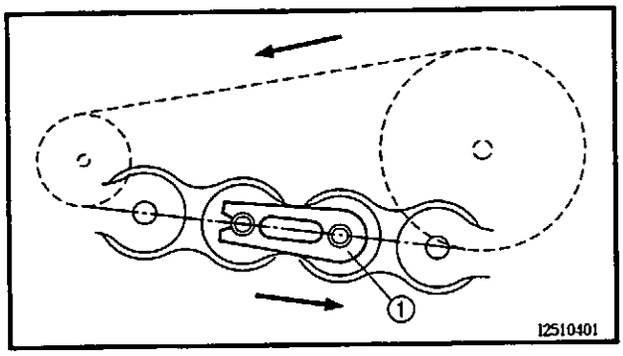
1. Stand the motorcycle on a level surface.

⚠ WARNING

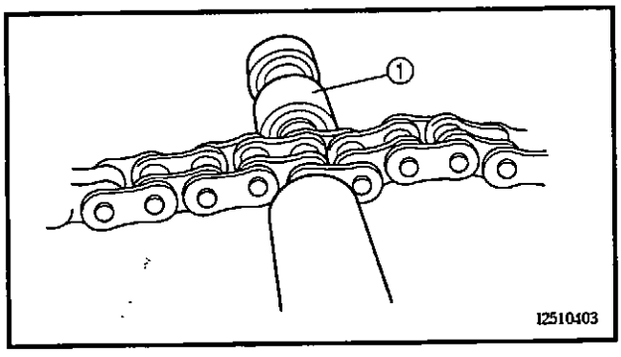
Securely support the motorcycle so that there is no danger of it falling over.

NOTE:

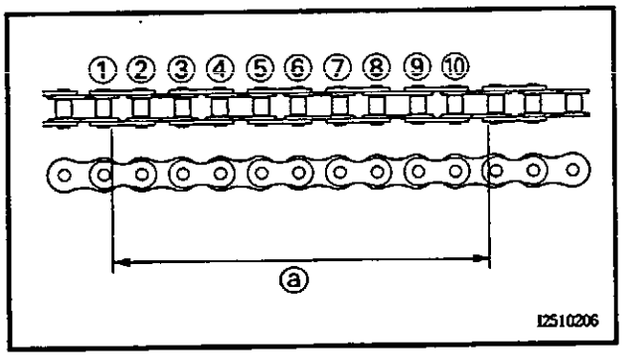
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



2. Remove:
   - master link clip ①



3. Remove:
   - master link plate
   - O-ring
   - master link
     (with a drive chain cutter ①)
4. Remove:
   - drive chain



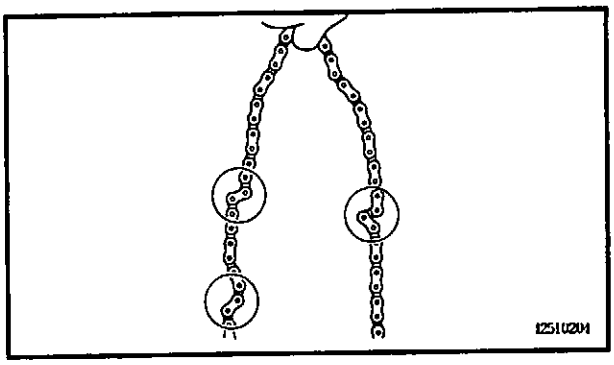
EAS00709
CHECKING THE DRIVE CHAIN

1. Measure:
   - ten-link section ⓐ of the drive chain
     Out of specification → Replace the drive chain.

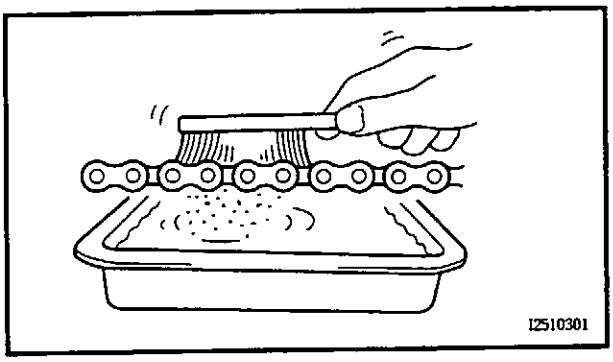
Maximum ten-link drive chain section length
120 mm

NOTE:

- While measuring the ten-link section, push down on the drive chain to increase its tension.
- Measure the length between drive chain roller ① and ⑩ as shown.
- Perform this measurement at two or three different places.



2. Check:
   • drive chain
   Stiffness → Clean and lubricate or replace.



3. Clean:
   • drive chain

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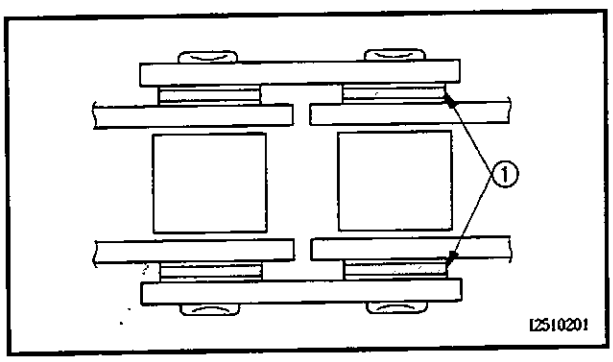
a. Wipe the drive chain with a clean cloth.
b. Put the drive chain in kerosene and remove any remaining dirt.
c. Remove the drive chain from the kerosene and completely dry it.

CAUTION:

This motorcycle has a drive chain with small rubber O-rings ① between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's internals, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only kerosene to clean the drive chain.



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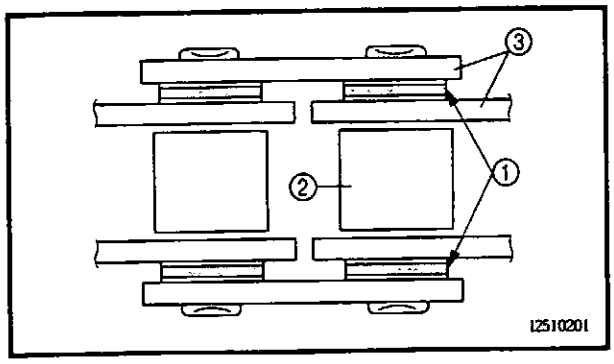
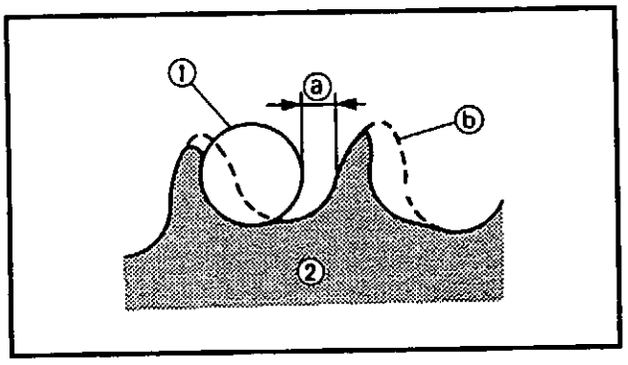
4. Check:
   • O-rings ①
   Damage → Replace the drive chain.
   • drive chain rollers ②
   Damage/wear → Replace the drive chain.
   • drive chain side plates ③
   Damage/wear → Replace the drive chain.
   Cracks → Replace the drive chain and make sure the battery breather hose is properly routed away from the drive chain and below the swingarm.



5. Lubricate:
   • drive chain

Recommended lubricant
Engine oil or chain lubricant suitable for O-ring chains



6. Check:
   - drive sprocket
   - rear wheel sprocket

   More than 1/4 tooth ⓐ wear → Replace the drive chain sprockets as a set.
   Bent teeth → Replace the drive chain sprockets as a set.

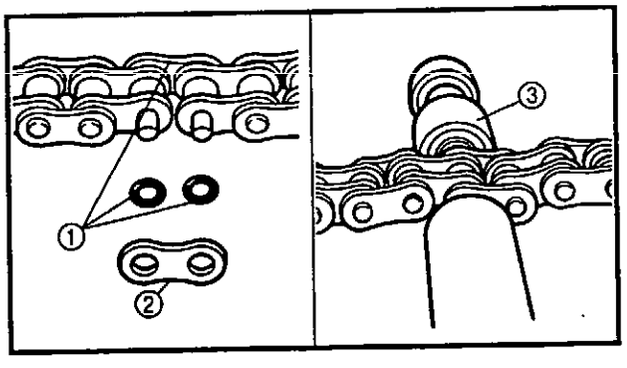
ⓑ Correct
① Drive chain roller
② Drive chain sprocket

EAS00713
INSTALLING THE DRIVE CHAIN

1. Lubricate:
   - drive chain
   - master link New

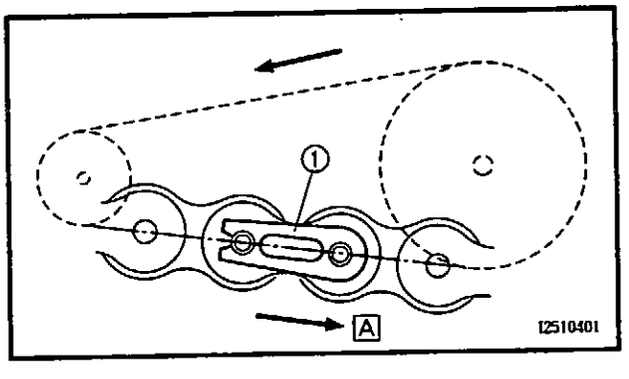
Recommended lubricant
Engine oil or chain lubricant suitable for O-ring chains

2. Install:
   - drive sprocket
   - washer
   - drive sprocket nut 60 Nm (6.0 m · kg)



3. Install:
   - master link/O-ring ① New
   - master link plate ② New

   (with a drive chain cutter ③)



4. Install:
   - master link clip ① New

CAUTION:
- **The closed end of the master link clip must face in the direction of drive chain rotation A.**
- **Never install a new drive chain onto worn drive chain sprockets; this will dramatically shorten the drive chain's life.**

5. Adjust:
   • drive chain slack
   Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in chapter 3.

Drive chain slack
40 ~ 60 mm

CAUTION:

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

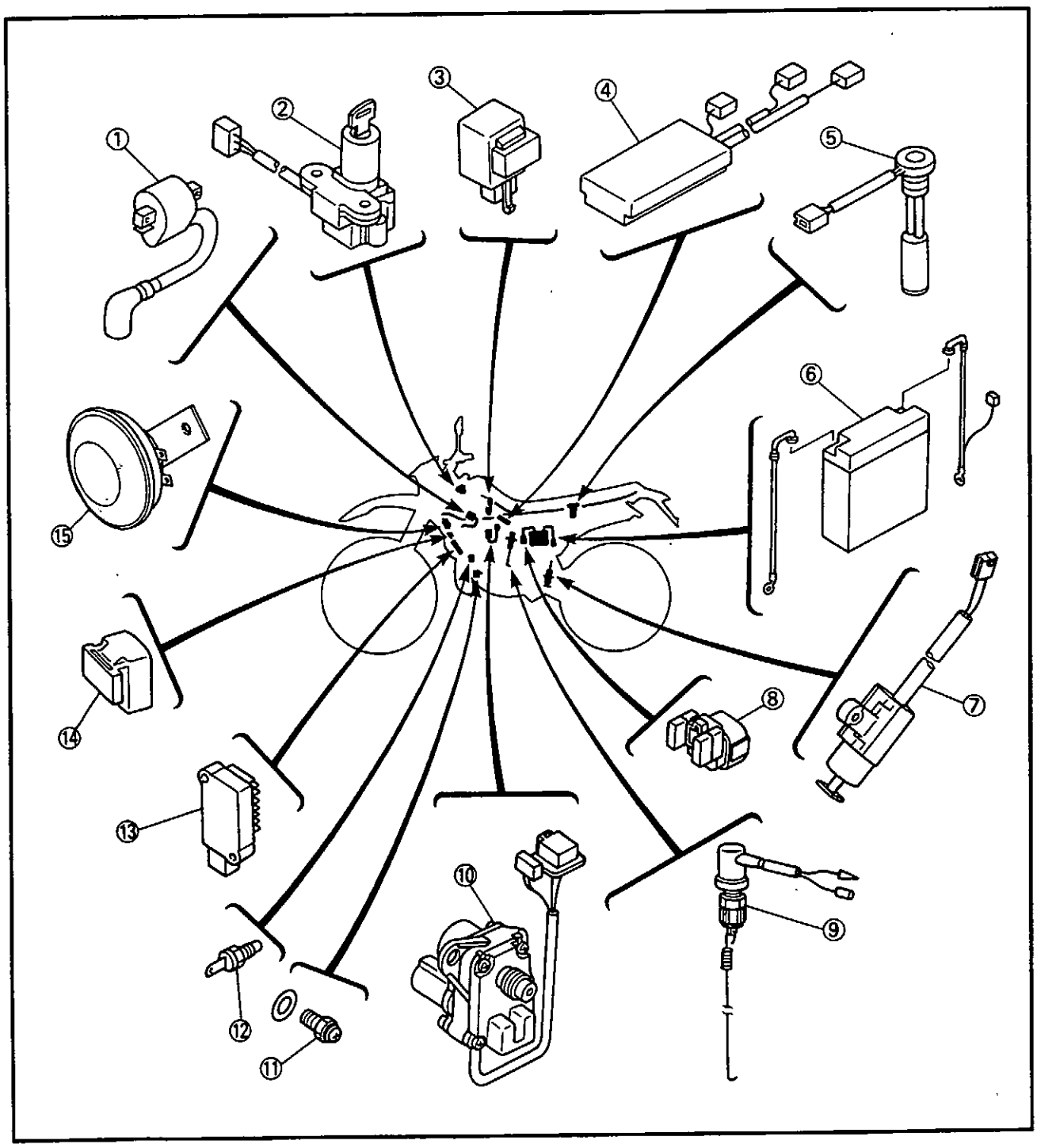
CONTENTS
ELECTRICAL

EAS00729

ELECTRICAL

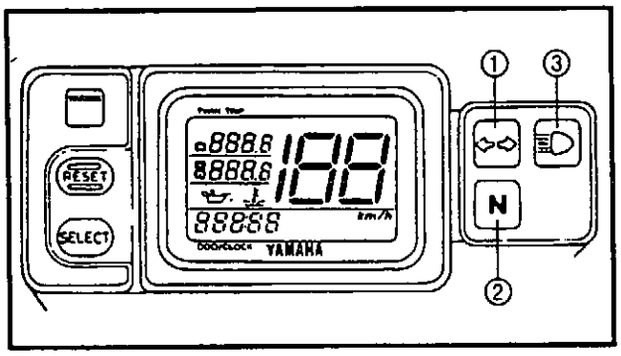
ELECTRICAL COMPONENTS

① Ignition coil
② Main switch
③ Turn signal relay
④ CDI unit
⑤ Oil level switch
⑥ Battery
⑦ Sidestand switch
⑧ Starter relay
⑨ Rear brake light switch
⑩ YPVS servo motor
⑪ Neutral switch
⑫ Thermo switch
⑬ Rectifier/regulator
⑭ Starting circuit cutoff relay
⑮ Horn



INSTRUMENT FUNCTIONS

INDICATOR LIGHTS



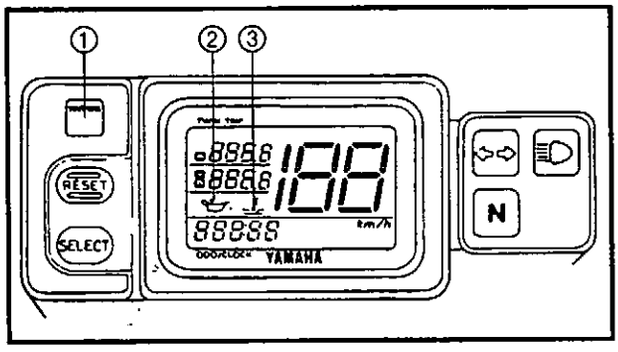
① Turn indicator light " ◇◇ "
② Neutral indicator light " N "
③ High beam indicator light " ≡D "

Turn indicator light " ◇◇ "
This indicator flashes when the turn switch is moved to the left or right.

Neutral indicator light " N "
This indicator comes on when the transmission is in neutral.

High beam indicator light "≡D"
This indicator comes on when the headlight high beam is used.

OIL LEVEL/COOLANT TEMPERATURE INDICATOR LIGHT "WARNING"



① Oil level/coolant temperature indicator light "WARNING"
② Oil level symbol " "
③ Coolant temperature symbol " "

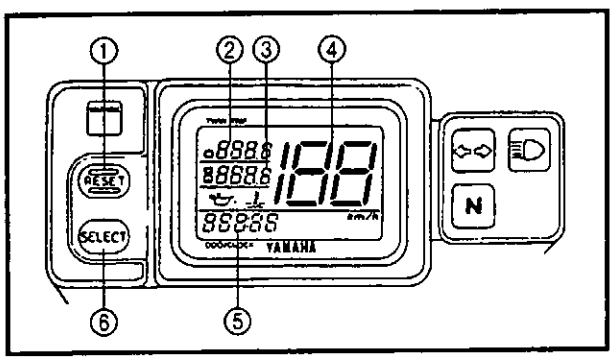
This warning light has three functions.
- The light will come on and symbol " " will appear on the display if the engine oil level is low.
- The light will come on and symbol " " will appear on the display if the engine over heats.
- The light will flash and both symbols " " and " " will appear on the display if the engine oil level is low and the engine overheats.

To check that the indicator light is working properly:
- Put the transmission in neutral or apply the clutch lever.
- Turn the engine stop switch to "○" and the main switch to "ON".
- The light will come on and symbol " ", will appear on display.

CAUTION:
- **Do not run the motorcycle until you know it has sufficient engine oil.**
- **Do not run the motorcycle if the engine is overheated.**

NOTE:
Even if the oil is filled to the specified level, the indicator light may flicker when riding on a slope or during sudden acceleration or deceleration, but this is normal.

DIGITAL SPEEDOMETER



① Reset button "RESET"
② Upper trip odometer
③ Lower trip odometer
④ Digital speedometer
⑤ Odometer/Clock "ODO/CLOCK"
⑥ Mode select button "SELECT"

The speedometer shows riding speed.
This speedometer is equipped with an odometer, two trip odometers and a clock.
The mode select button is used to switch between modes "A" and "B".

When in mode "A":
- The upper trip odometer can be reset to zero.
- The display can be switched to show the clock or the odometer.
- The clock can be set.

When in mode "B":
- The lower trip odometer can be reset.
- The lower trip odometer display can be switched to show the forward count or the reverse count trip odometer.
- The lower trip odometer can be set to count in reverse.

Select the different modes as follows:
- Turn on the main switch.

NOTE:
When the main switch is turned to "ON", the speedometer displays "188 km/h" for a few seconds.
A digital circuit check is being made during this time.

- Push the mode select button to display mode "A".

Mode "A"
To reset the upper trip odometer to zero, push the reset button for at least one second.
To display the clock or odometer reading, push the mode select button for one to three seconds.

To set the clock:
- Push the mode select button until the hours digit flash.
- Push the reset button to change the hours digit.
- Push the mode select button and the minutes digit will flash.
- Push the reset button to change the minutes digit.
- Push the mode select button again to set the clock.

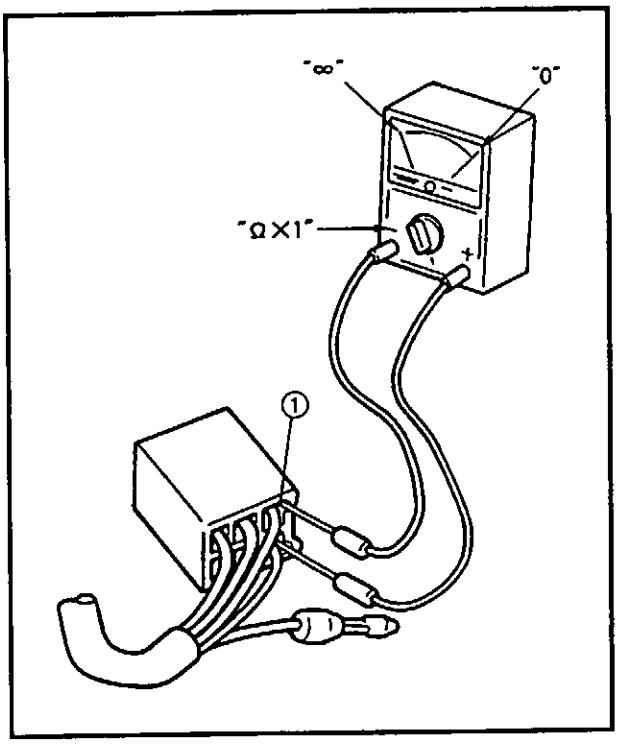
Push the mode select button to display mode "B".

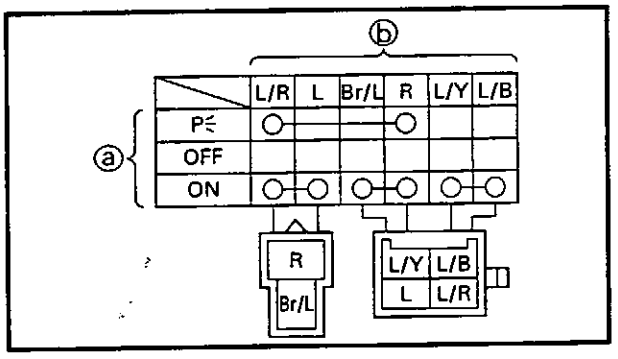
Mode "B"

To reset the lower trip odometer to zero, push the reset button for at least one second.

To display the forward count or the reverse count trip odometer, push the mode select button for one to three seconds. A minus sign — will appear when in the reverse count mode.

To set the reverse count distance:
- Push the mode select button until the hundreds digit flash.
- Push the reset button to change the hundreds digit.
- Repeat this procedure to change the tens and ones digits.
- Push the mode select button again to set the trip odometer.





EAS00730
SWITCHES

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

Never insert the tester probes into the coupler terminal slots ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

Pocket tester
90890-03112

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:

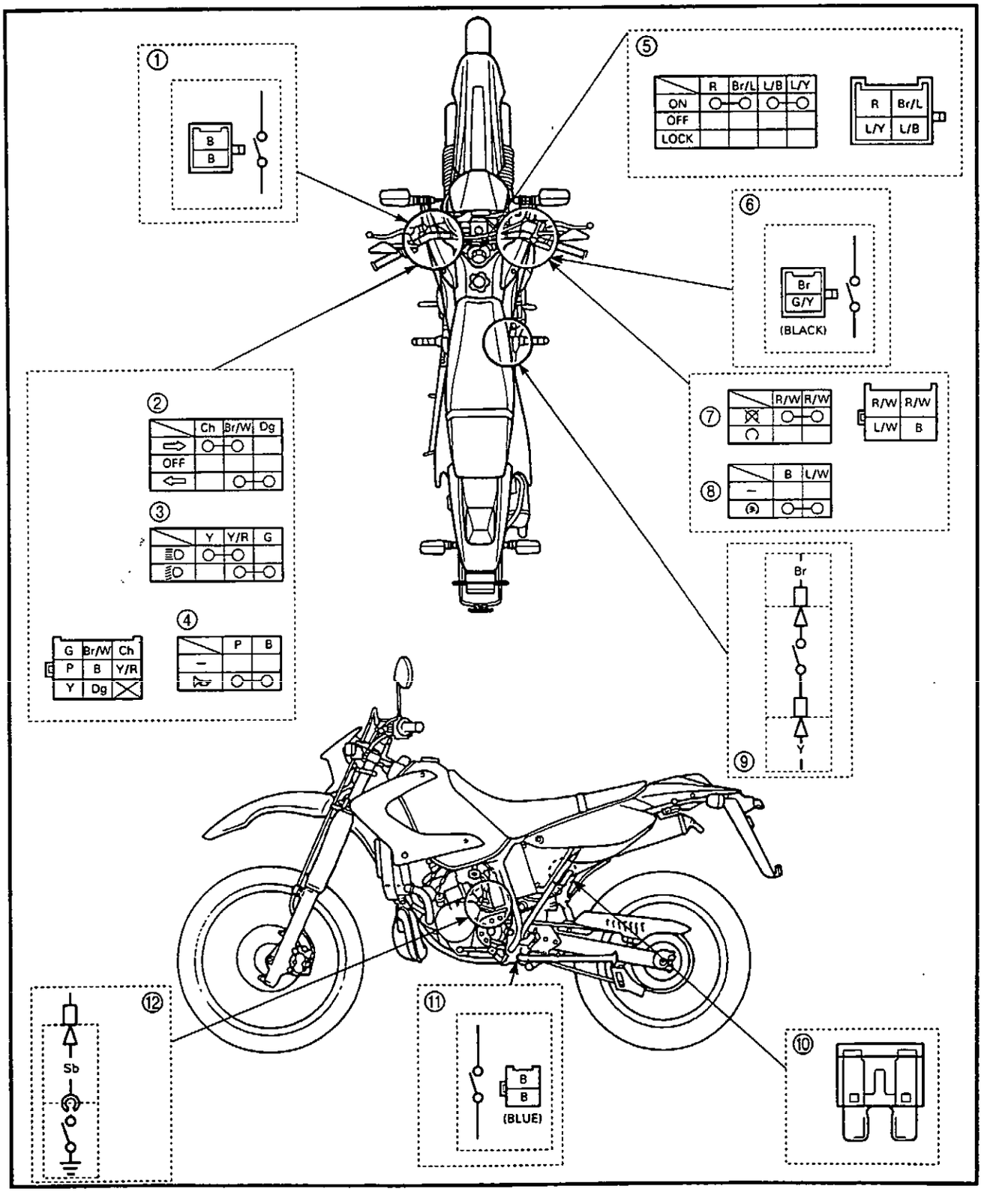
"○——○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:
There is continuity between black and black/white when the switch is set to "OFF".
There is continuity between red and brown when the switch is set to "ON".

EAS00731
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to "CHECKING SWITCH CONTINUITY".

Damage/wear → Repair or replace the switch.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.



①Clutch switch
②Turn signal switch
③Dimmer switch
④Horn switch
⑤Main switch
⑥Front brake light switch
⑦Engine stop switch
⑧Start switch
⑨Rear brake light switch
⑩Fuse
⑪Sidestand switch
⑫Neutral switch

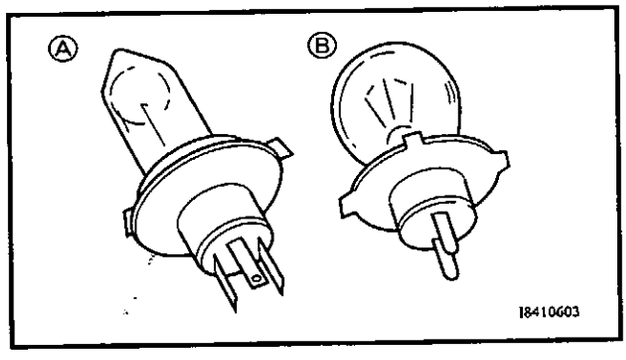
EAS00732
CHECKING THE BULBS AND BULB SOCKETS

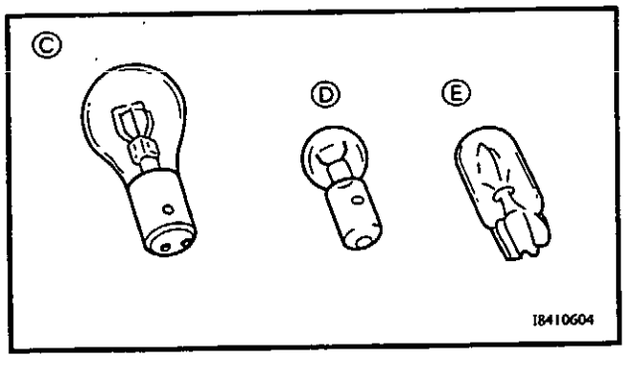
Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket, or both.

Improperly connected → Properly connect.

Incorrect continuity reading → Repair or replace the bulb, bulb socket, or both.





TYPES OF BULBS

The bulbs used on this motorcycle are shown in the illustration on the left.

- Bulbs Ⓐ and Ⓑ are used for the headlights and usually use a bulb holder which must be detached before removing the bulb. The majority of these bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb Ⓒ is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs Ⓓ and Ⓔ are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

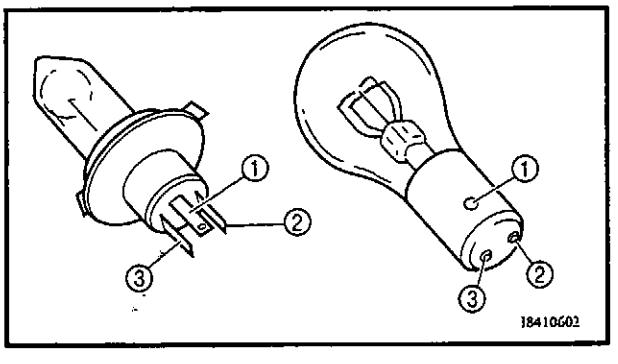
1. Remove:
   - bulb

⚠ WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

CAUTION:

- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**



2. Check:
   - bulb (for continuity)
     (with a pocket tester)
     No continuity → Replace.

	Pocket tester **90890-03112**

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.

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a. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ②, and check the continuity.

b. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ③, and check the continuity.

c. If either of the readings indicate no continuity, replace the bulb.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

1. Check:
   - bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

	Pocket tester **90890-03112**

NOTE:
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Install a good bulb into the bulb socket.

b. Connect the pocket tester probes to the respective leads of the bulb socket.

c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

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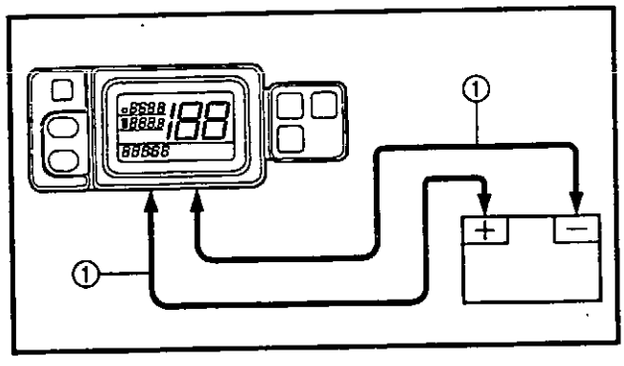
CHECKING THE LEDs

The following procedure applies to all of the LEDs.

1. Check:
   - LED (for proper operation)
     Improper operation → Replace the meter assembly.



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a. Disconnect the meter assembly coupler (meter assembly side).

b. Connect two jumper leads ① from the battery terminals to the respective coupler terminals as shown.

⚠ WARNING

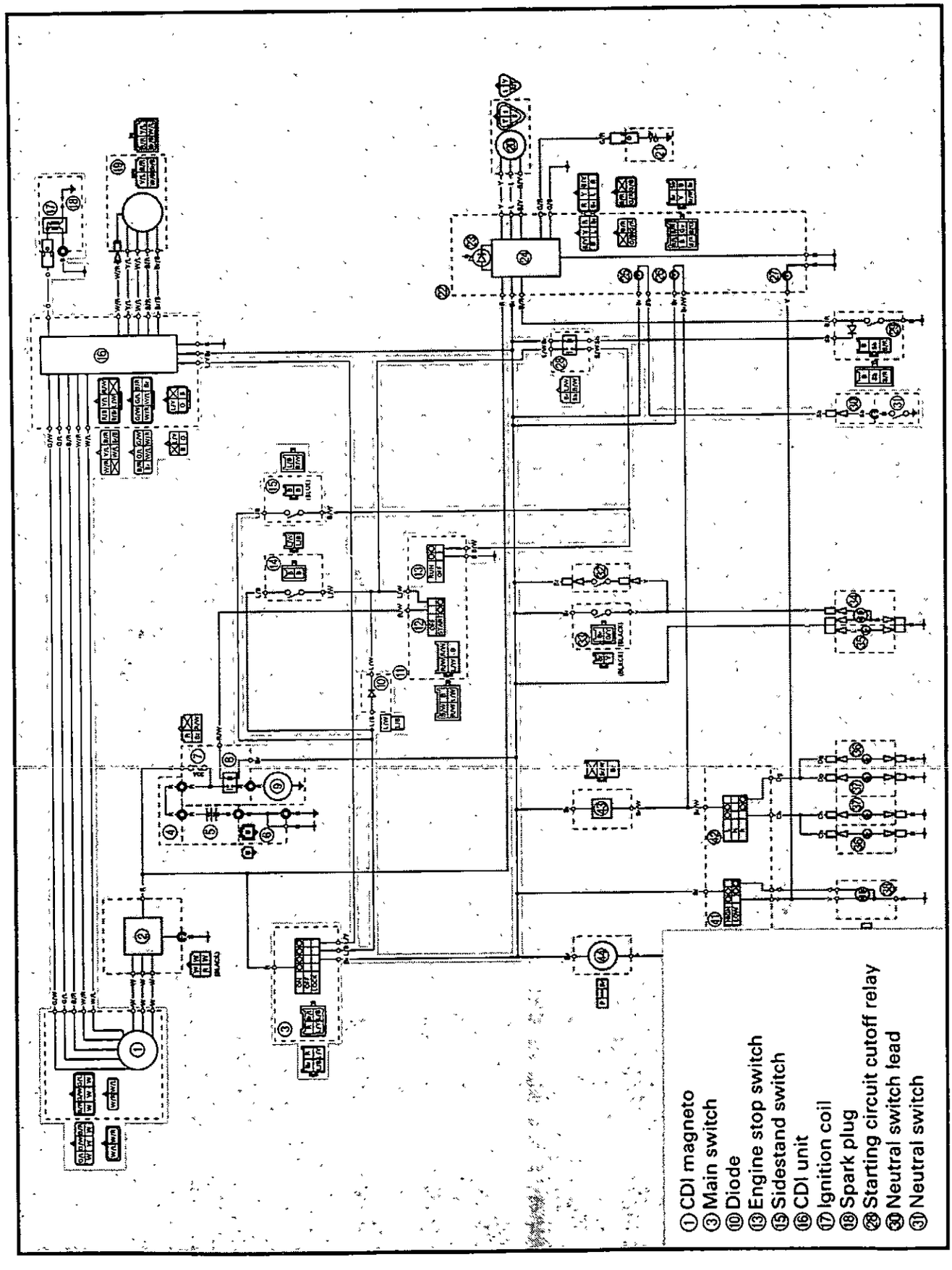
- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure no flammable gas or fluid is in the vicinity.**

c. When the jumper leads are connected to the terminals the respective LED should illuminate.
   Does not light → Replace the meter assembly.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00734
IGNITION SYSTEM

CIRCUIT DIAGRAM



EAS00736
TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:
1. spark plug
2. ignition spark gap
3. spark plug cap resistance
4. ignition coil resistance
5. pickup coil resistance
6. source coil resistance
7. main switch
8. engine stop switch
9. neutral switch
10. sidestand switch
11. starting circuit cutoff relay
12. diode
13. wiring
    (of the entire ignition system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Left side cover
2) Right side cover
3) Seat
4) Fuel tank

- Troubleshoot with the following special tool(-s).

Ignition checker
90890-06754
Pocket tester
90890-03112

EAS00740
1.Spark plug

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.
  Refer to "CHECKING THE SPARK PLUG" in chapter 3.

Standard spark plug
BR9ES (NGK)
Spark plug gap
0.7 ~ 0.8 mm

- Is the spark plug in good condition, is it of the correct type, and its gap within specification?

YES

NO

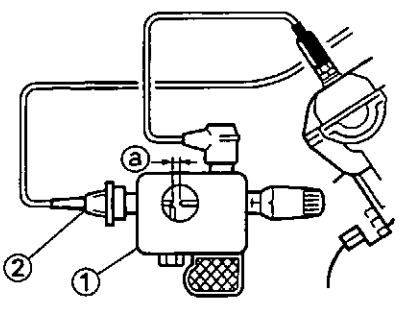
Re-gap or replace the spark plug.

EAS00742
2.Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.

②Spark plug cap

- Set the main switch to "ON".
- Measure the ignition spark gap ⓐ.
- Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.



Minimum ignition spark gap
6 mm

- Is there a spark and is the spark gap within specification?

NO

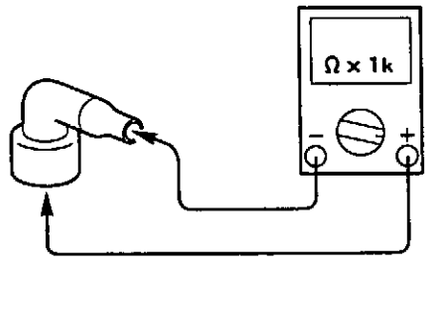
YES

The ignition system is OK.

EAS00744

3.Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ("Ω × 1 k" range) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
5 kΩ at 20 °C

- Is the spark plug cap OK?

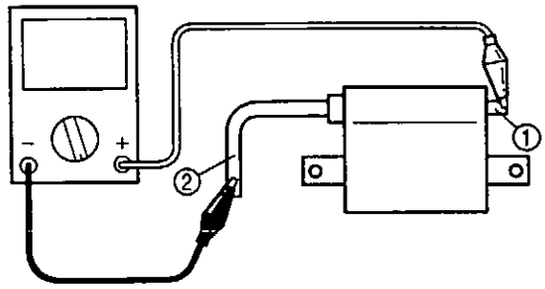
YES → NO

Replace the spark plug cap.

Primary coil resistance
0.18 ~ 0.28 Ω at 20 °C

- Connect the pocket tester (Ω × 1 k) to the ignition coil as shown.
- Measure the secondary coil resistance.

Positive tester probe → orange ①
Negative tester probe → spark plug lead ②



Secondary coil resistance
6.32 ~ 9.48 kΩ at 20 °C

- Is the ignition coil OK?

YES → NO

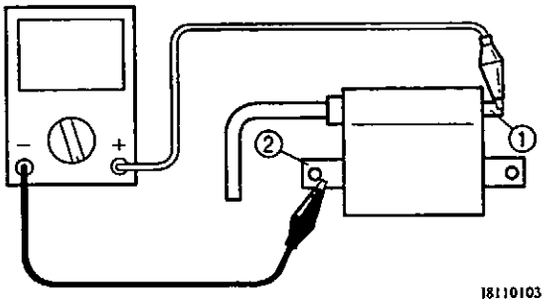
Replace the ignition coil.

EAS00746

4.Ignition coil resistance

- Disconnect the ignition coil connector from the ignition coil terminal.
- Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Positive tester probe → orange ①
Negative tester probe → ignition coil terminal ②



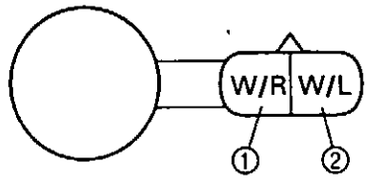
- Measure the primary coil resistance.

EAS00748

5.Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal as shown.

Positive tester probe → white/red ①
Negative tester probe → white/blue ②



- Measure the pickup coil resistance.

Pickup coil resistance
656 ~ 984 Ω at 20 °C
(between white/red and white/blue)

• Is the pickup coil OK?

YES → NO: Replace the pickup coil.

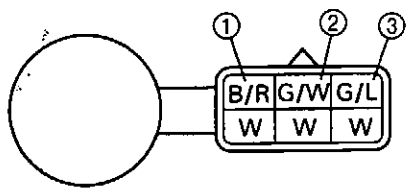
EAS00748

6.Source coil resistance

• Disconnect the source coil coupler from the wire harness.
• Connect the pocket tester (Ω × 100) to the source coil coupler.

Positive tester probe → black/red ①
Negative tester probe → green/white ②

Positive tester probe → green/blue ③
Negative tester probe → green/white ②



• Measure the source coil resistance.

Source coil 1 resistance
600 ~ 900 Ω at 20 °C
(between black/red and green/white)
Source coil 2 resistance
472 ~ 708 Ω at 20 °C
(between green/blue and green/white)

• Is the source coil OK?

YES → NO: Replace the stator coil assembly.

EAS00749

7.Main switch

• Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
• Is the main switch OK?

YES → NO: Replace the main switch.

EAS00750

8.Engine stop switch

• Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
• Is the engine stop switch OK?

YES → NO: Replace the right handlebar switch.

EAS00751

9.Neutral switch

• Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
• Is the neutral switch OK?

YES → NO: Replace the neutral switch.

EAS00752

10.Sidestand switch

• Check the sidestand switch for continuity. Refer to "CHECKING THE SWITCHES".
• Is the sidestand switch OK?

YES → NO: Replace the sidestand switch.

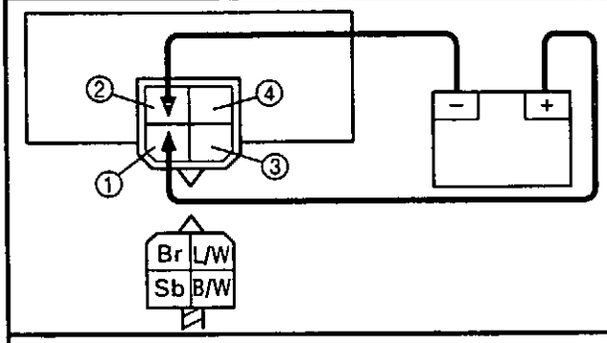
EAS00759

11.Starting circuit cutoff relay

- Disconnect the starting circuit cutoff relay from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cutoff relay terminals as shown.

Positive battery terminal → brown ①
Negative battery terminal → sky blue ②

Positive tester probe → blue/white ③
Negative tester probe → black/white ④



- Does the starting circuit cutoff relay have continuity between blue/white and black/white?

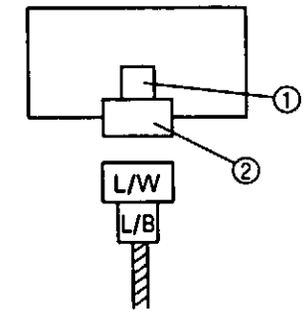
YES → NO → Replace the starting circuit cutoff relay.

EAS00753

12.Diode

- Disconnect the diode from the wire harness.
- Connect the pocket tester (Ω × 1) to the diode terminals as shown.
- Check the diode for continuity.

Positive tester probe → blue/black ① **Negative tester probe → blue/white ②**	**Continuity**
Positive tester probe → blue/white ② **Negative tester probe → blue/black ①**	**No continuity**



NOTE:
When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES → NO → Replace the diode.

EAS00754

13.Wiring

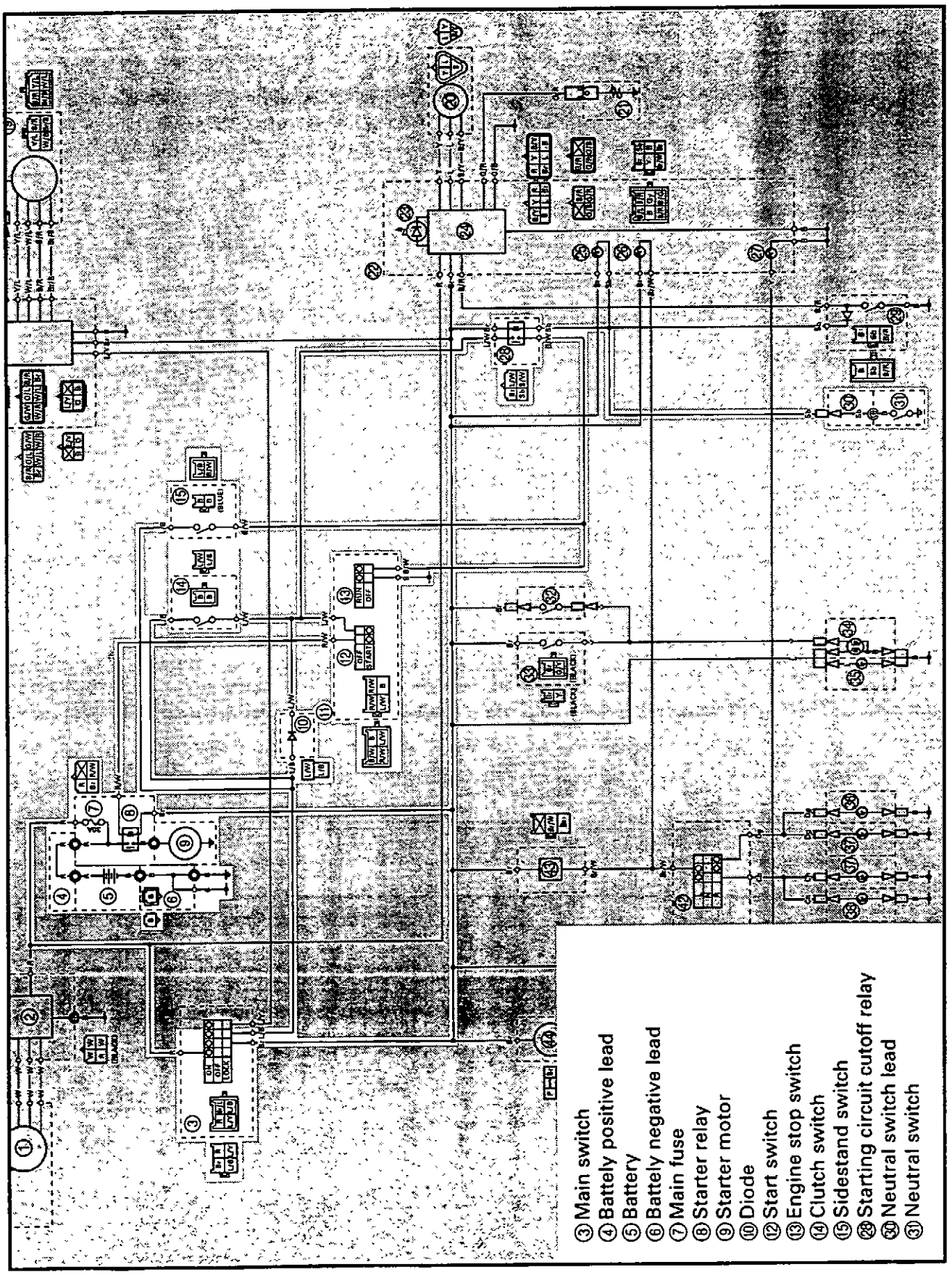
- Check the entire ignition system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

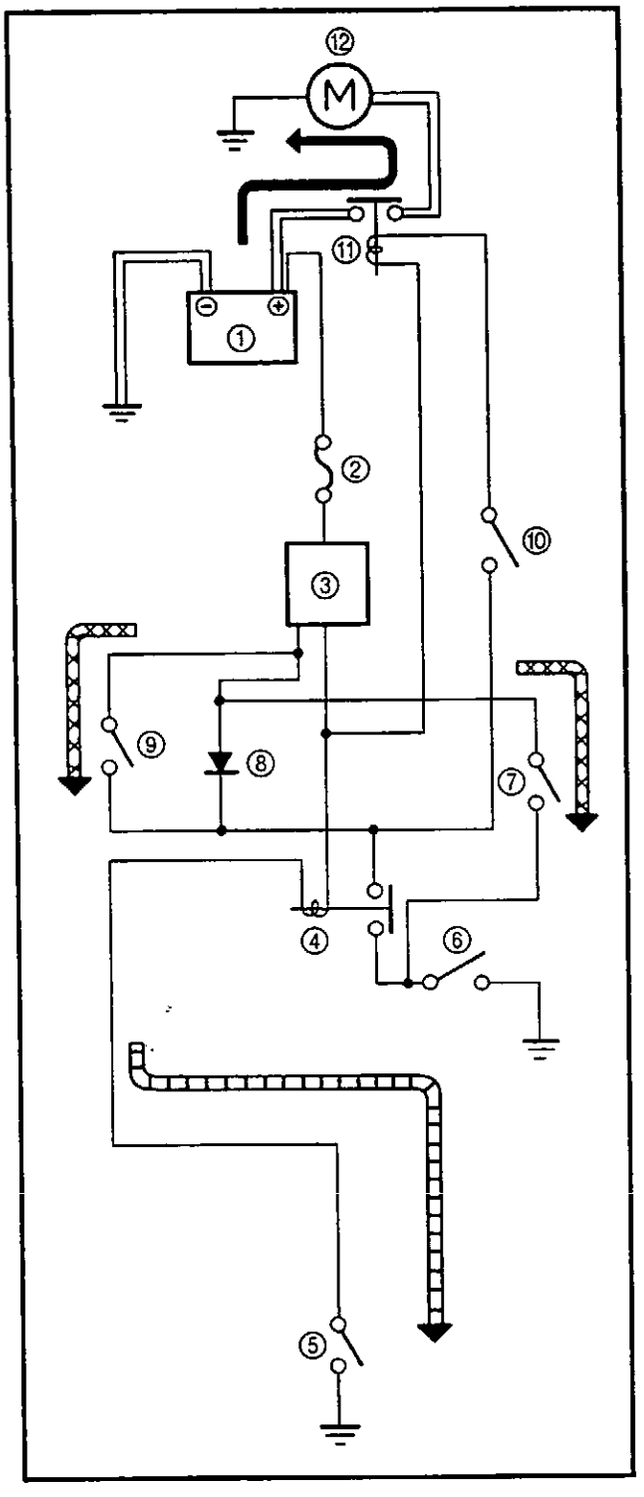
NO → Properly connect or repair the ignition system's wiring.

YES → Replace the CDI unit.

EAS00755
ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM





EAS00756
STARTING CIRCUIT CUTOFF SYSTEM OPERATION

If the engine stop switch is set to "RUN" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cutoff relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cutoff relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cutoff relay is closed and the engine can be started by pressing the start switch.

⟸ WHEN THE TRANSMISSION IS IN NEUTRAL

⟸ WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

① Battery
② Main fuse
③ Main switch
④ Starting circuit cutoff relay
⑤ Neutral switch
⑥ Engine stop switch
⑦ Sidestand switch
⑧ Diode
⑨ Clutch switch
⑩ Start switch
⑪ Starter relay
⑫ Starter motor

EAS00757
TROUBLESHOOTING

The starter motor fails to turn.

Check:
1. main fuse
2. battery
3. starter motor
4. starting circuit cutoff relay
5. diode
6. starter relay
7. main switch
8. engine stop switch
9. neutral switch
10. sidestand switch
11. clutch switch
12. start switch
13. wiring
    (of the entire starting system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Left side cover
2) Right side cover
3) Seat
4) Fuel tank

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738
1.Main fuse

- Check the main fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?

YES ⇩

NO ⇩

Replace the fuse(-s).

EAS00739
2.Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

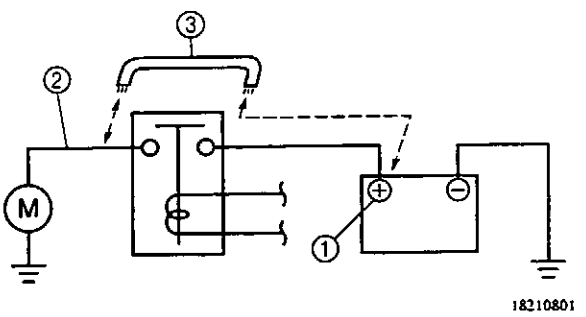
YES ⇩

NO ⇩

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00758
3.Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



⚠ WARNING
- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure no flammable liquids are in the vicinity.**

- Does the starter motor turn?

YES ⇩

NO ⇩

Repair or replace the starter motor.

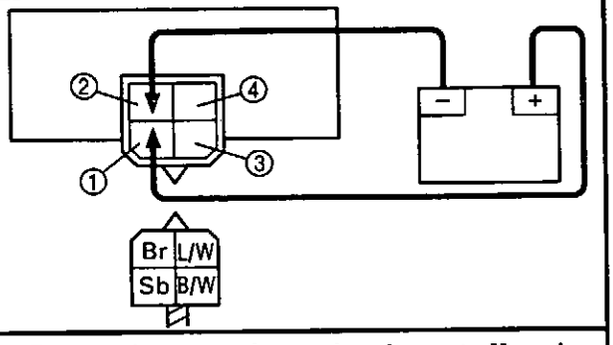
EAS00759

4.Starting circuit cutoff relay

- Disconnect the starting circuit cutoff relay from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cutoff relay terminals as shown.

Positive battery terminal → brown ①
Negative battery terminal → sky blue ②

Positive tester probe → blue/white ③
Negative tester probe → black/white ④



- Does the starting circuit cutoff relay have continuity between blue/white and black/white?

YES → NO

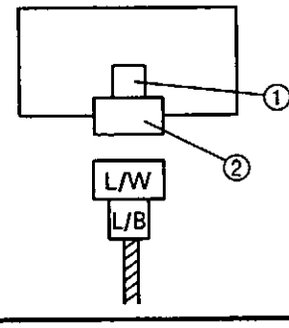
Replace the starting circuit cutoff relay.

EAS00753

5.Diode

- Disconnect the diode from the wire harness.
- Connect the pocket tester (Ω × 1) to the diode terminals as shown.
- Check the diode for continuity.

Positive tester probe → blue/black ① **Negative tester probe → blue/white ②**	**Continuity**
Positive tester probe → blue/white ② **Negative tester probe → blue/black ①**	**No continuity**



NOTE:
When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES → NO

Replace the diode.

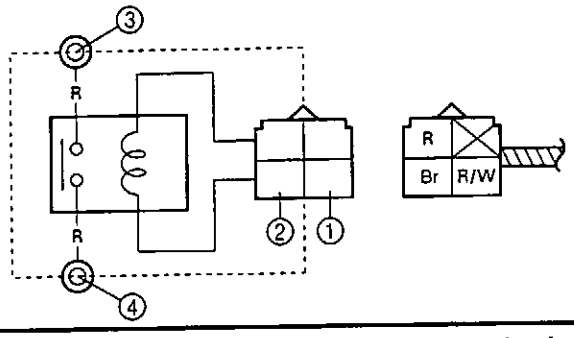
EAS00761

6.Starter relay

- Disconnect the starter relay from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starter relay coupler as shown.

Positive battery terminal → brown ①
Negative battery terminal → red/white ②

Positive tester probe → red ③
Negative tester probe → red ④



- Does the starter relay have continuity between red and red?

YES → NO

Replace the starter relay.

EAS00749

7.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO

Replace the main switch.

EAS00750

8.Engine stop switch

- Check the engine stop switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

YES → NO

Replace the right handlebar switch.

EAS00751

9.Neutral switch

- Check the neutral switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

YES → NO

Replace the neutral switch.

EAS00752

10.Sidestand switch

- Check the sidestand switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?

YES → NO

Replace the sidestand switch.

EAS00763

11.Clutch switch

- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?

YES → NO → Replace the clutch switch.

EAS00764

12.Start switch

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?

YES → NO → Replace the right handlebar switch.

EAS00766

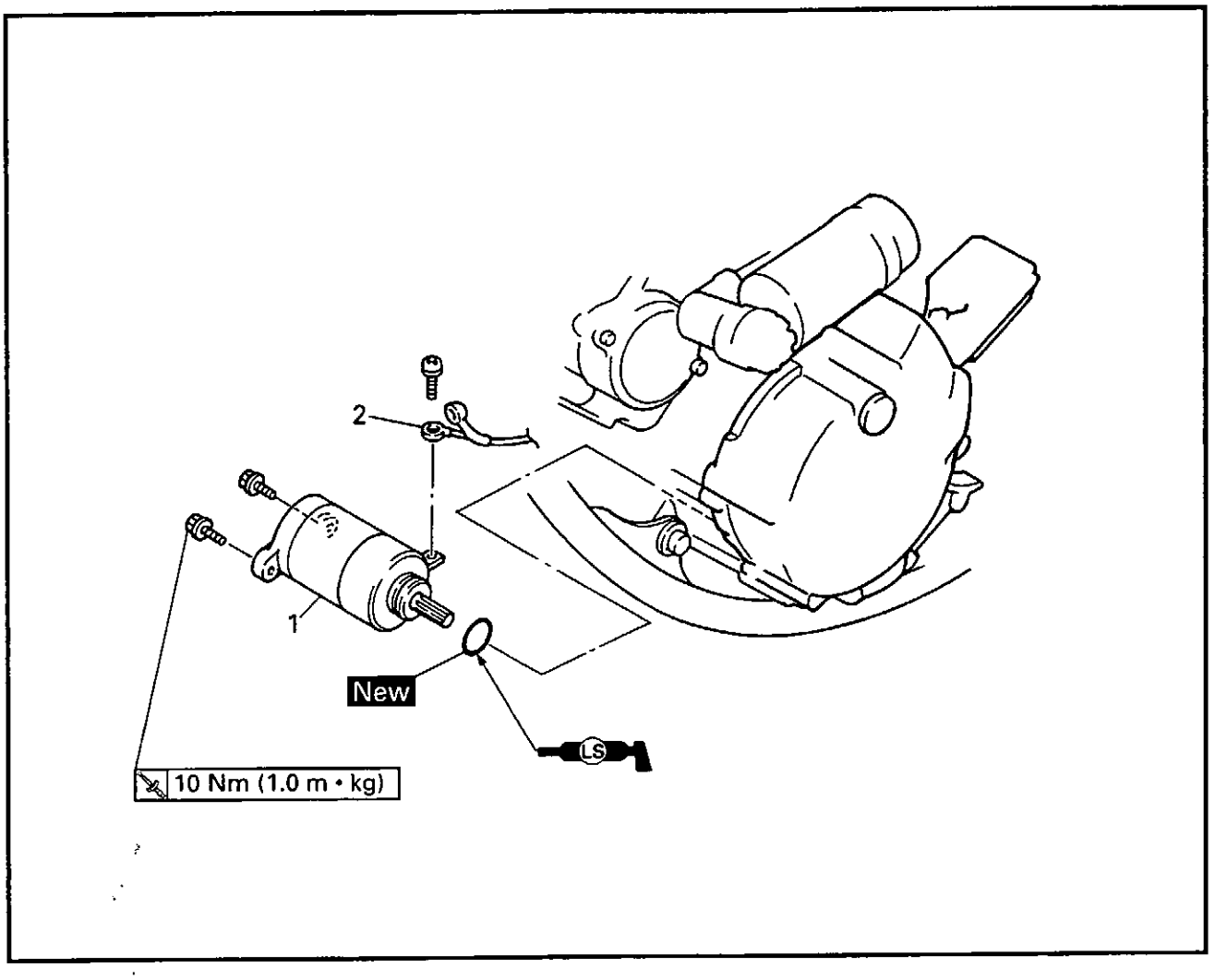
13.Wiring

- Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the starting system's wiring properly connected and without defects?

NO → Properly connect or repair the starting system's wiring.

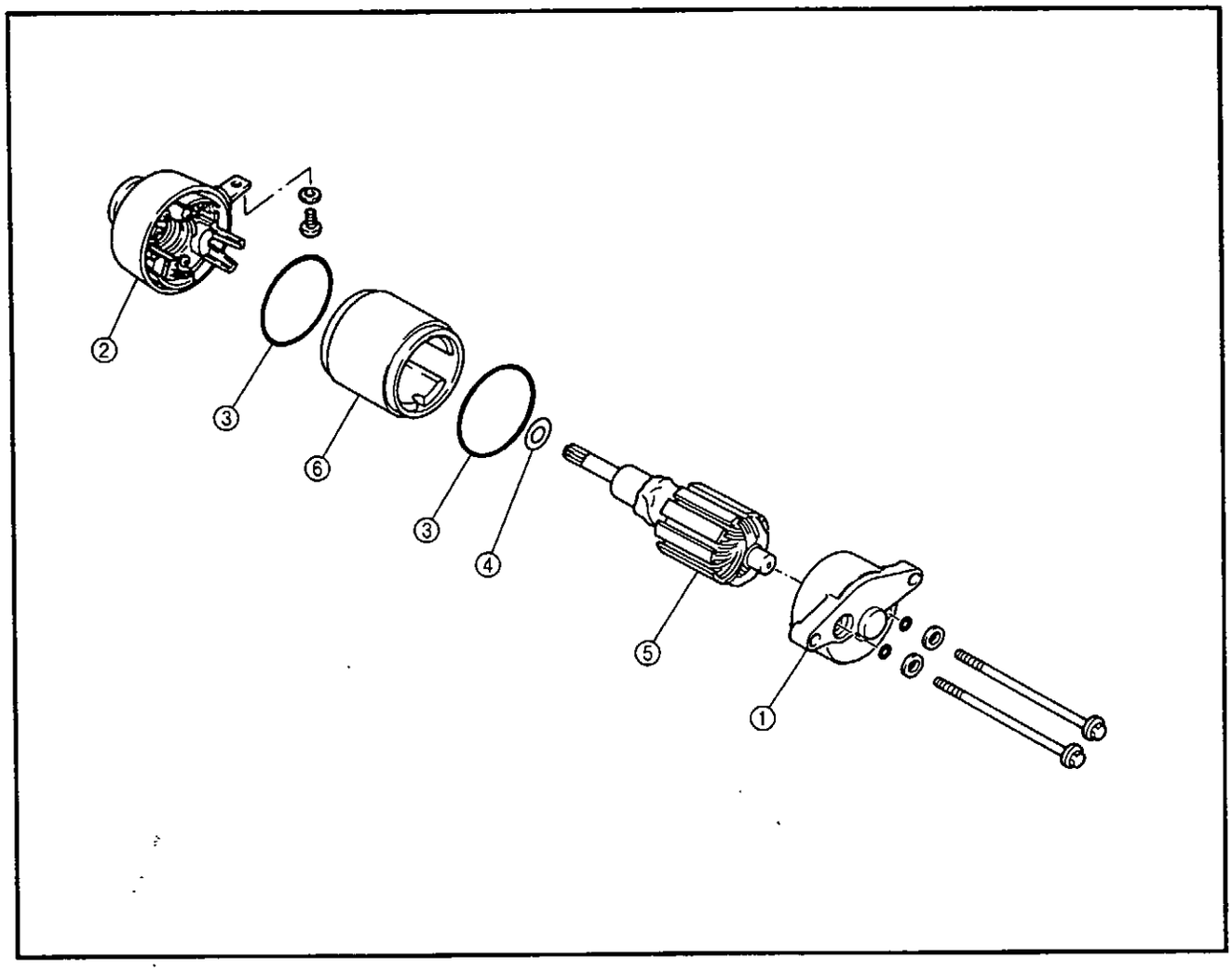
YES → The starting system circuit is OK.

EAS00767
STARTER MOTOR

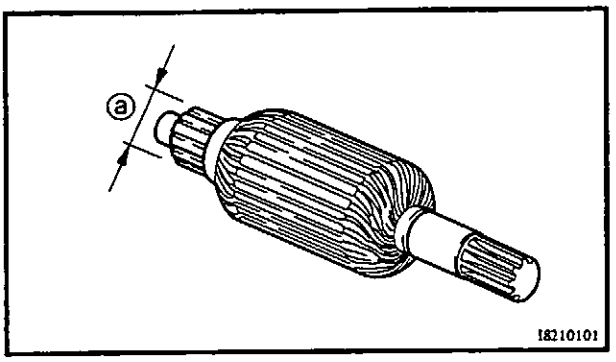


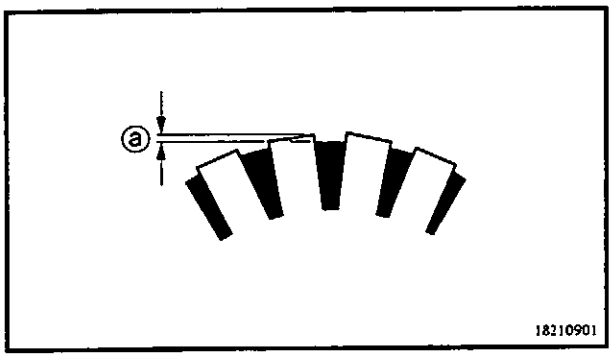
Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed
1	Starter motor assembly	1	
2	Starter motor lead	1	
			For installation, reverse the removal procedure.

EAS00768



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Remove the parts in the order listed.
①	Starter motor rear cover	1	
②	Starter motor front cover	1	
③	O-ring	2	
④	Washer	1	
⑤	Armature assembly	1	
⑥	Starter motor yoke	1	
			For assembly, reverse the disassembly procedure.





EAS00769
CHECKING THE STARTER MOTOR

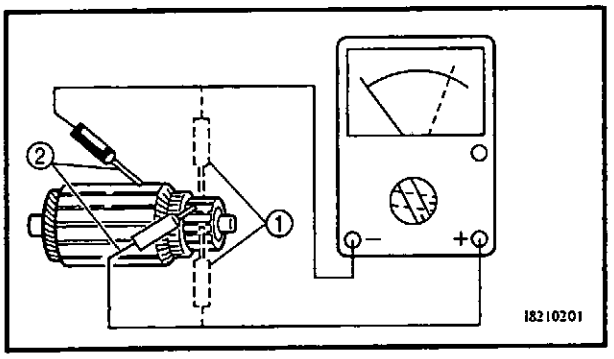
1. Check:
   - commutator
     Dirt → Clean with 600-grit sandpaper.
2. Measure:
   - commutator diameter ⓐ
     Out of specification → Replace the starter motor.

Minimum commutator diameter
21 mm

3. Measure:
   - mica undercut ⓐ
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade which has been grounded to fit the commutator.

Mica undercut
1.5 mm

NOTE:
The mica must be undercut to ensure proper operation of the commutator.



4. Measure:
   - armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

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a. Measure the armature assembly resistances with the pocket tester.

Pocket tester
90890-03112

Armature coil
Commutator resistance ①
0.031 ~ 0.037 Ω at 20 °C
Insulation resistance ②
Above 1 MΩ at 20 °C

b. If any resistance is out of specification, replace the starter motor.

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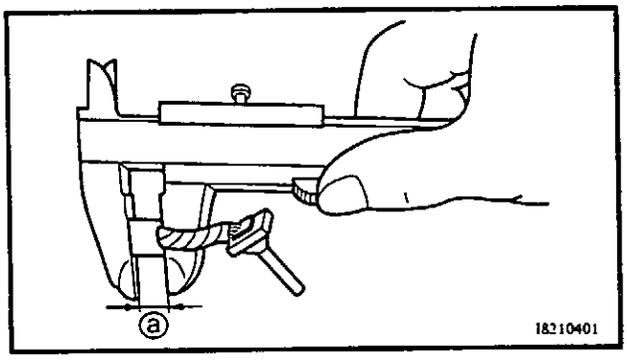
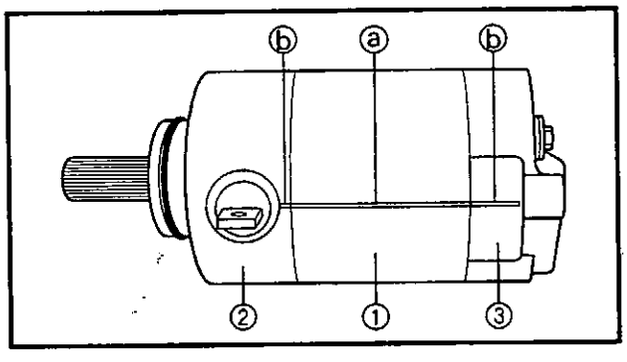


5. Measure:
   • brush length ⓐ
   Out of specification → Replace the brushes as a set.

	Minimum brush length **3.5 mm**

6. Check:
   • gear teeth
   Damage/wear → Replace the gear.



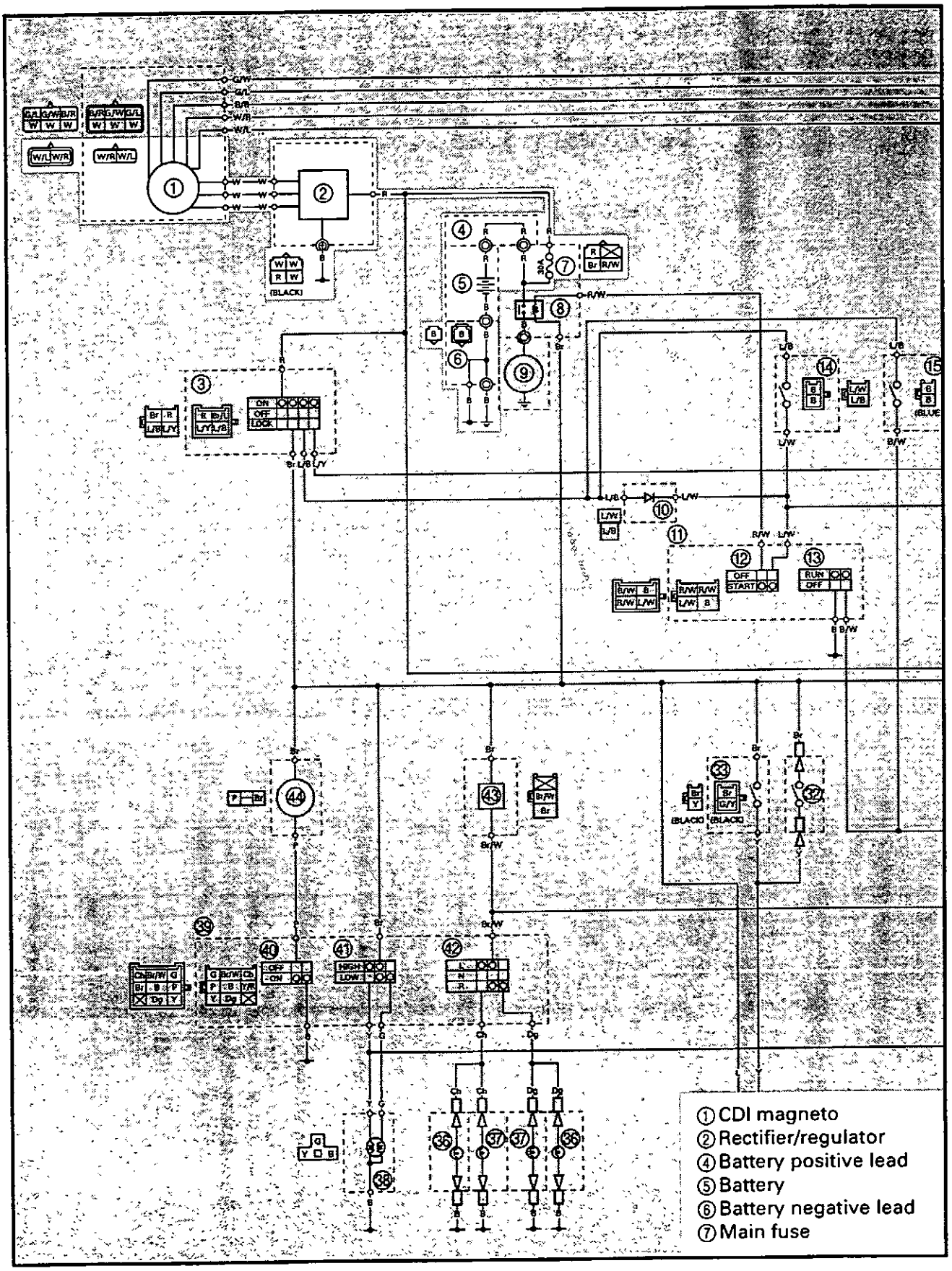
EAS00772
ASSEMBLING THE STARTER MOTOR

1. Install:
   • starter motor yoke ①
   • starter motor front cover ②
   • starter motor rear cover ③

NOTE:
Align the match mark ⓐ on the starter motor yoke with the match marks ⓑ on the starter motor front and rear covers.

EAS00773
CHARGING SYSTEM

CIRCUIT DIAGRAM



EAS00774
TROUBLESHOOTING

The battery is not being charged.

Check:
1. main fuse
2. battery
3. charging voltage
4. lighting coil resistance
5. wiring
   (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Left side cover
2) Right side cover
3) Seat
4) Fuel tank

- Troubleshoot with the following special tool(-s).

Engine tachometer
90890-03113
Pocket tester
90890-03112

EAS00738

1.Main fuse

- Check the main fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuses OK?

YES

NO → Replace the fuse(-s).

EAS00739

2.Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES

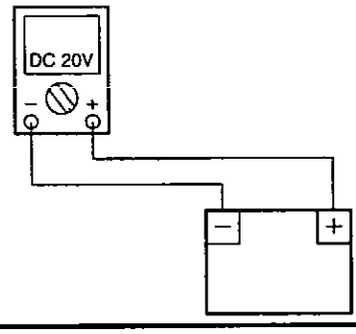
NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00775

3.Charging voltage

- Connect the engine tachometer to the spark plug lead of cylinder #1.
- Connect the pocket tester (DC 20 V) to the battery as shown.

Positive tester probe → positive battery terminal
Negative tester probe → negative battery terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.

Charging voltage
14 V at 5,000 r/min

NOTE:
Make sure the battery is fully charged.

- Is the charging voltage within specification?

NO → Properly connect or repair the charging system's wiring.

YES → The charging circuit is OK.

EAS00779

5.Wiring

- Check the entire charging system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

NO → Properly connect or repair the charging system's wiring.

YES → Replace the rectifier/regulator.

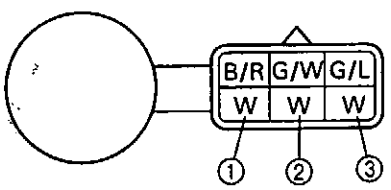
EB804401

4.Lighting coil resistance

- Disconnect the lighting coil coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the stator coil assembly coupler as shown.

Positive tester probe → white ①
Negative tester probe → white ②

Positive tester probe → white ①
Negative tester probe → white ③



- Measure the lighting coil resistance.

Source coil resistance
0.48 ~ 0.72 Ω at 20 °C

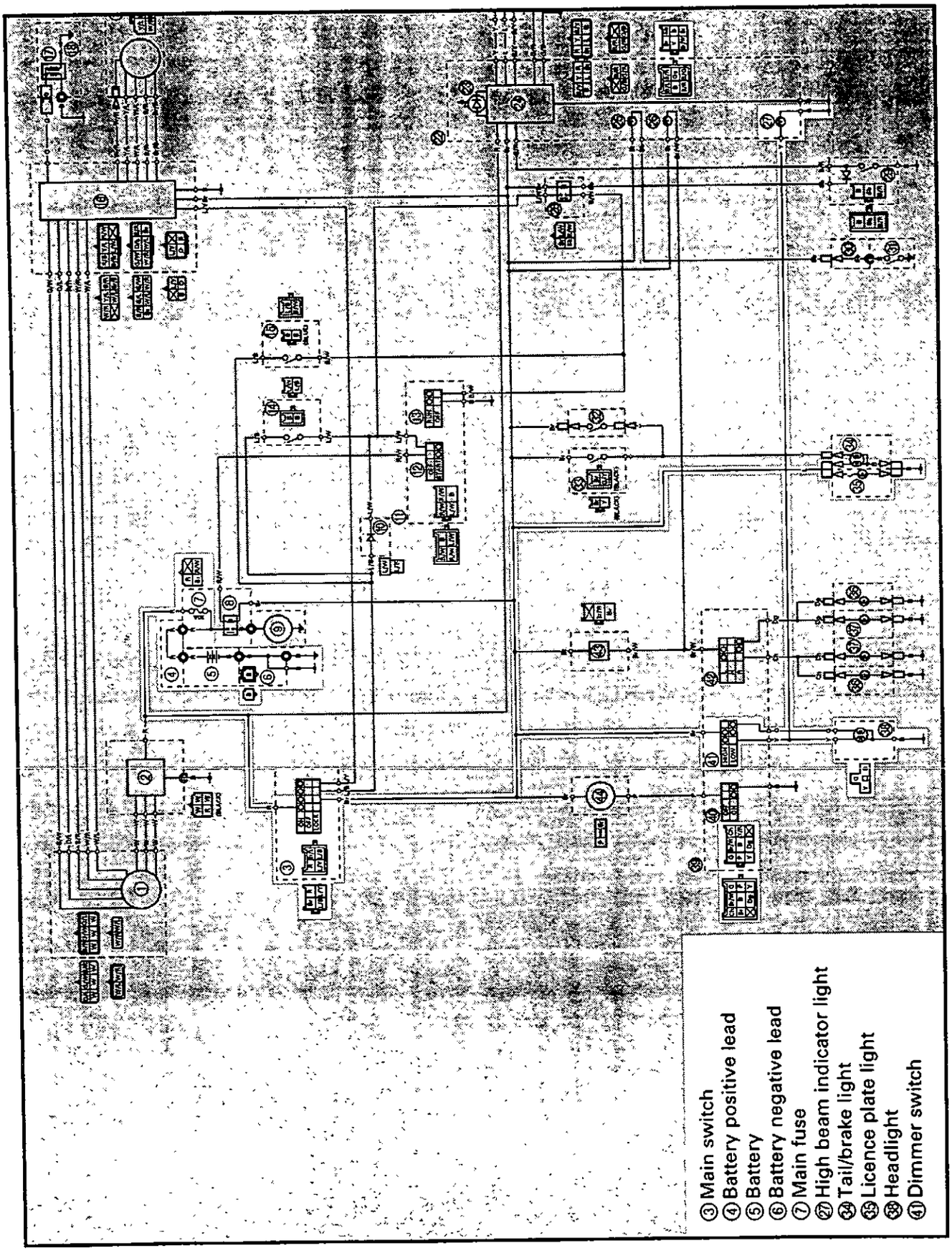
- Is the lighting coil OK?

YES → The charging circuit is OK.

NO → Replace the stator coil assembly.

EAS00780
LIGHTING SYSTEM

CIRCUIT DIAGRAM



EAS00782
TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, and licence plate light.

Check:
1. main fuse
2. battery
3. main switch
4. dimmer switch
5. wiring
   (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Left side cover
2) Right side cover
3) Fuel tank

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738
1.Main fuse

- Check the main fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?

YES ⇩

NO ⇩

Replace the fuse(-s).

EAS00739
2.Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩

NO ⇩

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749
3.Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ⇩

NO ⇩

Replace the main switch.

EAS00785
4.Dimmer switch

- Check the dimmer switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?

YES ⇩

NO ⇩

The dimmer switch is faulty. Replace the left handlebar switch.

EAS00787

5.Wiring

- Check the entire lighting system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?

YES → Check the condition of each of the lighting system's circuits.
Refer to "CHECKING THE LIGHTING SYSTEM".

NO → Properly connect or repair the lighting system's wiring.

EAS00788

CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to light.

1.Headlight bulb and socket

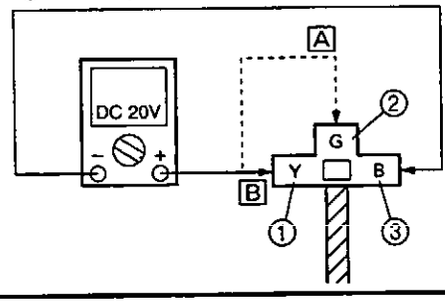
- Check the headlight bulb and socket for continuity.
- Are the headlight bulb and socket OK?

YES → 2.Voltage

- Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

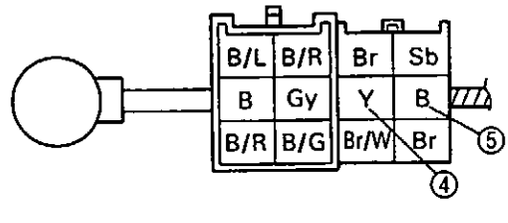
Ⓐ When the dimmer switch is set to "≡D"
Ⓑ When the dimmer switch is set to "≡D"

Headlight coupler (wire harness side)



Headlight
Positive tester probe → yellow ① or green ②
Negative tester probe → black ③
High beam indicator light
Positive tester probe → yellow ④
Negative tester probe → black ⑤

Meter assembly coupler (wire harness side)



NO → Replace the headlight bulb, socket, or both.

- Set the main switch to "ON".
- Set the dimmer switch to "≣D" or "≣D".
- Measure the voltage (12 V) of yellow ① (green ②) on the headlight coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

EAS00790
2. The tail/brake light fails to light.

1.Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity.
- Are the tail/brake light bulb and socket OK?

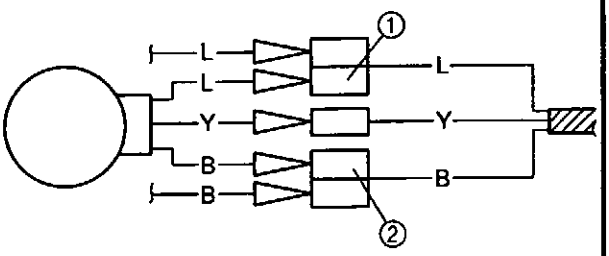
YES →

NO → Replace the tail/brake light bulb, socket, or both.

2.Voltage

- Connect the pocket tester (DC 20V) to the tail/brake light connectors (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of blue ① on the tail/brake light connectors (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the tail/brake light connector is faulty and must be repaired.

EAS00792
3. The licence plate light fails to light.

1.Licence plate light bulb and socket

- Check the licence plate light bulb and socket for continuity.
- Are the licence plate light bulb and socket OK?

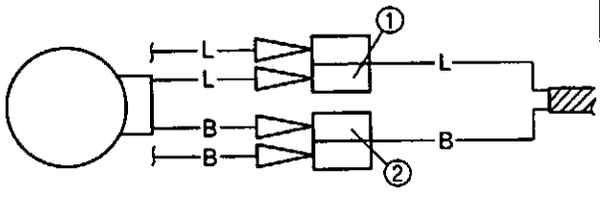
YES →

NO → Replace the licence plate light bulb, socket, or both.

2.Voltage

- Connect the pocket tester (DC 20V) to the licence plate light connectors (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



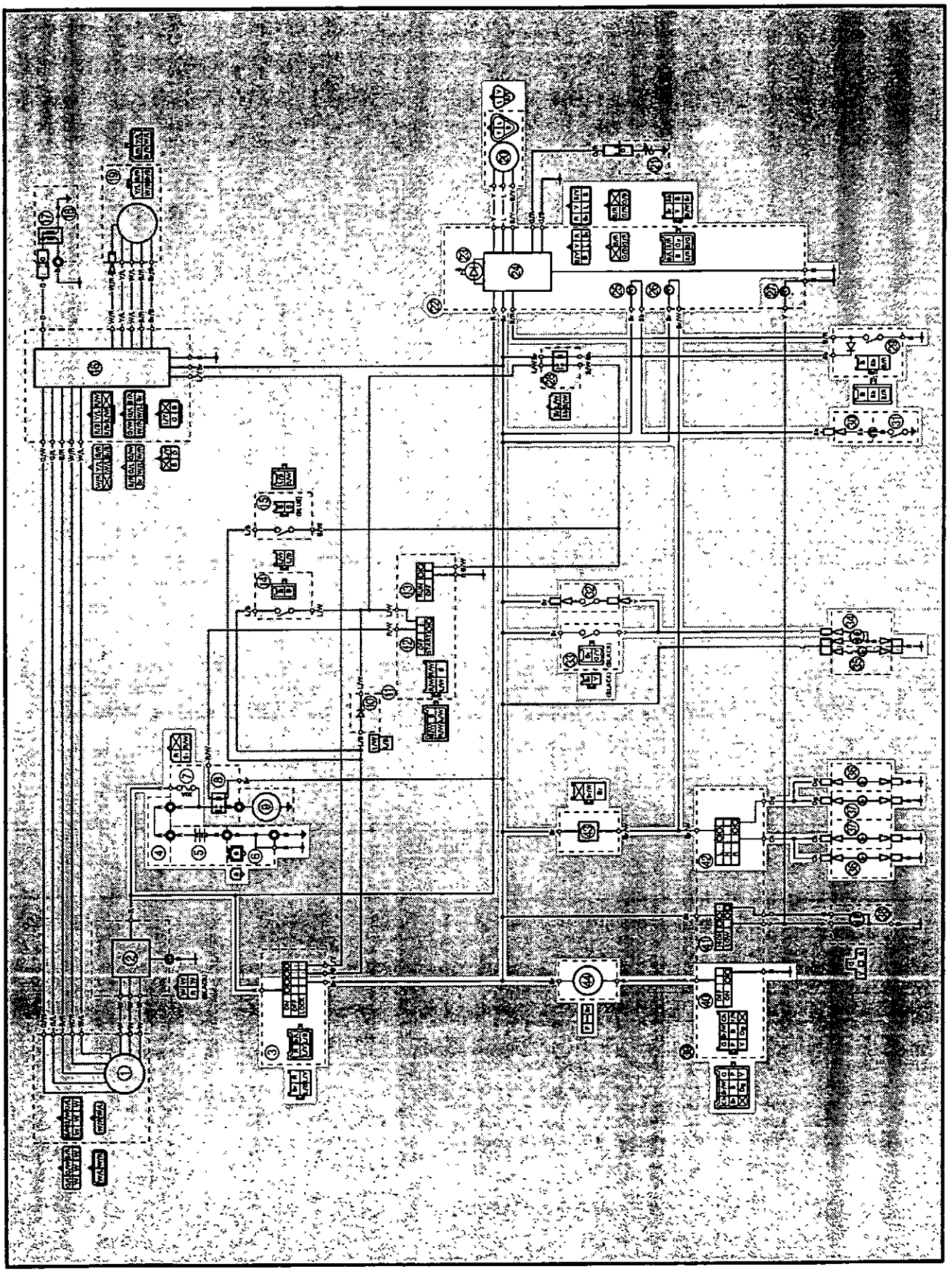
- Set the main switch to "ON".
- Measure the voltage (12 V) of blue ① on the licence plate light connectors (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the licence plate light connector is faulty and must be repaired.

EAS00793
SIGNALING SYSTEM

CIRCUIT DIAGRAM



③ Main switch
④ Battery positive lead
⑤ Battery
⑥ Battery negative lead
⑦ Main fuse
⑳ Speed sensor
㉒ Meter assembly
㉓ Oil level/coolant temperature warning light
㉔ Combination meter
㉕ Neutral indicator light
㉖ Turn signal indicator light
㉙ Engine oil level switch
㉚ Neutral switch lead
㉛ Neutral switch
㉜ Rear brake light switch
㉝ Front brake light switch
㉞ Tail/brake light
㉟ Rear turn signal light
㊲ Front turn signal light
㊵ Horn switch
㊷ Turn signal switch
㊸ Turn signal relay
㊹ Horn

EAS00794
TROUBLESHOOTING

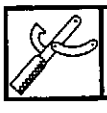
- **Any of the following fail to light: turn signal light, brake light, or an indicator light.**
- **The horn fails to sound.**
- **The speedometer does not operate.**

Check:
1. main fuse
2. battery
3. main switch
4. wiring
   (of the entire signaling system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Left side cover
2) Right side cover
3) Seat
4) Fuel tank

- Troubleshoot with the following special tool(-s).



Pocket tester
90890-03112

EAS00738
1.Main fuse

- Check the main fuse for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main fuse OK?

YES ↓

NO → Replace the fuse(-s).

EAS00739
2.Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ↓

NO → • Clean the battery terminals.
• Recharge or replace the battery.

EAS00749
3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ↓

NO → Replace the main switch.

EAS00795
4.Wiring

- Check the entire signaling system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

YES ↓ Check the condition of each of the signaling system's circuits.
Refer to "CHECKING THE SIGNALING SYSTEM".

NO → Properly connect or repair the signaling system's wiring.

EAS00796
CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

1.Horn switch

- Check the horn switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the horn switch OK?

YES ↓

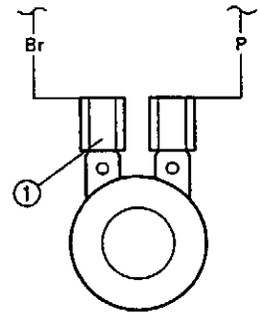
NO ↓

Replace the left handlebar switch.

2.Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

Positive tester probe → brown ①
Negative tester probe → ground



- Set the main switch to "ON".
- Push the horn switch.
- Measure the voltage (12 V) of brown at the horn terminal.
- Is the voltage within specification?

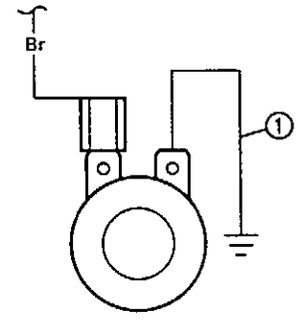
YES ↓

NO ↓

The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

3.Horn

- Disconnect the pink connector at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Set the main switch to "ON".
- Push the horn switch.
- Does the horn sound?



NO ↓

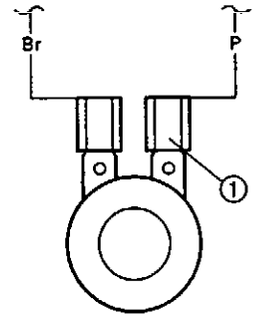
YES ↓

The horn is OK.

4.Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the pink terminal as shown.

Positive tester probe → pink ①
Negative tester probe → ground



- Set the main switch to "ON".
- Measure the voltage (12 V) of pink ① at the horn terminal.
- Is the voltage within specification?

YES ↓

NO ↓

Repair or replace the horn.

Replace the horn.

EAS00797
2. The tail/brake light fails to light.

1.Tail/brake light bulb and socket
- Check the tail/brake light bulb and socket for continuity.
- Are the tail/brake light bulb and socket OK?

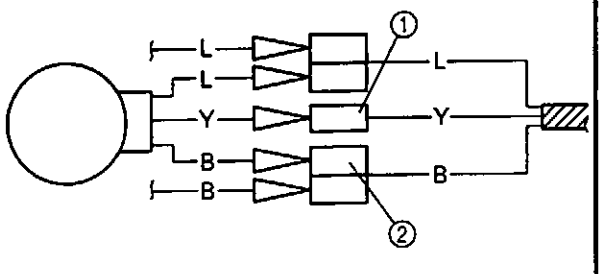
YES → NO → Replace the tail/brake light bulb, socket, or both.

2.Brake light switches
- Check the brake light switches for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the brake light switch OK?

YES → NO → Replace the brake light switch.

3.Voltage
- Connect the pocket tester (DC 20 V) to the tail/brake light connectors (wire harness side) as shown.

Positive tester probe → yellow ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (12 V) of yellow ① on the tail/brake light connector (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the tail/brake light connector is faulty and must be repaired.

EAS00800
3. A turn signal light, turn signal indicator light, or both fail to blink.

1.Turn signal indicator light bulb and socket
- Check the turn signal light bulb and socket for continuity.
- Are the turn signal light bulb and socket OK?

YES → NO → Replace the turn signal light bulb, socket, or both.

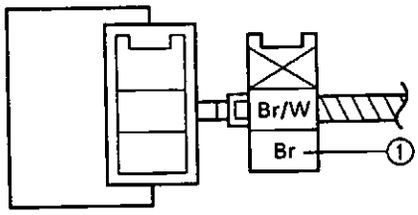
2.Turn signal switch
- Check the turn signal switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the turn signal switch OK?

YES → NO → Replace the left handlebar switch.

3.Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → ground



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

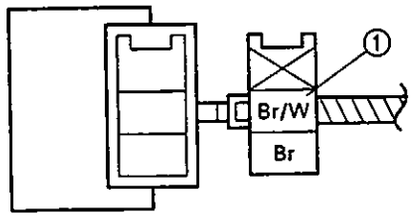
NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

4.Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown/white ①
Negative tester probe → ground



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (12 V) of brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

NO

The turn signal relay is faulty and must be replaced.

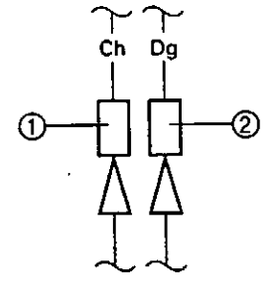
5.Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connectors or meter assembly coupler (wire harness side) as shown.

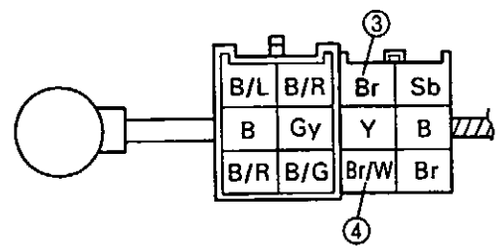
Ⓐ Turn signal light
Ⓑ Turn signal indicator light

Left turn signal light
Positive tester probe → chocolate ①
Negative tester probe → ground
Right turn signal light
Positive tester probe → dark green ②
Negative tester probe → ground
Turn signal indicator light
Positive tester probe → brown ③
Negative tester probe → brown/white ④

Ⓐ



Ⓑ



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (12 V) of chocolate ① or dark green ② at the turn signal light connector (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.

EAS00802
4. The neutral indicator light fails to light.

1.Neutral indicator light bulb and socket

- Check the neutral indicator light bulb and socket for continuity.
- Are the neutral indicator light bulb and socket OK?

YES →

NO → Replace the neutral indicator light bulb, socket, or both.

2.Neutral switch

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

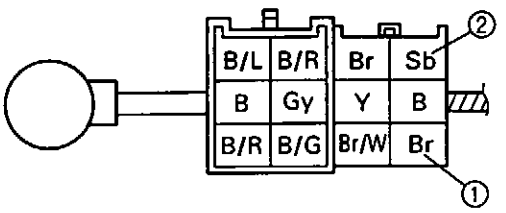
YES →

NO → Replace the neutral switch.

3.Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → sky blue ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown ① and sky blue ② at the meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the meter light bulb coupler is faulty and must be repaired.

EB806416
5. The oil level warning light fails to come on.

1.Oil level warning light LED

- Check the LED of the oil level warning light.
  Refer to "CHECKING THE LEDs".
- Is the oil level warning light LED OK?

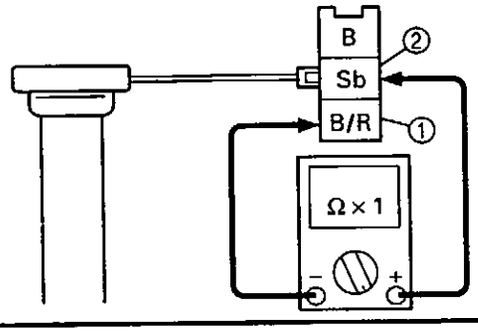
YES →

NO → Replace the meter assembly.

2.Oil level switch (Diode)

- Disconnect the oil level switch from the wire harness.
- Connect the pocket tester (Ω × 1) to the oil level switch coupler as shown.
- Check the oil level switch for continuity.

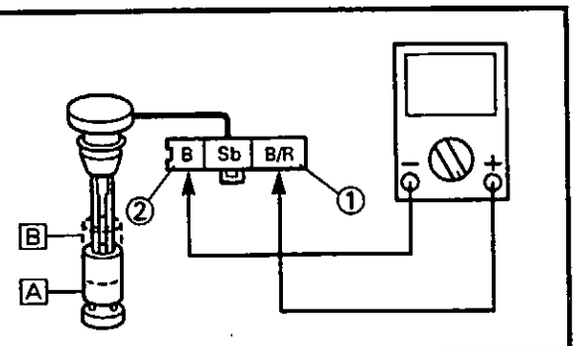
Positive tester probe → black/red ① **Negative tester probe → sky blue ②**	**Continuity**
Positive tester probe → sky blue ② **Negative tester probe → black/red ①**	**No continuity**



NOTE:
When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES → Replace the oil level switch.

NO → 

- Is the oil level switch in good condition?

YES → Replace the oil level switch.

NO

3.Oil level switch

- Connect the pocket tester (Ω × 1) to the oil level switch coupler.
- Check the oil level switch for continuity.

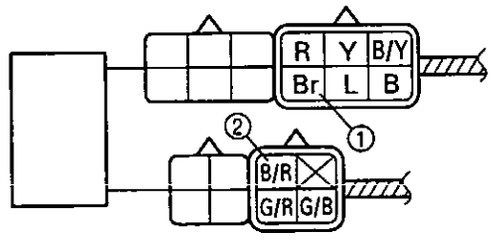
Positive tester probe → black/red ①
Negative tester probe → black ②

When the oil level switch is lowered [A].	**Continuity**
When the oil level switch is raised [B].	**No continuity**

4.Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly couplers (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → black/red ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown ① and black/red ② at the meter assembly couplers.
- Is the voltage within specification?

YES → This circuit is OK.

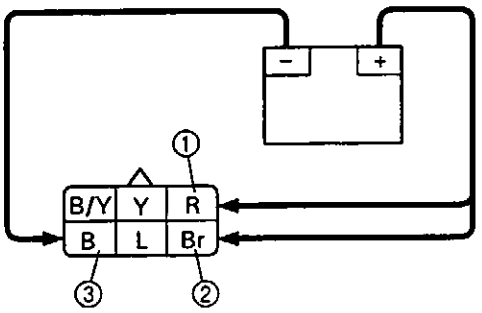
NO → The wiring circuit from the main switch to the meter light bulb coupler is faulty and must be repaired.

6. The speedometer does not opprate.

1.Meter assembly

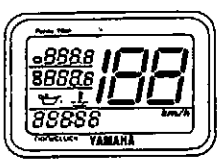
- Disconnect the meter assembly from the wire harness.
- Connect the battery to the meter assembly coupler (as shown).

Battery positive terminal → red ① and brown ②
Battery negative terminal → black ③

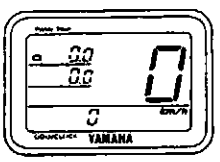


- Check that the display appears as shown in [A] for about 3 seconds after connecting the battery, and then returns to the normal display [B].

[A]



[B]



- Is the meter assembly in good condition?

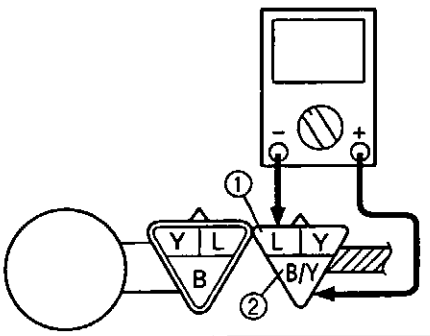
YES

NO → Replace the meter assembly.

2.Voltage

- Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black/yellow ②



- Set the main switch to "ON".
- Measure the voltage (5 V) of blue ① and black/yellow ② at the meter assembly coupler.
- Is the voltage within specification?

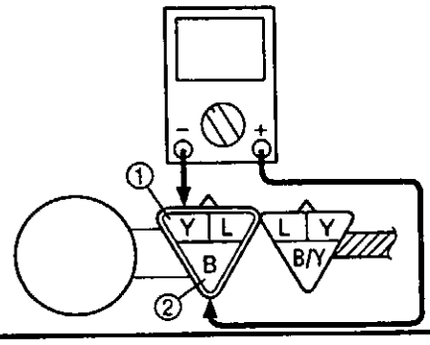
YES

NO → The wiring circuit from the main switch to the speed sensor couplers is faulty and must be repaired, or the speed sensor must be replaced.

3.Voltage

- Connect the pocket tester (DC 20 V) to the speed sensor coupler (as shown).

Positive tester probe → yellow ①
Negative tester probe → black ②



- Lift up and slowly turn the rear wheel.

NOTE:
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

- Check that the voltage between yellow ① and black ② cycles from 0 to 5 V with each turn of the rear wheel.

NOTE:
Even if 0 km/h is displayed on the speedometer, it should still be possible to measure a voltage.

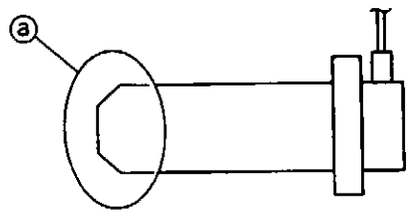
NO

YES

Properly connect or repair the signaling system's wiring.

4.Speed sensor

- Remove the speed sensor from the crankcase.
- Check speed sensor surface ⓐ.



- After installing the speed sensor, check that the speedometer operates correctly.

YES

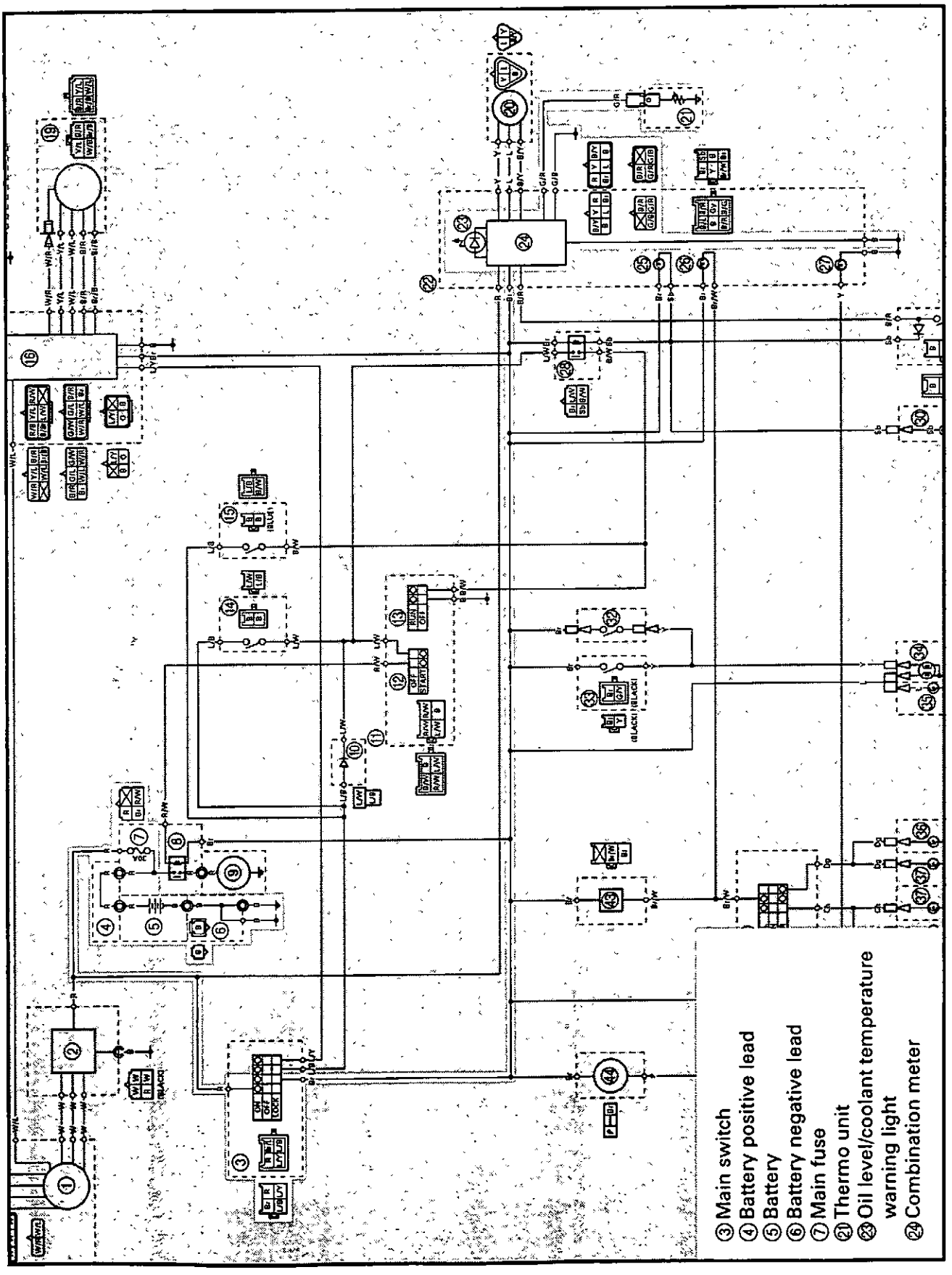
This circuit is OK.

NO

Replace the speed sensor.

EAS00807
COOLING SYSTEM

CIRCUIT DIAGRAM



EAS00808
TROUBLESHOOTING

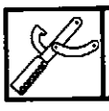
The oil level water/coolant temperature warning light LED fails to light when the engine is warm.

Check:
1. main fuse
2. battery
3. main switch
4. oil level/coolant temperature warning light LED
5. thermo unit
6. wiring
   (the entire cooling system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Seat
2) Fuel tank

- Troubleshoot with the following special tool(-s).



Pocket tester
90890-03112

EAS00738

1.Main fuse

- Check the main fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?

YES ⇩

NO ⇩

Replace the fuse(-s).

EAS00739

2.Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩

NO ⇩

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3.Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ⇩

NO ⇩

Replace the main switch.

4.Oil level/coolant temperature warning light LED

- Check the LED of the oil level/coolant temperature warning light. Refer to "CHECKING THE LEDs".
- Is the oil level/coolant temperature warning light LED OK?

YES ⇩

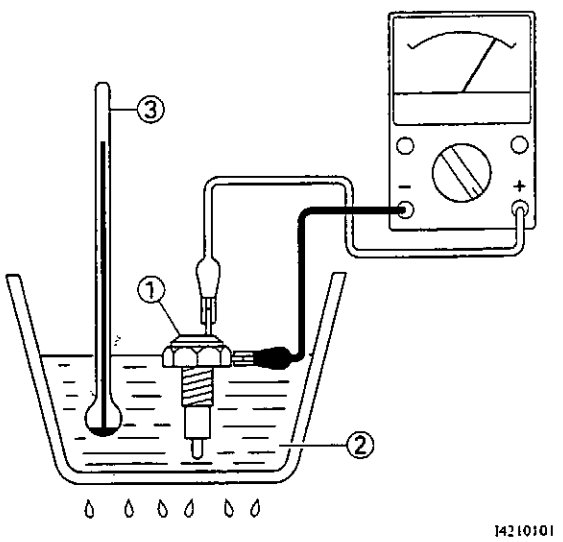
NO ⇩

Replace the meter assembly.

5.Thermo unit

- Remove the thermo unit from the cylinder head.
- Connect the pocket tester (Ω × 10) to the thermo unit ① as shown.
- Immerse the thermo unit in a container filled with coolant ②.
- Place a thermometer ③ in the coolant.
- Slowly heat the water, then let it cool down to the specified temperature.
- Check the thermo unit for continuity at the temperatures indicated below.

Thermo unit resistance
47.5 ~ 56.8 Ω at 80 °C
16.5 ~ 20.5 Ω at 115 °C



⚠ WARNING

Handle the temperature sender with special care.
Never subject the temperature sender to strong shocks. If the temperature sender is dropped, replace it.

Temperature sender
15 Nm (1.5 m • kg)
Three bond sealock® 10

- Does the temperature unit operate properly?

YES ⇩

NO ⇩

Replace the thermo unit.

EB807403

6.Wiring

- Check the entire cooling system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the cooling system's wiring properly connected and without defects?

YES ⇩

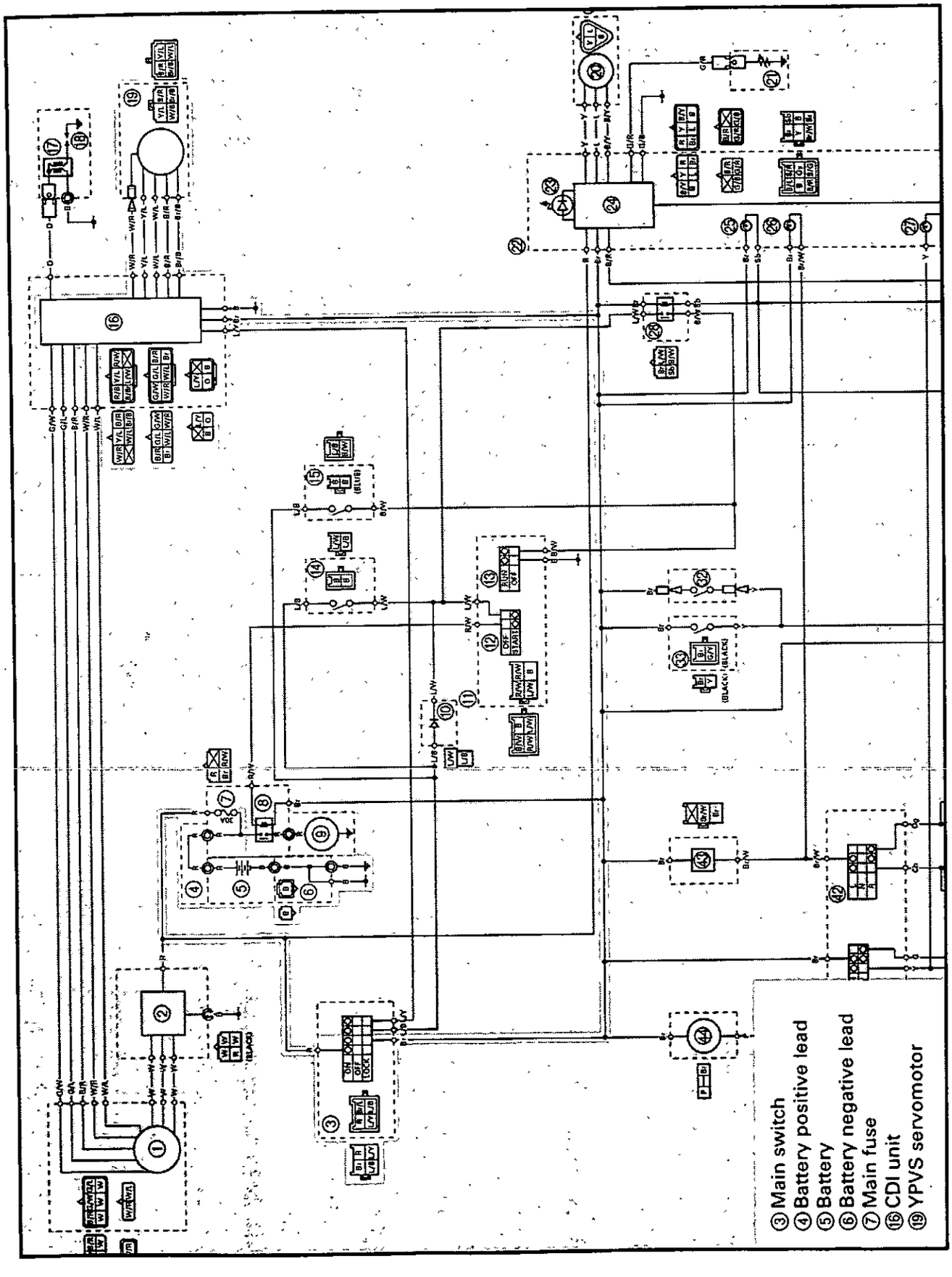
This circuit is OK.

NO ⇩

Properly connect or repair the cooling system's wiring.

EAS00827
YAMAHA POWER VALVE SYSTEM (YPVS)

CIRCUIT DIAGRAM



EAS00828
TROUBLESHOOTING

When the engine speed changes, the YPVS servomotor does not operate.

1. main fuse
2. battery
3. main switch
4. YPVS servomotor operation
   (with the YPVS servomotor coupler connected to the wire harness)
5. YPVS servomotor operation
   (with the YPVS servomotor coupler disconnected to the wire harness)
6. wiring
   (the entire yamaha power valve system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Left side cover
2) Right side cover
3) Fuel tank

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1.Main fuse

- Check the main fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?

YES ⇩

NO ⇩

Replace the fuse(-s).

EAS00739

2.Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩

NO ⇩

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3.Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ⇩

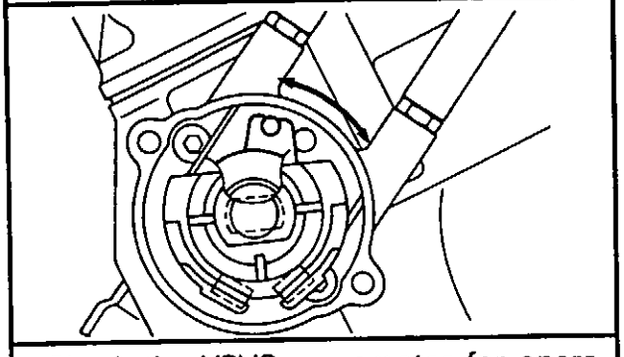
NO ⇩

Replace the main switch.

EAS00829

4.YPVS servomotor operation (with the YPVS servomotor coupler connected to the wire harness)

- Set the main switch to "ON".



- Check the YPVS servomotor for operation.
- Does the YPVS servomotor pulley turn?

NO

- Check the YPVS servomotor for operation.
- Does the YPVS servomotor pulley turn?

YES

Replace the YPVS servomotor.

YES

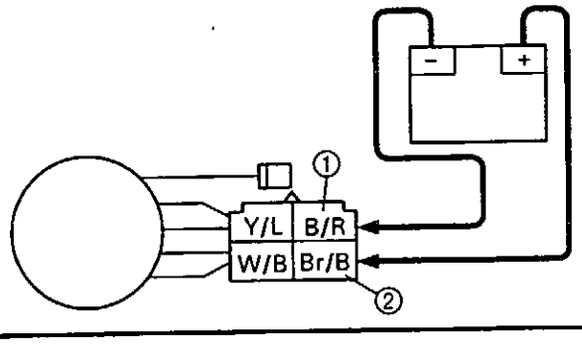
This circuit is OK.

EB811402

5.YPVS servomotor operation (with the servomotor coupler disconnected from the wire harness)

- Disconnect the YPVS servomotor coupler from the wire harness.
- Connect the battery leads to the YPVS servomotor coupler (servomotor side) as shown.

Battery positive terminal → black/red ①
Battery negative terminal → brown/black ②



6.Wiring

- Check the entire yamaha power valve (YPVS) system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the yamaha power valve (YPVS) system's wiring properly connected and without defects?

YES

Replace the CDI unit.

NO

Properly connect or repair the yamaha power valve (YPVS) system's wiring.

CONTENTS
TROUBLESHOOTING

EAS00002

NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:
Designs and specifications are subject to change without notice.

EAS00004

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person checking or repairing the motorcycle.

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.

NOTE: A NOTE provides key information to make procedures easier or clearer.

EAS00844

TROUBLESHOOTING

NOTE:
The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING PROBLEMS

ENGINE

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder

Piston and piston rings
- Incorrectly installed piston ring
- Damaged, worn, or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter
- Incorrectly installed air filter
- Clogged air filter element

Crankcase and crankshaft
- Incorrectly assembled crankcase
- Seized crankshaft

Reed valve
- Deformed reed valve stopper
- Improperly seated read valve
- Loose intake manifold
- Broken gasket
- Broken reed valve

FUEL SYSTEM

Fuel tank
- Empty fuel tank
- Clogged fuel filter
- Clogged fuel strainer
- Deteriorated or contaminated fuel

Fuel cock
- Clogged or damaged fuel hose

Carburetor
- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Incorrectly installed needle valve seat
- Incorrect fuel level
- Incorrectly installed pilot jet
- Clogged starter jet
- Faulty starter plunger
- Incorrectly adjusted starter cable

ELECTRICAL SYSTEMS

Battery
- Faulty battery
- Discharged battery

Fuses
- Blown, damaged, or incorrect fuse
- Incorrectly installed fuse

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil
- Damaged ignition coil
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system
- Faulty CDI unit
- Faulty pickup coil
- Damaged rotor woodruff key

Switches and wiring
- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch
- Incorrectly grounded circuit
- Loose connections

Starting system
- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cutoff relay
- Faulty starter clutch

EAS00846
INCORRECT ENGINE IDLING SPEED

ENGINE
Air filter
- Clogged air filter element

FUEL SYSTEM
Carburetor
- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Incorrectly adjusted engine idling speed (throttle stop screw)
- Incorrect throttle cable free play
- Flooded carburetor
- Faulty air induction system

ELECTRICAL SYSTEMS
Battery
- Incorrectly charged battery
- Faulty battery

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Damaged ignition coil

Ignition system
- Faulty CDI unit
- Faulty pickup coil
- Damaged rotor woodruff key

EAS00848
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING PROBLEMS".

ENGINE
Air filter
- Clogged air filter element

FUEL SYSTEM
Carburetor
- Incorrect fuel level
- Loose or clogged main jet

YAMAHA POWER VALVE SYSTEM (YPVS)
Power valve
- Seized or damaged YPVS valve
- Heavy carbon build-up

Control cable
- Incorrect adjusted cable
- Seized or discontinuous cable

Electrical parts
- Faulty main switch
- Faulty YPVS servomotor
- Faulty CDI unit
- Broken or shorted wiring

EAS00850
FAULTY GEAR SHIFTING

SHIFTING IS DIFFICULT
Refer to "CLUTCH DRAGS".
SHIFT PEDAL DOES NOT MOVE
Shift shaft
- Incorrectly adjusted shift rod
- Bent shift shaft.

Shift drum and shift forks
- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission
- Seized transmission gear
- Foreign object between transmission gears
- Incorrectly assembled transmission

JUMPS OUT OF GEAR
Shift shaft
- Incorrect shift pedal position
- Incorrectly returned stopper lever

Shift forks
- Worn shift fork

Shift drum
- Incorrect axial play
- Worn shift drum groove

Transmission
- Worn gear dog

EAS00851
FAULTY CLUTCH

CLUTCH SLIPS
Clutch
- Incorrectly assembled clutch
- Incorrectly adjusted clutch cable
- Loose or fatigued clutch spring
- Worn friction plate
- Worn clutch plate

Transmission oil
- Incorrect oil level
- Incorrect oil viscosity (low)
- Deteriorated oil

CLUTCH DRAGS
Clutch
- Unevenly tensioned clutch springs
- Warped pressure plate
- Bent clutch plate
- Swollen friction plate
- Bent clutch push rod
- Damaged clutch boss
- Burnt primary driven gear bushing
- Match marks not aligned

Transmission oil
- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

EAS00855
OVERHEATING

ENGINE
Clogged coolant passages
Cylinder head(-s) and pistons(-s)
- Heavy carbon buildup

Transmission oil
- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

FUEL SYSTEM
Carburetor
- Incorrect main jet setting
- Incorrect fuel level
- Damaged or loose carburetor joint

Air filter
- Clogged air filter element

COOLING SYSTEM

Coolant
- Low coolant level

Radiators
- Damaged or leaking radiator
- Faulty radiator cap
- Bent or damaged radiator fin

Water pump
- Damaged or faulty water pump

Thermostat
- Thermostat stays closed

Oil cooler
- Clogged or damaged oil cooler

Hoses and pipes
- Damaged hose
- Incorrectly connected hose
- Damaged pipe
- Incorrectly connected pipe

CHASSIS

Brakes
- Dragging brake

ELECTRICAL SYSTEMS

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system
- Faulty CDI unit

EB906000
OVERCOOLING

COOLING SYSTEM

Thermostat
- Thermostat stays open

EAS00857
POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS00860
FAULTY FRONT FORK LEGS

LEAKING OIL
- Bent, damaged, or rusty inner tube
- Damaged outer tube
- Incorrectly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Damaged cap bolt O-ring
- Loose drain bolt
- Damaged drain bolt gasket

MALFUNCTION
- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS00864
UNSTABLE HANDLING

Handlebar
- Bent or incorrectly installed handlebar

Steering-head components
- Incorrectly installed upper bracket
- Incorrectly installed lower bracket (incorrectly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork legs
- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Damaged fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm
- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly
- Faulty rear shock absorber spring
- Leaking oil or gas

Tires
- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheels
- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame
- Bent frame
- Damaged steering head pipe
- Incorrectly installed bearing race

EAS00866
FAULTY LIGHTING OR SIGNALING SYSTEM

HEADLIGHT DOES NOT LIGHT
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Incorrectly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT
- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Incorrectly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT LIGHT
- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

TAIL/BRAKE LIGHT BULB BURNT OUT
- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

TURN SIGNAL DOES NOT LIGHT
- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Incorrectly grounded circuit
- Faulty battery
- Blown, damaged, or incorrect fuse

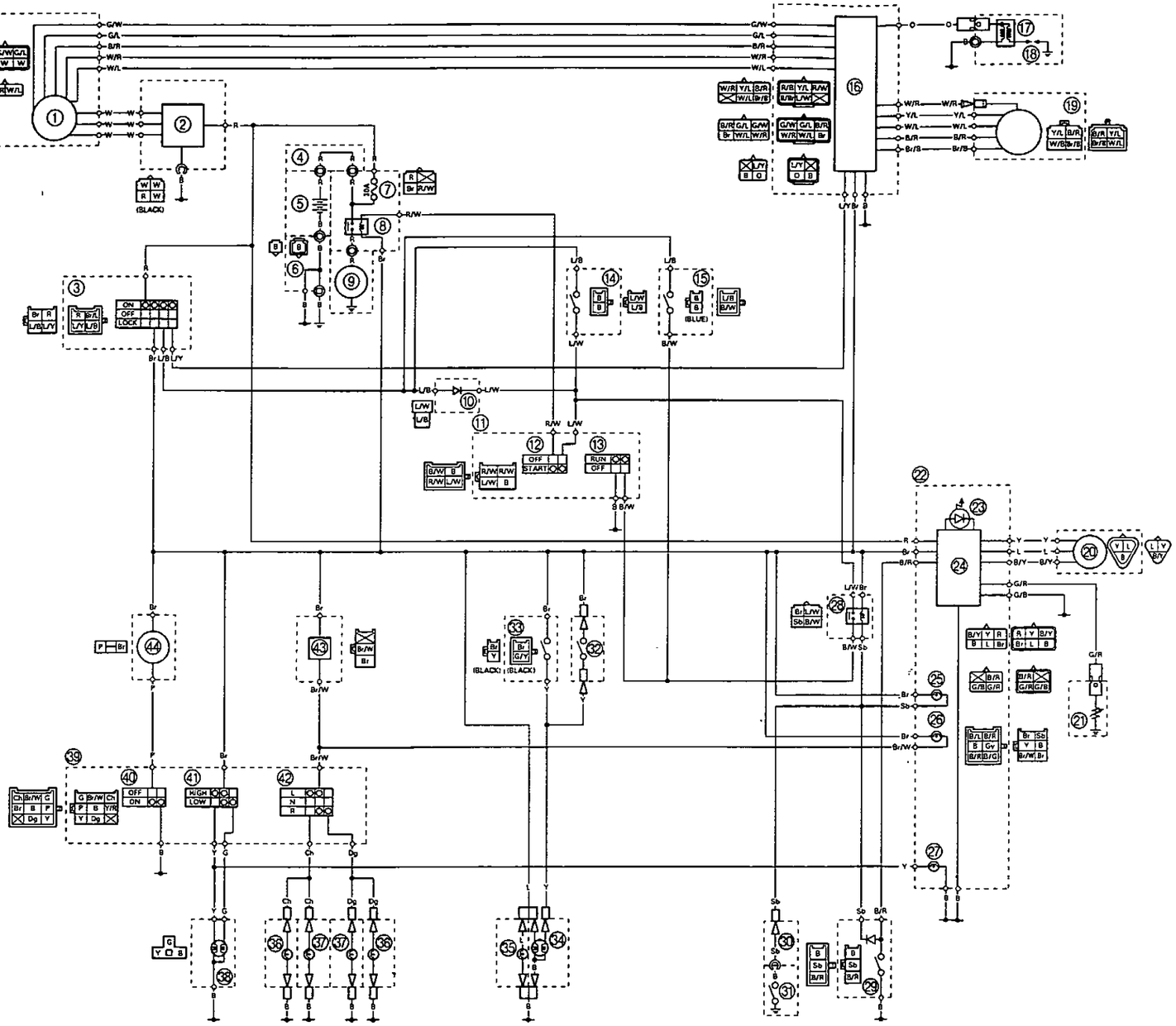
TURN SIGNAL BLINKS SLOWLY
- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

TURN SIGNAL REMAINS LIT
- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND
- Incorrectly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged, or incorrect fuse
- Faulty wire harness

DT230L WIRING DIAGRAM



1. CDI magneto
2. Rectifier/regulator
3. Main switch
4. Battery positive lead
5. Battery
6. Battery negative lead
7. Main fuse
8. Starter relay
9. Starter motor
10. Diode
11. Right handlebar switch
12. Start switch
13. Engine stop switch
14. Clutch switch
15. Sidestand switch
16. CDI unit
17. Ignition coil
18. Spark plug
19. YPVS servomotor
20. Speed sensor
21. Thermo switch
22. Meter assembly
23. Oil level/coolant temperature warning light
24. Combination meter
25. Neutral indicator light
26. Turn signal indicator light
27. High beam indicator light
28. Starting circuit cutoff relay
29. Engine oil level switch
30. Neutral switch lead
31. Neutral switch
32. Rear brake light switch
33. Front brake light switch
34. Tail/brake light
35. Licence plate light
36. Rear turn signal light
37. Front turn signal light
38. Headlight
39. Left handlebar switch
40. Horn switch
41. Dimmer switch
42. Turn signal switch
43. Turn signal relay
44. Horn

COLOR CODE

B ..... black	Sb ..... sky blue	Br/B ..... brown/black	L/W ..... blue/white
Br ..... brown	W ..... white	Br/L ..... brown/blue	L/Y ..... blue/yellow
Ch ..... chocolate	Y ..... yellow	Br/W ..... brown/white	R/W ..... red/white
G ..... green	B/Br ..... black/brown	G/B ..... green/black	W/B ..... white/black
Gy ..... Gray	B/G ..... black/green	G/L ..... green/blue	W/L ..... white/blue
L ..... blue	B/L ..... black/blue	G/R ..... green/red	W/R ..... white/red
O ..... orange	B/R ..... black/red	G/W ..... green/white	Y/L ..... yellow/blue
P ..... pink	B/W ..... black/white	G/Y ..... green/yellow	Y/R ..... yellow/red
R ..... red	B/Y ..... black/yellow	L/B ..... blue/black	