YAMAHA

AG200F '97

3GX-AE1

SERVICE MANUAL

EB000000

AG200F
SERVICE MANUAL

1st Edition, January 1997

YP002000

HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See "Illustrated symbols")

1st title ①: This is the title of the chapter with its symbol on the upper right corner of each page.

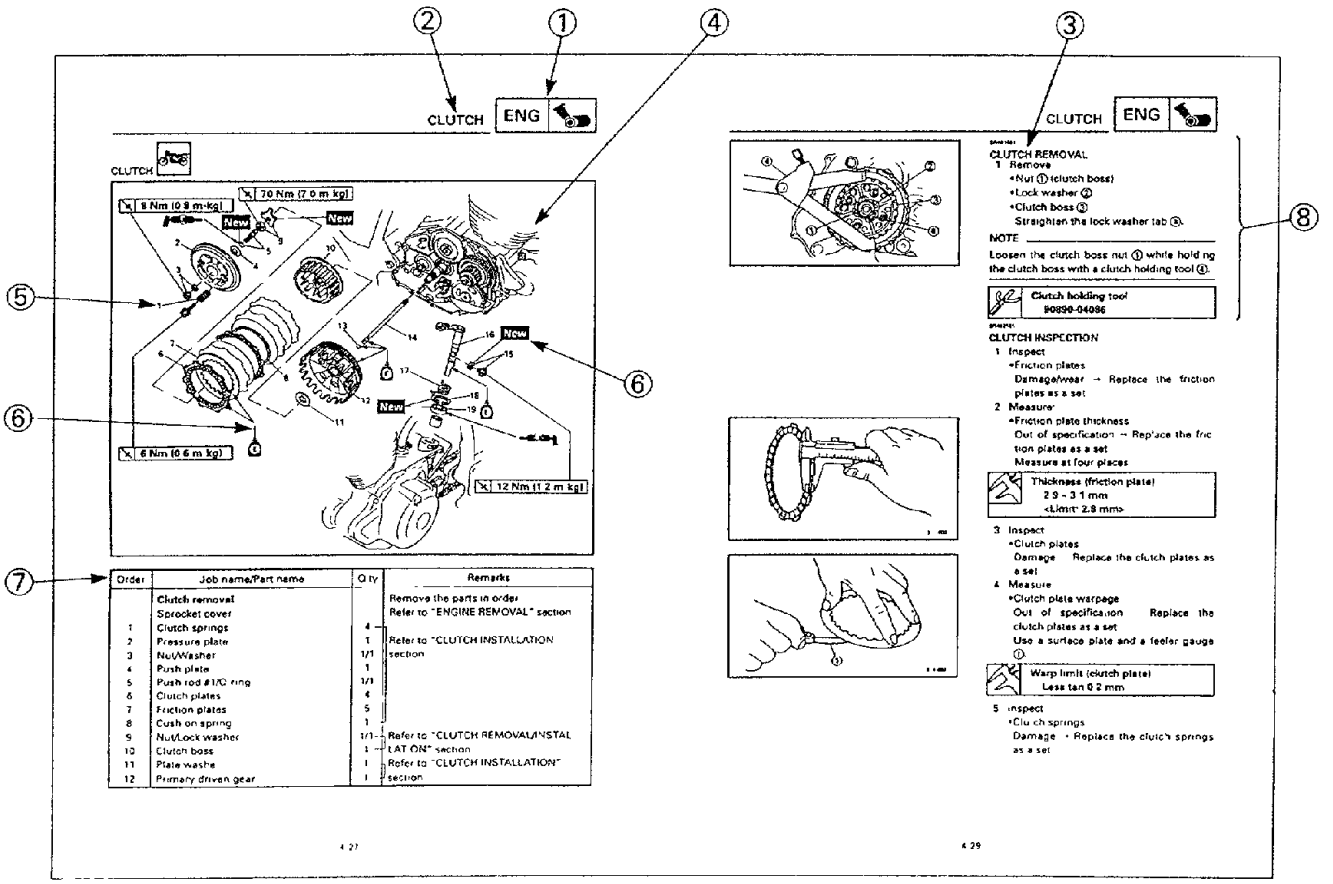
2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

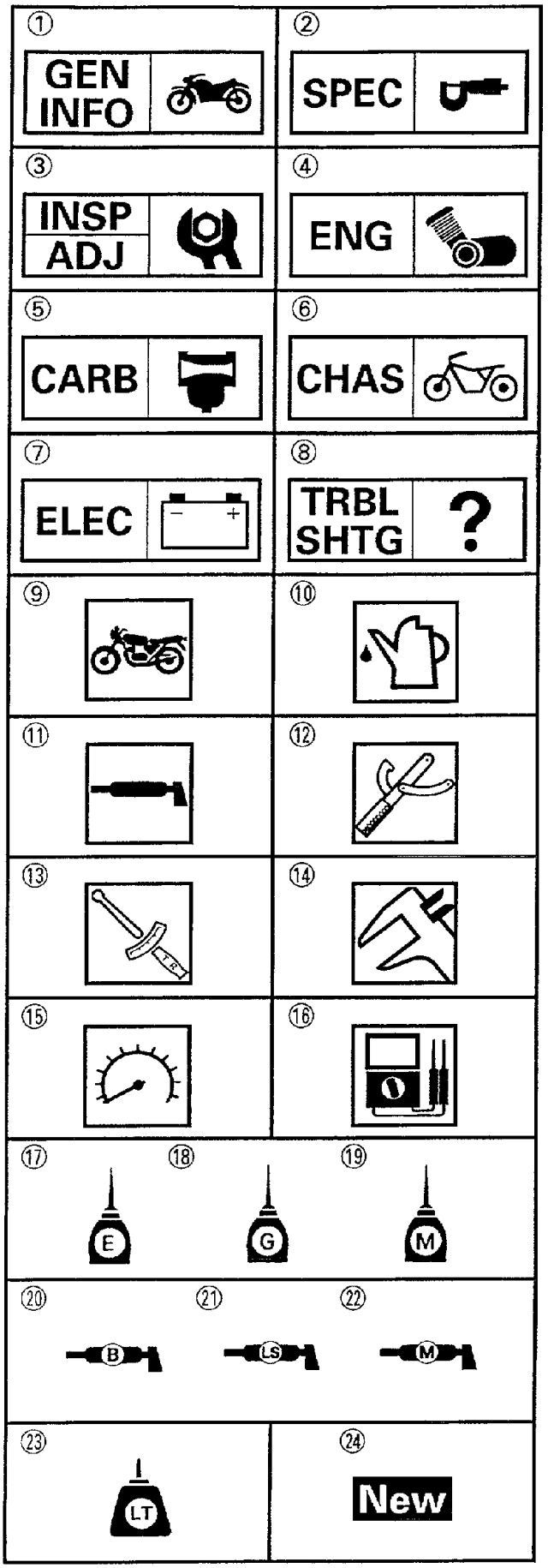
3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS

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

1. An easy-to-see exploded diagram ④ is provided for disassembly and assembly jobs.
2. Numbers ⑤ are given in the order of jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.





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ILLUSTRATED SYMBOLS

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburation
⑥ Chassis
⑦ Electrical
⑧ Troubleshooting

Illustrated symbols ⑨ to ⑯ are used to identify the specifications appearing in the text.

⑨ Possible to maintain with engine mounted
⑩ Filling fluid
⑪ Lubricant
⑫ Special tool
⑬ Tightening
⑭ Wear limit, clearance
⑮ Engine speed
⑯ Ω, V, A

Illustrated symbols ⑰ to ㉒ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disulfide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease

Illustrated symbols ㉓ to ㉔ in the exploded diagrams indicate the where to apply locking agent ㉓ and when to install new parts ㉔.

㉓ Apply locking agent (LOCTITE®)
㉔ Use new one

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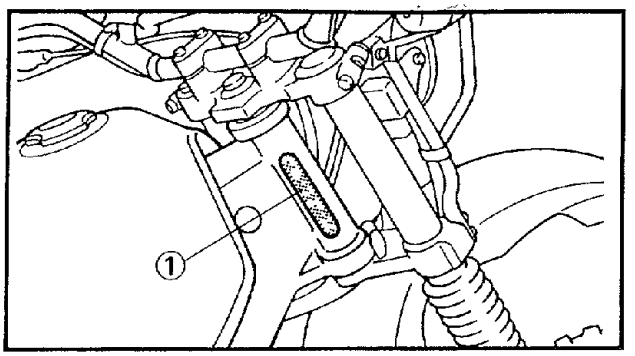
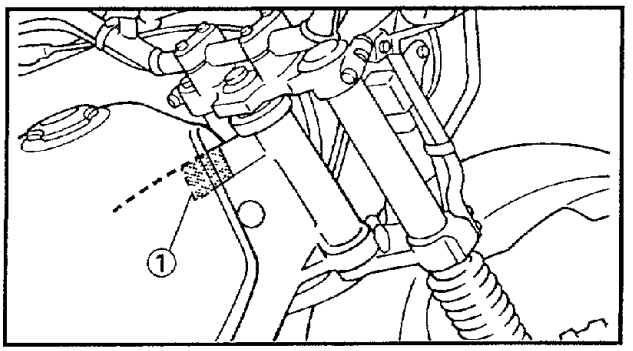
CHAPTER 5.
CARBURETION

CHAPTER 6.
CHASSIS

CHAPTER 7.
ELECTRICAL

CHAPTER 8.
TROUBLE SHOOTING





YP100000

GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

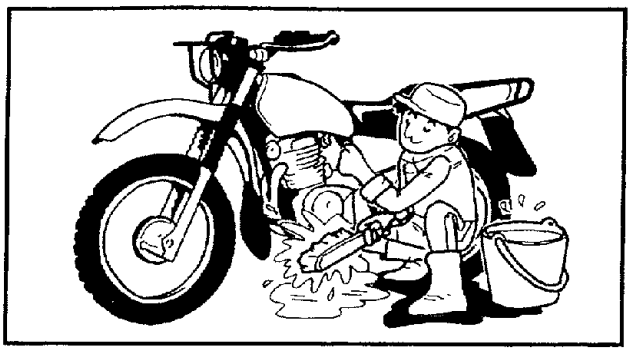
SR100020

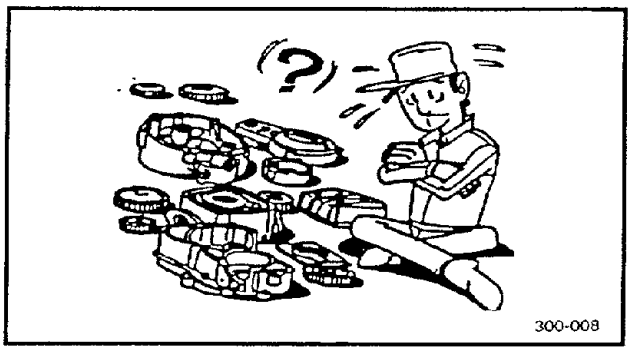
FRAME SERIAL NUMBER

The frame serial number ① is stamped into the right side of the frame

MODEL LABEL

The model label ① is affixed under the fuel tank. This information will be needed to order spare parts.



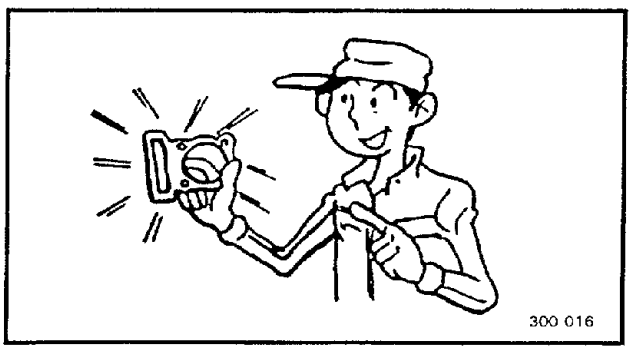


EB101000

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL PROCEDURES

1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment.
3. Refer to the "SPECIAL TOOLS" section.
4. When disassembling the machine, 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.
5. During machine disassembly, clean all 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.
6. Keep all parts away from any source of fire.



EB101010

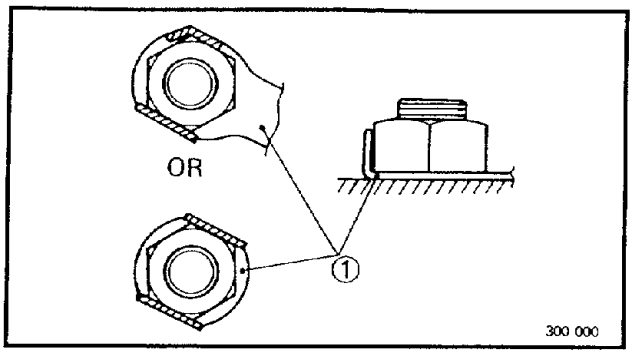
REPLACEMENT PARTS

1. 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.

EB101020

GASKETS, OIL SEALS AND O-RINGS

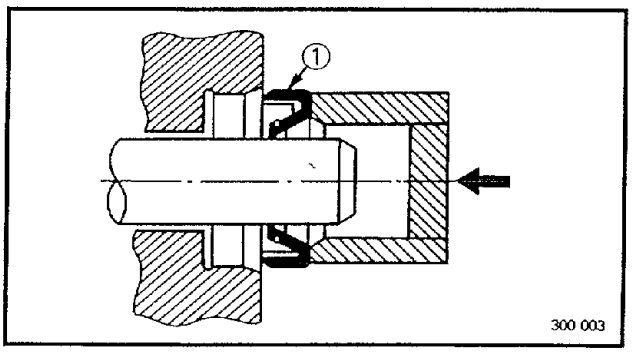
1. Replace all gaskets, seals and O-rings when overhauling the engine. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



EB101030

LOCK WASHERS/PLATES AND COTTER PINS

1. Replace all lock washers/plates and cotter pins after removal. Bend lock tabs along the bolt or nut flats after the bolt or nut has been tightened to specification.

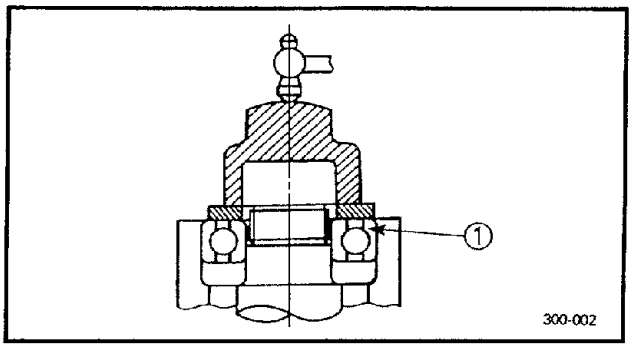


EB101040

BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil bearings liberally when installing, if appropriate.

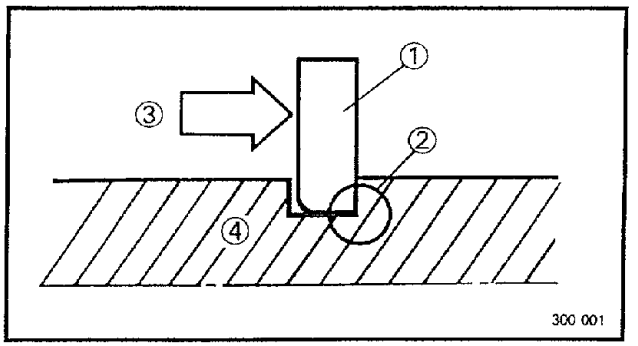
① Oil seal



CAUTION:

Do not use compressed air to spin the bearings dry. This will damage the bearing surfaces.

① Bearing

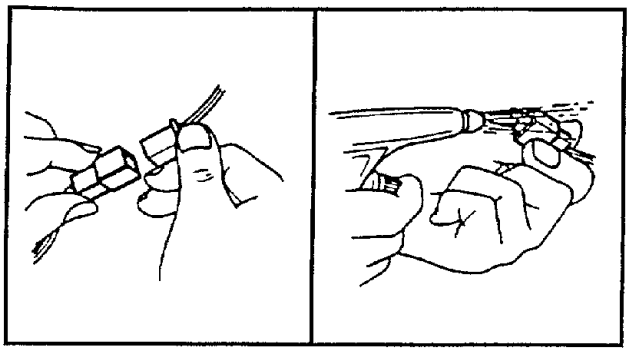


EB101050

CIRCLIPS

1. Check all circlips carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ it receives. See sectional view.

④ Shaft



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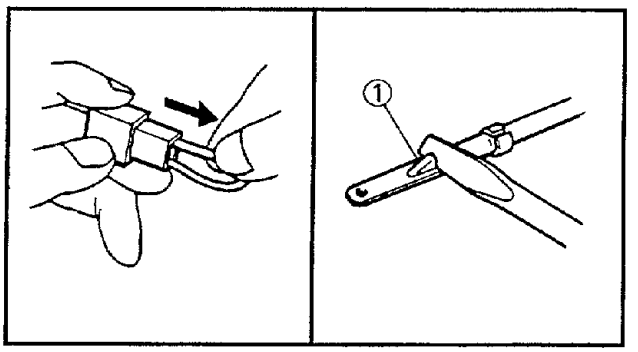
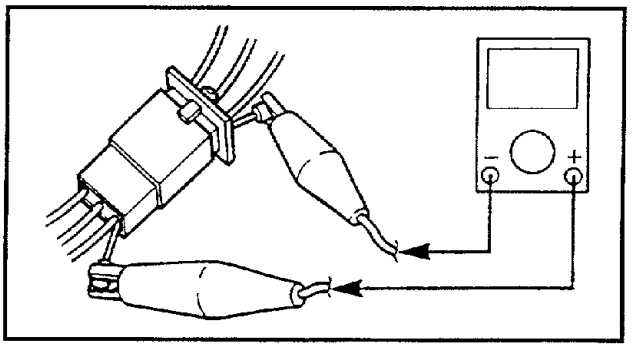
CHECKING OF CONNECTIONS

Dealing with stains, rust, moisture, etc. on the connector.

1. Disconnect:
   - Connector
2. Dry each terminal with an air blower.



3. Connect and disconnect the connector two or three.
4. Pull the lead to check that it will not come off.
5. If the terminal comes off, bend up the pin ① and reinsert the terminal into the connector.



6. Connect:
   - Connector

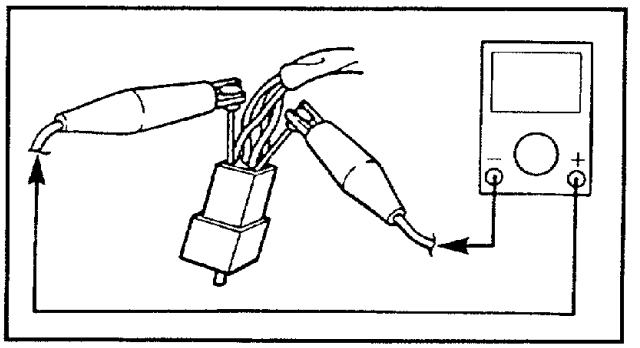
NOTE:

The two connectors "click" together.

7. Check for continuity with a tester.

NOTE:

- If there is no continuity, clean the terminals.
- Be sure to perform the steps 1 to 7 listed above when checking the wireharness.
- For a field remedy, use a contact revitalizer available on the market.
- Use the tester on the connector as shown.



EB201000

HOW TO USE THE 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		IMP
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

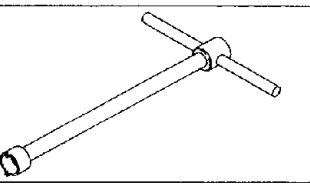
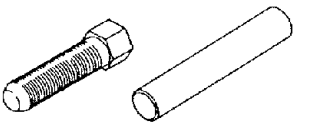
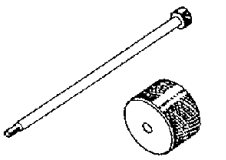
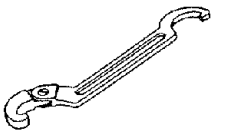
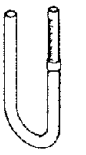
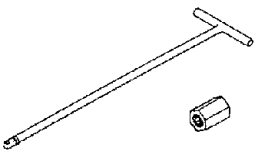
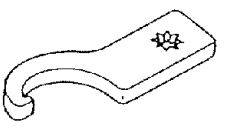
CONVERSION TABLE

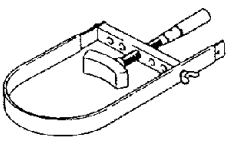
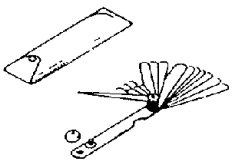
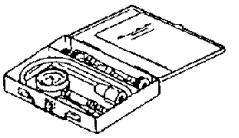
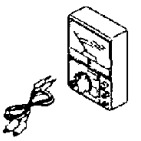
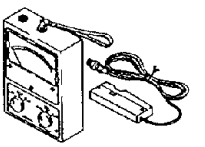
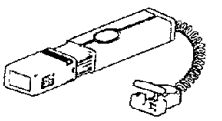
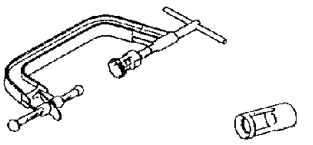
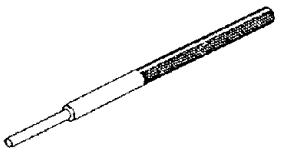
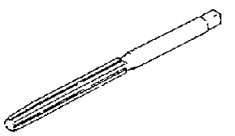
METRIC TO IMP			
	Known	Multiplier	Result
Torque	m•kg m•kg cm•kg cm•kg	7.233 86.794 0.0723 0.8679	ft•lb in•lb ft•lb in•lb
Weight	kg g	2.205 0.03527	lb oz
Distance	km/hr km m m cm mm	0.6214 0.6214 3.281 1.094 0.3937 0.03937	mph mi ft yd in in
Volume/ Capacity	cc (cm^3) cc (cm^3) lit (liter) lit (liter)	0.03527 0.06102 0.8799 0.2199	oz (IMP liq.) cu•in qt (IMP liq.) gal (IMP liq.)
Miscellaneous	kg/mm kg/cm^2 Centigrade	55.997 14.2234 9/5(°C)+32	lb/in psi (lb/in^2) Fahrenheit (°F)

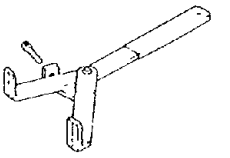
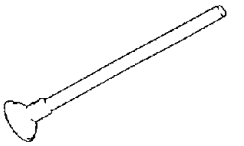
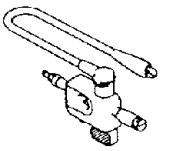
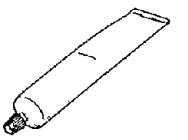
EB102000

SPECIAL TOOLS

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

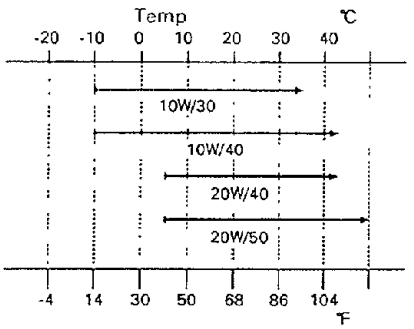
Tool No.	Tool name / Usage	Illustration
90890-01052	Meter gear bush tool This tool is used when removing or installing the meter gear bush.	
90890-01080 -04052	Rotor puller Attachment These tools are used when removing the magneto rotor.	
90890-01083 -01084	Rocker arm shaft puller bolt Weight These tools are used when removing or installing the rocker arm shafts.	
90890-01268	Ringnut wrench This tool is used to loosen and tighten the exhaust and steering ringnut.	
90890-01311	Valve adjusting tool This tool is necessary for adjusting valve clearance.	
90890-01312	Fuel level gauge This gauge is used to measure the fuel level in the float chamber.	
90890-01326 -04084	T-handle Damper rod holder (19 mm) These tools are used to loosen and tighten the front fork dumper rod holding bolt.	
90890-01367 -01369	Fork seal driver weight Fork seal driver attachment (ø35 mm) These tools are used when installing the fork seal.	
90890-01403	Ring nut wrench This tool is used to loosen and tighten the steering ring nut.	

Tool No.	Tool name / Usage	Illustration
90890-01701	Sheave holder This tool is used for holding the magneto rotor.	
90890-03079	Thickness gauge This tool is used to measure the valve clearance.	
90890-03081 -04082	Compression gauge Adaptor These tools are used to measure the engine compression.	
90890-03112	Pocket tester This instrument is invaluable for checking the electrical system.	
90890-03113	Engine tachometer This tool is needed for detecting engine rpm	
90890-03141	Timing light This tool is needed for detecting engine rpm.	
90890-04019 -04108	Valve spring compressor Attachment These tools are used when removing or installing the valve and the valve spring.	
90890-04064	Valve guide remover 6mm This tool is used to remove the valve guide.	
90890-04065	Valve guide reamer 6mm This tool is used to rebore the valve guide.	
90890-04066	Valve guide installer 6mm This tool is needed to install the valve guides properly.	

Tool No.	Tool name / Usage	Illustration
90890-04086	Clutch holding tool This tool is used for holding the Clutch Boss.	
90890-04101	Valve lapper This tool is used for removing and installing the lifter and for lapping the valve.	
90890-05245	Torques wrench This tool is used for removing and installing the segment bolt.	
90890-06754	Ignition checker This instrument is necessary for checking the ignition system components.	
90890-85505	Yamaha bond No. 1215 This sealant (bond) is used for crankcase mating surface, etc.	

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	AG200F
Model code:	3GXA
Dimensions:	
Overall length	2,160 mm
Overall width	930 mm
Overall height	1,155 mm
Seat height	830 mm
Wheelbase	1,345 mm
Minimum ground clearance	255 mm
Minimum turning radius	2,000 mm
Basic weight:	
With oil and full fuel tank	127 kg
Engine:	
Engine type	Air-cooled 4-stroke, SOHC
Cylinder arrangement	Forward-inclined single cylinder
Displacement	0.196 L (196 cm^3)
Bore × stroke	67.0 × 55.7 mm
Compression ratio	9.5 : 1
Compression pressure (STD)	900 kPa (9.0 kg/cm^2, 9.0 bar) at 1,000 r/min
Starting system	Electric starter
Lubrication system:	Wet sump
Oil type or grade:	
Engine oil	API "SE" or higher grade
	
Periodic oil change	1.0 L
With oil filter replacement	1.1 L
Total amount	1.3 L
Air filter:	Wet type element
Fuel:	
Type	Regular unleaded gasoline
Fuel tank capacity	10.0 L
Fuel reserve capacity	2.0 L

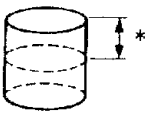
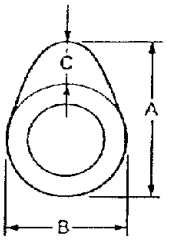
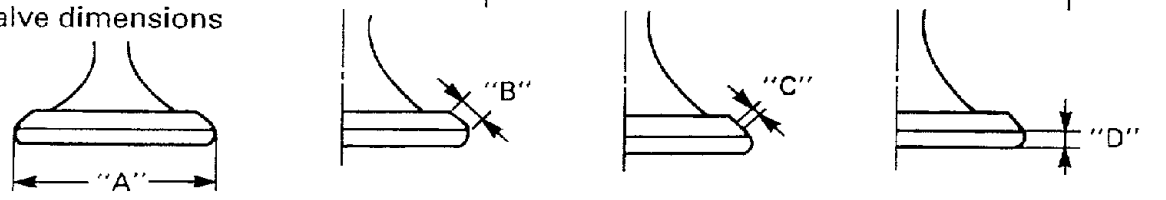
Model	AG200F
Carburetor:	
Type/quantity	BS26/1
Manufacturer	MIKUMI
Spark plug:	
Type	D8EA/X24ES-U
Manufacturer	NGK/DENSO
Spark plug gap	0.6~0.7 mm
Clutch type:	Wet, multiple - disc
Transmission:	
Primary reduction system	Spur gear
Primary reduction ratio	74/20 (3.700)
Secondary reduction system	Chain drive
Secondary reduction ratio	54/14 (3.857)
Transmission type	Constant mesh 5 speed
Operation	Left foot operation
Gear ratio 1st	35/11 (3.181)
2nd	31/15 (2.066)
3rd	30/21 (1.428)
4th	25/26 (0.961)
5th	22/31 (0.709)
Chassis:	
Frame type	Diamond
Caster angle	27.9°
Trail	87 mm
Tire:	
Type	Tube type
Size front	80/100-21 51M
rear	4.00-18 59M
Manufacturer front	INOUE
rear	INOUE
Type front	VE-32
rear	FARM SPECIAL - Z2
Tire pressure (cold tire):	
Maximum load-except motorcycle	112 kg
Loading condition A *	0~112 kg
front	120 kPa (1.2 kg/cm², 1.2 bar)
rear	150 kPa (1.5 kg/cm², 1.5 bar)

*Load is the total weight of cargo, rider, passenger, and accessories.

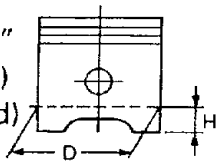
Model	AG200F
Brake:	
Front brake type	Drum brake
operation	Right hand operation
Rear brake type	Drum brake
operation	Right foot operation
Suspension:	
Front suspension	Telescopic fork
Rear suspension	Swingarm (monocross)
Shock absorber:	
Front shock absorber	Coil spring/Oil damper
Rear shock absorber	Coil spring/Gas-Oil damper
Wheel travel:	
Front wheel travel	200 mm
Rear wheel travel	165 mm
Electrical:	
Ignition system	CDI
Generator system	CDI magneto
Battery type	GT6B-3
Battery capacity	12V 6 AH
Headlight type:	Bulb type
Bulb wattage × quantity:	
Headlight	12V 45 W/45 W × 1
Tail/brake light	12V 5 W/21 W × 1
Flasher light	12V 10 W × 4
Meter light	12V 1.7 W × 1
Neutral indicator	12V 1.7 W × 1

MAINTENANCE SPECIFICATIONS

ENGINE

Item		Standard	Limit
Cylinder head:			
Warp limit		•••	0.03 mm
Cylinder:			
Bore size		66.97~67.02 mm	67.1 mm
Measuring point*		40 mm	•••
Camshaft:			
Cam dimensions			
Intake "A"		36.54~36.64 mm	36.48 mm
"B"		30.15~30.25 mm	30.1mm
"C"		6.59 mm	•••
Exhaust "A"		36.58~36.68 mm	36.49 mm
"B"		30.27~30.37 mm	30.2 mm
"C"		6.63 mm	•••
Camshaft runout limit		•••	0.03 mm
Cam chain:			
Cam chain type/No. of links		DID 25SH/104 ENDLESS	•••
Cam chain adjustment		Automatic	•••
Rocker arm/rocker armshaft:			
Rocker arm inside diameter		12.000~12.018 mm	12.036 mm
Rocker shaft outside diameter		11.981~11.991 mm	11.950 mm
Rocker arm-to-rocker armshaft clearance		0.009~0.037 mm	•••
Valve, valve seat, valve guide:			
Valve clearance (cold)	IN	0.10~0.14 mm	•••
	EX	0.16~0.20 mm	•••
Valve dimensions			
"A" head diameter	IN	33.9~234.1 mm	•••
	EX	28.4~28.6 mm	•••
"B" face width	IN	2.26 mm	•••
	EX	2.26 mm	•••
"C" seat width	IN	0.9~1.1 mm	1.6 mm
	EX	0.9~1.1 mm	1.6 mm
"D" margin thickness	IN	0.8~1.2 mm	•••
	EX	0.8~1.2 mm	•••
Stem outside diameter	IN	5.975~5.990 mm	5.955 mm
	EX	5.960~5.975 mm	5.940 mm

Item		Standard	Limit
Guide inside diameter	IN	6.000~6.012 mm	6.042 mm
	EX	6.000~6.012 mm	6.042 mm
Stem-to-guide clearance	IN	0.010~0.037 mm	0.08 mm
	EX	0.025~0.052 mm	0.10 mm
Stem runout limit		•••	0.03 mm
Valve seat width	IN	0.9~1.1 mm	1.6 mm
	EX	0.9~1.1 mm	1.6 mm
Valve spring:			
Free length (inner)	IN/EX	35.5 mm	33.5 mm
(outer)	IN/EX	37.2 mm	35.2 mm
Set length (valve closed)			
(inner)	IN/EX	30.5 mm	•••
(outer)	IN/EX	32.0 mm	•••
Compressed pressure			
(inner)	IN/EX	8.4~10.2 kg	•••
(outer)	IN/EX	16.6~20.4 kg	•••
Tilt limit (inner)	IN/EX	•••	2.5°/1.5 mm
Tilt limit (outer)	IN/EX	•••	2.5°/1.6 mm
Direction of winding (inner)	IN/EX	Counterclockwise	•••
(outer)	IN/EX	Clockwise	•••
Piston:			
Piston to cylinder clearance		0.025~0.045 mm	•••
Piston size "D"		66.935~66.985 mm	•••
Measuring point "H"		7.5 mm	•••
Piston over size (1st)		67.25 mm	•••
Piston over size (2nd)		67.50 mm	•••
Piston pin bore inside diameter		16.002~16.013 mm	•••
Piston pin outside diameter		15.991~16.000 mm	•••
Piston pin to piston clearance		0.002~0.022 mm	•••
Piston rings:			
Top ring:			
Type		Barrel	•••
Dimensions (B × T)		1.2 × 2.7 mm	•••
End gap (installed)		0.15~0.35 mm	0.60 mm
Side clearance (installed)		0.03~0.07 mm	0.15 mm
2nd ring:			
Type		Taper	•••
Dimensions (B × T)		1.2 × 2.7 mm	•••
End gap (installed)		0.15~0.35 mm	0.60 mm
Side clearance		0.02~0.06 mm	0.15 mm
Oil ring:			
Dimensions (B × T)		2.5 × 2.8 mm	•••
End gap (installed)		0.3~0.9 mm	•••



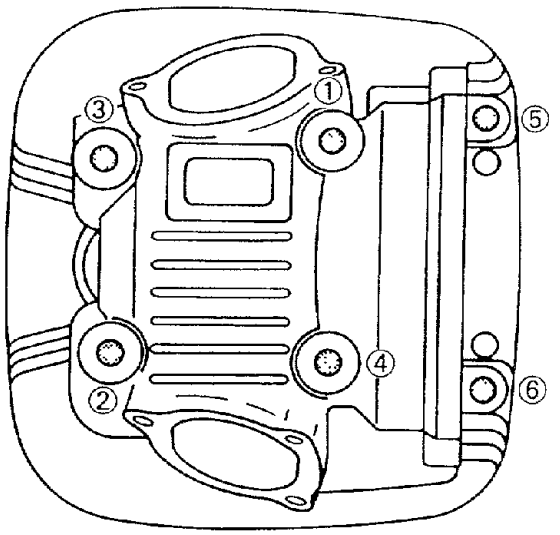
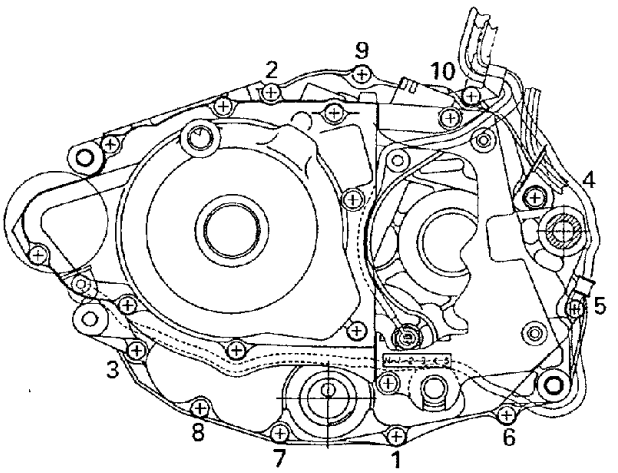
Item		Standard	Limit
Crankshaft:			
Crank width "A"		55.95~56.00 mm	•••
Runout limit "C"		•••	0.03 mm
Big end side clearance "D"		0.35~0.65 mm	1.0 mm
Big end radial clearance		0.010~0.025 mm	•••
Small end free play "F"		0.8~1.0 mm	•••
Clutch:			
Friction plate thickness		2.9~3.1 mm	2.8 mm
Quantity		5 pcs.	•••
Clutch plate thickness		1.5~1.7 mm	0.2 mm
Quantity		4 pcs.	•••
Clutch spring free length		37.3 mm	35.3 mm
Quantity		4 pcs.	•••
Push rod bending limit		•••	0.5 mm
Transmission:			
Main axle runout limit		•••	0.08 mm
Drive axle runout limit		•••	0.08 mm
Carburetor:			
Type		BS26	
I.D. mark		36X 01	•••
Main jet	(M.J)	#117.5	•••
Main air jet	(M.A.J)	ø1.6	•••
Jet needle	(J.N)	4FP40-4	•••
Needle jet	(N.J)	P-2	•••
Pilot outlet	(P.O)	0.8	•••
Pilot jet	(P.J)	#35	•••
Pilot air jet	(P.A.J)	#125	•••
Bypass 1	(B.P.1)	0.8	•••
Bypass 2	(B.P.2)	0.8	•••
Bypass 3	(B.P.3)	0.8	•••
Pilot screw	(P.S)	2	•••
Valve seat size	(V.S)	ø2.0	•••
Starter jet 1	(G.S.1)	#30	•••
Starter jet 2	(G.S.2)	0.5	•••
Throttle valve size	(TH. V)	#120	•••
Fuel level (with special tool)	(F.L)	2.5 ~ 3.5 mm	•••
Engine idle speed		1,300~1,400 r/min	•••
Intake vacuum		180~200 mmHg	•••
Oil pump:			
Type		Trochoid type	•••
Tip clearance		0.15 mm or less	0.15 mm
Side clearance		0.10~0.15 mm	0.35 mm
Housing and rotor clearance		0.03~0.09 mm	0.14 mm
Bypass valve setting pressure		80~120 kPa (0.8~1.2 kg/cm², 0.8~1.2 bar)	•••

TIGHTENING TORQUES

ENGINE

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m•kg	
Cylinder head oil check bolt	Bolt	M6	1	7	0.7	
Cylinder head and cylinder	Bolt	M8	4	22	2.2	E
Cylinder head (Timing chain side)	Bolt	M8	2	20	2.0	
Cam sprocket cover	Screw	M6	2	7	0.7	
Valve cover	Bolt	M6	5	10	1.0	
Plate	Bolt	M6	2	8	0.8	with lock washer
Spark plug	—	M12	1	18	1.8	
Cylinder	Bolt	M6	2	10	1.0	
Balancer weight gear	Nut	M14	1	50	5.0	with lock washer
CDI magneto	Bolt	M10	1	50	5.0	
Valve adjusting locknut	Nut	M6	2	14	1.4	
Cam sprocket	Bolt	M10	1	60	6.0	
Timing chain tensioner	Nut	M6	2	10	1.0	
Timing chain guide (intake)	Bolt	M6	2	8	0.8	
Oil pump	Screw	M6	3	7	0.7	
Oil pump and crankcase	Screw	M6	3	7	0.7	
Drain bolt	Bolt	M35	1	43	4.3	
Oil filter cover	Screw	M6	2	7	0.7	
Drain bolt (oil filter)	Bolt	M6	1	10	1.0	
Carburetor joint and carburetor	Screw	M6	2	12	1.2	
Carburetor joint and cylinder	Screw	M5	1	2	0.2	
Carburetor joint and air filter	Screw	M5	1	2	0.2	
Air filter case	Screw	M6	1	10	1.0	
Air filter case and frame	Screw	M6	2	10	1.0	
Muffler and frame	Bolt	M8	2	27	2.7	
Exhaust pipe and cylinder	Bolt	M6	2	10	1.0	
Exhaust pipe and muffler	Bolt	M8	1	20	2.0	
Crankcase (left and right)	Screw	M6	12	7	0.7	
Crankcase cover (left)	Screw	M6	8	7	0.7	
Crankcase cover (right)	Screw	M6	10	7	0.7	
Drive sprocket cover	Screw	M6	4	7	0.7	
Starter clutch	Bolt	M8	3	30	3.0	
Kick crank	Bolt	M8	1	20	2.0	
Primary drive gear	Nut	M14	1	50	5.0	with lock washer
Clutch spring	Screw	M5	4	6	0.6	
Clutch boss	Nut	M14	1	70	7.0	with lock washer
Push lever axle	Screw	M8	1	12	1.2	
Push lever adjuster	Nut	M6	1	8	0.8	
Drive sprocket	Bolt	M6	2	10	1.0	
Shift cam (Segment)	Screw	M6	1	12	1.2	LT

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m•kg	
Shift pedal	Bolt	M6	1	10	1.0	
Pick up coil	Screw	M6	2	7	0.7	LT
Neutral switch	Screw	M10	1	20	2.0	
Stator coil	Screw	M6	3	7	0.7	LT
Starter motor	Screw	M6	1	7	0.7	

Item	Standard	Limit
Tightening sequence Cylinder head		
Crankcase		

CHASSIS

Item	Standard	Limit
Steering system:		
Steering bearing type	Ball bearing	•••
No./size of steel balls (upper)	22 pcs. 0.1875 in	•••
(lower)	19 pcs. 0.251 in	•••
Front suspension:		
Front fork travel	200 mm	•••
Fork spring free length	403.5 mm	399 mm
Fitting length	398.4 mm	•••
Collar length	160 mm	•••
Spring rate (K1)	5.0 N/mm (0.50 kg/mm)	•••
(K2)	6.5 N/mm (0.65 kg/mm)	•••
Stroke (K1)	0 ~ 140 mm	•••
(K2)	140 ~ 200 mm	•••
Oil capacity	0.294 L (294 cm^3)	•••
Oil level	117 mm	•••
Oil grade	Fork oil 10 WT or equivalent	•••
Inner tube vend limit	•••	0.2 mm
Rear suspension:		
Shock absorber stroke	82 mm	•••
Spring free length	279 mm	276 mm
Fitting length	265 mm	•••
Spring rate (K1)	45.2 N/mm (4.52 kg/mm)	•••
(K2)	72.2N/mm (7.22 kg/mm)	•••
Stroke (K1)	0 ~ 42 mm	•••
(K2)	42 ~ 62 mm	•••
Front wheel:		
Type	Spoke wheel	•••
Rim size	21 × 1.60	•••
Rim material	Steel	•••
Rim runout limit radial	•••	2 mm
lateral	•••	2 mm
Rear wheel:		
Type	Spoke wheel	•••
Rim size	18 × 1.85	•••
Rim material	Steel	•••
Rim runout limit radial	•••	2 mm
lateral	•••	2 mm
Drive chain:		
Type/manufacturer	DID428HDS/DAIDO	•••
No. of links	122	•••
Chain free play	30~45 mm	•••

Item	Standard	Limit
Front brake:		
Type	Leading, trailing	...
Drum diameter	130 mm	131 mm
Shoe thickness	4.0 mm	2.0 mm
Shoe spring free length	50.5 mm	...
Rear brake:		
Type	Leading, trailing	...
Drum inside diameter	130 mm	131 mm
Shoe thickness	4.0 mm	2.0 mm
Shoe spring free length	50.5 mm	...
Brake lever:		
Brake lever free play (at lever end)	10~20 mm	...
Brake pedal:		
Brake pedal free play	20~30 mm	...
Brake pedal position	10 mm	...
Clutch lever:		
Clutch lever free play (at lever end)	10~15 mm	...
Throttle cable free play	2~3 mm	...

TIGHTENING TORQUES

CHASSIS

Part to be tightened	Thread size	Tightening torque		Remarks
		Nm	m•kg	
Handle crown and front fork	M10	34	3.4	
Handle crown and steering shaft	M14	55	5.5	
Handlebar holder (handle crown and upper)	M 8	20	2.0	
Steering ring nut	M25	38	3.8	Refer to NOTE
Handlebar under holder and nut	M14	55	5.5	
Steering shaft and front fork	M 8	23	2.3	
Engine and front engine stay	M 8	37	3.7	
Front engine stay and frame	M 8	37	3.7	
Engine and top engine stay	M 8	33	3.3	
Top engine stay and frame	M 8	33	3.3	
Engine and engine bracket (frame)	M 8	33	3.3	
Swingarm pivot shaft	M12	80	8.0	
Rear shock absorber and frame	M10	25	2.5	
Swingarm and tension bar	M 8	20	2.0	
Tension bar and rear brake shoe plate	M 8	20	2.0	
Fuel tank and fuel cock	M 6	7	0.7	
Footrest (left) and frame	M12	80	8.0	
Footrest (right) and frame	M10	45	4.5	
Sidestand (left)	M10	30	3.0	
(right)	M10	30	3.0	
Front wheel axle and nut	M10	39	3.9	
Rear wheel axle and nut	M14	80	8.0	
Driven sprocket and clutch hub	M 8	30	3.0	
Driven sprocket and axle	M20	80	8.0	
Meter gear and meter cable	M12	3	0.3	
Brake cam lever	M 6	9	0.9	
Rear carrier and frame	M10	30	3.0	LT
Chain case protector and swingarm	M 8	15	1.5	

NOTE:

1. When tighten the ring nut, should be steady the ball bearings and the steering shaft moving smoothly.
2. First, tighten the ring nut approximately 38 Nm (3.8 m•kg) by using the torque wrench, then loosen the ring nut until the steering shaft moving smoothly.

ELECTRICAL

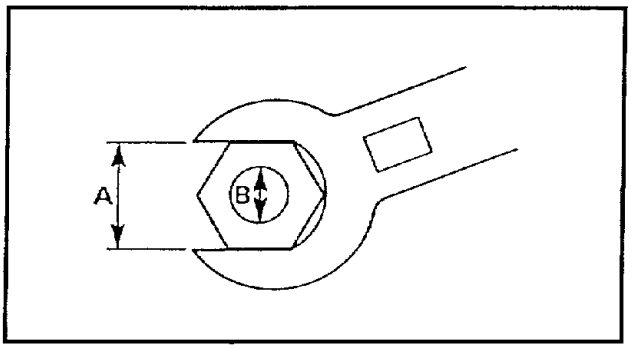
Item	Standard	limit
Ignition timing:		
Ignition timing (B.T.D.C.)	9° at 1,300 r/min	•••
Advanced timing	29° at 6,000 r/min	•••
Advanced type	Electrical type	•••
CDI:		
CDI magneto model/manufacturer	F3GX/YAMAHA	•••
Pickup coil resistance/color	656~984 Ω at 20°C/ Red — White	•••
Source coil 1 resistance/color	700~900 Ω at 20°C/ Brown — Green	•••
Source coil 2 resistance/color	472~708 Ω at 20°C/ Yellow — Green	•••
CDI unit model/manufacturer	3GX/YAMAHA	•••
Ignition coil:		
Model/manufacturer	2JN/YAMAHA	•••
Minimum spark gap	6 mm	•••
Primary winding resistance	0.27~0.33 Ω at 20°C	•••
Secondary winding resistance	5.76~8.52 kΩ at 20°C	•••
Spark plug cap:		
Type	Resin type	•••
Resistance	10 kΩ	•••
Charging system:		
Type	CDI magneto	•••
Model/manufacturer	F3GX/YAMAHA	•••
Standard output	14 V 12 A/5,000 r/min	•••
Stator coil resistance/color	0.48~0.72 Ω at 20°C/ White — White	•••
Rectifier/regulator:		
Model/manufacturer	SH569A-12/SHINDENGEN	•••
Type (regulator)	Semi conductor - short circuit type	•••
No load regulated voltage	14.1~14.9 V	•••
Capacity (rectifier)	25 A	•••
Withstand voltage	240 V	•••
Battery:		
Specific gravity	1.320	•••
Electric starter system:		
Type	Constant mesh type	
Starter motor:		
Model/manufacturer	3GX/YAMAHA	•••
Output	0.4 kW	•••
Armature coil resistance	0.0171~0.0207 Ω at 20°C	•••
Brush overall length	10 mm	3.5 mm
Brash spring pressure	5.49~6.24 N (560~840g)	•••

Item	Standard	limit
Commutator diameter	22 mm	21 mm
Mica undercut (depth)	1.5 mm	•••
Starter relay:		
Model/manufacturer	4FU/JIDECO	•••
Amperage rating	100 A	•••
Coil winding resistance	3.9~4.7 Ω at 20°C	•••
Horn:		
Model/manufacturer	GF-12/NIKKO	•••
Maximum amperage	1.5 A	•••
Flasher relay:		
Type	Full transistor type	•••
Model/manufacturer	FE218BH/DENSO	•••
Flasher frequency	85 cycle/min	•••
Starting circuit cut-off relay:		
Model/manufacturer	ACA12115-3/MATSUSHITA	•••
Coil winding resistance	72~88 Ω at 20°C	•••
Circuit breaker:		
Type	Fuse	•••
Main	20 A × 1 pcs.	•••
Reserve	20 A × 1 pcs.	•••
Auxiliary DC terminal	10 A × 1 pcs.	•••
Reserve	10 A × 1 pcs.	•••

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications	
		Nm	m•kg
10 mm	6 mm	6	0.6
12 mm	8 mm	15	1.5
14 mm	10 mm	30	3.0
17 mm	12 mm	55	5.5
19 mm	14 mm	85	8.5
22 mm	16 mm	130	13.0



A: Distance across flats
B: Outside thread diameter

LUBRICATION POINT AND GRADE OF LUBRICANT

ENGINE

Lubrication Point	Symbol
Oil seal lips (all)	LS
Bearing retainer (all)	E
Bolt (cylinder head)	E
Crank pin	E
Connecting rod (big end)	E
Piston pin	E
Piston/piston ring	E
Buffer boss	E
Valve stem/valve guide (IN, EX)	M
Valve stem end (IN, EX)	E
Rocker arm shaft	E
Cam and bearing (camshaft)	E
Rocker arm inner surface	M
Crankcase mating surfaces	Yamaha bond No. 1215
O-rings (all)	LS
Kick gear inside	E
Kick idle gear inside	E
Kick crank boss	M
Starter idle gear thrust surfaces	E
Starter clutch (outer/roller)	E
Starter wheel gear inner surface	E
Push rod	E
Primary driven gear inner surface	E
Push lever axle	E
Transmission gear inner surface	M
Shift fork/guide bar/shift shaft/shift cam	E

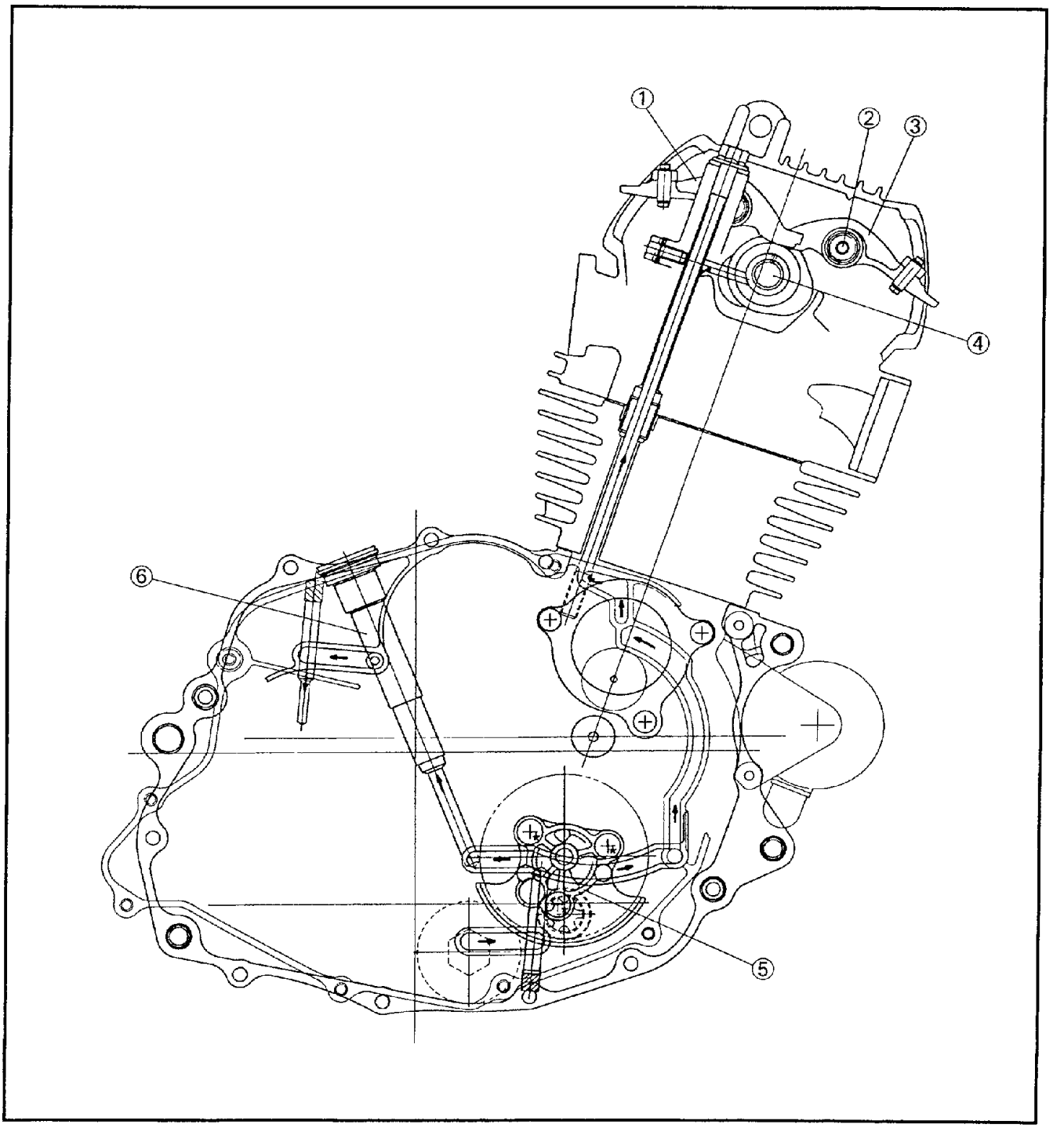
LUBRICATION POINT AND GRADE OF LUBRICANT

CHASSIS

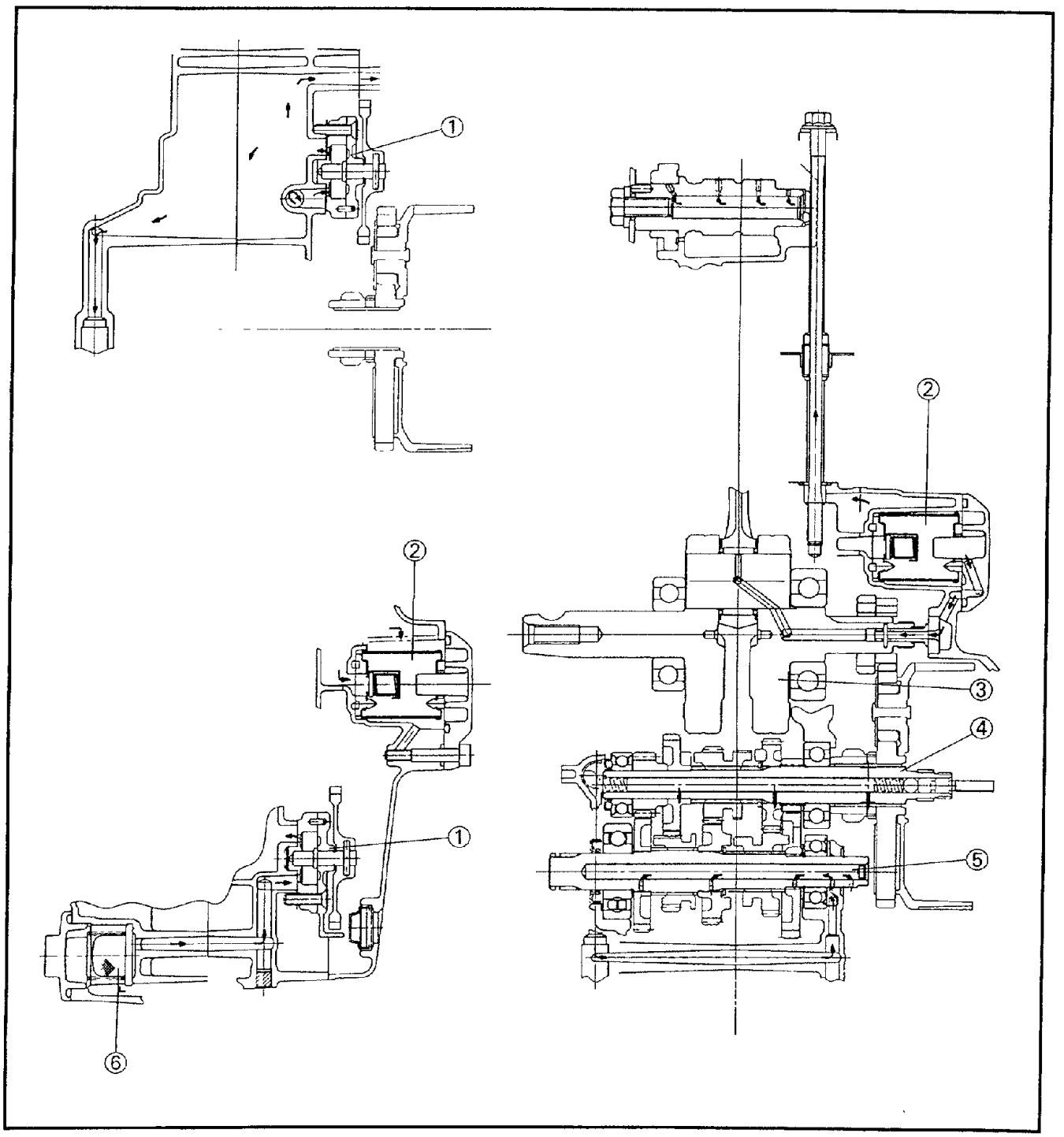
Lubrication Point	Symbol
Steering head pipe bearing (upper/lower)	LS
Front wheel oil seal lips (left/right)	LS
Rear wheel oil seal lips (left/right)	LS
Rear wheel hub	LS
Front/rear brake, camshaft and pivoting pin	LS
Sidestand sliding surface/mounting bolt	LS
Tube guide (throttle grip) inner surface	LS
Clutch lever bolt/collar/cable sliding surface	LS
Gear unit (speedometer)	LS
Swingarm pivot shaft and bush	LS
Rear shock absorber bush (swing arm side)	LS
Swingarm grease nipple	LS

LUBRICATION DIAGRAM

① Rocker arm (IN)
② Rocker shaft
③ Rocker arm (EX)
④ Camshaft
⑤ Oil pump
⑥ Push lever

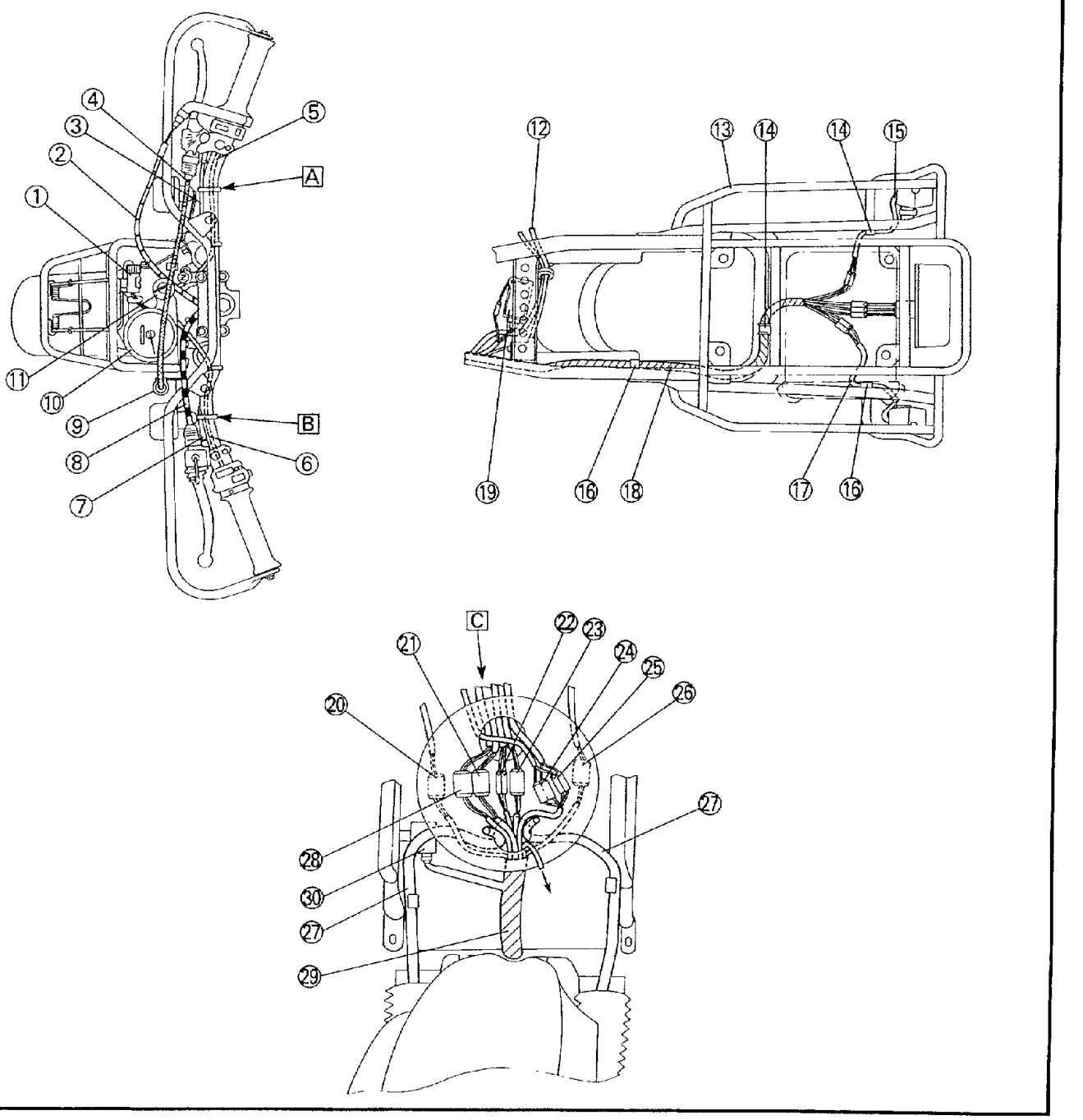


① Oil pump
② Oil filter
③ Crankshaft
④ Main axle
⑤ Drive axle
⑥ Oil strainer

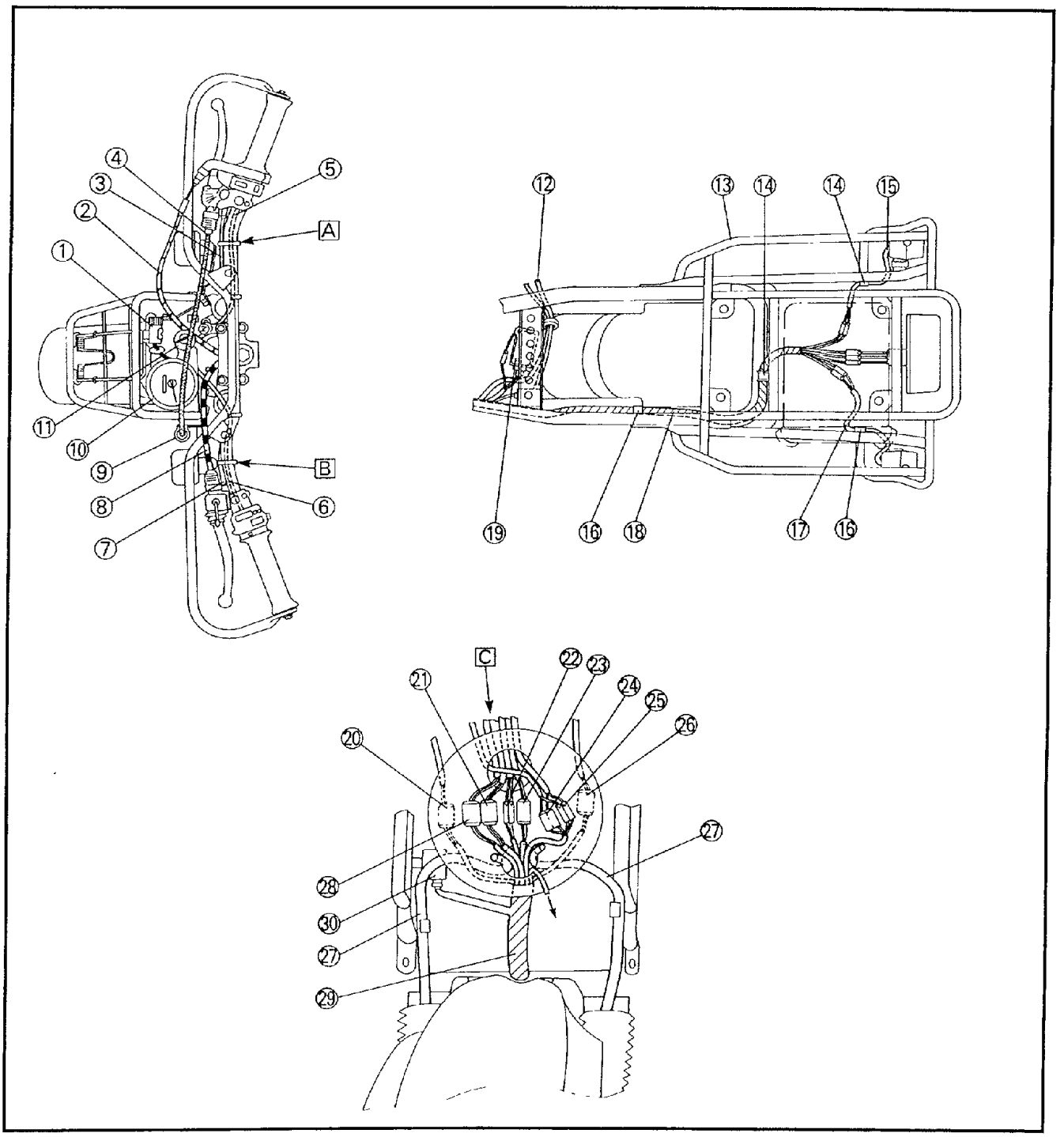


CABLE ROUTING

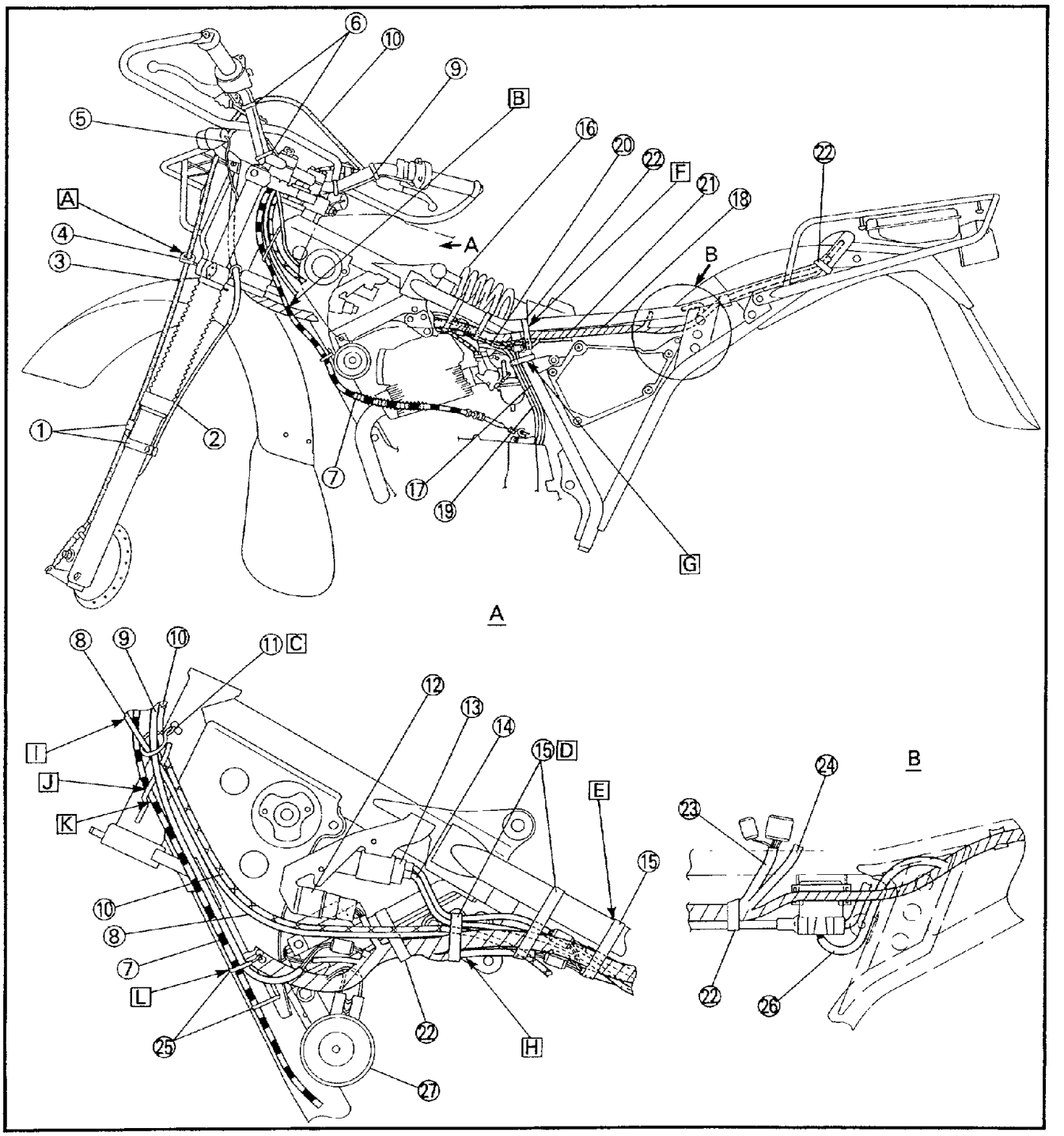
① Auxiliary DC terminal
② Throttle cable
③ Front brake switch lead
④ Brake cable
⑤ Handlebar switch lead (right)
⑥ Handlebar switch lead (left)
⑦ Clutch switch lead
⑧ Clutch cable
⑨ Cable guide
⑩ Speedometer
⑪ Main switch
⑫ Battery positive lead
⑬ Rear carrier
⑭ Clamp
⑮ Rear flasher lead (right)
⑯ Clamp
⑰ Rear flasher lead (left)
⑱ Wireharness
⑲ Rectifier/Regulator
⑳ Front brake switch coupler
㉑ Main switch coupler
㉒ Auxiliary DC terminal coupler
㉓ Meter lead
㉔ Front flasher lead (left)
㉕ Front flasher lead
㉖ Clutch switch coupler
㉗ Front fork breather hose
㉘ Handlebar switch lead (right)
㉙ Wireharness
㉚ Flasher relay



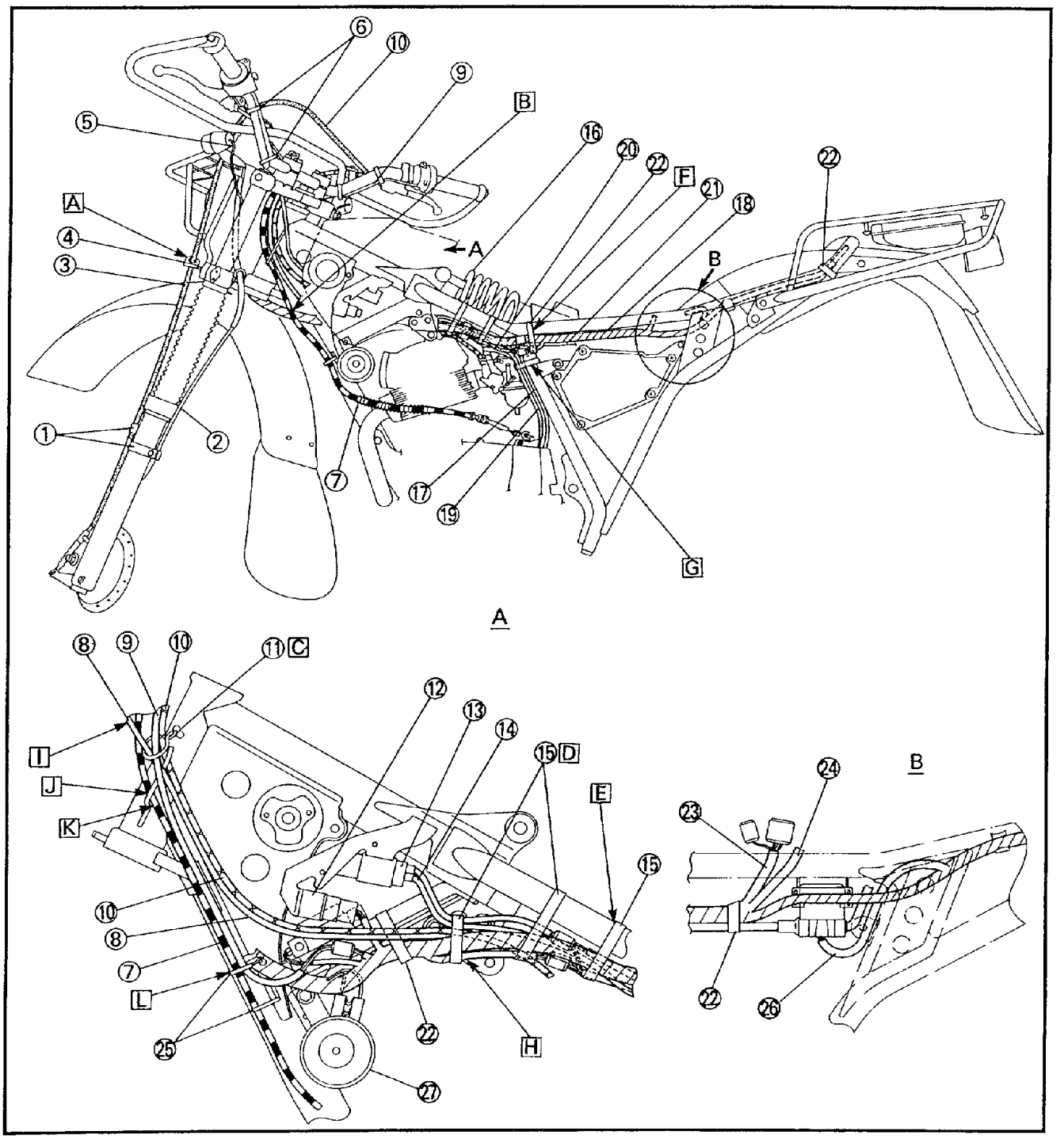
[A] Clamp the handlebar switch lead (right)and front brake switch lead to the handlebar.
[B] Clamp the handlebar switch lead (left)and clutch switch lead to the handlebar.
[C] From the left side:
Front flasher lead (right), handlebar switch lead (right), main switch lead, terminal lead, meter lead and front flasher lead (left).



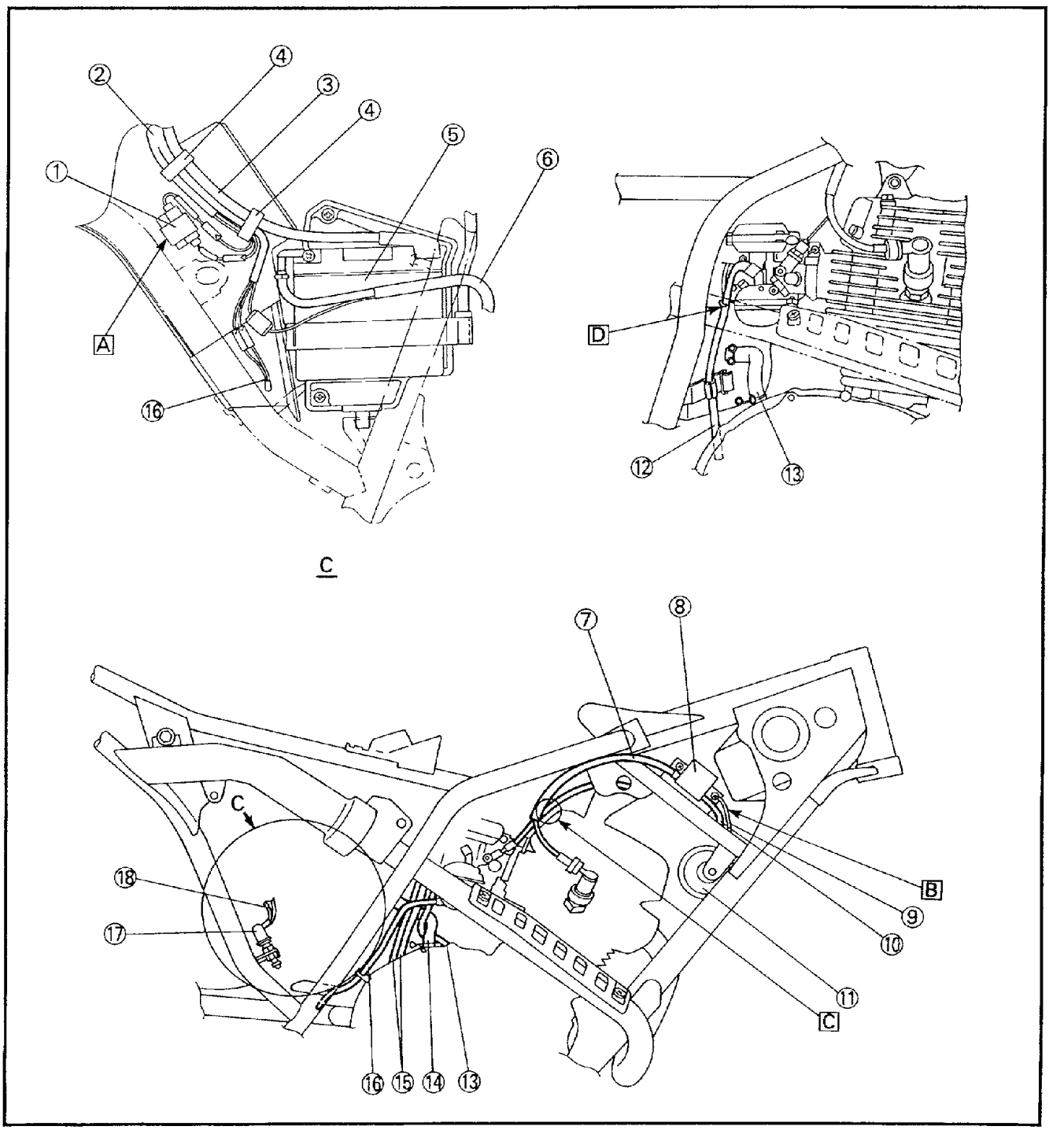
① Clamp
② Speedometer cable
③ Front brake cable
④ Cable guide
⑤ Front flasher lead
⑥ Band
⑦ Clutch cable
⑧ Starter cable
⑨ Handlebar switch lead
⑩ Throttle cable
⑪ Clamp
⑫ Neutral relay
⑬ CDI unit
⑭ CDI unit lead
⑮ Band
⑯ Rear shock absorber
⑰ Pulsar coil lead
⑱ Wireharness
⑲ Charge coil lead
⑳ Fuel hose
㉑ Starter motor lead
㉒ Band
㉓ Rectifier/Regulator lead
㉔ Rear brake switch lead
㉕ Clamp
㉖ Starter relay lead
㉗ Horn



[A] Pass the front flasher lead behind the front carrier and in front of the starter cable.
[B] Pass the clutch cable outside of the wireharness.
[C] Clamp the clutch cable, starter cable, handlebar switch lead and throttle cable.
[D] Bind the wireharness, CDI unit lead, throttle cable, pulsar lead, neutral lead and charge coil lead together front and rear, before insert the cover.
[E] Band the wireharness, CDI unit lead, and starting motor lead.
[F] Mating with the top on the wireharness to the seat pillar tube.
[G] Band pulsar coil lead, charge coil lead,neutral lead, and starting motor lead.
[H] Pass the CDI unit lead, throttle cable and starter cable into the center of the engine stay,with the wireharness positioned leftest, then band them together.
[I] Pass the starter cable in front of the throttle cable and clutch cable.
[L] Clamp the handlebar switch lead and the clutch cable.
[J] Pass the throttle cable and clutch cable in to the cable guide.
[K] Pass the starter cable and handlebar switch lead out side of the cable guide.



① Fuse holder (auxiliary DC terminal)
② Wireharness
③ Battery positive lead
④ Clamp
⑤ Battery
⑥ Battery negative lead
⑦ High tension cord
⑧ Ignition coil
⑨ Ground lead
⑩ Ignition coil primary lead
⑪ Horn
⑫ Air vent pipe
⑬ Starter motor lead
⑭ Breather hose
⑮ Magneto lead
⑯ Over flow hose
⑰ Rear brake switch
⑱ Rear brake switch lead
[A] Insert the fuse holder into the mud guard projection.
[B] Tighten the ground lead together with the front bolt.
[C] Adjust the cable position, do not allow the starter cable to contact the cylinder.
[D] Pass the air vent pipe into the clamp.



EB300000

PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. 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.

YP301000

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

NO.		ITEM	ROUTINE	BRAKE-IN 1,000 KM	EVERY 6,000 km or 6 months	EVERY 12,000 km or 12 months
1	*	Valve(s)	Check valve clearance. Adjust if necessary.	○	○	○
2	*	Spark plug	Check condition. Clean or replace if necessary.	○	○	○
3		Air filter	Clean. Replace if necessary.		○	○
4		Carburetor	Check idle speed/starter operation. Adjust if necessary.	○	○	○
5	*	Fuel line	Check fuel hose for cracks or damage. Replace if necessary.		○	○
6	*	Engine oil	Replace (Warm engine before draining.)	○	○	○
7	*	Engine oil strainer	Clean.	○		○
8	*	Engine oil filter	Clean.	○		○
9	*	Brake	Check operation. Adjust if necessary.		○	○
10	*	Clutch	Check operation. Adjust if necessary.		○	○
11	*	Rear arm pivot	Check rear arm assembly for looseness. Moderately repack.**	CHECK	○	○
12		Wheels	Check balance/damage/runout/spoke tightness. Replace if necessary.	○	○	○
13		Wheel bearings	Check bearing assembly for looseness/damage. Replace if damaged.		○	○
14	*	Steering bearing	Check bearing assembly for looseness. Correct if necessary. Moderately repack every 24,000 km or 24 months. **	CHECK		CHECK
15	*	Front forks	Check operation/oil leakage. Repair if necessary.		○	○
16	*	Rear shock absorber	Check operation/oil leakage. Repair if necessary.		○	○

*: It is recommended that these items be serviced by a Yamaha dealer.
**: Light weight lithium-soap base grease

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

INSP ADJ

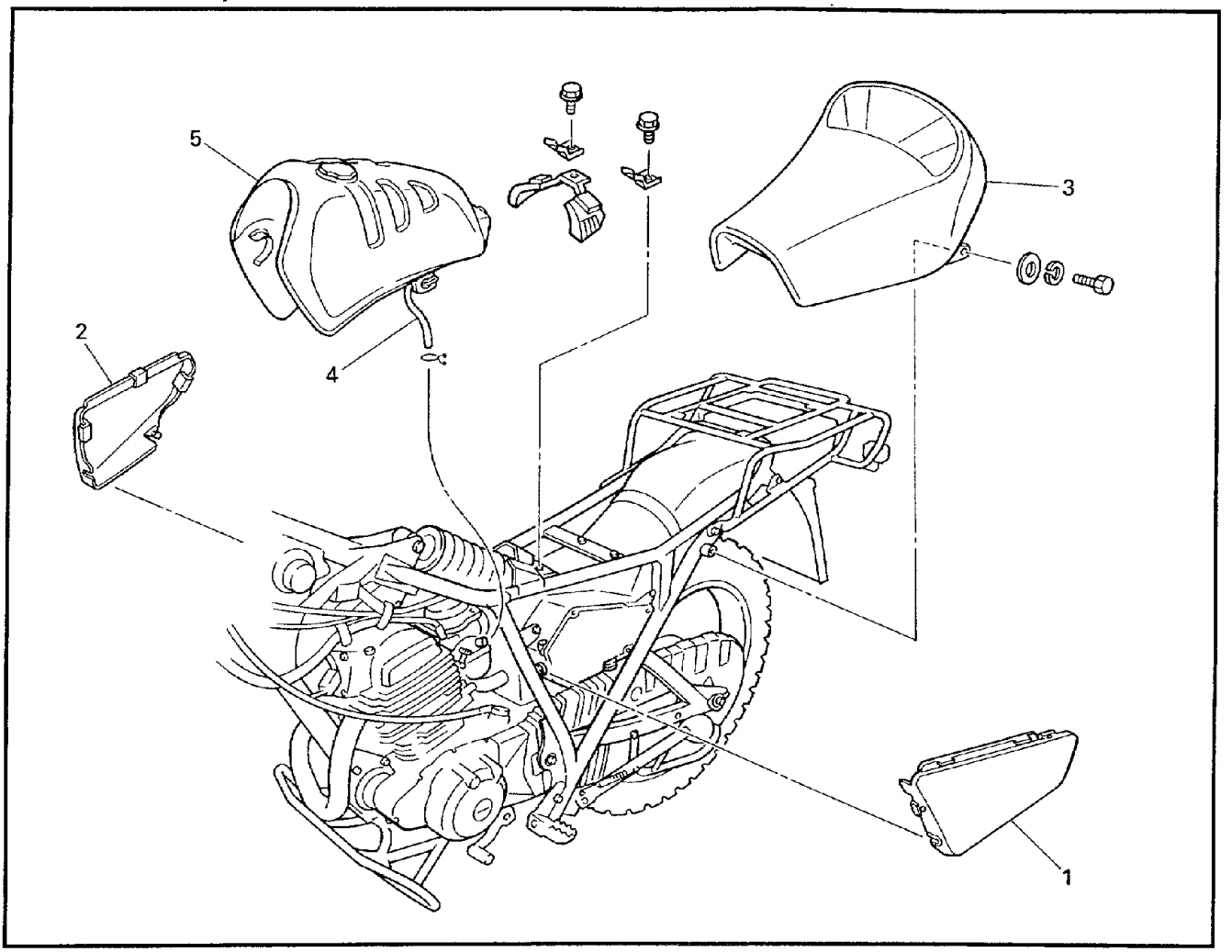
NO.		ITEM	ROUTINE	BRAKE-IN 1,000 KM	EVERY 6,000 km or 6 months	EVERY 12,000 km or 12 months
17		Drive chain	Check chain slack/alignment. Adjust if necessary. Clean and lube.	EVERY 500 km		
18	*	Chassis fasteners	Check all chassis fittings and fasteners. Correct if necessary.	○	○	○
19	*	Sidestand	Check operation. Repair if necessary.	○	○	○

*: It is recommended that these items be serviced by a Yamaha dealer.
**: Light weight lithium-soap base grease.

NOTE:

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

SIDE COVER, SEAT AND FUEL TANK



Order	Job name/Part name	Q'ty	Remarks
	Side cover, seat and fuel tank removal		Remove the parts in order.
1	Side cover (left)	1	
2	Side cover (right)	1	
3	Seat	1	
4	Fuel hose	1	**NOTE:** Before disconnect the fuel hose, turn the fuel cock lever "OFF" position.
5	Fuel tank	1	Reverse the removal procedure for installation.

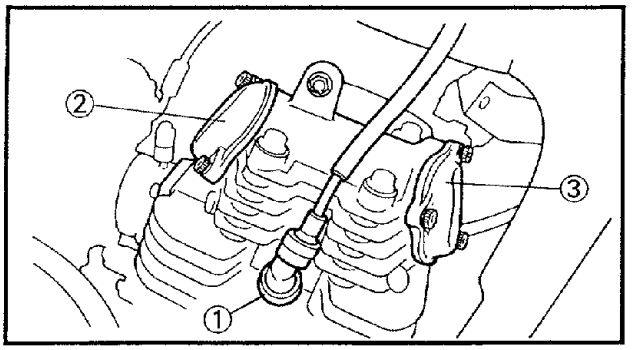
SR03004

ENGINE

VALVE CLEARANCE ADJUSTMENT

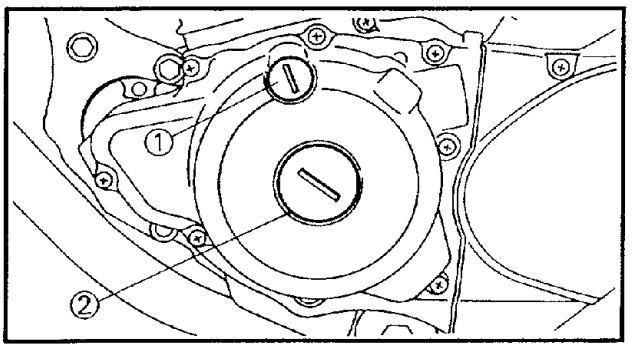
NOTE:

Valve clearance adjustment should be made with the engine cool, at room temperature. When the valve clearance is to be measured or adjusted, the piston must be at Top Dead Center (T.D.C.) on the compression stroke.

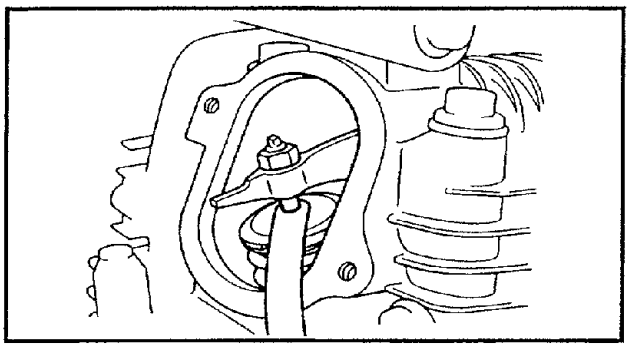


1. Remove:
   - •Seat
   - •Side cover (left and right)
   - •Fuel tank

   Refer to "SIDE COVER, SEAT AND FUEL TANK" section .



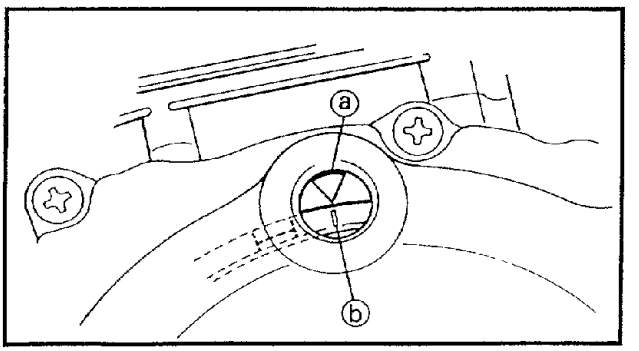
2. Remove:
   - •Spark plug cap ①
   - •Spark plug
   - •Valve cover (intake side) ②
   - •Valve cover (exhaust side) ③
3. Remove:
   - •Timing check plug (with O-ring) ①
   - •Center plug (with O-ring) ②



4. Measure:
   - •Valve clearance

   Out of specification → Adjust.

Valve clearance (cold):
Intake valve 0.10 ~ 0.14 mm
Exhaust valve 0.16 ~ 0.20 mm



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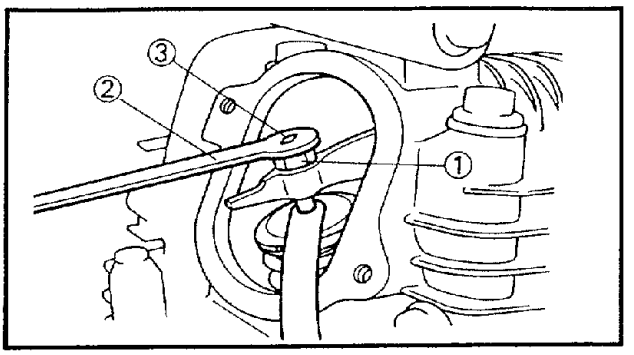
Measurement steps:

- Rotate the crankshaft counterclockwise to align the slit ⓐ on the rotor with the stationary pointer ⓑ on the crankcase cover (left) when the piston is Top Dead Center (T.D.C.).
- Measure the valve clearance by using a feeler gauge.

  Out of specification → Adjust clearance.

****



5. Adjust:
   •Valve clearance

****

Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ③ in or out with the valve adjusting tool ② until specified clearance is obtained.

Turning in→Valve clearance is decreased.
Turning out→Valve clearance is increased.

	Valve adjusting tool: 90890-01311

- Hold the adjuster to prevent it from moving and tighten the locknut.

14 Nm (1.4 m•kg)

- Measure the valve clearance.
- If the clearance is incorrect, repeat above steps until specified clearance is obtained.

****

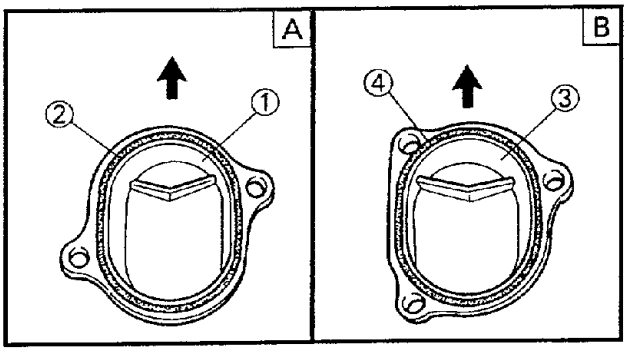
6. Install:
   •Valve cover (intake side) ①

10 Nm (1.0 m•kg)

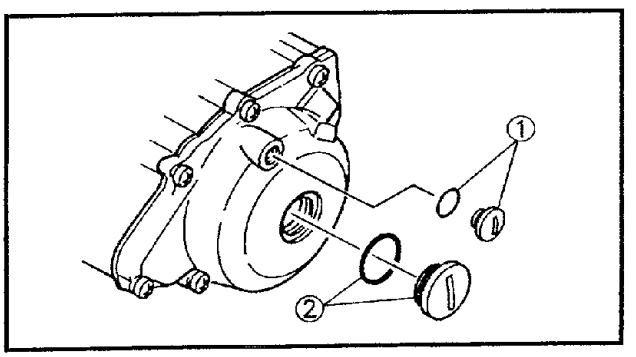
   •O-ring ②
   •Valve cover (exhaust side) ③

10 Nm (1.0 m•kg)

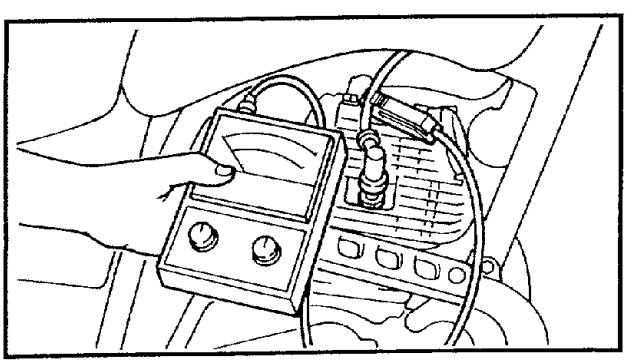
   •O-ring ④



A Intake side
B Exhaust side



7. Install:
   •Spark plug — 18 Nm (1.8 m•kg)
   •Timing check window screw ①
   (with O-ring)
   •Center plug ②
   (with O-ring)



YP303022

IDLING SPEED ADJUSTMENT

1. Start the engine and let it warm up for several minutes.
2. Attach:
   •Engine tachometer
   to the spark plug lead.

	Engine tachometer: 90890-03113

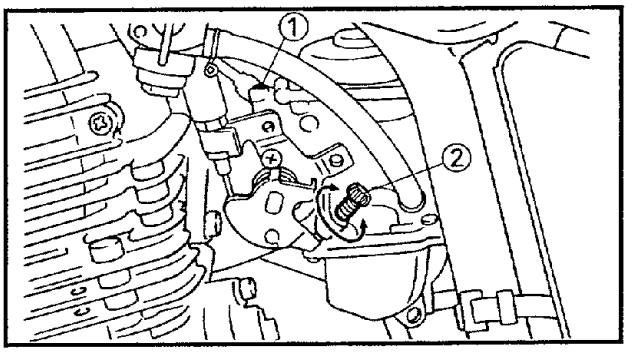
3. Check:
   •Engine idling speed
   Out of specification → Adjust.

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

4. Adjust:
   •Engine idle speed

****

Adjustment steps:



- Turn the pilot screw ① until it is lightly seated.
- Turn the pilot screw out by the specified number of turns.

Pilot screw: 2 turns out

- Turn the throttle stop screw ② in or out until the specified idling speed is obtained.

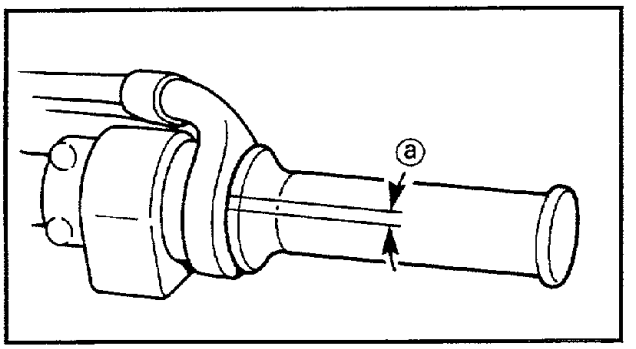
Turning in→Idling speed is increased.
Turning out→Idling speed is decreased.

****

5. Adjust:
   •Throttle cable free play
   Refer to "THROTTLE CABLE ADJUSTMENT" section.

YP303032

THROTTLE CABLE ADJUSTMENT



NOTE:

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

1. Check:
   •Throttle cable free play ⓐ
   Out of specification → Adjust.

Free play (throttle cable): 3~5 mm at throttle grip flange

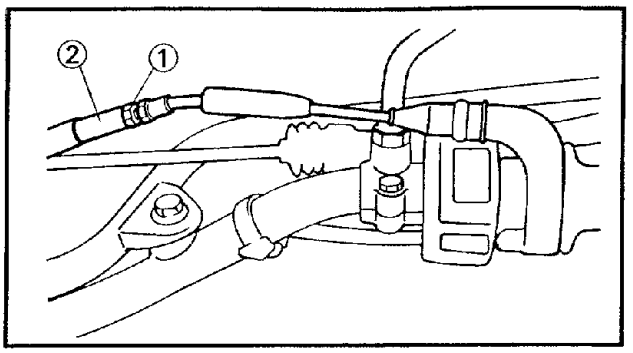
2. Adjust:
   •Throttle cable free play

****

Adjustment steps:

NOTE:

Never accelerate the throttle when stopping the engine.



- Loosen the locknut ① on the throttle cable.
- Turn the adjuster ② in or out until specified free play is obtained.

Turning in→Free play is increased.
Turning out→Free play is decreased.

- Tighten the locknut.

⚠WARNING

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

****

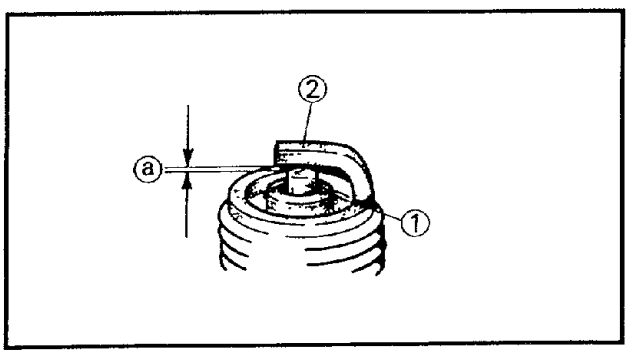
EB303040

SPARK PLUG INSPECTION

1. Remove:
   - Spark plug cap
   - Spark plug

CAUTION:

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



2. Check:
   - Spark plug type
     Incorrect → Replace.

	Standard spark plug: **D8EA/X24ES-U (NGK/DENSO)**

3. Inspect:
   - Electrode ①
     Wear/damage → Replace.
   - Insulator ②
     Abnormal color → Replace.
     Normal color is a medium-to-light tan color.
4. Clean:
   - Spark plug
     (with spark plug cleaner or wire brush)
5. Measure:
   - Spark plug gap ⓐ
     (with a wire gauge)
     Out of specification → Adjust gap.

	Spark plug gap: **0.6 ~ 0.7 mm**

6. Install:
   •Spark plug — 18 Nm (1.8 m•kg)

NOTE:

Before installing a spark plug, clean the gasket surface and plug surface.

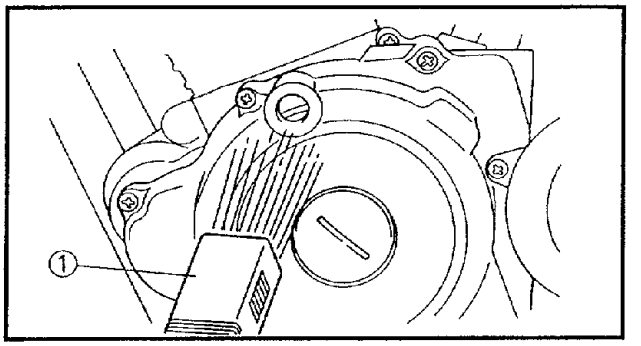
YP303052

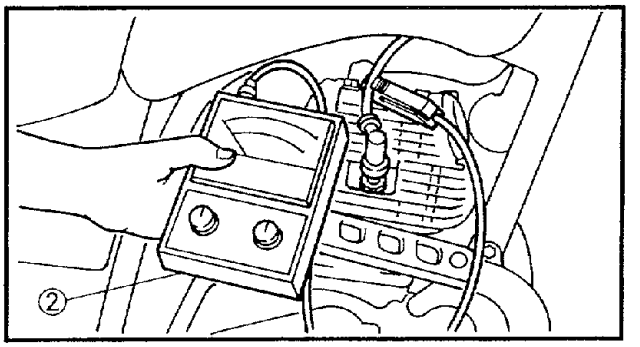
IGNITION TIMING CHECK

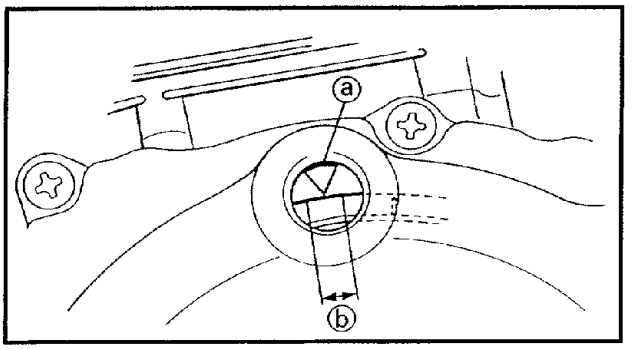
NOTE:

Prior to checking the ignition timing, check all electrical connections related to the ignition system. Make sure all connections are tight and free of corrosion and that all ground connections are tight.

1. Remove:
   •Timing check plug
2. Attach:
   •Timing light ①
   Engine tachometer ②
   (to the spark plug lead)







Timing light:
90890-03141
Engine tachometer:
90890-03113

3. Check:
   •Ignition timing

****

Checking steps:

- Start the engine and let it warm up for several minutes. Let the engine run at the specified speed.

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

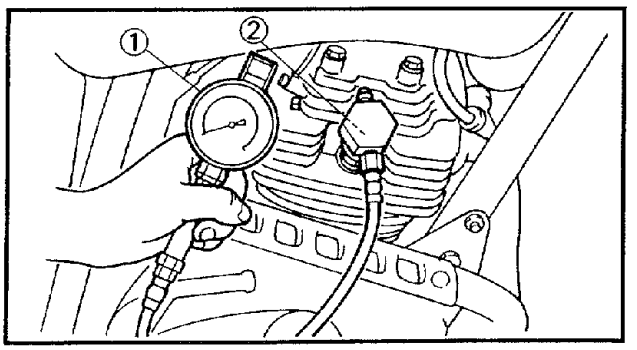
- Visually check the stationary pointer ⓐ to verify it is within the required firing range ⓑ indicated on the flywheel.
  Incorrect firing range → Check the ignition system.

****

NOTE:

Ignition timing is not adjustable.

3. Install:
   •Timing check plug



SR303060

COMPRESSION PRESSURE MEASUREMENT

NOTE:

Insufficient compression pressure will result in performance loss.

1. Check:
   - Valve clearance
     Out of specification → Adjust.
     Refer to "VALVE CLEARANCE ADJUSTMENT" section.
2. Start the engine and let it warm up for several minutes.
3. Turn off the engine.
4. Remove:
   - Spark plug

CAUTION:

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

5. Attach:
   - Compression gauge ①

	**Compression gauge: ①** **90890-03081** **Adaptor: ②** **90890-04082**

6. Measure:
   - Compression pressure
     If it exceeds the maximum pressure allowed → Inspect the cylinder head, valve surfaces and piston crown for carbon deposits.
     If it is below the minimum pressure → Squirt a few drops of oil into the affected cylinder and measure again.

Follow the table below.

Compression pressure (With oil applied into cylinder)	
Reading	**Diagnosis**
Higher than without oil	**Worn or damaged pistons**
Same as without oil	**Possible defective ring(s), valves, cylinder head gasket or piston → Repair.**

Compression pressure (at sea level):
Standard:
900 kPa (9.0 kg/cm^2, 9.0 bar)
Minimum:
800 kPa (8.0 kg/cm^2, 8.0 bar)
Maximum:
1,000 kPa (10.0 kg/cm^2, 10.0 bar)

Measurement steps:
- Crank the engine with the throttle wide-open until the reading on the compression gauge stabilizes.

⚠WARNING

Before cranking the engine, ground all spark plug leads to prevent sparking.

7. Install:
   - Spark plug — **18 Nm (1.8 m•kg)**

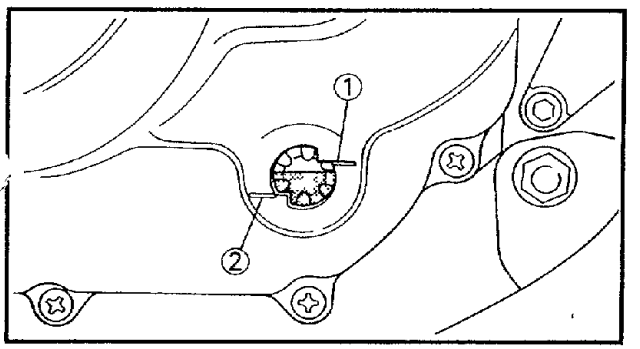
YP303070

ENGINE OIL LEVEL INSPECTION

1. Stand the motorcycle on a level surface.

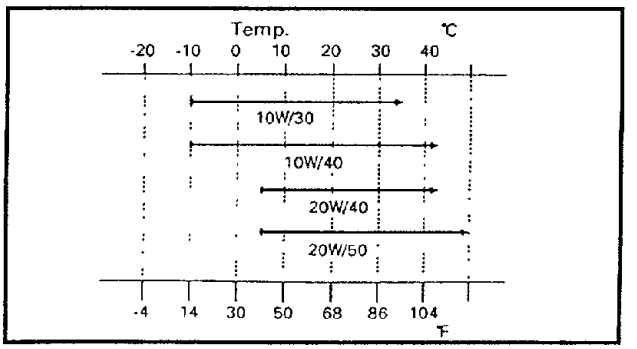
NOTE:

Make sure the motorcycle is upright when inspecting the oil level.



2. Start the engine and let it warm up for a few minutes.
3. Turn off the engine.
4. Inspect:
   - Engine oil level

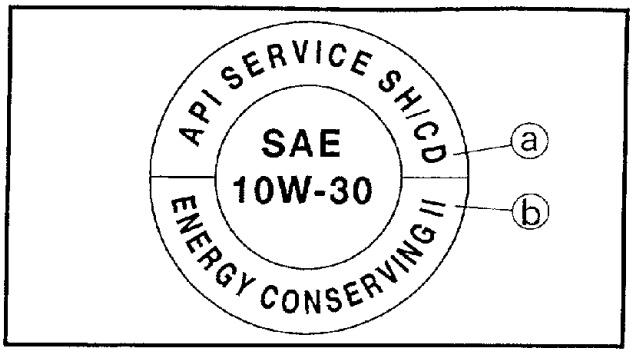
   Oil level should be between maximum ① and minimum ② marks.
   Oil level is below the minimum mark
   →Add oil up to the proper level.



RECOMMENDED ENGINE OIL

Refer to the chart for selection of the oils suited to the atomosperic temperature.

Recommended oil:
Refer to the following chart for selection of oils which are suited to the atmospheric temperatures.
Recommended engine oil classification:
API STANDARD:
API "SE" or higher grade



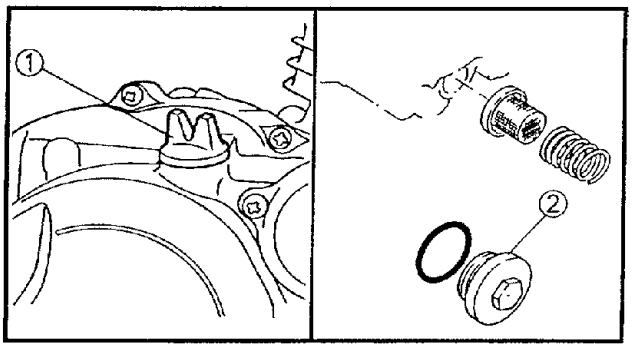
CAUTION:

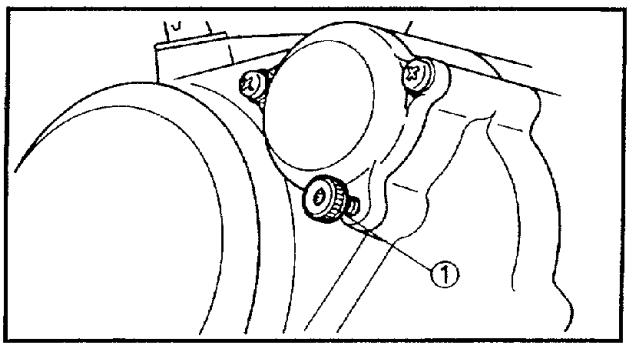
- **Do not put in any chemicals additives or use oils with a grade of CD ⓐ or higher.**
- **Be sure not to use oils labeled "ENERGY CONSERVING II" ⓑ or higher. Engine oil also lubricates the clutch and additives could cause clutch slippage.**
- **Be sure no foreign material enters the crankcase.**

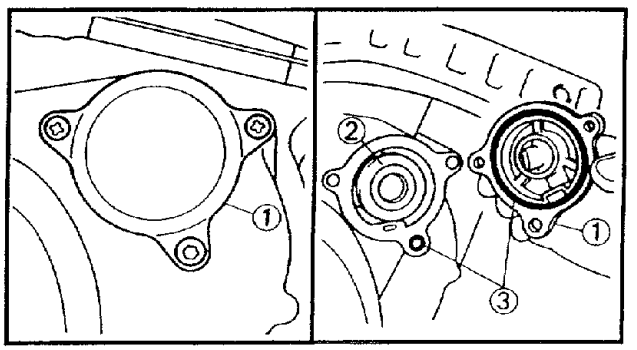
5. Start the engine and let it warm up for a few minutes.
6. Turn off the engine and inspect the oil level once again.

NOTE:

Wait a few minutes until the oil settles before inspecting the oil level.







SR303082

ENGINE OIL REPLACEMENT

1. Start the engine and let it warm up for several minutes.
2. Turn off the engine and place a container under the engine.
3. Remove:
   - Oil filler plug ①
   - Drain plug ②

   Drain the crankcase of its oil.
4. Loosen:
   - Bolt ① (oil filter cover-lower)
5. Drain the crankcase of its oil.

   If the oil filter is to be replaced during this procedure, remove the following parts and reinstall them afterwards.

****

Replacement steps:

- Remove the oil filter cover ① and oil filter element ②.
- Check the O-ring ③. If it is cracked or damaged, replace it.
- Install the oil filter element and oil filter cover.

	Screw: 7 Nm (0.7 m•kg) **Bolt:** 10 Nm (1.0 m•kg)

****

6. Install:
   •Drain plug — 43 Nm (4.3 m•kg)

NOTE:

Inspect the O-ring. If it is damaged, replace it with a new one.

CAUTION:

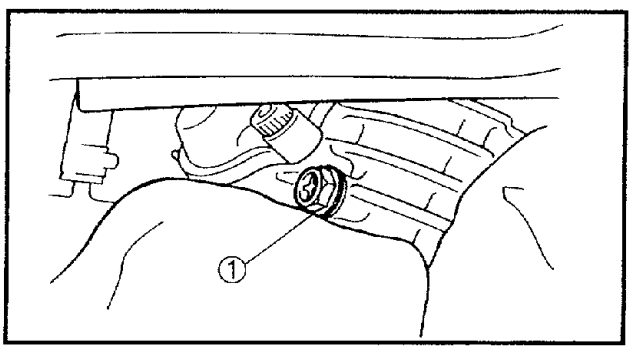
Before reinstalling the drain plug, do not forget to fit the O-ring, compression spring and oil strainer. Be sure you fit each item in the correct position and order.

7. Fill:
   •Crankcase

Oil quantity:
With oil filter change
1.1 L
Without oil filter change
1.0 L

Refer to "ENGINE OIL LEVEL INSPECTION" section.

8. Inspect:
   •Oil flow



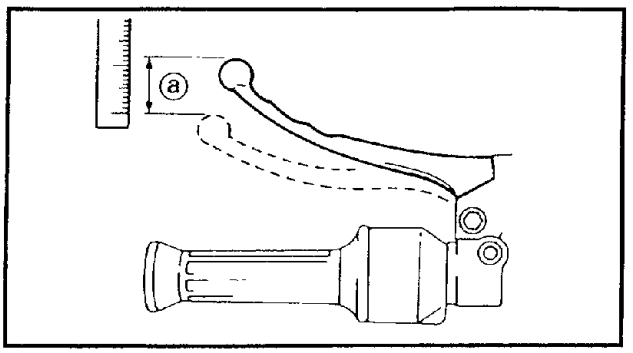
****

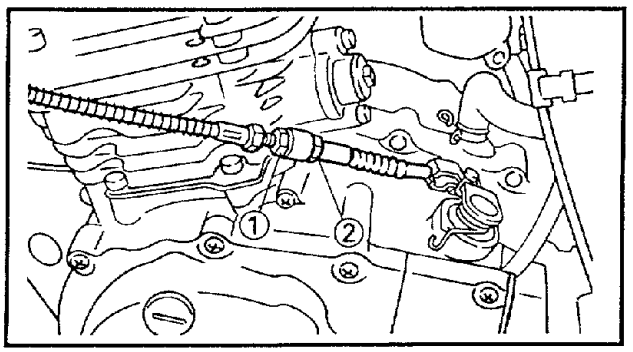
Inspection steps:

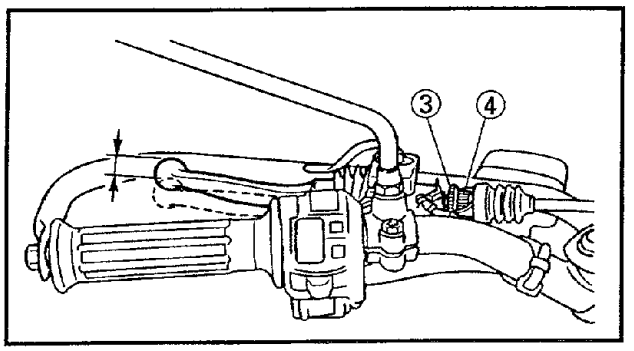
- Slightly loosen the oil check bolt ①.
- Start the engine and keep it idling until the oil begins to seep from the oil check bolt. If no oil comes out after one minute, turn the engine off so it will not seize.
- Check oil passages and oil pump for damage or leakage.
- Start the engine after solving the problem(s), and recheck the oil pressure.
- Tighten the oil check bolt to specification.

Oil check bolt:
7 Nm (0.7 m•kg)

****







EB303093

CLUTCH ADJUSTMENT

1. Check:
   - Clutch cable free play ⓐ
     Out of specification → Adjust.

Free play (clutch lever):
10 ~ 15 mm
at clutch lever end

2. Adjust:
   - Clutch cable free play

****

Adjustment steps:

Crankcase side

- Make sure that the adjuster ① and locknut ② are fully tightened.
- Loosen the locknut ②.
- Turn the adjuster ① in or out until the specified free play is obtained.

Turning in→Free play is decreased.
Turning out→Free play is increased.

- Tighten the locknut ②.

NOTE:

If the amount of free play is still incorrect, adjust the clutch cable free play with the other adjuster (on the clutch lever holder).

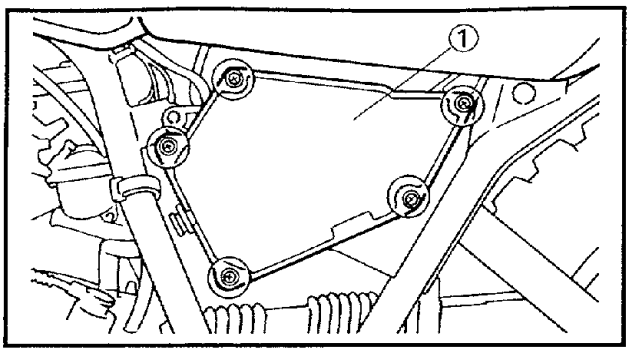
Lever side

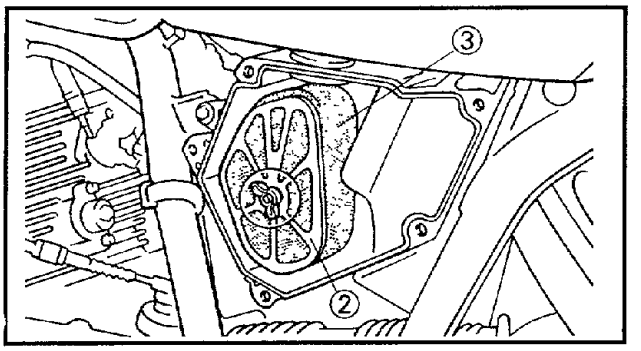
- Loosen the locknut ③.
- Turn the adjuster ④ in or out until the specified free play is obtained.

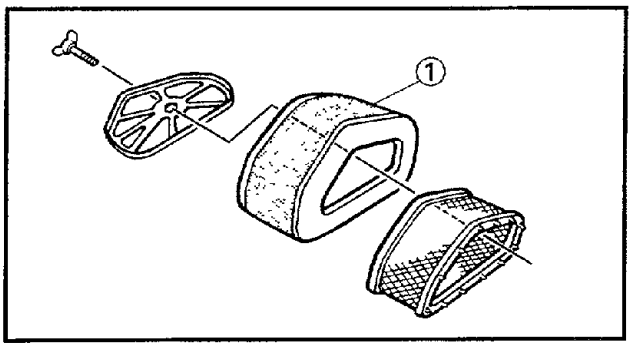
Turning in→Free play is increased.
Turning out→Free play is decreased.

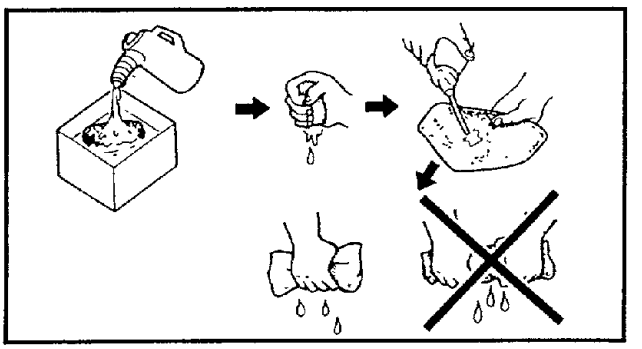
- Tighten the locknut ③.

****









AG303123

AIR FILTER CLEANING

1. Remove:
   - Side cover (left)
   - Air filter case cover ①
   - Air filter element holder ②
   - Air filter element ③

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 filter element will also affect the carburetor tuning, leading to poor engine performance and possible overheating.

2. Inspect:
   - Air filter element ①
     Damage → Replace.
3. Clean:
   - Air filter element
     Use solvent to clean the element.

NOTE:

After cleaning, remove the remaining solvent by squeezing the element.

CAUTION:

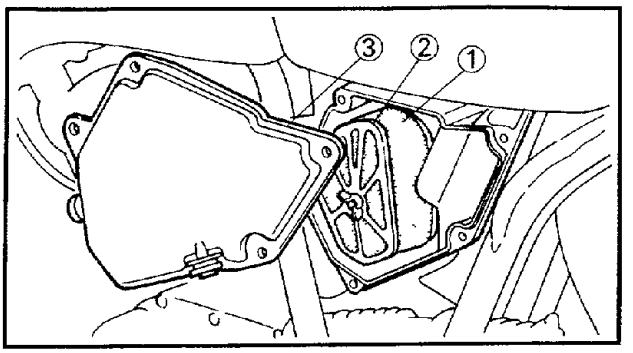
Do not twist the filter element when squeezing it.

⚠WARNING

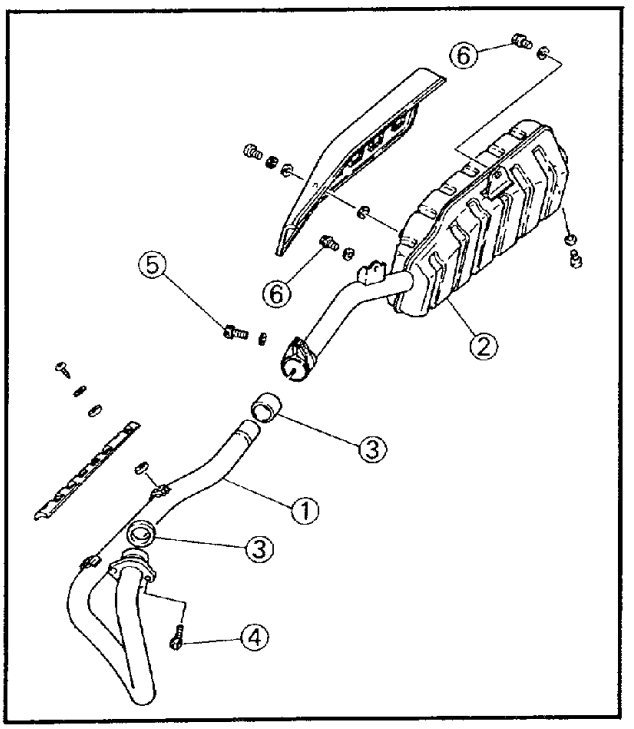
Never use low flash point solvents such as gasoline to clean the air filter element. Such solvents may cause a fire or an explosion.

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

	Recommended oil: **Engine oil**



5. Install:
   - Air filter element ①
   - Air filter element holder ②
   - Air filter case cover ③
   - Side cover (left)



EXHAUST SYSTEM INSPECTION

1. Inspect:
   - Exhaust pipe ①
   - Muffler ②
     Crack/Damage → Replace.
   - Gasket ③
     Exhaust gas leaks → Replace.

2. Check:
   - Tightening torque

Bolt ④:
10 Nm (1.0 m•kg)
Bolt ⑤:
20 Nm (2.0 m•kg)
Bolt ⑥:
27 Nm (2.7 m•kg)

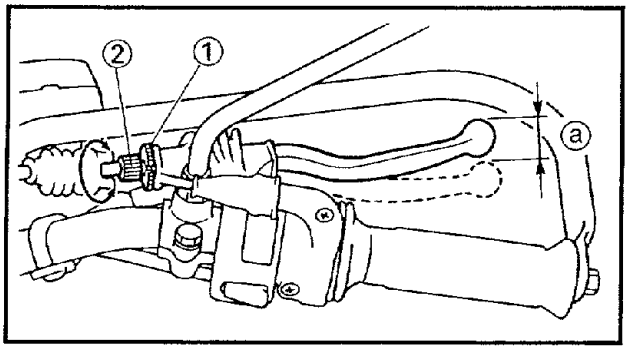
EB304002

CHASSIS

FRONT BRAKE ADJUSTMENT

1. Check:
   - Brake lever free play ⓐ
     Out of specification → Adjust.

Free play (Brake lever):
10 ~ 20 mm
at brake lever end



2. Adjust:
   - Brake lever free play

****

Adjustment steps:

Lever side

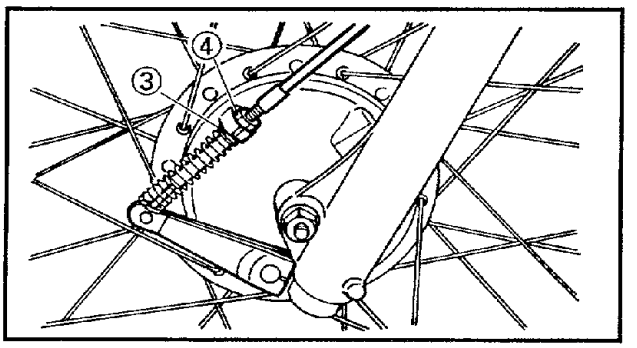
- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified free play is obtained.

Turning in→Free play is decreased.
Turning out→Free play is increased.

- Tighten the locknut.

CAUTION:

Make sure that there is no brake drag after adjusting the front brake lever free play.



Wheel side

- Loosen the locknut ③.
- Turn the adjuster ④ in or out until the specified free play is obtained.

Turning in→Free play is decreased.
Turning out→Free play is increased.

- Tighten the locknut.

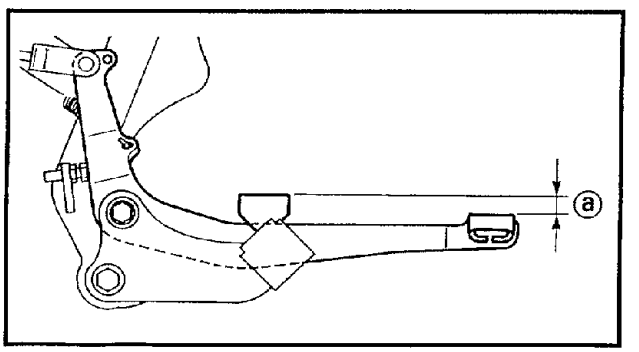
****

EB304012

REAR BRAKE ADJUSTMENT

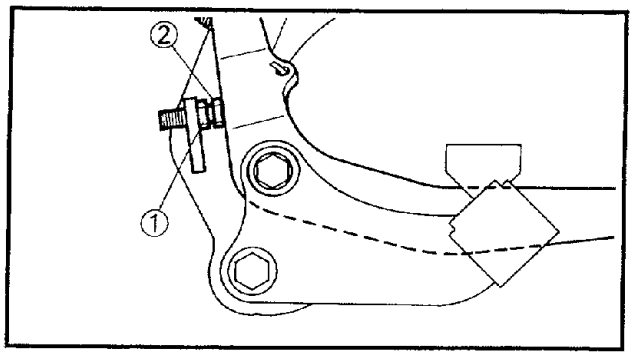
1. Check:
   - Brake pedal height ⓐ
     Out of specification → Adjust.

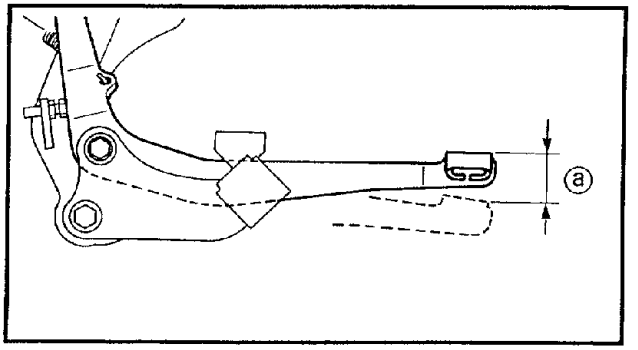
Brake pedal height:
10 mm
below the top of the footrest

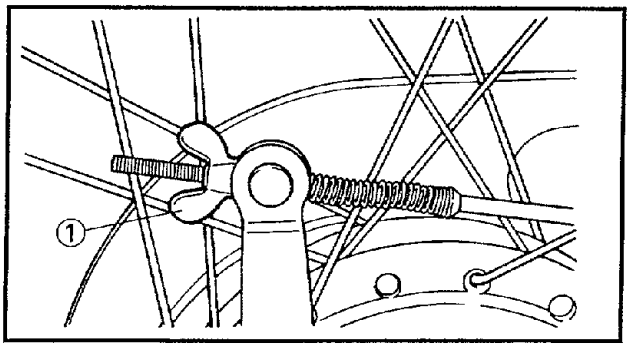


REAR BRAKE ADJUSTMENT

INSP ADJ







2. Adjust:
   •Brake pedal height

****

Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified pedal height is obtained.

Turning in→Pedal height is decreased.
Turning out→Pedal height is increased.

- Tighten the locknut.

****

3. Check:
   •Brake pedal free play ⓐ
   Out of specification → Adjust.

Free play (Brake pedal):
20 ~ 30 mm
at brake lever end

4. Adjust:
   •Brake pedal free play

****

Adjustment steps:

- Turn the adjuster ① in or out until the specified free play is obtained.

Turning in→Free play is decreased.
Turning out→Free play is increased.

CAUTION:

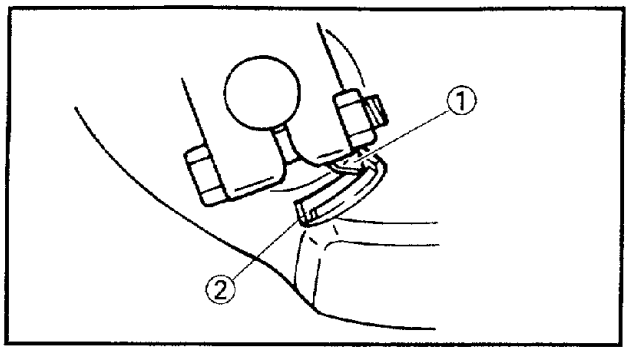
Make sure that there is no brake drag after adjusting the brake pedal height and the free play.

****

5. Adjust:
   •Brake light switch
   Refer to "BRAKE LIGHT SWITCH ADJUSTMENT".

BRAKE SHOE INSPECTION/ BRAKE LIGHT SWITCH ADJUSTMENT/ DRIVE CHAIN SLACK ADJUSTMENT

INSP ADJ



EB304040

BRAKE SHOE INSPECTION

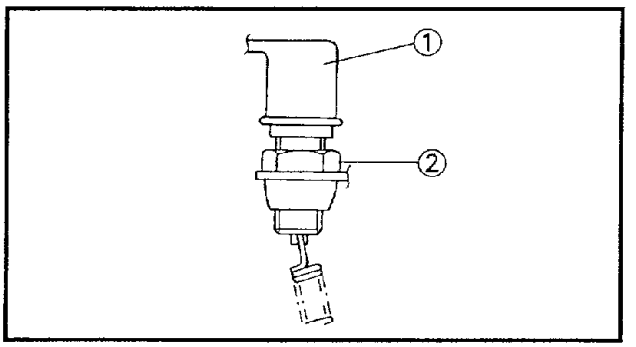
1. Operate the brake lever or brake pedal.
2. Inspect:
   - Brake shoes
     Wear indicator ① reaches the wear limit line ② → Replace the brake shoes as a set.
     Refer to "REAR WHEEL" in CHAPTER 6.

EB304050

BRAKE LIGHT SWITCH ADJUSTMENT

NOTE:

- The brake light switch is operated by movement of the brake pedal.
- Adjustment is correct when the brake light comes on just before the braking effect actually starts.



1. Check:
   - Brake light operation timing
   - Incorrect → Adjust.

2. Adjust:
   - Brake light operating timing

****

Adjustment steps:

- Hold the main body ① of the switch with your hand so that it does not rotate, and turn the adjuster ② in or out until the proper operation timing is obtained.

Turning in→Brake light comes on fast.
Turning out→Brake light comes on slow.

****

AG304091

DRIVE CHAIN SLACK ADJUSTMENT

NOTE:

Before checking and adjusting, rotate the rear wheel several revolutions and check the slack at several points to find the tightest point. Check and if necessary adjust the drive chain slack with the rear wheel in this "tightest" position.

DRIVE CHAIN SLACK ADJUSTMENT

INSP ADJ

CAUTION:

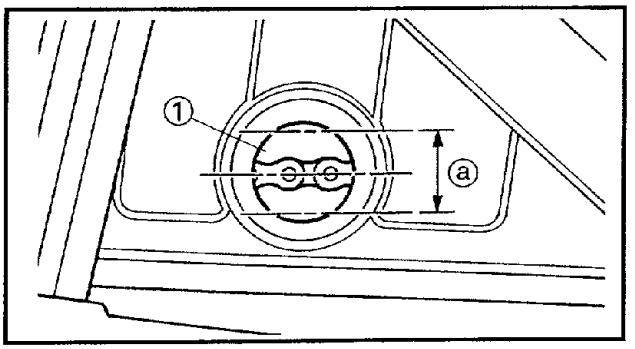
Too little chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

⚠WARNING

- **Securely support the motorcycle so that there is no danger of it falling over.**
- **Hold the motorcycle upright on a level surface.**

NOTE:

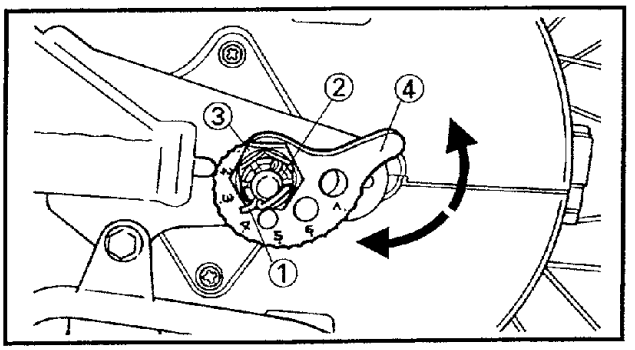
Both wheels should be on the ground and nobody should sit on the motorcycle while this adjustment is being performed.



1. Remove:
   - Cap
2. Check:
   - Drive chain slack ⓐ
     Out of specification → Adjust.

	Drive chain slack: 30 ~ 45 mm

① Check window



3. Remove:
   - Cotter pin ①
4. Adjust:
   - Drive chain slack

****

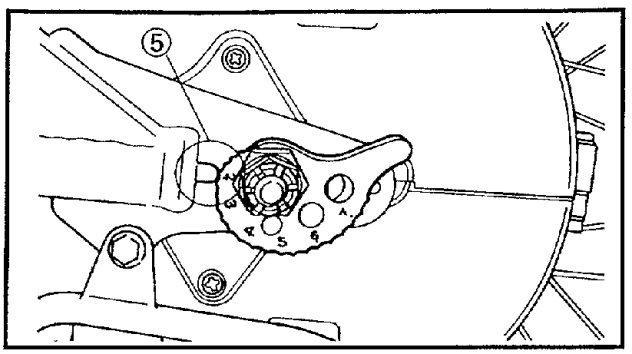
Adjustment steps:

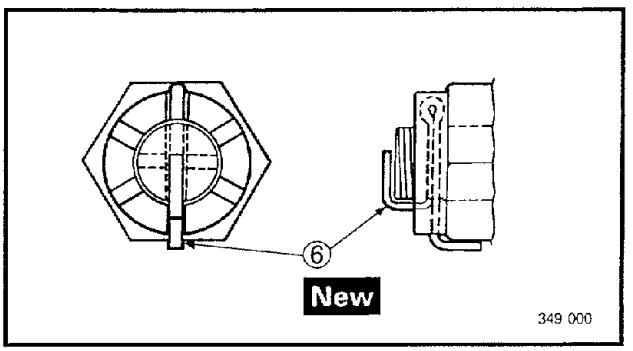
- Loosen the rear brake adjuster.
- Loosen the axle nut ② and the sprocket shaft nut ③.
- Turn the chain adjusters ④ clockwise or counterclockwise until the specified drive chain slack is obtained.

Clockwise	**→Chain slack is decreased.**
Counter-clockwise	**→Chain slack is increased.**

DRIVE CHAIN SLACK ADJUSTMENT

INSP ADJ





NOTE:

Turn each chain adjuster exactly the same amount to maintain correct axle alignment. (There are marks ⑤ on each chain adjuster. Use them when adjusting the slack for proper alignment.)

- Before tightening the axle nut to specification, make sure that there is no clearance at the adjuster (or the swingarm end) on both sides by pushing the wheel forward.

Driven sprocket shaft:
80 Nm (8.0 m•kg)
Rear wheel axle:
80 Nm (8.0 m•kg)

****

5. Install:
   - Cotter pin ⑥ **New**
     Into the axle nut and bend the end of the cotter pin.

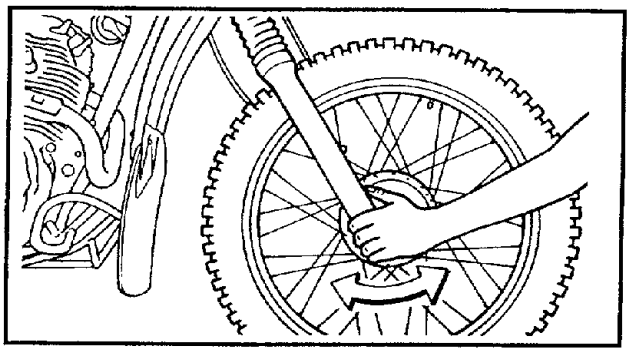
CAUTION:

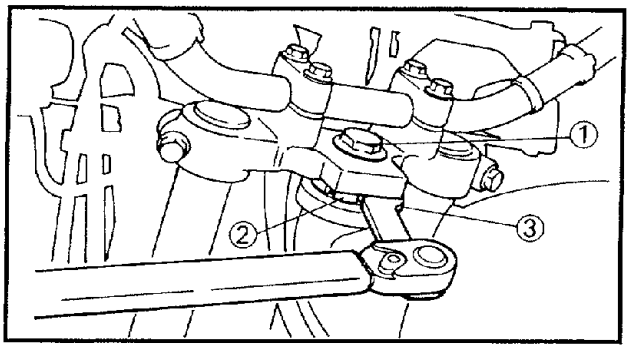
Do not loosen the axle nut after tightening the torque. If the axle nut groove is not aligned with the cotter pin hole, align the groove with the hole by tightening up the axle nut.

⚠WARNING

Always use a new cotter pin

6. Adjust:
   - Brake pedal free play
     Refer to "BRAKE PEDAL FREE PLAY" section.





EB304130

STEERING HEAD INSPECTION

⚠WARNING

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

1. Stand the motorcycle on a level surface.

NOTE:

Stand the motorcycle on its centerstand if it has one. If not, place a suitable stand under the engine.

2. Elevate the front wheel by placing a suitable stand under the engine.
3. Check:
   - Steering assembly bearings
     Grasp the bottom of the lower front fork tubes and gently rock the fork assembly.
     Looseness → Adjust the steering head.
4. Adjust:
   - Steering head

****

Adjustment steps:

- Loosen the handle crown bolt ①.
- Tighten the ring nut ② using the ring nut wrench ③. **38 Nm (3.8 m•kg)**
- Loosen the ring nut.

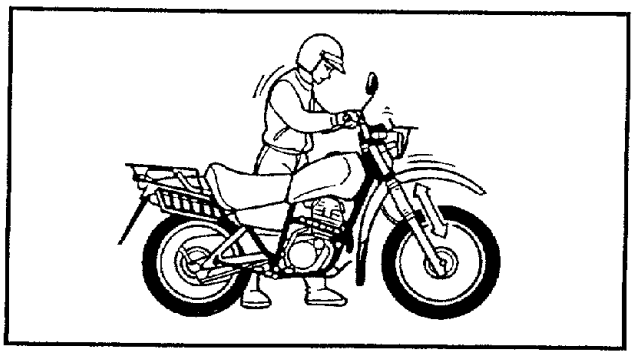
NOTE:

When loosen the ring nut, should be steady the ball bearings and steering shaft moving smoothly.

	Ring nut wrench: **90890-01403**

- Tighten the handle crown bolt ①. **55 Nm (5.5 m•kg)**
- Check the steering head for looseness or binding by turning it all the way in both directions.

****



EB304140

FRONT FORK INSPECTION

⚠WARNING

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

1. Stand the motorcycle on a level surface.
2. Check:
   - •Inner tube
     Scratches/damage → Replace.
   - •Oil seal
     Excessive oil leakage → Replace.
     Hold the motorcycle upright and apply the front brake.
3. Check:
   - •Operation
     Push down hard on the handlebars several times.
     Unsmooth operation → Repair.
     Refer to "FRONT FORK" in CHAPTER 6.

EB304160

REAR SHOCK ABSORBER ADJUSTMENT

⚠WARNING

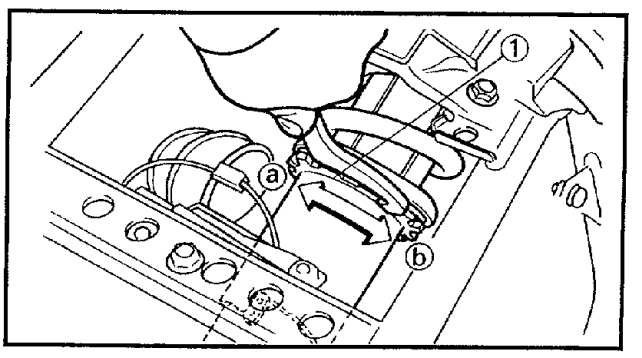
Securely support the motorcycle so that there is no danger of it falling over.

Spring preload:

1. Remove:
   - •Seat
2. Adjust:
   - •Spring preload

NOTE:

Use the special wrench and extension bar included in the owner's tool kit to adjust the spring preload.



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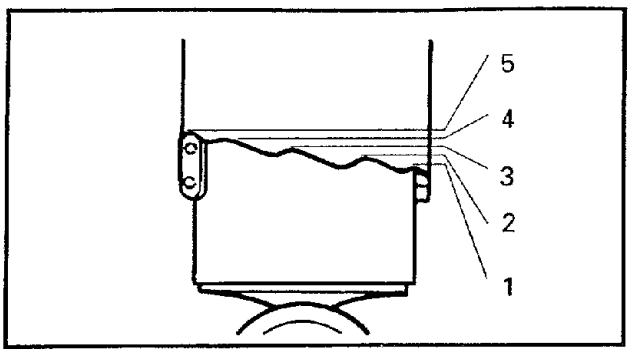
Adjustment steps:

- Turn the adjuster ① to direction ⓐ or ⓑ.

Turning toward ⓐ →Spring preload is increased.
Turning toward ⓑ →Spring preload is decreased.



Adjustment numbers:	
Standard number:	5
Minimum number:	5
Maximum number:	1

CAUTION:

Never turn the adjuster beyond the maximum or minimum adjustment number.

****

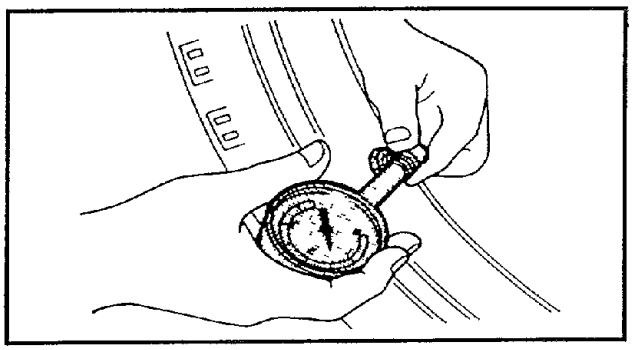
3. Install:
   - Seat

EB304171

TIRE INSPECTION

1. Measure:
   - Tire inflation pressure

   Out of specification → Adjust.



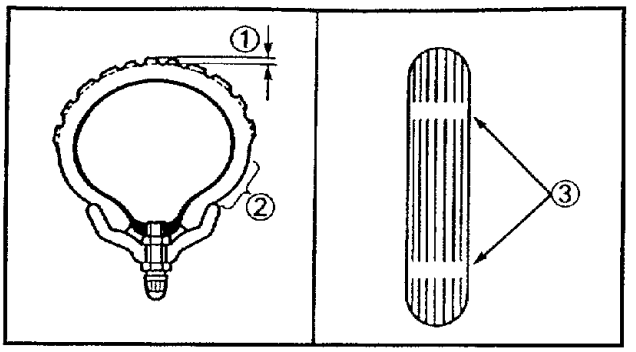
WARNING

- **Tire inflation pressure should only be checked and adjusted when the tire temperature equals the ambient air temperature. Tire inflation pressure and suspension must be adjusted according to the total weight of the cargo, rider and accessories (fairing, saddlebags, etc.if approved for this model), and according to whether the motorcycle will be operated at high speed or not.**

  NEVER OVERLOAD THE MOTORCYCLE.
- **Operation of an overloaded motorcycle could cause tire damage, accident or injury.**

Basic weight: With oil and full fuel tank	127 kg	
Maximum load*	112 kg	
	Front	Rear
Cold tire pressure	120 kPa (1.2 kg/cm², 1.2 bar)	150 kPa (1.5 kg/cm², 1.5 bar)

* Load is the total weight of the cargo, rider, and accessories.



2. Inspect:
   • Tire surfaces
   Wear/damage → Replace.

	Minimum tire tread depth (front and rear): 1.6 mm

① Tread depth
② Side wall
③ Wear indicator

⚠WARNING

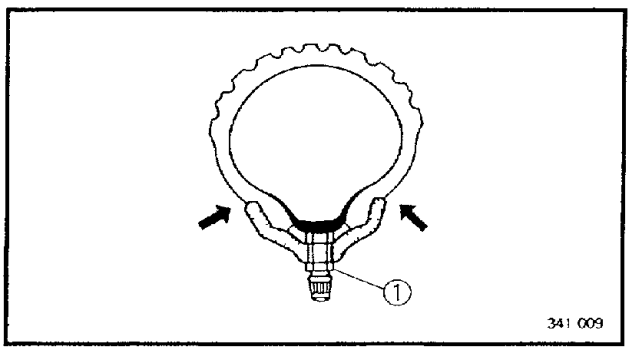
• It is dangerous to ride with a worn-out tire. When the tire tread begins to show signs of wear, replace the tire immediately.
• Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement tube.
• Do not use tubeless tires on a wheel designed for tube type tires only. Tire failure and personal injury may result from sudden deflation.

Tube type wheel → Tube type tire only
Tubeless type wheel → Tube type or tubeless tire.

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

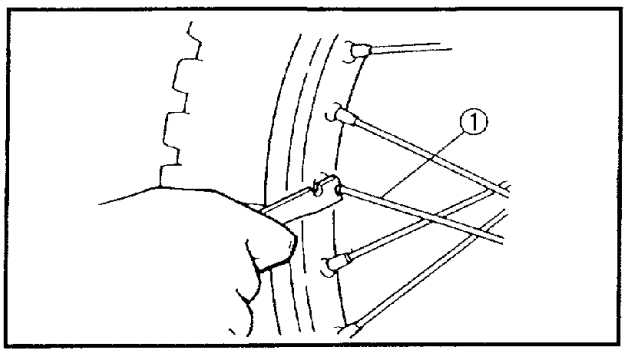
⚠WARNING

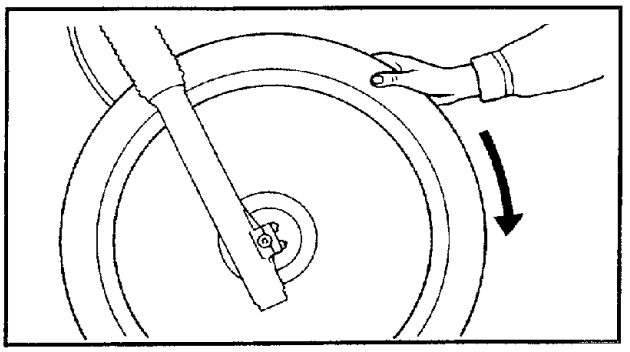
After mounting a tire, ride conservatively for a while to give the tire time to seat itself properly in the rim. Failure to do so could lead to an accident with possible injury to the rider or damage to the motorcycle.

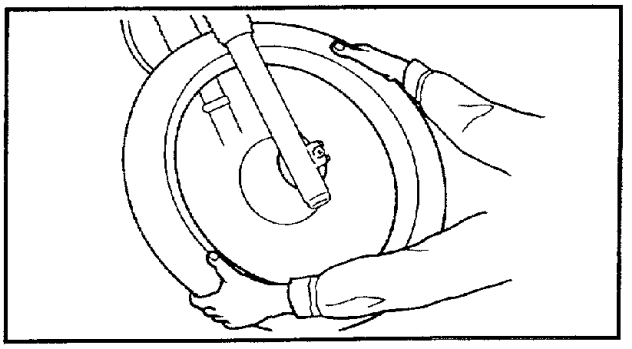


2. After a tire repair or replacement, be sure to tighten the valve stem locknut ① to specification.

	Locknut: 1.5 Nm (0.15 m•kg)







EB304190

SPOKE INSPECTION AND TIGHTENING

1. Inspect:
   - •Spokes ①
     Bending/damage → Replace.
     Loose spoke → Retighten.
2. Tighten:
   - •Spokes

NOTE:

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

	Nipple: **2 Nm (0.2 m•kg)**

EB304180

WHEEL INSPECTION

1. Inspect:
   - •Wheels
     Damage/Bends → Replace.

NOTE:

Always balance the wheel when a tire or wheel has been changed or replaced.

⚠WARNING

Never attempt to make any repairs to the wheel.

AG305000

ELECTRICAL

BATTERY INSPECTION

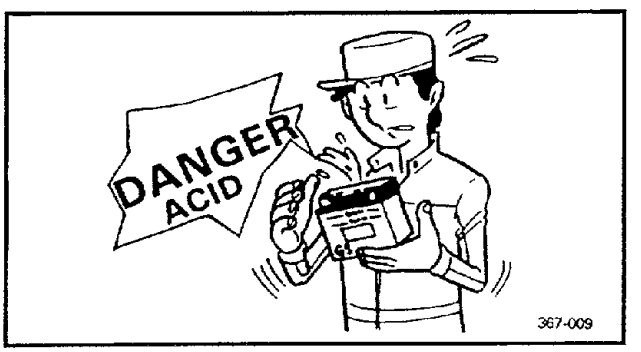
NOTE:

Since the MF battery is a sealed type battery, it is not possible to measure the specific gravity of the electrolyte in order to check the charge state of the battery. Therefore the charge of the battery has to be checked by measuring the voltage at the battery terminals.

CAUTION:

CHARGING METHOD

- **This is a sealed type battery. Never remove the sealing caps. If the sealing caps have been removed, the balance will not be maintained and battery performance will deteriorate.**
- **Charging time, charging current and charging voltage for the MF battery are different from those of batteries of general type.**
- **The MF battery should be charged as explained in "CHARGING METHOD". If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**



WARNING

Battery electrolyte is dangerous; it contains sulfuric acid which is poisonous and highly caustic.

- **Always follow these preventive measures:**
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**
- **Wear protective eye gear when handling or working near batteries.**

Antidote (EXTERNAL):

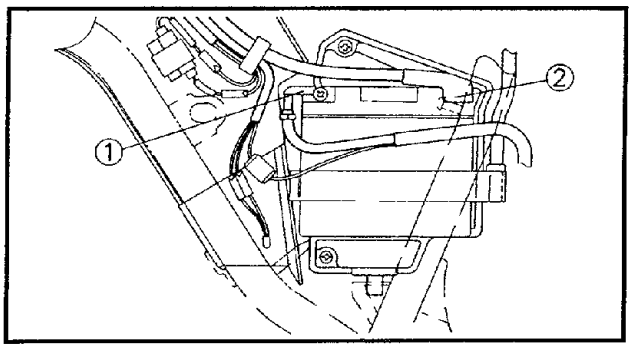
- **SKIN - Flush with water.**
- **EYES - Flush with water for 15 minutes and get immediate medical attention.**

Antidote (INTERNAL):

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

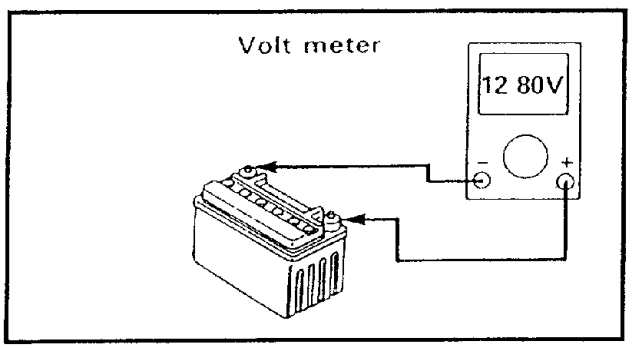
•Batteries generate explosive hydrogen gas. Always follow the following preventive measures:
•Charge batteries in a well-ventilated area.
•Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes, etc.)
•DO NOT SMOKE when charging or handling batteries.
KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

1. Remove:
   •Side cover (right)
   •Cover (battery case)
   Refer to "SIDE COVER, SEAT AND FUEL TANK" section.
2. Disconnect:
   •Battery leads



CAUTION:
Disconnect the negative lead ① first and then disconnect the positive lead ②.

3. Remove:
   •Battery
4. Check:
   •Battery condition



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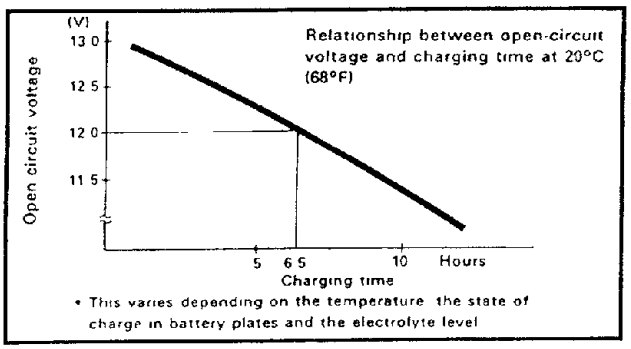
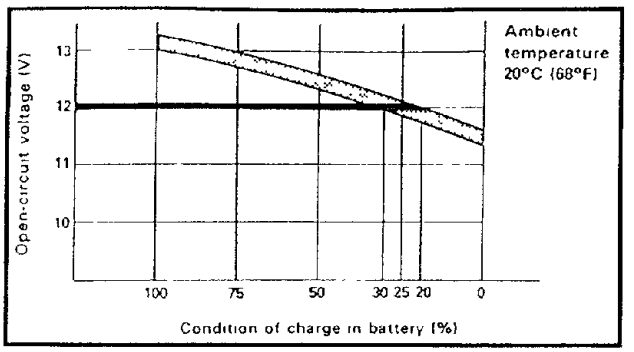
Battery condition checking steps:
• Connect a digital volt meter to the battery terminals.

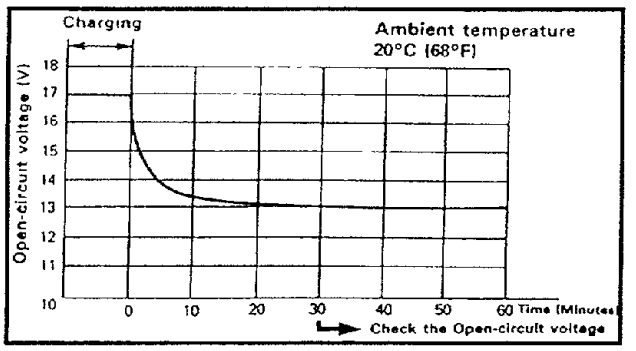
Tester (+) lead→Battery (+) terminal
Tester (–) lead→Battery (–) terminal

NOTE:
The charge state of an MF battery can be checked by measuring the open-circuit voltage (i.e. the voltage when the positive terminal is disconnected).



Open circuit voltage	Charging time
12.8 V or more	No charging is necessary.





- Check the condition of the battery using the charts.

Example:

Open-circuit voltage = 12.0V

Charging time = 6.5 hours

Charge condition of the battery = 20 ~ 30%

****

5. Charging method for MF batteries

CAUTION:

•If it is impossible to set the standard charging current, be careful not to overcharge.

•When charging the battery, be sure to remove it from the motorcycle. (If charging has to be done with the battery mounted on the motorcycle, be sure to disconnect the wire at the negative terminal.)

•Never remove the sealing caps of an MF battery.

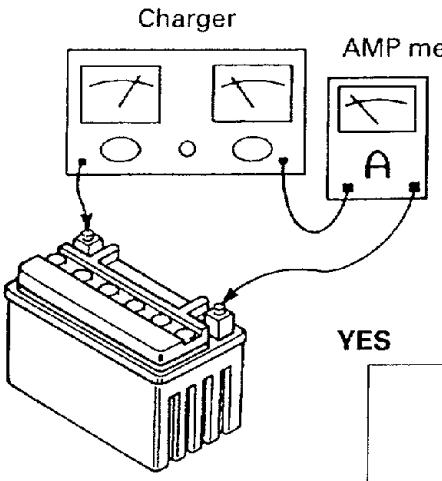
•Make sure that the charging clips are in full contact with the terminal and that they are not shorted together. (A corroded clip on the charger may cause the battery to generate heat in the contact area. A weak clip spring may cause sparks.)

•Before removing the clips from the battery terminals, be sure to turn off the charger's power switch.

•The open-circuit voltage variation for the MF battery after charging is shown below. As shown in the figure, the open-circuit voltage 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-current (voltage) type charger



Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charger and AMP meter to the battery, and start charging.

NOTE:
Set the changing voltage at 16~17V. (If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.)

Make sure the current is higher than the standard charging current written on the battery.

YES

NO

By turning the charging voltage adjust dial, set the charging voltage at 20~25V.

Monitor the amperage for 3~5 minutes to check if the standard charging current is reached.

YES

Adjust the voltage so that current is at standard charging level.

NO

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

Set the timer according to the charging time suitable for the open-circuit voltage. Refer to the "Battery condition checking steps" section.

In case that charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.

Measure the battery open-circuit voltage after having left the battery unused for more than 30 minutes.
12.8V or more - Charging is complete.
12.7V or less - Recharging is required.
Under 12.0V - Replace the battery.

Charging method using a constant-voltage type charger

Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped

Connect a charger and AMP meter to the battery, and start charging.

Make sure the current is higher than the standard charging current written on the battery.

YES

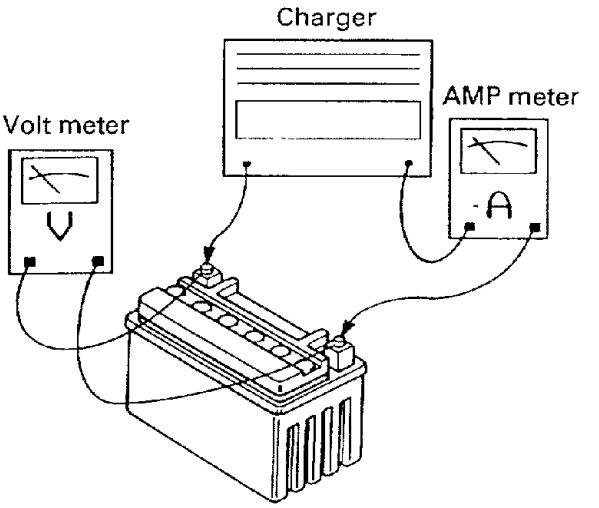
Charge the battery until the battery's charging voltage is 15 volts.

NOTE:
Set the charging time at 20 hours (maximum).

Check the open-circuit voltage after having left the battery for 30 minutes after charging.
12.8V or more - Charging is complete.
12.7V or less - Recharging is necessary.
Under 12V - Replace the battery.

NO

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



Charging method using a constant-current type charger

This type charger cannot charge the MF battery.

6. Inspect:
   •Battery terminals
   Dirty terminal→Clean with wire brush.
   Poor connection→Correct.

NOTE:

After cleaning the terminals, grease them lightly.

7. Install:
   •Battery
8. Connect:
   •Battery leads

CAUTION:

Connect the positive lead first and then connect the negative lead.

9. Install:
   •Side cover (right)
   Refer to "SEAT, SIDE COVER AND FUEL TANK" section.

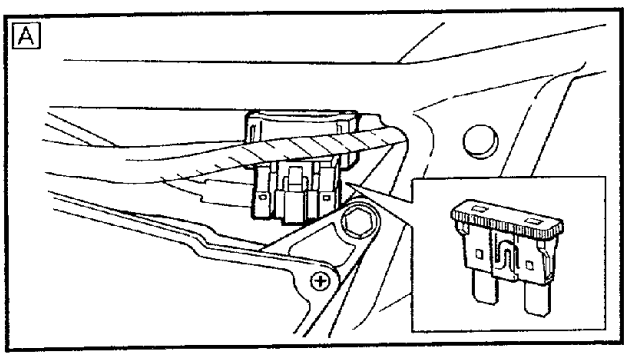
AG305010

FUSE INSPECTION

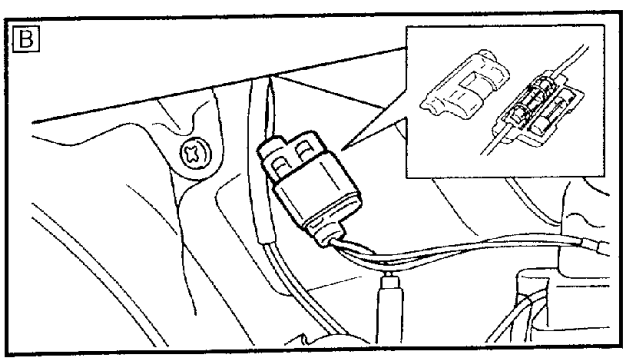
CAUTION:

Always turn off the main switch when checking or replacing the fuse. Otherwise, a short circuit may occur.

1. Remove:
   •Side cover (left, for main fuse)
   •Side cover (right, for terminal fuse)
   Refer to "SIDE COVER, SEAT AND FUEL TANK" section.
2. Inspect:
   •Fuse



A Fuse (main)



B Fuse (auxiliary DC terminal)

****

Inspection steps:

- Connect the Pocket tester to the fuse and check it for continuity.

NOTE:

Set the tester selector to "Ω×1" position.

	Pocket tester: **90890-03112**

- If the tester is indicated at ∞. Replace the fuse.

****

3. Replace:
   •Blown fuse

****

Replacement steps:

- Turn off the main switch.
- Install a new fuse with the proper current rating.

Main fuse side:

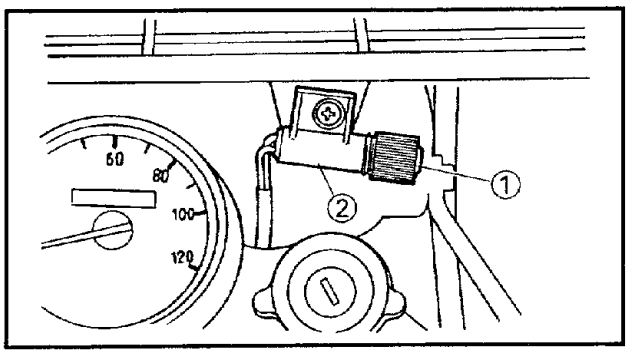
- Turn on switches to verify operation of related electrical devices.
- If the fuse blows again immediately, check the electrical circuit.

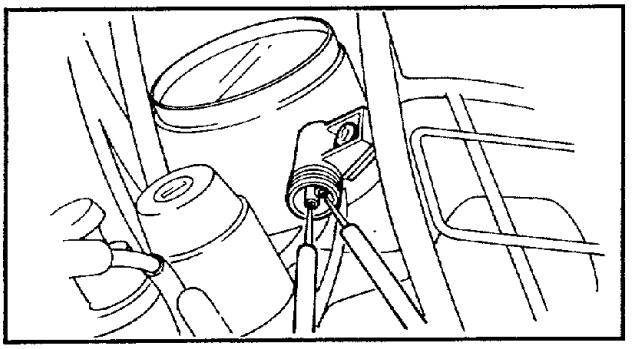
Terminal fuse side:

- Remove the cap ① and connect the pocket tester to the terminal ② on the front carrier.

NOTE:

Set the tester selector to "DC20V" position.





- Turn on the main switch and start the engine. Check for DC voltage output from the terminal.
- If the fuse blows again immediately or no voltage output, check the electrical circuit. Refer to "LIGHTING SYSTEM" section in CHAPTER 7.

⚠WARNING

Never use a fuse with a rating other than that specified. Never use other materials in place of a fuse. An improper fuse may cause extensive damage to the electrical system, malfunction of lighting and ignition systems and could possibly cause a fire.

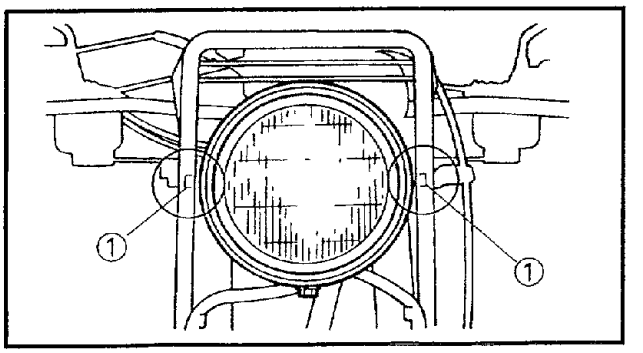
****

4. Install:
   •Side covers (left and right)
   Refer to "SIDE COVER, SEAT AND FUEL TANK" section.

EB305022

HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
   •Headlight beam (vertical)
   Loosen the bolt ① and adjust the head light unit.

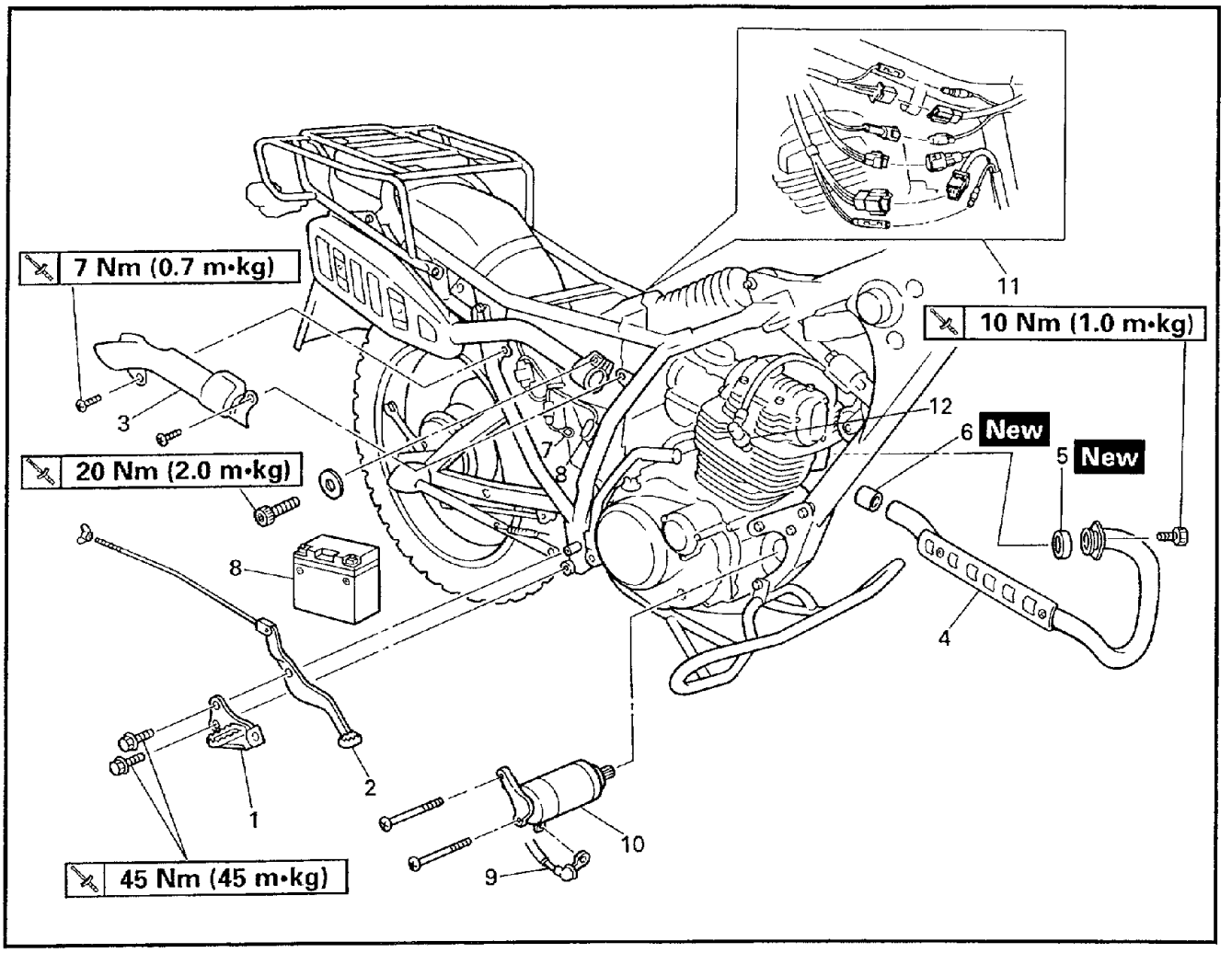


EB400000

ENGINE OVERHAUL

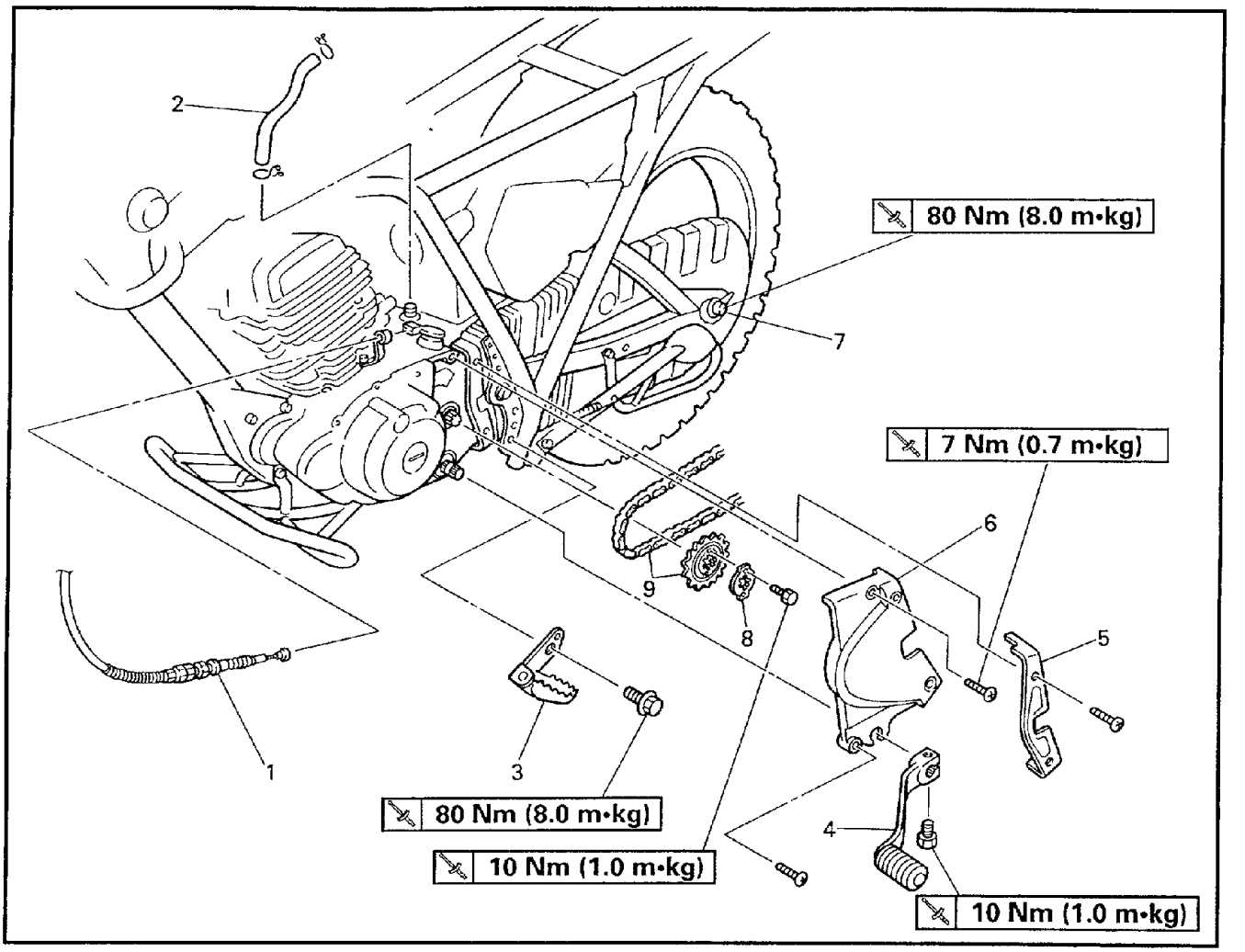
ENGINE REMOVAL

EXHAUST PIPE, STARTING MOTOR AND WIRE READ



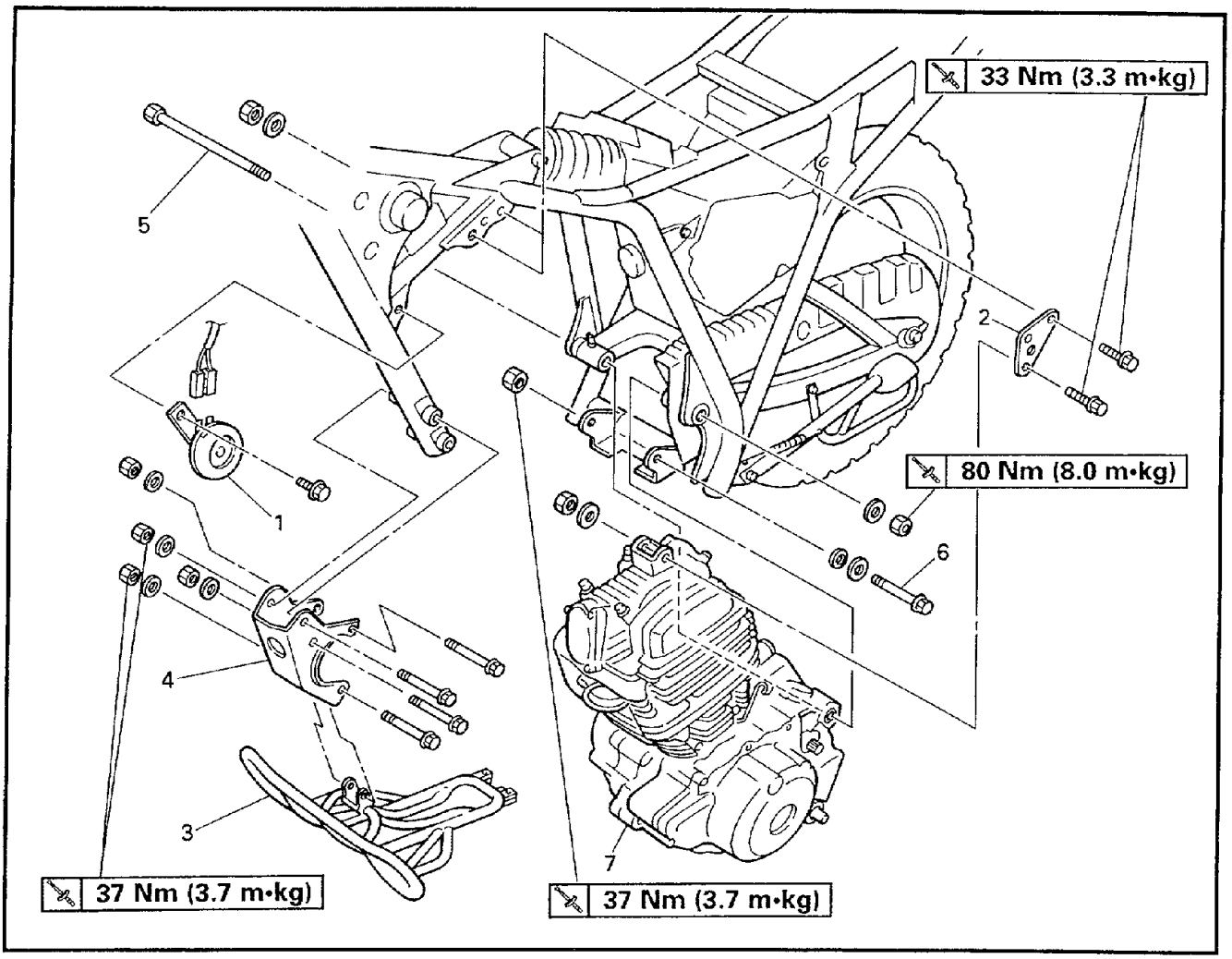
Order	Job name/Part name	Q'ty	Remarks
	Exhaust pipe, starting motor and wire read removal		Remove the parts in order.
	Side cover, seat and fuel tank		Refer to "SIDE COVER, SEAT AND FUEL TANK" section in CHAPTER 3.
1	Foot rest (right)	1	
2	Brake pedal	1	
3	Protector (exhaust pipe)	1	
4	Exhaust pipe Assembly	1	
5	Gasket (exhaust pipe)	1	
6	Gasket (muffler)	1	
7	Battery negative lead	1	
8	Battery/positive lead	1	
9	Starting motor lead	1/1	
10	Starting motor	1	**NOTE:**
11	CDI magneto couplers	1	Disconnect the couplers.
12	Plug cap	1	Reverse the removal procedure for installation.

CARBURETOR, CLUTCH CABLE AND DRIVE CHAIN



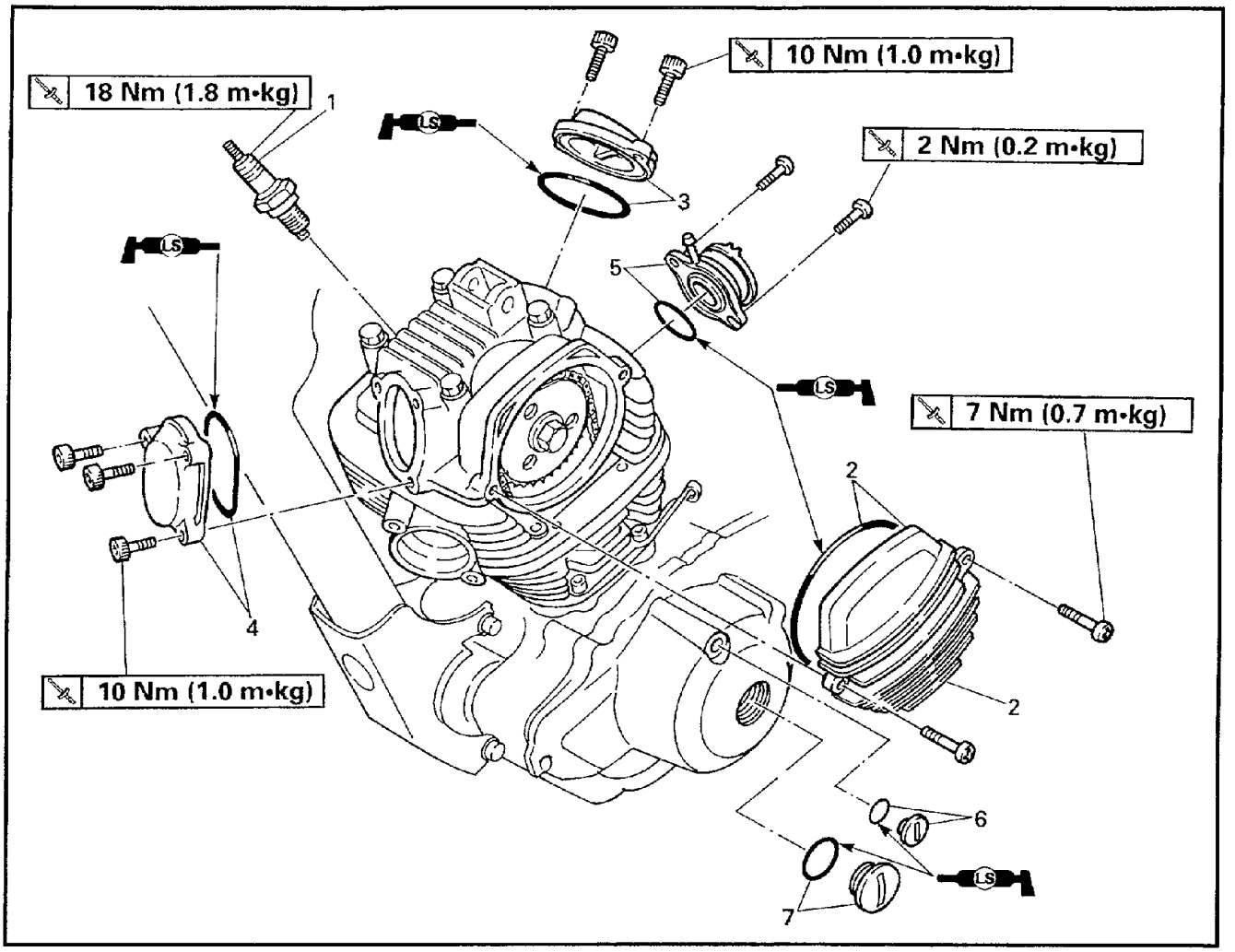
Order	Job name/Part name	Q'ty	Remarks
	Carburetor, clutch cable and drive chain removal		Remove the parts in order.
	Carburetor		Refer to "CARBURETOR" section in CHAPTER 5.
1	Clutch cable	1	**NOTE:** Disconnect.
2	Crankcase breather hose	1	
3	Foot rest (left)	1	
4	Shift pedal	1	
5	Fitting plate	1	
6	Drive sprocket cover	1	
7	Rear wheel axle nut/ drive sprocket shaft nut	1/1	**NOTE:** Loosen the axle nut, drive sprocket shaft nut and slacken the drive chain.
8	Sprocket holder	1	
9	Drive sprocket/drive chain	1/1	Reverse the removal procedure for installation.

ENGINE



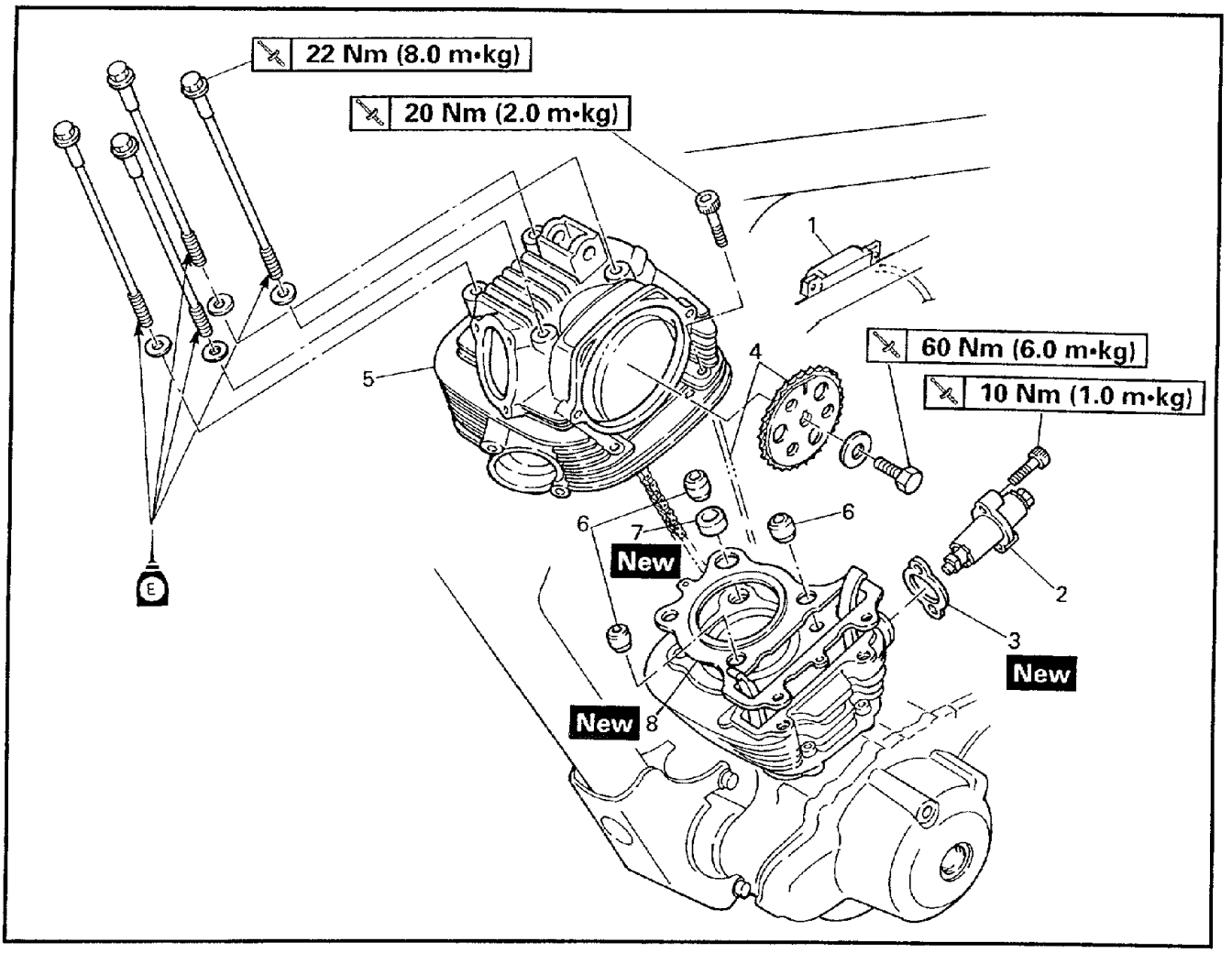
Order	Job name/Part name	Q'ty	Remarks
	Engine removal		Remove the parts in order. **⚠WARNING** **Securely support the motorcycle so there is no danger of it falling over.**
1	Horn	1	
2	Engine stay (top)	1	
3	Engine guard	1	
4	Front engine stay	1	
5	Swingarm pivot shaft	1	
6	Engine mount bolt (rear under)	1	
7	Engine	1	Reverse the removal procedure for installation.

CYLINDER HEAD
CAM SPROCKET COVER

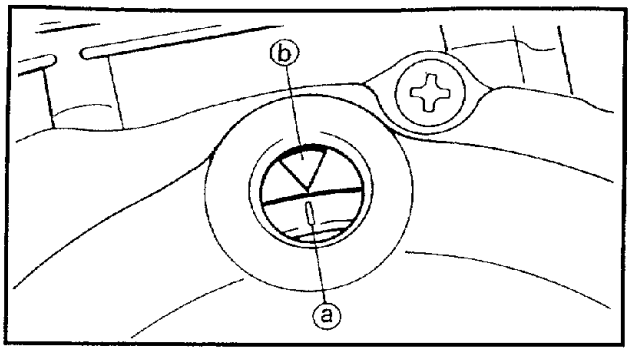


Order	Job name/Part name	Q'ty	Remarks
	Cam sprocket cover removal		Remove the parts in order.
	Side cover, seat and fuel tank		Refer to "SIDE COVER, SEAT AND FUEL TANK REMOVAL" section in CHAPTER 3.
	Exhaust pipe assembly		Refer to "ENGINE REMOVAL" section.
	Carburetor assembly		Refer to "CARBURETOR" section in CHAPTER 5.
	Engine stay (top)		Refer to "ENGINE REMOVAL" section.
1	Spark plug	1	
2	Cam sprocket cover/O-ring	1/1	
3	Valve cover (intake side)/O-ring	1/1	
4	Valve cover (exhaust side)/O-ring	1/1	
5	Carburetor joint/O-ring	1/1	
6	Timing mark cap/O-ring	1/1	
7	Center cap/O-ring	1/1	
			Reverse the removal procedure for installation.

CYLINDER HEAD



Order	Job name/Part name	Q'ty	Remarks
	Cylinder head removal		Remove the parts in order.
1	Ignition coil	1	
2	Timing chain tensioner assembly	1	Refer to "CYLINDER HEAD REMOVAL/ INSTALLATION" section.
3	Gasket (timing chain tensioner)	1	
4	Cam sprocket/Timing chain	1	
5	Cylinder head	1	
6	Dowel pins	3	
7	Gasket	1	Refer to "CYLINDER HEAD INSTALLATION" section.
8	Cylinder head gasket	1	
			Reverse the removal procedure for installation.



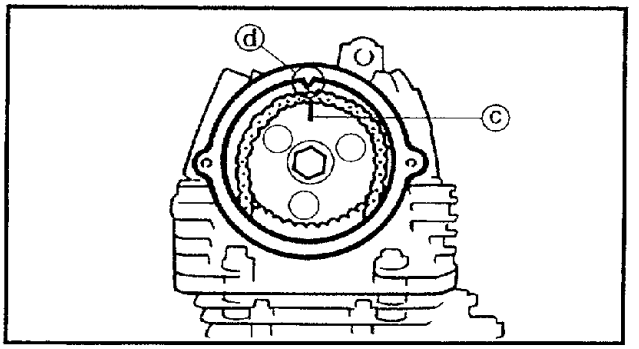
T401030

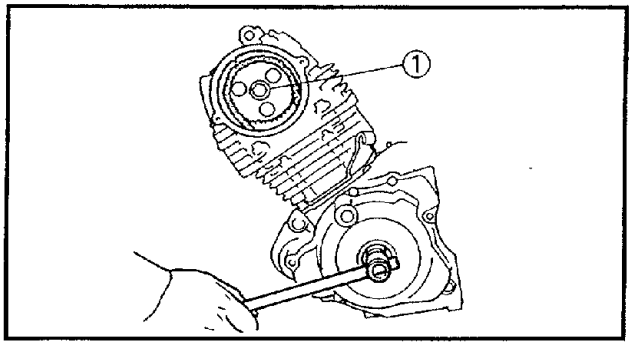
CYLINDER HEAD REMOVAL

1. Align:
   - Slit ⓐ on the magneto (with stationary pointer ⓑ on the crank case cover)

NOTE:

Turn the crank shaft counterclockwise with a wrench and align the "I" mark ⓒ with the cylinder head match mark ⓓ when the piston is at TDC on the compression stroke.

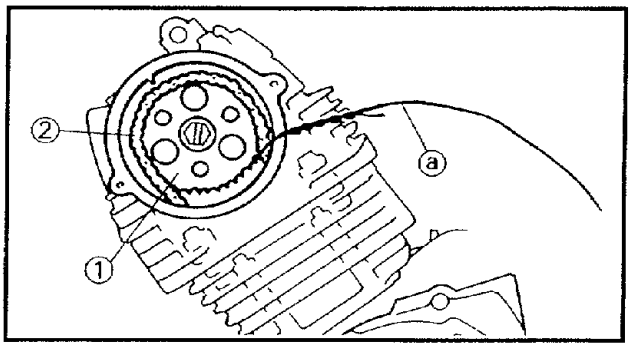




2. Loosen:
   - Bolt (cam sprocket) ①

NOTE:

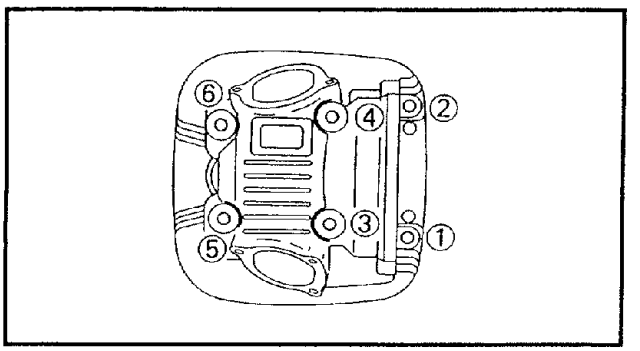
Loosen the bolt while holding the magneto mounting bolt with a wrench.



3. Remove:
   - Cam sprocket bolt
   - Cam sprocket ①
   - Timing chain ②

NOTE:

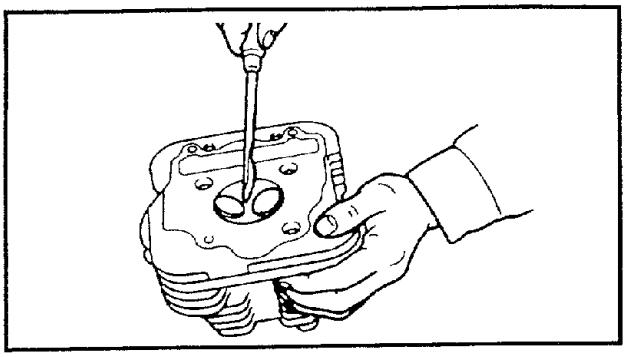
Fasten a safety wire ⓐ to the timing chain to prevent it from falling into the crankcase.

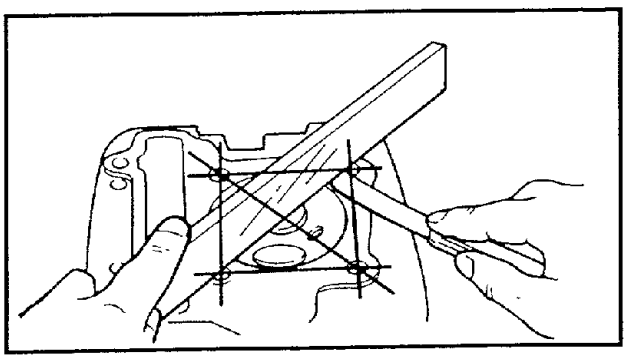


4. Remove:
   - Cylinder head

NOTE:

- Loosen the nuts in their proper loosening sequence.
- Start by loosening each nut 1/2 turn until all are loose.





YP402000

CYLINDER HEAD INSPECTION

1. Eliminate:
   - Carbon deposits
     (from combustion chambers)
     Use a rounded scraper.

NOTE:

Do not use a sharp instrument to avoid damaging or scratching:
- Spark plug threads
- Valve seats

2. Inspect:
   - Cylinder head
     Scratches/damage → Replace.
3. Measure:
   - Cylinder head warpage
     Out of specification → Resurface.

	Cylinder head warpage: **Less than 0.03 mm**

****

Warpage measurement and resurfacement steps:

- Place a straightedge and a feeler gauge across the cylinder head.
- Measure the warpage.
  If the warpage is out of specification, resurface the cylinder head.
- Place a 400 ~ 600 grit wet abrasive paper on the surface plate, and resurface the head using a figure-eight sanding pattern.

NOTE:

Rotate the cylinder head several times for an even resurfacement.

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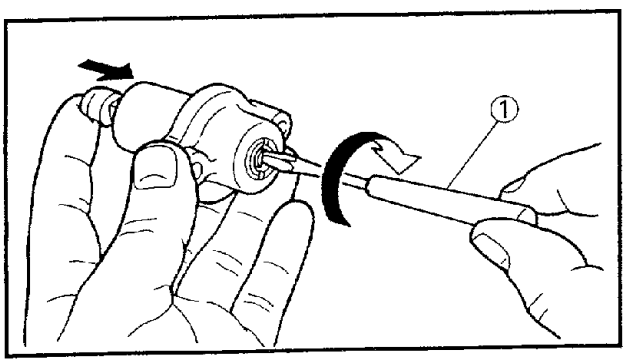
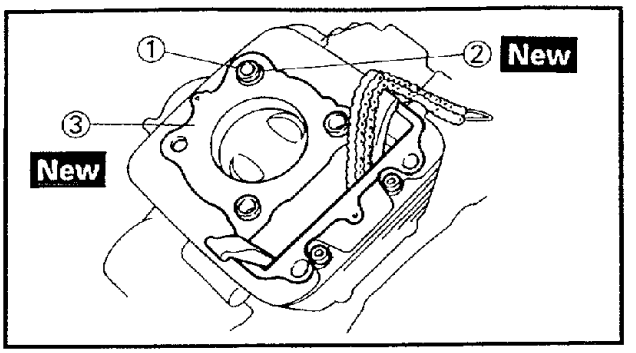
EB402080

TIMING CHAIN TENSIONER INSPECTION

1. Check:
   - One way cam operation
     Unsmooth operation → Replace.

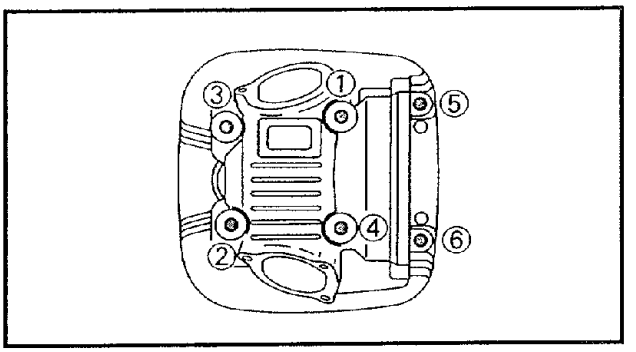




AG404193

CYLINDER HEAD INSTALLATION

1. Install:
   - Dowel pins ①
   - Gasket ② **New**
   - Gasket (cylinder head) ③ **New**

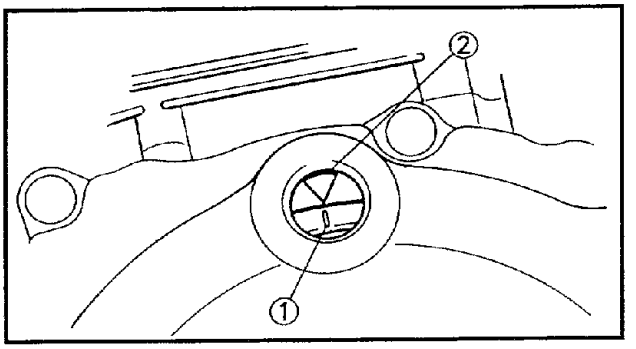


2. Install:
   - Cylinder head

	M8 (1~4)	22 Nm (2.2 m•kg)
	M8 (5~6)	20 Nm (2.0 m•kg)

NOTE:

- Apply engine oil onto the nut threads.
- Tighten the bolts starting with the lowest numbered one.

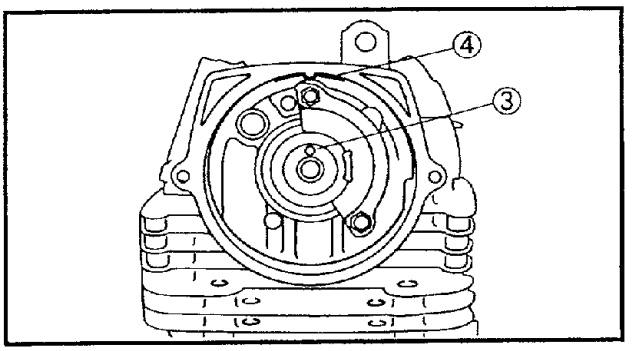


3. Install:
   - Cam sprocket
   - Timing chain

****

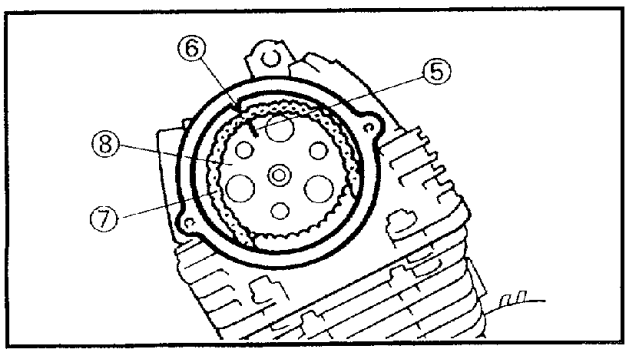
Installing steps:

- Turn the crank shaft counterclockwise until the slit ① matches the stationary pointer ②.
- Align the dowel pin ③ on the camshaft with the stationary pointer ④ on the cylinder head.
- Align the "I" mark ⑤ on the cam sprocket with the stationary pointer ⑥ on the cylinder head.
- Fit the timing chain ⑦ onto cam sprocket ⑧ and install the cam sprocket on the camshaft.



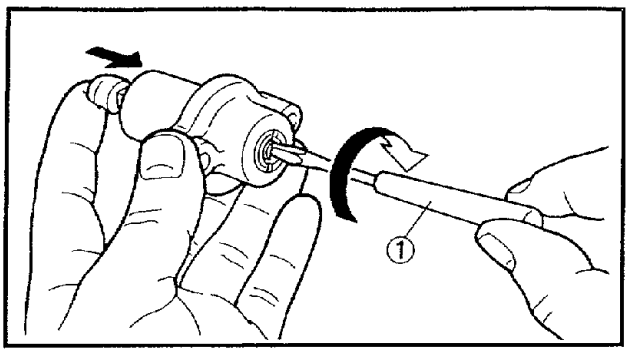
NOTE:

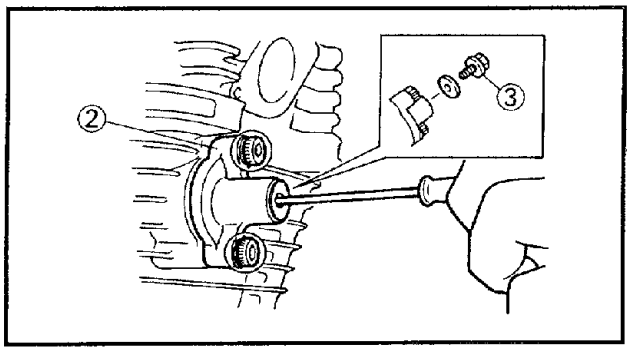
When installing the cam sprocket, keep the timing chain as tight as possible on the exhaust side.

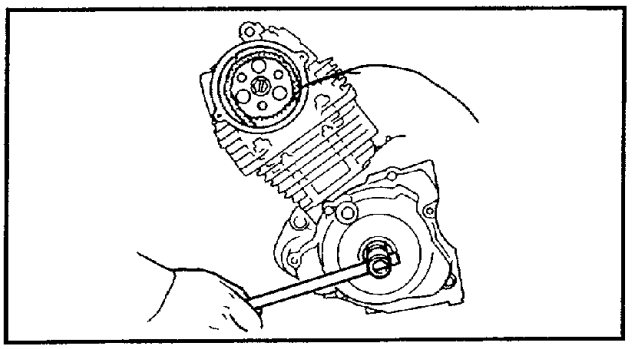


CAUTION:

Do not turn the crankshaft during installation of the camshaft. Damage or improper valve timing will result.







- Remove the safety wire from the timing chain.

****

4. Install:
   - Gasket
   - Timing chain tensioner

****

Installation steps:

- While lightly pressing the timing chain tensioner rod by hand, use a thin screwdriver ① and wind the tensioner rod up fully clockwise.
- With the tensioner rod fully wound, install the gasket and the chain tensioner ②, and tighten the bolt ③ to the specified torque.

	Timing chain tensioner: 10 Nm (1.0 m•kg)

- Remove the screwdriver, make sure the tensioner rod comes out and tighten the gasket and cap bolt to the specified torque.

	Cap bolt (timing chain tensioner): 7 Nm (0.7 m•kg)

****

5. Tighten:
   - Bolt (camshaft) **60 Nm (6.0 m•kg)**

NOTE:

Install the bolt while holding the magneto mounting bolt with a wrench.

6. Check:
   - Valve timing

   Out of alignment → Adjust.

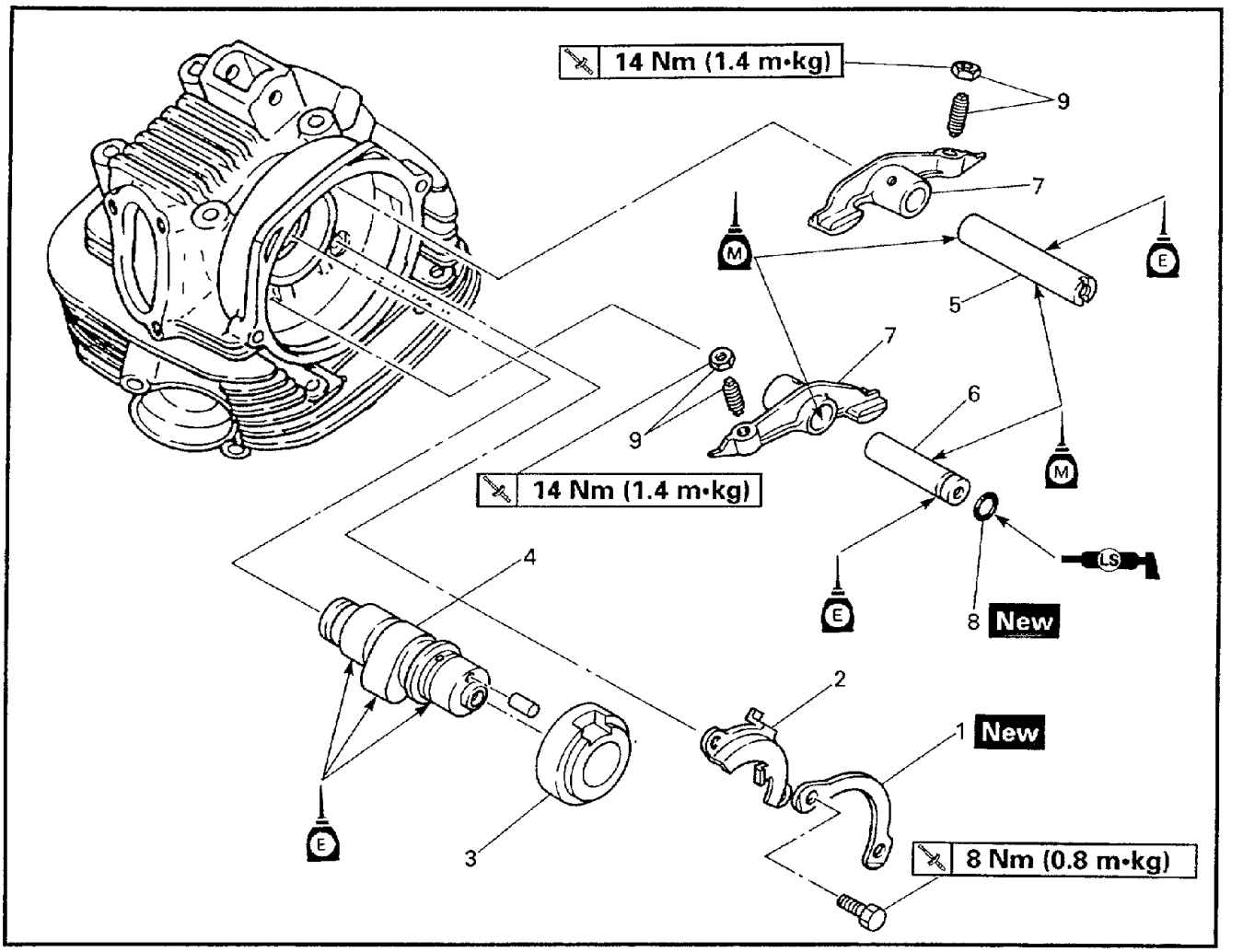
   Refer to above steps 3.
7. Check:
   - Valve clearance

   Out of specification → Adjust.

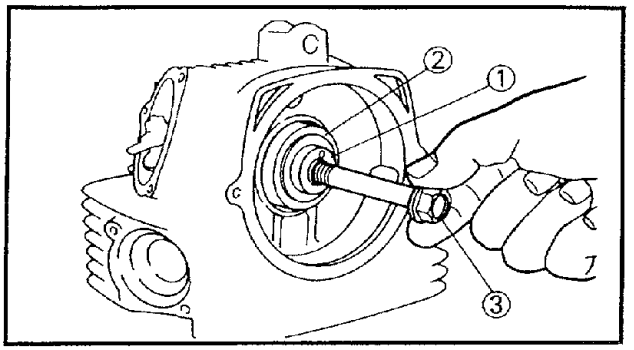
   Refer to "VALVE CLEARANCE ADJUSTMENT" section in CHAPTER 3.
8. Install:
   - O-ring
   - Cam sprocket cover

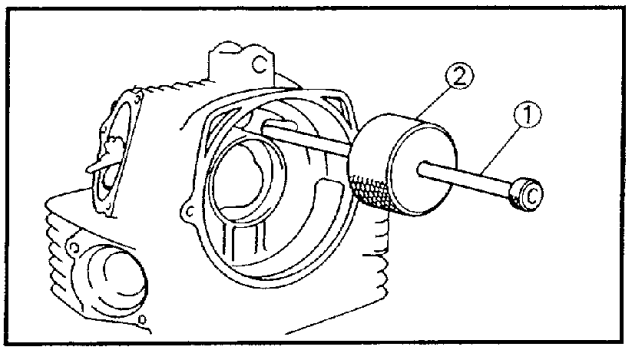
   7 Nm (0.7 m•kg)

CAM SHAFT AND ROCKER ARMS



Order	Job name/Part name	Q'ty	Remarks
	Cam shaft and rocker arm removal		Remove the parts in order.
	Cylinder head		Refer to the "CYLINDER HEAD" section.
1	Lock washer	1	Refer to the "CAMSHAFT AND ROCKER ARM INSTALLATION" section.
2	Plate	1	
3	Collar	1	Refer to the "ROCKER ARM AND ROCKER ARM SHAFT REMOVAL/CAMSHAFT AND ROCKER ARM INSTALLATION" section.
4	Cam shaft	1	
5	Rocker arm shaft (intake side)	1	
6	Rocker arm shaft (exhaust side)	1	
7	Rocker arms	2	
8	O-ring	1	
9	Nut/Adjusters	2/2	
			Reverse the removal procedure for installation.





SR*****

ROCKER ARM AND ROCKER ARM SHAFT REMOVAL

1. Remove:
   - Camshaft ①
   - Collar (camshaft) ②

NOTE:

Use 10 mm bolt ③ to remove the camshaft.

2. Remove:
   - Rocker arm shaft (intake)
   - Rocker arm shaft (exhaust)

NOTE:

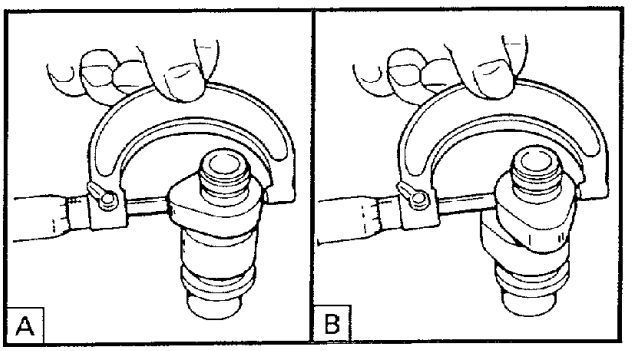
Attach a rocker arm shaft puller bolt ① and weight ② to the rocker arm shaft and slide out the shaft.

Rocker arm shaft puller bolt:
90890-01083
Weight:
90890-01084

YP402052

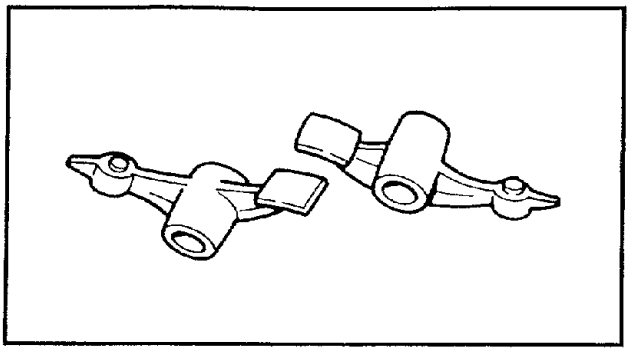
CAMSHAFT INSPECTION

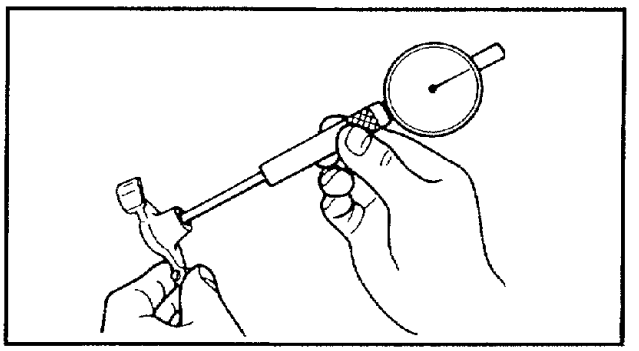
1. Inspect:
   - Cam lobes
     Pitting/Scratches/Blue discoloration→ Replace.
2. Measure:
   - Cam lobes length [A] and [B].
     Out of specification→Replace.

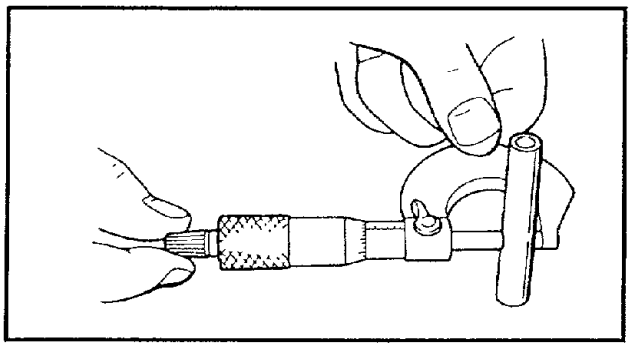


Cam lobes length:
Intake:
[A] 36.54~36.64 mm
<Limit: 36.48 mm>
[B] 30.15~30.25 mm
<Limit: 30.1 mm>
Exhaust:
[A] 36.58~36.68 mm
<Limit: 36.49 mm>
[B] 30.27~30.37 mm
<Limit: 30.2 mm>

3. Inspect:
   - Camshaft oil passage
     Stuffed→ Blow out oil passage with compressed the air.







YP402060

ROCKER ARMS AND ROCKER ARM SHAFTS INSPECTION

1. Inspect:
   - Rocker arm shafts
   - Rocker arms

   Wear/Pitting/Scratches/Blue discoloration → Replace.

****

Inspection steps:

- Inspect the two contact areas on the rocker arms for signs of unusual wear.
- Rocker arm shaft hole.
- Cam-lobe contact surface.

  Excessive wear → Replace.
- Inspect the surface condition of the rocker arm shafts.

  Pitting/scratches/blue discoloration → Replace or check lubrication.
- Measure the inside diameter of the rocker arm holes.

  Out of specification → Replace.

Inside diameter (rocker arm):
12.000~12.018 mm
<Limit: 12.036 mm>

- Measure the outside diameter of the rocker arm shafts.

  Out of specification → Replace.

Outside diameter
(rocker arm shaft):
11.981~11.991 mm
<Limit: 11.950 mm>

****

SR******

CAMSHAFT AND ROCKER ARM INSTALLATION

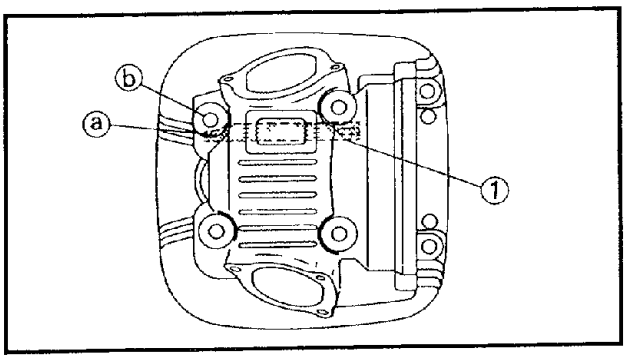
1. Lubricate:
   - Camshaft

Camshaft:
Engine oil
Camshaft bearing:
Engine oil

2. Apply:
   •Molybdenum disulfide oil
   (onto the rocker arm and rocker arm shaft)

	Molybdenum disulfide oil

3. Install:
   •Rocker arm
   •Rocker arm shaft ①

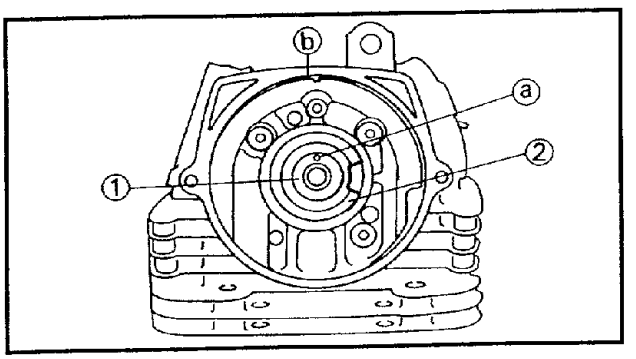


NOTE:

•Apply engine oil onto the outside of the rocker arm shaft and apply molybdenum disulfide oil onto the inside of the rocker arm.
•Install the rocker arm shaft (intake), mach the cut away ⓐ and bolt hole ⓑ.

CAUTION:

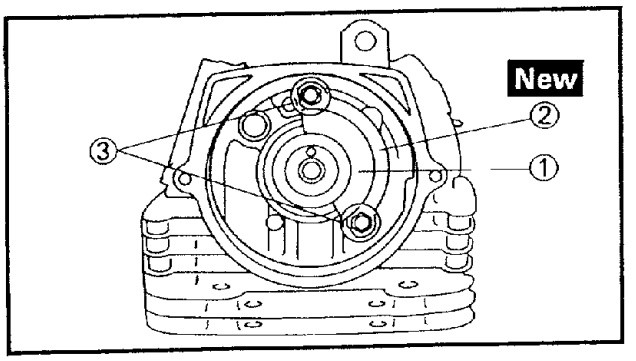
•Make sure that the rocker shaft install direction.
•Install the rocker arm shaft into the thread side for the out.



4. Install:
   •Camshaft ①
   •Collar ②

NOTE:

•Apply engine oil onto the cam profile face and journal face.
•Install the camshaft, mach the dowel pin ⓐ and cylinder head mark ⓑ.

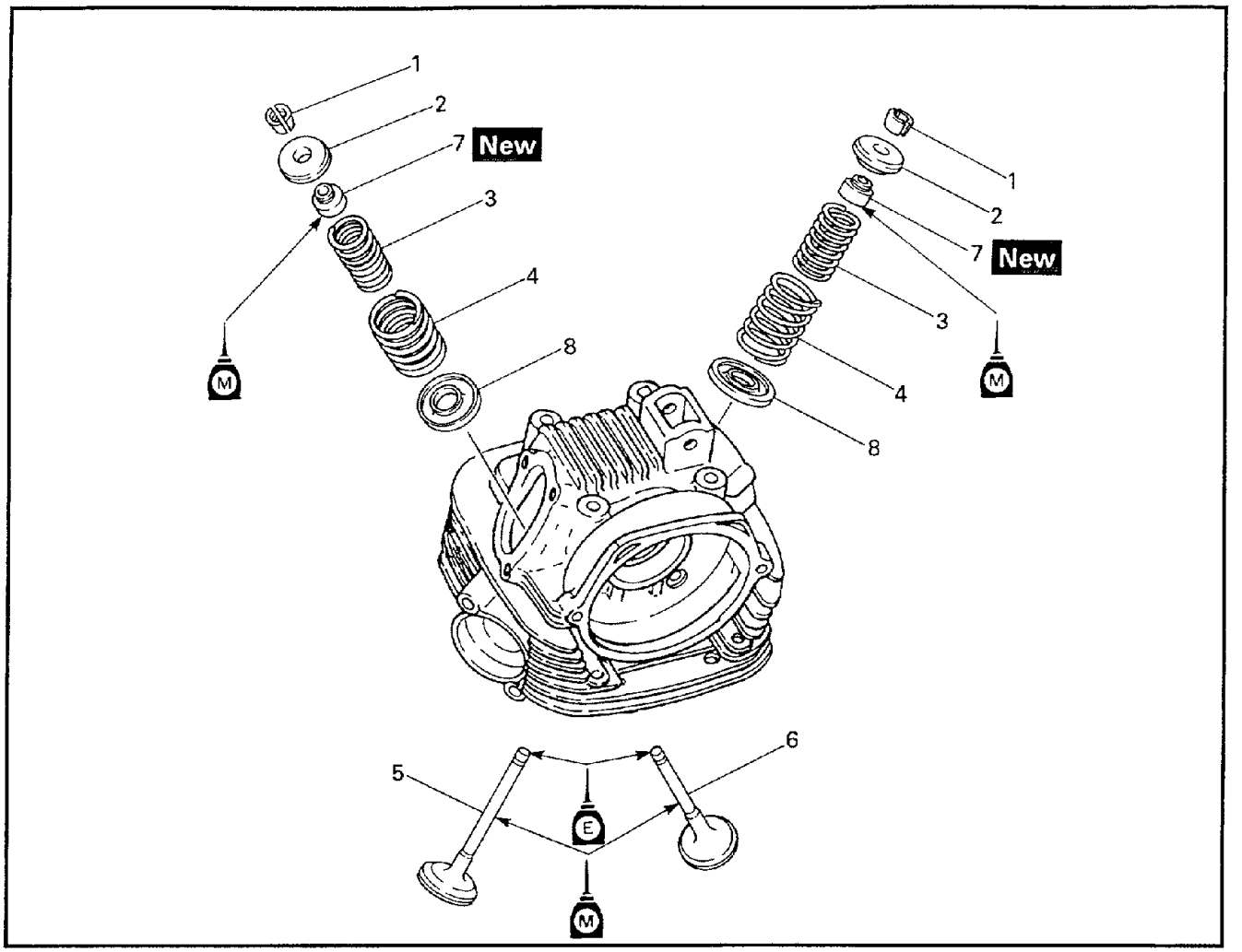


5. Install:
   •Plate ①
   •Lock washer ② **New**
   •Bolt ③ **8 Nm (0.8 m•kg)**

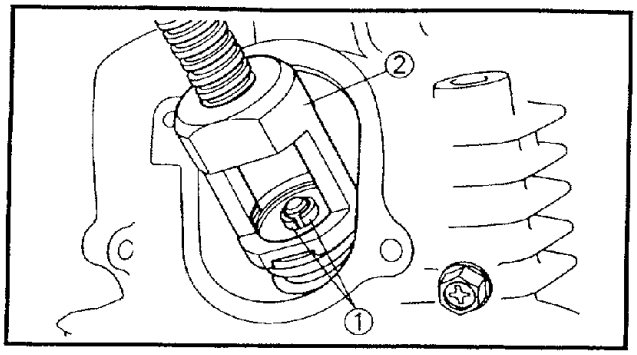
NOTE:

After tighten the bolt, bend the end of the rock washer.

VALVES AND VALVE SPRINGS



Order	Job name/Part name	Q'ty	Remarks
	Valves and valve springs removal		Remove the parts in order.
	Cylinder head		Refer to "CYLINDER HEAD" section.
	Rocker arm, Camshaft		Refer to "CAMSHAFT AND ROCKER ARMS" section.
1	Valve cotters	4	Refer to "VALVES AND VALVE SPRINGS REMOVAL/INSTALLATION" section.
2	Spring retainers	2	Refer to "VALVES AND VALVE SPRINGS INSTALLATION" section.
3	Valve springs (inner)	2	
4	Valve springs (outer)	2	
5	Valve (intake)	1	
6	Valve (exhaust)	1	
7	Valve guides (stem seal)	2	
8	Spring seats	2	Reverse the removal procedure for installation.



YP401150

VALVES AND VALVE SPRINGS REMOVAL

1. Remove:
   - Valve cotters ①

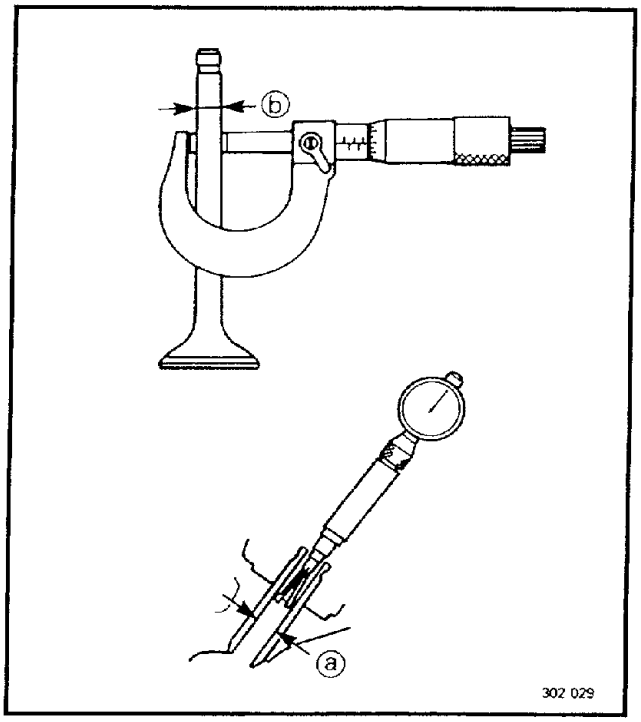
NOTE:

Attach a valve spring compressor and attachment ② between the valve spring retainer and cylinder head to remove the valve cotters.

CAUTION:

Do not compress so much as to avoid damage to the valve spring.

Valve spring compressor:
90890-04019
Valve spring compressor attachment:
90890-04108



EB402010

VALVES AND VALVE GUIDES INSPECTION

1. Measure:
   - Stem-to-guide clearance

Stem-to-guide clearance =
valve guide inside diameter ⓐ –
valve stem diameter ⓑ

Out of specification → Replace the valve guide.

Clearance (stem to guide):
Intake:
0.010 ~ 0.037 mm
<Limit: 0.08 mm>
Exhaust:
0.025 ~ 0.052 mm
<Limit: 0.10 mm>

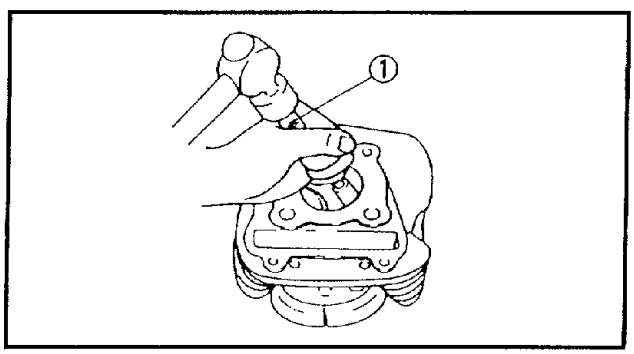
2. Replace:
   - Valve guide

****

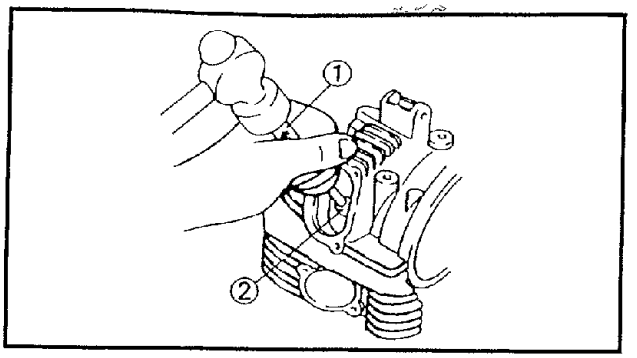
Replacement steps:

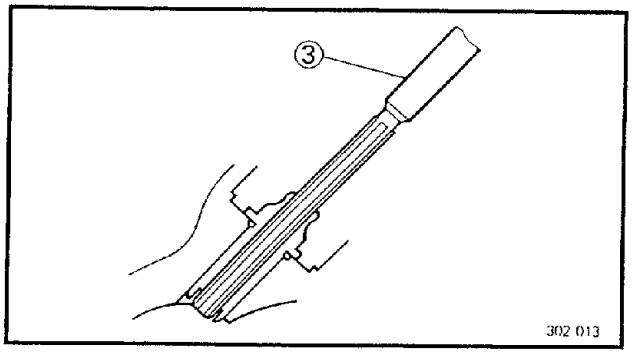
NOTE:

Heat the cylinder head in an oven to 100°C to ease guide removal and installation and to maintain correct fit.



- Remove the valve guide using a valve guide remover ①.





- Install the new valve guide using a valve guide installer ② and valve guide remover ①.
- After installing the valve guide, bore the valve guide using a valve guide reamer ③ to obtain proper stem-to-guide clearance.

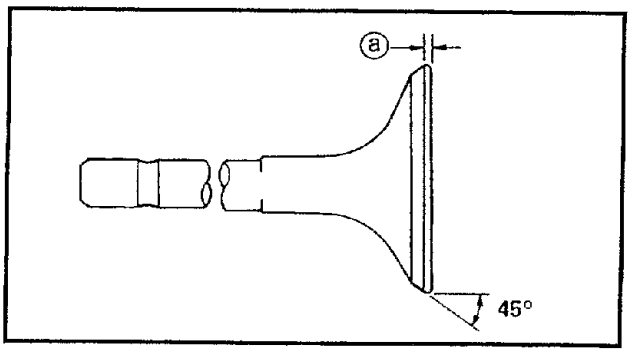
Valve guide remover (6 mm):
90890-04064
Valve guide installer (6 mm):
90890-04065
Valve guide reamer (6 mm):
90890-04066

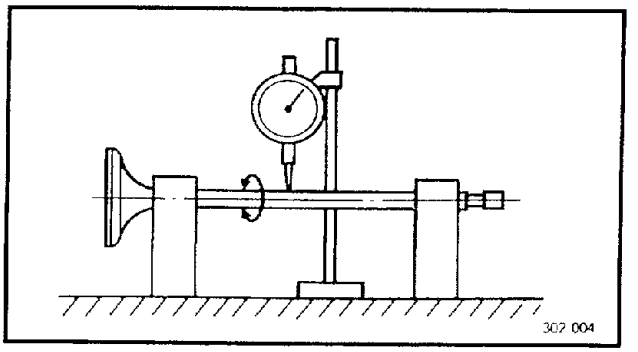
NOTE:

Reface the valve seat after replacing the valve guide.

****

3. Eliminate:
   - Carbon deposits (from the valve face)
4. Inspect:
   - Valve face
     Pitting/wear → Grind the face.
   - Valve stem end
     Mushroom shape or diameter larger than the body of the stem → Replace.





5. Measure:
   - Margin thickness ⓐ
     Out of specification → Replace.

Margin thickness:
Intake
0.8 ~ 1.2 mm
Exhaust
0.8 ~ 1.2 mm

6. Measure:
   - Runout (valve stem)
     Out of specification → Replace.

Runout:
Less than 0.03 mm

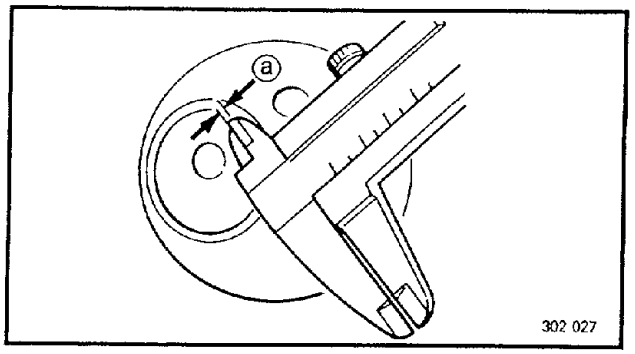
NOTE:

- Always replace the guide when installing a new valve.
- Always replace the oil seal if the valve is removed or replaced.

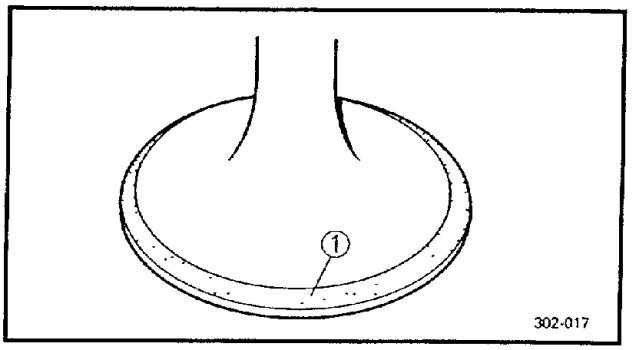
EB402020

VALVE SEATS INSPECTION

1. Eliminate:
   - Carbon deposits
     (from the valve face and valve seat)
2. Inspect:
   - Valve seats
     Pitting/wear → Reface the valve seat.
3. Measure:
   - Valve seat width ⓐ
     Out of specification → Reface the valve seat.



Valve seat width:
Intake:
0.9~1.1 mm
<Limit: 1.6 mm>
Exhaust:
0.9~1.1 mm
<Limit: 1.6 mm>



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Measurement steps:

- Apply Mechanic's blueing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width. Where the valve seat and valve face made contact, blueing will have been removed.
- If the valve seat is too wide, too narrow, or the seat is not centered, the valve seat must be replaced.

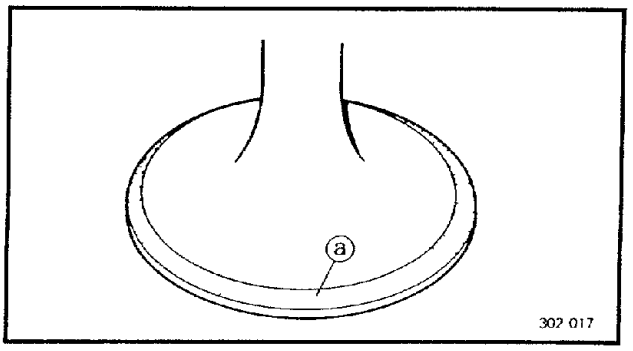
****

EB402020

4. Lap:
   - Valve face
   - Valve seat

NOTE:

After replacing the valve seat, valve and valve guide, the valve seat and valve face should be lapped.



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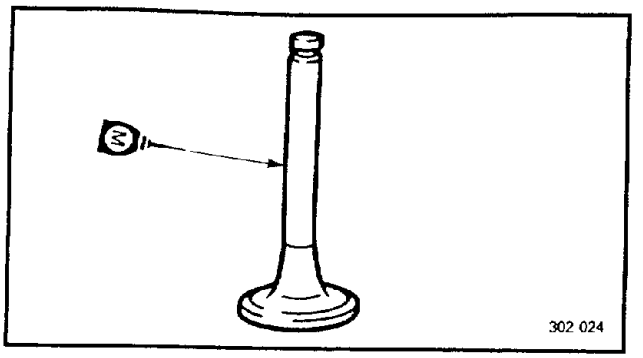
Lapping steps:

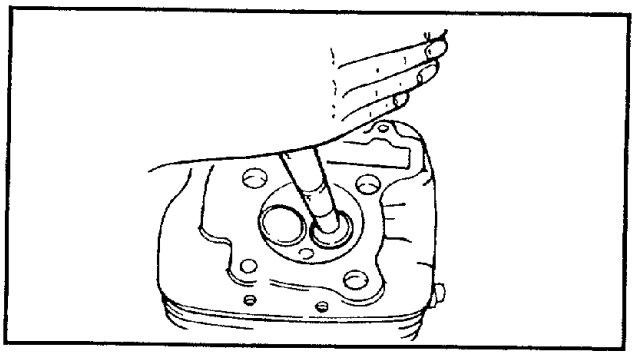
- Apply a coarse lapping compound ⓐ to the valve face.

CAUTION:

Do not let compound enter the gap between the valve stem and the guide.



- Apply molybdenum disulfide oil to the valve stem.
- Install the valve into the cylinder head.

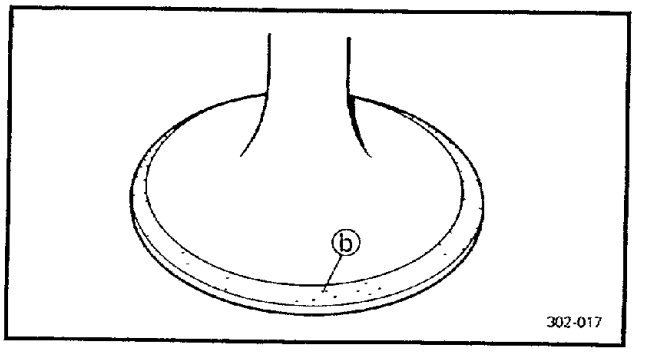


- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.

	Valve lapper: **90890-04101**

NOTE:

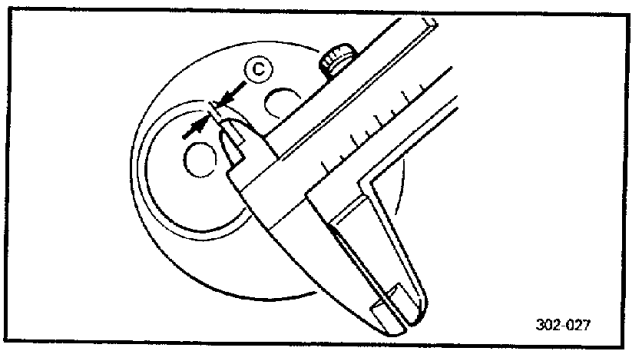
For best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hand.



- Apply a fine lapping compound to the valve face and repeat the above steps.

NOTE:

Make sure to clean off all compound from the valve face and valve seat after every lapping operation.



- Apply Mechanic's blueing dye (Dykem) ⓑ to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width ⓒ again.

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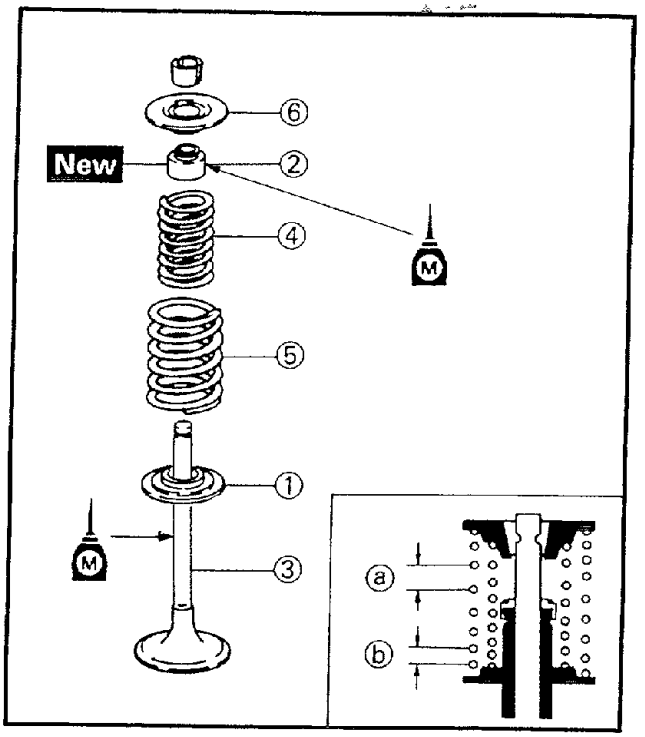
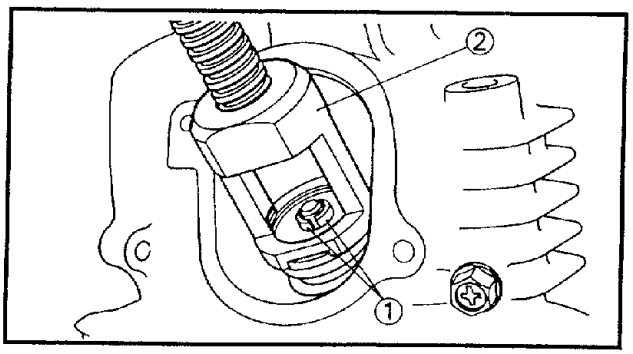
EB404032

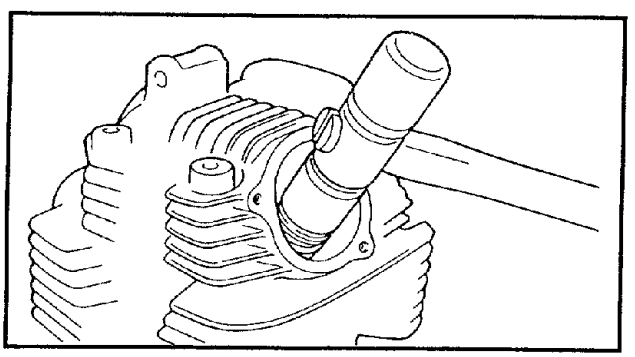
VALVES AND VALVE SPRINGS INSTALLATION

1. Deburr:
   - Valve stem end

   Use an oil stone to smooth the stem end.







2. Apply:
   - Molybdenum disulfide oil
   (onto the valve stem ③ and oil seal ②)

	Molybdenum disulfide oil

3. Install:
   - Valve spring seat ①
   - Valve stem seal ② **New**
   - Valve ③
   (into the cylinder head)
   - Valve spring (inner) ④
   - Valve spring (outer) ⑤
   - Spring retainer ⑥

NOTE:

Install the valve spring with the larger pitch ⓐ facing upwards.

ⓑ Smaller pitch

4. Install:
   - Valve cotters ①

NOTE:

Install the valve cotters while compressing the valve spring with a valve spring compressor and attachment ②.

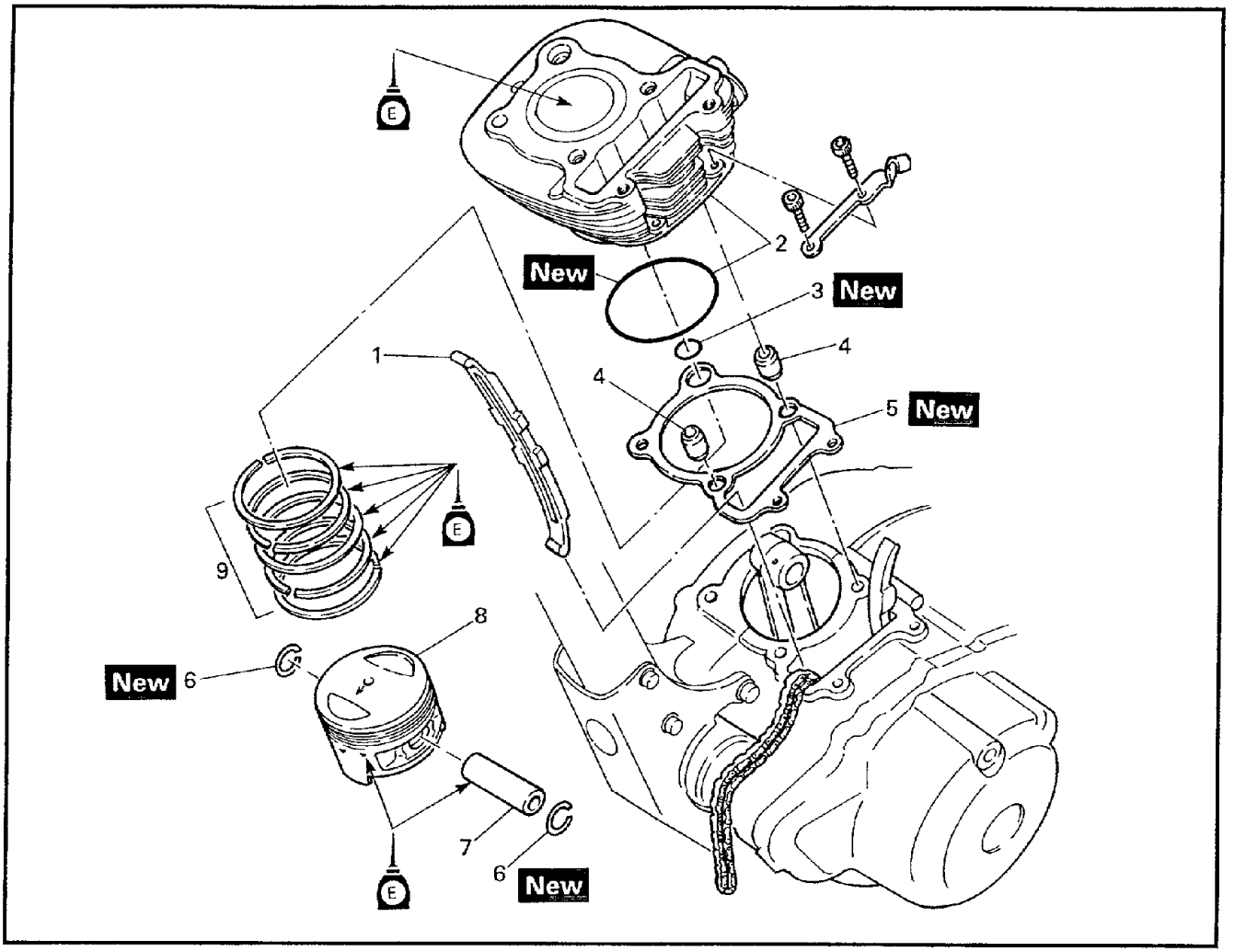
	Valve spring compressor: **90890-04019** **Valve spring compressor attachment:** **90890-04108**

5. Secure the valve cotters onto the valve stem by tapping lightly with a piece of wood.

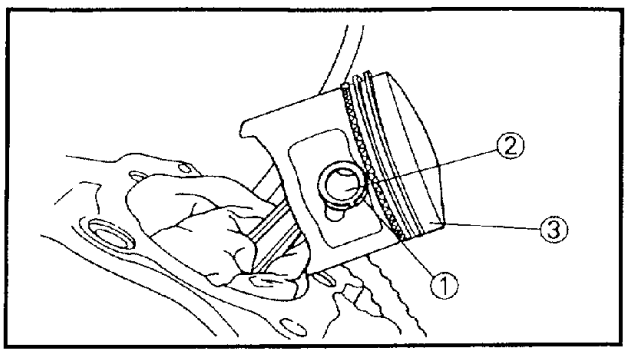
CAUTION:

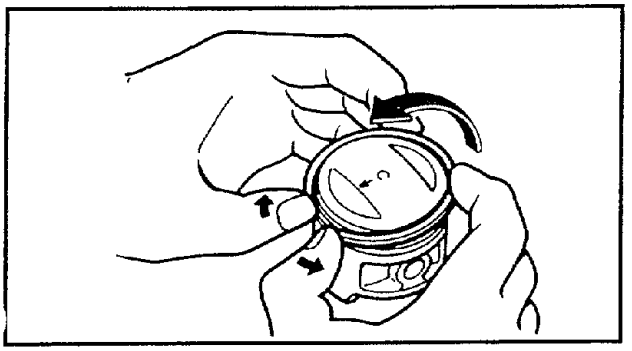
Do not hit so much as to damage the valve.

CYLINDER AND PISTON



Order	Job name/Part name	Q'ty	Remarks
	Cylinder and piston removal		Remove the parts in order.
	Cylinder head		Refer to "CYLINDER HEAD" section.
1	Timing chain guide (exhaust side)	1	
2	Cylinder/O-ring	1/1	
3	O-ring	1	Refer to "PISTON RINGS, PISTON AND
4	Dowel pins	2	CYLINDER INSTALLATION" section.
5	Cylinder gasket	1	
6	Piston pin clips	2	Refer to "PISTON AND PISTON RINGS
7	Piston pin	1	REMOVAL" section.
8	Piston	1	Refer to "PISTON RINGS, PISTON AND
9	Piston ring set	1	CYLINDER INSTALLATION" section.
			Reverse the removal procedure for installation.





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PISTON AND PISTON RINGS REMOVAL

1. Remove:
   - Piston pin clip ①
   - Piston pin ②
   - Piston ③

NOTE:

Before removing the piston pin clip, cover the crankcase opening with a clean towel or rag to prevent the circlip from falling into the crankcase cavity.

2. Remove:
   - Top ring
   - 2nd ring
   - Oil ring

NOTE:

When removing the piston ring, open the end gap of the ring by fingers, and push up the other side of the ring.

EB402100

CYLINDER AND PISTON INSPECTION

1. Inspect:
   - Cylinder and piston walls
     Vertical scratches → Rebore or replace the cylinder and the piston.
2. Measure:
   - Piston-to-cylinder clearance

****

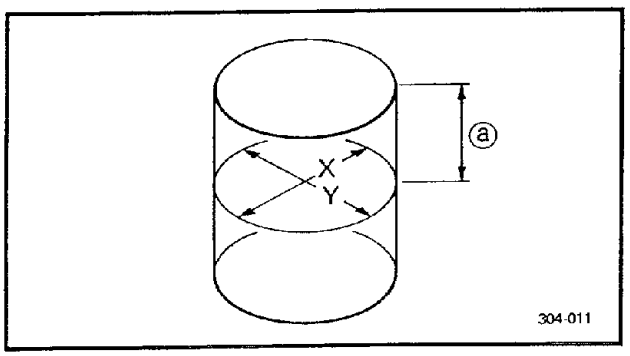
Measurement steps:

1st step:

- Measure the cylinder bore "C" with a cylinder bore gauge.
  ⓐ 40 mm from the top of the cylinder.

NOTE:

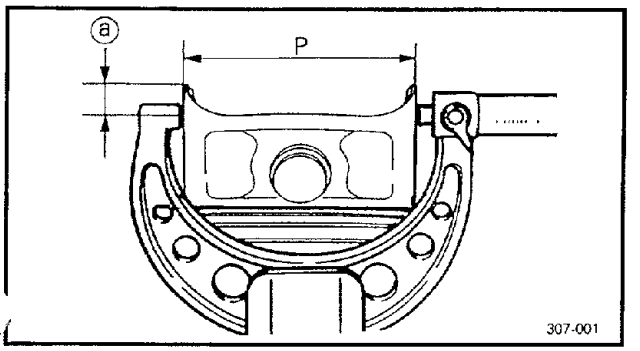
Measure the cylinder bore "C" in parallel to and at right angles to the cylinder mating surface. Then, find the average of the measurements.



Cylinder bore "C":
66.97~67.02 mm
<Limit:>
67.1 mm

$$C = \frac{X + Y}{2}$$

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



2nd step:

- Measure the piston skirt diameter "P" with a micrometer.

ⓐ 7.5 mm from from the piston bottom edge.

	Piston size P
Standard	66.935 ~ 66.985 mm
Oversize 2	0.50 mm
Oversize 4	1.00 mm

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

3rd step:

- Calculate the piston-to-cylinder clearance using the following formula:

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

Piston-to-cylinder clearance:
0.025 ~ 0.045 mm

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

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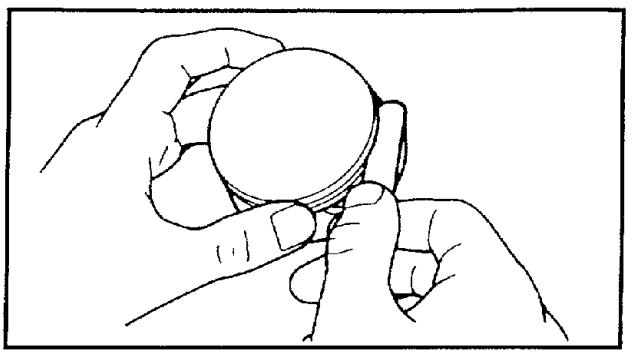


EB402110

PISTON RING INSPECTION

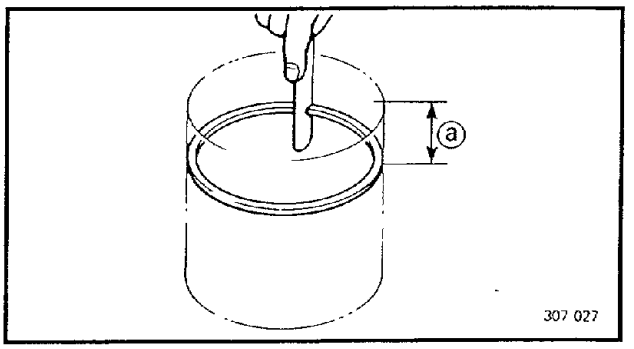
1. Measure:
   - Side clearance

   Out of specification → Replace the piston and the piston rings as a set.

NOTE:

Eliminate the carbon deposits from the piston ring grooves and rings before measuring the side clearance.

Side clearance:
Top ring: <Limit>
0.03 ~ 0.07 mm <0.15 mm>
2nd ring: <Limit>
0.02 ~ 0.06 mm < 0.15 mm>



2. Position:
   - Piston ring

   (into the cylinder)

NOTE:

Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.

ⓐ 40 mm

3. Measure:
   - End gap

   Out of specification → Replace.

NOTE:

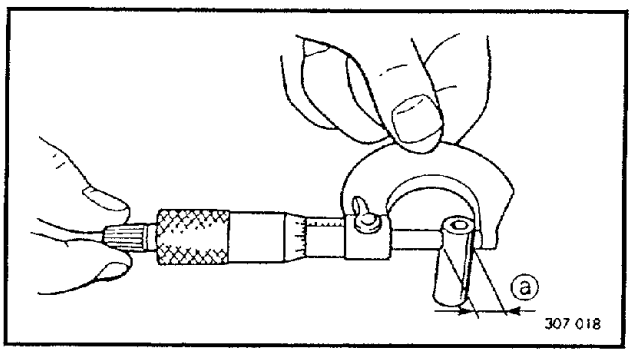
You cannot measure the end gap on the expander spacer of the oil ring. If the oil ring rails show excessive gap, replace all three rings.

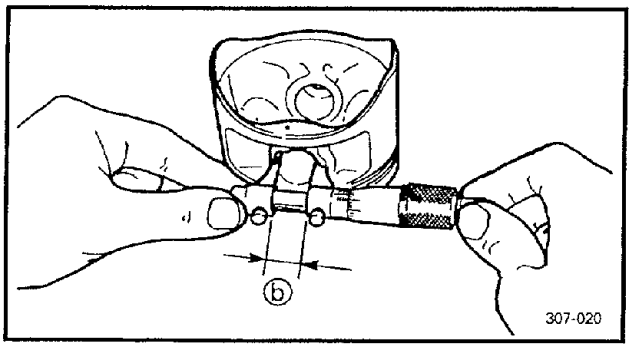
End gap:
Top ring: <Limit>
0.15 ~ 0.35 mm <0.60 mm>
2nd ring: <Limit>
0.15 ~ 0.35 mm <0.60 mm>
Oil ring:
0.3 ~ 0.9 mm

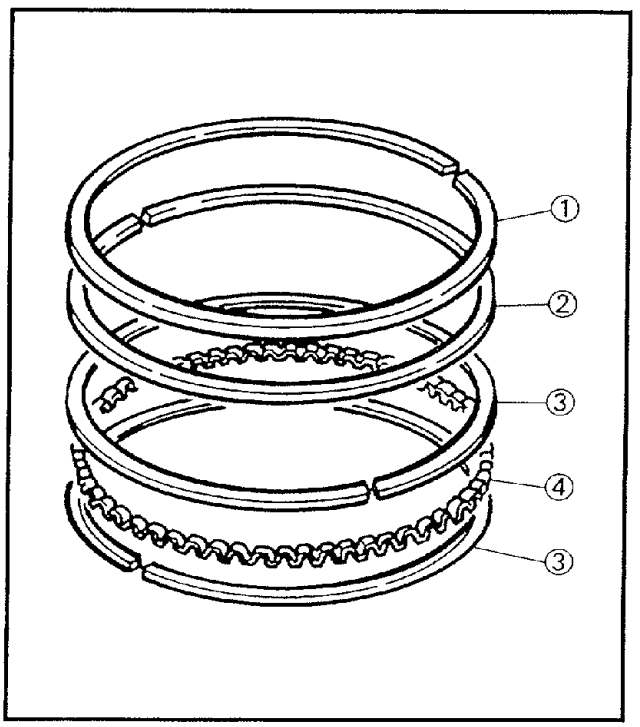
EB402120

PISTON PIN INSPECTION

1. Inspect:
   - Piston pin
     Blue discoloration/grooves → Replace, then inspect the lubrication system.
2. Measure:
   - Piston pin-to-piston clearance







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Measurement steps:

- Measure the piston pin outside diameter ⓐ.
  If out of specification, replace the piston pin.

Outside diameter (piston pin):
15.991 ~ 16.000 mm

- Measure the piston inside diameter ⓑ.
- Calculate the piston pin-to-piston clearance using the following formula:

Piston pin-to-piston clearance =
Bore size (piston pin) ⓑ –
Outside diameter (piston pin) ⓐ

- If out of specification, replace the piston.

Clearance (piston pin-to-piston):
0.002 ~ 0.022 mm

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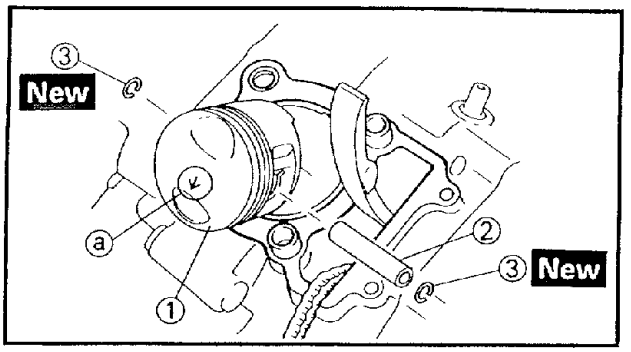
EB404184

PISTON RINGS, PISTON AND CYLINDER INSTALLATION

1. Install:
   - Top ring ①
   - 2nd ring ②
   - Side rails (oil ring) ③
   - Expander spacer (oil ring) ④

NOTE:

- Make sure to install the piston rings so that the manufacturer's marks or numbers are located on the upper side of the rings.
- Lubricate the pistons and piston rings liberally with engine oil.

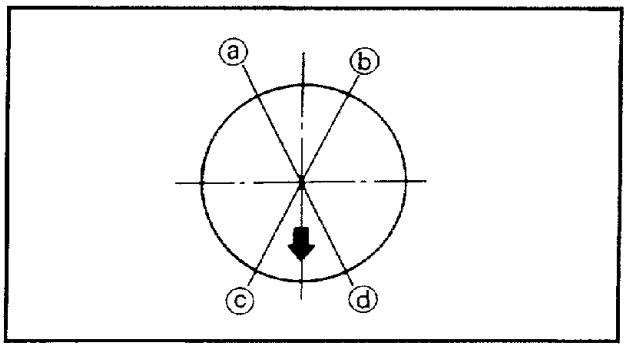


2. Install:
   - Piston ①
   - Piston pin ②
   - Piston pin clip ③ New

NOTE:

- Apply engine oil onto the piston pins.
- The "→" mark ⓐ on the piston must face the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Make sure to install each piston in its respective cylinder.

3. Install:
   - O-ring New
   - Dowel pins



4. Position:
   - Piston rings

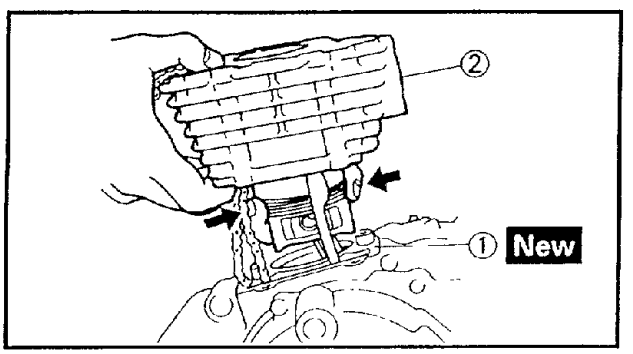
NOTE:

Offset the piston ring end gaps as shown.

ⓐ Top ring end
ⓑ Oil ring end (lower)
ⓒ Oil ring end (upper)
ⓓ 2nd ring end

5. Lubricate:
   - Piston outer surface
   - Piston ring
   - Cylinder inner surface

	Engine oil

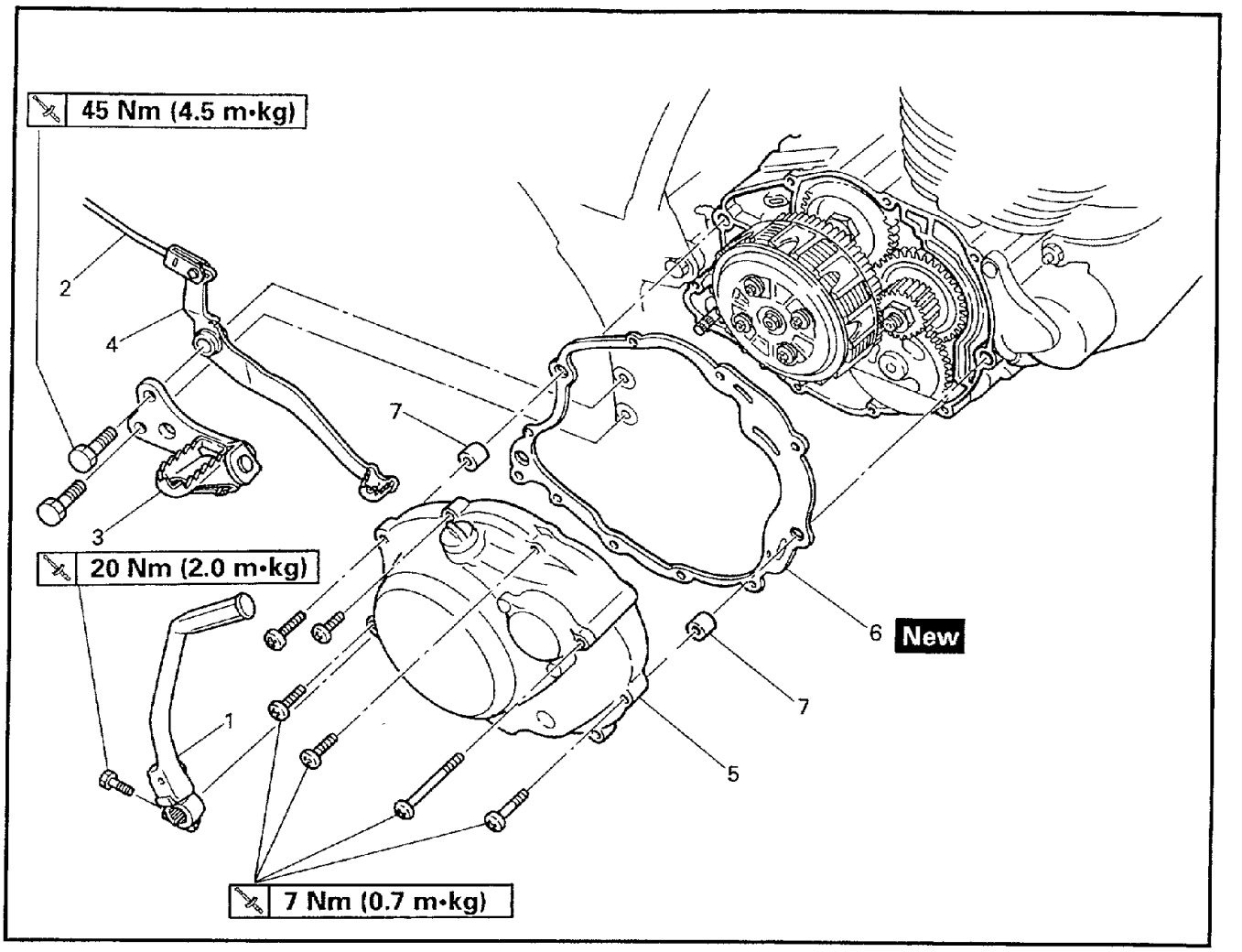


6. Install:
   - Gasket (cylinder) ① New
   - Cylinder ②

NOTE:

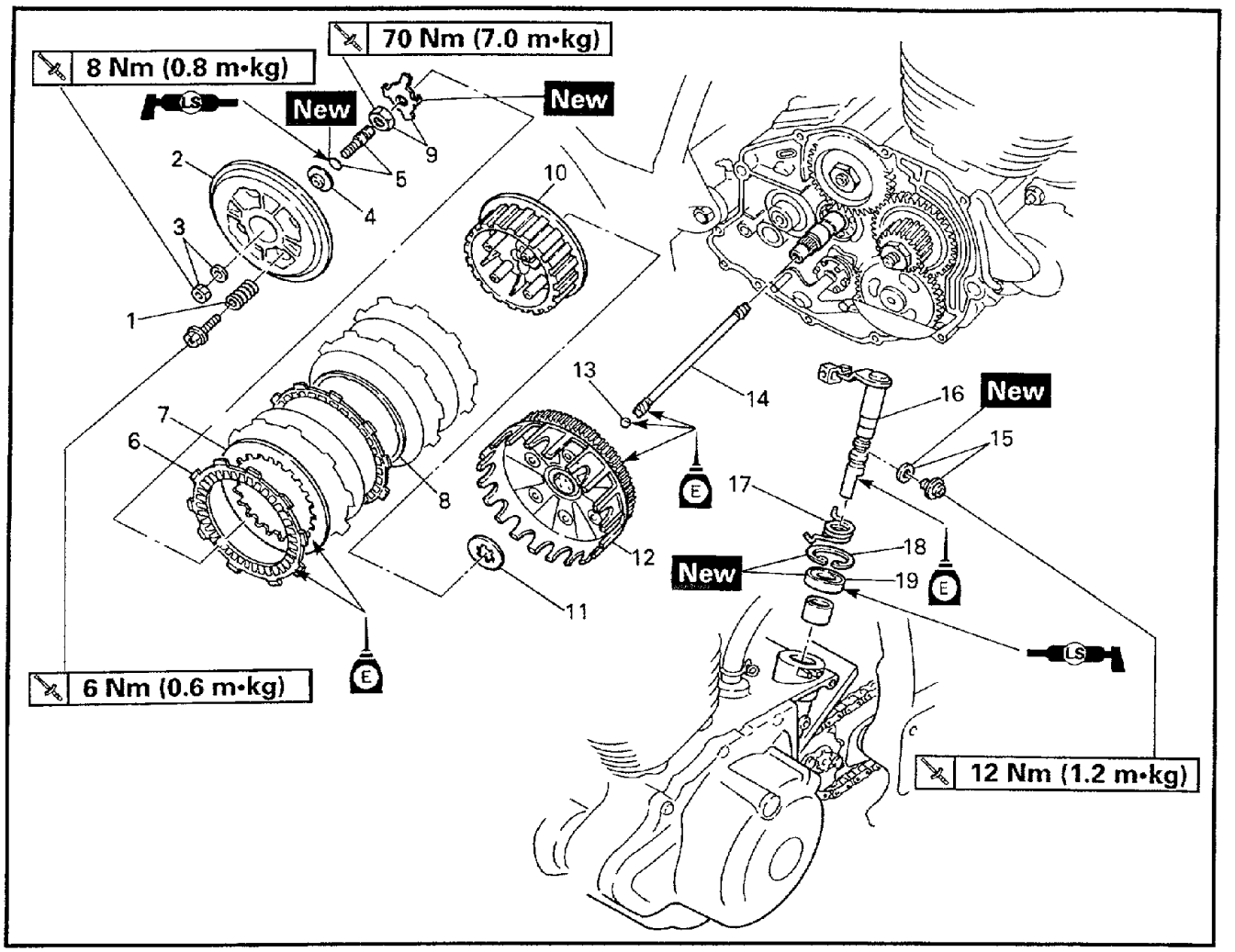
- Install the cylinder with one hand while compressing the piston rings with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.

CLUTCH
CRANKCASE COVER (RIGHT)

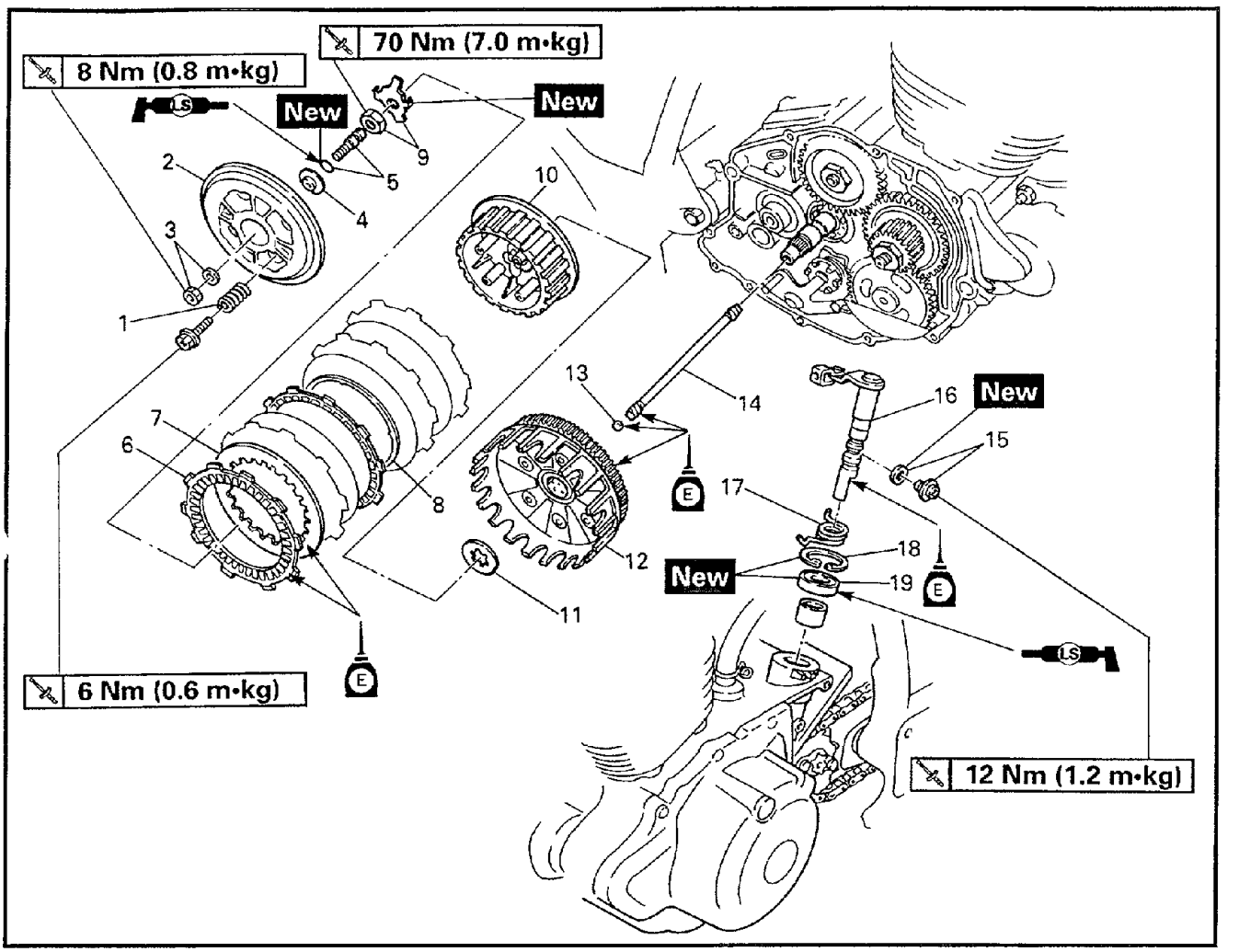


Order	Job name/Part name	Q'ty	Remarks
	Crankcase cover (right) removal		Remove the parts in order.
	Drain the engine oil		Refer to "ENGINE OIL REPLACEMENT" section in CHAPTER 3.
	Clutch cable		Refer to "CLUTCH ADJUSTMENT" section in CHAPTER 3.
1	Kick crank	1	
2	Rear brake rod	1	Refer to "REAR WHEEL, REAR BRAKE,SPROCKET AND DRIVE CHAIN" section in CHAPTER 6.
3	Foot rest (right)	1	
4	Rear brake pedal	1	
5	Crankcase cover (right)	1	
6	Crankcase cover gasket (right)	1	
7	Dowel pins	2	
			Reverse the removal procedure for installation.

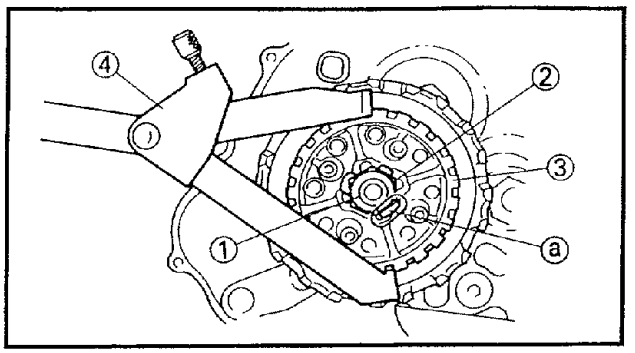
CLUTCH



Order	Job name/Part name	Q'ty	Remarks
	Clutch removal		Remove the parts in order.
	Sprocket cover		Refer to "ENGINE REMOVAL" section.
1	Clutch springs	4	
2	Pressure plate	1	Refer to "CLUTCH INSTALLATION"
3	Nut/Washer	1/1	section.
4	Push plate	1	
5	Push rod #1/O-ring	1/1	
6	Clutch plates	4	
7	Friction plates	5	
8	Cushion spring	1	
9	Nut/Lock washer	1/1	Refer to "CLUTCH REMOVAL/INSTAL-
10	Clutch boss	1	LATION" section.
11	Plate washer	1	Refer to "CLUTCH INSTALLATION"
12	Primary driven gear	1	section.



Order	Job name/Part name	Q'ty	Remarks
13	Ball	1	Refer to "CLUTCH INSTALLATION" section.
14	Push rod #2	1/1	
15	Push lever screw/Gasket	1	
16	Push lever axle	1	
17	Torsion spring	1	Refer to "CLUTCH INSTALLATION" section.
18	Circlip	1	
19	Oil seal	1	Reverse the removal procedure for installation.



SR401061

CLUTCH REMOVAL

1. Remove:
   - •Nut ① (clutch boss)
   - •Lock washer ②
   - •Clutch boss ③

   Straighten the lock washer tab ⓐ.

NOTE:

Loosen the clutch boss nut ① while holding the clutch boss with a clutch holding tool ④.

	Clutch holding tool: **90890-04086**

SR402181

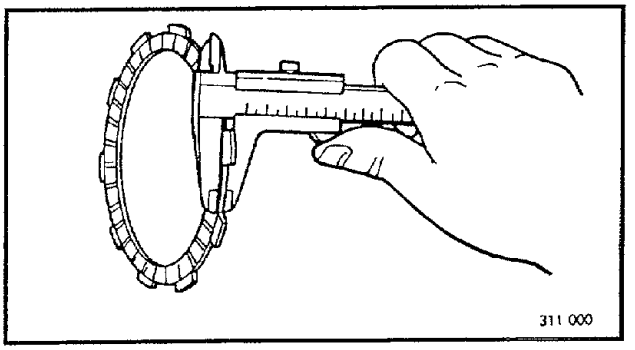
CLUTCH INSPECTION

1. Inspect:
   - •Friction plates

   Damage/wear → Replace the friction plates as a set.
2. Measure:
   - •Friction plate thickness

   Out of specification → Replace the friction plates as a set.

   Measure at four places.



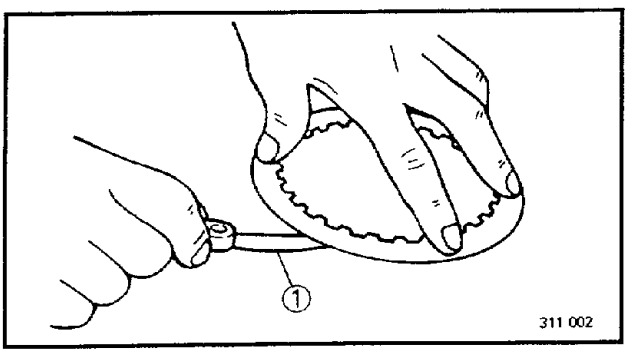
	Thickness (friction plate): **2.9 ~ 3.1 mm** **<Limit: 2.8 mm>**

3. Inspect:
   - •Clutch plates

   Damage → Replace the clutch plates as a set.
4. Measure:
   - •Clutch plate warpage

   Out of specification → Replace the clutch plates as a set.

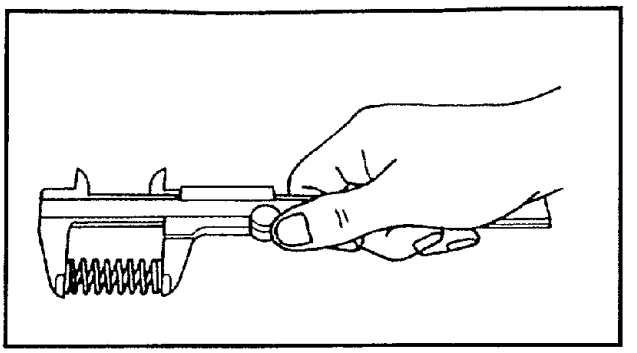
   Use a surface plate and a feeler gauge ①.



	Warp limit (clutch plate): **Less tan 0.2 mm**

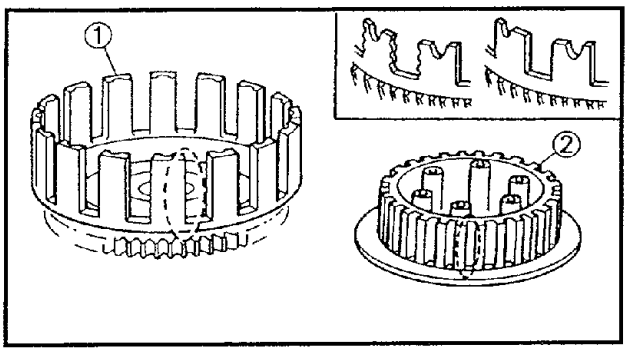
5. Inspect:
   - •Clutch springs

   Damage → Replace the clutch springs as a set.



6. Measure:
   •Free length (clutch spring) ⓐ
   Out of specification → Replace the clutch springs as a set.

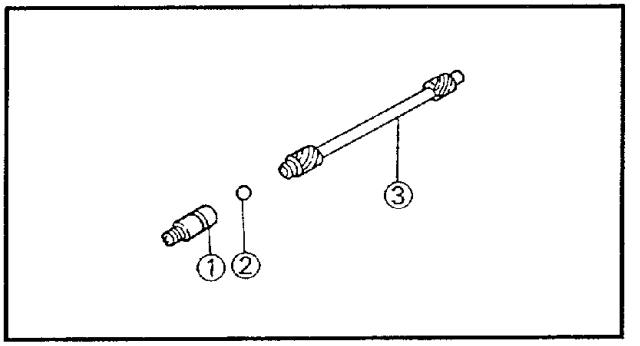
Free length (clutch spring):
37.3 mm
<Limit: 35.3 mm>



7. Inspect:
   •Dogs on the primary driven gear ①
   Scoring/wear/damage → Deburr or replace.
   •Clutch boss splines ②
   Scoring/wear/damage → Replace clutch boss.

NOTE:

Scoring on the clutch housing dogs and the clutch boss splines will cause erratic operation.



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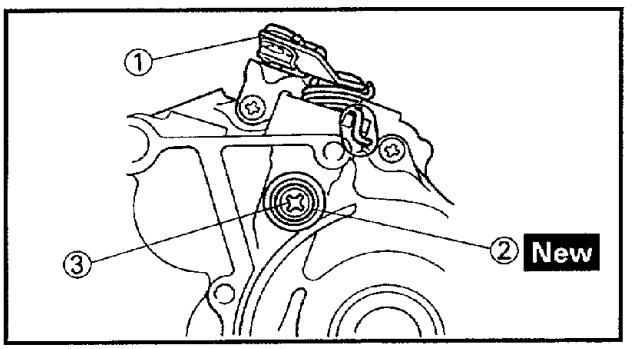
PUSH ROD INSPECTION

1. Inspect:
   •Push rod #1 ①
   •Ball ②
   •Push rod #2 ③
   Wear/crack/damage →Replace.



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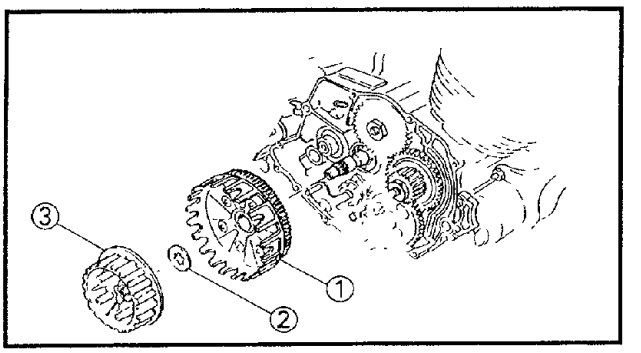
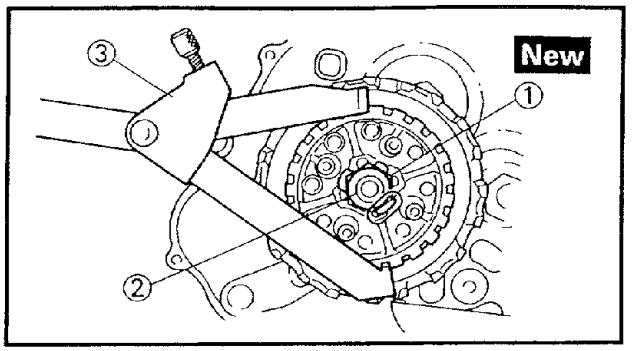
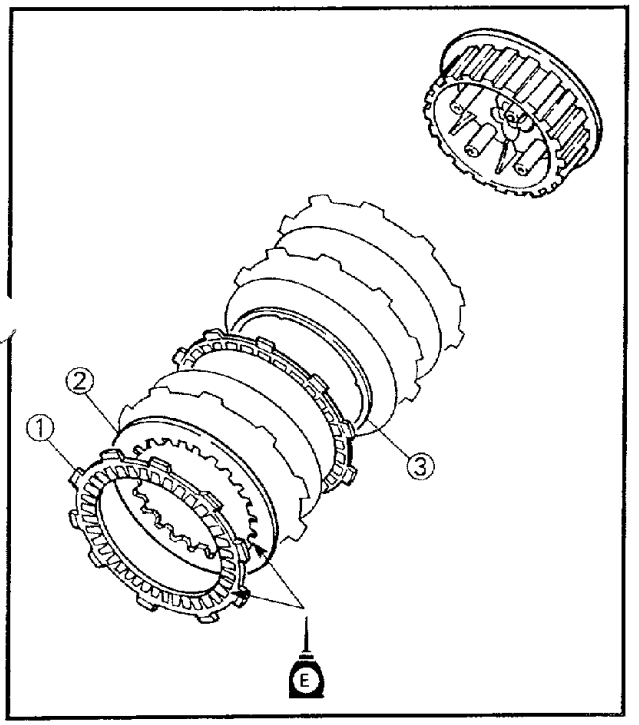
CLUTCH INSTALLATION

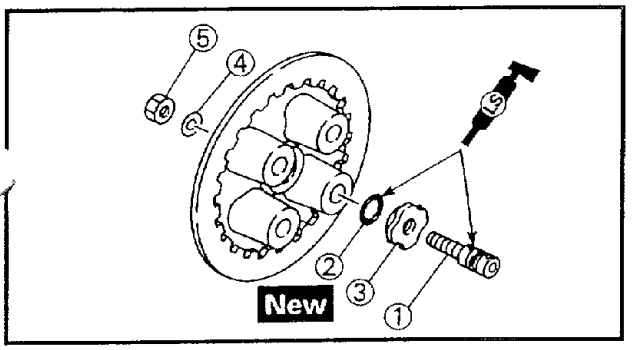
1. Install:
   •Push lever axle ①
   •Gasket ② **New**
   •Screw ③ **12 Nm (1.2 m•kg)**

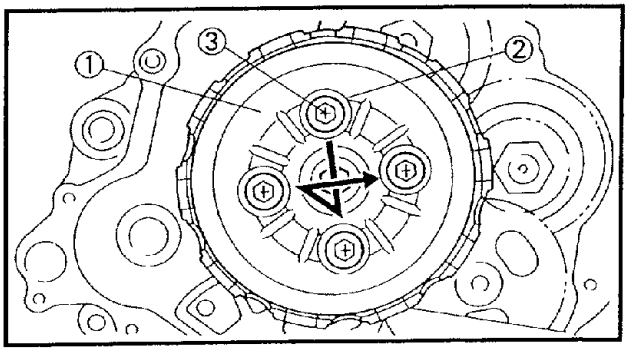


2. Install:
   •Primary driven gear ①
   •Plate washer ②
   •Clutch boss ③









3. Install:
   - Lock washer ① New
   - Nut ② (clutch boss)

   70 Nm (7.0 m•kg)

NOTE:

Install the clutch boss nut ② while holding the clutch boss with a clutch holding tool ③.

Clutch holding tool:
90890-04086

4. Bend:
   - Lock washer tab
     (along a flat side of the end)
5. Install:
   - Friction plate ①
   - Clutch plate ②
   - Cushion spring ③

NOTE:

- Install the clutch plates and friction plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.
- Install the cushion spring must be placed on inside of the third friction plate.
- Coat all clutch and friction plates with engine oil before installation.

6. Install:
   - Push rod #2
   - Ball

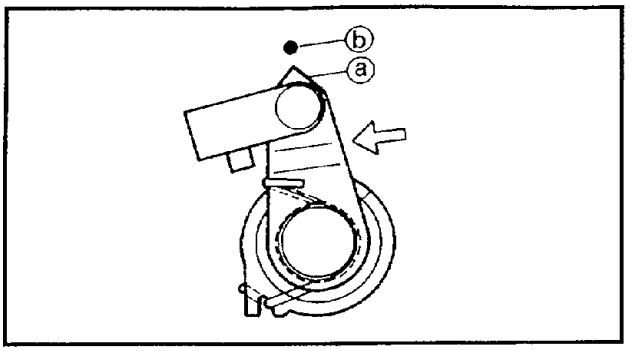
7. Install:
   - Push rod #1 ①
   - O-ring ② New
   - Push Plate ③
   - Plate washer ④
   - Nut ⑤ (push rod #1)

8. Install:
   - Pressure plate ①
   - Compression springs ②
   - Bolts ③ (clutch springs)

   6 Nm (0.6 m•kg)

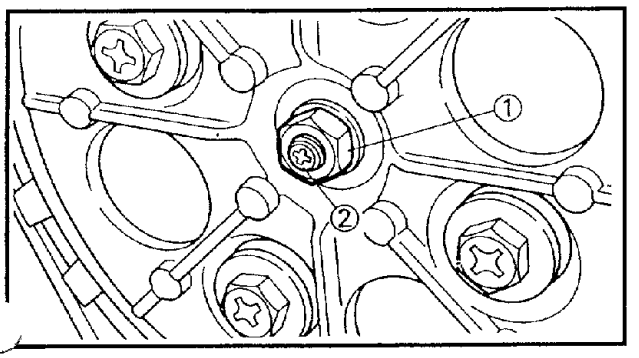
NOTE:

Tighten the clutch spring bolts in stage, using a crisscross pattern.



9. Check:
   • Push lever position
   Push the push lever assembly in the arrow direction and make sure that match marks are be aligned ‣ Adjust.

ⓐ Match mark on the push lever assembly
ⓑ Match mark on the crankcase



10. Adjust:
   • Push lever position

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Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② clockwise or counter-clockwise to match alignment marks.
- Hold the adjuster to prevent it from moving and tighten the locknut to specification.

CAUTION:

Take care not to overtighten the adjuster ② and to remove the free play between both push rods.

- Tighten the lock nut ①. **8 Nm (0.8 m•kg)**

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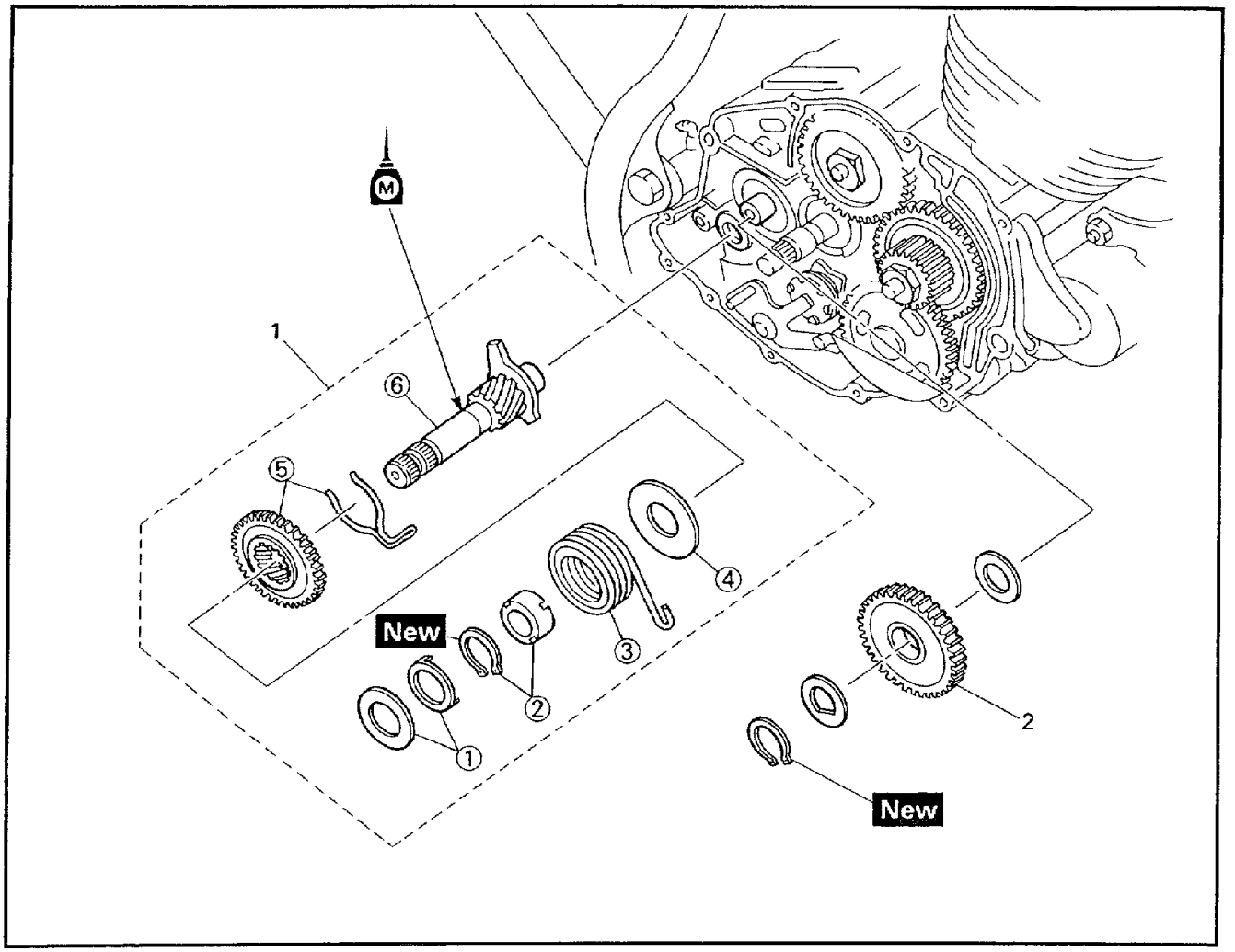
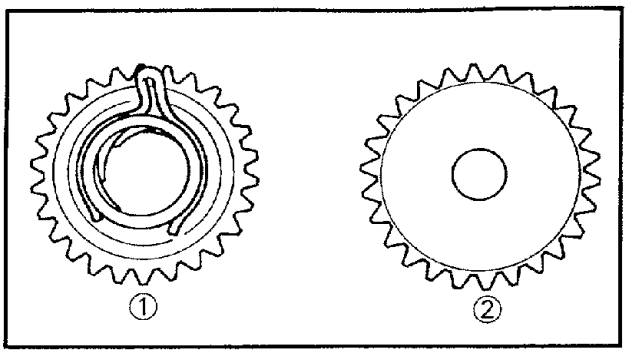
KICK STARTER



Order	Job name/Part name	Q'ty	Remarks
	Kick starter removal		Remove the parts in order.
	Crankcase cover		Refer to "CLUTCH" section.
	Clutch		
1	Kick starter	1	Refer to "KICK STARTER INSTALLATION" section
2	Kick idle gear	1	
			Reverse the removal procedure for installation.
	Kick starter disassembly		Disassemble the parts in order.
①	Washer/special washer	1/1	
②	Circlip/Cover (spring)	1/1	
③	Spring	1	
④	Washer	1	
⑤	Kick gear/Clip	1/1	
⑥	Kick axle	1	
			Reverse the disassemble procedure for assembly.



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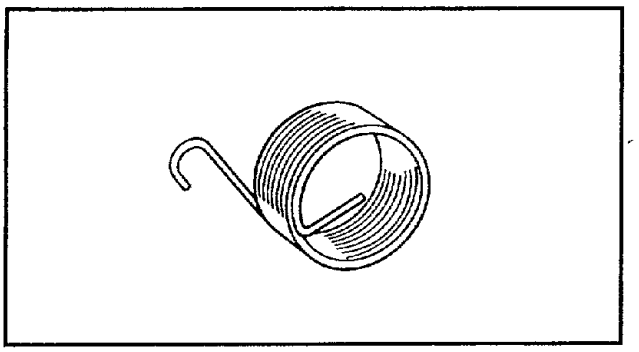
KICK STARTER INSPECTION

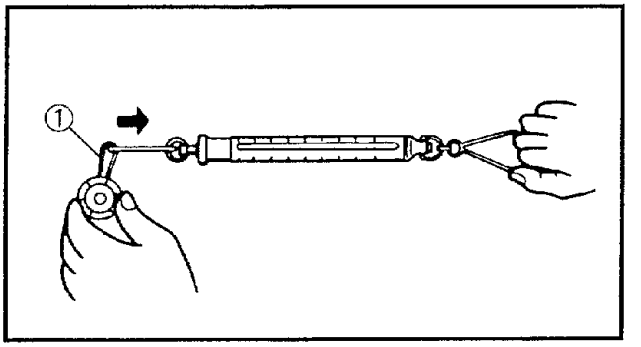
1. Inspect:
   - Gear teeth (kick gear) ①
   - Gear teeth (kick idle gear) ②

   Wear/damage → Replace.



2. Inspect:
   - Torsion spring

   Wear/crack → Replace.

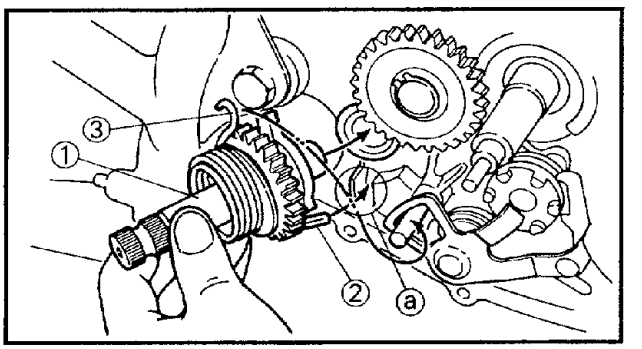


3. Measure:
   - Kick clip friction force (torsion spring ①)

   Out of specification → Replace.

   Use a spring gauge.

Kick clip friction force:
0.65 ~ 1.05 kg



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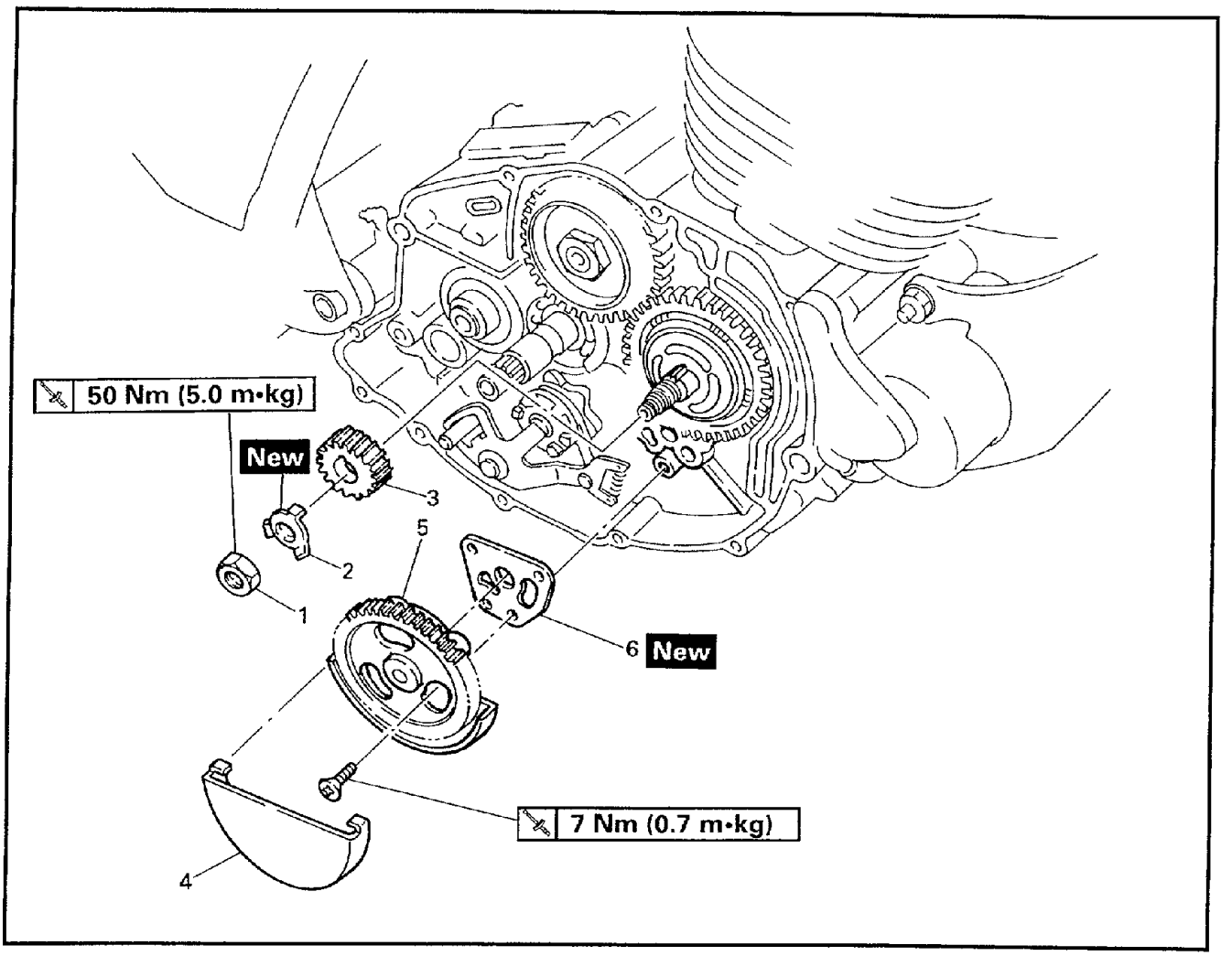
KICK STARTER INSTALLATION

1. Install:
   - Kick axle assembly ①
   - Kick gear clip ②
   - Torsion spring ③
   - Kick idle gear

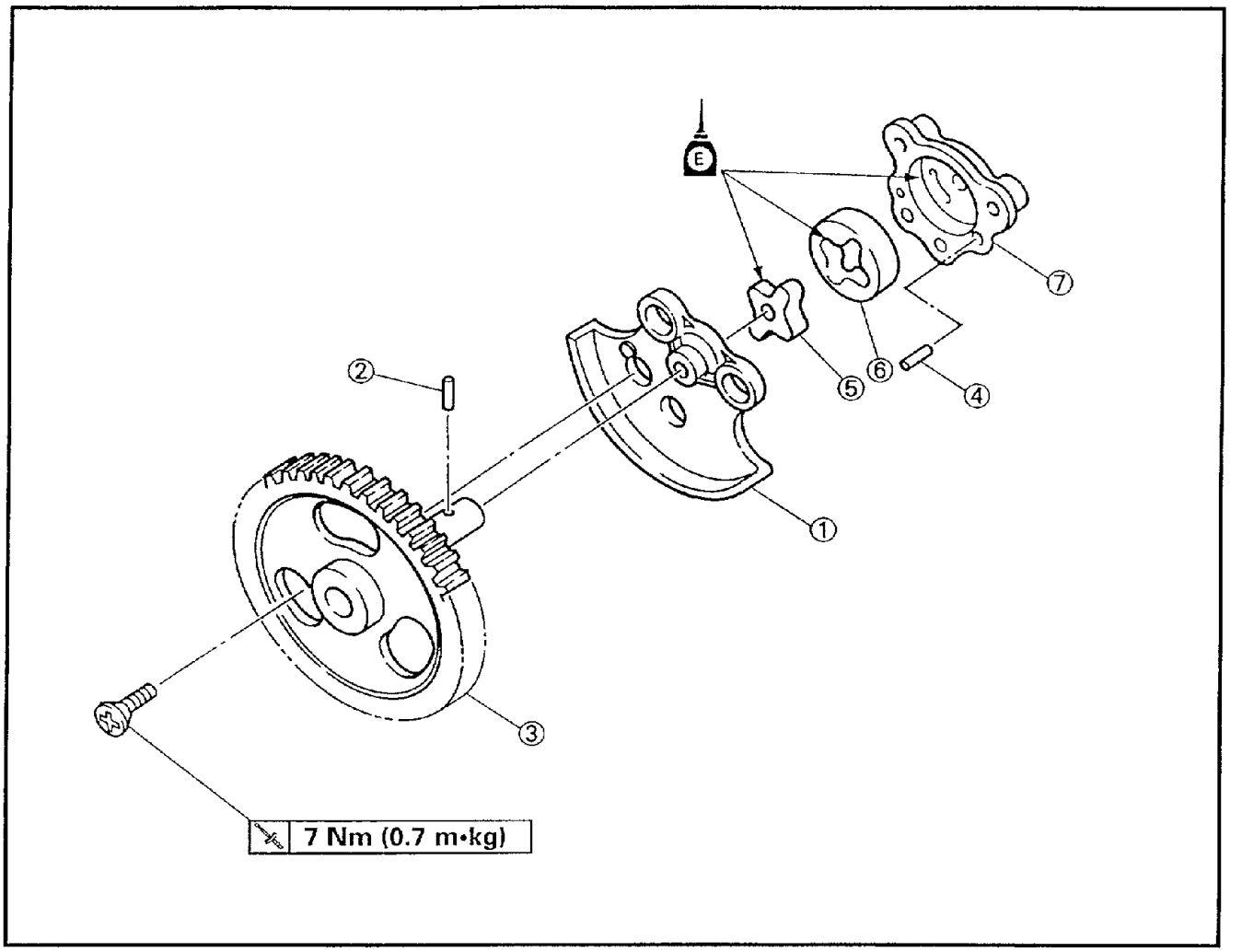
NOTE:

Turn the torsion spring clockwise and hook into the proper hole ⓐ in the crank case.

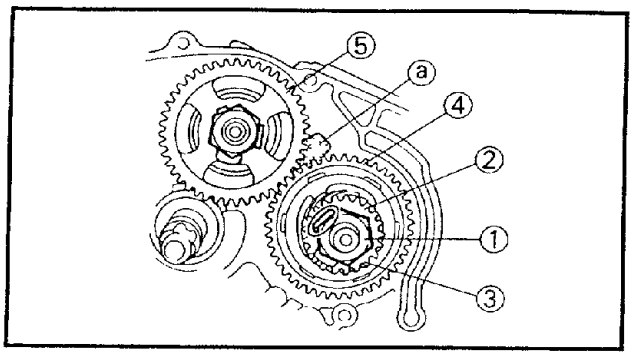
OIL PUMP



Order	Job name/Part name	Q'ty	Remarks
	Oil pump removal		Remove the parts in order.
	Clutch		Refer to "CLUTCH" section.
	Kick starter		Refer to "KICK STARTER" section.
1	Nut (primary drive gear)	1	Refer to "PRIMARY DRIVE GEAR REMOVAL/INSTALLATION" section.
2	Lock washer	1	
3	Primary drive gear	1	
4	Oil pump cover	1	
5	Oil pump assembly	1	Refer to "OIL PUMP INSTALLATION" section.
6	Gasket (oil pump cover)	1	Reverse the removal procedure for installation.



Order	Job name/Part name	Q'ty	Remarks
	Oil pump disassembly		Disassemble the parts in order.
①	Oil pump housing	1	
②	Dowel pin	1	
③	Oil pump driven gear	1	
④	Dowel pins	2	
⑤	Inner rotor	1	
⑥	Outer rotor	1	
⑦	Housing	1	Reverse the disassembly procedure for assembly.



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PRIMARY DRIVE GEAR REMOVAL

1. Remove:

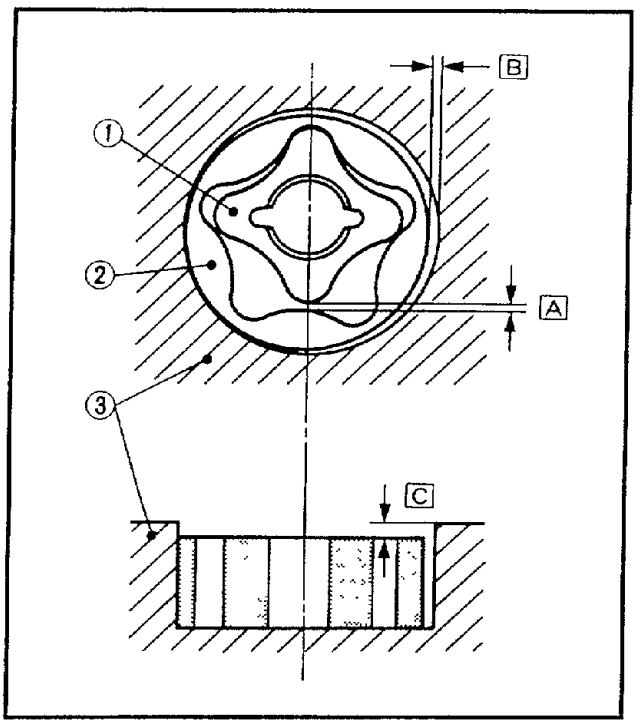
NOTE:

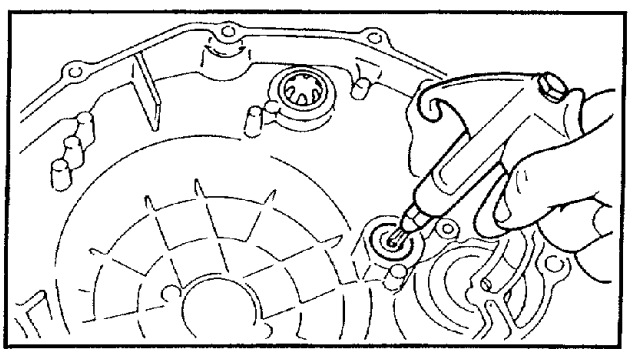
Straighten the lock washer tab.

- Nut (primary drive gear) ①
- Lock washer ②
- Primary drive gear ③

NOTE:

Place a folded aluminium plate or copper washer ⓐ between the teeth of the balancer drive gear ④ and balancer driven gear ⑤.





T402140

OIL PUMP INSPECTION

1. Measure:
   - Tip clearance [A]
     (between the inner rotor ① and the outer rotor ②)
   - Side clearance [B]
     (between the outer rotor ② and the pump housing ③)
     Out of specification → Replace the oil pump assembly.
   - Housing and rotor clearance [C]
     (between the pump housing ③ and the rotors ①, ②.)
     Out of specification → Replace the oil pump assembly.

Tip clearance [A]:
0.15 mm or less <Limit: 0.15 mm>
Side clearance [B]:
0.10 ~ 0.15 mm <Limit: 0.35 mm>
Housing and rotor clearance [C]:
0.03 ~ 0.09 mm <Limit: 0.14 mm>

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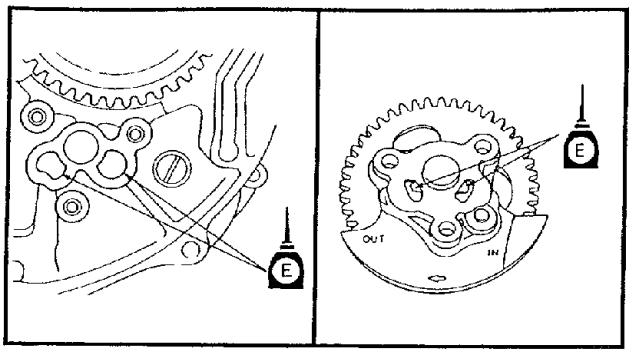
OIL DELIVERY PASSAGE INSPECTION (CRANK CASE COVER (right))

1. Check:
   - Oil delivery passage
     Blockage → Blow by the compressed air.

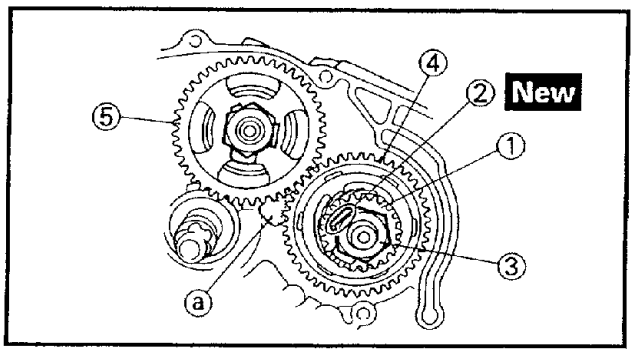


SR404010

OIL PUMP INSTALLATION

1. Lubricate:
   - Oil delivery passage (crankcase right)
   - Oil pump assembly

	Recommended lubricant : Engine oil



SR404140

PRIMARY DRIVE GEAR INSTALLATION

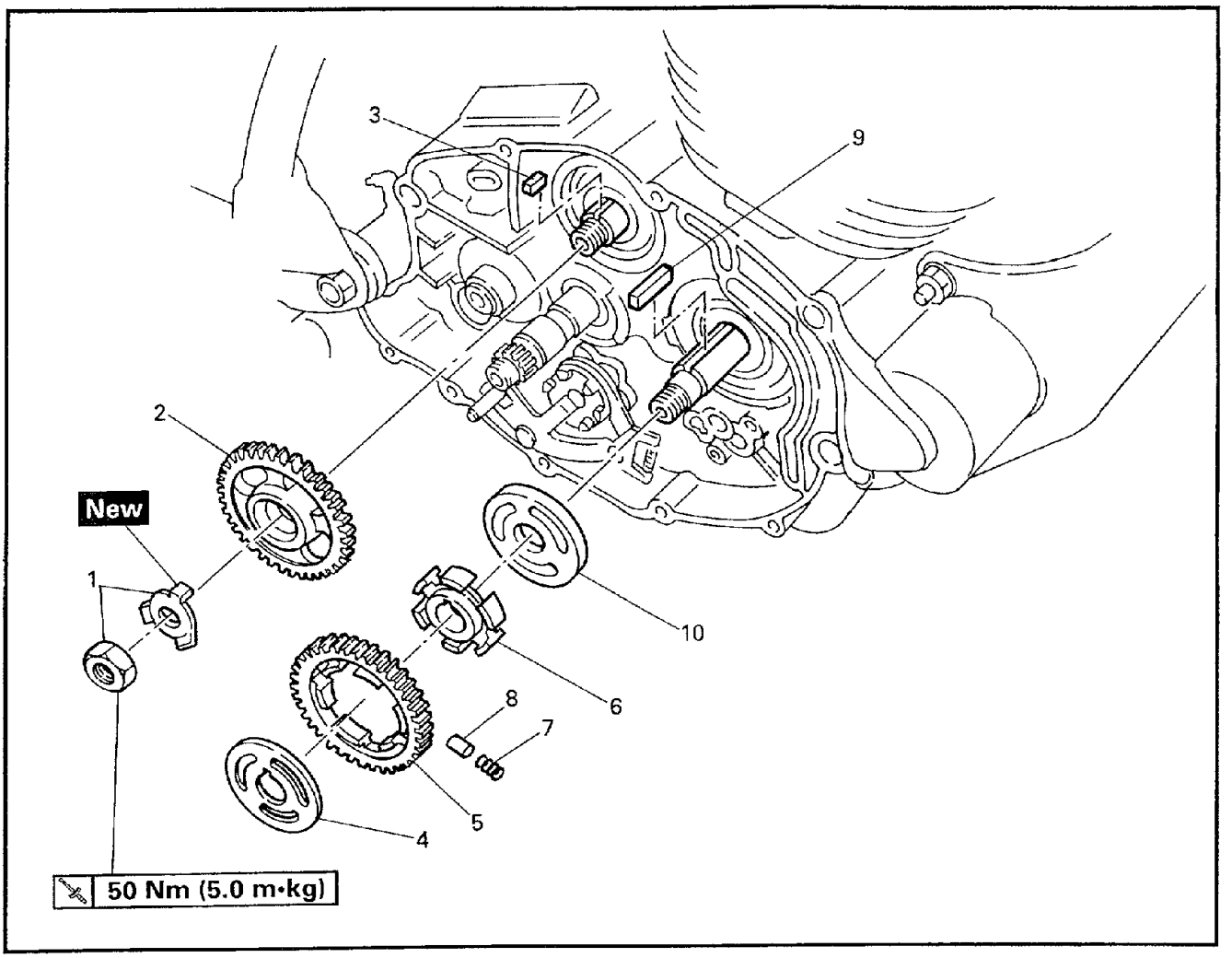
1. Install:
   - Primary drive gear ①
   - Lock washer ② **New**
   - Nut (primary drive gear) ③

50 Nm (5.0 m•kg)

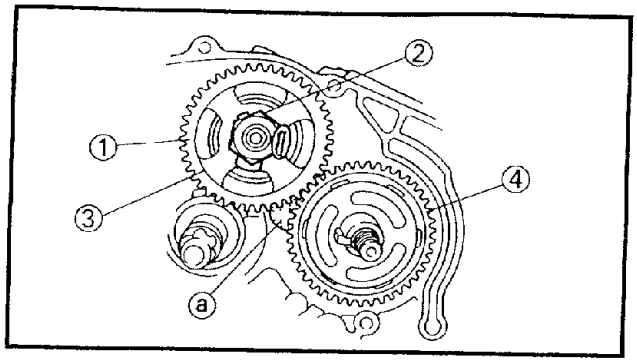
NOTE:

- Place a folded aluminium plate or copper washer ⓐ between the teeth of the balancer drive gear ④ and balancer driven gear ⑤.
- Bend the lock washer tab, after tighten the nut flats.

BALANCER GEAR



Order	Job name/Part name	Q'ty	Remarks
	Balancer gear removal		Remove the parts in order.
	Clutch		Refer to "CLUTCH" section.
	Kick starter		Refer to "KICK STARTER" section
	Primary drive gear/oil pump		Refer to "OIL PUMP" section.
1	Nut/Lock washer	1/1	Refer to "BALANCER DRIVEN GEAR
2	Balancer driven gear	1	REMOVAL/BALANCER GEAR INSTALLATION" section.
3	Woodruff key	1	
4	Claw washer	1	
5	Balancer drive gear	1	Refer to "BALANCER DRIVE GEAR ASSEMBLY" section.
6	Buffer boss	1	
7	Compression springs	6	
8	Dowel pins	3	
9	Woodruff key	1	
10	Plate washer	1	
			Reverse the removal procedure for installation.



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BALANCER DRIVEN GEAR REMOVAL

1. Remove:

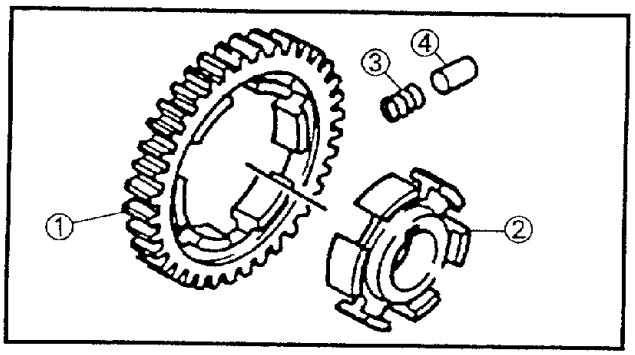
NOTE:

Straighten the lock washer tab.

- Nut (balancer driven gear) ①
- Lock washer ②
- Balancer driven gear ③

NOTE:

Place a folded aluminium plate or copper washer ⓐ between the teeth of the balancer drive gear ④ and balancer driven gear ③.



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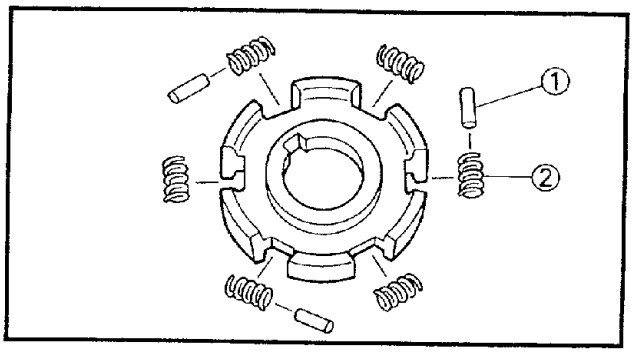
BALANCER DRIVE GEAR INSPECTION

1. Inspect:
   - Balancer drive gear ①
   - Buffer boss ②
   - Compression spring ③
   - Dowel pins ④

   Wear/Pitting/Scratches → Replace.



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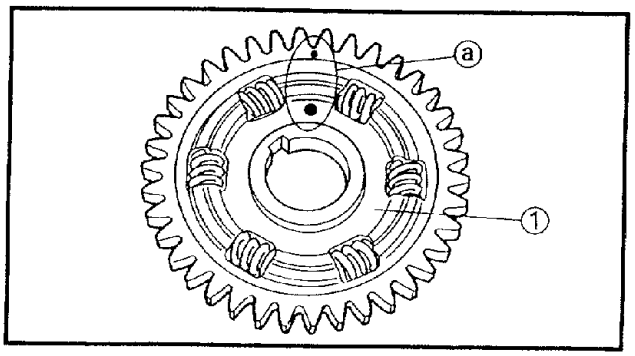
BALANCER DRIVE GEAR ASSEMBLY

1. Assembly:
   - Dowel pins ①
   - Compression springs ②

NOTE:

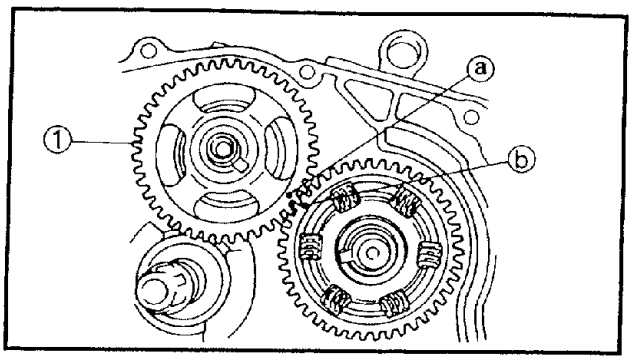
Install the dowel pins and compression springs alternately as shown as.

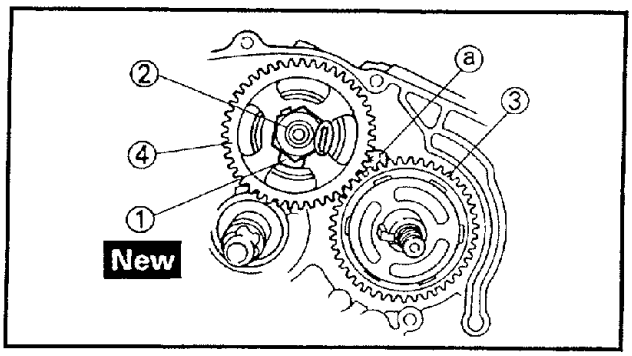


2. Install:
   - Buffer boss ①

NOTE:

Align the punched mark ⓐ on the buffer boss with the one on the balancer drive gear.





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BALANCER GEAR INSTALLATION

1. Install:
   - Balancer driven gear ①

NOTE:

Install the balancer driven gear, then mesh the balancer driven gear match mark ⓐ and balancer drive gear assembly match mark ⓑ.

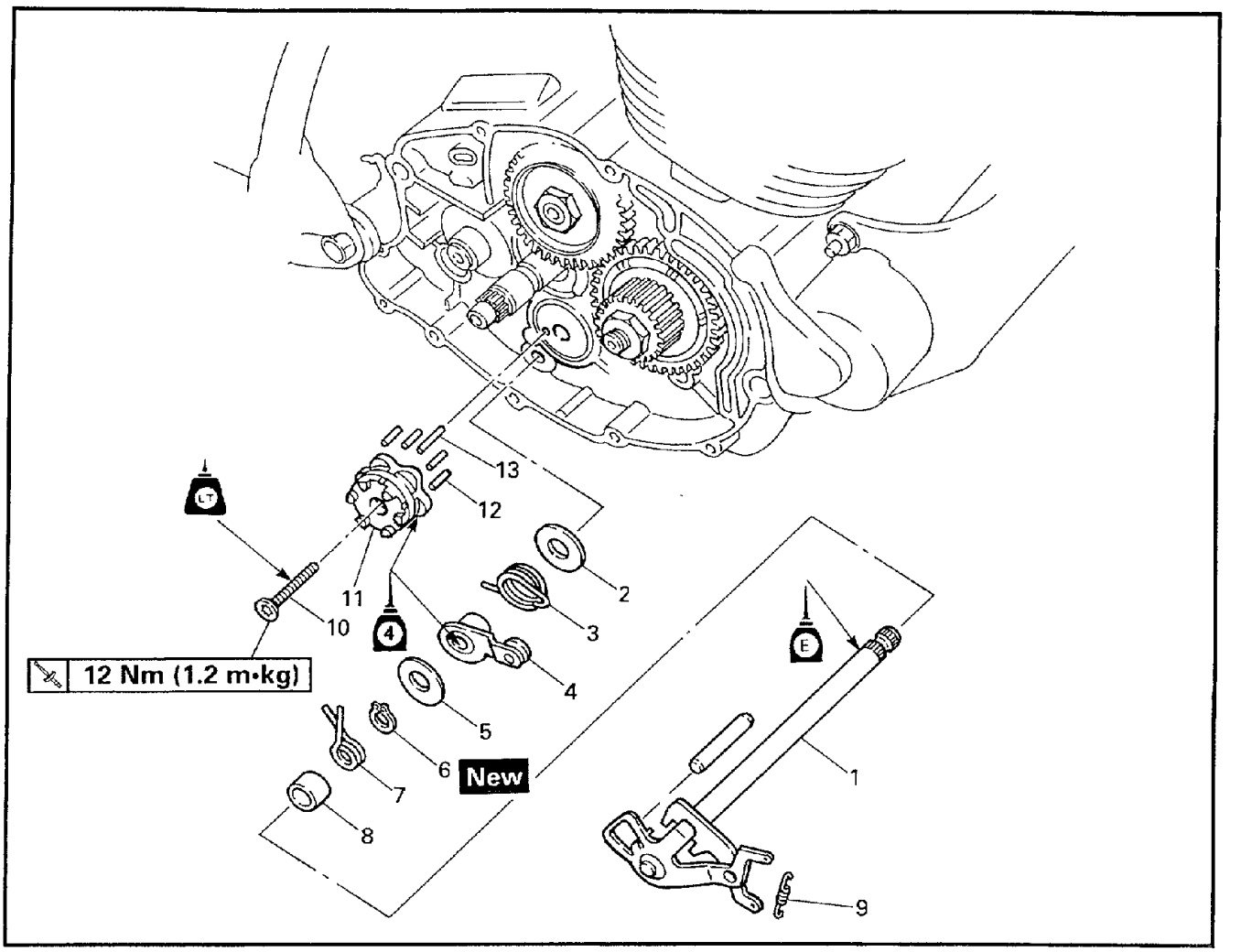
2. Install:
   - Lock washer ① **New**
   - Nut (balancer drive gear) ②

50 Nm (5.0 m·kg)

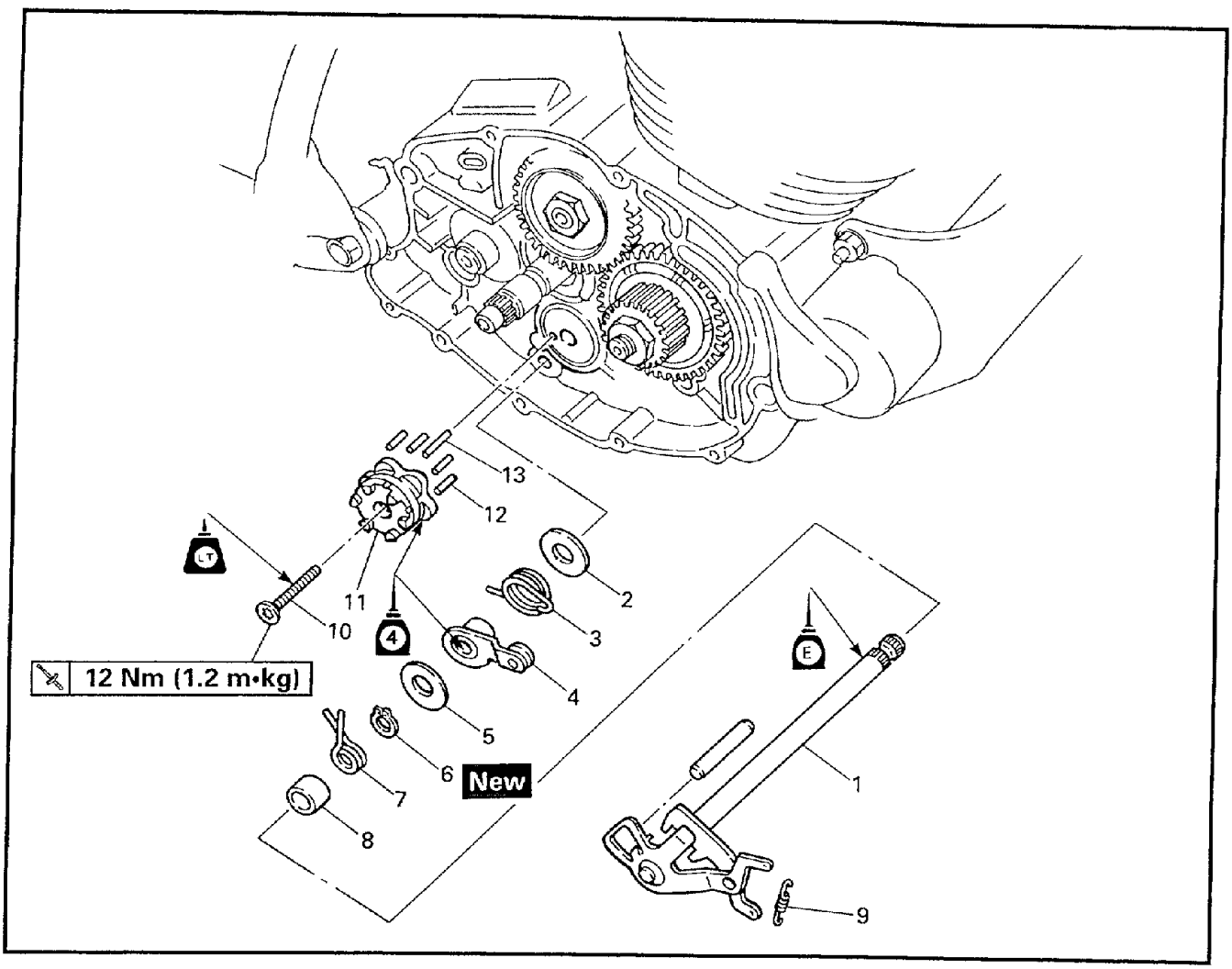
NOTE:

- Place a folded aluminium plate or copper washer ⓐ between the teeth of the balancer drive gear ③ and balancer driven gear ④.
- Bend the lock washer tab, after tighten the nut flats.

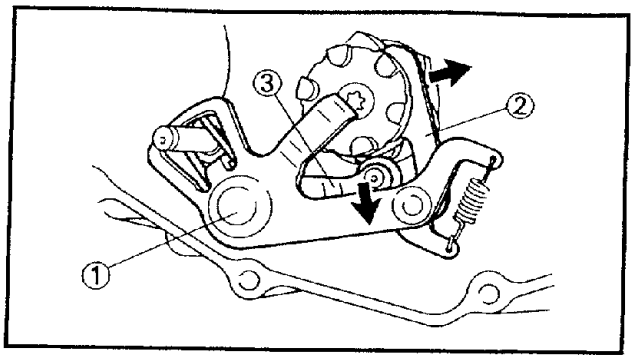
SHIFT SHAFT AND SEGMENT



Order	Job name/Part name	Q'ty	Remarks
	Shift shaft and segment removal		Remove the parts in order.
	Clutch		Refer to "CLUTCH" section.
	Kick starter		Refer to "KICK STARTER" section.
	Shift pedal		Refer to "ENGINE REMOVAL" section.
1	Shift shaft	1	Refer to "SHIFT SHAFT REMOVAL/ INSTALLATION" section.
2	Plate washer	1	
3	Torsion spring	1	
4	Stopper lever	1	
5	Plate washer	1	
6	Circlip	1	
7	Torsion spring	1	
8	Collar	1	
9	Tension spring	1	



Order	Job name/Part name	Q'ty	Remarks
10	Screw	1	
11	Segment	1	Refer to "SEGMENT INSTALLATION" section.
12	Dowel pins (short length)	4	
13	Dowel pin (long length)	1	
			Reverse the removal procedure for installation.



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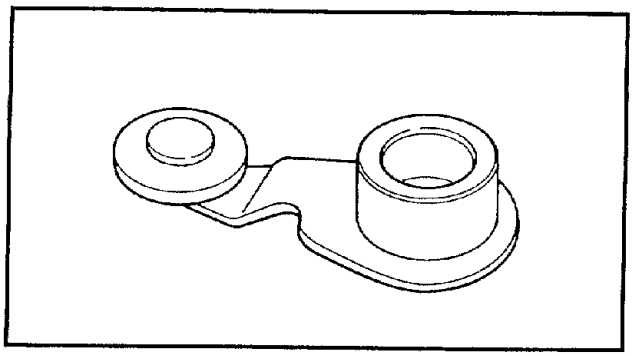
SHIFT SHAFT REMOVAL

1. Remove:
   - Shift shaft assembly ①

NOTE:

Push the shift lever arm ② and the stopper lever ③ to the arrow direction and remove them from the segment.



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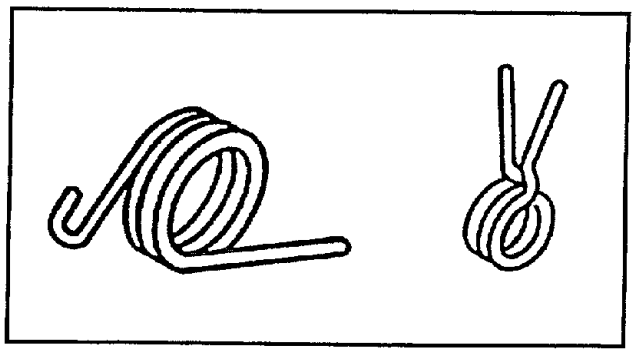
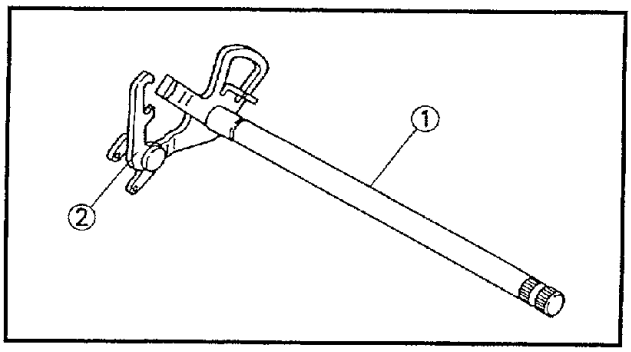
SHIFT SHAFT INSPECTION

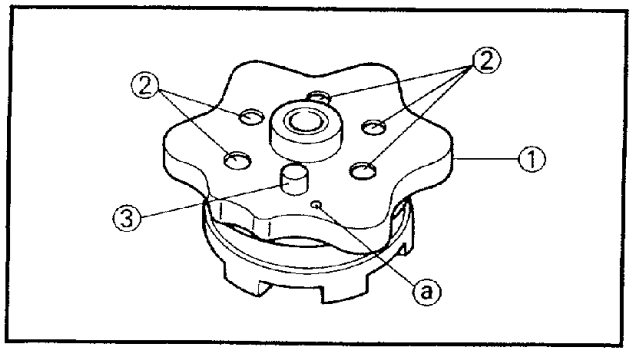
1. Inspect:
   - Stopper lever
     Roller turns roughly → Replace.
     Bends/damage → Replace.



2. Inspect:
   - Torsion springs (stopper lever and shift arm)
     Wear/damage → Replace.



3. Inspect:
   - Shift shaft assembly ①
   - Shift lever ②
     Bends/wear/damage → Replace.



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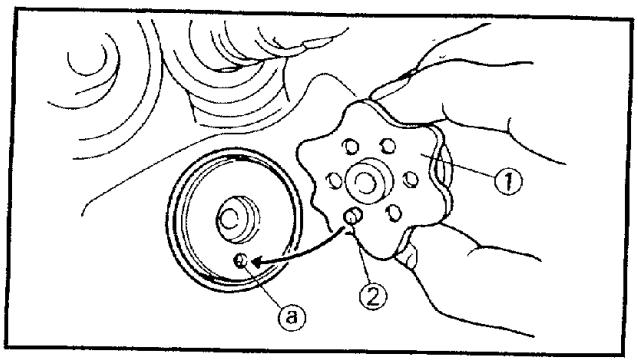
SEGMENT INSTALLATION

1. Install:
   - Segment ①
   - Dowel pins ② (short length)
   - Dowel pin ③ (long length)

NOTE:

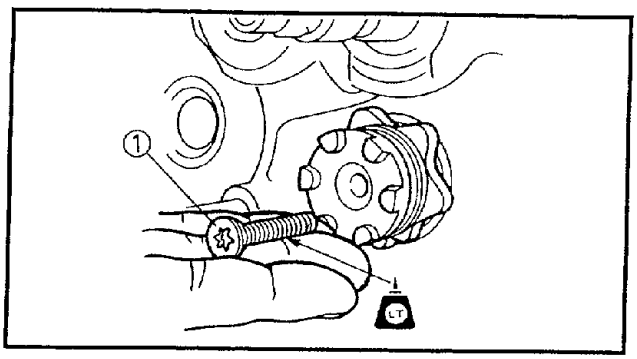
Install the dowel pin ③ (long length) into the hole beside the match mark ⓐ position.



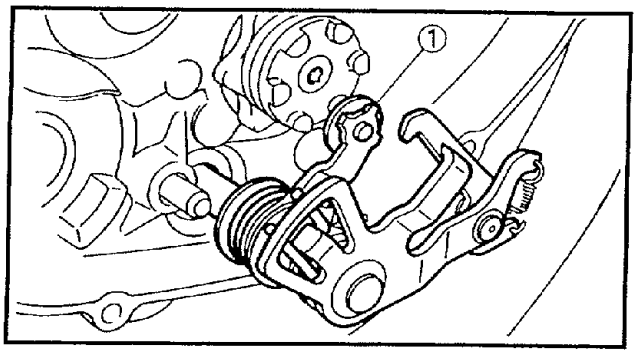
2. Install:
   •Segment ①

NOTE:

Fit the dowel pin ② (long length) on the segment to the locating hole ⓐ on the sift cam and install the segment.



3. Tighten:
   •Screw ① LT — 12 Nm (1.2 m•kg)



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SIFT SHAFT INSTALLATION

1. Install:
   •Sift shaft assembly

****

Installing steps:

- Set the stopper lever and return spring to the shift shaft.
- Mesh the stopper lever ① with the shift cam segment.
- Install the shift lever ② to the shift cam segment.
- After installing the shift shaft, check the shift cam for smooth operation by turning the shift shaft with your hand.

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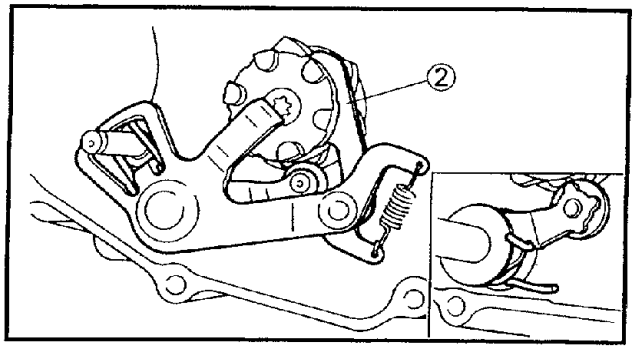
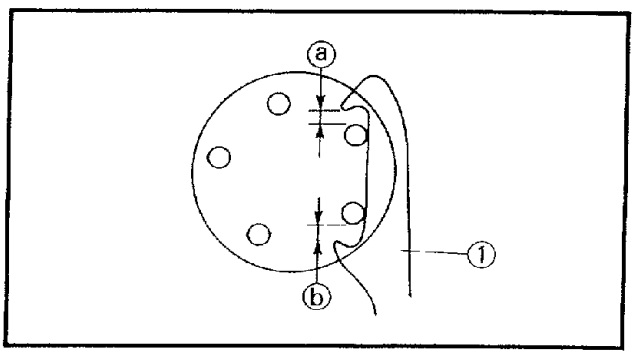
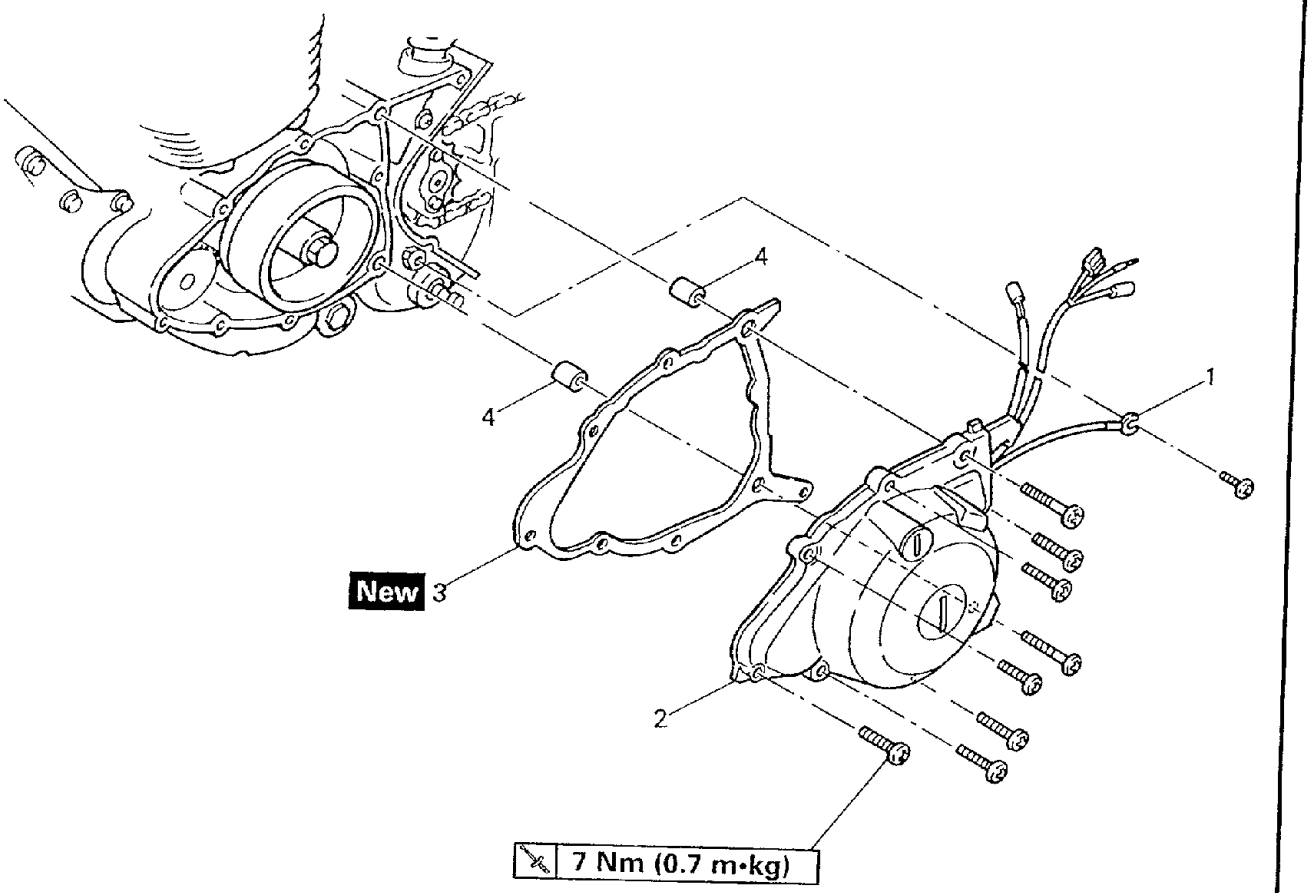




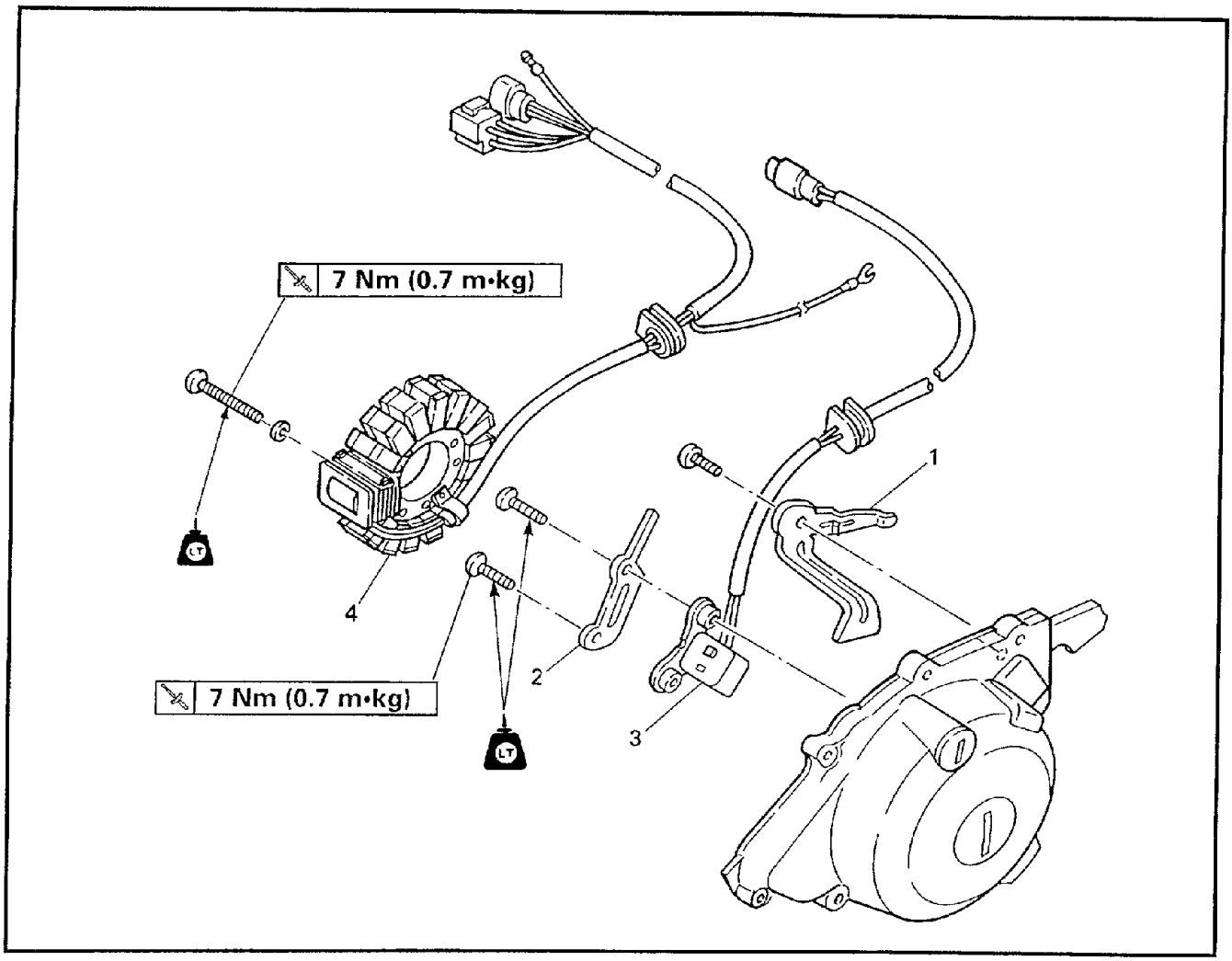
2. Check:
   •Shift lever ① position
   Gaps ⓐ and ⓑ are not equal ‣ Replace the defective parts.

CDI MAGNETO AND STARTER CLUTCH
CRANKCASE COVER (LEFT)



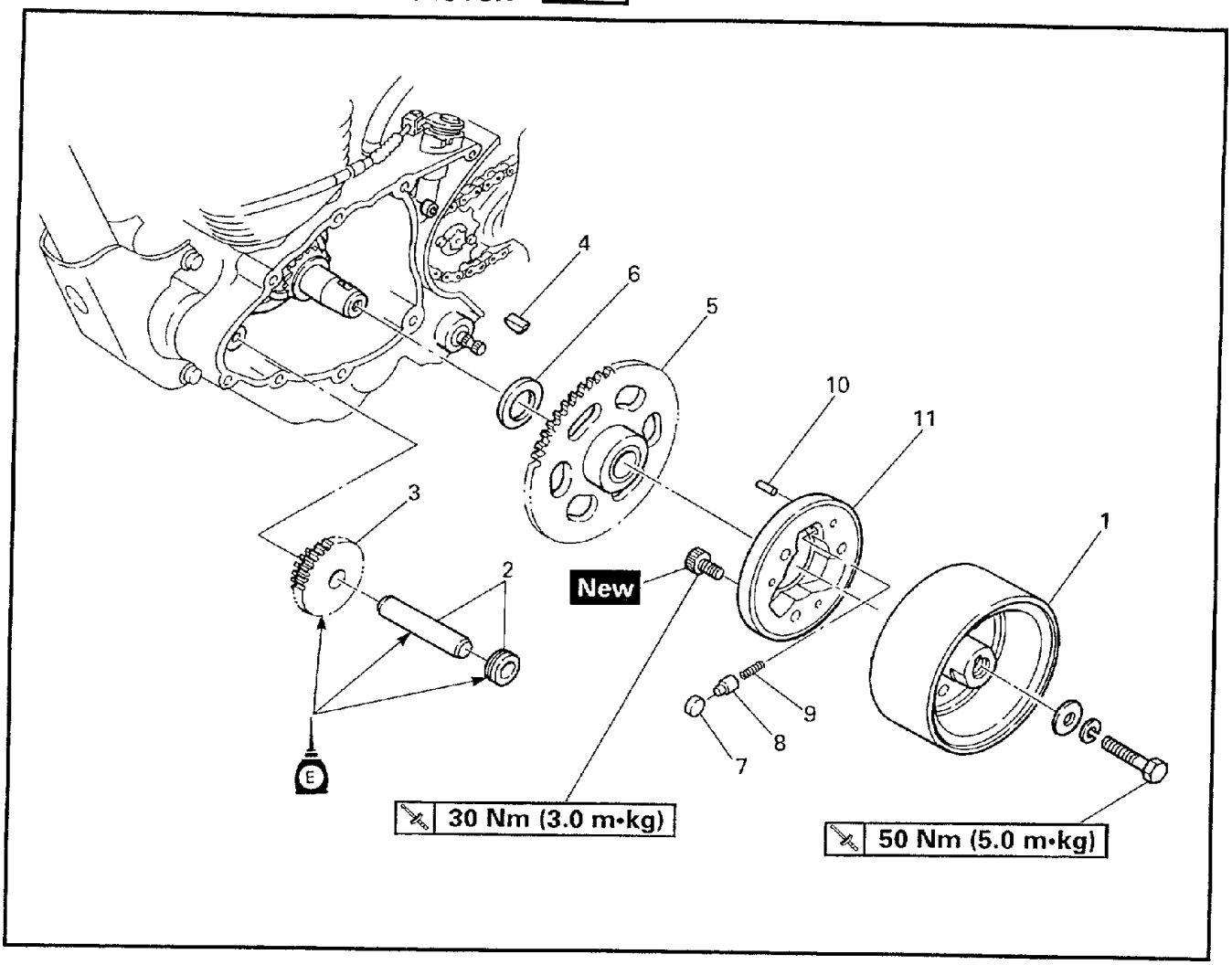
Order	Job name/Part name	Q'ty	Remarks
	Crankcase cover (left) removal		Remove the parts in order.
	Drain the engine oil		Refer to "ENGINE OIL REPLACEMENT" section in CHAPTER 3.
	Side cover (left)		Refer to "SIDE COVER, SEAT AND FUEL TANK" section in CHAPTER 3.
	Fitting plate/drive sprocket cover CDI magneto lead couplers		Refer to "ENGINE REMOVAL" section.
			NOTE:
1	Neutral switch lead connector	1	Disconnect.
2	Crankcase cover (left)	1	
3	Gasket	1	
4	Dowel pins	2	
			Reverse the removal procedure for installation.

PICKUP COIL AND STATOR COIL

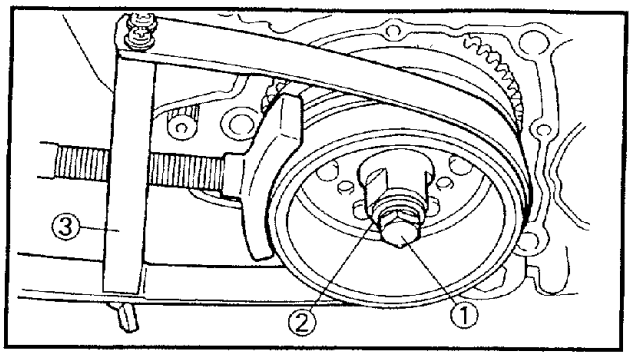


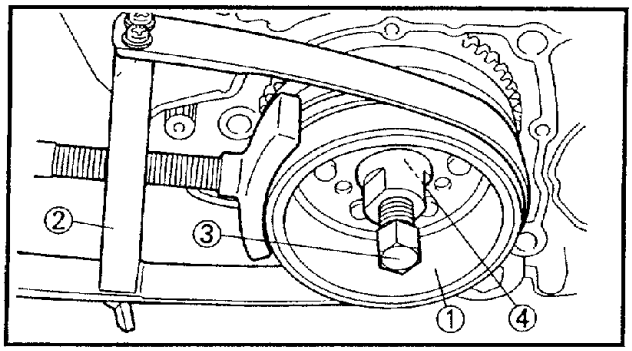
Order	Job name/Part name	Q'ty	Remarks
	Pickup coil and stator coil removal		Remove the parts in order.
1	Clamp (stator coil)	1	
2	Clamp (pickup coil)	1	
3	Pickup coil	1	
4	Stator coil	1	
			Reverse the removal procedure for installation.

CDI MAGNETO AND STARTER CLUTCH



Order	Job name/Part name	Q'ty	Remarks
	CDI magneto and starter clutch removal		Remove the parts in order.
	Sprocket cover		Refer to "ENGINE REMOVAL" section.
1	CDI magneto	1	Refer to "CDI MAGNETO REMOVAL/ INSTALLATION" section.
2	Idle shaft/collar	1	
3	Starter idle gear	1	
4	Woodruff key	1	Refer to "CDI MAGNETO INSTALLATION" section.
5	Starter wheel gear	1	
6	Shim	1	
7	Dowel pins (Inner)	3	Refer to "STARTER CLUTCH INSTALLATION" section.
8	Spring caps	3	
9	Compression springs	3	
10	Dowel pins (outer)	3	
11	Starter clutch	1	
			Reverse the removal procedure for installation.





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CDI MAGNETO REMOVAL

1. Remove:
   - Bolt ① (magneto)
   - Plain washer ②

NOTE:

- Loosen the bolt (magneto) ① while holding the rotor with a sheave holder ③.
- Do not allow the sheave holder to touch the projection on the magneto.

	**Sheave holder:** **90890-01701**

2. Remove:
   - CDI magneto assembly ①
   - Woodruff key

NOTE:

Remove the magneto using sheave holder ②, rotor puller ③ and rotor puller attachment ④.

	**Rotor puller:** **90890-01080** **Rotor puller attachment:** **90890-04052**

SR402163

STARTER CLUTCH INSPECTION

1. Check:
   - Starter clutch operation
     Push the dowel pins to the arrow direction.
     Unsmooth operation → Replace.

****

Checking steps:

- Hold the starter clutch.
- When turning the starter wheel gear clockwise ⓐ, the starter clutch and the starter wheel gear should be engaged.
- If not, the starter clutch is faulty. Replace it.
- When turning the starter wheel gear counterclockwise ⓑ, it should turn freely.
- If not, the starter clutch is faulty. Replace it.

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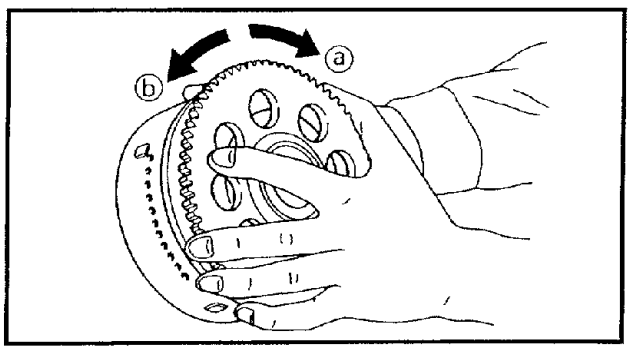
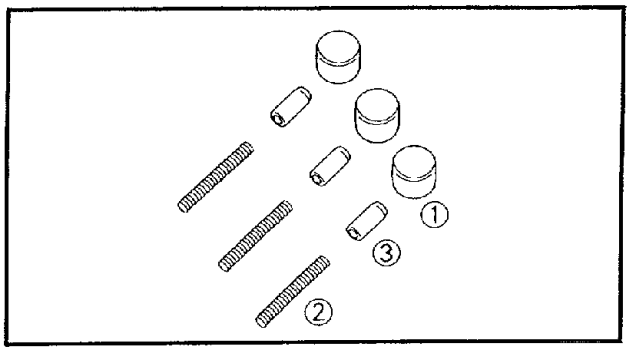
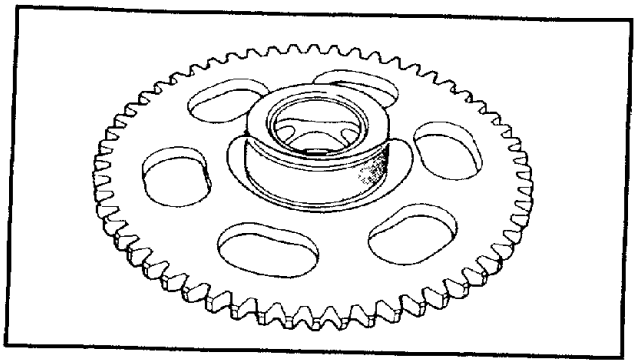
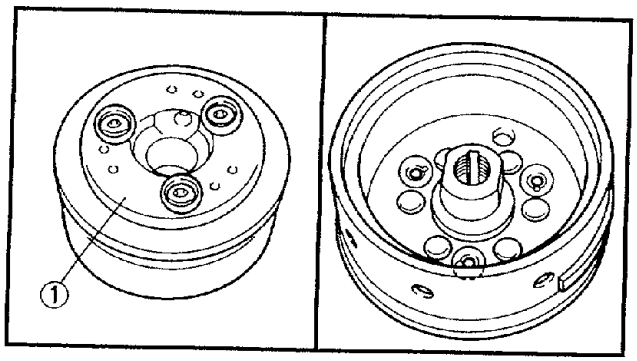
2. Inspect:
   - Dowel pins ①
   - Compression springs ②
   - Spring caps ③
     Wear/Damage → Replace.







3. Inspect:
   - Starter wheel gear (contacting surface)
     Pitting/Wear/Damage→Replace.



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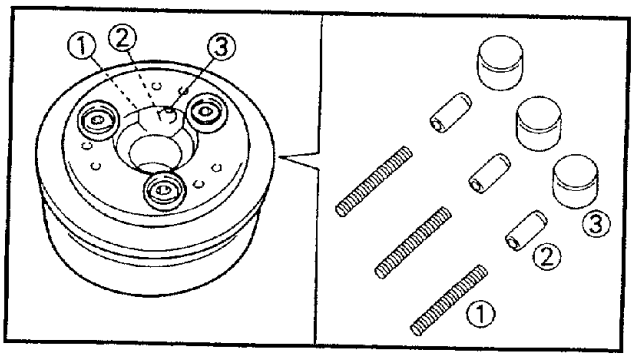
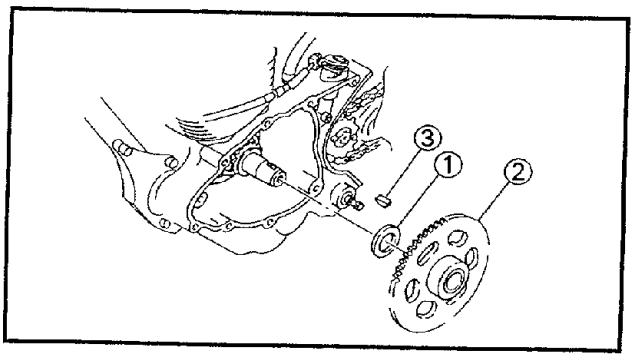
STARTER CLUTCH INSTALLATION

1. Install:
   - Starter clutch assembly ①

   30 Nm (3.0 m•kg)
2. Unloosen the starter clutch assembly by using the center punch.



3. Install:
   - Compression springs ①
   - Spring caps ②
   - Dowel pins ③



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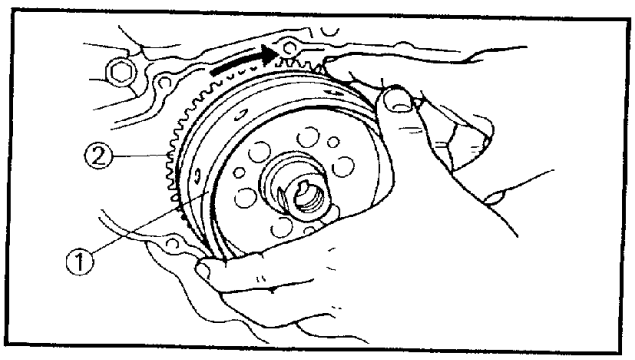
CDI MAGNETO INSTALLATION

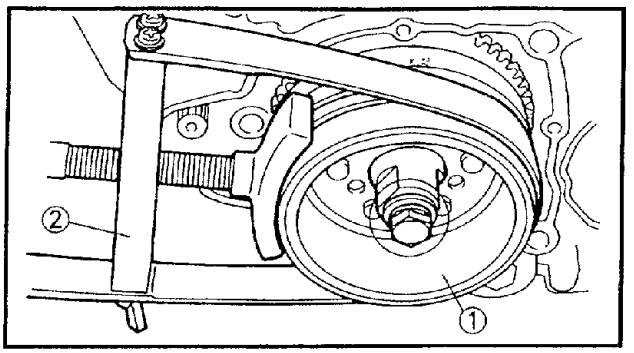
1. Install:
   - Shim ①
   - Starter wheel gear ②
   - Woodruff key ③



2. Install:
   - CDI magneto assembly ①

NOTE:

- Clean the tapered portion of the crankshaft and the magneto hub.
- When installing the magneto rotor, make sure the woodruff key is properly seated in the key way of the crankshaft and the starter wheel gear ② rotate to the right.



3. Tighten:
   •CDI magneto assembly ①

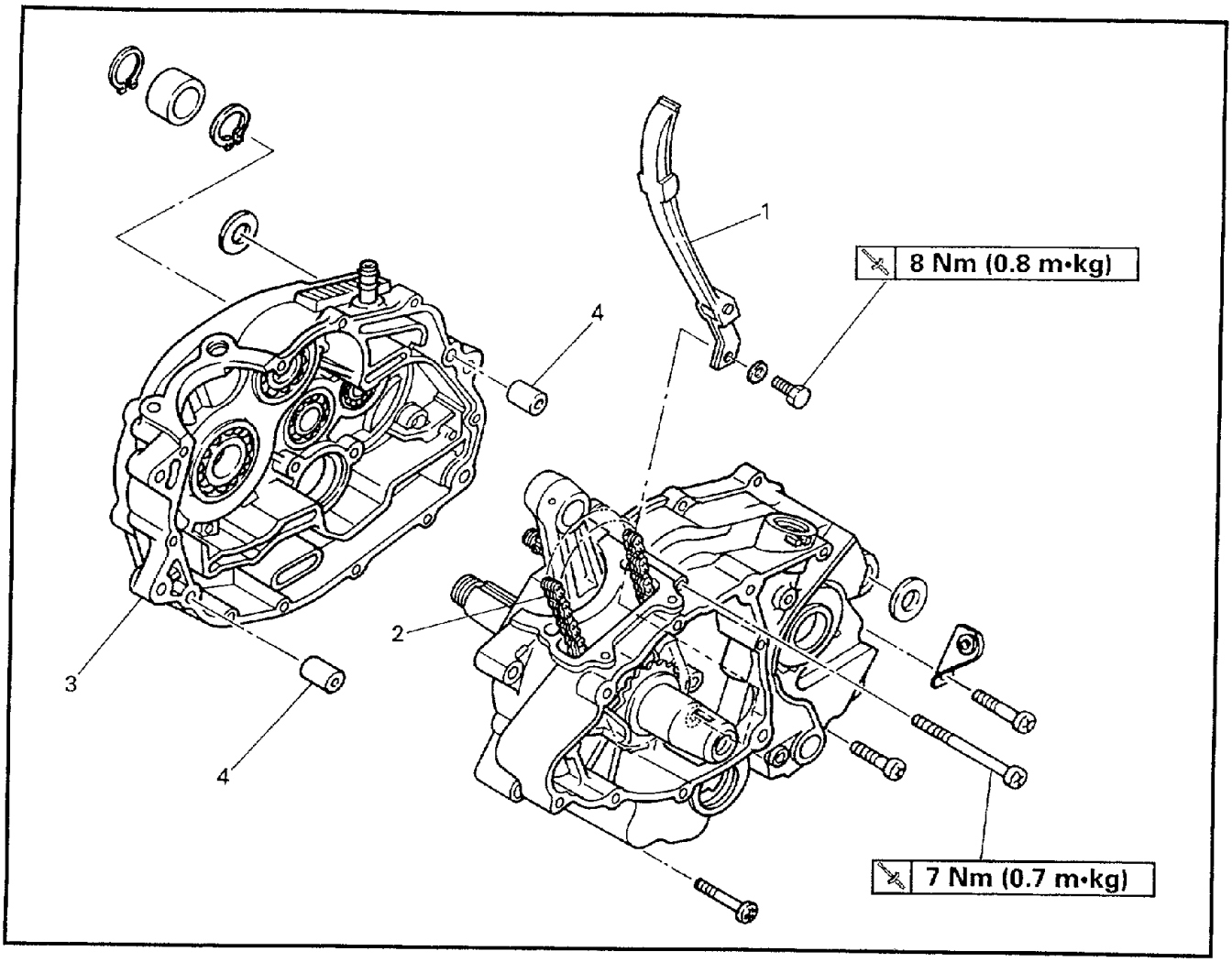
	50 Nm (5.0 m•kg)

NOTE:

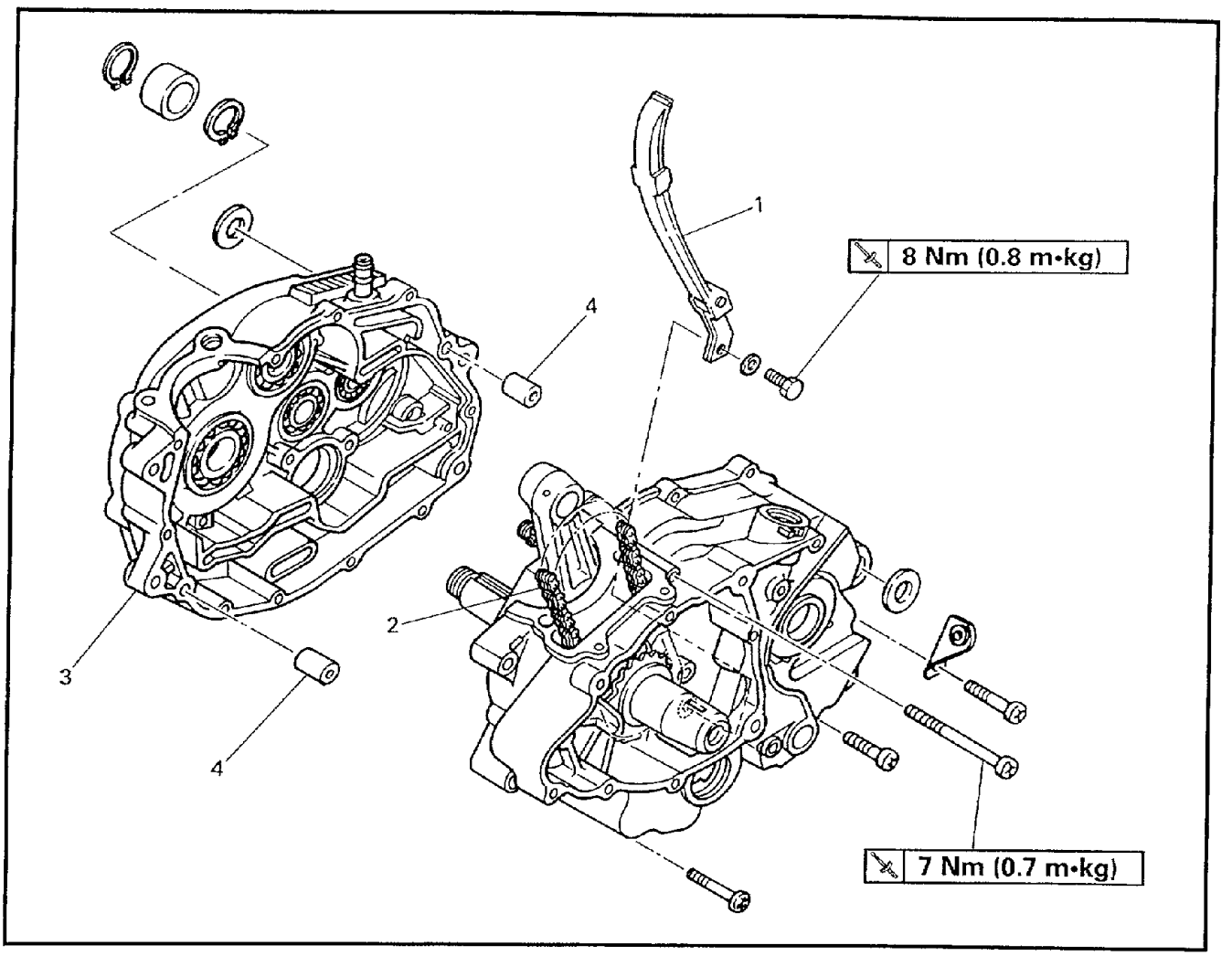
Tighten the bolt while holding the CDI magneto assembly with the sheave holder ②.

	Sheave holder: **90890-01701**

CRANK CASE AND CRANKSHAFT
CRANKCASE

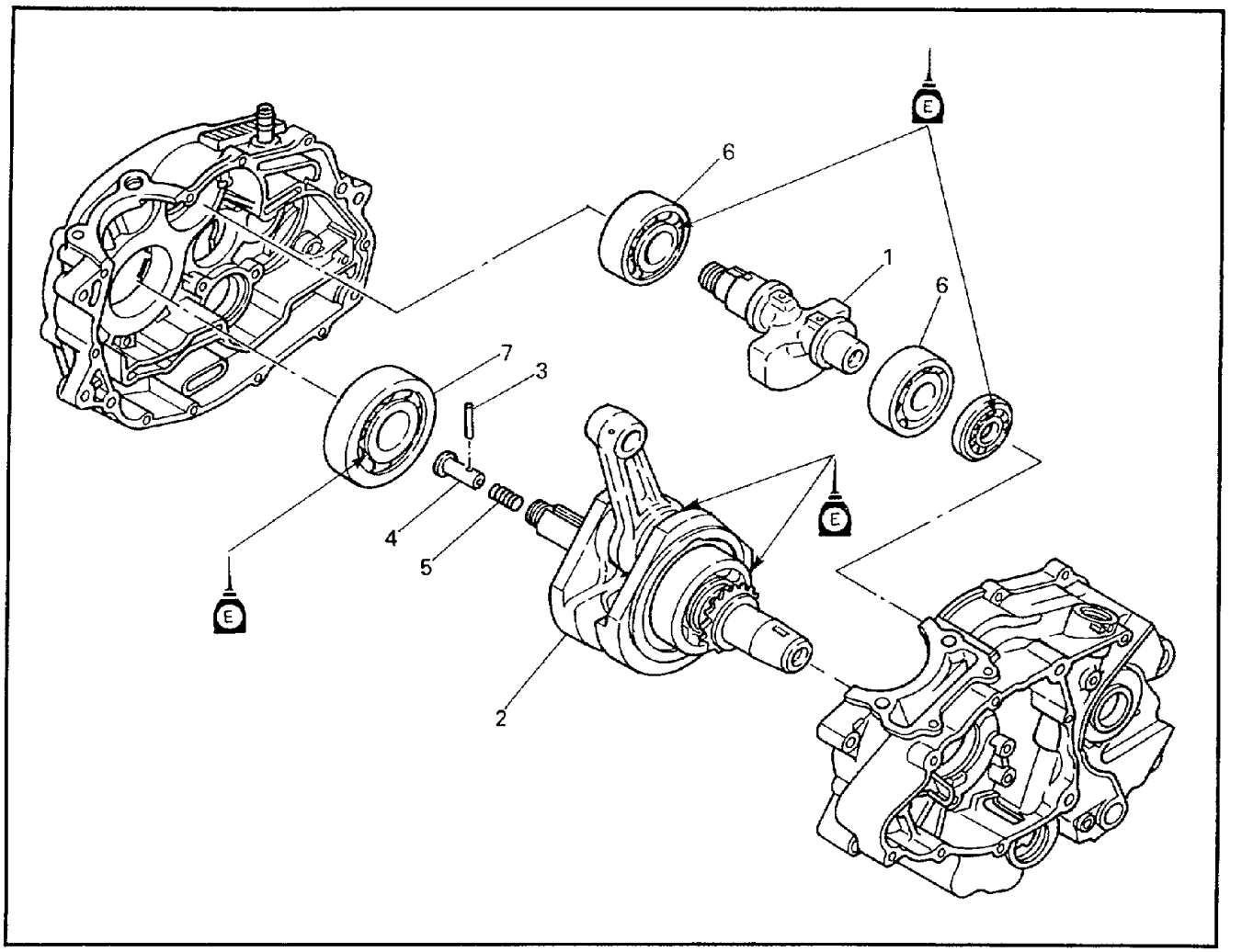


Order	Job name/Part name	Q'ty	Remarks
	Crankcase separation		Remove the parts in order.
	Engine		Refer to "ENGINE REMOVAL" section.
	Cylinder head		Refer to "CYLINDER HEAD" section.
	Cylinder and piston		Refer to "CYLINDER AND PISTON" section.
	Clutch		Refer to "CLUTCH" section.
	Kick starter		Refer to "KICK STARTER" section.
	Primary drive gear/oil pump		Refer to "OIL PUMP" section.
	Balancer gear		Refer to "BALANCER GEAR" section.
	Shift shaft and segment		Refer to "SHIFT SHAFT AND SEGMENT" section.
	CDI magneto/starter clutch		Refer to "CDI MAGNETO AND STARTER CLUTCH" section.
1	Timing chain guide (intake)	1	

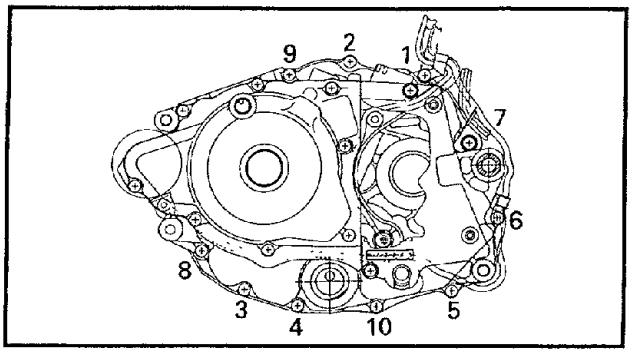


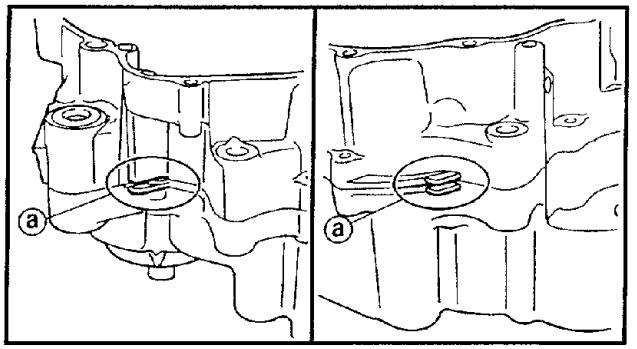
Order	Job name/Part name	Q'ty	Remarks
2	Timing chain	1	
3	Crankcase	1	Refer to "CRANKCASE SEPARATION/ INSTALLATION" section.
4	Dowel pins	2	Reverse the removal procedure for installation.

CRANKSHAFT AND BALANCER WEIGHT



Order	Job name/Part name	Q'ty	Remarks
	Crankshaft and balancer weight removal		Remove the parts in order.
1	Balancer weight	1	Refer to "BALANCER WEIGHT INSTALLATION" section.
2	Crankshaft assembly	1	
3	Dowel pin	1	Refer to "PLUNGER SEAL REMOVAL/ INSTALLATION" section.
4	Plunger seal	1	
5	Compression spring	1	
6	Bearing (balancer weight)	1	
7	Bearing (crankshaft right)	1	
			Reverse the removal procedure for installation.





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CRANKCASE SEPARATION

1. Remove:
   - Crankcase screws

NOTE:

- The numbers embossed on the crankcase indicate the tightening sequence. Loosen the screws in decreasing numerical order (see numbers on the illustration).
- Loosen each screw 1/4 turn at a time and remove them after all are loose.

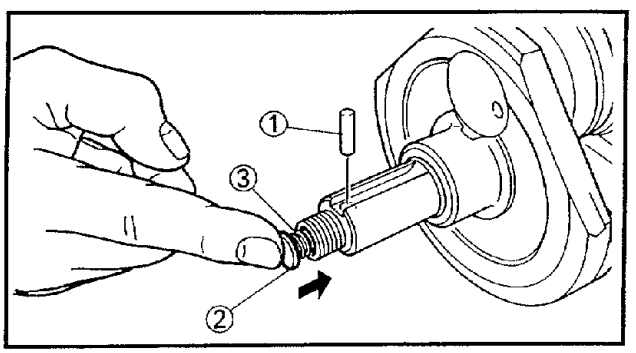
2. Remove:
   - Right crankcase half

NOTE:

Set the left crankcase half under then put in the flat head screw driver to the separating slit ⓐ.

CAUTION:

- **Do not use the flat head screw driver except place as shown.**
- **The left crankcase half should be under.**
- **Separate the crankcase after first checking that the shift cam segments and the drive axle circlip can be removed.**
- **Do not damage the crankcase mating surfaces.**



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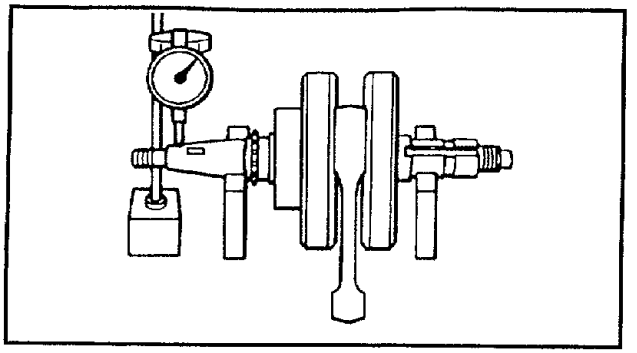
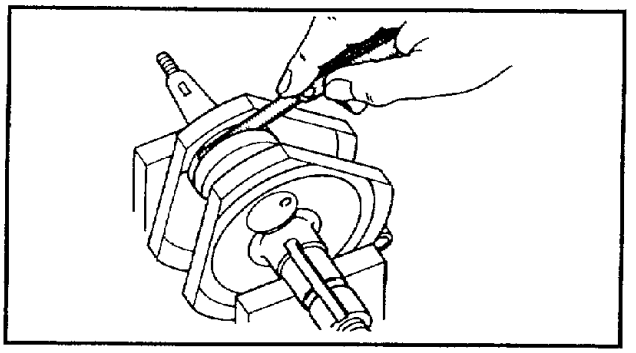
PLUNGER SEAL REMOVAL

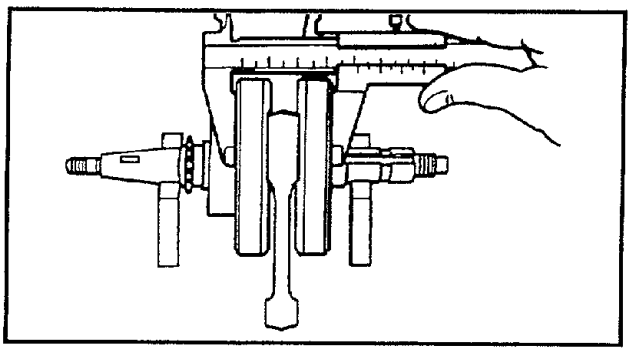
1. Remove:
   - Dowel pin ①
   - Plunger seal ②
   - Compression spring ③

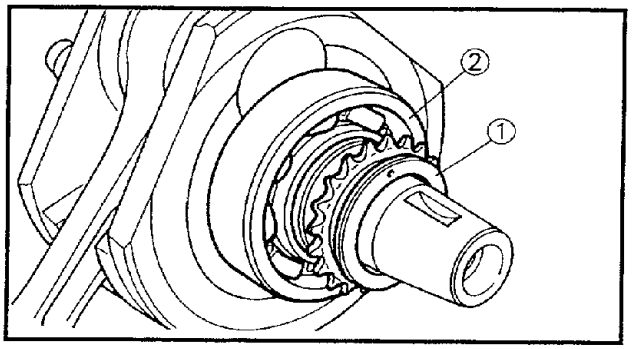
NOTE:

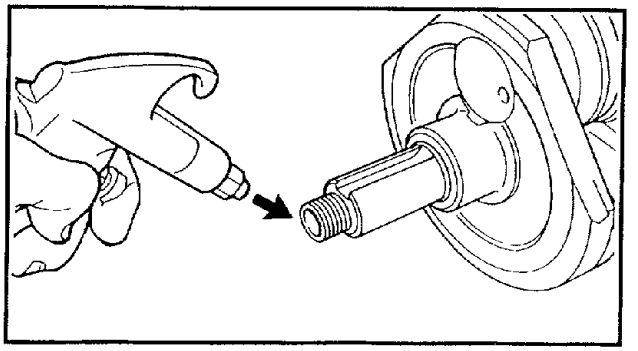
Remove the plunger seal and compression spring, push the plunger seal lightly and remove the dowel pin.











CRANKSHAFT INSPECTION

1. Measure:
   - •Crankshaft runout
     Out of specification→Replace crankshaft and/or bearing.

NOTE:

Measure the crankshaft runout with the crankshaft assembly turning slowly.

Runout limit:
0.03 mm

2. Measure:
   - •Big end side clearance
     Out of specification→Replace big end bearing, crank pin and/or connecting rod.

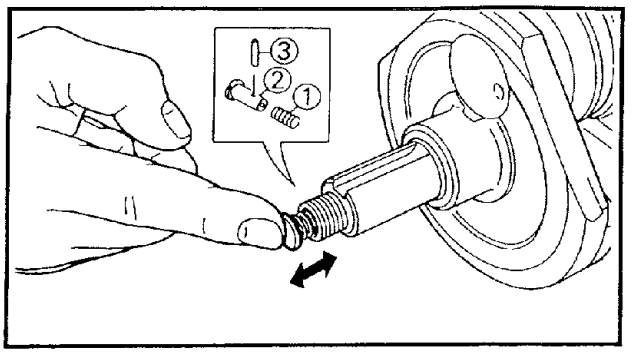
Big end side clearance:
0.35 ~ 0.65 mm
Limit
0.1 mm

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

Crank width:
55.95 ~ 56.00 mm

4. Inspect:
   - •Timing chain sprocket ①
     Wear/Damage→Replace crankshaft.
   - •Bearing ②
     Wear/Crack/Damage→Replace crankshaft.

5. Inspect:
   - •Crankshaft journal
     Clogged→Blow out the journal with compressed air.



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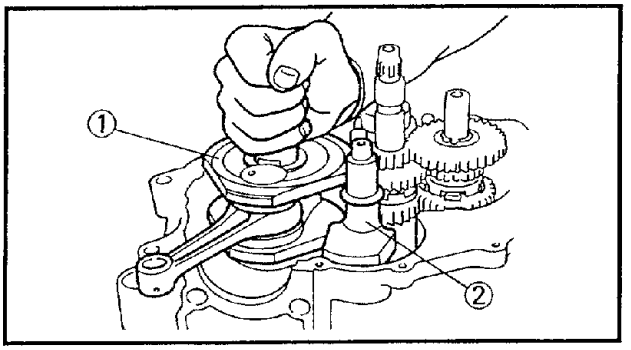
PLUNGER SEAL INSTALLATION

1. Install:
   - Compression spring ①
   - Plunger seal ②
   - Dowel pin ③
2. Check the plunger seal smooth operation pushing the plunger seal by your finger.



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BALANCER WEIGHT INSTALLATION

1. Install:
   - Crankshaft assembly ①
   - Balancer weight assembly ②

CAUTION:

Do not use the hammer forcefully during installation of the crankshaft. Damage the crankcase oil seal lip and gear teeth..

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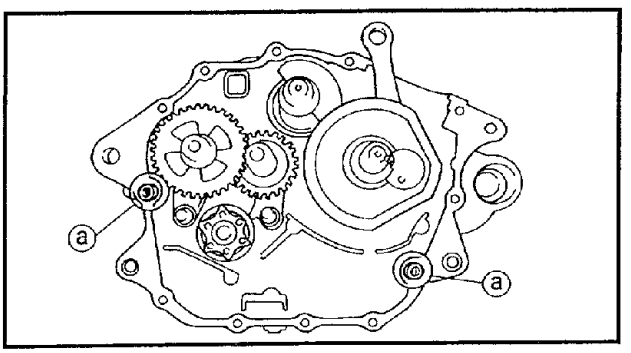
CRANKCASE INSTALLATION

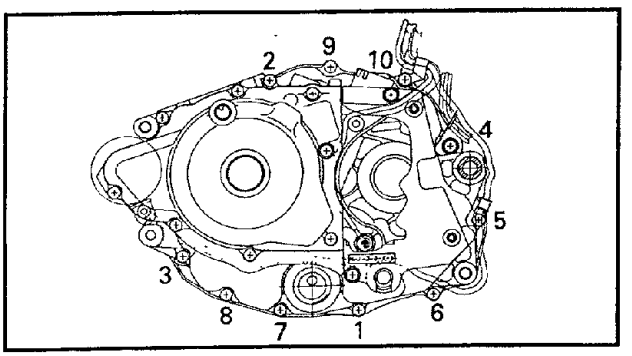
1. Clean all the gasket mating surface and crankcase mating surface thoroughly.
2. Apply:
   - Sealant
     (onto the crankcase mating surfaces)

	Yamaha bond No. 1215 : 90890-85505

NOTE:

DO NOT ALLOW any sealant to come in contact with the oil gallery ⓐ.





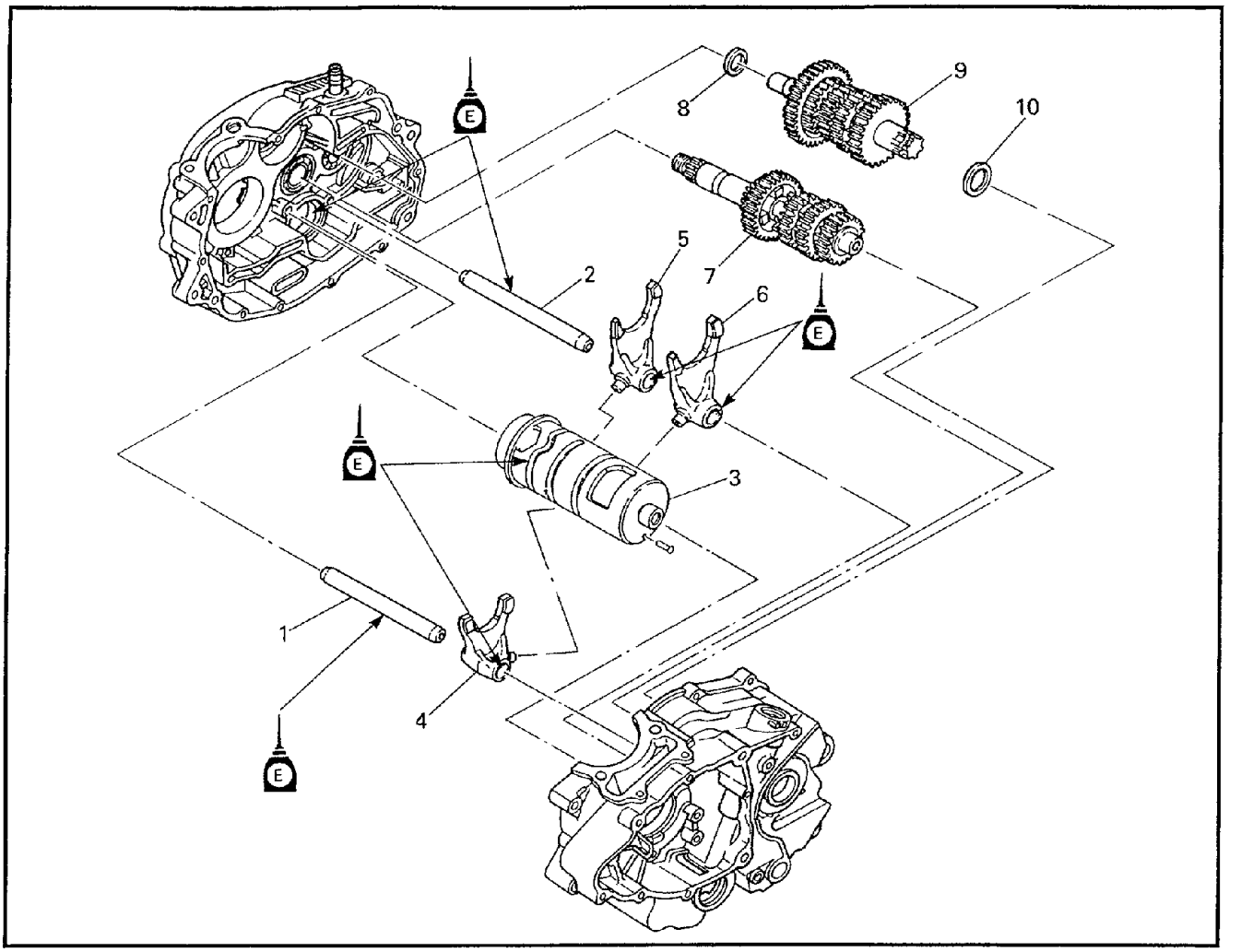
3. Tighten:
   - Crankcase right half

	7 Nm (0.7 m•kg)

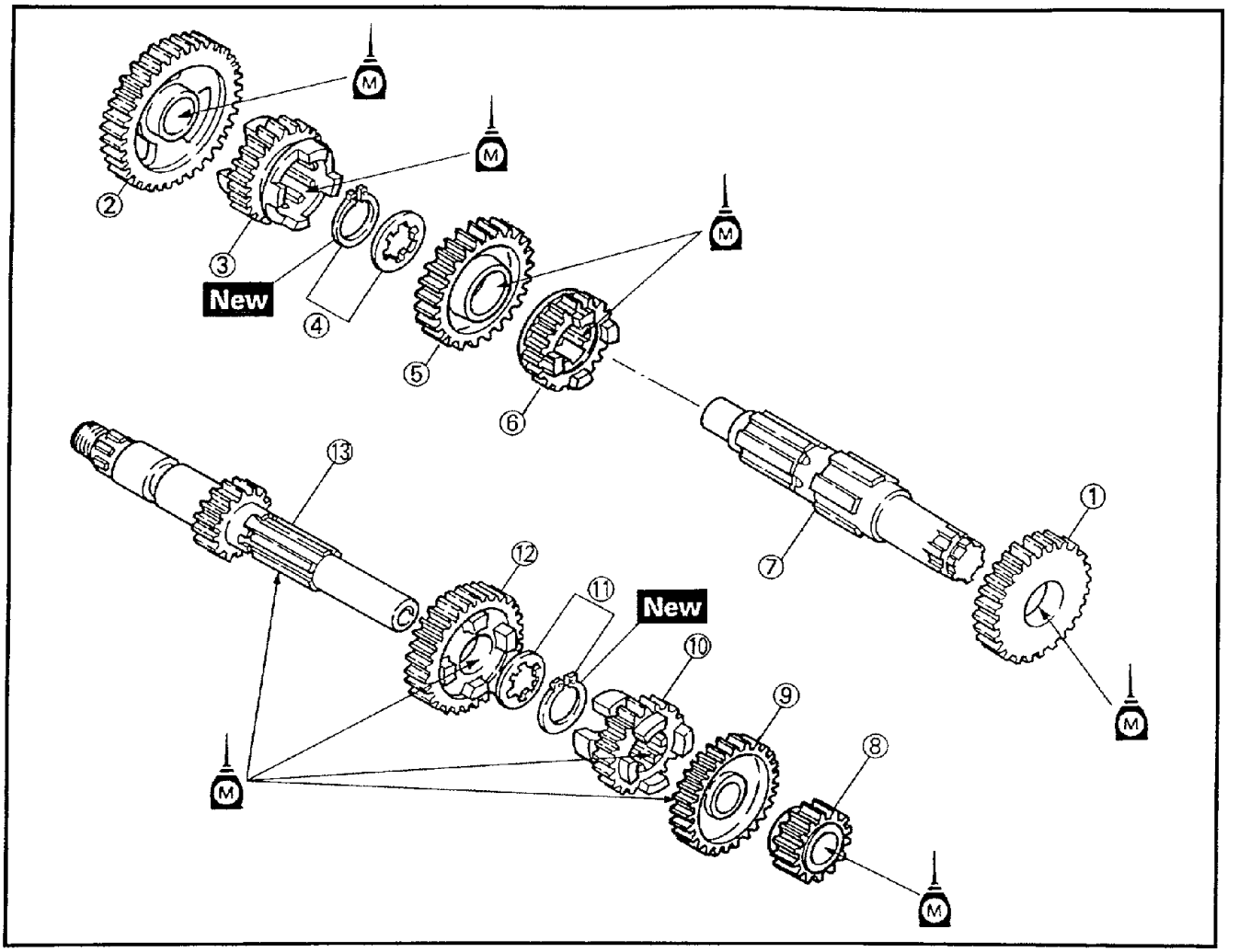
NOTE:

Tighten the screws in decreasing numerical order (see numbers on the illustration).

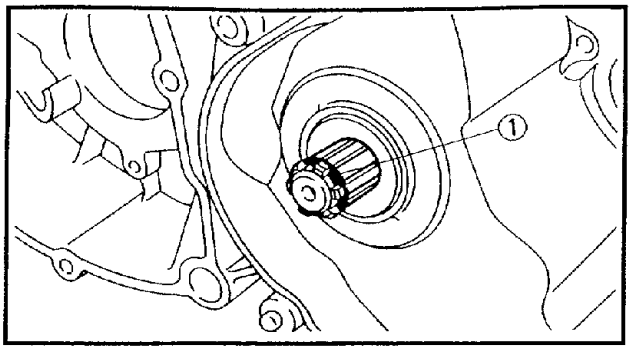
TRANSMISSION, SHIFT CAM AND SHIFT FORK



Order	Job name/Part name	Q'ty	Remarks
	Transmission, shift cam and shift fork removal		Remove the parts in order.
	Crankcase separating		Refer to "CRANKCASE AND CRANKSHAFT" section.
1	Shift fork guide bar 2 (short length)	1	Refer to "TRANSMISSION, SHIFT CAM AND SHIFT FORK INSTALLATION" section.
2	Shift fork guide bar 1 (long length)	1	
3	Shift cam	1	
4	Shift fork 1 "C"(center)	1	
5	Shift fork 2 "R"(right)	1	
6	Shift fork 3 "L"(left)	1	
7	Main axle assembly	1	Refer to "TRANSMISSION, SHIFT CAM AND SHIFT FORK REMOVAL/INSTALLATION" section.
8	Plate washer	1	
9	Drive axle assembly	1	
10	Plate washer	1	
			Reverse the removal procedure for installation.



Order	Job name/Part name	Q'ty	Remarks
	Drive axle and main axle disassembly		Disassemble the parts in order.
①	Second wheel gear		
②	First wheel gear	1	
③	Forth wheel gear	1	
④	Circlip/washer	1/1	
⑤	Third wheel gear	1	
⑥	Fifth wheel gear	1	
⑦	Drive axle	1	
⑧	Second pinion gear	1	
⑨	Fifth pinion gear	1	
⑩	Third pinion gear	1	
⑪	Circlip/washer	1/1	
⑫	Forth pinion gear gear	1	
⑬	Main axle	1	Reverse the disassembly procedure for assembly.



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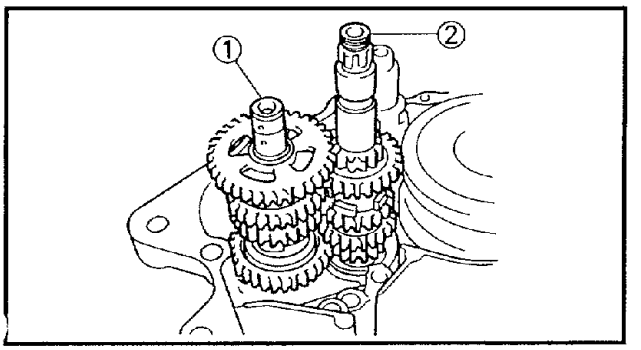
TRANSMISSION, SHIFT CAM AND SHIFT FORK REMOVAL

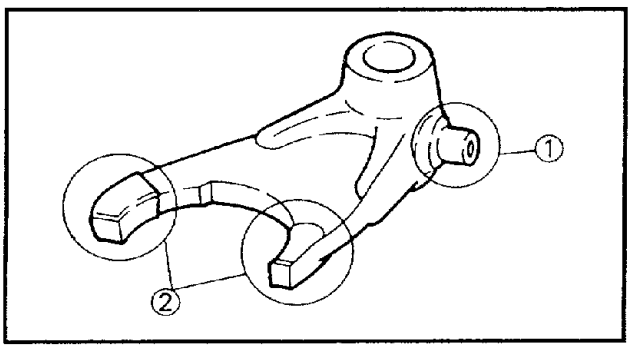
1. Install:
   - O-Ring ①

   To the drive sprocket groove.



2. Remove:
   - Drive axle assembly ①
   - Main axle assembly ②

   Remove them at same the time.



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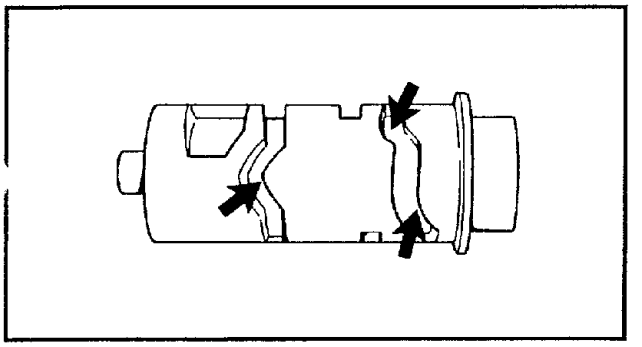
SHIFT FORK AND SHIFT CAM INSPECTION

1. Inspect:
   - Shift fork cam follower ①
   - Shift fork pawl ②

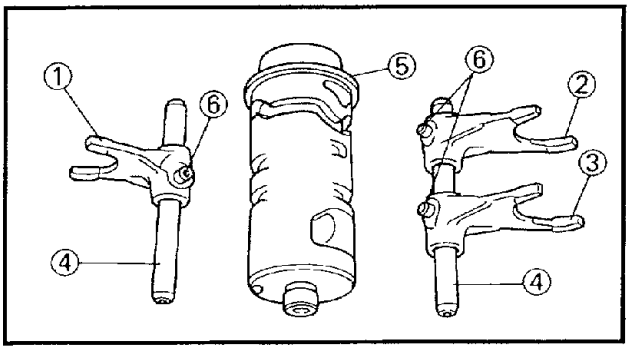
   Scoring/bends/wear/damage → Replace.



2. Inspect:
   - Shift cam grooves

   Wear/damage/scratches → Replace.
   - Shift cam segment

   Damage/wear → Replace.



3. Inspect:
   - Shift fork 1 "C"(center) ①
   - Shift fork 2 "R"(right) ②
   - Shift fork 3 "L"(left) ③
   - Guide bar ④
   - Shift cam ⑤
   - Dowel pin ⑥

   Roll the guide bar on a flat surface.
   Bends → Replace.

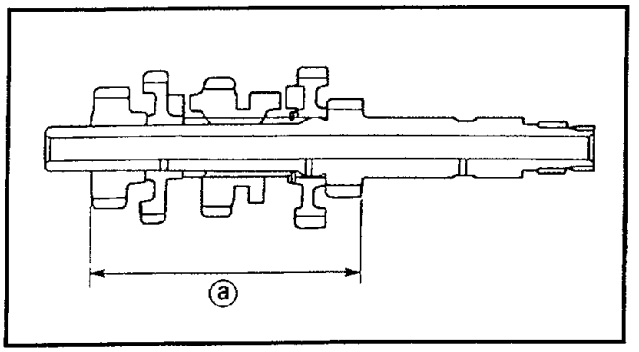
⚠WARNING

Do not attempt to straighten a bent guide bar.

4. Check:
   •Shift fork movement
   (on the guide bar)
   Unsmooth operation → Replace the shift fork and the guide bar.

NOTE:

When damaged the shift fork and mission gear, replace the facing each gear as set.



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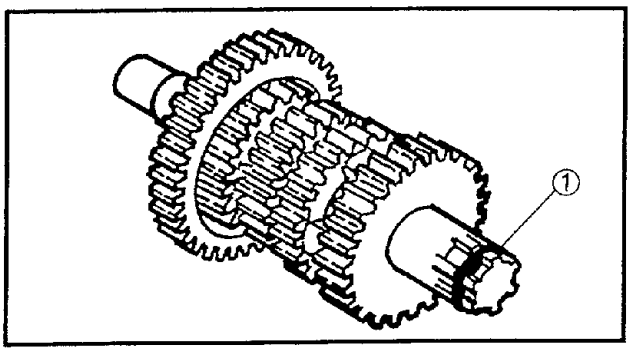
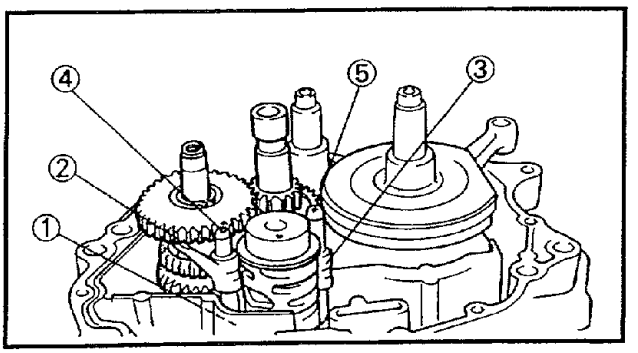
TRANSMISSION, SHIFT CAM AND SHIFT FORK INSTALLATION

1. Measure:
   •Main axle assembled length ⓐ

Assembled length (main axle):
90.9 ~ 91.1 mm



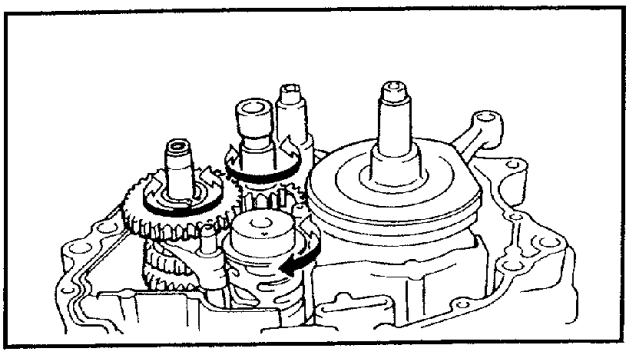
2. Install:
   •O-ring ①
   To the drive sprocket folder groove.



3. Install:
   •Shift fork 3 "L"(left) ①
   (face the "L" side for the clutch side.)
   •Shift fork 2 "R"(right)②
   (face the "R" side for the clutch side.)
   •Shift fork 1 "C"(center)③
   (face the "C" side for the magneto side.)
   •Shift fork guide bar 1 ④ (long)
   •Shift fork guide bar 2 ⑤ (short)

NOTE:

Install the shift forks with the embossed mark to the right and in sequence (R, C, L) beginning from the right.



4. Check:
   •Shift cam operation
   Unsmooth operation → Repair.

NOTE:

Check the transmission and shift forks for smooth operation by turning the shift cam with your hand.

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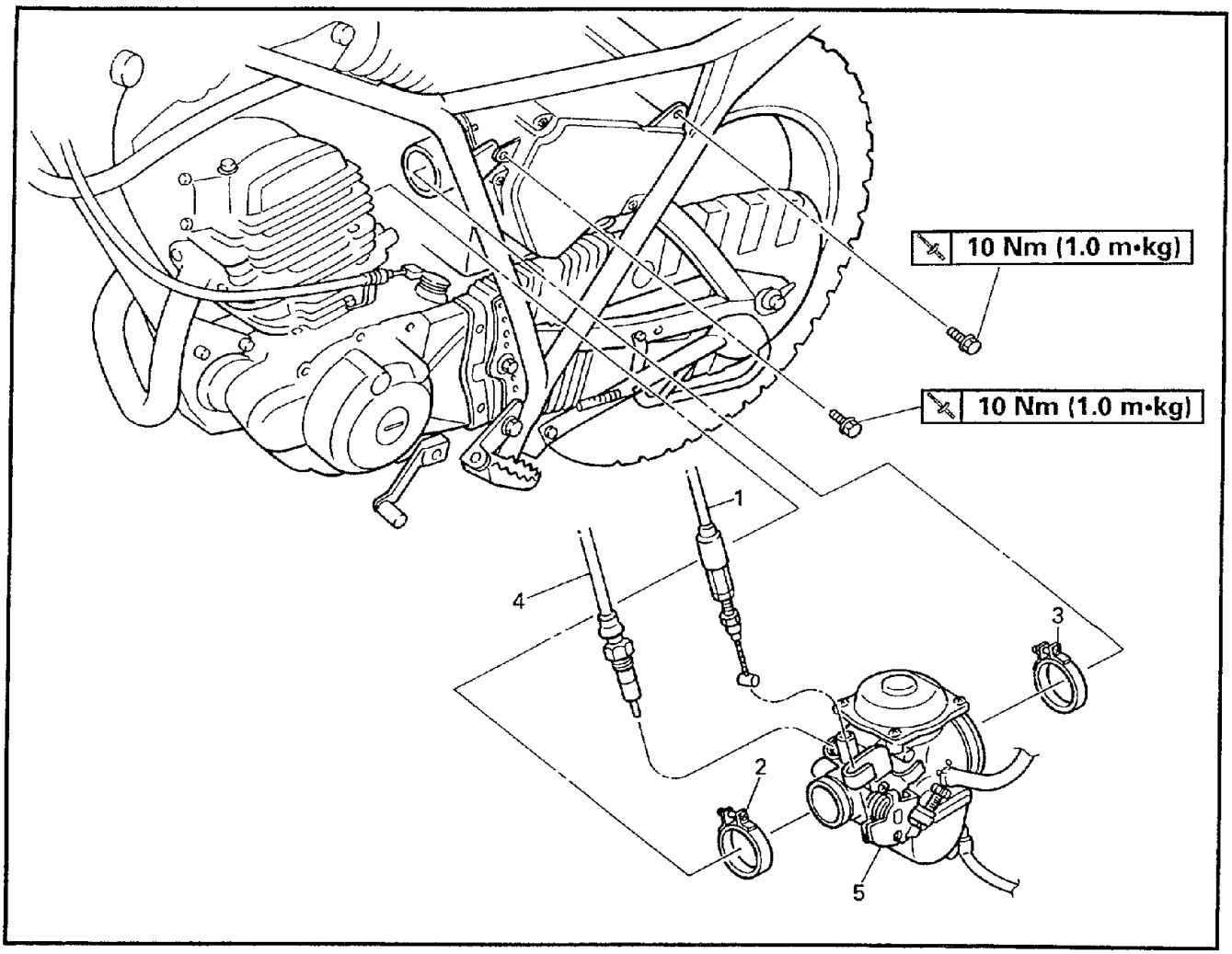
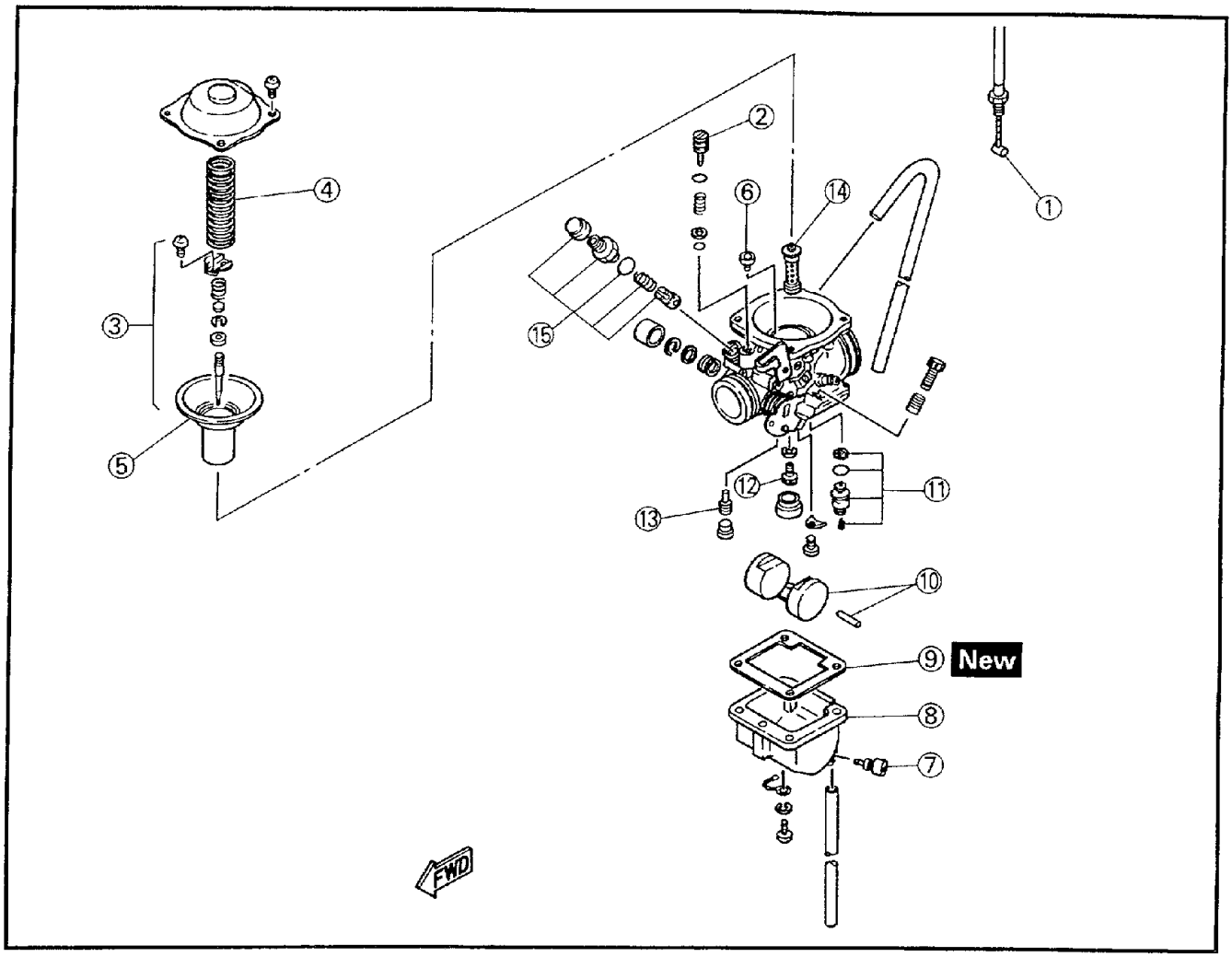
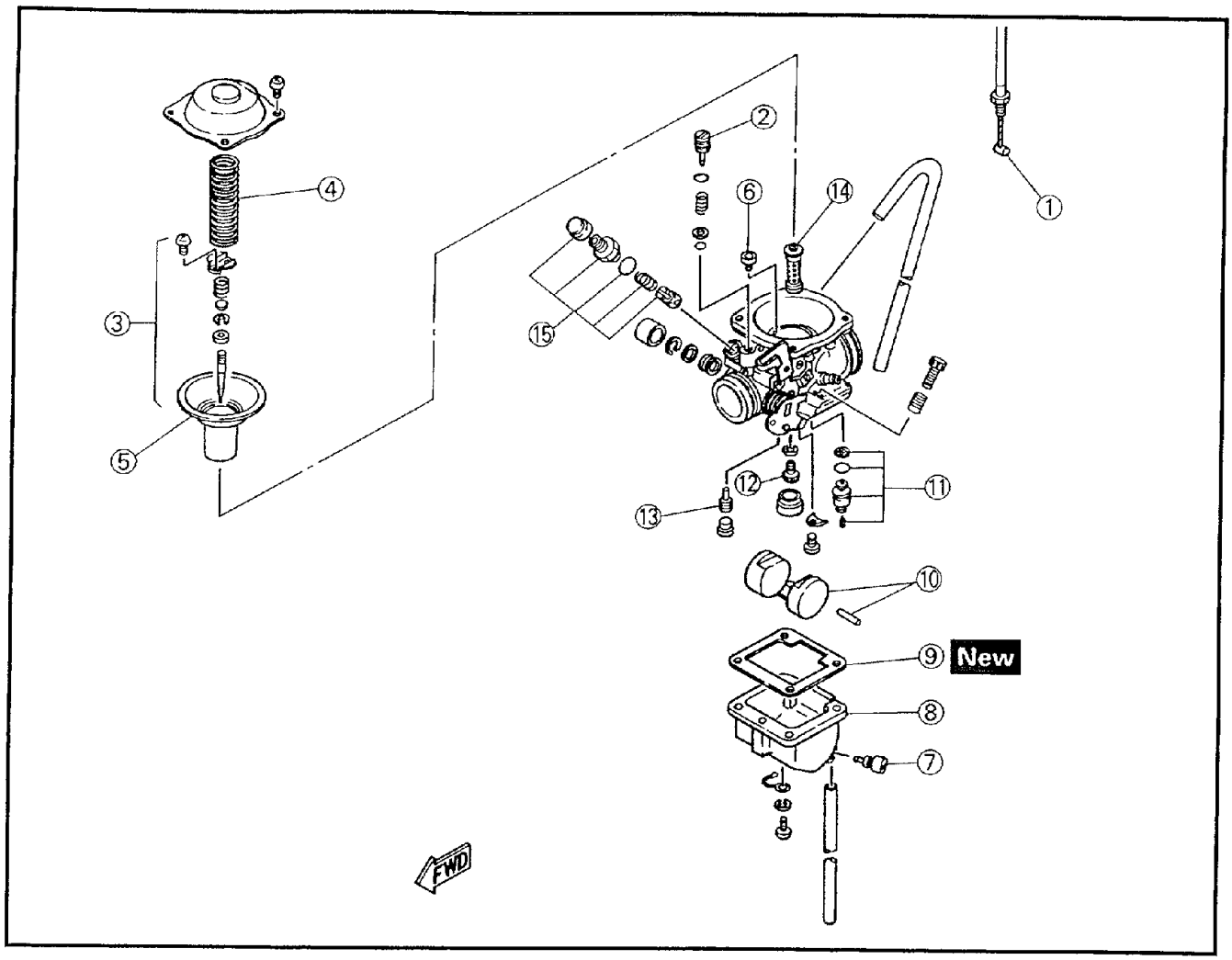
CARBURETION
CARBURETOR



Order	Job name/Part name	Q'ty	Remarks
	Carburetor removal		Remove the parts in order.
	Side cover (left) Seat Fuel tank		Refer to "SIDE COVER, SEAT AND FUEL TANK" section in CHAPTER 3.
	Cover (air filter joint) Air filter case		**NOTE:** Remove the cover from the pin of the frame and slide back the air filter case.
1	Throttle cable	1	
2	Carburetor joint clamp screw	1	**NOTE:**
3	Air filter joint clamp screw	1	Loosen.
4	Starter cable	1	
5	Carburetor assembly	1	Reverse the removal procedure for installation.



Order	Job name/Part name	Q'ty	Remarks
	Carburetor disassembly		Disassemble the parts in order.
①	Throttle cable	1	
②	Pilot screw	1	
③	Throttle valve assembly	1	
④	Throttle valve spring	1	
⑤	Piston valve	1	
⑥	Pilot air jet	1	
⑦	Drain screw	1	Refer to "CARBURETOR ASSEMBLY" section.
⑧	Float chamber	1	
⑨	Gasket (float chamber)	1	
⑩	Float pin/float	1	



Order	Job name/Part name	Q'ty	Remarks
⑪	Needle valve assembly	1/1	Refer to "CARBURETOR ASSEMBLY" section.
⑫	Main jet	1	
⑬	Pilot jet	1	
⑭	Main nozzle	1	
⑮	Starter plunger assembly	1	
			Reverse the disassembly procedure for assembly.

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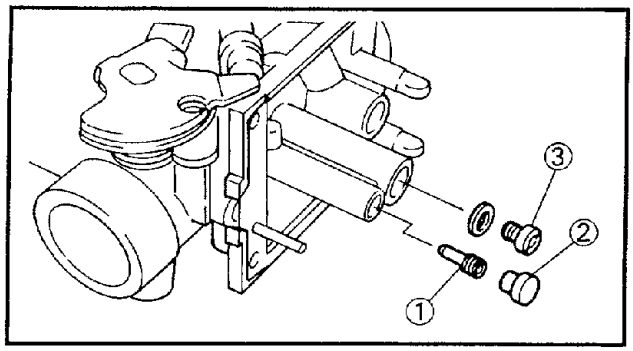
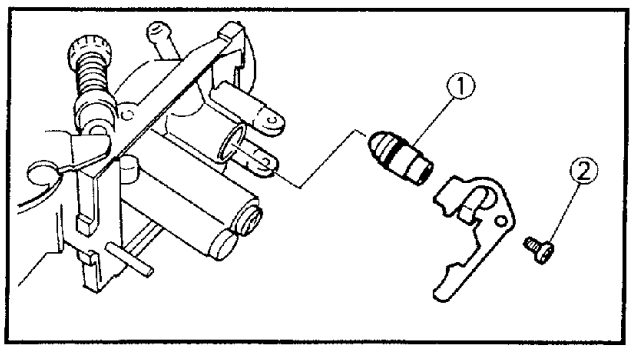
CARBURETOR ASSEMBLY

CAUTION:

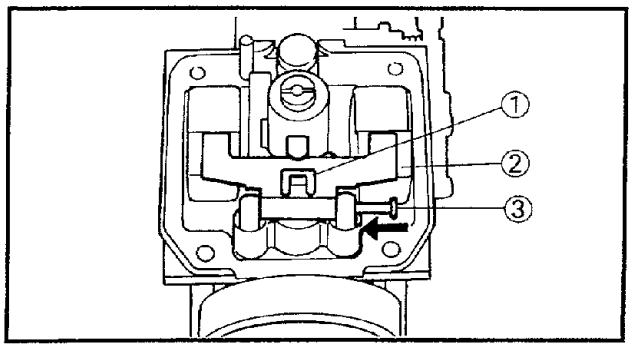
- **Do not use a wire for cleaning.**
- **Before assembling, wash all parts in clean petroleum based solvent.**
- **Always use a new gasket.**



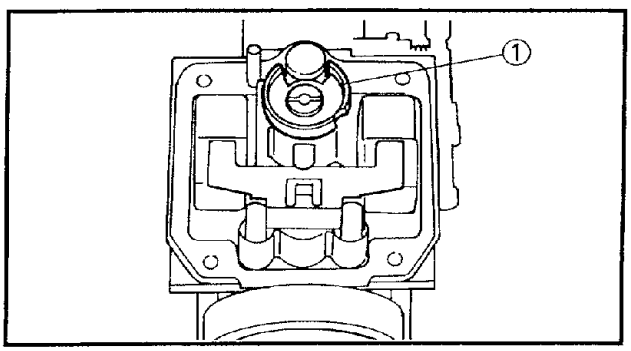
1. Install:
   - Main nozzle
   - Pilot jet ①
   - Plug ②
   - Main jet ③



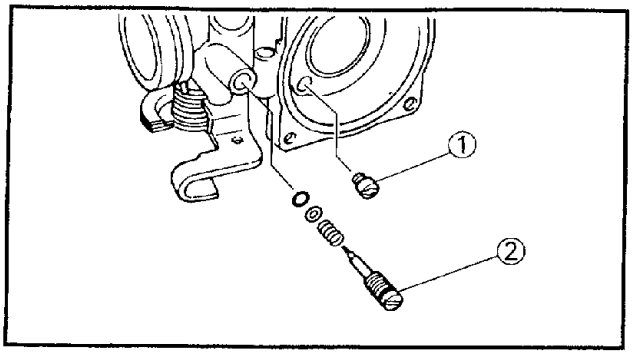
2. Install:
   - Valve seat ①
   - Screw ②



3. Install:
   - Needle valve ①
   - Float ②
   - Float pin ③

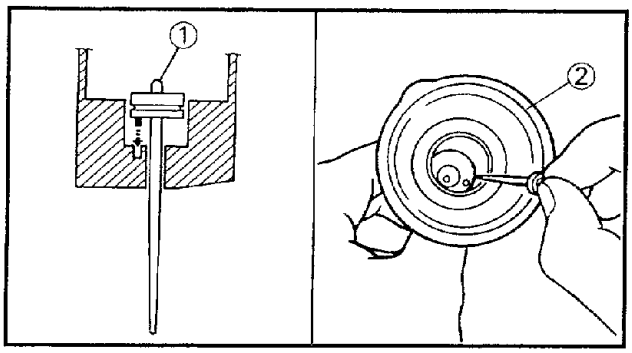


4. Install:
   - Main jet washer ①
   - Gasket (float chamber) **New**
   - Float chamber

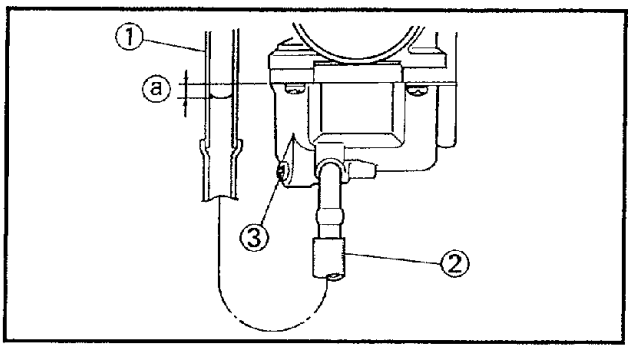


5. Install:
   - Pilot air jet ①
   - Pilot screw ②

Pilot screw (turn out):
2 turns out



6. Install:
   - Jet needle ①
   - Piston valve ②
   - Throttle valve spring
   - Starter plunger assembly



YP600060

FUEL LEVEL ADJUSTMENT

1. Measure:
   - Fuel level ⓐ

   Out of specification → Adjust.

Fuel level:
2.5 ~ 3.5 mm below the float chamber line

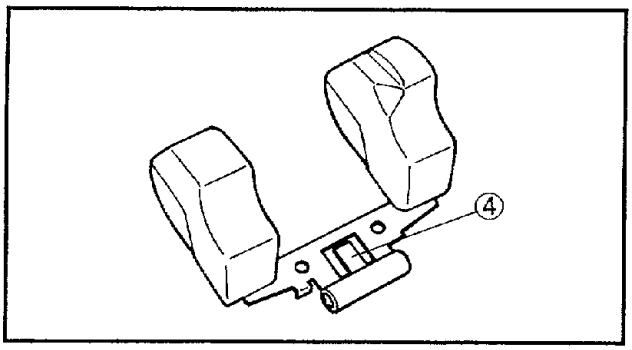
****

Measurement and adjustment steps:

- Place the motorcycle on a level surface.
- Put a garage jack under the engine to ensure that the carburetor is positioned vertically.
- Connect the fuel level gauge ① to the drain pipe ②.

Fuel level gauge:
90890-01312

- Loosen the drain screw ③.
- Hold the gauge vertically next to the float chamber line.
- Measure the fuel level ⓐ with the gauge.
- If the fuel level is incorrect, adjust the fuel level.
- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust float level by bending the float tang ④ slightly.
- Install the carburetor.
- Recheck the fuel level.



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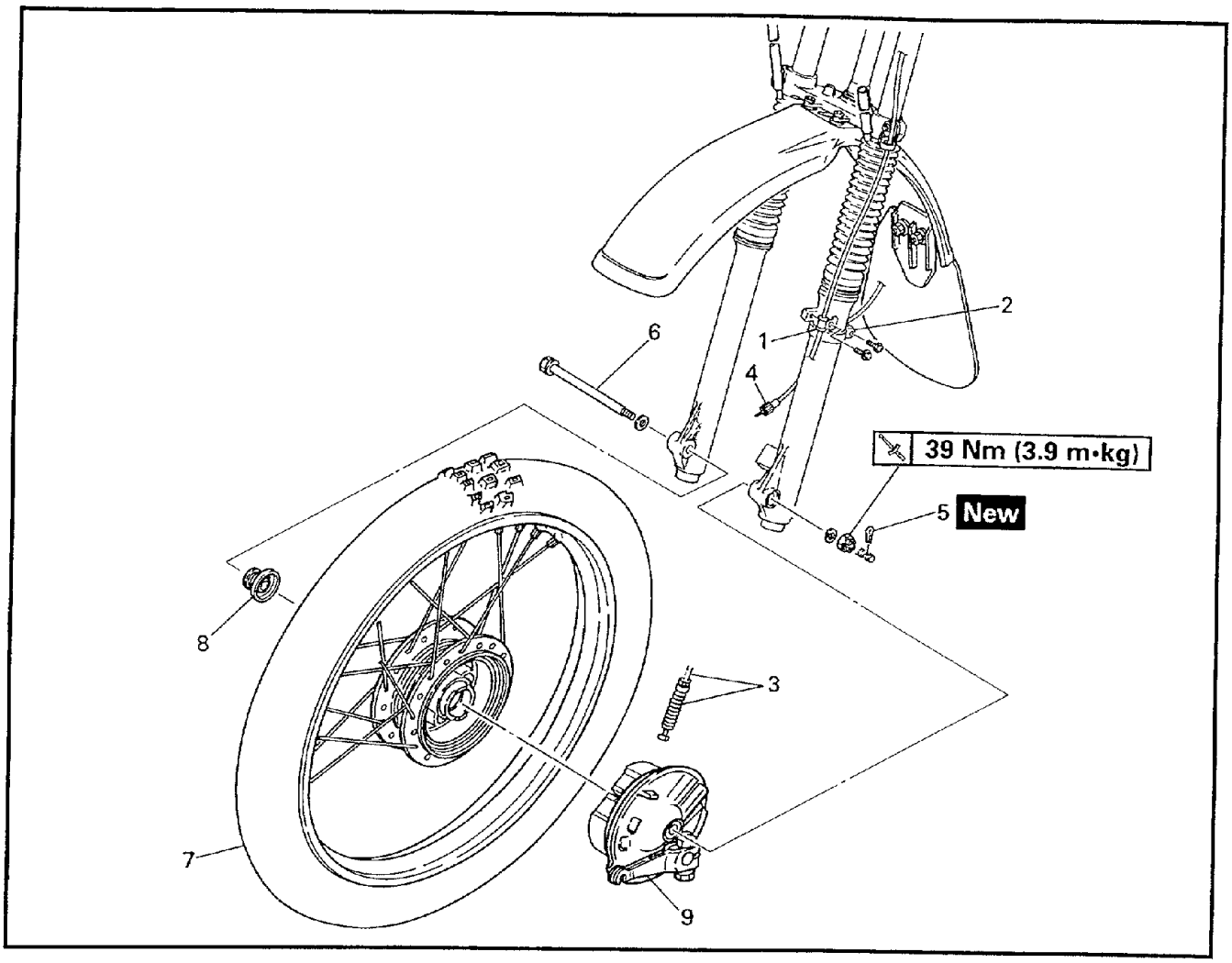
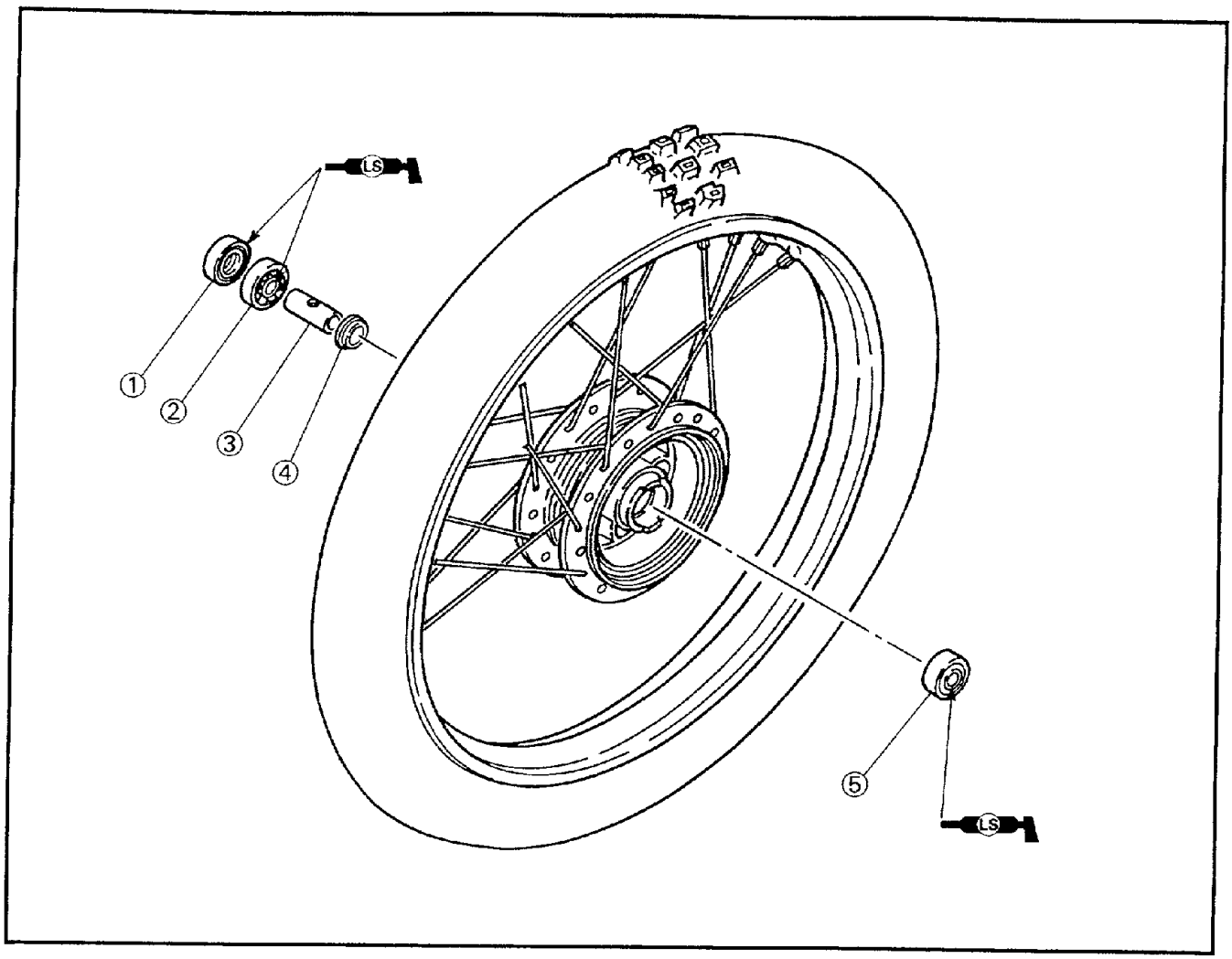
CHASSIS
FRONT WHEEL AND FRONT BRAKE



Order	Job name/Part name	Q'ty	Remarks
	Front wheel and front brake removal		Remove the parts in order. **⚠WARNING** **Securely support the motorcycle so there is no danger of it falling over.**
1	Cable holder (brake cable)	1	
2	Cable holder (meter cable)	1	
3	Front brake cable/spring	1/1	
4	Speedometer cable	1	
5	Cotter pin	1	Refer to "FRONT WHEEL INSTALLATION" section.
6	Wheel axle	1	
7	Front wheel assembly	1	
8	Collar	1	
9	Brake shoe plate assembly	1	Refer to "FRONT WHEEL ASSEMBLY" section. Reverse the removal procedure for installation.



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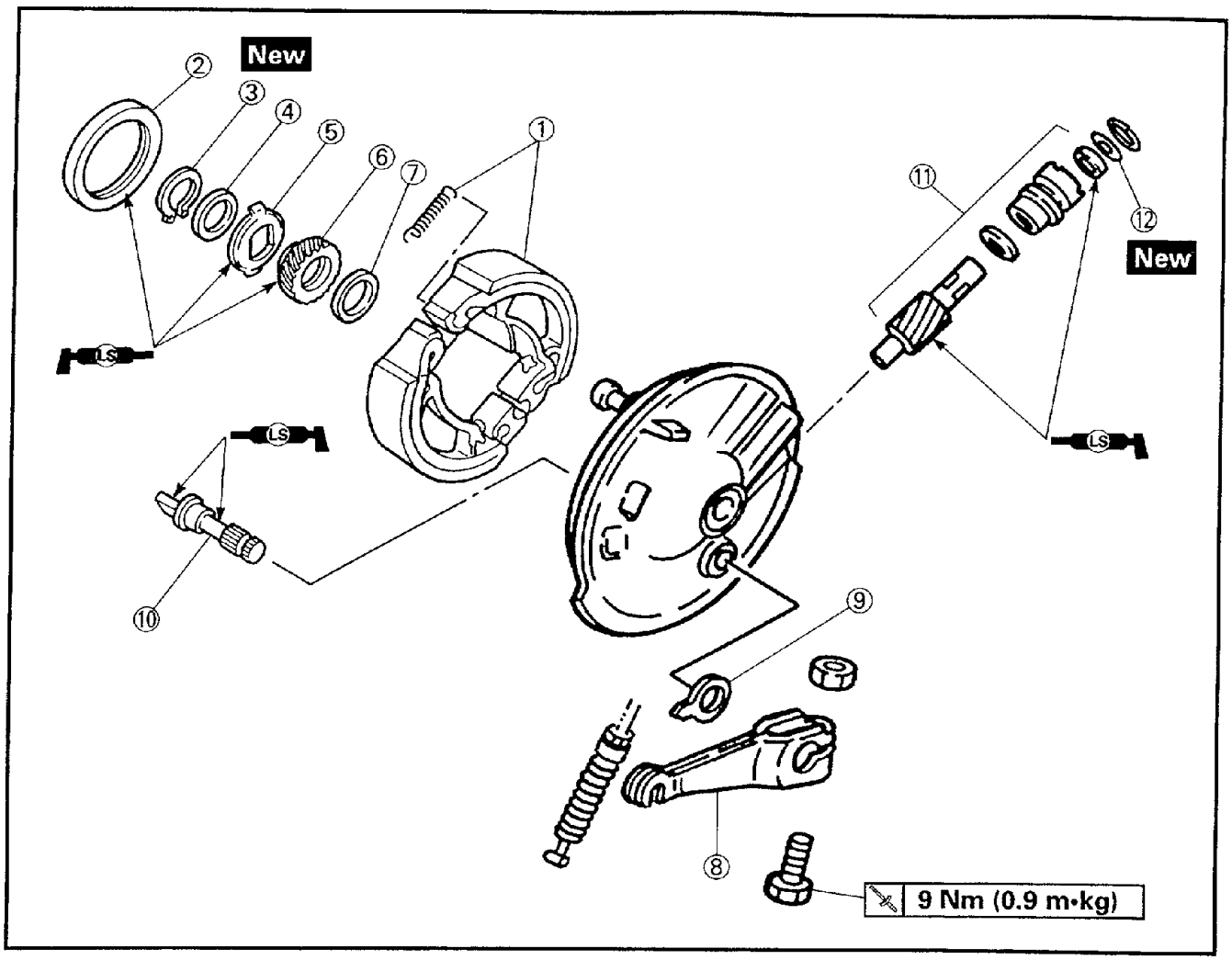
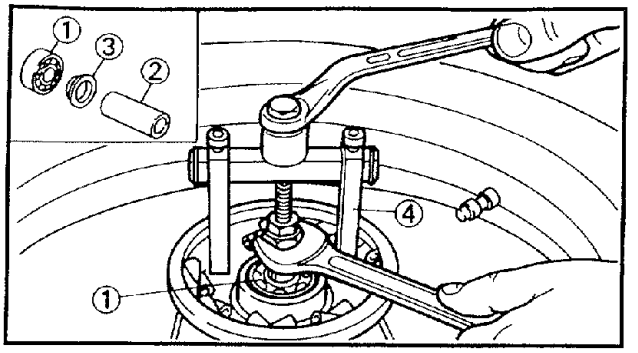
Order	Job name/Part name	Q'ty	Remarks
	Front wheel disassembly		Disassemble the parts in order.
①	Oil seal	1	Refer to "FRONT WHEEL ASSEMBLY" section.
②	Bearing	1	Refer to "FRONT WHEEL DISASSEMBLY/ASSEMBLY" section.
③	Spacer	1	
④	Spacer flange	1	
⑤	Bearing	1	
			Reverse the disassembly procedure for reassembly.



Order	Job name/Part name	Q'ty	Remarks
	Front brake shoe plate disassembly		Disassemble the parts in order.
①	Brake shoe kit	1	Refer to "BRAKE SHOE PLATE ASSEM-
②	Oil seal	1	BLY" section.
③	Circlip	1	
④	Washer	1	
⑤	Meter clutch	1	
⑥	Drive gear	1	
⑦	Washer	1	
⑧	Camshaft lever	1	Refer to "BRAKE SHOE PLATE ASSEM-
⑨	Indicator plate	1	BLY" section.
⑩	Camshaft	1	
⑪	Meter gear Assembly	1	Refer to "BRAKE SHOE PLATE DISAS-
⑫	O-ring	1	SEMBLY/ASSEMBLY" section.
			Reverse the disassembly procedure for assembly.



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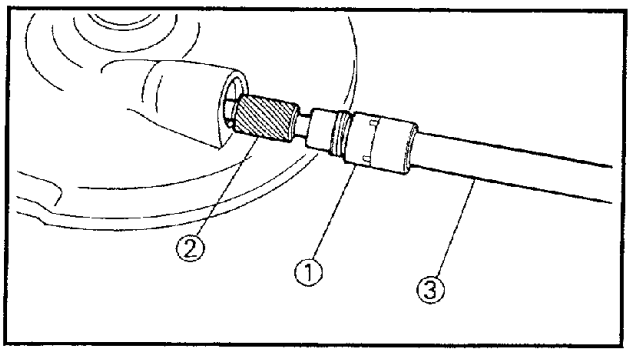
FRONT WHEEL DISASSEMBLY

1. Remove:
   - Bearings ①
   - Spacer ②
   - Collar ③

   Remove the bearings using a general bearing puller ④.



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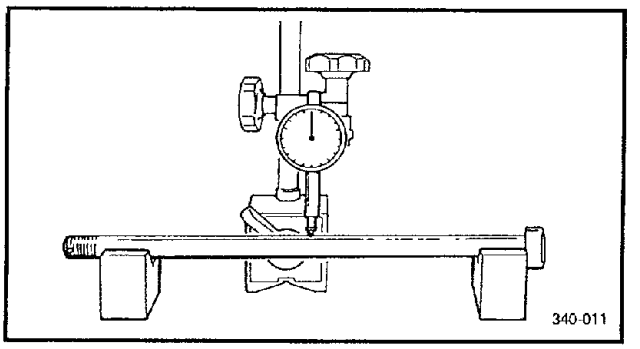
BRAKE SHOE PLATE DISASSEMBLY

1. Remove:
   - Bush ①
   - Meter gear ②

   Remove the bush using a meter gear bush tool ③.

	Meter gear bush tool: **90890-01052**



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FRONT WHEEL INSPECTION

1. Inspect:
   - Front wheel axle

   (by rolling it on a flat surface)

   Bends → Replace.

⚠WARNING

Do not attempt to straighten a bent axle.

	Wheel axle bending limit: **0.25 mm**

2. Inspect:
   - Front tire

   Wear/damage → Replace.

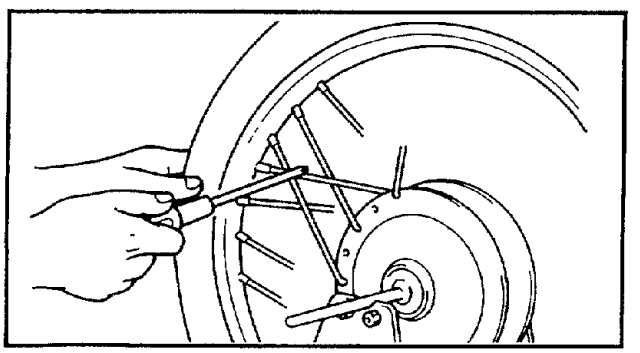
   Refer to "TIRE INSPECTION" in CHAPTER 3.
   - Front wheel

   Refer to "WHEEL INSPECTION" in CHAPTER 3.
3. Check:
   - Spokes

   Bends/damage → Replace.

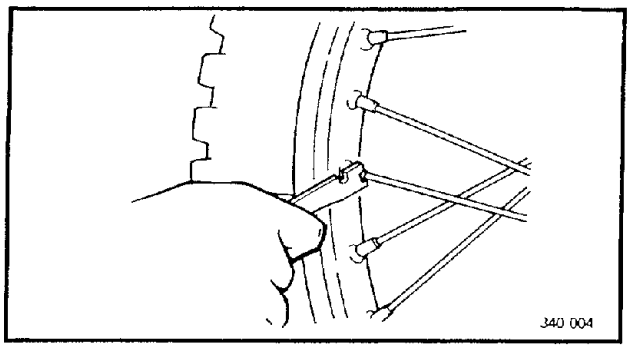
   Loose spokes → Retighten.

   Turn the wheel and tap the spokes with a screwdriver.



NOTE:

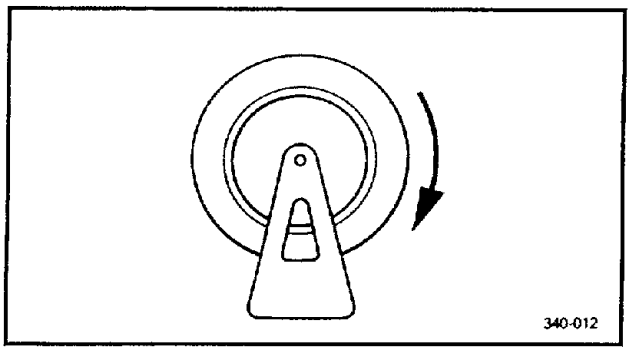
A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.



4. Tighten:
   - •Loose spokes
   - •Nipple

NOTE:

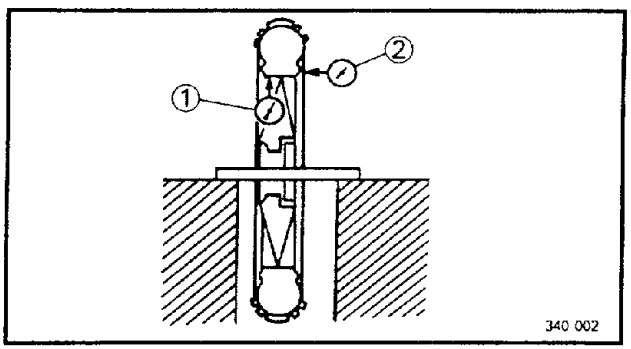
Check the front wheel runout after tightening the spokes.



5. Measure:
   - •Front wheel runout

   Over the specified limits → Replace.

Front wheel runout limits:
Radial ①: 2.0 mm
Lateral ②: 2.0 mm

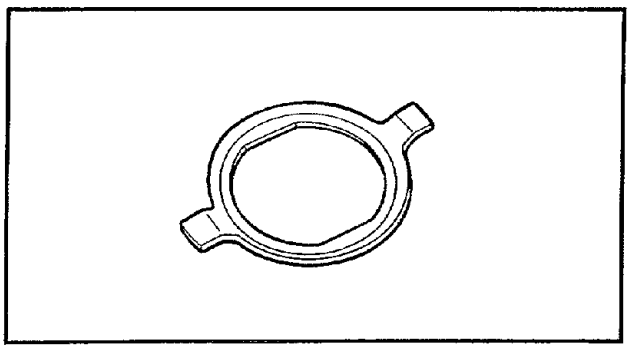


6. Inspect:
   - •Front wheel bearings

   Bearings allow free play in the wheel hub or the wheel does not turn smoothly → Replace.
   - •Oil seals

   Wear/damage → Replace.
7. Inspect:
   - •Collar

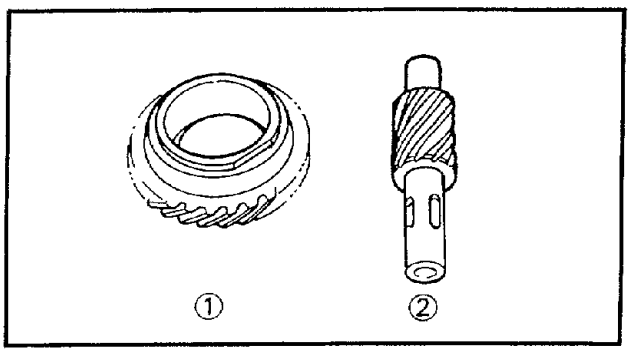
   Grooved wear→Replace the collar and the oil seal as a set.



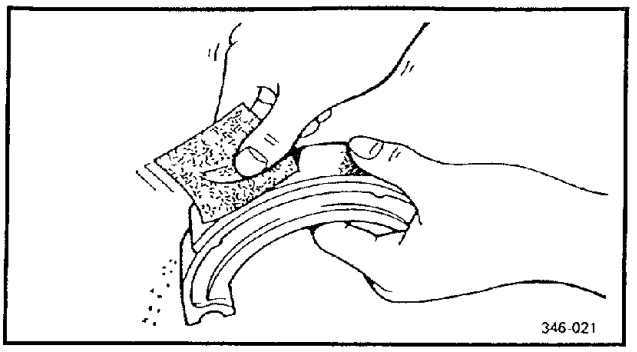
SPEEDOMETER GEAR INSPECTION

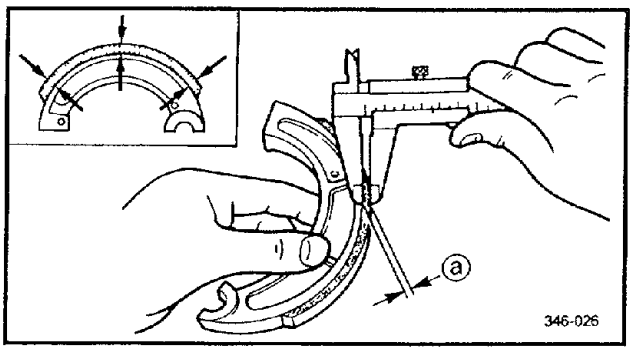
1. Inspect:
   - •Meter clutch

   Wear/damage→Replace.



2. Inspect:
   - •Meter drive gear ①
   - •Meter gear ②





FRONT BRAKE INSPECTION

1. Inspect:
   - Brake lining surface
     Glazed areas → Replace.
     Use coarse sand paper.

NOTE:

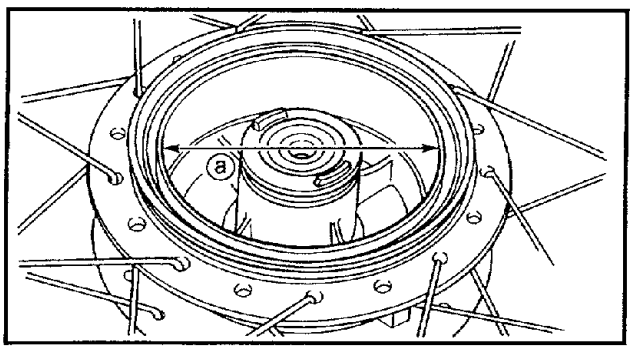
After polishing, wipe the polished particles with a cloth

2. Measure:
   - Brake lining thickness ⓐ
     Out of specification → Replace.
     Measuring points.

Brake lining thickness:
Standard:
4 mm
Limit:
2 mm

NOTE:

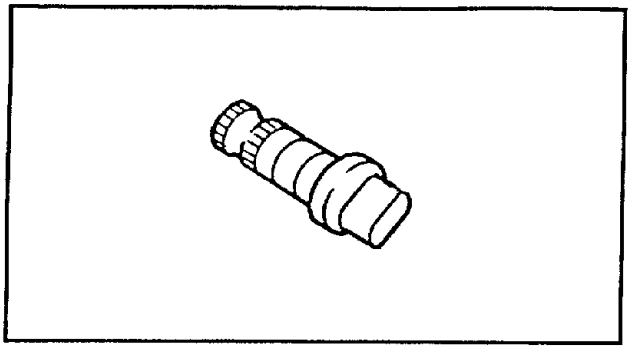
Replace the brake shoes as a set if either is worn to the limit.

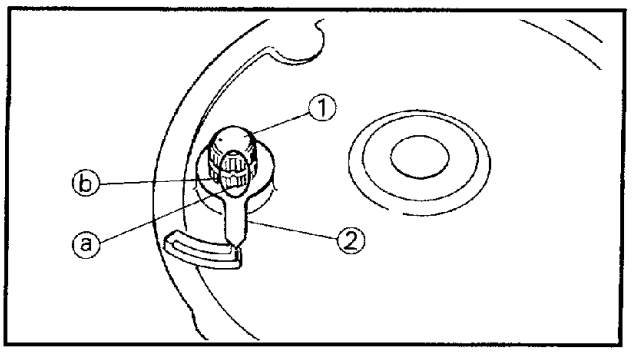


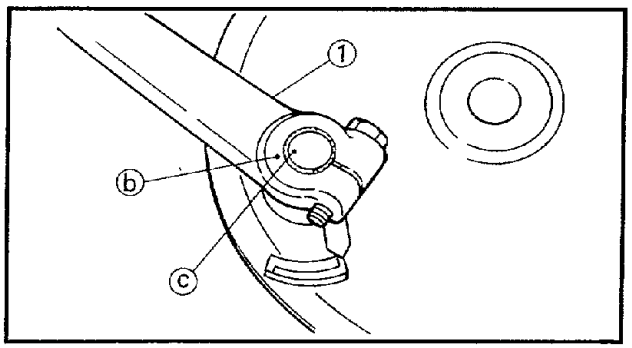
3. Measure:
   - Brake drum inside diameter ⓐ
     Out of specification → Replace the wheel.

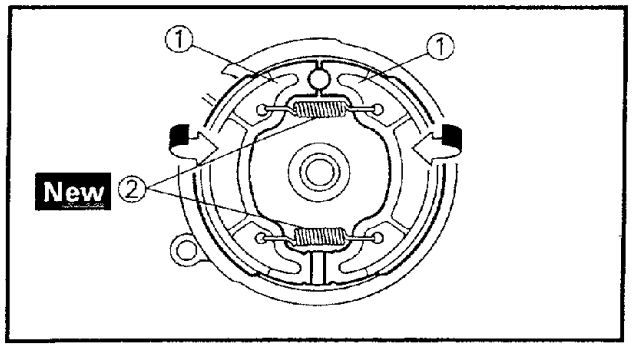
Brake drum inside diameter:
Standard:
130 mm
Limit:
131 mm

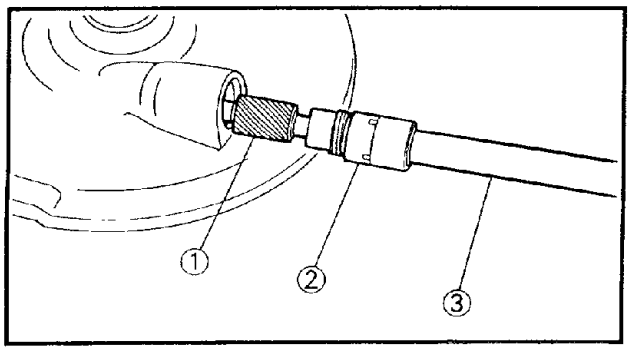
4. Inspect:
   - Brake drum inner surface
     Oil/scratches → Repair.
   - Oil
     Use a rag soaked in lacquer thinner or solvent.
   - Scratches
     Use an emery cloth.
     (lightly and evenly polishing)











5. Inspect:
   •Cam shaft face
   Wear → Replace.

⚠WARNING

When inspecting the brake lining, do not spill oil or grease on the brake lining.

AG••••••

BRAKE SHOE PLATE ASSEMBLY

1. Install:
   •Camshaft ①
   •Indicator plate ②

****

Installation steps:

- Align the projection ⓐ on the indicator plate with the camshaft notch ⓑ and install.
- Check the proper position of the brake shoe.

****

2. Install:
   •Cam lever ① — **9 Nm (0.9 m•kg)**

NOTE:

•Align the punch mark ⓒ on the cam shaft with the mark made on the cam lever ⓓ.
•Apply lithium soap base grease onto the brake cam shaft and pin.

3. Install:
   •Brake shoes ①
   •Tension springs ② **New**

NOTE:

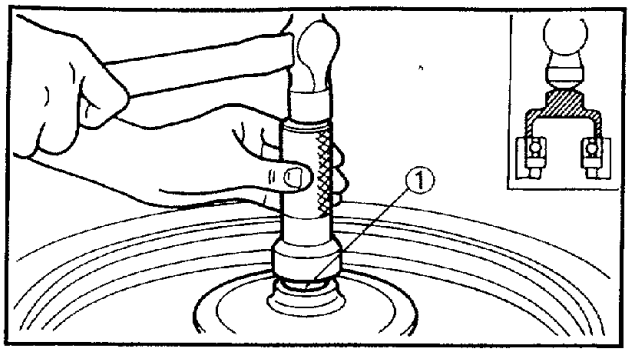
•When installing the springs and brake shoes, take care not to damage the springs.
•Replace the tension spring as a set when replace the brake shoes.

⚠WARNING

After installing the brake cam shaft, remove the excess grease.

4. Install:
   •Meter gear ①
   •Bush ②
   Install the bush using a meter gear bush tool ③.

	Meter gear bush tool: **90890-01052**



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FRONT WHEEL ASSEMBLY

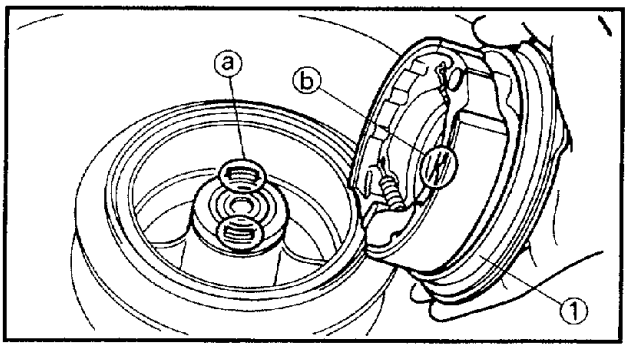
1. Install:
   - Bearing ①
   - Spacer
   - Bearing
   - Oil seal

NOTE:

- Apply the lithium soap base grease on the bearing and oil seal lip when installing.
- Use a socket that matches the outside diameter of the race of the bearing.
- Always use a new oil seal.
- Install the oil seal with its manufacturer's marks or numbers facing outward.

CAUTION:

Do not strike the inner race of balls of the bearing. Contact should be made only with the outer race.



2. Install:
   - Brake shoe plate assembly ①

NOTE:

Make sure that the wheel hub and the speedometer gear unit are installed with the two projections ⓐ meshed into the two slots ⓑ.

3. Install:
   - Hub dust cover
   - Collar

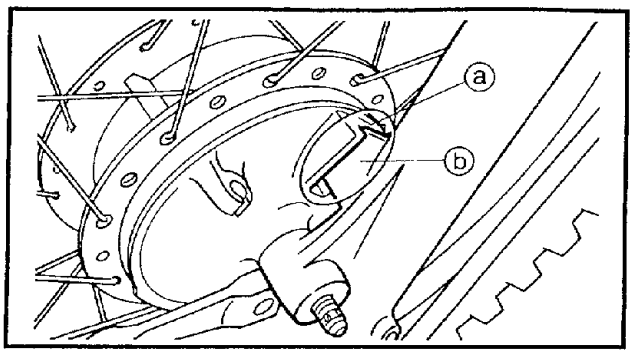
T700030

FRONT WHEEL INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Lubricate:
   - Front wheel axle
   - Bearings
   - Oil seal (lips)
   - Drive/driven gear (speedometer)

	Recommended lubricant: Lithium soap base grease



2. Install:
   - Front wheel

NOTE:

Make sure that the slot ⓐ in the shoe plate fits over the stopper ⓑ on the front fork outer tube.

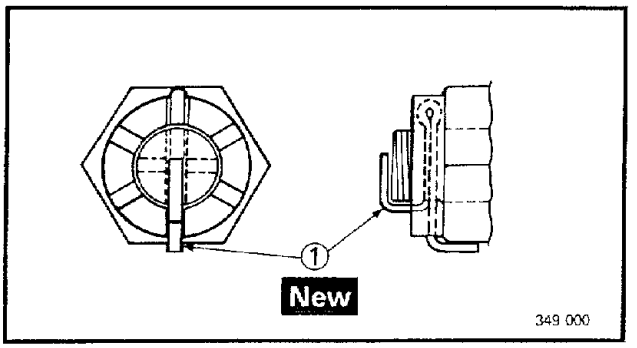
3. Tighten: **39 Nm (3.9 m•kg)**
   - Front wheel axle
   - Axle nut (front wheel)

NOTE:

Do not loosen the axle nut after torque tightening. If axle nut groove is not aligned with the wheel axle cotter pin hole, align groove to hole by tightening up on the axle nut.

CAUTION:

Before tightening the wheel axle, stroke the front fork several times to check for proper fork operation.



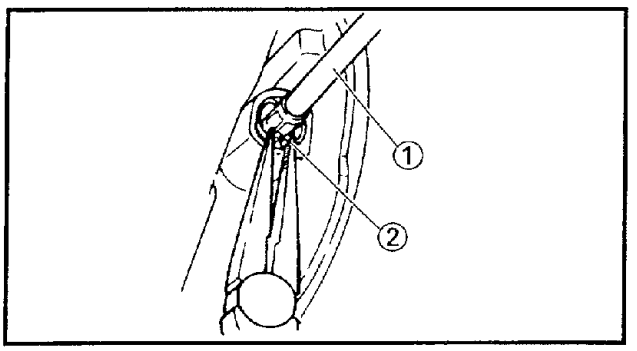
4. Install:
   - Cotter pin ① **New**

NOTE:

Bend the ends of the cotter pin.

⚠WARNING

Always use a new cotter pin.

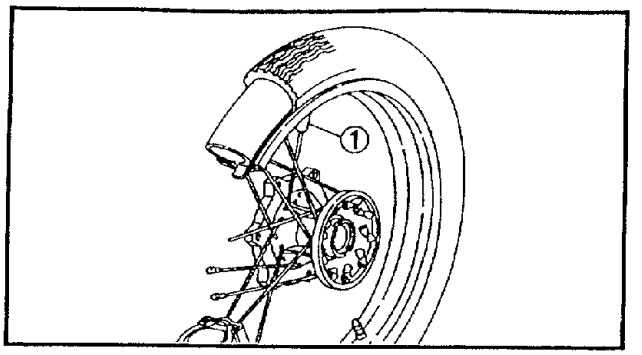


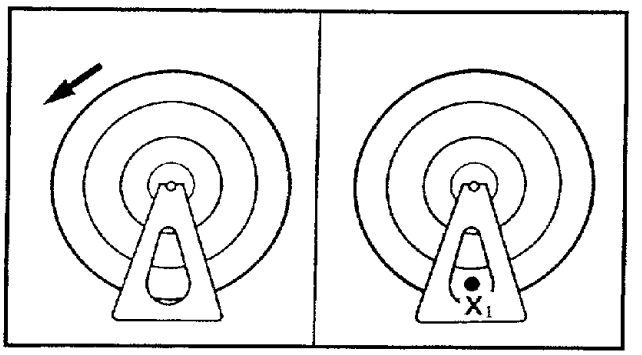
5. Install:
   - Brake cable
   - Meter cable ①
   - Clip ②

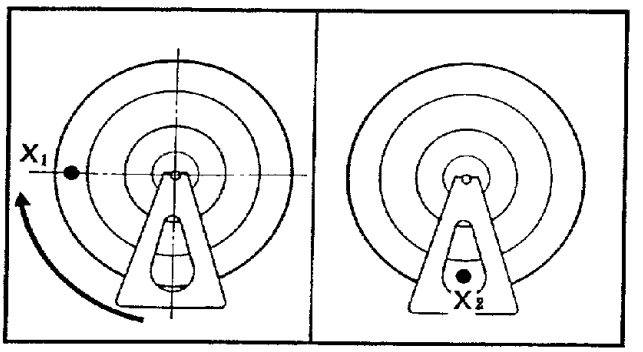
⚠WARNING

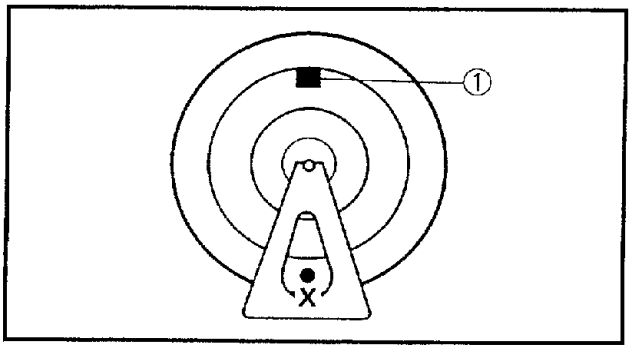
Make sure that the brake cable and meter cable is routed properly.

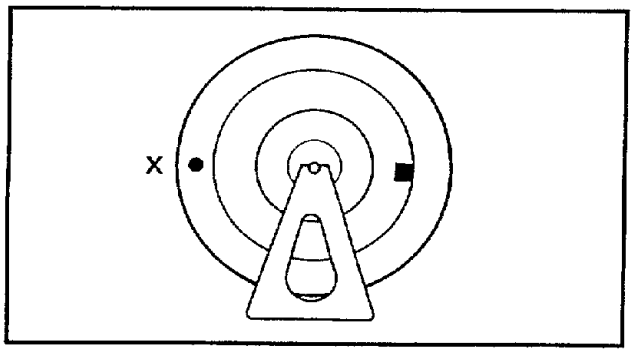
6. Check:
   - Front brake smooth operation
     Unsmooth operation → Disassembly or rechek.
   - Brake lever free play
     Refer to "FRONT BRAKE ADJUSTMENT" section in CHAPTER 3.











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WHEEL STATIC BALANCE ADJUSTMENT

NOTE:

- After replacing the tire and/or rim, the wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

1. Remove:
   - Balancing weight ①
2. Set:
   - Wheel
     (on a suitable stand)
3. Find:
   - Heavy spot

****

Procedure:

a. Spin the wheel and wait for it to rest.
b. Put an "X_1" mark on the wheel's bottom spot.
c. Turn the wheel so that the "X_1" mark is 90° up.
d. Release the wheel and wait for it to rest. Put an "X_2" mark on the wheel's bottom spot.
e. Repeat the above b., c., and d.several times until all marks come to the same spot.
f. This spot is the wheel's heavy spot "X".

****

4. Adjust:
   - Wheel static balance

****

Adjusting steps:

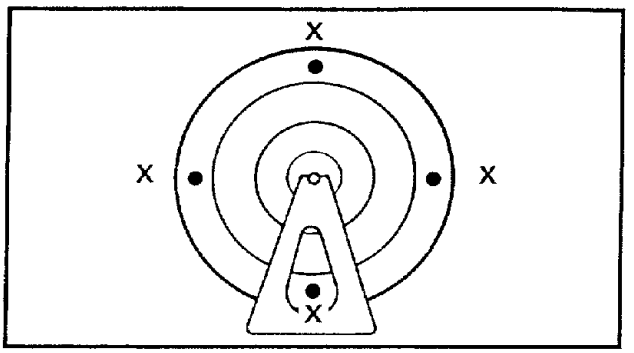
- Install a balancing weight ① on the rim exactly opposite to the heavy spot "X".

NOTE:

Start with the smallest weight.

- Turn the wheel so that the heavy spot is 90° up.
- Check that the heavy spot is at rest there. If not, try another weight until the wheel is balanced.

****



5. Check:
   •Wheel static balance

****

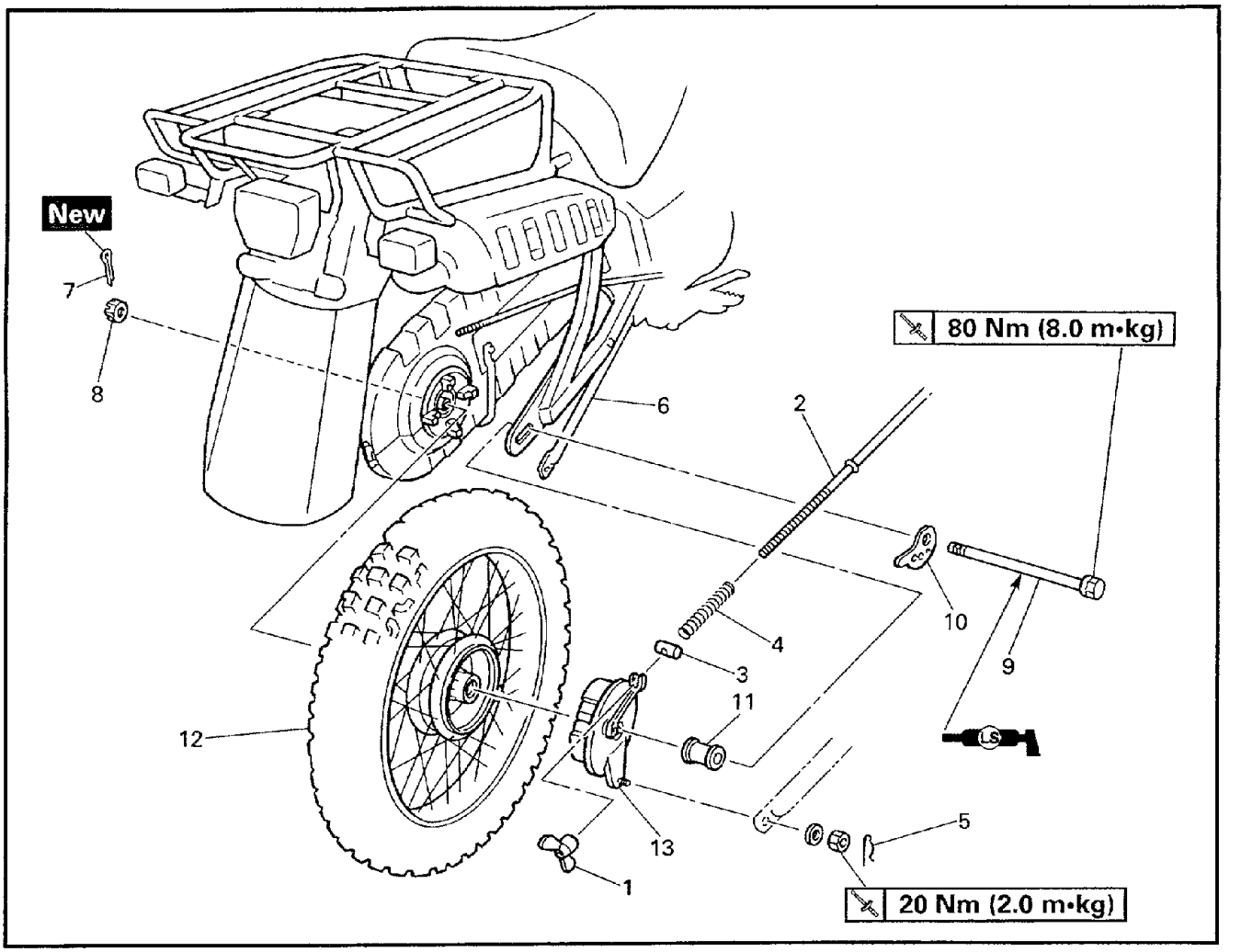
Checking steps:

- Turn the wheel so that it comes to each point as shown.
- Check that the wheel is at rest at each point. If not, readjust the front wheel static balance.

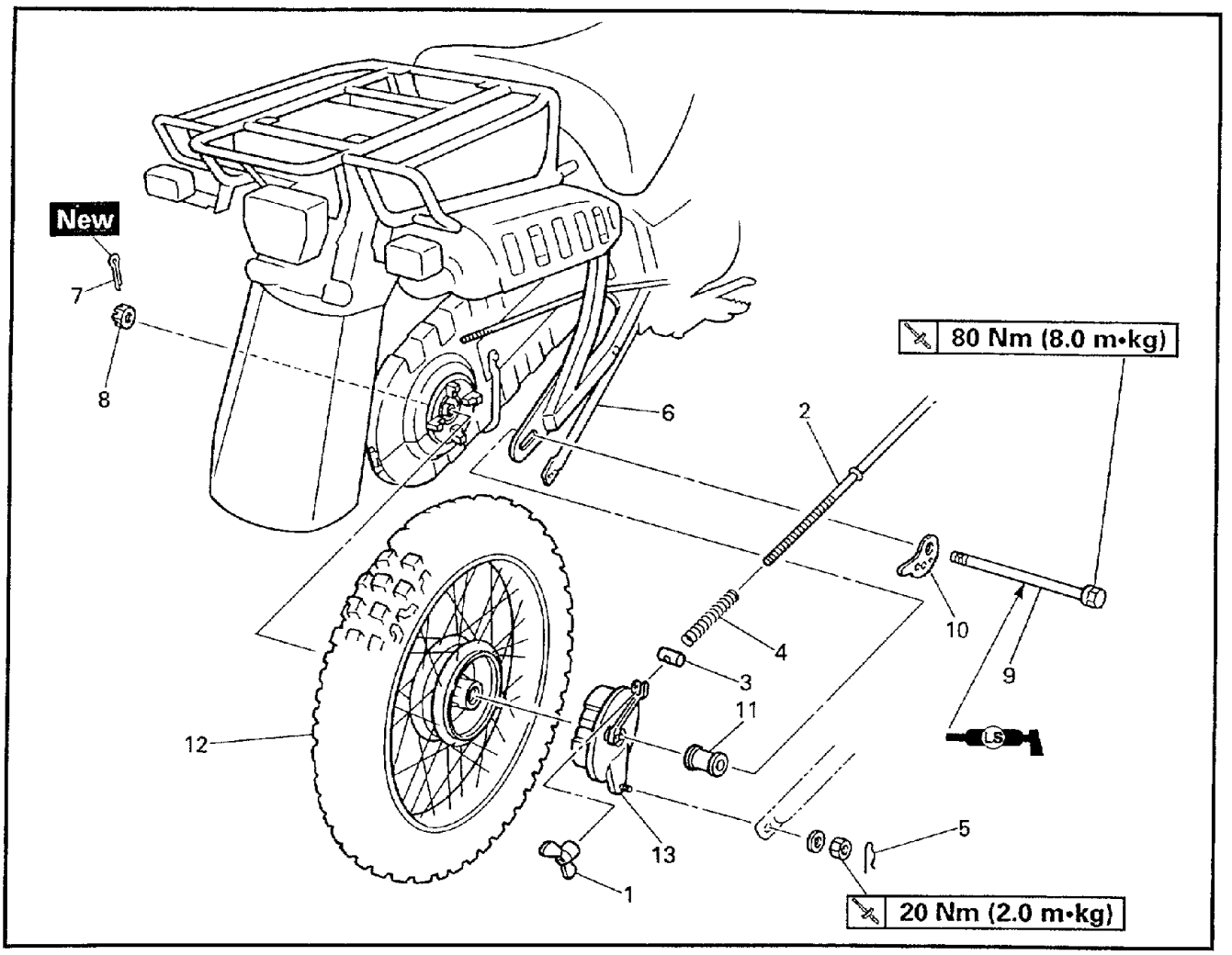
****

REAR WHEEL, REAR BRAKE AND DRIVE CHAIN

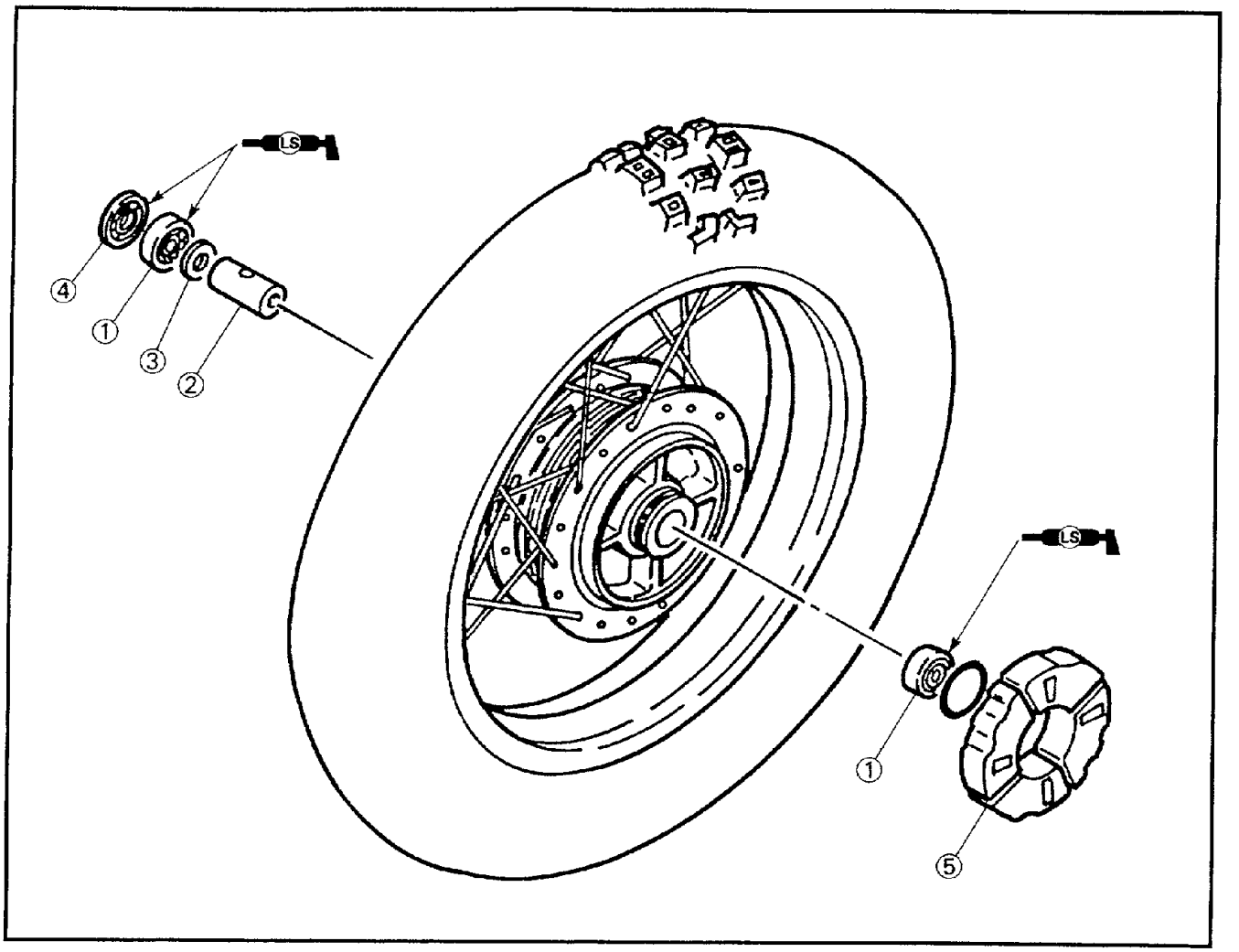
REAR WHEEL AND REAR BRAKE



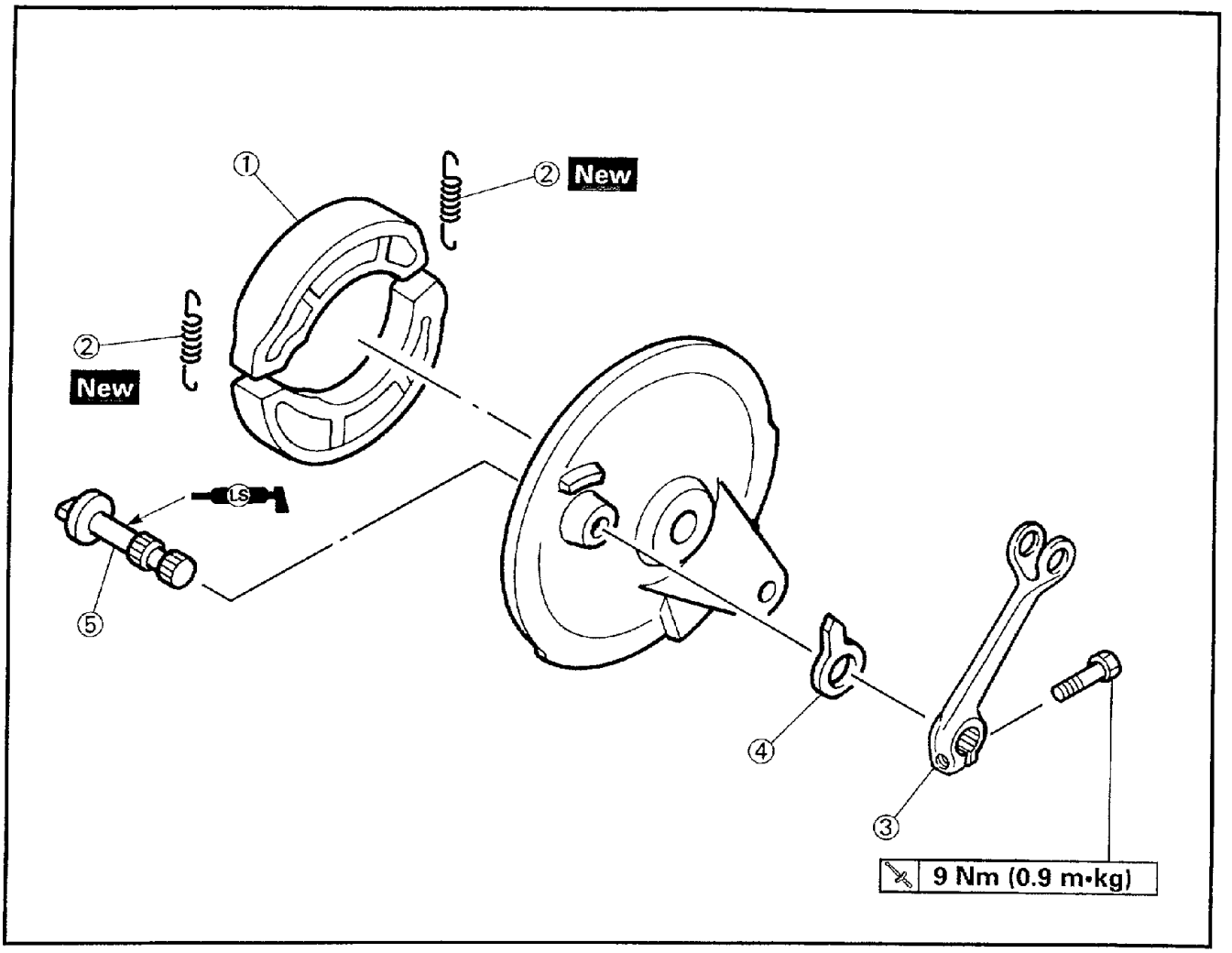
Order	Job name/Part name	Q'ty	Remarks
	Rear wheel and rear brake removal		Remove the parts in order.
1	Adjuster (rear brake)	1	
2	Brake rod	1	
3	Pin	1	
4	Compression spring	1	
5	Cotter pin	1	
6	Tension bar	1	
7	Cotter pin	1	Refer to "REAR WHEEL INSTALLATION" section.
8	Axle nut	1	
9	Wheel axle	1	
10	Chain puller	1	
11	Collar	1	



Order	Job name/Part name	Q'ty	Remarks
12	Rear wheel assembly	1	Refer to "REAR WHEEL INSTALLATION" section.
13	Brake shoe plate assembly	1	
			Reverse the removal procedure for installation.

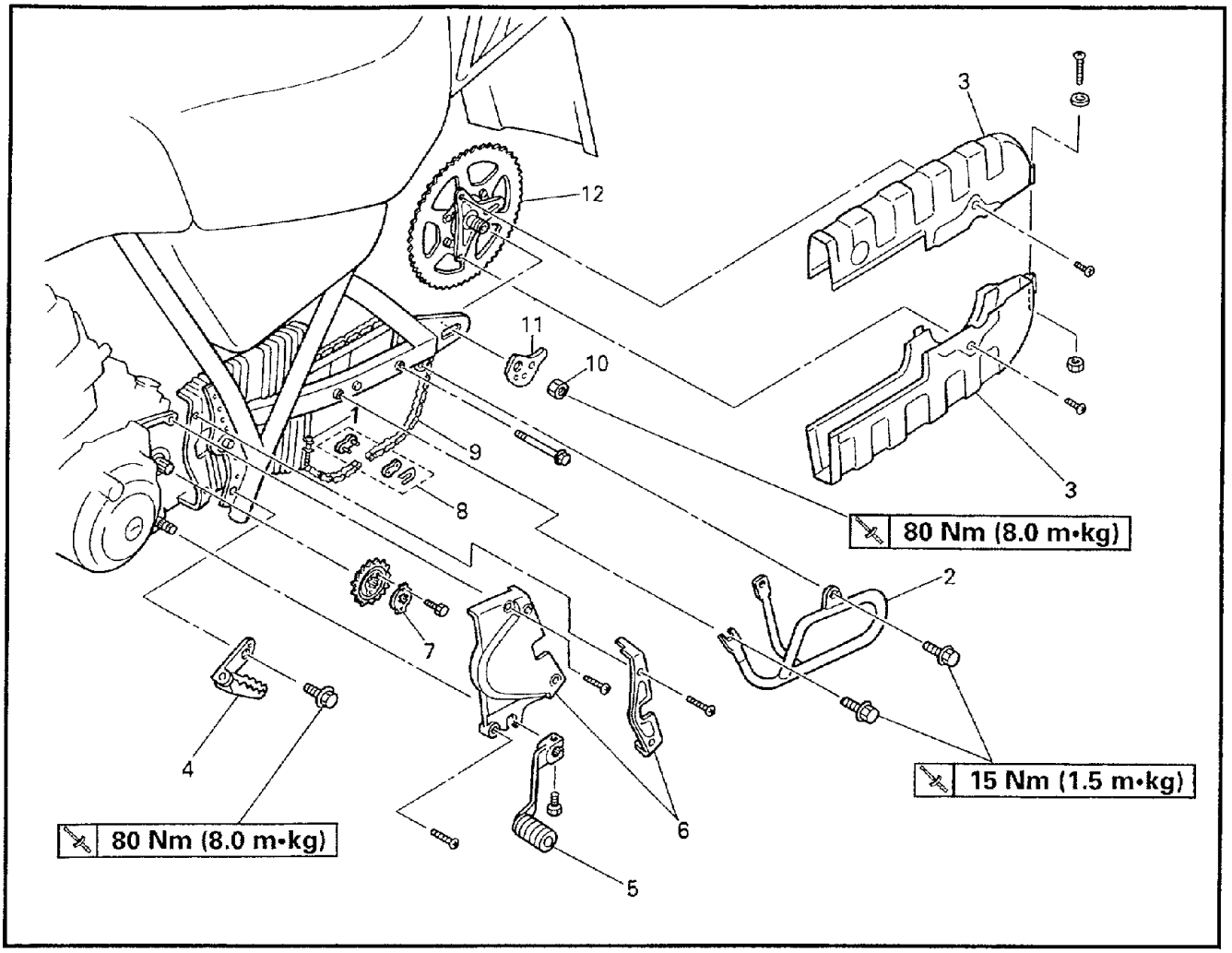


Order	Job name/Part name	Q'ty	Remarks
	Rear wheel disassembly		Disassemble the parts in order.
①	Bearing	1	Refer to "REAR WHEEL DISASSEMBLY/ ASSEMBLY" section.
②	Collar	1	
③	Spacer	1	
④	Oil seal	1	
⑤	Damper	1	Reverse the disassembly procedure for reassembly.

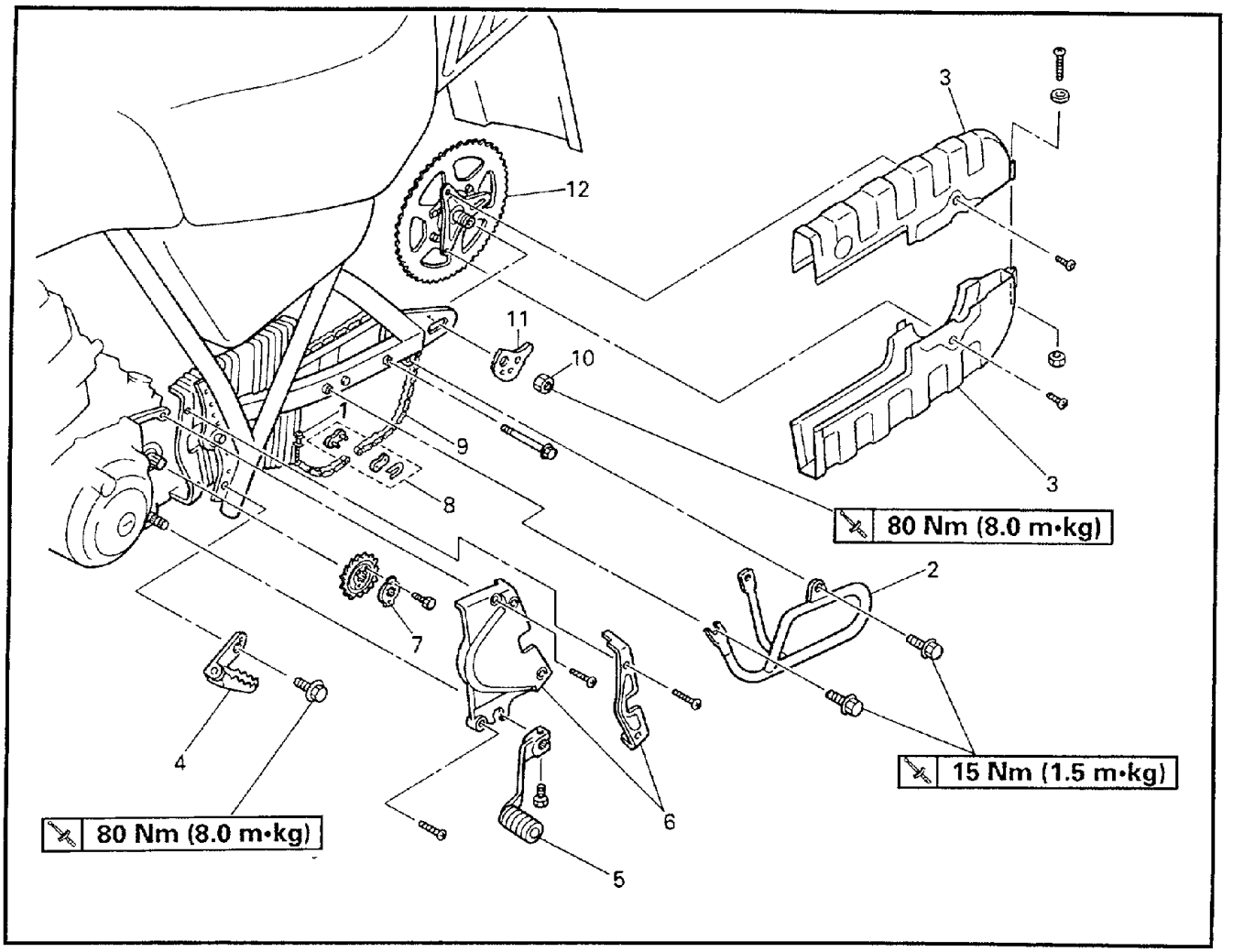


Order	Job name/Part name	Q'ty	Remarks
	Rear brake shoe plate disassembly		Disassemble the parts in order.
①	Brake shoe kit	1	
②	Tension springs	2	Refer to "BRAKE SHOE PLATE ASSEMBLY" section.
③	Cam lever	1	
④	Indicator plate	1	
⑤	Camshaft	1	
			Reverse the disassembly procedure for reassembly.

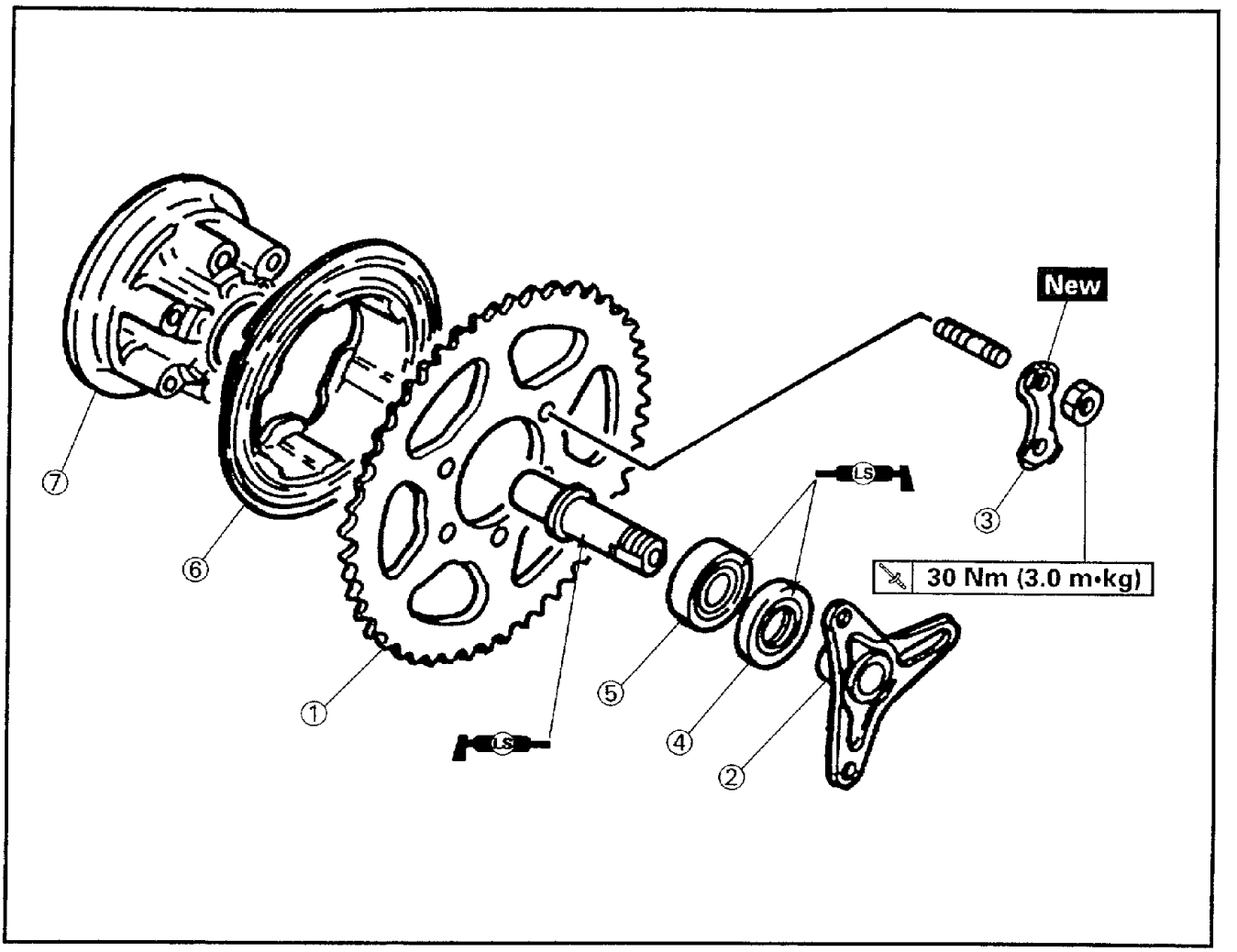
DRIVE CHAIN, DRIVE SPROCKET AND DRIVEN SPROCKET



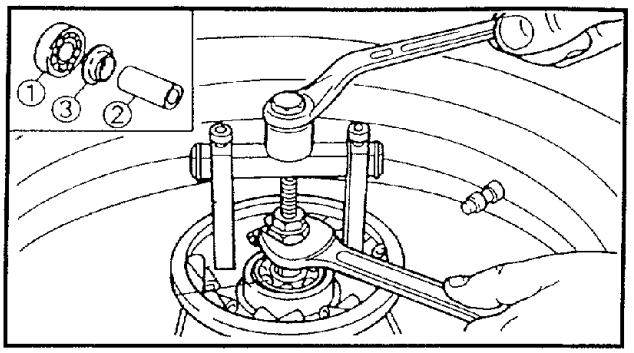
Order	Job name/Part name	Q'ty	Remarks
	Drive chain, drive sprocket and driven sprocket removal		Remove the parts in order.
	Rear wheel		
1	Band (boots)	2	**NOTE:** Loosen the screw.
2	Chain case guard	1	
3	Chain case (upper and lower)	2	Refer to "DRIVE SPROCKET AND DRIVE CHAIN" section.
4	Foot rest (left)	1	
5	Shift pedal	1	
6	Fitting plate/sprocket cover	1/1	
7	Sprocket holder	1	
8	Clip/chain joint/plate	1/1/1	Refer to "DRIVE SPROCKET AND DRIVE CHAIN INSTALLATION" section.
9	Drive chain	1	



Order	Job name/Part name	Q'ty	Remarks
10	Driven sprocket axle nut	1	**NOTE:** Loosen the axle nut and slacken the drive chain.
11	Chain puller	1	Refer to "DRIVEN SPROCKET INSTALLATION" section. Reverse the removal procedure for installation.
12	Driven sprocket axle assembly	1	



Order	Job name/Part name	Q'ty	Remarks
	Clutch hub disassembly		Disassemble the parts in order.
①	Driven sprocket	1	Refer to "DRIVEN SPROCKET ASSEMBLY" section.
②	Collar	1	
③	Lock washers	3	
④	Oil seal	1	
⑤	Bearing	1	
⑥	Cover	1	
⑦	Clutch hub	1	Reverse the disassembly procedure for assembly.



T*******

REAR WHEEL DISASSEMBLY

1. Remove:
   - Bearings ①
   - Spacer ②
   - Collar ③

   Refer to "FRONT WHEEL".

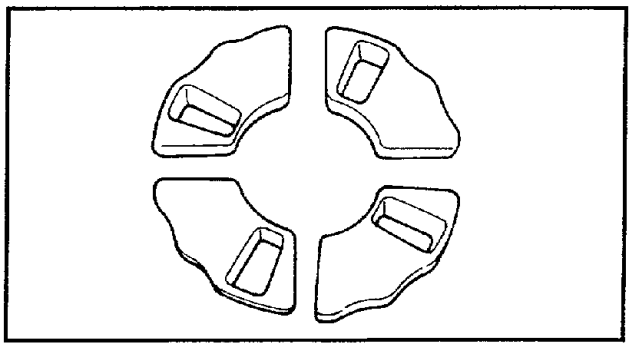
T701020

REAR WHEEL INSPECTION

1. Inspect:
   - Rear wheel axle
   - Rear wheel
   - Rear wheel bearings
   - Oil seals

   Refer to "FRONT WHEEL".
2. Measure:
   - Rear wheel runout

   Refer to "FRONT WHEEL".



3. Inspect:
   - Clutch hub damper

   Wear/damage → Replace.

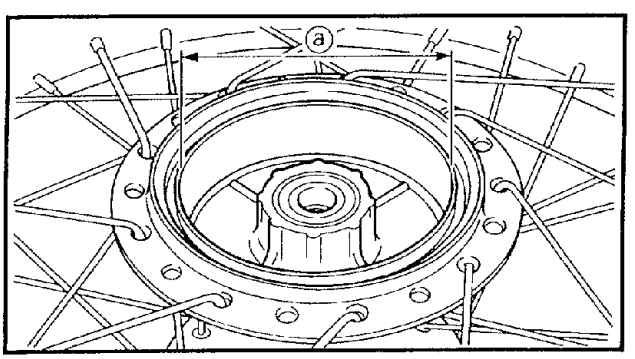
SR701021

REAR BRAKE INSPECTION

1. Inspect:
   - Brake lining surface
2. Measure:
   - Brake lining thickness
3. Inspect:
   - Brake drum inner surface
   - Oil
   - Scratches

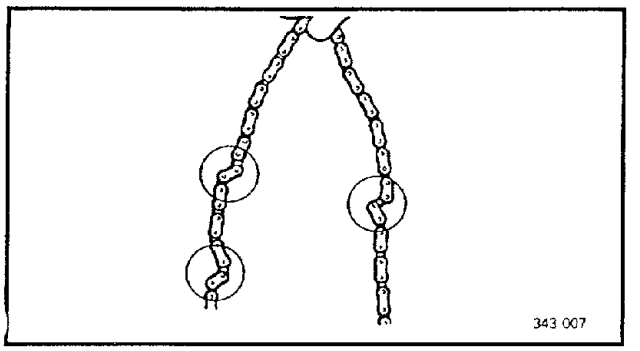
   Refer to "FRONT WHEEL".
4. Measure:
   - Brake drum inside diameter ⓐ

   Out of specification → Replace.



Brake drum inside diameter:
Standard:
130 mm
Limit:
131 mm

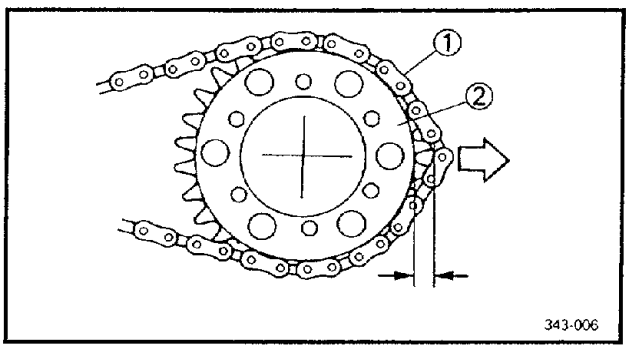
5. Inspect:
   •Cam shaft face
   Refer to "FRONT WHEEL".



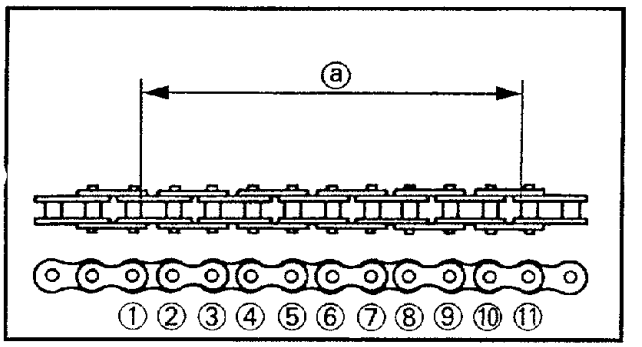
T701020

DRIVE CHAIN INSPECTION

1. Inspect:
   •Drive chain stiffness
   Stiffness → Clean and lubricate or replace.



2. Inspect:
   •Drive chain ①
   •Driven sprocket ②
   More than 1/2 tooth a wear → Replace the drive chain.
   Use new driven sprocket.

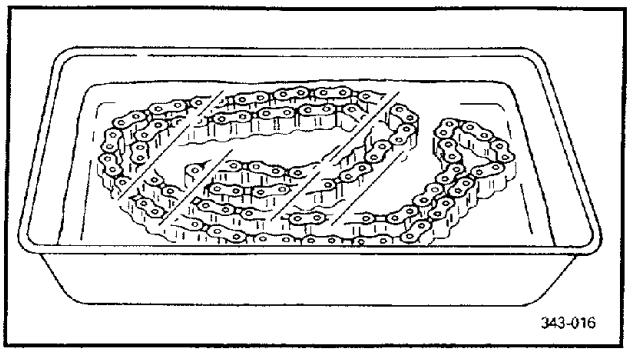


3. Measure:
   •10 link length ⓐ (drive chain)
   Out of specification → Replace the drive chain.

	10 link length limit: **122 mm**

NOTE:

- Tighten the drive chain with a finger before measuring.
- 10 link length is the distance between the inside edge of roller ① and ⑪ as shown.
- 10 link length measurement should be done at two or three different places.



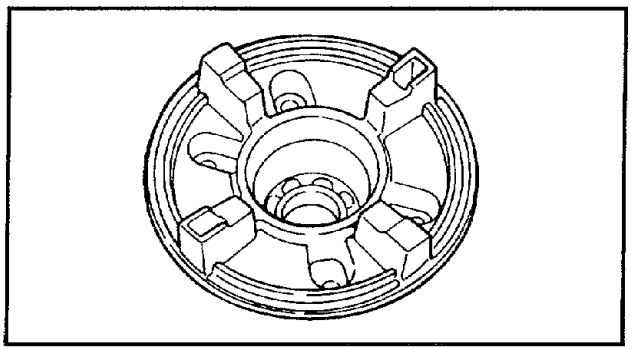
4. Clean:
   - Drive chain
     Put it in kerosene, and brush off as much dirt as possible. Then remove the drive chain from the kerosene and dry it.

	Drive chain lubricant: Engine oil

T*****

CLUTCH HUB INSPECTION

1. Inspect:
   - Clutch hub
     Wear/damage/cracks → Replace.

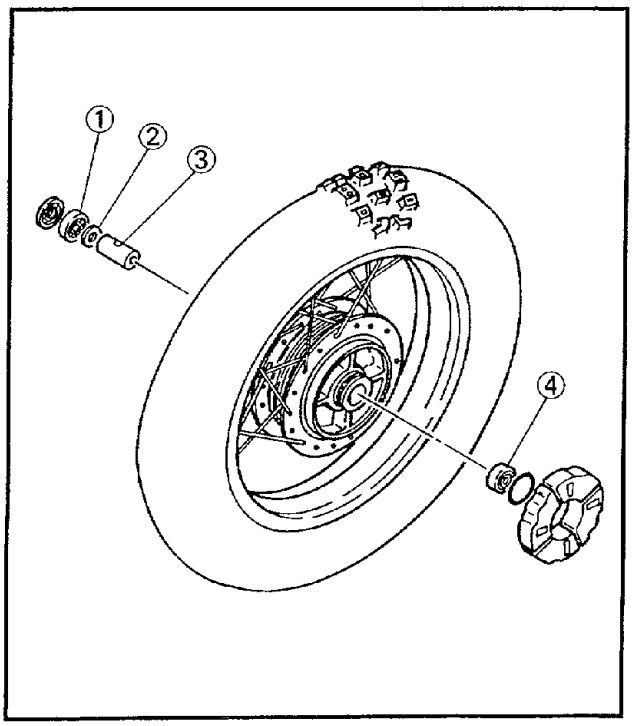


AG******

BRAKE SHOE PLATE ASSEMBLY

1. Install:
   - Camshaft
   - Indicator plate
2. Install:
   - Cam lever — **9 Nm (0.9 m·kg)**
3. Install:
   - Brake shoes
   - Tension springs **New**

   Refer to "FRONT WHEEL".

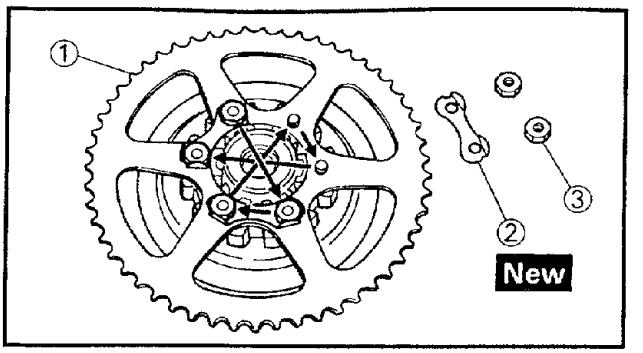


AG******

REAR WHEEL ASSEMBLY

1. Install:
   - Bearing ①
   - Spacer ②
   - Collar ③
   - Bearing ④

   Refer to "FRONT WHEEL".
2. Install:
   - Clutch hub dumper



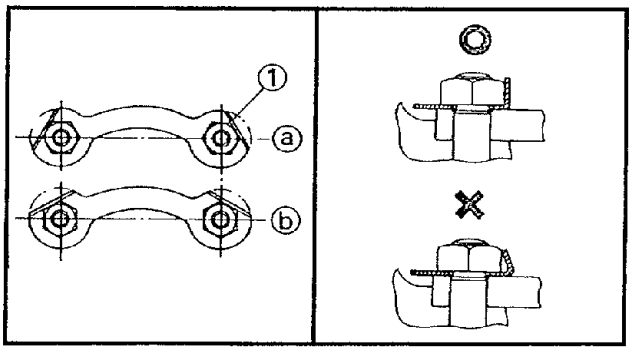
T******

DRIVEN SPROCKET ASSEMBLY

1. Install:
   - Driven sprocket ①
   - Lock washer ② **New**
   - Nut ③ **30 Nm (3.0 m•kg)**

NOTE:

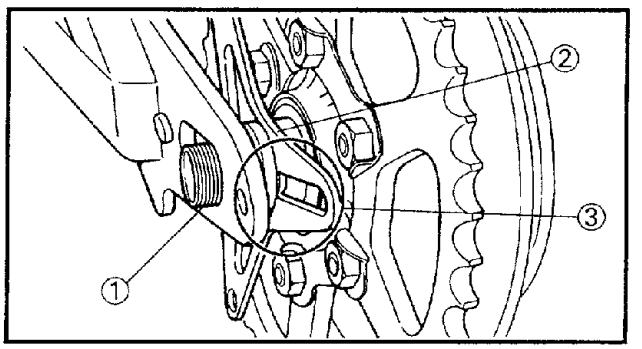
Tighten the nuts in a crisscross pattern.



2. Bend:
   - Lock washer tab ①
     (along a flat side of the end)

AG******

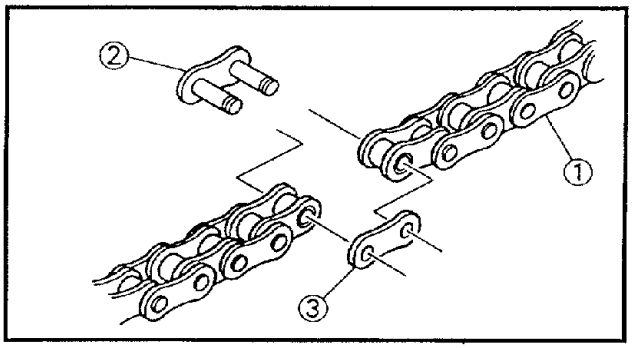
DRIVEN SPROCKET AND DRIVE CHAIN INSTALLATION



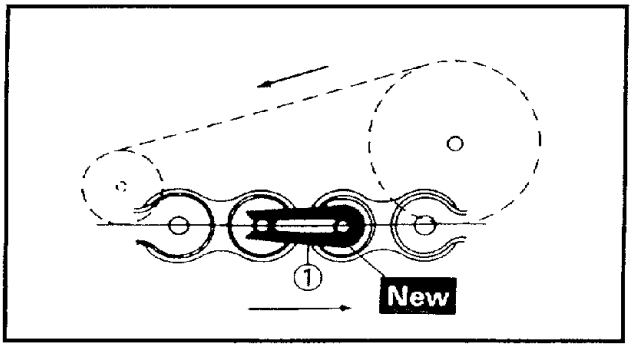
1. Install:
   - Driven sprocket axle ①
   - Collar ②

NOTE:

Align the tab on the swingarm with the slit of collar ③.



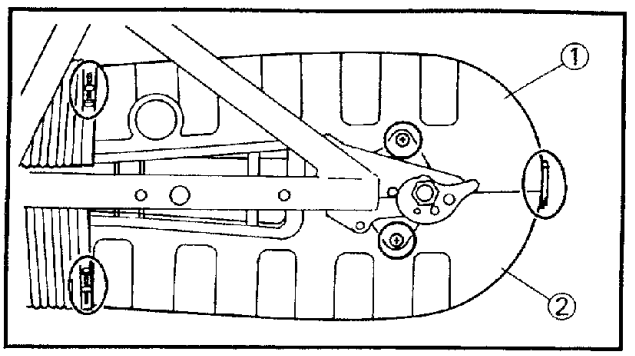
2. Install:
   - Drive chain ①
   - Chain joint ②
   - Plate ③



3. Install:
   - Clip ① **New**

CAUTION:

Be sure to install the chain joint clip to the direction as shown.



4. Install:
   - Chain case (upper) ①
   - Chain case (lower) ②

NOTE:

Make sure that the chain cases insert to the boots.

4. Tighten:
   - Band
   - Driven sprocket axle

80 Nm (8.0 m•kg)

T701032

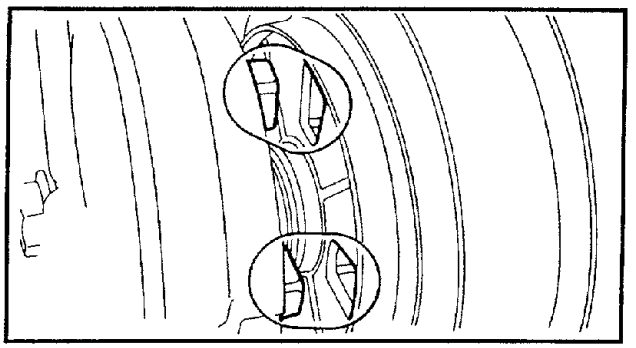
REAR WHEEL INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:
   - Brake shoe plate assembly
   - Rear wheel assembly

NOTE:

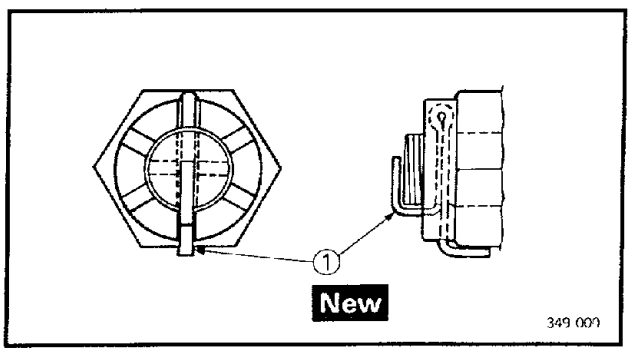
Make sure that the slot in the rear wheel hub damper fits over the tab on the clutch hub assembly.



2. Adjust:
   - Drive chain slack
     Refer to "DRIVE CHAIN ADJUSTMENT" section in CHAPTER 3.
3. Tighten:
   - Rear wheel axle **80 Nm (8.0 m•kg)**
   - Axle nut (rear wheel)

NOTE:

Do not loosen the axle nut after torque tightening. If axle nut groove is not aligned with the wheel axle cotter pin hole, align groove to hole by tightening up on the axle nut.



4. Install:
   - Cotter pin ① **New**

NOTE:

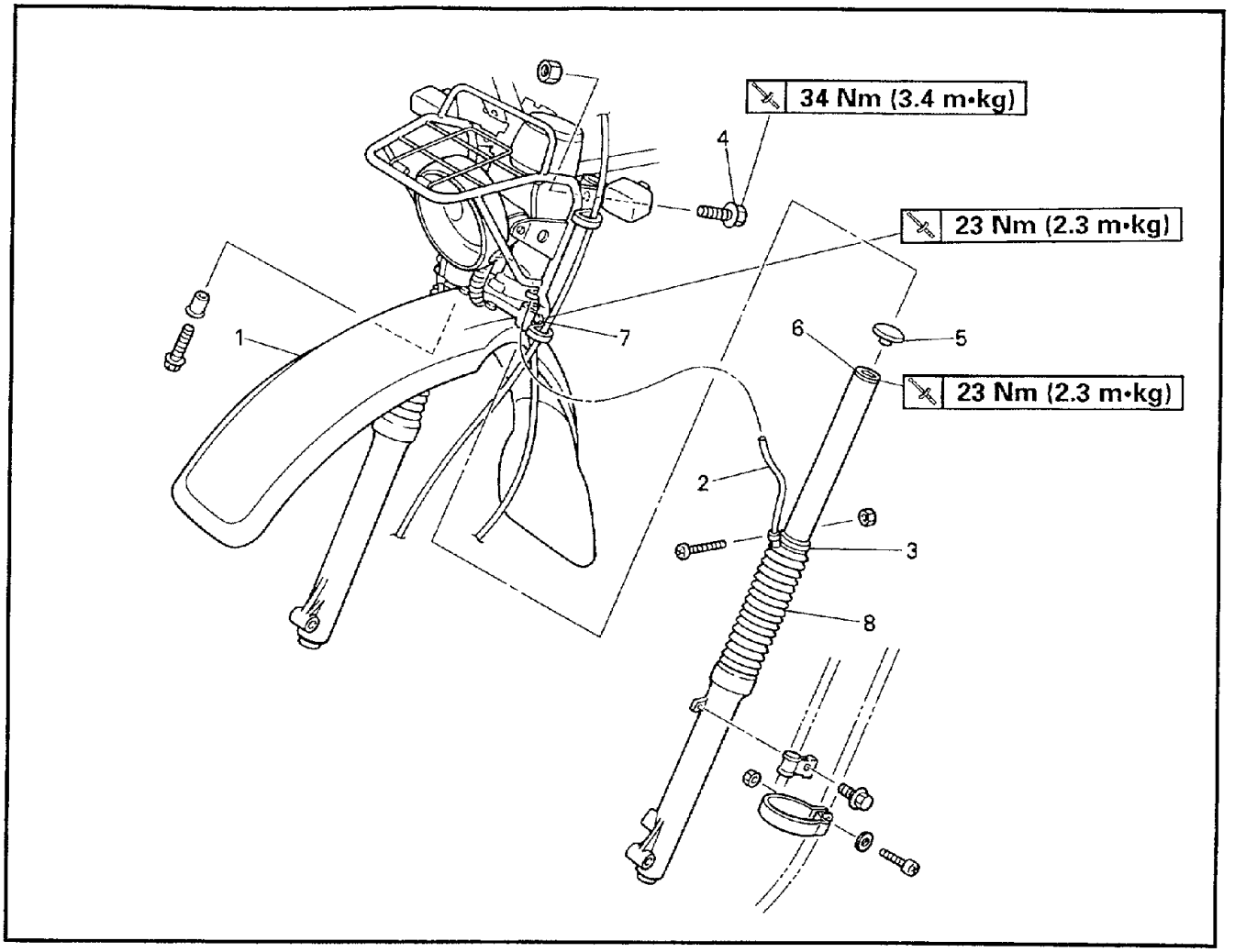
Bend the ends of the cotter pin.

⚠WARNING

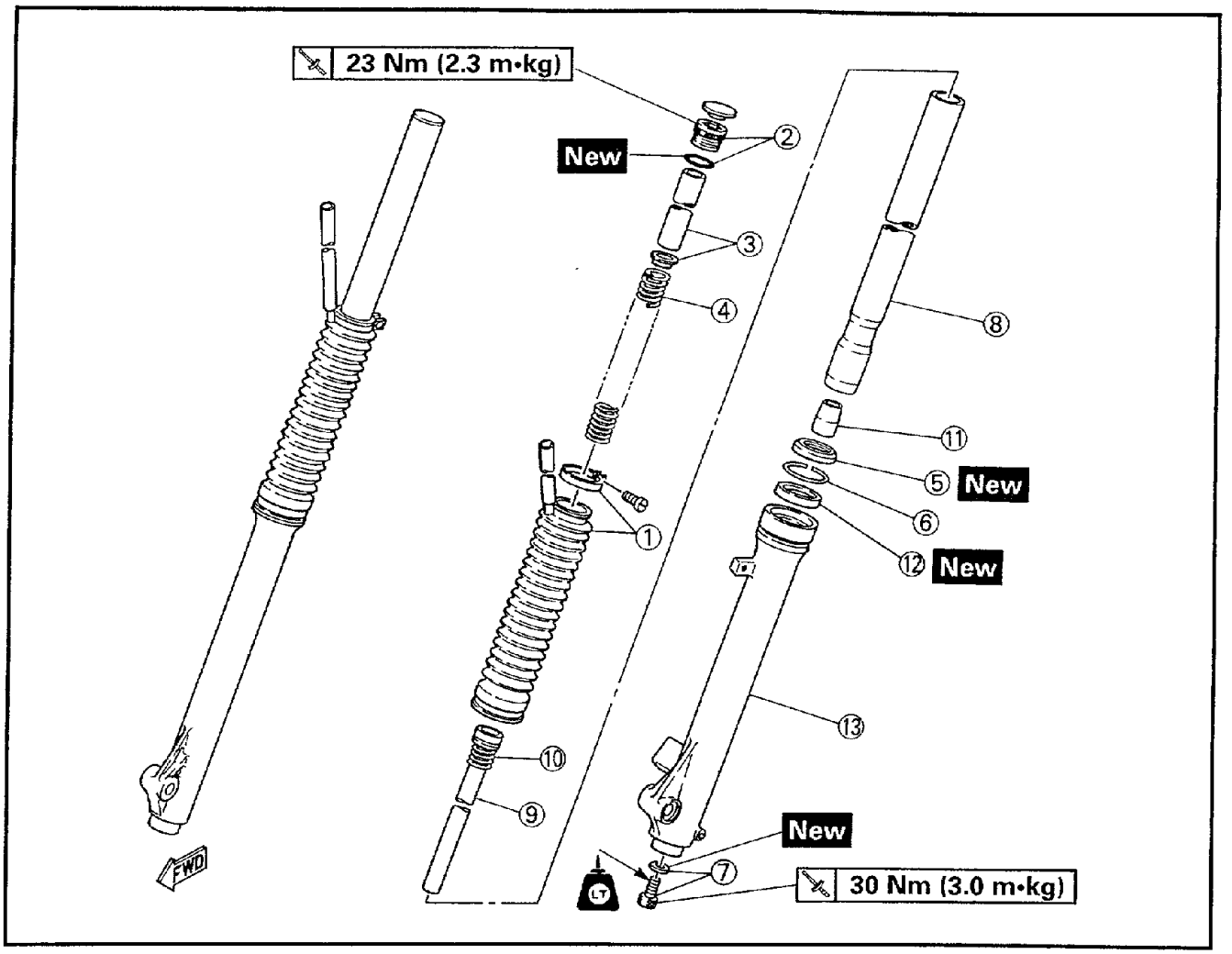
Always use a new cotter pin.

5. Check:
   - Brake pedal free play
     Refer to "REAR BRAKE ADJUSTMENT" section in CHAPTER 3.

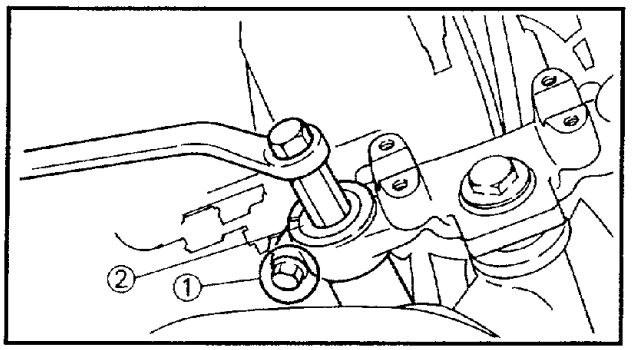
FRONT FORK

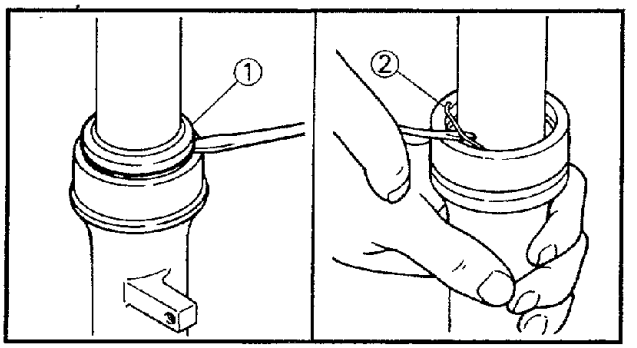


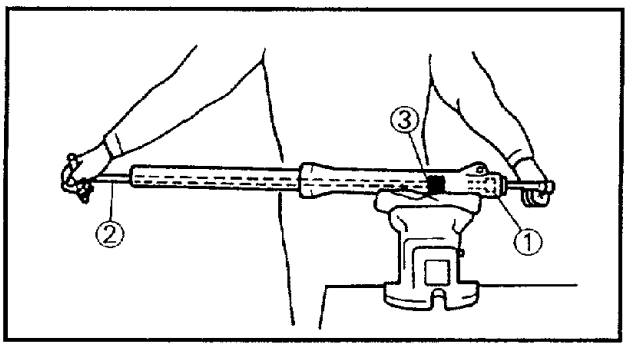
Order	Job name/Part name	Q'ty	Remarks
	Front fork removal		Remove the parts in order.
	Front wheel		Refer to "FRONT WHEEL AND FRONT
	Brake cable and meter cable		BRAKE " section.
	Handlebar		Refer to "HANDLEBAR" section.
	Headlight unit		
1	Front fender	1	
2	Breather hose	1	
3	Band/fork boots	1/1	
4	Bolt (handle crown)	1	Refer to "FRONT FORK REMOVAL/ INS-
5	Cap	1	TALLATION"section.
6	Cap bolt/O-ring	1/1	**NOTE:**
7	Bolts (under bracket)	1	Loosen the under bracket bolt.
8	Front fork assembly	1	Reverse the removal procedure for installation.

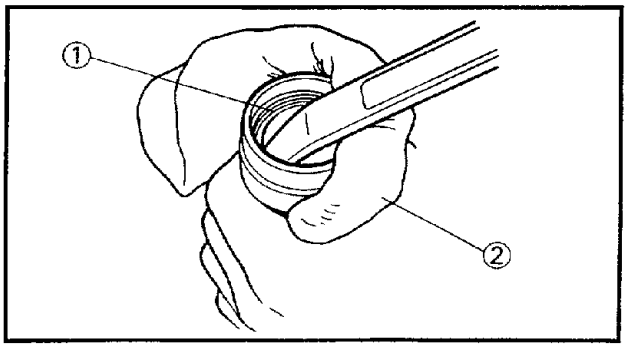


Order	Job name/Part name	Q'ty	Remarks
	Front fork disassembly		Disassemble the parts in order.
①	Band/fork boots	1/1	Refer to "FRONT FORK ASSEMBLY" section.
②	Cap bolt/O-ring	1/1	
③	Collar/spring seat	1/1	**NOTE:**
④	Fork spring	1	Drain the fork oil.
⑤	Dust seal	1	Refer to "FRONT FORK DISASSEMBLY/ ASSEMBLY" section.
⑥	Retaining clip	1	
⑦	Bolt/washer	1	
⑧	Inner tube assembly	1	Refer to "FRONT FORK ASSEMBLY" section.
⑨	Damper rod	1	
⑩	Rebound spring	1	
⑪	Oil lock piece	1	
⑫	Oil seal	1	
⑬	Outer tube	1	
			Reverse the disassembly procedure for assembly.









AG703010

FRONT FORK REMOVAL

⚠WARNING

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

1. Stand the motorcycle on a level surface.
2. Elevate the front wheel by placing a suitable stand under the engine.
3. Loosen:
   - Pinch bolt (handle crown) ①
   - Cap bolts ②

NOTE:

Use 19 mm width hexagonal wrench for loosening and tightening the cap bolt.

⚠WARNING

Support the front fork before loosening the pinch bolts.

AG703020

FRONT FORK DISASSEMBLY

1. Remove:
   - Dust seal ①
   - Retaining clip ②
     (using a slotted-head screwdriver)

CAUTION:

Take care not to scratch the inner tube.

2. Remove:
   - Bolt (damper rod) ①

   Loosen the bolt (damper rod) ① while holding the damper rod with T-handle ② and holder ③.

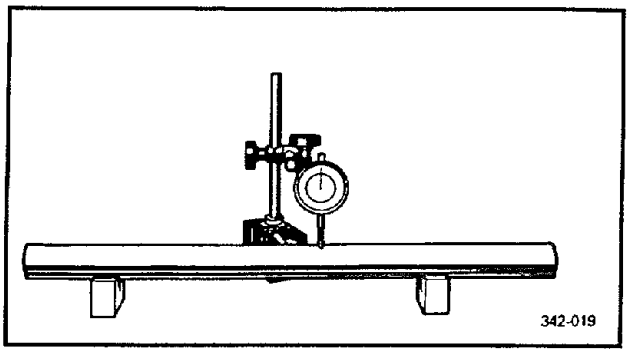
Damper rod holder (19 mm):
90890-04084
T-handle
90890-01326

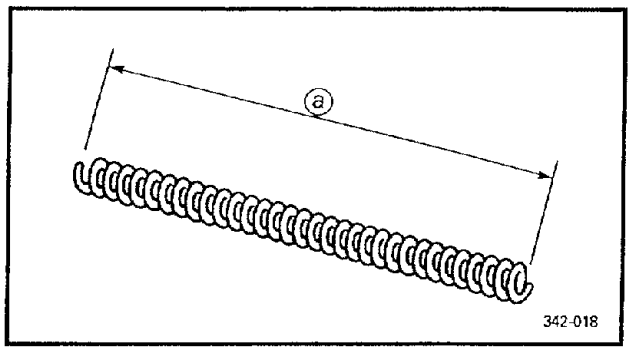
3. Remove:
   - Oil seal ①

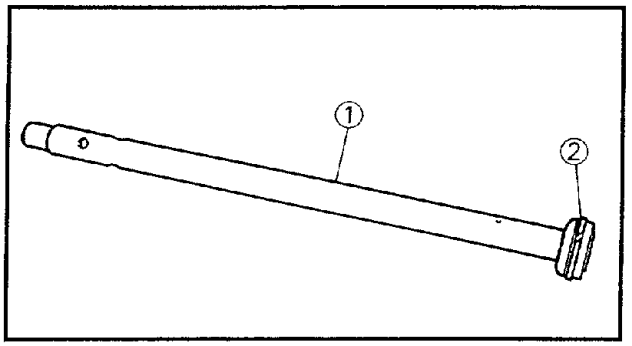
CAUTION:

Never reuse the oil seal.

② Rag







YP703030

FRONT FORK INSPECTION

1. Inspect:
   - Inner tube bending

	Inner tube bending limit: **0.2 mm**

Scratches/bends/damage → Replace.

⚠WARNING

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

2. Measure:
   - Fork spring ⓐ

	Front fork spring free length: **403.5 mm** **<Wear limit>** **399 mm**

Over the specified limit → Replace.

3. Inspect:
   - Damper rod ①
     Bends/damage → Replace.
     Contamination → Blow out all oil passages with compressed air.
   - Piston ring ②
     Wear/cracks/damage → Replace.

CAUTION:

- **The front fork has a built-in piston rod and a very sophisticated internal construction which are particularly sensitive to foreign material.**
- **When disassembling and assembling the front fork do not allow any foreign material to enter the oil.**

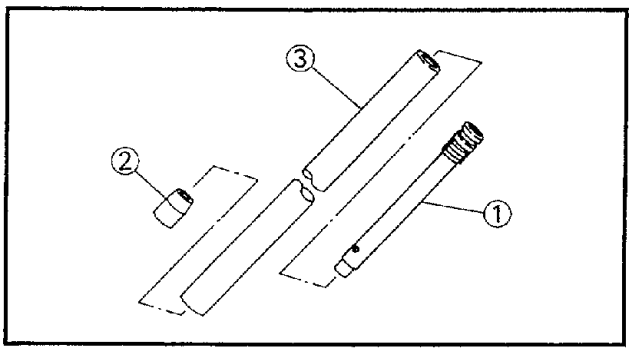
AG•••••

FRONT FORK ASSEMBLY

Reverse the "DISASSEMBLY" procedure.
Note the following points.

NOTE:

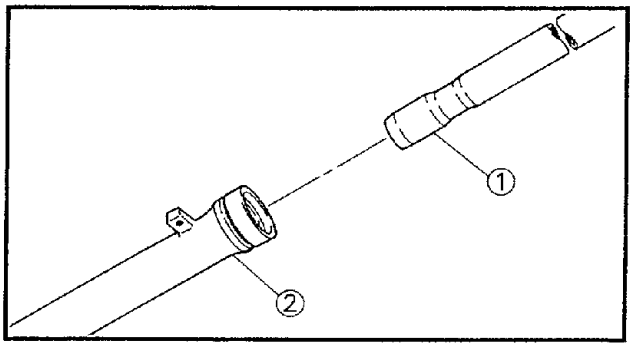
- When assembling the front fork be sure to replace the following parts.
  *Oil seal
  *Dust seal
- Before assembling the fork, make sure that all of the components are clean.



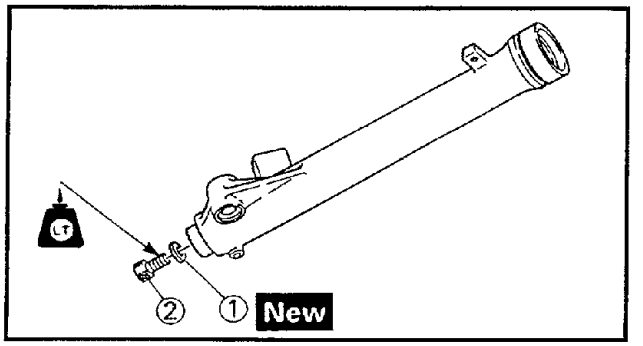
1. Install:
   - Damper rod ①
   - Rebound spring
   - Oil lock piece ②
   - Inner tube ③

NOTE:

Install the damper rod into the inner tube before install to the outer tube.



2. Install:
   - Inner tube ①
     Into outer tube ②.

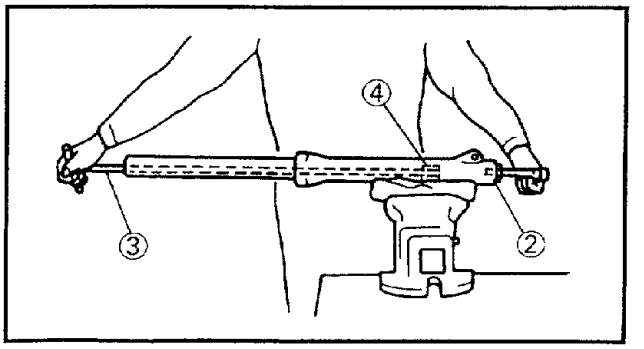


3. Install:
   - Washer ① **New**
   - Bolt (damper rod) ②
4. Tighten:
   - Bolt (damper rod)

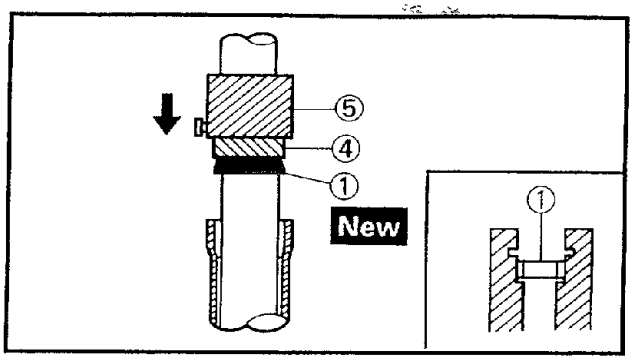
30 Nm (3.0 m•kg)

NOTE:

Tighten the damper rod bolt ② while holding the damper rod with a T-handle ③ and a damper rod holder ④.



Damper rod holder (19 mm):
90890-04084
T-handle
90890-01326

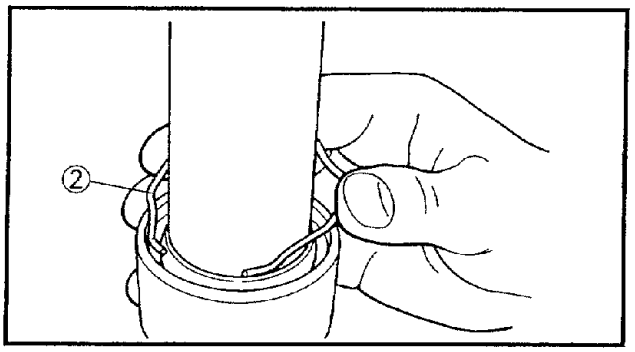


5. Install:
   - Oil seal ① **New**
   - Retaining clip ②
   - Dust seal ③ **New**

   Use the fork seal driver weight ④ and the attachment ⑤.

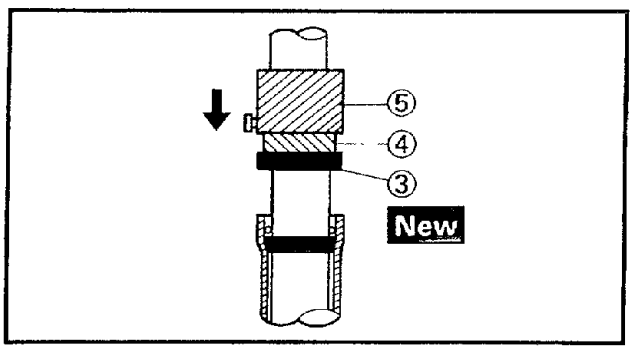
NOTE:

- Before installing the oil seal ①, apply lithium soap base grease onto the oil seal lips.
- Adjust the retaining clip so that it fits into the outer tube groove.

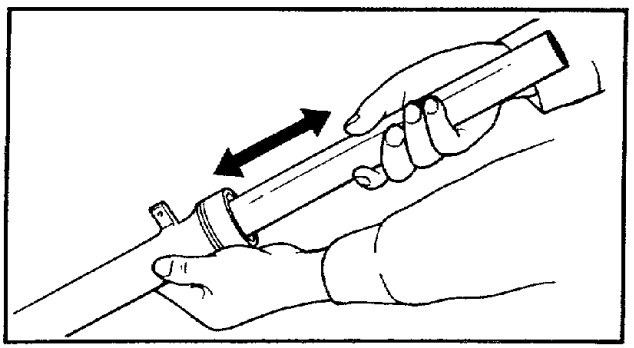


CAUTION:

Make sure that the oil seal numbered side faces upward.

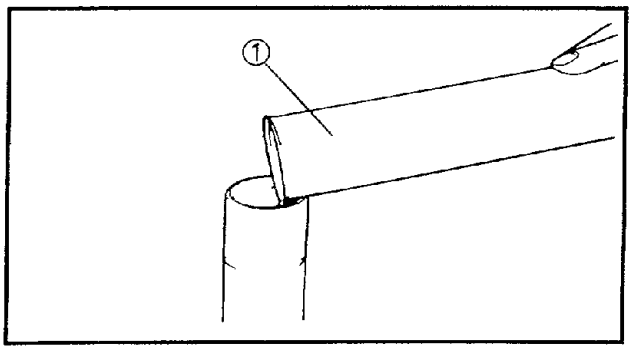


Fork seal driver weight:
90890-01367
Attachment:
90890-01369



6. Inspect:
   - Inner tube operation

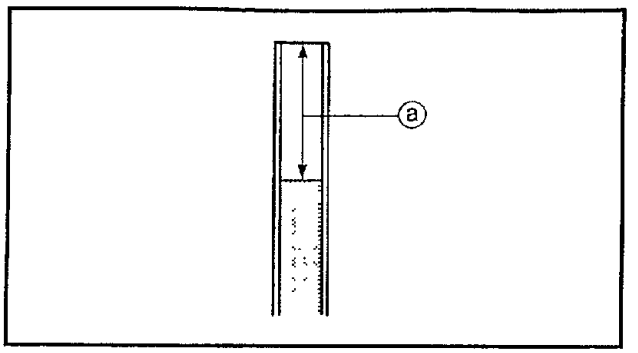
   Unsmooth operation→Disassembly and recheck.

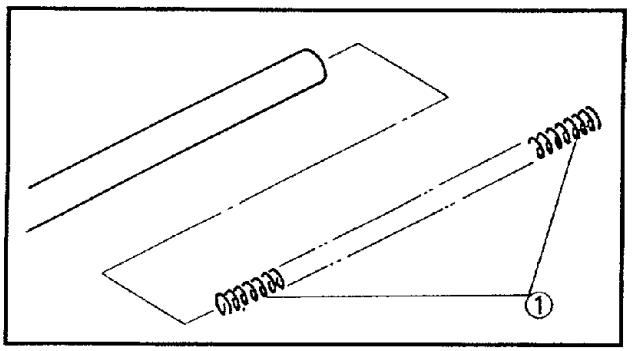


7. Fill:
   - Fork oil ①

Oil quantity:
0.294 L
Recommended oil:
Fork oil 15WT or equivalent

8. After filling up, slowly pump the fork up and down to distribute the fork oil.





9. Measure:
   •Oil level ⓐ
   Out of specfication→Adjust.

Oil level:
117 mm
(from the top of the inner tube fully compressed and without the fork spring)

NOTE:

Hold the fork in an upright position.

10. Install:
    •Front fork spring ①

NOTE:

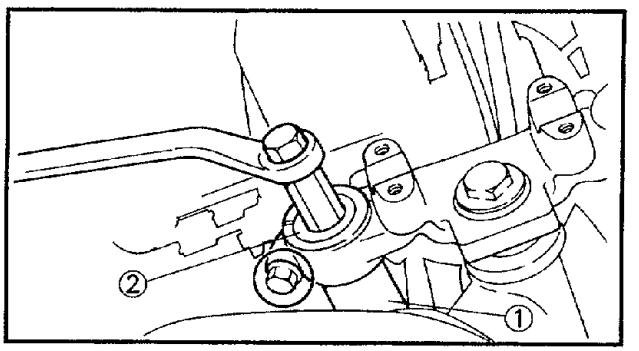
- Install the fork spring with its smaller pitch upward.
- Before installing the cap bolt, apply grease to the O-ring.
- Temporarily tighten the cap bolt.

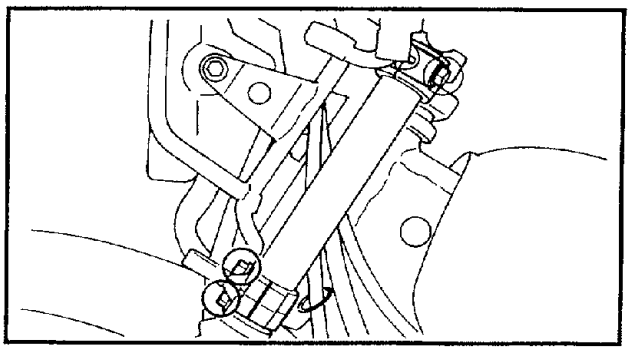
11. Install:
    •Spring seat
    •Spacer
    •O-ring **New**
    •Cap bolt
    •Fork boots

EB703050

FRONT FORK INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.





1. Install:
   •Front fork ①
   Temporary tighten the pinch bolts.

NOTE:

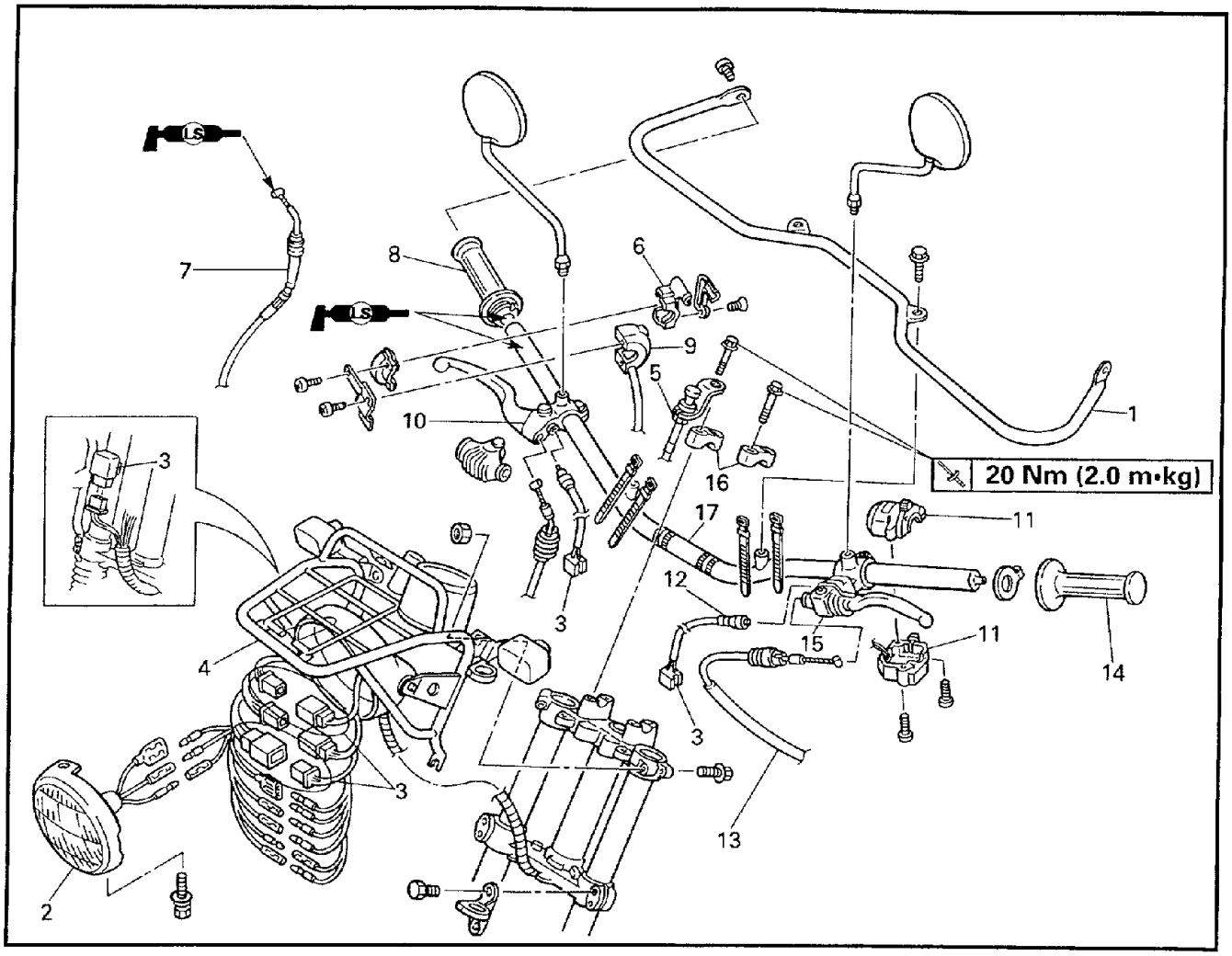
Pull up the inner tube until its end flushes the top of the under bracket, then temporarily tighten the bolt (under bracket lower).

2. Tighten:
   •Pinch bolts (under bracket upper/lower) **23 Nm (2.3 m•kg)**
   •Cap bolts ② **23 Nm (2.3 m•kg)**
   •Pinch bolts (handle crown) **34 Nm (3.4 m•kg)**

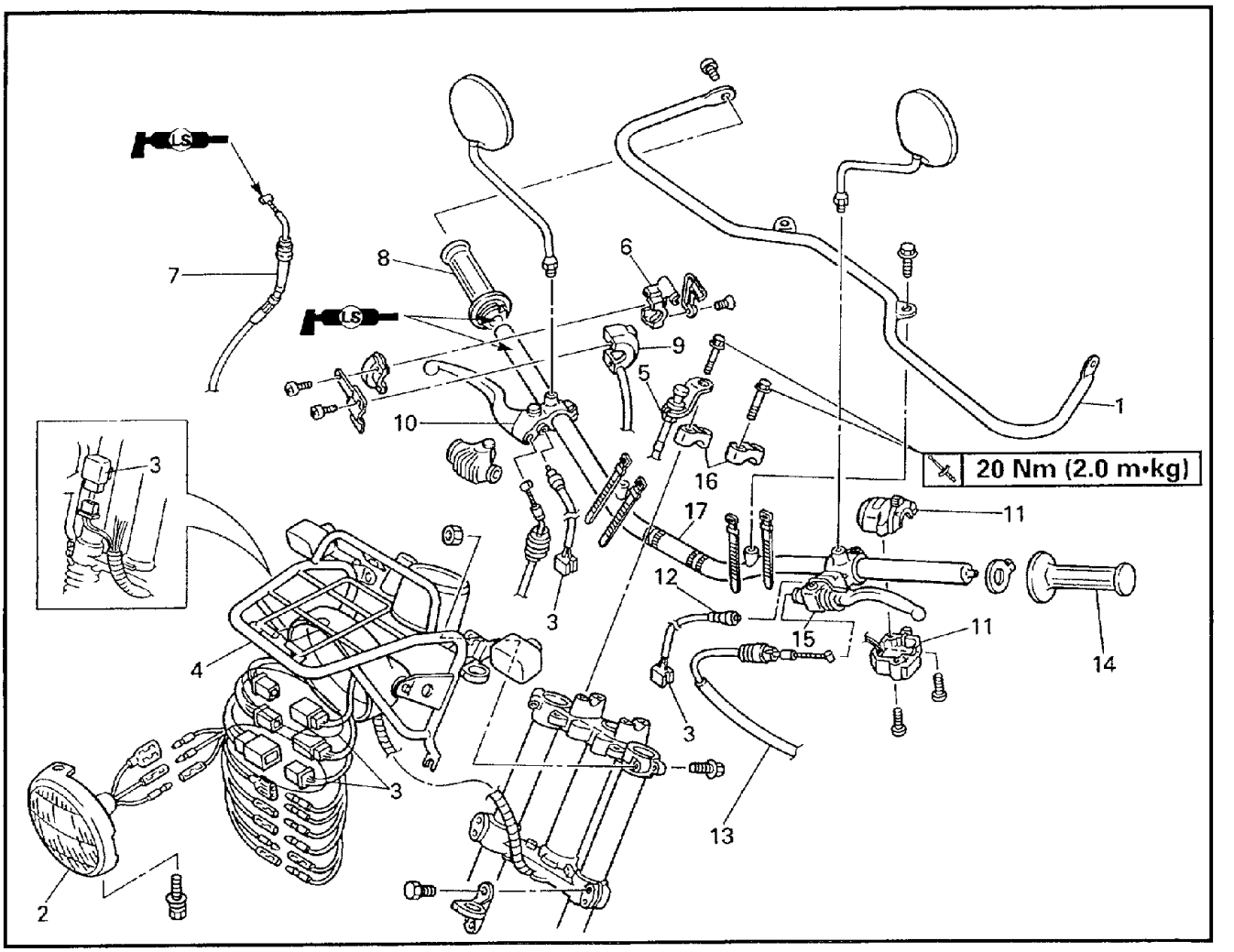
NOTE:

Refer to cable routing and insert the front fork breather hose into the headlight body.

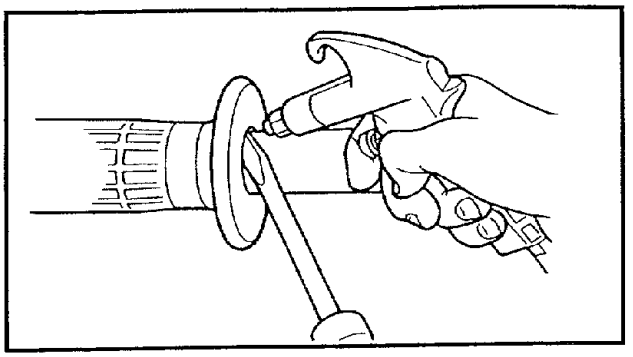
HANDLEBAR

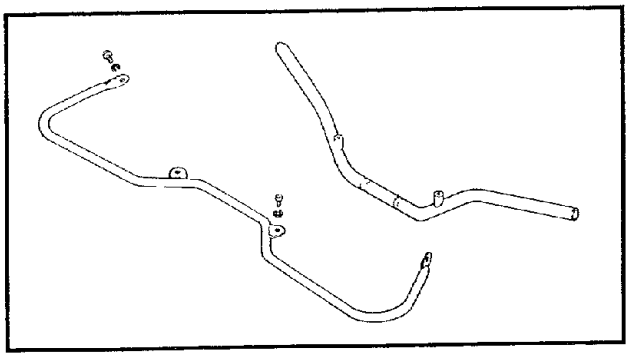


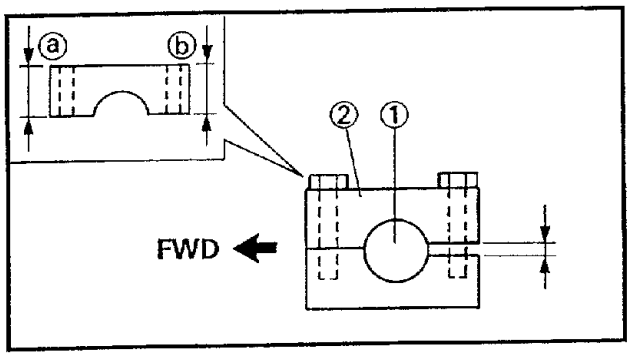
Order	Job name/Part name	Q'ty	Remarks
	Handlebar removal		Remove the parts in order.
1	Bush guard	1	
2	Headlight unit	1	
3	Handlebar switch lead (left and right), front brake switch lead, clutch switch lead and flasher relay	1	**NOTE:** Disconnect the couplers and connectors.
4	Front carrier assembly	1	
5	Starter cable	1	Refer to "HANDLEBAR INSTALLATION" section.
6	Housing (throttle grip)	1	
7	Throttle cable	1	
8	Throttle grip assembly	1	
9	Handlebar switch (right)	1	
10	Front brake lever assembly	1	
11	Handlebar switch (left)	1	

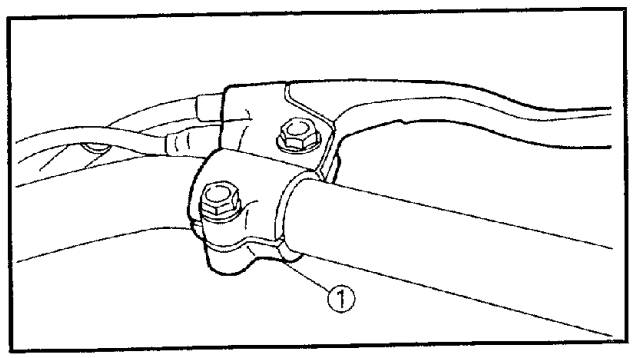


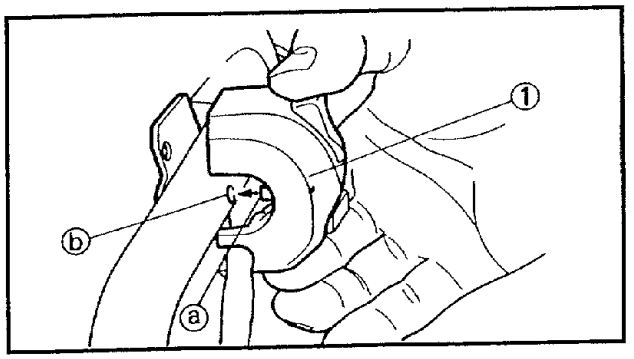
Order	Job name/Part name	Q'ty	Remarks
12	Clutch switch	1	
13	Clutch cable	1	
14	Grip (left)	1	Refer to "HANDLEBAR REMOVAL" section.
15	Clutch lever assembly	1	
16	Upper holders	2	Refer to "HANDLEBAR INSTALLATION" section.
17	Handlebar	1	
			Reverse the removal procedure for installation.











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HANDLEBAR REMOVAL

1. Remove:
   - Grip (Left)

****

Removal steps:

- Blow with compressed air between the handlebar and adhesive side of the grip to remove.

****

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HANDLEBAR INSPECTION

1. Inspect:
   - Handlebar
   - Bush guard

   Bends/Cracks/Damage → Replace.

⚠WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken the handlebar.

SR******

HANDLEBAR INSTALLATION

1. Install:
   - Handlebar ①
   - Upper handlebar holder ②

   20 Nm (2.0 m•kg)

NOTE:

- Apply a light coat of lithium soap base grease onto the handlebar right end.
- The upper handlebar holders should be installed with the longer side ⓐ to the forward, then tighten the front bolt as shown.

2. Install:
   - Front brake lever assembly ①
   - Handlebar switch (right)
   - Grip assembly
   - Throttle cable
   - Housing (throttle grip)

NOTE:

Align the projection ⓐ on the handlebar switch with the hole ⓑ in the handlebar.

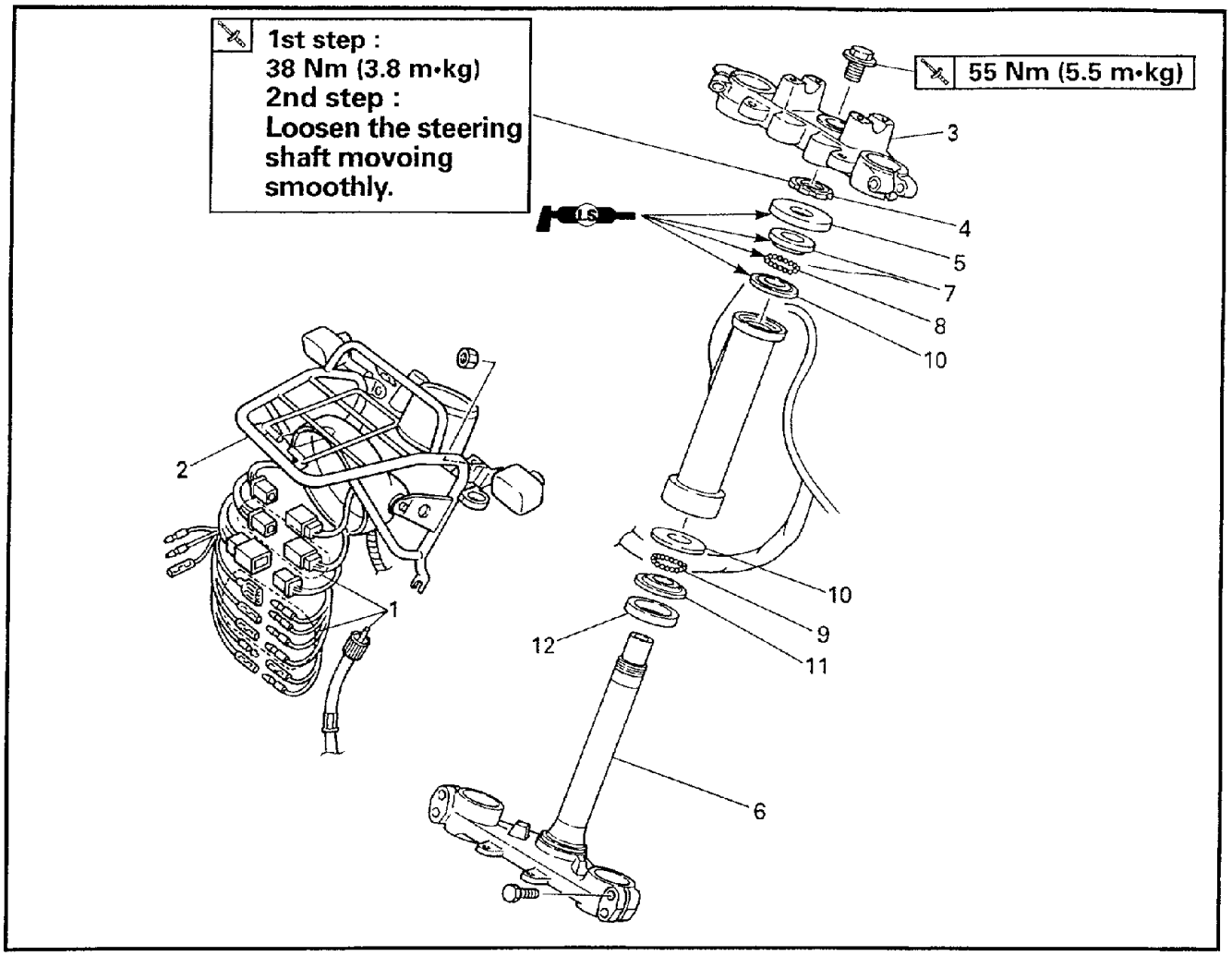
⚠WARNING

Check the throttle grip for smooth operation.

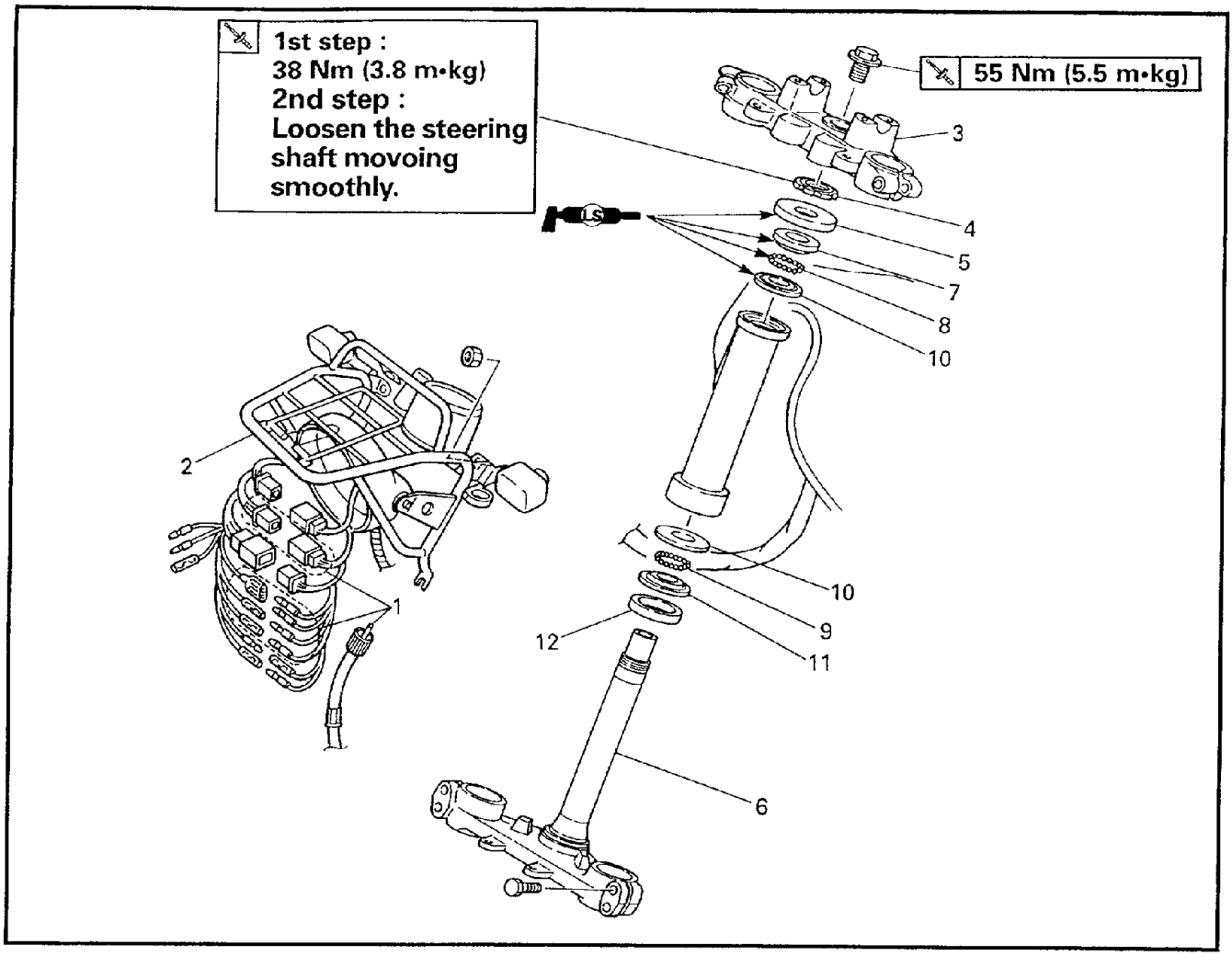
3. Adjust:
   - Throttle cable free play
   - Brake operation

   Refer to "THROTTLE CABLE ADJUSTMENT/BRAKE LEVER ADJUSTMENT" section in CHAPTER 3.

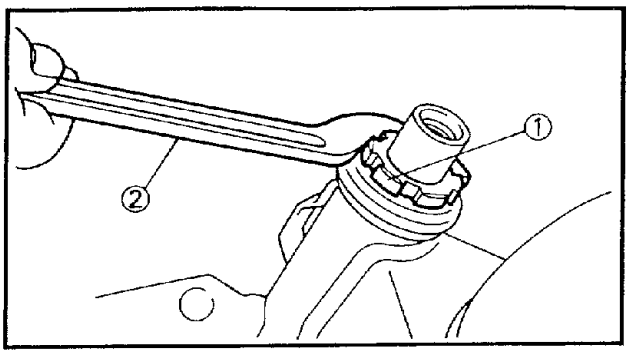
STEERING
UNDER BRACKET



Order	Job name/Part name	Q'ty	Remarks
	Under bracket removal		Remove the parts in order.
	Front fork and front fender		Refer to "FRONT FORK" section.
	Handlebar		Refer to "HANDLEBAR" section.
1	Meter cable/Meter lead/flasher lead	1/1/1	**NOTE:**
2	Front carrier assembly	1	Disconnect the couplers and connectors and remove the assembled parts in the front carrier (main switch, meter assembly, flasher relay, terminal assembly, flasher lights .) as a set.
3	Handle crown	1	
4	Ring nut	1	Refer to "STEERING REMOVAL/INSTALLATION" section.
5	Ball race cover	1	
6	Under bracket	1	
7	Ball race (upper)	1	



Order	Job name/Part name	Q'ty	Remarks
8	Ball	22	
9	Ball	19	Refer to "STEERING INSTALLATION" section.
10	Ball race (center)	1	
11	Ball race (lower)	1	
12	Steering seal	1	Reverse the removal procedure for installation.



YP704010

STEERING REMOVAL

⚠WARNING

•Securely support the motorcycle so that there is no danger of it falling over.
•Stand the motorcycle on a level surface.

1. Remove:
   •Ring nut ①
   Use a exhaust and steering nut wrench ②.

	Exhaust and steering nut wrench: 90890-01268

⚠WARNING

Securely support the steering shaft so that there is no danger of it falling down.

STEERING INSPECTION

1. Wash the bearing and ball races with a solvent.
2. Inspect:
   •Bearings
   •Ball races
   Pitting/Damage→Replace.

****

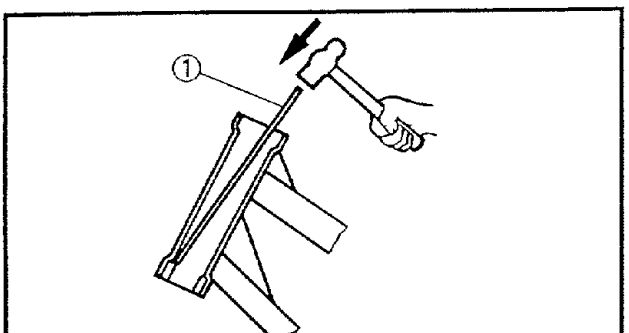
Bearing race replacement steps:

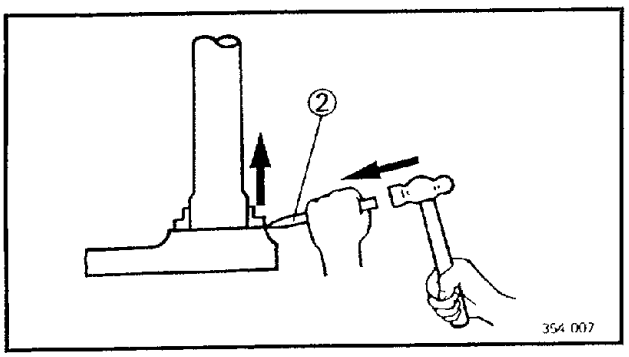
- Remove the ball races on the head pipe using long rod ① and the hammer as shown.
- Remove the ball race on the under bracket using the floor chisel ② and the hammer as shown.
- Install the new dust seal and races.

****

NOTE:

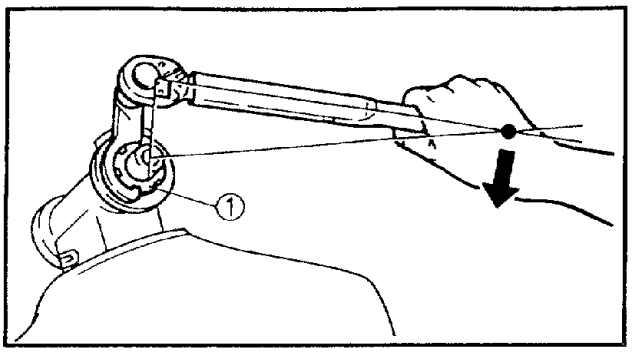
•Always replace bearings and races as a set.
•Replace the dust seal whenever a steering head disassembled.





CAUTION:

If the bearing race is not fitted squarely, the head pipe could be damaged.



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STEERING INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

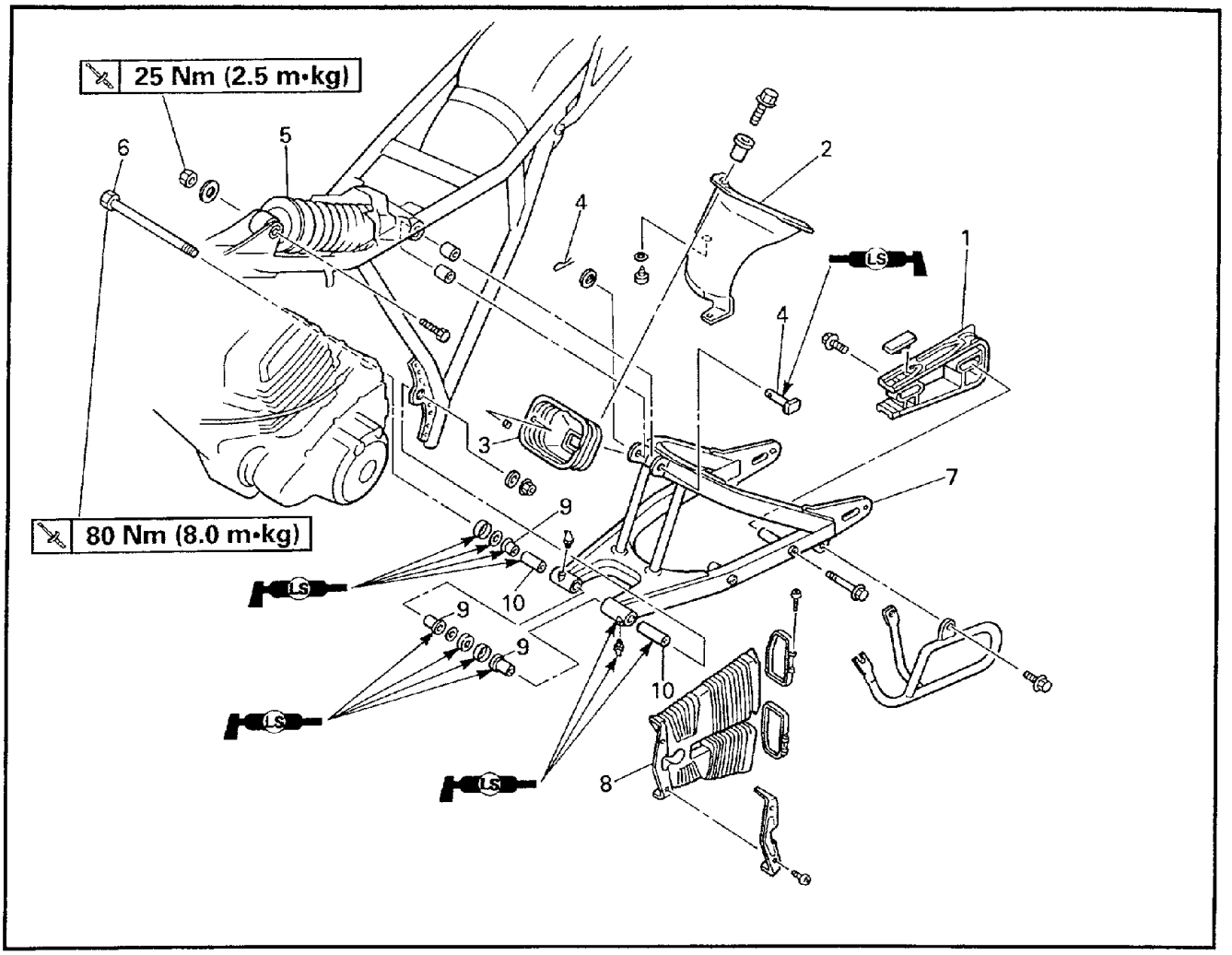
1. Lubricate:
   - Bearings (upper and lower)
   - Ball races

	Recommended lubricant: Lithium-soap base grease

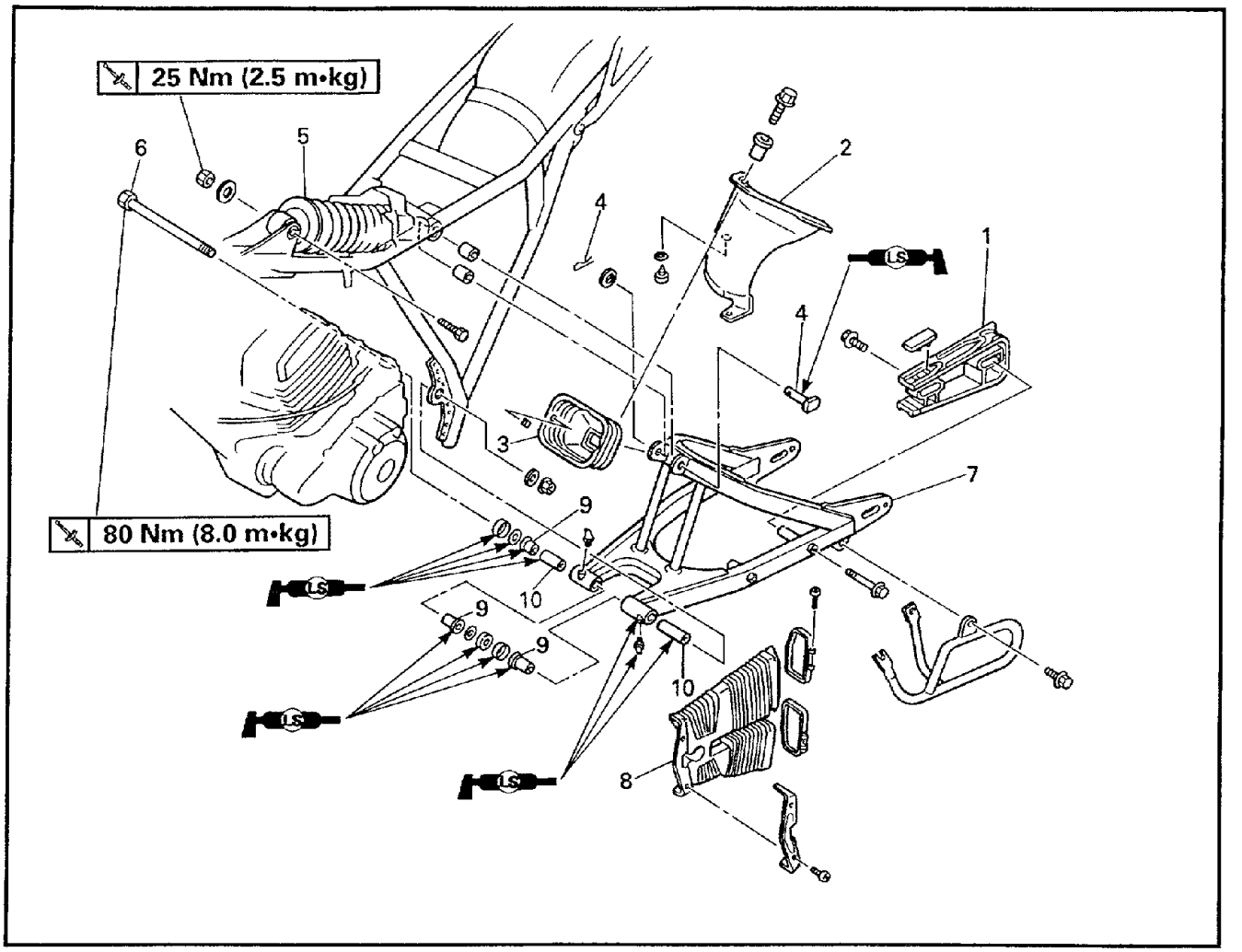
2. Install:
   - Ring nut ① **38 Nm (3.8 m·kg)**

   Refer to "STEERING HEAD INSPECTION" section in CHAPTER 3.

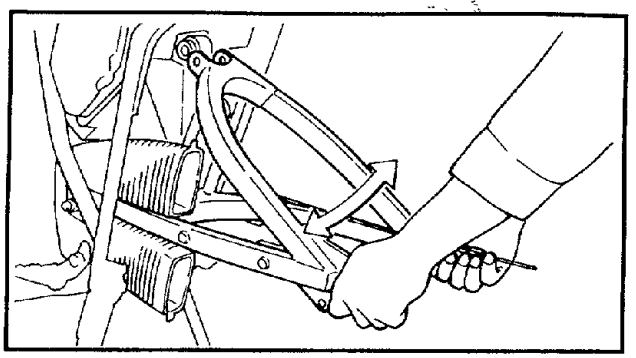
REAR SHOCK ABSORBER AND SWINGARM



Order	Job name/Part name	Q'ty	Remarks
	Rear shock absorber and swingarm removal		Remove the parts in order.
	Seat, fuel tank, and side cover		Refer to "SIDE COVER, SEAT AND FUEL TANK" section in CHAPTER 3.
	Rear wheel Foot rest assembly (left and right) Brake pedal Chain case guard, chain case Drive chain, driven sprocket		Refer to "REAR WHEEL, REAR BRAKE AND DRIVE CHAIN" section.
1	Drive chain guide	1	
2	Mud guard	1	
3	Boots	1	
4	Pin/shaft	1/1	
5	Rear shock absorber	1	



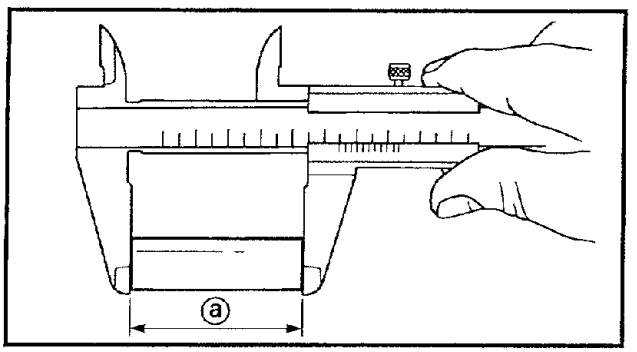
Order	Job name/Part name	Q'ty	Remarks
6	Pivot shaft	1	
7	Swingarm	1	
8	Boots (drive chain)	1	
9	Bushes	3	
10	Collars	2	
			Reverse the removal procedure for installation.



T*****

SWINGARM INSPECTION

1. Inspect:
   - •Swingarm looseness
     Looseness exists → Tighten the pivot shaft nut or replace bushes.
   - •Swingarm up and down movement
     Unsmooth movement/bending/rough spots → Replace bushes.



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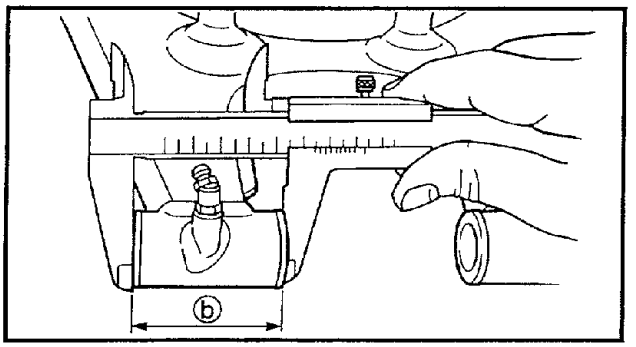
SWINGARM SIDE CLEARANCE ADJUSTMENT

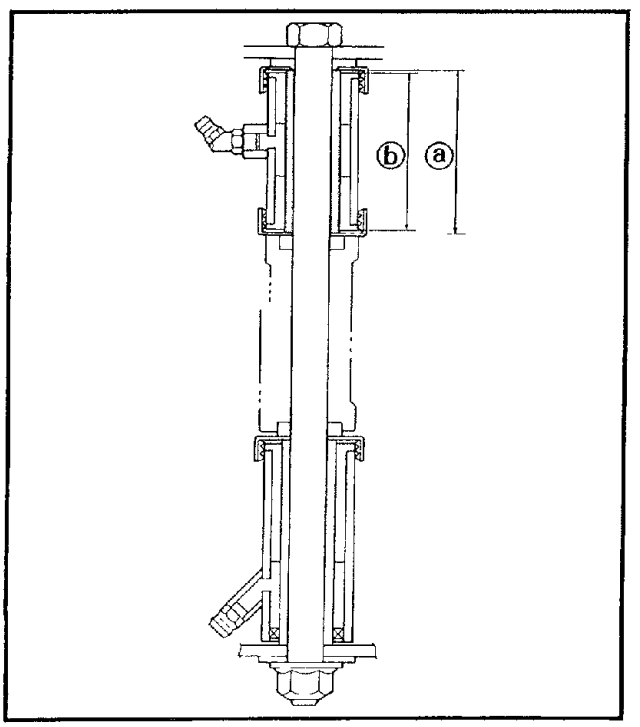
1. Measure:
   - •Collar length (swingarm right side) ⓐ



2. Measure:
   - •Pivot width (swingarm pivot right side) ⓑ

NOTE:

Install the bush to the both side of the pivot right side, when measure the pivot width



3. Calculate:
   - •Side clearance ⓒ
     Out of specification → Adjust side clearance using shim.
     By using formula given below.

Side clearance:
ⓒ = ⓐ - ⓑ =0.1~0.4 mm

****

Example:

- If the collar length (swingarm right side) ⓐ is bellow.
  ⓐ: 54.5 mm
- If the pivot width (swingarm pivot right side) ⓑ is bellow.
  ⓑ: 54.0 mm
- Side clearance
  ⓒ = 54.5 - 54.0
  = 0.5 mm

Then, install the one shim.
ⓒ = 54.5 - (54.0 + 0.3)
= 0.2 mm

NOTE:

- Shim thickness: 0.3 mm
- If the side clearance is not within specification, adjust it by means of shim.
- If only one shim is used, install it on the left side.
- Two shims must be installed both side.

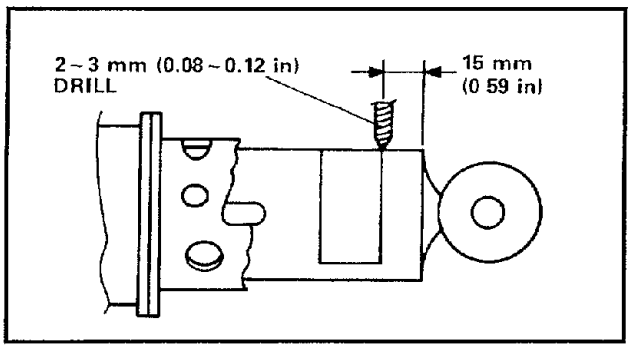
****

AG705010

REAR SHOCK ABSORBER HANDLING NOTES

⚠WARNING

- **This shock absorber contains highly compressed nitrogen gas. Read and make sure you understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.**
- **Do not tamper or attempt to open the cylinder assembly.**
- **Do not subject the shock absorber to an open flame or any other source of high heat. This may cause the unit to explode due to excessive gas pressure.**
- **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**



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NOTES ON DISPOSAL

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Shock absorber disposal procedure:

- Gas pressure must be released before disposing of the shock absorber. To do so, drill a 2 ~ 3 mm hole through the cylinder wall at a point 15 ~ 20 mm from the end of the gas chamber.

⚠WARNING

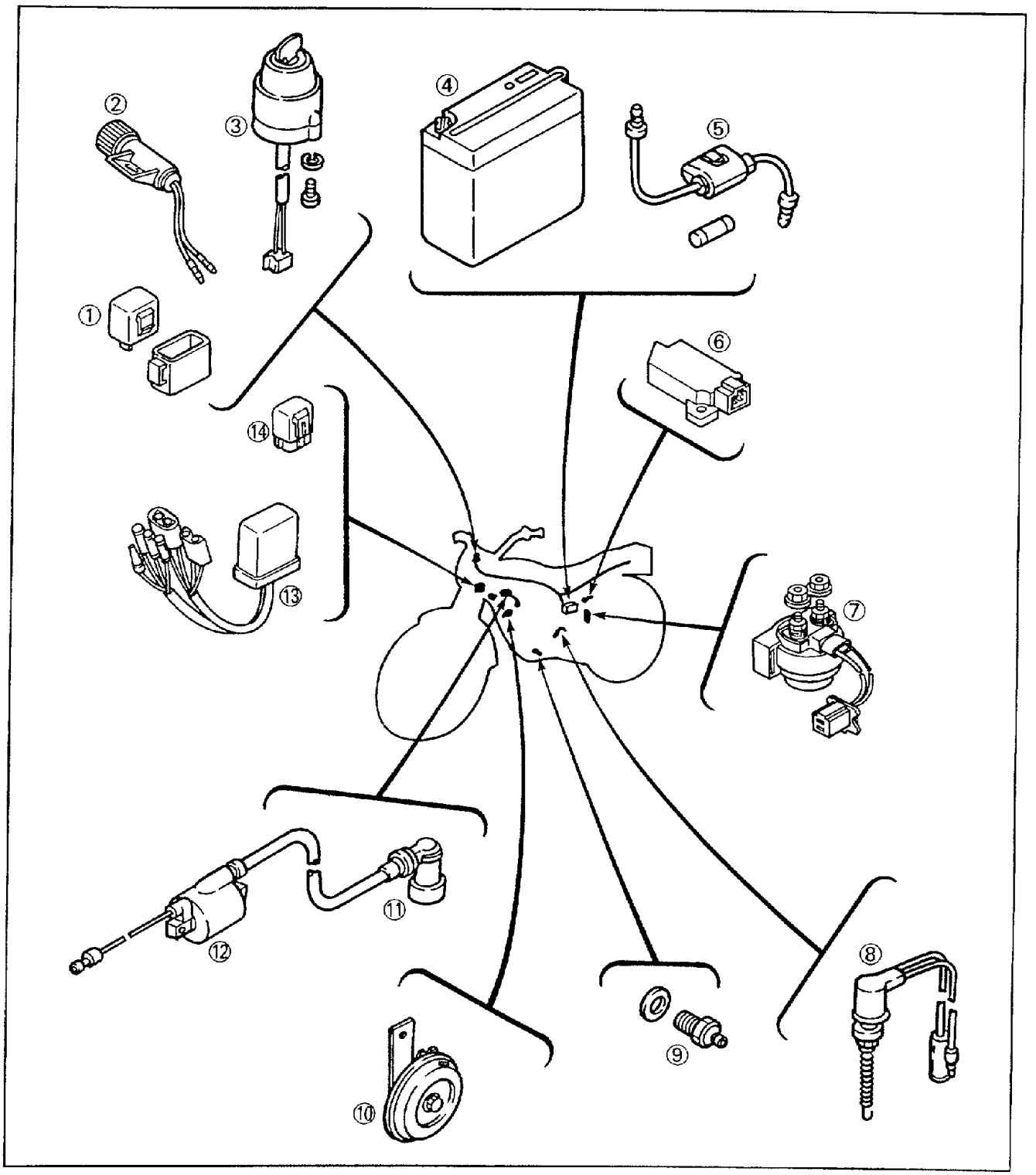
Wear eye protection to prevent eye damage from released gas and/or metal chips.

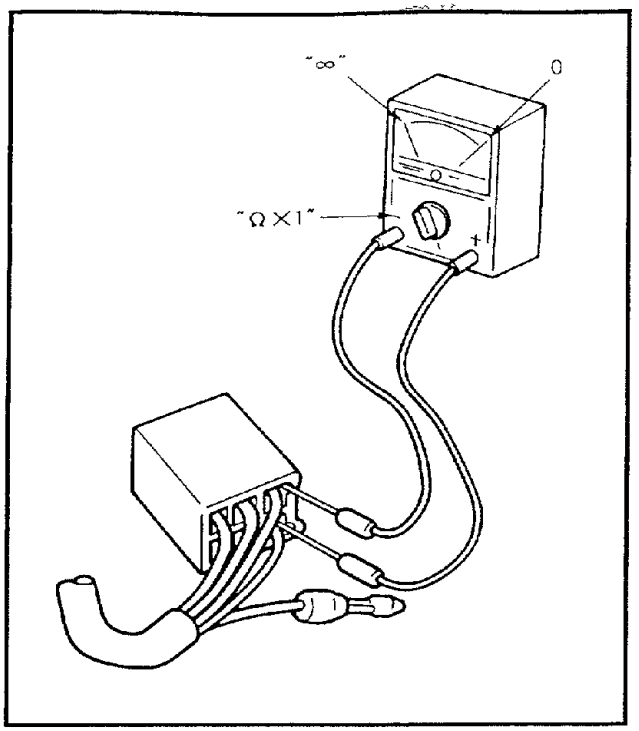
****

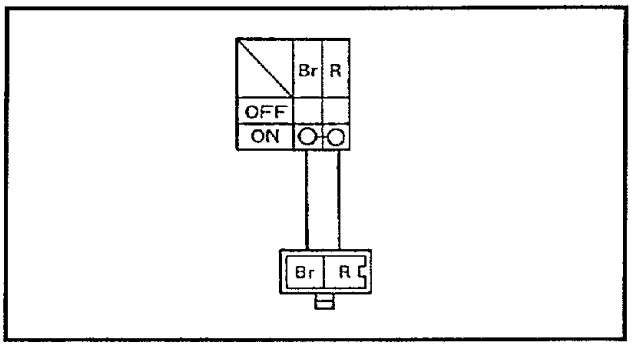
EB800000

ELECTRICAL
ELECTRICAL COMPONENTS

① Flasher relay
② Auxiliary DC terminal
③ Main switch
④ Battery
⑤ Fuse holder assembly (for auxiliary DC terminal)
⑥ Rectifier/Regulator
⑦ Starter relay/main fuse
⑧ Rear brake switch
⑨ Neutral switch
⑩ Horn
⑪ Spark plug cap
⑫ Ignition coil
⑬ CDI unit
⑭ Neutral relay







YP-N

SWITCH INSPECTION

INSPECTION STEPS

Using pocket tester, check switches for continuity between their terminals to determine whether they are correctly connected.
Replace the switch component if any of the combinations does not produce the correct reading.

	Pocket tester: **90890-03112**

NOTE:

- Turn the switch to the "ON", "OFF" positions several times.
- Adjust the pocket tester to correct "0" position before checking switches.
- Set the pocket tester selector to "×1"Ω.

SWITCH CONNECTION AS SHOWN IN THIS MANUAL

This manual contains connection charts, like the one shown on the left, showing the terminal connections of switches (e.g. the main switch, handlebar switch, brake switch, lighting switch etc.)

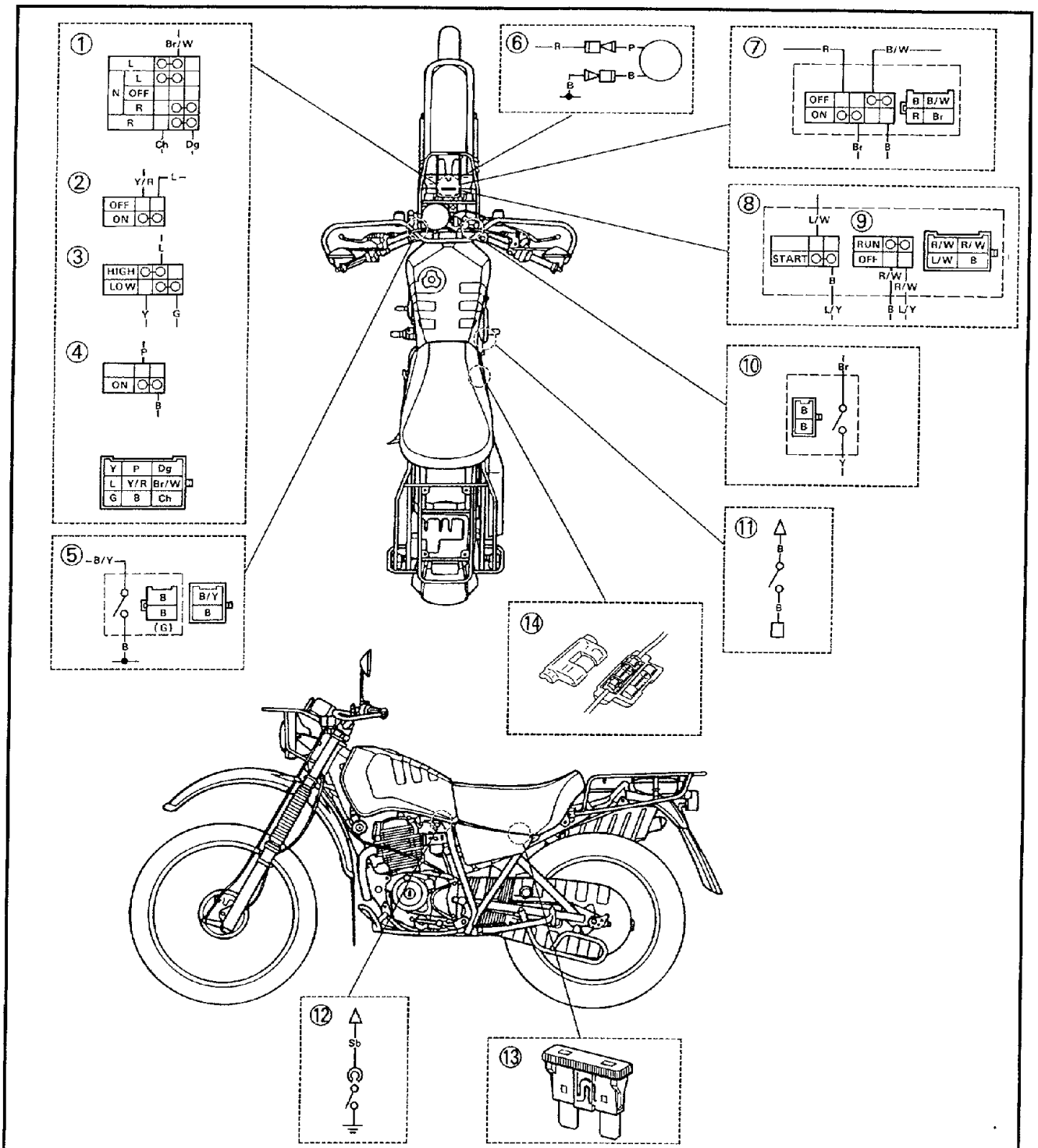
The column on the extreme left indicates the different switch positions, the top line indicates the colors of the leads connected to the terminals on the switch.

"O—O" indicates terminals between which there is continuity, i.e. a closed circuit, in the given switch position.

In this chart:
"Br and R" have continuity with the switch in the "ON" position.

SWITCH CONTINUITY INSPECTION

Refer to "SWITCH INSPECTION" and check for continuity between lead terminals.
Poor connection, no continuity → Correct or replace.
*The coupler locations are circled.

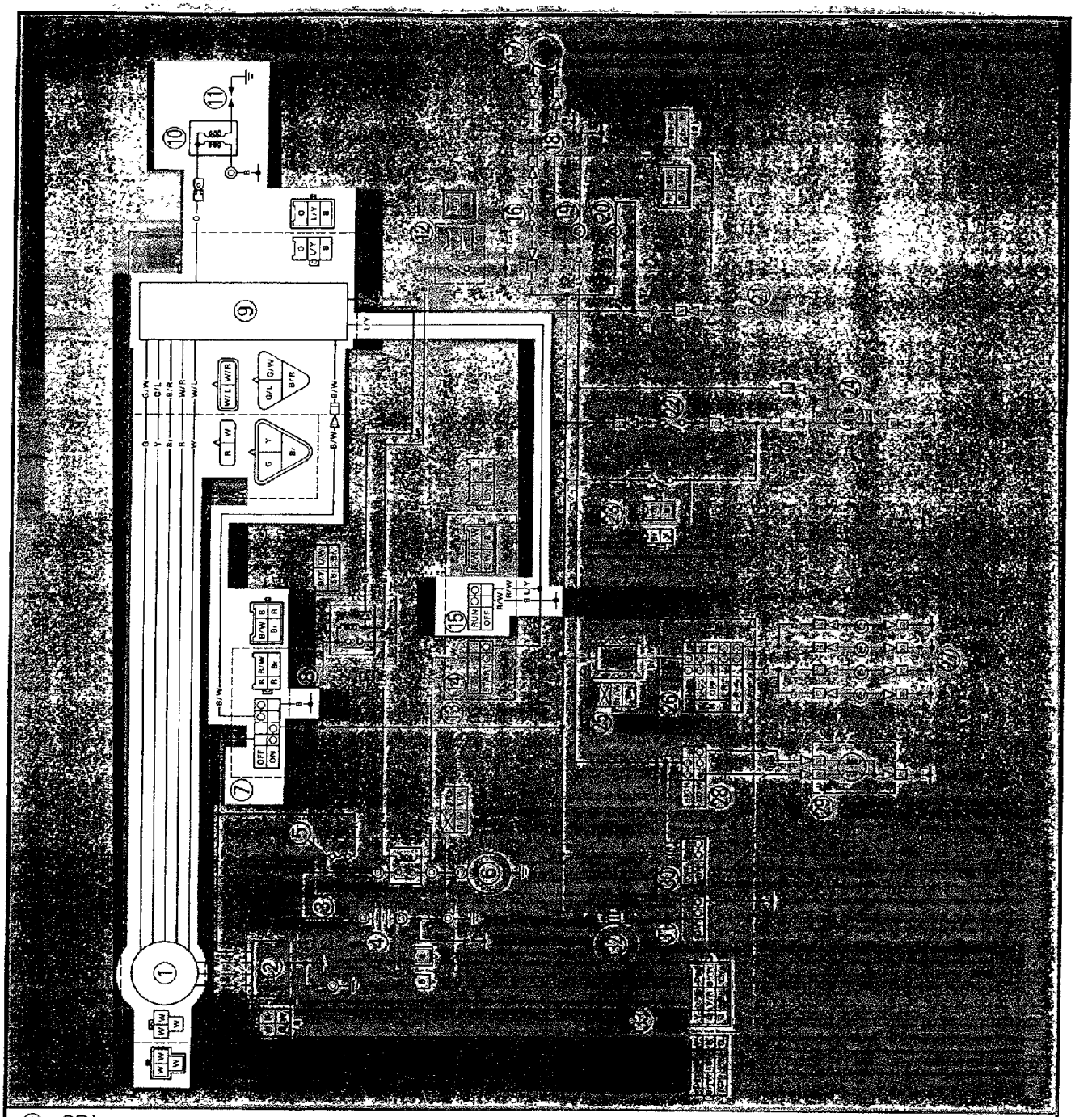


① Turn switch	⑦ Main switch	⑬ Fuse (main)
② Lights switch	⑧ Start switch	⑭ Fuse (auxiliary DC terminal)
③ Dimmer switch	⑨ Engine stop switch	
④ Horn switch	⑩ Front brake switch	
⑤ Clutch switch	⑪ Rear brake switch	
⑥ Auxiliary DC terminal	⑫ Neutral switch	

EB802000

IGNITION SYSTEM

CIRCUIT DIAGRAM



① CDI magneto
⑦ Main switch
⑨ CDI unit
⑩ Ignition coil
⑪ Spark plug
⑮ Engine stop switch

SR802010

TROUBLESHOOTING

IF THE IGNITION SYSTEM FAILS TO OPERATE.
(NO SPARK OR INTERMITTENT SPARK)

Procedure

Check:

1. Spark plug
2. Ignition spark gap
3. Spark plug cap resistance
4. Ignition coil
5. Pickup coil resistance
6. Source coil resistance
7. Main switch
8. Engine stop switch
9. Wiring connection (entire ignition system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Side cover (left and right)
  2) Seat
  3) Fuel tank
  4) Headlight unit
- Use the special tools specified in the trouble shooting section.

Ignition checker
90890-06754
Pocket tester:
90890-03112

YP******

1. Spark plug

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.

Refer to "SPARK PLUG INSPECTION" section in CHAPTER 3.

Spark plug gap:
0.6 ~ 0.7 mm

Standard spark plug:
D8EA/NGK or X24ES-U/DENSO

OUT OF SPECIFICATION

Repair or replace the spark plug

MEETS SPECIFICATION

*

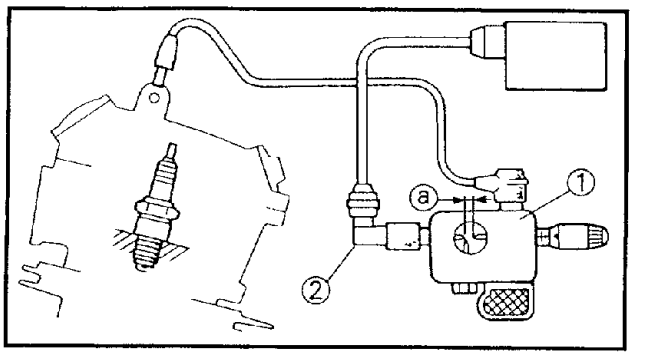
*

YP*****

2. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
  ② Spark plug cap
- Turn the main switch to "ON".
- Check the ignition spark gap ⓐ.
- Check the spark by pushing the starter switch, and increase the spark gap until a misfire occurs.

Minimum spark gap:
6 mm



MEETS SPECIFICATION

The ignition system is not faulty.

OUT OF SPECIFICATION OR NO SPARK

YP*****

3. Spark plug cap resistance

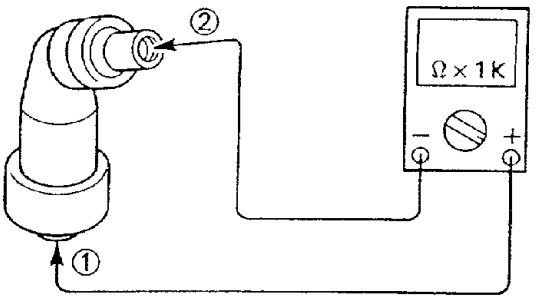
- Remove the spark plug cap.
- Connect the pocket tester (Ω×1k) to the spark plug cap.

NOTE:

- When removing the spark plug cap, do not pull the spark plug cap from high tension cord.
  Remove → Turning counterclockwise.
  Connect → Turning clockwise.
- Check the high tension cord when connecting the spark plug cap.
- When connecting the spark plug cap, cut the high tension cord about 5 mm.

Spark plug cap resistance:
10kΩ (20°C)

Tester (+) lead →
Spark plug side ①
Tester (–) lead →
High tension cord side ②



OUT OF SPECIFICATION

Replace the spark plug cap.

MEETS SPECIFICATION

*

*

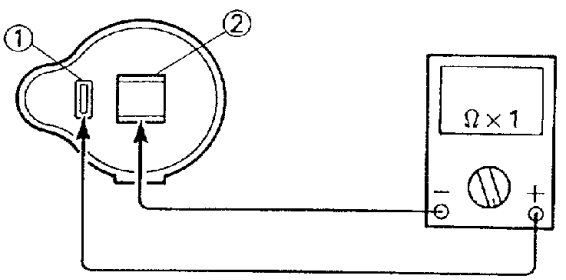
YP*****

4. Ignition coil resistance

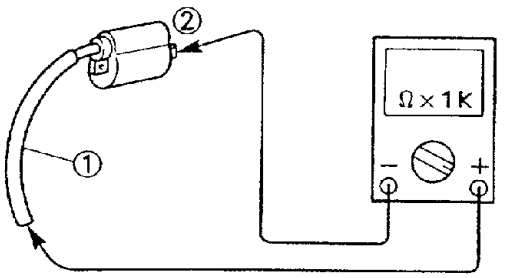
- Disconnect the ignition coil connector from the wireharness.
- Connect the pocket tester (Ω×1) to the ignition coil.
- Check if the primary coil has the specified resistance.

Primary coil resistance:
0.27 ~ 0.33Ω (20°C)

Tester (+) lead →
Orange Terminal ①
Tester (–) lead →
Ground Terminal ②



Tester (+) lead →
Spark plug lead ①
Tester (–) lead →
Orange Terminal ②



- Connect the pocket tester (Ω×1k) to the ignition coil.
- Check the secondary has the specified resistance.

Secondary coil resistance:
5.76 ~ 8.52kΩ (20°C)

OUT OF SPECIFICATION

Replace the ignition coil.

BOTH MEET SPECIFICATION

*

*

YP*******

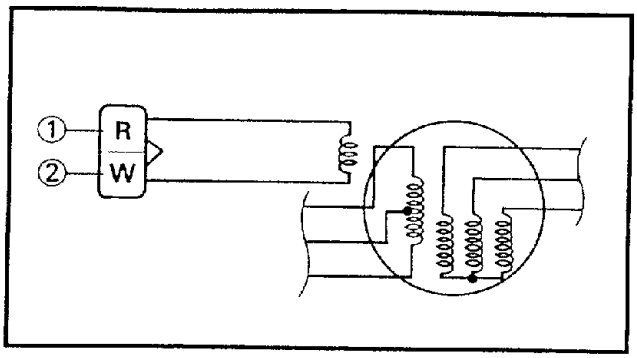
5. Pickup coil resistance

•Disconnect the pickup coil coupler from the wireharness.
•Connect the pocket tester (Ω×100) to the pickup coil coupler.

Tester (+) lead →
Red Terminal ①
Tester (–) lead →
White Terminal ②

•Check the pickup coil has the specified resistance.

Pickup coil resistance:
656 ~ 984Ω (20°C)



OUT OF SPECIFICATION

Replace the pickup coil.

MEETS SPECIFICATION

T*******

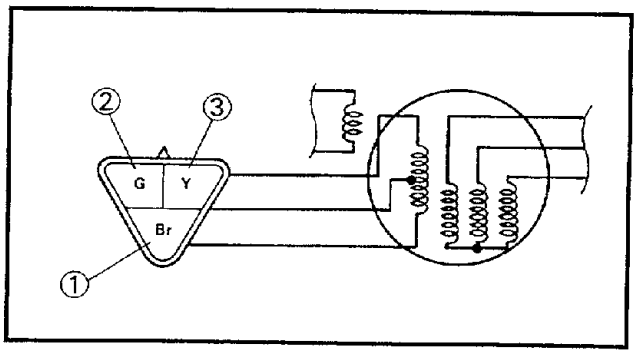
6. Source coil resistance

•Disconnect the source coil coupler from the wireharness.
•Connect the pocket tester (Ω×100) to the charging coil coupler.

Source coil 1:
Tester (+) lead →
Brown Terminal ①
Tester (–) lead →
Green Terminal ②
Source coil 2:
Tester (+) lead →
Yellow Terminal ③
Tester (–) lead →
Green Terminal ②

•Check the source coil has the specified resistance.

Source coil 1 resistance:
700 ~ 900Ω (20°C)
Source 2 coil 2 resistance:
472 ~ 708Ω (20°C)

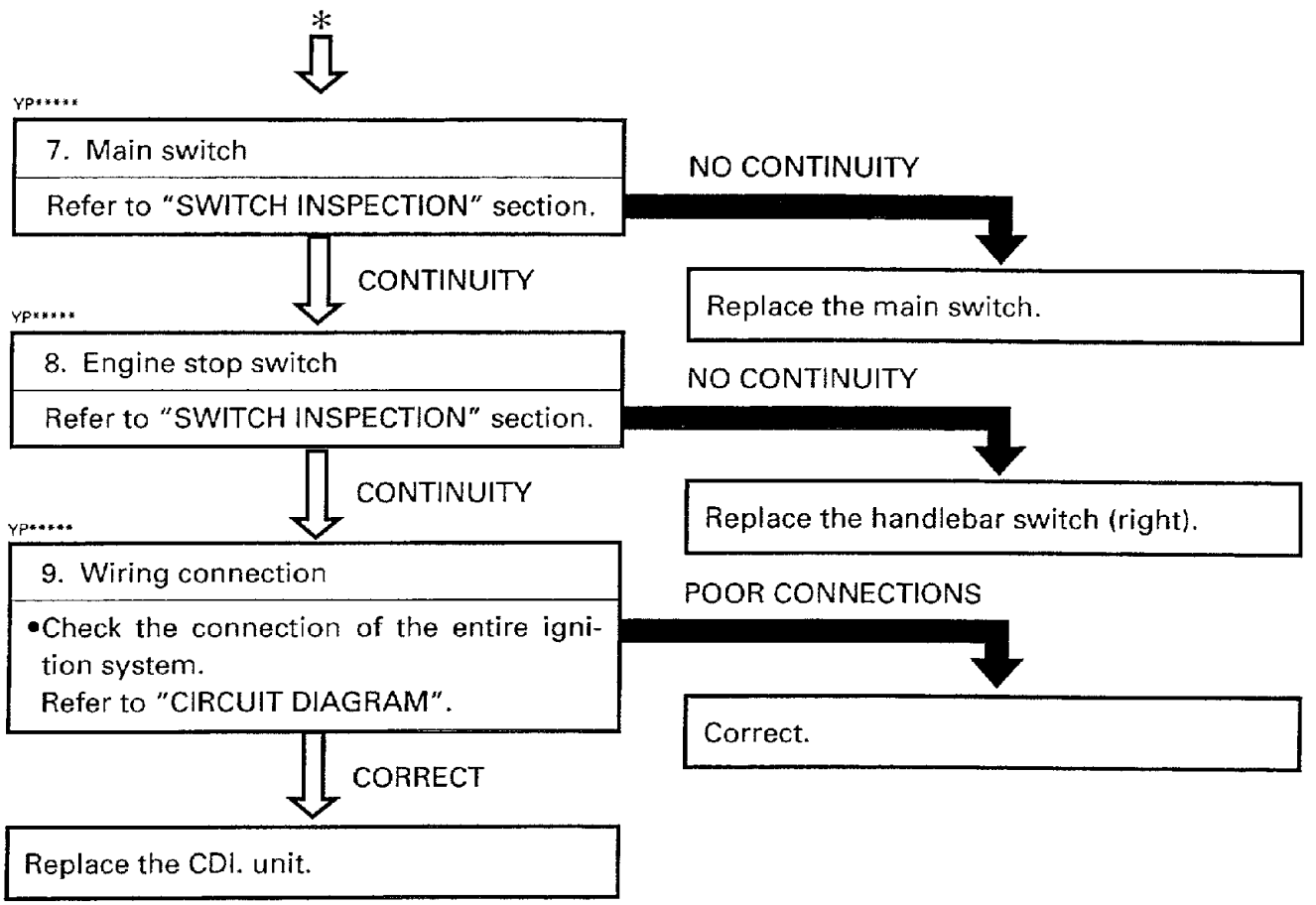


OUT OF SPECIFICATION

Replace the source coil.

MEETS SPECIFICATION

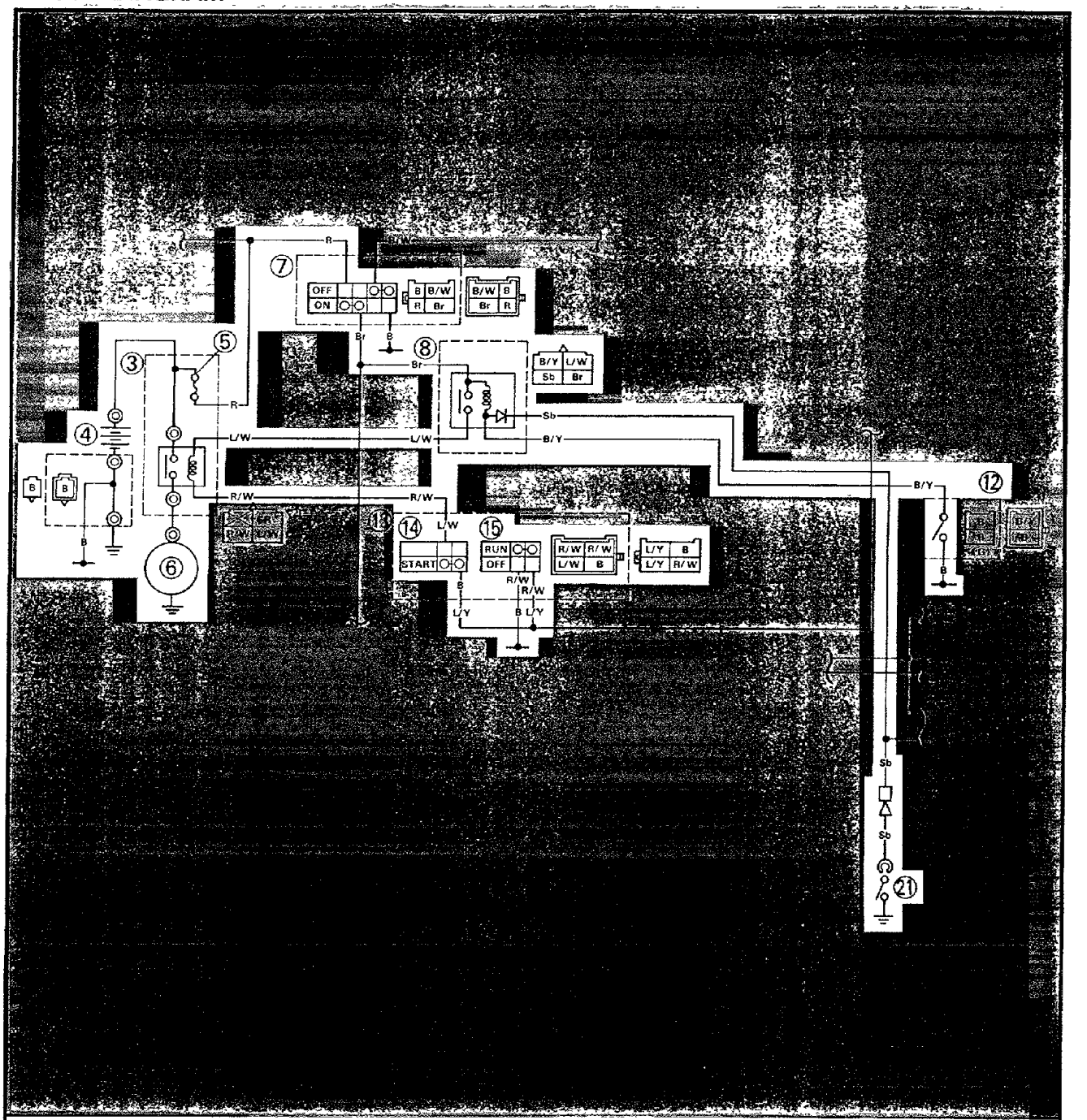
*


*
YP*****
7. Main switch
Refer to "SWITCH INSPECTION" section.
NO CONTINUITY
Replace the main switch.
CONTINUITY
YP*****
8. Engine stop switch
Refer to "SWITCH INSPECTION" section.
NO CONTINUITY
Replace the handlebar switch (right).
CONTINUITY
YP*****
9. Wiring connection
•Check the connection of the entire ignition system.
Refer to "CIRCUIT DIAGRAM".
POOR CONNECTIONS
Correct.
CORRECT
Replace the CDI. unit.

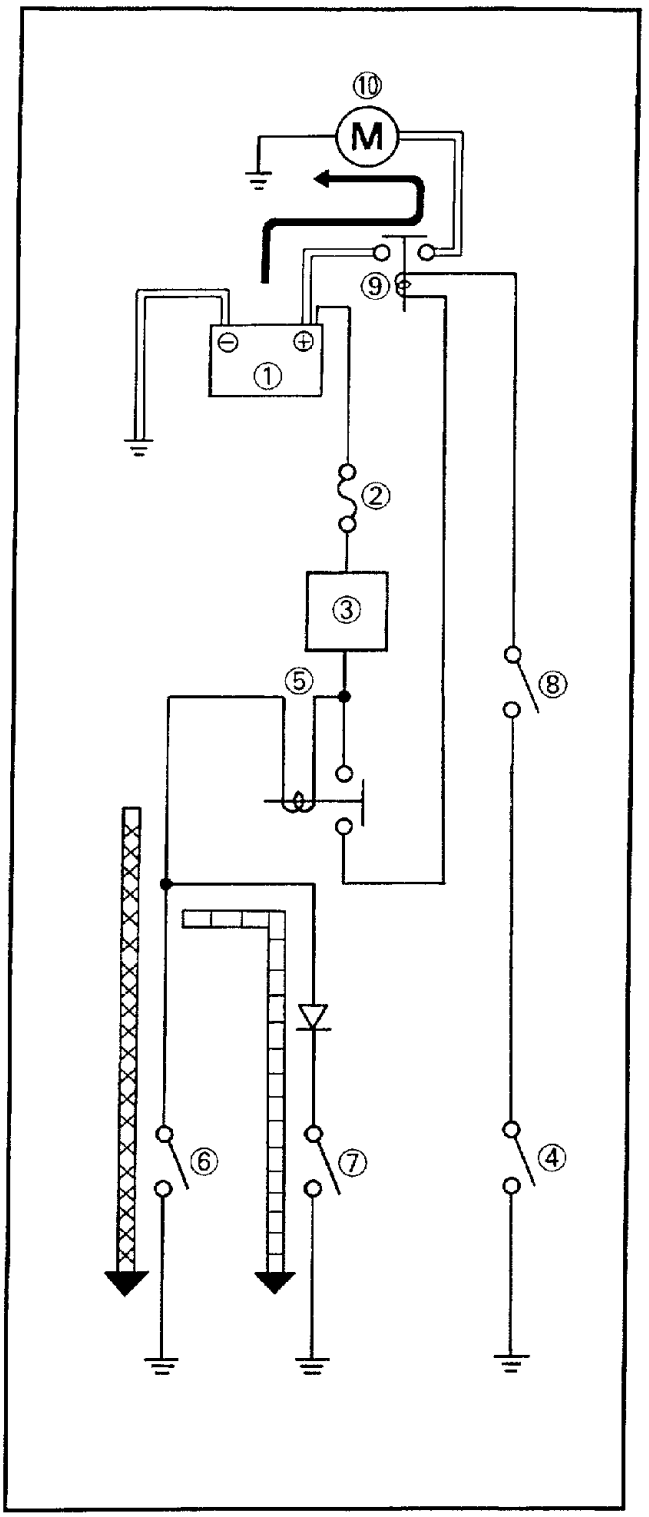
EB80300

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM



③ Starter relay
④ Battery
⑤ Fuse (main)
⑥ Starter motor
⑦ Main switch
⑧ Neutral relay
⑫ Clutch switch
⑭ Start switch
⑮ Engine stop switch
㉑ Neutral switch



SR*******

STARTING CIRCUIT OPERATION

The starting circuit on this model consists of the starter motor, starter relay, and the neutral relay. If the engine stop switch and the main switch are both closed, the starter motor can operate only if:

The transmission is in neutral (the neutral relay is closed).

or if

The clutch lever is pulled to the handlebar (the clutch switch is closed).

WHEN THE TRANSMISSION IS IN NEUTRAL

WHEN THE CLUTCH LEVER IS PULLED IN

① Battery
② Main fuse
③ Main switch
④ Engine stop switch
⑤ Neutral relay
⑥ Clutch switch
⑦ Neutral switch
⑧ Start switch
⑨ Starter relay
⑩ Starter motor

YP803020

TROUBLESHOOTING

IF THE STARTER MOTOR FAILS TO OPERATE.

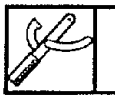
Procedure

Check:

1. Fuse
2. Battery
3. Starter motor
4. Starter relay
5. Neutral relay
6. Main switch
7. Engine stop switch
8. Neutral switch
9. Clutch switch
10. Start switch
11. Wiring connection (entire starting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Side cover (left and right)
  2) Headlight unit
  3) Seat
  4) Fuel tank
- Use the special tools specified in the troubleshooting section.



Pocket tester:
90890-03112

YP******

1. Fuse

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

YP******

2. Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" section in CHAPTER 3.

INCORRECT → • Clean battery terminals. • Recharge or replace the battery.

CORRECT ↓

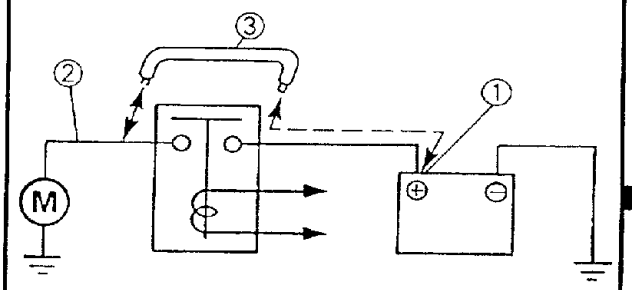
*

*

YP******

3. Starter motor

•Connect the battery positive terminal ① and starter motor cable ② using a jumper lead ③*.
•Check the starter motor operation.



*

⚠WARNING

•A wire used as a jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may burn.
•This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.

DOES NOT MOVE

Repair or replace the starter motor.

MOVES

YP******

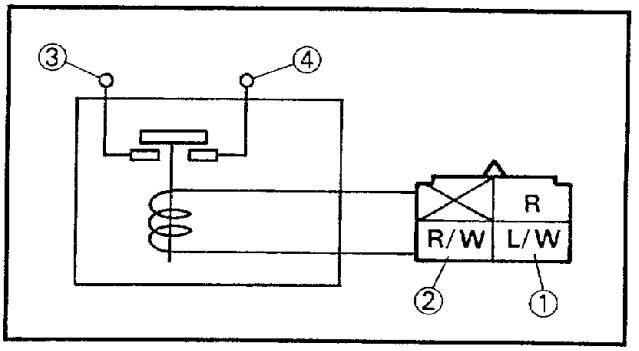
4. Starter relay

•Disconnect the relay unit coupler from the wireharness.
•Connect the pocket tester (Ω×1) and battery (12V) to the relay unit coupler terminals.

Battery (+) lead →
Blue/White terminal ①
Battery (–) lead →
Red/White terminal ②

•Check the starter relay for continuity.

Tester (+) lead → ③ terminal
Tester (–) lead → ④ terminal



NO CONTINUITY

Replace the starter relay.

CONTINUITY

*

*

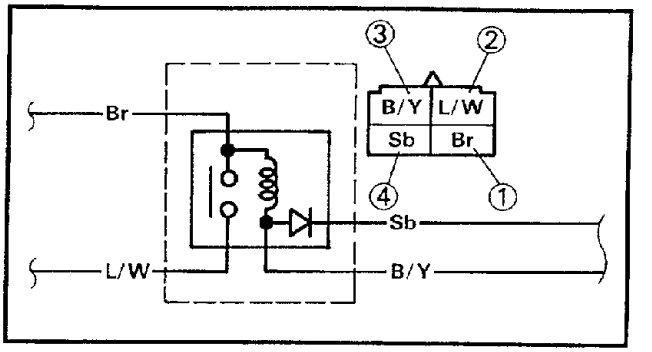
SR******

5. Neutral relay

•Remove the relay from the frame.
•Connect the pocket tester (Ω×100) to the Battery and the relay connecter.

Tester (+) lead →
Brown terminal ①
Tester (–) lead →
Blue/White terminal ②
Battery (+) lead →
Brown terminal ①
Battery (–) lead →
Black/Yellow ③ or
Sky blue ④ terminal

Check the neutral relay for continuity.



NO CONTINUITY → Replace the neutral relay.

CONTINUITY ↓

YP******

6. Main switch

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the main switch.

CONTINUITY ↓

YP******

7. Engine stop switch

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the handlebar switch (right).

CONTINUITY ↓

YP******

8. Neutral switch

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY (at NEUTRAL position) → Replace the neutral switch.

CONTINUITY (at NEUTRAL position) ↓

YP******

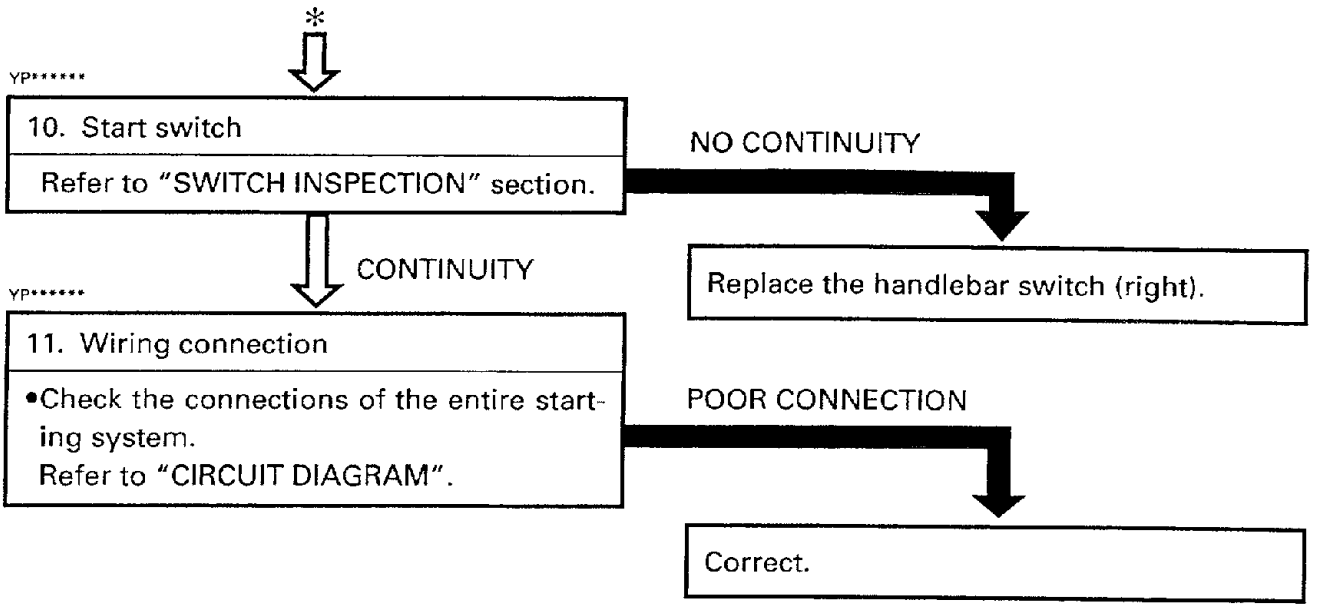
9. Clutch switch

Refer to "SWITCH INSPECTION" section.

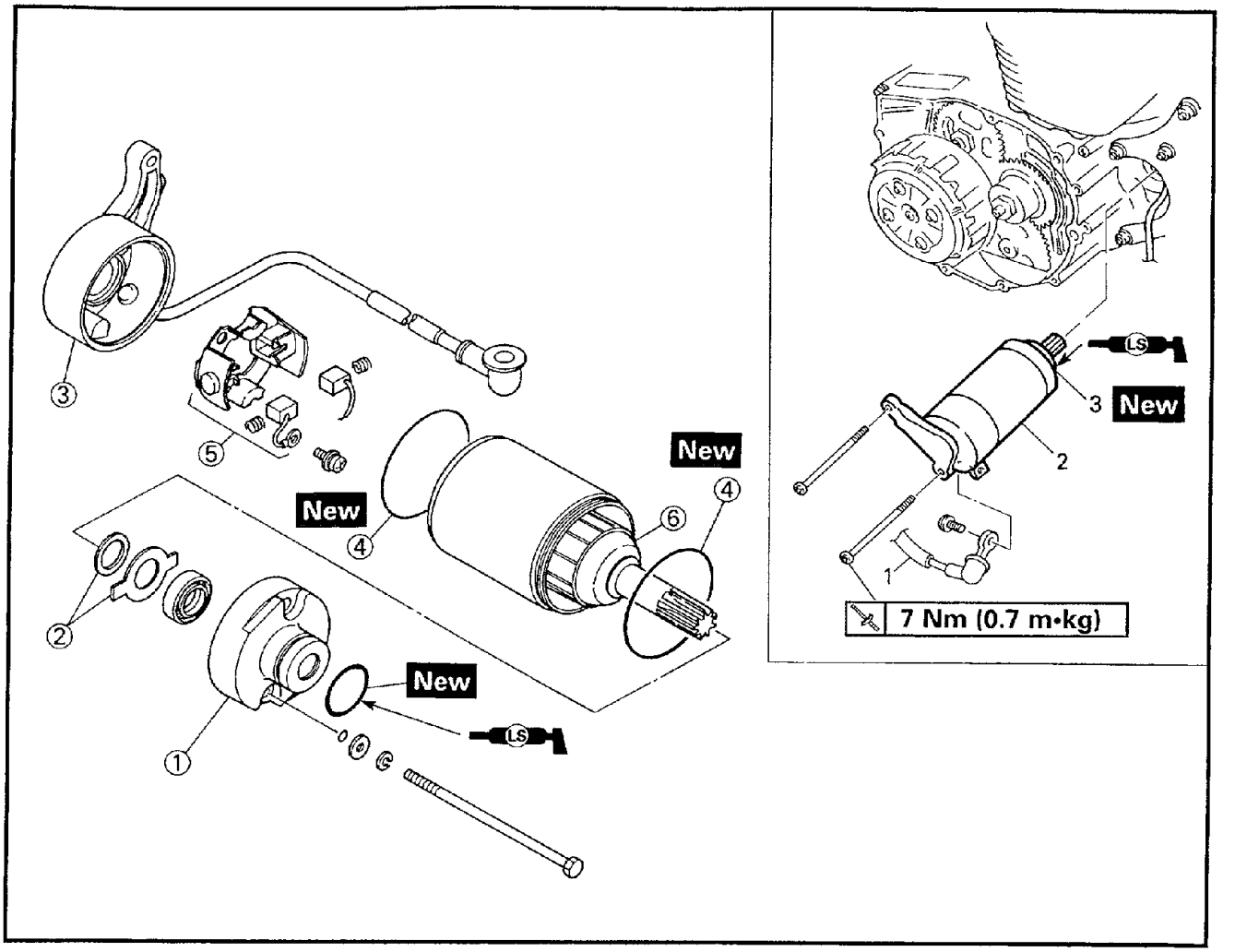
NO CONTINUITY → Replace the clutch switch.

CONTINUITY ↓

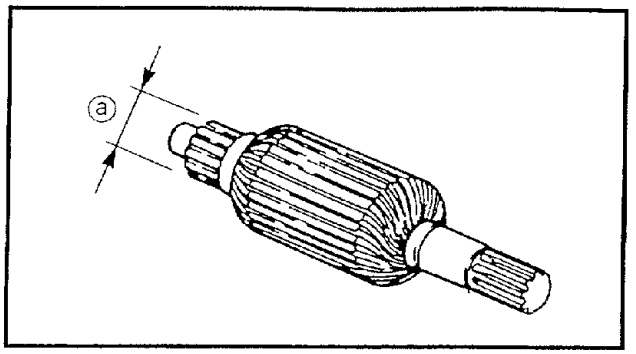
*


*
YP******
10. Start switch
Refer to "SWITCH INSPECTION" section.
NO CONTINUITY
Replace the handlebar switch (right).
CONTINUITY
YP******
11. Wiring connection
•Check the connections of the entire starting system.
Refer to "CIRCUIT DIAGRAM".
POOR CONNECTION
Correct.

STARTER MOTOR



Order	Job name/Part name	Q'ty	Remarks
	Starter motor removal		Remove the parts in order.
	Drain the engine oil		Refer to "ENGINE OIL REPLACEMENT" section in CHAPTER 3.
1	Starter motor lead		
2	Starter motor	1	
3	O-ring	1	
		1	Reverse the removal procedure for installation.
	Starter motor disassembly		Disassemble the parts in order.
①	Front bracket	2	
②	Washer set	1	
③	Rear bracket	1	
④	O-ring	1	Refer to "Assembly" section.
⑤	Brush holder/brush	1	
⑥	Armature coil	1	Reverse the disassembly procedure for assembly.



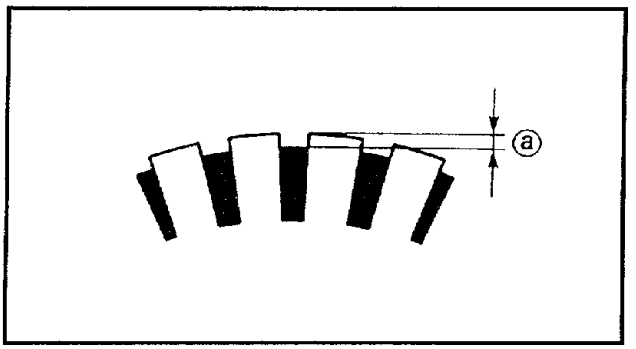
YP803034

Inspection and repair

1. Inspect:
   - •Commutator
     Dirt→Clean it with #600 grit sandpaper.
2. Measure:
   - •Commutator diameter ⓐ

	Commutator wear limit: **21 mm**

Out of specification→Replace the starter motor



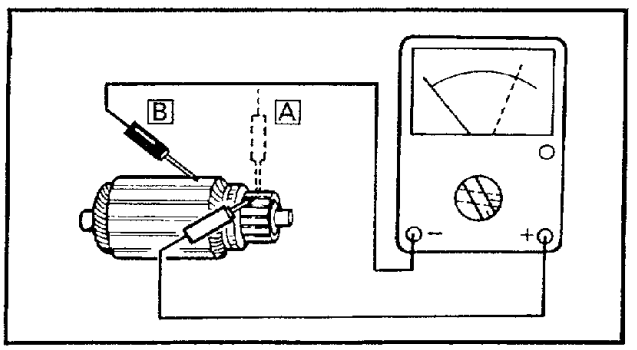
3. Measure:
   - •Mica undercut ⓐ

	Mica undercut: **1.5 mm**

Out of specification→Scrape the mica to the proper value (a hacksaw blade can be ground to fit).

NOTE:

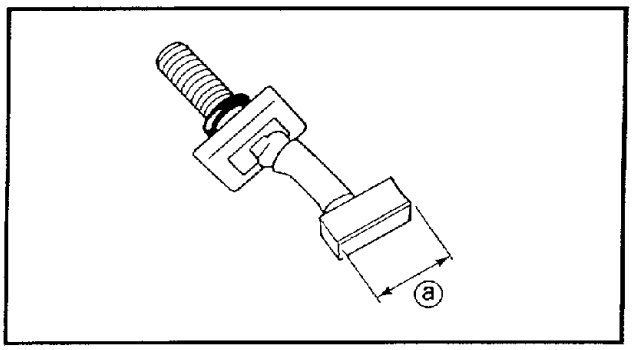
The mica insulation of the commutator must be undercut to ensure proper operation of commutator.



4. Inspect:
   - •Armature coil resistances (installation/continuity)
     Defects→Replace the starter motor.
     If commutator is dirty, clean it with sandpaper.

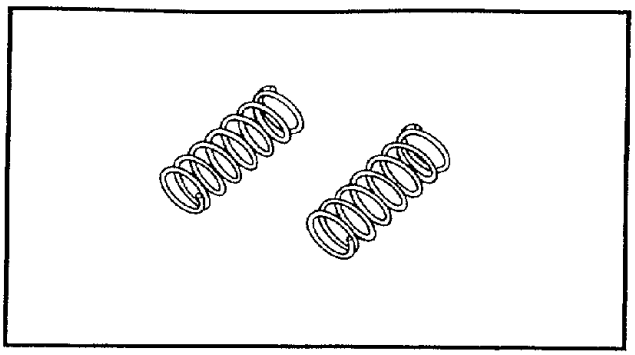
	Good condition	Bad condition		
A	○	○	×	×
B	×	○	×	○

○: Continuity
×: No continuity
Bad condition→Replace.



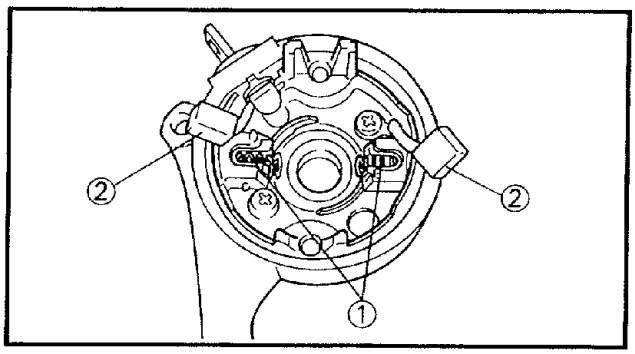
5. Measure:
   - •Brush length ⓐ
     Out of specification→Replace.

	Brush length wear limit: **3.5 mm**



6. Measure:
   •Brush spring force
   Fatigue/out of specification→Replace as a set.

Brush spring force:
560 ~ 840 g



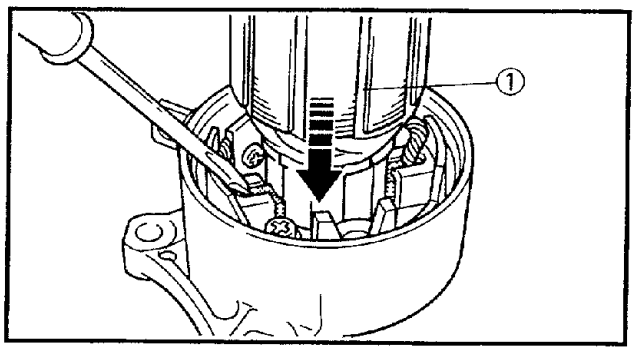
7. Inspect:
   •Oil seal
   Wear/damage ›Replace.

YP******

Assembly

Reverse the "Disassembly" procedure.
Note the following points.

1. Install:
   •Brush holder
   •Brush springs ①
   •Brush ②



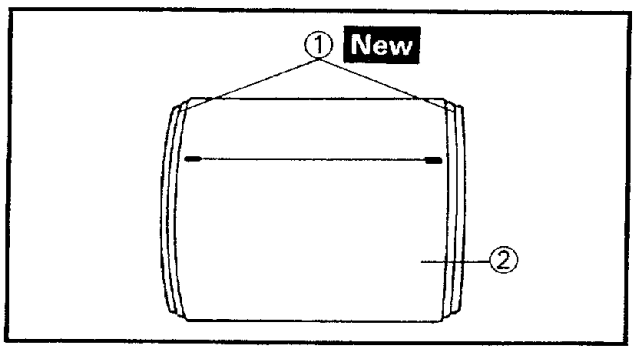
2. Install:
   •Armature coil ①

NOTE:

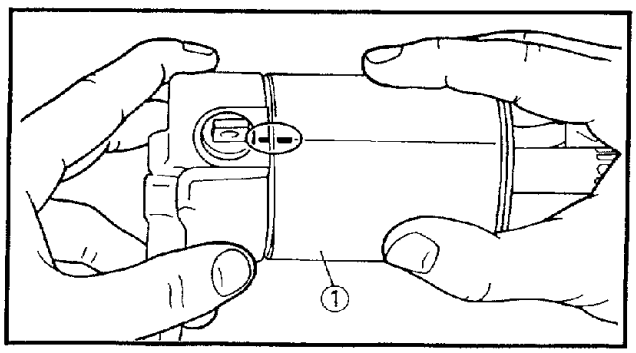
Hold the brush by the flat head driver, install the armature coil to the brush holder.

CAUTION:

Take care the brush.



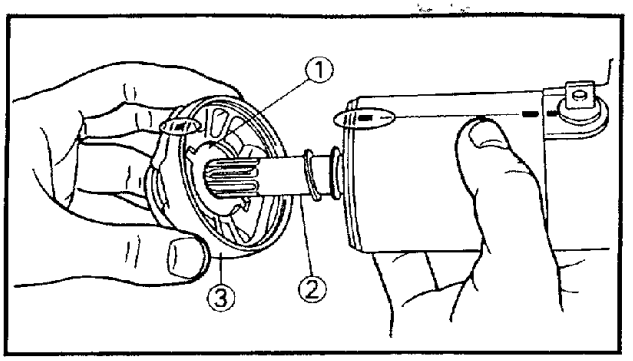
3. Install:
   •O-ing ① New
   •Stator assembly ②



4. Install:
   •Front bracket ①

NOTE:

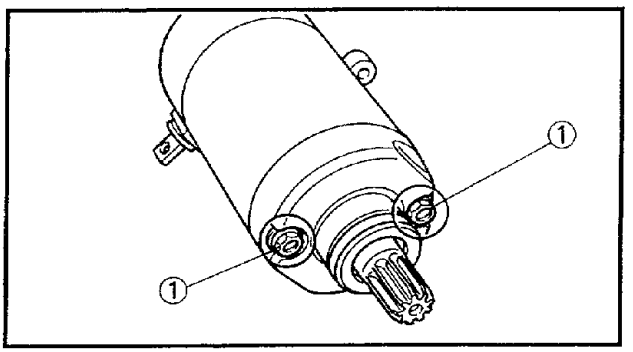
•Apply molybdenum grease lightly on to the bearings of the starter motor.
•Align the match marks on the yoke with the match marks on the brackets.



5. Install:
   - Tang washer ①
   - Plate washer ②
   - Front bracket ③

NOTE:

Align the match marks on the stator assembly with the match marks on the front bracket.



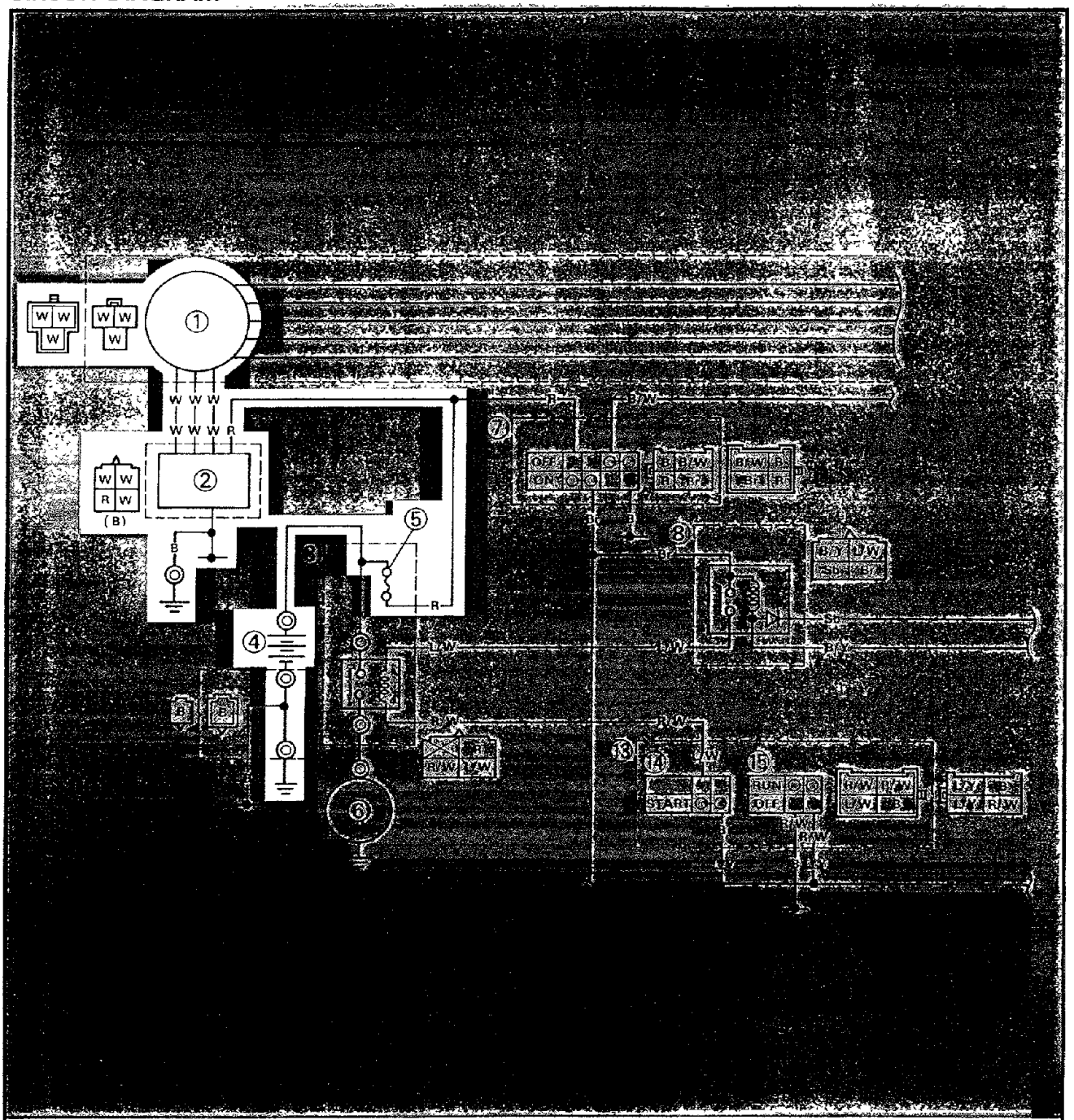
6. Tighten:
   - Bolt ①

5 Nm (0.5 m·kg)

YP804000

CHARGING SYSTEM

CIRCUIT DIAGRAM



① CDI magneto
② Rectifier/Regulator
④ Battery
⑤ Fuse (main)

YPB04010

TROUBLESHOOTING

IF THE BATTERY IS NOT CHARGED

Procedure

Check:

1. Fuse
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring system (entire charging system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Side cover (left and right)
  2) Seat
  3) Fuse
- Use the special tools specified in the troubleshooting section.

Engine tachometer
90890-03113
Pocket tester:
90890-03112

YP******

1. Fuse

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

YP******

2. Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" section in CHAPTER 3.

INCORRECT → • Clean battery terminals. • Recharge or replace the battery.

CORRECT ↓

*

*

YP******

3. Charging voltage

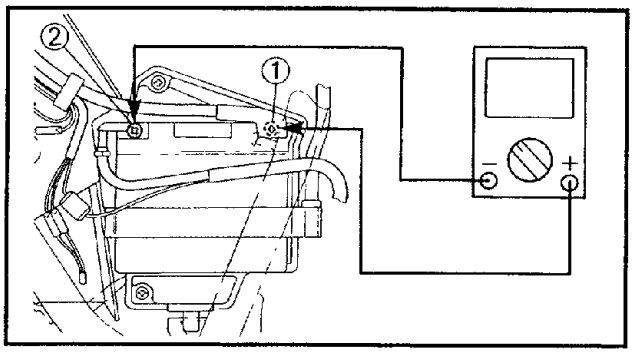
- Connect the engine tachometer to the spark plug lead.
- Connect the pocket tester (DC20V) to the battery.

Tester (+) lead →
Battery (+) terminal ①
Tester (–) lead →
Battery (–) terminal ②

- Measure the battery terminal voltage.
- Start the engine and accelerate to about 5,000 r/min.
- Check the terminal voltage.

Charging voltage:
14.1 ~ 14.9V at 5,000 r/min

NOTE:
Use a fully charged battery.



MEETS SPECIFICATION

The charging circuit is not faulty.
Replace the battery.

OUT OF SPECIFICATION

YP******

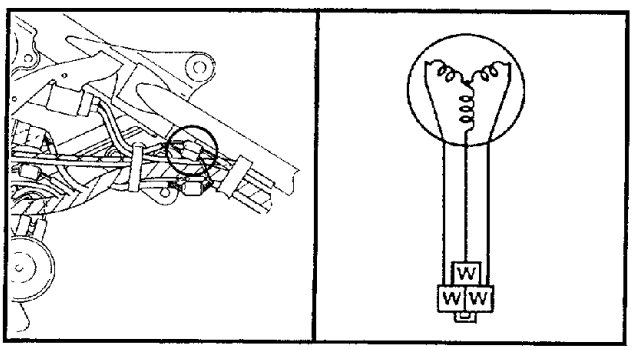
4. Stator coil resistance

- Remove the CDI magneto coupler from wireharness.
- Connect the pocket tester (Ω×1) to the stator coil.

Tester (+) lead → White terminal
Tester (–) lead → White terminal

- Measure the stator coil resistance.

Stator coil resistance:
0.48 ~ 0.72Ω (20°C)

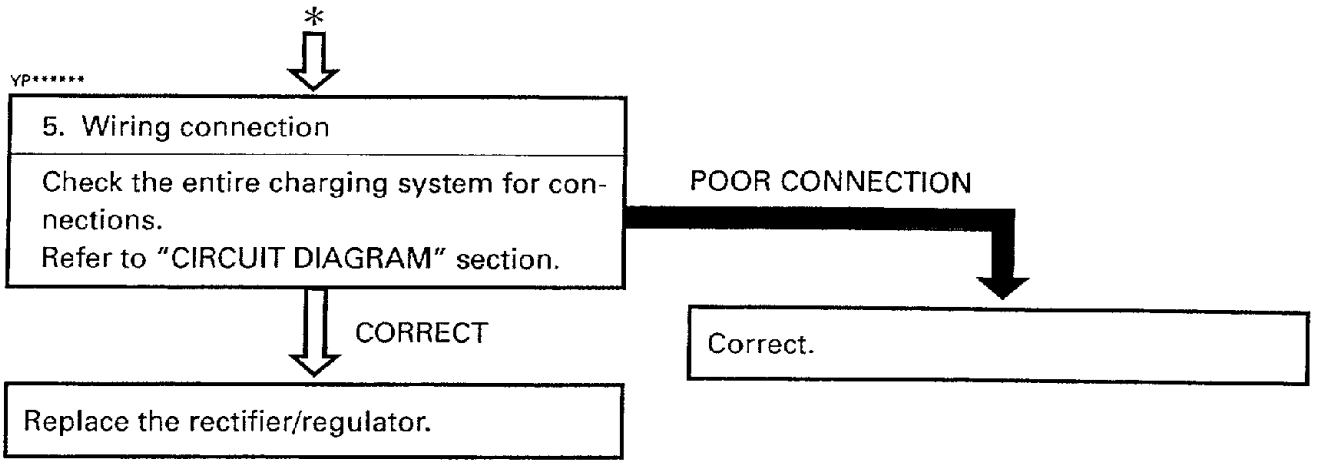


OUT OF SPECIFICATION

Replace the stator coil.

MEETS SPECIFICATION

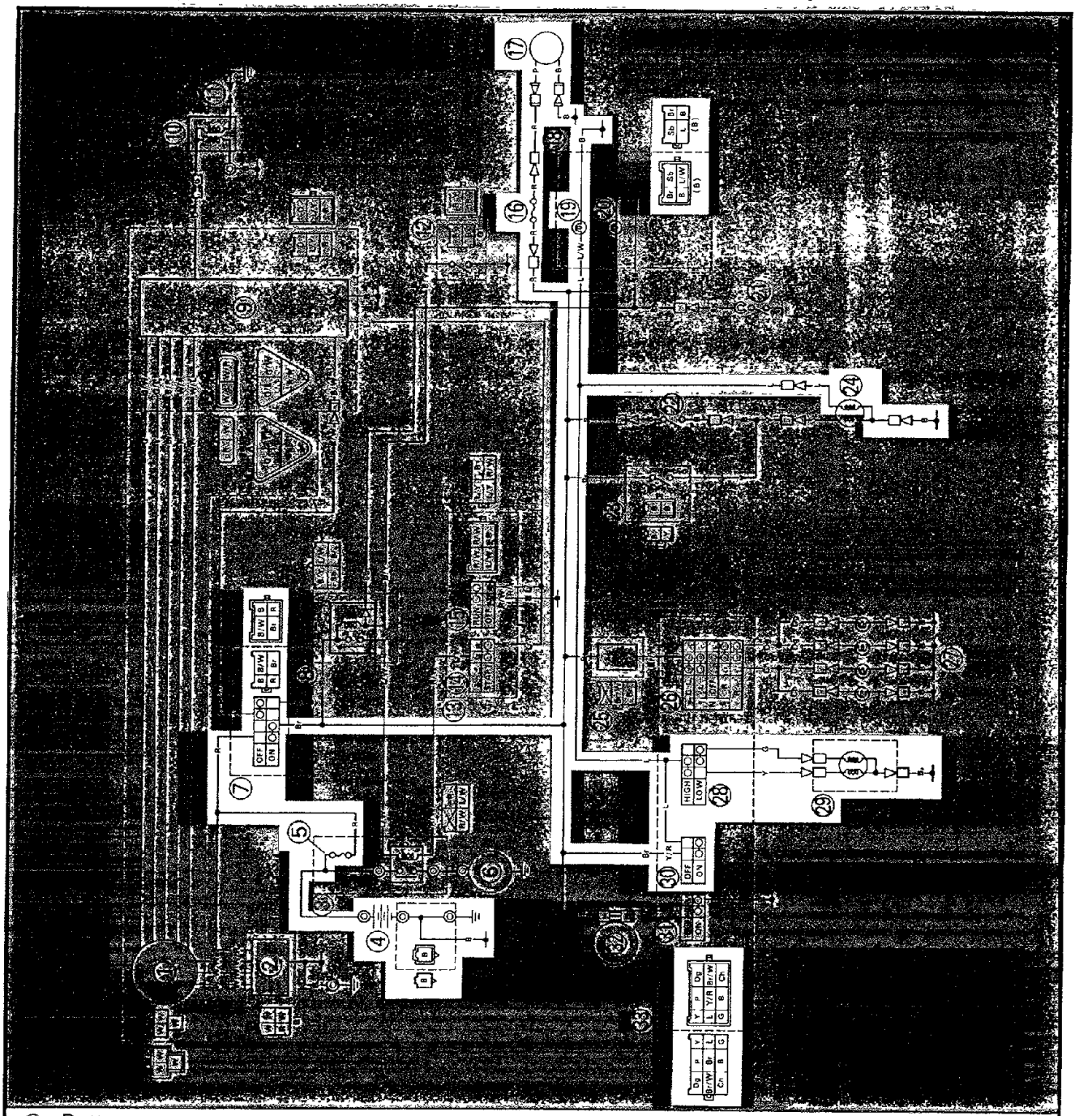
*


*
YP*******
5. Wiring connection
Check the entire charging system for connections.
Refer to "CIRCUIT DIAGRAM" section.
POOR CONNECTION
Correct.
CORRECT
Replace the rectifier/regulator.

EB804000

LIGHTING SYSTEM

CIRCUIT DIAGRAM



④ Battery
⑤ Fuse (main)
⑦ Main switch
⑯ Fuse (auxiliary DC terminal)
⑰ Auxiliary DC terminal
⑲ Meter light
㉔ Tail/Brake light
㉘ Dimmer switch
㉙ Headlight
㉚ Lights switch

YP805010

TROUBLESHOOTING

IF THE HEADLIGHT, TAILLIGHT AND/OR METER LIGHT FAIL TO COME ON.
IF THE DC VOLTAGE FROM AUXILIARY DC TERMINAL, DOSE NOT PUT PUT.

Procedure

Check:

1. Fuse
2. Battery
3. Main switch
4. Lights switch
5. Dimmer switch
6. Wiring connection (entire lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank
  3) Side cover (left and right)
  4) Headlight unit
- Use the special tools specified in the troubleshooting section.

Pocket tester:
90890-03112

YP******

1. Fuse

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

YP******

2. Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" section in CHAPTER 3.

INCORRECT → • Clean battery terminals. • Recharge or replace the battery.

CORRECT ↓

YP******

3. Main switch

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the main switch.

CONTINUITY ↓

*

*

YP******

4. Lights switch
Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the handlebar switch (left).

CONTINUITY ⇩

YP******

5. Dimmer switch
Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the handlebar switch (left).

CONTINUITY ⇩

YP******

6. Wiring connection
•Check the connections of the entire lighting system.
Refer to "CIRCUIT DIAGRAM".

POOR CONNECTIONS → Correct.

CORRECT ⇩

Check the condition of each of the lighting system's circuits.
Refer to "LIGHTING SYSTEM CHECK"

SR805020

LIGHTING SYSTEM CHECK

1. If the headlight fails to come on.

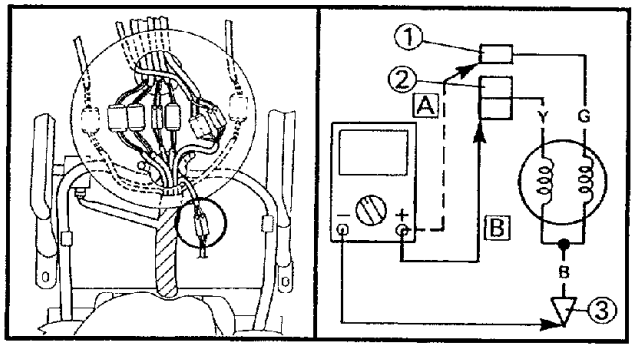
1. Bulb and bulb socket
Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ⇩

2. Voltage
•Connect the pocket tester (DC20V) to the headlight couplers.
[A] When the dimmer switch is on low beam.
[B] When dimmer switch is on high beam.

Headlight:
Tester (+) lead → Green ① or Yellow ② lead
Tester negative (–) lead → Black ③ lead



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*

- Turn the main switch to on position.
- Turn the lights switch to on position.
- Turn the dimmer switch to low beam or high beam.
- Check for voltage (12V) on the lead at bulb socket connectors.

OUT OF SPECIFICATION → The wiring circuit from the main switch to bulb socket connector is faulty. Repair.

MEETS SPECIFICATION ↓

This circuit is not faulty.

SR805021

2. If the meter light fails to come on.

1. Bulb and bulb socket

Refer to "SWITCH INSPECTION" section.

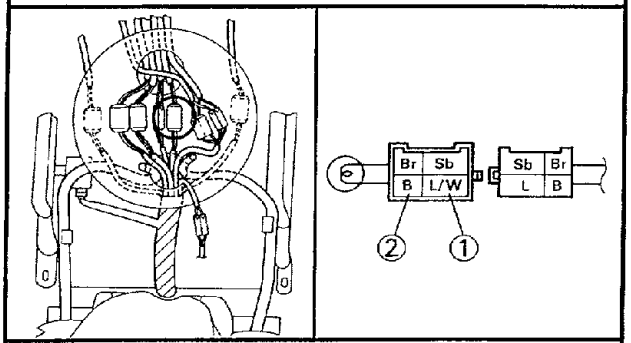
NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

2. Voltage

- Connect the pocket tester (DC20V) to the bulb socket coupler.

Tester (+) lead →
Blue/White terminal ①
Tester (–) lead →
Black terminal ②



- Turn the main switch to on.
- Turn the lights switch to on position.
- Turn the dimmer switch to low beam or high beam.
- Check the voltage (12V) of the leads on the bulb socket connector.

OUT OF SPECIFICATION → The wiring circuit from main switch to bulb socket is faulty. Repair.

MEETS SPECIFICATION ↓

This circuit is not faulty.

YP805022

3. The taillight fails to come on.

1. Bulb and bulb socket

Refer to "SWITCH INSPECTION" section.

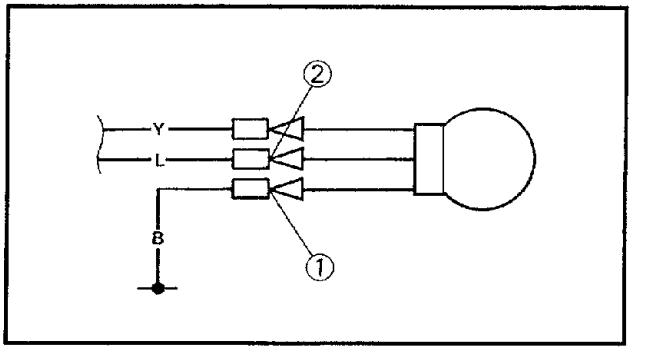
NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

2. Voltage

•Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead →
Blue terminal ①
Tester (–) lead →
Black terminal ②



•Turn the main switch to on position.
•Turn the lights switch to on position.
•Turn the dimmer switch to low beam or high beam.
•Check the voltage (12V) on the bulb socket connector.

OUT OF SPECIFICATION → The wiring circuit from main switch to bulb connector is faulty. Repair.

MEETS SPECIFICATION ↓

This circuit is not faulty.

AG******

AUXILIARY DC OUTPUT SYSTEM CHECK

1. The auxiliary DC terminal fails to put out.

1. Terminal fuse

Refer to "SWITCH INSPECTION" section.

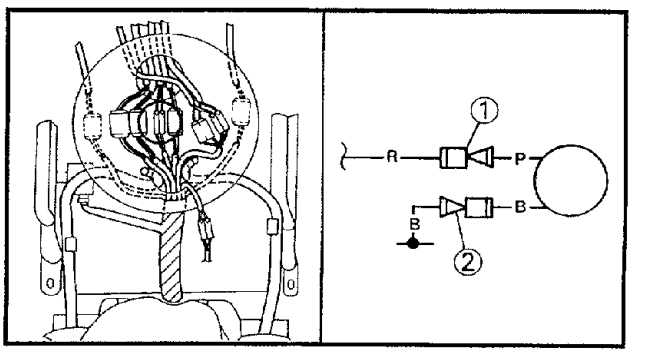
NO CONTINUITY → Replace the terminal fuse.

CONTINUITY ↓

2. Voltage

•Disconnect the auxiliary DC terminal socket connector.
•Connect the pocket tester (DC20V) to the auxiliary DC terminal connector from main harness.

Tester (+) lead →
Pink terminal ①
Tester (–) lead →
Black terminal ②



•Turn the main switch to on position and start the engine.
•Check the voltage (12V) on the auxiliary DC terminal connector.

OUT OF SPECIFICATION → The wiring circuit from main switch to terminal socket connector is faulty. Repair.

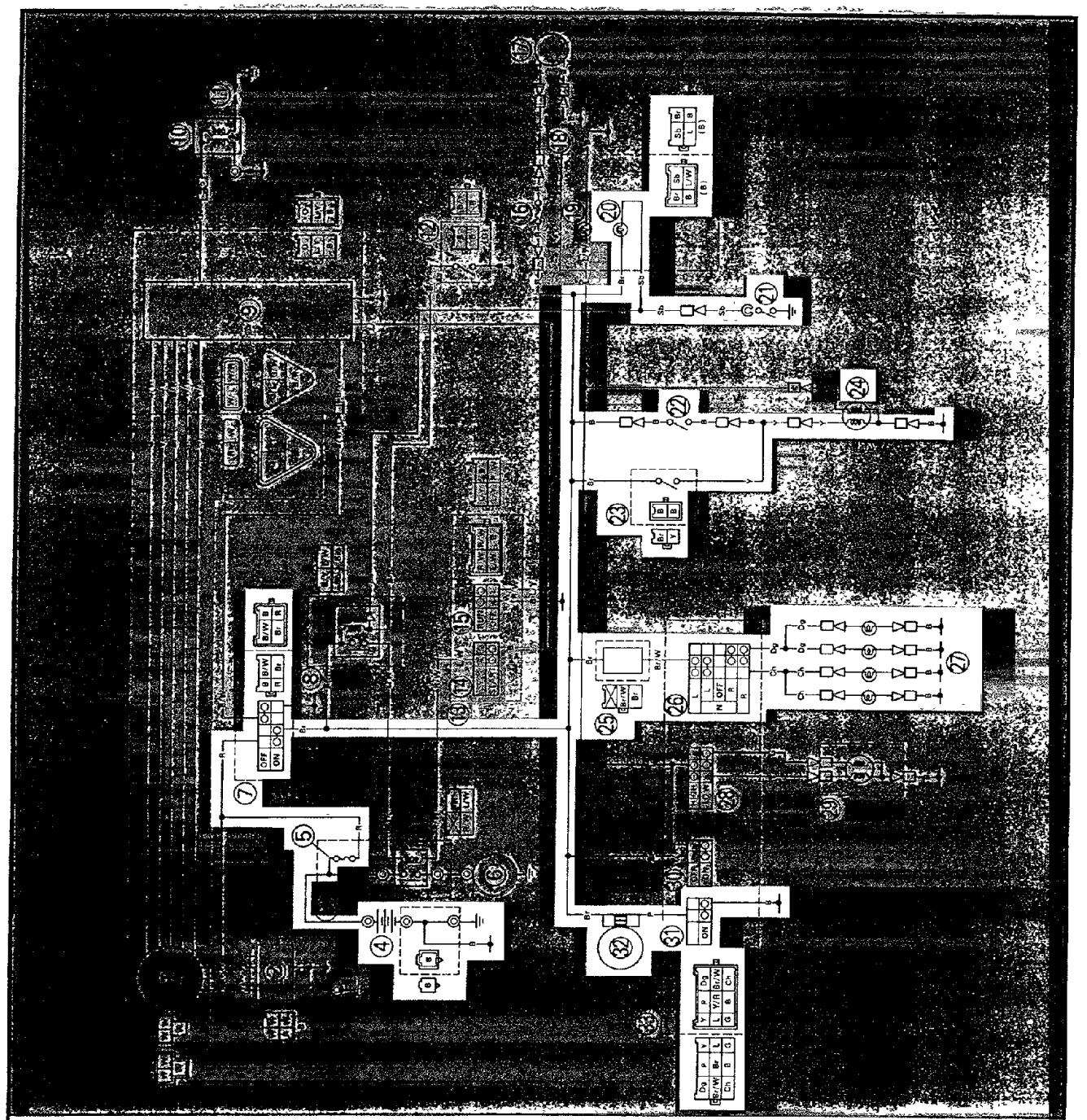
MEETS SPECIFICATION ↓

This circuit is not faulty.

EB806000

SIGNAL SYSTEM

CIRCUIT DIAGRAM



④ Battery
⑤ Fuse (main)
⑦ Main switch
⑳ Neutral indicator light
㉑ Neutral switch
㉒ Rear brake switch
㉓ Front brake switch
㉔ Tail/Brake light
㉕ Flasher relay
㉖ Turn switch
㉗ Flasher lights
㉛ Horn switch
㉜ Horn

YP806010

TROUBLESHOOTING

IF THE FLASHER LIGHT, BRAKE LIGHT AND/OR INDICATOR LIGHT FAIL TO COME ON.
IF THE HORN FAILS TO SOUND.

Procedure

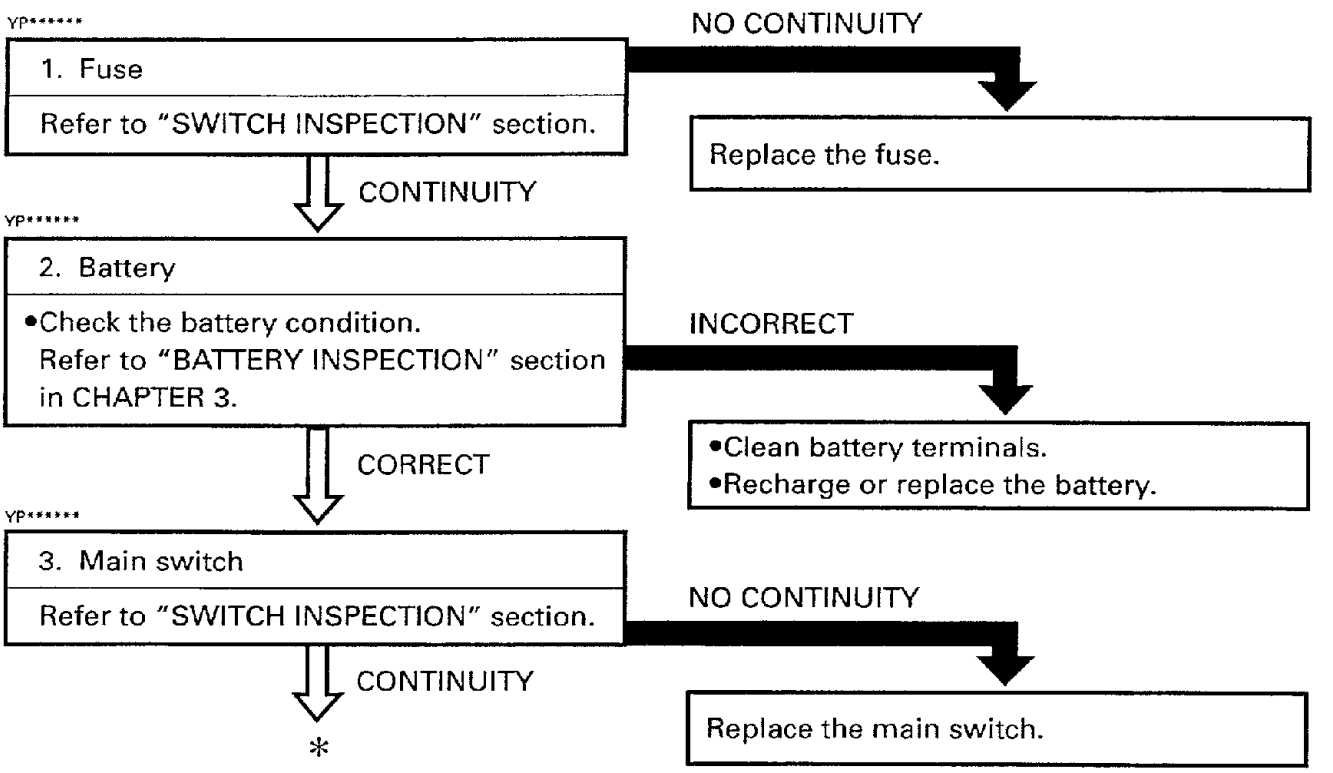
Check:

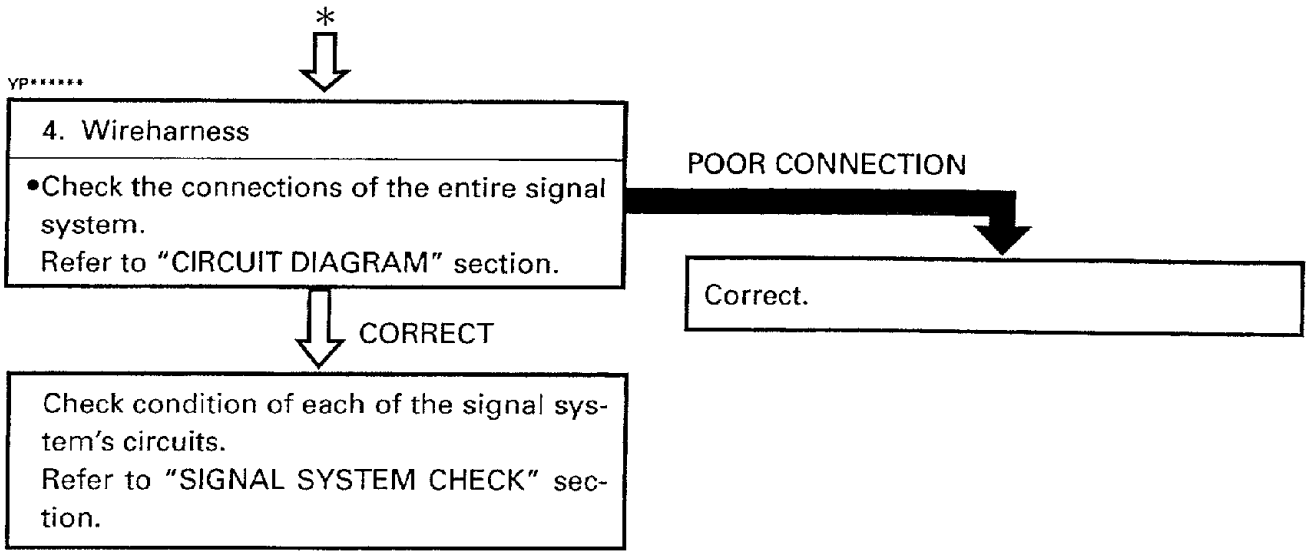
1. Fuse
2. Battery
3. Main switch
4. Wiring connection (entire signal system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Headlight unit
  2) Side cover (left and right)
- Use the special tools in the troubleshooting section.

Pocket tester:
90890-03112




*
YP******
4. Wireharness
•Check the connections of the entire signal system.
Refer to "CIRCUIT DIAGRAM" section.
POOR CONNECTION
Correct.
CORRECT
Check condition of each of the signal system's circuits.
Refer to "SIGNAL SYSTEM CHECK" section.

YP806020

SIGNAL SYSTEM CHECK

1. If the horn fails to sound.

1. Horn switch

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the left handlebar switch (left).

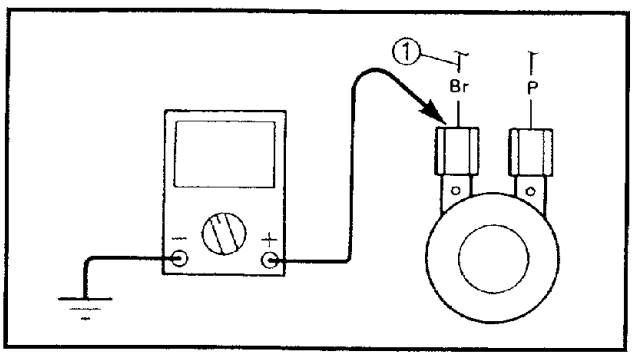
CONTINUITY ↓

2. Voltage

- Connect the pocket tester (DC20V) to the horn lead.

Tester (+) lead → Brown terminal ①
Tester (–) lead → Frame ground

- Turn the main switch to on.
- Check for voltage (12V) on the "Brown" lead at the horn terminal.



OUT OF SPECIFICATION → The wiring circuit from the main switch to the horn is faulty. Repair.

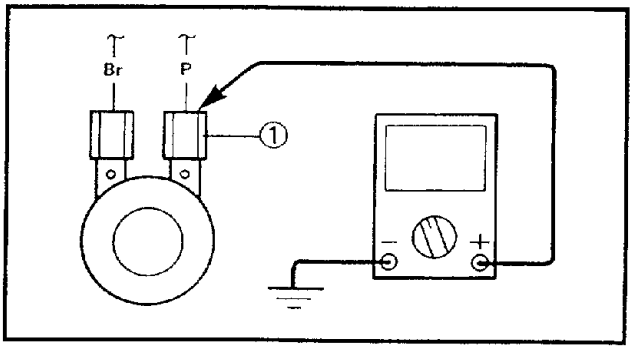
MEETS SPECIFICATION ↓

3. Horn

- Connect the pocket tester (DC20V) to the horn at the "Pink" terminal.

Tester (+) lead → Pink ① terminal
Tester (–) lead → Frame ground

- Turn the main switch to on.
- Check for voltage (12V) on the "Pink" lead to frame ground.



OUT OF SPECIFICATION → Replace the horn.

MEETS SPECIFICATION ↓

Adjust or replace horn.

YP806022

2. If the brake light fails to come on:

1. Bulb and bulb socket
Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

2. Brake switch (Front/Rear)
Refer to "SWITCH INSPECTION" section.

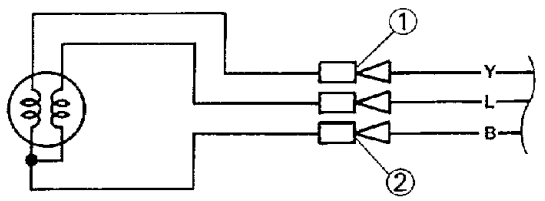
NO CONTINUITY → Replace brake switch.

CONTINUITY ↓

3. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead → Yellow terminal ①
Tester (–) lead → Black terminal ②



- Turn the main switch to on.
- The brake lever (or brake pedal) is pulled in (down).
- Check for voltage (12V) of the "Yellow" lead on the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from the main switch to the bulb socket connector is faulty. Repair. Refer to "CIRCUIT DIAGRAM".

MEETS SPECIFICATION ↓

This circuit is not faulty.

YP806023

3. If the flasher light fails to blink.

1. Bulb and bulb socket
Refer to "SWITCH INSPECTION" section.

NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

2. Turn switch
Refer to "SWITCH INSPECTION" section.

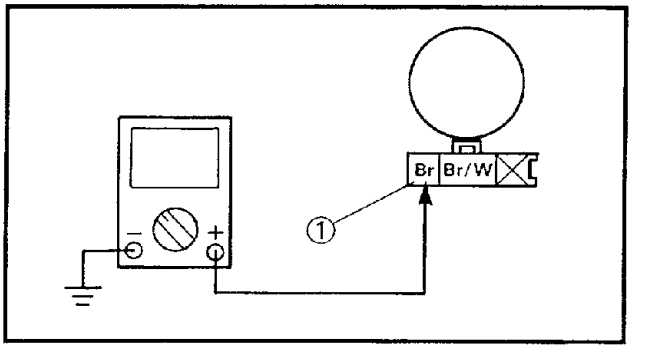
NO CONTINUITY → Replace the left handlebar switch (left).

CONTINUITY ↓

3. Voltage
- Connect the pocket tester (DC20V) to the flasher relay coupler.

Tester (+) lead → Brown terminal ①
Tester (–) lead → Frame ground

- Turn the main switch to on.
- Check for voltage (12V) of the "Brown" ① lead at the flasher relay terminal.



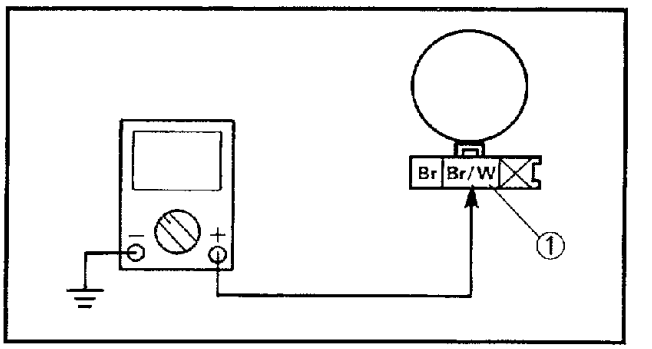
OUT OF SPECIFICATION → The wiring circuit from main switch to flasher relay connector is faulty. Repair.

MEETS SPECIFICATION ↓

4. Flasher relay
- Connect the pocket tester (DC20V) to the flasher relay coupler.

Tester (+) lead → Brown/White terminal ①
Tester (–) lead → Frame ground

- Turn the main switch to on.
- Check for voltage (12V) on the "Brown/White" lead at the flasher relay terminal.



OUT OF SPECIFICATION → The flasher relay is faulty. Replace.

MEETS SPECIFICATION ↓

*

*

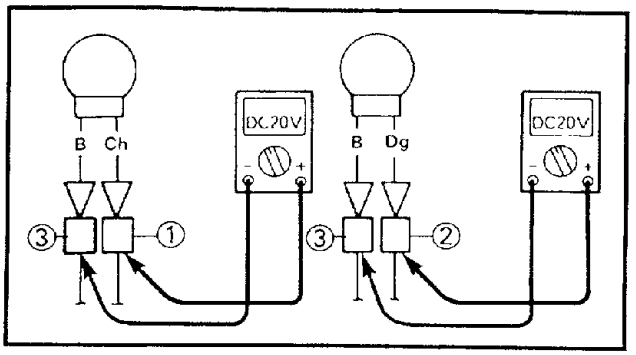
5. Voltage

•Connect the pocket tester (DC20V) to the bulb socket connector.

At flasher light (left)
Tester (+) lead → Chocolate lead ①
Tester (–) lead → Black terminal ③

At flasher light (right)
Tester (+) lead → Dark green lead ②
Tester (–) lead → Black terminal ③

•Turn the main switch to on.
•Turn the turn switch to left or right.
•Check for voltage (12V) on the "Chocolate" lead and "Dark green" at the flasher light terminal.



OUT OF SPECIFICATION

Wiring circuit from the turn switch to bulb socket connector is fault. Repair.
Refer to "CIRCUIT DIAGRAM".

MEETS SPECIFICATION

This circuit is not faulty.

SR806027

4. If the neutral indicator lights fails to operate.

1. Bulb and bulb socket

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY

Replace the bulb and/or bulb socket.

CONTINUITY

2. Neural switch

Refer to "SWITCH INSPECTION" section.

NO CONTINUITY

Replace the left neutral switch.

CONTINUITY

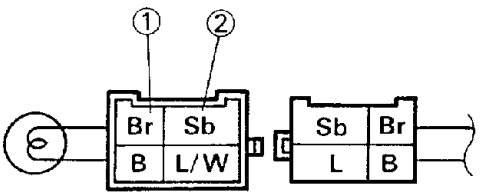
*

*

3. Voltage

•Connect the pocket tester (DC20V) to the fuel gauge coupler.

Tester (+) lead →
Brown terminal ①
Tester (–) lead →
Sky blue terminal ②



•Turn the main switch to on position.
•Select the gear position in neutral.
•Check for voltage (12V) of the "Sky blue" lead on the neutral switch.

OUT OF SPECIFICATION

Check the connection of the entire signal system.
Refer to "CIRCUIT DIAGRAM".

MEETS SPECIFICATION

This circuit is not faulty.

EB90000

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

SR90000

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank
- Empty
- Clogged fuel tank cap breather hole
- Deteriorated fuel or fuel containing water or foreign material

Fuel cock
- Clogged fuel hose
- Clogged fuel cock

Carburetor
- Deteriorated fuel or fuel containing water or foreign material
- Clogged pilot jet
- Clogged air passage
- Improperly set pilot screw
- Clogged pilot air passage
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Clogged starter jet
- Damaged carburetor joint
- Improperly tightened carburetor joint clamp hose
- Starter plunger malfunction
- Sucked-in air

Air filter
- Clogged air filter element
- Improper air filter setting

COMPRESSION SYSTEM

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Piston and piston ring
- Worn piston
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Valve system
- Improperly adjusted valve clearance
- Improperly sealed valve
- Improperly contacted valve and valve seat
- Improper valve timing
- Broken valve spring
- Seized valve

STARTING FAILURE/HARD STARTING
POOR IDLE SPEED PERFORMANCE

IGNITION SYSTEM

Battery
- Improperly charged battery
- Faulty battery

Fuse
- Burnt out, improper connection

Spark plug
- Improper plug gap
- Worn electrodes
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary/secondary coil
- Faulty high tension cord
- Broken ignition coil body

Ignition system
- Faulty CDI unit
- Faulty pick up coil
- Broken magneto woodruff key

Switch
- Faulty main switch
- Faulty "ENGINE STOP" switch
- Faulty front and/or rear brake switch

Wiring
- Loose battery terminal
- Loose coupler connection
- Improperly grounded
- Broken wireharness

SR901000

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor
- Improperly returned starter plunger
- Loose or clogged pilot jet
- Damaged carburetor joint
- Improperly tightened carburetor joint clamp hose
- Improperly adjusted idle speed (Pilot screw), (Throttle stop screw)
- Improperly adjusted throttle cable
- Flooded carburetor

Air filter
- Clogged air filter element

Ignition system
- Faulty spark plug
- Faulty high tension cord
- Faulty CDI unit
- Faulty pick up coil
- Faulty ignition coil

Valve system
- Improperly adjusted valve clearance

EB902000

POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE

Refer to "STARTING FAILURE/HARD STARTING" section. (Fuel system, electrical system, compression system and valve train)

Carburetor
- Improperly adjusted fuel level
- Clogged main nozzle
- Clogged or loose pilot jet

Air filter
- Clogged air filter element

SR******

POOR SPEED PERFORMANCE

POOR SPEED PERFORMANCE

Ignition system
- Dirty spark plug
- Improper heat range
- Faulty CDI unit
- Faulty pick up coil

Fuel system
- Clogged fuel tank cap breather hole
- Clogged air cleaner element
- Clogged jet
- Improperly adjusted fuel level

Compression system
- Worn cylinder
- Worn or seized piston ring
- Cylinder head gasket broken
- Cylinder gasket broken
- Carbon deposit build-up
- Improperly adjusted valve clearance
- Improperly contacted valve and valve seat
- Faulty valve timing

Clutch
- Refer to "CLUTCH SLIPPING/DRAGGING" section

Engine oil
- Improper oil level (low or over oil level)
- Improper quality (Low oil viscosity)
- Deterioration
- Clogged oil passage

Brakes
- Dragging brake

EB904000

CLUTCH SLIPPING/DRAGGING

CLUTCH SLIPPING

Clutch

- Improperly adjusted clutch cable
- Loose clutch spring
- Fatigued clutch spring
- Worn friction plate/clutch plate
- Incorrectly assembled clutch

Engine oil

- Improper oil level
- Improper quality/(low viscosity)
- Deterioration

CLUTCH DRAGGING

Clutch

- Warped pressure plate
- Unevenly tensioned clutch spring
- Bent push rod
- Broken clutch boss
- Burnt primary driven gear bushing
- Bent clutch plate
- Swollen friction plate
- Match marks not aligned

Engine oil

- Improper oil level
- Improper quality/(high viscosity)
- Deterioration

EB903000

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to "CLUTCH DRAGGING".

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift cam, shift fork

- Groove jammed with impurities
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Jammed impurities
- Incorrectly assembled transmission

JUMP-OUT GEAR

Shift shaft

- Improperly adjusted shift lever position
- Improperly returned stopper lever

Shift fork

- Worn shift fork

Shift cam

- Improper thrust play
- Worn shift cam groove

Transmission

- Worn gear dog

SR905000

OVER HEATING OR OVER-COOLING

OVER HEATING

Ignition system

- Improper spark plug gap
- Improper spark plug heat range
- Faulty CDI unit

Fuel system

- Improper carburetor setting
- Improper fuel level adjustment
- Clogged air filter element

Compression system

- Heavy carbon deposit build-up
- Improperly adjusted valve timing
- Improperly adjusted valve clearance

Engine oil

- Incorrect engine oil level
- Improper engine oil quality (High viscosity)
- Low engine oil quality

Brakes

- Dragging brake

AG906001

FAULTY BRAKE

POOR BRAKING EFFECT

Front brake

- Improper brake lever adjustment
- Worn brake shoe
- Improper brake shoe contact
- Worn camshaft
- Worn brake drum
- Mud or water into brake drum inside
- Oily or greasy brake lining
- Faulty brake cable
- Broken or fatigued tension spring
- Faulty camshaft, cam lever

Rear brake

- Improper brake pedal adjustment
- Worn brake shoe
- Improper brake shoe contact
- Worn camshaft
- Worn brake drum
- Mud or water into brake drum inside
- Oily or greasy brake lining
- Faulty brake cable
- Broken or fatigued tension spring
- Faulty camshaft, cam lever

FRONT FORK MALFUNCTION/INSTABLE HANDLING

TRBL SHTG ?

SR907000

FRONT FORK MALFUNCTION

OIL LEAKAGE

- Bent, damaged or rusty inner tube
- Damaged or cracked outer tube
- Damaged oil seal lip
- Loose hexagon bolt
- Damaged cap bolt O-ring
- Improperly installed oil seal

MALFUNCTION

- Bent inner tube
- Deformed outer tube
- Damaged fork spring
- Bent cylinder complete
- Improper oil viscosity (High viscosity)
- Improper oil level
- Worn or damaged slide metal

SR908000

INSTABLE HANDLING

INSTABLE HANDLING

Handlebars

- Improperly installed or bent
- Loose handlebar tightening bolt

Steering

- Improperly installed handlebar crown
- Loose or overtightening steering nut
- Bent under bracket
- Improperly installed steering shaft (improperly tightened ring nut)
- Damaged bearing or ball race

Front forks

- Uneven oil levels on both sides
- Uneven spring tension
- Broken front fork spring
- Fatigued front fork spring
- Twisted front forks

Wheels

- Incorrect wheel balance
- Loose spooks
- Deformed wheel rim
- Unevenly worn tires
- Incorrect tire pressure
- Loose bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Twisted
- Improperly installed bearing race
- Damaged head pipe bearings

Rear arm

- Faulty bearings
- Worm or damaged
- Faulty bushing
- Bent rear arm

Rear shock absorber

- Fatigued spring
- Improperly adjusted spring preload
- Oil leakage

Drive chain

- Improperly adjusted chain line

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STARTER MOTOR DOES NOT OPERATE

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Battery

- Insufficient battery capacity
- Faulty battery

Fuse

- Burnt out, improper connection

Switch

- Faulty main switch
- Faulty starter switch
- Faulty clutch switch
- Faulty neutral switch
- Faulty neutral relay
- Faulty starter relay

Wireharness

- Loose battery terminal
- Loosely connected coupler
- Improperly grounded
- Broken wireharness

Starter motor

- Worn brush
- Faulty commutator
- Broken armature coil

Engine

- Faulty starter clutch
- Seized engine

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FAULTY SIGNAL AND LIGHTING SYSTEM

HEADLIGHT DARK
- Improper bulb
- Too many electric accessories
- Hard charging
- Faulty rectifier/regulator
- Faulty battery
- Improperly connected coupler, connector, wireharness
- Improperly grounded
- Faulty main switch or Lights (dimmer) switch
- Bulb life expired

BULB BURNT OUT
- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Improperly mounting light unit
- Bulb life expired

FLASHER DOES NOT BLINK
- Improperly grounded
- Insufficient battery capacity
- Faulty fuse
- Faulty turn switch
- Faulty flasher relay
- Broken wireharness, incorrect coupler connection
- Bulb burnt out

FLASHER KEEPS ON
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Bulb burnt out (front or rear)

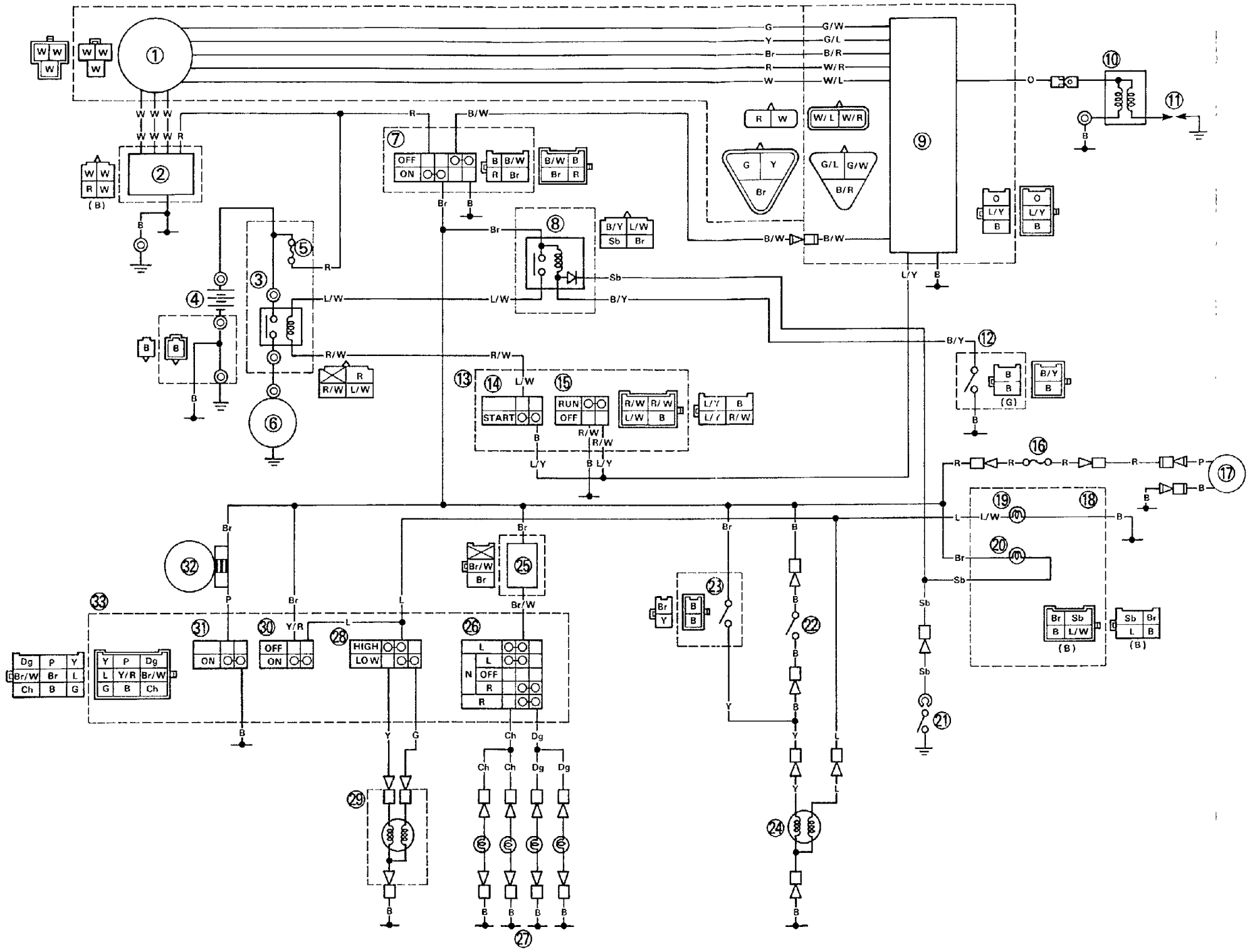
FLASHER BLINKS SLOWER
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Improper bulb
- Faulty main and/or turn switch

FLASHER BLINKS QUICKER
- Improper bulb
- Faulty flasher relay

HORN DOES NOT SOUND
- Faulty battery
- Faulty fuse
- Faulty main and/or horn switch
- Improper horn adjustment
- Faulty horn (burnt coil, connector)
- Broken wireharness

DC VOLTAGE FROM AUXILIARY DC TERMINAL DOES NOT PUT OUT
- Faulty battery
- Faulty fuse
- Faulty main switch
- Faulty auxiliary DC terminal (rusty socket or connector)
- Broken wireharness

AG200F '97 WIRING DIAGRAM



① CDI magneto
② Rectifier/Regulator
③ Starter relay
④ Battery
⑤ Fuse
⑥ Starting motor
⑦ Main switch
⑧ Neutral relay
⑨ CDI unit
⑩ Ignition coil
⑪ Spark plug
⑫ Clutch switch
⑬ Handlebar switches (right)
⑭ Start switch
⑮ Engine stop switch
⑯ Fuse (auxiliary DC terminal)
⑰ Auxiliary DC terminal socket
⑱ Speedometer
⑲ Meter light
⑳ Neutral indicator light
㉑ Neutral switch
㉒ Rear brake switch
㉓ Front brake switch
㉔ Tail/Brake light
㉕ Flasher relay
㉖ Turn switch
㉗ Flasher lights
㉘ Dimmer switch
㉙ Headlight
㉚ Lights switch
㉛ Horn switch
㉜ Horn
㉝ Handlebar switches (left)

COLOR CODE

B.....Black	Sb .....Sky blue	B/Y .....Black/Yellow	R/W .....Red/White
Br .....Brown	P.....Pink	Br/W.....Brown/White	W/L .....White/Blue
Ch .....Chocolate	R.....Red	G/W.....Green/White	W/R .....White/Red
Dg .....Dark green	Y.....Yellow	G/L .....Green/Blue	
G .....Green	W .....White	L/W .....Blue/White	
L.....Blue	B/W .....Black/White	L/Y.....Blue/Yellow	
O .....Orange	B/R .....Black/Red	Y/R .....Yellow/Red	