



YAMAHA

MBK 

CS50/Z ²⁰⁰²
_{5RW1-AE1}

SERVICE MANUAL

EAS00001

CS50/Z
SERVICE MANUAL
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NOTICE

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

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

NOTE:

Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

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



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

WARNING

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

CAUTION:

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

NOTE :

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

HOW TO USE THIS MANUAL

FORMAT OF THIS MANUAL

This manual consists of chapters for the main subject categories (See "Illustrated Symbols").

First heading ①: This is a chapter with a symbol at the top right-hand side of each page.

Second heading ②: This title appears at the top of each page to the left of the chapter symbol. (For the "Inspection and periodic adjustments", chapter the third heading appears.)

Third heading ③: This is a final heading.

MANUAL FORMAT

All the procedures in this manual are organized sequentially, step by step. The information has been compiled to make reading easy for the mechanic and to provide useful reference material which contains ample explanations of all disassembly, repair, assembly and inspection procedures. A particularly important procedure ④ is placed between a lines of asterisks "***" with each procedure preceded by "•".

IMPORTANT CHARACTERISTICS

- Data and special tools are put in a box preceded by a corresponding symbol ⑤.
- A number within a circle ⑥ indicates the number of a part, and a alphabetical letter within a circle indicates data or an alignment mark ⑦, everything else is indicated by a letter within a box ⑧.
- The conditions of defective components will precede an arrow symbol and the course of action to be followed will follow the symbol ⑨.

DETAILED DIAGRAM

Each chapter provides detailed diagrams before each disassembly section, for the easy identification of disassembly/assembly procedures.

② INSPECTION AND REPAIR MOT

①

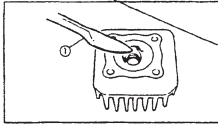
④ ③

INSPECTION AND REPAIR

CYLINDER HEAD

1. Eliminate:

- Carbon deposits
- Use a rounded scraper ①



2. Inspect:

- Warping of cylinder head
- Out of specification → Correct

Steps for measuring and correcting warp:

- Place a straight edge ① and a thickness gauge ② against the head
- Measure the warp limit.

⑤ Warp limit:
0.02 mm

- If warp is out of specification, straighten the head.

NOTE:

Rotate the head several times to avoid removing too much material from one side.

CYLINDER AND PISTON

1. Eliminate:

- Carbon deposits
- Use a rounded file ①

2. Inspect:

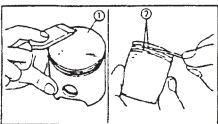
- Cylinder wall
- Wear/Scratches → Rectify or replace

⑨

3. Eliminate:

- Carbon deposits ① ②
- From the crown of the piston and ring slots.

⑥



SIGNAL SYSTEM ELEC

• Turn the main switch to "ON".

• Place the "↔" switch at "→" or "←".

• Check the voltage (12 V) on the "Chocolate" or "Dark Green" wire from the socket connector.

OUT OF SPECIFICATION

↓

MEETS SPECIFICATION (12V)

↓

The circuit is in good condition.

4. The "OIL" indicator light does not light up.

1. Bulb and socket

- Check the bulb and socket to see if there is continuity

NO CONTINUITY

↓

CONTINUITY

Change the bulb and/or socket.

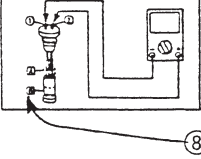
2. Oil level switch

- Remove the oil level switch from the oil tank.
- Connect the pocket tester (1x1) to the oil level switch.

Tester cable (+) → Terminal ①

Tester cable (-) → Terminal ②

- Check the oil level gauge for continuity.



Position of switch	Good condition	Poor condition
A Position straight upward	x	○ x ○
B Position backwards	○	x x ○
⑧ Continuity	x: No continuity	

POOR CONDITION

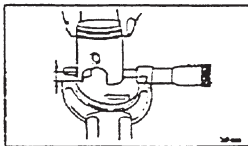
↓

Change the oil level switch.

• If it is out of specification, rectify or replace the cylinder. Replace the piston and piston rings together.

Second case:

- Measure the diameter of the skirt of piston "P" with a micrometer.
- ⑦ 5.0 mm (0.20 in.) from the lower edge of the piston.



ILLUSTRATED SYMBOLS

(See illustration)

The symbols from ① to ⑨ are designed as thumb indices, to indicate the chapter number and index.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ General motor revision
- ⑤ Cooling system
- ⑥ Carburetor
- ⑦ Chassis
- ⑧ Electrical system
- ⑨ Troubleshooting

The illustrated symbols from ⑩ to ⑯ are used to identify the specifications that appear in the text.

- ⑩ Refill liquid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Torque
- ⑭ Wear, play limit
- ⑮ Motor speed
- ⑯ Ω , V, A

The illustrated symbols from ⑰ to ⑳ of the detailed diagrams indicate the grade of lubricant and the site of the lubrication point.

- ⑰ Apply motor oil
- ⑱ Apply gear oil
- ⑲ Apply molybdenum disulphide oil
- ⑳ Apply wheel bearing grease
- ㉑ Apply lightweight lithium soap base grease
- ㉒ Apply molybdenum disulphide grease
- ㉓ Apply blocking agent (LOCTITE®)
- ㉔ Use a new one















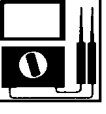














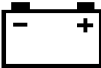
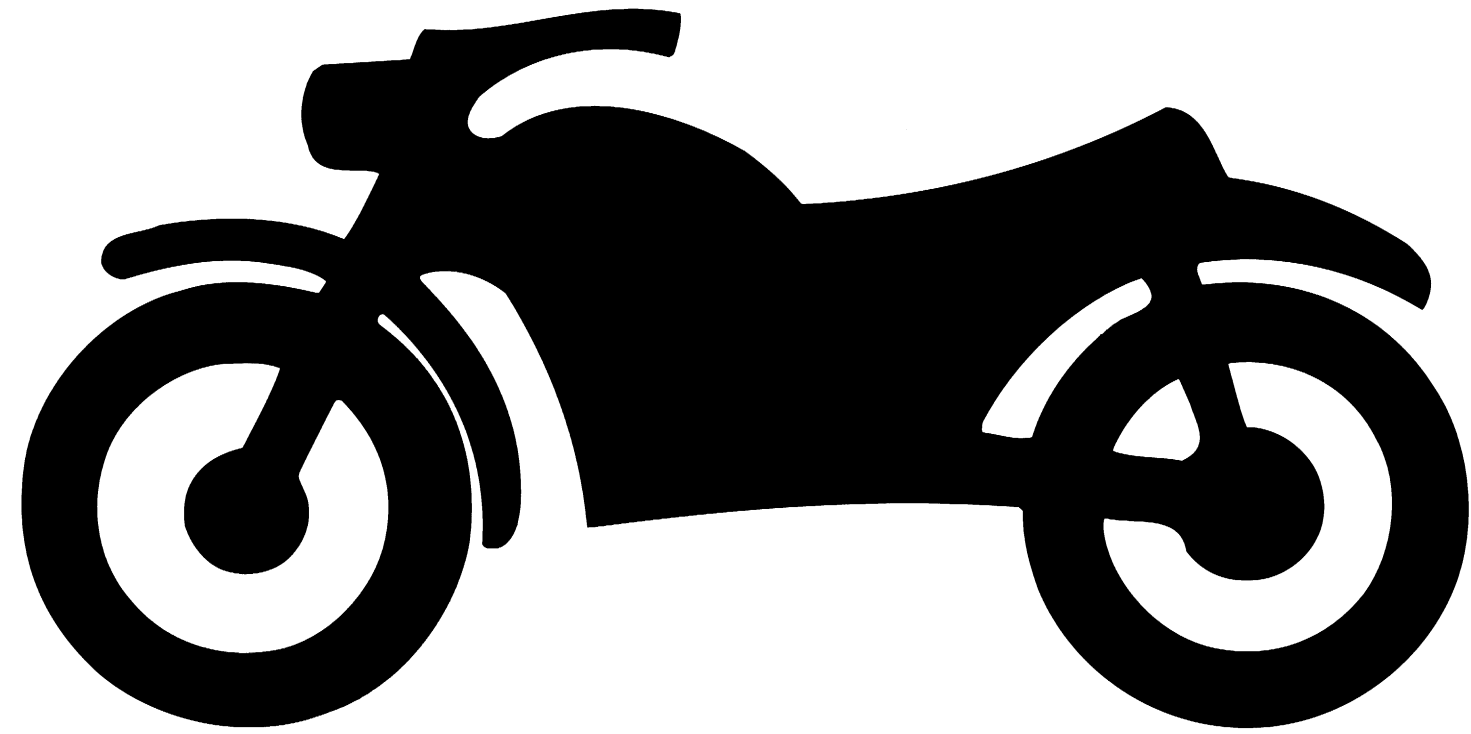
① GEN INFO 	② SPEC 	
③ CHK ADJ 	④ ENG 	
⑤ COOL 	⑥ CARB 	
⑦ CHAS 	⑧ ELEC 	
⑨ TRBL SHTG ?	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	
⑰ 	⑱ 	⑲ 
⑳ 	㉑ 	㉒ 
㉓ 	㉔ New	

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	TRBL SHTG 9



**GEN
INFO**

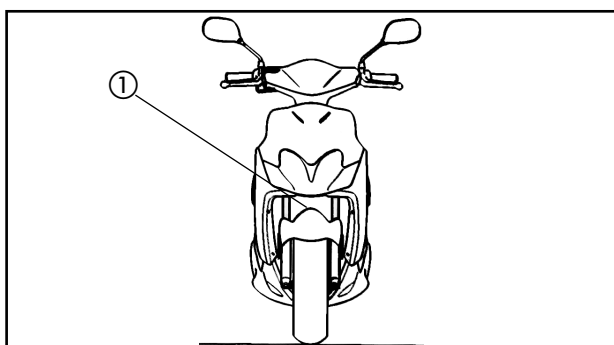
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CHAPTER 1 GENERAL INFORMATION

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IDENTIFICATION OF SCOOTER

GEN
INFO

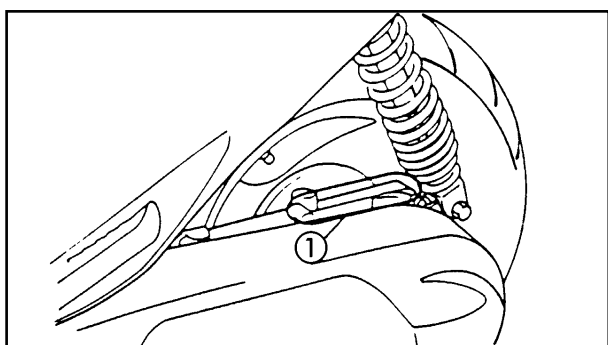


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GENERAL INFORMATION SCOOTER IDENTIFICATION

FRAME SERIAL NUMBER

The frame serial number ① is stamped on the chassis.



ENGINE SERIAL NUMBER

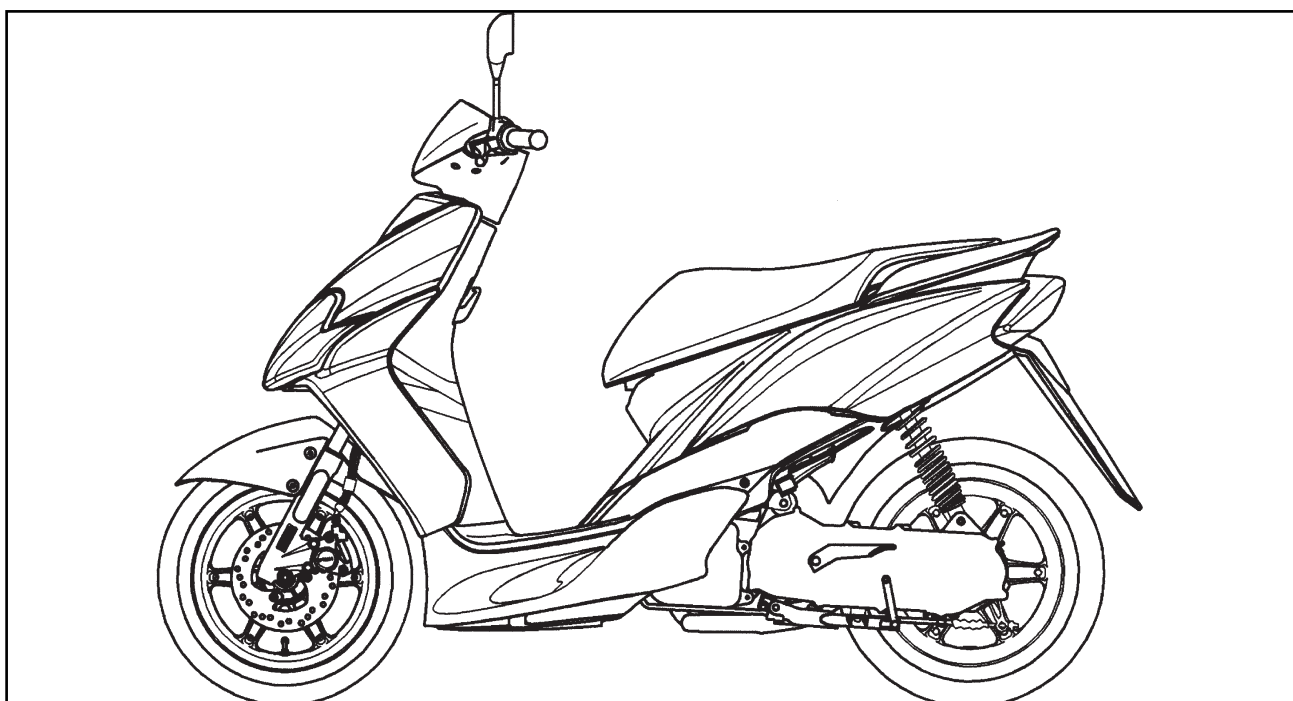
The serial number of the engine ① is stamped on the raised portion of the rear left section of the transmission box.

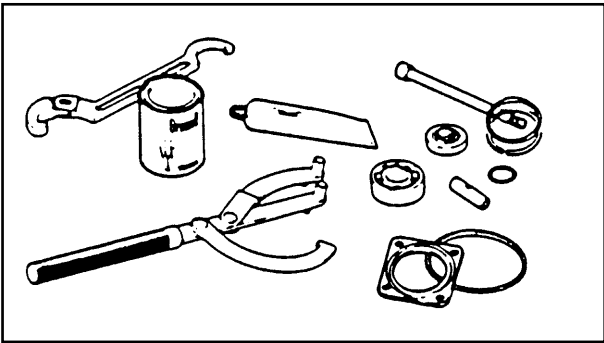
NOTE:

The first three digits of these numbers are for identifying the model; the remaining digits constitute the production number of the unit.

NOTE:

Designs and specifications are subject to change without notice.



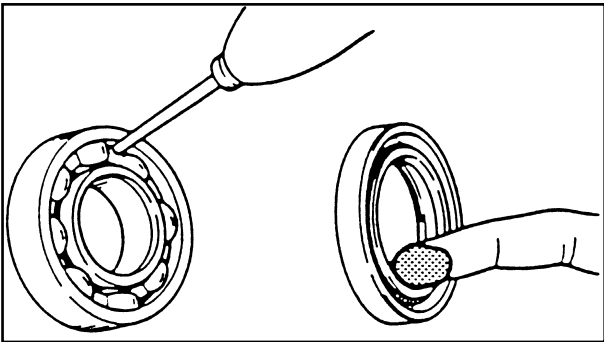


IMPORTANT INFORMATION

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REPLACEMENT PARTS

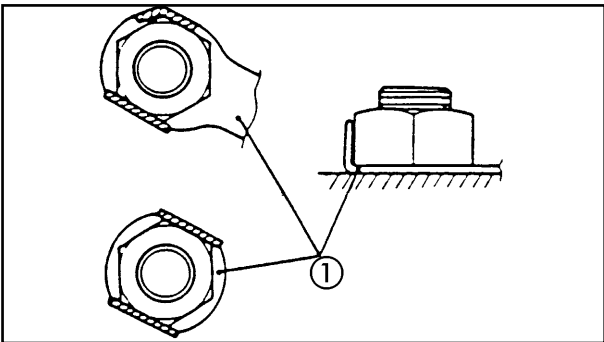
1. Use only genuine Yamaha/MBK parts for all replacements. Use the oil and/or grease recommended by Yamaha/MBK for assembly and adjustment.



EAS00022

GASKETS, OIL SEALS AND O-RINGS

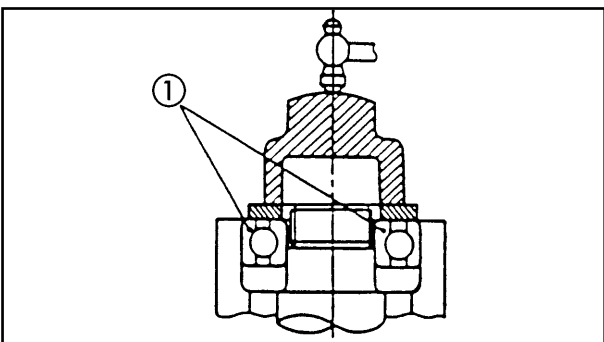
1. Replace all gaskets, seals and O-rings when overhauling the engine. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



EAS00023

LOCK WASHERS/PLATES AND COTTER PINS

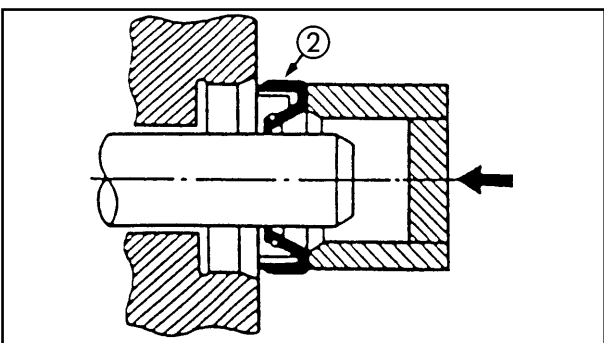
1. Replace all lock washers/plates ① and cotter pins after removal. Bend lock tabs along the bolt or nut flats after the bolt or nut has been tightened to specification.



EAS00024

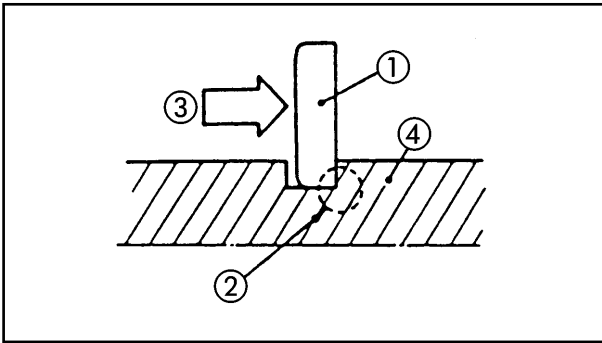
BEARINGS AND OIL SEALS

1. Install the bearings ① and oil stops ② with their manufacturer brands or numbers facing outwards. (In other words, the stamped letters should be on the side exposed to view.) When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Put oil on the bearings when installing.



CAUTION: _____

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



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CIRCLIPS

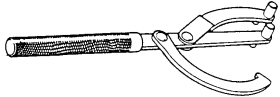
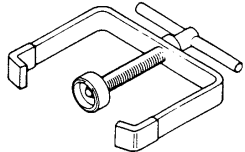
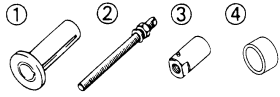
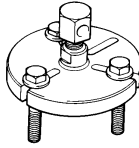
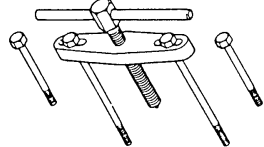

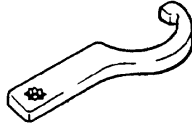
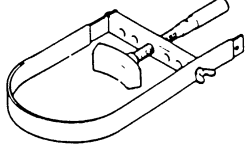
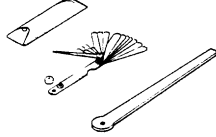
1. Check all circlips carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ it receives. See sectional view.
④ Shaft.

EAS00027

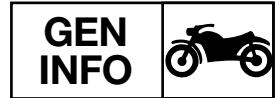
SPECIAL TOOLS

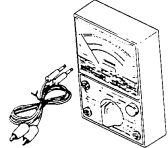
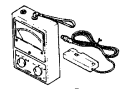
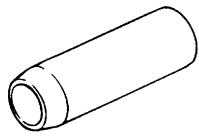
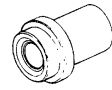
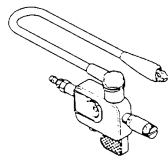
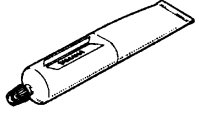
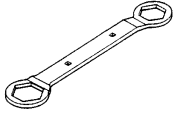
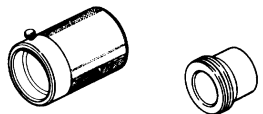
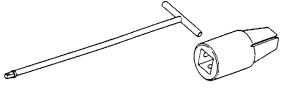
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques.

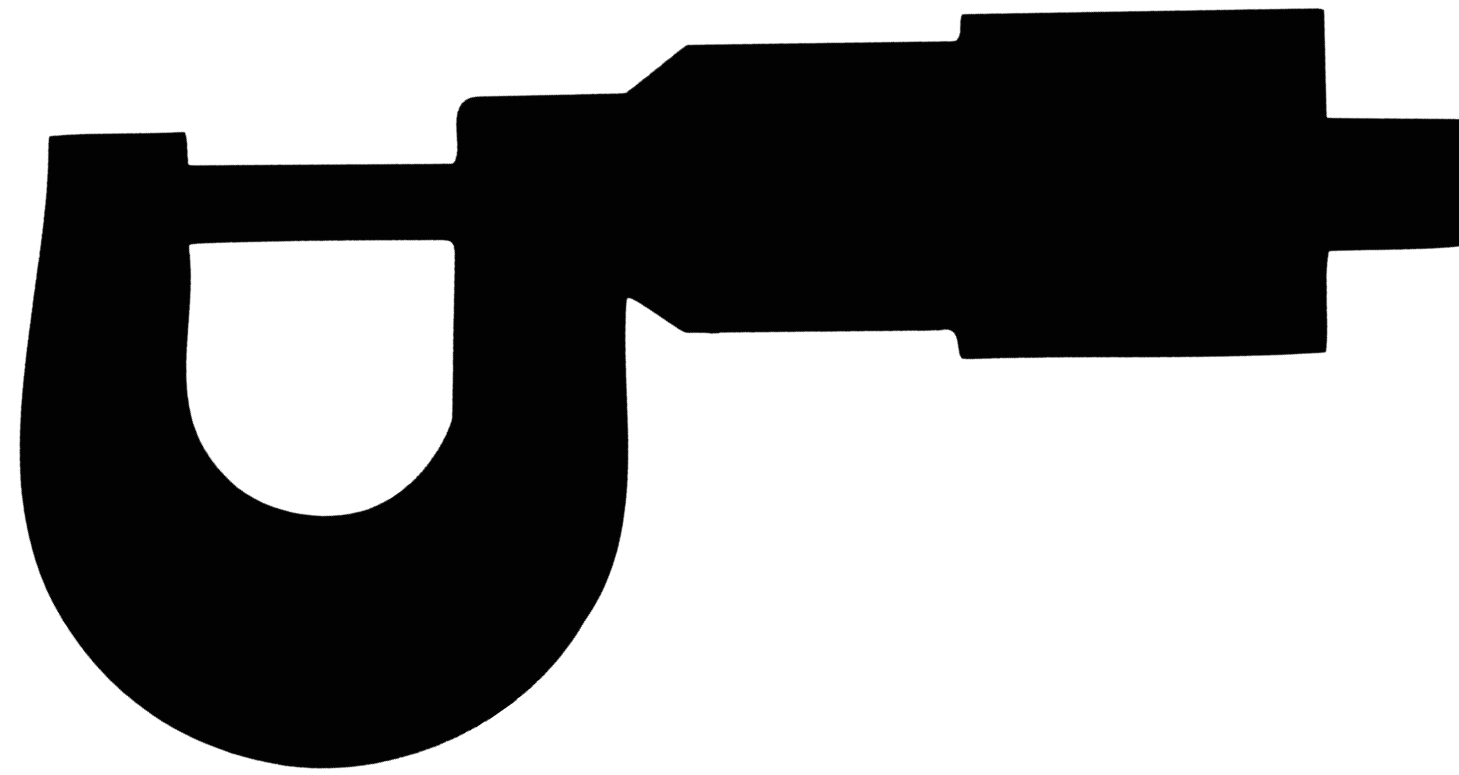
When placing an order, refer to the list provided below to avoid any mistakes.

Tool No.	Tool name / Usage	Illustration
90890-01235	<p>Rotor holding tool</p> <p>This tool is used to remove the flywheel magneto.</p>	
90890-01337	<p>Clutch spring bracket</p> <p>This tool is used to remove the clutch nut while holding the compression spring.</p>	
90890-01274 -01275 -01277 -01288	<p>Container of the crankshaft installer a Bolt of the crankshaft installer b Adapter c, Spacer d These tools are used to install the crankshaft.</p>	
90890-01362	<p>Flywheel puller</p> <p>For removing the flywheel.</p>	
90890-01135	<p>Crankcase separation tool</p> <p>This tool is used to remove the crankshaft or separate the crankcase.</p>	
90890-01384	<p>Oil seal guide</p> <p>Protects the edge of the oil seal during the installation of the secondary sliding pulley wheel.</p>	
90890-01403	<p>Ring nut wrench</p> <p>This tool is used to loosen and tighten the steering ring nut.</p>	
90890-01701	<p>Pulley bracket</p> <p>This tools is used to disassemble and assemble the secondary pulley.</p>	
90890-03079	<p>Thickenss gauge</p> <p>This tool is used to measure the clearance.</p>	

SPECIAL TOOLS



Tool No.	Tool name / Usage	Illustration
90890-03112	<p>Pocket tester</p> <p>This instrument is very important for checking the electrical system.</p>	
90890-03113	<p>Engine tachometer</p> <p>This tool is necessary for detecting the engine rpm.</p>	
90890-01409	<p>Oil seals guide</p> <p>This tool is used to install the left oil guide of the crankcase.</p>	
90890-01410	<p>Oil seals installer</p> <p>This tool is used to install the left oil seal of the crankcase.</p>	
90890-06754	<p>Ignition checker</p> <p>This instrument is necessary to check the components of the ignition system.</p>	
90890-85505	<p>Yamaha bond No. 1215</p> <p>This bond (sealant) is used for crankcase mating surface, etc.</p>	
90890-01348	<p>Locknut wrench</p> <p>This tool is used to loosen and tighten the secondary sheave nut.</p>	
90890-01367 ① -01400 ②	<p>Front oil seals inserter Counterweight a Adapter b</p> <p>These tools are used in the installation of seals.</p>	
90890-01326 -01294	<p>T-handle Damper rod holder</p> <p>These tool are used for holding the damper rod holder when removing or installing the damper rod holder.</p>	



SPEC

2



CHAPTER 2 SPECIFICATIONS

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SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	CS50	CS50Z
Dimensions: Overall length Overall width Overall height Seat height Wheelbase Minimum ground clearance	1.740 mm 675 mm 1.065 mm 770 mm / 776 mm 1.210 mm 132 mm	
Basic weight (With oil and full fuel tank):	80,5 kg	83,7 kg
Engine: Engine type Cylinder arrangement Displacement Bore x stroke Compression ratio Starting system	Plate valve, gasoline, 2-strokes air-cooled | Liquid cooled Forward-inclined single cylinder 49,3 cc 40,0 x 39,2 mm 10,2 : 1 | 11,4 : 1 Electric and kickstarter	
Lubrication system:	Yamaha autolube	
Oil type or grade: Engine oil Transmission oil	2-strokes motor oil (JASO grade FC) SE type 10W30 SAE motor oil	
Oil capacity: Oil tank (motor oil) Transmission fluid Periodic fluid change Total amount	1,4 L 0,10 L 0,11 L	
Cooling system capacity: (Total amount)	–	0,910 L
Air filter:	Wet type element	
Fuel: Type Fuel tank capacity	Unleaded gasoline 5,5 L	
Carburetor: Type/quantity Manufacturer	PHVA12ZS/1, PY12/1 DELL'ORTO, GURTNER	PHVA12ZS/1 DELL'ORTO
Spark plug: Type/Manufacturer Spark plug gap	BR8HS/N.G.K. 0,6 ~ 0,7 mm	
Clutch type:	Dry, centrifugal automatic	
Transmission: Primary reduction system Primary reduction ratio Secondary reduction system Secondary reduction ratio Transmission type Operation	Helical gear 52/13 (4.000) Straight gearing 42/13 (3.230) | 43/13 (3.310) Single speed automatic (V-belt type) Centrifugal automatic type	

GENERAL SPECIFICATIONS

SPEC

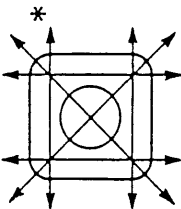
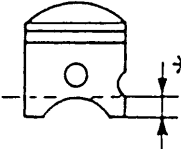
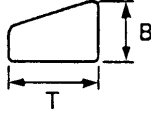
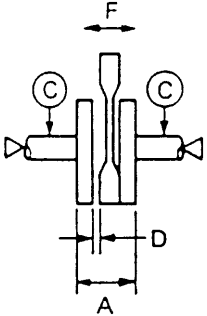


Model	CS50	CS50Z
Chassis: Frame type Front axle incline angle Steering angle base	Steel tube underbone 25° 80 mm	
Tire: Size/Type (Front) Size/Type (Rear)	110/70-12 / 47 L 120/70-12 / 51 L, 130/70-12 / 56 L	
Tire pressure (cold tire): Front Rear	175 KPa (1,75 kg/cm ²) 200 KPa (2,00 kg/cm ²)	
Maximum Load: Front Rear	175 KPa (1,75 Kg/cm ²) 225 KPa (2,25 Kg/cm ²)	
Brake: Type of front brake Activation Type of rear brake Activation	Disk brake Right hand operation Drum brake Left hand operation	
Suspension: Front suspension Rear suspension	Telescopic fork Unit swing	
Shock absorber: Front shock absorber Rear shock absorber	Coil spring/Oil damper Coil spring/Oil damper	
Wheel travel: Front wheel travel Rear wheel travel	70 mm 60 mm	
Electrical: Ignition system Generator system Battery type or model Battery capacity	DC-CDI Magnetic flywheel Maintenance free 12V 4AH	
Type of headlamp:	Bulb	
Bulb wattage/quantity: Headlight Tail/brake light Turn signal light Auxiliary light License plate light Meter lighting	12V, 35W / 35Wx1 12V, 5W / 21Wx1 12V, 10Wx2 (rear) / 12V, 16Wx2 (front) 12V, 5W x 2 12V, 5W x 1 12V, 1,2W x 2	
Indicator light voltage/quantity: Oil level warning light Turn signal indicator light High beam indicator light Coolant temperature warning light	LED 12V, 2W x 2 12V, 2W x 1	
	-	LED



MAINTENANCE SPECIFICATIONS

ENGINE

Model	CS50	CS50Z
Cylinder head: Warp limit 	0,02 mm * The lines indicate measurement with straight edge	
Cylinder: Bore size <Limit> Taper limit Out of round limit	39,993 ~ 40,012 mm <40,1 mm> 0,05 mm 0,01 mm	
Piston: Piston size Measuring point  Piston clearance On measurement 1st	39,952 - 39,972 mm	39,957 - 39,997 mm
	5 mm	
	0,034 - 0,047 mm	0,029 - 0,042 mm
Piston rings: Cut-away section (BXT)/TYPE Top ring 2nd ring  End gap (installed) Top ring 2nd ring <Limit> Side clearance Top ring 2nd ring	1.5 x 1.8 mm/Keystone 1.5 x 1.8 mm/Keystone 0,15 ~ 0,35 mm 0,15 ~ 0,35 mm <0,6 mm> 0,03 ~ 0,05 mm 0,03 ~ 0,05 mm	
Crankshaft:  Crank width "A" Runout limit "C" Large end of rod side clearance "D" Small end of rod clearance "F"	37,90 ~ 37,95 mm 0,03 mm 0,2 ~ 0,5 mm 0,4 ~ 0,8 mm	

MAINTENANCE SPECIFICATIONS

SPEC



Model	CS50	CS50Z	
Automatic centrifugal clutch: Clutch shoe thickness <Limit> Clutch shoe spring free length Clutch - in revolution Clutch - stall revolution	2,0 mm <1,0 mm> 29,9 mm		
	3.350 - 3.850 r/min. 5.200 - 6.000 r/min.	3.950 - 4.450 r/min. 6.900 - 7.700 r/min.	
V-belt: V-belt width <Limit>	16,5 mm <15,7 mm>		
Transmission: Main axle eccentricity limit Drive axle eccentricity limit	0,08 mm 0,08 mm		
Pedal starting: Type Strength of pedal spring	Ratchet 150 ~ 250 g		
Air filter oil grade:	For foam air filter or air-cooled 2-stroke motor oil		
Carburetor: Type / Manufacturer / Amount Main jet / Model (M.J.) Jet needle (J.N.) Main air jet (M.A.J.) Pilot jet (P.J.) Pilot screw (P.A.S.) Valve seat size Engine idling speed Starter jet	PHVA12ZS/1 DELL'ORTO #65	PY12/1 GURTNER #62	PHVA12ZS/1 DELL'ORTO #65
	A20-3/5	B10A-2/3	A35-4/5
	ø 2.5	ø 2.0	ø 2.5
	#36	#38	#36
2 - 2 ¹ / ₄	1 ³ / ₄ - 2	1 ³ / ₄ ± 1/8	
1.2	1.4	1.2	
	1650 ~ 1950 r/min		
	#50	#42	#50


CHASSIS

Model	CS50	CS50Z
Steering system: Steering bearing type Upper Lower	Ball bearing	Ball bearing
Front suspension: Front fork travel Fork spring free length Spring rate (K ₁) (K ₂) Oil capacity Oil grade	70 mm 224 mm 1,33 Kgf/mm 2,0 Kgf/mm 45 cc ± 1 Fork oil: 10W or equivalent	
Rear suspension: Shock absorber stroke Spring free length Spring rate (K ₁) (K ₂)	60 mm 220 mm 4,58 Kgf/mm 6,12 Kgf/mm	
Wheels: Type of front wheel Type of rear wheel Size/material of front tyre Size/material of rear tyre Rim runout limit Radial Lateral	Alloy rim Alloy rim 2,75 x 12 / aluminium 3,00 x 12 / aluminium 1,0 mm 1,0 mm	
Front disc brake: Type Disc outside diameter x thickness Pad thickness <Limit> Interior diameter of pump Calliper interior diameter Brake fluid type	Single ø 190 x 3,5 mm 4,5 mm <0,5 mm> 11 mm 30 mm DOT #4	
Rear drum brake: Type Drum inside diameter <Limit> Shoe thickness <Limit>	Single cam ø 110 mm <ø 110,5 mm> 4 mm <2 mm>	
Brake levers: Free play of the front brake lever (right)/measurement Free play of the rear brake lever (left)/measurement	2 ~ 5 mm / At the end of the lever 5 ~ 10 mm / At the end of the lever	



ELECTRICAL SYSTEM

Model	CS50	CS50Z
Ignition system: Type Ignition timing (B.T.D.C.) Pickup coil resistance (colour)	DC-CDI 14°/5.000 r/min 400 ~ 600 Ω at 20 °C (68 °F) (Black-White/Blue)	
Ignition coil: Minimum spark gap Primary winding resistance Secondary winding resistance	6.0 mm 0.56 ~ 0.84 Ω at 20 °C 5.68 ~ 8.52 KΩ at 20 °C	
Charging system: Normal output Source coil resistance (colour)	0.4 A or more/3.000 r/min 1.0 A or less/8.000 r/min 0.288 ~ 0.432 Ω at 20 °C (68 °F) (White-Black)	
Lighting system: Lighting output Lighting coil resistance (colour)	12 V or more/3.000 r/min 15 V or less/8.000 r/min 0.176 ~ 0.264 Ω at 20 °C (68 °F) (Yellow/Red-Black)	
Battery: Type Capacity	GT4L-BS 12V 4 Ah	
Electric starter system: Type	Constant mesh type	
Starter motor: Output Armature coil resistance Brush length <Limit>	0.14 kw 0.064 ~ 0.079 Ω at 20 °C (68°F) 3.9 mm <0.9 mm>	
Circuit breaker: Type Amperage/Quantity	Fuse 7.5A x 1	

CONVERSION TABLE / GENERAL TIGHTENING TORQUES SPECIFICATIONS



EAS00028

CONVERSION TABLE

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

Ex.

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

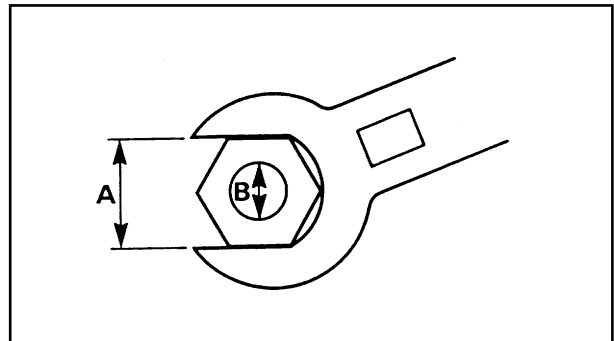
CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Tightening Torque	m•kg	7.233	ft•lb
	m•kg	86.794	in•lb
	cm•kg	0.0723	ft•lb
	cm•kg	0.8679	in•lb
Weight	kg	2.205	lb
	g	0.03527	oz
Speed	km/h	0.6214	mi/h
Distance	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume, Capacity	cc (cm ³)	0.03527	oz (IMP liq.)
	cc (cm ³)	0.06102	cu•in
	L (liter)	0.8799	qt (IMP liq.)
	L (liter)	0.2199	gal (IMP liq.)
Misc.	kg/mm	55.997	lb/in
	kg/cm ²	14.2234	psi (lb/in ²)
	Centigrade (°C)	9/5 + 32	Fahrenheit (°F)

EAS00029

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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



A: Width across flats
B: Thread diameter



A (Nut)	B (Bolt)	General tightening torques	
		Nm	m • kg
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

TIGHTENING TORQUES

SPEC



TIGHTENING TORQUES ENGINE TIGHTENING TORQUES

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque		Remarks
				Nm	m•kg	
Spark plug	-	M 14	1	20	2,0	
Cylinder head and cylinder	Nut	M 7	4	14	1.4	
Cylinder	Stud	M 7	4	17	1.7	
Air protector 2 (A/C)	Screw	M 6	3	7	0.7	
Air protector 3 (A/C)	Screw	M 6	1	2	0.2	
Fan (A/C)	Screw	M 6	3	7	0.7	
Automatic lubrication pump	Screw	M 5	2	4	0.4	
Reed valve	Bolt	M 6	4	11	1.1	
Air filter	Screw	M 6	1	9	0.9	
Carburettor cover	Screw	M 4	2	2	0.2	
Exhaust pipe	Screw	M 6	2	9	0.9	
Muffler	Bolt	M 8	2	26	2.6	
Exhaust pipe protector	Bolt	M 6	2	0.7	0.7	
Exhaust pipe cover	Bolt	M 6	5	0.7	0.7	
Crankcase	Bolt	M 6	6	10	1.0	
Cover of crankcase 2	Bolt	M 6	6	10	1.0	
Cover of crankcase 1	Bolt	M 6	12	12	1.2	
Air conduct (A/C)	Screw	M 6	2	7	0.7	
Crankcase bracket	Screw	M 6	2	7	0.7	
Drain bolt	Bolt	M 8	1	18	1.8	
Oil plug	Plug	M 14	1	3	0.3	
Intermediate gear plate	Screw	M 6	2	8	0.8	
Kickstarter	Bolt	M 6	1	9	0.9	
Starter motor	Bolt	M 6	2	13	1.3	
Clutch housing	Nut	M 10	1	40	4.0	
Primary pulley	Nut	M 12	1	45	4.5	
Magnet base	Screw	M 6	2	8	0.8	
Magnet rotor	Nut	M 12	1	43	4.3	
Crankshaft oil seal stay	Bolt	M 6	1	8	0.8	
Water pump housing cover (L/C)	Bolt	M 6	3	7	0.7	
Water pump driver bolts (L/C)	Bolt	M 6	3	6.5	0.65	
Magnet cover (L/C)	Bolt	M 6	3	6.5	0.65	

TIGHTENING TORQUES

SPEC



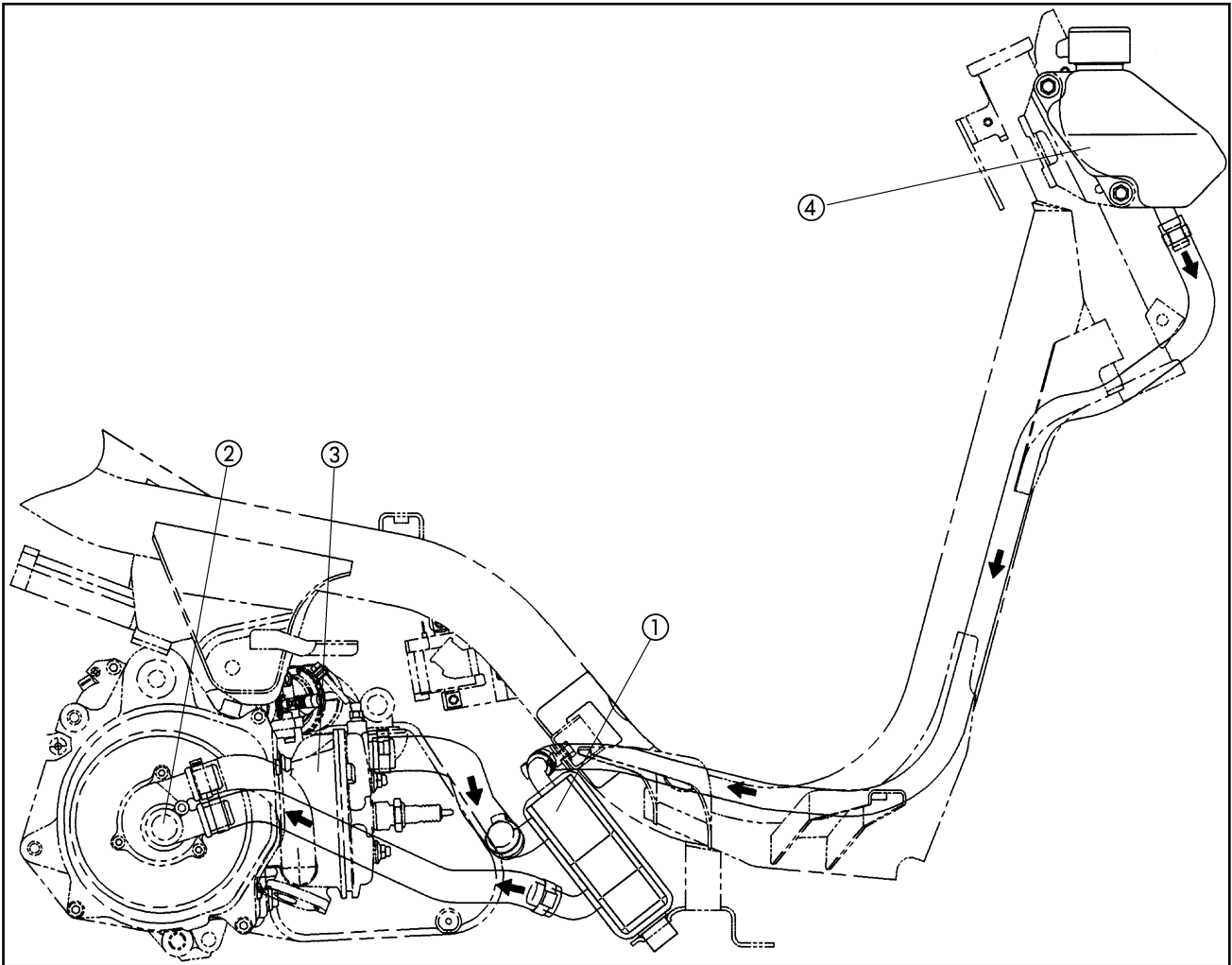
CHASSIS TIGHTENING TORQUES

Part to be tightened	Thread size	Tightening torque		Remarks
		Nm	m•kg	
Frame, Engine and Parts				
Frame with bracket 3	M10 x 1.25	42	4.2	
Engine bracket 3 with the engine	M12 x 1.25	84	8.4	
Cushion and related parts				
Rear shock absorber (bracket side)	M10 x 1.25	31.5	3.15	
Rear shock absorber (engine side)	M8 x 1.25	17.5	1.75	
Forks, handlebar and parts				
Handlebar or grip with axle guide	M10 x 1.25	42.5	4.25	
Axle guide	M25 x 1.00	75	7.5	See chapter 3 "ADJUSTING THE STEERING HEAD"
Brake tube joint screw	M10 x 1.25	23	2.3	
Seats and related parts				
Seat lock unit	M6 x 1.0	9.75	0.975	
Hook bracket	M6 x 1.0	8	0.8	
Case	M6 x 1.0	8	0.8	
Covers and related parts				
Plastic parts, plastic covers	M5	1.5	0.15	
Frame footrest plate	M6 x 1.0	4	0.4	
Leg protector 2/frame	M6 x 1.0	4	0.4	
Front and rear wheels				
Front wheel axle	M10 x 1.25	47.5	4.75	
Rear wheel axle	M14 x 1.5	125	12.5	
Rear brake lever	M6 x 1.0	13.5	1.35	
Shoe axle	M10 x 1.25	12	1.2	
Brake disk	M8 x 1.25	23	2.3	
Front brake calliper	M8 x 1.25	23	2.3	
Fuel tank				
Fuel cut-off valve		11	1.1	



COOLING SYSTEM (L/C VERSION ONLY)

- ① Radiator
- ② Water pump
- ③ Cylinder
- ④ Reservoir tank

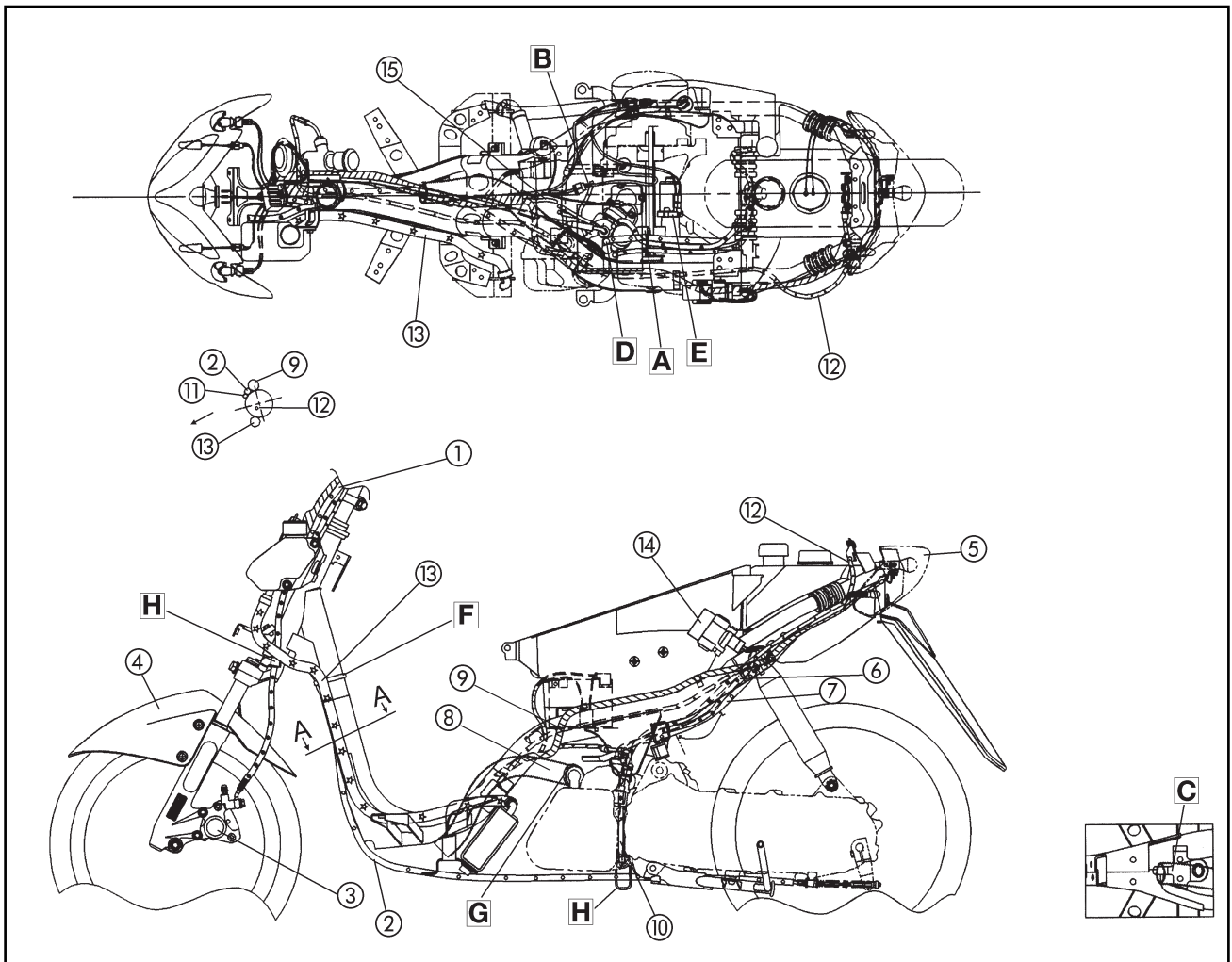




CABLE ROUTING

- ① Front brake hose
- ② Rear brake cable
- ③ Front brake calliper
- ④ Front mudguard
- ⑤ Taillight
- ⑥ Vacuum pipe
- ⑦ Fuel pipe
- ⑧ Intake hose (L/C)
- ⑨ Wire harness
- ⑩ Engine breather
- ⑪ Throttle cable
- ⑫ Seat lock cable
- ⑬ Coolant hose (L/C)
- ⑭ DC-CDI
- ⑮ Coolant hoses - Carburetor (L/C)

- A Insert the three tubes through the clamp
- B Connect the oil hose to the carburettor
- C Set the intake hose under the reinforcement (L/C)
- D Clamp the fuel pipe to the carburettor
- E Tighten together the ground cable and the starter motor
- F Clamp all the cables except the coolant hose (L/C) without tightening
- G Clamp the intake hose to the air filter box (L/C)
- H Pass the brake cable through the guide

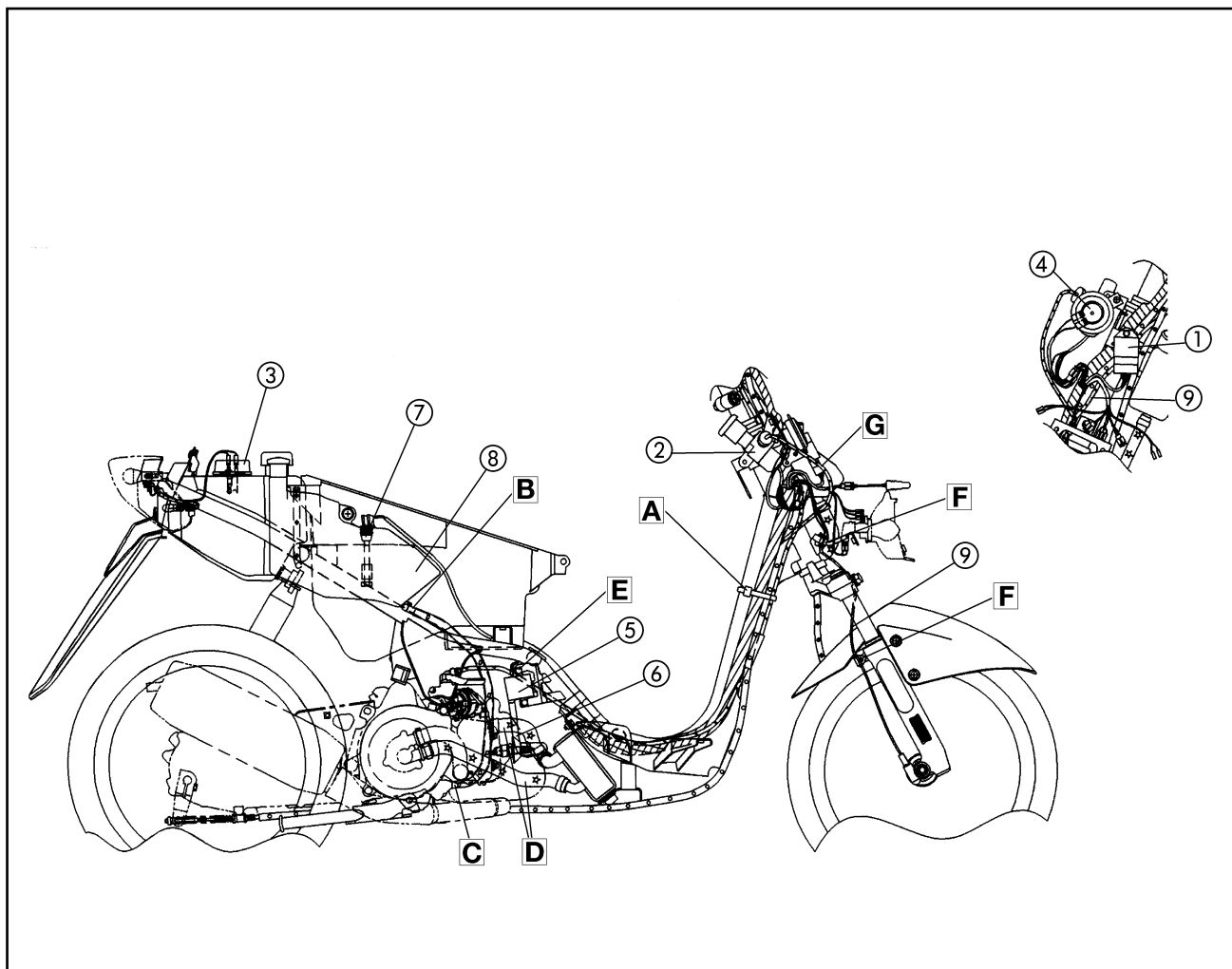




CABLE ROUTING

- ① Rectifier / Regulator
- ② Main switch
- ③ Fuel level gauge
- ④ Horn
- ⑤ Ignition coil
- ⑥ Spark plug wire
- ⑦ Oil level gauge
- ⑧ Oil tank
- ⑨ Speedometer cable

- A Clamp the wire harness, brake cable and throttle to the frame
- B Clamp the oil hose to the tank
- C Connect the oil hose to the pump
- D Tie both ends
- E Tighten together the ground cable and the ignition coil
- F Pass the speedometer cable through the guide
- G Insert the seat lock cable through the orifice of the frame

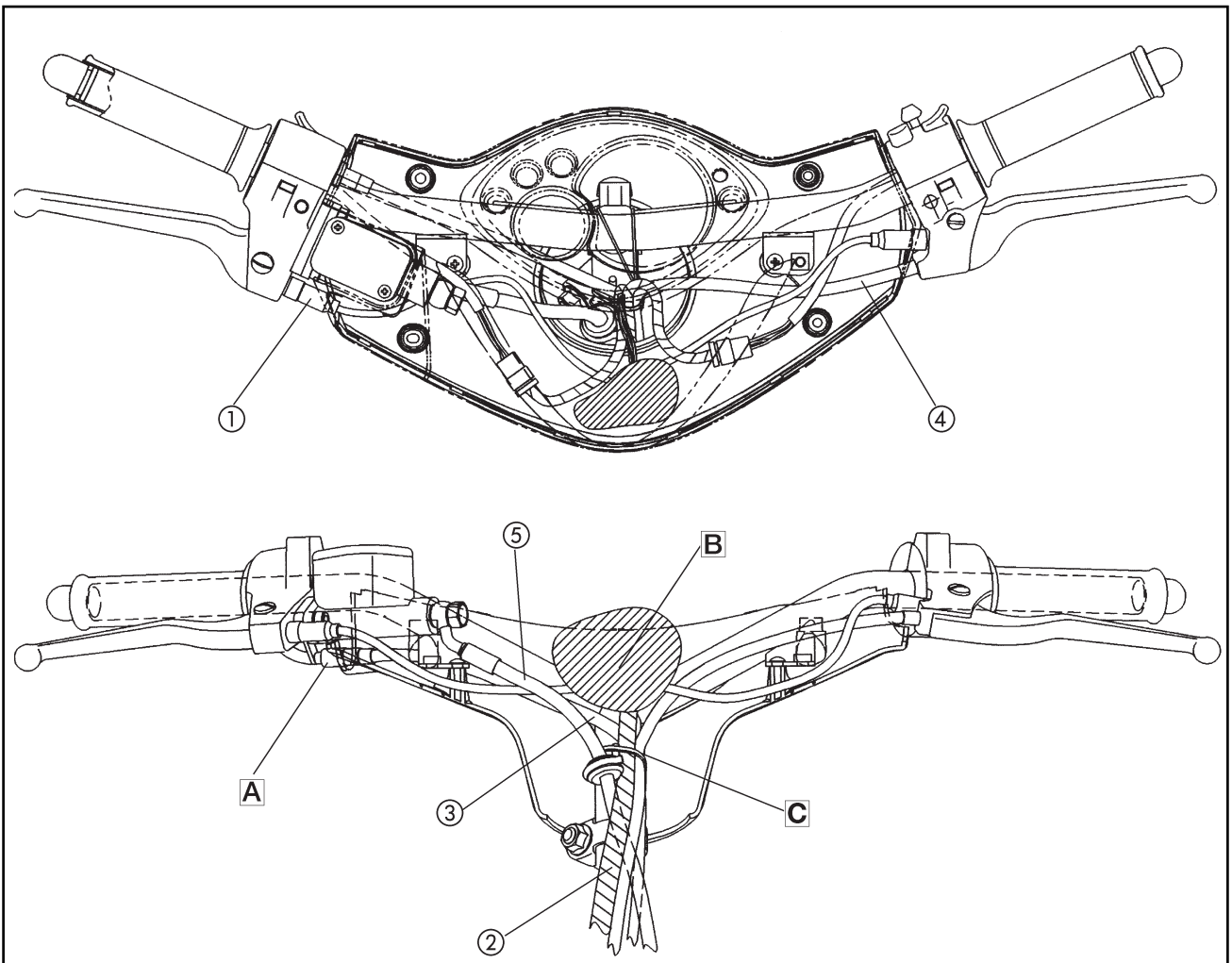




CABLE ROUTING

- ① Front brake switch
- ② Wire harness
- ③ Throttle cable
- ④ Rear brake cable
- ⑤ Front brake hose

- A Throttle tension cable. Cover then adjust
- B Connect the brake switch cables in this area
- C Do not pass the brake hose through the clamp





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3

CHAPTER 3 PERIODIC CHECKS AND ADJUSTMENTS

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INTRODUCTION/PERIODIC MAINTENANCE/ LUBRICATION INTERVALS



EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all the information necessary to perform the recommended inspections and adjustments. These preventive maintenance procedures, if followed correctly, will ensure more reliable operation of the vehicle and a longer life of service. The need for costly revision and repair work will be greatly reduced. This information is applicable to vehicles that are already in service, as well as for new vehicles that have been prepared for sale. All service technicians must become familiar with the entire chapter.

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PERIODIC MAINTENANCE AND LUBRICATION INTERVALS

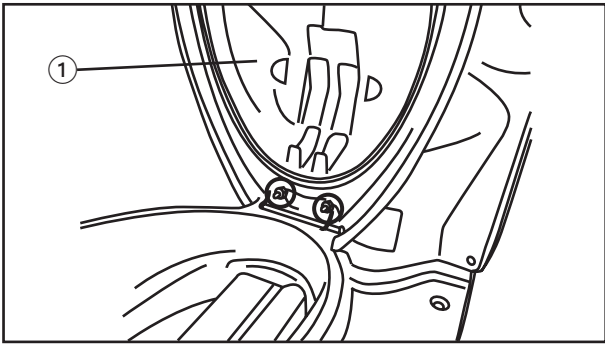
No.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (x 1.000 km)					ANNUAL CHECK
			1	6	12	18	24	
1	*	Fuel line		√	√	√	√	√
2		Spark Plug		√		√		
					√	√		
3		Air filter element		√		√		
4	*	Front brake	√	√	√	√	√	√
5	*	Rear brake	√	√	√	√	√	√
6	*	Brake hose		√	√	√	√	√
7	*	Wheels		√	√	√	√	
8	*	Tires		√	√	√	√	
9	*	Wheel bearings		√	√	√	√	
10	*	Steering bearings	√	√	√	√	√	
11	*	Chassis fasteners		√	√	√	√	√
12		Centerstand		√	√	√	√	√
13	*	Front fork		√	√	√	√	
14	*	Rear shock absorber assembly		√	√	√	√	
15	*	Carburetor	√	√	√	√	√	√
16	*	Autolube pump	√		√		√	√
17	*	Cooling system (L/C version only)		√	√	√	√	√
18		Final transmission oil	√	√		√		
			√		√		√	
19	*	V-belt			√		√	
20		Front and rear brake switches	√	√	√	√	√	√
21	*	Moving parts and cables		√	√	√	√	√
22		Lights, signals and switches	√	√	√	√	√	√

*: It is recommended that these items be revised by an authorized Yamaha/MBK dealer.

** : Apply grease for mid-weight bearings.

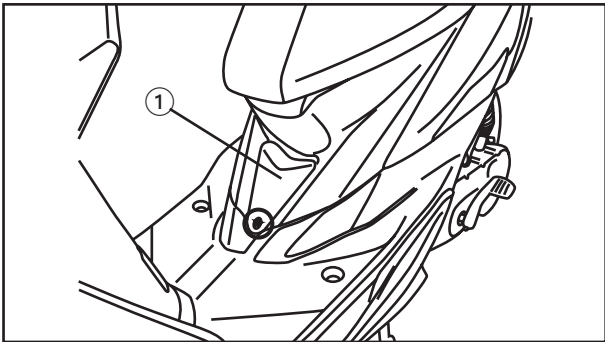
NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
- Regularly check and, if necessary, correct the brake fluid level.
- Replace the brake hoses every four years and if cracked or damaged.



REAR BODYWORK, MUDGUARD REMOVAL

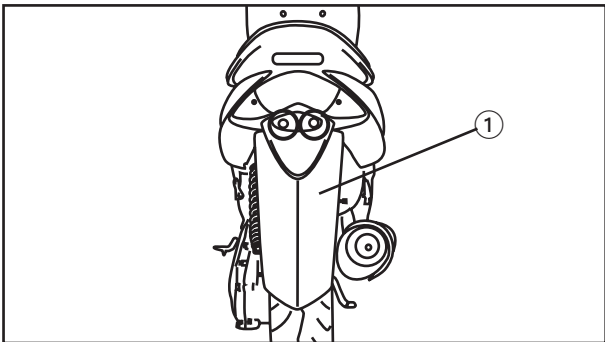
1. Remove:
 - seat (1)



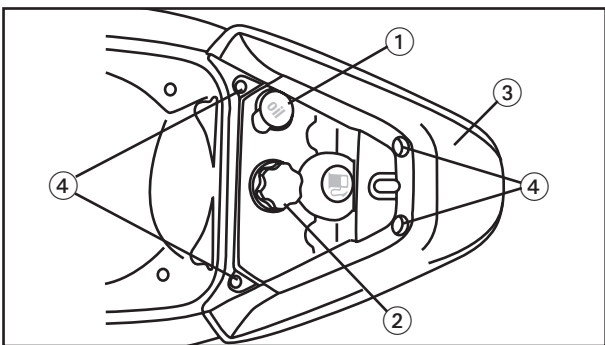
2. Remove:
 - central panel (1)

NOTE: _____

Slide the panel to the front.



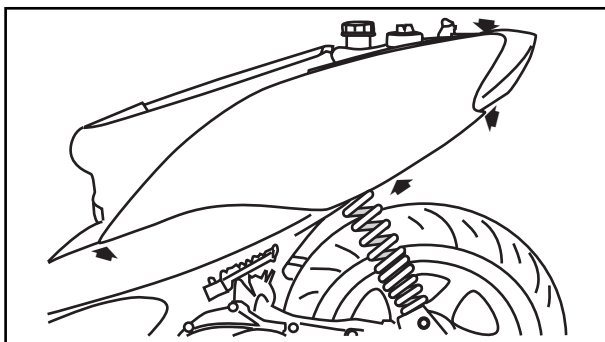
3. Remove:
 - rear fender (1)



4. Remove:
 - oil tank cap (1) and grommet
 - fuel tank cap (2) and grommet
 - passenger hand gras bolts and collars (4)
 - passenger hand gras (3)

REAR BODYWORK, MUDGUARD

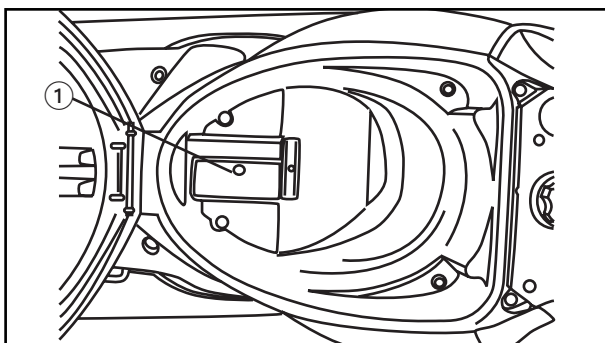
CHK
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5. Remove:
- side covers (4 bolts)

NOTE: _____

Remove carefully the hook between side cover and tail light.

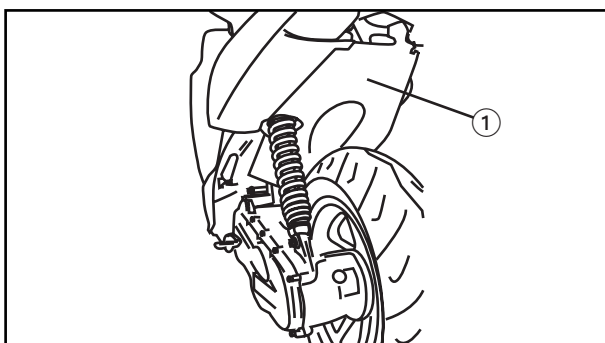


6. Remove:
- battery cover ①, leads and battery
 - oil tank fixing bolt

NOTE: _____

Fix the oil tank to the frame with a band.

- helmet box



7. Remove:
- rear mudguard ① (4 bolts)

INSTALLATION

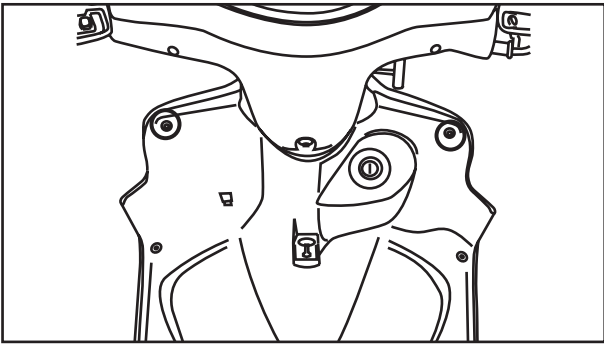
Reverse the removal process.

NOTE: _____

After installing all plastic parts, check that all hooks are properly attached.

FRONT COWLING AND FOOTREST

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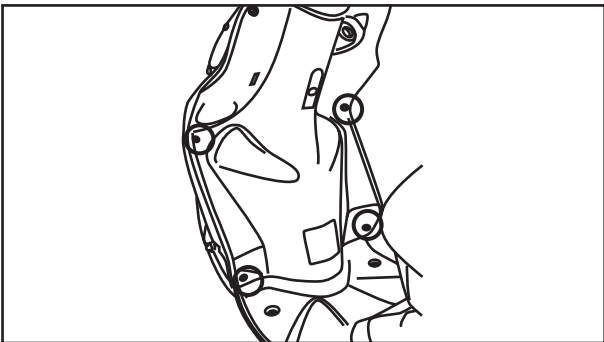
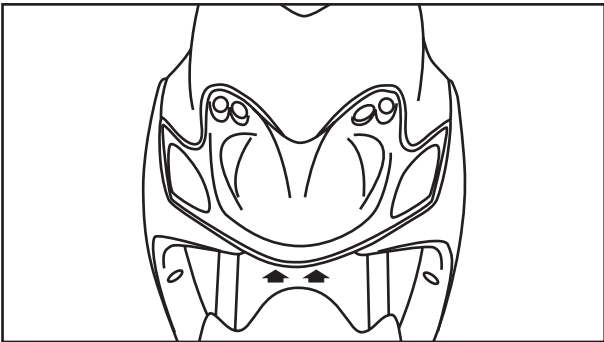
FRONT COWLING AND FOOTREST

REMOVAL

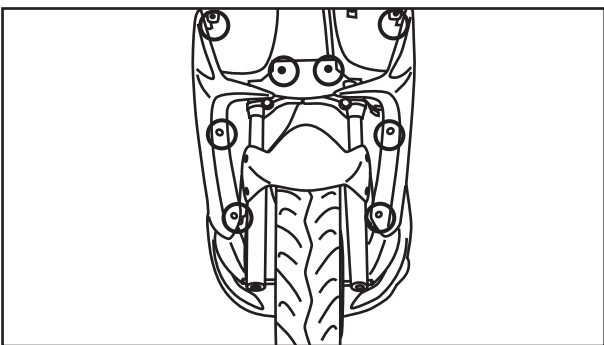
1. Remove:
 - front upper cowling

NOTE:

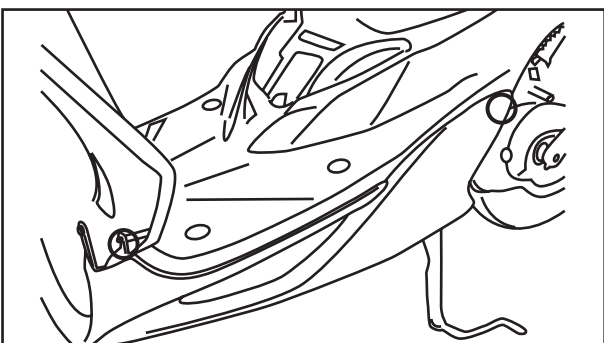
Disconnect front light and indicator light couplers.



2. Remove:
 - front middle cowling



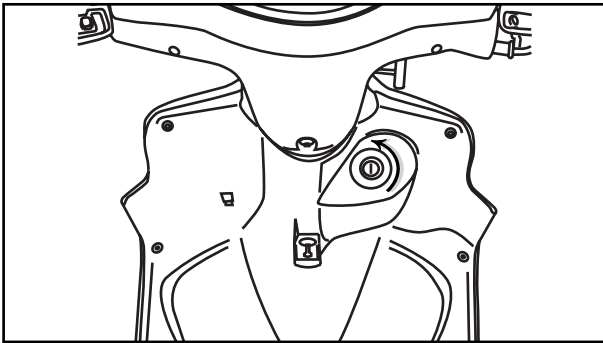
3. Remove:
 - lower cowling



4. Remove:
 - under cowling

FRONT COWLING AND FOOTREST

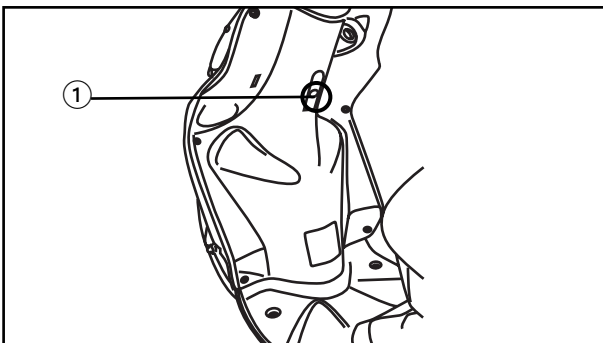
CHK
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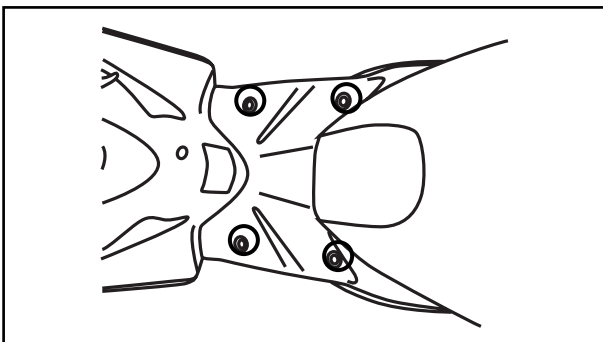
5. Remove:
- legshield

NOTE: _____

Remove first the main switch cover



6. Remove:
- hook bracket ①



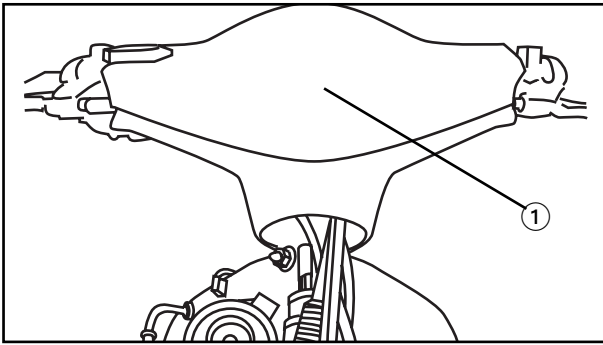
7. Remove:
- footrest

INSTALLATION

Reverse the removal process

NOTE: _____

After installing all plastic parts, check that all hooks are properly attached.



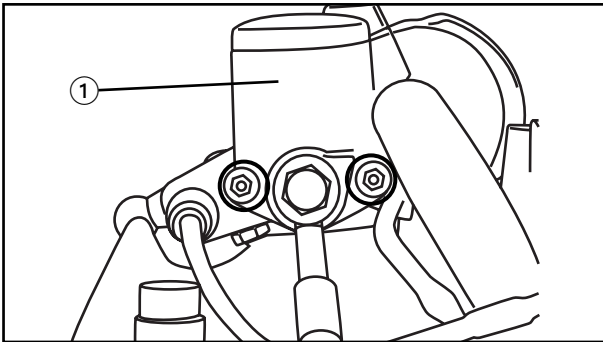
HANDLEBAR COVERS

REMOVAL

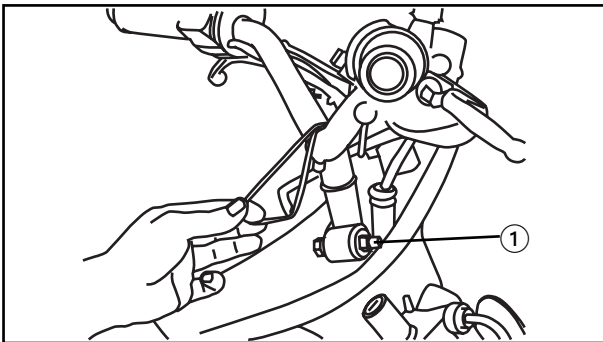
1. Remove:
 - upper handlebar cover ①

NOTE:

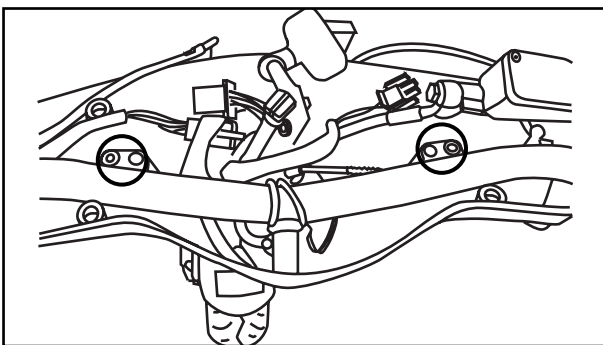
Disconnect panel meter couplers



2. Remove:
 - front master cylinder (2 bolts) ①
 - handlebar switch couplers
 - stop switch couplers
 - rear brake wire from lever side
 - throttle wire from throttle grip



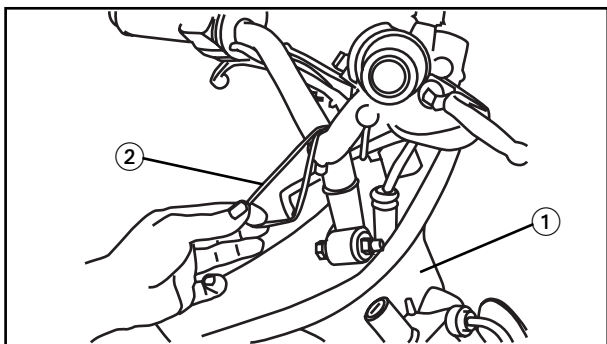
3. Remove:
 - handlebar fixing bolt ①



4. Remove:
 - lower handlebar cover bolts

HANDLEBAR COVERS

CHK
ADJ



5. Slide down the lower handlebar cover ①
6. Remove the wiring harness rubber band ② from the handlebar

7. Remove:
 - handlebar
 - lower handlebar cover

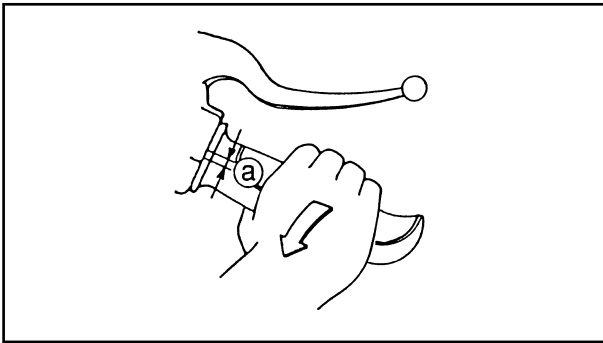
INSTALLATION

Reverse the removal process.

NOTE:

- For handlebar installation refer to chapter 7.
- After installing all plastic parts, check that all hooks are properly attached.

ADJUSTING THE THROTTLE CABLE FREE PLAY



EAS00058

ADJUSTING THE THROTTLE CABLE FREE PLAY

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.

Throttle cable free play (at the flange of the throttle grip)
2 ~ 5 mm

2. Remove:
 - center panel
 - grip bar
 - battery
 - right side cover
 - helmet box
 Refer to BODYWORK

3. Adjust:
 - throttle cable free play



Carburetor side

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

Direction Ⓐ	Throttle cable free play is increased.
Direction Ⓑ	Throttle cable free play is decreased.

- c. Tighten the locknut.

NOTE:

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

Handlebar side

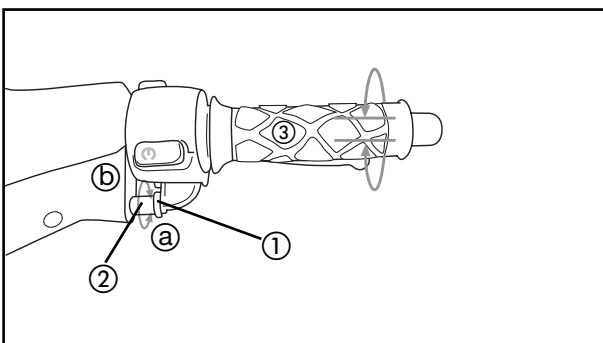
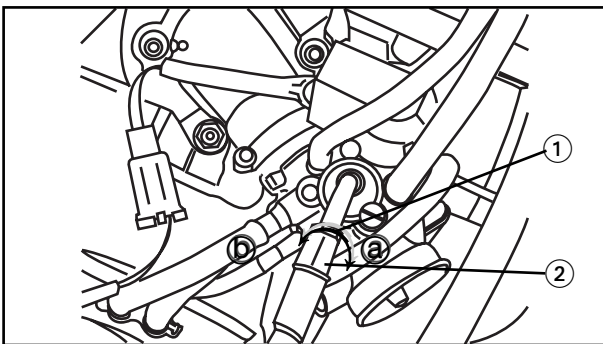
- a. Loosen the locknut **①**.
- b. Turn the adjusting nut **②** in direction **Ⓐ** or **Ⓑ** until the specified throttle cable free play is obtained.

Direction Ⓐ	Throttle cable free play is increased.
Direction Ⓑ	Throttle cable free play is decreased.

- c. Tighten the locknut.

⚠ WARNING

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





EAS0060

CHECKING THE SPARK PLUG

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

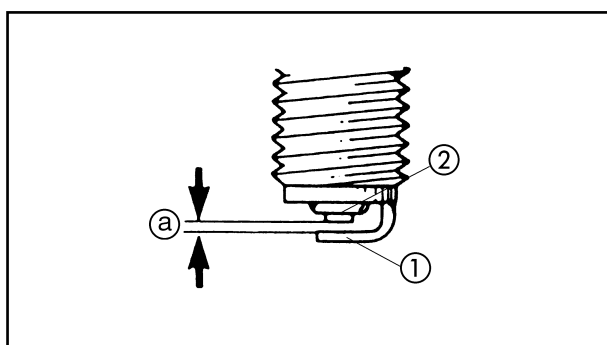
CAUTION:

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

3. Check:
 - spark plug type
Incorrect → Change.



**Spark plug type (manufacturer)
BR8HS (NGK)**



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



**Spark plug type (manufacturer)
0,6 ~ 0,7 mm**

7. Install:
 - spark plug



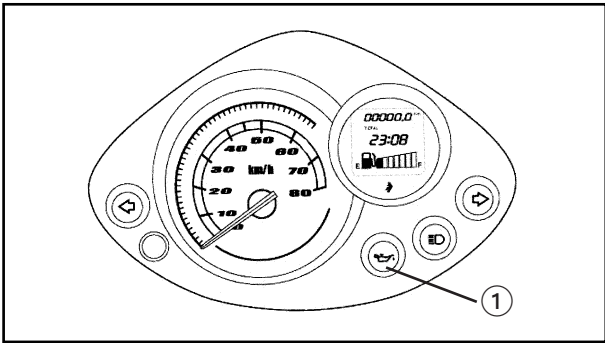
20 Nm (2.0 m • kg)

NOTE:

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

8. Connect:
 - spark plug cap

CHECKING THE ENGINE OIL LEVEL

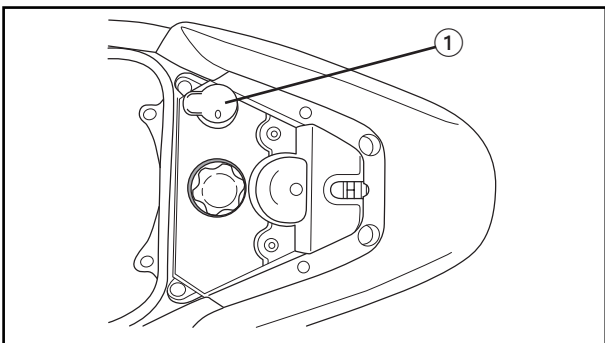
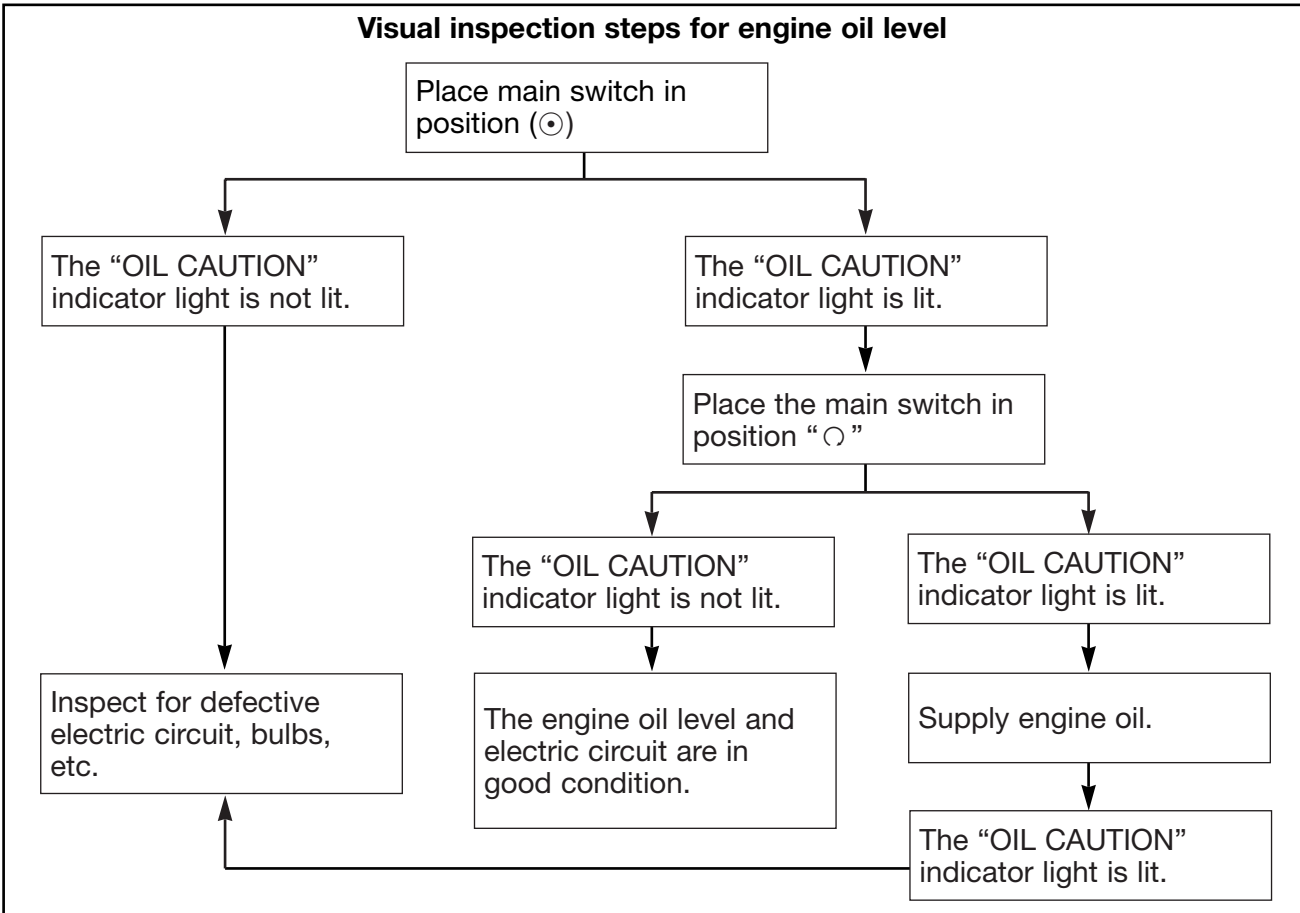


CHECKING THE ENGINE OIL LEVEL

- Inspect:
 - engine oil level
 - Low oil level → Add sufficient oil.

① Oil indicator light “OIL CAUTION”

Visual inspection steps for engine oil level

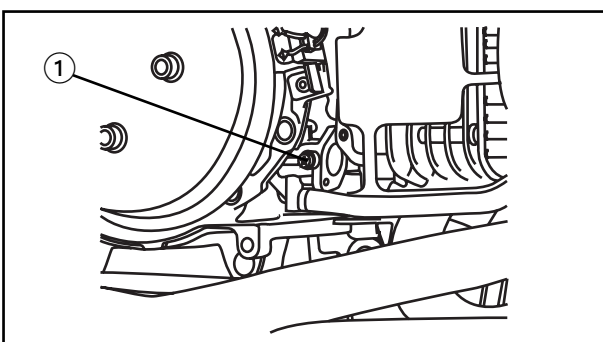
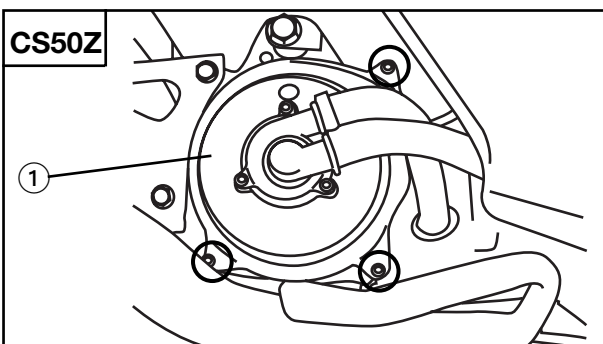
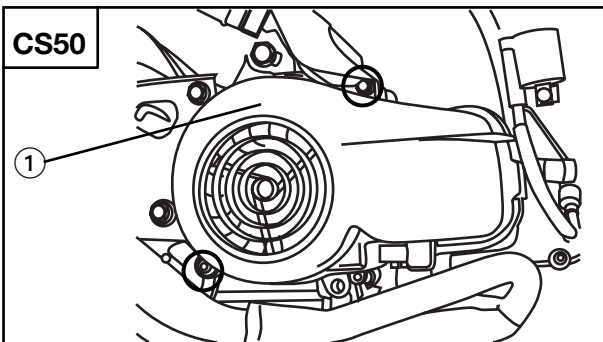
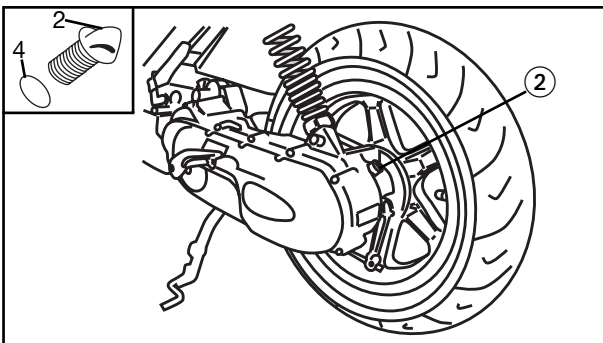
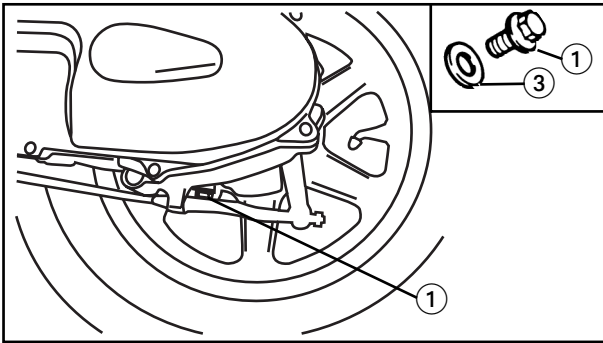


 **Recommended oil:**
YAMAHA 2T 2-stroke engine oil
 or equivalent
Total:
1.4 L

NOTE: _____
 After filling the oil tank, close it with the cap ① and close the seat.

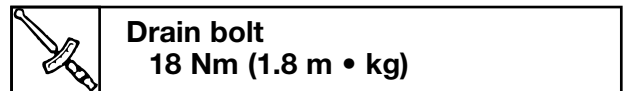
CHANGING THE TRANSMISSION OIL/ AUTOLUBE PUMP AIR BLEEDING

CHK
ADJ

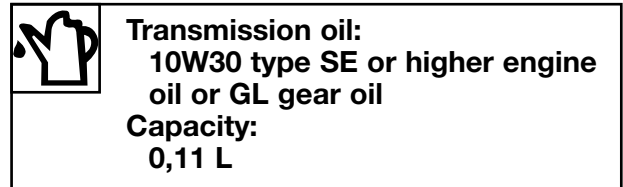


CHANGING THE TRANSMISSION OIL

1. Remove:
 - drain bolt ①
 - Drain the transmission oil.
 - oil filler cap ②
2. Inspect:
 - gasket ③ (drain bolt)
 - o-ring ④ (filler cap)
 - Damaged → Replace
3. Install:
 - gasket
 - drain bolt



4. Fill:
 - transmission case



AUTOLUBE PUMP AIR BLEEDING

The air bleeding must be done always the oil tank is empty, when the intake lube is disconnected or the tank is disassembled.

NOTE:

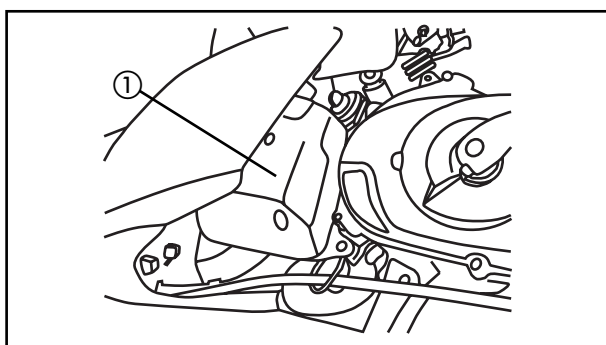
The air bleeding must be done after filling the oil tank.

1. Remove
 - fan cover ① (CS50)
 - crankcase cover (right) ① (CS50Z)

2. Remove
 - drain screw ①
 - Let the oil flow out until the air bubbles have been removed.

CLEANING THE AIR FILTER ELEMENT

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ADJ



EAS00089

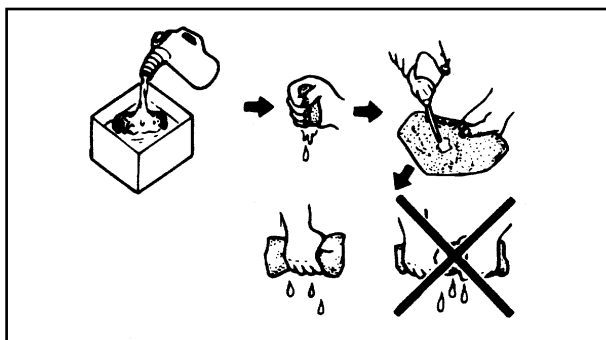
CLEANING THE AIR FILTER ELEMENT

Carburetor side

1. Remove:
 - center cover
 - grip bar
 - battery
 - right side cover
 - helmet box
 - air filter box assembly ①
2. Remove:
 - air filter box cover
 - air filter

CAUTION:

Never start up the engine with the air filter removed. This will allow the entry of unfiltered air, causing rapid wear and possible damage to the engine. Also, using the engine without the filter will affect the carburetor jets resulting in poor performance and the possible overheating of the engine. Be careful not to block the inlet area of the air filter with cloths or rags.



3. Inspect:
 - damaged element → Change
4. Clean:
 - air filter

Steps for cleaning air filter:

- Wash the filter carefully but completely with solvent.

WARNING

Never use solvents with a low flammability point, such as petrol, to clean the filter. Such solvents may cause fire or explosions.

- Clean off excess solvent from the filter and leave it to dry.

CAUTION:

Do not twist the air filter element when squeezing it.

- Apply oil for foam air filters or YAMAHA 2T engine oil or equivalent oil for 2 stroke engines.
- Wipe off the excess oil.

NOTE:

The filter should be wet but not dripping.



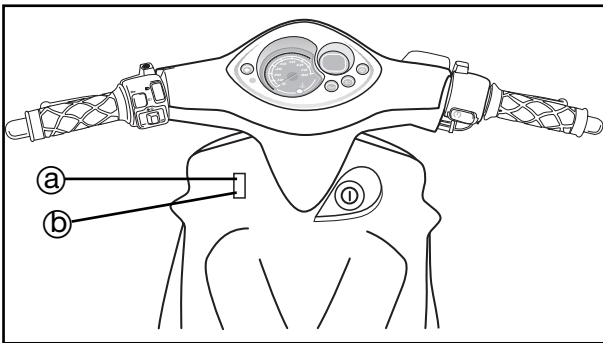
EAS00103

CHECKING THE COOLANT LEVEL (CS50Z only)

1. Stand the scooter on a level surface.

NOTE: _____

- Place the scooter on a suitable stand.
- Make sure the scooter is upright.



2. Check:

- coolant level

The coolant level should be between the maximum level mark @ and minimum level mark ①

Below the minimum level mark → Remove the front upper cowling and add the recommended coolant to the proper level.

CAUTION: _____

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

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

4. Check:

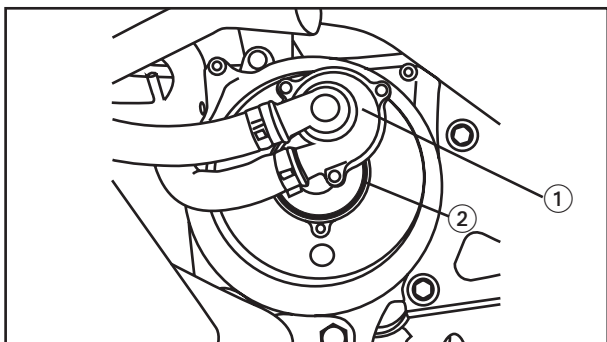
- coolant level

NOTE: _____

Before checking the coolant level, wait a few minutes until it settles.

CHANGING THE COOLANT

CHK
ADJ



EAS00105


CHANGING THE COOLANT (CS50Z only)

1. Remove:
 - water pump cover ①
 - coolant filler cap

WARNING

Do not remove the water pump cover when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, remove the water pump cover.

2. Drain:
 - coolant
(from the engine and radiator)
3. Check:
 - o-ring ② (water pump cover)
Damage → Replace
4. Install:
 - water pump cover

 7 Nm (0.7 m • kg)

5. Fill:
 - coolant reservoir
(with the specified amount of the recommended coolant)

NOTE:

While start the engine, fill the coolant until specified amount.



Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines

Mixing ratio
1:1 (antifreeze: water)

Quantity
Total amount
0,910 L

Coolant reservoir capacity
0,380 L



Handling notes for coolant

Coolant is potentially harmful and should be handled with special care.

⚠ WARNING

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

CAUTION:

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

CHANGING THE COOLANT

CHK
ADJ



6. Install:
 - coolant filler cap
7. Warm it up for several minutes, and then stop it.
8. Check:
 - coolant levelRefer to “CHECKING THE COOLANT LEVEL”.

NOTE: _____

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

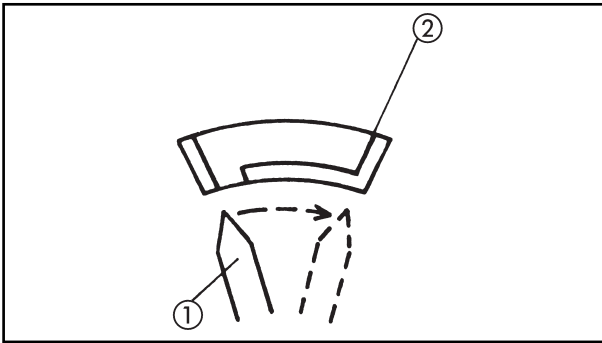
NOTE: _____

For a quick air bleeding, lift up the front wheel 1 metre with the engine at idle speed. This will provide a effective and air quick bleeding from the head cylinder to the radiator.

9. Install
 - front upper cowling

CHECKING THE REAR BRAKE SHOES/ CHECKING THE BRAKE FLUID LEVEL

CHK
ADJ



EAS00126

CHECKING THE REAR BRAKE SHOES

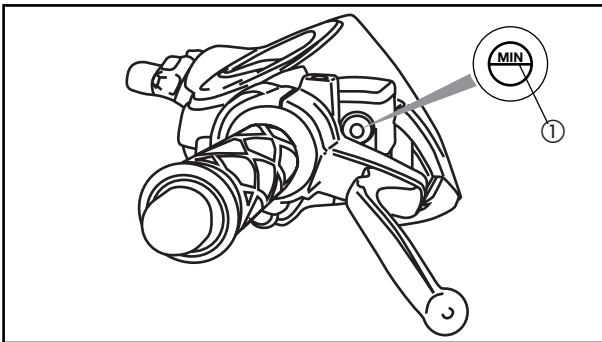
1. Activate the brake lever
2. Check:
 - wear indicator (1)
Indicator on wear limit line (2) → Replace the brake shoes.

EAS00116

CHECKING THE BRAKE FLUID LEVEL

NOTE: _____

Place the scooter upright when inspecting the fluid level.



1. Check:
 - brake fluid level.
The brake fluid level is below the minimum level line (1) → Refill up to correct level.



Recommended fluid:
DOT #4

CAUTION: _____

The fluid may corrode painted surfaces or plastic parts. Always clean any spilt fluid immediately.

⚠ WARNING _____

- Only use fluid of the designated quality. Otherwise the rubber seals may deteriorate due to leakages and poor performance of the brakes.
 - Refill with the same type of fluid. The mixture of fluids may cause a damaging chemical reaction which may cause the poor performance of the brakes.
 - Take care not to let water enter the pump while it is being filled. The water will lower the boiling point of the fluid significantly and may cause a steam blockage.
- _____



EAS00133

BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠ WARNING

Bleed the hydraulic brake system whenever:

- the system is disassembled.
- a brake hose is loosened, disconnected or replace.
- the brake fluid level is very low.
- brake operation is faulty.

NOTE:

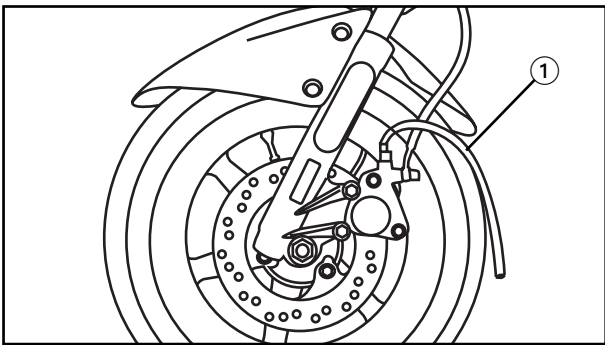
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably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

1. Bleed:
 - brake fluid



Steps for air bleeding:

- a. Add the appropriate amount of brake fluid to the sump.
- b. Install the diaphragm. Take care not to spill fluid or to let the sump overflow.
- c. Connect the clean plastic tube ①.
- d. Place the other end of the tube in a container.
- e. Slowly apply the brake lever several times.
- f. Pull the lever inwards. Keep it in this position.
- g. Loosen the bleed screw and tighten the lever as far as it will go.
- h. Tighten the bleed screw when it has reached its limit, afterwards loosen the lever.
- i. Repeat steps (e) to (h) until the air bubbles in the system have been removed.
- j. Add brake fluid to the correct level.



⚠ WARNING

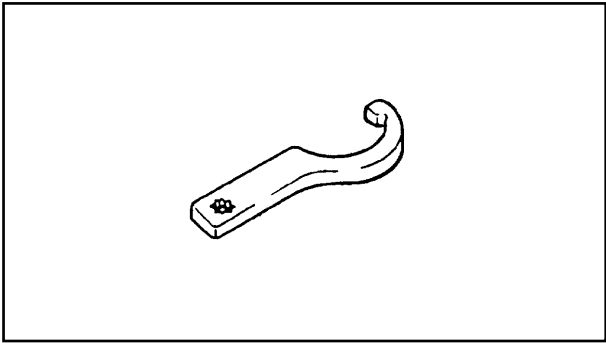
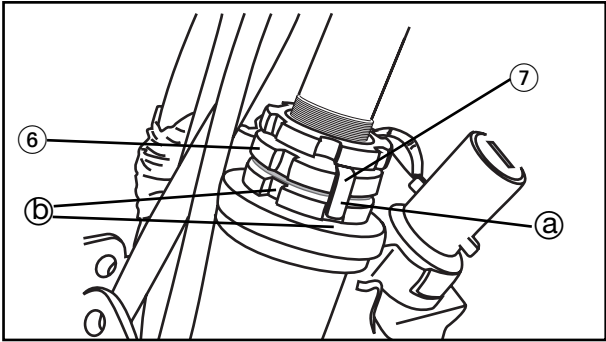
After bleeding the hydraulic brake system, check the brake operation.



CHECKING AND ADJUSTING THE STEERING HEAD



Lower ring nut (final tightening torque)
6.5 Nm (0.65 m • kg)



- d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings. Refer to “STEERING HEAD” in chapter 7.
- e. Install the rubber washer.
- f. Install the center ring nut.
- g. Finger tighten the center ring nut ⑥, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the center ring nut until their slots are aligned.
- h. Install the lock washer ⑦.

NOTE: _____
 Make sure the lock washer tabs ① sit correctly in the ring nut slots ②.

- i. Hold the lower and center ring nuts with a ring nut wrench and tighten the upper ring nut with a steering nut wrench.



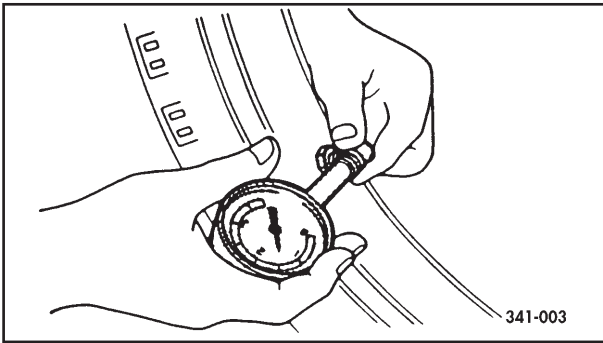
Steering/Ring nut wrench
90890-01403



Upper ring nut
75Nm (7.5 m • kg)



- 5. Install:
 - legshield
 - front middle cowling
 - front upper cowling



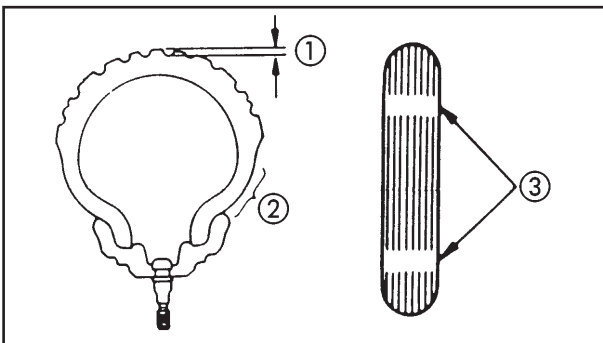
EAS00163

CHECKING THE TIRES

1. Measure:
 - air pressure
Outside specified value → Adjust

Maximum load*:	158.3 kg (CS50Z) 161.5 kg (CS50)	
Pressure cold	Front	Rear
Up to 90 kg	175kpa. (1.75kg/cm ²)	200kpa. (2.0kg/cm ²)
90 kg to maximum load	175kpa. (1.75kg/cm ²)	225kpa. (2.25kg/cm ²)

* Total weight of rider, passenger, cargo and accessories



2. Inspect:
 - tyre surface
Worn/Damaged → Change



**Minimum depth of thread of tyres
0.8 mm**

- ① Thread depth
- ② Side wall
- ③ Wear indicator

EAS00168

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

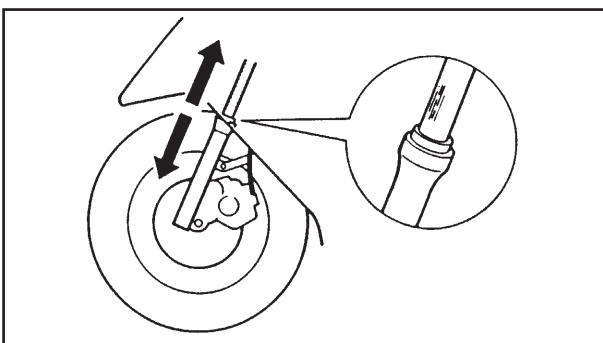
1. Check:
 - wheel
Damage/out-of-round → Replace.

⚠ WARNING _____

Never attempt to make any repairs to the wheel.

NOTE: _____

After a tire or wheel has been changed or replaced, always balance the wheel.



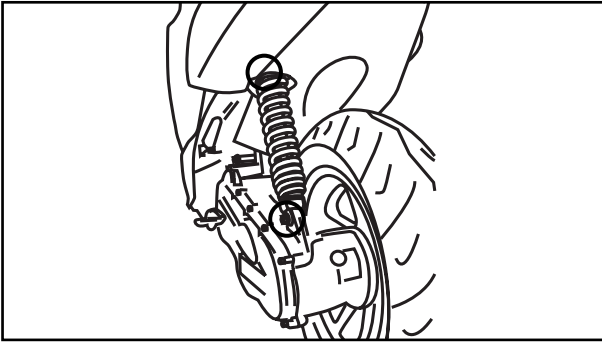
EAS00151

CHECKING THE FRONT FORK

1. Inspect:
 - front fork
Bent/Damaged → Fork bar → Change
Oil leaks → Seals → Replace
Rough operation → Fork assembly → Replace

REAR SHOCK ABSORBER INSPECTION

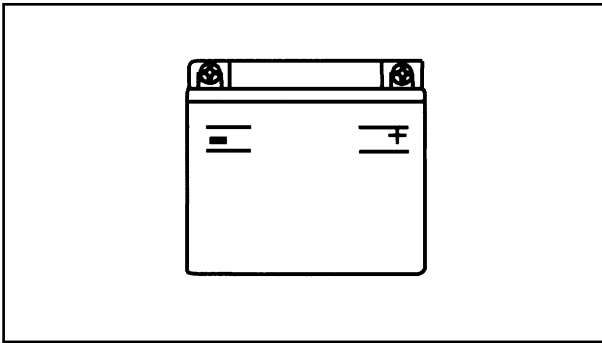
CHK
ADJ



REAR SHOCK ABSORBER INSPECTION

1. Inspect:
 - rear shock absorber
Oil leaks/Damage → Replace
2. Check
 - tightening torque

	Upper (nut)	31.5 Nm (3.15 m • kg)
	Lower (bolt)	17.5 Nm (1.75 m • kg)



EAS00179

ELECTRICAL SYSTEM

CHECKING AND CHARGING THE BATTERY

WARNING

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

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

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

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

INTERNAL

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

CAUTION:

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

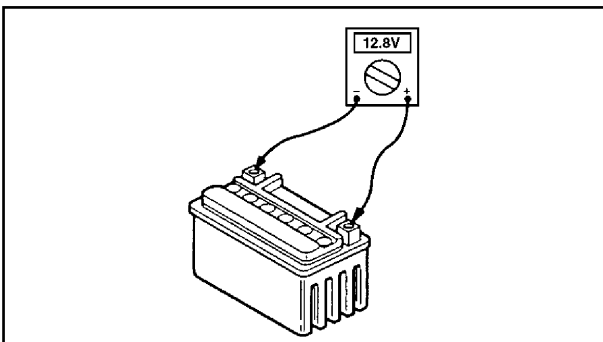
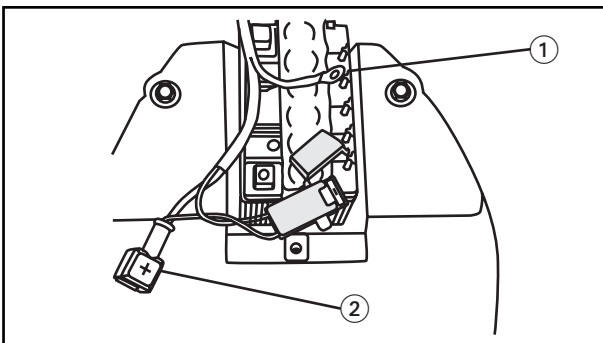
NOTE:

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

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

CAUTION:

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



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

a. Connect a pocket tester to the battery terminals.

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

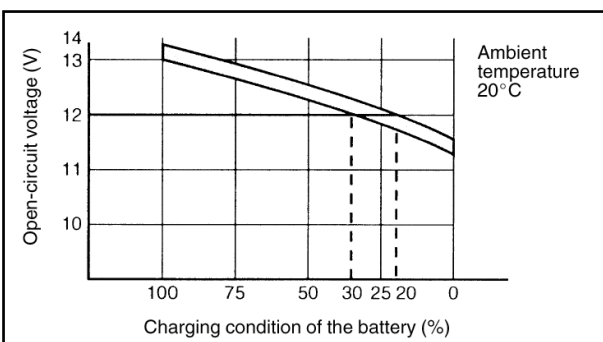
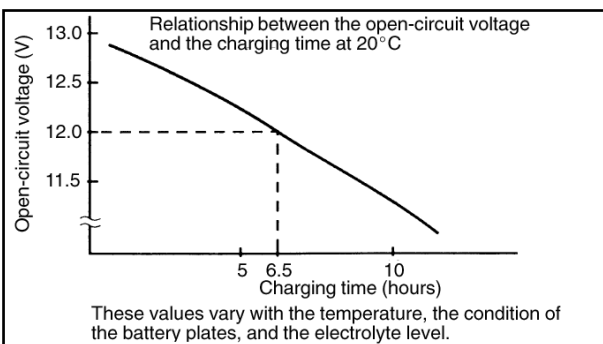
NOTE:

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

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

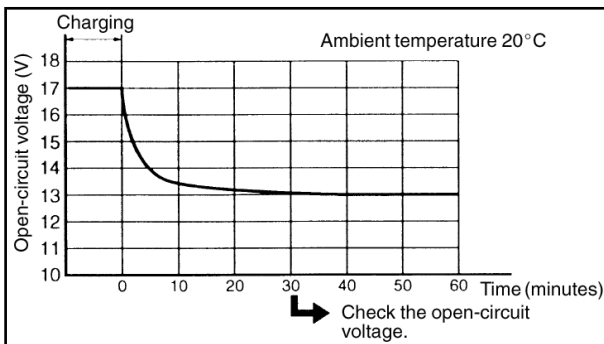
Example

- c. Open-circuit voltage = 12.0 V
- d. Charging time = 6.5 hours
- e. Charge of the battery = 20 ~ 30%



CHECKING AND CHARGING THE BATTERY

CHK
ADJ



5. Charge:

- battery (refer to the appropriate charging method illustration)

WARNING

Do not quick charge a battery.

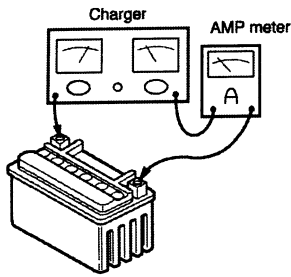
CAUTION:

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

CHECKING AND CHARGING THE BATTERY



Charging method using a variable-current (voltage) charger



Measure the open-circuit voltage prior to charging.

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

Connect a charged and AMP meter to the battery and start charging.

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

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

YES

NO

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

By turning the charging voltage adjust dial, set the charging voltage at 20 ~ 24 V.

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

YES

NO

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

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

If 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 leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery

CHECKING AND CHARGING THE BATTERY



Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

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

Connect a charged and AMP meter to the battery and start charging.

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

YES

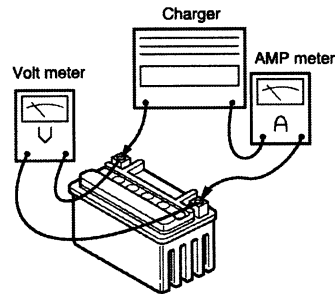
NO

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

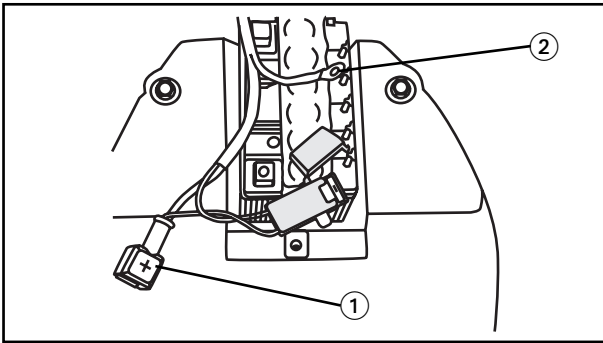
This type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.

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

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



CHECKING AND CHARGING THE BATTERY/ CHECKING THE FUSE



6. Install:
 - battery
7. Connect:
 - battery leads
(to the battery terminals)

CAUTION: _____

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

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

	Recommended lubricant Dielectric grease
--	--

10. Install:
 - battery cover

EAS00181

CHECKING THE FUSE

1. Remove:
 - the battery cover
See the “FRONT BODYWORK” section
2. Inspect:
 - fuse ①
Defective → Replace



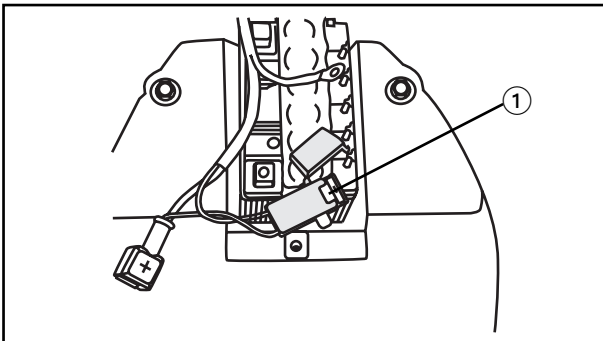
Steps to be taken for blown fuses:

- Disconnect the ignition and circuit.
- Install a new fuse of the correct amperage.
- Connect the switches to check the correct operation of the electrical device.
- If the fuse blows immediately after, check the circuit concerned.

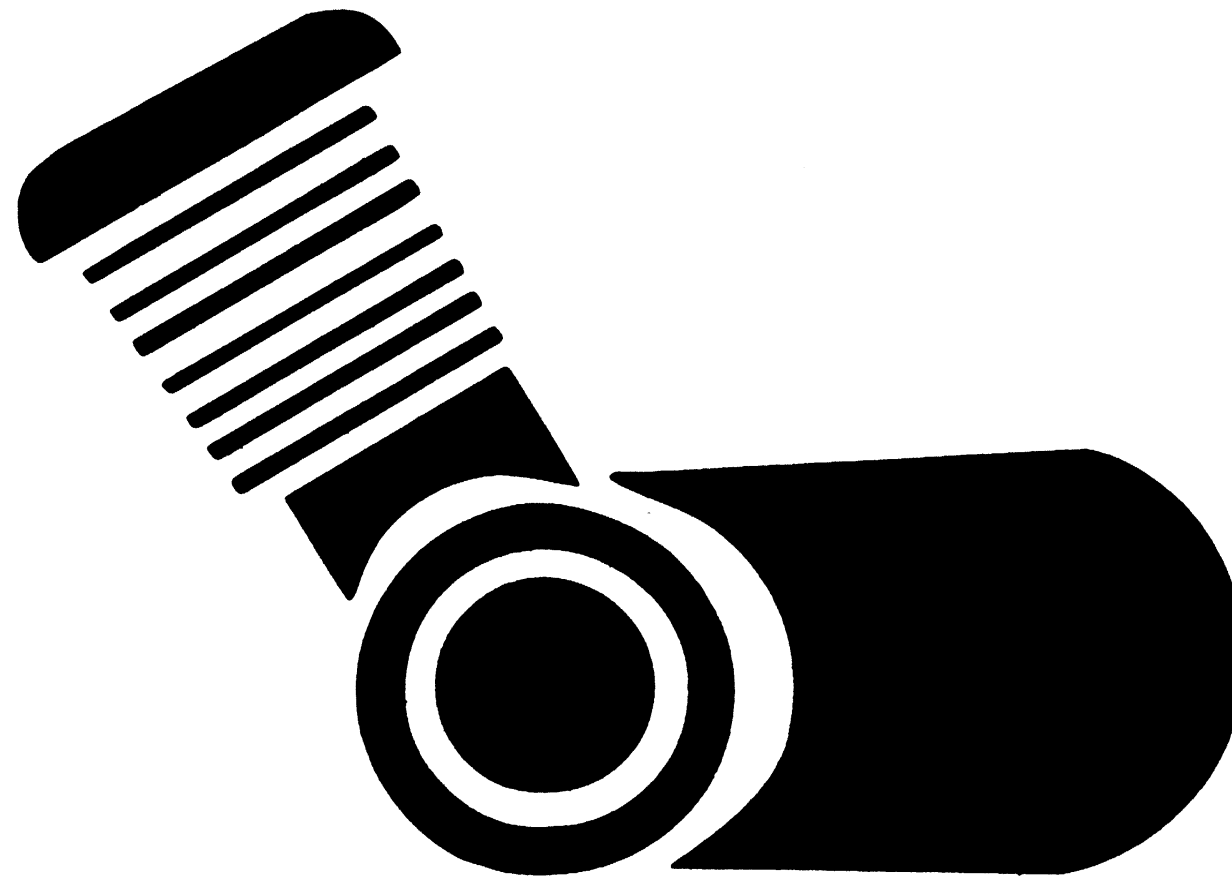


⚠ WARNING _____

Do not use fuses of a higher amperage than that recommended. This can cause extensive damage to the electrical system and fire.



Description	Amperage	Quantity
Principal	7.5 A	1



ENG

4



CHAPTER 4 ENGINE

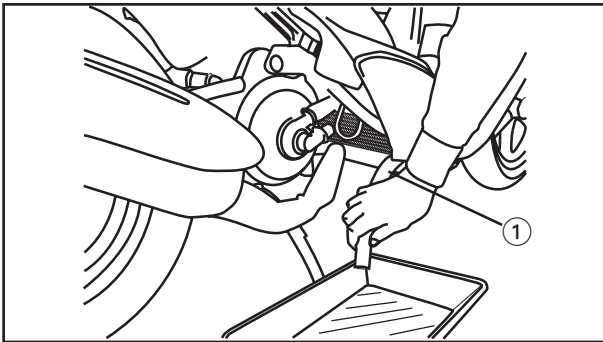
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ENGINE ENGINE REMOVAL

COVER REMOVAL

1. Remove:
 - center cover
 - helmet box
 Refer to "REAR BODYWORK, MUD-GUARD" in chapter 3.

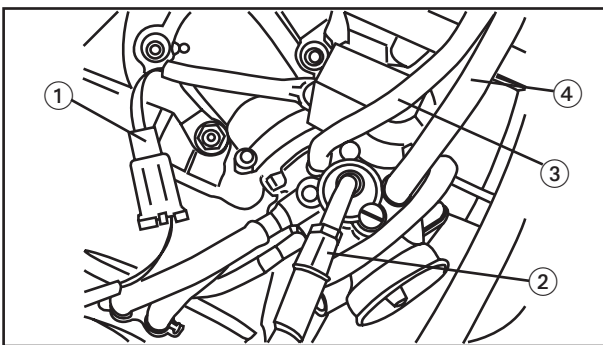


COOLING SYSTEM (CS50Z only)

1. Disconnect:
 - coolant hose ① (on water pump cover)
 Drain the coolant
 - coolant hose (on cylinder head)

CABLES, LEADS AND HOSES

1. Loosen:
 - rear axle nut
2. Disconnect:
 - rear brake cable
3. Disconnect:
 - starter motor leads (positive/negative leads)

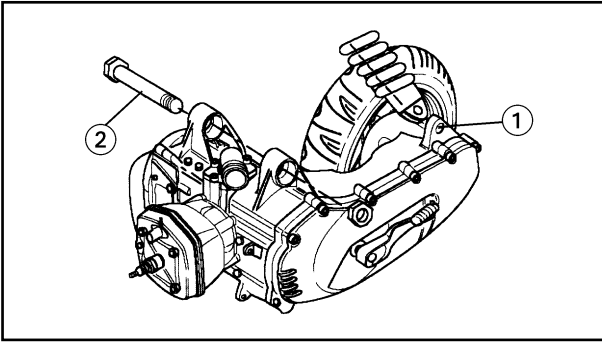


4. Disconnect:
 - DC-CDI magneto lead
 - spark plug cap
 - temperature sensor lead on the cylinder head
 - autochoke lead ①
 - throttle cable (with throttle valve) ②
 - vacuum hose ③
 - fuel hose ④

5. Disconnect:
 - oil hose delivery (oil tank-oil pump)

ENGINE REMOVAL

ENG



ENGINE REMOVAL

1. Place a suitable stand under the frame.

2. Remove:

- rear shock absorber bolt (lower) ①
- engine mounting bolt ②

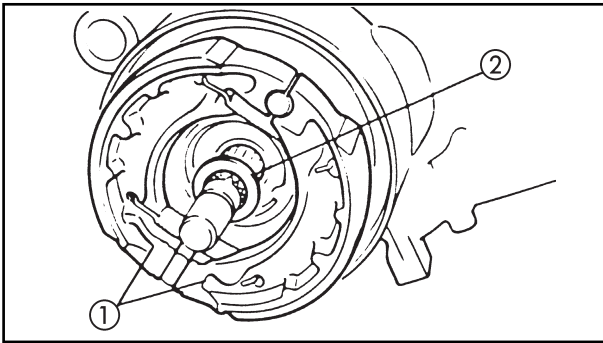
3. Remove:

- engine

NOTE: _____

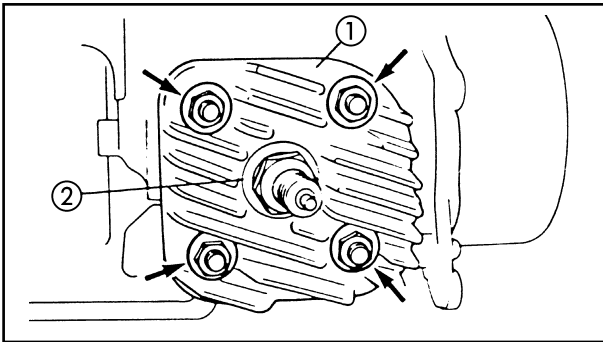
Lift up the frame and remove the engine.

4. Place the frame on a suitable stand.



ENGINE DISASSEMBLY REMOVING THE REAR WHEEL

- Remove:
 - rear wheel
Refer to “REMOVING THE REAR WHEEL” in chapter 7
 - brake shoes (1)
 - flat washer (2)

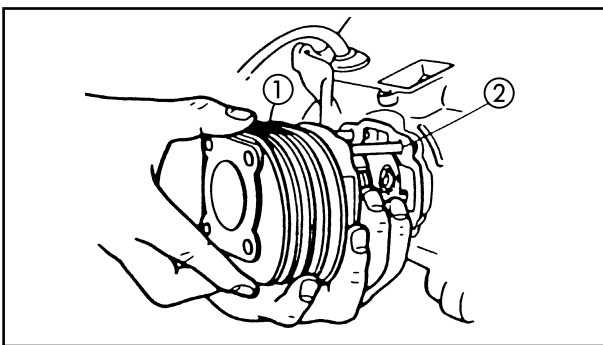


REMOVING THE CYLINDER HEAD AND CYLINDER

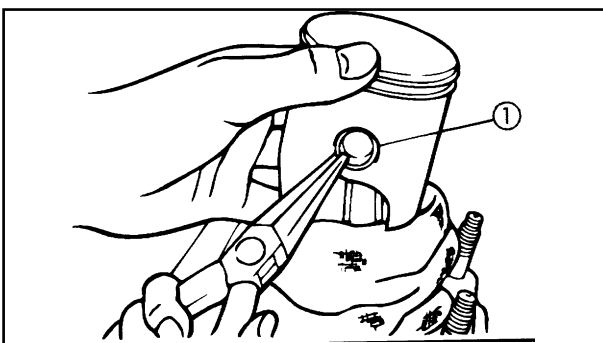
- Remove:
 - cylinder covers (CS50 only)
 - carburetor coolant hoses (CS50Z only)
 - cylinder head (1)
 - cylinder head gasket

NOTE: _____

- Before loosening the cylinder head, loosen the spark plug (2).
- The position nuts of the cylinder head should be loosened by 1/2 a turn each time and then removed.



- Remove:
 - coolant hose (on cylinder) (CS50Z only)
 - cylinder (1)
 - cylinder gasket (2)

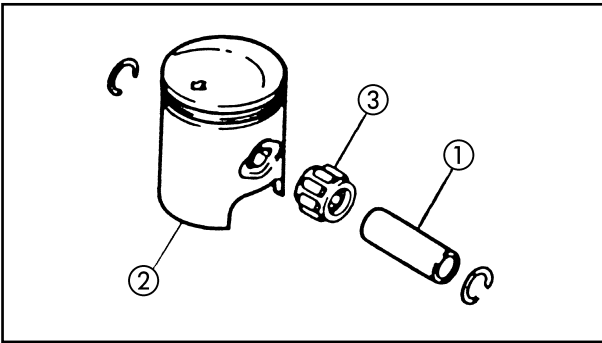


REMOVING THE PISTON PIN AND PISTON

- Remove:
 - piston pin clip (1)

NOTE: _____

Before removing the piston pin clip, cover the crankcase with a clean cloth so that it does not accidentally fall into the crankcase.



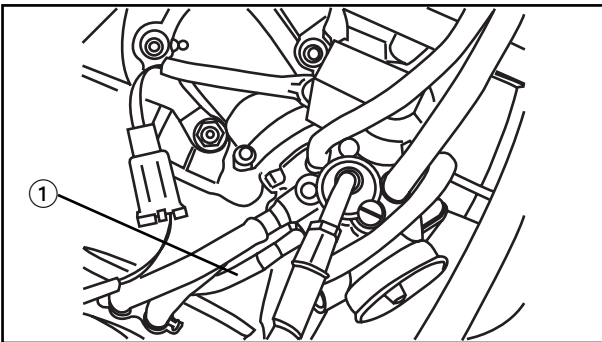
2. Remove:
 - piston pin ①
 - piston ②
 - piston pin bearing ③

CAUTION: _____

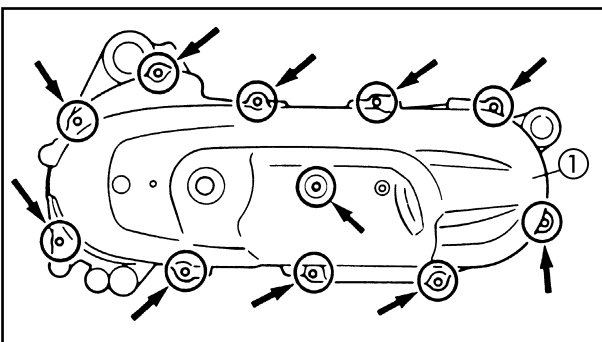
Do not use a hammer to take out the piston pin.

REMOVING THE KICKSTARTER SYSTEM

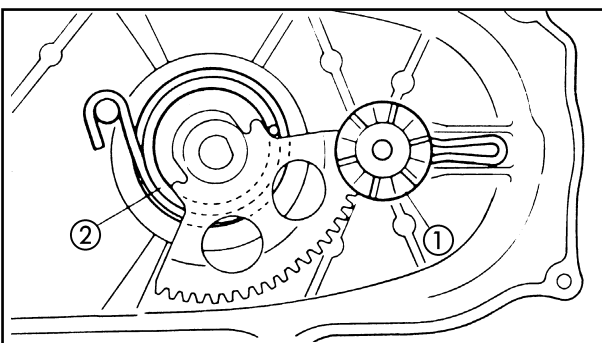
1. Remove:
 - clamp (air filter)
 - air filter



2. Remove:
 - oil hose delivery ①
 - carburetor



3. Remove:
 - kick crank
 - crankcase cover ① (left)

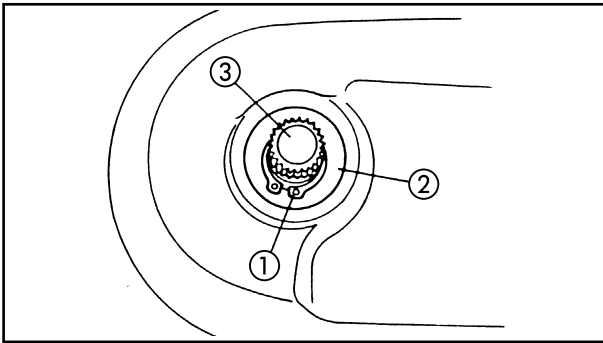


4. Remove:
 - kick pinion gear ①

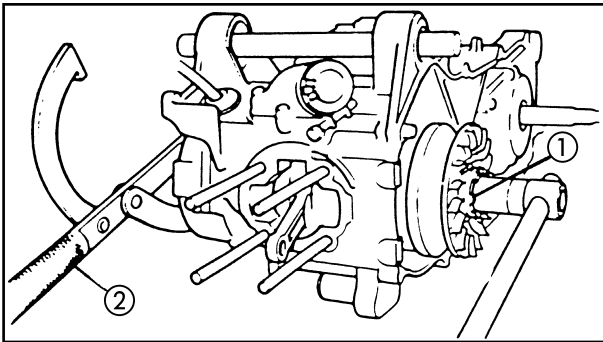
NOTE: _____

When the kick pinion gear removed, move the pedal axle.

5. Unhook:
 - return spring ②



6. Remove:
- circlip ①
 - flat washer ②
 - kick shaft ③



EAS00317

REMOVING THE PRIMARY SHEAVE

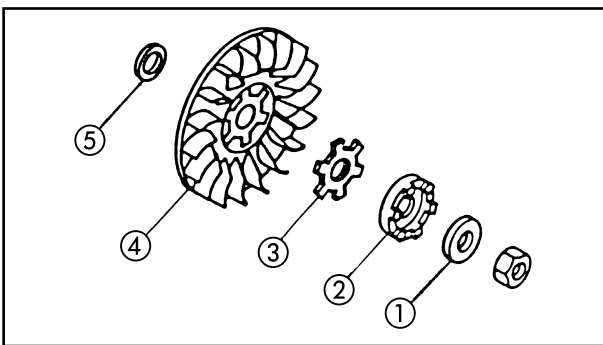
1. Remove:
- fan (CS50 only)
 - right crankcase cover (CS50Z only)
2. Remove:
- nut ① (primary sheave)

NOTE:

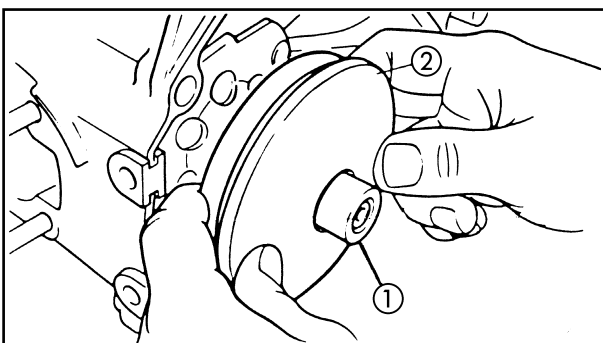
To loos nut (primary sheave), support the magnetic flywheel using Fly wheel holder ②.



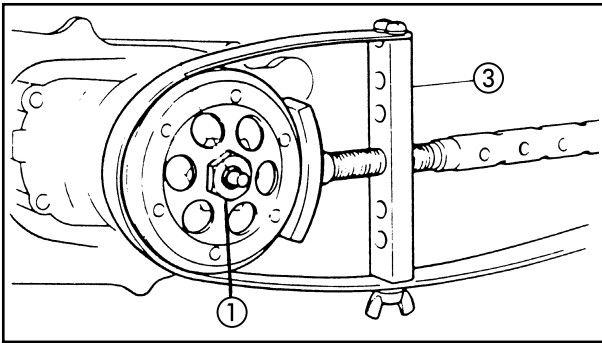
Fly wheel holder
90890-01235



3. Remove:
- conical spring washer ①
 - one-way clutch ②
 - special washer ③
 - fixed primary sheave ④
 - shim ⑤
 - v-belt



4. Remove:
- hub ①
 - primary sheave assembly ②



EAS00319

DISASSEMBLING THE SECONDARY SHEAVE

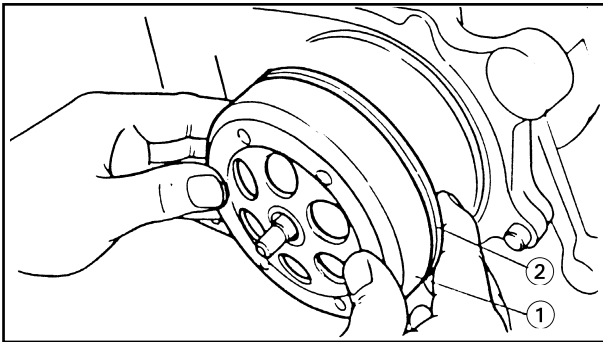
1. Remove:
 - nut ① (secondary sheave)

NOTE: _____

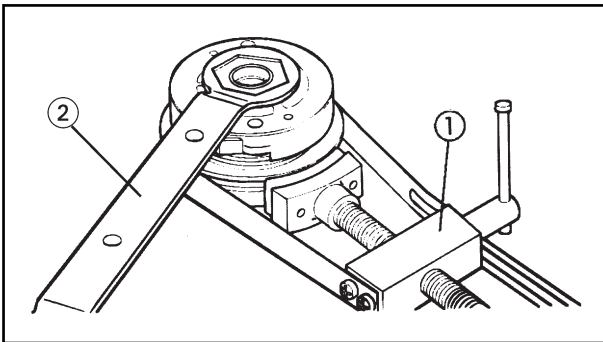
Hold the secondary sheave with a sheave holder ③ to loosen the nut.



Sheave holder
90870-01701



2. Remove:
 - clutch drum ①
 - secondary sheave ②
 - crankcase cover gasket
 - dowel pins



3. Attach:
 - sheave holder ①
 - nut spanner ② (41 mm)

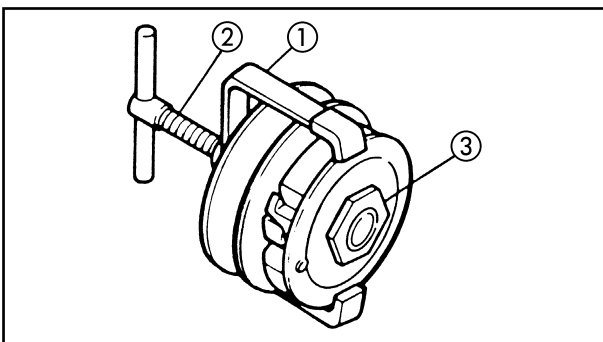


Sheave holder
90870-01701

4. Loosen:
 - clutch securing nut

CAUTION: _____

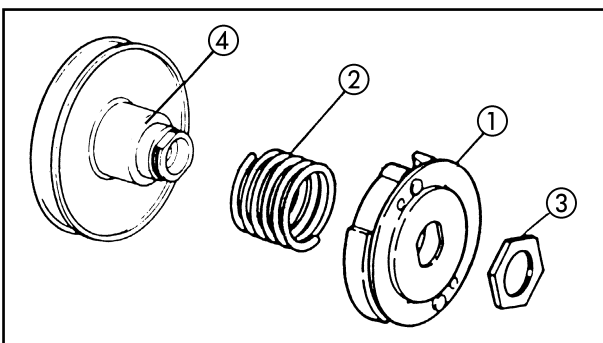
Do not remove the clutch positioning nut yet.



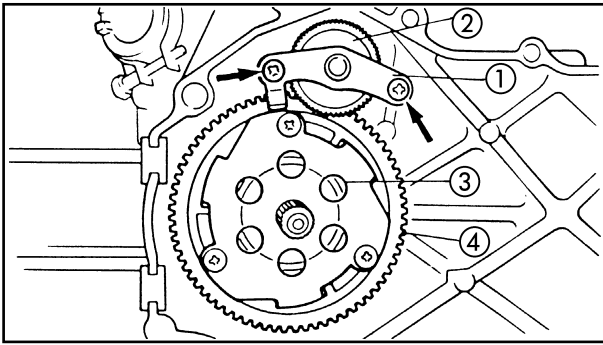
5. Attach:
 - clutch spring compressor ①



Clutch spring compressor
90890-01337

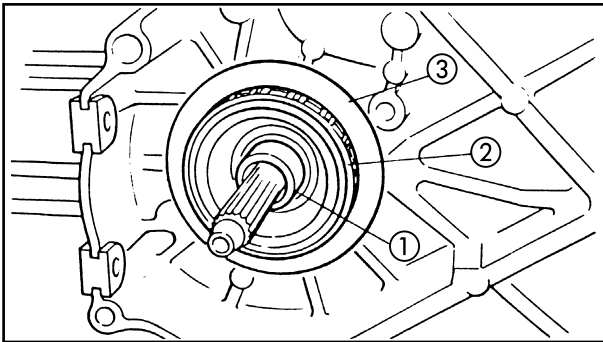


6. Remove:
 - clutch securing nut ③
7. Remove:
 - clutch assembly ①
 - secondary sheave spring ②
 - spring seat ④
 - guide pins
 - secondary sliding sheave

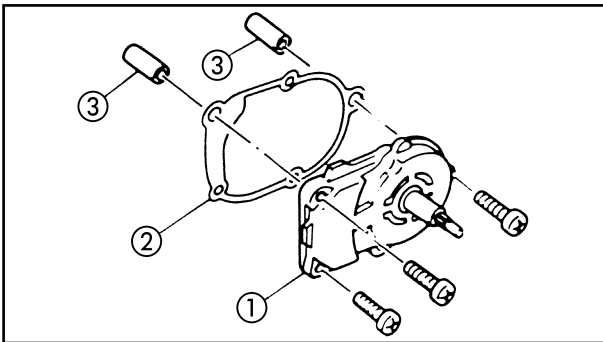


REMOVING THE STARTER SYSTEM

1. Remove:
 - plate ① (intermediate gearing)
 - intermediate gearing ②
 - starter clutch assembly ③
 - starter wheel gear ④



2. Remove:
 - spacer ①
 - bearing ②
 - washer ③
 - starter motor

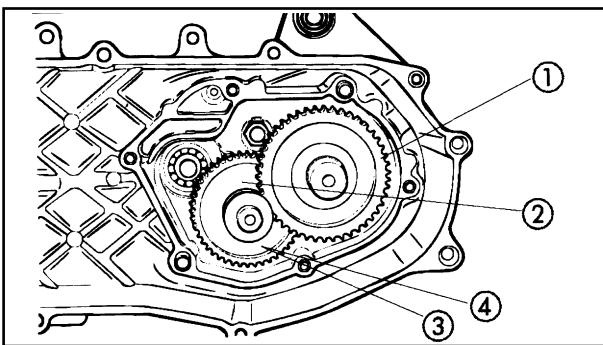


TRANSMISSION

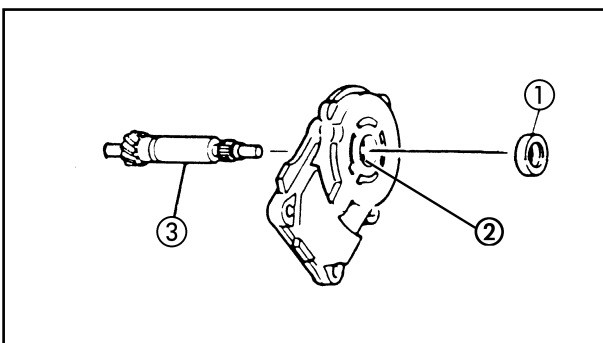
1. Remove:
 - transmission box cover ①
 - gasket ②
 - dowel pins ③

NOTE:

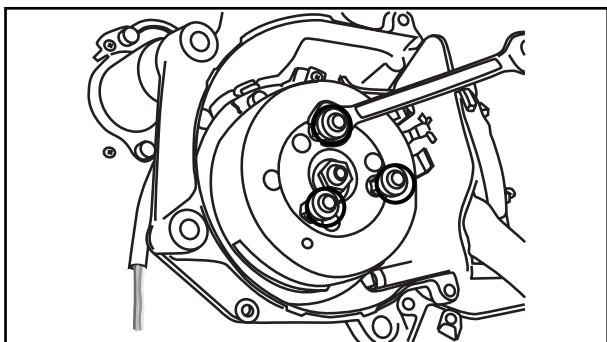
Before proceeding to disassemble the transmission cover, empty the oil.



2. Remove:
 - main shaft ①
 - drive shaft ②
 - flat washer ③
 - conical spring washer ④

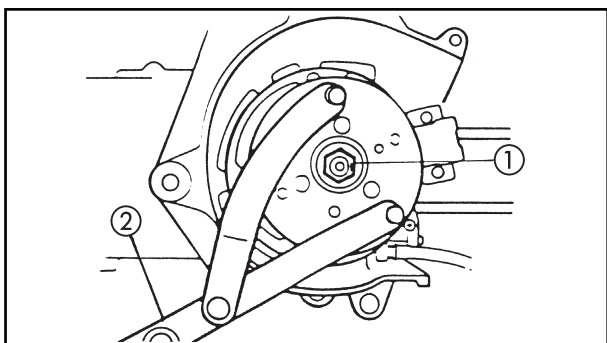


3. Remove:
 - oil seal ①
 - bearing ②
 - secondary sheave axle ③



DC-CDI MAGNETO

1. Remove:
 - bolts (CS50Z only)



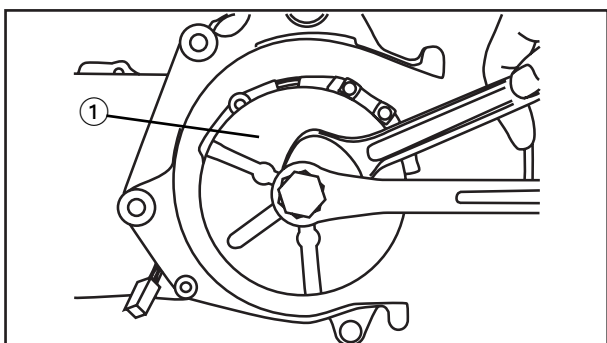
2. Remove:
 - nut ① (rotor)
 - flat washer

NOTE: _____

Support the rotor to loosen the nut with the engine flywheel holder ②.



Flywheel holder
90890-01235



3. Remove:
 - rotor
 - woodruff key
 Use the flywheel puller ①

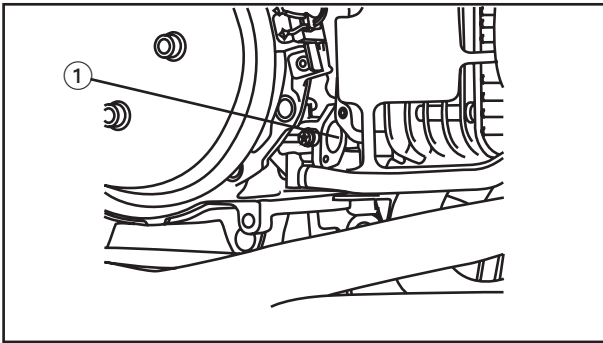


Flywheel puller
90890-01362

- stator assembly
- gasket

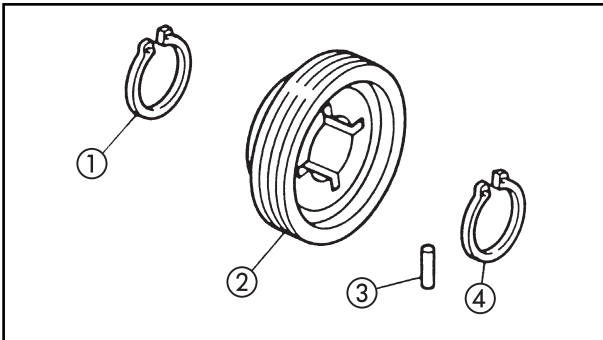
NOTE: _____

Attach the flywheel puller using the flywheel thread holes.

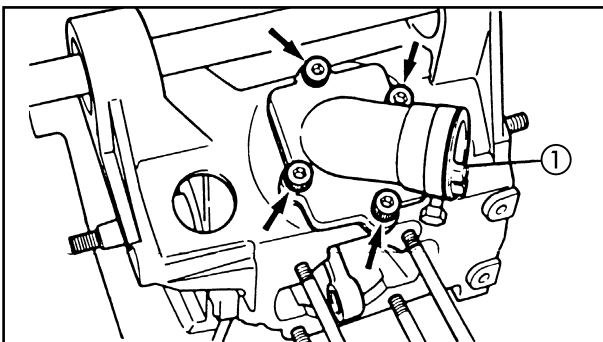


AUTOLUBE OIL PUMP

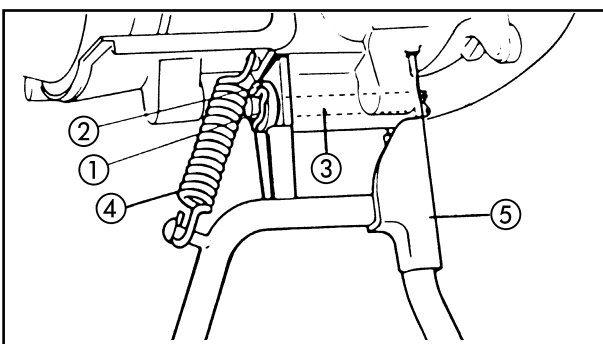
1. Remove:
 - autolube oil pump ①



2. Remove:
 - circlip ①
 - pump drive gear ②
 - pin ③
 - circlip ④

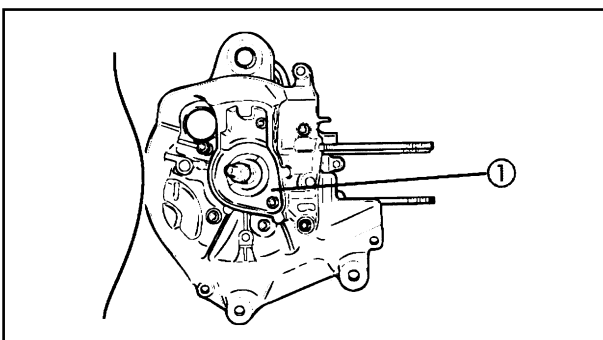


3. Remove:
 - carburetor joint ①
 - reed valve ②
 - reed valve gasket ③



REMOVING THE CENTERSTAND

1. Remove:
 - clip ①
 - rubber washer ②
 - axle ③
 - spring ④
 - central stand ⑤

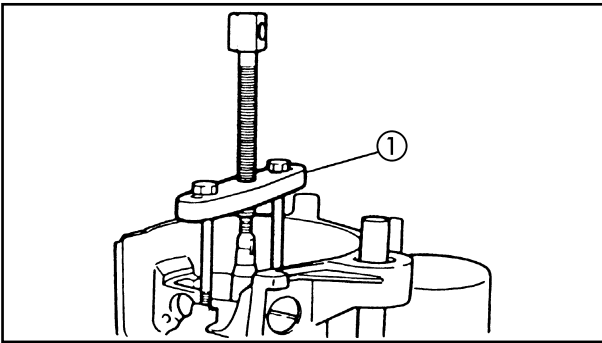


DISASSEMBLING THE CRANKCASE AND CRANKSHAFT

1. Remove:
 - oil seal stopper ①
 - screws (crankcase)

NOTE:

Loosen each screw 1/4 of a turn and remove them after loosening them.



2. Attach:
- crankcase puller ①



Crankcase puller
90890-01135

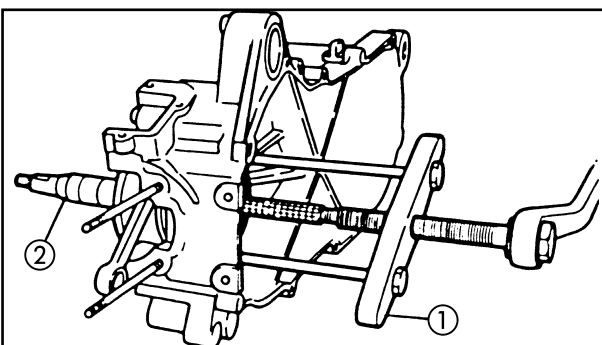
NOTE:

Fully tighten the positioning bolts of the tool, but ensure that the tool body is parallel with the box. If necessary, slightly loosen one of the bolts to level the body of the tool.

3. Remove:
- crankcase (right)
- As pressure is applied, keep taping carefully on the engine mounting bosses.

CAUTION:

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

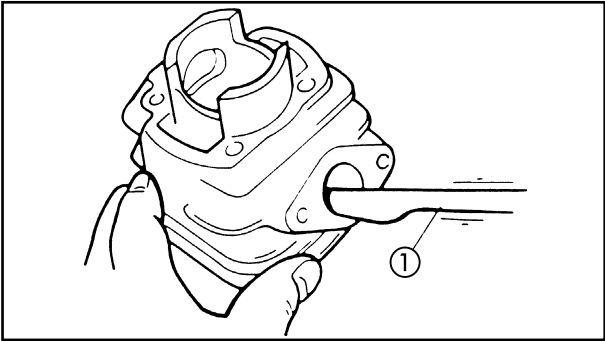


4. Attach:
- crankcase puller ①



Crankcase puller
90890-01135

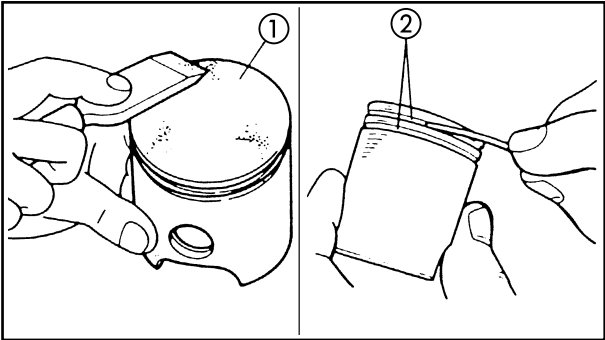
5. Remove:
- crankshaft ②



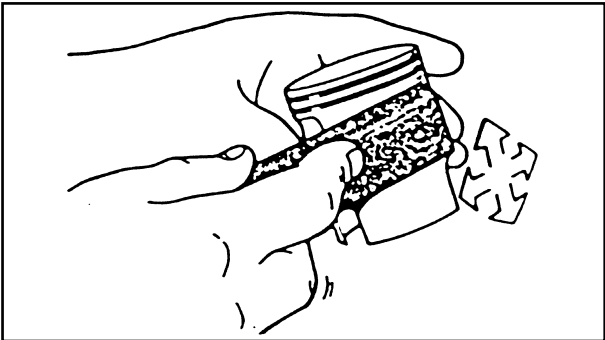
EAS00258

CHECKING THE CYLINDER AND PISTON

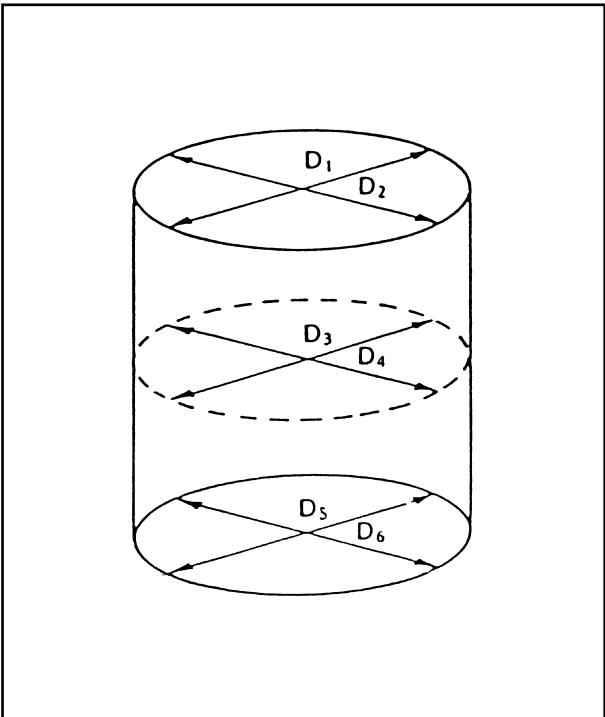
- 1. Eliminate:
 - carbon deposits
Use a rounde scraper ①
- 2. Inspect:
 - cylinder wall Wear/stripping → Rectify or change



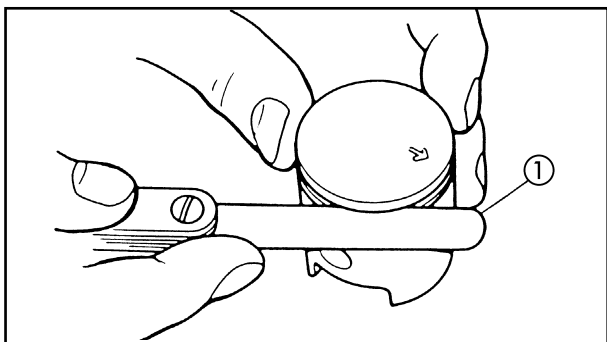
- 3. Eliminate:
 - carbon deposits
From the piston crown ① and ring groovers ②.



- 4. Remove:
 - cracking marks and carbon deposits on piston sides.
- 5. Inspect:
 - piston wall
Wear/stripping/damage → Replace.



- 6. Measure:
 - piston to cylinder clearance



EAS00263

CHECKING THE PISTON RINGS

1. Measure:

- piston ring side clearance
Out of specification → Replace the piston and piston rings as a set.
Use a Feeler Gauge ①

NOTE: _____

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

**Piston ring side clearance****Top ring**

0.03 ~ 0.05 mm

<Limit>: 0.1 mm

2nd ring

0.03 ~ 0.05 mm

<Limit>: 0.1 mm

2. Install:

- piston ring
(into the cylinder)

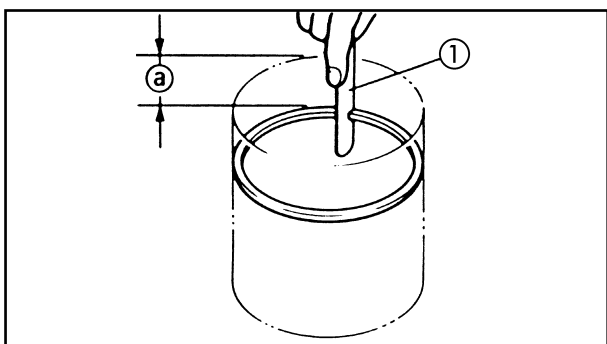
NOTE: _____

Level the piston ring into the cylinder with the piston crown.

@20 mm

3. Measure:

- piston ring end gap
Out of specification → Replace the piston ring.
Use a Feeler Gauge ①

**Piston ring end gap****Top ring**

0.15 ~ 0.35 mm

<Limit>: 0.6 mm

2nd ring

0.15 ~ 0.35 mm

<Limit>: 0.6 mm

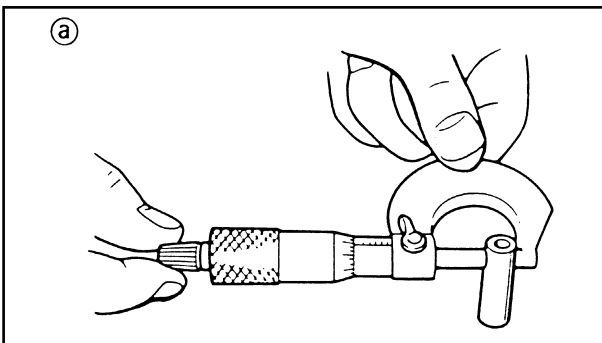


EAS00265

CHECKING THE PISTON PIN AND PISTON PIN BEARING

1. Check:

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



2. Measure:

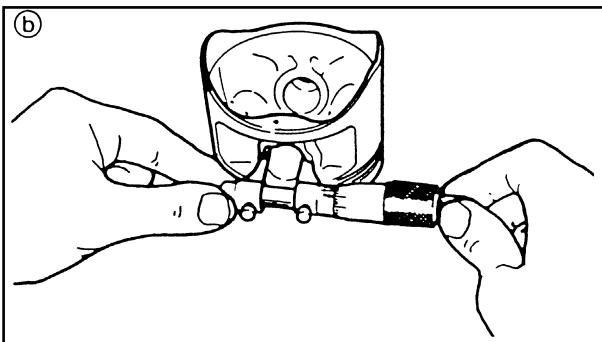
- piston pin outside diameter (a)
Out of specification → Replace the piston pin.



Piston pin outside diameter
9.996 ~ 10.000 mm

3. Calculate:

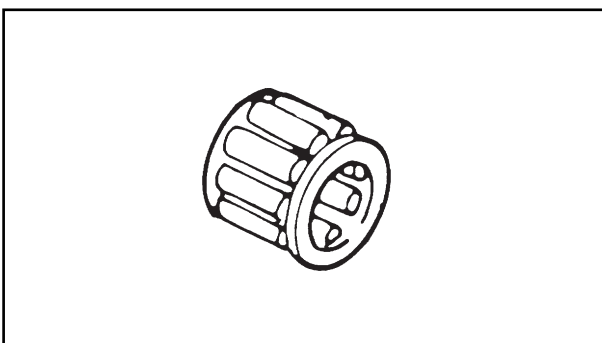
- piston-pin-to-piston clearance
Out of specification → Replace the piston pin and piston as a set.



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

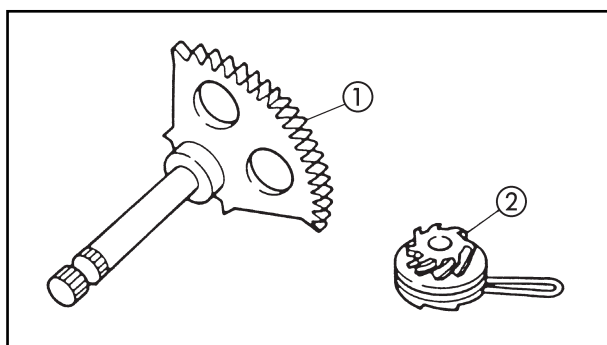


Piston-pin-to-piston clearance
0.004 ~ 0.017 mm
<Limit>: 0.07 mm



4. Inspect:

- bearing (piston pin)
Pitting/Damage → Change

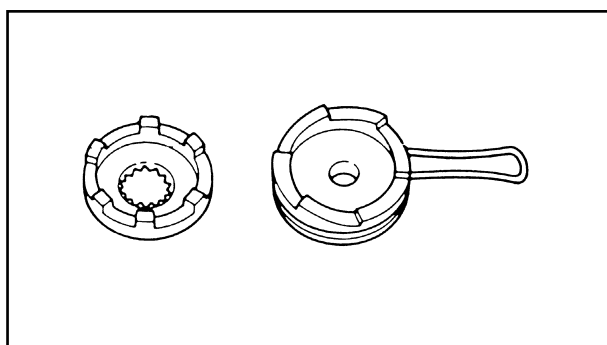


EAS00339

CHECKING THE KICKSTARTER

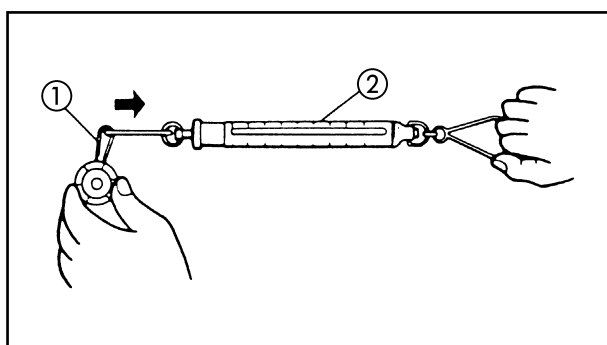
1. Check:

- kick gear teeth ①
 - kick pinion gear teeth ②
- Damage/wear → Replace.



2. Check:

- mating dogs (kick pinion gear and one-way clutch)
- Rounded edges/Damage → Replace.

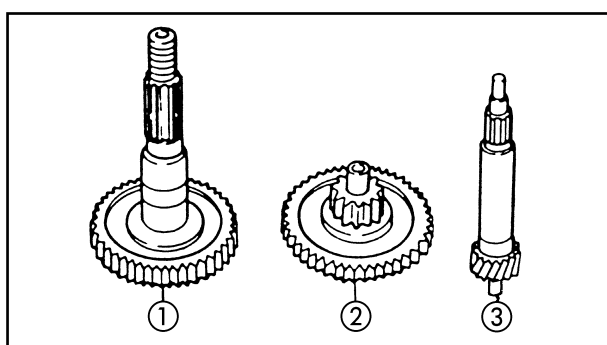


3. Measure:

- kickstarter pinion gear clip force ① (with the spring gauge) ②
- Out of specification → Replace the kickstarter pinion gear clip.

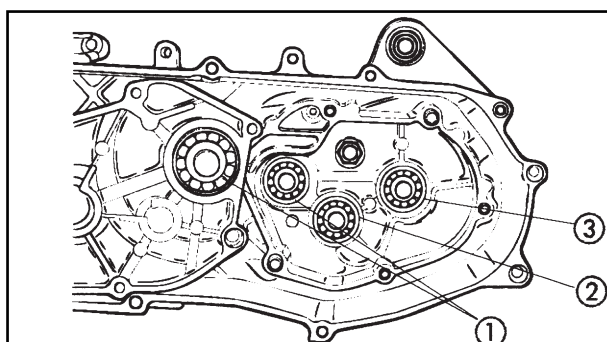


Kickstarter pinion gear clip force
150 ~ 250 gr (5.3 ~ 8.8 oz)

**TRANSMISSION**

1. Inspect:

- main axle ①
 - drive axle ②
 - secondary sheave axle ③
- Burrs/Chips/Non-uniformity/Wear → Replace



2. Inspect:

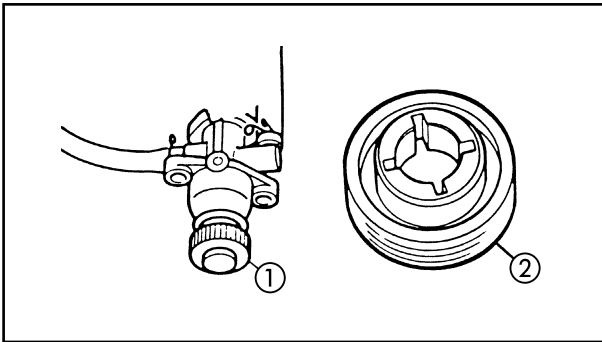
- secondary sheave axle bearing ①
 - drive axle bearing ②
 - main axle bearing ③
- Pivot the inner guide of the bearing.
Excessive play/Non-uniformity → Replace
Pitting/Damage → Replace



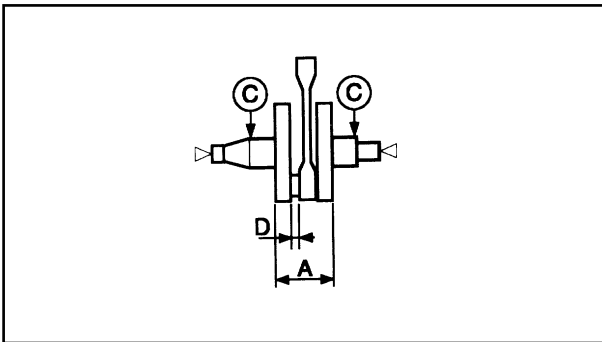
AUTOLUBE OIL PUMP

Internal wear or poor operation may cause the pump to deviate from its factory adjustment. However, this is very uncommon. If incorrect operation is suspected, inspect the following:

1. Inspect:
 - supply line Obstruction Apply air under pressure.
Wear/Damage → Replace.



2. Inspect:
 - drive gear teeth of the autolube oil pump ①
 - gear teeth driven by autolube oil pump ②
Pitting/Wear/Damage → Replace



EAS00394

CHECKING THE CRANKSHAFT

1. Measure:
 - crankshaft runout (B)
Out of specification → Replace the crankshaft, bearing or both.

NOTE: _____

Turn the crankshaft slowly.



Maximum crankshaft runout
0.03 mm

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



Big end side clearance
0.2 ~ 0.5 mm

3. Measure:
 - crankshaft width (A)
Out of specification → Replace the crankshaft.



Crankshaft width
37.90 ~ 37.95 mm

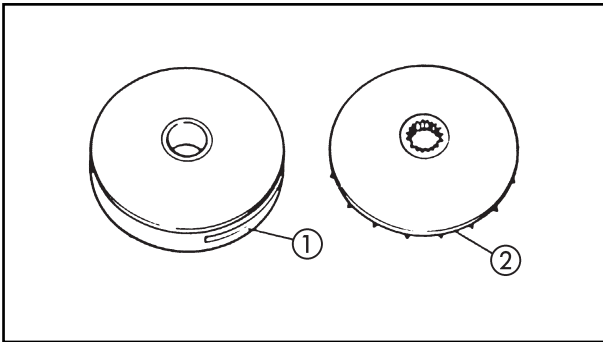


EAS00401

CHECKING THE BEARINGS

1. Check:

- bearings
Clean and lubricate the bearings, then rotate the inner race with your finger.
Rough movement → Replace.

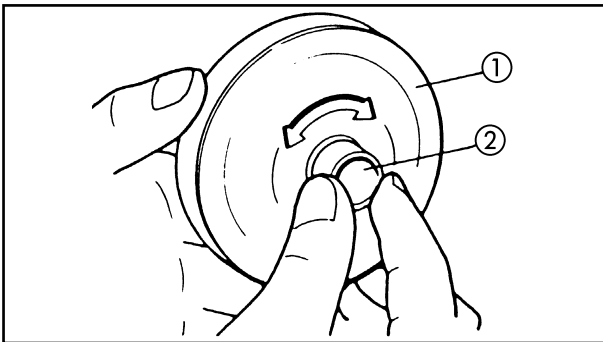


EAS00321

CHECKING THE PRIMARY SHEAVE

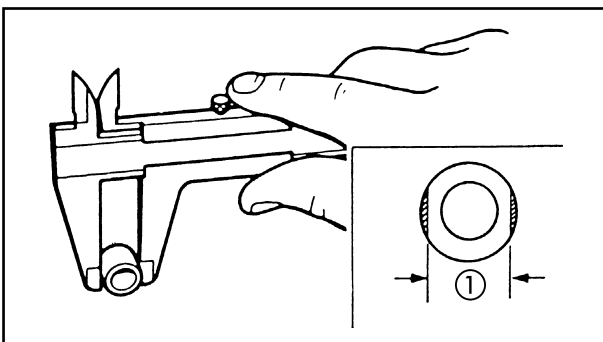
1. Inspect:

- primary sliding pulley wheel ①
- primary fixed pulley wheel ②
Wear/Cracks/Striping/Damage → Replace



2. Check:

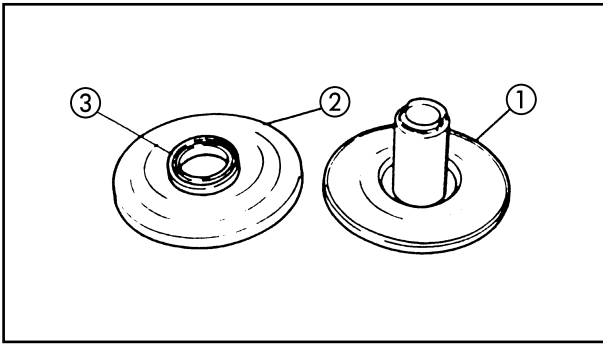
- free movement
Insert the collar ② in the primary sliding sheave ① and check if there is free movement.
If it catches or there is excessive play → Replace the pulley wheel or the bushing.



3. Measure:

- external diameter ① (collar)
Outside specified value → Replace

	Primary sheave weight outside diameter
	15 mm
	<Limit>: 14.5 mm

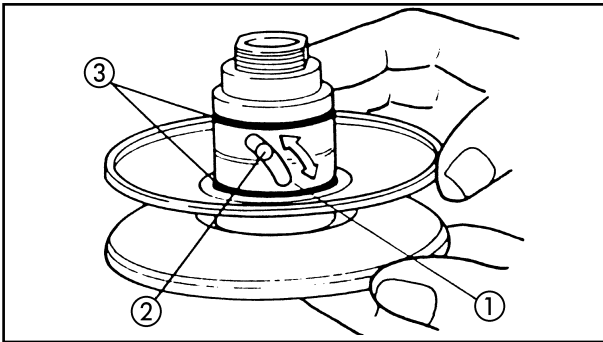


EAS00322

CHECKING THE SECONDARY SHEAVE

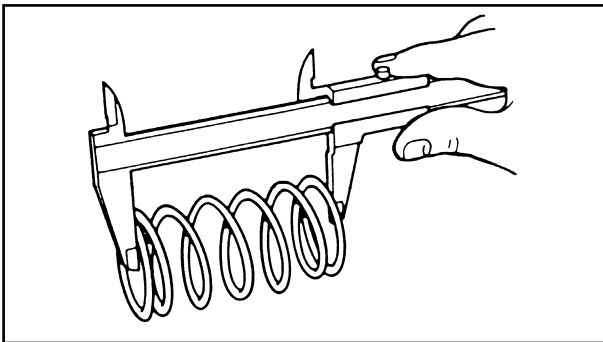
1. Inspect:

- secondary fixed sheave ①
- secondary sliding sheave ②
Striping/Cracks/Damage → Replace as a set.
- oil seal ③
Damage → Replace.



2. Inspect:

- torque cam groove ①
- guide pin ②
Wear/Damage → Replace as a set
- o-ring ③
Damaged → Replace

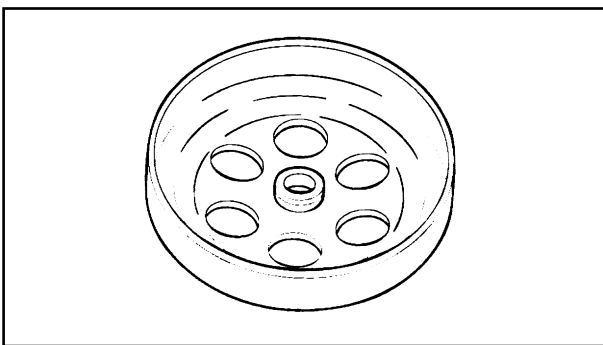


3. Measure:

- clutch spring free length
Outside specified value → Replace



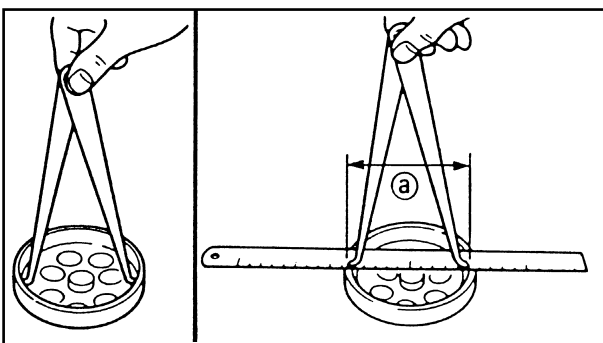
Clutch spring free length
121.7 mm
<Limit>: 106.7 mm



4. Inspect:

- clutch housing inner surface
Oil/Striping → Clean

Oil	Use a cloth dampened with dissolvent
Striping	Use sand paper (polish lightly and uniformly)



5. Measure:

- internal diameter of the clutch hub (a)
Outside of specification → Replace



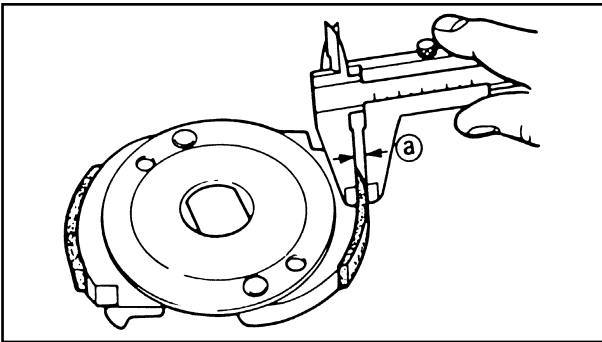
Clutch housing inside diameter
107.0 mm
<Wear limit>: 107.4 mm




6. Inspect:
 - clutch shoes
 - Shiny parts → Polish with sand paper.

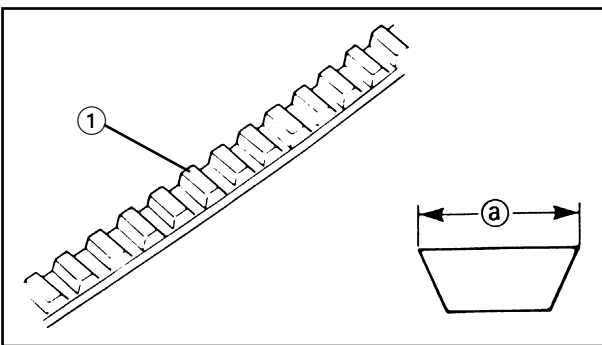
NOTE: _____

After using sand paper, clean off the polished particles with a cloth.



7. Measure:
 - clutch shoe thickness (a)
 - Outside specified value → Replace

	Clutch shoe thickness 2.0 mm <Wear limit>: 1.0 mm
---	--




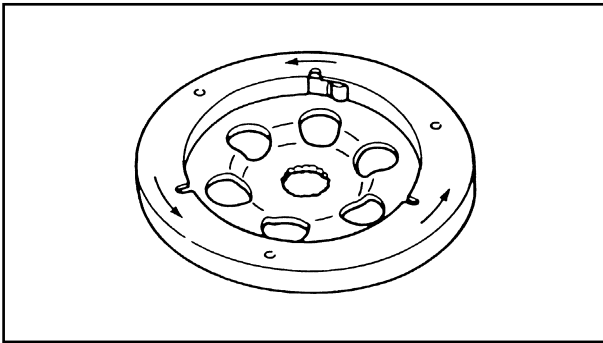
EAS00320

CHECKING THE V-BELT

1. Check:
 - v-belt (1)
 - Cracks/damage/wear → Replace
 - Grease/oil → Clean the primary and secondary sheave.

2. Measure:
 - v-belt width (a)
 - Out of specification → Replace

	V-belt width 16.5 mm <Limit>: 15.7 mm
---	--



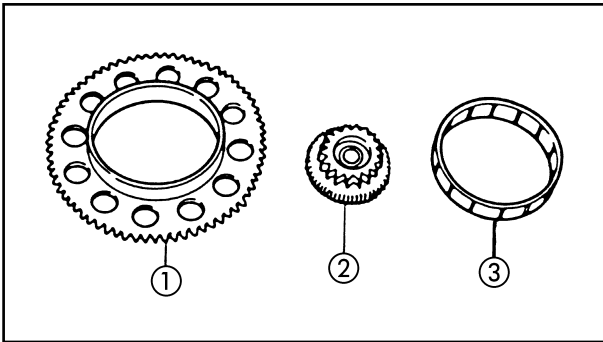
STARTER CLUTCH AND GEARS

1. Inspect:

- starter clutch

Press the conical pin in the direction of the arrow.

Unsmooth operation → Replace starter clutch assembly



2. Inspect:

- starter wheel gear teeth ①

- idle gear teeth ②

Burrs/Spalling/Non-uniformity/Wear → Replace

- bearing ③ (starter wheel gear)

Pitting/Damage → Replace

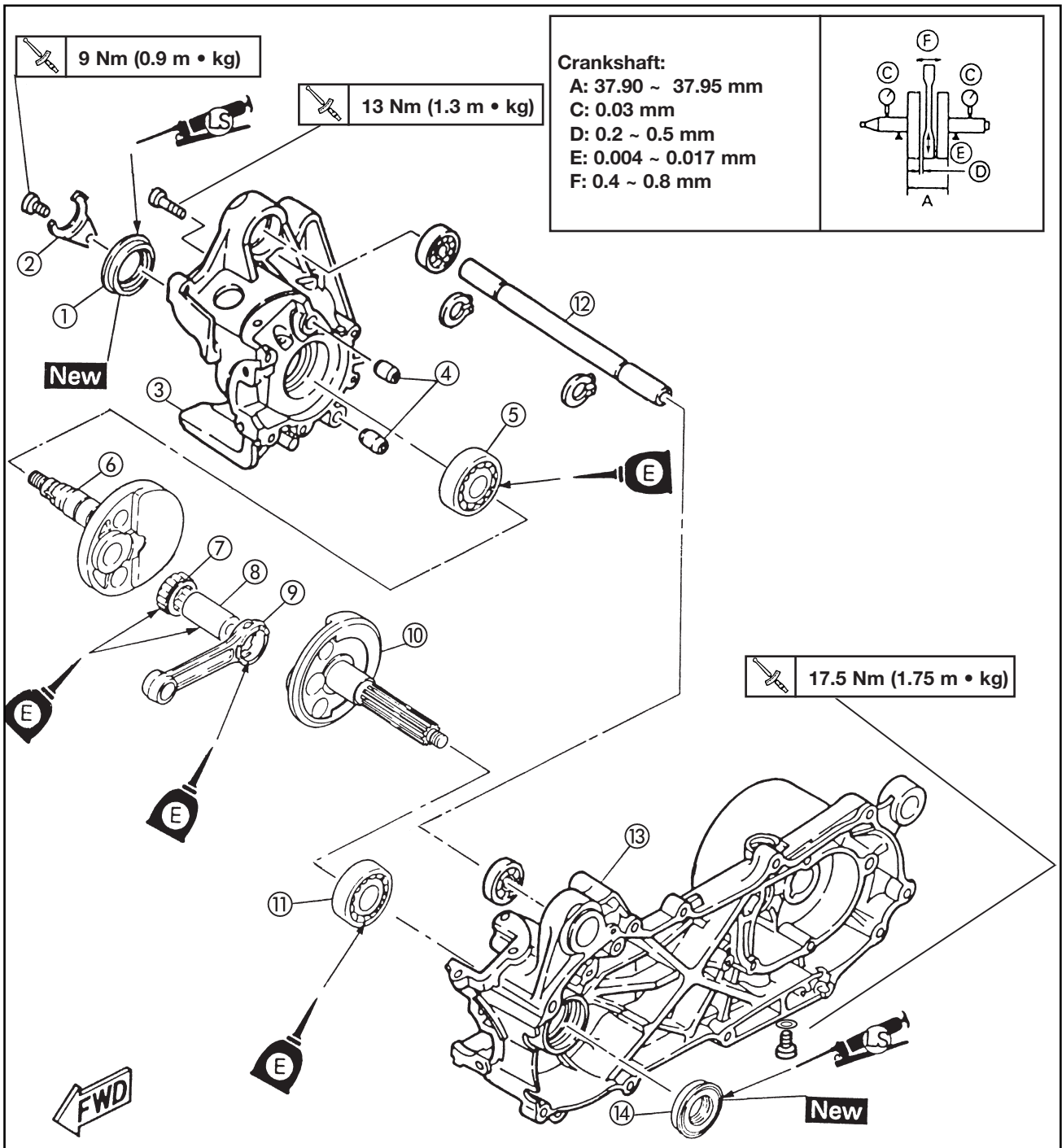


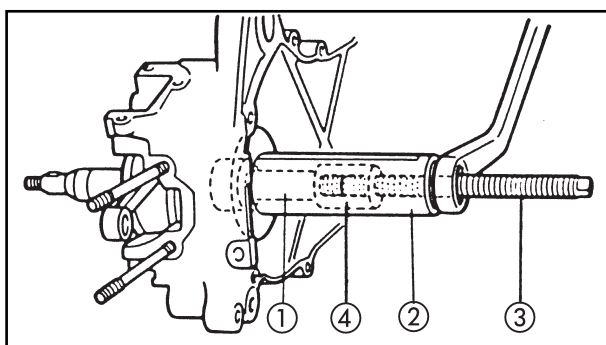
ENGINE ASSEMBLY AND ADJUSTMENT

EAS00381

CRANKSHAFT AND CRANKCASE

- | | |
|----------------------|--------------------------|
| ① Oil seal | ⑧ Crankshaft pin |
| ② Oil seal catch | ⑨ Connecting rod |
| ③ Crankcase (right) | ⑩ Crankshaft (left) |
| ④ Dowel pin | ⑪ Bearing |
| ⑤ Bearing | ⑫ Engine mounting spacer |
| ⑥ Crankshaft (right) | ⑬ Crankcase (left) |
| ⑦ Bearing | ⑭ Oil seal |





EAS00407

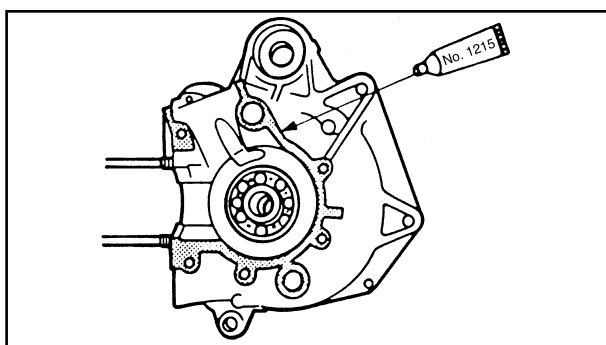
INSTALLING THE CRANKSHAFT

- Place:
 - crankshaft installation tool



Crankshaft installation tool

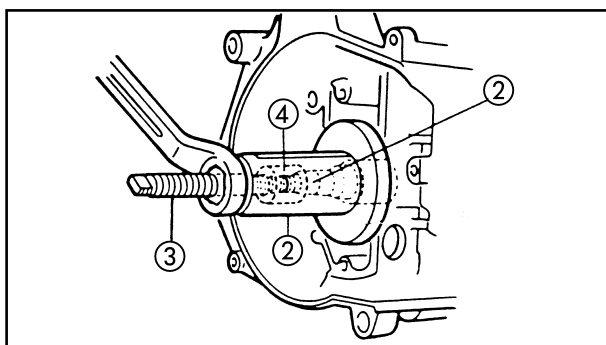
- ①: 90890-01411
- ②: 90890-01274
- ③: 90890-01275
- ④: 90890-01277



- Install:
 - crankshaft: (in left crankcase)
- Install:
 - dowel pins
- Apply:
 - Yamaha N° 1215 adhesive on the corresponding surfaces of both halves of the crankcase



Yamaha N° 1215 adhesive 90890-85505

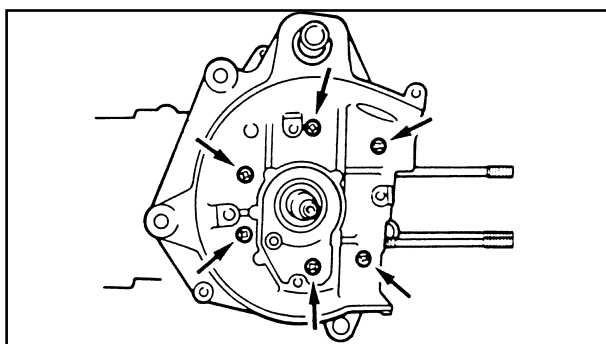


- Place:
 - crankshaft installation tool



Crankshaft installation tool

- ①: 90890-01411
- ②: 90890-01274
- ③: 90890-01275
- ④: 90890-01277



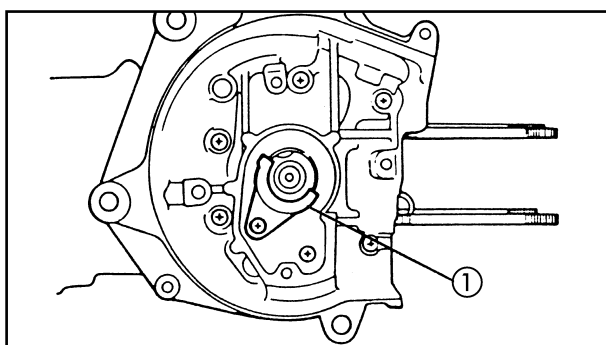
- Install:
 - right crankcase
- Tighten:
 - crankcase positioning screws

NOTE:

Tighten the crankcase positioning screws in stages, using a crossed method for tightening.



Screw (Crankcase) 13 Nm (1.3 m • kg)



- Check:
 - rotation of crankshaft
rough turning → Repair
- Install:
 - oil seal catch plate ①



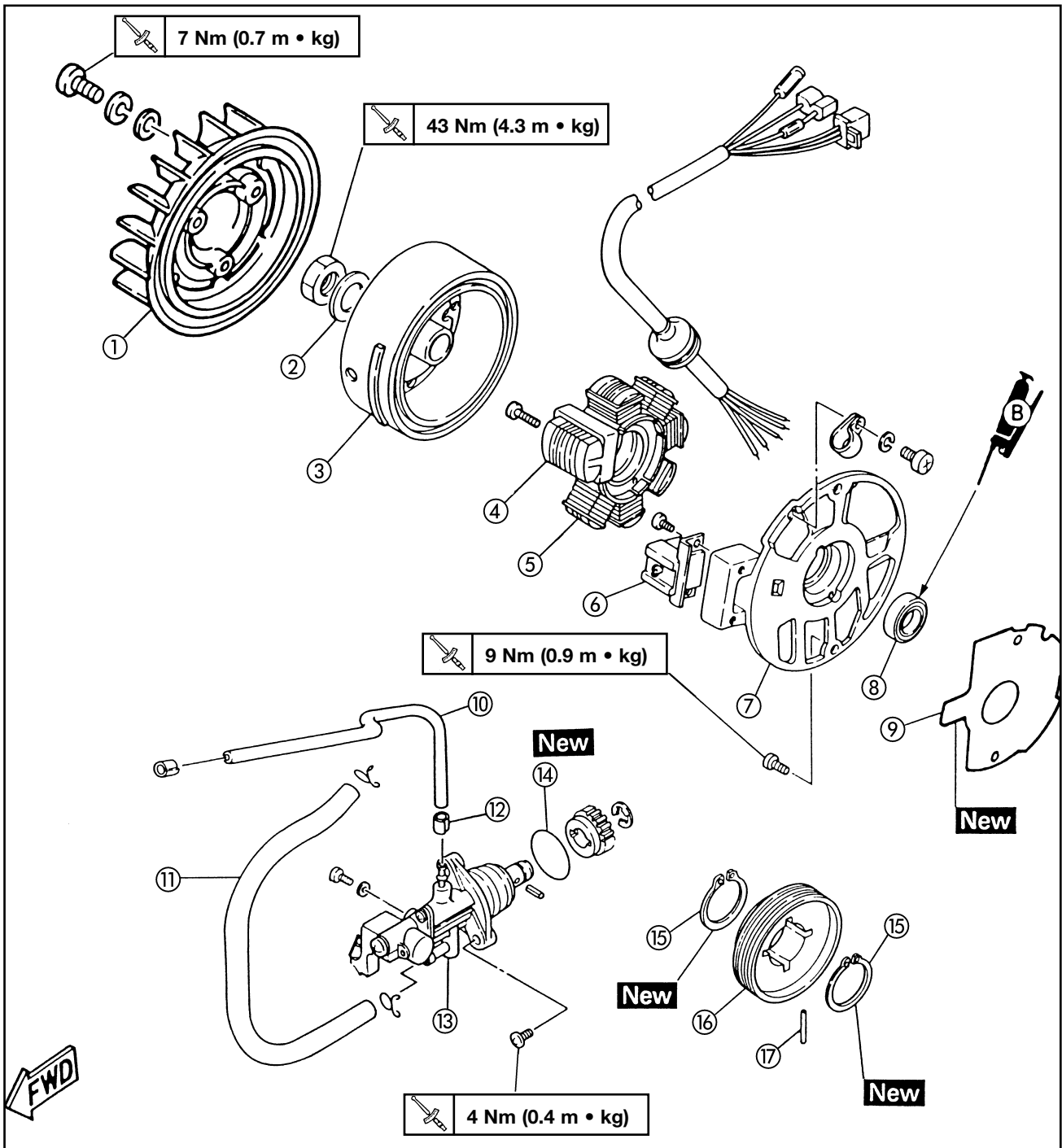
Screw (oil seal catch plate) 9 Nm (0.9 m • kg)

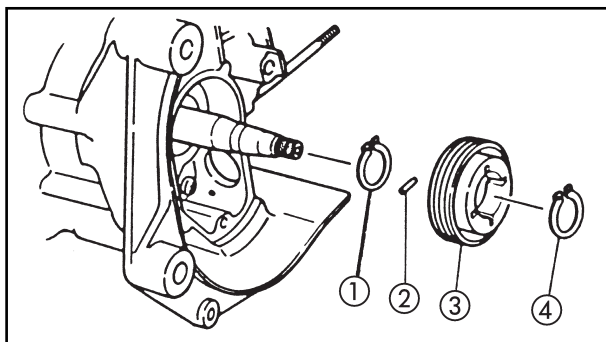


EAS00360

AUTOLUBE OIL PUMP AND DC-CDI MAGNETO

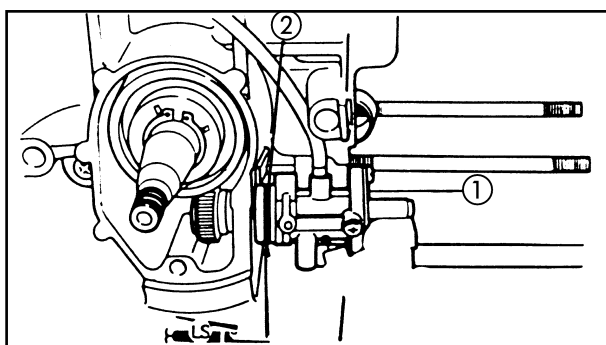
- | | |
|-------------------|-----------------------|
| ① Fan (CS50 only) | ⑩ Oil hose |
| ② Flat washer | ⑪ Oil delivery hose |
| ③ Rotor assembly | ⑫ Bushing |
| ④ Charge coil | ⑬ Autolube pump |
| ⑤ Lighting coil | ⑭ O-ring |
| ⑥ Pickup coil | ⑮ Circlip |
| ⑦ Stator plate | ⑯ Oil pump drive gear |
| ⑧ Oil seal | ⑰ Pin |
| ⑨ Gasket | |






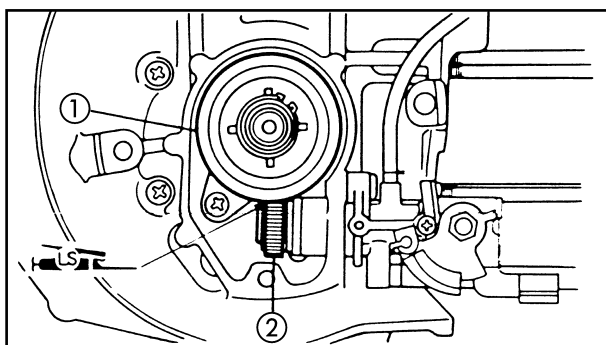
INSTALLING THE AUTOLUBE OIL PUMP

1. Install:
 - circlip ①
 - pin ②
 - pump drive gear ③
 - circlip ④




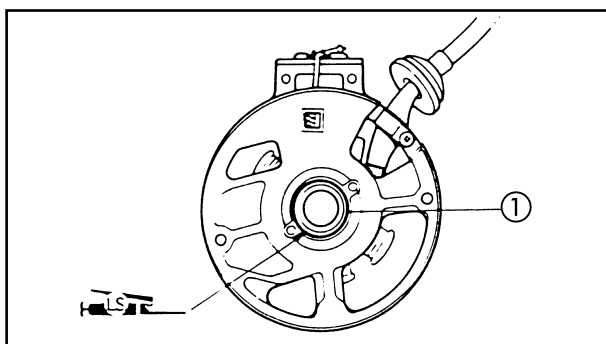
2. Apply:
 - grease with lithium soap base (on the o-ring ②)
3. Install:
 - autolubrication pump ①

	Screw (autolubrication pump) 4 Nm (0.4 m • kg)
---	--



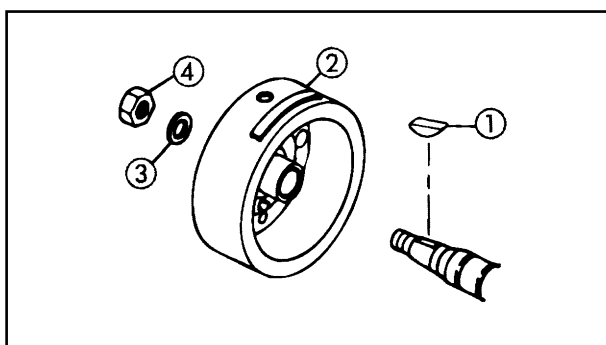
4. Apply:
 - grease with lithium soap base (on the autolubrication pump gear ①, ②)

	Lithium soap base grease 15 cc (0.92 cu • in)
---	---




INSTALLING THE DC-CDI MAGNETO

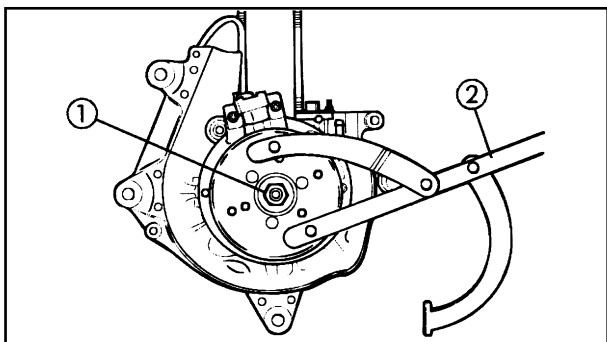
1. Install:
 - gasket
2. Apply:
 - grease with lithium soap base (on the oil seal ①)
3. Pass the wheel cable through the crankcase orifice.



4. Install:
 - stator assembly

	Screw (stator assembly) 8.5 Nm (0.85 m • kg)
---	--

5. Install:
 - woodruff key ①
 - rotor ②
 - plain washer ③
 - nut ④



6. Tighten:

- nut ① (magneto rotor)
Use the flywheel holding tool ②.



Flywheel holding tool
90890-01235



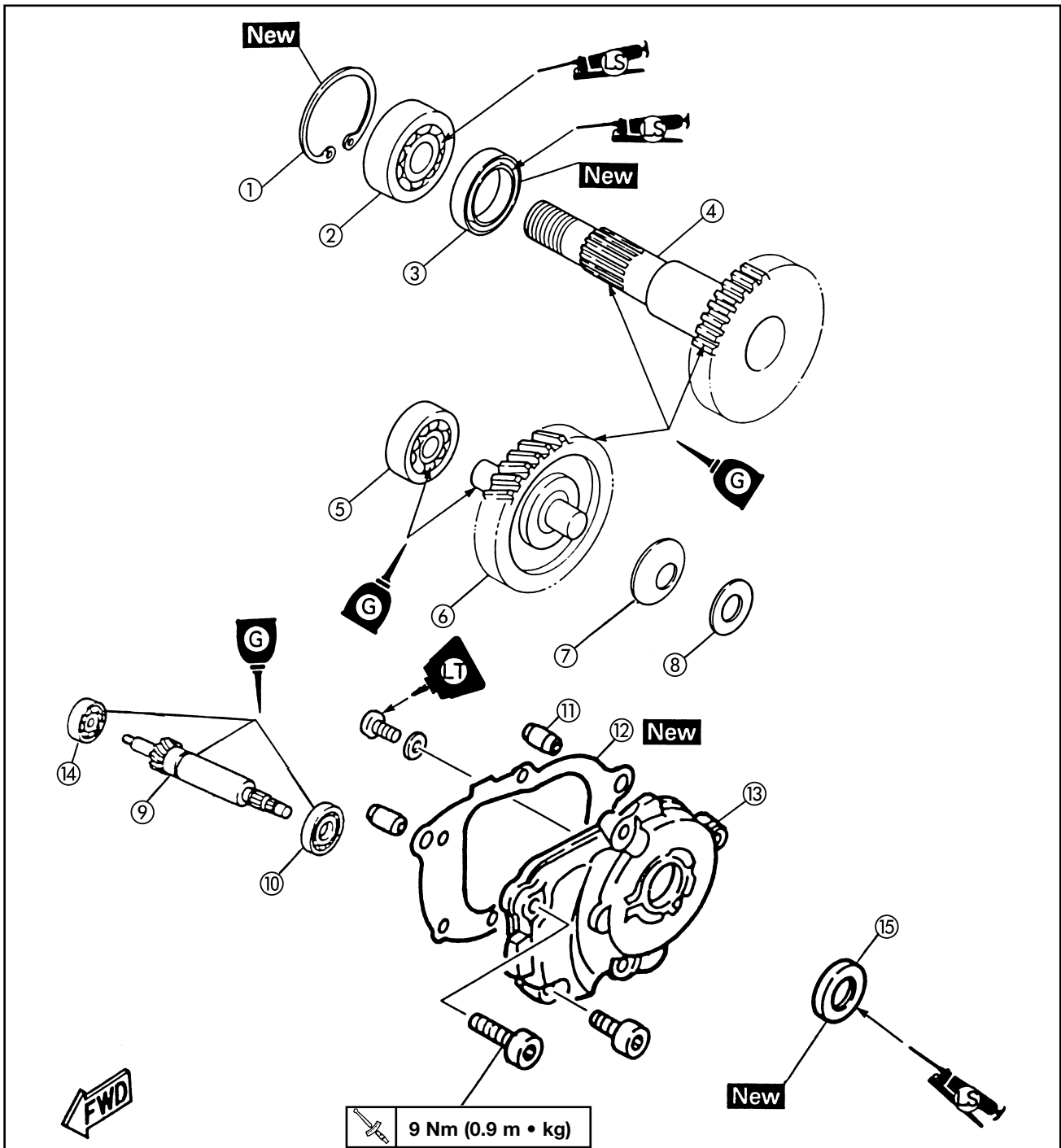
Nut (Flywheel magneto)
43 Nm (4.3 m • kg)

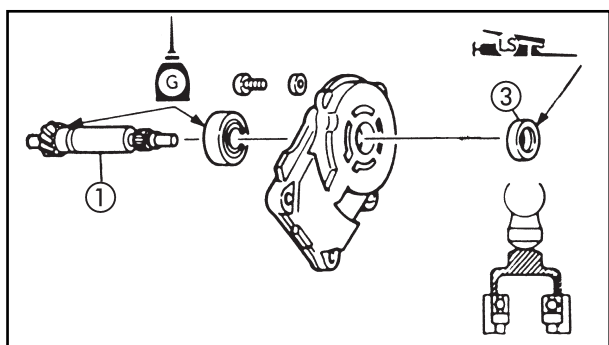


EAS00419

TRANSMISSION

- | | |
|-------------------------|---------------------------|
| ① Circlip | ⑨ Secondary sheave axle |
| ② Bearing | ⑩ Bearing |
| ③ Oil seal | ⑪ Dowel pin |
| ④ Drive axle | ⑫ Gasket |
| ⑤ Bearing | ⑬ Transmission case cover |
| ⑥ Main axle | ⑭ Bearing |
| ⑦ Conical spring washer | ⑮ Oil seal |
| ⑧ Flat washer | |





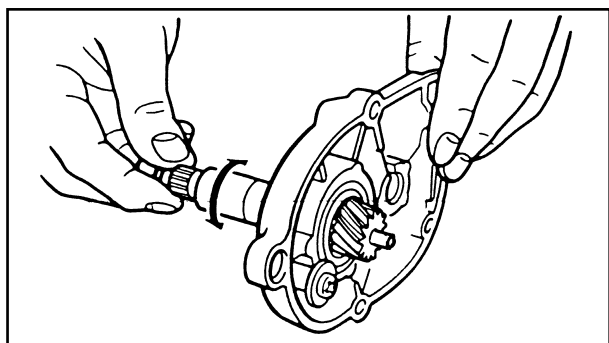
EAS00428

INSTALLING THE TRANSMISSION

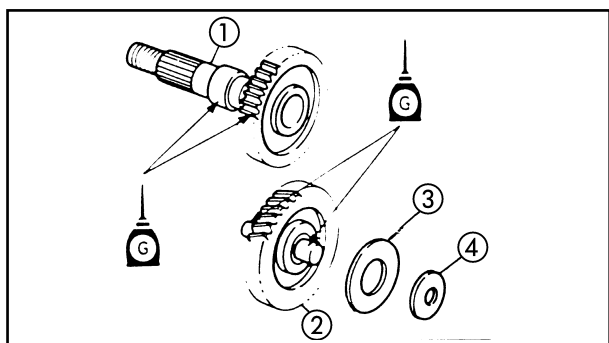
1. Apply:
 - SE engine oil type 10W30
(on the transmission box cover bearing)
2. Install:
 - secondary sheave axle ①
(on transmission case cover)
3. Install:
 - circlip ②
 - oil seal ③

NOTE:

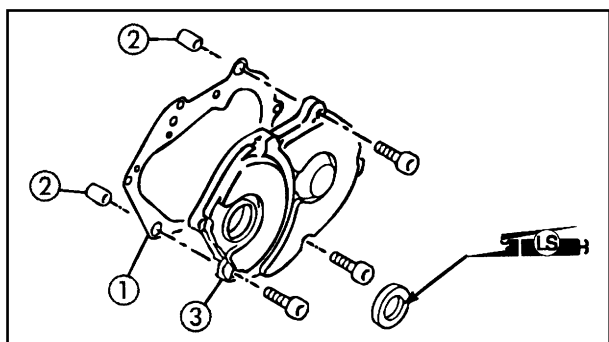
Apply grease with lithium soap based onto the oil seal lips.



4. Check:
 - rotation of secondary sheave axle
Rough rotation → Repair.



5. Apply:
 - SE type 10W30 engine oil
(on bearing of main axle and drive axle bearing)
6. Install:
 - drive axle ①
 - main axle ②
 - conical spring washer ③
 - flat washer ④



7. Install:
 - gasket
 - dowel pins
 - transmission case cover

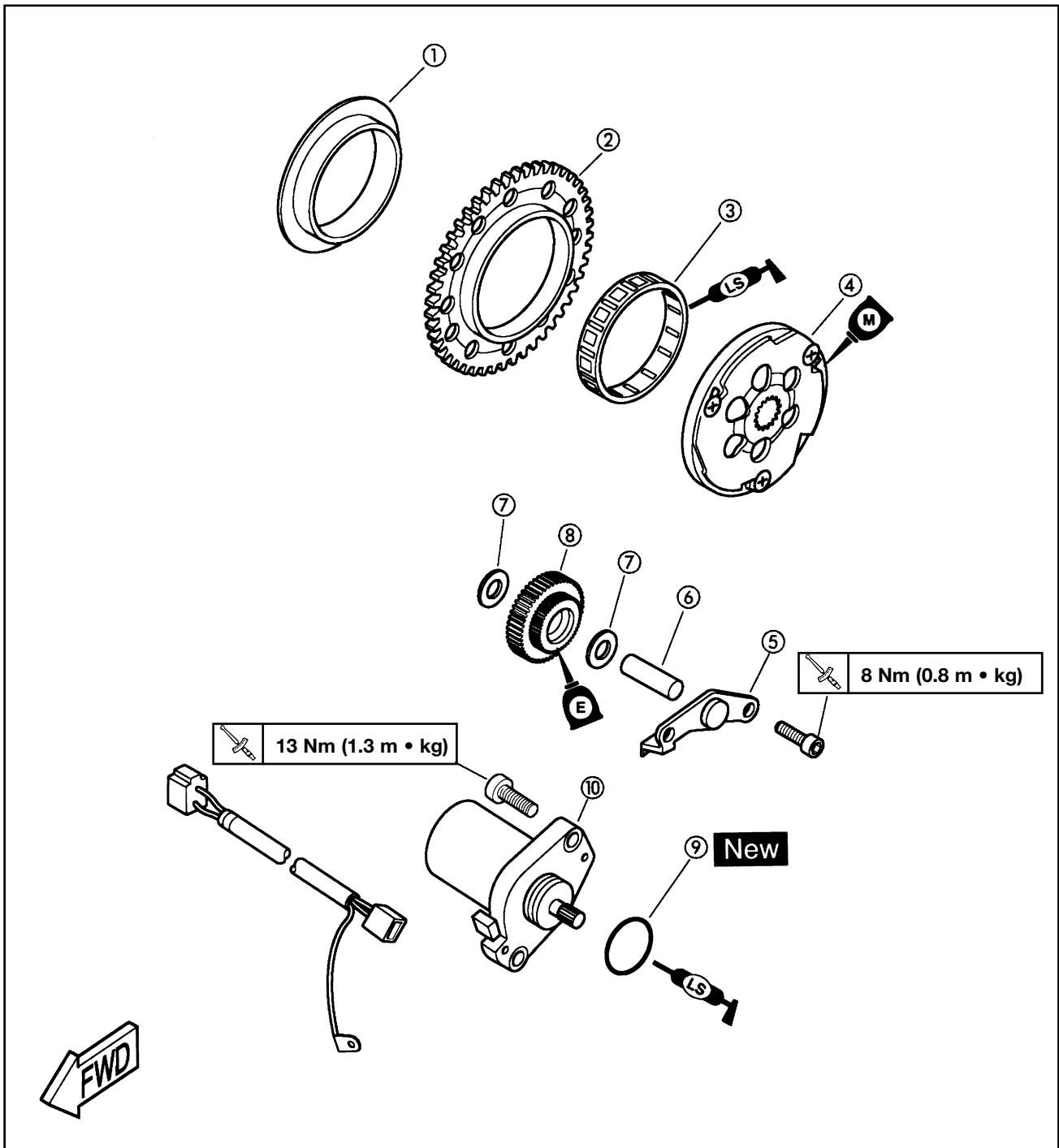
	<p>Screw (case cover) 9 Nm (0.9 m • kg)</p>
--	--

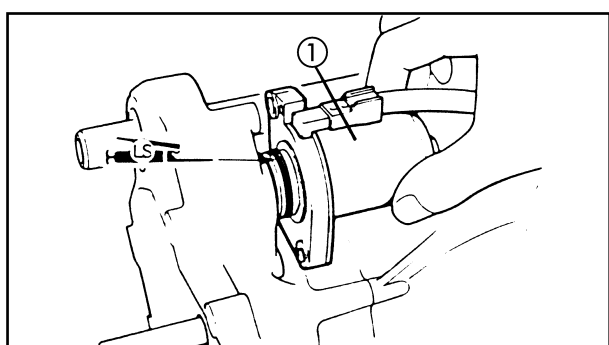
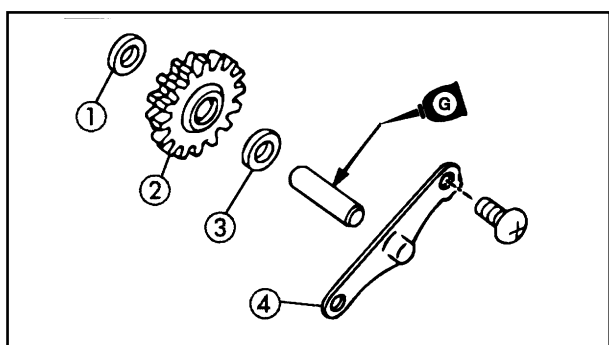
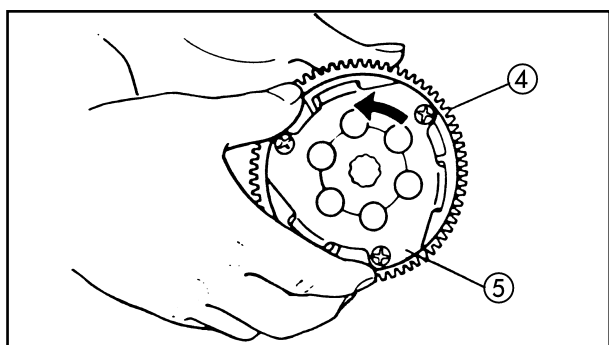
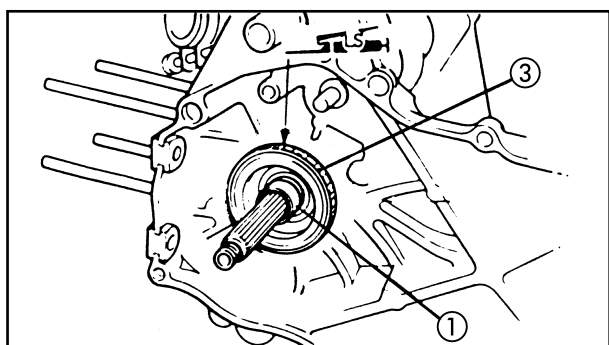


STARTER SYSTEM

- ① Collar
- ② Starter wheel gear
- ③ Bearing
- ④ Starter clutch
- ⑤ Plate

- ⑥ Shaft
- ⑦ Flat washer
- ⑧ Idle gear
- ⑨ O-ring
- ⑩ Starter motor





INSTALLING THE STARTER SYSTEM

1. Install:
- bushing ①
 - bearing ③
 - starter wheel gear ④
 - starter clutch ⑤

NOTE: _____

- Apply grease with a lithium soap base on the bearing ③.
 - Apply molybdenum disulphide oil on the pin (starter clutch) ⑤.
-

2. Install:
- flat washer ①
 - idle gear ②
 - flat washer ①
 - plate ③ (intermediate gear)



Screw (intermediate gear plate)
8 Nm (0.8 m • kg)

NOTE: _____

Apply engine oil on the intermediate gear ②.

3. Install:
- starter motor ①



Screw (starter motor)
13 Nm (1.3 m • kg)

NOTE: _____

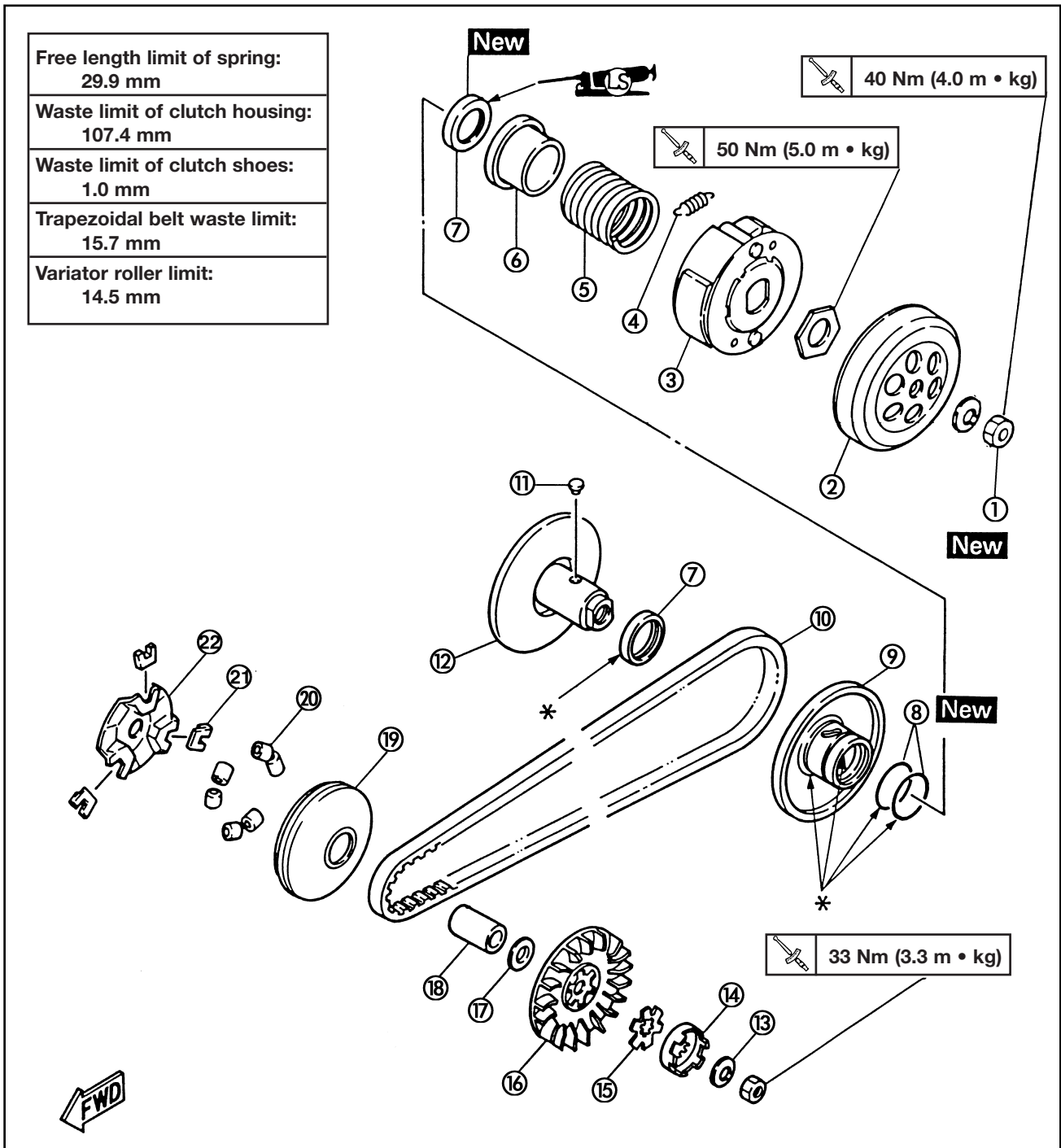
Apply grease with a lithium soap base on the o-ring of the starter motor.



PRIMARY AND SECONDARY SHEAVE

- | | | |
|-----------------|----------------------------|--------------------------|
| ① Nut | ⑨ Secondary sliding sheave | ⑰ Shim |
| ② Clutch drum | ⑩ V-belt | ⑱ Collar |
| ③ Clutch plate | ⑪ Guide pin | ⑲ Primary sliding sheave |
| ④ Clutch spring | ⑫ Secondary fixed sheave | ⑳ Weight |
| ⑤ Spring | ⑬ Conical washer | ㉑ Slider |
| ⑥ Spring seat | ⑭ One-way clutch | ㉒ Cam |
| ⑦ Oil seal | ⑮ Special washer | |
| ⑧ O-ring | ⑯ Primary fixed sheave | |

*: Apply assembly lube

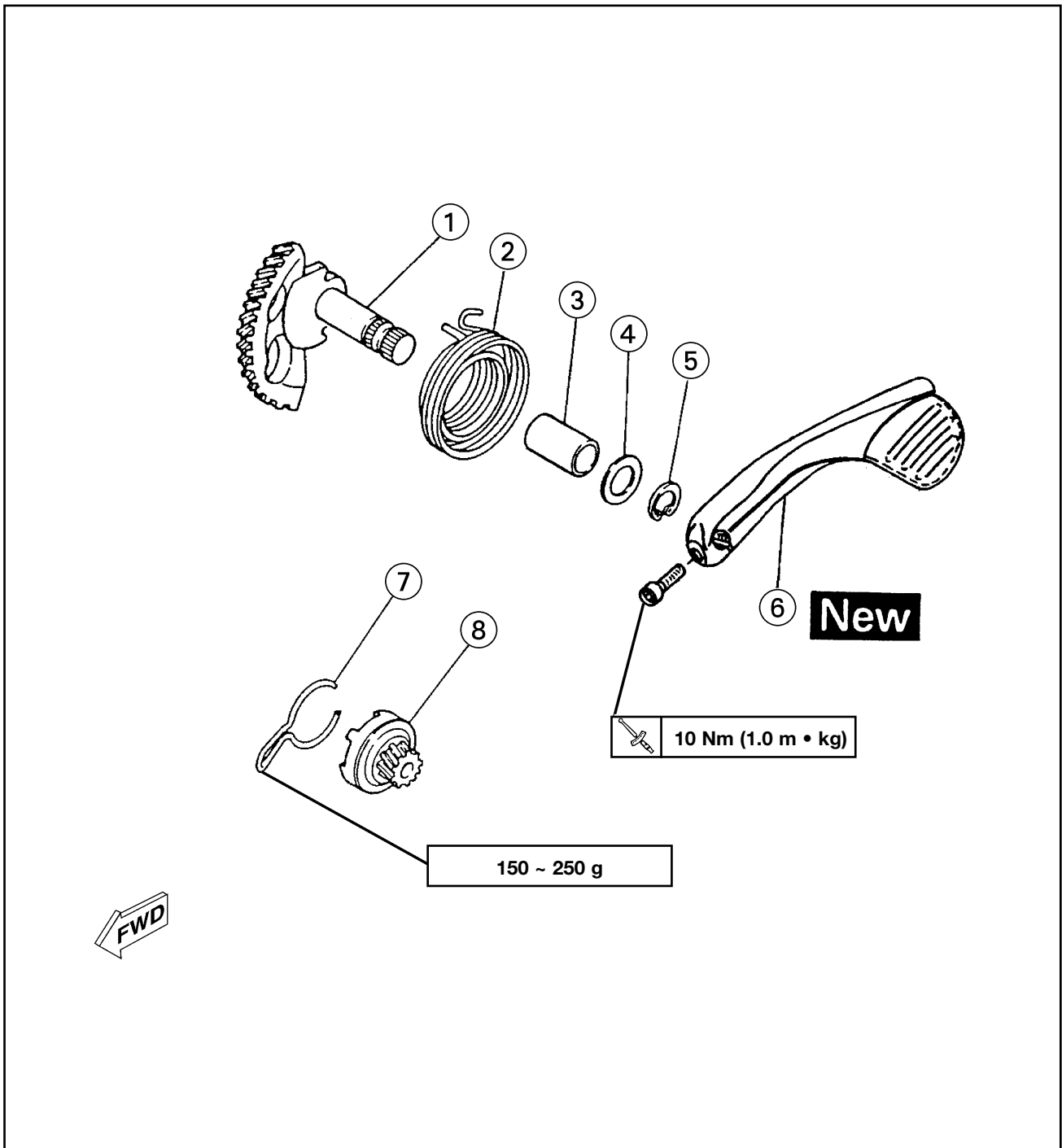


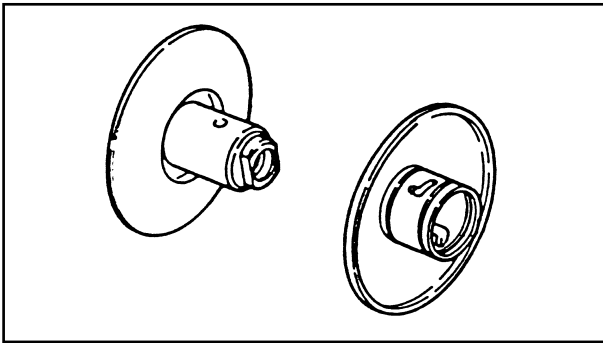


EAS00338

KICKSTARTER

- ① Kick shaft
- ② Return spring
- ③ Collar
- ④ Flat washer
- ⑤ Circlip
- ⑥ Kick crank
- ⑦ Kick pinion gear clip
- ⑧ Kick pinion gear





EAS00324

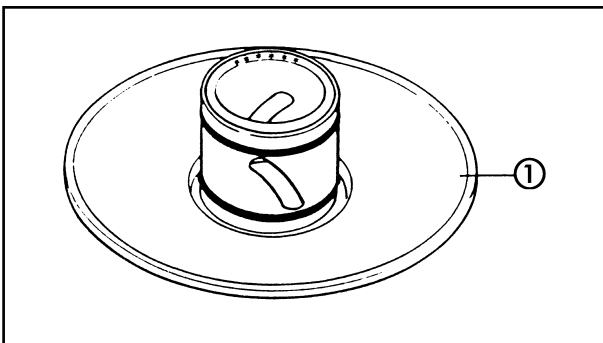
ASSEMBLING THE SECONDARY SHEAVE

1. Lubricate:

- secondary fixed sheave's inner surface
- secondary sliding sheave's inner surface



**Recommended lubricant
assembly lube**

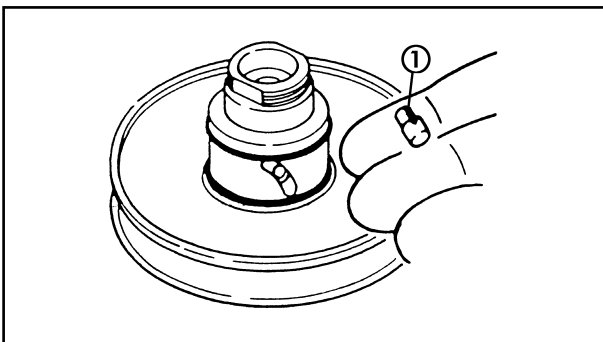


2. Install:

- secondary sliding sheave ①

NOTE:

Take care that the lips of the oil seals do not turn when the pulley wheel is installed.

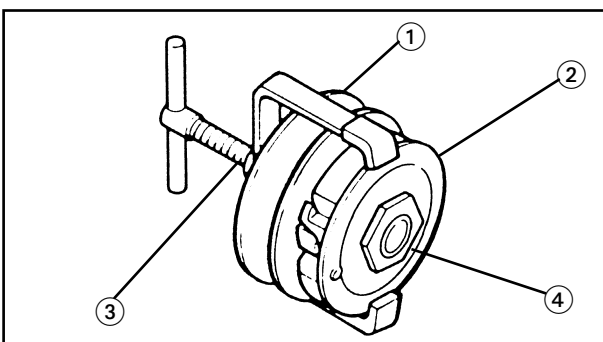


3. Install:

- guide pin ①

4. Lubricate:

- guide pin groove
- oil seal
(with the recommended lubricant)



5. Install:

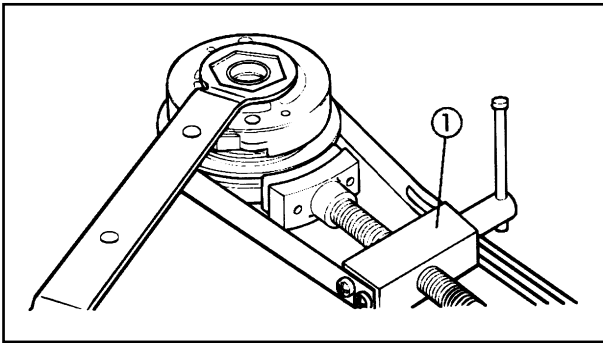
- secondary sheave complete ①
- spring
- clutch carrier ②
- spacer (diameter = 30 mm, thickness = 2 ~ 3 mm)

NOTE:

Attach the clutch spring holder and clutch spring holder arm ③ onto the secondary sheave as shown. Then, compress the spring, and tighten the clutch securing nut ④.



**Clutch spring holder
90890-01337**



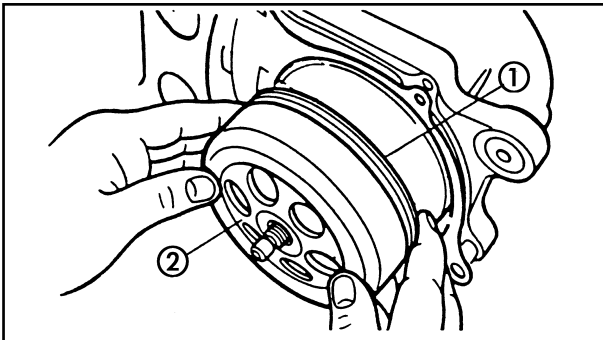
6. Tighten:
- clutch securing nut
use sheave holder ①
spanner (41 mm)



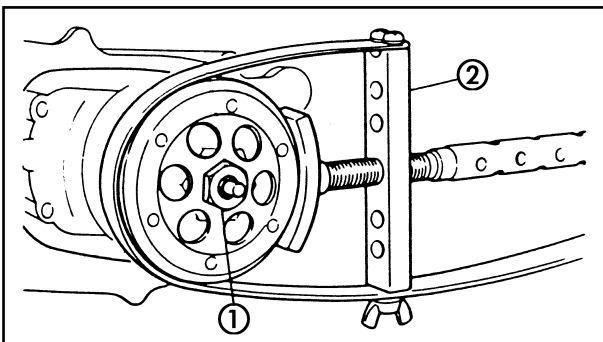
Sheave holder
90890-01701



Clutch securing nut
50 Nm (5.0 m • kg)



7. Install:
- dowel pin
 - gasket
 - secondary assembly ①
 - clutch housing ②



8. Tighten:
- nut ① (secondary sheave)
Use sheave holder



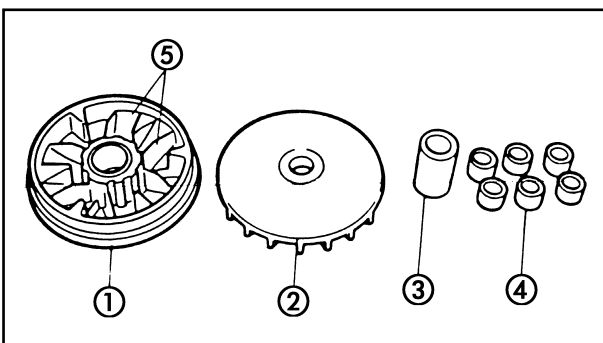
Sheave holder
90890-01701



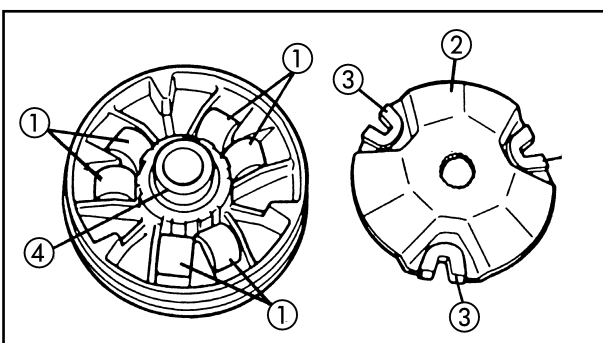
Nut (secondary sheave)
40 Nm (4.0 m • kg)

EAS00323

ASSEMBLING THE PRIMARY SHEAVE



1. Clean:
- primary sliding sheave face ①
 - primary fixed sheave face ②
 - collar ③
 - primary sheave weights ④
 - primary sliding sheave cam surface ⑤



2. Install:
- primary sheave weights ①
 - cam ②
 - slider ③
 - collar ④

NOTE:

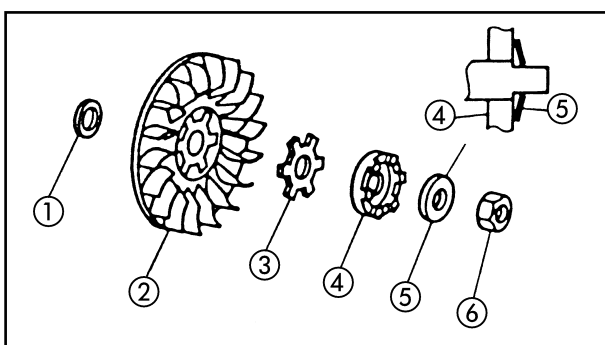
Before installing the primary sheave weights, lubricate the inside and outside of each weight.



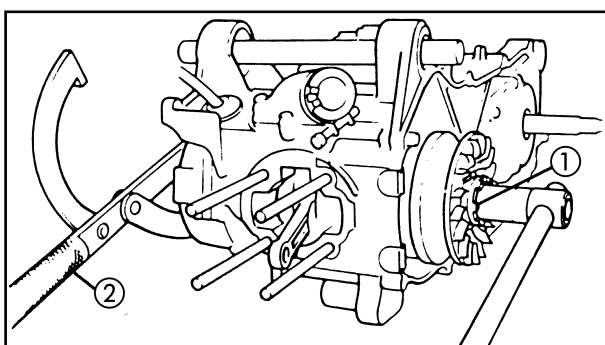
3. Check:
 - cam operation
 - Unsmooth operation → Repair
4. Install:
 - primary sheave assembly ①
 - collar ②
5. Install:
 - v-belt

NOTE: _____


The v-belt should be installed with the arrow facing towards the front.



6. Install:
 - shim ①
 - primary fixed sheave ②
 - special washer ③
 - one-way clutch ④
 - conical spring washer ⑤
 - nut ⑥



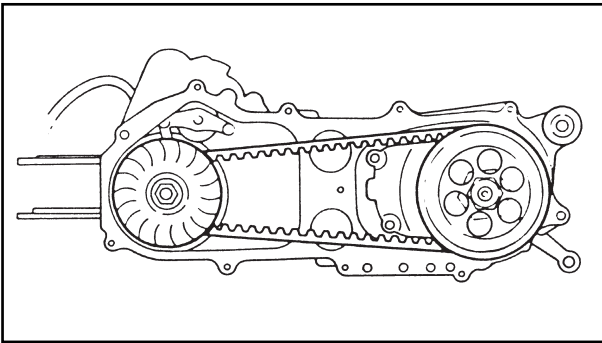
7. Tighten:
 - nut ① (primary sheave)

	<p>Nut (Primary sheave) 33 Nm (3.3 m • kg)</p>
---	---


NOTE: _____

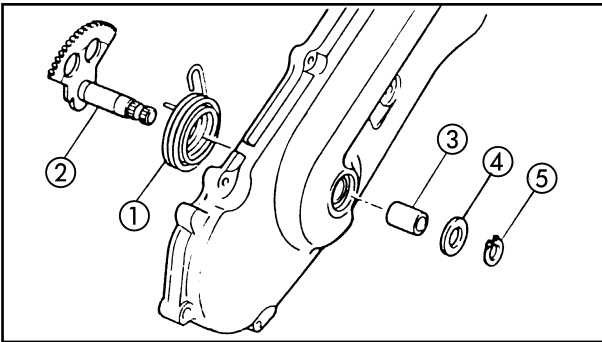
When the nut is tightened (primary sheave), support the magnetic flywheel using the engine wheel support tool ②.

	<p>Flywheel holding 90890-01235</p>
---	--



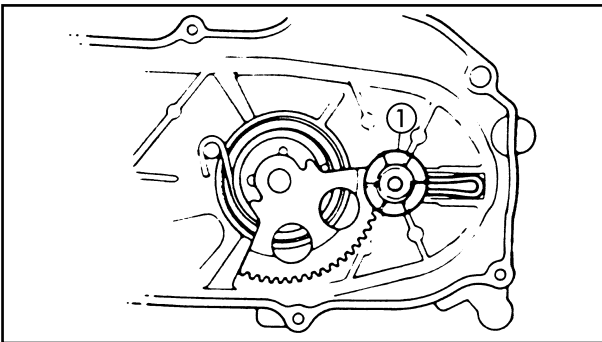
8. Adjust:
 - v-belt
Tense the V-belt by turning the primary sheave several times.
9. Install:
 - fan (CS50 only)
Side right

	Screw (fan) 7 Nm (0.7 m • kg)
---	---

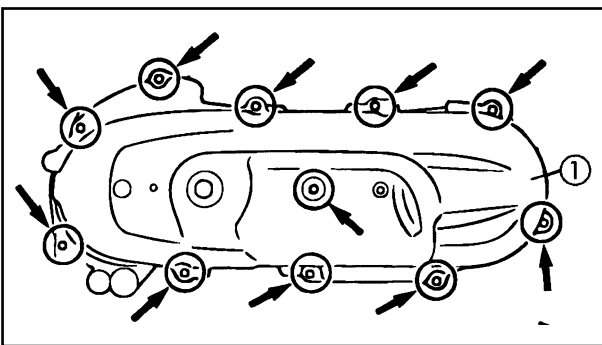


INSTALLING THE KICKSTARTER

1. Install:
 - return spring ①
 - kick shaft ②
 - collar ③
 - flat washer ④
 - circlip ⑤

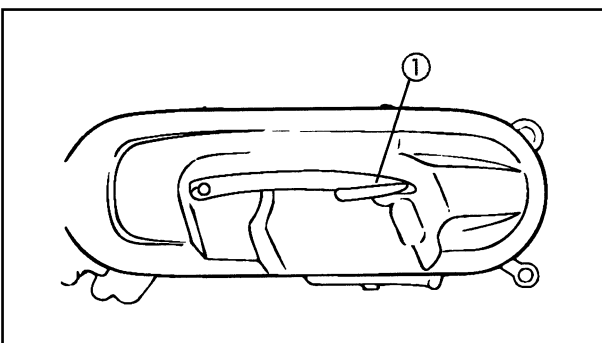


2. Hook on:
 - return spring
(on kick gear and hub)
3. Install:
 - kick pinion gear ①




4. Install:
 - crankcase cover ①

	Screw (crankcase cover) 9 Nm (0.9 m • kg)
---	---



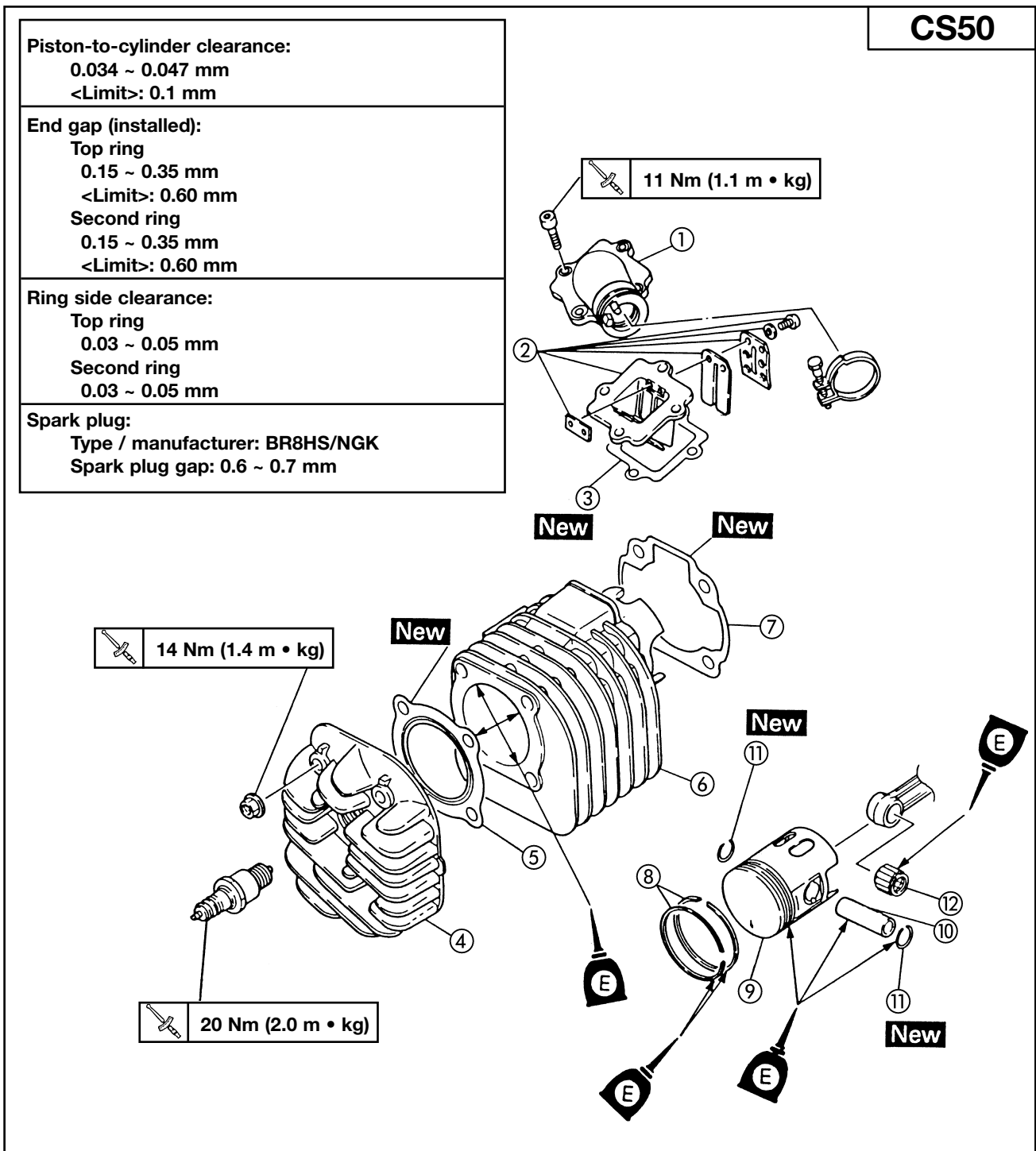
5. Install:
 - kick crank ①

	Bolt (kick crank) 10 Nm (1.0 m • kg)
---	--



PISTON, CYLINDER AND CYLINDER HEAD (CS50 A/C)

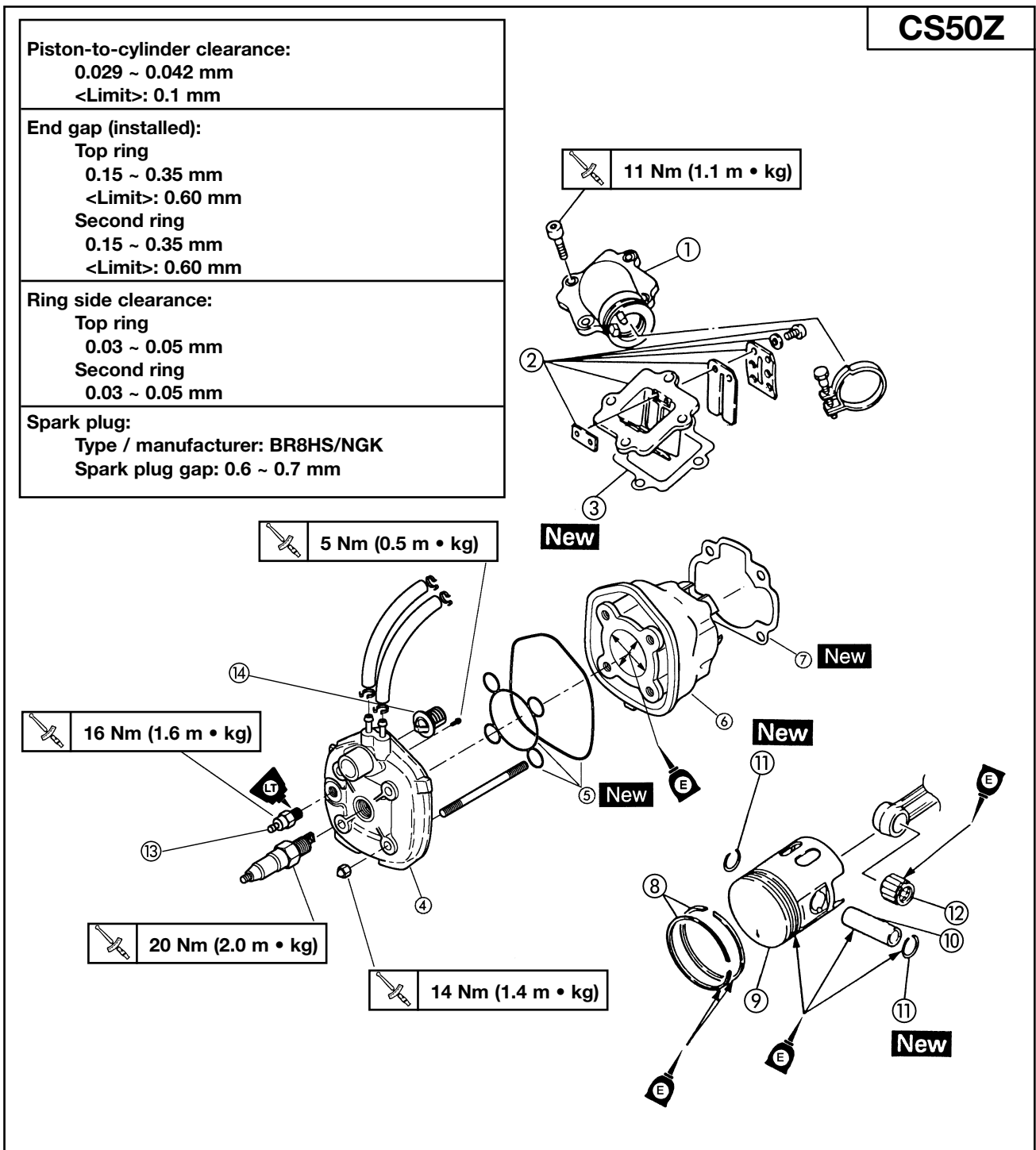
- | | |
|------------------------|--------------------|
| ① Carburetor joint | ⑦ Cylinder gasket |
| ② Reed valve | ⑧ Piston rings |
| ③ Gasket | ⑨ Piston |
| ④ Cylinder head | ⑩ Piston pin |
| ⑤ Cylinder head gasket | ⑪ Piston pin clips |
| ⑥ Cylinder | ⑫ Bearing |

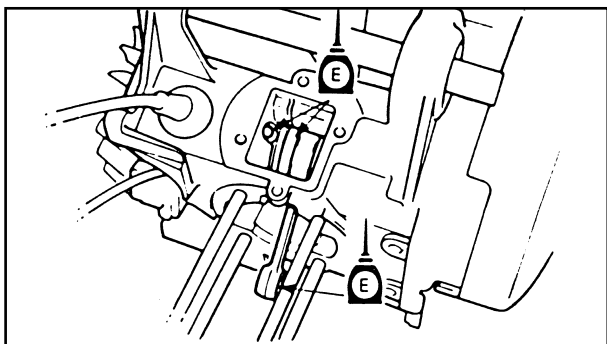




PISTON, CYLINDER AND CYLINDER HEAD (CS50Z L/C)

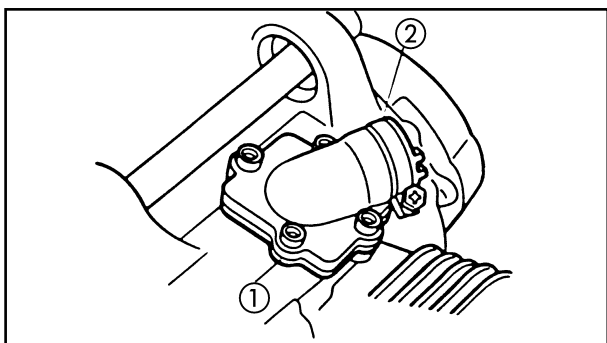
- | | |
|-------------------------|--------------------|
| ① Carburetor joint | ⑧ Piston rings |
| ② Reed valve | ⑨ Piston |
| ③ Gasket | ⑩ Piston pin |
| ④ Cylinder head | ⑪ Piston pin clips |
| ⑤ Cylinder head gaskets | ⑫ Bearing |
| ⑥ Cylinder | ⑬ Thermo switch |
| ⑦ Cylinder gasket | ⑭ Thermostat |





PISTON AND PISTON PIN

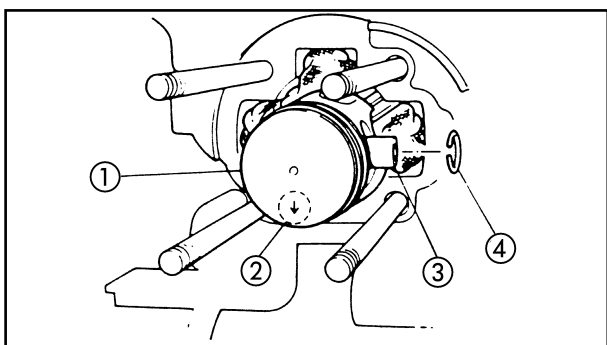
- Apply:
 - engine oil
(in the crankshaft bearing, big end bearing, small end bearing, piston pin, piston ring grooves and piston skirt areas).



- Install:
 - reed valve gasket
 - reed valve ①
 - carburetor joint ②



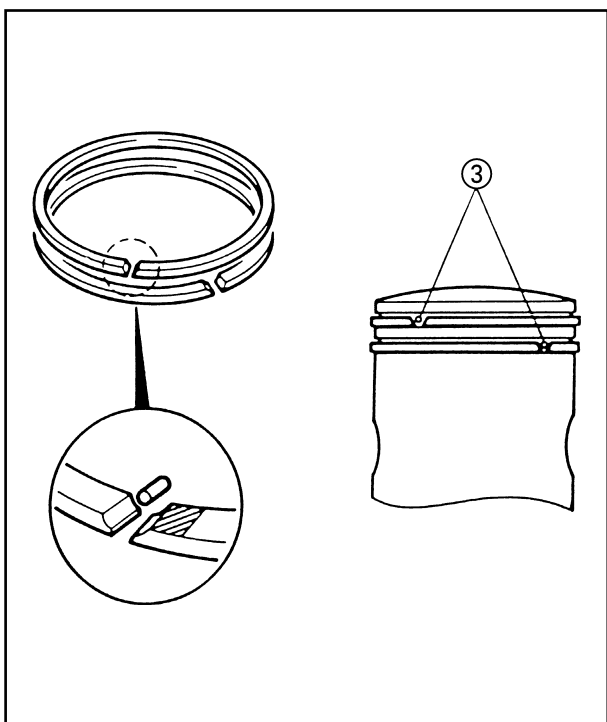
Carburetor joint
9 Nm (0.9 m • kg)



- Install:
 - small end bearing
 - piston ①
 - piston pin ③
 - piston circlips ④

NOTE:

- The arrow ② of the piston should point to the exhaust side.
- Before installing the piston circlip, cover the crankcase with a towel or clean cloth so that the circlip and other materials do not accidentally fall into the crankcase.
- Always use new piston circlips.



CYLINDER AND CYLINDER HEAD

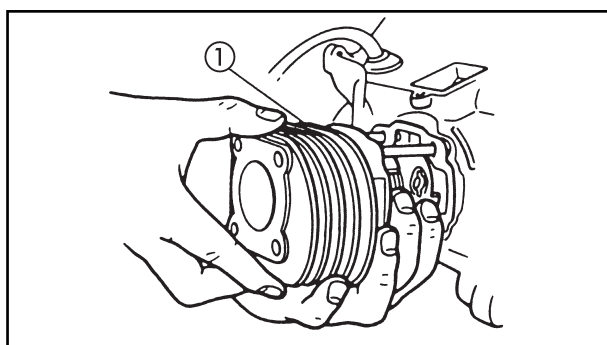
- Install:
 - cylinder gasket (Use a new gasket)
- Check:
 - piston rings

NOTE:

- Ensure that the ends of the rings are correctly coupled around the centring devices ③ on the piston grooves.



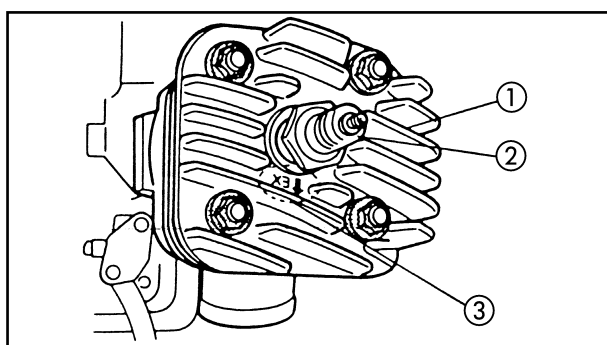
- Check that the manufacturers symbols or numbers printed on the rings are on the upper side.



3. Install:
 - cylinder ①

NOTE: _____

Install the cylinder with one hand while compressing the piston rings with the other.



4. Install:
 - cylinder head gasket (new gasket)
5. Install:
 - thermostat (CS50Z only) on cylinder head

	5 Nm (0.5 m • kg)
--	--------------------------

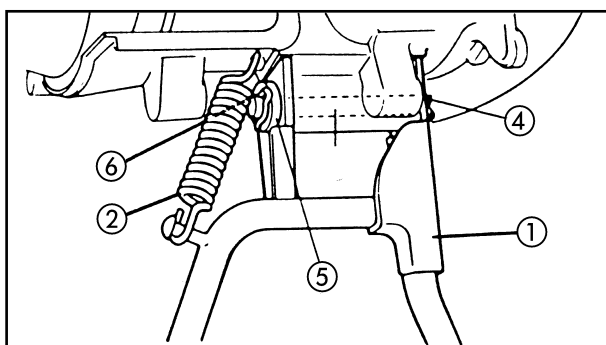
- cylinder head ①
- spark plug ②
- air covers (CS50 only)

NOTE: _____

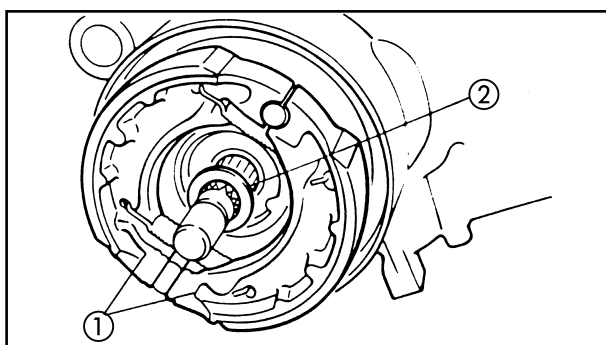
- The arrow ③ “EX” from the cylinder head should point to the exhaust side.
- Tighten the cylinder head positioning nuts in several steps, using a *cris-cross pattern*.

- right crankcase cover (CS50Z only)

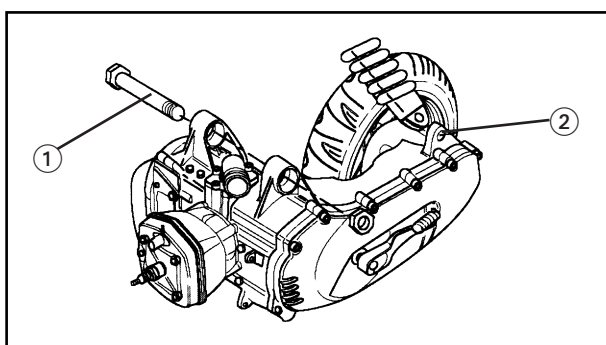
	Cylinder head positioning nuts
	14 Nm (1.4 m • kg)
	Spark plug
	20 Nm (2.0 m • kg)
	Thermo switch (CS50Z only)
	16 Nm (1.6 m • kg)



6. Install:
- central stand ①
 - spring ②
 - axle ③
 - clasp ④
 - rubber washer ⑤
 - strap loop ⑥



7. Install:
- brake shoes ①
 - flat washer ②
 - rear wheel
 - rear brake cable



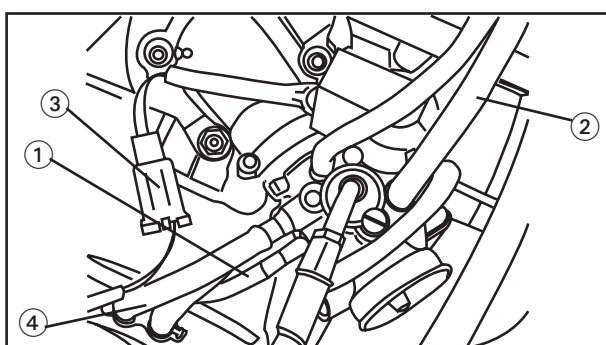
ENGINE REMOUNTING

When the engine is being assembled, reverse the removal procedure.

1. Install:
- engine assembly bolt ①
 - rear shock absorber bolt ② (lower)



Engine mounting bolt
84 Nm (8.4 m • kg)
Rear shock absorber bolt (lower)
18 Nm (1.8 m • kg)



2. Install:
- carburetor
 - oil supply pipe ①
 - fuel pipe ②
 - autochoke lead ③
 - air filter box assembly
 - water pipes of carburetor ④ (CS50Z only)

NOTE:

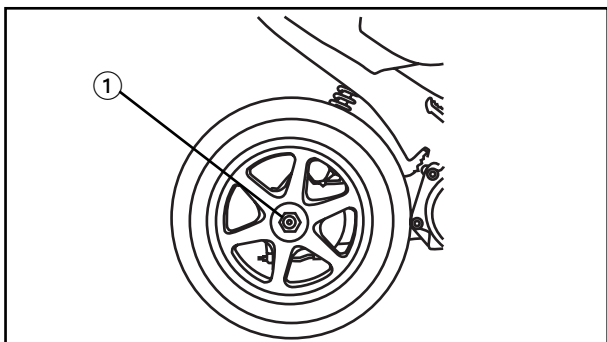
- Align the projection of the carburetor with the projections of the carburetor joint.
- Before installing the oil supply pipe, fill it with oil.

3. Install:

- oil pipe (oil tank)
- head cylinder coolant pipe (CS50Z only)
- spark plug cap

NOTE:


Pass the oil supply pipe and the oil pipe through as shown.

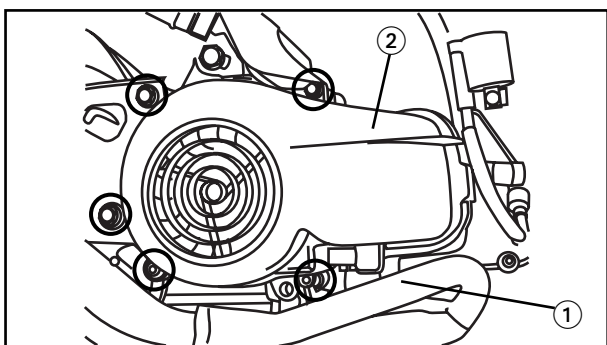


4. Bleed the air:
 - autolubrication pump
Refer to chapter 3, "BLEEDING OF AIR FROM THE AUTOLUBRICATION PUMP" section.
5. Tighten:
 - rear wheel axle nut ①


NOTE: _____

When the rear wheel axle nut is tightened, apply the rear brake.

	Rear wheel axle bolt 125 Nm (12.5 m • kg)
---	--



6. Install:
 - muffler ①
 - fan cover ② (CS50 only)

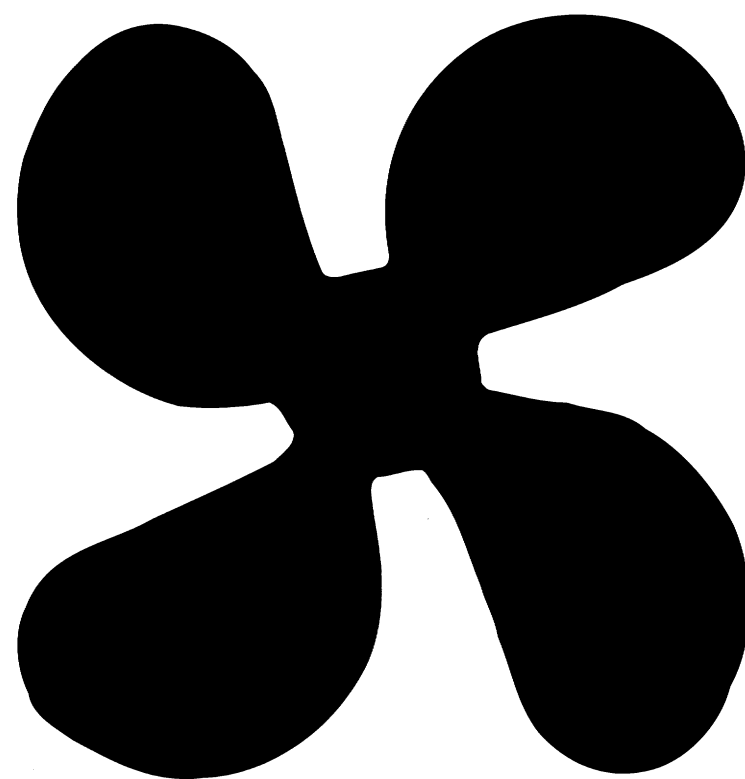
	Bolt (muffler) 26 Nm (2.6 m • kg) Bolt (exhaust pipe) 9 Nm (0.9 m • kg)
---	--

- coolant hose (on water pump cover) (CS50Z only)
Refill coolant and bleed the air.
Refer to chapter 5.

7. Apply:
 - transmission oil
Refer to "CHANGING TRANSMISSION OIL" in chapter 3.

8. Adjust:
 - free play of brake levers
Refer to "ADJUSTMENT OF FREE PLAY OF FRONT/REAR BRAKE LEVER" in chapter 3.
 - free play of throttle cable
Refer to "ADJUSTMENT OF FREE PLAY OF ACCELERATOR CABLE" in chapter 3.

9. Install:
 - helmet box
 - center cover
Refer to "REAR BODYWORK, MUD-GUARD" in chapter 3.



COOL

5



CHAPTER 5

COOLING SYSTEM (CS50Z only)

RADIATOR AND WATER PUMP	5-1
REMOVING THE RADIATOR	5-2
REMOVING THE WATER PUMP	5-2
CHECKING THE RADIATOR	5-3
CHECKING THE WATER PUMP	5-3
INSTALLING THE WATER PUMP	5-4
INSTALLING THE RADIATOR.....	5-5
THERMOSTAT	5-5
REMOVING THE THERMOSTAT	5-5
CHECKING THE THERMOSTAT	5-6
INSTALLING THE THERMOSTAT	5-6

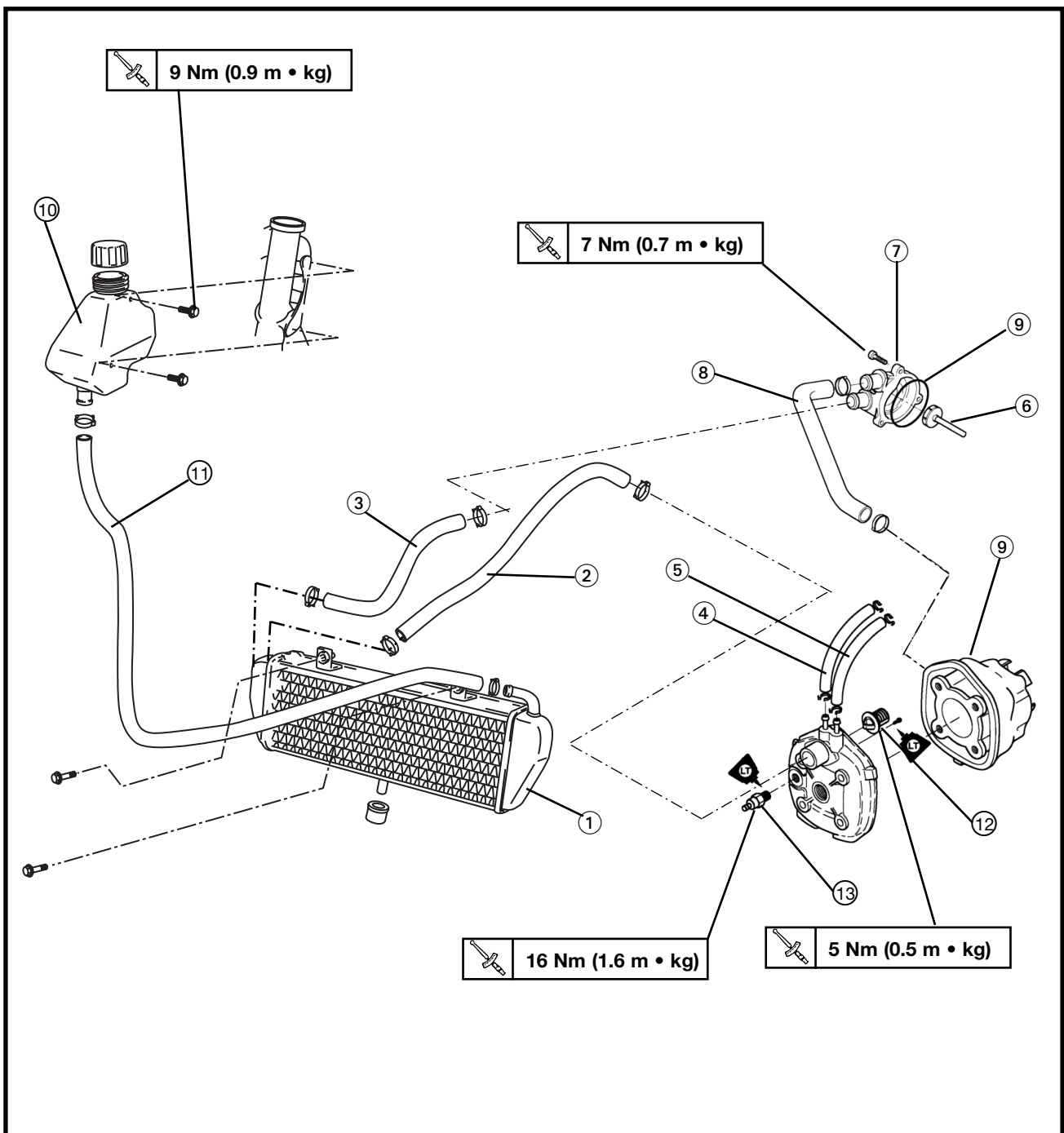


EAS00454

COOLING SYSTEM (CS50Z only)

RADIATOR AND WATER PUMP

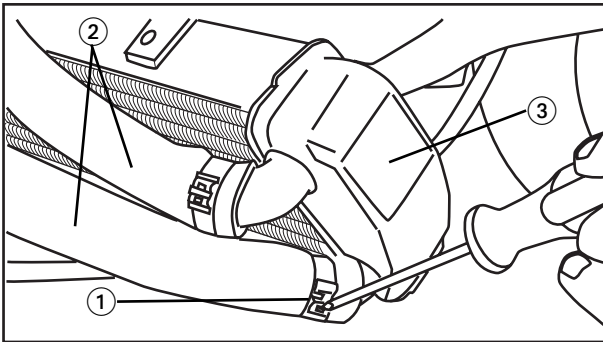
- ① Radiator
- ② Radiator inlet hose
- ③ Radiator outlet hose
- ④ Carburetor inlet hose
- ⑤ Carburetor outlet hose
- ⑥ Impeller
- ⑦ Water pump cover
- ⑧ Water pump outlet hose
- ⑨ O-ring
- ⑩ Reservoir tank
- ⑪ Reservoir tank hose
- ⑫ Thermostatic valve
- ⑬ Thermo switch





REMOVING THE RADIATOR

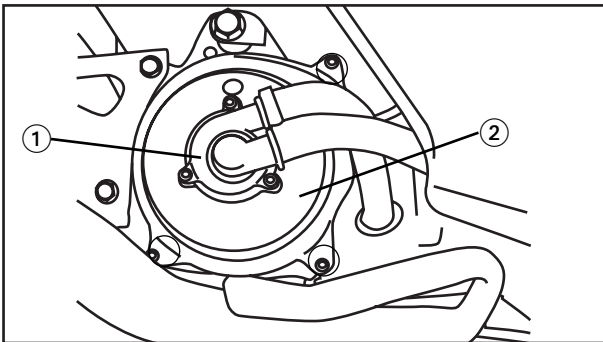
1. Remove:
 - front upper cowling
 - front middle cowling
 - front lower cowling
 Refer to "FRONT COWLING AND FOOTREST" in chapter 3.
2. Drain:
 - coolant (from cooling system)
 Refer to "CHANGING THE COOLANT" in chapter 3.
3. Remove:
 - hose clamp ①



NOTE:

Remove the hose clamp with a thin flatted-head screwdriver.

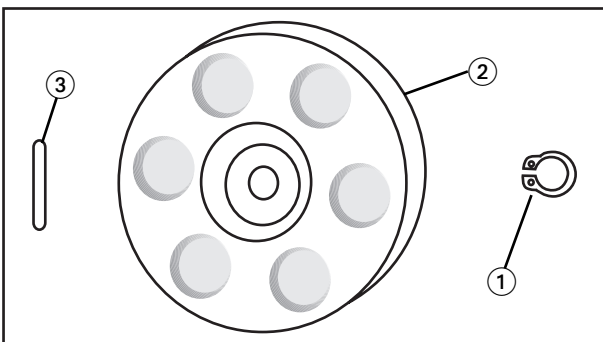
4. Remove:
 - radiator hoses ②
 - radiator ③



EAS00470

REMOVING THE WATER PUMP

1. Drain:
 - coolant (from cooling system)
 Refer to "CHANGING THE COOLANT" in chapter 3.
2. Remove:
 - water pump cover ①
 - crankcase cover ② (right)
3. Remove:
 - circlip ①
 - water pump drive pulley ②
 - pin ③
 - impeller
4. Remove:
 - bearings ④



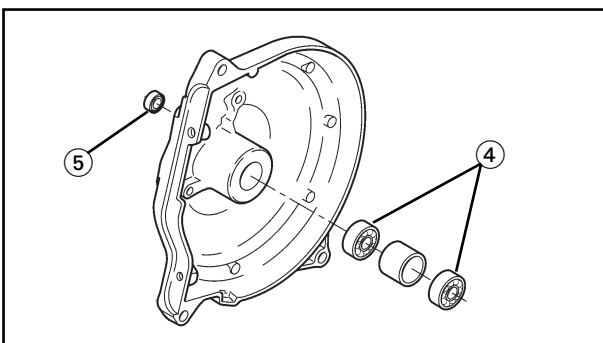
NOTE:

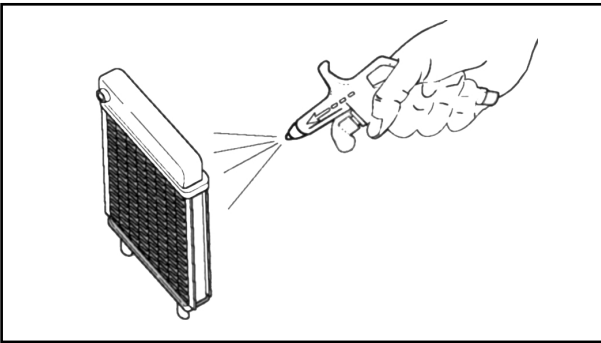
Remove the bearing and oil seal from the outside of the crankcase cover (right).

5. Remove:
 - water pump seal ⑤

NOTE:

Remove the water pump seal from the inside of the crankcase cover (right)





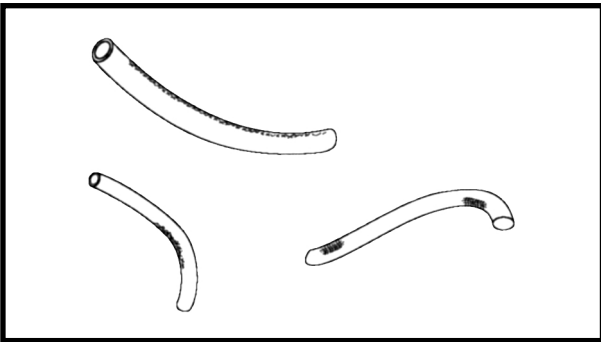
EAS00455

CHECKING THE RADIATOR

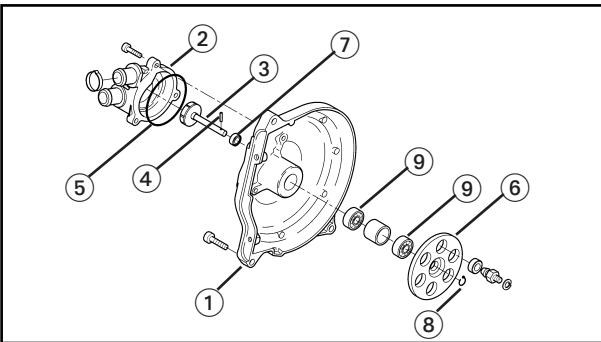
1. Check:
 - radiator fins
Obstruction → Clean.
Apply compressed air to the rear of the radiator.
 - Damage → Repair or replace.

NOTE:

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



2. Check:
 - radiator hoses
 - radiator pipes
Cracks/damage → Replace.



EAS00473

CHECKING THE WATER PUMP

1. Check:
 - crankcase cover (right) ①
 - water pump cover ②
 - impeller ③
 - pin ④
 - o-ring ⑤
 - water pump drive pulley ⑥
 - water pump seal ⑦
Cracks/damage/wear → Replace.
 - circlip ⑧
2. Check:
 - bearings ⑨
Rough movement → Replace.

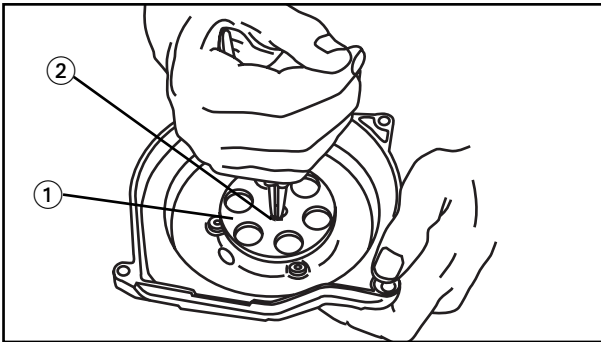


EAS00477

INSTALLING THE WATER PUMP

NOTE: _____

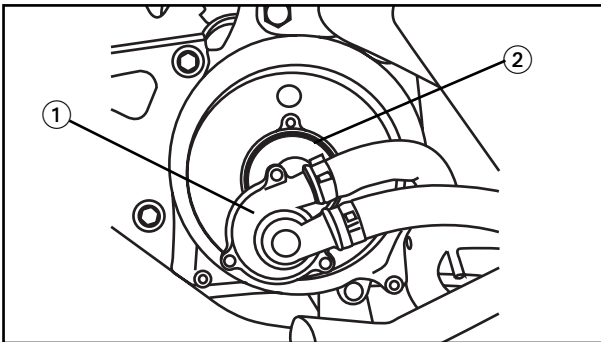
Always replace the entire water pump assembly.



1. Install:
 - impeller
 - pin
 - water pump drive pulley (1)
 - circlip **New** (2)

NOTE: _____

After installation, check that the impeller shaft rotates smoothly.



2. Install:
 - crankcase cover (right)
3. Install:
 - o-ring **New** (2)

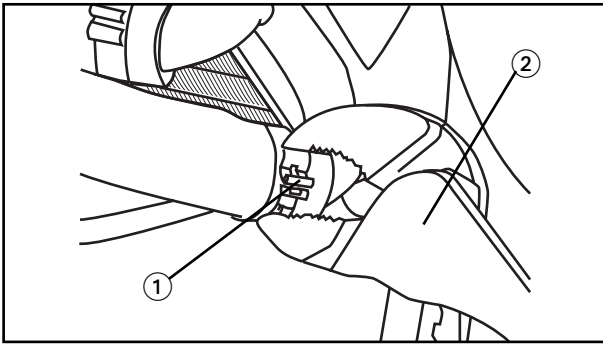
NOTE: _____

Lubricate the O-ring with a thin coat of lithium-soap-based grease.

4. Install:
 - water pump cover (1)



7 Nm (0.7 m • kg)



EAS00456

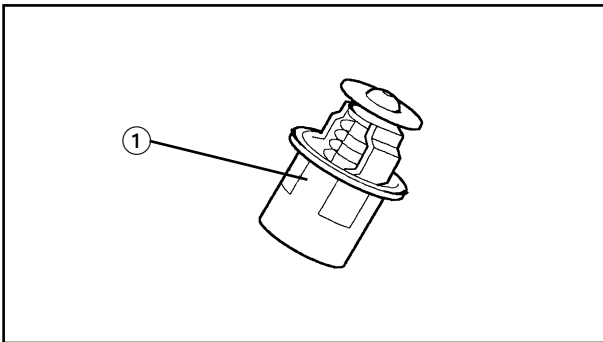
INSTALLING THE RADIATOR

1. Install:
 - hose clamp ①

NOTE:

Install the hose clamp with a pliers ②.

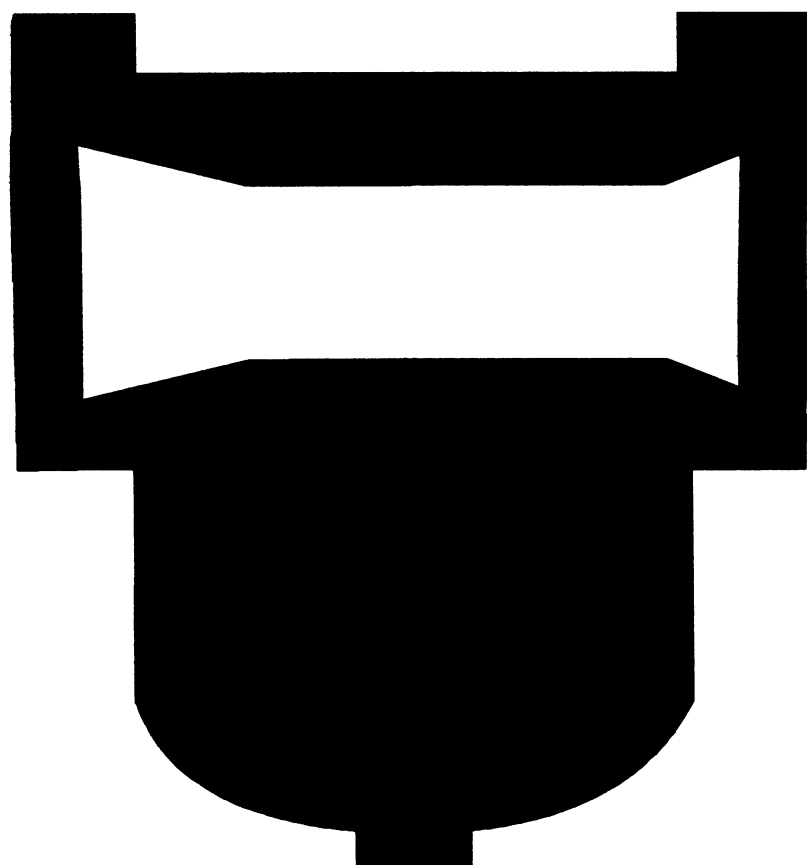
2. Fill:
 - cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" in chapter 3.
2. Check:
 - cooling system
Leaks → Repair or replace any faulty part.



THERMOSTAT

REMOVING THE THERMOSTAT

1. Drain:
 - coolant
Refer to "CHANGING COOLANT" in chapter 3.
2. Remove:
 - cylinder head
 - thermostat ①



CARB

6



CHAPTER 6 CARBURETOR

CARBURETOR	6-1
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CHECKING THE CARBURETOR	6-3
ASSEMBLING THE CARBURETOR	6-5
CHECKING THE AUTOCHOKE UNIT	6-6
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FUEL COCK	6-7
CHECKING THE FUEL COCK	6-7
REED VALVE	6-8
REMOVING THE REED VALVE	6-8
CHECKING THE REED VALVE	6-8
INSTALLING THE REED VALVE.....	6-9



EAS00480

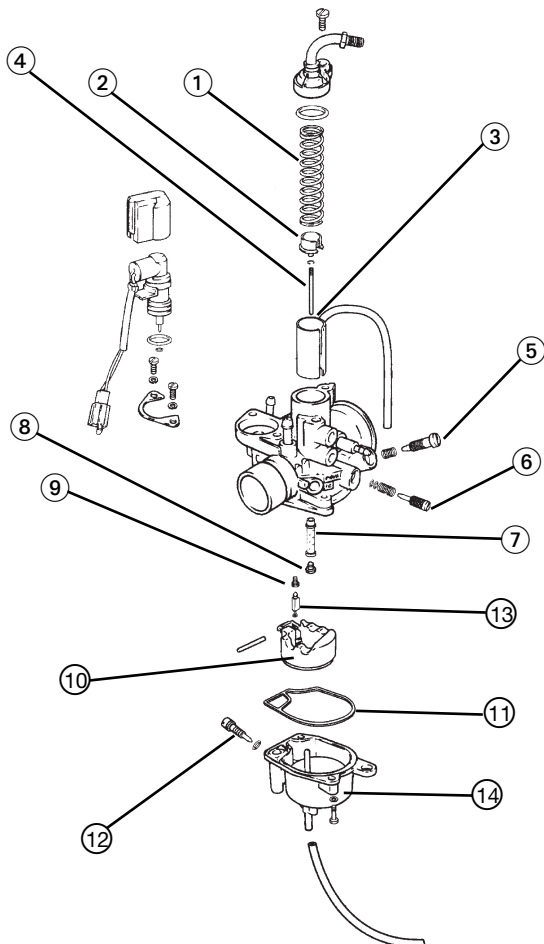
CARBURETOR

CARBURETOR

- ① Throttle valve spring
- ② Spring catch
- ③ Throttle valve
- ④ Jet needle
- ⑤ Pilot air screw
- ⑥ Throttle stop screw
- ⑦ Needle jet
- ⑧ Main jet
- ⑨ Pilot jet
- ⑩ Float
- ⑪ Float gasket
- ⑫ Drain screw
- ⑬ Needle valve
- ⑭ Float chamber

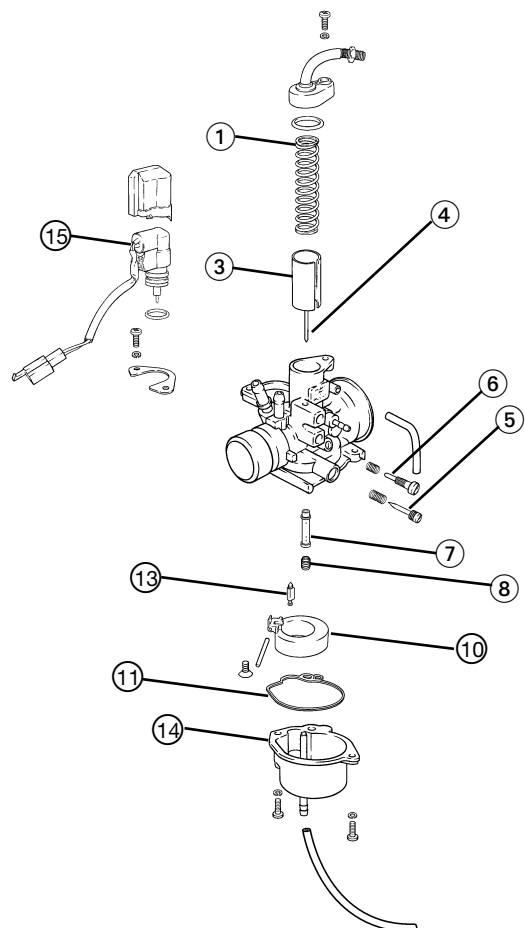
Main jet: #65
Jet needle A20 - $\frac{3}{5}$, A35 - $\frac{4}{5}$ (CS50Z)
Main air jet: \varnothing 2.5
Pilot jet: #36
Starter jet: #50
Pilot air screw: $1 \frac{3}{4} \pm \frac{1}{8}$ (CS50Z), $2 - \frac{1}{4}$
Idling speed: 1.800 r/min \pm 150

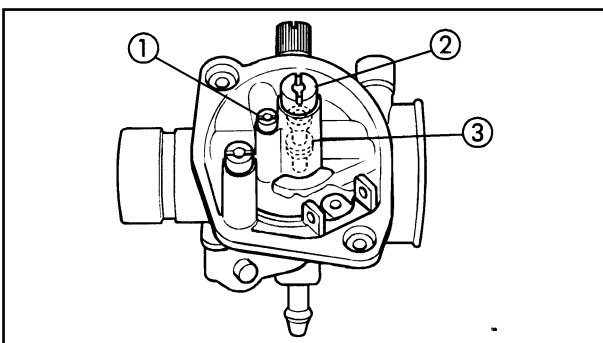
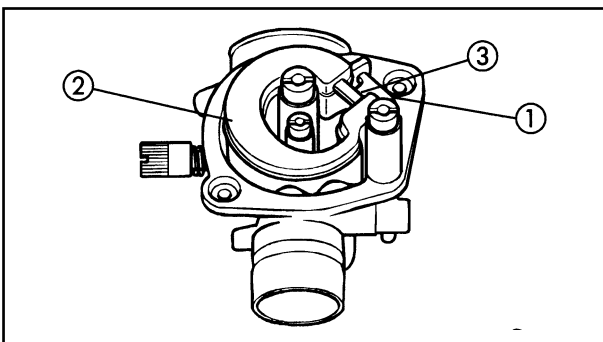
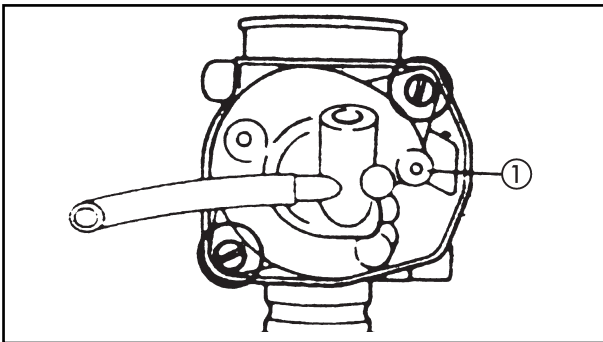
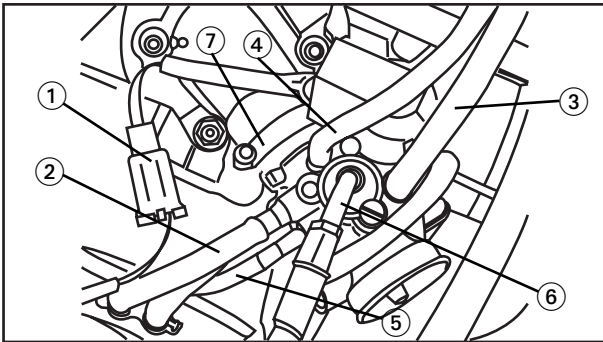
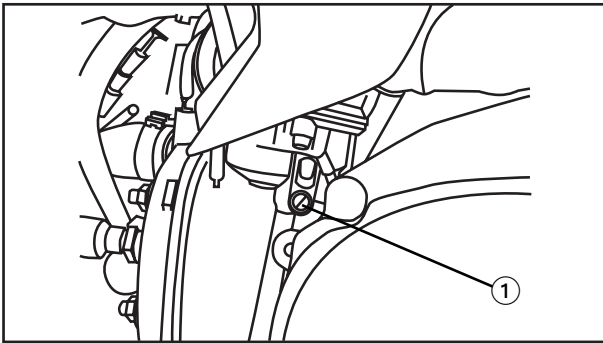
carburetor dell'orto (CS50/CS50Z)



Main jet: #62
Jet needle B10 A - $\frac{2}{3}$
Main air jet: \varnothing 2.0
Pilot jet: #38
Starter jet: #42
Pilot air screw: $1 \frac{3}{4} - 2$
Idling speed: 1.800 \pm 150 r/min

carburetor gurtner (CS50 only)





REMOVING THE CARBURETOR

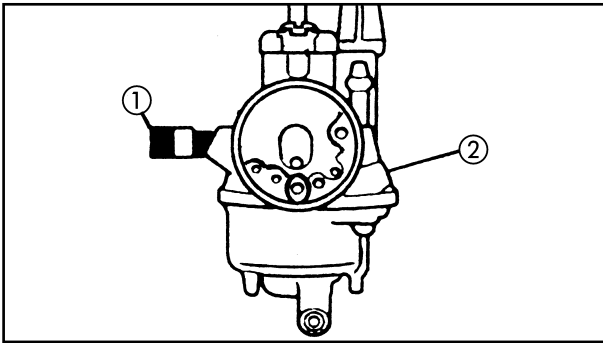
1. Remove:
 - air filter box
 - helmet box
 Refer to "REAR BODYWORK, MUD-GUARD" in chapter 3
2. Drain:
 - fuel (from drain screw ①)
 - coolant
 Refer to "CHANGING THE COOLANT" in chapter 3.
3. Disconnect:
 - autochoke lead coupler ①
 - coolant hoses ②
 - fuel hose ③
 - vacuum hose ④
 - oil delivery hose ⑤
 - throttle cable (with throttle valve) ⑥
 - clamp (fixing clip) ⑦
4. Remove:
 - carburetor

DISASSEMBLING THE CARBURETOR

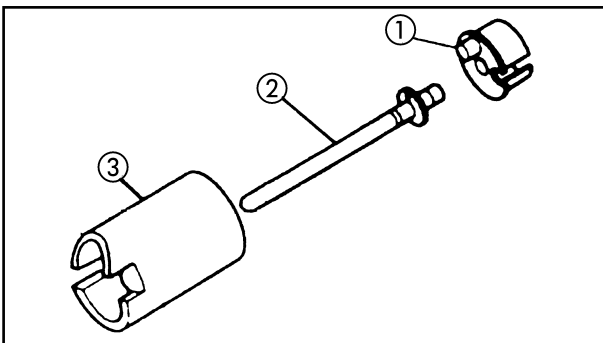
1. Remove:
 - float chamber ①
2. Remove:
 - float pin ①
 - float ②
 - needle valve ③
3. Remove:
 - pilot jet ①
 - main jet ②
 - needle jet ③

CARBURETOR

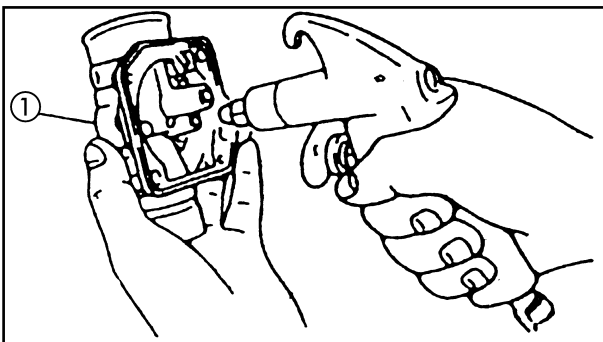
CARB



4. Remove:
 - throttle stop screw ① (with spring, washer and o-ring)
 - pilot air screw ② (with spring)



5. Remove:
 - spring seat ①
 - jet needle ②
 - throttle valve ③
 - throttle valve spring



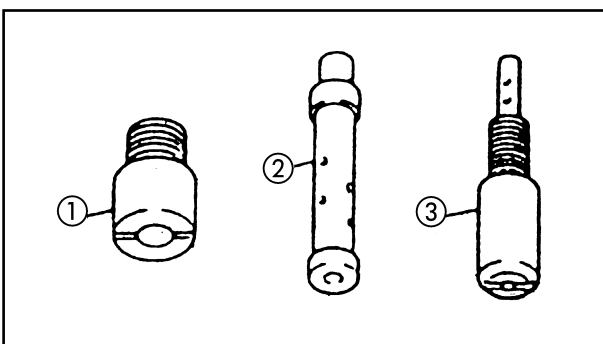
EAS00485

CHECKING THE CARBURETOR

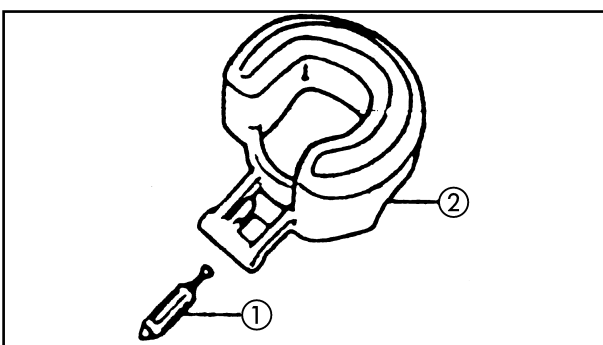
1. Check:
 - carburetor body ①
Dirty → Clean

NOTE:

For cleaning, use a petrol based solvent. Clean the pipes and jets with compressed air



2. Check:
 - main jet ①
 - needle jet ②
 - pilot jet ③
Dirty → Clean



3. Check:
 - needle valve ①
Wear/Dirty → Clean
 - float ②
Damage → Change
 - gasket Damage → Change



NOTE:

The arm of the float should be supported on the valve without compressing it.

- If the height of the float is not within the specified limits, inspect the valve and its seat.
- Substitute both parts if any part of them is worn.
- If both are in good condition, replace the float.
- Check the height of the float again.

NOTE:

The height of the float is adjusted in the factory. Do not try to modify it under any circumstances.

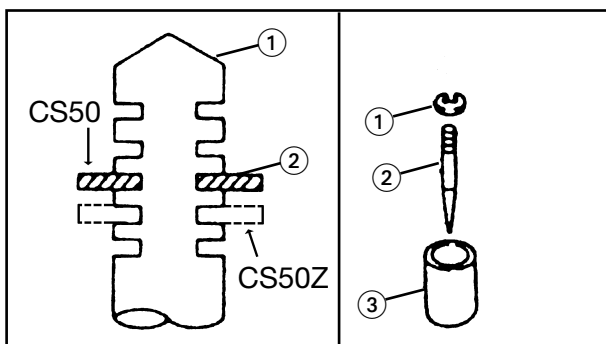
EAS00487

ASSEMBLING THE CARBURETOR

The assembly of the carburetor is carried out following the reverse procedure to "DISASSEMBLY". Bear in mind the following points:

CAUTION:

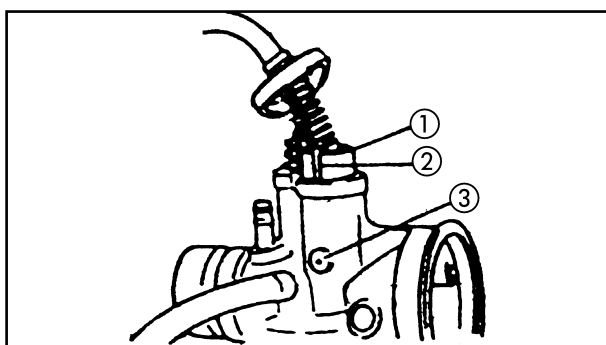
- Before assembling the carburetor, wash all of the parts in a petroleum-based solvent.
- Always use new gaskets.



1. Install:
 - jet needle ①
 - clip ②
 - throttle valve ③
 - spring seat
 - spring



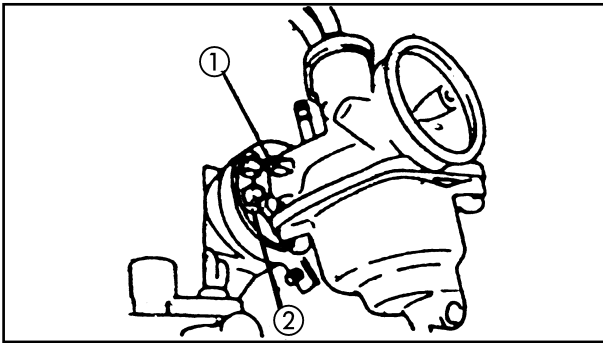
Jet needle clip position:
 CS50: 3/5 (Dell'orto)
 2/3 (Gurtner)
 CS50Z: 4/5 (Dell'orto)



2. Install:
 - throttle valve ①

NOTE:

Align the groove ② with the carburetor projection ③.



EAS00492

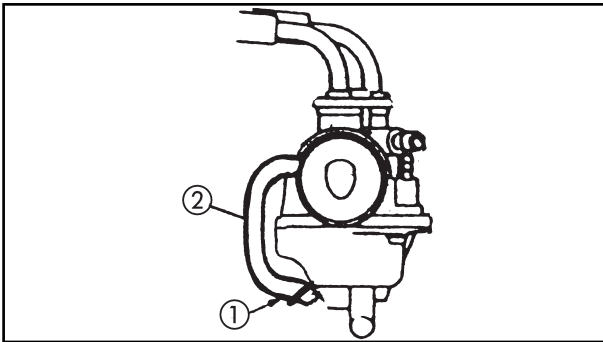
INSTALLING THE CARBURETOR

- Adjust:
 - engine idling speed



Engine idling speed
 1.650 ~ 1.950 r/min (CS50)
 1.850 ~ 2.150 r/min (CS50Z)

Refer to “ADJUSTING HE ENGINE IDLING SPEED” in chapter 3.

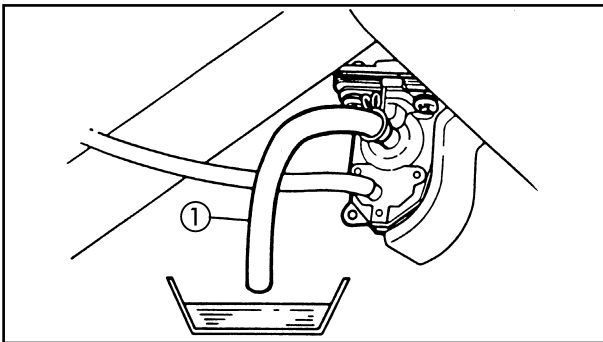


- Adjust:
 - throttle cable free play



Throttle cable free play (at the flange of the throttle grip)
 2 ~ 5 mm

Refer to “ADJUSTING HE ENGINE IDLING SPEED” in chapter 3.

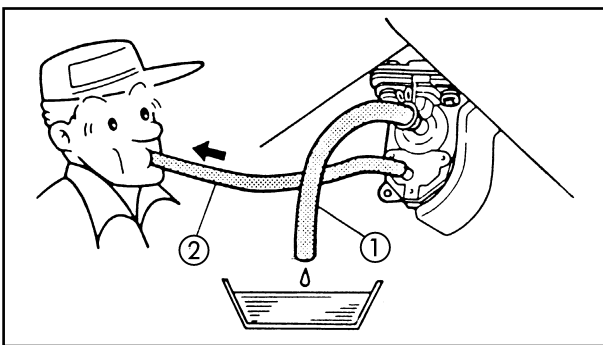


EAS00505

FUEL COCK

CHECKING THE FUEL COCK

- Stop the engine.
- Remove:
 - helmet box
Refer to chapter 3, “REAR BODYWORK, MUDGUARD” section.
- Inspect:
 - fuel cock

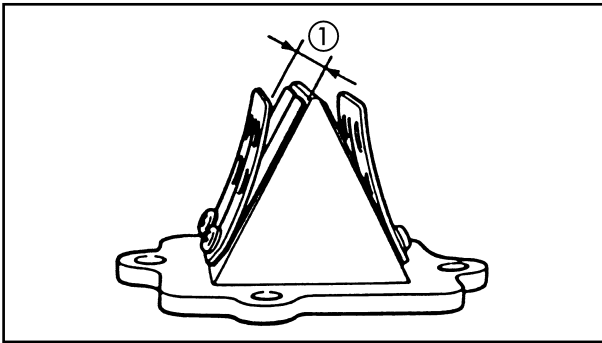


Steps for inspecting fuel cock:

- Disconnect the fuel hose ①
- Place a receptacle under the end of the fuel hose.
- Disconnect the vacuum hose ② and suction to create a vacuum
- If the fuel comes out of the fuel hose as a result of applying a vacuum and stops when the vacuum is stopped, the cock is in good condition. If not, clean or replace the vacuum hose, the fuel hose and cock.

REED VALVE

CARB

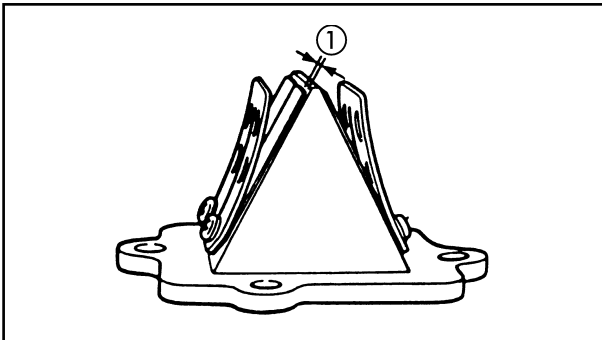


2. Measure:

- valve stopper height ①
Out of specification → Adjust the stopper/Replace the valve stopper.



Height of valve stopper ①
6.0 ~ 6.4 mm



3. Measure:

- clearance of reed valve ①
Out of specification → Replace the reed valve.



Clearance of reed valve ①
Less than 0.2 mm

INSTALLING THE REED VALVE

When the reed valve assembly is installed, reverse the removal procedure. Bear in mind the following points.

1. Install:

- gasket **New**

2. Tighten:

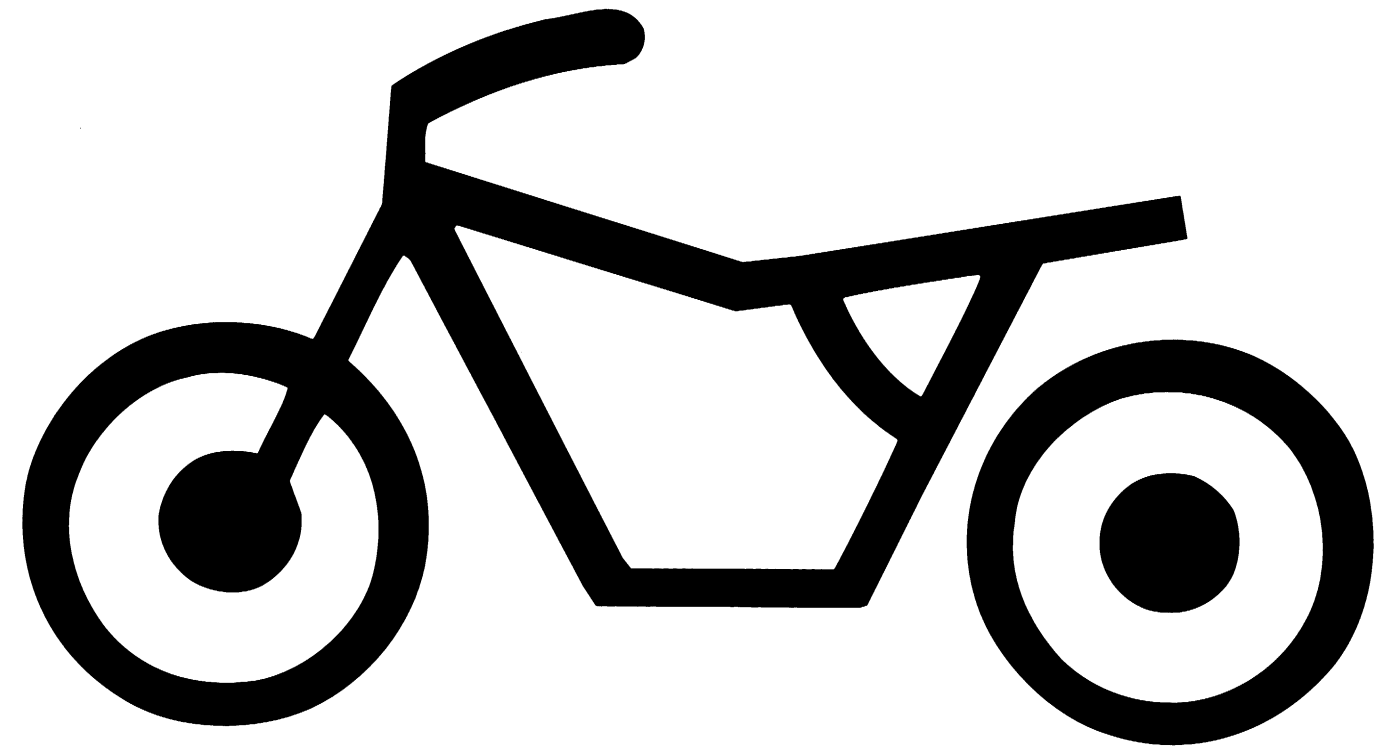
- tighten the bolts for reed valve



Reed valve
11 Nm (1.1 m • kg)

NOTE: _____

Tighten each bolt gradually to avoid it being deformed.



CHAS

7



CHAPTER 7 CHASSIS

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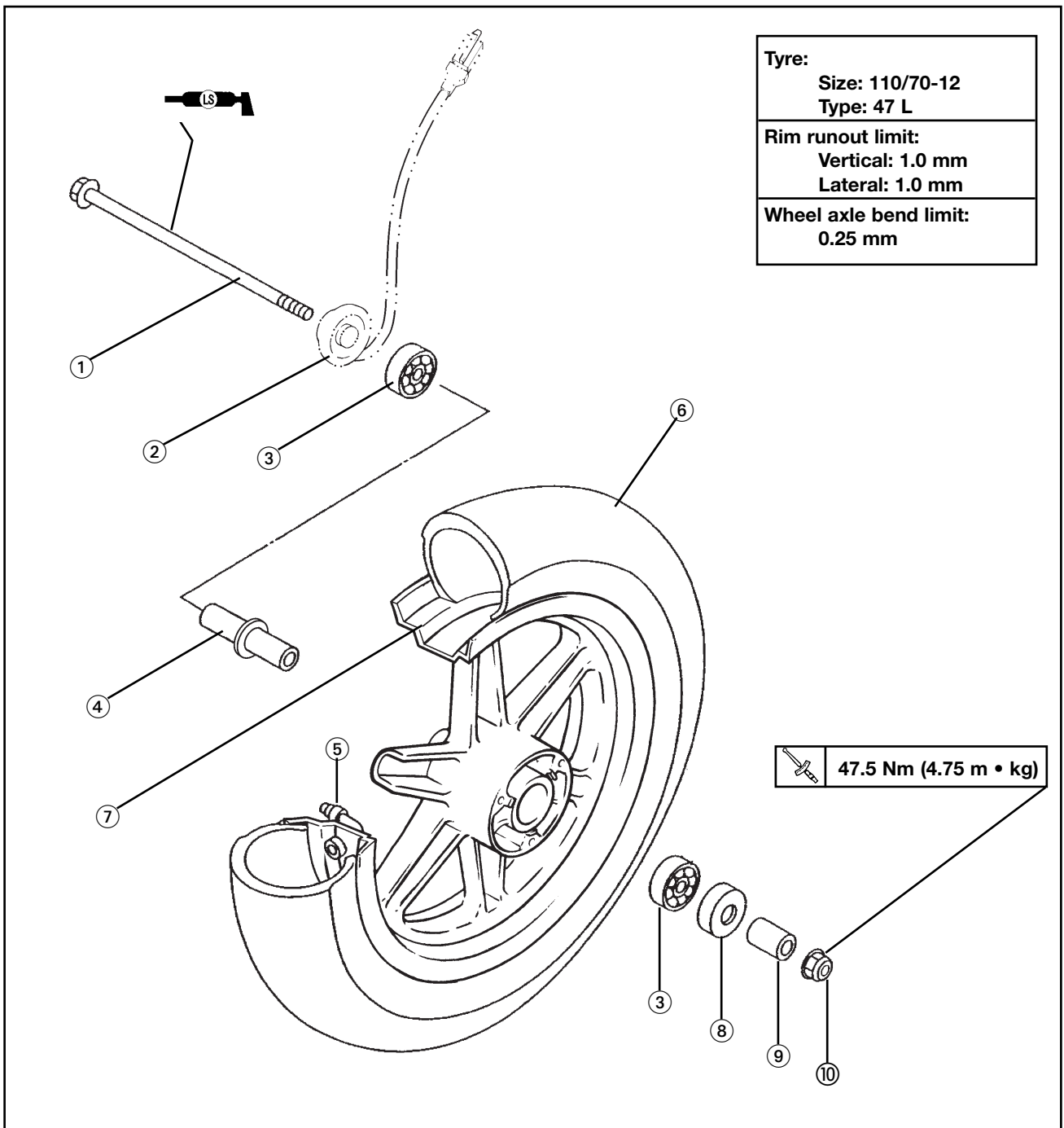


EAS00518

CHASSIS

FRONT WHEEL

- ① Wheel axle
- ② Speed sensor unit
- ③ Bearing
- ④ Collar
- ⑤ Valve
- ⑥ Tyre
- ⑦ Front rim
- ⑧ Oil seal
- ⑨ Spacer
- ⑩ Nut





EAS00520

REMOVING THE FRONT WHEEL

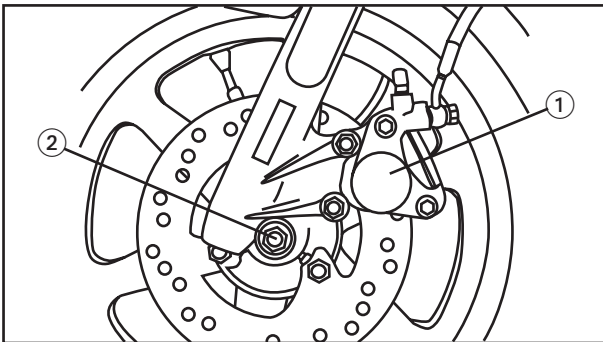
1. Stand the scooter on a level surface.

⚠ WARNING

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

NOTE:

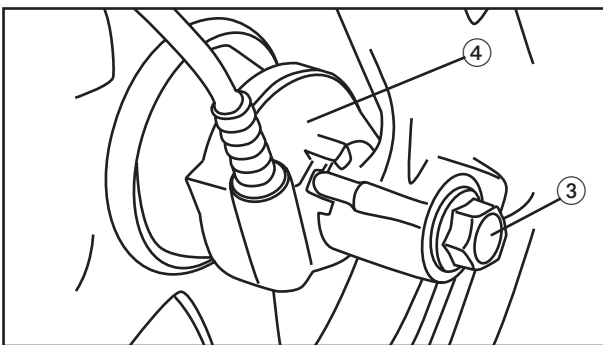
Place the scooter on a suitable stand so that the front wheel is elevated.



2. Remove:
 - brake caliper ①
 - axle nut ②

NOTE:

Do not apply the brake lever when removing the brake caliper.

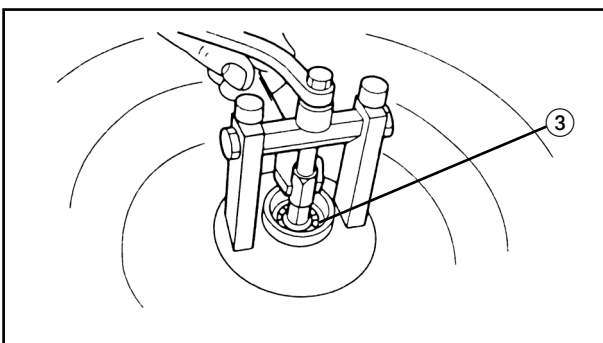
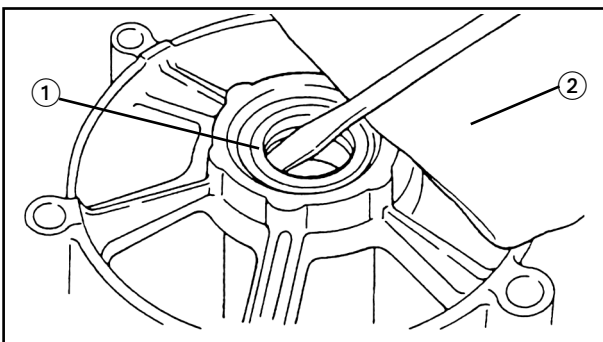
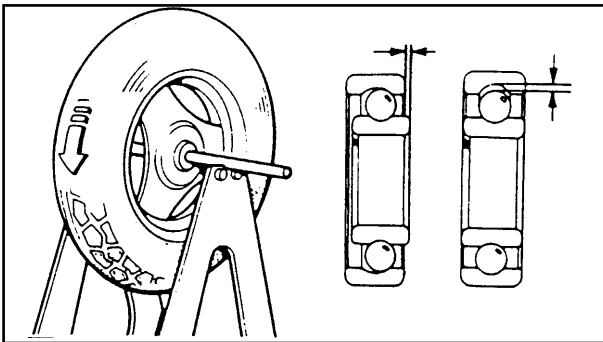
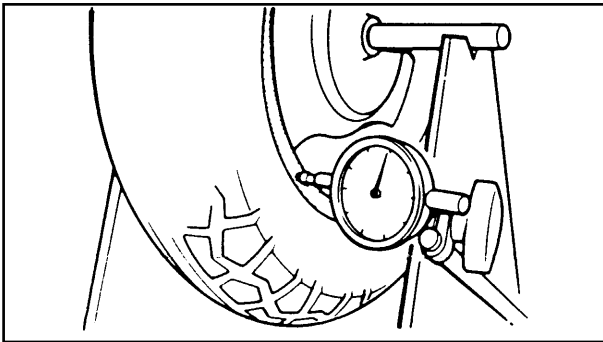
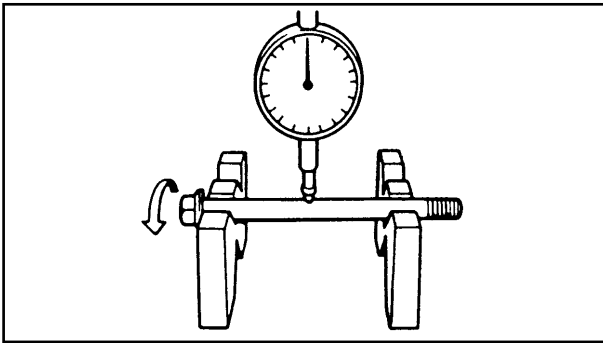


3. Elevate:
 - front wheel

NOTE:

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

4. Remove:
 - axle ③
 - speed sensor unit ④



EAS00525

CHECKING THE FRONT WHEEL

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

⚠ WARNING

Do not attempt to straighten a bent wheel axle.

2. Check:
 - tire
 - front wheel
Damage/wear → Replace.
Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.
3. Measure:
 - radial wheel runout
 - lateral wheel runout
Over the specified limits → Replace.

	Rim runout limit
	Radial: 1.0 mm
	Rim runout limit
	Lateral: 1.0 mm

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

5. Replace:
 - wheel bearings **New**
 - oil seals **New**

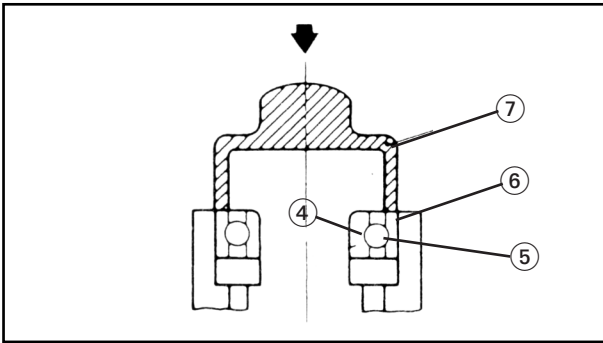


- a. Clean the outside of the front wheel hub.
- b. Remove the oil seals ① with a flat-head screwdriver.

NOTE:

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

- c. Remove the wheel bearings ③ with a general bearing puller.
- d. Install the new wheel bearings and oil seals in the reverse order of disassembly.



CAUTION:

Do not contact the wheel bearing inner race (4) or balls (5). Contact should be made only with the outer race (6).

NOTE:

Use a socket (7) that matches the diameter of the wheel bearing outer race and oil seal.



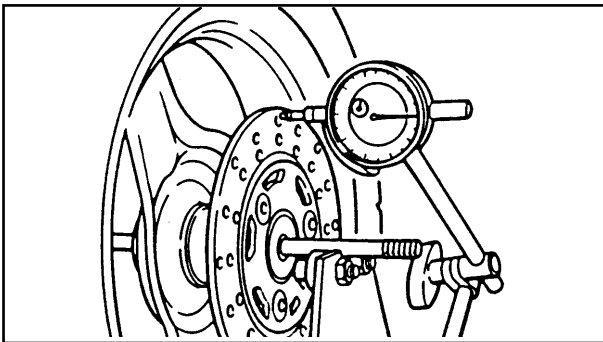
CHECKING THE SPEED SENSOR UNIT

1. Check:
 - speedometer sensor
Bends/damage/wear → Replace.
2. Check:
 - speedometer drive gear
 - speedometer driven gear
Damage/wear → Replace.

EAS00528

CHECKING THE BRAKE DISC

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

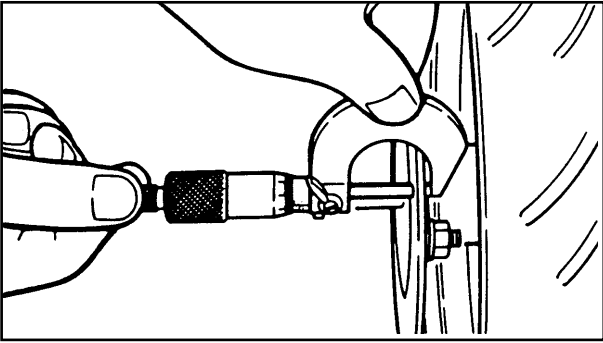


Brake disc deflection limit (maximum)
0.25 mm



- a. Place the scooter on a suitable stand so that the front wheel is elevated.
- b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Hold the dial gauge at a right angle against the brake disc surface.
- e. Measure the deflection below the edge of the brake disc.





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

	Brake disc thickness limit (minimum) 3.0 mm
---	--

4. Adjust:
- brake disc deflection




- Remove the brake disc.
- Rotate the brake disc by one bolt hole.
- Install the brake disc.

NOTE: _____

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



	Brake disc bolt 23 Nm (2.3 m•kg) LOCTITE®
---	--

- Measure the brake disc deflection.
- If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.
- If the brake disc deflection cannot be brought within specification, replace the brake disc.



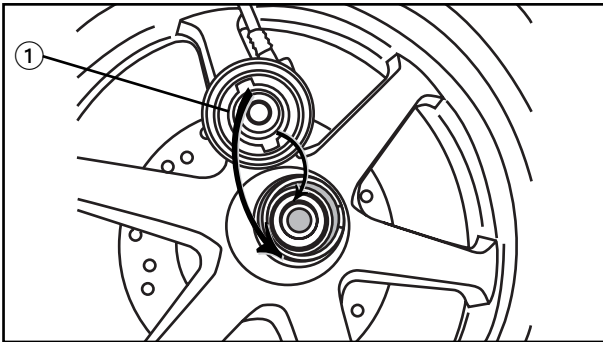


EAS00542

INSTALLING THE FRONT WHEEL

1. Lubricate:
 - wheel axle
 - wheel bearings
 - oil seal lips
 - speedometer drive gear
 - speedometer driven gear

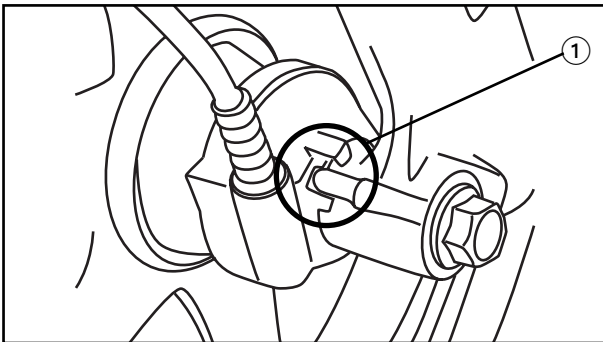
	Recommended lubricant Lithium-soap-based grease
--	--



2. Install:
 - speed sensor unit ①

NOTE: _____

Make sure the speed sensor unit and the wheel hub are installed with the two projections engaged into the flat surface of the wheel.



3. Install:
 - front wheel

NOTE: _____

Make sure the slot in the speed sensor unit fits over the stopper on the outer tube ①.

4. Tighten:
 - wheel axle
 - brake caliper bolts

	47.5 Nm (4.75 m • kg)
--	------------------------------

	23 Nm (2.3 m • kg)
--	---------------------------

⚠ WARNING _____

Make sure the brake hose is routed properly.

CAUTION: _____

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

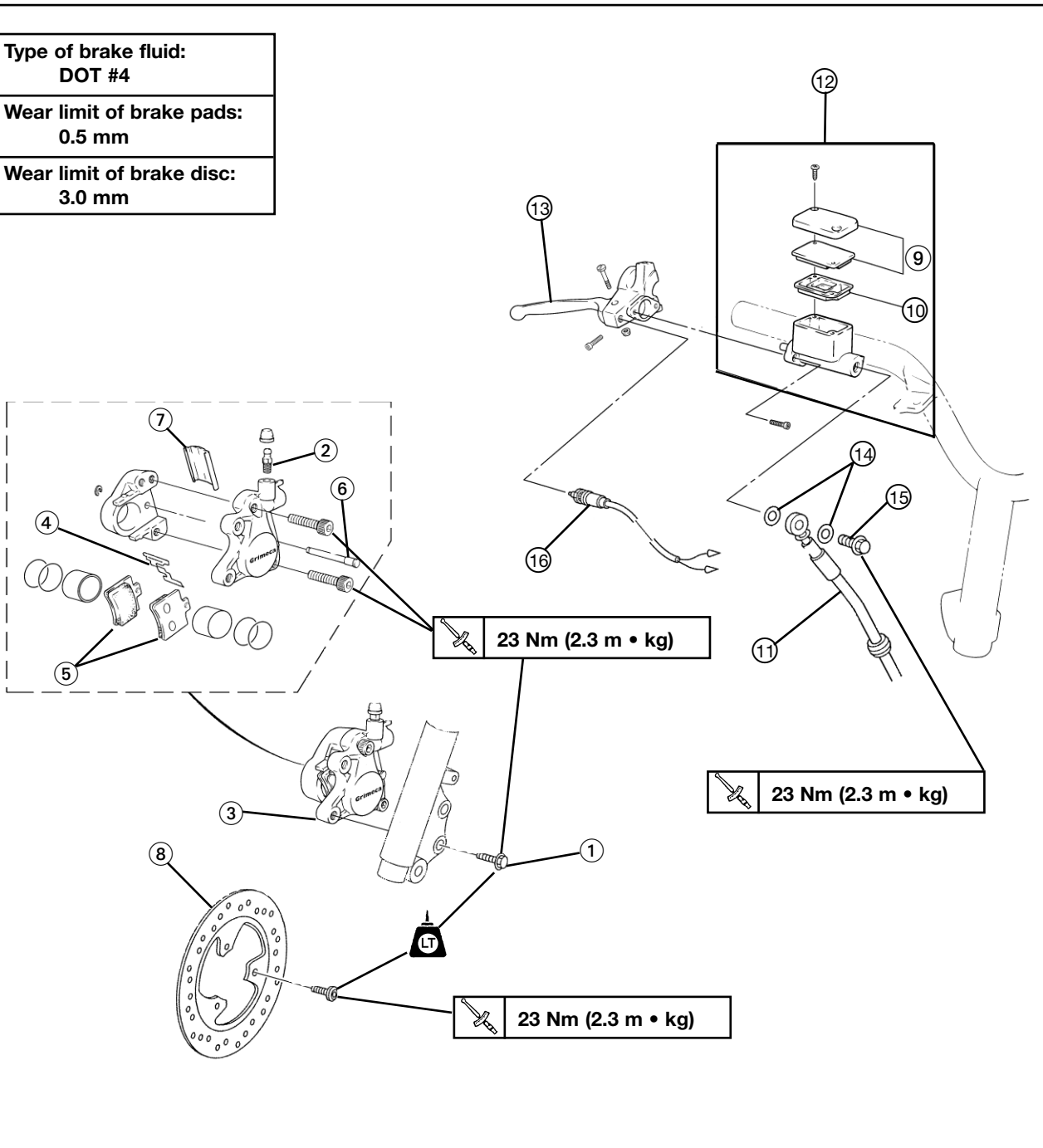


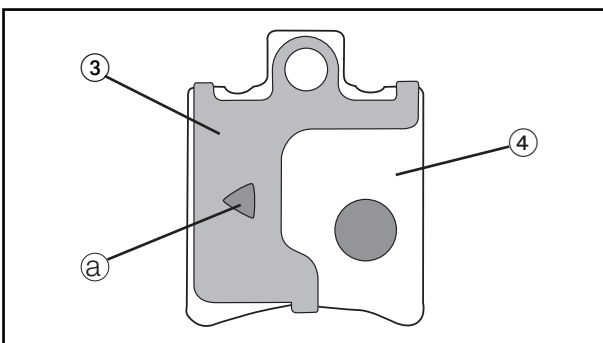
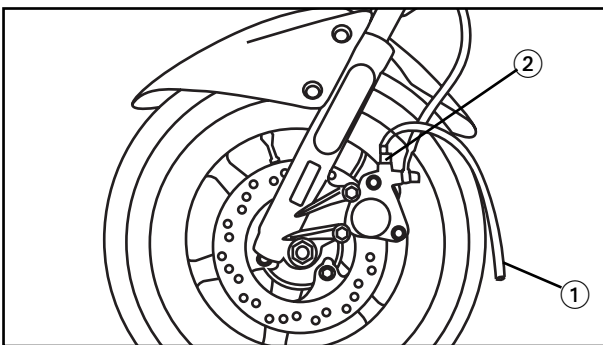
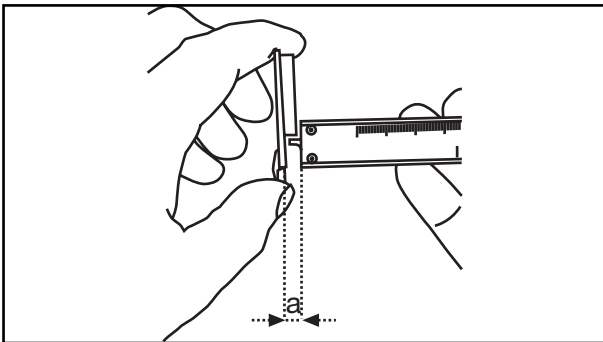
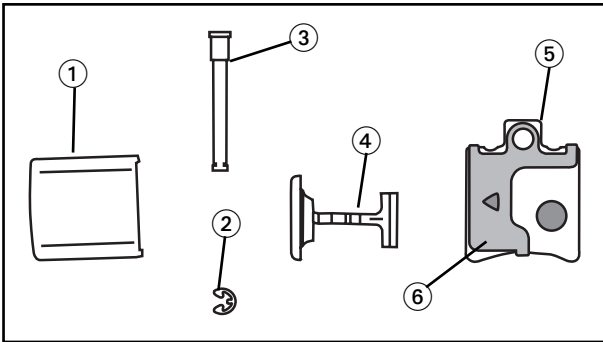
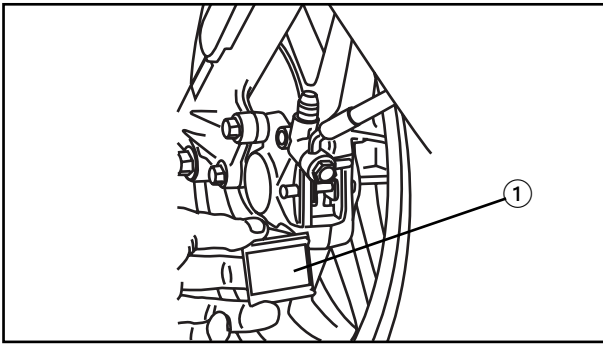
EAS00576

FRONT BRAKE

- ① Retaining bolt
- ② Air bleed screw
- ③ Caliper assembly
- ④ Pad spring
- ⑤ Pad set
- ⑥ Retaining pin
- ⑦ Brake pad cover
- ⑧ Brake disc
- ⑨ Master cylinder cap
- ⑩ Diaphragm
- ⑪ Brake hose
- ⑫ Brake pump assy
- ⑬ Front brake lever
- ⑭ Copper washers
- ⑮ Union bolt
- ⑯ Brake light switch cable

Type of brake fluid: DOT #4
Wear limit of brake pads: 0.5 mm
Wear limit of brake disc: 3.0 mm





EAS00583

REPLACING THE FRONT BRAKE PADS

NOTE:

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

1. Remove:

- brake pad cover ①
- brake pad clip ②
- brake pad pin ③
- brake pad spring ④

2. Remove:

- brake pads ⑤
(along with the brake pad shims ⑥)

3. Measure:

- brake pad wear limit @
Out of specification → Replace the brake pads as a set.



Brake pad wear limit
0.5 mm

4. Install:

- brake pad shims
(onto the brake pads)
- brake pads
- brake pad spring

NOTE:

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

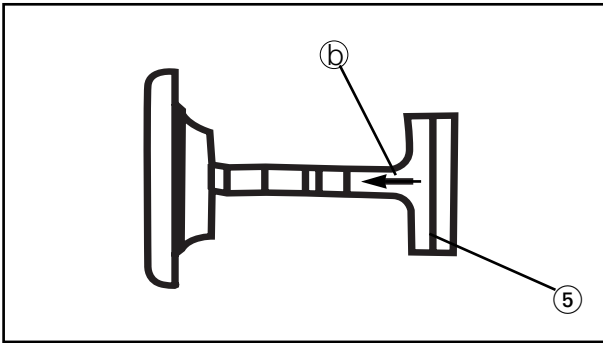


- Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.
- Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
- Tighten the bleed screw.



Bleed screw
6 Nm (0.6 m• kg)

- Install a new brake pad shim ③ onto each new brake pad ④.



NOTE:

The triangle mark (a) on the brake pad shim must point in the direction of disc rotation.

- e. Install new brake pads and a new brake pad spring (5).

NOTE:

The arrow mark (b) of the brake pad spring must point in the direction of disc rotation.



5. Install:

- brake pad pins
- brake pad clips
- brake pad cover

6. Check:

- brake fluid level
Below the minimum level mark → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

7. Check:

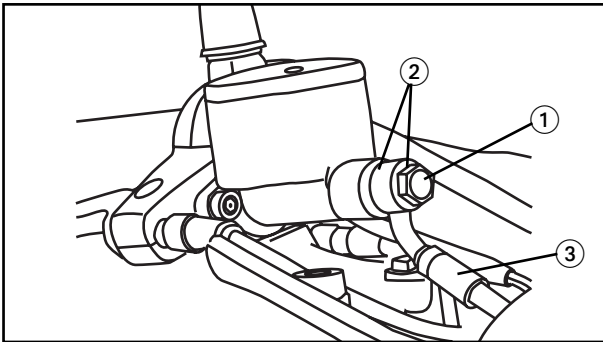
- brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



REMOVING THE BRAKE HOSE

NOTE: _____

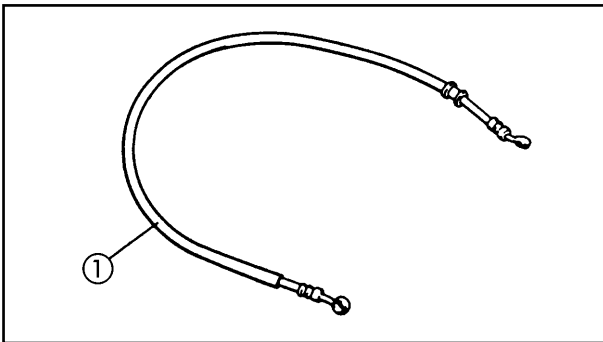
Before replacing the brake hose, drain the brake fluid from the entire brake system.

**1. Remove:**

- union bolt ①
- copper washers ②
- brake hose ③

NOTE: _____

To collect any remaining brake fluid, place a container under the end of the brake hose.



CHECKING THE BRAKE HOSE

1. Check:

- brake hoses ①
cracks/damage/wear → Replace.



EAS00596

INSTALLING THE BRAKE HOSE

⚠ WARNING

- Never use solvents on internal brake components.



**Recommended brake fluid
DOT #4**

1. Install:
 - copper washers **New**
 - brake hose
 - union bolt



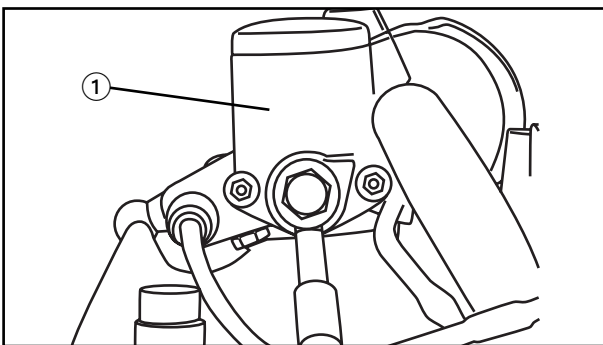
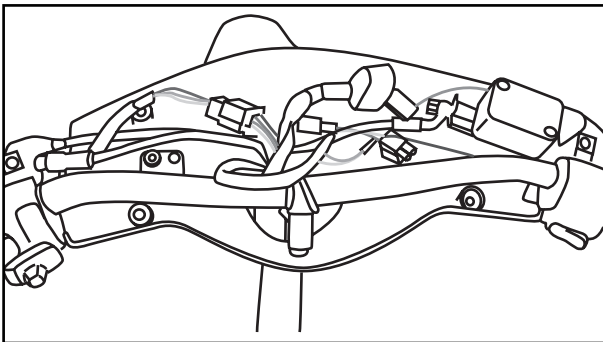
23 Nm (2.3 m • kg)

⚠ WARNING

Proper brake hose routing is essential to insure safe scooter operation. Refer to “CABLE ROUTING”.

NOTE:

- While holding the brake hose, tighten the union bolt.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



**Recommended brake fluid
DOT #4**

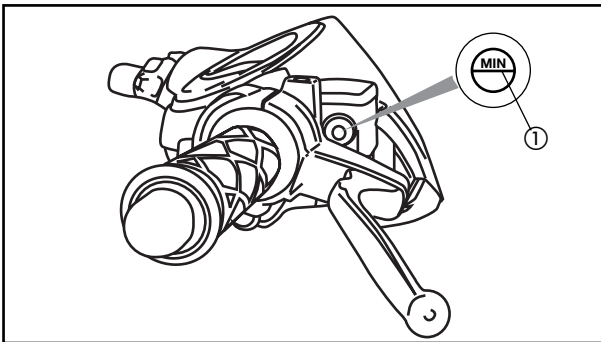
2. Fill:
 - brake master cylinder reservoir ① (with the specified amount of the recommended brake fluid)

**⚠ WARNING**

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

CAUTION:

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



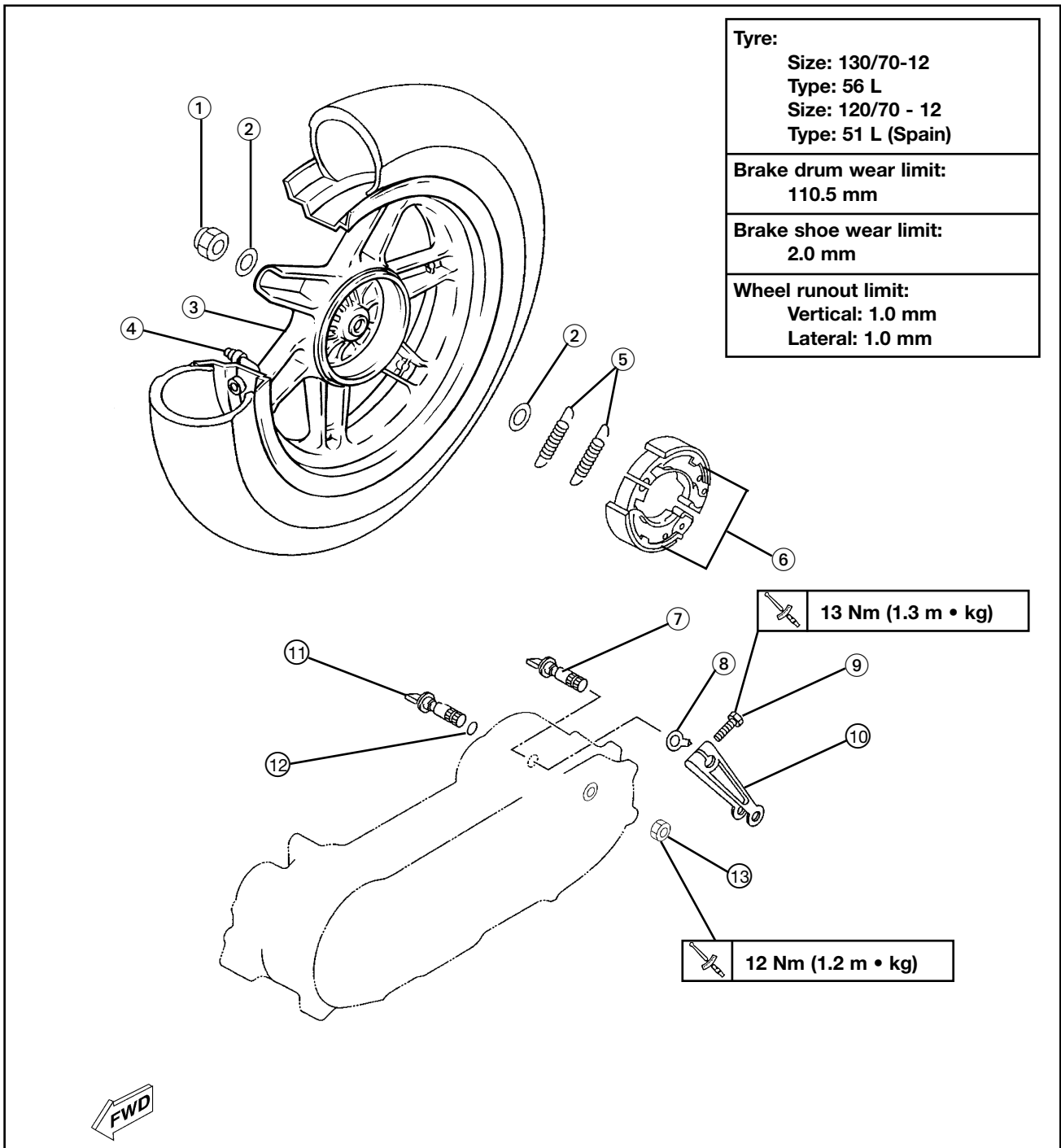
4. Bleed:
 - brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
5. Check:
 - brake fluid level
Below the minimum level mark ① → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
6. Check:
 - brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

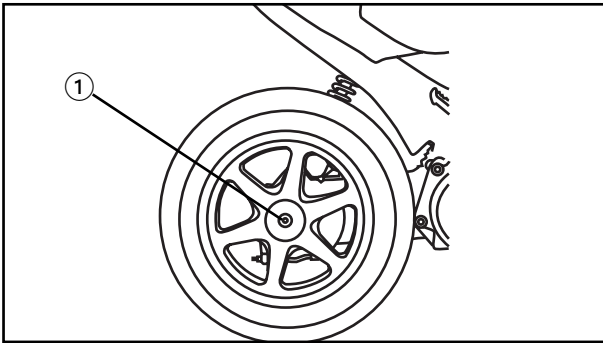


EAS00560

REAR WHEEL

- ① Nut
- ② Washer
- ③ Rear rim
- ④ Valve
- ⑤ Return springs
- ⑥ Brake shoes
- ⑦ Brake camshaft
- ⑧ Wear indicator
- ⑨ Bolt
- ⑩ Brake camshaft lever
- ⑪ Axle
- ⑫ O-ring
- ⑬ Nut





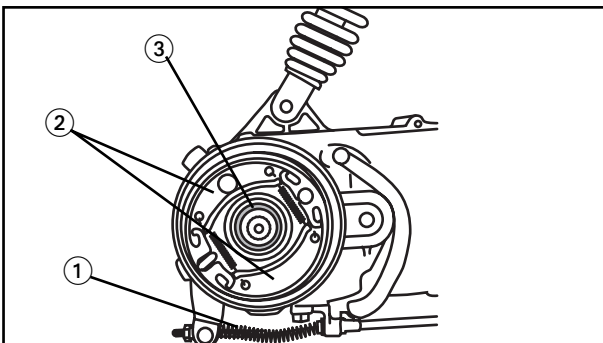
EAS00564

REMOVING THE REAR WHEEL

1. Remove:
 - exhaust pipe assembly
2. Loosen:
 - rear axle nut ①

NOTE: _____

When the axle nut is loosened, apply rear brake.



3. Remove:
 - rear wheel
4. Remove:
 - rear brake cable ①
 - brake shoes ②
 - plain washer ③

EAS00565

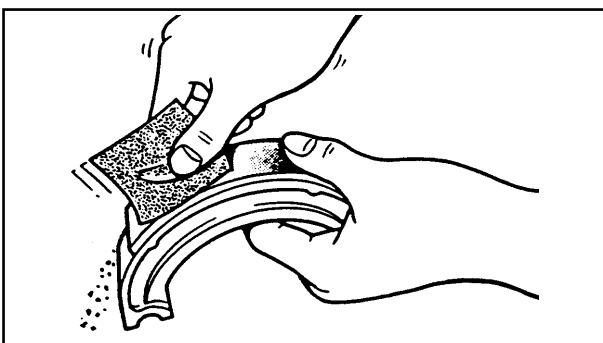
CHECKING THE REAR WHEEL

1. Inspect:
 - wheel
See "CHECKING THE FRONT WHEEL" section
2. Measure:
 - wheel runout
See "CHECKING THE FRONT WHEEL" section



Rim runout limits
Vertical: 1.0 mm
Lateral: 1.0 mm

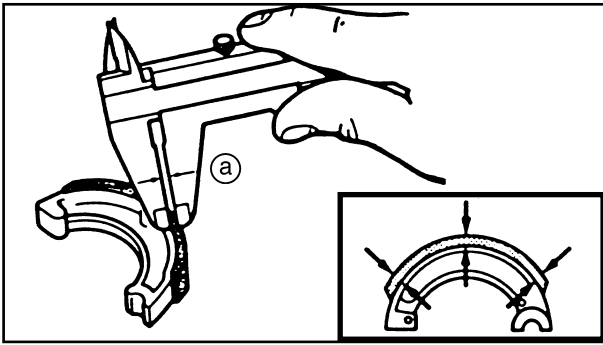
3. Check:
 - wheel bearings
See "CHECKING THE FRONT WHEEL" section



4. Inspect:
 - brake shoes Crystallisation → Polish with sand paper.

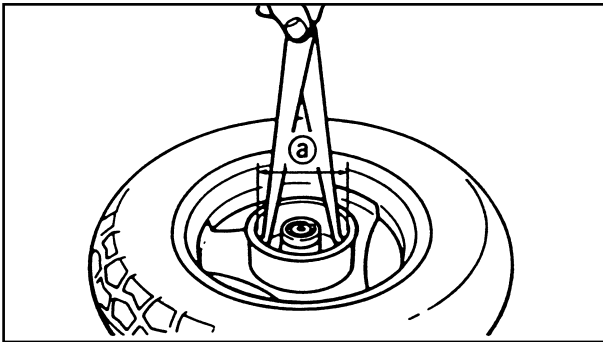
NOTE: _____

After using sand paper, clean the polished particles with a cloth.



5. Measure:
- Thickness of brake shoes (a)
Outside specified value → Change

	<p>Brake shoes thickness 4.0 mm <Limit>: 2.0 mm</p>
--	--



6. Inspect:
- Drum brake inner surface
Oil/Scratches → Replace

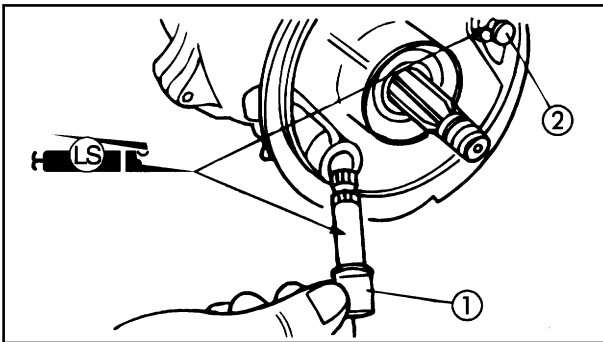
7. Measure
- Drum brake inner diameter (a):
Out of specification → Replace

	<p>Wear limit of brake drum 110.5 mm</p>
--	---

EAS00570

ASSEMBLING THE BRAKE SHOES

When the brake shoe carrier plate is assembled, reverse the removal procedure. Bear in mind the following points.



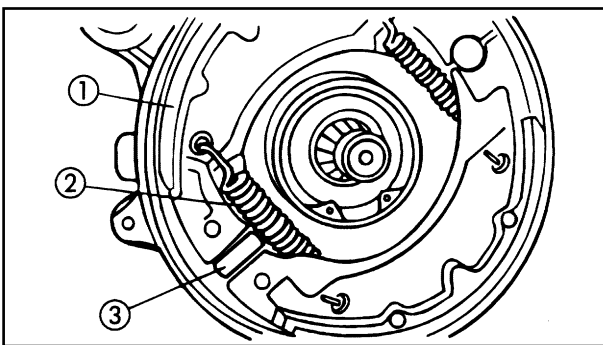
1. Install:
- brake cam (1)

NOTE: _____

Apply Grease with a lithium soap base on the brake cam (1) and pin (2).

CAUTION: _____

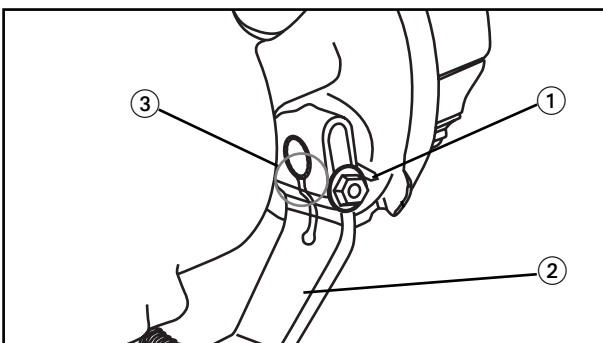
After installing the brake cam, remove excess grease.



2. Install:
- brake shoes (1)
 - return spring (2)

NOTE: _____

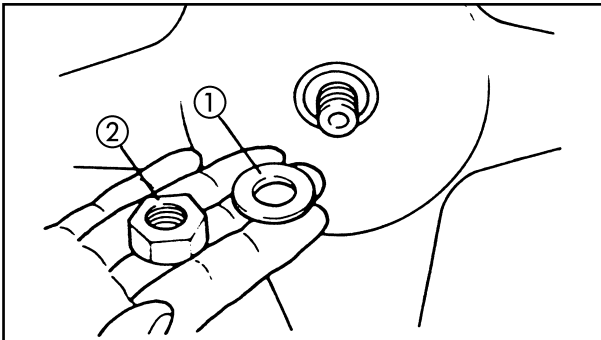
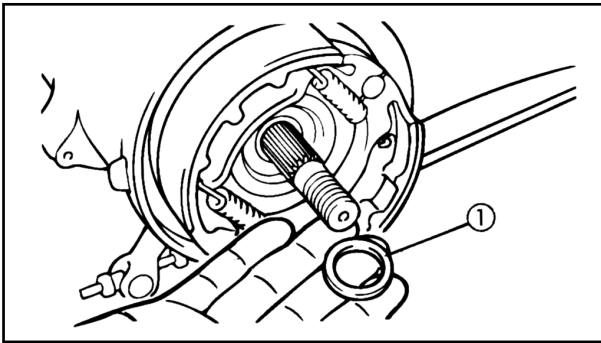
Install with the mark (3) outwards.



3. Install:
- wear indicator (1)
 - cam lever (2)

NOTE: _____

- Align the projection of the wear indicator (1) with the line as shown.
- Align the punch marks (3).



Bolt (cam lever)
10 Nm (1.0 m • kg)

4. Install:
- plain washer ①
 - brake cable

EAS00574

INSTALLING THE REAR WHEEL

When installing the rear wheel, reverse the removal procedure.

The following points should be remembered.

1. Install:
- rear wheel
 - plain washer ①
 - nut ②



Nut (Rear wheel axle)
125Nm (12.5 m • kg)

2. Install:
- muffler



Bolt (exhaust pipe side)
9 Nm (0.9 m • kg)
Bolt (muffler side)
26 Nm (2.6 m • kg)

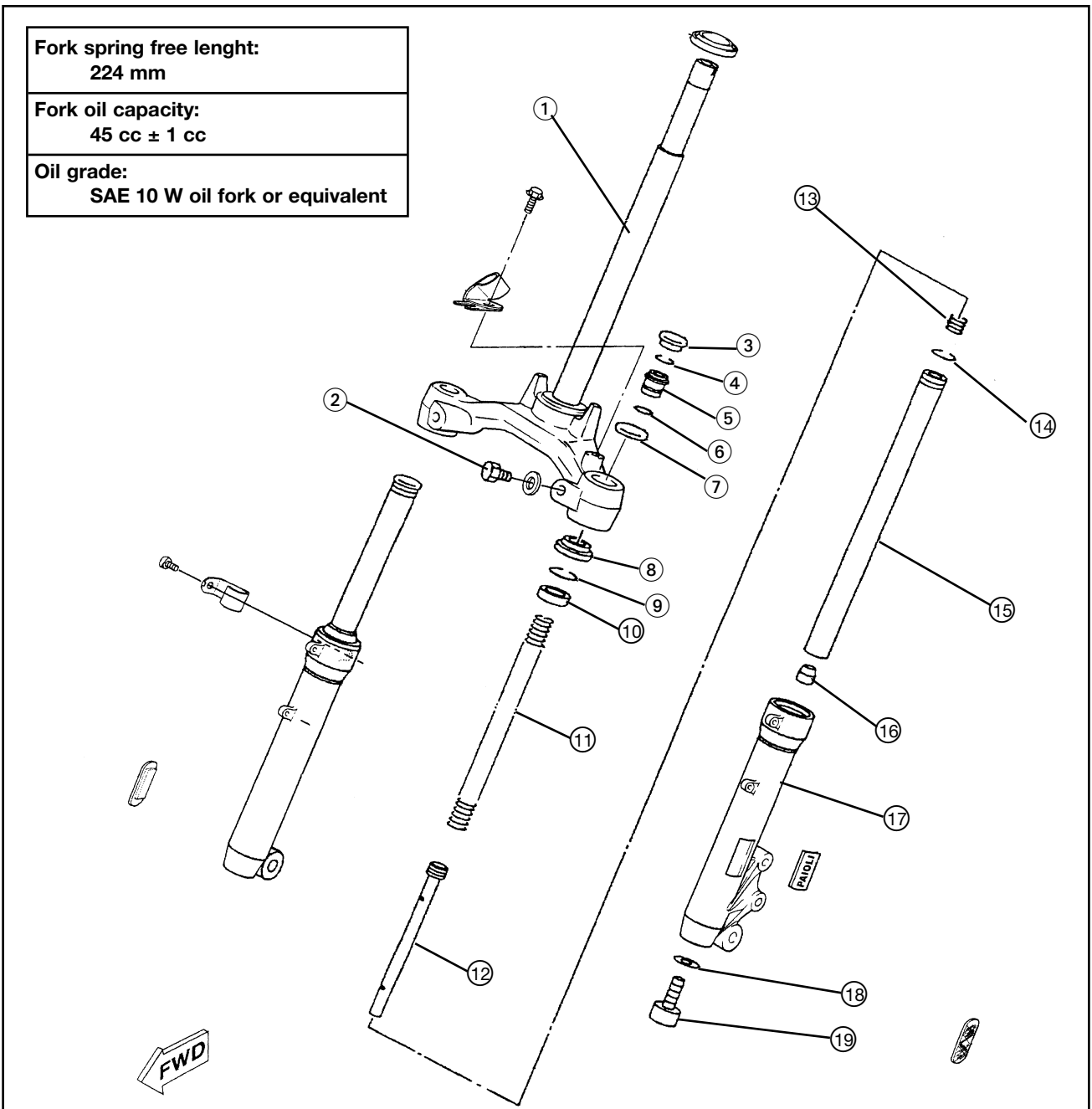
3. Adjust:
- free play of rear brake lever
Refer to “CHECKING FREE PLAY OF REAR BRAKE LEVER”, in chapter 3.



EAS00646

FRONT FORK

- ① Steering bracket
- ② Bolt
- ③ Rubber cap
- ④ Circlip
- ⑤ Spring stopper
- ⑥ O-ring
- ⑦ Collar
- ⑧ Dust seal
- ⑨ Oil seal circlip
- ⑩ Oil seal
- ⑪ Spring
- ⑫ Piston
- ⑬ Rebound spring
- ⑭ Circlip
- ⑮ Inner tube
- ⑯ Oil lock piece
- ⑰ Outer tube
- ⑱ Washer
- ⑲ Bolt

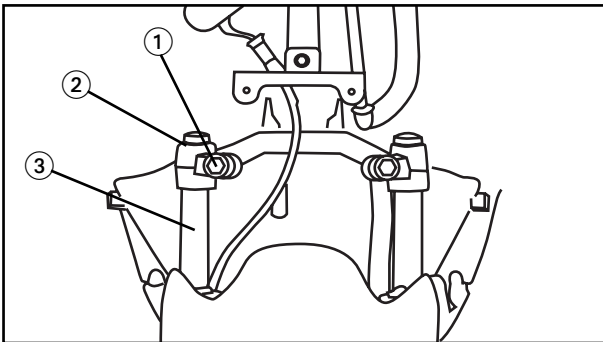




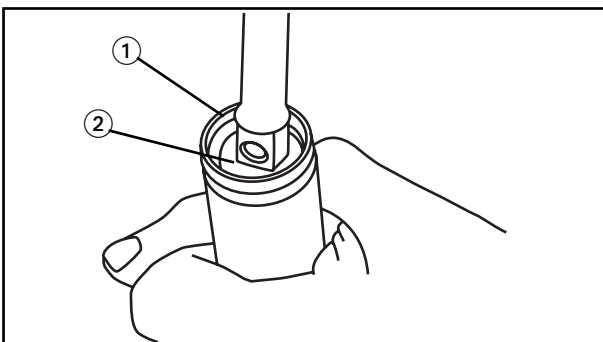
EAS00651

REMOVING THE FRONT FORK LEGS

1. Place the scooter on its central stand and place an adequate support under the engine
2. Remove:
 - brake calipers
Refer to “FRONT BRAKE REMOVAL” section.
3. Remove:
 - front fender
 - front wheel
See “FRONT WHEEL REMOVAL” section.
4. Remove:
 - front upper cowl
Refer to “FRONT BODYWORK, MUD-GUARD” in chapter 3.



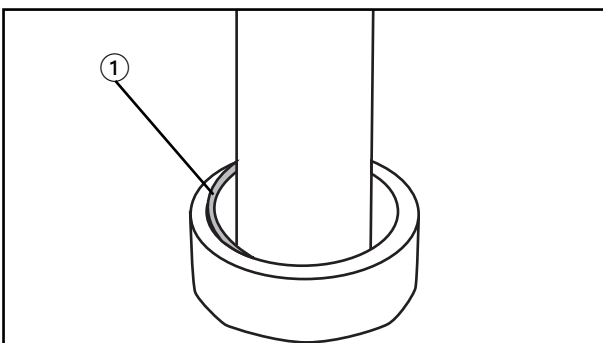
5. Loosen:
 - pinch bolt ① (fork)
6. Remove:
 - circlip ②
 - front fork ③

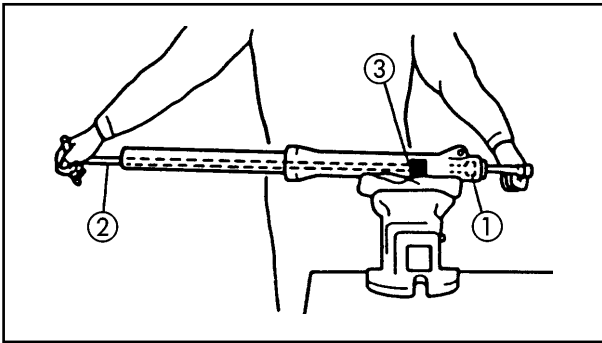


EAS00652

DISASSEMBLING THE FRONT FORK LEGS

1. Remove:
 - rubber cap
 - circlip ①
 - spring stopper ②
 - collar
 - fork spring
2. Drain:
 - fork oil
3. Remove:
 - dust seal
 - circlip ①





4. Remove:
- bolt (hydraulic rod) ①
 - copper washer

NOTE:

Remove the bolt (hydraulic rod) while the hydraulic rod is held with the T-handle ② and a support ③



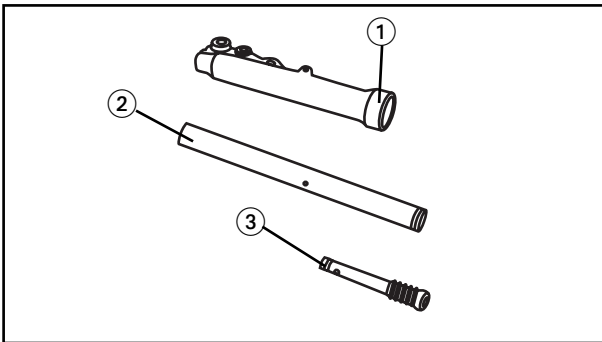
T-handle:
90890-01326
Support:
90890-01294

5. Remove:
- inner tube
 - piston (hydraulic rod)
 - rebound spring
 - oil lock piece
 - oil seal (outer tube)

EAS00657

CHECKING THE FRONT FORK LEGS

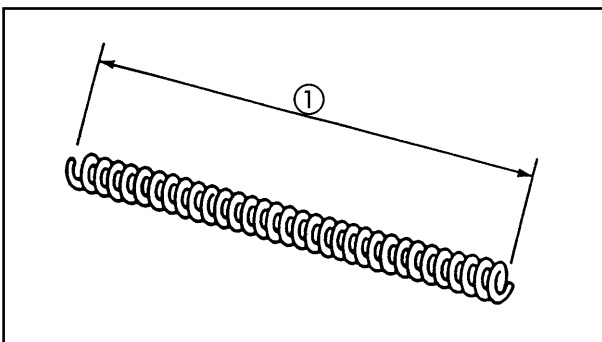
1. Check:
- outer tube ①
 - inner tube ②
 - piston (hydraulic rod) ③
- Striping/Warping/Wear/Damage → Replace



⚠ WARNING

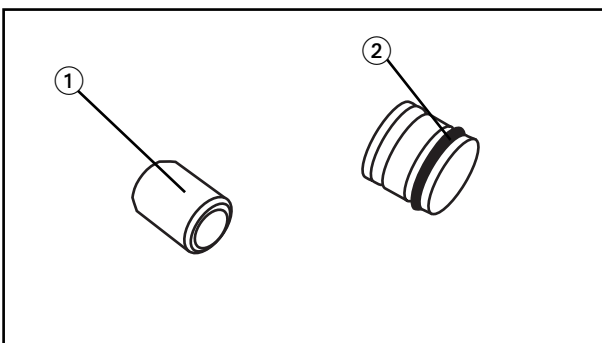
Do not try to straighten an outer tube or an inner tube as this may dangerously weaken the tube.

2. Measure:
- fork spring
- Above specified limit → Replace



Fork spring free length ①
224 mm

3. Inspect:
- oil lock piece ①
 - o-ring (spring stopper) ②
- Wear/Damage → Replace





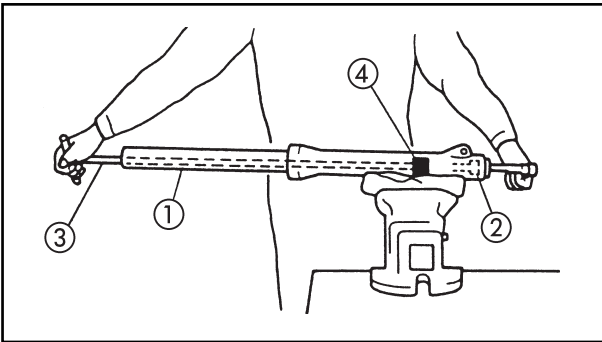
EAS00658

ASSEMBLING THE FRONT FORK LEGS

Reverse the disassembly procedure. Bear in mind the following points.

NOTE:

- When assembling the fork, ensure that the following new parts are used.
- Oil seal
- Circlips
- Ensure that all components are clean before assembly.



1. Install:

- oil lock piece
- piston (hydraulic rod)
- inner tube ①
- copper washer (new)
- bolt (hydraulic rod) ②



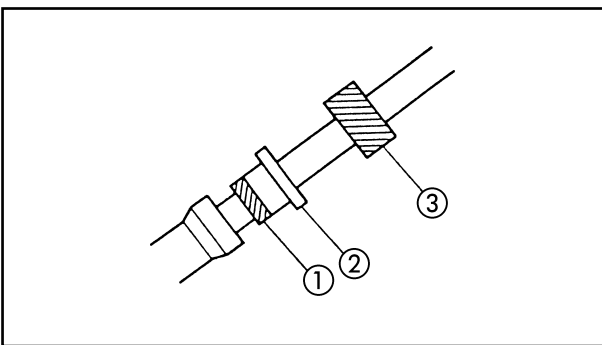
Bolt (hydraulic rod)
23 Nm (2.3 m • kg)
LOCTITE®

NOTE:

Tighten the bolt (hydraulic rod) while supporting the outer tube with the T-handle ③ and the support ④.



T-handle
90890-01326
Support:
90890-01294



2. Install:

- oil seal ①
- Use a counterbalance for installing fork seals ③ and an adaptor ②.



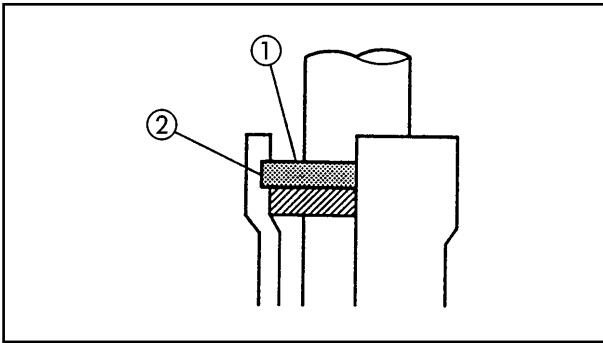
Counterbalance for installing oil seals
90890-01184
Adaptor:
90890-01186

NOTE:

Before installing the oil seal, apply grease with a lithium soap base on the edges of same.

CAUTION:

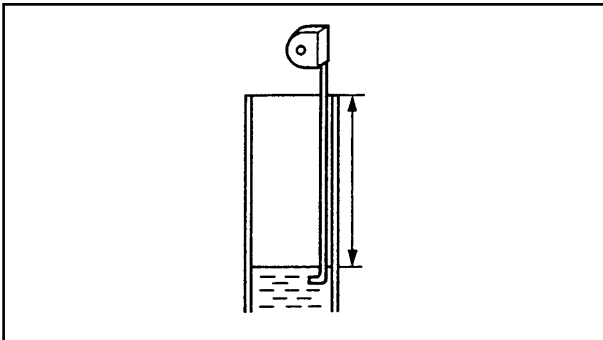
Ensure that the numbered side of the seal is facing upwards.



3. Install:
- circlip ①
 - dust seal

NOTE: _____

Couple the circlip correctly on the groove of the outer tube ②.



4. Fill:
- fork oil



Quantity (each front fork leg)
45 cc
Recommended oil
SAE 10W or equivalent



From fork leg oil level (from the top of the inner tube, with the inner tube fully compressed and without the fork spring)
105 mm

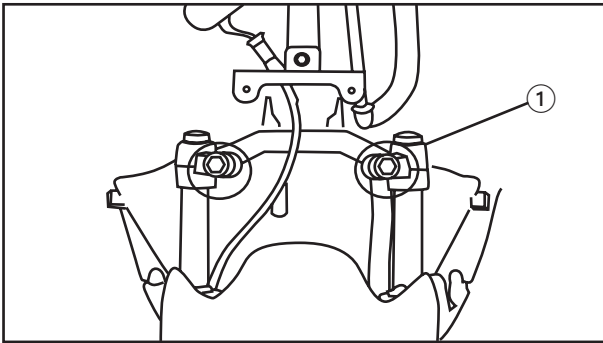
NOTE: _____

Place the fork in a vertical position.

5. Install:
- fork spring
 - collar
 - spring stopper
 - circlip
 - rubber cap

NOTE: _____

- Before installing the spring stopper, apply grease to the o-ring.
 - Couple the circlip correctly on the inner tube groove.
-



EAS00663

INSTALLING THE FRONT FORK LEGS

Reverse the removal procedure.

The following points should be remembered

1. Install:
 - front fork
 - circlip ①

NOTE:

Attach the circlip correctly on the inner tube groove.

2. Tighten:

- pinch bolt (steering bracket):



Pinch bolt (steering bracket)
30 Nm (3.0 m • kg)

3. Install:

- front wheel
- brake calliper
- brake hose holder
- speed sensor coupler
See "FRONT WHEEL" section
- front mudguard
Refer to "FRONT BODYWORK MUD-GUARD" in chapter 3.



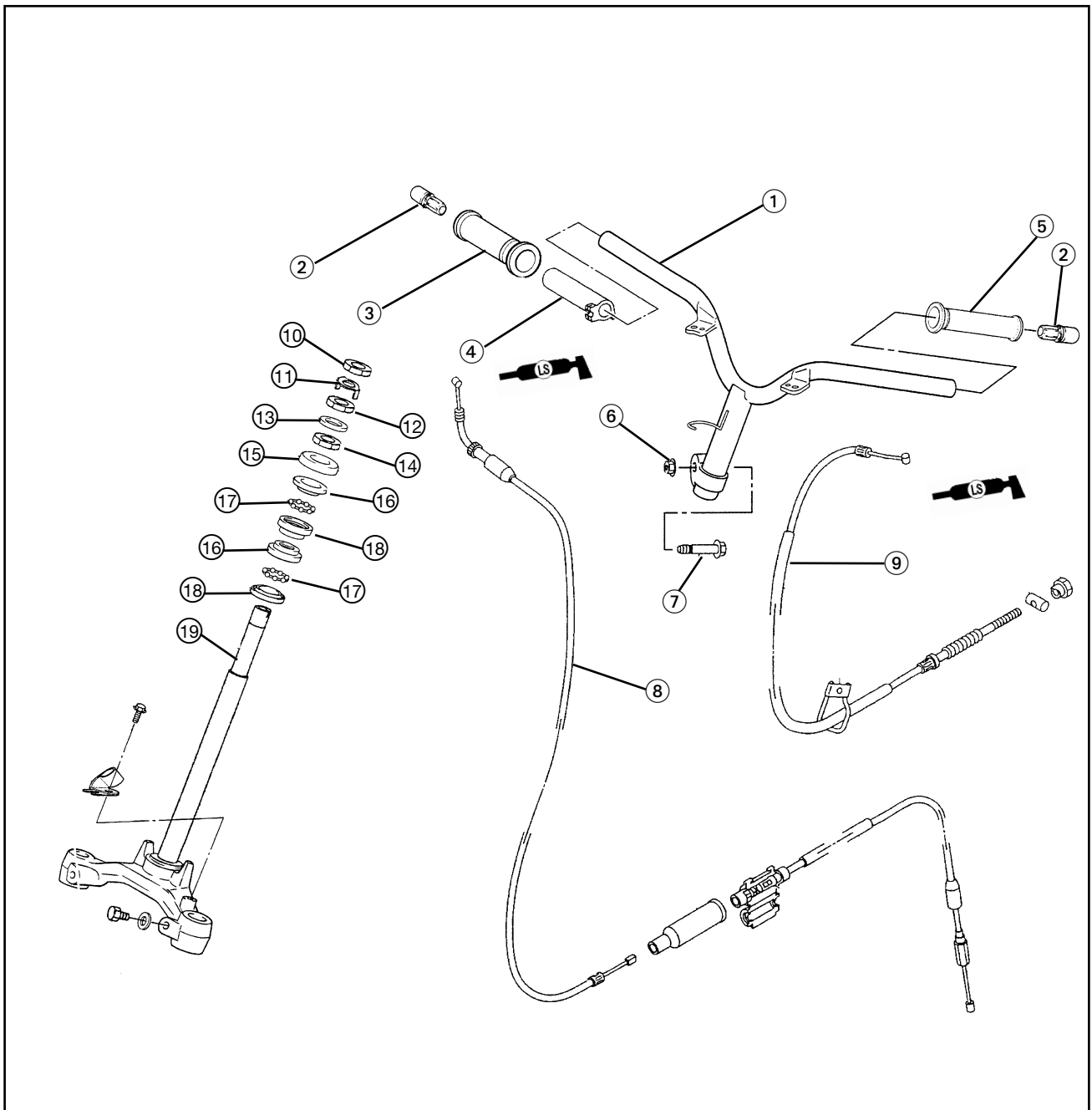
Wheel axle
47.5 Nm (4.75 m • kg)

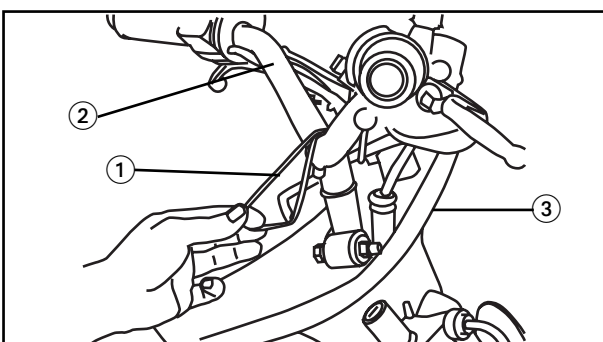
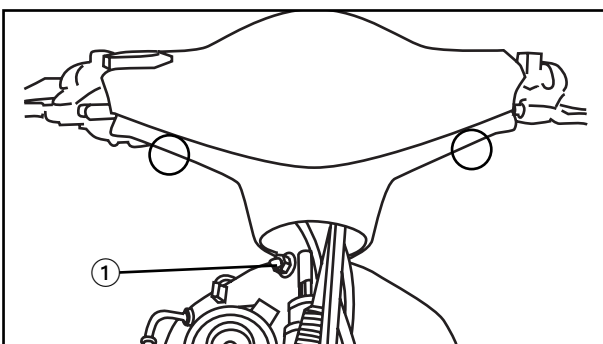
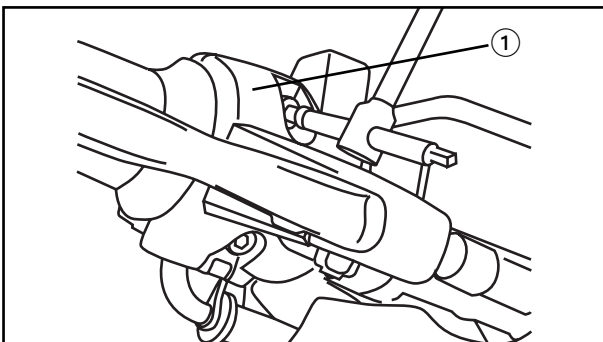
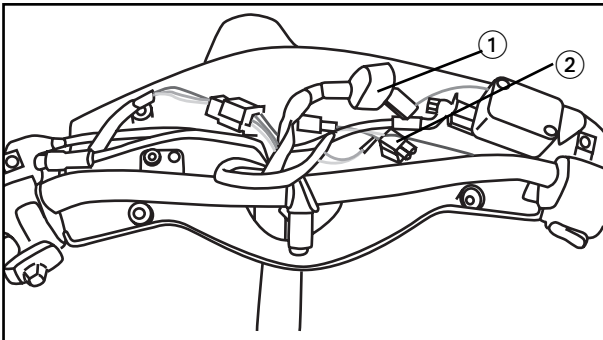
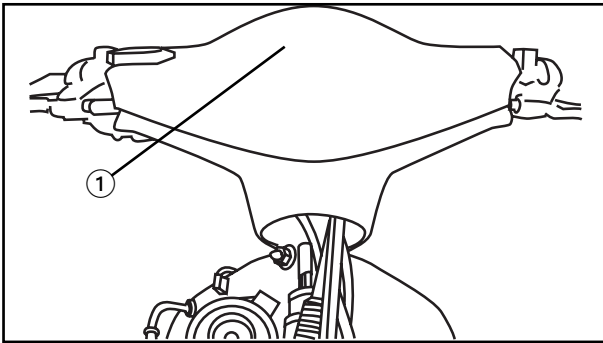


EAS00664

HANDLEBAR AND STEERING

- ① Handlebar
- ② Grip cap
- ③ Throttle grip
- ④ Throttle grip guide
- ⑤ Grip
- ⑥ Nut
- ⑦ Bolt
- ⑧ Throttle cable
- ⑨ Brake cable
- ⑩ Upper ring nut
- ⑪ Lock washer
- ⑫ Center ring nut
- ⑬ Rubber washer
- ⑭ Lower ring nut
- ⑮ Bearing cover
- ⑯ Upper bearing race
- ⑰ Bearing cage
- ⑱ Bearing race
- ⑲ Lower bracket





EAS00666

REMOVING THE HANDLEBAR

1. Stand the scooter on a level surface.

⚠ WARNING

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

2. Remove:
 - front upper cowling
 - front middle cowling
 - legshield
 - handlebar cover (upper) ①
3. Disconnect:
 - meter coupler ①
 - flasher relay ②
4. Disconnect
 - handlebar switch couplers (left and right)
 - brake switch connectors (front and rear)
 - rear brake cable
5. Remove:
 - handlebar switch (right) ①
6. Disconnect:
 - throttle cable
7. Remove:
 - throttle grip
8. Loosen:
 - handlebar securing nut ①
9. Remove:
 - screws (lower handlebar cover)
10. Remove:
 - wire harness fixed strap ①
11. Remove:
 - handlebar ②
 - handlebar cover (lower) ③



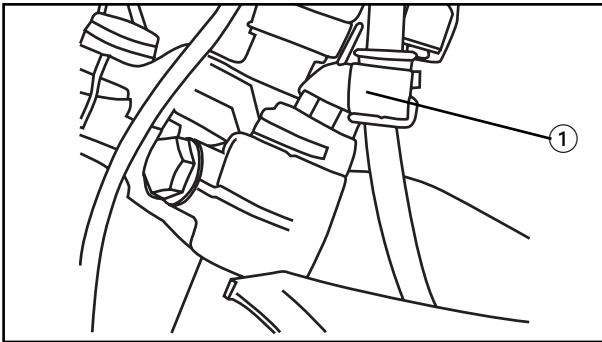
EAS00678

REMOVING THE LOWER BRACKET

1. Stand the scooter on a level surface.

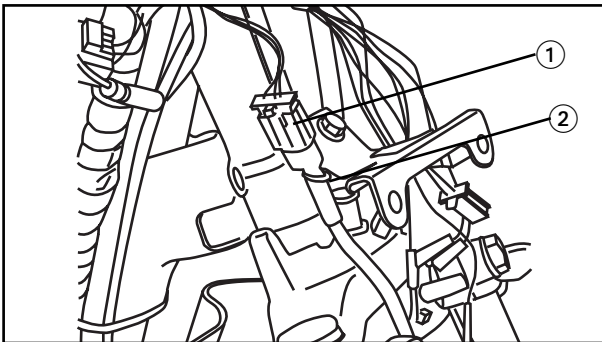
⚠ WARNING

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



2. Remove:
 - handlebar

3. Remove:
 - brake caliper
 - brake hose holder ①



4. Disconnect:
 - speed sensor coupler ①

5. Remove:
 - clamp ②

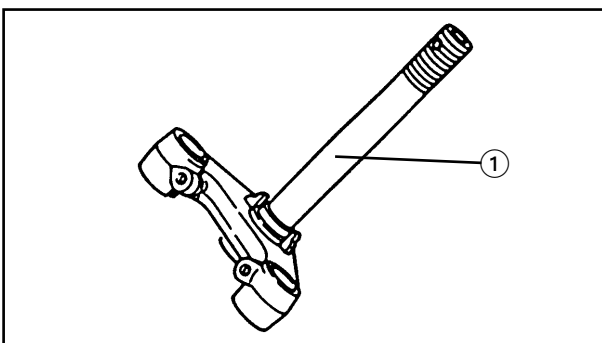
6. Remove:
 - ring nut (upper)
(with the ring nut wrench)

	<p>Ring nut wrench 90890-01403</p>
--	--

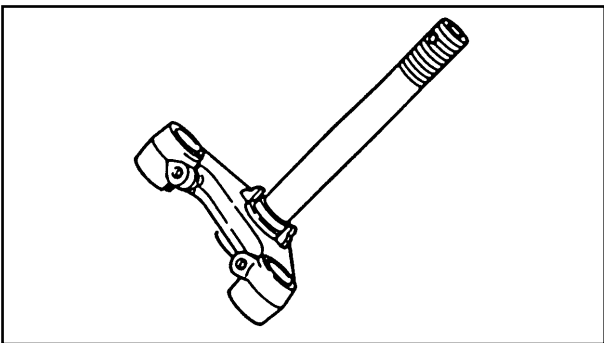
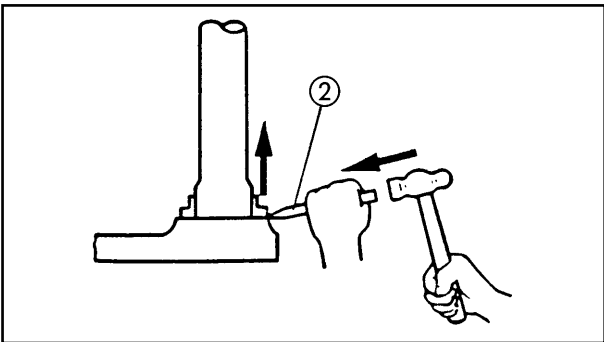
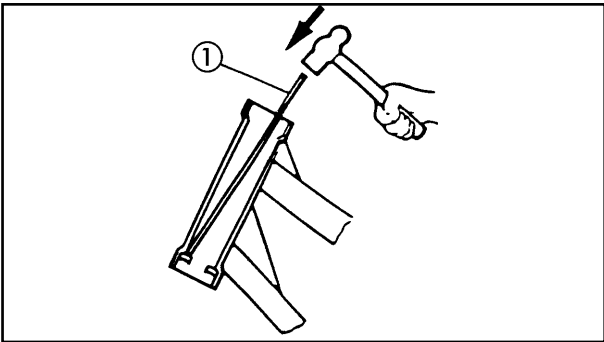
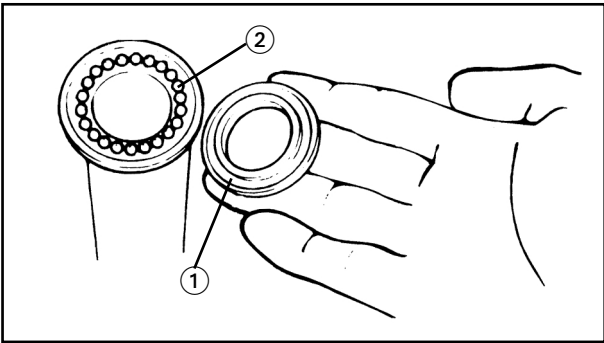
7. Remove:
 - lock washer
 - ring nut (center)
 - rubber washer
 - ring nut (lower)

⚠ WARNING

Securely support the lower bracket so that there is no danger of it falling.



8. Remove:
 - lower bracket ①
(with wheel and front forks)



EAS00682

CHECKING THE STEERING HEAD

1. Wash:
 - bearing balls
 - bearing races

	Recommended cleaning solvent Kerosene
---	--

2. Check:
 - bearing races ①
Damage/pitting → Replace.
 - bearing balls ②
Damage/pitting → Replace.
3. Replace:
 - bearing balls
 - bearing races



- a. Remove the bearing races from the steering head pipe with a long rod ① and hammer.
- b. Remove the bearing race from the lower bracket with a floor chisel ② and hammer.
- c. Install a new dust seal and new bearing races.

CAUTION: _____

If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE: _____

- Always replace the bearing balls and bearing races as a set.
- Whenever the steering head is disassembled, replace the dust seal.



4. Check:
 - lower bracket
(along with the steering stem)
Bends/cracks/damage → Replace.



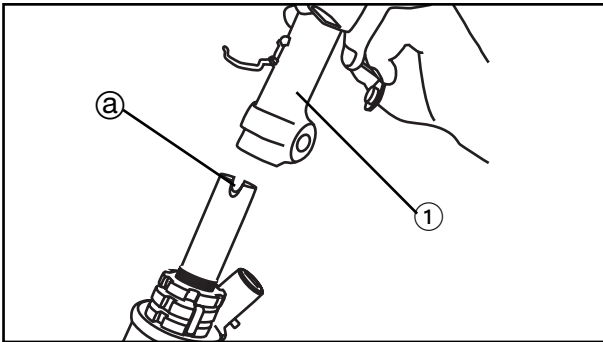
EAS00673

INSTALLING THE HANDLEBAR

1. Stand the scooter on a level surface.

⚠ WARNING

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



2. Install:
 - handlebar ①

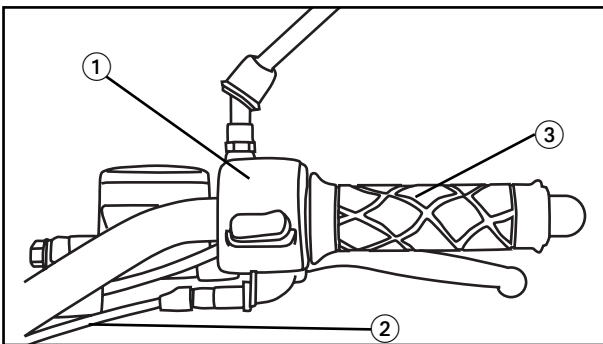
NOTE:

Align the slot @ on the steering with the pin on the handlebar.

3. Tighten:
 - handlebar securing nut



42.5 Nm (4.25 m • kg)



4. Install:
 - right handlebar switch ①
 - throttle cable ②
 - throttle grip ③

NOTE:

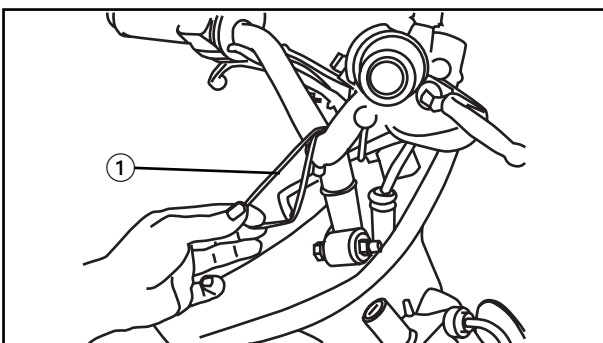
Lubricate the inside of the throttle grip with a thin coat of lithium-soap-based grease and install it onto the handlebar.

NOTE:

- Align the projection on the right handlebar switch with the hole on the handlebar.

⚠ WARNING

Make sure the throttle grip operates smoothly.

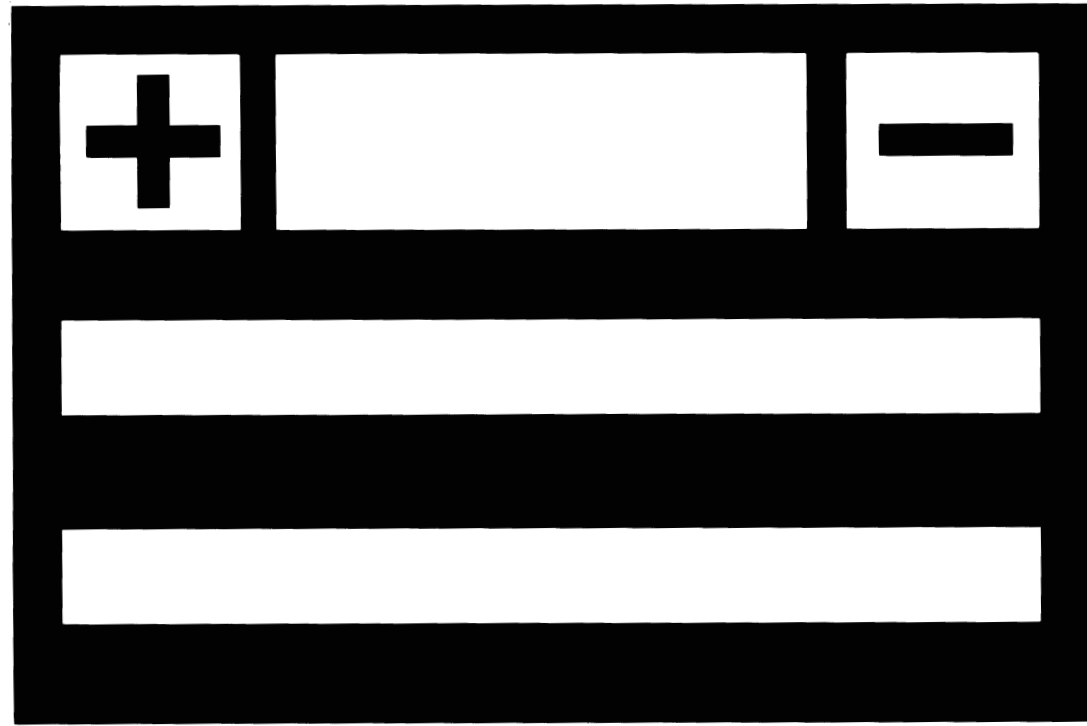


5. Fasten:
 - wire harness (fixed to steering head with a strap ①)

6. Adjust:
 - throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

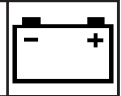


Throttle cable free play (at the flange of the throttle grip)
2 ~ 5 mm



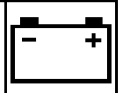
ELEC

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CHAPTER 8 ELECTRICAL SYSTEM

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EAS00729

ELECTRICAL SYSTEM

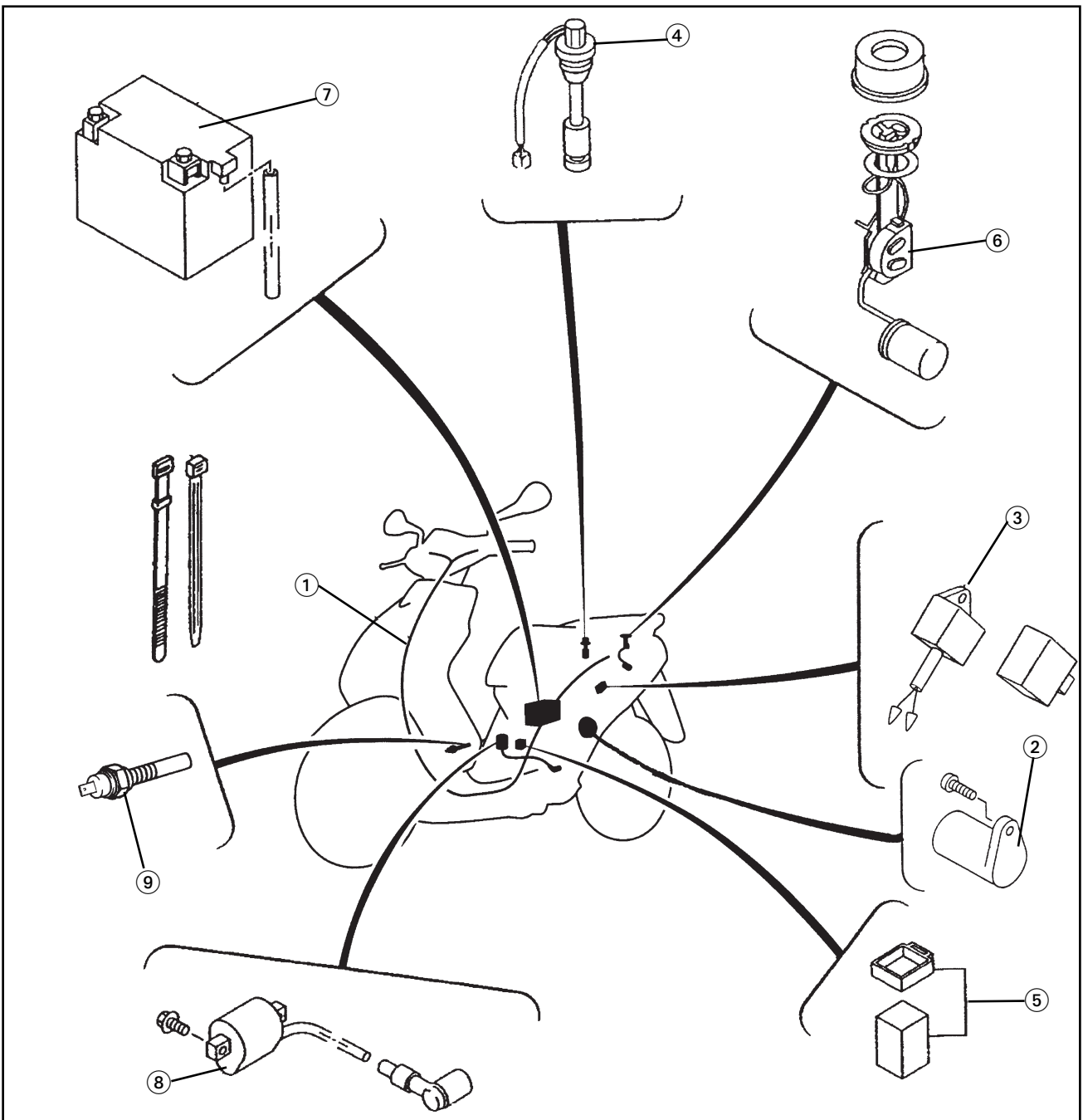
ELECTRICAL COMPONENTS

- ① Wire harness
- ② Starter motor
- ③ DC-CDI Unit
- ④ Engine oil level gauge
- ⑤ Starter relay
- ⑥ Fuel sender gauge
- ⑦ Battery
- ⑧ Ignition coil
- ⑨ Temperature sender (CS50Z only)

Ignition coil:

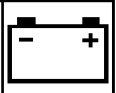
Primary coil resistance:
0.56 ~ 0.84 Ω at 20 °C

Secondary coil resistance:
5.68 ~ 8.52 Ω at 20 °C

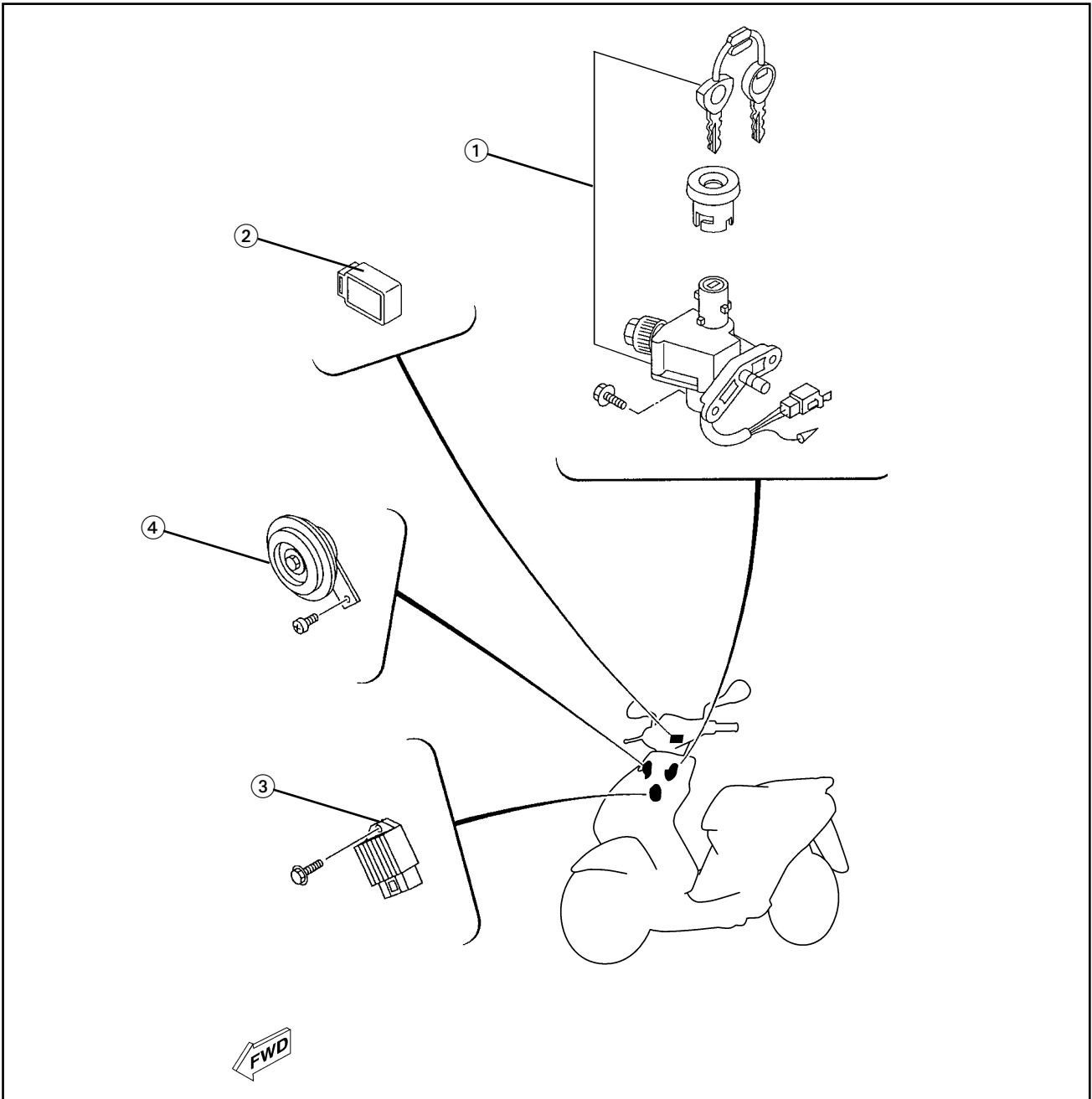


ELECTRICAL COMPONENTS

ELEC



- ① Main switch/seat closure
- ② Indicator relay
- ③ Rectifier/regulator
- ④ Horn





EAS00730

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION: _____

Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



NOTE: _____

- Before checking for continuity, set the pocket tester to “0” and to the “Ωx1” range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.

The switch positions ① are shown in the far left column and the switch lead colors ② are shown in the top row in the switch illustration.

NOTE: _____

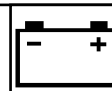
“○—○” indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:

There is continuity between black and black/white when the switch is set to “ON”.

There is continuity between red and brown when the switch is set to “ON”.

		b				
		GY	Br	R	B	B/W
a	LOCK					
	OPEN					
	OFF					
	CHECK	○		○		
	ON		○	○	○	○

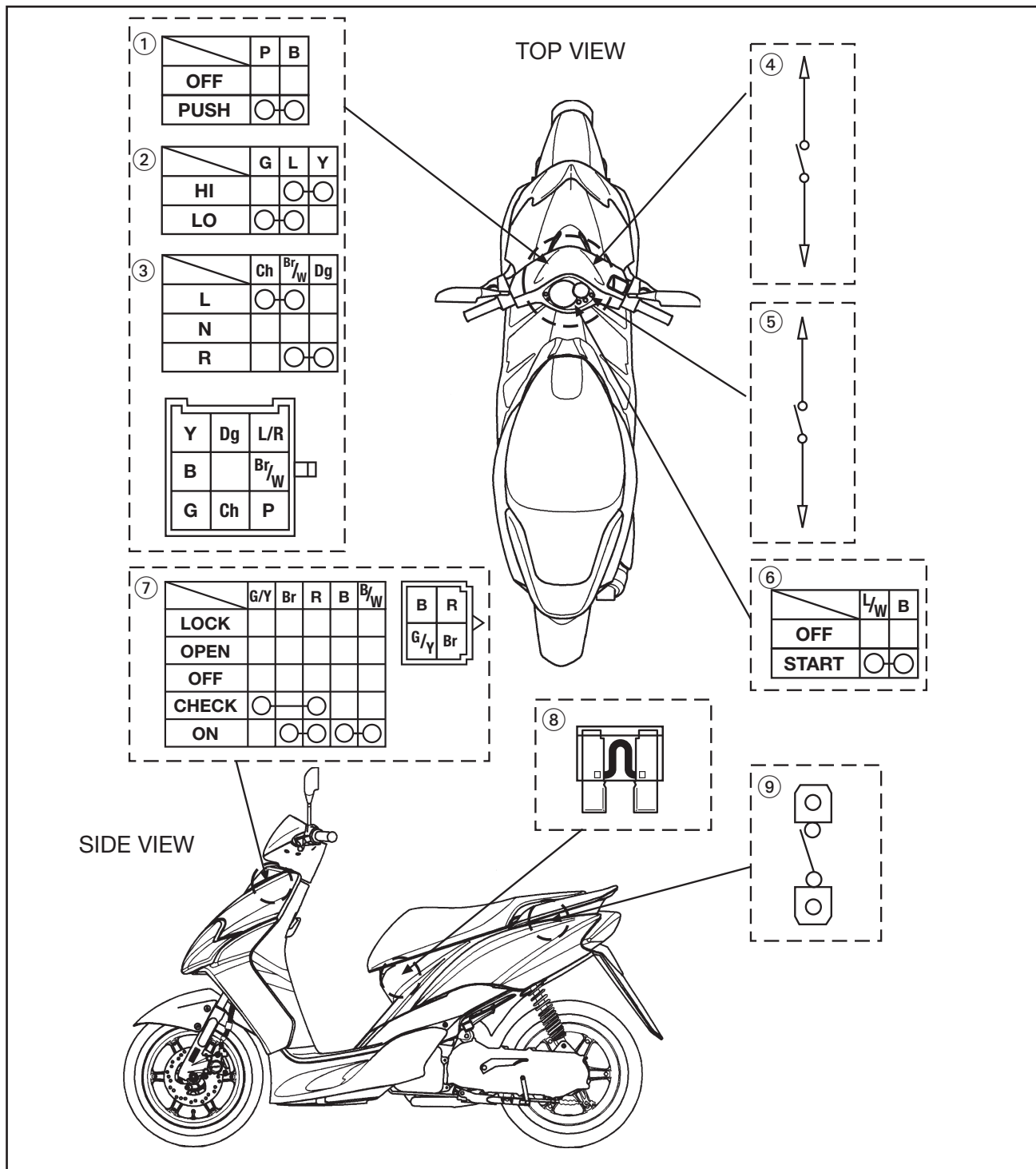


EAS00731

CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to "CHECKING SWITCH CONTINUITY".

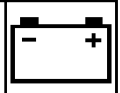
Damage/wear → Repair or replace.
 Improperly connected → Properly connect.
 Incorrect continuity reading → Replace the switch.



- ① Horn switch
- ② Dimmer switch
- ③ Turn signal switch

- ④ Front brake switch
- ⑤ Rear brake switch
- ⑥ Star switch

- ⑦ Main switch
- ⑧ Fuse
- ⑨ Oil level switch



EAS00733

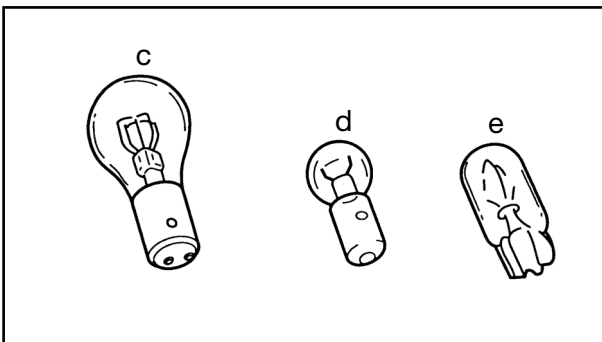
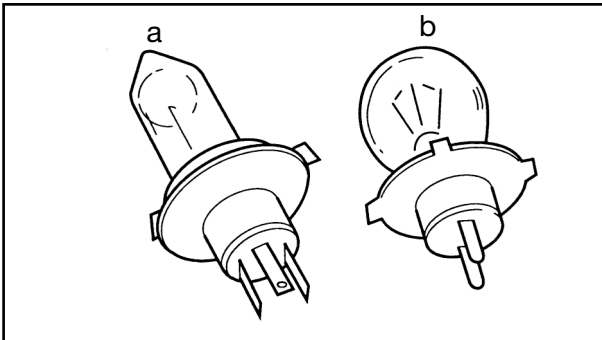
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

Improperly connected → Properly connect.

No continuity → Repair or replace the bulb, bulb socket or both.



TYPES OF BULBS

The bulbs used on this scooter are shown in the illustration on the left.

- Bulbs (a) and (b) are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb (c) is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs (d) and (e) are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

1. Remove:
 - bulb

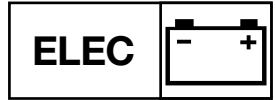
⚠ WARNING

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

CAUTION:

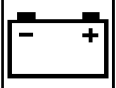
- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.

CHECKING THE BULBS AND BULB SOCKETS



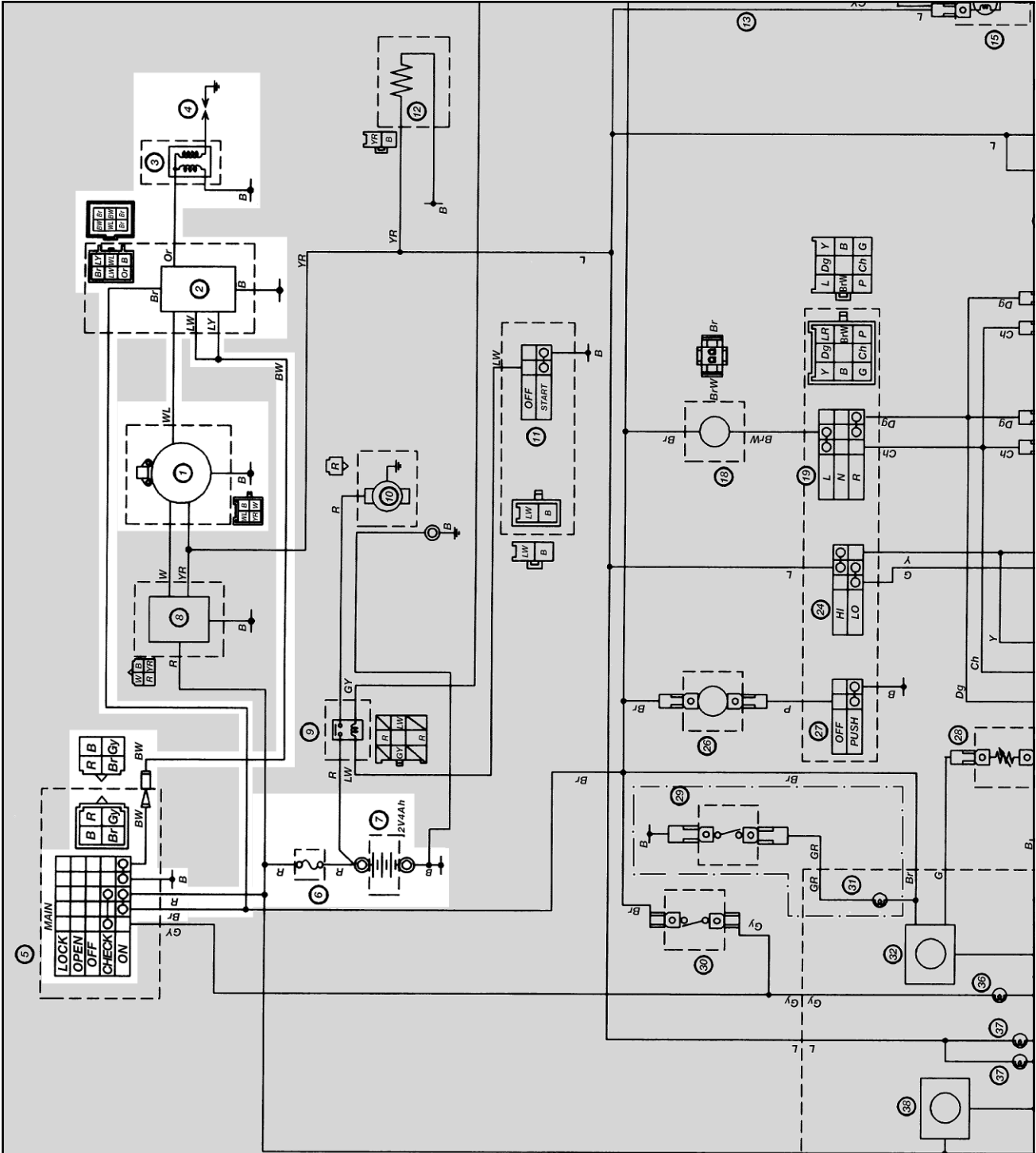
- b. Connect the pocket tester probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.



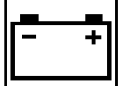


EAS00734

IGNITION SYSTEM CIRCUIT DIAGRAM



- ① DC-CDI magneto (pickup coil)
- ② DC-CDI unit
- ③ Ignition coil
- ④ Spark plug
- ⑤ Main switch
- ⑥ Fuse
- ⑦ Battery



EAS00736

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:

1. Spark plug
2. Ignition spark gap
3. Spark plug cap resistance
4. Ignition coil resistance
5. Main switch
6. Pickup coil resistance
7. Main fuse
8. Battery
9. Wiring connections (of the entire ignition system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. Front upper cover
 2. Footrest board
- Troubleshoot with the following special tool(s).



Ignition checker
90890-06754
Pocket tester
90890-03112

EAS00740

1. Spark plug

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.
 Refer to "CHECKING THE SPARK PLUG" in chapter 3.



Standard spark plug
BR8HS (NGK)
Spark plug gap
0.6 ~ 0.7 mm

- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?



YES



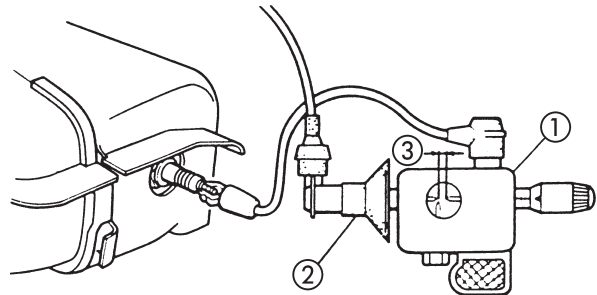
NO

Re-gap or replace the spark plug.

EAS00742

2. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.



② Spark plug cap

- Set the main switch to "ON".
- Measure the ignition spark gap ③.
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.



Minimum ignition spark gap
6,0 mm

- Is there a spark and is the spark gap within specification?

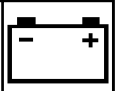


YES



NO

The ignition system is OK.



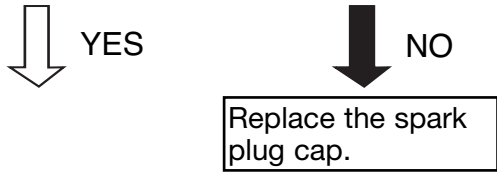
EAS00744

3. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester (“ $\Omega \times 1k$ ” range) to the spark plug cap as shown.
- Measure the spark plug cap resistance.

Spark plug cap resistance
10K Ω at 20°C

- Is the spark plug cap OK?



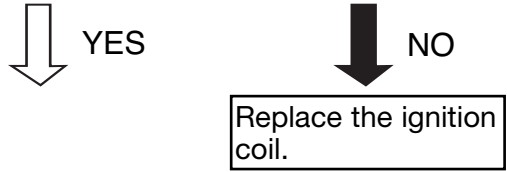
- Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.

Negative tester probe → spark plug lead ①
Positive tester probe → ground ②

- Measure the secondary coil resistance.

Secondary coil resistance
5.68 ~ 8.52 k Ω at 20°C

- Is the ignition coil OK?



EAS00749

4. Ignition coil resistance

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.

Positive tester probe → red/black
Negative tester probe → orange (gray)

- Measure the primary coil resistance.

Primary coil resistance
0.56 ~ 0.84 at 20°C

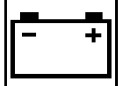
5. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES

NO

Replace the main switch.

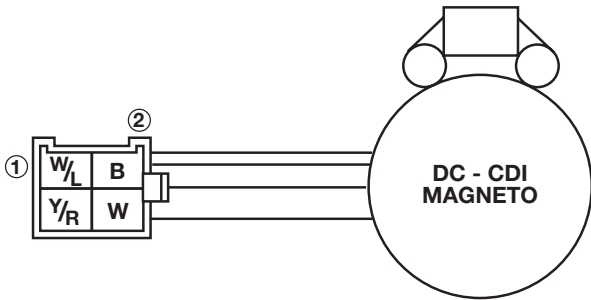


EAS00748

6. Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 100$) to the pickup coil terminal as shown.

Positive tester probe → white/blue ①
Negative tester probe → ground ②



- Measure the pickup coil resistance.



Pickup coil resistance
 460 ~ 600 Ω at 20°C
 (between white/red and white/green)

- Is the pickup coil OK?

↓ YES

↓ NO

Replace the pickup coil.

EAS00738

7. Main fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EAS00739

8. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
 12.8 V or more at 20°C

- Is the battery OK?

↓ YES

↓ NO

• Recharge or replace the battery.

EAS00754

9. Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

↓ YES

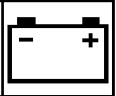
↓ NO

Replace the DC-CDI unit.

Properly connect or repair the ignition system's wiring.

ELECTRIC STARTING SYSTEM

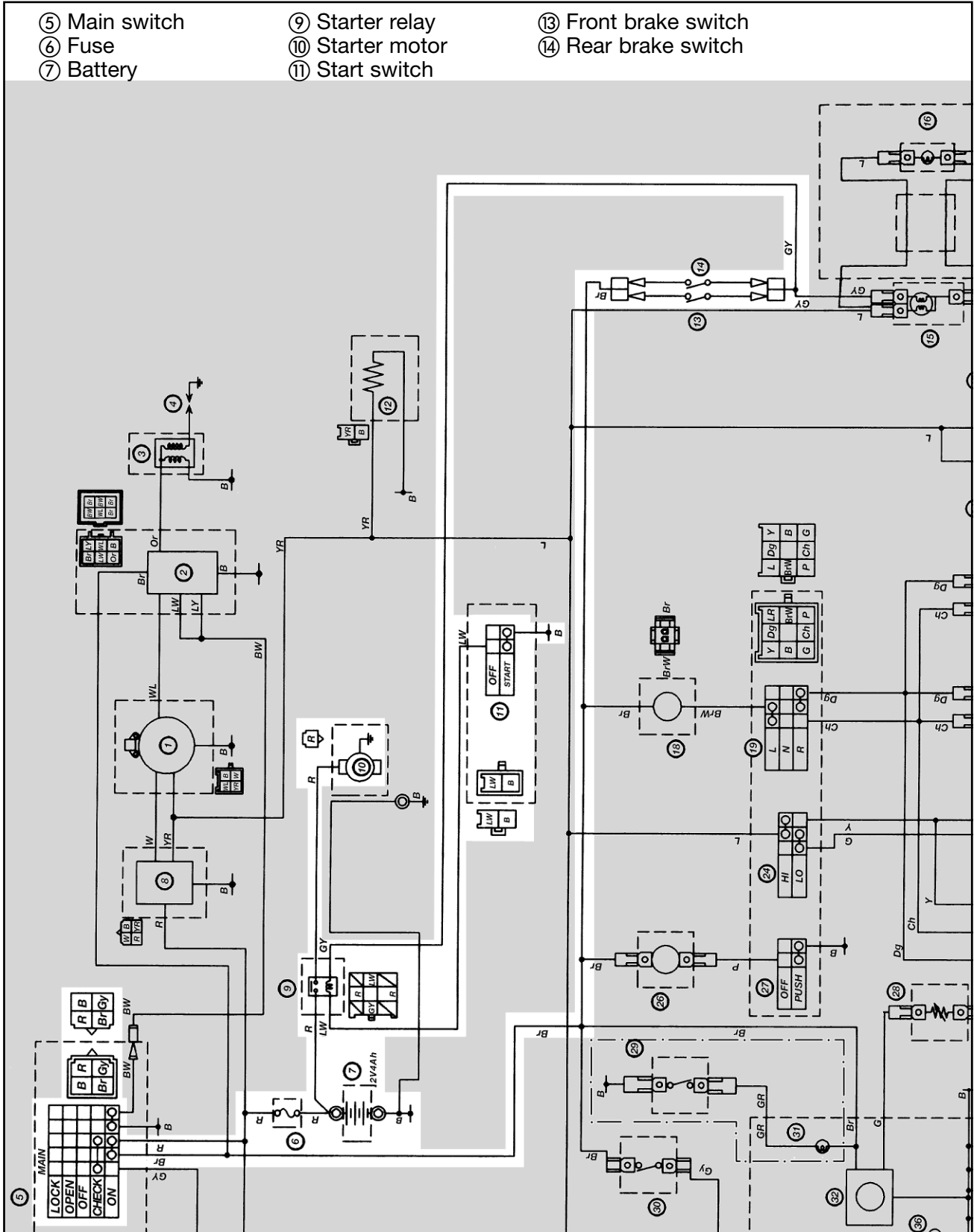
ELEC

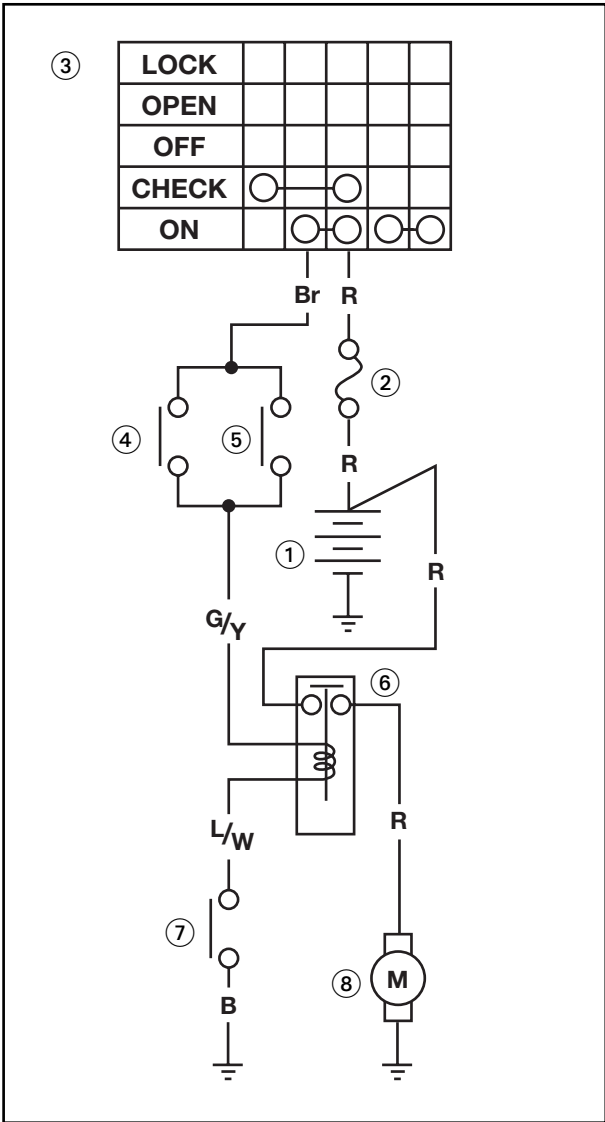


EAS00755

ELECTRIC STARTING SYSTEM CIRCUIT DIAGRAM

- ⑤ Main switch
- ⑥ Fuse
- ⑦ Battery
- ⑨ Starter relay
- ⑩ Starter motor
- ⑪ Start switch
- ⑬ Front brake switch
- ⑭ Rear brake switch





EAS00756

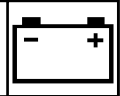
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is set to “ON” the starter motor can only operate if at least one of the following conditions is met:

- The front brake switch is ON.
- The rear brake switch is ON.

When at least one of the above conditions has been met the starter relay is closed and the engine can be started by pressing the starter switch.

- ① Battery
- ② Fuse
- ③ Main switch
- ④ Front brake switch
- ⑤ Rear brake switch
- ⑥ Starter relay
- ⑦ Start switch
- ⑧ Starter motor



EAS00757

TROUBLESHOOTING

The starter motor fails to turn.

Check:

1. main fuse
2. battery
3. starter motor
4. starter relay
5. main switch
6. start switch
7. wiring connections
(of the entire starting system)

NOTE: _____

- Before troubleshooting, remove the following part(s):
 1. Front upper cowling
 2. Center cover
 3. Footrest board
 4. Handlebar cover (upper)
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112

EAS00738

1. Main fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C

- Is the battery OK?

↓ YES

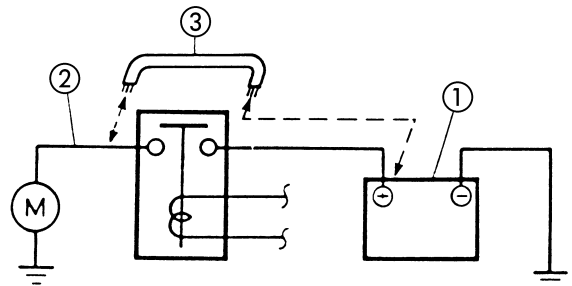
↓ NO

• Recharge or replace the battery.

EAS00758

3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



⚠ WARNING

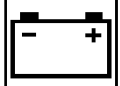
- A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.

- Does the starter motor turn?

↓ YES

↓ NO

Repair or replace the starter motor.



EAS00761

4. Starter relay

- Disconnect the starter relay coupler from the coupler.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starter relay coupler as shown.

Positive battery terminal → green/yellow ①
Negative battery terminal → blue/white ②

Positive tester probe → red ③
Negative tester probe → red ④

- Does the starter relay have continuity between red and red?

↓ YES ↓ NO

Replace the starter relay.

EAS00749

5. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

↓ YES ↓ NO

Replace the main switch.

EAS00764

6. Start switch

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?

↓ YES ↓ NO

Replace the right handlebar switch.

EAS00766

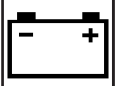
7. Wiring

- Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the starting system's wiring properly connected and without defects?

↓ YES ↓ NO

The starting system circuit is OK.

Properly connect or repair the starting system's wiring.



EAS00767

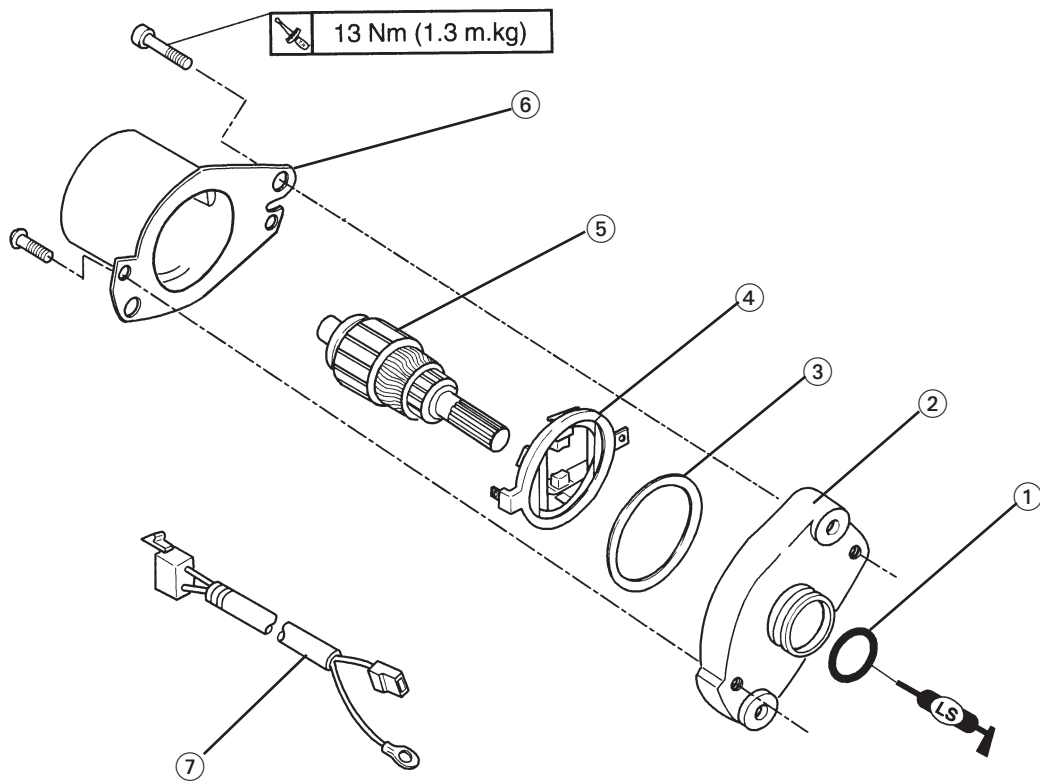
STARTER MOTOR

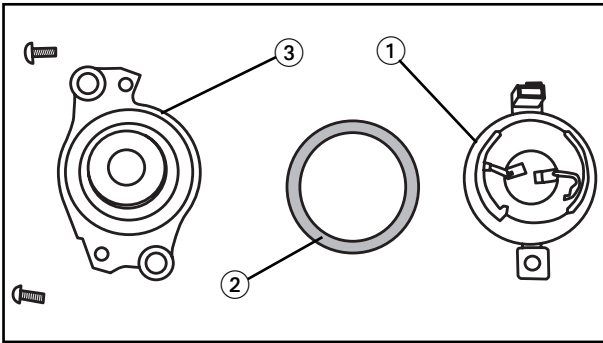
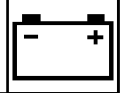
- ① O-ring
- ② Starter motor front cover
- ③ Rubber seal
- ④ Brush holder / brushes
- ⑤ Armature assembly
- ⑥ Starter motor rear cover
- ⑦ Wiring

Brush wear limit:
0.9 mm

Commutator wear limit:
14.8 mm

Mica lower cut-off:
1.15 mm



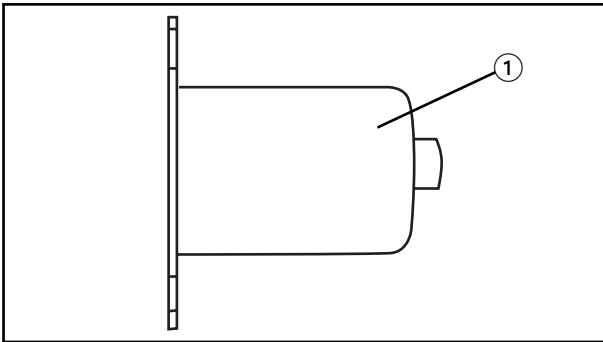


EAS00772

ASSEMBLING THE STARTER MOTOR

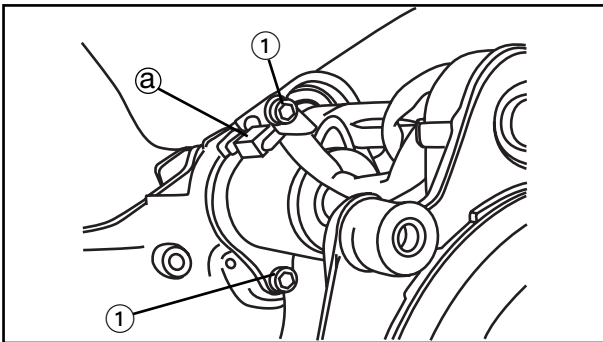
1. Install:

- brush set ①
- rubber seal ②
- starter motor front cover ③



2. Install:

- starter motor rear cover ①



3. Install:

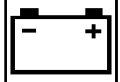
- Starter motor bolts ①



13 Nm (1.3 m • kg)

NOTE:

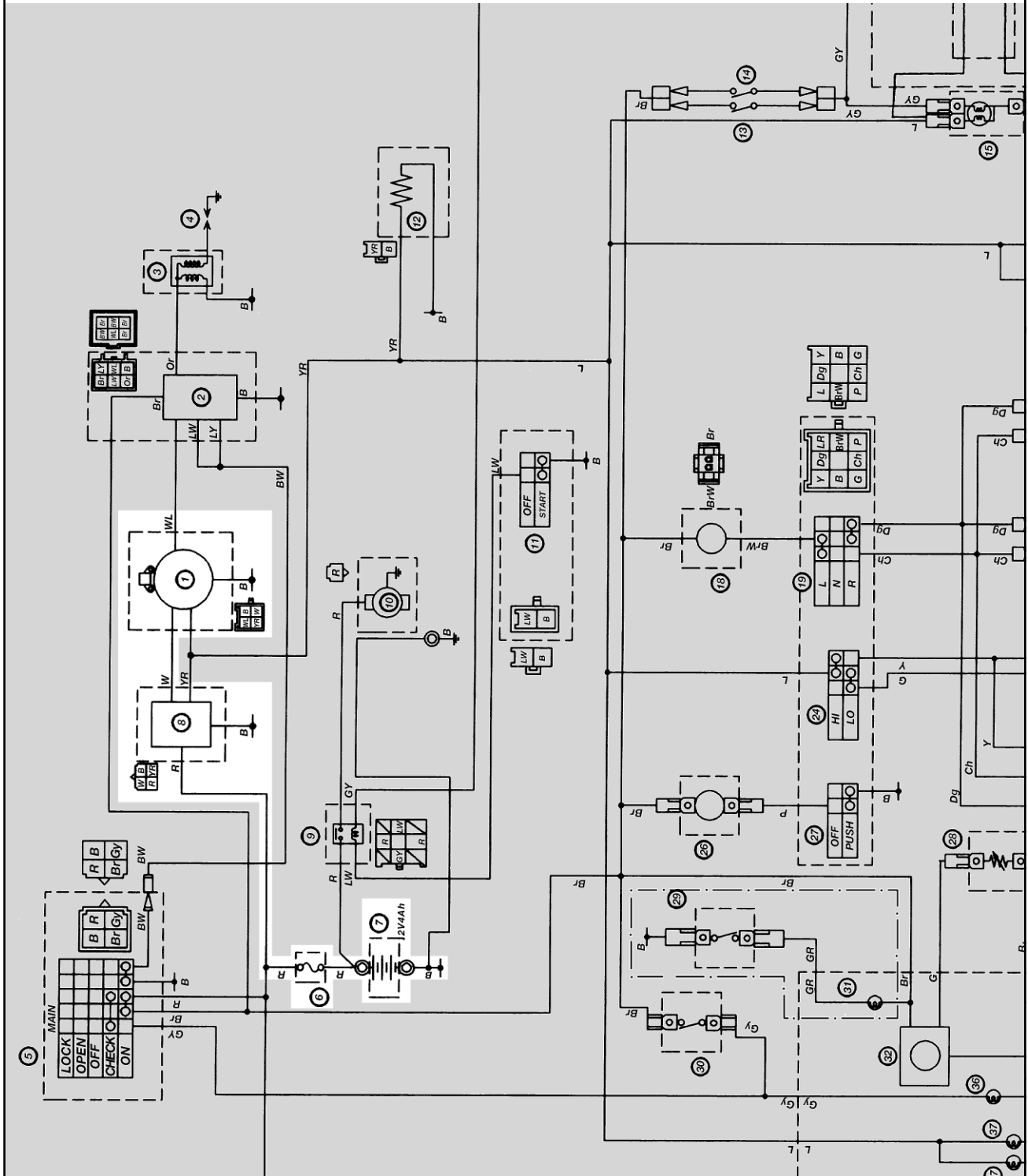
When install the starter motor the ground terminal @ is installed with upper side bolt.

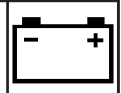


EAS00773

CHARGING SYSTEM CIRCUIT DIAGRAM

- ① DC-CDI Magneto
- ⑥ Main fuse
- ⑦ Battery
- ⑧ Rectifier/regulator





EAS00774

TROUBLESHOOTING

The battery is not being charged.

Check:

1. charging voltage
2. main fuse
3. battery
4. charging coil resistance
5. wiring connections
(of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. Front upper cowling
 2. Footrest board
- Troubleshoot with the following special tool(s).



Engine tachometer
90890-03113
Pocket tester
90890-03112

EAS00775

1. Charging voltage

- Connect the engine tachometer to the spark plug lead.
- Connect the pocket tester (DC 20 V) to the battery.

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

- Start the engine and let it run at approximately 3000 r/min.
- Measure the charging voltage.



Charging voltage
12 V or more at 3000 r/min
15 V or less at 8000 r/min

NOTE:

Make sure the battery is fully charged.

- Is the charging voltage within specification?



NO



YES

The charging circuit is OK.

EAS00738

2. Main fuse

- Check the fuse for continuity. Refer to “CHECKING THE FUSES” in chapter 3.
- Is the fuse OK?



YES



NO

Replace the fuse.

EAS00739

3. Battery

- Check the condition of the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C

- Is the battery OK?



YES



NO

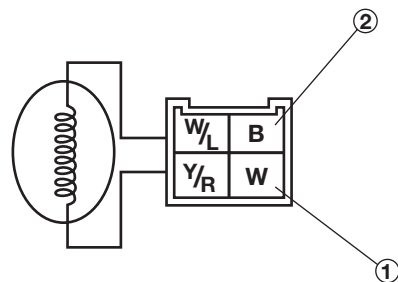
- Clean the battery terminals.

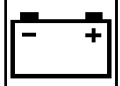
- Recharge or replace the battery.


EAS00776

4. Charging coil resistance

- Disconnect the DC-CDI magneto coupler.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils as shown.





Positive tester probe → white ① Negative tester probe → black ②	
• Measure the charging coil resistance.	
	Charging coil resistance 0.288 ~ 0.432 Ω at 20°C
• Is the charging coil OK?	



YES



NO

Replace the charging coil assembly.

EAS00779

5. Wiring
• Check the wiring connections of the entire charging system. Refer to "CIRCUIT DIAGRAM".
• Is the charging system's wiring properly connected and without defects?



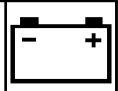
YES



NO

Replace the rectifier/regulator.

Properly connect or repair the charging system's wiring.



EAS00782

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, position light, and meter light.

Check:

1. lighting coil resistance
2. dimmer switch
3. wiring connections
(of the entire charging system)

NOTE:

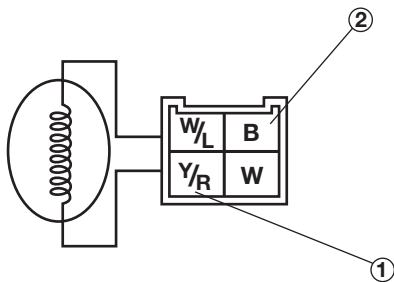
- Before troubleshooting, remove the following part(s):
 1. Front upper cowling
 2. Footrest board
 3. Handlebar cover (upper)
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112

1. Lighting coil resistance

- Disconnect the DC-CDI magneto coupler.
- Connect the pocket tester ($\Omega \times 1$) to the lighting coil as shown.



Positive tester probe → Yellow/red ①
Negative tester probe → black ②

- Measure the lighting coil resistance.



Lighting coil resistance:
0.116 ~0.264 Ω at 20°C

- Is the lighting coil OK?

↓ YES

↓ NO

Replace the lighting coil assembly

EAS00784

2. Dimmer switch

- Check the dimmer switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?

↓ YES

↓ NO

The dimmer switch is faulty. Replace the left handlebar switch.

EAS00787

3. Wiring

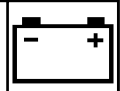
- Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?

↓ YES

↓ NO

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

Properly connect or repair the lighting system's wiring.



EAS00788

CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to come on.

1. Headlight bulb and socket

- Check the headlight bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the headlight bulb and socket OK?

↓ YES

↓ NO

Replace the headlight bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

A When the dimmer switch is set to “HI”
When the dimmer switch is set to “LO”
Headlight coupler (wire harness side)

Headlight
Positive tester probe → yellow ① or green ②
Negative tester probe → black ③

High beam indicator light
Positive tester probe → yellow ④
Negative tester probe → black ⑤

A

Meter light coupler (wire harness side)

- Set the main switch to “ON”.
- Start the engine.
- Set the dimmer switch to “HI” or “LO”.
- Measure the voltage (DC 12 V) of yellow ① or green ② on the headlight coupler (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

This circuit is OK.

The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

EAS00789

2. The meter light fails to come on.

1. Meter light bulb and socket

- Check the meter light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the meter light bulb and socket OK?

↓ YES

↓ NO

Replace the meter light bulb, socket or both.

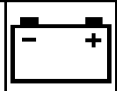
2. Voltage

- Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②

LIGHTING SYSTEM

ELEC



- Set the main switch to “ON”.
- Start the engine.
- Measure the voltage (DC 12 V) of blue ① on the meter light coupler (wire harness side).
- Is the voltage within specification?



YES

This circuit is OK.



NO

The wiring circuit from the main switch to the meter light coupler is faulty and must be repaired.

- Set the main switch to “ON”.
- Start the engine.
- Measure the voltage (DC 12 V) of blue ① on the tail/brake light coupler (tail/brake light side).
- Is the voltage within specification?



YES

This circuit is OK.



NO

Wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00790

3. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket
- Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
 - Are the tail/brake light bulb and socket OK?



YES

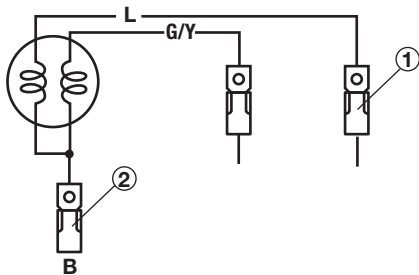


NO

Replace the tail/brake light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



EAS00791

4. The position light fails to come on.

1. Position light bulb and socket
- Check the position light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
 - Are the position light bulb and socket OK?



YES

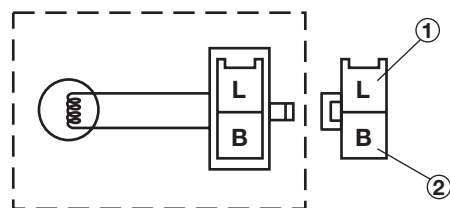


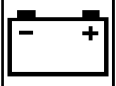
NO

Replace the position light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the position light coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②





- Set the main switch to “ON”.
- Start the engine.
- Measure the voltage (DC 12 V) of blue ① on the position light coupler (positionlight side).
- Is the voltage within specification?



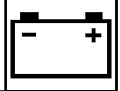
YES

This circuit is OK.



NO

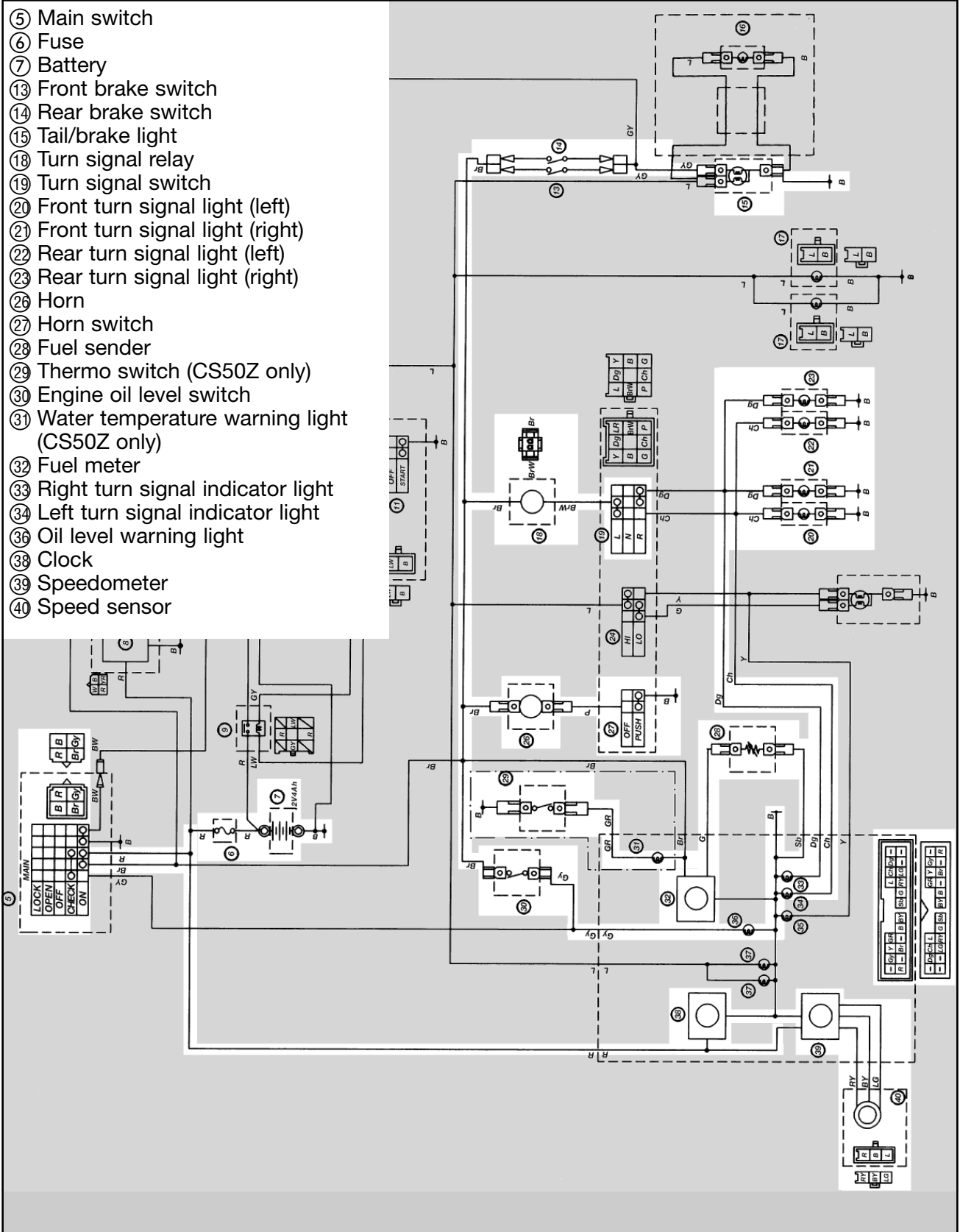
Wiring circuit from the main switch to the position light coupler is faulty and must be repaired.

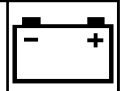


EAS00793

**SIGNALING SYSTEM
CIRCUIT DIAGRAM**

- ⑤ Main switch
- ⑥ Fuse
- ⑦ Battery
- ⑬ Front brake switch
- ⑭ Rear brake switch
- ⑮ Tail/brake light
- ⑱ Turn signal relay
- ⑲ Turn signal switch
- ⑳ Front turn signal light (left)
- ㉑ Front turn signal light (right)
- ㉒ Rear turn signal light (left)
- ㉓ Rear turn signal light (right)
- ㉖ Horn
- ㉗ Horn switch
- ㉘ Fuel sender
- ㉙ Thermo switch (CS50Z only)
- ㉚ Engine oil level switch
- ㉛ Water temperature warning light (CS50Z only)
- ㉜ Fuel meter
- ㉝ Right turn signal indicator light
- ㉞ Left turn signal indicator light
- ㉟ Oil level warning light
- ㊱ Clock
- ㊲ Speedometer
- ㊳ Speed sensor





EAS00794

TROUBLESHOOTING

- Any of the following fail to light: flasher light, brake light or an indicator light.
- The horn fails to sound.

Check:

1. main fuse
2. battery
3. main switch
4. wiring connections
(of the entire signaling system)

NOTE:

- Before troubleshooting, remove the following part(s):
 1. Front upper cowling
 2. Footrest board
 3. Handlebar cover (upper)
- Troubleshoot with the following special tool(s).



Pocket tester
90890-03112

EAS00738

1. Main fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSES" in chapter 3.
- Is the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open-circuit voltage
12.8 V or more at 20°C

- Is the battery OK?

↓ YES

↓ NO

- Clean the battery terminals.

- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.

EAS00795

4. Wiring

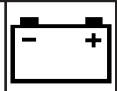
- Check the entire signal system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

↓ YES

↓ NO

Check the condition of each of the signaling system's circuits. Refer to "CHECKING THE SIGNALING SYSTEM".

Properly connect or repair the signaling system's wiring.



EAS00796

CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

1. Horn switch

- Check the horn switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the horn switch OK?



YES



NO

Replace the left handlebar switch.

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

Positive tester probe → brown ①
Negative tester probe → ground

- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of brown at the horn terminal.
- Is the voltage within specification?



YES



NO

The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

3. Horn

- Disconnect the pink connector at the horn terminal.
- Connect a jumper lead to the horn terminal and ground the jumper lead.
- Set the main switch to “ON”.
- Does the horn sound?



YES



NO

Replace the horn.

4. Voltage

- Disconnect the pink and brown connectors at the horn terminal.
- Connect the pocket tester (DC 20 V) to the horn connectors as shown.

Positive tester probe → brown ①
Negative tester probe → pink ②

- Set the main switch to “ON”. Push horn switch
- Measure the voltage (DC 12 V) of pink ① at the horn terminal.
- Is the voltage within specification?



YES



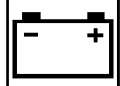
NO

This circuit is OK.

The wiring circuit or horn switch is faulty and must be repaired.

SIGNALING SYSTEM

ELEC



EAS00798

2. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the tail/brake light bulb and socket OK?

↓ YES

↓ NO

Replace the tail/brake light bulb, socket or both.

2. Brake light switches

- Check the brake light switches for continuity. Refer to "CHECKING THE SWITCHES".
- Is the brake light switch OK?

↓ YES

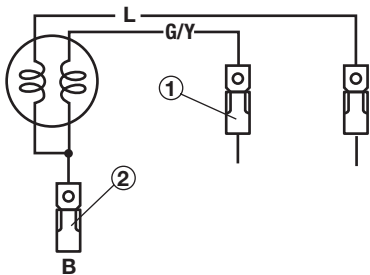
↓ NO

Replace the brake light switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → green/yellow ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Pull in the brake levers.
- Measure the voltage (DC 12 V) of green/yellow ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00799

3. The turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal indicator light bulb and socket

- Check the turn signal light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the turn signal light bulb and socket OK?

↓ YES

↓ NO

Replace the turn signal light bulb, socket or both.

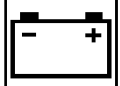
2. Turn signal switch

- Check the turn signal switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the turn signal switch OK?

↓ YES

↓ NO

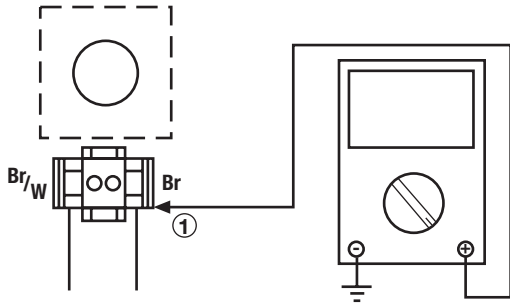
Replace the left handlebar switch.



3. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → ground



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

↓ YES

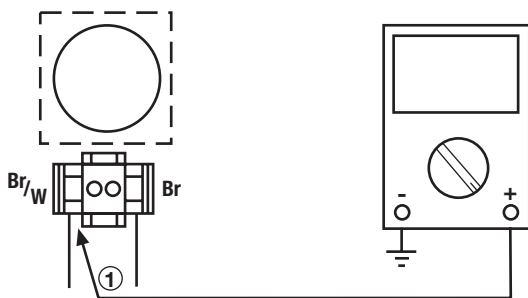
↓ NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

4. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown/white ①
Negative tester probe → ground



- Set the main switch to “ON”.
- Set the turn signal switch to “L” or “R”.
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

The turn signal relay is faulty and must be replaced.

5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connector or meter coupler (wire harness side) as shown.

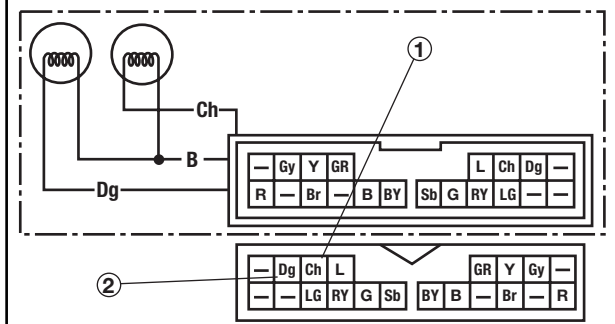
Turn signal light
 Turn signal indicator light

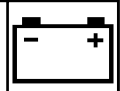
Left turn signal light

Positive tester probe → chocolate ①
Negative tester probe → ground

Right turn signal light

Positive tester probe → dark green ②
Negative tester probe → ground





- Set the main switch to “ON”.
- Set the turn signal switch to “L” or “R”.
- Measure the voltage (DC 12 V) of the chocolate ① or dark green 2 at the turn signal light connector (wire harness side).
- Is the voltage within specification?

↓ YES

This circuit is OK.

↓ NO

The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.

EAS00802

4. The oil level warning light fails to come on.

1. Oil level warning light bulb and socket
- Check the oil level warning light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
 - Are the oil level warning light bulb and socket OK?

↓ YES

Replace the oil level warning light bulb, socket or both.

↓ NO

2. Engine oil level switch
- Drain the engine oil and remove the engine oil level switch from the oil pan.
 - Check the engine oil level switch for continuity. Refer to “CHECKING THE SWITCHES”.
 - Is the engine oil level switch OK?

↓ YES

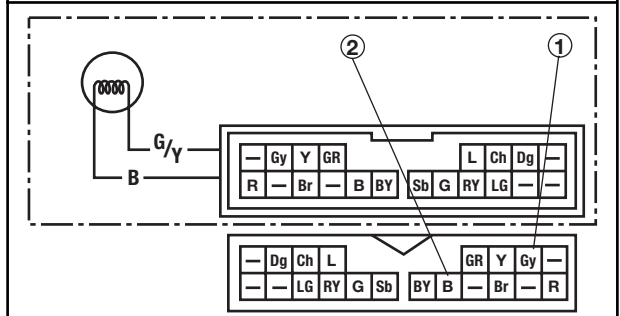
Replace the engine oil level switch.

↓ NO

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter coupler (wire harness side) as shown.

Positive tester probe → green/yellow ①
Negative tester probe → black ②



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of green/yellow ① and black ② at the meter coupler.
- Is the voltage within specification?

↓ YES

This circuit is OK.

↓ NO

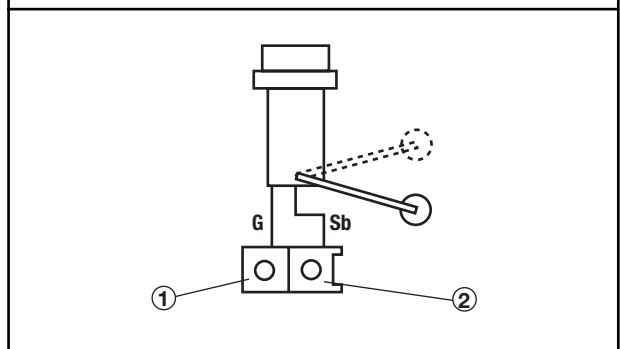
The wiring circuit from the main switch to the meter coupler is faulty and must be repaired.

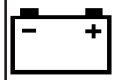
EAS00804

5. The fuel level gauge fails to operate.

1. Fuel sender
- Remove the fuel sender from the fuel tank.
 - Connect the pocket tester to the fuel sender coupler (wire harness side) as shown.

Positive tester probe → green ①
Negative tester probe → sky blue ②





- Measure the fuel sender resistances.



Fuel sender resistance (up position "F")

($\Omega \times 1$)

1.5 ~ 7.5 Ω at 20°C (68°F)

Fuel sender resistance (down position "E")

($\Omega \times 10$)

90 ~ 100 Ω at 20°C (68°F)

- Is the fuel sender OK?

↓ YES

↓ NO

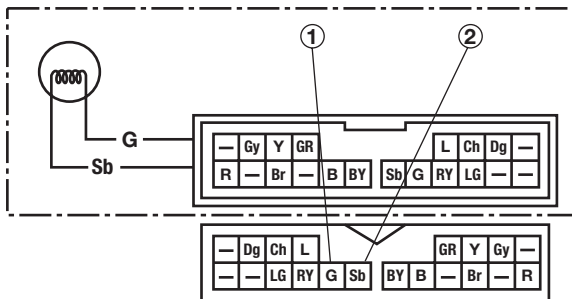
Replace the fuel sender.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter coupler (wire harness side) as shown.

Positive tester probe → green ①

Negative tester probe → sky blue ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of green ① on the meter light coupler (wire harness side).
- Is the voltage within specification?

↓ YES

↓ NO

Check the wiring connections of the entire signaling system.

3. Fuel level gauge

- Set the main switch to "ON".
- Move the float up or down.
- Check that the display segments of the fuel level gauge increase or decrease to "E" or "F".

NOTE:

Before reading the fuel level gauge, leave the float in one position (either up or down) for at least three minutes.

- Does the fuel level gauge needle move appropriately?

↓ YES

↓ NO

Replace the fuel level gauge.

4. Wiring

Check the entire signaling system's wiring.

EAS00806

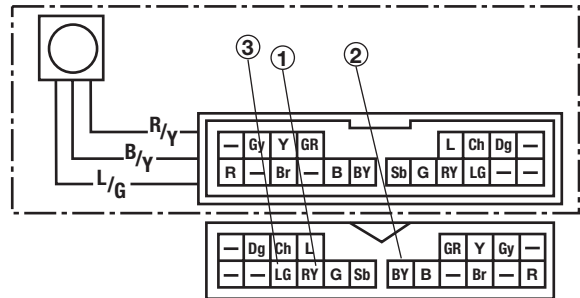
6. The speedometer fails to come on.

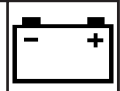
1. Voltage

- Connect the pocket tester (DC 20 V) to the multi-function meter socket coupler (wire harness side) as shown.

Positive tester probe → red/yellow ①

Negative tester probe → black/yellow ②





- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of red/yellow ① on the multi-function meter coupler (wire harness side).
- Is the voltage within specification?

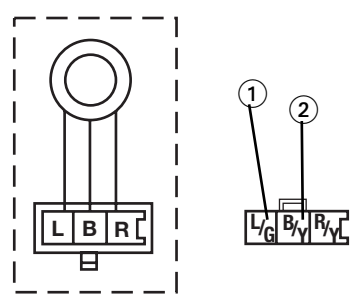
↓ YES

↓ NO

The wiring circuit from the main switch to the multi-function meter bulb socket coupler (wire harness side) is faulty, repair it.

2. Speed sensor
- Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.

Positive tester probe → blue/green ①
Negative tester probe → black/yellow ②



- Set the main switch to “ON”.
- Elevate the front wheel and slowly rotate it.
- Measure the voltage (DC 12 V) of red/yellow and black/yellow. With each full rotation of the front wheel, the voltage reading should cycle from 0 V to 5 ~ 11V to 0 V to 5 ~ 11V.
- Does the voltage reading cycle correctly?

↓ YES

↓ NO

This circuit is OK.

Replace the speed sensor.

EAS00802

7. The water temperature warning light fails to come on (CS50Z only).

1. Water temperature warning light bulb and socket

- Check the water temperature warning light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the water temperature warning light bulb and socket OK?

↓ YES

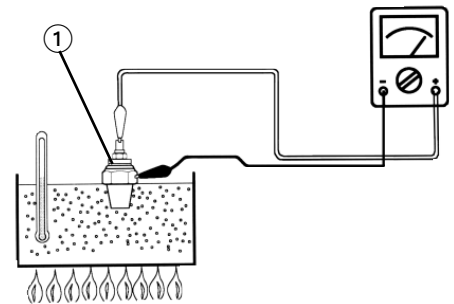
↓ NO

Replace the water temperature warning light bulb, socket or both.

EAS00811

2. Thermo switch

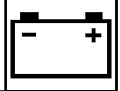
- Remove the thermo switch from the cylinder head.
- Connect the pocket tester ($\Omega \times 1$) to the thermo switch ① as shown.



- Immerse the thermo switch in a container filled with coolant.
- Place a thermometer in the coolant.
- Slowly heat the coolant, then let it cool down to the specified temperature.
- Check the thermo switch for continuity at the temperatures indicated below.


Test step	Coolant temperature	Continuity
	Thermo switch	
1	0 ~ 120 ± 3°C	NO
2	More than 120 ± 3°C	YES
3*	120 ± 3°C to 113 ± 3°C	YES
4*	Less than 113 ± 3°C	NO

Steps 1 & 2: Heating phase
 Steps 3* & 4*: Cooling phase



⚠ WARNING

- Handle the thermo switch with special care.
- Never subject the thermo switch to strong shocks. If the thermo switch is dropped, replace it.

 **Thermo switch**
16 Nm (1.6m • kg)
Three bond sealock® 10

- Does the thermo switch operate properly as described above?

↓ YES

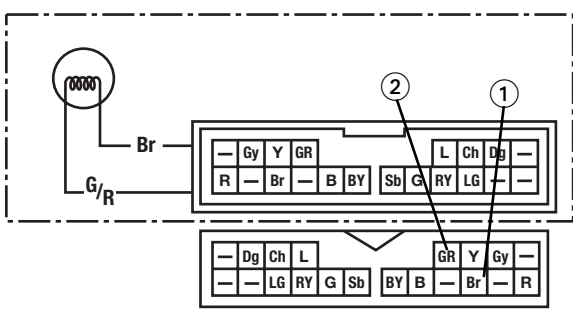
↓ NO

Replace the thermo switch

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → green/red ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown ① and green/red ② at the meter coupler.
- Is the voltage within specification?

↓ YES

↓ NO

The circuit is OK.

The wiring circuit from the main switch to the meter coupler is faulty and must be repaired.

?

TRBL

SHTG

9

CHAPTER 9 TROUBLESHOOTING

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EAS00845

TROUBLESHOOTING

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING FAILURE/ HARD STARTING

ENGINE**Cylinder(s) and cylinder head(s)**

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder

Piston(s) and piston ring(s)

- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter

- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft

- Improperly assembled crankcase
- Seized crankshaft

FUEL SYSTEM**Fuel tank**

- Empty fuel tank
- Clogged fuel tank cap breather hole
- Deteriorated or contaminated fuel
- Clogged or damaged fuel hose

Fuel pump

- Faulty fuel pump
- Faulty fuel pump relay
- Damaged vacuum hose
- Improperly routed hose

Carburetor(s)

- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Improperly installed needle valve seat
- Incorrect fuel level
- Improperly adjusted pilot air screw
- Improperly installed pilot jet
- Clogged starter jet
- Clogged emulsion tube

Autochoke unit

- Faulty starter plunger
- Improperly adjusted starter cable
- Faulty ignitor unit
- Faulty thermo switch

STARTING FAILURE/HARD STARTING / INCORRECT ENGINE IDLING SPEED

TRBL
SHTG



ELECTRICAL SYSTEMS

Battery

- Discharged battery
- Faulty battery

Fuse(s)

- Blown, damaged or incorrect fuse
- Improperly installed fuse

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil(s)

- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system

- Faulty ignitor unit
- Faulty pickup coil
- Broken generator rotor woodruff key

Switches and wiring

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty front, rear or both brake light switches
- Faulty start switch
- Faulty sidestand switch
- Improperly grounded circuit
- Loose connections

Starting system

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

EAS00847

INCORRECT ENGINE IDLING SPEED

ENGINE

Cylinder(s) and cylinder head(s)

- Incorrect valve clearance
- Damaged valve train components

Air filter

- Clogged air filter element

FUEL SYSTEM

Carburetor(s)

- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Improperly synchronized carburetors
- Improperly adjusted engine idling speed (throttle stop screw)
- Improper throttle cable free play
- Flooded carburetor

Autochoke unit

- Faulty starter plunger
- Improperly adjusted starter cable
- Faulty ignitor unit

ELECTRICAL SYSTEMS

Battery

- Discharged battery
- Faulty battery

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil(s)

- Faulty spark plug lead

Ignition system

- Faulty ignitor unit
- Faulty pickup coil



EAS00848

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURES".

ENGINE

Air filter

- Clogged air filter element

FUEL SYSTEM

Carburetor(s)

- Faulty diaphragm
- Incorrect fuel level
- Loose or clogged main jet

Fuel pump

- Faulty fuel pump

EAS00853

FAULTY CLUTCH

**ENGINE OPERATES BUT
SCOOTER WILL NOT MOVE**

V-belt

- Bent, damaged or worn V-belt
- Slipping V-belt

Primary pulley cam and primary pulley slider

- Damaged or worn primary pulley cam
- Damaged or worn primary pulley slider

Clutch spring(s)

- Damaged clutch spring

Transmission gear(s)

- Damaged transmission gear

CLUTCH SLIPS

Clutch shoe spring(s)

- Damaged, loose or worn clutch shoe spring

Clutch shoe(s)

- Damaged or worn clutch shoe

Primary sliding sheave

- Seized primary sliding sheave

POOR STARTING PERFORMANCE

V-belt

- V-belt slips
- Oil or grease on the V-belt

Primary sliding sheave

- Faulty operation
- Worn pin groove
- Worn pin

Clutch shoe(s)

- Bent, damaged or worn clutch shoe

POOR SPEED PERFORMANCE

V-belt

- Oil or grease on the V-belt

Primary pulley weight(s)

- Faulty operation
- Worn primary pulley weight

Primary fixed sheave

- Worn primary fixed sheave

Primary sliding sheave

- Worn primary sliding sheave

Secondary fixed sheave

- Worn secondary fixed sheave

Secondary sliding sheave

- Worn secondary sliding sheave

EAS00855

OVERHEATING

ENGINE

Clogged coolant passages

- Cylinder head(s) and piston(s)
- Heavy carbon buildup

Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

COOLING SYSTEM (CS50Z only)

Coolant

- Low coolant level

Radiator

- Damaged or leaking radiator
- Bent or damaged radiator fin

Water pump

- Damaged or faulty water pump
- Thermostat
- Thermostat stays closed
- Oil cooler
- Clogged or damaged oil cooler
- Hose(s) and pipe(s)
- Damaged hose
- Improperly connected hose
- Damaged pipe
- Improperly connected pipe

FUEL SYSTEM

Carburetor(s)

- Incorrect main jet setting
- Incorrect fuel level
- Damaged or loose carburetor joint

Air filter

- Clogged air filter element

CHASSIS

Brake(s)

- Dragging brake

ELECTRICAL SYSTEMS

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system

- Faulty ignitor unit

EAS00856

OVERCOOLING (CS50Z only)

COOLING SYSTEM

Thermostat

- Thermostat stays open

EAS00859

POOR BRAKING PERFORMANCE

Disc brake

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

Drum brake

- Worn brake shoe
- Worn or rusty brake drum
- Incorrect brake camshaft lever position
- Incorrect brake shoe position
- Damaged or fatigued brake shoe spring
- Oil or grease on the brake shoe
- Oil or grease on the brake drum
- Broken brake torque rod

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FAULTY FRONT FORK LEGS

LEAKING OIL

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

MALFUNCTION

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS00862

UNSTABLE HANDLING

Handlebar

- Bent or improperly installed handlebar

Steering head components

- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)

- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly(-ies)

- Faulty rear shock absorber spring
- Leaking oil or gas

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race



EAS00866

FAULTY LIGHTING OR SIGNALING SYSTEM

HEADLIGHT DOES NOT COME ON

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT COME ON

- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

TAIL/BRAKE LIGHT BULB BURNT OUT

- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

TURN SIGNAL DOES NOT COME ON

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

TURN SIGNAL BLINKS SLOWLY

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

TURN SIGNAL REMAINS LIT

- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY

- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND

- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

CS50/Z 2002 WIRING DIAGRAM

COLOR CODE

B	.....	BLACK
R	.....	RED
L	.....	BLUE
G	.....	GREEN
O	.....	ORANGE
Y	.....	YELLOW
P	.....	PINK
Br	.....	BROWN
Ch	.....	CHOCOLATE
Sb	.....	SKY BLUE
Dg	.....	DARK GREEN
B/Br	.....	BLACK/BROWN
B/Y	.....	BLACK/YELLOW
B/W	.....	BLACK/WHITE
G/R	.....	GREEN/RED
G/Y	.....	GREEN/YELLOW
Br/W	.....	BROWN/WHITE
W/L	.....	WHITE/BLUE
Y/R	.....	YELLOW/RED
L/G	.....	BLUE/GREEN
L/W	.....	BLUE/WHITE
L/Y	.....	BLUE/YELLOW
R/Y	.....	RED/YELLOW

1. DC-CDI magneto
2. DC-CDI. unit
3. Ignition coil
4. Spark plug
5. Main switch
6. Fuse
7. Battery
8. Rectifier/regulator
9. Starter relay
10. Starter motor
11. Start switch
12. Auto choke
13. Front brake switch
14. Rear brake switch
15. Tail/brake light
16. License light (for UK only)
17. Position light
18. Turn signal relay
19. Turn signal switch
20. Front turn signal light (Left)
21. Front turn signal light (right)
22. Rear turn signal light (Left)
23. Rear turn signal light (Right)
24. Dimmer switch
25. Headlight
26. Horn
27. Horn switch
28. Fuel sender
29. Thermo switch (for CS50Z only)
30. Oil level switch
31. Water temperature warning light (for CS50Z only)
32. Fuel meter
33. Turn signal indicator light (right)
34. Turn signal indicator light (left)
35. High beam indicator light
36. Oil level warning light
37. Meter light
38. Clock
39. Speedometer
40. Speed sensor

