

XV1600A(L) '99 5JA1-AE1

SERVICE MANUAL

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XV1600A (L)
SERVICE MANUAL
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First Edition, December 1998
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NOTICE

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

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

NOTE: -

Designs and specifications are subject to change without notice.

EAS00004

IMPORTANT MANUAL INFORMATION

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

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

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

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

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

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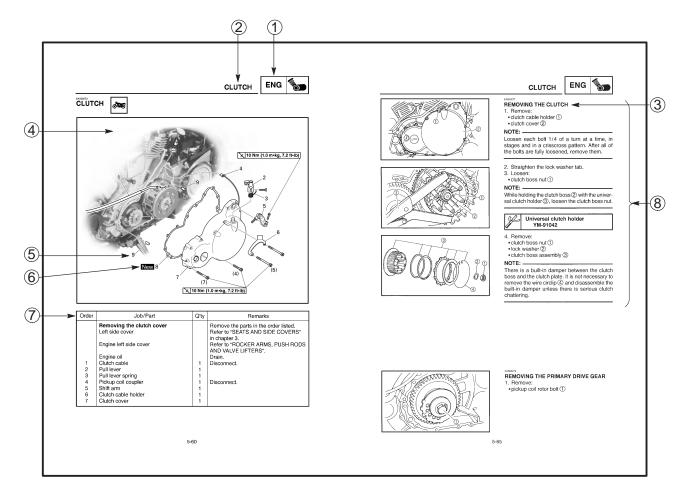
HOW TO USE THIS MANUAL

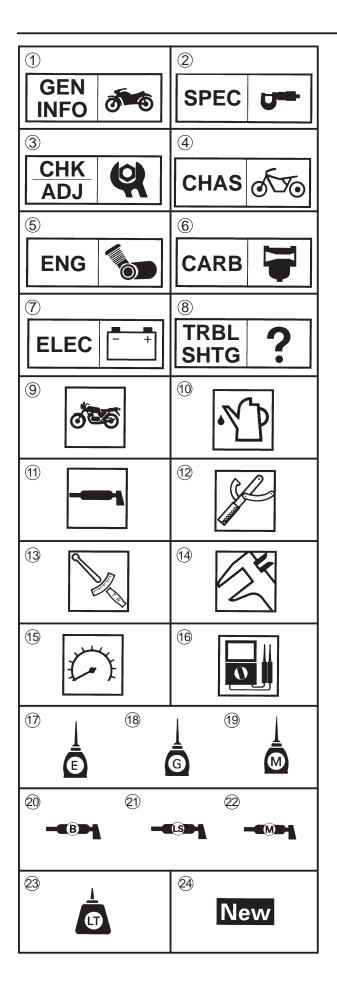
This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

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

Refer to "SYMBOLS".

- ② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 ("PERIODIC CHECKS AND ADJUSTMENTS"), where the sub-section title(-s) appears.
- 3 Sub-section titles appear in smaller print than the section title.
- ④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.
- ⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.
- **(6)** Symbols indicate parts to be lubricated or replaced. Refer to "SYMBOLS".
- (7) A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
- 8 Jobs requiring more information (such as special tools and technical data) are described sequentially.





SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols 1 to 8 indicate the subject of each chapter.

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

Symbols 9 to 16 indicate the following.

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

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

- (17) Engine oil
- 18 Gear oil
- (19) Molybdenum disulfide oil
- 20 Wheel bearing grease
- 21) Lithium soap base grease
- 22 Molybdenum disulfide grease

Symbols 23 to 24 in the exploded diagrams indicate the following.

- 23 Apply locking agent (LOCTITE®)
- 24 Replace the part

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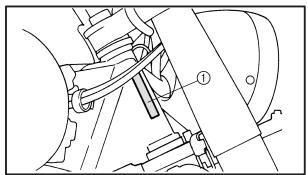
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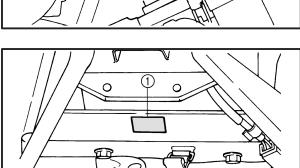
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GEN INFO

MOTORCYCLE IDENTIFICATION







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GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

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VEHICLE IDENTIFICATION NUMBER

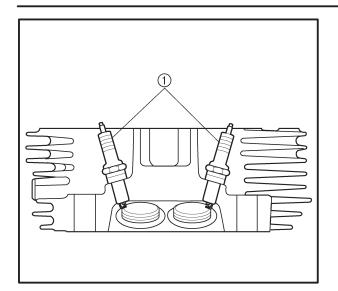
The vehicle identification number ① is stamped into the right side of the steering head pipe.

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MODEL CODE

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





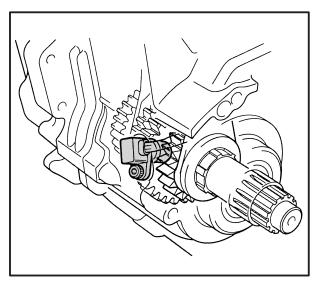
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FEATURES

Twin spark plugs

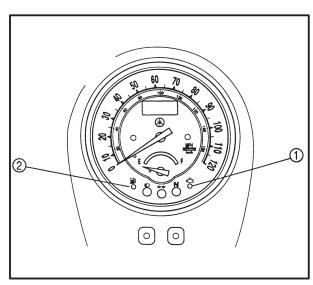
For this model, two spark plugs are incorporated per each cylinder.

By using two spark plugs, the combustion time in the combustion chamber is shortened in an attempt to improve torque.



Speed sensor

The speed sensor is installed to the crankcase and it detects the number of passing gears while the vehicle is running in 5th gear and sends the information out as an electrical signal to the ignitor unit.



Self-diagnosis device

This model is equipped with a self-diagnosis device that has four functions.

The engine trouble indicator light will come on or flash if trouble occurs in an engine monitoring circuit.

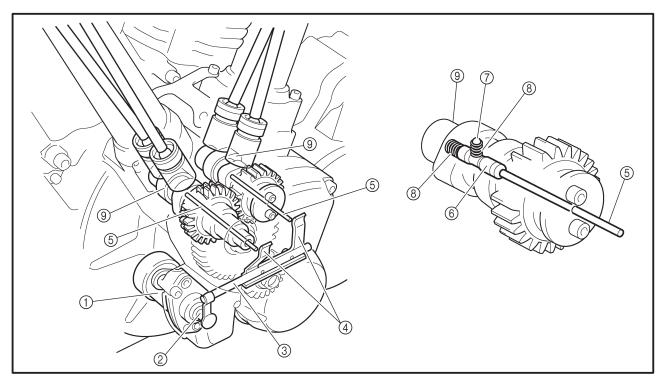
Circuit	Indicator lights	Number of flashes
Throttle position sensor	Engine trouble indicator light 1	3
Speed sensor	Engine trouble indicator light ①	4
Solenoid	Engine trouble indicator light ①	6
Fuel level meter	Fuel level indicator light 1	8

Refer to "SELF-DIAGNOSIS" in chapter 7.



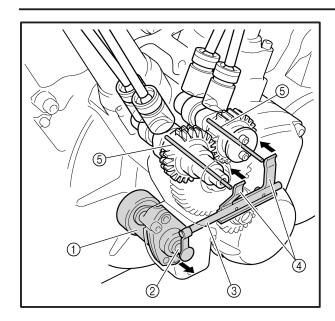
Auto decompression mechanism

The auto decompression mechanism occurs when the engine is started. When the engine is started the decompression cam and pin raise the exhaust valve lifters, push the push rods, move the rocker arms, and lower the exhaust valves which compress the cylinder. When the cylinder is compressed, pressure is released immediately, resulting in smoother engine starting capabilities and smoother crankshaft revolutions.



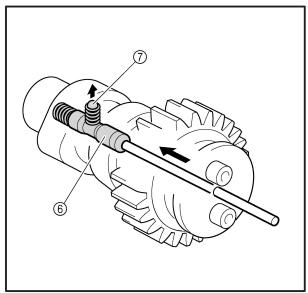
- (1) Decompression solenoid
- (2) Decompression solenoid rod
- (3) Decompression connector
- 4 Decompression lever
- (5) Decompression push rod
- (6) Decompression cam
- 7 Pin
- 8 Spring
- Camshaft



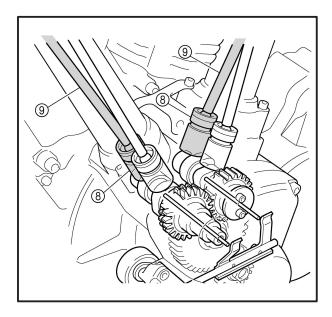


Operation

- When the starter switch is pushed, electricity is run to the decompression solenoid 1 causing it to push out the decompression solenoid rod 2.
- 2. When the decompression solenoid rod is pushed out, the decompression connector ③ moves the decompression levers ④ in the direction indicated by the arrows, and then the levers push the decompression rods ⑤ toward the camshaft side.



3. The decompression cam (6) is pushed in the direction indicated by the arrow, and then the pin (7) raises the projection of the decompression cam.



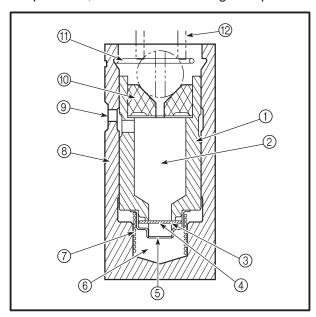
- 4. When the camshaft is rotated by the selftiming motor, the exhaust valve lifters (8) are lifted by the pin just before top dead center (TDC) and the exhaust valve push rod (9) and valve rocker arms are operated. Thus, opening the exhaust valve becomes easy.
- When the engine starts and reaches a specific engine speed the decompression solenoid is turned off and the decompression system stops operating.



Oil-pressure-operated valve lifters

Since the oil-pressure-operated valve-lifting mechanism maintains a valve clearance of zero, periodic valve clearance adjustments are unnecessary.

The advantages of this system as compared to conventional techniques include the following: mechanical noise is reduced, the camshaft action on the valves remains unaffected by engine speed or temperature, and the valve timing is kept stable.



- (1) Plunger
- 2 Oil reservoir
- (3) Check valve spring
- (4) Check valve
- (5) Spring retainer
- (6) High-pressure chamber
- 7 Plunger spring
- (8) Valve lifter body
- (9) Oil supply inlet
- 10 Push rod cup
- 11) Plunger retaining clip
- (12) Valve push rod

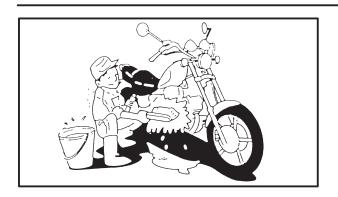
The oil-pressure-operated valve-lifting system functions as follows:

- 1. As the camshaft rotates, the valve lifter is pushed up by the passing cam lobe.
- 2. Since the check valve 4 prevents the engine oil contained inside the high-pressure chamber from escaping, the plunger 1 moves up along with the valve lifter body 8 and pushes up the push rods, causing the valve to be lifted.
- 3. As the camshaft continues to rotate, the valve lifter moves back down to its original position, where it remains while the cam heel passes.

When a positive valve clearance is caused by either heat expansion of the cylinder head or engine oil leaking from the valve lifter during stage 2, the plunger, which no longer receives pressure from the push rod, is pushed up by the plunger spring $\widehat{\mathcal{T}}$. As a result, the valve clearance is zeroed and engine oil is allowed to return to the high-pressure chamber from the reservoir $\widehat{\mathcal{D}}$ through the check valve $\widehat{\mathcal{D}}$. When, on the contrary, a negative valve clearance occurs (this is the case when the cam heel is passing the valve lifter, but the rocker arm, pushed by the push rods, is lifting the valve), the plunger $\widehat{\mathcal{D}}$ continues to receive pressure from the valve push rod. As engine oil contained inside the high-pressure chamber leaks from the gaps between the valve lifter body $\widehat{\mathcal{D}}$ and the plunger $\widehat{\mathcal{D}}$ as well as between the valve lifter body $\widehat{\mathcal{D}}$ and the check valve $\widehat{\mathcal{D}}$, the plunger $\widehat{\mathcal{D}}$ moves down and the valve clearance is zeroed.

IMPORTANT INFORMATION

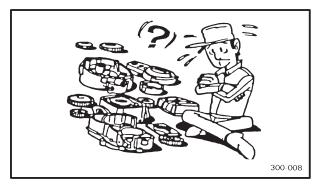




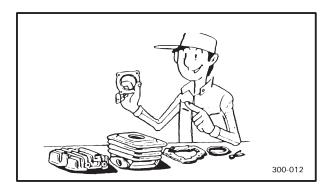
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IMPORTANT INFORMATION PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust, and foreign material.



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



EAS00021

REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs.

Other brands may be similar in function and appearance, but inferior in quality.

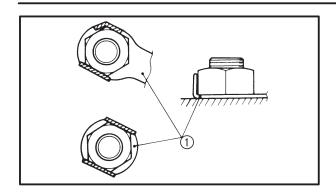
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GASKETS, OIL SEALS AND O-RINGS

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

IMPORTANT INFORMATION

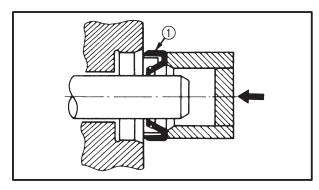




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LOCK WASHERS/PLATES AND COTTER PINS

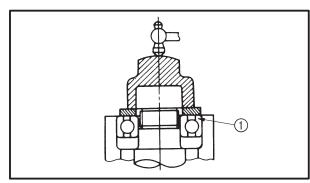
After removal, replace all lock washers/plates
1 and cotter pins. After the bolt or nut has been tightened to specification, bend the lock washer tabs and the cotter pin ends along a flat of the bolt or nut.



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BEARINGS AND OIL SEALS

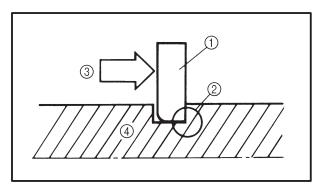
- Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium soap base grease. Oil bearings liberally when installing, if appropriate.
- (1) Oil seal



CAUTION:

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

(1) Bearing



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CIRCLIPS

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

4 Shaft

CHECKING THE CONNECTIONS

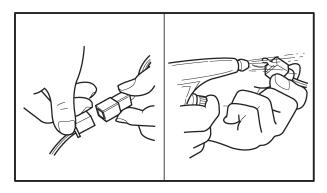


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CHECKING THE CONNECTIONS

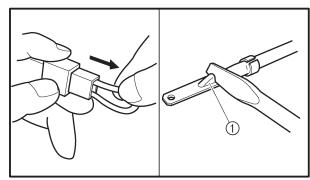
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

- 1. Disconnect:
 - lead
 - coupler
 - connector



- 2. Check:
 - lead
 - coupler
 - connector

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

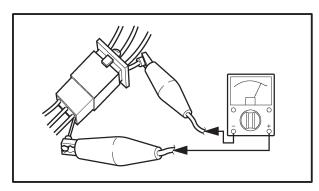


3. Check:

all connections
 Loose connection → Connect properly.

NOTE

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



- 4. Connect:
 - lead
 - coupler
 - connector

NOTE: -

Make sure all connections are tight.

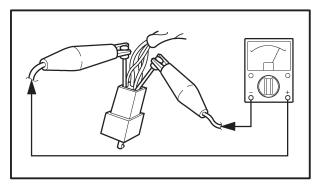
- 5. Check:
 - continuity (with the pocket tester)



Pocket tester 90890-03112

NOTE: —

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



SPECIAL TOOLS



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SPECIAL TOOLS

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

Tool No.	Tool name/Function	Illustration
90890-01080	Flywheel puller This tool is used to remove the generator rotor.	
T-handle 90890-01326 Damper rod holder 90890-01294	T-handle Damper rod holder These tools are used to hold the cartridge cylinder when loosening or tightening the cartridge cylinder bolt.	
90890-01312	This tool is used to measure the fuel level in the float chamber.	
90890-03141	Timing light This tool is used to check the ignition timing.	
90890-03170	Belt tention gauge This tool is used to measure the drive belt slack.	minima de la companya della companya
Fork seal driver weight 90890-01367 Adapter 90890-01374	Fork seal driver weight Adapter These tools are used to install the front fork's oil seal and dust seal.	
90890-06754	Ignition checker This tool is used to check the ignition system components.	
90890-04019	Valve spring compressor This tool is used to remove or install the valve assemblies.	

SPECIAL TOOLS



Tool No.	Tool name/Function	Illustration
90890-04064	Valve guide remover (6 mm)	The state of the s
	This tool is used to remove or install the Valve guides.	
	Valve guide installer	
90890-04065		
	This tool is used to install the valve guides.	
	Valve guide reamer	
90890-04066	This tool is used to rebore the new valve guides.	
	Clutch holding tool	
90890-04086	This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
90890-01701	Sheave holder This tool is used to hold the generator rotor when removing or installing the generator rotor bolt, generator shaft bolt or pickup coil rotor bolt.	
	Piston pin puller set	
90890-01304	This tool is used to remove the piston pins.	
	Micrometer (75 ~ 100 mm)	
90890-03009	This tool is used to measure the piston skirt diameter.	22
	Cylinder bore gauge (50 ~ 100 mm)	
90890-03017		
	This tool is used to measure the cylinder bore.	
	Pocket tester	
90890-03112	This tool is used to check the electrical system.	

SPECIAL TOOLS



Tool No.	Tool name/Function	Illustration
Compression gauge 90890-03081 Compression gauge adapter 90890-04082	Compression gauge These tools are used to measure engine compression.	
90890-01443	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
90890-01426	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
90890-03113	Engine tachometer This tool is used to check engine speed.	
90890-85505	Yamaha bond No.1215 This sealant is used to seal two mating surfaces (e.g., crank case mating surfaces).	
90890-03153	Oil pressure gauge This tool is used to measure the engine oil pressure.	THE WAY TO SEE THE PARTY OF THE
90890-04095	Plane bearing installer/remover This tool is used to install or remove the bearing.	
90890-04058	Middle driver shaft bearing driver This tool is used to install the seal	



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GENERAL SPECIFICATIONS



SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard	Limit
Dimensions		
Overall length	2,500 mm	•••
Overall width	980 mm	•••
Overall height	1,140 mm	•••
Seat height	710 mm	•••
Wheelbase	1,685 mm	•••
Minimum ground clearance	145 mm	•••
Minimum turning radius	3,200 mm	•••
Weight		
Wet (with oil and a full fuel tank)	332 kg	•••
Dry (without oil and fuel)	307 kg	•••
Maximum load (total of cargo, rider,	196 kg	•••
passenger, and accessories)		



ENGINE SPECIFICATIONS

Item	Standard	Limit
Engine Engine type Displacement Cylinder arrangement Bore × stroke Compression ratio Engine idling speed Vacuum pressure at engine idling speed Standard compression pressure	Air-cooled, 4-stroke, OHV 1,602 cm ³ V-type 2-cylinder 95 × 113 mm 8.3:1 850 ~ 950 r/min 52 kPa (390 mm Hg) 1,200 kPa	•••
(at sea level) Fuel Recommended fuel Fuel tank capacity Total (including reserve) Reserve only	12.0 kg/cm ² , at 200 r/min Regular unleaded gasoline 20 L 3.5 L	•••
Engine oil Lubrication system Recommended oil -20 -10 0 10 20 30 40 -20 10 0 10 20 30 40 10W/30 10W/40 1	Dry sump SAE20W40SE or SAE10W30SE	•••
Quantity Total amount Without oil filter cartridge replacement With oil filter cartridge replacement Oil pressure (hot) Relief valve opening pressure	5.0 L 3.7 L 4.1 L 60 kPa (0.6 kg/cm ²) at 900 r/min 600 kPa (6.0 kg/cm ²)	•••
Transfer gear oil Recommended oil Quantity Oil filter Oil filter type Bypass valve opening pressure	SAE80API "GL-4" hypoid gear oil 0.4 L Cartridge (paper) 80 ~ 120 kPa (0.8 ~ 1.2 kg/cm²)	•••

ltem	Standard	Limit
Engine oil pump Oil pump type	Trochoidal	•••
Inner rotor to outer rotor tip clearance Inner rotor outer rotor 2 to oil pump	0.00 ~ 0.12 mm 0.03 ~ 0.08 mm	0.17 mm 0.13 mm
housing clearance (feed pump) Inner rotor outer rotor 1 to oil pump housing clearance (scavenging pump)	0.06 ~ 0.11 mm	0.16 mm
Transfer oil pump Oil pump type Inner rotor to outer rotor tip clearance Inner rotor outer rotor to oil pump housing clearance	Trochoid 0.07 ~ 0.12 mm 0.03 ~ 0.08 mm	0.17 mm 0.16 mm
Starting system type	Electric starter	
Spark plugs Model Manufacturer Quantity Spark plug gap	DPR7EA-9/X22EPR-U9 NGK/DENSO 4 0.8 ~ 0.9 mm	•••
Cylinder heads Max. warpage	•••	0.10 mm
Camshafts Drive system Crankcase hole inside diameter Camshaft cover hole inside diameter Camshaft journal diameter (crankcase side) Camshaft journal diameter (camshaft cover side) Camshaft to crankcase clearance Camshaft to camshaft cover clearance Camshaft intake lobe dimensions	Gear drive 25.000 ~ 25.021 mm 28.000 ~ 28.021 mm 24.937 ~ 24.950 mm 27.967 ~ 27.980 mm 0.050 ~ 0.084 mm 0.020 ~ 0.054 mm	•••
A A		

SPEC U

Item	Standard	Limit
Measurement A Measurement B Camshaft exhaust lobe dimensions	36.594 ~ 36.649 mm 31.950 ~ 32.050 mm	36.494 mm 31.850 mm
A		
Measurement A Measurement B	36.554 ~ 36.654 mm 31.950 ~ 32.050 mm	36.454 mm 31.850 mm
Rocker arms, Rocker arm shafts Rocker arm inside diameter Rocker arm shaft outside diameter Rocker arm to rocker arm shaftclea- rance	15.000 ~ 15.018 mm 14.981 ~ 14.991 mm 0.009 ~ 0.037 mm	15.036 mm 14.97 mm 0.08 mm
Valves, valve seats, valve guides Valve clearance (cold) Intake Exhaust Valve dimensions	0 ~ 0.04 mm 0 ~ 0.04 mm	•••
	B	⇒ † D
Head Diameter Face Wid	dth Seat Width Margin T I	hickness I
Valve head diameter A Intake Exhaust Valve face width B	33.9 ~ 34.1 mm 27.9 ~ 28.1 mm	•••
Intake Exhaust Valve seat width C	1.3 ~ 2.3 mm 1.2 ~ 2.4 mm	•••
Intake Exhaust	0.9 ~ 1.1 mm 0.9 ~ 1.1 mm	2.0 mm 2.0 mm

SPEC	U
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Item	Standard	Limit
Valve margin thickness D		
Intake	0.7 ~ 1.3 mm	0.4 mm
Exhaust	0.7 ~ 1.3 mm	0.4 mm
Valve stem diameter		
Intake	5.975 ~ 5.990 mm	5.945 mm
Exhaust	5.960 ~ 5.975 mm	5.920 mm
Valve guide inside diameter		
Intake	6.000 ~ 6.012 mm	6.05 mm
Exhaust	6.000 ~ 6.012 mm	6.05 mm
Valve stem-to-valve guide clearance		
Intake	0.010 ~ 0.037 mm	0.08 mm
Exhaust	0.025 ~ 0.052 mm	0.1 mm
Valve stem runout	•••	0.01 mm
Valve seat width		
Intake	0.9 ~ 1.1 mm	•••
Exhaust	0.9 ~ 1.1 mm	•••
Valve springs Inner springs Free length		
Intake	38.26 mm	36.26 mm
Exhaust	38.26 mm	36.26 mm
Installed length (valve closed)		
Intake	29.0 mm	•••
Exhaust	29.0 mm	•••
Compressed spring force		
(installed)		
Intake	63 ~ 73 N (6.3 ~ 7.3 kg)	•••
Exhaust	63 ~ 73 N (6.3 ~ 7.3 kg)	•••



Item	Standard	Limit
Spring tilt		
Intake Exhaust	•••	2.5°/2.4 mm 2.5°/2.4 mm
Winding direction (top view)		2.5 /2.4 111111
Intake Exhaust	Counter clockwise Counter clockwise	•••
Exhaust	Counter clockwise	
Outer springs Free length Intake Exhaust	43.25 mm 43.25 mm	41.26 mm 41.26 mm
Installed length (valve closed) Intake	31.0 mm	
Exhaust	31.0 mm	•••
Compressed spring force (installed)		
Intake	139 ~ 161 N (13.9 ~ 16.1 kg)	•••
Exhaust Spring tilt	139 ~ 161 N (13.9 ~ 16.1 kg)	•••
Spirity till		
Intake	•••	2.5°/2.4 mm
Exhaust	•••	2.5°/2.4 mm

SPEC U

Item	Standard	Limit
Winding direction (top view) Intake Exhaust	Clockwise Clockwise	•••
VALVE LIFTERS		
Valve lifter outside diameter Valve lifter case inside diameter	22.9680 ~ 22.9744 mm 22.990 ~ 23.010 mm	•••
Valve lifter-to-valve lifter case clear- ance	0.0156 ~ 0.0420 mm	•••
VALVE PUSH RODS	000 45 000 05	
Valve push rod length Valve push rod runout	293.45 ~ 293.95 mm 0.3 mm	•••
CYLINDERS	0.0 11111	
Bore	95.000 ~ 95.010 mm	•••
Max. taper	•••	0.05 mm
Max. out of round	•••	0.05 mm
PISTONS	0.005	0.45
Piston-to-cylinder clearance Diameter D	0.025 ~ 0.050 mm 94.960 ~ 94.975 mm	0.15 mm
H		
Height H	5 mm	•••
Piston pin bore (in the piston) Diameter Offset	22.004 ~ 22.015 mm 1.0 mm	22.045 mm
Piston pins Outside diameter Piston pin-to-piston pin bore clearance	21.991 ~ 22.000 mm 0.004 ~ 0.024 mm	21.971 mm 0.074 mm

Item	Standard	Limit
Piston rings Top ring B		
Ring type Dimensions (B × T) End gap (installed) Ring side clearance 2nd ring	Barrel 1.2 × 3.8 mm 0.30 ~ 0.45 mm 0.03 ~ 0.08 mm	0.65 mm 0.12 mm
B		
Ring type Dimensions (B × T) End gap (installed) Ring side clearance Oil ring	Taper 1.2 × 3.8 mm 0.30 ~ 045 mm 0.03 ~ 0.07 mm	0.8 mm 0.12 mm
B		
Dimensions (B \times T) End gap (installed)	2.5 × 3.4 mm 0.2 ~ 0.7 mm	•••
Connecting rods Crankshaft pin-to-big end bearing clearance	0.037 ~ 0.074 mm	•••
Bearing color code Connecting rod length	1 = Blue, 2 = Black, 3 = Brown, 4 = Green, 5 = Yellow. 191.95 ~ 192.05 mm	•••
Crankshaft		
Width A Max. runout C Big end side clearance D	132.8 ~ 133.2 mm 0.320 ~ 0.474 mm	0.04 mm



Item	Standard	Limit
	0.037 ~ 0.074 mm	0.09 mm
Big end radial clearance E Crankshaft journal-to-crankshaftjour-	0.037 ~ 0.074 mm	0.09 mm
nal bearing clearance	0.000 0.002 11111	0.1 111111
Clutch	NA/at manufaire la alia a	
Clutch type Clutch release method	Wet, multiple disc	•••
	Rack and pinion (pull rod type)	
Clutch release method operation	Cable operation	
Operation	Left-hand operation 10 ~ 15 mm	
Clutch cable free play (at the end of the	10 ~ 15 mm	
clutch lever) Friction plates		
Thickness	2.9 ~ 3.1 mm	2.8 mm
Plate quantity	9	2.0 111111
Clutch plates	9	
Thickness	2.2 ~ 2.4 mm	
Plate quantity	8	•••
Max. warpage	•••	0.2 mm
Clutch springs		0.2 111111
Free length	7 mm	•••
Spring quantity	1	•••
Min. length		6.5 mm
Transmission		
Transmission type	Constant mesh, 5-speed	
Primary reduction system	Spur gear	•••
Primary reduction ratio	72/47 (1.532)	•••
Secondary reduction system	Belt drive	•••
Secondary reduction ratio	35/32 × 70/33 (2.320)	•••
Operation	Left-foot operation	•••
Gear ratios		
1st gear	39/16 (2.437)	•••
2nd gear	30/19 (1.578)	•••
3rd gear	29/25 (1.160)	•••
4rd gear	29/32 (0.906)	•••
5th gear	21/28 (0.750)	•••
Max. main axle runout	•••	0.08mm
Max. drive axle runout	•••	0.08 mm

CHASSIS SPECIFICATIONS



CHASSIS SPECIFICATIONS

Item		Standard	Limit
Shifting mechanism Shift mechanism type Max. shift fork guide bar Shift fork thickness	bending	Guide bar ••• 6.26 ~ 6.39 mm	0.025 mm
Air filter type		Dry element	•••
Fuel pump Pump type Model (manufacturer) Output pressure		Electrical 4WM (MITSUBISHI) 15 ~ 20 kPa (0.15 ~ 0.20 kgf/cm ²)	•••
Carburetor Model (manufacturer) × Throttle cable free play (a the throttle grip) ID mark Main jet Main air jet Jet needle Needle jet Pilot air jet Pilot air jet Pilot outlet Pilot jet Bypass 1 Bypass 2 Bypass 3 Pilot screw turns out Valve seat size Starter jet 1 Starter jet 2 Throttle valve size Fuel level	(M. J) (M. A. J) (M. A. J) (J. N) (N. J) (P. A. J1) (P. A. J2) (P. O) (P. J) (B. P1) (B. P2) (B. P3) (V. S) (V. S) (G. S. 1) (G. S. 2) (TH. V) (F. L)	BSR40 (MIKUNI) × 1 4 ~ 8 mm 5JA1 00 #165 #60 6HDC27-3 X-2 #100 2.0 1.1 #35 0.9 1.0 0.9 2-1/2 2.0 #57.5 0.7 #110 4.0 ~ 5.0 mm	•••
	` (F. L)		•••

CHASSIS SPECIFICATIONS



ltem	Standard	Limit
Frame		
Frame type	Double cradle	•••
Caster angle	32°	•••
Trail	142 mm	•••
Front wheel		
Wheel type	Spoke wheel	•••
Rim	·	
Size	16 × MT3.00	•••
Material	Steel	•••
Wheel travel	140 mm	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm
Max. lateral wheel runout	•••	0.5 mm
Rear wheel		
Wheel type	Spoke wheel	•••
Rim	·	
Size	16 × Mt 3.50	•••
Material	Steel	•••
Wheel travel	110 mm	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm
Max. lateral wheel runout	•••	0.5 mm
Front tire		
Tire type	With tube	•••
Size	130/90 - 16 67H	•••
Model (manufacturer)	D404FL (DUNLOP)/	•••
, ,	G703F (BRIDGESTONE)	
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kg/cm ²)	•••
90 kg ~ Maximum load*	250 kPa (2.5 kg/cm ²)	•••
High-speed riding	250 kPa (2.5 kg/cm ²)	•••
	*Load is the total weight of the cargo,	
	rider, passenger and accessories.	
Min. tire tread depth	•••	1.6 mm

CHASSIS SPECIFICATIONS



Item	Standard	Limit
Rear tire Tire type Size Model (manufacturer) Tire pressure (cold) 0 ~ 90 kg 90 kg ~ Maximum load* High-speed riding Min. tire tread depth	With tube 150/80 B16 71H D404 (DUNLOP)/ G702 (BRIDGESTONE) 250 kPa (2.5 kg/cm²) 280 kPa (2.8 kg/cm²) 280 kPa (2.8 kg/cm²) *Load is the total weight of the cargo, rider, passenger and accessories. •••	••• ••• ••• 1.6 mm
Front brakes Brake type Operation Brake lever free play (lever end) Recommended fluid Brake discs Diameter × thickness Min. thickness Max. deflection Brake pad lining thickness	Dual-disc brake Right-hand operation 2 ~ 5 mm DOT 4 298 × 5 mm ••• 6.0 mm	4.5 mm 0.1 mm 0.5 mm
Master cylinder inside diameter Caliper cylinder inside diameter	15.8 mm 30.1 mm and 33.3 mm	•••
Rear brake Brake type Operation Brake pedal position (from the top of the brake pedal to the bottom of the rider footrest boad) Recommended fluid Brake discs Diameter × thickness Min. thickness Max. deflection Brake pad lining thickness	Single-disc brake Right-foot operation 100 mm DOT 4 320 × 7 mm ••• 7.5 mm	••• ••• 6.5 mm 0.1 mm 0.5 mm

CHASSIS SPECIFICATIONS



Item	Standard	Limit
Master cylinder inside diameter	12.7 mm	•••
Caliper cylinder inside diameter	33.9 mm and 30.2 mm	•••
Steering		
Steering bearing type	Taper roller bearings	•••
Front suspension		
Suspension type	Telescopic fork	•••
Front fork type	Coil spring/oil damper	•••
Front fork travel	140 mm	•••
Spring		
Free length	571 mm	566 mm
Spring rate (K1)	6.8 N/mm (0.7 kg/mm)	•••
Spring stroke (K1)	0 ~140 mm	•••
Optional spring available	No	•••
Fork oil	Versele of out oil FWT	
Recommended oil Quantity (each front fork leg)	Yamaha fork oil 5WT 554 cm ³	
Level (from the top of the inner tube,	110 mm	•••
with the inner tube fully compressed,		
and without the fork spring)		
Inner tube outer diameter	43 mm	•••
Rear suspension		
Suspension type	Swingarm (link suspension)	•••
Rear shock absorber assembly	Coil spring/gas-oil damper	•••
type		
Rear shock absorber assembly	50 mm	•••
travel		
Spring	40-	100
Free length	187 mm	182 mm
Installed length	172 mm	
Spring rate (K1) Spring stroke (K1)	127 N/mm (13 kg/mm) 0 ~ 50 mm	
Optional spring available	No	
Standard spring preload gas/air	1,000 kPa (10 kg/cm ²)	•••
pressure	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Swingarm		
Free play (at the end of the swingarm)		
Radial	•••	1 mm
Axial	•••	1 mm

CHASSIS SPECIFICATIONS



Item	Standard	Limit
Drive belt		
Model (manufacturer)	UBD-0568	•••
Drive belt slack (on a sidestand)	7.5 ~ 13 mm	•••
Drive belt slack	14 ~ 21 mm	•••
(on a suitable stand)		

ELECTRICAL SPECIFICATIONS

SPEC U

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	•••
Ignitions system Ignition system type Ignition timing Advanced timing Advancer type Pickup coil resistance/color Transistorized coil ignition unit model (manufacturer)	Transistorized coil ignition (TCI) 10° BTDC at 1,000 r/min 40° BTDC at 4,000 r/min Throttle position sensor and electrical 248 ~ 372 Ω/Gy-B J4T098 (MITSUBISHI)	•••
Ignition coils Model (manufacturer) Minimum ignition spark gap Primary coil resistance Secondary coil resistance Spark plug caps Material Resistance	J0383 (DENSO) 6 mm 1.53 \sim 2.07 Ω 12 \sim 18 k Ω	•••
Throttle position sensor standard resistance	$4.0 \sim 6.0 \text{ k}\Omega$	•••
Charging system System type Model (manufacturer) Nominal output Stator coil resistance/color Voltage regulator Regulator type	AC magneto F4T363 (MITSUBISHI) 14 V/21 A at 5,000 r/min 0.45 ~ 0.55 Ω at 20°C/w–w Semiconductor, short circuit	•••
Model No-load regulated voltage/color	SH650D-11 14.1 ~ 14.9 V	•••
Rectifier Model (manufacturer) Rectifier capacity Withstand voltage Battery	SH650D-11 (SHINDENGEN) 18 A 200 V	•••
Battery type (manufacturer) Battery voltage/capacity	YTX20L-BS (YUASA) 12V/18 AH	•••
Headlight type	Halogen bulb	
Indicator light type $ imes$ quantity	Bulb $ imes$ 3 and LED $ imes$ 2	
Bulbs (voltage/wattage × quantity) Headlight Tail/brake light Front turn signal light Rear turn signal light Meter light	12 V 60 W/55 W × 1 12 V 21 W/5 W × 1 12 V 21 W × 2 12 V 21 W × 2 14 V 1.7 W × 3	•••

ELECTRICAL SPECIFICATIONS

SPEC U

Item Standard				
Neutral indicator light	12 V 1.7 W ×1	Limit		
Turn signal indicator light	12 V 1.7 W × 1	•••		
High beam indicator light	12 V 1.7 W ×1	•••		
Fuel level indicator light	LED	•••		
Engine trouble indicator light	LED	•••		
Electric starting system				
System type	Constant mesh	•••		
Starter motor				
Model (manufacturer)	SM-13 (MITSUBA)	•••		
Power output	0.8 kW	•••		
Brushes	40	_		
Overall length	10 mm	5 mm		
Spring force	7.65 ~ 10.01 N	•••		
Commutator resistance	$(765 \sim 1,001 \text{ kg})$ 25 $\sim 35 \text{ m}Ω$	•••		
Commutator diameter	28 mm	27 mm		
Mica undercut	0.7 mm	•••		
Starter relay	0.7 111111			
Model (manufacturer)	MS5F-411 (JIDECO)	•••		
Amperage	180 A	•••		
Coil resistance	4.18 ~ 4.62 Ω	•••		
Horn				
Horn type	Plane type	•••		
Model (manufacturer) × quantity	YF-12 (NIKKO) × 1	•••		
Max. amperage	3 A	•••		
Turn signal relay				
Relay type	Full-transistor	•••		
Model (manufacturer)	FE246BH (DENSO)	•••		
Self-cancelling device built-in	Yes	•••		
Turn signal blinking frequency	75 ~ 95 cycles/min.	•••		
Wattage	21 W × 2 + 3.4 W	•••		
Fuel sender				
Model (manufacturer)	4WM (NIPPON SEIKE)	•••		
Resistance	13 ~ 140 Ω at 20°C	•••		
Sidestanc relay				
Model (manufacturer)	G8R-30Y-B (OMRON)	•••		
Coil resistance	$202 \sim 248 \Omega$	•••		
Diode	Yes	•••		
Fuel pump maximum amperage	1A	•••		
Fuel pump relay model (manufacturer)	G8R-30Y-B (OMRON)	•••		
Thermo switch model (manufacturer)	4TR (NIPPON TEXISAS INSTALLMENTS)	•••		

ELECTRICAL SPECIFICATIONS



ltem	Standard	Limit
Fuses (amperage × quantity)		
Main fuse	30 A × 1	•••
Headlight fuse	15 A × 1	•••
Signaling system fuse	10 A × 1	•••
Ignition fuse	15 A × 1	•••
Carburetor heater	10 A × 1	•••
Backup fuse (odometer)	5 A × 1	
Reserve	30 A, 15 A, 10 A, 5 A × 1	•••

CONVERSION TABLE/TIGHTENING TORQUES

SPEC U

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		IMP
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

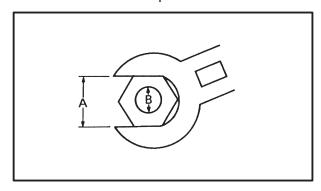
CONVERSION TABLE

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

EAS00029

TIGHTENING TORQUES GENERAL TIGHTENING TORQUES

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



A : Width across flats B : Thread diameter

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

SPEC U

ENGINE TIGHTENING TORQUES

lto me	Factorias	Through size	0'4	Tightenin	ng torque	Damarka
Item	Fastener	Thread size	Q'ty	Nm	m•kg	Remarks
Spark plug	_	M12	4	18	1.8	
Cylinder head	Nut	M12	8	50	5.0	
Cylinder head	Nut	M10	4	39	3.9	
Cylinder head (exhaust pipe)	Stud bolt	M8	4	15	1.5	
Camshaft driven gear	Nut	M14	1	52	5.2	
Camshaft driven gear	Bolt	M10	1	30	3.0	
Connecting rod	Bolt	M8	4	38.5	38.5	
Rocker arm adjusting screw	Nut	M7	4	20	2.0	_
Front cylinder camshaft end	Bolt	M5	2	10	1.0	-(€)
cover						7
Engine oil drain bolt (crankcase)	_	M14	1	43	4.3	
Engine oil drain bolt (oil tank)	_	M14	1	43	4.3	
Oil filter cartridge	_	MJ20	1	17	1.7	
Oil filter bolt	_	M20	1	70	7.0	
Oil filter bracket	Bolt	M6	4	10	1.0	⊣ Ū
Oil delivery pipe (generator	Nut	M20	1	40	4.0	7
cover-to-crankcase)						
Joint bolt	_	M16	1	40	4.0	
Oil delivery pipe (cylinder	Union	M10	2	21	2.1	
headto-crankcase)	bolt		_			
Oil delivery pipe (cylinder	Union	M8	1	18	1.8	
headto-crankcase)	bolt		·			
Carburetor joint	Bolt	M6	4	12	1.2	
Carburetor joint clamp	Screw	M4	1	3	0.3	
Air filter case	Bolt	M6	3	7	0.7	
Air filter case clamp	Screw	M4	1	3	0.3	
Exhaust pipe	Nut	M6	4	20	2.0	
Muffler	Bolt	M10	2	25	2.5	
Muffler clamp	Bolt	M10	2	30	3.0	
Crankcase (cylinder head)	Stub bolt	M12	8	_	_	⊸ @ *1
Crankcase (cylinder head)	Stub bolt	M10	4	_	_	⊸ @ *1
Crankcase (transfer gear case)	Stub bolt	M8	1	13	1.3	⊸ @ *2
Pickup coil	Screw	M6	2	7	0.7	_ <u>~</u> 0
Pickup coil lead holder	Screw	M6	7	7	0.7	76
Stator coil assembly	Screw	M6	3	7	0.7	76
Stator coil assembly	Screw	M6	1	7	0.7	- U
Starter clutch	Bolt	M8	6	24	2.4	⊣ ©



Item	Fastener	Thread size	Q'ty	Tightening torque		Remarks
item	rasteriei	Tilleau Size	Qty	Nm	m•kg	Nemaiks
Generator rotor	Bolt	M12	1	160	16.0	
Generator shaft	Bolt	M8	1	28	2.8	⊣©
Pickup coil rotor	Bolt	M12	1	115	11.5	999
Buffle plate	Bolt	M6	4	10	1.0	⊣©
Clutch boss	Nut	M20	1	70	7.0	Use a lock
						washer.
Clutch spring plate	Bolt	M6	6	8	0.8	
Pull lever	Bolt	M6	1	10	1.0	
Transfer gear oil drain bolt	_	M8	1	18	1.8	
Middle drive gear	Nut	M22	1	85	8.5	Use a lock
						washer.
Transfer gear case	Bolt	M8	4	30	3.0	
Transfer gear case	Nut	M8	1	30	3.0	
Transfer gear oil checking bolt	_	M6	1	8	0.8	
Transfer gear oil pump cover	Screw	M6	2	7	0.7	⊣ ⑤
Transfer gear oil pump	Bolt	M6	5	10	1.0	40
Drive sprocket case	Bolt	M8	7	30	3.0	
Drive sprocket	Nut	M22	1	85	8.5	Use a lock
						washer.
Drive sprocket cover bracket	Bolt	M8	2	30	3.0	
Shift arm	Bolt	M6	1	10	1.0	
Shift rod locknut	_	M8	2	12	1.2	
Shift shaft spring stopper	Bolt	M8	1	22	2.2	- 0
Stopper lever	Bolt	M6	1	10	1.0	-(0
Neutral switch	Screw	M6	2	7	0.7	

NOTE: —

 $^{^*}$ 1: When installing the crank case stud bolts(cylinder head), make sure that their installed length is 140.5 \sim 142.5 mm.

 $^{^*}$ 2: When installing the crankcase stud bolts (transfer gear case), make sure that their installed length is 68.3 \sim 70.3 mm.

SPEC U

CHASSIS TIGHTENING TORQUES

lia	Thursdains	Tightenin	ng torque	Damada
Item	Thread size	Nm	m•kg	Remarks
Upper bracket and inner tube	M6	10	1.0	
Upper bracket and steering shaft	M22	130	13.0	
Handlebar holder (lower) and handlebar	M8	23	2.3	
holder (upper)				
Ring nut (steering shaft)	M25	3	0.3	See NOTE.
Brake hose joint and lower bracket	M6	7	0.7	
Front brake master cylinder cap	M4	2	0.2	
Handlebar holder (lower)	M12	40	4.0	
Front brake master cylinder	M6	10	1.0	
Union bolt (brake hose)	M10	30	3.0	
Engine mounting:				
Mounting bolt	M10	48	4.8	
(cylinder head and engine stay)				
Mounting bolt	M12	88	8.8	
(crankcase and engine stay)				
Mounting bolt (crankcase and frame)	M12	88	8.8	
Engine stay and frame	M10	88	8.8	
Transfer gear case stay and frame	M8	48	4.8	
Muffler stay and frame	M8	30	3.0	
Muffler stay and muffler	M10	26	2.6	
Ignition coil	M6	30	3.0	
Swingarm pivot shaft	M18	7	0.7	
Relay arm and swingarm	M12	125	12.5	
Relay arm and connecting rod	M12	59	5.9	
Relay arm and rear shock absorber	M10	59	5.9	
Relay shock absorber, connecting rod	M12	40	4.0	
and frame		59	5.9	
Drive belt case (upper) and swingarm	M6	10	1.0	
Drive belt case (lower) and swingarm	M6	7	0.7	
Mud guard and swingarm	M6	7	0.7	
Fuel petcock and fuel tank	M6	7	0.7	
Fuel sender and fuel tank	M6	7	0.7	
Fuel tank (rear) and frame	M6	7	0.7	
Meter cover and fuel tank	M6	7	0.7	
Side cover and frame	M6	7	0.7	
Starter relay and battery positive lead	M6	7	0.7	
Starter relay and starter motor lead	M6	7	0.7	
Rear fender side mold and rear fender	M8	30	3.0	
stay				
Sidestand bolt and nut	M10	48	4.8	
Footrest bracket and frame	M10	48	4.8	
Rear footrest and frame	M8	23	2.3	



Item	Thread size	Tightenir	ng torque	Remarks
item	Tilleau Size	Nm	m•kg	Remarks
Rear master cylinder and brake bracket	M8	23	2.3	
Rear brake reservoir tank	M6	4	0.4	
Union bolt (rear brake hose)	M10	30	3.0	
Footrest bracket and rear brake bracket	M8	16	1.6	
Footrest bracket and shift rod bracket	M8	16	1.6	
Front wheel axle	M18	78	7.8	
Front wheel axle pinch bolt	M8	19	1.9	
Rear wheel axle nut	M18	150	15.0	
Front brake caliper	M10	40	4.0	
Rear brake caliper	M10	40	4.0	
Brake disc and wheel	M8	23	2.3	-©
Caliper bleed screw	M8	6	0.6	
Driven sprocket and rear wheel clutch	M12	95	9.5	
hub				
Rear brake caliper bracket and swin-	M10	48	4.8	
garm				

- 1. First, tighten the ring nut to approximately 52 Nm (5.2 m•kg) with a torque wrench, then loosen the ring nut completely.

 2. Retighten the ring nut to specification.

LUBRICATION POINTS AND LUBRICANT TYPES

SPEC U

LUBRICATION POINTS AND LUBRICANT TYPES ENGINE LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Oil seal lips	- LS
O-rings	
Bearings	⊸ ⓐ
Connecting rod bolts and nuts	
Connecting rod small end and big end	-
Crankshaft pins	→(3)
Crankshaft journals	⊸ ⓐ
Piston surfaces	⊸ @
Piston pins	-3
Camshaft cam lobes and camshaft journals	
Valve push rods	-3
Valve push rod end balls	⊸③
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	⊸ (3)
Valve lifters	- (3)
Oil pump rotors (inner and outer) and oil pump housing	⊸ (3)
Oil strainer	- (3)
Starter clutch idle gear inner surface	⊸©
Starter clutch idle gear shaft	→③
Starter clutch roller and starter clutch gear outer surface	⊸©
Clutch pull rod	— M
Pressure plate bearing	⊸ (3)
Transmission gears (wheel and pinion)	→©
Shift drum	⊸③
Shift forks and shift fork guide bars	⊸ €
Shift shaft	
Shift pedal	- (s)
Shift lever joint	
Crankcase mating surface	Sealant (Quick Gasket [®])
Stator coil lead grommet	Sealant (Quick Gasket [®])
Pickup coil lead grommet	Sealant (Quick Gasket [®])

LUBRICATION POINTS AND LUBRICANT TYPES



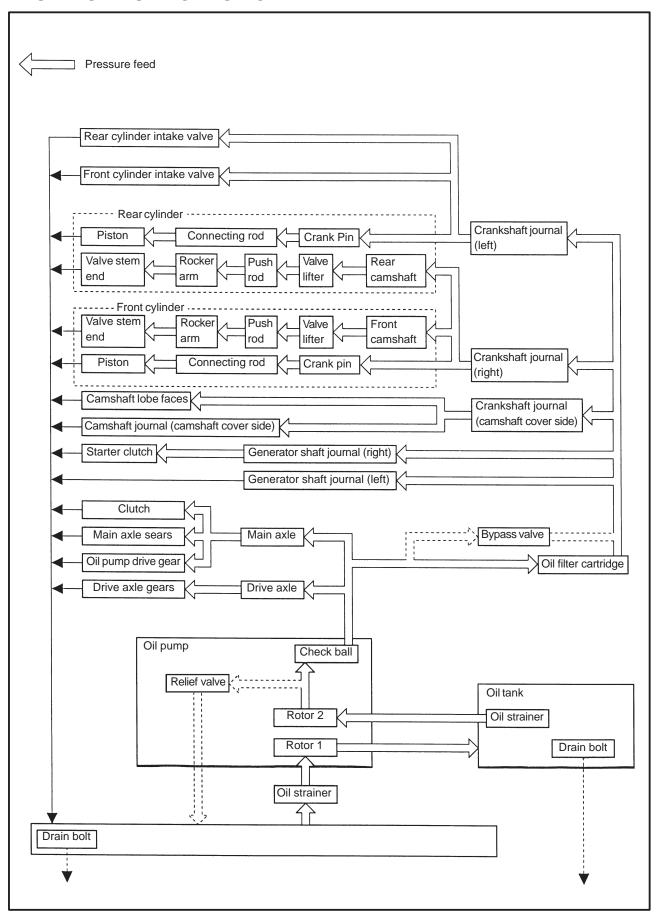
CHASSIS LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	- (s)-
Steering bearing cover	- (S)-1
Steering head pipe lower oil seal	
Front wheel oil seal (right and left)	- (s)
Rear wheel oil seal	
Rear wheel drive hub mating surface	- (9)-
Rear brake pedal shaft	(S)
Shift pedal	
Front footrest pivot	- (s)-1
Sidestand sliding surface	- (3)
Tube guide (throttle grip) inner surface	- (S)-1
Brake lever pivot bolt, contact surface	- (3)
Clutch lever pivot bolt, contact surface	- G
Swingarm pivot shaft	
Swingarm pivot bearing	
Swingarm pivot oil seal	-M>-1
Relay arm bearing (inner)	(M)-1
Rear shock absorber bearing (inner)	
Connecting rod bearing (inner)	

ENGINE OIL LUBRICATION CHART



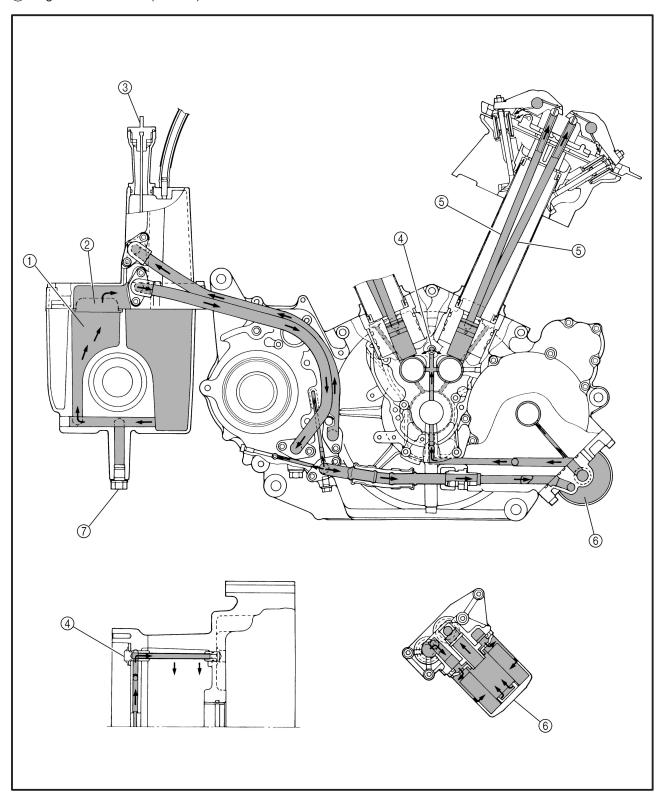
ENGINE OIL LUBRICATION CHART





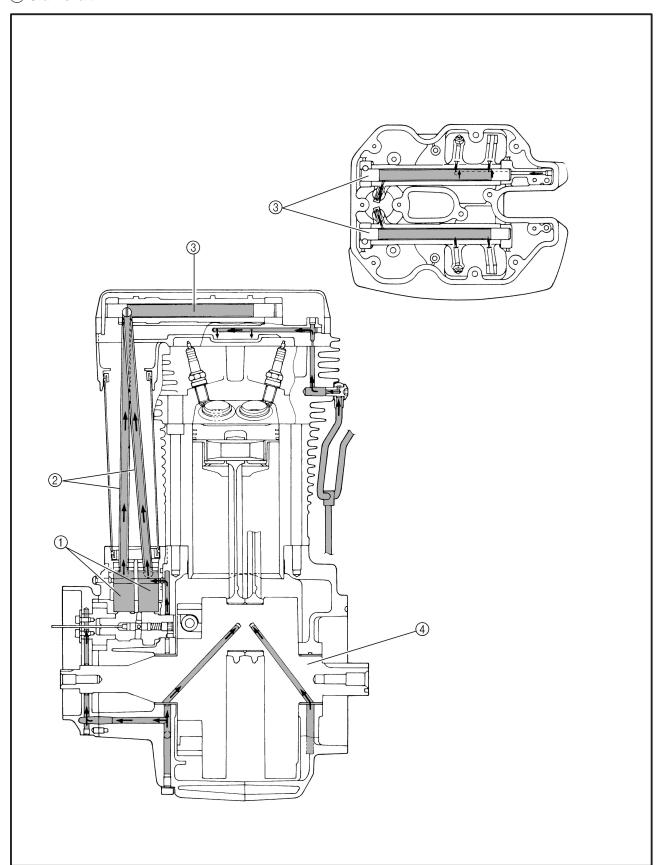
- Oil tank
 Oil strainer
 Dipstick
 Oil delivery pipe
 Push rod

- 6 Oil filter cartridge7 Engine oil drain bolt (oil tank)



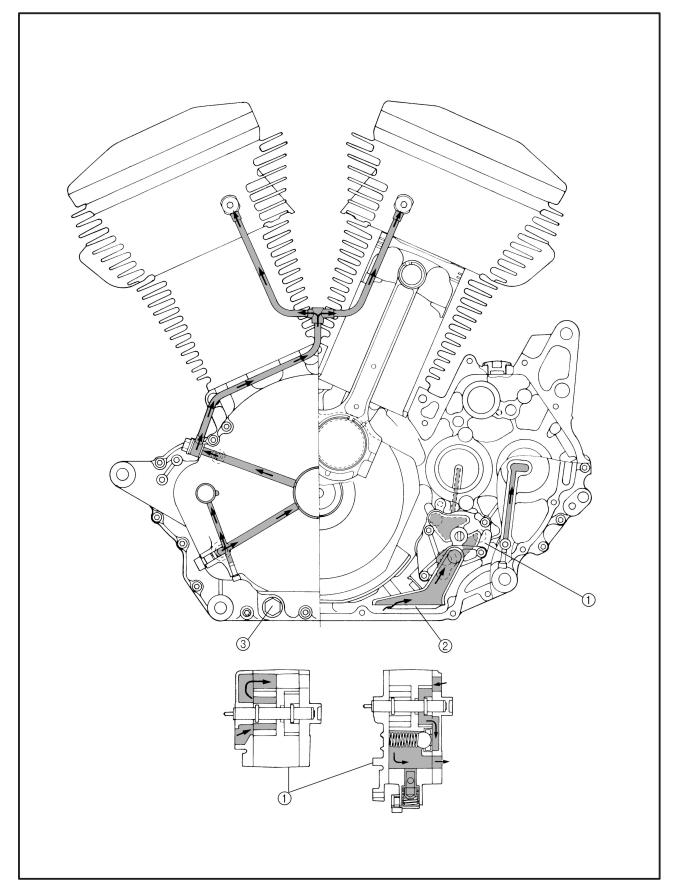


- 1 Valve lifter 2 Push rod
- 3 Rocker arm shaft4 Crankshaft



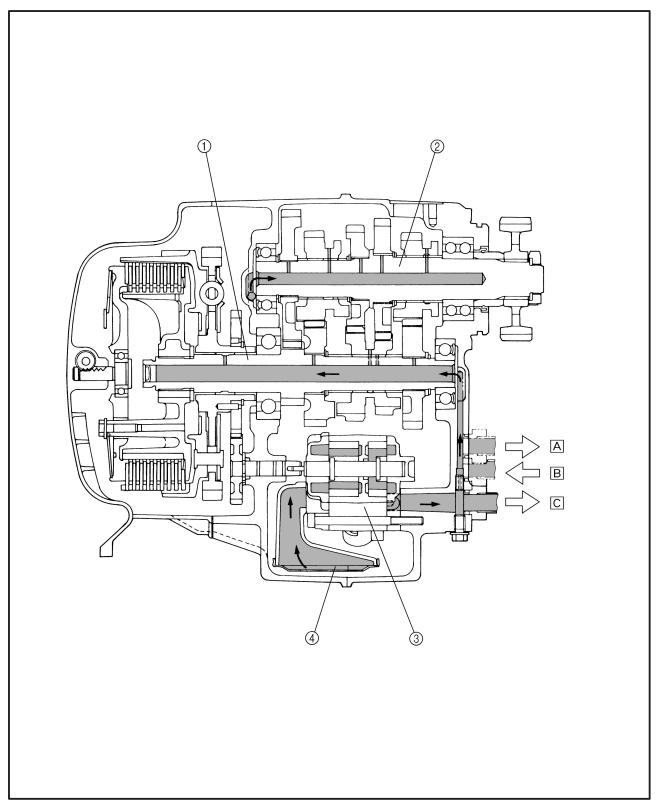


- Engine oil pump
 Oil strainer
 Engine oil drain bolt (engine)





- 1 Main axle
- 2 Drive axle
- 3 Engine oil pump4 Oil strainer
- A To oil tank
- B From oil tank
- C To oil filter cartridge

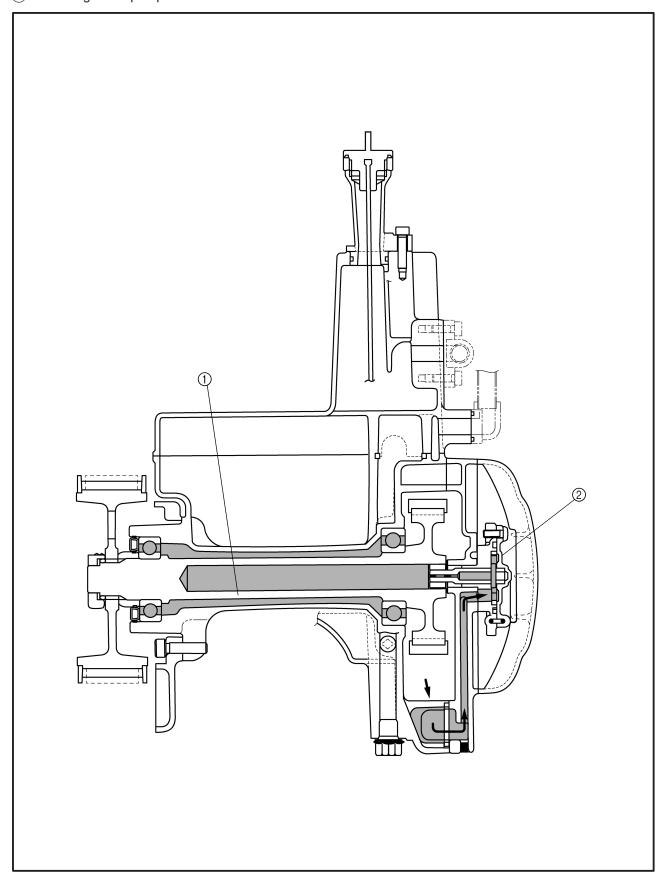


TRANSFER GEAR OIL FLOW DIAGRAMS



TRANSFER GEAR OIL FLOW DIAGRAMS

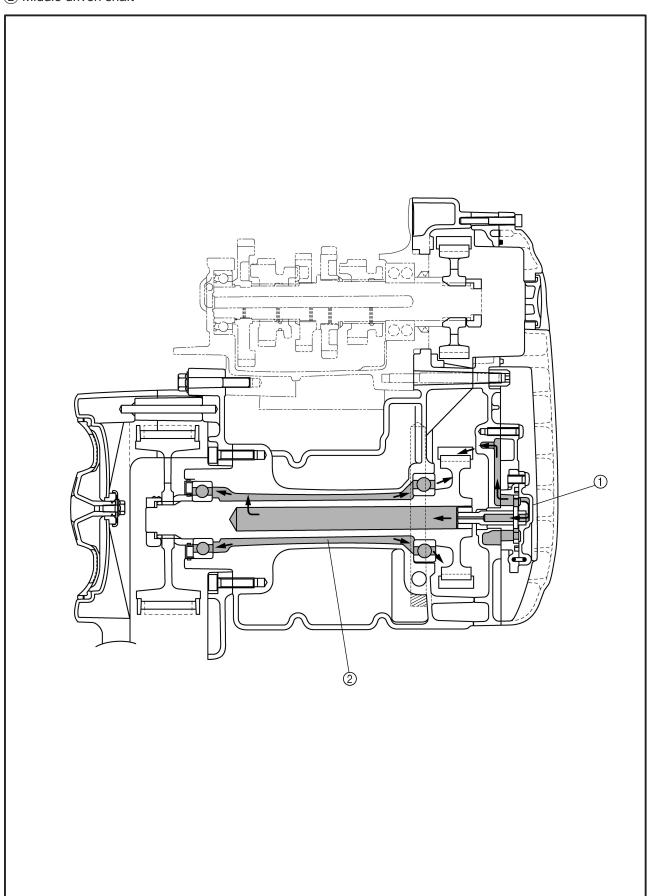
- Middle drive shaft
 Transfer gear oil pump



TRANSFER GEAR OIL FLOW DIAGRAMS

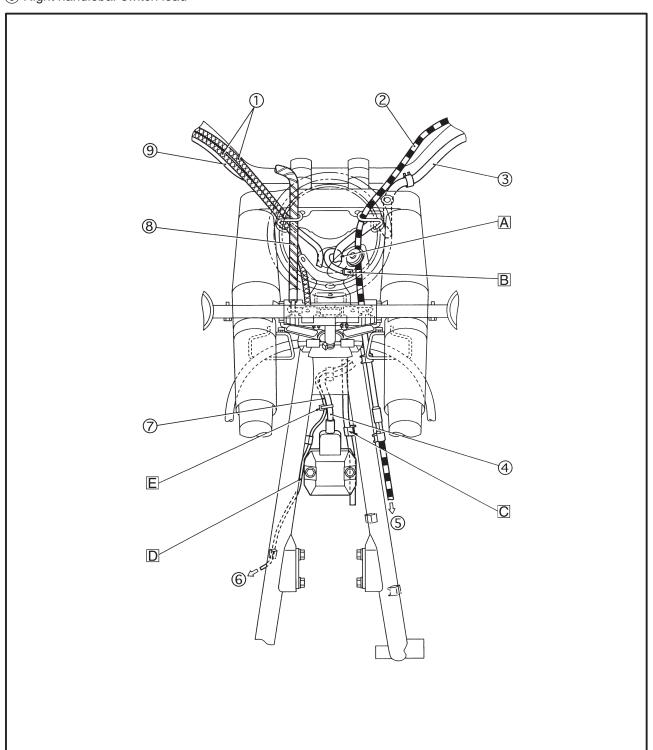
SPEC U

- 1 Transfer gear oil pump 2 Middle driven shaft



EB20600

- 1) Throttle cable
- 2 Clutch cable
- 3 Left handlebar switch lead
- 4 Rectifier/regulator lead
- 5 To engine
- 6 To rear brake light switch
- 7 Rear brake light switch lead
- 8 Front brake hose
- 9 Right handlebar switch lead
- A Pull the wire harness into the inside of the head light from through the hole on the back.
- B Clamp the wire harness.
- C Clamp the AIS vacuum hose.
- D Route the rear brake light switch lead in front of the rectifier/regulator bracket.
- E Clamp the rear brake light switch lead to the rectifier/regulator lead with a plastic band and cut the end of band.

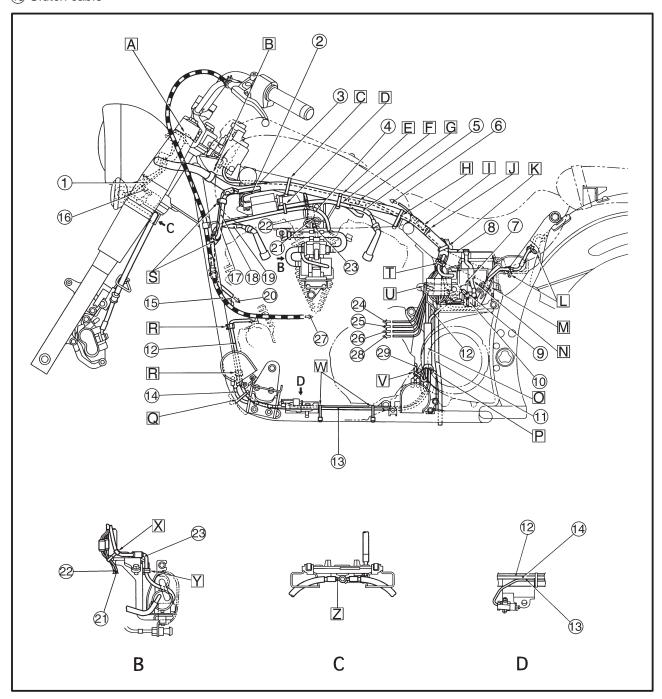




- (1) Turn signal lead
- (2) Ignition coil sub-wireharness
- (3) Seat lock cable
- (4) A.I.S vacuum hose
- 5 High tension code
- 6 To fuel sender
- $\bigcirc 7) 0^{\circ} \sim 45^{\circ}$
- 8 Battery negative lead
- 9 Starter relay
- 10 Thermo switch assembly
- (11) Fuel tank breather hose
- 12 Starter lead
- 13 Sidestand switch lead
- (14) Horn lead
- 15 Clutch cable

- 16 Headlight bracket
- (17) Front brake light switch lead
- 18 Rectifire/regulator lead
- 19 High tension code
- 20 To air cut valve assembly
- 21) Carbretor heater lead
- Throttle position sensor lead
- 23 Fuel pump lead
- 24 To speed sensor
- 25) To neutral switch
- 26 To stator coil
- 27) To engine
- 28 To decompression solenoid
- 29 Pickup coil lead

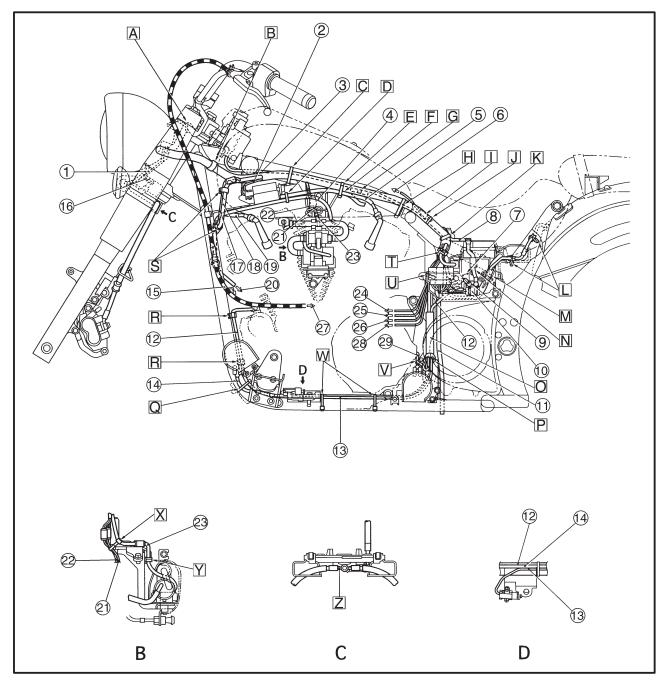
- A Route the left handlebar switch lead under the guide of handle upper bracket.
- B Clamp the wireharness.
- C Clamp the wireharness, seat lock cable to the frame and lock is dawnward.
- D Clamp the A.I.S vacuum hose and high tension code of rear side
- E Clamp the wireharness seat lock cable and high tension code of rear side to the frame.





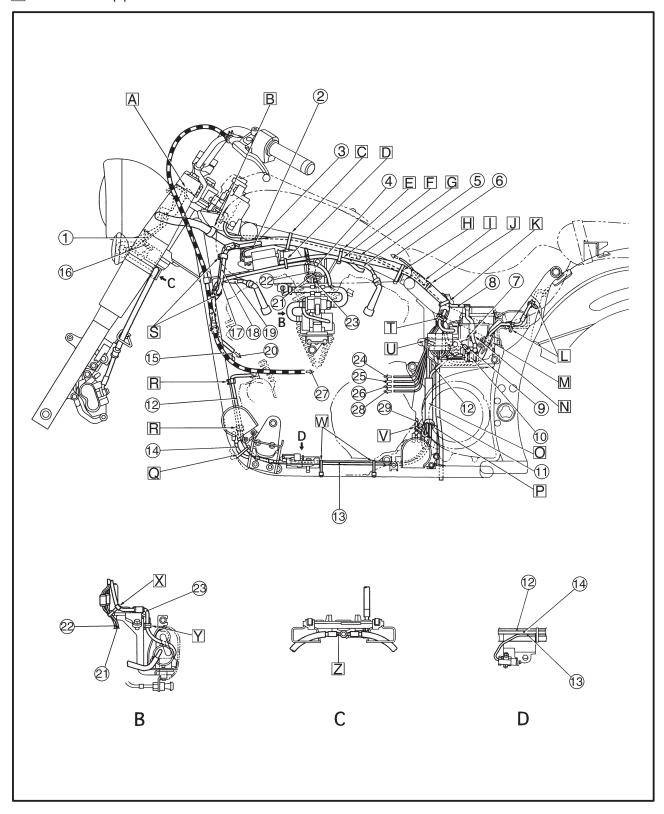
- F Route the seat lock cable on the wire harness.
- G Through the seat lock cable on the wireharness.
- H Clamp the wireharness, seat lock cable to the frame and the end of clamp is downward, Dont clamp the fuel sender lead.
- The coupler under the wireharness.
- J Clamp the wireharness, fuel sender lead and seat lock cable with a locking tie and cut of the end
- K Clamp the wireharness and battery negative lead.
- L Clamp the tail/brake light lead.
- M Route the starter negative lead through the guide of the battery box.
- N Push the alarm coupler on the wireharness.

- O Cover the sidestand switch lead, horn lead starter lead and pickup coil lead and then align the clamp to the cover. Cover slit is inside.
- P Clamp the sidestand switch lead, horn lead starter lead and pickup coil lead.
- Q Clamp the horn lead starter lead with a band and the cut the end of band. Locate the end of band to upward.
- R Clamp the starter lead.
- S Clamp the rear brake light switch lead and rectifire/regulator lead.
- T Clamp the wireharness.
- U Clamp the speed sensor lead decompression solelnoid lead pick up coil lead neutral switch lead stator coil lead sidestand switch lead and horn lead to the frame.





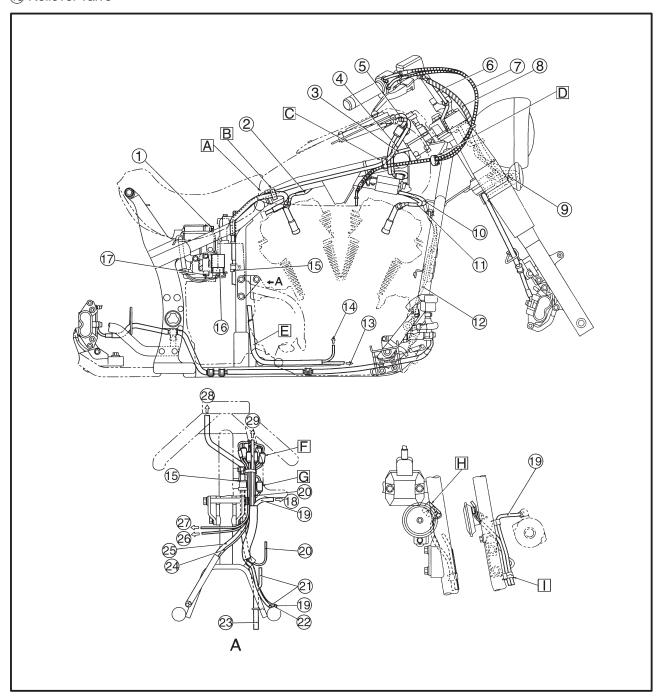
- V Clamp the pickup coil lead.
- W Clamp the starter lead side stand switch lead horn lead with a band and then cut of the end. Locate the end of band outside.
- X Clamp the fuel pump lead to the engine stay with a band and cut the end of band.
- Y Clamp the fuel pump lead.
- Z Set the brake pipe and see the white mark.



SPEC U

- 1) Battery negative lead
- 2 High tension code #2
- (3) Main switch lead
- (4) Fuel tank breather hose
- (5) Meter lead
- 6 Right handlebar switch lead
- 7 Throttle cable
- 8 Front brake hose
- 9 Flasher lead
- 10 High tension code #3
- (11) High tension code #4
- (12) Rear brake light switch lead
- 13 To stator coil
- 14 To decompression solenoid
- 15 Rollover valve

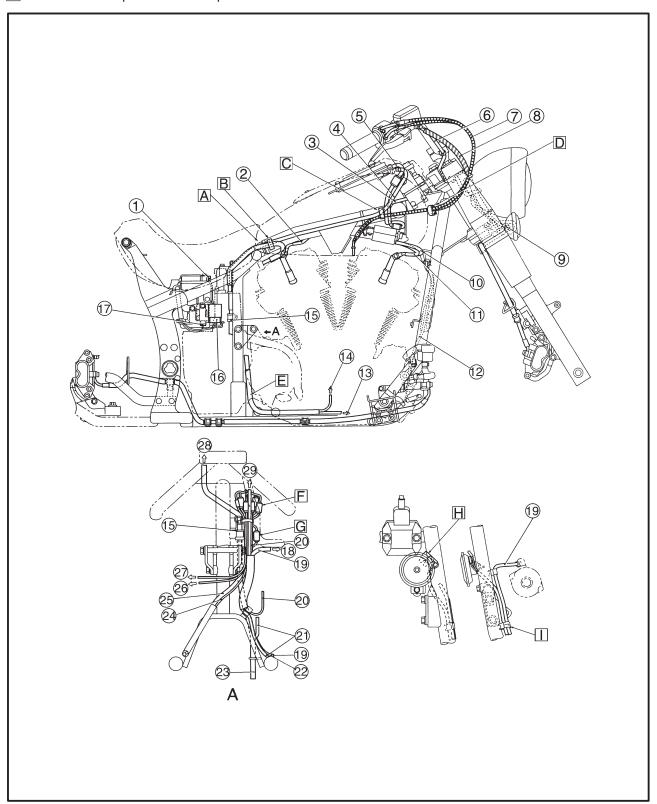
- 16 Side stand switch relay
- (17) Flasher relay
- 18 To starter relay
- 19 Starter lead
- 20 Pick up coil lead
- 21 Horn lead
- 22 Side stand switch lead
- 23 Fuel tank breather hose
- 24 Decompression solenoid
- 25 Stator coil lead
- 26 To neutral switch
- 27) To speed sensor
- 28 To fuel tank
- 29 To wireharness





- A Dont clamp the hoses.
- B Clamp the fuel tank breather hose and oil tank breather hose.
- C Clamp the throttle cable and fuel tank breather hose.
- D Clamp the throttle cable.
- E Locate the slit to downward.
- F Connect the coupler on the clamp.

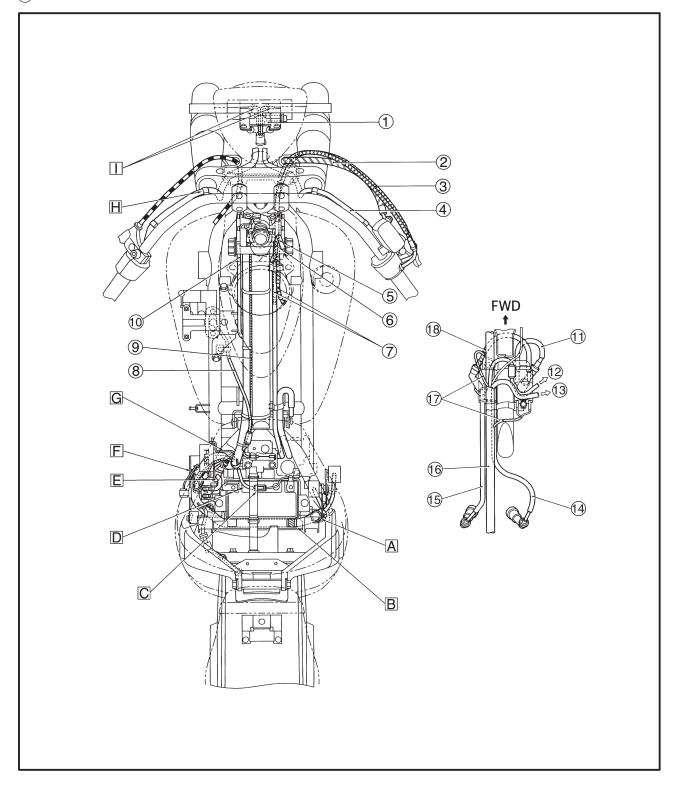
- G Connect the sidestand coupler under the clamp.
- H The terminal must be put in the way that the wire lead comes out dounward through the terminal along the body forward the lower side.
- I Clamp the starter lead and horn lead.



SPEC U

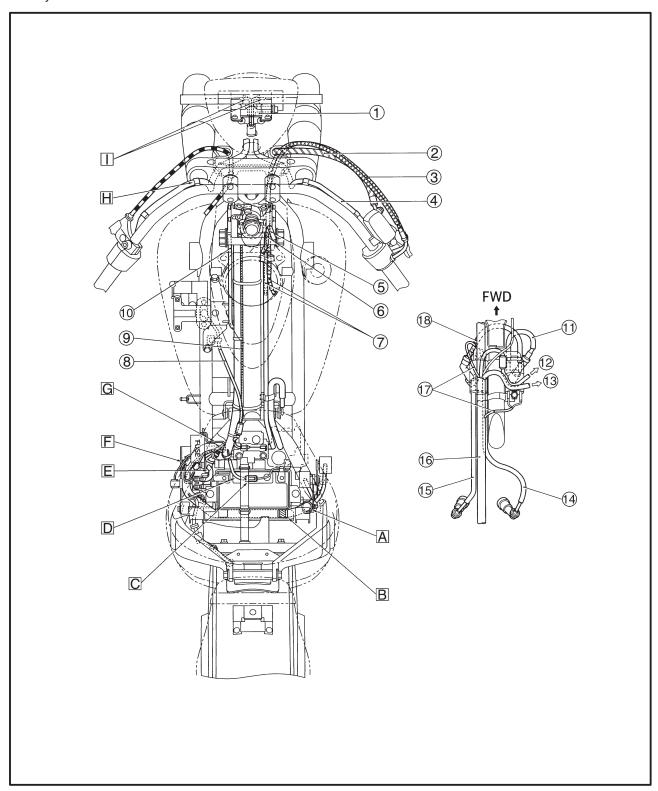
- 1) Stay
- (2) Front brake hose
- (3) Throttle cable
- (4) Left handlebar switch lead
- 5 Fuel tank breather hose
- 6 Meter lead
- 7 Throttle cable
- 8 Fuel sender lead
- 9 Seat lock cable
- 10 A.I.S vacuum hose

- 11) High tension code #4
- 12 To main switch
- 13 To meter
- High tension code #2
- 15 High tension code #1
- 16 Wireharness
- 17 Ignition coil lead
- 18 High tension code #3





- A Clamp the wireharness.
- B Position the white tape on the wireharness with the hole on battery box, as shown.
- C Fix the wireharness negative lead coupler to battery band.
- D Set the wireharness regative lead protecter between coupler and clamp.
- E Route the sterter lead between battery box and stay.
- F Hang the thermo switch lead to the hook.
 G Set the wireharness along a dent of stay.
- H Pull the front flasher lead from through flasher stay senter hole and pass on stay and pull the front flasher lead into the inside of headlight from through hole of headlight.



SPEC U



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INTRODUCTION/PERIODIC MAINTENANCE/ LUBRICATION INTERVALS



EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

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

EAS00037

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

					EVERY	
N	Э.	ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL (1,000 km)	6,000 km or 6 months (whichever comes first)	12,000 km or 12 months (whichever comes first)
1	*	Fuel line	Check fuel hoses for cracks or damage.Replace if necessary.		V	√
2	*	Fuel filter	Check condition. Replace if necessary.			\checkmark
3		Spark plugs	Check condition. Clean, regap or replace if necessary.	V	V	√
4	*	Valves	Check valve clearance. Adjust if necessary.		4,000 km or 24 ichever comes f	
5		Air filter	Clean or replace if necessary.		V	V
6		Clutch	Check operation. Adjust or replace cable.	V	V	\checkmark
7	*	Front brake	 Check operation, fluid level and vehicle for fluid leakage. Correct accordingly. Replace brake pads if necessary. 	1		√
8	*	Rear brake	 Check operation, fluid level and vehicle for fluid leakage. Correct accordingly. Replace brake pads if necessary. 	V V		V
9	*	Wheels	Check balance, runout, spoke tightness and for damage.Tighten spokes and rebalance or replace if necessary.		V	√
10	*	Tires	Check tread depth and for damage. Replace if necessary. Check air pressure. Correct if necessary.	√ √		V
11	*	Wheel bearings	Check bearing for looseness or damage. Replace if necessary.	√ √		√
12	*	Swingarm	 Check swingarm pivoting point for play. Correct if necessary. Lubricate with molybdenum disulfide grease every 24,000 km or 24 months (whichever comes first). 	√ √		V
13		Dirve belt	Check belt tension. Adjust if necessary. Make sure that the rear wheel is properly aligned.	√ Every 4,000 km		
14	*	Steering bearings	 Check bearing play and steering for roughness. Correct accordingly. Lubricate with lithium soap base grease every 24,000 km or 24 months (whichever comes first). 	√ √		√
15	*	Chassis fasteners	 Make sure that all nuts, bolts and screws are properly tightened. Tighten if necessary. 	√ √		V
16	*	Sidestand	Check operation. Lubricate and repair if necessary.		V	V

PERIODIC MAINTENANCE/LUBRICATION INTERVALS



Г					EVERY	
N	0.	ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL (1,000 km)	6,000 km or 6 months (whichever comes first)	12,000 km or 12 months (whichever comes first)
17	*	Sidestand switch	Check operation. Replace if necessary.	√ √		V
18	*	Front fork	Check operation and for oil leakage. Correct accordingly.		V	V
19	*	Rear shock absorber assembly	Check operation and shock absorber for oil leakage. Replace shock absorber assembly if necessary.		V	√
20	*	Rear suspension relay arm and connecting arm pivoting points	Check operation. Lubricate with molybdenum disulfide grease every 24,000 km or 24 months (whichever comes first).		٧	√
21	*	Carburetor	Check engine idling speed and starter operation. Adjust if necessary.	V	V	V
22		Engine oil	Check oil level and vehicle for oil leakage. Correct if necessary. Change. (Warm engine before draining.)	V	V	√
23		Engine oil filter cartridge	Replace.	٧ ٧		√
24	*	Transfer case oil	Check for leakage. Replace oil at initial 1,000 km and thereafter every 24,000 km or 24 months (whichever comes first).			√

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

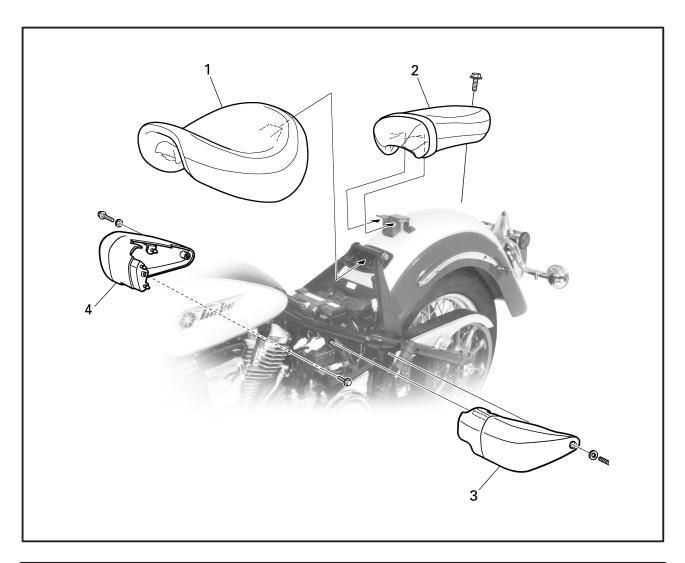
NOTE: -

- The air filter element needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake system
 - When disassembling the master cylinder or caliper cylinder, always replace the brake fluid. Check the brake fluid level regularly and fill as required.
 - Replace the master cylinder and caliper cylinder oil seals every two years.
 - Replace the brake hoses every four years, or if cracked or damaged.

SEATS AND SIDE COVERS



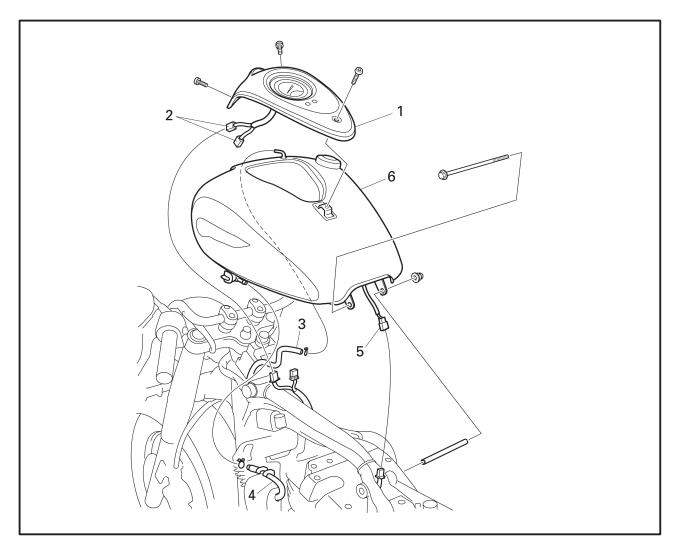
SEATS AND SIDE COVERS



Order	Job/Part	Q'ty	Remarks
1 2 3 4	Removing the seats and side covers Rider seat Passenger seat Left side cover Right side cover	1 1 1 1	Remove the parts in the order listed. For installation, reverse the removal procedure.



FUEL TANK

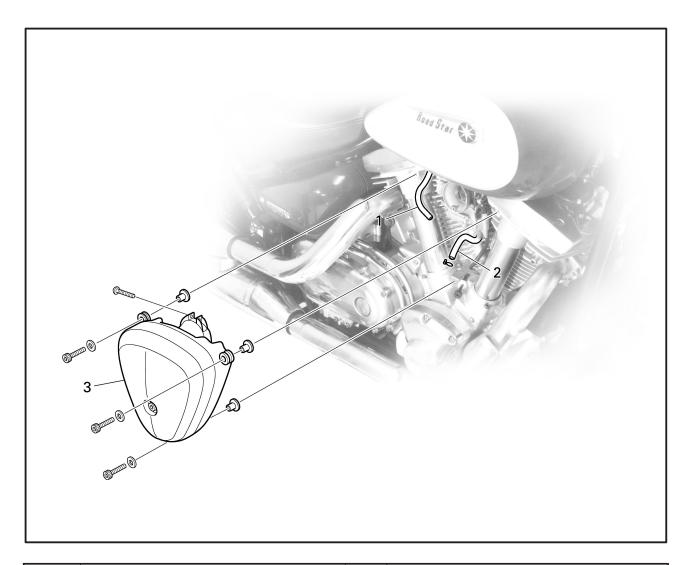


Order	Job/Part	Q'ty	Remarks
1	Removing the fuel tank Rider seat Meter assembly		Remove the parts in the order listed. Refer to "SEATS AND SIDE COVERS".
2 3	Meter assembly coupler Fuel tank breather hose	2	Disconnect.
4	Fuel hose		Disconnect. NOTE:
			Before disconnecting the fuel hose, set the fuel cock to "OFF".
5 6	Fuel sender coupler Fuel tank	1	Disconnect.
	1 doi taint	'	For installation, reverse the removal procedure.

AIR FILTER CASE



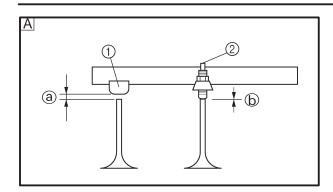
AIR FILTER CASE

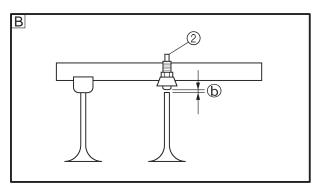


Order	Job/Part	Q'ty	Remarks
1	Removing the air filter case Vacuum chamber breather hose (air filter case to solenoid valve hose)	1	Remove the parts in the order listed. Disconnect.
2	Cylinder head breather hose	1	Disconnect.
3	Air filter case	1	For installation, reverse the removal procedure.

ADJUSTING THE VALVE CLEARANCE







EAS00047

ENGINE

ADJUSTING THE VALVE CLEARANCE

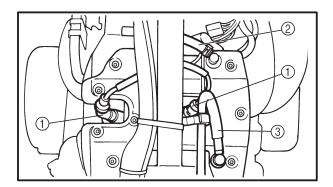
The following procedure applies to all of the valves.

NOTE: -

- The valve clearance is automatically adjusted by the oil pressure valve lifter. However, there are times that the valve clearance is needed to be adjusted manually. If this is the case, adjust the clearance of the two maladjusted or worn valves, which are inside a rocker arm, with the adjusting screw.
- A If clearance is on the slip side ①, loosen the adjusting screw and bring the valve clearance ② to within specification. Check if the valve clearance ⑤ on the adjusting screw ② side is within specification.
- B If clearance is on the adjusting screw 2 side, tighten the adjusting screw and bring the valve clearance b within specification.
- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

1. Remove:

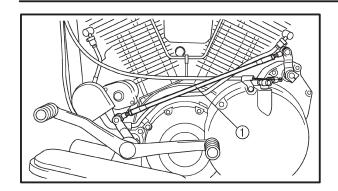
- rider seat
- Refer to "SEATS AND SIDE COVERS".
- fuel tank
 - Refer to "FUEL TANK".



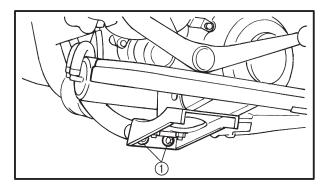
- 2. Disconnect:
 - spark plug caps (1)
 - cylinder head breather hose (2)
 - oil tank breather hose (3)
- 3. Remove:
 - spark plugs
 - cylinder head covers (upper)
 - gaskets
 - dowel pins

ADJUSTING THE VALVE CLEARANCE

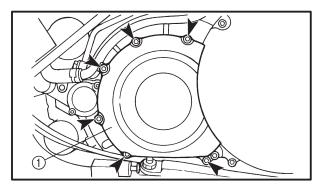




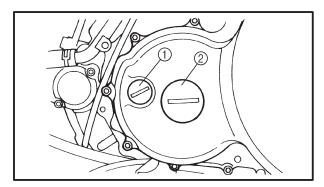
- 4. Remove:
 - shift rod ①



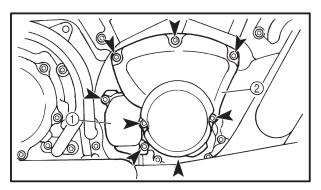
- 5. Remove:
 - rider footrest (left) bolts 1



- 6. Remove:
 - engine left side cover 1



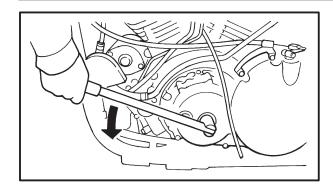
- 7. Remove:
 - timing mark accessing screw ①crankshaft end cover ②

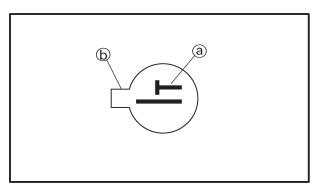


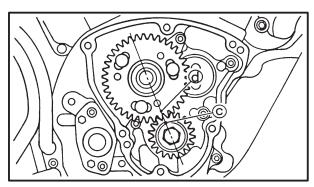
- 8. Remove:
 - decompression solenoid cover ①
 - camshaft sprocket cover 2

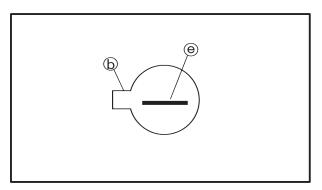
ADJUSTING THE VALVE CLEARANCE

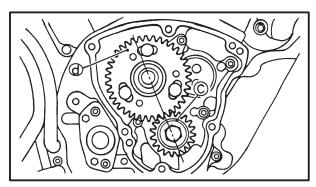












- 9. Measure:
 - valve clearance
 Out of specification → Adjust.



Valve clearance (cold) Intake valve $0 \sim 0.04 \text{ mm}$ Exhaust valve $0 \sim 0.04 \text{ mm}$

CAUTION:

Be sure to check the intake and exhaust valves.

piston #1 TDC (rear cylinder)

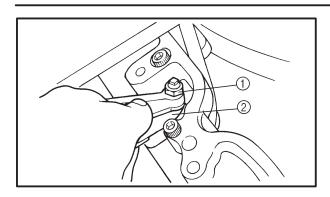
- a. Turn the crankshaft counter clockwise.
- b. When piston #1 is at TDC on the compression stroke, align the TDC mark (a) on the pickup coil rotor with the pointer (b) on the clutch/pickup coil rotor cover.
- c. Check the camshaft drive gear mark © position and camshaft driven gear mark d position as shown.
 - If the marks are not aligned, turn the crankshaft counter clockwise 360 degrees and recheck step b.
- d. Measure the valve clearance with a thickness gauge.

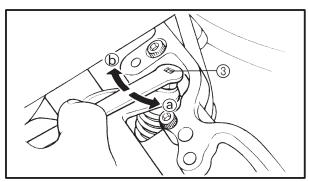
Piston #2 TDC (front cylinder)

- a. Turn the crankshaft counterclockwise from the piston #1 TDC by 405 degrees.
- b. When piston #2 is at TDC on the compression stoke, align the TDC mark (e) on the pickup coil rotor with the pointer (b) on the clutch/pickup coil rotor cover.
- c. Check the camshaft drive gear mark © position and camshaft driven gear mark d position as illustration.
- d. Measure the valve clearance with a thickness gauge.

ADJUSTING THE VALVE CLEARANCE







- 10. Adjust:
 - valve clearance
- a. Loosen the locknut (1).
- b. Insert a thickness gauge ② between the end of the adjusting screw and the valve tip.
- c. Turn the adjusting screw ③ in direction ② or
 b until the specified valve clearance is obtained.

	Adjusting screw side	Slip side
Direction (a)	Valve clear- ance is increased.	Valve clear- ance is decreased.
Direction (b)	Valve clear- ance is decreased.	Valve clear- ance is increased.

d. Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.



Locknut 20 Nm (2.0 m•kg)

- e. Measure the valve clearance again.
- f. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

11. Install:

all removed parts

NOTE: -

For installation, reverse the removal procedure. Note the following points.

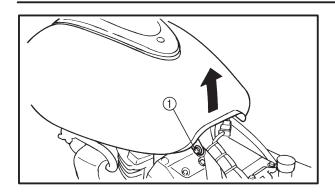
Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS" in chapter 5.

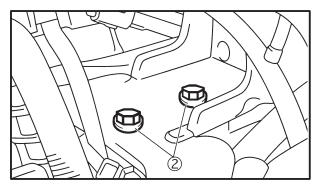
12. Adjust:

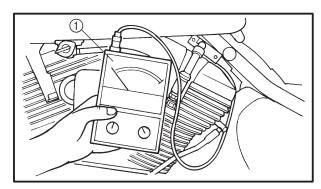
• installed shift rod length Refer to "ADJUSTING THE SHIFT PEDAL".

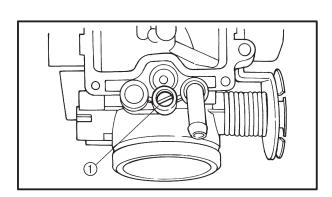
ADJUSTING THE ENGINE IDLING SPEED











EAS00054

ADJUSTING THE ENGINE IDLING SPEED

NOTE

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

- 1. Fuel cock off
- 2. Remove:
- rider seat
 Refer to "SEATS AND SIDE COVERS"
- 3. Remove:
 - fuel tank bolt (1)
- 4. Lift up the fuel tank end.
- 5. Remove:
 - fuel pump stay bolts 2

CAUTION:

When remove the fuel pump stay don't disconnect other hoses.

- 6. Install
 - inductive tachometer ①
 (onto the spark plug lead of cylinder #1)



Engine tachometer 90890-03113

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

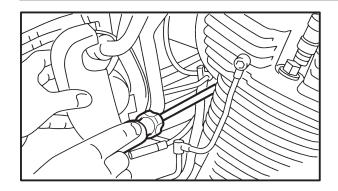


Engine idling speed $850 \sim 950 \text{ r/min}$

- 8. Adjust:
 - engine idling speed
- a. Turn the pilot screw 1 in or out until it is lightly seated.
- b. Turn the pilot screw out the specified number of turns.

ADJUSTING THE ENGINE IDLING SPEED



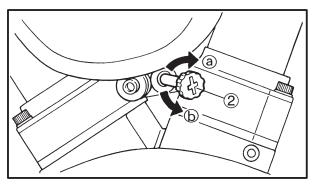




Carburetor angle driver 90890-03158



Pilot screw 2-1/2 turns out



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

Direction (a)	Engine idling speed is increased.
Direction (b)	Engine idling speed is decreased.

8. Adjust:

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



Throttle cable free play (at the flange of the throttle grip) $4 \sim 8 \text{ mm}$

ADJUSTING THE THROTTLE CABLE FREE PLAY

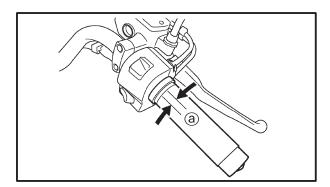


EAS00058

ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE: -

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



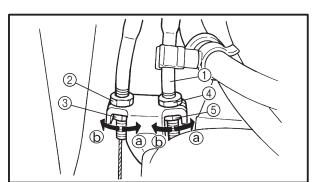


throttle cable free play ⓐ
 Out of specification → Adjust.



Throttle cable free play (at the flange of the throttle grip)

4 ~ 8 mm



2. Adjust:

• throttle cable free play

NOTE

When the throttle is opened, the accelerator cable ① is pulled.

Carburetor side

- a. Remove the rider seat and fuel tank.
 Refer to "SEATS AND SIDE COVERS" and "FUEL TANK".
- b. Loosen the locknut ② on the decelerator cable.
- c. Turn the adjusting nut ③ in direction ⓐ or ⓑ to take up any slack on the decelerator cable.
- d. Loosen the locknut 4 on the accelerator cable.

ADJUSTING THE THROTTLE CABLE FREE PLAY/ CHECKING THE SPARK PLUGS



e. Turn the adjusting nut 5 in direction a or b until the specified throttle cable free play is obtained.

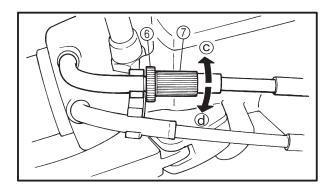
Direction (a)	Throttle cable free play is increased.
Direction (b)	Throttle cable free play is decreased.

f. Tighten the locknuts.

NOTE: -

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

g. Install the fuel tank and rider seat. Refer to "FUEL TANK" and "SEATS AND SIDE COV-ERS".



Handlebar side

- a. Loosen the locknut 6.
- b. Turn the adjusting nut 7 in direction © or d until the specified throttle cable free play is obtained.

Direction ©	Throttle cable free play is increased.
Direction (d)	Throttle cable free play is decreased.

c. Tighten the locknut.

A WARNING

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

EAS00059

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

- 1. Remove:
 - rider seat
- fuel tank

Refer to "SEATS AND SIDE COVERS" and "FUEL TANK".

CHECKING THE SPARK PLUGS



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

CAUTION:

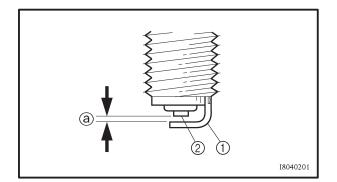
Before removing the spark plugs, blow away any dirt accumulated in the spark plug wells with compressed air to prevent it from falling into the cylinders.

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



Spark plugs

Model (manufacturer) DPR7EA-9 (NGK) X22EPR-U9 (DENSO)



- 5. Check:
 - electrodes 1

 $Damage/wear \rightarrow Replace \ the \ spark \ plug.$

• insulator 2

Abnormal color → Replace the spark plug. Normal color is medium-to-light tan.

- 6. Clean:
 - spark plug (with a spark plug cleaner or wire brush)
- 7. Measure:
 - spark plug gap ⓐ
 (with a wire gauge)
 Out of specification → Regap.



Spark plug gap $0.8 \sim 0.9 \text{ mm}$

8. Install:

spark plug

18 Nm (1.8 m•kg)

NOTE: -

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

- 9. Connect:
 - spark plug cap
- 10. Install:
 - fuel tank
 - rider seat

Refer to "FUEL TANK" and "SEATS AND SIDE COVERS".

CHECKING THE IGNITION TIMING

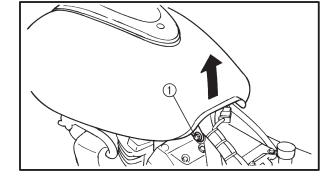
EAS00061

CHECKING THE IGNITION TIMING

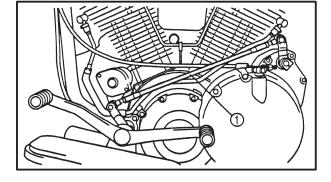
NOTE

Prior to checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

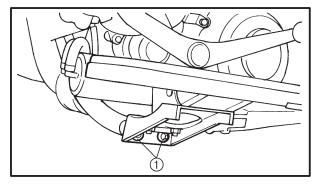
- 1. Remove:
 - rider seat Refer to "SEATS AND SIDE COVERS".
- 2. Remove:
 - fuel tank bolt (1)
- 3. Lift up the fuel tank end.



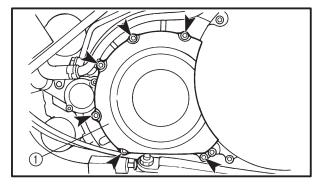
- 4. Remove:
- shift rod (1)



- 5. Remove:
 - rider footrest (left) bolts ①

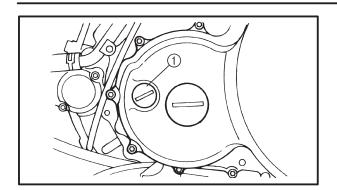


- 6. Remove:
- engine left side cover 1



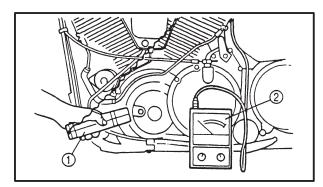
CHECKING THE IGNITION TIMING





7. Remove:

timing mark accessing screw 1



8. Install:

- timing light ①
- inductive tachometer ②
 (onto the spark plug lead of cylinder #1)



Timing light 90890-03141 Engine tachometer 90890-03113

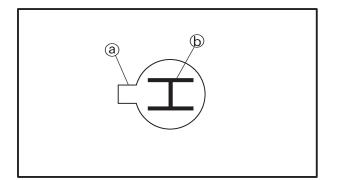
- 9. Check:
 - ignition timing

a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.



Engine idling speed $850 \sim 950 \text{ r/min}$

b. Check that the pointer ⓐ is within the required firing range ⓑ on the pickup coil rotor. Incorrect firing range → Check the ignition system.



NOTE: -

The ignition timing is not adjustable.

10. Install:

• all removed parts

NOTE: -

For installation, reverse the removal procedure. Note the following points.

Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS" in chapter 5.

CHECKING THE IGNITION TIMING/ MEASURING THE COMPRESSION PRESSURE



- 11. Adjust:
 - installed shift rod length Refer to "ADJUSTING THE SHIFT PEDAL".

EAS00065

MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

NOTE: ______ Insufficient compression pressure will result in a loss of performance.

- 1. Measure:
 - •valve clearance
 Out of specification → Adjust.
 Refer to "ADJUSTING THE VALVE CLEAR-ANCE".
- 2. Start the engine, warm it up for several minutes, and then turn it off.
- 3. Remove:
 - rider seat
 - fuel tank

Refer to "SEATS AND SIDE COVERS" and "FUEL TANK".

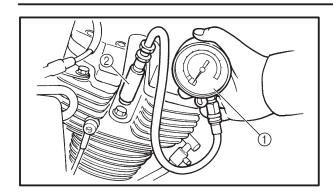
- 4. Remove:
 - camshaft sprocket cover Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFT-ERS".
 - decompression solenoid Refer to "CAMSHAFTS".
- 5. Install:
 - camshaft sprocket cover Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
- 6. Disconnect:
 - spark plug cap
- 7. Remove:
 - spark plug

CAUTION:

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

MEASURING THE COMPRESSION PRESSURE





- 8. Install:
 - compression gauge 1
 - compression gauge adapter 2



Compression gauge 90890-03081 Compression gauge adapter 90890-04082

- 9. Measure:
 - compression pressure
 Out of specification → Refer to steps (c) and (d).



Compression pressure (at sea level)

Minimum

1,000 kPa (10 kg/cm²)

Standard 1,200 kPa (12 kg/cm²) Maximum

1,400 kPa (14 kg/cm²)

- a. Set the main switch to "ON".
- b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

A WARNING

To prevent sparking, ground all spark plug leads before cranking the engine.

NOTE: -

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm^2).

- c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces, and piston crown for carbon deposits.
- d. Carbon deposits → Eliminate.
- e. If the compression pressure is below the minimum specification, squirt a few drops of oil into the cylinder and measure again.

MEASURING THE COMPRESSION PRESSURE/ CHECKING THE ENGINE OIL LEVEL



Refer to the following table.

Compression pressure (with oil applied into the cylinder)		
Reading	Diagnosis	
Higher than without oil	Piston wear or damage → Repair.	
Same as without oil	Piston ring(-s), valves, cylinder head gasket, or piston possibly defective → Repair.	

10. Install:

spark plug

18 Nm (1.8 m•kg)

- 11. Connect:
 - spark plug cap
- 12. Remove:
 - camshaft sprocket cover Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
- 13. Install:
 - decompression solenoid Refer to "CAMSHAFTS".
 - camshaft sprocket cover
 Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
- 14. Install:
 - fuel tank
 - rider seat

Refer to "FUEL TANK" and "SEATS AND SIDE COVERS".

EAS00071

CHECKING THE ENGINE OIL LEVEL

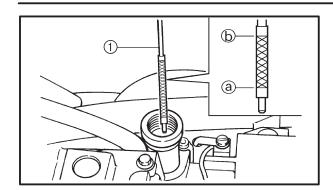
1. Stand the motorcycle on a level surface.

NOTE: -

- Place the motorcycle on a suitable stand.
- Make sure the motorcycle is upright.
- Start the engine and warm it up by running the engine or letting the engine run at idle for 15 minutes until the engine oil inside of the oil tank has reached a temperature of 60°C and then turn it off.

CHECKING THE ENGINE OIL LEVEL





- 3. Remove:
 - rider seat

Refer to "SEATS AND SIDE COVERS".

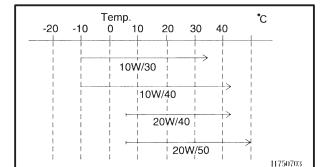
- 4. Remove:
 - dipstick (1)
- 5. Check:
 - engine oil level

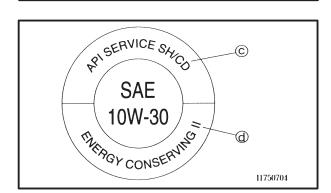
The engine oil level should be between the minimum level mark (a) and maximum level mark (b).

Below the minimum level mark \rightarrow Add the recommended engine oil to the proper level.

NOTF:

- Before checking the engine oil level, wait a few minutes until the oil has settled.
- Do not screw the dipstick in when insecting the oil level.







Recommended oil

Refer to the chart for the engine oil grade which is best suited for certain atmospheric temperatures. API standard

SE or higher grade (Non-Friction modified) ACEA standard G4 or G5

CAUTION:

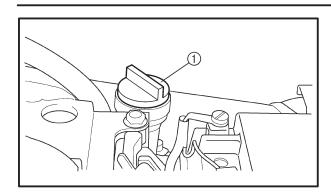
- Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of CD © or higher and do not use oils labeled "ENERGY CONSERV-ING II" © or higher.
- Do not allow foreign materials to enter the crankcase.
- 4. Start the engine, warm it up for several minutes, and then turn it off.
- 5. Check:
 - engine oil level

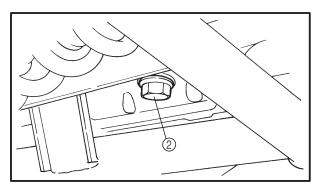
NOTE:

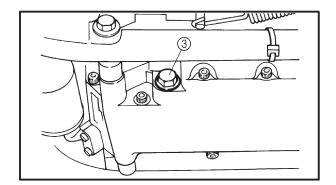
Before checking the engine oil level, wait a few minutes until the oil has settled.

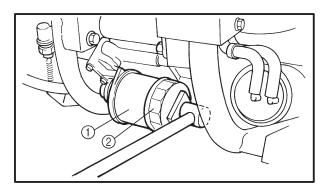
CHANGING THE ENGINE OIL

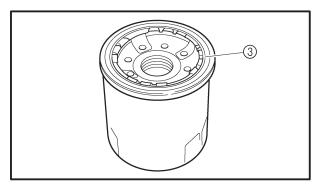












EAS00073

CHANGING THE ENGINE OIL

- 1. Start the engine, warm it up for several minutes, and then turn it off.
- 2. Place a container under the engine oil drain bolt.
- 3. Remove:
 - dipstick ①
 - engine oil drain bolt (oil tank) 2
 - engine oil drain bolt (engine) 3
- 4. Drain:
 - engine oil (completely from the oil tank and crankcase)

- 5. If the oil filter cartridge is also to be replaced, perform the following procedure.
- a. Remove the oil filter cartridge ① with an oil filter wrench ②.



Oil filter wrench 90890-01426

b. Lubricate the O-ring ③ of the new oil filter cartridge with a thin coat of engine oil.

CAUTION:

Make sure the O-ring ③ is positioned correctly in the groove of the oil filter cartridge.

CHANGING THE ENGINE OIL



c. Tighten the new oil filter cartridge to specification with an oil filter wrench.



Oil filter cartridge 17 Nm (1.7 m•kg)

- 6. Check:
 - engine oil drain bolt gasket Damage → Replace.
- 7. Install:
 - engine oil drain bolt

43 Nm (4.3 m•kg,)

- 8. Fill:
 - oil tank
 (with the specified amount of the recommended engine oil)



Quantity
Total amount
5.0 L
Periodic oil replacement
3.7 L
With oil filter cartridge
replacement
4.1 L

NOTE: -

- Pour the engine oil in several stages.
- First, pour in 2.5 L of oil and then start the engine and rev it 3 to 5 times. Stop the engine, and then pour in the remainder of the specified amount.

CAUTION:

When starting the engine make sure the dipstick is securely fitted into the oil tank.

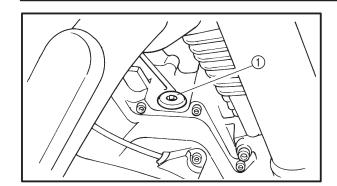
- 9. Fill: (when engine disassembly)
 - crankcase and oil tank



Quantity
Total amount
5.0 L
Oil tank
2.0 L
Crankcase
3.0 L

CHANGING THE ENGINE OIL



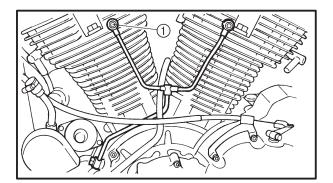


NOTE: -

After the engine has been disassembled, pour the specified amount of engine oil into the crankcase and the oil tank. When pouring engine oil into the crankcase, pour it into the hole of the removed bolt ①.

10. Install:

- dipstick
- 11. Start the engine, warm it up for several minutes, and then turn it off.
- 12. Check:
 - engine (for/engine oil leaks)
- 13. Check:
 - engine oil level
 Refer to "CHECKING THE ENGINE OIL LEVEL".



14. Check:

- engine oil pressure
- a. Slightly loosen the oil gallery bolt 1.
- b. Start the engine and keep it idling until engine oil starts to seep from the oil gallery bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- c. Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to "ENGINE OIL PUMP" in chapter 5.
- d. Start the engine after solving the problem(-s) and check the engine oil pressure again.
- e. Tighten the oil gallery bolt to specification.



Oil gallery bolt 21 Nm (2.1 m•kg)

MEASURING THE ENGINE OIL PRESSURE



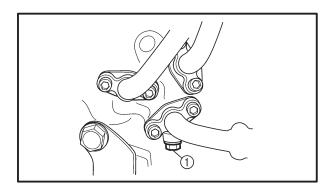
EAS00077

MEASURING THE ENGINE OIL PRESSURE

- 1. Check:
 - engine oil level
 Refer to "CHECKING THE ENGINE OIL LEVEL".
- 2. Start the engine, warm it up for several minutes, and then turn it off.

CAUTION:

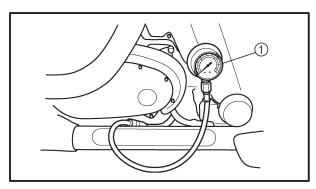
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.



- 3. Remove:
 - oil gallery bolt (1)

A WARNING

The engine, muffler and engine oil are extremely hot.



- 4. Install:
 - oil pressure gauge 1



Oil pressure gauge 90890-03153

- 5. Measure:
 - engine oil pressure (at the following conditions)



Engine oil pressure

40 ~ 80 kPa (0.4 ~

0.8 kg/cm²)

Engine speed

Approx. 900 r/min

Engine oil temperature

60°C

MEASURING THE ENGINE OIL PRESSURE/ CHECKING THE TRANSFER GEAR OIL LEVEL



Out of specification \rightarrow Adjust.

Engine oil pressure	Possible causes
Below specification	Faulty oil pumpClogged oil filterLeaking oil passage
Broken or damaged oil seal Above specification	Leaking oil passageFaulty oil filterOil viscosity too high

- 6. Install:
 - oil gallery bolt

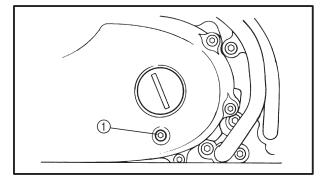
20 Nm (2.0 m•kg)

CHECKING THE TRANSFER GEAR OIL LEVEL

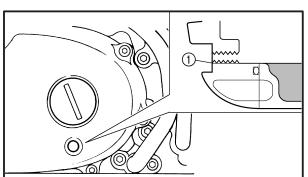
1. Stand the motorcycle on a level surface.

NOTE: -

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



- 2. Remove:
 - checking bolt 1



- 3. Check:
 - transfer gear oil level

The transfer gear oil level should be up to the brim 1 of the hole.

Below the brim \rightarrow Add the recommended transfer gear to the proper level.



Recommended oil SAE80API "GL-4" Hypoid gear oil

CHECKING THE TRANSFER GEAR OIL LEVEL/ CHANGING THE TRANSFER GEAR OIL



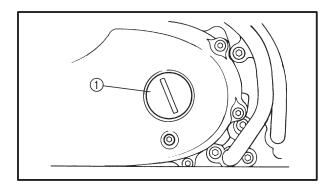
CAUTION:

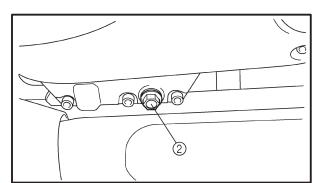
Do not allow foreign materials to enter the transfer case.

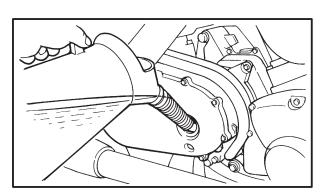
4. Install:

checking bolt

% 8 Nm (0.8 m•kg)







CHANGING THE TRANSFER GEAR OIL

- 1. Place a container under the transfer gear oil drain bolt.
- 2. Remove:
 - straight plug 1
 - transfer gear oil drain bolt 2
- 3. Drain:
 - transfer gear oil (completely from the transfer gear case)
- 4. Check:
 - transfer gear oil drain bolt gasket Damage → Replace.
- 5. Install:
 - transfer gear oil drain bolt

18 Nm (1.8 m•kg)

- 6. Fill:
 - transfer gear case (with the specified amount of the recommended transfer gear oil)

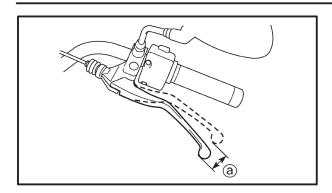


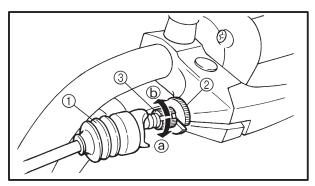
Quantity Total amount 0.4 L

- 7. Install:
 - straight plug
- 8. Check:
 - transfer gear oil level Refer to "CHECKING THE TRANSFER GEAR OIL LEVEL".

ADJUSTING THE CLUTCH CABLE FREE PLAY







EAS00078

ADJUSTING THE CLUTCH CABLE FREE PLAY

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



Clutch cable free play (at the end of the clutch lever)

 $10 \sim 15 \text{ mm}$

- 2. Adjust:
 - clutch cable free play

Handlebar side

- a. Pull the boot 1 off.
- b. Loosen the locknut (2).
- c. Turn the adjusting bolt ③ in direction ⓐ or ⓑ until the specified clutch cable free play is obtained.

Direction (a)	Clutch cable free play is increased.
Direction (b)	Clutch cable free play is decreased.

d. Tighten the locknut.

NOTE: -

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

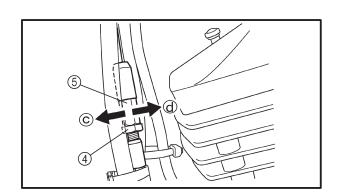
e. Pull the boot 1 in.

Engine side

- a. Loosen the locknut 4.
- b. Turn the adjusting bolt (5) in direction (C) or (d) until the specified clutch cable free play is obtained.

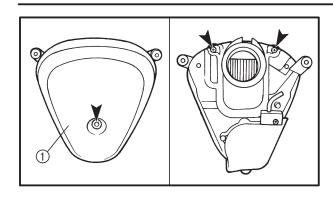
	Clutch cable free play is increased.
Direction (d)	Clutch cable free play is decreased.

c. Tighten the locknut.



CLEANING THE AIR FILTER ELEMENT

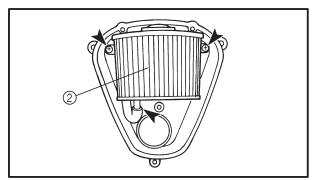




EAS00086

CLEANING THE AIR FILTER ELEMENT

- 1. Remove:
 - air filter case Refer to "AIR FILTER CASE".
- 2. Remove:
 - air filter case cover 1
 - air filter element 2





 air filter element Apply compressed air to the inner surface of the air filter element.

- 4. Check:
 - air filter element Damage → Replace.
 - O-ring Damage → Replace.
- 5. Install:
 - air filter element
 - air filter case cover

CAUTION:

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

TOM	F٠.							
			4.1	e-1.			4.1	

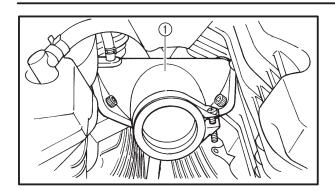
When installing the air filter element into the air filter case cover, make sure their sealing surfaces are aligned to prevent any air leaks.

• air filter case Refer to "AIR FILTER CASE".



CHECKING THE CARBURETOR JOINT/ CHECKING THE FUEL HOSES AND FUEL FILTER

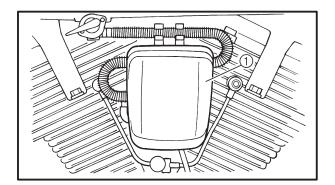




EAS00094

CHECKING THE CARBURETOR JOINT

- 1. Remove:
 - carburetor assembly Refer to "CARBURETOR" in chapter 6.
- 2. Check:
 - carburetor joint ①
 Cracks/damage → Replace.
 Refer to "CARBURETOR" in chapter 6.
- 3. Install:
 - carburetor assembly Refer to "CARBURETOR" in chapter 6.

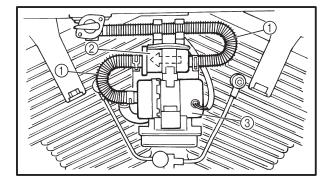


EAS00097

CHECKING THE FUEL HOSES AND FUEL FILTER

The following procedure applies to all of the fuel hoses.

- 1. Remove:
 - fuel pump cover 1



- 2. Check:
 - fuel hose 1

Cracks/damage → Replace.

• fuel filter (2)

Contaminants/damage → Replace.

NOTE: -

- Drain and flush the fuel tank if abrasive damage to any components of the fuel line is evident.
- The arrow mark on the fuel filter must point towards the fuel pump ③ as shown.
- 3. Install:
 - fuel pump cover

CHECKING THE CYLINDER HEAD BREATHER HOSE AND TRANSFER GEAR CASE BREATHER HOSE/CHECKING THE EXHAUST SYSTEM

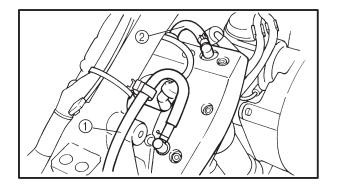


EAS00098

CHECKING THE CYLINDER HEAD BREATH-ER HOSE AND TRANSFER GEAR CASE BREATHER HOSE

- 1. Remove:
 - rider seat
 - fuel tank

Refer to "SEATS AND SIDE COVERS" and "FUEL TANK".



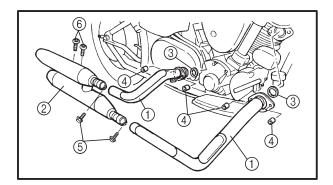
2. Check:

- oil pump breather hose (1)
- cylinder head breather hose ②
 Cracks/damage → Replace.
 Loose connection → Connect properly.

CAUTION:

Make sure the crankcase breather hose is routed correctly.

- 3. Install:
 - fuel tank
 - rider seat Refer to "FUEL TANK" and "SEATS AND SIDE COVERS".



EAS00100

CHECKING THE EXHAUST SYSTEM

The following procedure applies to all of the exhaust pipes, mufflers and gaskets.

- 1. Check:
 - exhaust pipe ①
 - muffler (2)

Cracks/damage → Replace.

• gasket ③

Exhaust gas leaks → Replace.

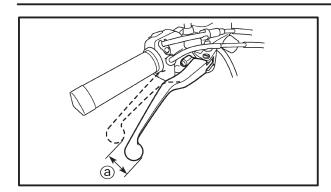
- 2. Measure:
 - tightening torque

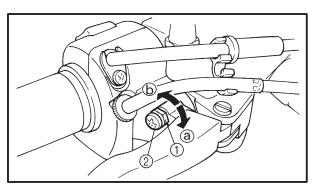


Exhaust pipe nut 4
20 Nm (2.0 m•kg)
Exhaust pipe and muffler bolt 5
25 Nm (2.5 m•kg)
Muffler and muffler bracket bolt 6
30 Nm (3.0 m•kg)

ADJUSTING THE FRONT BRAKE







EAS00108

CHASSIS

ADJUSTING THE FRONT BRAKE

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



Brake lever free play (at the end of the brake lever)

- 2 ~ 5 mm
- 2. Adjust:
 - brake lever free play
- a. Loosen the locknut ①.
- b. Turn the adjusting screw ② in direction ③ or
 b until the specified brake lever free play is obtained.

Direction (a)	Brake lever free play is increased.
Direction (b)	Brake lever free play is decreased.

c. Tighten the locknut.

A WARNING

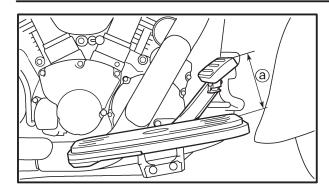
A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly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

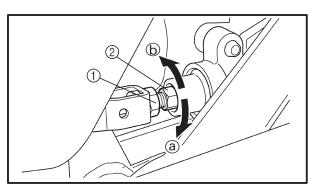
CAUTION:

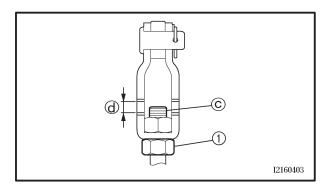
After adjusting the brake lever free play, make sure there is no brake drag.

ADJUSTING THE REAR BRAKE









EAS00110

ADJUSTING THE REAR BRAKE

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



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

100 mm

- 2. Adjust:
 - brake pedal position
- a. Loosen the locknut 1.
- b. Turn the adjusting bolt ② in direction ⓐ or ⓑ until the specified brake pedal position is obtained.

Direction (a)	Brake pedal is raised.
Direction (b)	Brake pedal is lowered.

A WARNING

After adjusting the brake pedal position, check that the end \bigcirc of the adjusting bolt is visible through the hole \bigcirc .

c. Tighten the locknut 1 to specification.



Locknut 18 Nm (1.8 m•kg)

A WARNING

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

CAUTION:

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

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

CHECKING THE BRAKE FLUID LEVEL



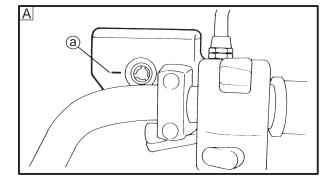
EAS00115

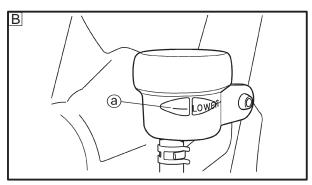
CHECKING THE BRAKE FLUID LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

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





2. Check:

brake fluid level
 Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.



Recommended brake fluid DOT 4

- A Front brake
- B Rear brake

A WARNING

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

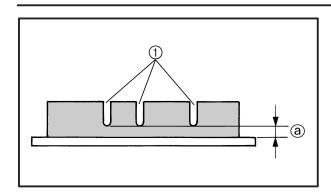
CAUTION:	
and plastic part	/ damage painted surfaces ts. Therefore, always clear ke fluid immediately.

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

NOTE: -

CHECKING THE FRONT BRAKE PADS/CHECKING THE REAR BRAKE PADS/ADJUSTING THE REAR BRAKE LIGHT SWITCH





EAS00120

CHECKING THE FRONT BRAKE PADS

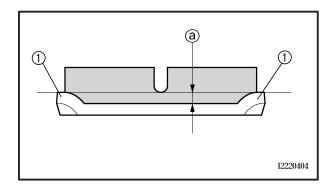
The following procedure applies to all of the brake pads.

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

Wear indicator groove ① almost disappeared → Replace the brake pads as a set. Refer to "REPLACING THE FRONT BRAKE PADS" in chapter 4.



Brake pad wear limit ⓐ 0.5 mm



EAS00118

CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

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

Wear indicators 1 almost touch the brake disc \rightarrow Replace the brake pads as a set. Refer to "REPLACING THE REAR BRAKE PADS" in chapter 4.



Brake pad wear limit ⓐ 0.5 mm

EAS0012

ADJUSTING THE REAR BRAKE LIGHT SWITCH

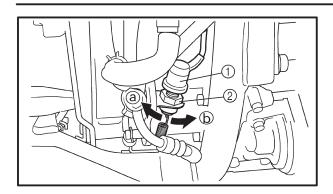
NOTE: -

The rear brake light switch is operated by movement of the brake pedal.

The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.

ADJUSTING THE REAR BRAKE LIGHT SWITCH/ CHECKING THE BRAKE HOSE

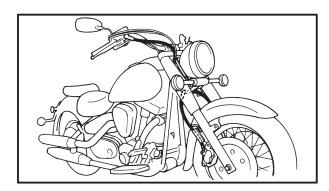


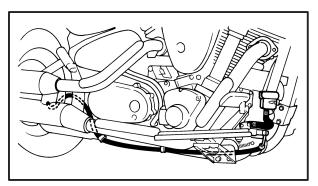


- 1. Check:
 - rear brake light operation timing Incorrect → Adjust.
- 2. Adjust:
 - rear brake light operation timing

a. Hold the main body ① of the rear brake light switch so that it does not rotate and turn the adjusting nut ② in direction ③ or ⑤ until the rear brake light comes on at the proper time.

Direction (a)	Brake light comes on sooner.
Direction (b)	Brake light comes on later.





EAS00129

CHECKING THE BRAKE HOSE

- 1. Check:
 - brake hose
 Cracks/damage/wear → Replace.
- 2. Check:
 - brake hose clamp
 Loose → Tighten the clamp bolt.
- 3. Hold the motorcycle upright and apply the front or rear brake several times.
- 4. Check:
 - brake hose

Brake fluid leakage \rightarrow Replace the damaged hose.

Refer to "FRONT AND REAR BRAKES" in chapter 4.

BLEEDING THE HYDRAULIC BRAKE SYSTEM



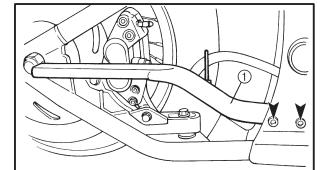
EAS00134

BLEEDING THE HYDRAULIC BRAKE SYSTEM

A WARNING

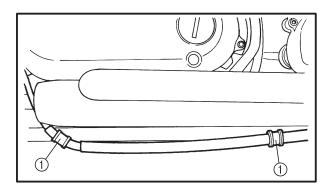
Bleed the hydraulic brake system whenever:

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



1. Remove:

- muffler
- muffler bracket (1)



2. Remove:

• plastic clamps (1)

NOTE

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

3. Bleed:

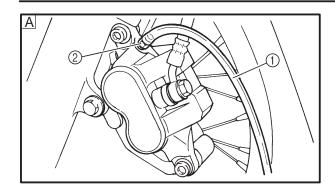
hydraulic brake system

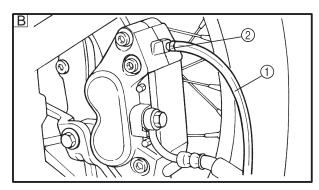
a. Fill the brake fluid reservoir to the proper level with recommended brake fluid.

b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).

BLEEDING THE HYDRAULIC BRAKE SYSTEM







- c. Connect a clear plastic hose 1 tightly to the bleed screw 2.
- A Front B Rear
- d. Place the other end of the hose into a container.
- e. Slowly apply the brake several times.
- f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
- g. Loosen the bleed screw.

NOTE: -

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

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



Bleed screw 6 Nm (0.6 m•kg)

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

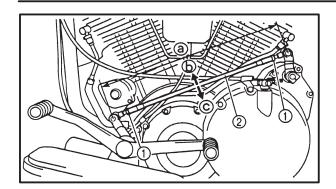
A WARNING

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

- 4. Install:
 - plastic clamps
 - muffler bracket
- ≥ 26 Nm (2.6 m•kg)
- muffler
- 5. Tighten:
 - muffler bolts
- 30 Nm (3.0 m•kg)
- muffler clamp bolts
- 25 Nm (2.5 m•kg)

ADJUSTING THE SHIFT PEDAL/ ADJUSTING THE DRIVE BELT SLACK





EAS0013

ADJUSTING THE SHIFT PEDAL

NOTE

The shift pedal position is determined by the installed shift rod length (a).

- 1. Measure:
 - installed shift rod length (a)
 Incorrect → Adjust.



Installed shift rod length $374.4 \sim 378.4 \text{ mm}$

- 2. Adjust:
 - installed shift rod length (a)
- a. Loosen both locknuts 1.
- b. Turn the shift rod ② in direction ⓑ or ⓒ to obtain the correct shift pedal position.

	Installed shift rod length increases.
Direction ©	Installed shift rod length decreases.

- c. Tighten both locknuts.
- d. Make sure the installed shift rod length is within specification.

ADJUSTING THE DRIVE BELT SLACK

engine and other	is too tight will overload the er vital parts, and one that is skip and damage the swin-
the drive belt sl	an accident. Therefore, keep ack within the specified lim-
	re belt slack when the engine is the drive belt is dry.

ADJUSTING THE DRIVE BELT SLACK



1. Stand the motorcycle on a level surface.

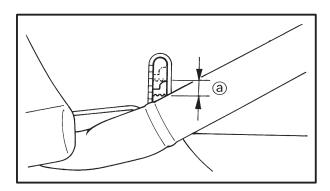
Λ	WARNING

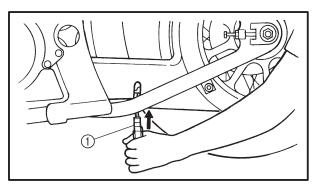
Securely support the motorcycle so that there is no danger of it falling over.

NOTE: -

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

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





- 3. Measure:
 - drive belt slack (a)
 Out of specification → Adjust.



Drive belt slack
On a sidestand $7.5 \sim 13 \text{ mm at } 4.5 \text{ kg}$ On a suitable stand $14 \sim 21 \text{ mm at } 4.5 \text{ kg}$



Belt tension gauge 90890-03170

NOTE: -

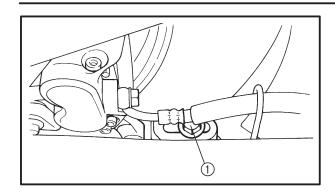
- The level marks of the level window on the lower drive belt cover are in units of 5 mm (0.20 in).
 Use them as a standard for measuring the drive belt slack.
- Measure the drive belt slack when the drive belt has been pushed with 4.5 kg (10 lbs) of pressure using a belt tension gauge ①.
- 4. Adjust:
 - drive belt slack

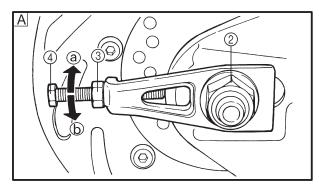
NOTE:

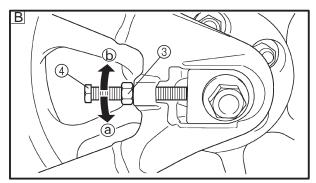
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

ADJUSTING THE DRIVE BELT SLACK/ CHECKING AND ADJUSTING THE STEERING HEAD









- a. Loosen the brake caliper bracket bolt ①.
- b. Loosen the wheel axle nut 2.
- c. Loosen both locknuts 3.
- A Right

B Left

d. Turn both adjusting bolts 4 in direction a or
b until the specified drive chain slack is obtained.

_	Drive belt slack is reduced.		
Direction (b)	Drive belt slack is increased.		

NOTE

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

e. Tighten both locknuts to specification.



Locknut 32 Nm (3.2 m•kg)

f. Tighten the wheel axle nut to specification.



Wheel axle nut 150 Nm (15.0 m•kg)

g. Tighten the brake caliper bracket bolt to specification.



Brake caliper bracket bolt 40 Nm (4.0 m•kg)

EAS0014

CHECKING AND ADJUSTING THE STEER-ING HEAD

1. Stand the motorcycle on a level surface.

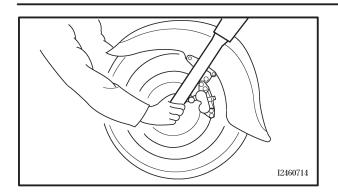
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	W	$\Delta R N$	IING
		-4848	

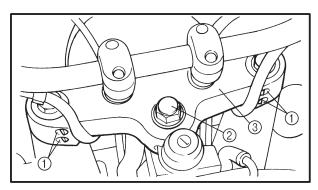
Securely support the motorcycle so that there is no danger of it falling over.

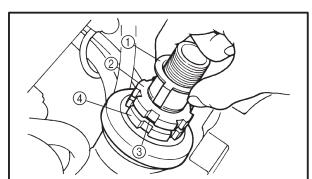
Place the motorcycle on a suitable stand so that the front wheel is elevated.

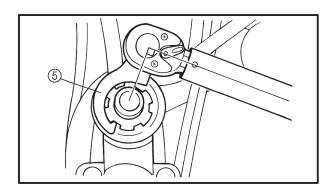
CHECKING AND ADJUSTING THE STEERING HEAD











- 2. Check:
 - steering head

Grasp the bottom of the front fork legs and gently rock the front fork.

Binding/looseness → Adjust the steering head.

- 3. Remove:
 - meter assembly Refer to "FUEL TANK".
- 4. Loosen:
 - upper bracket pinch bolts 1
- 5. Remove:
 - steering stem nut 2
 - washer
 - upper bracket ③
- 6. Adjust:
 - steering head
- a. Remove the lock washer ①, the upper ring nut ②, and the rubber washer ③.
- b. Loosen the lower ring nut 4 and then tighten it to specification with a ring nut wrench 5.

NOTF.

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



Ring nut wrench 90890-01443



Lower ring nut (initial tightening torque)

52 Nm (5.2 m•kg)

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

A WARNING

Do not overtighten the lower ring nut.

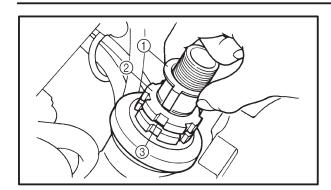


Lower ring nut (final tightening torque)

3 Nm (0.3 m•kg)

CHECKING AND ADJUSTING THE STEERING HEAD/ CHECKING THE FRONT FORK





- 4. 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 4.
- e. Install the rubber washer ③.
- f. Install the upper ring nut 2.
- g. Finger tighten the upper ring nut ②, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- h. Install the lock washer 1.

N	റ	Т	F	

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

- 7. Install:
 - upper bracket
 - washer
 - steering stem nut

130 Nm (13.0 m•kg)

- 8. Tighten:
 - upper bracket pinch bolt

10 Nm (1.0 m•kg)

- 9. Install:
 - meter assembly Refer to "FUEL TANK".

EAS00149

CHECKING THE FRONT FORK

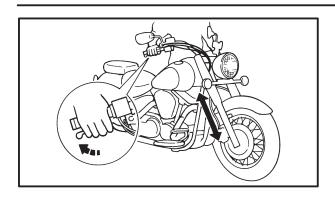
1. Stand the motorcycle on a level surface.

A WARNING

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

CHECKING THE FRONT FORK/ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY





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

Push down hard on the handlebar several times and check if the front fork rebounds smoothly.

Rough movement → Repair.

Refer to "FRONT FORK" in chapter 4.

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

WARNING

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

Spring preload

CAUTION:

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
- spring preload

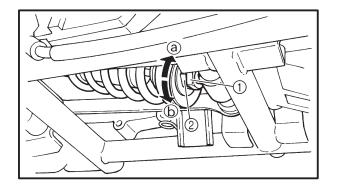
NOTE:

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



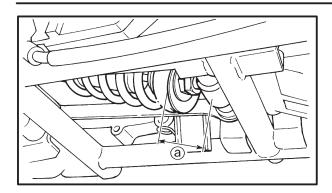
- a. Loosen the locknut 1
- b. Turn the adjusting ring ② in direction ③ or ⑤.

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



ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY/CHECKING THE TIRES

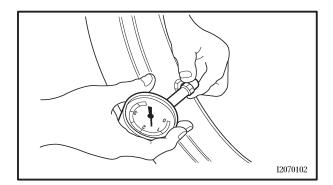




Adjusting length (a)
Minimum 42.5 mm
Standard 42.5 mm
Maximum 51.5 mm

CAUTION:

Never turn the adjusting ring beyond the maximum or minimum setting.



EAS00166

CHECKING THE TIRES

The following procedure applies to both of the tires.

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

A WARNING

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

NEVER OVERLOAD THE MOTORCYCLE.

CHECKING THE TIRES

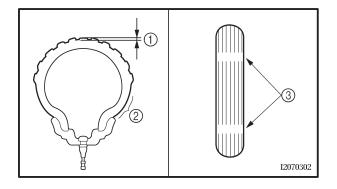


Basic weight (with oil and a full fuel tank)	332 kg	
Maximum load*	196 kg	
Cold tire pres- sure	Front tire	Rear tire
Up to 90 kg load*	250 kPa (2.5 kgf/cm ²)	250 kPa (2.5 kgf/cm ²)
90 kg ~ maxi- mum load*	250 kPa (2.5 kgf/cm ²)	280 kPa (2.8 kgf/cm ²)
High-speed riding	250 kPa (2.5 kgf/cm ²)	280 kPa (2.8 kgf/cm ²)

^{*} total of cargo, rider, passenger and accessories

A WARNING

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



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



Minimum tire tread depth 1.6 mm

- 1 Tire tread depth
- 2 Side wall
- (3) Wear indicator

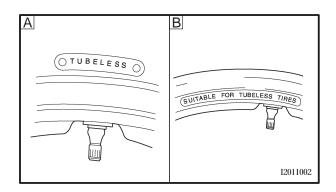
A WARNING

- Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.
- When using a tube tire, be sure to install the correct tube.
- Always replace a new tube tire and a new tube as a set.

CHECKING THE TIRES



- To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.
- A Tire
- B Wheel



Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

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

Front tire

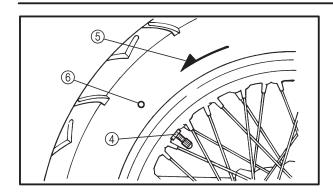
Manufacturer	Size	Model
BRIDGESTONE	130/90-16 67H	G703F
DUNLOP	130/90-16 67H	D404FL

Rear tire

Manufacturer	Size	Model
BRIDGESTONE	150/80 B16 71H	G702
DUNLOP	150/80 B16 71 H	D404

CHECKING THE TIRES/ CHECKING AND TIGHTENING THE SPOKES





A WARNING

- After mounting a new tire, ride conservatively for a while to become accustomed to the "feel" of the new tire and to allow the tire to seat itself properly in the rim. Failure to do so could lead to an accident with possible injury to the rider or damage to the motorcycle.
- After a tire has been repaired or replaced, be sure to tighten the tire air valve stem locknut 4 to specification.

NOTE: —

For tires with a direction of rotation mark ⑤:

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ⑥ with the valve installation point.



Tire air valve stem locknut 1.5 Nm (0.15 m•kg)

EAS00169

CHECKING AND TIGHTENING THE SPOKES

The following procedure applies to all of the spokes.

- 1. Check:
 - spoke

Bends/damage → Replace.

Loose → Tighten.

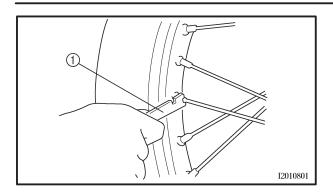
Tap the spokes with a screwdriver.

NOTE

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

CHECKING AND TIGHTENING THE SPOKES/ CHECKING AND LUBRICATING THE CABLES





2.	Tia	hten	
∠.	ΠŊ	писп	•

spokes

(with a spoke wrench 1)

3 Nm (0.3 m•kg)

NOTE: -

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

EAS00170

CHECKING AND LUBRICATING THE CABLES

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

A WARNING

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

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



Recommended lubricant
Engine oil or a suitable cable
lubricant

NOTE: —

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

LUBRICATING THE LEVERS AND PEDALS/ LUBRICATING THE SIDESTAND/ LUBRICATING THE REAR SUSPENSION



EAS00171

LUBRICATING THE LEVERS AND PEDALS

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



Recommended lubricant Lithium soap base grease

EAS00172

LUBRICATING THE SIDESTAND

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



Recommended lubricant Lithium soap base grease

EAS00174

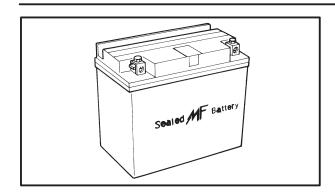
LUBRICATING THE REAR SUSPENSION

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



Recommended lubricant
Molybdenum disulfide grease





EAS0017

ELECTRICAL SYSTEM CHECKING AND CHARGING THE BATTERY

A 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.
- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.

CAUTION:

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:
- rider seat Refer to "SEATS AND SIDE COVERS".
- 2. Disconnect:
 - battery leads (from the battery terminals)

CAUTION:

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

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

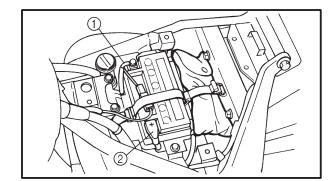
a. Connect a pocket tester to the battery terminals.

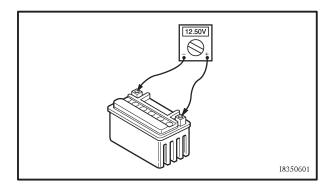
NOTE: -

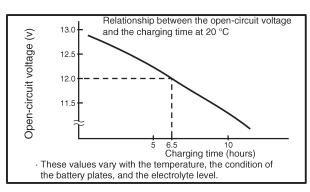
- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.
- b. Check the charge of the battery, as shown in the charts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

Example

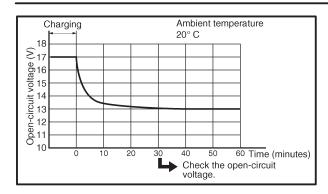
- c. Open-circuit voltage = 12.0 V
- d. Charging time = 6.5 hours
- e. Charge of the battery = $20 \sim 30 \%$

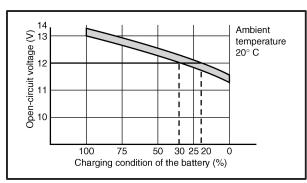












- 5. Charge:
 - battery (refer to the appropriate charging method illustration)

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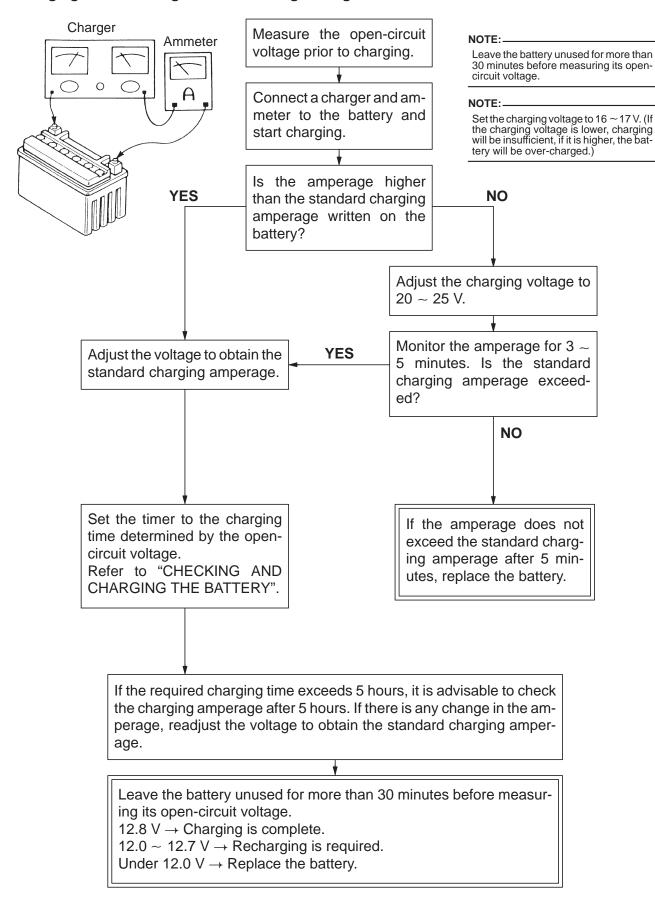
Do not quick charge a battery.

CAUTION:

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

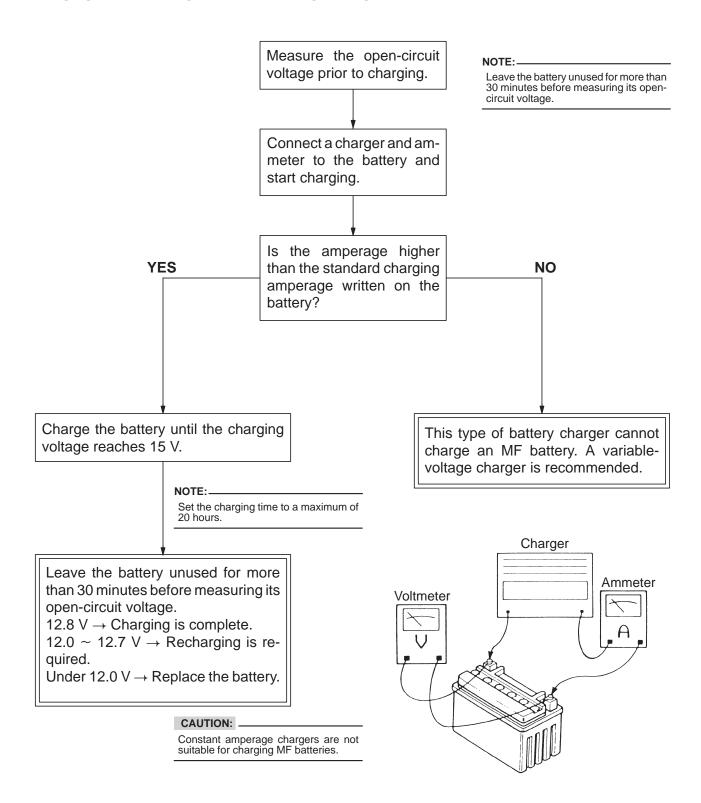


Charging method using a variable voltage charger



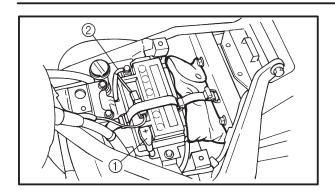


Charging method using a constant voltage charger



CHECKING AND CHARGING THE BATTERY/ CHECKING THE FUSES





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

CAUTION:

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

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



Recommended lubricant Dielectric grease

- 10. Install:
 - rider seat

Refer to "SEATS AND SIDE COVERS".

EAS00181

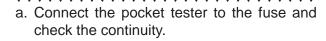
CHECKING THE FUSES

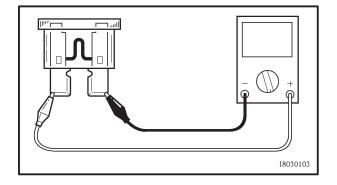
The following procedure applies to all of the fuses.

CAUTION:

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

- 1. Remove:
 - left side cover Refer to "SEATS AND SIDE COVERS".
- 2. Check:
 - continuity





CHECKING THE FUSES

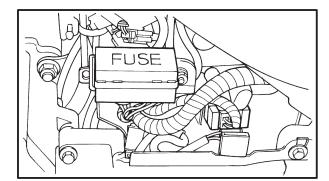
NOTE: -

Set the pocket tester selector to " $\Omega \times 1$ ".



Pocket tester 90890-03112

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



3. Replace:

blown fuse

- a. Set the main switch to "OFF".
- b. Install a new fuse of the correct amperage.
- c. Set the main switch to "ON" and verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

Item	Amperage	Q'ty
Main fuse	30 A	1
Headlight fuse	15 A	1
Ignition fuse	15 A	1
Signaling sys- tem fuse	10 A	1
Carburetor heater fuse	10 A	1
Backup fuse	5 A	1
Reserve fuse	30 A	1
Reserve fuse	15 A	1
Reserve fuse	10 A	1
Reserve fuse	5 A	1

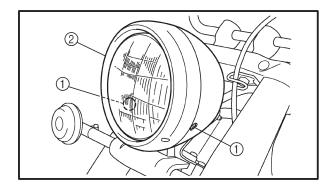
A WARNING

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

CHECKING THE FUSES/ REPLACING THE HEADLIGHT BULB



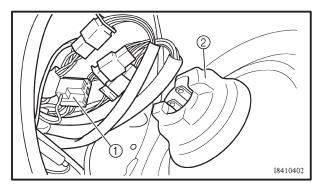
- 4. Install:
 - left side cover Refer to "SEATS AND SIDE COVERS".



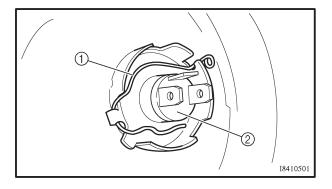
EAS00182

REPLACING THE HEADLIGHT BULB

- 1. Remove:
 - screws (1)
 - headlight lens unit 2



- 2. Disconnect:
 - head light coupler ①
- 3. Remove:
 - headlight bulb holder cover 2



- 4. Detach:
- headlight bulb holder 1
- 5. Remove:
 - headlight bulb 2

A WARNING

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

REPLACING THE HEADLIGHT BULB/ ADJUSTING THE HEADLIGHT BEAM



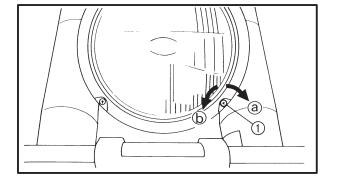
- 6. Install:
 - headlight bulb New

Secure the new headlight bulb with the headlight bulb holder.

CAUTION:

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

- 7. Attach:
 - headlight bulb holder
- 8. Install:
 - headlight bulb holder cover
- 9. Connect:
 - headlight coupler
- 10. Install:
 - headlight lens unit
 - screws



EAS00184

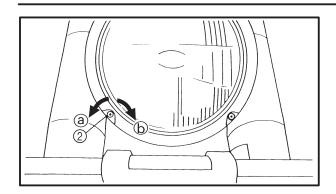
ADJUSTING THE HEADLIGHT BEAM

- 1. Adjust:
 - headlight beam (vertically)
- a. Turn the adjusting screw 1 in direction a orb.

	Headlight beam is raised.
Direction (b)	Headlight beam is lowered.

ADJUSTING THE HEADLIGHT BEAM



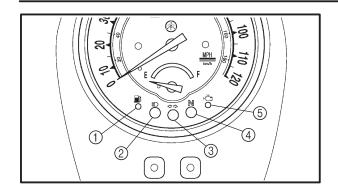


- 2. Adjust:
 - headlight beam (horizontally)
- a. Turn the adjusting knob ② in direction ③ or

Direction (a)	Headlight the right.	beam	moves	to
Direction (b)	Headlight the left.	beam	moves	to

INSTRUMENT FUNCTIONS





INSTRUMENT FUNCTIONS INDICATOR LIGHTS

- ② High beam indicator light ""

 "
 "
- ③ Turn indicator light "⋄ ▷"
- (4) Neutral indicator light "N"
- (5) Engine trouble indicator light "云"

Neutral indicator light "N"

This indicator comes on when the transmission is in neutral.

High beam indicator light "" " " "

This indicator comes on when the headlight high beam is used.

Turn indicator light "♦♦"

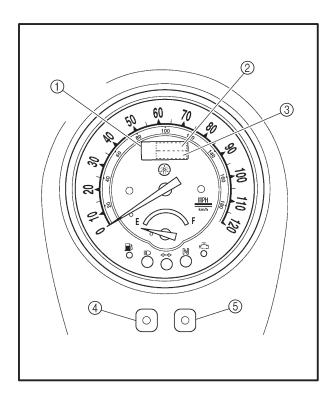
This indicator flashes when the turn switch is moved to the left or right.

Fuel level indicator light "■"

When the fuel level drops below approximately 3.5 L this light will come on. When this light comes on, turn the fuel cock to "RES". Then, switch the fuel cock to "RES". Then, fill the tank at the first opportunity.

Engine trouble indicator light "-"

This indicator light will come on or flash if trouble occurs in a monitoring circuit. In such a case, take the motorcycle to a Yamaha dealer to have the self-diagnostic systems checked.



COMBINATION METER

- (1) Combination meter
- (2) Clock
- (3) Odometer/trip meter
- (4) Mode button
- (5) Set button

This combination meter is equipped with an odometer and a twin trip meter. Pushing the mode button will change the display from one to the other as follows.

"ODO" \rightarrow "TRIP A" \rightarrow "TRIP B" \rightarrow "ODO"

When set to "ODO", it indicates the motorcycle's total mileage. When set to "TRIP A" or "TRIP B", it indicates the motorcycle's mileage since the trip meter was last reset. Use the trip meter to estimate how far you can ride on a tank of fuel. This information will enable you to plan fuel stops in the future.

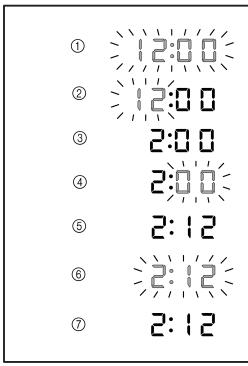
INSTRUMENT FUNCTIONS



To reset the trip meter "0", push the set button until it displays "TRIP A" or "TRIP B", then push mode button and hold it down for at least one second.

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This motorcycle does not have a tachometer. However, it is equipped with an engine revolution limiter, which prevents the engine revolution from exceeding approximately 4,400 r/min.



Setting the clock

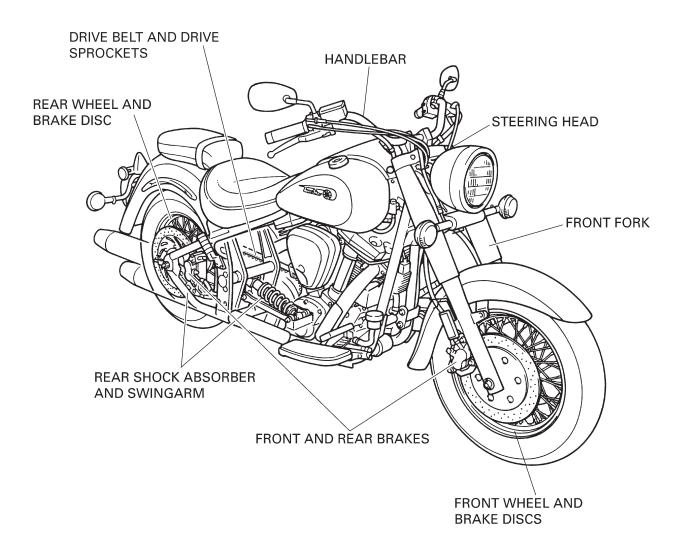
This clock always shows the time regardless of the main switch position.

- 1. Turn the main switch to "ON".
- Press both left and right buttons simultaneously until both hours and minutes flash.
- 3. Push the left button and the hour display will flash. ②
- 4. Push the right button to change the hours. 3
- 5. Push the left button and the minute display will flash. (4)
- 6. Push the right button to change the minutes. (5)
- 7. Push the left button and both hours and minutes will flash. (6)
- 8. Push the right button for two seconds to set the clock. (7)



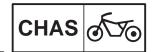


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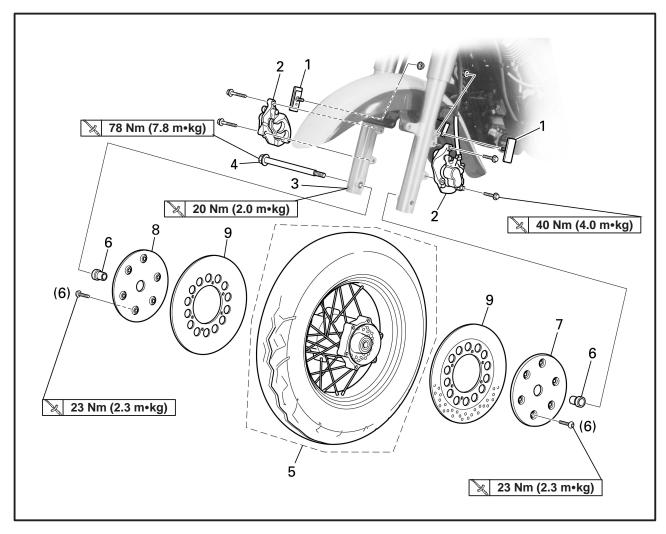
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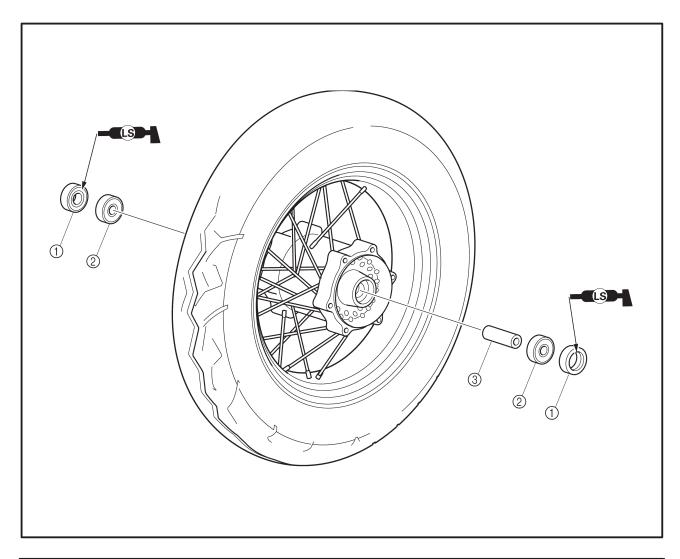
EAS00514

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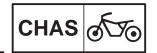
FRONT WHEEL AND BRAKE DISCS



Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake discs		Remove the parts in the order listed. NOTE:
			Place the motorcycle on a suitable stand so that the front wheel is elevated.
1 2 3 4 5 6 7 8 9	Reflector (left and right) Brake caliper (left and right) Wheel axle pinch bolt Front wheel axle Front wheel Collar (left and right) Brake disc cover (left) Brake disc cover (right-with weight) Brake disc (left and right)	2 2 1 1 1 2 1 1 2	Loosen. For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
1 2 3	Disassembling the front wheel Oil seal (left and right) Wheel bearing (left and right) Spacer	2 2 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.



EAS00521

REMOVING THE FRONT WHEEL

1. Stand the motorcycle on a level surface.

A WARNING

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

NOTE: -

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

2. Remove:

- left brake caliper
- right brake caliper

NOTE: -

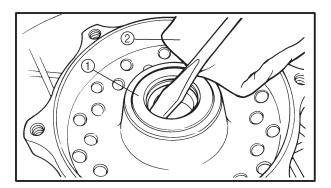
Do not squeeze the brake lever when removing the brake calipers.

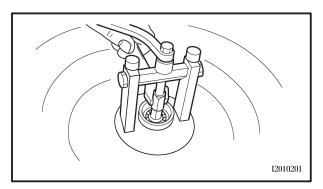
3. Elevate:

• front wheel

NOTE: -

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





EAS00523

DISASSEMBLING THE FRONT WHEEL

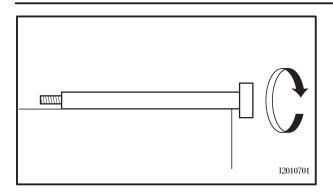
- 1. Remove
 - oil seals
 - wheel bearings
- a. Clean the outside of the front wheel hub.
- b. Remove the oil seals ① with a flat-head screwdriver.

NOTE

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

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





EAS00526

CHECKING THE FRONT WHEEL

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

A WARNING

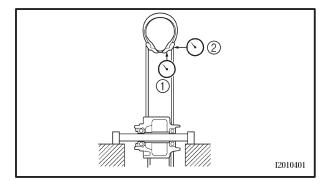
Do not attempt to straighten a bent wheel axle.

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

Bends/damage → Replace.

Loose \rightarrow Tighten.

Refer to "CHECKING AND TIGHTENING THE SPOKES" in chapter 3.



- 4. Measure:
 - radial wheel runout (1)
 - lateral wheel runout 2

Over the specified limits \rightarrow Replace.

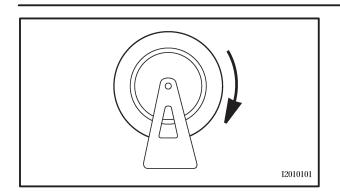


Maximum radial wheel runout 1.0 mm Maximum lateral wheel runout 0.5 mm

- 5. Check:
 - collars

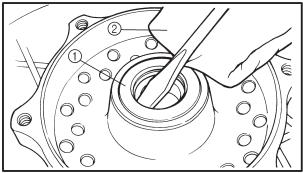
Damage/wear → Replace.







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





wheel bearings New

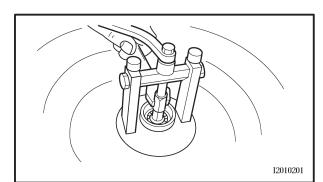
• oil seals New



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



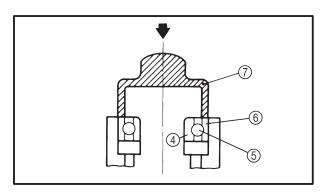
To prevent damaging the wheel, place a rag 2 between the screwdriver and the wheel surface.



- c. Remove the wheel bearings (3) with a general bearings 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.



EAS00531

CHECKING THE BRAKE DISCS

The following procedure applies to all of the brake discs.

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

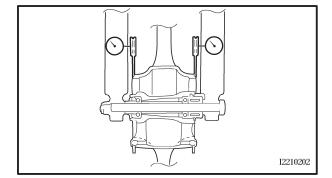


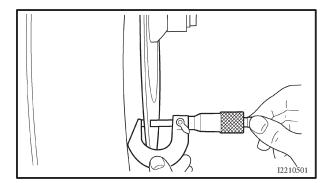
Maximum brake disc deflection

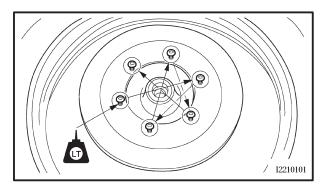
Front: 0.15 mm Rear: 0.15 mm



- 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 1.5 mm 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 \rightarrow Replace.



Minimum brake disc thickness

Front: 4.5 mm Rear: 6.5 mm

- 4. Adjust:
 - brake disc deflection
- a. Remove the brake disc cover and brake disc.
- b. Rotate the brake disc cover and brake disc by one bolt hole.
- c. Install the brake disc cover and brake disc.

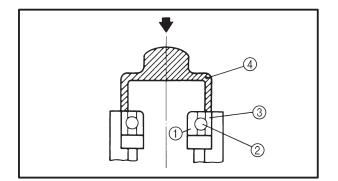
NOTE: -

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



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

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



EAS00539

ASSEMBLING THE FRONT WHEEL

- 1. Install:
 - wheel bearings
 - oil seals New

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

CAUTION:

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

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

EAS00544

INSTALLING THE FRONT WHEEL

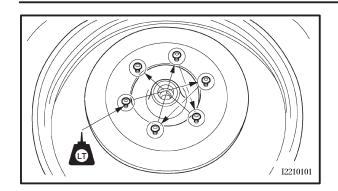
The following procedure applies to both brake discs.

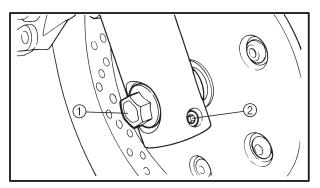
- 1. Lubricate:
 - wheel axle
 - oil seals lips



Recommended lubricant Lithium soap base grease







- 2. Install:
 - brake discs
 - brake disc covers

23 Nm (2.3 m• kg)

NOTE: -

- Apply locking agent (LOCTITE® 648) to the threads of the brake disc bolts.
- Tighten the brake disc in stages and in a criss-cross pattern.
- 3. Install:
 - collars
 - front wheel
 - front wheel axle
- 4. Tighten:

 - wheel axle pinch bolt 2

20 Nm (2.0 m•kg)

CAUTION:

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

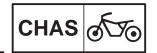
- 5. Install:
 - brake calipers

40 Nm (4.0 m•kg)

A WARNING

Make sure the brake hose is routed properly.

- 6. Install:
 - reflectors

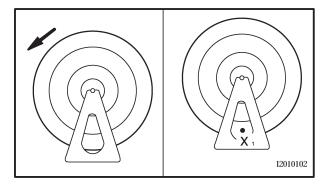


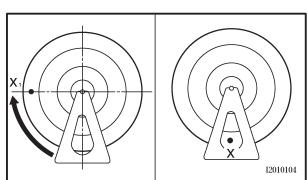
FAS0054

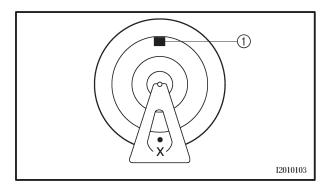
ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE: -

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







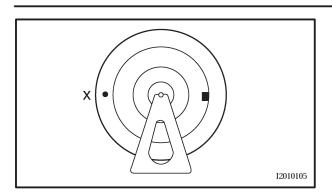
- 1. Remove:
 - balancing weight(-s)
- 2. Find:
 - front wheel's heavy spot
- a. Place the front wheel on a suitable balancing stand.
- b. Spin the front wheel.
- c. When the front wheel stops, put an "X₁" mark at the bottom of the wheel.
- d. Turn the front wheel 90° so that the "X₁" mark is positioned as shown.
- e. Release the front wheel.
- f. When the wheel stops, put an "X2" mark at the bottom of the wheel.
- g. Repeat steps (b) through (f) several times until all the marks come to rest at the same spot
- h. The spot where all the marks come to rest is the front wheel's heavy spot "X".
- 3. Adjust:
 - front wheel static balance
- a. Install a balancing weight ① onto the rim exactly opposite the heavy spot "X".

NOTE: -

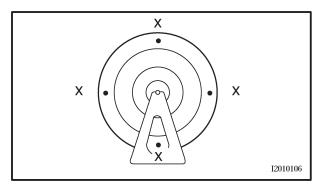
Start with the lightest weight.

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





- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.



- 4. Check:
 - front wheel static balance

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

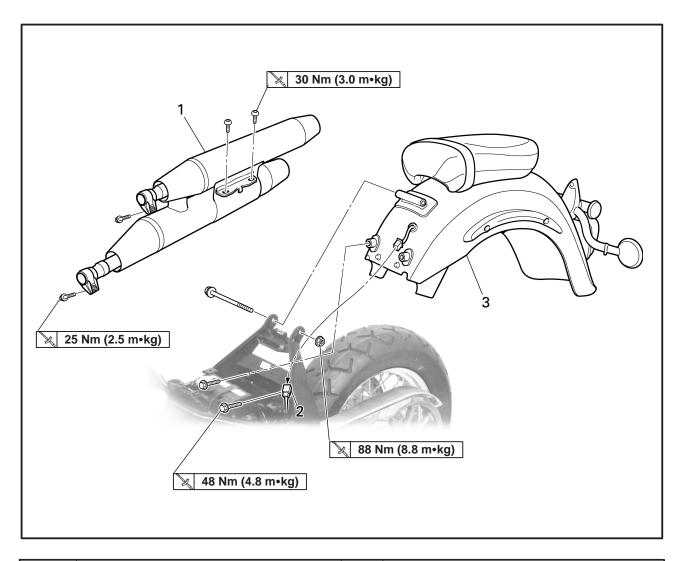
b. If the front wheel does not remain stationary at all of the positions, rebalance it.

4-10

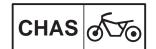


FAS0055

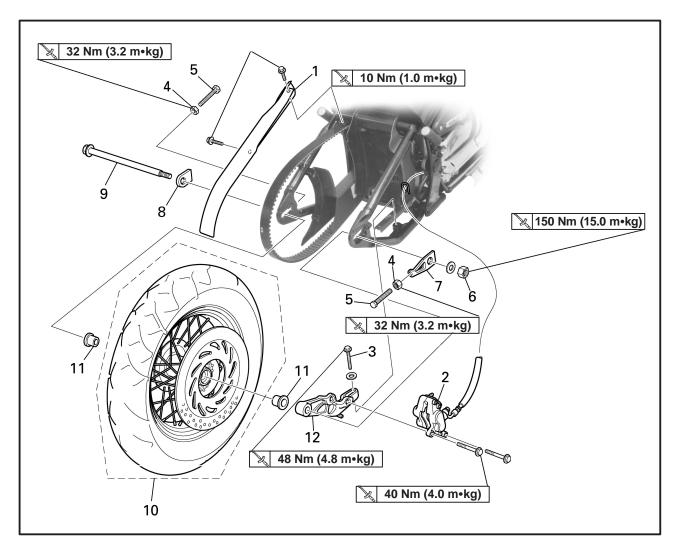
REAR WHEEL, BRAKE DISC AND REAR WHEEL SPROCKET



Order	Job/Part	Q'ty	Remarks
	Removing the rear fender and muffler Rider seat		Remove the parts in the order listed. Refer to "SEATS AND SIDE COVERS" in chapter 3.
1	Muffler	1	·
2	Tail/brake light and turn signal light sub-wire harness	1	Disconnect.
3	Rear fender assembly	1	
			For installation, reverse the removal procedure.

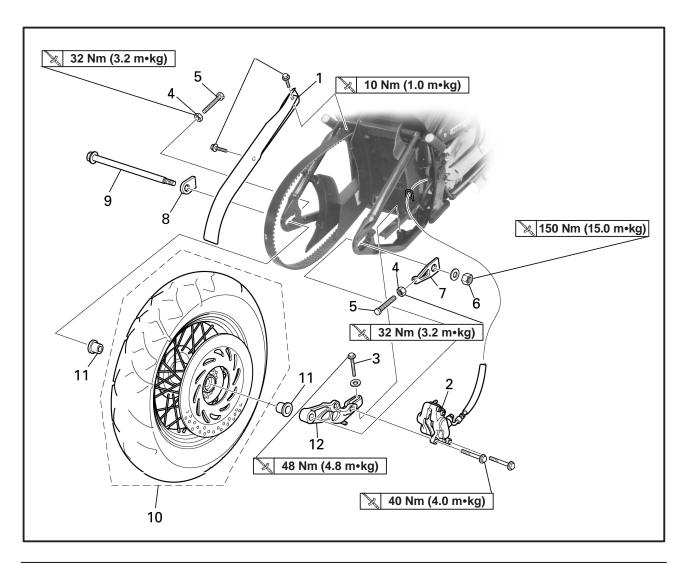


EAS00550



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed. NOTE:
			Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Upper drive belt cover	1	
2	Brake caliper	1	
3	Brake caliper bracket bolt	1	
4	Locknut (left and right)	2	Loosen.
5	Adjusting bolt (left and right)	2	Loosen.
6	Wheel axle nut	1	
7	Right adjusting plate	1	
8	Left adjusting plate	1	
9	Rear wheel axle	1	

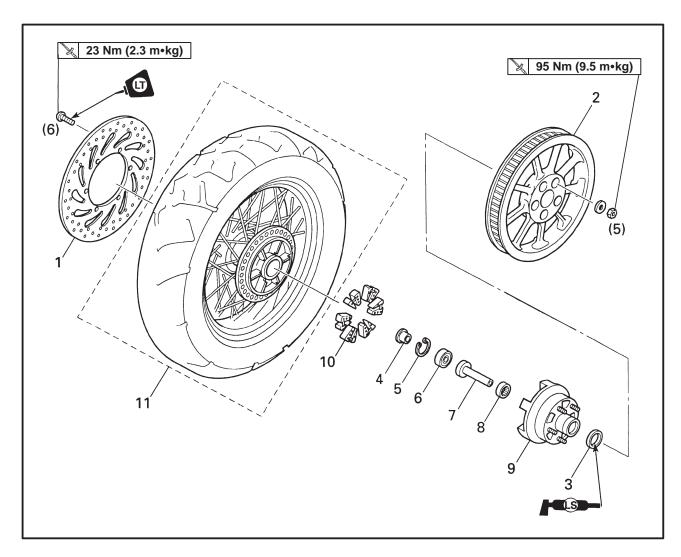




Order	Job/Part	Q'ty	Remarks
10	Rear wheel	1	For installation, reverse the removal procedure.
11	Collar (left and right)	2	
12	Brake caliper bracket	1	



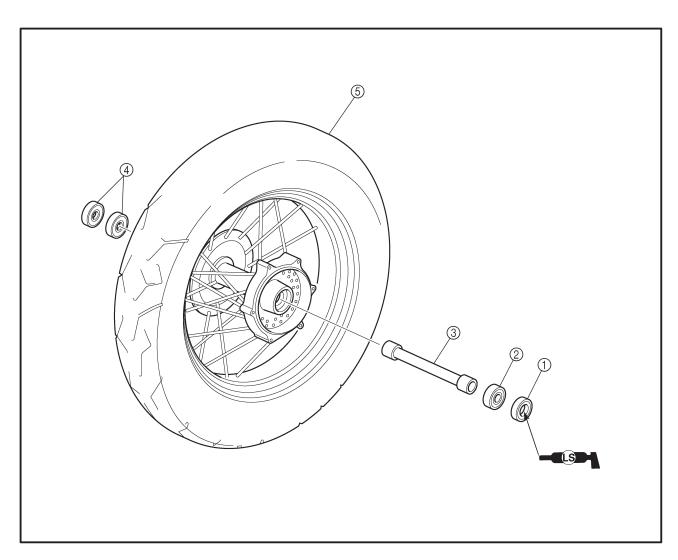
EAS00556



Order	Job/Part	Q'ty	Remarks
	Removing the brake disc and rear wheel sprocket		Remove the parts in the order listed.
1	Brake disc	1	
2	Rear wheel sprocket	1	
3	Oil seal	1	
4	Collar	1	
5	Circlip	1	
6	Bearing	1	
7	Collar	1	
8	Bearing	1	
9	Rear wheel drive hub	1	
10	Rear wheel drive hub damper	6	
11	Rear wheel	1	
			For installation, reverse the removal procedure.



EAS00560



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



EAS00561

REMOVING THE REAR WHEEL

1. Stand the motorcycle on a level surface.



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

NOTE: -

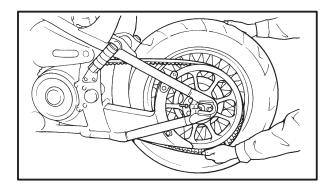
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove

brake caliper

NOTE: -

Do not depress the brake pedal when removing the brake caliper.



3. Remove:

rear wheel

NOTE: -

Push the rear wheel forward and remove the drive belt from the rear wheel sprocket.

EAS0056

CHECKING THE REAR WHEEL

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

Refer to "FRONT WHEEL BRAKE DISCS".

- 2. Check:
 - tire
 - rear wheel

Damage/wear → Replace.

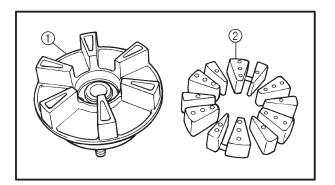
Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.



- 3. Check:
 - spokes

Refer to "FRONT WHEEL AND BRAKE DISCS".

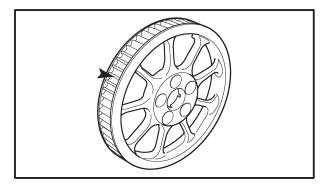
- 4. Measure:
 - radial wheel runout
 - lateral wheel runout Refer to "FRONT WHEEL AND BRAKE DISCS".



EAS00567

CHECKING THE REAR WHEEL DRIVE HUB

- 1. Check:
 - rear wheel drive hub ①
 Cracks/damage → Replace.
 - rear wheel drive hub dampers ②
 Damage/wear → Replace.



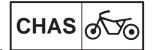
EAS00568

CHECKING AND REPLACING THE REAR WHEEL SPROCKET

- 1. Check:
 - rear wheel sprocket
 Surface plating has come off → Replace the
 rear wheel sprocket.

Bent teeth \rightarrow Replace the rear wheel sprocket.

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





Rear wheel sprocket self-locking nut

95 Nm (9.5 m•kg)

NOTE: -

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

ASSEMBLING THE REAR WHEEL

- 1. Install:
 - bearings
 - spacer
 - bearing
 - oil seal New

Refer to "FRONT WHEEL AND BRAKE DISCS".

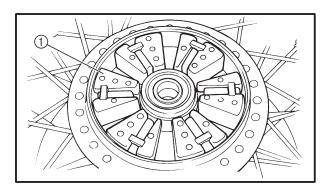
EAS00572

INSTALLING THE REAR WHEEL

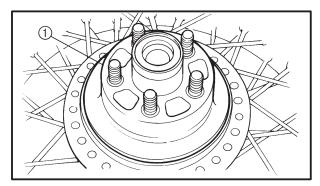
- 1. Lubricate:
 - oil seal lips



Recommended lubricant Lithium soap base grease

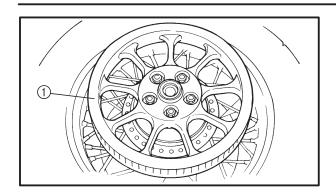


- 2. Install
 - rear wheel drive hub dampers 1



- 3. Install
 - rear wheel drive hub assembly 1





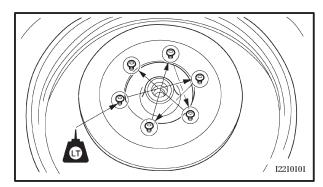
4. Install:

rear wheel sprocket 1

% 95 Nm (9.5 m•kg)

NOTE: -

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



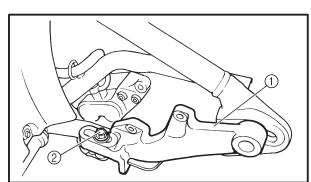
5. Install:

brake disc

NOTE: -

• Apply locking agent (LOCTITE® 648) to the threads of the brake disc bolts.

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



6. Install:

• brake caliper bracket (1)

washer

• brake caliper bracket bolt 2

NOTE

Temporarily tighten the brake caliper bracket bolt.

7. Install:

• collars

rear wheel

adjusting plates

• rear wheel axle

washer

wheel axle nut

NOTE

Temporarily tighten the wheel axle nut.

8. Adjust:

drive belt slack

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

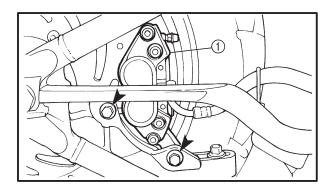


- 9. Tighten:
 - wheel axle nut

150 Nm (15.0 m•kg)

• brake caliper bracket bolt

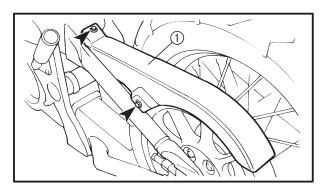
48 Nm (4.8 m•kg)



10. Install:

• brake caliper ①

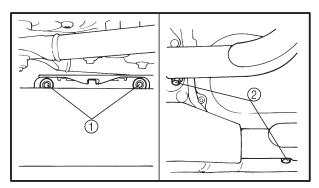
¾ 40 Nm (4.0 m•kg)



11. Install:

• upper drive belt cover 1

10 Nm (1.0 m•kg)



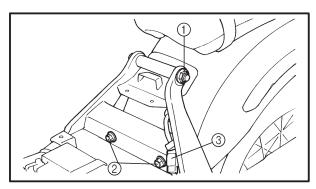
- 12. Install:
 - muffler
- 13. Tighten:

• muffler mounting bolt 1

30 NI

• Clamp bolt 2

30 Nm (3.0 m•kg) 25 Nm (2.5 m•kg)



- 14. Install:
 - rear fender assembly
- 15. Tighten:
 - nut (1)

88 Nm (8.8 m•kg)

• bolts 2

48 Nm (4.8 m•kg)

16. Connect:

• tail/brake light and turn signal light sub-wire harness coupler ③



17. Install:

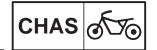
 rider seat Refer to "SEATS AND SIDE COVERS" in chapter 3.

EAS00575

ADJUSTING THE REAR WHEEL STATIC BALANCE

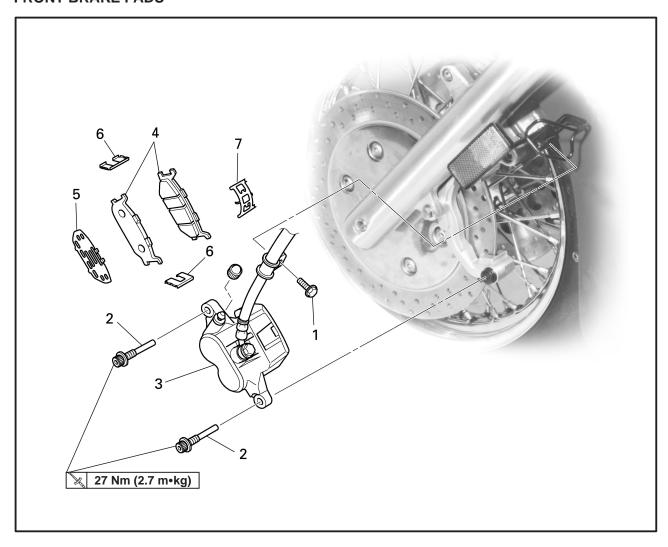
NOTE: -

- After replacing the tire, wheel, or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.
- 1. Adjust:
 - rear wheel static balance Refer to "FRONT WHEEL AND BRAKE DISCS".



EAS0057

FRONT AND REAR BRAKES FRONT BRAKE PADS

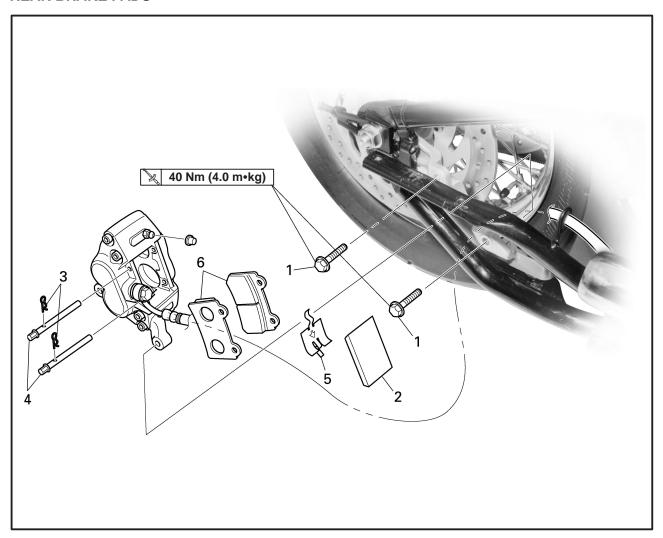


Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
1	Retaining hose holder bolt	1	
2	Retaining bolt	2	
3	Brake caliper	1	
4	Brake pad	2	
5	Brake pad shim	1	
6	Brake pad spring	2	
7	Brake pad spring	1	
			For installation, reverse the removal procedure.



EAS00578

REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads Muffler		Remove the parts in the order listed. Refer to "REAR WHEEL, BRAKE DISC AND REAR WHEEL SPROCKET".
1	Brake caliper bolt	2	
2	Brake pad cover	1	
3	Brake pad clip	2	
4	Brake pad pin	2	
5	Brake pad spring	1	
6	Brake pad	2	
			For installation, reverse the removal procedure.

CHAS 656

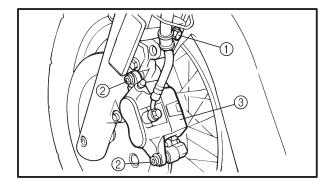
EAS00579

CAUTION:

Disc brake components rarely require disassembly.

Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
 FIRST AID FOR BRAKE FLUID ENTERING THE EYES:
- Flush with water for 15 minutes and get immediate medical attention.



EAS00580

REPLACING THE FRONT BRAKE PADS

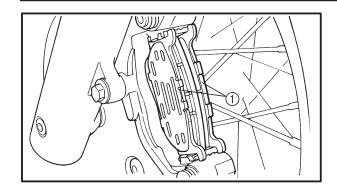
The following procedure applies to both brake calipers.

NOTE: -

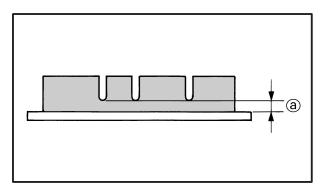
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

- 1. Remove:
 - brake hose holder bolt 1
 - brake caliper retaining bolts 2
 - brake caliper (3)





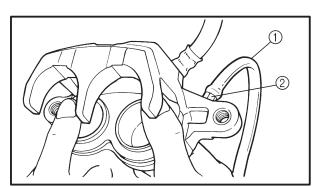
- 2. Remove:
- brake pads ①
 (along with the brake pad shim)
- brake pad springs



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



Minimum brake pad thickness 0.5 mm



- 4. Install:
 - brake pads
 - brake pad springs

NOTE: -

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

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



Bleed screw 6 Nm (0.6 m•kg)

d. Install a new brake pad shim onto caliper piston side new brake pad.

- 5. Lubricate:
 - brake caliper retaining bolt



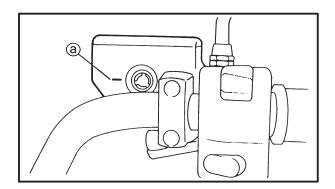
Recommended lubricant Lithium soap base grease

CAUTION:

- Do not allow grease to contact the brake pads.
- Remove any excess grease.
- 6. Install:
 - brake caliper
 - brake caliper retaining blots

27 Nm (2.7 m•kg)

• brake hose holder bolt



7. Check:

brake fluid level

Below the minimum level mark $\textcircled{a} \rightarrow \mathsf{Add}$ the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

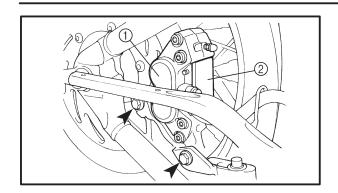
8. Check:

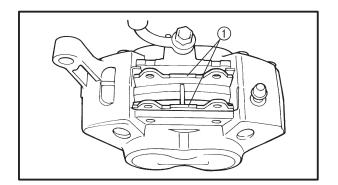
• brake lever operation

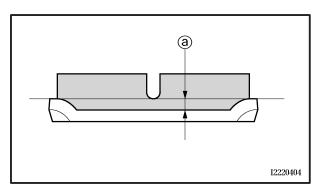
Soft or spongy feeling \rightarrow Bleed the brake system.

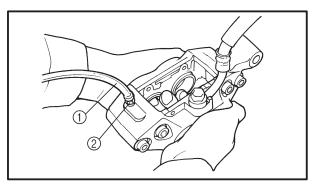
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.











EAS00583

REPLACING THE REAR BRAKE PADS

NOTE

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

- 1. Remove:
 - brake caliper 1
 - brake pad cover ②
- 2. Remove:
 - brake pad clips ①
 - brake pad pins 2
 - brake pad spring ③

- 3. Remove:
 - brake pads ①

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



Minimum brake thickness 0.5 mm

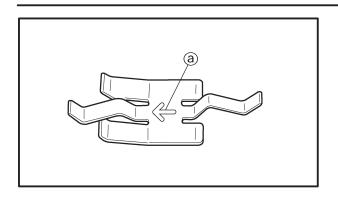
- 5. Install:
 - brake pads
 - brake pad spring

NOTE:

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

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





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



Bleed screw 6 Nm (0.6 m•kg)

d. Install new brake pads and a new brake pad spring.

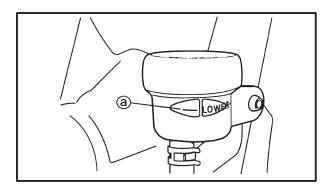
NOTE: -

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

6. Install:

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

40 Nm (4.0 m•kg)



7. Check:

brake fluid level

Below the minimum level mark $\textcircled{a} \rightarrow \mathsf{Add}$ the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

8. Check:

brake pedal operation

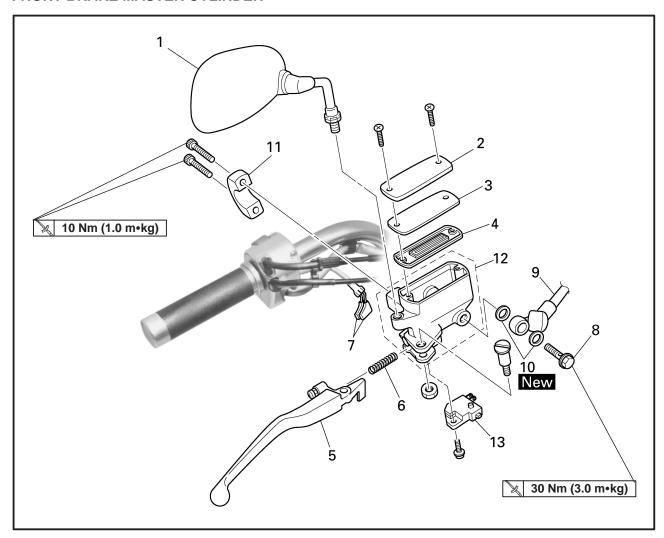
Soft or spongy feeling \rightarrow Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

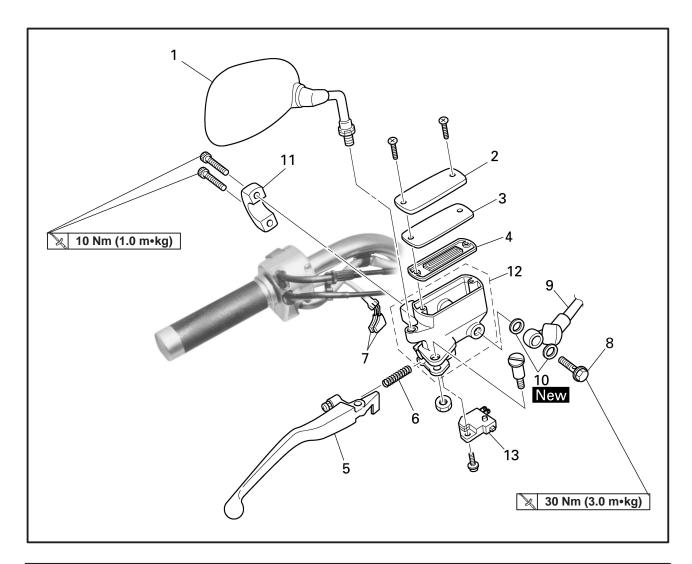


EAS00584

FRONT BRAKE MASTER CYLINDER

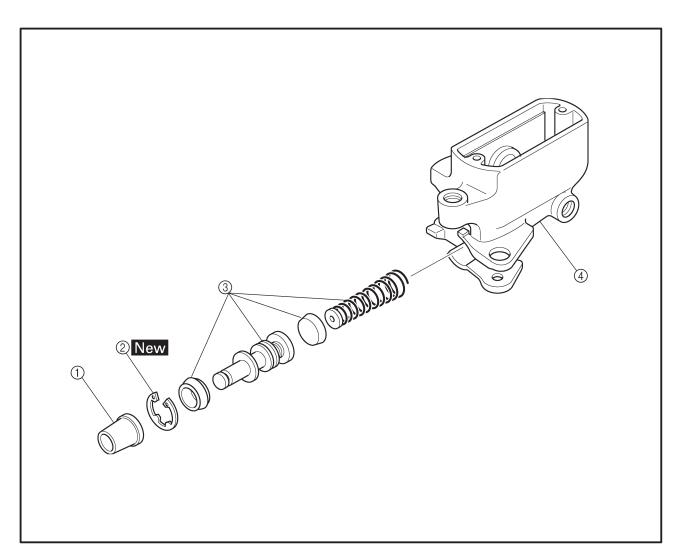


Order	Job/Part	Q'ty	Remarks
	Removing the front brake master		Remove the parts in the order listed.
	cylinder Brake fluid		Drain.
1	Rear view mirror	1	J.a
2	Brake master cylinder reservoir cap	1	
3	Brake master cylinder reservoir	1	
	diaphragm holder		
4	Brake master cylinder reservoir	1	
	diaphragm		
5	Brake level	2	
6	Brake level spring	1	
7	Front brake light switch connector	2	Disconnect.
8	Union bolt	1	
9	Brake hose	1	Disconnect.
10	Copper washer	2	



Order	Job/Part	Q'ty	Remarks
11 12 13	Brake master cylinder holder Brake master cylinder Front brake light switch	1 1 1	For installation, reverse the removal procedure.

EAS00585

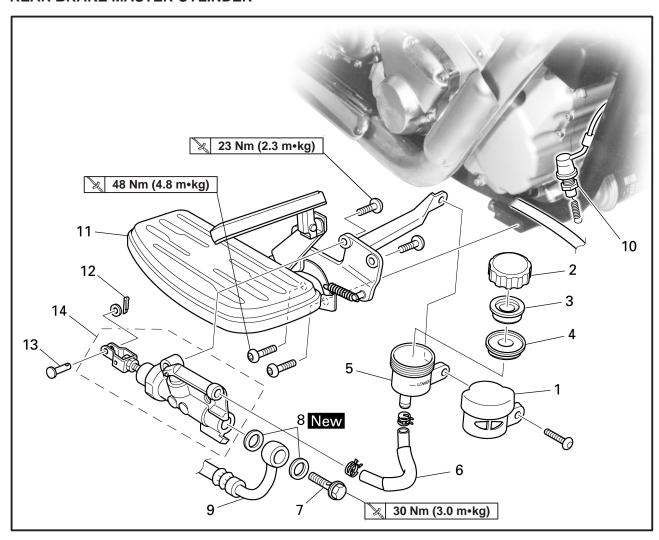


Order	Job/Part	Q'ty	Remarks
1 2 3 4	Disassembling the front brake master cylinder Dust boot Circlip Brake master cylinder kit Brake master cylinder	1 1 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.

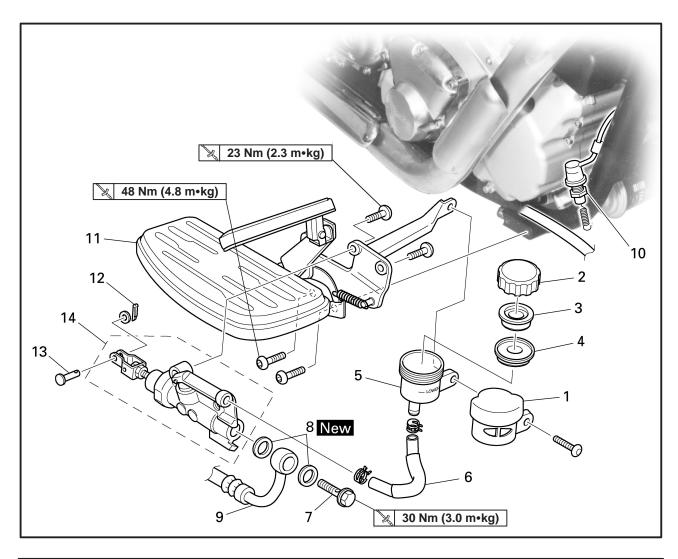


EAS00586

REAR BRAKE MASTER CYLINDER

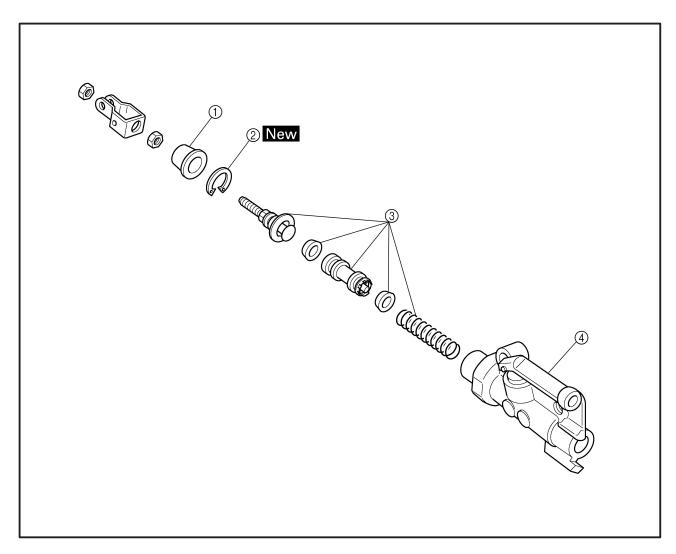


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake fluid reservoir cover	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Union bolt	1	
8	Copper washer	2	
9	Brake hose	1	Disconnect.
10	Rear brake light switch	1	Disconnect.



Order	Job/Part	Q'ty	Remarks
11 12 13 14	Left footrest assembly Cotter pin Pin Brake master cylinder	1 1 1 1	For installation, reverse the removal procedure.

EAS00587



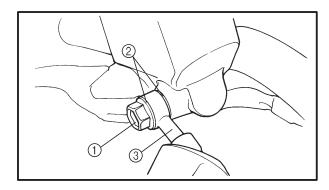
Order	Job/Part	Q'ty	Remarks
(1) (2) (3) (4)	Disassembling the rear brake master cylinder Dust boot Circlip Brake master cylinder kit Brake master cylinder	1 1 1 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.

EAS00588

DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

NOTE: -

Before disassembling the front brake master cylinder, drain the brake fluid from the entire brake system.

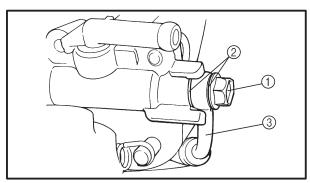


1. Remove:

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

NOTE: -

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



EAS00589

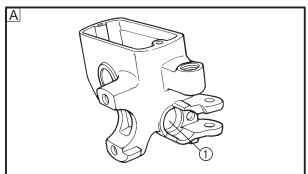
DISASSEMBLING THE REAR BRAKE MASTER CYLINDER

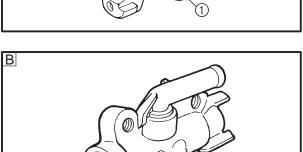
- 1. Remove:
 - union bolt (1)
 - copper washers 2
 - brake hose ③

NOTE: -

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





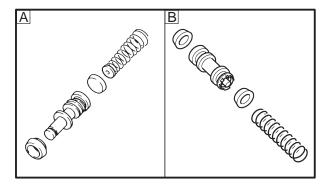




CHECKING THE FRONT AND REAR BRAKE **MASTER CYLINDERS**

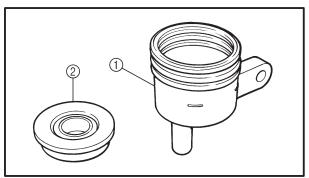
The following procedure applies to the both of the brake master cylinders.

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



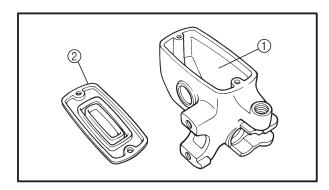
2. Check:

- brake master cylinder kit 1 Damage/scratches/wear → Replace.
- A Front
- B Rear



3. Check:

- rear brake fluid reservoir 1 Cracks/damage → Replace.
- rear brake fluid reservoir diaphragm 2 Cracks/damage → Replace.



4. Check:

- front brake master cylinder reservoir 1) Cracks/damage → Replace.
- •front brake master cylinder reservoir diaphragm 2



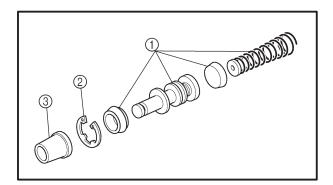
- 5. Check:
 - brake hoses
 - brake fluid reservoir hose Cracks/damage/wear → Replace.

EAS00598

ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

WARNING

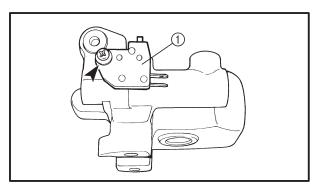
- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components.





Recommended brake fluid DOT 4

- 1. Install:
 - brake master cylinder kit 1
 - circlip 2 New
 - dust boot (3)



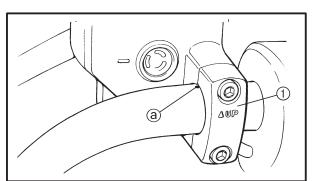
- 2. Install:
- front brake light switch (1)

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

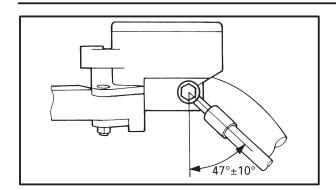
10 Nm (1.0 m•kg)



- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark (a) in the handlebar.
- First, tighten the upper bolt, then the lower bolt.







- 4. Install:
 - copper washers New
 - brake hose
 - union bolt

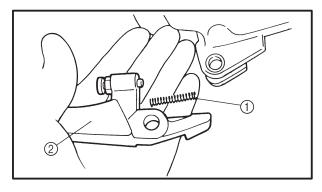
30 Nm (3.0 m•kg)



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

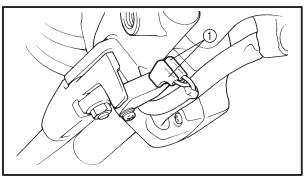
NOTE: -

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



5. Install:

- brake lever spring ①
- brake lever (2)



6. Connect:

• front brake light switch connectors (1)

7. Fill

• brake master cylinder reservoir (with the specified amount of the recommended brake fluid)



Recommended brake fluid DOT 4

A 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:

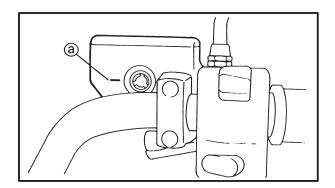
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt fluid immediately.

8. Bleed:

- brake system
 Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
- 9. Install:
 - brake master cylinder diaphragm
 - brake master cylinder diaphragm holder
 - brake master cylinder cap
 - rear view mirror

10. Check:

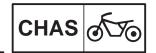
brake fluid level
Below the minimum level mark (a) → Add the
recommended brake fluid to the proper level.
Referto "CHECKING THE BRAKE FLUID
LEVEL" in chapter 3.

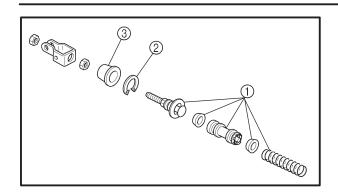


11. Check:

brake lever operation
 Soft or spongy feeling → Bleed the brake

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

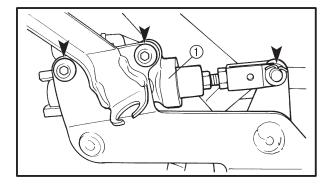




EAS00608

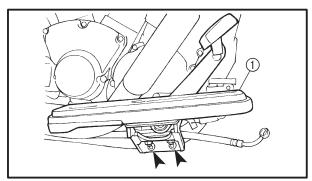
ASSEMBLING AND INSTALLING THE REAR BRAKE MASTER CYLINDER

- 1. Install:
- brake master cylinder kit 1
- circlip 2 New
- dust boot (3)



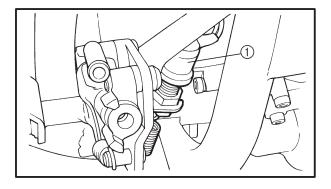
- 2. Install:
 - brake master cylinder ①

23 Nm (2.3 m•kg)



- 3. Install:
 - left footrest assembly 1

48 Nm (4.8 m•kg)



- 4. Install:
- rear brake light switch 1

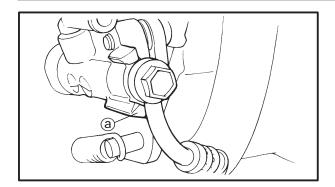
- 5. Install:
 - copper washers New
 - brake hose
 - union bolt

30 Nm (3.0 m•kg)



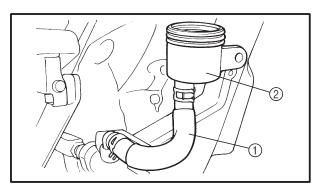
Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".





CAUTION:

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



6. Install:

- brake fluid reservoir hose (1)
- brake fluid reservoir (2)

7. Fill:

 brake fluid reservoir (to the maximum level mark)



Recommended brake fluid DOT 4

A WARNING

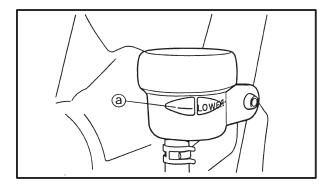
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

וואי	TION	

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

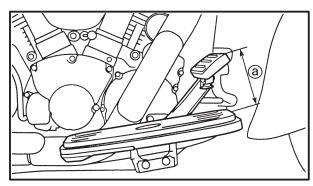


- 8. Bleed:
 - brake system
 Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
- 9. Install:
 - brake fluid reservoir diaphragm
 - brake fluid reservoir diaphragm holder
 - brake fluid reservoir cap
 - brake fluid reservoir cover



10. 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.



11. Adjust:

brake pedal position (a)
 Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.



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

100 mm

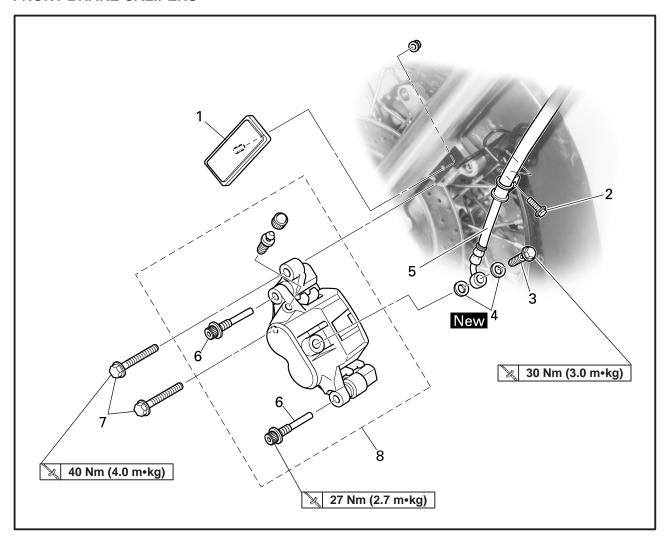
12. Adjust:

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



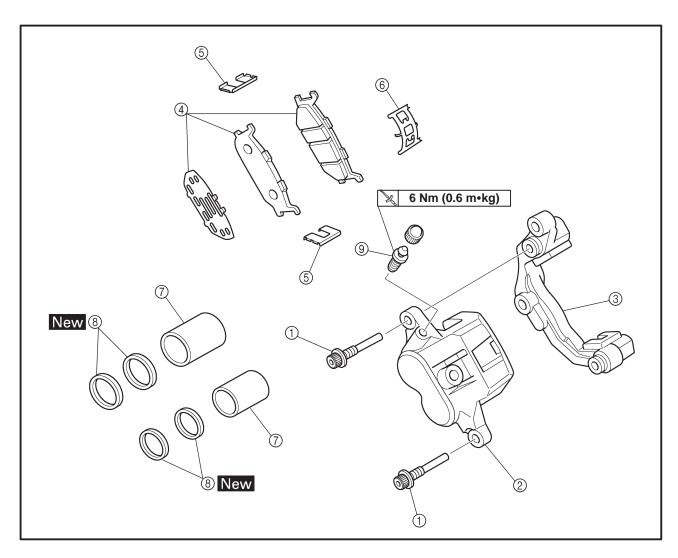
EAS00613

FRONT BRAKE CALIPERS

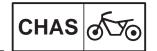


Order	Job/Part	Q'ty	Remarks
	Removing the front brake calipers Brake fluid		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers. Drain.
1 2 3 4 5 6 7 8	Reflector Brake hose holder bolt Union bolt Copper washer Brake hose Retaining bolt Brake caliper bolt Brake caliper	1 1 1 2 1 2 2 1	Loosen. For installation, reverse the removal procedure.

EAS00615

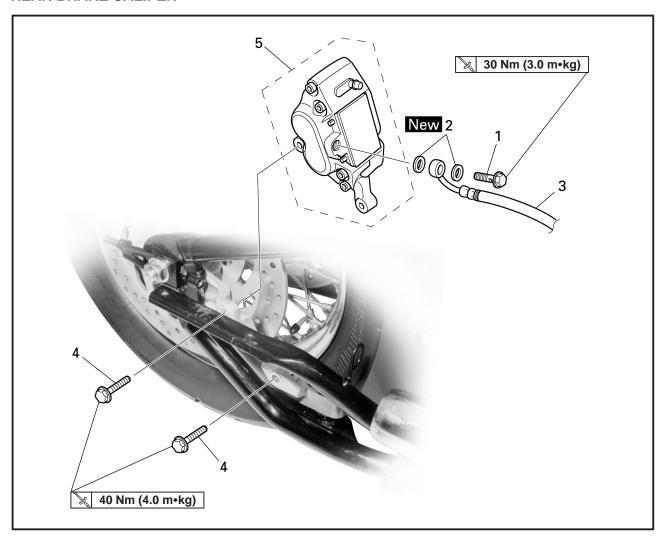


Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
1	Retaining bolt	2	·
2	Brake caliper	1	
3	Brake caliper bracket	2	
4	Brake pad	2	
(5)	Brake pads spring	2	
6	Brake pad spring	1	
(7)	Brake caliper piston	2	
(2) (3) (4) (5) (6) (7) (8) (9)	Brake caliper piston seal	4	
9	Bleed screw	1	
			For assembly, reverse the disassembly procedure.



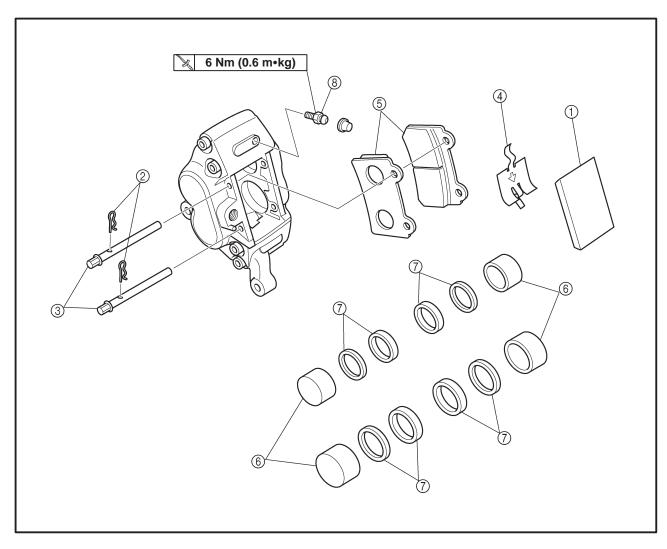
EAS00616

REAR BRAKE CALIPER



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

EAS00617



Order	Job/Part	Q'ty	Remarks
① ② ③ ④ ⑤ ⑥ ⑦ ⑧	Disassembling the rear brake caliper Brake pad cover Brake pad clip Brake pad pin Brake pad spring Brake pad Brake caliper piston Brake caliper piston seal Bleed screw	1 2 2 1 2 4 8 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.

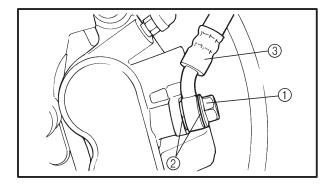
EAS00624

DISASSEMBLING THE FRONT BRAKE CAL-IPERS

The following procedure applies to both of the brake calipers.

NOTE: -

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

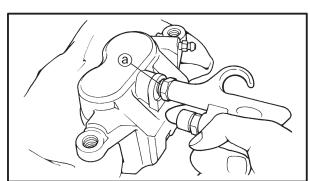


1. Remove:

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

NOTE: -

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



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

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

A WARNING

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

				alip					4
				A'A				A	4

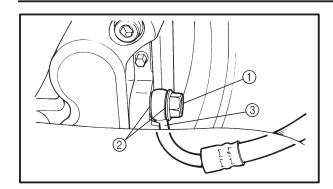
AS00627

DISASSEMBLING THE REAR BRAKE CAL-IPER

NOTE: -

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



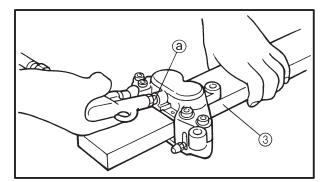




- union bolt (1)
- copper washers 2
- brake hose (3)

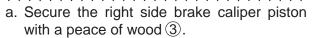
NOTE: -

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



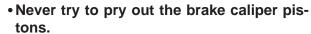
2. Remove:

- brake caliper pistons 1
- brake caliper piston seals (2)

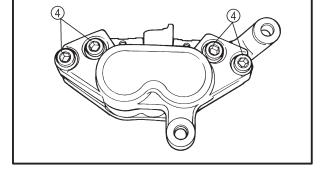


b. Blow compressed air into the brake hose joint opening ⓐ to force out the left side pistons from the brake caliper.





- Do not loosen the bolts 4.
- c. Remove the brake caliper piston seals.
- d. Repeat the previous steps to force out the right side piston from the brake caliper.

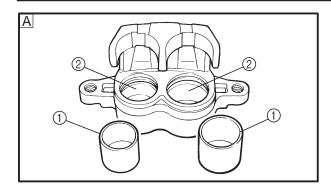


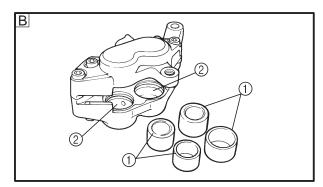
EAS00633

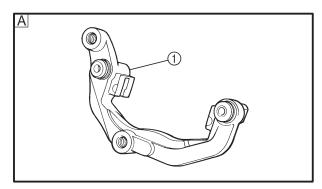
CHECKING THE FRONT AND REAR BRAKE CALIPERS

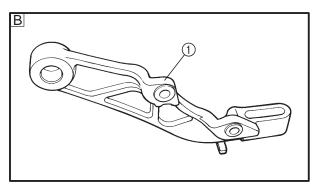
Recommended brake component replacement schedule						
Brake pads	If necessary					
Piston seals	Every two years					
Brake hoses	Every two years					
Brake fluid	Every two years and whenever the brake is disas- sembled					











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

A WARNING

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

- A Front
- **B** Rear
- 2. Check:
- brake caliper brackets ①
 Cracks/damage → Replace.
- A Front
- B Rear

EAS00638

ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

WARNING

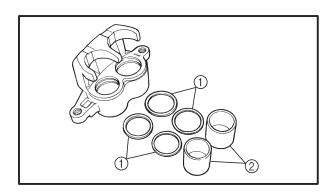
 Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.



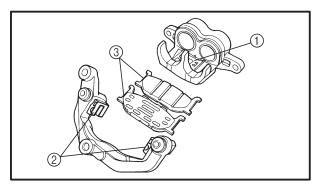
- Never use solvents on internal brake components as they will cause the piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston seals.



Recommended brake fluid DOT 4



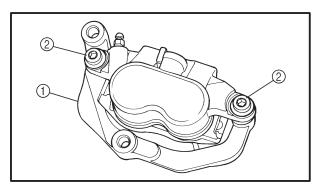
- 1. Install:
- bleed screw
- brake caliper piston seals ① New
- brake caliper pistons 2



- 2. Install:
 - brake pad spring 1
 - brake pad springs ②
 - brake pads ③

NOTE: -

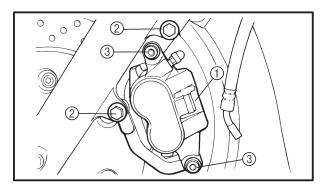
Install the brake pad with the attached brake pad shim on the brake caliper piston side.



- 3. Install:
 - brake caliper bracket (1)
 - retaining bolts 2

NOTE: -

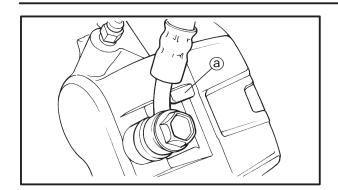
Temporarily tighten the retaining bolts.



- 4. Install:
 - brake caliper (1)
 - brake caliper bolts 2 X 40 Nm (4.0 m•kg)
- 5. Tighten:
 - retaining bolts ③

27 Nm (2.7 m•kg)





- 6. Install:
 - copper washers New
 - brake hose
 - union bolt

30 Nm (3.0 m•kg)

A WARNING

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

CAUTION:

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

7. Fill:

 brake master cylinder reservoir (with the specified amount of the recommended brake fluid)



Recommended brake fluid DOT 4

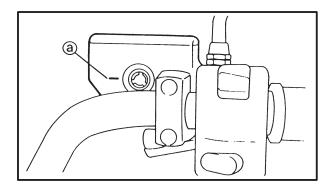
WARNING

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

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



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



9. Check:

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

10. Check:

brake lever operation
 Soft or spongy feeling → Bleed the brake system.

 Refer to "BLEEDING THE HYDRAULIC

BRAKE SYSTEM" in chapter 3.

EAS00642

ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

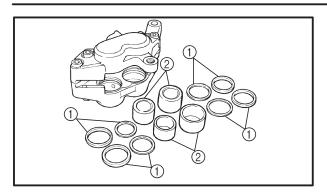
A WARNING

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

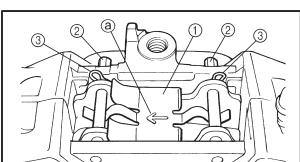


Recommended brake fluid DOT 4





- 1. Install:
- bleed screw
- brake caliper piston seals ① New
- brake caliper pistons 2

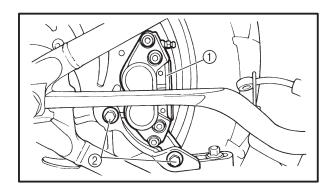


2. Install:

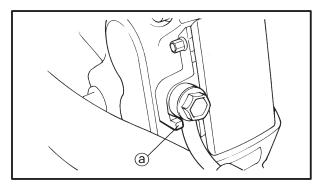
- brake pads
- brake pad spring 1
- brake pad pins 2
- brake pad clips ③

NOTE: _

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



- 3. Install:
- brake pad cover
- 4. Install
 - brake caliper (1)
 - brake caliper bolts 2 🔪 40 Nm (4.0 m•kg)



- 5. Install:
 - copper washers New
 - brake hose
- union bolt

30 Nm (3.0 m•kg)

A WARNING

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

CAUTION:

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

- 6. Fill:
 - brake fluid reservoir (with the specified amount of the recommended brake fluid)



Recommended brake fluid DOT 4

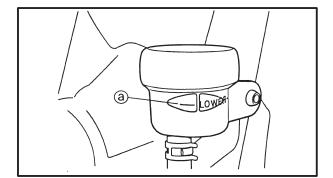
A WARNING

- 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 systems. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

CAUTION:

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

- 7. Bleed:
 - brake system
 Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
- 8. Check:
 - brake fluid level
 Below the minimum level mark (a) → Add the
 recommended brake fluid to the proper level.
 Refer to "CHECKING THE BRAKE FLUID
 LEVEL" in chapter 3.



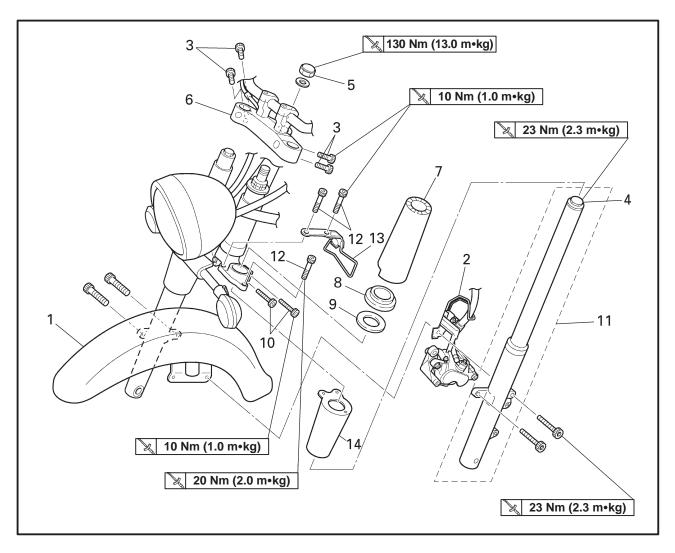
- 9. Check:
 - brake pedal operation
 Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

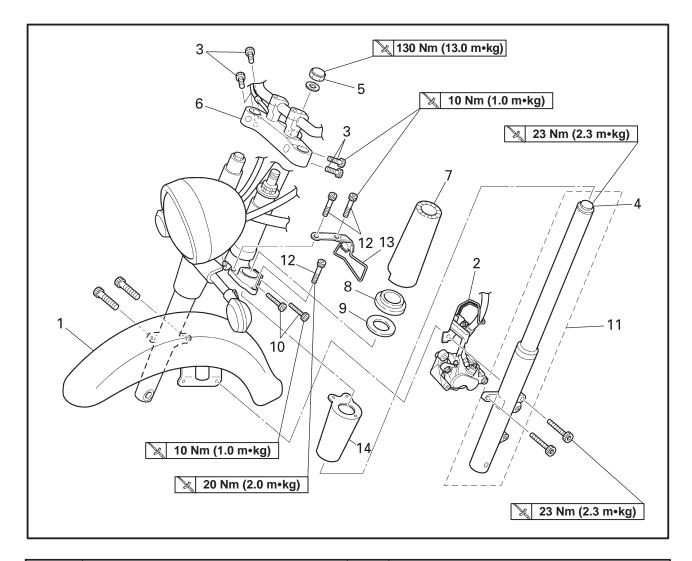


EAS0064

FRONT FORK

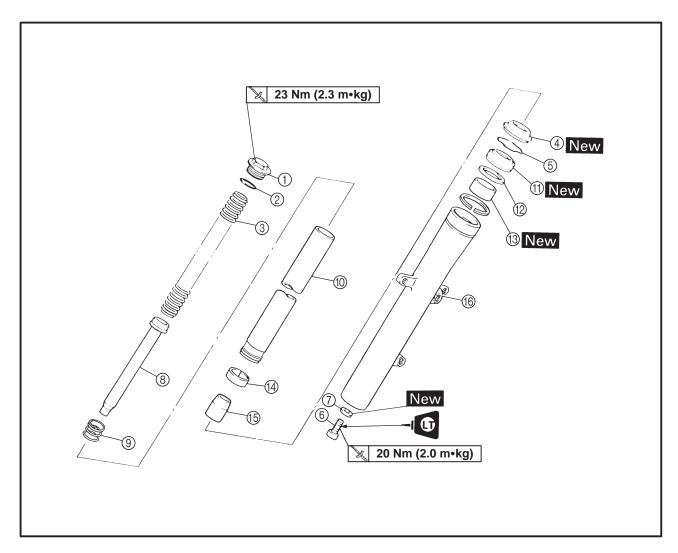


Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Meter assembly		Refer to "FUEL TANK" in chapter 3.
1	Front fender	1	·
2	Brake hose holder	1	
3	Upper bracket pinch bolt	4	Loosen.
4	Cap bolt	1	
5	Steering stem nut	1	
6	Upper bracket	1	
7	Upper fork cover	1	
8	Upper fork cover spacer	1	
9	Upper fork cover washer	1	

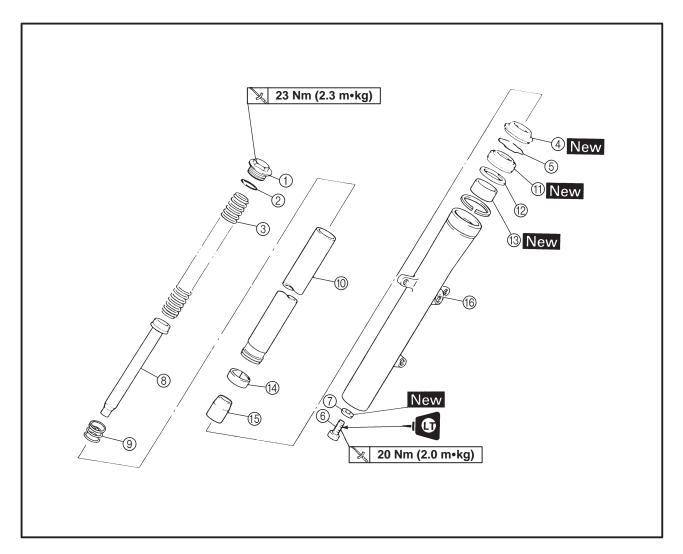


Order	Job/Part	Q'ty	Remarks
10 11 12 13 14	Lower bracket pinch bolt Front fork legs Bolt Brake hose guide Lower fork cover	2 1 3 1 1	Loosen. For installation, reverse the removal procedure.

EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork leg		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
1	Cap bolt	1	Ü
2	O-ring	1	
② ③	Fork spring	1	
<u>4</u>	Dust seal	1	
(5)	Oil seal clip	1	
(5) (6)	Cartridge cylinder bolt	1	
$\widetilde{\mathcal{T}}$	Copper washer	1	
8	Cartridge cylinder	1	
9	Rebound spring	1	
10	Inner tube	1	



Order	Job/Part	Q'ty	Remarks
(1) (1) (2) (3) (4) (5) (6)	Oil seal Seal spacer Outer tube busing Inner tube busing Oil flow stopper Outer tube	1 1 1 1 1	For assembly, reverse the disassembly procedure.



EAS00649

REMOVING THE FRONT FORK LEGS

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

1. Stand the motorcycle on a level surface.

A WARNING

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



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



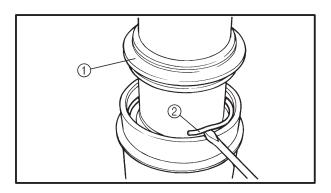
• lower bracket pinch bolts 1

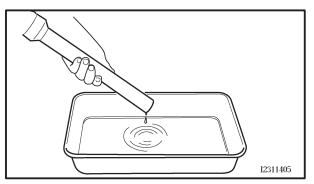
A WARNING

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

3. Remove:

• front fork leg





EAS00652

DISASSEMBLING THE FRONT FORK LEGS

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

- 1. Remove:
 - dust seal (1)
 - oil seal clip ②
 (with a flat-head screwdriver)

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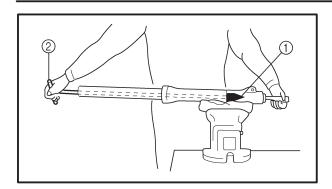
Do not scratch the inner tube.

- 2. Drain:
 - fork oil

NOTE: -

Stroke the outer tube several times while draining the fork oil.





3. Remove:

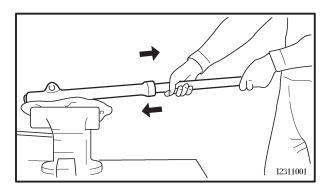
cartridge cylinder bolt

NOTE: -

While holding the cartridge cylinder with the damper rod holder ① and T-handle ②, loosen the cartridge cylinder bolt.



Damper rod holder 90890-01294 T-Handle 90890-01326



4. Remove:

• inner tube

a. Hold the front fork leg horizontally.

- b. Securely clamp the brake caliper bracket in a vise with soft jaws.
- c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

CAUTION:

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

AS00656

CHECKING THE FRONT FORK LEGS

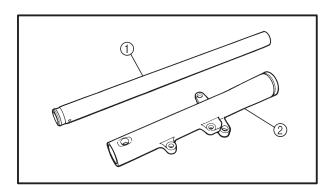
The following procedure applies to both of the front fork legs.

- 1. Check:
 - inner tube (1)
 - outer tube 2

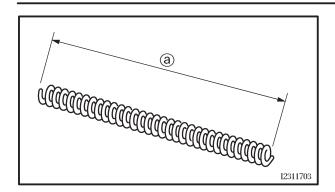
Bends/damage/scratches → Replace.



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





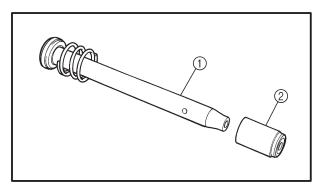




spring free length (a)
 Out of specification → Replace.



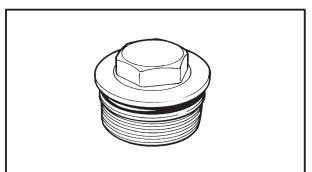
Spring free length limit 566 mm



3. Check:

cartridge cylinder ①
 Damage/wear → Replace.
 Obstruction → Blow out all of the oil passages with compressed air.

oil flow stopper ②
 Damage → Replace.



4. Check:

cap bolt O-ring
 Damage/wear → Replace.

EAS00658

ASSEMBLING THE FRONT FORK LEGS

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

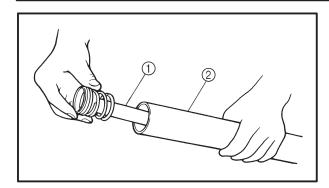
WARNING

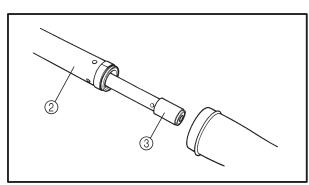
- Make sure the oil levels in both front fork legs are equal.
- Uneven oil levels can result in poor handling and a loss of stability.

NOTE: -

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







1. Install:

• cartridge cylinder ①

CAUTION:

Allow the cartridge cylinder to slide slowly down the inner tube ② until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

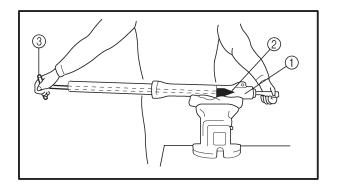
2. Install:

- oil flow stopper ③
- 3. Lubricate:
 - inner tube's outer surface



Recommended lubricant Yamaha fork and shock oil 5WT or equivalent

- 4. Install:
- outer tube (onto the inner tube)
- copper washer New
- cartridge cylinder bolt



5. Tighten:

• cartridge cylinder bolt (1)

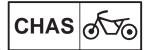
20 Nm (2.0 m•kg)

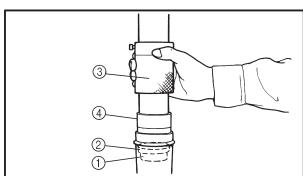
NOTE: -

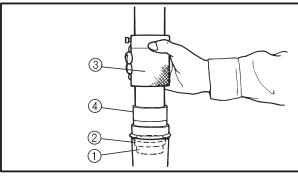
- Apply the locking agent (LOCTITE® 204) to the threads of the cartridge cylinder bolt.
- While holding the cartridge cylinder with the damper rod holder ② and T-handle ③, tighten the cartridge cylinder bolt.

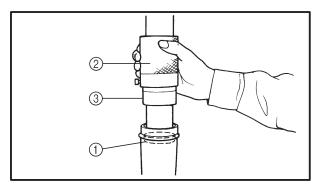


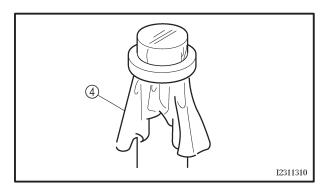
Damper rod holder 90890-01294 T-handle 90890-01326

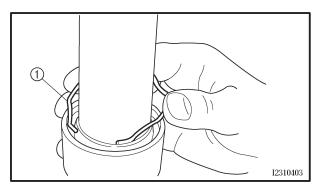


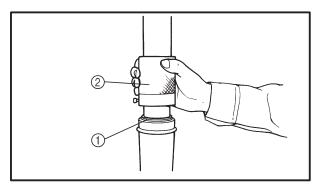












- 6. Install:
- outer tube bushing ① New
- seal spacer 2 (with the fork seal driver weight 3) and adapter (4)



Fork seal driver weight 90890-01367 Adapter 90890-01374

- 7. Install:
 - oil seal 1 New (with the fork seal driver weight 2) and adapter (3)

CAUTION:

Make sure the numbered side of the oil seal faces up.

NOTE: -

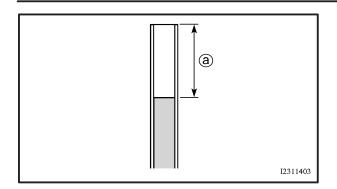
- · Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag 4 to protect the oil seal during installation.
- 8. Install:
 - oil seal clip 1

Adjust the oil seal clip so that it fits into the outer tube's groove.

- 9. Install:
- dust seal 1 New

(with the fork seal driver weight 2)





10. Fill:

 front fork leg (with the specified amount of the recommended fork oil)



Quantity (each front fork leg) 554 cm³

Front fork leg oil level ⓐ (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)

110 mm

Recommended oil

Yamaha fork shock oil 5WT or equivalent

NOTE: -

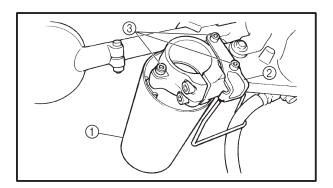
- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.

11. Install:

- fork spring
- cap bolt

NOTE: -

- Before installing the cap bolt, lubricate its Oring with grease.
- Temporarily tighten the cap bolt.



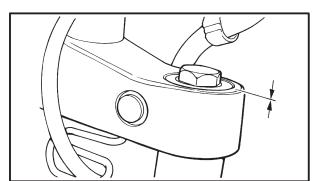
EAS00662

INSTALLING THE FRONT FORK LEGS

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

- 1. Install:
 - lower fork cover (1)
 - brake hose guide 2
 - bolts ③

10 Nm (1.0 m•kg)



2. Install:

• front fork leg

NOTE: -

- When aligning the fork tube do not install the upper fork cover.
- Temporarily tighten the lower bracket pinch bolts.

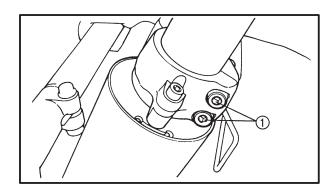


- 3. Install:
 - Upper bracket
 - Steering stem nut

130 Nm (13.0 m•kg)

NOTE: -

Make sure the inner fork tube is flush with the top of the upper bracket.



- 4. Tighten:
 - lower bracket pinch bolt 1

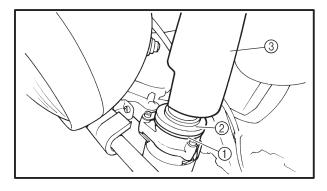
20 Nm (2.0 m•kg) 23 Nm (2.3 m•kg)

• cap bolt

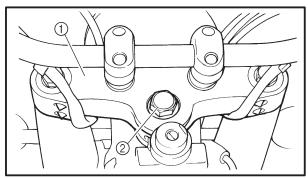
A WARNING

Make sure the brake hoses are routed properly.

- 5. Remove:
 - steering stem nut
 - upper bracket

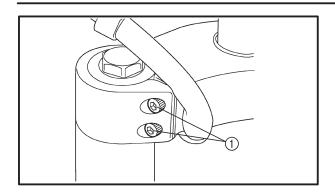


- 6. Install
 - upper fork washer ①
 - upper fork spacer ②
 - upper fork cover ③



- 7. Install:
 - upper bracket (1)
 - steering stem nut 2 | 130 Nm (13.0 m•kg)

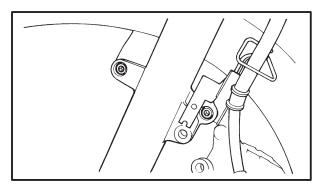




8. Tighten:

• upper bracket pinch bolts ①

10 Nm (1.0 m•kg)



9. Install:

- brake hose holder
- front fender

23 Nm (2.3 m•kg)

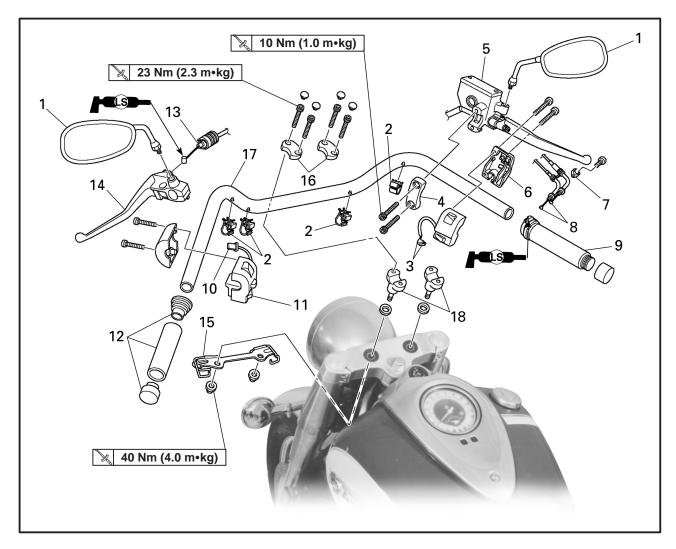
10. Install:

• front wheel Refer to "FRONT WHEEL AND BRAKE DISCS".

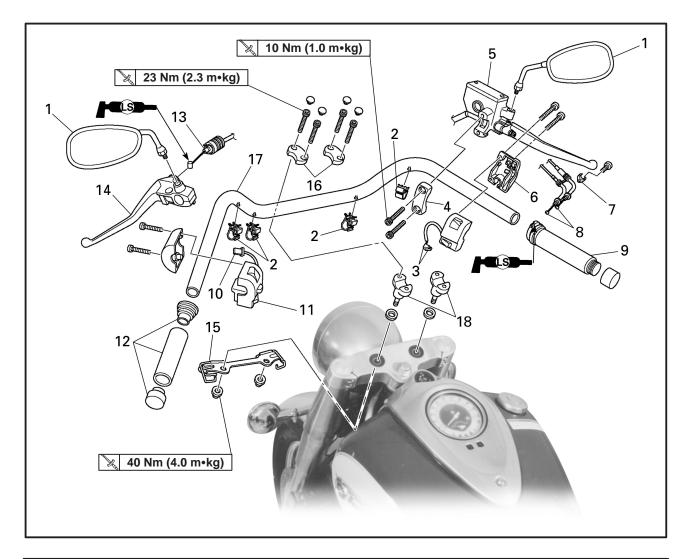


EAS00664

HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
1	Rear view mirror (left and right)	2	·
2	Plastic clamp	4	
3	Front brake light switch connector	2	Disconnect.
4	Brake master cylinder holder	1	
5	Brake master cylinder	1	
6	Right handlebar switch	1	
7	Throttle cable holder	1	
8	Throttle cable	2	Disconnect.
9	Throttle grip	1	
10	Clutch switch connector	1	Disconnect.



Order	Job/Part	Q'ty	Remarks
11	Left handlebar switch	1	
12	Handlebar grip	1	
13	Clutch cable	1	Disconnect.
14	Clutch lever holder	1	
15	Cable guide	1	
16	Upper handlebar holder	2	
17	Handlebar	1	
18	Lower handlebar holder	2	
			For installation, reverse the removal procedure.



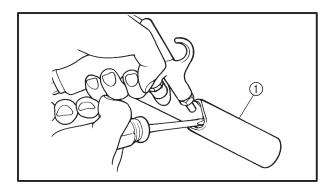
EAS00666

REMOVING THE HANDLEBAR

1. Stand the motorcycle on a level surface.



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

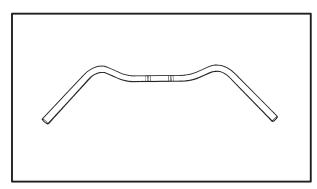


2. Remove:

• handlebar grip ①

NOTE: -

Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.



EAS00668

CHECKING THE HANDLEBAR

- 1. Check:
 - handlebar Bends/cracks/damage → Replace.



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

EAS00670

INSTALLING THE HANDLEBAR

- 1. Install:
 - washers
 - lower handlebar holders (1)
 - cable guide 2

NOTE: -

Temporarily tighten the nuts 3.

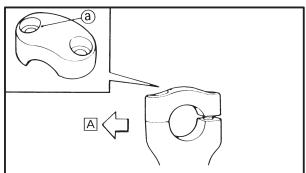
- 2. Install:
 - handlebar
 - upper handlebar holders

23 Nm (2.3 m•kg)

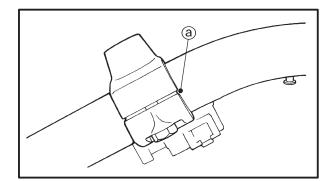
CAUTION:

- First, tighten the bolts on the front side of the handlebar holder, then on the rear side.
- Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.





6



NOTE: -

- •The upper handlebar holders should be installed with the arrows (a) facing forward (A).
- Align the match marks (b) on the handlebar with the upper surface of the lower handlebar holders.
- 3. Tighten:
 - lower handlebar holder nuts

40 Nm (4.0 m•kg)

4. Install:

clutch lever

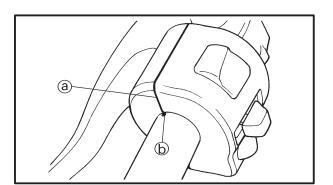
NOTE: —

Align the slit of clutch lever holder with the punch mark (a) on the handlebar.

5. Install:

clutch cable

Lubricate the end of the clutch cable with a thin coat of lithium soap base grease.



6. Install:

• left handlebar switch

Align the end (a) of the left handlebar switch with the punch mark (b) on the handlebar.

7. Connect:

clutch switch connector



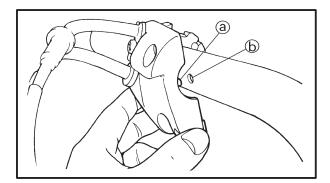
- 8. Install:
 - · handlebar grip
- a. Apply a thin coat of rubber adhesive onto the left end of the handlebar.

- b. Slide the handlebar grip over the left end of the handlebar.
- c. Wipe off any excess rubber adhesive with a clean rag.

A WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

- 9. Install:
 - throttle grip
- 10. Connect:
 - throttle cable



A UP

- 11. Install:
- right handlebar switch

NOTE:

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

- 12. Install:
 - brake master cylinder
- brake master cylinder holder

10 Nm (1.0 m•kg)

NOTE: -

- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark (a) in the handlebar.



• First, tighten the upper bolt, then the lower bolt.

13. Connect:

• front brake light switch connector

14. Install:

- plastic clamp
- rear view mirrors

15. Adjust:

 clutch cable free play
 Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.



Clutch cable free play (at the end of the clutch lever) $10 \sim 15 \text{ mm}$

16. Adjust:

• throttle cable free play Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

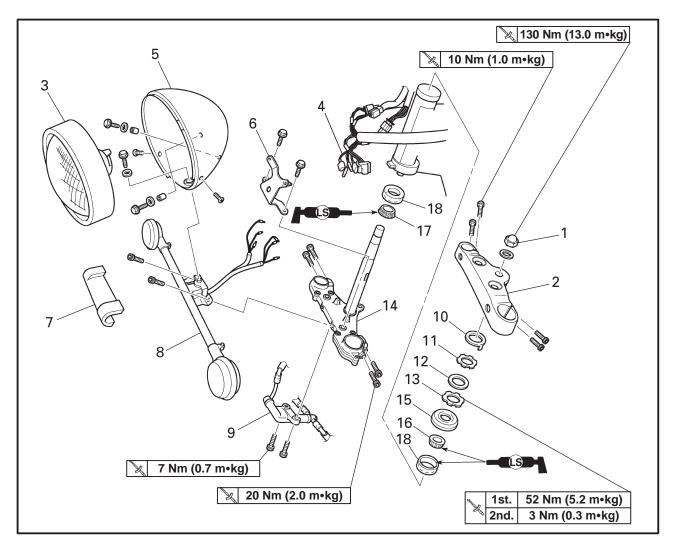


Throttle cable free play (at the flange of the throttle grip) $4 \sim 8 \text{ mm}$

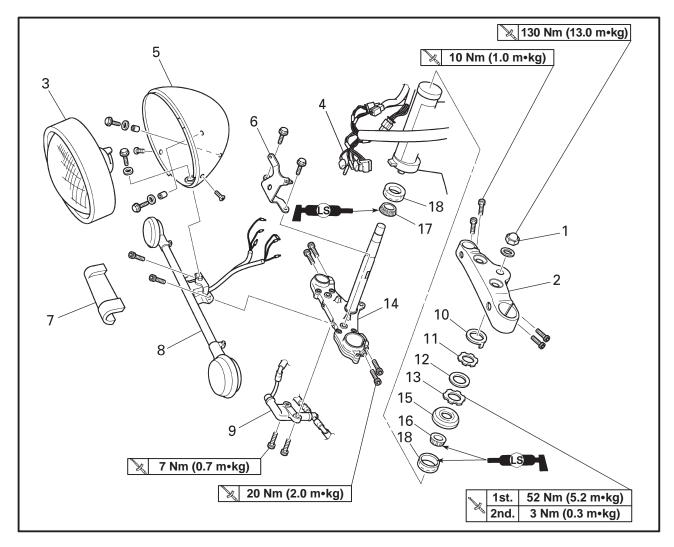


EAS00676

STEERING HEAD

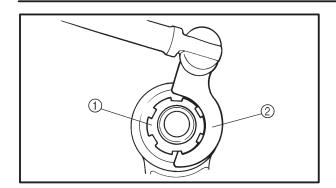


Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket Meter assembly Front fork legs/fork covers Front wheel Handlebar/handlebar holders		Remove the parts in the order listed. Refer to "FUEL TANK" in chapter 3. Refer to "FRONT FORK". Refer to "FRONT WHEEL AND BRAKE DISCS". Refer to "HANDLEBAR".
1	Steering stem nut	1	
2	Upper bracket	1	
3	Headlight lens unit	1	
4	Lead (in the headlight body)	1	
5	Headlight body	1	
6	Headlight bracket	1	
7	Chrome turn signal light bracket cover	1	
8	Turn signal light bracket assembly	1	



Order	Job/Part	Q'ty	Remarks
9	Brake hose joint	1	
10	Lock washer	1	
11	Upper ring nut	1	
12	Rubber washer	1	
13	Lower ring nut	1	
14	Lower bracket	1	
15	Bearing cover	1	
16	Upper bearing	1	
17	Lower bearing	1	
18	Bearing outer race	2	
			For installation, reverse the removal procedure.





EAS00677

REMOVING THE LOWER BRACKET

1. Stand the motorcycle on a level surface.

A WARNING

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

- 2. Remove:
 - lower ring nut ①
 (with the special tool ②)



Ring nut wrench 90890-01443

A WARNING

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

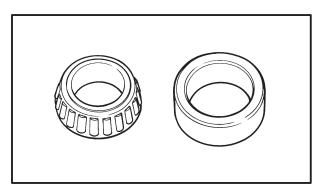
EAS00681

CHECKING THE STEERING HEAD

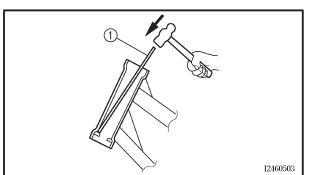
- 1. Wash:
 - bearings
 - · bearing races



Recommended cleaning solvent Kerosene

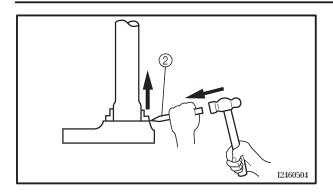


- 2. Check:
 - bearings
 - bearing races
 Damage/pitting → Replace.



- 3. Replace:
 - bearings
 - 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 rubber 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 bearings and bearing races as a set.
- Whenever the steering head is disassembled, replace the rubber seal.

4. Check:

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

EAS00683

INSTALLING THE STEERING HEAD

- 1. Lubricate:
 - upper bearing
 - lower bearing
 - bearing races

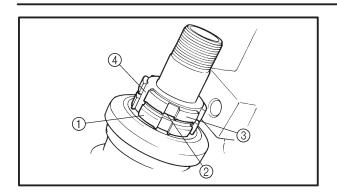


Recommended lubricant Lithium soap base grease

2. Install:

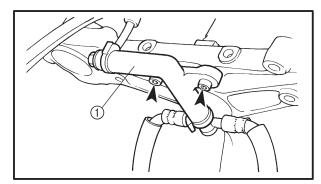
- upper bearing
- lower bearing
- bearing races
- bearing cover
- lower bracket





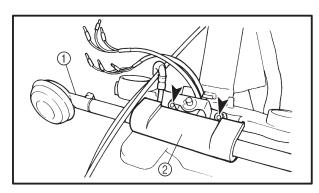
- 3. Install:
 - lower ring nut 1
 - rubber washer 2
 - upper ring nut ③
 - lock washer 4

Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" in chapter 3.

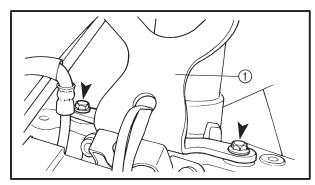


- 4. Install:
 - brake hose joint ①

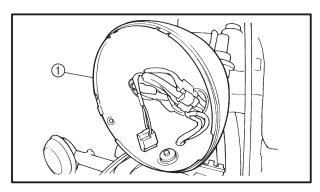
7 Nm (0.7 m•kg)



- 5. Install:
 - turn signal light bracket assembly 1
 - chrome turn signal light bracket cover 2



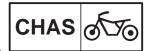
- 6. Install:
 - headlight bracket 1



- 7. Install:
 - headlight body 1
- 8. Connect:
 - leads

(in the headlight body)

- 9. Install:
 - headlight lens unit

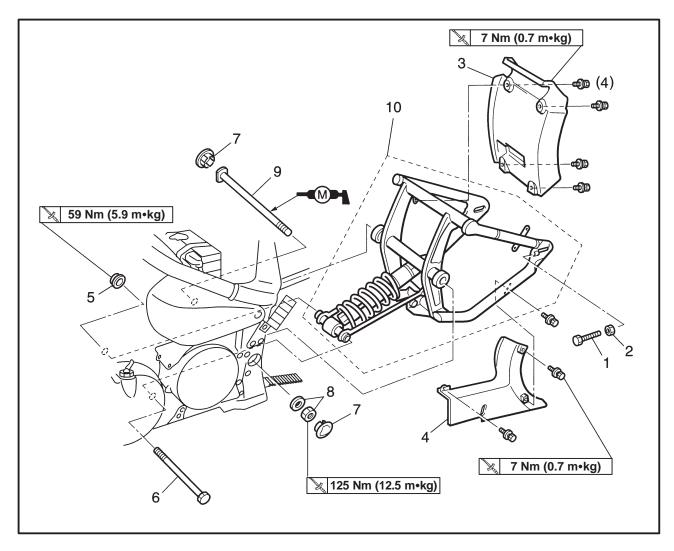


- 10. Install:
 - upper bracket
 - steering stem nut
 - front fork legs Refer to "FRONT FORK".

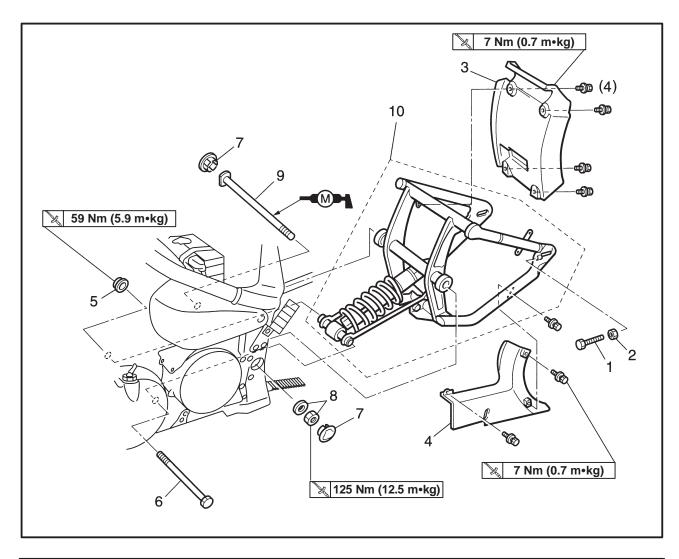
11. Install:

- handlebar Refer to "HANDLEBAR".
- front fork legs Refer to "FRONT FORK".
- meter assembly Refer to "FUEL TANK" in chapter 3.

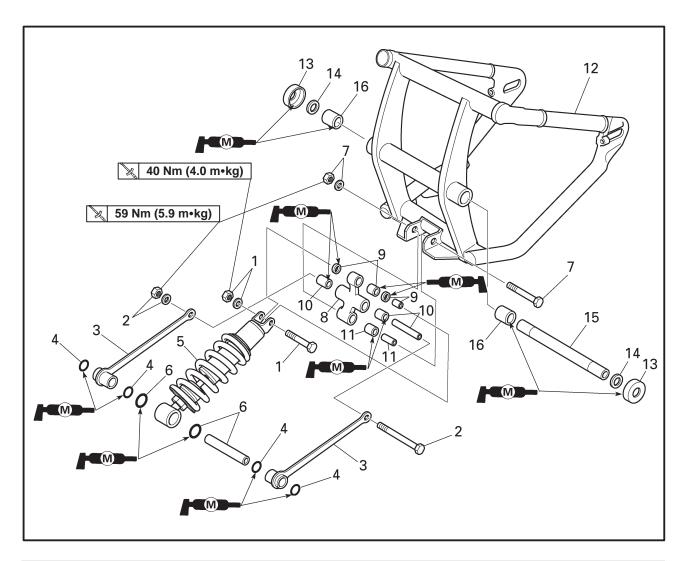




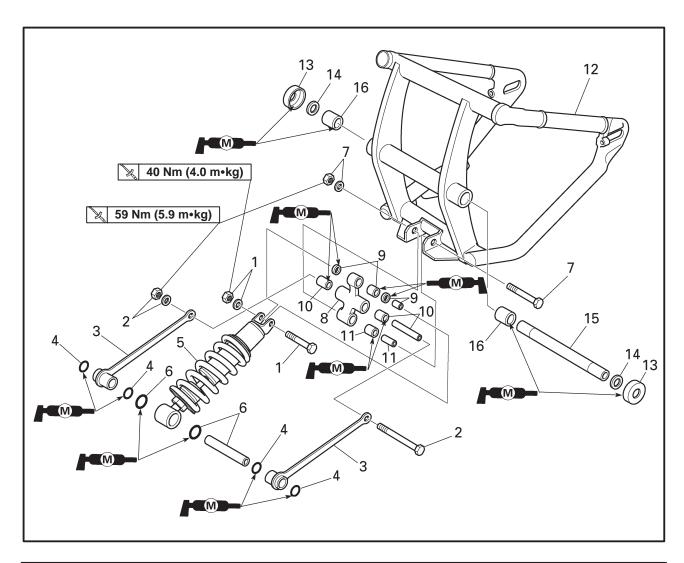
Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber		Remove the parts in the order listed.
	and swingarm		
	Rear wheel		Refer to "REAR WHEEL, BRAKE DISC
			AND REAR WHEEL SPROCKET".
1	Adjusting bolt	1	
2	Locknut	1	
3	Mud guard	1	
4	Lower drive belt cover	1	
5	Self-locking nut	1	
6	Bolt (shock absorber-connecting	1	ℓ = 158 mm
	arm-frame)		
7	Cover (left and right)	2	
8	Pivot shaft nut/washer	1/1	



Order	Job/Part	Q'ty	Remarks
9	Pivot shaft Rear shock absorber and swingarm assembly	1 1	For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber and swingarm		Remove the parts in the order listed.
1	Self-locking nut/washer/bolt	1/1/1	Bolt $\ell = 53 \text{ mm}$
2	Self-locking nut/washer/bolt	1/1/1	Bolt <i>ℓ</i> = 124 mm
3	Connecting arm	2	
4	O-ring	4	
5	Rear shock absorber	1	
6	Spacer/O-ring	1/2	
7	Self-locking nut/washer/bolt	1/1/1	Bolt $\ell = 77 \text{ mm}$
8	Relay arm	1	
9	Spacer/oil seal/bearing	1/2/1	
10	Spacer/bearing	1/2	



Order	Job/Part	Q'ty	Remarks
11 12 13 14 15 16	Spacer/bearing Swingarm Dust cover Washer Spacer Bearing	1/1 1 2 2 1 2	For installation, reverse the removal procedure.



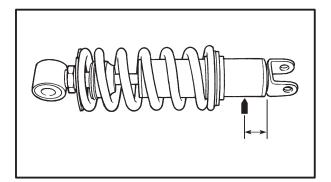
EAS00686

HANDLING THE REAR SHOCK ABSORBER

A WARNING

This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber.

- Do not tamper or attempt to open the rear shock absorber.
- Do not subject the rear shock absorber to an open flame or any other source of high heat, High heat can cause an explosion due to excessive gas pressure.
- Do not deform or damage the rear shock absorber in any way. Rear shock absorber damage will result in poor damping performance.



EAS00689

DISPOSING OF A REAR SHOCK ABSORB-ER AND GAS CYLINDER

Gas pressure must be released before disposing of a rear shock absorber and gas cylinder. To release the gas pressure, drill a 2 \sim 3 mm (0.08 \sim 0.12 in) hole through the gas cylinder at a point 15 mm (0.6 in) from its end as shown.

A WARNING

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

EAS00703

REMOVING THE REAR SHOCK ABSORBER SWINGARM

1. Stand the motorcycle on a level surface.

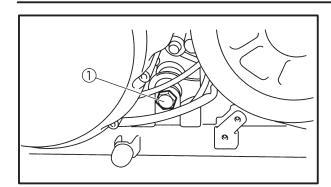
A WARNING

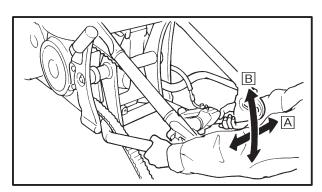
Securely support the motorcycle so that there is no danger of it falling over.

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N	V		느	

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







2. Remove:

• bolt (shock absorber-connecting arm-frame)

NOTE: -

When removing the bolt (shock absorber-connecting arm-frame) ①, hold the swingarm so that it does not drop down.

- 3. Measure:
 - swingarm free play
 - swingarm vertical movement
- a. Measure the tightening torque of the pivot shaft nut.



Pivot shaft nut 125 Nm (12.5 m•kg)

- b. Measure the swingarm free play A by moving the swingarm from side to side.
- c. If the swingarm free play is out of specification, check the spaces, bearings, washers, and dust covers.



Swingarm free play (at the end of the swingarm)
0 mm

d. Check the swingarm vertical movement B by moving the swingarm up and down. If swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, washers, and dust covers.

EAS00696

CHECKING THE REAR SHOCK ABSORBER

- 1. Check:
 - rear shock absorber rod
 Bends/damage → Replace the rear shock
 absorber assembly.
 - rear shock absorber
 Gas leaks/oil leaks → Replace the rear shock absorber assembly.



• spring

Damage/wear → Replace the rear shock absorber assembly.

• gas cylinder

Damage/gas leaks → Replace.

bushings

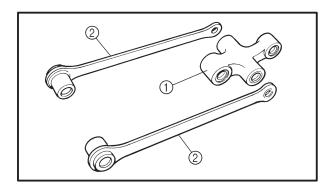
Damage/wear → Replace.

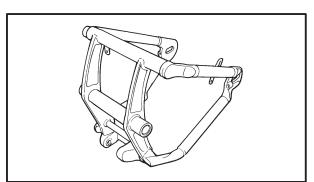
• O-ring

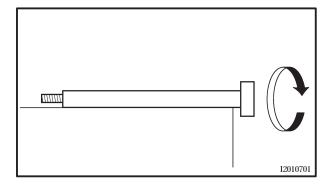
Damage/wear → Replace.

bolts

Bends/damage/wear → Replace.







CHECKING THE REPLAY ARM AN CONNECTING ARM

- 1. Check:
 - relay arm 1
 - connecting arm 2

Damage/wear → Replace.

- bearings
- oil seals

Damage/pitting → Replace.

- spacers
- Damage/scratches → Replace.

CHECKING THE SWINGARM

- 1. Check:
 - swingarm

Bends/cracks/damage → Replace.

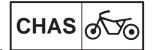
- 2. Check:
 - pivot shaft

Roll the pivot shaft on a flat surface.

Bends → Replace.

A WARNING

Do not attempt to straighten a bent pivot shaft.



- 3. Wash:
 - pivot shaft
 - dust covers
 - spacer
 - bearings



Recommended cleaning solvent Kerosine

- 4. Check:
 - dust covers
 - spacer
 - oil seals

Damage/wear → Replace.

bearings
 Damage/pitting → Replace.

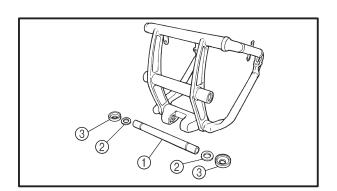
EAS00711

INSTALLING THE REAR SHOCK ABSORBER AND SWINGARM

- 1. Lubricate:
 - bearings
 - spacers
 - dust covers
 - O-rings
 - pivot shaft



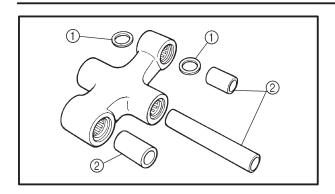
Recommended lubricant
Molybdenum disulfide grease



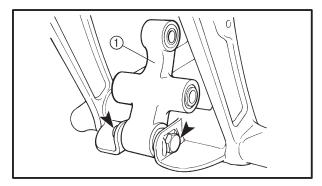
- 2. Install:
 - bearings
 - spacer ①
 - washers 2
 - dust covers ③

REAR SHOCK ABSORBER AND SWINGARM

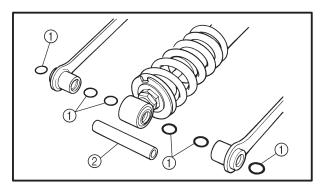




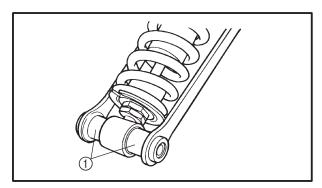
- 3. Install:
 - bearings
 - oil seals 1
 - spacers ②



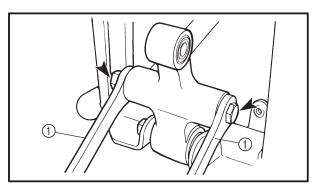
- 4. Install:



- 5. Install:
 - O-rings ①
 - spacer ②



- 6. Install:
 - connecting arms ①
 (onto the rear shock absorber)

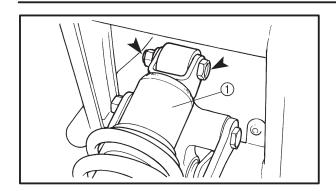


- 7. install:
 - connecting arms 1 (onto the relay arm)

№ 59 Nm (5.9 m•kg)

REAR SHOCK ABSORBER AND SWINGARM





- 8. install:
 - rear shock absorber ①
 (onto the relay arm)

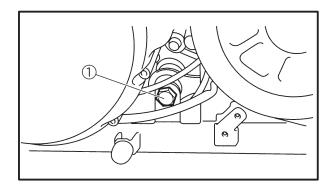
 | 40 Nm (4.0 m•kg)

9. Install:

- rear shock absorber and swingarm assembly
- pivot shaft
- washer
- pivot shaft nut

125 Nm (12.5 m•kg)

• covers



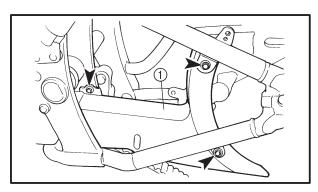
10. Install:

• bolt (shock absorber-connecting arm-frame)



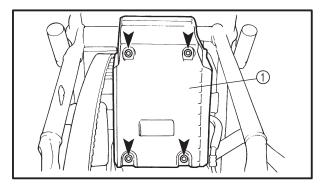
NOTE: —

When installing the bolt (shock absorber-connecting arm-frame), hold the swing arm so that it does not drop down.



11. Install:

• lower drive belt cover 1

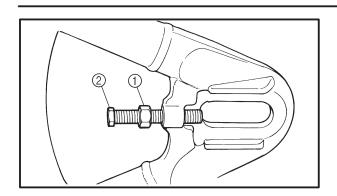


12. Install:

• mud guard ①

REAR SHOCK ABSORBER AND SWINGARM





- 13. Install:
- locknut 1
- adjusting bolt ②

14. Install:

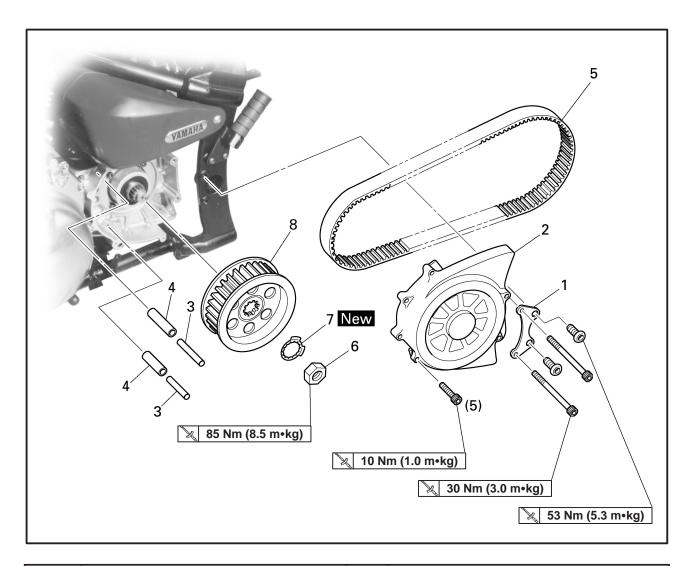
• rear wheel Rear to "REAR WHEEL, BRAKE DISC AND REAR WHEEL SPROCKET".

15. Adjust:

• drive belt slack Refer to "ADJUSTING THE DRIVE BELT SLACK" in chapter 3.

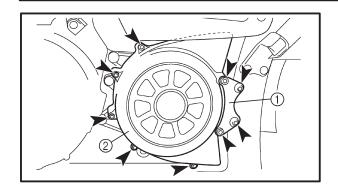


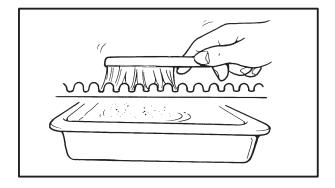
DRIVE BELT AND DRIVE SPROCKET

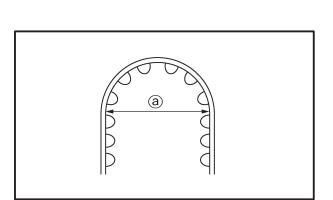


Order	Job/Part	Q'ty	Remarks
1 2 3 4 5 6 7 8	Removing the drive belt and drive sprocket Rear wheel Rear shock absorber and swingarm assembly Drive sprocket cover bracket Drive sprocket cover Dowel pin Slider Drive belt Drive sprocket nut Lock washer Drive sprocket	1 1 2 2 1 1 1	Remove the parts in the order listed. Refer to "REAR WHEEL, BRAKE DISC AND REAR WHEEL SPROCKET". Refer to "REAR SHOCK ABSORBER AND SWINGARM".









REMOVING THE DRIVE BELT AND DRIVE SPROCKET

NOTE: -

Loosen the drive sprocket nut before remove the rear wheel.

- 1. Remove:
- drive sprocket bracket 1
- drive sprocket cover 2
- 2. Straighten the lock washer tab.
- 3. Loosen:
 - drive sprocket nut (1)

NOTE: -

When loosening the drive sprocket nut, press down on the brake pedal so the drive sprocket does not move.

CHECKING THE DRIVE BELT

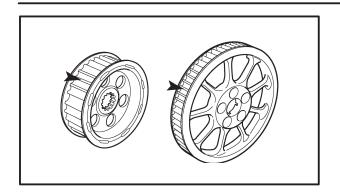
- 1. Clean:
 - drive belt
- a. Wipe the drive belt with a clean cloth.
- b. Put the drive belt in a mixture of mild detergent and water. Then, remove any dirt from the drive belt.
- c. Remove the drive belt from the mixture and rinse it off with clean water. Then, let the drive belt thoroughly dry.

- 2. Check:
 - drive belt

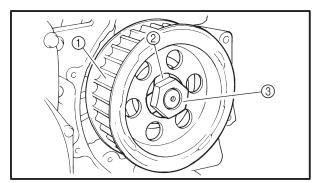
CAUTION:

- To protect the installation drive belt from damage, handle it with care.
- The drive belt can not be bent smaller ⓐ than 127 mm (5 in).
- The removed drive belt can not be twisted inside out.



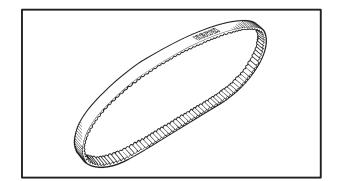


- 3. Check:
 - drive sprocket
 - rear wheel sprocket
 Bent teeth → Replace the drive belt and
 sprockets as a set.



INSTALLING THE DRIVE BELT AND DRIVE SPROCKET

- 1. Install:
 - drive sprocket ①
 - lock washer 2 New
 - drive sprocket nut (3)



- 2. Install:
 - drive belt

CA	UTI	O	N	F

Install the drive belt facing the same way it was removed.

- 3. Install:
 - rear shock absorber and swingarm assembly

Refer to "REAR SHOCK ABSORBER AND SWINGARM".

• rear wheel

Refer to "REAR WHEEL, BRAKE DISC AND SWINGARM".

- 4. Tighten:
 - drive sprocket nut

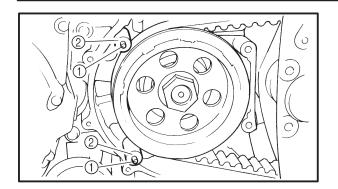
85 Nm (8.5 m•kg)

NOTE: -

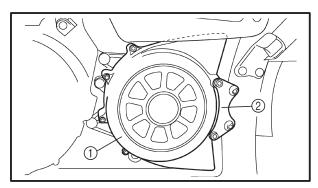
When tightening the drive sprocket nut, press down on the brake pedal so the drive sprocket does not move.

5. Bend the lock washer tab along a flat side of the nut.





- 6. Install:
 - dowel pins ①
 - sliders 2



7. Install:

• drive sprocket cover ①

10 Nm (1.0 m•kg)

- drive sprocket cover bracket ②
- bolts (M10)

53 Nm (5.3 m•kg)

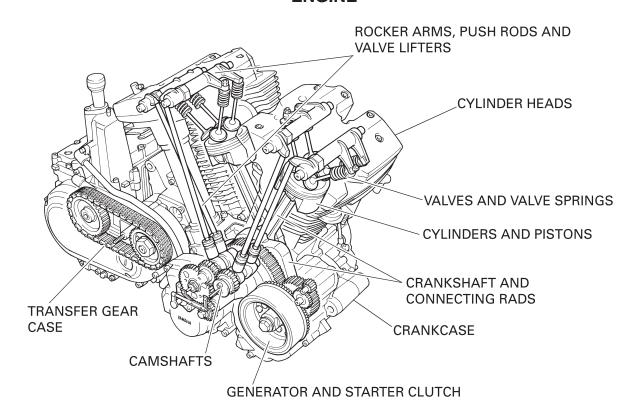
• bolts (M8)

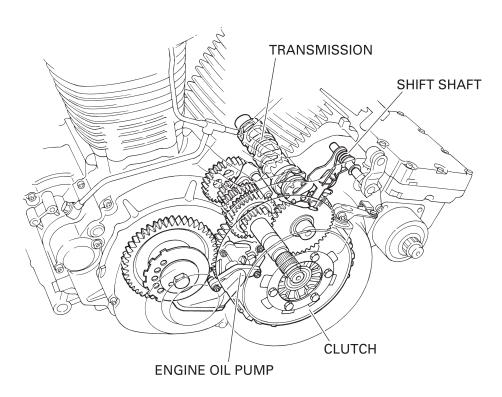
30 Nm (3.0 m•kg)

CHAS 650



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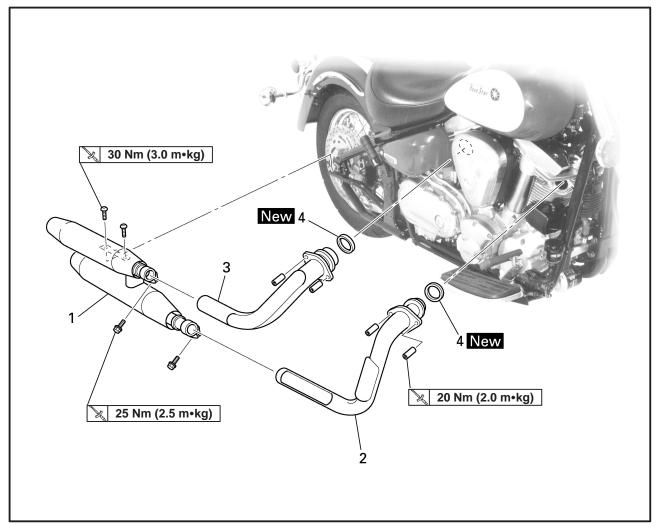
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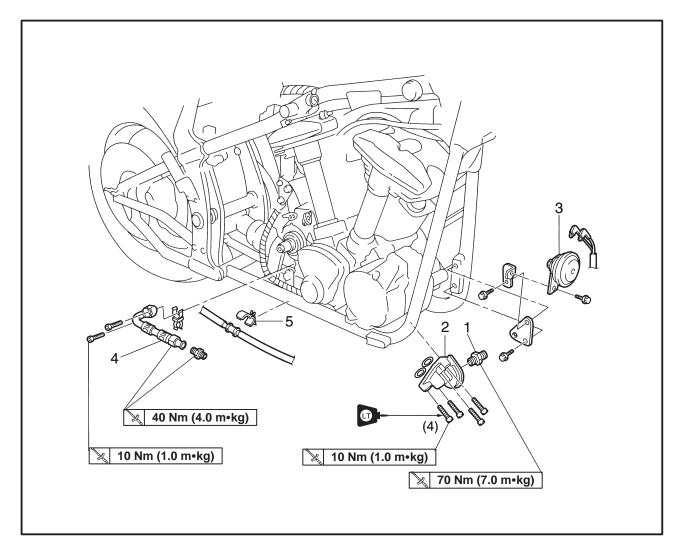
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ENGINE



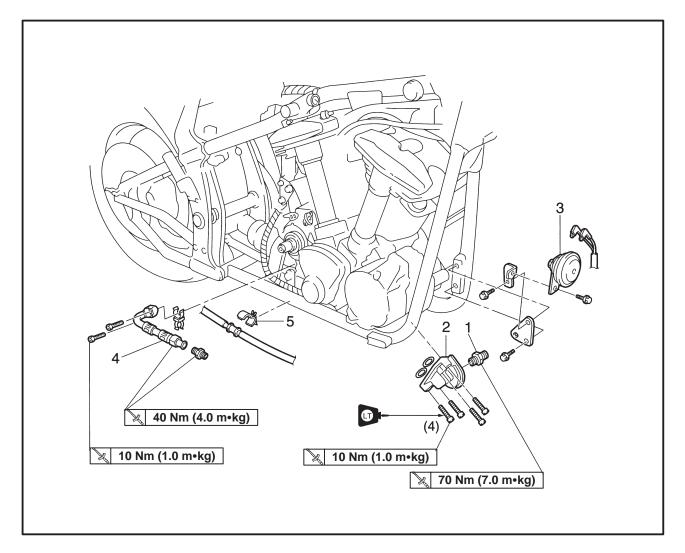
Order	Job/Part	Q'ty	Remarks
	Removing the muffler and exhaust pipes		Remove the parts in the order listed.
1	Muffler	1	
2	Front exhaust pipe	1	
3	Rear exhaust pipe	1	
4	Gasket	2	
			For installation, reverse the removal procedure.





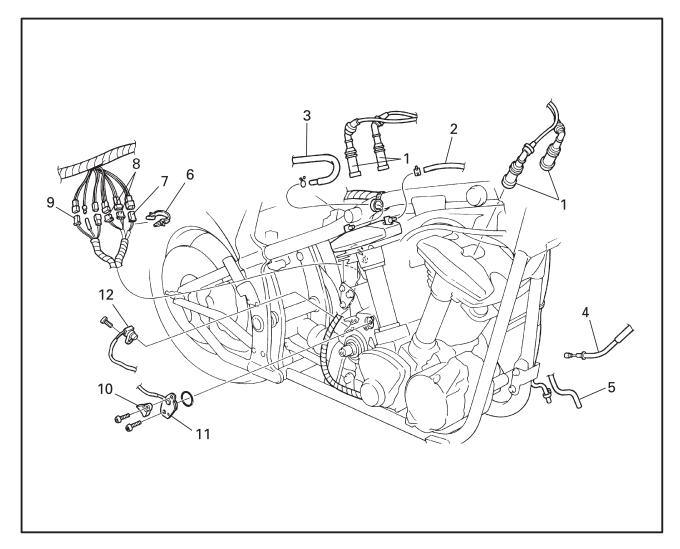
Order	Job/Part	Q'ty	Remarks
	Removing the oil filter bracket and horn		
	Rider seat/side covers		Refer to "SEATS AND SIDE COVERS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Carburetor/carburetor joint		Refer to "CARBURETOR" in chapter 6.
	Air induction system parts		Refer to "AIR INDUCTION SYSTEM" in chapter 6.
	Starter motor		Refer to "STARTER MOTOR" in chapter 7.





Order	Job/Part	Q'ty	Remarks
1 2 3 4 5	Engine oil/oil filter cartridge Transfer gear oil Transfer gear case Rider footrest (left) Rider footrest (right) Oil filter bolt Oil filter bracket Horn Oil delivery pipe Brake hose holder	1 1 1 1	Drain. Drain. Refer to "TRANSFER GEAR CASE". Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS". Refer to "GENERATOR AND STARTER CLUTCH".
			procedure.

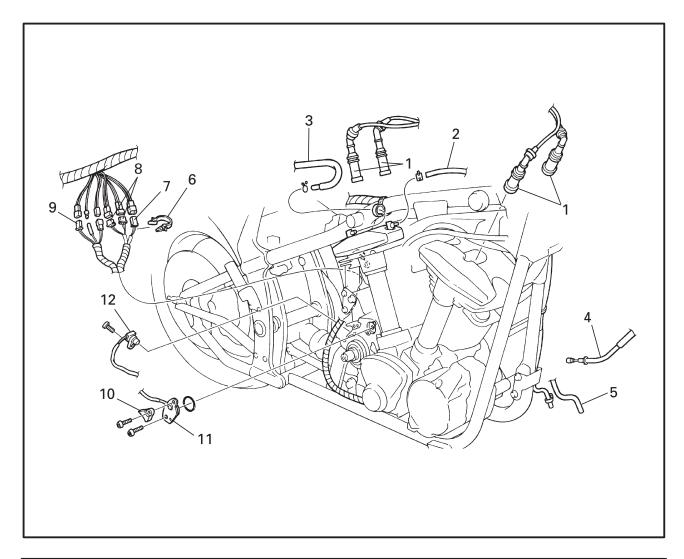




Order	Job/Part	Q'ty	Remarks
	Disconnecting the leads and hoses		Disconnect the parts in the order listed.
1	Sparks plug caps	4	·
2	Cylinder head breather hose	1	
3	Oil tank breather hose	1	
4	Clutch cable	1	
5	Charcoal canister hose	1	
	(carburetor to charcoal canister)		
6	Plastic clamp	1	
7	Stator coil coupler	1	
8	Decompression solenoid coupler	2	
9	Pickup coil coupler	1	





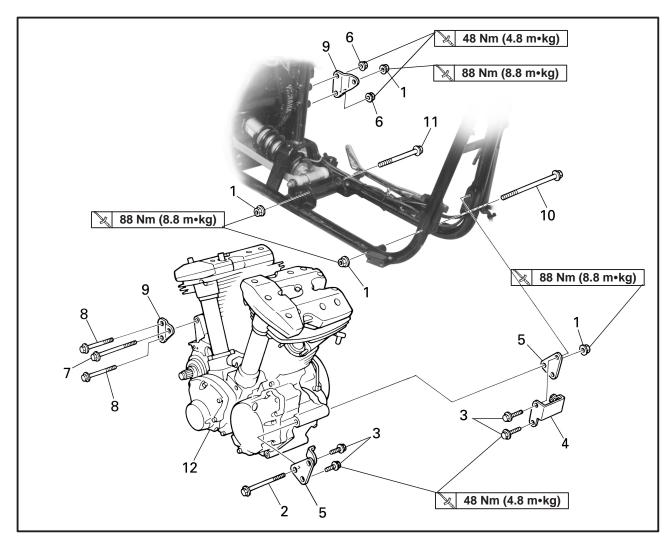


Order	Job/Part	Q'ty	Remarks
10 11 12	Neutral switch over Neutral switch Speed sensor	1 1 1	For connecting, reverse the disconnection procedure.

ENG



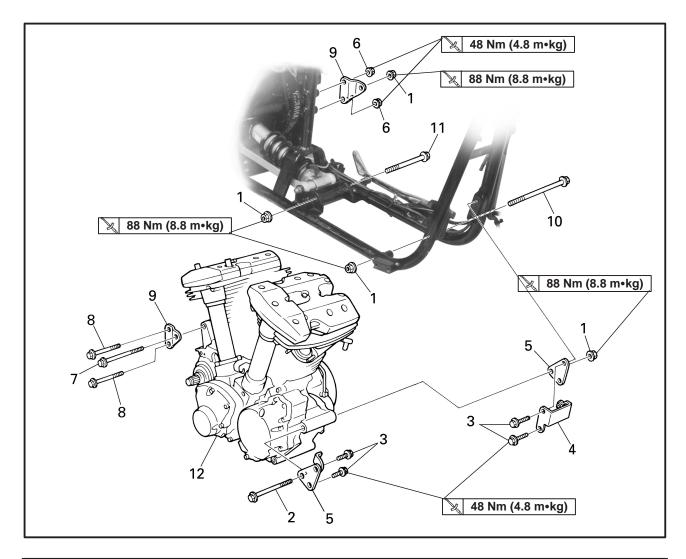
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Order	Job/Part	Q'ty	Remarks
	Removing the engine		Remove the parts in the order listed. NOTE: Place a suitable stand under the frame and engine.
1 2 3 4 5 6 7 8	Self-locking nut Upper front mounting bolt Front engine bracket bolt Horn bracket Front engine bracket Self-locking nut Upper rear mounting bolt Rear engine bracket bolt	4 1 4 1 2 2 1 2	



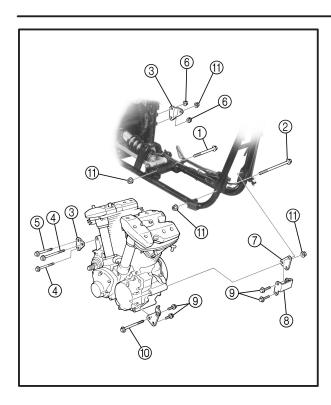




Order	Job/Part	Q'ty	Remarks
9 10 11 12	Rear engine bracket Lower front mounting bolt Lower rear mounting bolt Engine	2 1 1 1	Refer to "INSTALLING THE ENGINE". For installation, reverse the removal procedure.







INSTALLING THE ENGINE

- 1. Install:
 - lower rear mounting bolt 1
 - lower front mounting bolt 2
 - rear engine brackets ③
 - rear engine bracket bolts 4
 - upper rear mounting bolt 5
 - self-locking nuts 6
 - front engine brackets 7
 - horn bracket (8)
 - front engine bracket bolts (9)
 - upper front mounting bolt 10
 - self-locking nuts 11

NOTE: -

Do not fully tighten the bolts and nuts.

- 2. Tighten:
 - front engine bracket bolts 9

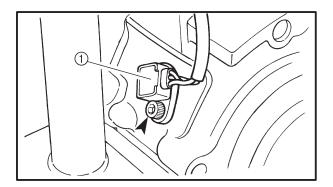
48 Nm (4.8 m•kg)

• self-locking nut 6

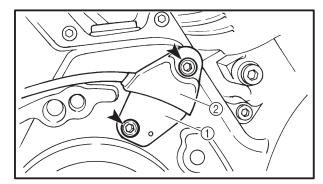
48 Nm (4.8 m•kg)

• self-locking nuts 11

88 Nm (8.8 m•kg)



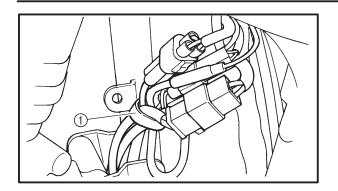
- 3. Install:
 - speed sensor ①



- 4. Install:
 - neutral switch (1)
 - neutral switch cover 2

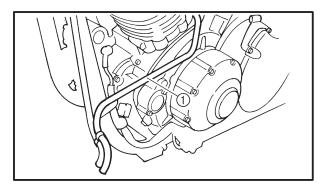






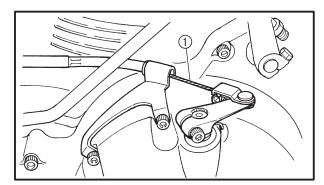


- speed sensor coupler
- neutral switch connector
- pickup coil coupler
- decompression solenoid coupler
- stator coil coupler
- 6. Install:
 - plastic clamp 1



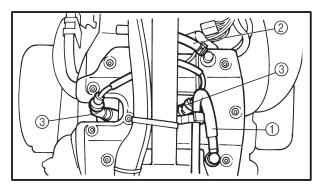
7. Connect:

• charcoal canister hose (carburetor to charcoal canister) ①



8. Connect:

• clutch cable 1

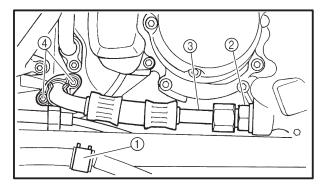


9. Connect:

- oil tank breather hose (1)
- cylinder head breather hose 2
- spark plug caps ③

NOTE: -

Refer to "CABLE ROUTING" in chapter 2.



10. Install:

- brake hose holder (1)
- joint bolt ②
- oil delivery pipe ③

. .

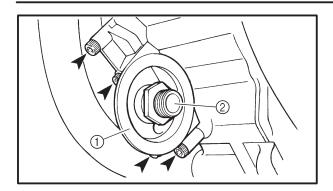
• bolts (4)

40 Nm (4.0 m•kg)

№ 40 Nm (4.0 m•kg)

10 Nm (1.0 m•kg)





11. Install:

- oil filter bracket (1)
- oil filter bolt 2

10 Nm (1.0 m•kg)
70 Nm (7.0 m•kg)

NOTE:

Apply locking agent (LOCTITE®) to the threads of the oil filter bracket bolts.

12. Install:

- rider footrest (right) Refer to "GENERATOR AND STARTER CLUTCH".
- rider footrest (left)
 Refer to "ROCKER ARMS, PUSH RODS
 AND VALVE LIFTERS".
- transfer gear case Refer to "TRANSFER GEAR CASE".
- 13. Fill:
 - transfer gear case
 (with the specified amount of the recommended transfer gear oil)

 Refer to "CHANGING THE TRANSFER GEAR OIL" in chapter 3.
- 14. Install:
 - oil filter cartridge
- 15. Fill:
 - oil tank

(with the specified amount of the recommended engine oil)

Refer to "CHANGING THE ENGINE OIL" in chapter 3.

ENG



16. Install:

starter motor

Refer to "STARTER MOTOR" in chapter 7.

• air induction system parts.

Refer to "AIR INDUCTION SYSTEM" in chapter 6.

- carburetor joint
- carburetor

Refer to "CARBURETOR" in chapter 6.

• air filter case

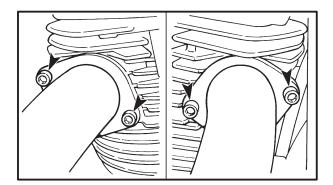
Refer to "AIR FILTER CASE" in chapter 3.

fuel tank

Refer to "FUEL TANK" in chapter 3.

- side covers
- rider seat

Refer to "SEATS AND SIDE COVERS" in chapter 3.

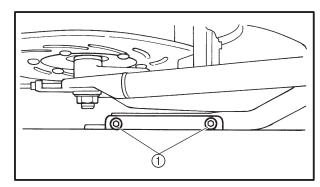


17. Install:

- gaskets
- exhaust pipes

NOTE: -

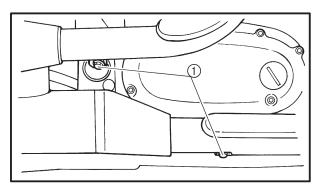
Finger tighten the exhaust pipe nuts.



18. Install:

- muffler
- bolts 1

30 Nm (3.0 m•kg)



19. Tighten:

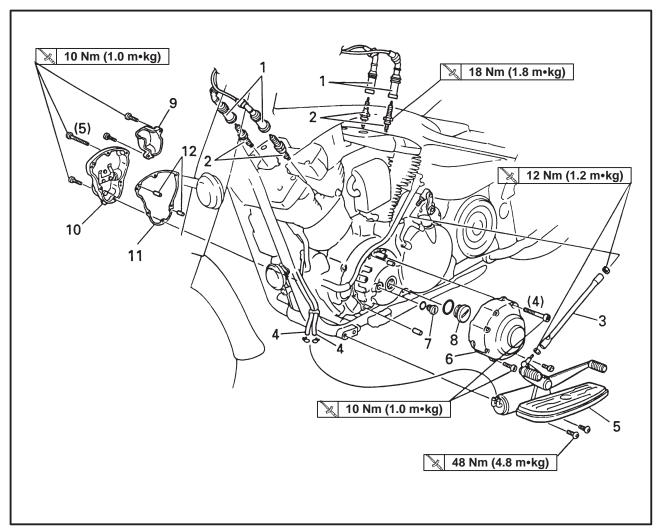
- exhaust pipe nuts
- clamp bolts 1

20 Nm (2.0 m•kg) 25 Nm (2.5 m•kg)

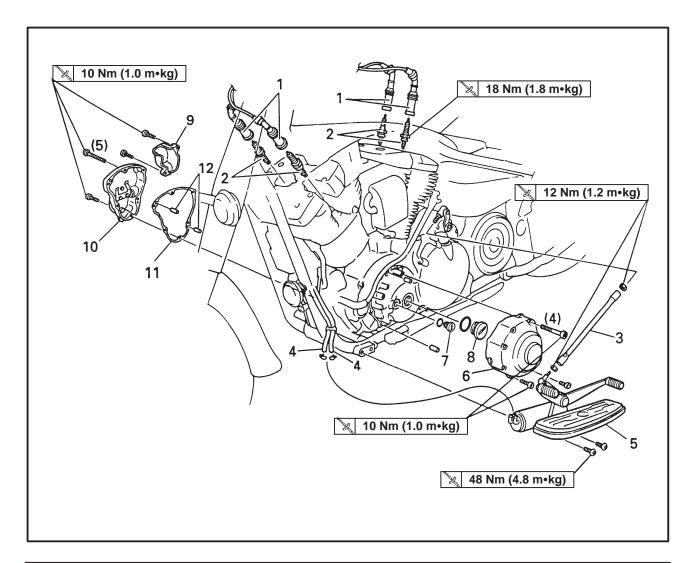




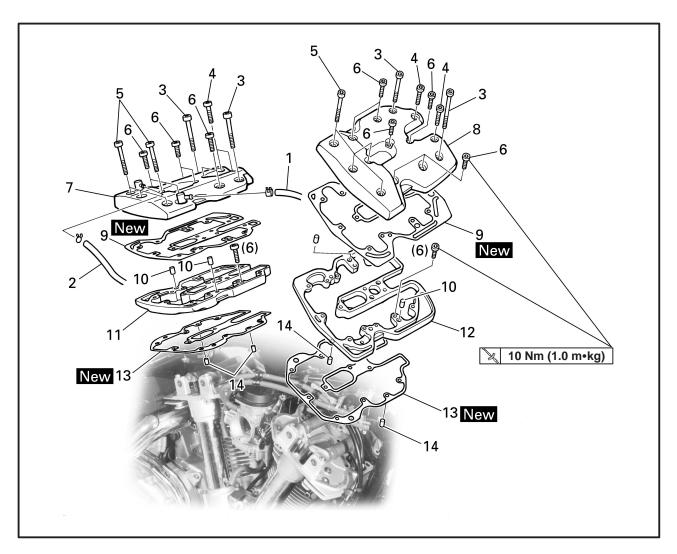




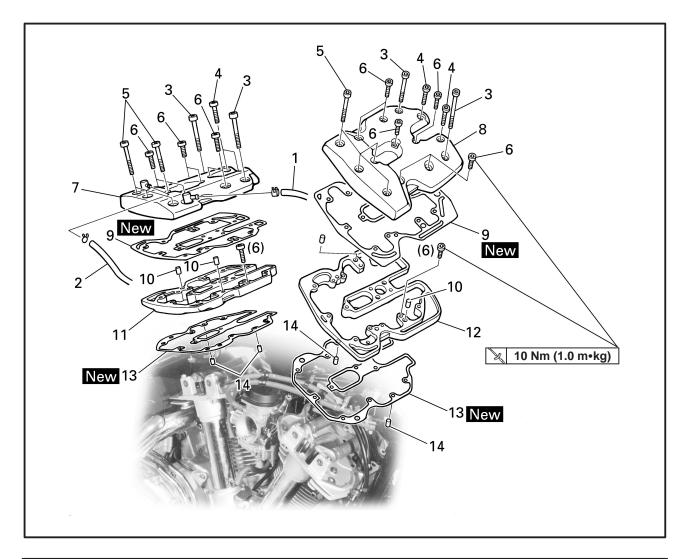
Order	Job/Part	Q'ty	Remarks
	Removing the engine left side cover and camshaft sprockets cover		Remove the parts in the order listed.
	Rider seat/fuel tank/air filter case		Refer to "SEATS AND SIDE COVER", "FUEL TANK" and "AIR FILTER CASE" in chapter 3.
	Engine oil		Drain.
1	Spark plug cap	4	Disconnect.
2	Spark plug	4	
3	Shift rod	1	
4	Charcoal canister hose	2	Disconnect.
5	Rider footrest (left)	1	
6	Engine left side cover	1	
7	Timing mark accessing screw	1	
8	Crankshaft end cover	1	



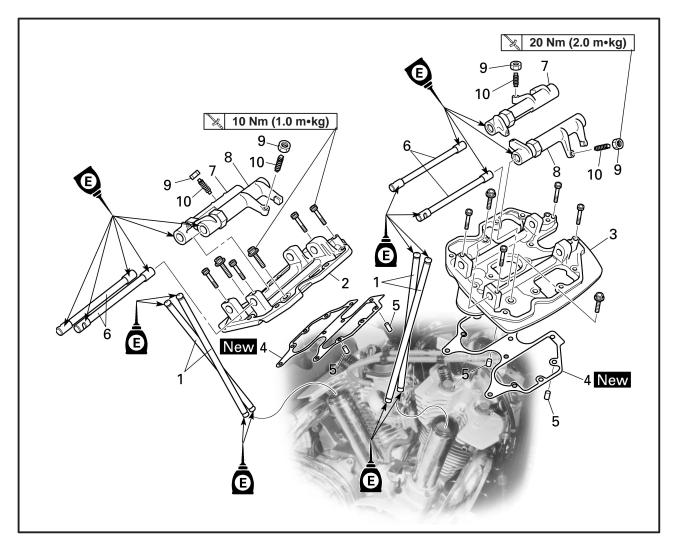
Order	Job/Part	Q'ty	Remarks
9	Decompression solenoid cover	1	For installation, reverse the removal procedure.
10	Camshaft sprocket cover	1	
11	Camshaft sprocket cover gasket	1	
12	Dowel pin	2	



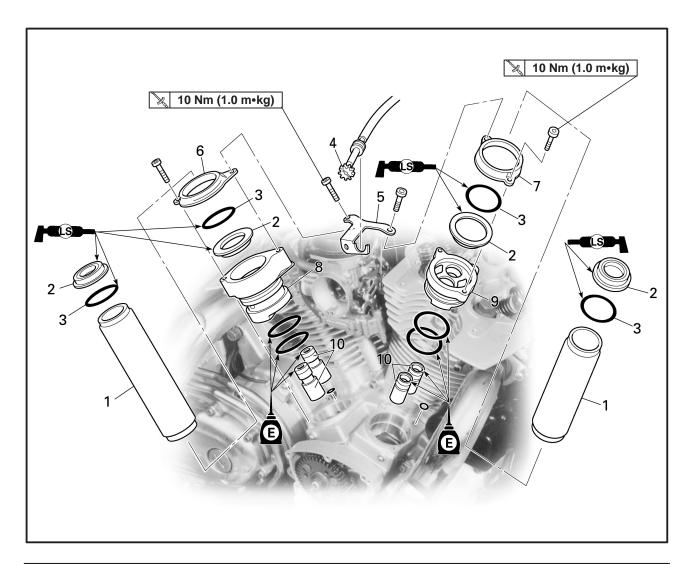
Order	Job/Part	Q'ty	Remarks
	Removing cylinder head covers		Remove the parts in the order listed.
1	Cylinder head breather hose	1	·
2	Oil tank breather hose	1	
3	Bolt	4	ℓ = 65 mm
4	Bolt	4	ℓ = 35 mm
5	Bolt	4	ℓ = 50 mm
6	Bolt	12	ℓ = 25 mm
7	Rear cylinder head cover	1	
8	Front cylinder head cover	1	
9	Cylinder head cover gasket	2	
10	Dowel pin	4	



Order	Job/Part	Q'ty	Remarks
11	Rear cylinder head cover spacer	1	For installation, reverse the removal procedure.
12	Front cylinder head cover spacer	1	
13	Cylinder head cover spacer gasket	2	
14	Dowel pin	4	



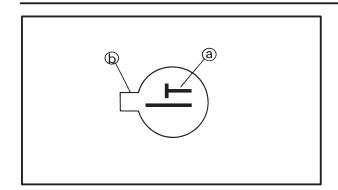
Order	Job/Part	Q'ty	Remarks
	Removing the push rods and rocker		Remove the parts in the order listed.
	arms		
1	Push rod	4	
2	Rear rocker arm base	1	
3	Front rocker arm base	1	
4	Rocker arm base gasket	2	
5	Dowel pin	4	
6	Rocker arm shaft	4	
7	Rocker arm 1	2	
8	Rocker arm 2	2	
9	Locknut	2	
10	Adjusting screw	2	
			For installation, reverse the removal procedure.

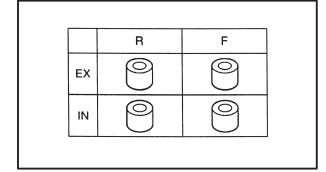


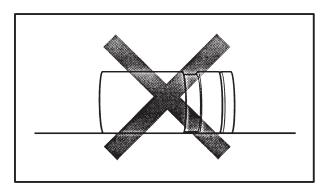
Order	Job/Part	Q'ty	Remarks
	Removing the valve lifters		Remove the parts in the order listed.
1	Push rod cover	2	
2	Oil seal	4	
3	O-ring	4	
4	Throttle stop screw	1	Unhook.
5	Throttle stop screw holder	1	
6	Rear valve lifter case cover	1	
7	Front valve lifter case cover	1	
8	Rear valve lifter case	1	
9	Front valve lifter case	1	
10	Valve lifter	4	
			For installation, reverse the removal procedure.

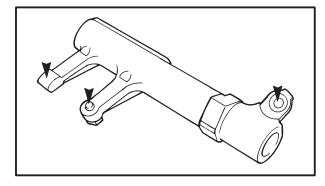
ENG











REMOVING THE ROCKER ARMS, PUSH RODS AND VALVE LIFTERS

- 1. Align:
- TDC mark (a) on the pickup coil rotor (with the pointer (b) on the clutch/pickup coil rotor cover)
- a. Turn the crankshaft clockwise.
- b. When piston #1 is at TDC on the compression stroke, align the TDC mark (a) on the pickup coil rotor with the pointer (b) on the clutch/pickup coil rotor cover.
- c. Check the camshaft drive gear mark © position and camshaft driven gear mark d position as shown.
 - If the marks are not aligned, turn the crankshaft counterclockwise 360 degrees and recheck step b.
- 2. Remove:
 - rocker arm bases (with the rocker arms)
- 3. Remove:
 - valve lifters

NOTE: -

Make a note of the position of each valve lifter so that they can be installed in the correct place.

CAUTION:

Do not lay the removed valve lifter on its side.

CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

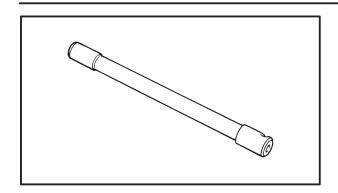
The following procedure applies to all of the rocker arms and rocker arm shafts.

- 1. Check:
- rocker arm

Damage/wear → Replace.

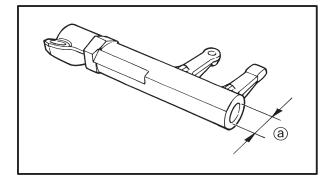






2. Check:

 rocker arm shaft
 Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.

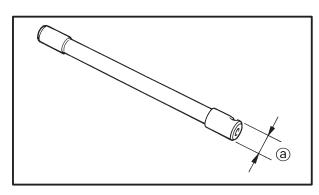


3. Measure:

rocker arm inside diameter ⓐ
 Out of specification → Replace.



Rocker arm inside diameter 15.000 ~ 15.018 mm



4. Measure:

rocker arm shaft outside diameter
 Out of specification → Replace.



Rocker arm shaft outside diameter 14.981 \sim 14.991 mm

5. Calculate:

• rocker arm to rocker arm shaft clearance

NOTE

Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

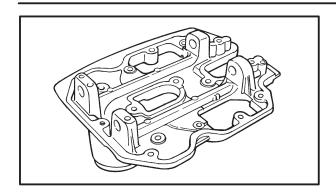
Above 0.08 mm \rightarrow Replace the defective part(-s).



Rocker arm to rocker arm shaft clearance

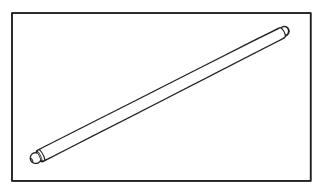
 $0.009 \sim 0.037 \text{ mm}$





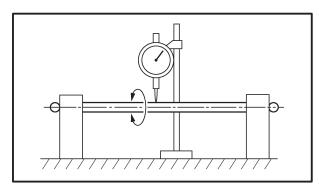
CHECKING THE ROCKER ARM BASES

- 1. Check:
 - rocker arm base
 Cracks/damage → Replace.



CHECKING THE PUSH RODS

- 1. Check:
 - push rod
 - push rod end
 Bends/damage → Replace.

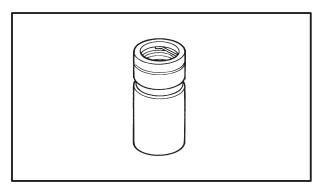


2. Measure:

push rod runout
 Out of specification → Replace.



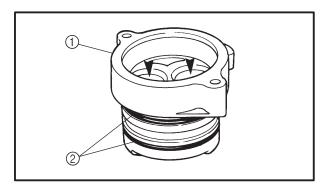
Push rod runout 0.3 mm



CHECKING THE VALVE LIFTERS AND VALVE LIFTER CASES

- 1. Check:
- valve lifter

Blue discoloration/excessive wear/pitting/scratches \rightarrow Replace or check the lubrication system.

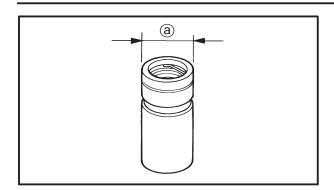


2. Check:

- valve lifter case ①
 Damage/wear → Replace the valve lifter case.
- O-ring ②
 Damage/wear → Replace the O-ring.

ENG



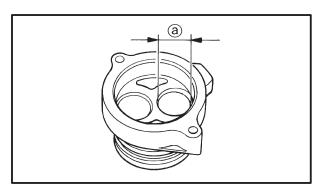


3. Measure:

valve lifter outside diameter ⓐ
 Out of specification → Replace.



Valve lifter case outside diameter 22.9680 ∼ 22.9744 mm



4. Measure:

valve lifter case inside diameter (a)
 Out of specification → Replace.



Valve lifter case inside diameter 22.990 ∼ 23.010 mm

5. Calculate:

valve lifter-to-valve lifter case clearance

NOTE:

Calculate the clearance by subtracting the valve lifter case outside diameter.

Above 0.072 mm \rightarrow Replace the defective part(-s)



Valve lifter-to-valve lifter case clearance

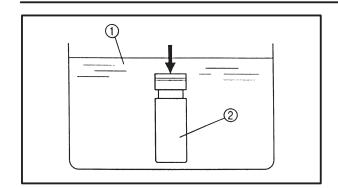
 $0.0156 \sim 0.042 \text{ mm}$

BLEEDING THE VALVE LIFTER

The valve lifter must be bled in the following conditions.

- replacing parts
- oil flows out from the valve lifter while adjusting





- 1. Bleed:
- valve lifter
- a. Fill the container with kerosene and place the valve lifter into the container.

On the plunger side of the valve lifter use a hand press and pump it a number of times and pour in the kerosene.

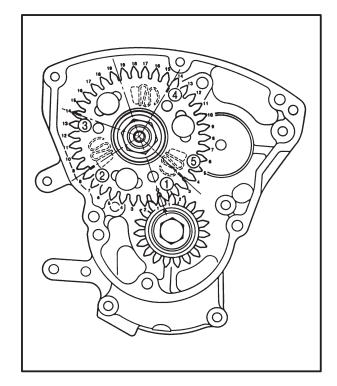
CAUTION:

- Do not pump the valve lifter more than necessary.
- Kerosene is highly flammable.
- 1 Kerosene
- (2) Valve lifter
- b. Install the valve lifter to the engine.

CAUTION:

Be sure to reinstall the valve lifter to its original position.

- c. Start the engine and warm it up.
- d. Stop the engine.
- e. Remove the camshaft sprocket cover.



f. Rotate the camshaft and align it to top dead center (TDC) of piston #1.

NOTE:

If the spark plugs are removed, the crankshaft can be rotated smoothly.

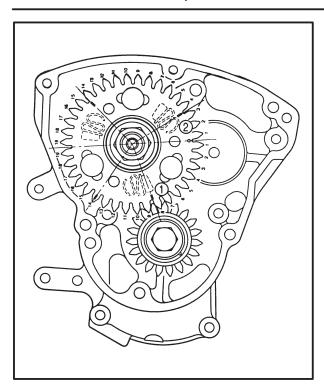
▲ WARNING

Be careful as the engine will get hot.

- g. When piston #1 is at TDC, mark the position of the camshaft driven gear when the valve lifter is lifted to its highest point.
- (1) TDC Punch mark Valve lifter
- 2 #2 cylinder Intake side Highest point
- (3) #1 cylinder Exhaust side Highest point(4) #1 cylinder Intake side Highest point
- (5) #2 cylinder Exhaust side

ENG



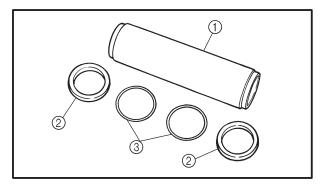


- h. Rotate the crankshaft and align the position of the highest lifted point of the valve lifters, which need to be bled, to the camshaft drive gear.
 - <Example: when bleeding the valve lifter of the #2 cylinder on the intake side of the.>
- 1 Highest lifted point of the #2 cylinder intake side valve lifter
- 2 TDC punch mark

NOTE: —

Match the positions that were marked to the camshaft drive gear when bleeding the valve lifters and then bleed the valve lifters.

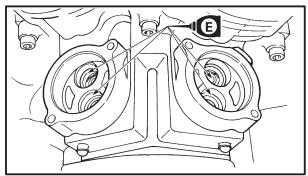
- i. Leave the valve lifters and camshaft drive gear aligned for five minutes.
- j. If a number of valve lifters are to be bled, repeat steps "h" and "i" above.



CHECKING THE PUSH ROD COVERS

- 1. Check:
 - push rod cover ①
 Cracks/damage → Replace.
 - oil seal (2)
 - O-ring ③

Damage/wear \rightarrow Replace the oil seal and Oring as a set.



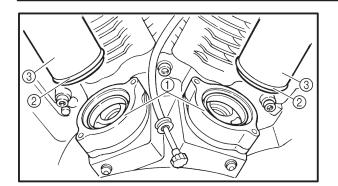
INSTALLING THE VALVE LIFTERS AND PUSH ROD COVERS

- 1. Install:
 - valve lifter cases (front and rear)
 - valve lifters

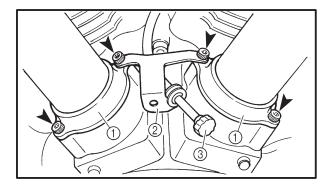
NOTE: -

- Install the valve lifter in the correct place.
- After installing the valve lifters, fill the tops of them with engine oil.

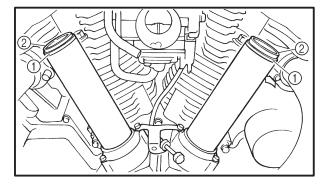




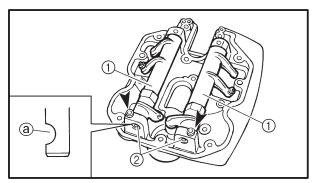
- 2. Install:
 - oil seals (1)
 - O-rings 2
 - push rod covers ③



- 3. Install:
 - valve lifter case covers (1)
 - throttle stop screw holder 2
- 4. Hook:
 - throttle stop screw ③



- 5. Install:
 - O-rings 1
 - oil seals (2)



INSTALLING THE ROCKER ARMS AND PUSH RODS

The following procedure applies to both cylinders.

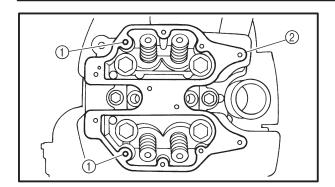
- 1. Install:
 - rocker arms ①
 - rocker arm shafts ② (onto rocker arm base)

NOTE:

The thread hole ⓐ of the rocker arm shaft must face to the outside.

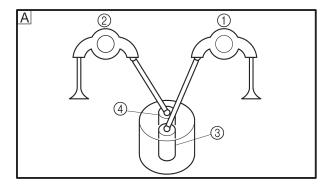






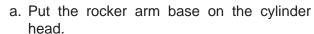
- 2. Install:
 - dowel pins 1
 - rocker arm gasket ② New





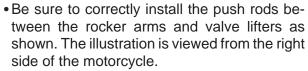
В

- 3. Install:
 - rocker arm base (with rocker arms)
 - push rods

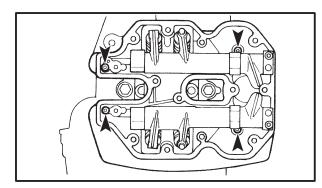


b. Install the push rods.





- A Rear cylinder
- B Front cylinder
- 1 Intake side rocker arm
- (2) Exhaust side rocker arm
- (3) Intake valve lifter
- (4) Exhaust valve lifter
- Lubricate the push rod end balls to the engine oil.



c. Install the rocker arm base bolts.

NOTE:

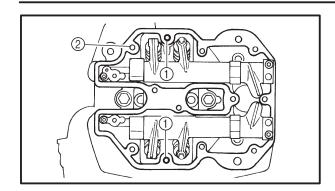
Tighten the rocker arm base bolts in stages and in a crisscross pattern.



Rocker arm base bolt 10 Nm (1.0 m•kg)

ENG



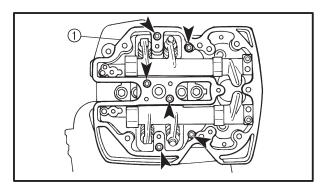


INSTALLING THE CYLINDER HEAD COV-

The following procedure applies to both cylin-

- 1. Install:
 - dowel pins ①
 - cylinder head cover spacer gasket 2 New

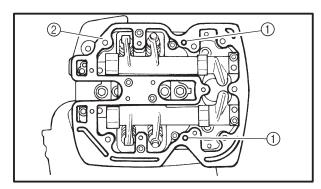




2. Install:

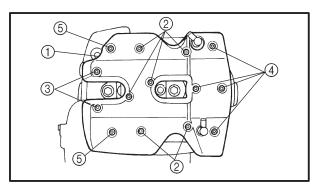
• cylinder head cover spacer 1

10 Nm (1.0 m•kg)



3. Install:

- dowel pins (1)
- cylinder head cover gasket 2 New



4. Install:

• cylinder head cover 1

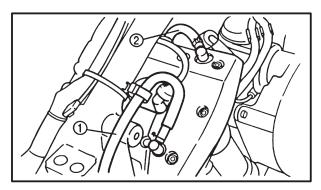
10 Nm (1.0 m•kg)

Bolts ②: $\ell = 25 \text{ mm}$

Bolts ③: $\ell = 35 \text{ mm}$

Bolts 4: $\ell = 50 \text{ mm}$

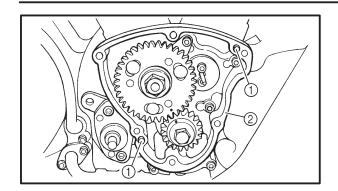
Bolts \odot : ℓ = 65 mm



5. Connect:

- oil tank breather hose (1)
- cylinder head breather hose 2

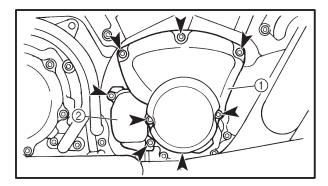




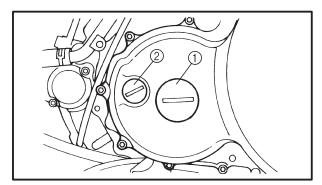
INSTALLING THE CAMSHAFT SPROCKET **COVER AND ENGINE LEFT SIDE COVER**

- 1. Install:
- dowel pins 1
- camshaft sprocket cover gasket 2 New

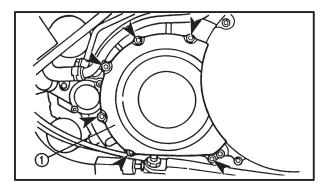




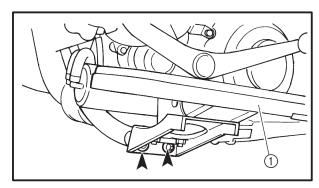
- 2. Install:
 - camshaft sprocket cover 1
 - decompression solenoid cover 2



- 3. Install:
 - crankshaft end cover ①
 - timing mark accessing screw 2

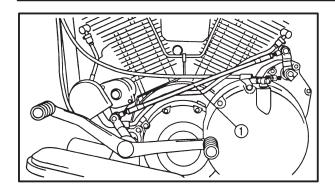


- 4. Install:
 - engine left side cover 1



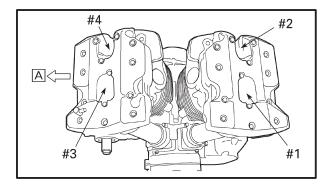
- 5. Install:
 - rider footrest (left) 1
- 6. Connect:
 - charcoal canister hoses





7. Install:

• shift rod ①



8. Install:

- spark plugs
- 9. Connect:
 - spark plug caps

NOTE:

Refer to "CABLE ROUTING" in chapter 2.

A Forward

10. Fill:

oil tank

(with the specified amount of the recommended engine oil)

Refer to "CHANGING THE ENGINE OIL" in chapter 3.

11. Install:

- air filter case
- fuel tank
- rider seat Refer to "AIR FILTER CASE", "FUEL TANK" and "SEATS AND SIDE COVERS" in chapter 3.

12. Adjust:

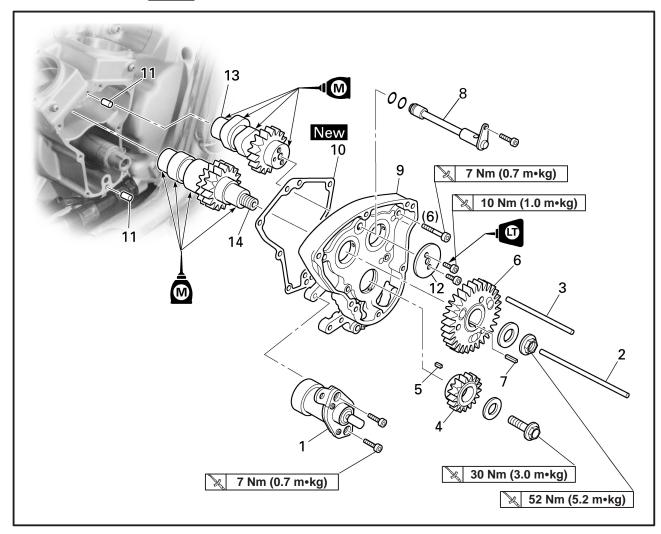
• installed shift rod length Refer to "ADJUSTING THE SHIFT PEDAL" in chapter 3.



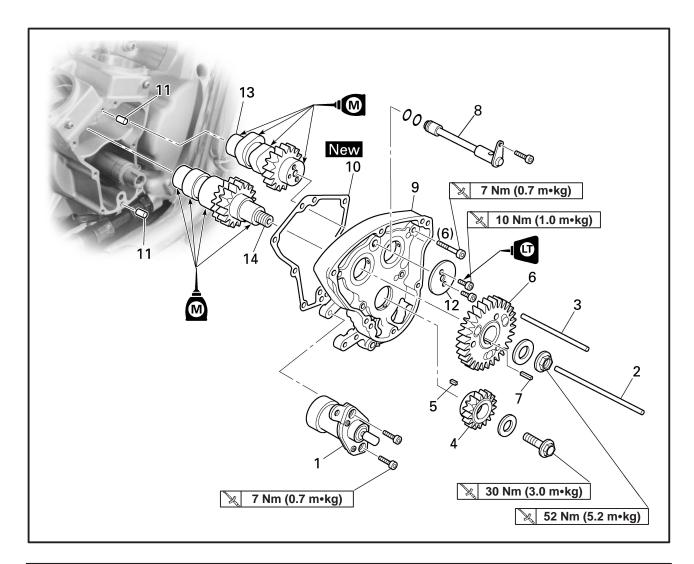


CAMSHAFTS



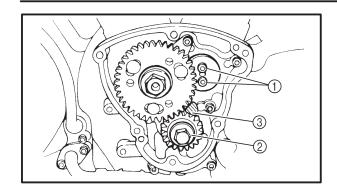


Order	Job/Part	Q'ty	Remarks
	Removing the camshafts		
	Valve lifters		Refer to "ROCKER ARMS, PUSH RODS
	Martin and and acceptance		AND VALVE LIFTERS".
	Muffler/exhaust pipes		Refer to "ENGINE".
1	Decompression solenoid	1	
2	Long decompression push rod	1	92 mm
3	Short decompression push rod	1	78 mm
4	Camshaft drive gear	1	
5	Straight key	1	
6	Camshaft driven gear	1	
7	Straight key	1	
8	Oil delivery pipe	1	



Order	Job/Part	Q'ty	Remarks
9 10 11 12 13 14	Camshaft cover Camshaft cover gasket Dowel pin Front cylinder camshaft end cover Front cylinder camshaft Rear cylinder camshaft	1 1 1 1 1	For installation, reverse the removal procedure.



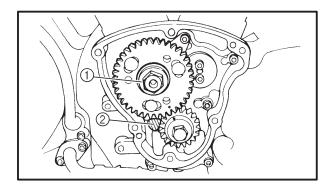


REMOVING THE CAMSHAFTS

- 1. Loosen:
 - front cylinder camshaft end cover bolts 1
 - camshaft drive gear bolt 2

NOTE: -

- Place a folded copper washer ③ between the teeth of the camshaft drive gear and camshaft driven gear in order to lock them.
- Do not damage the teeth of the camshaft drive and camshaft driven gears.

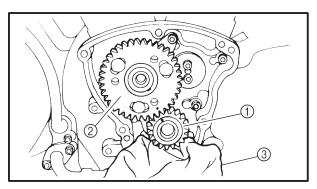


2. Loosen:

camshaft driven gear nut 1

NOTE

- Place a folded copper washer ② between the teeth of the camshaft drive gear and camshaft driven gear in order to lock them.
- Do not damage the teeth of the camshaft drive and camshaft driven gears.

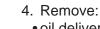


3. Remove:

- front cylinder camshaft end cover
- camshaft drive gear 1
- camshaft driven gear 2
- straight keys

NOTE

Cover the crankcase hole with a clean reg ③ to prevent the straight keys from falling into the crankcase.

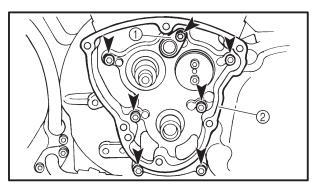


oil delivery pipe ①camshaft cover ②

(along with the camshfts)

N	0	Т	F	
1.4	v		_	

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



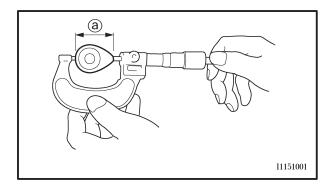


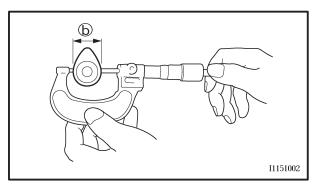
EAS00204

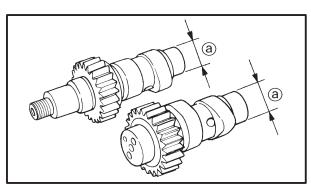
CHECKING THE CAMSHAFTS

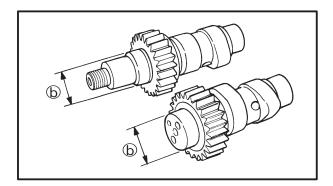
- 1. Check:
 - camshaft lobes

Blue discoloration/pitting/scratches \rightarrow Replace the camshaft.









2. Measure:

camshaft lobe dimensions (a) and (b)
 Out of specification → Replace the camshaft.



Minimum camshaft lobe dimensions

Intake lobe

- (a) 36.494 mm
- **b** 31.850 mm

Exhaust lobe

- (a) 36.454 mm
- **b** 31.850 mm

3. Measure:

camshaft journal diameter (crankcase side) (a)
 Out of specification → Replace the camshaft.



Camshaft journal diameter (crankcase side)

24.937 ~ 24.950 mm

4. Measure:

camshaft journal diameter (camshaft cover side)

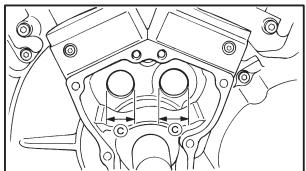
Out of specification \rightarrow Replace the camshaft.

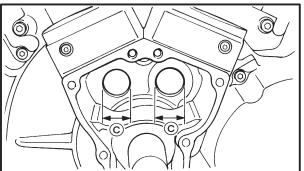


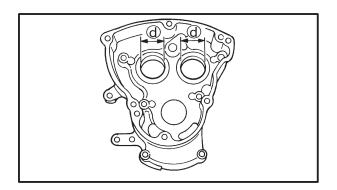
Camshaft journal diameter (camshaft cover side)
27.967 ~ 27.980 mm











5. Measure:

 crankcase hole inside diameter © Out of specification - Replace the crank-



Crankcase hole inside diameter 25.000 ~ 25.021 mm

6. Measure:

• camshaft caver hole inside diameter (d) Out of specification → Replace the camshaft cover.



Camshaft cover hole inside diameter

 $28.000 \sim 28.021 \text{ mm}$

7. Calculate:

• camshaft-to-crankcase clearance Out of specification → Replace the defective part (-s).

NOTE: -

Calculate the clearance by subtracting the crankcase side camshaft journal diameter (crankcase side) from the crankcase hole inside diameter.



Camshaft to crankcase clearance $0.050 \sim 0.084 \text{ mm}$

8. Calculate:

• camshaft-to-camshaft cover clearance Out of specification → Replace the defective part(-s).

NOTE: -

Calculate the clearance by subtracting the camshaft journal diameter (camshaft cover side) from the camshaft cover hole inside diameter.

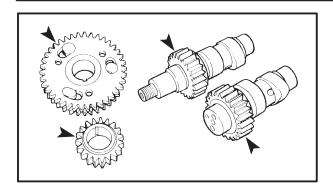


Camshaft to camshaft cover clearance

 $0.020 \sim 0.054 \text{ mm}$

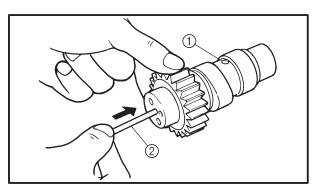






9. Check:

- camshaft drive gears
- camshaft driven gears
 Chips/pitting/roughness/wear ~ Replace the defective part(-s).

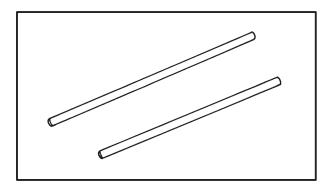


CHECKING THE DECOMPRESSION SYSTEM

- 1. Check:
 - decompression system

NOTE: -

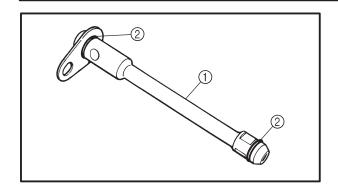
- Check the decompression system while the decompression push rod is installed in the camshaft.
- Check that the decompression pin ① projects from the camshaft.
- Check that the decompression push rod ② moves smoothly.



2. Check:

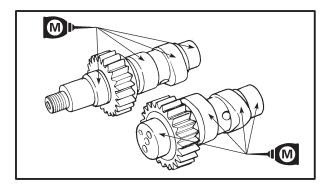
 decompression push rods Bends/damage → Replace.





CHECKING THE OIL DELIVERY PIPE

- 1. Check:
 - oil delivery pipe ① $\mathsf{Damage} \to \mathsf{Replace}.$ Obstruction → Wash and blow out with compressed air.
 - O-rings ② Damage/wear → Replace.

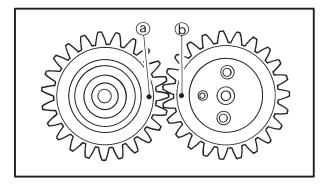


INSTALLING THE CAMSHAFTS

- 1. Install:
 - camshafts (to the camshaft cover)
- front cylinder camshaft end cover

NOTE: -

- Lubricate molybdenum disulfide oil onto the camshft journals and lobes.
- Align the punch mark (a) on the rear cylinder camshaft with the punch mark (b) on the front cylinder camshaft.

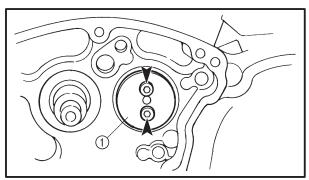




• front cylinder camshaft end cover ①



Finger tighten the place bolts.

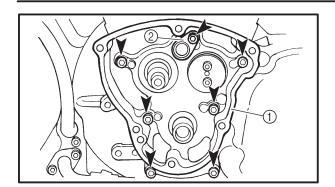


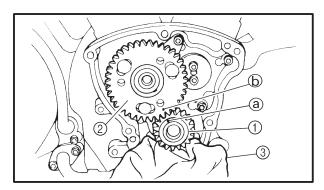
- 3. Install:
 - dowel pins 1
 - camshaft cover gasket 2 New

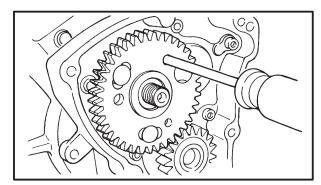












4. Install:

• camshaft cover ①
(along with the camshafts)

• oil delivery pipe 2

NOTE: -

Tighten the camshaft cover bolts in stages and in a crisscross pattern.

5. Install:

straight keys

• camshaft drive gear 1

• camshaft driven gear 2

NOTE:

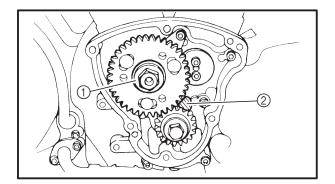
• Cover the crankcase hole with a clean rag ③ to prevent the straight keys from falling into the crankcase.

 Align the punch mark (a) on the camshaft drive gear (1) with the punch mark (b) on the camshaft driven gear (2).

• Insert a cross-headed screwdriver into one of the holes in the outer camshft driven gear and rotate the gear until the teeth of both driven gears are aligned. The teeth of both camshaft driven gears must be aligned for installation.

6. Install:

- washers
- camshaft drive gear bolt
- camshaft driven gear nut



7. Tighten:

• camshaft driven gear nut 1

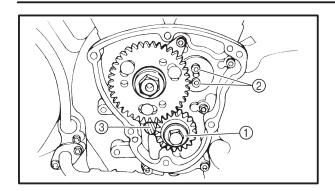
52 Nm (5.2 m•kg)

NOTE: -

• Place a folded copper washer ② between the teeth of the camshaft drive gear and camshaft driven gear in order to lock them.

 Do not damage the teeth of the camshaft drive and camshaft driven gear.





8. Tighten:

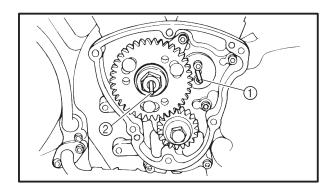
• camshaft drive gear bolt 1)

30 Nm (3.0 m•kg)

•front cylinder camshaft end cover bolts 2

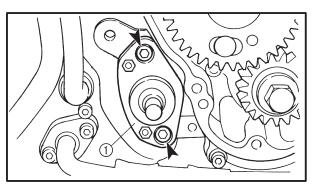
NOTE: -

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



9. Install:

- short decompression push rod 1
- long decompression push rod 2



10. Install:

• decompression solenoid 1)

11. Install:

- valve lifter's
- push rods
- rocker arms
- cylinder head covers Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
- exhaust pipes
- muffler

Refer to "ENGINE".



- 12. Fill:
 - oil tank

(with the specified amount of the recommended engine oil)

Refer to "CHANGING THE ENGINE OIL" in chapter 3.

- 13. Install:
 - air filter case
 - fuel tank
 - rider seat

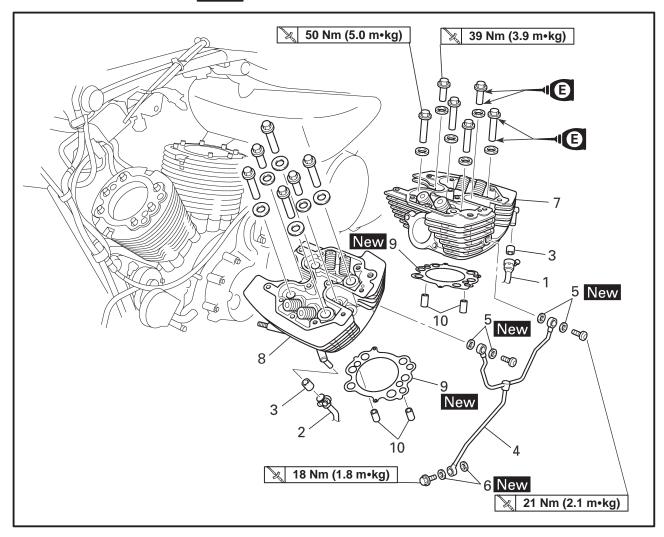
Refer to "AIR FILTER CASE", "FUEL TANK" and "SEATS AND SIDE COVERS" in chapter 3.



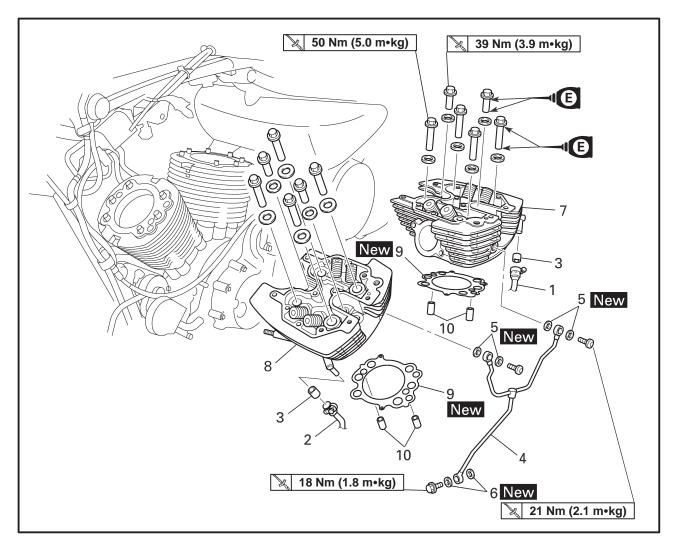


CYLINDER HEADS



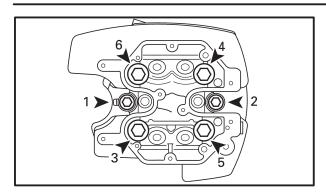


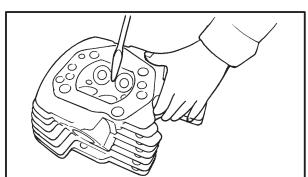
Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head Rider seat/fuel tank/air filter case		Remove the parts in the order listed. Refer to "SEATS AND SIDE COVERS", "FUEL TANK" and "AIR FILTER CASE" in chapter 3.
	Carburetor/carburetor joint Muffler/exhaust pipes Rocker arms/push rod cover		Refer to "CARBURETOR" in chapter 6. Refer to "ENGINE". Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
1	Reed valve case to rear cylinder pipe	1	Disconnect.
2	Reed valve case to front cylinder pipe	1	Disconnect.
3	Gasket	2	
4	Oil delivery pipe	1	
5	Copper washer	4	



Order	Job/Part	Q'ty	Remarks
6	Copper washer	2	
7	Rear cylinder head	1	
8	Front cylinder head	1	
9	Cylinder head gasket	2	
10	Dowel pin	4	
			For installation, reverse the removal procedure.







REMOVING THE CYLINDER HEADS

- 1. Remove:
 - cylinder head

NOTE: -

- Loosen the nuts in the proper sequence.
- Follow the numerical order shown in the illustration. Loosen each bolt 1/4 of a turn at a time until all of the nuts are loose.

EAS00228

CHECKING THE CYLINDER HEADS

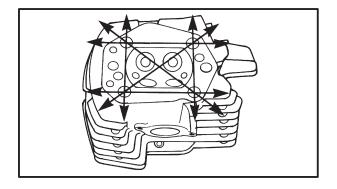
The following procedure applies to all of the cylinder heads.

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

NOTE: -

Do not use a sharp instrument to avoid damaging or scratching:

- spark plug bore threads
- valve seats



- 2. Check:
 - cylinder head
 Damage/scratches → Replace.
- 3. Measure:
 - cylinder head warpage
 Out of specification → Resurface the cylinder head.



Maximum cylinder head warpage 0.10 mm

- a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
- b. Measure the warpage.
- c. If the limit is exceeded, resurface the cylinder head as follows.

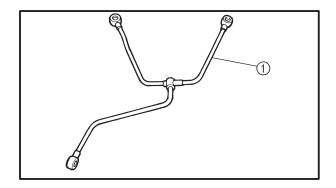
ENG



d. Place a 400 ~ 600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE

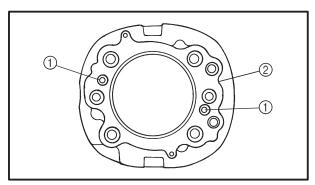
To ensure an even surface, rotate the cylinder head several times.



CHECKING THE OIL DELIVERY PIPE

1. Check:

oil delivery pipe ①
 Damage → Replace.
 Obstruction → Wash and blow out with com-



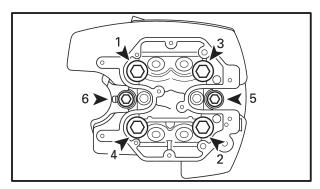
EAS00232

INSTALLING THE CYLINDER HEADS

- 1. Install:
 - dowel pins (1)

pressed air.

• gasket 2 New



- 2. Install:
 - cylinder heads
 - washers
 - cylinder head nuts (M12: 1 ~ 4)

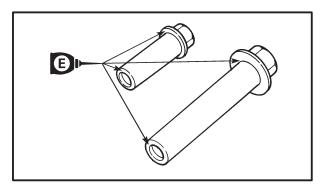
50 Nm (5.0 m•kg)

cylinder head nuts (M10: 5, 6)

39 Nm (3.9 m•kg)

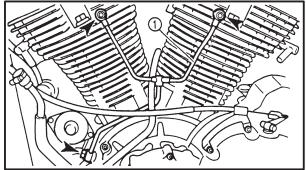


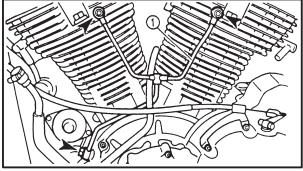
- Lubricate the cylinder head nuts with engine oil.
- Tighten the cylinder head nuts in the proper tightening sequence as shown and torque them in two stages.

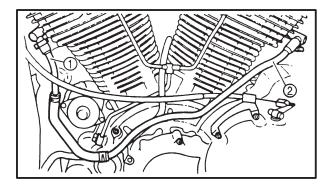












3. Install:

- copper washers New
- oil delivery pipe 1
- oil delivery pipe bolts (M10)

21 Nm (2.1 m•kg)

• oil delivery pipe bolt (M8)

18 Nm (1.8 m•kg)

- 4. Install:
 - gaskets
 - reed valve case to front cylinder pipe ①
 - reed valve case to rear cylinder pipe 2

5. Install:

- rocker arms
- cylinder head covers Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
- muffler
- exhaust pipes Refer to "ENGINE".
- carburetor

Refer to "CARBURETOR" in chapter 6.

- air filter case
- fuel tank
- rider seat

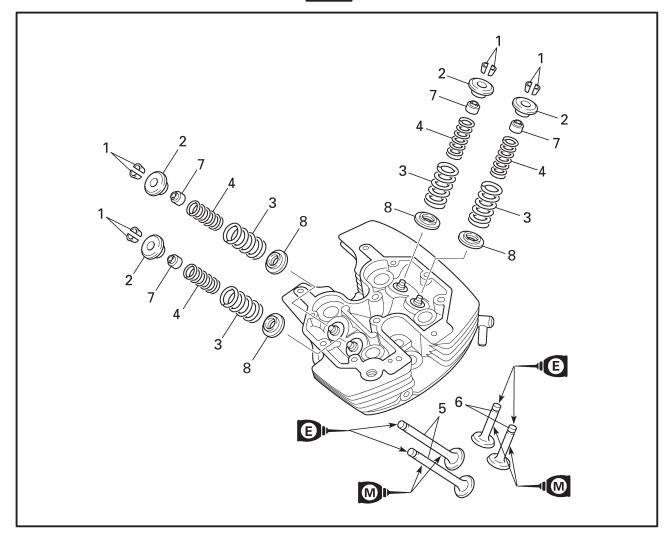
Refer to "AIR FILTER CASE", "FUEL TANK" and "SEATS AND SIDE COVERS" in chapter 3.





VALVES AND VALVE SPRINGS





Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
			The following procedure applies to both cylinders.
	Cylinder head	,	Refer to "CYLINDER HEADS".
1	Valve cotter	4	
2	Upper spring seat	4	
3	Outer valve spring	4	
4	Inner valve spring	4	
5	Intake valve	2	
6	Exhaust valve	2	
7	Valve oil seal	4	
8	Lower spring seat	4	
J			For installation, reverse the removal procedure.

ENG

EAS00238

REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

NOTE: -

Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

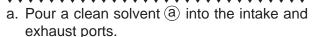


valve

(for leakage)

Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.

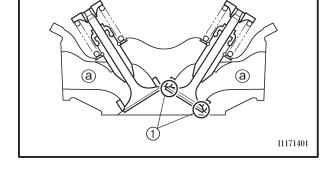
Refer to "CHECKING THE VALVE SEATS".

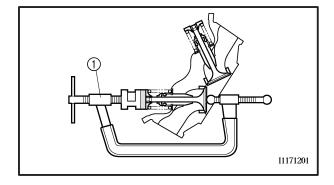


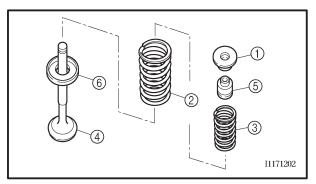
b. Check that the valves properly seal.

NOTE: -

There should be no leakage at the valve seat 1.







2. Remove:

valve cotters

NOTE:

Remove the valve cotters by compressiong the valve springs with the valve spring compressor ①.



Valve spring compressor 90890-04019

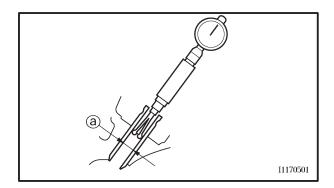
3. Remove:

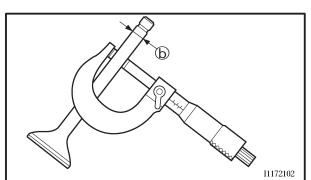
- upper spring seat ①
- outer valve spring 2
- inner valve spring ③
- valve (4)
- oil seal (5)
- lower spring seat 6

ENG

NOTE: -

Identify the position of each part very carefully so that it can be reinstalled in its original place.





EAS00239

CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

- 1. Measure:
 - valve stem-to-valve guide clearance

Valve stem-to-valve guide clearance = Valve guide inside diameter (a) – Valve stem diameter (b)

Out of specification \rightarrow Replace the valve guide.



Valve stem-to-valve guide clearance

Intake

 $0.010 \sim 0.037 \text{ mm}$ <Limit>: 0.08 mm

Exhaust

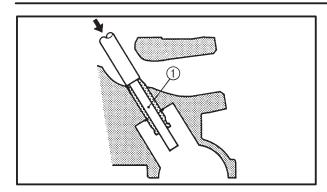
0.025 ~ 0.052 mm <Limit>: 0.1 mm

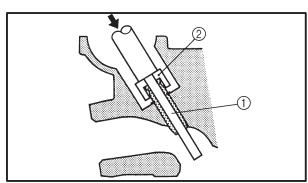
- 2. Replace:
 - valve guide

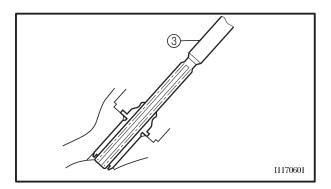
NOTE: -

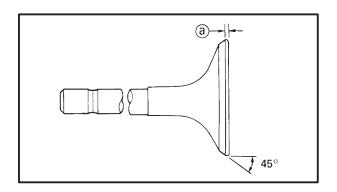
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C in an oven.











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

NOTE: -

After replacing the valve guide, reface the valve seat.



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

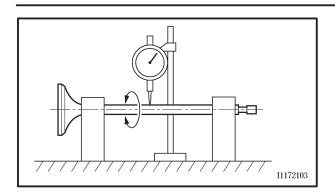
- 3. Eliminate:
 - carbon deposits (from the valve face and valve seat)
- 4. Check:
 - valve face
 - Pitting/wear → Grind the valve face.

 valve stem end
 - valve stem end
 Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
- 5. Measure:
 - valve margin thickness (a)
 Out of specification → Replace the valve.



Valve margin thickness $0.7 \sim 1.3 \text{ mm}$ <Limit>: 0.4 mm





- 6. Measure:
 - valve stem runout Out of specification → Replace the valve.

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.



Valve stem runout 0.01 mm



FAS00240

CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

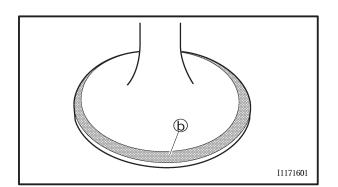
- 1. Eliminate:
 - carbon deposits (from the valve face and valve seat)
- 2. Check
 - valve seat Pitting/wear → Replace the cylinder head.
- 3. Measure:
 - valve seat width (a) Out of specification → Replace the cylinder



I1171603

Valve seat width Intake: $0.9 \sim 1.1 \text{ mm}$ <Limit>: 2.0 mm

> **Exhaust: 0.9 ~ 1.1 mm** <Limit>: 2.0 mm



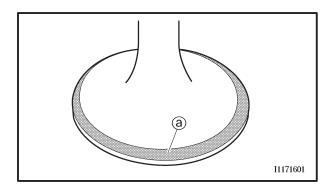
- a. Apply Mechanic's blueing dye (Dykem) (b) onto the valve face.
- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.

ENG

d. Measure the valve seat width.

NOTE: -

Where the valve seat and valve face contacted one another, the blueing will have been removed.



4. Lap:

- valve face
- valve seat

NOTE

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

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

CAUTION:

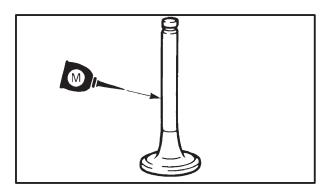
Do not let the lapping compound enter the gap between the valve stem and the valve guide.

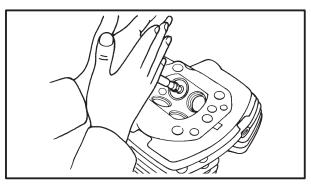
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

NOTE: -

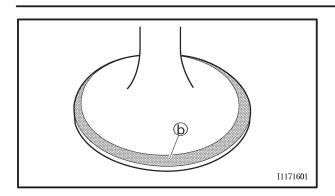
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.

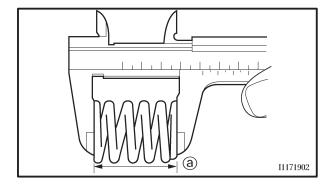








- g. Apply Mechanic's blueing dye (Dykem) (b) onto the valve face.
- h. Install the valve into the cylinder head.
- Press the vive through the valve guide and onto the valve seat to make a clear impression.
- Measure the valve seat width again. If the valve seat width is out of specification, reface and lap the valve seat.



EAS00241

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

- 1. Measure:
 - valve spring free length (a)
 Out of specification → Replace the valve spring.

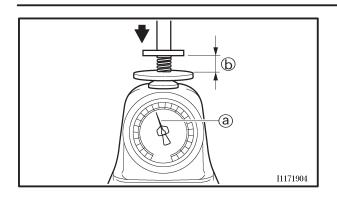


Valve spring free length (intake and exhaust)

Inner valve spring 38.26 mm <Limit>: 36.26 mm Outer valve spring 43.25 mm

<Limit>: 41.26 mm





2. Measure:

- compressed valve spring force (a)
 Out of specification → Replace the valve spring.
- (b) Installed length

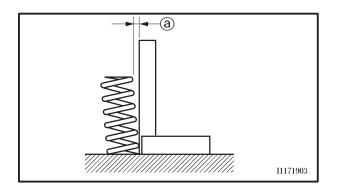


Compressed valve spring force (installed)

Intake and exhaust inner valve spring

 $6.3\sim 7.3\ kg$ at 29.0 mm Intake and exhaust outer valve spring

13.9 ~ 16.1 kg at 31.0 mm



3. Measure:

valve spring tilt ⓐ
 Out of specification → Replace the valve spring.



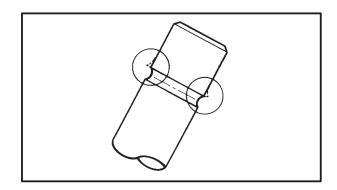
Maximum valve spring tilt

Intake and exhaust inner valve spring

2.4 mm

Intake and exhaust outer valve spring

2.4 mm



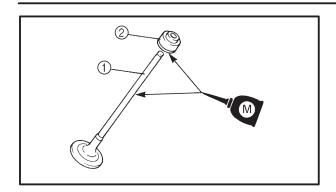
EAS0024

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

- 1. Deburr:
 - valve stem end (with an oil stone)





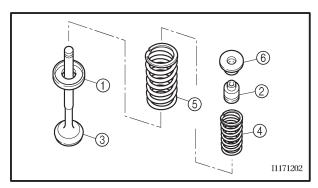


- valve stem (1)
- oil seal ②

(with the recommended lubricant)

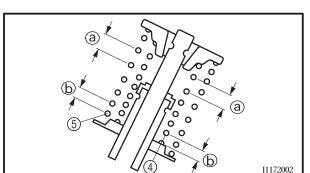


Recommended lubricant
Molybdenum disulfide oil





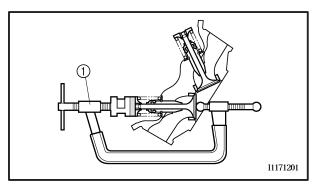
- lower spring seat ①
- oil seal 2 New
- valve ③
- inner valve spring 4
- outer valve spring (5)
- upper spring seat ⑥ (into the cylinder head)



NOTE:

Install the valve springs with the larger pitch (a) facing up.

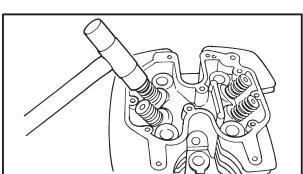
(b) Smaller pitch



- 4. Install:
 - valve cotters

NOTE: —

Install the valve cotters by compressing the valve springs with the valve spring compressor ①.





Valve spring compressor 90890-04019

5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

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CA	U	•	ш	U		п

Hitting the valve tip with excessive force could damage the valve.

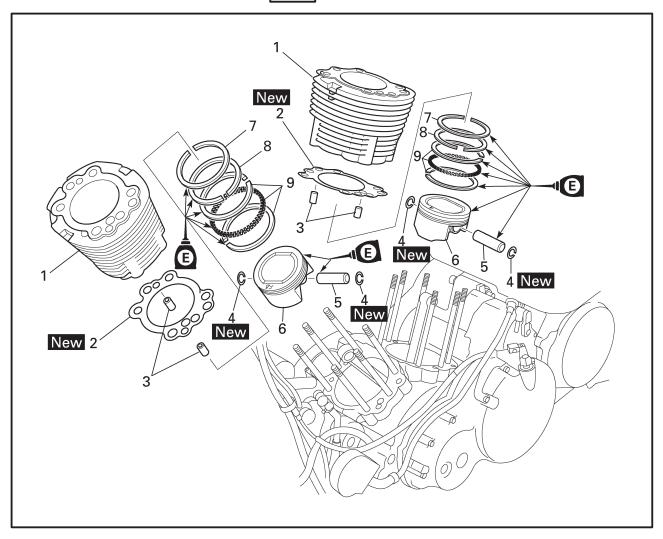
- 6. Install:
 - cylinder head Refer to "CYLINDER HEADS".





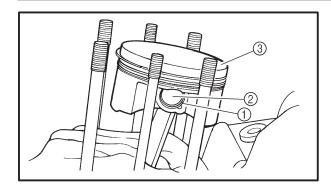
CYLINDERS AND PISTONS

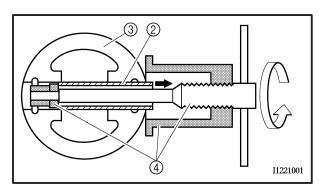




Order	Job/Part	Q'ty	Remarks
	Removing the cylinders and pistons Cylinder heads		Remove the parts in the order listed. Refer to "CYLINDER HEAD".
1	Cylinder	2	
2	Cylinder gasket	2	
3	Dowel pin	4	
4	Piston pin clip	4	
5	Piston pin	2	
6	Piston	2	
7	Top ring	2	
8	2nd ring	2	
9	Oil ring	2	
			For installation, reverse the removal procedure.







EAS00254

REMOVING THE CYLINDERS AND PISTONS

The following procedure applies to all of the cylinders and pistons.

- 1. Remove:
 - piston pin clip (1)
 - piston pin 2
 - piston (3)

CAUTION:

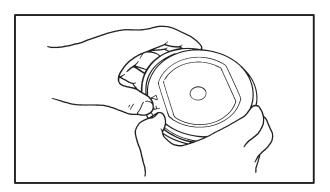
Do not use a hammer to drive the piston pin out.

NOTE: ---

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase
- For reference during installation, put an identification mark on each piston crown.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller (4).



Piston pin puller set 90890-01304



- 2. Remove:
 - top ring
 - 2nd ring
 - oil ring

NOTE: -

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

AS00258

CHECKING THE CYLINDERS AND PISTONS

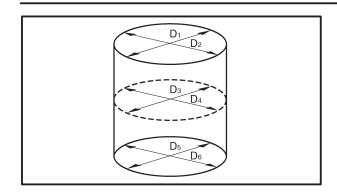
The following procedure applies to all of the cylinders and pistons.

- 1. Check:
 - piston wall
 - cylinder wall

Vertical scratches \rightarrow Replace the cylinder, and the piston and piston rings as a set.







- 2. Measure:
 - piston-to-cylinder clearance
- a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE: -

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



Cylinder bore gauge 90890-03017

Cylinder bore "C"	95.000 ~ 95.010 mm
Maximum taper "T"	0.05 mm
Out of round "R"	0.05 mm

 $\overline{\text{"C"=maximum of D}_1} \sim D_6$

"T"=maximum of D_1 or D_2 – maximum of D_5 or D_6

"R"=maximum of D_1 , D_3 or D_5 - minimum of D_2 , D_4 or D_6

- b. If out of specification, replace the cylinder, and the piston and piston rings as a set.
- c. Measure piston skirt diameter "P" with the micrometer.



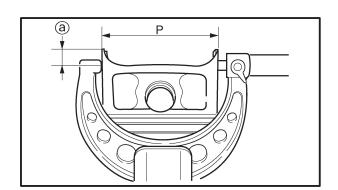
Micrometer 90890-03009

(a) 5 mm from the bottom edge of the piston

	Piston size "P"	
Standard	94.960 ~ 94.975 mm	

- d. If out of specification, replace the piston and piston rings as a set.
- e. Calculate the piston-to-cylinder clearance with the following formula.

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



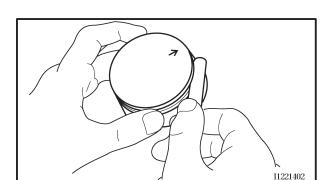
ENG





Piston-to-cylinder clearance 0.025 ∼ 0.050 mm <Limit>: 0.15 mm

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



EAS00263

CHECKING THE PISTON RINGS

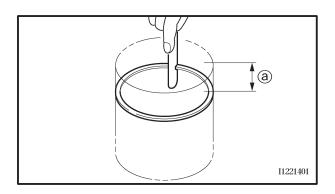
- 1. Measure:
 - piston ring side clearance
 Out of specification → Replace the piston and piston rings as a set.

NOTE: -

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



Piston ring side clearance Top ring $0.03 \sim 0.08 \text{ mm}$ <Limit>: 0.12 mm 2nd ring $0.03 \sim 0.07 \text{ mm}$ <Limit>: 0.12 mm



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

NOTE: -

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

- (a) 10 mm
- 3. Measure:
 - piston ring end gap
 Out of specification → Replace the piston ring.

NOTE: -

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







Piston ring end gap
Top ring
0.30 ~ 0.45 mm
<Limit>: 0.65 mm
2nd ring
0.30 ~ 0.45 mm
<Limit>: 0.80 mm
Oil ring
0.2 ~ 0.7 mm

EAS00266

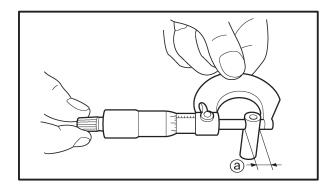
CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

1. Check:

piston pin

Blue discoloration/grooves \rightarrow Replace the piston pin and then check the lubrication system.

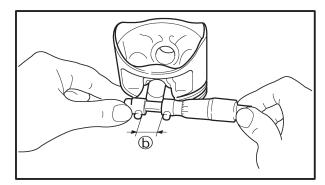


2. Measure:

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



Piston pin outside diameter 21.991 ~ 22.000 mm <Limit>: 21.971 mm



3. Measure:

piston pin bore diameter (in the piston) (b)
 Our of specification → Replace the piston pin.



Piston pin bore diameter (in the piston)

22.004 \sim 22.015 mm <Limit>: 22.045 mm





- 4. Calculate:
 - piston pin-to-piston pin bore clearance Out of specification → Replace the piston

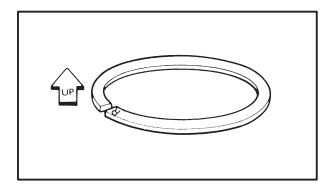
Piston pin-to-piston pin bore clearance = Piston pin bore diameter (in the piston)

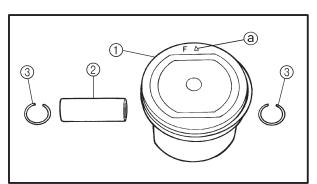
Piston pin outside diameter (a)



Piston pin-to-piston pin bore clearance

 $0.004 \sim 0.024 \ mm$ <Limit>: 0.074 mm





EAS00268

INSTALLING THE PISTONS AND CYL-**INDERS**

The following procedure applies to all of the pistons and cylinders.

- 1. Install:
 - top ring
 - 2nd ring
 - lower oil ring rail
 - upper oil ring rail
 - oil ring expander

NOTE: -

Be sure to install the piston rings so that the manufacturer's marks or numbers face up.

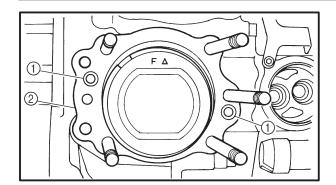
- 2. Install:
 - piston (1)
 - piston pin 2
 - piston pin clip 3 New

NOTE: -

- Apply engine oil onto the piston pin.
- Make sure the "arrow" mark (a) on the piston faces towards the front of the motorcycle.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.





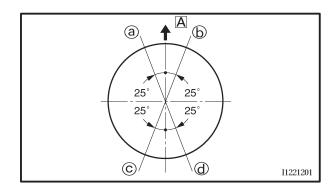


- 3. Install:
 - dowel pins 1
 - gasket 2 New

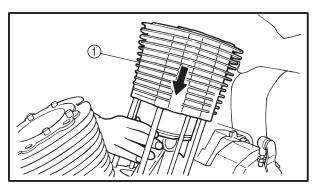
- 4. Lubricate:
 - piston
 - piston rings
 - cylinder (with the recommended lubricant)



Recommended lubricant Engine oil



- 5. Offset:
 - piston ring end gaps
- (a) Top ring
- **b** Lower oil ring rail
- © Upper oil ring rail
- d 2nd ring
- A Front of the motorcycle



- 6. Install:
 - cylinder 1

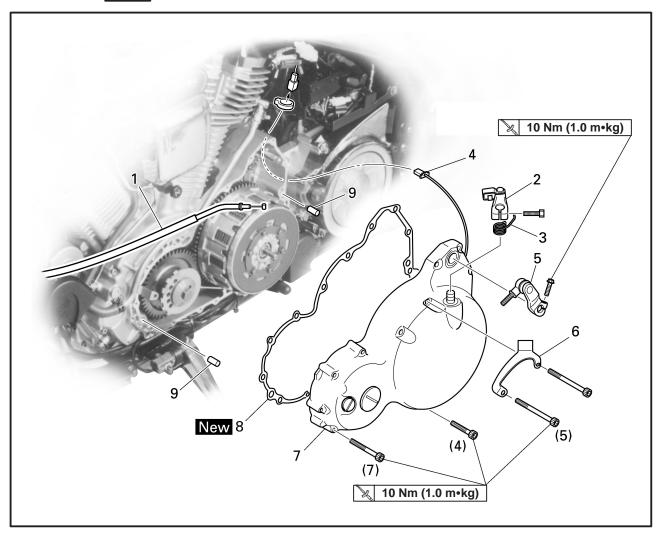
NOTE

While compressing the piston rings with one hand, install the cylinder with the other hand.



CLUTCH

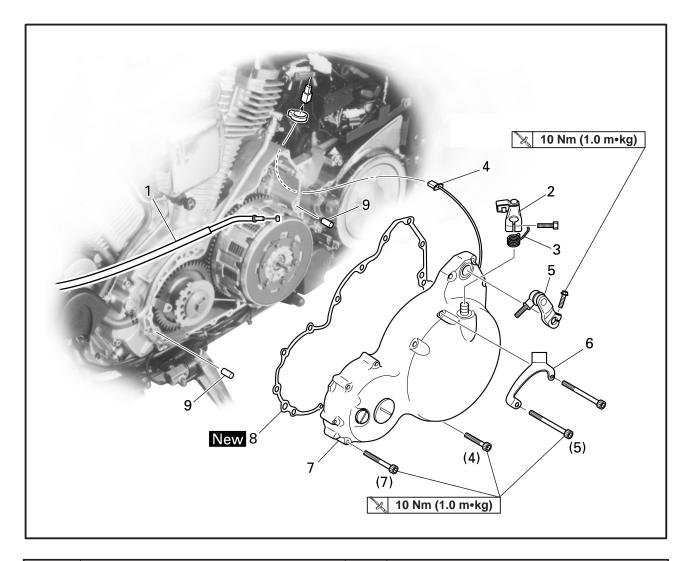




Order	Job/Part	Q'ty	Remarks
	Removing the clutch cover Left side cover		Remove the parts in the order listed. Refer to "SEATS AND SIDE COVERS" in chapter 3.
	Engine left side cover		Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
	Engine oil		Drain.
1	Clutch cable	1	Disconnect.
2	Pull lever	1	
3	Pull lever spring	1	
4	Pickup coil coupler	1	Disconnect.
5	Shift arm	1	
6	Clutch cable holder	1	
7	Clutch cover	1	

ENG

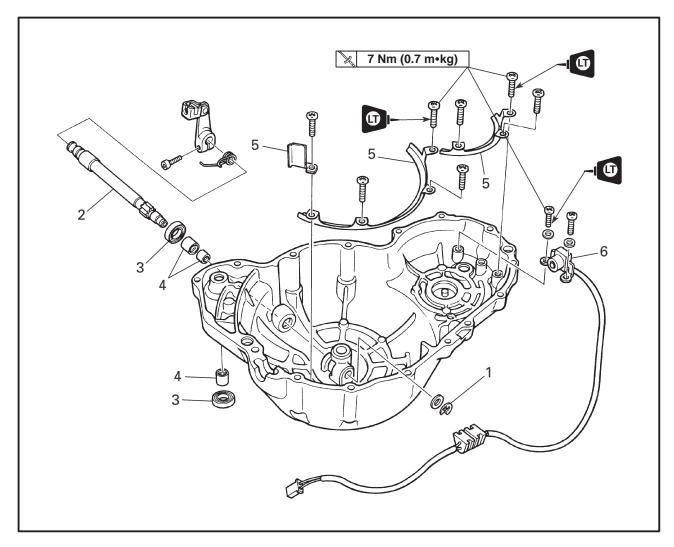




Order	Job/Part	Q'ty	Remarks
8 9	Clutch cover gasket Dowel pin	1	For installation, reverse the removal procedure.

ENG



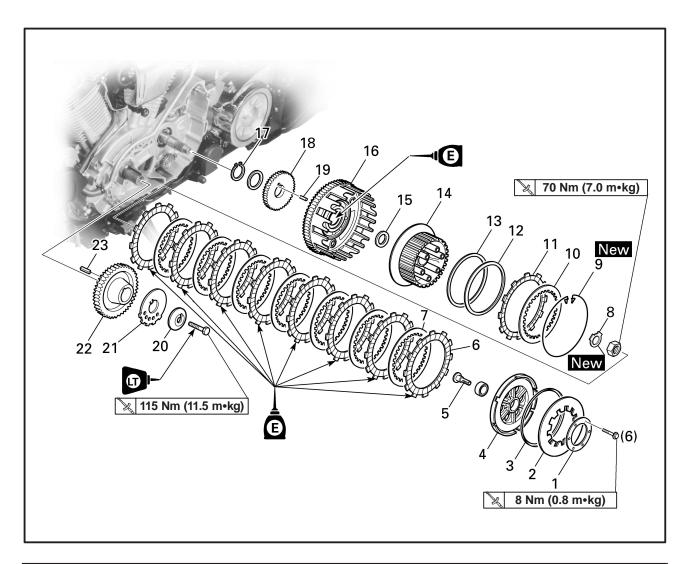


Order	Job/Part	Q'ty	Remarks
	Removing the pull lever shaft and pickup coil Pull lever	1	Remove the parts in the order listed.
	Pull lever spring	1	
1	Circlip	1	
2	Pull lever shaft	1	
3	Oil seal	2	
4	Bearing	3	
5	Pickup coil lead holder	3	
6	Pickup coil	1	
			For installation, reverse the removal procedure.

ENG



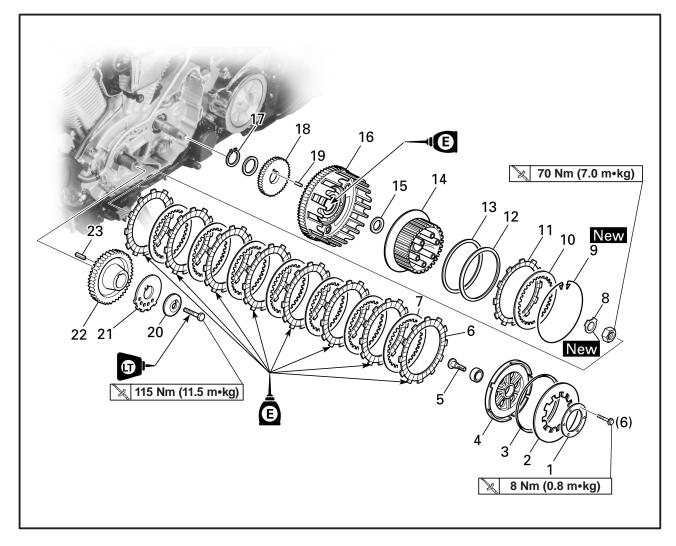
EAS00274



Order	Job/Part	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
	Generator rotor cover		Refer to "GENERATOR".
1	Clutch spring plate retainer	1	
2	Clutch spring plate	1	
3	Clutch spring plate seat	1	
4	Pressure plate	1	
5	Pull rod	1	
6	Friction plate	7	
7	Clutch plate	6	
8	Lock washer	1	
9	Wire circlip	1	
10	Clutch plate	1	
11	Friction plate	1	
12	Clutch damper spring	1	

ENG

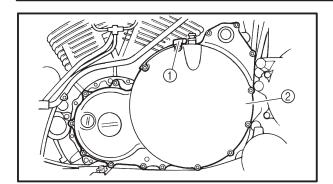


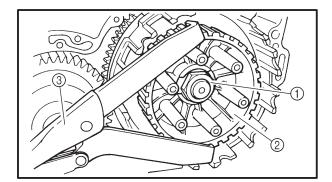


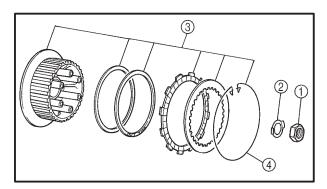
Order	Job/Part	Q'ty	Remarks
13	Clutch damper spring seat	1	
14	Clutch boss	1	
15	Thrust washer	1	
16	Clutch housing	1	
17	Circlip	1	
18	Oil pump drive gear	1	
19	Dowel pin	1	
20	Spacer	1	
21	Pickup coil rotor	1	
22	Primary drive gear	1	
23	Straight key	1	
			For installation, reverse the removal procedure.

ENG









EAS00277

REMOVING THE CLUTCH

- 1. Remove:
 - clutch cable holder 1
 - clutch cover (2)

NOTE: -

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

- 2. Straighten the lock washer tab.
- 3. Loosen:
 - clutch boss nut (1)

NOTE: -

While holding the clutch boss ② with the universal clutch holder ③, loosen the clutch boss nut.

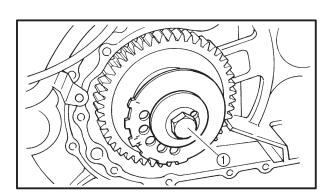


Clutch holding tool 90890-04086

- 4. Remove:
 - clutch boss nut (1)
 - lock washer (2)
 - clutch boss assembly ③

NOTE: -

There is a built-in damper between the clutch boss and the clutch plate. It is not necessary to remove the wire circlip (4) and disassemble the built-in damper unless there is serious clutch chattering.



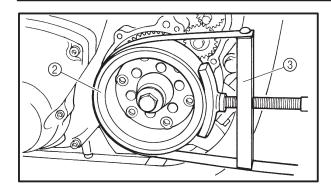
EAS00279

REMOVING THE PRIMARY DRIVE GEAR

- 1. Remove:
- pickup coil rotor bolt 1

ENG





NOTE: -

While holding the generator rotor ② with the sheave holder ③, loosen the pickup coil rotor bolt.



Sheave holder 90890-01701



CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

- 1. Check:
 - friction plate
 Damage/wear → Replace the friction plates
 as a set.
- 2. Measure:
 - friction plate thickness
 Out of specification → Replace the friction
 plates as a set.

NOTE:

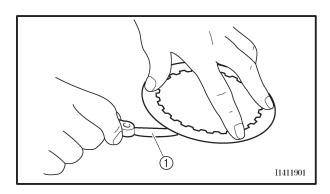
I1411101

Measure the friction plate at four places.



Friction plate thickness

2.9 ~ 3.1 mm <Limit>: 2.8 mm



EAS0028

CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

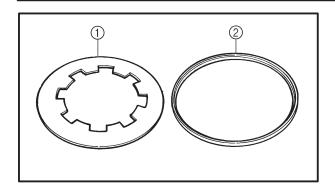
- 1. Check:
 - clutch plate
 Damage → Replace the clutch plates as a set.
- 2. Measure:
 - clutch plate warpage
 (with a surface plate and thickness gauge 1)
 Out of specification → Replace the clutch plates as a set.



Maximum clutch plate warpage 0.2 mm



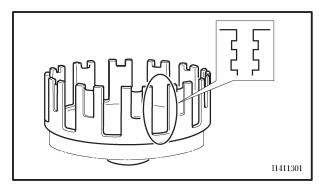




EAS00283

CHECKING THE CLUTCH SPRING PLATE

- 1. Check:
 - clutch spring plate ①
 Damage → Replace.
- 2. Check:
 - clutch spring plate seat ② Damage → Replace.



FAS00284

CHECKING THE CLUTCH HOUSING

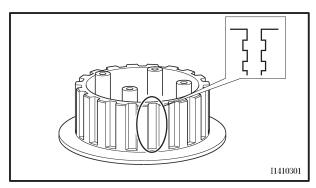
- 1. Check:
 - clutch housing dogs
 Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

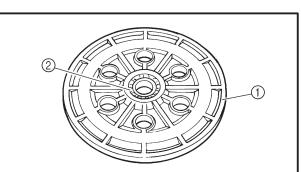
NOTE: -

Pitting on the clutch housing dogs will cause erratic clutch operation.

- 2. Check:
 - bearing

 $\mbox{Damage/wear} \rightarrow \mbox{Replace the bearing and clutch housing}.$





EAS00285

CHECKING THE CLUTCH BOSS

- 1. Check:
 - clutch boss splines
 Damage/pitting/wear → Replace the clutch boss.

NOTE: -

Pitting on the clutch boss splines will cause erratic clutch operation.

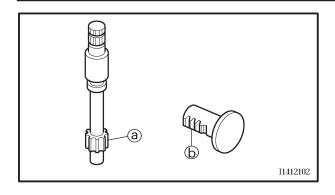
EAS00286

CHECKING THE PRESSURE PLATE

- 1. Check:
- pressure plate ①
 Cracks/damage → Replace.
- bearing ②
 Damage/wear → Replace.

ENG

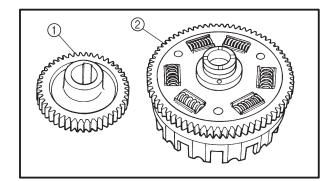




EAS00287

CHECKING THE PULL LEVER SHAFT AND PULL ROD

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



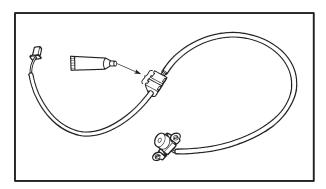
EVSUUSUS

CHECKING THE PRIMARY DRIVE

- 1. Check:
 - primary drive gear 1
 - primary driven gear 2

Damage/wear → Replace the primary drive gear and clutch housing as a set.

Excessive noise during operation → Replace the primary drive gear and clutch housing as a set.



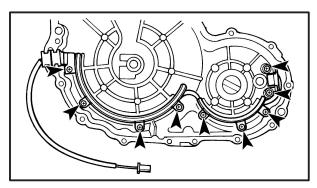
INSTALLING THE PICKUP COIL AND PULL LEVER SHAFT

- 1. Apply
 - sealant

(onto the pickup coil lead grommet)



Yamaha bond No.1215 90890-85505



- 2. Install:
 - pickup coil

7 Nm (0.7 m•kg)

• pickup coil lead holder

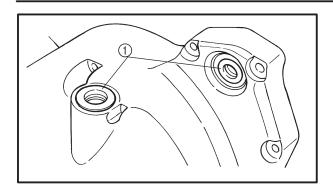
7 Nm (0.7 m•kg)

NOTE: -

Apply locking agent (LOCTITE®) to the threads of the pickup coil bolts and pickup coil lead holder bolts.





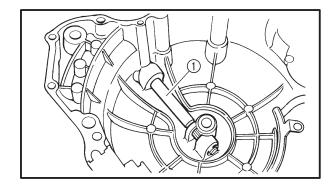


3. Install:

- bearings
- oil seals (1)

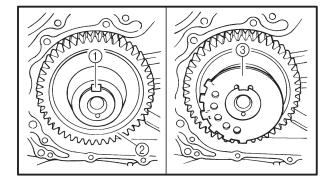
NOTE: -

Lubricate the oil seal lips with lithium soap base grease.



4. Install:

- pull lever shaft (1)
- washer
- circlip



WWW.

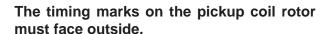
EAS00303

INSTALLING THE PRIMARY DRIVE GEAR

- 1. Install:
 - straight key 1
 - primary drive gear 2
- pickup coil rotor ③
- spacer 4
- pickup coil rotor bolt (5)

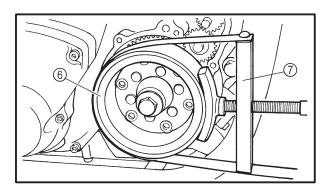
115 Nm (11.5 m•kg)





NOTE: -

- Apply locking agent (LOCTITE®) to the threads of the pickup coil rotor bolt.
- While holding the generator rotor ⑥ with the sheave holder ⑦, tighten the pickup coil rotor bolt.



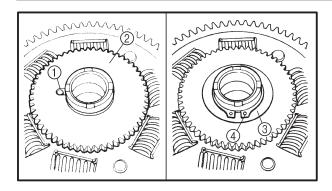


Sheave holder 90890-01701

2. Bend the lock washer tab along a flat side of the nut.

ENG

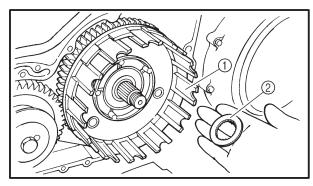




EAS00296

INSTALLING THE CLUTCH

- 1. Install:
 - dowel pin (1)
- oil pump drive gear 2
- plate ③
- circlip (4)

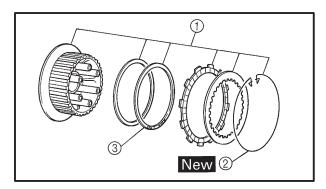


2. Install:

- clutch housing ①
- thrust washer (2)

NOTE:

- Lubricate the clutch housing bearings with engine oil.
- Make sure that the primary driven gear teeth and primary drive gear teeth mesh correctly.
- Make sure that the oil pump drive gear teeth and oil pump driven gear teeth mesh correctly.

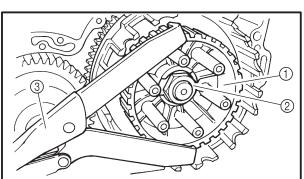


3. Install:

• clutch boss assembly (1)

NOTE

- If the wire circlip ② has been removed, carefully install a new one.
- Install the clutch damper spring ③ with the "OUTSIDE" mark facing out.



- 4. Install:
 - clutch boss (1)
 - lock washer New
 - clutch boss nut (2)

70 Nm (7.0m•kg)

NOTE:

While holding the clutch boss with the universal clutch holder ③, tighten the clutch boss nut.

ENG



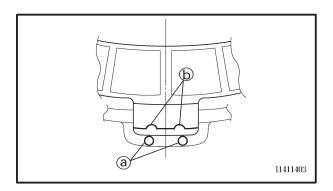


Clutch holding tool 90890-04066

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



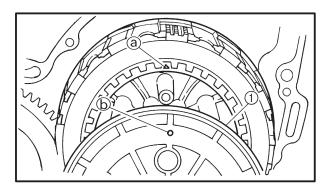
Recommended lubricant Engine oil



- 7. Install:
 - friction plates
 - clutch plates

NOTE: -

- First, install a friction plate and then alternate between a clutch plate and a friction plate.
- Align the two embossed mark (a) on the clutch housing with the two semicircular slots (b) in the friction plates.



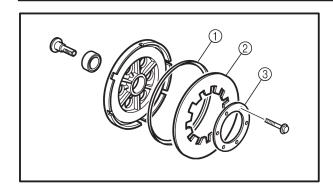
- 8. Install:
 - pressure plate 1

NOTE: —

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





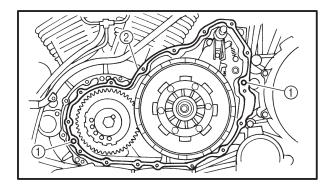


9. Install:

- clutch spring plate seat 1
- clutch spring plate ②
- clutch spring plate retainer 3

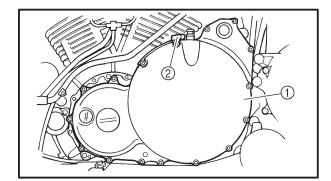
8 Nm (0.8 m•kg)

Tighten the clutch spring plate retainer bolts in stages and in a crisscross pattern.



10. Install:

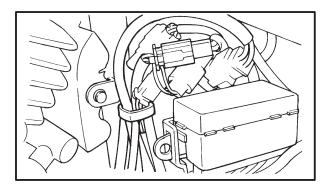
- dowel pins (1)
- clutch cover gasket 2 New



11. Install:

- clutch cover (1)
- clutch cable holder 2 X 10 Nm (1.0 m•kg)

Tighten the clutch cover bolts in stages and in a crisscross pattern.

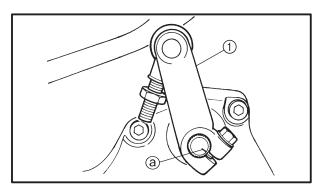


12. Connect:

pickup coil coupler

NOTE: -

Refer to "CABLE ROUTING" in chapter 2.



13. Install:

• shift arm (1)

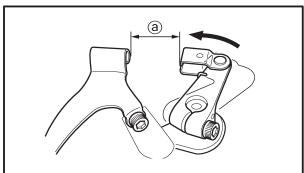
10 Nm (1.0 m•kg)

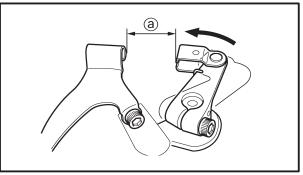
NOTE: -

Align the mark (a) in the shift shaft with the slot in the shift arm.









14. Install:

- pull lever spring
- pull lever

NOTE: -

If there is no free play in the clutch, install the pull lever to the pull lever shaft in order to get the distance a between the pull lever and clutch cable holder to 31.8 mm.

15. Connect:

• clutch cable (1)



oil tank

(with the specified amount of the recommended engine oil)

Refer to "CHANGING THE ENGINE OIL" in chapter 3.

17. Install:

- engine left side cover Refer to "ROCKER ARMS, PUSH RODS
 - AND VALVE LIFTERS".
- left side cover Refer to "SEATS AND SIDE COVERS" in chapter 3.
- 18. Adjust:
 - clutch cable free play Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.



SHIFT SHAFT

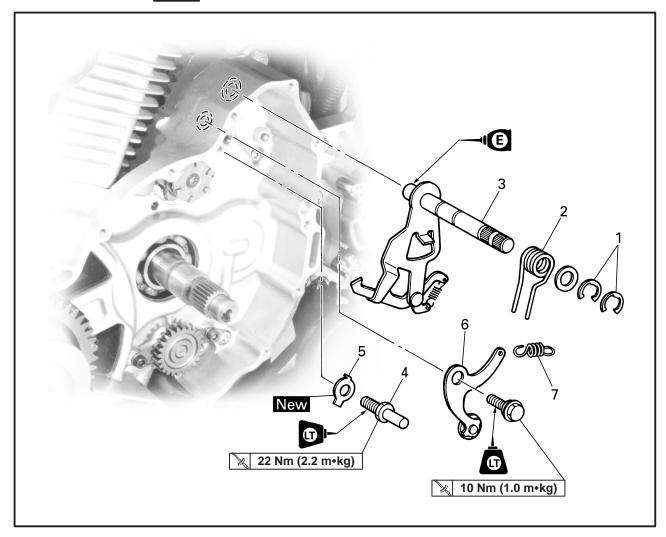
ENG



EAS00327

SHIFT SHAFT

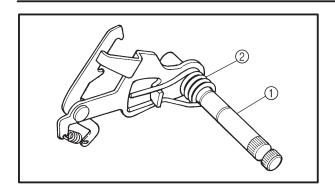




Order	Job/Part	Q'ty	Remarks
	Removing the shift shaft and stopper lever		Remove the parts in the order listed.
	Engine oil Clutch housing		Drain. Refer to "CLUTCH".
1	Circlip	2	
2	Shift shaft spring	1	
3	Shift shaft	1	
4	Shift shaft spring stopper	1	
5	Lock washer	1	
6	Stopper lever	1	
7	Stopper lever spring	1	
			For installation, reverse the removal procedure.

SHIFT SHAFT





EAS00328

CHECKING THE SHIFT SHAFT

- 1. Check:
 - shift shaft (1)

Bends/damage/wear → Replace.

shift lever spring ②
 Damage/wear → Replace.



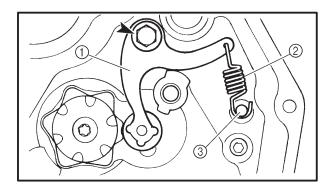
EAS00330

CHECKING THE STOPPER LEVER

- 1. Check:
 - stopper lever 1

Bends/damage → Replace.

Roller turns roughly \rightarrow Replace the stopper lever.



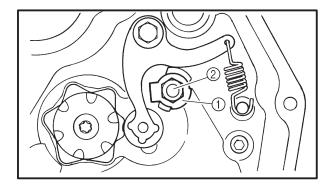
EAS00331

INSTALLING THE STOPPER LEVEL AND SHIFT SHAFT

- 1. Install:
- stopper lever (1)
- stopper lever spring 2

NOTE

- Apply locking agent (LOCTITE®) to the threads of stopper lever bolt.
- Install the ends of the stopper lever spring onto the stopper lever and the crankcase boss ③.
- Mesh the stopper lever with the shift drum segment assembly.



- 2. Install:
 - lock washer 1 New
 - shift shaft spring stopper (2)

22 Nm (2.2 m•kg)

NOTE: -

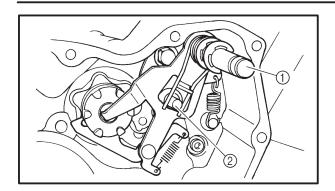
Apply locking agent (LOCTITE®) to the threads of shift shaft spring stopper.

3. Bend the lock washer tab along a flat side of the shift shaft spring stopper.

SHIFT SHAFT







4. Install:

- shift shaft spring
- circlips
- shift shaft 1

NOTE: -

Install the end of the shift shaft spring onto the shift shaft spring stopper ②.

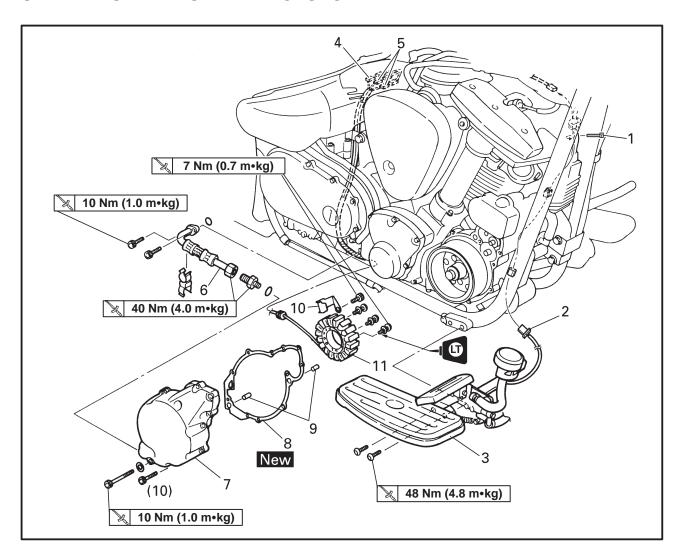
- 5. Install:
 - clutch housing Refer to "CLUTCH".
- 6. Fill:
 - oil tank

Refer to "CHANGING THE ENGINE OIL".

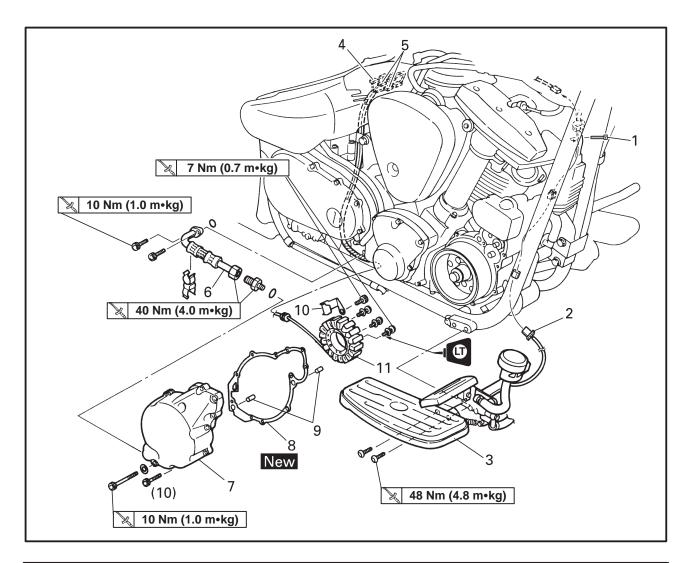
ENG

E 1 C 1 1 2 1

GENERATOR AND STARTER CLUTCH



Order	Job/Part	Q'ty	Remarks
	Removing the stator coil assembly Rider seat/left side cover/fuel tank		Remove the parts in the order listed. Refer to "SEATS AND SIDERS" and "FUEL TANK" in chapter 3.
	Muffler/exhaust pipes		Refer to "ENGINE".
	Engine oil		Drain.
1	Plastic locking tie	1	
2	Rear brake light switch coupler	1	Disconnect.
3	Rider footrest (right)	1	
4	Stator coil assembly coupler	1	Disconnect.
5	Decompression solenoid coupler	2	Disconnect.
6	Oil delivery pipe	1	
7	Generator cover	1	
8	Generator cover gasket	1	
9	Dowel pin	2	

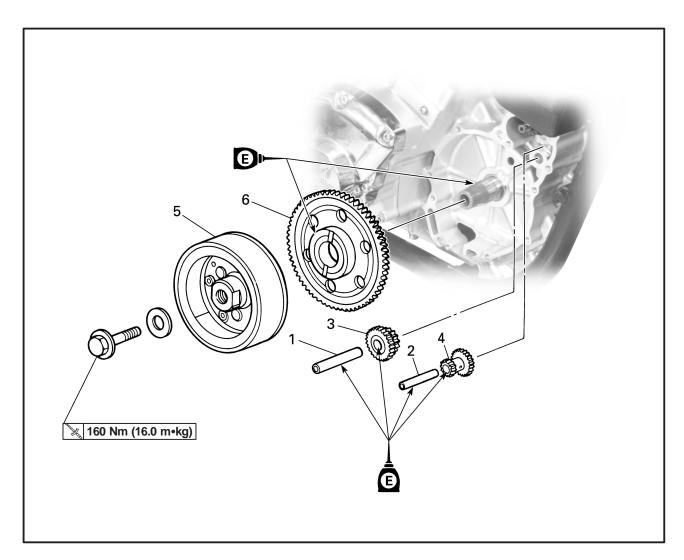


Order	Job/Part	Q'ty	Remarks
10 11	Stator coil assembly lead holder Stator coil assembly	1 1	For installation, reverse the removal procedure.

ENG



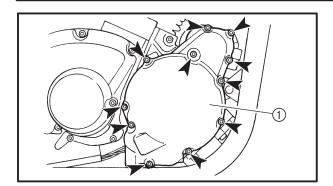
EAS00343

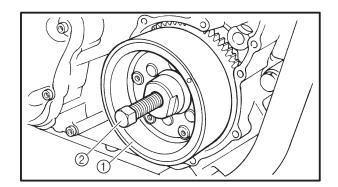


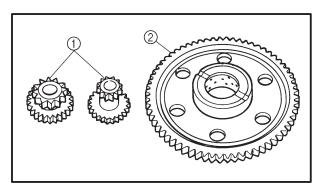
Order	Job/Part	Q'ty	Remarks
	Removing the generator rotor and starter clutch		Remove the parts in the order listed.
1	Starter clutch idle gear shaft #2	1	
2	Starter clutch idle gear shaft #1	1	
3	Starter clutch idle gear #2	1	
4	Starter clutch idle gear #1	1	
5	Generator rotor	1	
6	Starter clutch gear	1	
			For installation, reverse the removal procedure.

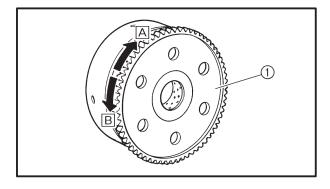
ENG











EAS00347

REMOVING THE GENERATOR

- 1. Remove:
- generator cover 1

NOTE: —

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

- 2. Remove:
 - generator rotor bolt 1
- washer

NOTE: -

While holding the generator rotor ② with the sheave holder ③, loosen the generator rotor bolt.



Sheave holder 90890-01701

- 3. Remove:
 - generator rotor ①
 (with the rotor puller ②)



Rotor puller 90890-01081

EAS00348

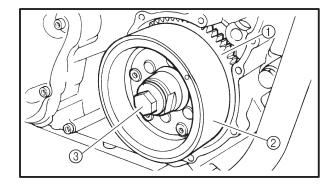
CHECKING THE STARTER CLUTCH

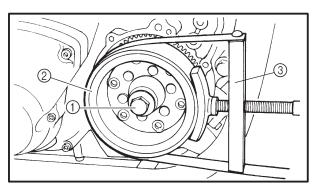
- 1. Check:
 - starter clutch idle gears 1
 - starter clutch gear ②
 Chips/pitting/roughness/wear → Replace the defective part (-s).
- 2. Check:
 - starter clutch operation
- a. Install the starter clutch gear ① onto the starter clutch and hold the starter clutch.
- b. When turning the starter clutch gear clockwise A, the starter clutch and the starter clutch gear should engage, otherwise the starter clutch is faulty and must be replaced.

ENG



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





EV8003E4

INSTALLING THE GENERATOR

- 1. Install:
 - starter clutch gear ①
 - generator rotor 2
 - washer
 - generator rotor bolt ③

NOTE: -

Clean the tapered portion of the crankshaft and the generator rotor hub.

- 2. Tighten:
 - generator rotor bolt 1

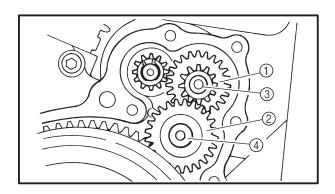
160 Nm (16.0 m•kg)

NOTE: -

While holding the generator rotor ② with the sheave holder ③, tighten the generator rotor bolt.



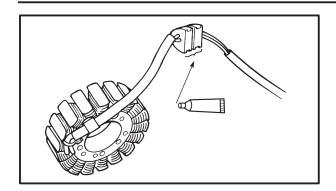
Sheave holder 90890-01701



- 3. Install:
 - starter clutch idle gear #1 1
 - starter clutch idle gear #2 (2)
 - starter clutch idle gear shaft #1 ③
 - starter clutch idle gear shaft #2 4



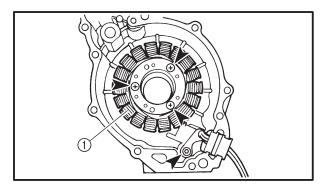




- 4. Apply:
 - sealant (onto the stator coil assembly lead grommet)



Yamaha bond No.1215 90890-85505



- 5. Install:
 - stator coil assembly 1

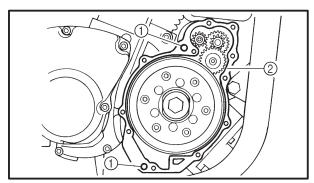
7 Nm (0.7 m•kg)

• stator coil assembly lead holder

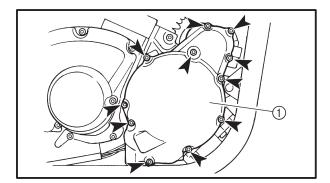
7 Nm (0.7 m•kg)

NOTE: _

Apply locking agent (LOCTITE $^{\tiny{(\! B)}}\!)$ to the threads of the stator coil assembly bolts.

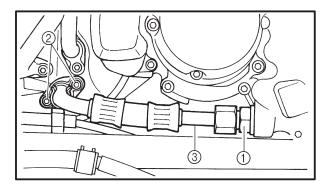


- 6. Install:
 - dowel pins (1)
 - generator cover gasket 2 New



- 7. Install:
- generator cover 1

10 Nm (1.0 m•kg)



- 8. Install:
 - oil delivery pipe joint ①
 - bolts 2
 - oil delivery pipe (3)

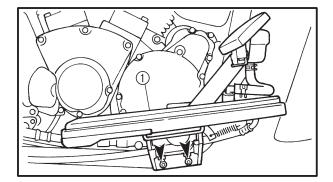
 40 Nm (4.0 m•kg) 10 Nm (1.0 m•kg) 40 Nm (4.0 m•kg)



- 9. Connect:
 - decompression solenoid couplers
 - stator coil assembly coupler

NOTE: -

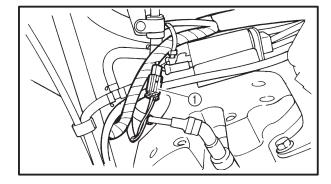
Refer to "CABLE ROUTING" in chapter 2.



10. Install:

• rider footrest (right) 1

48 Nm (4.8 m•kg)

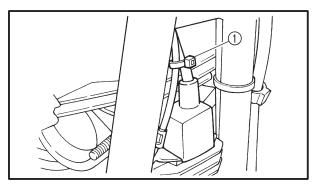


11. Connect:

• rear brake light switch coupler 1

NOTE:

Refer to "CABLE ROUTING" in chapter 2.



12. Install:

• plastic locking tie 1

NOTE:

Fasten the rear brake light switch lead and wire harness.

13. Fill:

• oil tank

(with the specified amount of the recommended engine oil)

Refer to "CHANGING THE ENGINE OIL" in chapter 3.

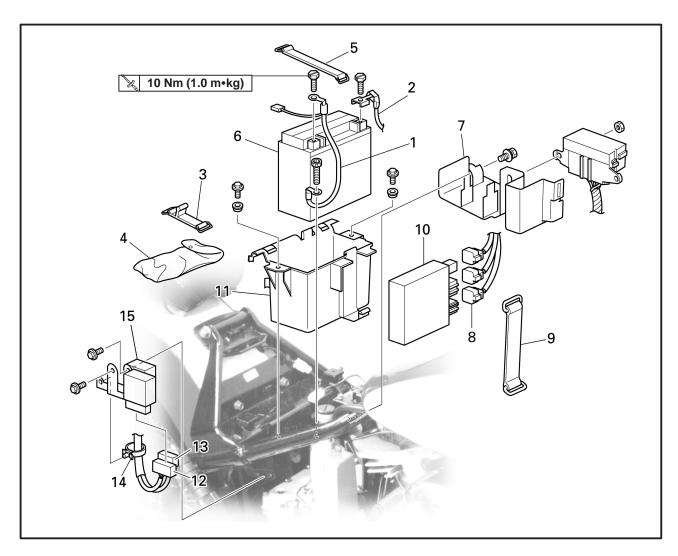
ENG

- 14. Install:
 - exhaust pipes
 - muffler Refer to "ENGINE".

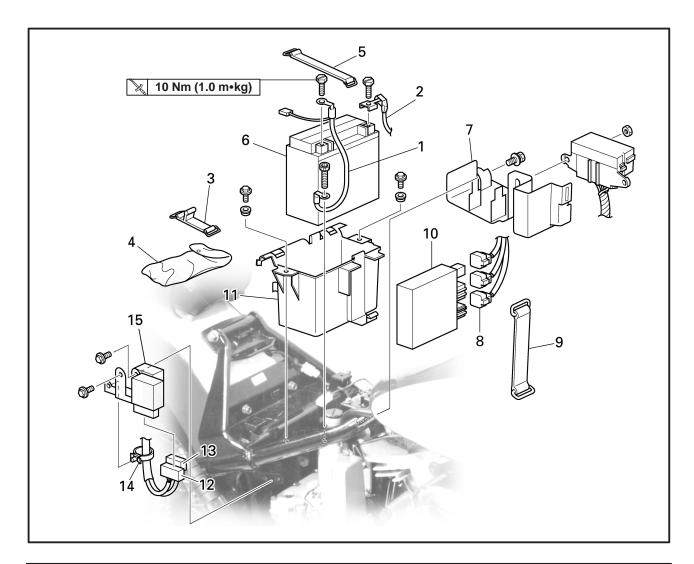
15. Install:

- fuel tank
- left side cover
- rider seat
 Refer to "FUEL TANK" and "SEATS AND SIDE COVERS" in chapter 3.



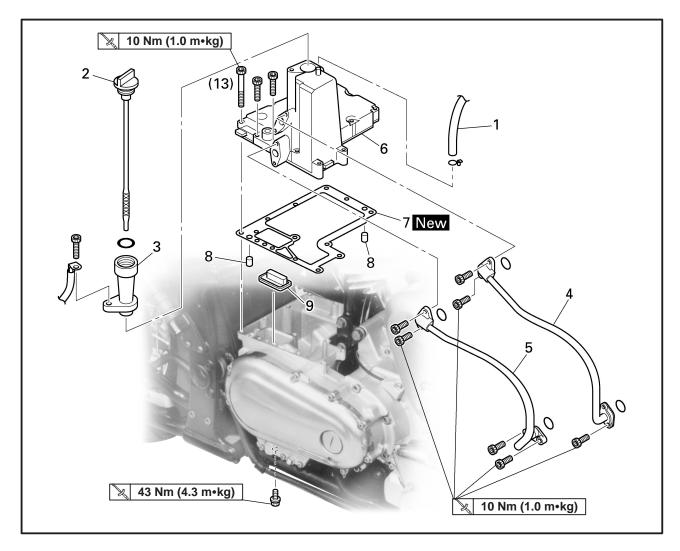


Order	Job/Part	Q'ty	Remarks
	Removing the battery box Rider seat/sider covers		Remove the parts in the order listed. Refer to "SEATS AND SIDE COVERS" in chapter 3.
1	Negative battery lead	1	
2	Positive battery lead	1	Disconnect.
3	Tool kit holder	1	
4	Tool kit	1	
5	Battery holder	1	
6	Battery	1	
7	Plastic bracket	1	
8	Ignitor unit coupler	3	Disconnect.
9	Ignitor unit holder	1	

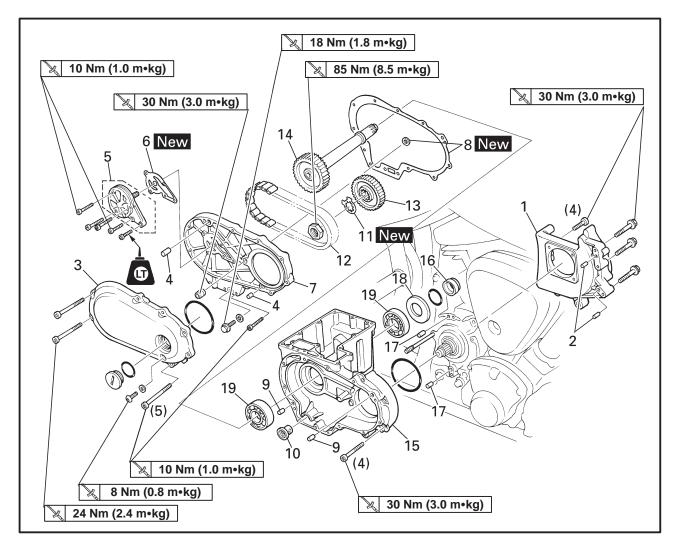


Order	Job/Part	Q'ty	Remarks
10 11 12 13 14 15	Ignitor unit Battery box Relay unit coupler Turn signal relay coupler Plastic clamp Relay bracket	1 1 1 1 1	Disconnect. Disconnect. For installation, reverse the removal procedure.

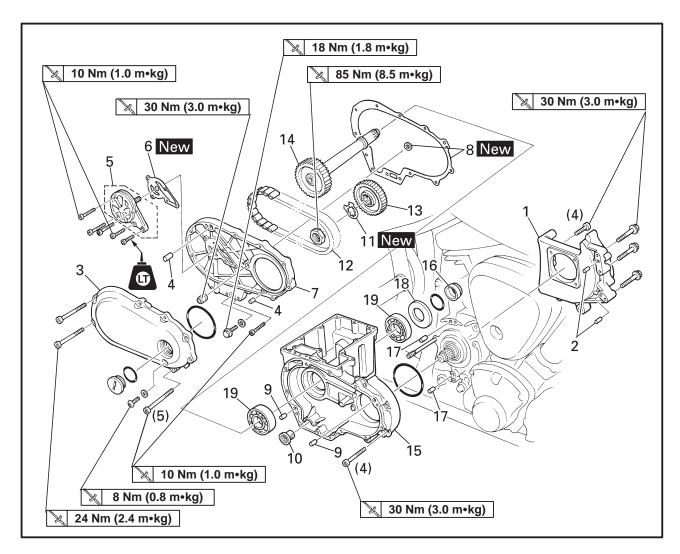




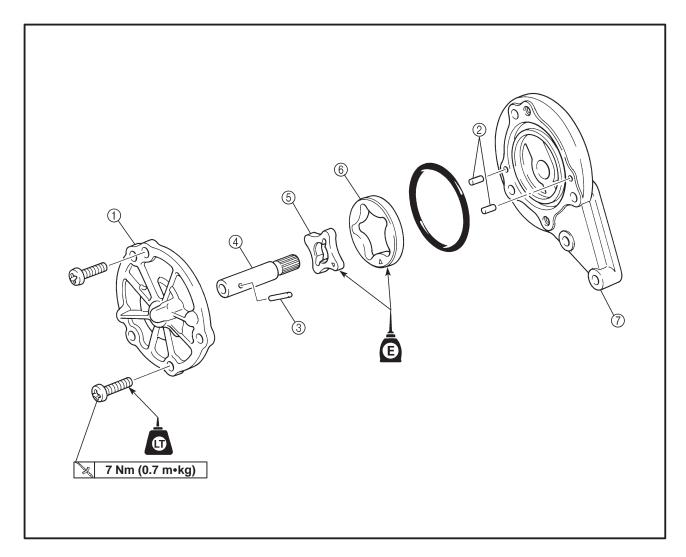
Order	Job/Part	Q'ty	Remarks
1 2 3 4 5 6 7 8	Removing the oil tank cover Muffler/exhaust pipes Engine oil Oil tank breather hose Dipstick Dipstick joint Oil pipe #1 Oil pipe #2 Oil tank cover Oil tank cover gasket Dowel pin Oil strainer	1 1 1 1 1 1 1 2	Remove the parts in the order listed. Refer to "ENGINE". Drain. Disconnect. For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Removing the transfer gear case Transfer gear oil Drive sprocket		Remove the parts in the order listed. Drain. Refer to "DRIVE BELT AND DRIVE SPROCKET" in chapter 4.
1 2 3 4	Drive sprocket case Dowel pin Cover Dowel pin	1 2 1 2	
5 6 7 8 9	Transfer gear oil pump Transfer gear oil pump gasket Transfer gear case cover Transfer gear case cover gasket Dowel pin	1 1 1 1 2	
10	Oil strainer	1	



Order	Job/Part	Q'ty	Remarks
11	Lock washer	1	
12	Primary chain	1	
13	Middle drive gear	1	
14	Middle driven shaft	1	
15	Transfer gear case	1	
16	Spacer	1	
17	Dowel pin	2	
18	Oil seal	1	
19	Bearing	2	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the transfer gear case oil pump		Remove the parts in the order listed.
1 2 3 4 5 6 7	Oil pump cover	1	
(2)	Pin	2	
3	Pin	1	
4	Oil pump shaft	1	
(5)	Oil pump inner rotor	1	
<u>6</u>	Oil pump outer rotor	1	
(7)	Oil pump housing	1	
			For assembly, reverse the disassembly procedure.

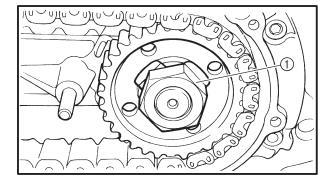


REMOVING THE BATTERY

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

A WARNING

First, disconnect the negative battery lead, then the positive battery lead.



REMOVING THE MIDDLE DRIVEN SHAFT

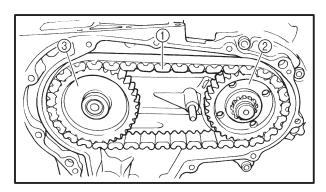
NOTE: -

Loosen the middle drive gear nut before remove the drive sprocket.

- 1. Straighten the lock washer tab.
- 2. Loosen:
 - middle drive gear nut 1

NOTE: -

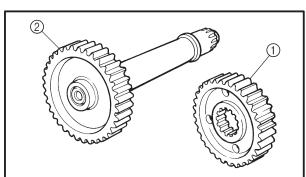
When loosening the middle drive gear nut, press down on the brake pedal so the middle drive gear does not move.



- 3. Remove:
 - primary chain ①
 - middle drive gear 2
 - middle driven shaft ③

NOTE: -

Remove the primary chain, middle drive gear and middle driven shaft at the same time.

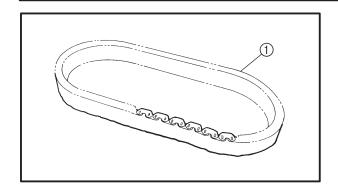


CHECKING THE MIDDLE DRIVE

- 1. Check:
 - middle drive gear 1
 - middle driven gear ②
 Damage/wear → Replace the middle drive gear, middle driven shaft and primary chain as a set.



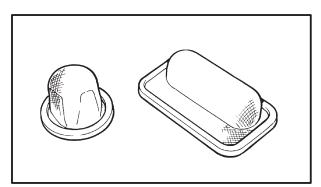




2. Check:

• primary chain 1

Damage/stiffness → Replace the primary chain, middle drive gear and middle driven shaft as a set.

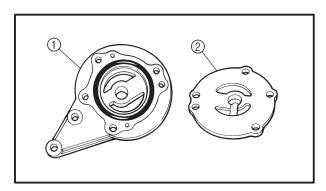


CHECKING THE OIL STRAINER

- 1. Check:
 - oil strainer

Damage → Replace.

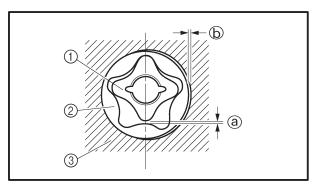
Contaminants → Clean with engine oil.



CHECKING THE OIL PUMP

- 1. Check:
 - oil pump housing ①
 - oil pump cover ②

Cracks/damage/wear \rightarrow Replace the defective part(-s).



2. Measure:

- inner rotor-to-outer rotor tip clearance (a)
- outer rotor-to-oil pump housing clearance (b)
 Out of specification → Replace the oil pump.
- 1 Inner rotor
- 2 Outer rotor
- (3) Oil pump housing



Inner rotor-to-outer rotor tip clearance

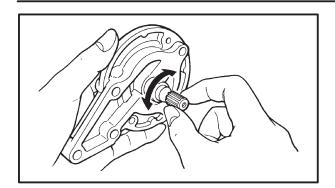
 $0.07 \sim 0.12 \text{ mm}$

Outer rotor-to-oil pump housing clearance

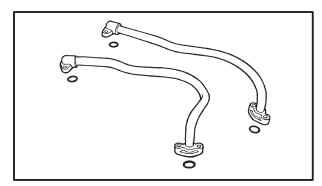
 $0.03 \sim 0.08 \text{ mm}$







- 3. Check:
 - oil pump operation
 Unsmooth → Repair or replace the defective part(-s).



CHECKING THE OIL PIPE

- 1. Check:
 - oil pipe
 Damage → Replace.

EAS00375

ASSEMBLING THE OIL PUMP

- 1. Lubricate:
 - inner rotor
 - outer rotor
- oil pump shaft (with the recommended lubricant)



Recommended lubricant Engine oil

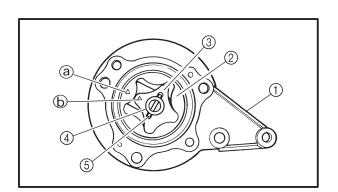


- oil pump housing 1
- oil pump outer rotor 2
- oil pump inner rotor ③
- oil pump shaft 4
- pin (5)

NOTE: -

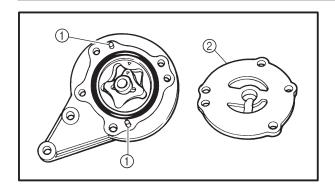
• When installing the oil pump shaft, align the pin in the oil pump shaft with the groove in the oil pump inner rotor.

• Align the arrow (a) on the pump outer rotor with the arrow (b) on the oil pump inner rotor.









3. Install:

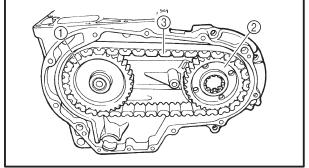
- pins (1)
- oil pump cover ②

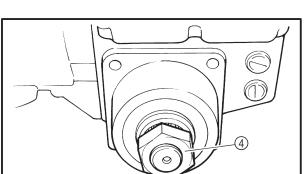
7 Nm (0.7 m•kg)

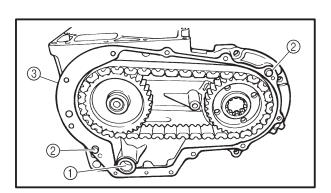
NOTE: -

Apply locking agent (LOCTITE®) to the threads of the oil pump cover screws.

- 4. Check:
 - oil pump operation Refer to "CHECKING THE OIL PUMP".







INSTALLING THE TRANSFER GEAR CASE

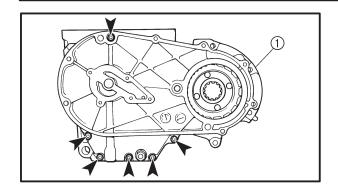
- 1. Install:
 - bearings
 - oil seal
- 2. Install:
 - middle driven shaft 1
 - middle drive gear 2
 - primary chain ③
 - (into the transfer gear case)
 - O-ring
 - spacer
 - drive sprocket nut 4

- Install the middle driven shaft, middle drive gear and primary chain at the same time.
- Temporarily install the drive sprocket nut onto the middle driven shaft.
- 3. Install:
 - oil strainer (1)
 - dowel pins 2
 - transfer gear case cover gasket 3 New





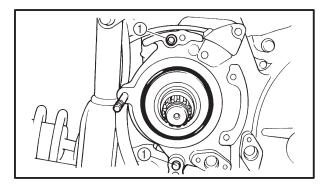




4. Install:

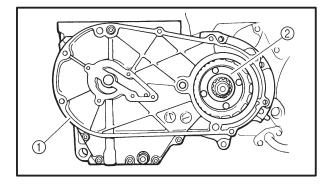
• transfer gear case cover ①

10 Nm (1.0 m•kg)



5. Install:

• dowel pins ①



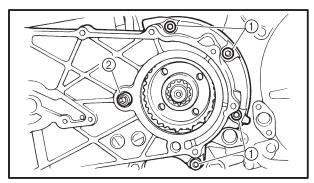
6 Install:

• transfer gear case assembly 1

NOTE:

• While installing the middle drive gear ② onto the drive axle, install the transfer gear case assembly onto the engine.

• Align the splines on the middle gear with the splines on the drive axle.



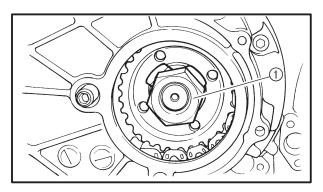
7. Install:

• transfer gear case bolts 1

30 Nm (3.0 m•kg)

• Nut 2

30 Nm (3.0 m•kg)



8. Install:

lock washer New

• middle drive gear nut 1

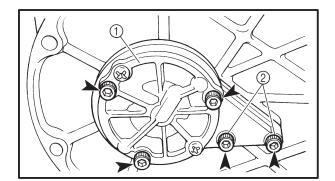
85 Nm (8.5 m•kg)

9. Bend the lock washer tab along a flat side of the nut.

ENG



- 10. Remove:
 - drive sprocket nut



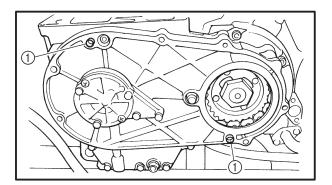


- transfer gear oil pump gasket New
- transfer gear oil pump 1

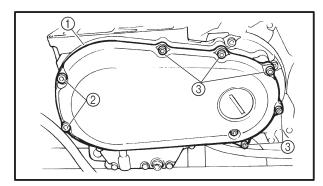
10 Nm (1.0 m•kg)

NOTE: -

Apply locking agent (LOCTITE®) only to the threads of the transfer gear oil pump bolts (M6 \times 25 mm) bolts ②.



- 12. Install:
 - dowel pins ①

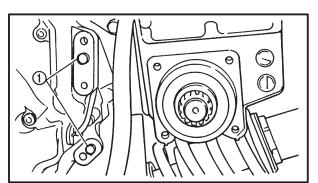


- 13. Install:
 - cover (1)
 - cover bolts (M8) 2

24 Nm (2.4 m•kg)

• cover bolts (M6) ③

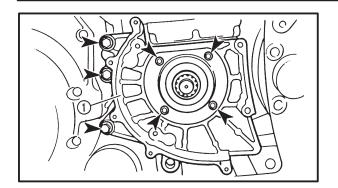
10 Nm (1.0 m•kg)



- 14. Install:
- dowel pins 1

TRANSFER GEAR CASE





15. Install:

• drive sprocket case 1

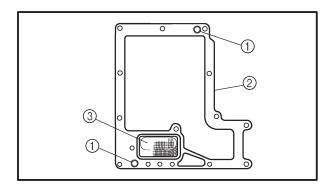
30 Nm (3.0 m•kg)

16. Install:

 drive sprocket
 Refer to "DRIVE BELT AND DRIVE SPROCKET" in chapter 4.

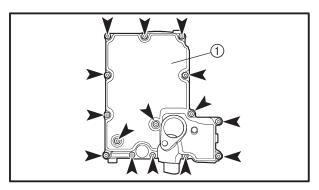
17. Fill:

transfer gear case
 (with the specified amount of the recommended transfer gear oil)
 Refer to "CHANGING THE TRANSFER GEAR OIL" in chapter 3.

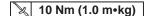


INSTALLING THE OIL TANK COVER

- 1. Install:
 - dowel pins 1
 - oil tank cover gasket 2 New
 - oil strainer ③



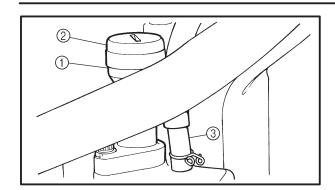
- 2. Install:
 - oil tank cover (1)



TRANSFER GEAR CASE







3. Install:

- dipstick joint ①
- dipstick 2

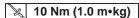
NOTE: —

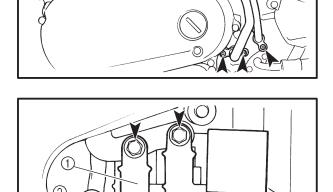
Finger tighten the dipstick joint bolt.

- 4. Connect:
 - oil tank breather hose ③



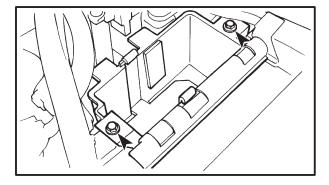
• oil pipes ①



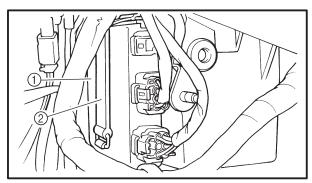


INSTALLING THE BATTERY

- 1. Install:
 - relay bracket (1)
 - plastic clamp ②
- 2. Connect:
 - turn signal relay coupler
 - relay unit coupler



- 3. Install:
 - battery box

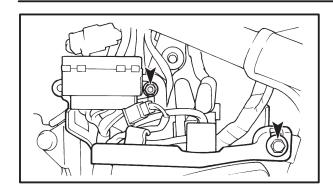


- 4. Install:
 - ignitor unit (1)
 - ignitor unit holder 2
- 5. Connect:
 - ignitor unit couplers

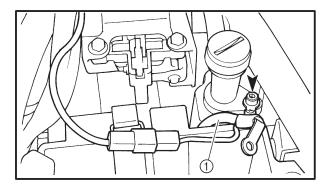
TRANSFER GEAR CASE



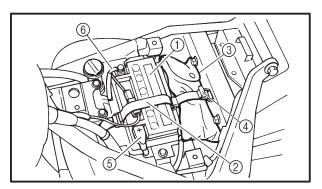




- 6. Install:
 - plastic bracket



- 7. Install:
 - Negative battery lead ①
 (to the dipstick joint)



- 8. Install:
 - battery 1
 - battery holder ②
 - tool kit ③
 - tool kit holder 4
- 9. Connect:
 - battery leads (to the battery terminals)

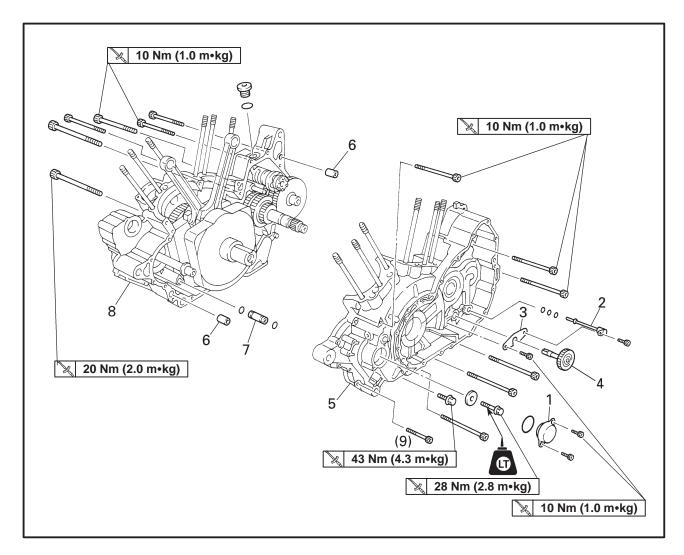
CAUTION:

First, connect the positive battery lead 5, then the negative battery lead 6.

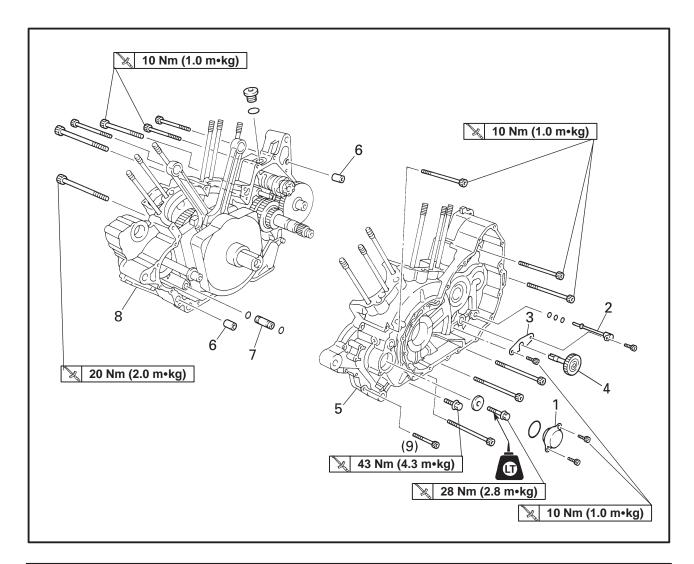
- 10. Check:
 - battery terminals



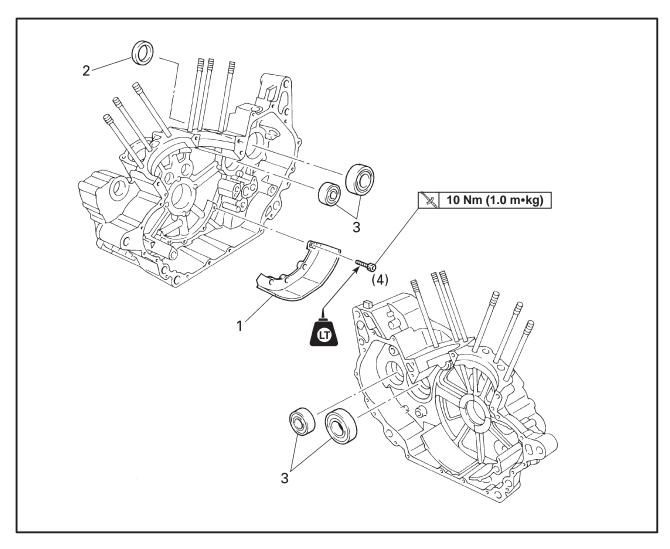
CRANKCASE



Order	Job/Part	Q'ty	Remarks
	Separating the crankcase Engine Camshaft Piston Shift shaft Generator rotor		Remove the parts in the order listed. Refer to "ENGINE". Refer to "CAMSHAFTS". Refer to "CYLINDERS AND PISTONS". Refer to "SHIFT SHAFT". Refer to "GENERATOR AND STARTER CLUTCH".
1 2 3	Generator shaft end cover Oil delivery pipe Engine oil pump driven gear stopper	1 1 1	



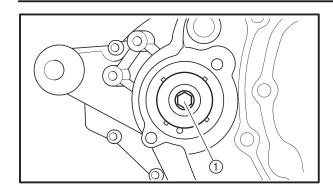
Order	Job/Part	Q'ty	Remarks
4	Engine oil pump driven gear	1	For installation, reverse the removal procedure.
5	Left crankcase	1	
6	Dowel	2	
7	Joint pipe	1	
8	Right crankcase	1	

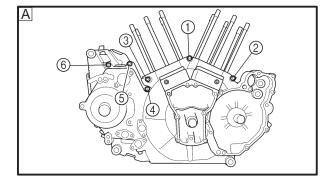


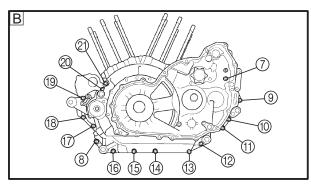
Order	Job/Part	Q'ty	Remarks
1 2	Removing the buffle plate and bearings Crankshaft Transmission Buffle plate Oil seal	1 1	Remove the parts in the order listed. Refer to "CRANKSHAFT". Refer to "TRANSMISSION".
3	Bearing	4	Installation, reverse the removal procedure.

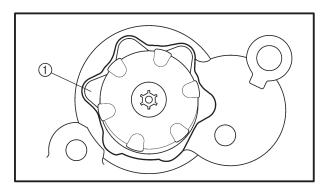












EAS00386

DISASSEMBLING THE CRANKCASE

NOTE:

Loosen the generator shaft bolt before remove the generator rotor.

1. Remove:

• generator shaft bolt 1

NOTE:

While the holding the generator rotor ② with the sheave holder ③, loosen the generator shaft bolt.



Sheave holder 90890-01701

2. Remove:

crankcase bolts

NOTE

• Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

- Loosen the bolts in decreasing numerical order (refer to the numbers in the illustration).
- A Right crankcase
- B Left crankcase

 $M8 \times 100 \text{ mm bolts: } (1), (2)$

 $M8 \times 80 \text{ mm bolts: } 3$

 $M6 \times 105$ mm bolts: 21

 $M6 \times 85 \text{ mm bolts: } 9, 13$

 $M6 \times 75 \text{ mm bolts: } \boxed{4}, \boxed{5}$

M6 \times 60 mm bolts: $\textcircled{4} \sim \textcircled{7}$

M6 \times 40 mm bolts: 8, 10 \sim 12, 16 \sim 20

3. Turn:

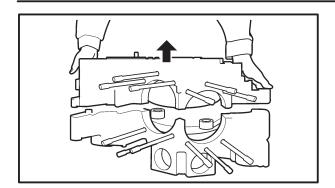
• shift drum segment

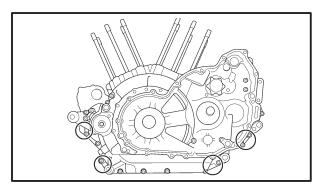
NOTE: -

Turn the shift drum segment ① to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase separation.









4. Remove:

right crankcase

CAUTION:

- First check that the shift drum segment's teeth then remove the right crankcase.
- 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.

EAS00399

CHECKING THE CRANKCASE

- Thoroughly wash the crankcase halves in a mild solvent.
- 2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- 3. Check:
 - crankcase

 $Cracks/damage \rightarrow Replace.$

• oil delivery passages

 $Obstruction \rightarrow Blow\ out\ with\ compressed\ air.$

EAS0040

CHECKING THE BEARINGS AND OIL SEAL

- 1. Check:
 - bearings

Clean and lubricate the bearings, then rotate the inner race with your finger.

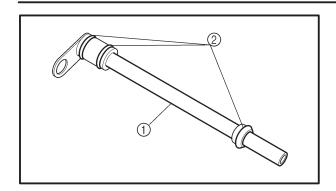
Rough movement → Replace.

- 2. Check:
 - oil seal

Damage/wear → Replace.

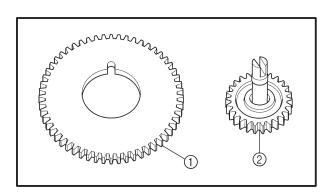






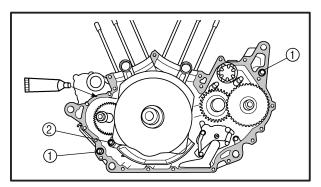
CHECKING THE OIL DELIVERY PIPE

- 1. Check:
 - oil delivery pipe ①
 Damage → Replace.
 Obstruction → Wash and blow out with compressed air.
 - O-rings 2
 - Damage/wear → Replace.



CHECKING THE ENGINE OIL PUMP DRIVE

- 1. Check:
 - oil pump drive gear 1
 - oil pump drive gear ②
 Chips/pitting/roughness/wear → Replace the defective part(-s).



EAS00416

ASSEMBLING THE CRANKCASE

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

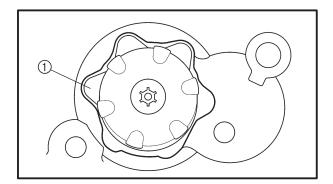


Yamaha bond No.1215 90890-85505

NOTE: -

Do not allow any sealant to come into contact with the oil gallery.

- 2. Install:
 - dowel pins 1
 - joint pipe 2



- 3. Install:
 - left crankcase

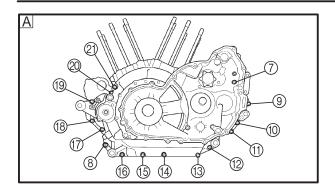
 (onto the right crankcase)

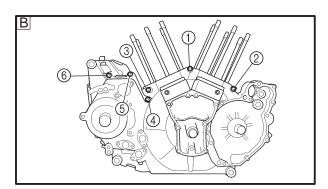
NOTE: -

- Turn the shift drum segment ① to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase installation.
- Tap lightly on the left crankcase with a softface hammer.









4. Install:

crankcase bolts

NOTE: _

- Lubricate the bolt threads with engine oil.
- Tighten each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
- Tighten the bolts in numerical order (refer to the numbers in the illustration).

A Left crankcase

B Right crankcase

 $M8 \times 100$ mm bolts: (1), (2)

 $M8 \times 80 \text{ mm bolts: } 3$

 $M6 \times 105$ mm bolts: 21)

 $M6 \times 85 \text{ mm bolts: } 9, 13$

 $M6 \times 75$ mm bolts: (14), (15)

M6 \times 60 mm bolts: $\textcircled{4} \sim \textcircled{7}$

M6 \times 40 mm bolts: (8), (10 \sim (12), (16 \sim (20)



Bolt ① ~ ③

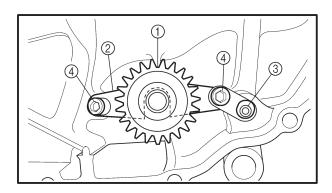
24 Nm (2.4 m•kg)

Bolt 4 ~ 21

10 Nm (1.0 m•kg)

5. Check:

 crankshaft and transmission operation Rough movement → Repair.



- 6. Install:
 - engine oil pump driven gear 1
 - engine oil pump driven gear stopper 2
 - oil delivery pipe ③
 - bolts 4

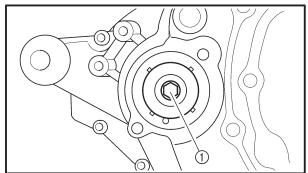
10 Nm (1.0 m•kg)

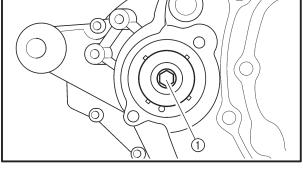
7. Install:

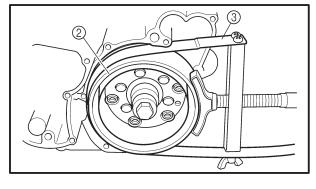
•generator rotor
Refer to "GENERATOR AND STARTER
CLUTCH".

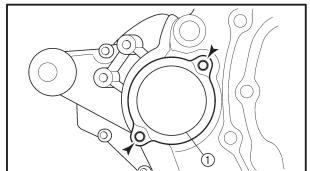












8. Install:

- washer
- generator shaft bolt 1

28 Nm (2.8 m•kg)

NOTE: -

- Apply locking agent (LOCTITE®) to the threads of the generator shaft bolt.
- While holding the generator rotor 2 with the sheave holder 3, tighten the generator shaft bolt.



Sheave holder 90890-01701

9. Install:

• generator shaft end cover 1

10. Install:

- shift shaft
- clutch

Refer to "SHIFT SHAFT" and "CLUTCH".

- pistons
- cylinders

Refer to "CYLINDERS AND PISTONS".

camshaft

Refer to "CAMSHAFTS".

cylinder head

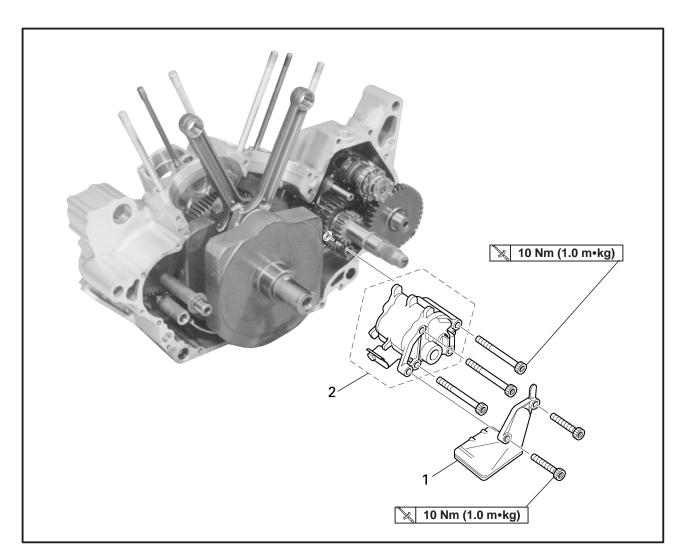
Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".

- 11. Install:
 - engine

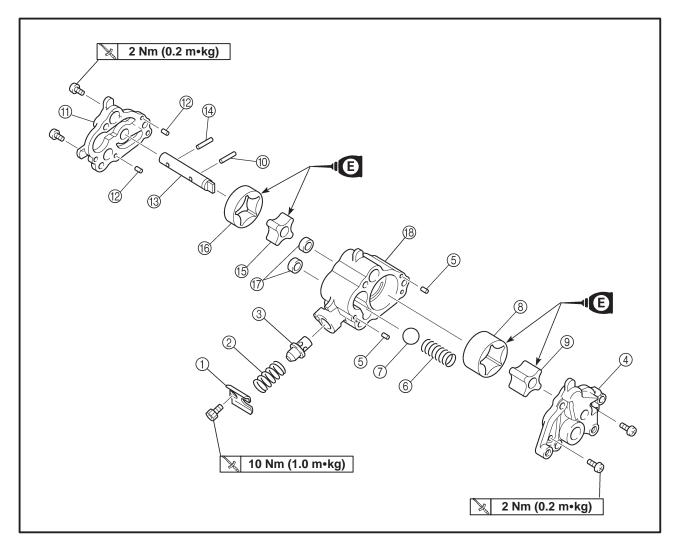
Refer to "ENGINE".



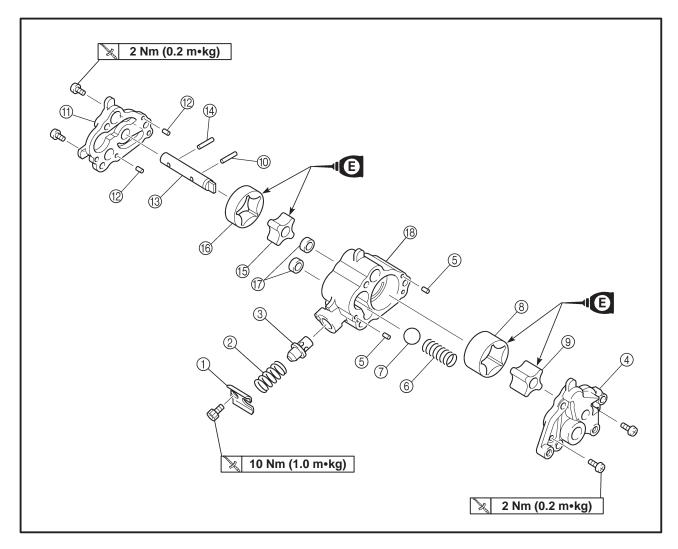
ENGINE OIL PUMP



Order	Job/Part	Q'ty	Remarks
	Removing the engine oil pump Crankcase		Remove the parts in the order listed. Separate. Refer to "CRANKCASE".
1 2	Oil strainer Engine oil pump assembly	1	Installation, reverse the removal
			procedure.



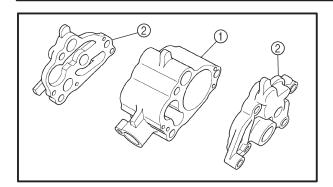
Order	Job/Part	Q'ty	Remarks
1 2 3 4 5 6 7 8 9 0	Disassembling the engine oil pump Spring retainer Spring Relief valve Oil pump housing cover 1 Pin Spring Ball Oil pump outer rotor 1 Oil pump inner rotor 1 Pin	1 1 1 1 2 1 1 1 1	Remove the parts in the order listed.



Order	Job/Part	Q'ty	Remarks
(1) (2) (3) (4) (5) (6) (7) (8)	Oil pump housing cover 2 Pin Oil pump shaft Pin Oil pump inner rotor 2 Oil pump outer rotor 2 Oil seal Oil pump housing	1 2 1 1 1 1 2	For assembly, reverse the disassembly procedure.

ENG

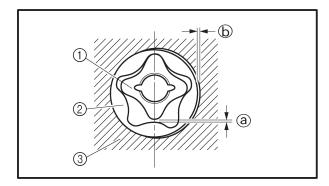




EAS00363

CHECKING THE OIL PUMP

- 1. Check:
 - oil pump housing 1
 - oil pump housing covers ②
 Cracks/damage/wear → Replace the defective part(-s).



2. Measure:

- inner rotor-to-outer rotor tip clearance (a)
- outer rotor-to-oil pump housing clearance (b)
 Out of specification → Replace the oil pump.
- 1 Inner rotor
- (2) Outer rotor
- 3 Oil pump housing



Inner rotor-to-outer rotor tip clearance

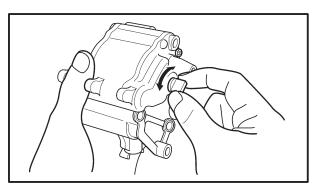
 $0 \sim 0.12 \text{ mm}$

Outer rotor-to-oil pump housing clearance (feed pump)

 $0.03 \sim 0.08 \text{ mm}$

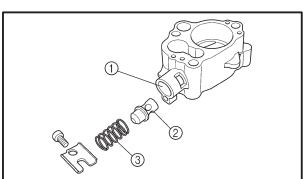
Outer rotor-to-oil pump housing clearance (scavenging pump)

0.06 ~ 0.11 mm



3. Check:

oil pump operation
 Rough movement → Repeat steps (1)
 and (2) or replace the defective part(-s).



EAS00365

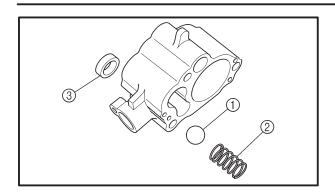
CHECKING THE RELIEF VALVE

- 1. Check:
 - relief valve body 1
 - relief valve 2
 - spring (3)

Damage/wear \rightarrow Replace the defective part(-s).



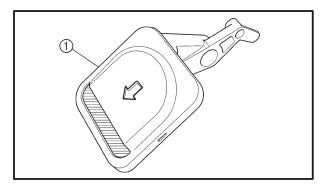




2. Check:

- ball (1)
- spring 2
- oil seal ③

Damage/wear \rightarrow Replace the defective part(-s).



EAS00368

CHECKING THE OIL STRAINER

- 1. Check:
 - oil strainer (1)

Damage → Replace.

Contaminants → Clean with engine oil.

EAS00374

ASSEMBLING THE OIL PUMP

- 1. Lubricate:
 - inner rotor
 - outer rotor
 - oil pump shaft

(with the recommended lubricant)



Recommended lubricant Engine oil



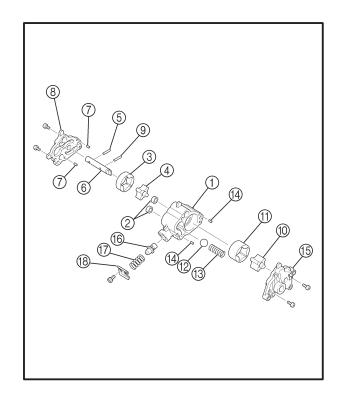
- oil pump housing 1
- oil seals (2)
- oil pump outer rotor 2 3
- oil pump inner rotor 2 4
- pin (5)
- oil pump shaft 6
- pins (7)
- oil pump housing cover 2 (8)

2 Nm (0.2 m•kg)

- pin (9)
- oil pump inner rotor 1 10
- oil pump inner rotor 1 11
- ball (12)
- spring 13
- pins (14)
- oil pump housing cover 1 (15)

2 Nm (0.2 m•kg)

• relief valve 16



ENG

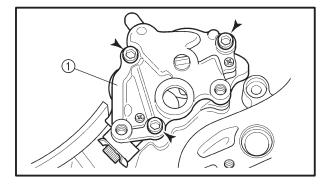
- spring 17
- spring retainer 18

10 Nm (1.0 m•kg)

NOTE: -

When installing the inner rotor, align the pin in the oil pump shaft with the groove in the inner rotor.

- 3. Check:
 - oil pump operation Refer to "CHECKING THE OIL PUMP".

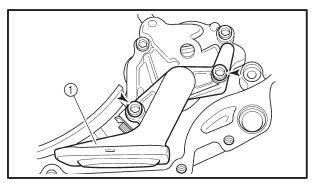


EAS00376

INSTALLING THE OIL PUMP

- 1. Install:
 - oil pump ①

10 Nm (1.0 m•kg)



EAS00378

INSTALLING THE OIL STRAINER

- 1. Install:
 - oil strainer 1

10 Nm (1.0 m•kg)

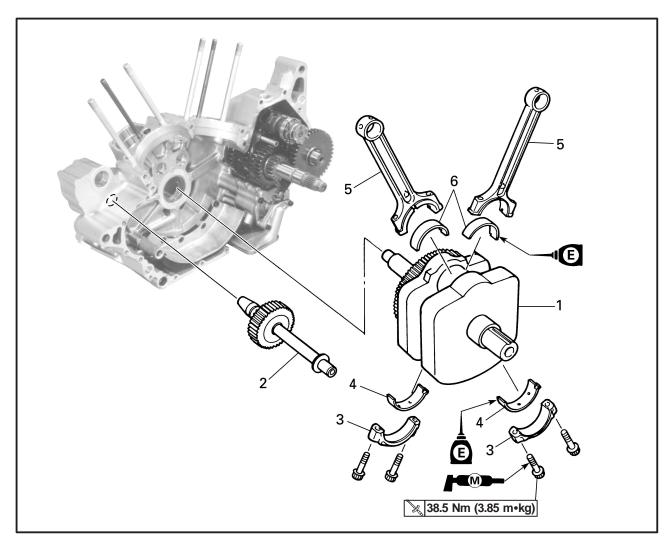
NOTE:

The arrow (a) on the oil strainer cover must point towards the rear of the engine.





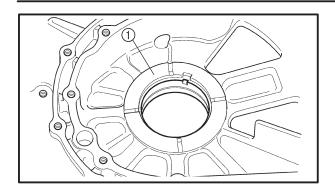
CRANKSHAFT AND CONNECTING RODS

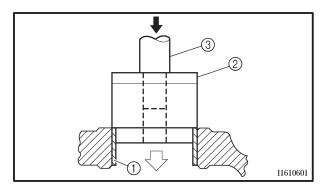


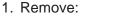
Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft and connecting rods		Remove the parts in the order listed.
	Crank case		Separate.
			Refer to "CRANKCASE".
1	Crankshaft	1	
2	Generator shaft	1	
3	Connecting rod cap	2	
4	Big end lower bearing	2	
5	Connecting rod	2	
6	Big end upper bearing	2	
			Installation, reverse the removal procedure.

ENG









• crankshaft journal bearings ①

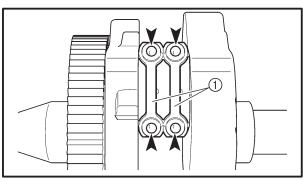
REMOVING THE CRANKSHAFT

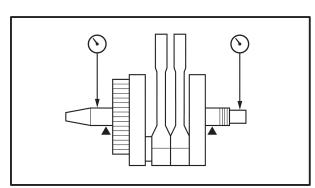
NOTF-

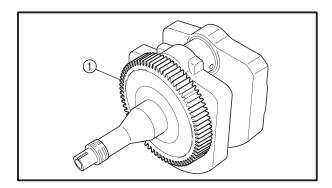
Remove the crankshaft journal bearing with the bearing remover and installer ② and bearing driver ③.



Bearing remover and installer 90890-04095 Bearing driver 90890-04058







EAS00391

REMOVING THE CONNECTING RODS

- 1. Remove:
 - connecting rod caps ①
- connecting rods
- big end bearings

NOTF-

Identify the position of each big end bearing so that it can be reinstalled in its original place.

EAS00398

CHECKING THE CRANKSHAFT AND CONNECTING RODS

- 1. Measure:
 - crankshaft runout
 Out of specification → Replace the crankshaft.



Maximum crankshaft runout 0.04 mm

- 2. Check:
 - crankshaft journal surfaces
 - crankshaft pin surfaces
 - bearing surfaces
 Scratches/wear → Replace the crankshaft and bearings.
 - Generator shaft drive gear ①
 Damage/wear → Replace the crankshaft.

ENG



- 3. Measure:
- crankshaft pin-to-big end bearing clearance
 Out of specification → Replace the big end bearings.



Crankshaft pin-to-big end bearing clearance

0.037 ~ 0.074 mm <Limit>: 0.09 mm

The following procedure applies to all of the connecting rods.

CAUTION:

Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft pin-to-big end bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.

- a. Clean the big end bearings, crankshaft pins, and the inside of the connecting rod halves.
- b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

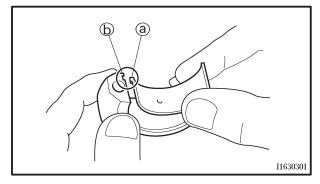
NOTE:

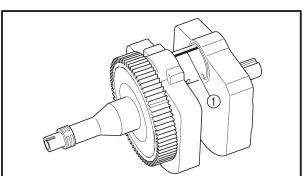
Align the projections ⓐ on the big end bearings with the notches ⓑ in the connecting rod and connecting rod cap.

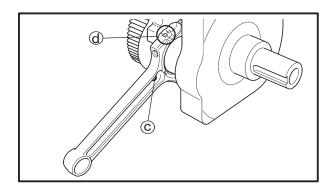
- c. Put a piece of Plastigauge[®] ① on the crankshaft pin.
- d. Assemble the connecting rod halves.

NOTE

- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Lubricate the bolt threads and seats with molybdenum disulfide grease.
- Make sure the projection © on the connecting rod faces towards the left side of the crankshaft.
- Make sure the characters (d) on both the connecting rod and connecting rod cap are aligned.







ENG

e. Tighten the connecting rod bolts.

	•	П	ᆫ	П		м	
C	Δ				()		E
	$\boldsymbol{\neg}$				U		г

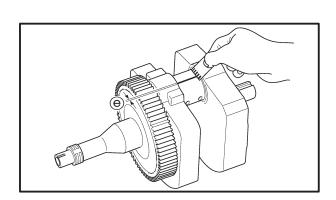
- When tightening the connecting rod bolts, be sure to use an F-type torque wrench.
- Without pausing, tighten the connecting rod bolts to the specified torque. Apply continuous torque between 3.3 and 4.0 m•kg. Once you reach 3.3 m•kg, DO NOT STOP TIGHTENING until the specified torque is reached. If the tightening is interrupted between 3.3 and 4.0 m•kg, loosen the connecting rod bolts to less than 3.3 m•kg and start again.

Refer to "INSTALLING THE CONNECTING RODS".



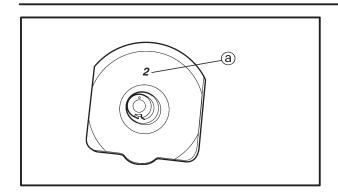
Connecting rod bolt 38.5 Nm (3.85 m•kg)

- f. Remove the connecting rod and big end bearings.
 Refer to "REMOVING THE CONNECTING
 - Refer to "REMOVING THE CONNECTING RODS".
- g. Measure the compressed Plastigauge[®] width [®] on each crankshaft pin.
 If the crankshaft pin-to-big end bearing clearance is out of specification, select replacement big end bearings.



ENG



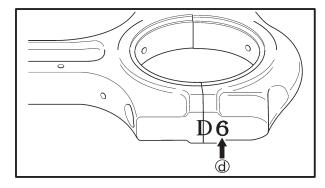


4. Select:

big end bearings (P₁ ~ P₂)

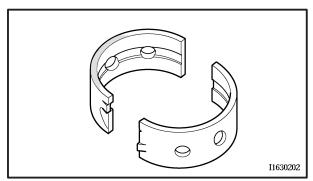
NOTE: _

- The numbers ⓐ stamped into the crankshaft web and the numbers ⓑ on the connecting rods are used to determine the replacement big end bearing sizes.
- "P₁" ~ "P₂" refer to the bearings shown in the crankshaft illustration.

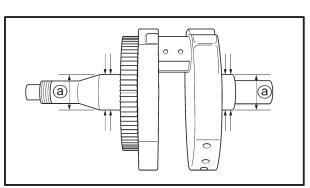


For example, if the connecting rod "P₁" and the crankshaft web "P₁" numbers are "6" and "2" respectively, then the bearing size for "P₁" is:

"
$$P_1$$
" (connecting rod) – " P_1 " (crankshaft web) = 6 – 2 = 4 (green)



BIG END BEARIN	BIG END BEARING COLOR CODE				
1	blue				
2	black				
3	brown				
4 green					
5	yellow				



5. Measure:

crankshaft journal diameter (a)
 Out of specification → Replace the crankshaft.



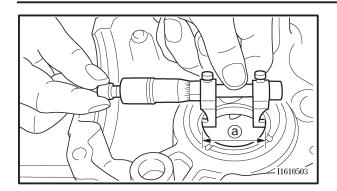
Crankshaft journal diameter 49.968 ~ 49.980 mm

NOTE: _

Measure the diameter of each crankshaft journal at two places.







6. Measure:

• crankshaft journal bearing inside diameter (a)

Out of specification \rightarrow Replace the crankcase assembly.



Crankshaft journal bearing inside diameter

50.01 ~ 50.03 mm

NOTE: -

Measure the inside diameter of each crankshaft bearing at two places.

7. Calculate:

 crankshaft journal-to-crankshaft journal bearing clearance

Out of specification \rightarrow Replace the crankshaft and crankshaft journal bearings as a set.

NOTE: —

Calculate the clearance by subtracting the crankshaft journal diameter from the crankshaft journal bearing inside diameter.



Crankshaft journal-to-crankshaft Journal bearing clearance $0.030 \sim 0.062 \text{ mm}$

INSTALLING THE CONNECTING RODS

- 1. Lubricate:
 - bolt threads and seats
 (with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide grease

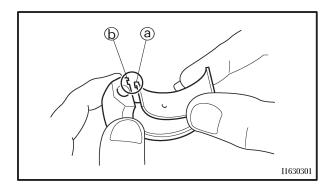
ENG

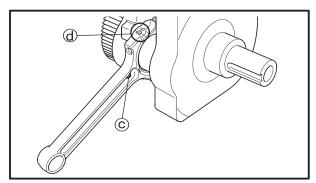


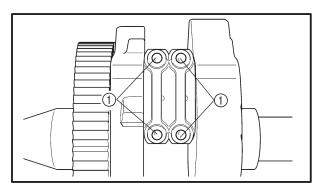
- 2. Lubricate:
 - crankshaft pins
 - big end bearings
 - connecting rod inner surface (with the recommended lubricant)



Recommended lubricant Engine oil







- 3. Install:
 - big end bearings
 - connecting rods
 - connecting rod caps (onto the crankshaft pins)

NOTE:

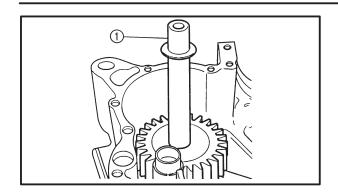
- Align the projections (a) on the big end bearings with the notches (b) in the connecting rods and connecting rod caps.
- Be sure to reinstall each big end bearing in its original place.
- Make sure the projection © on the connecting rods face towards the left side of the crankshaft.
- Make sure the characters (d) on both the connecting rod and connecting rod cap are aligned.
- 4. Tighten: connecting rod bolt ①

¾ 40 Nm (4.0 m•kg)

CAUTION:

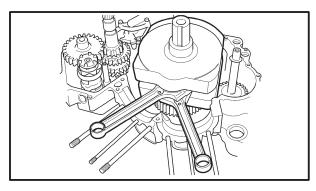
- When tightening the connecting rod bolts, be sure to use an F-type torque wrench.
- Without pausing, tighten the connecting rod bolts to the specified torque. Apply continuous torque between 3.3 and 4.0 m•kg. Once you reach 3.3 m•kg, DO NOT STOP TIGHTENING until the specified torque is reached. If the tightening is interrupted between 3.3 and 4.0 m•kg, loosen the connecting rod bolts to less than 3.3 m•kg and start again.





INSTALLING THE CRANKSHAFT

- 1. Install:
 - generator shaft ①



2. Install:

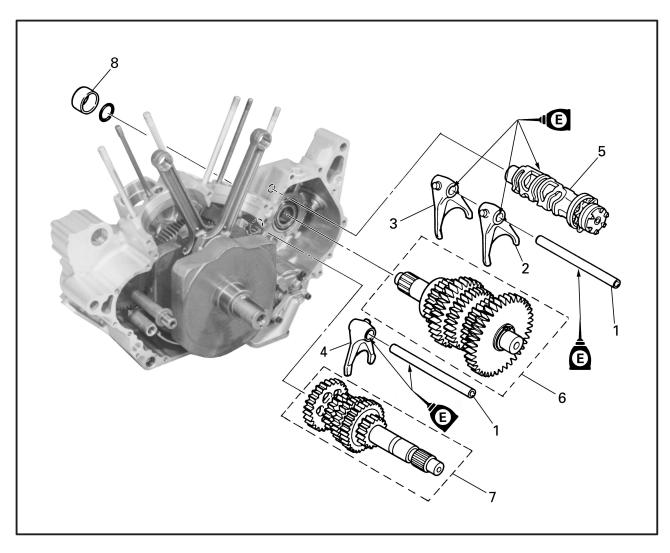
crankshaft

NOTE: -

- Make sure that the generator shaft drive gear teeth and generator shaft driven gear teeth mesh correctly.
- Align the right connecting rod with the front cylinder sleeve hole.

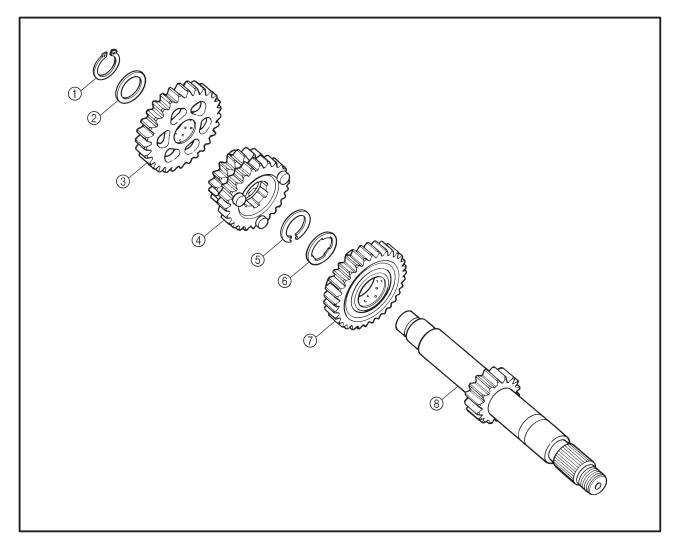


TRANSMISSION



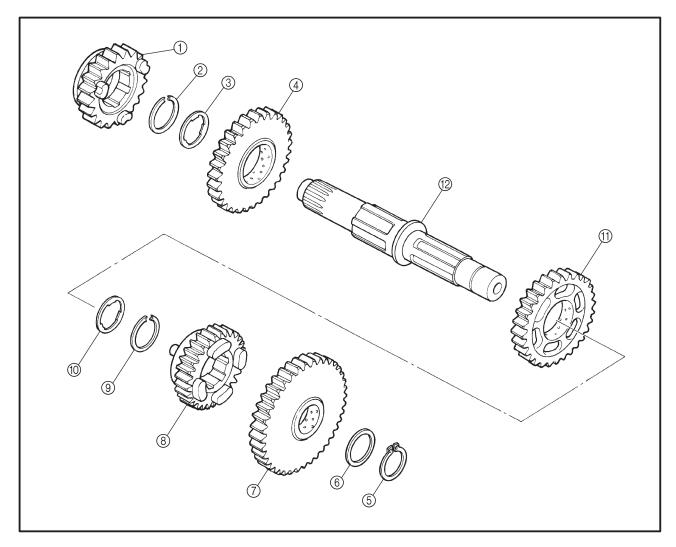
Order	Job/Part	Q'ty	Remarks
	Removing the shift forks, shift drum assembly and transmission		Remove the parts in the order listed.
	Crankcase		Separate. Refer to "CRANKCASE".
1	Shift fork guide bar	2	
2	Shift fork "L"	1	
3	Shift fork "R"	1	
4	Shift fork "C"	1	
5	Shift drum assembly	1	
6	Drive axle assembly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





Order	Job/Part	Q'ty	Remarks
1 2 3 4 5 6 7 8	Disassembling the main axle assembly Circrip Washer 5th pinion gear 2nd/3rd pinion gear Circlip Washer 4th pinion gear Main axle/1st pinion gear	1 1 1 1 1 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.

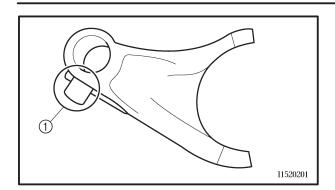




Order	Job/Part	Q'ty	Remarks
1234567899112	Disassembling the drive axle assembly 5th wheel gear Circlip Washer 2nd wheel gear Circlip Washer 1st wheel gear 4th wheel gear Circlip Washer 3rd wheel gear Drive axle	1 1 1 1 1 1 1 1 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.





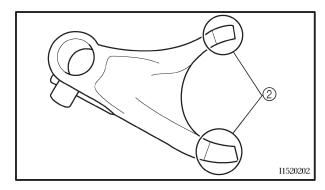


EAS00421

CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

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



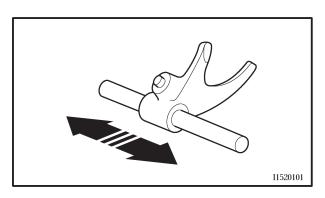


shift fork guide bar
 Roll the shift fork guide bar on a flat surface.
 Bends → Replace.



A WARNING

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



3. Check:

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



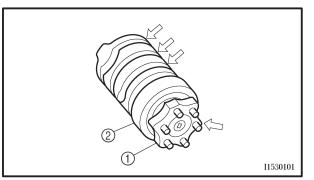


- 1. Check:
 - shift drum grooves

 Damage/scratches/wear

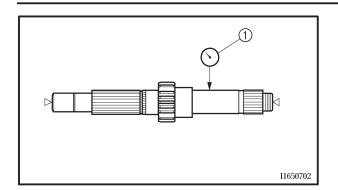
Damage/scratches/wear \rightarrow Replace the shift drum assembly.

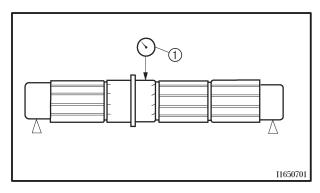
- shift drum segment ①
 Damage/wear → Replace the shift drum assembly.
- shift drum bearing ②
 Damage/pitting → Replace the shift drum assembly.

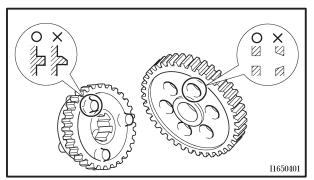














CHECKING THE TRANSMISSION

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



Maximum main axle runout 0.08 mm

2. Measure:

 drive axle runout (with a centering device and dial gauge 1) Out of specification -> Replace the drive axle.



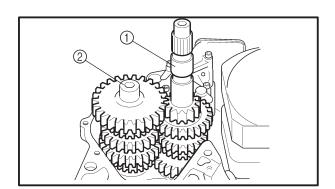
Maximum drive axle runout 0.08 mm

3. Check:

- transmission gears Blue discoloration/pitting/wear → Replace the defective gear(-s).
- transmission gear dogs Cracks/damage/rounded edges → Replace the defective gear(-s).
- 4. Check:
 - transmission gear engagement (each pinion gear to its respective wheel gear)

Incorrect → Reassemble the transmission axle assemblies.

- 5. Check:
 - transmission gear movement Rough movement → Replace the defective part(-s).
- 6. Check:
 - circlips Bends/damage/looseness → Replace.

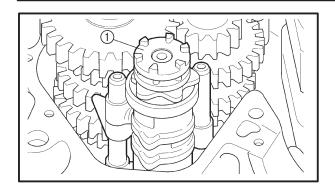


INSTALLING THE TRANSMISSION, SHIFT **DRUM ASSEMBLY AND SHIFT FORKS**

- 1. Install:
 - main axle assembly 1
 - drive axle assembly ②
 - O-ring
- spacer





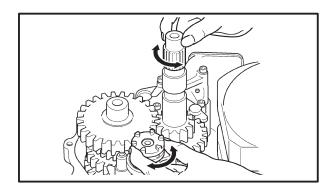


2. Install:

- shift drum assembly 1
- shift fork "R"
- shift fork "C"
- shift fork "L"
- shift fork guide bars

NOTE: -

The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".



3. Check:

transmission Rough movement → Repair.

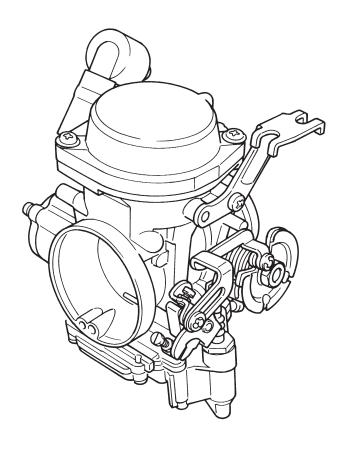
NOTE: -

Oil each gear, shaft, and bearing thoroughly.





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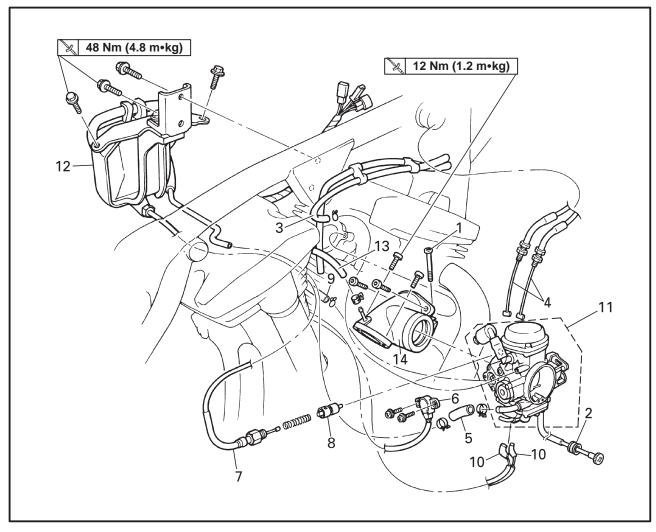
CARBURETOR



EASS0480

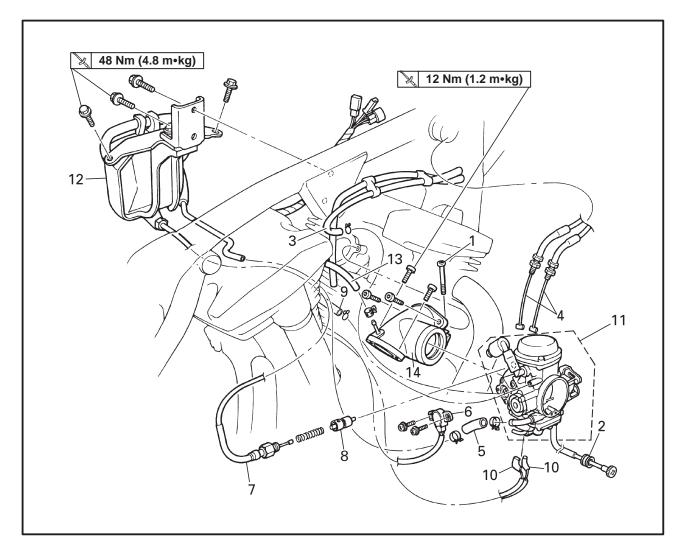
CARBURETOR

CARBURETOR



Order	Job/Part	Q'ty	Remarks
	Removing the carburetor		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS AND SIDE COVERS" in
	Fuel tank		chapter 3. Refer to "FUEL TANK" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Fuel (from the carburetor)		Drain.
1	Carburetor joint clamp screw	1	Loosen.
2	Throttle stop screw	1	Unhook.
3	Vacuum chamber breather hose	1	Disconnect.
	(carburetor to solenoid valve hose)		
4	Throttle cable	2	Disconnect.
5	Fuel hose	1	
6	Throttle position sensor	1	
7	Starter cable	1	Disconnect.
8	Starter plunger	1	

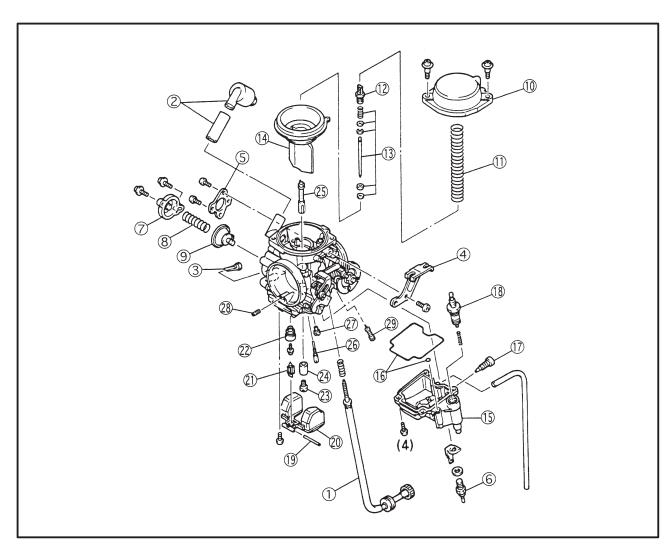
CARBURETOR



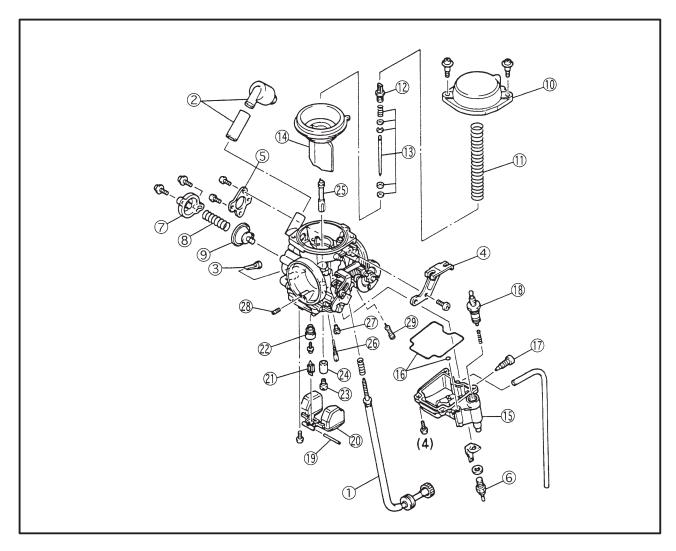
Order	Job/Part	Q'ty	Remarks
9	Charcoal canister hose (carburetor to charcoal canister)	1	Disconnect.
10	Carburetor heater connector	2	Disconnect.
11	Carburetor	1	
12	Fuel pump bracket assembly (with fuel pump)	1	
13	Vacuum hose	1	Disconnect.
14	Carburetor joint	1	
	-		For installation, reverse the removal procedure.



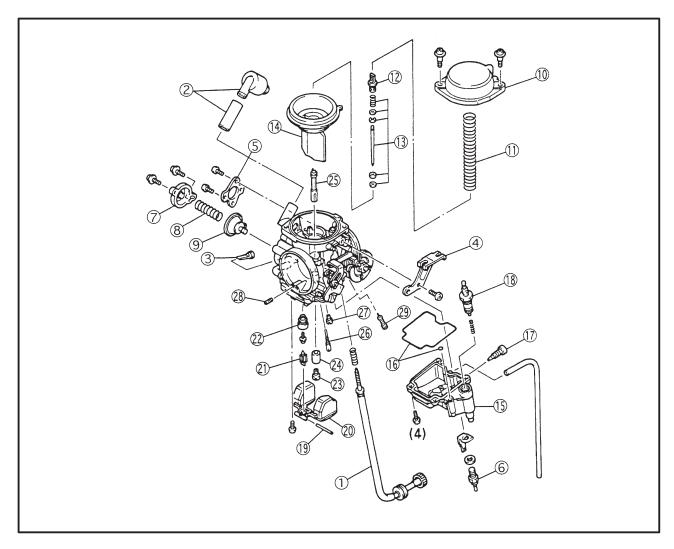
EAS00483



Order	Job/Part	Q'ty	Remarks
123456789	Disassembling the carburetor Throttle stop screw Vacuum chamber air vent hose Fuel strainer Throttle cable holder Throttle position sensor bracket Carburetor heater Coasting enricher cover Coasting enricher spring Coasting enricher	1 1 1 1 1 1 1 1	Remove the parts in the order listed.



Order	Job/Part	Q'ty	Remarks
10 (1) (12 (13) (14) (15) (16) (17)	Vacuum chamber cover Piston valve spring Jet needle holder Jet needle kit Piston valve Float chamber Float chamber rubber gasket Drain bolt	1 1 1 1 1 1 1 1	remains
18 19	Accelerator plunger Float pivot pin	1 1	



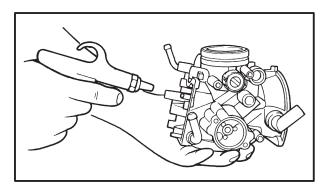
Order	Job/Part	Q'ty	Remarks
20 Color	Float Needle valve Needle valve seat Main jet Spacer Needle jet Pilot jet Starter jet Pilot air jet Pilot screw	1 1 1 1 1 1 1 1 1	Remarks
			For assembly, reverse the disassembly procedure.



EAS00485

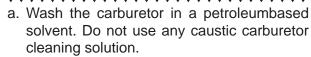
CHECKING THE CARBURETOR

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

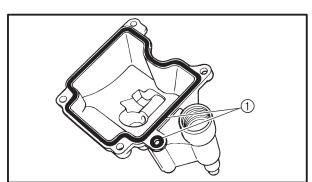




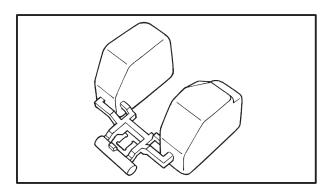
fuel passages
 Obstruction → Clean.



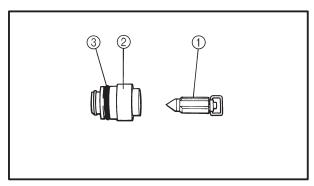
b. Blow out all of the passages and jets with compressed air.



- 3. Check:
 - float chamber body Dirt → Clean.
- 4. Check:
 - •float chamber rubber gasket ①
 Cracks/damage/wear → Replace.

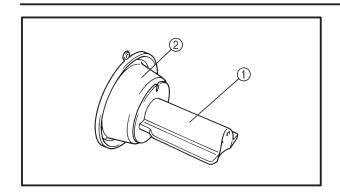


- 5. Check:
 - float
 Damage → Replace.



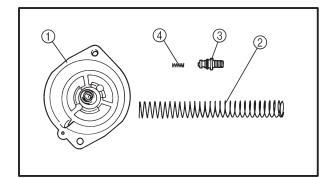
- 6. Check:
 - needle valve (1)
 - needle valve seat ②
 Damage/obstruction/wear → Replace the needle valve, needle valve seat and O-ring as a set.
- 7. Check:
 - O-ring ③
 Damage/wear → Replace the needle valve, needle valve seat and O-ring as a set.





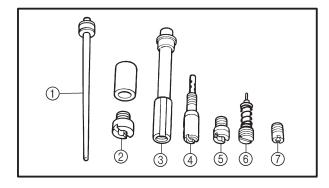
8. Check:

- piston valve 1
- Damage/scratches/wear → Replace.
- piston valve diaphragm ②
 Cracks/tears → Replace.



9. Check:

- vacuum chamber cover (1)
- piston valve spring 2
- jet needle holder ③
- jet needle spring ④
 Cracks/damage → Replace.



10. Check:

- jet needle kit (1)
- main jet 2
- needle jet ③
- pilot jet 4
- starter jet ⑤
- pilot screw 6
- pilot air jet (7)

Bends/damage/wear → Replace.

Obstruction \rightarrow Clean.

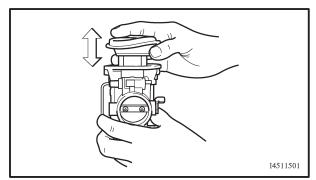
Blow out the jets with compressed air.



piston valve movement

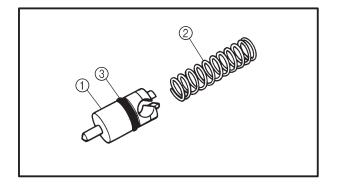
Insert the piston valve into the carburetor body and move it up and down.

Tightness \rightarrow Replace the piston valve.

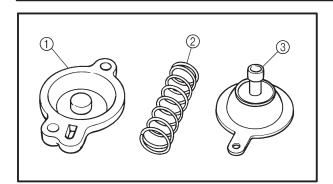


12. Check:

- starter plunger ①
- starter plunger spring ②
 Bends/cracks/damage → Replace.
- O-ring ③
 Damage/wear → Replace.

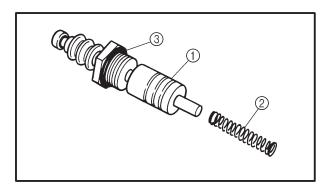






13. Check:

- coasting enricher cover 1
- coasting enricher spring ②
 Cracks/damage → Replace.
- coasting enricher ③
 Cracks/tears/damage → Replace.



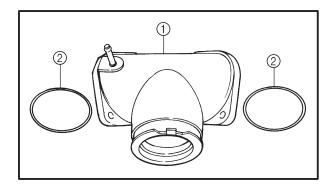
14. Check:

- accelerator plunger (1)
- accelerator plunger spring ②
 Bends/cracks/damage → Replace.
- O-ring ③
 Damage/wear → Replace.

15. Check:

 fuel hose Cracks/damage/wear → Replace. Obstruction → Clean.

Blow out the hoses with compressed air.



CHECKING THE CARBURETOR JOINT

- 1. Check:
 - carburetor joint ①
 Cracks/damage → Replace.
 - O-rings ②
 Damage/wear → Replace the O-ring.

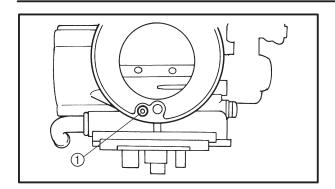
EAS0048887

ASSEMBLING THE CARBURETOR

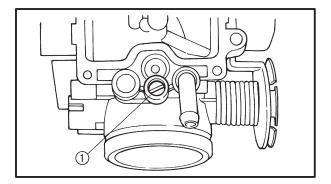
CAUTION:

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





- 1. Install:
 - pilot air jet ①

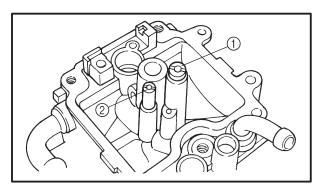


- 2. Install:
 - pilot screw ①

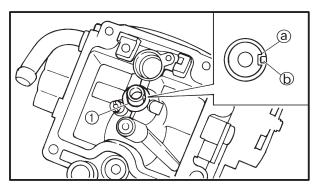


Pilot screw setting

2 - 1/2 turns out



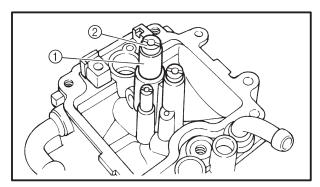
- 3. Install:
 - starter jet ①
 - pilot jet 2



- 4. Install:
 - needle jet ①

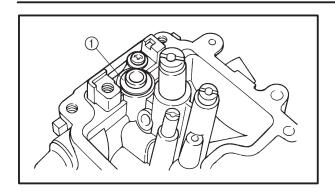
NOTE:

Align the slot ⓐ on the needle jet with the projection ⓑ on the carburetor body.

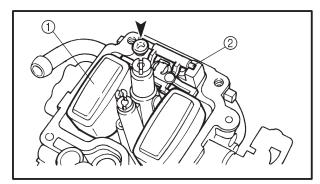


- 5. Install:
 - spacer ①
 - main jet 2

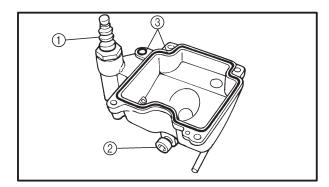




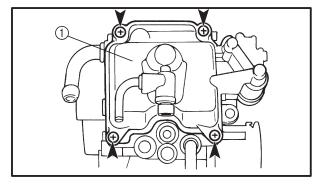
- 6. Install:
 - needle valve seat 1



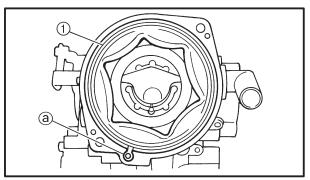
- 7. Install:
 - needle valve
 - float 1
 - float pin ②



- 8. Install:
 - accelerator plunger 1
 - drain bolt 2
 - float chamber rubber gasket ③

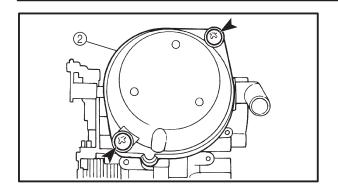


- 9. Install:
 - float chamber 1



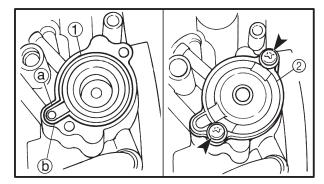
- 10. Install:
 - piston valve ①
 - jet needle kit
 - jet needle holder
 - piston valve spring
 - vacuum chamber cover 2





NOTE: -

- Install the end of the piston valve spring onto the spring guide on the vacuum chamber cov-
- Align the tab a on the piston valve diaphragm with the recess in the carburetor body.

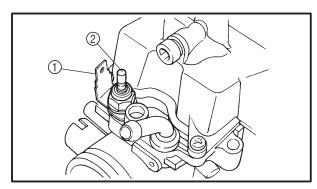


11. Install:

- coasting enricher (1)
- coasting enricher spring
- coasting enricher cover 2

NOTE: -

Align the tab (a) on the coasting enricher with the recess **b** in the carburetor body.



12. Install:

- terminal (1)
- washer
- carburetor heater 2 2.5 Nm (0.25 m•kg)

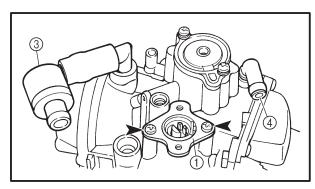
Use "Heat Sinker" when installing carburetor heater.

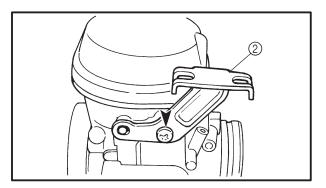


Heat Sinker

13. Install:

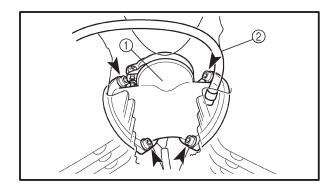
- throttle position sensor bracket 1
- throttle cable holder 2
- vacuum chamber air vent hose (3)
- fuel strainer 4







- 14. Install:
 - throttle stop screw
 - drain hose

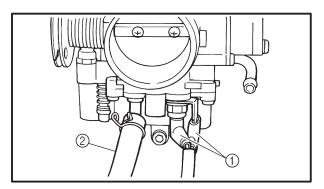


INSTALLING THE CARBURETOR JOINT

- 1. Install:
 - carburetor joint ①

12 Nm (1.2 m•kg)

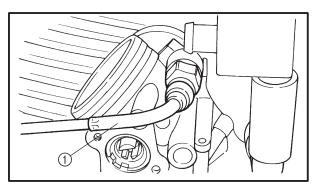
- 2. Connect:
 - vacuum hose 2



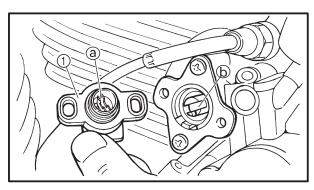
EAS00492

INSTALLING THE CARBURETOR

- 1. Connect:
 - carburetor heater connectors 1
 - charcoal canister hose (carburetor to charcoal canister) ②



- 2. Install:
 - starter plunger
- 3. Connect:
 - starter cable (1)

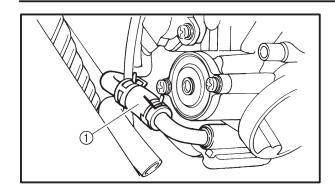


- 4. Install:
 - throttle position sensor 1

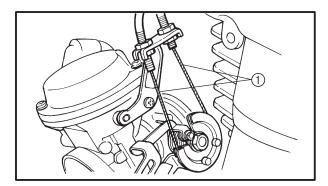
NOTE

- Align the slot ⓐ of the throttle position sensor with the projection ⓑ of the throttle lever shaft.
- For the correct installation, refer to "CHECK-ING AND ADJUSTING THE THROTTLE POSITION SENSOR".

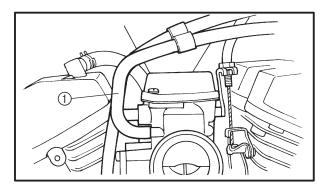




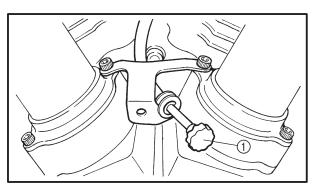
- 5. Connect:
 - fuel hose 1



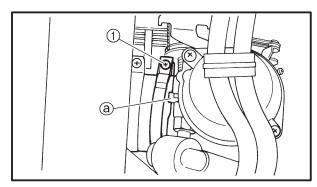
- 6. Connect:
 - throttle cables ①



- 7. Connect:
 - float chamber breather hose (carburetor to solenoid valve) ①



- 8. Hook:
 - throttle stop screw 1



- 9. Install:
 - carburetor

NOTE: -

Align the projection ⓐ of the carburetor with slot of the carburetor joint.

- 10. Tighten:
 - carburetor joint clamp screw ①



- 11. Adjust:
 - engine idling speed



Engine idling speed $850 \sim 950 \text{ r/min}$

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

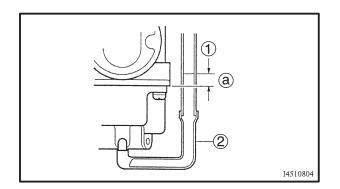
12. Adjust:

• throttle cable free play



Throttle cable free play (at the flange of the throttle grip) $4 \sim 8 \text{ mm}$

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



EAS00498

MEASURING AND ADJUSTING THE FUEL LEVEL

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



Fuel level (fuel level above the float chamber mating surface) $4.0 \sim 5.0 \text{ mm}$

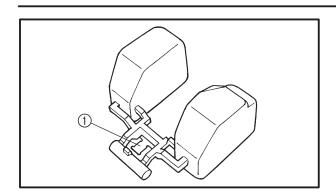
- a. Stand the motorcycle on a level surface.
- b. Place the motorcycle on a suitable stand to ensure that the motorcycle is standing straight up.
- c. Install the fuel level gauge ① onto the fuel drain pipe ②.



Fuel level gauge 90890-01312

- d. Loosen the fuel drain bolt.
- e. Measure the fuel level ⓐ.





- 2. Adjust:
- fuel level
- a. Remove the carburetor.
- b. Check the needle valve seat and needle valve.
- c. If either is worn, replace them as a set.
- d. If both are fine, adjust the float level by slightly bending the float tang ①.
- e. Install the carburetor.
- f. Measure the fuel level again.
- g. Repeat steps (a) to (f) until the fuel level is within specification.

EAS00502

CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR

NOTE: -

Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

- 1. Check:
 - throttle position sensor (installed on the carburetor)
- a. Disconnect the throttle position sensor coupler from the wire harness.
- b. Connect the pocket tester ($\Omega \times 1k$) to the throttle position sensor coupler.

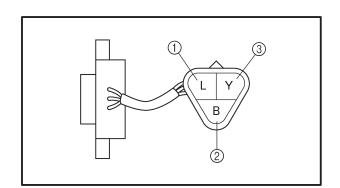
Positive tester probe \rightarrow blue terminal 1Negative tester probe \rightarrow black terminal 2

c. Measure the maximum throttle position sensor resistance.

Out of specification \rightarrow Replace the throttle position sensor.



Maximum throttle position sensor resistance $4.0 \sim 6.0 \text{ k}\Omega$ at 20°C (blue – black)





d. Connect the pocket tester ($\Omega \times 1$ k) to the throttle position sensor.

Positive tester probe \rightarrow yellow terminal 3Negative tester probe \rightarrow black terminal 2

e. While slowly opening the throttle, check that the throttle position sensor resistance is within the specified range.

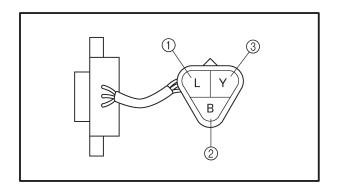
NOTE: -

Check mainly that the resistance changes gradually when turning the throttle, since the readings (from closed to wide-open throttle) may differ slightly from those specified.

Out of specification or the resistance changes abruptly \rightarrow Go to step 2 below.



Throttle position sensor resistance $(520 \sim 900~\Omega) \sim (4.0 \sim 6.0~k\Omega) \\ at~20^{\circ}\text{C} \\ (yellow - black)$



- 2. Check:
 - throttle position sensor (removed from the carburetor)
- a. Disconnect the throttle position sensor coupler from the wire harness.

- b. Remove the throttle position sensor from the carburetor
- c. Connect the pocket tester ($\Omega \times$ 1k) to the throttle position sensor.

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



d. Measure the maximum throttle position sensor resistance.

Out of specification \rightarrow Replace the throttle position sensor.

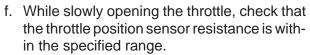


Maximum throttle position sensor resistance

4.0 \sim 6.0 k Ω at 20°C (blue – black)

e. Connect the pocket tester ($\Omega \times 1k$) to the throttle position sensor coupler.

Positive tester probe \rightarrow yellow terminal 3Negative tester probe \rightarrow black terminal 2



The resistance does not change or it changes abruptly \rightarrow Replace the throttle position sensor.

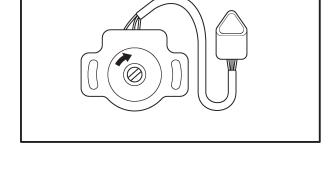
The slot is worn or broken \rightarrow Replace the throttle position sensor.

NOTE: -

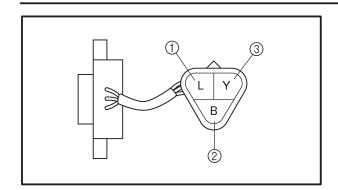
Check mainly that the resistance changes gradually when turning the throttle, since the readings (from closed to wide-open throttle) may differ slightly from those specified.



Throttle position sensor resistance $0 \sim 5 \pm 1.0 \text{ k}\Omega$ at 20°C (yellow – black)









• throttle position sensor angle

- a. Disconnect the throttle position sensor coupler from the wire harness.
- b. Connect the pocket tester ($\Omega \times 1k$) to the throttle position sensor coupler.

Positive tester probe \rightarrow blue terminal 1Negative tester probe \rightarrow black terminal 2

- Measure the throttle position sensor maximum resistance.
- d. Calculate the throttle position sensor maximum resistance when the throttle is fully closed.

Throttle position sensor maximum resistance (throttle is fully closed) = Maximum resistance \times (0.13 \sim 0.15)



If the maximum resistance = 5 k Ω , then the throttle position sensor's maximum resistance when the throttle is fully closed should be:

5 k Ω × (0.13 ~ 0.15) = 650 ~ 750 Ω

Lift the carburetor assembly slightly out of the intake manifolds.

Loosen the throttle position sensor screws 4. Connect the pocket tester ($\Omega \sim 100$) to the throttle position sensor.

Positive tester probe → yellow terminal ③ Negative tester probe → black terminal ②

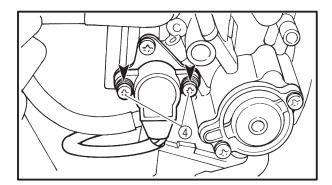
e. Adjust the throttle position sensor angle so that the measured resistance is within the specified range.



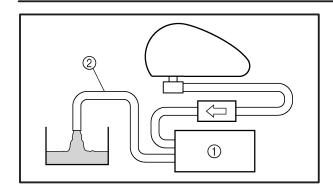
Throttle position sensor resistance

 $650 \sim 750 \Omega$ (yellow – black terminal)

After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.







EAS00504

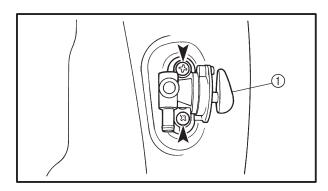
CHECKING THE FUEL PUMP

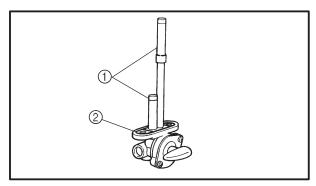
- 1. Check:
 - fuel pump 1
- a. Disconnect the fuel hose (fuel pump to carburetor) ② from the carburetor.
- b. Place a container under the end of the fuel hose.
- c. Set the fuel cock to "ON" or "RES".
- d. Start the engine and check if fuel flows from the fuel hose ②.

Fuel flows.	Fuel pump is OK.
Fuel does not flow.	Replace the fuel pump.

e. Stop the engine and check if the fuel stops flowing from the fuel hose ②.

Fuel stops flowing.	Fuel pump is OK.
Fuel flows.	Replace the fuel
l del llows.	pump.





EAS00505

CHECKING THE FUEL COCK

- 1. Drain:
- fuel

(for the fuel tank)

- 2. Disconnect:
 - fuel hose

(from the fuel cock)

- 3. Remove:
 - fuel cock (1)
- 4. Check:
 - fuel cock

Cracks/damage/wear → Replace.

- 5. Check:
- fuel cock strainer (1)

(with compressed air)

Dirt/obstruction \rightarrow Clean.

Damage → Replace the fuel cock as a set.

• rubber gasket 2

Cracks/damage/wear → Replace.



- 6. Install:
 - fuel cock
- 7. Connect:
 - fuel hose

EAS00506

CHECKING THE FUEL COCK OPERATION

NOTE: -

After installing the fuel cock, check its operation.

- 1. Set the fuel cock to "OFF".
- 2. Disconnect:
 - fuel hose (from fuel cock)
- 3. Check:
 - fuel cock operation

a. Place a container under the end of the fuel cock.

b. Check that the fuel cock lever is turned to "ON" or "RES".

Fuel flows.	Fuel cock is OK.
Fuel does not flow.	Replace the fuel cock.

- 4. Connect:
 - fuel hose



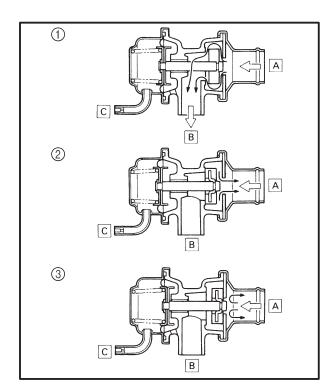
EAS00507

AIR INDUCTION SYSTEM

AIR INJECTION

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons.

When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700°C.



EAS00508

AIR CUTOFF VALVE

The air cutoff valve is operated by the intake gas pressure through the piston valve diaphragm. Normally, the air cutoff valve is open to allow fresh air to flow into the exhaust port. During sudden deceleration (the butterfly valve suddenly closes), negative pressure is generated and the air cutoff valve is closed in order to prevent after-burning.

Additionally, at high engine speeds and when the pressure decreases, the air cutoff valve automatically closes to guard against a loss of performance due to self-EGR (Exhaust Gas Recirculation).

- 1 During normal operation, the air cutoff valve is open.
- ② During sudden deceleration (the butterfly valve suddenly closes), the air cutoff valve closes.
- 3 At high engine speeds and when the pressure decreases, the air cutoff valve is closed.
- A From the air cleaner
- B To the reed valve
- C To the carburetor joint



EAS00509

AIR INDUCTION SYSTEM DIAGRAMS

1 Reed valve

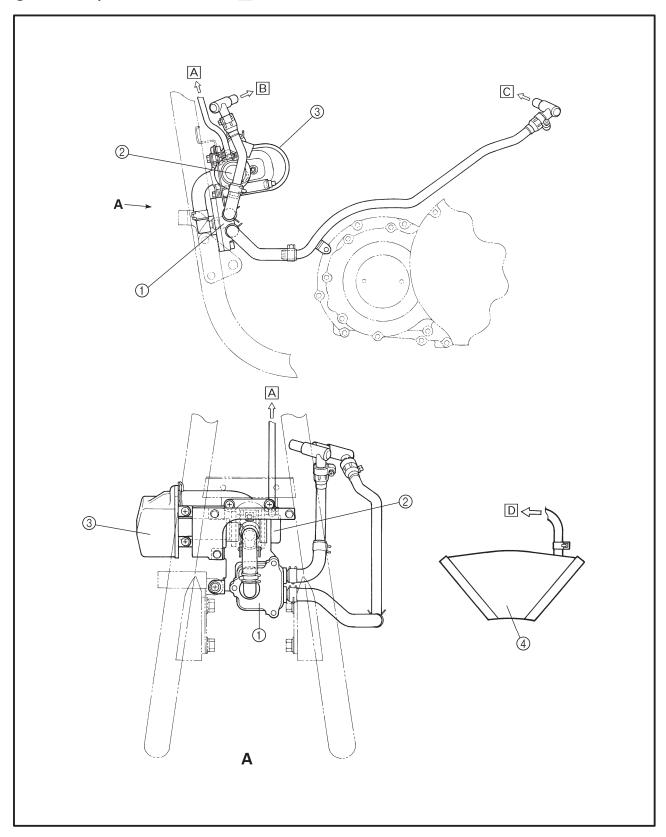
2 Air cut valve

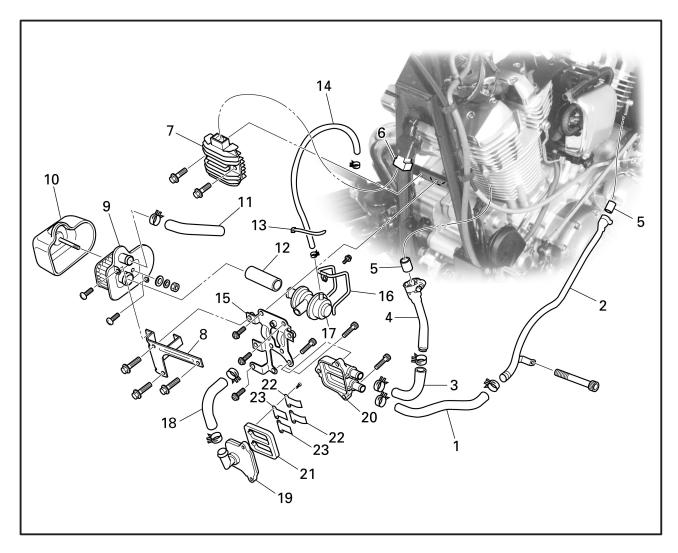
A To the carburetor joint
B To the front cylinder head

3 Air cleaner

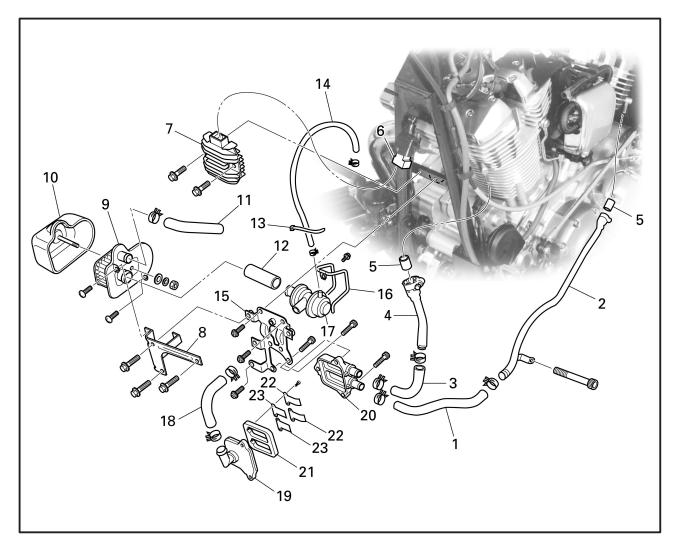
C To the rear cylinder head D To the air cut valve

(4) Carburetor joint

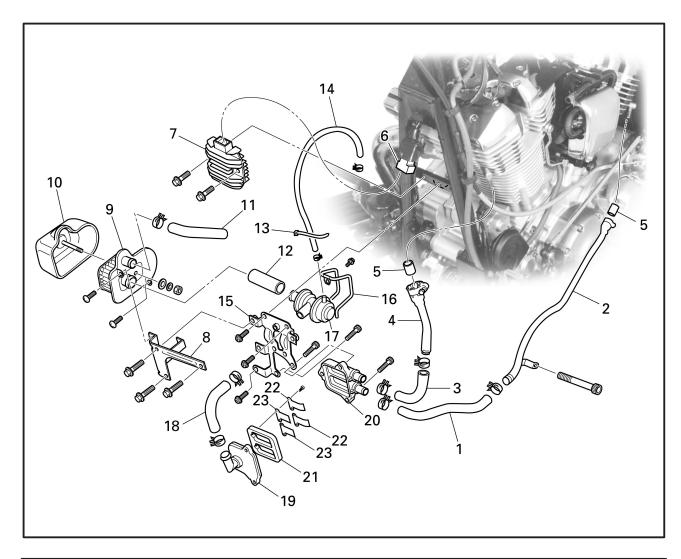




Order	Job/Part	Q'ty	Remarks
	Removing the air induction system fuel tank		Remove the parts in the order listed. Refer to "FUEL TANK" in chapter 3.
1	Reed valve case to rear cylinder head hose	1	·
2	Reed valve case to rear cylinder head pipe	1	
3	Reed valve case to rear cylinder head hose	1	
4	Reed valve case to rear cylinder head hose	1	
5	Gasket	2	
6	Rectifier/regulator coupler	1	Disconnect.
7	Rectifier/regulator	1	
8	Air filter bracket	1	



Order	Job/Part	Q'ty	Remarks
9	Air filter	1	
10	Air filter cover	1	
11	Air filter hose	1	
12	Air cut valve to air filter hose	1	
13	Plastic locking tie	1	
14	Vacuum hose	1	
15	Bracket	1	
16	Air cut valve holder	1	
17	Air cut valve	1	
18	Air cut valve to reed valve cover hose	1	
19	Reed valve cover	1	
20	Reed valve cover	1	



Order	Job/Part	Q'ty	Remarks
21	Reed valve base	1	For installation, reverse the removal procedure.
22	Reed valve stopper	2	
23	Reed valve	2	



EAS00510

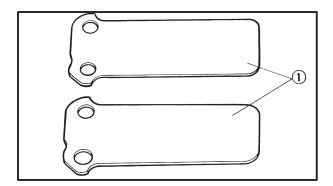
CHECKING THE AIR INDUCTION SYSTEM

- 1. Check:
 - hoses

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

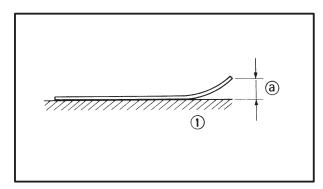
pipes

Cracks/damage → Replace.



2. Check:

- fibre reed (1)
- fibre reed stopper
- reed valve seat
 Cracks/damage → Replace the reed valve.



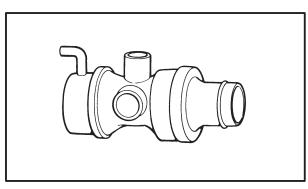
3. Measure:

•fibre reed bending ⓐ
 Out of specification → Replace the reed valve.



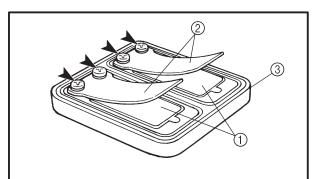
Maximum fibre reed bending 0.4 mm

1 Surface plate



4. Check:

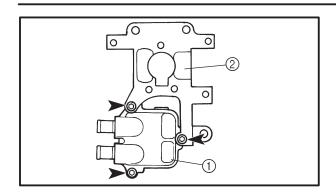
air cutoff valve
 Cracks/damage → Replace.



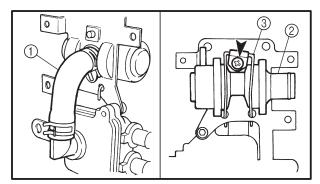
INSTALLING THE AIR INDUCTION SYSTEM

- 1. Install:
 - reed valves (1)
 - reed valve stoppers 2
 - reed valve base 3

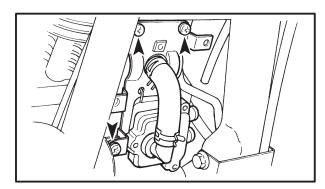




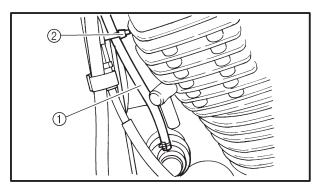
- 2. Install:
 - reed valve case 1
 - reed valve cover
 - bracket (2)



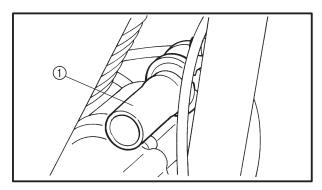
- 3. Install:
 - air cut valve to reed valve cover hose ①
 - air cut valve 2
 - air cut valve holder ③



- 4. Install:
 - bracket (with the air cut valve and reed valve)

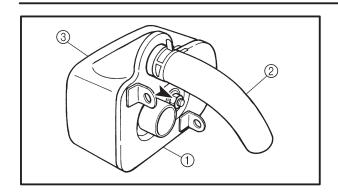


- 5. Install:
 - vacuum hose 1
 - plastic locking tie ②

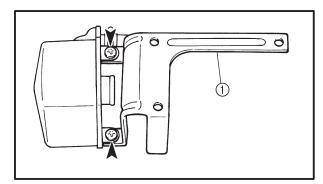


- 6. Install:
 - air cut valve to air filter hose (1)

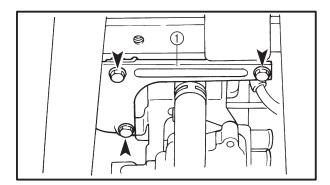




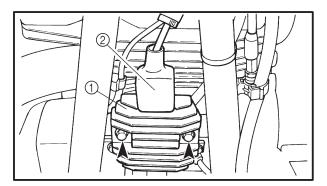
- 7. Install:
- air filter 1
- air filter hose 2
- air filter cover ③



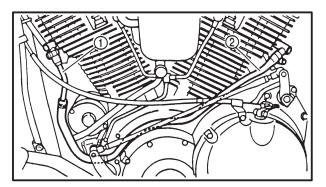
- 8. Install:
 - air filter bracket (1)



- 9. Install:
 - air filter case assembly 1



- 10. Install:
 - rectifier/regulator 1
- 11. Connect:
 - rectifier/regulator coupler 2



- 12. Install
 - gaskets
 - reed valve case to front cylinder head pipe 1
 - reed valve case to front cylinder head hose
 - reed valve case to rear cylinder head pipe 2
 - reed valve case to rear cylinder head hose



13. Install:

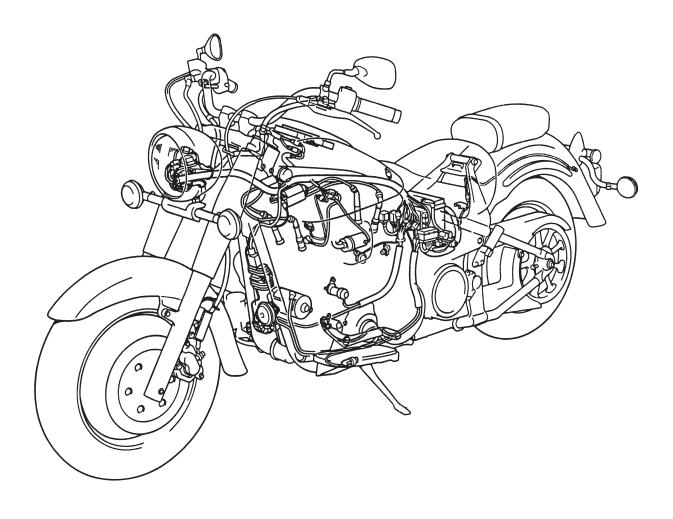
• fuel tank

Refer to "FUEL TANK" in chapter 3.





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ELECTRICAL COMPONENTS

ELEC |

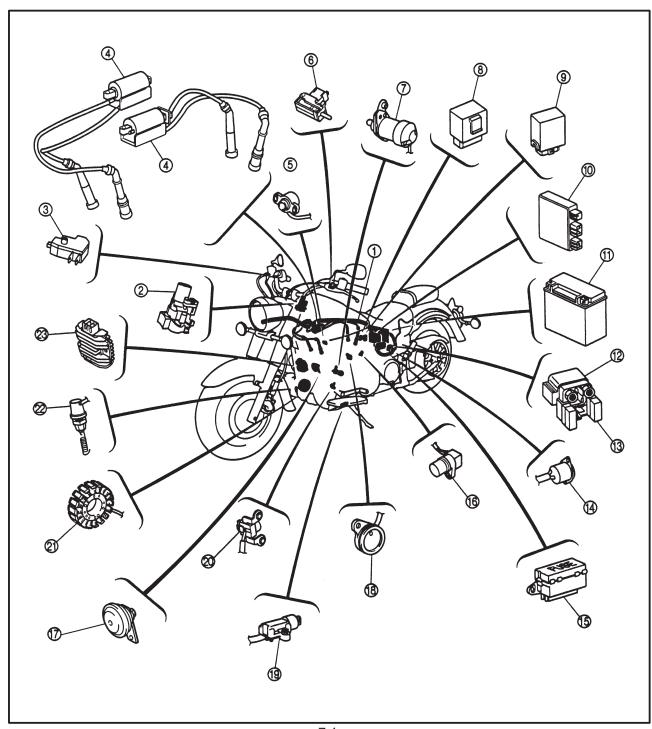
ESA00729

ELECTRICAL SYSTEM ELECTRICAL COMPONENTS

- 1) Wire harness
- 2 Main switch
- 3 Front brake light switch
- 4 Ignition coils
- 5 Throttle position sensor
- 6 Clutch switch
- 7 Decompression solenoid
- 8 Relay unit
- 9 Turn signal relay
- 10 Ignitor unit

- (11) Battery
- 12 Starter relay
- 13 Main fuse
- 14) Thermo switch
- 15) Fuse box
- 16 Speed sensor
- (17) Horns
- 18 Neutral switch
- 19 Sidestand switch
- 20 Pickup coil

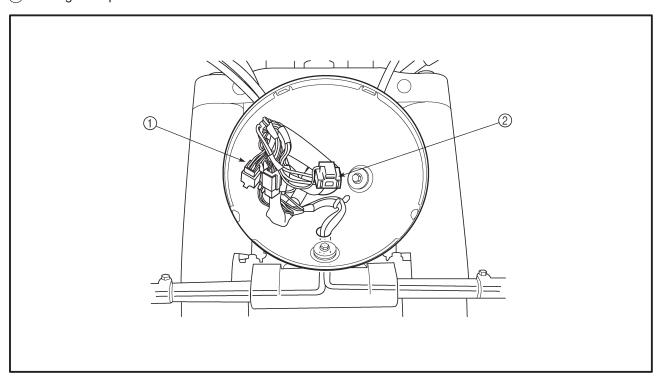
- 21) Startor coil assembly
- 22 Rear brake light switch
- 23 Rectifier/regulator



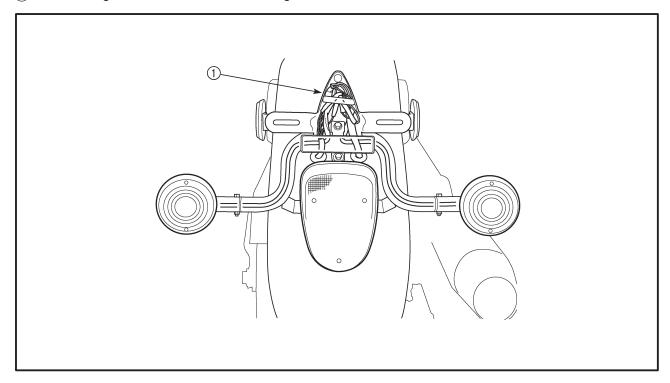


ARRANGEMENT OF THE ELECTRICAL COMPONENTS AND COUPLERS

- 1) Right handlebar switch coupler, left handlebar switch couplers and front turn signal connectors
- 2 Headlight coupler

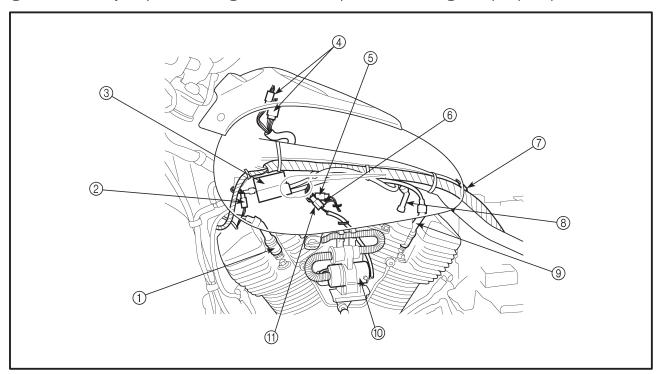


(1) Tail/brake light connectors and rear turn signal connectors

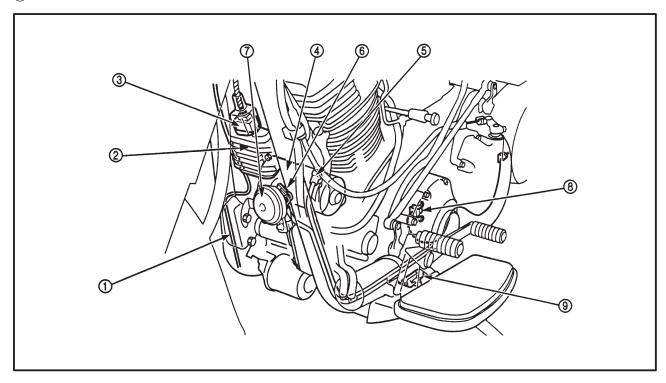




- 1 Spark plug cap #3
- 2 Rear brake light switch coupler
- 3 Ignition coil (front cylinder)
- (4) Meter assembly couplers
- (5) Carburetor heater sub-wire harness coupler
- 6 Throttle position sensor coupler
- (7) Fuel sender coupler
- 8 Spark plug cap #2
- 9 Spark plug cap #1
- 10 Fuel pump
- 11) Fuel pump coupler

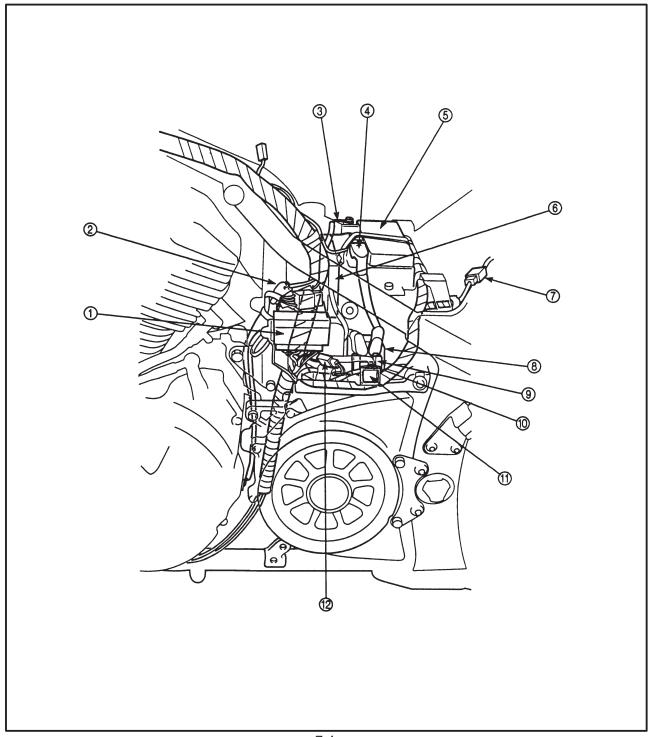


- 1) Rear brake light switch lead
- 2 Rectifier/regulator
- 3 Rectifier/regulator coupler
- (4) Starter motor
- (5) Starter motor lead
- 6 Horn coupler
- 7 Horn
- 8 Pickup coil
- (9) Side stand switch





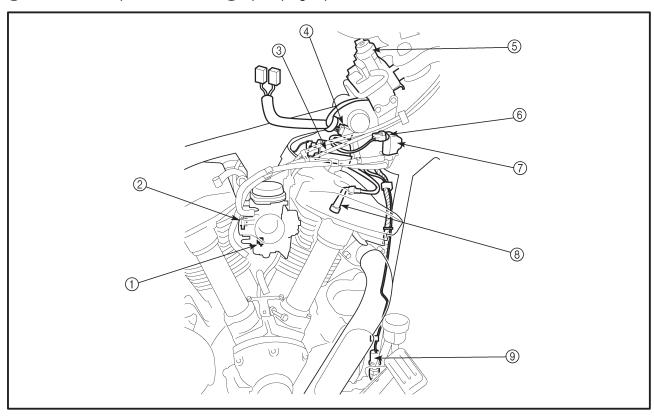
- 1) Fuse box
- 2 Startor coil coupler, decompression solenoid couplers, pickup coil coupler, speed sensor coupler, neutral switch connector and side stand switch coupler
- 3 Battery negative load
- 4 Battery positive lead
- 5 Battery
- 6 Ignitor unit
- 7 Tail/brake light and rear turn signal light sub-wire harness coupler
- 8 Starter relay
- (9) Main fuse
- 10 Starter relay coupler
- 11) Thermo switch
- 12 Thermo switch coupler





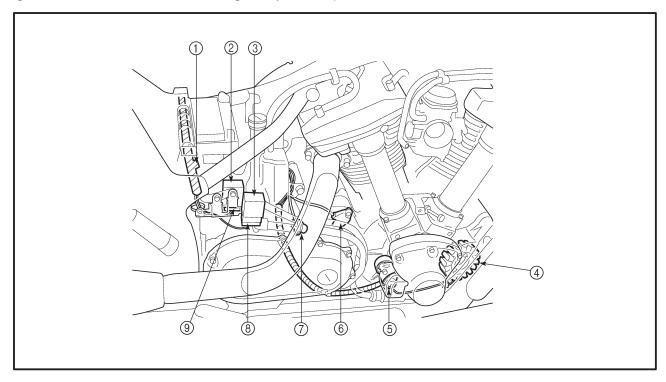
- 1 Carburetor heater
- 2 Throttle position sensor
- 3 Ignition coil (rear cylinder)
- (4) Main switch coupler
- (5) Main switch
- 6 Solenoid valve coupler
- (7) Solenoid valve
- 8 Spark plug cap #4

(9) Rear brake light switch



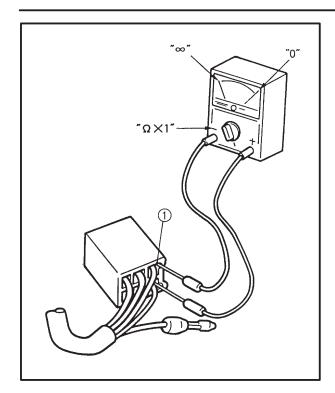
- 1) Diode
- 2 Turn signal relay
- 3 Relay unit
- (4) Stator coil

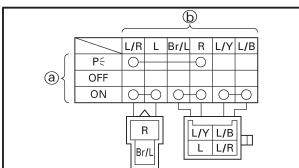
- (5) Decompression solenoid
- 6 Neutral switch
- 7 Speed sensor
- 8 Relay unit coupler
- 9 Turn signal relay coupler



SWITCHES







EAS00730

SWITCHES

CHECKING SWITCH CONTINUITY

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

CAUTION:

Never insert the tester probes into the coupler terminal slots ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester 90890-03112

NOTE: -

- Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times$ 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left. The switch positions (a) are shown in the far left column and the switch lead colors (b) are shown in the top row in the switch illustration.

NOTE: -

"O—O" 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 red and brown/blue, and between blue/yellow and blue/black when the switch is set to "ON".

CHECKING THE SWITCHES

ELEC - +

EAS0073

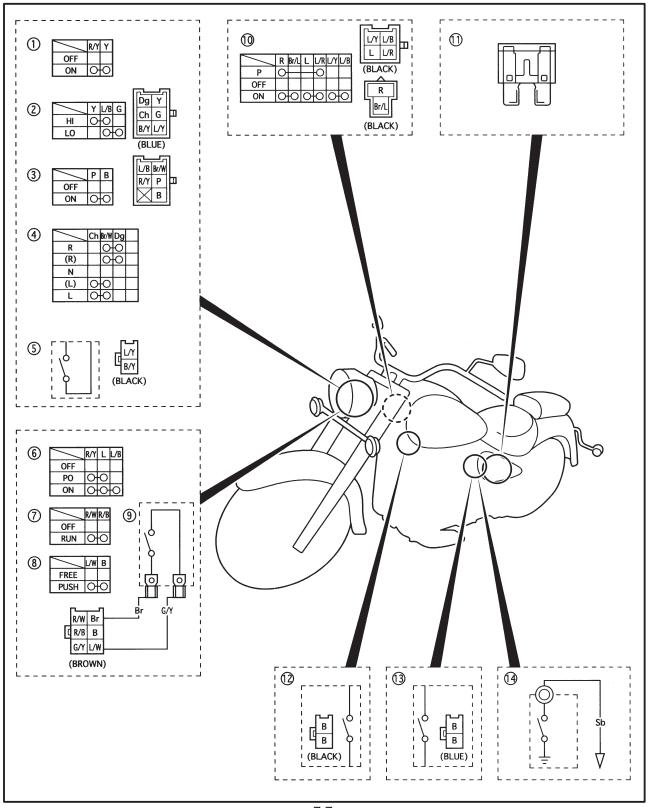
CHECKING THE SWITCHES

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

Damage/wear → Repair or replace the switch.

Improperly connected → Properly connect.

Incorrect continuity reading → Replace the switch.



CHECKING THE SWITCHES



- 1 Pass switch
- 2 Dimmer switch
- 3 Horn switch
- 4 Turn signal switch
 5 Clutch switch
- 6 Light switch

- 7 Engine stop switch
 8 Start switch
 9 Front brake light switch
 10 Main switch

- 11) Fuse 12 Rear brake light switch 13 Sidestand switch
- 14) Neutral switch

CHECKING THE BULBS AND BULB SOCKETS



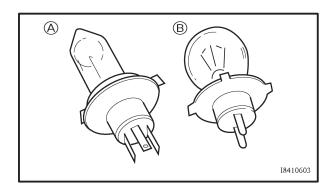
EAS00732

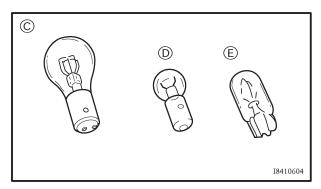
CHECKING THE BULBS AND BULB SOCKETS

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

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

Improperly connected \rightarrow Properly connect. Incorrect continuity reading \rightarrow Repair or replace the bulb, bulb socket or both.





TYPES OF BULBS

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

- Bulbs (A) and (B) are used for the headlights and usually use a bulb holder which must be detached before removing the bulb. The majority of these bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb © is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

- 1. Remove:
- bulb

CHECKING THE BULBS AND BULB SOCKETS



A WARNING

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

CAUTION:

- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.



bulb (for continuity)
 (with the pocket tester)
 No continuity → Replace.

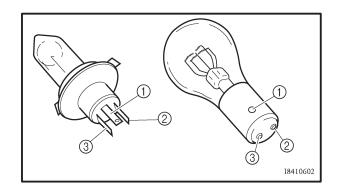


Pocket tester 90890-03112

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " range.

- a. Connect the tester positive probe to terminal
 - 1) and the tester negative probe to terminal
 - 2, and check the continuity.
- b. Connect the tester positive probe to terminal
 - 1 and the tester negative probe to terminal
 - (3), and check the continuity.
- c. If either of the readings indicate no continuity, replace the bulb.



CHECKING THE BULBS AND BULB SOCKETS



CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

- 1. Check:
 - bulb socket (for continuity) (with the pocket tester)
 No continuity → Replace.



Pocket tester 90890-03112

NOTE: -

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

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

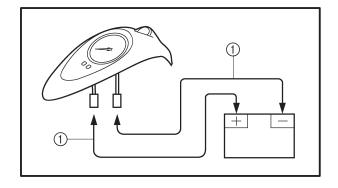
CHECKING THE LEDS

The following procedure applies to all of the LEDs.

- Check: LED (for proper operation)
- a. Disconnect the meter assembly coupler (meter assembly side).
- b. Connect two jumper leads ① from the battery terminals to the respective coupler terminals as shown.

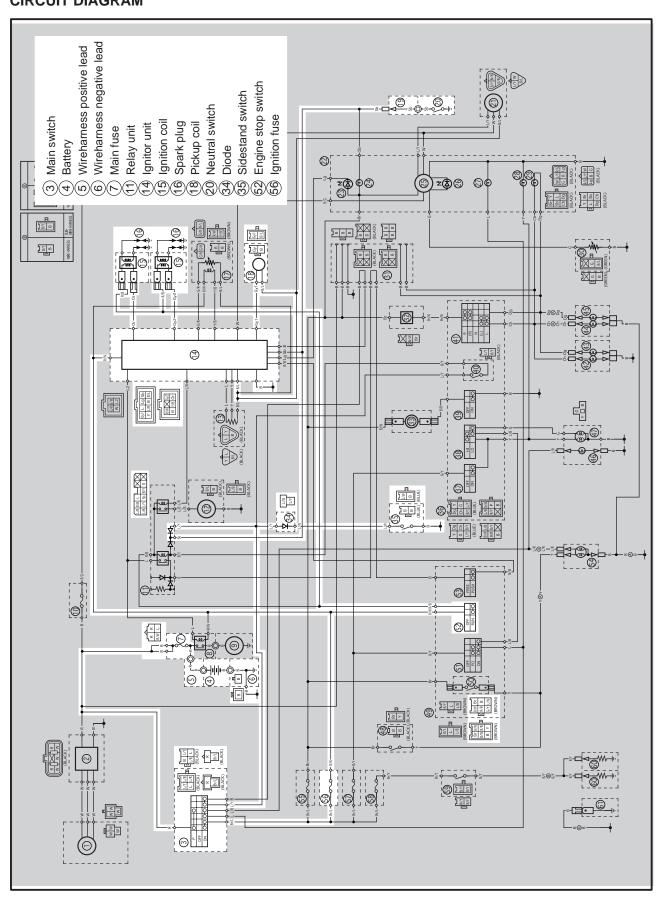
WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure that no flammable gas or fluid is in the vicinity.
- c. When the jumper leads are connected to the terminals the respective LED should illuminate.
 - Does not light \rightarrow Replace the meter assembly.





IGNITION SYSTEM CIRCUIT DIAGRAM



ELEC - +

FB80201

TROUBLESHOOTING

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

Check:

- 1. main and ignition fuses
- 2. battery
- 3. spark plugs
- 4. ignition spark gap
- 5. spark plug cap resistance
- 6. ignition coil resistance
- 7. pickup coil resistance
- 8. main switch
- 9. engine stop switch
- neutral switch
- 11. sidestand switch
- 12. diode
- 13. relay unit (diode)
- 14. wiring (of the entire ignition system)

NOTE: -

- Before troubleshooting, remove the following part(-s):
- 1) rider seat
- 2) fuel tank
- 3) side covers
- 4) ignition coils
- 5) headlight lens unit
- Troubleshoot with the following special tool(-s).



Ignition checker 90890-06754 Pocket tester 90890-03312

FB802400

- 1. Main and ignition fuses
- Check the main and ignition fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3.

Are the main and ignition fuses OK?





Replace the fuse(-s).

EB802401

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?





NO

- Clean the battery terminals.
- Recharge or replace the battery.

EB802403

3. Spark plugs

The following procedure applies to all of the spark plugs.

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



Standard spark plug DPR7EA-9 (NGK) X22EPR-U9 (DENSO)

Spark plug gap 0.8 ~ 0.9 mm

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





Re-gap or replace the spark plug.

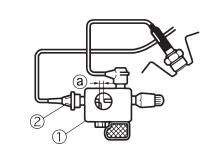
ELEC - +

EB802405

4. Ignition spark gap

The following procedure applies to all of the spark plugs.

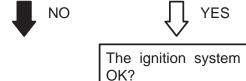
- Disconnect the spark plug cap from the spark plug.
- Connect the Ignition checker ①as shown.
- (2) Spark plug cap
- Set the main switch to "ON".
- Measure the ignition spark gap (a).
- Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.





Minimum ignition spark gap 6 mm

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

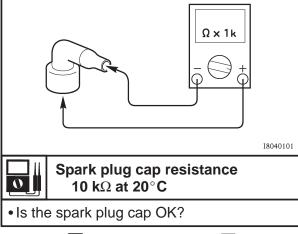


EB802407

5. Spark plug cap resistance

The following procedure applies to all of the spark plug caps.

- Disconnect the spark plug cap from the spark plug.
- Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap as shown.
- Measure the spark plug cap resistance.







Replace the spark plug cap.

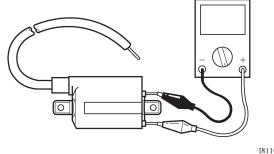
EB802409

6. Ignition coil resistance

The following procedure applies to all of the ignition coils.

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

Tester positive probe → red/black Tester negative probe → orange (gray)



I8110104

Measure the primary coil resistance.



Primary coil resistance $1.53 \sim 2.07 \Omega$ at 20° C

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

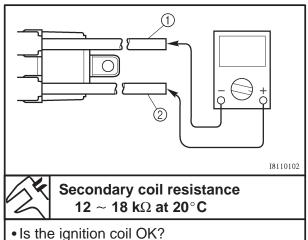
Tester positive probe →

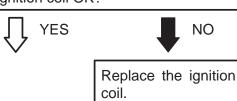
spark plug lead (1)

Tester negative probe →

spark plug lead (2)





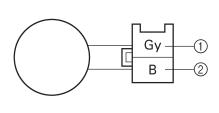


EB802410

7. Pickup coil resistance

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

Tester positive probe \rightarrow gray ① Tester negative probe \rightarrow black ②

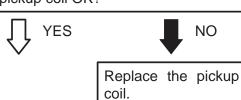


• Measure the pickup coil resistance.



Pickup coil resistance 248 \sim 372 Ω at 20°C (between gray and black)

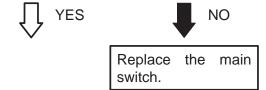
Is the pickup coil OK?



EB802411

8. Main switch

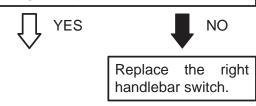
- Check the main switch for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?



EB802412

9. Engine stop switch

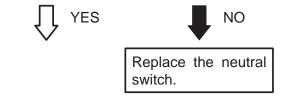
- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?



EB802413

10. Neutral switch

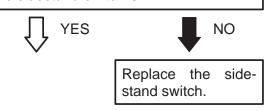
- Check the neutral switch for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?



EB802414

11. Sidestand switch

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





12. Diode

- Remove the diode from the coupler.
- Connect the pocket tester ($\Omega \times 1$) to the diode terminals as shown.
- Check the diode for continuity as follows.

Tester positive pro blu Tester negative pro blu	Continu- ity	
Tester positive pro blu Tester negative pro blu	No conti- nuity	
① LW		

NOTE: .

When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

Are the tester readings correct?



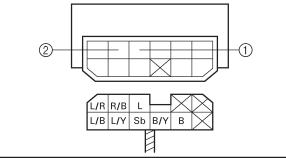


Replace the diode.

EB80241

- 13. Relay unit (diode)
- Remove the relay unit from the coupler.
- Connect the pocket tester ($\Omega \times 1$) to the relay unit terminals as shown.
- Check the diode for continuity as follows.

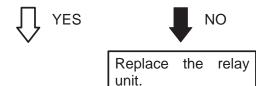
Tester positive probe → sky blue ① Tester negative probe → blue/yellow ②	Continu- ity
Tester positive probe → blue/yellow ② Tester negative probe → sky blue ①	No conti- nuity



NOTE: -

When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

Are the tester readings correct?



EAS00754

14. Wiring

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



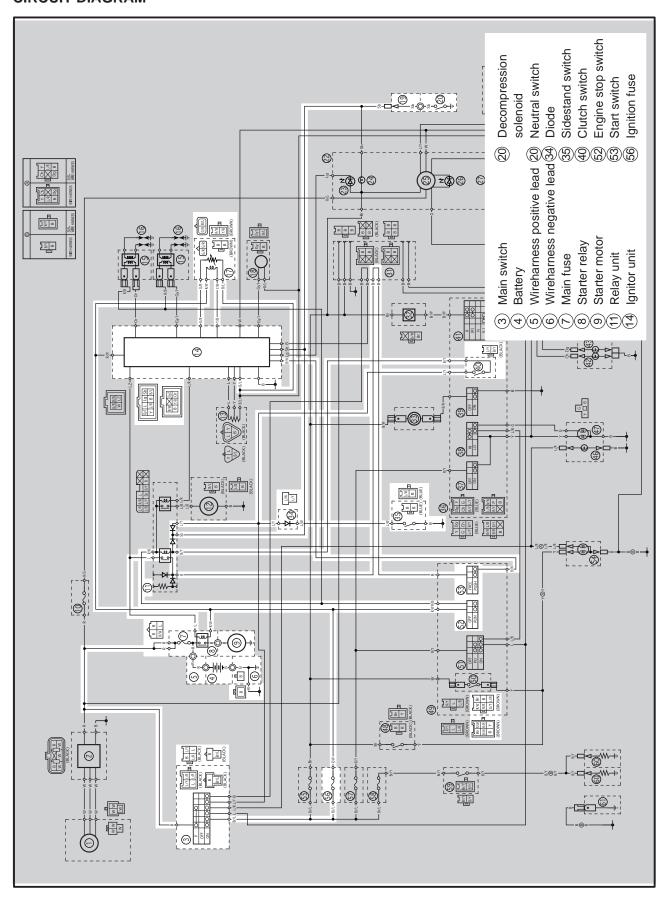
Replace the ignitor unit.

Properly connect or repair the ignition system's wiring.

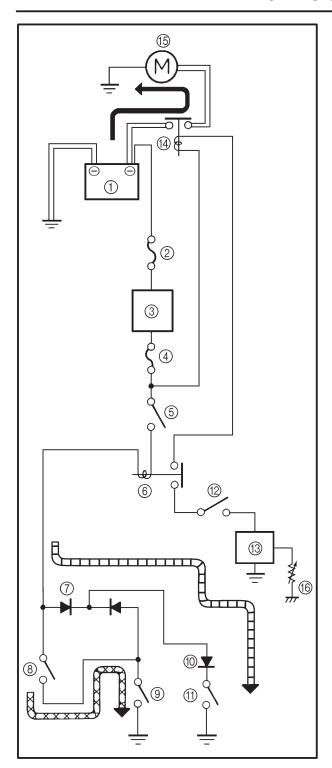


EB803000

ELECTRIC STARTING SYSTEM CIRCUIT DIAGRAM







STARTING CIRCUIT CUTOFF SYSTEM OP-**ERATION**

If the engine stop switch is set to "RUN" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cutoff relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cutoff relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cutoff relay is closed and the engine can be started by pressing the start switch.



WHEN THE TRANSMISSION IS IN **NEUTRAL**



WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

- (1) Battery
- (2) Main fuse
- (3) Main switch
- (4) Ignition fuse
- (5) Engine stop switch
- (6) Starting circuit cutoff relay (relay unit)
- 7 Diode (relay unit)
- (8) Clutch switch
- (9) Sidestand switch
- 10 Diode
- (11) Neutral switch
- (12) Start switch
- (13) Ignitor unit
- (14) Starter relay
- (15) Starter motor
- (16) Decompression solenoid thermistor

ELEC - +

EB803020

TROUBLESHOOTING

The starter motor fails to turn.

Check:

- 1. main and ignition fuses
- 2. battery
- 3. starter motor
- 4. relay unit (starting circuit cutoff relay)
- 5. relay unit (diode)
- 6. starter relay
- 7. main switch
- 8. engine stop switch
- 9. neutral switch
- 10. sidestand switch
- 11. diode
- 12. clutch switch
- 13. start switch
- 14. wiring (of the entire starting system)
- 15. Decompression solenoid

NOTE: -

- Before troubleshooting, remove the following part(-s):
- 1) rider seat
- 2) fuel tank
- 3) side covers
- 4) headlight lens unit
- Troubleshoot with the following special tool(-s).



Pocket tester 90890-03112

EB802400

- 1. Main and ignition fuses
- Check the main and ignition fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3.

Are the main and ignition fuses OK?





Replace the fuse(-s).

EB802401

2. Battery

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



Open-circuit voltage 12.8 V or more at 20°C

• Is the battery OK?



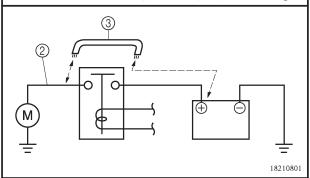


- Clean the battery terminals.
- Recharge or replace the battery.

EB803400

3. Starter motor

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



A WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure that no flammable gas or fluid is in the vicinity.
- Does the starter motor turn?





Repair or replace the starter motor.

ELEC - +

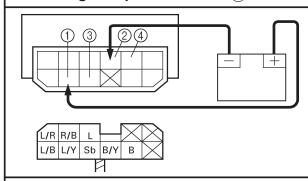
EB803402

- 4. Relay unit (starting circuit cutoff relay)
- Disconnect the relay unit from the coupler.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay unit terminals as shown.

Battery positive terminal → red/black ①
Battery negative terminal →

black/yellow 2

Tester positive probe → blue ③
Tester negative probe → black ④



 Does the starting circuit cutoff relay have continuity between blue and blue/white?





Replace the relay unit.

EB80340

- 5. Relay unit (diode)
- Disconnect the relay unit from the coupler.
- Connect the pocket tester ($\Omega \times 1$) to the relay unit terminals as shown.
- Check the diode for continuity as follows.

Tester positive probe → sky blue (1)

Tester negative probe →

black/yellow 2

Continuity

Tester positive probe → sky blue ①

Tester negative probe →

blue/yellow 3

Tester positive probe →

black/yellow ② Tester negative probe →

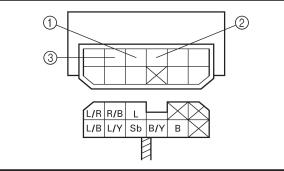
sky blue 1

No continu-

Tester positive probe → blue/yellow ③

Tester negative probe → sky blue ①

ity



NOTE: -

When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

Are the tester readings correct?





NO

Replace the relay unit.

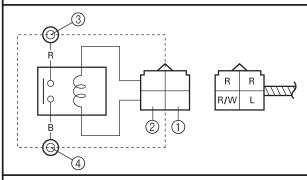
ELEC - +

EB803404

6. Starter relay

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

Battery positive terminal → red/white ①
Battery negative terminal → blue ②



 Does the starter relay have continuity between red and black?

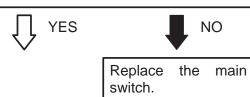


Replace the starter relay.

EB80241

7. Main switch

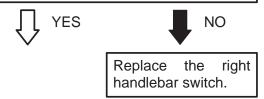
- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?



B802412

8. Engine stop switch

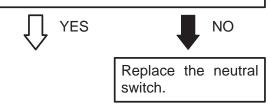
- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?



EB802413

9. Neutral switch

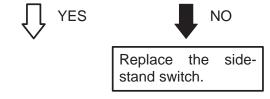
- Check the neutral switch for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?



EB802414

10. Sidestand switch

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



ELEC - +

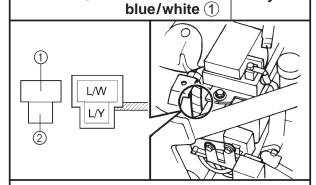
11. Diode

- Remove the diode from the coupler.
- Connect the pocket tester ($\Omega \times 1$) to the diode terminals as shown.
- Check the diode for continuity as follows.

Tester positive probe →
blue/white ①
Tester negative probe →
blue/yellow ②
Continuity

Tester positive probe → blue/yellow ②
Tester negative probe →

No continuity



NOTE: .

When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

Are the tester readings correct?





Replace the diode.

EB803405

12. Clutch switch

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



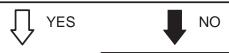


Replace the clutch switch.

EB80340

13. Start switch

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



Replace the right handlebar switch.

FAS00754

14. Wiring

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





Properly connect or repair the starting system's wiring

15. Decompression solenoid (thermistor)

- Check the decompression solenoid for continuity.
- Refer to "SELF-DIAGNOSIS".
- Is the decompression solenoid OK?





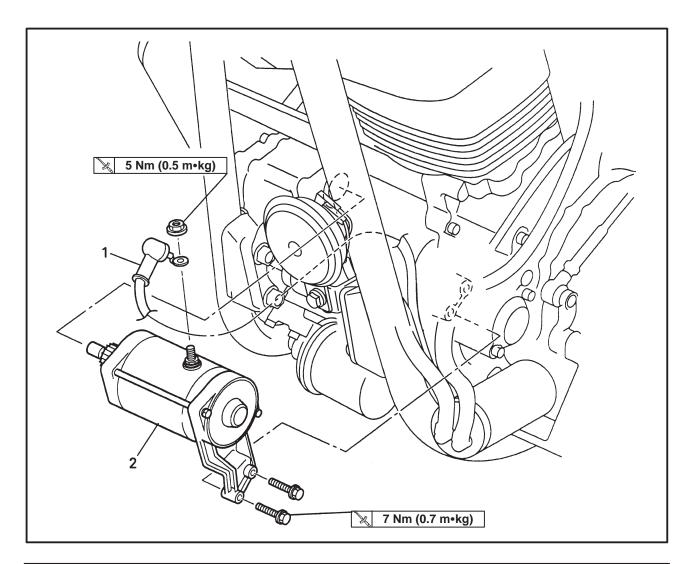
Replace the ignitor unit.

Replace the decompression solenoid.



EB803500

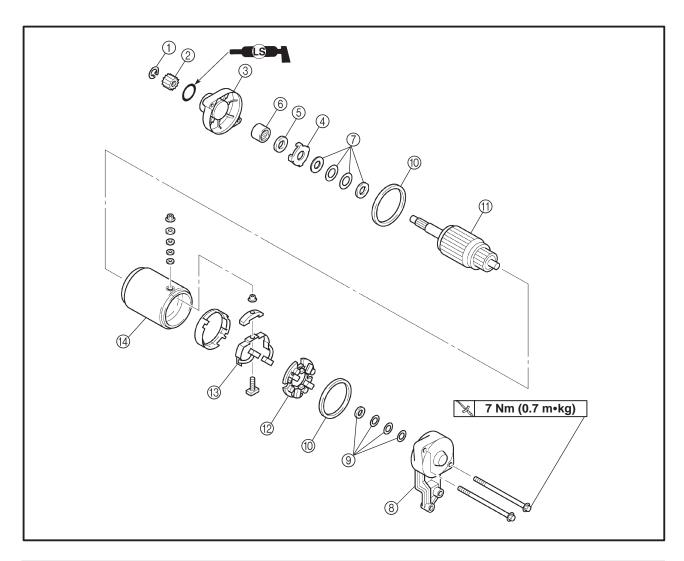
STARTER MOTOR



Order	Job/Part	Q'ty	Remarks
1 2	Removing the starter motor Starter motor lead Starter motor assembly	1 1	Remove the parts in the order listed. For installation, reverse the removal procedure.

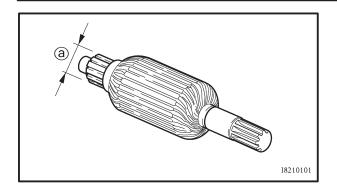


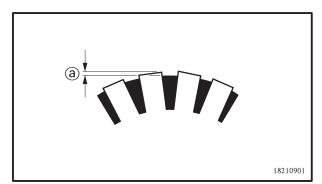
EB803501



Order	Job/Part	Q'ty	Remarks
123456789911234	Disassembling the starter motor Circlip Starter motor starter motor rear cover Lock washer Oil seal Bearing Washer set Starter motor front cover Washer set O-ring Armature assembly Brush seat (along with the brushes) Brush holder (along with the brushes) Starter motor yoke	1 1 1 1 1 1 1 1 1 1 1 1	Remove the parts in the order listed. For assembly, reverse the disassembly procedure.







EB803511

CHECKING THE STARTER MOTOR

- 1. Check:
 - commutator

Dirt → Clean with 600 grit sandpaper.

- 2. Measure:
 - commutator diameter (a)
 Out of specification → Replace the starter motor.



Minimum commutator diameter 27 mm

- 3. Measure:
 - mica undercut ⓐ

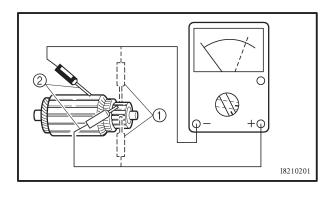
Out of specification — Scrape the mica to the proper measurement with a hacksaw blade which has been grounded to fit the commutator.



Mica undercut 0.7 mm

NOTE: -

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



- 4. Measure:
 - armature assembly resistances (commutator and insulation)

Out of specification \rightarrow Replace the starter motor.

a. Measure the armature assembly resistances with the pocket tester.



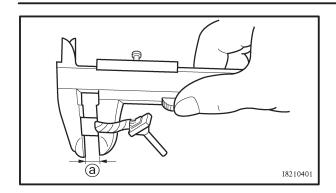
Pocket tester 90890-03112



Armature assembly Commutator resistance ① $0.025 \sim 0.035~\Omega$ at 20° C Insulation resistance ② Above 1 M Ω at 20° C

b. If any resistance is out of specification, replace the starter motor.



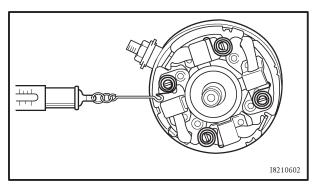


5. Measure:

brush length ⓐ
 Out of specification → Replace the brushes as a set.



Minimum brush length 5 mm



6. Measure:

brush spring force
 Out of specification → Replace the brush springs as a set.



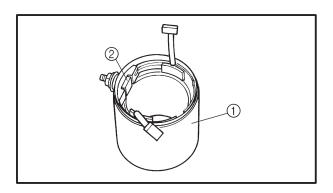
Brush spring force $7.65\sim\,10.01\;\text{Nm}$

(765 ~ 1,001 gf)

7. Check:

- gear teeth
 Damage/wear → Replace the gear.
- 8. Check:
 - bearing
 - oil seal

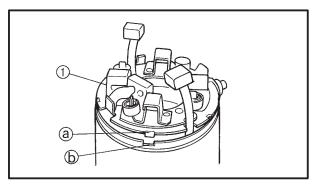
Damage/wear \rightarrow Replace the defective part(-s).



EB803701

ASSEMBLING THE STARTER MOTOR

- 1. Install:
 - starter motor yoke 1
 - bush holder 2



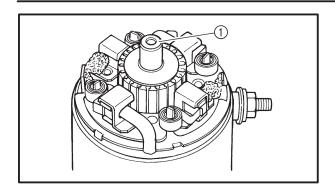
2. Install:

• brush seat (1)

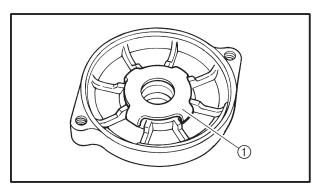
NOTE: _

Align the tab (a) on the brush seat with the slot (b) in the starter motor rear cover.

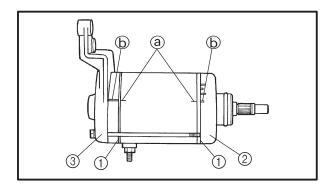




- 3. Install:
 - armature assembly



- 4. Install:
 - bearing
 - oil seal
 - lock washer ①

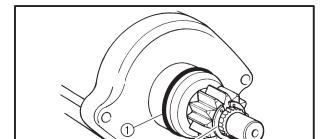


- 5. Install:
 - O-rings 1 New
 - starter motor rear cover 2
 - starter motor front cover ③
 - bolts

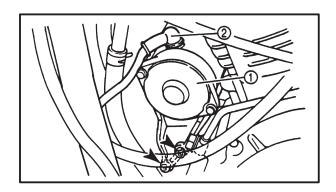
7 Nm (0.7 m•kg)



Align the match marks (a) on the starter motor yoke with the match marks (b) on the front and rear covers.



- 6. Install:
 - starter motor gear ①
 - circlip 2



INSTALLING THE STARTER MOTOR

- 1. Install:
- starter motor (1)

7 Nm (0.7 m•kg)

- 2. Connect:
 - starter lead 2

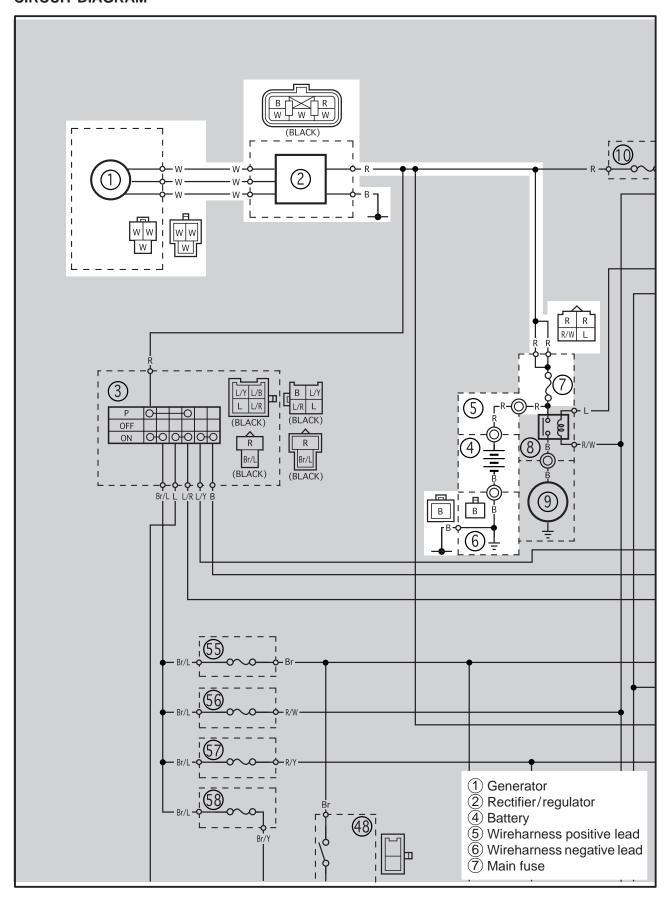
5 Nm (0.5 m•kg)

CHARGING SYSTEM



EB80400

CHARGING SYSTEM CIRCUIT DIAGRAM



CHARGING SYSTEM



FR804010

TROUBLESHOOTING

The battery is not being charged.

Check:

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

NOTF:

- Before troubleshooting, remove the following part(-s):
- 1) rider seat
- 2) left side cover
- Troubleshoot with the following special tool(-s).



Engine tachometer 90890-03113 Pocket tester 90890-03112

EB802400

1. Main fuse

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





NO

Replace the fuse.

B802401

2. Battery

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



Open-circuit voltage 12.8 V or more at 20°C

• Is the battery OK?





- Clean the battery terminals.
- Recharge or replace the battery.

EB804400

3. Charging voltage

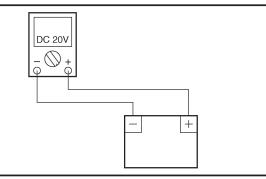
- Connect the inductive tachometer to the spark plug lead of cylinder #1.
- Connect the pocket tester (DC 20V) to the battery as shown.

Tester positive probe →

battery positive terminal

Tester negative probe →

battery negative terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.



Charging voltage 14 V at 5,000 r/min

CHARGING SYSTEM

ELEC - +

NOTE: -

Make sure that the battery is fully charged.

Is the charging voltage within specification?



NO



The charging circuit is OK?

EB804401

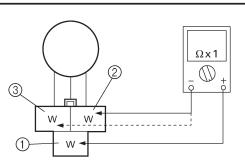
- 4. Stator coil assembly resistances
- Disconnect the generator coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the stator coil assembly coupler as shown.

Tester positive probe → White ①

Tester negative probe → white ②

Tester positive probe \rightarrow white ①

Tester negative probe → white ③



Measure the startor coil assembly resistances.



Stator coil resistance 0.45 \sim 0.55 Ω at 20°C

• In the stator coil assembly OK?



YES



Replace the stator coil assembly.

B804404

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?



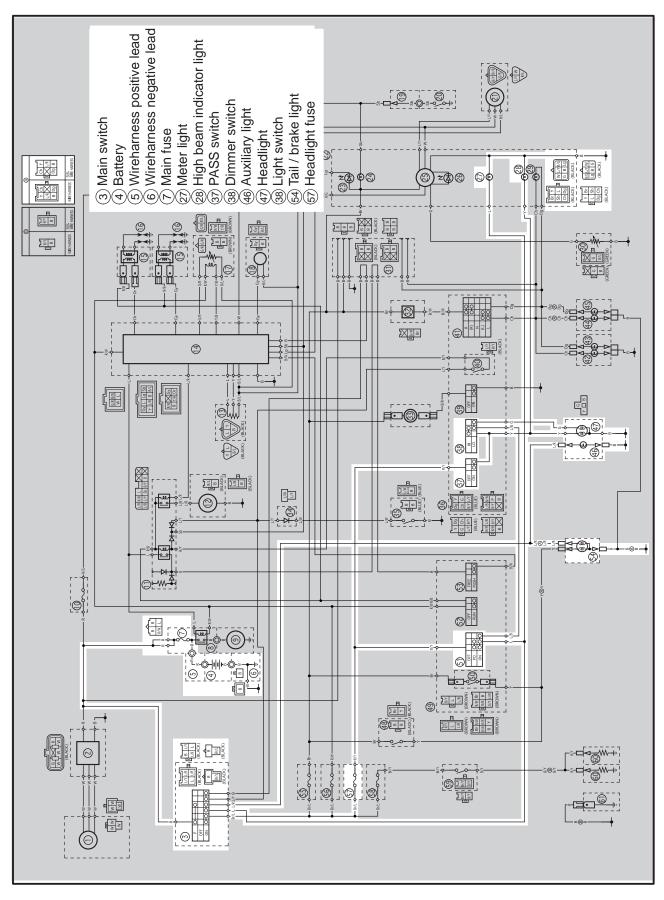
NO



Replace the rectifier/regulator. Properly connect or repair the charging system's wiring.



LIGHTING SYSTEM CIRCUIT DIAGRAM



ELEC - +

FB805010

TROUBLESHOOTING

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

Check:

- 1. main, and headlight fuses
- 2. battery
- 2. main switch
- 3. dimmer switch
- wiring (of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(-s):
- 1) rider seat
- 2) fuel tank
- 3) left side cover
- 4) headlight lens unit
- Troubleshoot with the following special tool(-s).



Pocket tester 90890-03112

EB802400

- 1. Main and headlight fuses
- Check the main and headlight fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3

• Are the main and headlight fuses OK?





Replace the fuse(-s).

EB802401

2. Battery

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



Open-circuit voltage 12.8 V or more at 20°C

• Is the battery OK?





NO

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3. Main switch

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





NO

Replace the main switch.

EB805400

4. Lights switch

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





NO

The lights switch is faulty. Replace the right handlebar switch.



EB805401

5. Dimmer switch

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





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

EB805403

6. Pass switch

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





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

EB805404

7. Wiring

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





NO

Check the condition of each of the lighting system's circuits. Refer to "CHECK-ING THE LIGHTING SYSTEM". Properly connect or repair the lighting system's wiring.

EB805401

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".

• Is the headlight bulb and socket OK?





Replace the headlight bulb, socket or both.

- 2. High beam indicator light bulb and socket
- Check the high beam indicator light bulb and socket for continuity.

Refer to "CHECKING THE BULBS AND BULB SOCKETS".

• Is the high beam indicator light bulb and socket OK?





NO

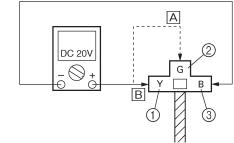
Replace the high beam indicator light bulb, socket or both.

3. Voltage

 Connect the pocket tester (DC 20 V) to the headlight coupler and the meter assembly couplers as shown.

AWhen the dimmer switch is set to " > "
BWhen the dimmer switch is set to " > "

Headlight coupler





Headlight

Tester positive probe →

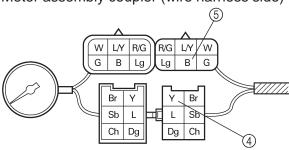
yellow (1) or green (2)

Tester negative probe → black ③ High beam indicator light

Tester positive probe → **yellow** (4)

Tester negative probe → black (5)

Meter assembly coupler (wire harness side)



- Set the main switch to "ON".
- Set the dimmer switch to " ≦○ " or " ≣○ ".
- Measure the voltage (12 V) of yellow (green)
 2 on the headlight coupler and yellow (4) on the meter assembly coupler.
- Is the voltage within specification?





repaired.

The wiring circuit from the main switch to the headlight coupler and meter assembly couplers are faulty and must be EB805411

- 2. A 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?



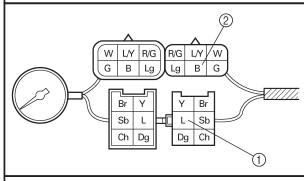


Replace the meter light bulb, socket or both.

2. Voltage

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

Tester positive probe → blue ①
Tester negative probe → black ②



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





NO

This circuit is OK?

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

ELEC - +

EB805412

3. A 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?



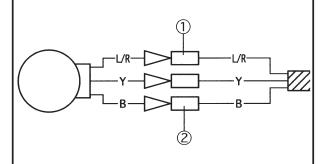


Replace the tail/ brake light bulb, socket or both.

2. Voltage

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

Tester positive probe → blue/red ①
Tester negative probe → black ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of blue ① on the fail/brake light coupler (wire harness side).
- Is the voltage within specification?





This circuit is OK.

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

4. The auxiliary light fails to come on.

- 1. Auxiliary light bulb and socket
- Check the auxiliary light bulb and socket for continuity.

Refer to "CHECKING THE BULBS AND BULB SOCKETS".

Are the auxiliary light bulb and socket OK?



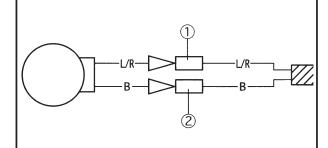


Replace the auxiliary light bulb, socket or both.

2. Voltage

 Connect the pocket tester (DC 20 V) to the auxiliary light couplers (wire harness side) as shown.

Tester positive probe → blue/red ①
Tester negative probe → black ②



- Set the main switch to "ON".
- Set the light switch to "≥D d∈" or "- \(\subseteq\).
- Measure the voltage (12 V) of blue/red ①
 on the auxiliary light couplers (wire harness side).
- Is the voltage within specification?



YES



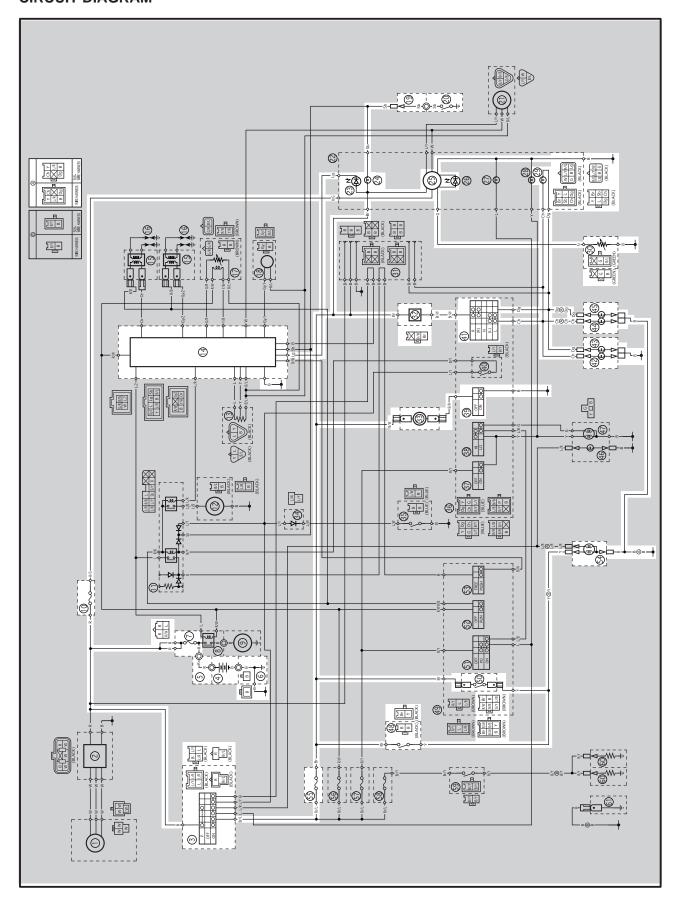
This circuit is OK.

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



EB806000

SIGNALING SYSTEM CIRCUIT DIAGRAM





- (3) Main switch
- 4 Battery
- (5) Wireharness positive lead
- 6 Wireharness negative lead
- 7 Main fuse
- 10 Backup fuse
- 14 Ignitor unit
- 19 Neutral switch lead
- 20 Neutral switch
- 23 Engine trouble indicator light
- 24 Neutral indicator light
- Speed meter assembly (speed meter, combination meter and fuel level meter)
- 29 Turn signal indicator light
- 30 Fuel sender
- 32 Flasher relay
- 33 Horn
- 39 Horn switch
- 41 Turn signal switch
- 42 Front flasher light (left)
- 43 Front flasher light (right)
- 44 Rear flasher light (left)
- 45 Rear flasher light (right)
- 48 Rear brake light switch
- 50 Front brake light switch
- 54 Tail/brake light
- 55 Signaling system fuse

ELEC - +

FB806010

TROUBLESHOOTING

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

Check:

- 1. main, signaling system and backup fuses
- 2. battery
- 3. main switch
- 4. wiring (of the entire signaling system)

NOTE: -

- Before troubleshooting, remove the following part(-s):
- 1) rider seats
- 2) fuel tank
- 3) side covers
- 4) headlight lens unit
- Troubleshoot with the following special tool(-s).



Pocket tester 90890-03112

EB802400

- 1. Main, signaling system and backup fuses
- Check the main and signaling system fuses for continuity.

Refer to "CHECKING AND CHARGING THE FUSES" in chapter 3.

Are the main, signaling system and backup fuses OK?





Replace the fuse(-s).

EB802401

2. Battery

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



Open-circuit voltage 12.8 V or more at 20°C

• Is the battery OK?





NO

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3. Main switch

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





NO

Replace the main switch.

EB806400

4. Wiring

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





Check the condition of each of the signaling system's circuits. Refer to "CHECK-ING THE SIGNAL-ING SYSTEM".

Properly connect or repair the signaling system's wiring.

ELEC - +

EB806410

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



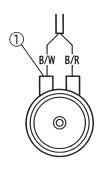
NO

Replace the left handlebar switch.

2. Voltage

 Connect the pocket tester (DC 20 V) to the horn coupler as shown.

Tester positive probe → black/white ①
Tester negative probe → ground



- Set the main switch to "ON".
- Push the horn switch.
- Measure the voltage (12 V) of brown on the horn coupler.
- Is the voltage within specification?



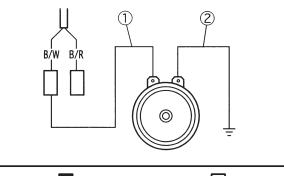
YES



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

3. Horn

- Disconnect the horn coupler at the horn.
- Connect a jumper lead 1 to the brown terminal in the horn coupler and the horn terminal.
- Connect a jumper lead ② to the horn terminal and ground the jumper lead.
- Set the main switch to "ON".
- Push the horn switch.
- Does the horn sound?





YES

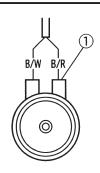


The horn is OK.

4. Voltage

• Connect the pocket tester (DC 20 V) to the born coupler as shown.

Tester positive probe → black/red ①
Tester negative probe → ground



- Set the main switch to "ON".
- Measure the voltage (12 V) of pink ① on the horn coupler.
- Is the voltage within specification?





NO

Repair or replace the horn.

Replace the horn.

ELEC - +

EB806411

2. A 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?





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?

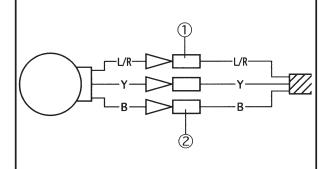




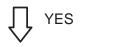
Replace the brake light switch.

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

Tester positive probe → yellow ①
Tester negative probe → black ②



- Set the main switch to "ON".
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (12 V) of yellow at the tail/brake light coupler (wire harness side).
- Is the voltage within specification?





This circuit OK.

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

EB806413

- 3. A turn signal light, turn signal indicator light or both fail to blink.
- 1. Turn signal 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?





NO

Replace the turn signal light bulb, socket or both.

- 2. Turn signal indicator light bulb and socket
- Check the turn signal indicator light bulb and socket for continuity.

Refer to "CHECKING THE BULBS AND BULB SOCKETS".

 Is the turn signal indicator light bulb and socket OK?





NO

Replace the turn signal indicator light bulb, socket or both.

ELEC - +

3. Turn signal switch

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



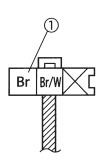


Replace the left handlebar switch.

4. Voltage

• Connect the pocket tester (DC 20 V) to the turn signal relay coupler as shown.

Tester positive probe → brown ①
Tester negative probe → ground



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown ① at the turn signal relay coupler.
- Is the voltage within specification?



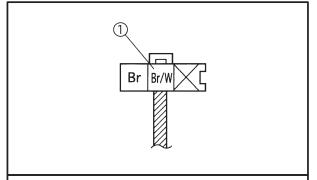


The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

5. Voltage

• Connect the pocket tester (DC 20 V) to the turn signal relay coupler as shown.

Tester positive probe → brown/white ①
Tester negative probe → ground



- Set the main switch to "ON".
- Set the turn signal switch to "L" or "R".
- Measure the voltage (12 V) of brown/white at the turn signal relay coupler.
- Is the voltage within specification?





The turn signal relay is faulty and must be replaced.

6. Voltage

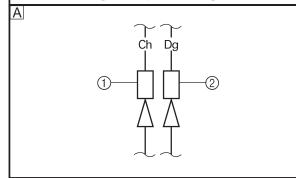
- Connect the pocket tester (DC 20 V) to the turn signal light connectors (wire harness side) or the meter assembly coupler as shown.
- A Turn signal light
- B Turn signal indicator light

Left turn signal light

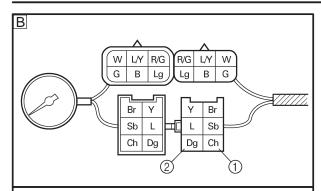
Tester positive probe → chocolate ①
Tester negative probe → ground

Right turn signal light

Tester positive probe → dark green ②
Tester negative probe → ground







- Set the main switch to "ON".
- Set the turn signal switch to "L" or "R".
- Measure the voltage (12 V) of chocolate (1) or dark green(2) at the turn signal light connectors (wire harness side) or the meter assembly coupler.
- Is the voltage within specification?





This circuit is OK.

The wiring circuit from the turn signal switch to the turn signal light connector or the meter assembly coupler are faulty and must be repaired.

- 4. The neutral indicator light fails to come on.
 - 1. Neutral indicator light bulb and socket
- Check the neutral indicator light bulb and socket for continuity.

Refer to "CHECKING THE BULBS AND BULB SOCKETS".

• Is the neutral indicator light bulb and socket OK?



YES



NO

Replace the neutral indicator light bulb, socket or both.

2. Neutral switch

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



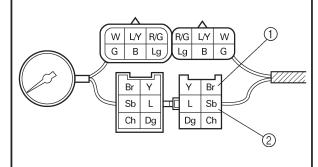


Replace the neutral switch.

3. Voltage

• Connect the pocket tester (DC 20 V) to the meter assembly coupler as shown.

Tester positive probe → brown (1) Tester negative probe → sky blue ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown (1) and sky blue (2) at the meter assembly coupler.
- Is the voltage within specification?





NO

This circuit is OK.

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

SIGNALING SYSTEM

ELEC - +

EB806417

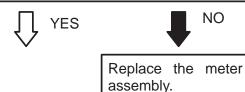
5. The fuel level indicator light, fuel level meter or both fails to come on.

1. Fuel level indicator light LED

 Check the LED of the fuel level indicator light.

Refer to "CHECKING THE BULBS AND BULB SOCKETS".

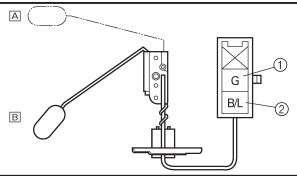
• Is the fuel level indicator light LED OK?



2. Fuel sender

- Disconnect the fuel sender coupler from the wire harness.
- Drain the fuel from the fuel tank and remove the fuel sender from the fuel tank.
- Connect the pocket tester ($\Omega \times 10$) to the fuel sender coupler.

Tester positive probe → green ①
Tester negative probe → black/blue ②



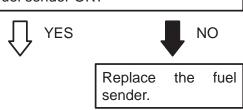
• Measure the fuel sender resistance.



Fuel sender resistance Full position of the float $\boxed{\mathbb{A}}$ 11 \sim 13 Ω at 20 $^{\circ}$ C

Empty position of the float \blacksquare 140 \sim 143 Ω at 20°C

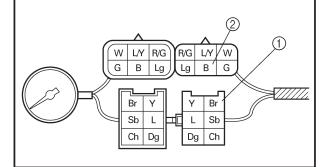
• Is the fuel sender OK?



3. Voltage

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

Tester positive probe \rightarrow brown ① Tester negative probe \rightarrow black ②



- Set the main switch to "ON".
- Measure the voltage (12 V).
- Is the voltage within specification?



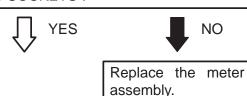
Replace the meter assembly.

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

6. A engine trouble indicator light fails to come on.

1. Engine trouble indicator LED

 Check the LED of the engine indicator light.
 Refer to "CHECKING THE BULBS AND BULB SOCKETS".



SIGNALING SYSTEM



EAS00843

- 2. Wire harness
- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- Is the wire harness OK?



Replace the ignitor unit.

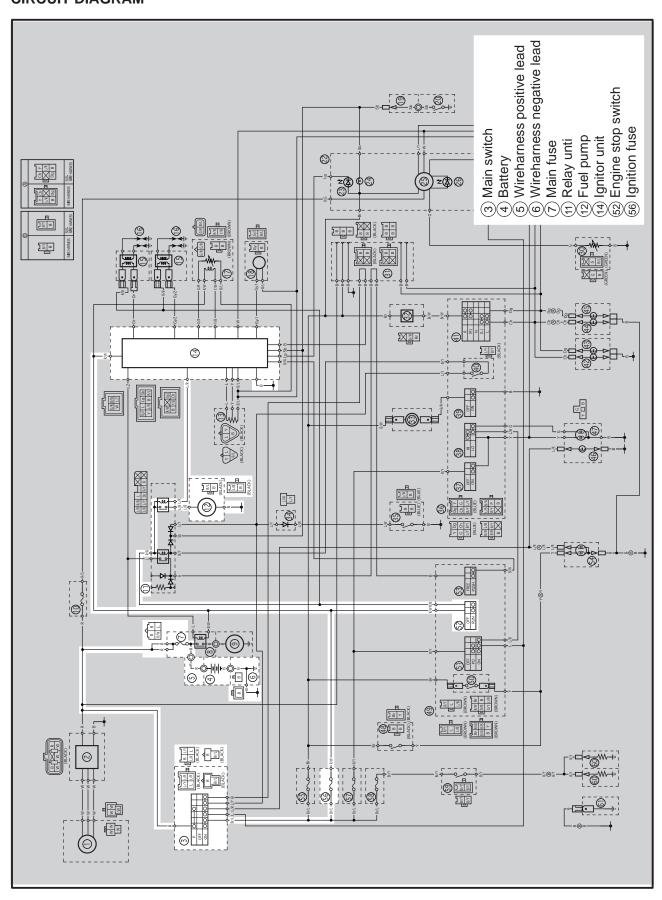
Repair or replace the wire harness.

NO



EB80800

FUEL PUMP SYSTEM CIRCUIT DIAGRAM

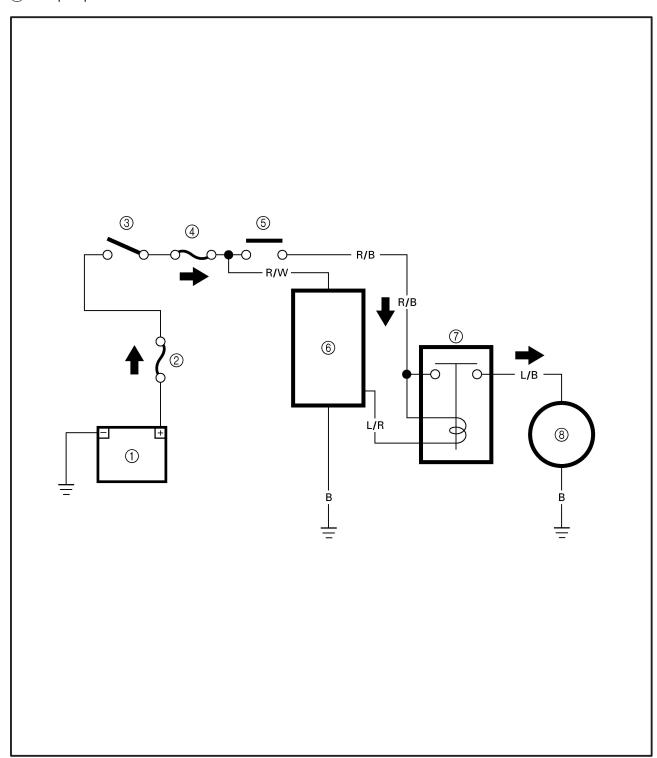




FUEL PUMP CIRCUIT OPERATION

The ignitor unit includes the control unit for the fuel pump.

- 1 Battery
- 2 Main fuse
- 3 Main switch
- 4 Ignition fuse
 5 Engine stop switch
- 6 Ignitor unit
- 7 Fuel pump relay
- 8 Fuel pump



ELEC - +

EB808020

TROUBLESHOOTING

The fuel pump fails to operate.

Check:

- 1. main and ignition fuses
- 2. battery
- 3. main switch
- 4. engine stop switch
- 5. relay unit (fuel pump relay)
- 6. fuel pump
- 7. wiring (the entire fuel pump system)

NOTE:

- Before troubleshooting, remove the following part(-s):
- 1) rider seat
- 2) fuel tank
- 3) side covers
- 4) headlight lens unit
- Troubleshoot with the following special tool(-s).



Pocket tester 90890-03112

EAS00738

- 1. Main and ignition fuses
- Check the main and ignition fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3

• Are the main and ignition fuses OK?





Replace the fuse(-s).

AS00739

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?





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?





NO

Replace the main switch.

EAS00750

- 4. Engine stop switch
- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?





Replace the right handlebar switch.

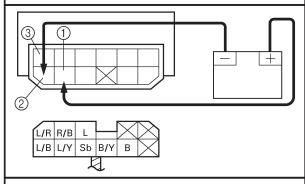
ELEC - +

5. Relay unit (fuel pump relay)

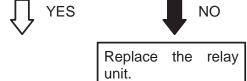
- Disconnect the relay unit from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the relay unit terminals as shown.

Battery positive terminal → red/black ① Battery negative terminal → blue/red ②

Tester positive probe → red/black ①
Tester negative probe → blue/black ②



 Does the fuel pump relay have continuity between red/black and blue/black?

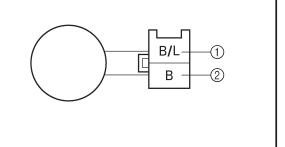


EB808400

6. Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the fuel pump coupler (fuel pump side) as shown.

Tester positive probe → black/blue ①
Tester negative probe → black ②

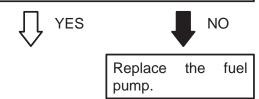


Measure the fuel pump resistance.



Fuel pump resistance 1.6 \sim 2.2 Ω at 20 $^{\circ}$ C

• Is the fuel pump OK?



EAS00754

7. Wiring

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



Replace the ignitor unit.

Properly connect or repair the fuel pump system's wiring.



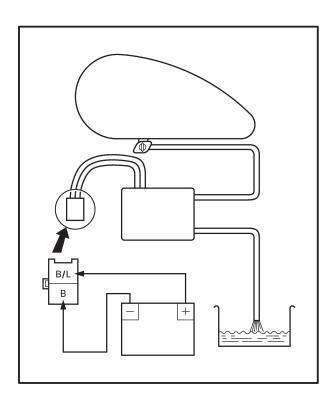
EB808410

CHECKING THE FUEL PUMP

A WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or fire. Be extremely careful and note the following points:

- Stop the engine before refuelling.
- Do not smoke and keep away from open flames, sparks or any other source of fire.
- If you do accidentally spill gasoline, wipe it up immediately with dry rags.
- If gasoline touches the engine when it is hot, a fire may occur. Therefore, make sure that the engine is completely cool before performing the following test.



- 1. Check:
 - fuel pump operation
- a. Fill the fuel tank.
- b. Put the end of the fuel hose into an open container.
- c. Turn the fuel cock to "ON" or "RES".
- d. Connect the battery (12 V) to the fuel pump coupler as shown.

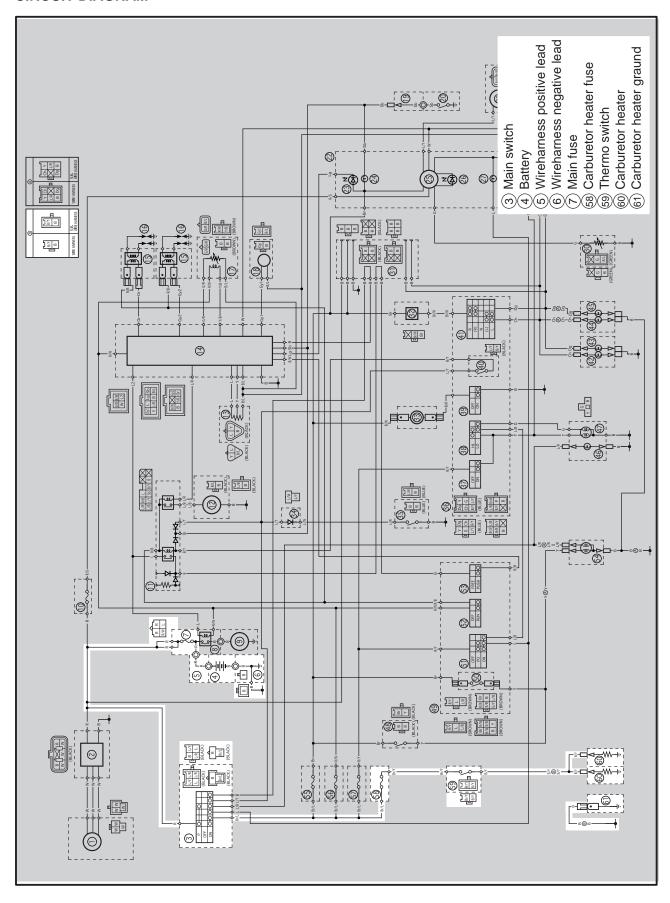
Battery positive lead → black/blue ①
Battery negative lead → black ②

e. If fuel flows out of the fuel hose, the fuel pump is OK. If fuel does not flow, replace the fuel pump.



EAS00820

CARBURETOR HEATING SYSTEM CIRCUIT DIAGRAM



ELEC - +

EAS00821

TROUBLESHOOTING

The carburetor heating system fails to operate.

Check:

- 1. Main and carburetor heater fuses
- 2. Battery
- 3. Main switch
- 4. Thermo switch
- 5. Carburetor heater
- Wiring (of the entire carburetor heating system)

NOTF:

- Before troubleshooting, remove the following part(-s).
- 1) rider seat
- 2) fuel tank
- 3) carburetor
- 4) left side cover
- Troubleshoot with the following special tool(-s).



Pocket tester 90890-03112

EAS00738

- 1. Main and carburetor heater fuses
- Check the main and carburetor heater fuses for continuity.

Refer to "CHECKING THE FUSES" in chapter 3

Are the main and carburetor heater fuses OK?





NO

Replace the fuse(-s).

AS00739

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?





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?





NO

Replace the main switch.

EAS00823

4. Thermo switch

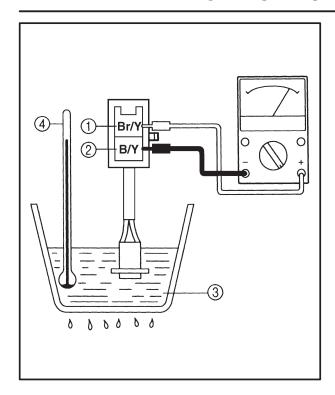
- Remove the thermo switch from the plastic bracket.
- Connect the pocket tester to the thermo switch coupler as shown.

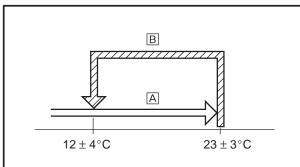
Tester positive lead → black Tester negative lead → black



- Immerse the thermo switch in a container filled with water (3).
- Place a thermometer (4) in the water.
- Slowly heat the water, than let it cool to the specified temperature as indicated in the table.
- Check the thermo switch for continuity at the temperatures indicated in the table.







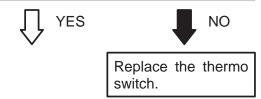
- A The thermo switch circuit is open.
- B The thermo switch circuit is closed.

Test step	Water temperature	Continu- ity
1	Less than 23 ± 3°C	YES
2	More than 23 \pm 3 $^{\circ}$ C	NO
3	More than 12 ± 4°C	NO
4	Less than 12 \pm 4°C	YES

Test steps 1 & 2: Heating phase Test steps 3 & 4: Cooling phase

A WARNING

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



5. Carburetor heater

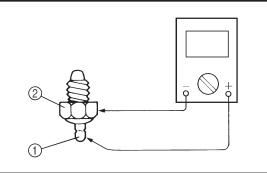
- Remove the carburetor heater from the carburetor.
- Connect the pocket tester to the carburetor heater as shown.

Tester positive probe →

carburetor heater terminal (1)

Tester negative probe →

carburetor heater body ②



Measure carburetor heater resistance.



• Is the carburetor heater OK?





Replace the carburetor heater.

ELEC - +

EAS00754

6. Wiring

• Check the entire carburetor heating system's wiring.

Refer to "CIRCUIT DIAGRAM".

• Is the carburetor heating system's wiring properly connected and without defects?





NO

This circuit is OK.

Properly connect or repair the carburetor heating system's wiring.



EB81200

SELF-DIAGNOSIS

The XV1600A features a self-diagnosing system for the following circuit(-s):

- throttle position sensor
- speed sensor
- decompression solenoid
- fuel level meter

If any of these circuits are defective, their respective condition codes will be displayed on the engine trouble indicator light or fuel level indicator light when the main switch is set to "ON" (irrespective of whether the engine is running or not).

Blinks in or	_			Condition code	
lights up the indica- tor light	Circuit	Defect(-s)	System response	When engine is stopped	When engine is running
Ą	Throttle position sensor	DisconnectedShort-circuitLocked	 The ignitor unit stays set to the wide-open throttle ignition timing. The motorcycle can be ridden. The engine trouble indicator light displays the condition code. 	Blinks in Patterns of 3	Lights up
Ą	Speed sensor	Abnormal pulseDisconnectedShort-circuit	 The engine speed limiter sets in approximately 4,400 rpm. The engine trouble indicator light displays the condition code. 	Blinks in patterns of 4	Lights up
Ĝ	Decompression solenoid	 Disconnected Short-circuit Over heated solenoid Disconnected the thermistor in solenoid Short-circuit the thermistor in solenoid 	 The decompression solenoid does not move. The starter motor does not operate. The engine trouble indicator light displays the condition code. 	Blinks in patterns of 6	Lights up
₽ð	Fuel level meter	Disconnected Short-circuit	 The fuel level meter displays the empty position. The fuel level indicator light displays the condition code. 	Blinks in patterns of 8	Blinks in patterns of 8

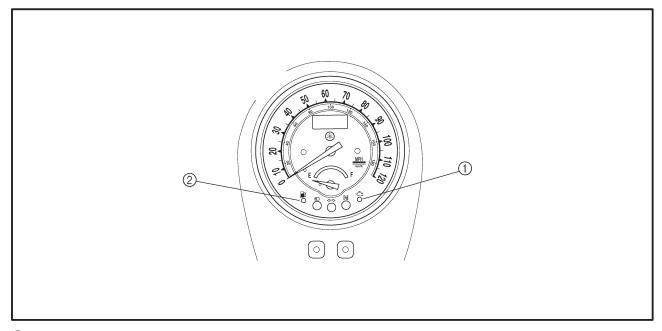
NOTE: -

The XV1600A features a self-diagnosing system.

In the XV1600A, when the main switch is turned on the "Engine trouble indicator light" and "Fuel level indicator light" in the meter assembly comes on for 1.4 seconds then goes off. However, if there is a malfunction, it comes on for 1.4 seconds, goes off and then begins flashing. (However, it is on while the engine is running.)

Display order on the engine trouble indicator light and fuel level indicator light

- 1 Engine trouble indicator light
- 2 Fuel level indicator light



① Indicator lights check 1.4 seconds

③ Condition code First fault code (3 = throttle position sensor)

(5) Light on 0.5 seconds

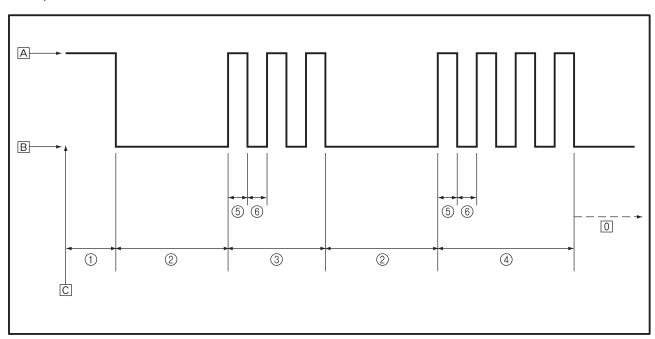
© Light off 0.5 seconds

A Light on

B Light off

C Main switch is turned on

D Repetition



ELEC - +

EB812010

TROUBLESHOOTING

The engine trouble indicator light or the fuel level level indicator light starts to blink, display the self-diagnosis sequence.

Check:

- 1. throttle position sensor
- 2. speed sensor
- 3. decompression solenoid
- 4. fuel level meter

NOTE: -

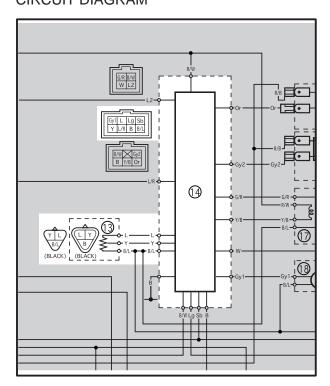
- Before troubleshooting, remove the following part(-s):
- 1) rider seat
- 2) fuel tank
- 3) left side cover
- Troubleshoot with the following special tool(-s).



Pocket tester 90890-03112

EB812020

1. Throttle position sensor CIRCUIT DIAGRAM



- (13) Throttle position sensor
- (14) Ignitor unit

EAS00843

- 1. Wire harness
- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- Is the wire harness OK?





NO

Repair or replace the wire harness.

EB81240

- 2. Throttle position sensor
- Check the throttle position sensor for continuity.

Refer to "CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR" in chapter 6.

Is the throttle position sensor OK?





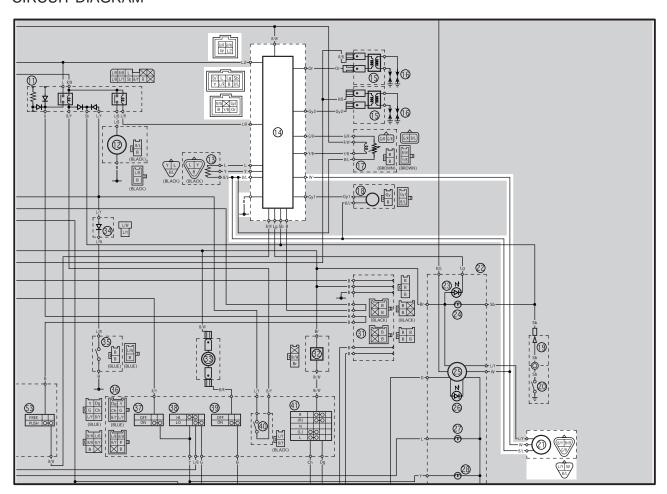
NO

Replace the ignitor unit.

Replace the throttle position sensor.



2. Speed sensor CIRCUIT DIAGRAM



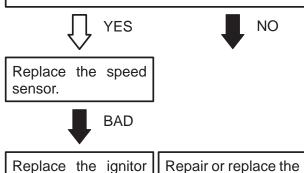
- (14) Ignitor unit
- (21) Speed sensor

EAS00843

unit.

1. Wire harness

- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- In the wire harness OK?

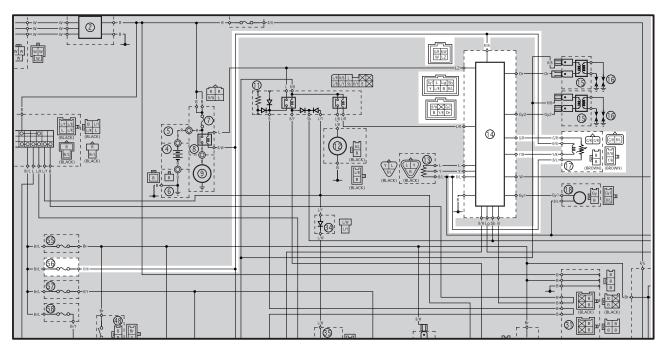


wire harness.



3. Decompression solenoid

CIRCUIT DIAGRAM



- (14) Ignitor unit
- (18) Decompression solenoid

EAS00843

1. Wire harness

- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- Is the wire harness OK?



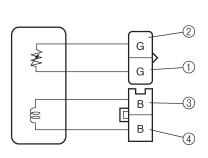
YES



Repair or replace the wire harness.

- 2. Decompression solenoid (thermistor)
- Disconnect the decompression solenoid couplers from the wire harness.
- Connect the pocket tester ($\Omega \times 10$) to the decompression solenoid coupler as shown.

Tester positive probe \rightarrow green ① Tester negative probe \rightarrow green ②



Measure the decompression solenoid resistance.



Decompression solenoid resistance (thermistor)

68.75 ~ **78.75** Ω at **25**°C

NOTE:

The resistance value for the thermistor changes when the temperature changes; therefore, measure the decompression solenoid resistance at the specified temperature.

• Connect the pocket tester ($\Omega \times 1$) to the decompression solenoid coupler as shown.

Tester positive probe → black ③
Tester negative probe → black ④



Decompression solenoid resistance 1.2 Ω at 20 °C

ELEC

- Check the decompression solenoid for continuity.
- Is the decompression solenoid OK?

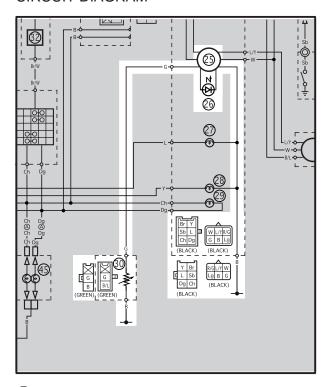




Replace the ignitor unit.

Replace the decompression solenoid.

4. Fuel level meter CIRCUIT DIAGRAM



- (25) Speedometer assembly (fuel level meter)
- 26 Fuel level indicator light
- 30 Fuel sender

EB812403

- 1. Fuel level indicator light LED
- · Check the LED of the fuel level indicator

Refer to "CHECKING THE LEDs".

Is the fuel level indicator light LED OK?



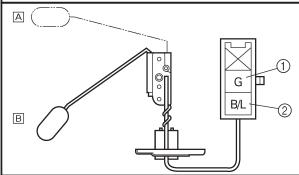


Repair the meter assembly.

2. Fuel sender

- Disconnect the fuel sender coupler from the wire harness.
- Drain the fuel from the fuel tank and remove the fuel sender from the fuel tank.
- Connect the pocket tester ($\Omega \times 10$) to the fuel sender coupler.

Tester positive probe → **green** (1) **Tester negative probe** → **black/blue** ②



Measure the fuel sender resistance.



Fuel sender resistance Full position of the float A 11 \sim 13 Ω at 20 $^{\circ}$ C Empty position of the float B 140 \sim 143 Ω at 20 $^{\circ}$ C

• Is the fuel sender OK?





NO

Replace fuel the sender.



EAS00843

- 3. Wire harness
- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- Is the wire harness OK?





Replace the meter assembly.

Replace or replace the wire harness.

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TRBL ?

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STARTING PROBLEMS

EAS00844

TROUBLESHOOTING

NOTE:

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

STARTING PROBLEMS

ENGINE

Cylinders and cylinder heads (See page 5-39 to 5-43 and 5-53 to 5-59)

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Incorrectly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Pistons and piston rings (See page 5-53 to 5-59)

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

Air filter (See page 3-7 and 3-29)

- Incorrectly installed air filter
- Clogged air filter element

Crankcase and crankshaft (See page 5-100 to 5-107 and 5-114 to 5-121)

- Incorrectly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank (See page 3-6)

- Empty fuel tank
- Clogged fuel filter
- Clogged fuel strainer
- Clogged fuel tank breather hose
- Clogged rollover valve
- Clogged rollover valve hose
- Deteriorated or contaminated fuel

Fuel pump (See page 7-46 to 7-50)

- Faulty fuel pump
- Faulty fuel pump relay

Fuel cock (See page 6-19 to 6-20)

Clogged or damaged fuel hose

Carburetor (See page 6-1 to 6-20)

- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Incorrectly installed needle valve seat
- Incorrect fuel level
- Incorrectly installed pilot jet
- Clogged starter jet
- Faulty starter plunger
- Incorrectly adjusted starter cable

STARTING PROBLEMS/ INCORRECT ENGINE IDLING SPEED

ELECTRICAL SYSTEMS

Battery (See page 3-51 to 3-56)

- Faulty battery
- Discharged battery

Fuses (See page 3-56 to 3-58)

- Blown, damaged, or incorrect fuse
- Incorrectly installed fuse

Spark plugs (See page 3-14 to 3-15)

- 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 coils (See page 7-14 to 7-15)

- Damaged ignition coil
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system (See page 7-12 to 7-16)

- Faulty ignitor unit
- Faulty pickup coil

Switches and wiring (See page 7-7 to 7-8)

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch
- Incorrectly grounded circuit
- Loose connections

Starting system (See page 7-17 to -7-27)

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cutoff relay
- Faulty starter clutch

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INCORRECT ENGINE IDLING SPEED ENGINE

Cylinders and cylinder heads (See page 5-39 to 5-43 and 5-53 to 5-59)

- Incorrect valve clearance
- Damaged valve train components

Air filter (See page 3-7 and 3-29)

Clogged air filter element

FUEL SYSTEM

Carburetor (See page 6-1 to 6-20)

- Faulty starter plunger
- · Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Incorrectly adjusted engine idling speed (throttle stop screw)
- Incorrect throttle cable free play
- Flooded carfuretor
- Faulty air induction system

ELECTRICAL SYSTEMS

Battery (See page 3-51 to 3-56)

- Incorrectly charged battery
- Faulty battery

Spark plugs (See page 3-14 to 3-15)

- 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 coils (See page 7-14 to 7-15)

- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Damaged ignition coil

Ignition system (See page 7-12 to 7-16)

- Faulty ignitor unit
- Faulty pickup coil

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE/ FAULTY GEAR SHIFTING/FAULTY CLUTCH

TRBL ?

EAS00848

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING PROBLEMS". **ENGINE**

Air filter (See page 3-7 and 3-29)

Clogged air filter element

FUEL SYSTEM

Carburetor (See page 6-1 to 6-20)

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

Fuel pump (See page 7-46 to 7-50)

Faulty fuel pump

FAS00850

FAULTY GEAR SHIFTING

SHIFTING IS DIFFICULT

Refer to "CLUTCH DRAGS".

SHIFT PEDAL DOES NOT MOVE

Shift shaft (See page 5-74 to 5-76)

- · Incorrectly adjusted shift rod
- · Bent shift shaft.

Shift drum and shift forks (See page 5-122 to 5-127)

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission (See page 5-122 to 5-127)

- Seized transmission gear
- Foreign object between transmission gears
- Incorrectly assembled transmission

JUMPS OUT OF GEAR

Shift shaft (See page 5-74 to 5-76)

- Incorrect shift pedal position
- Incorrectly returned stopper lever

Shift forks (See page 5-122 to 5-127)

Worn shift fork

Shift drum (See page 5-122 to 5-127)

- Incorrect axial play
- Worn shift drum groove

Transmission (See page 5-122 to 5-127)

Worn gear dog

EAS00851

FAULTY CLUTCH

CLUTCH SLIPS

Clutch (See page 5-60 to 5-73)

- Incorrectly assembled clutch
- Incorrectly adjusted clutch cable
- Loose or fatigued clutch spring
- Worn friction plate
- Worn clutch plate

Engine oil (See page 3-20 to 3-21)

- Incorrect oil level
- Incorrect oil viscosity (low)
- Deteriorated oil

CLUTCH DRAGS

Clutch (See page 5-60 to 5-73)

- Unevenly tensioned clutch springs
- Warped pressure plate
- Bent clutch plate
- Swollen friction plate
- Bent clutch push rod
- Damaged clutch boss
- Burnt primary driven gear bushing
- Match marks not aligned

Engine oil (See page 3-20 to 3-21)

- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

OVERHEATING/POOR BRAKING PERFORMANCE/ FAULTY FRONT FORK LEGS

TRBL ?

EAS00855

OVERHEATING

ENGINE

Cylinder heads and pistons (See page 5-53 to 5-59)

Heavy carbon buildup

Engine oil (See page 3-20 to 3-21)

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

FUEL SYSTEM

Carburetor (See page 6-1 to 6-20)

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

Ait filter (See page 3-7 and 3-29)

Clogged air filter element

CHASSIS

Brakes (See page 3-34 to 3-38 and 4-22 to 4-54)

Dragginh brake

ELECTRICAL SYSTEMS

Spark plugs (See page 3-14 to 3-15)

- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system (See page 7-12 to 7-16)

Faulty ignitor unit

FAS0085

POOR BRAKING PERFORMANCE (See page 3-34 to 3-38 and 4-22 to 4-54)

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

EAS00860

FAULTY FRONT FORK LEGS (See page 3-43 to 3-44 and 4-55 to 4-66) LEAKING OIL MALFUNCTION

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

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

UNSTABLE HANDLING/FAULTY LIGHTING OR SIGNALING SYSTEM

TRBL ?

EASOO86

UNSTABLE HANDLING

Handleber (See page 4-67 to 4-72)

Bent or incorrectly installed handlebar

Steering-head components (See page 3-41 to 3-43 and 4-73 to 4-78)

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

Front fork legs (See page 3-43 to 3-44 and 4-55 to 4-66)

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

Swingarm (See page 4-79 to 4-89)

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly (See page 4-79 to 4-89)

- · Faulty rear shock absorber spring
- · Leaking oil or gas

Tires (See page 3-45 to 3-48)

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

Wheels (See page 3-48 to 3-49 and 4-1 to 4-21)

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

Frame

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

EAS00866

FAULTY LIGHTING OR SIGNALING SYSTEM (See page 7-31 to 7-45)

HEADLIGHT DOES NOT LIGHT

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

HEADLIGHT BULB BURNT OUT

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Incorrectly grounded circuit
- Faulty main switch
- Faulty light switch
- · Faulty pass switch
- Faulty dimmer switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT LIGHT

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

TAIL/BRAKE LIGHT BULB BUTNT OUT

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

TURN SIGNAL DOES NOT LIGHT

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

TURN SIGNAL BLINKS SLOWLY

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

TURN SIGNAL REMAINS LIT

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

TURN SIGNAL BLINKS QUICKLY

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

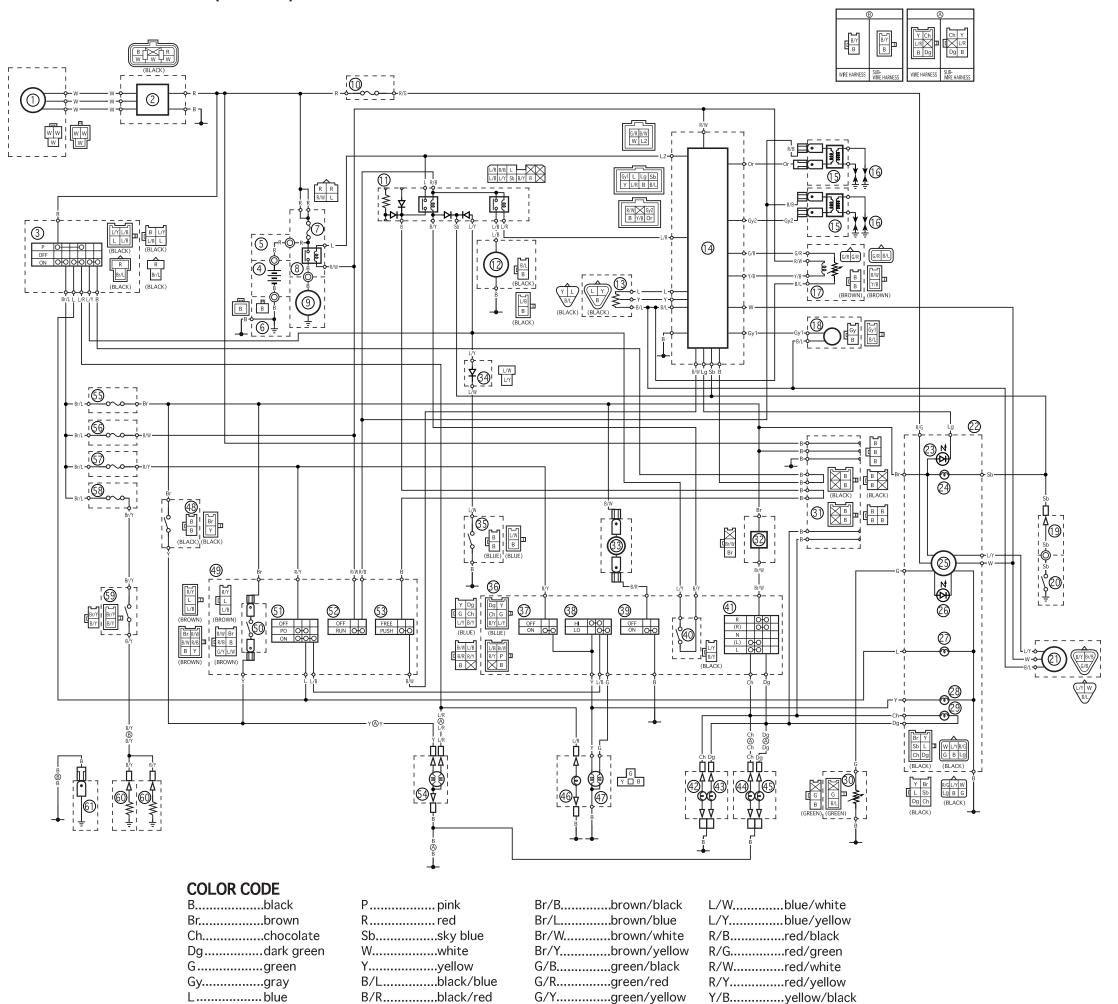
HORN DOES NOT SOUND

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

XV1600A WIRING DIAGRAM (for EUR)

Lg.....light green

Or.....orange



L/B.....blue/black

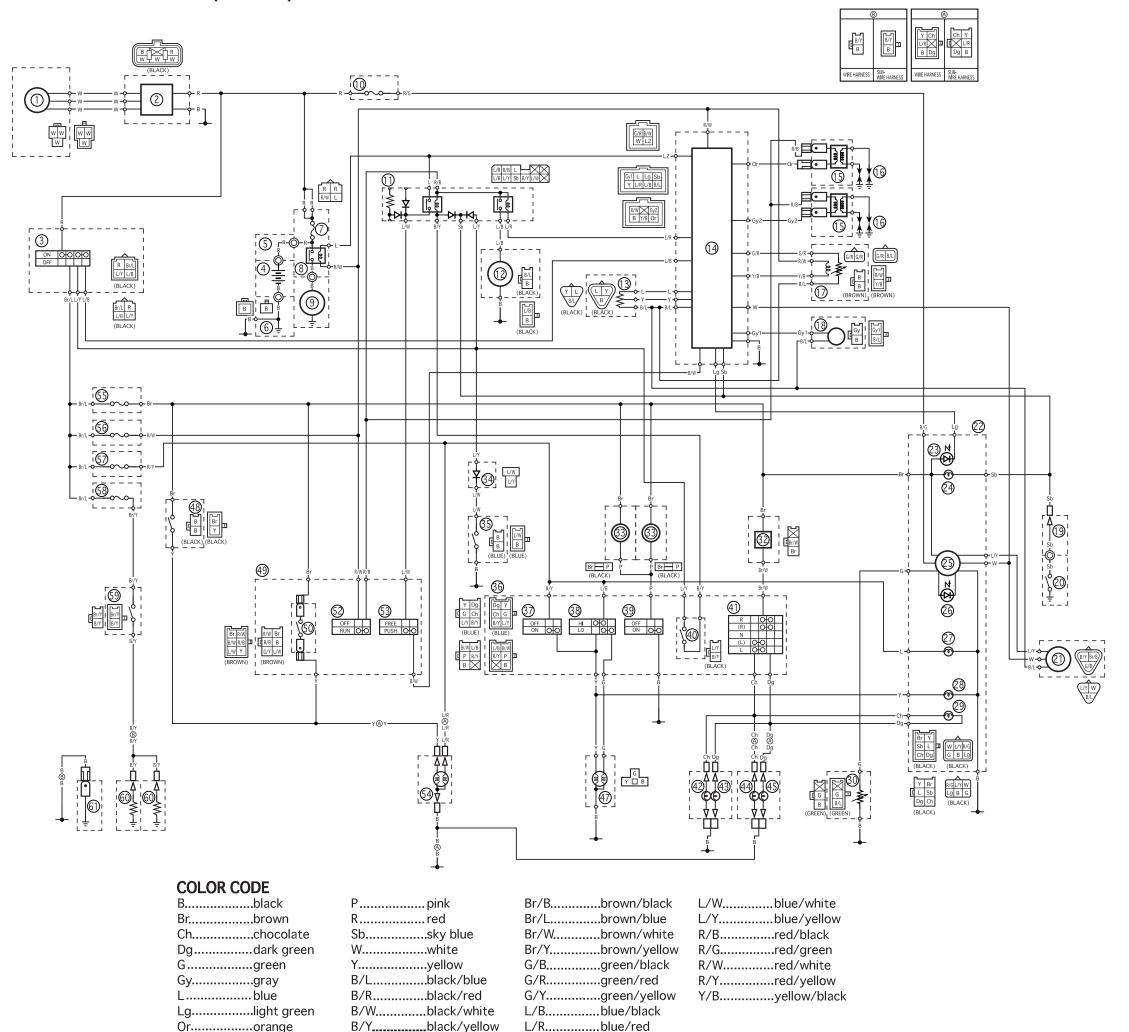
L/R.....blue/red

B/W.....black/white B/Y____black/yellow

- ① Generator (2) Rectifier/regulator
- (3) Main switch
- (4) Battery
- (5) Wireharness positive lead (6) Wireharness negative lead
- (7) Main fuse
- (8) Starter relay
- (9) Starter motor
- (10) Backup fuse
- (1) Relay unit
- (2) Fuel pump
- (13) Throttle Position Sensor
- (4) Ignitor unit
- (15) Ignition coil
- (6) Spark plug
- (7) Decompression solenoid
- (8) Pickup coil
- (19) Neutral switch lead
- (a) Neutral switch
- ② Speed sensor
- 2 Meter assembly
- (3) Engine trouble indicator light
- (4) Neutral indicator light
- (25) Speed meter assembly (speed meter, combination meter and fuel level meter)
- (26) Fuel level indicator light
- (27) Meter light
- (8) High beam indicator light
- (9) Turn signal indicator light
- (3) Fuel sender (1) Alarm
- 32 Flasher relay
- 3 Horn
- (34) Diode
- (35) Sidestand switch
- (36) Left handlebar switch
- (37) PASS swich
- (38) Dimmer switch
- (9) Horn switch
- (4) Clutch switch
- (1) Turn signal swich
- 42 Front flasher light(left)
- (43) Front flasher light(right)
- (44) Rear flasher light(left)
- (45) Rear flasher light(right)
- (6) Auxiliary light
- (47) Headlight
- (48) Rear brake light switch
- (49) Right handlebar switch
- (5) Front brake light switch
- (51) Light switch
- (2) Engine stop switch
- § Start switch
- (4) Tail/brake light
- 5 Signaling system fuse
- (56) Ignition fuse
- (57) Headlight fuse
- (58) Carbretor heater fuse
- (59) Thermo switch
- (iii) Carbretor heater
- (1) Carbretor heater ground

XV1600AL WIRING DIAGRAM (for AUS)

Or.....orange



- ① Generator
- 2 Rectifier/regulator
- (3) Main switch
- Battery
- (5) Wireharness positive lead
- (6) Wireharness negative lead
- (7) Main fuse
- (8) Starter relay
- (9) Starter motor
- (10) Backup fuse
- (1) Relay unit
- (2) Fuel pump
- (3) Throttle Position Sensor
- (14) Ignitor unit
- (15) Ignition coil
- (6) Spark plug
- (17) Decompression solenoid
- (18) Pickup coil
- (19) Neutral switch lead
- ② Neutral switch
- ② Speed sensor
- 2 Meter assembly
- 2 Engine trouble indicator light
- (4) Neutral indicator light
- Speed meter assembly (speed meter, combination meter and fuel level meter)
- © Fuel level indicator light
 Meter light
- 28 High beam indicator light
- ② Turn signal indicator light
- (3) Fuel sender (2) Flasher relay
- (33) Horn
- (34) Diode
- (35) Sidestand switch
- (36) Left handlebar switch
- (37) PASS swich
- (3) Dimmer switch
- (9) Horn switch
- (40) Clutch switch
- (1) Turn signal swich
- Front flasher light(left)
- 43 Front flasher light(right)
- (4) Rear flasher light(left)
- (45) Rear flasher light(right)
- (47) Headlight
- (48) Rear brake light switch
- (49) Right handlebar switch
- (5) Front brake light switch
- (52) Engine stop switch
- (53) Start switch
- (54) Tail/brake light \$\sqrt{5}\$ Signaling system fuse
- (5) Ignition fuse
- (57) Headlight fuse
- (58) Carbretor heater fuse
- (59) Thermo switch
- 60 Carbretor heater
- (f) Carbretor heater ground